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**GOVERNMENT OF PUERTO RICO**
**PUERTO RICO PUBLIC SERVICE REGULATORY BOARD**
**PUERTO RICO ENERGY BUREAU**

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| IN RE: ELECTRIC SYSTEM PRIORITY STABILIZATION PLAN | Case No.: NEPR-MI-2024-0005<br><br>Subject: Motion in Compliance with Resolution and Order of October 15, 2026 and Presenting Responses to Supplemental Requirements of Information (Questions 35 through 48) |

**MOTION IN COMPLIANCE WITH RESOLUTION AND ORDER OF OCTOBER 15, 2026 AND PRESENTING RESPONSES TO SUPPLEMENTAL REQUIREMENTS OF INFORMATION (QUESTIONS 35 THROUGH 48)**

**TO THE ENERGY BUREAU:**

COMES NOW, GENERA PR LLC ("Genera"), through its undersigned counsel and, very respectfully, states and prays as follows:

1. On October 15, 2026, the Puerto Rico Energy Bureau ("Energy Bureau" or "PREB") issued a *Resolution and Order* in the above-captioned proceeding (the "October 15 Resolution") concerning, among other matters, certain questions that remained pending following the Technical Conference held on September 15, 2026, regarding the temporary generation fleet associated with Priority Stabilization Plan ("PSP") Activity No. 1.

2. As explained in the *October 15 Resolution*, the Energy Bureau memorialized certain matters that Genera PR LLC ("Genera") and the Puerto Rico Electric Power Authority ("PREPA") were unable to answer during the September 15 Technical Conference and reformulated those matters as *Supplemental Requirements of Information* ("Supplemental ROIs").

3. Attachment A to the *October 15 Resolution* contains Supplemental ROIs 35 through 48, directed to Genera, and Supplemental ROIs 49 through 53, directed to PREPA. The *Supplemental ROIs* directed to Genera concern, among other matters, the (i) review of affiliate charges under the Intercompany Services Agreement ("ISA"); (ii) operation and maintenance expenditures; (iii) the condition of the TM2500 units at acquisition; (iv) the condition of certain Palo Seco units; (v) the contractual scope of major maintenance under the OMA and ISA; and (vi) the identification of certain TM2500 units and serial numbers.

4. Through the October 15 Resolution, the Energy Bureau ordered Genera to file, within fourteen (14) calendar days of notification thereof, complete responses to Supplemental ROIs 35 through 48, together with the underlying documents requested and any spreadsheets in native format with all formulas and links intact.

5. The Energy Bureau further directed that Genera's responses be submitted as a single document titled "Responses to Supplemental Requirements of Information (Questions 35 through 48)", organized by question number, with the full text of each question preceding the corresponding response and an index identifying where Genera's prior and supplemental responses may be found.

6. The *October 15 Resolution* also provides that, to the extent a response submitted by Genera on September 30, 2026 already answers a Supplemental ROI in whole or in part, Genera shall respond through a specific cross-reference identifying the applicable question number, page, and attachment and shall supplement only the remaining information rather than repeat the material previously submitted.

**7.** In compliance with the *October 15 Resolution*, Genera hereby submits, as **Exhibit A** to this Motion, its Responses to Supplemental Requirements of Information (Questions 35 through 48).

8. Exhibit A has been prepared in the format prescribed by the Energy Bureau and contains Genera's responses to Supplemental ROIs 35 through 48, together with the specific cross-references to Genera's prior submissions where applicable and the additional information responsive to the matters identified by the Energy Bureau.

9. Genera also submits, together with Exhibit A, the supporting information and documentation identified in its responses, including the documents specifically requested by the Energy Bureau. Consistent with the October 15 Resolution, this production includes the May 14, 2024 Power Engineering Consultants report and the supporting materials identified in Genera's responses, as applicable.

10. Genera respectfully submits that, through Exhibit A and the supporting documentation submitted therewith, it has provided its responses to Supplemental ROIs 35 through 48 in accordance with the requirements and format established in the October 15 Resolution. Due to their size, the exhibits to the motion will be filed separately after this motion.

11. Moreover, Exhibits 4, 5, 6, and 12 to the Responses contain confidential and protected information. Accordingly, Genera requests that Exhibits 4, 5, 6, and 12 be kept confidential pursuant to PREB's Policy on Management of Confidential Information, CEPR-MI-2016-0009, as amended on September 21, 2016. Through a separate filing, within the next ten (10) days, as set forth in Section A.2 of the PREB's policy on Management of Confidential Information, Genera will present a memorandum of law in support of its request to treat as confidential, and to protect as such, those attachments.

**WHEREFORE**, Genera respectfully requests that the Energy Bureau **TAKE NOTICE** of the foregoing; **RECEIVE AND ACCEPT** Genera's *Responses to Supplemental Requirements of Information (Questions 35 through 48)* submitted as **Exhibit A**, together with the supporting information and documentation identified therein; **ACCEPT** Exhibits 4, 5, 6, and 12 as confidential filings and allow Genera to present a Memorandum in Support of the confidentiality designations within ten (10) days of this filing; and **DEEM GENERA IN COMPLIANCE** with the *October 15 Resolution's* directive requiring Genera to respond to Supplemental ROIs 35 through 48.

**RESPECTFULLY SUBMITTED.**

In San Juan, Puerto Rico, this 26 day of October, 2026.

It is hereby certified that this motion was filed using the electronic filing system of this Energy Bureau, and that electronic copies of this Motion will be notified to the who have filed a notice of appearance in this case.

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*s/Luis R. Román Negrón*
Luis R. Román Negrón
RUA 14,265

**Docket Number:** NEPR-MI-2024-0005
**In Re:** Priority Plan for Electric Grid Stabilization
**RE:** Technical Conference of September 15, 2026; Genera PR LLC's Motion for Reconsideration of Order Denying Rescheduling of Technical Hearing; Supplemental Requirement of Information

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**PART I – QUESTIONS TO GENERA PR LLC**

**A. Review of Affiliate Charges Under the Intercompany Services Agreement**

35. In its response to ROI 20, Genera stated that the P3A reviews the pass-through amounts billed under the ISA. At the Technical Conference, Genera could not state whether the P3A reviews and approves each invoice of Genera Services LLC before it is paid or whether its involvement is limited to the possibility of an audit after payment. State precisely:

a) the step-by-step process by which an invoice of Genera Services LLC under the ISA was received, reviewed, approved and paid by Genera PR LLC, identifying each person or office that reviewed it – within Genera, at the P3A and at PREPA – what each reviewed, and the form in which each recorded its approval;

**Response:**

Please see **Exhibit 1**- "Written Procedure by Genera" and **Exhibit 2**- "Written Procedures by Genera Services (process workflow)".

b) whether the P3A reviewed and approved every invoice before payment; if so, provide the P3A's approval for each invoice issued in FY2025 and FY2026;

**Response:**

P3A does not approve each invoice payable by Genera to its suppliers, including subcontractors, before payment is made. Concurrently with each disbursement, Genera provides P3A with notice identifying the suppliers paid and the amounts disbursed for P3A's review and consideration. P3A reviews these expenditures and may issue follow-up requests for information (RFIs), to which Genera is obligated to respond. P3A is actively reviewing Pass-Through Expenditures.

c) if the P3A's involvement consists of an audit right rather than invoice-by-invoice approval, each audit or review the P3A performed of ISA charges in FY2025 and in FY2026 through the date of the response, stating its date, scope, the periods and amounts covered, its findings, any amount questioned or disallowed, and providing a copy of each audit report, finding or related communications; and

**Response:**

P3A issues RFIs to review Pass-Through Expenditures on May 27, 2026, June 8, 2026, and September 22, 2026. P3A is actively reviewing all Pass-Through Expenditures. Please see **Exhibit 3**- "P3A Reviews of Pass-Through Expenditures"

d) the same information for any review of ISA charges performed by PREPA.

**Response:**

PREPA has visibility on service account payments and has requested invoices from time to time.

36. Provide each monthly invoice issued by Genera Services LLC to Genera PR LLC under the ISA for the period August 1, 2024 through June 30, 2026, together with the supporting documentation that accompanied it, in the form in which it was received and approved. For each invoice, identify the tasks, services, parts and labor billed – by unit where the charge is unit-specific and by site where the charge is shared – so that the Energy Bureau can distinguish the tasks invoiced on units that were out of service from those invoiced on units that were operating in the same month. Provide, in native Excel format, a summary by invoice, month, site and unit that reconciles to the FY2025 and FY2026 amounts charged against the $17 million allocation as reported in Genera's response to ROI 9. For any month in the period in which no invoice of Genera Services LLC was issued – including any month after the April 2026 transfer of the TM2500 operation to Genera PR LLC's own personnel – so state and identify how TM2500 costs were charged to the allocation in that month.

**Response:**

Please see **Exhibit 4**- "Genera Services & New Fortress Invoices [Confidential]" and **Exhibit 3**- "P3A Reviews of Pass-Through Expenditures"

**B. Operation and Maintenance Expenditures**

37. Genera's response to ROI 9 reports preventive-maintenance expenses for the fourteen (14) units of $324,509 in FY2025 and $2,370,436 in FY2026 – a more than sevenfold increase – against total charges of $15,567,401 and $16,861,407 in those years. At the Technical Conference, Genera could not explain the change. State:

a) what the FY2025 preventive-maintenance amount comprised, by unit and by task, and how a fleet of fourteen (14) units subject to manufacturer-prescribed maintenance intervals incurred only that amount in a full fiscal year;

**Response:**

During FY2025, preventive maintenance activities were performed across the TM2500 fleet, with 678 maintenance task entries documented across 13 generating units. These activities included instrumentation calibration, filter replacements, mechanical inspections, lubrication, and battery maintenance. The scope of maintenance varied by unit based on operational requirements and equipment condition, as detailed in the attached maintenance breakdown.

Unit 9 remained out of service due to a breaker cubicle failure and required major repairs. Additionally, its hot section was utilized to replace the failed hot section on TM4, further delaying Unit 9's return to service. As a result, Unit 9 did not undergo routine preventive maintenance during this period.

b) what the FY2026 amount comprised, by unit and by task;

**Response:**

The charges comprise a combination of preventive maintenance, contractor services, parts, corrective maintenance, and other operations and maintenance (O&M) expenses. These costs were recorded and reviewed by expenditure category rather than allocated to individual generating units. Accordingly, a unit-level breakdown is not available from the underlying accounting records. This presentation reflects the level at which the costs were incurred and maintained in the ordinary course of business and does not indicate that the expenditures were unclassified or unsupported.

c) whether the change reflects additional work performed, a reclassification of costs between categories (for example, from "corrective maintenance," "external contractors" or "other O&M expenses"), or a change in the entity performing or invoicing the work.

**Response:**

The charges reflect a combination of costs classified among preventive maintenance, contractor services, parts, corrective maintenance, and other operations and maintenance (O&M) expense categories. Accordingly, the change is attributable to the allocation and classification of the underlying costs across these categories, rather than solely to a single category of expenditure.

38. Attachment 4 to Genera's responses identifies Patriot Power Group LLC among the vendors whose charges were passed through to the TM2500 allocation under "External Contractors" in FY2025 and in FY2026. At the Technical Conference, Genera could not state what services that vendor provides. State: a)the services Patriot Power Group LLC provides or provided for the TM2500 units, at which site, and under what contract or purchase order – parties, date, term, scope, pricing structure and the entity that engaged it – providing a copy; b)the total amount charged to the TM2500 allocation for that vendor in each of FY2025 and FY2026, and the deliverables or work records that support those charges; c)whether the vendor was selected through a competitive process and whether it is affiliated with Genera or with New Fortress Energy Inc.; and d) whether its services continued after the April 2026 transfer of the operation to Genera PR LLC and, if so, under what instrument and at what cost.

**Response:**

Please see **Exhibit 5**–"Patriot Power Group POs and Approvals [Confidential]"

39. At the Technical Conference, Genera identified the supply of demineralized water for the unit's water-injection systems as one of the larger recurring costs charged to the allocation, but could not state whether that cost is fixed or vary with the units in operation. Identify the supplier and the contract – parties, date, term and pricing structure – and provide a copy. State whether the charges are fixed or vary with the units in operation or the hours run, and provided the monthly amounts charged to the TM2500 allocation in FY2025 and FY2026. State whether the contract was renegotiated, reduced or suspended for any period in which units were out of service and, if not, why not.

**Response:**

The supplier of demineralized water treatment services for the TM2500 units at the San Juan and Palo Seco Power Plants is Veolia, pursuant to the existing agreement with Genera PR LLC.

The costs associated with this agreement are fixed and only vary based additional maintenances not covered by contract, not on the number of units operating or their operating hours.

As part of its ongoing efforts to optimize operational expenditures, Genera evaluated the services provided under the agreement and determined that these functions could be performed internally at a lower cost. Accordingly, Genera decided not to renew the agreement upon its expiration in November 2026 and to transition the associated functions to its internal personnel. This initiative is expected to generate approximately $165,000 in savings per plant per Month.

To facilitate this transition, Genera invested approximately $180,000 at the San Juan Power Plant to interconnect the existing treated-water storage tank serving the temporary generation units with the filling line for the plant's existing water storage tanks. This improvement will facilitate the integration of

existing infrastructure and support the internal operation of the water treatment systems following the expiration of the Veolia agreement.

Please see **Exhibit 6** "Demineralized Water Agreements and Invoices [Confidential]".

**C. Condition of the Units at Acquisition**

40. At the Technical Conference, Genera stated that a letter it received from the P3A in August 2026 attached a report dated May 14, 2024, prepared by Power Engineering Consultants on the condition of the TM2500 units and addressed to an engineer of PREPA, which Genera had not previously located in its own records. PREPA's counsel stated that PREPA's representatives had no knowledge of the report and asked that it be made part of the record. The report states that its authors did not perform the borescope inspections on which it relies, and that they used borescope inspection reports provided by PREPA. Genera shall file:

a) a complete copy of the May 14, 2024 report, with all attachments and appendices, and of the P3A's August 2026 transmittal letter with its enclosures;

**Response:**

Please see **Exhibit 7**- PEC Report (May 14, 2024) and P3A Transmittal. Genera can certify that this document was sent by P3A on August 25, 2026, and that it identifies PREPA staff as the apparent recipient, but it cannot certify the completeness or accuracy of the information.

b) a statement of when and how Genera first obtained the report, and of the search Genera made of its own records and of the records transferred to it by Genera Services LLC and NFE Power LLC;

**Response:**

Genera first became aware of this report on August 25, 2026, when P3A shared that information as part of an RFI. Please see **Exhibit 7**

c) for each unit for which the report identified a condition or recommended corrective or major maintenance, whether that maintenance was performed, by whom, at whose cost and when, and whether the unit was later removed from service for the condition the report identified; and

**Response:**

Please see **Exhibit 8**- "Status of PEC Report Recommendations by Unit"

d) whether Genera, upon obtaining the report, referred it to PREPA or to the P3A for purposes of the side letter or of the representations and warranties of the APA, and, if not, why not;

**Response:**

This report was received from P3A in August 2026. The report was issued in PREPA's name and addressed to a PREPA employee who is currently a contractor for the P3A. Additionally, the Executive Director of PREPA at the time that the report was issued was Josue Colón, the current Executive Director of P3A. Therefore, Genera understood that it didnt have to share this document with PREPA nor P3A. See **Exhibit 7.**

e) the date on which Genera assumed the operation and maintenance of the TM2500 units, and the instrument – side letter, amendment, letter agreement or otherwise – under which it did so;

**Response:**

Genera assumed "operation" of the TM2500s under a side letter to the OMA dated March 15, 2024. This side letter does not discuss any other obligations related to the TM2500s. It is silent on (and did not transfer) obligations like existing contract administration, asset hand-over and acquisition, warranty enforcement, reporting, and other services provided under the OMA in respect of the listed Legacy Generation Assets (LGAs). If P3A & PREPA had wanted to convey those responsibilities to Genera, they would have done so clearly, just as they did in the OMA with respect to the LGAs, through an amendment rather than a side letter. In fact, the OMA side letter does not mention the APA side letter at all. From Genera's records, neither PREPA nor P3A ever provided the APA side letter - a non-public document - to Genera or requested Genera to take any action under it within the relevant time period. The OMA side letter does not offer any additional compensation for taking over the operation of TM2500s, and while confirming that Genera receives the benefits and protections of the OMA in respect of the TM2500s, it does not say it confers any additional liability or penalty on Genera.

f) the documentation Genera requested from PREPA and from NFE Power PR LLC or its affiliates in order to assume that operation and maintenance – inspection and borescope reports, maintenance histories, operating logs, manufacturer manuals and services bulletins, open work orders and spare-parts records – and the documentation actually received, identifying for each item the date requested, the date received, identifying for each item the date requested, the date received and the party that provided it; state specifically whether Genera received the TM2500 inspection and borescope reports referenced in Schedule 5.6 of the APA Disclosure Schedules and those on which the May 14, 2024 report relies, and if it did not, whether it asked for them; and

**Response:**

Genera did not have responsibility for enforcing the APA, as PREPA retained that responsibility. Moreover, the OMA restricts Genera from making independent determinations regarding compliance with contracts involving its affiliates, including matters related to contract warranties. Accordingly, Genera was not tasked with evaluating or enforcing NFE's or its affiliates' obligations under the APA.

Rather, PREPA and P3A requested that Genera assume the prospective operation of the TM2500 units, not responsibility of assessing compliance with the APA or enforcing obligations arising thereunder.

As stated in the hearing, beginning April 2026, NFE provided Genera with certain technical documentation related to the TM2500 units. Copies of the documentation received are submitted herewith as **Exhibit 11**-"Technical Documentation"

g) a complete copy of every contract and operation and maintenance agreement between Genera and the affiliate responsible for the operation and maintenance of the TM2500 units from April 2024 through June 2026 – the ISA with all of its exhibits and any

amendment, together with every work order, task order, service schedule or similar instrument issued under it – to the extent not already filed in response to ROI 22.

**Response:**

The only agreement Genera PR LLC made with the affiliate is the ISA already provided in prior RFI's.

**D. Borescope Inspections and Risk Evaluations**

41. Attachment 1 reports borescope inspections of the fourteen (14) units in June 2026 and their results, and a "last semi-annual" inspection date for each unit between January and March 2026. At the Technical Conference, Genera could not state who performed the June 2026 inspections or at what cost, what other borescope inspections were performed between 2024 and 2026 and what they found, or whether a written technical and risk evaluation follows a finding that a hot section is damaged; Genera also stated that it applies an annual borescope interval, whereas the manufacturer's published maintenance recommendations for the TM2500 call for a borescope inspection every six (6) months or 4,000 operating hours. State:

a) for every borescope inspection performed on any of the fourteen (14) units from January 1, 2024 through the date of the response including those performed before closing and referenced in Schedule 5.6 of the APA Disclosure Schedules, those performed while Genera Services LLC operated the units, and those of June 2026 the date, the unit, the entity that performed it, the operating hours at inspection, its cost and the account to which the cost was charged, and provide the inspection report; if no inspection was performed on a unit in any twelve month period since January 1, 2024, so state and explain why;

**Response:**

Please see **Exhibit 9**- "Borescope Inspections 2024–2026" and **Exhibit 10**- "Borescopes Report_FY24-FY26"

b) for each unit, what the inspections performed in 2024 and 2025 found in the hot section, and how those findings compare with the findings of June 2026;

**Response:**

Please see **Exhibit 9**- "Borescope Inspections 2024–2026" and **Exhibit 10**- "Borescopes Report_FY24-FY26"

c) whether the semi-annual inspections recorded in Attachment 1 for January through March 2026 included a borescope of the hot section and, if so, what they found and to whom the findings were reported;

**Response:**

Yes. The inspections conducted between January and March 2026 included borescope inspections of the hot section, which were performed by GESA. The corresponding inspection reports were provided to Genera. The findings were subsequently evaluated by GE Vernova, the Original Equipment Manufacturer (OEM).

d) whether, after each inspection that found a hot section damaged or not serviceable, Genera prepared a written technical evaluation and risk assessment supporting the decision to continue operating the unit, and provide each such evaluation; if none exists, so state, and describe the basis on which the decision to continue operating was made and who made it;

**Response:**

GESA performed the borescope inspections, and the inspection findings were subsequently evaluated by GE Vernova, the OEM. Following its evaluation, GE provided its technical recommendations and proposed maintenance plan, included as **Exhibit 12**- "GE Vernova Root-Cause Assessment [Confidential]"

Genera relied GE Vernova's technical assessment and recommendations to evaluate the condition of the units and determine the appropriate maintenance actions.

However, decisions regarding the continued operation of individual units also considered the generation requirements of Puerto Rico's electrical system, particularly the limited availability of generation capacity and operating reserves. Accordingly, Genera evaluated the recommended maintenance activities in conjunction with the need to maintain sufficient generation capacity to support system reliability and meet the operational requirements of the system operator.

e) why Genera has applied an annual borescope interval when the manufacture's published recommendations call for an inspection every six (6) months or 4,000 operating hours, whichever occurs first; identify the document on which Genera relies for the interval it applies; state, for each unit that remains in service, the operating hours accumulated since its last borescope and the date on which it will next be inspected; and state whether Genera will conform its interval to the manufacturer's recommendation and, if not, why not; and

**Response:**

On September 17, 2026, Genera held a meeting with GE Vernova, the OEM, who confirmed that the maintenance interval is 4000 operating hours, 450 fired starts, or annually, whichever comes first. This maintenance interval is also established in the manufacturer's technical document GEK 105054.

f) the status of the failure-mode and root-cause analysis that Genera has entrusted to the original equipment manufacturer and that its responses describe as pending: the date it was commissioned, the contract or purchase order under which it is being performed and its cost, its scope, the units and failure modes it covers, the date by which the manufacturer has committed to deliver it, and any interim findings or recommendations received to date, with copies.

**Response:**

This service is covered by the customer service relationship provided by GE Vernova. Therefore, no task order or additional contract is needed. Genera requested GE Vernova's support back in March 2026. The assessment was completed by GE Vernova on October 2, 2026. Please see **Exhibit 12**- "GE Vernova Root-Cause Assessment [Confidential]".

**E. Palo Seco Units – Transformer and Fuel Nozzles**

42. Genera's response to ROI 5 (e) states that the fuel nozzles of Palo Seco Unit 3 were replaced and that the unit is "awaiting a replacement Main Power Transformer," with a return to service in six (6) to eight (8) weeks. Attachment 2 to the same response attributes the transformer problem to Palo Seco TM02 – out of service since August 6, 2026 – under a $67,800 contract with Electricoop for conservation works and tests "to confirm the integrity" of the transformer, not a replacement, and lists TM03 as awaiting a Siemens hot-section exchange with an estimated return to service of six (6) to eight (8) weeks after the contract is awarded. At the Technical Conference, Genera could not state which unit has the transformer problem or whether the transformer is being repaired or replaced. State:

**Response:**

Genera clarifies that Palo Seco TM03 is currently out of service due to hot section damage. Replacement fuel nozzles have been ordered for this unit but have not yet been installed. GE Vernova has recommended a major overhaul for this unit and a final determination regarding the recommended maintenance work remains is pending PREBs review and approval.

a) which unit or units at Palo Seco have a main power transformer failure, the date and nature of each failure and its root cause;

**Response:**

The TM2500 installation works were designed and completed as temporary under a mission assignment by FEMA and the United States Corps of Engineers. As a result, the main power transformer serving Block 3 was not equipped with zone protection. On August 6, 2026, this transformer experienced a failure, affecting Units TM02 and TM04, both of which are connected to it. Genera is currently working on integrating zone protection.

b) whether the transformer is being repaired or replaced; if replaced, the source of the replacement (new, spare or transferred from another unit), its vendor, cost, order date and delivery date; if repaired, the scope, contractor, cost and completion date of the repair, and the purpose and status of the Electricoop contract;

**Response:**

The transformer is currently neither undergoing repair nor being replaced. As an interim measure, TM02 has been connected to Block 2 transformer, which previously served TM01. Genera is currently in the process of identify a suitable replacement transformer.

c) the return-to-service date for each of Palo Seco TM02 and TM03, identifying every approval, funding certification and contract award on which each date depends and the current status of each; and

**Response:**

**TM03:** GE Vernova, has recommended a major overhaul for the unit. A final determination regarding the recommended work remains pending PREBs approval. Accordingly, an estimated return to service date is TBD.

**TM02:** A contract in the form of a Task Order has been awarded to Electricoop. Pro-Energy is currently performing the connection and verification of the protection relays. The unit is expected to return to service on November 10, 2026, subject to the satisfactory competition of all required testing.

d) a corrected response to ROI 5 (e) and a corrected Attachment 2, if either is wrong.

**Response:**

**Palo Seco Unit TM03** – At the time of the response, the information provided was the correct. The unit was awaiting approval by FOMB of the Siemens Contract No. 368192 for a hot section exchange. Upon approval, the unit was expected to return to service withing approximately 20 to 30 days, depending on shipping and hot section availability.

**Palo Seco Unit TM04**: During the VSV repair activities, the contractor determined that the necessary repairs could not be completed on site and recommended sending the unit to the mainland for repair. The estimated return to service timeframe is approximately 160 days from contract award. Funding for these repairs has not yet been identified.

43. ROI 5 (j) asked for the fuel-nozzle replacement history at Palo Seco since January 1, 2024; Genera deferred that response, and the "Last Change Fuel Nozzle" column of Attachment 1 is blank for every unit. Genera's responses to ROI 5 (a) and 5(b) attribute the failure of Palo Seco Unit 3 to an exhaust temperature spread suspected to result from "dirty or restricted fuel nozzle," while the planned-actions table of Attachment 1 attributes the unit's condition to a high temperature spread and hot-section damage. At the Technical Conference, Genera could not say whether it tracks fuel-nozzle changes, what the manufacturer's interval is, or whether the units whose nozzles require replacement had operated on diesel. State:

a) whether Genera tracks fuel-nozzle inspections and replacements for each unit and, if so, provide the record for each of the fourteen (14) units since January 1, 2024 – date, unit, nozzle set, reason, operating hours at the change, vendor and cost – completing the blank column of Attachment 1;

**Response:**

Records received from NFE are not complete, so the table (Please see **Exhibit 13**- "Fuel Nozzle Record") shows the information available; however Genera knows of the importance of these records and will keep these information updated as replacements are made.

b) the manufacturer's inspection and replacement interval for fuel nozzle when operating on ultra-low sulfur diesel and on natural gas, and whether it has been followed on each unit;

**Response:**

There is no fixed replacement interval for fuel nozzles. Replacement is determined based on their condition during operation and on annual inspections.

When an inspection identifies a potential issue, Genera first attempts to clean and service the affected fuel nozzles. If these corrective measures are unsuccessful, the fuel nozzles are replaced, subject to the availability of suitable components.

c) for each unit whose fuel nozzles currently require replacement – including each unit that Attachment 1 identifies as unable to operate on diesel for that reason – whether the unit has operated on diesel since PREPA's acquisition and for how many hours, the date the need for replacement was identified, the date the unit became unable to operate on diesel, and the date on which the system operator was notified of that restriction; and

**Response:**

The units operate on diesel as needed because they are dual-fuel capable. However, their ability to run on diesel is primarily limited by two issues: defective fuel nozzles, damaged hot sections, or a combination of both.

Currently, San Juan Units 2, 4, and 7 are unable to operate on diesel. Unit 2 is experiencing a high-temperature spread, although its hot section is serviceable following replacement in August 2026; the unit requires new or refurbished fuel nozzles. Units 4 and 7 are affected by both a high-temperature spread and damaged hot sections, so replacing the fuel nozzles alone would not resolve the issue.

Fuel nozzles and hot-section components are being sourced to restore the units' full dual-fuel capability and improve their reliability.

d) the cause of failure Genera assigns to Palo Seco Unit 3 – fuel nozzles, hot-section damage, or both – reconciling its responses to ROI 5 (a) and 5 (b) with Attachment 1 and providing the inspection or borescope report that supports that determination;

**Response:**

The condition identified at Palo Seco TM2500 Unit 3 involved both fuel-nozzle issues and hot-section damage.

Initially, the unit experienced an exhaust temperature spread condition suspected to be associated with dirty or restricted fuel nozzles, as previously reported in Genera's response to ROI 5(a) and 5(b).

However, subsequent borescope inspections identified additional damage to the hot section, establishing that the required corrective work extended beyond the fuel nozzles and included major maintenance of the hot section.

Accordingly, the information provided in Attachment 1 reflects the additional findings identified through the subsequent inspection and is not inconsistent with the initial assessment of the fuel-nozzle condition. Also, GE Vernova recommended a major overhaul for TM2500 Unit 3 and Genera is waiting for PREBs approval on this matter.

e) a detailed description of the fuel-nozzle inspection methodology and certification process Genera applies: the inspection and flow-test procedures used, the acceptance criteria, who performs the inspections, the qualifications and certifications the technicians hold, and whether the nozzles are sent to a manufacturer-certified shop for inspection, cleaning, flow testing and certification, identifying the shop; and

**Response:**

Genera conducts fuel-nozzle inspections on a semiannual basis as part of its preventive maintenance activities.

When a fuel nozzle exhibits operational deficiencies, Genera's maintenance personnel initially attempt to clean and service the component internally to restore its functionally.

If the fuel nozzle continues to exhibit deficiencies following these corrective measures, Genera evaluates whether a suitable replacement is available from another unit that is out of service. When an appropriate component is available, it may be transferred and installed in the affected unit.

If no suitable replacement is available, Genera proceeds with the procurement of new fuel nozzles, which generally have an estimated lead time of approximately ten (10) weeks.

Genera does not routinely send fuel nozzles to an external inspection or repair facility, as no such specialized facility is available in Puerto Rico. Instead, Genera performs the cleaning and maintenance activities internally and procures replacement necessary.

f) the written fuel-nozzle inspection and certification reports for each unit since January 1, 2024; if no written report exists for an inspection, so state.

**Response:**

There are currently no written reports for fuel nozzle replacements.

**F. The Side Letter to the Asset Purchase Agreement**

44. The side letter to the APA provided up to seven (7) major-maintenance completions at the Seller's sole cost, upon written request of the Buyer no later than twelve (12) months following closing. Genera's response to ROI 24 (a) states that "[i]n 2024, Genera requested use of the major maintenance services," that three (3) were completed, and that "the remainder contractual major maintenance is under negotiation"; its funding table assigns four (4) units to "Major Maintenance by Seller." At the Technical Conference, Genera could not produce or identify the request referred to in its response, its date or the instrument under which it was made, and could not state the Seller's position on the four (4) remaining completions or when that position will be known. Genera shall provide:

a) every written communication, by e-mail or otherwise, by which Genera or its personnel requested, scheduled or discussed with the Seller or any of its affiliates the performance of major maintenance under the side letter, identifying the date, sender, recipient and the unit or units referred to;

**Response:**

Please see **Exhibit 14**- "Communications with NFE on Major Maintenance"

b) for each of the three (3) completions performed, the unit, the scope of work actually performed, the dates of performance, the party that bore the cost and the completion certification obtained, and whether Genera contends that the work counts as a "major maintenance" within the meaning of the side letter, given that the certificates in Attachment 5 and 6 describe compressor work on two (2) of the three (3) units;

**Response:**

Although Genera is not responsible for interpreting or enforcing contractual compliance under the APA, from a technical standpoint Genera understands that the three works performed by Siemens Energy for Unit GT2(557-121), for Unit (481-717), and for Unit (557-259) are generally considered major maintenances.

c) the status of the negotiation with the Seller – its participants, the date of each communication since it began, the Seller's stated position on the twelve month period and on the four (4) remaining completions – with copies of the correspondence;

**Response:**

Back in July 28, 2025, NFE expressed that the major maintenances under the APA were expired. However, after that date, Genera has been trying to mediate with NFE for the execution of the requested maintenance. The only response received from NFE in writing was the one from July 28, 2025 (See **Exhibit 14**- "Communications with NFE on Major Maintenance"). All other communications have been informal and verbal.

If PREPA or P3A understand that a legal claim or further formal enforcement action needs to be raised, PREPA should take that forward. Genera would in any case be prohibited from participating due to the OCI.

d) whether, before March 15, 2025, Genera recommended to PREPA or to the P3A which units should be nominated under the side letter, and whether anyone at PREPA or at the P3A asked Genera for that recommendation, with copies of the communications;

**Response:**

The request was directly to NFE, (See **Exhibit 14**- "Communications with NFE on Major Maintenance").

Genera understands PREPA received a report from PEC in May 2024 recommending units for maintenance; P3A received the report prior to Genera and provided Genera a copy in August 2026. This report would have provided sufficient information for PREPA to notify NFE of its intent to use the maintenance under the side letter. Following search of its records, it does not appear that PREPA or P3A provided the APA or maintenance side letter to Genera or requested Genera to provide any input take any responsibility or action regarding such agreements or the PEC report, until after the relevant maintenance period expired. For its part, Genera requested maintenance to be performed directly to NFE, (See **Exhibit 14**- "Communications with NFE on Major Maintenance").

e) whether Genera, before March 15, 2025, requested or recommended the nomination under the side letter of San Juan TM09 – out of service since its switchgear failure of January 8, 2025 and marked in Genera's own schedule as requiring a hot section – or of Palo Seco TM03 and TM04, the units then closest to their manufacturer's milestone, and, if not, why not;

**Response:**

In May 6, 2024, NFE and Genera personnel exchanged emails communications regarding the Major Maintenance Schedule, (See **Exhibit 14**- "Communications with NFE on Major Maintenance"). The Schedule shared among NFE and Genera was:

**San Juan:**

- November 11, 2024: TM2
- December 16, 2024: TM3
- January 13, 2025: TM 4
- February 10, 2025: TM6

**Palo Seco:**

- May 13, 2024: PS1 – completed on May 17, 2024.
- April 16, 2024: PS2 – completed on May 2, 2024.
- April 22, 2024: PS4 – completed on May 2, 2024.

f) who decided which units would receive the three (3) completions performed under the side letter and who decided which units would be repaired with other funds; the criteria applied in each case – operating hours, borescope findings, availability need, cost, parts availability or other – and the documents in which those decisions and criteria are recorded; and

**Response:**

The determination to perform major maintenance of Units 557-121, 481-717, and 557-259 back in May 2024 was made due to unit conditions. For the rest of the units, the criteria was the borescope findings and GE Vernova Work Plan.

g) a copy of the request for an amendment of the OMA that Genera stated at the Technical Conference it made to the P3A in connection with these units, and of the P3A's response.

**Response:**

See **Exhibit 15**- "FW P3A - Temporary Units – Acknowledgment"

## G. Contract Scope of Major Maintenance Under the OMA and the ISA

45. At the Technical Conference, Genera answered affirmatively to each of the following: that, under the ISA, the services Genera Services LLC provides to Genera PR LLC are defined by reference to the O&M Services under Section 5 and Annex IX of the OMA; that Section 5.1 of the OMA defines the O&M Services as "management, operation, maintenance, repair, restoration, replacement and other related services" for the Legacy Generation Assets, "in accordance with the Contract Standards"; that Annex IX, Section I.A, makes the Operator responsible for "day-to-day operation and maintenance (including any major maintenance) services" and for "performing scheduled and emergency maintenance, repair and replacement of equipment"; and the Annex IX, Section VII.A, requires the Operator to "perform all normal and ordinary maintenance (including any major maintenance)" and to "conduct predictive, preventive and corrective maintenance … as required by the Contract Standards," which are defined to include "applicable equipment manufacturer's specifications and reasonable recommendations." Genera asked that the conclusion drawn from those provisions be put to it in writing. It follows from the provisions Genera confirmed that:

(i) a hot-section inspection or exchange on a TM2500 unit, when due under the manufacturer's interval, is major maintenance required by the Contract Standards;

**Response:**

Genera respectfully objects to this question because it calls for a legal interpretation that may affect potential legal claims or defenses. In the event that a contractual dispute arises, the appropriate forum for the presentation and adjudication of all legal arguments is the Courts of the Commonwealth of Puerto Rico. Advancing legal interpretations in the context of this administrative proceeding could prejudice or otherwise affect the parties' positions in any future contractual dispute. Without waiving this objection, Genera remains willing to cooperate and assist in this matter. Accordingly,

Genera will make available any information or documents within its possession, custody, or control that evidence: (1) Genera's efforts to request the scheduling of the maintenance from NFE; and (2) NFE's scheduling of such maintenance.

(ii) it is therefore an O&M Service under Section 5 and Annex IX of the OMA;

**Response:**

Genera respectfully objects to this question because it calls for a legal interpretation that may affect potential legal claims or defenses. In the event that a contractual dispute arises, the appropriate forum for the presentation and adjudication of all legal arguments is the Courts of the Commonwealth of Puerto Rico. Advancing legal interpretations in the context of this administrative proceeding could prejudice or otherwise affect the parties' positions in any future contractual dispute. Without waiving this objection, Genera remains willing to cooperate and assist in this matter. Accordingly, Genera will make available any information or documents within its possession, custody, or control that evidence: (1) Genera's efforts to request the scheduling of the maintenance from NFE; and (2) NFE's scheduling of such maintenance.

(iii) it is therefore within the services that Genera Services LLC performed or procured, and invoiced to Genera PR LLC, under the ISA; and

**Response:**

Genera respectfully objects to this question because it calls for a legal interpretation that may affect potential legal claims or defenses. In the event that a contractual dispute arises, the appropriate forum for the presentation and adjudication of all legal arguments is the Courts of the Commonwealth of Puerto Rico. Advancing legal interpretations in the context of this administrative proceeding could prejudice or otherwise affect the parties' positions in any future contractual dispute. Without waiving this objection, Genera remains willing to cooperate and assist in this matter. Accordingly,

Genera will make available any information or documents within its possession, custody, or control that evidence: (1) Genera's efforts to request the scheduling of the maintenance from NFE; and (2) NFE's scheduling of such maintenance.

(iv) as a Pass-Through Expenditure under Section 7.2 and Annex XII of the OMA, it is payable from the Operating Budget for these units – the $17 million annual allocation – as Genera has itself done for the San Juan TM02 hot section, which its own table reports as "Completed using O&M funds," and proposes to do for additional units.

**Response:**

Genera respectfully objects to this question because it calls for a legal interpretation that may affect potential legal claims or defenses. In the event that a contractual dispute arises, the appropriate forum for the presentation and adjudication of all legal arguments is the Courts of the Commonwealth of Puerto Rico. Advancing legal interpretations in the context of this administrative proceeding could prejudice or otherwise affect the parties' positions in any future contractual dispute. Without waiving this objection, Genera remains willing to cooperate and assist in this matter. Accordingly, Genera will make available any information or documents within its possession, custody, or control that evidence: (1) Genera's efforts to request the scheduling of the maintenance from NFE; and (2) NFE's scheduling of such maintenance.

## H. Intercompany Invoices and Seconded Employees

46. The ISA provides for periodic intercompany invoices with a reasonably detailed description of the services and supporting documentation on request, and allows Genera PR LLC to withhold disputed amounts. At the Technical Conference, Genera could not state whether it had ever questioned, rejected or withheld an intercompany charge. For FY2025 and FY2026, state:

    a) the number and total amount of intercompany invoices for TM2500 charges that Genera PR LLC received under the ISA, by month;

**Response:**

Please see **Exhibit 4**- "Genera Services & New Fortress Invoices [Confidential]"

b) the number of invoices or the line items that Genera questioned, rejected or withheld, the amounts involved, the reasons, and the resolution of each;

**Response:**

Please see **Exhibit 16** "Rejected Invoices" and **Exhibit 17**- "List of Invoices rejected"

c) the documentation Genera required before approving an intercompany invoice – timesheets, vendor invoices, allocation workpapers, proof of payment – and the written procedure or policy that established that requirement, with a copy; and

**Response:**

Please see **Exhibit 1**- "Written Procedure by Genera"

d) one documented example of a change rejected or reduced. If Genera never questioned, rejected or withheld an intercompany charge, it shall so state.

**Response:**

Please see response to RFI 46 (b).

47. State whether the list of employees seconded under the ISA (Exhibit B) forms part of the agreement or is maintained separately, and by whom. Provide the list as of June 30, 2025, as of June 30, 2026 and as of the date of the response, identifying for each person: position; home entity; salary or hourly cost billed; the share of the person's time charged to the TM2500 allocation; and the basis on which that share was determined. State the basis on which the cost of a seconded employee was allocated between the TM2500 fleet and the rest of the legacy fleet. Identify the persons who, since the April 2026 transfer, perform the same functions as employees of Genera PR LLC, and the account or budget line to which their cost is now charged. Provide, in addition, a list of every company that provides or has provided operation and maintenance services for the TM2500 units and for the FT8 MOBILEPAC units since PREPA's acquisition – whether engaged by Genera PR LLS, by Genera Services LLC or by another affiliate – stating for each the services provided, the site, the engaging entity and the contract, and the total expenditure charged to each fleet's allocation by contractor in each of FY2025, FY2026 and FY2027 to date.

**Response:**

Please see **Exhibit 18** "Seconded Employees & O&M Contractors". During Fiscal Year 2026, most seconded employees rendered services through April 2026. Three employees remained for an additional period: one rendered services through June 2026, while the other two continue to provide Senior Gas Turbine SME services.

The seconded employees were only used for the TM2500 fleet and not the rest of the legacy fleet.

Please see **Exhibit 18** "TM Transfer Employees Genera April 2026 RFI". The budget line now used is "Labor Operating Expenses".

For the TM2500, please see **Exhibit 3**. In the case of FT8 MobilePac Units, most of the work was performed internally by Genera personnel during FY2025 &

FY2026. Genera is currently evaluating quotations to perform major maintenances but works haven't been completed yet.

## I. Unit Identification in the Response to ROI 6

48. Genera's response to ROI 6 identifies the unit bearing gas generator serial number 557-238 – the unit for which GE Vernova quoted hot-section and combustor work at $3,752,573 – as Palo Seco TM01 in one place and as a San Juan unit in another; Genera's unit-by-unit table in Attachment 1 lists Palo Seco TM01 under serial number 557-259. At the Technical Conference, Genera's own records suggested that serial number 557-238 corresponds to San Juan TM01, but Genera could not resolve the point. Genera shall:

    a) state the site and unit designation of the unit bearing serial number 557-238, and the date and scope of its last hot-section exchange;

**Response:**

557-238 is SJU TM #1-Hot Section swapped 07/15/2023.

b) reconcile the serial-number-to-unit mapping of the response to ROI 6, Attachment 1 and the GE Vernova quotation;

**Response:**

See **Exhibit 19**- TM2500 Serial Number Reconciliation.

c) state whether the GE Vernova work quoted for that unit, and the Siemens Energy hot-section exchanges performed or contracted for other units, carry a warranty and, if so, its terms; and

**Response:**

The Hot section for that unit was performed before the units were transferred to Genera on 03/15/2024. The seller retains its information. As for the GE Vernova Quotation – Warranty Period for Material shall expire one (1) year form first use or eighteen (18) months from delivery, whichever occurs first. For the Siemens Quote: Seller warrants to the Customer that goods of its manufacture and/or supply will be free form defects in material or workmanship for a period of twelve (12) months of operation or eighteen (18) months from date of delivery.

d) file a revised response to ROI 6 if the response as field is incorrect, or confirm that it stands.

**Response**:

Genera confirms that answer to RFI 6 is correct. TM2500 Unit 557-238 presently shows VSV problems and in January 22, 2026, the unit suffered a switchgear explosion.

Exhibit 7

# CERTIFICATION

**TO WHOM IT MAY CONCERN:**

I, José Francisco Rosario-Soto, of legal age, single, information technology consultant, and resident of San Juan, Puerto Rico, certify as follows:

**A. Background and Capacity**

1. I am principal and owner of JOFCO Consulting Group, Inc. ("JOFCO"), a San Juan, Puerto Rico IT consulting firm supporting Sepulvado, Maldonado & Couret at its client Genera PR, LLC's ("Genera") request. My 30 years' experience includes administering Microsoft 365 and predecessor suites, Microsoft Purview eDiscovery, and collecting, searching and reviewing electronically stored information. As systems expert, I consulted Genera on scope, instructed firm personnel, and coordinated and supervised—not personally conducted—the searches. I have supervised similar work in other cases.

2. I certify the scope, methods and results below based on my communications, coordination and supervision, and the performing personnel's certifications that they followed prescribed procedures and obtained the reported results. Statements about their searches and review rely on those certifications.

**B. Purpose of the Review**

3. On or about September 22, 2026, Genera, through counsel, requested review of whether it received: (a) the March 15, 2024 Asset Purchase Agreement between the Puerto Rico Electric Power Authority ("PREPA") and NFE Power PR LLC ("APA") and related Maintenance Side Letter by March 15, 2025, the twelve-month major-maintenance coupon redemption deadline, to determine its knowledge of P3A or PREPA instructions requiring TM2500 maintenance requests through that mechanism; and (b) Power Engineering Consultants, LLC's May 2024 TM2500 deficiencies report, to determine its knowledge of those deficiencies.

4. The review also sought evidence of any PREPA or Puerto Rico Public-Private Partnerships Authority ("P3A") instructions to Genera on TM2500 maintenance or inspection.

**C. Data Set Reviewed**

5. Genera granted us email-account access for persons, including current and former employees, reasonably potentially involved in the investigation. Under applicable protocols, personnel searched Genera's Microsoft 365 Purview eDiscovery case "Legal – March 2024 – July 2026" ("Purview Case"): inbound and outbound emails and attachments [and the files stored in the associated OneDrive and SharePoint locations] for Daniel Hernández, William Ríos Mera, Ferdinand Correa, Katiuska Bolaños, Frances Vallejo, Kevin D. Futch, Jaime López and Omar Aponte ("Custodians"), covering March 2024 through July 2026.

**D. Search Parameters**

6. Genera supplied all terms, variants and parameters on September 22, 2026. Personnel applied two search sets to the above case, Custodians and period:

7. Attachment searches (Keyword AND HasAttachment = "true"): "Side Letter Maintenance," "Side Letter," "TM2500 Gas Turbines Assessment Report," "APA" and "Asset Purchase Agreement"; document-title variants: "TM2500," "TM2500 Report," "TM2500 Gas Turbines," "TM2500 Assessment," "TM2500 Gas" and "Asset Purchase."

8. General searches (full item content, without the attachment condition): "Side Letter," "Coupons," "Cupons," "Cupones," "Major Inspection," "Hot Gas Section," "Major Maintenance," "Jaime Umpierre," "PEC," "Power Engineering Consultants, LLC," "APA" and "Asset Purchase Agreement"; variants: "Side Letter Maintenance," "Gas Section," "Power Engineering Consultants" and "Asset Purchase."

**E. Review Method**

9. Personnel counted each search's results and reviewed messages and attachments against paragraphs 3–4, subject to the completion status below. My instructions reflected the systems, Genera's terms and available access.

10. Personnel tagged items "Discovery" if relevant to paragraph 3, even outside March 15, 2024–March 15, 2025; or "For Review" if discussing the APA, TM2500 maintenance, or APA/Side Letter obligations with Genera or copying its personnel.

11. For tagged items, personnel recorded date, sender, recipients, subject/title, Purview Case location (compound path) and, where useful, a relevant excerpt.

12. I did not alter, delete, move or remove any item from the Purview Case.

Personnel certified that they likewise did not alter, delete, move or remove any item. Queries, results and tags remain in the Purview Case for inspection; searches can be re-run.

**F. Status of the Review**

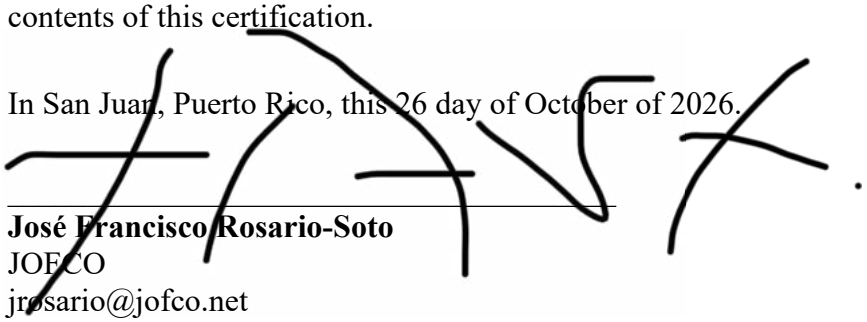
13. Genera's priority searches were reported fully reviewed: attachment terms "Side Letter Maintenance," "TM2500 Report," "Asset Purchase Agreement" and "Asset Purchase"; general terms "Side Letter Maintenance," "Coupons," "Cupons," "Cupones," "Power Engineering Consultants, LLC" and "Power Engineering Consultants"; and [identify the two supplemental searches referenced in the prior draft and confirm their review status]. "Coupons," the largest priority set (779 items), was fully reviewed by September 30, 2026. "Cupons" yielded one irrelevant item; attachment terms "TM2500 Gas Turbines Assessment Report" and "TM2500 Assessment" yielded none.

**G. General Findings**

14. As of September 30, 2026, no reviewed item indicated PREPA or P3A instructions to Genera on TM2500 maintenance or inspection. This held across all reviewed keywords, including the completed "Coupons," "Cupones," "Side Letter Maintenance," "Asset Purchase Agreement" and "Power Engineering Consultants" sets. No conclusion extends to unreviewed results.

I certify that the foregoing is true and correct to the best of my knowledge, and as limited by the contents of this certification.

In San Juan, Puerto Rico, this 26 day of October of 2026.



**José Francisco Rosario-Soto**
JOFCO
jrosario@jofco.net

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PUBLIC-PRIVATE PARTNERSHIPS AUTHORITY
GOVERNMENT OF PUERTO RICO

CZAR ENERGY
GOVERNMENT OF PUERTO RICO

Eng. Josué A. Colón Ortiz I Executive Director

August 25, 2026

**BY ELECTRONIC MAIL**
winnie@genera-pr.com
legal@genera-pr.com

Mr. Winnie Irizarry Velázquez
President and CEO
Genera PR, LLC
954 Ponce de León Avenue, Suite 400
San Juan, Puerto Rico

Dear Mr. Irizarry Velázquez:

Initial XO

**Re.: Confirmation of Compliance with Generation OMA Responsibilities – GE TM2500 Gas Turbine Fleet**

The Puerto Rico Public-Private Partnerships Authority ("P3A"), in its capacity as Administrator under the Puerto Rico Thermal Generation Operation and Maintenance Agreement (the "Generation OMA"), is conducting a unit-by-unit reconciliation of the maintenance, repair, and operational status of the GE TM2500 gas turbine fleet located at the San Juan and Palo Seco power stations. This review follows P3A's May 28, 2026 Request for Information and Genera PR LLC's ("Genera") June 10, 2026 response and is intended to confirm the status of Genera's responsibilities as Operator and identify the actions necessary to return unavailable generation resources to reliable service.

As Operator under the Generation OMA, Genera is responsible, within the scope of that agreement, for the operation and maintenance of PREPA's generation assets. Those responsibilities include identifying operational and maintenance needs; planning and scheduling maintenance; developing and processing necessary procurements; coordinating OEM and specialized services; executing repairs and corrective actions falling within Genera's contractual scope; maintaining the operational and maintenance record; and timely informing PREPA and P3A of conditions affecting availability and reliability. With respect to work that falls within NFE Power PR LLC's ("NFE") surviving obligations under the

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March 15, 2024 maintenance side letter, Genera's operational role also includes the coordination necessary to facilitate, monitor, and document that work.

P3A recognizes that Genera's June 10 response identified material constraints affecting execution of the TM2500 maintenance program and attributed certain deferred activities to funding limitations. That information is relevant to the present review. At the same time, a funding constraint does not, by itself, determine the contractual source of an outstanding maintenance obligation or eliminate the Operator's responsibility to identify the required work, develop and advance the applicable procurement or maintenance plan, coordinate with the responsible party, document the impediment, and provide the Administrator and Owner with timely information necessary to address it.

Accordingly, P3A respectfully requests that Genera confirm, for each TM2500 unit at San Juan and Palo Seco: (i) its current operational status and available MW capacity; (ii) all outstanding maintenance, repair, inspection, or component-replacement requirements; (iii) the contractual basis upon which Genera understands each item to be the responsibility of Genera, NFE, or another party; (iv) the procurement and vendor status for each outstanding item; (v) any funding, parts, OEM, scheduling, transportation, or other impediment affecting completion; (vi) the actions Genera has taken to resolve each impediment; and (vii) the expected return-to-service or completion date.




For any work that Genera considers to fall within NFE's obligations under the March 15, 2024 side letter, please identify the applicable unit and maintenance item, the date the matter was communicated or coordinated with NFE, the present status of NFE's performance, and any action that Genera believes remains necessary from NFE, PREPA, or another party to complete the work. This information will permit P3A to reconcile Genera's operational record with PREPA's records and NFE's confirmation of its performance under the acquisition documents. This review is particularly important in light of the May 14, 2024 assessment prepared by Power Engineering Consultants, LLC ("PEC"), which documented immediate or near-term corrective needs affecting several TM2500 units. The assessment identified Hot Section Exchanges at San Juan GT-2, GT-3, and GT-4 and Palo Seco GT-1, as well as significant compressor-related work affecting Palo Seco GT-2 and GT-4. P3A seeks to confirm the disposition of those findings, including which items have been completed, which remain open, and the contractual and operational basis for any remaining work.

The condition of the TM2500 fleet must also be considered within the broader generation conditions presently affecting Puerto Rico. Based on the operational information available to the Government, significant baseload, reserve, and peaking generation is unavailable or operating under material limitations. Genera's June 10 response itself reported multiple TM2500 units in forced outage

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and several Hot Section replacements as due. In this environment, each unavailable reserve or peaking resource reduces the system's flexibility to respond to forced outages, demand peaks, and other contingencies.

The TM2500 units have particular reliability significance. They were acquired with substantial FEMA support to serve as a system-stabilization resource while permanent generation repairs were undertaken. They are also included among the Specified Generation Resources addressed by the applicable Department of Energy emergency order under Section 202(c) of the Federal Power Act. The continued unavailability of these resources may affect PREPA's ability to comply with the federal emergency requirements directed to PREPA and its agents. That circumstance does not alter the contractual allocation of responsibility, but it underscores the need for Genera, as Operator, to identify, plan, coordinate, document, and advance the maintenance and repair activities within its responsibility and to facilitate the timely performance of work assigned to other parties.

Against this operational backdrop, P3A requests that Genera review all presently unavailable generation resources under its operation—not only the TM2500 fleet—and confirm the actions underway to restore available capacity. The enclosed generation-status information identifies baseload, reserve, and peaking units presently reported as unavailable or materially limited, including steam, combined-cycle, Cambalache, TM2500, Palo Seco MobilePac, and Mayagüez resources. Please validate that information, identify any changes in status or capacity, and provide the current repair or maintenance plan and expected return-to-service date for each affected Genera-operated unit.

Initial
XO

P3A's objective is to ensure that each outstanding maintenance and repair item is promptly connected to the correct contractual obligation, responsible party, funding mechanism, procurement action, and completion schedule. This process is not intended to attribute to Genera obligations retained by NFE under the acquisition documents or responsibilities assigned elsewhere under the applicable contractual framework. It is intended, however, to confirm that Genera has fully performed the planning, operational, maintenance, procurement, coordination, documentation, and reporting responsibilities assigned to it as Operator and has timely escalated any impediment requiring action by another entity.

Given the current reliability conditions and the importance of restoring available generation, please provide Genera's written confirmation and supporting documentation within five (5) business days of receipt of this letter. P3A is available to meet promptly with Genera, PREPA, NFE, or other appropriate parties to address any outstanding item that would benefit from coordinated action.

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We appreciate Genera's continued cooperation and attention to these matters.

Cordially,




Energy Czar of Puerto Rico
Executive Director, P3A

Annexes:

1. P3A Request for Information to Genera PR LLC, May 28, 2026.
2. Genera PR LLC Response to Request for Information, June 10, 2026.
3. Power Engineering Consultants, LLC, Gas Turbine Visual Condition Assessment, May 14, 2024.
4. March 15, 2024 Maintenance Side Letter.
5. Generation Units Currently Unavailable or Operating Under Material Capacity Limitations, August 25, 2026.

c Mr. Robert F. Mujica, Jr., Executive Director; FOMB; Robert.mujica@promesa.gov
Mary C. Zapata-Acosta, Executive Director, PREPA; mary.zapata@prepa.pr.gov
Rubén Lugo Mas, Contract Compliance Manager, P3A; ruben.lugo@p3.pr.gov
Kevin Futch, General Counsel, Genera; kevin.futch@genera-pr.com
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Administratorp3@genera-pr.com; Administrator@p3..pr.gov

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June 10, 2026

**VIA ELECTRONIC EMAIL**

Puerto Rico Public-Private Partnerships Authority
PO BOX 42001
San Juan, Puerto Rico 00940-2001
Attention: Executive Director – Josué Colón Ortiz
Telephone: (787) 722-2525 Ext. 15330
Email: josue.colon@p3.pr.gov and Administrator@p3.pr.gov

**Re: Response to Request for Information – Status of Repairs, Corrective Actions and Major Maintenance Obligations Associated with the TM2500 Gas Turbine Fleet (P3A Letter dated May 28, 2026)**

Dear Administrator:

We refer to the letter dated May 28, 2026, from the Puerto Rico Public-Private Partnerships Authority ("P3A"), in its capacity as Administrator under the Puerto Rico Thermal Generation Operation and Maintenance Agreement (the "OMA"), requesting information regarding the status of repairs, corrective actions, major maintenance activities, component replacements, and ancillary equipment improvements associated with the TM2500 gas turbine fleet acquired by PREPA pursuant to the Asset Purchase Agreement dated March 15, 2024 (the "RFI").

Genera PR LLC ("Genera") appreciates the Administrator's continued engagement on matters related to the TM2500 fleet and responds as follows.

**I. Prior Disclosures**

Genera respectfully notes that it previously provided information requested in Items 1 through 7 and Item 9 of the RFI to the Administrator in substantial detail. Genera furnished comprehensive information responsive to these items in its submissions dated August 12, 2025, August 20, 2025, February 6, 2026, and

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March 5, 2026 (collectively, the "Prior Submissions"). The Prior Submissions addressed, among other things, major maintenance program status, borescope findings and corrective actions, hot section exchanges, component replacements, ancillary equipment improvements, outstanding deficiencies, and warranty and reimbursement efforts with respect to the TM2500 fleet.

Genera is willing to resend the Prior Submissions if needed and to meet with P3A staff to address any specific questions or gaps identified by the Administrator arising from those disclosures.

**II. Update – Item 8: Current Fleet Condition**

The table included in *Annex A* sets forth the current operational status of each TM2500 unit. Genera must highlight the material constraints that have directly affected, and continue to affect, Genera's ability to fully execute its maintenance and repair program for the TM2500 fleet.

As the Administrator is aware, the OMA places funding obligations on PREPA. PREPA must fund the Service Accounts to enable Genera to plan, schedule, procure, and execute maintenance and repair activities across the generation fleet. Regrettably, PREPA has consistently failed to fund the Service Accounts at levels required under the OMA, directly causing delays in maintenance and repair activities, as well as other projects. Genera has repeatedly notified PREPA and the Administrator of these ongoing breaches and defaults since as early as 2023. We do so again today.

The chronic underfunding has not been an abstract or administrative shortfall; it has had direct, tangible consequences on Genera's operational and maintenance capacity. The procurement of long lead-time parts, the scheduling of specialized OEM service teams, and the execution of hot section exchanges and other major maintenance activities all require consistent funding commitments. Genera has been unable to make these due to PREPA's cashflow deficiencies and failure to meet its funding obligations under the OMA.

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The Puerto Rico Energy Bureau ("PREB") has compounded the problem. As Administrator is also aware, PREB's order for the current fiscal year retroactively reduced the provisional budget previously approved for generation operations and maintenance, imposing an additional and unanticipated financial burden on the program mid-cycle. Not only was the final budget too low to meet operational needs (with no allocation for forced outages or routine plant maintenance, and budgets for virtually every repair project cut), but also the way in which it was delivered – the surprise impact of an unpredictable and unreliable regulatory process – has already disrupted planned maintenance schedules, interrupted ongoing procurement processes, and forced Genera to reassess and reprioritize activities that had been approved, budgeted, and underway.

For Administrator's awareness, the budget approved by PREB for the next fiscal year similarly falls short of what will be required to address the full scope of maintenance obligations across the generation fleet, including the TM2500s. This further limits Genera's ability to perform necessary repairs on schedule. Genera has requested reconsideration of these decisions, but no response has been forthcoming.

Faced with these funding realities, Genera has prioritized maintenance activities that most directly relate to public safety and preventing load shedding. This means that certain scheduled or overdue repairs and maintenance activities must be deferred, not due to any failure or neglect on Genera's part, but as a direct consequence of inadequate funding, which Genera does not control. The deferred or rescheduled maintenance could have been performed had PREPA, together with PREB, not constrained funding to Genera.

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**III. Reservation of Rights**

Genera expressly reserves all rights and claims arising from PREPA's failure to adequately fund the Service Accounts, including any rights to seek relief, adjustment, or indemnification under the OMA for consequences flowing from such underfunding. Nothing in this response waives any rights, defenses, claims, or remedies available to Genera under the Generation OMA, applicable law, or any other agreement. Genera expressly reserves all such rights.

We are available to further discuss or clarify any questions that the Administrator may have regarding this topic. Should the need arise, please contact Mr. Vladimir Scutt, VP of Operations, at vladimir.scutt@genera-pr.com.

*[Signature Page to Follow]*

American International Plaza
250 Av. Luis Muñoz Rivera, Suite 1200
San Juan, PR 00918

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June 10, 2026

Cordially,

**Genera PR LLC**

Kevin D. Futch
General Counsel

American International Plaza
250 Av. Luis Muñoz Rivera, Suite 1200
San Juan, PR 00918

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**Annex A**

The entries reflecting "Due", have been deferred due to the lack of funding as set forth in Section II of the letter. Genera continues to work diligently within available resources to advance these activities as rapidly as funding permits and is actively pursuing all contractual and procurement avenues to minimize further delays.

| Site | Unit ID and Serial # | Availability | Estimated Hot Section Replacement Schedule | Comments |
|---|---|---|---|---|
| Palo Seco | PSTM01 - 557-259 | Forced Outage | August 2027 | Hot Section Exchange accelerated. Vendor awarded contract. |
| Palo Seco | PSTM02 -557-121 | Available – 25MW | March 2027 | N/A |
| Palo Seco | PSTM03 -481-559 | Forced Outage | January 2028 | Nozzles are expected mid-June. Expected return to service end of June. |
| Palo Seco | PSTM04 -481-717 | Forced Outage | November 2027 | Parts and tools to arrive in June. Estimated return to service end of June 2026. |
| San Juan | SJTM01 -557-238 | Forced Outage | December 2026 | 13.8Kv Arc. Repair in progress of breaker. Found VSV stuck. |
| San Juan | SJTM02 -557-251 | Available – 25MW | Due | Contract Request for 2 Hot Section Swaps, under review and identification of funds. |

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| | | | | |
|---|---|---|---|---|
| San Juan | SJTM03-557-258 | Available – 25MW | Due | Contract Request for 2 Hot Section Swaps, under review and identification of funds. |
| San Juan | SJTM04-557-268 | Available – 25MW | July 2027 | N/A |
| San Juan | SJTM05-557-252 | Available - 25MW | Due | Identifying funds and sourcing market. |
| San Juan | SJTM06-557-254 | Available - 25MW | Due | Identifying funds and sourcing market. |
| San Juan | SJTM07-557-230 | Available - 25MW | June 2026 | Hote Section replacement due. Identifying funds and sourcing market. |
| San Juan | SJTM08-557-242 | Forced Outage | March 2027 | VSV stuck. Coordinating assessment. |
| San Juan | SJTM09-557-266 | Forced Outage | Due | Identifying funds and sourcing market. |
| San Juan | SJTM10-557-262 | Available - 25MW | July 2026 | N/A |

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# Generation Units Currently Unavailable or Operating Under Material Capacity Limitations

## 25 de Agosto de 2026

| Category | Unit | Capacity / Limitation |
|---|---|---|
| **Baseload** | San Juan Steam 6 | 50 MW |
| | San Juan Steam 7 | 100 MW |
| | San Juan Steam 9 | 100 MW |
| | Palo Seco Steam 3 | Limited by 80 MW |
| | Palo Seco Steam 4 | Limited by 50 MW |
| | Aguirre Steam 1 | 400 MW |
| | Aguirre Steam 2 | Limited by 120 MW |
| | Costa Sur Steam 6 | Limited by 35 MW |
| **Reserve / Peaking** | Aguirre CC 1-3 | 50 MW |
| | Aguirre CC 1-4 | 50 MW |
| | Aguirre Steam 1 | 90 MW |
| | Aguirre CC 2-1 | 50 MW |
| | Aguirre CC 2-3 | 50 MW |
| | Aguirre Steam 2 | 90 MW |
| | Cambalache 1 | 80 MW |
| | TMSJ 1 | 25 MW |
| | TMSJ 6 | 25 MW |
| | TMSJ 8 | 25 MW |
| | TMSJ 9 | 25 MW |
| | TMPS 1 | 25 MW |
| | TMPS 2 | 25 MW |
| | TMPS 3 | 25 MW |
| | TMPS 4 | 25 MW |
| | MPPS 1 | 27 MW |
| | MPPS 2 | 27 MW |
| | MPPS 3 | 27 MW |
| | Mayagüez 1A | ~27 MW |
| | Mayagüez 1B | ~27 MW |
| | Mayagüez 2A | ~27 MW |
| | Mayagüez 4A | ~27 MW |

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PUBLIC-PRIVATE PARTNERSHIPS AUTHORITY
GOVERNMENT OF PUERTO RICO
Eng. Josué A. Colón Ortiz I Executive Director

May 28, 2026

**BY ELECTRONIC MAIL**
winnie@genera-pr.com
legal@genera-pr.com

Mr. Winnie Irizarry Velázquez
President and CEO
Genera PR, LLC
954 Ponce de León Avenue, Suite 400
San Juan, Puerto Rico

Dear Engineer Irizarry Velázquez:

**Re.: Request for Information – Status of Repairs, Corrective Actions and Major Maintenance Obligations Associated with the TM2500 Gas Turbine Fleet Acquired Pursuant to the Asset Purchase Agreement Dated March 15, 2024**

Initial XO

Reference is made to the Generation Operation and Maintenance Agreement (the "Generation OMA"), by and among (a) the Puerto Rico Electric Power Authority ("PREPA"), as Owner, (b) the Puerto Rico Public-Private Partnerships Authority ("P3A"), as Administrator, and (c) Genera PR LLC ("Genera"), as Operator. The P3A, in its capacity as contract administrator and the entity responsible for oversight under the Generation OMA, hereby requests information regarding the status of the repairs, corrective actions, major maintenance activities, component replacements, and ancillary equipment improvements associated with the GE TM2500 gas turbine fleet acquired by PREPA pursuant to the Asset Purchase Agreement executed on March 15, 2024 among NFE Power PR LLC, PREPA, and New Fortress Energy, Inc. ("NFE").

As you are aware, the Disclosure Schedules incorporated into the Asset Purchase Agreement expressly identified multiple maintenance findings, borescope inspection observations, and equipment condition exceptions affecting several TM2500 units located at both the San Juan and Palo Seco temporary generation facilities. In addition, pursuant to the side letter agreement executed concurrently with the Asset Purchase Agreement, NFE agreed to perform major maintenance on up to seven (7) units following closing, including the repair and/or replacement of any components identified as damaged, defective, degraded, or otherwise not

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serviceable in accordance with the original equipment manufacturer ("OEM") recommendations and prudent industry practice.

Accordingly, P3A requests that Genera provide a comprehensive status update regarding all corrective actions, maintenance activities, repairs, replacements, and equipment upgrades that have been performed, are currently underway, or remain outstanding pursuant to the obligations assumed by NFE and subsequently transferred to PREPA as part of the transaction. Specifically, please include the following information:

**1. Major Maintenance Program**

- Identify each TM2500 unit for which major maintenance has been completed pursuant to the March 15, 2024, side letter agreement.

- For each unit, provide:

    - Unit identification number and serial number;
    - Date maintenance was requested by PREPA or Genera;
    - Date maintenance commenced;
    - Date maintenance was completed;
    - Description of all work performed;
    - Description of all components repaired, refurbished, exchanged, or replaced;
    - Name of the entity performing the work;
    - Copies of all certifications, acceptance reports, service reports, and OEM documentation issued following completion of the work.

- Confirm the number of major maintenance completions remaining available under the side letter agreement.

**2. Borescope Findings and Corrective Action**

- For each finding identified in the Disclosure Schedules, provide:

    - Current status of the finding;
    - Whether the issue has been corrected;
    - Description of corrective measures implemented;
    - Date corrective actions were completed;
    - Copies of all supporting inspection reports, engineering evaluations, and work orders;

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- Remaining work required, if any.

**3. Hot Section Exchanges**

- For each TM2500 unit identified as requiring a hot section exchange, provide:
  - Original recommended maintenance date;
  - Actual completion date;
  - Scope of work completed;
  - Components replaced;
  - Current operating hours since completion;
  - Current condition assessment.

**4. Compressor and Turbine Component Replacements**

- Please identify all:
  - High-pressure turbine components replaced;
  - Stage 16 compressor blade replacements;
  - Outlet guide vane replacements;
  - Combustion system repairs;
  - Rotor repairs;
  - Generator repairs;
  - Control system upgrades.




- For each item, provide completion dates, scope of work, vendors, and supporting documentation.

**5. Ancillary Equipment Improvements**

- Please provide a detailed status report regarding all repairs, upgrades, replacements, and corrective actions undertaken with respect to ancillary equipment included in the Asset Purchase Agreement, including but not limited to:
  - Black-start diesel generators;
  - Auxiliary transformers;
  - Load interrupter switches;
  - Switchgear equipment;

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- Natural gas pressure regulation systems;
- Liquid fuel forwarding systems;
- Demineralized water systems;
- SCADA and control systems;
- Auxiliary electrical panels;
- Power control rooms;
- Fuel handling equipment;
- Fire protection systems;
- Communications systems;
- Cable systems;
- Balance-of-plant equipment.

**6. Outstanding Deficiencies**

- Please identify all deficiencies, maintenance findings, OEM recommendations, inspection observations, or corrective actions that remain open as of the date of your response. For each item, provide:




  - Description of the issue;
  - Associated unit or equipment;
  - Risk assessment;
  - Expected completion date;
  - Estimated cost;
  - Responsible party.

**7. Warranty, Reimbursement and Recovery Efforts**

- Please provide a detailed status report of:

  - All claims submitted to NFE;
  - All warranty claims;
  - All reimbursement requests;
  - All disputes regarding maintenance obligations;
  - Amounts recovered to date;
  - Amounts currently outstanding.

**8. Current Fleet Condition**

- Please provide Genera's current assessment of:

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- The operational condition of each TM2500 unit;
- Available capacity attributable to each unit;
- Reliability risks associated with any deferred maintenance;
- Expected maintenance schedule for the next twenty-four (24) months.

**9. Certification**

- Provide a certification executed by a duly authorized officer of Genera attesting that:
  - the information provided is complete, accurate, and responsive;
  - all documents and information responsive to this RFI have been disclosed; and
  - no material facts have been omitted.

Given the importance of these units to system reliability and reserve margin adequacy, Genera shall provide the requested information on or before June 10, 2026. Failure to provide a complete and timely response may result in the exercise of P3A's rights under the Generation OMA, including further administrative action as may be warranted.

Nothing herein shall be construed as limiting P3A's rights under the Generation OMA, applicable law, or any rights available to PREPA under the Asset Purchase Agreement, related side letter agreements, warranties, guarantees, or other transaction documents.

We appreciate your prompt attention to this matter.

Cordially,

Signed by:

ACAE19A8DEF549C...

Josué A. Colón Ortiz
Executive Director

c Mary C. Zapata-Acosta, Executive Director, PREPA; mary.zapata@prepa.pr.gov
Lionel Santa Crispín, Chief Legal Officer, P3A, lionel.santa@p3.pr.gov
Rubén Lugo Mas, Contract Compliance Manager, P3A; ruben.lugo@p3.pr.gov
Kevin Futch, General Counsel, Genera; kevin.futch@genera-pr.com
Ricardo Pallens, CRO, Genera; ricardo.pallens@genera-pr.com
Administratorp3@genera-pr.com; Administrator@p3..pr.gov

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***Execution***

**Confidential**

March 15, 2024

Puerto Rico Electric Power Authority
Attn: Chief Executive Officer – Josué Colón Ortiz
PO BOX 364267
San Juan, Puerto Rico 00936-4267

Ladies and Gentlemen:

Reference is made to the Asset Purchase Agreement dated as of March 15, 2024 between NFE Power PR LLC as Seller, The Puerto Rico Electric Power Authority as Buyer and New Fortress Energy Inc. (solely for the purposes of Section 9.5 thereof) (the "Asset Purchase Agreement"). Capitalized terms used but not defined herein shall have the meanings set forth in the Asset Purchase Agreement.

Section 5.6 of the Disclosure Schedules to the Asset Purchase Agreement include references to a list of borescope reports shared with Buyer related to the Acquired Assets. Those reports contain certain maintenance findings relating to the Acquired Assets which are included in the Disclosure Schedules as an exception to the representation and warranty of Seller in Section 5.6 of the Asset Purchase Agreement. Buyer and Seller are entering into this letter agreement to set forth an accommodation that Seller is agreeing to with respect to such maintenance findings and in consideration for Buyer accepting such disclosures.

Upon written request by Buyer (specifying the applicable unit) no later than 12 months following the closing of the Asset Purchase Agreement, Seller will provide a major maintenance for up to seven units of any of the Power Generation Equipment (seven major maintenance completions in the aggregate for all units). Such work shall be done by Seller in accordance with manufacturer's recommendations and prudent industry practice for such major maintenanee repairs of similar units. Upon completion, Seller shall deliver to Buyer a standard certification from General Electric or a third party General Electric qualified company such as ProEnergy, GE Vernova or GE Aerospace. For the avoidance of doubt, "major maintenance" shall include, but is not limited, to any repair and/or replacement of any and all parts that are identified as damaged or not serviceable as part of the entire unit while the Hot Section major maintenance is being performed. Seller will also bear any and all cost and expenses in connection with, if applicable, disassembly and reassembly at site, as well as shipping the Power Generation Equipment to and from an authorized General Electric or General Electric repair service center.

Buyer will cooperate and provide Seller access to the site and Power Generation Equipment as needed to complete such work. Buyer will have the right to be present, inspect and confirm that such maintenances conform to the manufacturer's specifications for the product.

The obligations of Seller under this side letter shall be considered "Guaranteed Obligations" and subject to Parent's obligations under Section 9.5 of the Asset Purchase Agreement, subject to the terms and conditions thereof.

The terms of Article IX of the Asset Purchase Agreement are hereby incorporated by reference as if set forth herein and for purposes hereof references therein to "this Agreement" shall be deemed to be references to this side letter.

[*Signature Page Follows*]

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Very truly yours,

**NFE POWER PR LLC**

By: _____
Name: CHRISTOPHER GUDITA
Title: CHIEF FINANCIAL OFFICER

EIN: 66 0943155

Acknowledged and agreed:

**THE PUERTO RICO ELECTRIC POWER AUTHORITY**

By: _____
Name: Josué A. Colón Ortiz
Title: Executive Director
EIN: 66 0433747

**NEW FORTRESS ENERGY INC.**
**(solely for purposes of the second to last paragraph of this letter)**

By: _____
Name: CHRISTOPHER GUDITA
Title: CHIEF FINANCIAL OFFICER

EIN: 83 - 1482060

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# Power Engineering Consultants, LLC

May 14, 2024

**Jaime Umpierre**
Puerto Rico Electric Power Authority
Email: ja-umpierre@prepa.com

REF: Gas Turbine Visual Condition Assessment

Dear Mr. Umpierre,

Following is our report based on our visual inspection and additional information provided by the owner. This report was prepared based on the following information:

- Visual inspection of the units while they are in operation
- Records principal units' operation parameters that could be captured on the units control console
- Complete photographic record of the unit's overall condition, as much as possible considering the units may be in operation
- Evaluate past maintenance inspection records provided

We also attached a photographic record of our visit and all the additional documentation received that supported the creation of this report.

We look forward to the possibility of assisting you in future opportunities.

Sincerely,

Emmanuel Ortiz, P.E.
General Manager
Power Engineering Consultants, LLC
E. emmanuel.ortiz@pecllcpr.com
C. +1-787-409-4881

William Velez Castro
Senior Project Manager
Power Engineering Consultants, LLC
E. william.velez@pecllcpr.com
C. +1-787-630-4112



**PEC, LLC**
2108 Onfala St.
Urb. Reparto Apolo
Guaynabo,PR 00969
USA

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- SAN JUAN GT-1
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- SAN JUAN POWER PLANT, GT-1, 04-JUN-2023
- SAN JUAN POWER PLANT, GT-1, 08-MAR-2024
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- SAN JUAN POWER PLANT, GT-2, 07-MAR-2024
- SAN JUAN POWER PLANT, GT-3, 05-DEC-2023
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- SAN JUAN POWER PLANT, GT-4, 06-DEC-2023
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**ATTACHMENT #4 PALO SECO BORESCOPIC INSPECTION REPORTS**

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SAN JUAN POWER PLANT, GT-10, 02-FEB-2024 to 05-FEB-2024

**ATTACHMENT #6 UNIT PERFORMANCE CURVES**

GE TM2500 GEN-4 "NEW & CLEAN" DESIGN ID SWEEP (PROVIDED BY NFE)
GE TM2500 GEN-6 "NEW & CLEAN" DESIGN ID SWEEP (PROVIDED BY NFE)
GE TM2500 GEN-8 "NEW & CLEAN" DESIGN ID SWEEP (PROVIDED BY NFE)

**ATTACHMENT #7 MOBILE GAS TURBINE GENERATOR (MGTG) OPERATION AND MAINTENANCE DOCUMENTS**

SPD-001 PACKAGE DESCRIPTION
SPD-011 CONTROL SYSTEM DESCRIPTION
SPD-012 FIRE SUPPRESSION & GAS DETECTION DESCRIPTION
SPM-001 PACKAGE MAINTENANCE
SP0-001 PACKAGE OPEREATION
SPO-012 FIRE SUPRESSION & GAS DETECTION SYSTEM OPERATION
OMM-TP8102 TM2500 STARTING SEQUENCE
GEK-105054 VOLUME I & 2 - ONSITE OPERATION AND MAINTENANCE MANUAL (GE)

**ATTACHMENT #8 GE AERODERIVATIVE GAS TURBINE (GEAGT) REFFERENCE DOCUMENTS**

MID-TD-0000-1 FUEL GASES REQUIREEMENTS
MID-TD-0000-2 LIQUID FUEL REQUIREMENTS
MID-TD-0000-3 REQUIREMENTS FOR WATER & STEAM PURITY FOR INJECTION
MID-TD-0000-4 COMPRESSOR CLEARNING WATER PURITY SPECIFICATIONS
MID-TD-0000-5 LIQUID DETERGENT FOR COMPRESSOR CLEANING
MID-TD-0000-6 LUBRICATING OIL SPECIFICATIONS



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## Executive Summary

PREPA contracted Power Engineering Consultants (PEC) to perform a visual assessment of seventeen (17) GE TM2500 gas turbine generator sets, of which ten (10) of them are installed at Central San Juan Power Station and the remaining seven (7) at the Palo Seco Power Station.

On March 12, 2024, The PEC team met with PREPA's Operations Director, Jaime Umpierre, at the San Juan Power Station to initiate the inspection. The inspection was limited since the units were in operation at the time of the visits. The PEC team photographed every unit and inspected and collected operational data on each unit's Woodward® control HMI (Human Machine Interphase) screen. The most important data was summarized below. For additional information, please refer to the photographic record attached to this report.

The PEC team also requested past inspection and maintenance records of the units. PREPA supplied past Borescopic inspections, and field service reports. PEC reviewed all the information provided recommendations accordingly. Based on the analysis of all data provided and additional reference documentation, here is a summary of the findings:

- San Juan Power Plant
  - GT-1, Had Hot Section Exchange on Aug 20, 2023. Continue Annual Borescope Inspections, prepare for next Hot Section Exchange after 25k fire hours.
  - GT-2, Need Hot Section Exchange as soon as possible. Unit operating beyond OEM recommendations. Currently Scheduled for Oct 1, 2024
  - GT-3, Need Hot Section Exchange as soon as possible. Unit operating beyond OEM recommendations. Currently Scheduled for Oct 7, 2024
  - GT-4, Need Hot Section Exchange as soon as possible. Unit operating beyond OEM recommendations. Currently Scheduled for May 15, 2024.
  - GT-5, Had Hot Section Exchange on Aug 14, 2023. Continue Annual Borescope Inspections, prepare for next Hot Section Exchange after 25k fire hours.
  - GT-6, Hot Section Exchange Scheduled for Oct 14, 2024 based on hours. Unit operating withing OEM specifications based on last Borescope Inspections on Mar 6, 2024.
  - GT-7, Had Hot Section Exchange on Jan 17, 2024. Continue Annual Borescope Inspections, prepare for next Hot Section Exchange after 25k fire hours.
  - GT-8, Had Hot Section Exchange on Jan 26, 2024. Continue Annual Borescope Inspections, prepare for next Hot Section Exchange after 25k fire hours.
  - GT-9, Had Hot Section Exchange on Feb 1, 2024. Continue Annual Borescope Inspections, prepare for next Hot Section Exchange after 25k fire hours.
  - GT-10, Had Hot Section Exchange on Feb 5, 2024. Continue Annual Borescope Inspections, prepare for next Hot Section Exchange after 25k fire hours.

- Palo Seco Power Plant
  - GT-1 Need Hot Section Exchange as soon as possible. Unit operating beyond OEM recommendations. Currently Scheduled for May 15, 2024.
  - GT-2, Need Stage 16 High Pressure Compressor Exchange and outlet guide vanes as soon as possible. Unit operating beyond OEM recommendations based on Mar 12, 2024 Borescope Inspection. Need to Schedule Outage as soon as possible. Waiting for the next Hot Section Exchange could potentially risk having one of the damaged stage 16 blade liberate and cause additional damage to the unit.



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- GT-3, Need to Schedule Annual Borescope Inspection in 2024 since the last one was completed on May 2023. Schedule Hot Section Exchange according findings and unit's operating regime.
- GT-4, Need Stage 16 High Pressure Compressor Exchange and outlet guide vanes as soon as possible. Unit operating beyond OEM recommendations based on Mar 14, 2024 Borescope Inspection. Need to Schedule Outage as soon as possible. Waiting for the next Hot Section Exchange could potentially risk having one of the damaged stage 16 blade liberate and cause additional damage to the unit.
- GT-5, Need to Schedule Annual Borescope Inspection since there is none provided since the unit was place in operation. Schedule Hot Section Exchange according findings and unit's operating regime.
- GT-6, Need to Schedule Annual Borescope Inspection since there is none provided since the unit was place in operation. Schedule Hot Section Exchange according findings and unit's operating regime.
- GT-7, Need to Schedule Annual Borescope Inspection since there is none provided since the unit was place in operation. Schedule Hot Section Exchange according findings and unit's operating regime.



**PEC, LLC**
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Docusign Envelope ID: 059FAE39-0956-8C40-8041-79D8E09612B4



## Immediate Action Recommendations Based on Provided Inspection Reports

**GT-2 San Juan Power Station, Serial No. 7253162**

i. November 2, 2023 Borescopic inspection showed that the unit HPT Stage 1 nozzles are not serviceable as per OEM's GEK-105054. Customer should follow OEM recommendations.

ii. March 7, 2024 another Borescopic inspection was performed showing again that HPT Stage 1 Nozzle is not serviceable as per OEM's GEK-105054, Customer should follow OEM Maintenance Recommendations.

**Action Recommended:** Based on the above, GT-2 San Juan Station, Serial No. 7253162 Hot Gas Path Section should be replaced at the next opportunity pending parts availability and maintenance windows availability. Per the supplied information, NFE had scheduled the next Hot Section Exchange Outage for October 1, 2024. It will be highly recommended to follow up with this service as previously planned or earlier since the Stage 1 Nozzle is already considered not serviceable, which means that replacement should be done immediately.

**GT-3 San Juan Power Station, Serial No. 7250393**

i. December 5, 2023 Borescopic inspection showed that the unit's High Pressure Turbine Section is not Serviceable as per OEM's GEK-105054. Customer should Follow OEM Maintenace Recommendations.

ii. March 5, 2024 Borescopic inspection showed that the unit's High Pressure Turbine Section is not Serviceable as per OEM's GEK-105054. Customer should Follow OEM Maintenace Recommendations.

**Action Recommended:** Based on the above, GT-3 San Juan Station, Serial No. 7250393 Hot Gas Path Section should be replaced at the next opportunity pending parts availability and maintenance windows availability. Per the supplied information, NFE had scheduled the next Hot Section Exchange Outage for October 7, 2024. It will be highly recommended to follow up with this service as previously planned or earlier since the complete High Pressure Turbine Section is already considered not serviceable, which means that replacement should be done immediately.

**GT-4 San Juan Station, Serial No. 7253293**

i. December 6, 2023 Borescopic inspection showed that the unit's High Pressure Turbine Section is not Serviceable as per OEM's GEK-105054. Customer should Follow OEM Maintenace Recommendations.

**ii.** March 7, 2023 Borescopic inspection showed that unit's High Pressure Turbine Section is not Serviceable as per OEM's GEK-105054. Customer should Follow OEM Maintenace Recommendations.

**Action Recommended:** Based on the above, GT-4 San Juan Station, Serial No. 7253293 Hot Gas Path Section should be replaced at the next opportunity pending parts availability and maintenance windows availability. Per the supplied information, NFE had scheduled the next Hot Section Exchange Outage for May 15, 2024. It will be highly recommended to follow up with this service as previously planned or earlier since the complete High Pressure Turbine Section is already considered not serviceable, which means that replacement should be done immediately.



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**GT-1 Palo Seco Power Station, Serial No. 7251610**

i. January 26, 2024 showed that the unit's High Pressure Turbine Section is not Serviceable as per OEM's GEK-105054. Customer should Follow OEM Maintenace Recommendations.

**Recommendation:** Based on the above, GT-1 Palo Seco Station, Serial No. 7251610 Hot Gas Path Section should be replaced at the next opportunity pending parts availability and maintenance windows availability. Per the supplied information, NFE had scheduled the next Hot Section Exchange Outage for May 15, 2024. It will be highly recommended to follow up with this service as previously planned or earlier since the complete High Pressure Turbine Section is already considered not serviceable, which means that replacement should be done immediately.

**GT-2 Palo Seco Power Station, Serial No. 557-121**

i. March 12, 2024 showed that the unit's High Pressure Compressor Section is not Serviceable as per OEM's GEK-105054. Customer should Follow OEM Maintenace Recommendations.

**Recommendation:** Based on the above, GT-2 Palo Seco Station, Serial No. 557-121 High Pressure Compressor Stage 16 Blades and outlet guide vanes should be replaced at the next opportunity pending parts availability and maintenance windows availability. Per the supplied information, NFE ha s not yet schedule this service. Waiting until the next Hot Section Exchange outage could potentially rick the compressor's integrity.

**GT-4 Palo Seco Power Station, Engine Serial No. 481-718**

i. March 14, 2024 showed that the unit's High Pressure Turbine Section is not Serviceable as per OEM's GEK-105054. Customer should Follow OEM Maintenace Recommendations.

**Recommendation:** Based on the above, GT-2 Palo Seco Station, Serial No. 557-121 High Pressure Compressor Stage 16 Blades and outlet guide vanes should be replaced at the next opportunity pending parts availability and maintenance windows availability. Per the supplied information, NFE ha s not yet schedule this service. Waiting until the next Hot Section Exchange outage could potentially rick the compressor's integrity.



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## Operations Data Collected at the time of the Inspection

Date: March 6, 2024

| San Juan GE TM2500 Units Control Data | GT-1 | GT-2 | GT-3 | GT-4 | GT-5 | GT-6** | GT-7 | GT-8 | GT-9 | GT-10 |
|---|---|---|---|---|---|---|---|---|---|---|
| DMMF MVARS | 5.88 | 4.86 | 3.5 | 4.19 | NA* | 0** | 4.44 | 4.85 | 4.33 | 4.08 |
| DMMF MWATTS | 23.6 | 23.16 | 17.27 | 23.35 | NA* | 0** | 21.89 | 22.11 | 24.68 | 22.44 |
| DMMF MVA | 24.32 | 23.66 | 17.6 | 23.71 | NA* | 0** | 22.33 | 22.63 | 25.07 | 22.8 |
| DMMF POWER FACTOR | 0.97 | 0.98 | 0.98 | 0.98 | NA* | 0** | 0.98 | 0.98 | 0.98 | 0.98 |
| GENERATOR Voltage | 13.96 | 14.33 | 14.02 | 14.04 | NA* | 0** | 14.3 | 14.25 | 14.03 | 14.01 |
| BUS FREQUENCY | 59.99 | 60.05 | 60.02 | 60.09 | NA* | 60.09 | 60.11 | 60.11 | 60.11 | 60.08 |
| Fire Start Counter | 781 | 592 | 635 | 700 | NA* | 103 | 53 | 536 | 640 | 417 |
| Starts Attempt | 794 | 691 | 767 | 799 | NA* | 106 | 58 | 576 | 679 | 429 |
| CDLO Counter | 630 | 519 | 536 | 578 | NA* | 91 | 36 | 438 | 389 | 328 |
| FSLO Counter | 32 | 19 | 21 | 54 | NA* | 7 | 7 | 17 | 20 | 8 |
| Normal Stop Counter | 638 | 504 | 518 | 574 | NA* | 85 | 35 | 431 | 405 | 347 |
| Turbine Run Time (HRS) | 7049 | 6355 | 6144 | 6535 | NA* | 4055 | 3518 | 6338 | 6253 | 6155 |

*The HMI (Human Machine Interphase) screens were not available at the time of the inspection to collect the operations information

**GT-6 was out of service at the time of the inspection

Date: March 8, 2024

| Palo Seco GE TM2500 Units Control Data | GT-1 | GT-2 | GT-3 | GT-4 | GT-5 | GT-6 | GT-7 |
|---|---|---|---|---|---|---|---|
| DMMF MVARS | 9.97 | 4.05 | 3.69 | 3.75 | NA* | NA* | NA* |
| DMMF MWATTS | 24.01 | 23.49 | 21.66 | 20.2 | NA* | NA* | NA* |
| DMMF MVA | 26.01 | 23.85 | 21.97 | 20.56 | NA* | NA* | NA* |
| DMMF POWER FACTOR | 0.92 | 0.99 | 0.99 | 0.98 | NA* | NA* | NA* |
| GENERATOR Voltage | 13.14 | 13.04 | 13.8 | 13.1 | NA* | NA* | NA* |
| BUS FREQUENCY | 59.83 | 59.88 | 60.26 | 60.44 | NA* | NA* | NA* |
| Fire Start Counter | 436 | 206 | 548 | 818 | NA* | NA* | NA* |
| Starts Attempt | 459 | 224 | 819 | 1075 | NA* | NA* | NA* |
| CDLO Counter | 358 | 117 | 933 | 1201 | NA* | NA* | NA* |
| FSLO Counter | 10 | 26 | 13 | 642 | NA* | NA* | NA* |
| Normal Stop Counter | 356 | 120 | 415 | 866 | NA* | NA* | NA* |
| Turbine Run Time (HRS) | 8035 | 14859 | 30706 | 35062 | NA* | NA* | NA* |

*The HMI (Human Machine Interphase) screens were not available at the time of the inspection to collect the operations information

Acronyms:

DMMF: Digital Multi Monitor Function

CDLO: Cool Down Lock Out (Trip Function when there is a high temperature alarm on unit bearing allowing unit to come down to Ful Speed No Load, FSNL)

FSLO: Fast Stop Lock Out (Trip occurs when fuel stop feeding unit)



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## PSPP & SJPP Hour Counters as of Jan 7, 2024
## (Provided by NFE)

**Palo Seco**

| # | Year | Make & Model | Engine S.N. | Status | Origin | Prev. Owner | When Delivered to NFE Starts | When Delivered to NFE Run Hours | Current - As of 01/27/24 Starts | Current - As of 01/27/24 Run Hours |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2014 | GE TM2500+ | 557-259 | Installed | Egypt | EGPC | 371 | 2,262 | 425 | 7,075 |
| 2 | 2011 | GE TM2500+ | 557-121 | Installed | Yuma, AZ | Prodomex | 150 | 1,021 | 200 | 6,443 |
| 3 | 2006 | GE TM2500 Base | 481-559 | Installed | Yuma, AZ | Prodomex | 502 | 29,228 | 537 | 29,879 |
| 4 | 2007 | GE TM2500 Base | 481-718 | Installed | Yuma, AZ | Prodomex | 776 | 28,672 | 851 | 34,131 |
| 5 | 2017 | GE TM2500+ G4 | 679-285 | Installed | Yuma, AZ | Saavi | 23 | 2,350 | 77 | 7,772 |
| 6 | 2017 | GE TM2500+ G4 | 679-318 | Installed | Yuma, AZ | Saavi | 5 | 2,650 | 73 | 8,297 |
| 7 | 2017 | GE TM2500+ G4 | 679-292 | Installed | Yuma, AZ | Saavi | 7 | 2,855 | 79 | 8,113 |
| 8 | 2014 | GE TM2500+ | 557-239 | Storage | Egypt | EGPC | 705 | 3,191 | 705 | 3,191 |
| 9 | 2014 | GE TM2500+ | 557-256 | Storage | Egypt | EGPC | 558 | 2,750 | 558 | 2,750 |
| 10 | 2014 | GE TM2500+ | 557-265 | Storage | Egypt | EGPC | 536 | 2,378 | 536 | 2,378 |
| 11 | 2014 | GE TM2500+ | 557-258 | Storage | Egypt | EGPC | 770 | 4,026 | 770 | 4,026 |
| 12 | 2014 | GE TM2500+ | 557-250 | Storage | Egypt | EGPC | 776 | 4,565 | 776 | 4,565 |
| 13 | 2014 | GE TM2500+ | 557-261 | Storage | Egypt | EGPC | 509 | 2,415 | 509 | 2,415 |

**San Juan**

| # | Year | Make & Model | Engine S.N. | Status | Origin | Prev. Owner | When Delivered to NFE Starts | When Delivered to NFE Run Hours | Current - As of 01/27/24 Starts | Current - As of 01/27/24 Run Hours |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2014 | GE TM2500+ | 557-238 | Installed | Egypt | EGPC | 737 | 3,269 | 777 | 6,165 |
| 2 | 2014 | GE TM2500+ | 557-251 | Installed | Egypt | EGPC | 555 | 2,485 | 587 | 5,443 |
| 3 | 2014 | GE TM2500+ | 557-240 | Installed | Egypt | EGPC | 584 | 2,715 | 625 | 5,445 |
| 4 | 2014 | GE TM2500+ | 557-266 | Installed | Egypt | EGPC | 655 | 2,856 | 694 | 5,673 |
| 5 | 2014 | GE TM2500+ | 557-252 | Installed | Egypt | EGPC | 692 | 4,115 | 745 | 6,089 |
| 6 | 2014 | GE TM2500+ | 557-254 | Installed | Egypt | EGPC | 79 | 2,973 | 99 | 3,192 |
| 7 | 2014 | GE TM2500+ | 557-230 | Installed | Egypt | EGPC | 42 | 12 | 46 | 2,619 |
| 8 | 2014 | GE TM2500+ | 557-242 | Installed | Egypt | EGPC | 492 | 2,973 | 525 | 5,528 |
| 9 | 2014 | GE TM2500+ | 557-260 | Installed | Egypt | EGPC | 593 | 2,670 | 630 | 5,469 |
| 10 | 2014 | GE TM2500+ | 557-262 | Installed | Egypt | EGPC | 86 | 57 | 407 | 5,436 |



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**SJPP & PSPP Hour Counters as of Feb 7, 2024**
**(Provided by NFE)**






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## SJPP & PSPP Projected Maintenance Schedule as of Jan 29, 2024 (Provided by NFE)

**Palo Seco**

| # | Year | Make & Model | Engine S.N. | HS - Completed | HS1 - Scheduled | HS2 - Scheduled |
|---|---|---|---|---|---|---|
| 1 | 2014 | GE TM2500+ | 557-259 | - | 5/15/2024 | 3/22/2027 |
| 2 | 2011 | GE TM2500+ | 557-121 | - | [TBD] | [TBD] |
| 3 | 2006 | GE TM2500 Base | 481-559 | - | [TBD] | [TBD] |
| 4 | 2007 | GE TM2500 Base | 481-718 | - | [TBD] | [TBD] |
| 5 | 2017 | GE TM2500+ G4 | 679-285 | - | 11/30/2026 | 10/7/2029 |
| 6 | 2017 | GE TM2500+ G4 | 679-318 | - | 11/30/2026 | 10/7/2029 |
| 7 | 2017 | GE TM2500+ G4 | 679-292 | - | 11/30/2026 | 10/7/2029 |
| 8 | 2014 | GE TM2500+ | 557-239 | - | [TBD] | [TBD] |
| 9 | 2014 | GE TM2500+ | 557-256 | - | [TBD] | [TBD] |
| 10 | 2014 | GE TM2500+ | 557-265 | - | [TBD] | [TBD] |
| 11 | 2014 | GE TM2500+ | 557-258 | - | [TBD] | [TBD] |
| 12 | 2014 | GE TM2500+ | 557-250 | - | [TBD] | [TBD] |
| 13 | 2014 | GE TM2500+ | 557-261 | - | [TBD] | [TBD] |

*- Maintenance schedule for GTs 2 - 4 will be determined following borescope inspections*
*- Maintenance schedule for GTs 8 - 13 will be determined following borescopes if placed in service*
*- Maintenance schedule for GTs 5-7 determined by GE service intervals, units delivered like-new to NFE*
*- Hot section maintenance projections are based upon 24/7 baseload operation of the units*
*- GE recommended hot section interval is 25,000 hours*

**San Juan**

| # | Year | Make & Model | Engine S.N. | HS - Completed | HS1 - Scheduled | HS2 - Scheduled |
|---|---|---|---|---|---|---|
| 1 | 2014 | GE TM2500+ | 557-238 | 8/20/2023 | - | 6/26/2026 |
| 2 | 2014 | GE TM2500+ | 557-251 | - | 10/1/2024 | 8/8/2027 |
| 3 | 2014 | GE TM2500+ | 557-240 | - | 10/7/2024 | 8/14/2027 |
| 4 | 2014 | GE TM2500+ | 557-266 | - | 5/15/2024 | 3/22/2027 |
| 5 | 2014 | GE TM2500+ | 557-252 | 8/14/2023 | - | 6/20/2026 |
| 6 | 2014 | GE TM2500+ | 557-254 | - | 10/14/2024 | 8/21/2027 |
| 7 | 2014 | GE TM2500+ | 557-230 | 1/17/2024 | - | 11/23/2026 |
| 8 | 2014 | GE TM2500+ | 557-242 | 1/26/2024 | - | 12/2/2026 |
| 9 | 2014 | GE TM2500+ | 557-260 | - | 2/1/2024 | 12/8/2026 |
| 10 | 2014 | GE TM2500+ | 557-262 | - | 2/6/2024 | 12/13/2026 |

*- Hot section maintenance projections are based upon 24/7 baseload operation of the units*
*- GE recommended hot section interval is 25,000 hours*



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Exhibit 8

**Date** 26-Oct-26

| SITE | Turbine Number | GG PT SERIAL Number | Before Genera Last Hot section Date | Pec Report | NFE Certificate used | Last Hotsection Date Hours | Forced Outage Date | IN/OUT of service | Comments |
|---|---|---|---|---|---|---|---|---|---|
| PSTP | GT01 | 557-259 | | Operating beyond OEM recommendations | ######## | | 2-Sep-25 | Out | **FORCED** |
| | | | | | 9,531 | | | | VSV / HOT SECTION DAMAGE |
| | GT02 | 557-121 | | Operating beyond OEM recommendations | 2-May-24 | HS is on site. Once TM 6 is avalible to be removed from service. The LPT will be removed and joined with the new hot section for PS tm 2 | 6-Aug-26 | Out | Hot section damaged / Tx failure- Hot section received |
| | GT03 | 481-559 | | | | - | 3-Dec-25 | Out | **FORCED** |
| | | | | | | - | | | Major OH/ High Temperature Spread |
| | GT04 | 481-717 | | Operating beyond OEM recommendations | 2-May-24 | - | 13-Jun-25 | Out | **FORCED** |
| | | | | | | - | | | Major OH/ VSV Failure |
| SJTP | GT01 | 557-238 | 20-Aug-23 | | | | 22-Jan-26 | Out | **FORCED** |
| | | | 3,361 | | | | | | Hot section/VSV AUX Switchgear Explosion |
| | GT02 | 557-251 | | Operating beyond OEM recommendations | | 8/13/2026 Repaired by Genera | | IN | |
| | | | | | | 17,903 | | | |
| | GT03 | 557-258 | | Operating beyond OEM recommendations | | | | IN | |
| | GT04 | 557-268 | | Operating beyond OEM recommendations | | Hot Section is on site .Once unit is avaible to be removed from service hot section will be installed | | IN | |
| | GT05 | 557-252 | 14-Aug-23 | | | | | | |
| | | | 4,140 | | | | | | |
| | GT06 | 557-254 | | Operating beyond OEM recommendations | | Hs is being procured and unit needs to be shipped to the states for repair. The LPT will be removed and used on PS TM 2 | | IN | **Emergency use** HOT SECTION DAMAGE |
| | GT07 | 557-230 | 17-Jan-24 | | | | | | |
| | | | 2,403 | | | | | | |
| | GT08 | 557-242 | 26-Jan-24 | | | | 3-Dec-25 | Out | **FORCED** |
| | | | 5,487 | | | | | | HS/VSV/ High Temperature Spread |
| | GT09 | 557-266 | 1-Feb-24 | | | IN the USA Currently being repaired by Genera | 8-Jan-25 | Out | **FORCED** |
| | | | | | | | | IN | HOT SECTION DAMAGE - SW Explosion |
| | GT10 | 557-262 | 5-Feb-24 | | | | | | |
| | | | 5,562 | | | | | IN | |

## San Juan Power Plant – Gas Turbine Maintenance Status

| Unit | Current Status / Findings | Last HSE / Inspection | Recommended Action | Scheduled / Due |
|---|---|---|---|---|
| GT-1 | Hot Section Exchange (HSE) completed | HSE: Aug. 20, 2023 | Continue annual borescope inspections. Prepare for next HSE after 25,000 fired hours. | Based on fired hours |
| GT-2 | Operating beyond OEM recommendations | — | Perform Hot Section Exchange as soon as possible. | Oct. 1, 2024 |
| GT-3 | Operating beyond OEM recommendations | — | Perform Hot Section Exchange as soon as possible. | Oct. 7, 2024 |
| GT-4 | Operating beyond OEM recommendations | — | Perform Hot Section Exchange as soon as possible. | May 15, 2024 |
| GT-5 | Hot Section Exchange (HSE) completed | HSE: Aug. 14, 2023 | Continue annual borescope inspections. Prepare for next HSE after 25,000 fired hours. | Based on fired hours |
| GT-6 | Operating within OEM specifications based on last borescope inspection | Borescope: Mar. 6, 2024 | Perform Hot Section Exchange based on operating hours. | Oct. 14, 2024 |
| GT-7 | Hot Section Exchange (HSE) completed | HSE: Jan. 17, 2024 | Continue annual borescope inspections. Prepare for next HSE after 25,000 fired hours. | Based on fired hours |
| GT-8 | Hot Section Exchange (HSE) completed | HSE: Jan. 26, 2024 | Continue annual borescope inspections. Prepare for next HSE after 25,000 fired hours. | Based on fired hours |
| GT-9 | Hot Section Exchange (HSE) completed | HSE: Feb. 1, 2024 | Continue annual borescope inspections. Prepare for next HSE after 25,000 fired hours. | Based on fired hours |
| GT-10 | Hot Section Exchange (HSE) completed | HSE: Feb. 5, 2024 | Continue annual borescope inspections. Prepare for next HSE after 25,000 fired hours. | Based on fired hours |

## Palo Seco Power Plant – Gas Turbine Maintenance Status

| Unit | Current Status / Findings | Last HSE / Inspection | Recommended Action | Scheduled / Due |
|---|---|---|---|---|
| GT-1 | Operating beyond OEM recommendations | — | Perform Hot Section Exchange as soon as possible. | May 15, 2024 |
| GT-2 | Stage 16 High Pressure Compressor and outlet guide vane damage. Operating beyond OEM recommendations. Risk of damaged Stage 16 blade liberation and additional unit damage. | Borescope: Mar. 12, 2024 | Stage 16 High Pressure Compressor Exchange and outlet guide vane replacement as soon as possible. Schedule outage immediately. | ASAP / Outage required |
| GT-3 | Annual borescope inspection required; previous inspection completed May 2023. | Borescope: May 2023 | Schedule annual borescope inspection. Determine Hot Section Exchange timing based on findings and unit operating regime. | Borescope due in 2024 |
| GT-4 | Stage 16 High Pressure Compressor and outlet guide vane damage. Operating beyond OEM recommendations. Risk of damaged Stage 16 blade liberation and additional unit damage. | Borescope: Mar. 14, 2024 | Stage 16 High Pressure Compressor Exchange and outlet guide vane replacement as soon as possible. Schedule outage immediately. | ASAP / Outage required |

Exhibit 9

## TM's Borescope Inspection Summary

Cost of Inspection $77,000. 00 Account: 01-1071-31101-555-663-100G26109002

| Site | Unit | Date | Hours | Done By | Findings | Comparison Against Previous Reports |
|---|---|---|---|---|---|---|
| SJTP | GT01 | 12-Jun-26 | 16,173 | GESA | VSV actuation system failed to move freely<br>Hot Section is SERVICEABLE | Inspection results are consistent with normal wear from previous inspection. No abnormal damage detected |
| | GT02 | 13-Jun-26 | 17,903 | GESA | NOT SERVICEABLE - Combustor Cracks<br>HPT copious amounts of material missing | Inspection results are consistent with previous inspection findings. Perform Hot Section replacement |
| | GT03 | 14-Jun-26 | 17,297 | GESA | NOT SERVICEABLE - Combustor burn through<br>HPT cooling holes plugged and burn through | Inspection results are consistent with previous inspection findings. Perform Hot Section replacement |
| | GT04 | 15-Jun-26 | 14,429 | GESA | NOT SERVICEABLE - Combustor missing rivets/burn through<br>HPT Trailing edge heavy erosion | Inspection results show clear deterioration compared to previous inspection findings. Schedule a Hot Section replacement. |
| | GT05 | 16-Jun-26 | 19,606 | GESA | NOT SERVICEABLE - Combustor cracks/burn through<br>HPT Serviceable light erosion | Inspection results are consistent with previous inspection findings. Combustor cracks have increased and should be replaced |
| | GT06 | 17-Jun-26 | 16,621 | GESA | NOT SERVICEABLE - Compressor STG16 blade damage<br>HPT Burn trough holes/ heavy erosion | Inspection results are consistent with previous inspection findings. Top Case service is needed and Hot Section replacement |
| | GT07 | 18-Jun-26 | 17,279 | GESA | NOT SERVICEABLE - Combustor burn through and cracks<br>HPT Damage, missing material | Inspection results show clear deterioration compared to previous inspection findings. Schedule a Hot Section replacement. |
| | GT08 | 19-Jun-26 | 16,778 | GESA | NOT SERVICEABLE - Combustor burn through<br>HPT Burn trough holes/ heavy erosion | Inspection results confirm previous inspection findings. Perform Hot Section replacement |
| | GT09 | 20-Jun-26 | 12,294 | GESA | NOT SERVICEABLE - Combustor burn through<br>HPT Burn trough holes/ heavy erosion | Inspection results are consistent with the previous failure report on Nov 2024 |
| | GT10 | 21-Jun-26 | 19,731 | GESA | NOT SERVICEABLE - Combustor cracks/burn through<br>HPT Burn trough holes/ Rubbing | Inspection results show a deterioration compared to previous inspection findings. Schedule a Hot Section replacement. |
| PSTP | GT01 | 8-Jun-26 | 18,954 | GESA | NOT SERVICEABLE - Combustor heavy burn through.<br>HPT Numerous large holes | Inspection results are consistent with previous inspection findings. Perform Hot Section replacement ASAP |
| | GT02 | 11-Jun-26 | 21,343 | GESA | NOT SERVICEABLE - Dome burn through.<br>HPT Erosion and missing material. LPT STG1 Damage | Cracks and erosion identified in previous report have progressed to a point where now a replacement of the Hot Section is needed |
| | GT03 | 9-Jun-26 | 42,843 | GESA | NOT SERVICEABLE - Combustor burns on inner liners<br>HPT Damage, missing material | Hot Section especially the HPT has continued to deterioate further as seen in prevoius report. Hot Section needs to be replaced. |
| | GT04 | 10-Jun-26 | 43,187 | GESA | NOT SERVICEABLE - VSV stuck. Broken vane arm<br>-Combustor Burn through and chipping<br>-HPT Burn trough holes and rubbing | Inspection results show clear deterioration compared to previous inspection findings. Replace Hot Section ASAP |

## 2025

Cost of Inspection $164.076,92, O&M services also included
Account: 01-1071-31101-555-663-100G26109002

| Site | Unit | Date | Hours | Done By | Findings |
|---|---|---|---|---|---|
| SJTP | GT01 | 4-Aug-25 | 7,266 | SOM | Serviceable |
| | GT02 | N/A | NFE reported that it was not done since contractor was asked to replace Nozzles at Palo Seco | | |
| | GT03 | 6-Aug-25 | 14,052 | SOM | Not Serviceable |
| | GT04 | 7-Aug-25 | N/A | SOM | Serviceable |
| | GT05 | 8-Aug-25 | 16,253 | SOM | Serviceable |
| | GT06 | 11-Aug-25 | 13,422 | SOM | Not Serviceable |
| | GT07 | 12-Aug-25 | 13,736 | SOM | Serviceable |
| | GT08 | 13-Aug-25 | 15,618 | SOM | Not Serviceable |
| | GT09 | N/A | Unit suffered Hot Section Damage in Nov. Unit 4 and 9 were swaped | | |
| | GT10 | 14-Aug-25 | 16,133 | SOM | Serviceable |
| PSTP | GT01 | 22-Aug-25 | 18,733 | SOM | Not Serviceable |
| | GT02 | 5-Aug-25 | 16,772 | SOM | Serviceable |
| | GT03 | 21-Aug-25 | 40,833 | SOM | Serviceable |
| | GT04 | 19-Aug-25 | 43,186 | SOM | Serviceable |

## 2024

Cost of Inspection $421,595.2, Semi-annual inspections included
Account: 01-1071-31101-555-663-100G26109002

| Site | Unit | Date | Hours | Done By | Findings |
|---|---|---|---|---|---|
| SJTP | GT01 | 29-Nov-24 | 6,272 | PPGEnergy | Serviceable |
| | GT02 | 1-Dec-24 | 11,613 | PPGEnergy | Not Serviceable |
| | GT03 | 4-Dec-24 | 2,081 | PPGEnergy | Not Serviceable |
| | GT04 | N/A | Unit suffered Hot Section Damage in Nov. Report requested to NFE | | |
| | GT05 | 7-Dec-24 | 12,223 | PPGEnergy | Serviceable |
| | GT06 | 23-Nov-24 | 9,148 | PPGEnergy | Not Serviceable |
| | GT07 | 13-Dec-24 | 9,305 | PPGEnergy | Serviceable |
| | GT08 | 26-Nov-24 | 11,345 | PPGEnergy | Serviceable |
| | GT09 | 31-Dec-24 | 12,269 | PPGEnergy | Serviceable |
| | GT10 | N/A | Explanation as to why it was not done has been requested to NFE | | |
| PSTP | GT01 | 23-Dec-24 | 14,391 | PPGEnergy | Not Serviceable |
| | GT02 | 27-Dec-24 | 13,074 | PPGEnergy | Serviceable |
| | GT03 | 16-Dec-24 | 36,823 | PPGEnergy | Not serviceable |
| | GT04 | 20-Dec-24 | 40,781 | PPGEnergy | Serviceable |

Exhibit 10

# *BORESCOPE INSPECTION REPORT*
# *TM2500 GEN. 6-7*
# *7LM2500 – PK – MDWG05*

## NFE PALO SECO POWER PLANT

## *PACKAGE # 7251610*

## *UNIT #1*

| | | | |
|---|---|---|---|
| **Visit Date:** | 12/23/2024 | **Total Starts:** | 501 |
| **Engine S/N:** | 557-259 | **GG Hours:** | 14391 |
| **Power Turbine S/N:** | 557-259 | **PT Hours:** | 14391 |
| **PPG GT Field Engineer:** | Daniel Arroyo | **NFE Representative:** | Lance Florent |



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1 Conclusions and Recommendations .....3
2 Outage Data .....4
3 Borescope Inspection Checklist.....5
4 Borescope Inspection Record.....6
4.1 Compressor Section .....9
4.2 Combustor and 1St Stage Nozzle Section.....12
4.3 Turbine Section.....18
4.4 LPT Section .....27

## 1. Conclusions and Recommendations

**Purpose of visit:**
The purpose of this visit was to perform a borescope inspection of the Engine in accordance with GEK105054, WP 406 00.

1.1 The HPC Section is serviceable according to GEK105054 Volume II WP40600 Table 4. The HPC section was found clean and without damages.

1.2 The Combustion section is serviceable according to GEK 105054 Volume II WP 406 00 Table 7. Found minor wear damage on dome cups

1.3 The HPT is not serviceable according to WP 406 00 Table 8 paragraph 7.c.
There is one (1) Stage 1 Blade showing burnt through damage in Area B where the cooling passages are exposed.

| | | | | |
|---|---|---|---|---|
| c. | Erosion, corrosion, oxidation, and burning | None permitted. Inspect at 600 hour intervals and replace within 1800 hours | Not repairable | Replace HPT rotor blade per WP 202 00 |

1.4 LPT section is serviceable found no damage

## 2. Outage Data

**ENGINE DATA**

| | | | | | |
|---|---|---|---|---|---|
| **ESN:** | 557 - 259 | **Engine Fired Hours:** | 14391 | **Package Hours:** | 14391 |
| **Model:** | 7LM2500-PK-MDWG05 | **Engine Fired starts:** | 501 | **Package Fired Starts:** | 501 |

**MAINTENANCE DATA**

| WP, SB, SL, PB, PL Performed | GEK105054, REV 11 | Date completed | Comments |
|---|---|---|---|
| WP 406 00 | Borescope Inspection | 22DEC24 | Not Serviceable |

**PARTS DATA**

| Description | PN Removed | SN Removed | Qty | Disposition | PN Installed | SN Installed |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |

## 3. Borescope Inspection Checklist

**Date unit out of operation:** 22DEC24
**Date unit into operation:** 24DEC24
**Last inspection date:** 30MAR24; PPG O&M

**Type of Fuel:** Gas / Diesel
**Type of outage:** Scheduled

**Type of NOx suppression:** Water Injection

**Inspection of gas turbine:**

| WATERWASH: | HIGH PRESSURE COMPRESSOR: |
|---|---|
| ☒ PERFORMED WATER WASH | ☒ HPC BORESCOPE INSPECTION |
| **COMBUSTOR:** | **HIGH PRESSURE TURBINE** |
| ☒ COMBUSTOR BORESCOPE INSPECTION | ☒ HPT STAGE 1 & 2 NOZZLE BORESCOPE INSPECTION |
| | ☒ HPT BLADE BORESCOPE INSPECTION |
| **LOW PRESSURE TURBINE:** | |
| ☒ LPT BORESCOPE INSPECTION | |

☒ ***Please verify all borescope plugs have been reinstalled***

## 4. Borescope Inspection Record

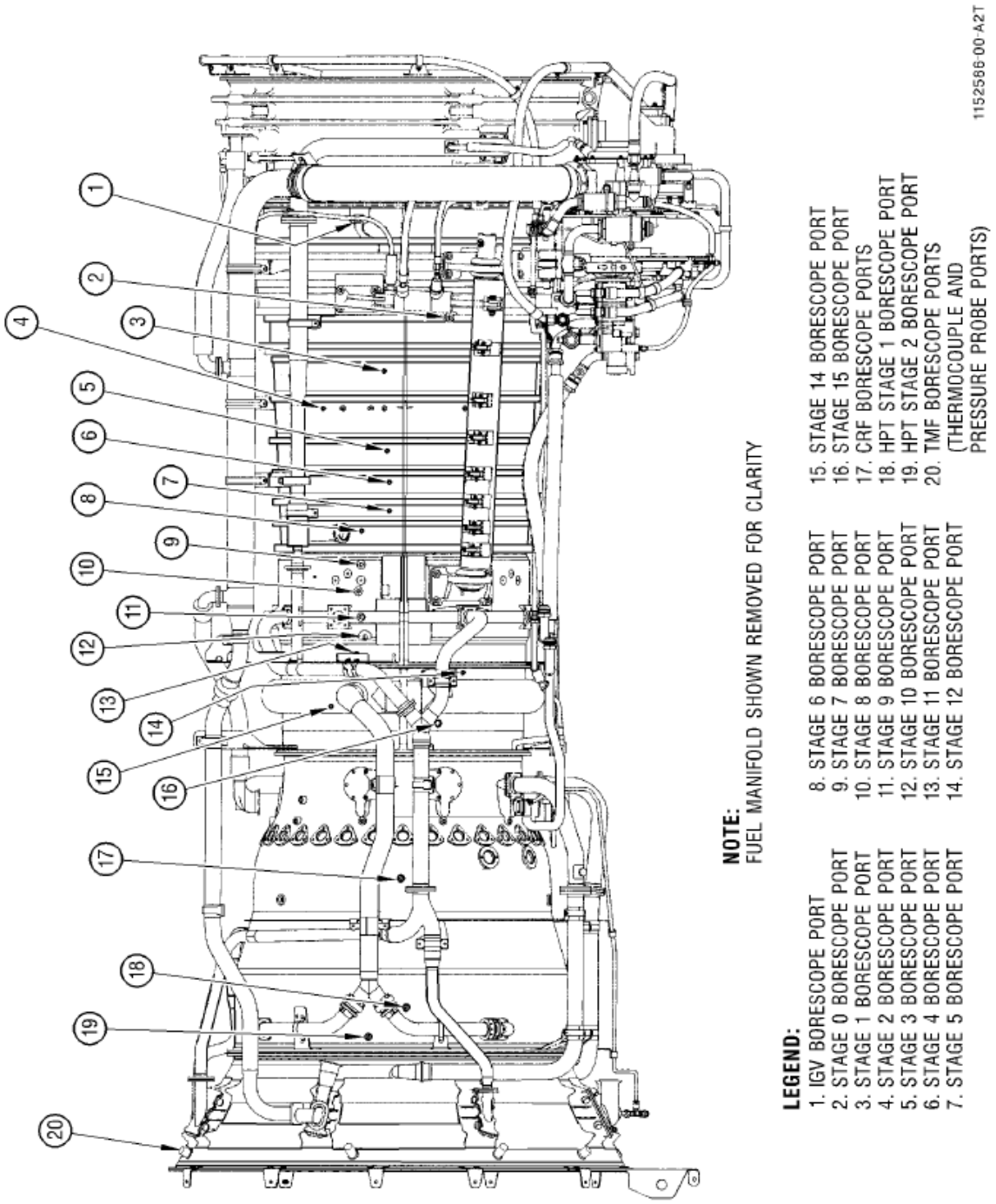



Figure 1: Position of Borescope Inspection Ports.

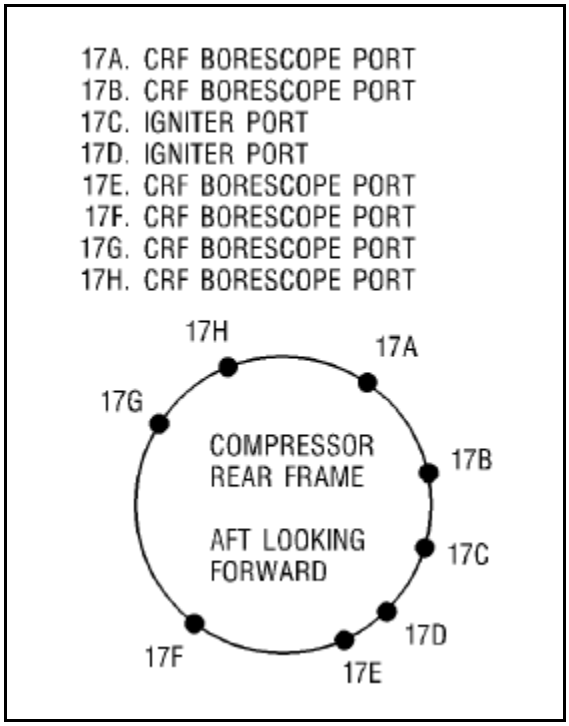


Figure 2: Position of Borescope Inspection Ports.

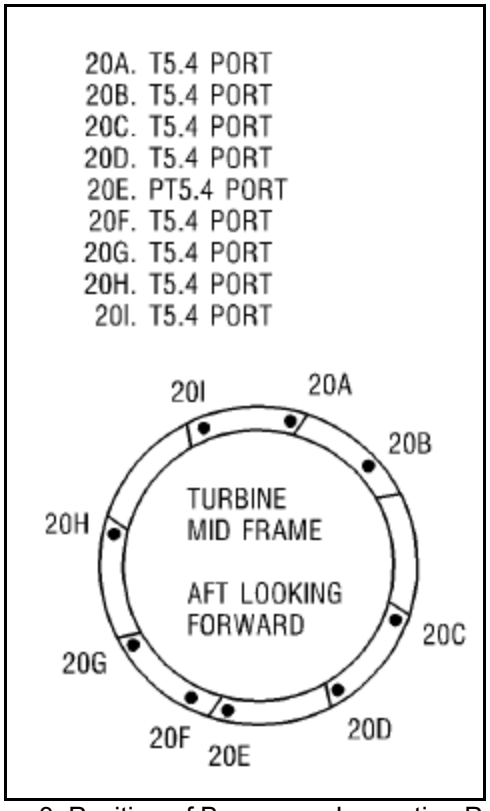


Figure 3: Position of Borescope Inspection Ports.

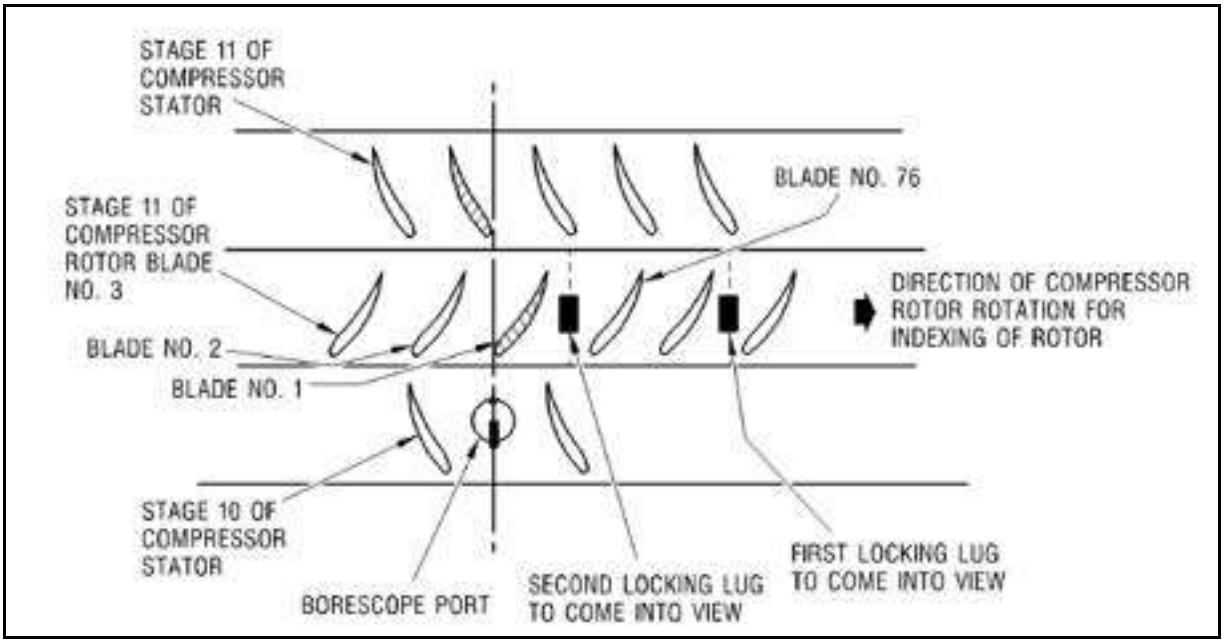


Figure 4: Zero indexing of HPC rotor and HPT rotor

Compressor Section

| Port | T.E. | L.E. | blades | Remarks: | photo no: |
|---|---|---|---|---|---|
| 1 | IGV | | | | P1 |
| 1 | | 0 | 36 | | P2 P3 |
| 2 | 0 | | 36 | | P4 P5 |
| 2 | | 1 | 26 | | P6 P7 |
| 3 | 1 | | 26 | | P8 P9 P10 |
| 3 | | 2 | 26 | | P11 P12 |
| 4 | 2 | | 26 | | P14 |
| 4 | | 3 | 42 | | P15 |
| 5 | 3 | | 42 | | P15 P16 |
| 5 | | 4 | 45 | | P17 P18 |
| 6 | 4 | | 45 | | P19 P20 |
| 6 | | 5 | 48 | | P21 |
| 7 | 5 | | 48 | | P22 P23 |
| 7 | | 6 | 54 | | P24 P25 |
| 8 | 6 | | 54 | Blades contacting tip | |
| 8 | | 7 | 56 | Blades contacting tip | |
| 9 | 7 | | 56 | | P26 |
| 9 | | 8 | 64 | | P27 P28 |
| 10 | 8 | | 64 | | P29 P30 |
| 10 | | 9 | 66 | | P31 |
| 11 | 9 | | 66 | | P32 P33 P34 |
| 11 | | 10 | 66 | | P35 P36 |
| 12 | 10 | | 66 | | P37 P38 |
| 12 | | 11 | 76 | | P39 P40 |
| 13 | 11 | | 76 | | P41 P42 |
| 13 | | 12 | 76 | | P43 P44 |
| 14 | 12 | | 76 | | P45 P46 |
| 14 | | 13 | 76 | | P47 |
| 15 | 14 | | 76 | Inside bleed manifold | |
| 15 | | 15 | 76 | Inside bleed manifold | |
| 16 | 15 | | 76 | | P489 P49 |
| 16 | | 16 | 76 | | P50 P51 P52 |

**Notes:**
The HPC Section is serviceable according to GEK105054 Volume II WP40600 Table 4.
The HPC section was found clean.

.



Picture 1. CFF & IGV



Picture 2. Stage 0 Leading edge tip



Picture 3. Stage 0 Leading edge base



Picture 4. Stage 0 Trailing edge tip



Picture 5. Stage 0 Trailing edge base



Picture 6. Stage 1 Leading edge tip



Picture 7. Stage 1 Leading edge base



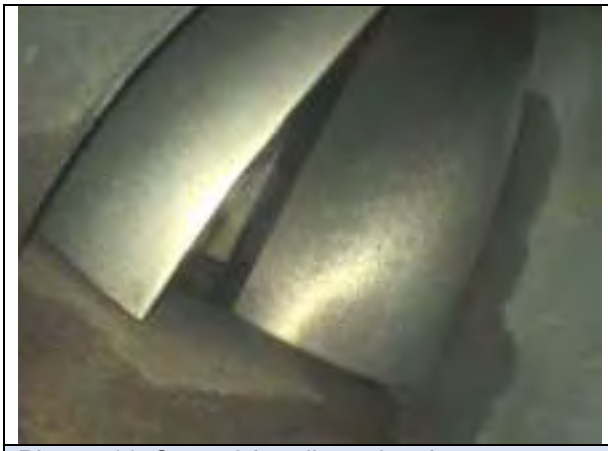
Picture 8. Stage 1 Blade retainers



Picture 9. Stage 1 Trailling edge



Picture 10. Stage 1 Trailing edge baase



Picture 11. Stage 2 Leading edge tip



Picture12. Stage 2 Leading edge



Picture 13. Stage 2 Trailing edge tip



Picture 14. Stage 2 Leading edge base



Picture 15. Stage 3 Leading edge tip



Picture 16. Stage 3 Trailing edge base



Picture 17. Stage 4 Leading edge tip



Picture 18. Stage 4 Leading edge base



Picture 19. Stage 4 Trailing edge tip



Picture 20. Stage 4 Trailing edge base



Picture 21. Stage 5 Leading edge



Picture 22. Stage 5 Trailing edge base



Picture 23. Stage 5 Trailing edge tip



Picture 24. Stage 6 Leading edge tip



Picture 25. Stage 6 Leading edge base



Picture 26. Stage 7 Trailing edge tip



Picture 27. Stage 8 Leading edge tip



Picture 28. Stage 8 Leading edge base



Picture 29. Stage 8 Trailing edge tip



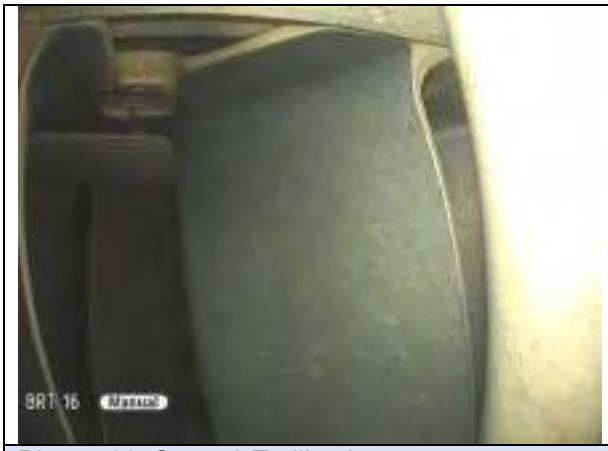
Picture 30. Stage 8 Trailing edge base



Picture 31. Stage 9 Leading edge



Picture 32. Stage 9 Trailing edge tip



Picture 33. Stage 9 Trailing base



Picture 34. Stage 9 Bleed manifold



Picture 35. Stage 10 Leading edge tip



Picture 36. Stage 10 Leading edge base



Picture 37. Stage 10 Trailing edge tip



Picture 38. Stage 10 Leading edge base



Picture 39. Stage 11 Leading edge tip



Picture 40. Stage 11 Leading edge base



Picture 41. Stage 11 Trailing edge tip



Picture 42. Stage 11 Trailing edge base



Picture 43. Stage 12 Leading edge tip



Picture 44. Stage 12 Leading edge base



Picture 45. Stage 12 Trailing edge tip



Picture 46. Stage 12 Trailing edge base



Picture 47. Stage 13 Leading edge tip



Picture 48. Stage 15 Trailing edge



Picture 49. Stage 15 Trailing edge base



Picture 50. Stage 15 Rotor TBC flaking



Picture 51. Stage 16 Leading edge base



Picture 52. Stage 16 leading edge base and OGV's

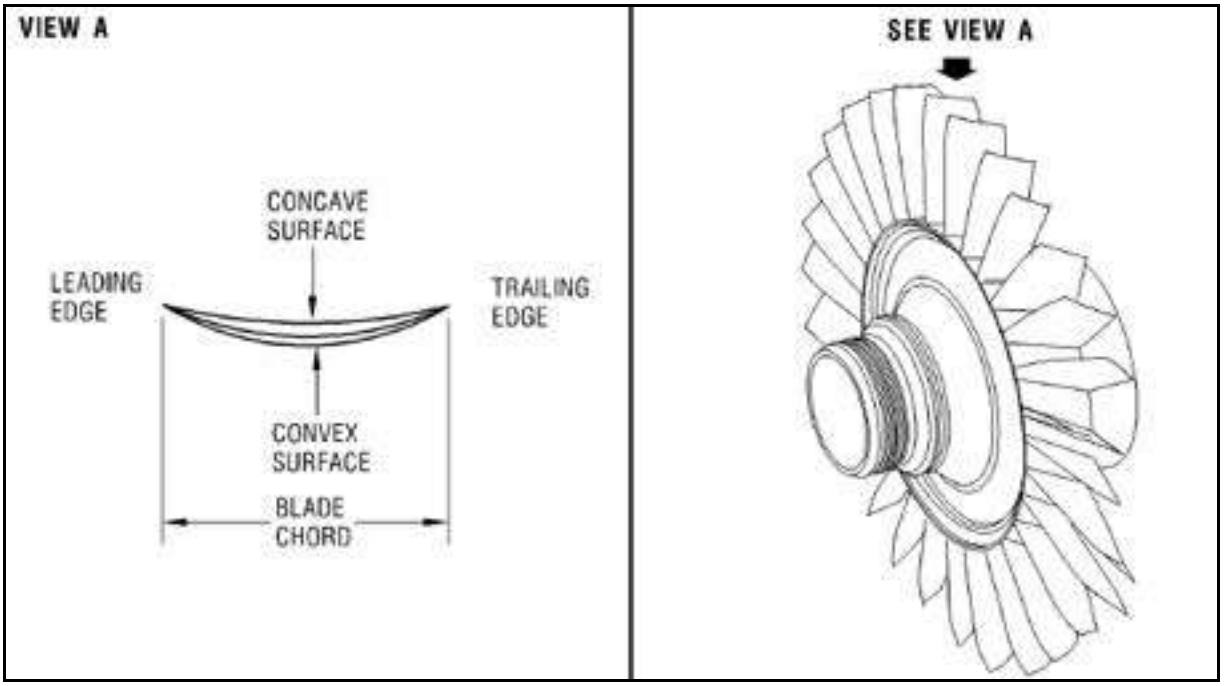



Figure 5: HPC stage 0 BLISK

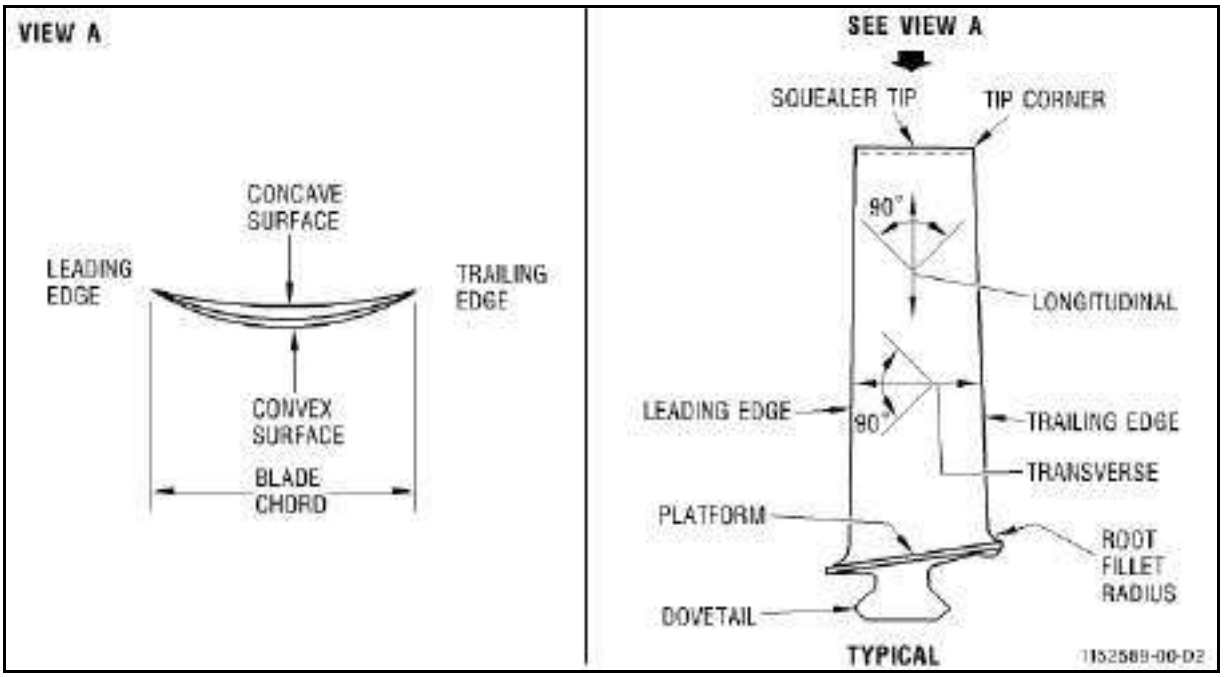



Figure 6: Compressor Rotor Blades

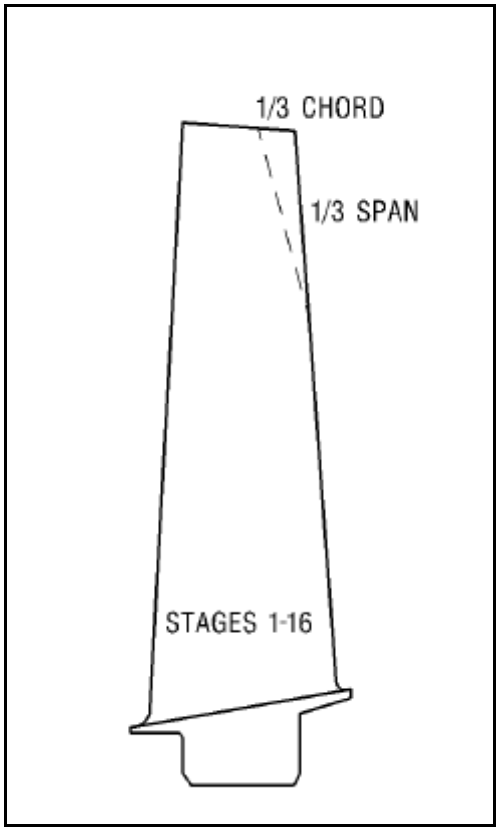


Figure 7: Tip Trailing Edge Inspection

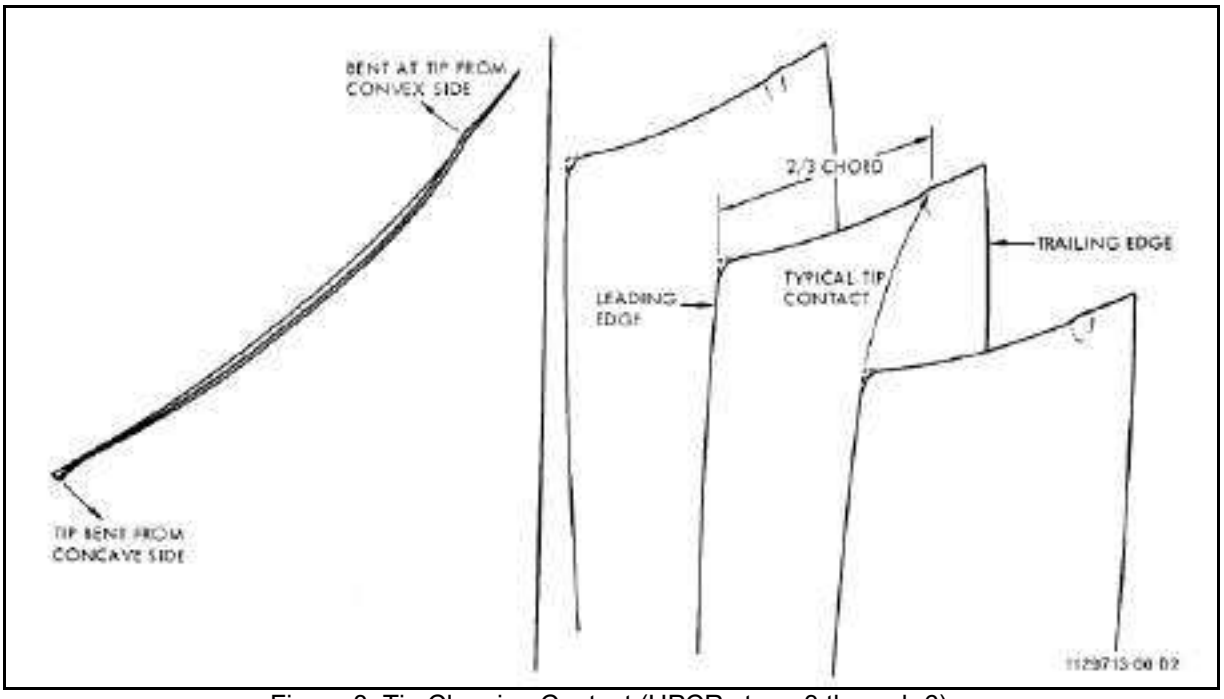
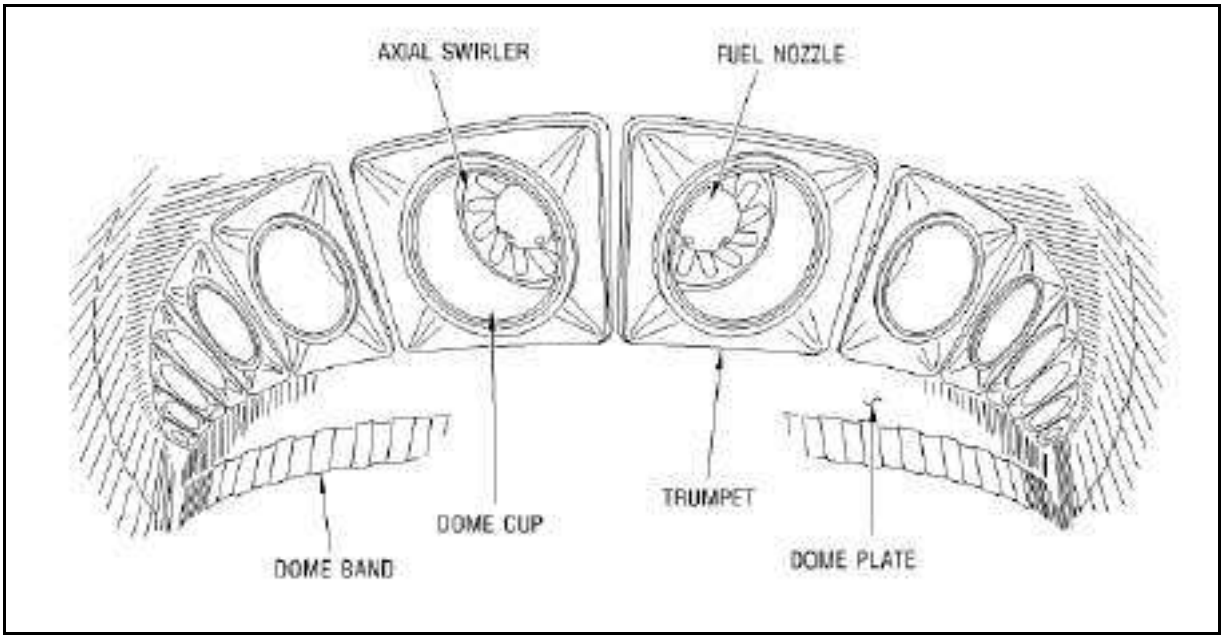


Figure 8: Tip Clanging Contact (HPCR stage 3 through 6)

Combustor and 1St Stage Nozzle Section

| Port | Condition observed | Photo no: |
|---|---|---|
| **17A** | | |
| **17B** | | |
| **17C** | | |
| **17D** | **See below notes.** | |
| **17E** | | |
| **17F** | | |
| **17G** | | |
| **17H** | | |
| **17** | 1st stage nozzle (leading edge): | |

**Notes:**
The Combustor section is serviceable according to GEK105054 Volume II WP40600 Table 7.



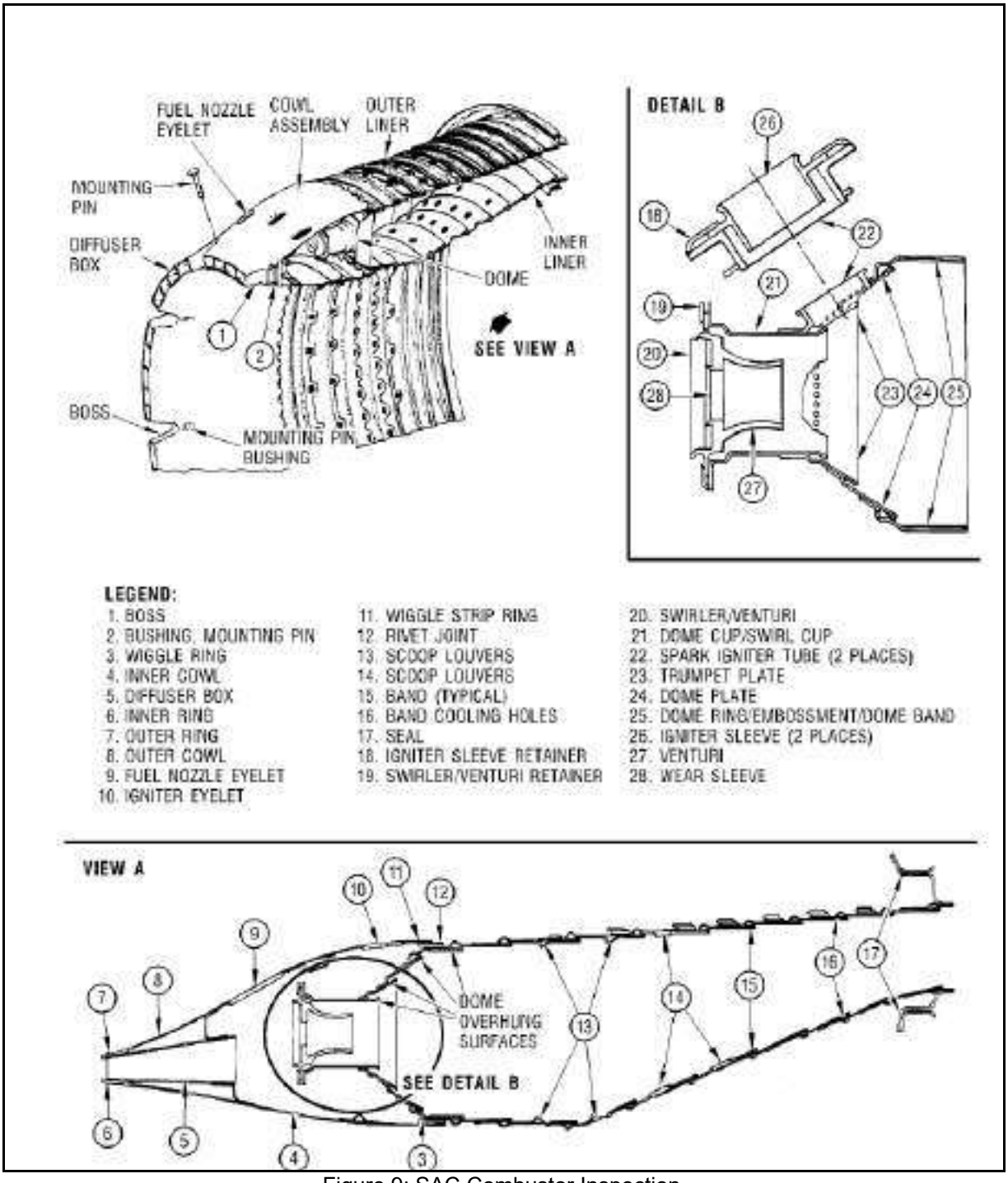



Figure 9: SAC Combustor Inspection

Figure 10: SAC Combustor Inspection

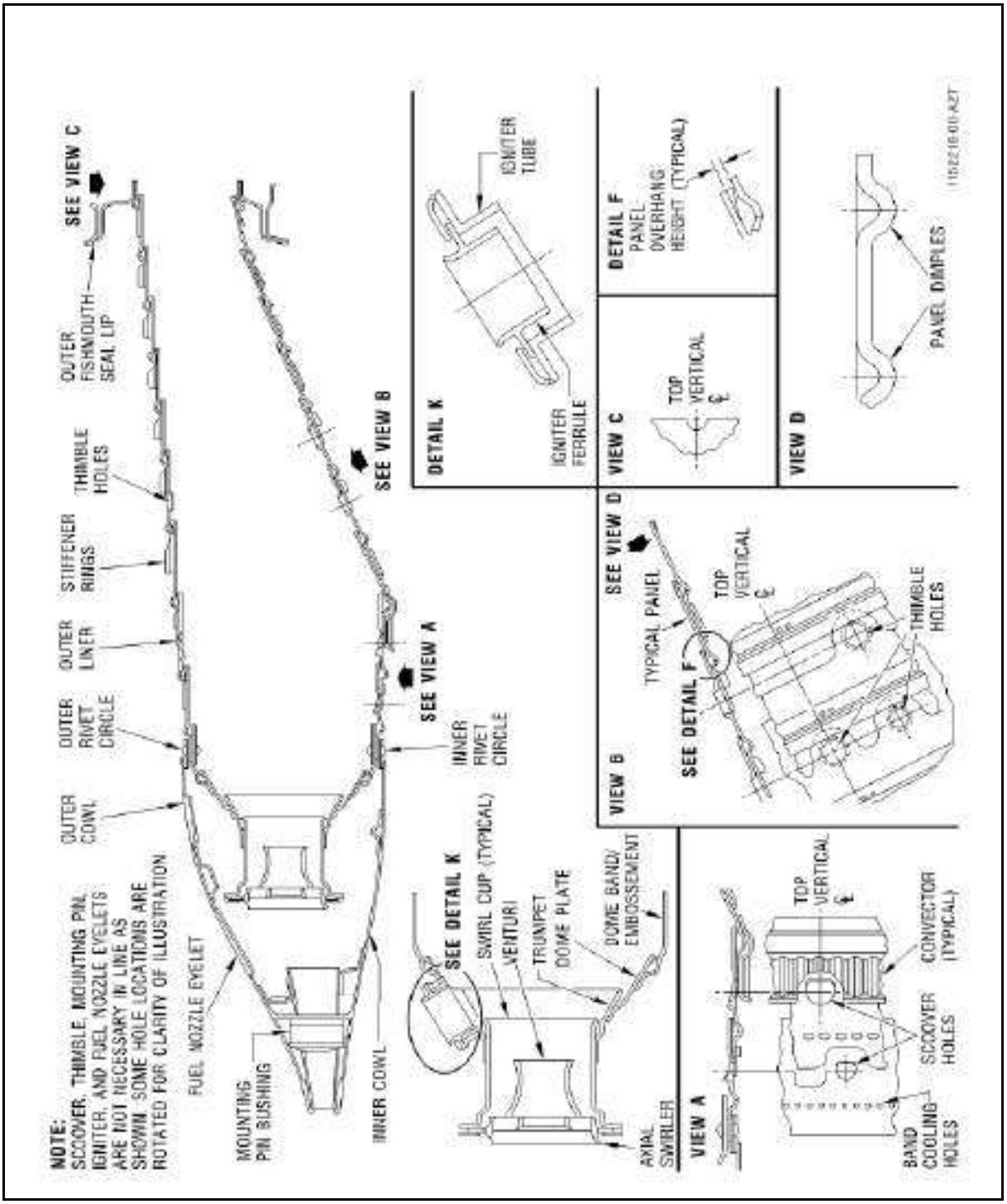



Figure 11: SAC Combustor Inspection

**Borescope Pictures**



Picture 53. Upper igniter



Picture 54. Lower igniter



Picture 55. Outer rivets band



Picture 56. Inner rivets band



Picture 57. Combustor liners



Picture 58. Comustor dome cups wear



Picture 59. Combustor dome. Splash plates



Picture 60. Fuel nozzle tip



Picture 61. Splash plates, fuel nozzle tips



Picture 62. Combustor liners and HPT nozzles interference

Turbine Section

| | turbine stage | | | | |
|---|---|---|---|---|---|
| **Port** | **L.E.** | **T.E.** | **blades** | **Remarks:** | **photo no:** |
| **18** | **1** | | **88** | | |
| **19** | | **1** | **88** | **See below notes.** | |
| **19** | **2** | | **90** | | |
| **20** | | **2** | | | |

**Notes:**
The HPT is not serviceable according to WP 406 00 Table 8 paragraph 7.c.
There is one (1) Stage 1 Blade showing burnt through damage in Area B where the cooling passages are exposed.

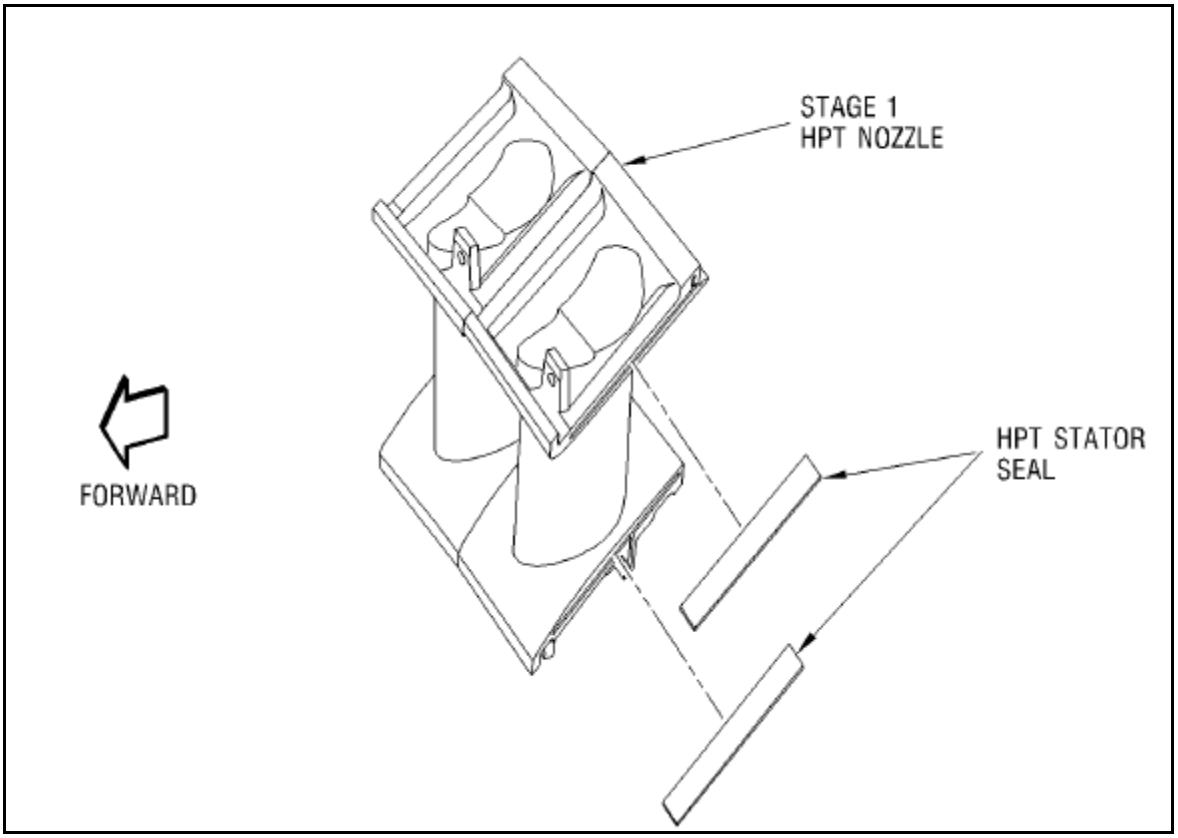


Figure 12: Stage 1 HPT Nozzle Seal Displacement

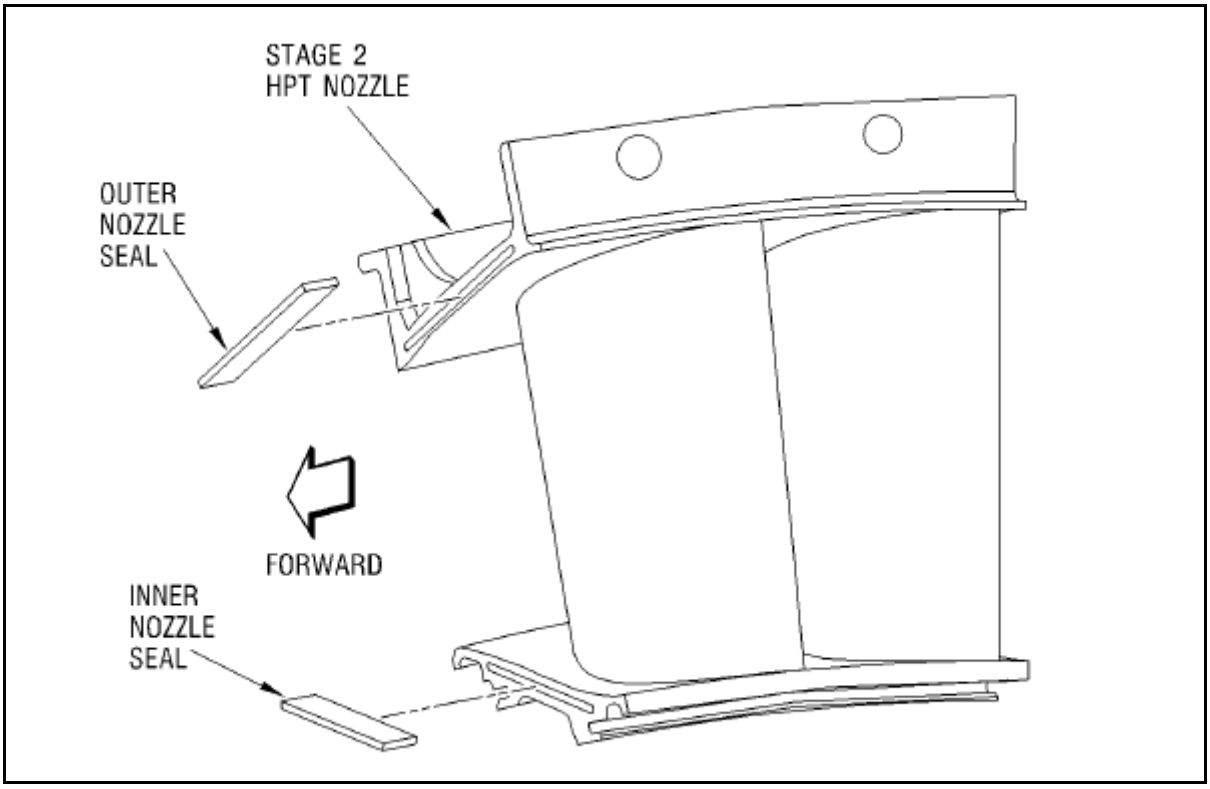


Figure 13: Stage 2 HPT Nozzle Seal Displacement

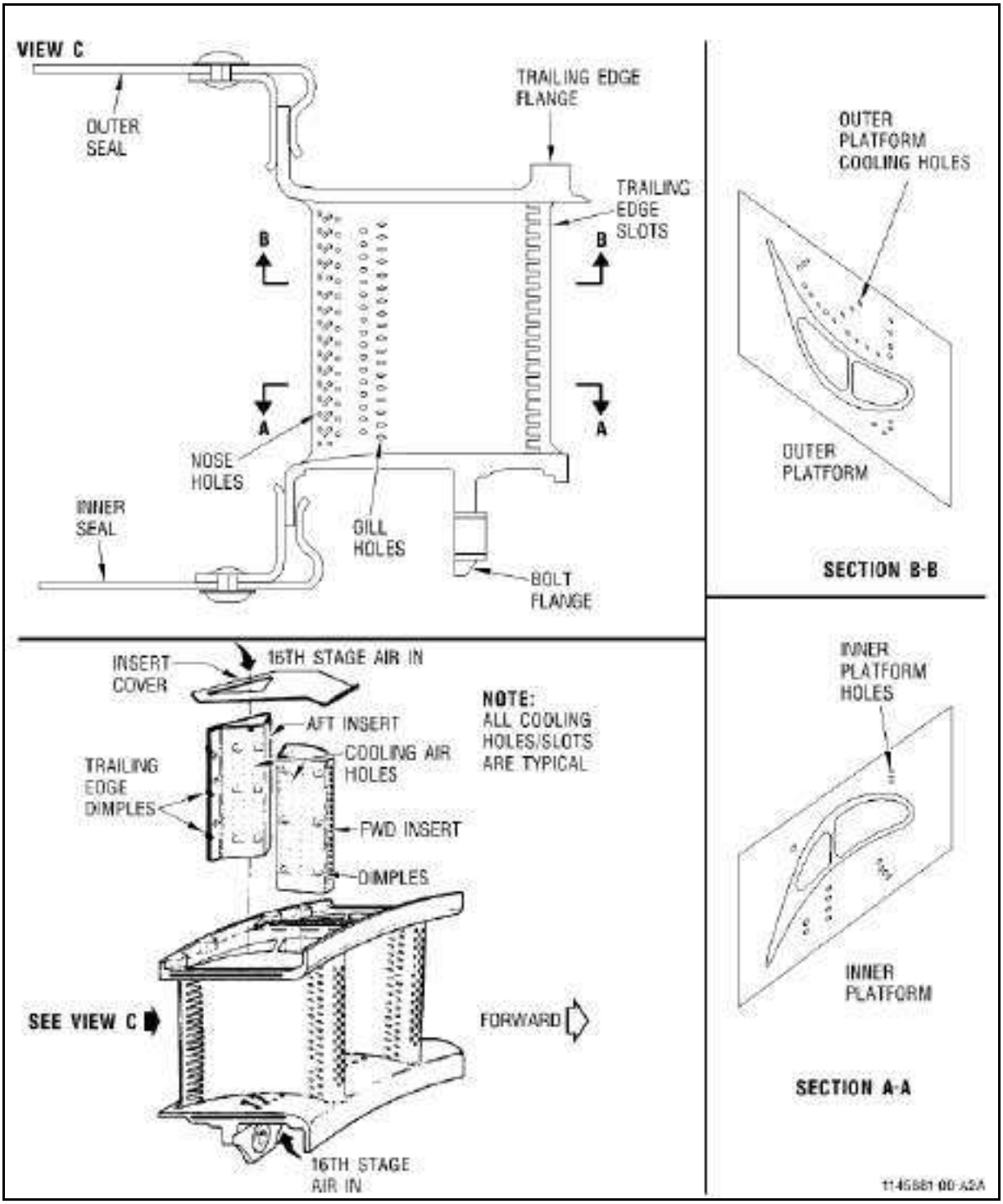



Figure 14: HPT Stage 1 Nozzle

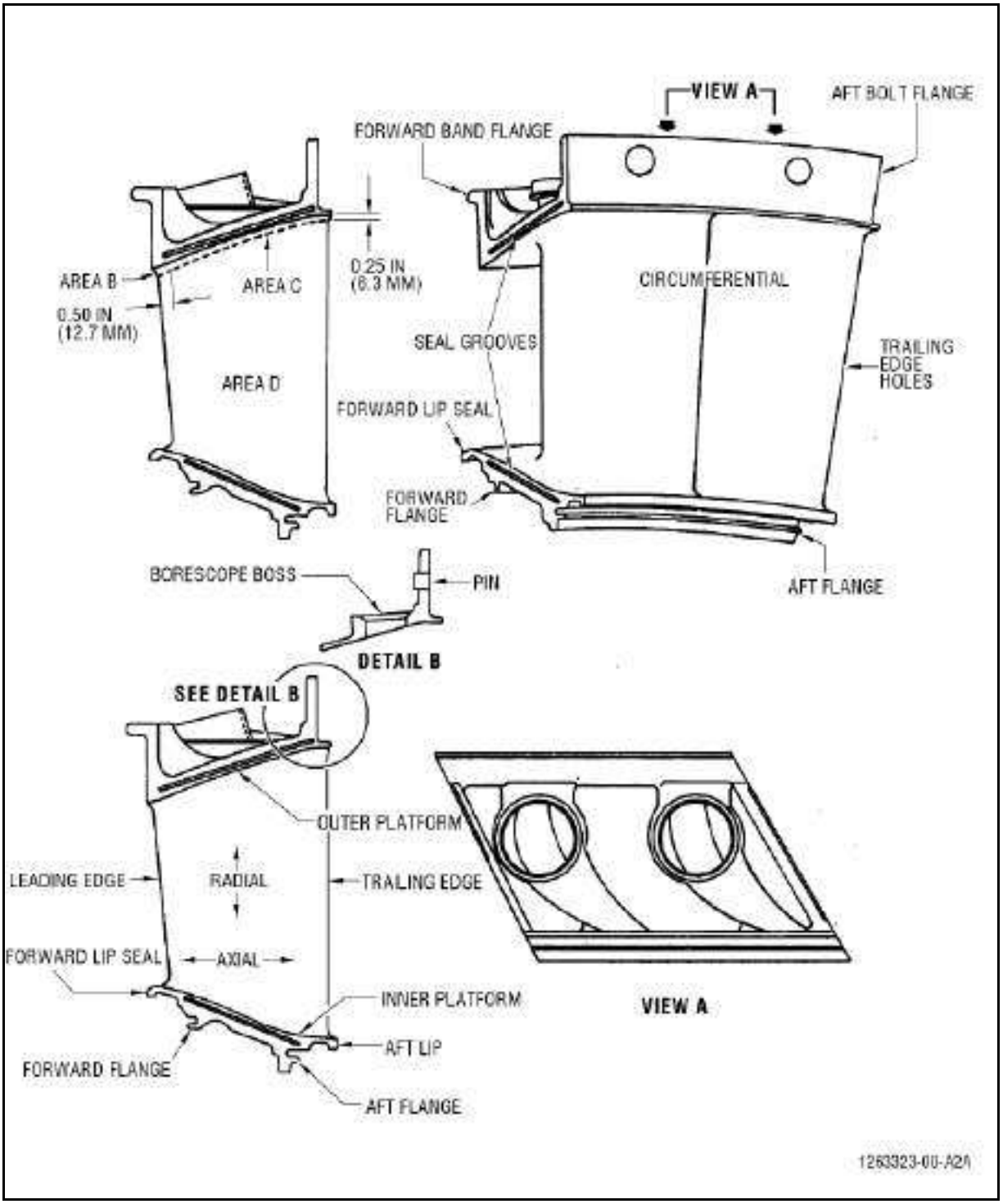



Figure 15: HPT Stage 2 Nozzle

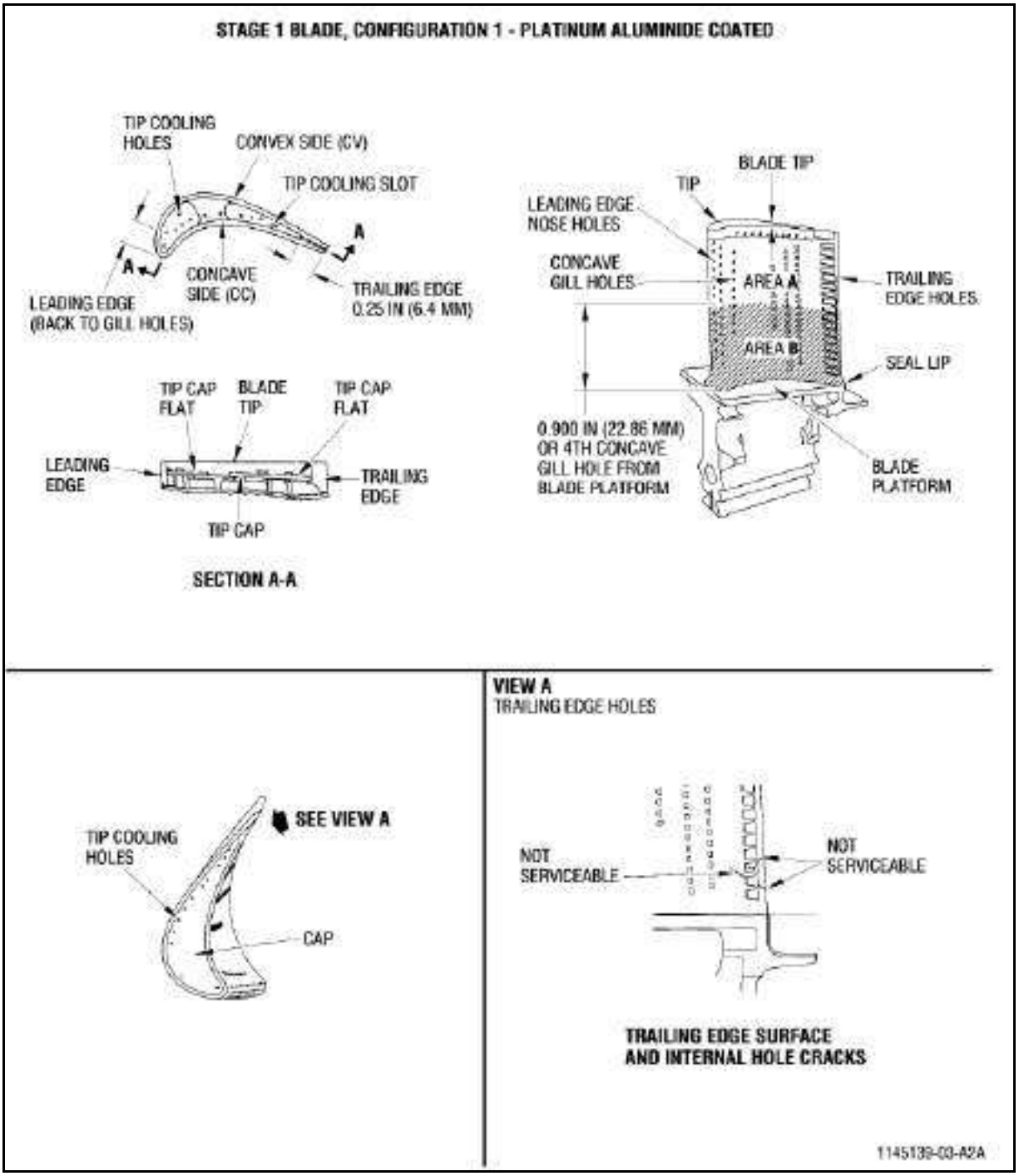



Figure 16: HPT Stage 1 Rotor Blades Inspection Areas (Platinum Aluminide Coated Blades)

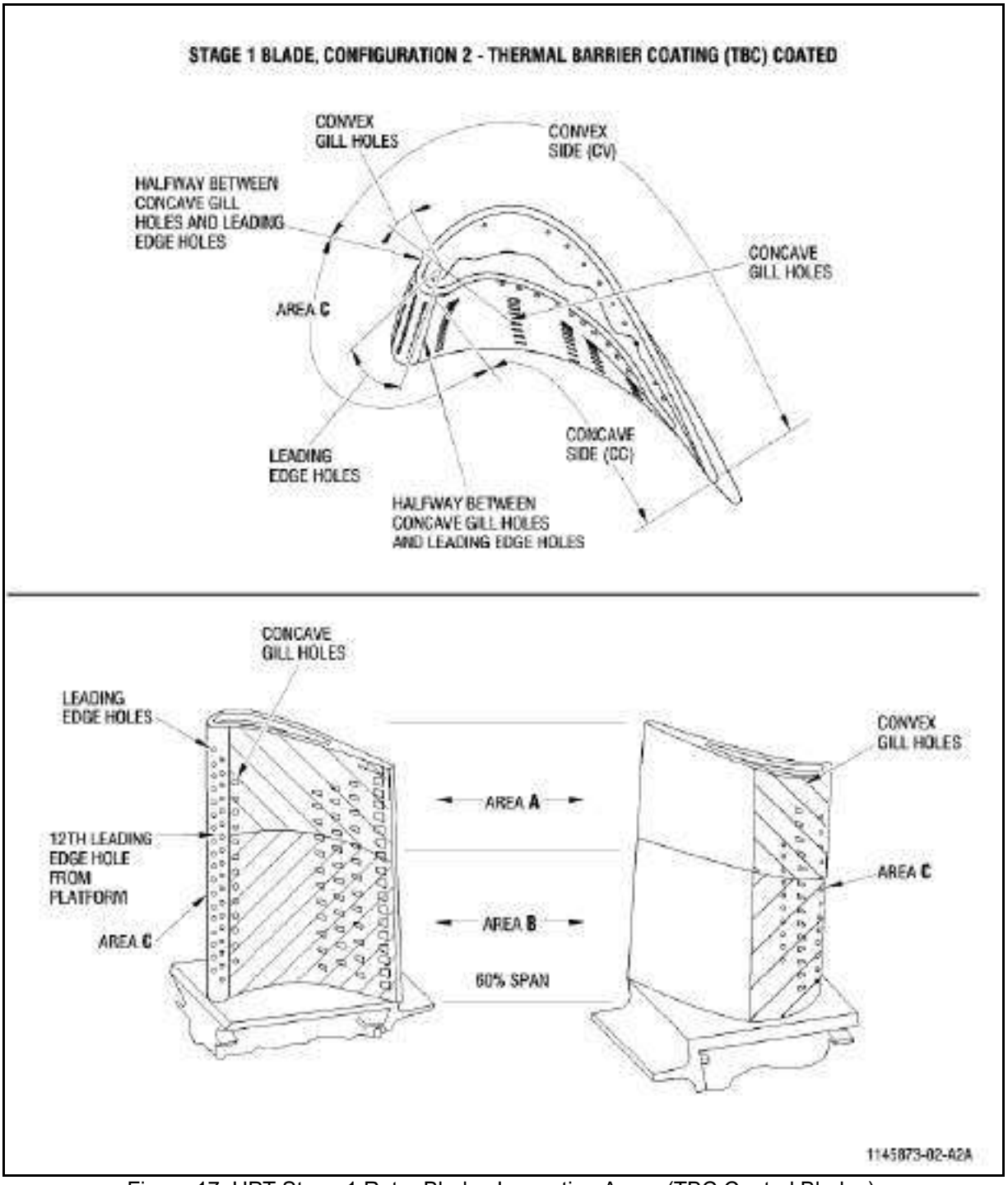


Figure 17: HPT Stage 1 Rotor Blades Inspection Areas (TBC Coated Blades)

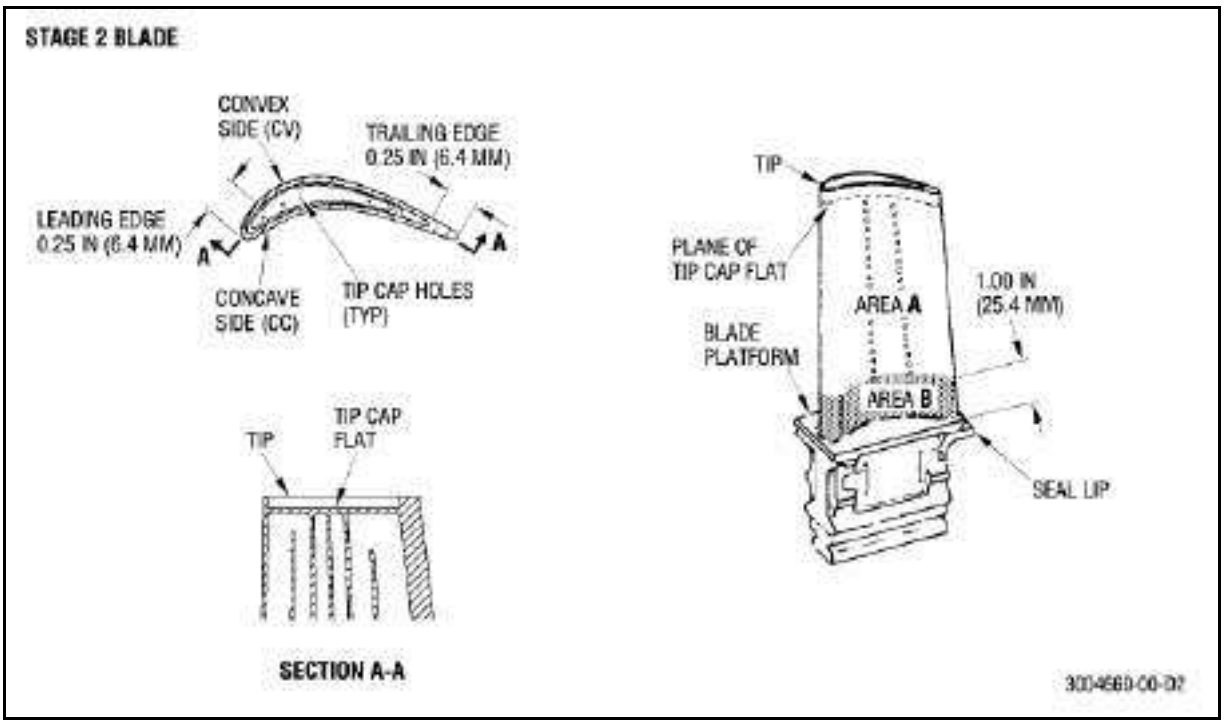


Figure 18: HPT Stage 2 Rotor Blades Inspection Areas

**Borescope Pictures**



Picture 63: Stage1 Nozzles leading edge



Picture 64: Stage1 Nozzles leading edge



Picture 65: Stage1 Nozzle airfoil concave side



Picture 66: Stage1 Nozzle airfoil concave side



Picture 67: Stage1 Nozzle airfoil concave side



Picture 68: Stage1 Nozzle airfoil concave base



Picture 69: Stage1 Nozzle airfoil concave side



Picture 70: Stage1 Nozzle trailingedge concave side base



Picture 71: Stage1 Nozzle airfoil convex side



Picture 72: Stage1 Nozzle trailing edge concave



Picture 73: Stage1 Blades tip



Picture 74: Stage1 Blades leading edge base



Picture 75: Stage1 Blades tip leading concave



Picture 76: Stage1 Blade leading edge



Picture 77: Stage1 Blades leading edge burn through damage



Picture 78: Stage 1 Blades leading edge



Picture 79: Stage 1 Blades trailing edge convex



Picture 80: Stage 1 Blades trailing edge convex



Picture 81: Stage 2 Blades leading edge



Picture 82: Stage 2 Honeycomb seals



Picture 83: Stage 2 Blades leading edge



Picture 84: Stage 2 Blades leading edge



Picture 85: Stage 2 Blades trailing edge



Picture 86: Stage 2 Blades trailing edge

LPT Section

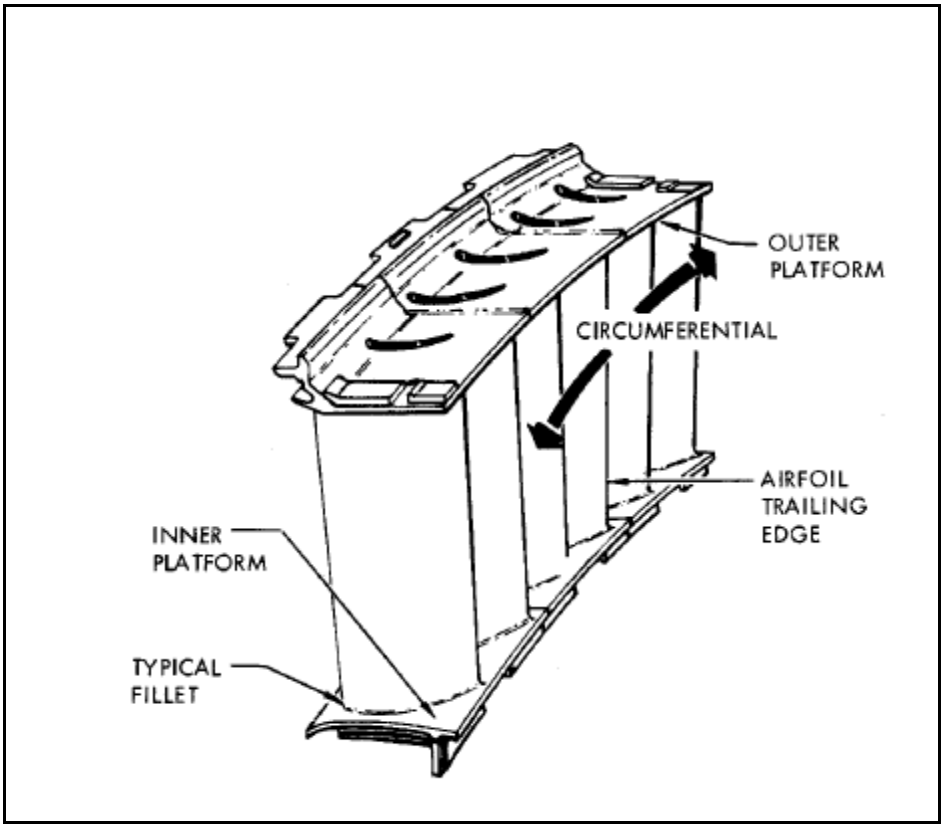



Figure 19: Power Turbine Nozzles

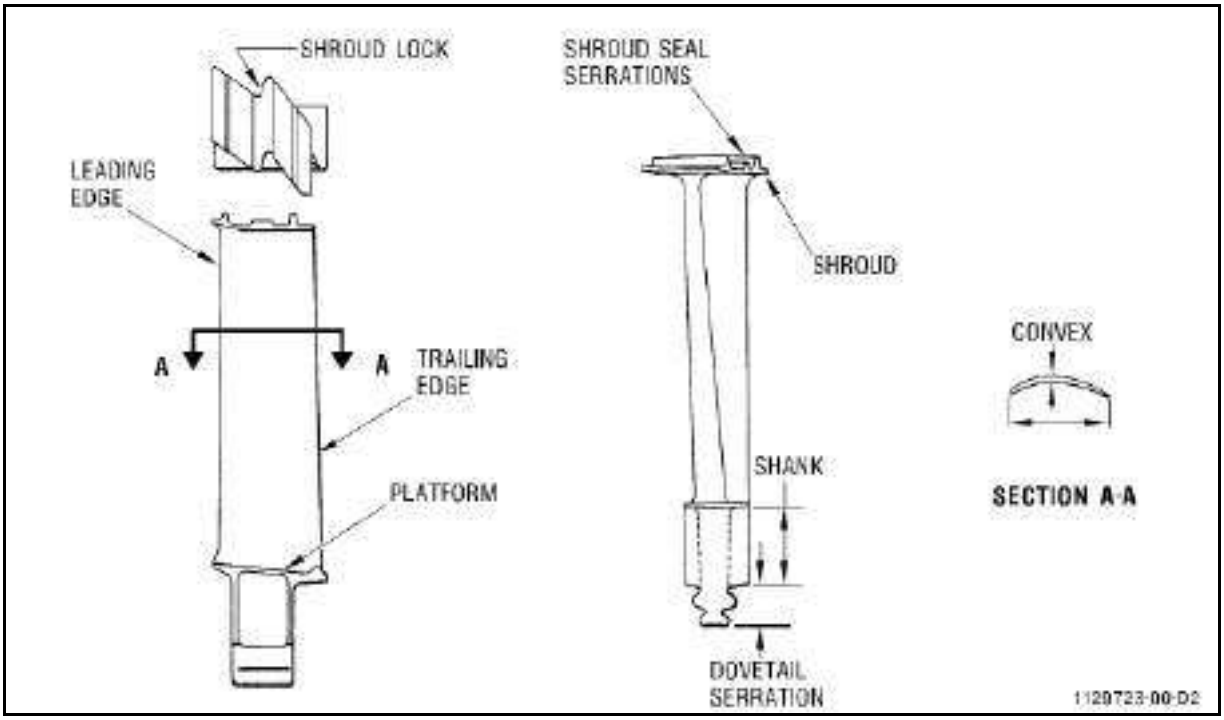



Figure 20: Power Turbine Rotor Blades

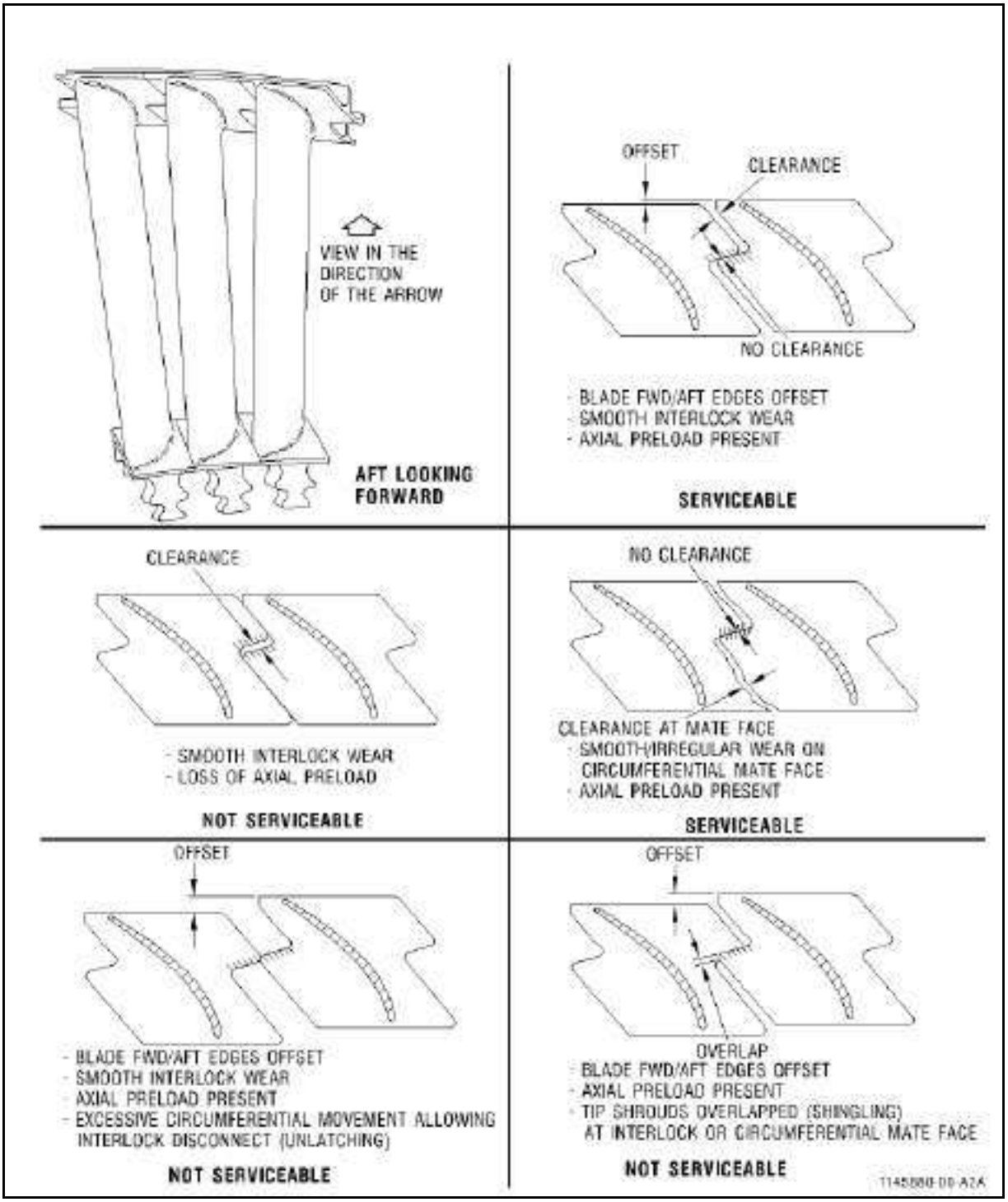


Figure 21: LPT Rotor Blade Circumferential Inspection

**Notes:**

The LPT stage 1 accessible nozzles and blades did not show any damage.

**Borescope Pictures**



Picture 87: TMF and LPT Inlet



Picture 88: LPT stage one nozzles



Picture 89: Stage 1 Blades



Picture 90: LPT Stage 1 Blades tip interlock

# *BORESCOPE INSPECTION REPORT*
# *TM2500 GEN. 6-7*
# *7LM2500 – PK – MDWG05*

# NFE PALO SECO POWER PLANT

## *PACKAGE # TP08*

## *UNIT #2*

| | | | |
|---|---|---|---|
| **Visit Date:** | December 27, 2024 | **Total Starts:** | 287 |
| **Engine S/N:** | 557-121 | **GG Hours:** | 13074 |
| **Power Turbine S/N:** | 557-121 | **PT Hours:** | 13074 |
| **PPG GT Field Engineer:** | Daniel Arroyo | **NFE Representative:** | Lance Florent |



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4.2 Combustor and 1St Stage Nozzle Section.....12
4.3 Turbine Section.....18
4.4 LPT Section .....27

## 1. Conclusions and Recommendations

**Purpose of visit:**
The purpose of this visit was to perform a borescope inspection of the Engine in accordance with GEK105054, WP 406 00.

1.1 The HPC Section is serviceable according to GEK105054 Volume II WP40600 Table 4. The HPC section was found clean and without damages.

1.2 The Combustion section is serviceable according to GEK 105054 Volume II WP 406 00 Table 7.

1.3 The HPT is serviceable according to GEK 105054 Volume II WP 406 00

1.4 The PT is serviceable according to GEK 105054 Volume II WP 406 00

## 2. Outage Data

**ENGINE DATA**

| | | | | | |
|---|---|---|---|---|---|
| **ESN:** | 557 – 121 | **Engine Fired Hours:** | 13074 | **Package Hours:** | 13074 |
| **Model:** | 7LM2500-PK-MDWG05 | **Engine Fired starts:** | 287 | **Package Fired Starts:** | 287 |

**MAINTENANCE DATA**

| WP, SB, SL, PB, PL Performed | GEK105054, REV 11 | Date completed | Comments |
|---|---|---|---|
| WP 406 00 | Borescope Inspection | 27DEC24 | Serviceable |

**PARTS DATA**

| Description | PN Removed | SN Removed | Qty | Disposition | PN Installed | SN Installed |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |

## 3. Borescope Inspection Checklist

**Date unit out of operation:** 27DEC24
**Date unit into operation:** 29DEC24
**Last inspection date:** 12MAR24; PPG O&M

**Type of Fuel:** Gas / Diesel
**Type of outage:** Scheduled

**Type of NOx suppression:** Water Injection

**Inspection of gas turbine:**

| WATERWASH: | HIGH PRESSURE COMPRESSOR: |
|---|---|
| ☒ PERFORMED WATER WASH | ☒ HPC BORESCOPE INSPECTION |
| **COMBUSTOR:** | **HIGH PRESSURE TURBINE** |
| ☒ COMBUSTOR BORESCOPE INSPECTION | ☒ HPT STAGE 1 & 2 NOZZLE BORESCOPE INSPECTION |
| | ☒ HPT BLADE BORESCOPE INSPECTION |
| **LOW PRESSURE TURBINE:** | |
| ☒ LPT BORESCOPE INSPECTION | |

☒ ***Please verify all borescope plugs have been reinstalled***

## 4. Borescope Inspection Record

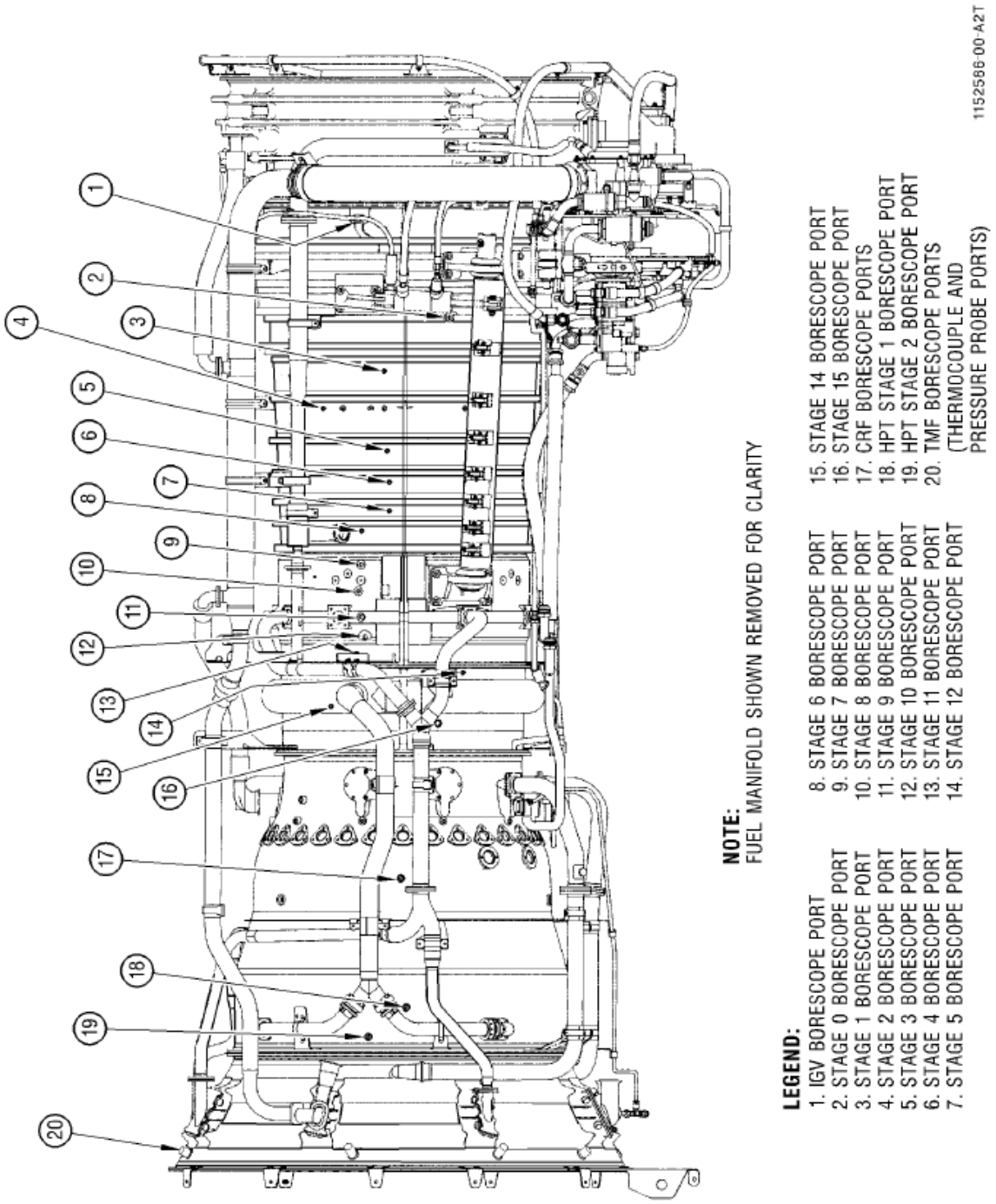



Figure 1: Position of Borescope Inspection Ports.

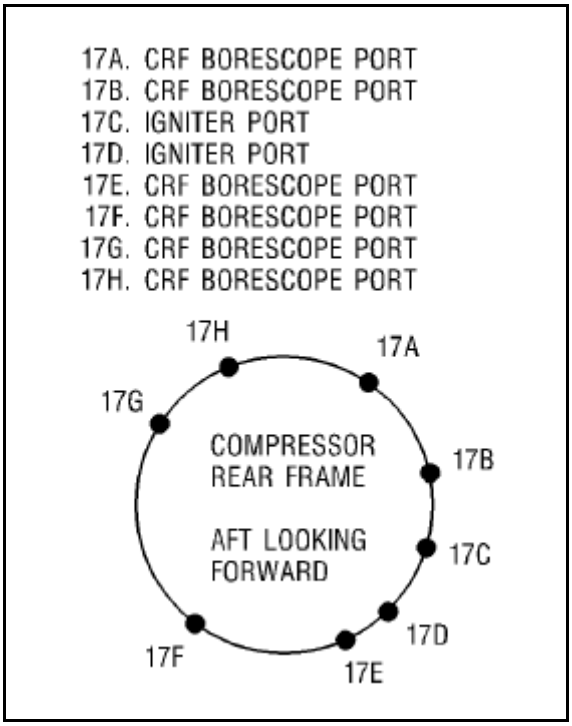


Figure 2: Position of Borescope Inspection Ports.

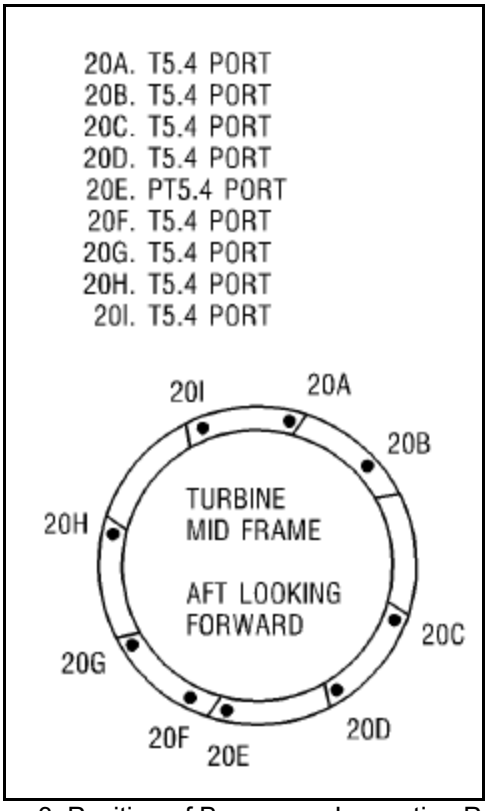


Figure 3: Position of Borescope Inspection Ports.

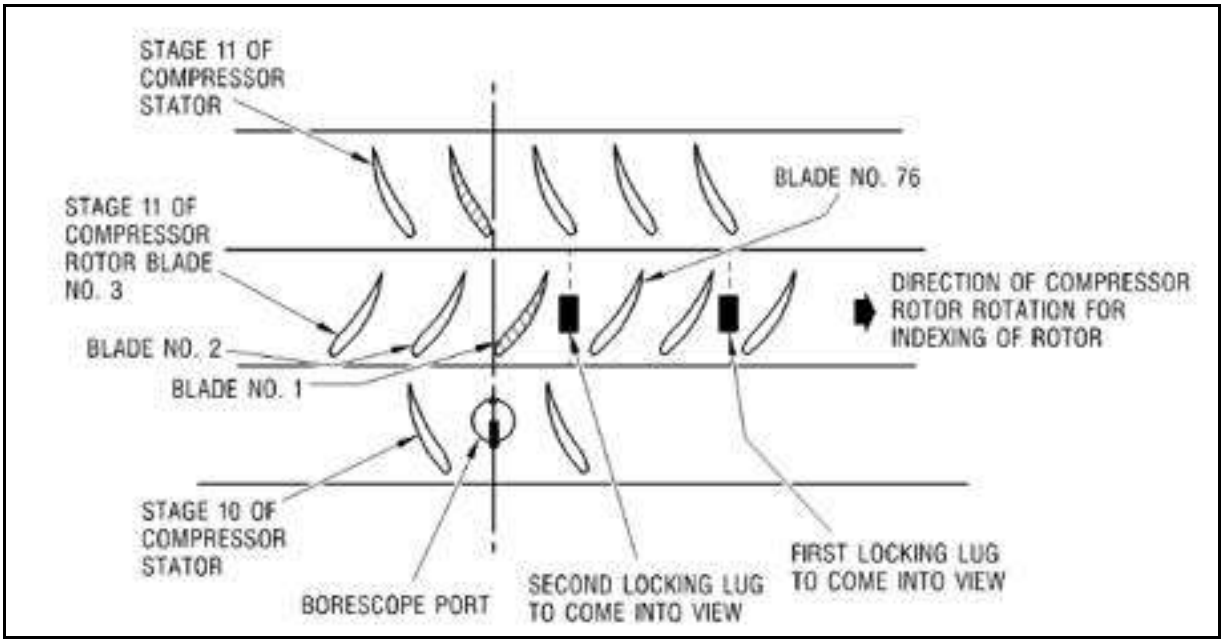


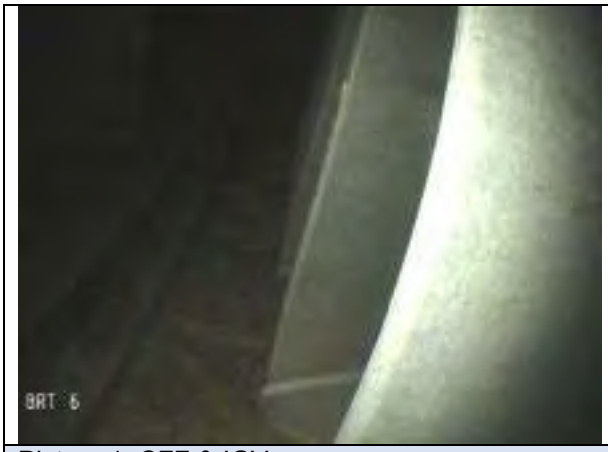
Figure 4: Zero indexing of HPC rotor and HPT rotor

## Compressor Section

| Port | T.E. | L.E. | blades | Remarks: | photo no: |
|---|---|---|---|---|---|
| 1 | IGV | | | | P1 |
| 1 | | 0 | 36 | | P2 P3 |
| 2 | 0 | | 36 | | P4 P5 |
| 2 | | 1 | 26 | | P6 P7 |
| 3 | 1 | | 26 | | P8 P9 P10 |
| 3 | | 2 | 26 | | P11 P12 |
| 4 | 2 | | 26 | | P13 |
| 4 | | 3 | 42 | | P14 |
| 5 | 3 | | 42 | | P15 P16 |
| 5 | | 4 | 45 | | P17 P18 |
| 6 | 4 | | 45 | | P19 P20 |
| 6 | | 5 | 48 | | P21 |
| 7 | 5 | | 48 | | P22 P23 |
| 7 | | 6 | 54 | | P24 P25 |
| 8 | 6 | | 54 | Blades contacting tip | |
| 8 | | 7 | 56 | Blades contacting tip | |
| 9 | 7 | | 56 | | P26 |
| 9 | | 8 | 64 | | P27 P28 |
| 10 | 8 | | 64 | | P29 P30 |
| 10 | | 9 | 66 | | P31 |
| 11 | 9 | | 66 | | P32 P33 P34 |
| 11 | | 10 | 66 | | P35 P36 |
| 12 | 10 | | 66 | | P37 P38 |
| 12 | | 11 | 76 | | P39 P40 |
| 13 | 11 | | 76 | | P41 P42 |
| 13 | | 12 | 76 | | P43 P44 |
| 14 | 12 | | 76 | | P45 P46 |
| 14 | | 13 | 76 | | P47 |
| 15 | 14 | | 76 | Inside bleed manifold | |
| 15 | | 15 | 76 | Inside bleed manifold | |
| 16 | 15 | | 76 | | P489 P49 |
| 16 | | 16 | 76 | | P50 P51 P52 |

**Notes:**
The HPC Section is serviceable according to GEK105054 Volume II WP40600 Table 4.
The HPC section was found clean.

.



Picture 1. CFF & IGV



Picture 2. Stage 0 Leading edge tip



Picture 3. Stage 0 Leading edge base



Picture 4. Stage 0 Trailing edge tip



Picture 5. Stage 0 Weep hole



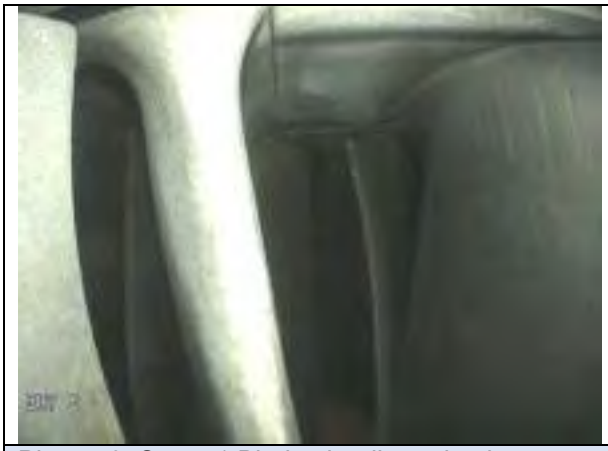
Picture 6. Stage 1 Leading edge tip



Picture 7. Stage 1 Leading edge base



Picture 8. Stage 1 Weep hole



Picture 9. Stage 1 Blades leading edge base



Picture 10. Stage 1 Trailing edge tip



Picture 11. Stage 2 Leading edge tip



Picture12. Stage 2 Leading edge base



Picture 13. Stage 2 Trailing edge tip



Picture 14. Stage 3 Leading edge tip



Picture 15. Stage 3 Trailing edge tip



Picture 16. Stage 3 Trailing edge base



Picture 17. Stage 4 Leading edge tip



Picture 18. Stage 4 Leading edge base



Picture 19. Stage 4 Trailing edge tip



=

Picture 20. Stage 4 Trailing edge base



Picture 21. Stage 5 Leading edge



Picture 22. Stage 5 Trailing edge base



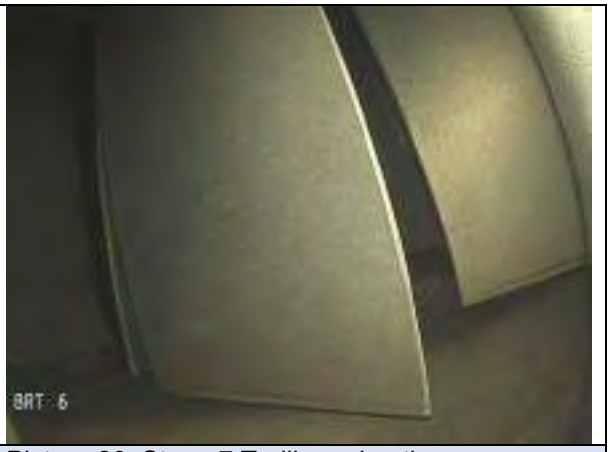
Picture 23. Stage 5 Trailing edge tip



Picture 24. Stage 6 Leading edge base



Picture 25. Stage 6 Leading edge tip



Picture 26. Stage 7 Trailing edge tip



Picture 27. Stage 8 Leading edge tip



Picture 28. Stage 8 Leading edge base



Picture 29. Stage 8 Trailing edge tip



Picture 30. Stage 8 Trailing edge base



Picture 31. Stage 9 Leading edge



Picture 32. Stage 9 Trailing edge tip



Picture 33. Stage 9 Trailing base



Picture 34. Stage 9 Bleed manifold



Picture 35. Stage 10 Leading edge tip



Picture 36. Stage 10 Leading edge base



Picture 37. Stage 10 Trailing edge



Picture 38. Stage 10 Trailing edge base



Picture 39. Stage 11 Leading edge base



Picture 40. Stage 11 Leading edge tip



Picture 41. Stage 11 Trailing edge tip



Picture 42. Stage 11 Trailing edge base



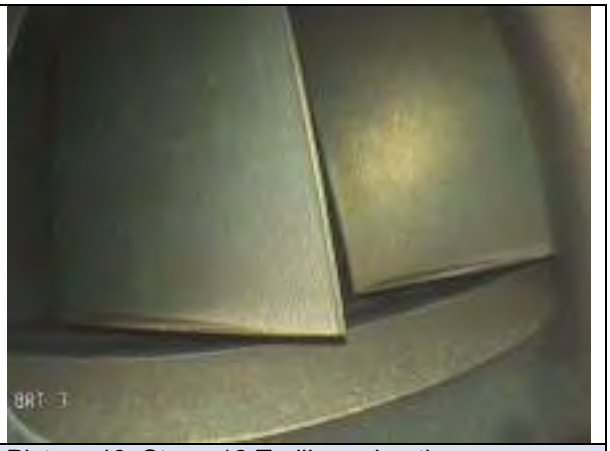
Picture 43. Stage 12 Leading edge tip



Picture 44. Stage 12 Leading edge base



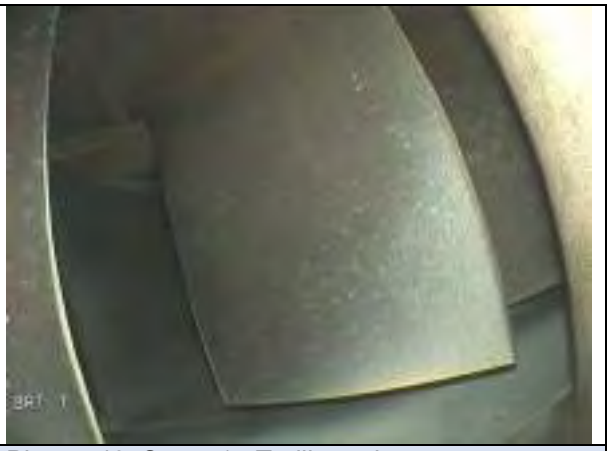
Picture 45. Stage 12 Trailing edge base



Picture 46. Stage 12 Trailing edge tip



Picture 47. Stage 13 Leading edge



Picture 48. Stage 15 Trailing edge



Picture 49. Stage 15 Trailing edge base



Picture 50. Stage 16 Leading edge tip



Picture 51. Stage 16 Leading edge base



Picture 52. Outlet guide vanes

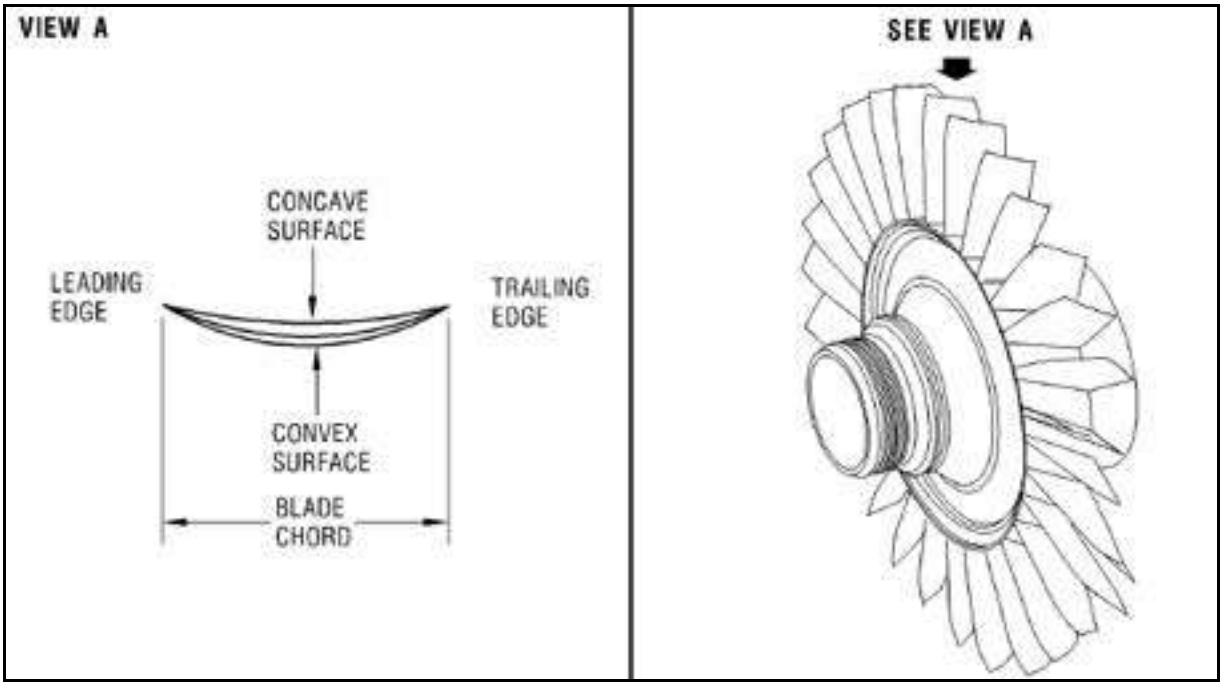



Figure 5: HPC stage 0 BLISK

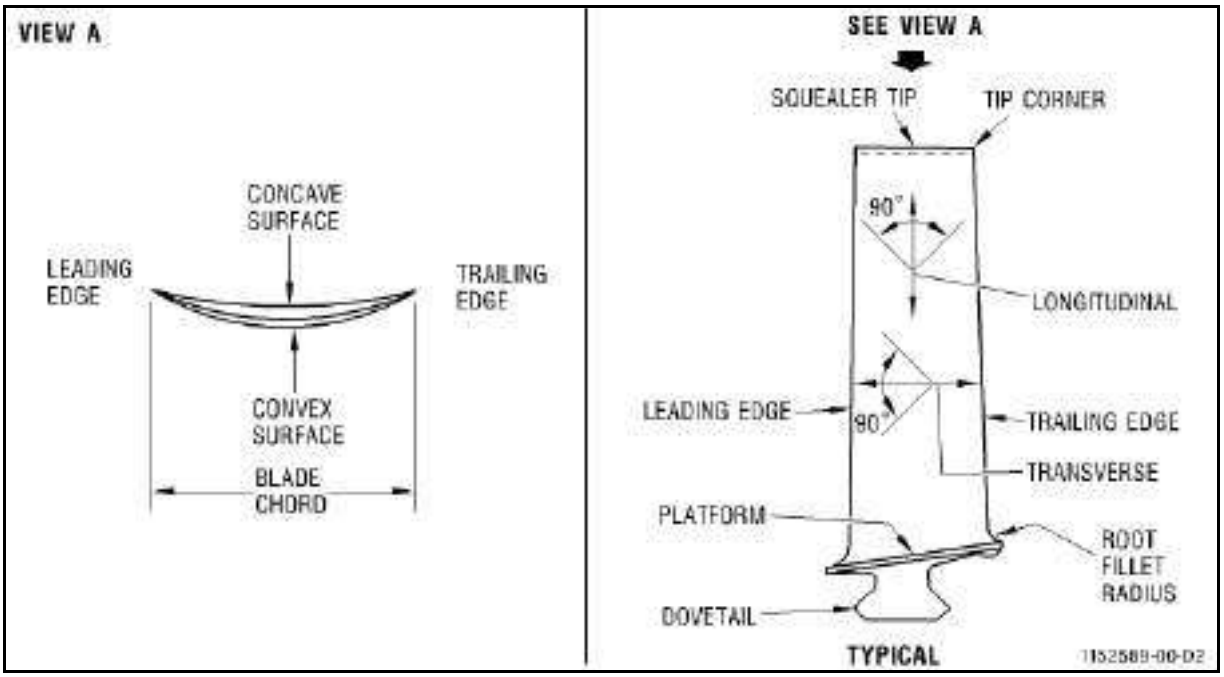



Figure 6: Compressor Rotor Blades

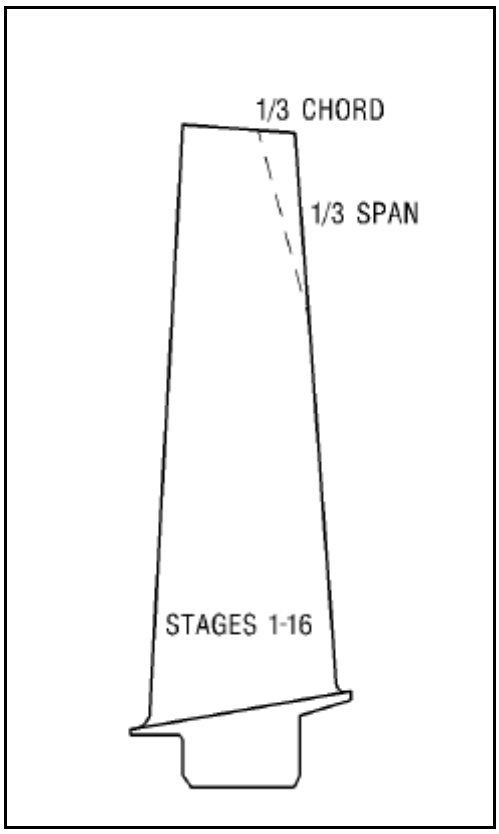


Figure 7: Tip Trailing Edge Inspection

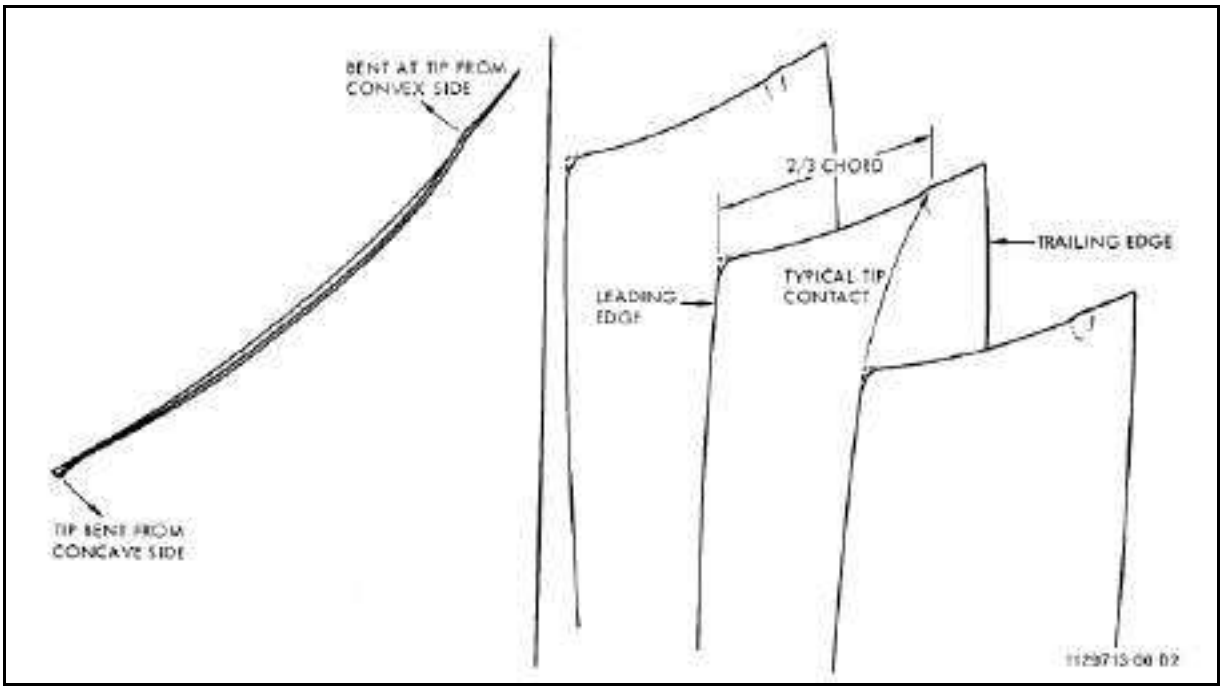
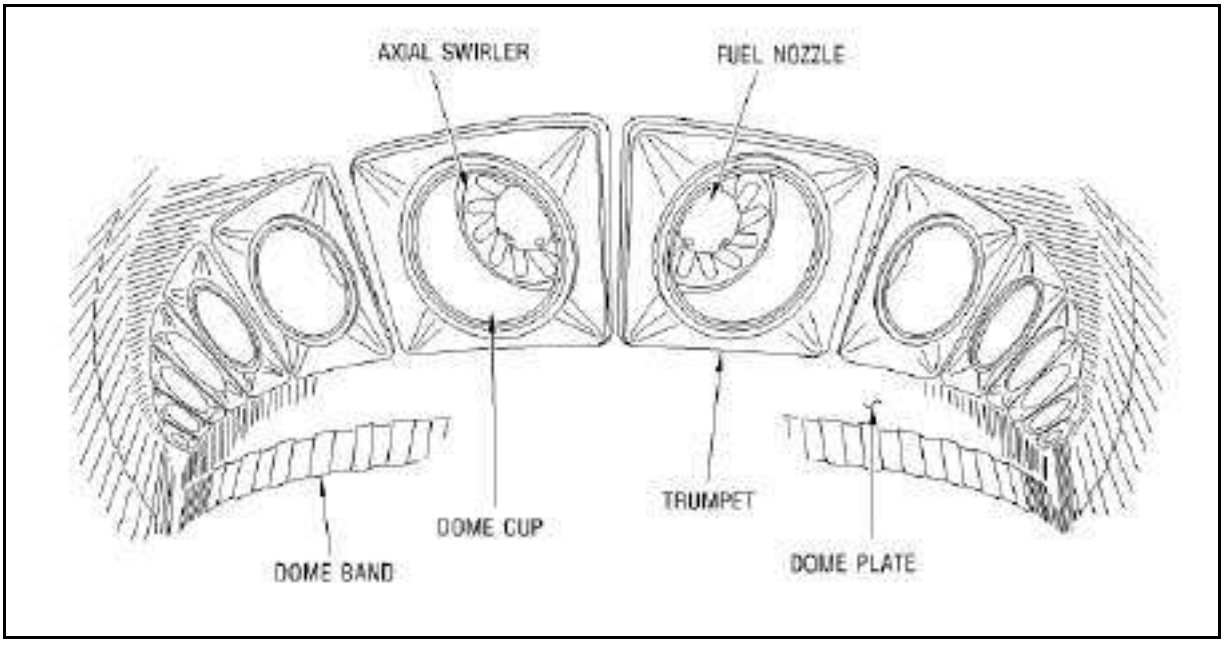


Figure 8: Tip Clanging Contact (HPCR stage 3 through 6)

## Combustor and 1St Stage Nozzle Section

| Port | Condition observed | Photo no: |
|---|---|---|
| 17A | | |
| 17B | | |
| 17C | | |
| 17D | See below notes. | |
| 17E | | |
| 17F | | |
| 17G | | |
| 17H | | |
| 17 | 1st stage nozzle (leading edge): | |

**Notes:**
The Combustor section is serviceable according to GEK105054 Volume II WP40600 Table 7.



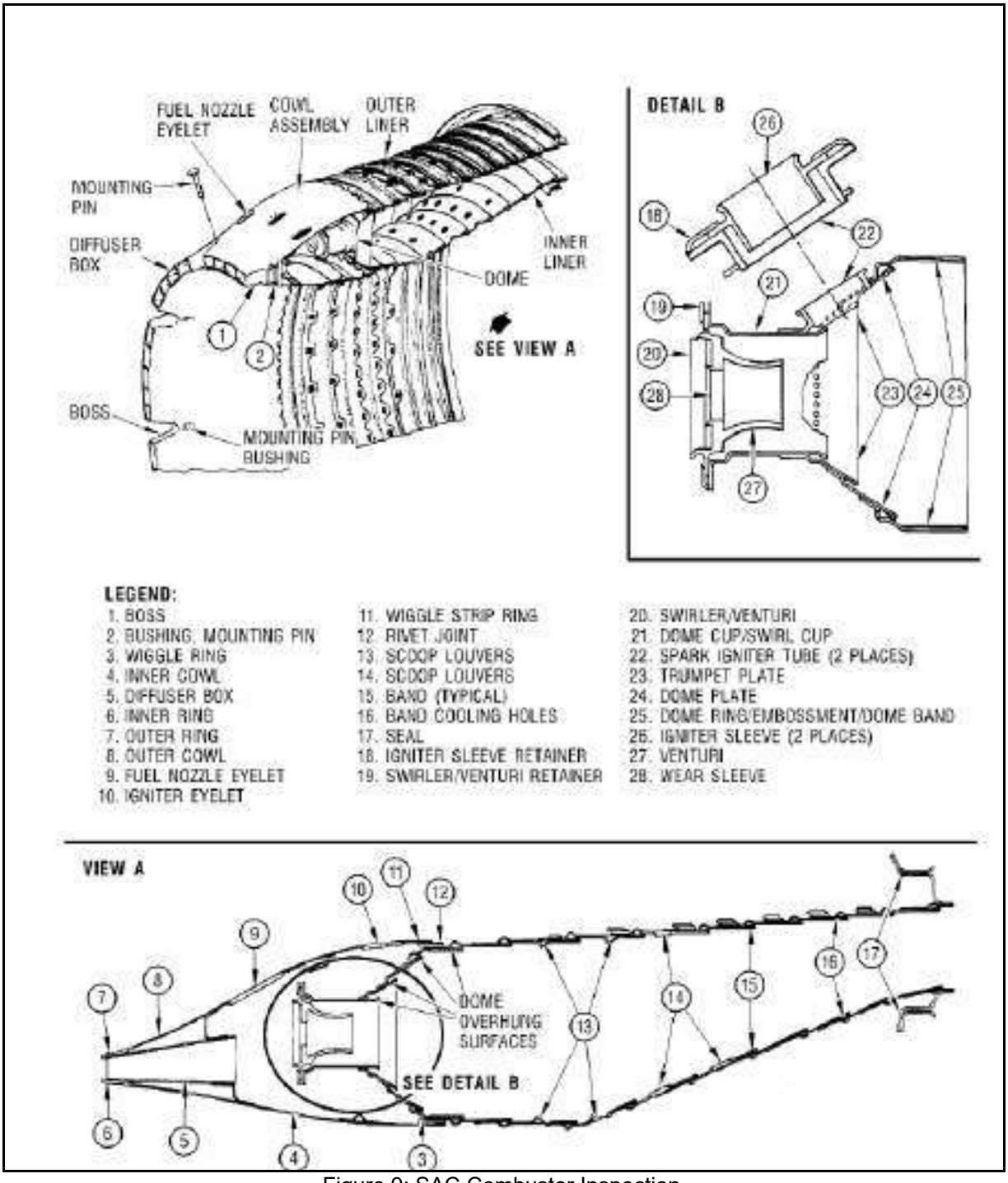



Figure 9: SAC Combustor Inspection

Figure 10: SAC Combustor Inspection

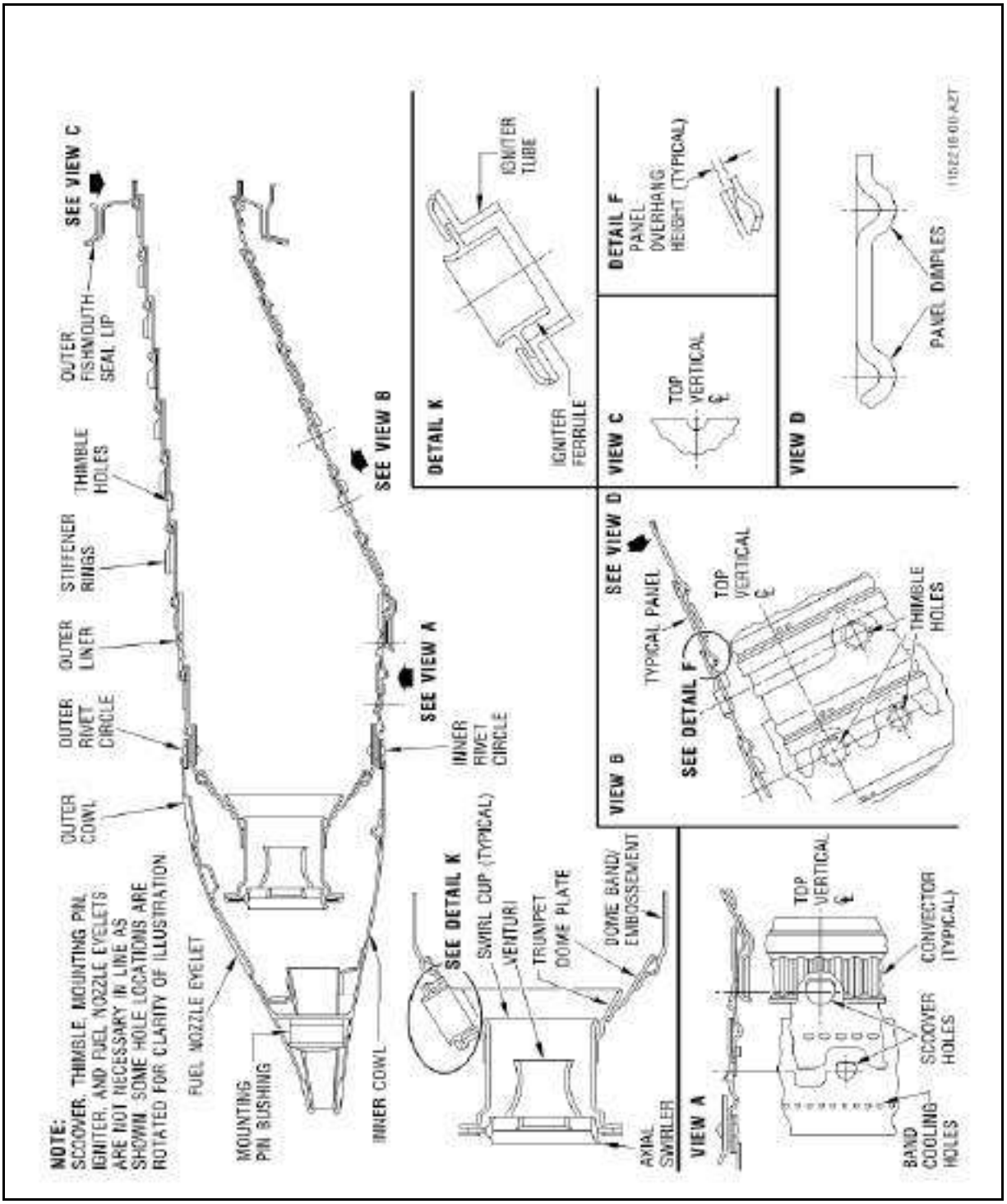
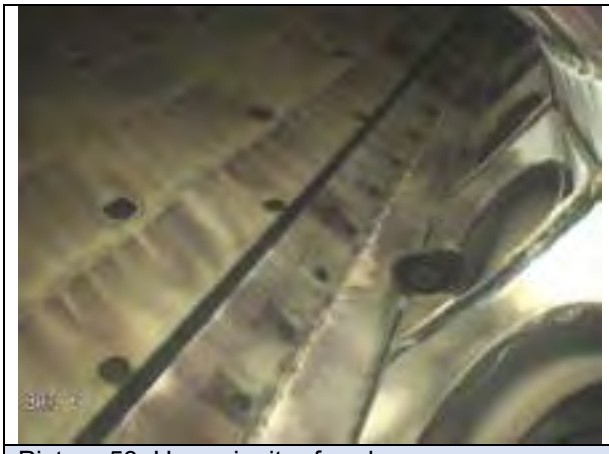



Figure 11: SAC Combustor Inspection

**Borescope Pictures**



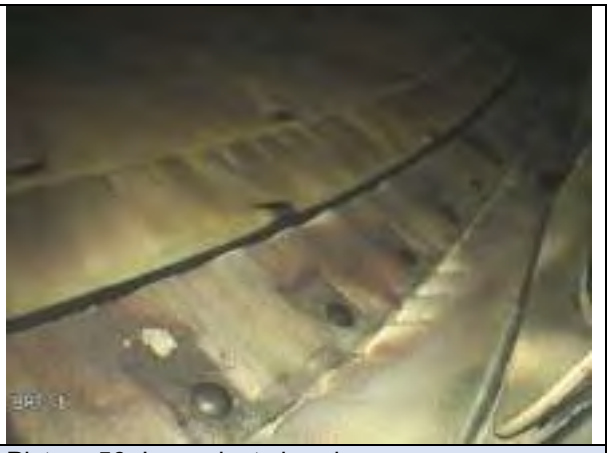
Picture 53. Upper igniter ferrule



Picture 54. Lower igniter ferrule



Picture 55. Outer rivets band



Picture 56. Inner rivets band



Picture 57. Combustor liners



Picture 58. Combustor liners



Picture 59. Combustor dome. Splash plates



Picture 60. Fuel nozzle tip



Picture 61. Combustor liners and HPT nozzles interference



Picture 62. Combustor liners and HPT nozzles interference

## Turbine Section

| | turbine stage | | | | |
|---|---|---|---|---|---|
| **Port** | **L.E.** | **T.E.** | **blades** | **Remarks:** | **photo no:** |
| **18** | **1** | | **88** | | |
| **19** | | **1** | **88** | **See below notes.** | |
| **19** | **2** | | **90** | | |
| **20** | | **2** | | | |

**Notes:**
The HPT is serviceable according to GEK 105054 Volume II WP 406 00.

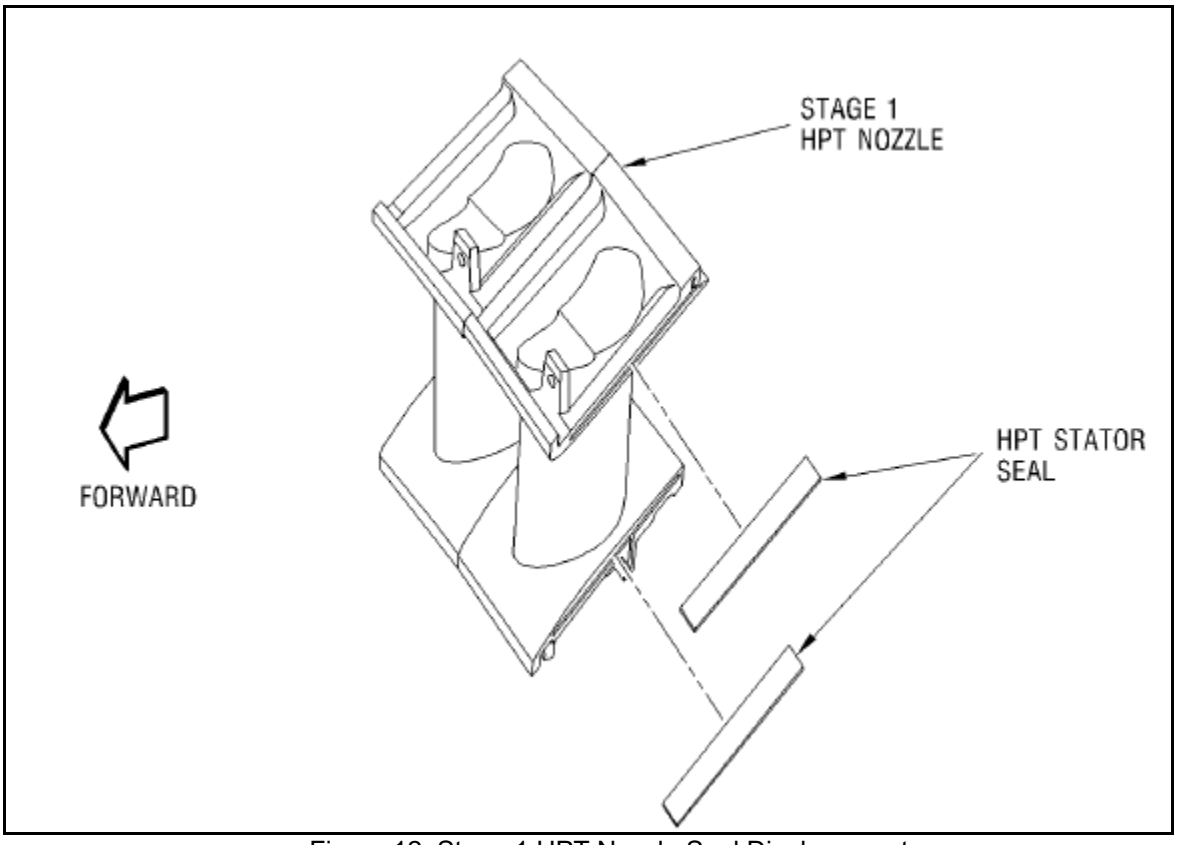


Figure 12: Stage 1 HPT Nozzle Seal Displacement

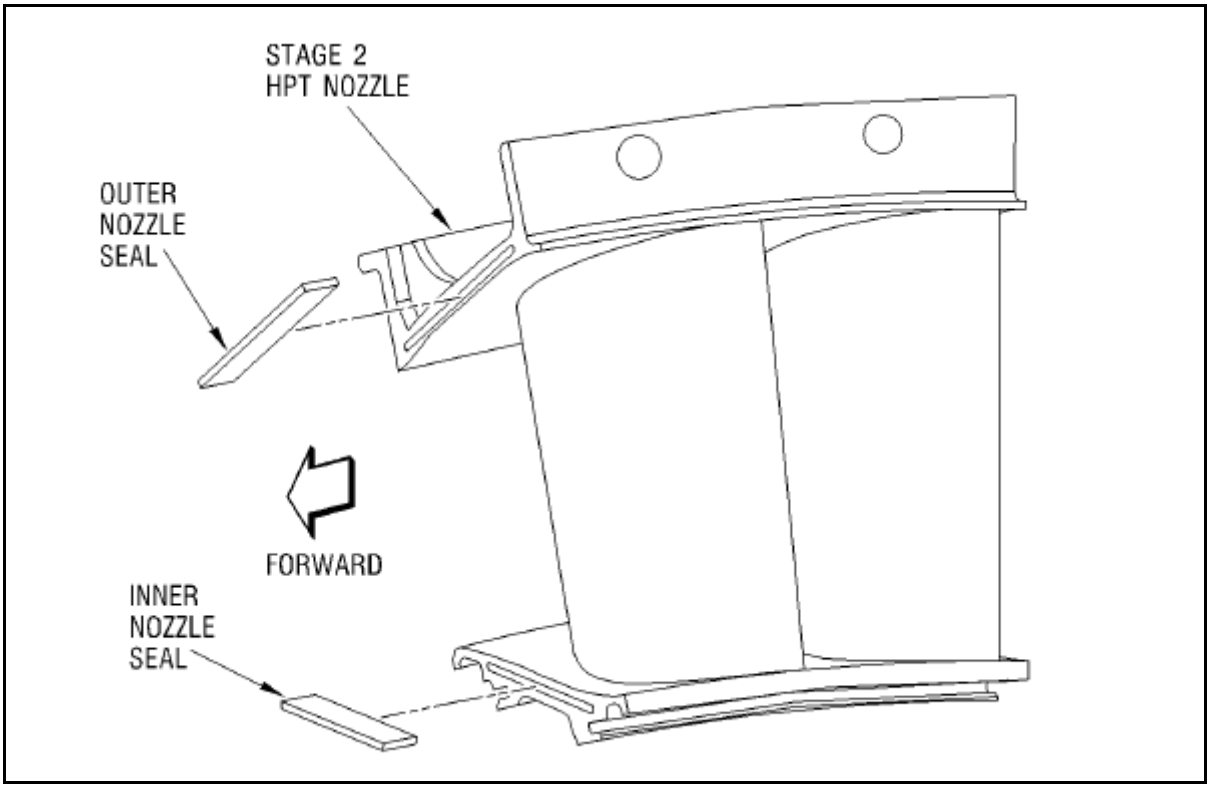


Figure 13: Stage 2 HPT Nozzle Seal Displacement

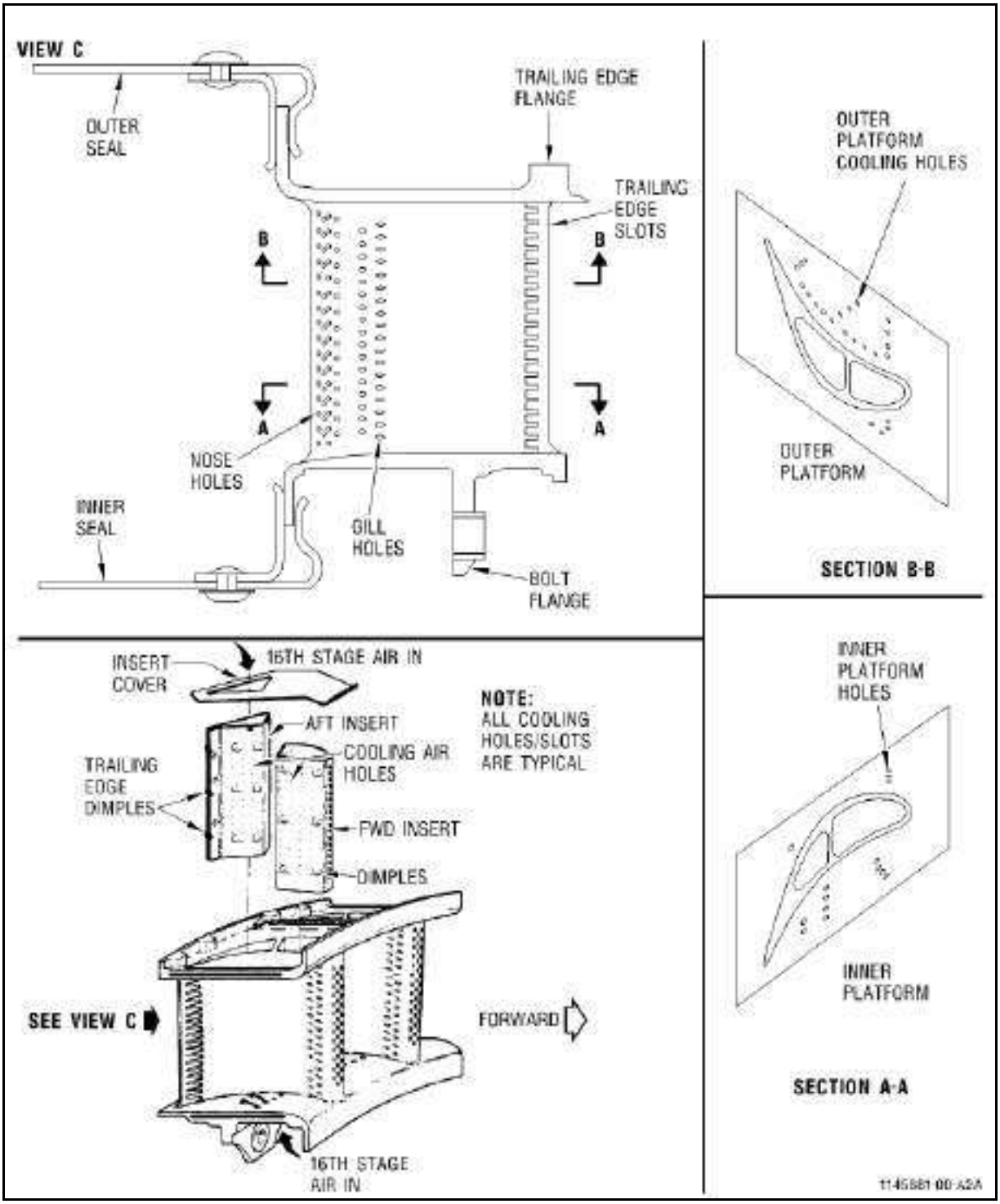



Figure 14: HPT Stage 1 Nozzle

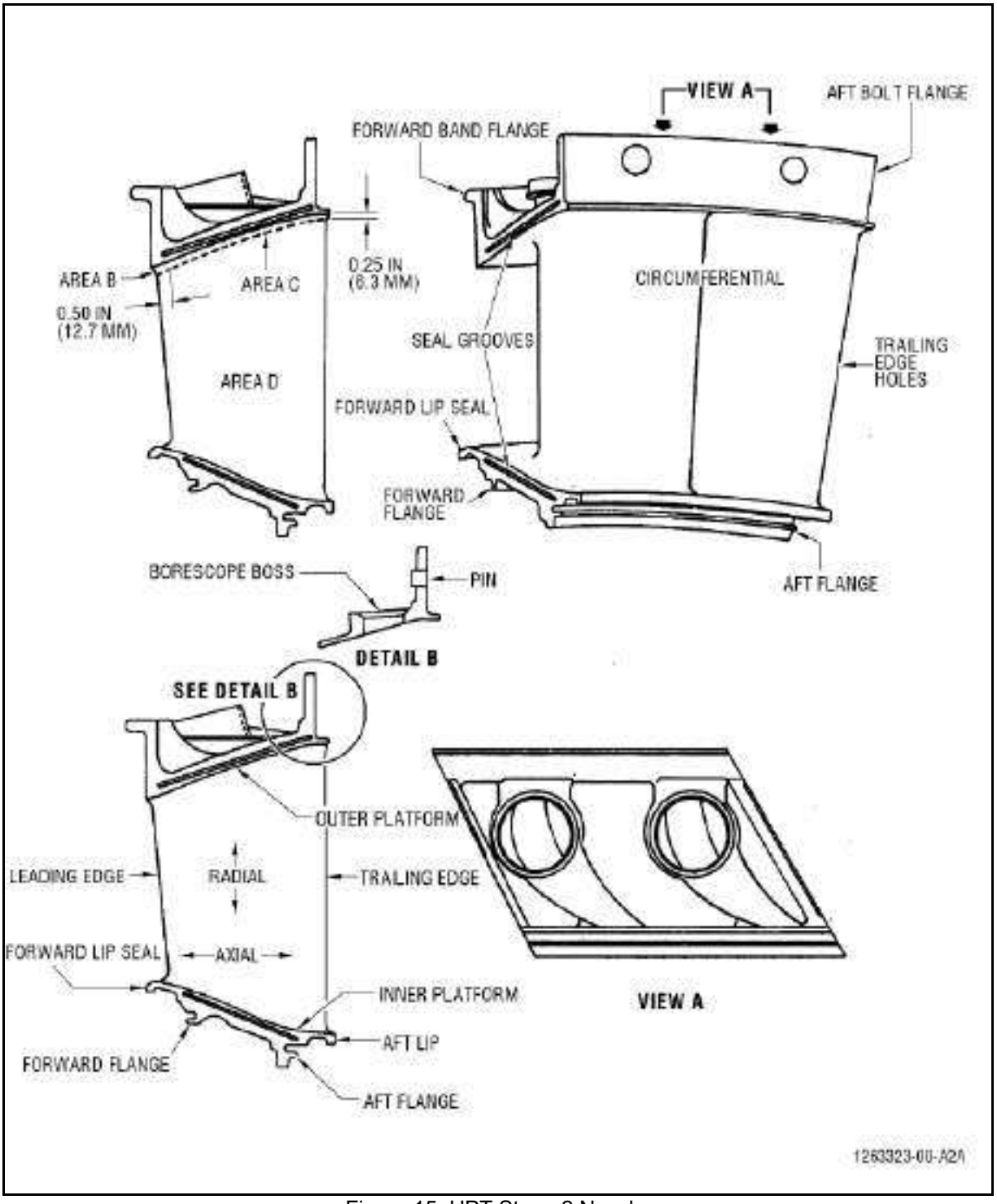



Figure 15: HPT Stage 2 Nozzle

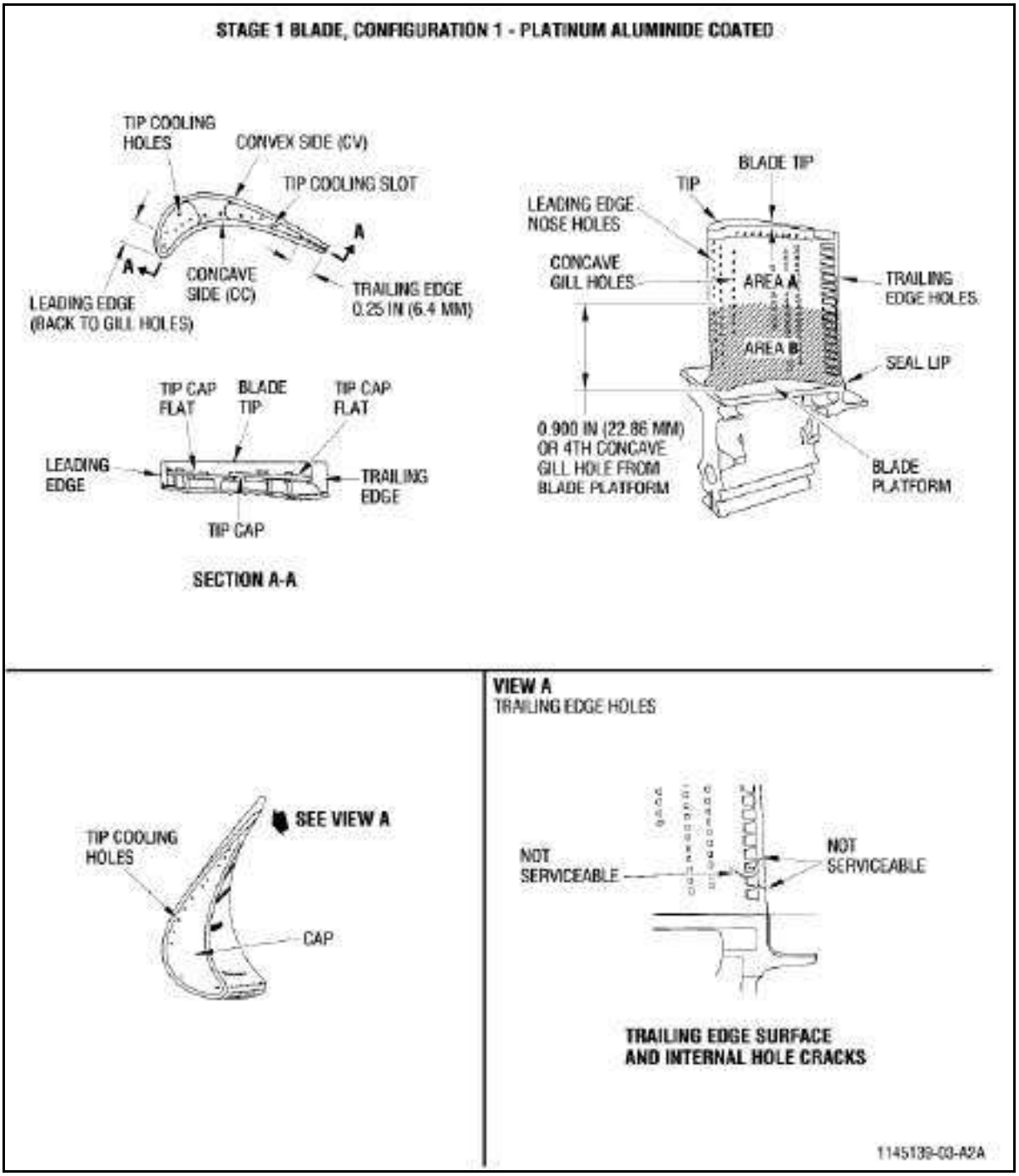



Figure 16: HPT Stage 1 Rotor Blades Inspection Areas (Platinum Aluminide Coated Blades)

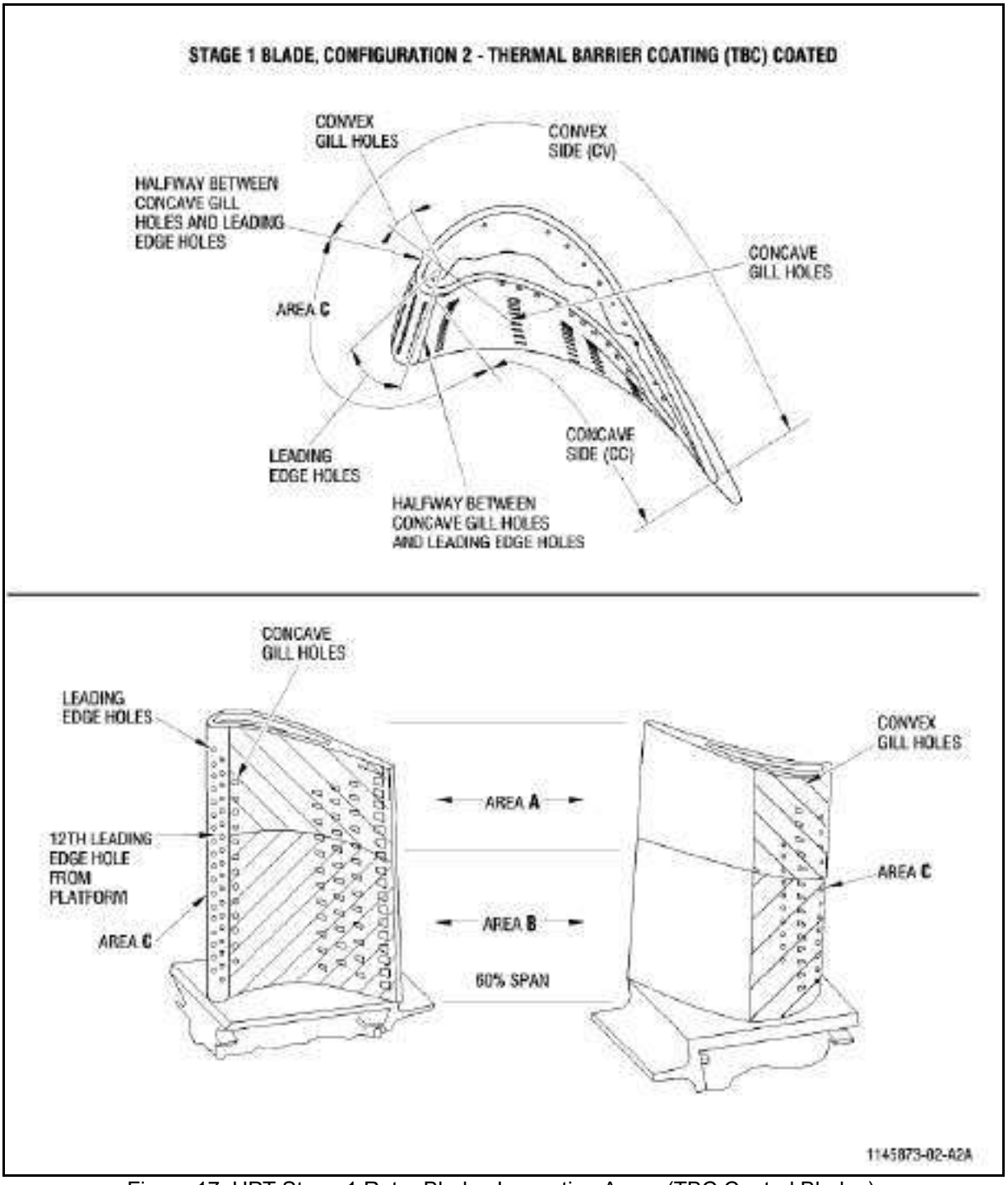


Figure 17: HPT Stage 1 Rotor Blades Inspection Areas (TBC Coated Blades)

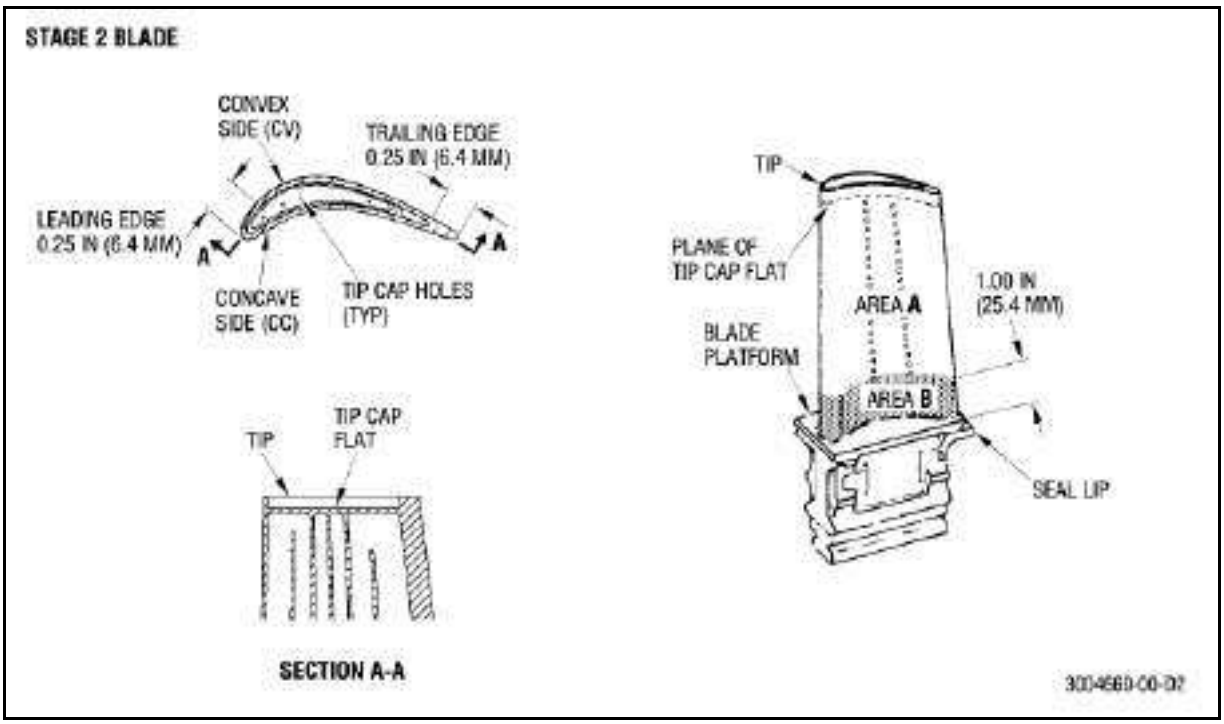


Figure 18: HPT Stage 2 Rotor Blades Inspection Areas

**Borescope Pictures**



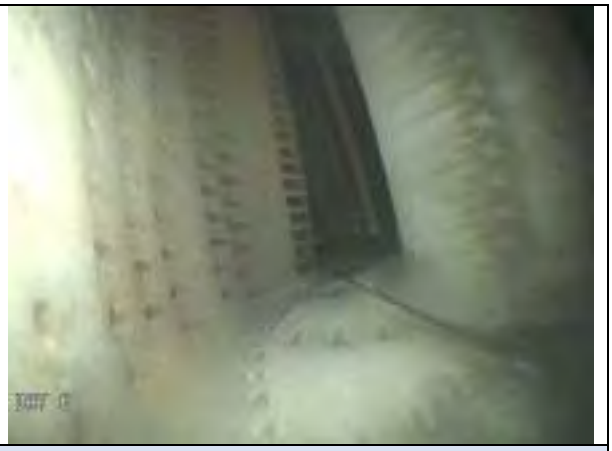
Picture 63: Stage1 Nozzles leading edge



Picture 64: Stage1 Nozzles leading edge



Picture 65: Stage1 Nozzle airfoil concave side



Picture 66: Stage1 Nozzle airfoil concave side



Picture 67: Stage1 Nozzle airfoil concave side



Picture 68: Stage1 Nozzle airfoil concave side



Picture 69: Stage1 Nozzle airfoil concave side



Picture 70: Stage1 Nozzle airfoil concave side



Picture 71: Stage1 Nozzle airfoil concave side



Picture 72: Stage1 Nozzle trailing edge concave



Picture 73: Stage1 Nozzle trailing edge concave



Picture 74: Stage1 Nozzle trailing edge convex. Blades leading edge



Picture 75: Stage1 Nozzle trailing edge convex. Blades leading edge



Picture 76: Stage1 Nozzle trailing edge convex. Blades leading edge



Picture 77: Stage1 Blades leading edge convex



Picture 78: Stage 1 Blades leading edge concave



Picture 79: Stage 1 Blades leading edge concave



Picture 80: Stage 1 Blades trailing edge convex



Picture 81: Stage 2 Blades leading edge



Picture 82: Stage 2 Honeycomb seals



Picture 83: Stage 2 Blades Leading edge convex



Picture 84: Stage 2 Blades trailing edge



Picture 85: Stage 2 Blades trailing edge



Picture 86: Stage 2 Blades leading and stage 2 nozzles trailing

**LPT Section**

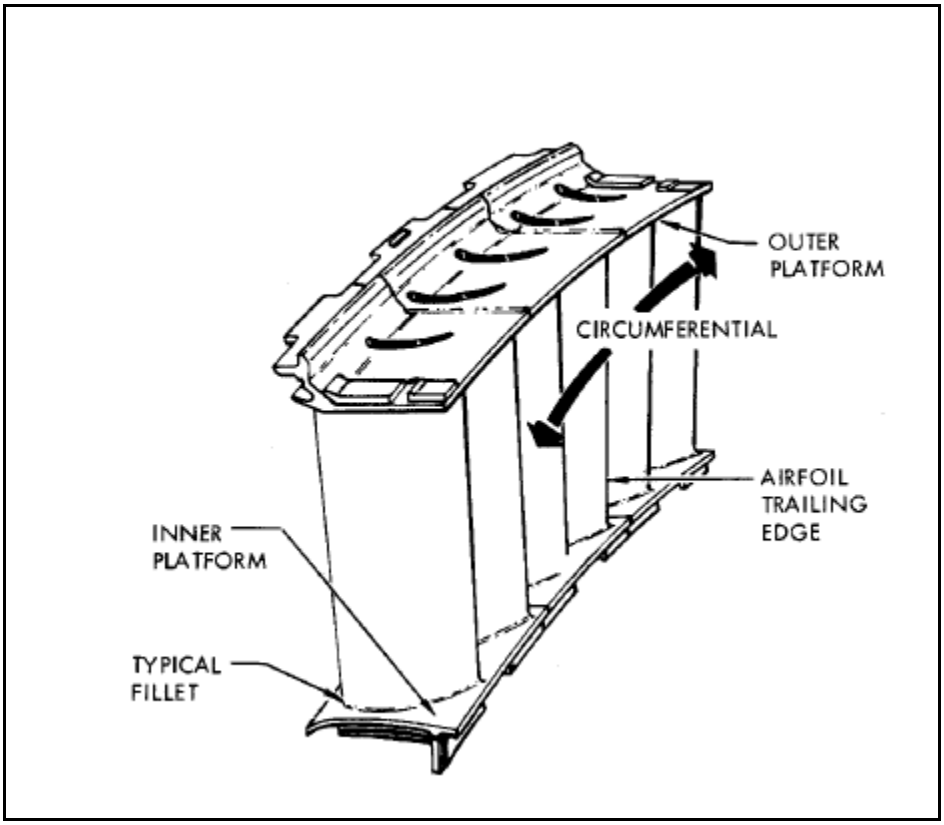



Figure 19: Power Turbine Nozzles

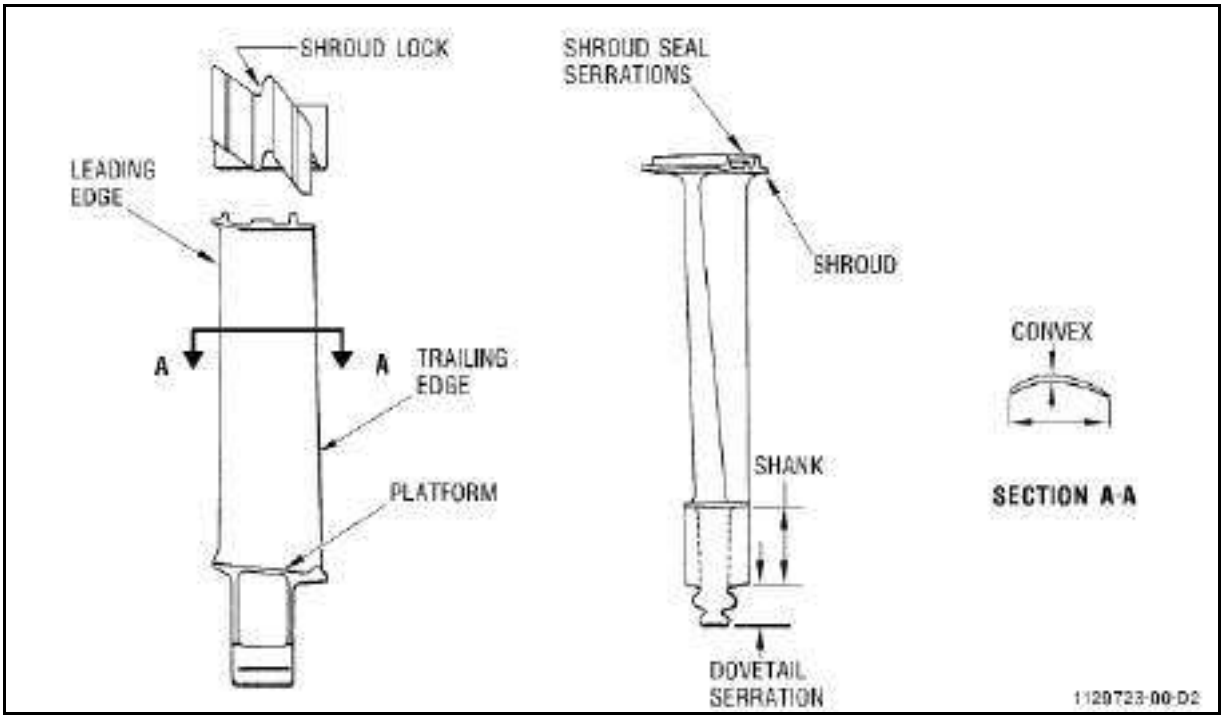



Figure 20: Power Turbine Rotor Blades

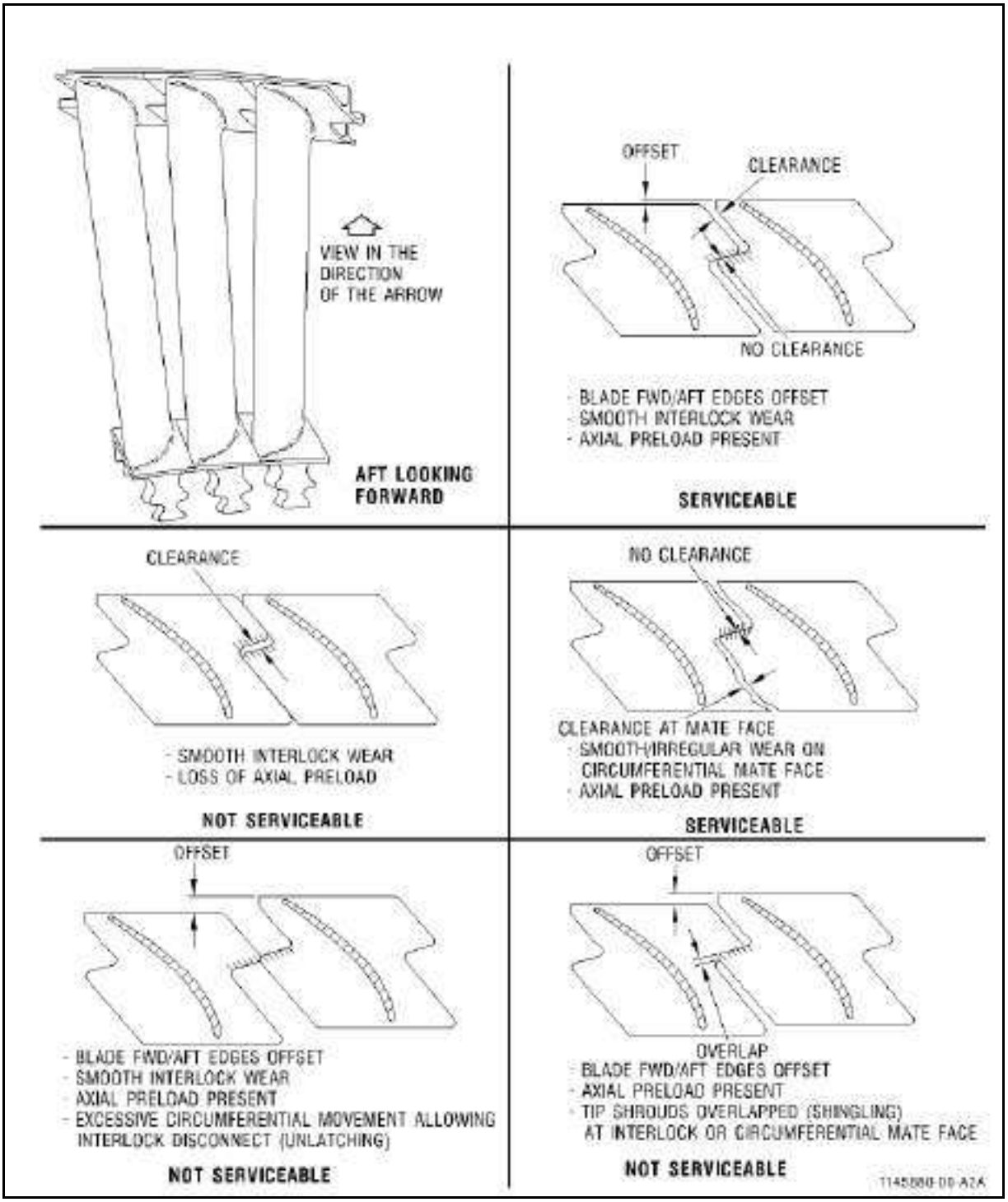


Figure 21: LPT Rotor Blade Circumferential Inspection

**Notes:**

The LPT stage 1 accessible nozzles and blades did not show any damage.

**Borescope Pictures**



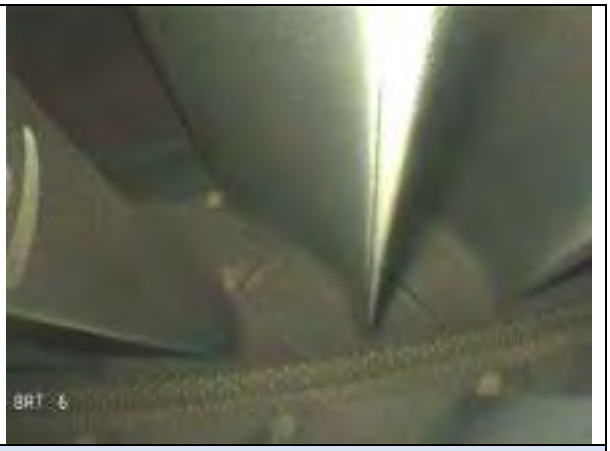
Picture 87: TMF and LPT Inlet



Picture 88: TMF and LPT Inlet



Picture 89: Stage 1 Blades



Picture 90: LPT Stage 1 Blades tip interlock

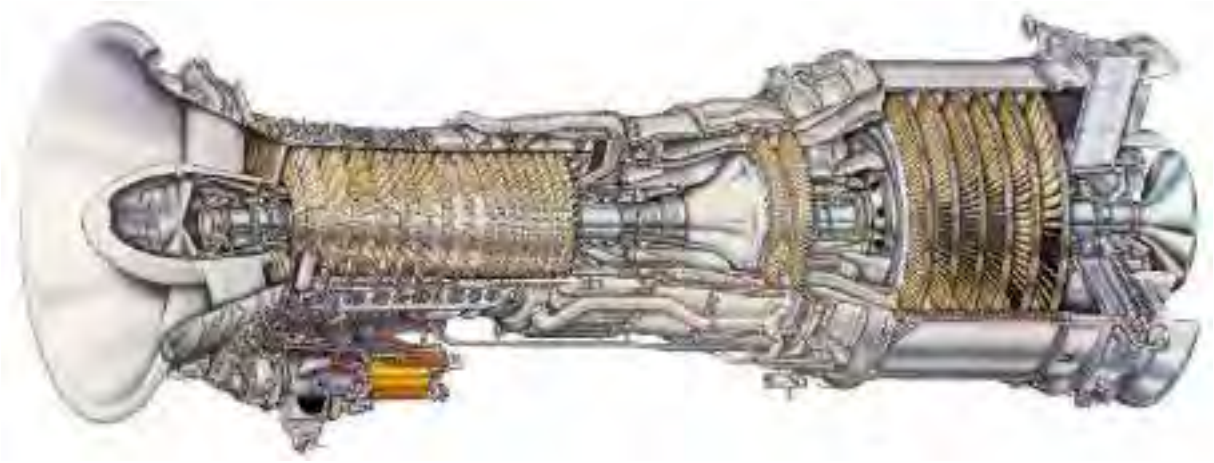
# *BORESCOPE INSPECTION REPORT*
# *TM2500 GEN4*
# *7LM2500 – PE – MGG16*

# NFE PALO SECO POWER PLANT

## *TM49*

## *UNIT #3*

| | | | |
|---|---|---|---|
| **Visit Date:** | December 16, 2024 | **Total Starts:** | 620 |
| **Engine S/N:** | 481 – 559 | **GG Hours:** | 36823 |
| **Power Turbine S/N:** | 481 - 559 | **PT Hours:** | 36823 |
| **PPG GT Field Engineer:** | JC Requena H | **NFE Representative:** | Lance Florent |



# TABLE OF CONTENTS


1 Conclusions and Recommendations .....3
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3 Borescope Inspection Checklist.....5
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4.3 Turbine Section.....18
4.4 LPT Section .....27

## 1. Conclusions and Recommendations

**Purpose of visit:**
The purpose of this visit was to perform an engine borescope inspection in accordance with GEK105054, WP 406 00.

**The Engine is not servicebale according to GEK97310 Volume II Chapter 5**

**1.1** The HPC Section is serviceable according to GEK97310 Chapter 5 Table 5-4.
There is one (1) Blade with a small nick damage in the leading edge tip area. This damage is was detected during previous inspections (March 12, 2024) and it's serviceable.
The Stages 10 to 16 are dirty.

**1.2** The Combustor section is serviceable according to GEK97310 Volume II Chapter 5 Table 5.5.

**1.3** The High Pressure Turbine section is not serviceable according to GEK 97310 Volume II Chapter 5 Tables 5.6 & 5.8

Several Stage 1 Nozzles (around 40%) were found affected by burns with loss of metal on inner platform trailing edge. The extension of the damage is beyond limits in some of the affected nozzles according to the Table 5.6 paragraph 2.f.

There are four (4) Stage 1 Blades with missing pieces in the leading edge tip. This damage is not serviceable according to Table 5.8 paragraph 3.d.

There is one (1) Stage 2 Blade with an open hole, missing piece and surrounded with cracks, at Area A convex surface. This damage is not serviceable according to Table 5.8. 3.a.

## 2. Outage Data

**ENGINE DATA**

| | | | | | |
|---|---|---|---|---|---|
| **ESN:** | 557-559 | **Engine Fired Hours:** | 36823 | **Package Hours:** | 36823 |
| **Model:** | 7LM2500-PE-MGG16 | **Engine Fired starts:** | 620 | **Package Fired Starts:** | 620 |

**MAINTENANCE DATA**

| WP, SB, SL, PB, PL Performed | GEK197310, REV 10 | Date completed | Comments |
|---|---|---|---|
| N/A | Borescope Inspection | 16DEC24 | Not Serviceable |

**PARTS DATA**

| Description | PN Removed | SN Removed | Qty | Disposition | PN Installed | SN Installed |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |

## 3. Borescope Inspection Checklist

**Date unit out of operation:** 14DEC24
**Date unit into operation:** 14DEC24
**Last inspection date:** 13MAR24; PPG O&M

**Type of Fuel:** Gas / Diesel
**Type of outage:** Scheduled

**Type of NOx suppression:** Water Injection

**Inspection of gas turbine:**

| WATERWASH: | HIGH PRESSURE COMPRESSOR: |
|---|---|
| ☒ PERFORMED WATER WASH | ☒ HPC BORESCOPE INSPECTION |
| **COMBUSTOR:** | **HIGH PRESSURE TURBINE** |
| ☒ COMBUSTOR BORESCOPE INSPECTION | ☒ HPT STAGE 1 & 2 NOZZLE BORESCOPE INSPECTION |
| | ☒ HPT BLADE BORESCOPE INSPECTION |
| **LOW PRESSURE TURBINE:** | |
| ☒ LPT BORESCOPE INSPECTION | |

☒ ***Please verify all borescope plugs have been reinstalled***

## 4. Borescope Inspection Record

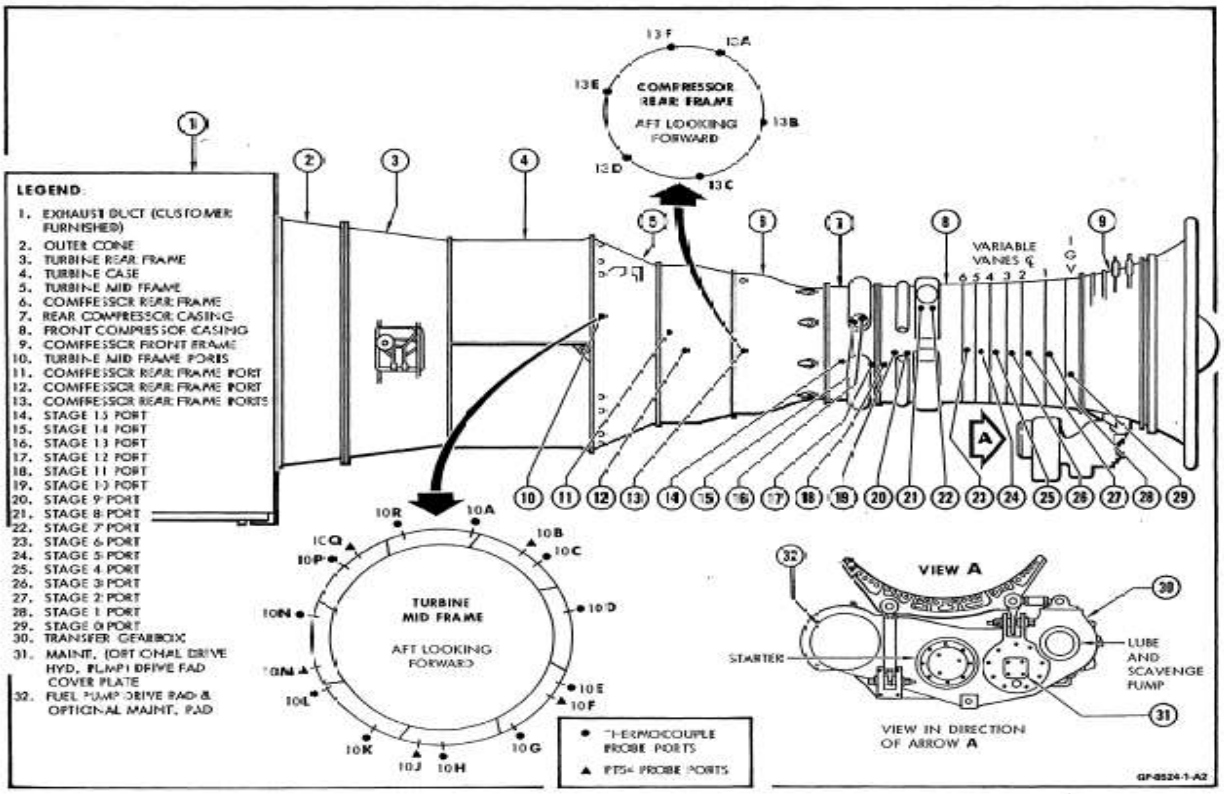



Figure 5-4. Borescope Inspection

Figure 1: Position of Borescope Inspection Ports.

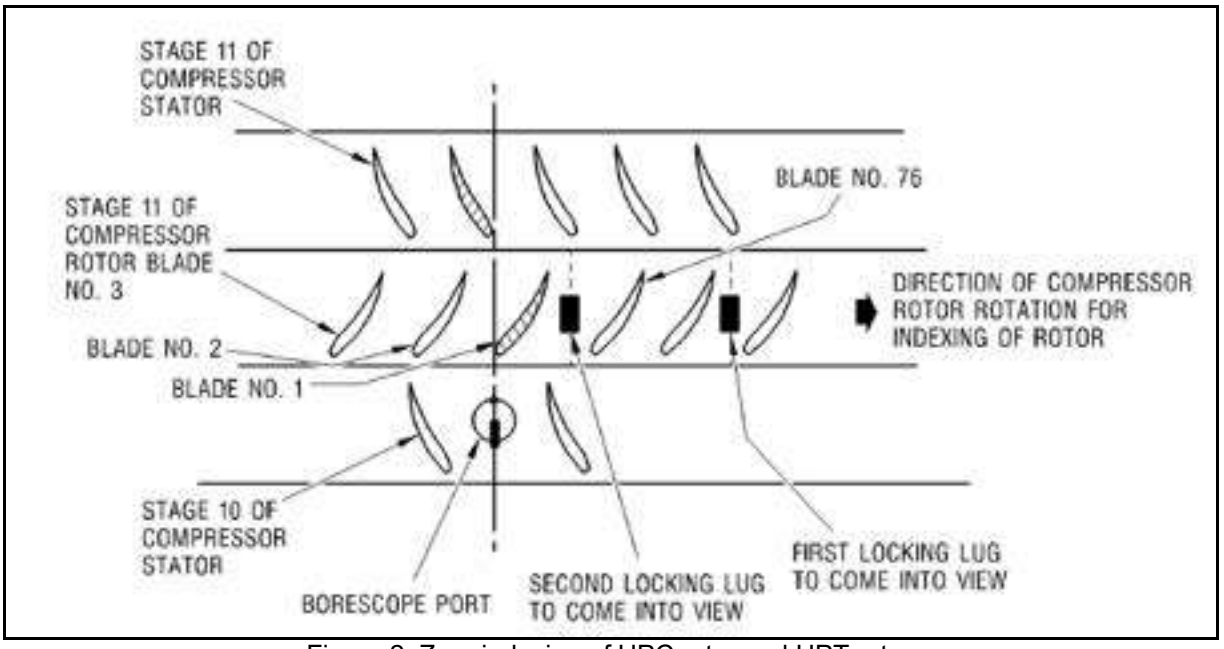


Figure 2: Zero indexing of HPC rotor and HPT rotor

## 1. Compressor Section

| | Compressor Stage | | | | |
|---|---|---|---|---|---|
| Port | LE | TE | Blades | Remarks: | Photo no: |
| 0 | 1 | | 36 | | 1 – 2 – 3 – 4 |
| 1 | | 1 | 36 | | 5 – 6 |
| 1 | 2 | | 42 | | 7 – 8 |
| 2 | | 2 | 42 | | 9 |
| 2 | 3 | | 42 | | 10 – 11 |
| 3* | | 3 | 42 | | 12 |
| 3* | 4 | | 45 | | 13 – 14 |
| 4 | | 4 | 45 | | 15 |
| 4 | 5 | | 48 | | 16 – 17 |
| 5* | | 5 | 48 | | 18 |
| 5* | 6 | | 54 | | 19 – 20 |
| 6 | | 6 | 54 | | 21 |
| 6 | 7 | | 56 | | 22 – 23 |
| 7 | | 7 | 56 | INSIDE MANIFOLD | |
| 7 | 8 | | 64 | INSIDE MANIFOLD | |
| 8 | | 8 | 64 | INSIDE MANIFOLD | |
| 8 | 9 | | 66 | INSIDE MANIFOLD | |
| 9* | | 9 | 66 | | 24 – 25 |
| 9* | 10 | | 66 | | 26 – 27 – 28 |
| 10** | | 10 | 66 | | 29 – 30 |
| 10 | 11 | | 76 | | 31 – 32 |
| 11 | | 11 | 76 | | 33 |
| 11 | 12 | | 76 | | 34 |
| 12 | | 12 | 76 | | 35 |
| 12 | 13 | | 76 | One (1) Blade with nick damage in leading edge. Serviceable | 36 – 37 |
| 13 | | 13 | 76 | INSIDE MANIFOLD | |
| 13 | 14 | | 76 | INSIDE MANIFOLD | |
| 14 | | 14 | 76 | INSIDE MANIFOLD | |
| 14 | 15 | | 76 | INSIDE MANIFOLD | |
| 15* | | 15 | 76 | | 38 |
| 15* | 16 | | 76 | | 39 – 40 |

**Notes:**

The HPC Section is serviceable according to GEK97310 Chapter 5 Table 5-4.
There is one (1) Blade with a small nick damage in the leading edge tip area. This damage is was detected during previous inspections ( March 12, 2024) and it's serviceable.
The Stages 10 to 16 are dirty.

**Borescope Pictures**



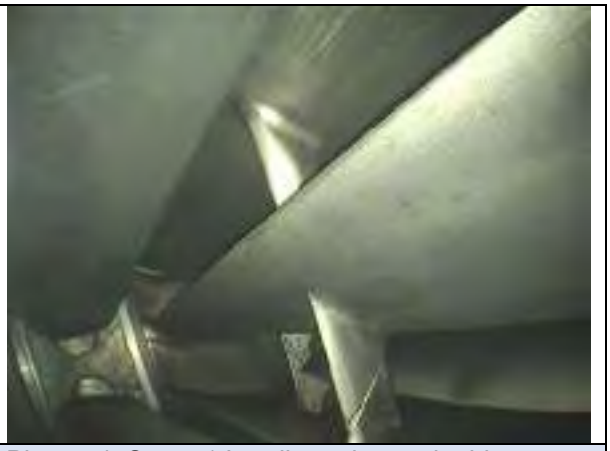
Picture 1. CFF



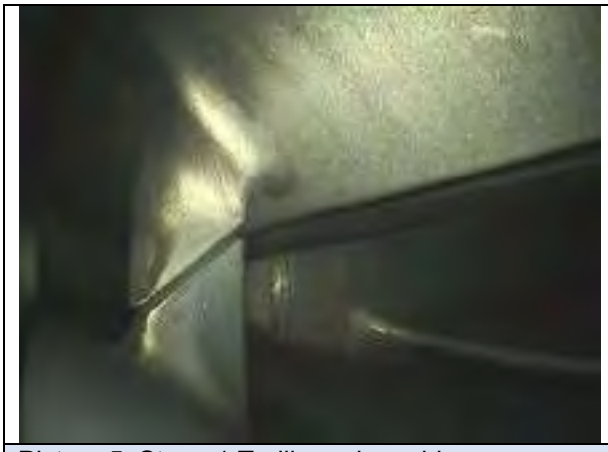
Picture 2. CFF & IGV



Picture 3. Stage 1 Leading edge tip repaired



Picture 4. Stage 1 Leading edge and mid span damper



Picture 5. Stage 1 Trailing edge mid span damper



Picture 6. Stage 1 Trailing edge tip



Picture 7. Stage 2 Leading edge base



Picture 8. Stage 2 Trailing edge tip



Picture 9. Stage 2 Trailing edge



Picture 10. Stage 3 Leading edge nick repaired



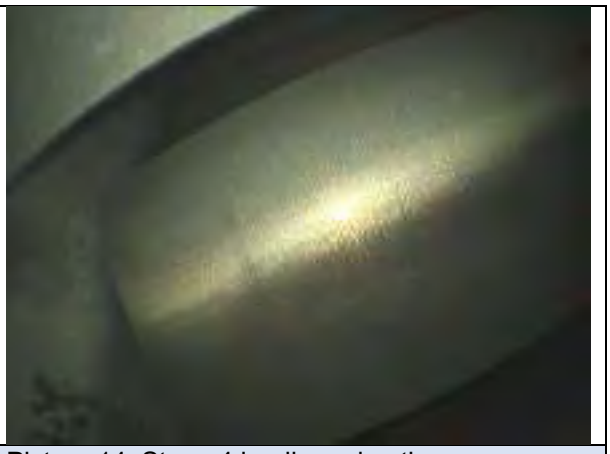
Picture 11. Stage 3 Leading edge base



Picture12. Stage 3 Trailing edge



Picture 13. Stage 4 Leading edge base



Picture 14. Stage 4 leading edge tip



Picture 15. Stage 4 Trailing edge base



Picture 16. Stage 5 Leading edge base



Picture 17. Stage 5 Leading edge tip



Picture 18. Stage 5 Trailing edge



Picture 19. Stage 6 Leading edge



Picture 20. Stage 6 Leading edge base



Picture 21. Stage 6 Trailing edge



Picture 22. Stage 7 Leading edge



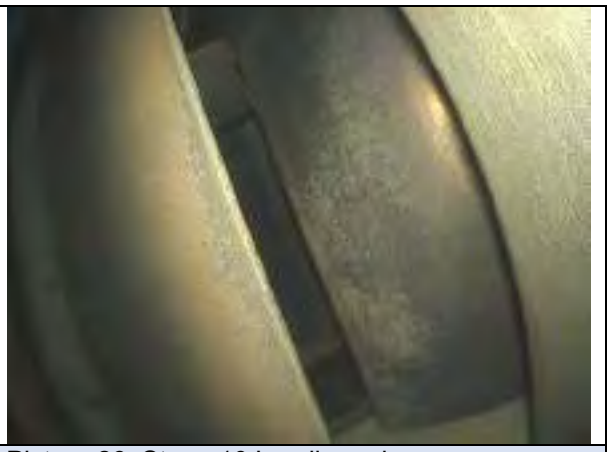
Picture 23. Stage 7 Leading edge base



Picture 24. Stage 9 Trailing edge tip



Picture 25. Stage 9 Trailing edge base



Picture 26. Stage 10 Leading edge



Picture 27. Stage 10 Leading edge tip



Picture 28. Stage 10 Leading edge base. Rotor rubbing marks



Picture 29. Stage 10 Trailing edge tip



Picture 30. Stage 10 Trailing edge base



Picture 31. Stage 11 Leading edge base



Picture 32. Stage 11 Leading edge



Picture 33. Stage 11 Trailing edge tip



Picture 34. Stage 12 Leading edge



Picture 35. Stage 12 Trailing edge



Picture 36. Stage 13 Leading edge minor nick



Picture 37. Stage 13 Leading edge base



Picture 38. Stage 15 Trailing edge



Picture 39. Stage 16



Picture 40. Stage 16

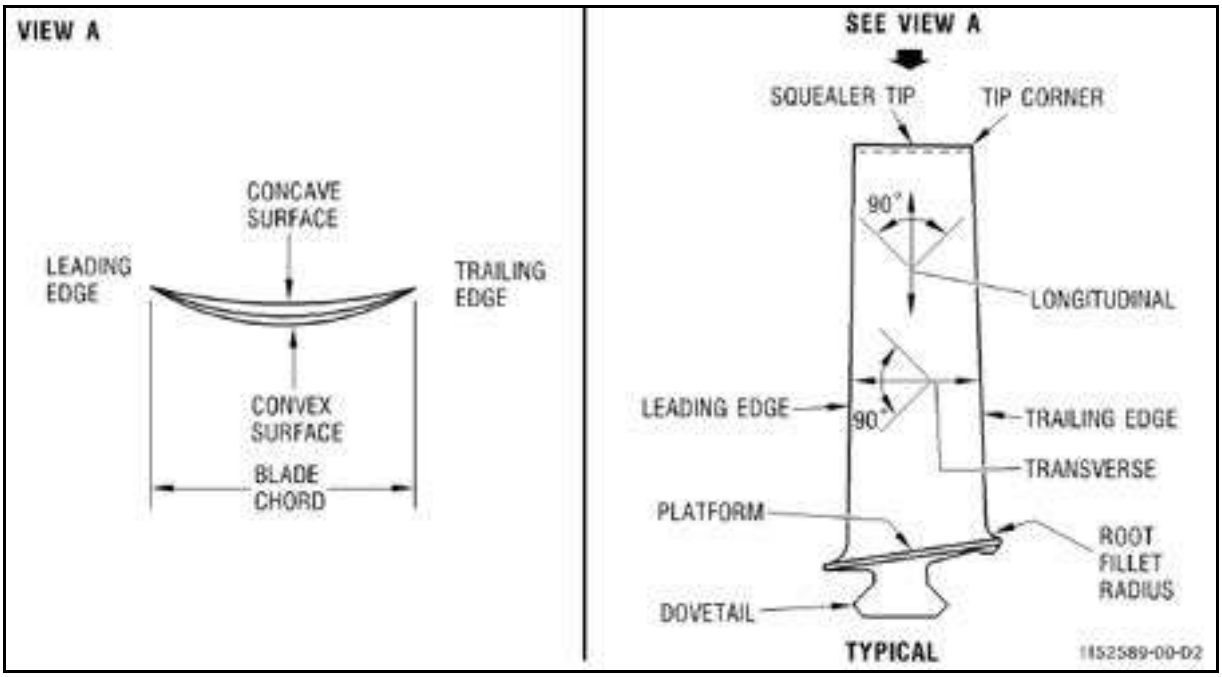



Figure 3: Compressor Rotor Blades

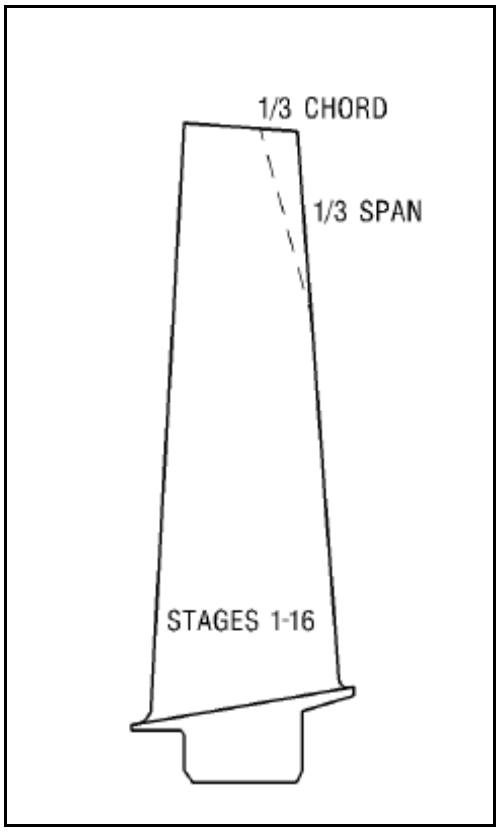


Figure 4: Tip Trailing Edge Inspection

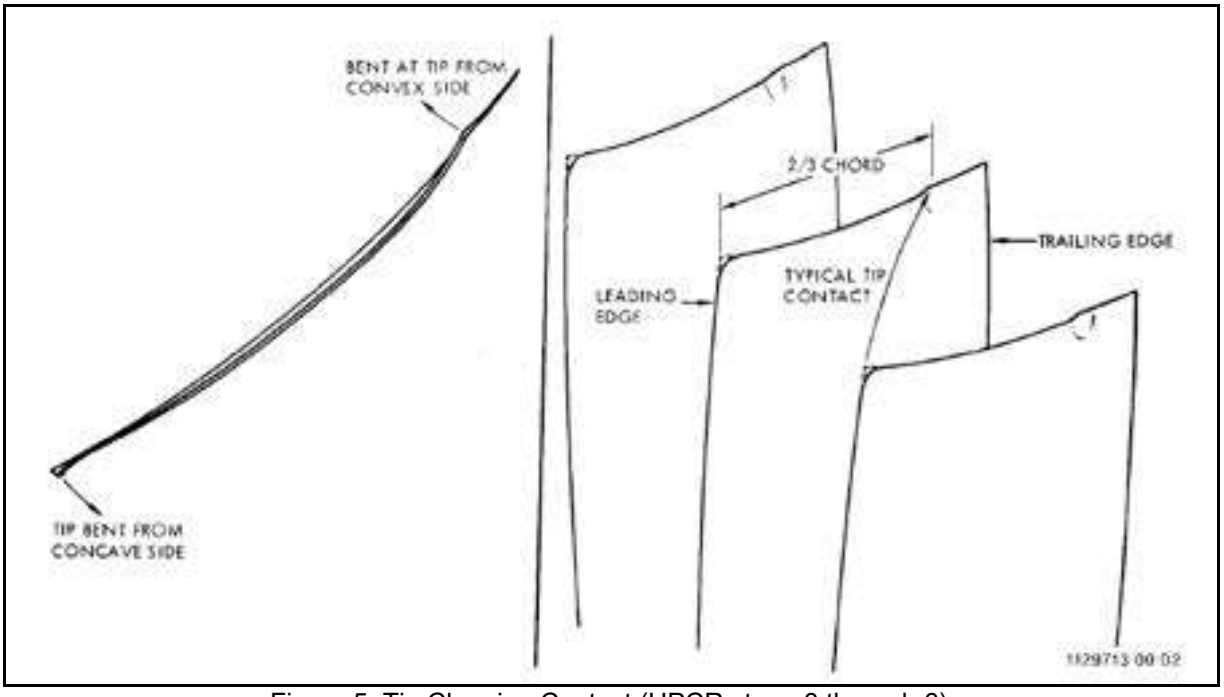


Figure 5: Tip Clanging Contact (HPCR stage 3 through 6)

## 2. Combustor and 1st Stage Nozzle Section

| Port | Condition observed | Photo no: |
|---|---|---|
| 17A | | |
| 17B | | |
| 17C | | |
| 17D | **See below notes.** | 41 to 48 |
| 17E | | |
| 17F | | |
| 17G | | |
| 17H | | |
| 17 | 1st stage nozzle (leading edge): | |

**Notes:**
The Combustor section is serviceable according to GEK97310 Volume II Chapter 5 Table 5.5.

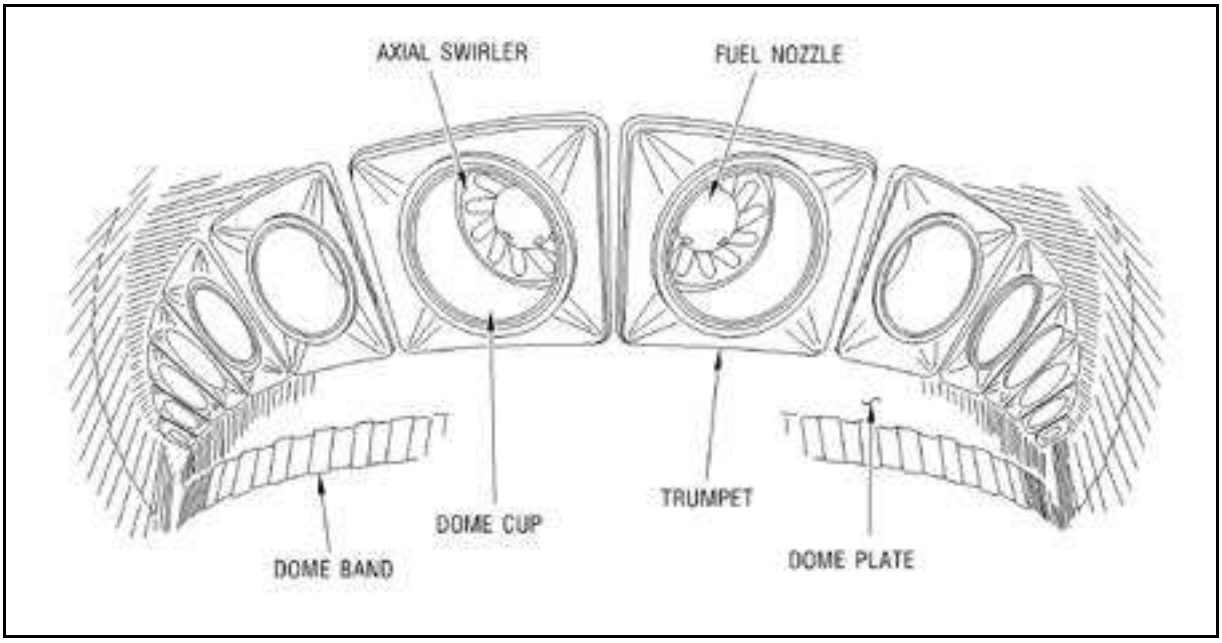



Figure 6: SAC Combustor Inspection

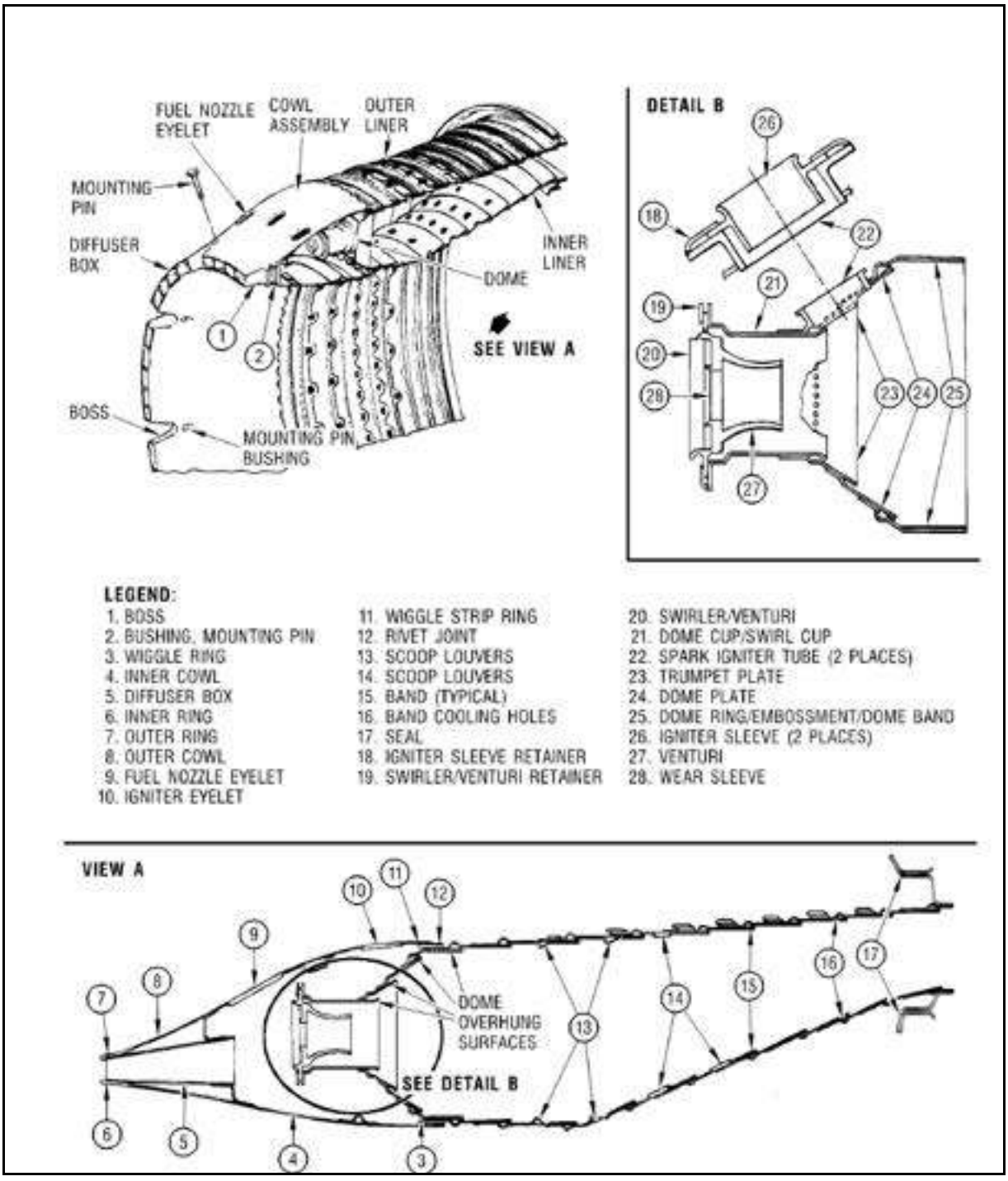



Figure 7: SAC Combustor Inspection

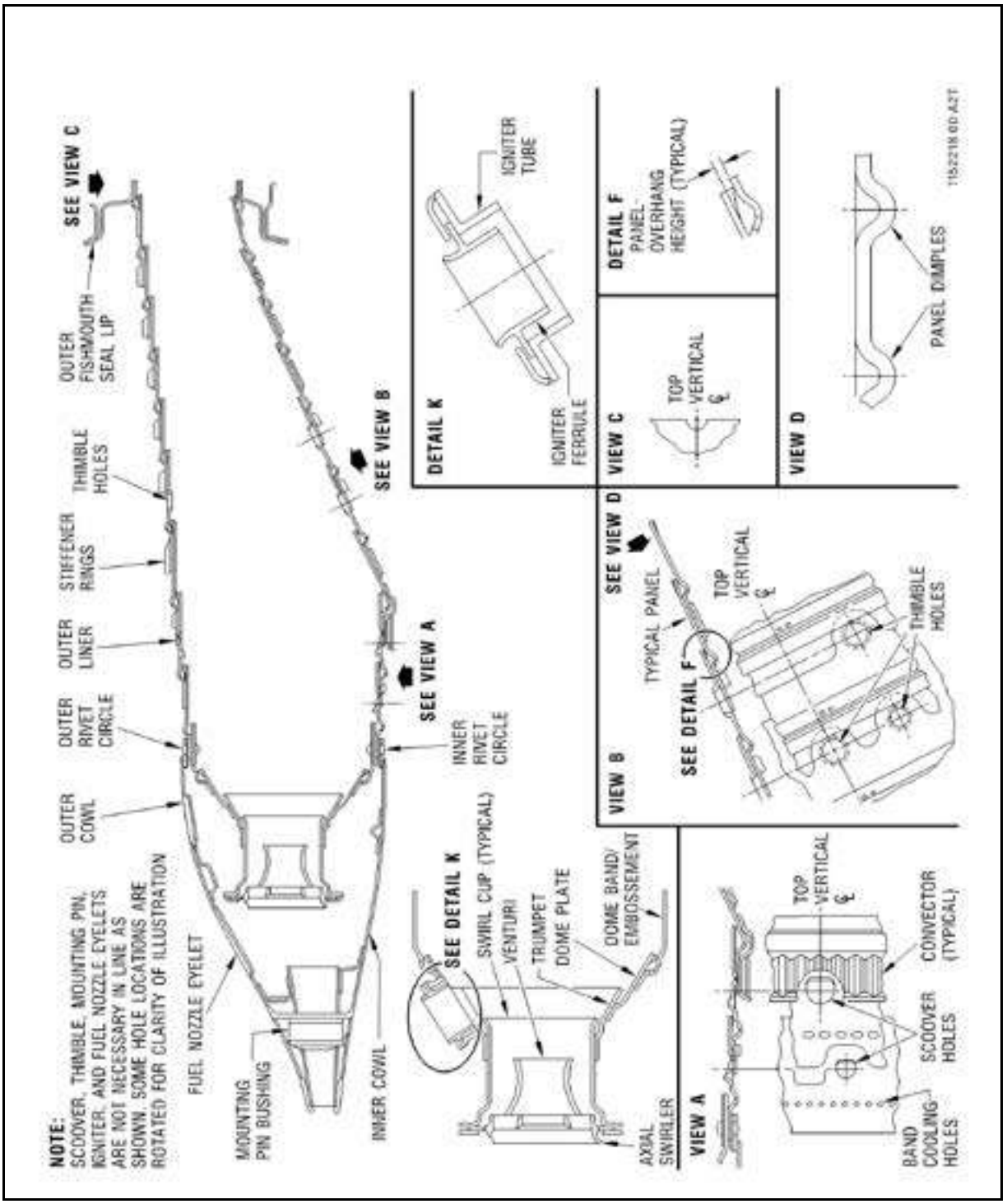



Figure 8: SAC Combustor Inspection

**Borescope Pictures**



Picture 41. Combustor dome & upper igniter



Picture 42. Combustor dome & lower igniter



Picture 43. Inner liner and rivets band



Picture 44. Outer liner and rivets band



Picture 45. Combustor outer liner



Picture 46. Fuel nozzle tip

| | | |
|---|---|---|
|  | |  |
| Picture 47. Fuel nozzle tip | | Picture 48. Combustor liners and HPT Nozzles |

### 3. High Pressure Turbine Section

| | turbine stage | | | | |
|---|---|---|---|---|---|
| **Port** | **L.E.** | **T.E.** | **blades** | **Remarks:** | **photo no:** |
| **18** | **1** | | **88** | | |
| **19** | | **1** | **88** | **See below notes.** | 49 to 72 |
| **19** | **2** | | **90** | | |
| **20** | | **2** | | | |

**Notes:**
The High Pressure Turbine section is not serviceable according to GEK 97310 Volume II Chapter 5 Tables 5.6 & 5.8

Several Stage 1 Nozzles (around 40%) were found affected by burns with loss of metal on inner platform trailing edge. The extension of the damages is beyond limits in some of the affected nozzles according to the Table 5.6 paragraph 2.f.

There are four (4) Stage 1 Blades with missing pieces in the leading edge tip. This damage is not serviceable according to Table 5.8 paragraph 3.d.

There is one (1) Stage 2 Blade with an open hole, missing piece and surrounded with cracks, at the Area A convex surface. This damage is not serviceable according to Table 5.8. 3.a.

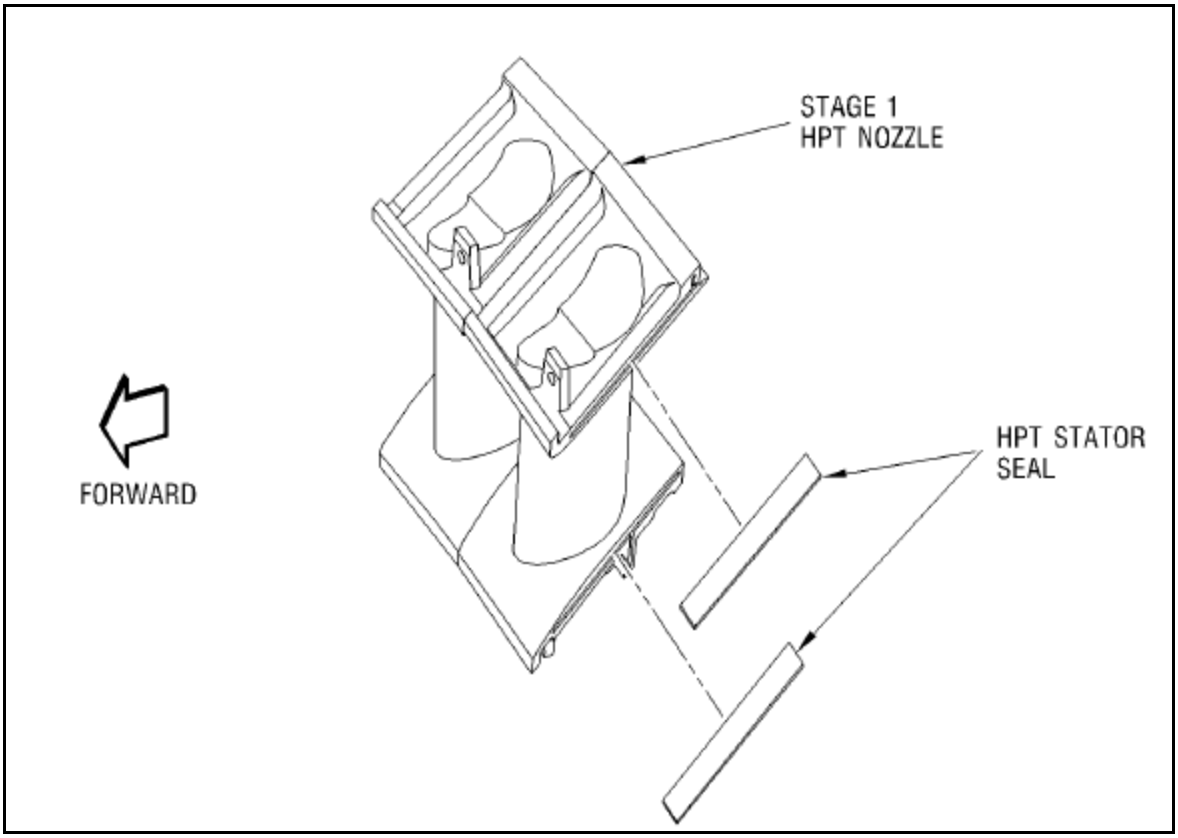


Figure 9: Stage 1 HPT Nozzle Seal Displacement

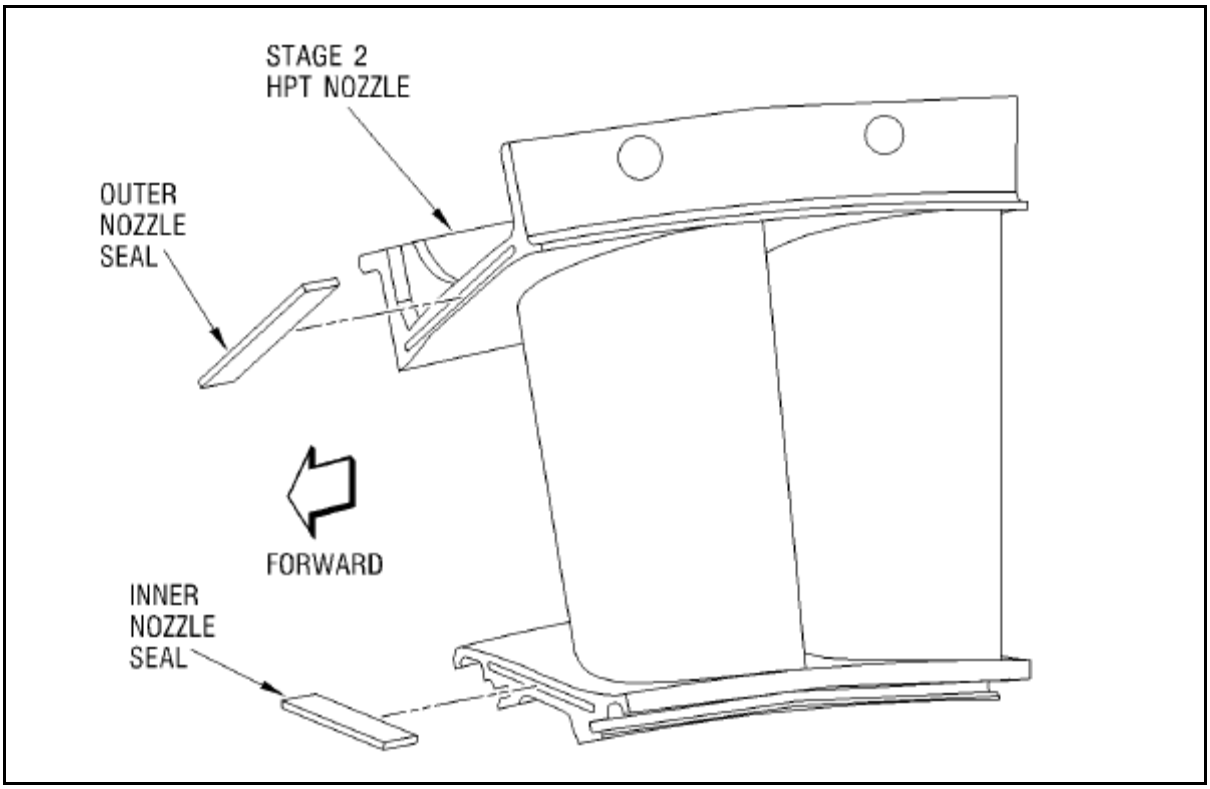


Figure 10: Stage 2 HPT Nozzle Seal Displacement

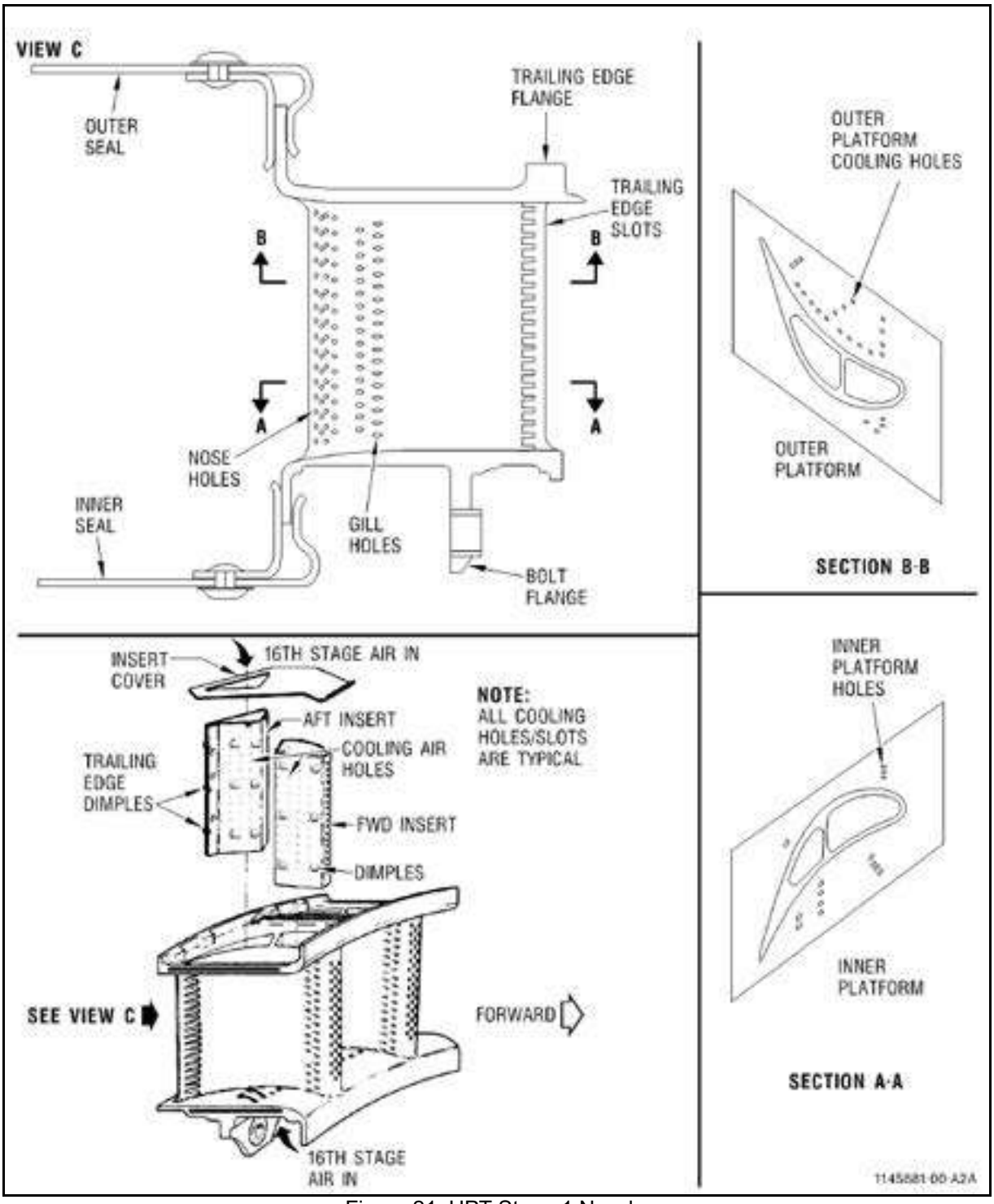



Figure 21: HPT Stage 1 Nozzle

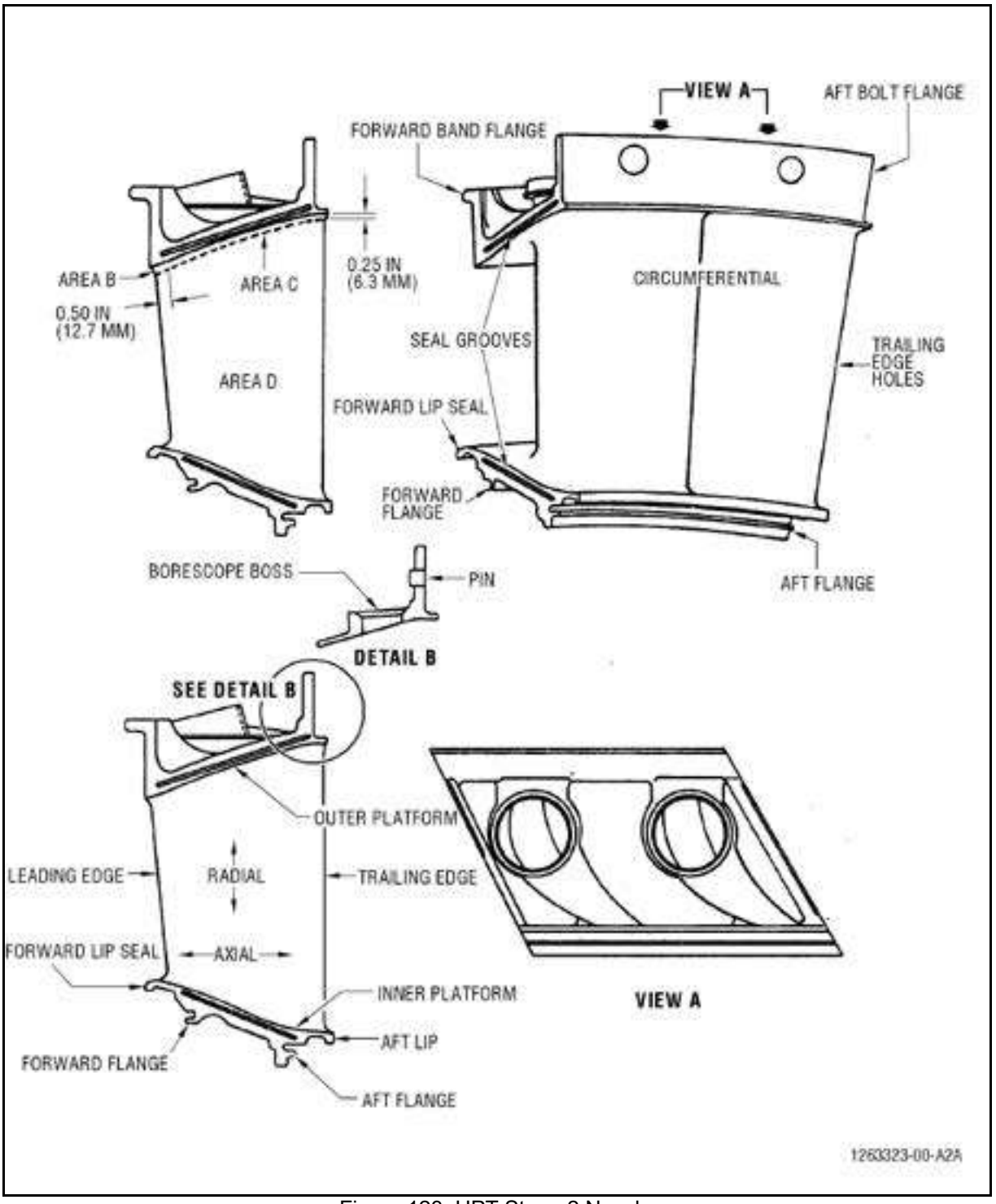



Figure 123: HPT Stage 2 Nozzle

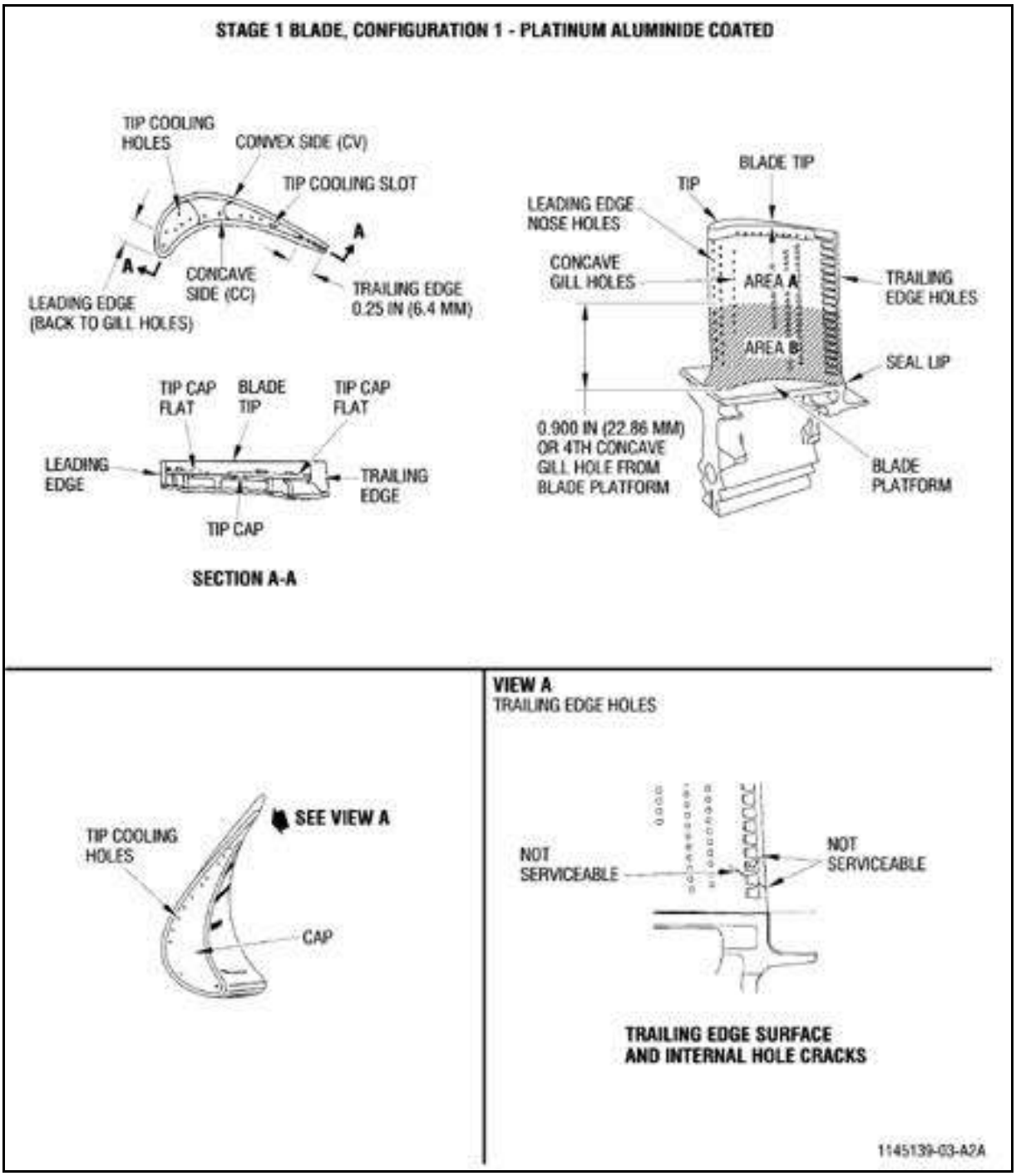



Figure 13: HPT Stage 1 Rotor Blades Inspection Areas (Platinum Aluminide Coated Blades)

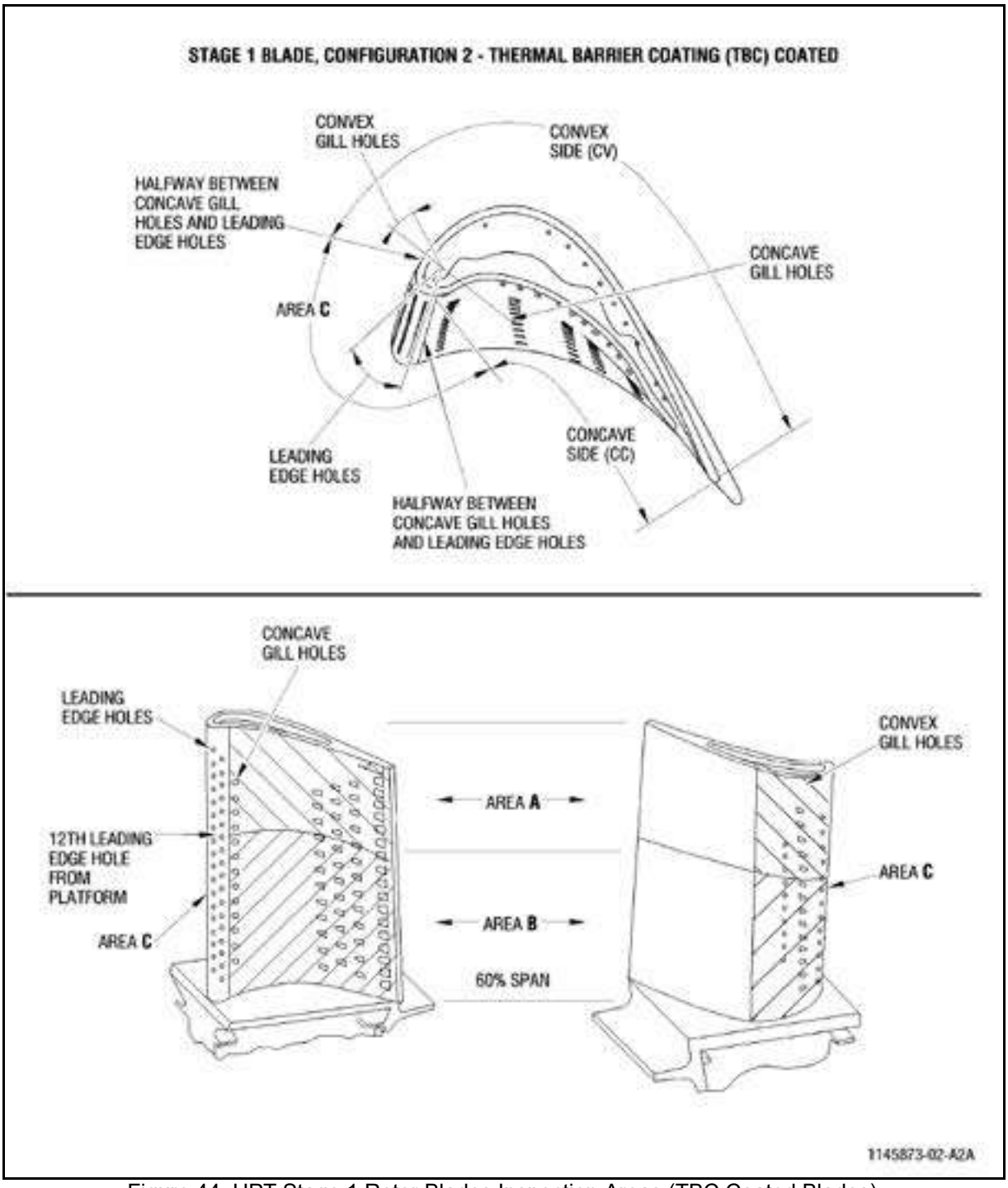


Figure 44: HPT Stage 1 Rotor Blades Inspection Areas (TBC Coated Blades)

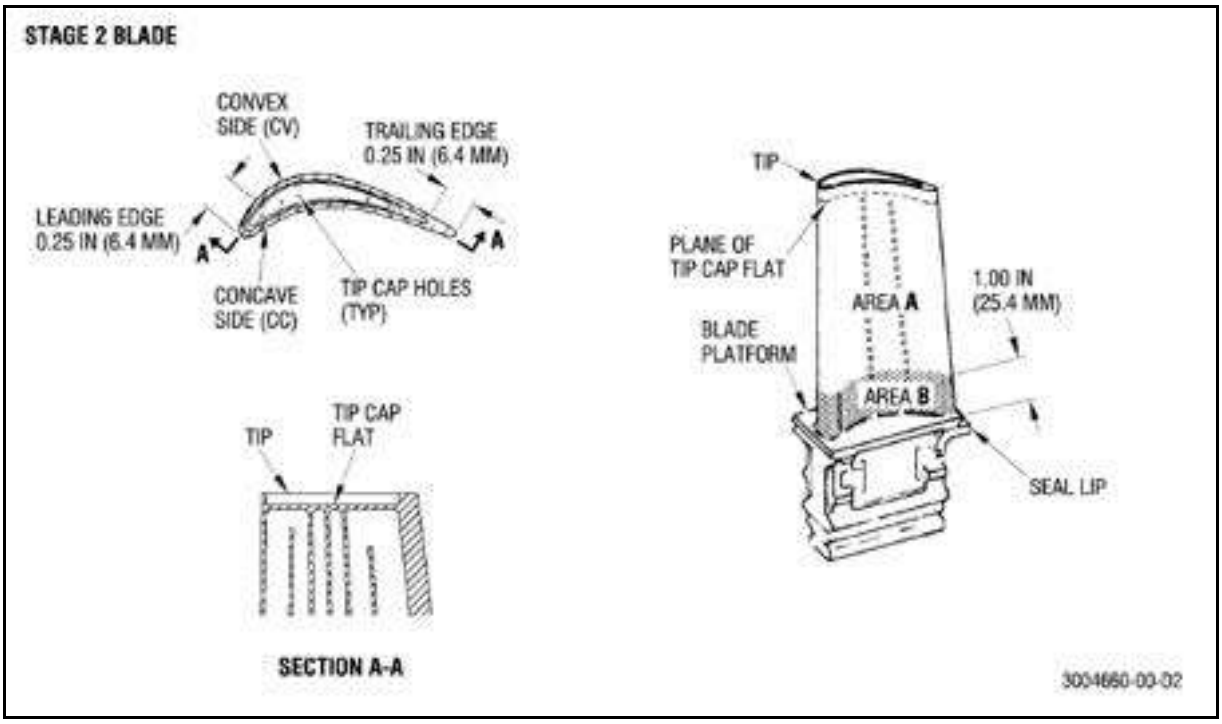



Figure 15: HPT Stage 2 Rotor Blades Inspection Areas

**Borescope Pictures**



Picture 49: Combustor seals and HPT Nozzles



Picture 50: Stage1 Nozzles leading edge



Picture 51: Stage1 Nozzles Leading edge



Picture 52: Stage1 Nozzle airfoil. Burn through on nozzle trailing edge platform



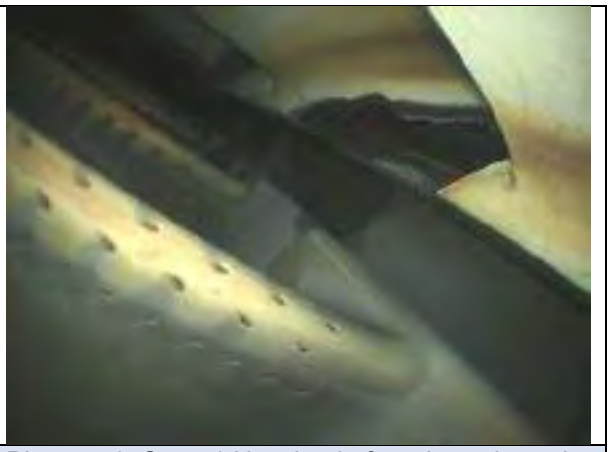
Picture 53: Stage1 Nozzle platform burn through



Picture 54: Stage1 Nozzle platform burn through



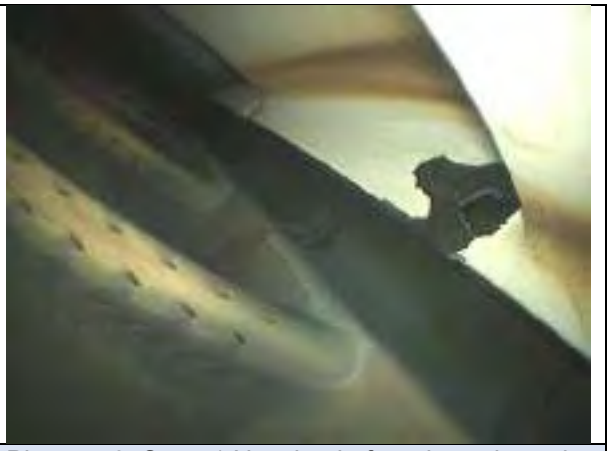
Picture 55: Stage1 Nozzle platform burn through



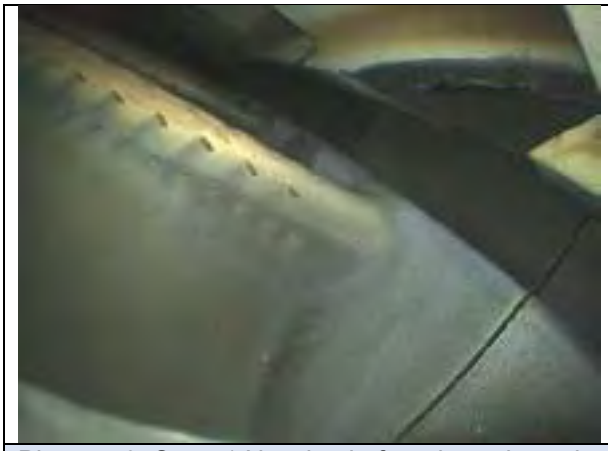
Picture 56: Stage1 Nozzle platform burn through



Picture 57: Stage1 Nozzle platform burn through



Picture 58: Stage1 Nozzle platform burn through



Picture 59: Stage1 Nozzle platform burn through



Picture 60: Stage 1 Nozzles trailing edge. Blades leading edge



Picture 61: Stage1 Blades leading edge



Picture 62: Stage 1 Blades leading edge



Picture 63: Stage1 schrouds



Picture 64: Stage 1 Blade leading edge tip missing material



Picture 65: Stage 1 Blade leading edge tip missing material



Picture 66: Stage 1 Blade leading edge tip missing material



Picture 67: Stage 1 Blade leading edge tip missing material



Picture 68: Stage 1 Blades trailing edge



Picture 69: Stage 2 Nozzles trailing edge and blades leading edge



Picture 70: Stage 2 Blades leading edge and honeycomb seals



Picture 71: Stage 2 Blade leading edge hole



Picture 72: Stage 2 Blade leading edge hole



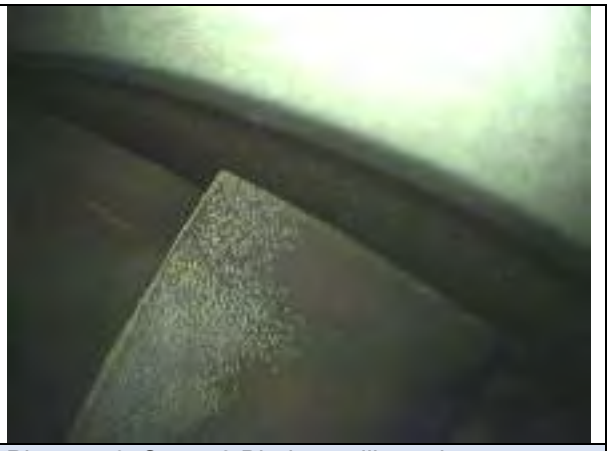
Picture 73: Stage 2 Blades trailing edge



Picture 74: Stage 2 Blades trailing edge



Picture 75: Stage 2 Blades trailing edge



Picture 76: Stage 2 Blades trailing edge

## 4. LPT Section

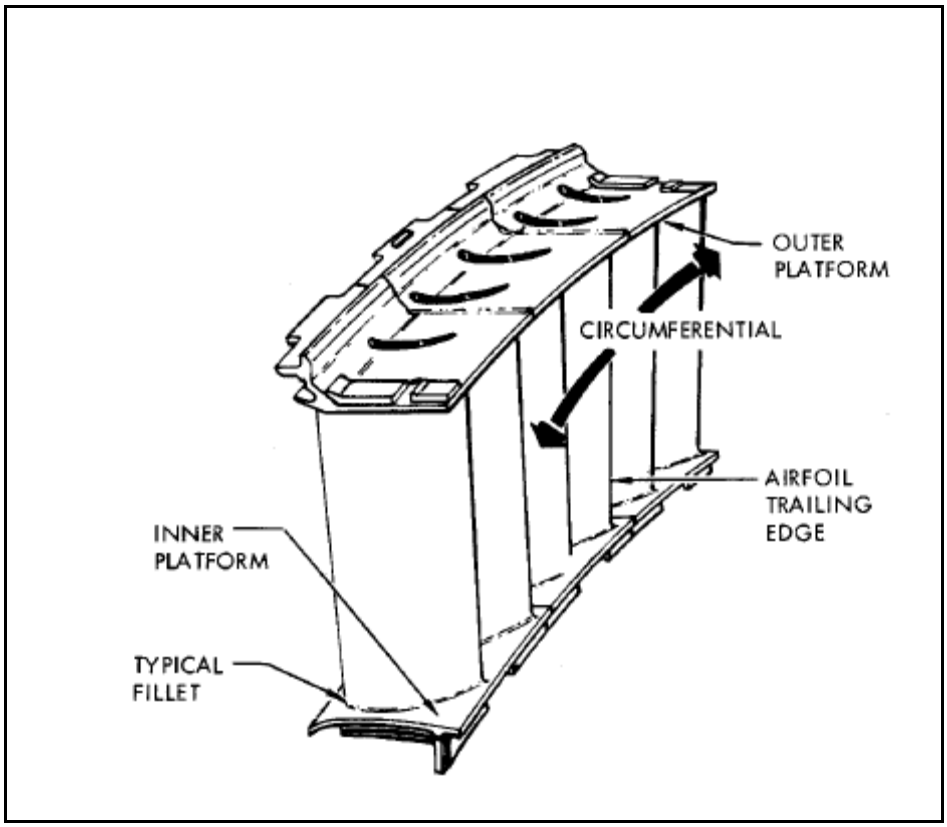



Figure 16: Power Turbine Nozzles

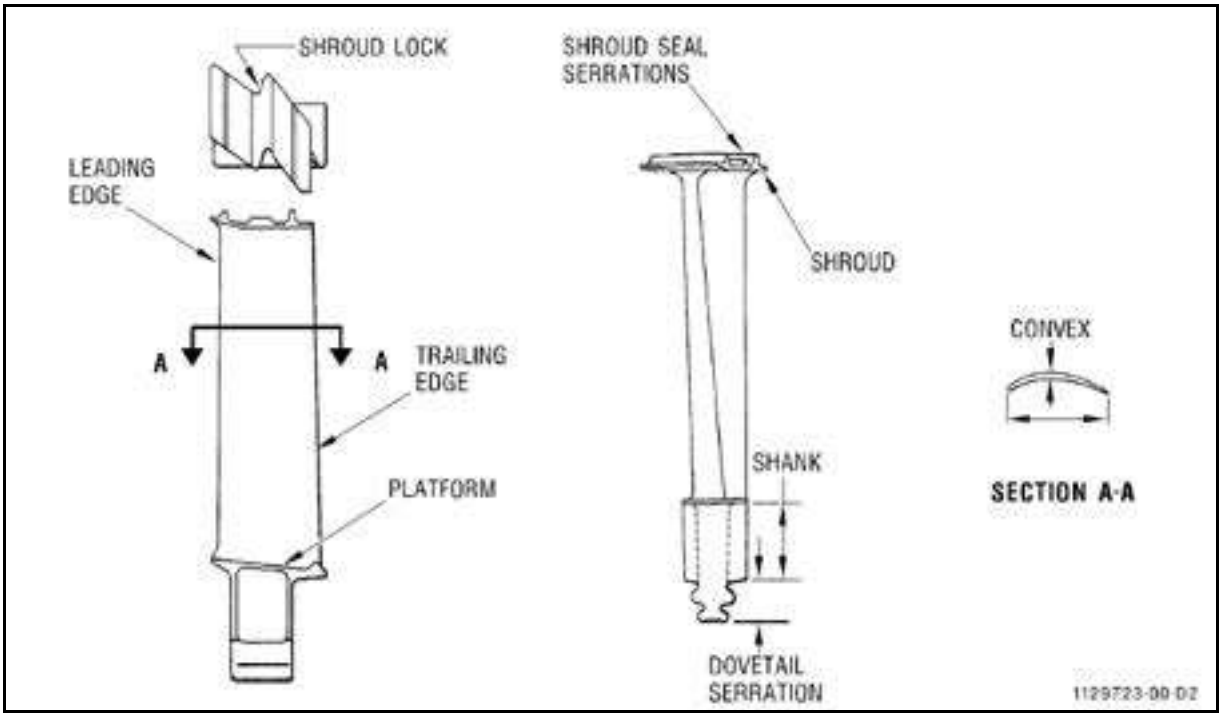



Figure 17: Power Turbine Rotor Blades

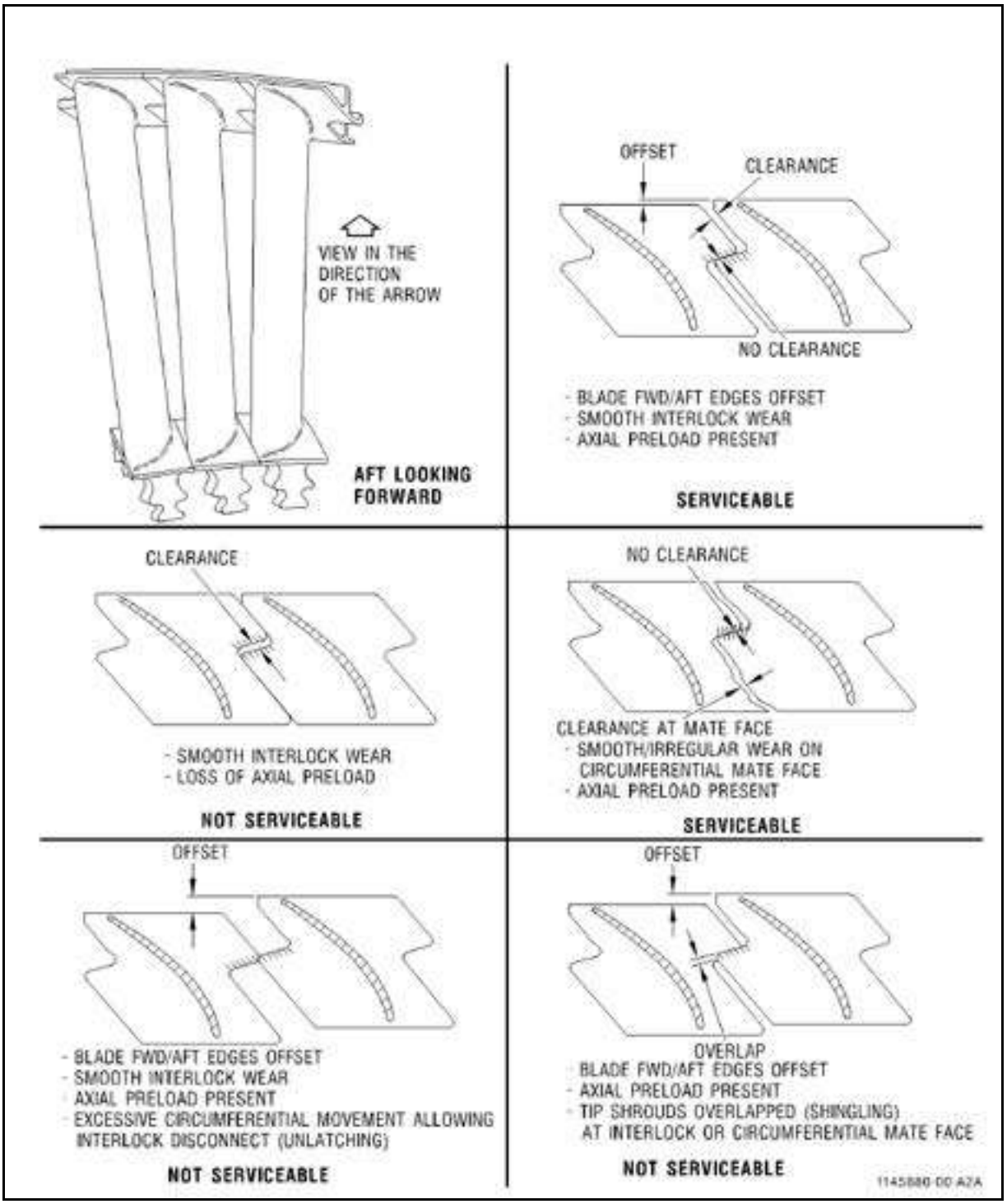


Figure 18: LPT Rotor Blade Circumferential Inspection

**Borescope Pictures**



Picture 77: TMF. LPT Inlet



Picture 78: LPT Stage 1 Blades



Picture 79: LPT stage 1 Blades tip interlock

**Notes:**

The LPT stage 1 accessible nozzles and blades did not show any damage.

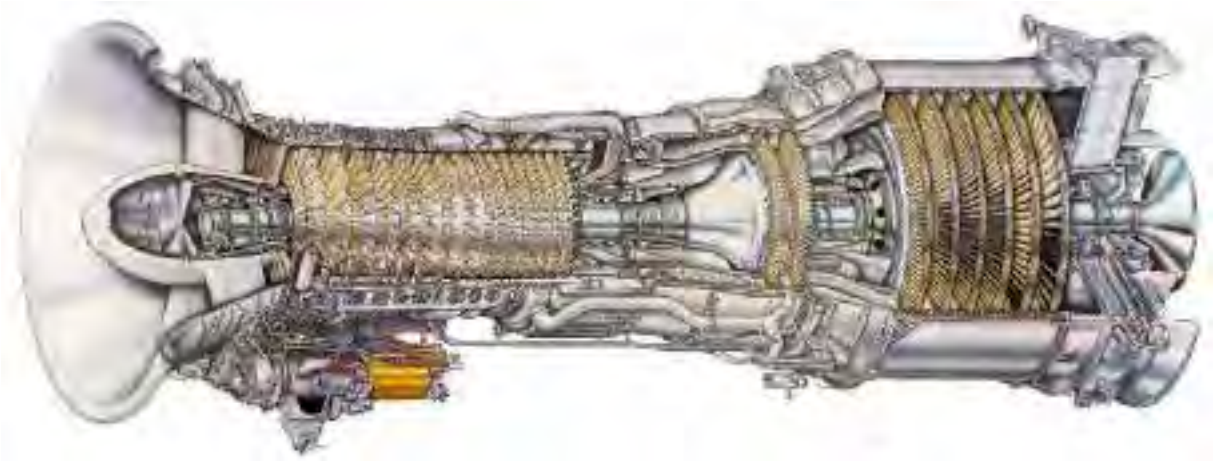
# *BORESCOPE INSPECTION REPORT*
# *TM2500 GEN4*
# *7LM2500 – PE – MGG16*

# NFE PALO SECO POWER PLANT

## *TM #51*

## *UNIT #4*

| | | | |
|---|---|---|---|
| **Visit Date:** | December 20, 2024 | **Total Starts:** | 907 |
| **Engine S/N:** | 481 – 718 | **GG Hours:** | 40781 |
| **Power Turbine S/N:** | 481 - 718 | **PT Hours:** | 40781 |
| **PPG GT Field Engineer:** | JC Requena H | **NFE Representative:** | Lance Florent |



# TABLE OF CONTENTS


1 Conclusions and Recommendations .....3
2 Outage Data ……..…4
3 Borescope Inspection Checklist.....5
4 Borescope Inspection Record.....6
4.1 Compressor Section .....9
4.2 Combustor and 1St Stage Nozzle Section.....12
4.3 Turbine Section.....18
4.4 LPT Section .....27

## 1. Conclusions and Recommendations

**Purpose of visit:**
The purpose of this visit was to perform an engine borescope inspection in accordance with GEK105054, WP 406 00.

**The Engine is not servicebale according to GEK97310 Volume II Chapter 5**

**1.1** The HPC Section is serviceable according to GEK97310 Chapter 5 Table 5-4.
The HPC Section is very dirty. The dirt adhering to the blade's surface requires a manual cleaning to restore the compressor efficiency.

**1.2** The Combustor section is serviceable according to GEK97310 VolumeII Chapter 5 Table 5.5.

**1.3** The High Pressure Turbine section is serviceable according to GEK 97310 Volume II Chapter 5 Table 5.6.

There are at least four (4) Stage 1 Nozzles affected by burns with loss of metal on the inner platform trailing edge. The extension of the damages observed are still within limits according to the Table 5.6 paragraph 2.f.

There are at least two (2) Stage 2 Nozzles with missing material on trailing edge. The extension of the damages observed are still within limits according to Table 5.6 paragraph 1.l.

## 2. Outage Data

**ENGINE DATA**

| | | | | | |
|---|---|---|---|---|---|
| **ESN:** | 557-718 | **Engine Fired Hours:** | 40781 | **Package Hours:** | 40781 |
| **Model:** | 7LM2500-PE-MGG16 | **Engine Fired starts:** | 907 | **Package Fired Starts:** | 907 |

**MAINTENANCE DATA**

| WP, SB, SL, PB, PL Performed | GEK197310, REV 10 | Date completed | Comments |
|---|---|---|---|
| N/A | Borescope Inspection | 19DEC24 | Not Serviceable |

**PARTS DATA**

| Description | PN Removed | SN Removed | Qty | Disposition | PN Installed | SN Installed |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |

## 3. Borescope Inspection Checklist

**Date unit out of operation:** 17DEC24
**Date unit into operation:** 21DEC24
**Last inspection date:** 14MAR24; PPG O&M

**Type of Fuel:** Gas / Diesel
**Type of outage:** Scheduled

**Type of NOx suppression:** Water Injection

**Inspection of gas turbine:**

| WATERWASH: | HIGH PRESSURE COMPRESSOR: |
|---|---|
| ☒ PERFORMED WATER WASH | ☒ HPC BORESCOPE INSPECTION |
| **COMBUSTOR:** | **HIGH PRESSURE TURBINE** |
| ☒ COMBUSTOR BORESCOPE INSPECTION | ☒ HPT STAGE 1 & 2 NOZZLE BORESCOPE INSPECTION |
| | ☒ HPT BLADE BORESCOPE INSPECTION |
| **LOW PRESSURE TURBINE:** | |
| ☒ LPT BORESCOPE INSPECTION | |

☒ ***Please verify all borescope plugs have been reinstalled***

## 4. Borescope Inspection Record

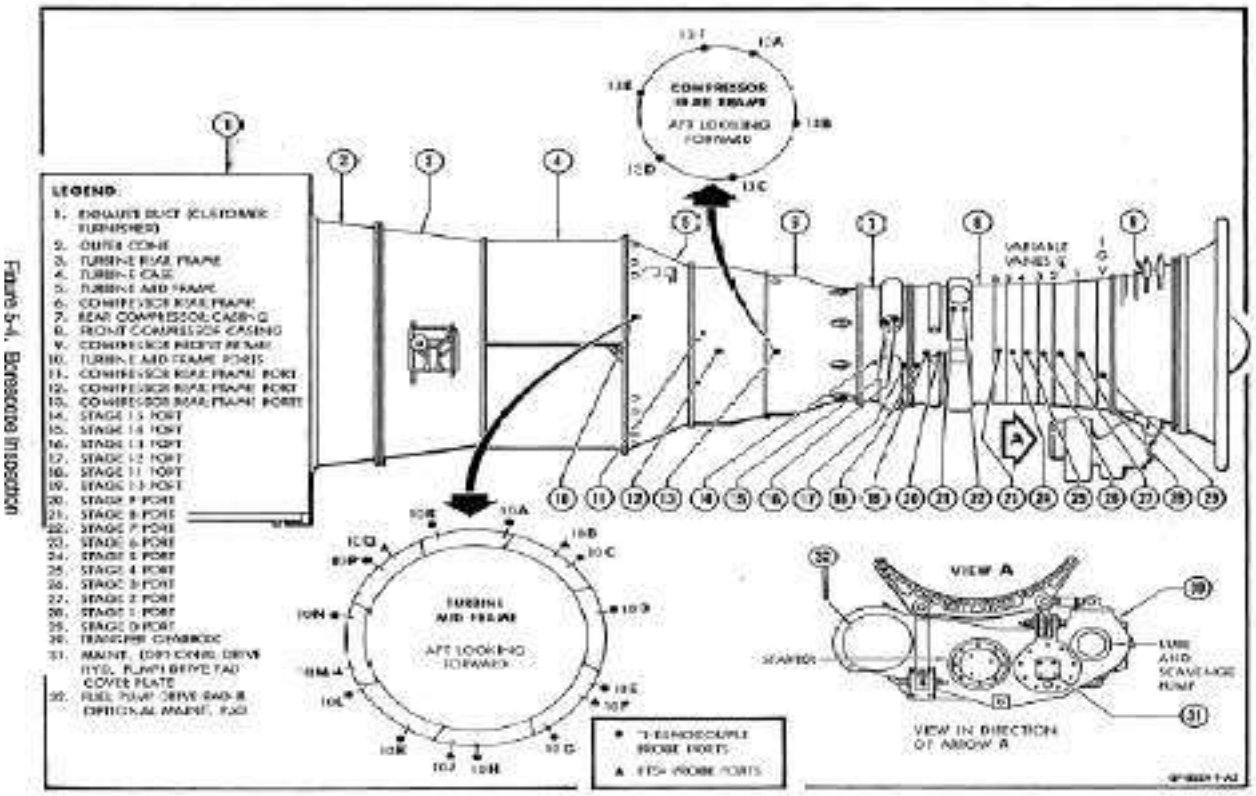



Figure 5-4. Borescope Inspection

Figure 1: Position of Borescope Inspection Ports.

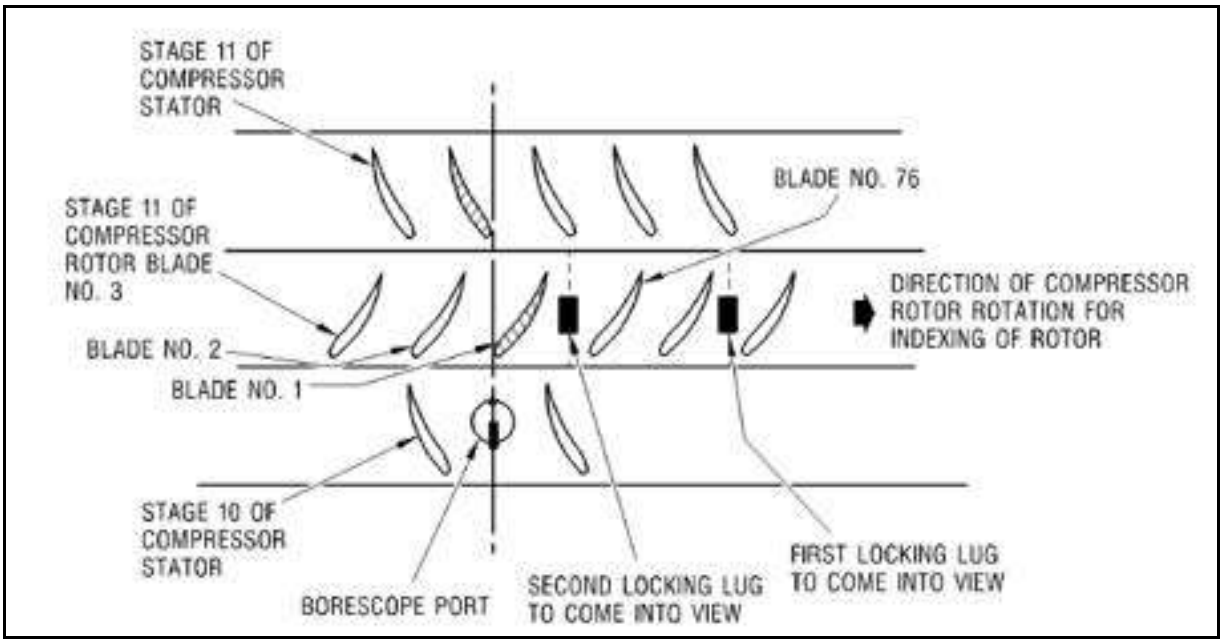


Figure 2: Zero indexing of HPC rotor and HPT rotor

## 1. Compressor Section

| | Compressor Stage | | | | |
|---|---|---|---|---|---|
| **Port** | **LE** | **TE** | **Blades** | **Remarks:** | **Photo no:** |
| **0** | **1** | | **36** | | 1 – 2 – 3 – 4 |
| **1** | | **1** | **36** | | 5 |
| **1** | **2** | | **42** | | 6 – 7 |
| **2** | | **2** | **42** | | 8 |
| **2** | **3** | | **42** | | 9 – 10 |
| **3*** | | **3** | **42** | | 11 – 12 |
| **3*** | **4** | | **45** | | 13 – 14 |
| **4** | | **4** | **45** | | 15 – 16 |
| **4** | **5** | | **48** | One (1) Blade with minor nick on leading edge. Serviceable | 17 – 18 |
| **5*** | | **5** | **48** | | 19 |
| **5*** | **6** | | **54** | | 20 – 21 |
| **6** | | **6** | **54** | | 22 |
| **6** | **7** | | **56** | | 23 – 24 |
| **7** | | **7** | **56** | INSIDE MANIFOLD | |
| **7** | **8** | | **64** | INSIDE MANIFOLD | |
| **8** | | **8** | **64** | INSIDE MANIFOLD | |
| **8** | **9** | | **66** | INSIDE MANIFOLD | |
| **9*** | | **9** | **66** | | 25 – 26 |
| **9*** | **10** | | **66** | | 27 – 28 |
| **10**** | | **10** | **66** | | 29 |
| **10** | **11** | | **76** | | 30 |
| **11** | | **11** | **76** | | 31 |
| **11** | **12** | | **76** | One (1) Blade with minor nick on leading edge. Serviceable | 32 – 33 |
| **12** | | **12** | **76** | | 34 |
| **12** | **13** | | **76** | | 35 |
| **13** | | **13** | **76** | INSIDE MANIFOLD | |
| **13** | **14** | | **76** | INSIDE MANIFOLD | |
| **14** | | **14** | **76** | INSIDE MANIFOLD | |
| **14** | **15** | | **76** | INSIDE MANIFOLD | |
| **15*** | | **15** | **76** | | 36 – 37 |
| **15*** | **16** | | **76** | One (1) Blade with minor nick on leading edge. Serviceable. | 38 – 39 – 40 |

**Notes:**

The HPC Section is serviceable according to GEK97310 Chapter 5 Table 5-4.
The HPC Section is very dirty. The dirt adhering to the blade´s surface requires a manual cleaning to restore the compressor efficiency.

**Borescope Pictures**



Picture 1. CFF



Picture 2. CFF & IGV



Picture 3. Stage 1 Leading edge tip dirty



Picture 4. Stage 1 Leading edge and mid span damper



Picture 5. Stage 1 Trailing edge mid span damper



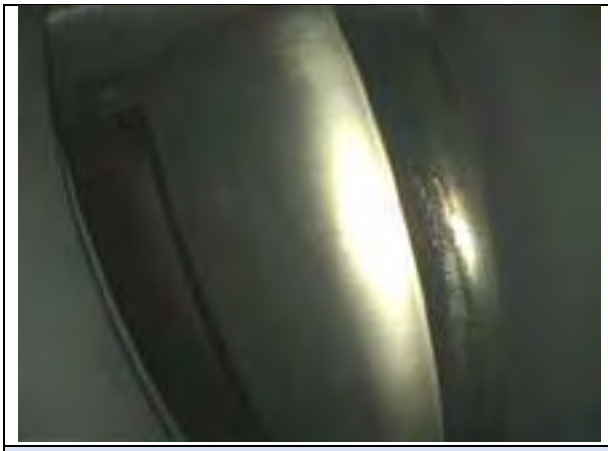
Picture 6. Stage 2 Leading edge base dirty



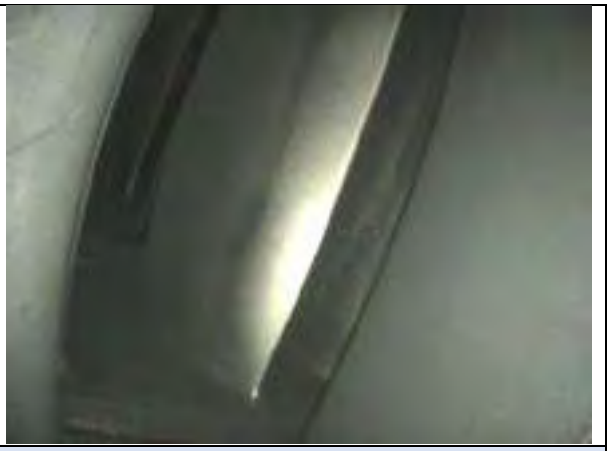
Picture 7. Stage 2 Leading edge base



Picture 8. Stage 2 Trailing edge tip



Picture 9. Stage 3 Leading edge



Picture 10. Stage 3 Leading edge



Picture 11. Stage 3 Trailing edge base



Picture12. Stage 3 Trailing edge



Picture 13. Stage 4 Leading edge tip



Picture 14. Stage 4 leading edge base



Picture 15. Stage 4 Trailing edge



Picture 16. Stage 4 Airfoil dirty



Picture 17. Stage 5 Leading edge minor nick



Picture 18. Stage 5 Leading edge base



Picture 19. Stage 5 Airfoil dirty



Picture 20. Stage 6 Leading edge tip



Picture 21. Stage 6 Leading edge base



Picture 22. Stage 6 Trailing edge



Picture 23. Stage 7 Leading edge base



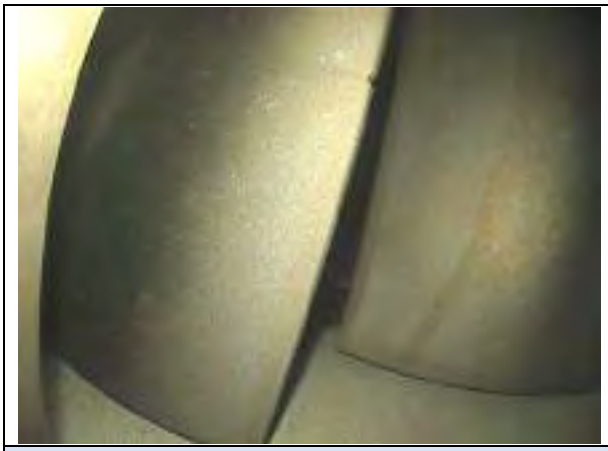
Picture 24. Stage 9 Trailing edge tip



Picture 25. Stage 9 Trailing edge tip



Picture 26. Stage 9 Trailing edge base



Picture 27. Stage 10 Leading edge minor nick



Picture 28. Stage 10 Leading edge base



Picture 29. Stage 10 Trailing edge



Picture 30. Stage 11 Leading edge



Picture 31. Stage 11 Trailing edge tip



Picture 32. Stage 12 Leading edge minor nick



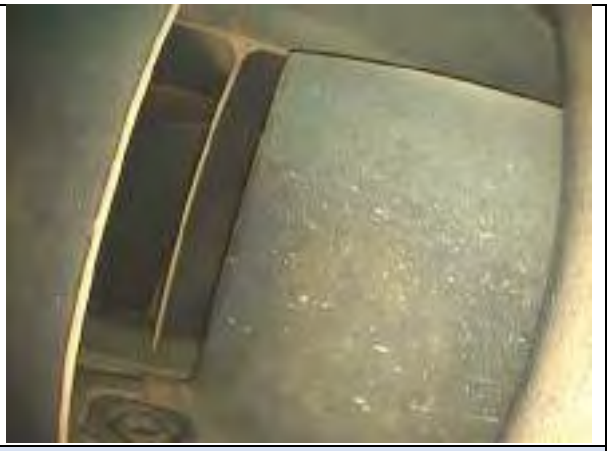
Picture 33. Stage 12 Leading edge



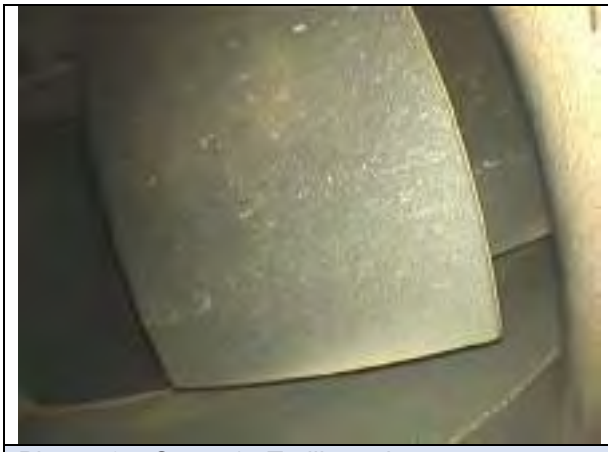
Picture 34. Stage 12 Trailing edge



Picture 35. Stage 13 Leading edge



Picture 36. Stage 15 Trailing edge



Picture 37. Stage 15 Trailing edge



Picture 38. Stage 16 leading edge dirt build up



Picture 39. Stage 16. OGV Repaired



Picture 40. Outlet guide vanes

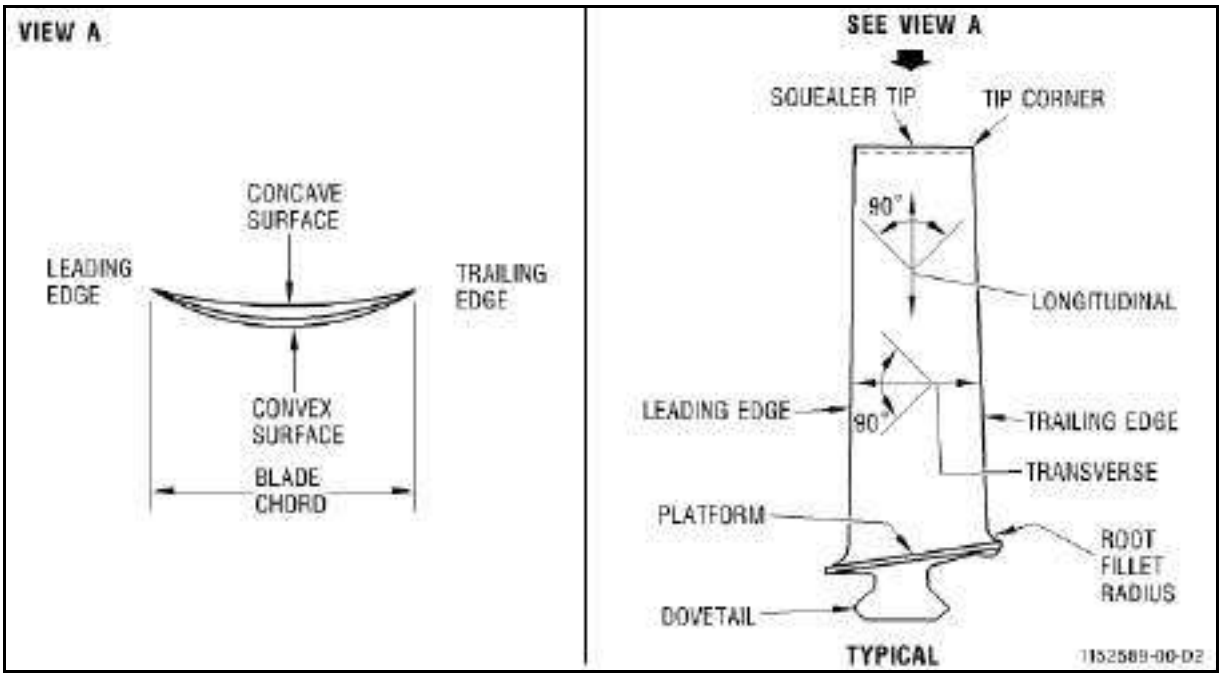


Figure 3: Compressor Rotor Blades

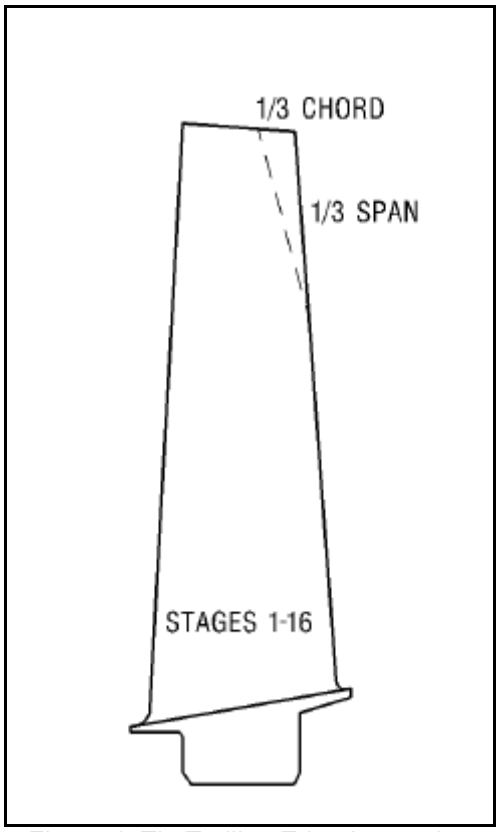


Figure 4: Tip Trailing Edge Inspection

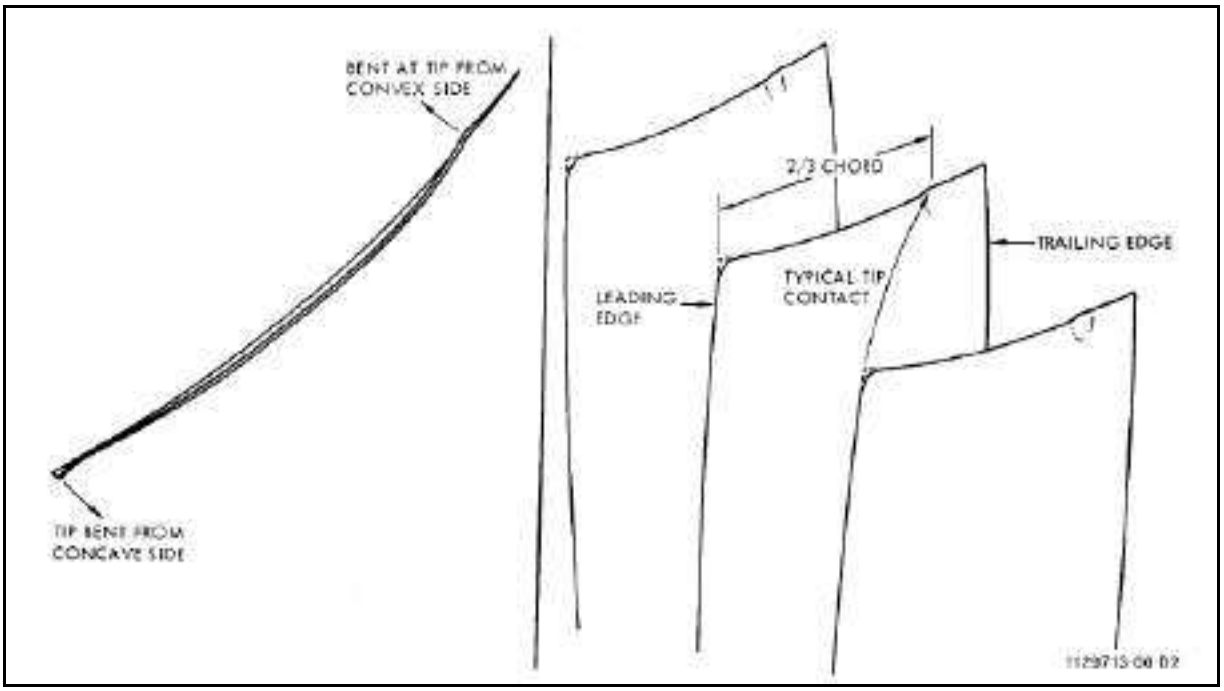


Figure 5: Tip Clanging Contact (HPCR stage 3 through 6)

## 2. Combustor and 1st Stage Nozzle Section

| Port | Condition observed | Photo no: |
|---|---|---|
| 17A | | |
| 17B | | |
| 17C | | |
| 17D | **See below notes.** | 41 to 52 |
| 17E | | |
| 17F | | |
| 17G | | |
| 17H | | |
| 17 | 1st stage nozzle (leading edge): | |

**Notes:**
The Combustor section is serviceable according to GEK97310 VolumeII Chapter 5 Table 5.5.

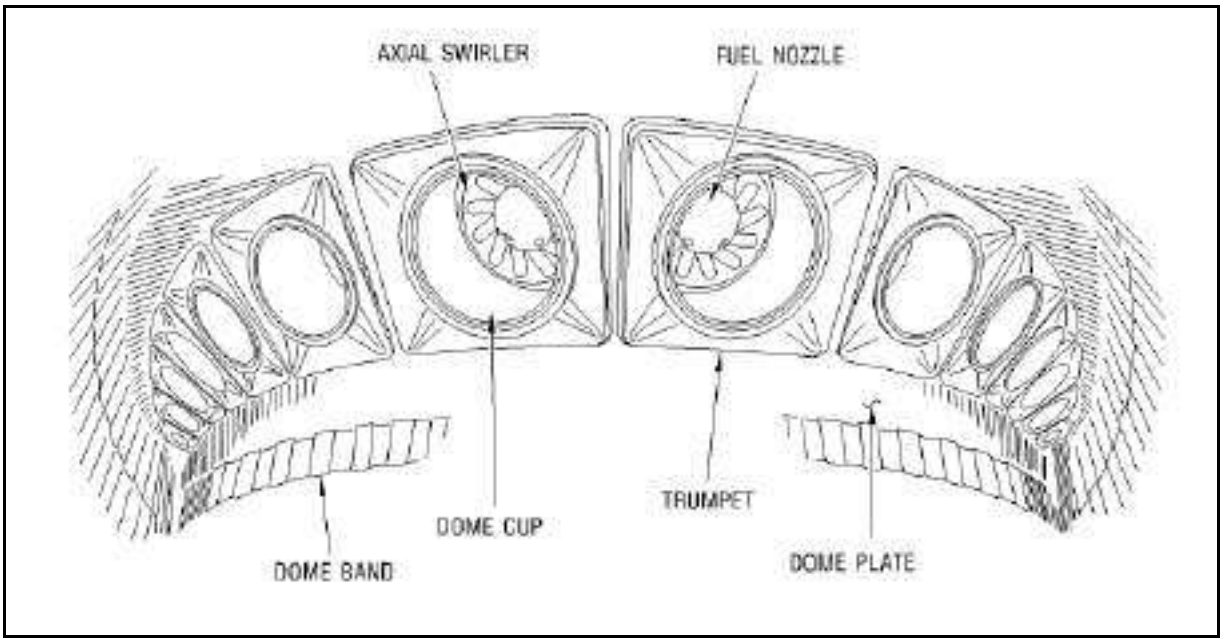



Figure 6: SAC Combustor Inspection

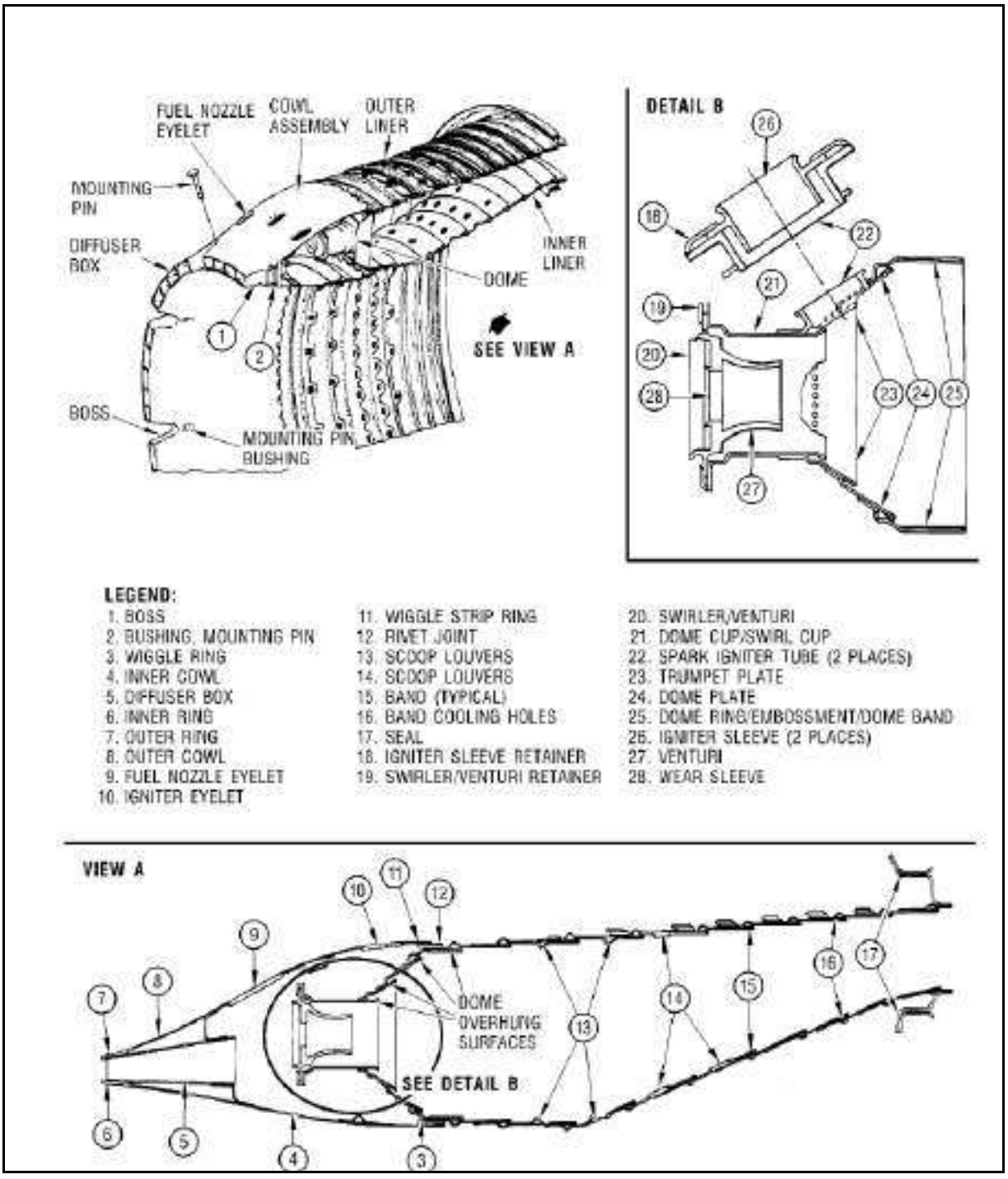



Figure 7: SAC Combustor Inspection

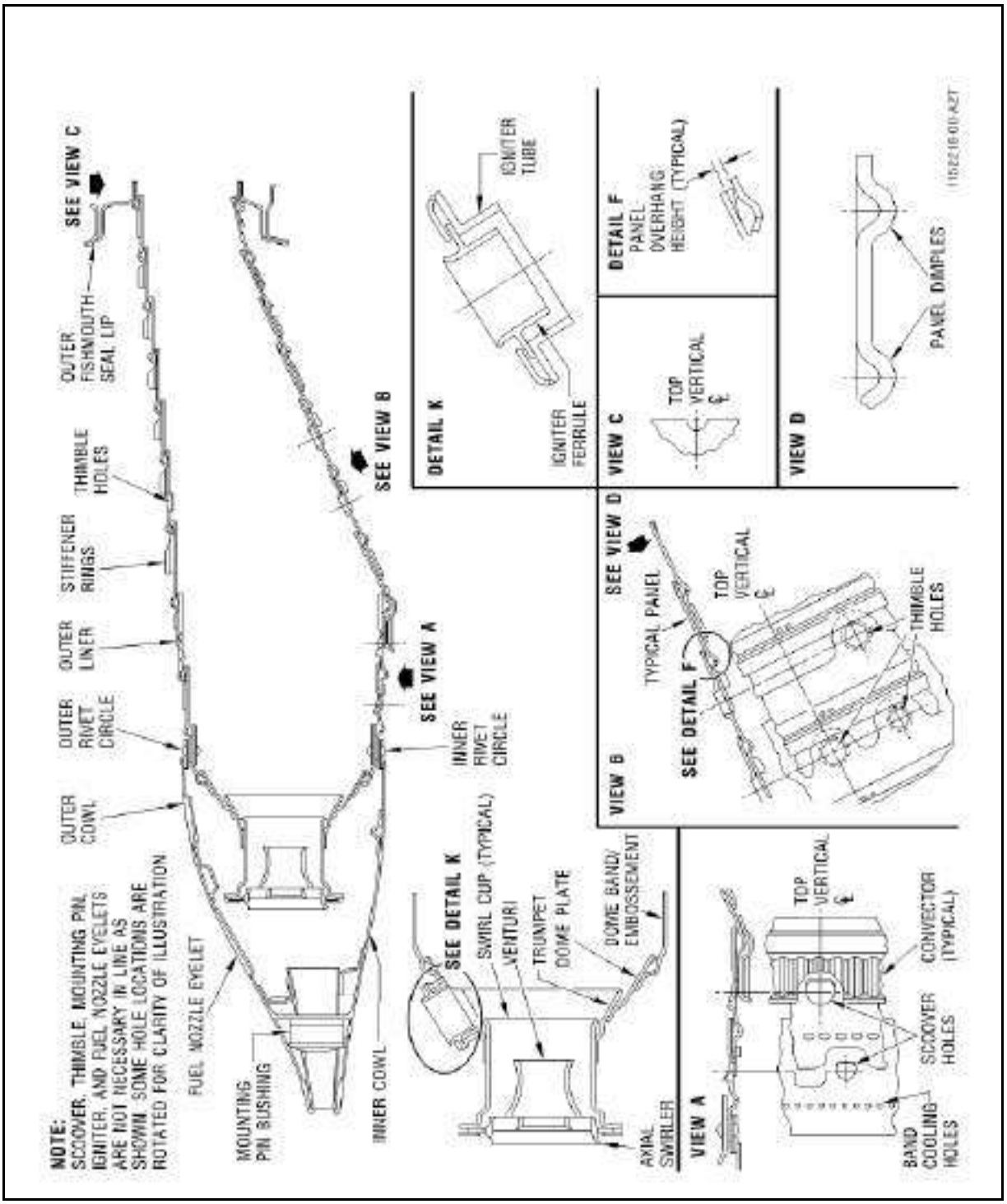



Figure 8: SAC Combustor Inspection

**Borescope Pictures**



Picture 41. Combustor dome & upper igniter



Picture 42. Combustor dome & lower igniter



Picture 43. Inner liner and rivets band



Picture 44. Outer liner and rivets band



Picture 45. Combustor outer liner



Picture 46. Fuel nozzle tip



Picture 47. Fuel nozzle tip



Picture 48. Splash plate edge erosion



Picture 49. Dome plate erosion



Picture 50. Combustor dome and liners



Picture 51. Combustor dome and liners



Picture 52. Combustor liners and HPT Nozzles

### 3. High Pressure Turbine Section

| | turbine stage | | | | |
|---|---|---|---|---|---|
| **Port** | **L.E.** | **T.E.** | **blades** | **Remarks:** | **photo no:** |
| **18** | **1** | | **88** | | |
| **19** | | **1** | **88** | **See below notes.** | 53 to 76 |
| **19** | **2** | | **90** | | |
| **20** | | **2** | | | |

**Notes:**
The High Pressure Turbine section is serviceable according to GEK 97310 Volume II Chapter 5 Table 5.6.

There are at least four (4) Stage 1 Nozzles affected by burns with loss of metal on the inner platform trailing edge. The extension of the damages observed are still within limits according to the Table 5.6 paragraph 2.f.

There are at least two (2) Stage 2 Nozzles with missing material on trailing edge. The extension of the damages observed are still within limits according to Table 5.6 paragraph 1.l.

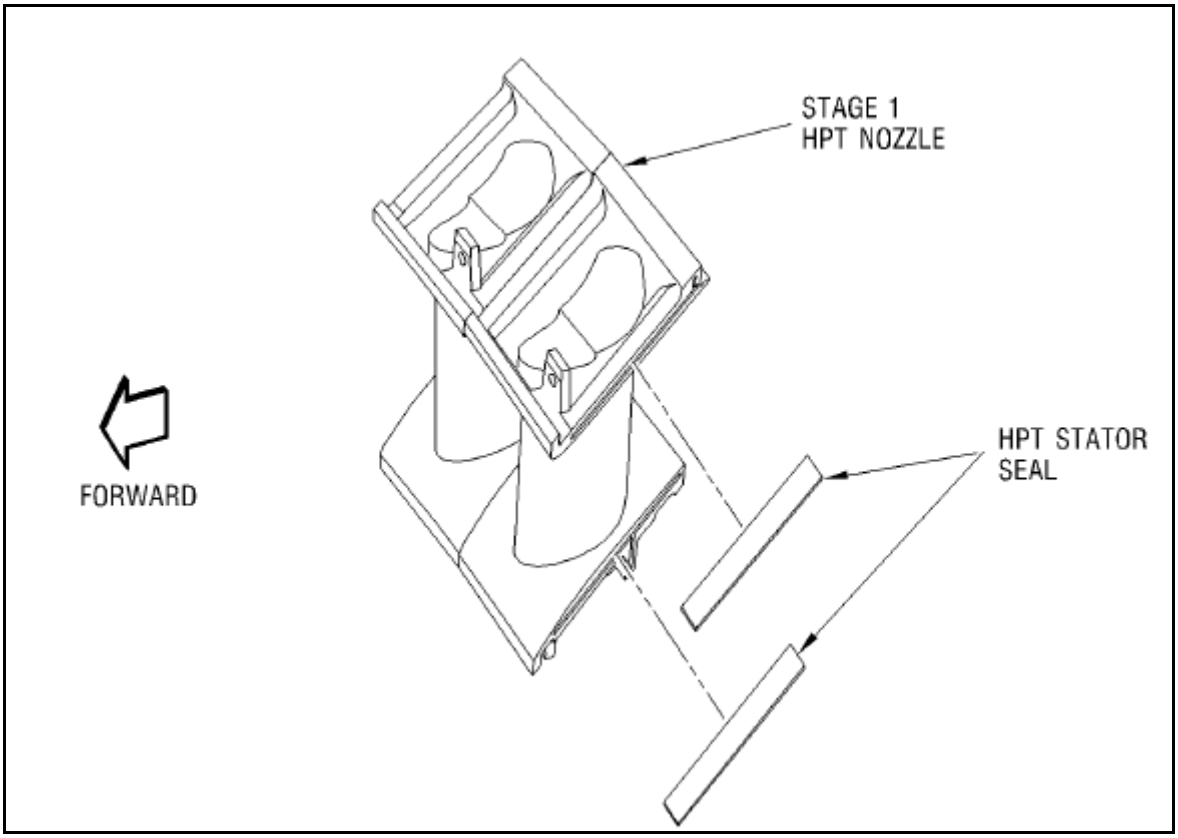


Figure 9: Stage 1 HPT Nozzle Seal Displacement

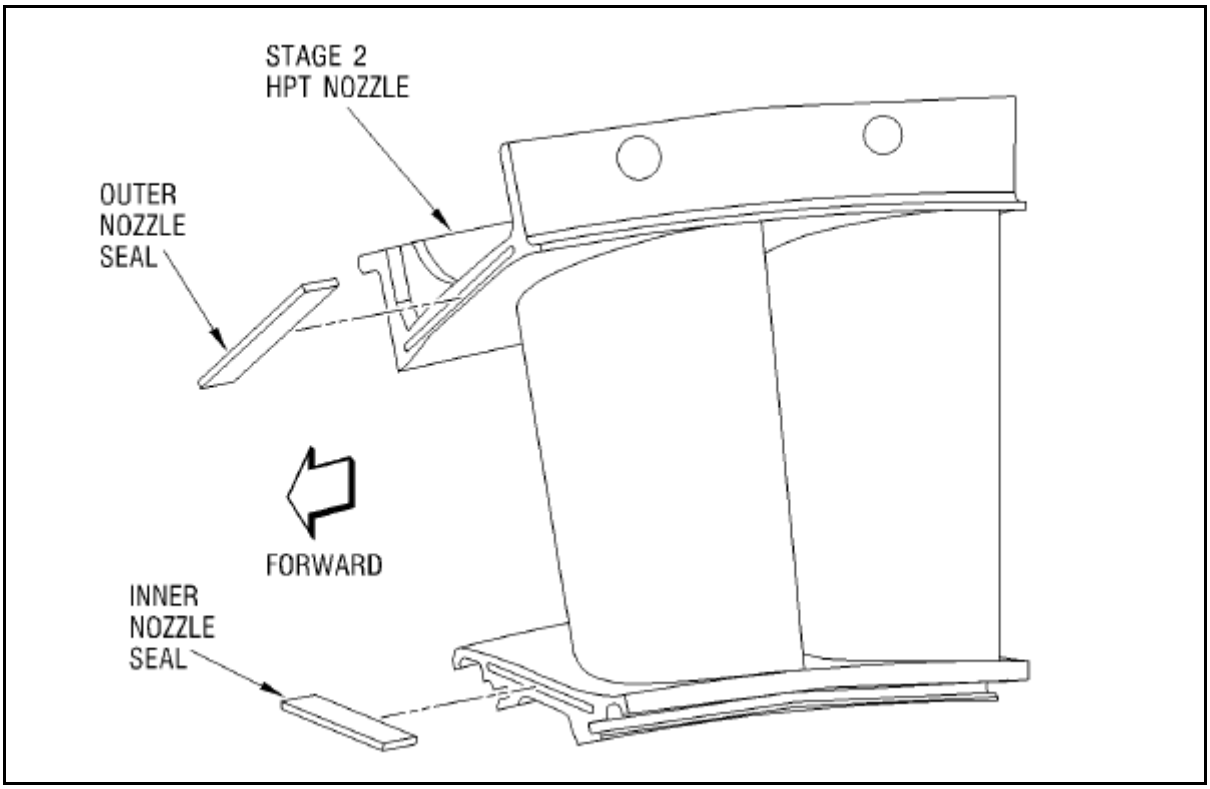


Figure 10: Stage 2 HPT Nozzle Seal Displacement

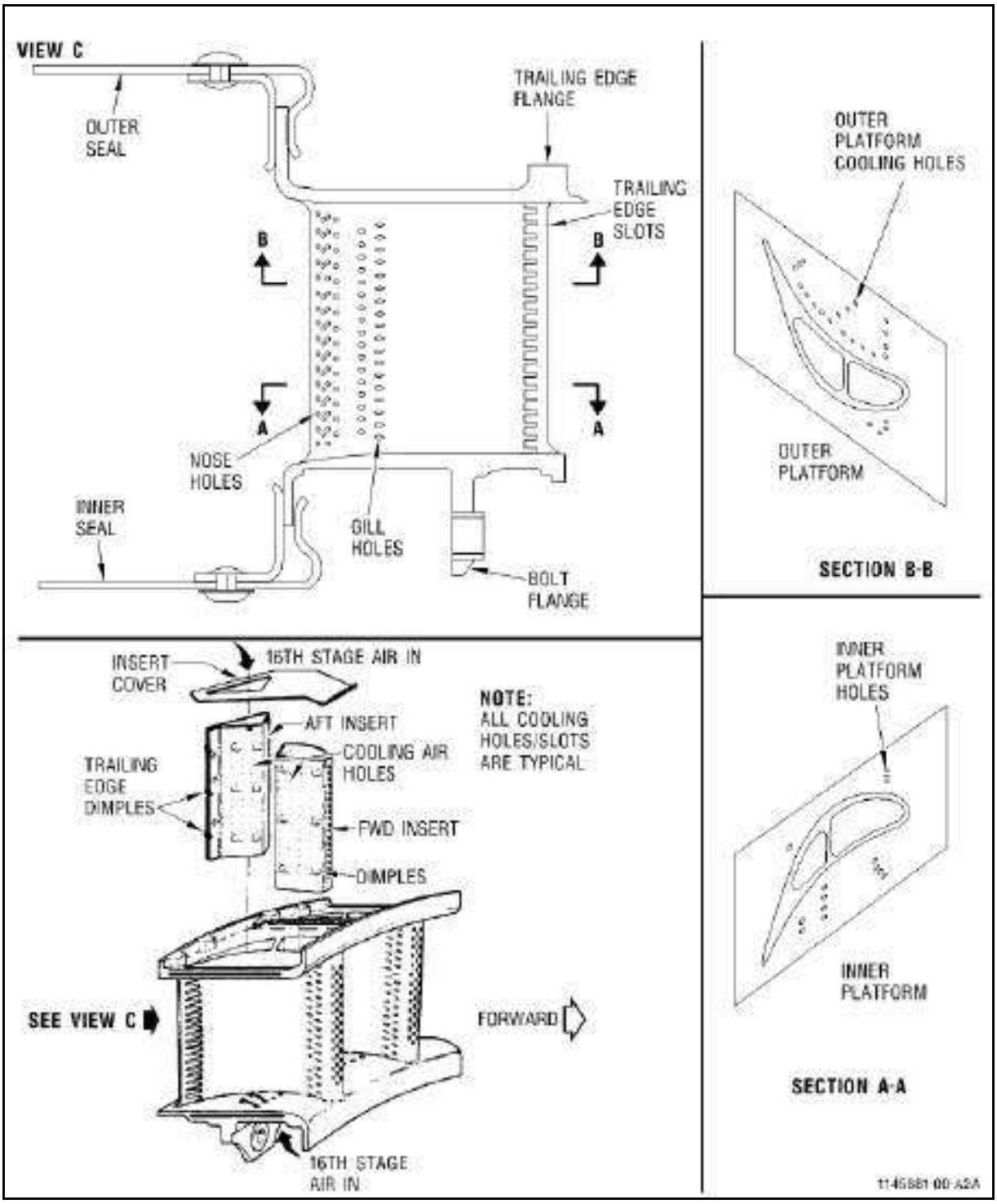



Figure 21: HPT Stage 1 Nozzle

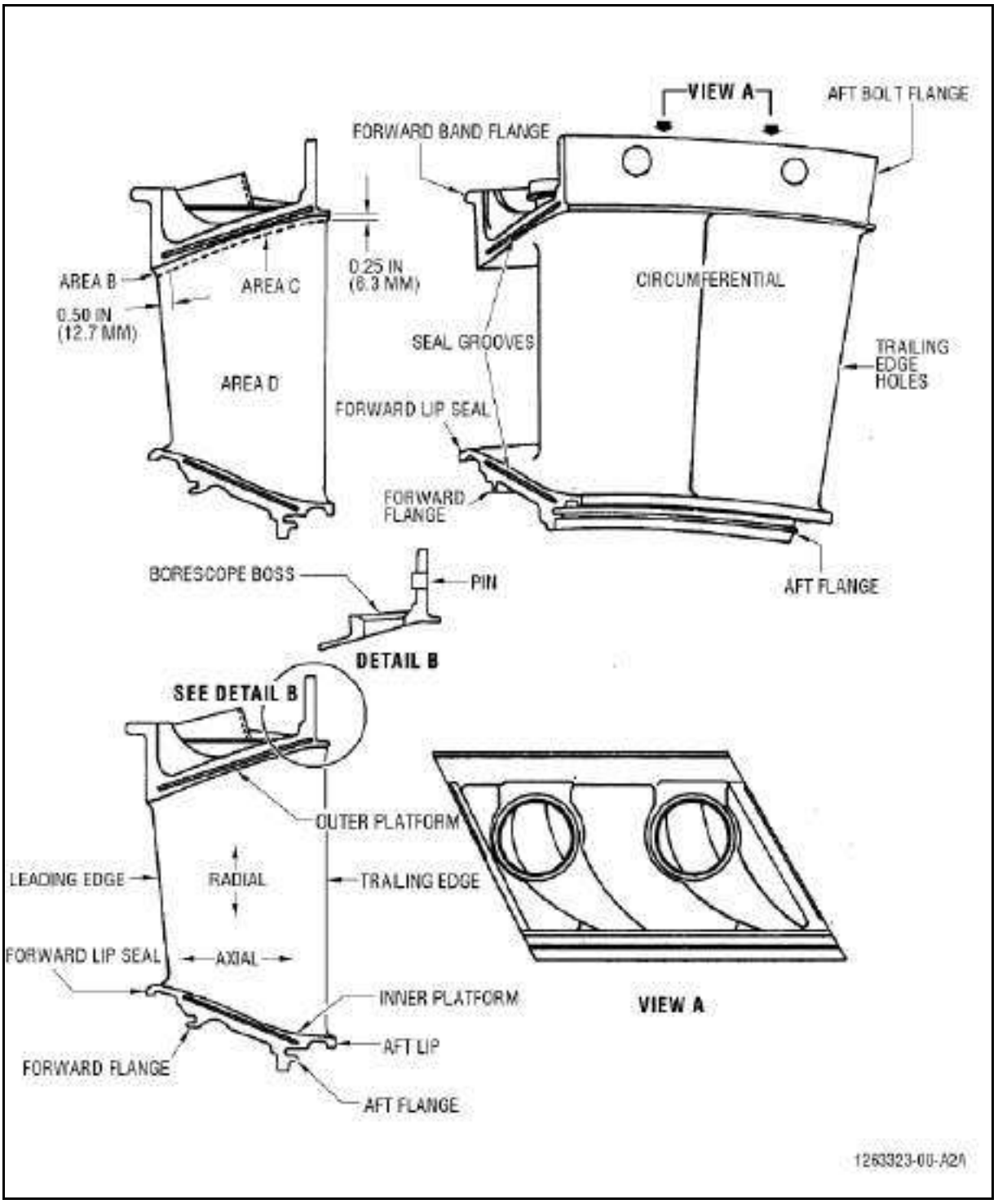



Figure 123: HPT Stage 2 Nozzle

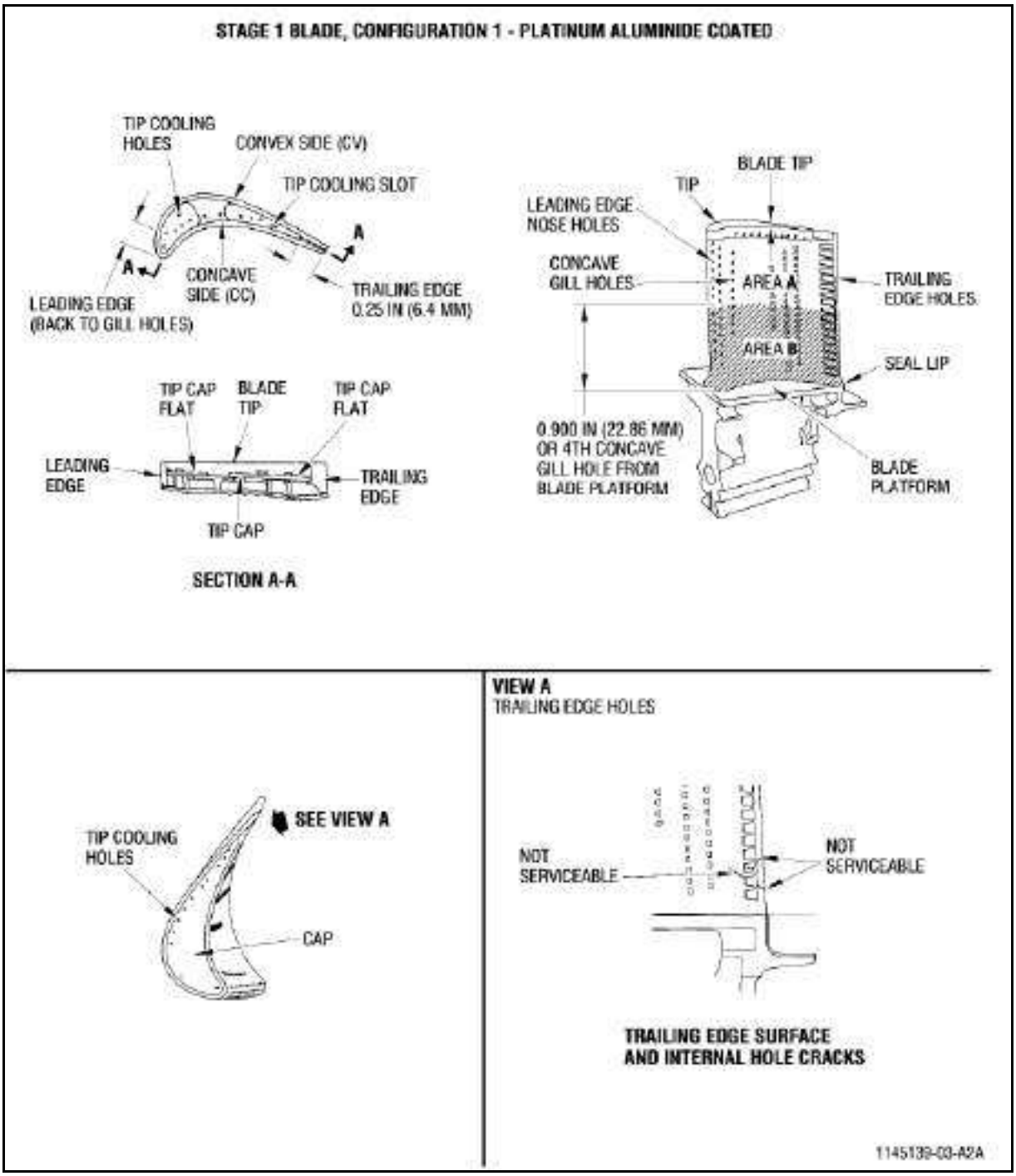



Figure 13: HPT Stage 1 Rotor Blades Inspection Areas (Platinum Aluminide Coated Blades)

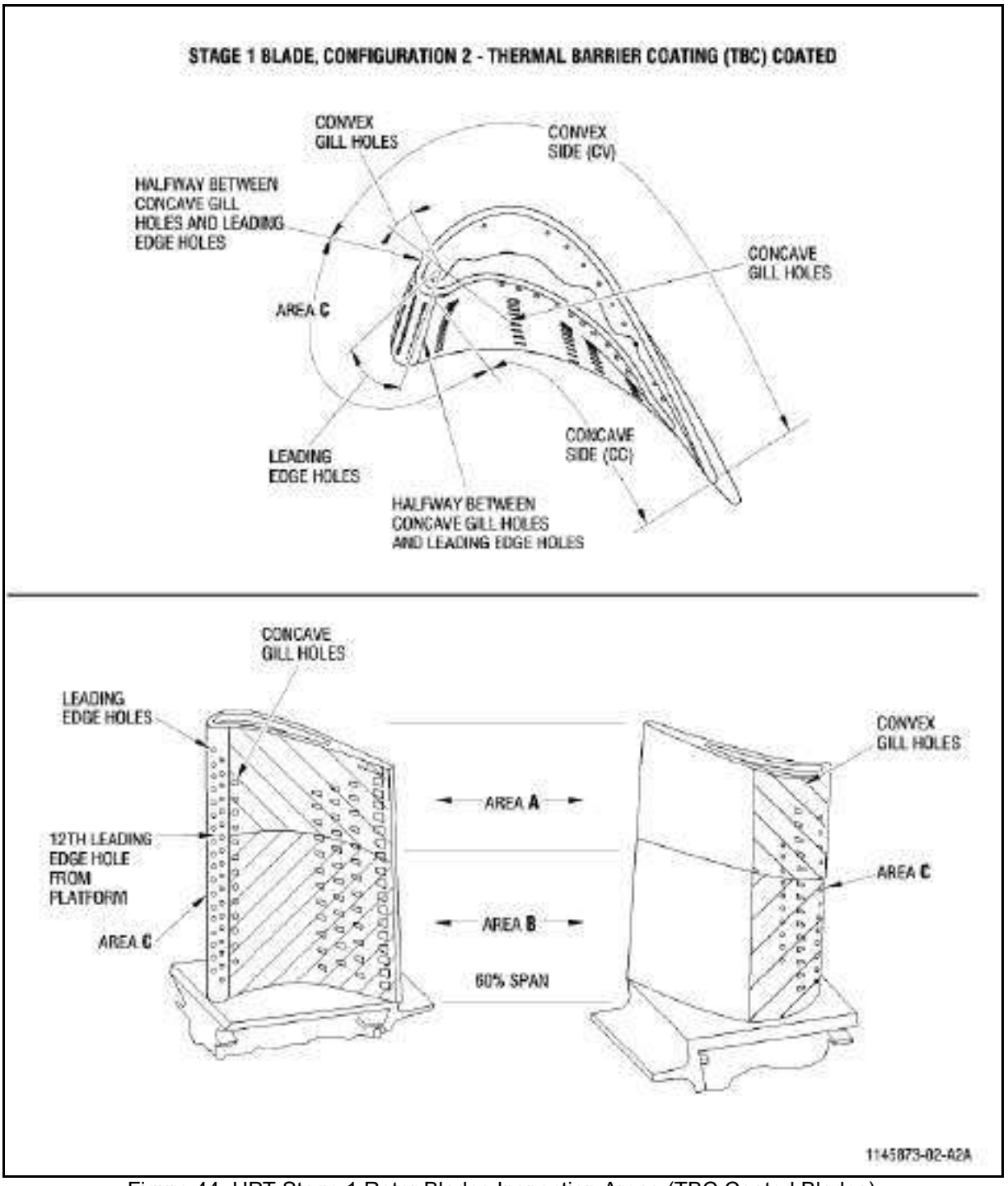


Figure 44: HPT Stage 1 Rotor Blades Inspection Areas (TBC Coated Blades)

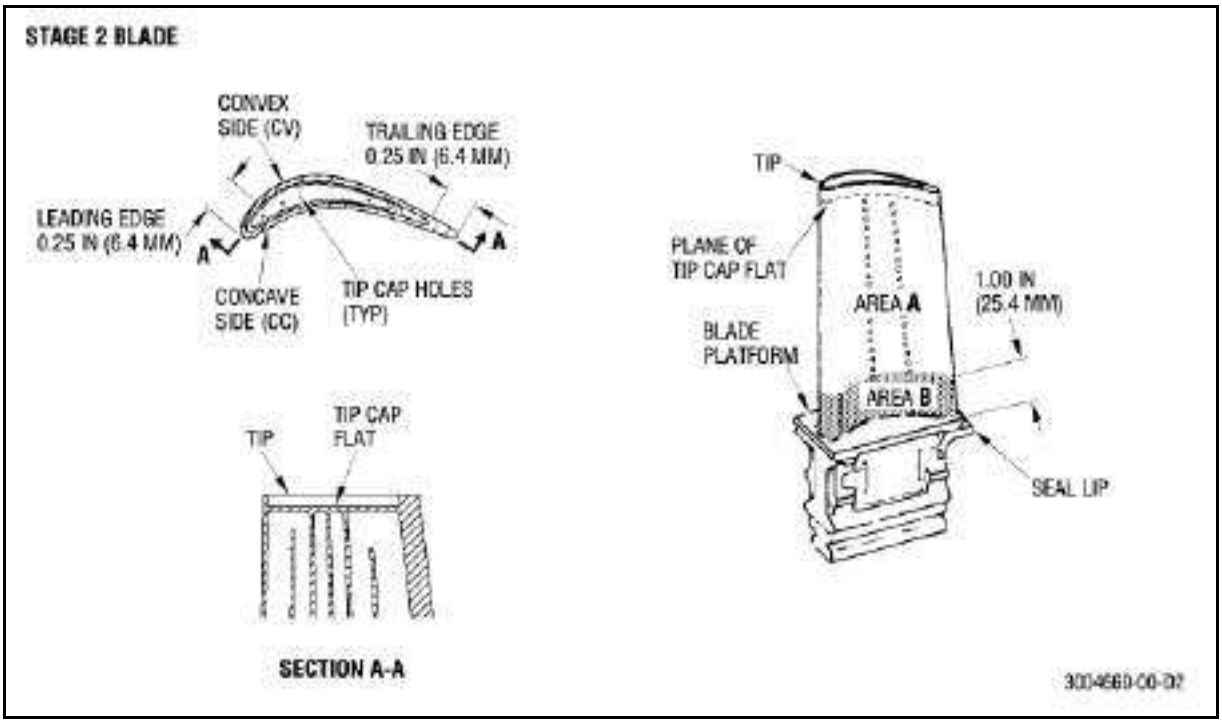


Figure 15: HPT Stage 2 Rotor Blades Inspection Areas

**Borescope Pictures**



Picture 53: Combustor seals and HPT Nozzles



Picture 54: Stage1 Nozzles leading edge



Picture 55: Stage1 Nozzles Leading edge



Picture 56: Stage1 Nozzles leading edge



Picture 57: Stage1 Nozzle airfoil



Picture 58: Stage1 Nozzles



Picture 59: Stage1 Nozzle platform burn through



Picture 60: Stage1 Nozzle platform burn through



Picture 61: Stage1 Nozzle platform burn through



Picture 62: Stage1 Nozzle platform burn through



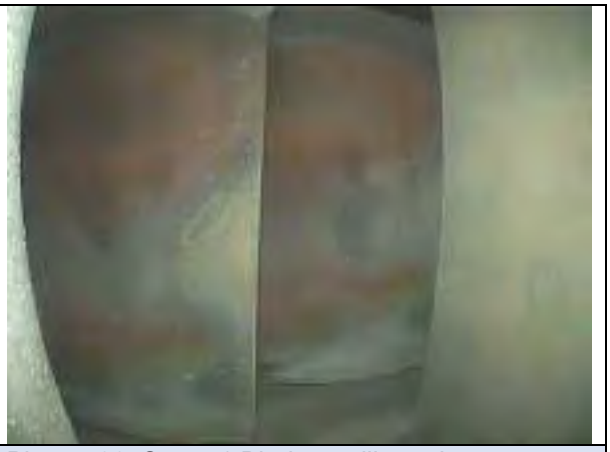
Picture 63: Stage1 Nozzles trailing edge. Blades leading edge



Picture 64: Stage 1 Blades leading edge



Picture 65: Stage1 Blades shrouds rubbing marks



Picture 66: Stage 1 Blades trailing edge



Picture 67: Stage1 Blades trailing edge



Picture 68: Stage 2 Nozzle trailing edge burnt. Missing material



Picture 69: Stage 2 Nozzle trailing edge burnt. Missing material



Picture 70: Stage 2 Blades leading edge



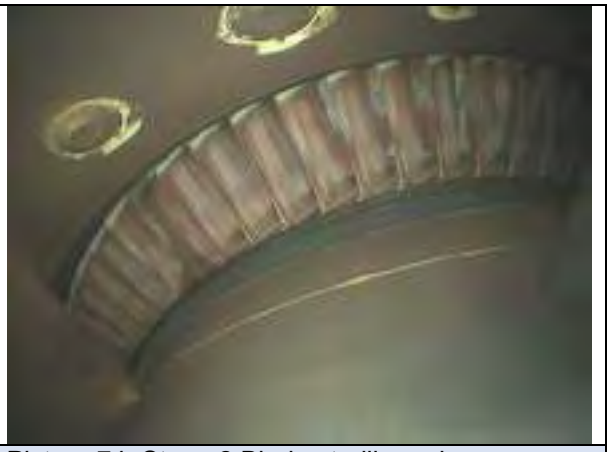
Picture 71: Stage 2 Nozzles trailing edge. Blades leading edge



Picture 72: Stage 2 Blades leading edge



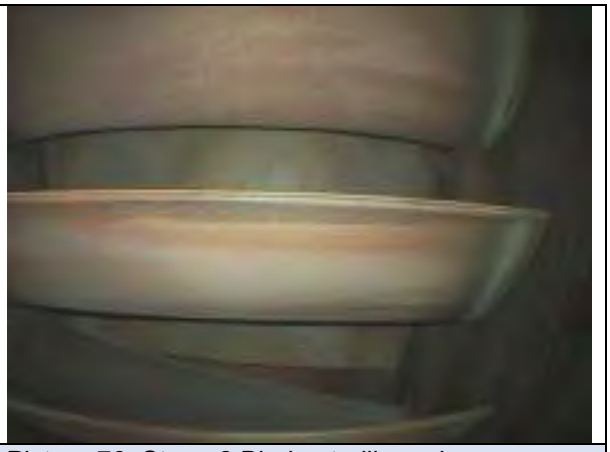
Picture 73: Stage 2 Honeycomb seals



Picture 74: Stage 2 Blades trailing edge



Picture 75: Stage 2 Blades Trailing edge



Picture 76: Stage 2 Blades trailing edge

## 4. LPT Section

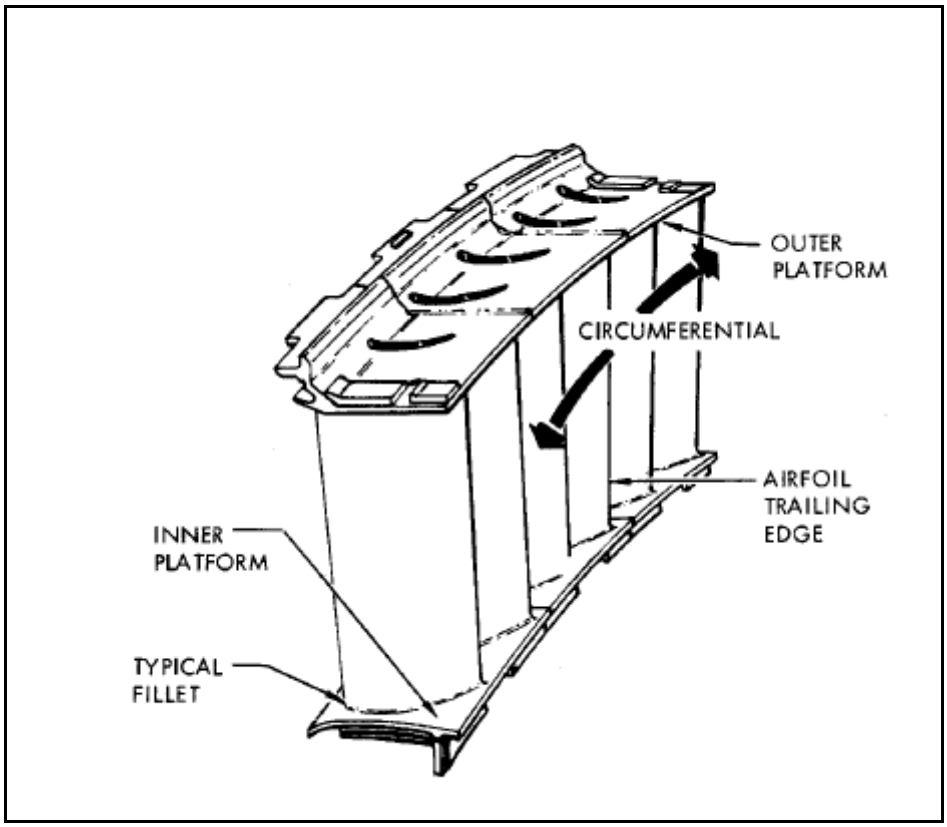



Figure 16: Power Turbine Nozzles

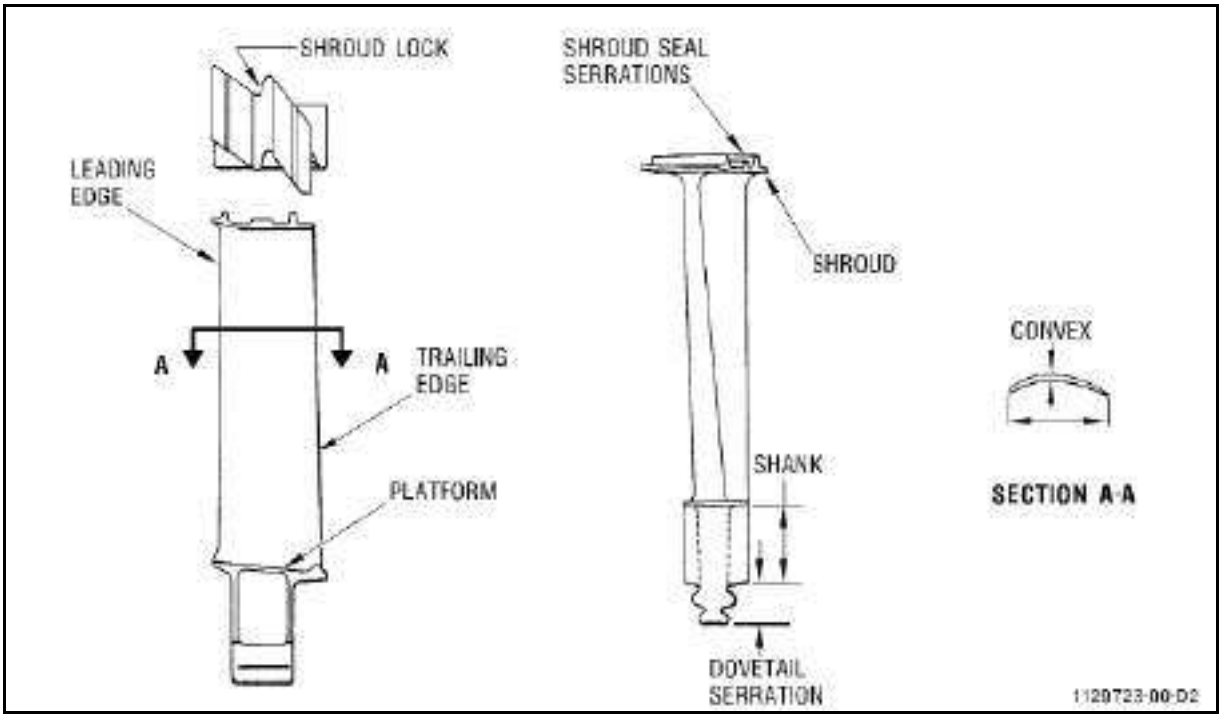



Figure 17: Power Turbine Rotor Blades

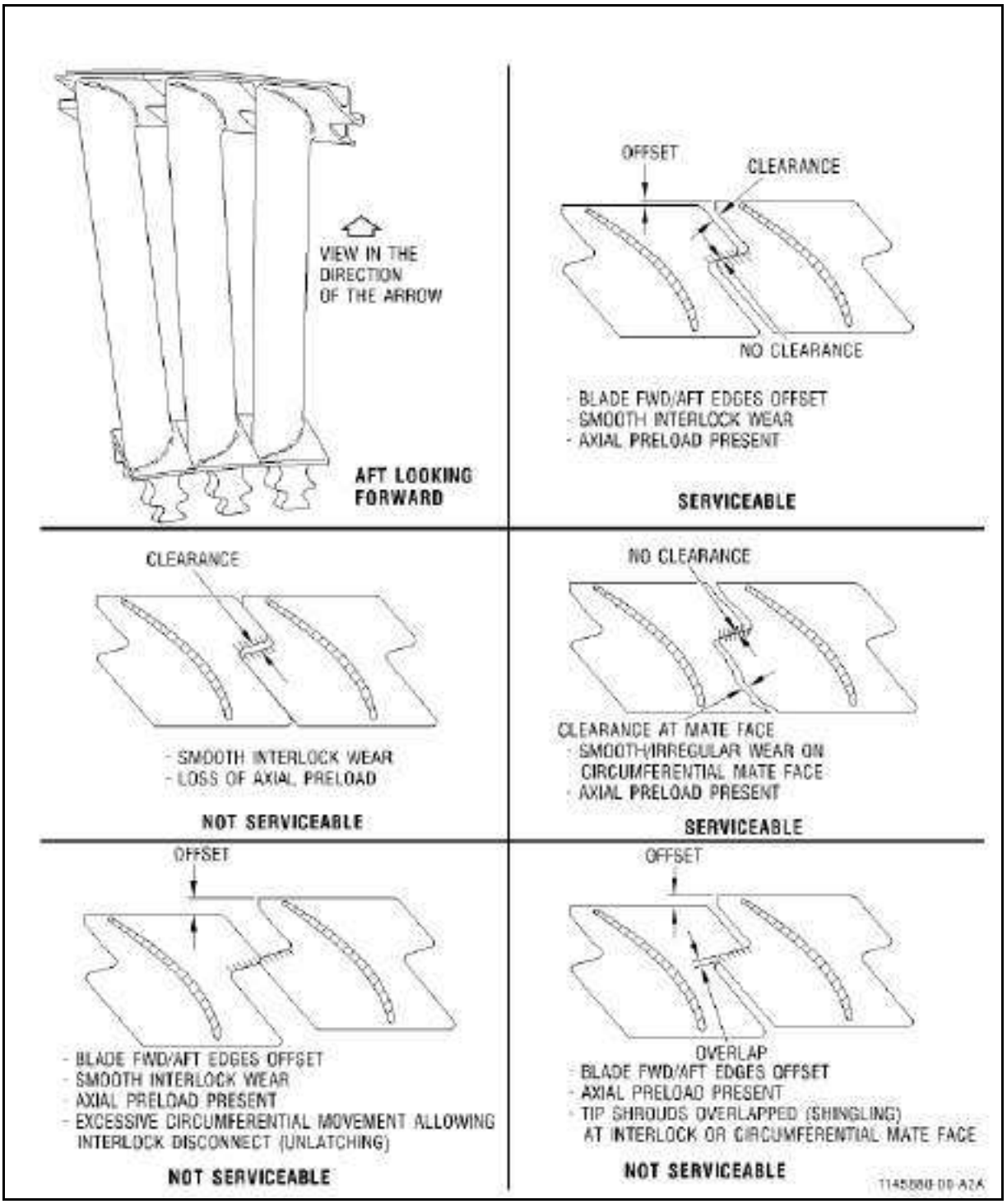


Figure 18: LPT Rotor Blade Circumferential Inspection

**Borescope Pictures**



Picture 77: TMF. LPT Inlet



Picture 78: LPT Stage 1 Blades



Picture 79: LPT stage 1 Blades tip interlock

**Notes:**

The LPT stage 1 accessible nozzles and blades did not show any damage.

# *BORESCOPE INSPECTION REPORT*
# *TM2500 GEN. 6-7*
# *7LM2500 – PK – MDWG05*

## NFE SAN JUAN POWER PLANT

## *PACKAGE # 7250391*

## *UNIT #1*

| | | | |
|---|---|---|---|
| **Visit Date:** | November 29, 2024 | **Total Starts:** | 923 |
| **Engine S/N:** | 557 – 238 | **GG Hours:** | 6272 |
| **Power Turbine S/N:** | 557 - 238 | **PT Hours:** | 6272 |
| **PPG GT Field Engineer:** | JC Requena H | **NFE Representative:** | Lance Florent |



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1 Conclusions and Recommendations .....3
2 Outage Data .....4
3 Borescope Inspection Checklist.....5
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4.3 Turbine Section.....18
4.4 LPT Section .....27

## 1. Conclusions and Recommendations

**Purpose of visit:**
The purpose of this visit was to perform a borescope inspection of the Engine in accordance with GEK105054, WP 406 00.

1.1 The HPC Section is serviceable according to GEK105054 Volume II WP40600 Table 4.

The HPC Section is clean.
There are several stages with blades affected by minor nick damage; all detected during previous inspections. Please refer to the pictures below.
All these damages are serviceable according to Table 4 paragraph 2.c.

1.2 The Engine Hot Section is serviceable according to GEK105054 Volume II WP40600 Tables 7 & 8.
The Combustor axial crack in the dome band TBC found during previous inspection (10/17/2024) did not grow and it is within serviceable limits.

## 2. Outage Data

**ENGINE DATA**

| | | | | | |
|---|---|---|---|---|---|
| **ESN:** | 557-238 | **Engine Fired Hours:** | 6272 | **Package Hours:** | 6272 |
| **Model:** | 7LM2500-PK-MDWG05 | **Engine Fired starts:** | 923 | **Package Fired Starts:** | 923 |

**MAINTENANCE DATA**

| WP, SB, SL, PB, PL Performed | GEK105054, REV 11 | Date completed | Comments |
|---|---|---|---|
| WP 406 00 | Borescope Inspection | 29NOV24 | Serviceable |

**PARTS DATA**

| Description | PN Removed | SN Removed | Qty | Disposition | PN Installed | SN Installed |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |

## 3. Borescope Inspection Checklist

**Date unit out of operation:** 28NOV24
**Date unit into operation:** 30NOV24
**Last inspection date:** 08MAR24, PPG O&M

**Type of Fuel:** Gas / Diesel
**Type of outage:** Scheduled

**Type of NOx suppression:** Water Injection

**Inspection of gas turbine:**

| WATERWASH: | HIGH PRESSURE COMPRESSOR: |
|---|---|
| ☒ PERFORMED WATER WASH | ☐ HPC BORESCOPE INSPECTION |
| **COMBUSTOR:** | **HIGH PRESSURE TURBINE** |
| ☒ COMBUSTOR BORESCOPE INSPECTION | ☒ HPT STAGE 1 & 2 NOZZLE BORESCOPE INSPECTION |
| | ☒ HPT BLADE BORESCOPE INSPECTION |
| **LOW PRESSURE TURBINE:** | |
| ☒ LPT BORESCOPE INSPECTION | |

☒ ***Please verify all borescope plugs have been reinstalled***

## 4. Borescope Inspection Record

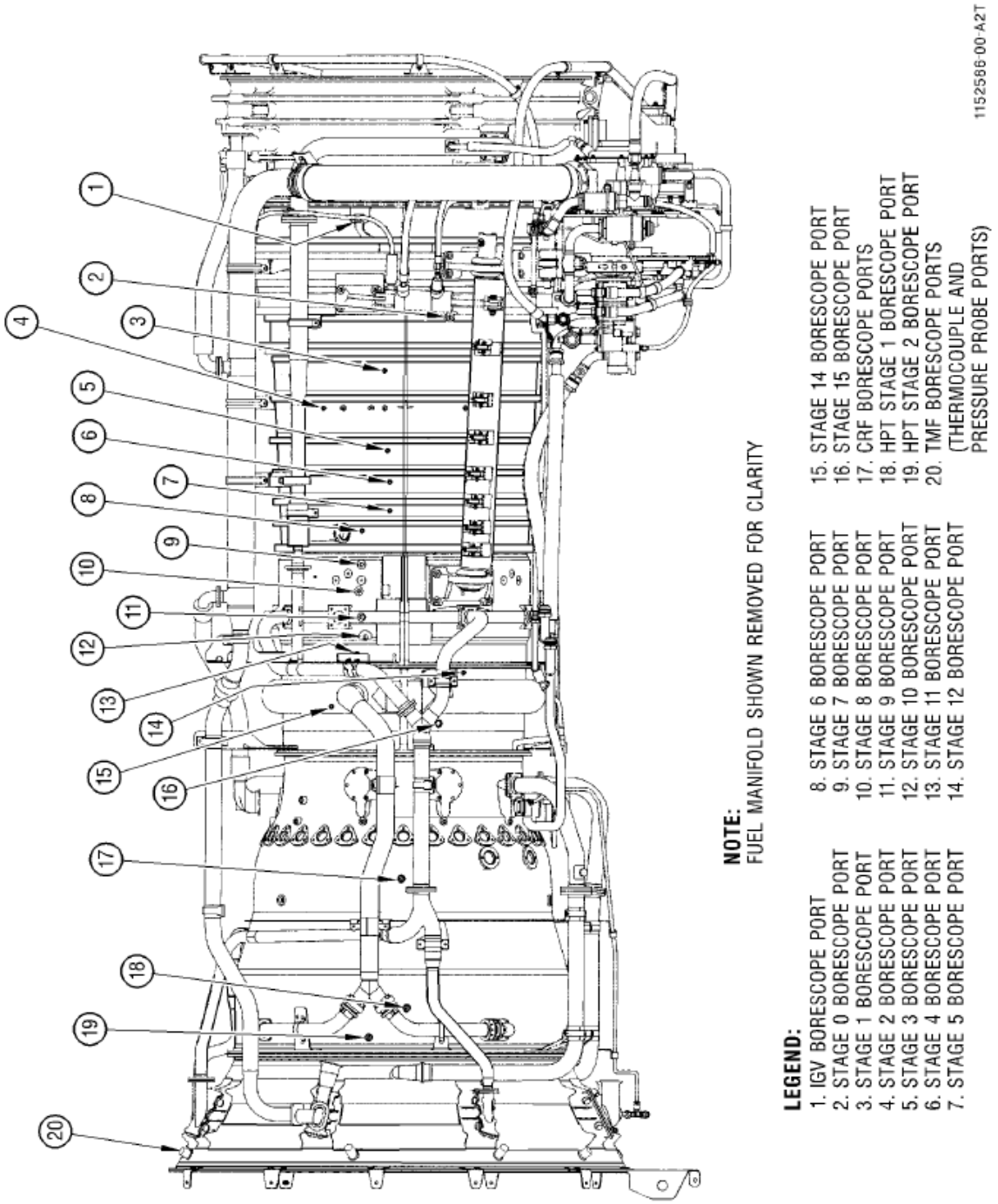



Figure 1: Position of Borescope Inspection Ports.

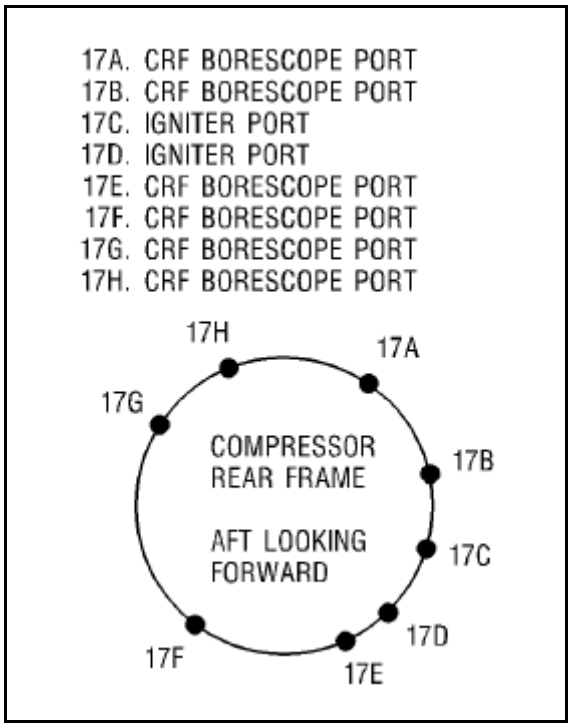


Figure 2: Position of Borescope Inspection Ports.

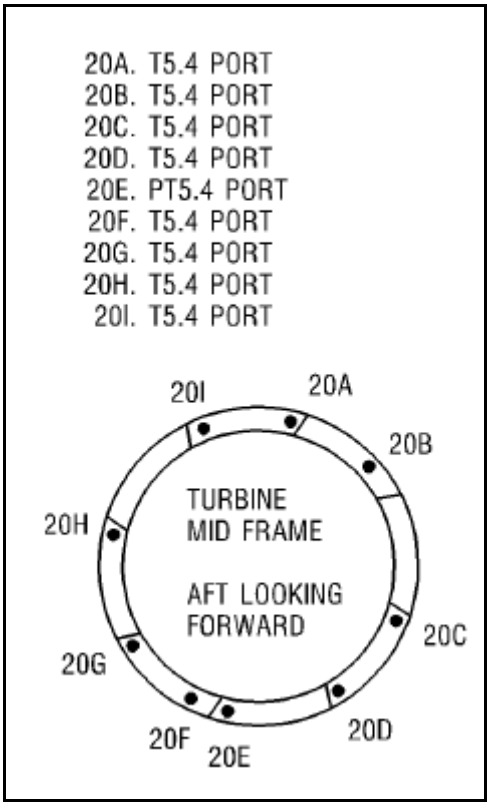


Figure 3: Position of Borescope Inspection Ports.

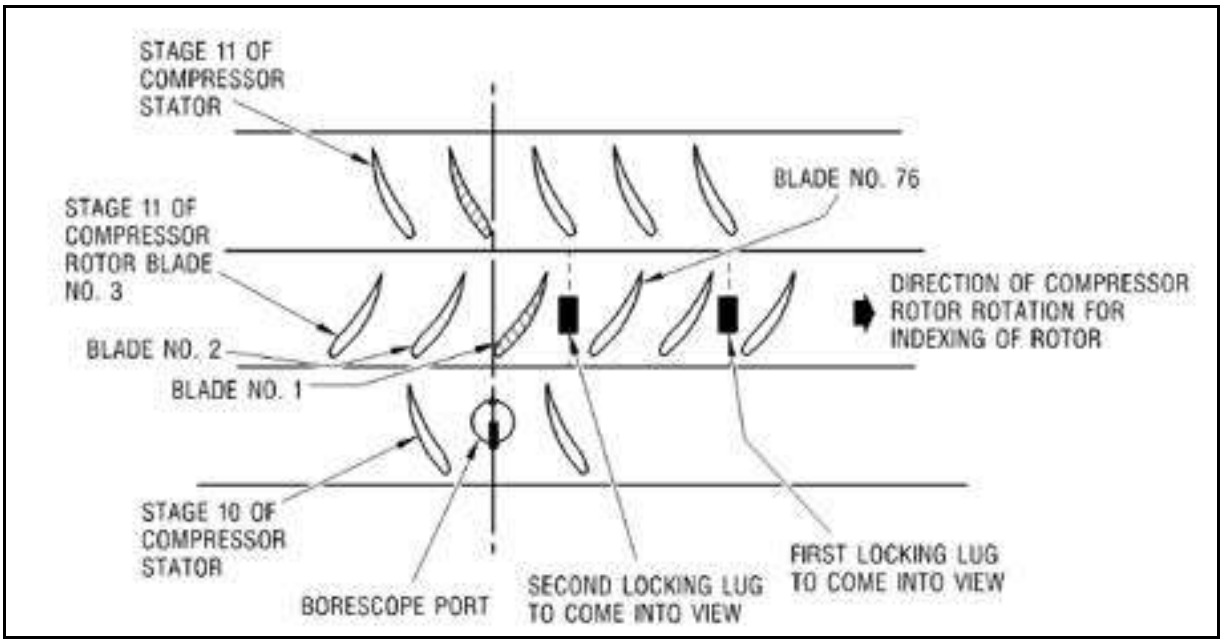


Figure 4: Zero indexing of HPC rotor and HPT rotor

## 4.1 Compressor Section

| Port | T.E. | L.E. | blades | Remarks: | photo no: |
|---|---|---|---|---|---|
| 1 | IGV | | | | 1 |
| 1 | | 0 | 36 | | 2 – 3 – 4 |
| 2 | 0 | | 36 | | 5 – 6 – 7 |
| 2 | | 1 | 26 | | 8 – 9 |
| 3 | 1 | | 26 | | 10 – 11 – 12 |
| 3 | | 2 | 26 | | 13 – 14 |
| 4 | 2 | | 26 | | 15 – 16 |
| 4 | | 3 | 42 | 2 Blades with minor nicks on Leading edge | 17 – 18 |
| 5 | 3 | | 42 | | 19 |
| 5 | | 4 | 45 | 2 Blades with minor nicks on Leading edge | 20 – 21 – 22 |
| 6 | 4 | | 45 | | 23 – 24 |
| 6 | | 5 | 48 | | 25 – 26 |
| 7 | 5 | | 48 | 1 Blade minor nick on TE and 1 Blade dent on TE | 27 – 28 |
| 7 | | 6 | 54 | 4 Blades with minor nicks on Leading edge | 29 – 30 – 31 |
| 8 | 6 | | 54 | Blades contacting tip | |
| 8 | | 7 | 56 | Blades contacting tip | |
| 9 | 7 | | 56 | | 32 – 33 |
| 9 | | 8 | 64 | | 34 – 35 |
| 10 | 8 | | 64 | | 36 |
| 10 | | 9 | 66 | 1 Blade with minor nicks on Leading edge | 37 – 38 |
| 11 | 9 | | 66 | | 39 – 40 |
| 11 | | 10 | 66 | 4 Blades with minor nicks on Leading edge | 41 – 42 – 43 – 44 |
| 12 | 10 | | 66 | | 45 |
| 12 | | 11 | 76 | 3 Blades with minor nicks on Leading edge | 46 – 47 – 48 |
| 13 | 11 | | 76 | | 49 |
| 13 | | 12 | 76 | 4 Blades with minor nicks on Leading edge | 50 – 51 – 52 – 53 |
| 14 | 12 | | 76 | | 54 |
| 14 | | 13 | 76 | 1 Blade with nick on Leading edge | 55 – 56 – 57 |
| 15 | 14 | | 76 | Inside bleed manifold | |
| 15 | | 15 | 76 | Inside bleed manifold | |
| 16 | 15 | | 76 | | 58 – 59 |
| 16 | | 16 | 76 | | 60 – 61 - 62 |

**Notes:** The HPC Section is serviceable according to GEK105054 Volume II WP40600 Table 4.

The HPC Section is clean.
There are several stages with blades affected by minor nick damages. Please refer to below pictures.
All these damages are serviceable according to Table 4 paragraph 2.c.



Picture 1. CFF & IGV



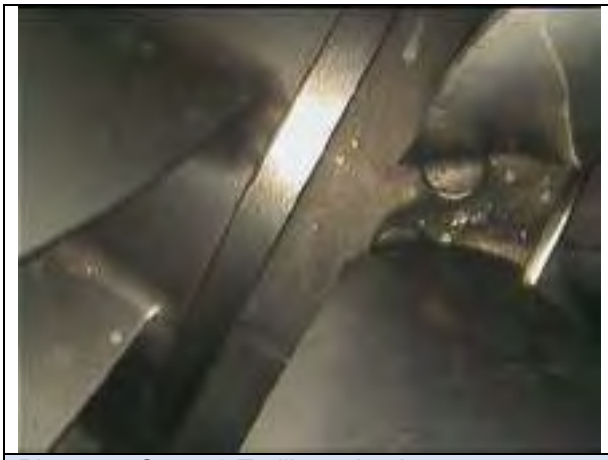
Picture 2. Stage 0 Leading edge base



Picture 3. Stage 0 Airfoil



Picture 4. Stage 0 Leading edge tip



Picture 5. Stage 0 Trailing edge base



Picture 6. Stage 0 Weep hole



Picture 7. Stage 0 Trailing edge tip



Picture 8. Stage 1 Leading edge



Picture 9. Stage 1 Leading edge



Picture 10. Stage 1 Trailing edge



Picture 11. Stage 1 Weep hole



Picture12. Stage 1 Blades retaining ring



Picture 13. Stage 2 Leading edge tip



Picture 14. Stage 2 Leading edge base



Picture 15. Stage 2 Trailing edge



Picture 16. Stage 2 Trailing edge tip



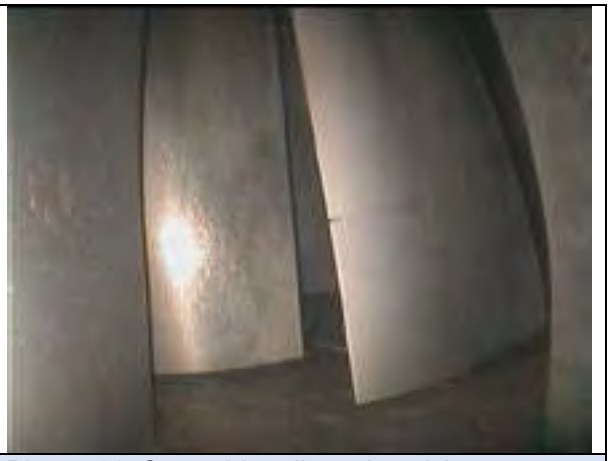
Picture 17. Stage 3 Leading edge base



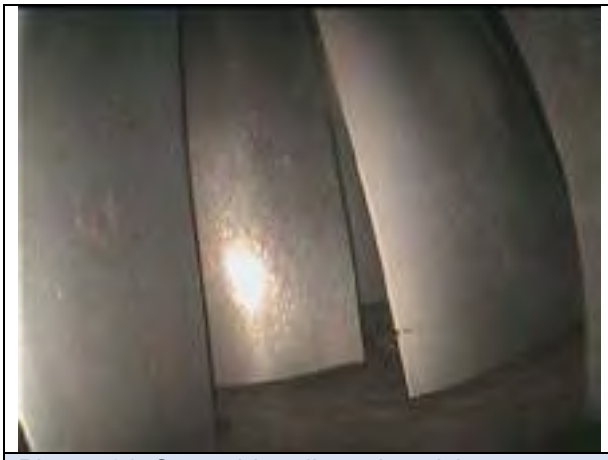
Picture 18. Stage 3 Leading edge nick



Picture 19. Stage 3 Trailing edge



Picture 20. Stage 4 Leading edge nick



Picture 21. Stage 4 Leading edge nick



Picture 22. Stage 4 Leading edge base



Picture 23. Stage 4 Trailing edge tip



Picture 24. Stage 4 Trailing edge base



Picture 25. Stage 5 Leading edge



Picture 26. Stage 5 Leading edge base



Picture 27. Stage 5 Trailing edge dent



Picture 28. Stage 5 Trailing edge nick



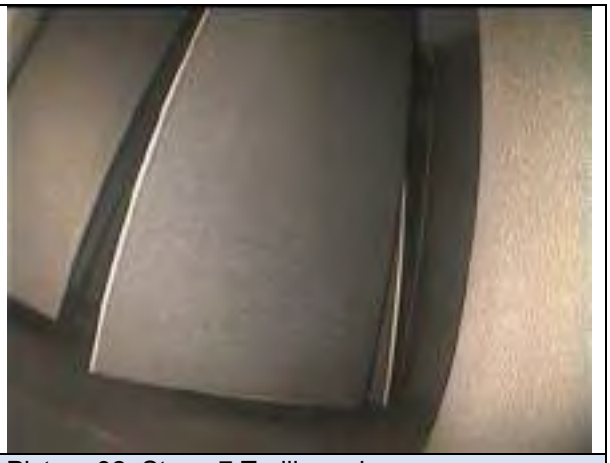
Picture 29. Stage 6 Leading edge



Picture 30. Stage 6 Leading edge base



Picture 31. Stage 6 Leading edge minor nick



Picture 32. Stage 7 Trailing edge



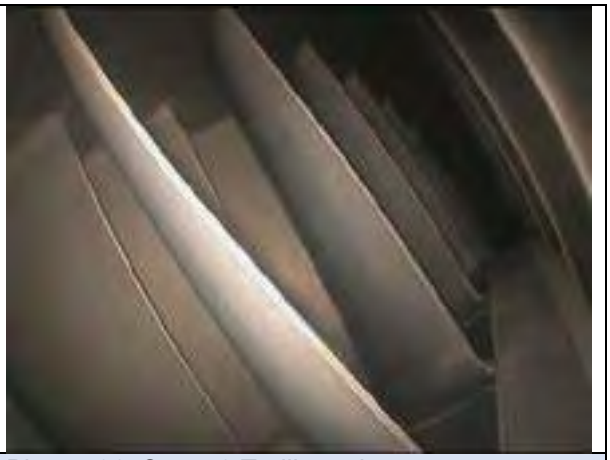
Picture 33. Stage 7 Trailing edge base



Picture 34. Stage 8 Leading edge



Picture 35. Stage 8 Leading edge base



Picture 36. Stage 8 Trailing edge



Picture 37. Stage 9 Leading edge



Picture 38. Stage 9 Leading edge nick



Picture 39. Stage 9 Trailing edge



Picture 40. Stage 9 Bleed manifold



Picture 41. Stage 10 Leading edge nick



Picture 42. Stage 10 Leading edge nick



Picture 43. Stage 10 Leading edge nick



Picture 44. Stage 10 Leading edge nick



Picture 45. Stage 10 Trailing edge



Picture 46. Stage 11 Leading edge nick



Picture 47. Stage 11 Leading edge nick



Picture 48. Stage 11 Leading edge nick



Picture 49. Stage 11 Trailing edge



Picture 50. Stage 12 Leading edge nick



Picture 51. Stage 12 Leading edge nick



Picture 52. Stage 12 Leading edge nick



Picture 53. Stage 12 Leading edge nick



Picture 54. Stage 12 Trailing edge



Picture 55. Stage 13 Leading edge nick



Picture 56. Stage 13 Leading edge nick



Picture 57. Stage 13 Leading edge nick



Picture 58. Stage 15 Trailing edge



Picture 59. Stage 15 Trailing edge



Picture 60. Stage 16 Leading edge



Picture 61. Stage 16 Leading edge



Picture 62. Outlet guide vanes

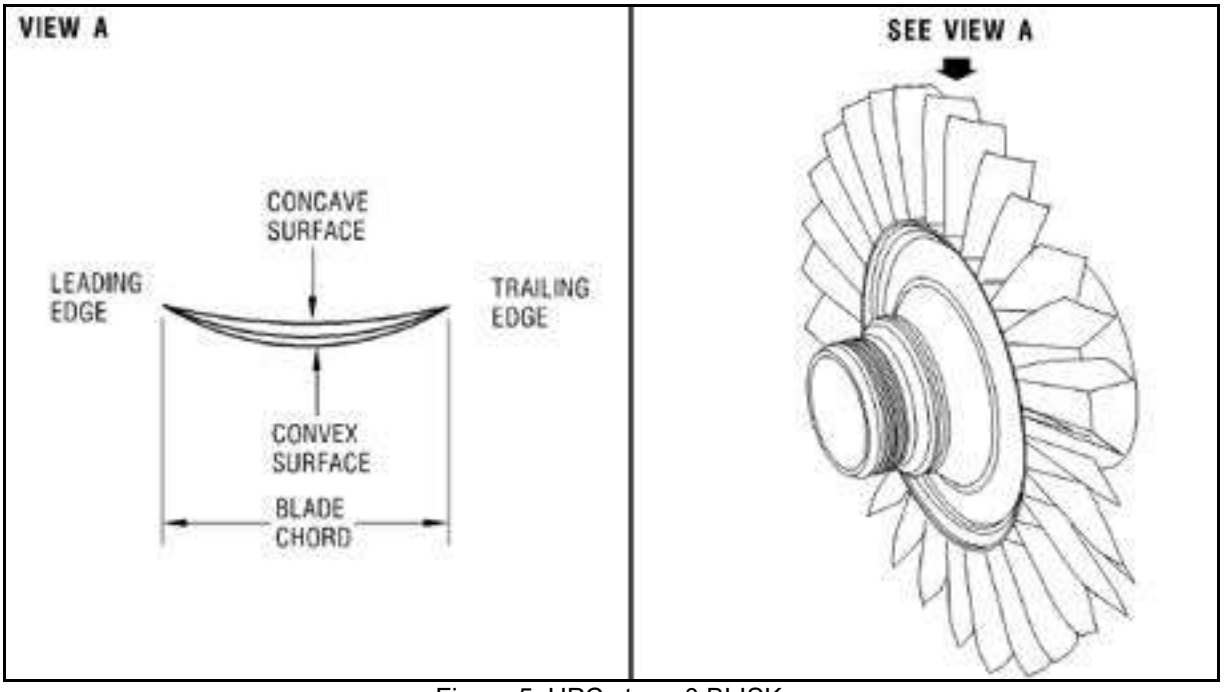



Figure 5: HPC stage 0 BLISK

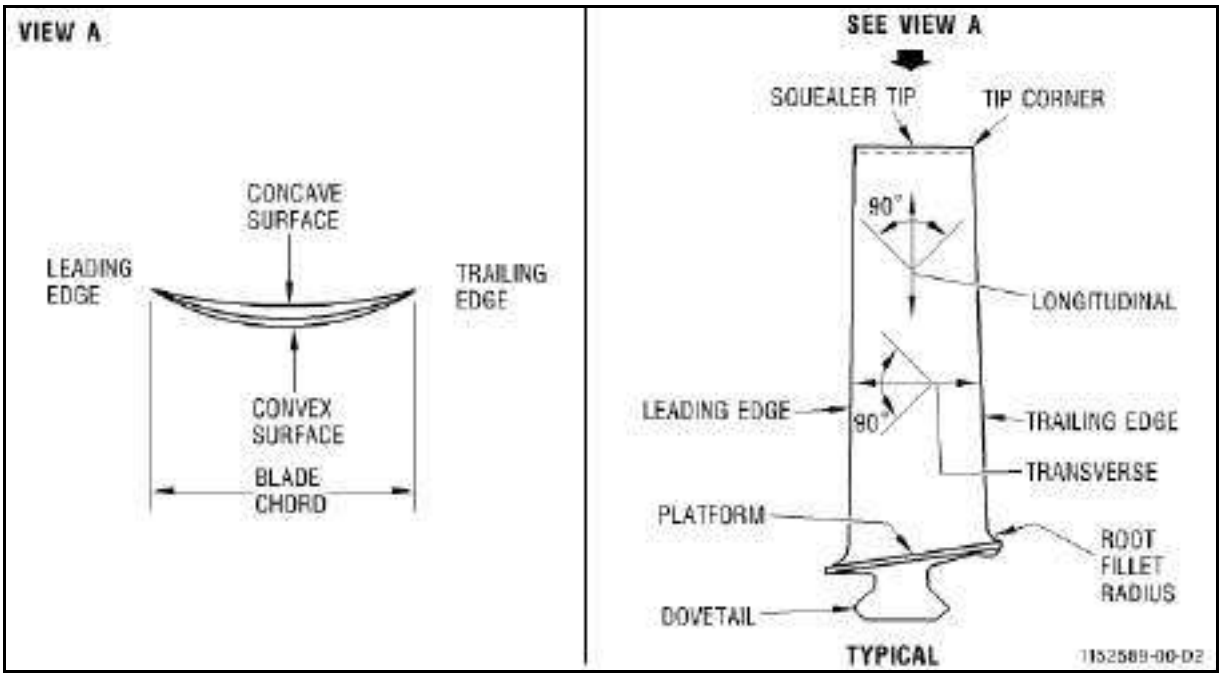


Figure 6: Compressor Rotor Blades

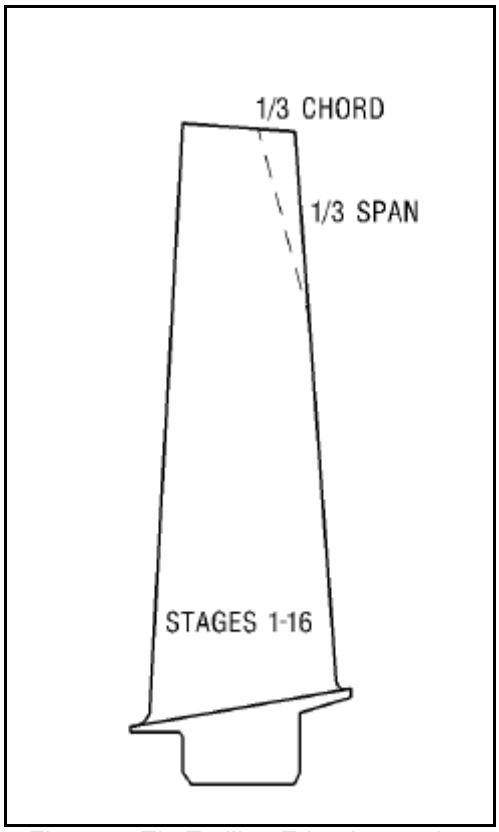


Figure 7: Tip Trailing Edge Inspection

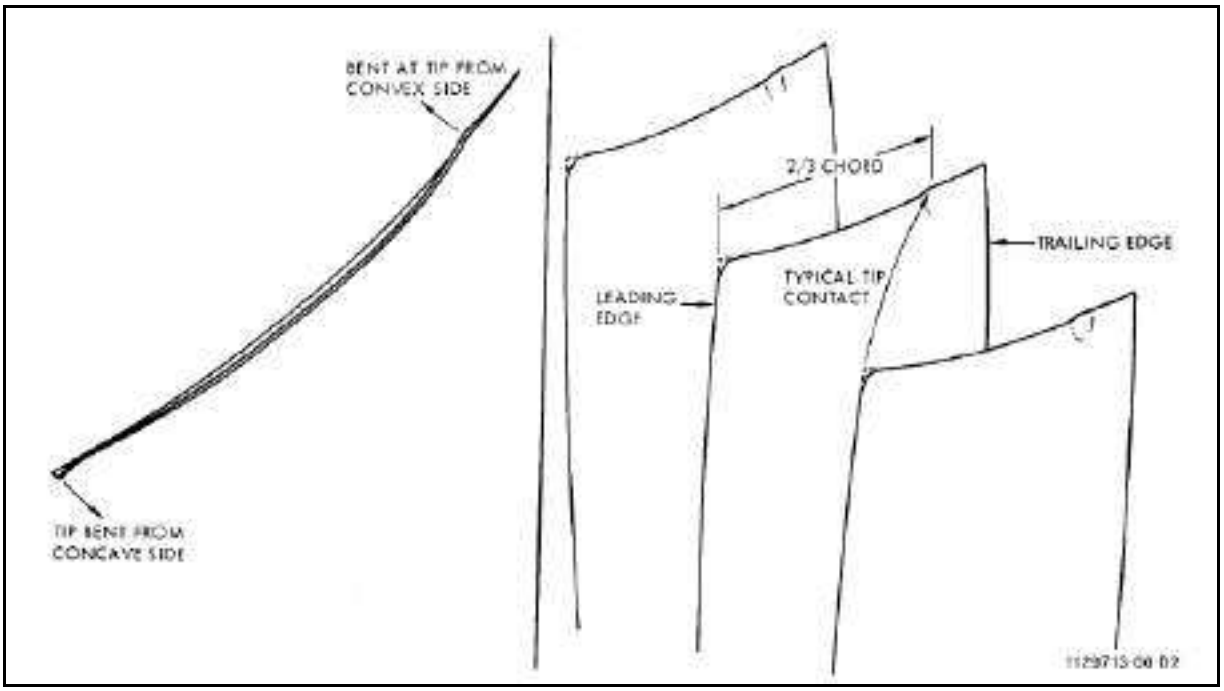
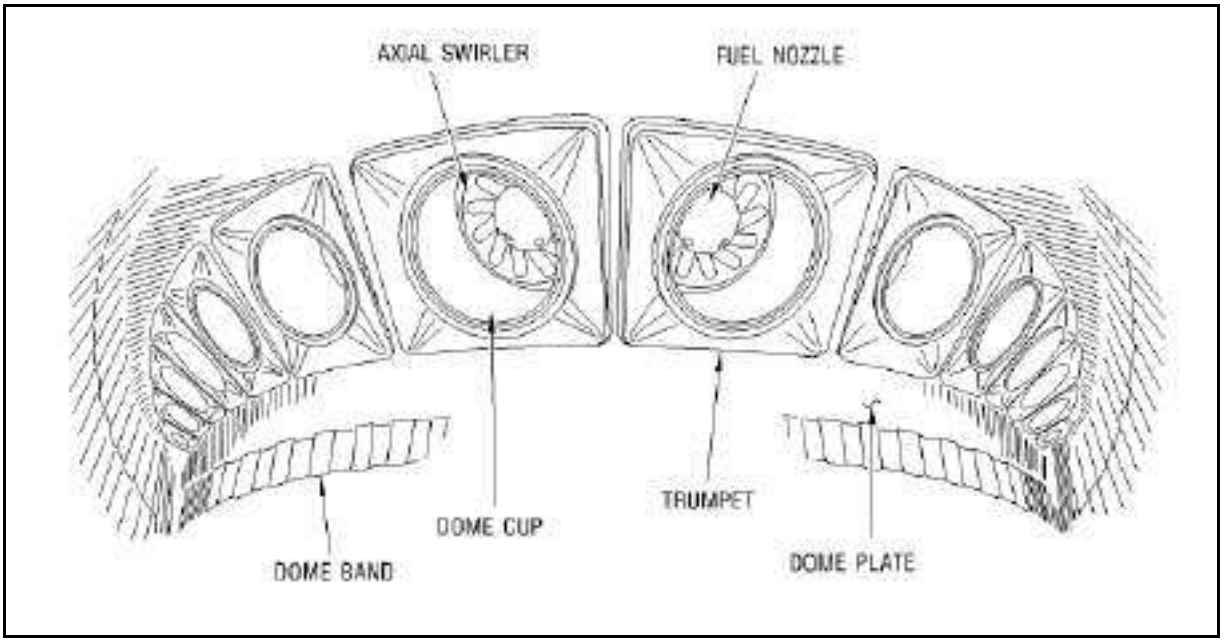


Figure 8: Tip Clanging Contact (HPCR stage 3 through 6)

## 4.2 Combustor and 1St Stage Nozzle Section

| Port | Condition observed | Photo no: |
|---|---|---|
| 17A | | |
| 17B | | |
| 17C | | |
| 17D | See below notes. | |
| 17E | | |
| 17F | | |
| 17G | | |
| 17H | | |
| 17 | 1st stage nozzle (leading edge): | |

**Notes:**
The Combustor section is serviceable according to GEK105054 Volume II WP40600 Table 7.



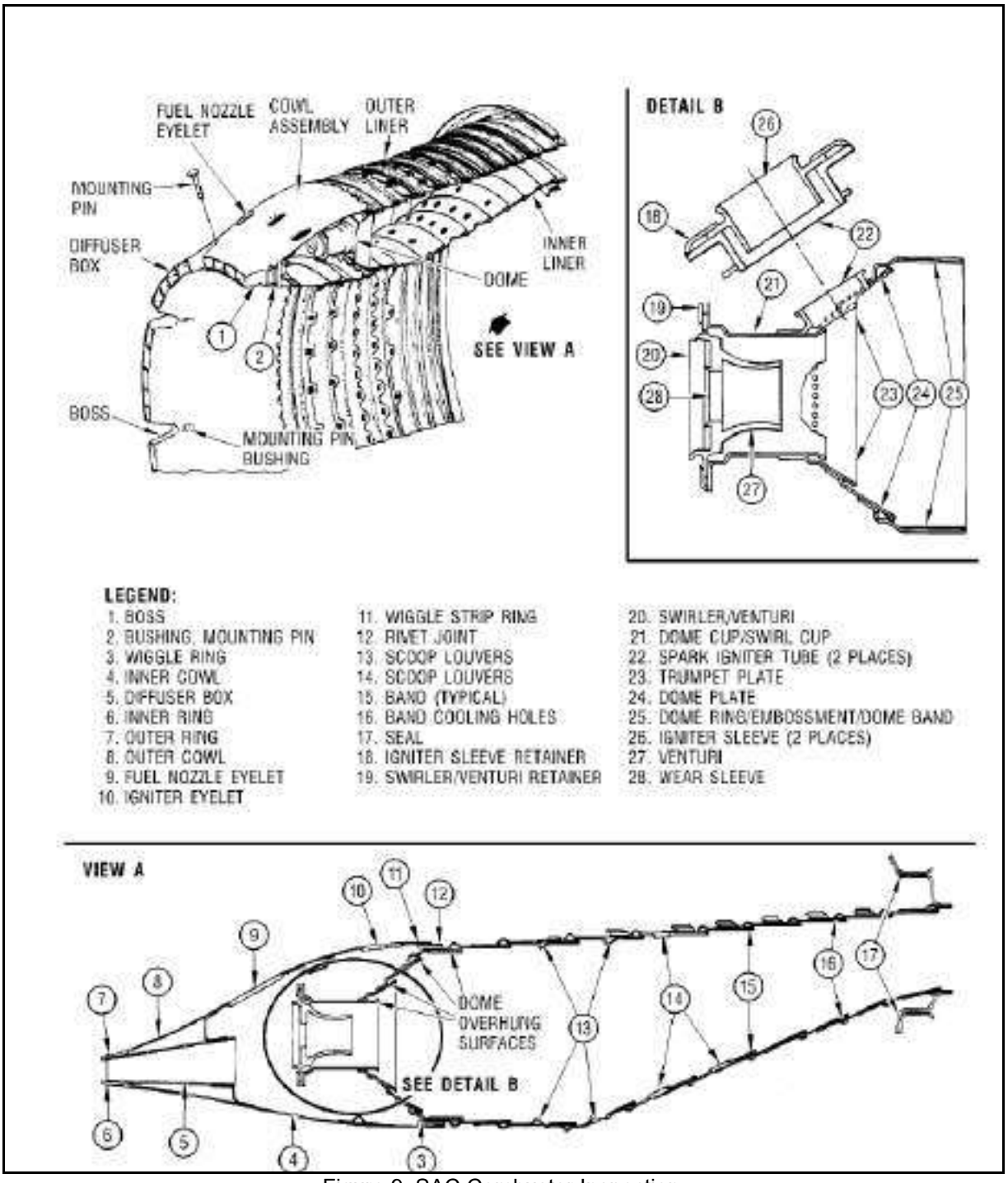



Figure 9: SAC Combustor Inspection

Figure 10: SAC Combustor Inspection

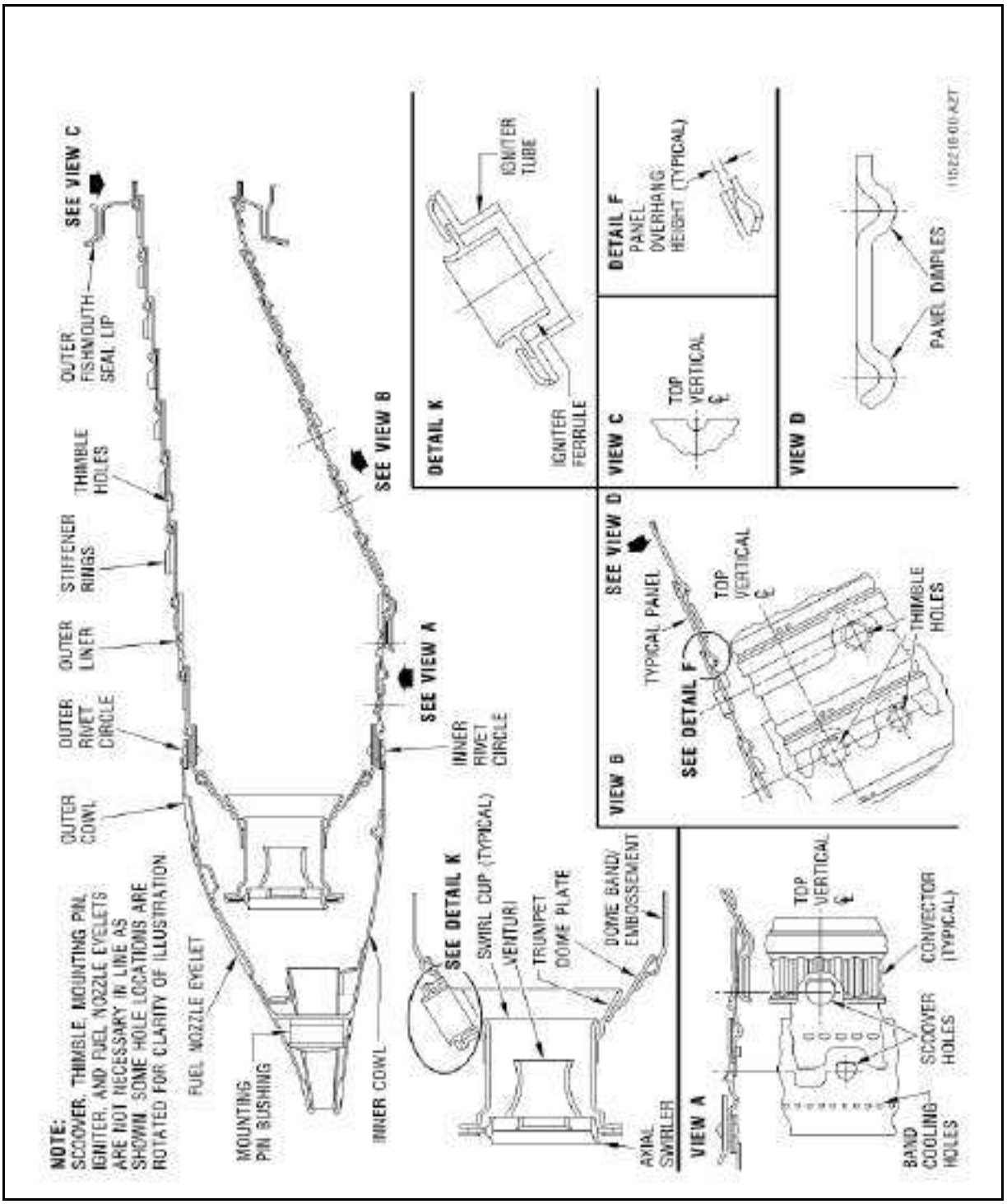
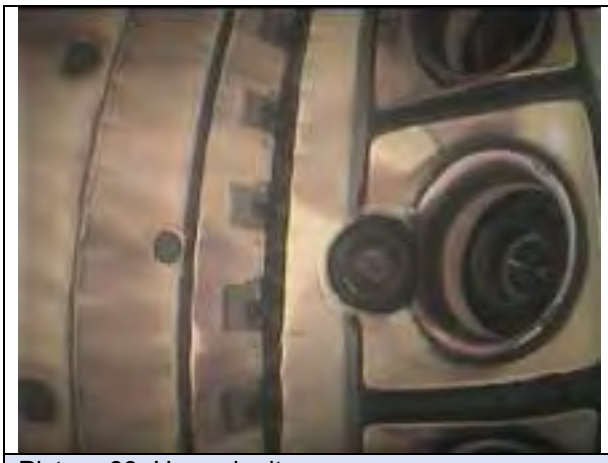



Figure 11: SAC Combustor Inspection

**Borescope Pictures**



Picture 63. Upper igniter



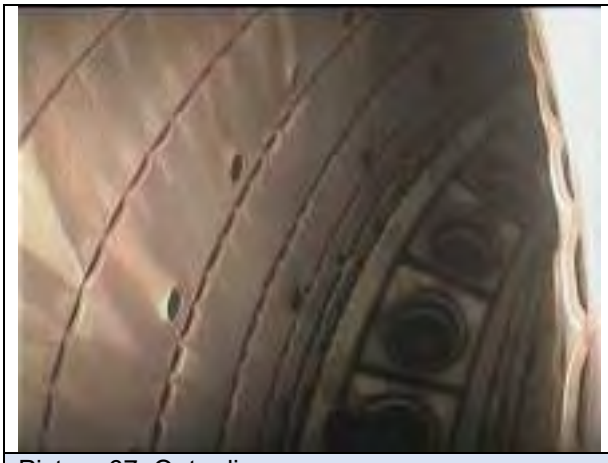
Picture 64. Lower igniter



Picture 65. Combustor dome



Picture 66. Outer rivets band



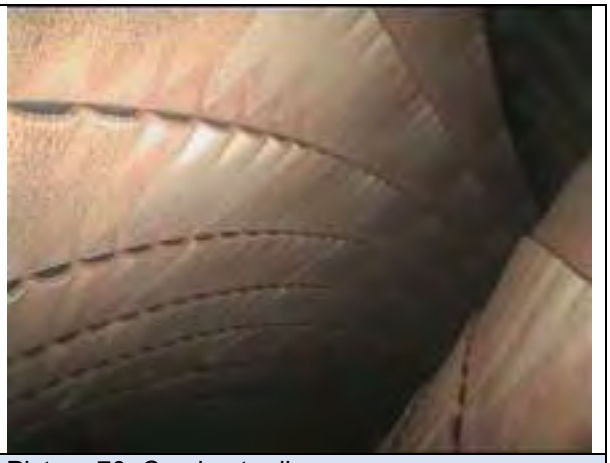
Picture 67. Outer liner



Picture 68. Inner rivets band



Picture 69. Inner liner



Picture 70. Combustor liners



Picture 71. Combustor seals



Picture 72. Combustor liners and HPT Nozzles



Picture 73. Combustor liners and HPT Nozzles



Picture 74. Fuel nozzle tip and swirler

### 4.3 Turbine Section

| | turbine stage | | | | |
|---|---|---|---|---|---|
| **Port** | **L.E.** | **T.E.** | **blades** | **Remarks:** | **photo no:** |
| **18** | **1** | | **88** | | |
| **19** | | **1** | **88** | **See below notes.** | |
| **19** | **2** | | **90** | | |
| **20** | | **2** | | | |

**Notes:** The High Pressure Turbine section is serviceable according to GEK105054 Volume II WP40600 Table 8.

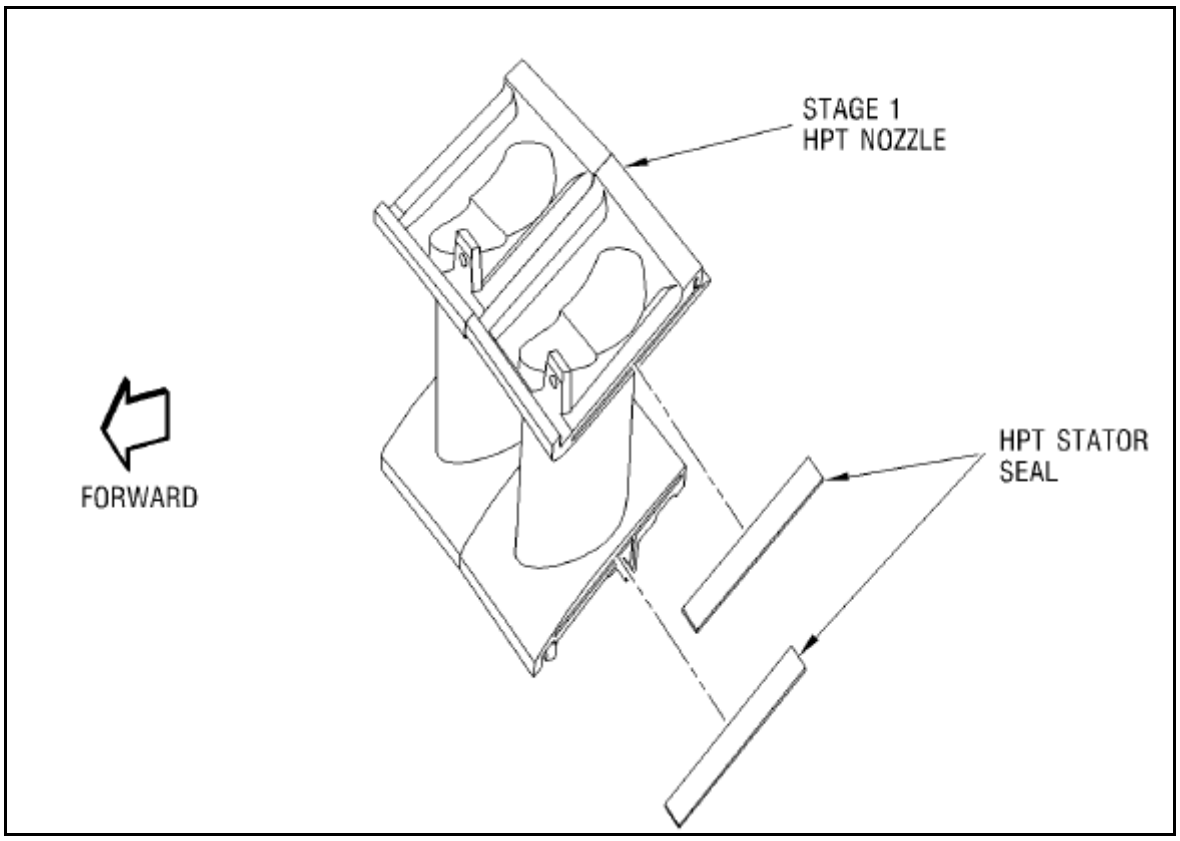



Figure 12: Stage 1 HPT Nozzle Seal Displacement

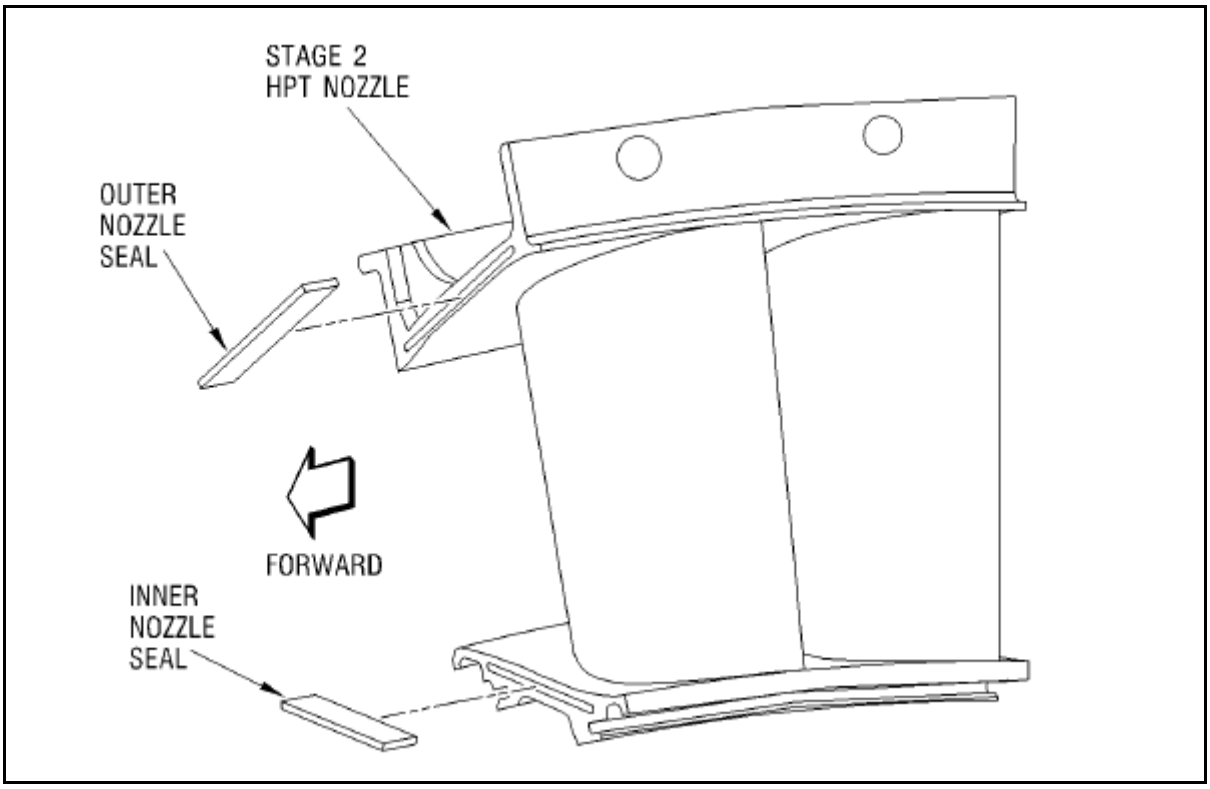


Figure 13: Stage 2 HPT Nozzle Seal Displacement

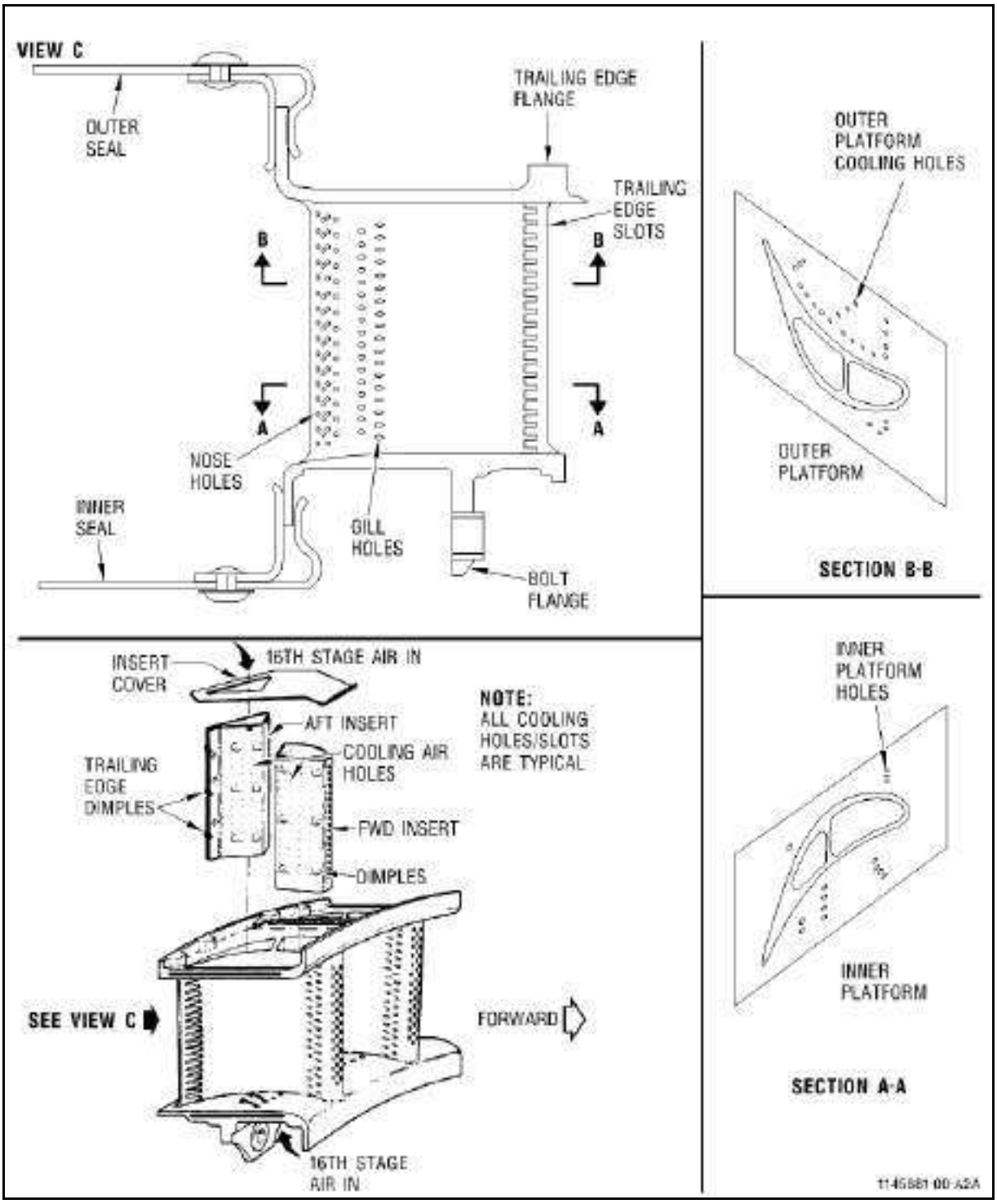



Figure 14: HPT Stage 1 Nozzle

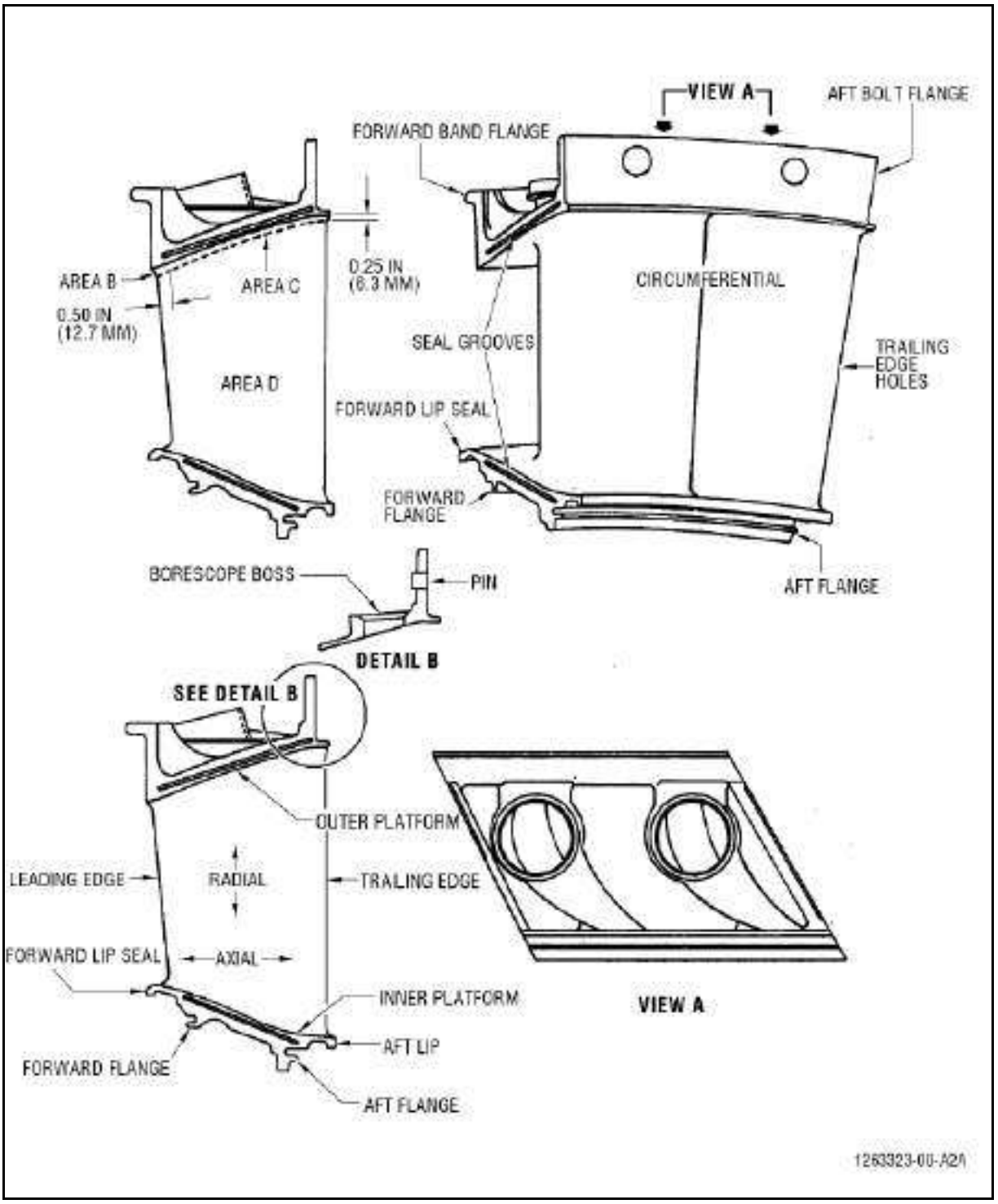



Figure 15: HPT Stage 2 Nozzle

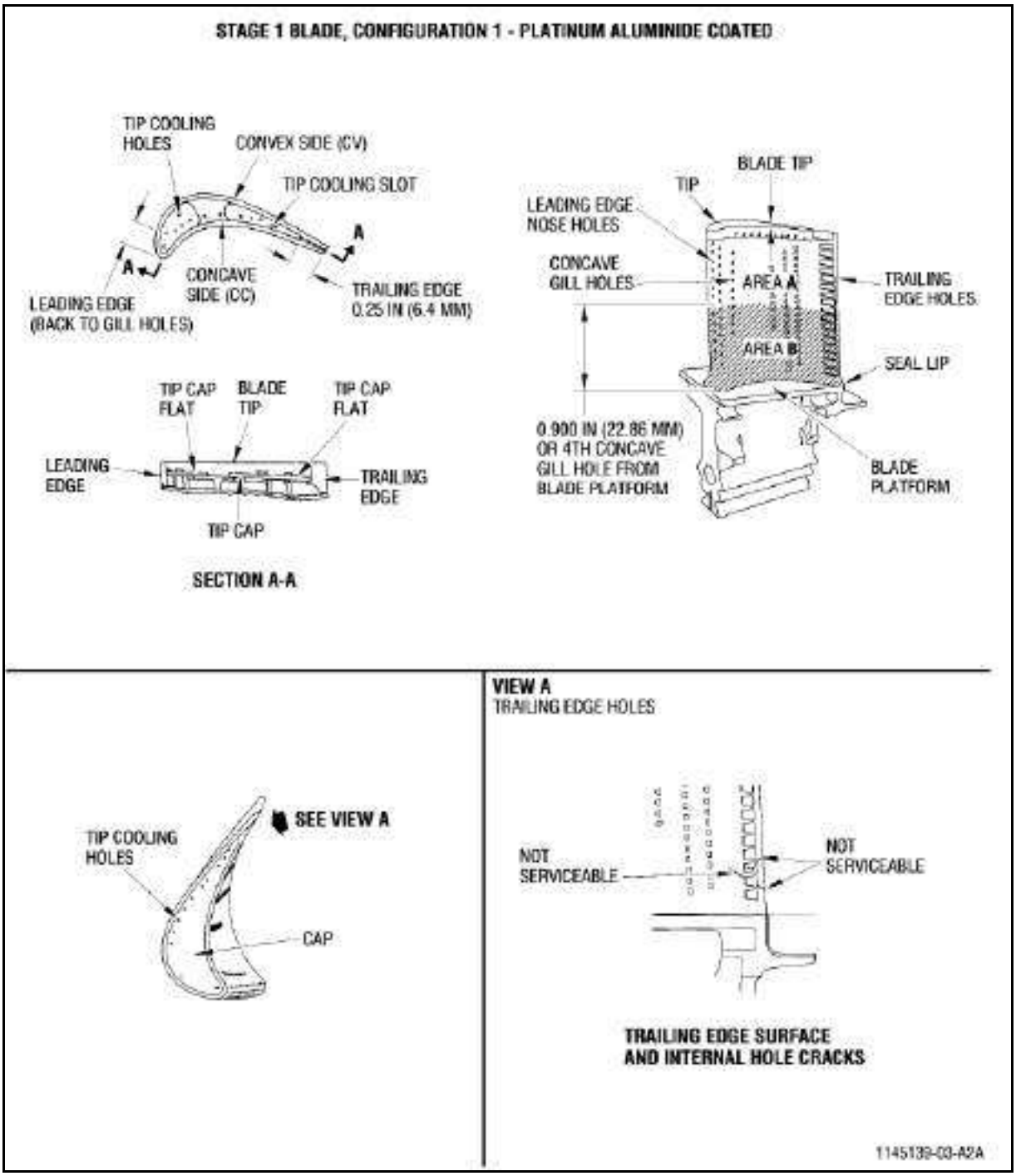



Figure 16: HPT Stage 1 Rotor Blades Inspection Areas (Platinum Aluminide Coated Blades)

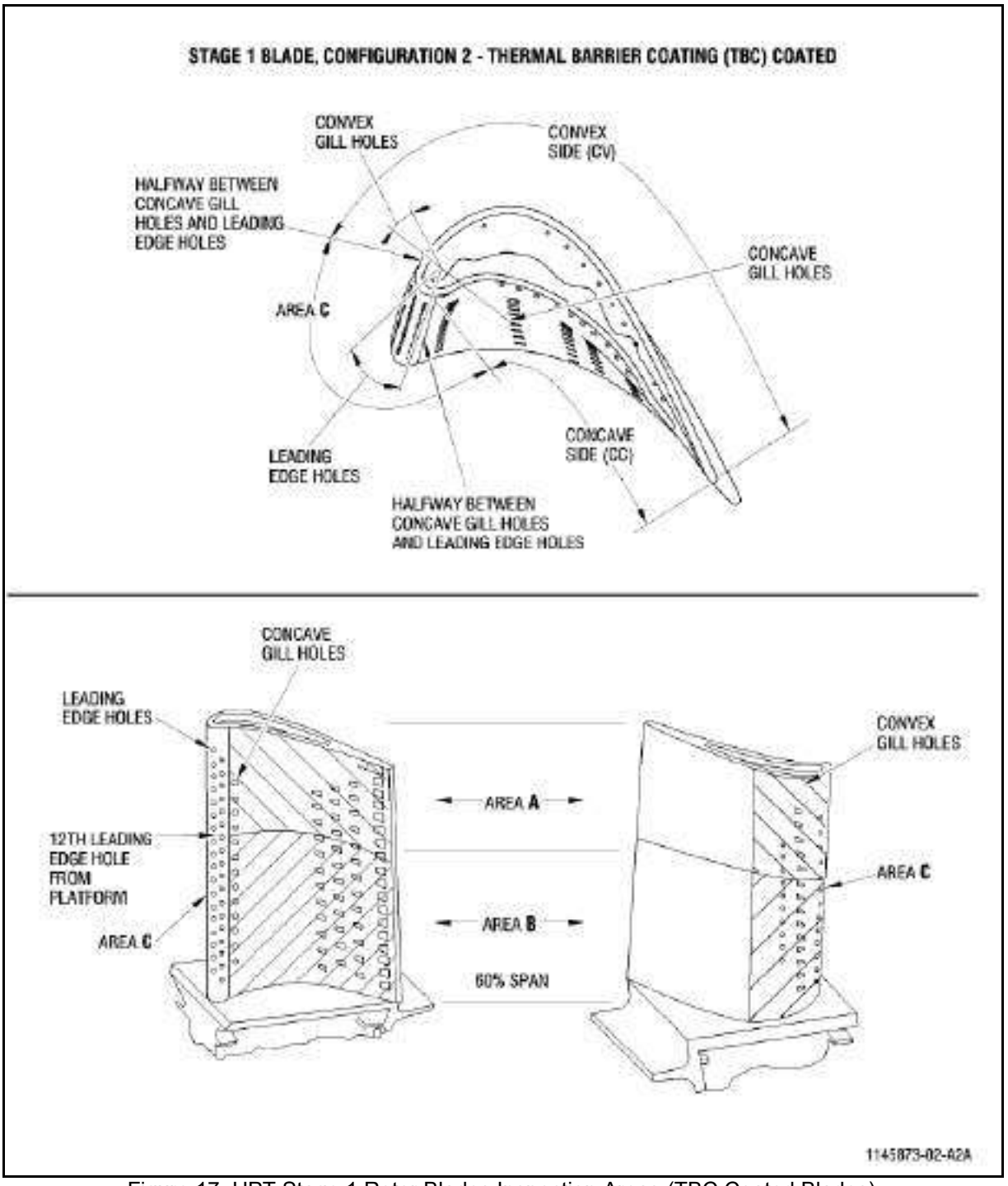


Figure 17: HPT Stage 1 Rotor Blades Inspection Areas (TBC Coated Blades)

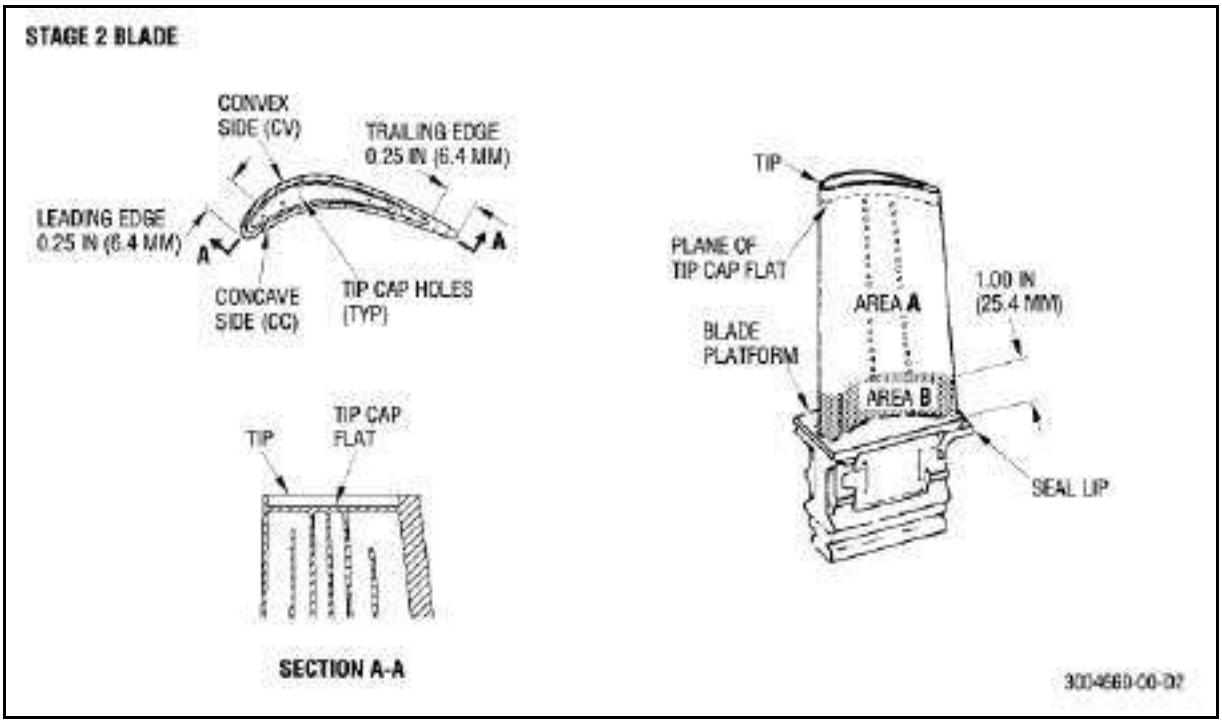


Figure 18: HPT Stage 2 Rotor Blades Inspection Areas

**Borescope Pictures**



Picture 75: Stage1 Nozzles leading edge



Picture 76: Stage1 Nozzle leading edge



Picture 77: Stage1 Nozzles airfoil



Picture 78: Stage1 Nozzles trailing edge convex. Blades leading edge



Picture 79: Stage1 Nozzles trailing edge concave. Blades leading edge



Picture 80: Stage1 Blades leading edge



Picture 81: Stage1 Blades convex side



Picture 82: Stage1 Blades trailing edge



Picture 83: Stage 1 Blades trailing edge convex



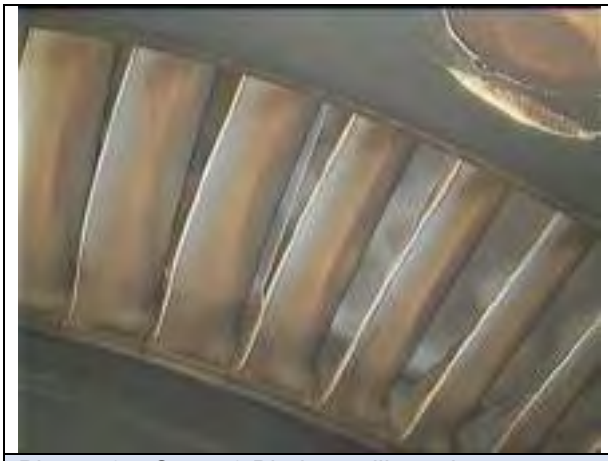
Picture 84: Stage 1 shrouds rubbing marks



Picture 85: Stage 2 Nozzles trailing edge. Blades leading edge



Picture 86: Stage 2 Blades leading edge



Picture 87: Stage 2 Blades trailing edge



Picture 88: Stage 2 Blades trailing edge

## 4.4 LPT Section

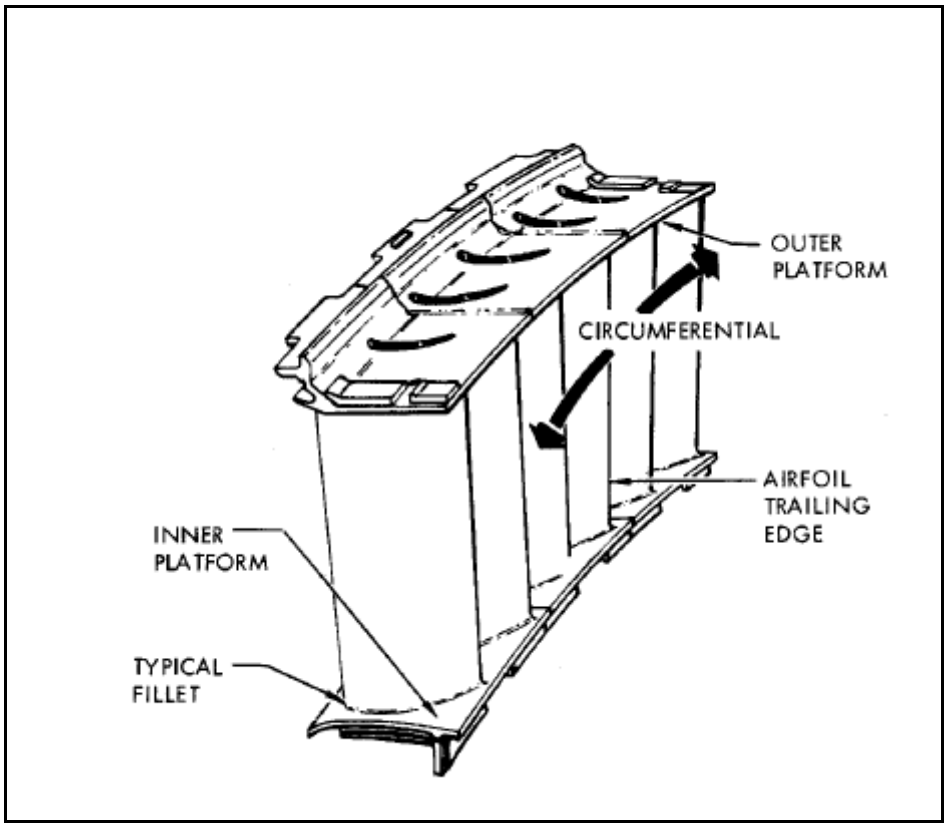



Figure 19: Power Turbine Nozzles

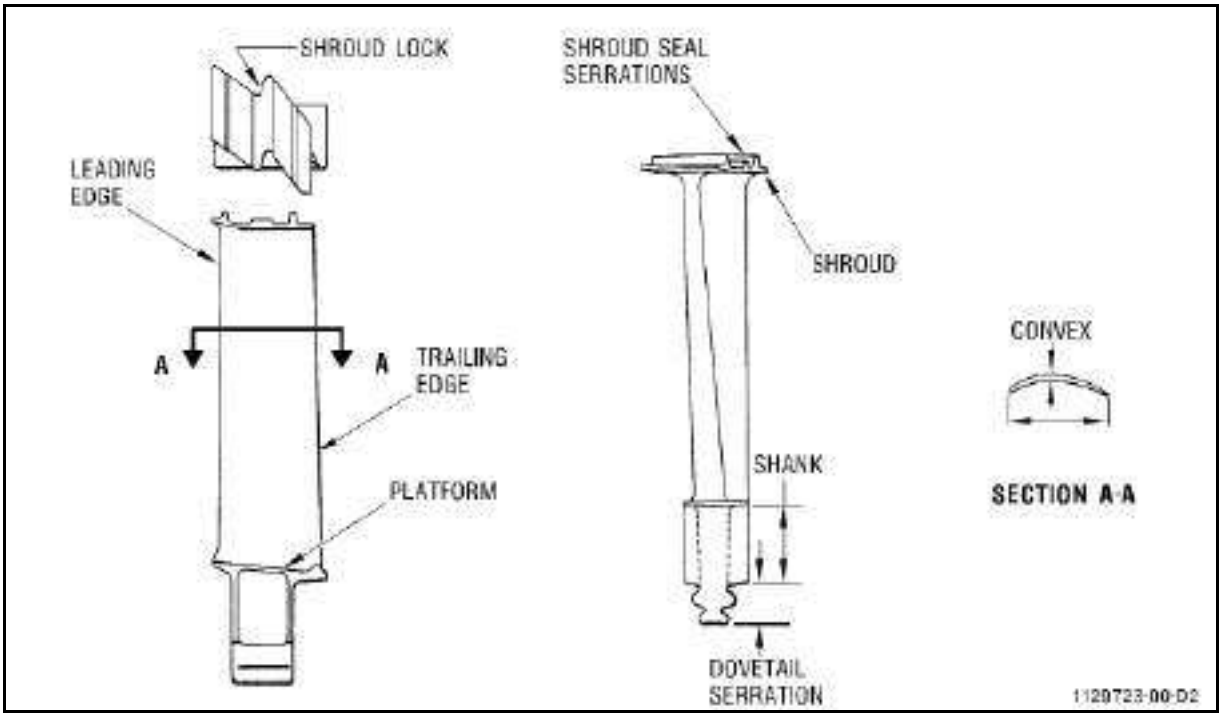



Figure 20: Power Turbine Rotor Blades

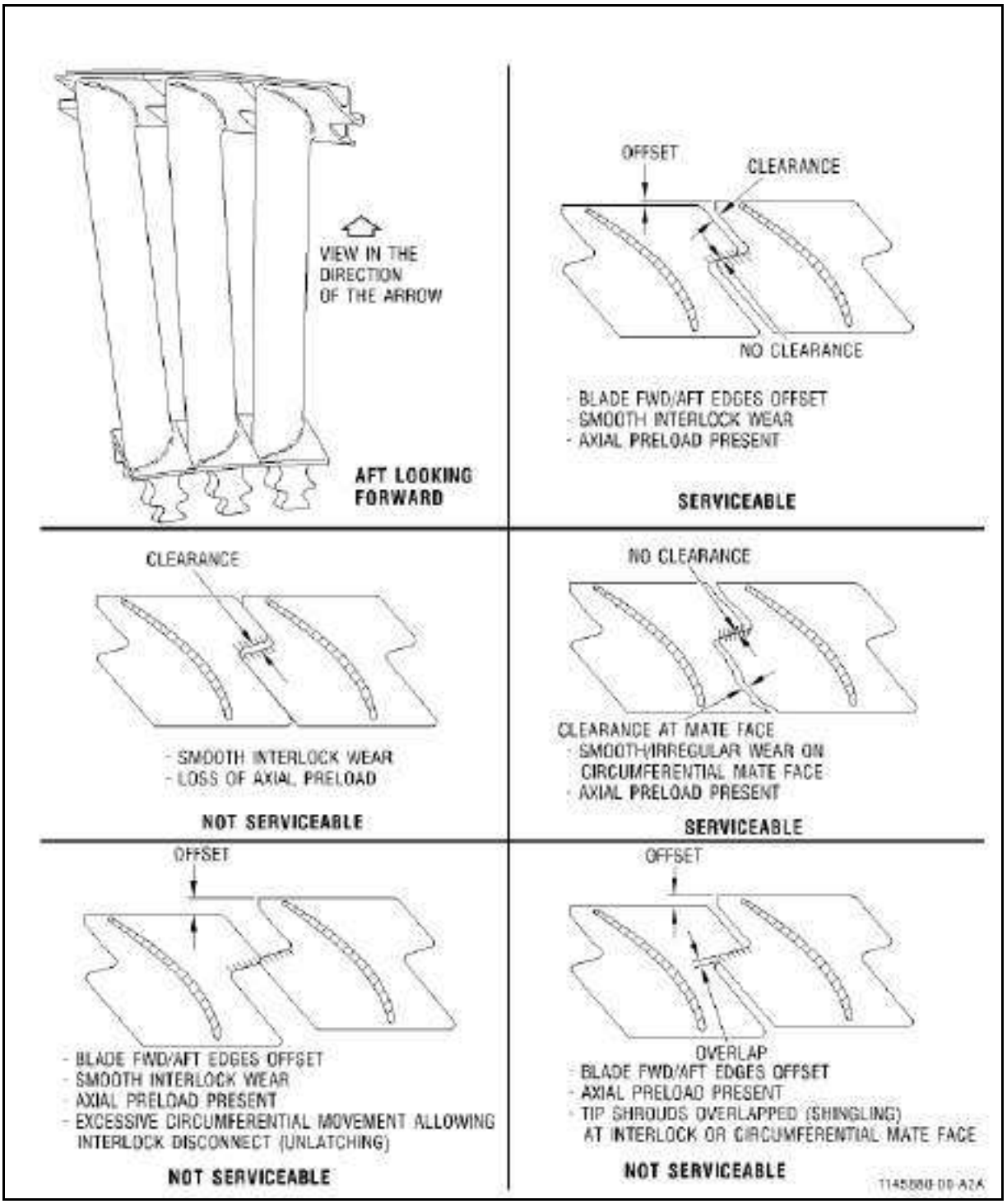


Figure 21: LPT Rotor Blade Circumferential Inspection

**Notes:**

The LPT stage 1 accessible nozzles and blades did not show any damage.

**Borescope Pictures**



Picture 89: TMF and LPT Inlet



Picture 90: LPT Inlet



Picture 91: Stage 1 Nozzles and Blades



Picture 92: LPT Stage 1 Blades tip interlock

# *BORESCOPE INSPECTION REPORT*
# *TM2500 GEN. 6-7*
# *7LM2500 – PK – MDWG05*

## NFE SAN JUAN POWER PLANT

## *PACKAGE # 7253162*

## *UNIT #2*

| | | | |
|---|---|---|---|
| **Visit Date:** | December 1, 2024 | **Total Starts:** | 765 |
| **Engine S/N:** | 557-251 | **GG Hours:** | 11613 |
| **Power Turbine S/N:** | 557-251 | **PT Hours:** | 11613 |
| **PPG GT Field Engineer:** | JC Requena H | **NFE Representative:** | Lance Florent |



# TABLE OF CONTENTS


1 Conclusions and Recommendations .....3
2 Outage Data .....4
3 Borescope Inspection Checklist.....5
4 Borescope Inspection Record.....6
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4.3 Turbine Section.....18
4.4 LPT Section .....27

## 1. Conclusions and Recommendations

**Purpose of visit:**
The purpose of this visit was to perform a borescope inspection of the Engine in accordance with GEK105054, WP 406 00.

1.1 The HPC Section is serviceable according to GEK105054 Volume II WP40600 Table 4.

In Stage 10 there are two (2) blades showing minor nicks, one in Leading edge and another one in Trailing edge.
In Stage 12 there are three (3) blades showing minor nicks in Leading edge.
All the above damages are serviceable.

1.2 The Combustion section is serviceable according to GEK 105054 Volume II WP 406 00 Table 7.

1.3 The Engine Hot Section is not serviceable due to the High Pressure Turbine 1st Stage nozzles condition (Table 8 paragraph g.) and the axial crack detected in the Combustor dome. It's highly recommended to continue monitoring the HS damages at intervals of no more than 2000 hours.

1.4 The 1st stage blades were found in good condition, tip has minor missing material
The shrouds are covered with waste material projected from the HPT Stage 1 nozzles

1.5 The 2nd stage vanes and blades and the honeycomb seals were found in good condition.

## 2. Outage Data

**ENGINE DATA**

| | | | | | |
|---|---|---|---|---|---|
| **ESN:** | 557-251 | **Engine Fired Hours:** | 11613 | **Package Hours:** | 11613 |
| **Model:** | 7LM2500-PK-MDWG05 | **Engine Fired starts:** | 765 | **Package Fired Starts:** | 765 |

**MAINTENANCE DATA**

| WP, SB, SL, PB, PL Performed | GEK105054, REV 11 | Date completed | Comments |
|---|---|---|---|
| WP 406 00 | Borescope Inspection | 01DEC24 | Not Serviceable |

**PARTS DATA**

| Description | PN Removed | SN Removed | Qty | Disposition | PN Installed | SN Installed |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |

## 3. Borescope Inspection Checklist

**Date unit out of operation:** 01DEC24
**Date unit into operation:** 03DEC24
**Last inspection date:** 01SEP24; PPG O&M

**Type of Fuel:** Gas / Diesel
**Type of outage:** Scheduled

**Type of NOx suppression:** Water Injection

**Inspection of gas turbine:**

| WATERWASH: | HIGH PRESSURE COMPRESSOR: |
|---|---|
| ☒ PERFORMED WATER WASH | ☒ HPC BORESCOPE INSPECTION |
| **COMBUSTOR:** | **HIGH PRESSURE TURBINE** |
| ☒ COMBUSTOR BORESCOPE INSPECTION | ☒ HPT STAGE 1 & 2 NOZZLE BORESCOPE INSPECTION |
| | ☒ HPT BLADE BORESCOPE INSPECTION |
| **LOW PRESSURE TURBINE:** | |
| ☒ LPT BORESCOPE INSPECTION | |

☒ ***Please verify all borescope plugs have been reinstalled***

## 4. Borescope Inspection Record

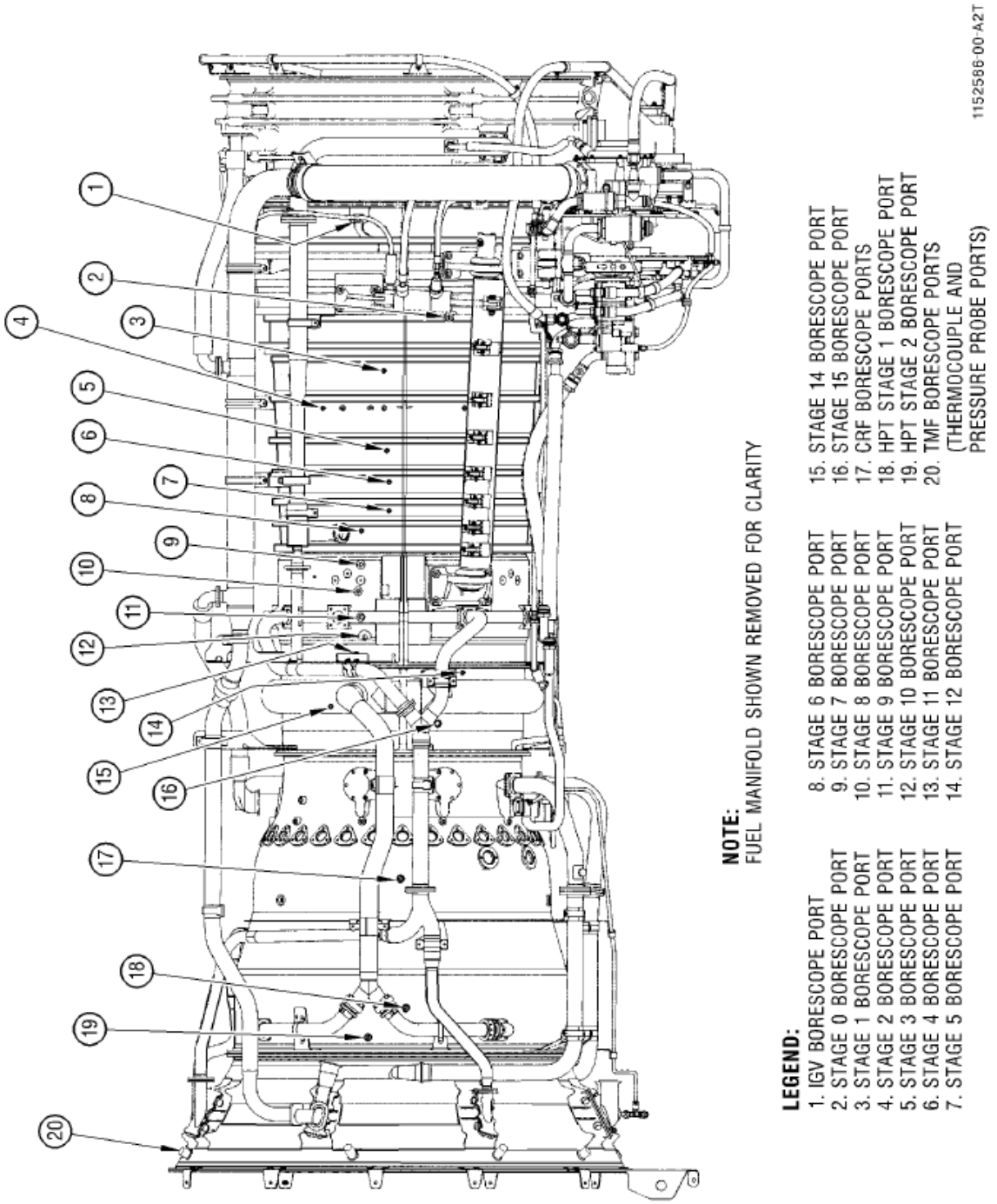



Figure 1: Position of Borescope Inspection Ports.

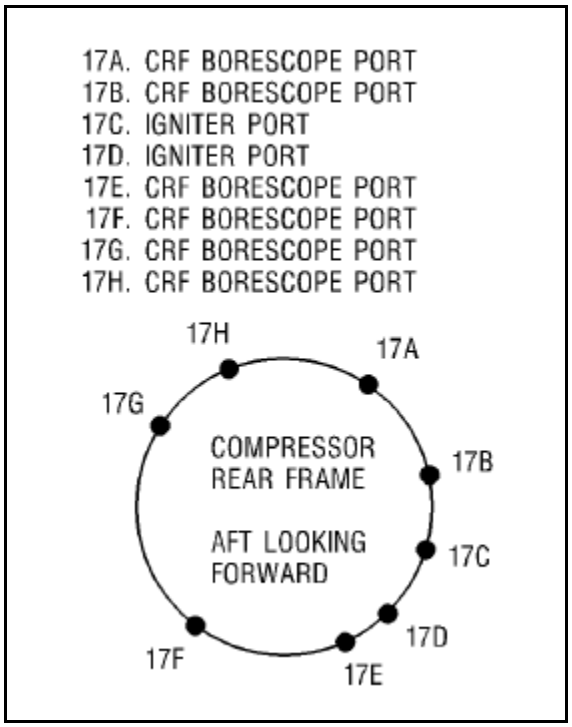


Figure 2: Position of Borescope Inspection Ports.

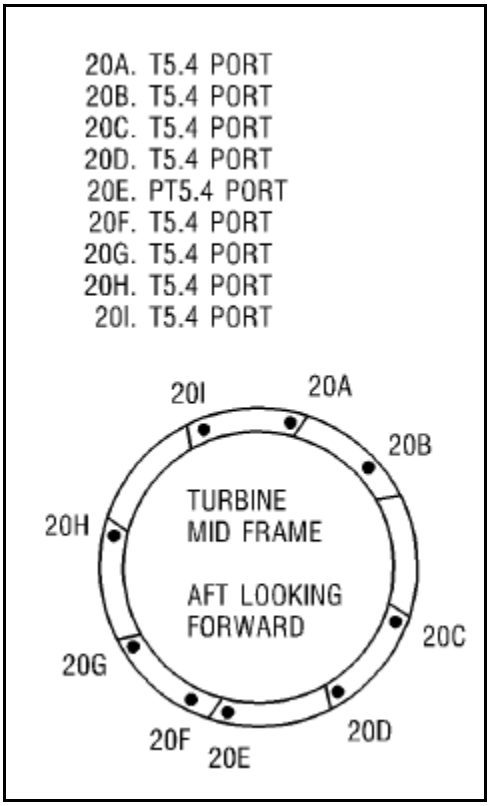


Figure 3: Position of Borescope Inspection Ports.

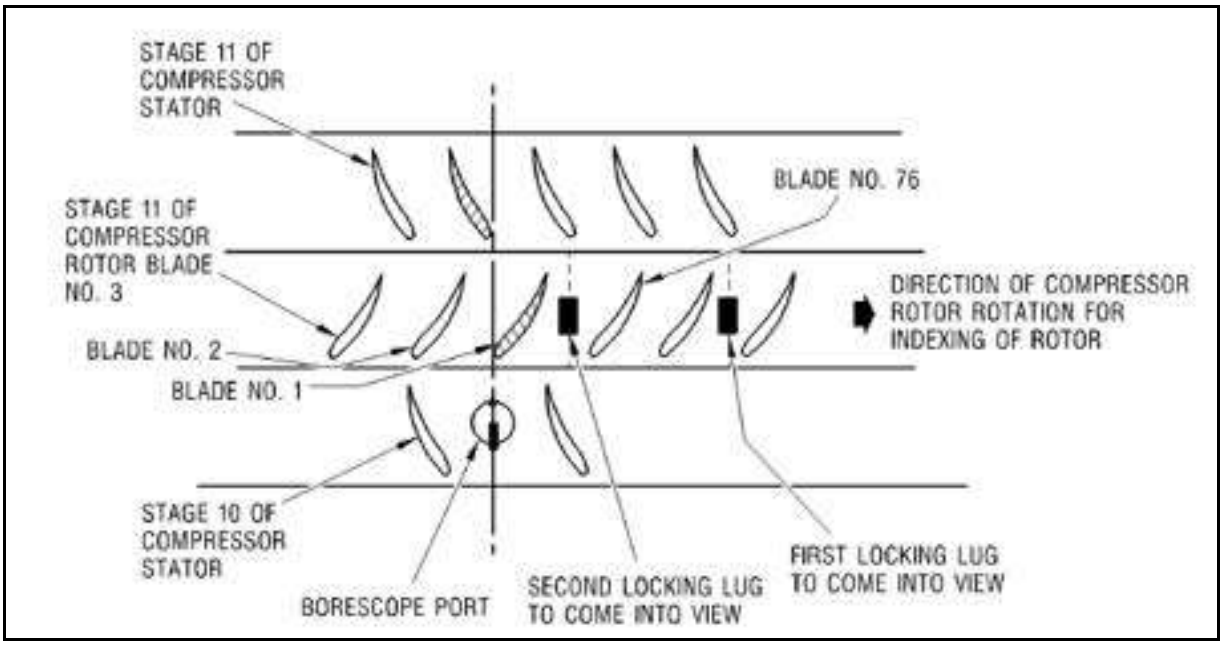


Figure 4: Zero indexing of HPC rotor and HPT rotor

Compressor Section

| Port | T.E. | L.E. | blades | Remarks: | photo no: |
|---|---|---|---|---|---|
| 1 | IGV | | | | 1 |
| 1 | | 0 | 36 | | 2 – 3 – 4 |
| 2 | 0 | | 36 | | 5 – 6 – 7 |
| 2 | | 1 | 26 | | 8 – 9 |
| 3 | 1 | | 26 | | 10 – 11 – 12 |
| 3 | | 2 | 26 | | 13 – 14 |
| 4 | 2 | | 26 | | 15 |
| 4 | | 3 | 42 | | 16 – 17 |
| 5 | 3 | | 42 | | 18 |
| 5 | | 4 | 45 | | 19 – 20 |
| 6 | 4 | | 45 | | 21 – 22 |
| 6 | | 5 | 48 | | 23 |
| 7 | 5 | | 48 | | 24 |
| 7 | | 6 | 54 | | 25 – 26 |
| 8 | 6 | | 54 | Blades contacting tip | |
| 8 | | 7 | 56 | Blades contacting tip | |
| 9 | 7 | | 56 | | 27 – 28 |
| 9 | | 8 | 64 | | 29 – 30 – 31 |
| 10 | 8 | | 64 | | 32 |
| 10 | | 9 | 66 | | 33 – 34 |
| 11 | 9 | | 66 | | 35 – 36 – 39 |
| 11 | | 10 | 66 | One (1) Blade with minor nick in Leading edge. Serviceable | 37 – 38 |
| 12 | 10 | | 66 | One (1) Blade with minor nick in Trailing edge. Serviceable | 40 |
| 12 | | 11 | 76 | | 41 – 42 |
| 13 | 11 | | 76 | | 43 |
| 13 | | 12 | 76 | Three (3) Baldes with minor nicks in Trailing edge. Serviceable | 44 – 45 – 46 |
| 14 | 12 | | 76 | | 47 |
| 14 | | 13 | 76 | | 48 |
| 15 | 14 | | 76 | Inside bleed manifold | |
| 15 | | 15 | 76 | Inside bleed manifold | |
| 16 | 15 | | 76 | | 49 – 50 |
| 16 | | 16 | 76 | | 51 – 52 |

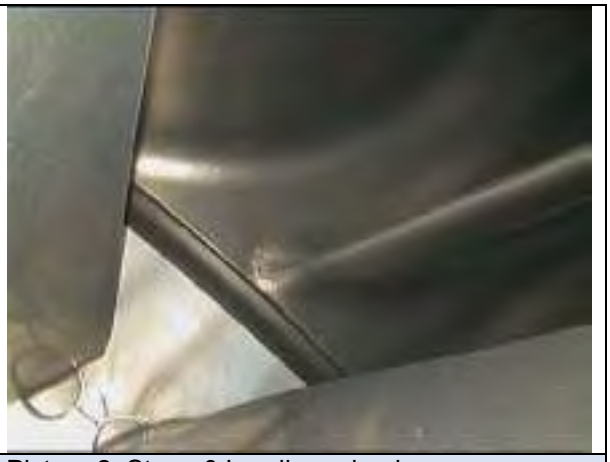
**Notes:**
The HPC Section is serviceable according to GEK105054 Volume II WP40600 Table 4.

In Stage 10 there are two (2) blades showing minor nicks, one in Leading edge and another one in Trailing edge.
In Stage 12 there are three (3) blades showing minor nicks in Leading edge.
All the above damages are serviceable.

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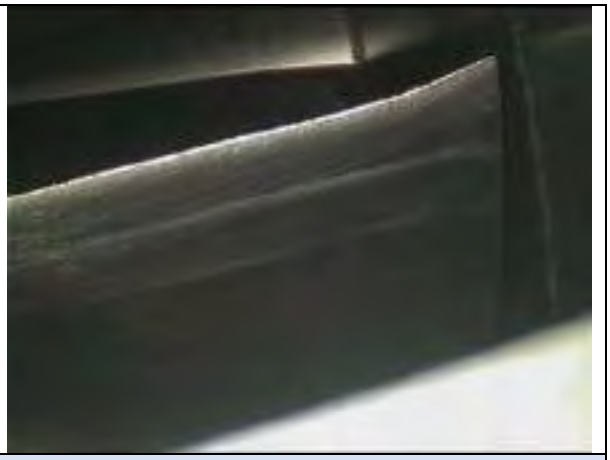
Picture 1. CFF & IGV



Picture 2. Stage 0 Leading edge base



Picture 3. Stage 0 leading edge



Picture 4. Stage 0 Trailing edge tip



Picture 5. Stage 0 Trailing edge tip



Picture 6. Stage 0 Trailing edge base



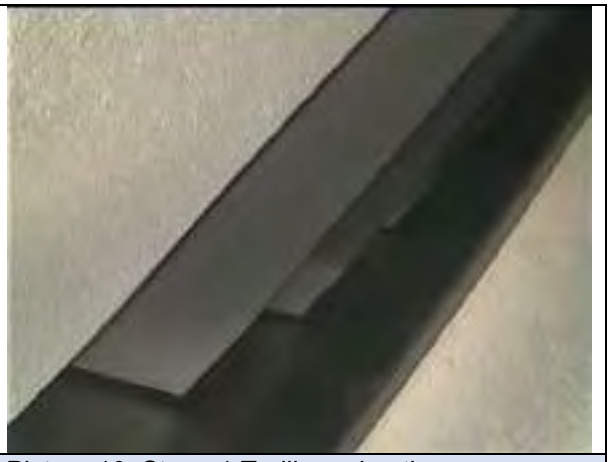
Picture 7. Stage 0 Weep hole



Picture 8. Stage 1 Leading edge base



Picture 9. Stage 1 Leading edge tip



Picture 10. Stage 1 Trailing edge tip



Picture 11. Stage 1 Weep hole



Picture12. Stage 1 Blade retainers



Picture 13. Stage 2 Leading edge tip



Picture 14. Stage 2 Leading edge base



Picture 15. Stage 2 Trailing edge



Picture 16. Stage 3 Leading edge



Picture 17. Stage 3 Leading edge base



Picture 18. Stage 3 Trailing edge



Picture 19. Stage 4 Leading edge



Picture 20. Stage 4 Leading edge base



Picture 21. Stage 4 Trailing edge squealer tip



Picture 22. Stage 4 Trailing edge



Picture 23. Stage 5 Leading edge



Picture 24. Stage 5 Trailing edge base



Picture 25. Stage 6 Leading edge tip



Picture 26. Stage 6 Leading edge base



Picture 27. Stage 7 Trailing edge



Picture 28. Stage 7 Trailing edge base



Picture 29. Stage 8 Leading edge tip



Picture 30. Stage 9 Leading edge base



Picture 31. Stage 8 Stator casing rubbing marks



Picture 32. Stage 8 Trailing edge



Picture 33. Stage 9 leading edge



Picture 34. Stage 9 Leading edge base



Picture 35. Stage 9 Trailing edge tip



Picture 36. Stage 9 Trailing edge base



Picture 37. Stage 10 Leading edge minor nick



Picture 38. Stage 10 Leading base



Picture 39. Stage 9 Bleed manifold



Picture 40. Stage 10 Trailing edge minor nick



Picture 41. Stage 11 Leading edge tip



Picture 42. Stage 11 Leading edge base



Picture 43. Stage 11 Trailing edge



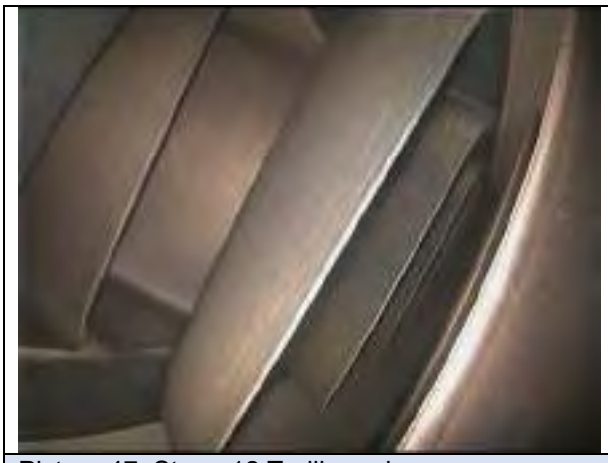
Picture 44. Stage 12 Leading edge minor nick



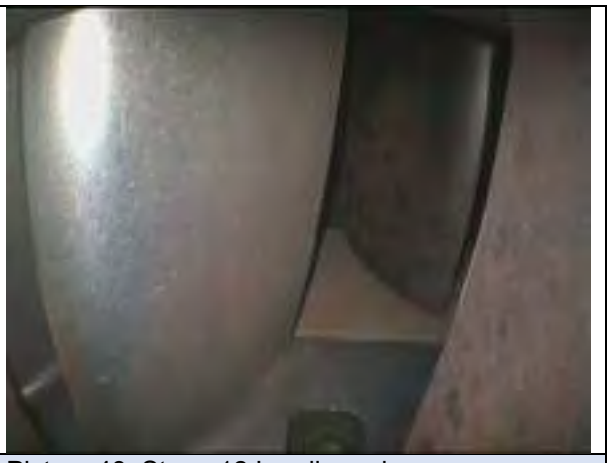
Picture 45. Stage 12 Leading edge minor nick



Picture 46. Stage 12 Leading edge minor nick



Picture 47. Stage 12 Trailing edge



Picture 48. Stage 12 Leading edge



Picture 49. Stage 15 Trailing edge



Picture 50. Stage 15 Leading edge dirt build up



Picture 51. Stage 16 Leading edge



Picture 52. Outlet guide vanes

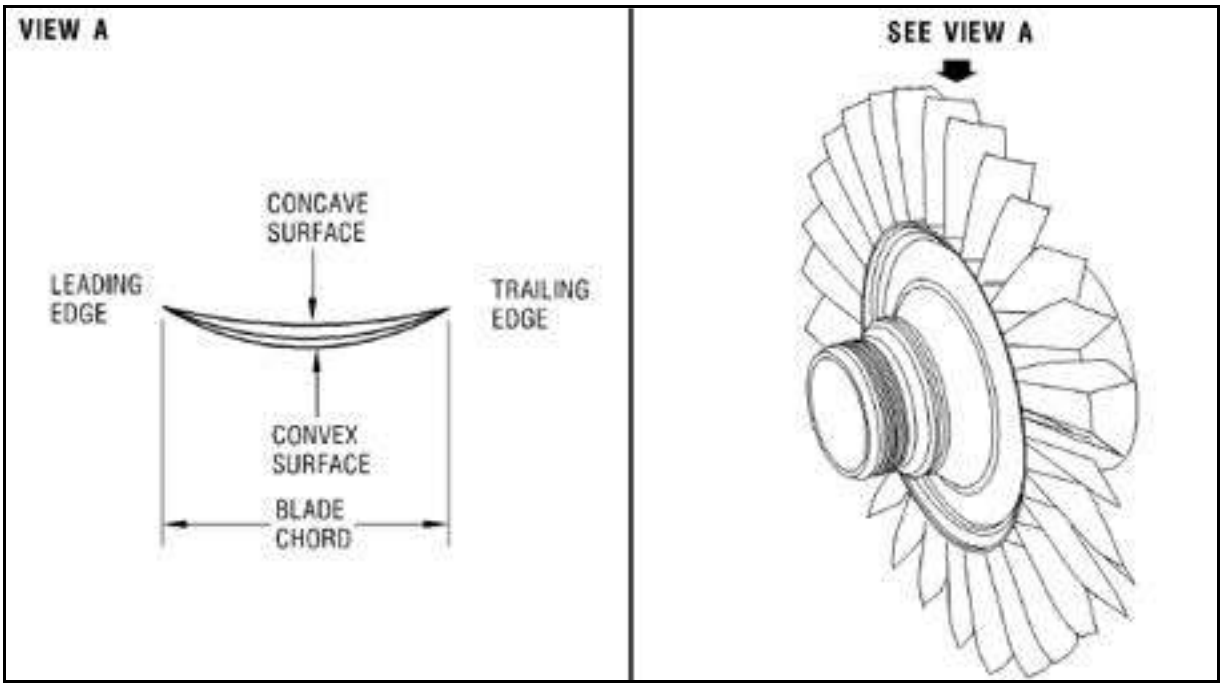



Figure 5: HPC stage 0 BLISK

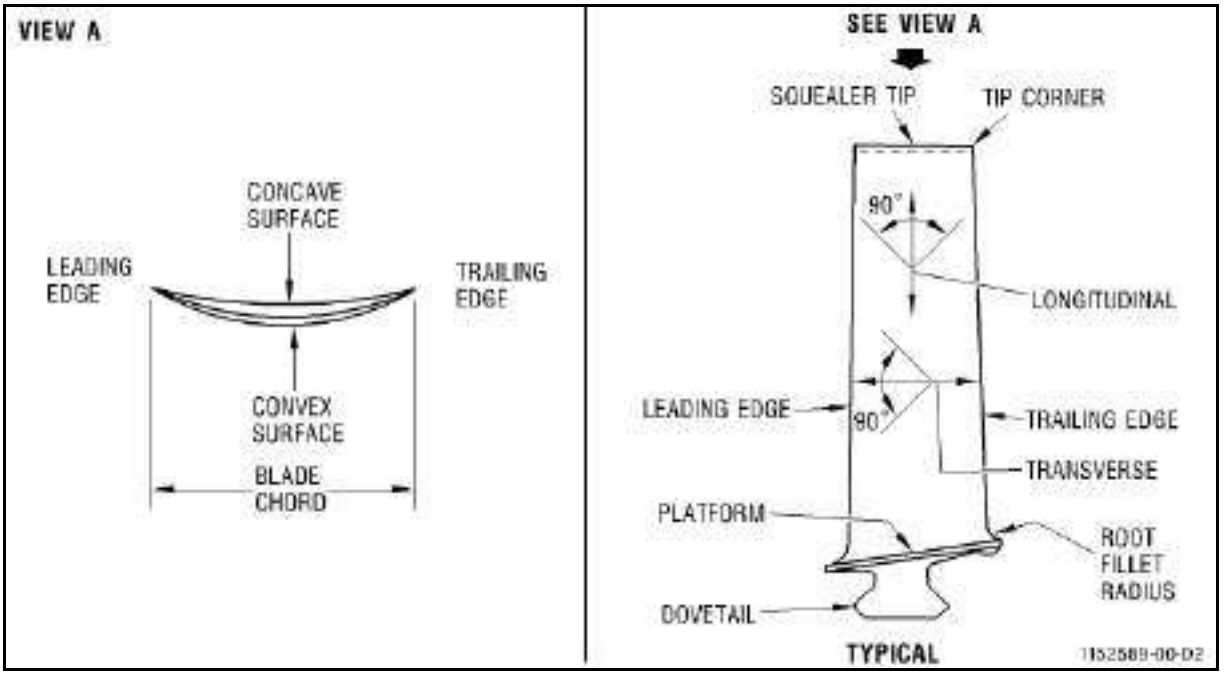



Figure 6: Compressor Rotor Blades

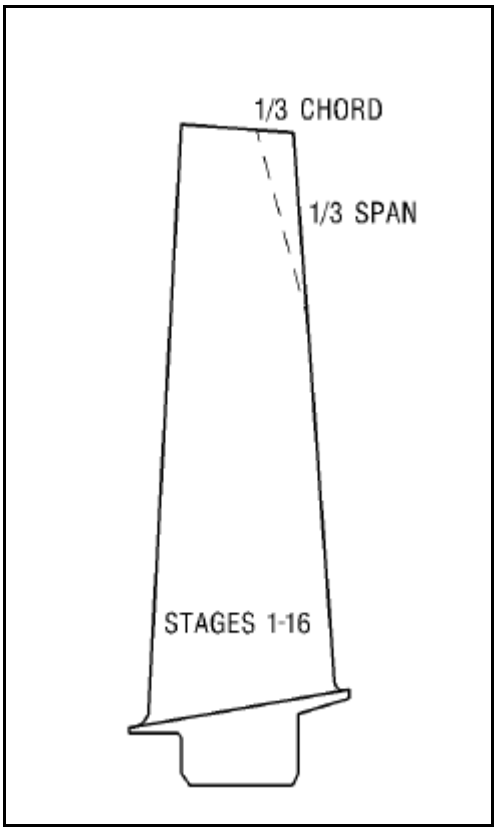



Figure 7: Tip Trailing Edge Inspection

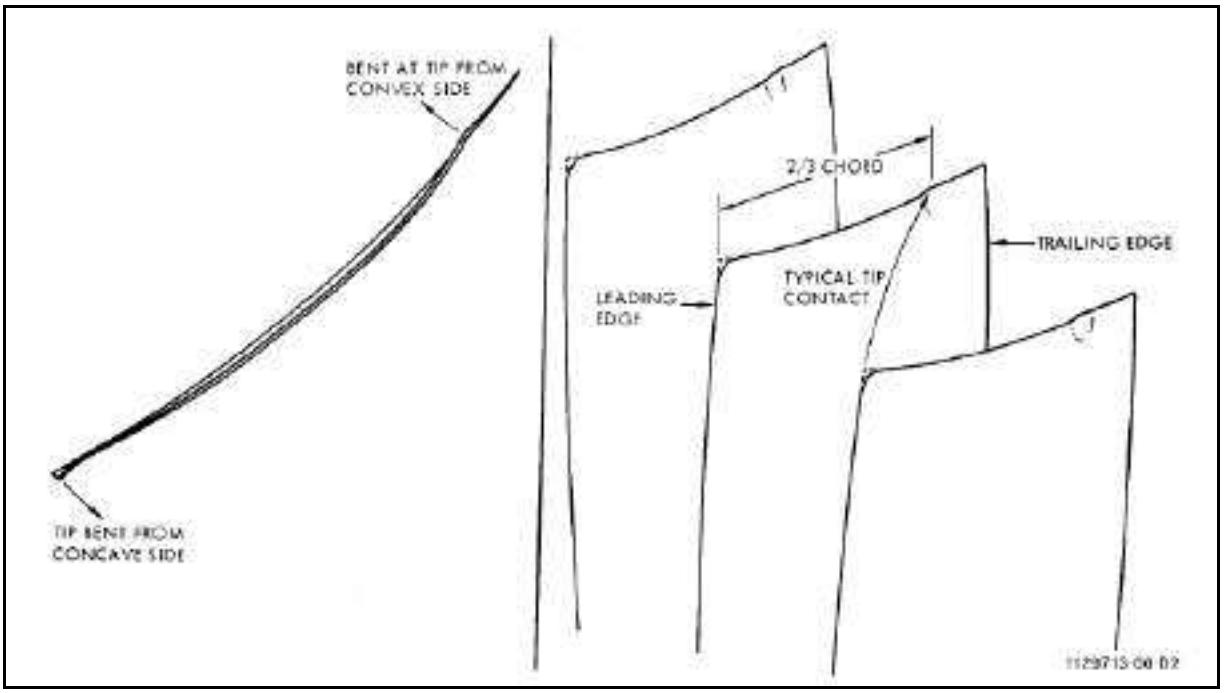
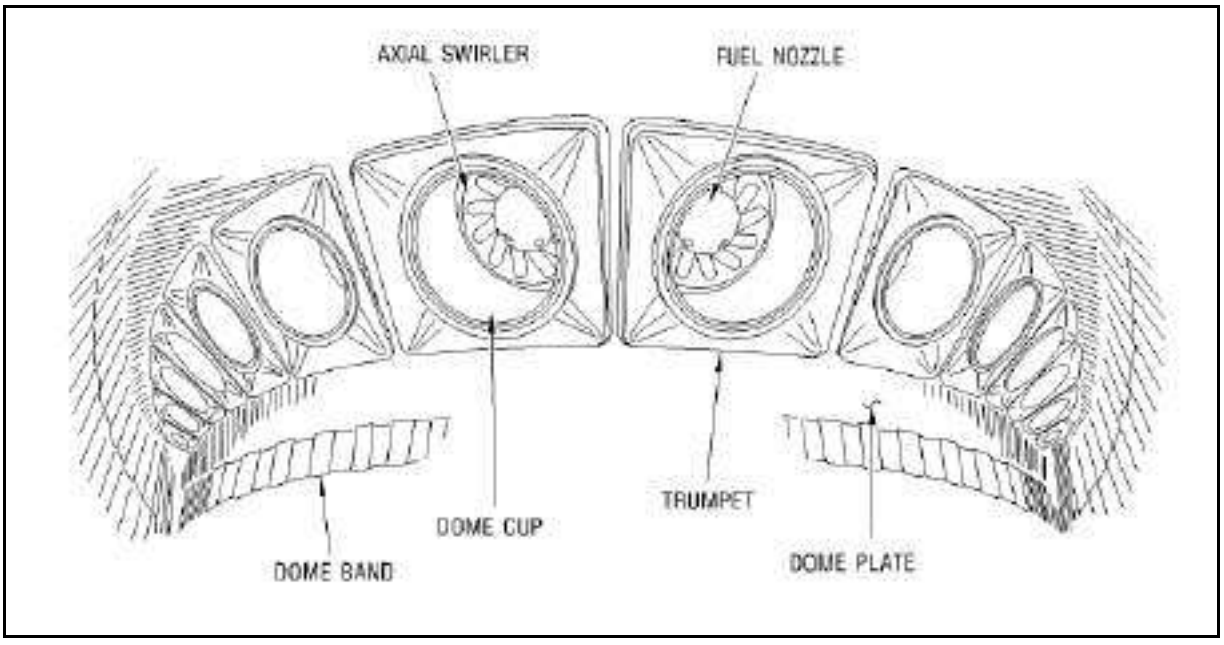



Figure 8: Tip Clanging Contact (HPCR stage 3 through 6)

Combustor and 1St Stage Nozzle Section

| Port | Condition observed | Photo no: |
|---|---|---|
| **17A** | | |
| **17B** | | |
| **17C** | | |
| **17D** | **See below notes.** | Pictures 53 to 68 |
| **17E** | | |
| **17F** | | |
| **17G** | | |
| **17H** | | |
| **17** | 1st stage nozzle (leading edge): | |

**Notes:**
The Combustor section is serviceable according to GEK105054 Volume II WP40600 Table 7. There is one (1) axial crack located in the dome plate, around 4 o'clock (Fuel Nozzle 11 position). The reference measurement od the crack is just in the serviceability limits indicated in Table 7 paragraph 3.a.



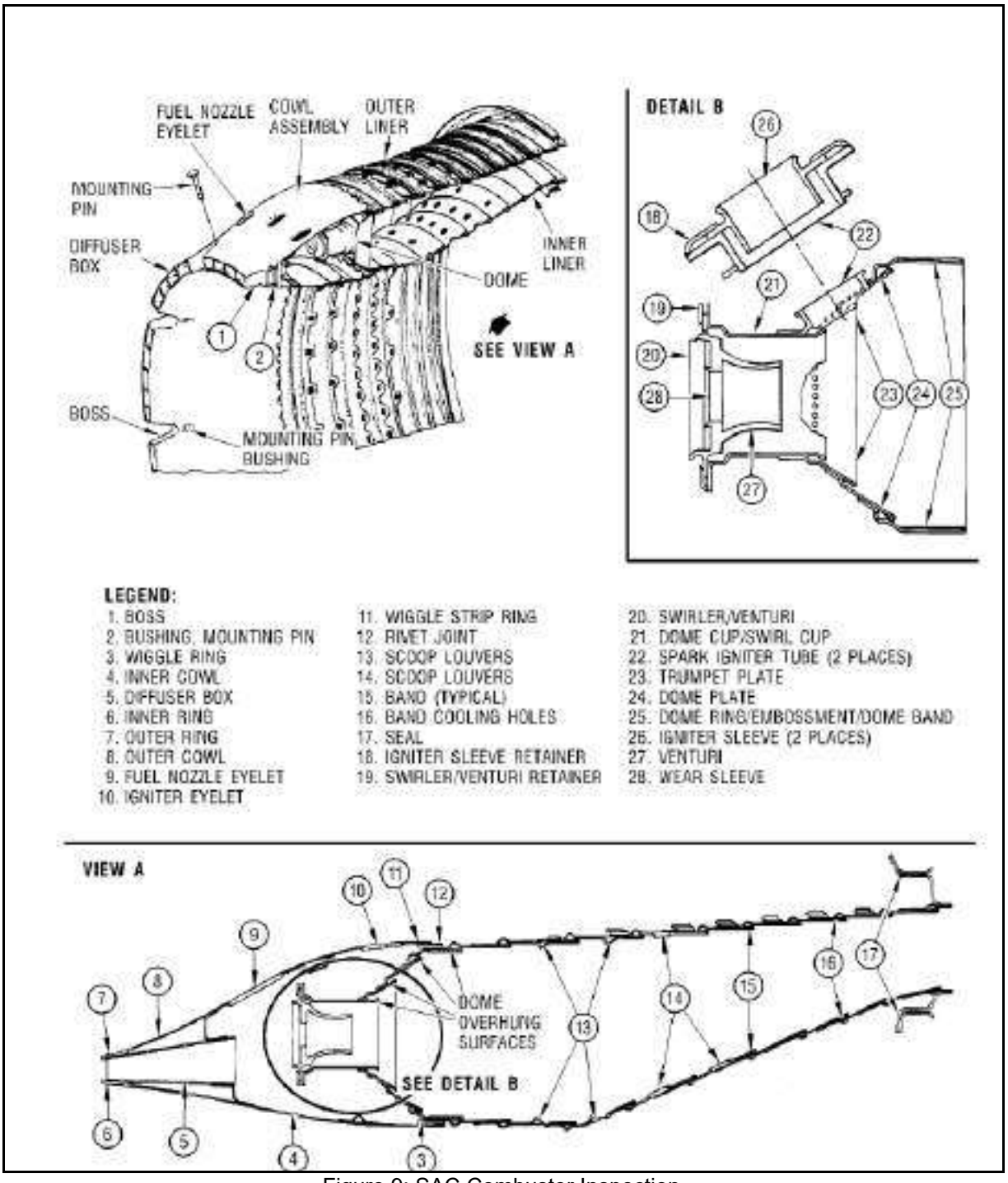



Figure 9: SAC Combustor Inspection

Figure 10: SAC Combustor Inspection

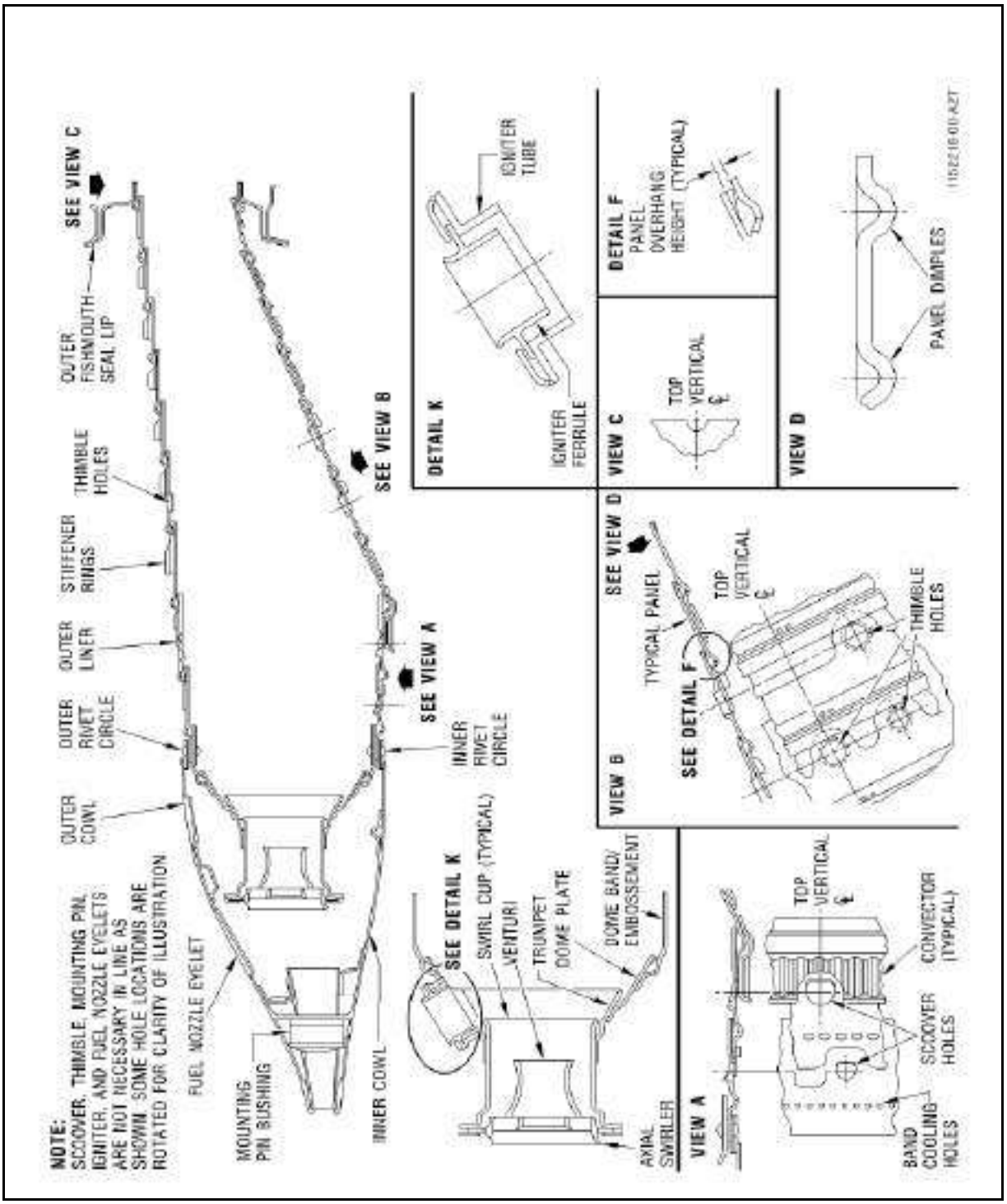



Figure 11: SAC Combustor Inspection

**Borescope Pictures**



Picture 53. Upper igniter installed



Picture 54. Lower igniter installed



Picture 55. Outer rivets band



Picture 56. Inner rivets band



Picture 57. Combustor liners



Picture 58. Combustor liners



Picture 59. Combustor dome. Splash plates



Picture 60. Combustor dome. Splash plates



Picture 61. Inner liner TBC Flaking off



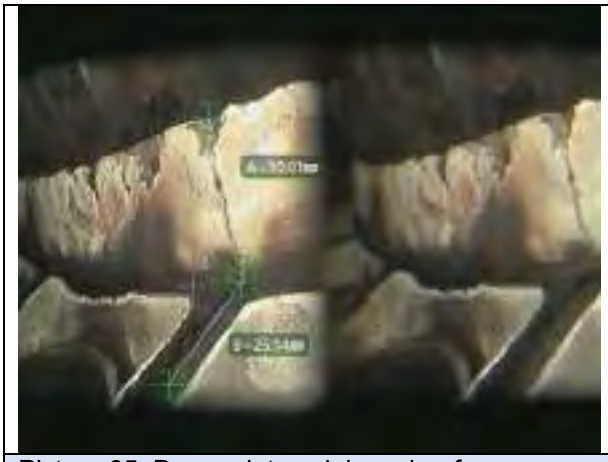
Picture 62. Fuel nozzle tip and swirler



Picture 63. Dome plate axial crack



Picture 64. Dome plate axial crack



Picture 65. Dome plate axial crack reference measurements



Picture 66. Combustor liners and HPT Nozzles



Picture 67. Combustor liners and HPT Nozzles



Picture 68. Combustor liners and HPT Nozzles

## Turbine Section

| | turbine stage | | | | |
|---|---|---|---|---|---|
| **Port** | **L.E.** | **T.E.** | **blades** | **Remarks:** | **photo no:** |
| **18** | **1** | | **88** | | |
| **19** | | **1** | **88** | **See below notes.** | |
| **19** | **2** | | **90** | | |
| **20** | | **2** | | | |

**Notes:**
The High Pressure Turbine section is not serviceable according to GEK105054 Volume II WP40600 Table 8 paragraph “g” due to the Stage 1 nozzles condition.

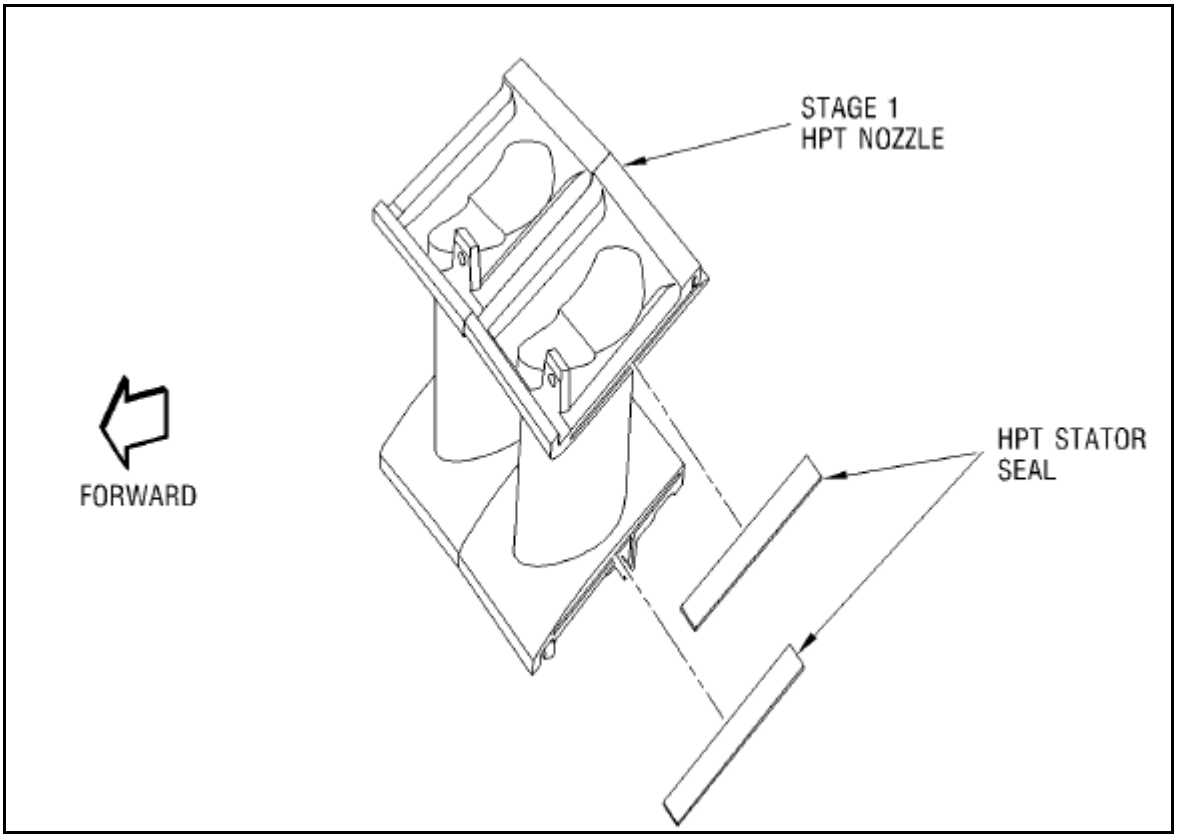



Figure 12: Stage 1 HPT Nozzle Seal Displacement

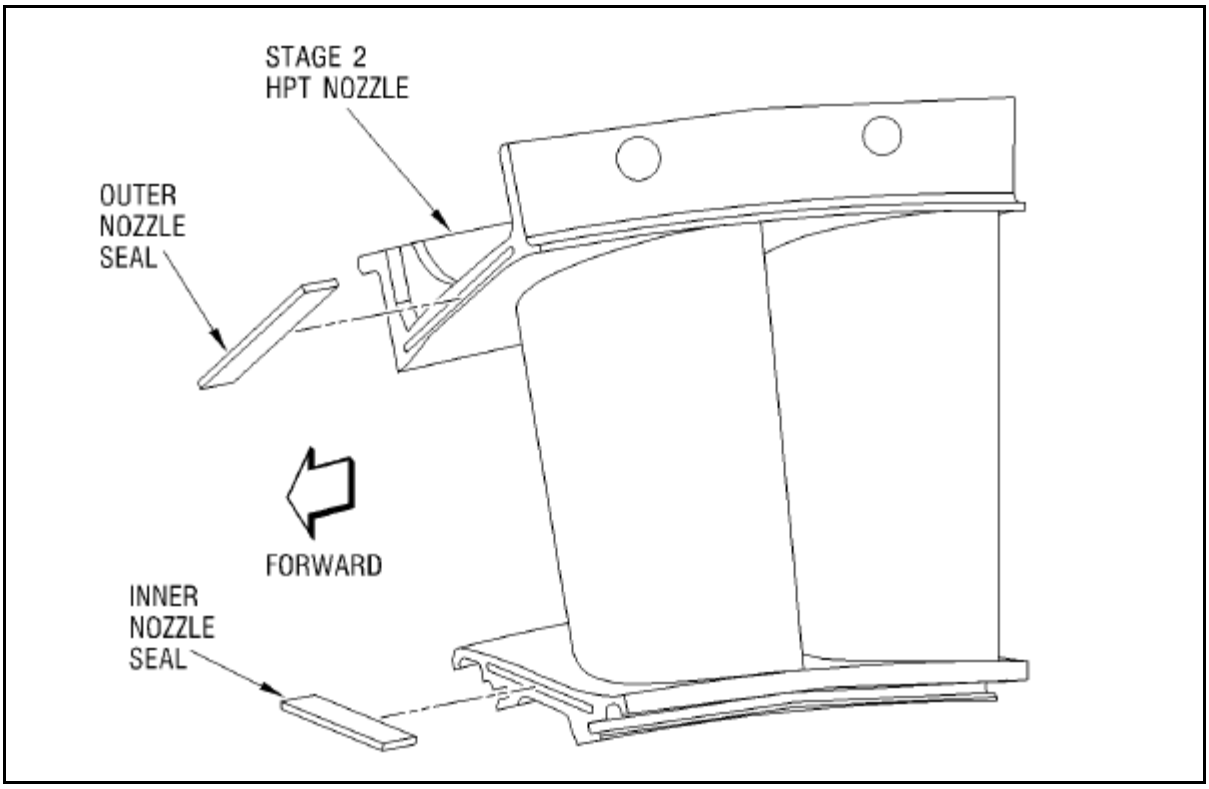


Figure 13: Stage 2 HPT Nozzle Seal Displacement

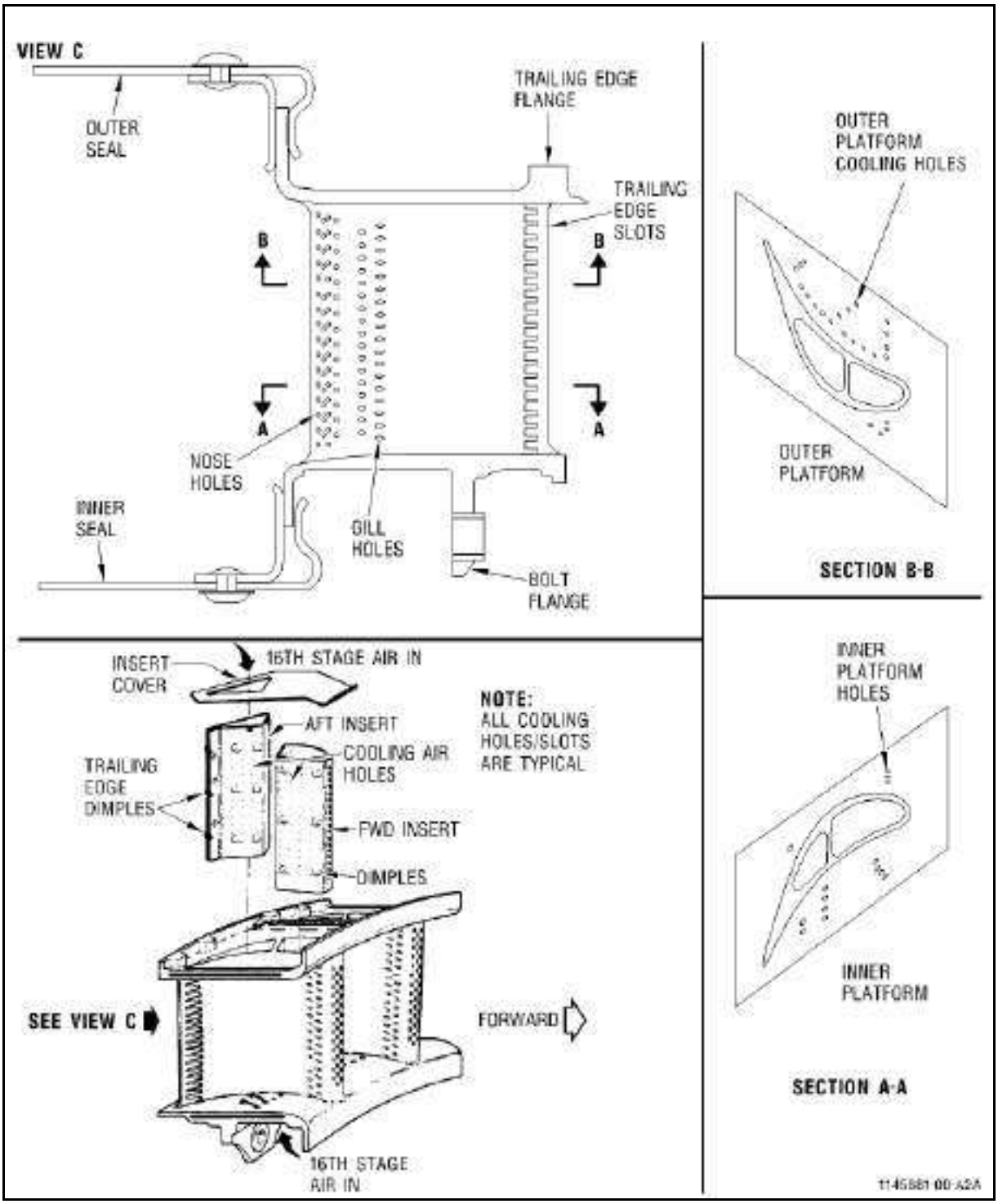



Figure 14: HPT Stage 1 Nozzle

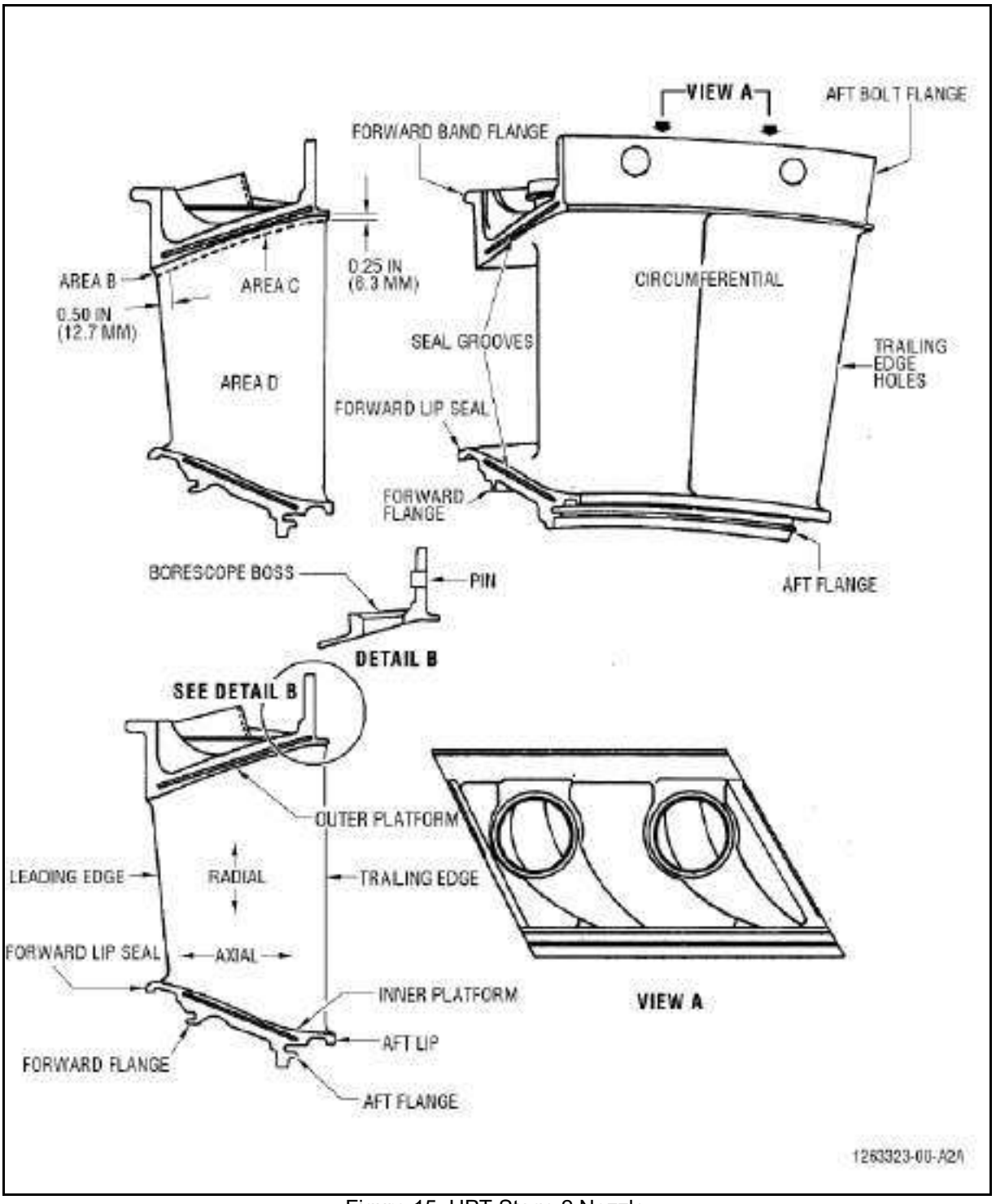



Figure 15: HPT Stage 2 Nozzle

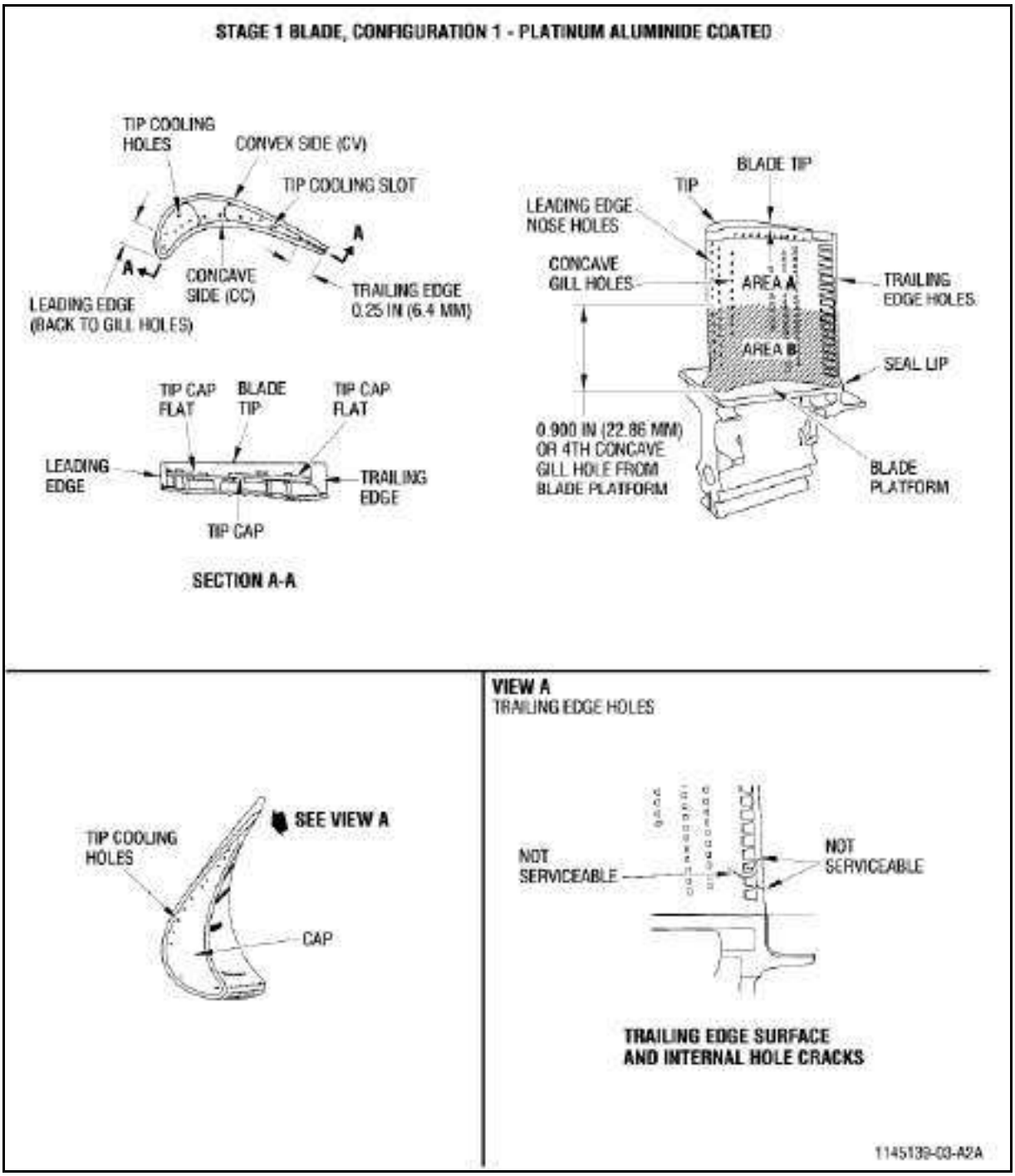



Figure 16: HPT Stage 1 Rotor Blades Inspection Areas (Platinum Aluminide Coated Blades)

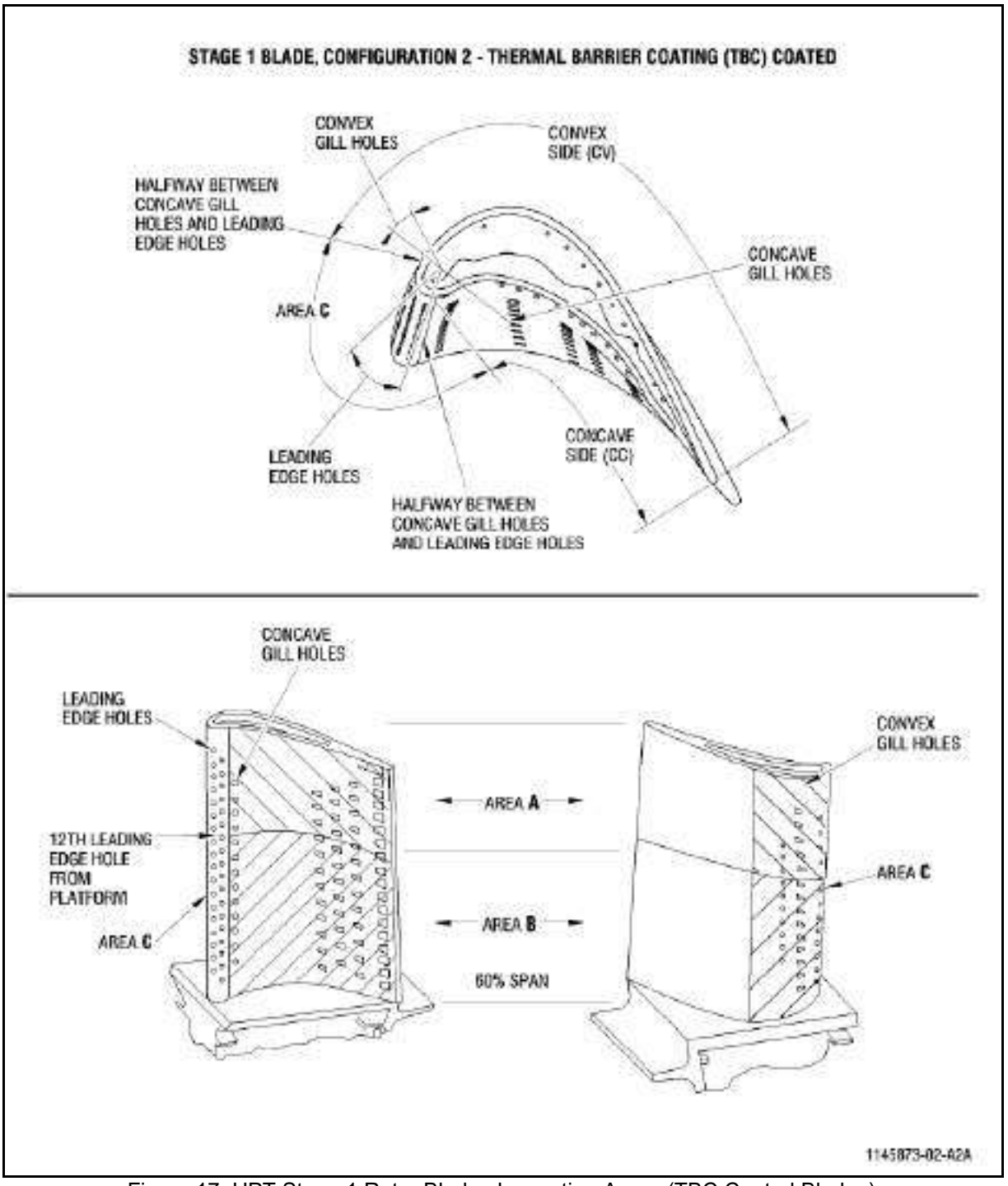



Figure 17: HPT Stage 1 Rotor Blades Inspection Areas (TBC Coated Blades)

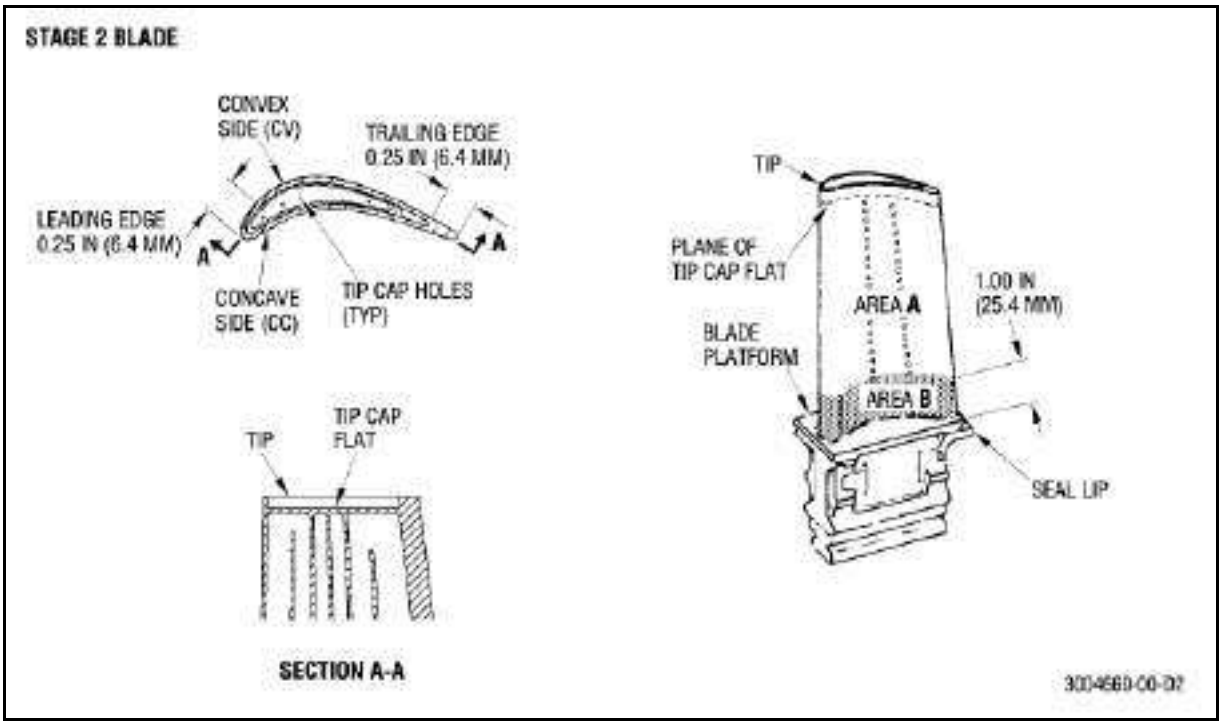


Figure 18: HPT Stage 2 Rotor Blades Inspection Areas

**Borescope Pictures**



Picture 69: Stage1 Nozzles leading edge



Picture 70: Stage1 Nozzles leading edge



Picture 71: Stage1 Nozzles leading edge



Picture 72: Stage1 Nozzles airfoil concave



Picture 73: Stage1 Nozzles axial crack



Picture 74: Stage1 Nozzles airfoil



Picture 75: Stage1 Nozzles trailing edge



Picture 76: Stage1 Nozzles trailing edge



Picture 77: Stage1 Nozzles trailing edge



Picture 78: Stage1 Nozzles trailing edge



Picture 79: Stage1 Nozzles trailing edge. Concave



Picture 80: Stage1 Nozzles trailing edge. Concave



Picture 81: Stage1 Blades leading edge



Picture 82: Stage1 Blades leading edge



Picture 83: Stage1 shrouds covered with waste material projected from the stage 1 nozzles



Picture 84: Stage 1 Blades trailing edge convex side



Picture 85: Stage 1 Blades trailing edge concave



Picture 86: Stage 2 Nozzles trailing edge. Blades leading edge



Picture 87: Stage 2 Blades leading edge



Picture 88: Stage 2 Nozzles trailing edge

LPT Section

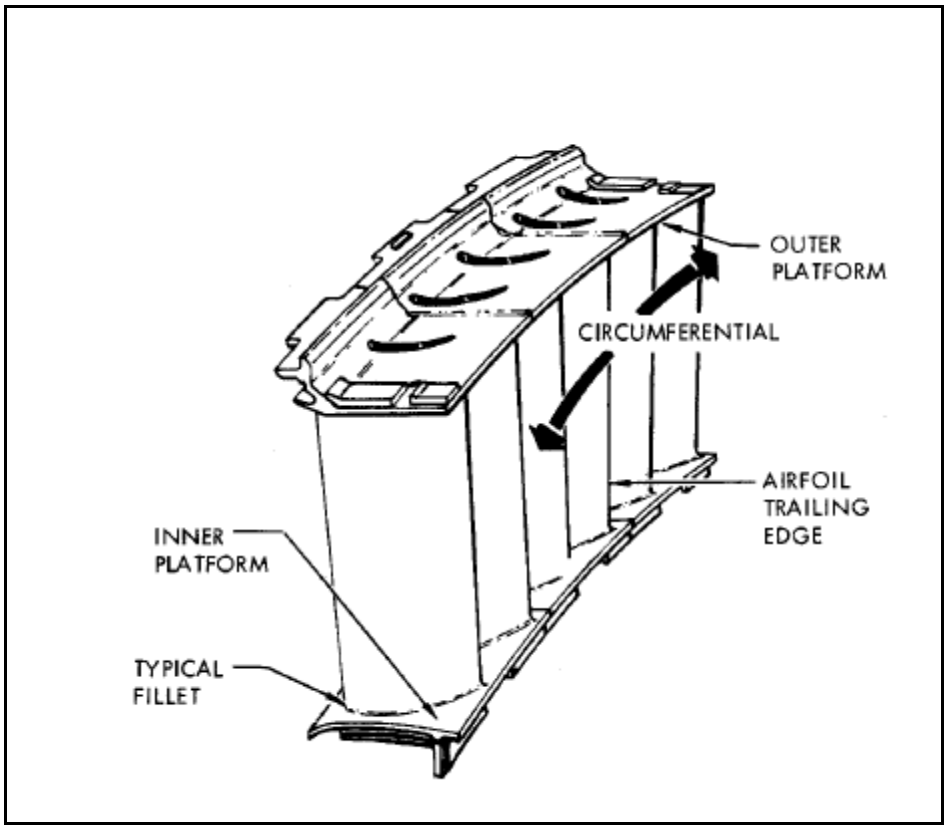



Figure 19: Power Turbine Nozzles

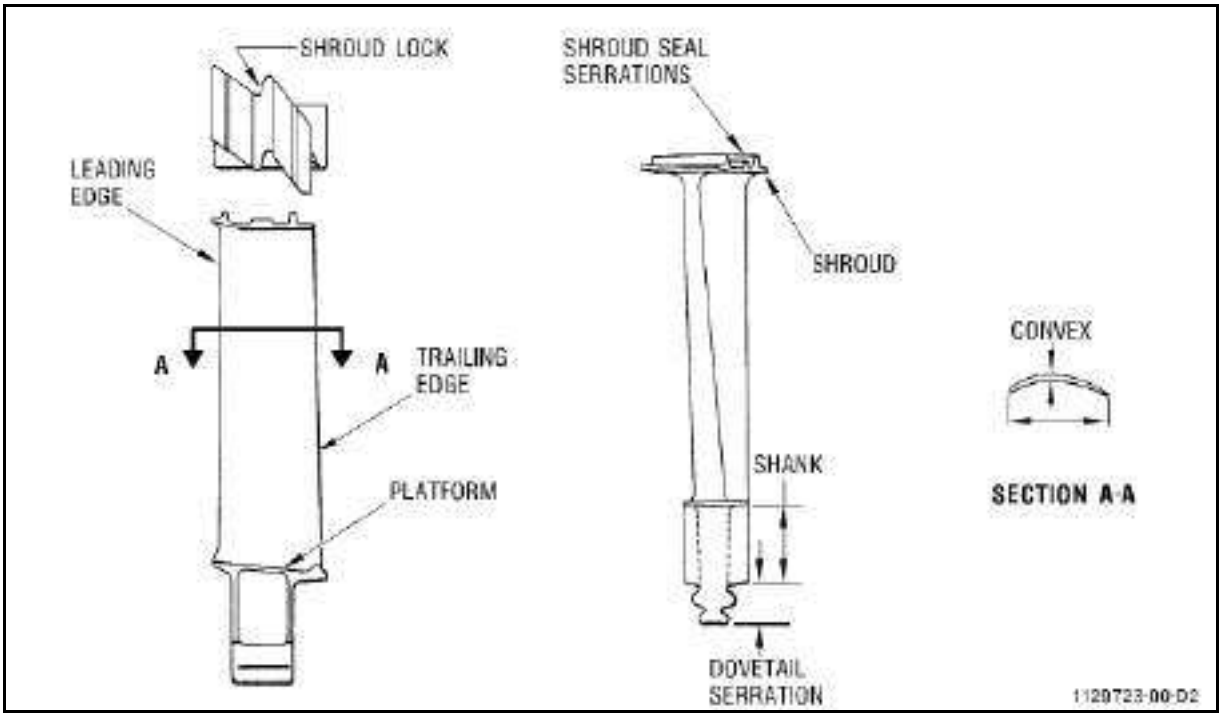



Figure 20: Power Turbine Rotor Blades

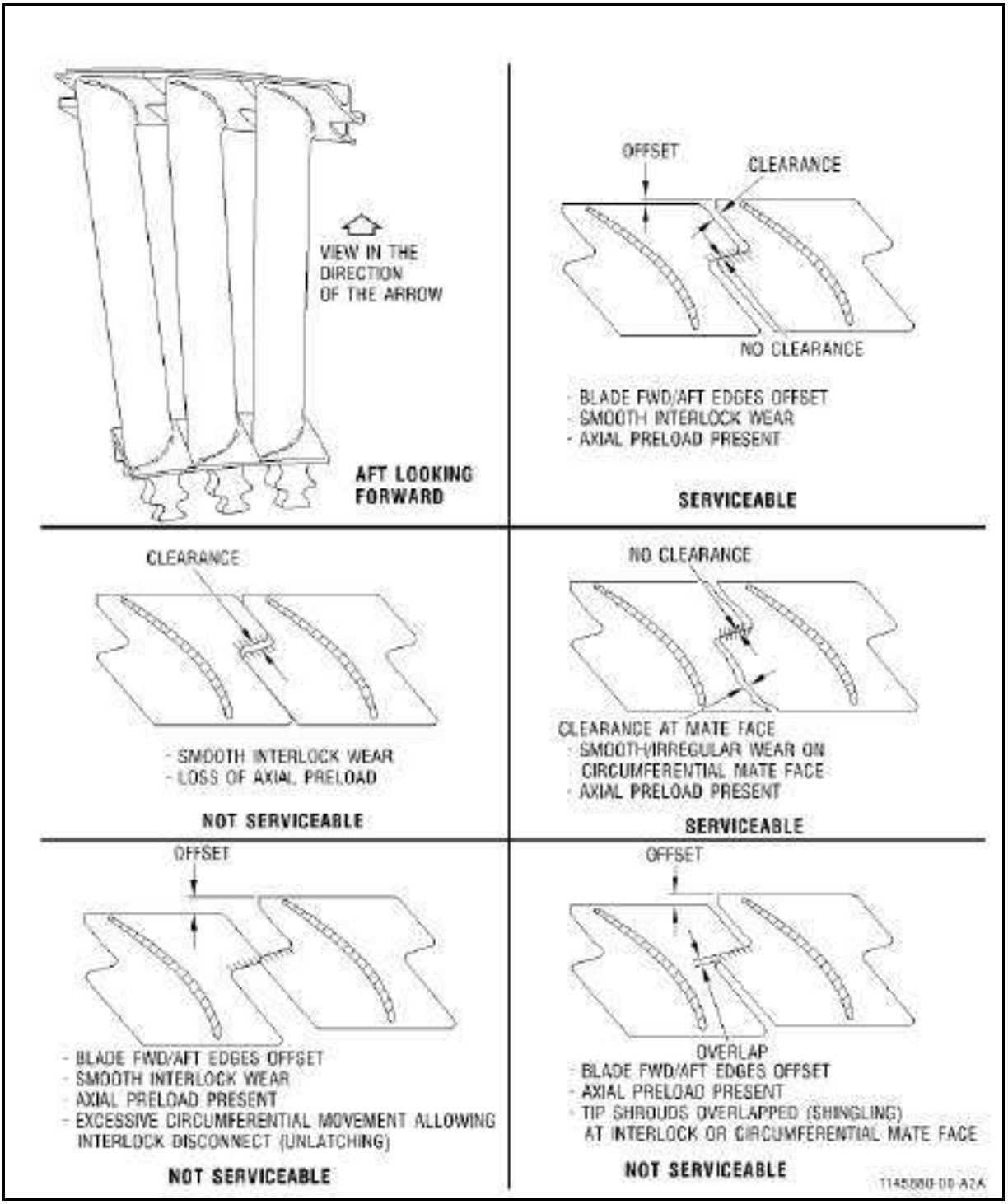


Figure 21: LPT Rotor Blade Circumferential Inspection

**Notes:**

The LPT stage 1 accessible nozzles and blades did not show any damage.

**Borescope Pictures**



Picture 89: TMF and LPT Inlet



Picture 90: TMF and LPT Inlet



Picture 91: Stage 1 Blades tip interlock



Picture 92: LPT Stage 1 Nozzles and blades

# *BORESCOPE INSPECTION REPORT*
# *TM2500 GEN. 6-7*
# *7LM2500 – PK – MDWG05*

## NFE SAN JUAN POWER PLANT

## *PACKAGE # 7250393*

## *UNIT #3*

| | | | |
|---|---|---|---|
| **Visit Date:** | December 4, 2024 | **Engine Starts:** | 56 |
| **Engine S/N:** | 557-258 | **GG Hours:** | 2081 |
| **Power Turbine S/N:** | 557-258 | **PT Hours:** | 2081 |
| **PPG GT Field Engineer:** | JC Requena H | **NFE Representative:** | Lance Florent |



# TABLE OF CONTENTS


1 Conclusions and Recommendations .....3
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3 Borescope Inspection Checklist.....5
4 Borescope Inspection Record.....6
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4.2 Combustor and 1St Stage Nozzle Section.....12
4.3 Turbine Section.....18
4.4 LPT Section .....27

## 1. Conclusions and Recommendations

**Purpose of visit:**
The purpose of this visit was to perform a borescope inspection of the Engine in accordance with GEK105054, WP 406 00.

1.1 The HPC Section is serviceable according to GEK105054 Volume II WP40600 Table 4. There is one (1) blade in Stage 8 showing a minor nick in the leading edge tip area. This damage is Serviceable.

1.2 The Combustion section is serviceable according to GEK 105054 Volume II WP 406 00 Table 7.

1.3 The High Pressure Turbine section is not serviceable according to GEK105054 Volume II WP40600 Table 8 paragraph 1.g. due to the Stage 1 nozzles condition.

1.4 The Stage 1 blades were found in good condition, tip has minor missing material
The shrouds showed rubbing marks; serviceable.

1.5 The Stage 2 vanes and blades and the honeycomb seals were found in good condition.

## 2. Outage Data

**ENGINE DATA**

| | | | | | |
|---|---|---|---|---|---|
| **ESN:** | 557-240 | **Engine Fired Hours*:** | 2081 | **Package Hours:** | 10284 |
| **Model:** | 7LM2500-PK-MDWG05 | **Engine Fired starts*:** | 56 | **Package Fired Starts:** | 673 |

***ESN 557 – 258 was installed in Package 7250393 on August 18th, 2024, replacing ESN 557 – 240. At this date the HMI Total starts and fired hours were 673 and 8203.***

**MAINTENANCE DATA**

| WP, SB, SL, PB, PL Performed | GEK105054, REV 11 | Date completed | Comments |
|---|---|---|---|
| WP 406 00 | Borescope Inspection | 04DEC24 | Not Serviceable |

**PARTS DATA**

| Description | PN Removed | SN Removed | Qty | Disposition | PN Installed | SN Installed |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |

## 3. Borescope Inspection Checklist

**Date unit out of operation:** 04DEC24
**Date unit into operation:** 06DEC24
**Last inspection date:** 15MAY24; PPG O&M

**Type of Fuel:** Gas / Diesel
**Type of outage:** Scheduled

**Type of NOx suppression:** Water Injection

**Inspection of gas turbine:**

| WATERWASH: | HIGH PRESSURE COMPRESSOR: |
|---|---|
| ☒ PERFORMED WATER WASH | ☒ HPC BORESCOPE INSPECTION |
| **COMBUSTOR:** | **HIGH PRESSURE TURBINE** |
| ☒ COMBUSTOR BORESCOPE INSPECTION | ☒ HPT STAGE 1 & 2 NOZZLE BORESCOPE INSPECTION |
| | ☒ HPT BLADE BORESCOPE INSPECTION |
| **LOW PRESSURE TURBINE:** | |
| ☒ LPT BORESCOPE INSPECTION | |

☒ ***Please verify all borescope plugs have been reinstalled***

## 4. Borescope Inspection Record

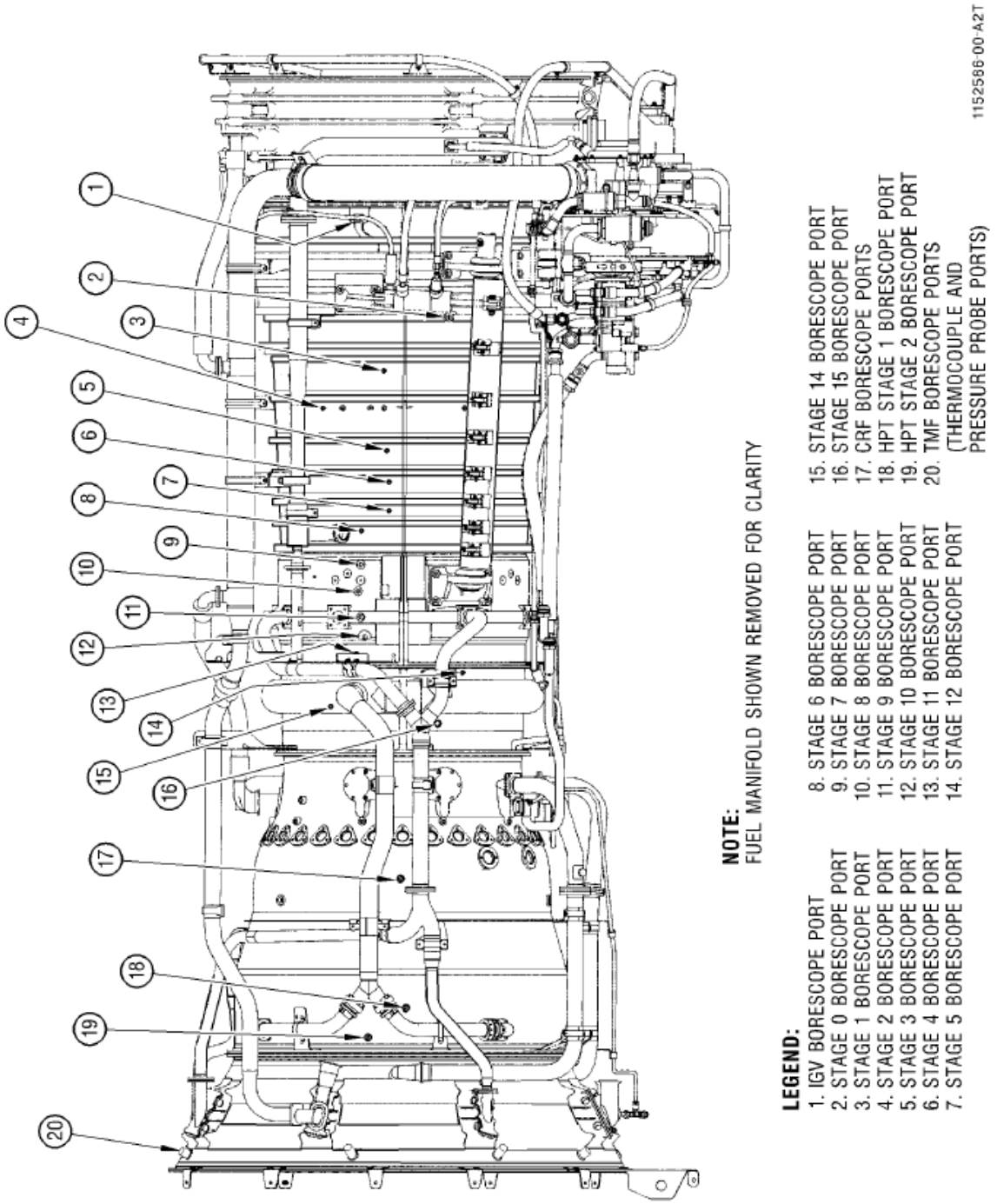



Figure 1: Position of Borescope Inspection Ports.

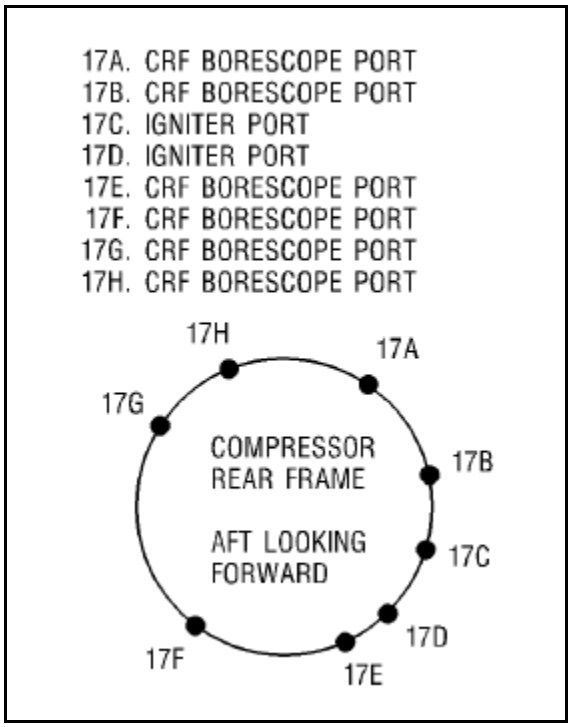


Figure 2: Position of Borescope Inspection Ports.

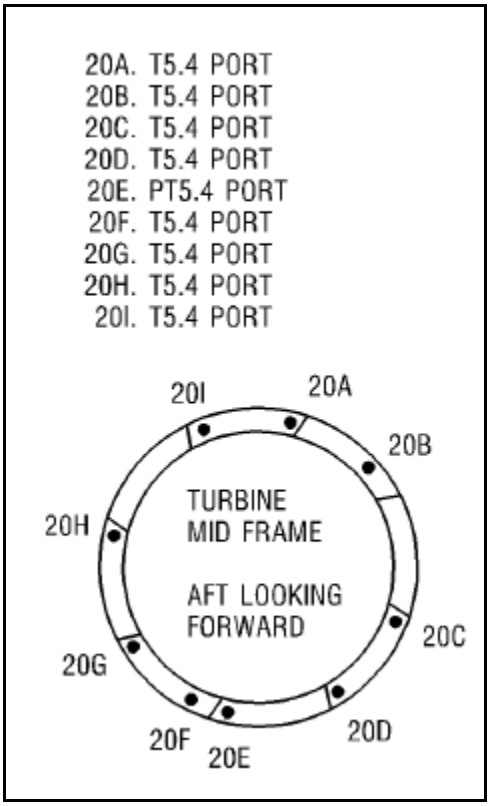


Figure 3: Position of Borescope Inspection Ports.

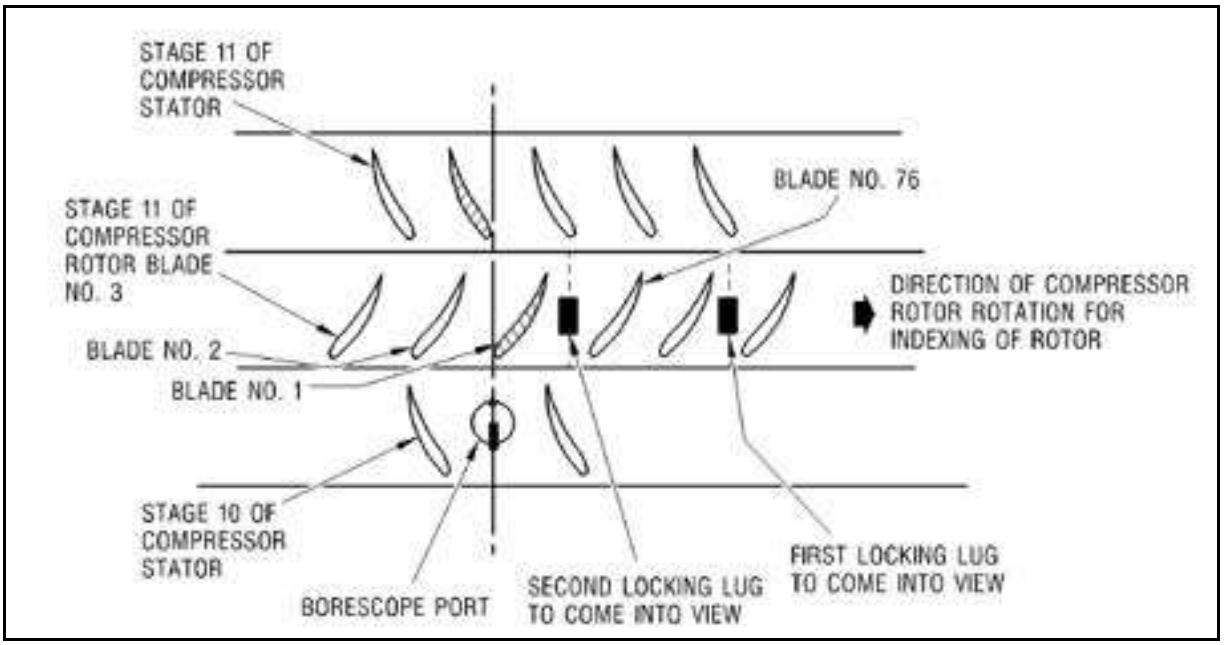


Figure 4: Zero indexing of HPC rotor and HPT rotor

Compressor Section

| Port | T.E. | L.E. | blades | Remarks: | photo no: |
|---|---|---|---|---|---|
| 1 | IGV | | | | 1 |
| 1 | | 0 | 36 | | 2 - 3 |
| 2 | 0 | | 36 | | 4 – 5 |
| 2 | | 1 | 26 | | 6 – 7 |
| 3 | 1 | | 26 | | 8 – 9 – 10 |
| 3 | | 2 | 26 | | 11 – 12 |
| 4 | 2 | | 26 | | 13 – 14 |
| 4 | | 3 | 42 | | 15 – 16 |
| 5 | 3 | | 42 | | 17 – 18 |
| 5 | | 4 | 45 | | 19 – 20 |
| 6 | 4 | | 45 | | 21 – 22 |
| 6 | | 5 | 48 | | 23 – 24 |
| 7 | 5 | | 48 | | 25 – 26 |
| 7 | | 6 | 54 | | 27 – 28 |
| 8 | 6 | | 54 | Blades contacting tip | |
| 8 | | 7 | 56 | Blades contacting tip | |
| 9 | 7 | | 56 | | 29 – 30 |
| 9 | | 8 | 64 | **One (1) Blade with minor nick in tip area. Serviceable** | 31 - 32 |
| 10 | 8 | | 64 | | 33 – 34 |
| 10 | | 9 | 66 | | 35 |
| 11 | 9 | | 66 | | 36 – 37 |
| 11 | | 10 | 66 | | 38 – 39 |
| 12 | 10 | | 66 | | 40 |
| 12 | | 11 | 76 | | 41 – 42 |
| 13 | 11 | | 76 | | 43 – 44 |
| 13 | | 12 | 76 | | 45 – 46 |
| 14 | 12 | | 76 | | 47 – 48 |
| 14 | | 13 | 76 | | 49 – 50 |
| 15 | 14 | | 76 | Inside bleed manifold | |
| 15 | | 15 | 76 | Inside bleed manifold | |
| 16 | 15 | | 76 | | 51 |
| 16 | | 16 | 76 | | 52 – 53 – 54 |

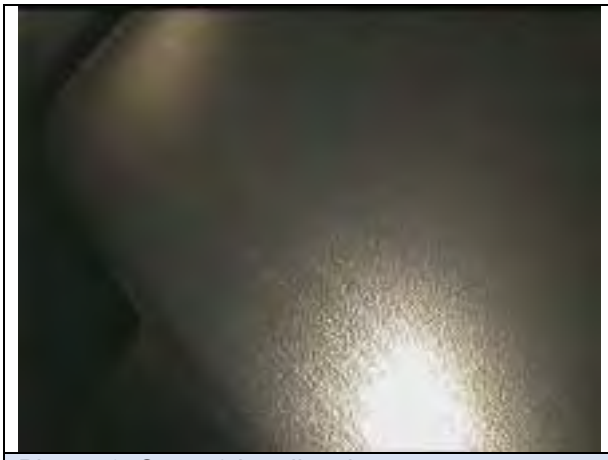
**Notes:**
The HPC Section is serviceable according to GEK105054 Volume II WP40600 Table 4.
There is one (1) blade showing a minor nick in the leading edge tip area. This damage is Serviceable
.



Picture 1. CFF & IGV



Picture 2. Stage 0 Leading edge base



Picture 3. Stage 0 Leading tip



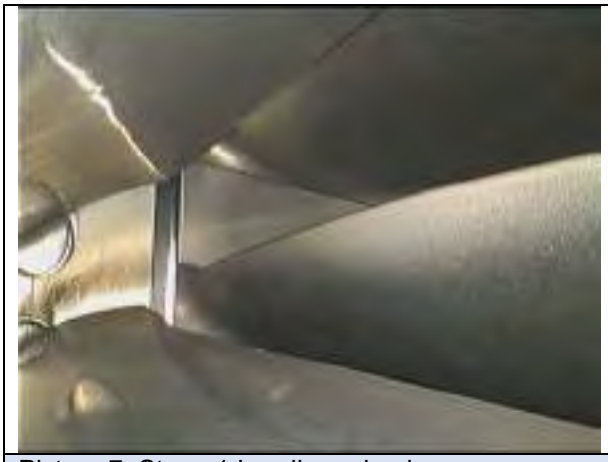
Picture 4. Stage 0 Trailing edge



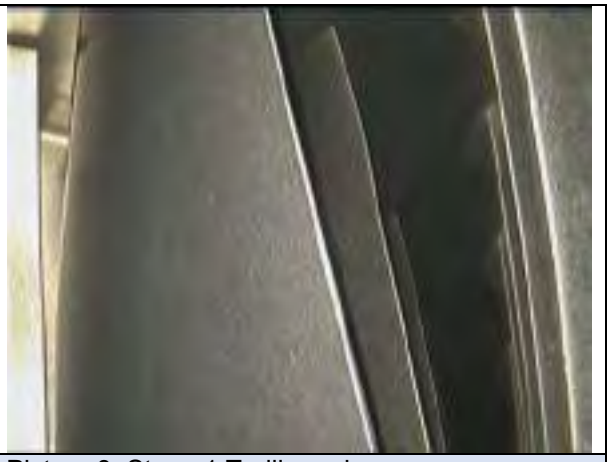
Picture 5. Stage 0 Weep hole



Picture 6. Stage 1 Leading edge tip



Picture 7. Stage 1 Leading edge base



Picture 8. Stage 1 Trailing edge



Picture 9. Stage 1 Weep hole



Picture 10. Stage 1 Blades retainer



Picture 11. Stage 2 Leading edge tip



Picture12. Stage 2 Leading edge base



Picture 13. Stage 2 Trailing edge



Picture 14. Stage 2 Trailing edge



Picture 15. Stage 3 Leading edge tip



Picture 16. Stage 3 Leading edge base



Picture 17. Stage 3 Trailing edge base



Picture 18. Stage 3 Trailing edge tip



Picture 19. Stage 4 Leading edge tip



Picture 20. Stage 4 Leading edge base



Picture 21. Stage 4 Trailing edge



Picture 22. Stage 4 Trailing edge base



Picture 23. Stage 5 Leading edge tip



Picture 24. Stage 5 Leading edge base



Picture 25. Stage 5 Trailing edge squealer tip



Picture 26. Stage 5 Trailing edge



Picture 27. Stage 6 Leading edge tip



Picture 28. Stage 6 Leading edge base



Picture 29. Stage 7 Trailing edge



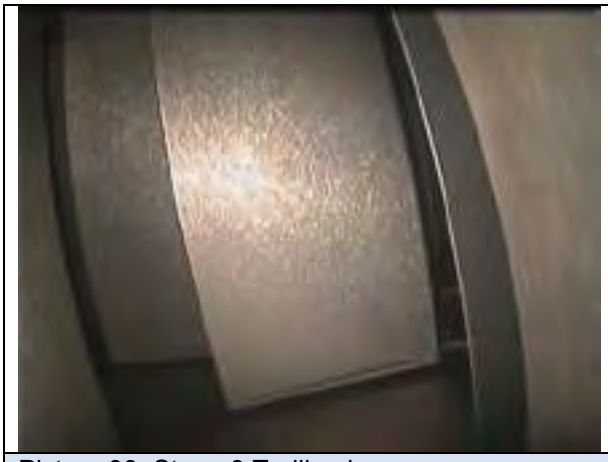
Picture 30. Stage 7 Trailing edge base



Picture 31. Stage 8 Leading edge minor nick



Picture 32. Stage 8 Leading edge base



Picture 33. Stage 8 Trailing base



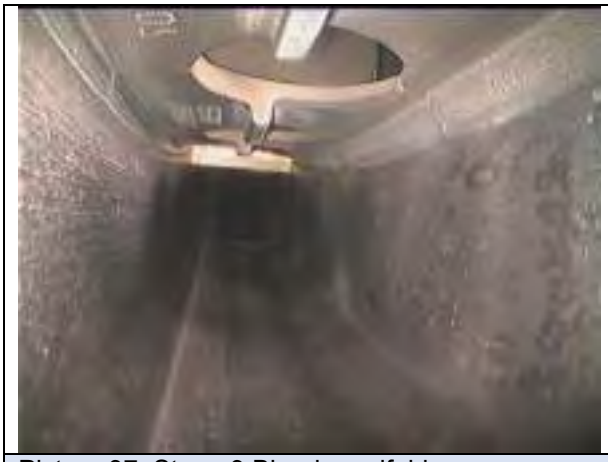
Picture 34. Stage 8 Trailing edge base



Picture 35. Stage 9 Leading edge



Picture 36. Stage 9 Trailing edge



Picture 37. Stage 9 Bleed manifold



Picture 38. Stage 10 Leading edge tip



Picture 39. Stage 10 Leading edge base



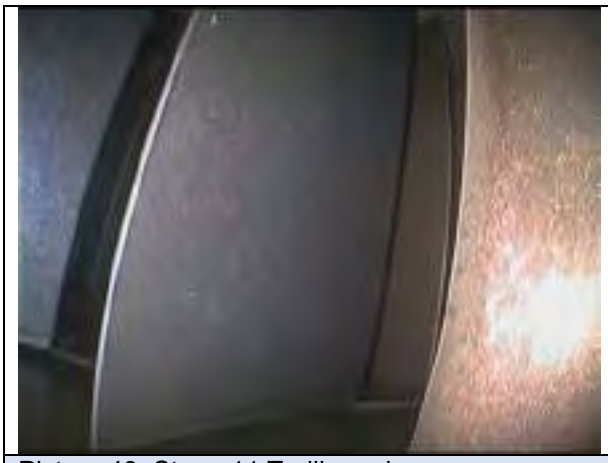
Picture 40. Stage 10 Trailing edge



Picture 41. Stage 11 Leading edge



Picture 42. Stage 11 Leading edge base



Picture 43. Stage 11 Trailing edge



Picture 44. Stage 11 Trailing edge



Picture 45. Stage 12 Leading edge tip



Picture 46. Stage 12 Leading edge base



Picture 47. Stage 12 Trailing edge



Picture 48. Stage 12 Trailing edge



Picture 49. Stage 13 Leading edge



Picture 50. Stage 13 Leading edge



Picture 51. Stage 15 Trailing edge



Picture 52. Stage 16 Leading edge



Picture 53. Stage 16 Leading edge



Picture 54. Outlet guide vanes

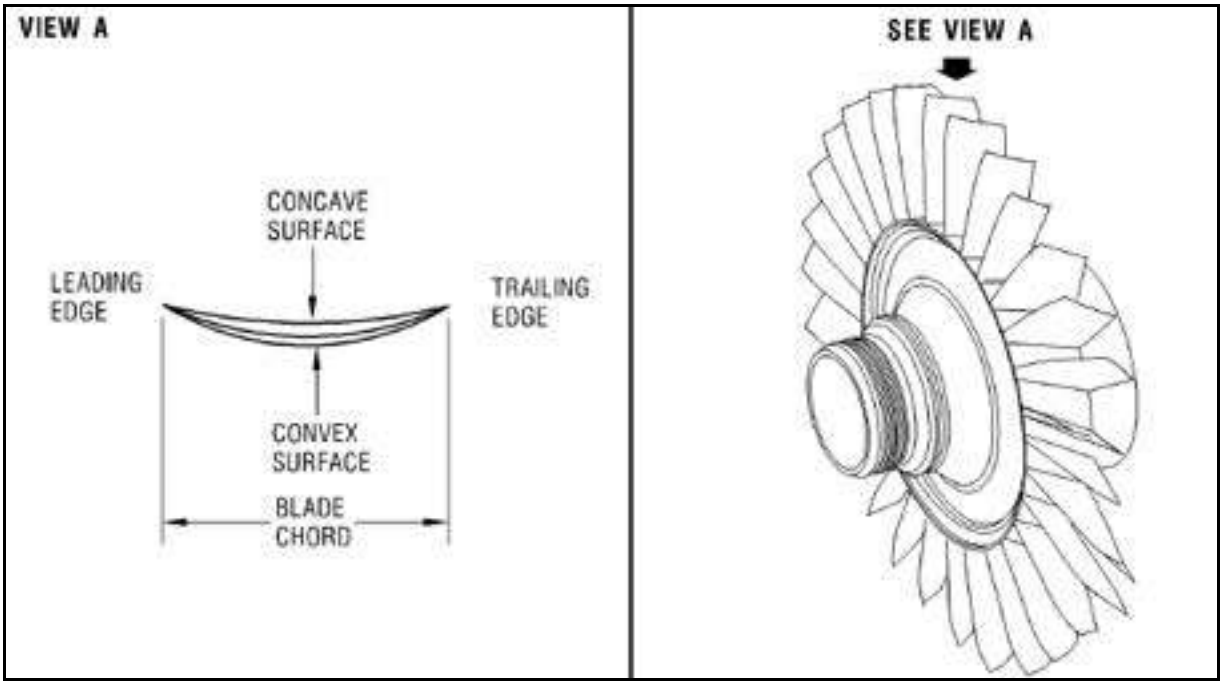



Figure 5: HPC stage 0 BLISK

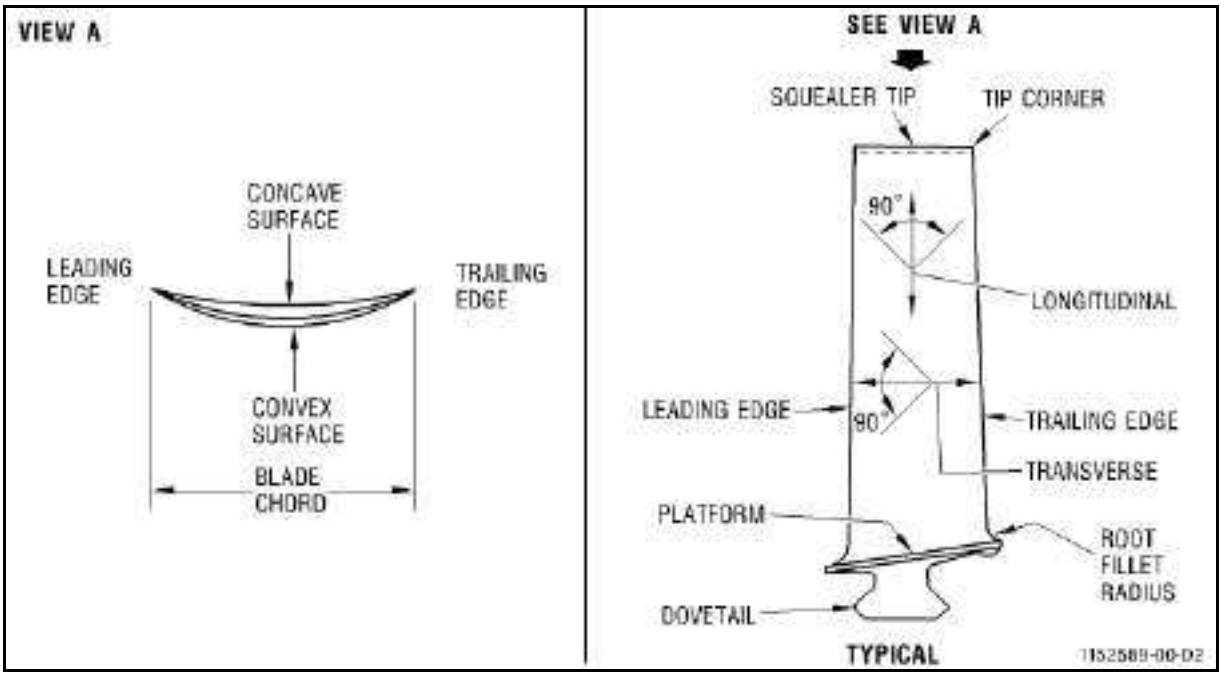



Figure 6: Compressor Rotor Blades

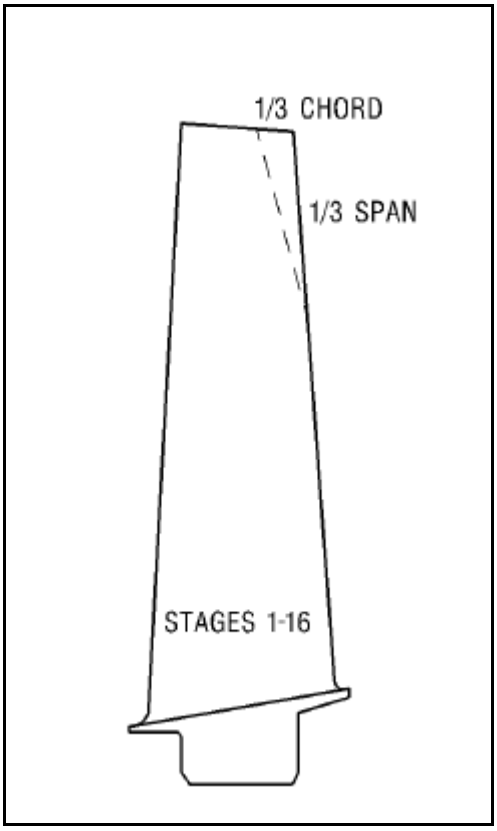


Figure 7: Tip Trailing Edge Inspection

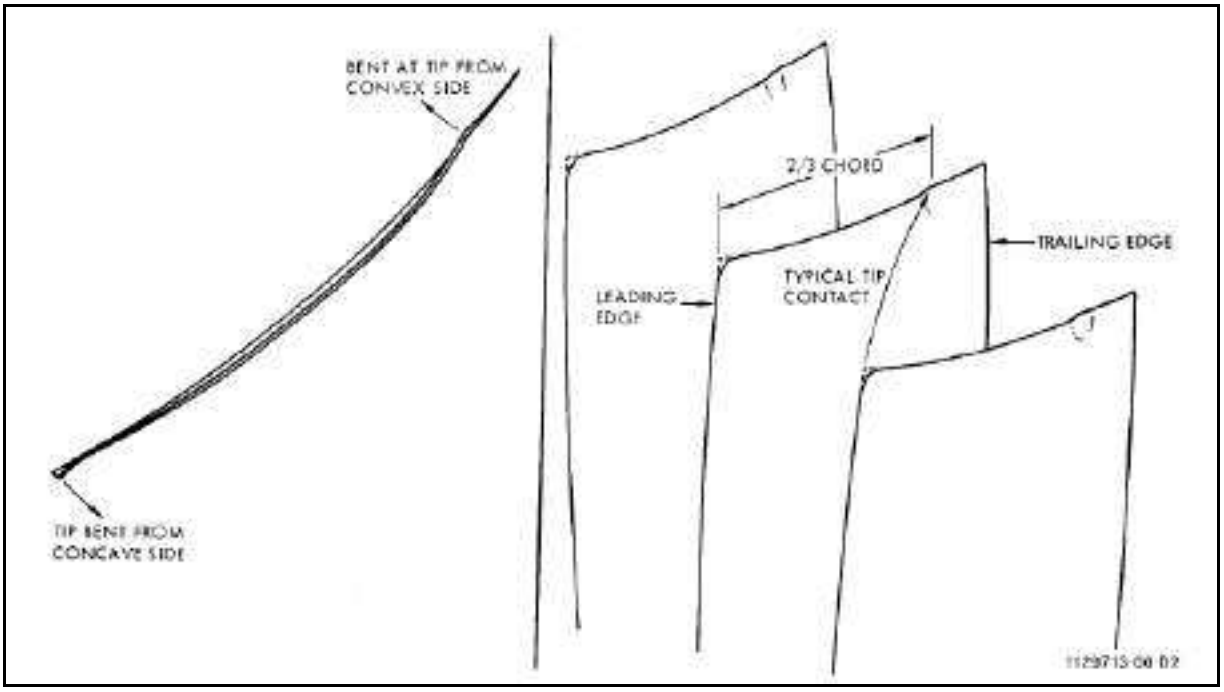
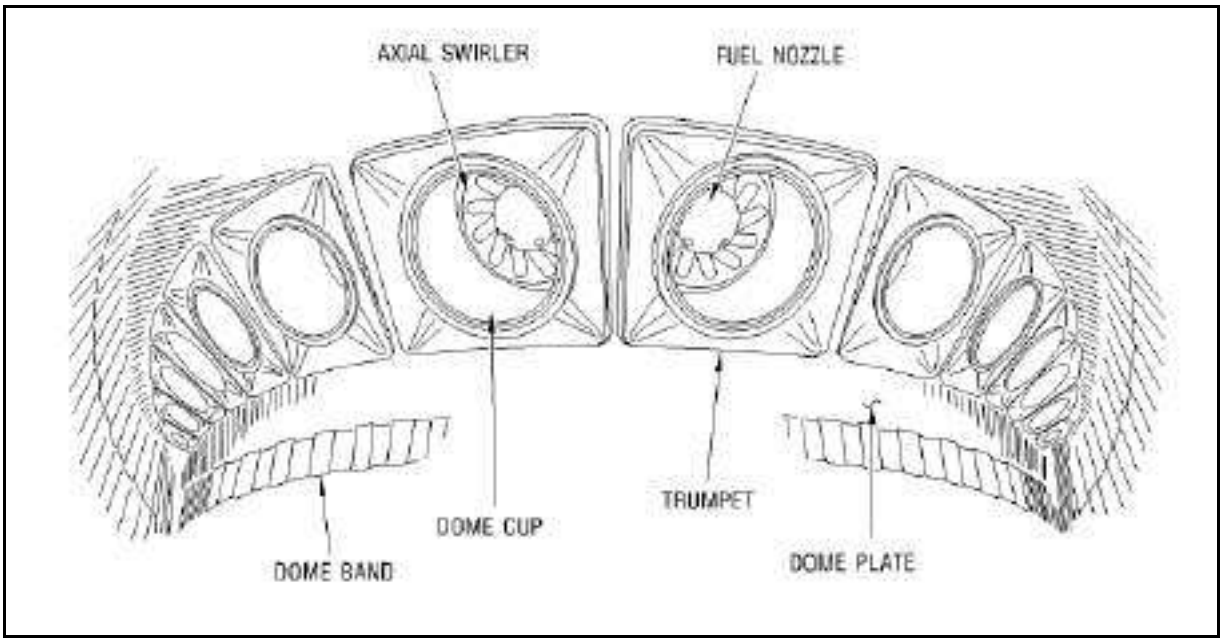


Figure 8: Tip Clanging Contact (HPCR stage 3 through 6)

Combustor and 1St Stage Nozzle Section

| Port | Condition observed | Photo no: |
|---|---|---|
| **17A** | | |
| **17B** | | |
| **17C** | | |
| **17D** | **See below notes.** | |
| **17E** | | |
| **17F** | | |
| **17G** | | |
| **17H** | | |
| **17** | 1st stage nozzle (leading edge): | |

**Notes:**
The Combustor section is serviceable according to GEK105054 Volume II WP40600 Table 7.



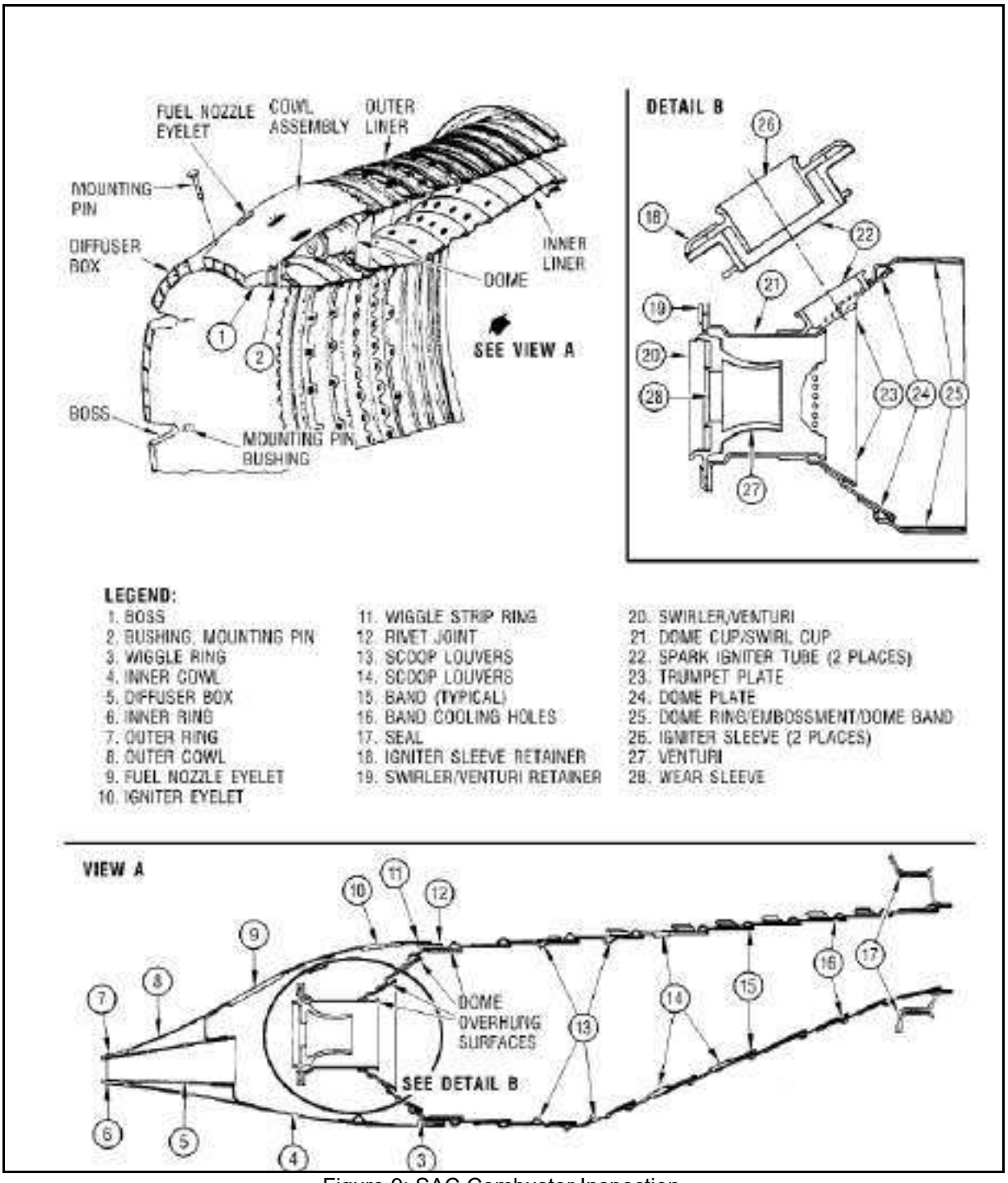



Figure 9: SAC Combustor Inspection

Figure 10: SAC Combustor Inspection

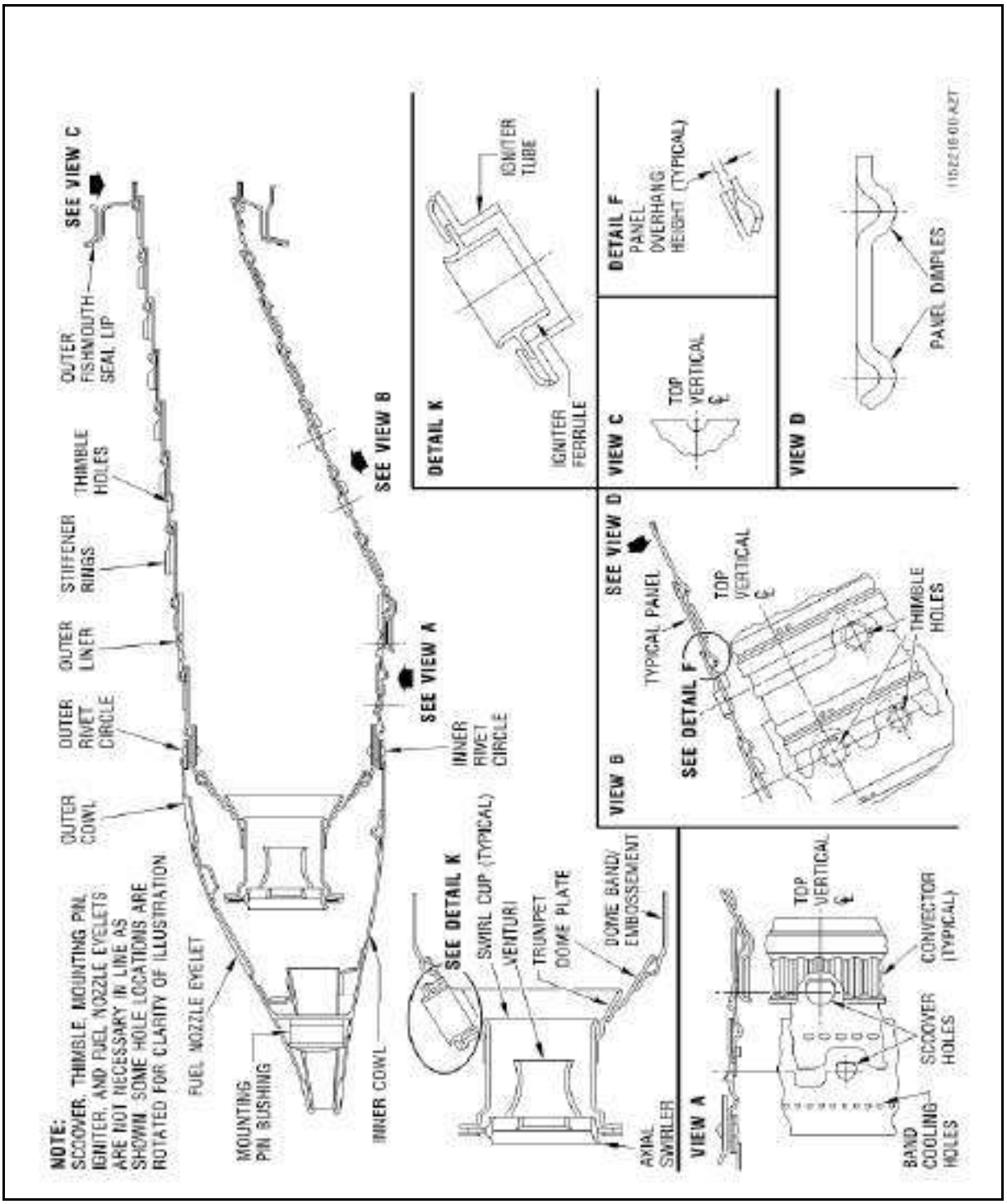



Figure 11: SAC Combustor Inspection

**Borescope Pictures**



Picture 55. Upper igniter installed



Picture 56. Lower igniter installed



Picture 57. Inner liner



Picture 58. Inner rivets band



Picture 59. Combustor outer rivets band



Picture 60. Combustor outer liner



Picture 61. Combustor dome. Splash plates



Picture 62. Fuel nozzle tip



Picture 63. Combustor liners and HPT Nozzles



Picture 64. Combustor seals and HPT Nozzles

Turbine Section

| | turbine stage | | | | |
|---|---|---|---|---|---|
| **Port** | **L.E.** | **T.E.** | **blades** | **Remarks:** | **photo no:** |
| **18** | **1** | | **88** | | |
| **19** | | **1** | **88** | **See below notes.** | |
| **19** | **2** | | **90** | | |
| **20** | | **2** | | | |

**Notes:**
The High Pressure Turbine section is not serviceable according to GEK105054 Volume II WP40600 Table 8 paragraph “g” due to the Stage 1 nozzles condition.

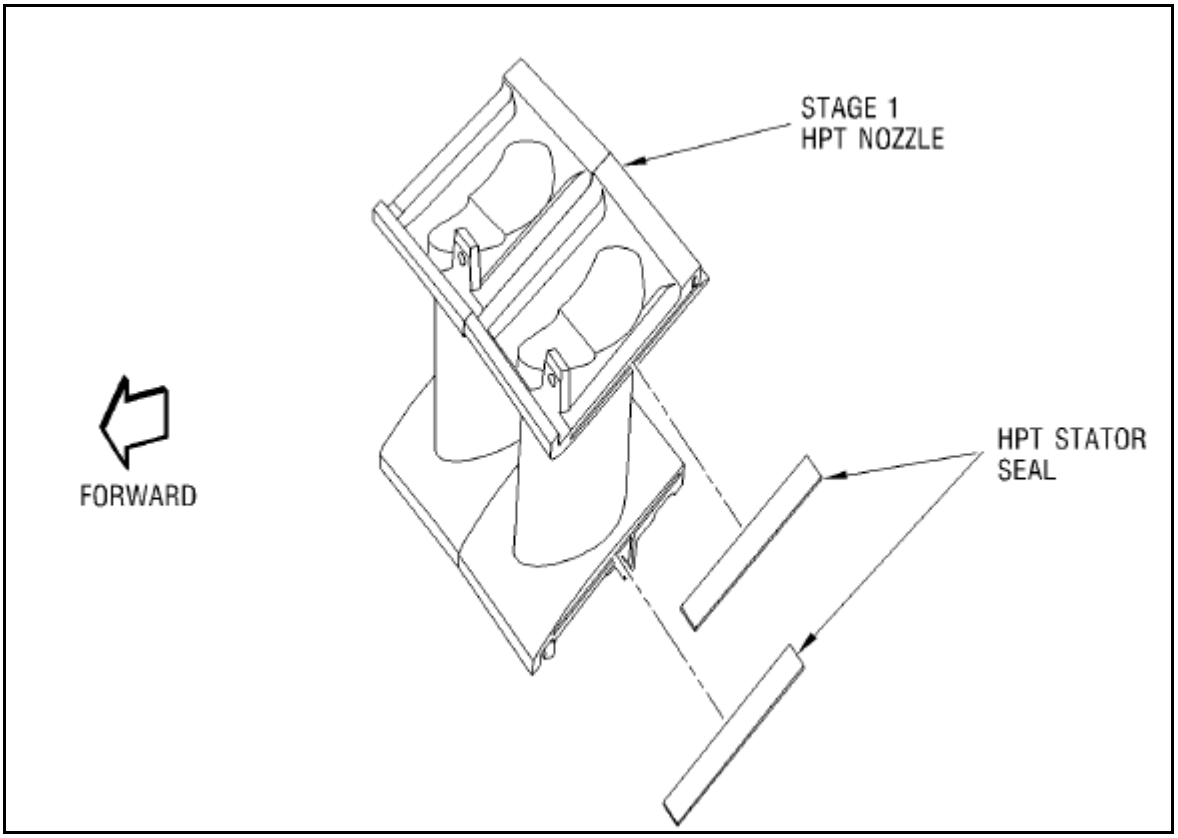


Figure 12: Stage 1 HPT Nozzle Seal Displacement

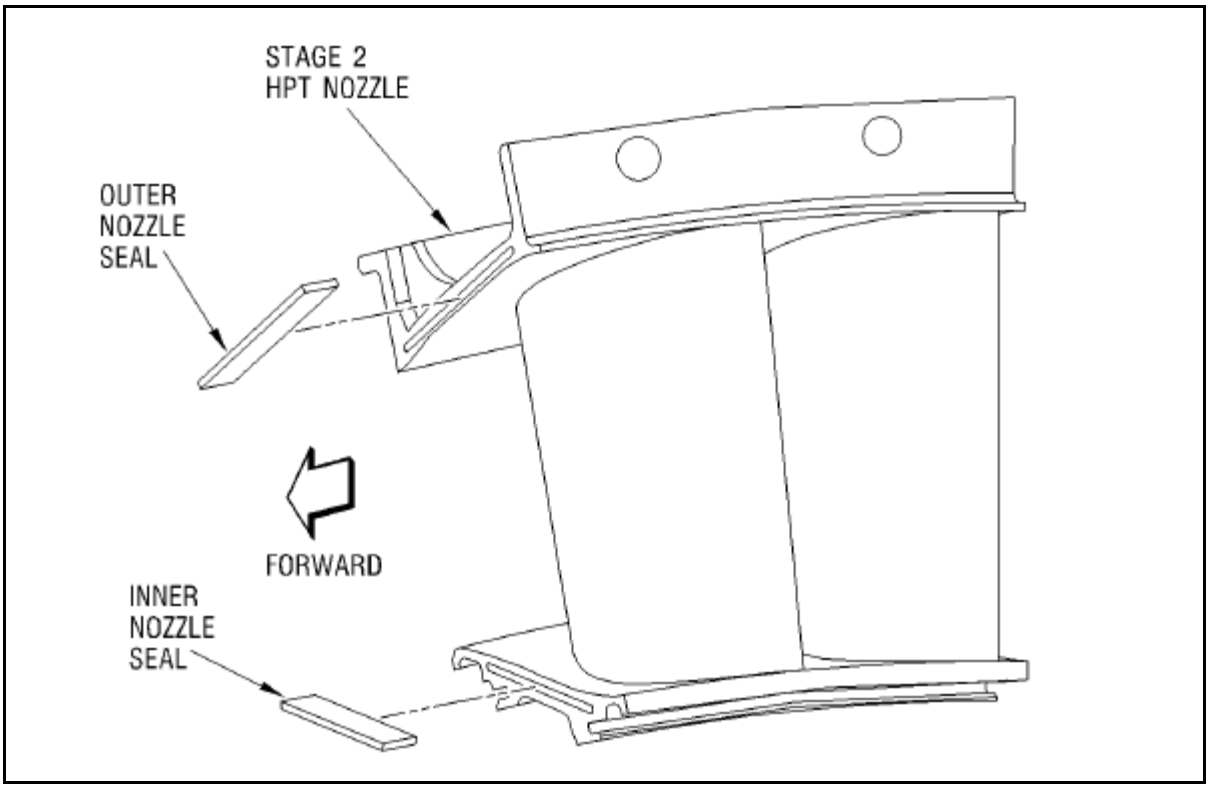


Figure 13: Stage 2 HPT Nozzle Seal Displacement

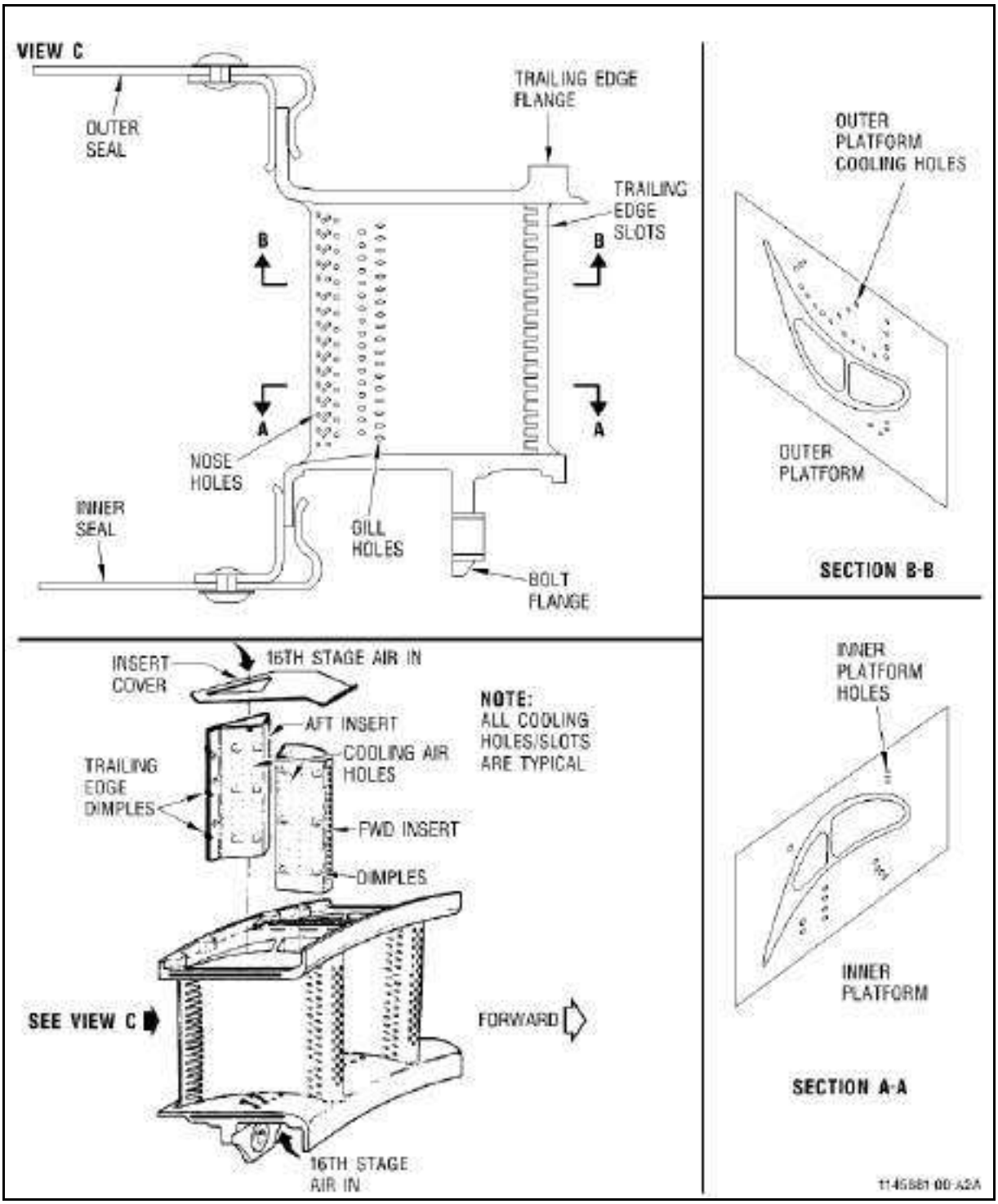



Figure 14: HPT Stage 1 Nozzle

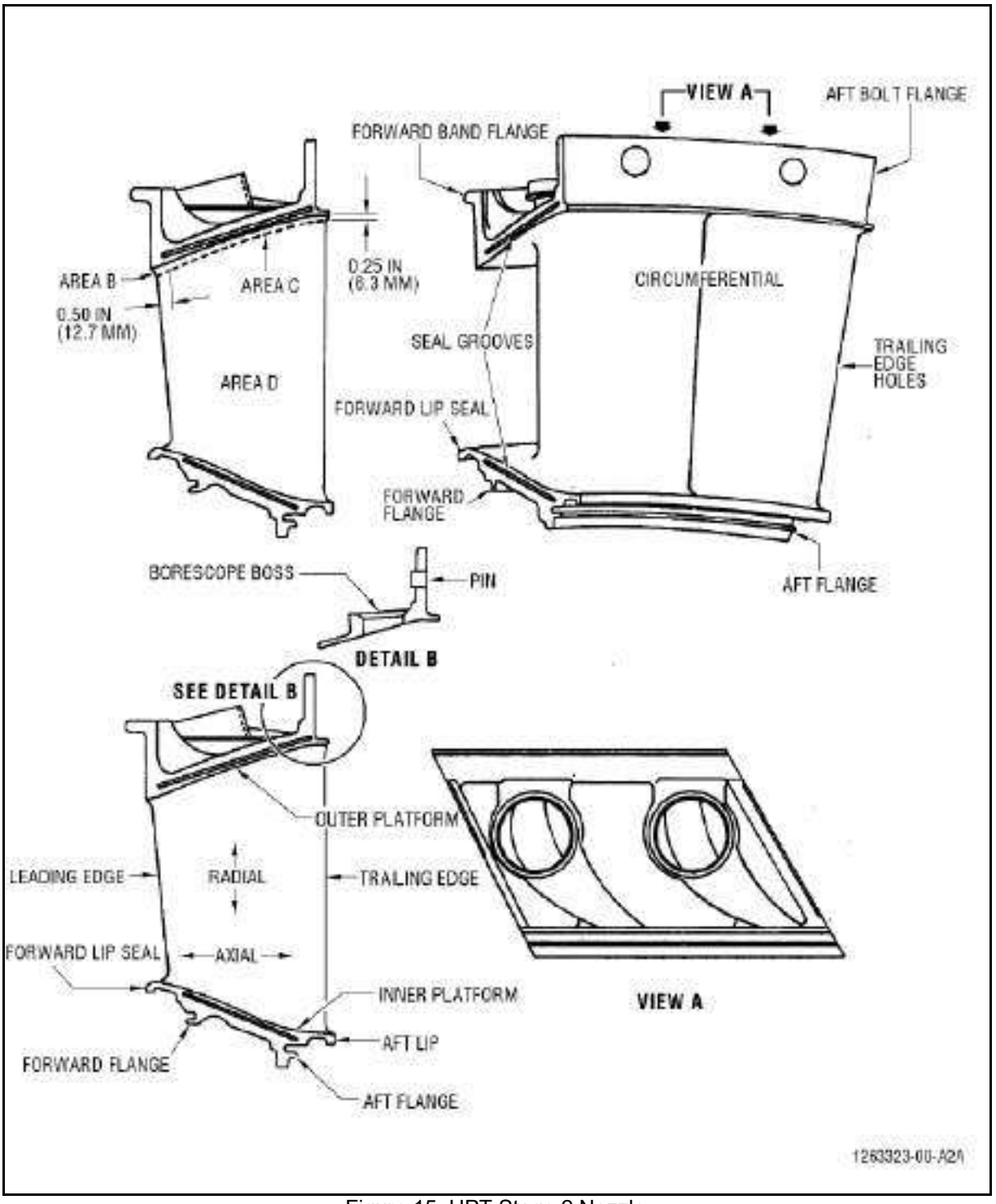



Figure 15: HPT Stage 2 Nozzle

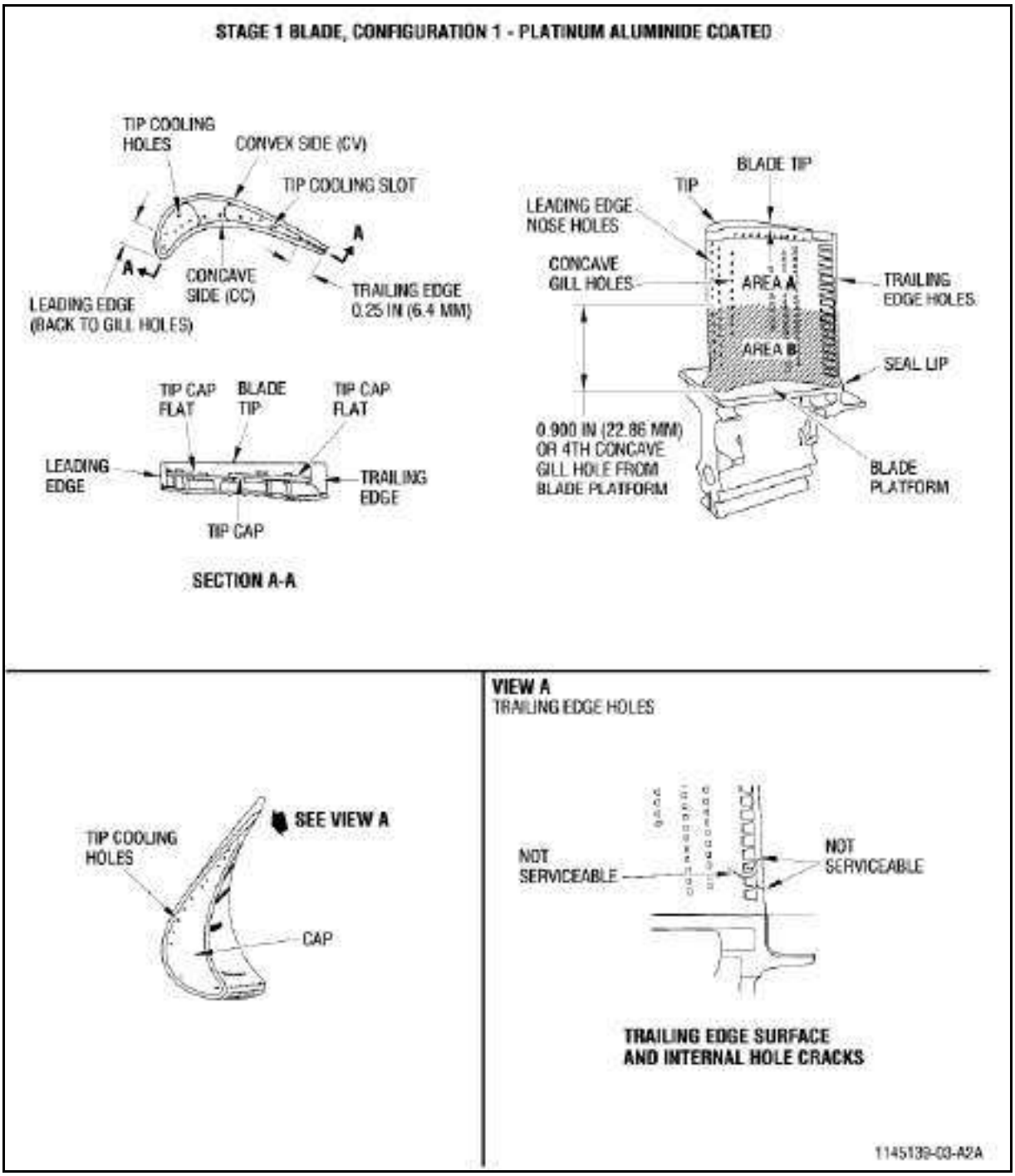



Figure 16: HPT Stage 1 Rotor Blades Inspection Areas (Platinum Aluminide Coated Blades)

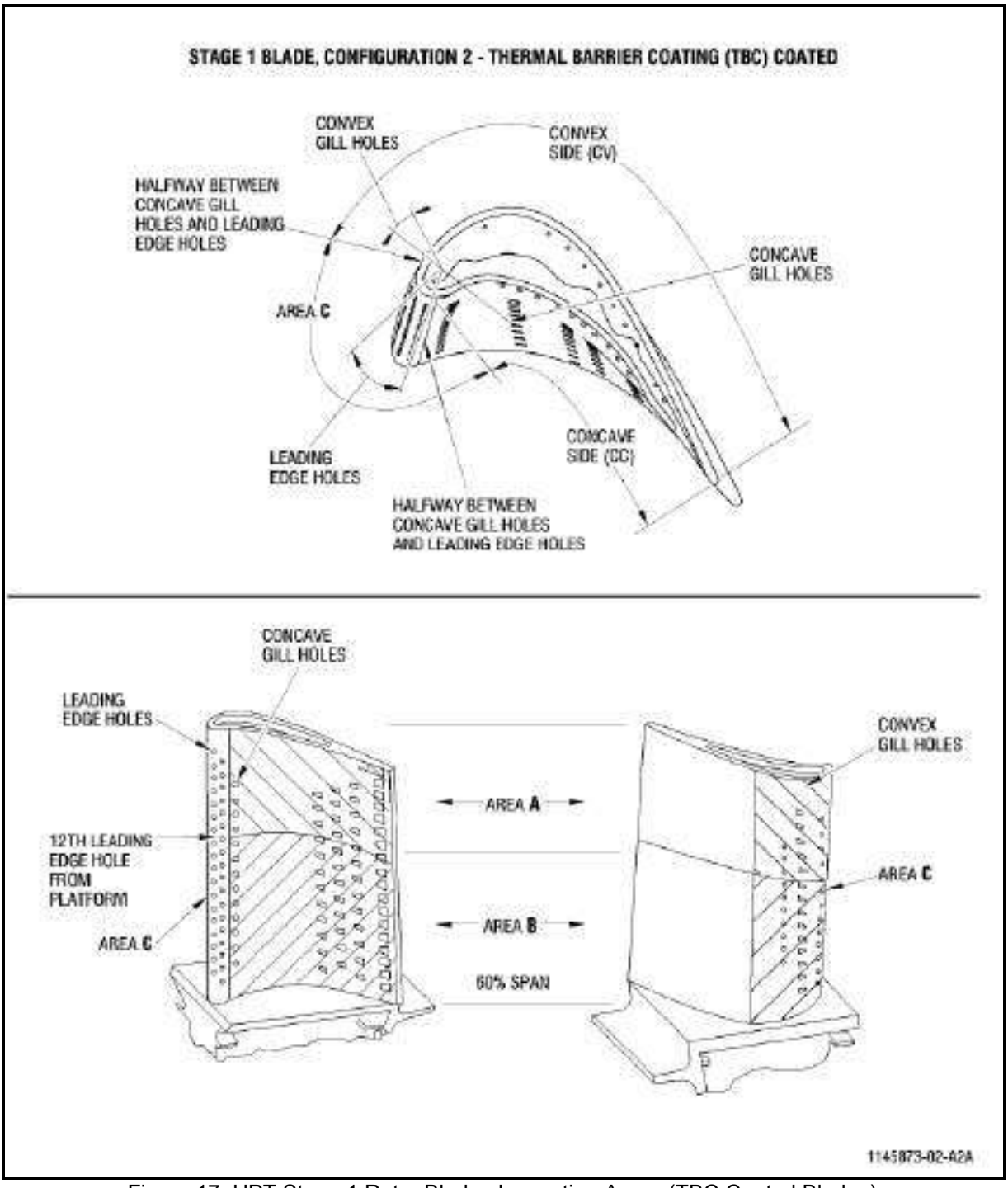



Figure 17: HPT Stage 1 Rotor Blades Inspection Areas (TBC Coated Blades)

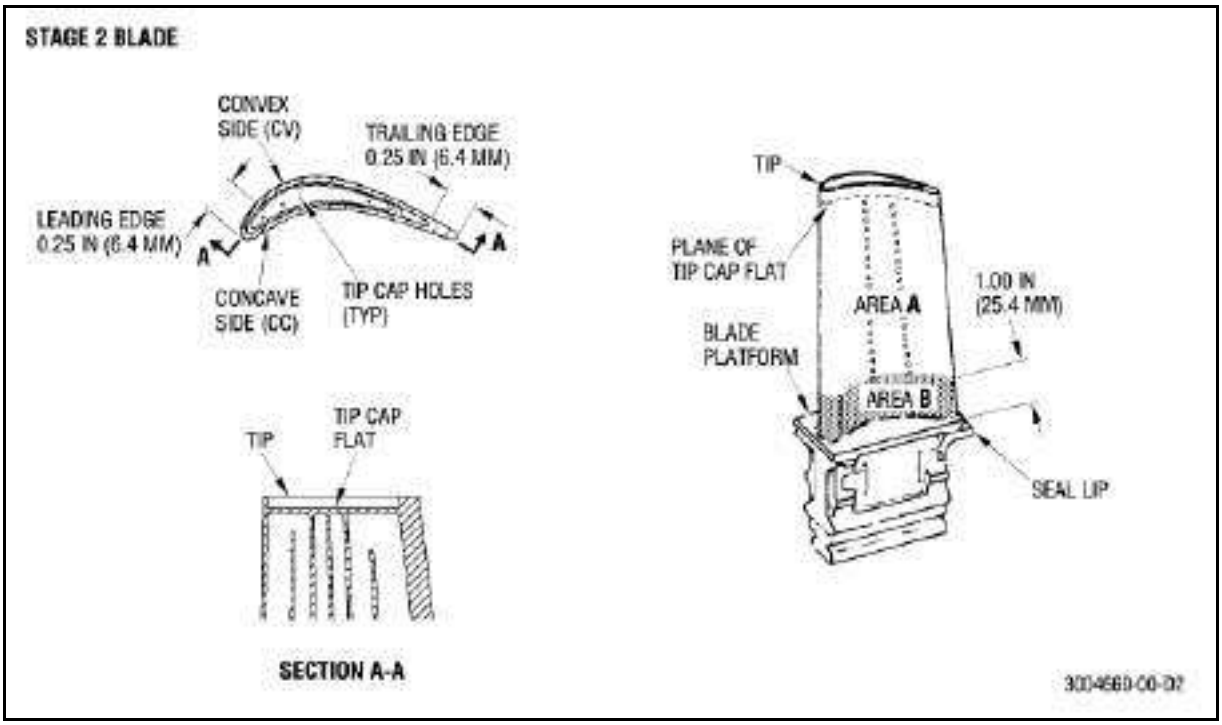


Figure 18: HPT Stage 2 Rotor Blades Inspection Areas

**Borescope Pictures**



Picture 65: Stage1 Nozzles leading edge



Picture 66: Stage1 Nozzles leading edge



Picture 67: Stage1 Nozzle airfoil concave side



Picture 68: Stage1 Nozzle airfoil concave side



Picture 69: Stage1 Nozzle airfoil concave side



Picture 70: Stage1 Nozzle leading edge and convex side



Picture 71: Stage1 Nozzles trailing edge



Picture 72: Stage1 Nozzles trailing edge



Picture 73: Stage1 Nozzles trailing edge



Picture 74: Stage1 Nozzles trailing edge. Blades leading edge



Picture 75: Stage1 Blades leading edge



Picture 76: Stage1 Blades leading edge



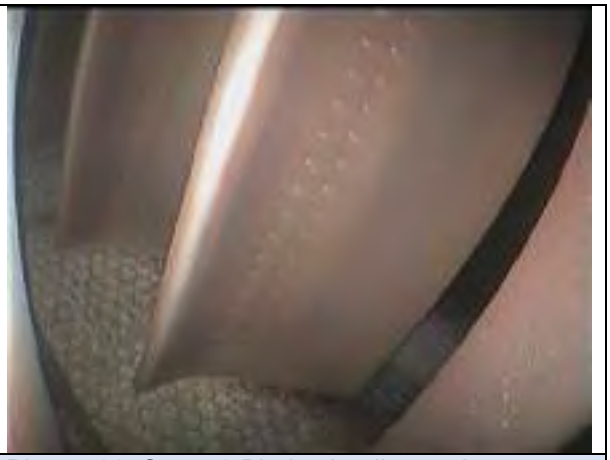
Picture 77: Stage1 Blades trailing edge



Picture 78: Stage1 Nozzle trailing edge and shrouds



Picture 79: Stage 2 Nozzles trailing edge. Blades leading edge



Picture 80: Stage 2 Blades leading and honeycomb seals



Picture 81: Stage 2 Blades trailing edge



Picture 82: Stage 2 Blades trailing edge

LPT Section

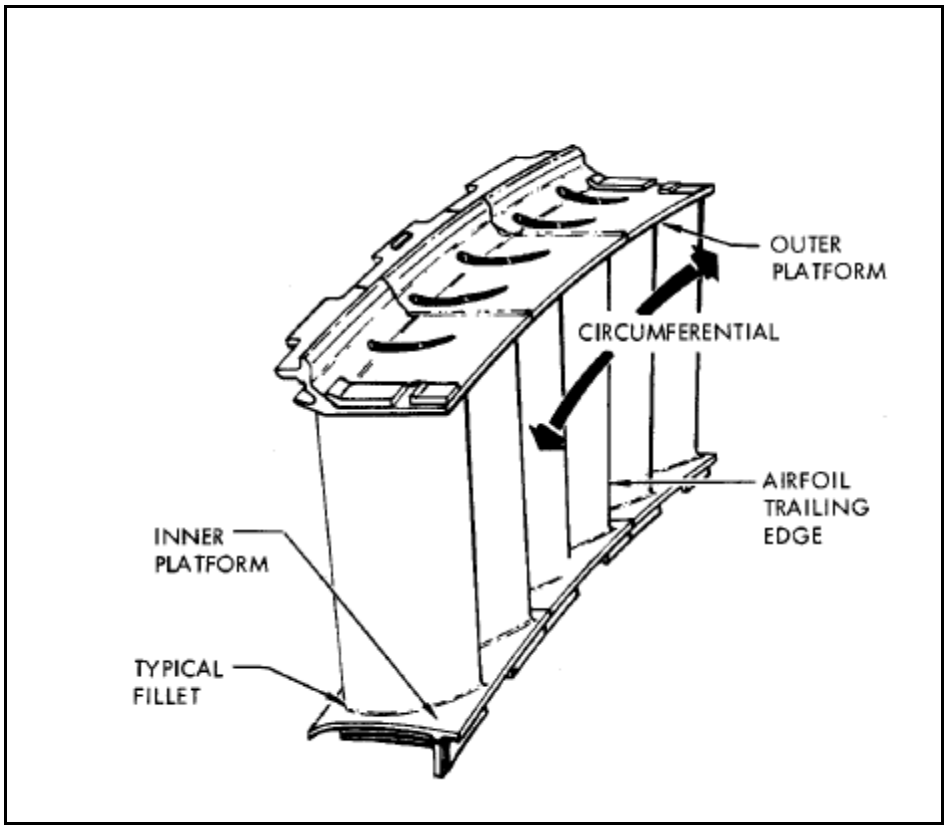



Figure 19: Power Turbine Nozzles

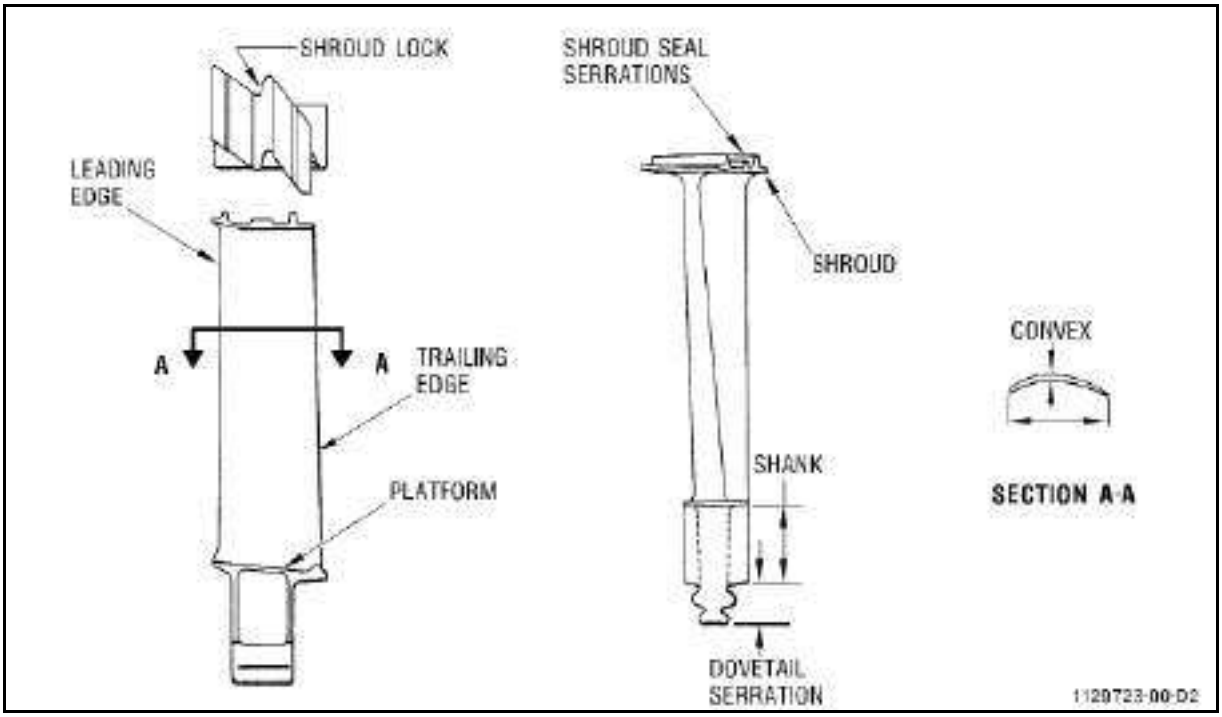



Figure 20: Power Turbine Rotor Blades

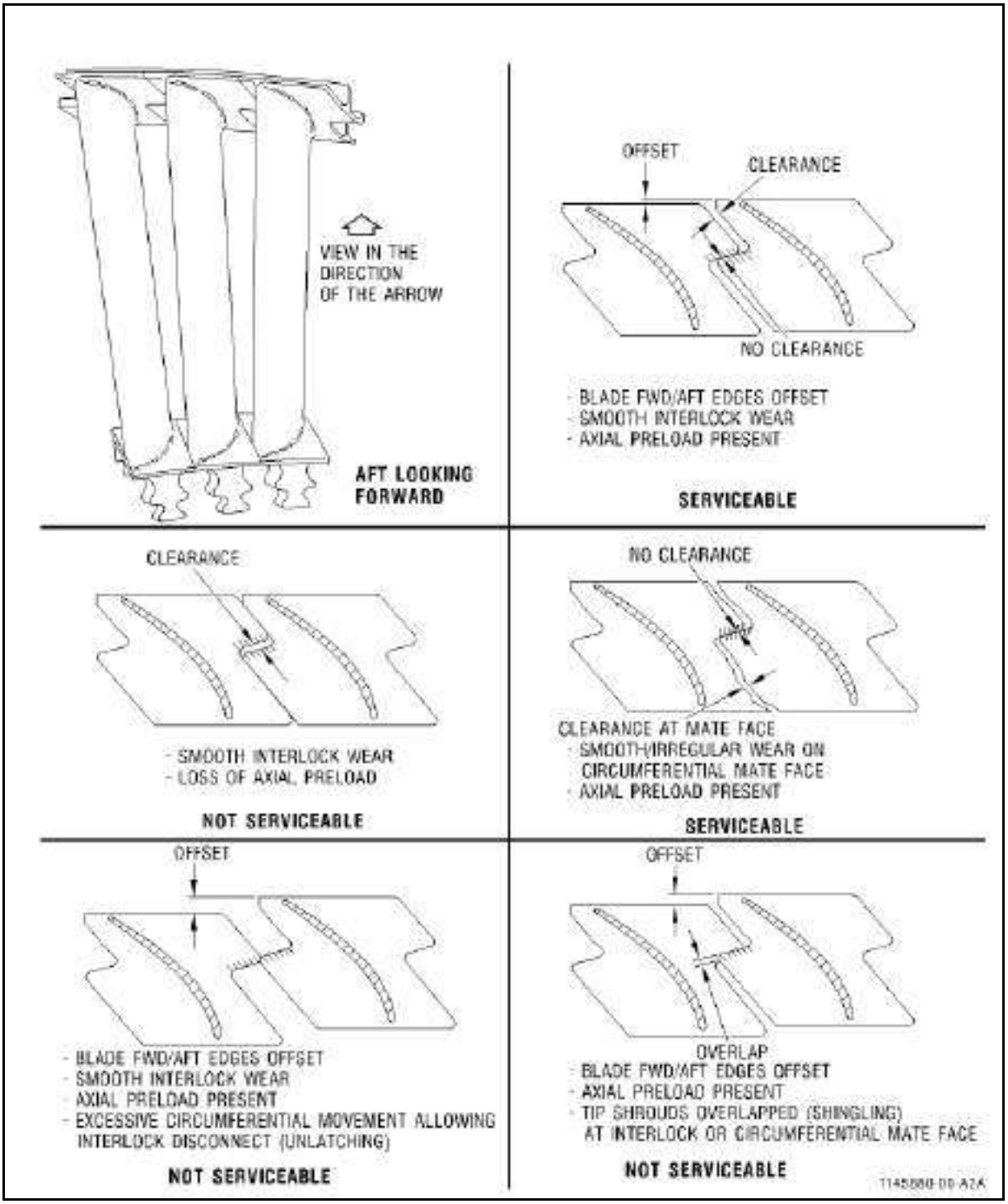


Figure 21: LPT Rotor Blade Circumferential Inspection

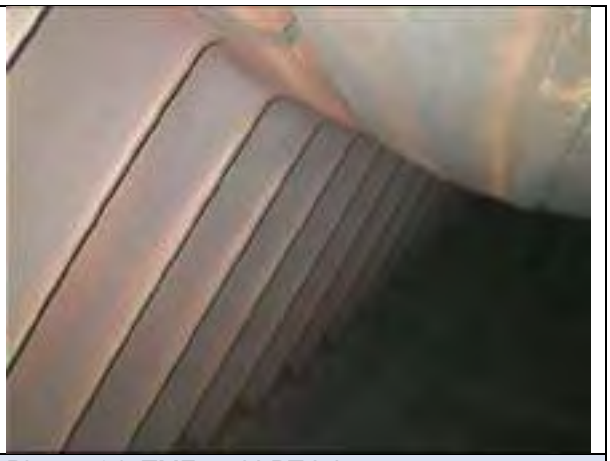
**Notes:**

The LPT stage 1 accessible nozzles and blades did not show any damage.

**Borescope Pictures**



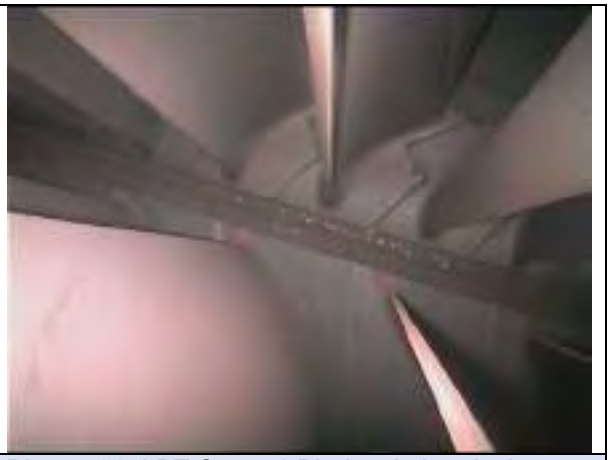
Picture 83: TMF and LPT Inlet



Picture 84: TMF and LPT Inlet



Picture 85: Stage 1 Blades



Picture 86: LPT Stage 1 Blades tip interlock

# *BORESCOPE INSPECTION REPORT*
# *TM2500 GEN. 6-7*
# *7LM2500 – PK – MDWG05*

## NFE SAN JUAN POWER PLANT

## *PACKAGE # 7251579*

## *UNIT #5*

| | | | |
|---|---|---|---|
| **Outage Date:** | December 7, 2024 | **Total Starts:** | 896 |
| **Engine S/N:** | 557 – 252 | **GG Hours:** | 12223 |
| **Power Turbine S/N:** | 557 - 252 | **PT Hours:** | 12223 |
| **PPG GT Field Engineer:** | JC Requena H | **NFE Representative:** | Lance Florent |



# TABLE OF CONTENTS


1 Conclusions and Recommendations .....3
2 Outage Data .....4
3 Borescope Inspection Checklist.....5
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4.3 Turbine Section.....18
4.4 LPT Section .....27

## 1. Conclusions and Recommendations

**Purpose of visit:**
The purpose of this visit was to perform a borescope inspection of the Engine in accordance with GEK105054, WP 406 00.

1.1 The HPC Section is serviceable according to GEK105054 Volume II WP40600 Table 4.
The nick damages detected on stages 6, 7, 8, 10, 13 and 15 are all of them Serviceable.
The HPC section was found clean.

1.2 The Combustor section is serviceable according to GEK105054 Volume II WP40600 Table 7.
The axial crack in the Dome plate detected during previous borescope inspection (October 15, 2024) remains in the same condition.
It is recommended to keep monitoring this damage during the next scheduled inspections.

1.3 The High Pressure Section is serviceable according to GEK105054 Volume II WP40600 Table 8.
The Stage 1 borescope port nozzle shows erosion and axial crack at the outer platform.
The Stage 1 and 2 blades are in good condition.
The Stage 1 shrouds are in good condition.
The Stage 2 Honeycomb seals showed rubbing marks at some positions.

## 2. Outage Data

**ENGINE DATA**

| ESN: | 557-252 | Engine Fired Hours: | 12223 | Package Hours: | 12223 |
|---|---|---|---|---|---|
| Model: | 7LM2500-PK-MDWG05 | Engine Fired starts: | 896 | Package Fired Starts: | 896 |

**MAINTENANCE DATA**

| WP, SB, SL, PB, PL Performed | GEK105054, REV 11 | Date completed | Comments |
|---|---|---|---|
| WP 406 00 | Borescope Inspection | 07DEC24 | SERVICEABLE |

**PARTS DATA**

| Description | PN Removed | SN Removed | Qty | Disposition | PN Installed | SN Installed |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |

## 3. Borescope Inspection Checklist

**Date unit out of operation:** 07DEC24
**Date unit into operation:** 09DEC24
**Last inspection date:** 09MAR24; PPG O&M

**Type of Fuel:** Gas / Diesel
**Type of outage:** Scheduled

**Type of NOx suppression:** Water Injection

**Inspection of gas turbine:**

| WATERWASH: | HIGH PRESSURE COMPRESSOR: |
|---|---|
| ☒ PERFORMED WATER WASH | ☒ HPC BORESCOPE INSPECTION |
| **COMBUSTOR:** | **HIGH PRESSURE TURBINE** |
| ☒ COMBUSTOR BORESCOPE INSPECTION | ☒ HPT STAGE 1 & 2 NOZZLE BORESCOPE INSPECTION |
| | ☒ HPT BLADE BORESCOPE INSPECTION |
| **LOW PRESSURE TURBINE:** | |
| ☒ LPT BORESCOPE INSPECTION | |

☒ ***Please verify all borescope plugs have been reinstalled***

## 4. Borescope Inspection Record

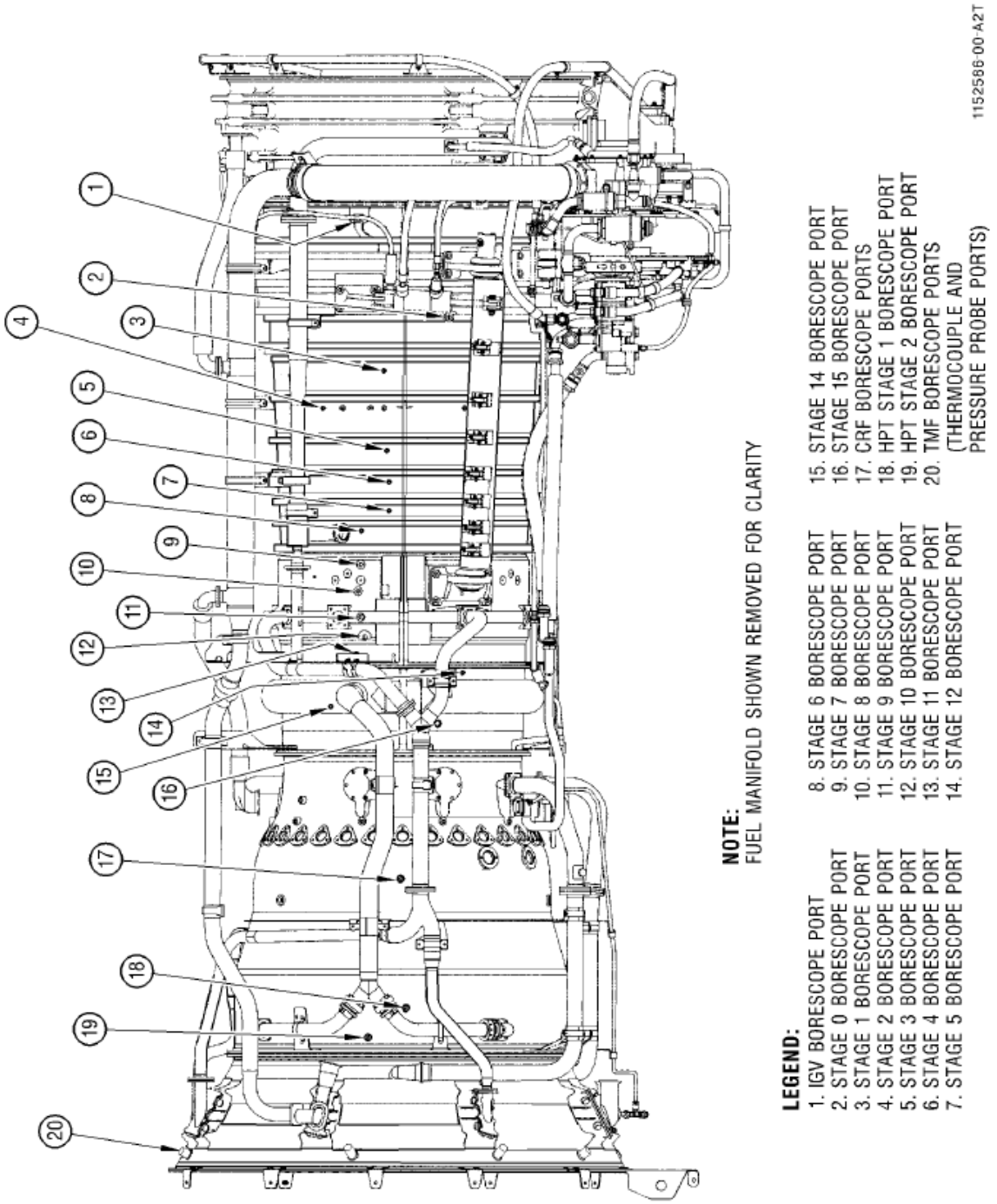



Figure 1: Position of Borescope Inspection Ports.

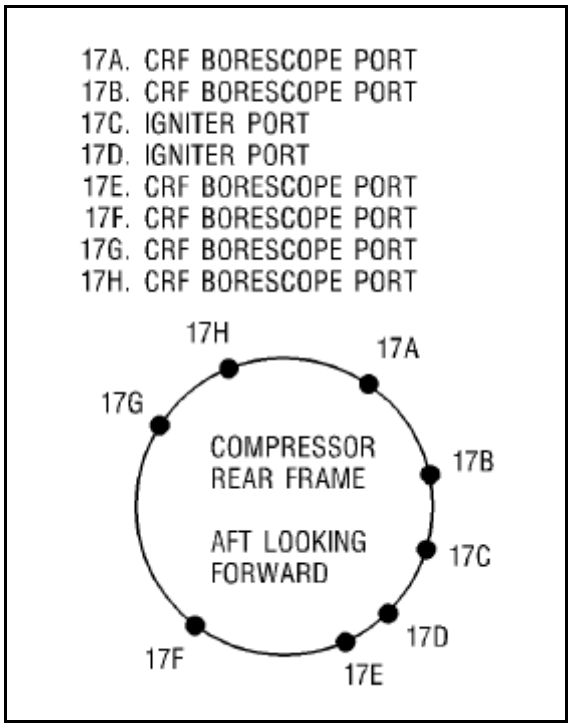


Figure 2: Position of Borescope Inspection Ports.

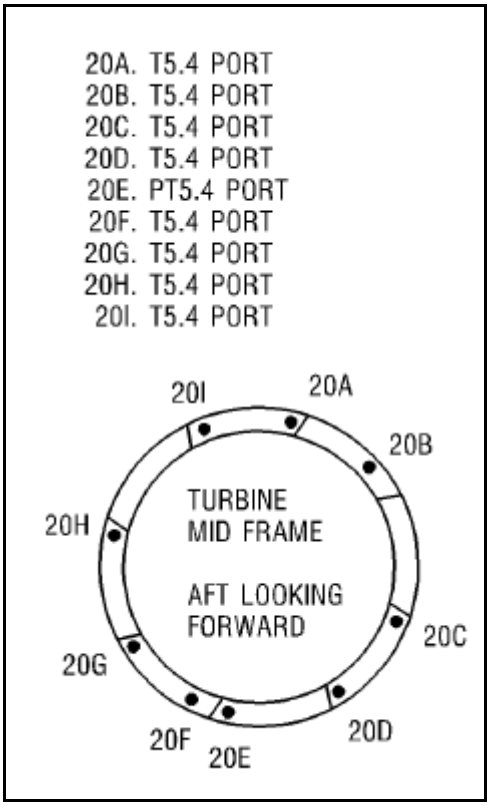


Figure 3: Position of Borescope Inspection Ports.

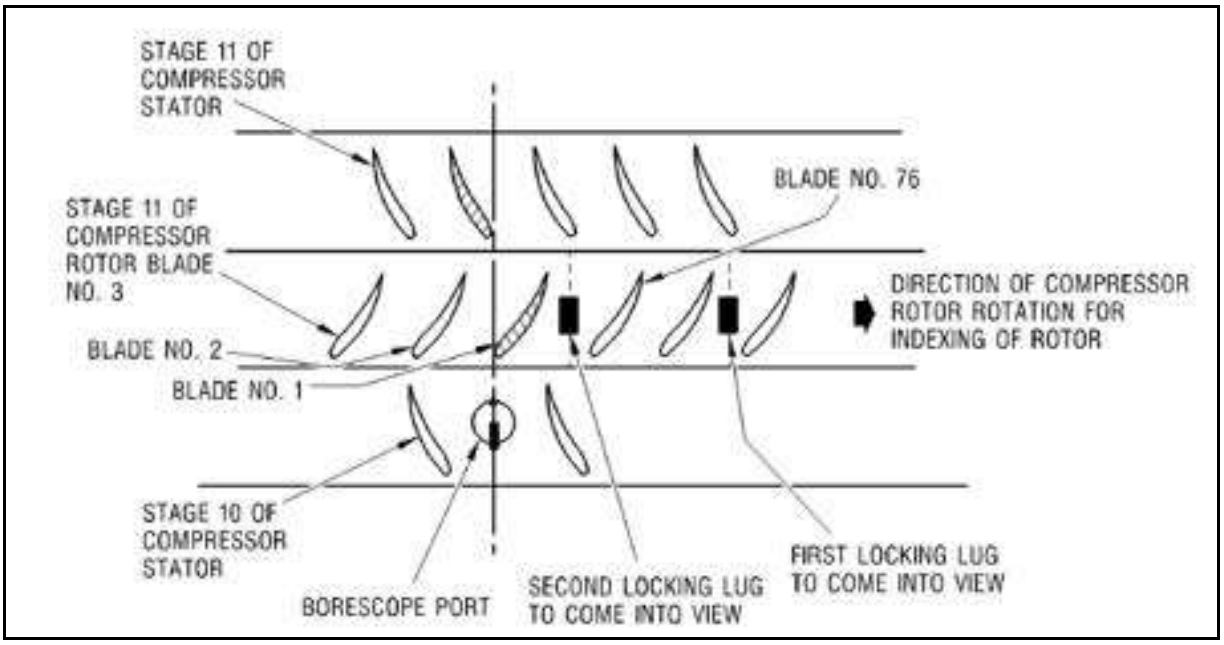


Figure 4: Zero indexing of HPC rotor and HPT rotor

## 4.1 Compressor Section

| Port | T.E. | L.E. | blades | Remarks: | photo no: |
|---|---|---|---|---|---|
| 1 | IGV | | | | 1 |
| 1 | | 0 | 36 | | 2 – 3 |
| 2 | 0 | | 36 | | 4 |
| 2 | | 1 | 26 | | 5 – 6 – 7 |
| 3 | 1 | | 26 | | 8 – 9 – 10 |
| 3 | | 2 | 26 | | 11 – 12 |
| 4 | 2 | | 26 | | 13 |
| 4 | | 3 | 42 | | 14 – 15 |
| 5 | 3 | | 42 | | 16 |
| 5 | | 4 | 45 | | 17 – 18 |
| 6 | 4 | | 45 | | 19 – 20 |
| 6 | | 5 | 48 | | 21 – 22 |
| 7 | 5 | | 48 | | 23 – 24 |
| 7 | | 6 | 54 | **One (1) Blade with minor nick on tip area** | 25 – 26 |
| 8 | 6 | | 54 | Blades contacting tip | |
| 8 | | 7 | 56 | Blades contacting tip | |
| 9 | 7 | | 56 | **One (1) Blade with minor nick on leading edge tip area** | 27 – 28 |
| 9 | | 8 | 64 | **One (1) Blade with minor nick on tip area** | 29 – 30 |
| 10 | 8 | | 64 | | 31 |
| 10 | | 9 | 66 | | 32 |
| 11 | 9 | | 66 | | 33 |
| 11 | | 10 | 66 | **One (1) Blade with minor nick on tip area** | 34 – 35 – 36 – 37 |
| 12 | 10 | | 66 | | 38 |
| 12 | | 11 | 76 | | 39 – 40 |
| 13 | 11 | | 76 | | 41 |
| 13 | | 12 | 76 | | 42 – 43 |
| 14 | 12 | | 76 | | 44 – 45 |
| 14 | | 13 | 76 | **One (1) Blade with minor nick on tip area** | 46 - 47 |
| 15 | 14 | | 76 | Inside bleed manifold | |
| 15 | | 15 | 76 | Inside bleed manifold | |
| 16 | 15 | | 76 | **One (1) Blade with nick on leading edge tip area** | 48 – 49 |
| 16 | | 16 | 76 | | 50 – 51 – 52 |

**Notes:**
The HPC Section is serviceable according to GEK105054 Volume II WP40600 Table 4.
The nick damages detected on stages 6, 7, 8, 10, 13 and 15 are all of them Serviceable.
The HPC section was found clean.

.



Picture 1. CFF & IGV



Picture 2. Stage 0 Leading edge tip



Picture 3. Stage 0 Leading edge base



Picture 4. Stage 0 Trailing edge tip



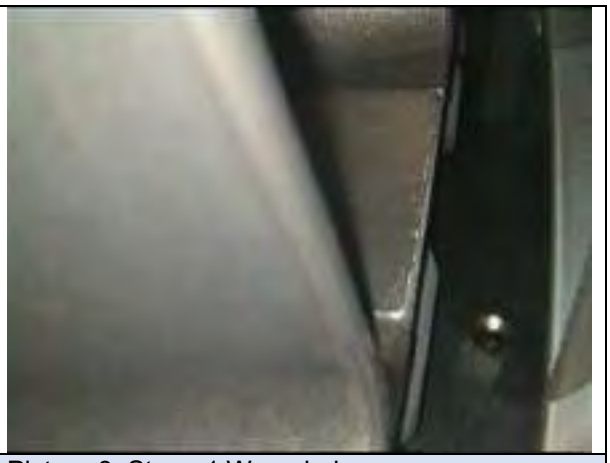
Picture 5. Stage 0 Weep hole



Picture 6. Stage 1 Leading edge base



Picture 7. Stage 1 Leading edge tip



Picture 8. Stage 1 Weep hole



Picture 9. Stage 1 Blades retaining ring



Picture 10. Stage 1 Trailing edge



Picture 11. Stage 2 Leading edge minor nick



Picture12. Stage 2 Leading edge base



Picture 13. Stage 2 Trailing edge



Picture 14. Stage 2 Leading edge



Picture 15. Stage 3 Leading edge base



Picture 16. Stage 3 Trailing edge



Picture 17. Stage 4 Leading edge tip



Picture 18. Stage 4 Leading edge base



Picture 19. Stage 4 Trailing edge base



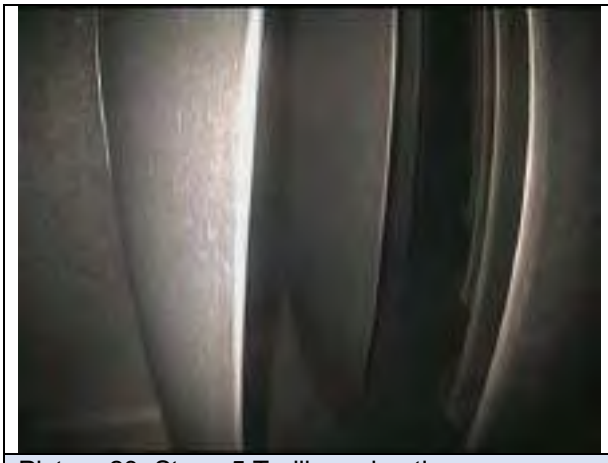
Picture 20. Stage 4 Trailing edge tip



Picture 21. Stage 5 leading edge tip



Picture 22. Stage 5 Leading edge base



Picture 23. Stage 5 Trailing edge tip



Picture 24. Stage 5 Trailing edge base



Picture 25. Stage 6 Leading edge minor nick



Picture 26. Stage 5 Leading edge base



Picture 27. Stage 7 Leading edge minor nick



Picture 28. Stage 7 Trailing edge base



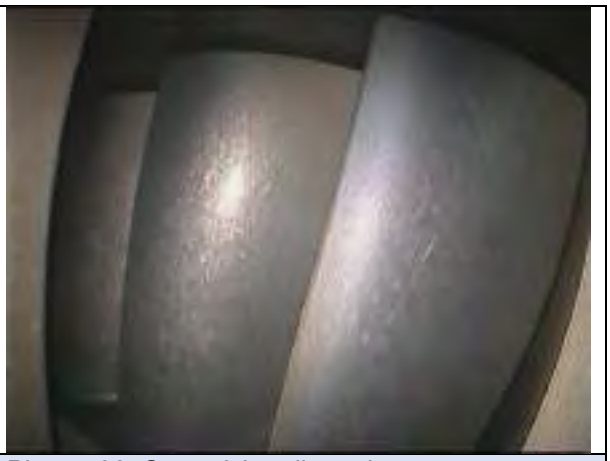
Picture 29. Stage 8 Leading edge minor nick



Picture 30. Stage 8 Leading edge base



Picture 31. Stage 8 Trailing edge



Picture 32. Stage 9 Leading edge



Picture 33. Stage 9 Trailing edge



Picture 34. Stage 10 Leading minor nick



Picture 35. Stage 9 Bleed manifold



Picture 36. Stage 10 Leading edge base



Picture 37. Stage 10 Leading edge



Picture 38. Stage 10 Trailing edge



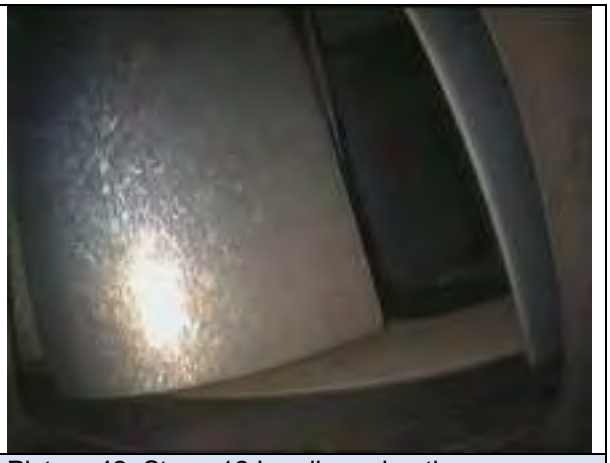
Picture 39. Stage 11 Leading edge



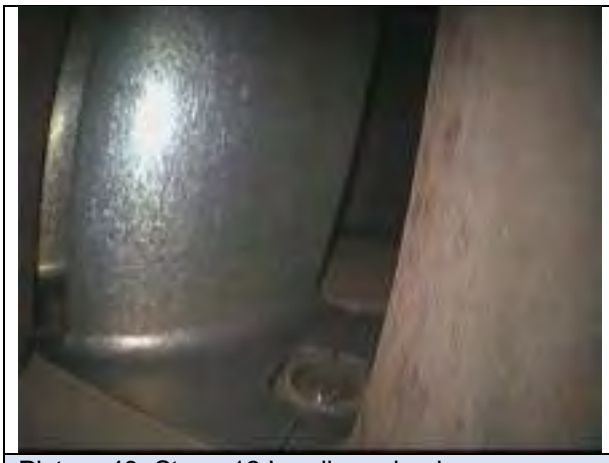
Picture 40. Stage 11 Leading edge base



Picture 41. Stage 11 Trailing edge tip



Picture 42. Stage 12 Leading edge tip



Picture 43. Stage 12 Leading edge base



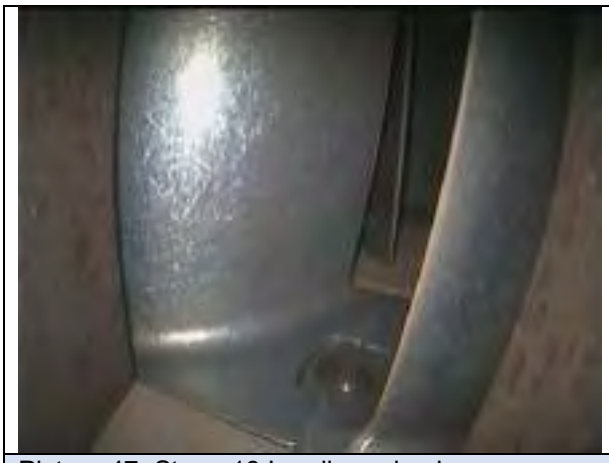
Picture 44. Stage 12 Trailing edge



Picture 45. Stage 12 Trailing edge tip



Picture 46. Stage 13 Leading edge minor nick



Picture 47. Stage 13 Leading edge base



Picture 48. Stage 15 Leading edge nick



Picture 49. Stage 15 Trailing edge



Picture 50. Stage 16 Leading edge



Picture 51. Stage 16 Leading edge



Picture 52. Outlet guide vanes

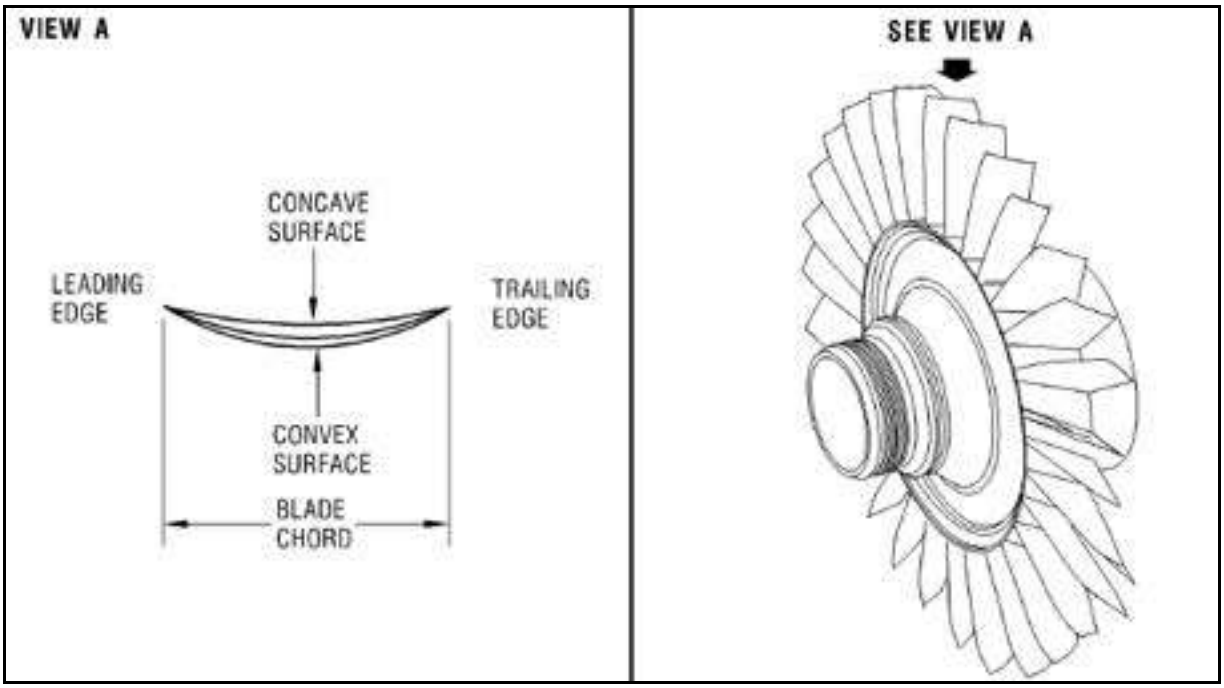



Figure 5: HPC stage 0 BLISK

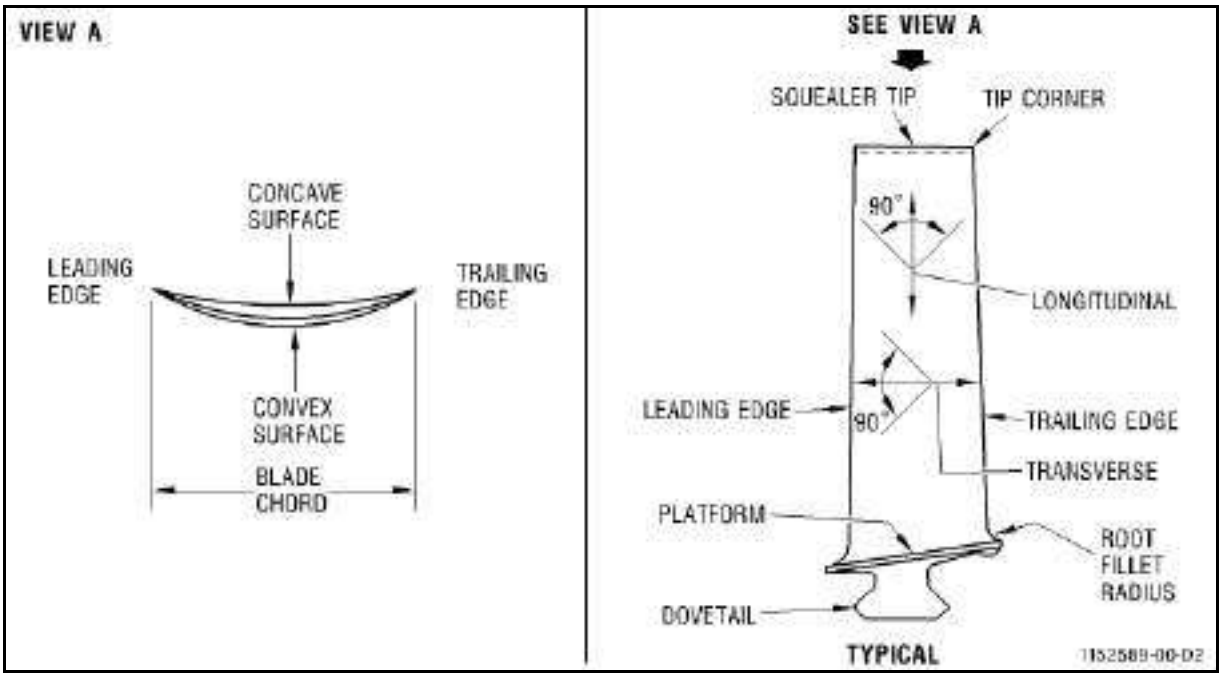



Figure 6: Compressor Rotor Blades

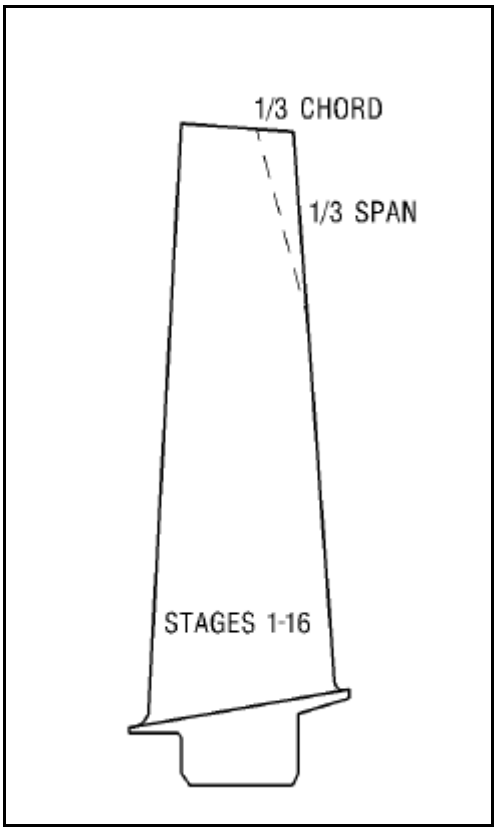


Figure 7: Tip Trailing Edge Inspection

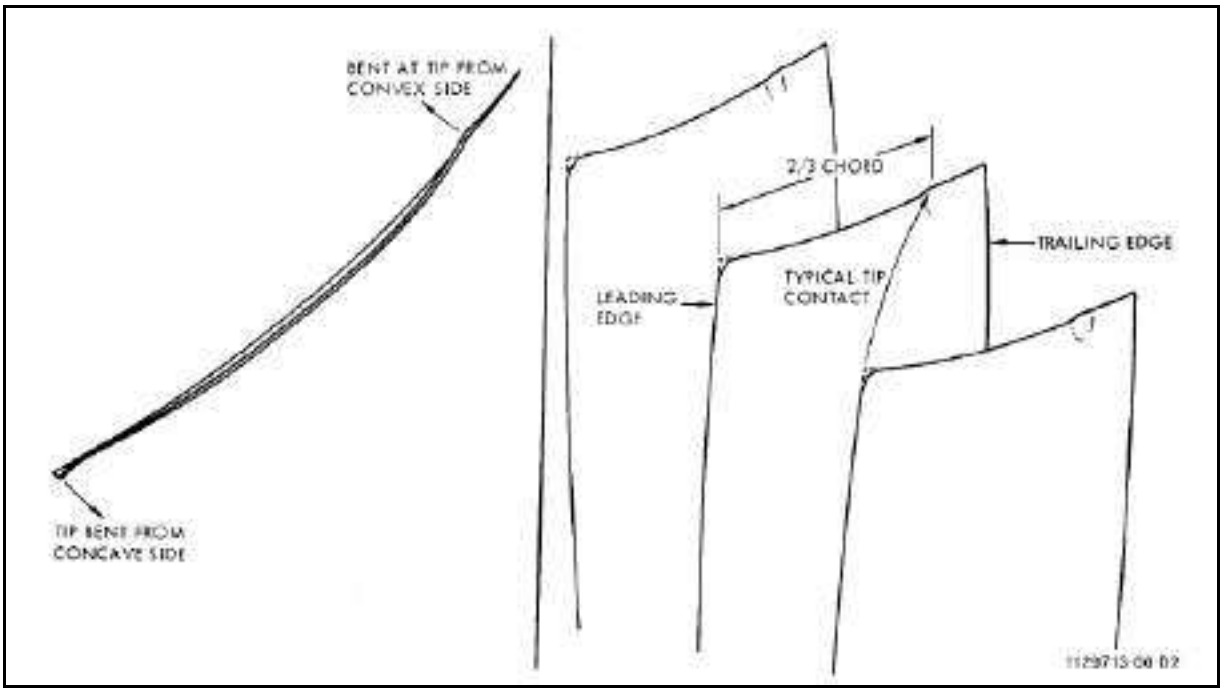
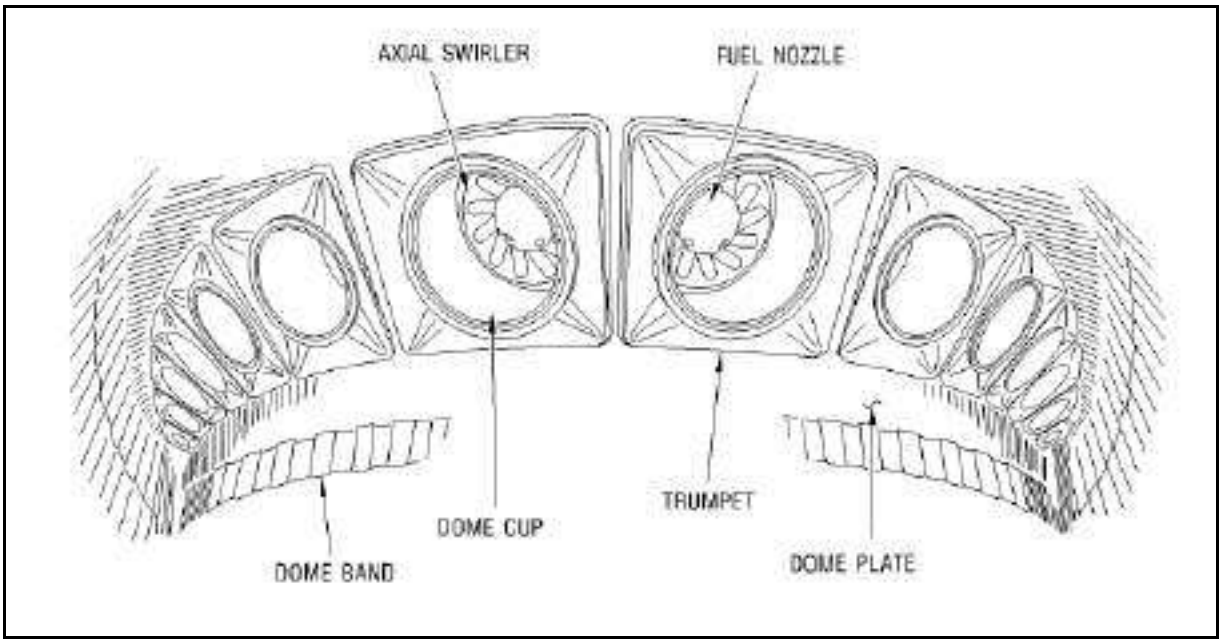


Figure 8: Tip Clanging Contact (HPCR stage 3 through 6)

## 4.2 Combustor and 1St Stage Nozzle Section

| Port | Condition observed | Photo no: |
|---|---|---|
| **17A** | | |
| **17B** | | |
| **17C** | | |
| **17D** | **See below notes.** | |
| **17E** | | |
| **17F** | | |
| **17G** | | |
| **17H** | | |
| **17** | 1st stage nozzle (leading edge): | |

**Notes:**
The Combustor section is serviceable according to GEK105054 Volume II WP40600 Table 7.
The axial crack in the Dome plate detected during previous borescope inspection (October 15, 2024) remains in the same condition. The Combustor section is serviceable; please refer to Table 7 paragraph 3.a.
It is recommended to keep monitoring this damage during the next scheduled inspections.



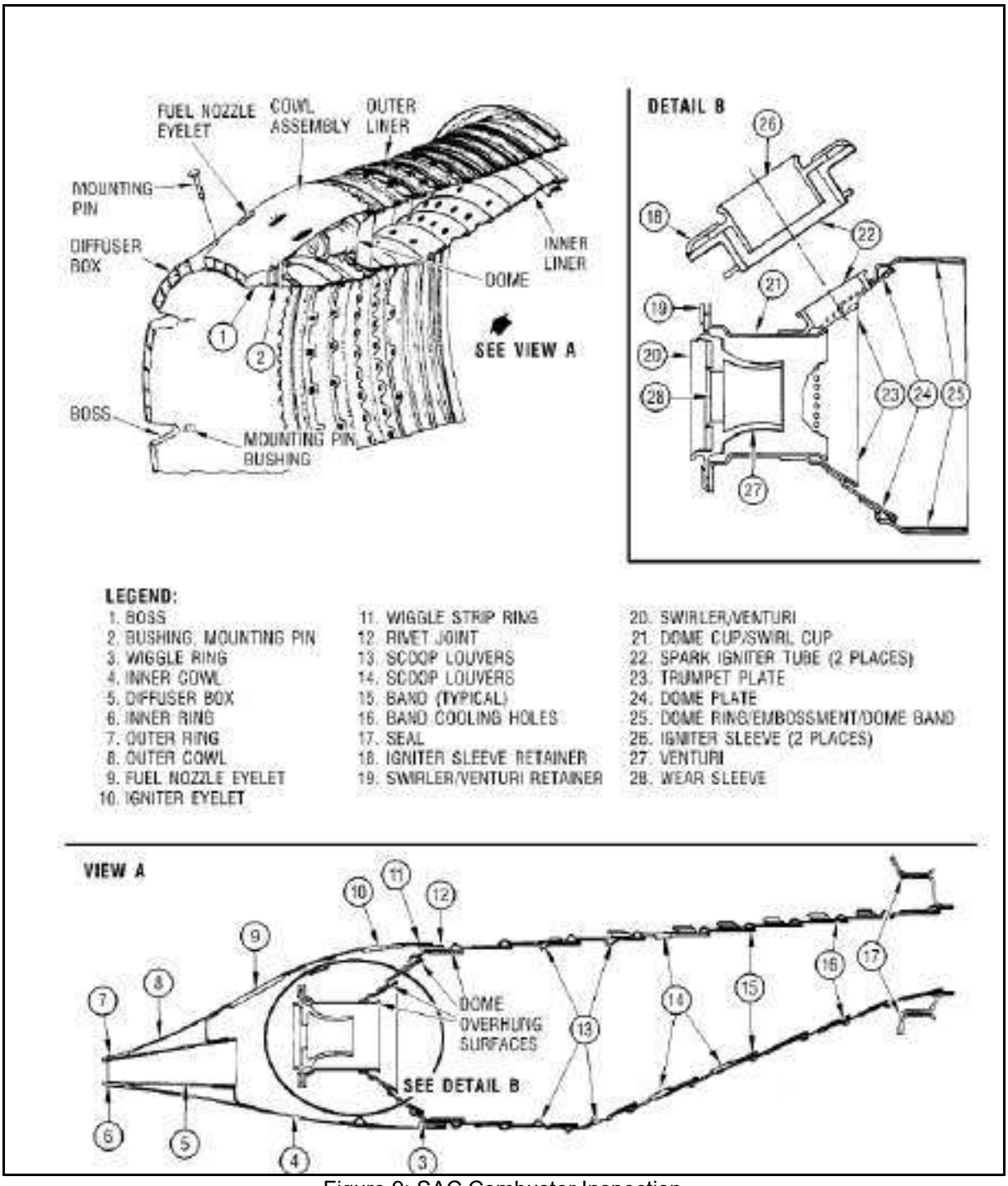



Figure 9: SAC Combustor Inspection

Figure 10: SAC Combustor Inspection

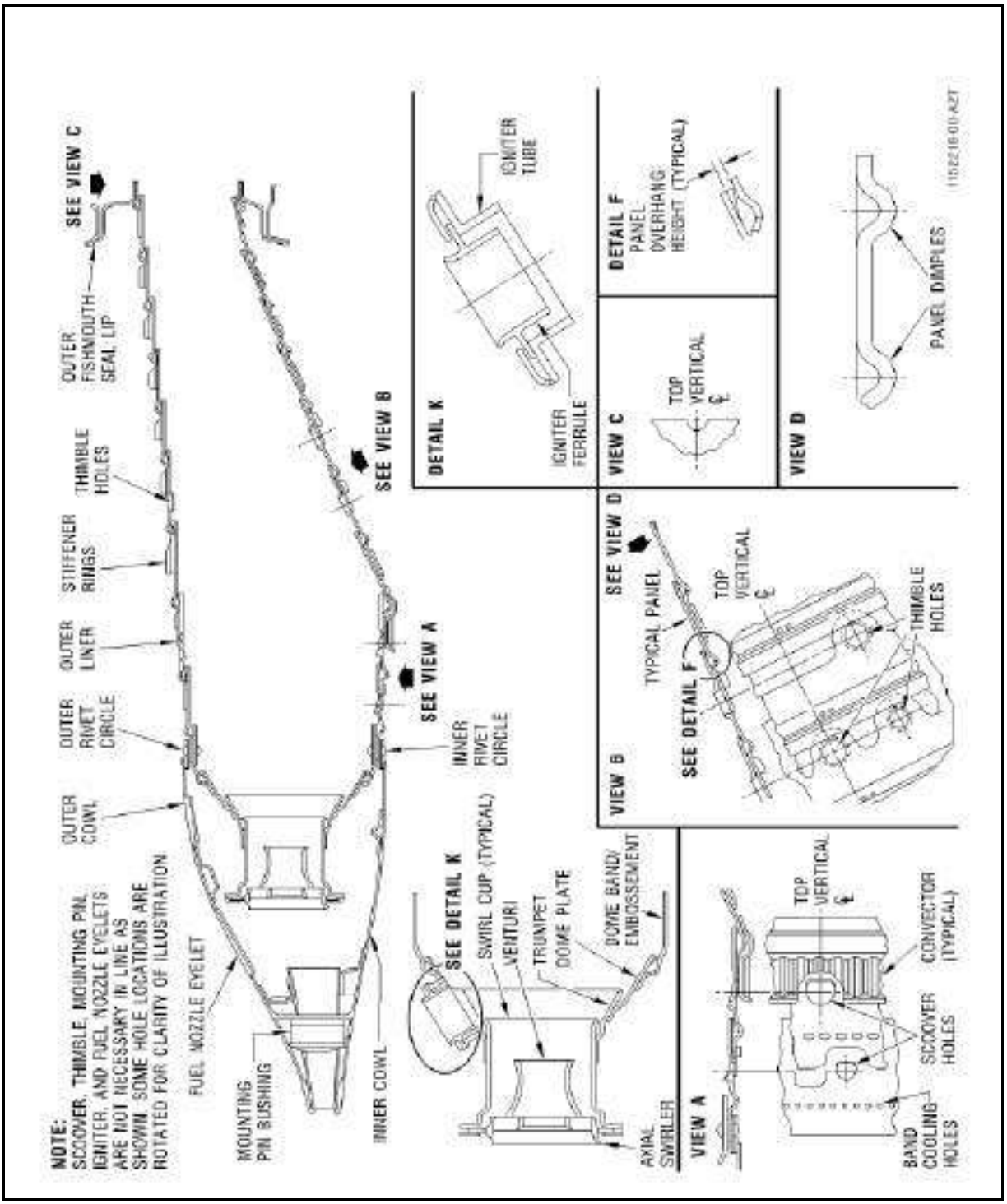



Figure 11: SAC Combustor Inspection

**Borescope Pictures**



Picture 53. Upper igniter ferrule



Picture 54. Upper igniter



Picture 55. Outer rivets band



Picture 56. Outer lliner



Picture 57. Inner rivets band



Picture 58. Inner liner



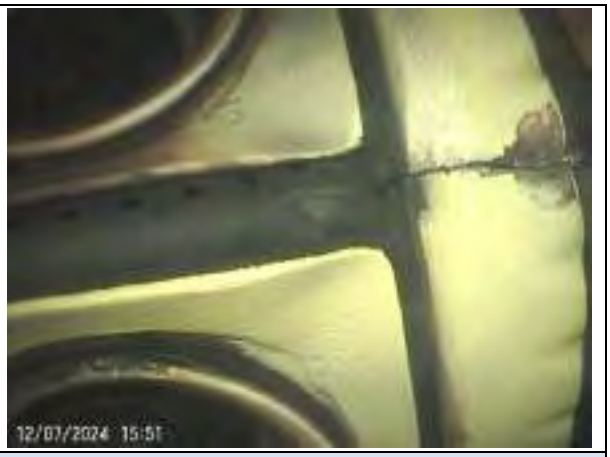
Picture 59. Fuel nozzle tip and swirler



Picture 60. Combustor dome. Splash plates



Picture 61. Combustor liners and HPT Nozzles




Picture 62. Dome plate axial crack




Picture 63. Dome plate axial crack. Reference measurement

### 4.3 Turbine Section

| | turbine stage | | | | |
|---|---|---|---|---|---|
| **Port** | **L.E.** | **T.E.** | **blades** | **Remarks:** | **photo no:** |
| **18** | **1** | | **88** | | |
| **19** | | **1** | **88** | **See below notes.** | |
| **19** | **2** | | **90** | | |
| **20** | | **2** | | | |

**Notes:**
The High Pressure Turbine section is serviceable according to GEK105054 Volume II WP40600 Table 8.
Stage 1 borescope port nozzle shows erosion and axial crack at the outer platform.
Stage 1 and 2 blades are in good condition.
The Stage 1 shrouds are in good condition.
The Stage 2 Honeycomb seals showed rubbing marks at some positions.

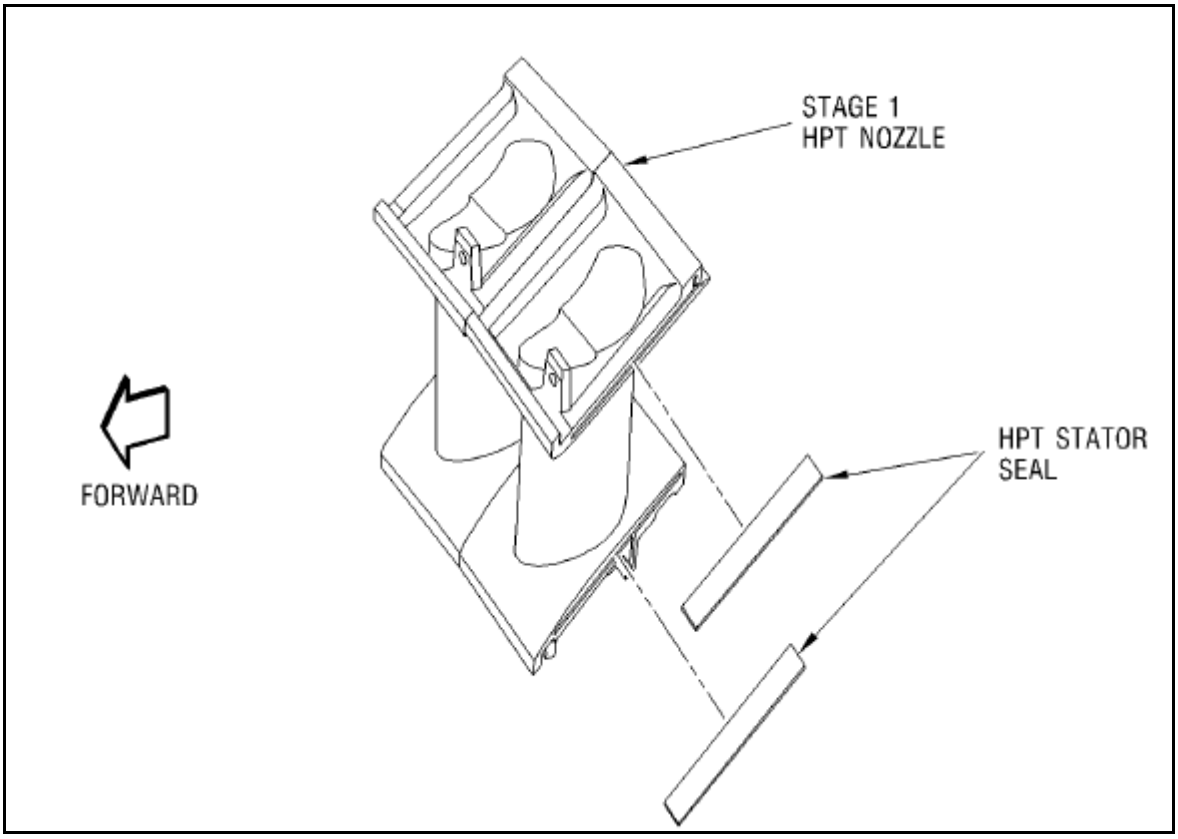


Figure 12: Stage 1 HPT Nozzle Seal Displacement

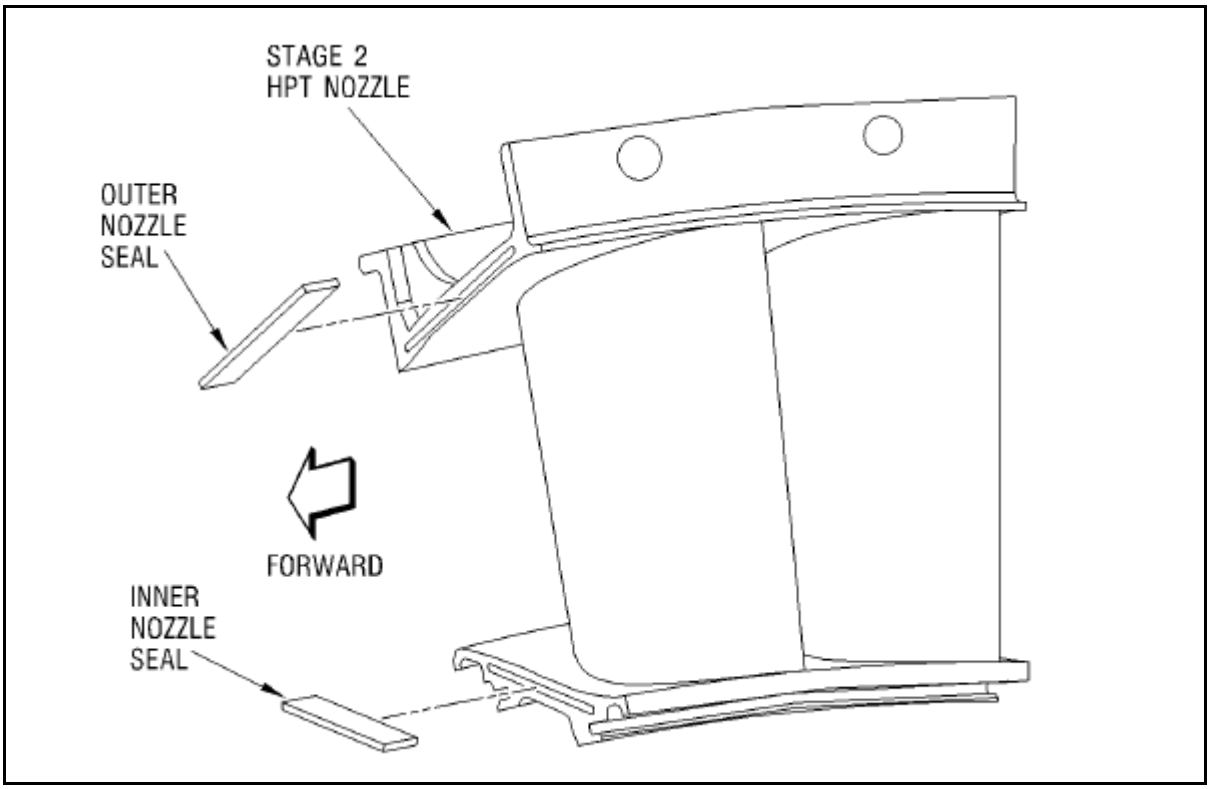


Figure 13: Stage 2 HPT Nozzle Seal Displacement

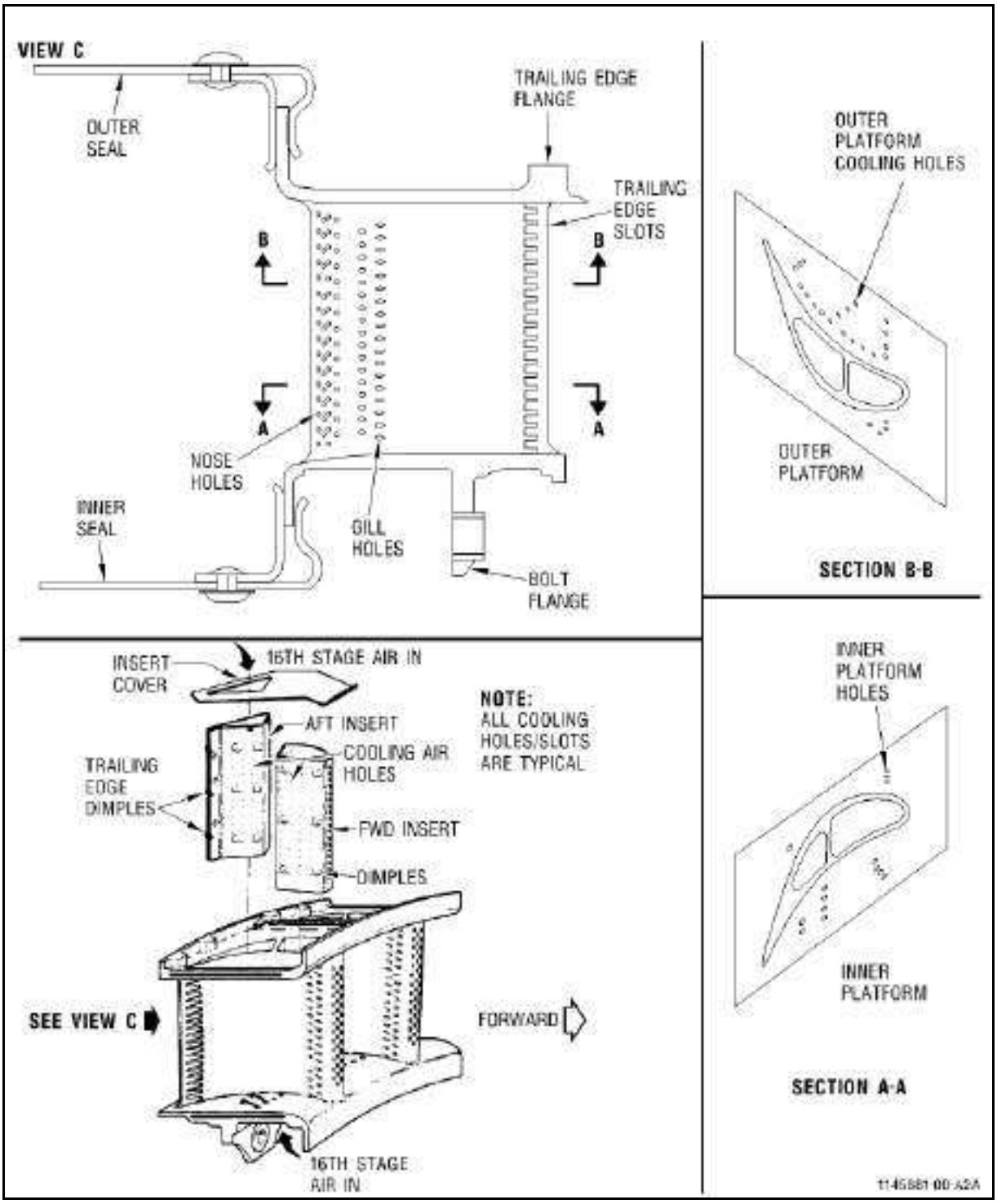


Figure 14: HPT Stage 1 Nozzle

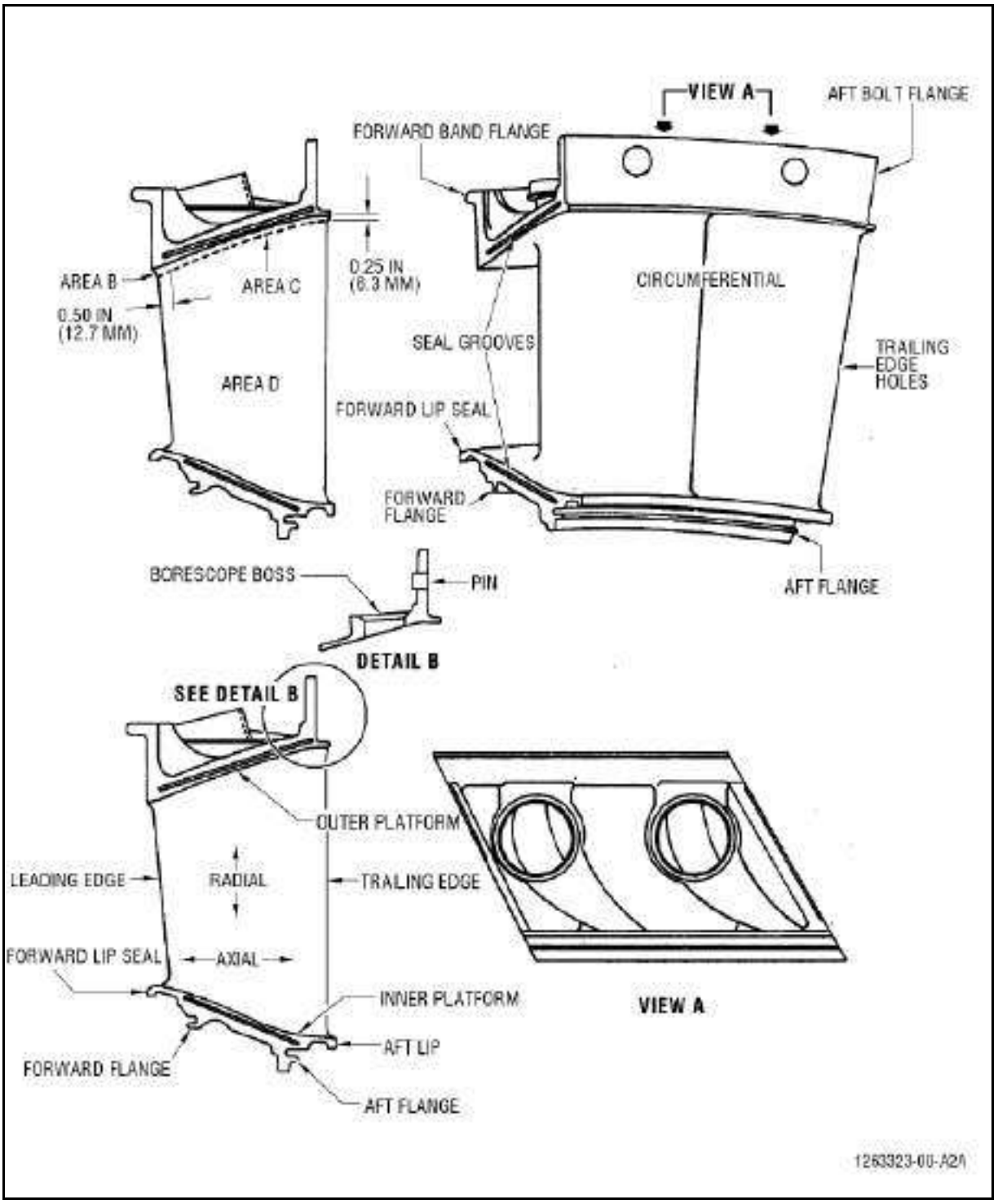



Figure 15: HPT Stage 2 Nozzle

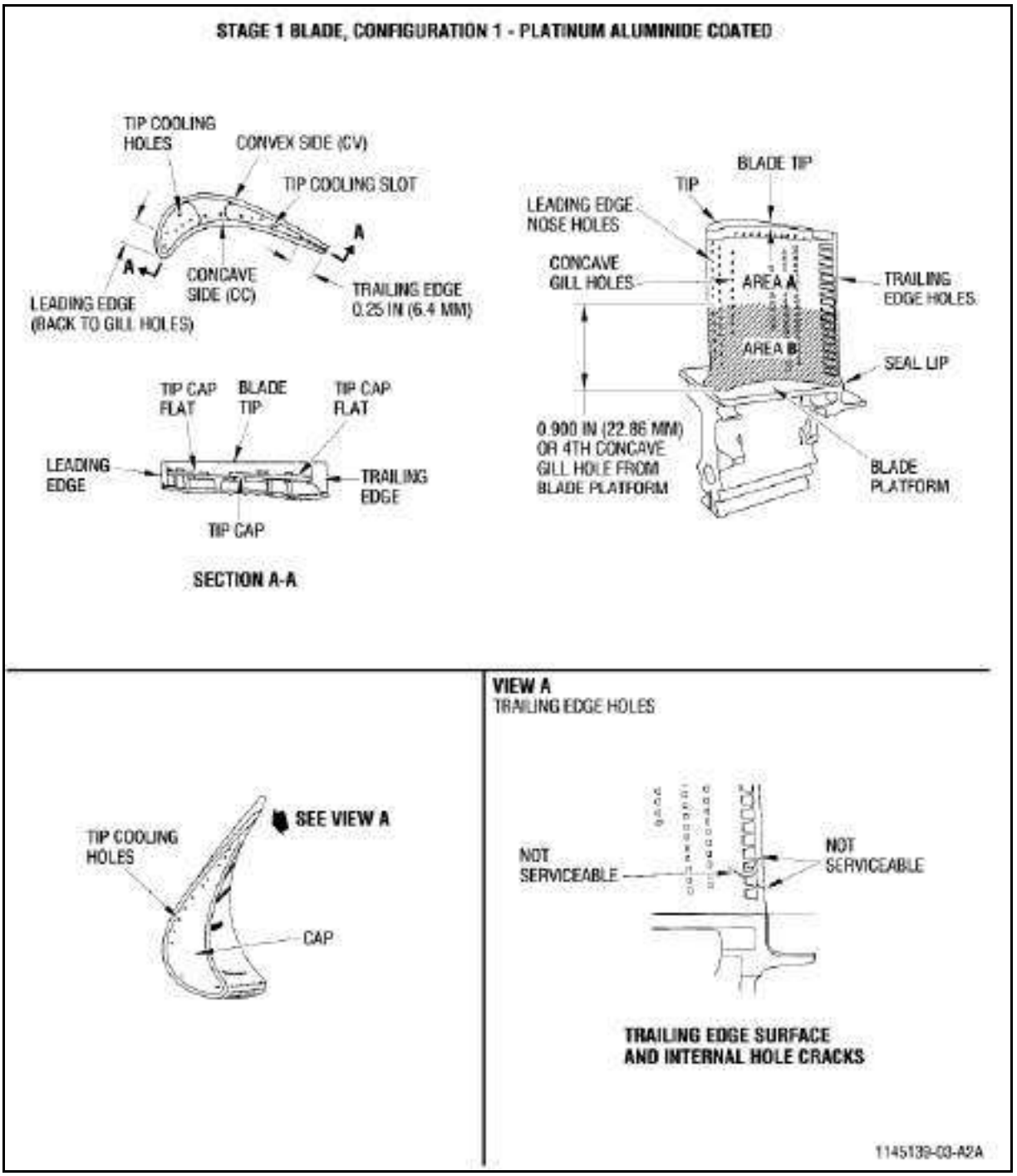



Figure 16: HPT Stage 1 Rotor Blades Inspection Areas (Platinum Aluminide Coated Blades)

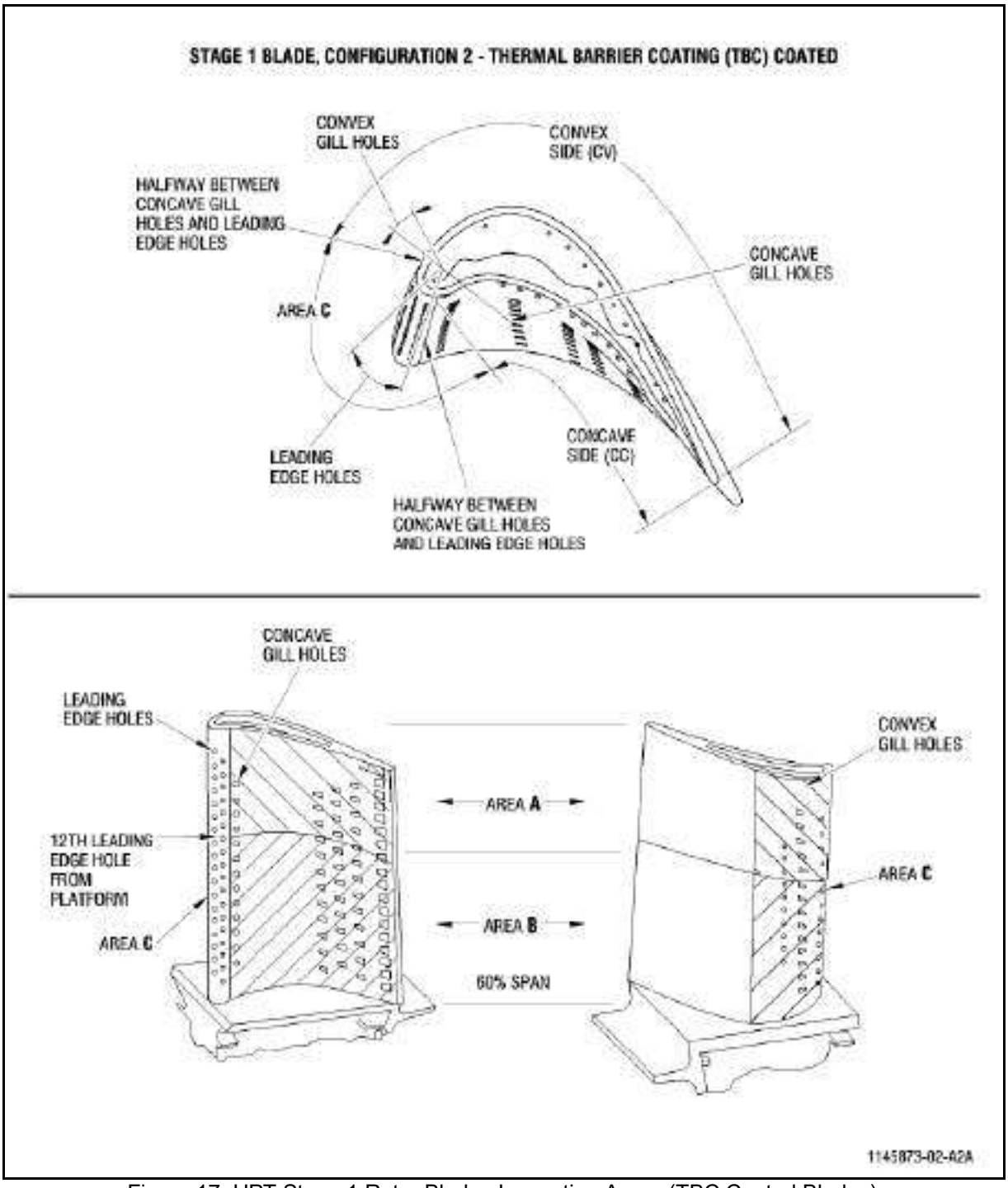


Figure 17: HPT Stage 1 Rotor Blades Inspection Areas (TBC Coated Blades)

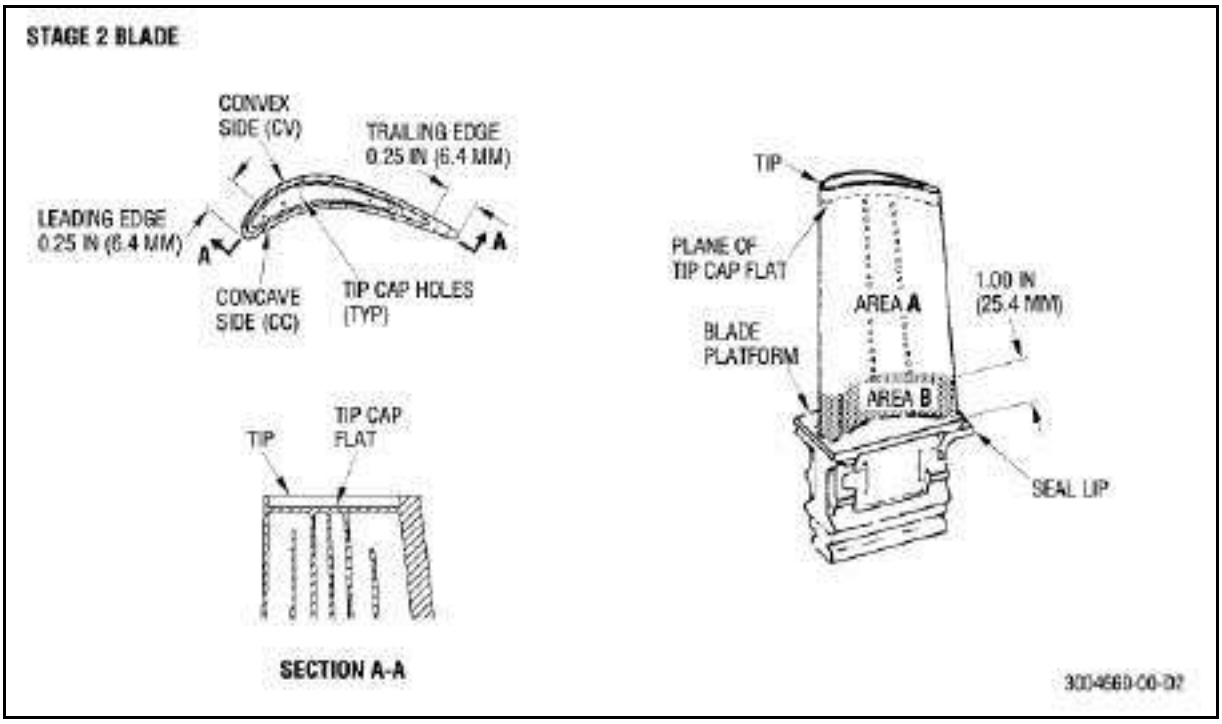


Figure 18: HPT Stage 2 Rotor Blades Inspection Areas

**Borescope Pictures**



Picture 64: Stage1 Nozzles leading edge



Picture 65: Stage1 Nozzle leading edge



Picture 66: Stage1 Nozzle borescope port erosion and axial crack



Picture 67: Stage1 Nozzles trailing edge. Blades leading edge



Picture 68: Stage1 Nozzles trailing edge. Blades leading edge



Picture 69: Stage1 Blades leading edge




Picture 70: Stage1 Blades Leading edge




Picture 71: Stage 1 Blades leading edge



Picture 72: Stage 1 Blades trailing edge



Picture 73: Stage 2 Blades leading edge




Picture 74: Stage 2 Blades trailing edge




Picture 75: Honeycomb seals rubbing marks

| | | |
|---|---|---|
|  | |  |
| Picture 76: Stage 2 Blades trailing edge | | Picture 77: Stage 2 Blades trailing edge |

## 4.4 LPT Section

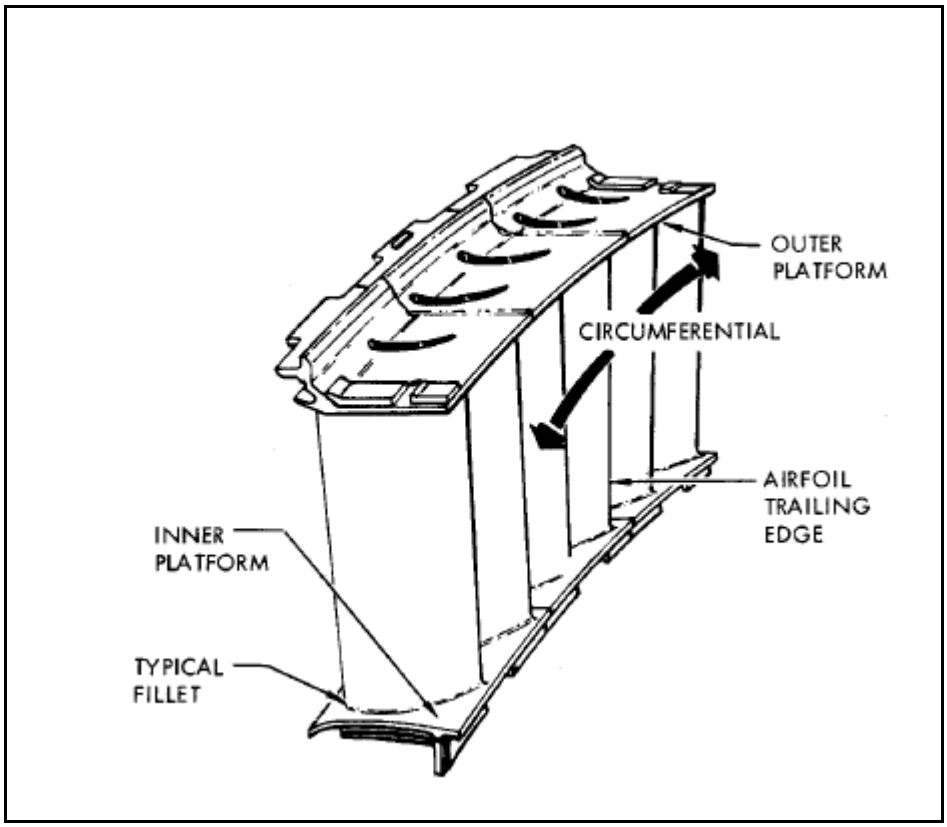



Figure 19: Power Turbine Nozzles

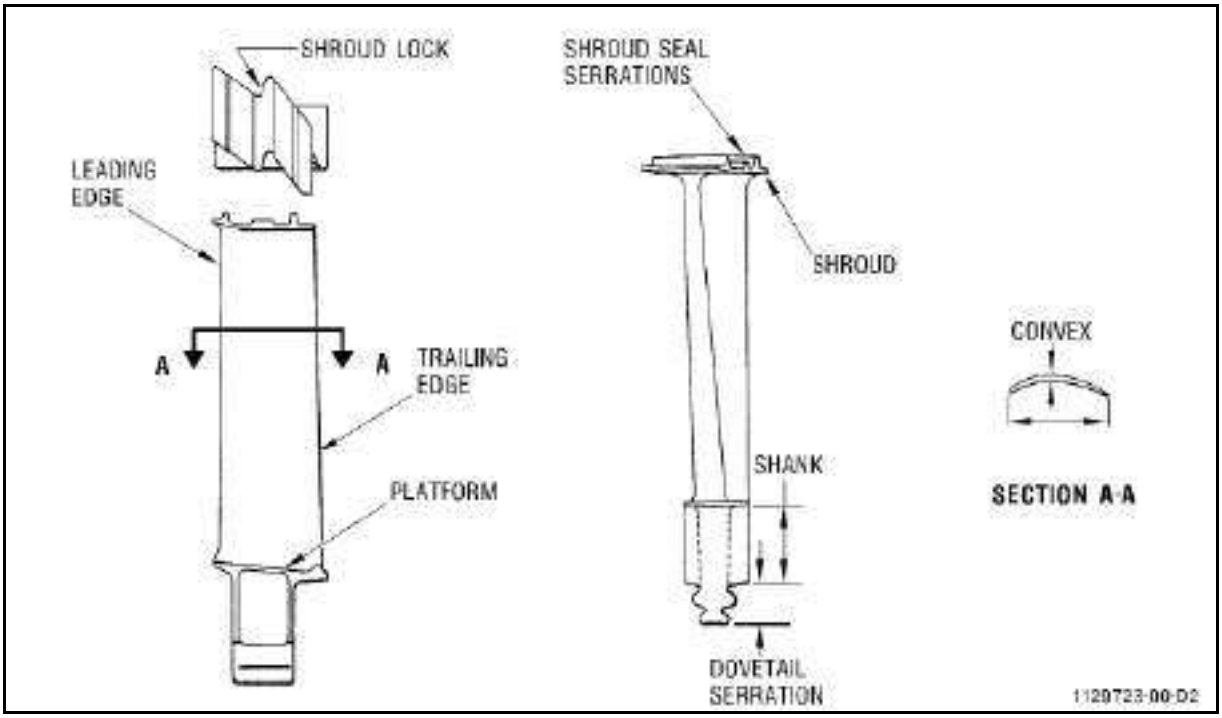



Figure 20: Power Turbine Rotor Blades

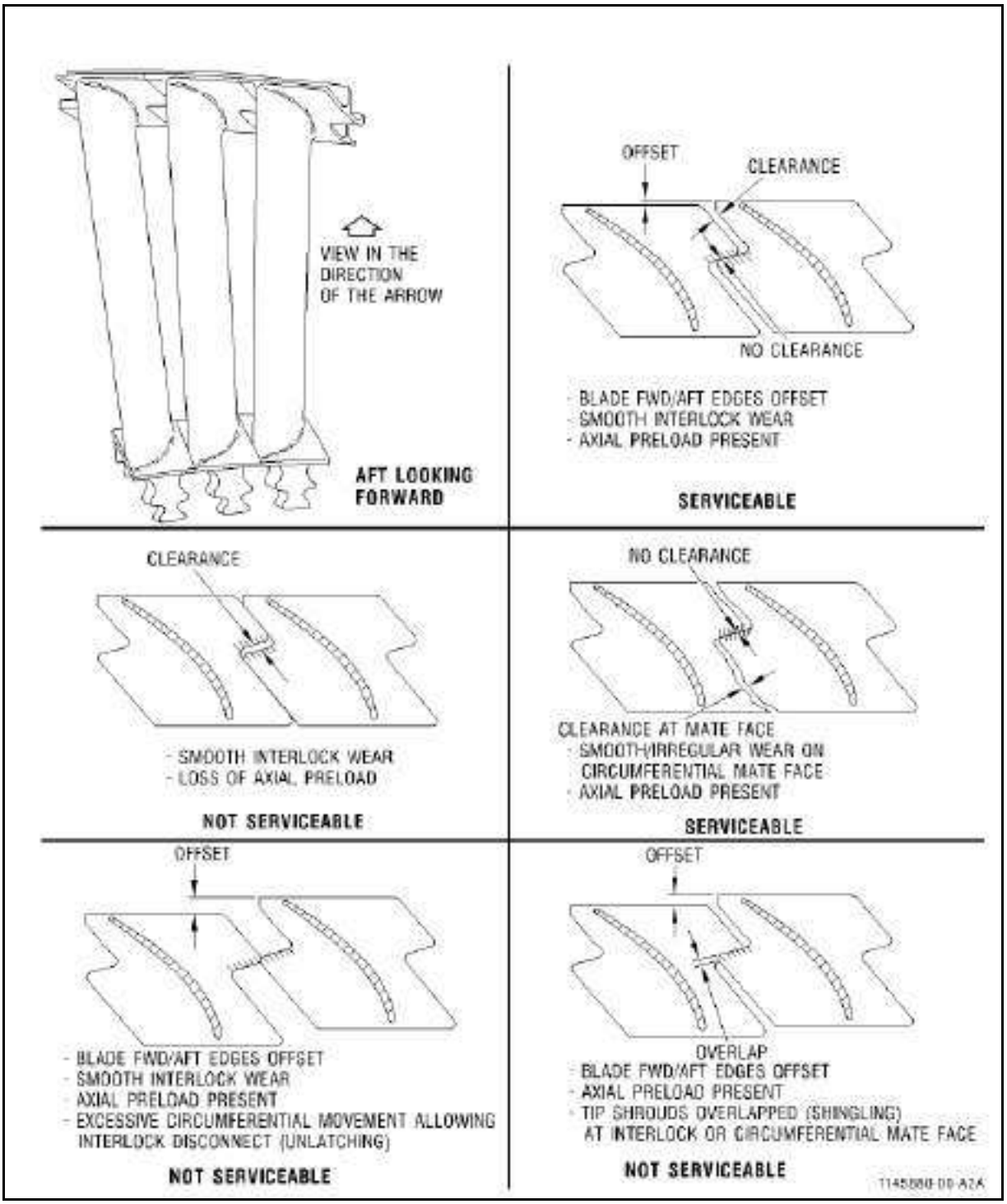


Figure 21: LPT Rotor Blade Circumferential Inspection

**Notes:**

The LPT stage 1 accessible nozzles and blades did not show any damage.

**Borescope Pictures**



Picture 78: TMF and LPT Inlet



Picture 79: TMF and LPT Inlet



Picture 80: TMF and LPT Inlet



Picture 81: LPT Stage nozzles and Blades



Picture 82: Stage 1 Blades tip interlock



Picture 83: LPT Stage nozzles and Blades

# *BORESCOPE INSPECTION REPORT*
# *TM2500 GEN. 6-7*
# *7LM2500 – PK – MDWG05*

## NFE SAN JUAN POWER PLANT

## *PACKAGE # 7251614*

## *UNIT #6*

| | | | |
|---|---|---|---|
| **Visit Date:** | November 23, 2024 | **Total Starts:** | 237 |
| **Engine S/N:** | 557-254 | **GG Hours:** | 9148 |
| **Power Turbine S/N:** | 557-254 | **PT Hours:** | 9148 |
| **PPG GT Field Engineer:** | JC Requena H | **NFE Representative:** | Lance Florent |



# TABLE OF CONTENTS


1 Conclusions and Recommendations .....3
2 Outage Data .....4
3 Borescope Inspection Checklist.....5
4 Borescope Inspection Record.....6
4.1 Compressor Section .....9
4.2 Combustor and 1St Stage Nozzle Section.....12
4.3 Turbine Section.....18
4.4 LPT Section .....27

## 1. Conclusions and Recommendations

**Purpose of visit:**
The purpose of this visit was to perform a borescope inspection of the Engine in accordance with GEK105054, WP 406 00.

1.1 The HPC Section is not serviceable according to GEK105054 Volume II WP40600 Table 4 paragraph 2.c.
There are at least five (5) blades with trailing edge damages beyond serviceability limits. One (1) blade has a platform missing piece

1.2 The Combustion section is serviceable according to GEK 105054 Volume II WP 406 00 Table 7.

1.3 The High Pressure Turbine section is not serviceable according to GEK105054 Volume II WP40600 Table 8 paragraph “g” due to the Stage 1 nozzles condition.
The nozzles corrosion has increased affecting bigger areas of the base material.

1.4 The 1st stage blades were found in good condition, tip has minor missing material
The shrouds showed rubbing marks; serviceable.

1.5 The 2nd stage vanes and blades and the honeycomb seals were found in good condition.

## 2. Outage Data

**ENGINE DATA**

| ESN: | 557-254 | Engine Fired Hours: | 237 | Package Hours: | 237 |
|---|---|---|---|---|---|
| Model: | 7LM2500-PK-MDWG05 | Engine Fired starts: | 9148 | Package Fired Starts: | 9148 |

**MAINTENANCE DATA**

| WP, SB, SL, PB, PL Performed | GEK105054, REV 11 | Date completed | Comments |
|---|---|---|---|
| WP 406 00 | Borescope Inspection | 22NOV24 | Not Serviceable |

**PARTS DATA**

| Description | PN Removed | SN Removed | Qty | Disposition | PN Installed | SN Installed |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |

## 3. Borescope Inspection Checklist

**Date unit out of operation:** 20NOV24
**Date unit into operation:** 23NOV24
**Last inspection date:** 22MAY24; PPG O&M

**Type of Fuel:** Gas / Diesel
**Type of outage:** Scheduled

**Type of NOx suppression:** Water Injection

**Inspection of gas turbine:**

| WATERWASH: | HIGH PRESSURE COMPRESSOR: |
|---|---|
| ☒ PERFORMED WATER WASH | ☒ HPC BORESCOPE INSPECTION |
| **COMBUSTOR:** | **HIGH PRESSURE TURBINE** |
| ☒ COMBUSTOR BORESCOPE INSPECTION | ☒ HPT STAGE 1 & 2 NOZZLE BORESCOPE INSPECTION |
| | ☒ HPT BLADE BORESCOPE INSPECTION |
| **LOW PRESSURE TURBINE:** | |
| ☒ LPT BORESCOPE INSPECTION | |

☒ ***Please verify all borescope plugs have been reinstalled***

## 4. Borescope Inspection Record

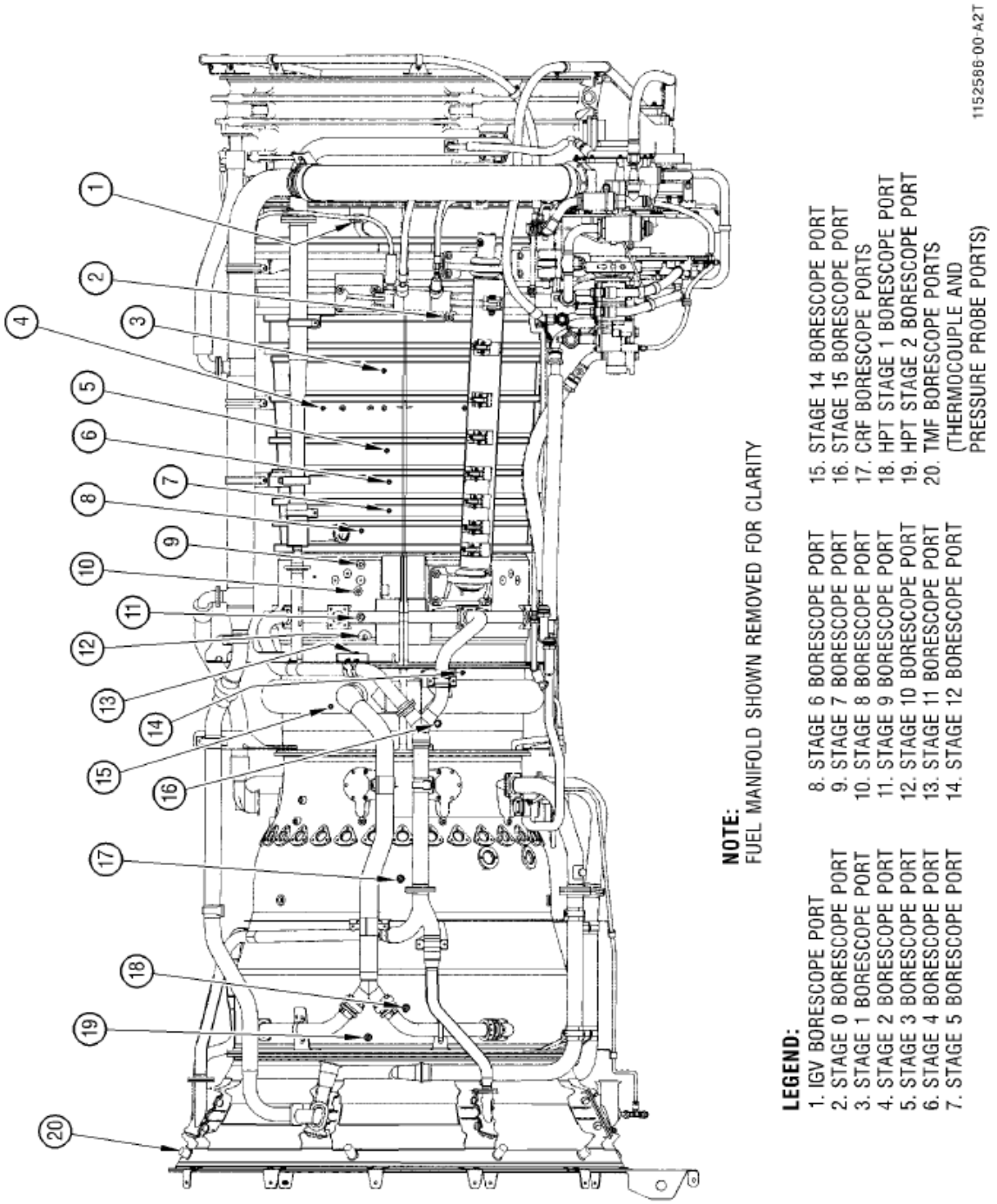



Figure 1: Position of Borescope Inspection Ports.

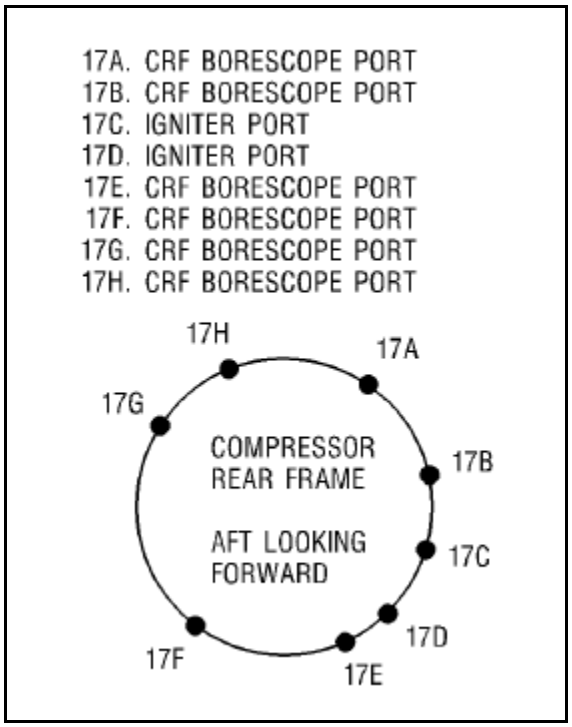


Figure 2: Position of Borescope Inspection Ports.

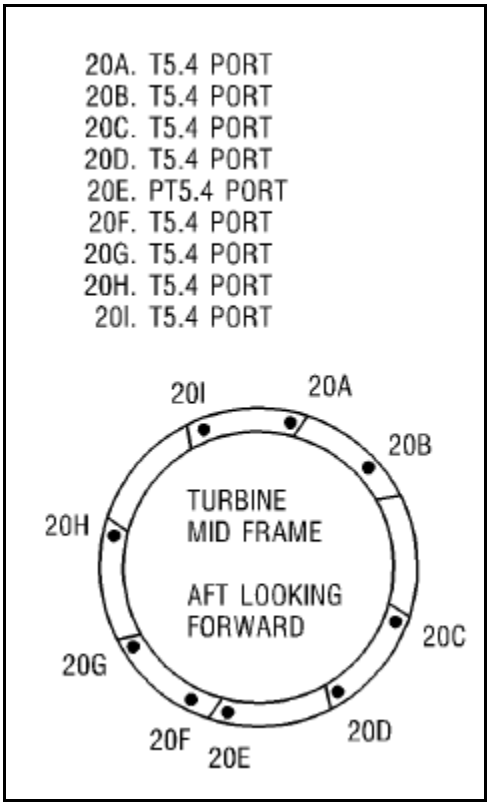


Figure 3: Position of Borescope Inspection Ports.

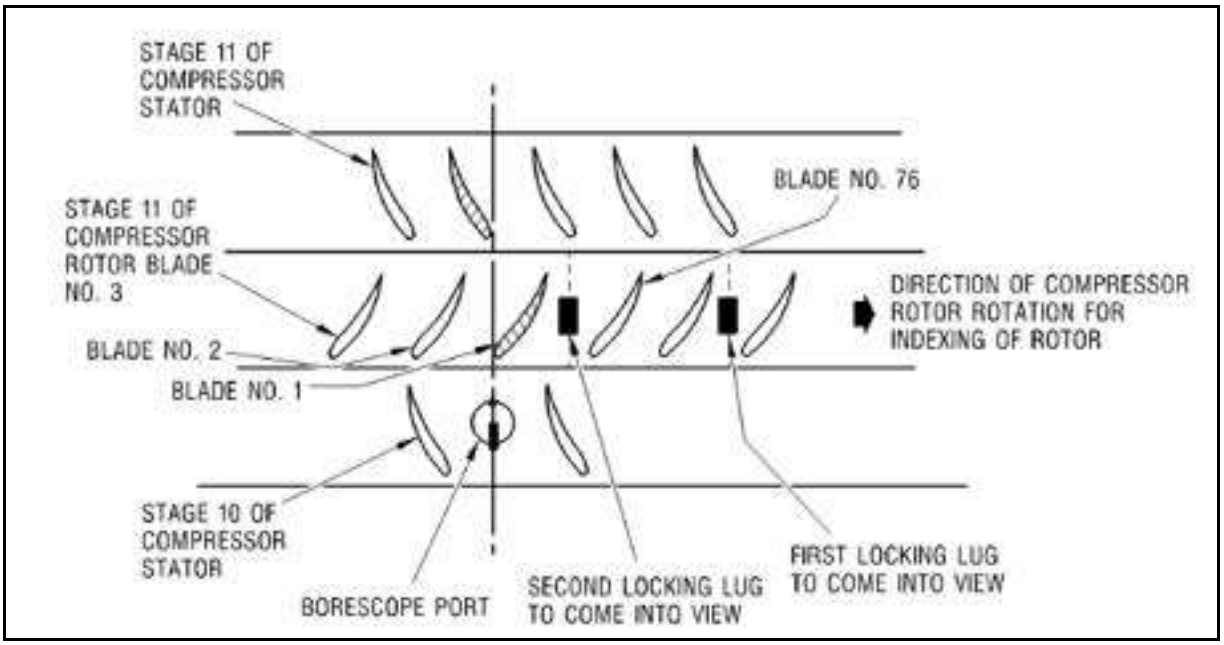


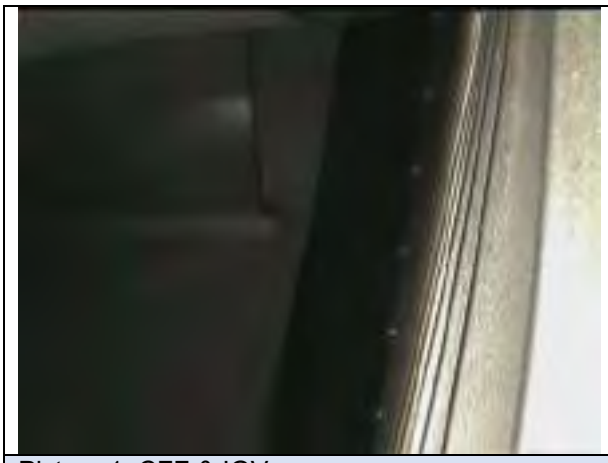
Figure 4: Zero indexing of HPC rotor and HPT rotor

Compressor Section

| Port | T.E. | L.E. | blades | Remarks: | photo no: |
|---|---|---|---|---|---|
| 1 | IGV | | | | P1 |
| 1 | | 0 | 36 | | P2 P3 |
| 2 | 0 | | 36 | | P4 P5 |
| 2 | | 1 | 26 | | P6 P7 |
| 3 | 1 | | 26 | | P8 P9 |
| 3 | | 2 | 26 | | P10 |
| 4 | 2 | | 26 | | P11 |
| 4 | | 3 | 42 | | P12 P13 |
| 5 | 3 | | 42 | | P14 |
| 5 | | 4 | 45 | | P15 P16 |
| 6 | 4 | | 45 | | P17 P18 |
| 6 | | 5 | 48 | | P19 P20 |
| 7 | 5 | | 48 | | P21 P22 |
| 7 | | 6 | 54 | | P23 P24 |
| 8 | 6 | | 54 | Blades contacting tip | |
| 8 | | 7 | 56 | Blades contacting tip | |
| 9 | 7 | | 56 | | P25 P26 |
| 9 | | 8 | 64 | 2 blades with nick damage in leading edge. Serviceable | P27 P28 |
| 10 | 8 | | 64 | | P29 |
| 10 | | 9 | 66 | | P30 P31 |
| 11 | 9 | | 66 | | P32 P33 |
| 11 | | 10 | 66 | | P34 P35 |
| 12 | 10 | | 66 | | P36 |
| 12 | | 11 | 76 | | P37 P38 |
| 13 | 11 | | 76 | | P39 P40 |
| 13 | | 12 | 76 | | P41 P42 |
| 14 | 12 | | 76 | | P43 |
| 14 | | 13 | 76 | 1 Blade with nick damage in Leading edge. Serviceable | P44 |
| 15 | 14 | | 76 | Inside bleed manifold | |
| 15 | | 15 | 76 | Inside bleed manifold | |
| 16 | 15 | | 76 | | P45 P46 |
| 16 | | 16 | 76 | Blades trailing edge damages and broken platform. Not serviceable | P47 to P54 |

**Notes:**
The HPC Section is not serviceable according to GEK105054 Volume II WP40600 Table 4 paragraph 2.c.

.



Picture 1. CFF & IGV



Picture 2. Stage 0 Leading edge tip



Picture 3. Stage 0 Root



Picture 4. Stage 0 Trailing edge tip



Picture 5. Stage 0 Weep hole and T.E. IGV



Picture 6. Stage 1 Leading edge tip



Picture 7. Stage 1 Leading edge root



Picture 8. Stage 1 Trailing edge root



Picture 9. Stage 1 Trailing edge



Picture 10. Stage 2 Leading edge



Picture 11. Stage 2 Trailing edge



Picture12. Stage 3 Leading edge tip



Picture 13. Stage 3 Leading edge root



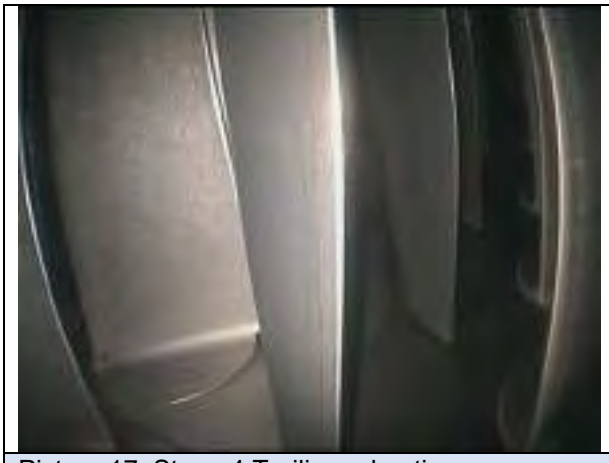
Picture 14. Stage 3 Trailing edge



Picture 15. Stage 4 Leading edge tip



Picture 16. Stage 4 Leading edge base



Picture 17. Stage 4 Trailing edge tip



Picture 18. Stage 4 Trailing edge root



Picture 19. Stage 5 Leading edge tip



Picture 20. Stage 5 Leading edge root



Picture 21. Stage 5 Trailing edge



Picture 22. Stage 5 Trailing edge



Picture 23. Stage 6 Leading edge tip



Picture 24. Stage 6 Leading edge root



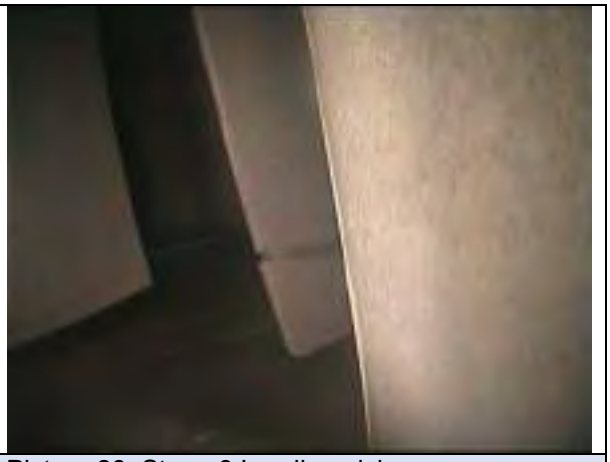
Picture 25. Stage 7 Trailing edge tip



Picture 26. Stage 7 Trailing edge root



Picture 27. Stage 8 Leading edge nick



Picture 28. Stage 8 Leading nick



Picture 29. Stage 8 Trailing edge



Picture 30. Stage 9 Leading edge



Picture 31. Stage 9 Leading edge



Picture 32. Stage 9 Trailing edge tip



Picture 33. Stage 9 Trailing squealer tip



Picture 34. Stage 9 Bleed manifold



Picture 35. Stage 10 Leading edge tip



Picture 36. Stage 10 Trailing edge



Picture 37. Stage 11 Leading edge root



Picture 38. Stage 11 Leading edge



Picture 39. Stage 11 Trailing edge squealer tip



Picture 40. Stage 11 Trailing edge tip



Picture 41. Stage 12 Leading edge tip



Picture 42. Stage 12 Leading edge base



Picture 43. Stage 12 Trailing edge root



Picture 44. Stage 13 Leading edge nick



Picture 45. Stage 15 Trailing edge



Picture 46. Stage 15 Trailing edge



Picture 47. Stage 16 Blade broken platform and OGV



Picture 48. Stage 16 Trailing edge damage



Picture 49. Stage 16 Trailing edge damage



Picture 50. Stage 16 Trailing edge damage



Picture 51. Stage 16 Trailing edge damage



Picture 52. Stage 16 Trailing edge damage



Picture 53. Stage 16 Broken platform



Picture 54. Stage 16 Platform

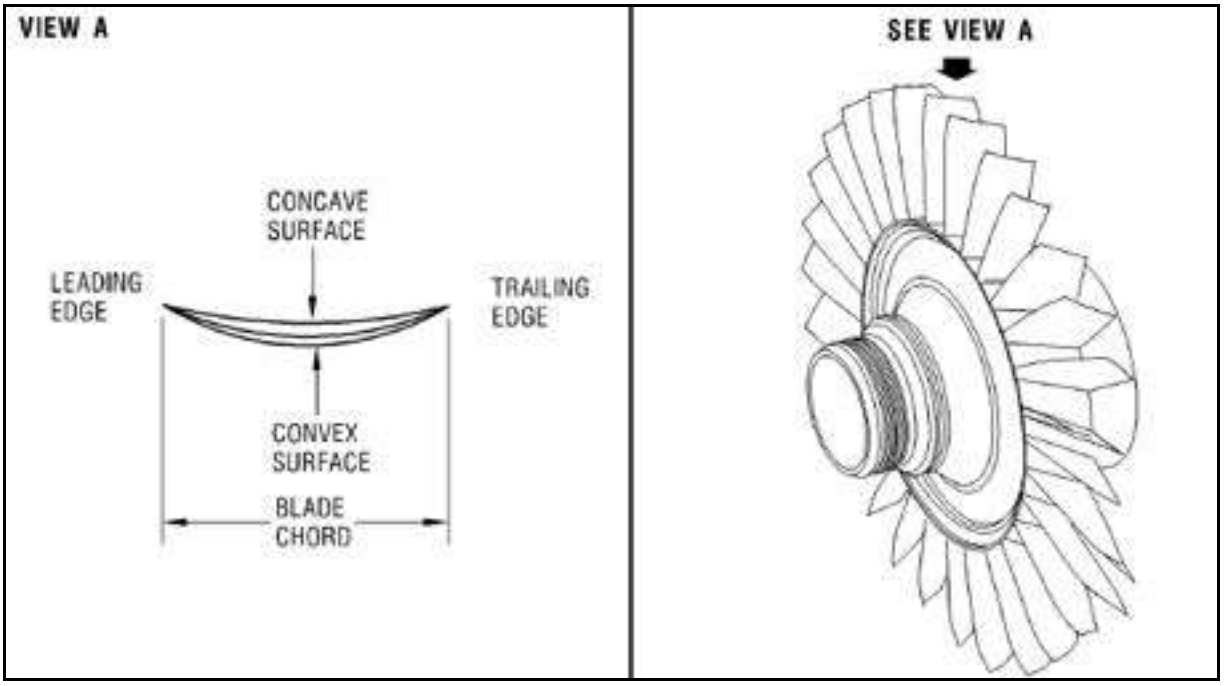



Figure 5: HPC stage 0 BLISK

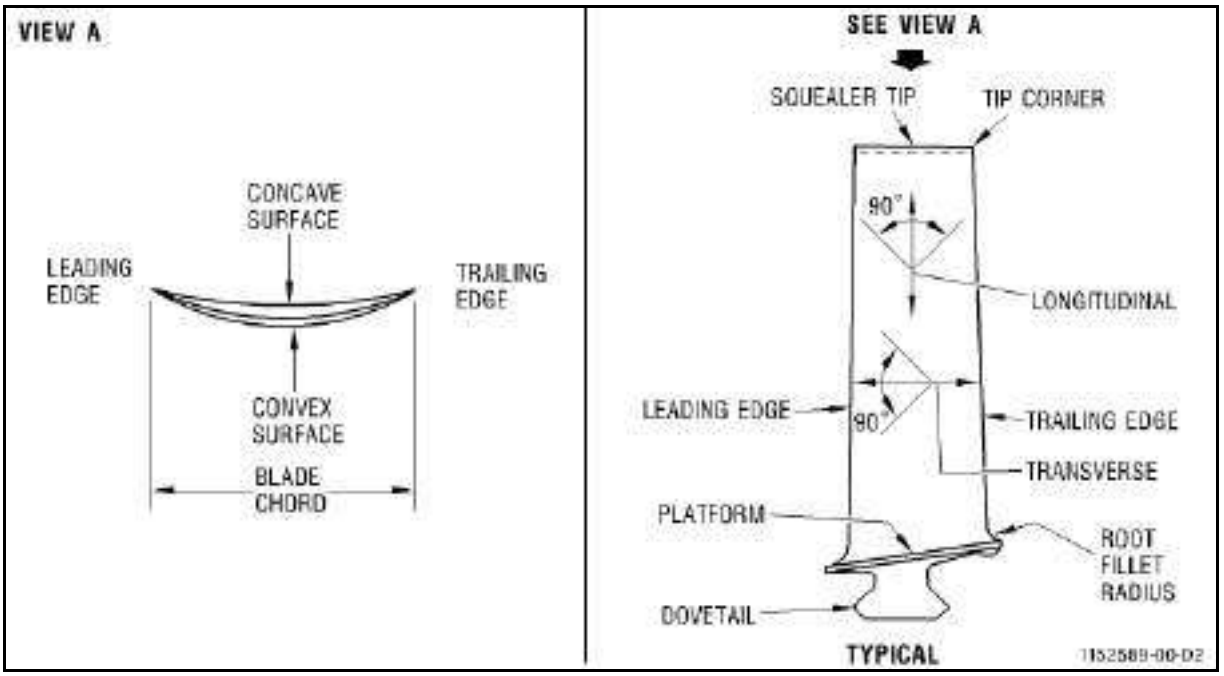



Figure 6: Compressor Rotor Blades

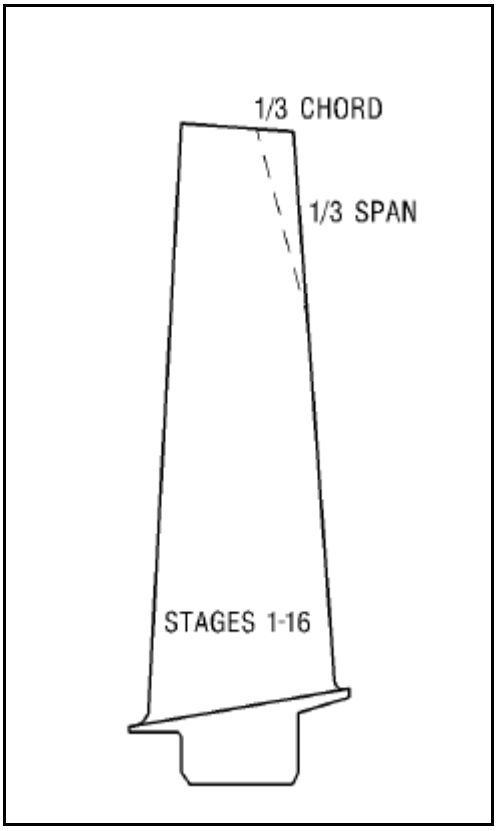


Figure 7: Tip Trailing Edge Inspection

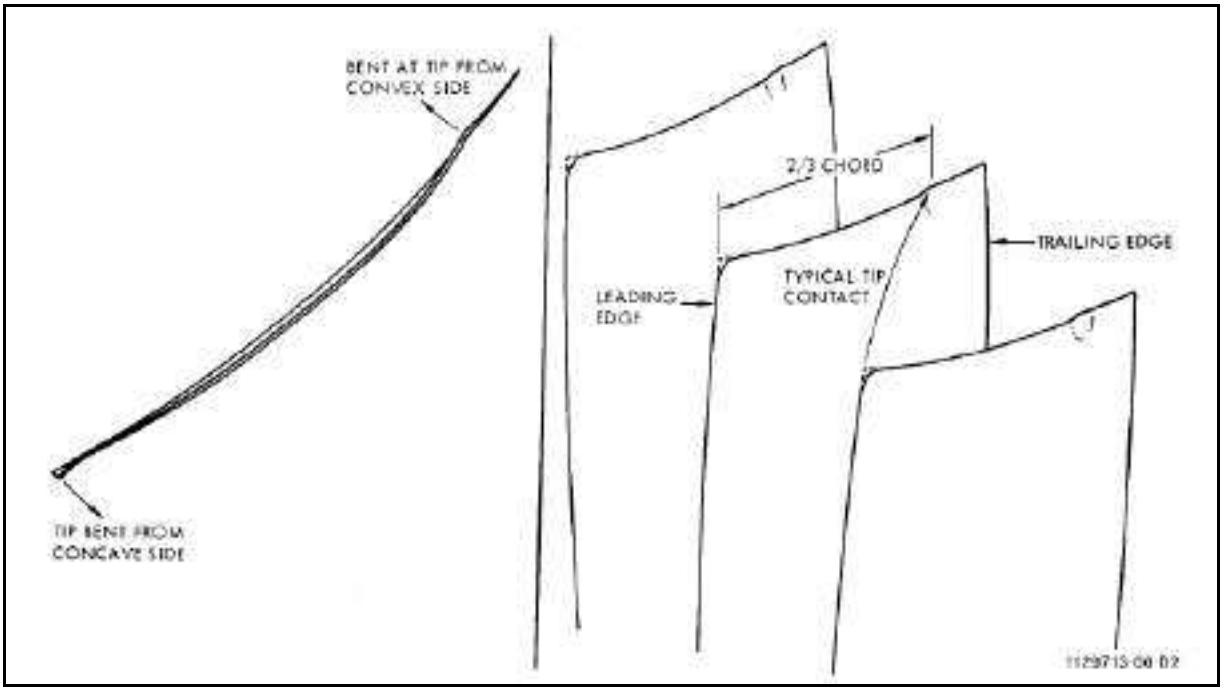
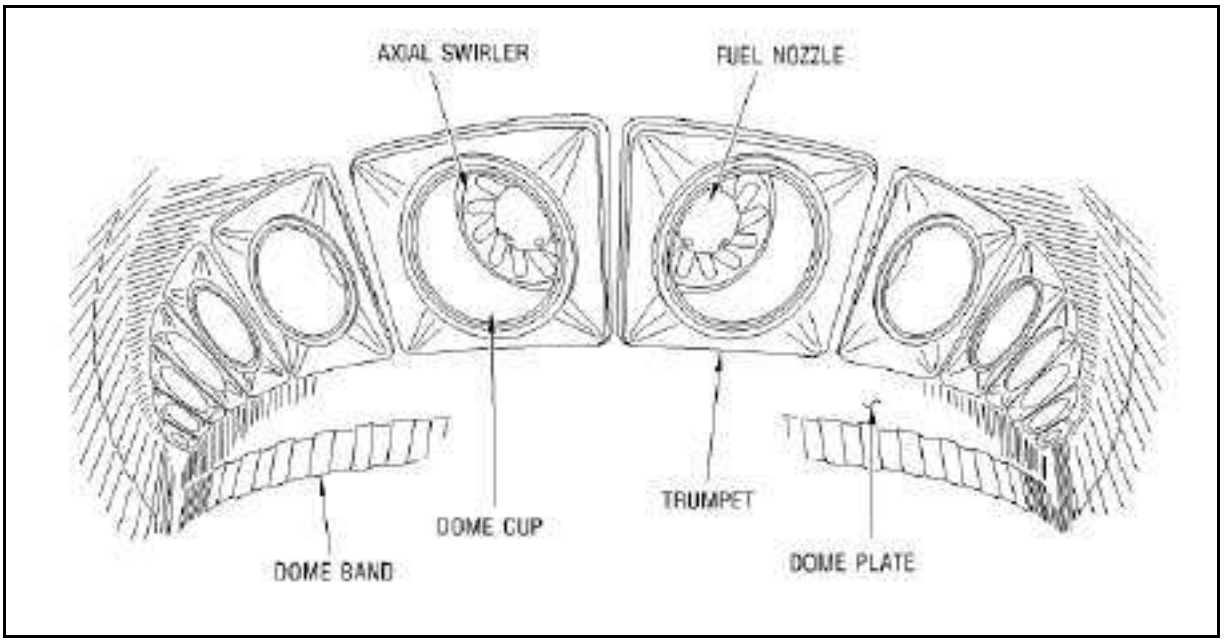


Figure 8: Tip Clanging Contact (HPCR stage 3 through 6)

Combustor and 1St Stage Nozzle Section

| Port | Condition observed | Photo no: |
|---|---|---|
| **17A** | | |
| **17B** | | |
| **17C** | | |
| **17D** | **See below notes.** | Pictures 55 to 66 |
| **17E** | | |
| **17F** | | |
| **17G** | | |
| **17H** | | |
| **17** | 1st stage nozzle (leading edge): | |

**Notes:**
The Combustor section is serviceable according to GEK105054 Volume II WP40600 Table 7.



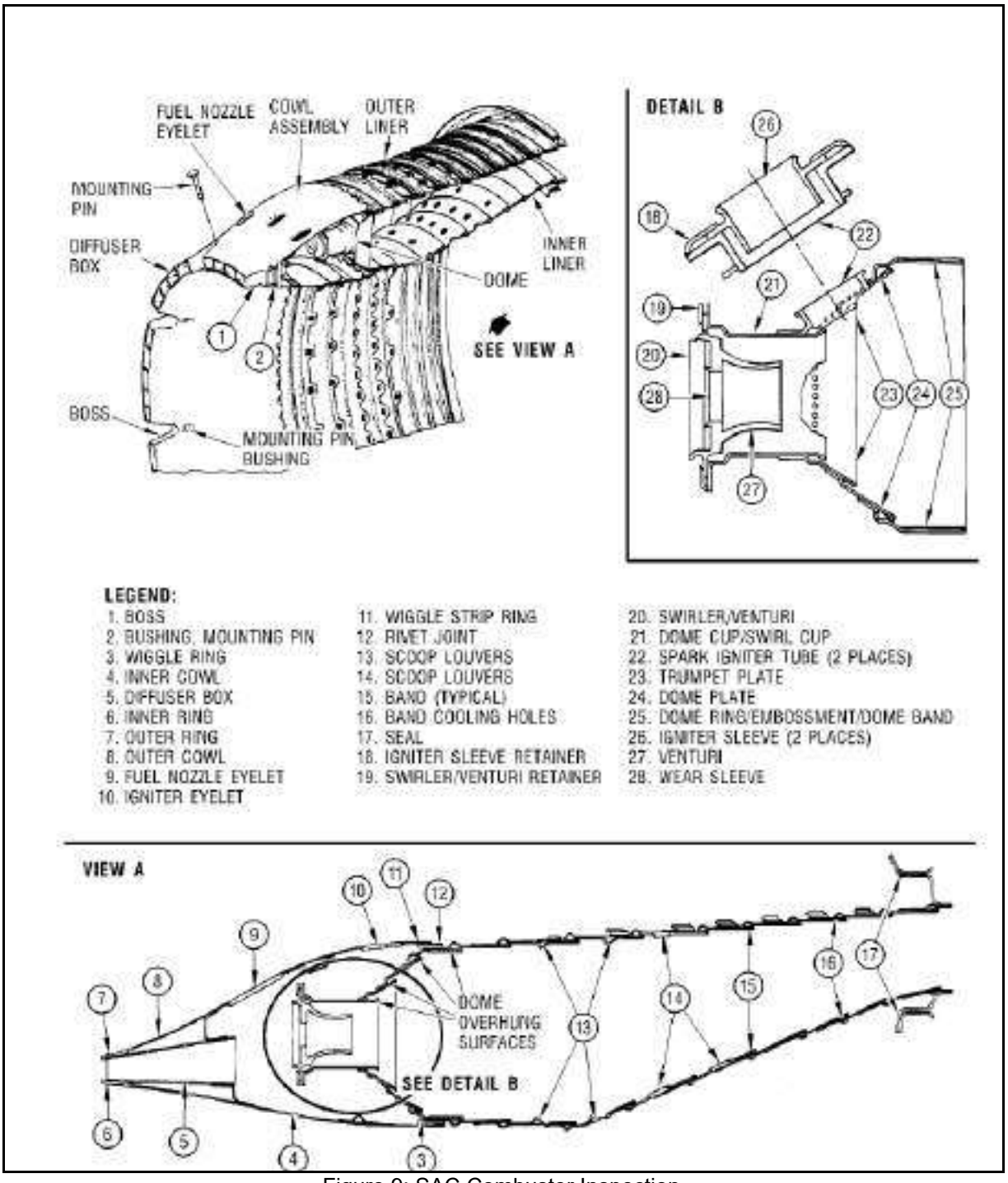



Figure 9: SAC Combustor Inspection

Figure 10: SAC Combustor Inspection

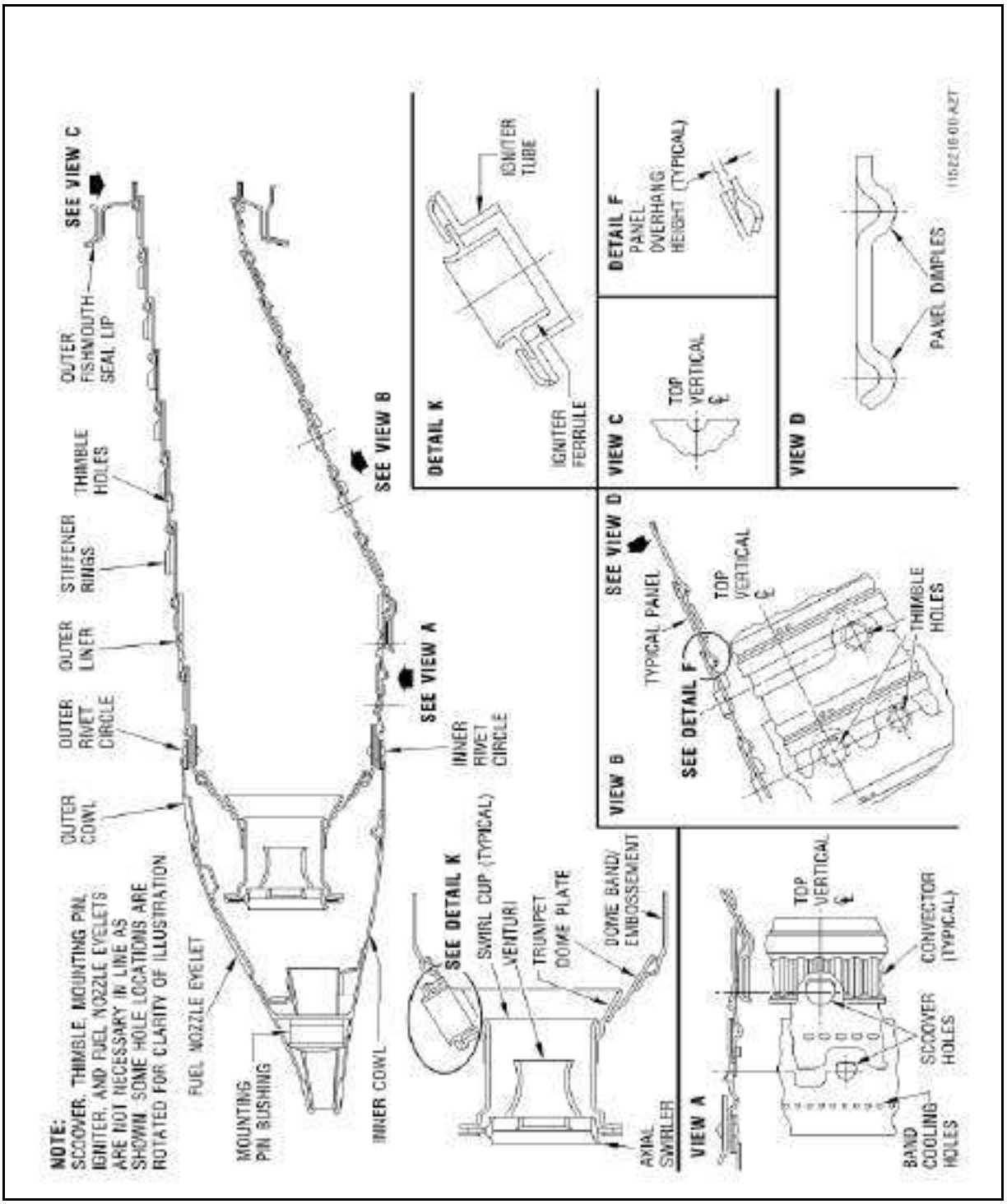
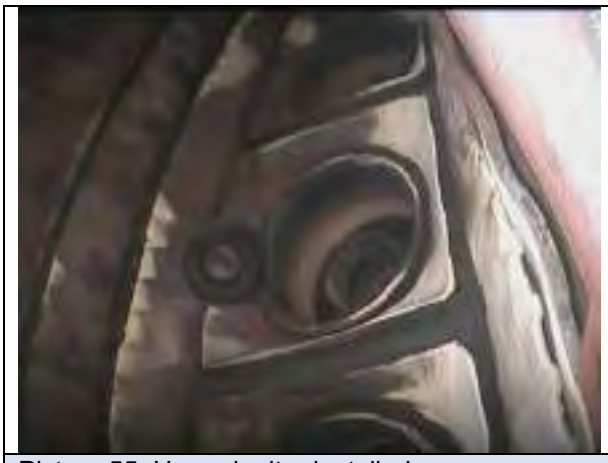



Figure 11: SAC Combustor Inspection

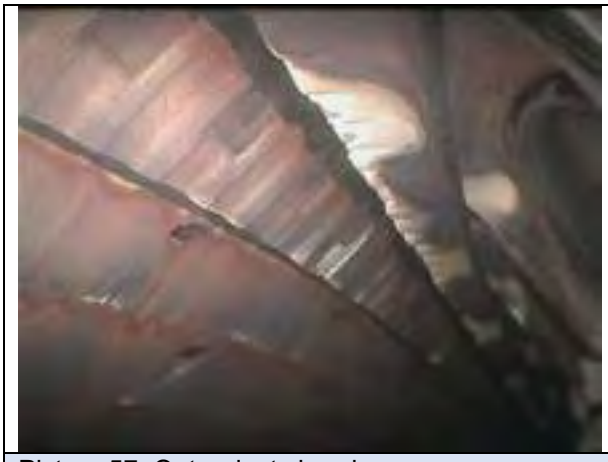
**Borescope Pictures**



Picture 55. Upper igniter installed



Picture 56. Lower igniter installed



Picture 57. Outer rivets band



Picture 58. Inner rivets band



Picture 59. Combustor liners



Picture 60. Combustor dome



Picture 61. Combustor dome. Splash plates



Picture 62. Fuel nozzle tip



Picture 63. Splash plate and fuel nozzle tip



Picture 64. Combustor liners and HPT nozzles



Picture 65. Combustor / HPT Interface



Picture 66. Combustor / HPT Interface

Turbine Section

| | turbine stage | | | | |
|---|---|---|---|---|---|
| **Port** | **L.E.** | **T.E.** | **blades** | **Remarks:** | **photo no:** |
| **18** | **1** | | **88** | | |
| **19** | | **1** | **88** | **See below notes.** | |
| **19** | **2** | | **90** | | |
| **20** | | **2** | | | |

**Notes:**
The High Pressure Turbine section is not serviceable according to GEK105054 Volume II WP40600 Table 8 paragraph “g” due to the Stage 1 nozzles condition.

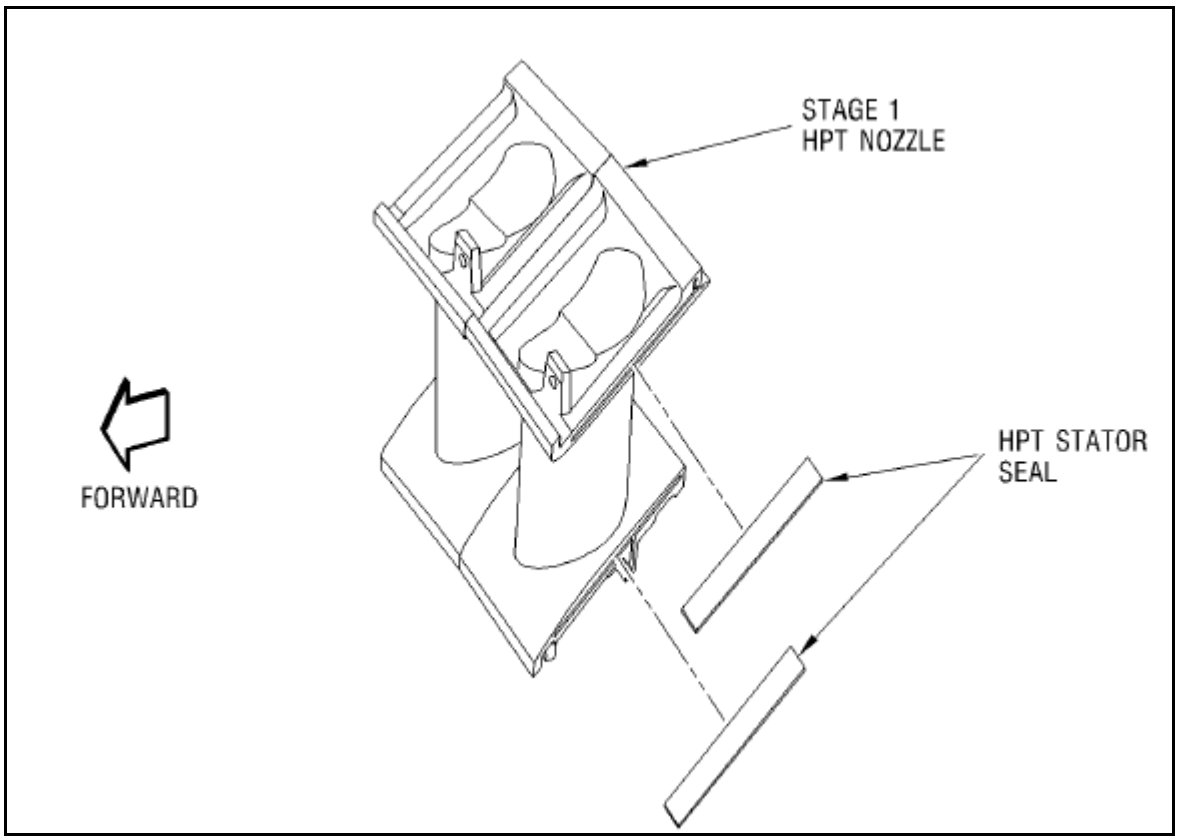


Figure 12: Stage 1 HPT Nozzle Seal Displacement

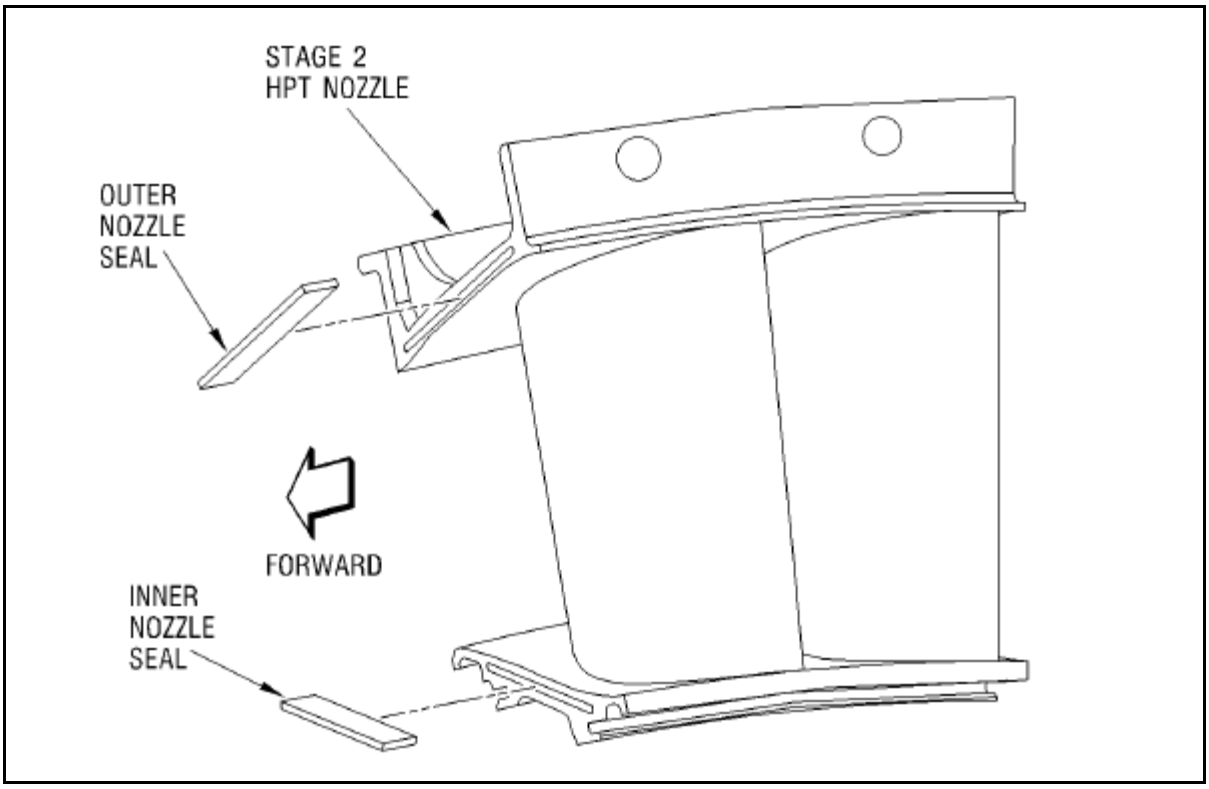


Figure 13: Stage 2 HPT Nozzle Seal Displacement

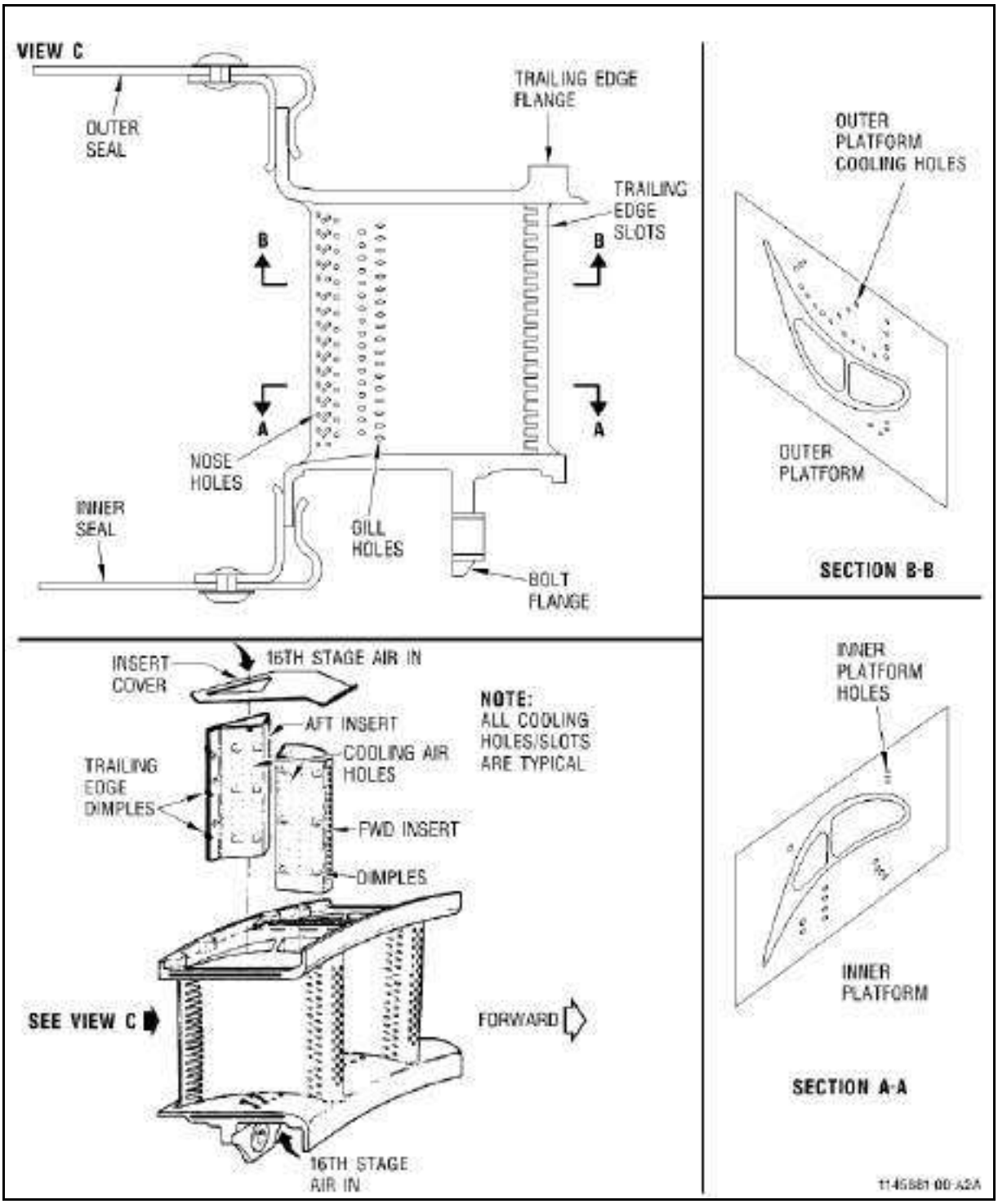



Figure 14: HPT Stage 1 Nozzle

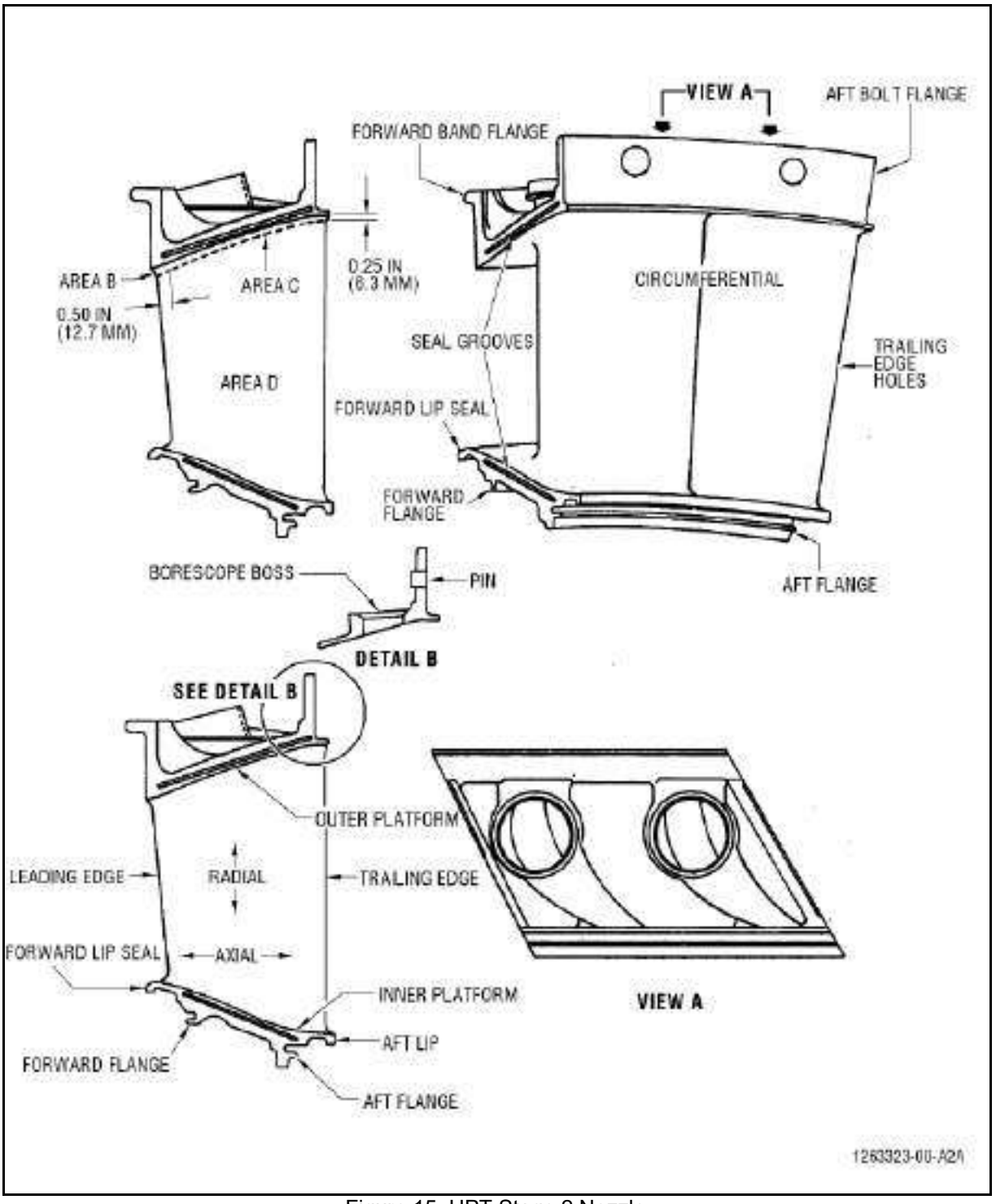



Figure 15: HPT Stage 2 Nozzle

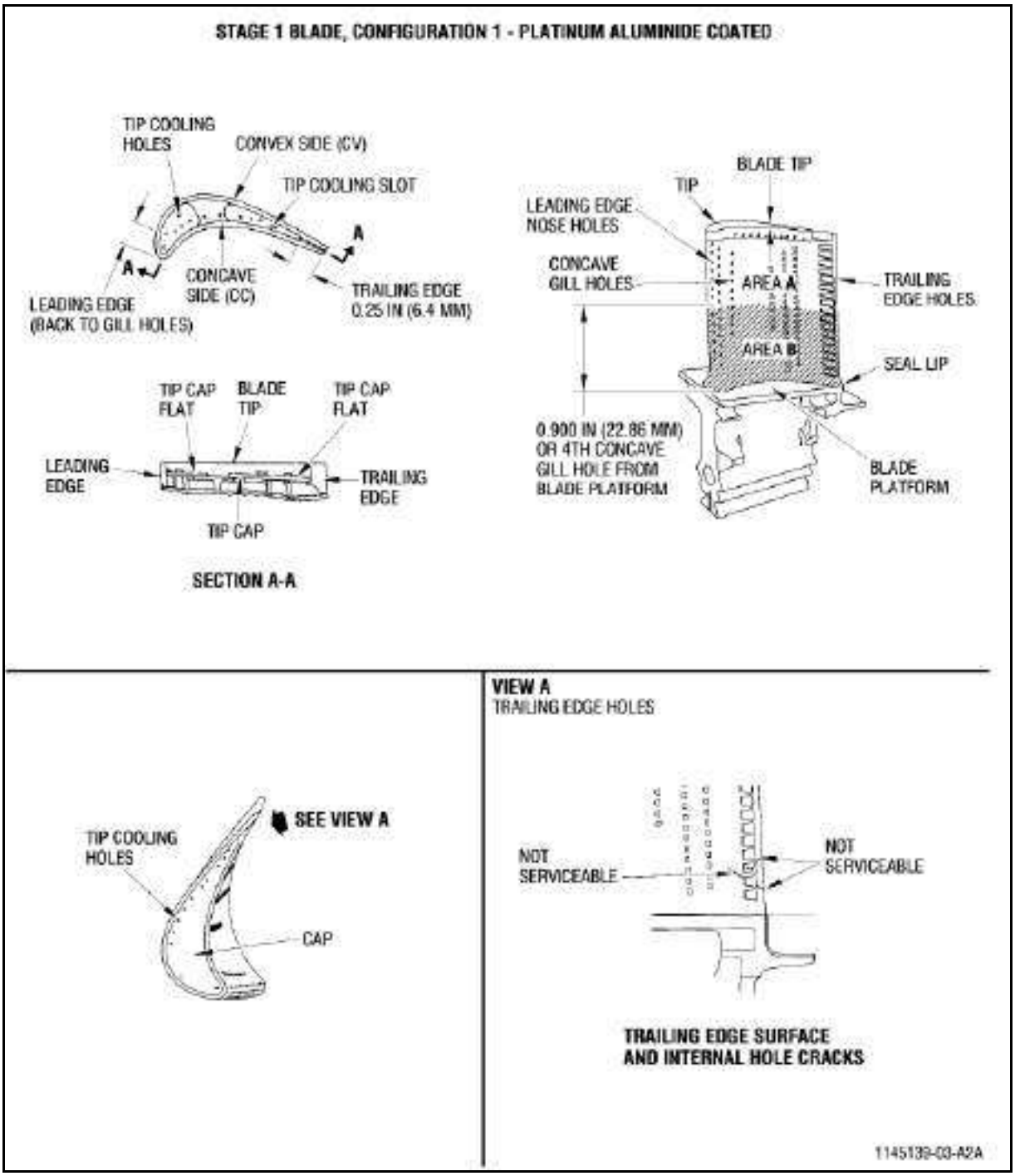



Figure 16: HPT Stage 1 Rotor Blades Inspection Areas (Platinum Aluminide Coated Blades)

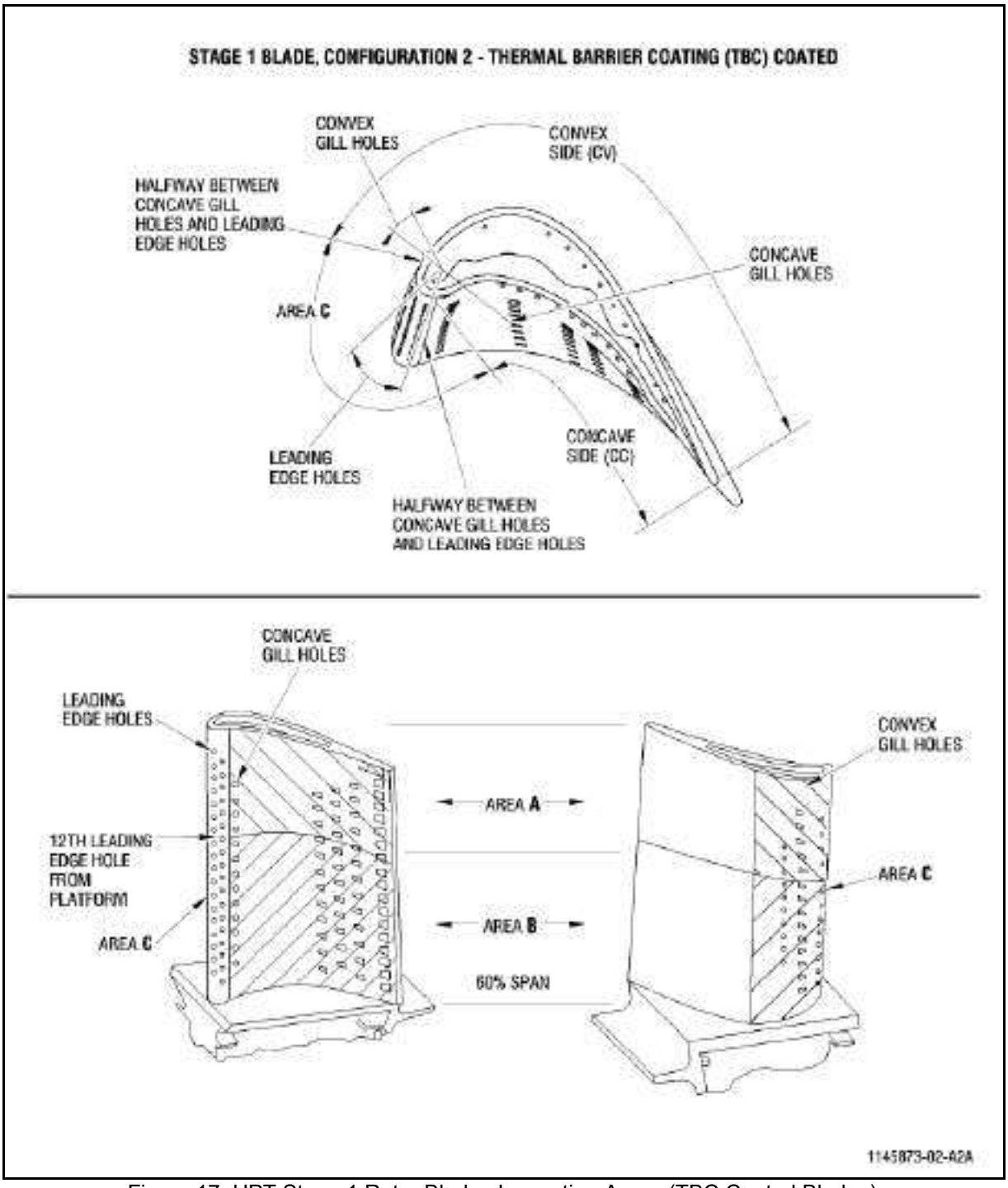



Figure 17: HPT Stage 1 Rotor Blades Inspection Areas (TBC Coated Blades)

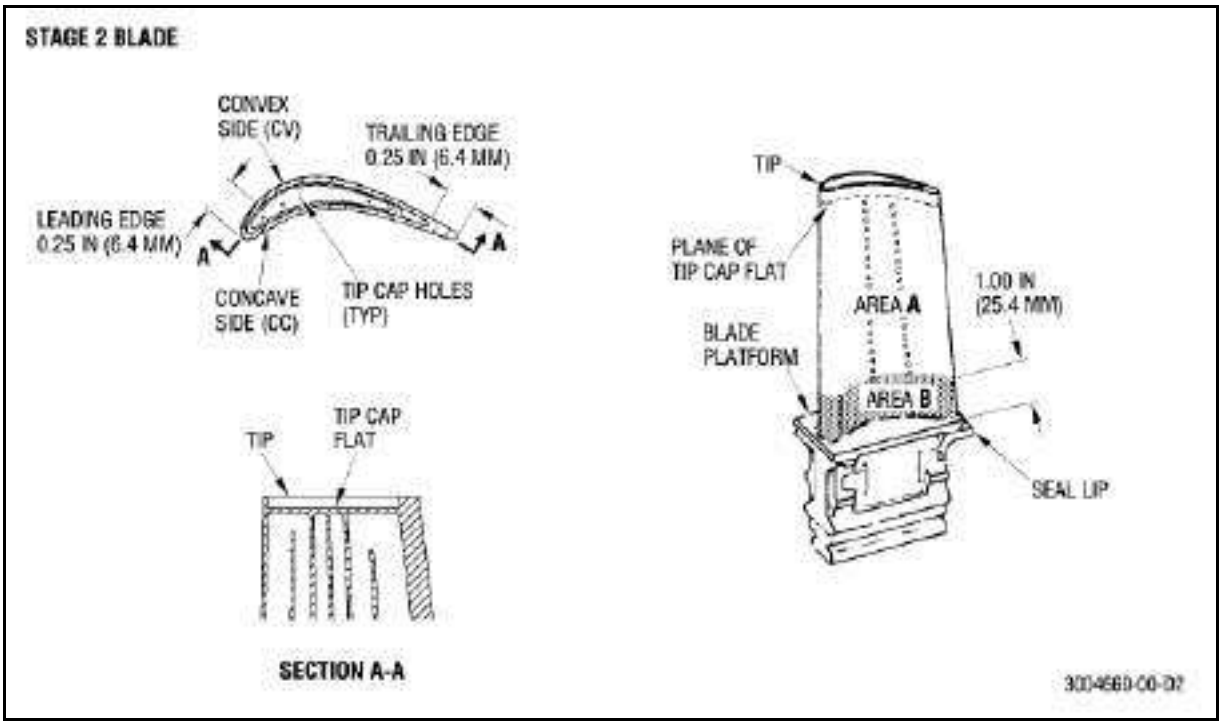


Figure 18: HPT Stage 2 Rotor Blades Inspection Areas

**Borescope Pictures**



Picture 67: Stage1 Nozzles leading edge



Picture 68: Stage1 Nozzles leading edge



Picture 69: Stage1 Nozzles leading edge



Picture 70: Stage1 Nozzles leading edge



Picture 71: Stage1 Nozzles leading edge



Picture 72: Stage1 Nozzles leading edge



Picture 73: Stage1 Nozzle airfoil concave side



Picture 74: Stage1 Nozzles trailing edge. Convex



Picture 75:Stage1 Nozzles trailing edge. Convex



Picture 76: Stage1 Nozzles trailing edge. Convex



Picture 77:Stage1 Nozzles trailing edge. Convex



Picture 78:Stage1 Nozzles trailing edge. Convex



Picture 79: Stage1 Nozzle trailing edge concave



Picture 80: Stage1 Nozzle trailing edge cooling slots



Picture 81: Stage1 Nozzle trailing edge cooling slots



Picture 82: Stage 1 Nozzles trailing edge. Blades leading edge convex



Picture 83: Stage 1 Blades leading edge



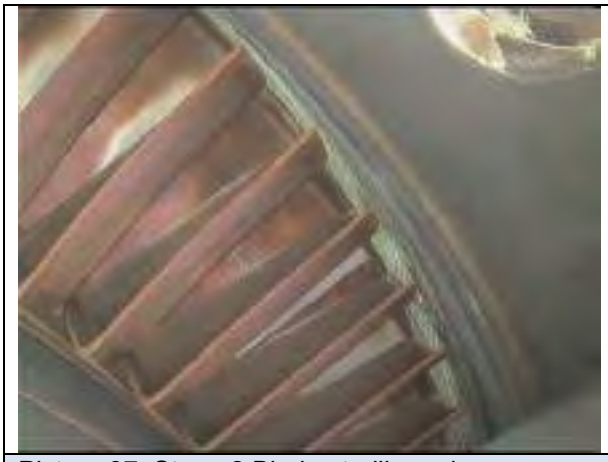
Picture 84: Stage 1 Blades trailing edge



Picture 85: Stage 2 Blades leading edge



Picture 86: Stage 2 Nozzles trailing edge



Picture 87: Stage 2 Blades trailing edge



Picture 88: Stage 2 Blades trailing edge

LPT Section

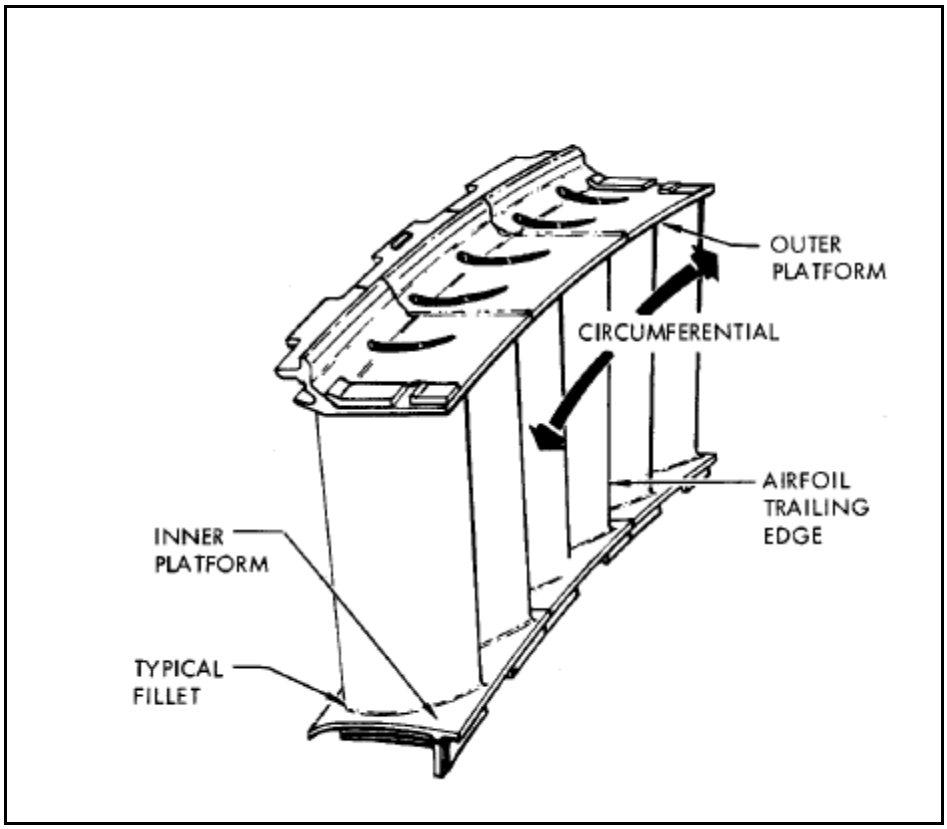



Figure 19: Power Turbine Nozzles

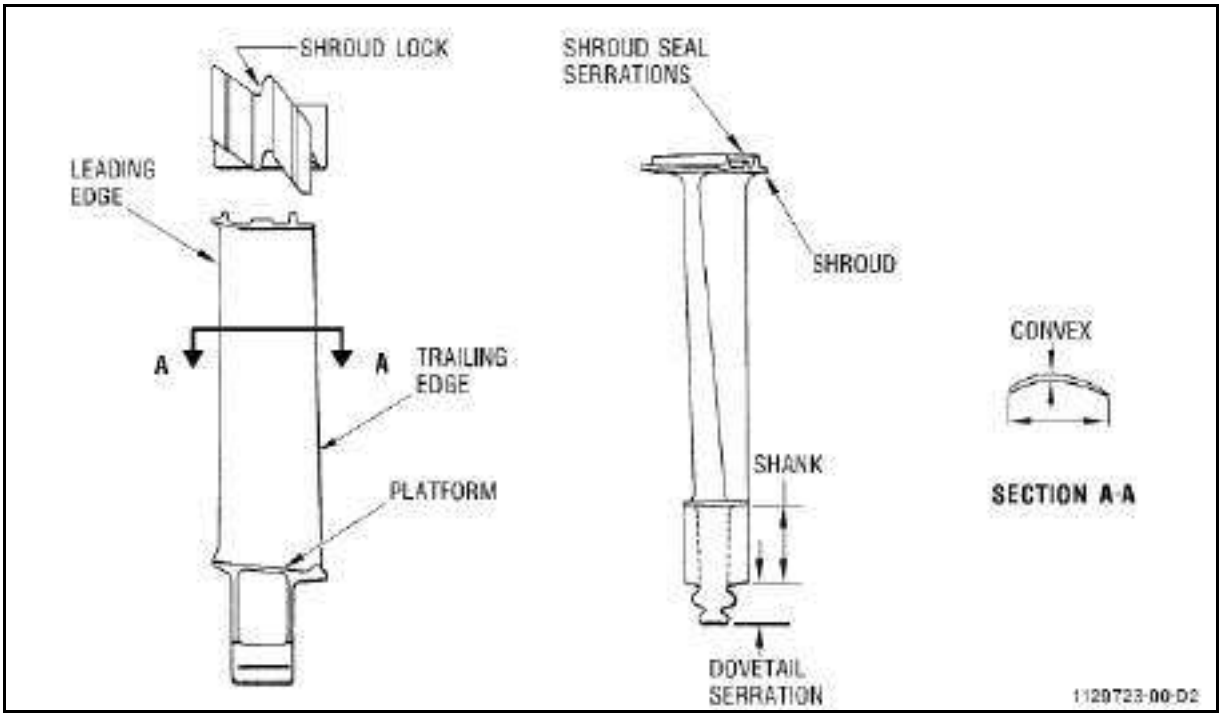



Figure 20: Power Turbine Rotor Blades

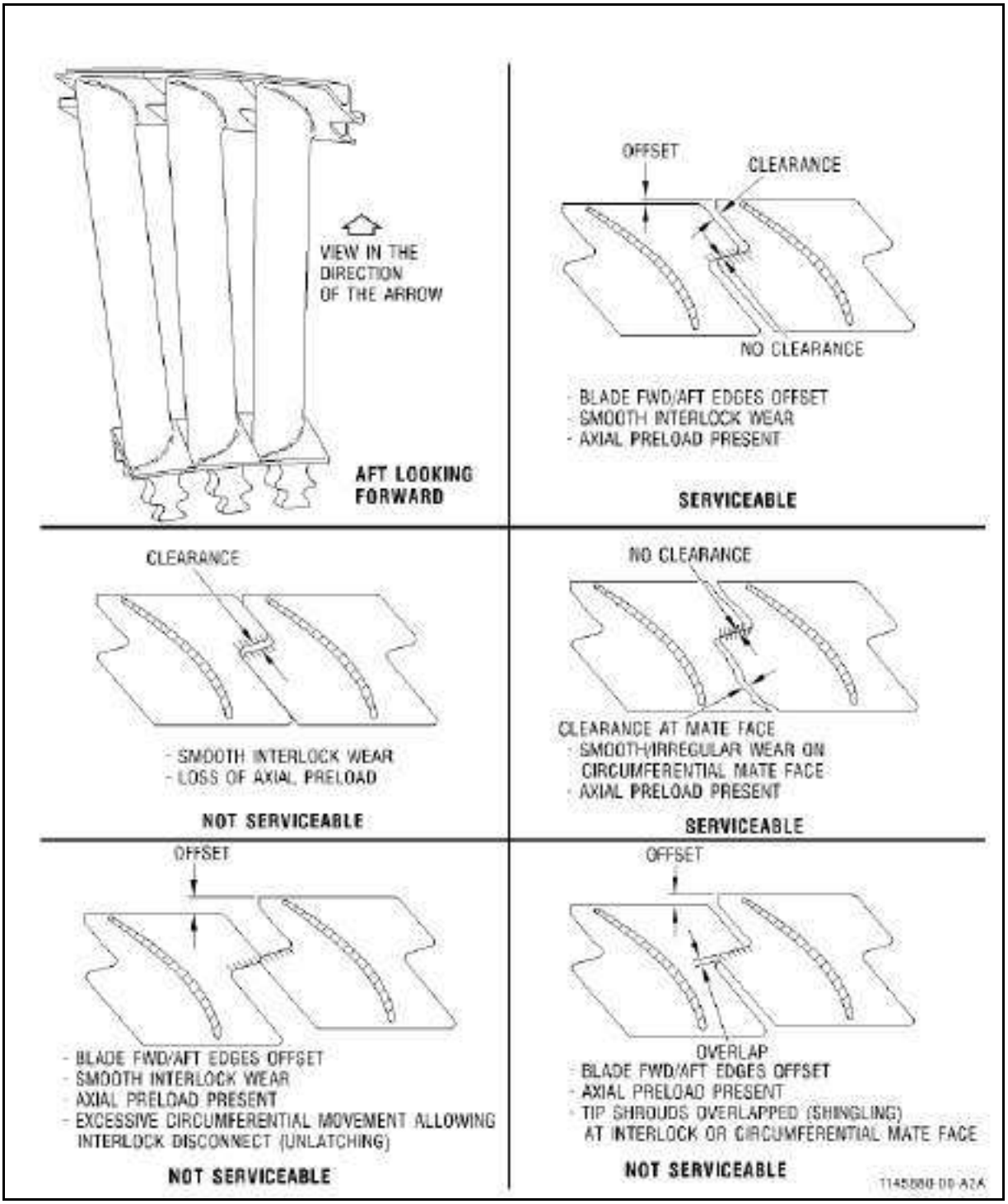


Figure 21: LPT Rotor Blade Circumferential Inspection

**Notes:**

The LPT stage 1 accessible nozzles and blades did not show any damage.

**Borescope Pictures**



Picture 89: TMF and LPT Inlet



Picture 90: TMF and LPT Inlet



Picture 91: Stage 1 Blades tip interlock



Picture 92: LPT Stage 1 Nozzles and blades

# *BORESCOPE INSPECTION REPORT*
# *TM2500 GEN. 6-7*
# *7LM2500 – PK – MDWG05*

## NFE SAN JUAN POWER PLANT

## *PACKAGE # 7250394*

## *UNIT #7*

| | | | |
|---|---|---|---|
| **Visit Date:** | December 13, 2024 | **Total Starts:** | 165 |
| **Engine S/N:** | 557 – 230 | **GG Hours:** | 9305 |
| **Power Turbine S/N:** | 557 - 230 | **PT Hours:** | 9305 |
| **PPG GT Field Engineer:** | JC Requena H | **NFE Representative:** | Lance Florent |



# TABLE OF CONTENTS


1 Conclusions and Recommendations .....3
2 Outage Data .....4
3 Borescope Inspection Checklist.....5
4 Borescope Inspection Record.....6
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4.2 Combustor and 1St Stage Nozzle Section.....12
4.3 Turbine Section.....18
4.4 LPT Section .....27

## 1. Conclusions and Recommendations

**Purpose of visit:**
The purpose of this visit was to perform a borescope inspection of the Engine in accordance with GEK105054, WP 406 00.

1.1 The HPC Section is serviceable according to GEK105054 Volume II WP40600 Table 4.
One (1) blade with minor nick on leading edge tip area. Serviceable
The HPC section was found clean.

1.2 The Combustor section is serviceable according to GEK105054 Volume II WP40600 Table 7.
The burn through damages detected during previous inspection (May 25, 2024) did not increase significantly.

1.3 The High Pressure Turbine section is serviceable according to GEK105054 Volume II WP40600 Table 8.
The Stage 1 & 2 blades have minor missing coating spots at several blades.
The Stage 1 Shrouds and Stage 2 Honeycomb seals are in good condition, just showing minor rubbing marks.
The Stage 1 Borescope plug nozzle shows outer platform erosion.

1.4 PT section is serviceable vanes and STG-1 blades and honeycomb seal no damage found.

## 2. Outage Data

**ENGINE DATA**

| | | | | | |
|---|---|---|---|---|---|
| **ESN:** | 557-230 | **Engine Fired Hours:** | 9305 | **Package Hours:** | 9305 |
| **Model:** | 7LM2500-PK-MDWG05 | **Engine Fired starts:** | 165 | **Package Fired Starts:** | 165 |

**MAINTENANCE DATA**

| WP, SB, SL, PB, PL Performed | GEK105054, REV 11 | Date completed | Comments |
|---|---|---|---|
| WP 406 00 | Borescope Inspection | 12DEC24 | Serviceable |

**PARTS DATA**

| Description | PN Removed | SN Removed | Qty | Disposition | PN Installed | SN Installed |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |

## 3. Borescope Inspection Checklist

**Date unit out of operation:** 11DEC24
**Date unit into operation:** 13DEC24
**Last inspection date:** 29MAY24; PPG O&M

**Type of Fuel:** Gas / Diesel
**Type of outage:** Scheduled

**Type of NOx suppression:** Water Injection

**Inspection of gas turbine:**

| WATERWASH: | HIGH PRESSURE COMPRESSOR: |
|---|---|
| ☒ PERFORMED WATER WASH | ☒ HPC BORESCOPE INSPECTION |
| **COMBUSTOR:** | **HIGH PRESSURE TURBINE** |
| ☒ COMBUSTOR BORESCOPE INSPECTION | ☒ HPT STAGE 1 & 2 NOZZLE BORESCOPE INSPECTION |
| | ☒ HPT BLADE BORESCOPE INSPECTION |
| **LOW PRESSURE TURBINE:** | |
| ☒ LPT BORESCOPE INSPECTION | |

☒ ***Please verify all borescope plugs have been reinstalled***

## 4. Borescope Inspection Record

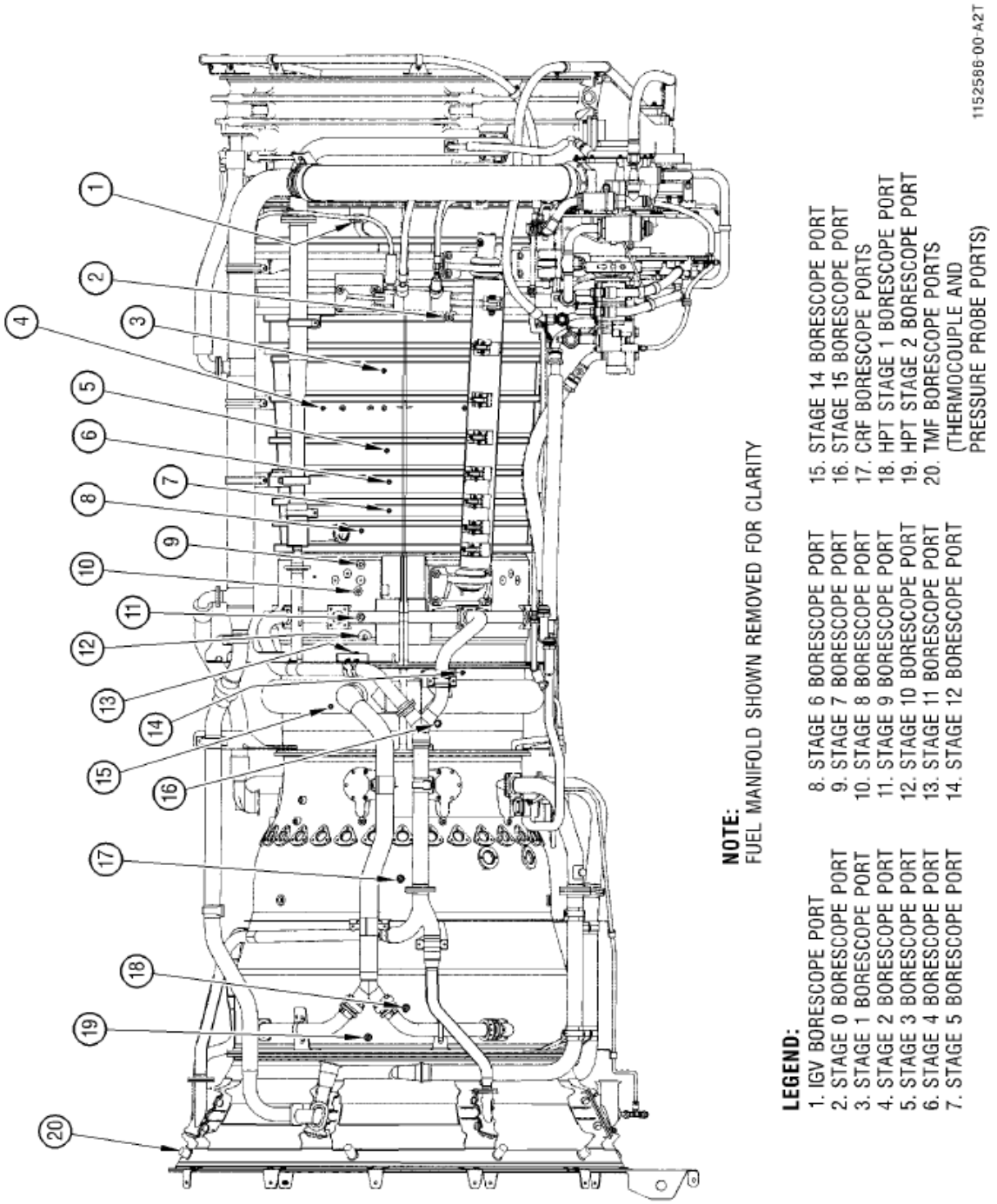



Figure 1: Position of Borescope Inspection Ports.

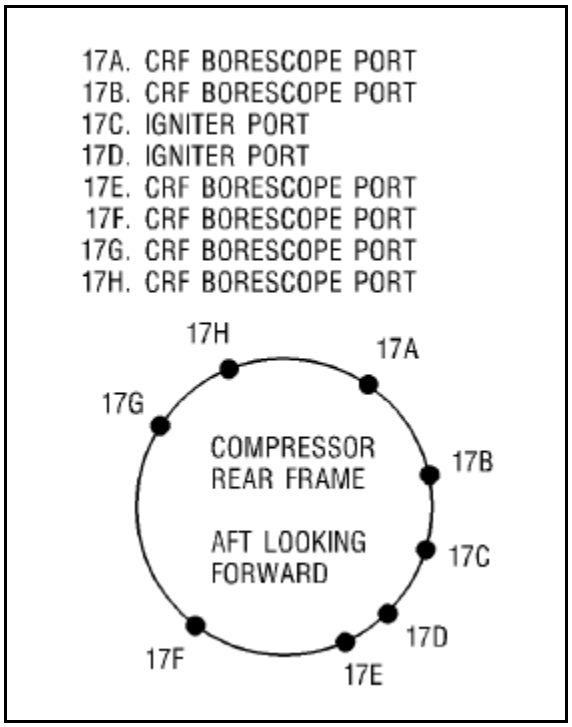


Figure 2: Position of Borescope Inspection Ports.

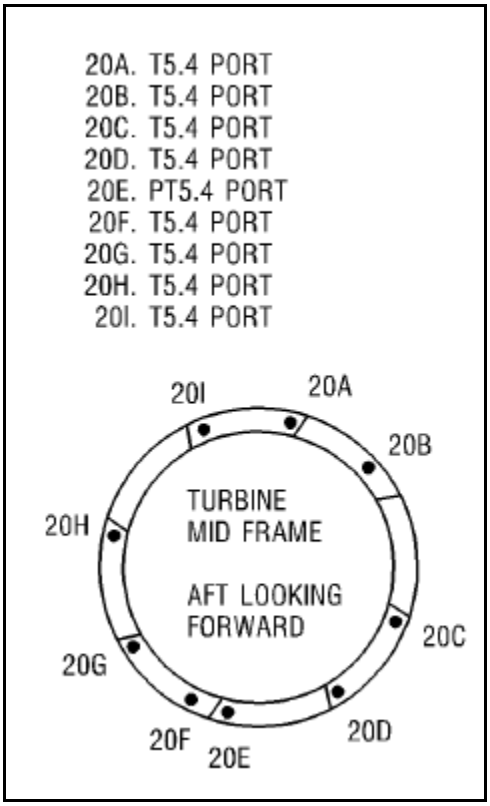


Figure 3: Position of Borescope Inspection Ports.

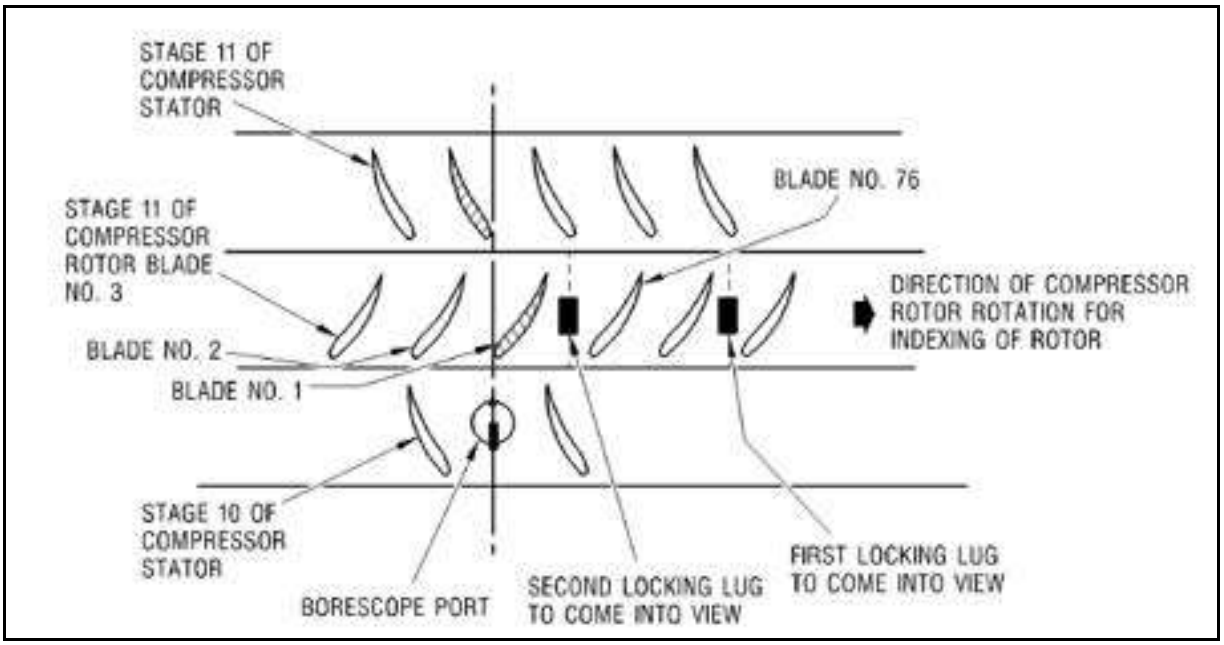


Figure 4: Zero indexing of HPC rotor and HPT rotor

## Compressor Section

| Port | T.E. | L.E. | blades | Remarks: | photo no: |
|---|---|---|---|---|---|
| 1 | IGV | | | | 1 – 2 |
| 1 | | 0 | 36 | | 3 – 4 |
| 2 | 0 | | 36 | | 5 – 6 |
| 2 | | 1 | 26 | | 7 |
| 3 | 1 | | 26 | | 8 – 9 – 10 |
| 3 | | 2 | 26 | | 11 – 12 |
| 4 | 2 | | 26 | | 13 |
| 4 | | 3 | 42 | | 14 – 15 |
| 5 | 3 | | 42 | | 16 |
| 5 | | 4 | 45 | | 17 – 18 |
| 6 | 4 | | 45 | | 19 |
| 6 | | 5 | 48 | | 20 – 21 |
| 7 | 5 | | 48 | | 22 |
| 7 | | 6 | 54 | | 23 – 24 |
| 8 | 6 | | 54 | Blades contacting tip | |
| 8 | | 7 | 56 | Blades contacting tip | |
| 9 | 7 | | 56 | | 25 – 26 |
| 9 | | 8 | 64 | | 27 – 28 |
| 10 | 8 | | 64 | | 29 – 30 |
| 10 | | 9 | 66 | | 31 – 32 |
| 11 | 9 | | 66 | | 33 – 34 |
| 11 | | 10 | 66 | | 35 – 36 |
| 12 | 10 | | 66 | | 37 |
| 12 | | 11 | 76 | | 38 – 39 |
| 13 | 11 | | 76 | | 40 – 41 |
| 13 | | 12 | 76 | One blade (1) with minor nick on leading edge tip area | 42 – 43 |
| 14 | 12 | | 76 | | 44 |
| 14 | | 13 | 76 | | 45 – 46 |
| 15 | 14 | | 76 | Inside bleed manifold | |
| 15 | | 15 | 76 | Inside bleed manifold | |
| 16 | 15 | | 76 | | 47 |
| 16 | | 16 | 76 | | 48 – 49 – 50 |

**Notes:**
The HPC Section is serviceable according to GEK105054 Volume II WP40600 Table 4.
One (1) blade with minor nick on leading edge tip area. Serviceable
The HPC section was found clean.

.



Picture 1. CFF & IGV



Picture 2. IGV



Picture 3. Stage 0 base



Picture 4. Stage 0 Leading edge tip



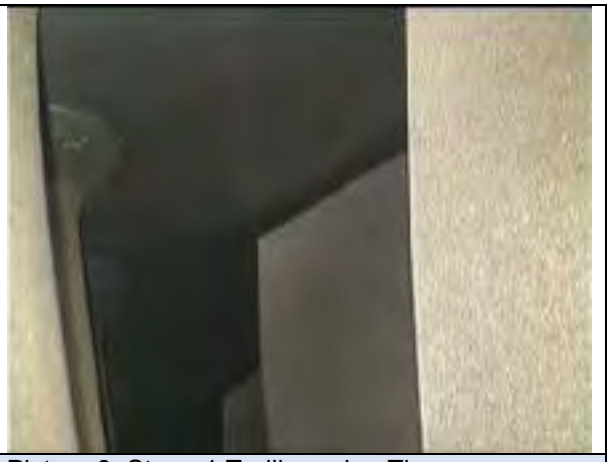
Picture 5. Stage 0 Trailing edge



Picture 6. Stage 0 Weep hole



Picture 7. Stage 1 Leading edge base



Picture 8. Stage 1 Trailing edge Tip



Picture 9. Stage 1 Weep hole



Picture 10. Stage 1 Blades retaining ring



Picture 11. Stage 2 Leading edge tip



Picture12. Stage 2 Trailing edge base



Picture 13. Stage 2 Trailing edge



Picture 14. Stage 3 Leading edge



Picture 15. Stage 3 Leding edge base



Picture 16. Stage 3 Trailing edge



Picture 17. Stage 4 Leading edge tip



Picture 18. Stage 4 Leading edge base



Picture 19. Stage 4 Trailing edge



Picture 20. Stage 5 Leading edge



Picture 21. Stage 5 Leading edge base



Picture 22. Stage 5 Trailing edge



Picture 23. Stage 5 Trailing edge tip



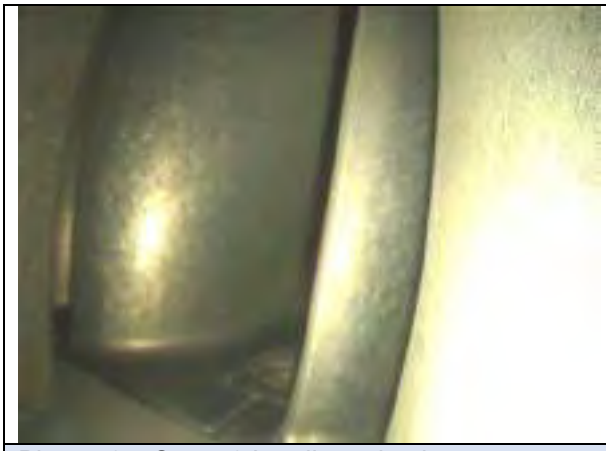
Picture 24. Stage 6 Leading edge base



Picture 25. Stage 7 Trailing edge tip



Picture 26. Stage 7 Trailing edge base



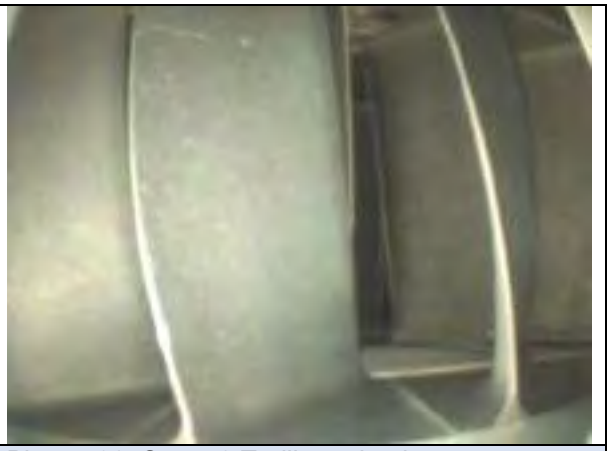
Picture 27. Stage 8 Leading edge base



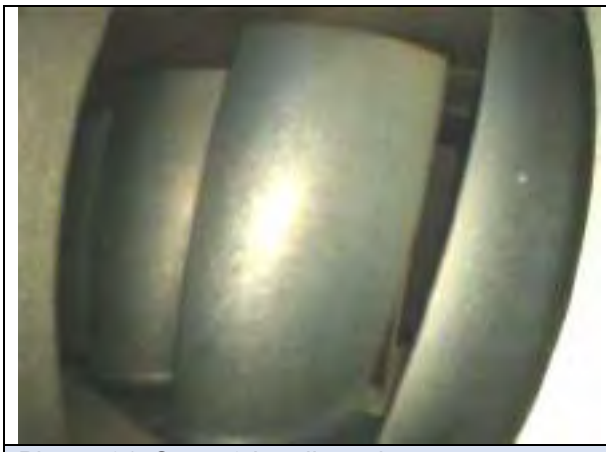
Picture 28. Stage 8 Leading edge tip



Picture 29. Stage 8 Trailing edge tip



Picture 30. Stage 8 Trailing edge base



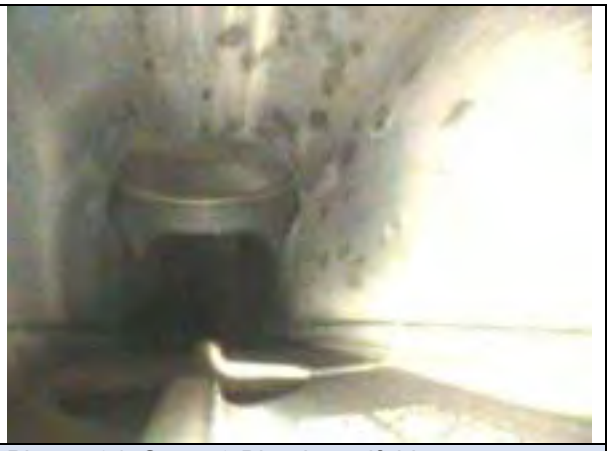
Picture 31. Stage 9 Leading edge



Picture 32. Stage 9 Leading edge



Picture 33. Stage 9 Trailing edge



Picture 34. Stage 9 Bleed manifold



Picture 35. Stage 10 Leading edge tip



Picture 36. Stage 10 Leading edge base



Picture 37. Stage 10 Trailing edge



Picture 38. Stage 11 Leading edge tip



Picture 39. Stage 11 Leading edge base



Picture 40. Stage 11 Trailing edge tip



Picture 41. Stage 11 Trailing edge base



Picture 42. Stage 12 Leading edge minor nick



Picture 43. Stage 12 Leading edge base



Picture 44. Stage 12 Trailing edge



Picture 45. Stage 13 Leading edge



Picture 46. Stage 13 Leading edge base



Picture 47. Stage 15 Trailing edge



Picture 48. Stage 16 Leading edge



Picture 49. Stage 16 Leading edge



Picture 50. Outlet guide vanes

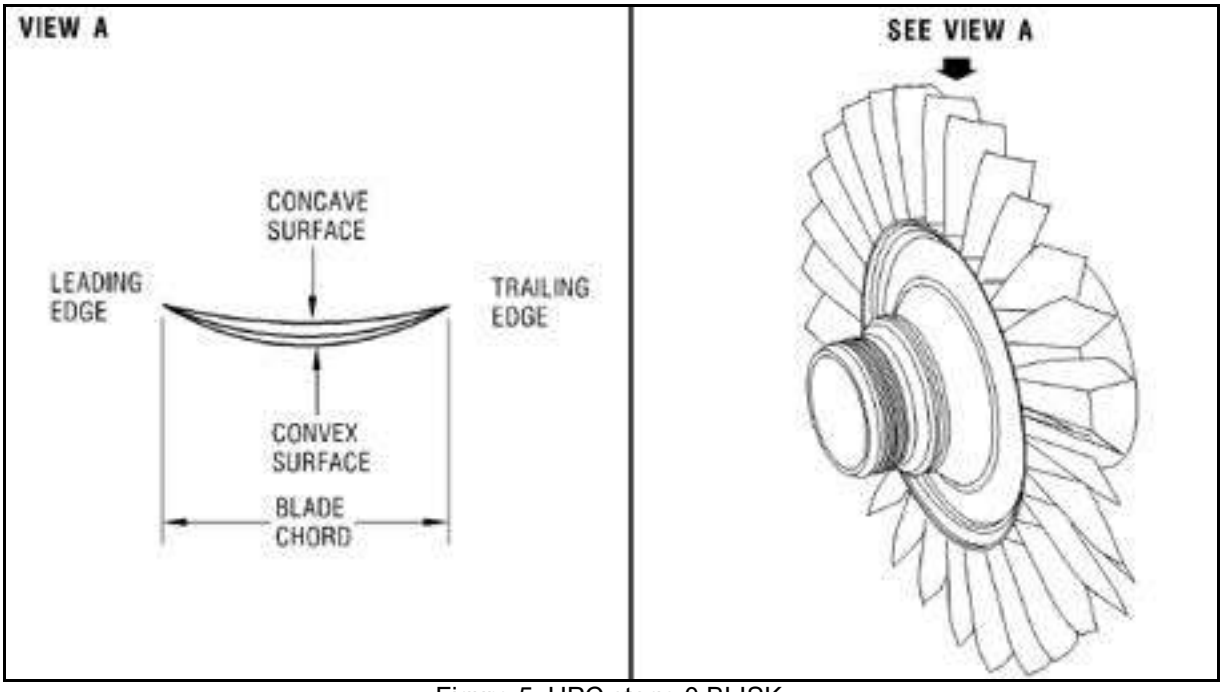



Figure 5: HPC stage 0 BLISK

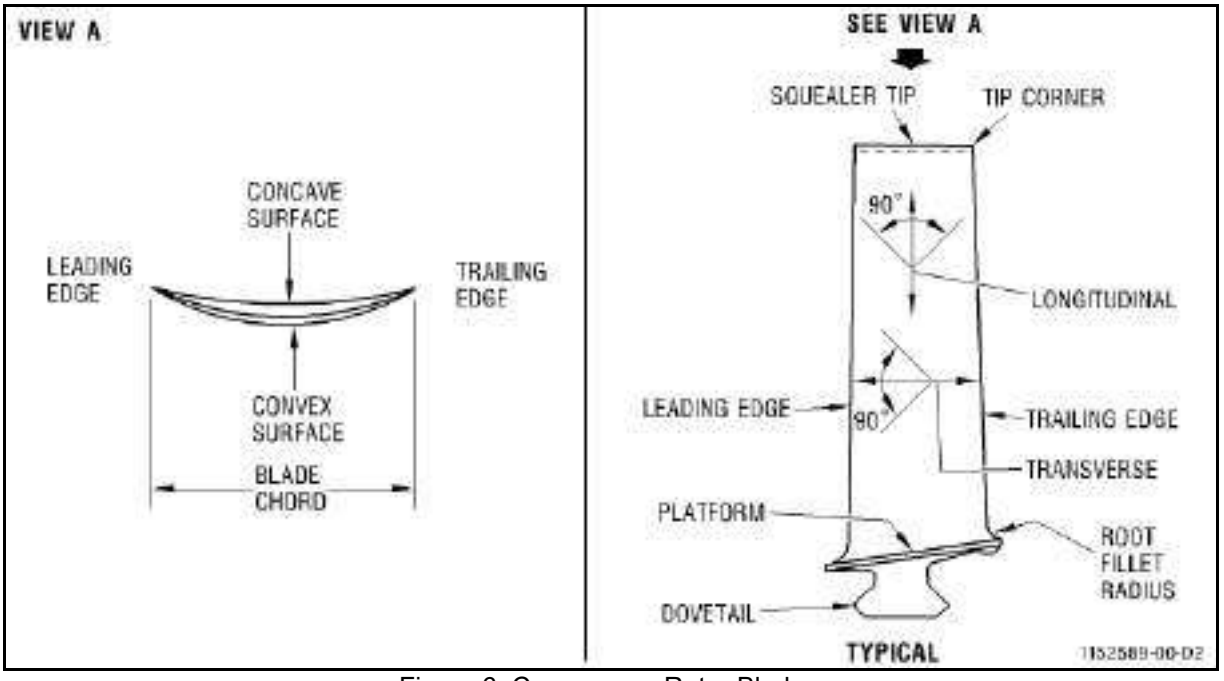



Figure 6: Compressor Rotor Blades

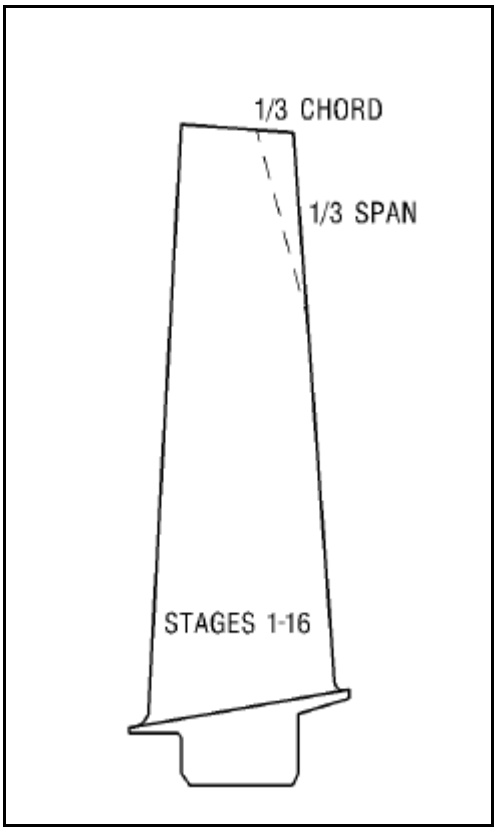


Figure 7: Tip Trailing Edge Inspection

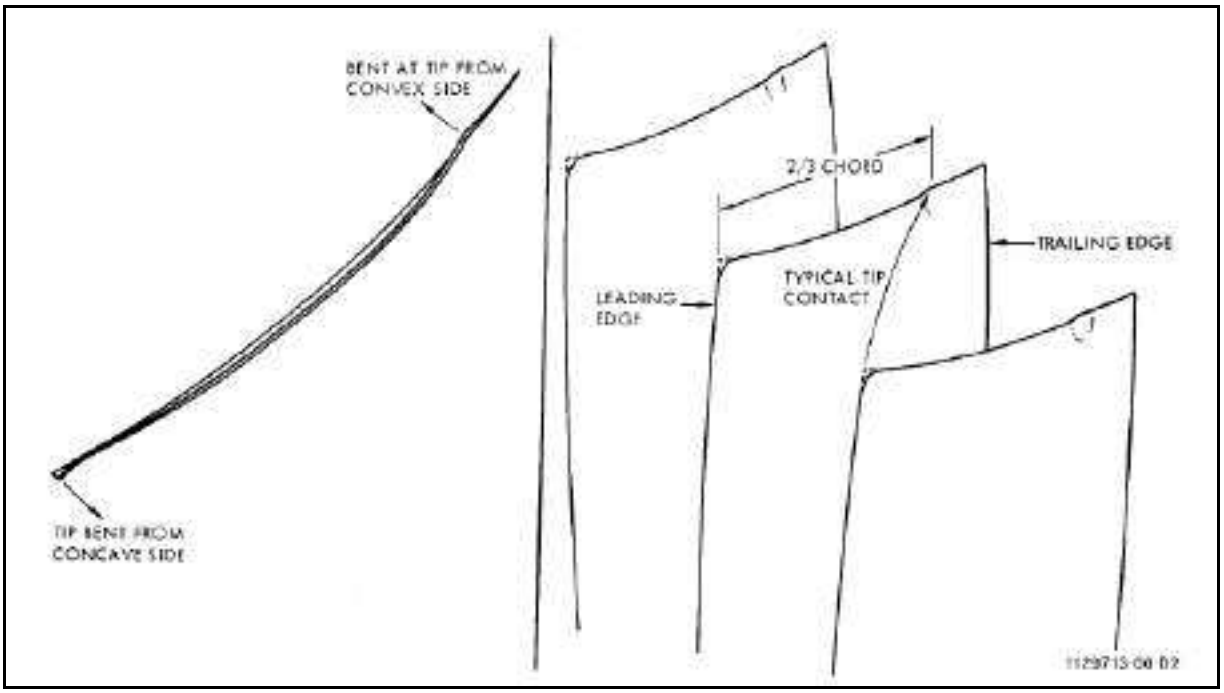
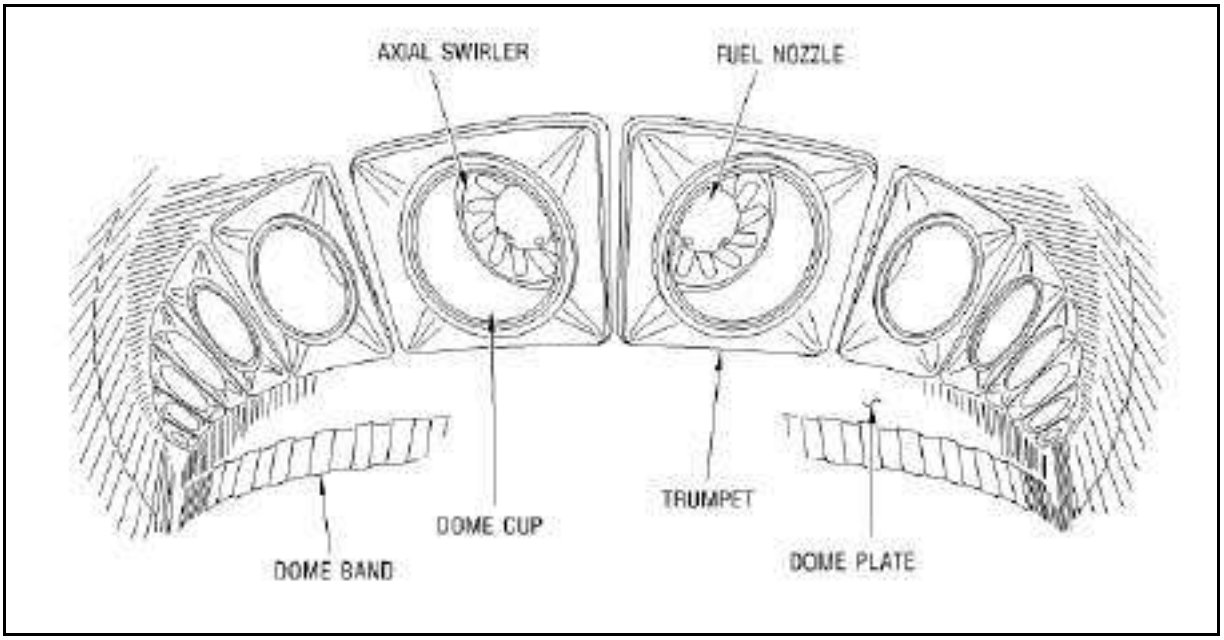


Figure 8: Tip Clanging Contact (HPCR stage 3 through 6)

## Combustor and 1St Stage Nozzle Section

| Port | Condition observed | Photo no: |
|---|---|---|
| **17A** | | |
| **17B** | | |
| **17C** | | |
| **17D** | **See below notes.** | |
| **17E** | | |
| **17F** | | |
| **17G** | | |
| **17H** | | |
| **17** | 1st stage nozzle (leading edge): | |

**Notes:**
The Combustor section is serviceable according to GEK105054 Volume II WP40600 Table 7.
The burn through damages detected during previous inspection (May 25, 2024) did not increase significantly.



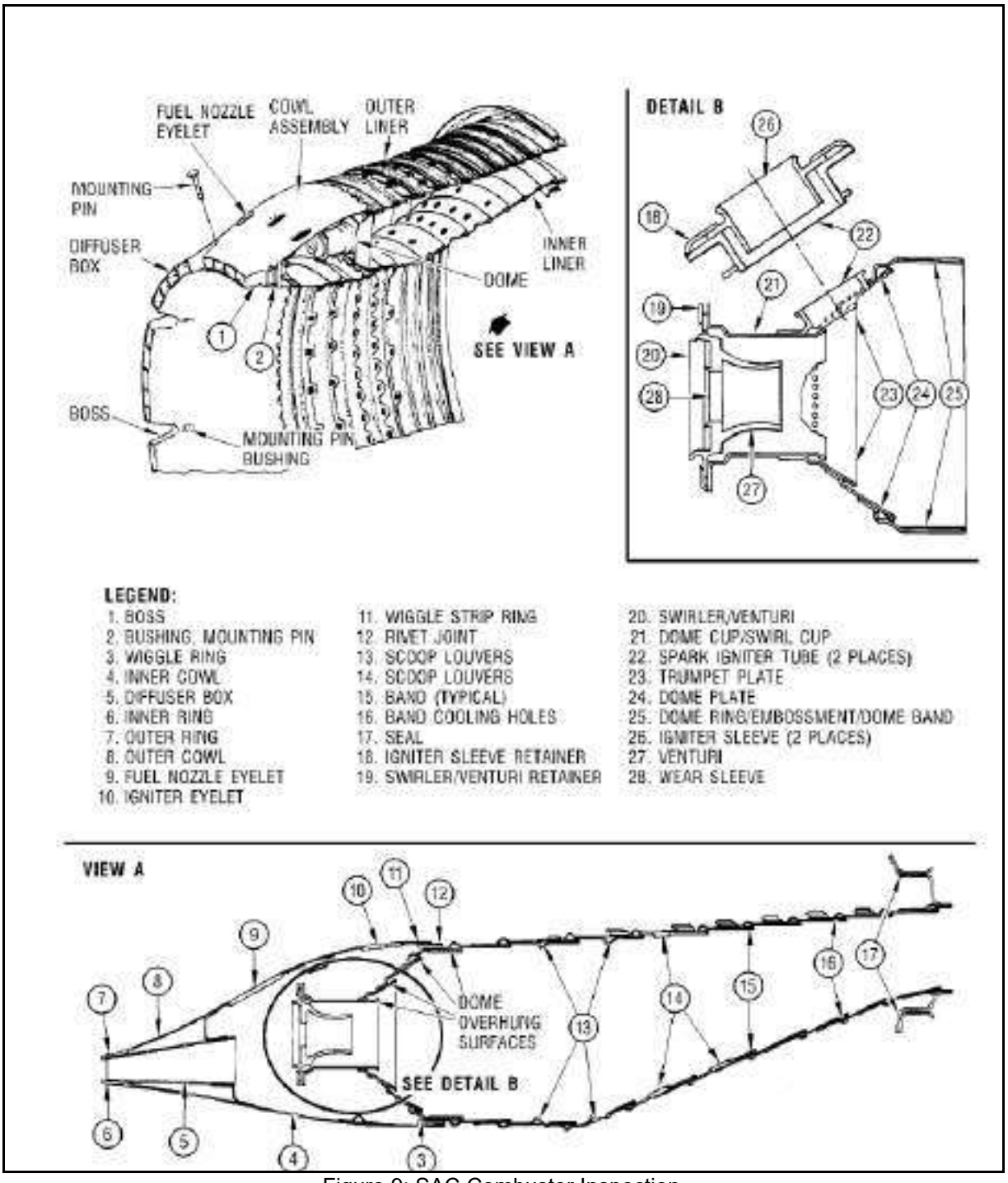



Figure 9: SAC Combustor Inspection

Figure 10: SAC Combustor Inspection

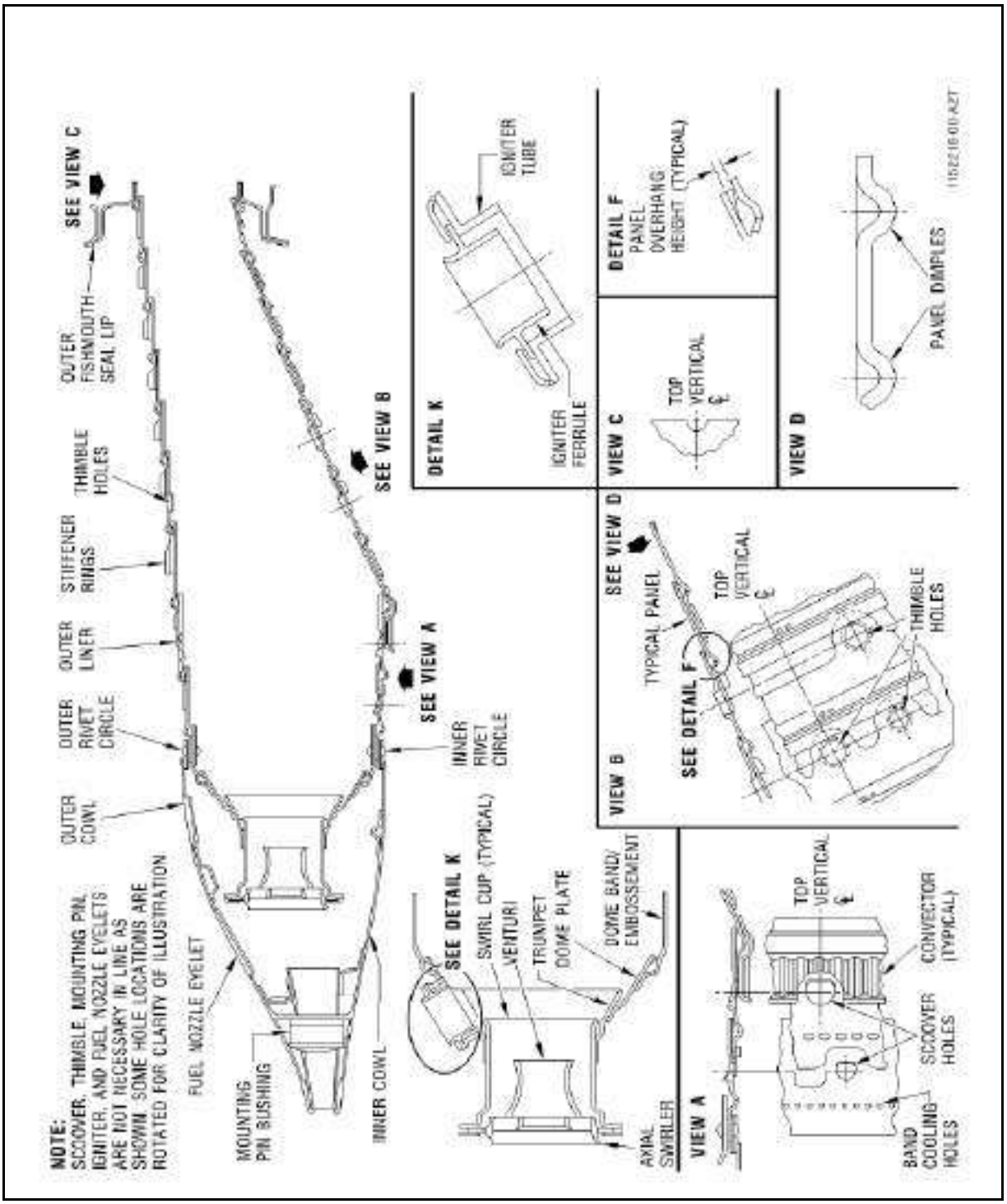
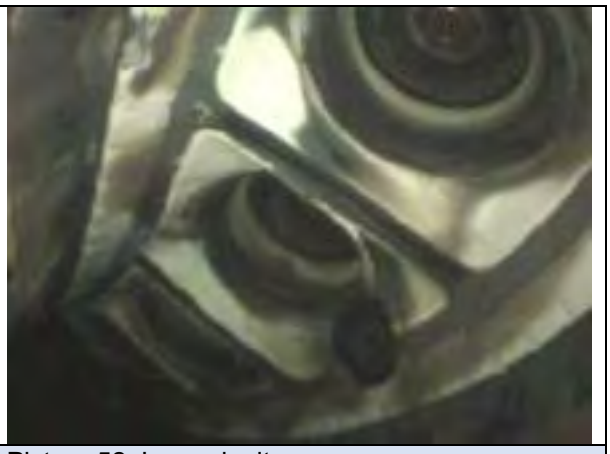



Figure 11: SAC Combustor Inspection

**Borescope Pictures**



Picture 51. Upper igniter



Picture 52. Lower igniter



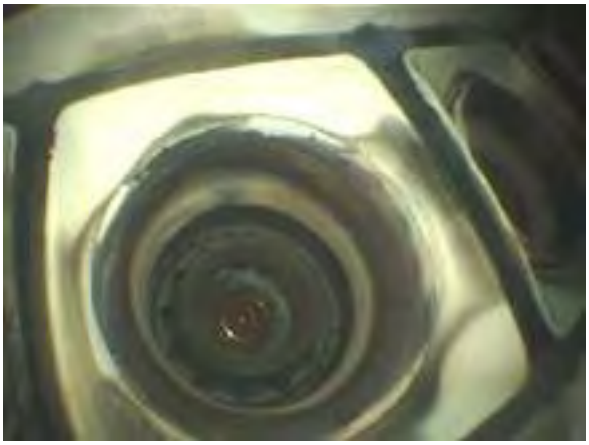
Picture 53. Outer rivets band



Picture 54. Inner rivets band



Picture 55. Inner rivets band burn through



Picture 56. Combustor dome. Splash plates



Picture 57. Combustor dome. Splash plates



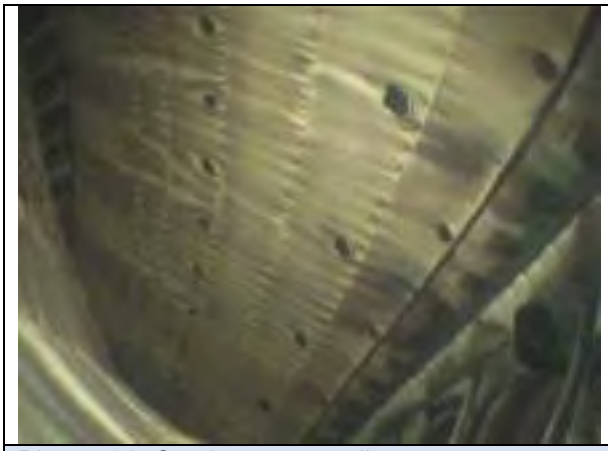
Picture 58. Fuel nozzle tip



Picture 59. Fuel nozzle tip



Picture 60. Combustor inner liner



Picture 61. Combustor outer liner



Picture 62. Combustor seals and HPT Nozzles

## Turbine Section

| | turbine stage | | | | |
|---|---|---|---|---|---|
| **Port** | **L.E.** | **T.E.** | **blades** | **Remarks:** | **photo no:** |
| **18** | **1** | | **88** | | |
| **19** | | **1** | **88** | **See below notes.** | |
| **19** | **2** | | **90** | | |
| **20** | | **2** | | | |

**Notes:**
The High Pressure Turbine section is serviceable according to GEK105054 Volume II WP40600 Table 8.
The Stage 1 & 2 blades have minor missing coating spots at several blades.
The Stage 1 Shrouds and Stage 2 Honeycomb seals are in good condition, just showing minor rubbing marks.
The Stage 1 Borescope plug nozzle shows outer platform erosion.

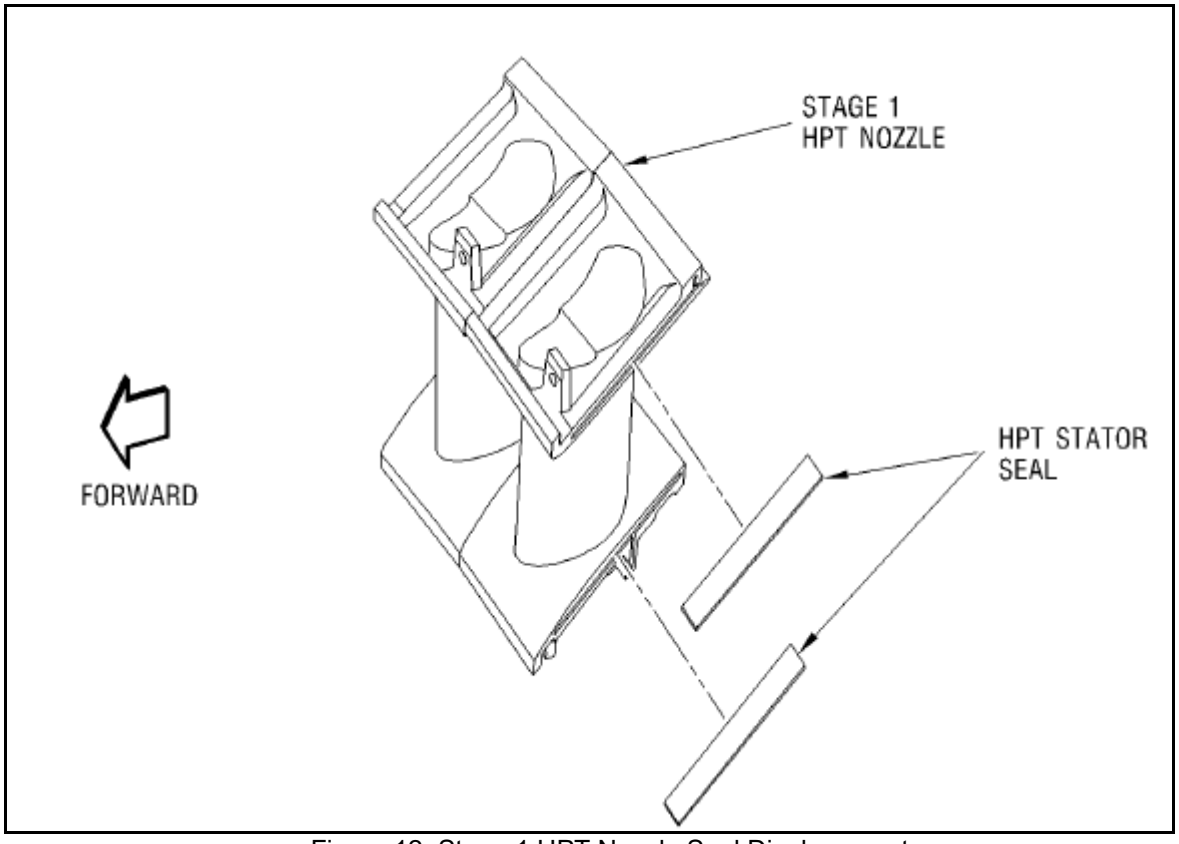


Figure 12: Stage 1 HPT Nozzle Seal Displacement

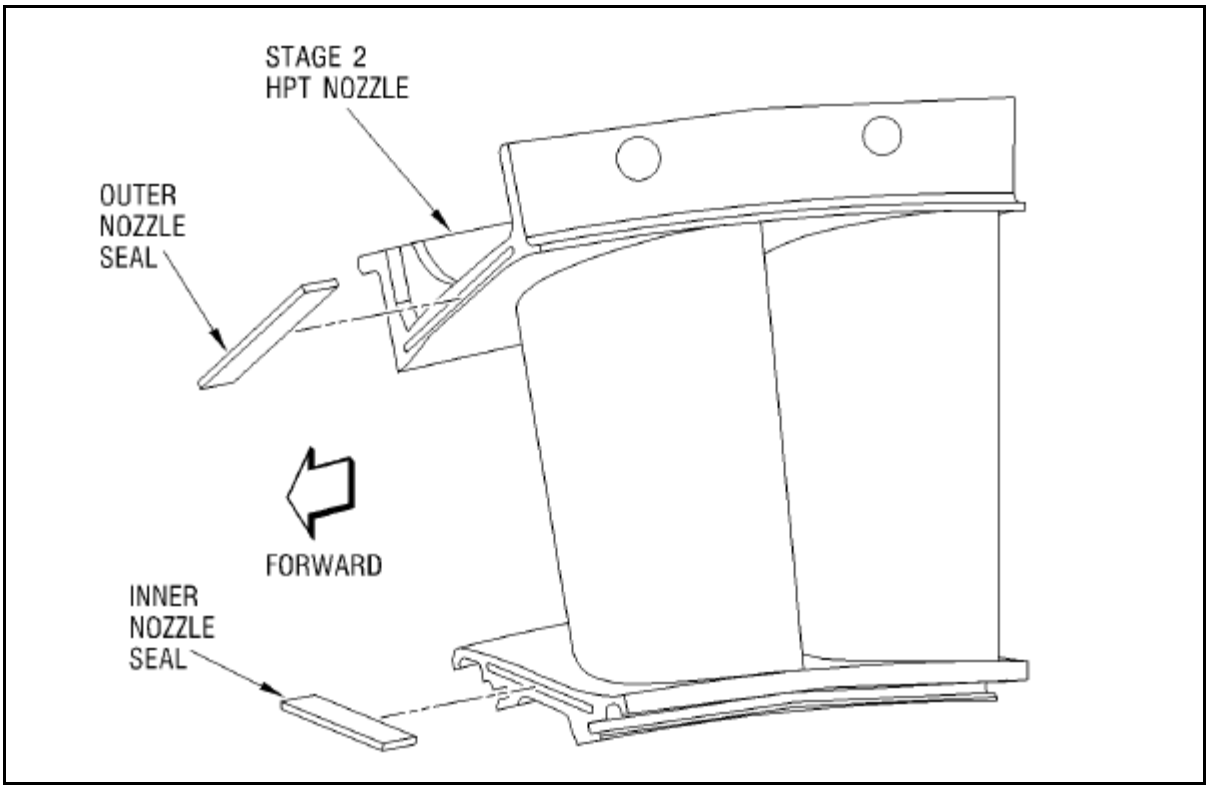


Figure 13: Stage 2 HPT Nozzle Seal Displacement

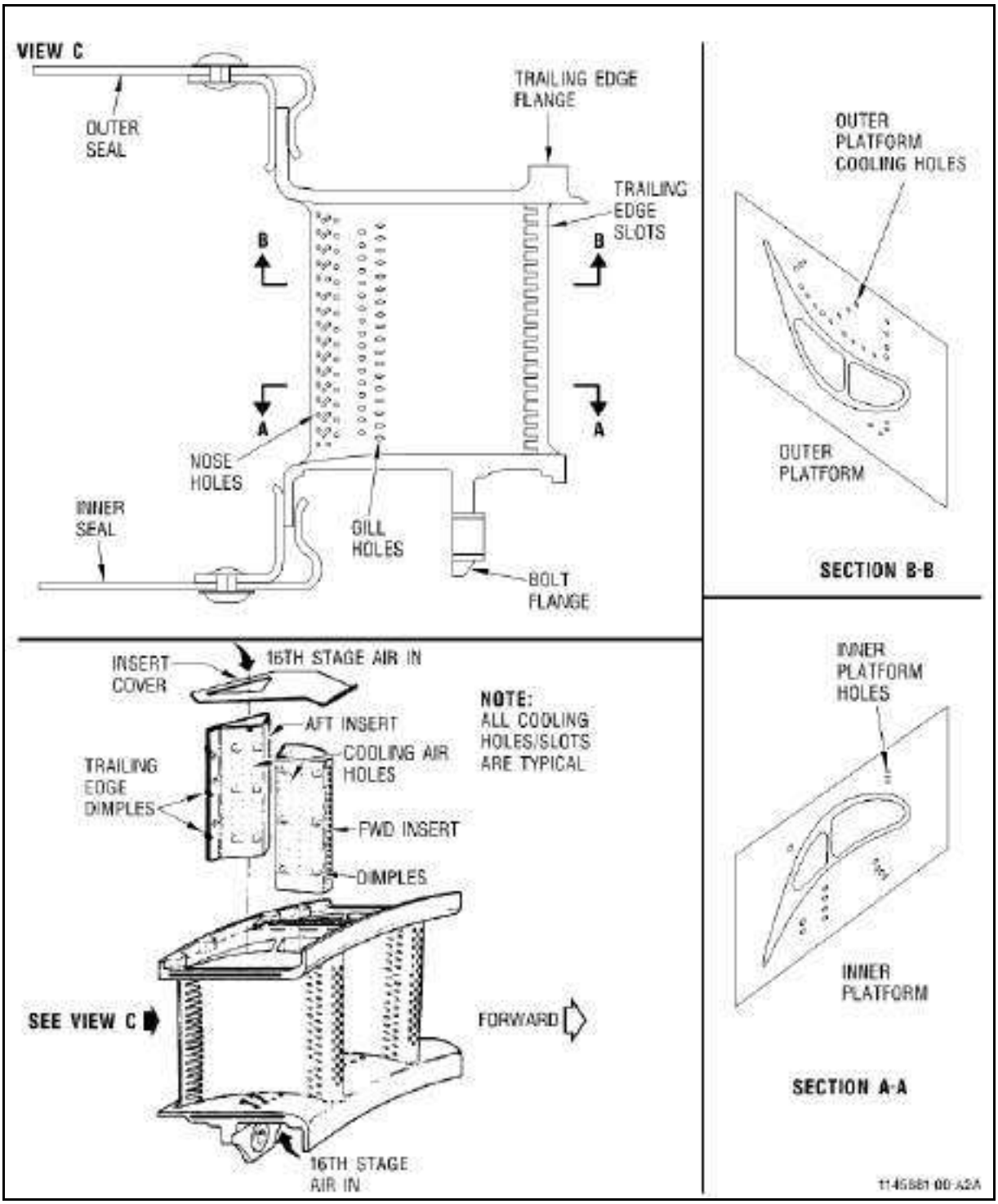



Figure 14: HPT Stage 1 Nozzle

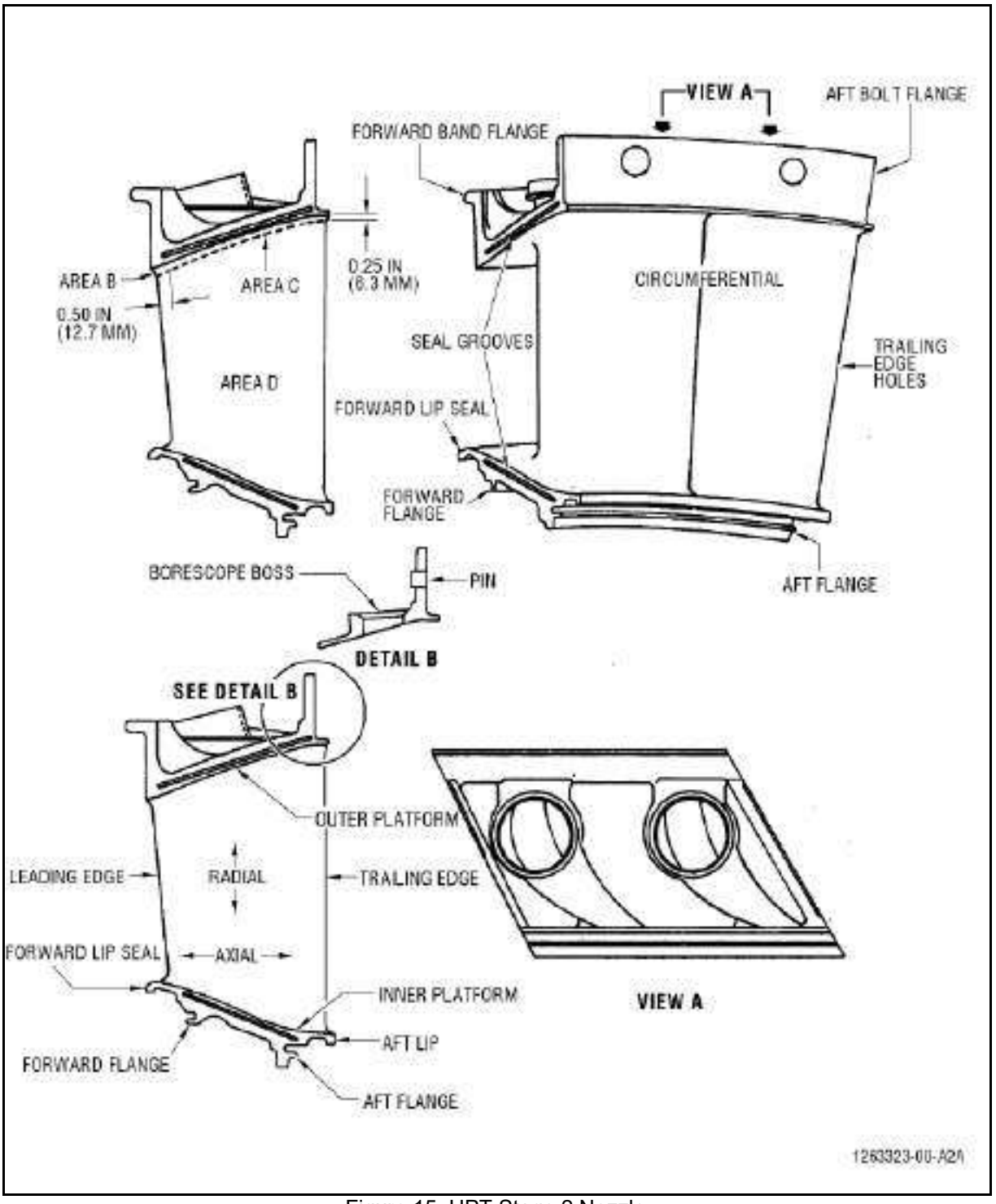



Figure 15: HPT Stage 2 Nozzle

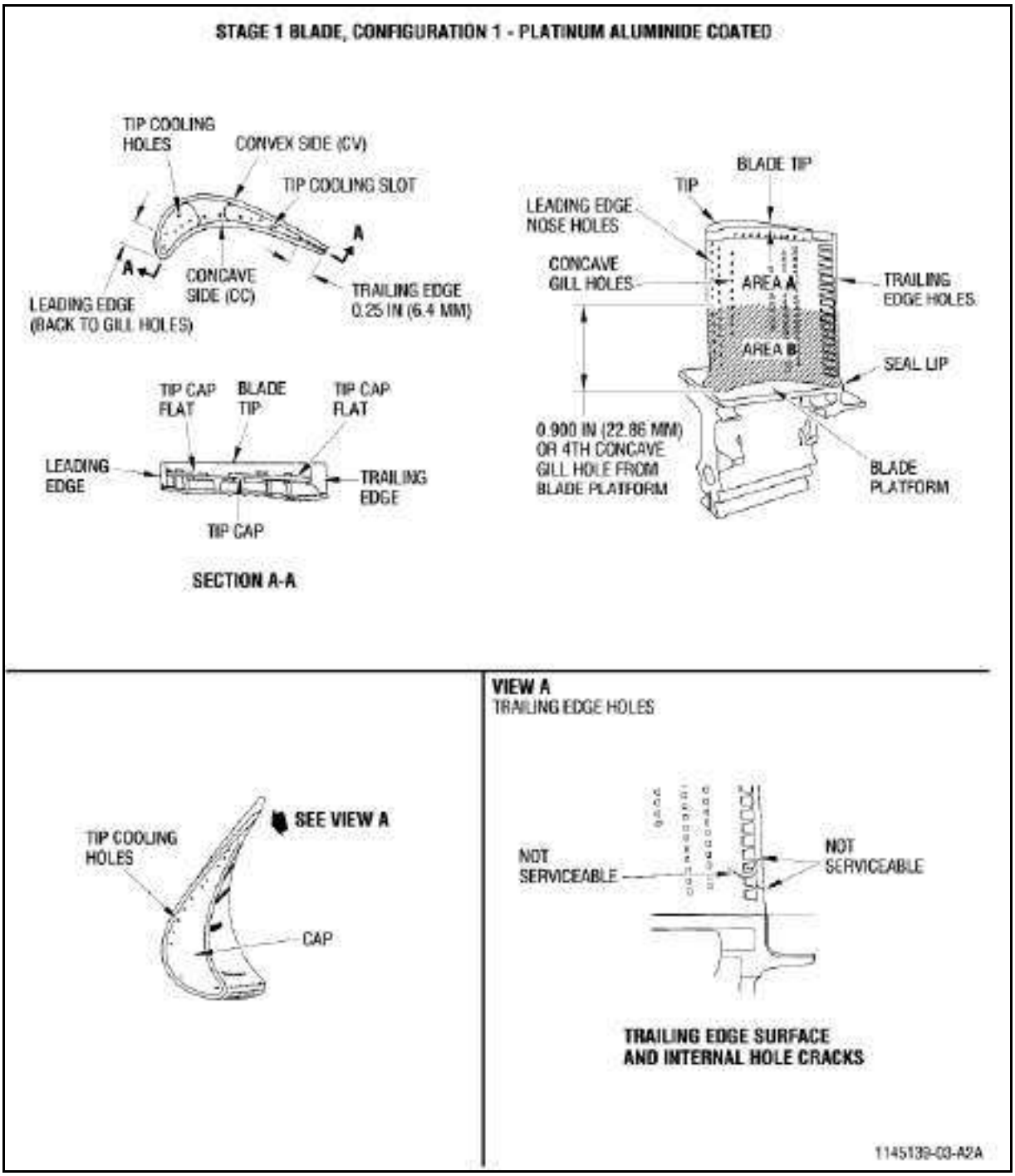



Figure 16: HPT Stage 1 Rotor Blades Inspection Areas (Platinum Aluminide Coated Blades)

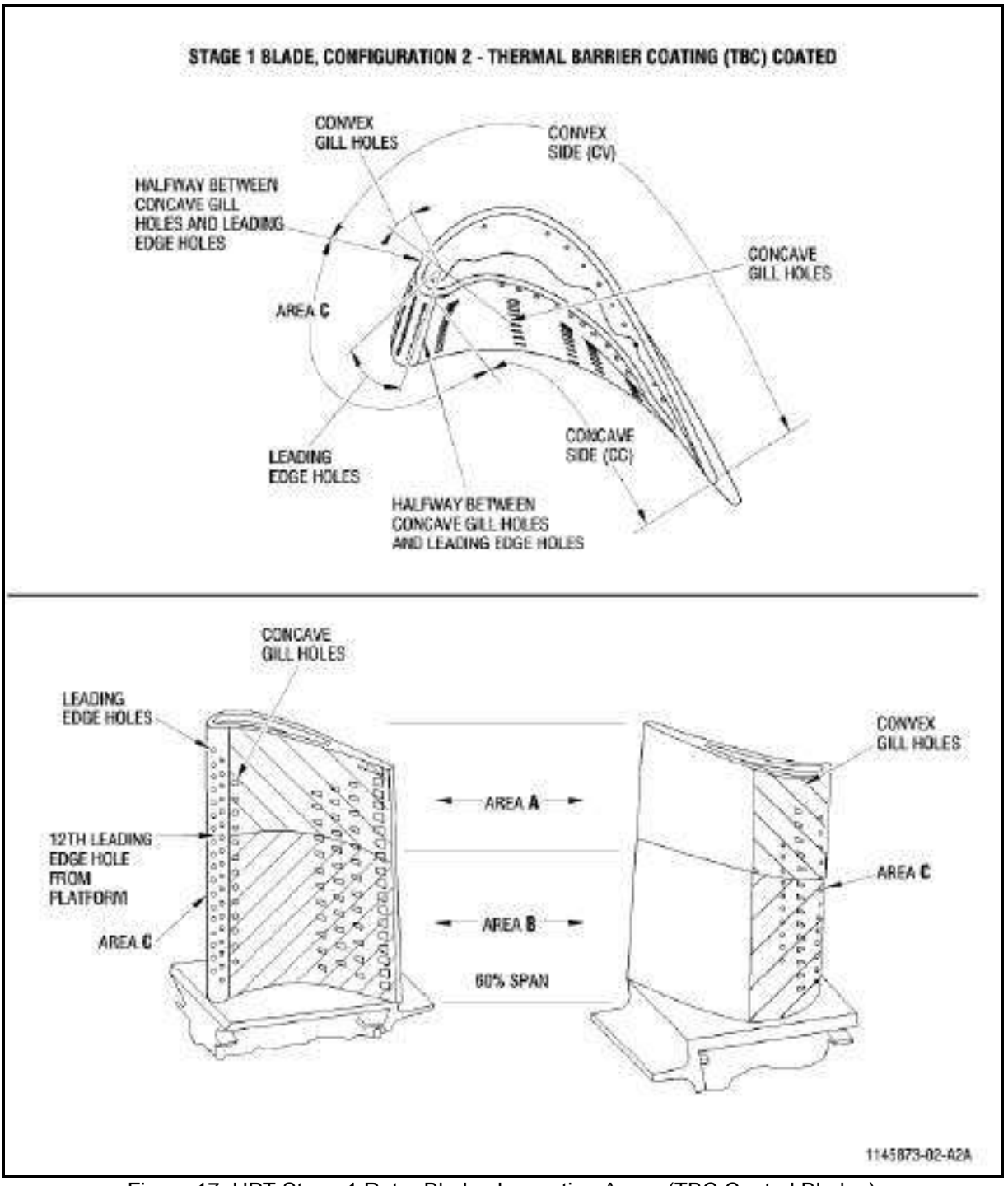


Figure 17: HPT Stage 1 Rotor Blades Inspection Areas (TBC Coated Blades)

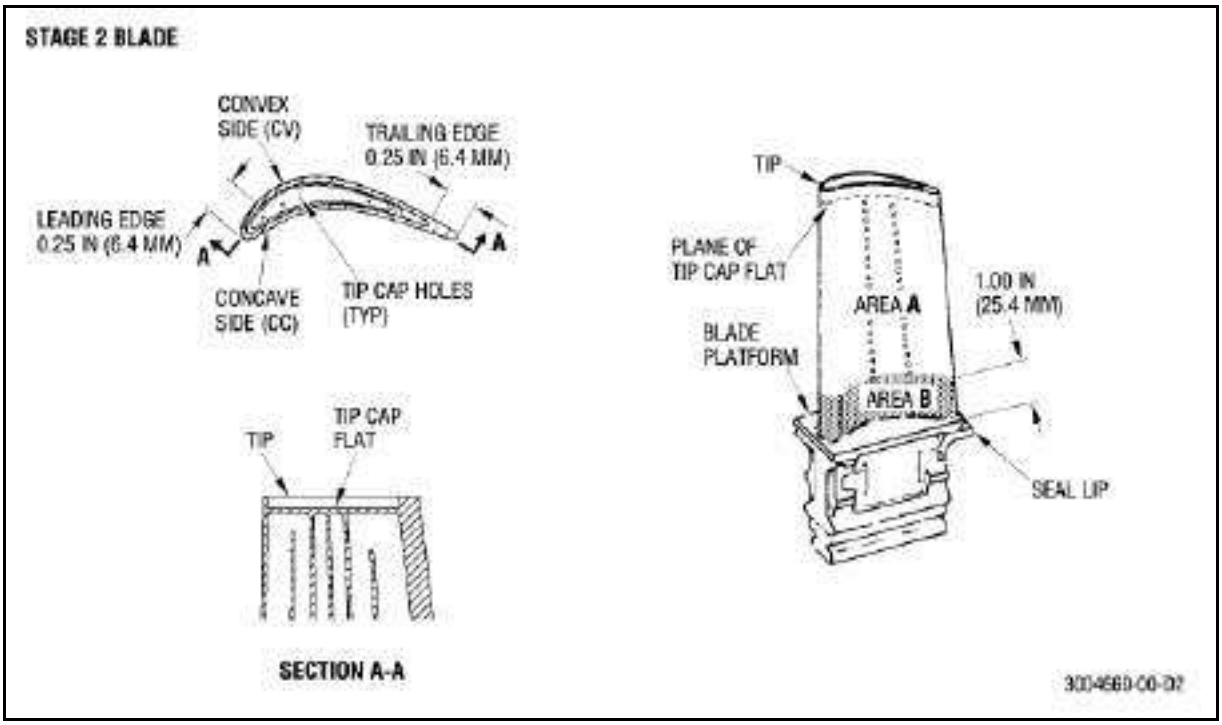


Figure 18: HPT Stage 2 Rotor Blades Inspection Areas

**Borescope Pictures**



Picture 63: Combustor liners and HPT Stage 1 Nozzles



Picture 64: Combustor liners and HPT Stage 1 Nozzles



Picture 65: Stage1 Nozzles leading edge



Picture 66: Stage1 Nozzles leading edge



Picture 67: Stage1 Nozzle airfoil concave side



Picture 68: Stage1 borescope plug nozzle erosion



Picture 69: Stage1 Nozzles trailing edge. Blades leading edge



Picture 70: Stage1 Nozzles trailing edge. Blades leading edge



Picture 71: Stage1 Blades leading edge



Picture 72: Stage1 Blades leading edge



Picture 73: Stage 1 Shrouds



Picture 74: Stage1 Blades trailing edge



Picture 75: Stage1 Blades trailing edge



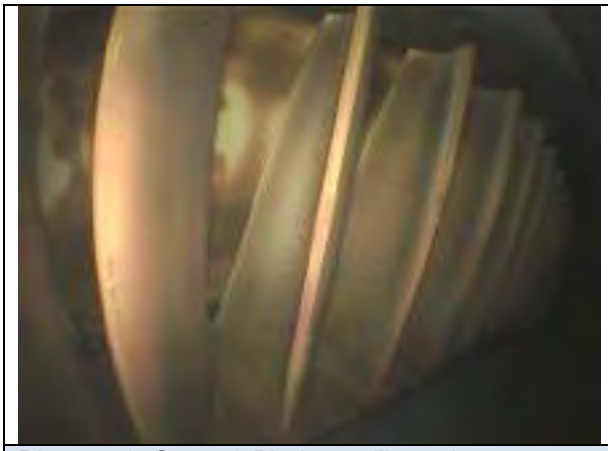
Picture 76: Stage1 Blades trailing edge



Picture 77: Stage 2 Blades leading edge



Picture 78: Stage 2 Blades trailing edge



Picture 79: Stage 2 Blades trailing edge



Picture 80: Stage 2 Blades trailing edge

**LPT Section**

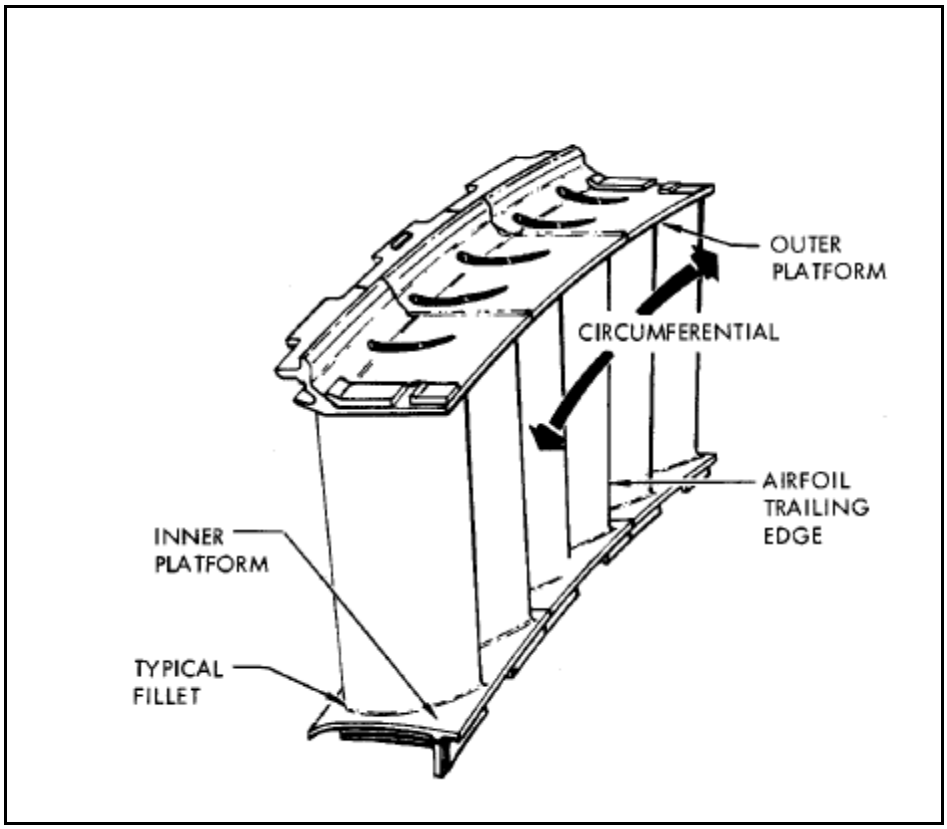



Figure 19: Power Turbine Nozzles

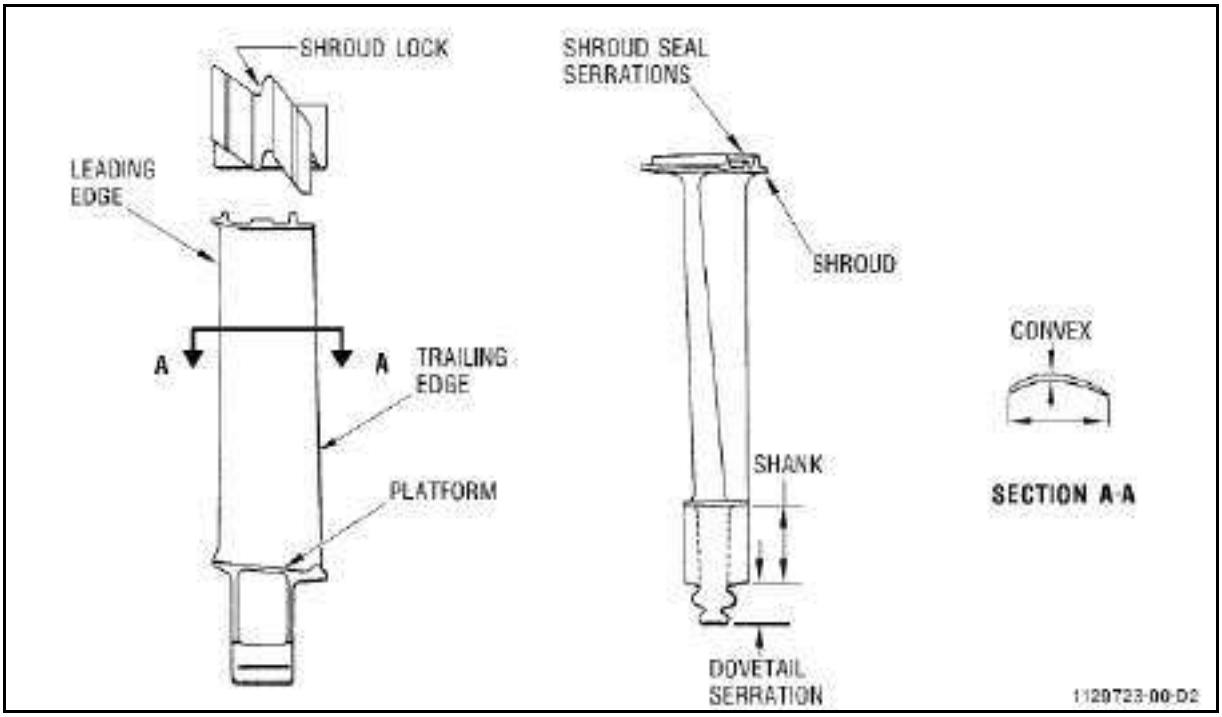



Figure 20: Power Turbine Rotor Blades

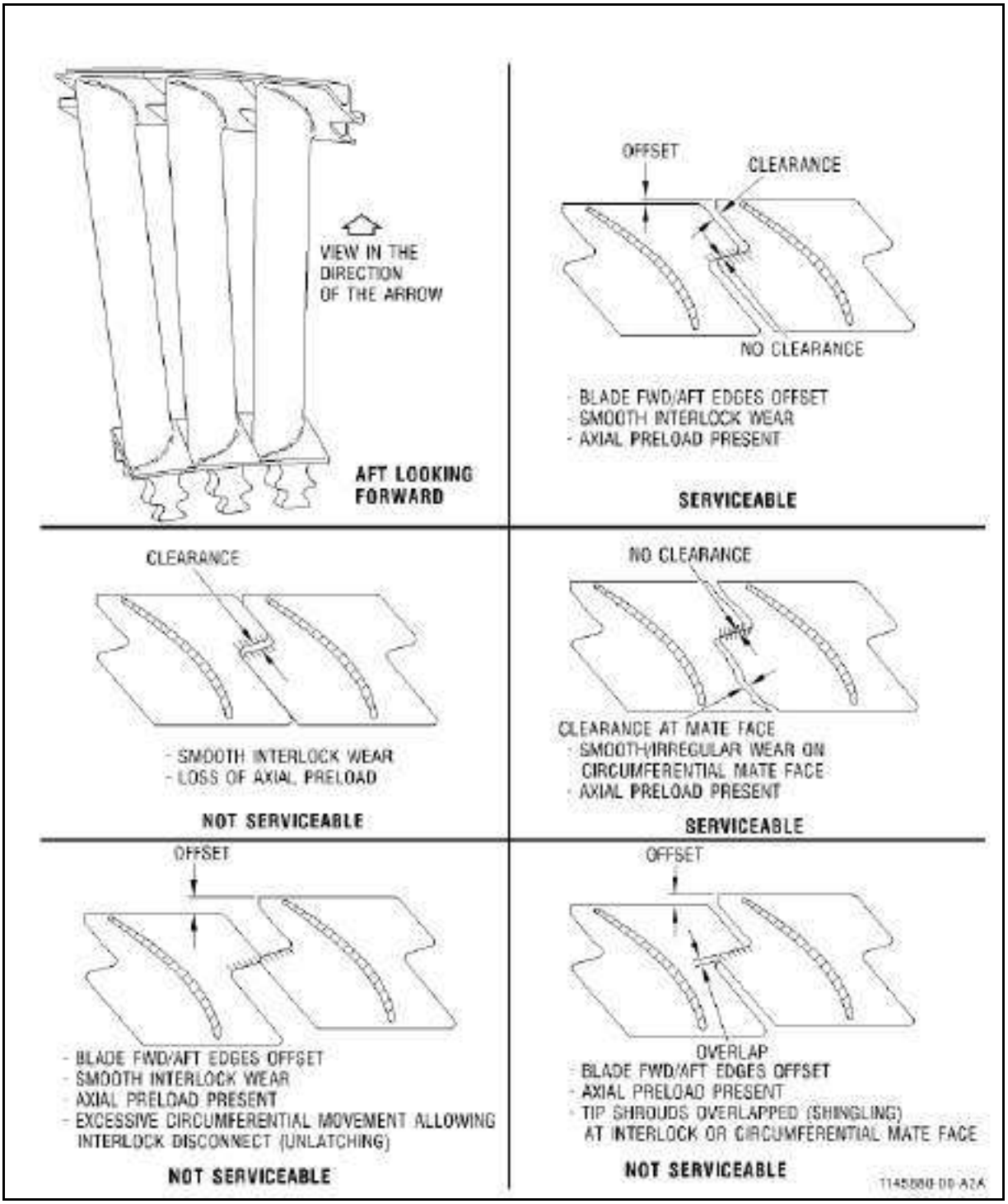


Figure 21: LPT Rotor Blade Circumferential Inspection

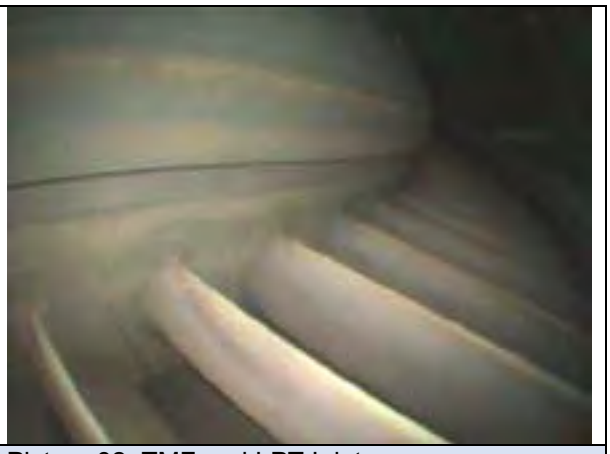
**Notes:**

The LPT stage 1 accessible nozzles and blades did not show any damage.

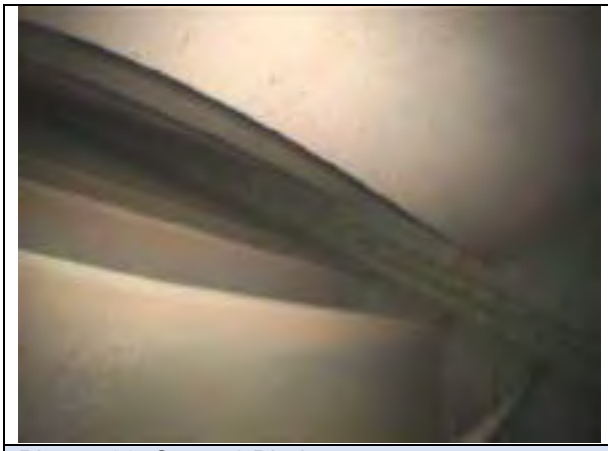
**Borescope Pictures**



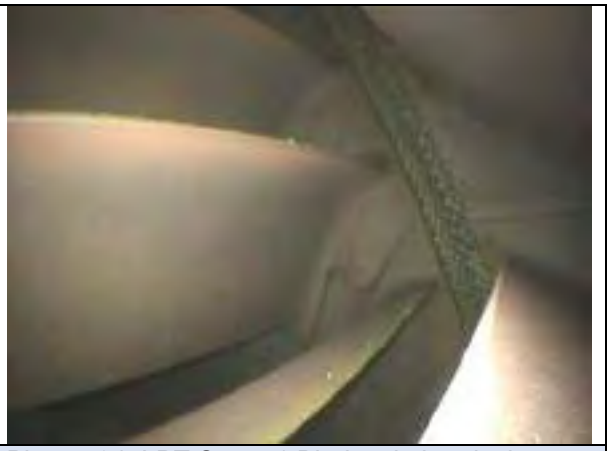
Picture 81: TMF and LPT Inlet



Picture 82: TMF and LPT Inlet



Picture 83: Stage 1 Blades



Picture 84: LPT Stage 1 Blades tip interlock

# *BORESCOPE INSPECTION REPORT*
# *TM2500 GEN. 6-7*
# *7LM2500 – PK – MDWG05*

## NFE SAN JUAN POWER PLANT

## *PACKAGE # 7251611*

## *UNIT #8*

| | | | |
|---|---|---|---|
| **Visit Date:** | November 26, 2024 | **Total Starts:** | 674 |
| **Engine S/N:** | 557 – 242 | **GG Hours:** | 11345 |
| **Power Turbine S/N:** | 557 - 242 | **PT Hours:** | 11345 |
| **PPG GT Field Engineer:** | JC Requena H | **NFE Representative:** | Lance Florent |



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4.2 Combustor and 1St Stage Nozzle Section.....12
4.3 Turbine Section.....18
4.4 LPT Section .....27

## 1. Conclusions and Recommendations

**Purpose of visit:**
The purpose of this visit was to perform a borescope inspection of the Engine in accordance with GEK105054, WP 406 00.

1.1 The HPC Section is serviceable according to GEK105054 Volume II WP40600 Table 4. The HPC section was found clean and without damages.

1.2 The Combustion section is serviceable according to GEK 105054 Volume II WP 406 00 Table 7.

1.3 The High Pressure Turbine section is serviceable according to GEK105054 Volume II WP40600 Table 8.

## 2. Outage Data

**ENGINE DATA**

| | | | | | |
|---|---|---|---|---|---|
| **ESN:** | 557-242 | **Engine Fired Hours:** | 11345 | **Package Hours:** | 11345 |
| **Model:** | 7LM2500-PK-MDWG05 | **Engine Fired starts:** | 674 | **Package Fired Starts:** | 674 |

**MAINTENANCE DATA**

| WP, SB, SL, PB, PL Performed | GEK105054, REV 11 | Date completed | Comments |
|---|---|---|---|
| WP 406 00 | Borescope Inspection | 26NOV24 | Serviceable |

**PARTS DATA**

| Description | PN Removed | SN Removed | Qty | Disposition | PN Installed | SN Installed |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |

## 3. Borescope Inspection Checklist

**Date unit out of operation:** 24NOV24
**Date unit into operation:** 26NOV24
**Last inspection date:** 06JUN24, PPG O&M

**Type of Fuel:** Gas / Diesel
**Type of outage:** Scheduled

**Type of NOx suppression:** Water Injection

**Inspection of gas turbine:**

| WATERWASH: | HIGH PRESSURE COMPRESSOR: |
|---|---|
| ☒ PERFORMED WATER WASH | ☒ HPC BORESCOPE INSPECTION |
| **COMBUSTOR:** | **HIGH PRESSURE TURBINE** |
| ☒ COMBUSTOR BORESCOPE INSPECTION | ☒ HPT STAGE 1 & 2 NOZZLE BORESCOPE INSPECTION |
| | ☒ HPT BLADE BORESCOPE INSPECTION |
| **LOW PRESSURE TURBINE:** | |
| ☒ LPT BORESCOPE INSPECTION | |

☒ ***Please verify all borescope plugs have been reinstalled***

## 4. Borescope Inspection Record

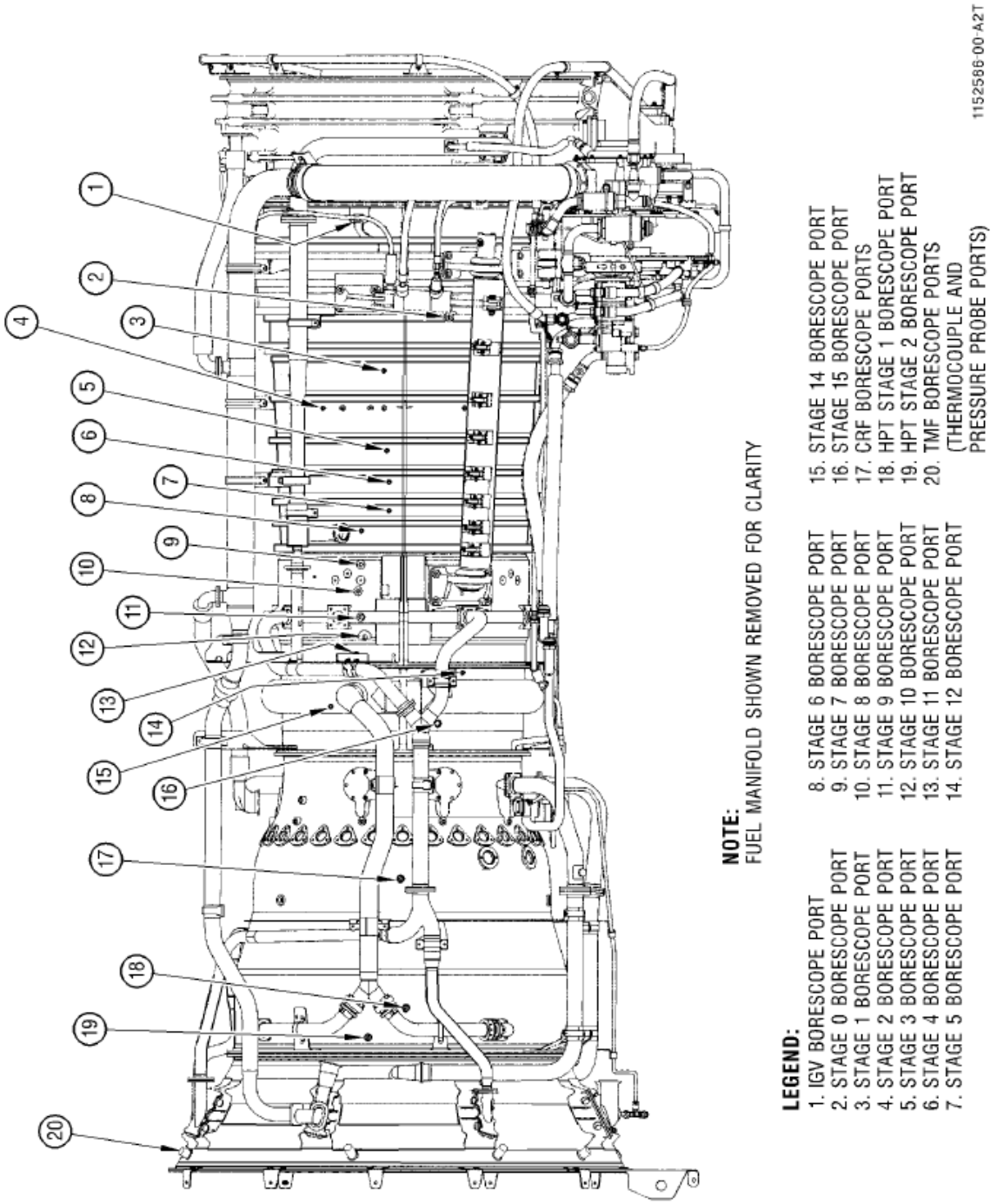



Figure 1: Position of Borescope Inspection Ports.

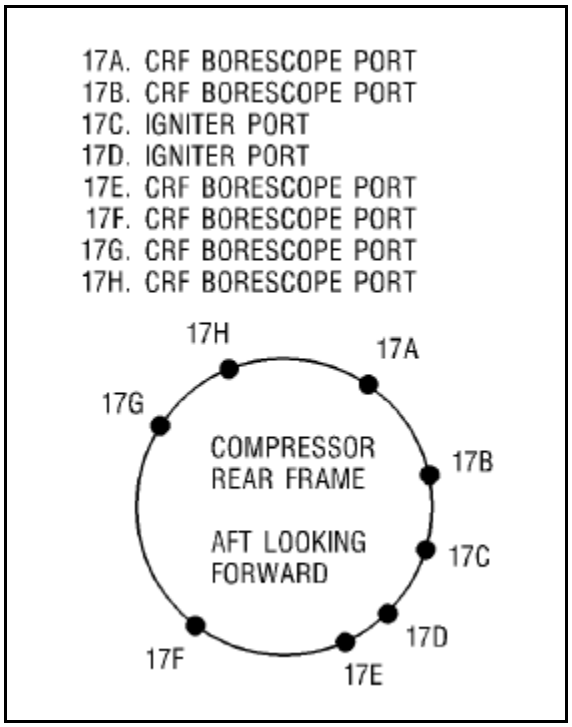


Figure 2: Position of Borescope Inspection Ports.

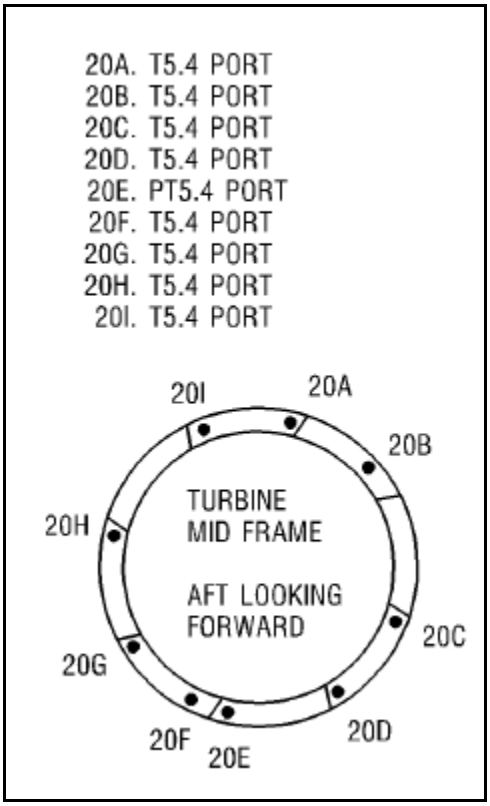


Figure 3: Position of Borescope Inspection Ports.

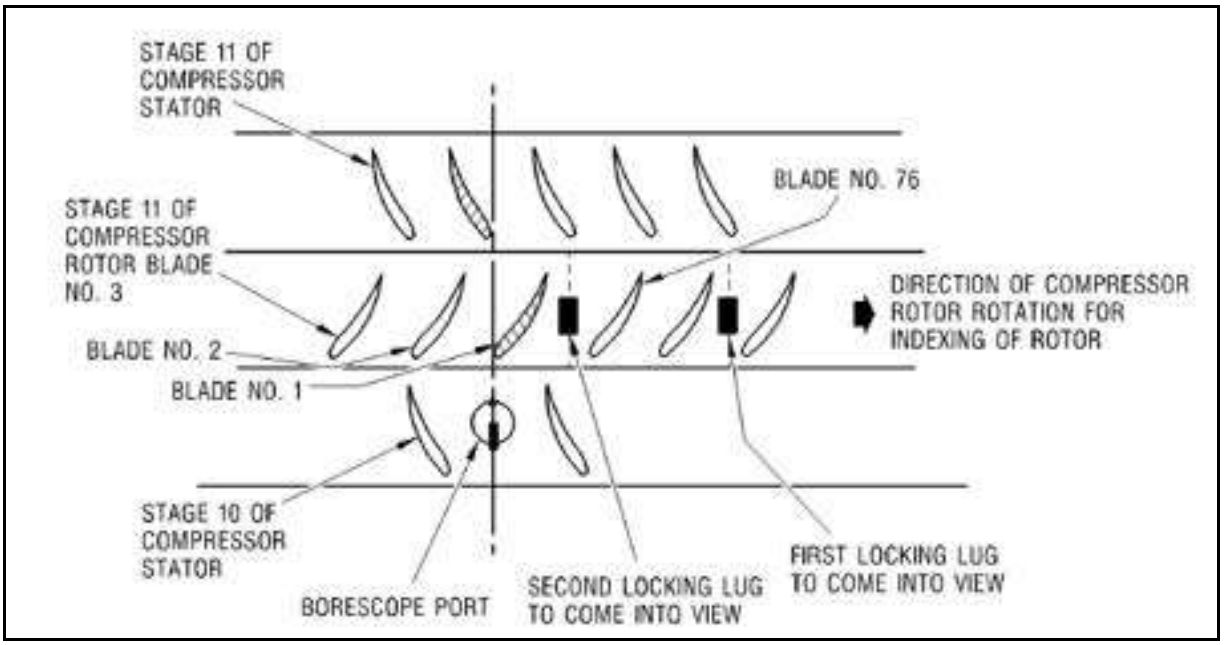


Figure 4: Zero indexing of HPC rotor and HPT rotor

## Compressor Section

| Port | T.E. | L.E. | blades | Remarks: | photo no: |
|---|---|---|---|---|---|
| 1 | IGV | | | | 1 |
| 1 | | 0 | 36 | | 2 – 3 |
| 2 | 0 | | 36 | | 4 – 5 – 6 |
| 2 | | 1 | 26 | | 7 – 8 |
| 3 | 1 | | 26 | | 9 – 10 |
| 3 | | 2 | 26 | | 11 – 12 |
| 4 | 2 | | 26 | | 13 |
| 4 | | 3 | 42 | | 14 – 15 |
| 5 | 3 | | 42 | | 16 |
| 5 | | 4 | 45 | | 17 – 18 |
| 6 | 4 | | 45 | | 19 – 20 |
| 6 | | 5 | 48 | | 21 – 22 |
| 7 | 5 | | 48 | | 23 |
| 7 | | 6 | 54 | | 24 – 25 |
| 8 | 6 | | 54 | Blades contacting tip | |
| 8 | | 7 | 56 | Blades contacting tip | |
| 9 | 7 | | 56 | | 26 – 27 |
| 9 | | 8 | 64 | | 28 – 29 |
| 10 | 8 | | 64 | | 30 |
| 10 | | 9 | 66 | | 31 |
| 11 | 9 | | 66 | | 32 - 33 |
| 11 | | 10 | 66 | | 34 – 35 - 36 |
| 12 | 10 | | 66 | | 37 |
| 12 | | 11 | 76 | | 38 – 39 |
| 13 | 11 | | 76 | | 40 |
| 13 | | 12 | 76 | | 41 – 42 |
| 14 | 12 | | 76 | | 43 |
| 14 | | 13 | 76 | | 44 |
| 15 | 14 | | 76 | Inside bleed manifold | |
| 15 | | 15 | 76 | Inside bleed manifold | |
| 16 | 15 | | 76 | | 45 |
| 16 | | 16 | 76 | One (1) Blade with nick damage. Serviceable | 46 – 47 – 48 |

**Notes:**
The HPC Section is serviceable according to GEK105054 Volume II WP40600 Table 4.

.



Picture 1. CFF & IGV



Picture 2. Stage 0 Leading edge tip



Picture 3. Stage 0 Leading edge base



Picture 4. Stage 0 Trailing edge tip



Picture 5. Stage 0 Weep hole



Picture 6. Stage 0 Trailing edge base



Picture 7. Stage 1 leading edge tip



Picture 8. Stage 1 leading edge base



Picture 9. Stage 1 trailing edge tip



Picture 10. Stage 1 Weep hole & blade retainers



Picture 11. Stage 2 Leading edge tip



Picture12. Stage 2 Leading edge base



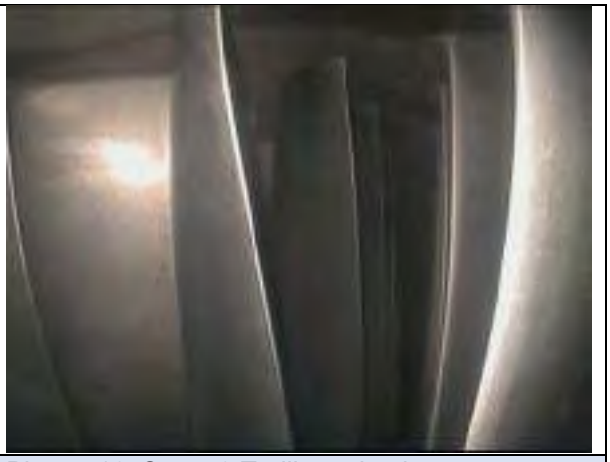
Picture 13. Stage 2 Trailing edge tip



Picture 14. Stage 3 Leading edge tip



Picture 15. Stage 3 Leading edge base



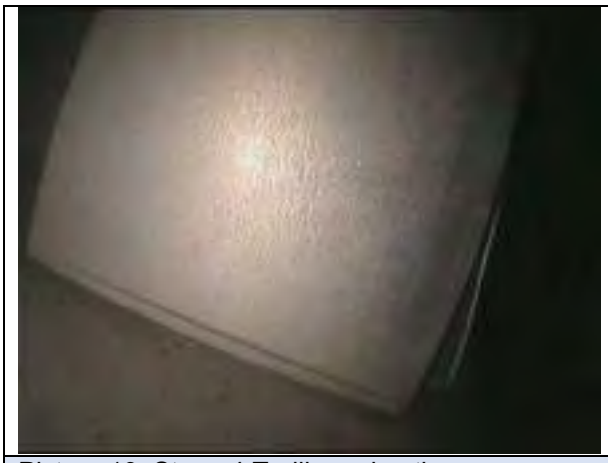
Picture 16. Stage 3 Trailing edge base



Picture 17. Stage 4 Leading edge tip



Picture 18. Stage 4 Leading edge root



Picture 19. Stage 4 Trailing edge tip



Picture 20. Stage 4 Trailing edge base



Picture 21. Stage 5 Leading edge tip



Picture 22. Stage 5 Leading edge base



Picture 23. Stage 5 Trailing edge



Picture 24. Stage 6 Leading edge tip



Picture 25. Stage 6 leading edge base



Picture 26. Stage 7 Trailing edge tip



Picture 27. Stage 8 Leading edge tip



Picture 28. Stage 8 Leading edge base



Picture 29. Stage 8 Leading edge tip



Picture 30. Stage 8 Trailing edge



Picture 31. Stage 9 Leading edge



Picture 32. Stage 9 Trailing edge



Picture 33. Stage 9 Trailing tip



Picture 34. Stage 9 Bleed manifold



Picture 35. Stage 10 Leading edge tip



Picture 36. Stage 10 Leading edge base



Picture 37. Stage 10 Trailing edge



Picture 38. Stage 11 Leading edge base



Picture 39. Stage 11 Leading edge tip



Picture 40. Stage 11 Trailing edge



Picture 41. Stage 12 Leading edge tip



Picture 42. Stage 12 Leading edge base



Picture 43. Stage 12 Trailing edge



Picture 44. Stage 13 Leading edge



Picture 45. Stage 15 Trailing edge



Picture 46. Stage 16 Leading edge nick



Picture 47. Stage 16 Leading edge



Picture 48. Outlet guide vanes

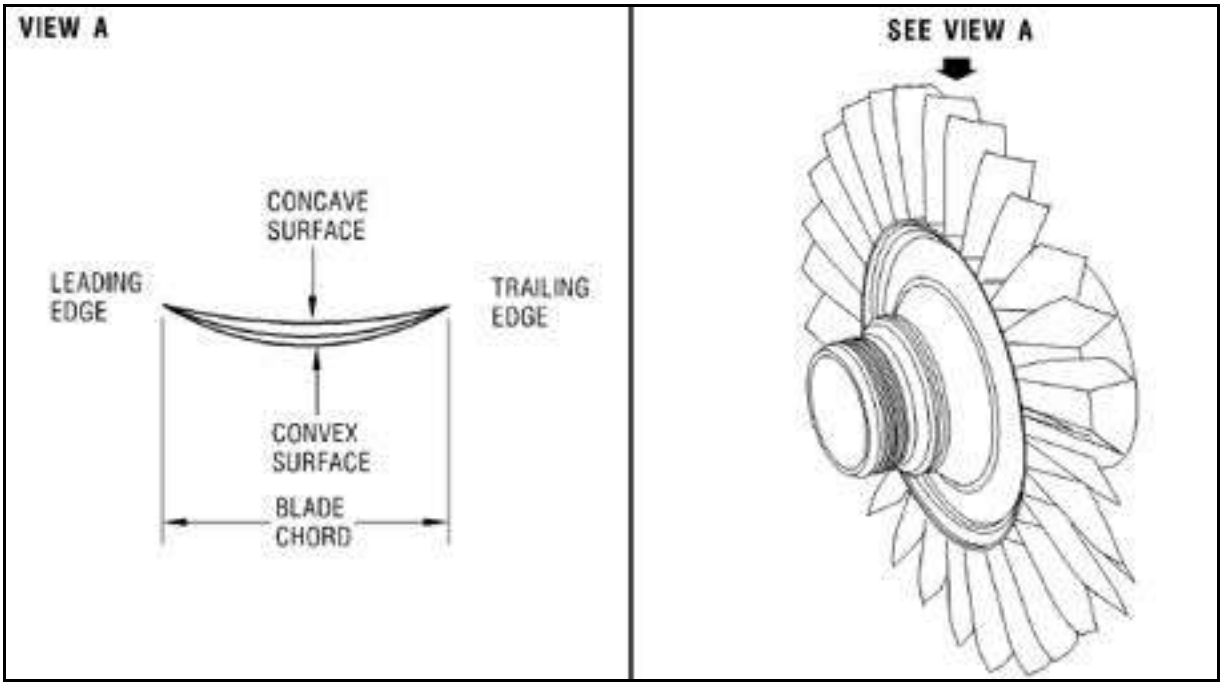



Figure 5: HPC stage 0 BLISK

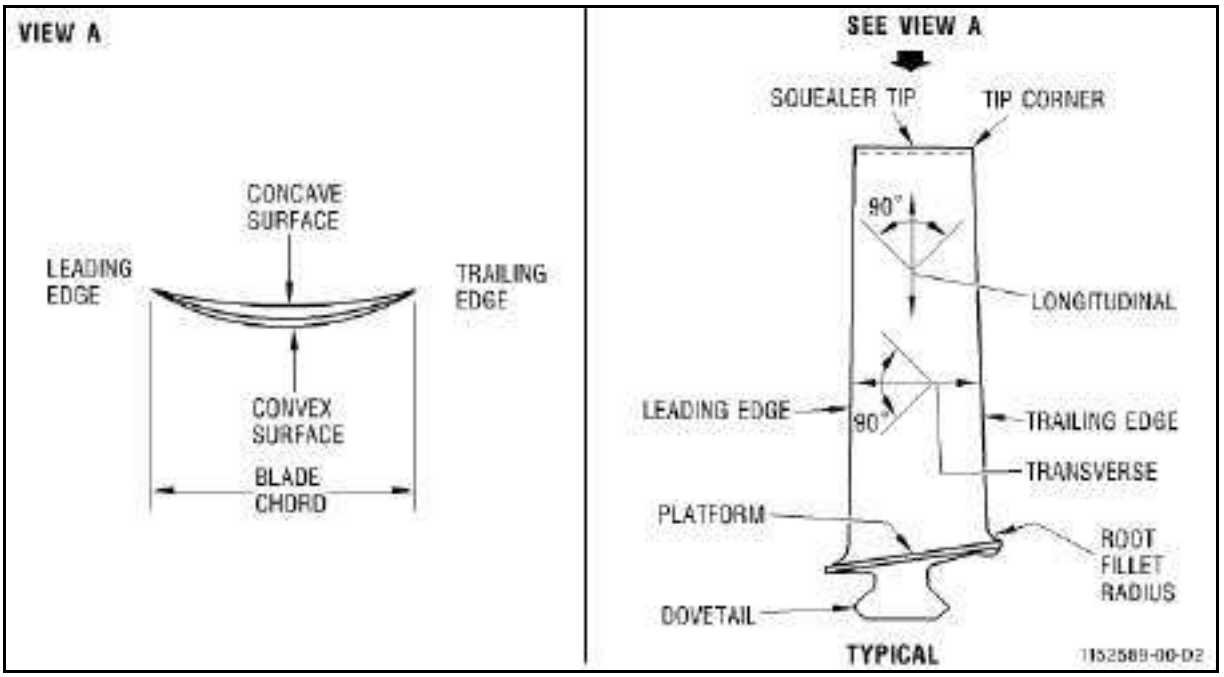



Figure 6: Compressor Rotor Blades

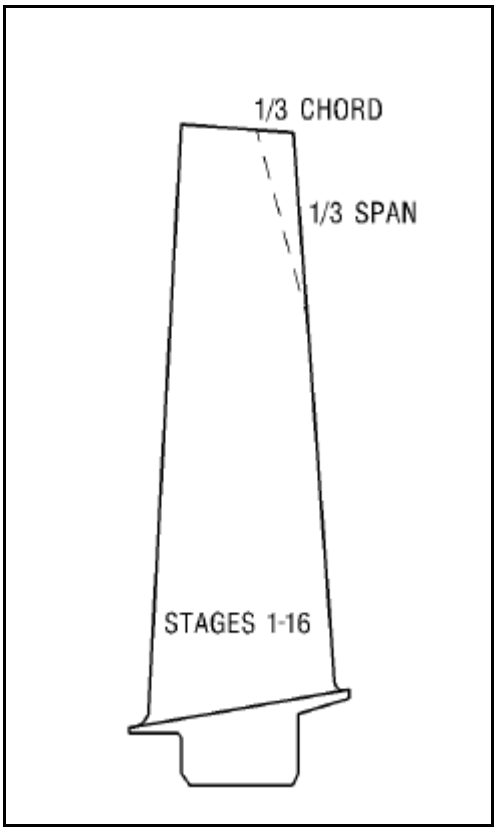


Figure 7: Tip Trailing Edge Inspection

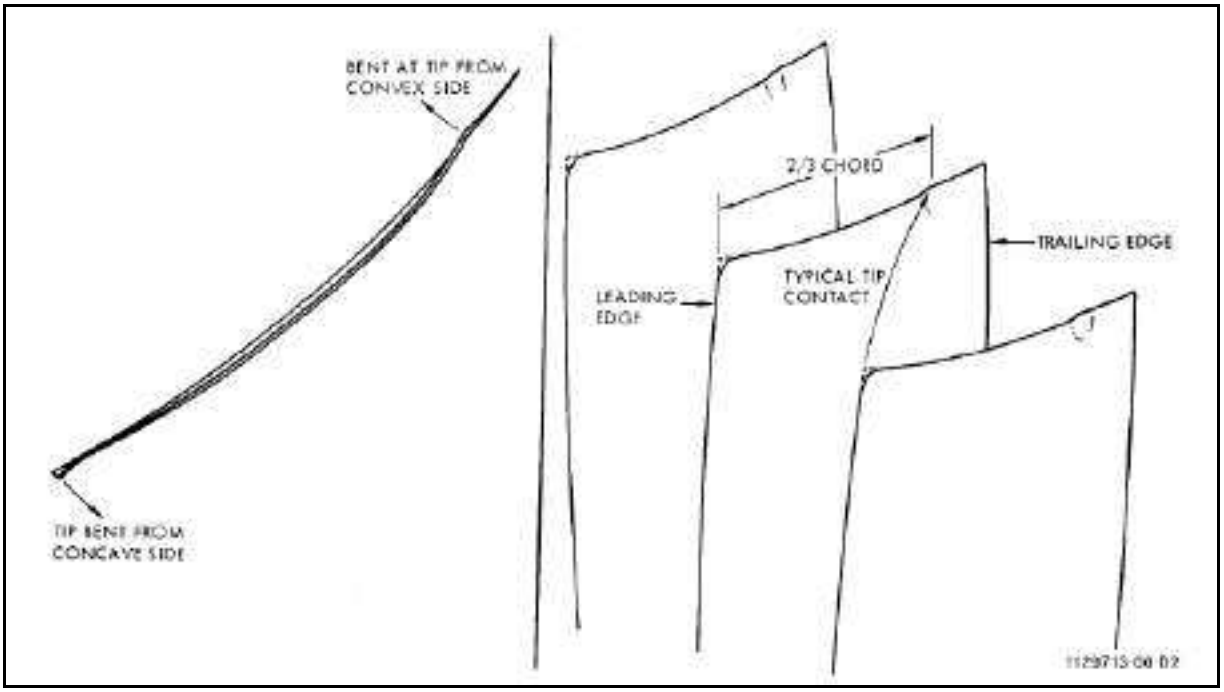
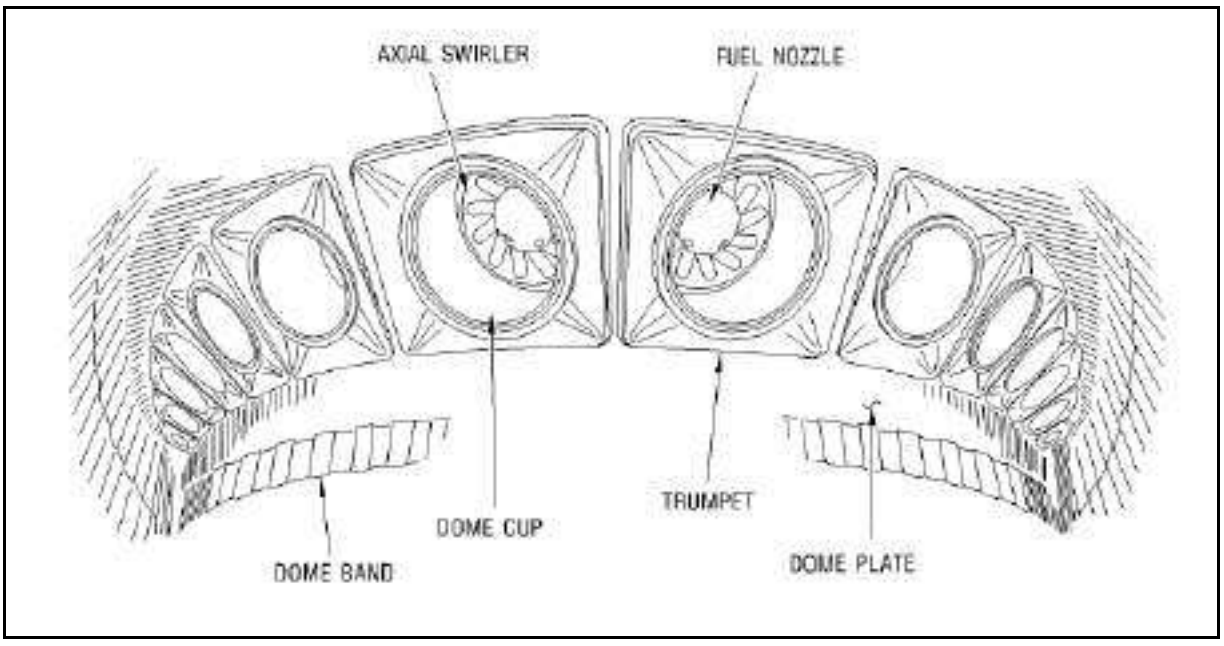


Figure 8: Tip Clanging Contact (HPCR stage 3 through 6)

## Combustor and 1St Stage Nozzle Section

| Port | Condition observed | Photo no: |
|---|---|---|
| **17A** | | |
| **17B** | | |
| **17C** | | |
| **17D** | **See below notes.** | |
| **17E** | | |
| **17F** | | |
| **17G** | | |
| **17H** | | |
| **17** | 1st stage nozzle (leading edge): | |

**Notes:**
The Combustor section is serviceable according to GEK105054 Volume II WP40600 Table 7.



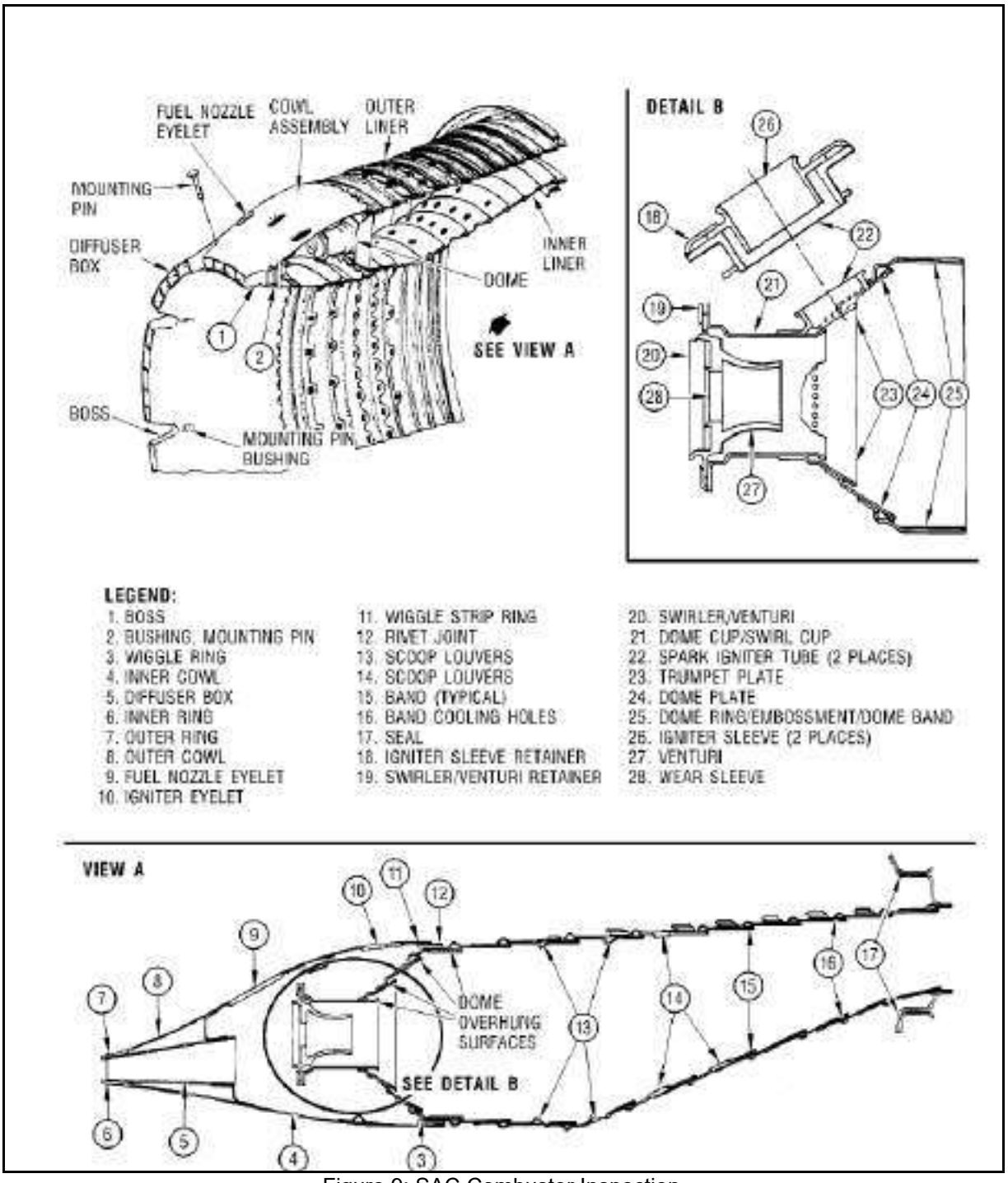



Figure 9: SAC Combustor Inspection

Figure 10: SAC Combustor Inspection

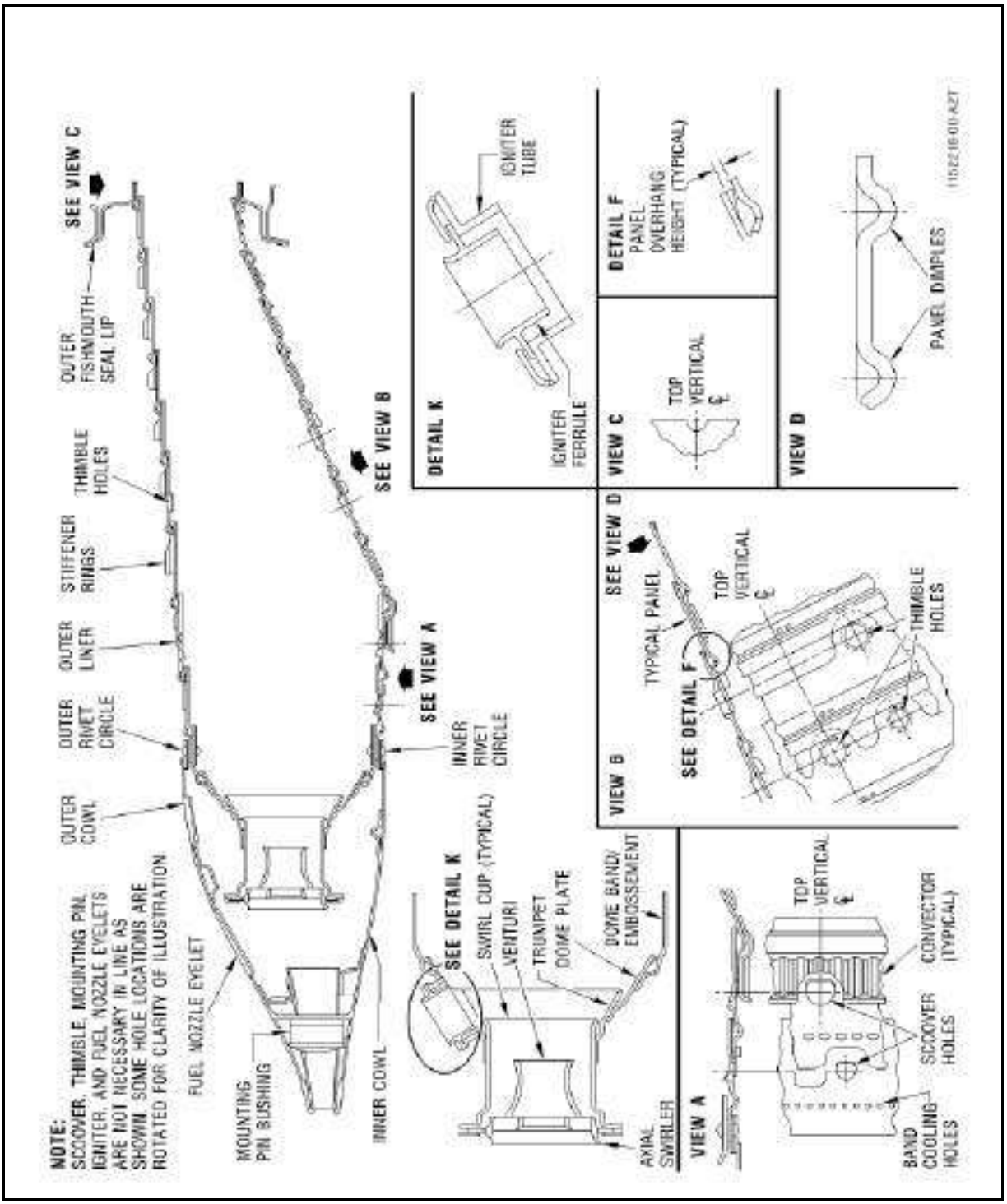



Figure 11: SAC Combustor Inspection

**Borescope Pictures**



Picture 49. Lower igniter and outer rivets band



Picture 50. Upper igniter



Picture 51. Combustor dome



Picture 52. Combustor dome



Picture 53. Combustor liners



Picture 54. Combustor inner liner



Picture 55. Venturi, swirlers and fuel nozzle tip



Picture 56. Combustor liners and HPT nozzles



Picture 57. Inner rivets band



Picture 58. Combustor to HPT interference

## Turbine Section

| | turbine stage | | | | |
|---|---|---|---|---|---|
| **Port** | **L.E.** | **T.E.** | **blades** | **Remarks:** | **photo no:** |
| **18** | **1** | | **88** | | |
| **19** | | **1** | **88** | **See below notes.** | |
| **19** | **2** | | **90** | | |
| **20** | | **2** | | | |

**Notes:**
The High Pressure Turbine section is serviceable according to GEK105054 Volume II WP40600 Table 8

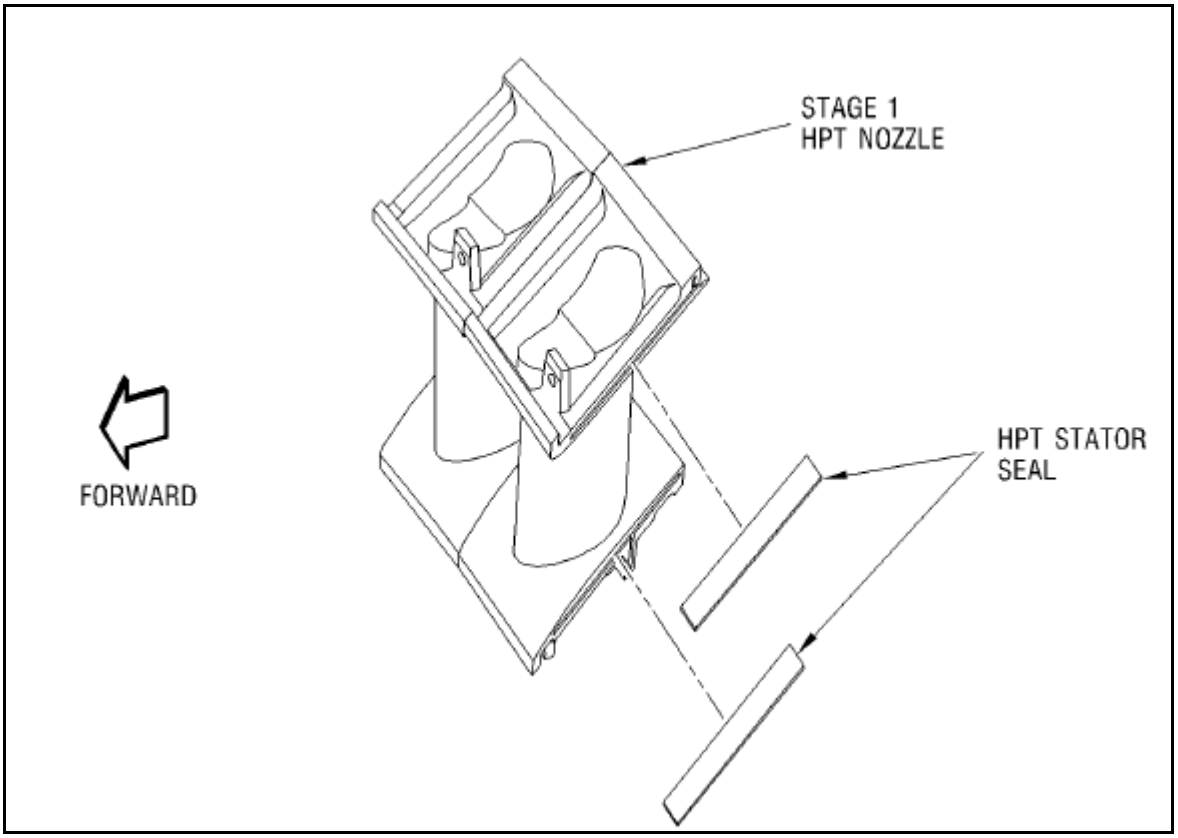


Figure 12: Stage 1 HPT Nozzle Seal Displacement

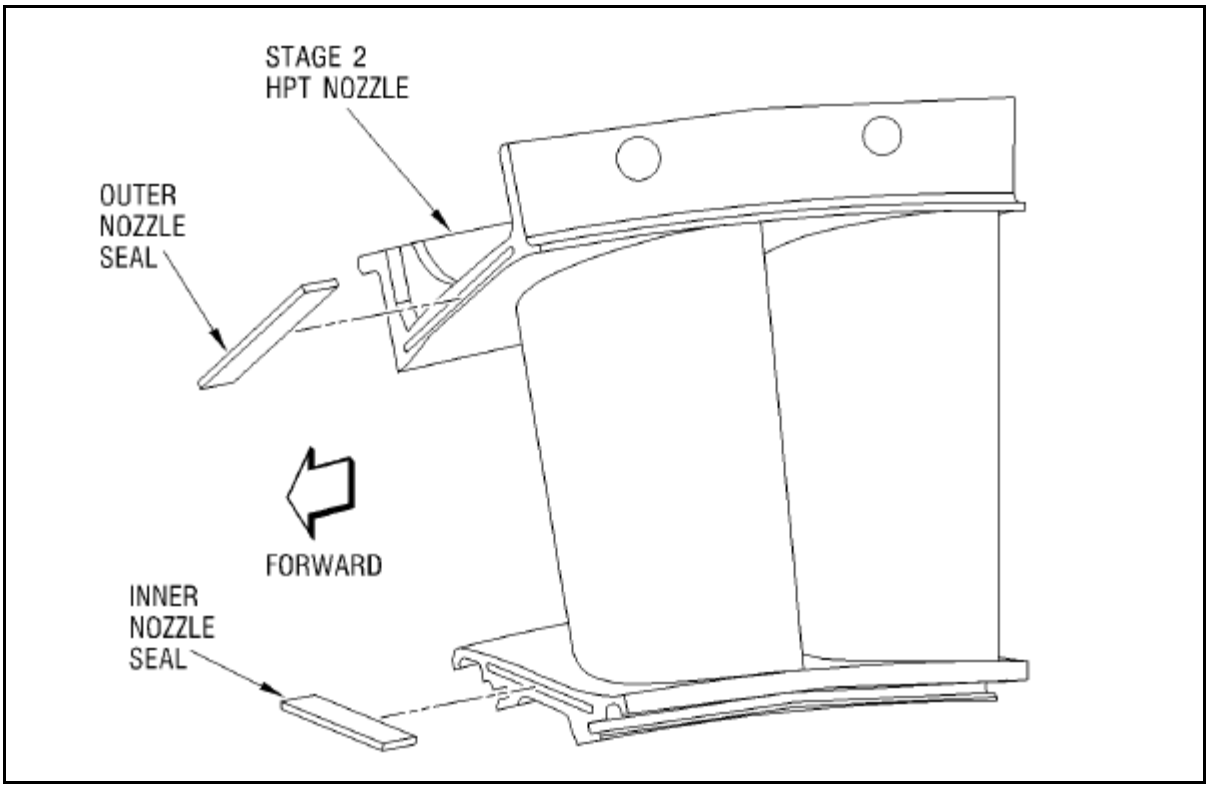


Figure 13: Stage 2 HPT Nozzle Seal Displacement

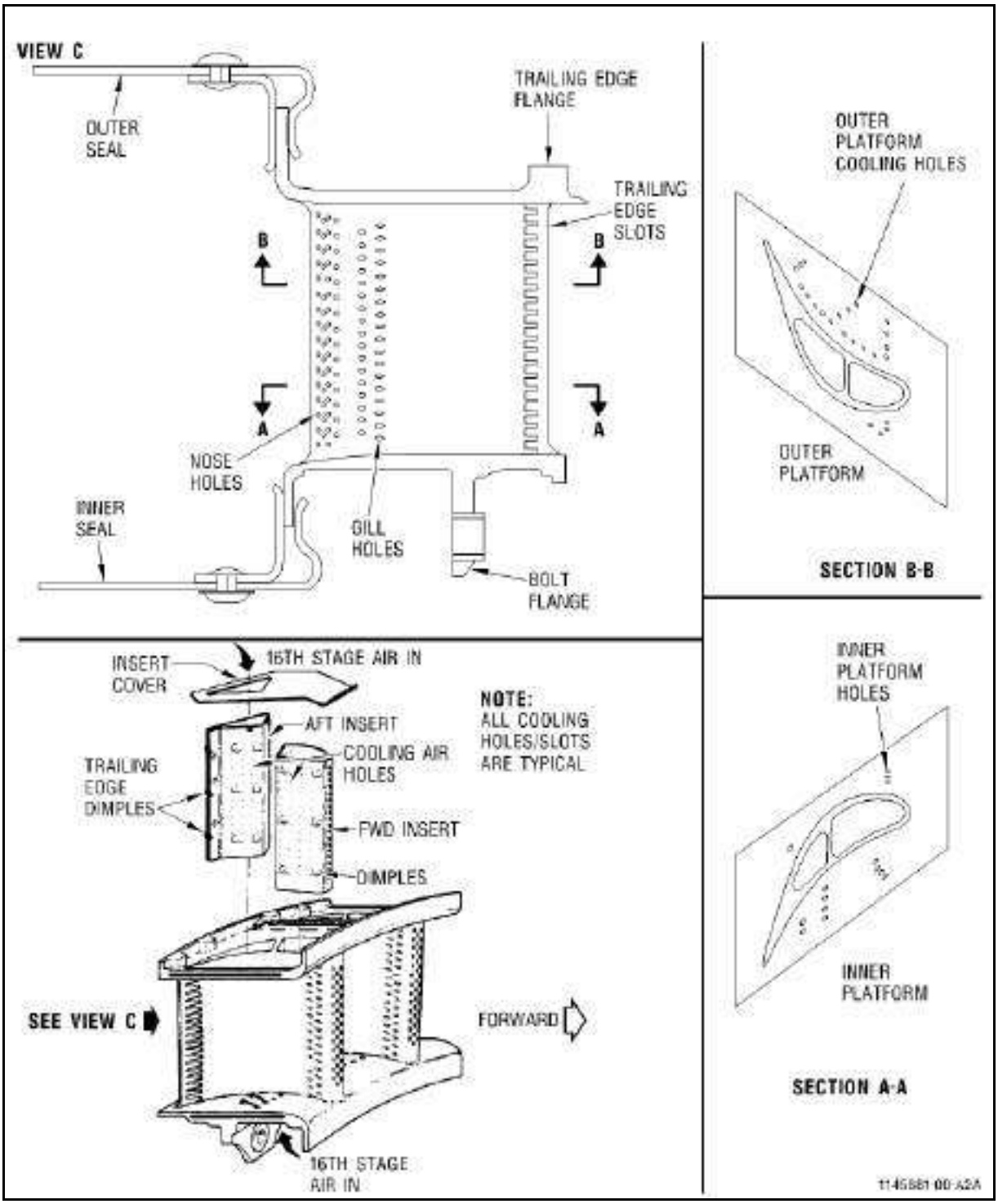



Figure 14: HPT Stage 1 Nozzle

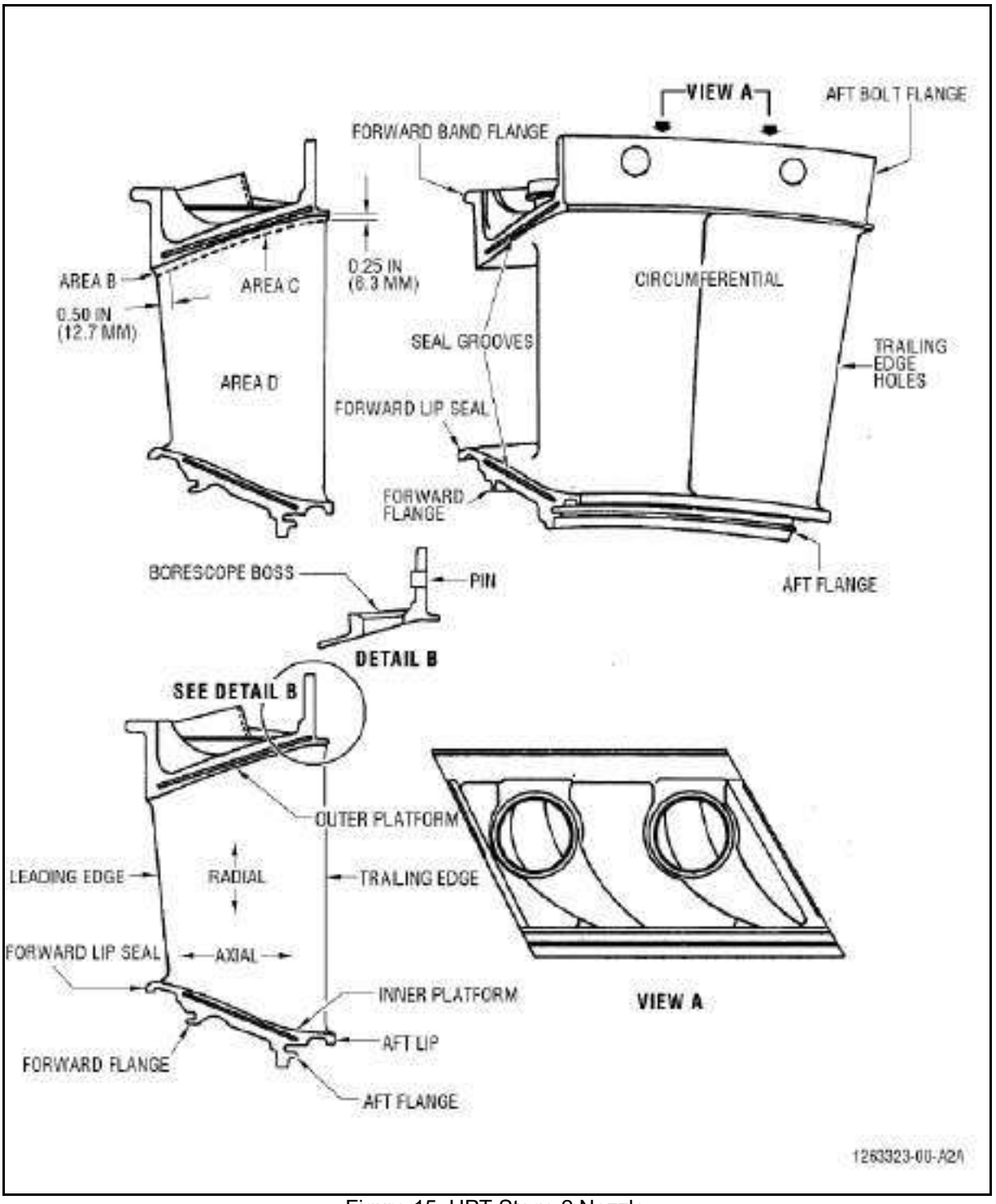



Figure 15: HPT Stage 2 Nozzle

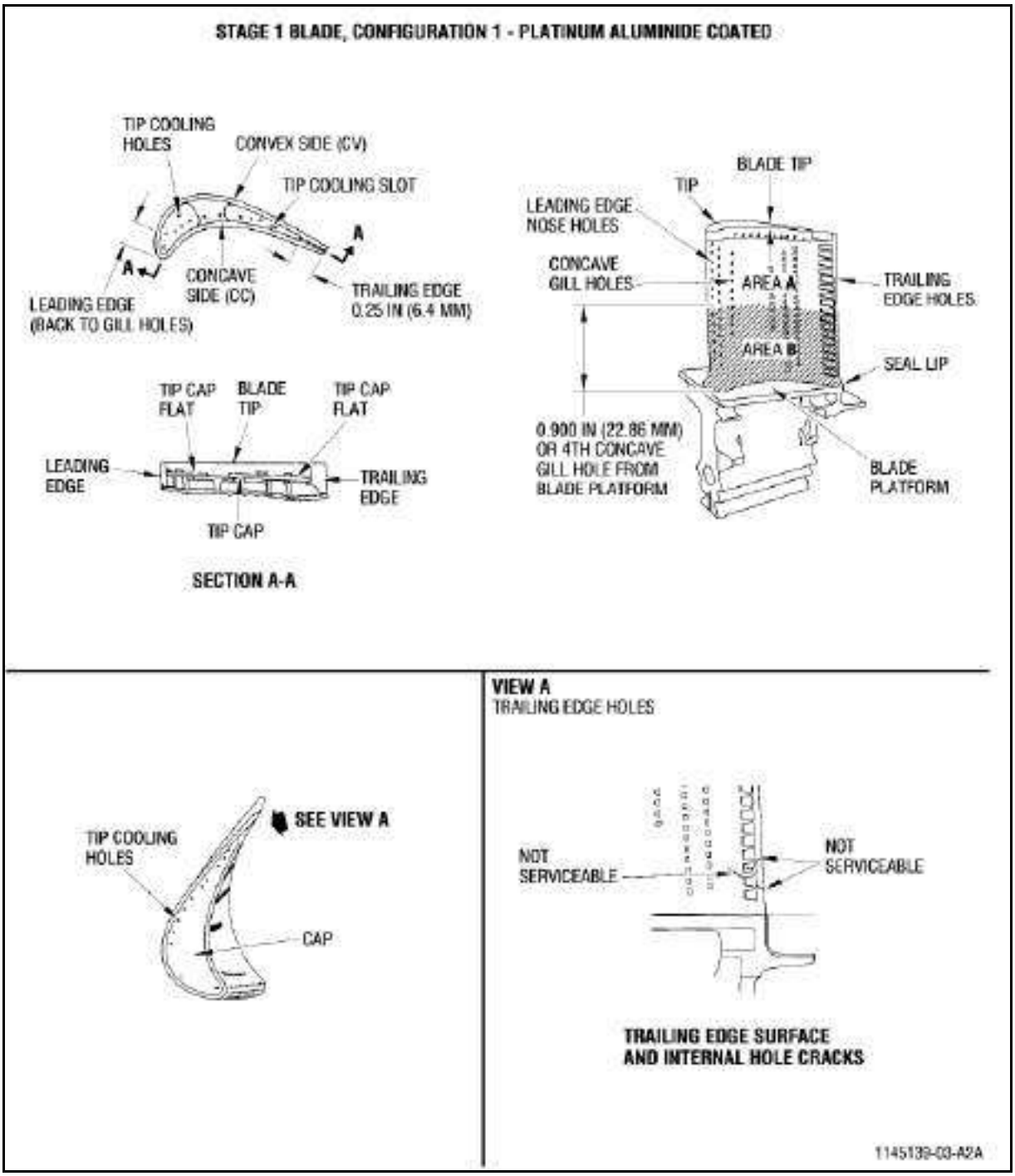



Figure 16: HPT Stage 1 Rotor Blades Inspection Areas (Platinum Aluminide Coated Blades)

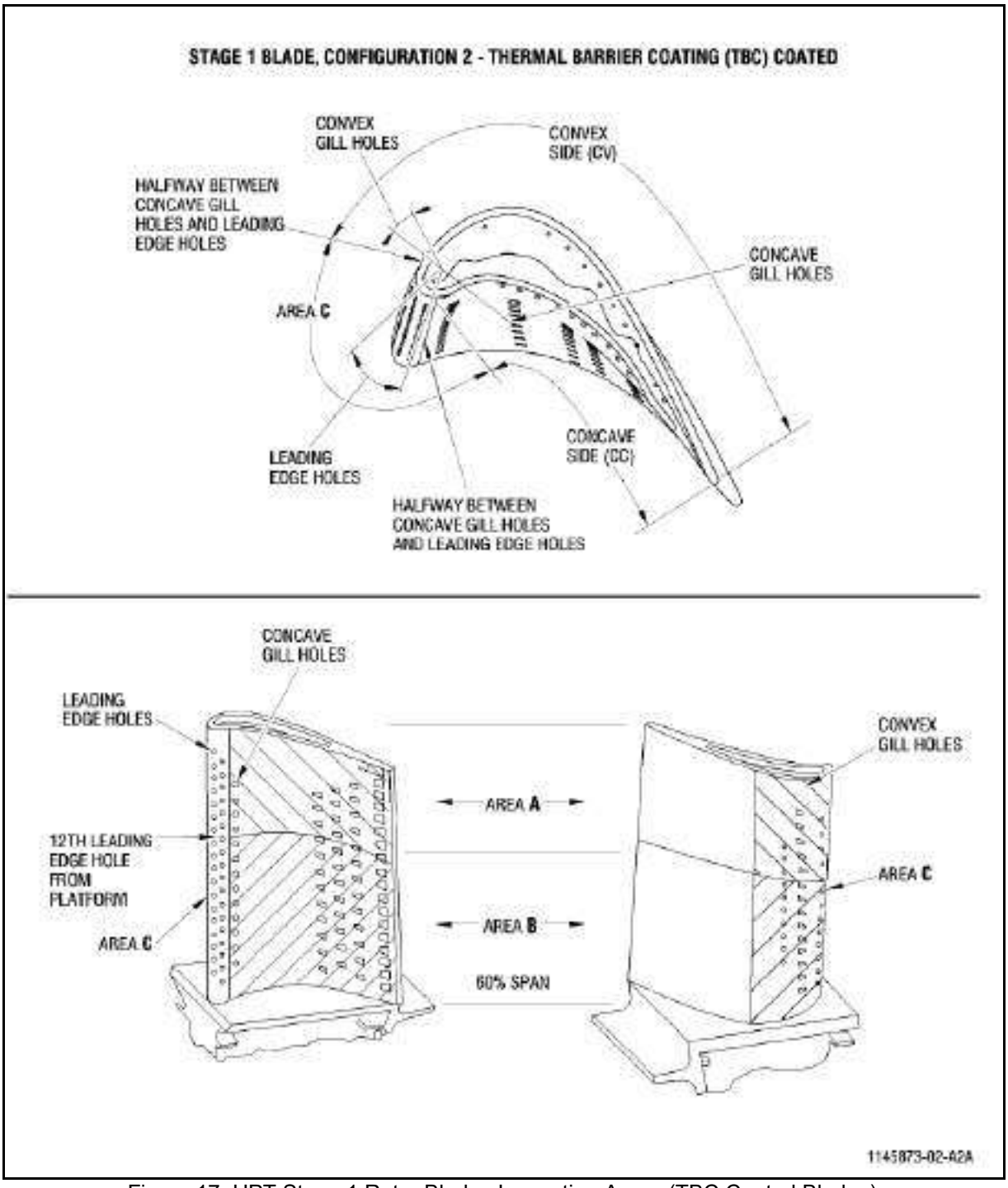


Figure 17: HPT Stage 1 Rotor Blades Inspection Areas (TBC Coated Blades)

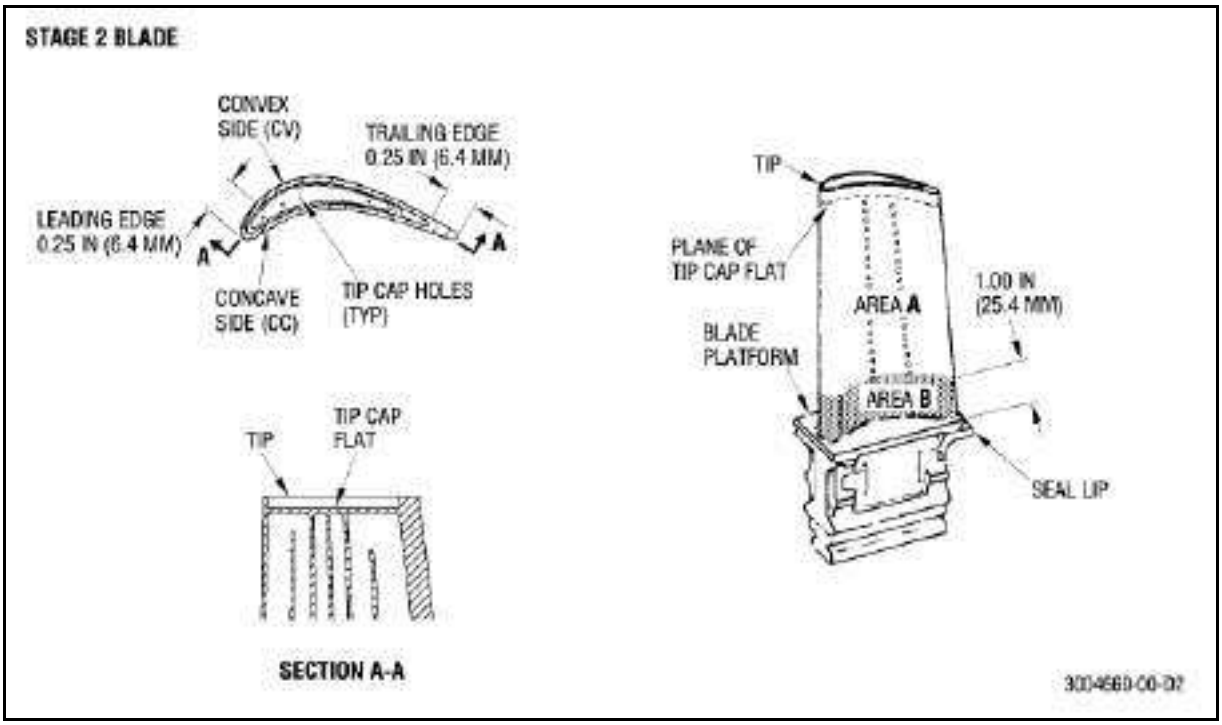


Figure 18: HPT Stage 2 Rotor Blades Inspection Areas

**Borescope Pictures**



Picture 59: Stage1 Nozzles



Picture 60: Stage1 Nozzles



Picture 61: Stage1 Nozzles



Picture 62: Stage1 Nozzles



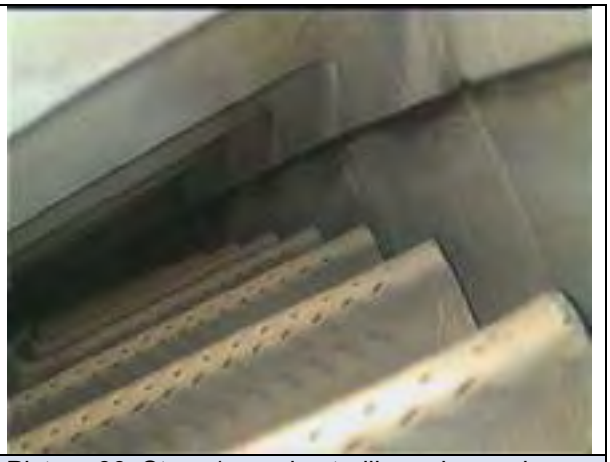
Picture 63: Stage1 Nozzles



Picture 64: Stage1 Nozzles



Picture 65: Stage1 Nozzles trailing edge



Picture 66: Stage1 nozzles trailing edge and blades leading edge



Picture 67: Stage1 nozzles trailing edge and blades leading edge



Picture 68: Stage 1 Blades leading edge and shrouds



Picture 69: Stage 1 blades convex



Picture 70: Stage 1 blades leading edge



Picture 71: Stage 1 Blades trailing edge



Picture 72: Stage 1 Blades trailing edge convex



Picture 73: Stage 2 Nozzles trailing edge



Picture 74: Stage 2 Blades leading edge



Picture 75: Stage 2 blades leading edge



Picture 76: Stage 2 Blades trailing edge

**LPT Section**

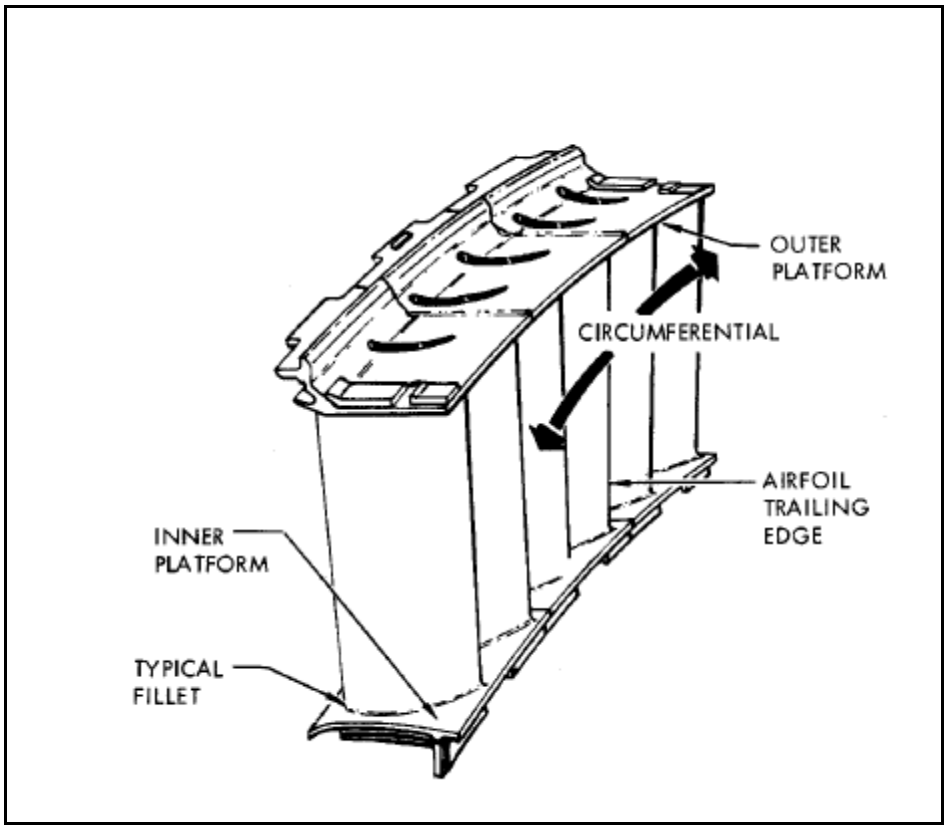



Figure 19: Power Turbine Nozzles

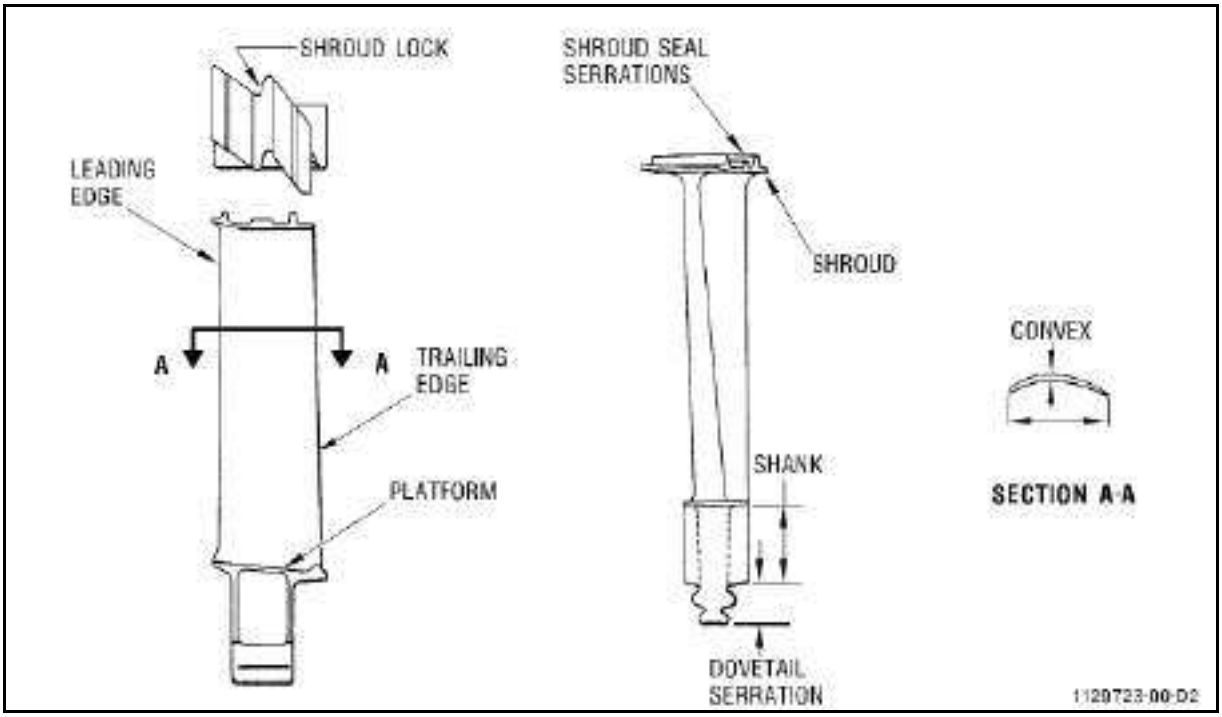



Figure 20: Power Turbine Rotor Blades

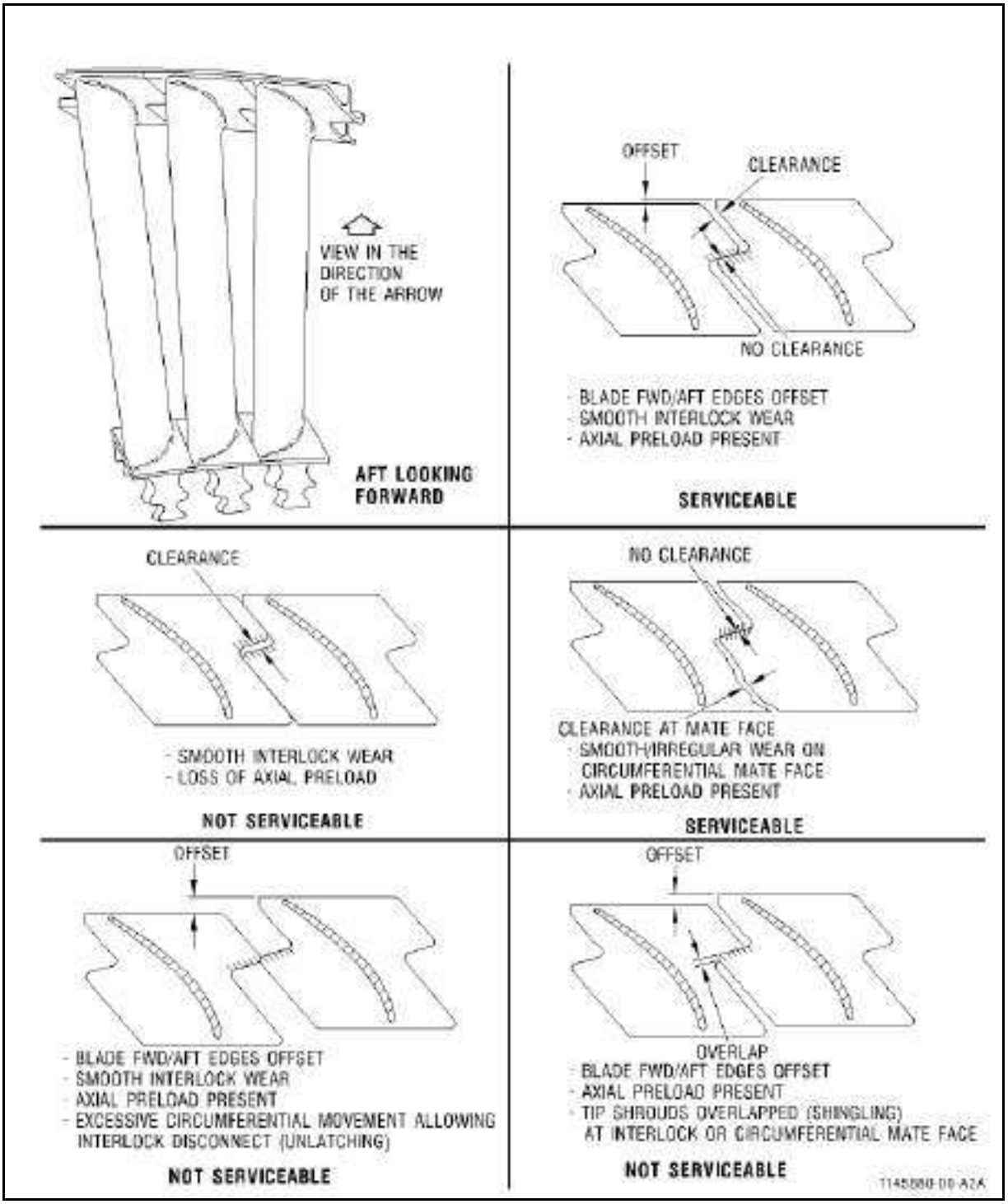


Figure 21: LPT Rotor Blade Circumferential Inspection

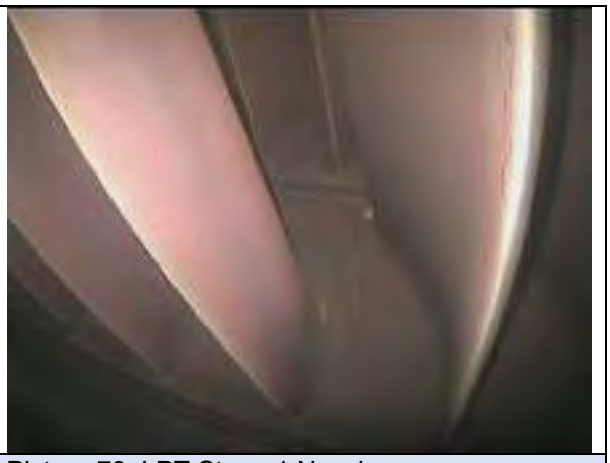
**Notes:**

The LPT stage 1 accessible nozzles and blades did not show any damage.

**Borescope Pictures**



Picture 77: TMF and LPT Inlet



Picture 78: LPT Stage 1 Nozzles



Picture 79: Stage 1 Blades



Picture 80: LPT Stage 1 Blades tip interlock

# *BORESCOPE INSPECTION REPORT*
# *TM2500 GEN. 6-7*
# *7LM2500 – PK – MDWG05*

## NFE SAN JUAN POWER PLANT

## *PACKAGE # 7253289*

## *UNIT #9*

| | | | |
|---|---|---|---|
| **Visit Date:** | 12/31/2024 | **Total Starts:** | 775 |
| **Engine S/N:** | 557 - 260 | **GG Hours:** | 12269 |
| **Power Turbine S/N:** | 557 - 260 | **PT Hours:** | 12269 |
| **PPG GT Field Engineer:** | Daniel Arroyo | **NFE Representative:** | Lance Florent |



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4.1 Compressor Section .....9
4.2 Combustor and 1St Stage Nozzle Section.....12
4.3 Turbine Section.....18
4.4 LPT Section .....27

## 1. Conclusions and Recommendations

**Purpose of visit:**
The purpose of this visit was to perform a borescope inspection of the Engine in accordance with GEK105054, WP 406 00.

1.1 The HPC Section is serviceable according to GEK105054 Volume II WP40600 Table 4.
The HPC section was found clean and without damages.

1.2 The Combustion section is serviceable according to GEK 105054 Volume II WP 406 00 Table 7.

1.3 The HPT is serviceable according to GEK105054 Volume II WP 406 00 Table 8

The 1st stage blades were found in good condition, minor tip rubing marks.
The shrouds showed rubbing marks; serviceable.

The 2nd stage vanes and blades and the honeycomb seals were found in good condition.

## 2. Outage Data

**ENGINE DATA**

| | | | | | |
|---|---|---|---|---|---|
| **ESN:** | 557-260 | **Engine Fired Hours:** | 12269 | **Package Hours:** | 12269 |
| **Model:** | 7LM2500-PK-MDWG05 | **Engine Fired starts:** | 775 | **Package Fired Starts:** | 775 |

**MAINTENANCE DATA**

| WP, SB, SL, PB, PL Performed | GEK105054, REV 11 | Date completed | Comments |
|---|---|---|---|
| WP 406 00 | Borescope Inspection | 31DEC24 | Serviceable |

**PARTS DATA**

| Description | PN Removed | SN Removed | Qty | Disposition | PN Installed | SN Installed |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |

## 3. Borescope Inspection Checklist

**Date unit out of operation:** 31JAN24
**Date unit into operation:** 02JAN25
**Last inspection date:** 16JUN24; PPG O&M

**Type of Fuel:** Gas / Diesel
**Type of outage:** Scheduled

**Type of NOx suppression:** Water Injection

**Inspection of gas turbine:**

| WATERWASH: | HIGH PRESSURE COMPRESSOR: |
|---|---|
| ☒ PERFORMED WATER WASH | ☒ HPC BORESCOPE INSPECTION |
| **COMBUSTOR:** | **HIGH PRESSURE TURBINE** |
| ☒ COMBUSTOR BORESCOPE INSPECTION | ☒ HPT STAGE 1 & 2 NOZZLE BORESCOPE INSPECTION |
| | ☒ HPT BLADE BORESCOPE INSPECTION |
| **LOW PRESSURE TURBINE:** | |
| ☒ LPT BORESCOPE INSPECTION | |

☒ ***Please verify all borescope plugs have been reinstalled***

## 4. Borescope Inspection Record

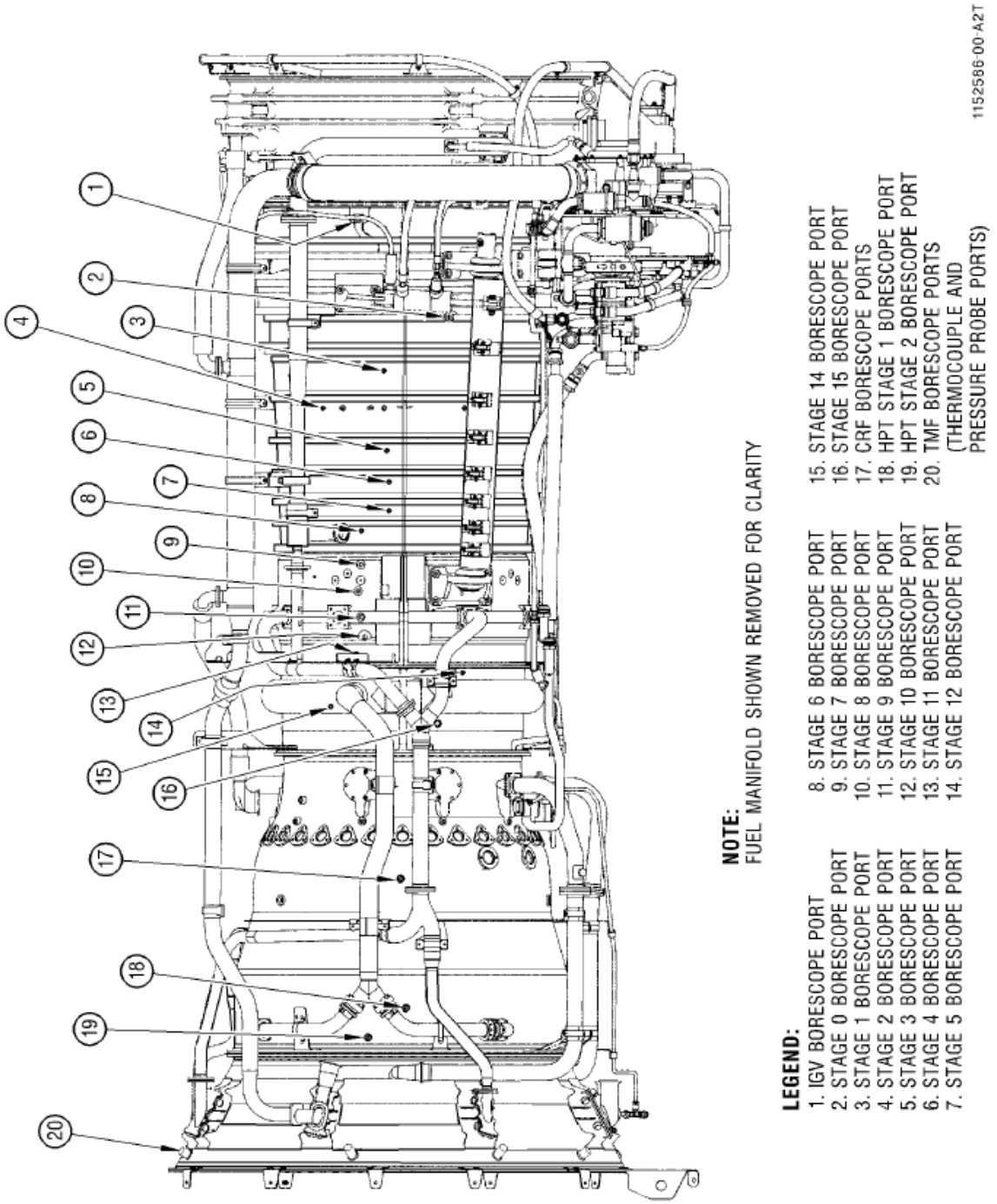



Figure 1: Position of Borescope Inspection Ports.

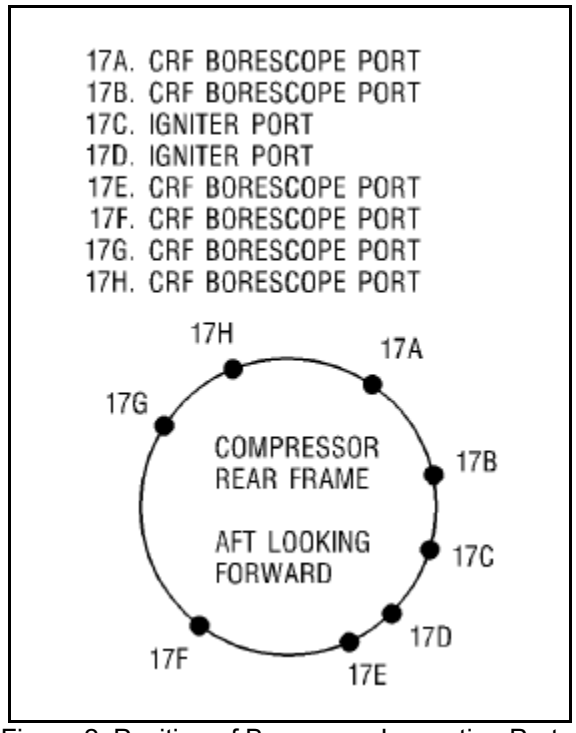


Figure 2: Position of Borescope Inspection Ports.

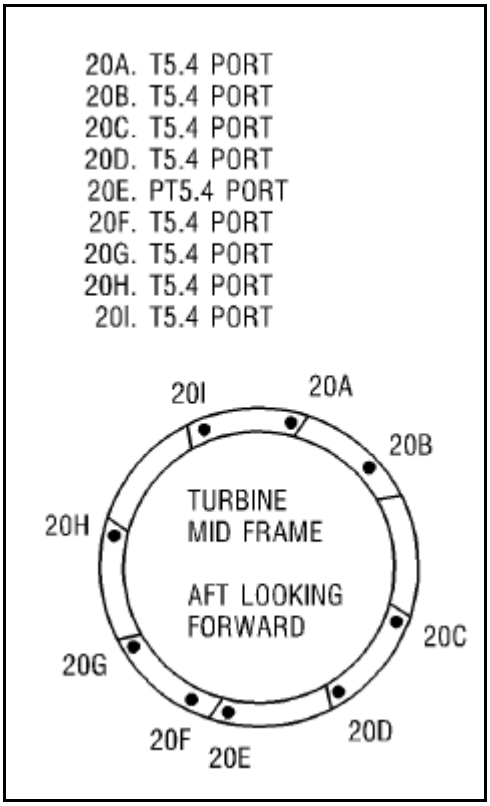


Figure 3: Position of Borescope Inspection Ports.

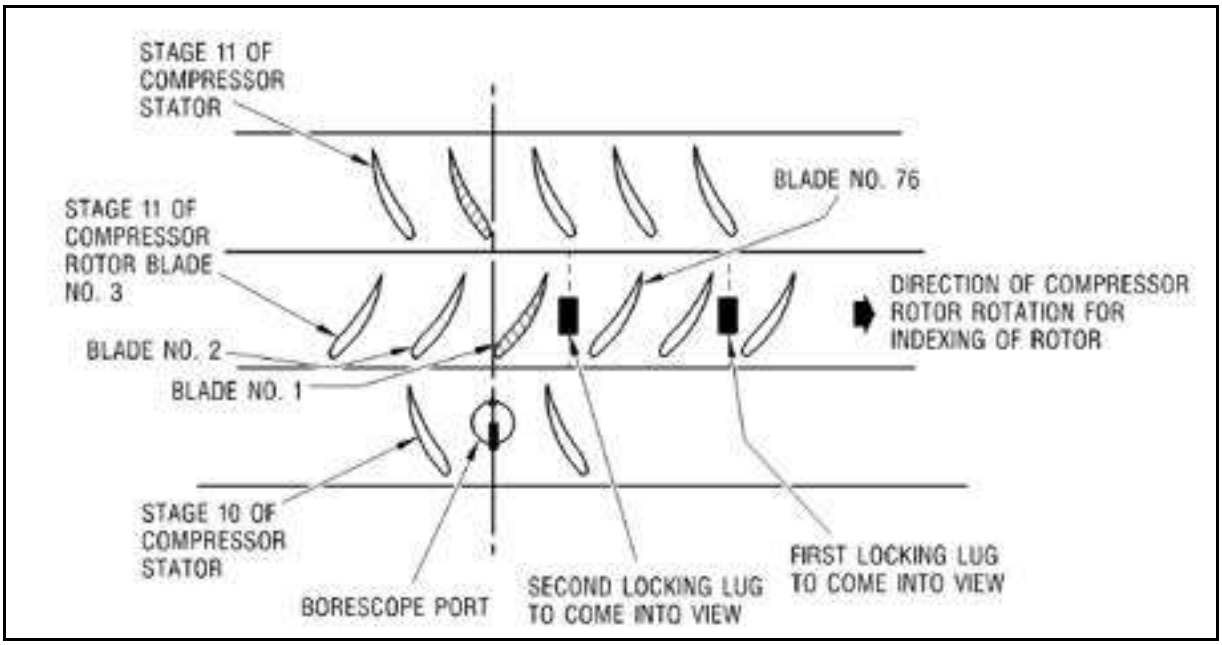


Figure 4: Zero indexing of HPC rotor and HPT rotor

Compressor Section

| Port | T.E. | L.E. | blades | Remarks: | photo no: |
|---|---|---|---|---|---|
| 1 | IGV | | | | P1 |
| 1 | | 0 | 36 | | P2 P3 |
| 2 | 0 | | 36 | | P4 P5 |
| 2 | | 1 | 26 | | P6 P7 |
| 3 | 1 | | 26 | | P8 P9 P10 |
| 3 | | 2 | 26 | | P11 P12 |
| 4 | 2 | | 26 | | P13 |
| 4 | | 3 | 42 | | P14 |
| 5 | 3 | | 42 | | P15 P16 |
| 5 | | 4 | 45 | | P17 P18 |
| 6 | 4 | | 45 | | P19 P20 |
| 6 | | 5 | 48 | | P21 |
| 7 | 5 | | 48 | | P22 P23 |
| 7 | | 6 | 54 | | P24 P25 |
| 8 | 6 | | 54 | Blades contacting tip | |
| 8 | | 7 | 56 | Blades contacting tip | |
| 9 | 7 | | 56 | | P26 |
| 9 | | 8 | 64 | | P27 P28 |
| 10 | 8 | | 64 | | P29 P30 |
| 10 | | 9 | 66 | | P31 |
| 11 | 9 | | 66 | | P32 P33 P34 |
| 11 | | 10 | 66 | | P35 P36 |
| 12 | 10 | | 66 | | P37 P38 |
| 12 | | 11 | 76 | | P39 P40 |
| 13 | 11 | | 76 | | P41 P42 |
| 13 | | 12 | 76 | | P43 P44 |
| 14 | 12 | | 76 | | P45 P46 |
| 14 | | 13 | 76 | | P47 |
| 15 | 14 | | 76 | Inside bleed manifold | |
| 15 | | 15 | 76 | Inside bleed manifold | |
| 16 | 15 | | 76 | | P489 P49 |
| 16 | | 16 | 76 | | P50 P51 P52 |

**Notes:**
The HPC Section is serviceable according to GEK105054 Volume II WP40600 Table 4.
The HPC section was found clean.

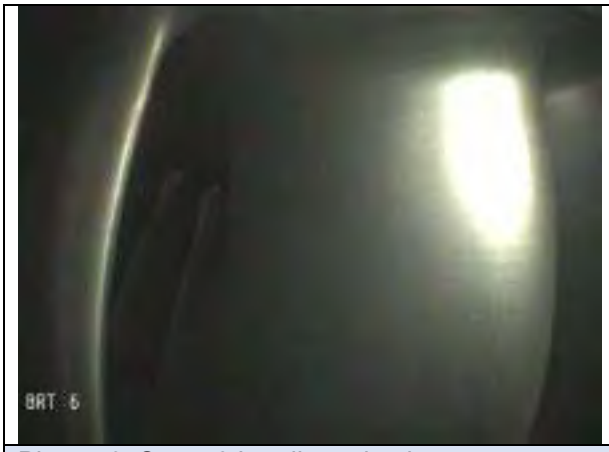
.



Picture 1. CFF & IGV



Picture 2. Stage 0 Leading edge tip



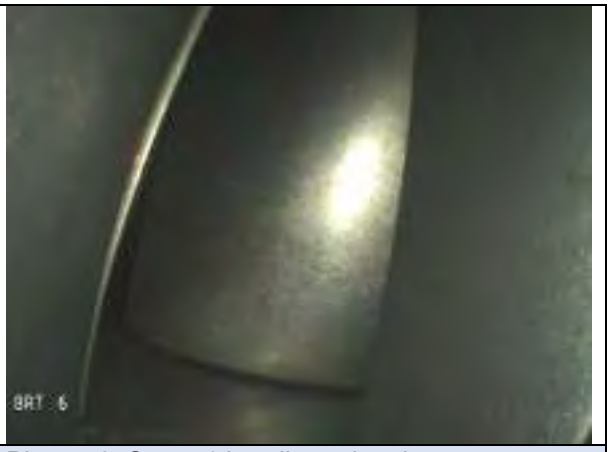
Picture 3. Stage 0 Leading edge base



Picture 4. Stage 0 Trailing edge tip



Picture 5. Stage 0 wiping hole



Picture 6. Stage 1 Leading edge tip



Picture 7. Stage 1 Leading edge base



Picture 8. Stage 1 leading root



Picture 9. Stage 1 Blades Trailing edge tip



Picture 10. Stage 1 Trailing edge base



Picture 11. Stage 2 Leading edge tip



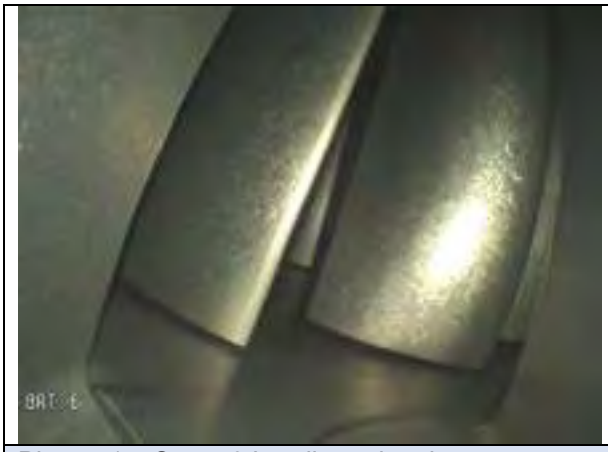
Picture12. Stage 2 Leading edge base



Picture 13. Stage 2 Trailing edge tip



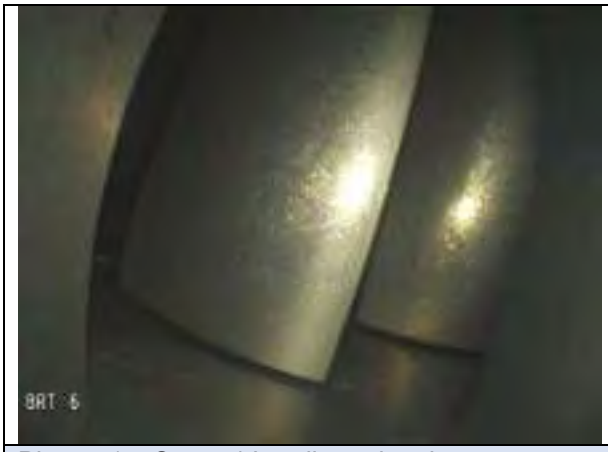
Picture 14. Stage 2 Trailing edge base



Picture 15. Stage 3 Leading edge tip



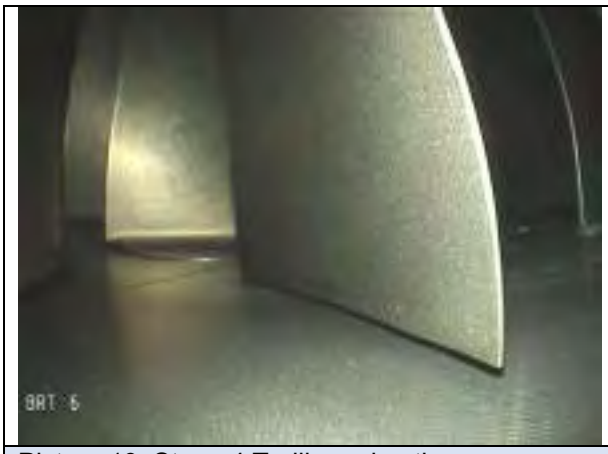
Picture 16. Stage 3 Trailing edge base



Picture 17. Stage 4 Leading edge tip



Picture 18. Stage 4 Leading edge base



Picture 19. Stage 4 Trailing edge tip



Picture 20. Stage 4 Trailing edge base



Picture 21. Stage 5 Leading edge



Picture 22. Stage 5 Trailing edge base



Picture 23. Stage 5 Trailing edge tip



Picture 24. Stage 6 Leading edge base



Picture 25. Stage 6 Leading edge tip



Picture 26. Stage 7 Trailing edge tip



Picture 27. Stage 8 Leading edge tip



Picture 28. Stage 8 Leading edge base



Picture 29. Stage 8 Trailing edge tip



Picture 30. Stage 8 Trailing edge base



Picture 31. Stage 9 Leading edge



Picture 32. Stage 9 Trailing edge tip



Picture 33. Stage 9 Trailing base



Picture 34. Stage 9 Bleed manifold



Picture 35. Stage 10 Leading edge tip



Picture 36. Stage 10 Leading edge base



Picture 37. Stage 10 Trailing edge tip



Picture 38. Stage 10 Trailing edge base



Picture 39. Stage 11 Leading edge base



Picture 40. Stage 11 Leading edge tip



Picture 41. Stage 11 Trailing edge tip



Picture 42. Stage 11 Trailing edge base



Picture 43. Stage 12 Leading edge tip



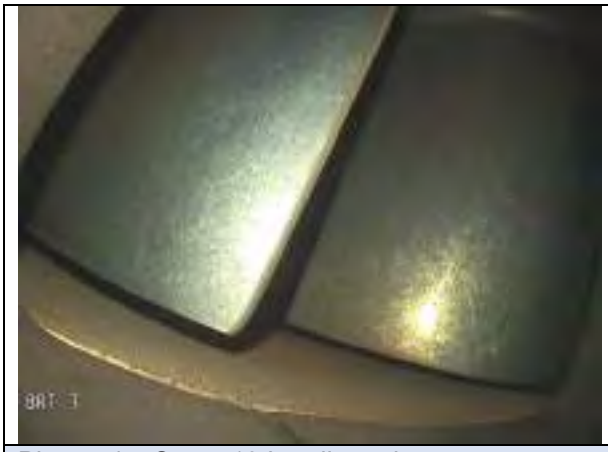
Picture 44. Stage 12 Leading edge base



Picture 45. Stage 12 Trailing edge base



Picture 46. Stage 12 Trailing edge tip



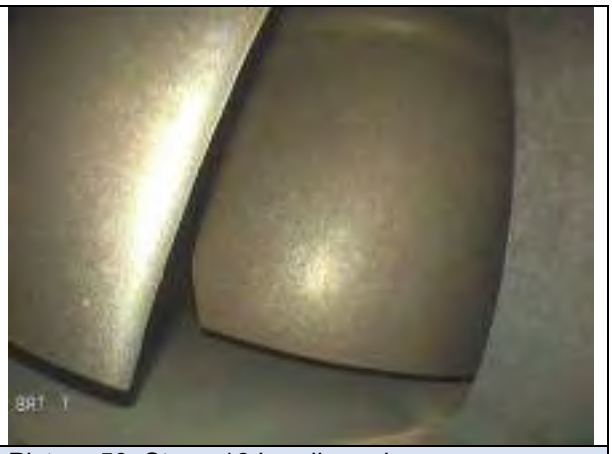
Picture 47. Stage 13 Leading edge



Picture 48. Stage 15 Trailing edge



Picture 49. Stage 15 Trailing edge base



Picture 50. Stage 16 Leading edge



Picture 51. Stage 16 Leading edge base



Picture 52. Outlet guide vanes

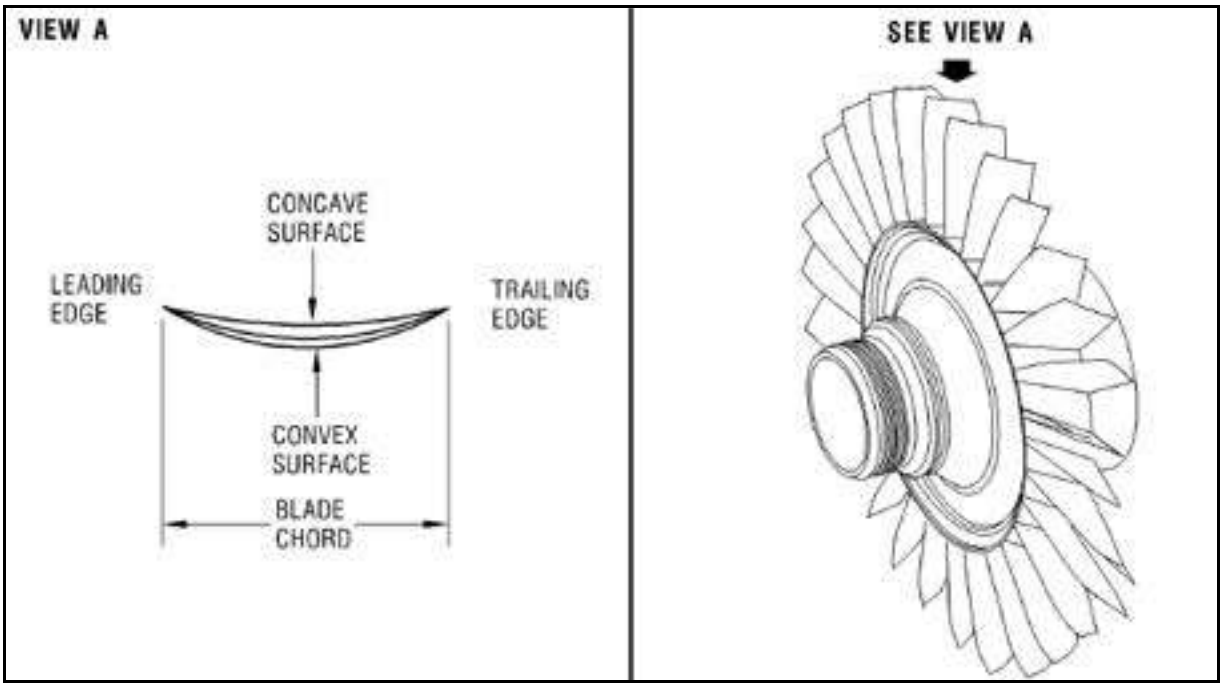



Figure 5: HPC stage 0 BLISK

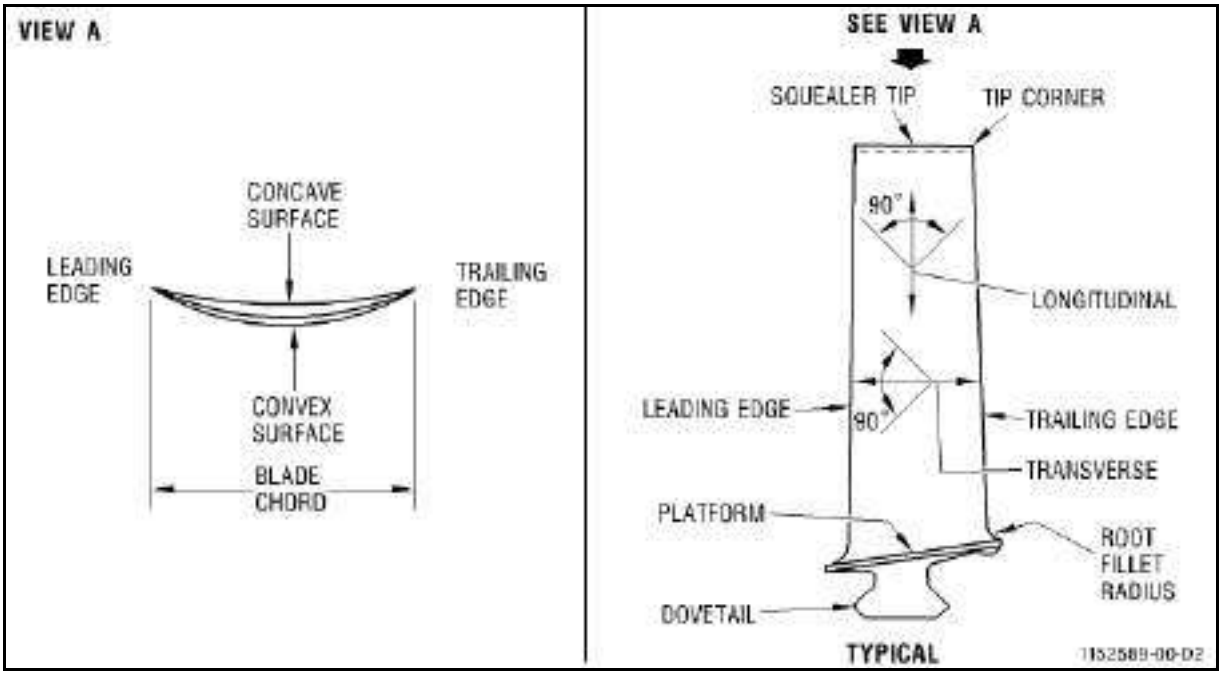



Figure 6: Compressor Rotor Blades

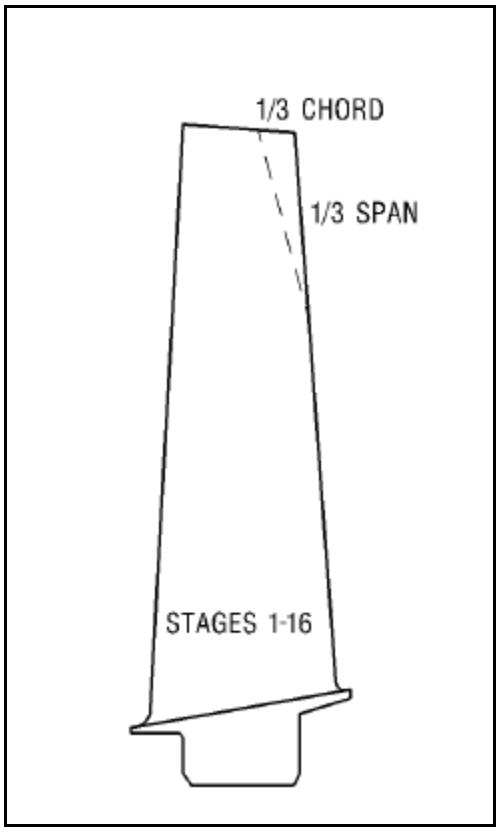


Figure 7: Tip Trailing Edge Inspection

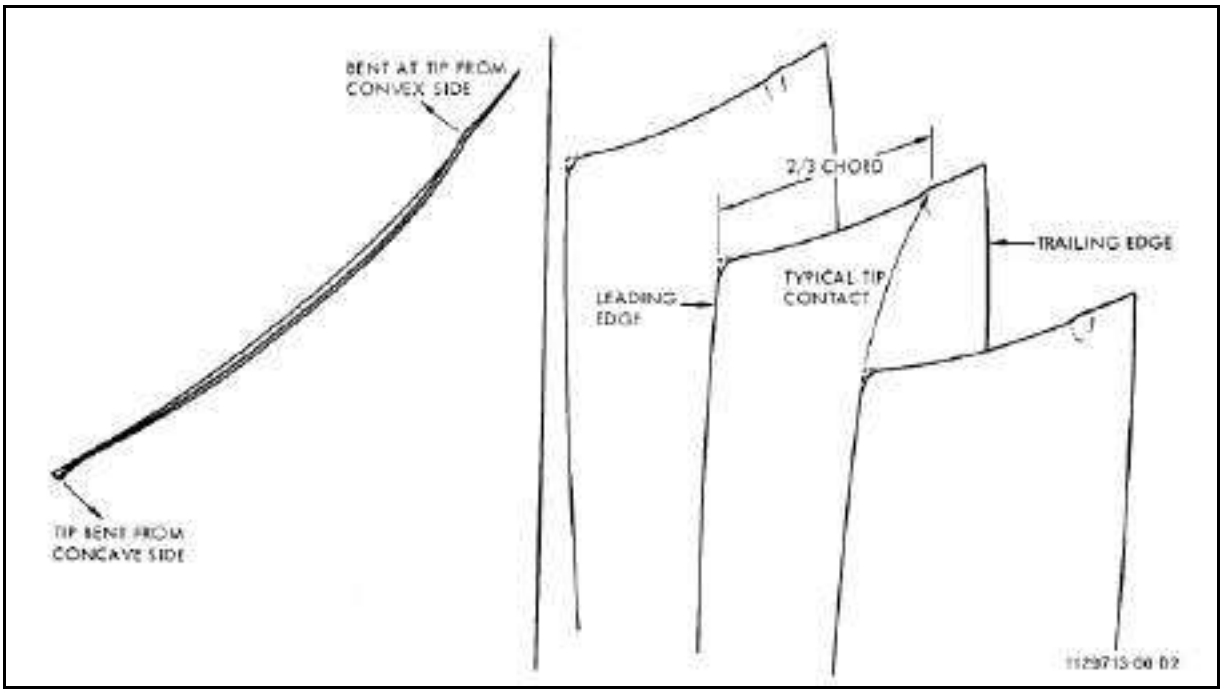
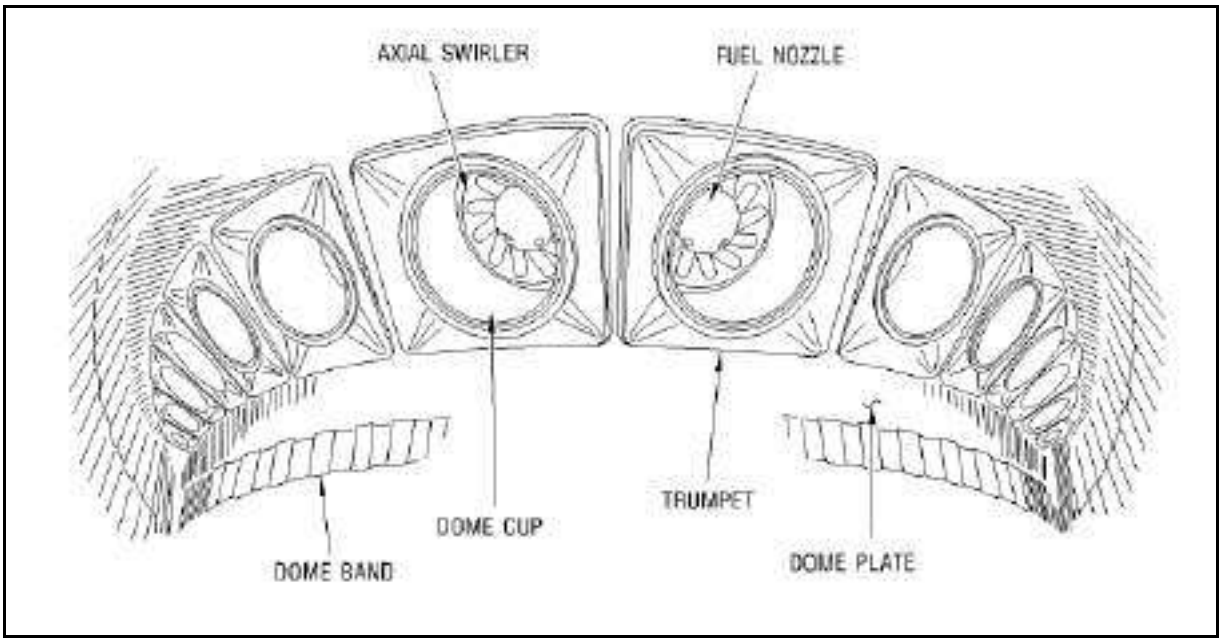


Figure 8: Tip Clanging Contact (HPCR stage 3 through 6)

Combustor and 1St Stage Nozzle Section

| Port | Condition observed | Photo no: |
|---|---|---|
| **17A** | | |
| **17B** | | |
| **17C** | | |
| **17D** | **See below notes.** | |
| **17E** | | |
| **17F** | | |
| **17G** | | |
| **17H** | | |
| **17** | 1st stage nozzle (leading edge): | |

**Notes:**
The Combustor section is serviceable according to GEK105054 Volume II WP40600 Table 7.



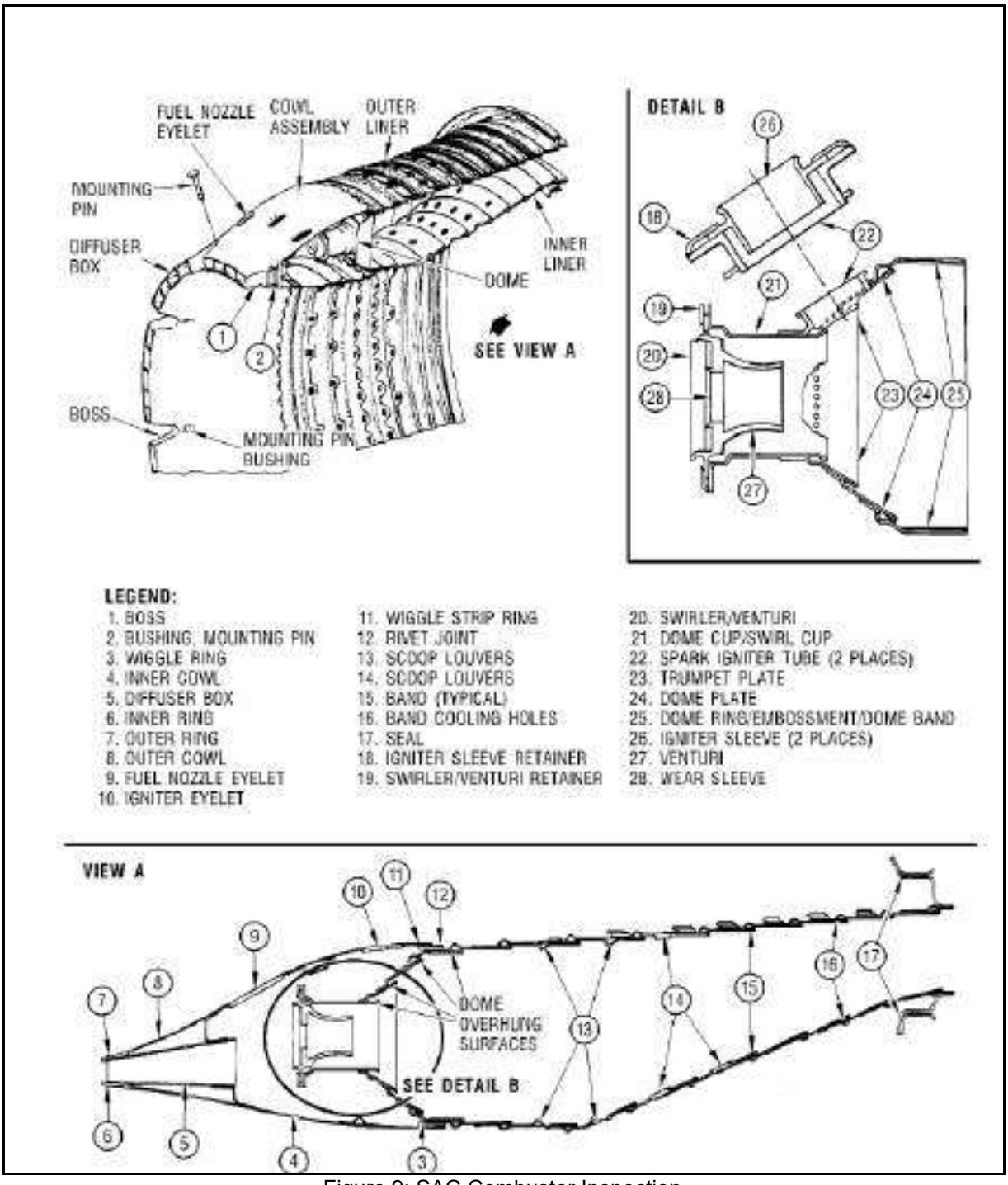



Figure 9: SAC Combustor Inspection

Figure 10: SAC Combustor Inspection

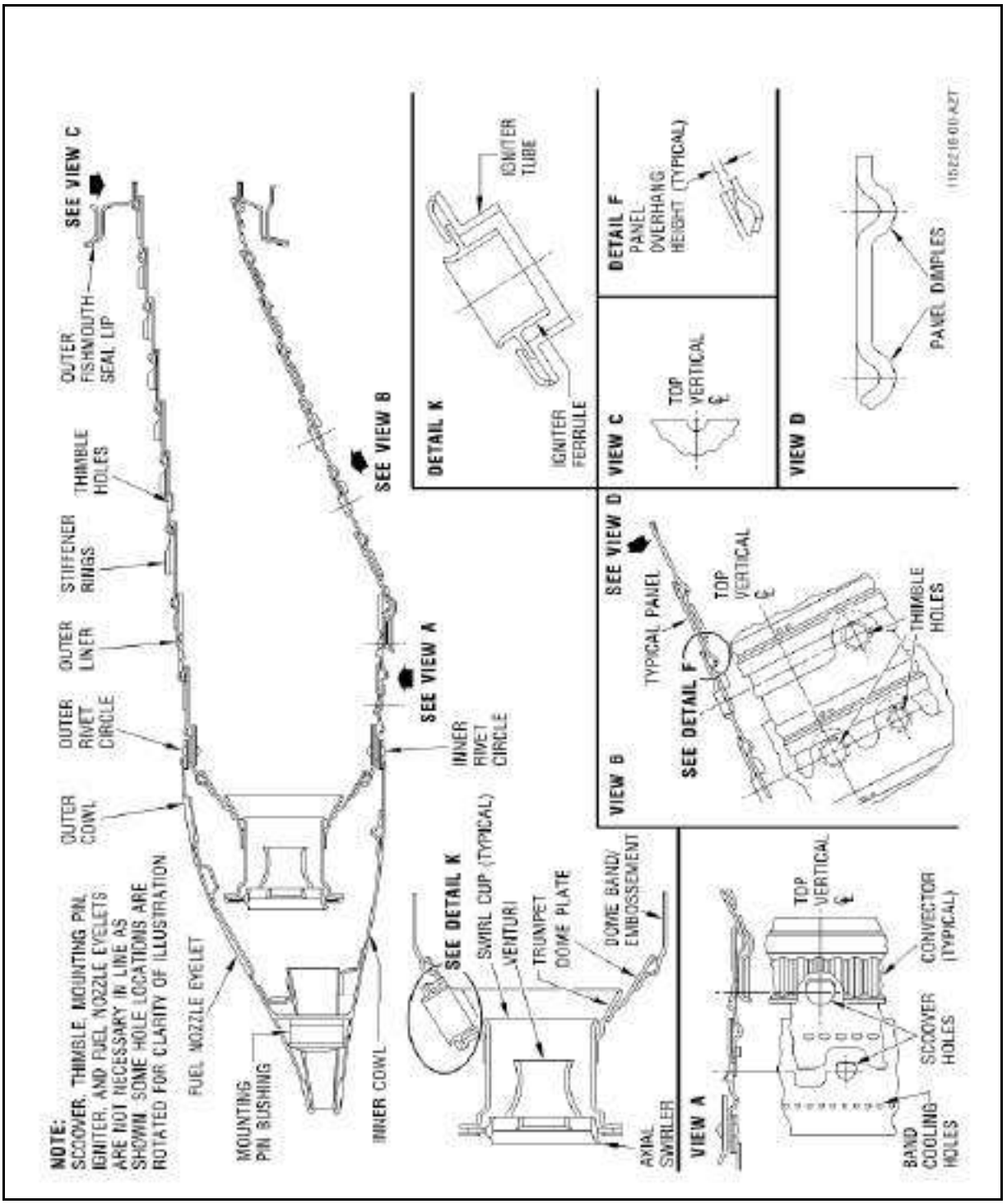



Figure 11: SAC Combustor Inspection

**Borescope Pictures**



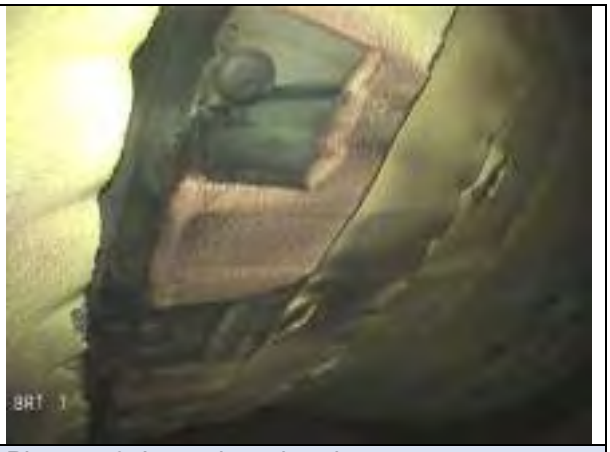
Picture 53. Upper igniter ferrule



Picture 54. Lower igniter ferrule



Picture 55. Outer rivets band



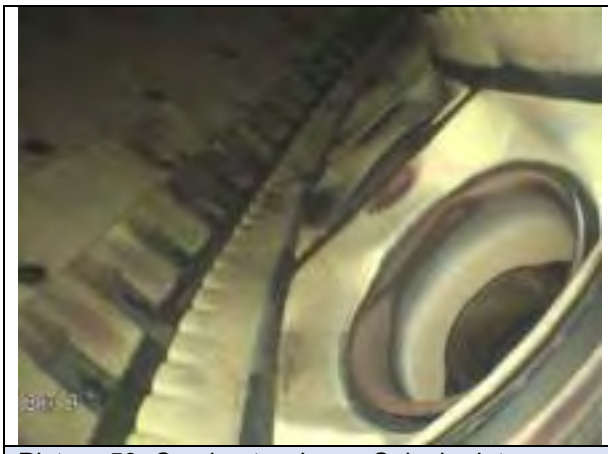
Picture 56. Inner rivets band



Picture 57. Combustor liners



Picture 58. Combustor liners



Picture 59. Combustor dome. Splash plates



Picture 60. Fuel nozzle tip



Picture 61. Combustor liners and HPT nozzles interference



Picture 62. Combustor liners and HPT nozzles interference

Turbine Section

| | turbine stage | | | | |
|---|---|---|---|---|---|
| **Port** | **L.E.** | **T.E.** | **blades** | **Remarks:** | **photo no:** |
| **18** | **1** | | **88** | | |
| **19** | | **1** | **88** | **See below notes.** | |
| **19** | **2** | | **90** | | |
| **20** | | **2** | | | |

**Notes:**
The High Pressure Turbine section is serviceable according to GEK105054 Volume II WP40600 Table 8.

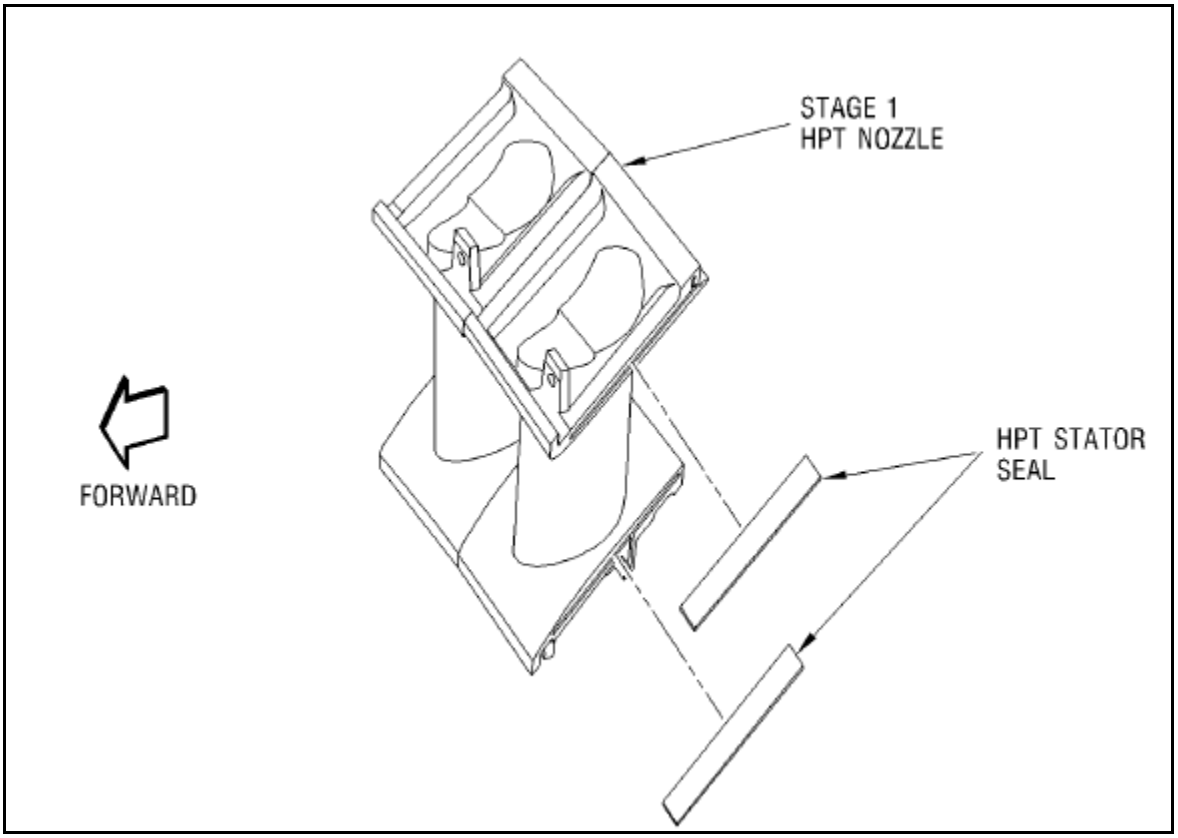


Figure 12: Stage 1 HPT Nozzle Seal Displacement

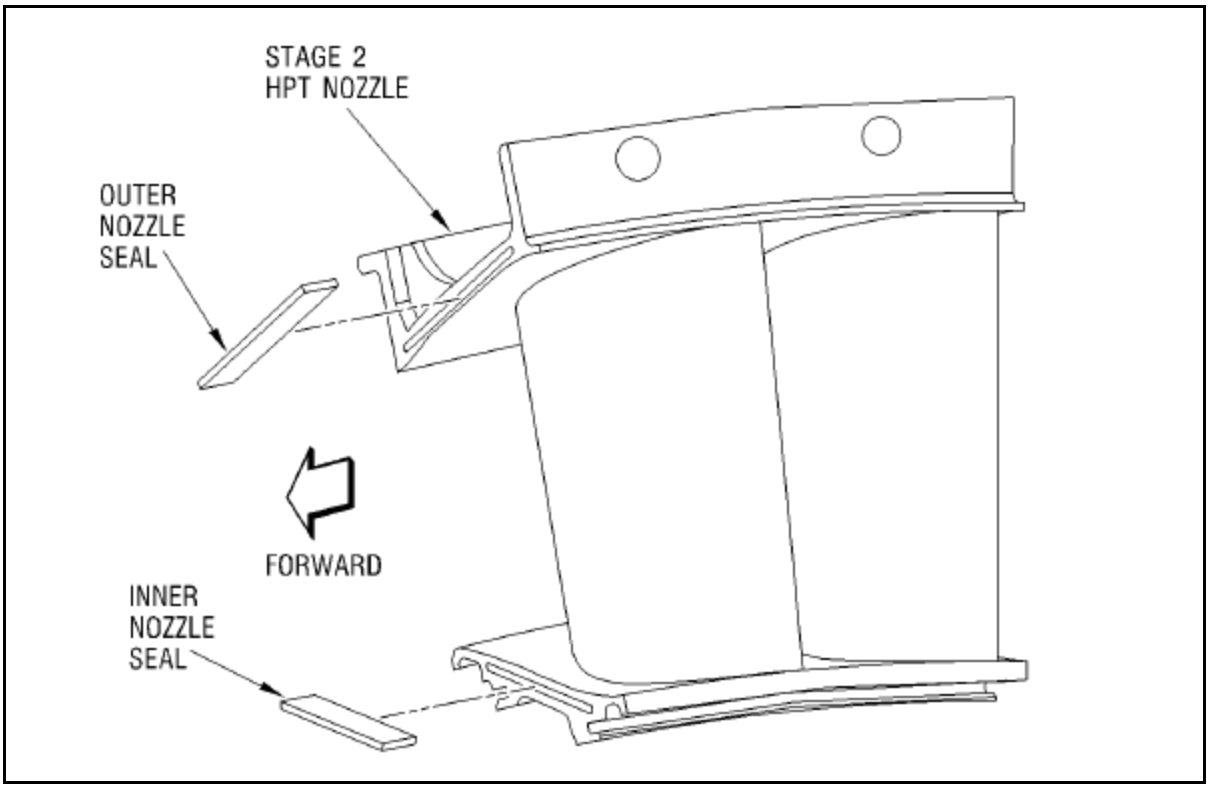


Figure 13: Stage 2 HPT Nozzle Seal Displacement

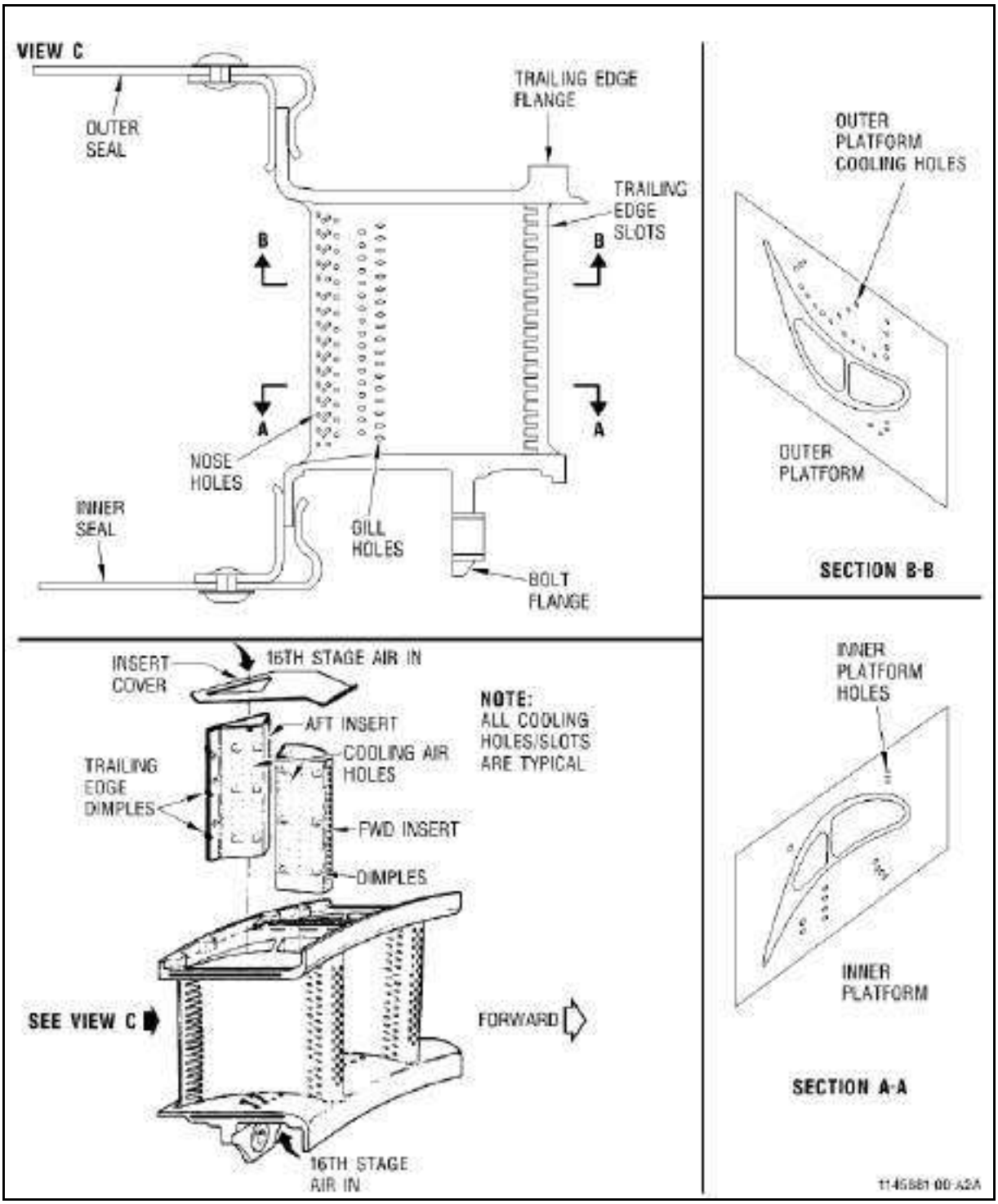



Figure 14: HPT Stage 1 Nozzle

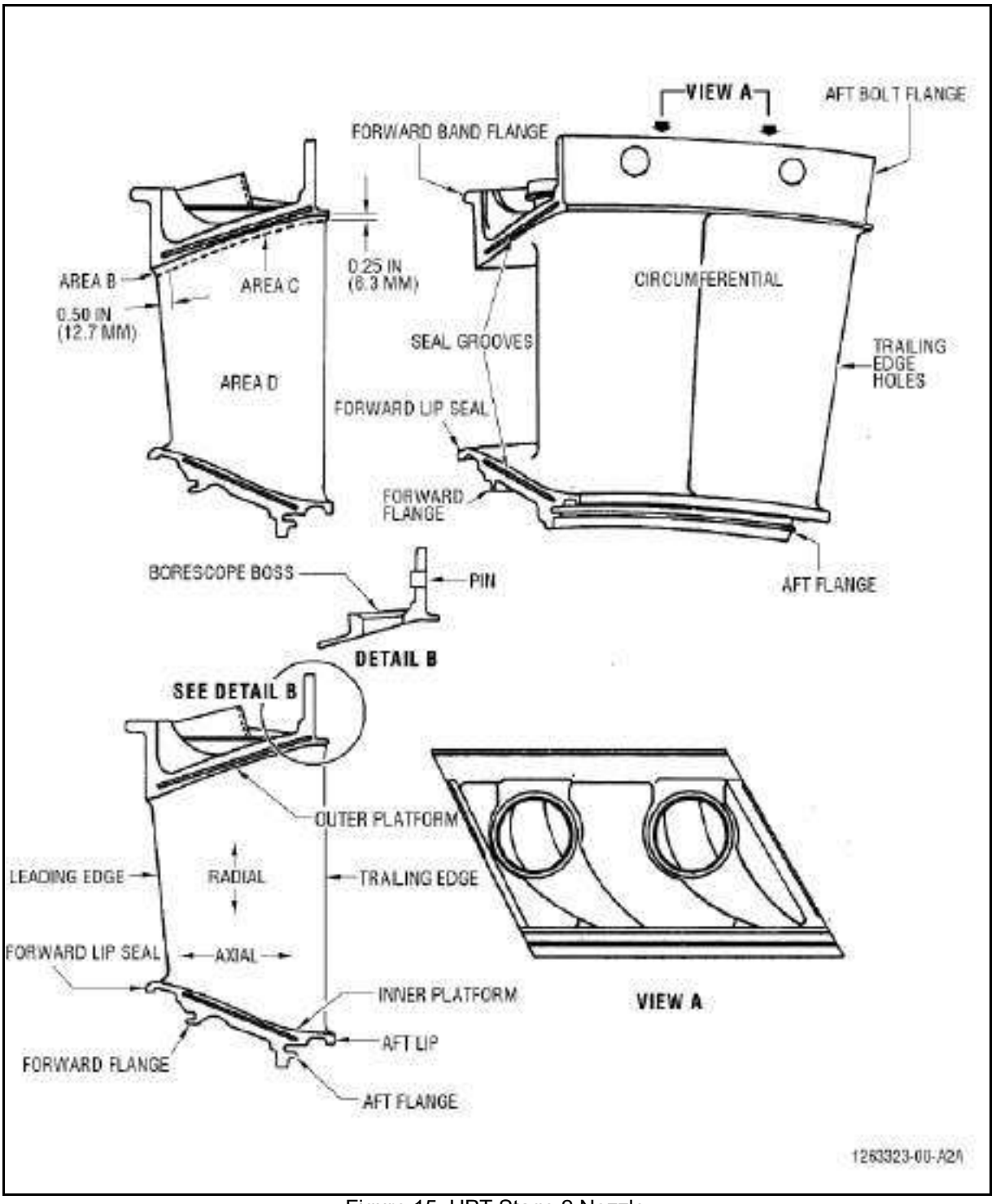



Figure 15: HPT Stage 2 Nozzle

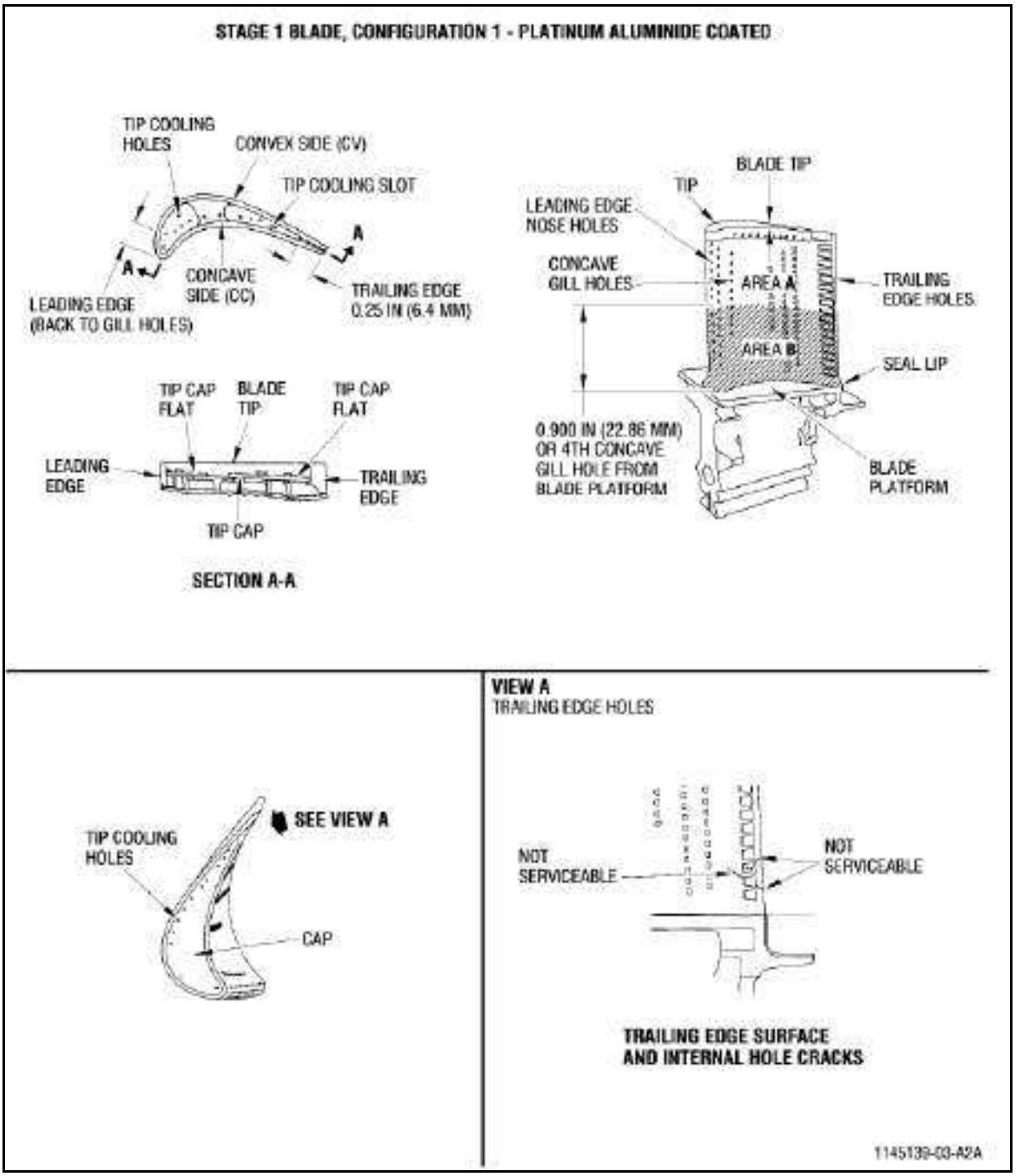



Figure 16: HPT Stage 1 Rotor Blades Inspection Areas (Platinum Aluminide Coated Blades)

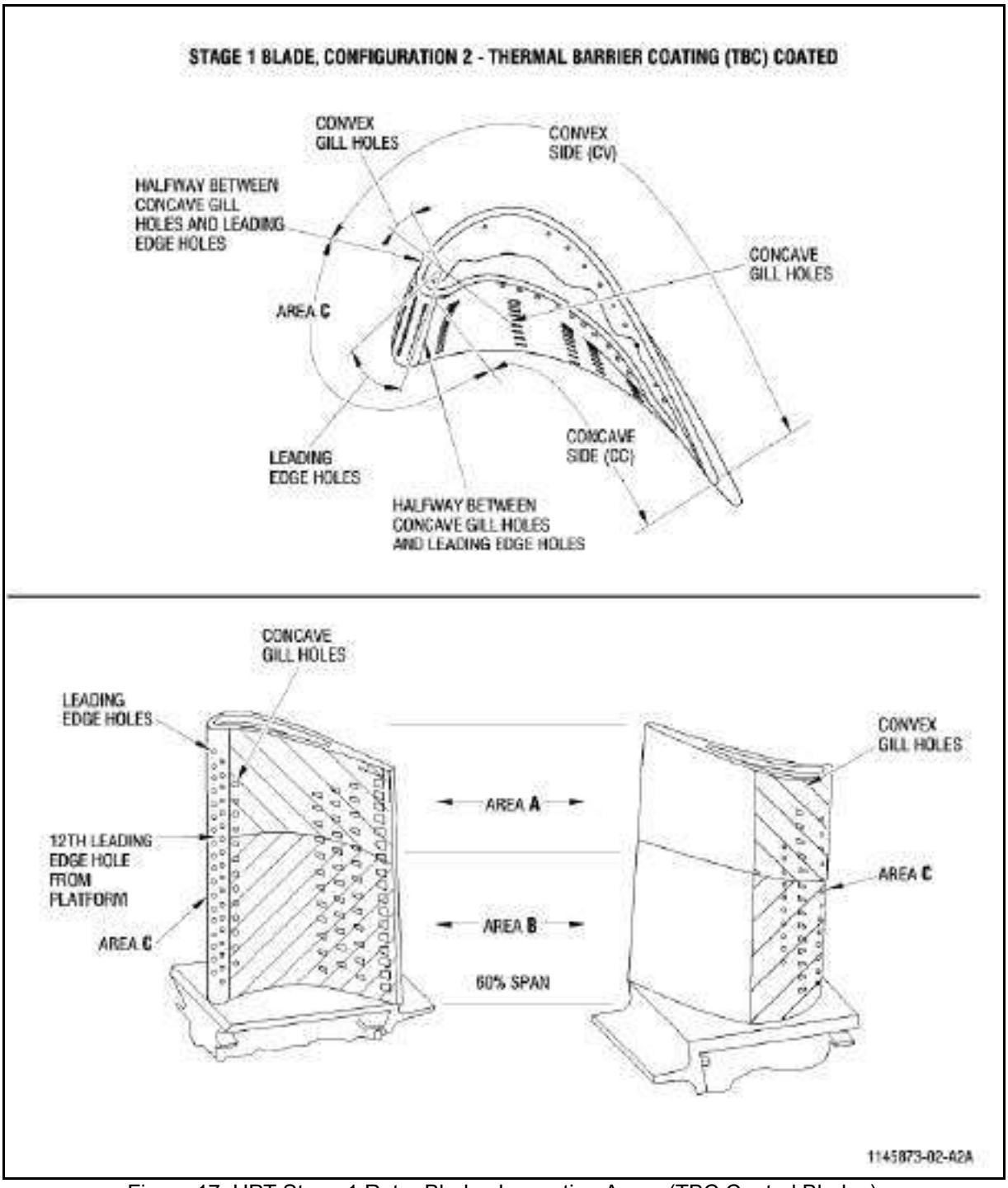


Figure 17: HPT Stage 1 Rotor Blades Inspection Areas (TBC Coated Blades)

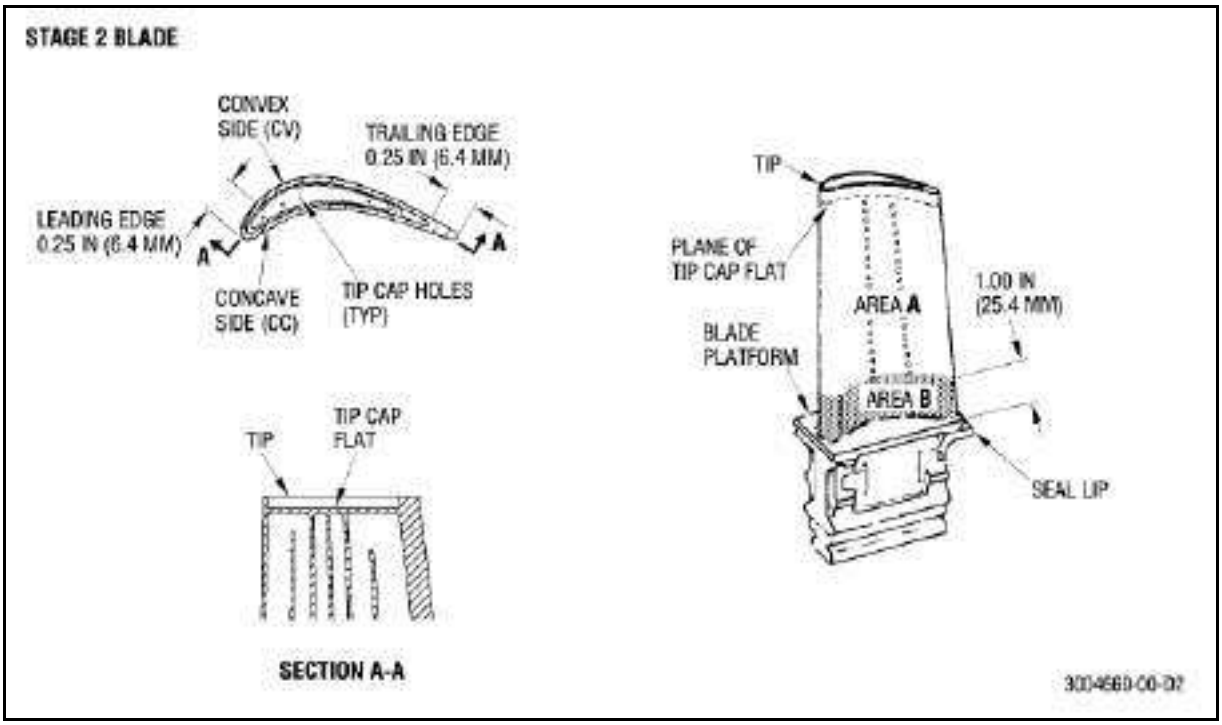


Figure 18: HPT Stage 2 Rotor Blades Inspection Areas

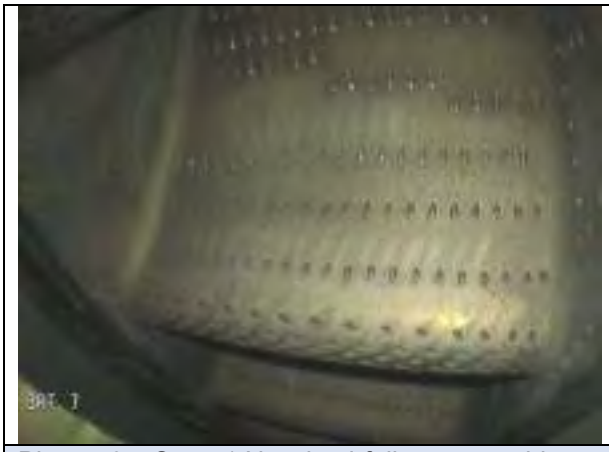
**Borescope Pictures**



Picture 63: Stage1 Nozzles leading edge



Picture 64: Stage1 Nozzles leading edge



Picture 65: Stage1 Nozzle airfoil concave side



Picture 66: Stage1 Nozzle airfoil concave side



Picture 67: Stage1 Nozzle airfoil concave side



Picture 68: Stage1 Nozzle airfoil concave side



Picture 69: Stage1 Nozzle airfoil concave side



Picture 70: Stage1 Nozzle airfoil concave side



Picture 71: Stage1 Nozzle airfoil concave side



Picture 72: Stage1 Nozzle trailing edge concave



Picture 73: Stage1 Nozzle trailing edge concave



Picture 74: Stage1 Nozzle trailing edge convex. Blades leading edge



Picture 75: Stage1 Blades leading edge tip rub



Picture 76: Stage1 Blades leading edge tip rub



Picture 77: Stage1 Blades leading edge



Picture 78: Stage 1 Blades leading edge base



Picture 79: Stage 1 Blades trailing edge convex



Picture 80: Stage 1 Blades trailing edge convex



Picture 81: Stage 2 Blades leading edge



Picture 82: Stage 2 Honeycomb seals



Picture 83: Stage 2 Blades and stage 2 nozzles trailing edge



Picture 84: Stage 2 Blades leading edge



Picture 85: Stage 2 Blades leading convex base



Picture 86: Stage 2 Blades trailing edge

LPT Section

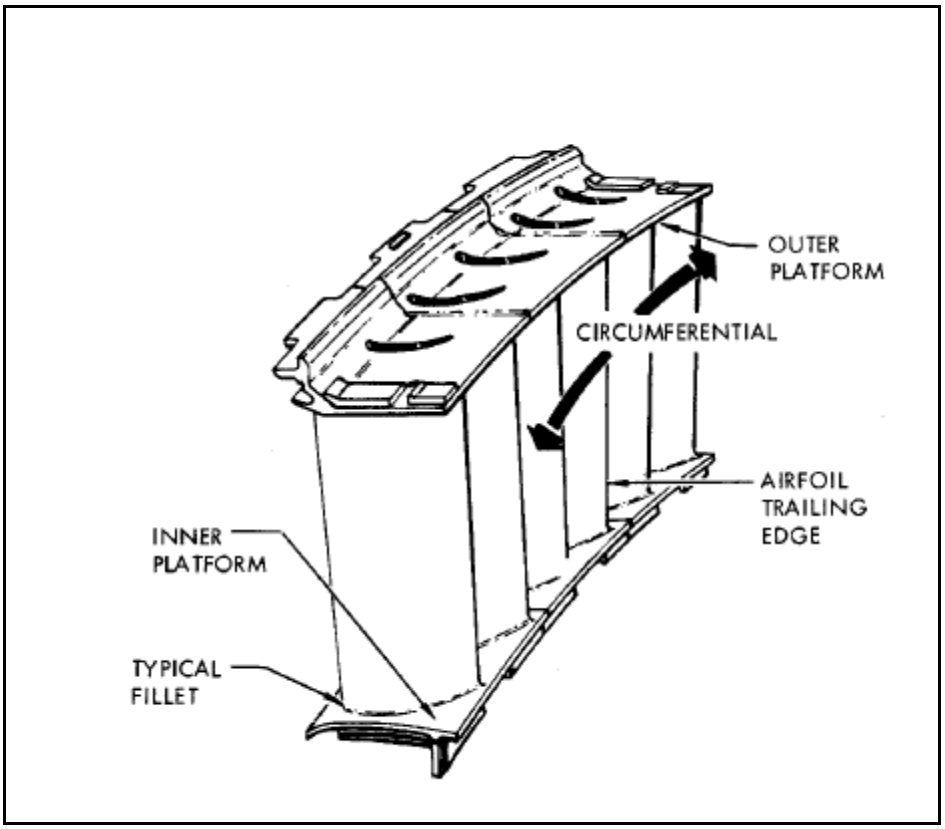



Figure 19: Power Turbine Nozzles

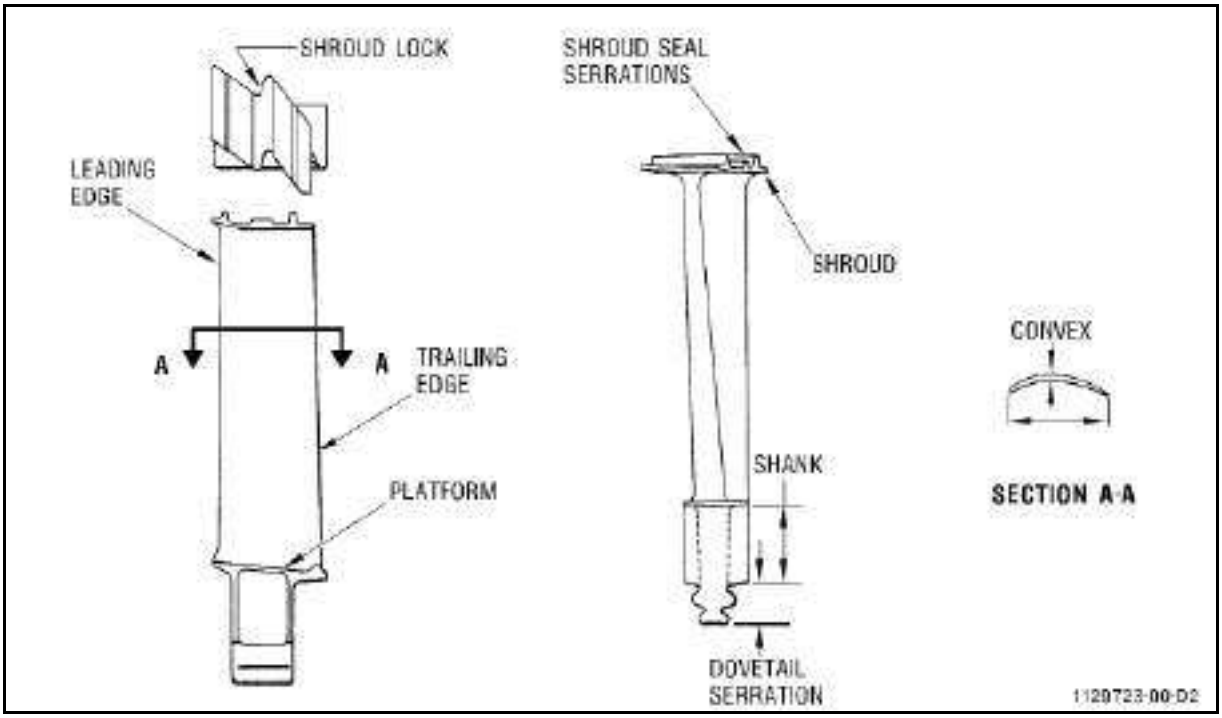



Figure 20: Power Turbine Rotor Blades

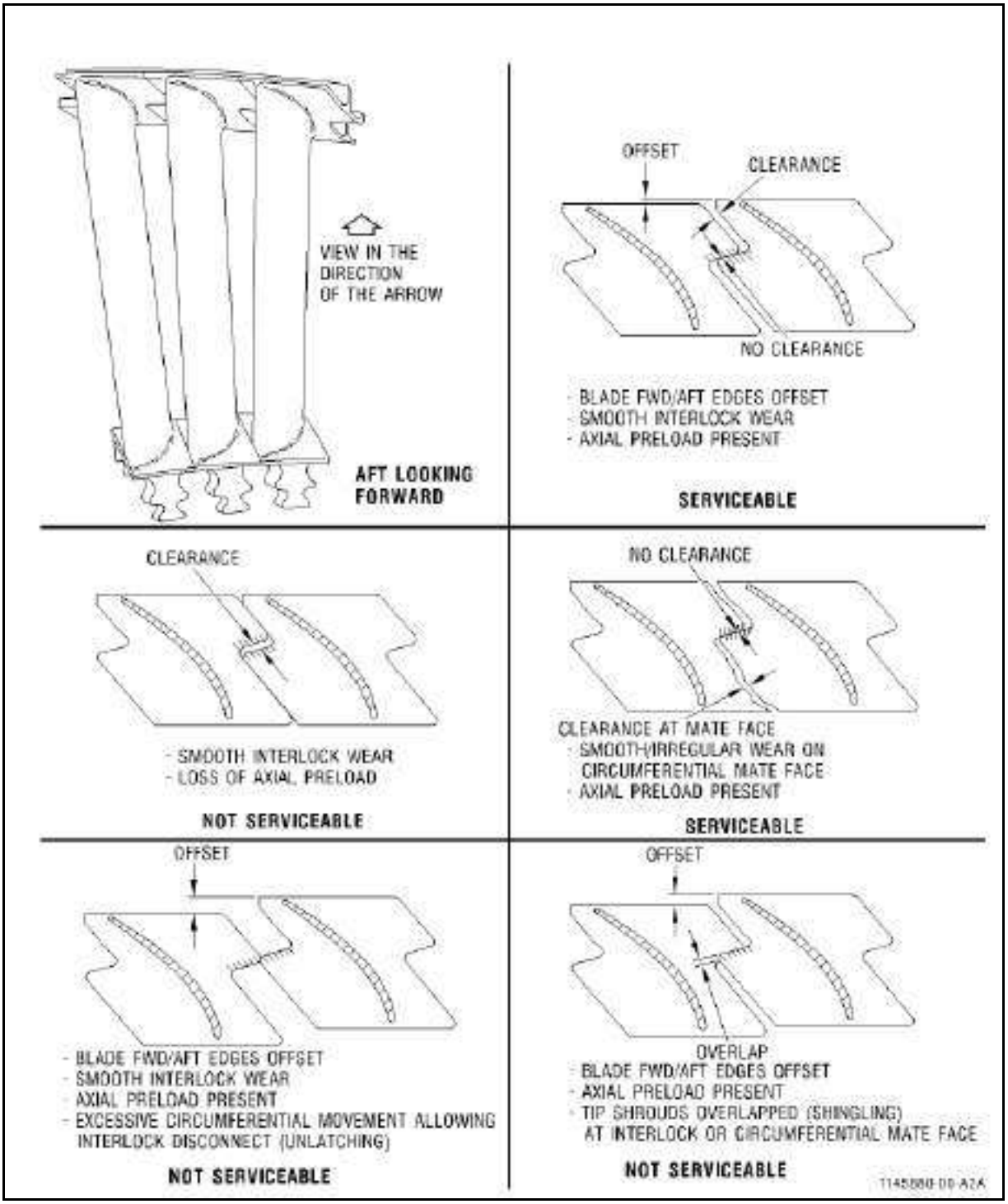


Figure 21: LPT Rotor Blade Circumferential Inspection

**Notes:**

The LPT stage 1 accessible nozzles and blades did not show any damage.

**Borescope Pictures**



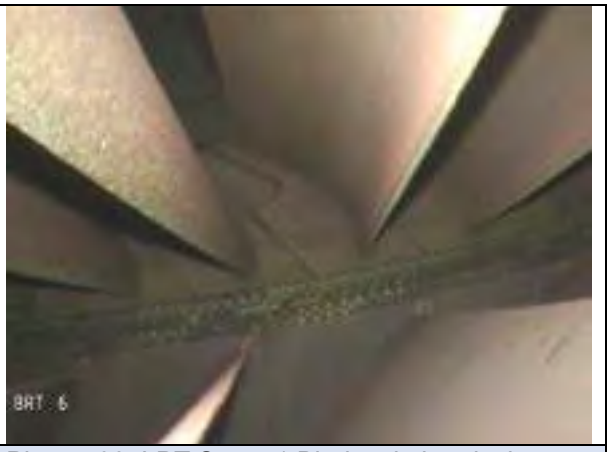
Picture 87: TMF and LPT Inlet



Picture 88: TMF and LPT Inlet



Picture 89: Stage 1 Blades



Picture 90: LPT Stage 1 Blades tip interlock

PPG ENERGY

# *SEMI ANNUAL INSPECTION REPORT*
# *TM2500 GEN. 6&7*
# *LM2500+ SAC*

## NFE SAN JUAN POWER PLANT

## *PACKAGE # 7253290*

## *UNIT #10*

# *LM2500+ SAC*

| | | | |
|---|---|---|---|
| **Outage Date:** | January 5, 2025 | **Total Starts:** | 528 |
| **Engine S/N:** | 557 – 262 | **GG Hours:** | 12454 |
| **Power Turbine S/N:** | 557 – 262 | **PT Hours:** | 12454 |
| **PPG GT Field Engineer:** | JC Requena H | **NFE Representative:** | Lance Florent |




All technical recommendations and information contained in this report are based on GE manuals that have been developed and approved for use with GE engines and parts that have been operated and maintained in accordance with GE technical documentation and recommendations.

# SUMMARY

The purpose of this visit was to perform a Semiannual Inspection in accordance with GEK 105054 Volume I Chapter 11 Table 11.1.

## Maintenance Data:

| WP Performed | Revision/manual reference | Date completed | Comments |
|---|---|---|---|
| WP 119 00 | Change 11 01 October 2020 | 05JAN25 | Serviceable |
| WP 400 00 | Change 11 01 October 2020 | 05JAN25 | Serviceable |
| WP 401 00 | Change 11 01 October 2020 | 05JAN25 | Serviceable |
| WP 402 00 | Change 11 01 October 2020 | 05JAN25 | Serviceable |
| WP 403 00 | Change 11 01 October 2020 | 05JAN25 | Serviceable |
| WP 404 00 | Change 11 01 October 2020 | 05JAN25 | Serviceable |
| WP 405 00 | Change 11 01 October 2020 | 05JAN25 | Serviceable |
| WP 406 00 | Change 11 01 October 2020 | 05JAN25 | Serviceable |
| WP 407 00 | Change 11 01 October 2020 | | Not Performed |
| WP 408 00 | Change 11 01 October 2020 | 05JAN25 | Serviceable |
| WP 409 00 | Change 11 01 October 2020 | 05JAN25 | Serviceable |
| WP 410 00 | Change 11 01 October 2020 | 05JAN25 | Serviceable |
| WP 411 00 | Change 11 01 October 2020 | | Not Performed |
| WP 412 00 | Change 11 01 October 2020 | | Not Performed |
| WP 414 00 | Change 11 01 October 2020 | 05JAN25 | Serviceable |
| WP 415 00 | Change 11 01 October 2020 | 05JAN25 | Serviceable |
| WP 417 00 | Change 11 01 October 2020 | 05JAN25 | Serviceable |
| WP 418 00 | Change 11 01 October 2020 | 05JAN25 | Serviceable |
| WP 419 00 | Change 11 01 October 2020 | 05JAN25 | Serviceable |
| WP 431 00 | Change 11 01 October 2020 | 04NOV24 | Serviceable |

**Parts Data**

| Description | PN OUT | SN OUT | Qty | Disposition | PN IN | SN IN |
|---|---|---|---|---|---|---|
| Filter, Element | PH414-12-CGV | N/A | 2 | Scrap | PH414-12-CGV | N/A |
| Filter, Element | P176567 | N/A | 3 | Scrap | P176567 | N/A |
| Filter, Element | FP-235347 | N/A | 2 | Scrap | FP-235347 | N/A |
| Filter, Element | P165354 | N/A | 1 | Scrap | P165354 | N/A |
| Filter, Element | AC-B244F-2440 | N/A | 1 | Scrap | AC-B244F-2440 | N/A |
| Packing, Preformed | J221P140 | N/A | 2 | Scrap | J221P140 | N/A |
| Seal, Oil | 9032M84P02 | N/A | 1 | Customer | 9032M84P02 | N/A |
| Seal, O-Ring | 9365M85P01 | N/A | 1 | Scrap | 9365M85P01 | N/A |
| Ring, Seal Mating | 9634M85P01 | N/A | 1 | Scrap | 9634M85P01 | N/A |
| Packing, Preformed | J221P138 | N/A | 1 | Scrap | J221P138 | N/A |
| Filter, Element, Gas | TMR-S-710-HCC3-V | N/A | 1 | Scrap | TMR-S-710-HCC3-V | N/A |
| Ventilation Fan bands | 5VX – 830 | N/A | 8 | Scrap | 5VX – 830 | N/A |
| Seal, o-ring | 0391 -00 – 151 – T | N/A | 2 | Scrap | 0391 -00 – 151 – T | N/A |
| Fin Fan V Bands | 5VX – 740 | N/A | 6 | Scrap | 5VX – 740 | N/A |
| | | | | | | |

# DETAILS AND DATA

**GEK 105054 Chapter 11 Table 11.1**

| Maintenance Item | Reference | Comments |
|---|---|---|
| Enclosure Inspection | Packager's manual | See below |
| L&S pump Inlet Screens & Chip detectors Inspection and cleaning | WP 400 00 | See below |
| GT starter Oil return line screen Inspection | Packager's manual | See below |
| Supply and Scavenge Lube filter Inspection | Packager's manual | See below |
| Inlet Inspection | WP 401 00 | See below |
| External engine cleaning | WP 402 00 | See below |
| External engine inspection | WP 403 00 | See below |
| Exhaust inspection | WP 404 00 | See below |
| Compressor cleaning | WP 405 00 | See below |
| BSI | WP 406 00 | Refer to separate report |
| Lube Oil sampling | WP 407 00 | See below |
| Hydraulic Pump filter inspection | WP 408 00 | See below |
| Ignition System functional check | WP 409 00 | See below |
| Vibration monitoring system functional check | WP 410 00 | See below |
| Overspeed Inspection | WP 411 00 | See below |
| Overtemperature Inspection | WP 412 00 | See below |
| Compressor stall VSV Off schedule Inspection | WP 414 00 | See below |
| Fuel system inspection | WP 415 00 | See below |
| Thermocouple inspection | WP 419 00 | See below |
| HP Recoup Preferred operating range | WP 417 00 | See below |
| VSV system inspection | WP 418 00 | See below |
| Redundant Over speed | Packager's manual | See below |
| PTB | WP 431 00 | See below |
| SL2500-IND-19-001 Hilliard Hydraulic Starter Clutch Inspection | | See below |
| AGB Carbon Seals Replacement | WP119 00 | See below |

## TM Package GT & Auxiliaries Instrumentation calibration checks

## Fire Fighting system inspections.

***Please refer to EPC report***

- CO2 Damper operational check performed without discrepancies. Both dampers were actuated by means of compressed air. The dampers closed and the position alarm became active in the HMI

| | | |
|---|---|---|
|  | |  |
| CO2 Dampers inspection | | CO2 Dampers inspection |

## Combustion and Ventilation (GT & Generator) Filtration system checks

- The Gas turbine combustion and ventilation filters were not replaced as the DP values are within operational limits.
- The Generator ventilation filters were replaced.

| | | |
|---|---|---|
|  | |  |
| Generator filters replacement | | Generator filters replacement |

**Gas Turbine Ventilation system checks**

- E- Motor bearings greased.
- V Bands were found damaged. ***All 8 bands were replaced by new ones***
- Bypass (Educter mode) dampers inspected. Found in good condition.

| | | |
|---|---|---|
|  | |  |
| V Bands found worn | | V Bands replaced |

| | | |
|---|---|---|
|  | |  |
| GT ventilation system inspection | | GT ventilation system inspection |

## TLO and GLO Fin Fan coolers inspection

- E-Motor bearings greased.
- (A) V Bands were replaced with new ones.
- (B) V Bands were replaced with new ones.
- Fan Bearings greased.
- Vibration switch inspected and functional test performed.

| | | |
|---|---|---|
|  | |  |
| Fin Fan A Inspection | | Fin Fan A Inspection. V Bands replaced |
|  | |  |
| Fin Fan B Inspection | | Fin Fan B Inspection. V Bands replaced |

**Hydraulic starter system inspection**

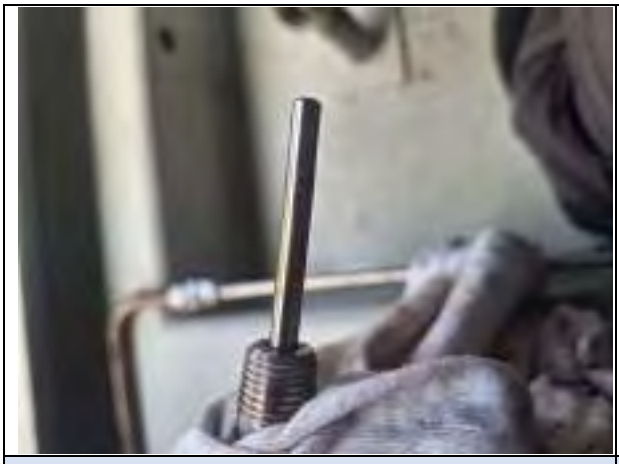
- E-Motor bearings greased.
- Flexible coupling inspected and found in good condition.
- Charge pump filter element replaced.
- LP Return filters replaced.
- Case drain return filter element replaced.
- The Hydraulic starter system tank was topped up after the inspection.



Hydraulic starter pump coupling inspection



Hydraulic system filters replacement



Clutch lube oil return line inspection



Clutch lube oil return line inspection



Starter splines as found

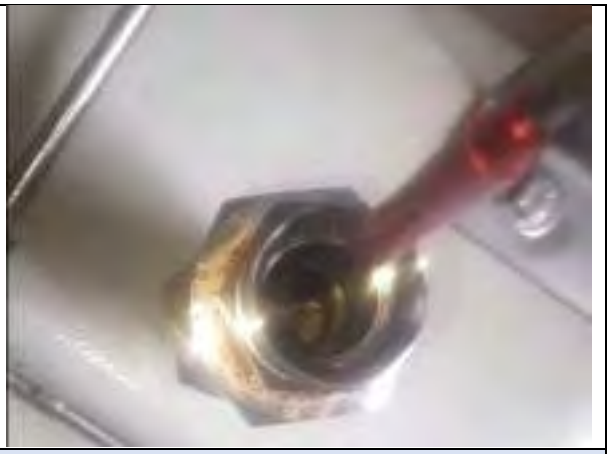
## Liquid fuel system inspection

- The Pump discharge filters were not replaced as the Differential pressure values are within normal values
- E- Motor bearings greased.
- Flexible coupling inspected and found in good condition.
- Piping inspection for leaks, loose brackets, etc., without discrepancies.
- Check valves (41 & 42) inspection performed and found in good condition. Valves were disassembled and check for spring functionality and proper sealing condition.

| | | |
|---|---|---|
|  | |  |
| Liquid fuel pump coupling inspection | | Liquid fuel system check valves inspection |
|  | |  |
| Liquid fuel system inspection | | Liquid fuel system inspection |
|  | |  |
| Liquid fuel system inspection | | Liquid fuel system inspection |

## Water Injection system inspection

- Y Strainer inspected and cleaned.
- E- Motor bearings greased.
- Piping inspection for leaks, loose brackets, etc, without discrepancies. ***The pressure control valve PCV2214 was replaced as it was found damaged.***
- Check valve (54) disassembled for inspection. Valve disassembled and check for spring functionality and proper sealing condition.
- Water injection pump coupling inspection performed and found in good condition

| | | |
|---|---|---|
|  | |  |
| Water injection pump coupling inspection | | Water Injection system check valve inspection |

## FCV 2005 Exhaust collector drain flow control valve Inspection and functional check

- Valve operational check (compressed air) performed without discrepancies.
- Position switch operational check performed without discrepancies.
- Turbine fuel drain check valve (64) inspection without discrepancies.

| | | |
|---|---|---|
|  | |  |
| FCV-2005 Functional check | | FCV-2005 Functional check |

## Local Control room maintenance tasks

***Please refer to EPC report***

## 24 VDC Battery System (TCP)

***Please refer to EPC report***

- Grease all posts and plates.
- Verify batteries' fluid level.
- Measure batteries bank voltage.
- Battery load test.

## 24 VDC Battery System (F&G)

***Please refer to EPC report***

- Grease all posts and plates.
- Verify batteries' fluid level.
- Measure batteries bank voltage.
- Battery load test.

## 125 VDC Battery System

***Please refer to EPC report***

## TCP / GCP

***Please refer to EPC report***

- Inspect the cable connections for damage and or lose cables.
- Check grounding connections.
- Ensure the relays are properly seated.
- Check the ethernet cables connection.
- Measure DC volts between each leg of DC voltage (+12 -12 VDC).

### MCC MEGGER

***Please refer to EPC report***

### Control room AC

- Filters were found in good condition. The system is working properly.

**Generator**

- Mechanical Oil pump, gear type coupling inspection and grease change. ***Not performed. Due in February 2025.***
- The lube oil supply and return lines were inspected for leaks without findings.
- Oil demister inspection without discrepancies.
- Generator lube oil filter replaced. ***It's recommended to replace the filter cover gasket as soon as possible.***

***HILCO PN 0391 – 00 – 505 - T***

| | | |
|---|---|---|
|  | |  |
| GLO Filter replacement | | GLO Filter replacement. Gasket worn |

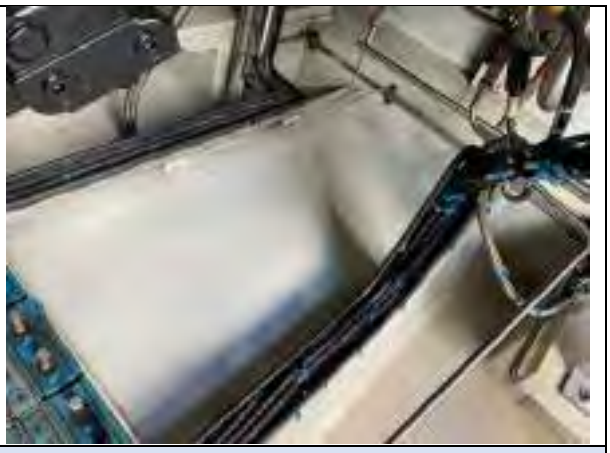
**Generator 52G Breaker**

***Please refer to EPC report***

- Inspection of mechanism.
- SF6 gauge level indicator inspection.
- Maintenance or replacement of any connection showing hot spots.

**Enclosure Inspection per Packager's Manual (Instrumentation calibrations not included)**

- The GT enclosure was found clean and in good general condition.
- The doors mechanisms and rubber seals are in good condition.
- The package drains are not clogged.

| | | |
|---|---|---|
|  | |  |
| GT Enclosure deck clean | | GT Enclosure deck clean |

| | | |
|---|---|---|
|  | |  |
| GT Enclosure deck clean | | GT Enclosure deck clean |

## L&S pump Inlet Screens & Chip detectors Inspection and cleaning WP 400 00

L&S Pump inlet screens and chip detectors were inspected for foreign material. Functional checks were performed to all the chip detectors; all of them were working properly.

- Magnetic Chip Detector Sump A; Sensor and screen were found clean.
- Magnetic Chip Detector Sump B; Sensor and screen were found clean.
- Magnetic Chip Detector Sump C; Sensor and screen were found clean.
- Magnetic Chip Detector Sump D; Sensor and screen were found clean.
- Magnetic Chip Detector AGB; ***Minor amount of metallic particles was found in the chip detector.***

| | | |
|---|---|---|
|  | |  |
| L&S Pump chip detectors and screens inspection | | AGB Chip detector |

## Supply and Scavenge filter inspection per Packager's manual.

- The supply and scavenge filters were replaced. The filter bowl O-rings were replaced.
-

| | | |
|---|---|---|
|  | |  |
| TLO System lines oil leakages | | TLO System lines oil leakages repaired |

## Inlet Inspection WP401 00

- The inlet inspection was performed after the engine water wash was carried out and before the unit started up.

**Inlet duct inspected:**

- Cracks; without remarks.
- Nicks and scores; without remarks.
- Dents; without remarks.
- Missing paint; without remarks.
- Wash discharge holes not plugged.
- Bellmouth airflow path surface left clean after the water wash.
- Installation fasteners found tight.
- Water wash inlet connection without leakages.

**Center body inspected for:**

- Cracks; without remarks.
- Loose bolts, locking wire condition; without remarks.

| | | |
|---|---|---|
|  | |  |
| Inlet plenum cleaned and inspected | | Inlet plenum cleaned and inspected |

## External engine cleaning WP 402 00

- The engine's external surfaces were found clean; the compressor front frame and the HPC FWD casing is rusted.

### External engine inspection WP 403 00

- **Gas Generator External Inspection:**

  - ✓ Inspection of hoses, tubes, and fittings per WP 403 00 Table 1:
  - ✓ Signs of oil leakage were under the Stater / Clutch drain tubing. ***The carbon seal has been replaced during this outage***
  - ✓ Inspection of electrical cables and connectors per WP 403 00 Table 2.
  - ✓ Inspection of CFF per WP 403 00 Table 3. ***The CFF shows rust spots***.
  - ✓ Inspection of AGB and air/oil separator per WP 403 00 Table 4; without remarkable findings.
  - ✓ Inspection of HPC stator casings per WP 403 00 Table 5; ***minor rust spots showed on forward casings.***
  - ✓ Inspection of VSV components per WP 418 00:
    ***It's recommended to accomplish the SB-290 "VSV Shaft improvement" as most of the connecting links are showing looseness***
  - ✓ Inspection of CRF per WP 403 00 Table 6; without remarkable findings. Inspection of TMF per WP 403 00 Table 7; without remarkable findings.

- **Power Turbine External Inspection:**

  - ✓ Inspection of hoses, tubes and fittings per WP 403 00 Table 1.
    ***The PTB tube has one bracket damaged that must be replaced as soon as spare parts are available on site.***

    ***Bracket, Tube -Air, HPT Cooling left side; PN L51201G01; QTY 1***
    ***Strap, Retaining; PN 9134M25P125; QTY 1***
    ***Bolt, Machine; PN MS9557-10; QTY 2***

    ***The Sump D manifold was disassembled for o-rings replacement and cleaning.***

  - ✓ Inspection of electrical cables and connectors per WP 403 00 Table 2; without remarkable findings.
  - ✓ Inspection of Power Turbine Stator Assembly per WP 403 00 Table 8; without remarkable findings.
  - ✓ Inspection of TMF per WP 403 00 Table 7; without remarkable findings.

| | | |
|---|---|---|
|  | |  |
| Sump D Manifold as found | | Sump D Manifold cleaning |

| | | |
|---|---|---|
|  | |  |
| PTB Tube damaged bracket | | PTB Tube damaged bracket |

| | | |
|---|---|---|
|  | |  |
| External engine inspection | | External engine inspection |

| | | |
|---|---|---|
|  | |  |
| External engine inspection | | External engine inspection |
|  | |  |
| External engine inspection | | External engine inspection |
|  | |  |
| External engine inspection | | External engine inspection |
|  | |  |
| CFF Rust spots | | CFF Rust spots |

## Exhaust inspection WP 404 00

- ***The exhaust diffuser seal carrier weld is broken in almost 90% of the perimeter. The seal carrier must be inspected at every engine scheduled stop to make sure it's not moving forward towards the TRF. The seal carrier should be welded at the next opportunity that the engine is removed from the enclosure.***
- ***Some exhaust duct attaching bolts were found loose / missing.***
- The PT outlet was also inspected without findings.

| | | |
|---|---|---|
|  | |  |
| Exhaust inspection. Seal carrier weld broken | | Exhaust inspection. Seal carrier weld broken |
|  | |  |
| Exhaust inspection. Attaching hardware loose / missing | | Exhaust inspection |
|  | |  |
| Exhaust inspection | | Exhaust inspection |

| | | |
|---|---|---|
|  | |  |
| Exhaust inspection | | Exhaust inspection |

| | | |
|---|---|---|
|  | |  |
| Exhaust inspection | | Exhaust inspection |

## Compressor cleaning WP 405 00

- The compressor offline water wash was performed without issues.

| | | |
|---|---|---|
|  | |  |
| Offline water wash tank cleaned up | | Offline water wash. Instrumentation protected |

## Borescope Inspection WP 406 00

- Please refer to separate report.

## Lube Oil sampling WP 407 00

- Oil samples were not taken.

## Hydraulic Pump filter inspection WP 408 00

- The Variable Stator Vanes System filter was replaced.



VSV Filter replacement



VSV Filter replacement

## Ignition system functional check WP 409 00

- A functional check of the system was performed without discrepancies during the unit startup.
- The igniters were removed for inspection following WP 103 00 instructions; both igniters were found in good condition.

| | | |
|---|---|---|
| **Upper Igniter:** PN L43450P01 | SN Unreadable | 4 Shims installed |
| **Lower Igniter:** PN L43450P01 | SN Unreadable | 5 Shims installed |



Upper igniter



Lower igniter

## Vibration monitoring system functional check WP 410 00

- The Vibration Monitoring System functional check was carried out according to WP indications without discrepancies.
- The mechanical inspection of the accelerometer did not show discrepancies. Accelerometers continuity and isolation checks:

| ACCELEROMETER | RESISTANCE | ISOLATION |
|---|---|---|
| CRF | **>1000 MΩ** | **120 MΩ** |
| TRF | **>1000 MΩ** | **120 MΩ** |

## Overspeed inspection WP 411 00

- The unit didn't suffer any overspeed condition during the operation cycle. Not Applicable

## Overtemperature inspection WP 412 00

- The unit didn't suffer any overspeed condition during the operation cycle. Not Applicable

## Variable Stator Vane Off-Schedule WP 414 00

- The VSV system was thoroughly inspected as per WP 418 00. ***It's recommended to accomplish the SB-290 "VSV Shaft improvement" as most of the connecting links are showing looseness***
- VSV calibrated before start-up.

## Fuel system inspection WP 415 00

- The Fuel system was inspected as per WP 415 00 Table 1 and Figure 1 Fuel Manifolds inspected, without discrepancies. ***The Gas Fuel filter in use was replaced by a new one.***
- Electrical harness, cables and connectors were inspected, without discrepancies.
- Fuel tubes inspected, without discrepancies.
- Hose assemblies were inspected, without discrepancies.



Fuel system inspection



Gas fuel filter casing as found



Gas fuel filter casing clean



Fuel System inspection

## Thermocouple inspection WP 419 00

- All T48 probes were inspected for corrosion, cracks or missing material and other kinds of defects; All the probes were disassembled for inspection. Without discrepancies
- The P48 probe was also inspected



T48 Probes inspection



P48 Probe inspection

| T48 | | TC Threads (0.44 – 0.83 Ω) | | | Insualtion Resistance (>10MΩ) - @ 500VDC | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | + / - | - / + | AVRG | KP (Chromel) (+) to Component Body | KN (Alumel) (-) to Component Body | PASS/FAIL | **PART NUMBER** | **SERIAL NUMBER** |
| RHS | A | 0,79 | 0,78 | 0,78 | >10 MΩ | >10 MΩ | Pass | L44830P03 | FDTT3761 |
| | B | 0,83 | 0,81 | 0,82 | >10 MΩ | >10 MΩ | Pass | L44830P03 | FDTT3759 |
| | C | 0,78 | 0,74 | 0,76 | >10 MΩ | >10 MΩ | Pass | L44830P03 | FDTT4151 |
| | D | 0,79 | 0,76 | 0,78 | >10 MΩ | >10 MΩ | Pass | L44830P03 | FDTT4164 |
| LHS | E | 0,77 | 0,79 | 0,78 | >10 MΩ | >10 MΩ | Pass | L44830P03 | FDTT3755 |
| | F | 0,78 | 0,78 | 0,78 | >10 MΩ | >10 MΩ | Pass | L44830P03 | FDTT3762 |
| | G | 0,77 | 0,74 | 0,76 | >10 MΩ | >10 MΩ | Pass | L44830P03 | FDTT4160 |
| | H | 0,80 | 0,73 | 0,76 | >10 MΩ | >10 MΩ | Pass | L44830P03 | FDTT3760 |

## VSV system inspection WP 418 00

- The Hydraulic actuator unit was connected to the engine HCU and the VSV system was actuated to full open and full closed positions. The system operated smoothly throughout the entire range of travel in both positions. No leaks were detected. The VSV filter was replaced

- No discrepancies were found between instrumentation and mechanical indications.

- All the VSV system components were inspected as per WP 418 00 Table 1 and Figures 1 through 3. ***It's recommended to accomplish the SB-290 "VSV Shaft improvement" as most of the connecting links are showing looseness***

  - ✓ VSV Servo valve; without remarks. Torque motor cable connectors found tight.
  - ✓ VSV Actuators; without remarks.
  - ✓ VSV Actuator mounts brackets; without remarks.
  - ✓ VSV Torque shafts; without remarks. The bearings showed minor play; within limits.
  - ✓ VSV Torque shaft mounts; without remarks.
  - ✓ Connector Links; without remarks.
  - ✓ Actuation ring segments; without remarks.
  - ✓ Actuation ring spacers; without remarks.
  - ✓ Vane arm sleeves; without remarks.
  - ✓ Vane assemblies; without remarks.
  - ✓ Vanes locking nuts; without remarks.
  - ✓ Vanes actuation arms; without remarks.
  - ✓ Spacers; without remarks.
  - ✓ Glass bushings; without remarks.

### VSV actuator ring spacer clearance check; Dimension M

- Clearances measured and adjusted as per GEK 105054 WP 418 00 Tabe1

| VSV DIMMENSION M INCH (mm) | | | |
|---|---|---|---|
| **STAGE** | **MIN** | **MAX** | **AS LEFT** |
| **IGV** | 0.002 (0.05) | 0.004 (0.10) | 0.004 |
| **0** | 0.002 (0.05) | 0.004 (0.10) | 0.004 |
| **1** | 0.002 (0.05) | 0.004 (0.10) | 0.004 |
| **2** | 0.002 (0.05) | 0.004 (0.10) | 0.004 |
| **3** | 0.002 (0.05) | 0.004 (0.10) | 0.004 |
| **4** | 0.005 (0.13) | 0.007 (0.18) | 0.007 |
| **5** | 0.010 (0.25) | 0.012 (0.30) | 0.011 |
| **6** | 0.014 (0.36) | 0.016 (0.41) | 0.015 |

**Redundant Overspeed per Packager's manual**

***Please refer to EPC report***

## SL2500-IND-19-001 Hilliard Hydraulic Starter Clutch Inspection

- The Hydraulic starter and the clutch were disassembled for inspection. ***The Clutch female splines were found slightly worn. The splines were cleaned up and greased for installation.***



Clutch inspection



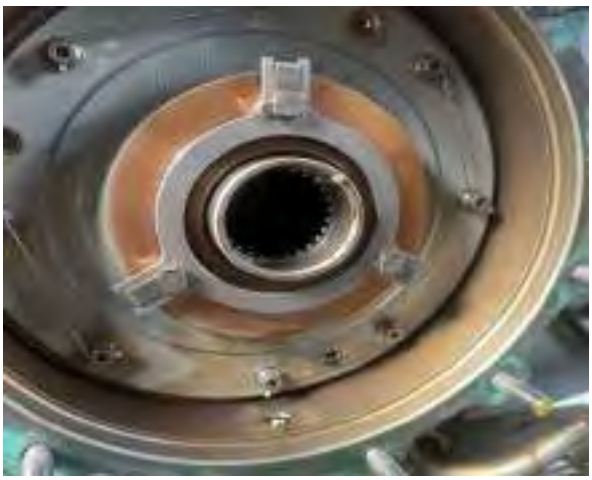
Clutch inspection



Clutch inspection

## WP119 00 AGB Carbon Seals Replacement

- The Starter drive pad carbon seal was replaced.

| | | |
|---|---|---|
|  | |  |
| Carbon seal leaking | | New Carbon seal installed |
|  | |  |
| Carbon seal replacement | | Carbon seal replacement |

**High Pressure Recoup Orifice Preferred Operating Range**

# HP RECOUP ORIFICE SELECTION WORKSHEET

## LM2500+ GR, GY, PR, PY, GK, GV, PK, PV, PM, and PZ MODELS ONLY

Version: 5.0

## GENERAL ENGINE INFORMATION

CLEAR

LOG DATA

| | |
|---|---|
| DATE: | 11/04/2024 |
| SITE: | NFE SAN JUAN GT#10 |
| ESN: | 559-262 |
| MODEL: | Plus |
| NITRIDED 4B Bearing: | NO |
| Miscellaneous Notes | |

.....

## SELECTED DATA POINT

FILL IN THE INFORMATION BELOW FOR A STEADY STATE DATA POINT

VALID TO MEASURE RANGE: 9000 rpm <XN2R < 10000 rpm

CHECK BOX IF CRITERIA IS UNATTAINABLE DUE TO OPERATING CONDITIONS: ☐

| Required Inputs | Description | Units | Value |
|---|---|---|---|
| XNHTAC | High Pressure (HP) shaft speed | RPM | 9866 |
| P2SEL | Total pressure at entrance of compressor | psia | 14,50 |
| PS3SEL | Static pressure at exit of compressor | psia | 294,00 |
| HPRC | High pressure recoup pressure | psia | 138,00 |
| P48SEL | Total pressure at exit of High Pressure Turbine (HPT) | psia | 59,50 |
| T2SEL | Temperature of air at entrance of compressor | F | 90,0 |
| Current L34518P | Current L34518 part number, I.e. L34518P## | n/a | 3 |

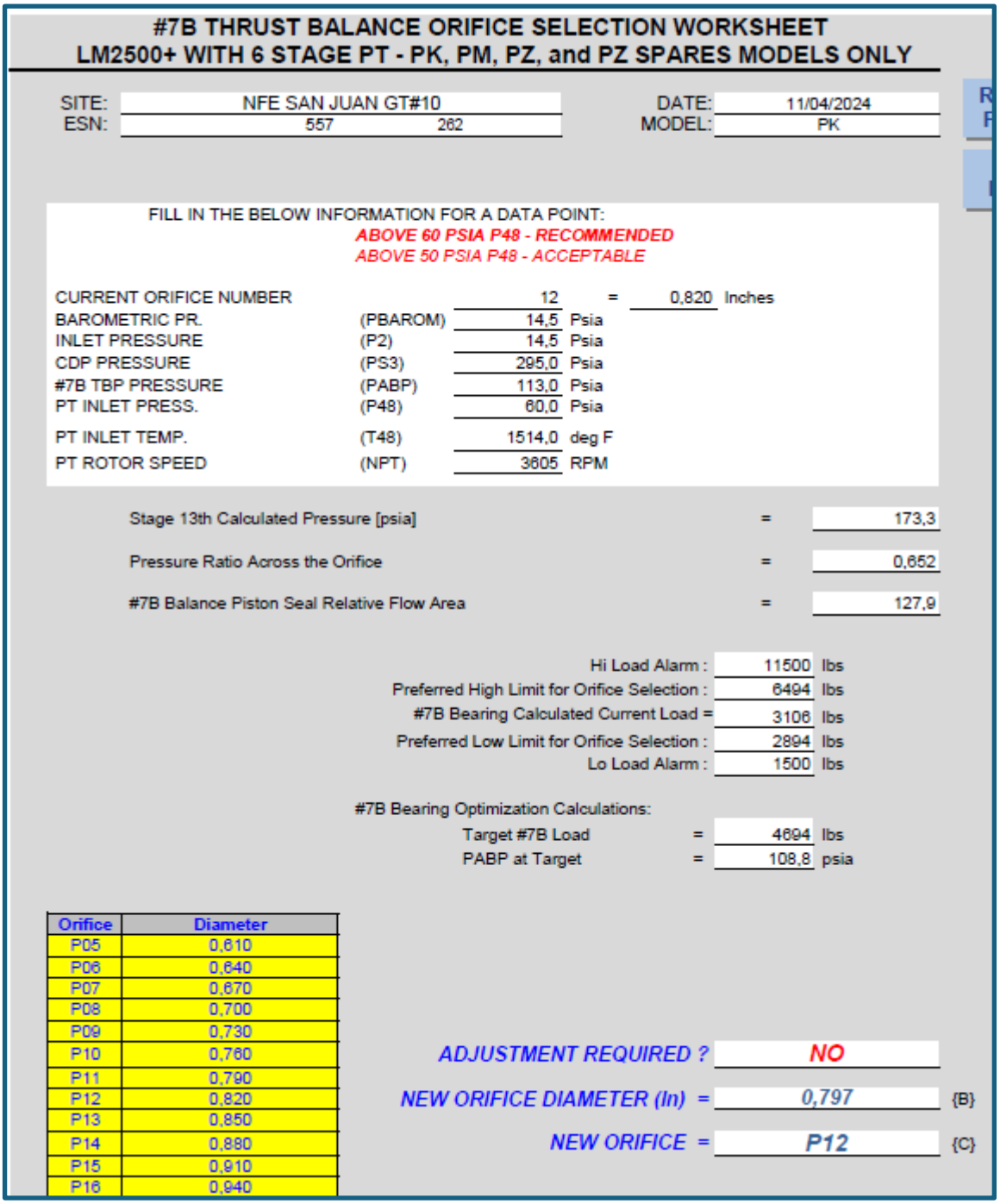
## HP RECOUP ORIFICE CORRECTION

CURRENT: L34518P03

**NO ACTION REQUIRED**

Sum Total (lbf): 1055

**Power Turbine Thrust Balance Preferred Operating Range**



## #7B THRUST BALANCE ORIFICE SELECTION WORKSHEET
## LM2500+ WITH 6 STAGE PT - PK, PM, PZ, and PZ SPARES MODELS ONLY

SITE: NFE SAN JUAN GT#10 DATE: 11/04/2024
ESN: 557 262 MODEL: PK

FILL IN THE BELOW INFORMATION FOR A DATA POINT:
*ABOVE 60 PSIA P48 - RECOMMENDED*
*ABOVE 50 PSIA P48 - ACCEPTABLE*

| | | | | |
|---|---|---|---|---|
| CURRENT ORIFICE NUMBER | | 12 | = 0,820 | Inches |
| BAROMETRIC PR. | (PBAROM) | 14,5 | Psia | |
| INLET PRESSURE | (P2) | 14,5 | Psia | |
| CDP PRESSURE | (PS3) | 295,0 | Psia | |
| #7B TBP PRESSURE | (PABP) | 113,0 | Psia | |
| PT INLET PRESS. | (P48) | 60,0 | Psia | |
| PT INLET TEMP. | (T48) | 1514,0 | deg F | |
| PT ROTOR SPEED | (NPT) | 3605 | RPM | |

| | | |
|---|---|---|
| Stage 13th Calculated Pressure [psia] | = | 173,3 |
| Pressure Ratio Across the Orifice | = | 0,652 |
| #7B Balance Piston Seal Relative Flow Area | = | 127,9 |

| | | |
|---|---|---|
| Hi Load Alarm : | 11500 | lbs |
| Preferred High Limit for Orifice Selection : | 6494 | lbs |
| #7B Bearing Calculated Current Load = | 3106 | lbs |
| Preferred Low Limit for Orifice Selection : | 2894 | lbs |
| Lo Load Alarm : | 1500 | lbs |

#7B Bearing Optimization Calculations:

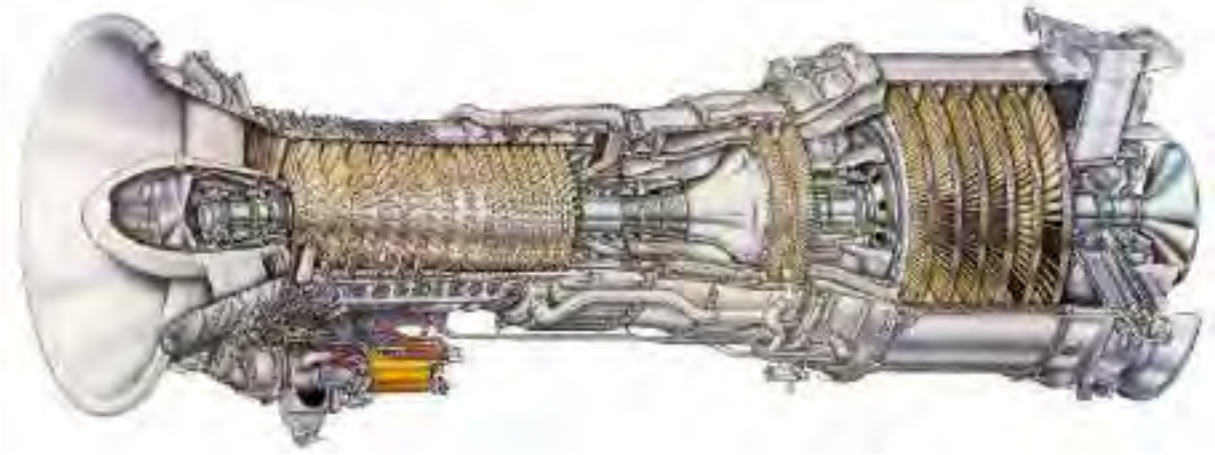
| | | | |
|---|---|---|---|
| Target #7B Load | = | 4694 | lbs |
| PABP at Target | = | 108,8 | psia |

| Orifice | Diameter |
|---|---|
| P05 | 0,610 |
| P06 | 0,640 |
| P07 | 0,670 |
| P08 | 0,700 |
| P09 | 0,730 |
| P10 | 0,760 |
| P11 | 0,790 |
| P12 | 0,820 |
| P13 | 0,850 |
| P14 | 0,880 |
| P15 | 0,910 |
| P16 | 0,940 |

*ADJUSTMENT REQUIRED ?* NO

*NEW ORIFICE DIAMETER (In) =* 0,797 {B}

*NEW ORIFICE =* P12 {C}



# Final Report

## Date of Visit: 06/08/2026

| | | | |
|---|---|---|---|
| **GESA Job #:** | PR557 | **Unit #:** | 1 |
| **PO#:** | MSA 107284 Task Order 1 | **Serial #:** | 557-259 |
| **Customer:** | Genera PR | **Engine/Machine:** | TM2500 |
| **Site Name:** | SJ Steam Plant /Palo Seco | **Description of Work:** | BSI |
| **Site Location:** | San Juan Steam Plant PR | **GESA Lead:** | Caden Bergeron |

# Table of Contents

Section 1: Work Scope Summary
Section 2: Daily Events
Section 3: BSI, Turbine, and Turbine Package Inspection
Section 4: Used and Required Parts
Section 5: Findings and Recommendations
Section 6: Conclusion and Pictures

# Section 1: Work Scope Summary

**Gas Turbine Inspection Scope**

- Full Gas Turbine Borescope Inspection
  - Lube & Scavenge Pump Screens & Chip Detector Inspection
  - Gas Turbine Starter Oil Return Line Screen Inspection
  - Fuel Nozzle Inspection
  - T5.4 Thermocouple Inspection
  - Igniter Inspection
- Gas Turbine Exterior Inspection
  - VSV System Inspection
  - All external piping & hardware

# Section 2: Daily Events

**Monday, 06/08/2026**

- All borescope plugs were removed
- All Injectors had been removed already by the customer
- Removed and inspected #T5.4 thermocouple probe
- Removed and inspected igniters
- Performed hydraulic starter oil return line screen inspection
- Performed inspection for chip detector and screen on lube and scavenge pump
- Performed external piping and hardware inspection

# Section 3: BSI, Turbine, and Turbine Package Inspection

## External Inspection:

**Compressor Section:**

- The VSV actuation system was inspected for damage

**Combustor Section**:

- External inspection was performed
- Igniters were inspected and found to be in satisfactory condition

**High Pressure Turbine (HPT) Section:**

- No abnormalities were observed on external surfaces

**Accessory Gearbox (AGB):**

- Chip detector and lube scavenge screen were inspected; no abnormalities were found
- Hydraulic starter return line was inspected. Found large metallic flakes up to an inch. NOT SERVICEABLE

## Borescope Inspection:

**High Pressure Compressor (HPC):**

- Blades and vanes were inspected
- Corosion has been observed on some blades and stator vanes.

**Combustor Section:**

- Dome Plate and Cup are missing large amounts of material due to burn through. NOT SERVICEABLE
- The liners were burned through. NOT SERVICEABLE

**High Pressure Turbine (HPT):**

- Both sets of blades in the HPT has been heavily damaged showing burn through, and missing material. NOT SERVICEABLE
- The first stage Nozzle has light damage in the form of erosion and distortion in the leading edge

**Turbine Mid-Frame (TMF):**

- Light corrosion

**Power Turbine (PT):**

- No abnormalities

# Section 4: Used and Required Parts List

**Required Parts List**

| | Nomenclature | Part No | Quantity | |
|---|---|---|---|---|
| | | | | |
| | | | | |

**Used Parts List**

| | Nomenclature | Part No | Quantity | |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

# Section 5: Findings and Recommendations

**Findings**

- Hot-Section is heavily damaged. NOT SERVICEABLE
- HPT heavily damaged NOT SERVICEABLE
- Metallic foreign material in the starter return line Y-strainer. NOT SERVICEABLE

**Recommendations:**

- Per GEK 105054 WP 406 00 Turbine 481-559 needs hot-section replacement
- Per GEK 105054, starter return line has screen maintenance having metal chips travel through it; refer to the Package Manual for further instruction.
- **Unit is NOT SERVICEABLE**

# Section 6: Conclusion and Pictures



**VSV assembly**



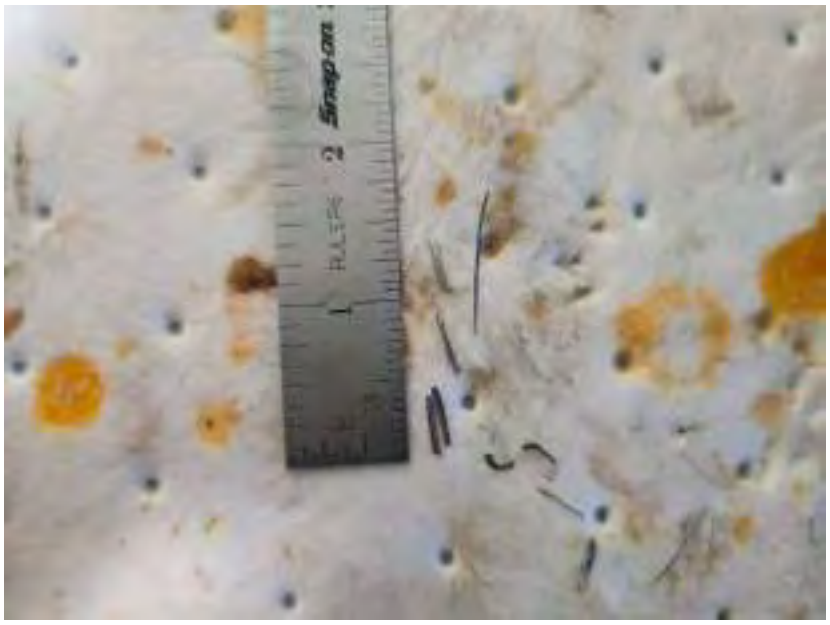

**Chip detectors**



**Starter return line strainer**

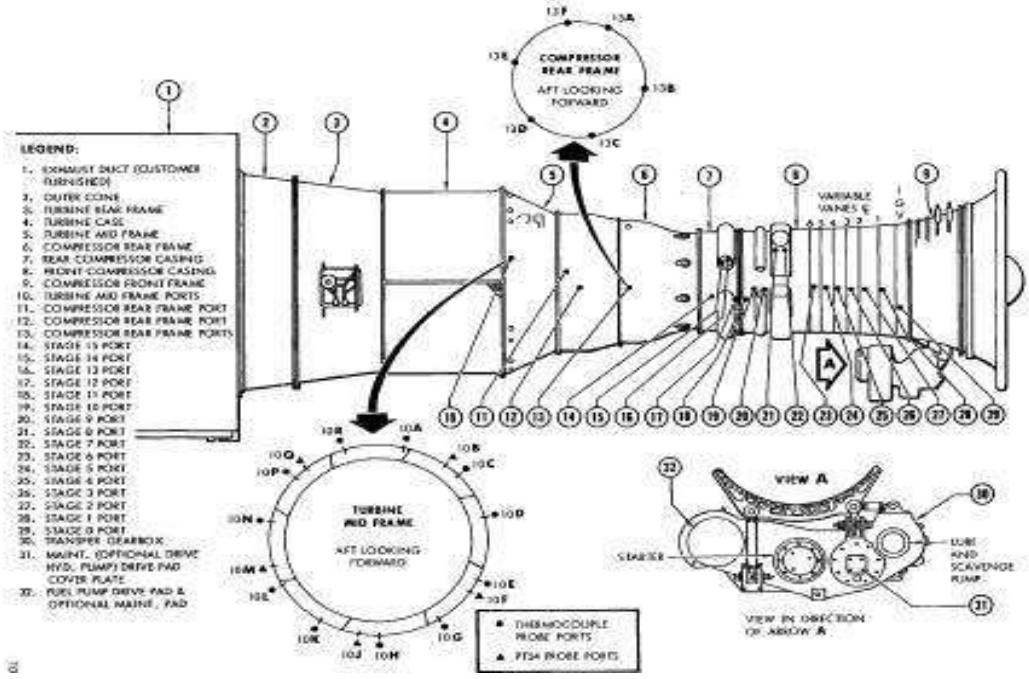


**Thermocouple**



**Foreign material found in starter return line strainer**

| **High Pressure Compressor** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect stages 1 through 16 blades for cracks, nicks, tears, burrs, dents, missing material, evidence of tip clang, curl, or deformation. | Inspected. |
| ☒Stage 1 Blades (Qty 36) & Vanes, | Serviceable |
| ☒Stage 2 Blades (Qty 26) & Vanes, | Serviceable |
| ☒Stage 3 Blades (Qty 38) & Vanes, | Serviceable |
| ☒Stage 4 Blades (Qty 42) & Vanes, | Serviceable |
| ☒Stage 5 Blades (Qty 44) & Vanes, | Serviceable |
| ☒Stage 6 Blades (Qty 48) & Vanes, | Serviceable |
| ☒Stage 7 Blades (Qty 54) & Vanes, | Serviceable |
| ☒Stage 8 Blades (Qty 56) & Vanes, | Serviceable |
| ☒Stage 9 Blades (Qty 64) & Vanes, | Serviceable |
| ☒Stage 10 Blades (Qty 66) & Vanes, | Serviceable |
| ☒Stage 11 Blades (Qty 66) & Vanes, | Serviceable |
| ☒Stage 12 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Stage 13 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Stage 14 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Stage 15 Blades (Qty 76) & Vanes,<br>☒Stage 16 Blades (Qty 76) & Vanes, | Serviceable<br>Serviceable |
| ☒Inspect for erosion, corrosion, or deposits. | Inspected |
| ☒Inspect for platform shingling, bowing, distortion, or cracks | Inspected. |


LEGEND:
1. EXHAUST DUCT (CUSTOMER FURNISHED)
2. OUTER CONE
3. TURBINE REAR FRAME
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VARIABLE VANES
IGV
View A
STARTER
VIEW IN DIRECTION OF ARROW A
THERMOCOUPLE PROBE PORTS
PT54 PROBE PORTS

**High Pressure Compressor Photos:**




**Stage 1**




**Stage 4**




**Stage 5**




**Stage 6**




**Stage 7**




**Stage 8**




**Stage 13**




**Stage 14**




**Stage 15**




**Stage 16**

| **Combustor** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect combustor and 1st stage HPT Leading Edge with flex scope for burning, cracks, erosion, discoloration, wear and missing metal. | Leading edge clogged cooling holes. NOT SERVICEABLE |
| ☒Dome Plate | Burned and Material Missing. NOT SERVICEABLE |
| ☒Inner/Outer Liners | Heavy burn through. NOT SERVICEABLE |
| ☒Igniter Tube Area | Ok. |
| ☒Fuel Nozzle Shrouds | Ok. |
| ☒Fuel Nozzle Axial Swirler/Venturi | Burned. NOT SERVICEABLE |
| ☒1st Stage Nozzle | Clogged cooling holes. NOT SERVICEABLE |
| ☒Igniter Tube Area | OK |
| ☒Inspect all visible fuel nozzle tips for contamination or damage. | Not Present |

**Combustor Photos:**




**Dome burned missing material Not Serviceable**




**Inner liner heavy burn through Not Serviceable**




**Outer Liner Burn Through Not Serviceable**

## HPT Section

| **HPT** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect 1st stage HPT Leading Edge through Combustion Chamber with flex scope for burning, cracks, erosion, discoloration, wear and missing metal. | Distortion in trailing edge. Clogged cooling holes. NOT SERVICEABLE |
| ☒HPT Stage 1 Rotor Blades (Qty 88) | Numerous large holes. NON SERVICEABLE |
| ☒HPT Stage 2 Nozzle | Slight erosion and hot spots |
| ☒HPT Stage 2 Rotor Blades (Qty 90) | Numerous large holes. NON SERVICEABLE |

**HPT Photos:**




**Stage 1 not serviceable 1**




**Stage 1 not serviceable 2**




**Stage 1 not serviceable 3**




**Stage 1 not serviceable 4**




**Stage 1 not serviceable 5**




**Stage 2 fan blades not serviceable**




**Stg 2 fan blades not serviceable**



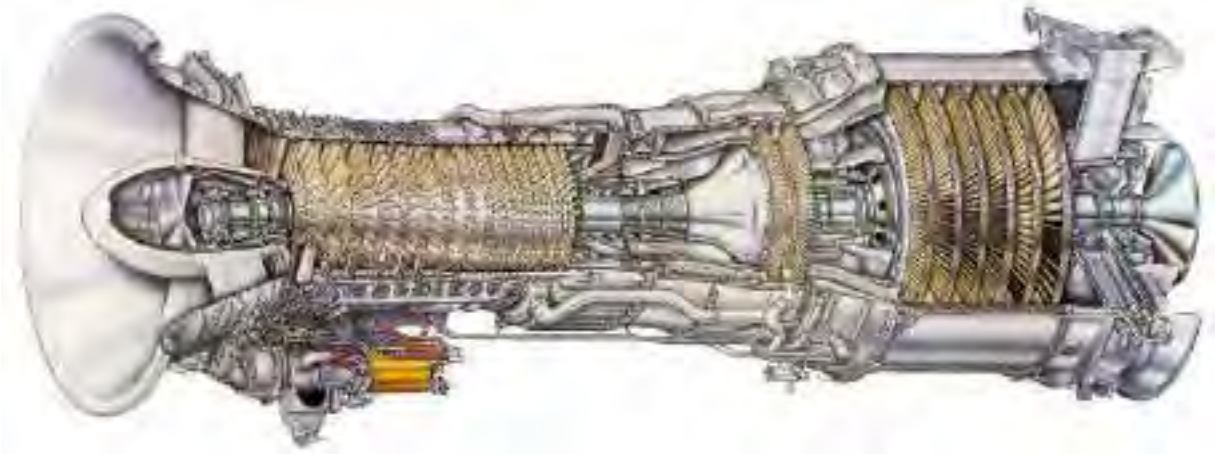

**Holes in fan blades Stage 2**

| **LPT** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect LPT with flex scope for burning, cracks, erosion, discoloration, wear and missing metal. | No Anomaly noted. |
| ☒ Liner: Cracks in skin (no separation through aft ring) | Cracks found on platform of the stg 1 nozzle. |
| ☒Missing material | No anomaly noted. |
| ☒Buckling or distortion | No anomaly noted. |

**LPT Photos:**




**Cracks on stage 1 nozzle**



# Final Report

## Date of Visit: 06/11/2026

| | | | |
|---|---|---|---|
| **GESA Job #:** | PR557 | **Unit #:** | 2 |
| **PO#:** | MSA 107284 Task Order 1 | **Serial #:** | 557--121 |
| **Customer:** | Genera PR | **Engine/Machine:** | TM2500 |
| **Site Name:** | SJ Steam Plant /Palo Seco | **Description of Work:** | BSI |
| **Site Location:** | San Juan PR | **GESA Lead:** | Caden Bergeron |

# Table of Contents

Section 1: Work Scope Summary
Section 2: Daily Events
Section 3: BSI, Turbine, and Turbine Package Inspection
Section 4: Used and Required Parts
Section 5: Findings and Recommendations
Section 6: Conclusion and Pictures

# Section 1: Work Scope Summary

**Gas Turbine Inspection Scope**

- Full Gas Turbine Borescope Inspection
  - Lube & Scavenge Pump Screens & Chip Detector Inspection
  - Gas Turbine Starter Oil Return Line Screen Inspection
  - Fuel Nozzle Inspection
  - T5.4 Thermocouple Inspection
  - Igniter Inspection
- Gas Turbine Exterior Inspection
  - VSV System Inspection
  - All external piping & hardware

# Section 2: Daily Events

**Thursday, 06/11/2026**

- All borescope plugs were removed
- Removed and inspected #T5.4 thermocouple probe
- Removed and inspected igniters
- Performed hydraulic starter oil return line screen inspection
- Performed inspection for chip detector and screen on lube and scavenge pump
- Performed external piping and hardware inspection

# Section 3: BSI, Turbine, and Turbine Package Inspection

## External Inspection:

**Compressor Section:**

- The VSV actuation system was observed to be functioning properly

**Combustor Section**:

- External inspection was performed
- Igniters were inspected and found to be in satisfactory condition

**High Pressure Turbine (HPT) Section:**

- No abnormalities were observed on external surfaces

**Accessory Gearbox (AGB):**

- Chip detector and lube scavenge screen were inspected; no abnormalities were found
- Hydraulic starter return line was removed and inspected.

## Borescope Inspection:

**High Pressure Compressor (HPC):**

- Blades and vanes were inspected

**Combustor Section:**

- NA

**High Pressure Turbine (HPT):**

- NA

**Turbine Mid-Frame (TMF):**

- Light corrosion

**Power Turbine (PT):**

- No abnormalities

# Section 4: Used and Required Parts List

**Required Parts List**

| | Nomenclature | Part No | Quantity | |
|---|---|---|---|---|
| | | | | |
| | | | | |

**Used Parts List**

| | Nomenclature | Part No | Quantity | |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

# Section 5: Findings and Recommendations

**Findings**

- HPT has numerous areas of burn through and cracking. NOT SERVICEABLE
- LPT has torn metal and many dents on the first stage. NOT SERVICEABLE
- Combustor has many areas around the overhung and dome surfaces.

**Recommendations:**

- Per GEK 105054 WP 406 00, turbine 557-121 needs a hot-section replacement and further inspection of the LPT because of stage 1 blade damage. NOT SERVICEABLE

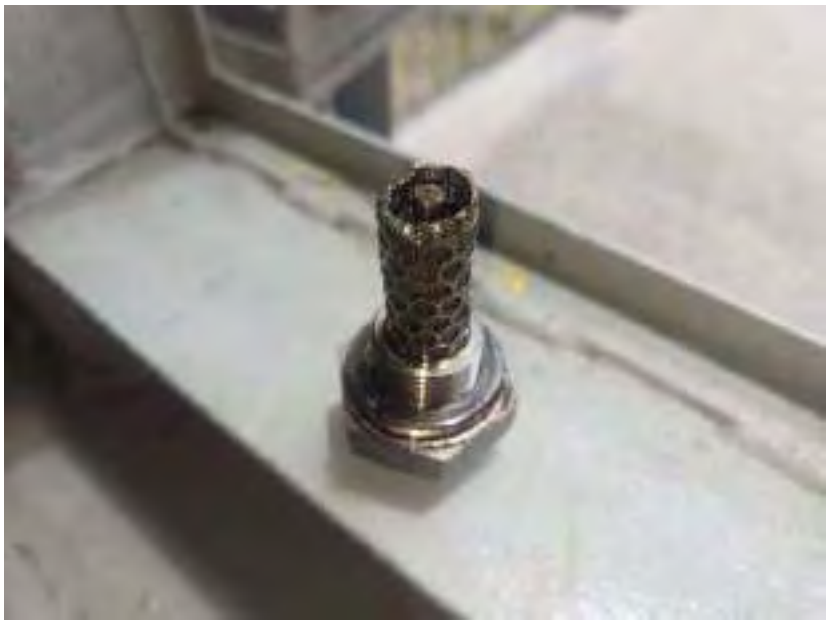
# Section 6: Conclusion and Pictures



**VSV Assembly**




**Chip Detectors**

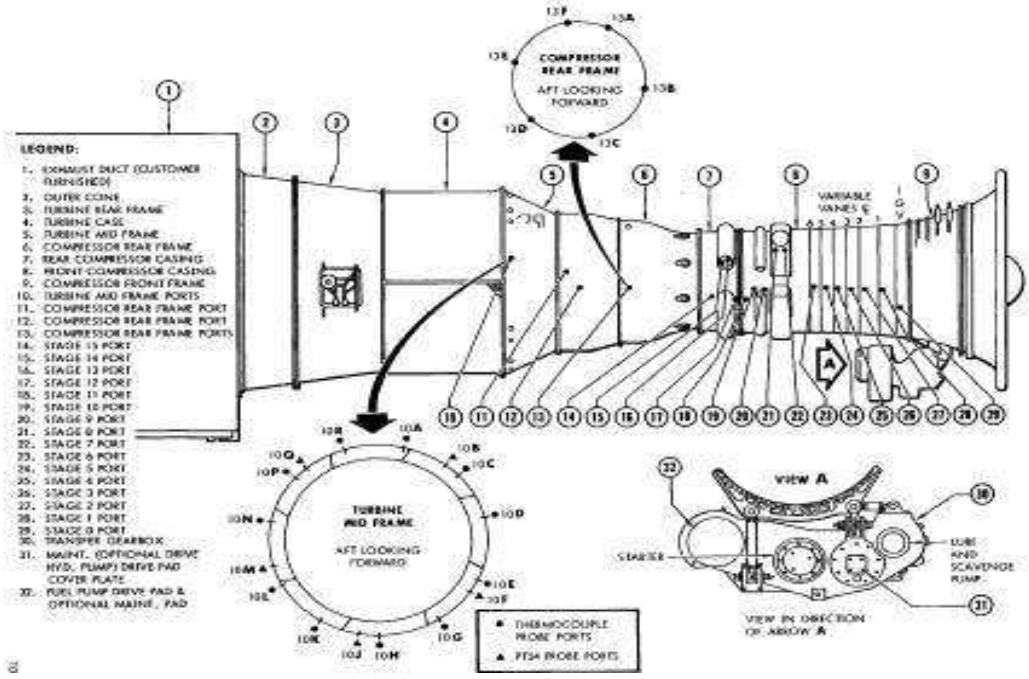


**Starter Return Line Strainer**



**Thermocouple**

| High Pressure Compressor | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect stages 1 through 16 blades for cracks, nicks, tears, burrs, dents, missing material, evidence of tip clang, curl, or deformation. | Inspected. |
| ☒Stage 1 Blades (Qty 36) & Vanes, | Serviceable |
| ☒Stage 2 Blades (Qty 26) & Vanes, | Serviceable |
| ☒Stage 3 Blades (Qty 38) & Vanes, | Serviceable |
| ☒Stage 4 Blades (Qty 42) & Vanes, | Serviceable |
| ☒Stage 5 Blades (Qty 44) & Vanes, | Serviceable |
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| ☒Stage 7 Blades (Qty 54) & Vanes, | Serviceable |
| ☒Stage 8 Blades (Qty 56) & Vanes, | Serviceable |
| ☒Stage 9 Blades (Qty 64) & Vanes, | Serviceable |
| ☒Stage 10 Blades (Qty 66) & Vanes, | Serviceable |
| ☒Stage 11 Blades (Qty 66) & Vanes, | Serviceable |
| ☒Stage 12 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Stage 13 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Stage 14 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Stage 15 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Stage 16 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Inspect for erosion, corrosion, or deposits. | Inspected |
| ☒Inspect for platform shingling, bowing, distortion, or cracks | Inspected. |


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IGV
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VIEW IN DIRECTION OF ARROW A
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PT54 PROBE PORTS

**High Pressure Compressor Photos:**




**Stage 1**




**Stage 2**




**Stage 3**




**Stage 4**




**Stage 5**




**Stage 6**




**Stage 7**




**Stage 8**




**Stage 9**




**Stage 10**




**Stage 11**



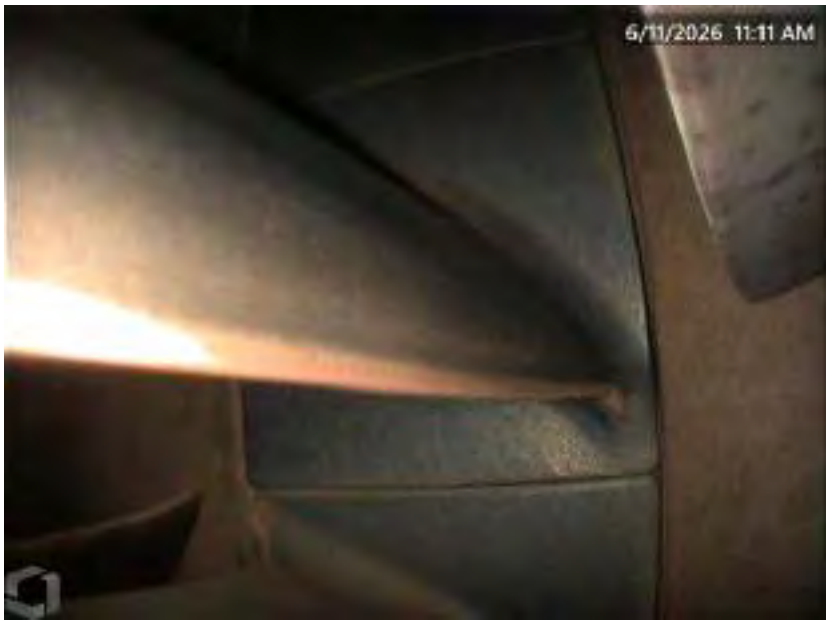

**Stage 12**




**Stage 13**




**Stage 14**




**Stage 15**




**Stage 16**

| **Combustor** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect combustor and 1st stage HPT Leading Edge with flex scope for burning, cracks, erosion, discoloration, wear and missing metal. | Leading edge ok |
| ☒Dome Plate | Burnign on trumpet plate and overhung surfaces.<br>Dome cup burned through on some areas |
| ☒Inner/Outer Liners | ok |
| ☒Igniter Tube Area | Ok. |
| ☒Fuel Nozzle Shrouds | Ok. |
| ☒Fuel Nozzle Axial Swirler/Venturi | Ok. |
| ☒1st Stage Nozzle | NOT Serviceable |
| ☒Igniter | 1 of 2 ignitors is seized and could not be removed. |
| ☒Inspect all visible fuel nozzle tips for contamination or damage. | ok |

**Combustor Photos:**




**Dome burn through**




**Inner and outer Liner**




**1st Stage Nozzle burn through**




**Outer liner**



**Fuel Nozzle**

## HPT Section

| **HPT** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect 1st stage HPT Leading Edge through Combustion Chamber with flex scope for burning, cracks, erosion, discoloration, wear and missing metal. | NOT SERVICEABLE |
| ☒HPT Stage 1 Rotor Blades (Qty 88) | NOT SERVICEABLE |
| ☒HPT Stage 2 Nozzle | NOT SERVICEABLE |
| ☒HPT Stage 2 Rotor Blades (Qty 90) | NOT SERVICEABLE |

**HPT**




**Stage 1 discoloration**




**Stage 1 missing material**




**Stage 1 Erosion**




**Stage 1 missing material**




**Stage 1 leading edge**




**Leading edge missing material**




**Stage 2 damaged missing material**




**Stage 2 Leading edge damaged missing material**




**Stage 2 damaged missing material**




**Stage 2 damaged missing material**

| **LPT** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect LPT with flex scope for burning, cracks, erosion, discoloration, wear and missing metal. | Torn metal and dents on stage 1 |
| ☒ Liner: Cracks in skin (no separation through aft ring) | No Anomaly noted. |
| ☒Missing material | No anomaly noted. |
| ☒Buckling or distortion | No anomaly noted. |

**LPT**




**Damaged blade edge**



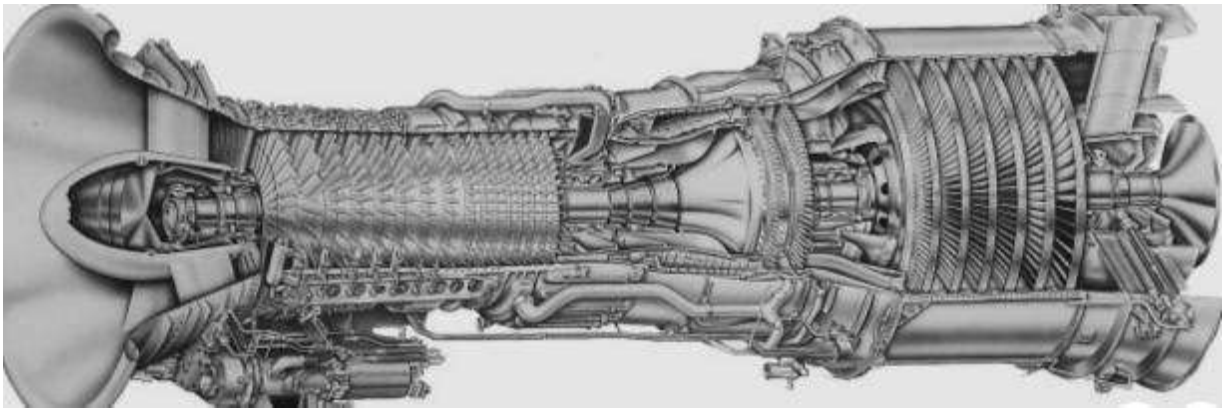

**Damaged Blade edge**




**Discoloration**




**Damaged edge**



# Final Reportate of Visit: 06/08/2026

| | | | |
|---|---|---|---|
| **GESA Job #:** | PR557 | **Unit #:** | 3 |
| **PO#:** | MSA 107284 Task Order 1 | **Serial #:** | 481-559 |
| **Customer:** | Genera PR | **Engine/Machine:** | LM2500 |
| **Site Name:** | SJ Steam Plant /Palo Seco | **Description of Work:** | BSI |
| **Site Location:** | San Juan PR | **GESA Lead:** | Ruben Garcia |

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# Section 1: Work Scope Summary

**Gas Turbine Inspection Scope**

- Full Gas Turbine Borescope Inspection
  - Lube & Scavenge Pump Screens & Chip Detector Inspection
  - Gas Turbine Starter Oil Return Line Screen Inspection
  - Fuel Nozzle Inspection
  - T5.4 Thermocouple Inspection
  - Igniter Inspection
- Gas Turbine Exterior Inspection
  - VSV System Inspection
  - All external piping & hardware

# Section 2: Daily Events

**Monday, 06/08/2026**

- All borescope plugs were removed
- Prepared motoring device for BSI
- All Injectors have been removed already by the customer
- Removed and inspected #T5.4 thermocouple probe
- Removed and inspected igniters
- Performed hydraulic starter oil return line screen inspection
- Performed inspection for chip detector and screen on lube and scavenge pump
- Performed external piping and hardware inspection

# Section 3: BSI, Turbine, and Turbine Package Inspection

## External Inspection:

**Compressor Section:**

- The VSV actuation system was observed Ok

**Combustor Section**:

- External inspection was performed
- Igniters were inspected and found to be in satisfactory condition

**High Pressure Turbine (HPT) Section:**

- No abnormalities

**Accessory Gearbox (AGB):**

- No abnormalities

## Borescope Inspection:

**High Pressure Compressor (HPC):**

- Compressor rotor blades good condition
- Blades and vanes were inspected and are in serviceable condition

**Combustor Section:**

- Igniters were removed and inspected; found to be serviceable

**High Pressure Turbine (HPT):**

- HPT some material damage
- HPT stg 1-2 nozzles material damage

**Turbine Mid-Frame (TMF):**

- Some corrosion

**Power Turbine (PT):**

- Serviceable

# Section 4: Used and Required Parts List

**Required Parts List**

| | Nomenclature | Part No | Quantity | |
|---|---|---|---|---|
| | | | | |
| | | | | |

**Used Parts List**

| | Nomenclature | Part No | Quantity | |
|---|---|---|---|---|
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# Section 5: Findings and Recommendations

**Findings**

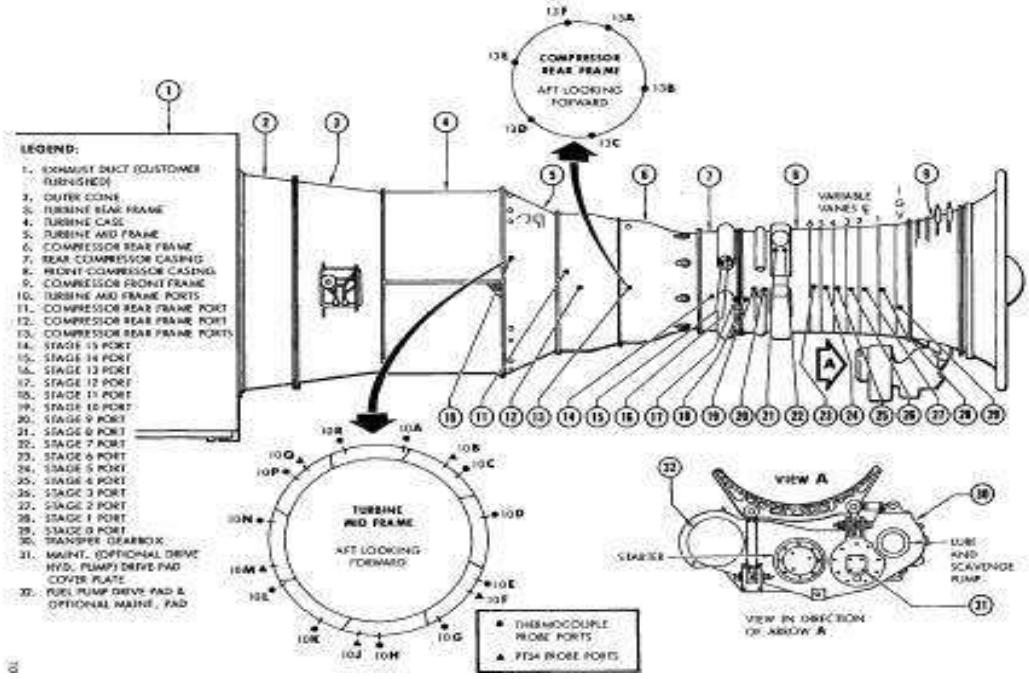
- A hot section borescope inspection (ISP) identified damage to the first-stage nozzle, first-stage turbine disk, second-stage nozzle, and both the first- and second-stage high-pressure turbine (HPT) blades. Not serviceable.
- Cracks were observed to originate from the leading edges of multiple HPT blades, with associated fractures and material loss present in the affected areas. The extent of the damage indicates significant degradation of the hot section components. Not serviceable.

**Recommendations**

- Based on the inspection findings, removal of the engine/module from service is recommended to allow for a detailed teardown inspection, engineering evaluation, and repair or replacement

# Section 6: Conclusion and Pictures

| **High Pressure Compressor** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect stages 1 through 16 blades for cracks, nicks, tears, burrs, dents, missing material, evidence of tip clang, curl, or deformation. | Inspected. |
| ☒Stage 1 Blades (Qty 36) & Vanes, | Ok. |
| ☒Stage 2 Blades (Qty 26) & Vanes, | Ok. |
| ☒Stage 3 Blades (Qty 38) & Vanes, | Ok. |
| ☒Stage 4 Blades (Qty 42) & Vanes, | ok |
| ☒Stage 5 Blades (Qty 44) & Vanes, | Ok. |
| ☒Stage 6 Blades (Qty 48) & Vanes, | Ok. |
| ☒Stage 7 Blades (Qty 54) & Vanes, | Ok. |
| ☒Stage 8 Blades (Qty 56) & Vanes, | ok |
| ☒Stage 9 Blades (Qty 64) & Vanes, | Ok |
| ☒Stage 10 Blades (Qty 66) & Vanes, | Ok. |
| ☒Stage 11 Blades (Qty 66) & Vanes, | Ok. |
| ☒Stage 12 Blades (Qty 76) & Vanes, | Ok. |
| ☒Stage 13 Blades (Qty 76) & Vanes, | Ok. |
| ☒Stage 14 Blades (Qty 76) & Vanes, | Ok. |
| ☒Stage 15 Blades (Qty 76) & Vanes, | Ok. |
| ☒Stage 16 Blades (Qty 76) & Vanes, | Ok. |
| ☒Inspect for erosion, corrosion, or deposits. | Inspected |
| ☒Inspect for platform shingling, bowing, distortion, or cracks | Inspected. |


COMPRESSOR REAR FRAME
AFT LOOKING FORWARD
LEGEND:
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THERMOCOUPLE PROBE PORTS
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View A
STARTER
VIEW IN DIRECTION OF ARROW A

**High Pressure Compressor Photos:**




**Stg 1**




**Stg 2**




**Stg 3**




**Stg 4**




**Wear on LE**




**Stg 9**




**Stg 10**




**Stg 11**




**Stg 12**




**Stg 17 discoloration**

| **Combustor** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect combustor and 1st stage HPT Leading Edge with flex scope for burning, cracks, erosion, discoloration, wear and missing metal. | Observed discoloration on liners and all surfaces. Cracks and missing material |
| ☒Dome Plate | |
| ☒Inner/Outer Liners | Burning on inner liners |
| ☒Igniter Tube Area | Ok. |
| ☒Fuel Nozzle Shrouds | Ok. |
| ☒Fuel Nozzle Axial Swirler/Venturi | Ok. |
| ☒1st Stage Nozzle | Ok. |
| ☒Igniter Tube Area | |
| ☒Inspect all visible fuel nozzle tips for contamination or damage. | |

**Combustor Photos:**




**Fuel nozzle**




**Inner and outer liner**

## HPT Section

| **HPT** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect 1st stage HPT Leading Edge through Ccombustor Chamber with flex scope for burning, cracks, erosion, discoloration, wear and missing metal. | Serviceble |
| ☒HPT Stage 1 Rotor Blades (Qty 88) | Damage; missing material |
| ☒HPT Stage 2 Nozzle | ok |
| ☒HPT Stage 2 Rotor Blades (Qty 90) | ok |

**HPT Photos:**




**1St stage nozzle damage missing material airflow leading edge**




**1st missing material leading edge and base**




**HPT 2nd stage disc leading edge and tip damage missing material**

**LPT**

| **LPT** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect LPT with flex scope for burning, cracks, erosion, discoloration, wear and missing metal. | Discoloration on liners. |
| ☒ Liner: Cracks in skin (no separation through aft ring) | No Anomaly noted. |
| ☒Missing material | No anomaly noted. |
| ☒Buckling or distortion | No anomaly noted. |

**LPT Photos:**




**Minor corrosion**




# Final Report

## Date of Visit: 06/18/2026

| | | | |
|---|---|---|---|
| **GESA Job #:** | PR557 | **Unit #:** | 4 |
| **PO#:** | MSA 107284 Task Order 1 | **Serial #:** | 481-717 |
| **Customer:** | Genera PR | **Engine/Machine:** | TM2500 |
| **Site Name:** | Palo Seco | **Description of Work:** | BSI |
| **Site Location:** | San Juan PR | **GESA Lead:** | Caden Bergeron |

# Table of Contents

Section 1: Work Scope Summary
Section 2: Daily Events
Section 3: BSI
Section 4: Used and Required Parts
Section 5: Findings and Recommendations
Section 6: Conclusion and Pictures

# Section 1: Work Scope Summary

**Gas Turbine Inspection Scope**

- Full Gas Turbine Borescope Inspection
  - Lube & Scavenge Pump Screens & Chip Detector Inspection
  - Gas Turbine Starter Oil Return Line Screen Inspection
  - Fuel Nozzle Inspection
  - T5.4 Thermocouple Inspection
  - Igniter Inspection
- Gas Turbine Exterior Inspection
  - VSV System Inspection
  - All external piping & hardware

# Section 2: Daily Events

**Monday, 06/18/2026**

- All borescope plugs were removed
- Removed and inspected #T5.4 thermocouple probe
- Removed and inspected igniters
- Fuel nozzles were removed by site.
- Performed hydraulic starter oil return line screen inspection
- Performed inspection for chip detector and screen on lube and scavenge pump
- Performed external piping and hardware inspection

# Section 3: BSI, Turbine, and Turbine Package Inspection

## External Inspection:

**Compressor Section:**

- The VSV actuation system was observed to have a broken vane arm. NOT SERVICEABLE

**Combustor Section**:

- External inspection was performed
- Igniters were inspected and found to be in satisfactory condition

**High Pressure Turbine (HPT) Section:**

- No abnormalities were observed on external surfaces

**Accessory Gearbox (AGB):**

- Chip detector and lube scavenge screen were inspected
- Hydraulic starter return line screen was removed and inspected.

## Borescope Inspection:

**High Pressure Compressor (HPC):**

- Remaining blades and vanes were inspected

**Combustor Section:**

- Liners have burn through in numerous areas. NOT SERVICEABLE
- Dome and dome plate have chips. NOT SERVICEABLE

**High Pressure Turbine (HPT):**

- Stage 1 nozzle has a hole in the platform. NOT SERVICEABLE
- Stage 1 blade is rubbing on the shroud
- Stage 2 nozzle has burn through on the trailing edge. NOT SERVICEABLE
- Stage 2 blade has no abnormalities

**Turbine Mid-Frame (TMF):**

- No Abnormalities found

**Power Turbine (PT):**

- Light discoloration andcorrosion was observed.

# Section 4: Used and Required Parts List

**Required Parts List**

| Nomenclature | Part No | Quantity |
|---|---|---|
| | | |
| | | |

**Used Parts List**

| Nomenclature | Part No | Quantity |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

# Section 5: Findings and Recommendations

## Findings

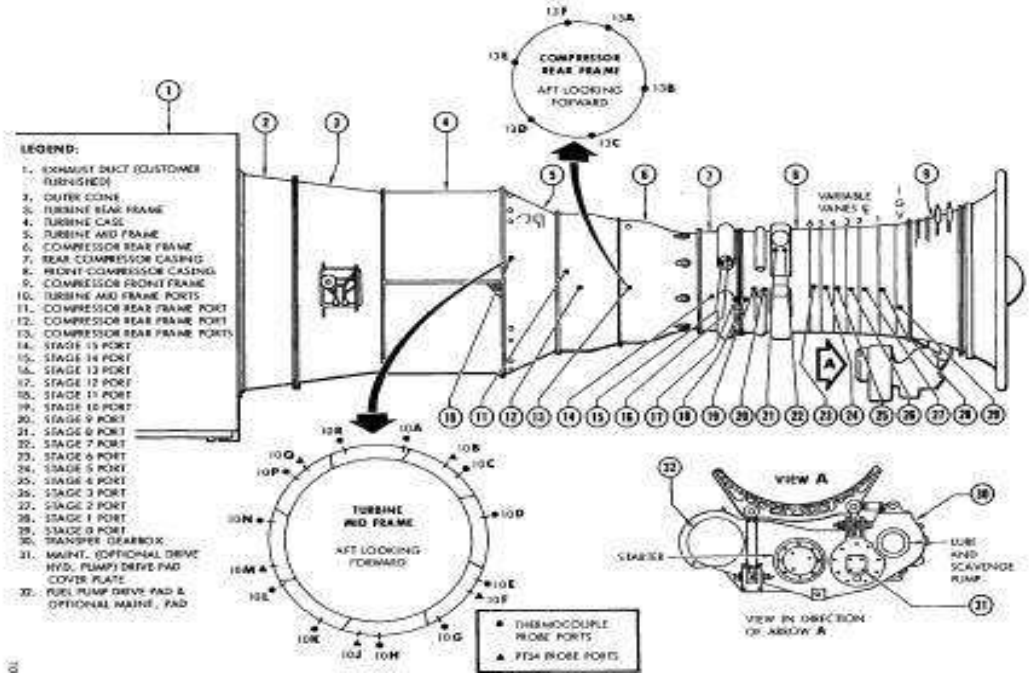
- Vane arm found broken
- Stage 2 Nozzle has large burn through in numerous areas
- Stage 1 Nozzle platform has holes
- Combustion section has numerous areas of burn through and chipping.
- NOT SERVICEABLE

## Recommendations:

- -Gas Turbine 481-717 NOT SERVICEABLE. Perform hot-section and top-case.

# Section 6: Conclusion and Pictures

| **High Pressure Compressor** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect stages 1 through 16 blades for cracks, nicks, tears, burrs, dents, missing material, evidence of tip clang, curl, or deformation. | Inspected. |
| ☒Stage 1 Blades (Qty 36) & Vanes, | Serviceable |
| ☒Stage 2 Blades (Qty 26) & Vanes, | Serviceable |
| ☒Stage 3 Blades (Qty 38) & Vanes, | Serviceable |
| ☒Stage 4 Blades (Qty 42) & Vanes, | Serviceable |
| ☒Stage 5 Blades (Qty 44) & Vanes, | Serviceable |
| ☒Stage 6 Blades (Qty 48) & Vanes, | Serviceable |
| ☒Stage 7 Blades (Qty 54) & Vanes, | Serviceable |
| ☒Stage 8 Blades (Qty 56) & Vanes, | Serviceable |
| ☒Stage 9 Blades (Qty 64) & Vanes, | Serviceable |
| ☒Stage 10 Blades (Qty 66) & Vanes, | Serviceable |
| ☒Stage 11 Blades (Qty 66) & Vanes, | Serviceable |
| ☒Stage 12 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Stage 13 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Stage 14 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Stage 15 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Stage 16 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Inspect for erosion, corrosion, or deposits. | Inspected |
| ☒Inspect for platform shingling, bowing, distortion, or cracks | Inspected. |


LEGEND:
1. EXHAUST DUCT (CUSTOMER FURNISHED)
3. OUTER CONE
5. TURBINE REAR FRAME
4. TURBINE CASE
5. TURBINE MID FRAME
6. COMPRESSOR REAR FRAME
7. REAR COMPRESSOR CASING
8. FRONT COMPRESSOR CASING
9. COMPRESSOR FRONT FRAME
10. TURBINE MID FRAME PORTS
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23. STAGE 6 PORT
24. STAGE 5 PORT
25. STAGE 4 PORT
26. STAGE 3 PORT
27. STAGE 2 PORT
28. STAGE 1 PORT
29. STAGE 0 PORT
30. TRANSFER GEARBOX
31. MAINT. (OPTIONAL DRIVE HYD. PUMP) DRIVE PAD COVER PLATE
32. FUEL PUMP DRIVE PAD & OPTIONAL MAINT. PAD
COMPRESSOR REAR FRAME
AFT LOOKING FORWARD
TURBINE MID FRAME
AFT LOOKING FORWARD
VARIABLE VANES
IGV
View A
STARTER
VIEW IN DIRECTION OF ARROW A
THERMOCOUPLE PROBE PORTS
PT54 PROBE PORTS



**Ignitors**



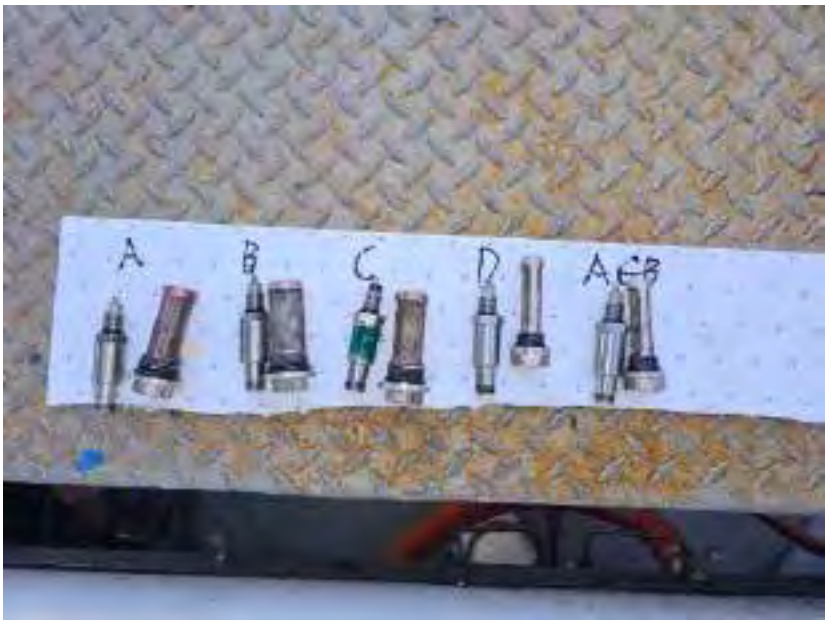
**Thermocouple**



**VSV Assembly**



**VSV vane arm**




**Chip Detectors**



**Starter return line strainer**




**Stage 1**




**Stage 2**




**Stage 3**




**Stage 4**




**Stage 5**




**Stage 6**




**Stage 7**




**Stage 8**




**Stage 9**




**Stage 10**




**Stage 1**




**Stage 12**




**Stage 13**




**Stage 14**




**Stage 15**

| **Combustor** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect combustor and 1st stage HPT Leading Edge with flex scope for burning, cracks, erosion, discoloration, wear and missing metal. | NOT SERVICEABLE |
| ☒Dome Plate | NOT SERVICEABLE |
| ☒Inner/Outer Liners | NOT SERVICEABLE |
| ☒Igniter Tube Area | Ok. |
| ☒Fuel Nozzle Shrouds | Ok. |
| ☒Fuel Nozzle Axial Swirler/Venturi | |
| ☒1st Stage Nozzle | NOT SERVICEABLE |
| ☒Igniter Tube Area | Ok |
| ☒Inspect all visible fuel nozzle tips for contamination or damage. | No fuel nozzles present |




**Inner Liner missing material.**




**Outer Liner missing material**




**Dome**

## HPT Section

| **HPT** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect 1st stage HPT Leading Edge through Ccombustion Chamber with flex scope for burning, cracks, erosion, discoloration, wear and missing metal. | NOT SERVICEABLE |
| ☒HPT Stage 1 Rotor Blades (Qty 88) | OK |
| ☒HPT Stage 2 Nozzle | NOT SERVICEABLE |
| ☒HPT Stage 2 Rotor Blades (Qty 90) | OK |




**HPT Stage 1**




**Rust on nozzles**




**Chipping and missing material**




**Leading edge missing material**




**Stage 2 Missing material**




**Missing material**




**Discoloration**




**Missing material**

**LPT**

| **LPT** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect LPT with flex scope for burning, cracks, erosion, discoloration, wear and missing metal. | ok |
| ☒ Liner: Cracks in skin (no separation through aft ring) | ok |
| ☒Missing material | ok |
| ☒Buckling or distortion | ok |




# Final Report

**Date of Visit: 06/08/2026**

| | | | |
|---|---|---|---|
| **GESA Job #:** | PR557 | **Unit #:** | 1 |
| **PO#:** | MSA 107284 TO 1 | **Serial #:** | 557-238 |
| **Customer:** | Genera PR | **Engine/Machine:** | TM2500 |
| **Site Name:** | SJ Steam Plant /San Juan | **Description of Work:** | BSI |
| **Site Location:** | San Juan PR | **GESA Lead:** | Ruben Garcia |

# Table of Contents

Section 1: Work Scope Summary
Section 2: Daily Events
Section 3: BSI, Turbine, and Turbine Package Inspection
Section 4: Used and Required Parts
Section 5: Findings and Recommendations
Section 6: Conclusion and Pictures

# Section 1: Work Scope Summary

**Gas Turbine Inspection Scope**

- Full Gas Turbine Borescope Inspection
  - Lube & Scavenge Pump Screens & Chip Detector Inspection
  - Gas Turbine Starter Oil Return Line Screen Inspection
  - Fuel Nozzle Inspection
  - T5.4 Thermocouple Inspection
  - Igniter Inspection
- Gas Turbine Exterior Inspection
  - VSV System Inspection
  - All external piping & hardware

# Section 2: Daily Events

**Monday, 06/09/2026**

- All borescope plugs were removed
- Removed and inspected #T5.4 thermocouple probe
- Removed and inspected igniters
- Performed hydraulic starter oil return line screen inspection
- Performed inspection for chip detector and screen on lube and scavenge pump
- Performed external piping and hardware inspection

# Section 3: BSI, Turbine, and Turbine Package Inspection

## External Inspection:

**Compressor Section:**

- The VSV actuation system has failed to move freely and was found that stage 0 and 1 actuation ring spacer did not meet the proper clearance of .002-.004 requirement as the .002 feeler gauge did not clear the space.

**Combustor Section**:

- External inspection was performed
- Igniters were inspected and found to be in satisfactory condition

**High Pressure Turbine (HPT) Section:**

- No abnormalities were observed on external surfaces

**Accessory Gearbox (AGB):**

- Chip detector and lube scavenge screen were inspected; no abnormalities were found
- Hydraulic starter return line was removed and inspected.

## Borescope Inspection:

**High Pressure Compressor (HPC):**

- Compressor rotor blades are in dirty condition and build up of deposits, especially in the bottom of the case.
- Blades and vanes were inspected and are in serviceable condition

**Combustor Section:**

- Igniters were removed and inspected; found to be serviceable
- Inlet Nozzles have deposits built up on the forward edges

**High Pressure Turbine (HPT):**

- Erosion found on the inner platforms of the stage 1 nozzle not exceeding 1 square inch.
- Stage 1 nozzle is showing signs of discoloration.
- Stage 2 nozzle and blade show signs of wear but no damage

**Turbine Mid-Frame (TMF):**

- Detected corrosion

**Power Turbine (PT):**

- Slight build up of deposits
- Preloading is present with no extreme offset or overlap.

# Section 4: Used and Required Parts List

**Required Parts List**

| | Nomenclature | Part No | Quantity | |
|---|---|---|---|---|
| | HPT Stage 1 Plug | 9103M85G02 | 1 | |
| | HPT Stage 1 Washer | 9609M43P01 | 1 | |

**Used Parts List**

| | Nomenclature | Part No | Quantity | |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

# Section 5: Findings and Recommendations

**Findings**

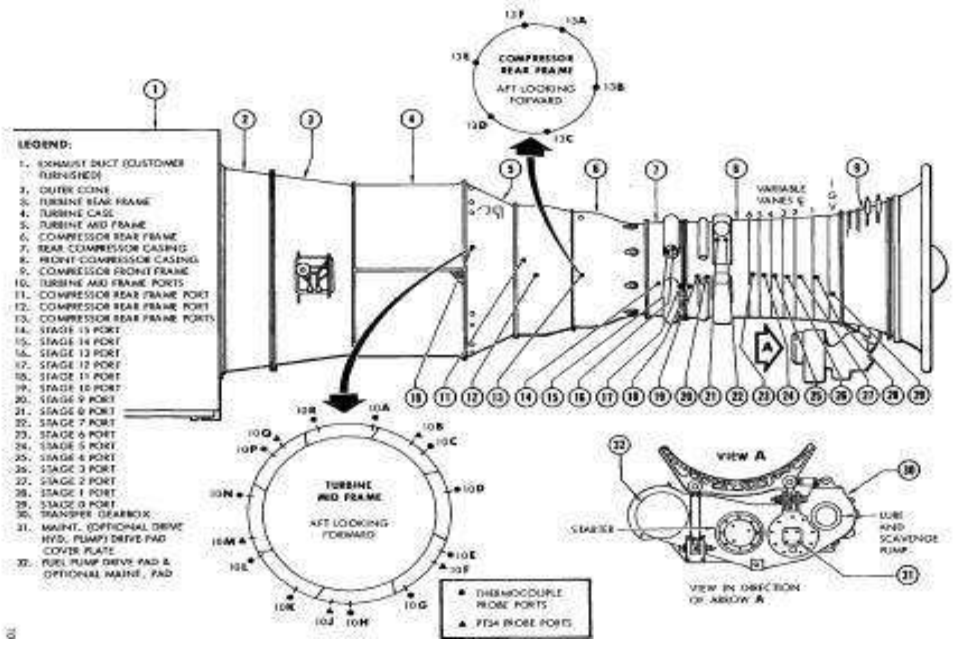
- Borescope findings show a build up of deposits likened to salt throughout the entirety of the compressor.
- In the hot section we found evidence of the genesis of erosion and discoloration that follows the same pattern as the other Turbines on site. No damage alongside the GE O&M leads me to believe this turbine is serviceable.

**Recommendations:**

- Based on the recent investigations at Palo Seco and San Jaun we recommend Turbine 557-238 is capable to continue service but will require a stage 1 borescope plug replacement and more careful monitoring in operations going forward to prevent further damage that was starting to occur in the hot section.

# Section 6: Conclusion and Pictures

| **High Pressure Compressor** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect stages 1 through 16 blades for cracks, nicks, tears, burrs, dents, missing material, evidence of tip clang, curl, or deformation. | Inspected. |
| ☒Stage 1 Blades (Qty 36) & Vanes, | Serviceable |
| ☒Stage 2 Blades (Qty 26) & Vanes, | Serviceable |
| ☒Stage 3 Blades (Qty 38) & Vanes, | Serviceable |
| ☒Stage 4 Blades (Qty 42) & Vanes, | Serviceable |
| ☒Stage 5 Blades (Qty 44) & Vanes, | Serviceable |
| ☒Stage 6 Blades (Qty 48) & Vanes, | Serviceable |
| ☒Stage 7 Blades (Qty 54) & Vanes, | Serviceable |
| ☒Stage 8 Blades (Qty 56) & Vanes, | Serviceable |
| ☒Stage 9 Blades (Qty 64) & Vanes, | Serviceable |
| ☒Stage 10 Blades (Qty 66) & Vanes, | Serviceable |
| ☒Stage 11 Blades (Qty 66) & Vanes, | Serviceable |
| ☒Stage 12 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Stage 13 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Stage 14 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Stage 15 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Stage 16 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Inspect for erosion, corrosion, or deposits. | Inspected |
| ☒Inspect for platform shingling, bowing, distortion, or cracks | Inspected. |




**High Pressure Compressor Photos:**



**Stg 1**




**Stg 2 with weephole**




**Stg 3**



**Stg 4**




**Stg 5 some corrosion at base**




**Stg 6**




**Stg 7**




**Stg 8**




**Stage 10**




**Stage 11**




**Stage 12 Discoloration**



**Stage 13**




**Stage 14**




**Stage 15**



**Stage 16**




**Stage 17 Discoloration**

| **Combustor** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect combustor and 1st stage HPT Leading Edge with flex scope for burning, cracks, erosion, discoloration, wear and missing metal. | Inner and outer liners have discoloration and some missing material. |
| ☒Dome Plate | Large crack but still servicable x<2.25 and only one seen. GEK 105054 |
| ☒Inner/Outer Liners | Burning on inner liners |
| ☒Igniter Tube Area | Serviceable |
| ☒Fuel Nozzle Shrouds | Serviceable |
| ☒Fuel Nozzle Axial Swirler/Venturi | Serviceable |
| ☒1st Stage Nozzle | Serviceable |
| ☒Igniter Tube Area | Serviceable |
| ☒Inspect all visible fuel nozzle tips for contamination or damage. | Serviceable |

**Combustor Photos:**




**Fuel Nozzle**




**Inner and outer Liner**

## HPT Section

| **HPT** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect 1st stage HPT Leading Edge through Ccombustion Chamber with flex scope for burning, cracks, erosion, discoloration, wear and missing metal. | Serviceble/Discoloration, erosion |
| ☒HPT Stage 1 Rotor Blades (Qty 88) | Serviceable |
| ☒HPT Stage 2 Nozzle | Serviceable |
| ☒HPT Stage 2 Rotor Blades (Qty 90) | Serviceable |

HPT:




**1St stage**




**1St stage**




**2nd stage**




**2nd stage**

**LPT**

| **LPT** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect LPT with flex scope for burning, cracks, erosion, discoloration, wear and missing metal. | Discoloration on liners. |
| ☒ Liner: Cracks in skin (no separation through aft ring) | No Anomaly noted. |
| ☒Missing material | No anomaly noted. |
| ☒Buckling or distortion | No anomaly noted. |




**LPT**




**Honeycomb**




# Final Report

## Date of Visit: 06/14/2026

| | | | |
|---|---|---|---|
| **GESA Job #:** | PR557 | **Unit #:** | 2 |
| **PO#:** | MSA 107284 Task Order 1 | **Serial #:** | 557-251 |
| **Customer:** | Genera PR | **Engine/Machine:** | TM2500 |
| **Site Name:** | SJ Steam Plant | **Description of Work:** | BSI |
| **Site Location:** | San Juan PR | **GESA Lead:** | Caden Bergeron |

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Section 1: Work Scope Summary
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# Section 1: Work Scope Summary

**Gas Turbine Inspection Scope**

- Full Gas Turbine Borescope Inspection
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  - Gas Turbine Starter Oil Return Line Screen Inspection
  - Fuel Nozzle Inspection
  - T5.4 Thermocouple Inspection
  - Igniter Inspection
- Gas Turbine Exterior Inspection
  - VSV System Inspection
  - All external piping & hardware

# Section 2: Daily Events

**Monday, 06/09/2026**

- All borescope plugs were removed.
- Removed and inspected #T5.4 thermocouple probe.
- Removed and inspected igniters.
- Performed hydraulic starter oil return line screen inspection.
- Performed inspection for chip detector and screen on lube and scavenge pump.
- Performed external piping and hardware inspection.

# Section 3: BSI, Turbine, and Turbine Package Inspection

## External Inspection:

**Compressor Section:**

- The VSV actuation system was observed to be functioning properly

**Combustor Section**:

- External inspection was performed
- Igniters were inspected and found to be in satisfactory condition

**High Pressure Turbine (HPT) Section:**

- Stage 1 borescope plug has experienced wear creating a hole needs to be replaced
- No abnormalities were observed on external surfaces

**Accessory Gearbox (AGB):**

- Chip detector and lube scavenge screen were inspected; no abnormalities were found
- Hydraulic starter return line was removed and inspected.

## Borescope Inspection:

**High Pressure Compressor (HPC):**

- Compressor rotor blades are in dirty condition.
- Blades and vanes were inspected and are in serviceable condition

**Combustor Section:**

- Igniters were removed and inspected; found to be serviceable

**High Pressure Turbine (HPT):**

- Stage 1 nozzle has a large amount of damage to the trailing edge covering more than 75% of the edge. The Leading edge also has experienced wear to a point where cooling holes have been blocked. The inner platform of the nozzle has had enough erosion to create a hole.
- Stage 1 blades are starting to have crazing along the leading edge connecting between multiple cooling holes as well as minor chipping to the tip that has not exceeded the cap plane
- Stage 2 had one inperfection found on the nozzle in the form of a nick with shape edged protruding aft towards the stage 2 blade. It does not show signs of breaking off or contacting any moving parts
- Stage 2 blades showed no sign of extreme damage, however the tips of the blades have small chips that do not exceed the cap plane

**Turbine Mid-Frame (TMF):**

- No cracks or imperfections spotted within the TMF section.

**Power Turbine (PT):**

- No damage Detected within the first 2 stages of the PT
- Preloading is present with no extreme offset or overlap.

# Section 4: Used and Required Parts List

**Required Parts List**

| | Nomenclature | Part No | Quantity | |
|---|---|---|---|---|
| | | | | |
| | | | | |

**Used Parts List**

| | Nomenclature | Part No | Quantity | |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

# Section 5: Findings and Recommendations

## Findings

- HPT Stage 1 nozzles had copious amounts of material missing from the trailing edge and copious amounts of material missing from the platform. NOT SERVICEABLE
- The combustor has signs of burn through small, isolated areas around the dome plate and ring.
- HPT Stage 1 borescope plug has a hole at the tip of the plunger**.**

## Recommendations:

- Perform hot section and replace damaged nozzle segments/HPT per GEK 105054 SW 406 00.
- Replace Stage 1 Borescope Plug.
- Further inspection of the liners of the combustion chamber and HPT.
- NOT SERVICEABLE

# Section 6: Conclusion and Pictures



**VSV Assembly**



**Chip Detectors**



**Starter Return Line Screen**

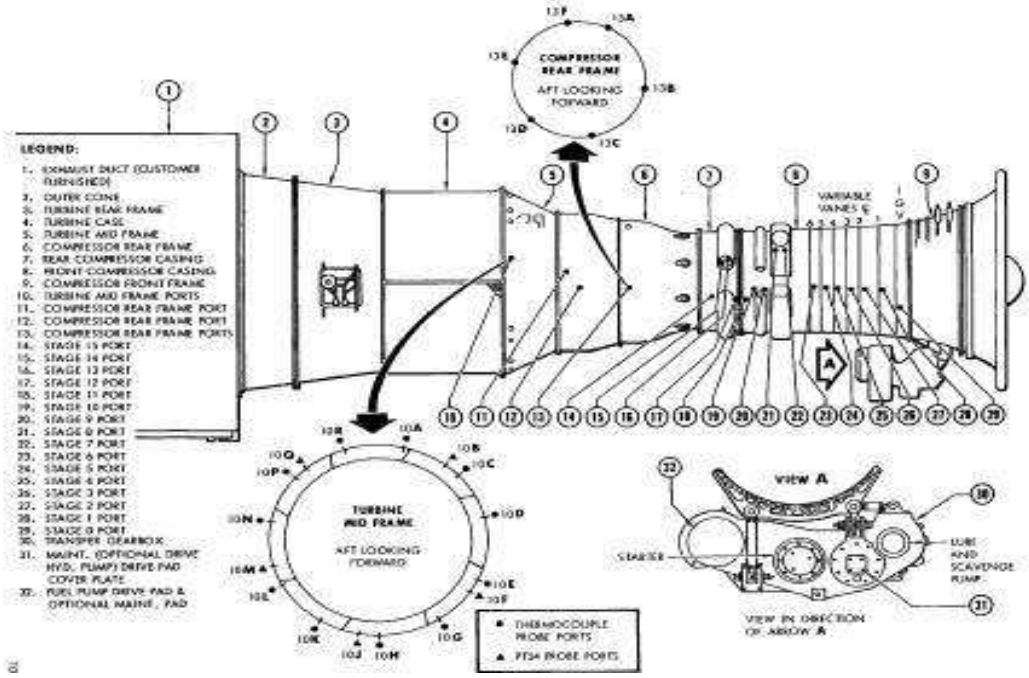


**Thermocouple**



**HPT Borescope Plugs**

| **High Pressure Compressor** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect stages 1 through 16 blades for cracks, nicks, tears, burrs, dents, missing material, evidence of tip clang, curl, or deformation. | Inspected. |
| ☒Stage 1 Blades (Qty 36) & Vanes, | Serviceable |
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| ☒Stage 4 Blades (Qty 42) & Vanes, | Serviceable |
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| ☒Stage 6 Blades (Qty 48) & Vanes, | Serviceable |
| ☒Stage 7 Blades (Qty 54) & Vanes, | Serviceable |
| ☒Stage 8 Blades (Qty 56) & Vanes, | Serviceable |
| ☒Stage 9 Blades (Qty 64) & Vanes, | Serviceable |
| ☒Stage 10 Blades (Qty 66) & Vanes, | Serviceable |
| ☒Stage 11 Blades (Qty 66) & Vanes, | Serviceable |
| ☒Stage 12 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Stage 13 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Stage 14 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Stage 15 Blades (Qty 76) & Vanes,<br>☒Stage 16 Blades (Qty 76) & Vanes, | Serviceable<br>Serviceable |
| ☒Inspect for erosion, corrosion, or deposits. | Inspected |
| ☒Inspect for platform shingling, bowing, distortion, or cracks | Inspected. |


COMPRESSOR REAR FRAME
AFT LOOKING FORWARD
LEGEND:
1. EXHAUST DUCT (CUSTOMER FURNISHED)
3. OUTER CONE
4. TURBINE REAR FRAME
5. TURBINE CASE
6. TURBINE MID FRAME
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30. STAGE 0 PORT
31. TRANSFER GEARBOX
32. MAINT. (OPTIONAL DRIVE HYD. PUMP) DRIVE PAD COVER PLATE
33. FUEL PUMP DRIVE PAD & OPTIONAL MAINT. PAD
VARIABLE VANES
TURBINE MID FRAME
AFT LOOKING FORWARD
THERMOCOUPLE PROBE PORTS
PT54 PROBE PORTS
VIEW A
STARTER
TUBE AND SCAVENGE PUMP
VIEW IN DIRECTION OF ARROW A

**High Pressure Compressor Photos:**




**Stage 1**




**Stage 2**




**Stage 3**




**Stage 4**




**Stage 5**




**Stage 6**




**Stage 7**




**Stage 8**




**Stage 9**




**Stage 10**




**Stage 11**




**Stage 12**




**Stage 13**




**Stage 14**




**Stage 15**




**Stage 16**

| **Combustor** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect combustor and 1st stage HPT Leading Edge with flex scope for burning, cracks, erosion, discoloration, wear, and missing metal. | Observed discoloration on liners and all surfaces. Cracks and missing material |
| ☒Dome Plate | Burned/ok |
| ☒Inner/Outer Liners | Burned/ok |
| ☒Igniter Tube Area | ok |
| ☒Fuel Nozzle Shrouds | ok |
| ☒Fuel Nozzle Axial Swirler/Venturi | Burned/ok |
| ☒1st Stage Nozzle | Not Serviceable |
| ☒Igniter Tube Area | ok |
| ☒Inspect all visible fuel nozzle tips for contamination or damage. | ok |




**Swirler and Trumpet**




**Inner Liner and Dome Ring**




**Swirler and Trumpet**




**Swirler and Trumpet**



**Ignitors**

## HPT Section

| **HPT** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect 1st stage HPT Leading Edge through Combustor Chamber with flex scope for burning, cracks, erosion, discoloration, wear, and missing metal. | Not Serviceable |
| ☒HPT Stage 1 Rotor Blades (Qty 88) | ok |
| ☒HPT Stage 2 Nozzle | Has one imperfection on a trailing edge/ok |
| ☒HPT Stage 2 Rotor Blades (Qty 90) | ok |

**HPT**




**Stage 1**




**Stage 1**




**Stage 1**




**Stage 1**




**Stage 2**




**Stage 2**




**Stage 2**




**Stage 2**

| **LPT** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect LPT with flex scope for burning, cracks, erosion, discoloration, wear, and missing metal. | No Anomaly noted. |
| ☒ Liner: Cracks in skin (no separation through aft ring) | No Anomaly noted. |
| ☒Missing material | No anomaly noted. |
| ☒Buckling or distortion | No anomaly noted. |




**LPT Liner**




**LPT Liner**




# Final Report

## Date of Visit: 06/15/2026

| | | | |
|---|---|---|---|
| **GESA Job #:** | PR557 | **Unit #:** | 3 |
| **PO#:** | MSA 107284 Task Order 1 | **Serial #:** | 557-258 |
| **Customer:** | Genera PR | **Engine/Machine:** | TM2500 |
| **Site Name:** | SJ Steam Plant | **Description of Work:** | BSI |
| **Site Location:** | San Juan PR | **GESA Lead:** | Caden Bergeron |

# Table of Contents

Section 1: Work Scope Summary
Section 2: Daily Events
Section 3: BSI
Section 4: Used and Required Parts
Section 5: Findings and Recommendations
Section 6: Conclusion and Pictures

# Section 1: Work Scope Summary

**Gas Turbine Inspection Scope**

- Full Gas Turbine Borescope Inspection
  - Lube & Scavenge Pump Screens & Chip Detector Inspection
  - Gas Turbine Starter Oil Return Line Screen Inspection
  - Fuel Nozzle Inspection
  - T5.4 Thermocouple Inspection
  - Igniter Inspection
- Gas Turbine Exterior Inspection
  - VSV System Inspection
  - All external piping & hardware

# Section 2: Daily Events

**Monday, 06/15/2026**

- All borescope plugs were removed.
- Removed and inspected #T5.4 thermocouple probe.
- Removed and inspected igniters.
- Performed hydraulic starter oil return line screen inspection.
- Performed inspection for chip detector and screen on lube and scavenge pump.
- Performed external piping and hardware inspection.

# Section 3: BSI, Turbine, and Turbine Package Inspection

## External Inspection:

**Compressor Section:**

- The VSV actuation system was observed to be functioning properly

**Combustor Section**:

- External inspection was performed
- Igniters were inspected and found to be in satisfactory condition

**High Pressure Turbine (HPT) Section:**

- No abnormalities were observed on external surfaces
- Stage 1 borescope plug has a small hole on the plunger.

**Accessory Gearbox (AGB):**

- Chip detector and lube scavenge screen were inspected; no abnormalities were found
- Hydraulic starter return line was removed and inspected.

## Borescope Inspection:

**High Pressure Compressor (HPC):**

- Blades and vanes were inspected and are serviceable

**Combustor Section:**

- Igniters were removed and inspected; found to be serviceable
- The liners have numerous large areas of burn through. NOT SERVICEABLE
- Dome plate/ring have multiple areas of burn through. NOT SERVICEABLE

**High Pressure Turbine (HPT):**

- Stage 1 nozzle has a large amount of damage to the trailing edge with distortion and material missing on the concave side. The Leading edge also has experienced distortion from heat where the cooling holes are becoming obstructed. The nozzle has had enough erosion to cut into the platform substantially NOT SERVICEABLE
- Stage 1 blades show heavy wear on the convex side and hase large holes present. Also chipping on the blade tip was found but did not exceed tip cap plane. NOT SERVICEABLE
- Stage 2 had discoloration on the trailing edge. The leading edge is starting to show signs increased wear and dicoloration from operation
- Stage 2 blades showed no sign of extreme damage.

**Turbine Mid-Frame (TMF):**

- No Abnormalities

**Power Turbine (PT):**

- No abnomalities found

# Section 4: Used and Required Parts List

**Required Parts List**

| | Nomenclature | Part No | Quantity | |
|---|---|---|---|---|
| | | | | |
| | | | | |

**Used Parts List**

| | Nomenclature | Part No | Quantity | |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

# Section 5: Findings and Recommendations

## Findings

- Combustor has multiple areas of burn through where the insulating material is no longer present. NOT SERVICEABLE
- HPT Stage 1 nozzles have leading edge cooling holes plugged, trailing edge distortion and burn through. NOT SERVICEABLE
- HPT stage 1 blades have holes and heavy wear on the convex surface exposing cooling passages. The tips also have very heavy wear. NOT SERVICEABLE.

## Recommendations:

- Perform a full hot section to replace HPT and Combustor per GEK 105054 SW 406 00.
- NOT SERVICEABLE

# Section 6: Conclusion and Pictures



**VSV Assembly**



**Chip Detectors**



**Starter Return Line Strainer**

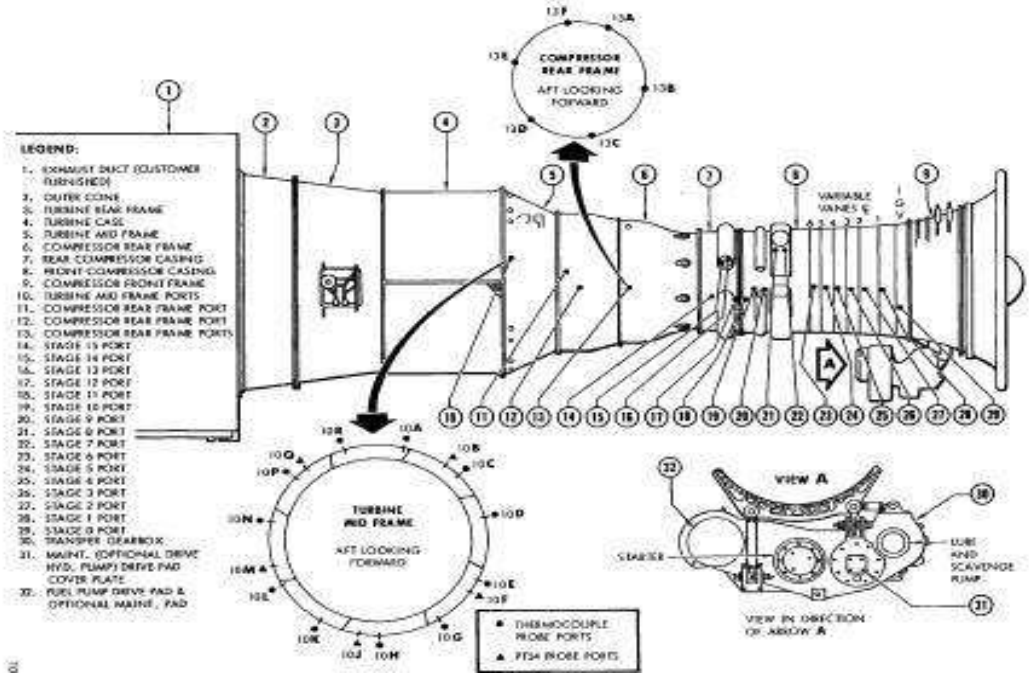


**Thermocouple**



**HPT Borescope Plugs**

| **High Pressure Compressor** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect stages 1 through 16 blades for cracks, nicks, tears, burrs, dents, missing material, evidence of tip clang, curl, or deformation. | Inspected. |
| ☒Stage 1 Blades (Qty 36) & Vanes, | Serviceable |
| ☒Stage 2 Blades (Qty 26) & Vanes, | Serviceable |
| ☒Stage 3 Blades (Qty 38) & Vanes, | Serviceable |
| ☒Stage 4 Blades (Qty 42) & Vanes, | Serviceable |
| ☒Stage 5 Blades (Qty 44) & Vanes, | Serviceable |
| ☒Stage 6 Blades (Qty 48) & Vanes, | Serviceable |
| ☒Stage 7 Blades (Qty 54) & Vanes, | Serviceable |
| ☒Stage 8 Blades (Qty 56) & Vanes, | Serviceable |
| ☒Stage 9 Blades (Qty 64) & Vanes, | Serviceable |
| ☒Stage 10 Blades (Qty 66) & Vanes, | Serviceable |
| ☒Stage 11 Blades (Qty 66) & Vanes, | Serviceable |
| ☒Stage 12 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Stage 13 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Stage 14 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Stage 15 Blades (Qty 76) & Vanes,<br>☒Stage 16 Blades (Qty 76) & Vanes, | Serviceable<br>Serviceable |
| ☒Inspect for erosion, corrosion, or deposits. | Inspected |
| ☒Inspect for platform shingling, bowing, distortion, or cracks | Inspected. |


LEGEND:
1. EXHAUST DUCT (CUSTOMER FURNISHED)
2. OUTER CONE
3. TURBINE REAR FRAME
4. TURBINE CASE
5. TURBINE MID FRAME
6. COMPRESSOR REAR FRAME
7. REAR COMPRESSOR CASING
8. FRONT COMPRESSOR CASING
9. COMPRESSOR FRONT FRAME
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25. STAGE 4 PORT
26. STAGE 3 PORT
27. STAGE 2 PORT
28. STAGE 1 PORT
29. STAGE 0 PORT
30. TRANSFER GEARBOX
31. MAINT. (OPTIONAL DRIVE HYDL. PUMP) DRIVE PAD COVER PLATE
32. FUEL PUMP DRIVE PAD & OPTIONAL MAINT. PAD
COMPRESSOR REAR FRAME
AFT LOOKING FORWARD
TURBINE MID FRAME
AFT LOOKING FORWARD
VARIABLE VANES
IGV
View A
STARTER
LUBE AND SCAVENGE PUMP
VIEW IN DIRECTION OF ARROW A
THERMOCOUPLE PROBE PORTS
PT54 PROBE PORTS

**High Pressure Compressor Photos:**




**Stage 1**




**Stage 2**




**Stage 3**




**Stage 4**




**Stage 5**




**Stage 6**




**Stage 7**




**Stage 8**




**Stage 9**



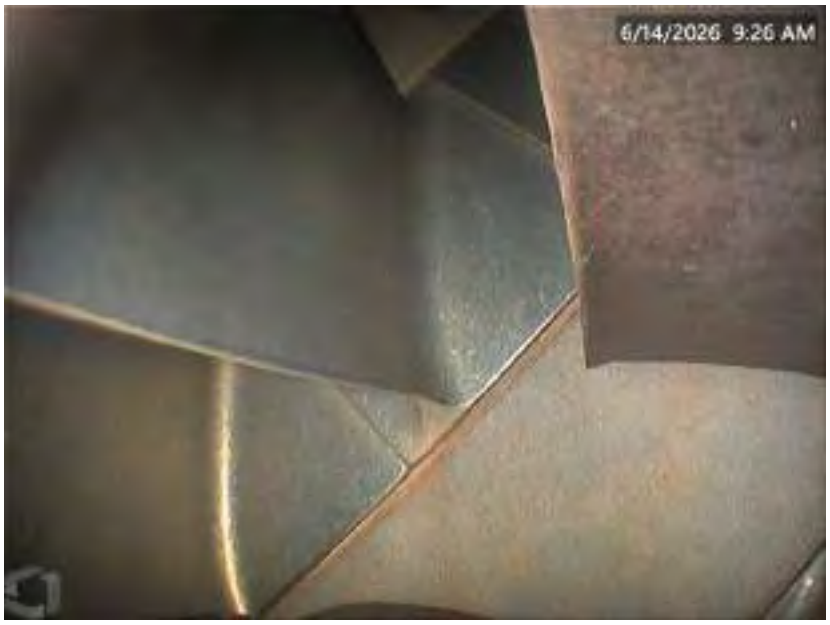

**Stage 10**



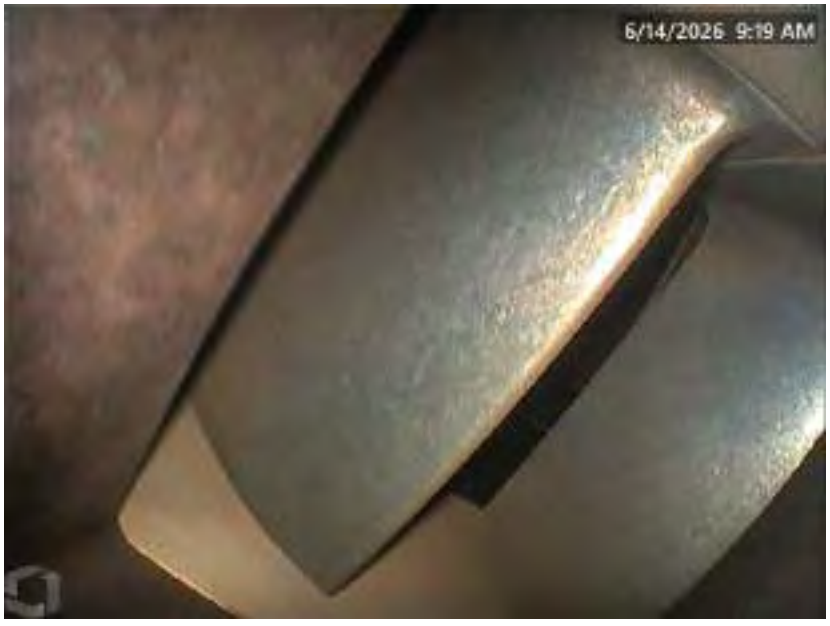

**Stage 11**




**Stage 12**




**Stage 13**




**Stage 14**




**Stage 15**




**Stage 16**

| **Combustor** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect combustor and 1st stage HPT Leading Edge with flex scope for burning, cracks, erosion, discoloration, wear, and missing metal. | Leading edge cooling holes are obdstructed. NOT SERVICEABLE |
| ☒Dome Plate | Burn through in multiple domes NOT SERVICABLE |
| ☒Inner/Outer Liners | Burn Through in numerous areas NOT SERVEABLE |
| ☒Igniter Tube Area | ok |
| ☒Fuel Nozzle Shrouds | ok |
| ☒Fuel Nozzle Axial Swirler/Venturi | ok |
| ☒1st Stage Nozzle | Leading edge wear and cooling holes obstructed NOT SERVICEABLE |
| ☒Igniters | Ok |
| ☒Inspect all visible fuel nozzle tips for contamination or damage. | ok |

**Combustor Photos:**




**Plate and Swirler**




**Inner and outer Liner**




**Dome plate and ring**




**Dome plate and ring**



**Ignitors**

## HPT Section

| **HPT** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect 1st stage HPT Leading Edge through Combustor Chamber with flex scope for burning, cracks, erosion, discoloration, wear, and missing metal. | Numerous holes in concave surface and distortion. NOT SERVICEABLE |
| ☒HPT Stage 1 Rotor Blades (Qty 88) | Holes found in convex surface. Cooling passages exposed NOT SERVICEABLE |
| ☒HPT Stage 2 Nozzle | ok |
| ☒HPT Stage 2 Rotor Blades (Qty 90) | ok |

**HPT**




**Stage 1**




**Stage 1**




**Stage 2**



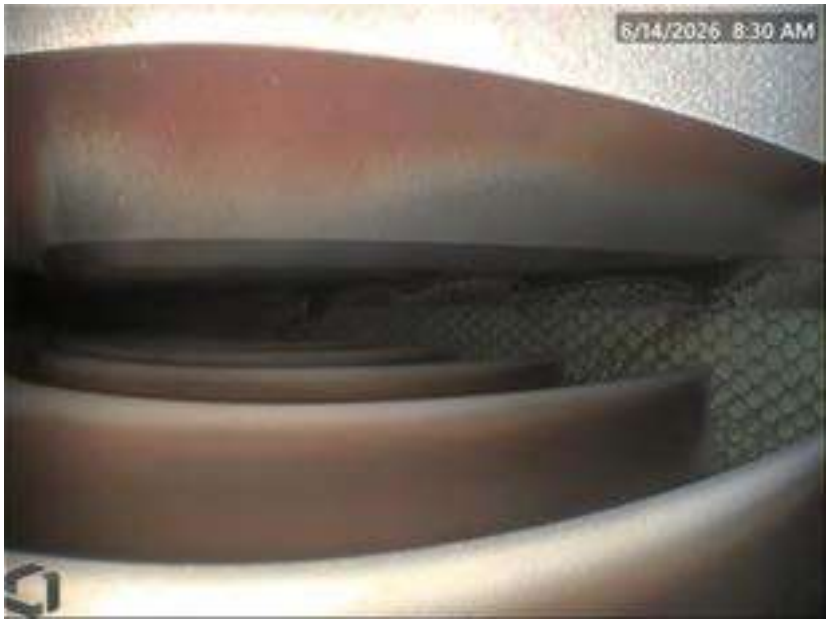

**Stage 2**

| **LPT** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect LPT with flex scope for burning, cracks, erosion, discoloration, wear, and missing metal. | No Anomaly noted. |
| ☒ Liner: Cracks in skin (no separation through aft ring) | No Anomaly noted. |
| ☒Missing material | No anomaly noted. |
| ☒Buckling or distortion | No anomaly noted. |

**LPT**




**LPT Liner**




**LPT**




# Final Report

## Date of Visit: 06/15/2026

| | | | |
|---|---|---|---|
| **GESA Job #:** | PR557 | **Unit #:** | 4 |
| **PO#:** | MSA 107284 Task Order 1 | **Serial #:** | 557-260 |
| **Customer:** | Genera PR | **Engine/Machine:** | TM2500 |
| **Site Name:** | SJ Steam Plant /San Juan | **Description of Work:** | BSI |
| **Site Location:** | San Juan PR | **GESA Lead:** | Caden Bergeron |

# Table of Contents

Section 1: Work Scope Summary
Section 2: Daily Events
Section 3: BSI, Turbine, and Turbine Package Inspection
Section 4: Used and Required Parts
Section 5: Findings and Recommendations
Section 6: Conclusion and Pictures

# Section 1: Work Scope Summary

**Gas Turbine Inspection Scope**

- Full Gas Turbine Borescope Inspection
  - Lube & Scavenge Pump Screens & Chip Detector Inspection
  - Gas Turbine Starter Oil Return Line Screen Inspection
  - Fuel Nozzle Inspection
  - T5.4 Thermocouple Inspection
  - Igniter Inspection
- Gas Turbine Exterior Inspection
  - VSV System Inspection
  - All external piping & hardware

# Section 2: Daily Events

**Monday, 06/15/2026**

- All borescope plugs were removed
- Removed and inspected #T5.4 thermocouple probe
- Removed and inspected igniters
- Performed hydraulic starter oil return line screen inspection
- Performed inspection for chip detector and screen on lube and scavenge pump
- Performed external piping and hardware inspection

# Section 3: BSI, Turbine, and Turbine Package Inspection

## External Inspection:

**Compressor Section:**

- The VSV actuation system was observed to be functioning properly

**Combustor Section**:

- External inspection was performed
- Igniters were inspected and found to be in satisfactory condition

**High Pressure Turbine (HPT) Section:**

- No abnormalities were observed on external surfaces

**Accessory Gearbox (AGB):**

- Chip detector and lube scavenge screen were inspected; no abnormalities were found
- Hydraulic starter return line was removed and inspected.

## Borescope Inspection:

**High Pressure Compressor (HPC):**

- Compressor rotor blades are in dirty condition
- Blades and vanes were inspected and are in serviceable condition

**Combustor Section:**

- More than 6 rivets were found to be missing and most are adjacent to others. The Rivet holes are also compromised with burn through. NOT SERVICEABLE
- Igniters were removed and inspected; found to be serviceable
- Fuel Nozzles do not show signs of build up or distortion

**High Pressure Turbine (HPT):**

- Stage 1 nozzle shows signs of erosion that cuts deep into the inner platform exceeding allowable limit. NOT SERVICEABLE
- Stage 1 Blades show no signs of extreme damage. Tips have chippping but do not exceed the tip cap plane
- Stage 2 nozzles and blades do not show signs of notable damage
- Stage 2 blades are serviceable

**Turbine Mid-Frame (TMF):**

- No abnormalities

**Power Turbine (PT):**

- Light discoloration and corrosion was observed.

# Section 4: Used and Required Parts List

**Required Parts List**

| | Nomenclature | Part No | Quantity | |
|---|---|---|---|---|
| | | | | |
| | | | | |

**Used Parts List**

| | Nomenclature | Part No | Quantity | |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

# Section 5: Findings and Recommendations

## Findings

- Many missing rivets in the combustor, most of which are adjacent to each other. NOT SERVICEABLE
- One stage 1 nozzle erosion on the platform has exceeded the allowable amount. NOT SERVICEABLE

## Recommendations:

- Replace Combustor GEK 105054 WP 203 00
- Replace Nozzle Segment Per GEK 105054 WP 201 02
- Perform hot-section and replace damaged parts. NOT SERVICEABLE

# Section 6: Conclusion and Pictures



**VSV Assembly**




**Chip Detectors**

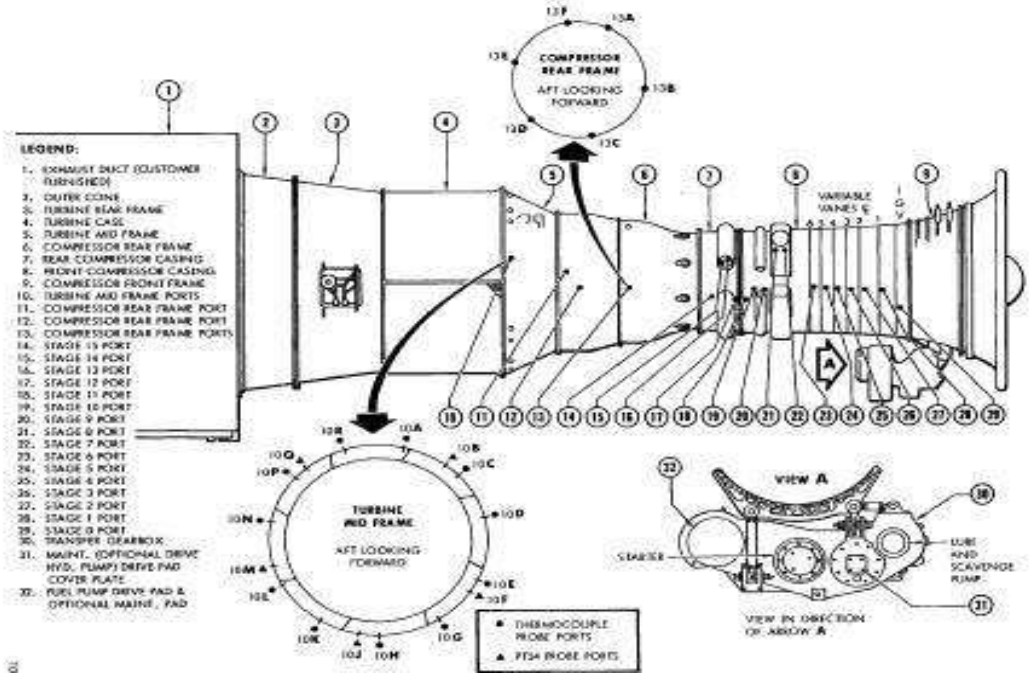


**Starter Return Line Strainer**



**Thermocouple**

| High Pressure Compressor | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect stages 1 through 16 blades for cracks, nicks, tears, burrs, dents, missing material, evidence of tip clang, curl, or deformation. | Inspected. |
| ☒Stage 1 Blades (Qty 36) & Vanes, | Servicable |
| ☒Stage 2 Blades (Qty 26) & Vanes, | Servicable |
| ☒Stage 3 Blades (Qty 38) & Vanes, | Servicable |
| ☒Stage 4 Blades (Qty 42) & Vanes, | Servicable |
| ☒Stage 5 Blades (Qty 44) & Vanes, | Servicable |
| ☒Stage 6 Blades (Qty 48) & Vanes, | Servicable |
| ☒Stage 7 Blades (Qty 54) & Vanes, | Servicable |
| ☒Stage 8 Blades (Qty 56) & Vanes, | Servicable |
| ☒Stage 9 Blades (Qty 64) & Vanes, | Servicable |
| ☒Stage 10 Blades (Qty 66) & Vanes, | Servicable |
| ☒Stage 11 Blades (Qty 66) & Vanes, | Servicable |
| ☒Stage 12 Blades (Qty 76) & Vanes, | Servicable |
| ☒Stage 13 Blades (Qty 76) & Vanes, | Servicable |
| ☒Stage 14 Blades (Qty 76) & Vanes, | Servicable |
| ☒Stage 15 Blades (Qty 76) & Vanes,<br>☒Stage 16 Blades (Qty 76) & Vanes, | Servicable<br>Servicable |
| ☒Inspect for erosion, corrosion, or deposits. | Inspected |
| ☒Inspect for platform shingling, bowing, distortion, or cracks | Inspected. |


COMPRESSOR REAR FRAME
AFT LOOKING FORWARD
LEGEND:
1. EXHAUST DUCT (CUSTOMER FURNISHED)
2. OUTER CONE
3. TURBINE REAR FRAME
4. TURBINE CASE
5. TURBINE MID FRAME
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28. STAGE 1 PORT
29. STAGE 0 PORT
30. TRANSFER GEARBOX
31. MAINT. (OPTIONAL DRIVE HYD. PUMP) DRIVE PAD COVER PLATE
32. FUEL PUMP DRIVE PAD & OPTIONAL MAINT. PAD
VARIABLE VANES
IGV
TURBINE MID FRAME
AFT LOOKING FORWARD
THERMOCOUPLE PROBE PORTS
PT54 PROBE PORTS
View A
STARTER
LUBE AND SCAVENGE PUMP
VIEW IN DIRECTION OF ARROW A

**High Pressure Compressor Photos:**




**Stage 1**




**Stage 2**




**Stage 3**




**Stage 4**




**Stage 5**




**Stage 6 discoloration**




**Stage 7**




**Stage 8**



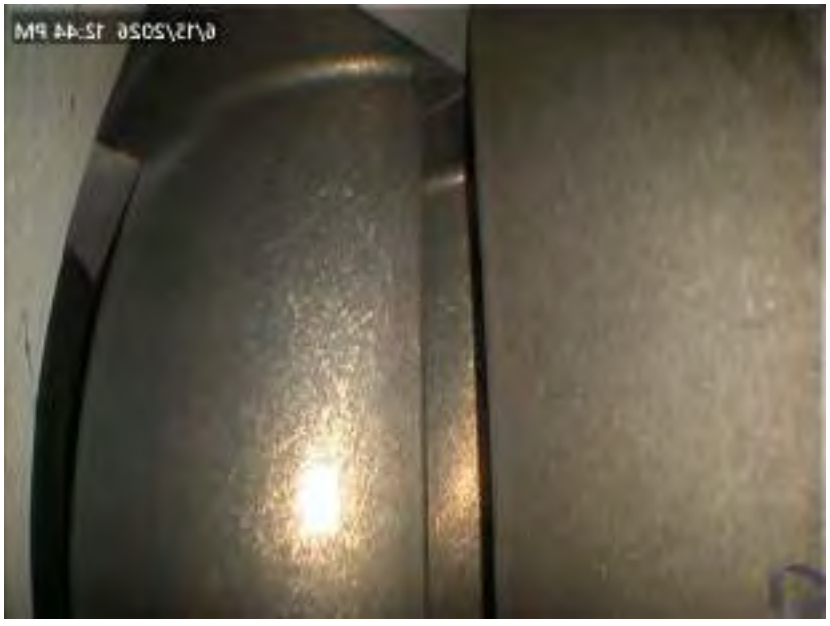

**Stage 9**




**Stage 10**




**Stage 11 Discoloration**



**Stage 12**




**Stage 13**




**Stage 14**




**Stage 15**




**Stage 16**

| **Combustor** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect combustor and 1st stage HPT Leading Edge with flex scope for burning, cracks, erosion, discoloration, wear and missing metal. | Leading edge. Serviceable |
| ☒Dome Plate | Cracks originating from dome ring. |
| ☒Inner/Outer Liners | Burning on inner liners and missing riviets with heavy wear/damage to the area around rivit holes. NOT SERVICEABLE |
| ☒Igniter Tube Area | Serviceable |
| ☒Fuel Nozzle Shrouds | Serviceable |
| ☒Fuel Nozzle Axial Swirler/Venturi | Serviceable |
| ☒1st Stage Nozzle | Serviceable |
| ☒Igniter Tube Area | Serviceable |
| ☒Inspect all visible fuel nozzle tips for contamination or damage. | Serviceable |




**Fuel Nozzle**




**Inner and outer Liner**




**Liner and Rivet Damage**




**Liner and Rivet Damage**



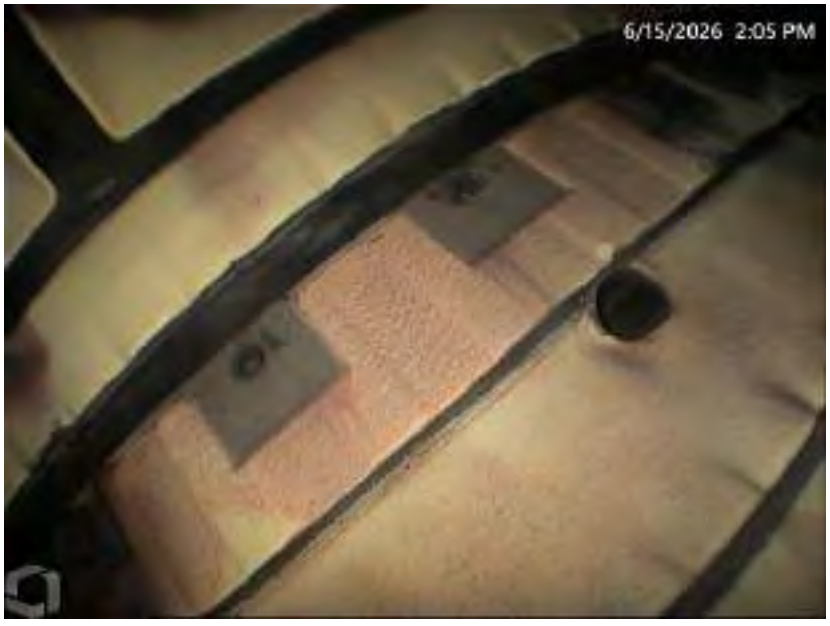

**Liner and Rivet Damage**




**Liner and Rivet Damage**




**Liner and Rivet Damage**




**Liner and Rivet Damage**

## HPT Section

| **HPT** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect 1st stage HPT Leading Edge through Ccombustion Chamber with flex scope for burning, cracks, erosion, discoloration, wear and missing metal. | Trailing edge heavy erosion of nozzle platform. Not Serviceable |
| ☒HPT Stage 1 Rotor Blades (Qty 88) | Serviceable |
| ☒HPT Stage 2 Nozzle | Serviceable |
| ☒HPT Stage 2 Rotor Blades (Qty 90) | Serviceable |




**Stage 1**




**Stage 1**




**Stage 1**




**Stage 2**




**Stage 2**




**Stage 2**




**Stage 2**

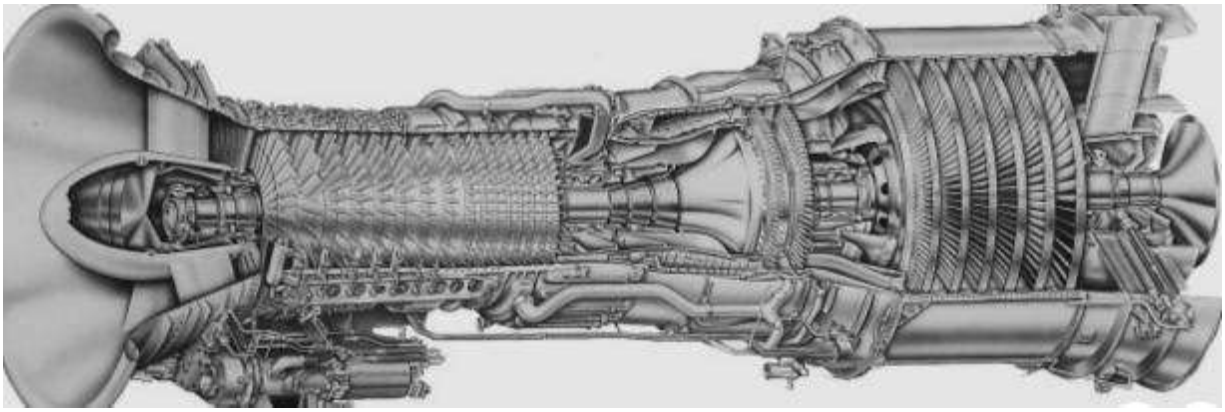
| **LPT** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect LPT with flex scope for burning, cracks, erosion, discoloration, wear and missing metal. | Discoloration on liners. |
| ☒ Liner: Cracks in skin (no separation through aft ring) | No Anomaly noted. |
| ☒Missing material | No anomaly noted. |
| ☒Buckling or distortion | No anomaly noted. |




**Stage 1**




**Stage 1**



# Final Report

## Date of Visit: 06/16/2026

| | | | |
|---|---|---|---|
| **GESA Job #:** | PR557 | **Unit #:** | 5 |
| **PO#:** | MSA 107284 Task Order 1 | **Serial #:** | 557-252 |
| **Customer:** | Genera PR | **Engine/Machine:** | TM2500 |
| **Site Name:** | SJ Steam Plant /San Juan | **Description of Work:** | BSI |
| **Site Location:** | San Juan PR | **GESA Lead:** | Caden Bergeron |

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  - Gas Turbine Starter Oil Return Line Screen Inspection
  - Fuel Nozzle Inspection
  - T5.4 Thermocouple Inspection
  - Igniter Inspection
- Gas Turbine Exterior Inspection
  - VSV System Inspection
  - All external piping & hardware

# Section 2: Daily Events

**Tuesday, 06/16/2026**

- All borescope plugs were removed
- Removed and inspected #T5.4 thermocouple probe
- Removed and inspected igniters
- Performed hydraulic starter oil return line screen inspection
- Performed inspection for chip detector and screen on lube and scavenge pump
- Performed external piping and hardware inspection

# Section 3: BSI, Turbine, and Turbine Package Inspection

## External Inspection:

**Compressor Section:**

- The VSV actuation system was observed to be functioning properly

**Combustor Section**:

- External inspection was performed
- Igniters were inspected and found to be in satisfactory condition

**High Pressure Turbine (HPT) Section:**

- No abnormalities were observed on external surfaces

**Accessory Gearbox (AGB):**

- Chip detector and lube scavenge screen were inspected; no abnormalities were found
- Hydraulic starter return line was removed and inspected

## Borescope Inspection:

**High Pressure Compressor (HPC):**

- Blades and vanes were inspected and are in serviceable condition

**Combustor Section:**

- Discoloration and chipping of the liners detected
- Igniters were removed and inspected; found to be serviceable
- Dome plate and ring have chips and cracks.

**High Pressure Turbine (HPT):**

- Stage 1 nozzles
- Stage 1 blades
- Stage 2 blades
- The Stage 2 nozzles

**Turbine Mid-Frame (TMF):**

- No abnormalities

**Power Turbine (PT):**

- Light discoloration and corrosion were observed

# Section 4: Used and Required Parts List

**Required Parts List**

| | Nomenclature | Part No | Quantity | |
|---|---|---|---|---|
| | | | | |
| | | | | |

**Used Parts List**

| | Nomenclature | Part No | Quantity | |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

# Section 5: Findings and Recommendations

**Findings:**

- Combustor has cracks and burn through around the domes
- The inner liner on the overhung surfaces has one area of complete burn through. NOT SERVICEABLE
- The inner liners are discolored and have minimal burn through

**Recommendations:**

- Per GEK 105054 WP 406 00 Unit 5 is NOT SERVICEABLE due to combustion chamber damage

# Section 6: Conclusion and Pictures



**VSV assembly**




**Chip detectors**

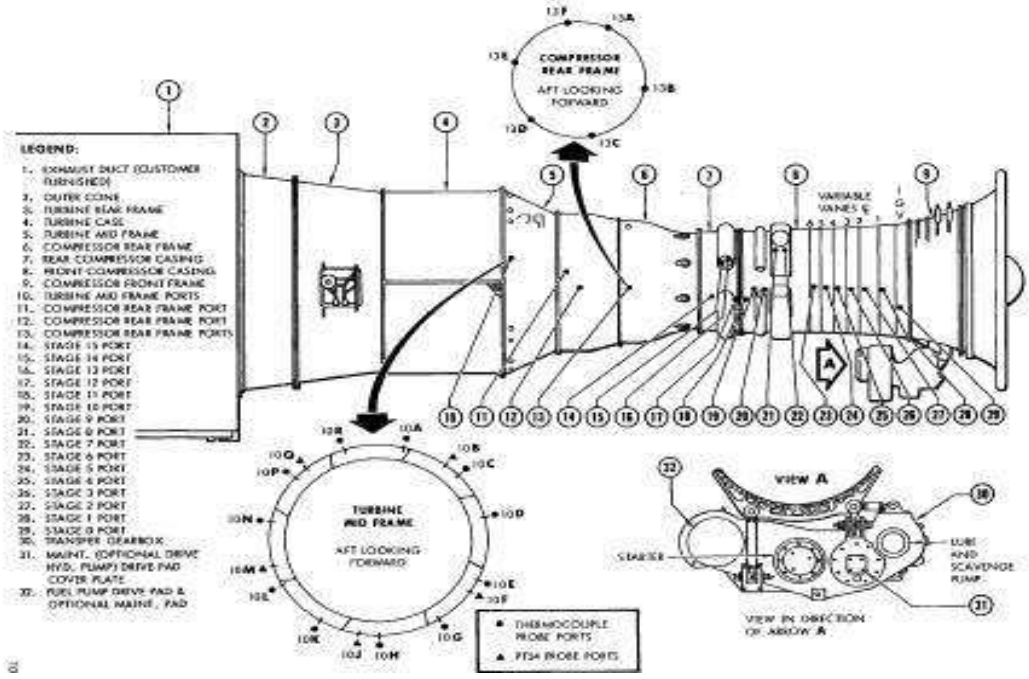


**Starter return line strainer**



**Thermocouple**

| High Pressure Compressor | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect stages 1 through 16 blades for cracks, nicks, tears, burrs, dents, missing material, evidence of tip clang, curl, or deformation. | Inspected |
| ☒Stage 1 Blades (Qty 36) & Vanes, | Serviceable |
| ☒Stage 2 Blades (Qty 26) & Vanes, | Serviceable |
| ☒Stage 3 Blades (Qty 38) & Vanes, | Serviceable |
| ☒Stage 4 Blades (Qty 42) & Vanes, | Serviceable |
| ☒Stage 5 Blades (Qty 44) & Vanes, | Serviceable |
| ☒Stage 6 Blades (Qty 48) & Vanes, | Serviceable |
| ☒Stage 7 Blades (Qty 54) & Vanes, | Serviceable |
| ☒Stage 8 Blades (Qty 56) & Vanes, | Serviceable |
| ☒Stage 9 Blades (Qty 64) & Vanes, | Serviceable |
| ☒Stage 10 Blades (Qty 66) & Vanes, | Serviceable |
| ☒Stage 11 Blades (Qty 66) & Vanes, | Serviceable |
| ☒Stage 12 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Stage 13 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Stage 14 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Stage 15 Blades (Qty 76) & Vanes,<br>☒Stage 16 Blades (Qty 76) & Vanes, | Serviceable<br>Serviceable |
| ☒Inspect for erosion, corrosion, or deposits. | Inspected |
| ☒Inspect for platform shingling, bowing, distortion, or cracks | Inspected |


LEGEND:
1. EXHAUST DUCT (CUSTOMER FURNISHED)
3. OUTER CONE
5. TURBINE REAR FRAME
4. TURBINE CASE
5. TURBINE MID FRAME
6. COMPRESSOR REAR FRAME
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28. STAGE 1 PORT
29. STAGE 0 PORT
30. TRANSFER GEARBOX
31. MAINT. (OPTIONAL DRIVE HYD. PUMP) DRIVE PAD COVER PLATE
32. FUEL PUMP DRIVE PAD & OPTIONAL MAINT. PAD
COMPRESSOR REAR FRAME
AFT LOOKING FORWARD
TURBINE MID FRAME
AFT LOOKING FORWARD
THERMOCOUPLE PROBE PORTS
PT54 PROBE PORTS
VARIABLE VANES
IGV
View A
STARTER
LUBE AND SCAVENGE PUMP
VIEW IN DIRECTION OF ARROW A

**High Pressure Compressor Photos:**




**Stg 1**



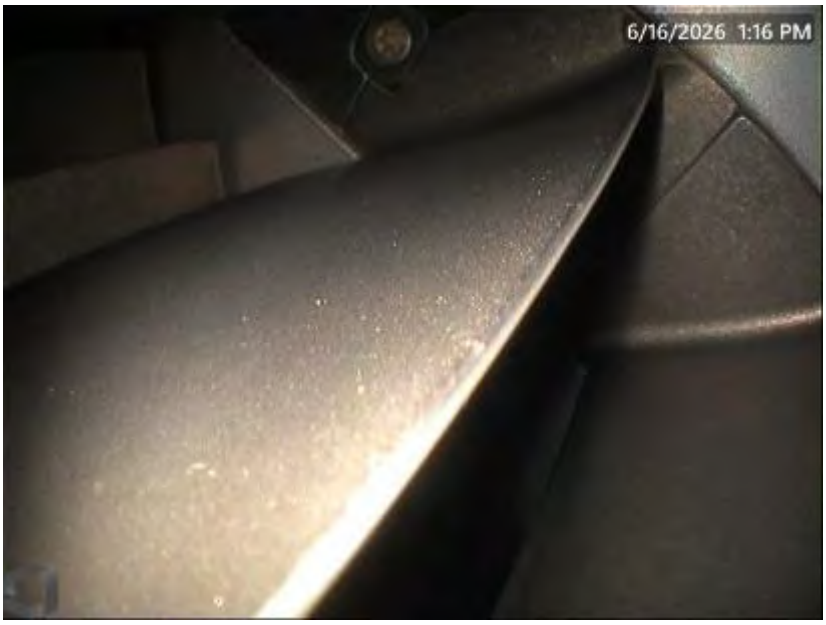

**Stg 2**




**Stg 3**




**Stg 4**




**Stg 5**




**Stg 6**




**Stg 7**




**Stg 8**




**Stage 17 discoloration**

| **Combustor** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect combustor and 1st stage HPT Leading Edge with flex scope for burning, cracks, erosion, discoloration, wear and missing metal. | ok |
| ☒Dome Plate | Numerous Large cracks NOT SERVICEABLE |
| ☒Inner/Outer Liners | Burning on inner liners<br>Overhung surface has complete burn through. NOT SERVICEABLE |
| ☒Igniter Tube Area | ok |
| ☒Fuel Nozzle Shrouds | ok |
| ☒Fuel Nozzle Axial Swirler/Venturi | ok |
| ☒1st Stage Nozzle | Minimal burn through and light erosion on platforms |
| ☒Igniter Tube Area | ok |
| ☒Inspect all visible fuel nozzle tips for contamination or damage. | ok |

**Combustor Photos:**




**Dome with numerous cracks. Not sercviceable.**




**Complete burn through on inner liners**

## HPT Section

| **HPT** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect 1st stage HPT Leading Edge through Ccombustion Chamber with flex scope for burning, cracks, erosion, discoloration, wear and missing metal. | Leading edge is ok. Trailing edge has areas of light burning and light erosion on platform. |
| ☒HPT Stage 1 Rotor Blades (Qty 88) | Serviceable |
| ☒HPT Stage 2 Nozzle | Serviceable |
| ☒HPT Stage 2 Rotor Blades (Qty 90) | Serviceable |

**HPT**




**Stg 1**



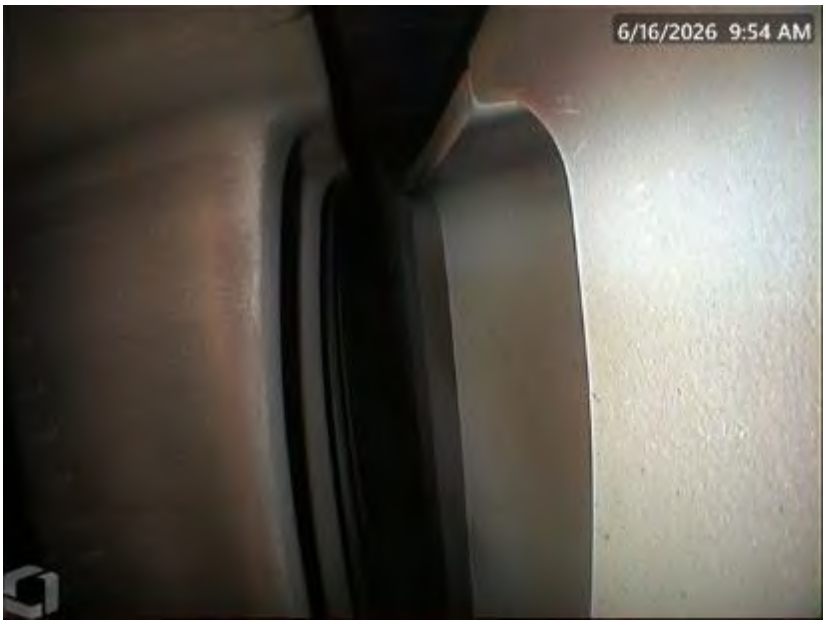

**Stg 1**




**Stg 1**




**Stg 2**




**Stg 2**

**LPT**

| **LPT** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect LPT with flex scope for burning, cracks, erosion, discoloration, wear and missing metal. | No Anomaly noted. |
| ☒ Liner: Cracks in skin (no separation through aft ring) | No Anomaly noted. |
| ☒Missing material | No anomaly noted. |
| ☒Buckling or distortion | No anomaly noted. |




**LPT Stg 1**




**LPT Stg 1**




**Honeycomb**




# Final Report

## Date of Visit: 06/08/2026

| | | | |
|---|---|---|---|
| **GESA Job #:** | PR557 | **Unit #:** | 6 |
| **PO#:** | 107284 Task Order 1 | **Serial #:** | 557-254 |
| **Customer:** | Genera PR | **Engine/Machine:** | TM2500 |
| **Site Name:** | SJ Steam Plant /San Juan | **Description of Work:** | BSI |
| **Site Location:** | San Juan PR | **GESA Lead:** | Caden Bergeron |

# Table of Contents

Section 1: Work Scope Summary
Section 2: Daily Events
Section 3: BSI
Section 4: Used and Required Parts
Section 5: Findings and Recommendations
Section 6: Conclusion and Pictures

# Section 1: Work Scope Summary

**Gas Turbine Inspection Scope**

- Full Gas Turbine Borescope Inspection
  - Lube & Scavenge Pump Screens & Chip Detector Inspection
  - Gas Turbine Starter Oil Return Line Screen Inspection
  - Fuel Nozzle Inspection
  - T5.4 Thermocouple Inspection
  - Igniter Inspection
- Gas Turbine Exterior Inspection
  - VSV System Inspection
  - All external piping & hardware

# Section 2: Daily Events

**Monday, 06/18/2026**

- All borescope plugs were removed
- Removed and inspected #T5.4 thermocouple probe
- Removed and inspected igniters
- Performed hydraulic starter oil return line screen inspection
- Performed inspection for chip detector and screen on lube and scavenge pump
- Performed external piping and hardware inspection

# Section 3: BSI, Turbine, and Turbine Package Inspection

## External Inspection:

**Compressor Section:**

- The VSV actuation system was observed to be functioning properly

**Combustor Section**:

- External inspection was performed
- Igniters were inspected and found to be in satisfactory condition

**High Pressure Turbine (HPT) Section:**

- No abnormalities were observed on external surfaces

**Accessory Gearbox (AGB):**

- Chip detector and lube scavenge screen were inspected; no abnormalities were found
- Hydraulic starter return line was removed and inspected.

## Borescope Inspection:

**High Pressure Compressor (HPC):**

- Stage 16 has heavy damage from a blade platform, and the material has not shown evidence of leaving the turbine. NOT SERVICABLE
- Remaining blades and vanes were inspected and are in condition

**Combustor Section:**

- Liners have discoloration and chipping
- Dome and dome ring have cracks

**High Pressure Turbine (HPT):**

- Stage 1 nozzle has erosion and corosion damage on the leading edge and a large amount of missing material on the trailing edge. The burn through on the outer platform is also present
- Stage 1 blade shows tip erosion and the shroud also has burn through
- Stage 2 nozzle has discoloration
- Stage 2 has large chips to the tip of the blade.

**Turbine Mid-Frame (TMF):**

- No Abnormalities found

**Power Turbine (PT):**

- Light discoloration andcorrosion was observed.

# Section 4: Used and Required Parts List

**Required Parts List**

| Nomenclature | Part No | Quantity |
|---|---|---|
| | | |
| | | |

**Used Parts List**

| Nomenclature | Part No | Quantity |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

# Section 5: Findings and Recommendations

## Findings

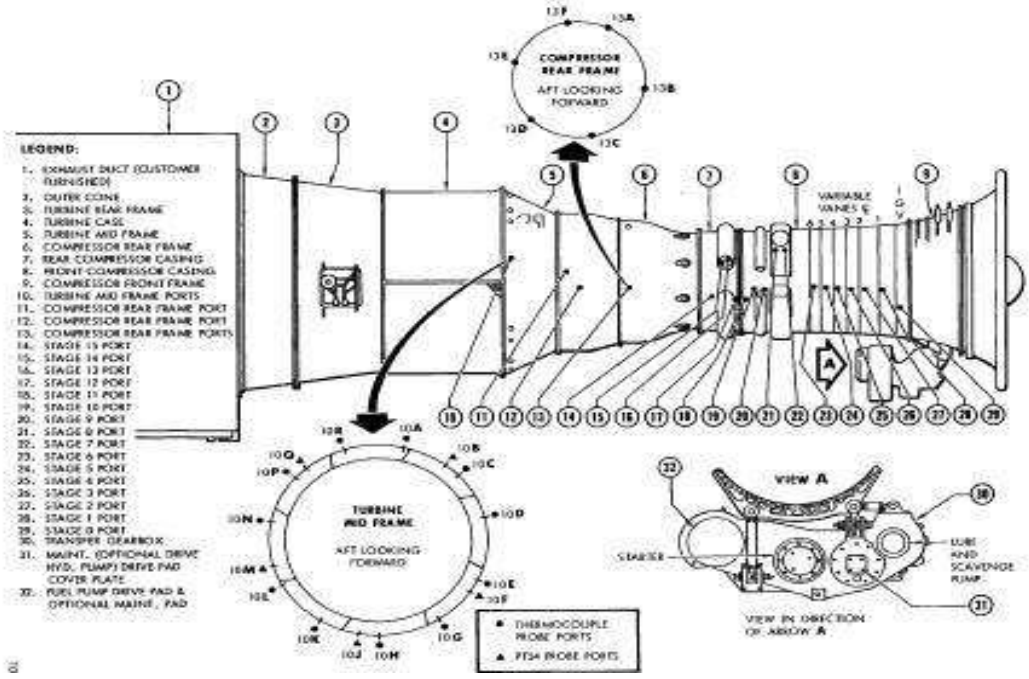
- There I heavy damage within the hot section that has burned completely through to the point the hot gas path has direct access to the outer case.
- The damage in the 16th stage shows jagged edges and missing material.
- This material has not been confirmed to have exited the turbine and could still be inside.

## Recommendations:

- Gas Turbine 557-254 NOT SERVICABLE. Perform hot-section and top-case.

# Section 6: Conclusion and Pictures

| **High Pressure Compressor** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect stages 1 through 16 blades for cracks, nicks, tears, burrs, dents, missing material, evidence of tip clang, curl, or deformation. | Inspected. |
| ☒Stage 1 Blades (Qty 36) & Vanes, | Serviceable |
| ☒Stage 2 Blades (Qty 26) & Vanes, | Serviceable |
| ☒Stage 3 Blades (Qty 38) & Vanes, | Serviceable |
| ☒Stage 4 Blades (Qty 42) & Vanes, | Serviceable |
| ☒Stage 5 Blades (Qty 44) & Vanes, | Serviceable |
| ☒Stage 6 Blades (Qty 48) & Vanes, | Serviceable |
| ☒Stage 7 Blades (Qty 54) & Vanes, | Serviceable |
| ☒Stage 8 Blades (Qty 56) & Vanes, | Serviceable |
| ☒Stage 9 Blades (Qty 64) & Vanes, | Serviceable |
| ☒Stage 10 Blades (Qty 66) & Vanes, | Serviceable |
| ☒Stage 11 Blades (Qty 66) & Vanes, | Serviceable |
| ☒Stage 12 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Stage 13 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Stage 14 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Stage 15 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Stage 16 Blades (Qty 76) & Vanes, | Not Serviceable |
| ☒Inspect for erosion, corrosion, or deposits. | Inspected |
| ☒Inspect for platform shingling, bowing, distortion, or cracks | Inspected. |


LEGEND:
1. EXHAUST DUCT (CUSTOMER FURNISHED)
2. OUTER CONE
3. TURBINE REAR FRAME
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AFT LOOKING FORWARD
TURBINE MID FRAME
AFT LOOKING FORWARD
VARIABLE VANES
IGV
View A
STARTER
VIEW IN DIRECTION OF ARROW A
THERMOCOUPLE PROBE PORTS
PT54 PROBE PORTS




**Stg 1**




**Stg 2**




**Stg 3**




**Stg 4**




**Stg 5**




**Stg 6**




**Stg 7**




**Stg 8**




**Stage 10**




**Stage 11**




**Stage 12**




**Stage 13**




**Stage 14**




**Stage 15**




**Stage 16**



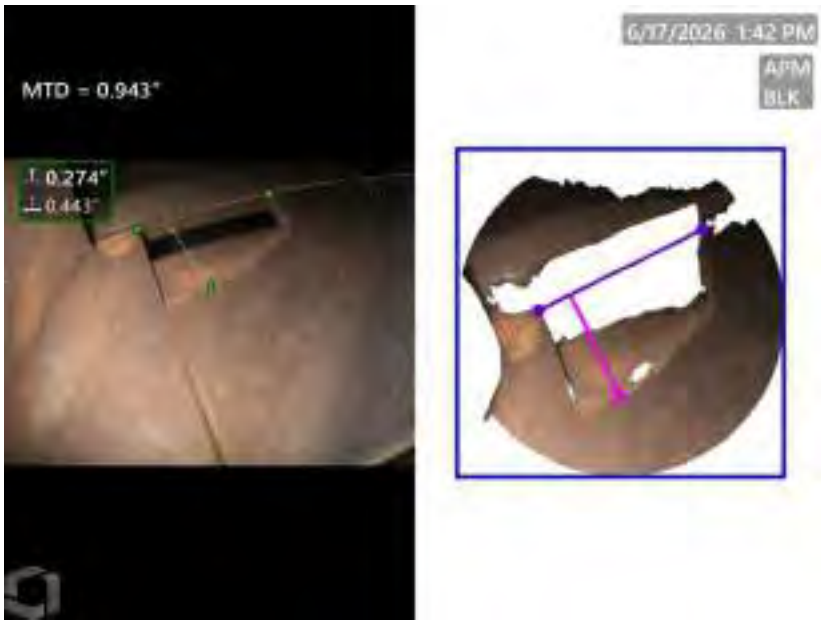

**Stage 16**



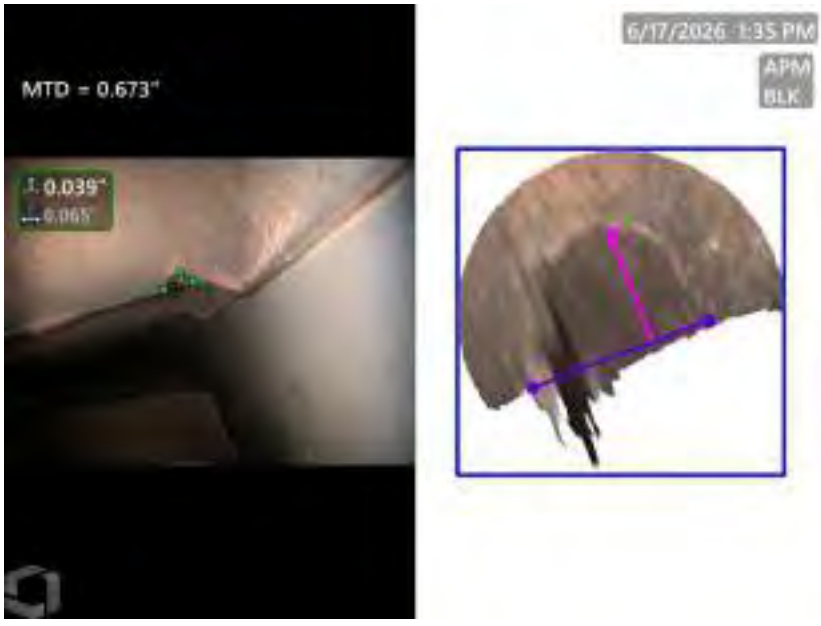

**Stage 16 Blade and Stator Damage**




**Stage 16 Blade and Stator Damage**




**Stage 17 Blade and Stator Damage**




**Stage 17 Blade and Stator Damage**

| **Combustor** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect combustor and 1st stage HPT Leading Edge with flex scope for burning, cracks, erosion, discoloration, wear and missing metal. | Observed discoloration on liners and all surfaces. Cracks and missing material |
| ☒Dome Plate | Ok |
| ☒Inner/Outer Liners | Burning on inner liners |
| ☒Igniter Tube Area | Ok. |
| ☒Fuel Nozzle Shrouds | Ok. |
| ☒Fuel Nozzle Axial Swirler/Venturi | Ok. |
| ☒1st Stage Nozzle | Erosion and corrosion found |
| ☒Igniter Tube Area | Ok |
| ☒Inspect all visible fuel nozzle tips for contamination or damage. | ok |




**Fuel Nozzle**




**Inner and outer Liner**




**Dome**




**Dome**

## HPT Section

| **HPT** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect 1st stage HPT Leading Edge through Ccombustion Chamber with flex scope for burning, cracks, erosion, discoloration, wear and missing metal. | Not Servicable |
| ☒HPT Stage 1 Rotor Blades (Qty 88) | Leading Edge Erosion, Tip Eroded up to tip cap |
| ☒HPT Stage 2 Nozzle | Not Servicable |
| ☒HPT Stage 2 Rotor Blades (Qty 90) | Not Servicable |




**HPT Stage 1**




**Stage 1 Burn through**



**Stage 1 Burn through**




**Stage 1 Burn through**




**Stage 1 Burn through**




**Stage 1 Burn through**




**Stage 1 Burn through**




**Stage 1 Burn through**




**Stage 2**




**Stage 2**




**Missing material**




**Missing material**

**LPT**

| **LPT** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect LPT with flex scope for burning, cracks, erosion, discoloration, wear and missing metal. | Discoloration and surface corrosion |
| ☒ Liner: Cracks in skin (no separation through aft ring) | No Anomaly noted. |
| ☒Missing material | No anomaly noted. |
| ☒Buckling or distortion | No anomaly noted. |
| | |




**LPT Stage 1**




**Discoloration**




**Rust and discoloration.**




# Final Report

**Date of Visit: 06/08/2026**

| | | | |
|---|---|---|---|
| **GESA Job #:** | PR557 | **Unit #:** | 7 |
| **PO#:** | MSA 107284 TO 1 | **Serial #:** | 557-230 |
| **Customer:** | Genera PR | **Engine/Machine:** | TM2500 |
| **Site Name:** | SJ Steam Plant /Palo Seco | **Description of Work:** | BSI |
| **Site Location:** | San Juan PR | **GESA Lead:** | Ruben Garcia/Caden Bergeron |

# Table of Contents

Section 1: Work Scope Summary
Section 2: Daily Events
Section 3: BSI, Turbine, and Turbine Package Inspection
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# Section 1: Work Scope Summary

**Gas Turbine Inspection Scope**

- Full Gas Turbine Borescope Inspection
  - Lube & Scavenge Pump Screens & Chip Detector Inspection
  - Gas Turbine Starter Oil Return Line Screen Inspection
  - Fuel Nozzle Inspection
  - T5.4 Thermocouple Inspection
  - Igniter Inspection
- Gas Turbine Exterior Inspection
  - VSV System Inspection
  - All external piping & hardware

# Section 2: Daily Events

**Monday, 06/09/2026**

- All borescope plugs were removed
- All Injectors have been removed already by the customer
- Removed and inspected #T5.4 thermocouple probe
- Removed and inspected igniters
- Performed hydraulic starter oil return line screen inspection
- Performed inspection for chip detector and screen on lube and scavenge pump
- Performed external piping and hardware inspection

# Section 3: BSI, Turbine, and Turbine Package Inspection

## External Inspection:

**Compressor Section:**

- The VSV actuation system was observed to be functioning properly

**Combustor Section**:

- External inspection was performed
- Igniters were inspected and found to be in satisfactory condition

**High Pressure Turbine (HPT) Section:**

- No abnormalities were observed on external surfaces

**Accessory Gearbox (AGB):**

- Chip detector and lube scavenge screen were inspected; no abnormalities were found
- Hydraulic starter return line was removed and inspected.

## Borescope Inspection:

**High Pressure Compressor (HPC):**

- Compressor rotor blades are in dirty condition
- Blades and vanes were inspected and are in serviceable condition

**Combustor Section:**

- More than 6 rivets were found to be missing and most are adjacent to others
- Igniters were removed and inspected; found to be serviceable
-

**High Pressure Turbine (HPT):**

- HPT rotor blades were inspected found damage and missing material leding airflow.
- HPT nozzles were inspected and found damage ,cracking missing material see pics below.

**Turbine Mid-Frame (TMF):**

- Detected corrosion

**Power Turbine (PT):**

- Light discoloration andcorrosion was observed.

# Section 4: Used and Required Parts List

**Required Parts List**

| | Nomenclature | Part No | Quantity | |
|---|---|---|---|---|
| | | | | |
| | | | | |

**Used Parts List**

| | Nomenclature | Part No | Quantity | |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

# Section 5: Findings and Recommendations

**Findings:**

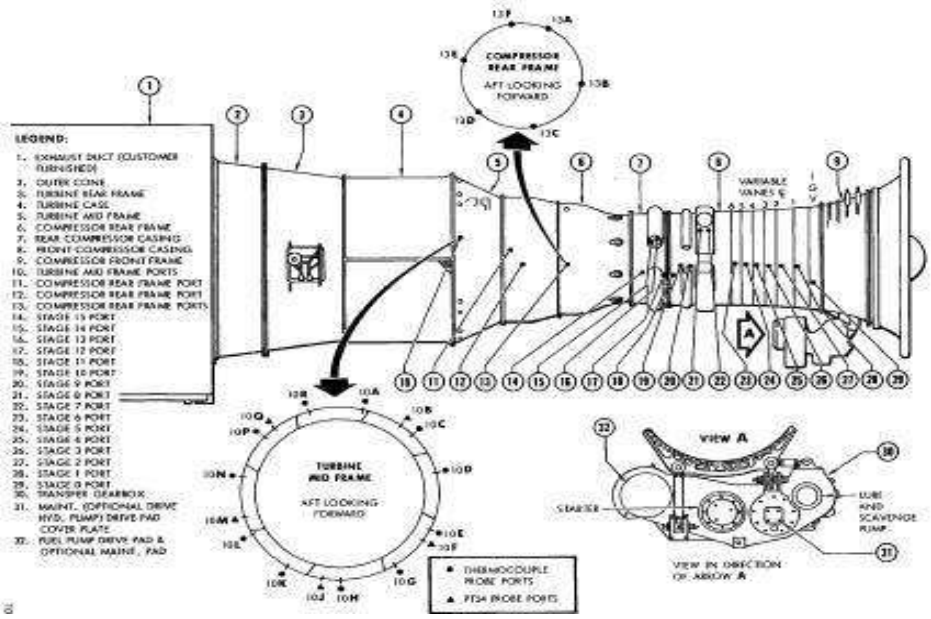
- Hot section Borescope ISP revealed damage to the first stage nozzle and first stage disk and second stage nozzle and 1 stage HPT blades.
- Cracks observed originating from the leading edges of the blades, with evidence of fracture and material loss in effected areas.

**Recommendations:**

- Based on the extent of the damage observed, removal of the engine/module from service recommended for further teardown inspection, evaluation, and repair or replacement of affected components in accordance with the manufacturer's maintenance instructions.

# Section 6: Conclusion and Pictures

| **High Pressure Compressor** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect stages 1 through 16 blades for cracks, nicks, tears, burrs, dents, missing material, evidence of tip clang, curl, or deformation. | Inspected. |
| ☒Stage 1 Blades (Qty 36) & Vanes, | Ok. |
| ☒Stage 2 Blades (Qty 26) & Vanes, | Ok. |
| ☒Stage 3 Blades (Qty 38) & Vanes, | Ok. |
| ☒Stage 4 Blades (Qty 42) & Vanes, | ok |
| ☒Stage 5 Blades (Qty 44) & Vanes, | Ok. |
| ☒Stage 6 Blades (Qty 48) & Vanes, | Ok. |
| ☒Stage 7 Blades (Qty 54) & Vanes, | Ok. |
| ☒Stage 8 Blades (Qty 56) & Vanes, | ok |
| ☒Stage 9 Blades (Qty 64) & Vanes, | Ok |
| ☒Stage 10 Blades (Qty 66) & Vanes, | Ok. |
| ☒Stage 11 Blades (Qty 66) & Vanes, | Ok. |
| ☒Stage 12 Blades (Qty 76) & Vanes, | Ok. |
| ☒Stage 13 Blades (Qty 76) & Vanes, | Ok. |
| ☒Stage 14 Blades (Qty 76) & Vanes, | Ok. |
| ☒Stage 15 Blades (Qty 76) & Vanes, | Ok. |
| ☒Stage 16 Blades (Qty 76) & Vanes, | Ok. |
| ☒Inspect for erosion, corrosion, or deposits. | Inspected |
| ☒Inspect for platform shingling, bowing, distortion, or cracks | Inspected. |




**High Pressure Compressor Photos:**




**Stg 1**




**Stg 2**




**Stg 3**




**Stg 4**




**Stg 5**




**Stg 6**




**Stg 7**




**Stg 8**




**Stage 10**




**Stage 11**




**Stage 12**




**Stage 13**




**Stage 14**




**Stage 15**




**Stage 16**




**Stage 17**

| **Combustor** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect combustor and 1st stage HPT Leading Edge with flex scope for burning, cracks, erosion, discoloration, wear and missing metal. | Observed discoloration on liners and all surfaces. Cracks and missing material |
| ☒Dome Plate | |
| ☒Inner/Outer Liners | Burning on inner liners |
| ☒Igniter Tube Area | Ok. |
| ☒Fuel Nozzle Shrouds | Ok. |
| ☒Fuel Nozzle Axial Swirler/Venturi | Ok. |
| ☒1st Stage Nozzle | Ok. |
| ☒Igniter Tube Area | |
| ☒Inspect all visible fuel nozzle tips for contamination or damage. | |

**Combustor Photos:**




**Fuel Nozzle**




**Inner and outer Liner**



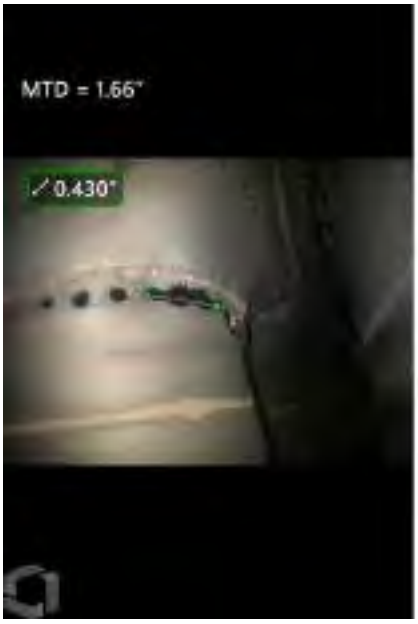

**Swirler Cup**




**Dome**




**Dome**







**Trumpet Damage**




**Trumpet Damage**

## HPT Section

| **HPT** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect 1st stage HPT Leading Edge through Combustor Chamber with flex scope for burning, cracks, erosion, discoloration, wear and missing metal. | Serviceble |
| ☒HPT Stage 1 Rotor Blades (Qty 88) | Damage missing material |
| ☒HPT Stage 2 Nozzle | Coating is chipping off |
| ☒HPT Stage 2 Rotor Blades (Qty 90) | Coating is chipping off |

**HPT:**




**Stage 1**




**Stage 1**







**Stage 1**







**Stage 1**




**Stage 1**




**Stage 1**




**Stage 2**




**Stage 2**




**Stage 2**




**Stage 2**







**Stage 2**




**Stage 2**

**LPT**

| **LPT** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect LPT with flex scope for burning, cracks, erosion, discoloration, wear and missing metal. | Discoloration on liners. |
| ☒ Liner: Cracks in skin (no separation through aft ring) | No Anomaly noted. |
| ☒Missing material | No anomaly noted. |
| ☒Buckling or distortion | No anomaly noted. |

**LPT:**




**LPT**




**LPT**




**LPT**




# Final Report

## Date of Visit: 06/19/2026

| | | | |
|---|---|---|---|
| **GESA Job #:** | PR557 | **Unit #:** | 8 |
| **PO#:** | MSA 107284 Task Order 1 | **Serial #:** | 557-242 |
| **Customer:** | Genera PR | **Engine/Machine:** | TM2500 |
| **Site Name:** | SJ Steam Plant /San Juan | **Description of Work:** | BSI |
| **Site Location:** | San Juan PR | **GESA Lead:** | Caden Bergeron |

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Section 1: Work Scope Summary
Section 2: Daily Events
Section 3: BSI
Section 4: Used and Required Parts
Section 5: Findings and Recommendations
Section 6: Conclusion and Pictures

# Section 1: Work Scope Summary

**Gas Turbine Inspection Scope**

- Full Gas Turbine Borescope Inspection
  - Lube & Scavenge Pump Screens & Chip Detector Inspection
  - Gas Turbine Starter Oil Return Line Screen Inspection
  - Fuel Nozzle Inspection
  - T5.4 Thermocouple Inspection
  - Igniter Inspection
- Gas Turbine Exterior Inspection
  - VSV System Inspection
  - All external piping & hardware

# Section 2: Daily Events

**Monday, 06/19/2026**

- All borescope plugs were removed.
- Removed and inspected #T5.4 thermocouple probe.
- Removed and inspected igniters.
- Performed hydraulic starter oil return line screen inspection.
- Performed inspection for chip detector and screen on lube and scavenge pump.
- Performed external piping and hardware inspection.

# Section 3: BSI, Turbine, and Turbine Package Inspection

## External Inspection:

**Compressor Section:**

- The VSV actuation system was observed to be functioning properly

**Combustor Section**:

- External inspection was performed
- Igniters were inspected and found to be in satisfactory condition

**High Pressure Turbine (HPT) Section:**

- No abnormalities were observed on external surfaces

**Accessory Gearbox (AGB):**

- Chip detector and lube scavenge screen were inspected; no abnormalities were found
- Hydraulic starter return line was removed and inspected.

## Borescope Inspection:

**High Pressure Compressor (HPC):**

- Blades and vanes were inspected and are in serviceable condition
- All locking lugs are present and set correctly

**Combustor Section:**

- Combustor Dome cups have burn through.
- Igniters were removed and inspected
- Liners have Burn through around the rivets and near the dome ring.

**High Pressure Turbine (HPT):**

- Stage 1 Nozzle has tailing edge distortion and burn though on few airfoils.
- Stage 1 has many blades with leading edge holes that exopse cooling passages. Also the shroud has many areas erosion and blade rubbing. NOT SERVICEABLE
- Stage 2 nozzles has few areas of burn through where cooling passages are exposed. NOT SERVICEABLE
- Stage 2 Blades have a few arifoils with large holes exopsing cooling pasages and there is rubbing on the shroud. NOT SERVICEABLE

**Turbine Mid-Frame (TMF):**

- No Abnormalities

**Power Turbine (PT):**

- No Abnormalities

# Section 4: Used and Required Parts List

**Required Parts List**

| | Nomenclature | Part No | Quantity | |
|---|---|---|---|---|
| | | | | |
| | | | | |

**Used Parts List**

| | Nomenclature | Part No | Quantity | |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

# Section 5: Findings and Recommendations

**Findings**

- Dome cups have material missing from burn through.
- Liner have burning around the domes and rivets.
- HPT Stage 1 has holes in the leading edge of the blades. NOT SERVICEABLE
- HPT Stage 1 Nozzle has burns, one blade with missing material, and another with trailing edge distortion.
- HPT Stage 2 nozzle had one airfoil with heavy burn through on the trailing edge and the concave portion that covers a large area. NOT SERVICEABLE
- HPT Stage 2 Blades have multiple airfoils with holes that expose the cooling passages and larger tip chips. NOT SERVICEABLE

**Recommendations:**

- Perform hot section replace damaged nozzle segments/HPT per GEK 105054 SW 406 00.

# Section 6: Conclusion and Pictures



**VSV Assembly**




**Chip Detectors**

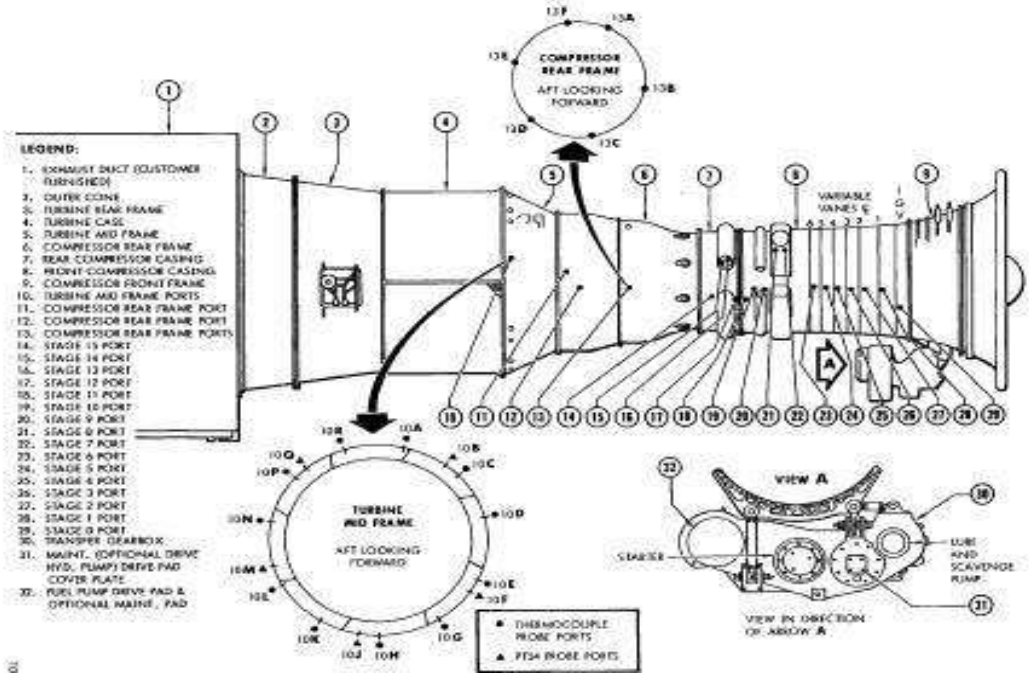


**Starter Return Line Screen**



**Thermocouple**

| High Pressure Compressor | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect stages 1 through 16 blades for cracks, nicks, tears, burrs, dents, missing material, evidence of tip clang, curl, or deformation. | Inspected. |
| ☒Stage 1 Blades (Qty 36) & Vanes, | Ok. |
| ☒Stage 2 Blades (Qty 26) & Vanes, | Ok. |
| ☒Stage 3 Blades (Qty 38) & Vanes, | Ok. |
| ☒Stage 4 Blades (Qty 42) & Vanes, | ok |
| ☒Stage 5 Blades (Qty 44) & Vanes, | Ok. |
| ☒Stage 6 Blades (Qty 48) & Vanes, | Ok. |
| ☒Stage 7 Blades (Qty 54) & Vanes, | Ok. |
| ☒Stage 8 Blades (Qty 56) & Vanes, | ok |
| ☒Stage 9 Blades (Qty 64) & Vanes, | Ok |
| ☒Stage 10 Blades (Qty 66) & Vanes, | Ok. |
| ☒Stage 11 Blades (Qty 66) & Vanes, | Ok. |
| ☒Stage 12 Blades (Qty 76) & Vanes, | Ok. |
| ☒Stage 13 Blades (Qty 76) & Vanes, | Ok. |
| ☒Stage 14 Blades (Qty 76) & Vanes, | Ok. |
| ☒Stage 15 Blades (Qty 76) & Vanes, | Ok. |
| ☒Stage 16 Blades (Qty 76) & Vanes, | Ok. |
| ☒Inspect for erosion, corrosion, or deposits. | Inspected |
| ☒Inspect for platform shingling, bowing, distortion, or cracks | Inspected. |


LEGEND:
COMPRESSOR REAR FRAME
AFT LOOKING FORWARD
TURBINE MID FRAME
AFT LOOKING FORWARD
VIEW A
VIEW IN DIRECTION OF ARROW A
THERMOCOUPLE PROBE PORTS
PT54 PROBE PORTS

**High Pressure Compressor Photos:**




**Stage 1**




**Stage 2**



**Stage 3**




**Stage 4**




**Stage 5**




**Stage 6**




**Stage7**




**Stage 8**




**Stage 9**




**Stage 10**




**Stage 11**




**Stage 12**




**Stage 13**




**Stage 14**




**Stage 15**




**Stage 16**

| **Combustor** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect combustor and 1st stage HPT Leading Edge with flex scope for burning, cracks, erosion, discoloration, wear, and missing metal. | OK |
| ☒Dome Plate | Dome cup is burned through in a few areas |
| ☒Inner/Outer Liners | Burning on inner and outer liners near rivets and dome plate |
| ☒Igniter Tube Area | Ok. |
| ☒Fuel Nozzle Shrouds | Ok. |
| ☒Fuel Nozzle Axial Swirler/Venturi | ok |
| ☒1st Stage Nozzle | Ok. |
| ☒Igniter Tube Area | ok |
| ☒Inspect all visible fuel nozzle tips for contamination or damage. | ok |

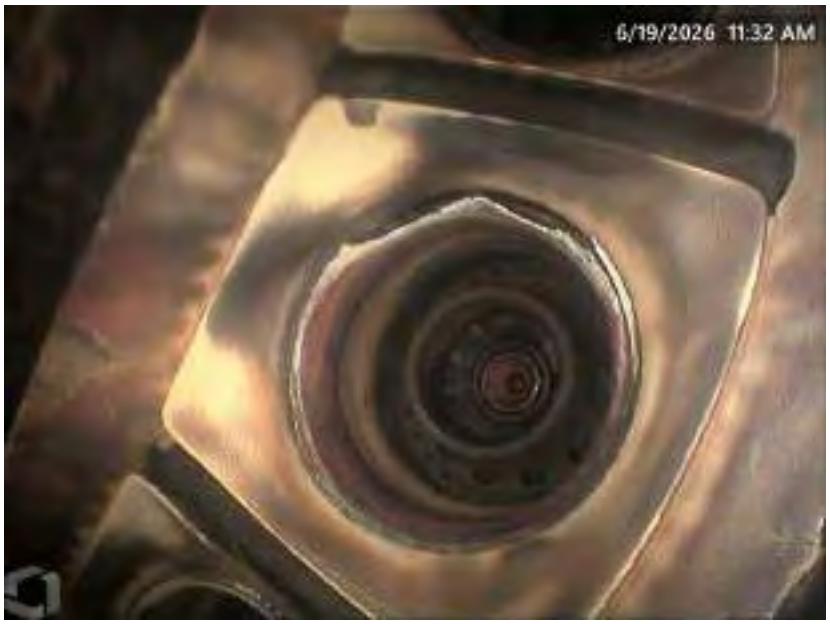
**Combustor Photos:**




**Dome cup with signs if burn through**




**Doe cups, inner liner**




**Dome cup with signs if burn through**



**Outer liner with signs of burn through**



**Ignitors**

| **HPT** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect 1st stage HPT Leading Edge through combustor Chamber with flex scope for burning, cracks, erosion, discoloration, wear, and missing metal. | Minimal Distortion and Erosion. |
| ☒HPT Stage 1 Rotor Blades (Qty 88) | Many large leading edge holes NOT SERVICEABLE |
| ☒HPT Stage 2 Nozzle | Burn through and missing material. NOT SERVICEABLE |
| ☒HPT Stage 2 Rotor Blades (Qty 90) | Large holes exposing cooling passages. NOT SERVICEABLE |

**HPT**




**Stage 1**







**Stage 1 missing material**




**Damaged edge**




**Wear damage**



**Leading edge missing material**




**Hole on leading edge**




**Hole on leading edge**



**Cracked edge.**




**Stage 2 Discoloration**




**Leading edges rubbing**




**Damaged and missing material**




**Damaged and missing material**




**Large hole damage**



**Leading edge making contact with seam liner**




**Leading edge damage**




**Crack damage near edge**

| **LPT** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect LPT with flex scope for burning, cracks, erosion, discoloration, wear, and missing metal. | No Anomaly noted. |
| ☒ Liner: Cracks in skin (no separation through aft ring) | No Anomaly noted. |
| ☒Missing material | No anomaly noted. |
| ☒Buckling or distortion | No anomaly noted. |

**LPT**




**Discoloration**




**Seam intact**




**Discoloration**




# Final Report

**Date of Visit: 06/08/2026**

| | | | |
|---|---|---|---|
| **GESA Job #:** | PR557 | **Unit #:** | 9 |
| **PO#:** | 107284 Task Order 1 | **Serial #:** | 557-266 |
| **Customer:** | Genera PR | **Engine/Machine:** | TM2500 |
| **Site Name:** | SJ Steam Plant / San Juan | **Description of Work:** | BSI |
| **Site Location:** | San Juan PR | **GESA Lead:** | Caden Bergeron |

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# Section 1: Work Scope Summary

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  - Lube & Scavenge Pump Screens & Chip Detector Inspection
  - Gas Turbine Starter Oil Return Line Screen Inspection
  - Fuel Nozzle Inspection
  - Ignitor Inspection
  - T5.4 Thermocouple Inspection
- Gas Turbine Exterior Inspection
  - VSV System Inspection
  - All external piping & hardware

# Section 2: Daily Events

**Monday, 06/18/2026**

- All borescope plugs were removed
- Removed and inspected #T5.4 thermocouple probe
- Performed inspection for chip detector and screen on lube and scavenge pump
- Performed external piping and hardware inspection

# Section 3: BSI, Turbine, and Turbine Package Inspection

## External Inspection:

**Compressor Section:**

- The VSV System was not in an operational state. NOT SERVICEABLE

**Combustor Section**:

- External inspection was performed
- Igniters were not present

**High Pressure Turbine (HPT) Section:**

- No abnormailites found

**Accessory Gearbox (AGB):**

- Chip detector and lube scavenge screen were inspected and D-sump had coke. PUT ON 24hr WATCH
- Hydraulic starter return line screen was not present. Removed and used on another turbine. NOT SERVICEABLE

## Borescope Inspection:

**High Pressure Compressor (HPC):**

- Remaining blades and vanes were inspected

**Combustor Section:**

- Liners have burn through in numerous areas. NOT SERVICEABLE
- Dome and dome plate have chips and burns. NOT SERVICEABLE

**High Pressure Turbine (HPT):**

- Stage 1 nozzle has a hole in the platform. NOT SERVICEABLE
- Stage 1 blade is rubbing on the shroud
- Stage 2 nozzle has no abnormalities
- Stage 2 blade has no abnormalities

**Turbine Mid-Frame (TMF):**

- No Abnormalities found

**Power Turbine (PT):**

- Light discoloration andcorrosion was observed.

# Section 4: Used and Required Parts List

**Required Parts List**

| | Nomenclature | Part No | Quantity | |
|---|---|---|---|---|
| | | | | |
| | | | | |

**Used Parts List**

| | Nomenclature | Part No | Quantity | |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

# Section 5: Findings and Recommendations

**Findings**

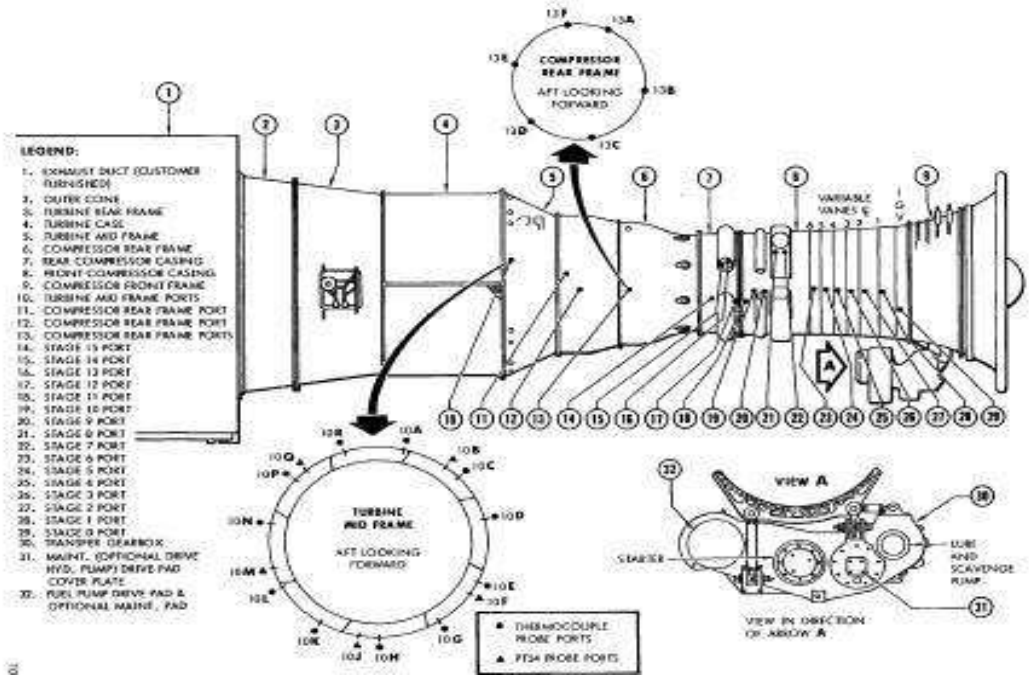
- VSV found incomplete and missing parts.
- Bell mount and inlet are not installed
- Stage 1 Nozzle has large amounts of erosion and burning.
- Ignition and fuel system are not complete.
- Combustion section has numerous large areas of burns and chipping
- NOT SERVICEABLE

**Recommendations:**

- Gas Turbine 557-266 NOT SERVICEABLE. Perform hot-section.
- D-Sump chip detector had large amounts of coke built up in the screen as per GE the unit would need to be put under a 24HR WATCH per GEK 105054 WP 400 00
- 1 Inspect and clean chip detectors and lube and scavenge pump screens, and monitor lube system parameters and vibration levels daily until source of contamination is located.
- 2 Engine can be removed from watch status and returned to normal inspection schedule, if screens and chip detectors are free of debris for two consecutive days.
- 3 If a chip detector alarm is received on a unit operating in on-watch mode, immediately shut down the unit and contact GE for instructions.

# Section 6: Conclusion and Pictures

| **High Pressure Compressor** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect stages 1 through 16 blades for cracks, nicks, tears, burrs, dents, missing material, evidence of tip clang, curl, or deformation. | Inspected. |
| ☒Stage 1 Blades (Qty 36) & Vanes, | Serviceable |
| ☒Stage 2 Blades (Qty 26) & Vanes, | Serviceable |
| ☒Stage 3 Blades (Qty 38) & Vanes, | Serviceable |
| ☒Stage 4 Blades (Qty 42) & Vanes, | Serviceable |
| ☒Stage 5 Blades (Qty 44) & Vanes, | Serviceable |
| ☒Stage 6 Blades (Qty 48) & Vanes, | Serviceable |
| ☒Stage 7 Blades (Qty 54) & Vanes, | Serviceable |
| ☒Stage 8 Blades (Qty 56) & Vanes, | Serviceable |
| ☒Stage 9 Blades (Qty 64) & Vanes, | Serviceable |
| ☒Stage 10 Blades (Qty 66) & Vanes, | Serviceable |
| ☒Stage 11 Blades (Qty 66) & Vanes, | Serviceable |
| ☒Stage 12 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Stage 13 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Stage 14 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Stage 15 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Stage 16 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Inspect for erosion, corrosion, or deposits. | Inspected |
| ☒Inspect for platform shingling, bowing, distortion, or cracks | Inspected. |


LEGEND:
1. EXHAUST DUCT (CUSTOMER FURNISHED)
3. OUTER CONE
4. TURBINE REAR FRAME
5. TURBINE CASE
6. TURBINE MID FRAME
7. COMPRESSOR REAR FRAME
8. REAR COMPRESSOR CASING
9. FRONT COMPRESSOR CASING
10. COMPRESSOR FRONT FRAME
11. TURBINE MID FRAME PORTS
12. COMPRESSOR REAR FRAME PORT
13. COMPRESSOR REAR FRAME PORTS
14. STAGE 15 PORT
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25. STAGE 4 PORT
26. STAGE 3 PORT
27. STAGE 2 PORT
28. STAGE 1 PORT
29. STAGE 0 PORT
30. TRANSFER GEARBOX
31. MAINT. (OPTIONAL DRIVE HYD. PUMP) DRIVE PAD COVER PLATE
32. FUEL PUMP DRIVE PAD & OPTIONAL MAINT. PAD
COMPRESSOR REAR FRAME
AFT LOOKING FORWARD
TURBINE MID FRAME
AFT LOOKING FORWARD
VARIABLE VANES
VIEW A
STARTER
VIEW IN DIRECTION OF ARROW A
THERMOCOUPLE PROBE PORTS
PT54 PROBE PORTS



**VSV Assembly**



**Thermocouple**



**Chip Detectors**



**Inlet**



**Ignitors**



**Fuel System**




**Stg 1**




**Stg 2**




**Stg 3**




**Stg 4**




**Stg 5**




**Stg 6**




**Stg 7**




**Stg 8**




**Stage 9**




**Stage 10**




**Stage 11**




**Stage 12**




**Stage 13**




**Stage 14**




**Stage 15**




**Stage 16**

| **Combustor** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect combustor and 1st stage HPT Leading Edge with flex scope for burning, cracks, erosion, discoloration, wear and missing metal. | NOT SERVICEABLE |
| ☒Dome Plate | NOT SERVICEABLE |
| ☒Inner/Outer Liners | NOT SERVICEABLE |
| ☒Igniter Tube Area | Ok. |
| ☒Fuel Nozzle Shrouds | Ok. |
| ☒Fuel Nozzle Axial Swirler/Venturi | |
| ☒1st Stage Nozzle | NOT SERVICEABLE |
| ☒Igniter | Not Present |
| ☒Inspect all visible fuel nozzle tips for contamination or damage. | Some nozzles present but not removed due to turbine status. |

**Combustor Photos:**




**Inner Liner**




**Outer Liner**




**Dome**




**Dome**

## HPT Section

| **HPT** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect 1st stage HPT Leading Edge through Ccombustion Chamber with flex scope for burning, cracks, erosion, discoloration, wear and missing metal. | NOT SERVICEABLE |
| ☒HPT Stage 1 Rotor Blades (Qty 88) | OK |
| ☒HPT Stage 2 Nozzle | OK |
| ☒HPT Stage 2 Rotor Blades (Qty 90) | OK |

**HPT**




**Stage 1**




**Stage 1**




**Stage 1**




**Stage 1**




**Stage 2**




**Stage 2**




**Stage 2**




**Stage 2**

**LPT**

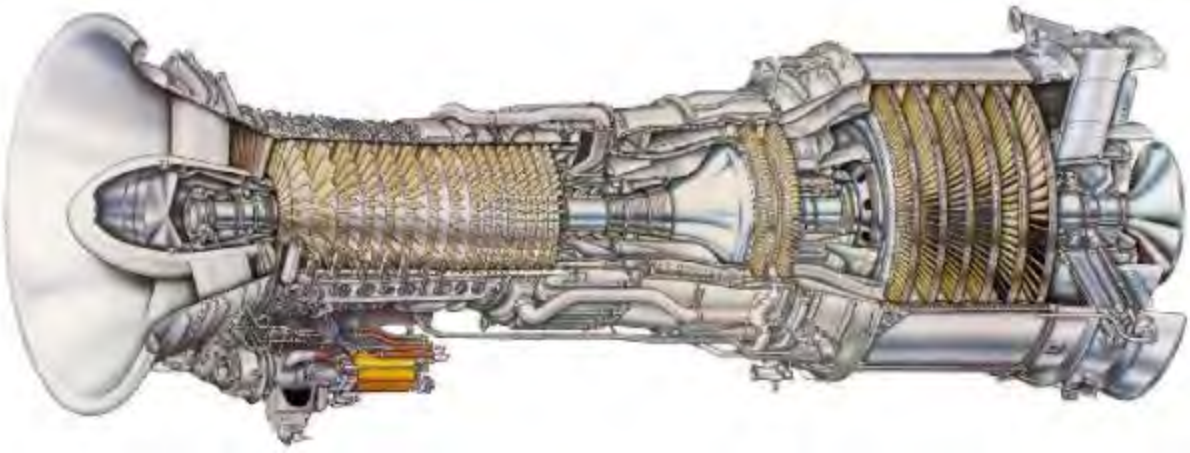
| **LPT** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect LPT with flex scope for burning, cracks, erosion, discoloration, wear and missing metal. | ok |
| ☒ Liner: Cracks in skin (no separation through aft ring) | ok |
| ☒Missing material | ok |
| ☒Buckling or distortion | ok |




**LPT**




**LPT**



# Final Report

## Date of Visit: 06/21/2026

| | | | |
|---|---|---|---|
| **GESA Job #:** | PR557 | **Unit #:** | 10 |
| **PO#:** | MSA 107284 Task Order 1 | **Serial #:** | 557-262 |
| **Customer:** | Genera PR | **Engine/Machine:** | TM2500 |
| **Site Name:** | SJ Steam Plant /San Juan | **Description of Work:** | BSI |
| **Site Location:** | San Juan PR | **GESA Lead:** | Caden Bergeron |

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  - Gas Turbine Starter Oil Return Line Screen Inspection
  - Fuel Nozzle Inspection
  - T5.4 Thermocouple Inspection
  - Igniter Inspection
- Gas Turbine Exterior Inspection
  - VSV System Inspection
  - All external piping & hardware

# Section 2: Daily Events

**Sunday, 06/21/2026**

- All borescope plugs were removed
- Removed and inspected #T5.4 thermocouple probe
- Removed and inspected igniters
- Performed hydraulic starter oil return line screen inspection
- Performed inspection for chip detector and screen on lube and scavenge pump
- Performed external piping and hardware inspection

# Section 3: BSI, Turbine, and Turbine Package Inspection

## External Inspection:

**Compressor Section:**

- The VSV actuation system was observed to be functioning properly

**Combustor Section**:

- External inspection was performed
- Igniters were inspected and found to be in satisfactory condition

**High Pressure Turbine (HPT) Section:**

- No abnormalities were observed on external surfaces

**Accessory Gearbox (AGB):**

- Chip detector and lube scavenge screen were inspected; no abnormalities were found
- No External Damage
- Hydraulic starter return line was removed and inspected.

## Borescope Inspection:

**High Pressure Compressor (HPC):**

- Blades and vanes were inspected

**Combustor Section:**

- Numerous holes and cracks were found in the Dome and Trumpet Plate. NON SERVICEABLE
- Igniters were removed and inspected
- Axial Cracks in dome band
- Nozzles Inspected

**High Pressure Turbine (HPT):**

- Stage 1 nozzles had Burns on the air foil. Heavy Erosion on the inner platform causing holes. NON SERVICEABLE
- Stage 1 blades rubbing on shround in some areas. NON SERVICEABLE
- Stage 2 nozzles Inspected
- Stage 2 blades had large chips that exceeded the tip cap. NON SERVICEABLE

**Turbine Mid-Frame (TMF):**

- No Abnormalities

**Power Turbine (PT):**

- Light discoloration andcorrosion was observed.

# Section 4: Used and Required Parts List

**Required Parts List**

| | | Nomenclature | Part No | Quantity |
|---|---|---|---|---|
| | | | | |
| | | | | |

**Used Parts List**

| | Nomenclature | Part No | Quantity | |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

# Section 5: Findings and Recommendations

**Findings:**

- Dome and Trumpet Plate have numerous holes and cracks. NOT SERVICEABLE
- HPT Stage 1 nozzle has holes in the inner platform. NOT SERVICEABLE
- HPT Stage 1 blade is rubbing against the shroud leaving deep grooves. NOT SERVICEABLE
- HPT Stage 2 blades have chips that exceed the tip cap. NOT SERVICEABLE

**Recommendations:**

- Per GEK 105054 WP 406 00, Unit 557-626 Is NOT SERVICEABLE. Recommend replacing hot section.

# Section 6: Conclusion and Pictures



**VSV assembly**



**Chip detectors (A,B,C,D,AGB)**

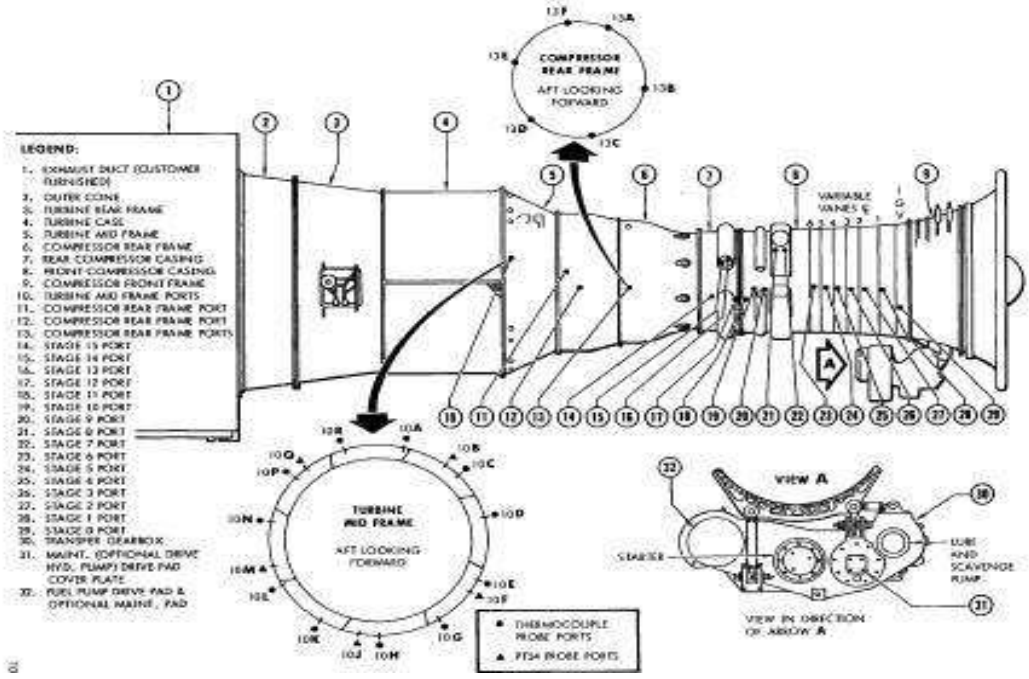


**Starter return line strainer**



**Thermocouple**

| High Pressure Compressor | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect stages 1 through 16 blades for cracks, nicks, tears, burrs, dents, missing material, evidence of tip clang, curl, or deformation. | Inspected. |
| ☒Stage 1 Blades (Qty 36) & Vanes, | Serviceable |
| ☒Stage 2 Blades (Qty 26) & Vanes, | Serviceable |
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| ☒Stage 12 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Stage 13 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Stage 14 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Stage 15 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Stage 16 Blades (Qty 76) & Vanes, | Serviceable |
| ☒Inspect for erosion, corrosion, or deposits. | Inspected |
| ☒Inspect for platform shingling, bowing, distortion, or cracks | Inspected. |


LEGEND:
1. EXHAUST DUCT (CUSTOMER FURNISHED)
3. OUTER CONE
4. TURBINE REAR FRAME
5. TURBINE CASE
6. TURBINE MID FRAME
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VARIABLE VANES
TURBINE MID FRAME
AFT LOOKING FORWARD
VIEW A
STARTER
VIEW IN DIRECTION OF ARROW A
THERMOCOUPLE PROBE PORTS
PT54 PROBE PORTS

**High Pressure Compressor Photos:**




**Stg 1**




**Stg 2**




**Stg 3**



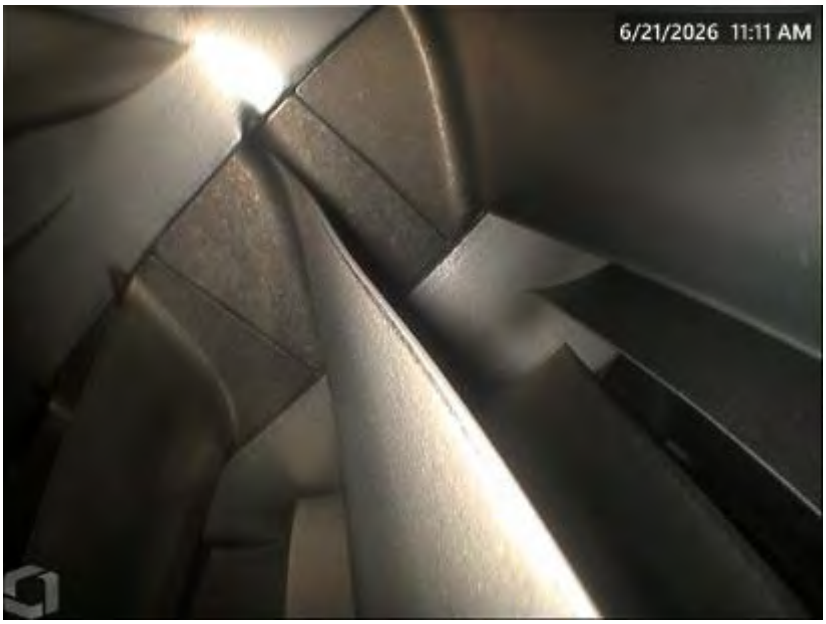

**Stg 4**




**Stg 5**




**Stg 6**




**Stg 7**




**Stg 8**




**Stg 9**




**Stg 10**




**Stg 11**




**Stg 12**




**Stg 13**




**Stg 14**




**Stg 15**



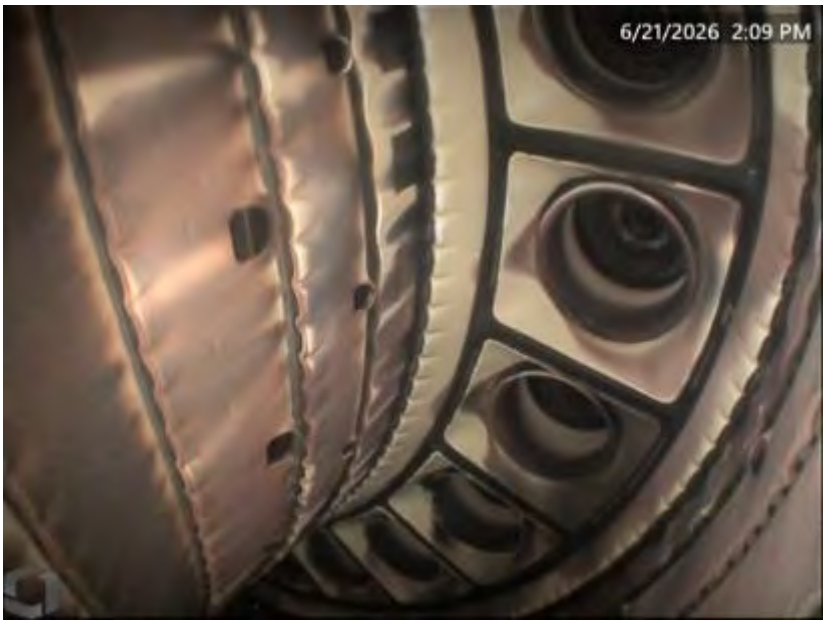

**Stg 16**

| **Combustor** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect combustor and 1st stage HPT Leading Edge with flex scope for burning, cracks, erosion, discoloration, wear and missing metal. | Observed numerous holes and cracks in the dome plate. The dome ring also has axial cracks. |
| ☒Dome Plate | NON SERVICEABLE |
| ☒Inner/Outer Liners | Ok. |
| ☒Igniter Tube Area | Ok. |
| ☒Fuel Nozzle Shrouds | Ok. |
| ☒Fuel Nozzle Axial Swirler/Venturi | Ok. |
| ☒1st Stage Nozzle | Ok. |
| ☒Igniter Tube Area | OK |
| ☒Inspect all visible fuel nozzle tips for contamination or damage. | OK |

**Combustor Photos:**




**Inner and outer liner**



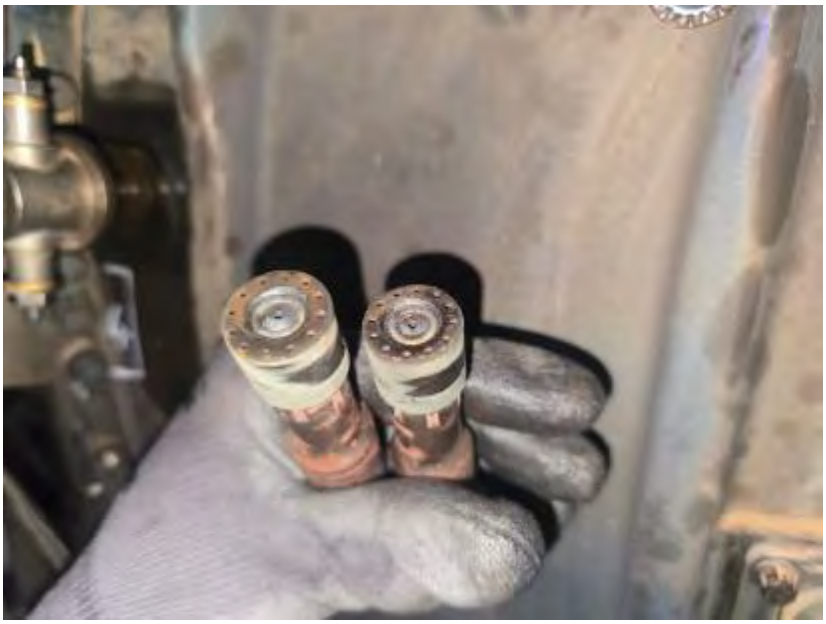

**Dome plate**




**Dome plate not serviceable 1**




**Dome plate not serviceable 2**



**Ignitors**



**Fuel nozzle**

## HPT Section

| **HPT** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect 1st stage HPT Leading Edge through Combustion Chamber with flex scope for burning, cracks, erosion, discoloration, wear and missing metal. | NON SERVICEABLE |
| ☒HPT Stage 1 Rotor Blades (Qty 88) | ok |
| ☒HPT Stage 2 Nozzle | ok |
| ☒HPT Stage 2 Rotor Blades (Qty 90) | NON SERVICEABLE |




**Stg 1**




**Stg 1 continued**




**Stg 1 continued**




**Stg 2**




**Stg 2 continued**



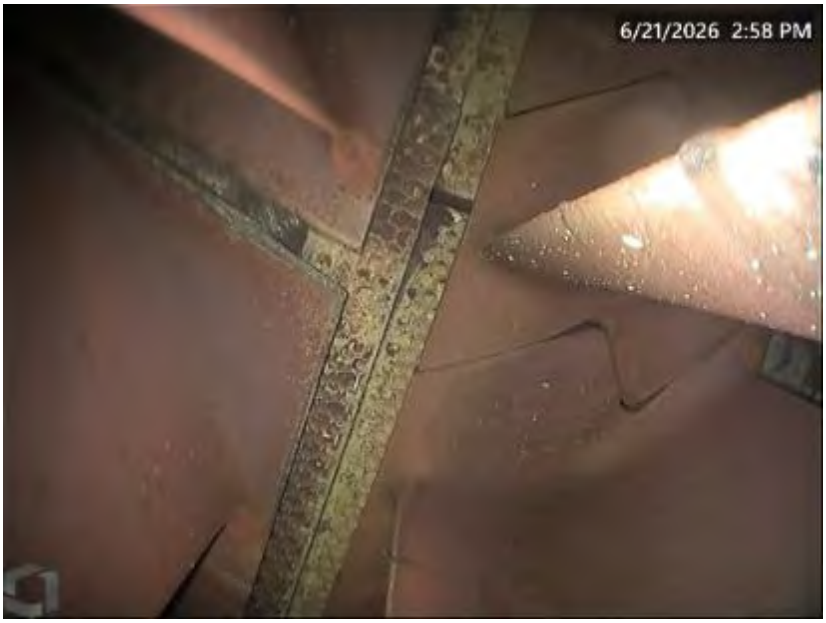
**Tip damage on stg 2 blade tip . Not serviceable.**

**LPT**

| **LPT** | |
|---|---|
| Inspection Area | Comments |
| ☒Inspect LPT with flex scope for burning, cracks, erosion, discoloration, wear and missing metal. | No Anomaly noted. |
| ☒ Liner: Cracks in skin (no separation through aft ring) | No Anomaly noted. |
| ☒Missing material | No anomaly noted. |
| ☒Buckling or distortion | No anomaly noted. |




**Stg 1**




**Honeycomb stg 1 blade**




**Honeycomb stg 1 blade**

# BORESCOPE INSPECTION REPORT
# TM2500 GEN. 6-7
## *7LM2500 – PK – MDWG05*

## NEW FORTRESS ENERGY

## Palo Seco, PR

## PACKAGE # 7251610

## UNIT #1

| | | | |
|---|---|---|---|
| **Visit Date:** | 08/22/2025 | **Total Starts:** | 699 |
| **Engine S/N:** | 557-259 | **GG Hours:** | 18733 |
| **Power Turbine S/N:** | 557-259 | **PT Hours:** | 18733 |
| **SOM GT Field Engineer:** | Daniel Arroyo | **New Fortress Representative:** | Jonathan Rodriguez |



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1 Conclusions and Recommendations 3

2 Outage Data 4

3 Borescope Inspection Checklist 5

4 Borescope Inspection Record 6

4.1 Compressor Section

4.2 Combustor and 1St Stage Nozzle Section

4.3 Turbine Section

4.4 LPT Section

## 1. Conclusions and Recommendations

**Purpose of visit:**

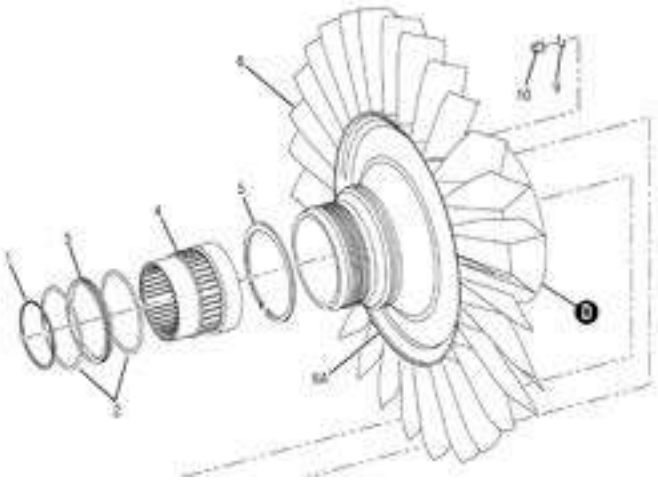
The purpose of this visit was to perform a borescope inspection of the Engine in accordance with GEK105054, WP 406 00.

1.1 The HPC serviceable according to GEK105054, WP 406 00 Table 4. No damages were found.

**Please note the following (Refer to Picture 8):**

During the inspection of the rotor weep holes, it was detected a metallic pice that seems to be loose inside the rotor hub. This piece could be part of the Encased Plain Seal (Item 1) or part of the Retaining Ring (Item 5) showed in the IPB Figure 9 " HPC Rotor Assembly Breakdown". Any of the parts mentioned could have broken, and the piece seen in the weep hole could be a detached fragment.

Regardless of the consequences that may arise from the breakage of the aforementioned parts, there is a risk that a fragment may be propelled into the HPC air path causing a DOD.



1.2 The Combustor section is serviceable according to GEK105054, WP 406 00 Table 7.

1.3 The High Pressure Turbine section is **Not Serviceable** according to GEK105054 WP 406 00 due to the condition of the Stage 1 and Stage 2 blades. 50% of Stage 1 blades have burn through at the tip, and about 85% of stage 2 blades have burn through damage at the tip. These damages are Not Serviceable according to Table 8 Paragraphs 6, 7 and 8.

1.4 The LPT is serviceable according to GEK105054 Volume II WP40600.

## 2. Outage Data

### Engine Data

| ESN: | 557-259 | Engine Fired Hours: | 18733 | Package Hours: | 18733 |
|---|---|---|---|---|---|
| Model: | 7LM2500-PK-MDWG05 | Engine Fired starts: | 699 | Package Fired Starts: | 699 |

**MAINTENANCE DATA**

| WP, SB, SL, PB, PL Performed | GEK105054, REV 11 | Date completed | Comments |
|---|---|---|---|
| WP 406 00 | Borescope Inspection | 22AUG25 | **Not Serviceable** |

**Parts Data**

| Description | PN Removed | SN Removed | Qty | Disposition | PN Installed | SN Installed |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

## 3. Borescope Inspection Checklist

**Date unit out of operation:** 08/22/2025
**Date unit into operation:** 08/22/2025
**Last inspection date:**

**Type of Fuel:** Gas / Diesel
**Type of NOx suppression:** Water Injection
**Type of outage:** Scheduled BSI

**Inspection of gas turbine:**

| WATERWASH: | HIGH PRESSURE COMPRESSOR: |
|---|---|
| ☒ PERFORMED WATER WASH | ☒ HPC BORESCOPE INSPECTION |
| **COMBUSTOR:** | **HIGH PRESSURE TURBINE** |
| ☒ COMBUSTOR BORESCOPE INSPECTION | ☒ HPT STAGE 1 & 2 NOZZLE BORESCOPE INSPECTION |
| | ☒ HPT BLADE BORESCOPE INSPECTION |
| **LOW PRESSURE TURBINE:** | |
| ☒ LPT BORESCOPE INSPECTION | |

☒ ***Please verify all borescope plugs have been reinstalled***

## 4. Borescope Inspection Record

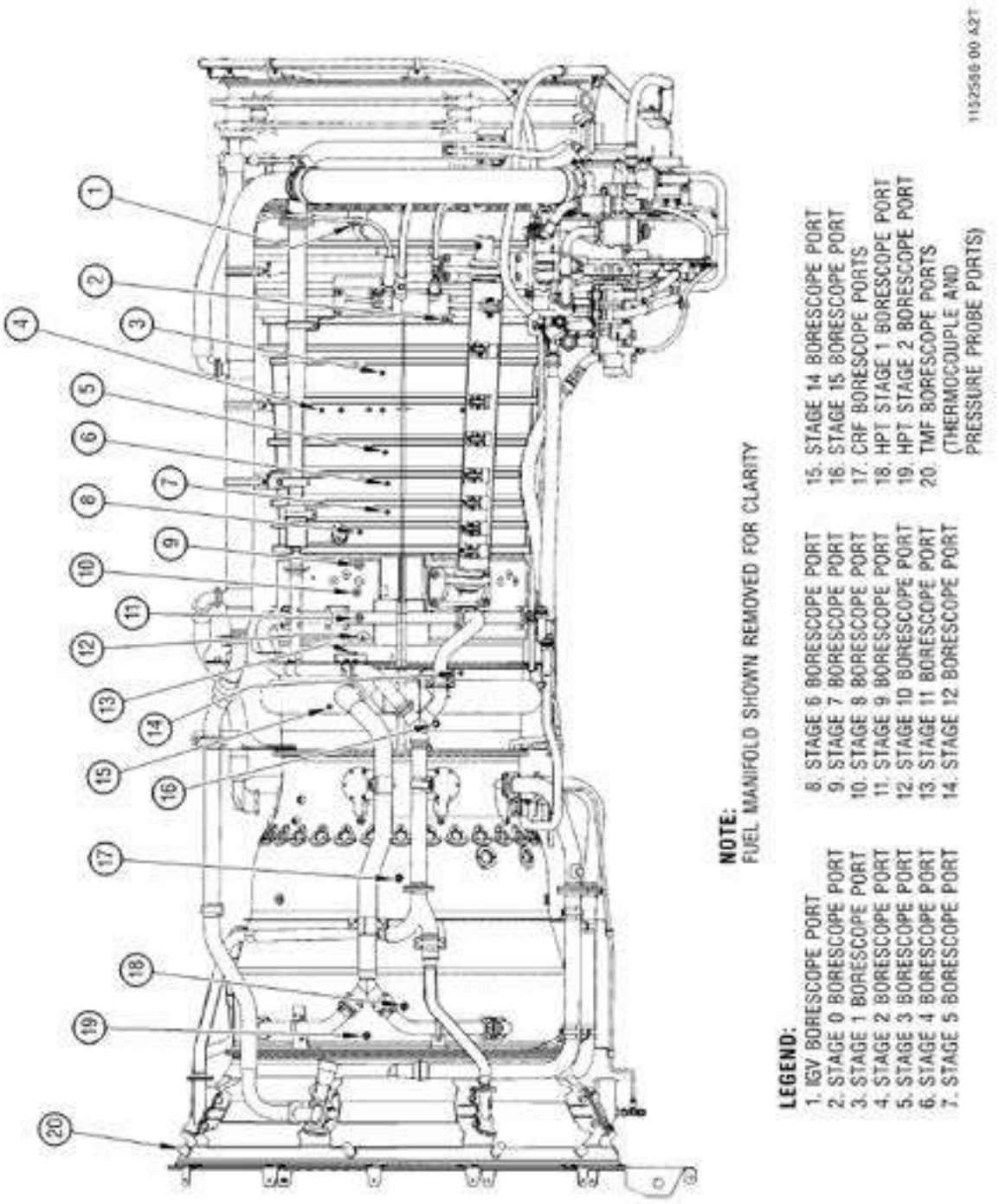



*Figure 1: Position of Borescope Inspection Ports.*

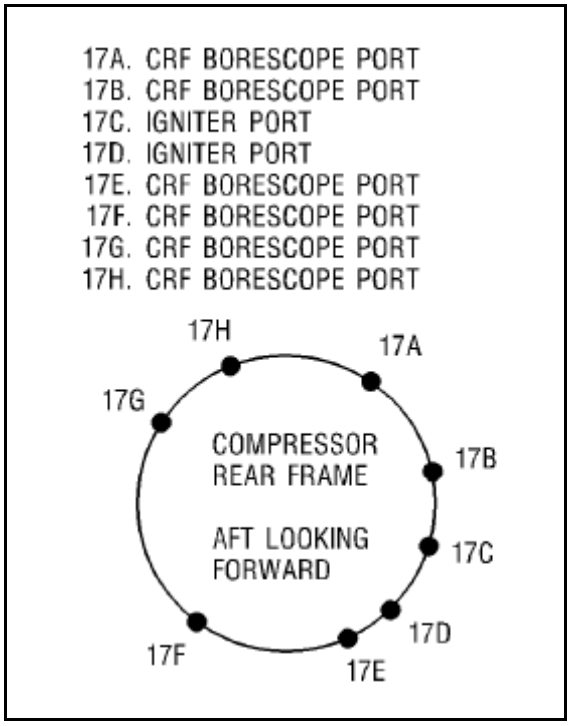



*Figure 2: Position of Borescope Inspection Ports.*

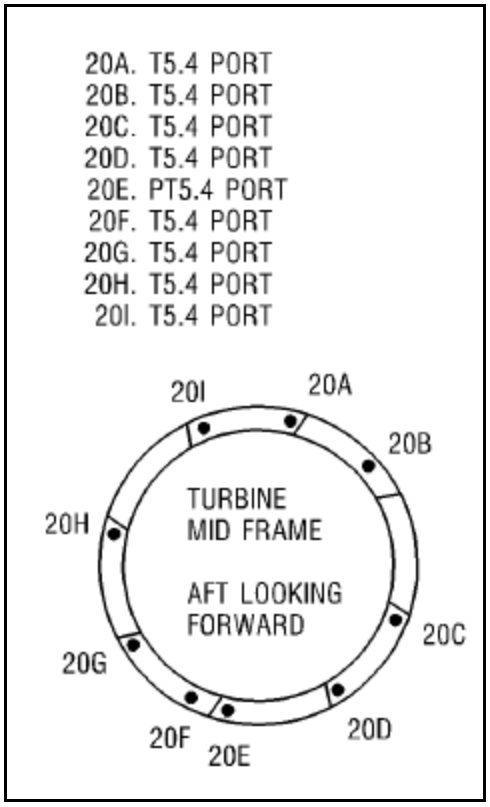



*Figure 3: Position of Borescope Inspection Ports.*

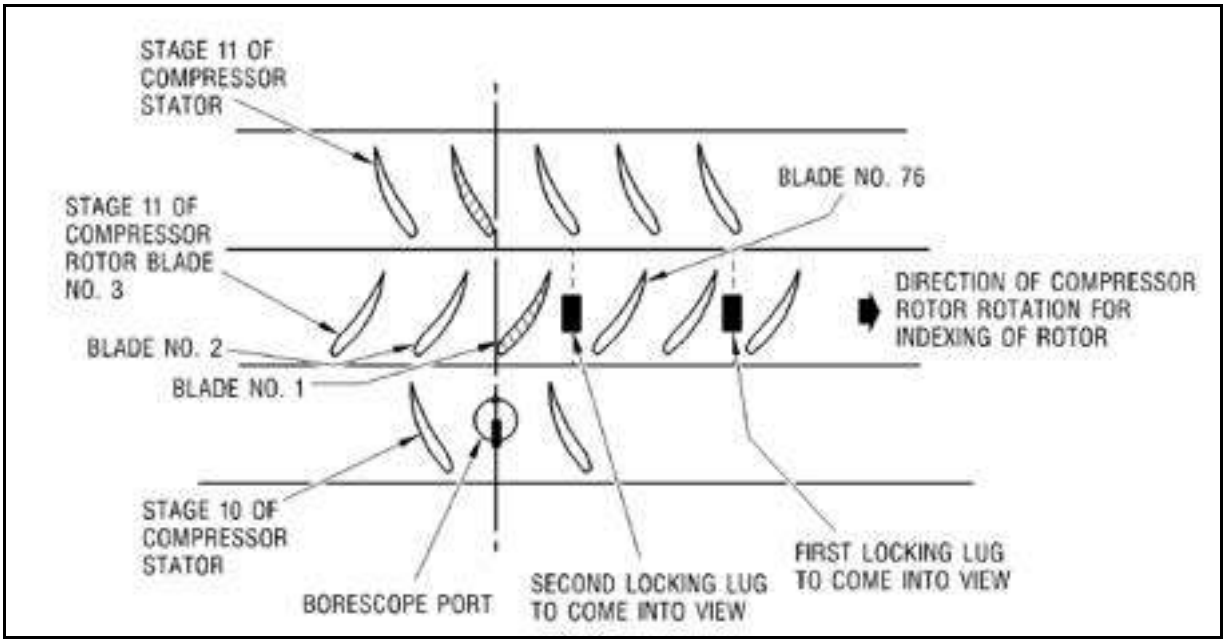



*Figure 4: Zero indexing of HPC rotor and HPT rotor*

## 4.1 Compressor Section

| Port | T.E. | L.E. | blades | Remarks: | photo no: |
|---|---|---|---|---|---|
| 1 | IGV | | | | 1 |
| 1 | | 0 | 36 | | 2,3 |
| 2 | 0 | | 36 | | 4 |
| 2 | | 1 | 26 | | 6,7 |
| 3 | 1 | | 26 | | 9,10 |
| 3 | | 2 | 26 | | 11,12 |
| 4 | 2 | | 26 | | 13 |
| 4 | | 3 | 42 | | 14 |
| 5 | 3 | | 42 | | 15,16 |
| 5 | | 4 | 45 | | 17,18 |
| 6 | 4 | | 45 | | 19, 20 |
| 6 | | 5 | 48 | | 21, 22 |
| 7 | 5 | | 48 | | 23, 24 |
| 7 | | 6 | 54 | | 25, 26 |
| 8 | 6 | | 54 | Blades contacting tip | |
| 8 | | 7 | 56 | Blades contacting tip | |
| 9 | 7 | | 56 | | 27 |
| 9 | | 8 | 64 | | 28 |
| 10 | 8 | | 64 | | 29,30 |
| 10 | | 9 | 66 | | 31 |
| 11 | 9 | | 66 | | 32, 33 |
| 11 | | 10 | 66 | | 35, 36 |
| 12 | 10 | | 66 | | 37, 38 |
| 12 | | 11 | 76 | | 39, 40 |
| 13 | 11 | | 76 | | 41, 42 |
| 13 | | 12 | 76 | | 43, 44 |
| 14 | 12 | | 76 | | 45, 46 |
| 14 | | 13 | 76 | | 47, 48 |
| 15 | 14 | | 76 | Inside bleed manifold | |
| 15 | | 15 | 76 | Inside bleed manifold | |
| 16 | 15 | | 76 | | 49, 50 |
| 16 | | 16 | 76 | | 51, 52 |

**Notes:**

The HPC Section is serviceable. No damages were found.



Picture 1. CFF & IGV



Picture 2. Stage 0 Leading edge tip



Picture 3. Stage 0 Leading edge base



Picture 4. Stage 0 Trailing edge tip



Picture 5. Stage 0 Weep hole



Picture 6. Stage 1 Leading edge tip



Picture 7. Stage 1 Leading edge base



Picture 8. Stage 1 weep hole



Picture 9. Stage 1 Trailing edge tip



Picture 10. Stage 1 Trailing base



Picture 11. Stage 2 Leading edge tip



Picture12. Stage 2 Leading edge base



Picture 13. Stage 2 Trailing edge tip



Picture 14. Stage 3 Leading edge tip



Picture 15. Stage 3 Trailing edge tip



Picture 16. Stage 3 Trailing edge base



Picture 17. Stage 4 Leading edge tip



Picture 18. Stage 4 Leading edge base



Picture 19. Stage 4 Trailing edge tip



Picture 20. Stage 4 Trailing edge base



Picture 21. Stage 5 Leading edge tip



Picture 22. Stage 5 Leading edge base



Picture 23. Stage 5 Trailing edge tip



Picture 24. Stage 5 Trailing edge base



Picture 25. Stage 6 Leading edge tip



Picture 26. Stage 6 Leading edge base



Picture 27. Stage 7 Trailing edge tip



Picture 28. Stage 8 Leading edge tip



Picture 29. Stage 8 Trailing edge tip



Picture 30. Stage 8 Trailing edge base



Picture 31. Stage 9 Leading edge



Picture 32. Stage 9 Trailing edge tip



Picture 33. Stage 9 Trailing base



Picture 34. Stage 9 Bleed manifold



Picture 35. Stage 10 Leading edge tip



Picture 36. Stage 10 Leading edge base



Picture 37. Stage 10 Trailing edge tip



Picture 38. Stage 10 Trailing edge base



Picture 39. Stage 11 Leading edge tip



Picture 40. Stage 11 Leading edge base



Picture 41. Stage 11 Trailing edge tip



Picture 42. Stage 11 Trailing edge base



Picture 43. Stage 12 Leading edge tip



Picture 44. Stage 12 Leading edge base



Picture 45. Stage 12 Trailing edge tip



Picture 46. Stage 12 Trailing edge base



Picture 47. Stage 13 Leading edge tip



Picture 48. Stage 13 Leading edge base



Picture 49. Stage 15 Trailing edge tip



Picture 50. Stage 15 Leading edge base



Picture 51. Stage 16 Leading edge tip



Picture 52. OGV'S

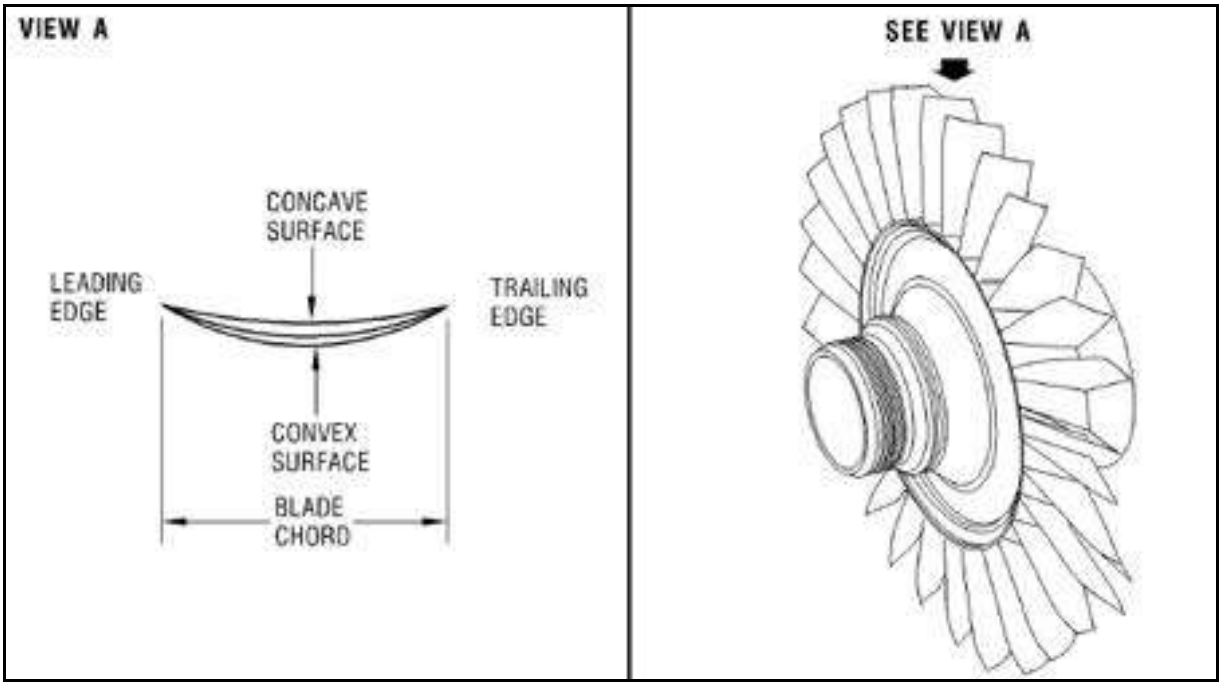



*Figure 5: HPC stage 0 BLISK*

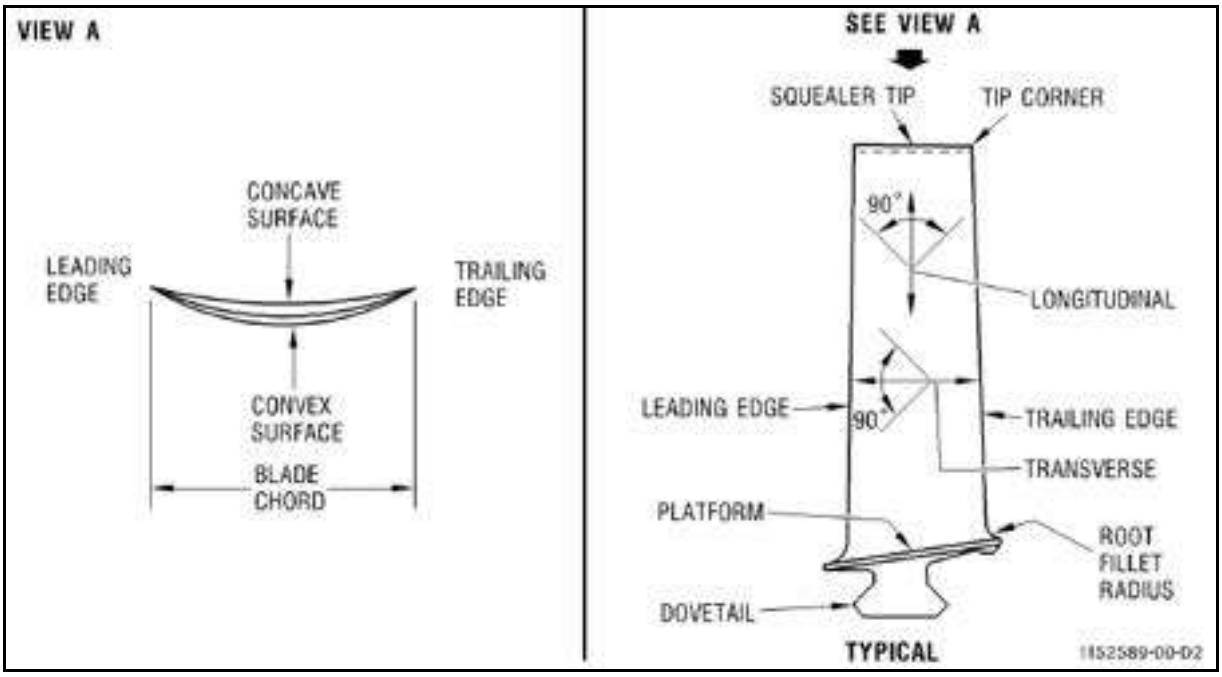



*Figure 6: Compressor Rotor Blades*

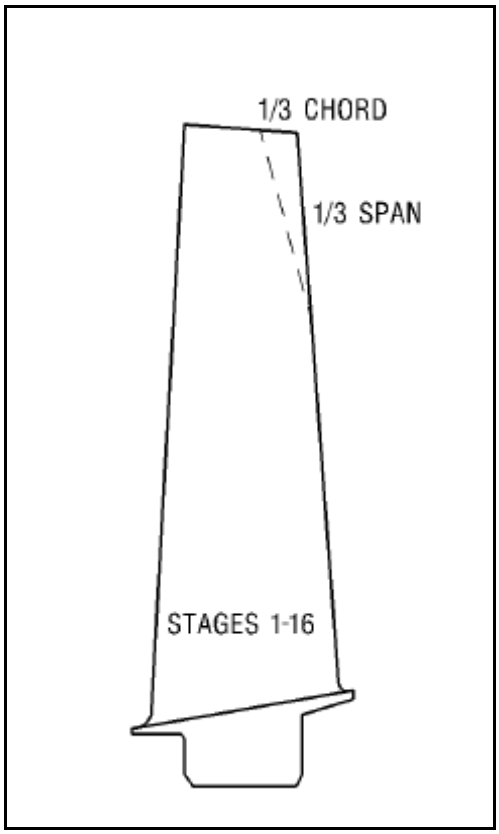



*Figure 7: Tip Trailing Edge Inspection*

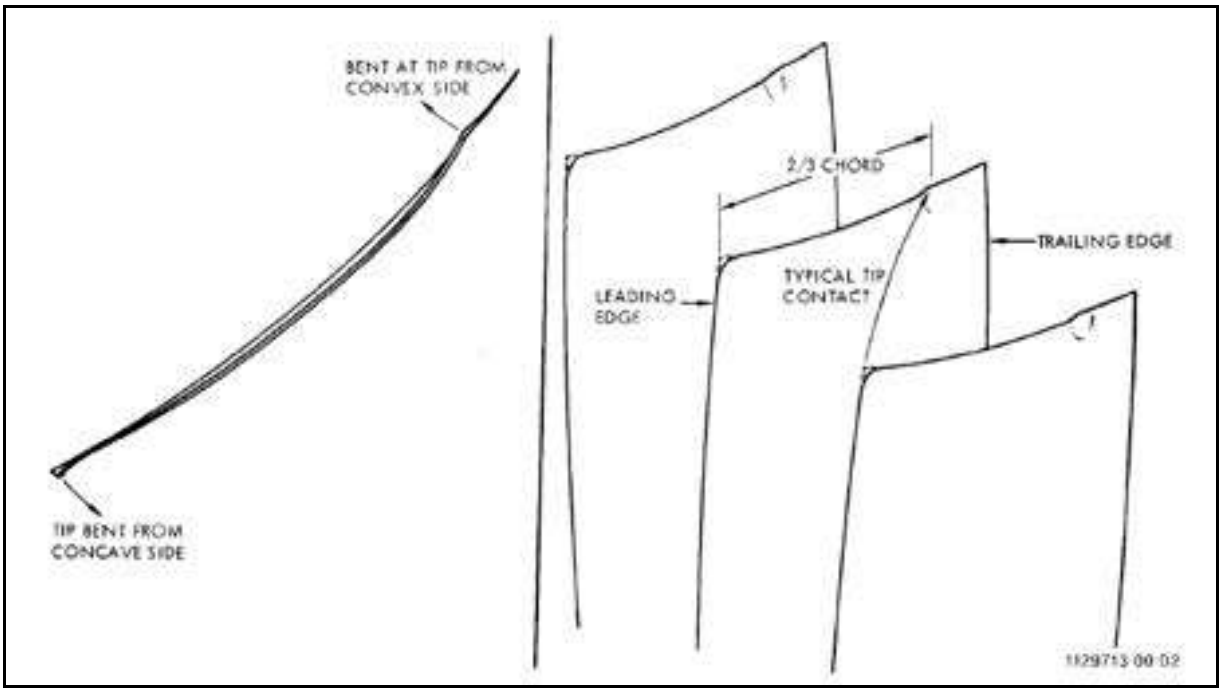


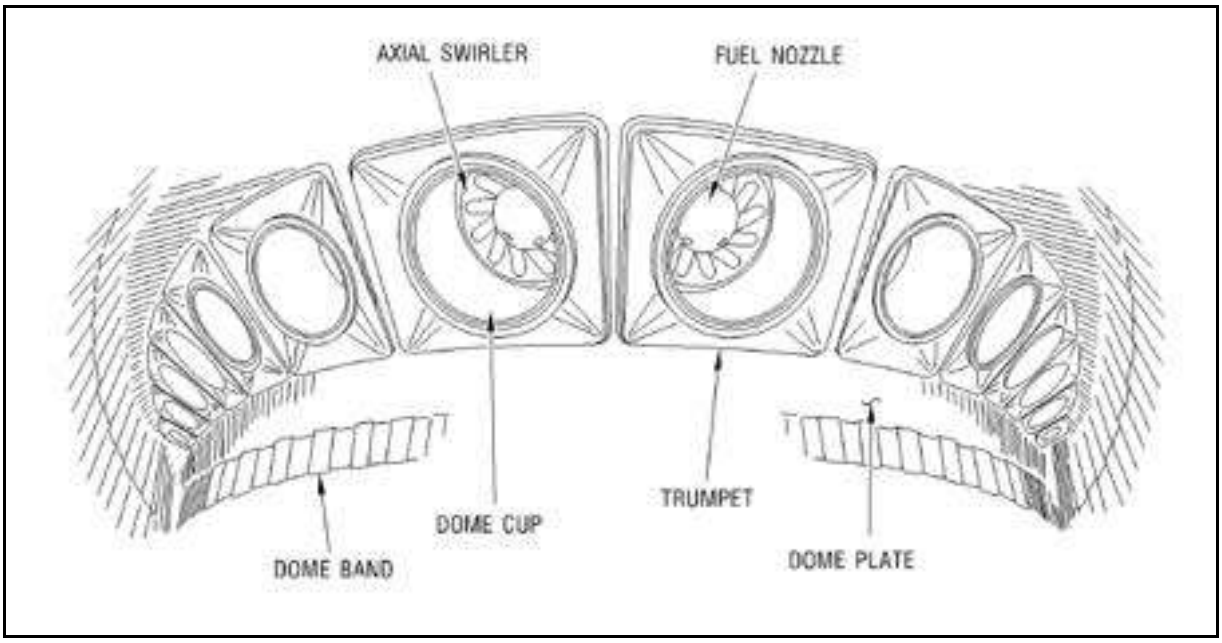

*Figure 8: Tip Clanging Contact (HPCR stage 3 through 6)*

## 4.2 Combustor and 1St Stage Nozzle Section

| Port | Condition observed | Photo no: |
|---|---|---|
| **17A** | | |
| **17B** | | |
| **17C** | | |
| **17D** | **See below notes.** | |
| **17E** | | |
| **17F** | | |
| **17G** | | |
| **17H** | | |
| **17** | 1st stage nozzle (leading edge): | |

**Notes:**

The Combustor section is serviceable according to GEK105054 Volume II WP40600 Table 7.



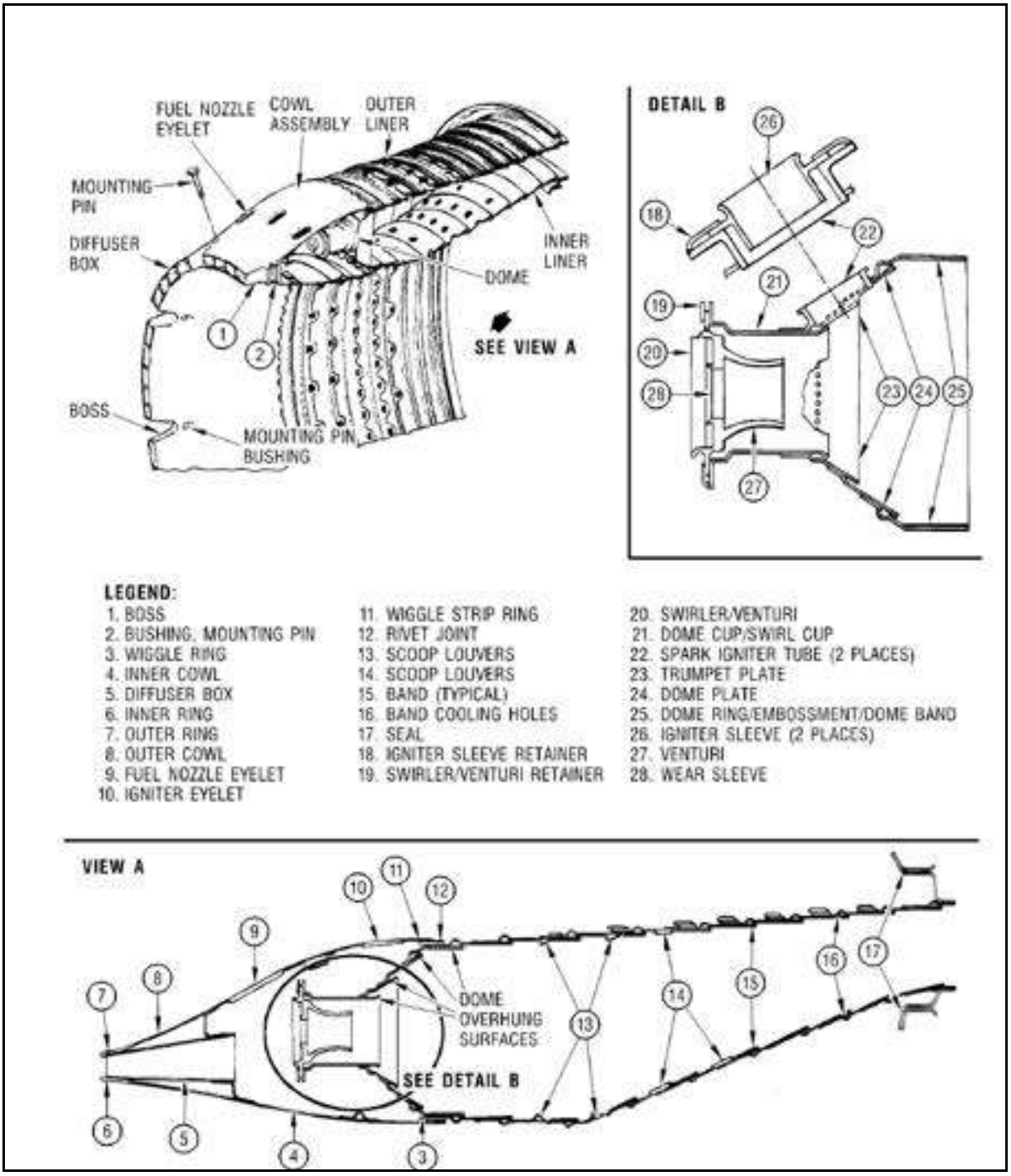



*Figure 9: SAC Combustor Inspection*

*Figure 10: SAC Combustor Inspection*

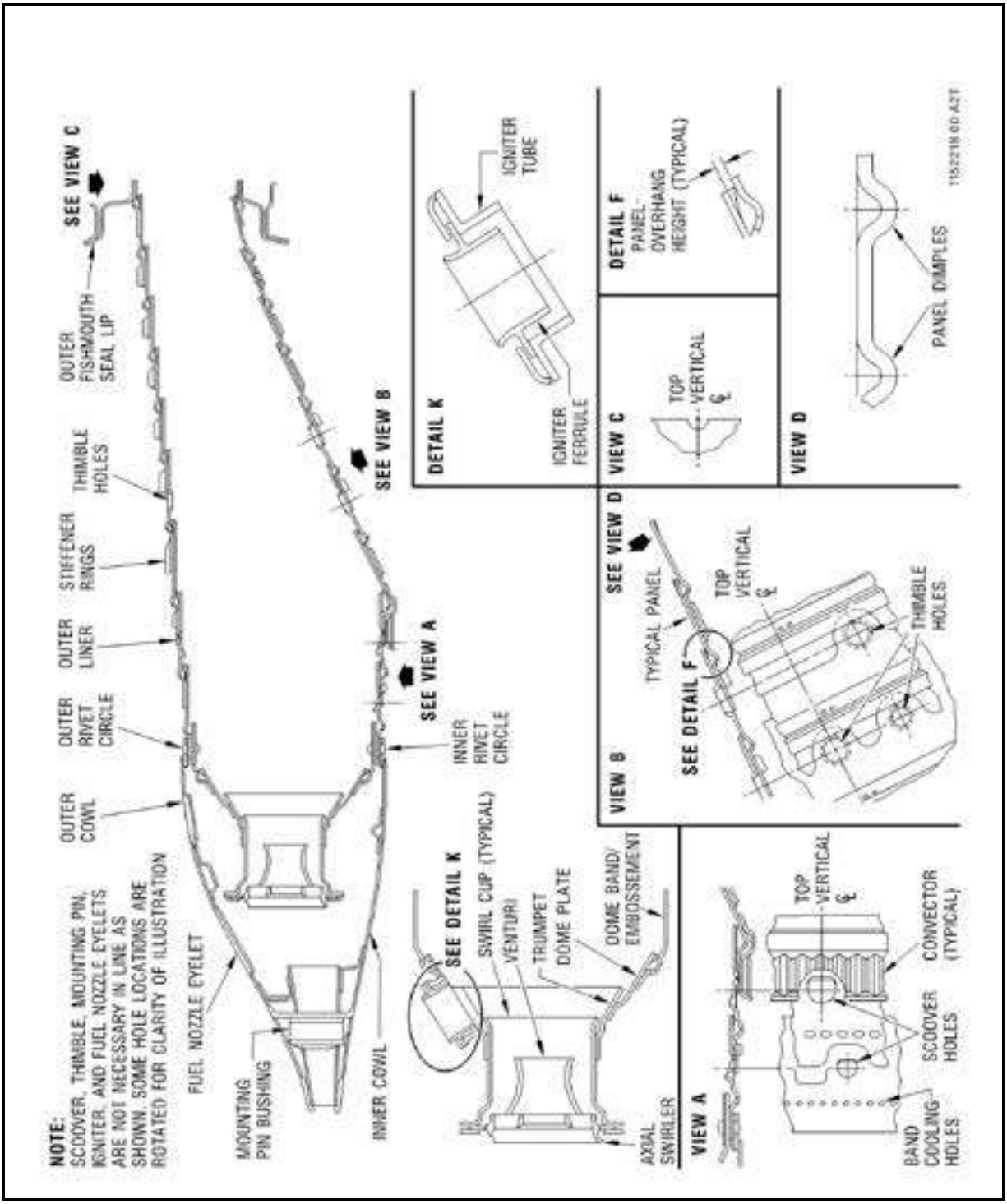
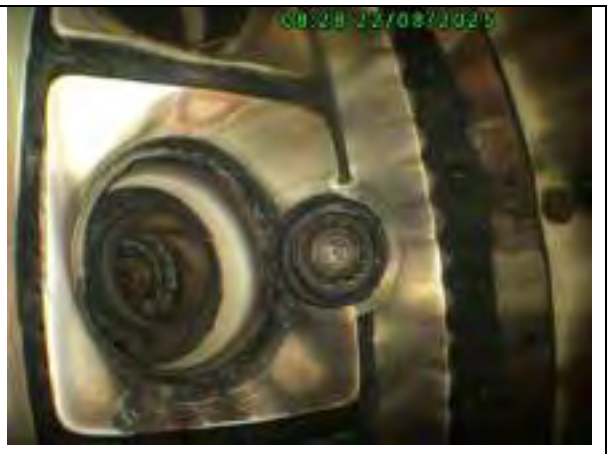



*Figure 11: SAC Combustor Inspection*

**Borescope Pictures**



Picture 53. Upper igniter ferrule



Picture 54. Lower igniter ferrule



Picture 55. Outer rivets band



Picture 56. Inner rivets band



Picture 57. Combustor liners



Picture 58. Combustor liners



Picture 59. Combustor splash plates



Picture 60. Fuel Nozzle tip



Picture 61. Combustor liners and HPT nozzle interference



Picture 62. . Combustor liners and HPT nozzle interference

## 4.3 Turbine Section

| | turbine stage | | | | |
|---|---|---|---|---|---|
| **Port** | **L.E.** | **T.E.** | **blades** | **Remarks:** | **photo no:** |
| **18** | **1** | | **88** | | |
| **19** | | **1** | **88** | **See below notes.** | |
| **19** | **2** | | **90** | | |
| **20** | | **2** | | | |

**Notes:**

The High Pressure Turbine section is **Not Serviceable** according to GEK105054 Volume II WP40600 Table 8 due to stage1 and 2 blades condition.

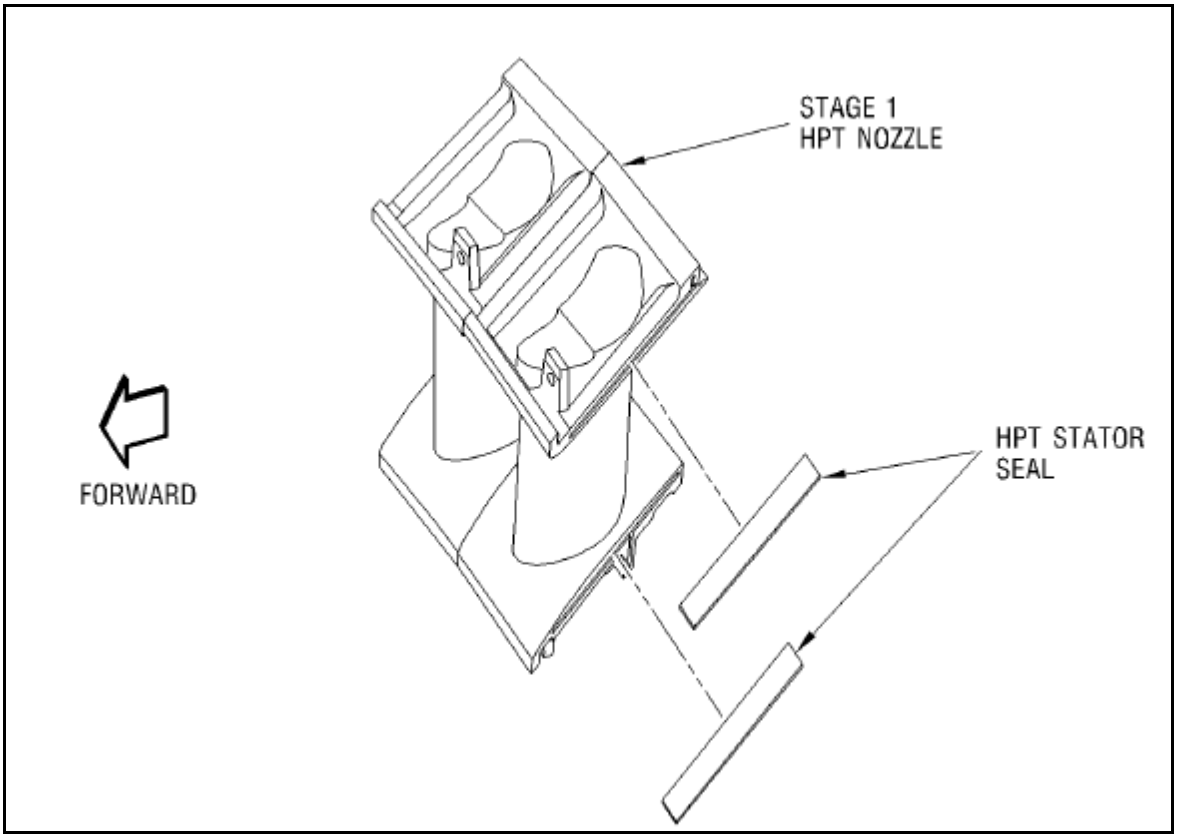



*Figure 12: Stage 1 HPT Nozzle Seal Displacement*

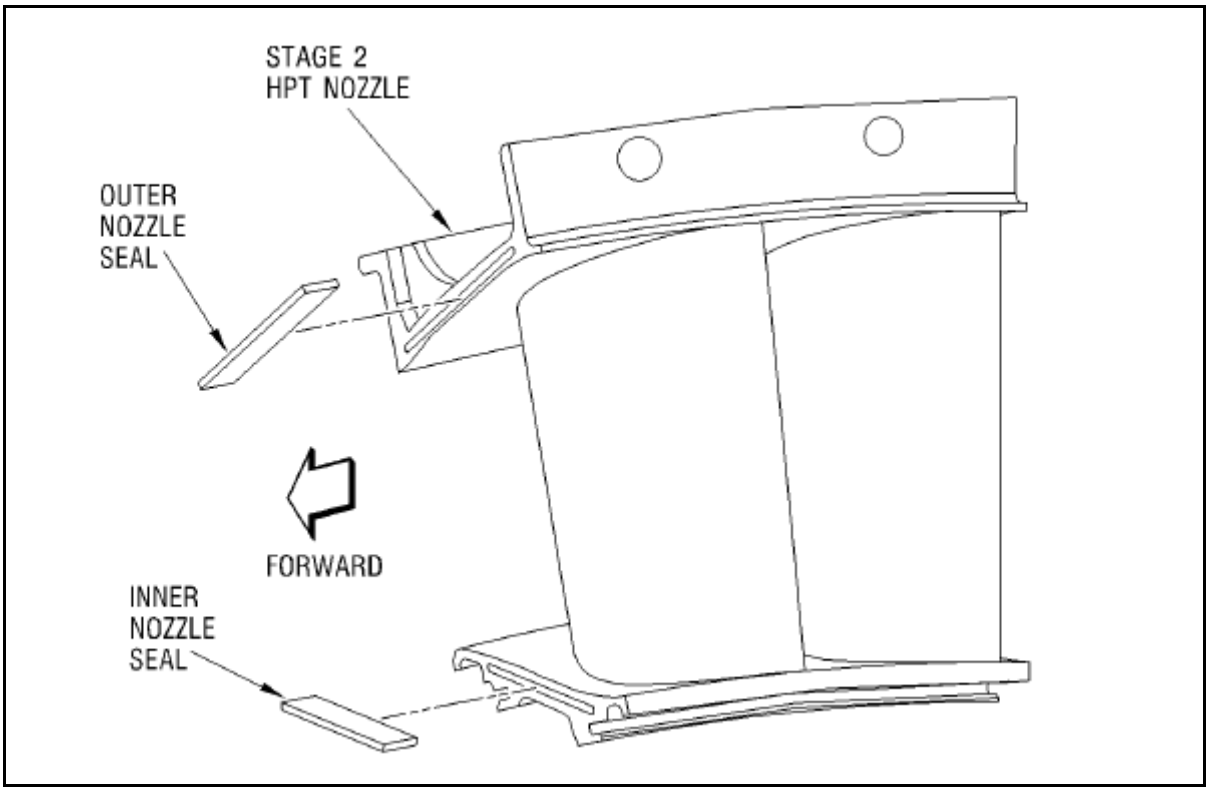



*Figure 13: Stage 2 HPT Nozzle Seal Displacement*

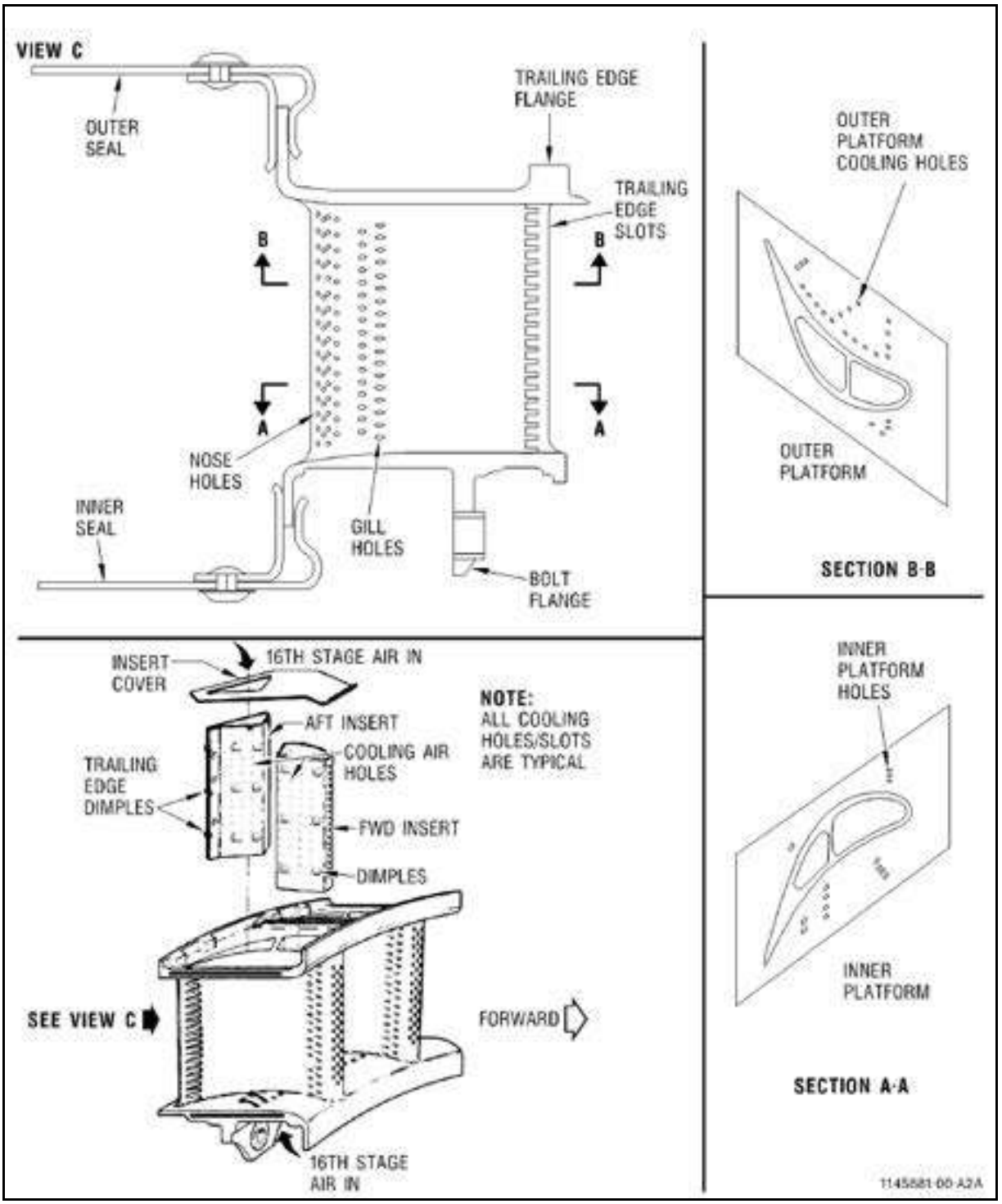



*Figure 14: HPT Stage 1 Nozzle*

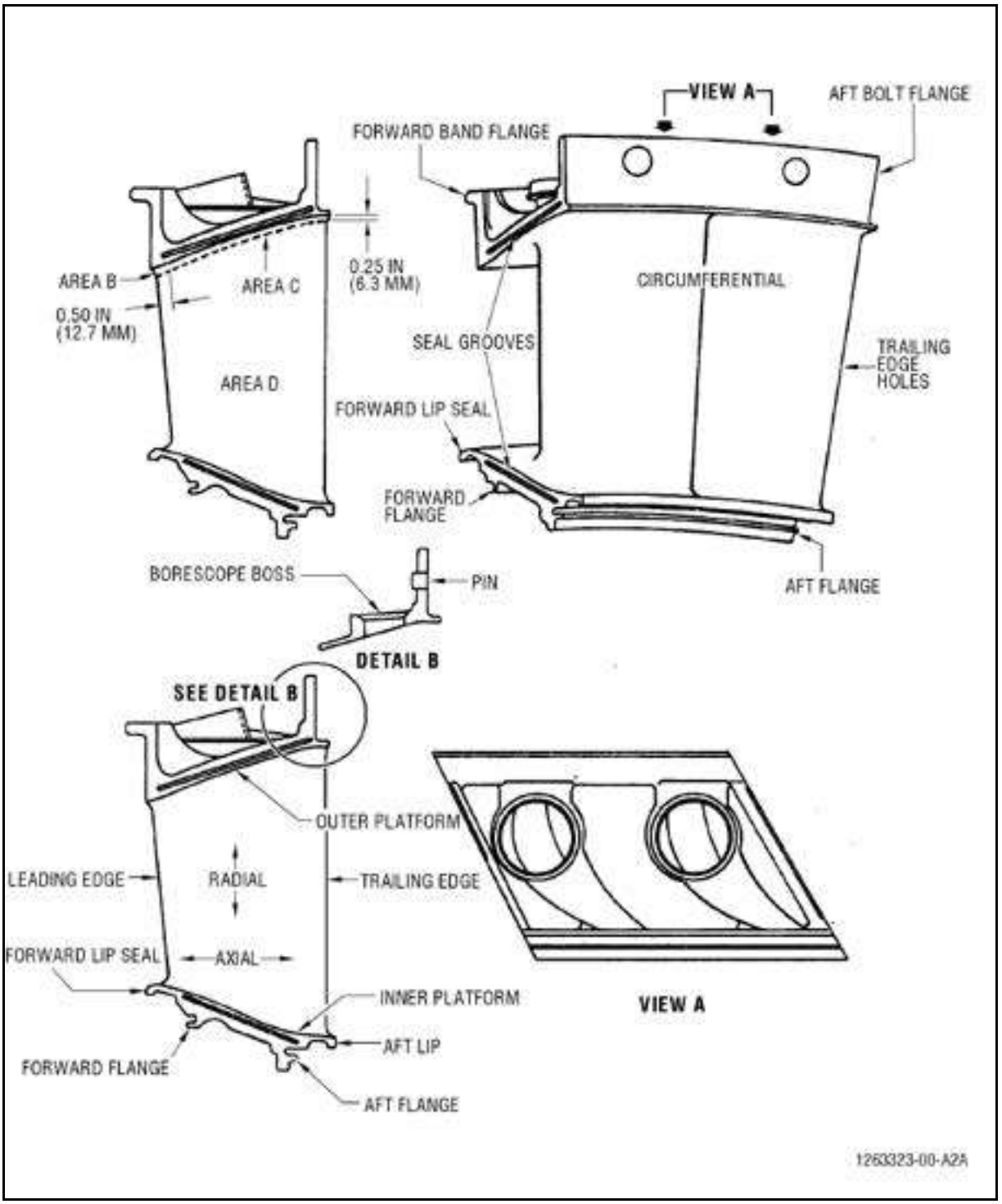



*Figure 15: HPT Stage 2 Nozzle*

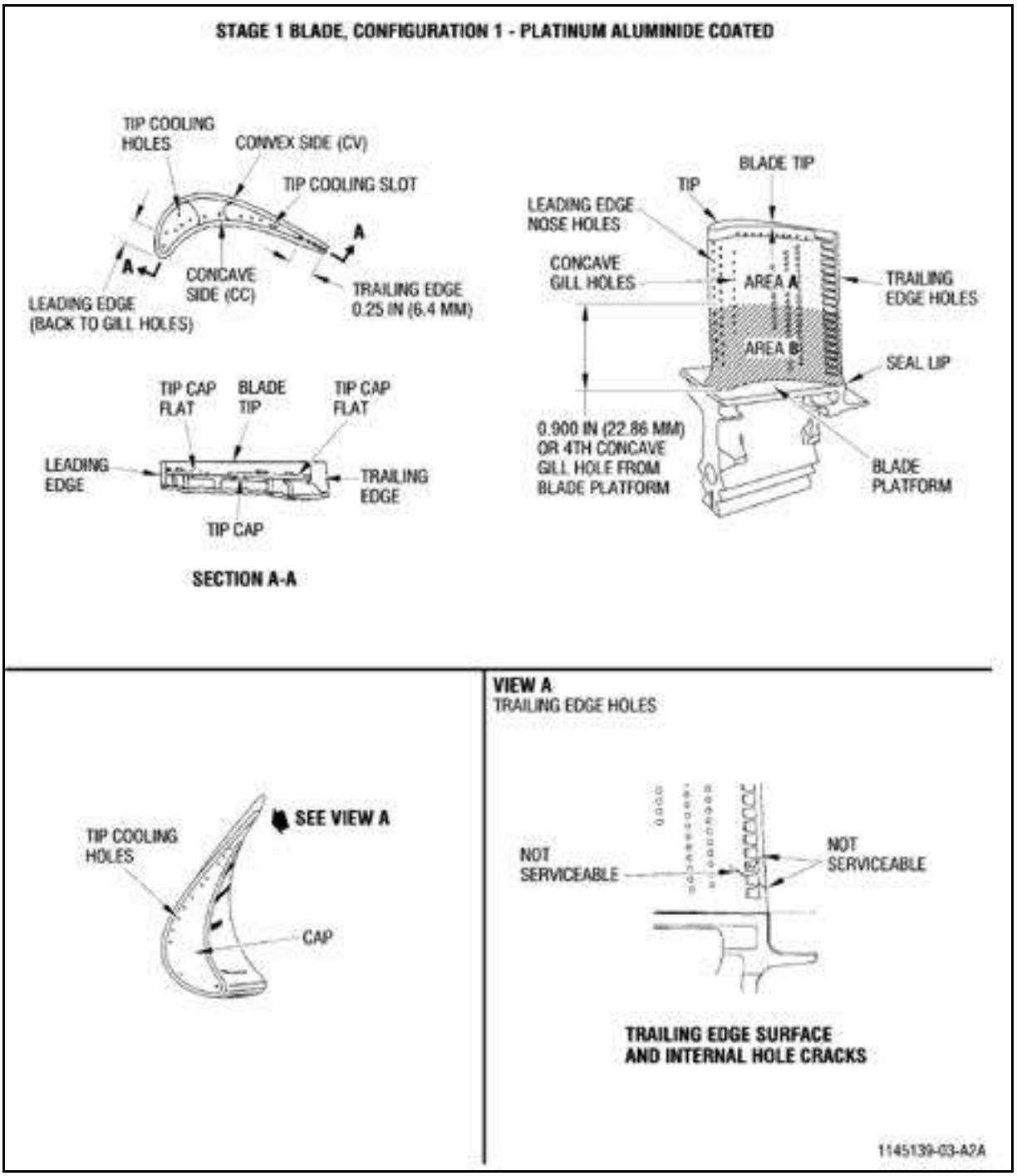



*Figure 16: HPT Stage 1 Rotor Blades Inspection Areas (Platinum Aluminide Coated Blades)*

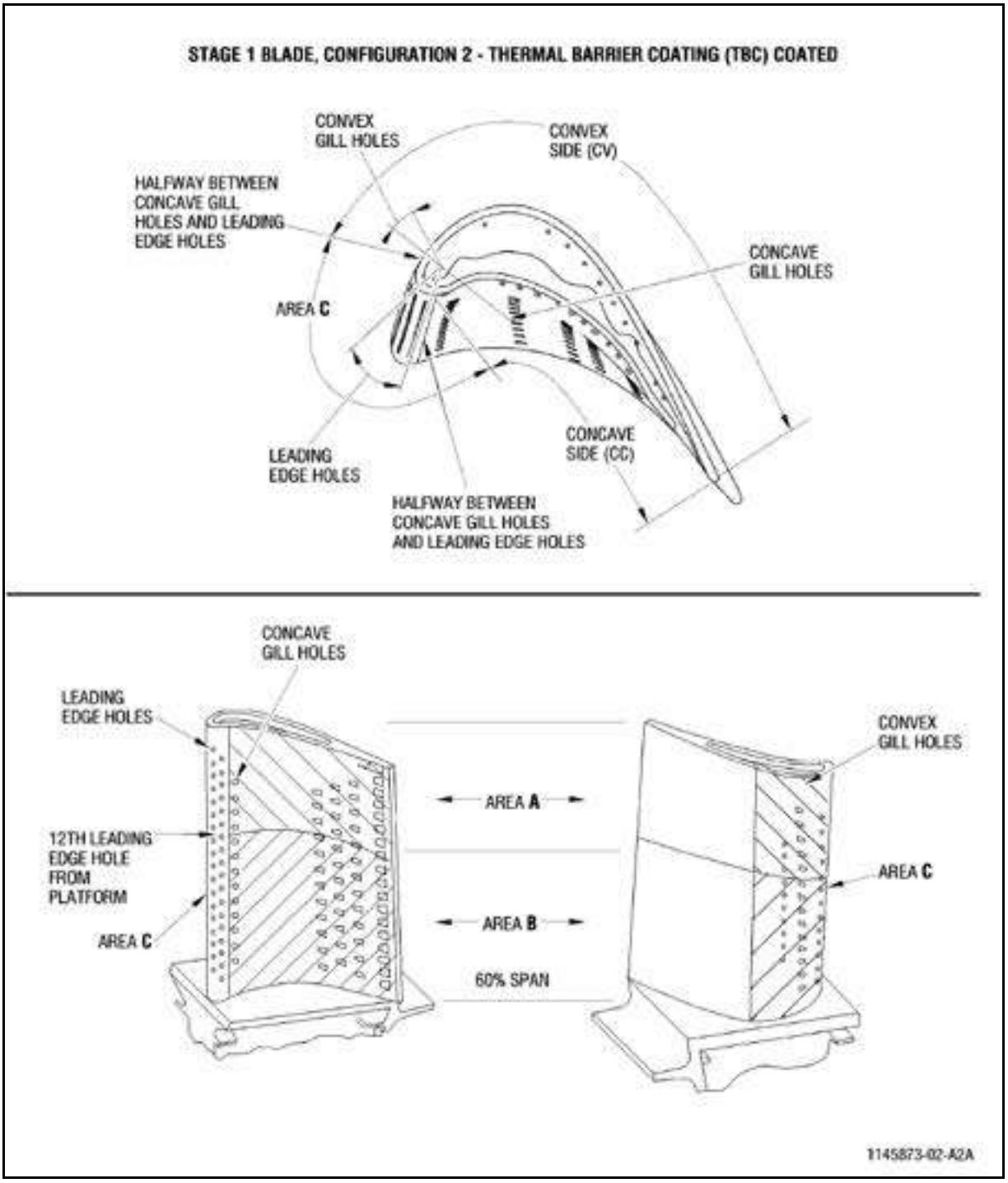



*Figure 17: HPT Stage 1 Rotor Blades Inspection Areas (TBC Coated Blades)*

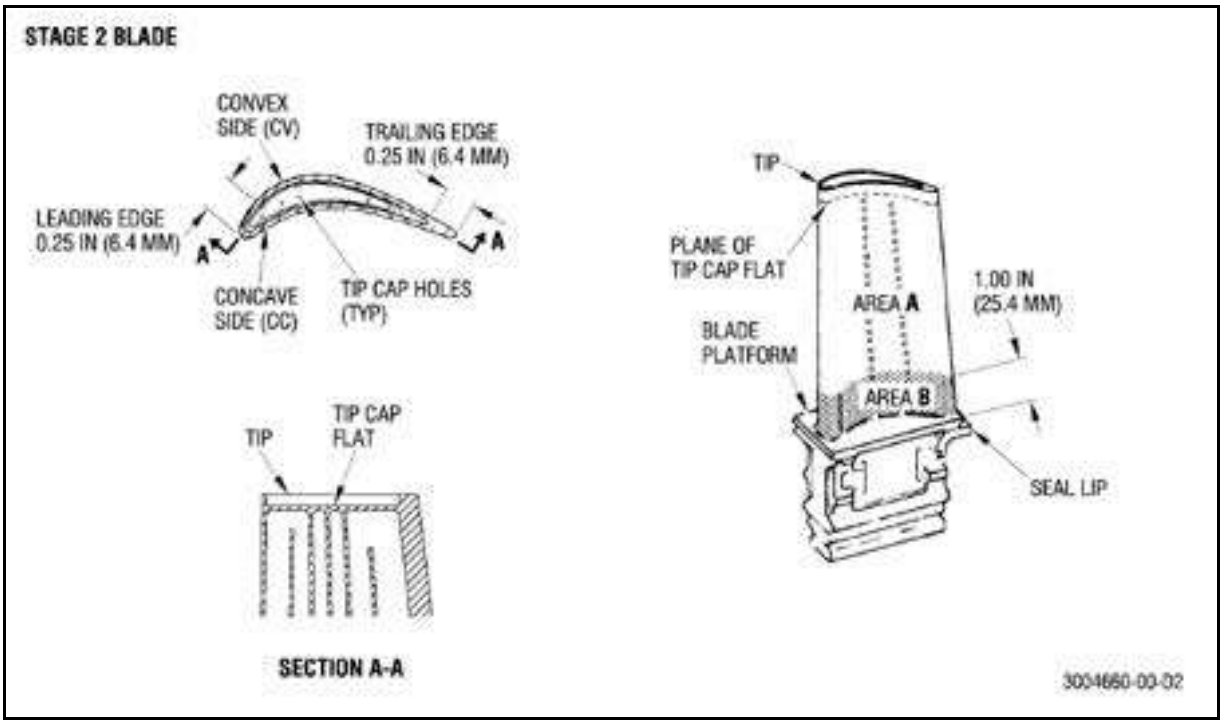



*Figure 18: HPT Stage 2 Rotor Blades Inspection Areas*

**Borescope Pictures**



Picture 63: Stage1 Nozzle leading edge



Picture 64: Stage1 Nozzles Leading edge



Picture 65: Stage1 Nozzle airfoil concave side



Picture 66: Stage1 Nozzle airfoil concave side



Picture 67: Stage1 Nozzles airfoil concave



Picture 68: Stage1 Nozzle airfoil convex



Picture 69: Stage1 Nozzle leading edge



Picture 70: Stage1 Nozzle leading edge convex



Picture 71: Stage1 Nozzle trailing edge concave



Picture 72: Stage1 Nozzle trailing edge convex



Picture 73: Stage1 Nozzle trailing edge



Picture 74: Stage1 Nozzle trailing edge and



Picture 75: Stage1 Blades leading edge tip



Picture 76: Stage1 Blades leading edge tip



Picture 77: Stage 1 Blades leading edge base



Picture 78: Stage 1 Blades leading edge base



Picture 79: Stage 1 Blades trailing edge tip



Picture 80: Stage 1 Blades trailing edge root



Picture 81: Stage 2 Blades leading edge tip



Picture 82: Stage 2 Honeycomb seals



Picture 83: Stage 2 Blades leading edge root



Picture 84: Stage 2 Blades and stage 2



Picture 85: Stage 2 Blades trailing edge



Picture 86: Stage 2 Blades trailing edge

## 4.4 LPT Section

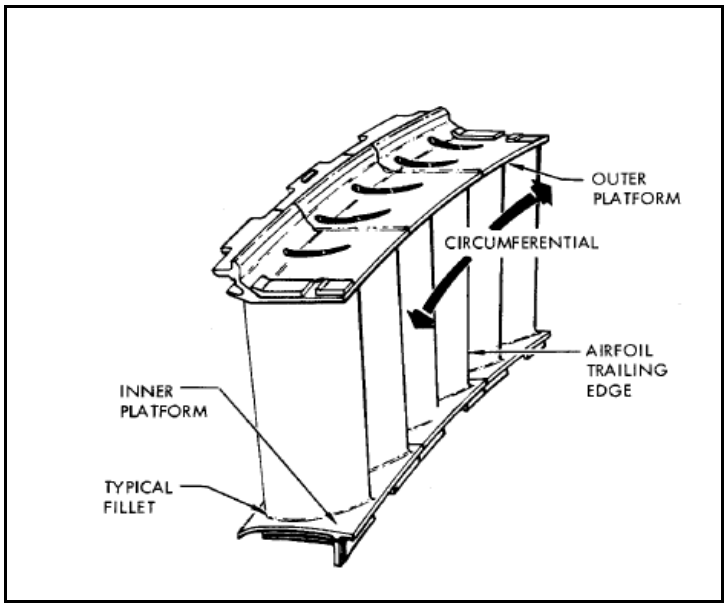



*Figure 19: Power Turbine Nozzles*

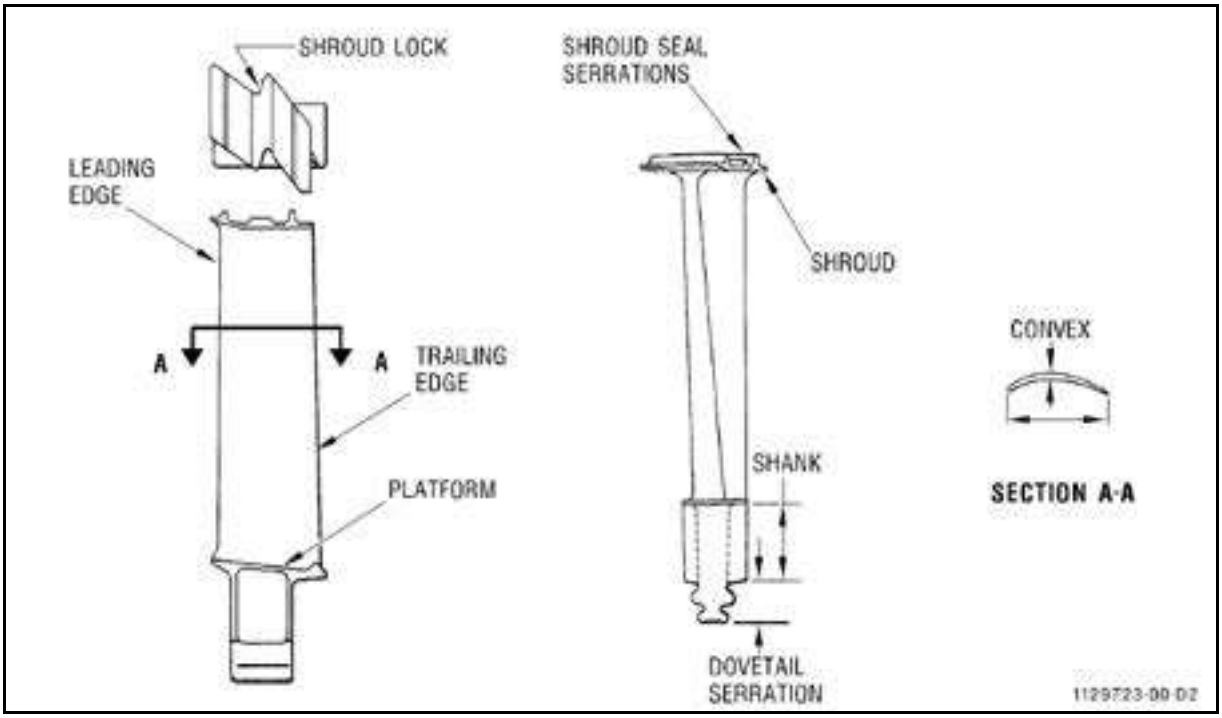



*Figure 20: Power Turbine Rotor Blades*

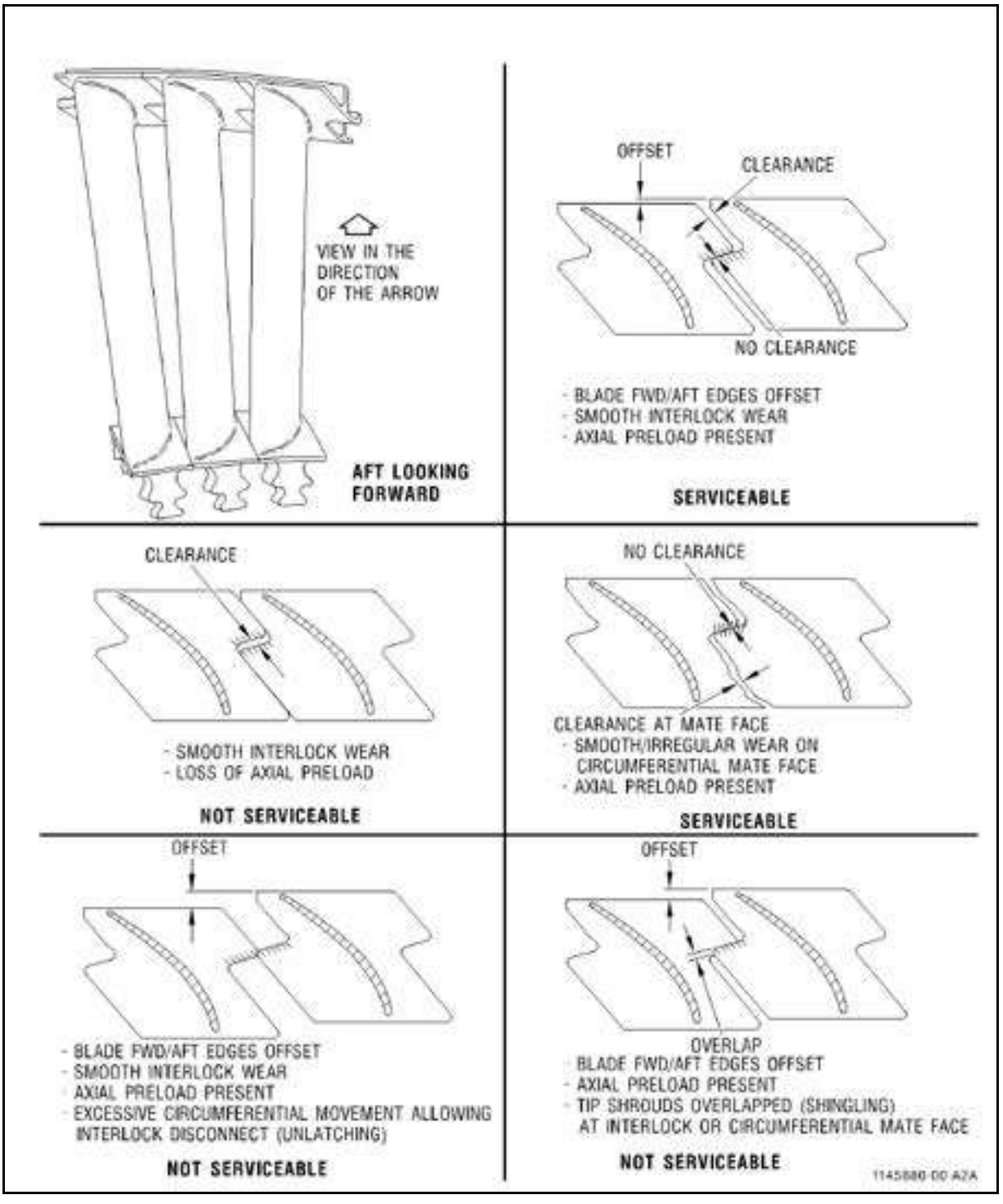



*Figure 21: LPT Rotor Blade Circumferential Inspection*

**Notes:**

The LPT stage 1 accessible nozzles and blades did not show any damage.

**Borescope Pictures**



Picture 87: STG1 LPT nozzles



Picture 88: TMF and LPT Inlet



Picture 89: Stage 1 Blades



Picture 90: LPT Stage 1 Blades tip interlock

# BORESCOPE INSPECTION REPORT
# TM2500 GEN. 6-7
## *7LM2500 – PK – MDWG05*

## NEW FORTRESS ENERGY

## PALO SECO, PR

## PACKAGE #

## UNIT #2

| | | | |
|---|---|---|---|
| **Visit Date:** | 08/05/2025 | **Total Starts:** | 451 |
| **Engine S/N:** | 557-121 | **GG Hours:** | 16772 |
| **Power Turbine S/N:** | 557-121 | **PT Hours:** | 16772 |
| **SOM GT Field Engineer:** | Daniel Arroyo | **New Fortress Representative:** | Jonathan Rodriguez |



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4.3 Turbine Section

4.4 LPT Section

## 1. Conclusions and Recommendations

**Purpose of visit:**

The purpose of this visit was to perform a borescope inspection of the  Engine in accordance with GEK105054, WP 406 00.

1.1 The HPC is serviceable according to GEK105054, WP 406 00. No damages were fund.
1.2 The Combustor section is serviceable according to GEK105054 Volume II WP406 00. There were found two cracks at the inner dome plate, one around the upper igniter position and onother one around the T48 F position. These cracks are within limits according to Table 7.
1.3 The High Pressure Turbine section is serviceable according to GEK105054 Volume II WP40600.
There was found one (1) Stage 2 blade with a  minor dent at the leading edge tip area. This damage is serviceable according to Table 8.
1.4 The LPT is serviceable according to GEK105054 Volume II WP40600.

## 2. Outage Data

### Engine Data

| | | | | | |
|---|---|---|---|---|---|
| **ESN:** | 557-121 | **Engine Fired Hours:** | 16772 | **Package Hours:** | 16772 |
| **Model:** | 7LM2500-PK-MDWG05 | **Engine Fired starts:** | 451 | **Package Fired Starts:** | 451 |

**MAINTENANCE DATA**

| WP, SB, SL, PB, PL Performed | GEK105054, REV 11 | Date completed | Comments |
|---|---|---|---|
| WP 406 00 | Borescope Inspection | 05AUG25 | Serviceable |

**Parts Data**

| Description | PN Removed | SN Removed | Qty | Disposition | PN Installed | SN Installed |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
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## 3. Borescope Inspection Checklist

**Date unit out of operation:** 08/05/2025
**Date unit into operation:** 08/05/2025
**Last inspection date:**

**Type of Fuel:** Natural Gas / Diesel
**Type of outage:** Scheduled BSI

**Type of NOx suppression:** Water Injection

**Inspection of gas turbine:**

| WATERWASH: | HIGH PRESSURE COMPRESSOR: |
|---|---|
| ☐ PERFORMED WATER WASH | ☒ HPC BORESCOPE INSPECTION |
| **COMBUSTOR:** | **HIGH PRESSURE TURBINE** |
| ☒ COMBUSTOR BORESCOPE INSPECTION | ☒ HPT STAGE 1 & 2 NOZZLE BORESCOPE INSPECTION |
| | ☒ HPT BLADE BORESCOPE INSPECTION |
| **LOW PRESSURE TURBINE:** | |
| ☒ LPT BORESCOPE INSPECTION | |

☒ ***Please verify all borescope plugs have been reinstalled***

## 4. Borescope Inspection Record

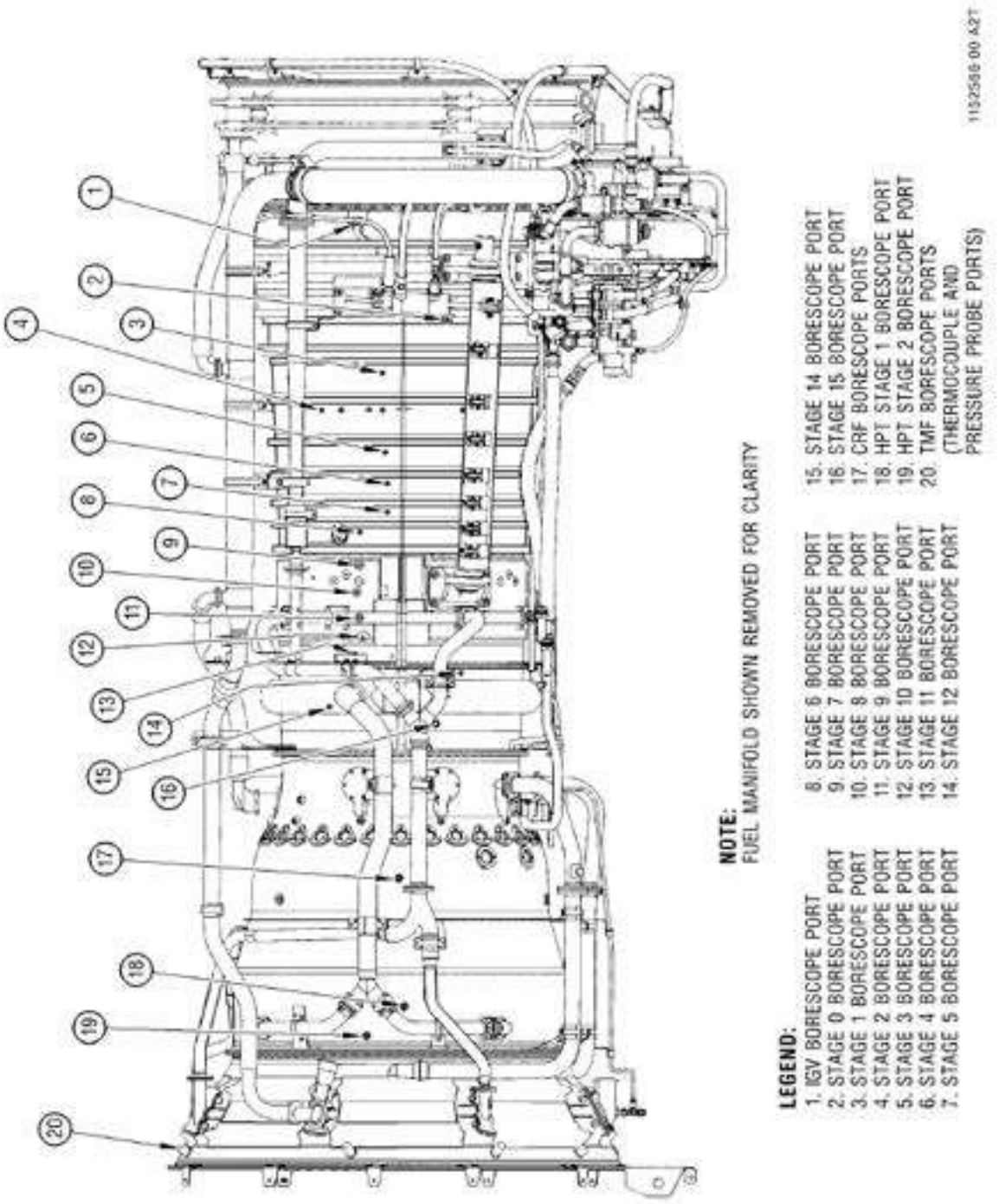



*Figure 1: Position of Borescope Inspection Ports.*

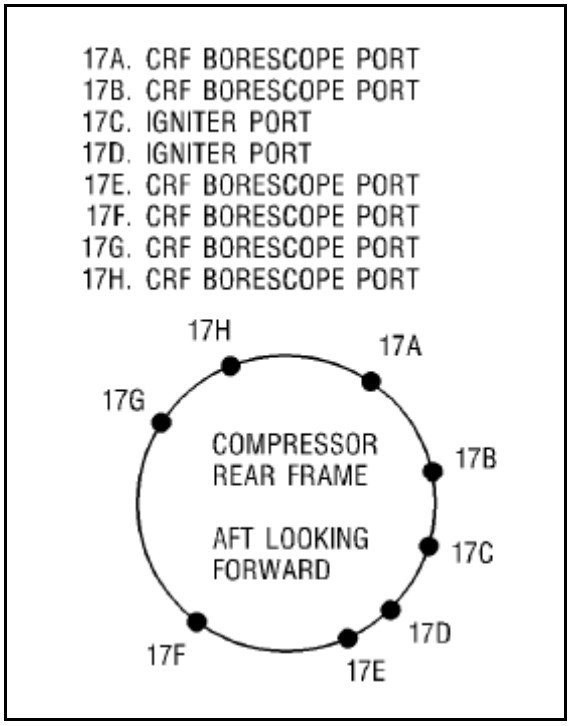



*Figure 2: Position of Borescope Inspection Ports.*

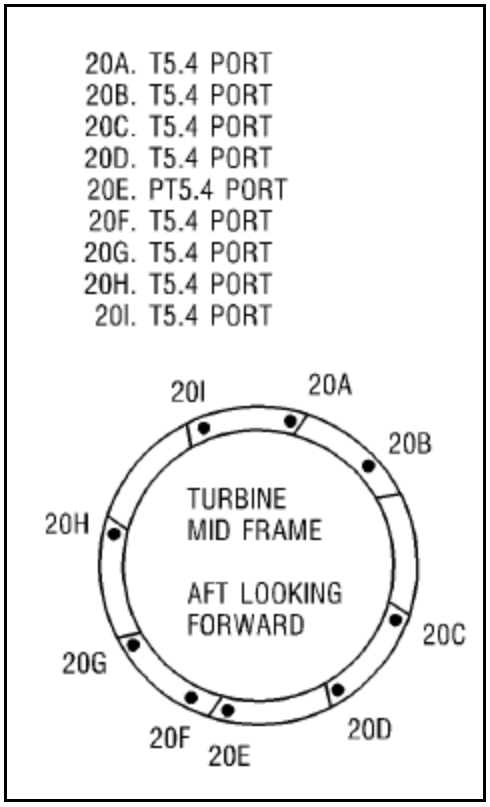



*Figure 3: Position of Borescope Inspection Ports.*

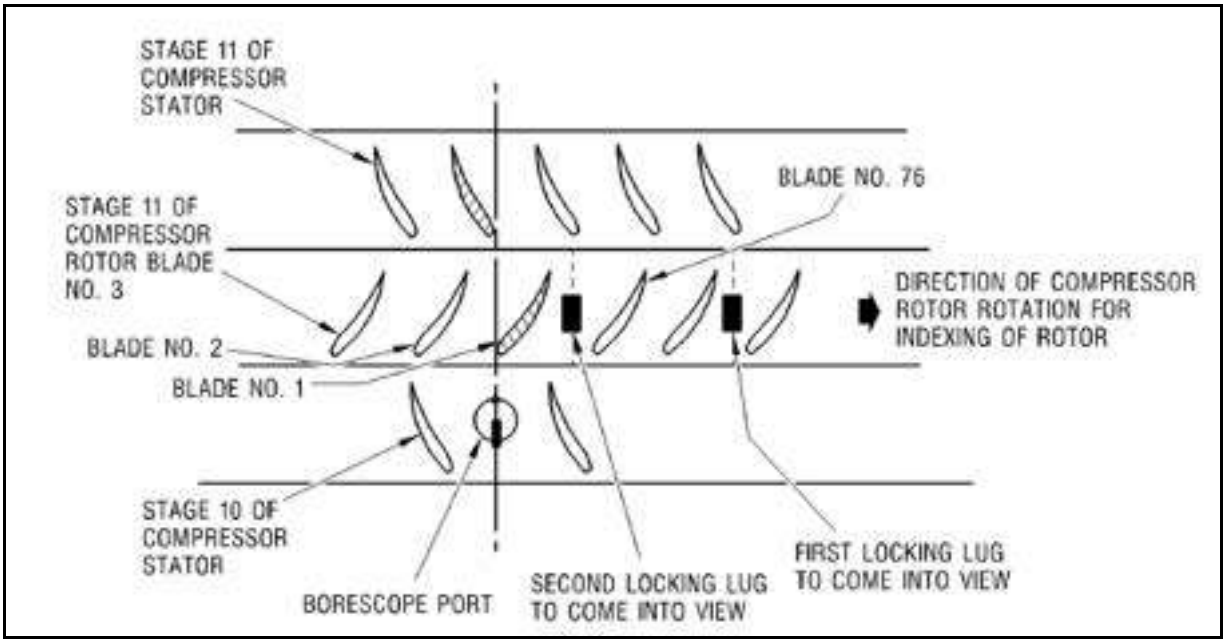



*Figure 4: Zero indexing of HPC rotor and HPT rotor*

## 4.1 Compressor Section

| Port | T.E. | L.E. | blades | Remarks: | photo no: |
|---|---|---|---|---|---|
| 1 | IGV | | | | 1 |
| 1 | | 0 | 36 | | 2,3 |
| 2 | 0 | | 36 | | 4 |
| 2 | | 1 | 26 | | 6,7 |
| 3 | 1 | | 26 | | 9,10 |
| 3 | | 2 | 26 | | 11,12 |
| 4 | 2 | | 26 | | 13 |
| 4 | | 3 | 42 | | 14 |
| 5 | 3 | | 42 | | 15,16 |
| 5 | | 4 | 45 | | 17,18 |
| 6 | 4 | | 45 | | 19, 20 |
| 6 | | 5 | 48 | | 21, 22 |
| 7 | 5 | | 48 | | 23, 24 |
| 7 | | 6 | 54 | | 25, 26 |
| 8 | 6 | | 54 | Blades contacting tip | |
| 8 | | 7 | 56 | Blades contacting tip | |
| 9 | 7 | | 56 | | 27 |
| 9 | | 8 | 64 | | 28 |
| 10 | 8 | | 64 | | 29,30 |
| 10 | | 9 | 66 | | 31 |
| 11 | 9 | | 66 | | 32, 33 |
| 11 | | 10 | 66 | | 35, 36 |
| 12 | 10 | | 66 | | 37, 38 |
| 12 | | 11 | 76 | | 39, 40 |
| 13 | 11 | | 76 | | 41, 42 |
| 13 | | 12 | 76 | | 43, 44 |
| 14 | 12 | | 76 | | 45, 46 |
| 14 | | 13 | 76 | | 47, 48 |
| 15 | 14 | | 76 | Inside bleed manifold | |
| 15 | | 15 | 76 | Inside bleed manifold | |
| 16 | 15 | | 76 | | 49, 50 |
| 16 | | 16 | 76 | | 51, 52 |

**Notes:**

The High Pressure Compressor section is serviceable according to GEK105054 Volume II WP40600 Table 4.



Picture 1. CFF & IGV



Picture 2. Stage 0 Leading edge tip



Picture 3. Stage 0 Leading edge base



Picture 4. Stage 0 Trailing edge tip



Picture 5. Stage 0 Weep hole



Picture 6. Stage 1 Leading edge tip



Picture 7. Stage 1 Leading edge base



Picture 8. Stage 1 weep hole



Picture 9. Stage 1 Trailing edge tip



Picture 10. Stage 1 Trailing base



Picture 11. Stage 2 Leading edge tip



Picture12. Stage 2 Leading edge base



Picture 13. Stage 2 Trailing edge tip



Picture 14. Stage 3 Leading edge tip



Picture 15. Stage 3 Trailing edge tip



Picture 16. Stage 3 Trailing edge base



Picture 17. Stage 4 Leading edge tip



Picture 18. Stage 4 Leading edge base



Picture 19. Stage 4 Trailing edge tip



Picture 20. Stage 4 Trailing edge base



Picture 21. Stage 5 Leading edge tip



Picture 22. Stage 5 Leading edge base



Picture 23. Stage 5 Trailing edge tip



Picture 24. Stage 5 Trailing edge base



Picture 25. Stage 6 Leading edge tip



Picture 26. Stage 6 Leading edge base



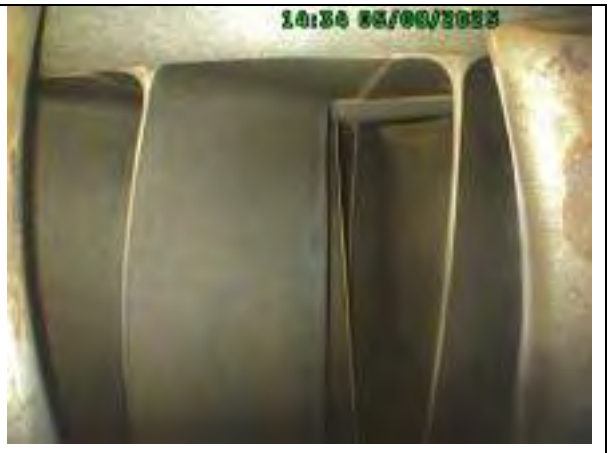
Picture 27. Stage 7 Trailing edge tip



Picture 28. Stage 8 Leading edge tip



Picture 29. Stage 8 Trailing edge tip



Picture 30. Stage 8 Trailing edge base



Picture 31. Stage 9 Leading edge



Picture 32. Stage 9 Trailing edge tip



Picture 33. Stage 9 Trailing base



Picture 34. Stage 9 Bleed manifold



Picture 35. Stage 10 Leading edge tip



Picture 36. Stage 10 Leading edge base




Picture 37. Stage 10 Trailing edge tip



Picture 38. Stage 10 Trailing edge base




Picture 39. Stage 11 Leading edge tip




Picture 40. Stage 11 Leading edge base




Picture 41. Stage 11 Trailing edge tip



Picture 42. Stage 11 Trailing edge base



Picture 43. Stage 12 Leading edge tip



Picture 44. Stage 12 Leading edge base



Picture 45. Stage 12 Trailing edge tip



Picture 46. Stage 12 Trailing edge base



Picture 47. Stage 13 Leading edge tip



Picture 48. Stage 13 Leading edge base



Picture 49. Stage 15 Trailing edge tip



Picture 50. Stage 15 Trailing edge base



Picture 51. Stage 16 Leading edge tip



Picture 52. OGV'S

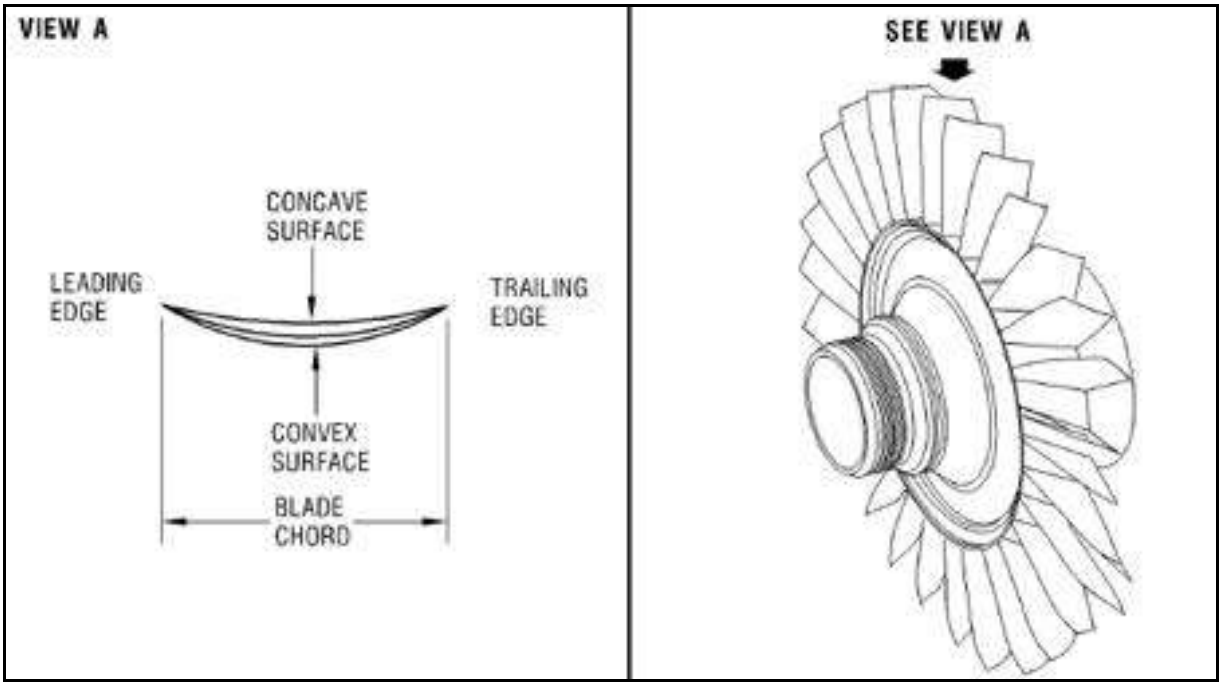



*Figure 5: HPC stage 0 BLISK*

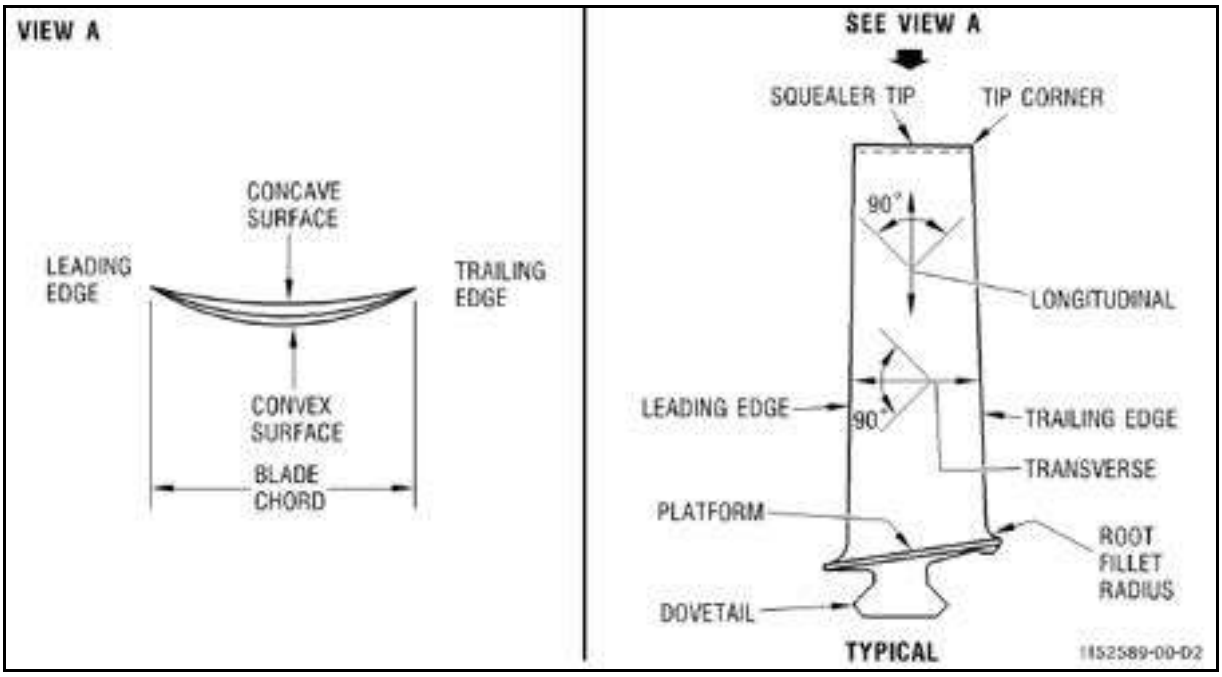



*Figure 6: Compressor Rotor Blades*

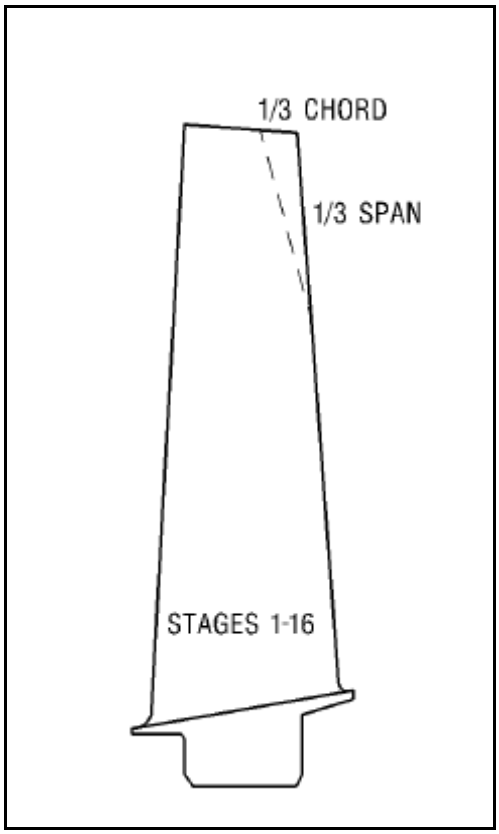



*Figure 7: Tip Trailing Edge Inspection*

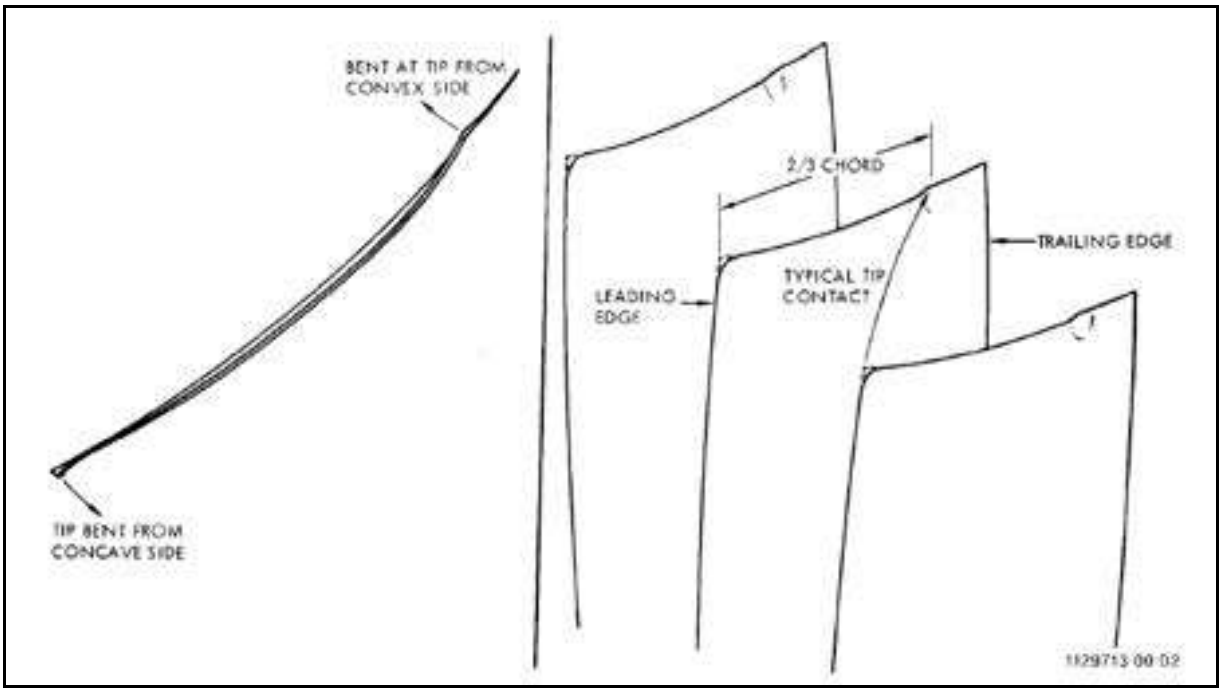


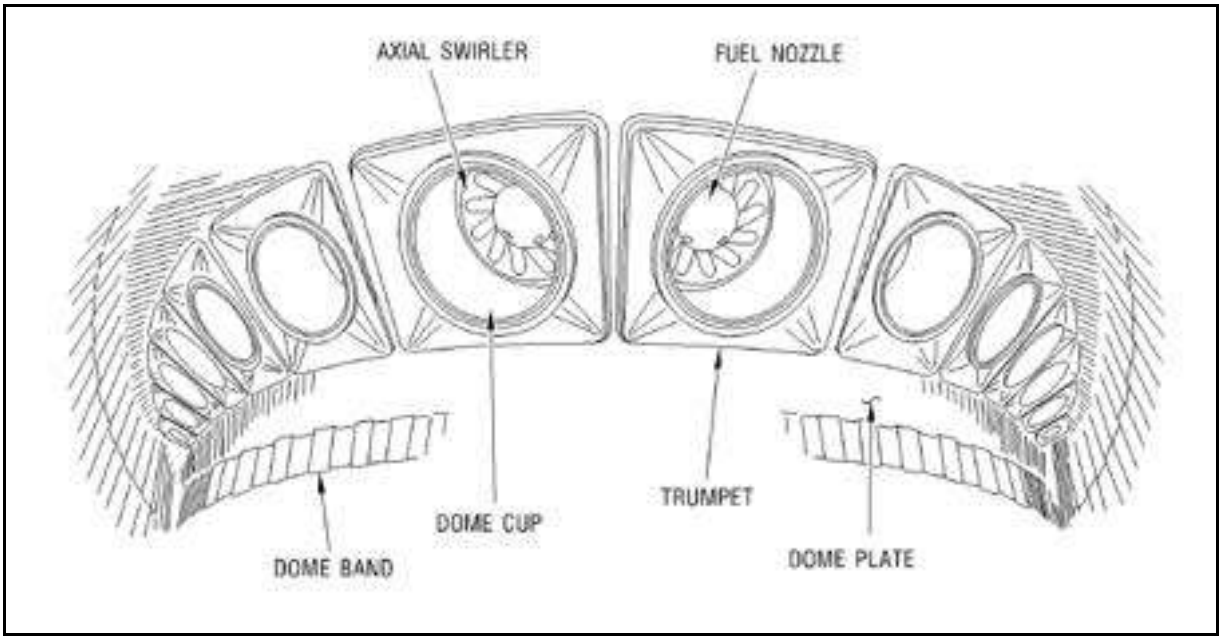

*Figure 8: Tip Clanging Contact (HPCR stage 3 through 6)*

## 4.2 Combustor and 1St Stage Nozzle Section

| Port | Condition observed | Photo no: |
|---|---|---|
| **17A** | | |
| **17B** | | |
| **17C** | | |
| **17D** | **See below notes.** | |
| **17E** | | |
| **17F** | | |
| **17G** | | |
| **17H** | | |
| **17** | 1st stage nozzle (leading edge): | |

**Notes:**

The Combustor section is serviceable according to GEK105054 Volume II WP40600 Table 7.
Found 2 cracks on combustor at upper and lower igniter location



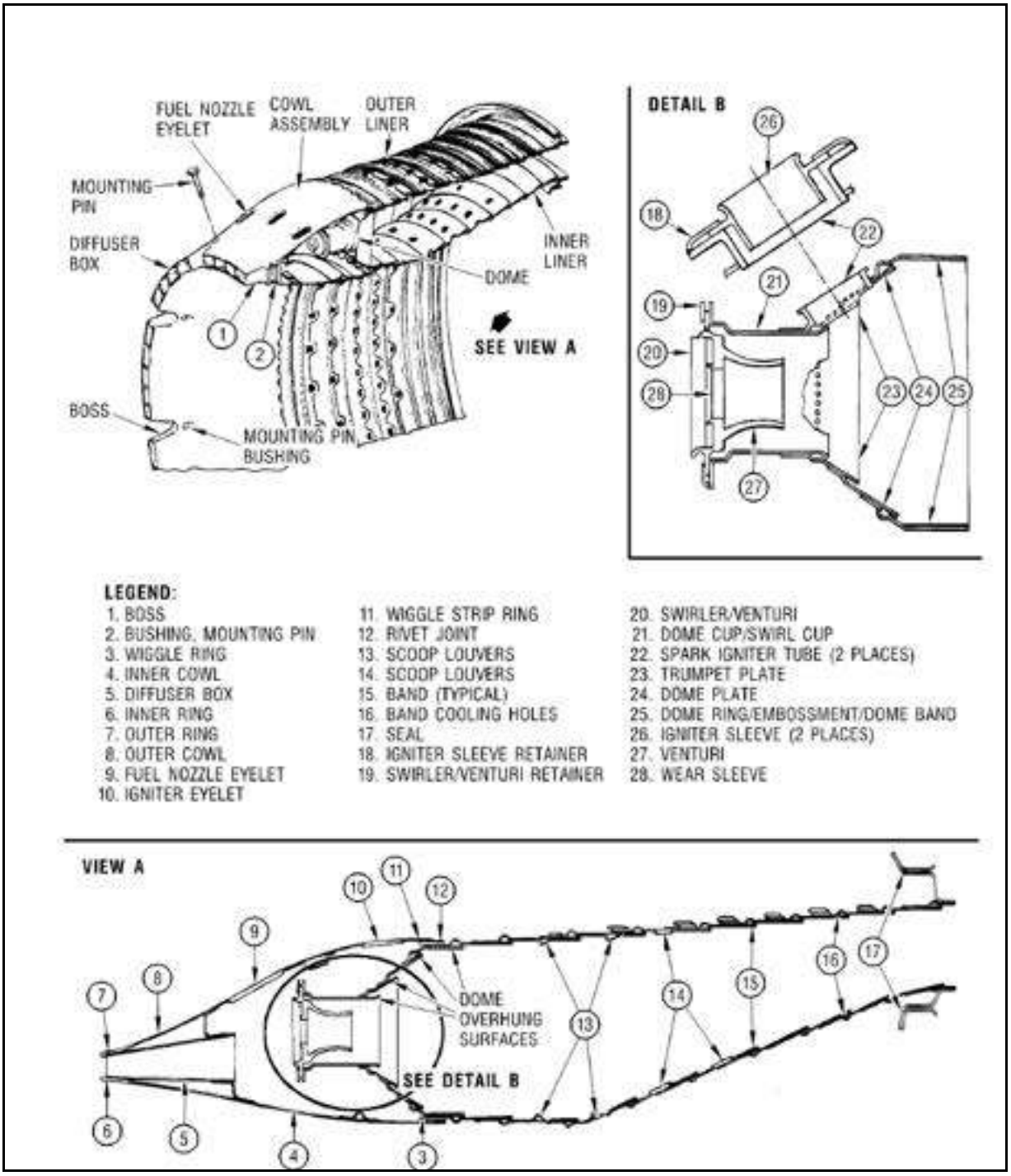



*Figure 9: SAC Combustor Inspection*

*Figure 10: SAC Combustor Inspection*

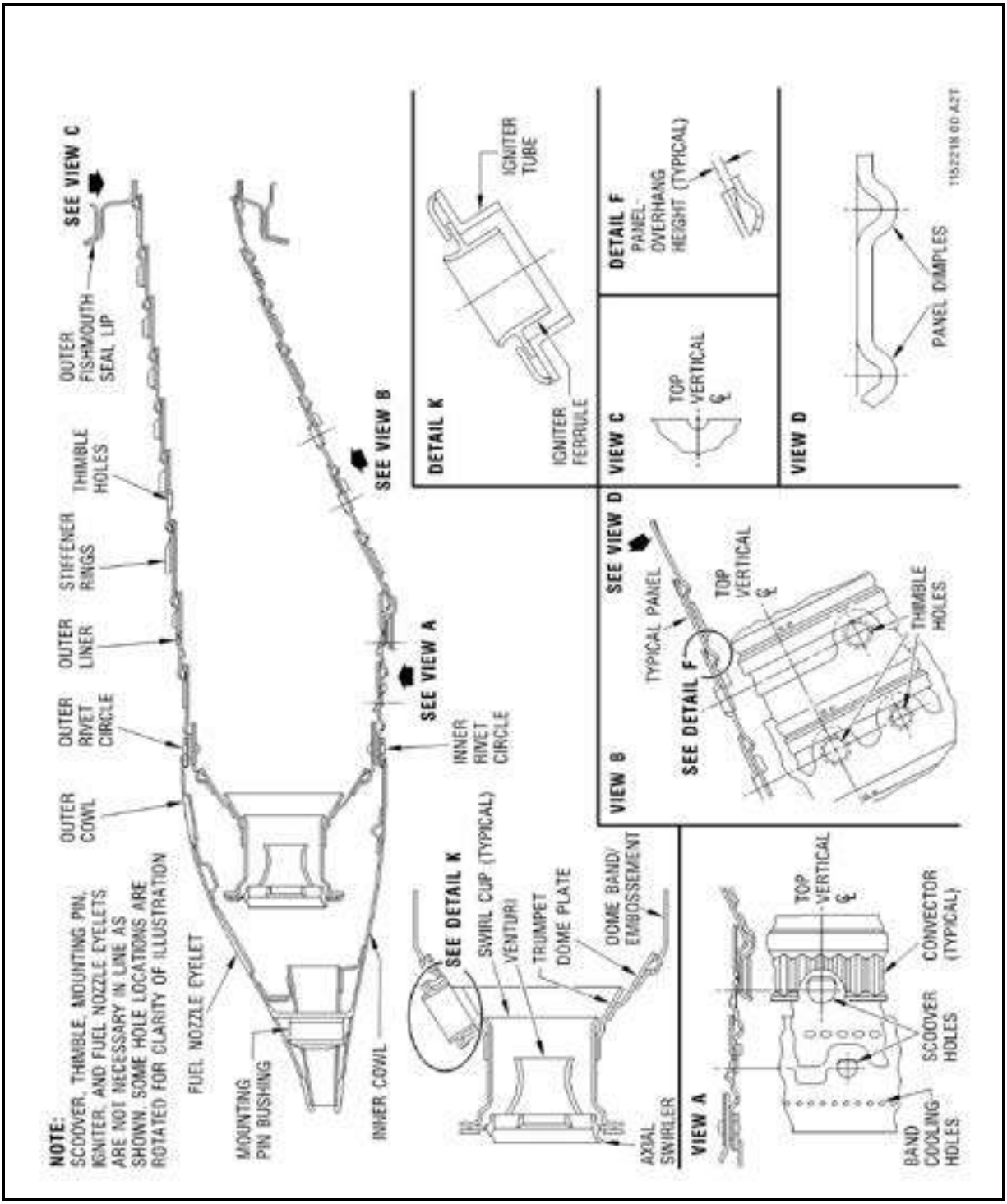



*Figure 11: SAC Combustor Inspection*

**Borescope Pictures**



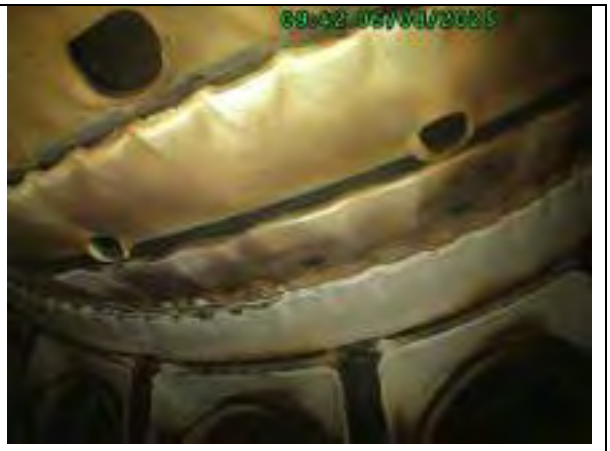
Picture 53. Upper igniter ferrule



Picture 54. Lower igniter ferrule



Picture 55. Outer rivets band



Picture 56. Inner rivets band



Picture 57. Combustor liners



Picture 58. Combustor crack

| | | |
|---|---|---|
|  | |  |
| Picture 59. Combustor crack | | Picture 60. Fuel Nozzle tip |

| | | |
|---|---|---|
|  | |  |
| Picture 61. Combustor liners and HPT nozzle interference | | Picture 62. . Combustor liners and HPT nozzle interference |

## 4.3 Turbine Section

| | turbine stage | | | | |
|---|---|---|---|---|---|
| **Port** | **L.E.** | **T.E.** | **blades** | **Remarks:** | **photo no:** |
| **18** | **1** | | **88** | | |
| **19** | | **1** | **88** | **See below notes.** | |
| **19** | **2** | | **90** | | |
| **20** | | **2** | | | |

**Notes:**

The High Pressure Turbine section is serviceable according to GEK105054 Volume II WP40600 Table 8.

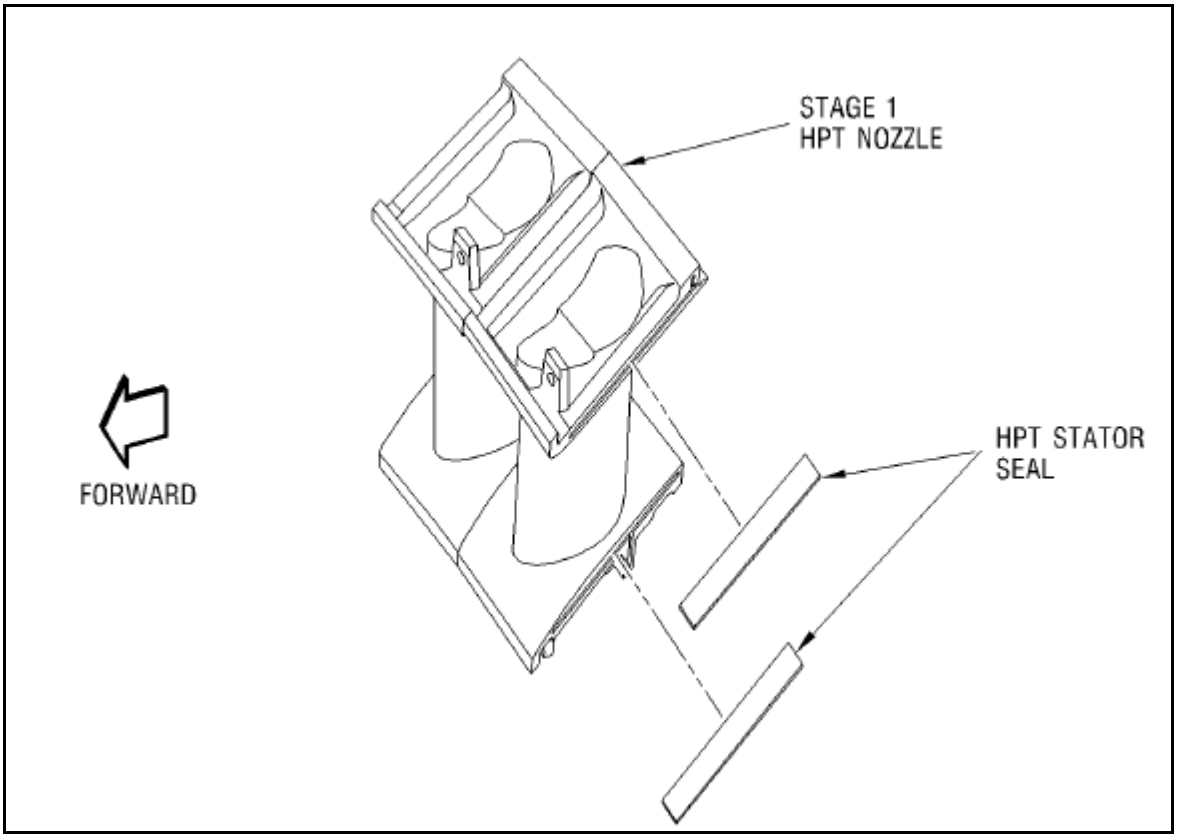



*Figure 12: Stage 1 HPT Nozzle Seal Displacement*

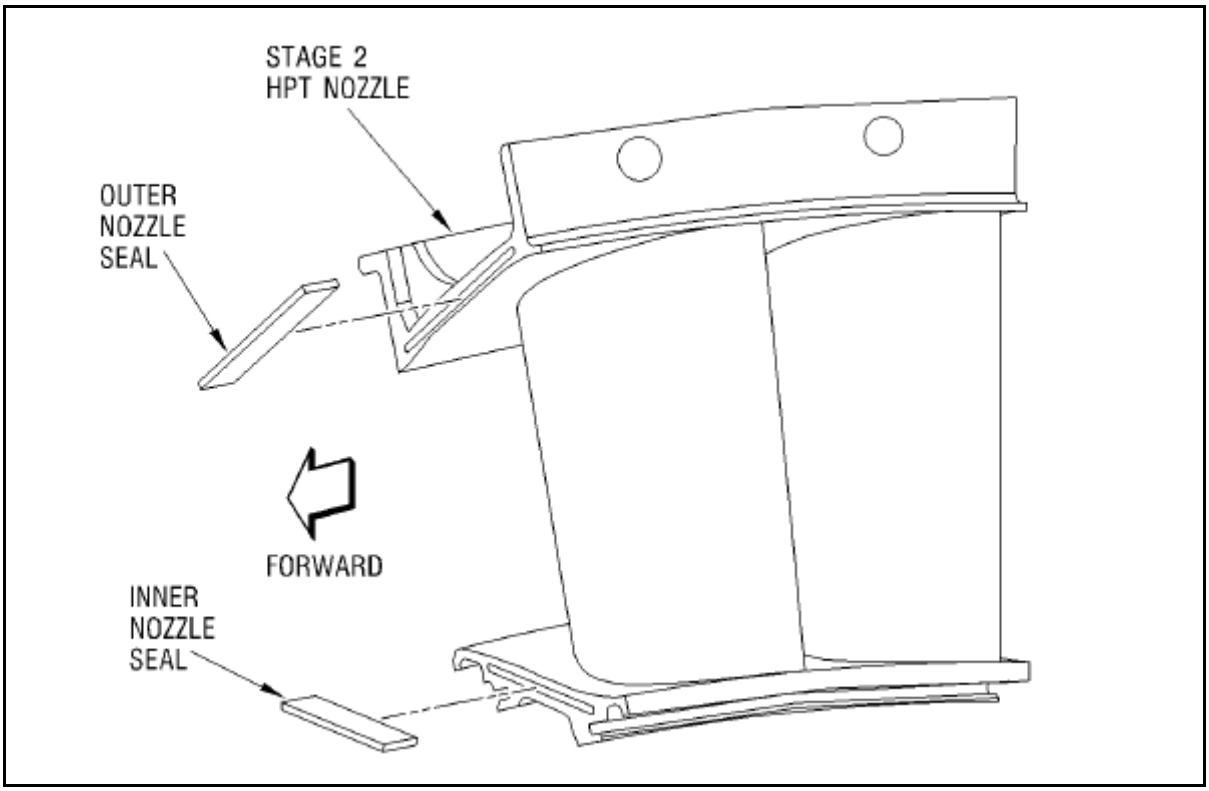



*Figure 13: Stage 2 HPT Nozzle Seal Displacement*

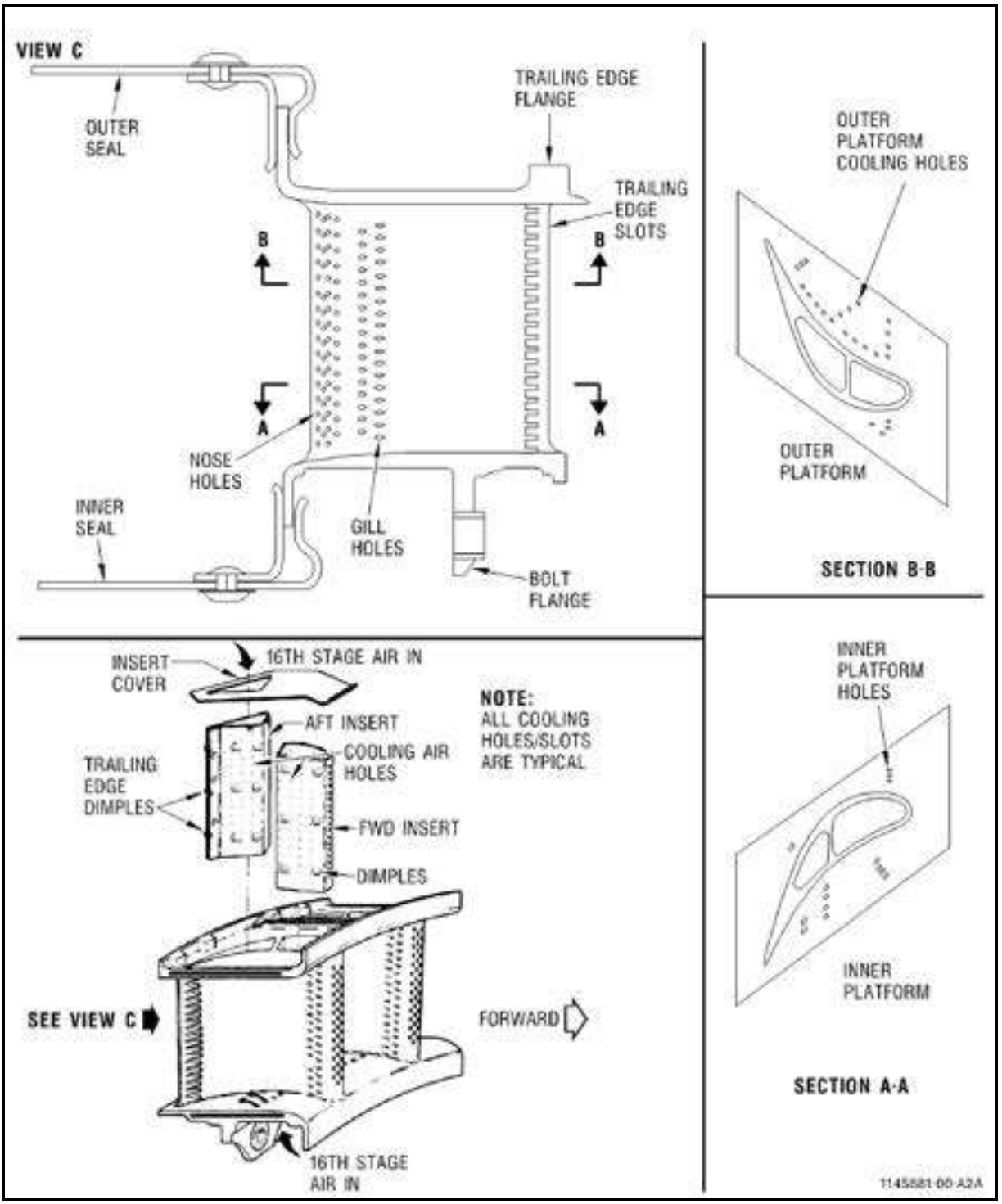



*Figure 14: HPT Stage 1 Nozzle*

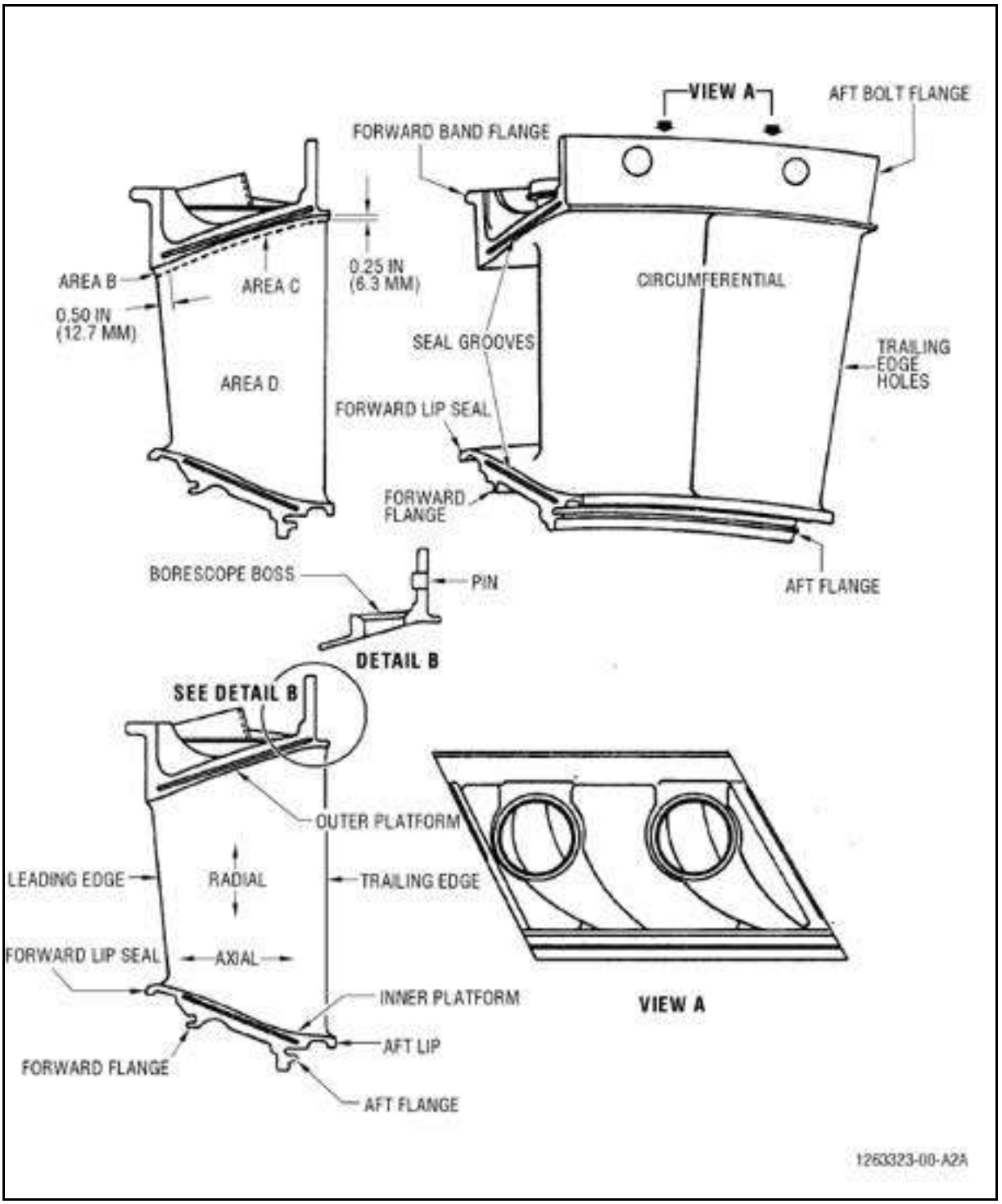



*Figure 15: HPT Stage 2 Nozzle*

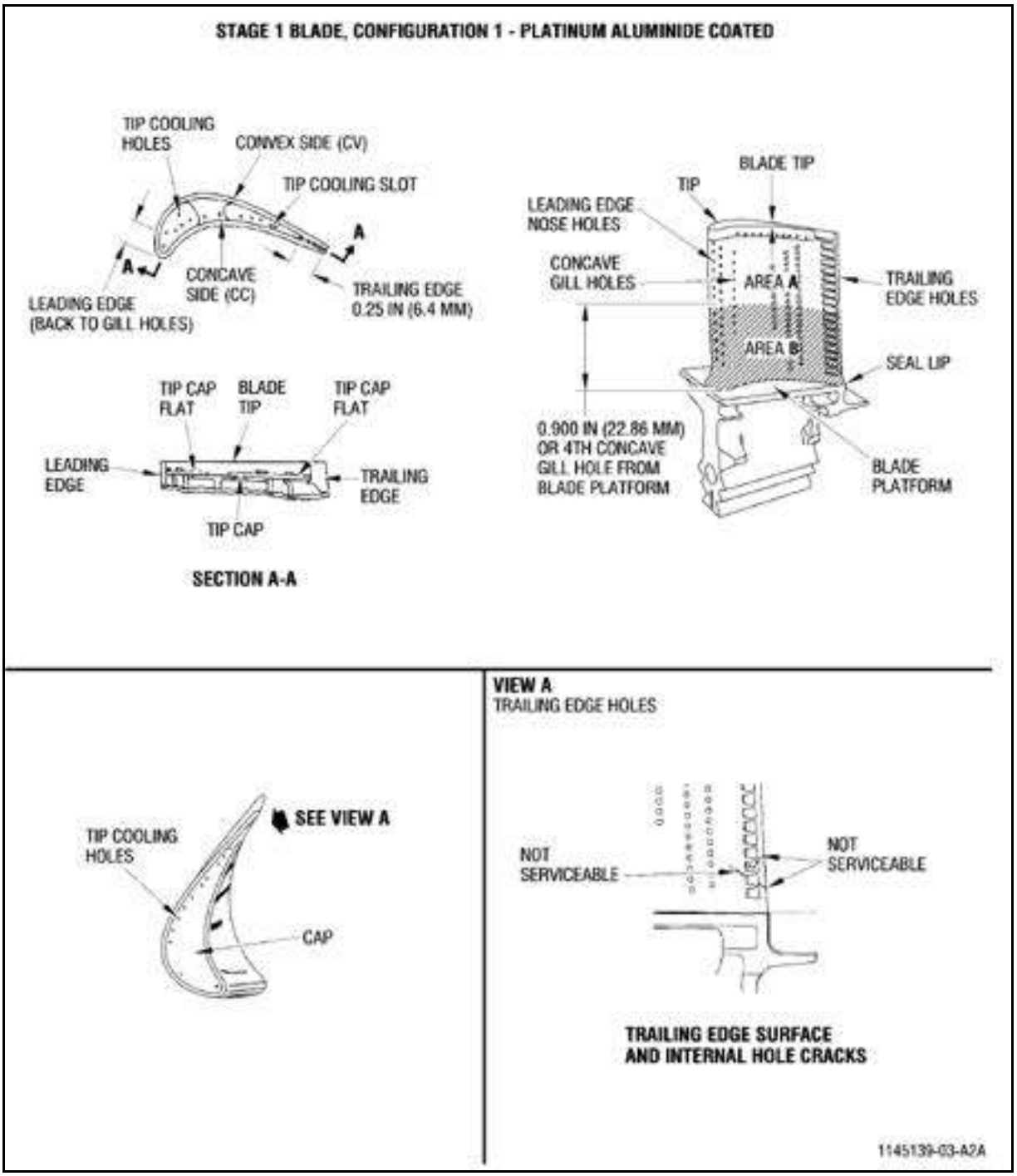



*Figure 16: HPT Stage 1 Rotor Blades Inspection Areas (Platinum Aluminide Coated Blades)*

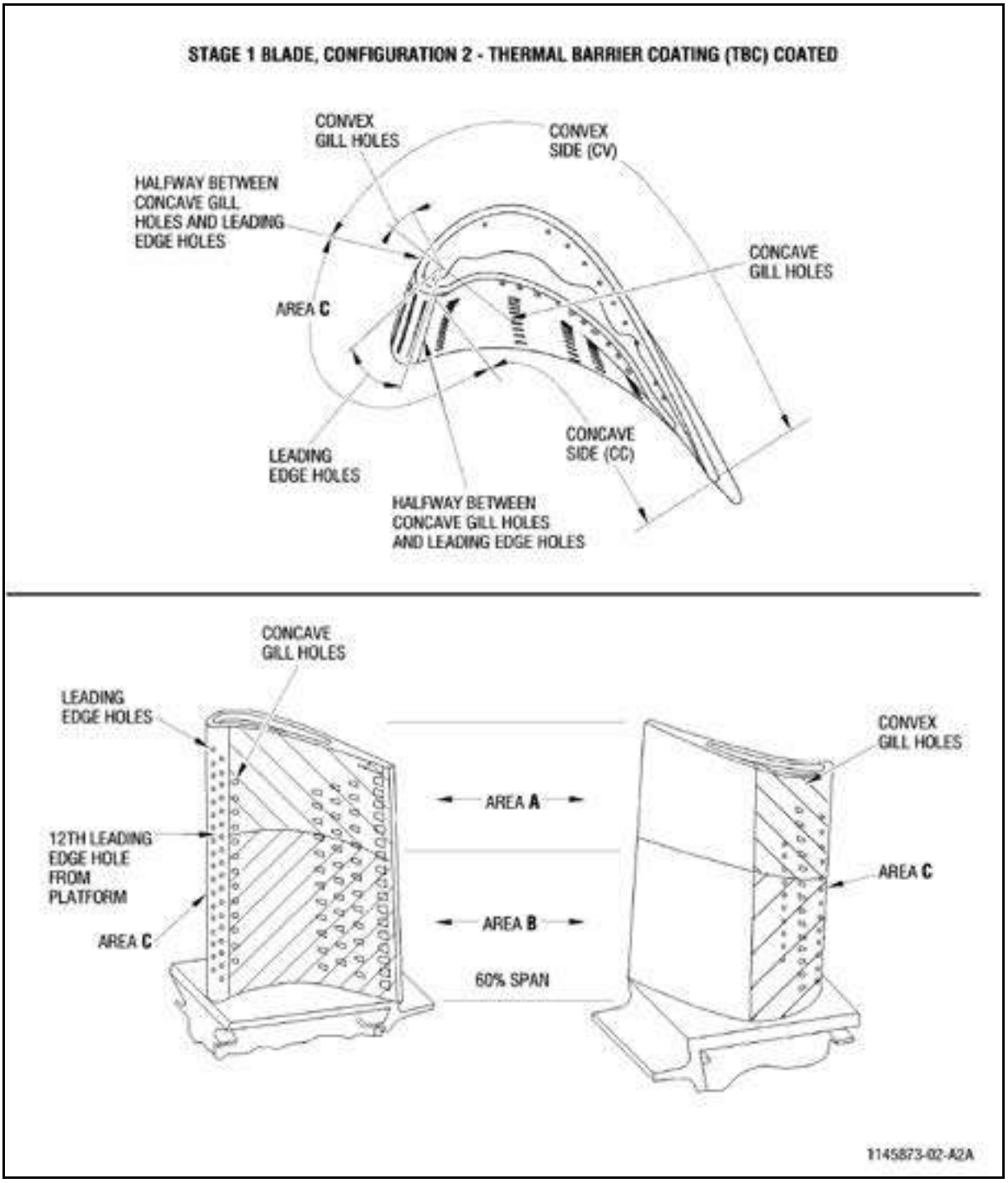



*Figure 17: HPT Stage 1 Rotor Blades Inspection Areas (TBC Coated Blades)*

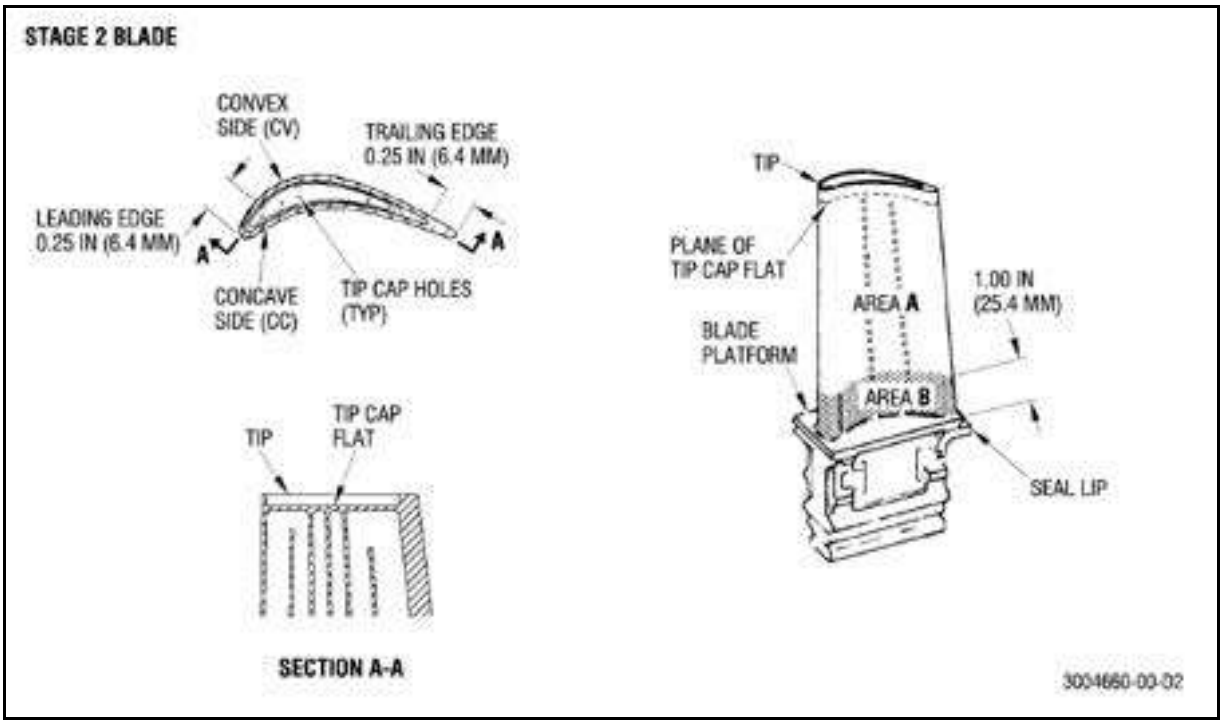



*Figure 18: HPT Stage 2 Rotor Blades Inspection Areas*

**Borescope Pictures**



Picture 63: Stage1 Nozzle leading edge



Picture 64: Stage1 Nozzles Leading edge



Picture 65: Stage1 Nozzle airfoil concave side



Picture 66: Stage1 Nozzle airfoil concave side



Picture 67: Stage1 Nozzles airfoil concave



Picture 68: Stage1 Nozzle airfoil concave



Picture 69: Stage1 Nozzle airfoil concave side



Picture 70: Stage1 Nozzle airfoil concave side



Picture 71: Stage1 Nozzle trailing edge concave



Picture 72: Stage1 Nozzle trailing edge convex



Picture 73: Stage1 Nozzle trailing edge



Picture 74: Stage1 Nozzle trailing edge



Picture 75: Stage1 Blades leading edge tip



Picture 76: Stage1 Blades leading edge convex



Picture 77: Stage 1 Blades leading edge base



Picture 78: Stage 1 Blades leading edge base



Picture 79: Stage 1 Blades trailing edge tip



Picture 80: Stage 1 Blades trailing edge root



Picture 81: Stage 2 Blades leading edge tip



Picture 82: Stage 2 Honeycomb seals



Picture 83: Stage 2 Blades leading edge root



Picture 84: Stage 2 Blades and stage 2 nozzles



Picture 85: Stage 2 Blades trailing edge



Picture 86: Stage 2 Blades trailing edge

## 4.4 LPT Section

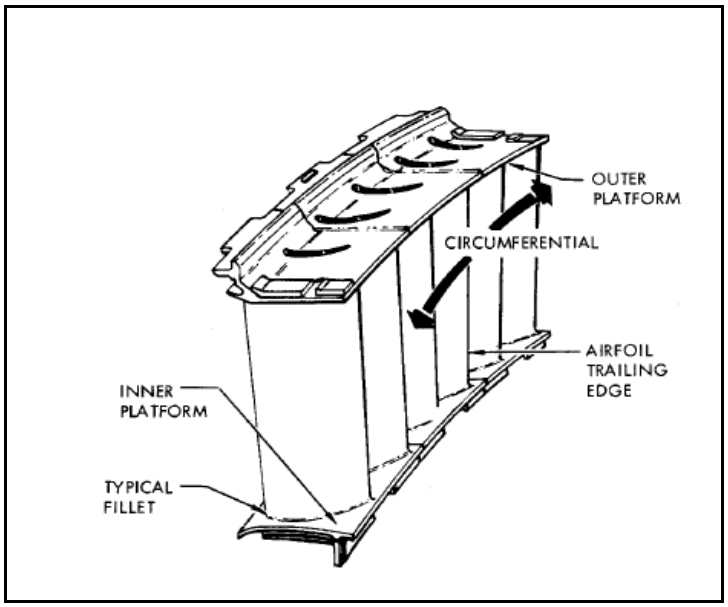



*Figure 19: Power Turbine Nozzles*

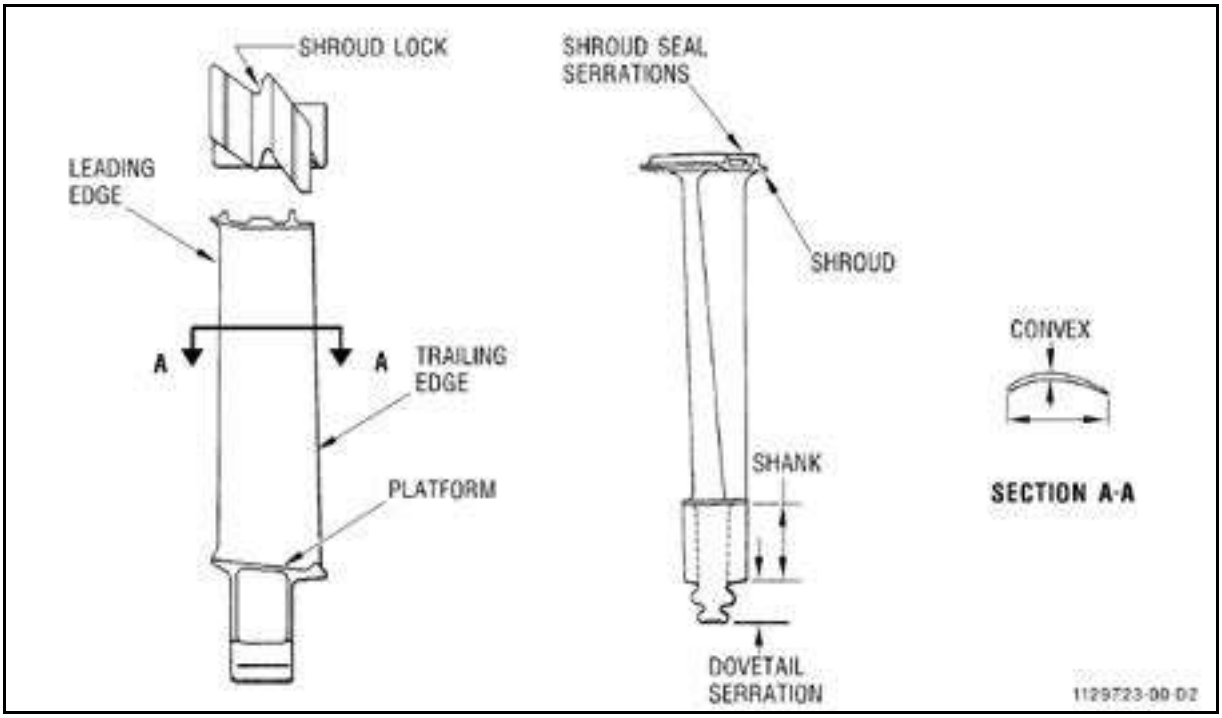



*Figure 20: Power Turbine Rotor Blades*

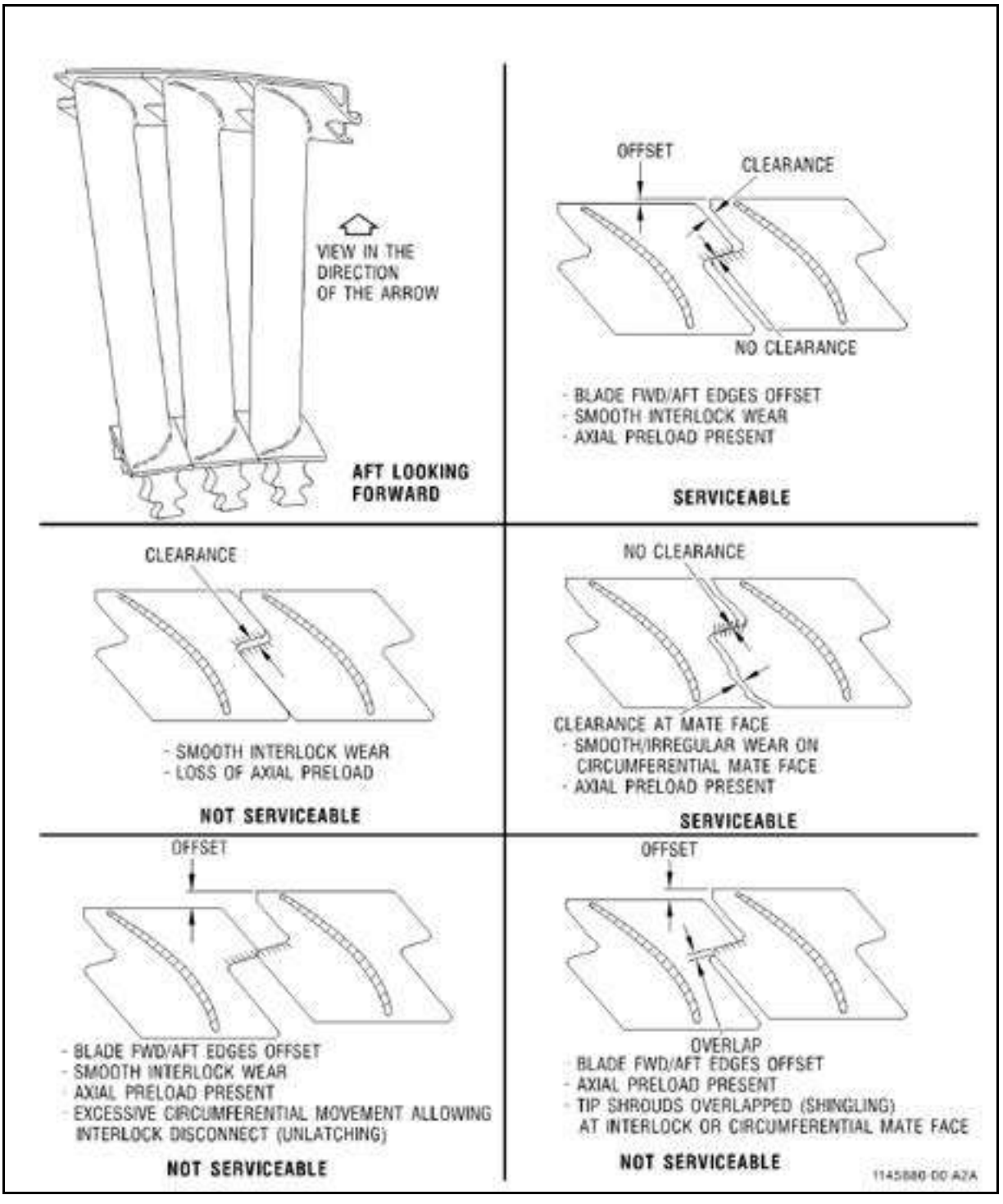



*Figure 21: LPT Rotor Blade Circumferential Inspection*

**Notes:**

The LPT stage 1 accessible nozzles and blades did not show any damage.

**Borescope Pictures**



Picture 87: STG1 LPT nozzles



Picture 88: TMF and LPT Inlet



Picture 89: Stage 1 Blades



Picture 90: LPT Stage 1 Blades tip interlock

# BORESCOPE INSPECTION REPORT
# TM2500 GEN. 6-7
## *7LM2500 – PK – MDWG05*

## NEW FORTRESS ENERGY

## Palo Seco, PR

## PACKAGE # TM-49

## UNIT #3

| | | | |
|---|---|---|---|
| **Visit Date:** | 08/21/2025 | **Total Starts:** | 812 |
| **Engine S/N:** | 481-559 | **GG Hours:** | 40833 |
| **Power Turbine S/N:** | 481-559 | **PT Hours:** | 40833 |
| **SOM GT Field Engineer:** | Daniel Arroyo | **New Fortress Representative:** | Jonathan Rodriguez |



## TABLE OF CONTENTS


1 Conclusions and Recommendations 3

2 Outage Data 4

3 Borescope Inspection Checklist 4

4 Borescope Inspection Record 6

4.1 Compressor Section

4.2 Combustor and 1St Stage Nozzle Section

4.3 Turbine Section

4.4 LPT Section

## 1. Conclusions and Recommendations

**Purpose of visit:**

The purpose of this visit was to perform a borescope inspection of the Engine in accordance with GEK 97310 , Chapter 5-3.5.

1.1 The HPC section is serviceable according to GEK97310, Table 5-4. No damages were found.
1.2 The Combustor section is serviceable according to GEK97310, Table 5-5.
1.3 The High Pressure Turbine section is serviceable according to GEK97310, Table 5-6.
1.4 The LPT inspected nozzles and blades are serviceable according to GEK97310, Table 5-10 and Table 5-11.

## 2. Outage Data

### Engine Data

| | | | | | |
|---|---|---|---|---|---|
| **ESN:** | 481-559 | **Engine Fired Hours:** | 40833 | **Package Hours:** | 40833 |
| **Model:** | 7LM2500-PK-MDWG05 | **Engine Fired starts:** | 812 | **Package Fired Starts:** | 812 |

**MAINTENANCE DATA**

| WP, SB, SL, PB, PL Performed | GEK105054, REV 11 | Date completed | Comments |
|---|---|---|---|
| Chapter 5-3.5 | Borescope Inspection | 21AUG25 | Serviceable |

5

**Parts Data**

| Description | PN Removed | SN Removed | Qty | Disposition | PN Installed | SN Installed |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

## 3. Borescope Inspection Checklist

**Date unit out of operation:** 08/21/2025
**Date unit into operation:** 08/21/2025
**Last inspection date:**

**Type of Fuel:** Gas / Diesel
**Type of NOx suppression:** Water Injection
**Type of outage:** Scheduled BSI

**Inspection of gas turbine:**

| WATERWASH: | HIGH PRESSURE COMPRESSOR: |
|---|---|
| ☒ PERFORMED WATER WASH | ☒ HPC BORESCOPE INSPECTION |
| **COMBUSTOR:** | **HIGH PRESSURE TURBINE** |
| ☒ COMBUSTOR BORESCOPE INSPECTION | ☒ HPT STAGE 1 & 2 NOZZLE BORESCOPE INSPECTION |
| | ☒ HPT BLADE BORESCOPE INSPECTION |
| **LOW PRESSURE TURBINE:** | |
| ☒ LPT BORESCOPE INSPECTION | |

☒ ***Please verify all borescope plugs have been reinstalled***

## 4. Borescope Inspection Record

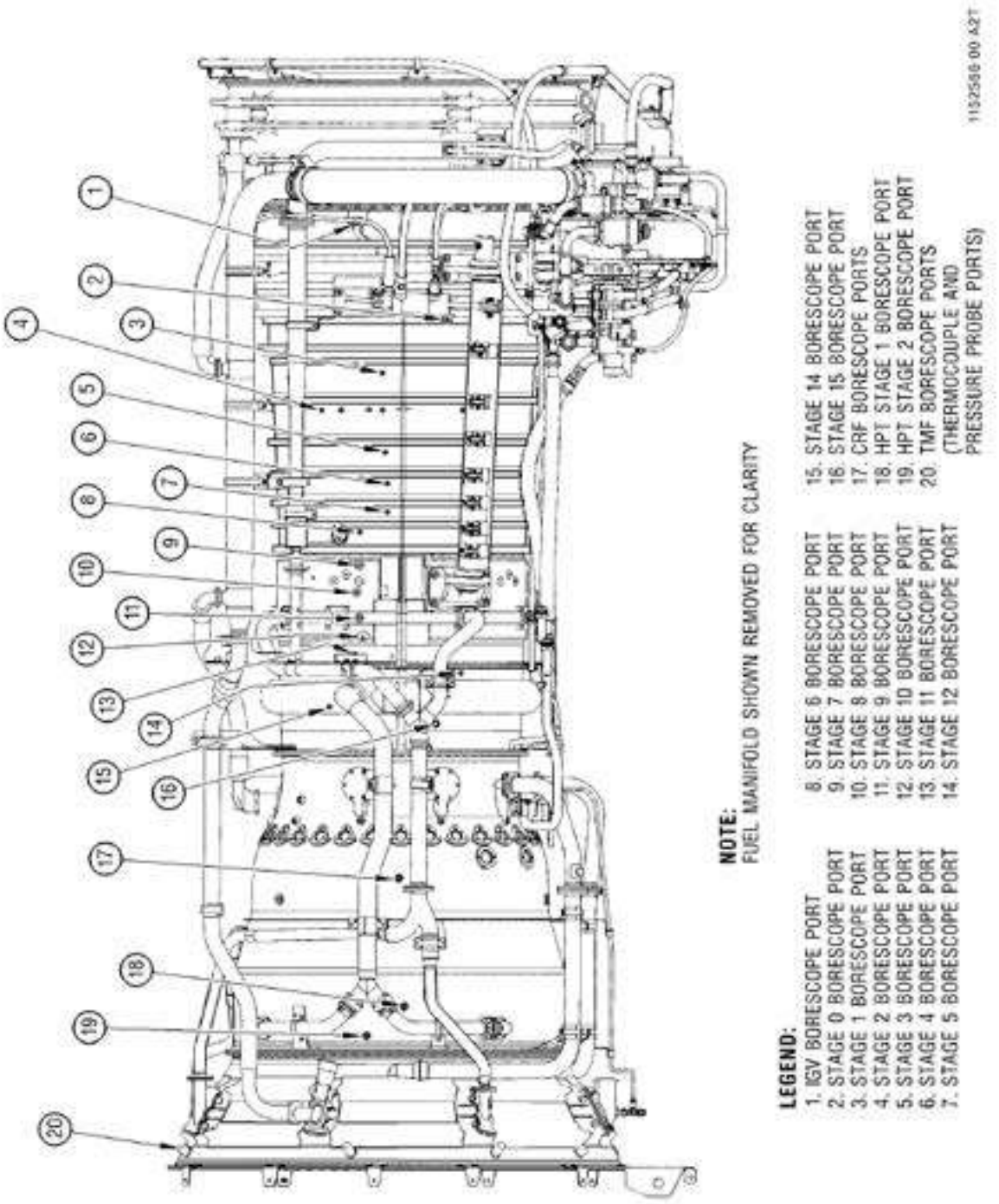



*Figure 1: Position of Borescope Inspection Ports.*

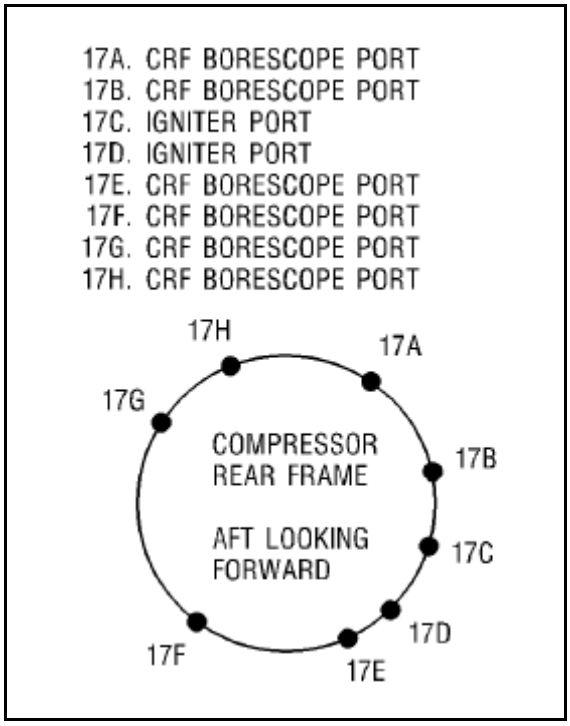



*Figure 2: Position of Borescope Inspection Ports.*

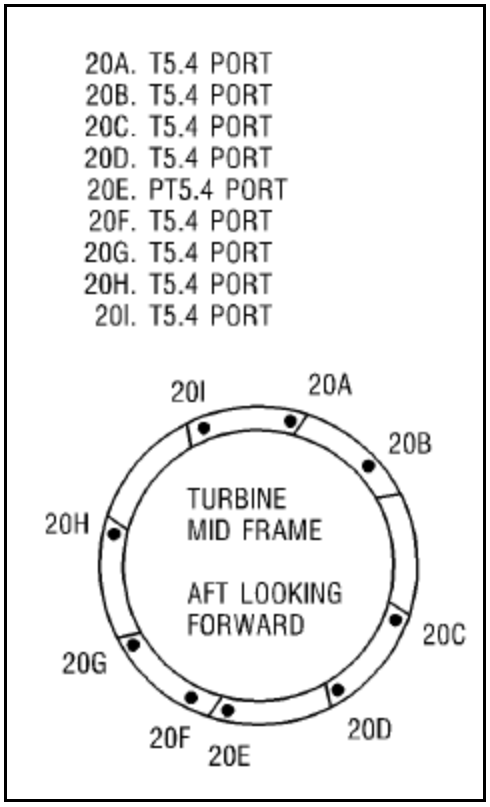



*Figure 3: Position of Borescope Inspection Ports.*

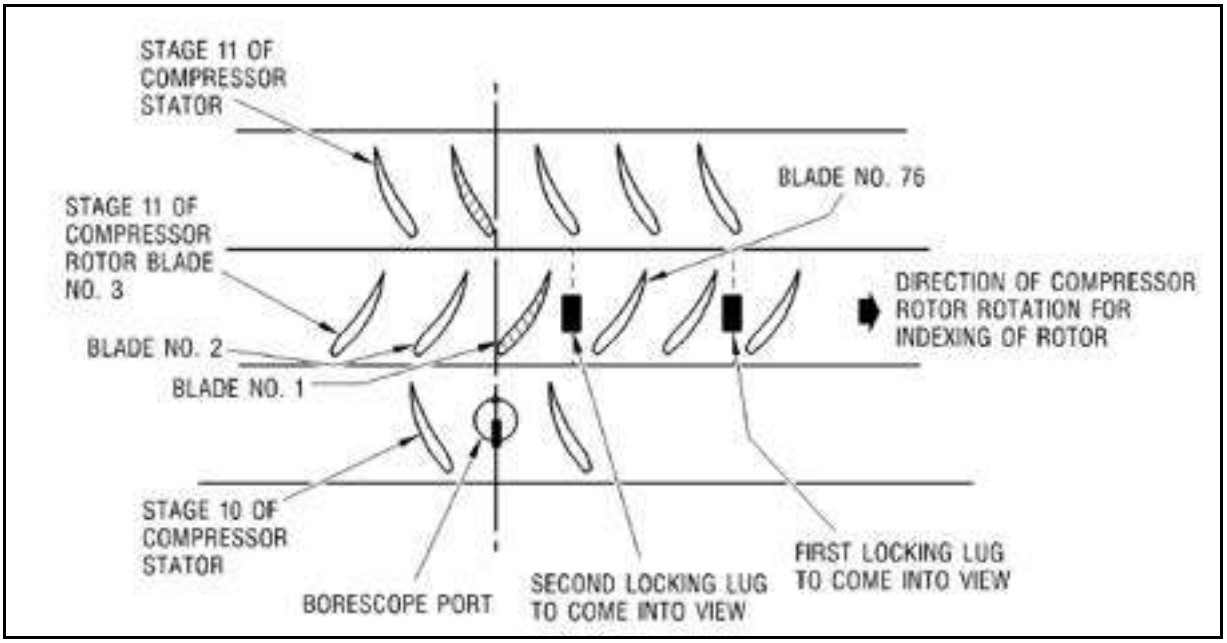



*Figure 4: Zero indexing of HPC rotor and HPT rotor*

## 4.1 Compressor Section

| Port | T.E. | L.E. | blades | Remarks: | photo no: |
|---|---|---|---|---|---|
| 1 | IGV | | | | 1 |
| 1 | | 0 | 36 | | 2,3 |
| 2 | 0 | | 36 | | 4 |
| 2 | | 1 | 26 | | 6,7 |
| 3 | 1 | | 26 | | 9,10 |
| 3 | | 2 | 26 | | 11,12 |
| 4 | 2 | | 26 | | 13 |
| 4 | | 3 | 42 | | 14 |
| 5 | 3 | | 42 | | 15,16 |
| 5 | | 4 | 45 | | 17,18 |
| 6 | 4 | | 45 | | 19, 20 |
| 6 | | 5 | 48 | | 21, 22 |
| 7 | 5 | | 48 | | 23, 24 |
| 7 | | 6 | 54 | | 25, 26 |
| 8 | 6 | | 54 | Blades contacting tip | |
| 8 | | 7 | 56 | Blades contacting tip | |
| 9 | 7 | | 56 | | 27 |
| 9 | | 8 | 64 | | 28 |
| 10 | 8 | | 64 | | 29,30 |
| 10 | | 9 | 66 | | 31 |
| 11 | 9 | | 66 | | 32, 33 |
| 11 | | 10 | 66 | | 35, 36 |
| 12 | 10 | | 66 | | 37, 38 |
| 12 | | 11 | 76 | | 39, 40 |
| 13 | 11 | | 76 | | 41, 42 |
| 13 | | 12 | 76 | | 43, 44 |
| 14 | 12 | | 76 | | 45, 46 |
| 14 | | 13 | 76 | | 47, 48 |
| 15 | 14 | | 76 | Inside bleed manifold | |
| 15 | | 15 | 76 | Inside bleed manifold | |
| 16 | 15 | | 76 | | 49, 50 |
| 16 | | 16 | 76 | | 51, 52 |

**Notes:**




Picture 1. CFF & IGV




Picture 2. Stage 1 Leading edge tip




Picture 3. Stage 1 Leading edge base



Picture 4. Stage 1 Trailing edge tip



Picture 5. Stage 1Trailing edge base



Picture 6. Stage 1 weep hole




Picture 7. Stage 2 Leading edge tip



Picture 8. Stage 2 leading edge base



Picture 9. Stage 2 Trailing edge tip



Picture 10. Stage 2 Trailing base



Picture 11. Stage 3 Leading edge tip



Picture12. Stage 3 Leading edge base



Picture 13. Stage 3 Trailing edge tip



Picture 14. Stage 3 Trailing edge base



- Picture 15. Stage 4 Leading edge tip



Picture 16. Stage 4 Leading edge base



Picture 17. Stage 4 Trailing edge tip



Picture 18. Stage 4 Trailing edge base



Picture 19. Stage 5 Leading edge tip



Picture 20. Stage 5 Leading edge base



Picture 21. Stage 5 Trailing edge tip



Picture 22. Stage 5 Trailing edge base



Picture 23. Stage 6 Leading edge tip



Picture 24. Stage 6 Leading edge base



Picture 25. Stage 6 Trailing edge tip



Picture 26. Stage 6 Trailing edge base



Picture 27. Stage 7 Leading edge tip



Picture 28. Stage 7 Leading edge base



Picture 29. Stage 9 Trailing edge tip



Picture 30. Stage 9 Trailing edge base



Picture 31. Stage 10 Leading edge tip



Picture 32. Stage 10 Leading edge base



Picture 33. Stage 10 Trailing edge tip



Picture 34. Stage 10 Trailing edge base



Picture 35. Stage 11 Leading edge tip



Picture 36. Stage 11 Leading edge base



Picture 37. Stage 11 Trailing edge tip



Picture 38. Stage 11 Trailing edge base



Picture 39. Stage 12 Leading edge tip



Picture 40. Stage 12 Leading edge base



Picture 41. Stage 12 Trailing edge tip



Picture 42. Stage 12 Trailing edge base



Picture 43. Stage 13 Leading edge tip



Picture 44. Stage 13 Leading edge base



Picture 45. Stage 15 Trailing edge tip



Picture 46. Stage 15 Trailing edge base



Picture 47. Stage 16 Leading edge tip



Picture 48. Stage 16 Leading edge base



Picture 49. OGV's

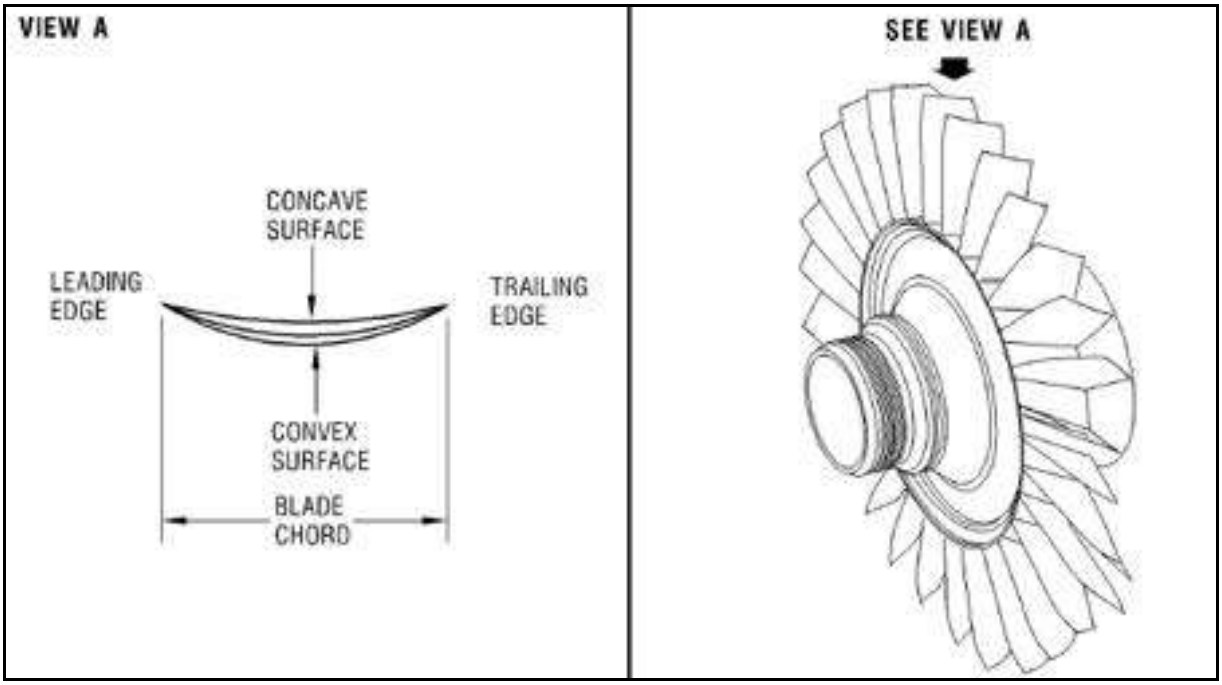



*Figure 5: HPC stage 0 BLISK*

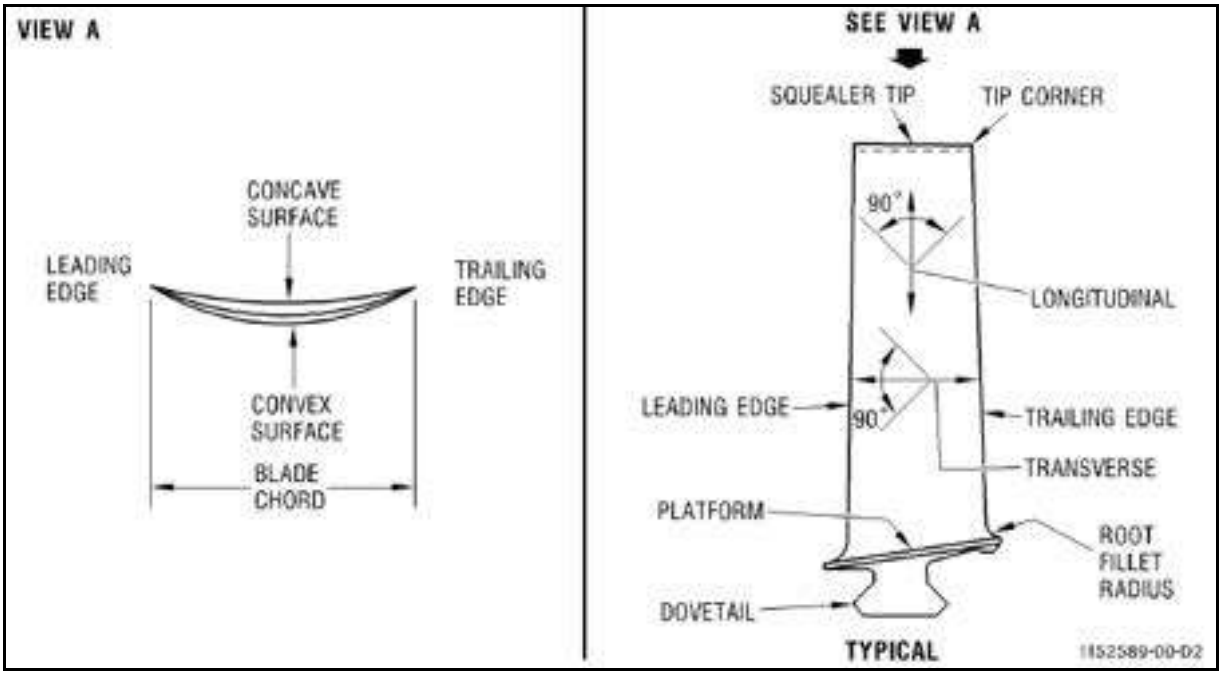



*Figure 6: Compressor Rotor Blades*

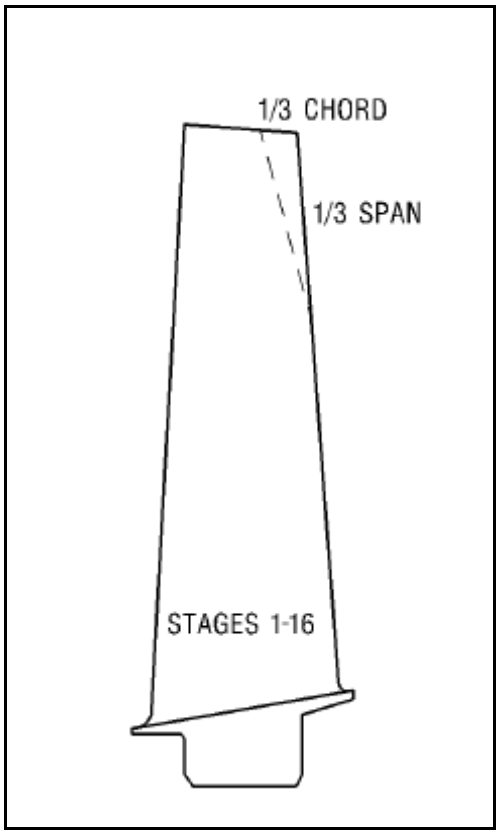



*Figure 7: Tip Trailing Edge Inspection*

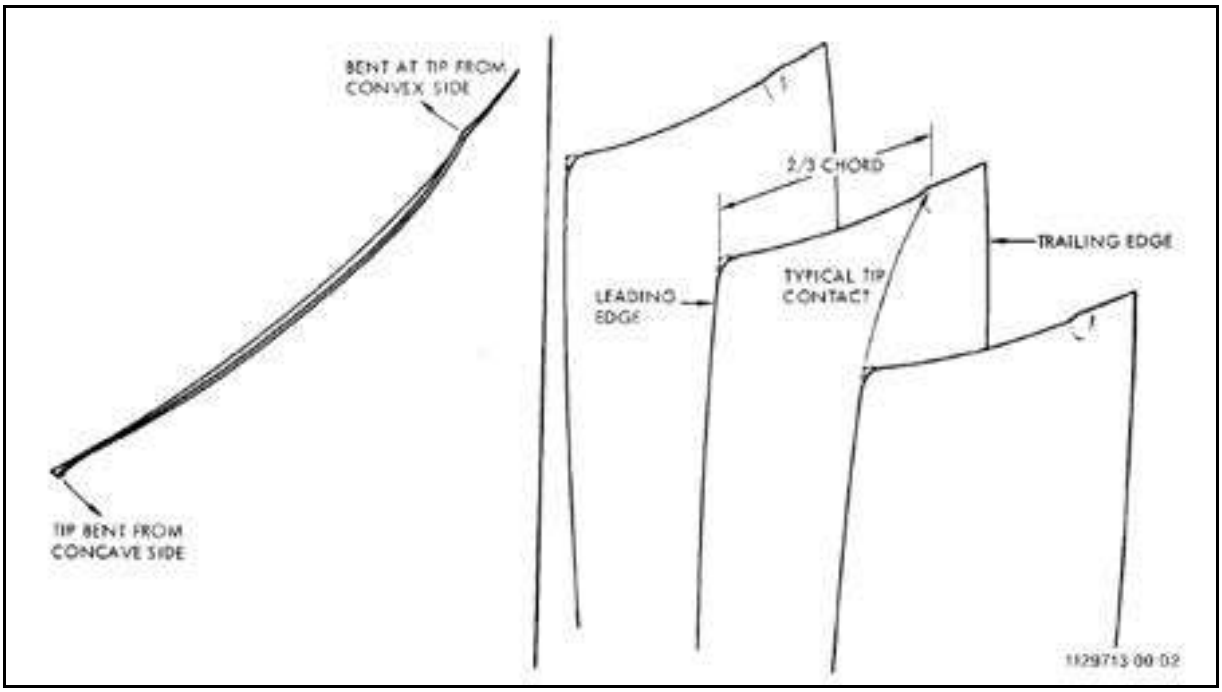


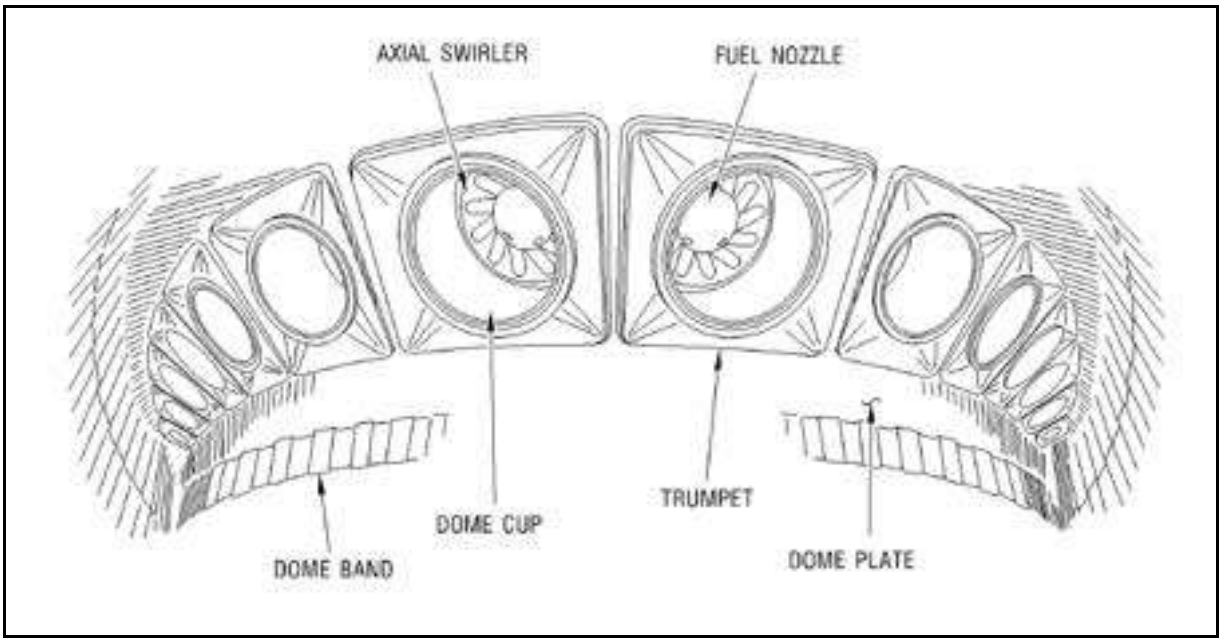

*Figure 8: Tip Clanging Contact (HPCR stage 3 through 6)*

## 4.2 Combustor and 1St Stage Nozzle Section

| Port | Condition observed | Photo no: |
|---|---|---|
| **17A** | | |
| **17B** | | |
| **17C** | | |
| **17D** | **See below notes.** | |
| **17E** | | |
| **17F** | | |
| **17G** | | |
| **17H** | | |
| **17** | 1st stage nozzle (leading edge): | |

**Notes:**

The Combustor section is serviceable according to GEK97310, Table 5-5.



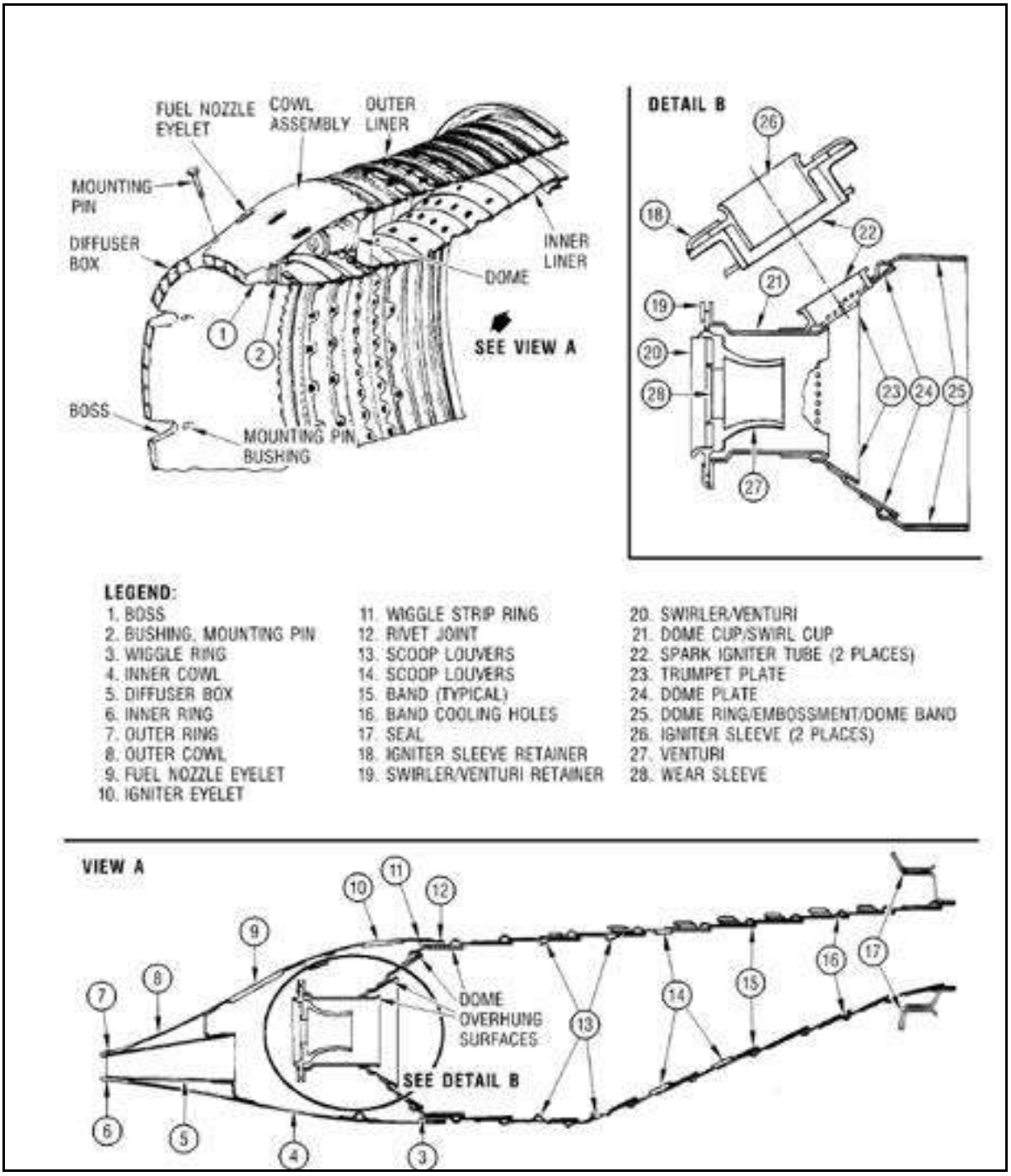



*Figure 9: SAC Combustor Inspection*

*Figure 10: SAC Combustor Inspection*

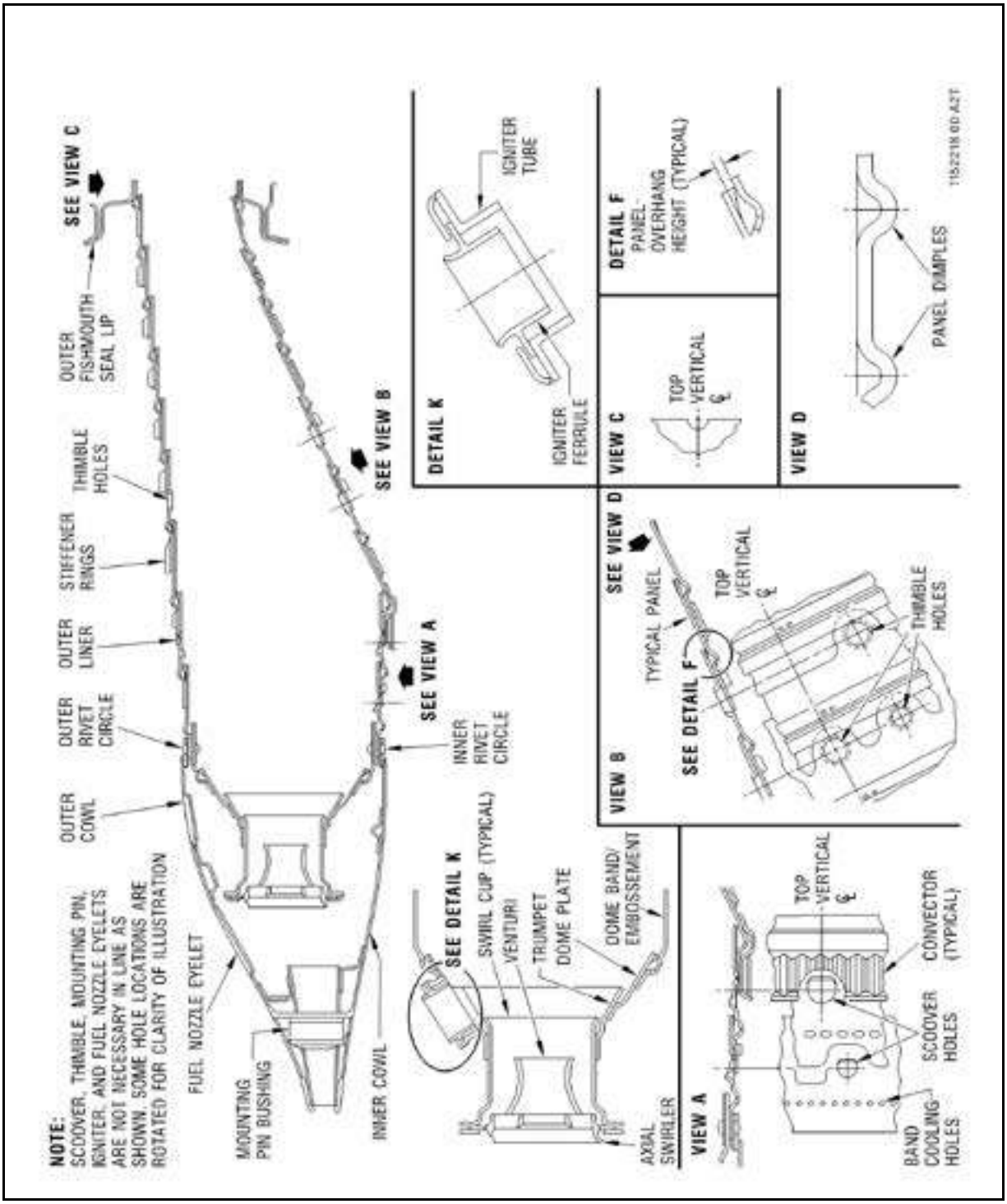



*Figure 11: SAC Combustor Inspection*

**Borescope Pictures**




Picture 50. Upper igniter ferrule




Picture 51. Lower igniter ferrule




Picture 52. Outer rivets band



Picture 53. Inner rivets band




Picture 54. Combustor liners



Picture 55. Combustor liners




Picture 56. Combustor splash plates



Picture 57. Fuel Nozzle tip




Picture 58. Combustor liners and HPT nozzle interference




Picture 59. Combustor liners and HPT nozzle interference

## 4.3 Turbine Section

| | turbine stage | | | | |
|---|---|---|---|---|---|
| **Port** | **L.E.** | **T.E.** | **blades** | **Remarks:** | **photo no:** |
| **18** | **1** | | **88** | | |
| **19** | | **1** | **88** | **See below notes.** | |
| **19** | **2** | | **90** | | |
| **20** | | **2** | | | |

**Notes:**

The High Pressure Turbine section is serviceable according to GEK97310, Table 5-6

64

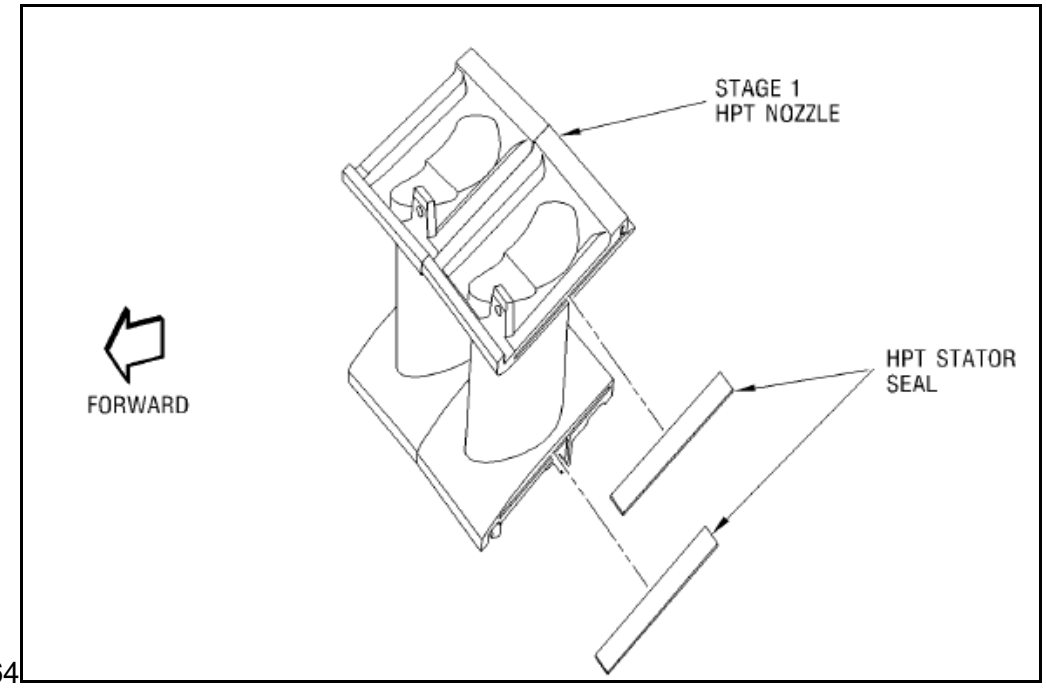



*Figure 12: Stage 1 HPT Nozzle Seal Displacement*

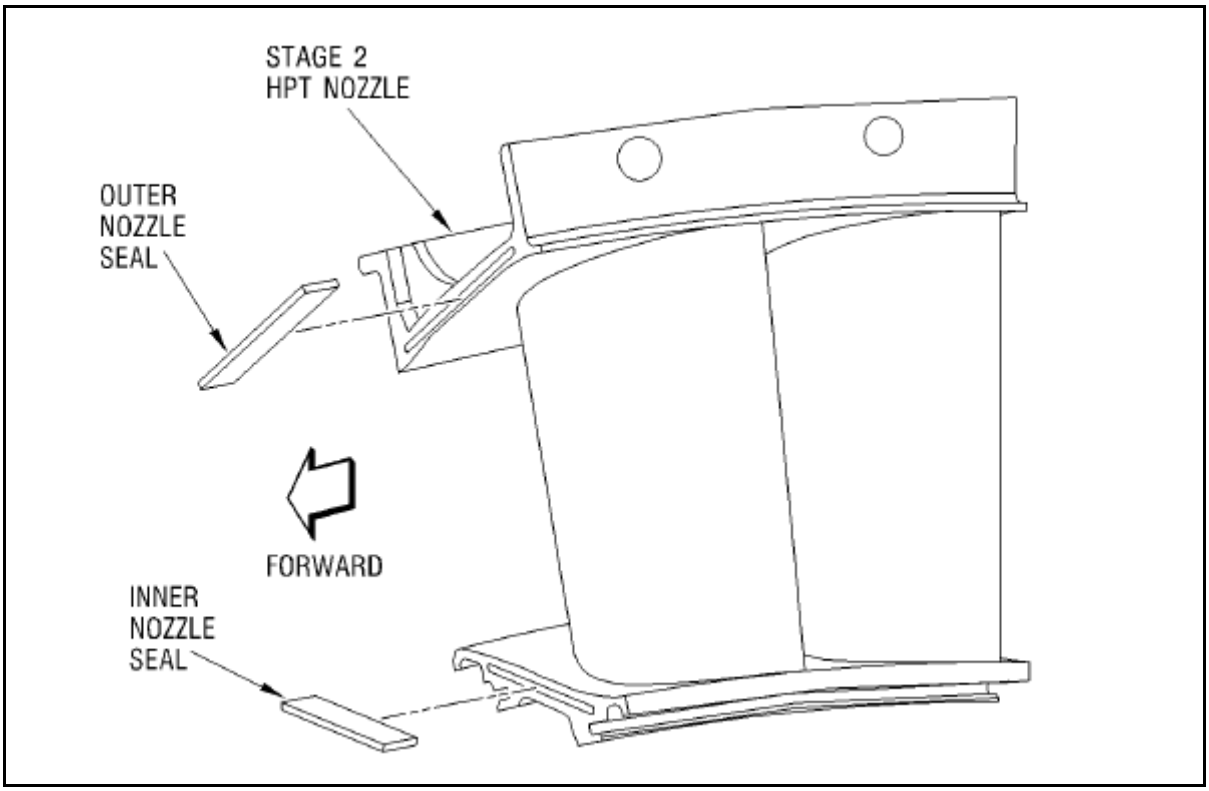



*Figure 13: Stage 2 HPT Nozzle Seal Displacement*

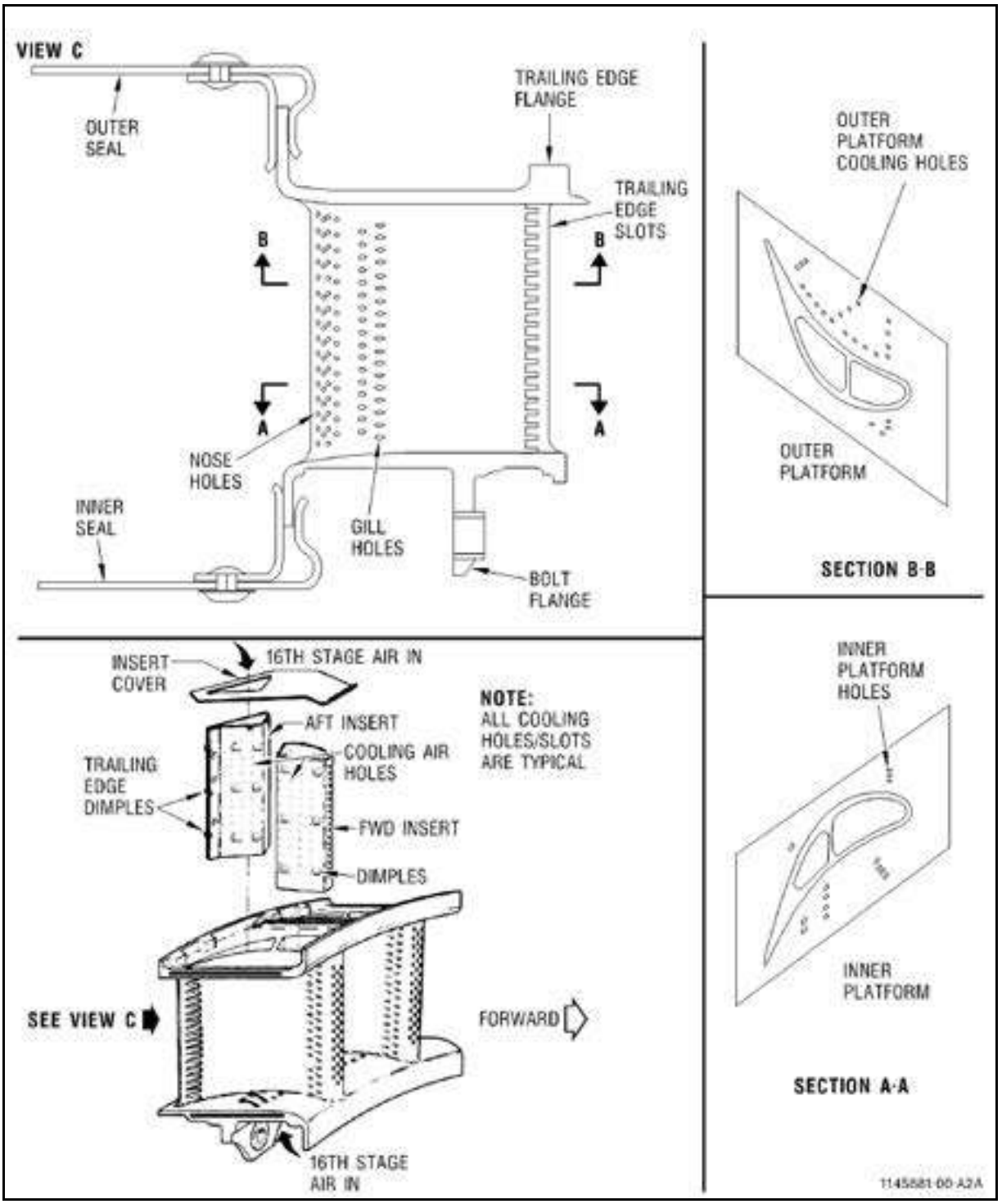



*Figure 14: HPT Stage 1 Nozzle*

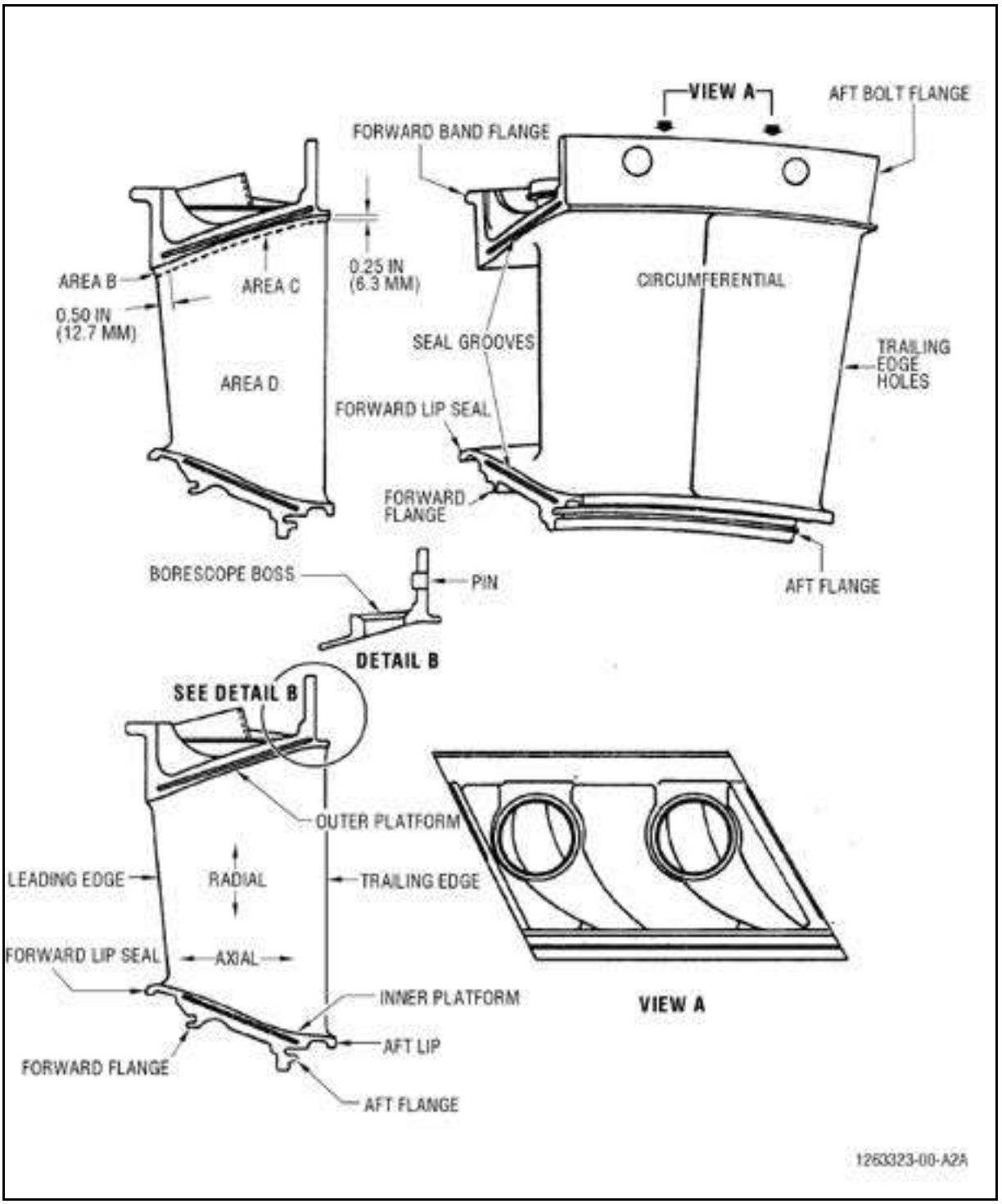



*Figure 15: HPT Stage 2 Nozzle*

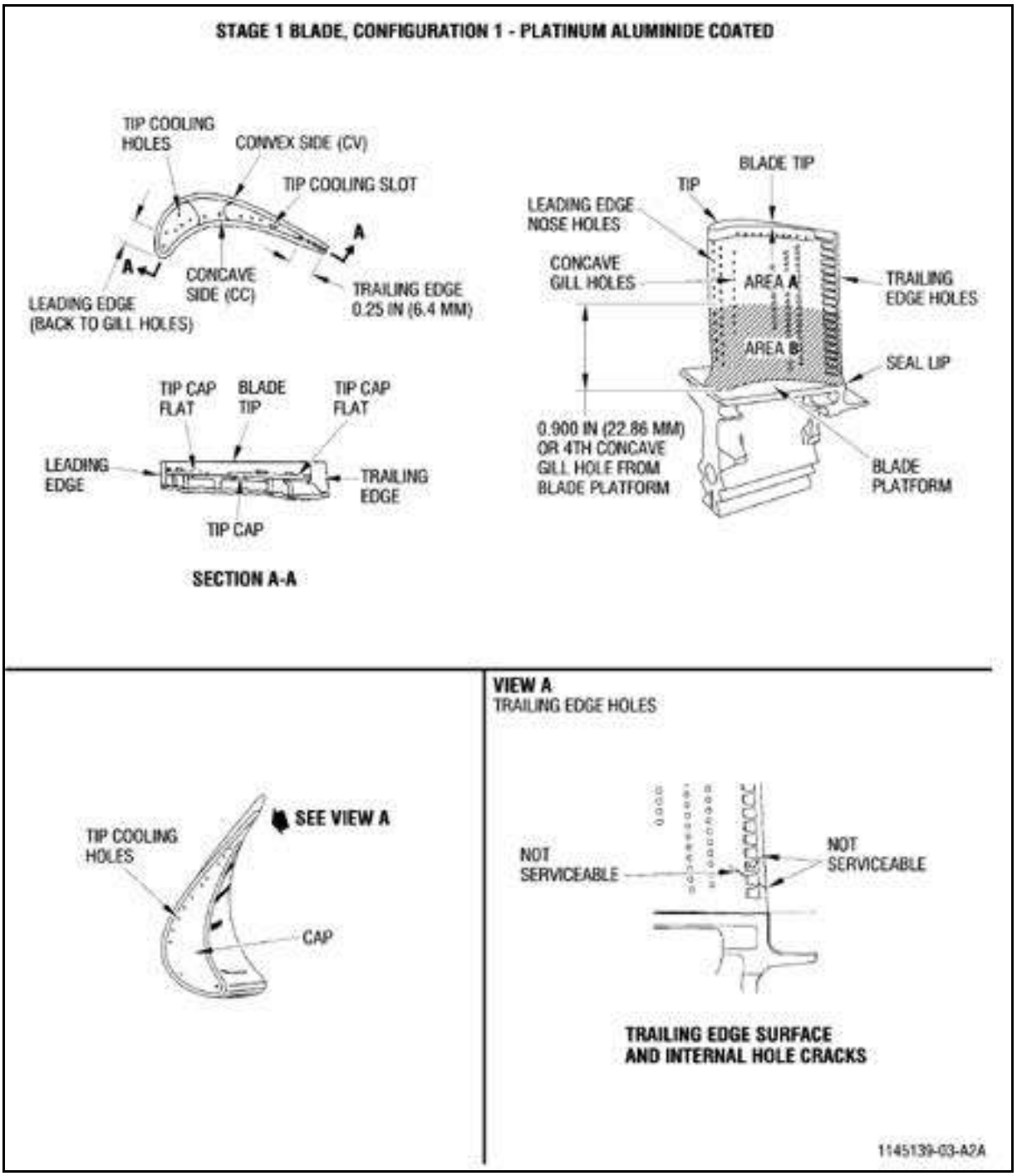



*Figure 16: HPT Stage 1 Rotor Blades Inspection Areas (Platinum Aluminide Coated Blades)*

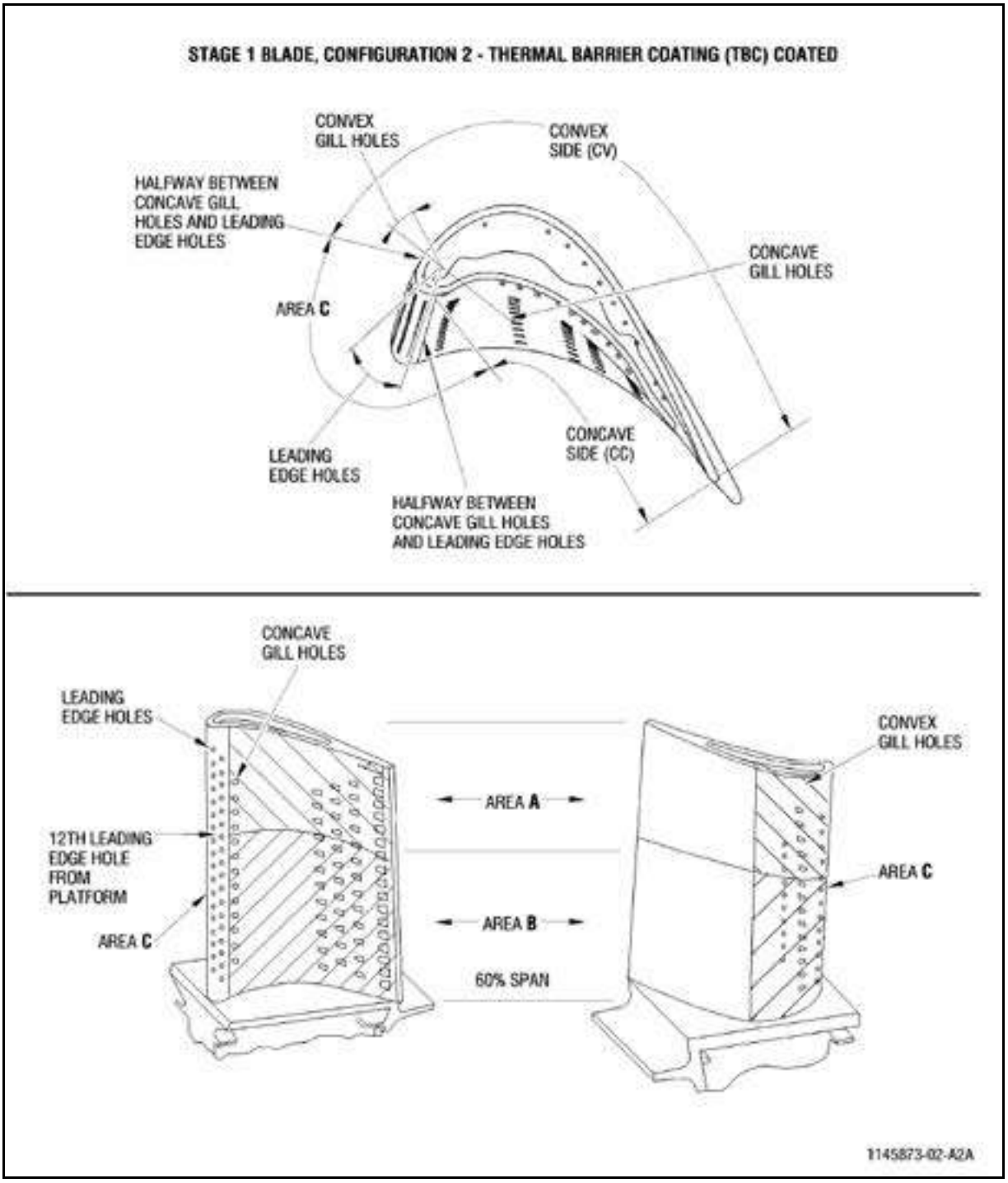



*Figure 17: HPT Stage 1 Rotor Blades Inspection Areas (TBC Coated Blades)*

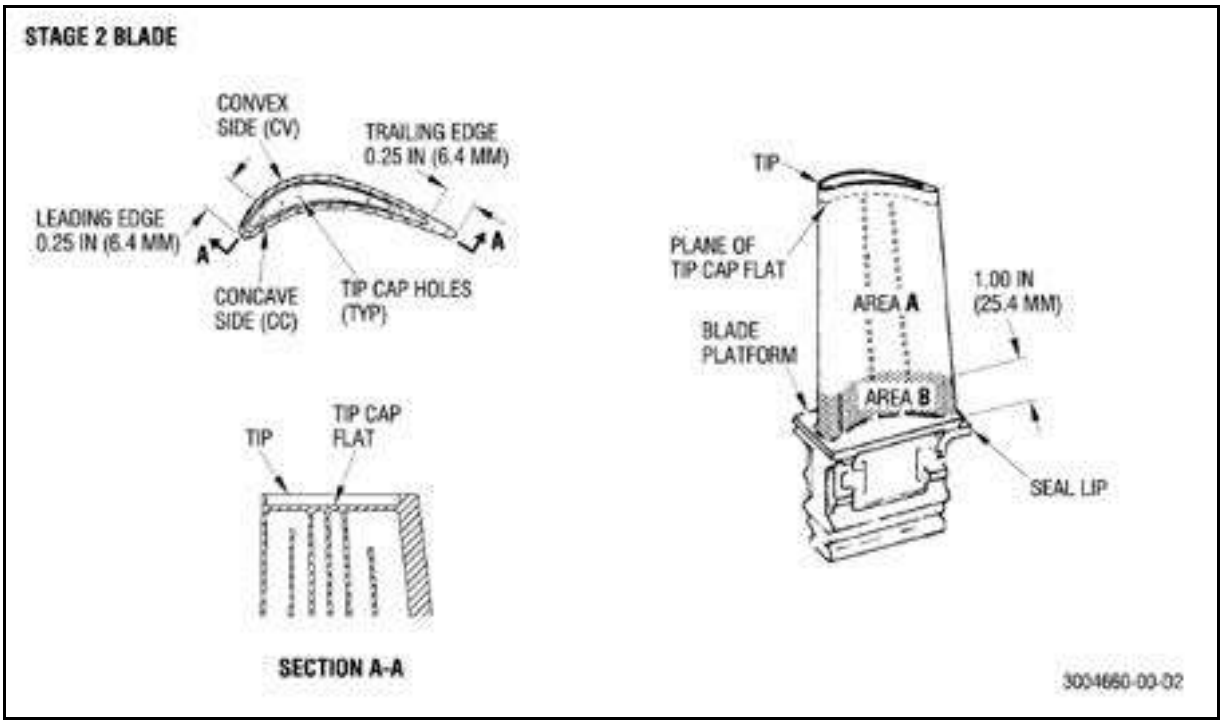



*Figure 18: HPT Stage 2 Rotor Blades Inspection Areas*

**Borescope Pictures**



Picture 60: Stage1 Nozzle leading edge



Picture 61: Stage1 Nozzles Trailing damage



Picture 62: Stage1 Nozzle platform burnt through damage



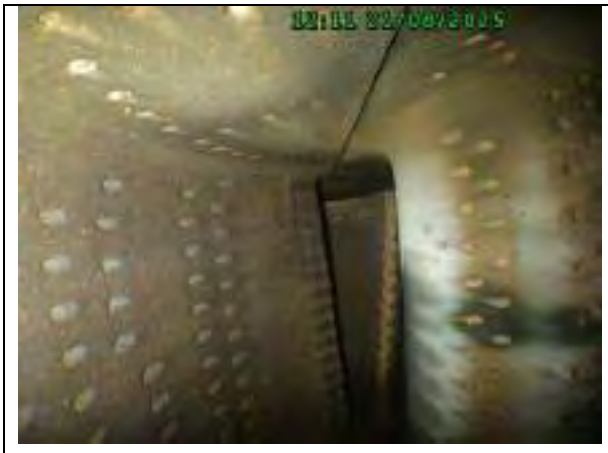
Picture 63: Stage1 Nozzle airfoil concave side



Picture 64: Stage1 Nozzles airfoil concave



Picture 65: Stage1 Nozzle airfoil concave

| | | |
|---|---|---|
|  | |  |
| Picture 66: Stage1 Nozzle airfoil concave side | | Picture 67: Stage1 Nozzle Trailing dent |
|  | |  |
| Picture 68: Stage1 Nozzle trailing edge concave | | Picture 69: Stage1 Nozzle trailing edge burnt through |



Picture 70: Stage1 Nozzle trailing edge concave



Picture 71: Stage1 Nozzle trailing edge and stage 1 nozzles



Picture 72: Stage1 Blades leading edge tip



Picture 73: Stage1 Blades leading edge convex



Picture 74: Stage 1 Blades leading edge base



Picture 75: Stage 1 Blades leading edge base



Picture 76: Stage 1 Blades trailing edge tip



Picture 77: Stage 1 Blades trailing edge root



Picture 78: Stage 2 Blades leading edge tip



Picture 79: Stage 2 Honeycomb seals



Picture 80: Stage 2 Blades leading edge root



Picture 81: Stage 2 Blades and stage 2 nozzles

| | | |
|---|---|---|
|  | |  |
| Picture 82: Stage 2 Blades trailing edge | | Picture 83: Stage 2 Blades trailing edge |

## 4.4 LPT Section

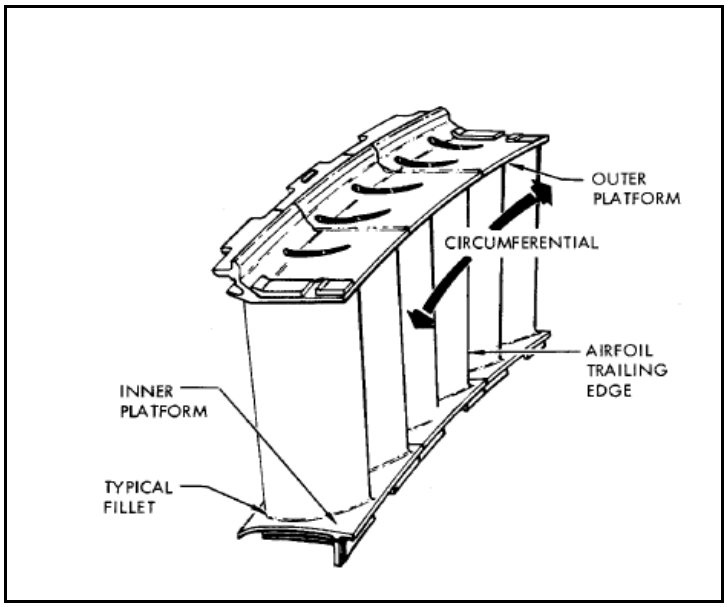



*Figure 19: Power Turbine Nozzles*

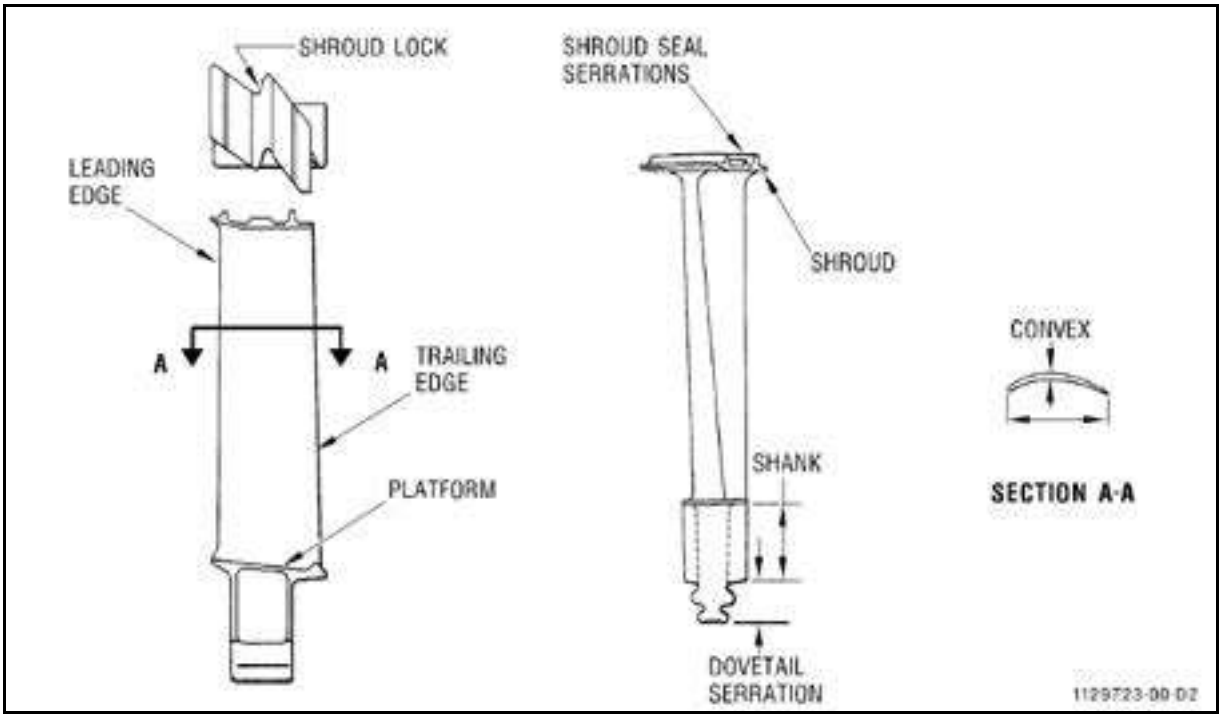



*Figure 20: Power Turbine Rotor Blades*

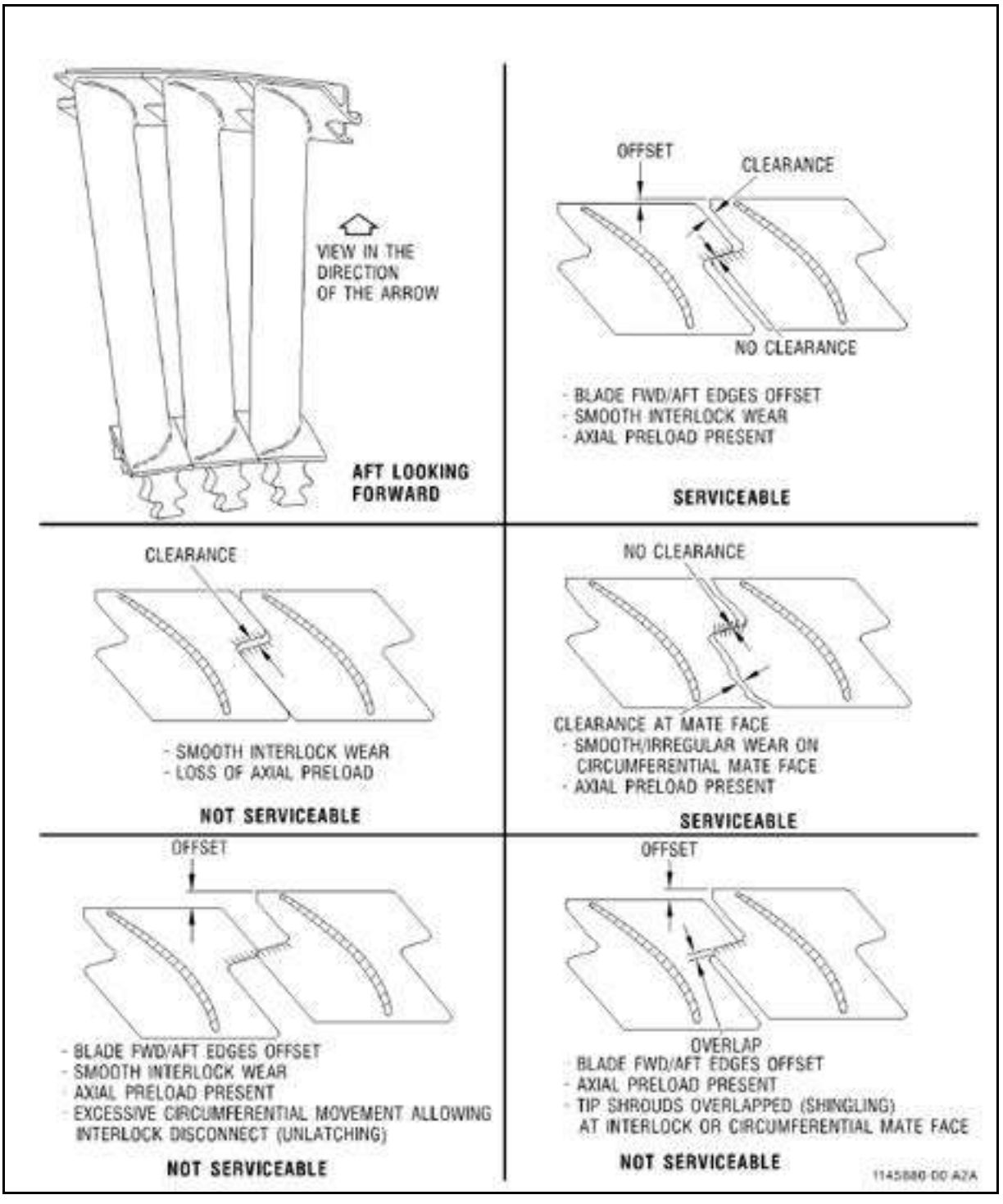



*Figure 21: LPT Rotor Blade Circumferential Inspection*

**Notes:**

The LPT stage 1 accessible nozzles and blades did not show any damage.

**Borescope Pictures**



Picture 84: STG1 LPT nozzles



Picture 85: TMF and LPT Inlet



Picture 86: Stage 1 Blades



Picture 87: LPT Stage 1 Blades tip interlock

# BORESCOPE INSPECTION REPORT
# TM2500 GEN.4
## *7LM2500 – PK – MDWG05*

## NEW FORTRESS ENERGY

## Palo Seco, PR

## PACKAGE # TM-49

## UNIT #4

| | | | |
|---|---|---|---|
| **Visit Date:** | 08/19/2025 | **Total Starts:** | 1050 |
| **Engine S/N:** | 481-717 | **GG Hours:** | 43186 |
| **Power Turbine S/N:** | 481-717 | **PT Hours:** | 43186 |
| **SOM GT Field Engineer:** | Daniel Arroyo | **New Fortress Representative:** | Jonathan Rodriguez |



## TABLE OF CONTENTS


1 Conclusions and Recommendations 3

2 Outage Data 4

3 Borescope Inspection Checklist 4

4 Borescope Inspection Record 6

4.1 Compressor Section

4.2 Combustor and 1St Stage Nozzle Section

4.3 Turbine Section

4.4 LPT Section

## 1. Conclusions and Recommendations

**Purpose of visit:**

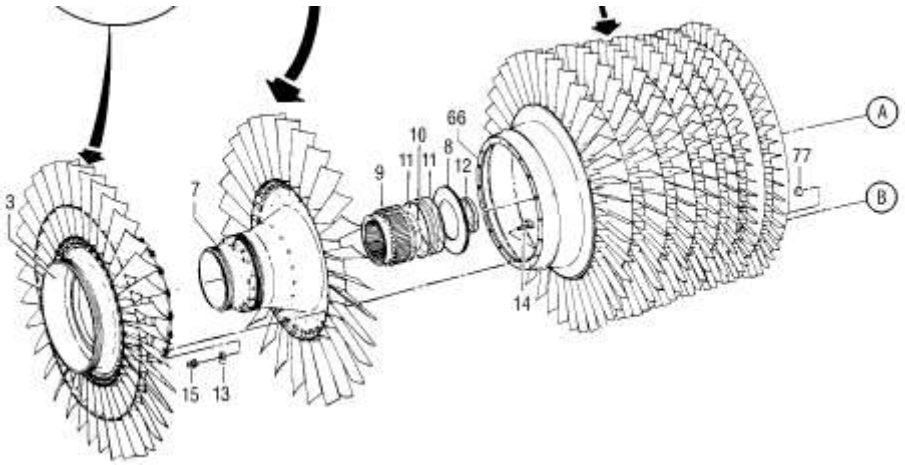
The purpose of this visit was to perform a borescope inspection of the Engine in accordance with GEK 97310 , Chapter 5-3.5.

1.1 The HPC section is serviceable according to GEK97310, Table 5-4. No damages were found.

**Please note the following (Refer to Picture 6):**

During the inspection of the rotor weep holes, it was detected a metallic piece that seems to be loose inside the rotor hub. This piece seem to be a detached fragment of an internal seal. Item 8 or item 12 of the below figure.

Regardless of the consequences that may arise from the breakage of a rotor internal seal, there is a risk that a fragment may be propelled into the HPC air path causing a DOD.




1.2 The Combustor section is serviceable according to GEK97310, Table 5-5.
1.3 The High Pressure Turbine section is serviceable according to GEK97310, Table 5-6.
1.4 The LPT inspected nozzles and blades are serviceable according to GEK97310, Table 5-10 and Table 5-11.

## 2. Outage Data

### Engine Data

| | | | | | |
|---|---|---|---|---|---|
| **ESN:** | 481-717 | **Engine Fired Hours:** | 43186 | **Package Hours:** | 43186 |
| **Model:** | 7LM2500-PK-MDWG05 | **Engine Fired starts:** | 1050 | **Package Fired Starts:** | 1050 |

**MAINTENANCE DATA**

| WP, SB, SL, PB, PL Performed | GEK 97310 | Date completed | Comments |
|---|---|---|---|
| Chapter 5-3.5 | Borescope Inspection | 19AUG25 | Serviceable |

5

**Parts Data**

| Description | PN Removed | SN Removed | Qty | Disposition | PN Installed | SN Installed |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

## 3. Borescope Inspection Checklist

**Date unit out of operation:** 08/19/2025
**Date unit into operation:** 08/19/2025
**Last inspection date:**

**Type of Fuel:** Gas / Diesel
**Type of NOx suppression:** Water Injection
**Type of outage:** Scheduled BSI

**Inspection of gas turbine:**

| WATERWASH: | HIGH PRESSURE COMPRESSOR: |
|---|---|
| ☒ PERFORMED WATER WASH | ☒ HPC BORESCOPE INSPECTION |
| **COMBUSTOR:** | **HIGH PRESSURE TURBINE** |
| ☒ COMBUSTOR BORESCOPE INSPECTION | ☒ HPT STAGE 1 & 2 NOZZLE BORESCOPE INSPECTION |
| | ☒ HPT BLADE BORESCOPE INSPECTION |
| **LOW PRESSURE TURBINE:** | |
| ☒ LPT BORESCOPE INSPECTION | |

☒ ***Please verify all borescope plugs have been reinstalled***

## 4. Borescope Inspection Record

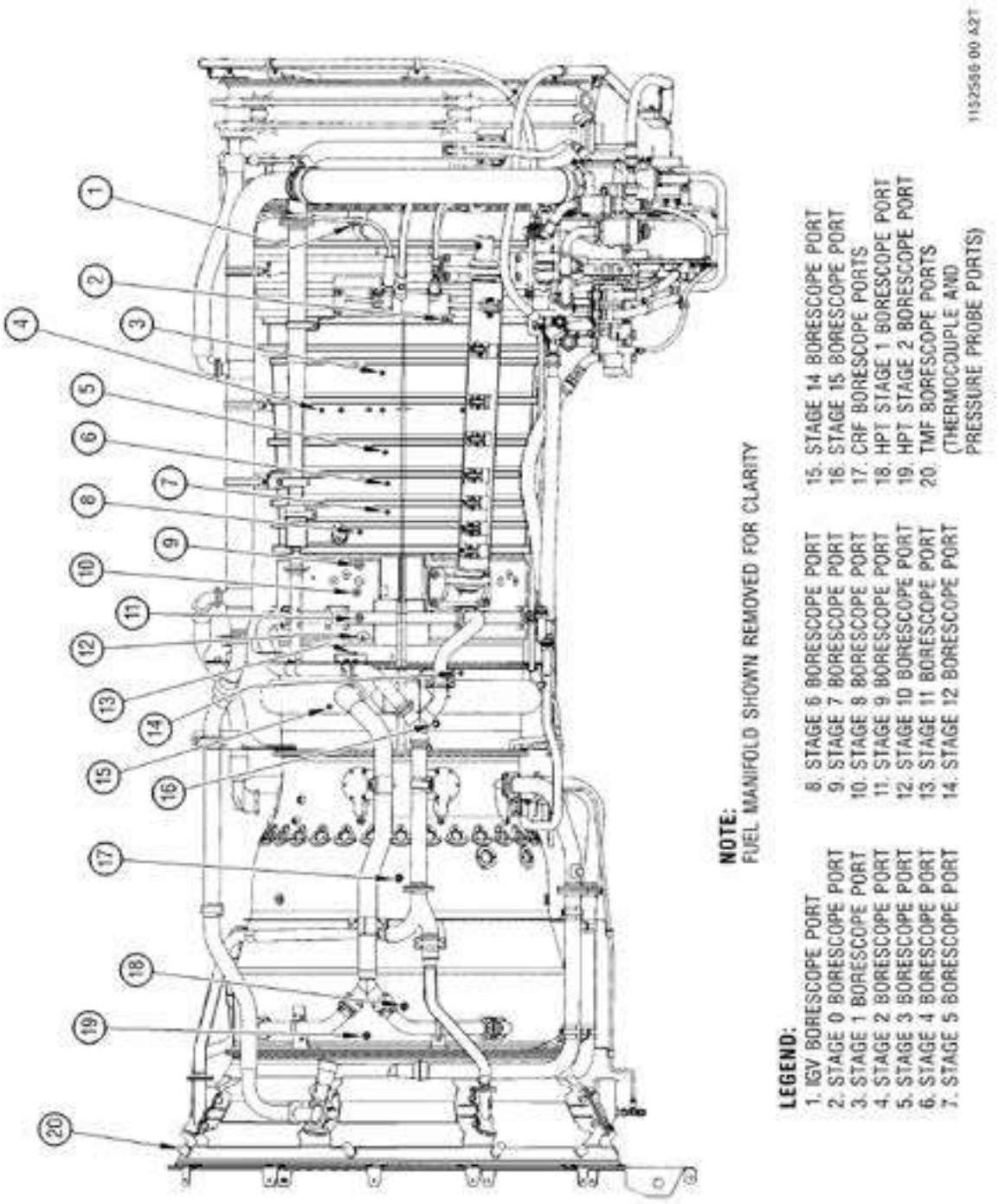



*Figure 1: Position of Borescope Inspection Ports.*

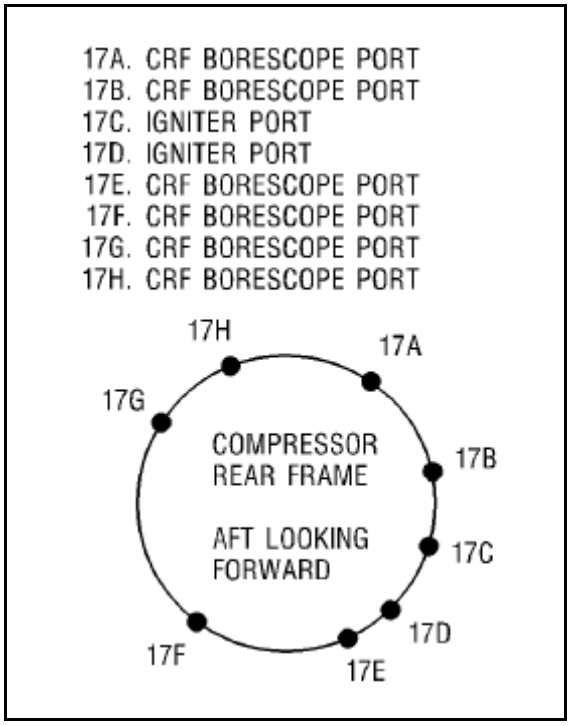



*Figure 2: Position of Borescope Inspection Ports.*

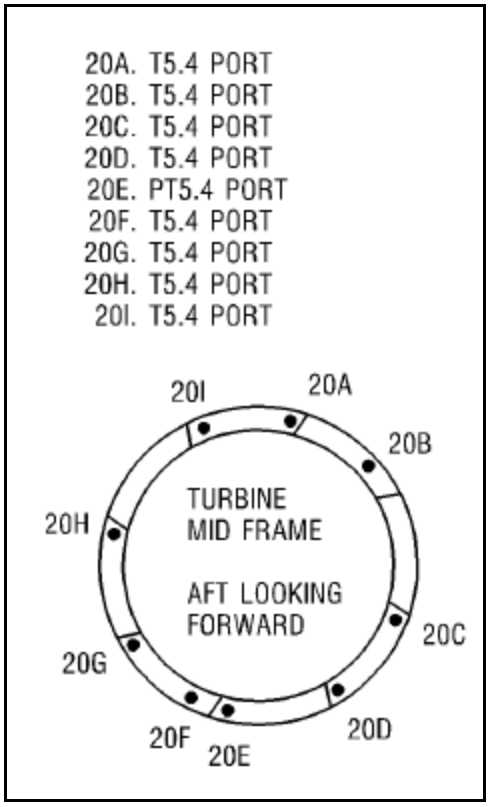



*Figure 3: Position of Borescope Inspection Ports.*

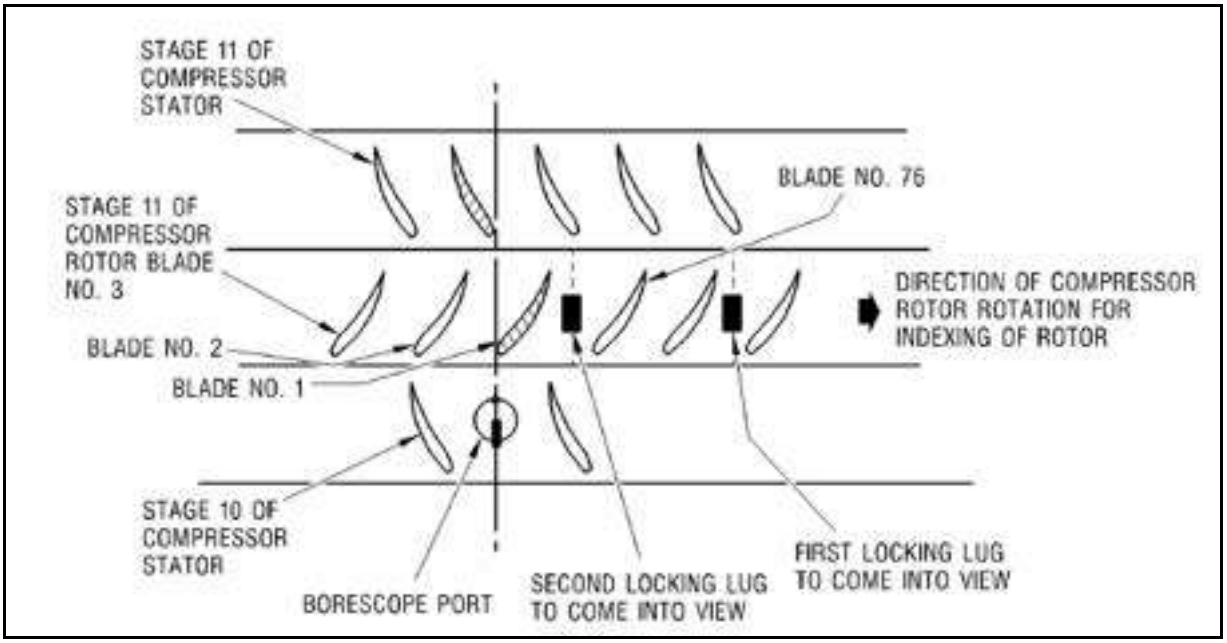



*Figure 4: Zero indexing of HPC rotor and HPT rotor*

## 4.1 Compressor Section

| Port | T.E. | L.E. | blades | Remarks: | photo no: |
|---|---|---|---|---|---|
| 1 | IGV | | | | 1 |
| 1 | | 0 | 36 | | 2,3 |
| 2 | 0 | | 36 | | 4 |
| 2 | | 1 | 26 | | 6,7 |
| 3 | 1 | | 26 | | 9,10 |
| 3 | | 2 | 26 | | 11,12 |
| 4 | 2 | | 26 | | 13 |
| 4 | | 3 | 42 | | 14 |
| 5 | 3 | | 42 | | 15,16 |
| 5 | | 4 | 45 | | 17,18 |
| 6 | 4 | | 45 | | 19, 20 |
| 6 | | 5 | 48 | | 21, 22 |
| 7 | 5 | | 48 | | 23, 24 |
| 7 | | 6 | 54 | | 25, 26 |
| 8 | 6 | | 54 | Blades contacting tip | |
| 8 | | 7 | 56 | Blades contacting tip | |
| 9 | 7 | | 56 | | 27 |
| 9 | | 8 | 64 | | 28 |
| 10 | 8 | | 64 | | 29,30 |
| 10 | | 9 | 66 | | 31 |
| 11 | 9 | | 66 | | 32, 33 |
| 11 | | 10 | 66 | | 35, 36 |
| 12 | 10 | | 66 | | 37, 38 |
| 12 | | 11 | 76 | | 39, 40 |
| 13 | 11 | | 76 | | 41, 42 |
| 13 | | 12 | 76 | | 43, 44 |
| 14 | 12 | | 76 | | 45, 46 |
| 14 | | 13 | 76 | | 47, 48 |
| 15 | 14 | | 76 | Inside bleed manifold | |
| 15 | | 15 | 76 | Inside bleed manifold | |
| 16 | 15 | | 76 | | 49, 50 |
| 16 | | 16 | 76 | | 51, 52 |

**Notes:**




Picture 1. CFF & IGV




Picture 2. Stage 1 Leading edge tip




Picture 3. Stage 1 Leading edge base




Picture 4. Stage 1 Trailing edge tip




Picture 5. Stage 1Trailing edge base




Picture 6. Stage 1 weep hole. Metallic piece protruding

| | | |
|---|---|---|
|  | |  |
| Picture 7. Stage 2 Leading edge tip | | Picture 8. Stage 2 leading edge base |
|  | |  |
| Picture 9. Stage 2 Trailing edge tip | | Picture 10. Stage 2 Trailing base |



Picture 11. Stage 3 Leading edge tip



Picture12. Stage 3 Leading edge base



Picture 13. Stage 3 Trailing edge tip



Picture 14. Stage 3 Trailing edge base



- Picture 15. Stage 4 Leading edge tip



Picture 16. Stage 4 Leading edge base



Picture 17. Stage 4 Trailing edge tip



Picture 18. Stage 4 Trailing edge base



Picture 19. Stage 5 Leading edge tip



Picture 20. Stage 5 Leading edge base



Picture 21. Stage 6 Leading edge tip



Picture 22. Stage 6 Leading edge base



Picture 23. Stage 6 Trailing edge tip



Picture 24. Stage 6 Trailing edge base



Picture 25. Stage 7 Leading edge tip



Picture 26. Stage 7 Leading edge base



Picture 27. Stage 9 Trailing edge tip



Picture 28. Stage 9 Trailing edge base



Picture 29. Stage 10 Leading edge tip



Picture 30. Stage 10 Leading edge base



Picture 31. Stage 10 Trailing edge base



Picture 32. Stage 10 Trailing edge tip



Picture 33. Stage 11 Leading edge tip



Picture 34. Stage 11 Leading edge base



Picture 35. Stage 11 Trailing edge tip



Picture 36. Stage 11 Trailing edge base



Picture 37. Stage 12 Leading edge tip



Picture 38. Stage 12 Leading edge base



Picture 39. Stage 12 Trailing edge tip



Picture 40. Stage 12 Trailing edge base

| | | |
|---|---|---|
|  | |  |
| Picture 41. Stage 13 Leading edge tip | | Picture 42. Stage 13 Leading edge base |
|  | |  |
| Picture 43. Stage 15 Trailing edge tip | | Picture 44. Stage 15 Trailing edge base |
|  | |  |
| Picture 45. Stage 16 Leading edge tip | | Picture 46. Stage 16 Leading edge base |




Picture 47. OGVs

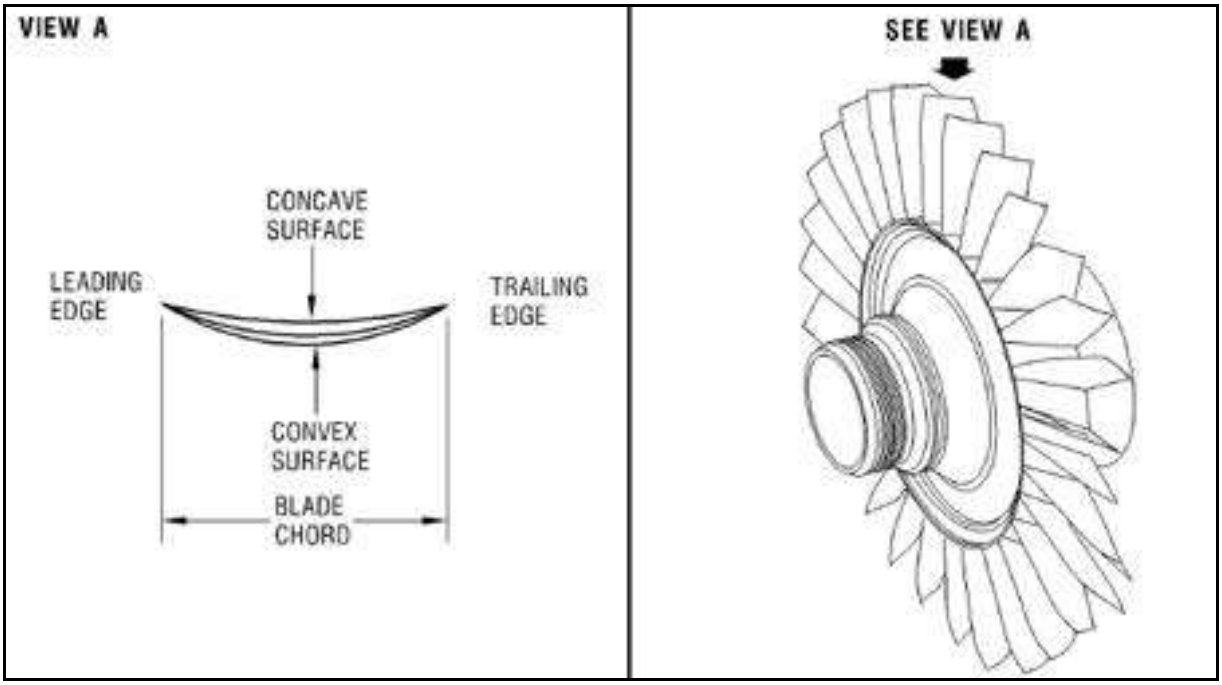



*Figure 5: HPC stage 0 BLISK*

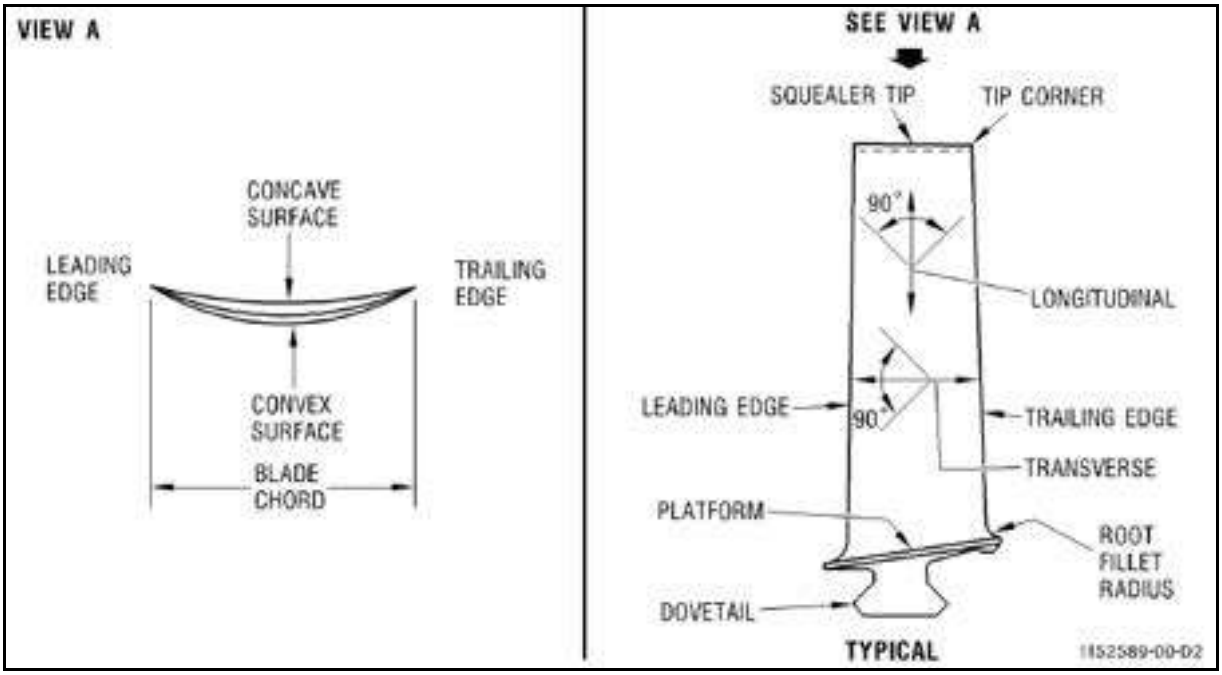



*Figure 6: Compressor Rotor Blades*

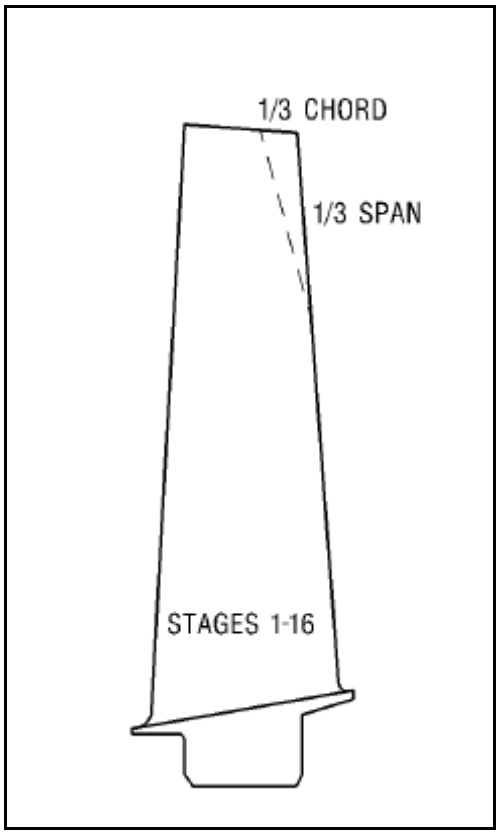



*Figure 7: Tip Trailing Edge Inspection*

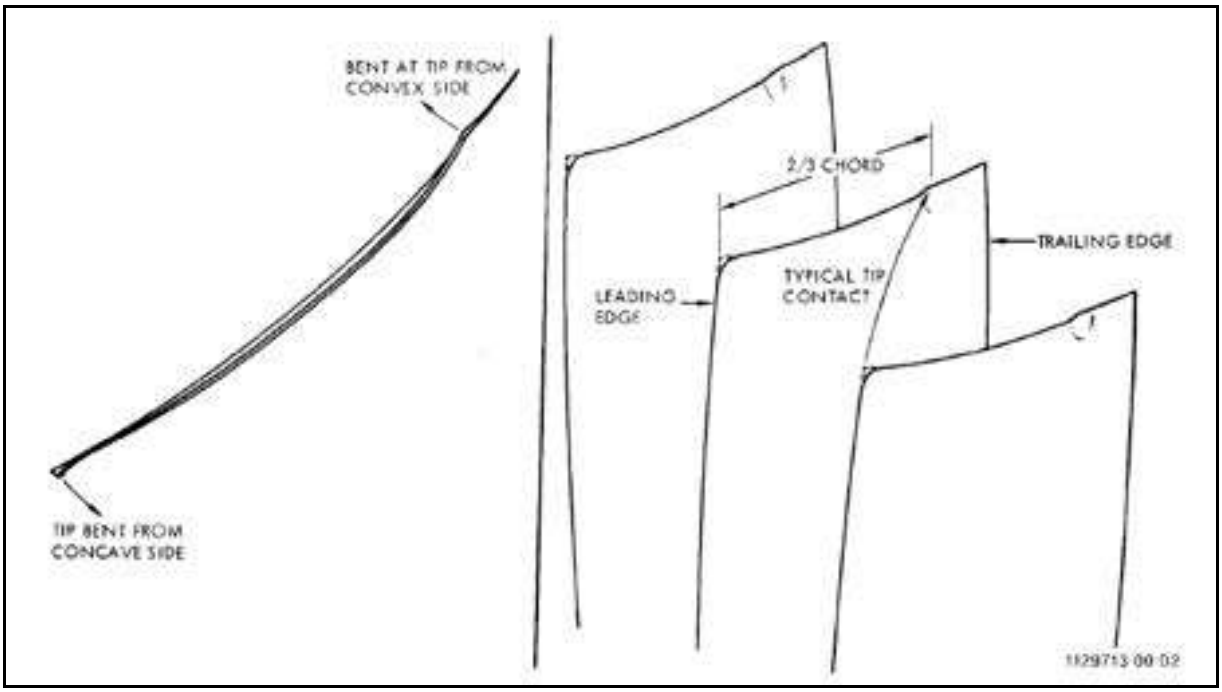


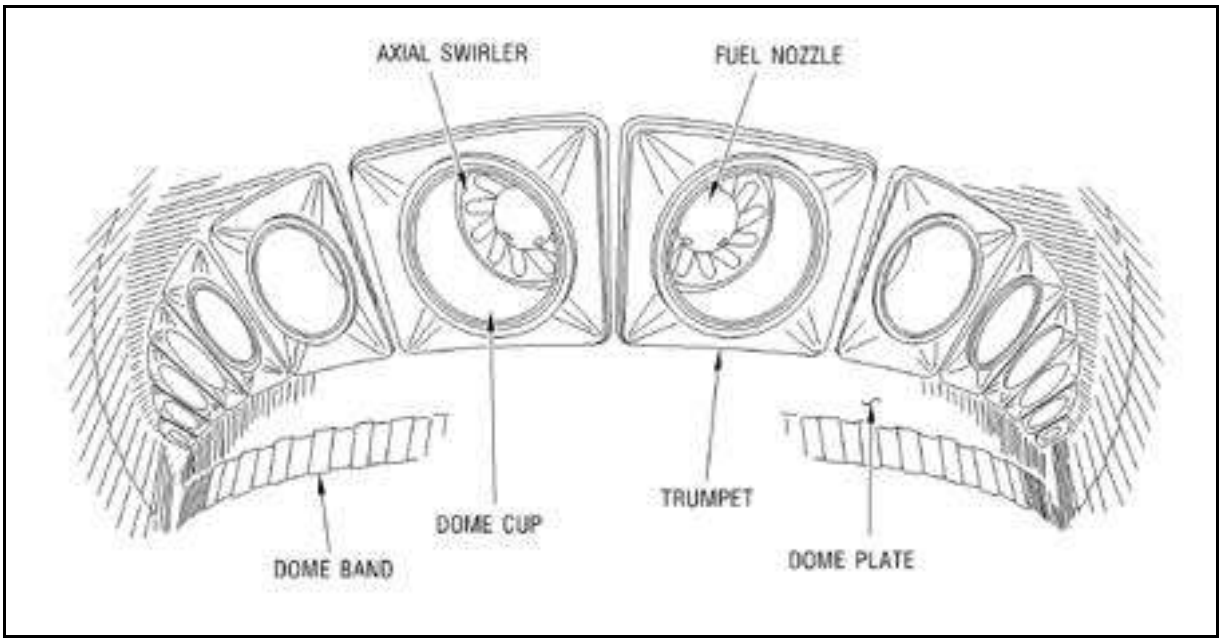

*Figure 8: Tip Clanging Contact (HPCR stage 3 through 6)*

## 4.2 Combustor and 1St Stage Nozzle Section

| Port | Condition observed | Photo no: |
|---|---|---|
| **17A** | | |
| **17B** | | |
| **17C** | | |
| **17D** | **See below notes.** | |
| **17E** | | |
| **17F** | | |
| **17G** | | |
| **17H** | | |
| **17** | 1st stage nozzle (leading edge): | |

**Notes:**

The Combustor section is serviceable according to GEK97310, Table 5-5.



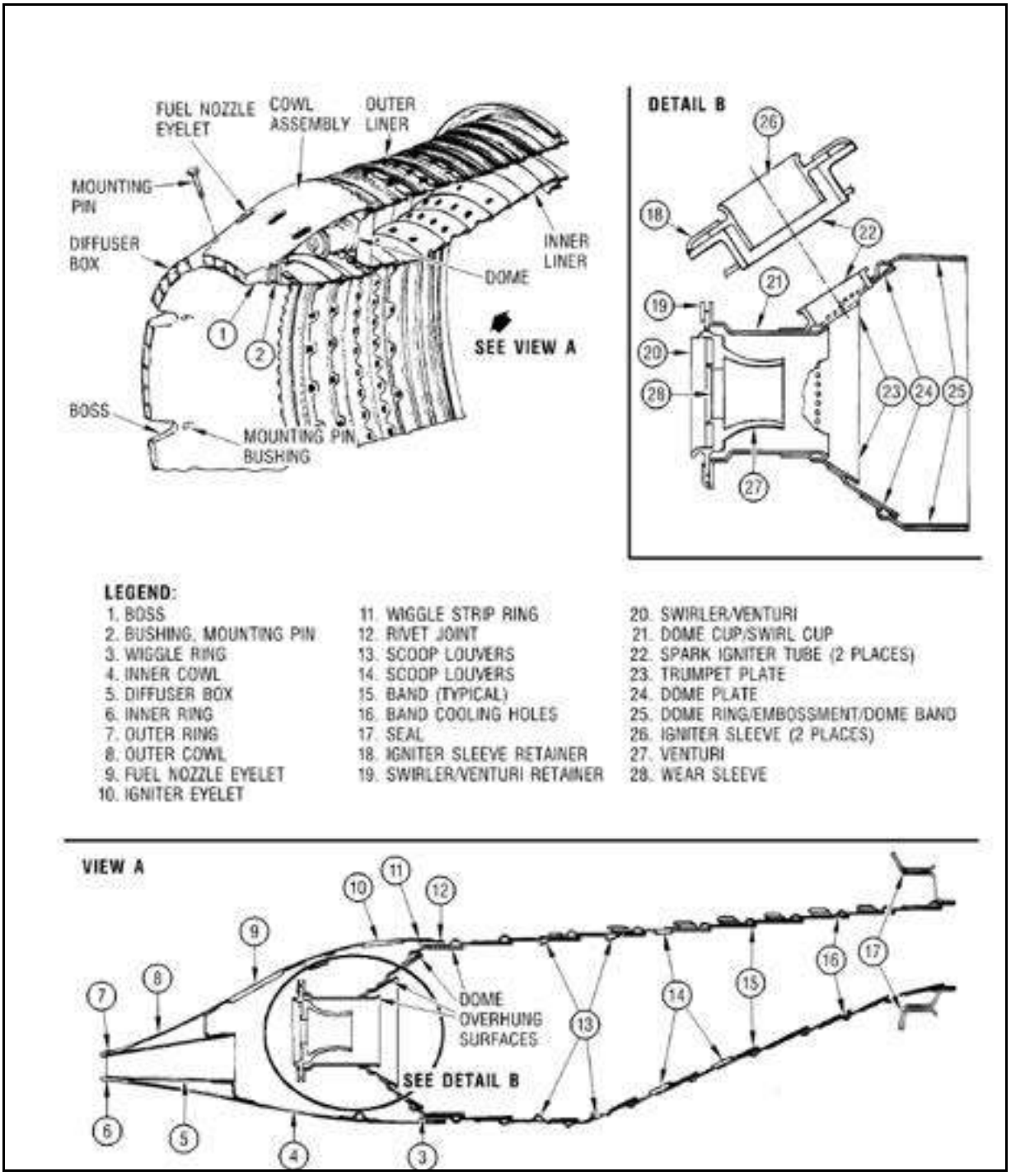



*Figure 9: SAC Combustor Inspection*

*Figure 10: SAC Combustor Inspection*

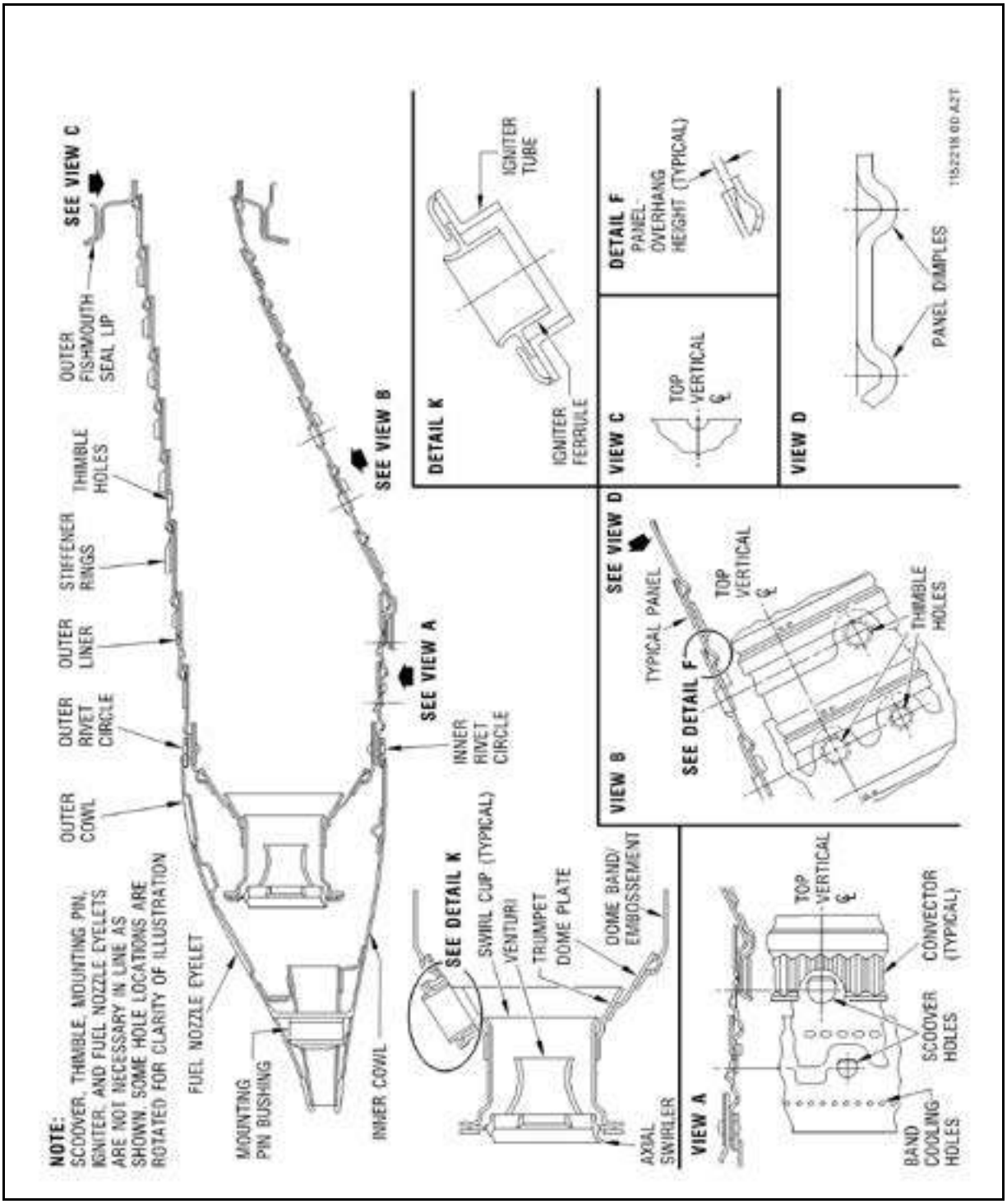



*Figure 11: SAC Combustor Inspection*

**Borescope Pictures**



Picture 48. Upper igniter ferrule



Picture 49. Lower igniter ferrule



Picture 50. Outer rivets band



Picture 51. Inner rivets band



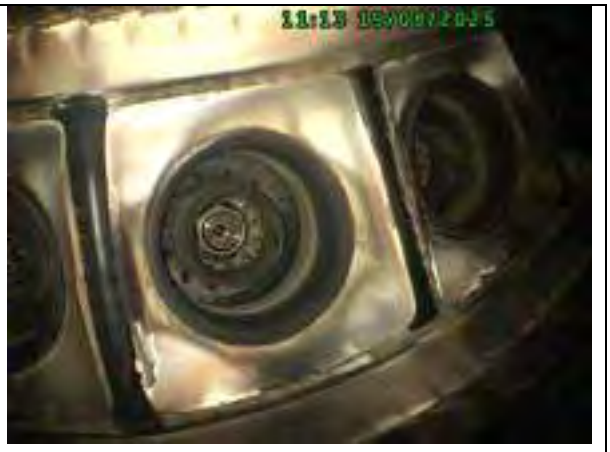
Picture 52. Combustor liners



Picture 53. Combustor liners



Picture 54. Combustor splash plates



Picture 55. Fuel Nozzle tip



Picture 56. Combustor liners and HPT nozzle interference



Picture 57. . Combustor liners and HPT nozzle interference

## 4.3 Turbine Section

| | turbine stage | | | | |
|---|---|---|---|---|---|
| **Port** | **L.E.** | **T.E.** | **blades** | **Remarks:** | **photo no:** |
| **18** | **1** | | **88** | | |
| **19** | | **1** | **88** | **See below notes.** | |
| **19** | **2** | | **90** | | |
| **20** | | **2** | | | |

**Notes:**

The High Pressure Turbine section is serviceable according to GEK97310, Table 5-6

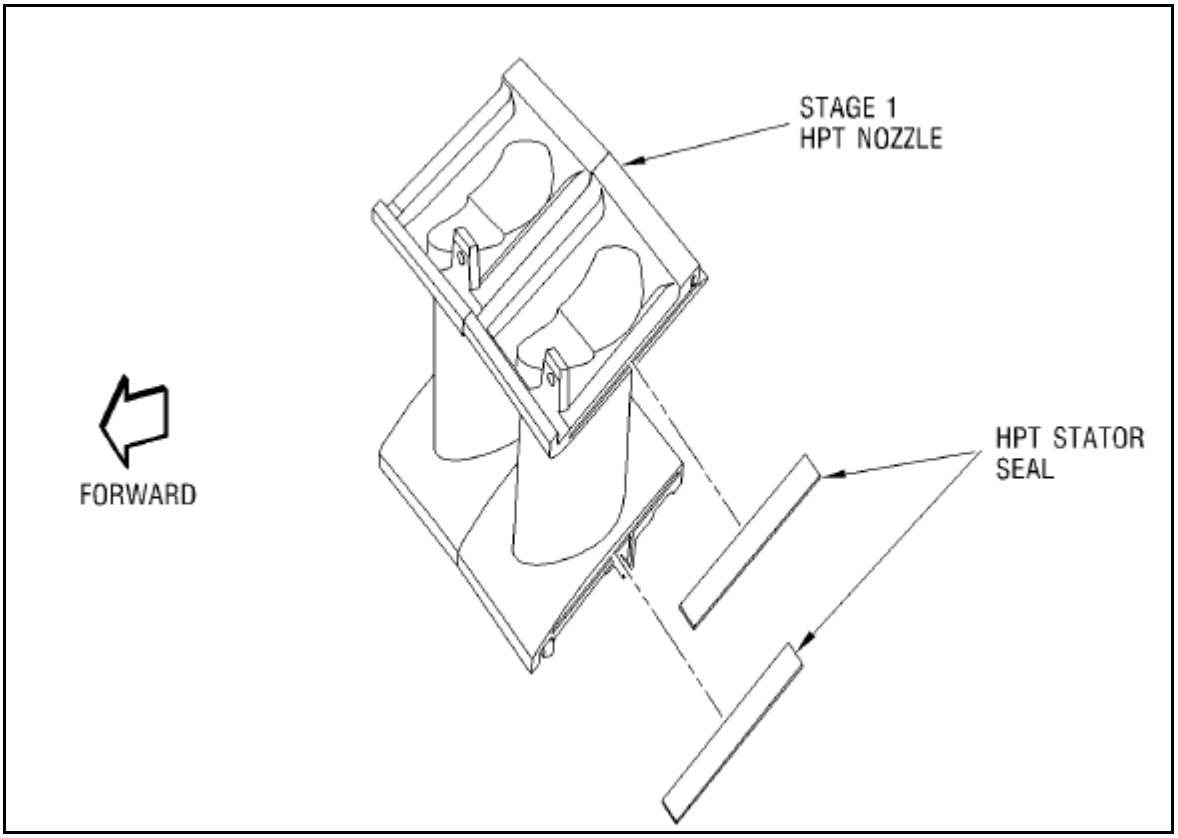



*Figure 12: Stage 1 HPT Nozzle Seal Displacement*

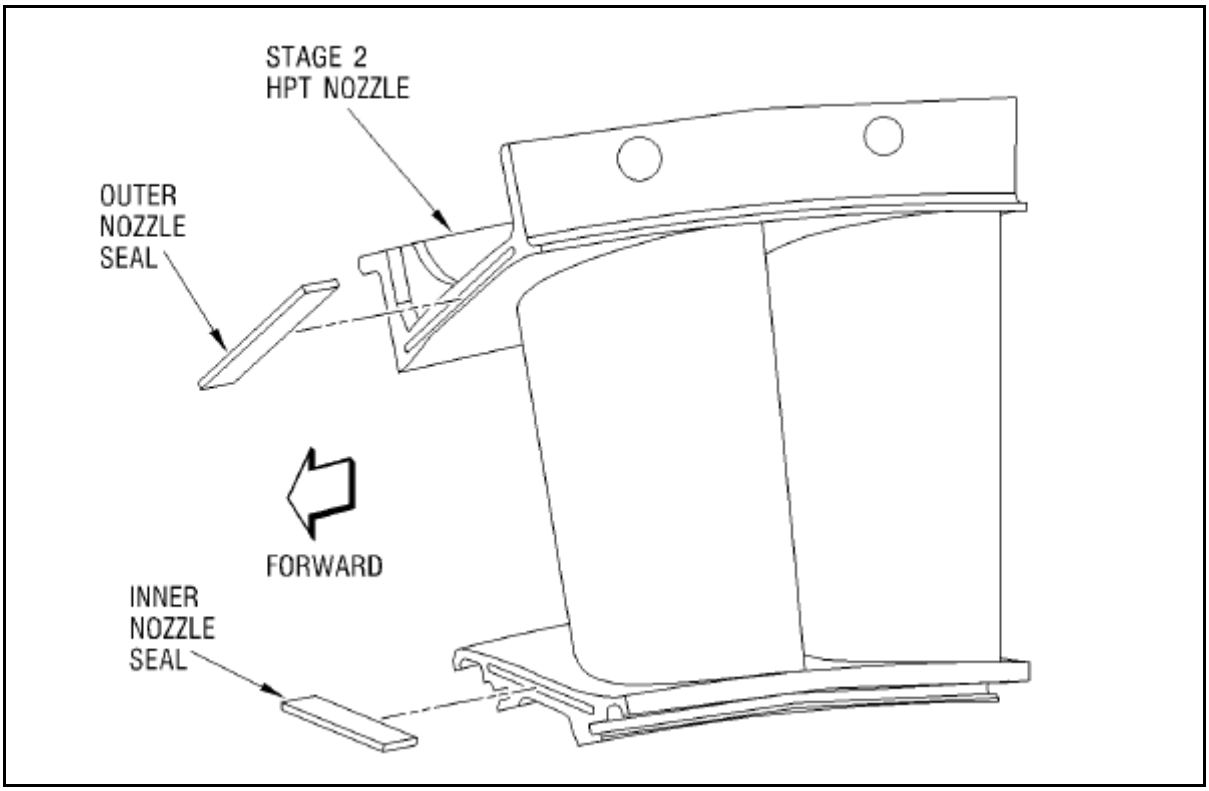



*Figure 13: Stage 2 HPT Nozzle Seal Displacement*

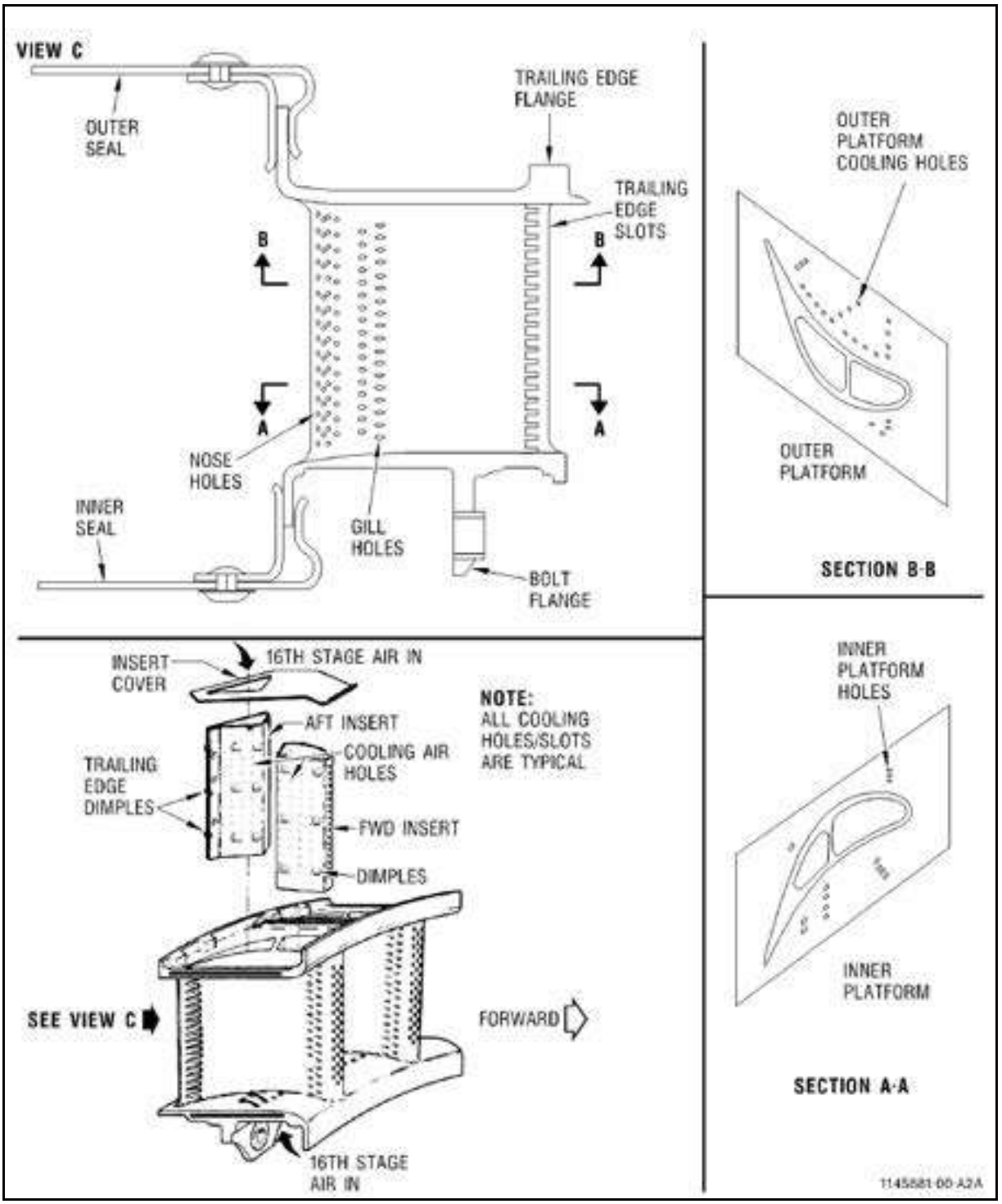



*Figure 14: HPT Stage 1 Nozzle*

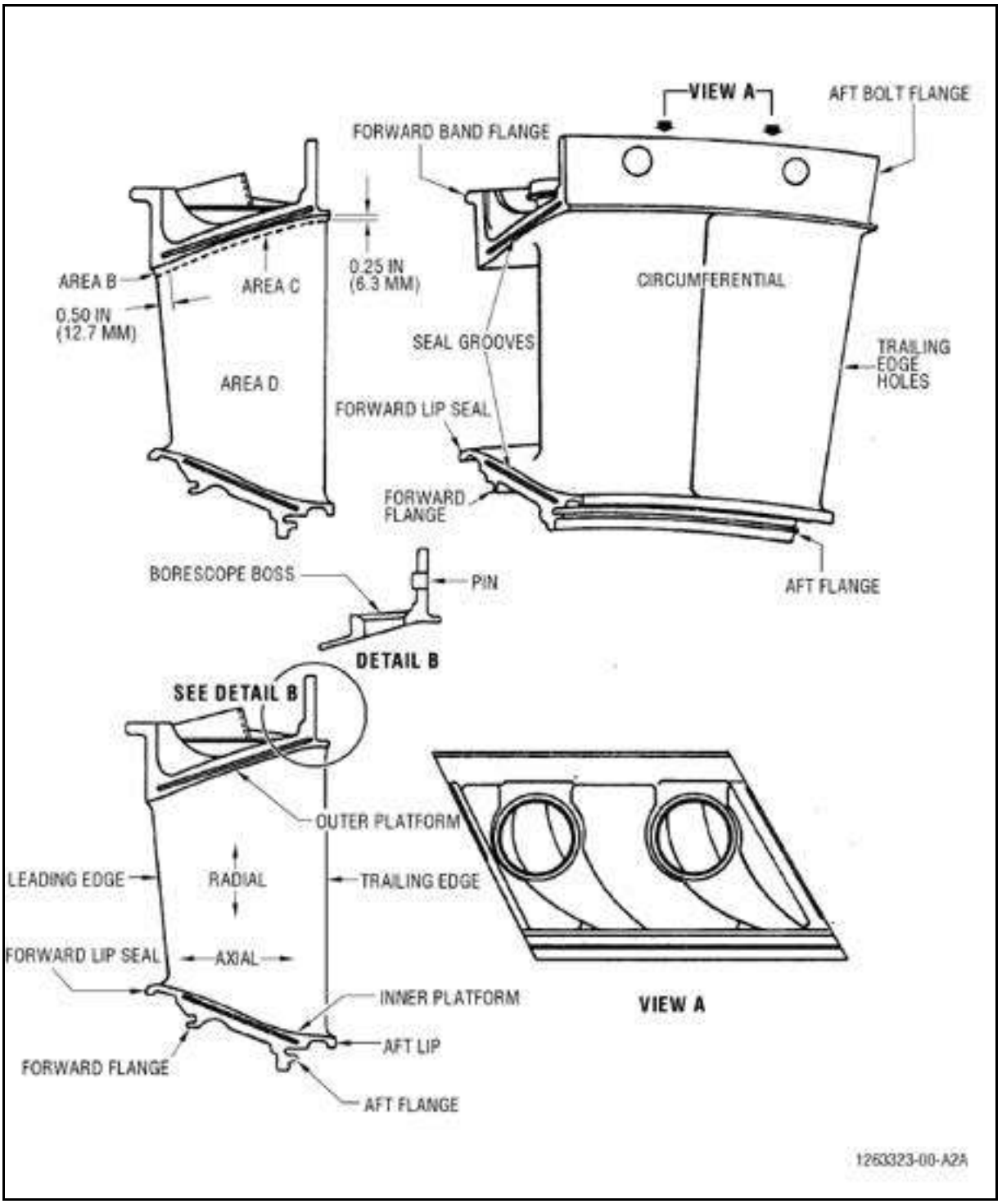



*Figure 15: HPT Stage 2 Nozzle*

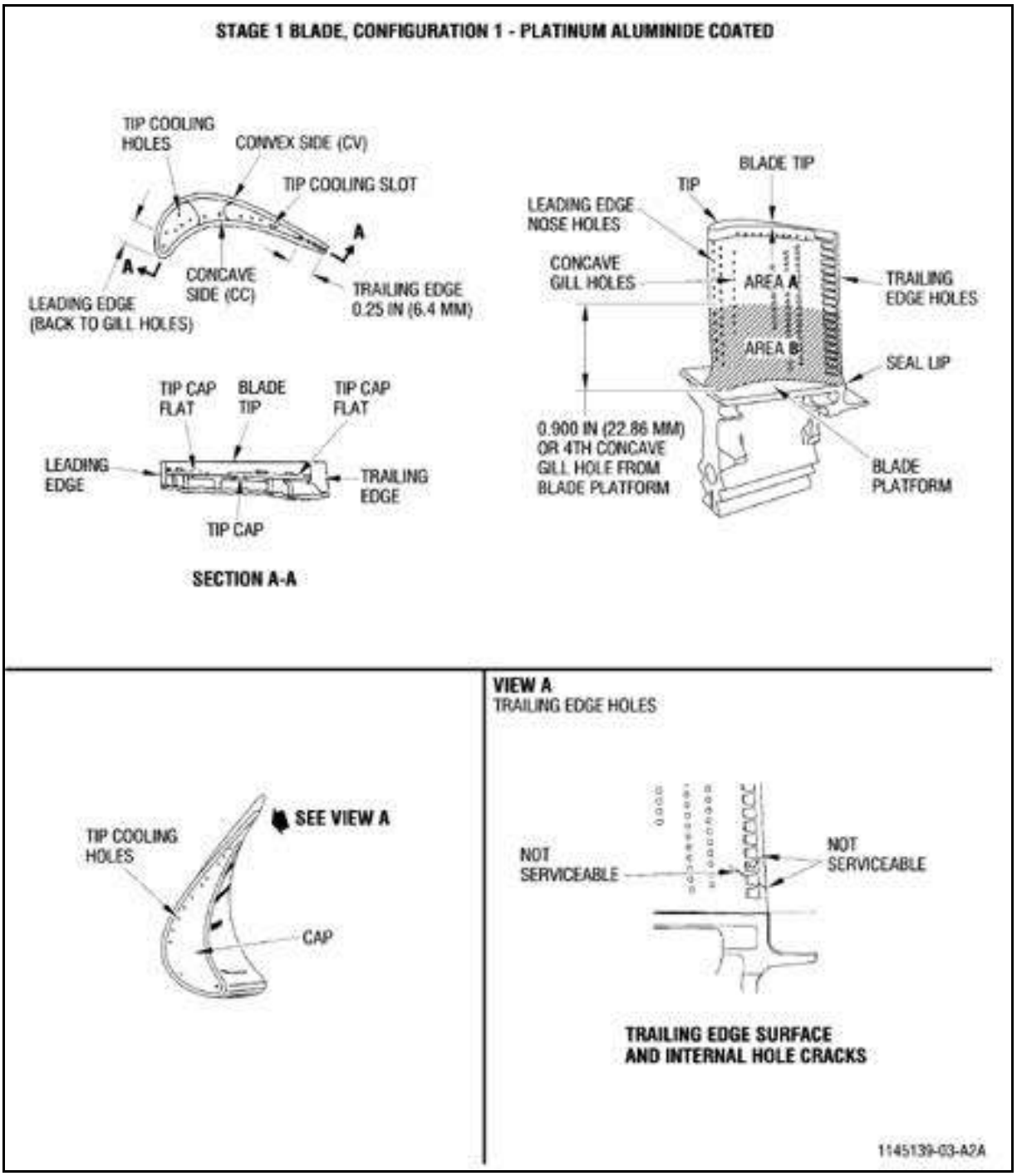



*Figure 16: HPT Stage 1 Rotor Blades Inspection Areas (Platinum Aluminide Coated Blades)*

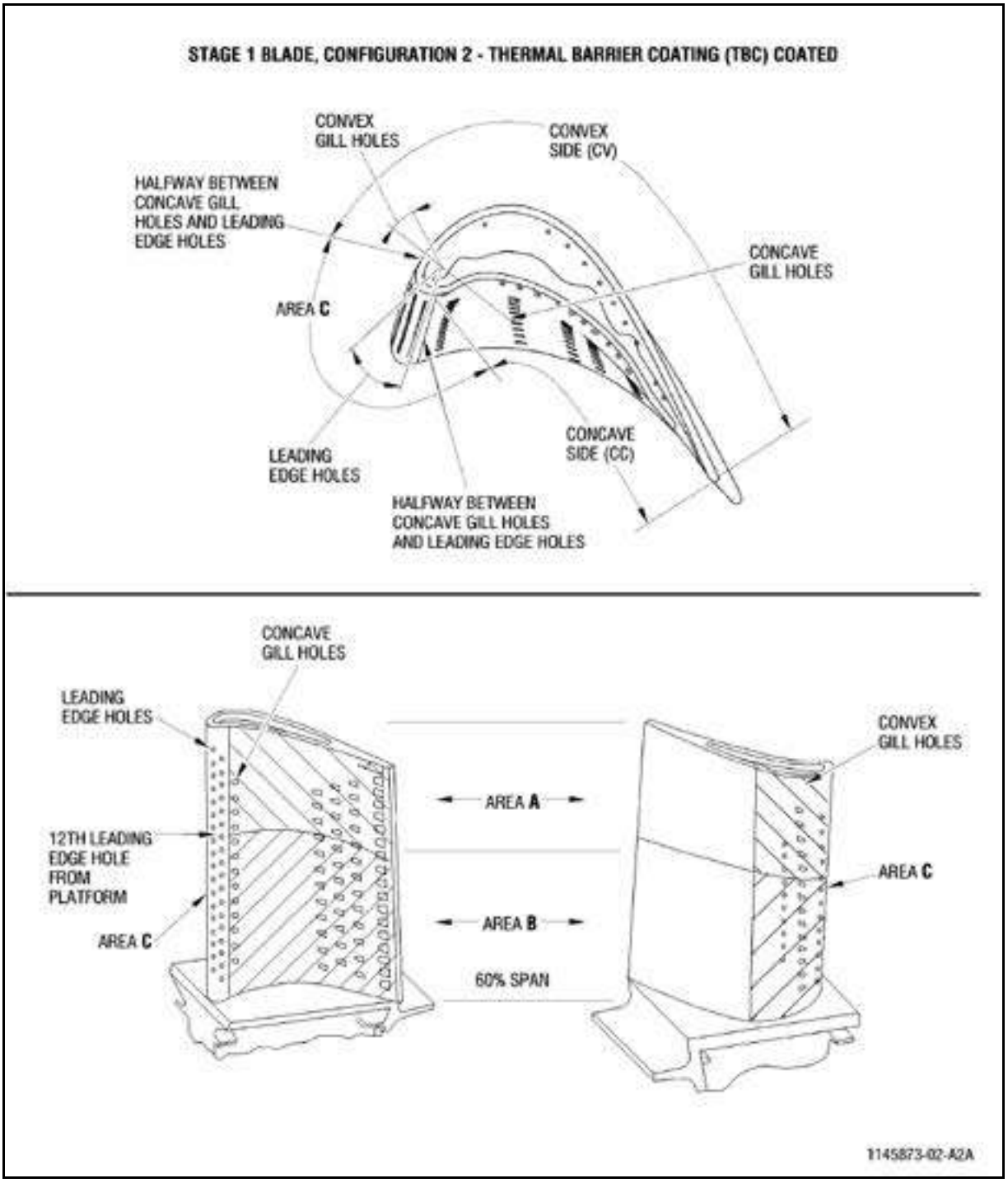



*Figure 17: HPT Stage 1 Rotor Blades Inspection Areas (TBC Coated Blades)*

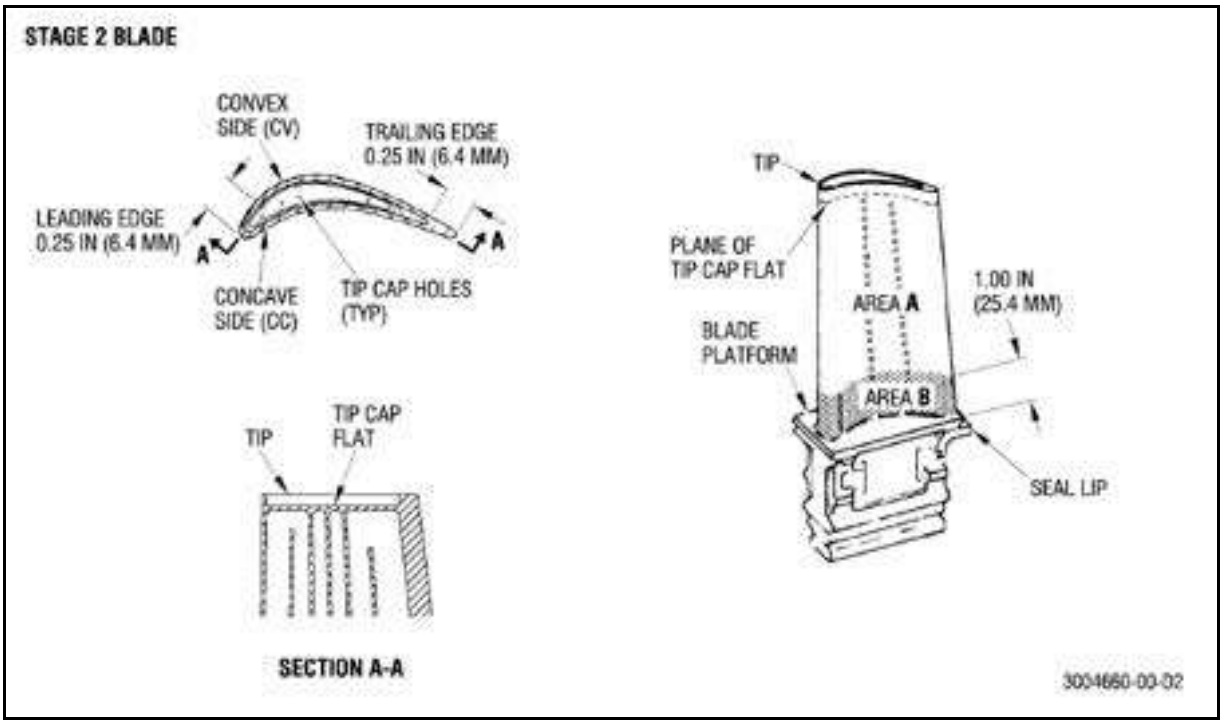



*Figure 18: HPT Stage 2 Rotor Blades Inspection Areas*

**Borescope Pictures**



Picture 58: Stage1 Nozzle leading edge



Picture 59: Stage1 Nozzles Leading edge



Picture 60: Stage1 Nozzle airfoil concave side



Picture 61: Stage1 Nozzle airfoil concave side



Picture 62: Stage1 Nozzles airfoil concave



Picture 63: Stage1 Nozzle airfoil concave



Picture 64: Stage1 Nozzle airfoil concave side



Picture 65: Stage1 Nozzle airfoil convex side



Picture 66: Stage1 Nozzle trailing edge concave



Picture 67: Stage1 Nozzle trailing edge convex



Picture 68: Stage1 Nozzle trailing edge



Picture 69: Stage1 Nozzle trailing edge and



Picture 70: Stage1 Blades leading edge tip



Picture 71: Stage1 Blades leading edge convex



Picture 72: Stage 1 Blades leading edge base



Picture 73: Stage 1 Blades leading edge base



Picture 74: Stage 1 Blades trailing edge tip



Picture 75: Stage 1 Blades trailing edge root



Picture 76: Stage 2 Blades leading edge tip



Picture 77: Stage 2 Honeycomb seals



Picture 78: Stage 2 Blades leading edge root



Picture 79: Stage 2 Blades and stage 2 nozzles burn through



Picture 80: Stage 2 Blades trailing edge



Picture 81: Stage 2 Blades trailing edge

## 4.4 LPT Section

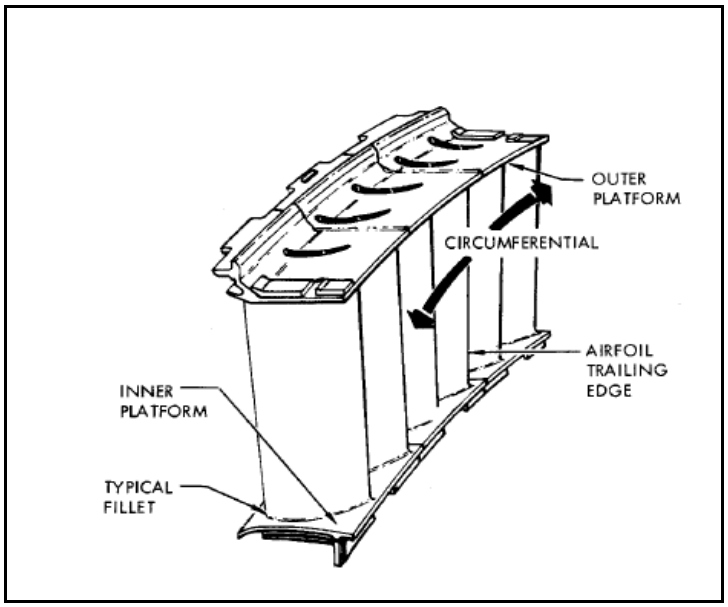



*Figure 19: Power Turbine Nozzles*

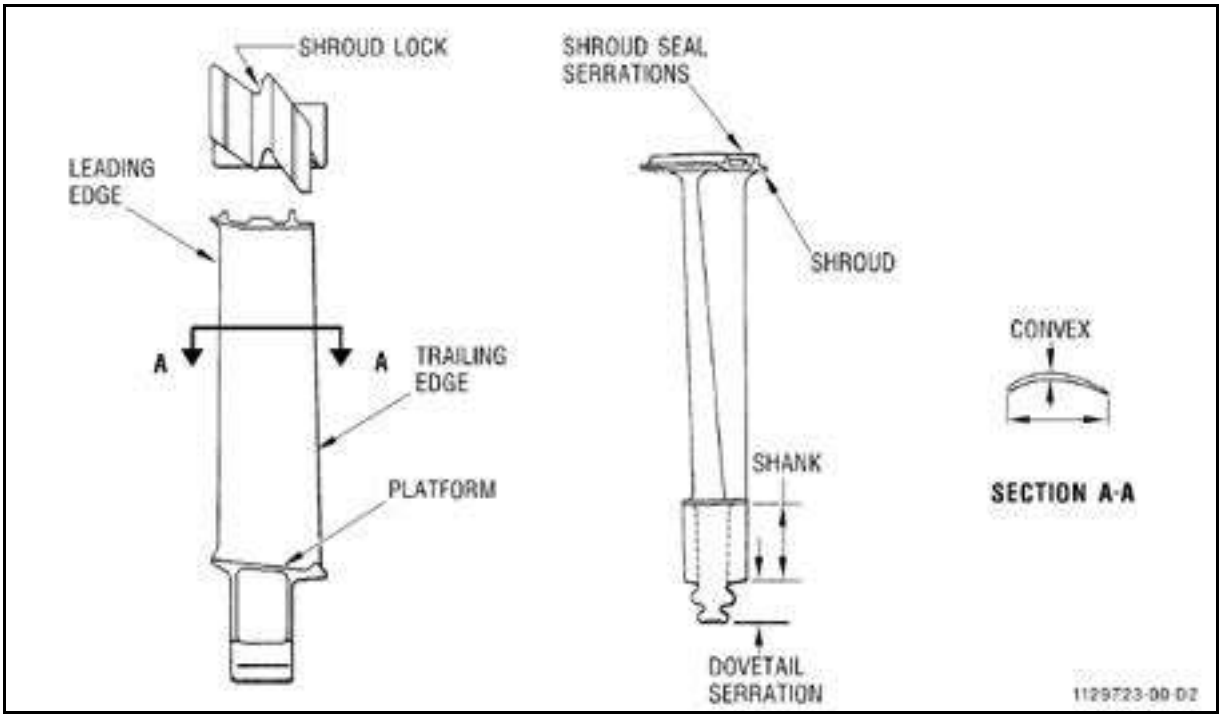



*Figure 20: Power Turbine Rotor Blades*

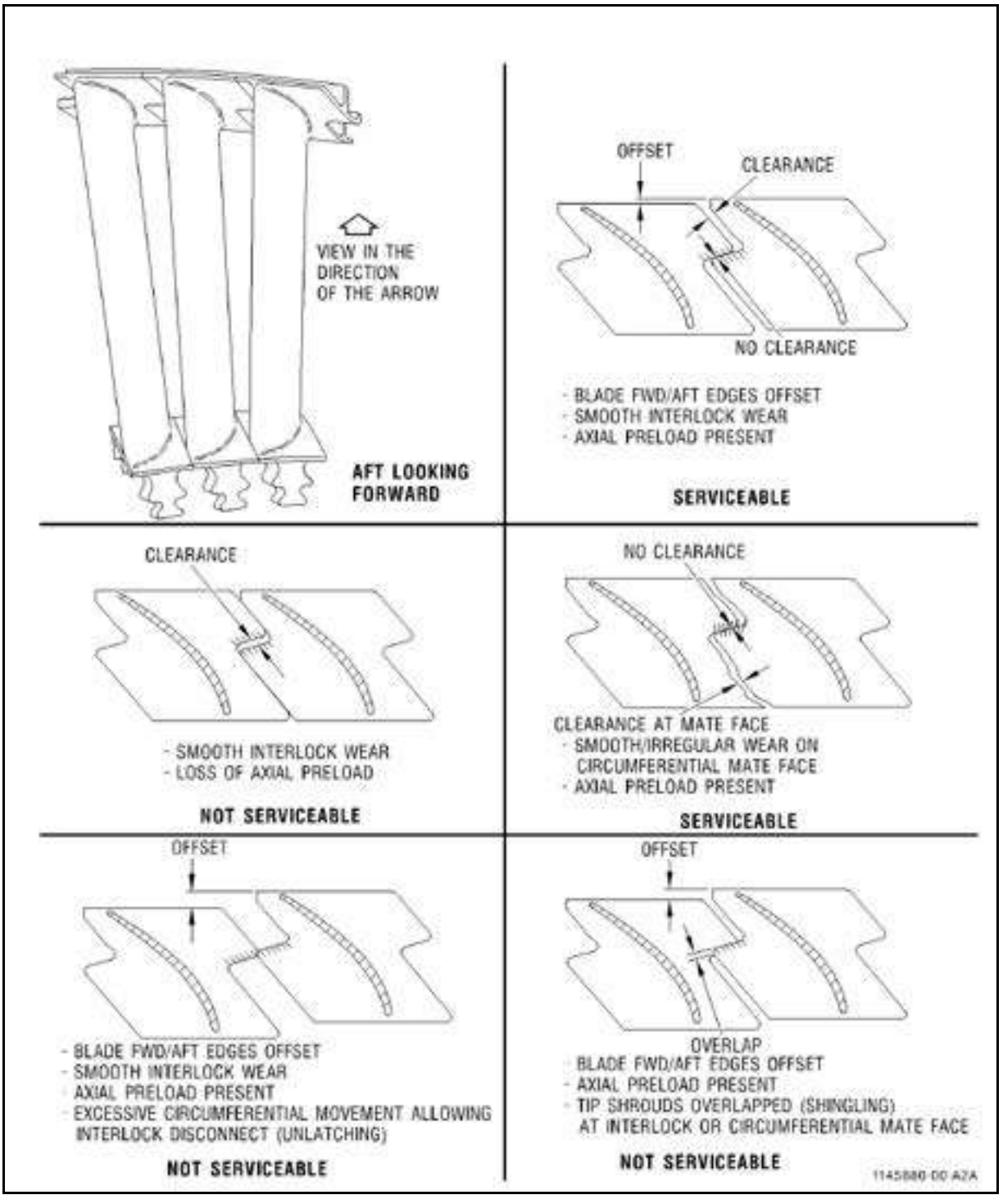



*Figure 21: LPT Rotor Blade Circumferential Inspection*

**Notes:**

The LPT stage 1 accessible nozzles and blades did not show any damage.

**Borescope Pictures**



Picture 82: STG1 LPT nozzles



Picture 83: TMF and LPT Inlet



Picture 84: Stage 1 Blades



Picture 85: LPT Stage 1 Blades tip interlock

# BORESCOPE INSPECTION REPORT
# TM2500 GEN. 6-7
## *7LM2500 – PK – MDWG05*

## NEW FORTRESS ENERGY

## SJTPP, PR

## PACKAGE # 7250391

## UNIT #1

| | | | |
|---|---|---|---|
| **Visit Date:** | 08/04/2025 | **Total Starts:** | 1066 |
| **Engine S/N:** | 557-238 | **GG Hours:** | 7266 |
| **Power Turbine S/N:** | 557-238 | **PT Hours:** | 7266 |
| **SOM GT Field Engineer:** | Daniel Arroyo | **New Fortress Representative:** | Jonathan Rodriguez |



## TABLE OF CONTENTS


1 Conclusions and Recommendations 3

2 Outage Data 4

3 Borescope Inspection Checklist 4

4 Borescope Inspection Record 6

4.1 Compressor Section

4.2 Combustor and 1St Stage Nozzle Section

4.3 Turbine Section

4.4 LPT Section

## 1. Conclusions and Recommendations

**Purpose of visit:**

The purpose of this visit was to perform a borescope inspection of the Engine in accordance with GEK105054, WP 406 00

1.1 The HPC is serviceable according to GEK105054, WP 406 00. No damages were found
1.2 The Combustor section is serviceable according to GEK105054, WP406 00 Table 7.
1.3 The High Pressure Turbine section is serviceable according to GEK105054, WP406 00 Table 8.
1.4 The LPT is serviceable according to GEK105054, WP40600.

## 2. Outage Data

### Engine Data

| | | | | | |
|---|---|---|---|---|---|
| **ESN:** | 557-238 | **Engine Fired Hours:** | 7266 | **Package Hours:** | 7266 |
| **Model:** | 7LM2500-PK-MDWG05 | **Engine Fired starts:** | 1066 | **Package Fired Starts:** | 1066 |

**MAINTENANCE DATA**

| WP, SB, SL, PB, PL Performed | GEK105054, REV 11 | Date completed | Comments |
|---|---|---|---|
| WP 406 00 | Borescope Inspection | 04AUG25 | Serviceable |

**Parts Data**

| Description | PN Removed | SN Removed | Qty | Disposition | PN Installed | SN Installed |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

## 3. Borescope Inspection Checklist

**Date unit out of operation:** 08/04/2025
**Date unit into operation:** 08/04/2025
**Last inspection date:**

**Type of Fuel:** Gas / Diesel
**Type of NOx suppression:** Water Injection
**Type of outage:** Scheduled BSI

**Inspection of gas turbine:**

| WATERWASH: | HIGH PRESSURE COMPRESSOR: |
|---|---|
| ☒ PERFORMED WATER WASH | ☒ HPC BORESCOPE INSPECTION |
| **COMBUSTOR:** | **HIGH PRESSURE TURBINE** |
| ☒ COMBUSTOR BORESCOPE INSPECTION | ☒ HPT STAGE 1 & 2 NOZZLE BORESCOPE INSPECTION |
| | ☒ HPT BLADE BORESCOPE INSPECTION |
| **LOW PRESSURE TURBINE:** | |
| ☒ LPT BORESCOPE INSPECTION | |

☒ ***Please verify all borescope plugs have been reinstalled***

## 4. Borescope Inspection Record

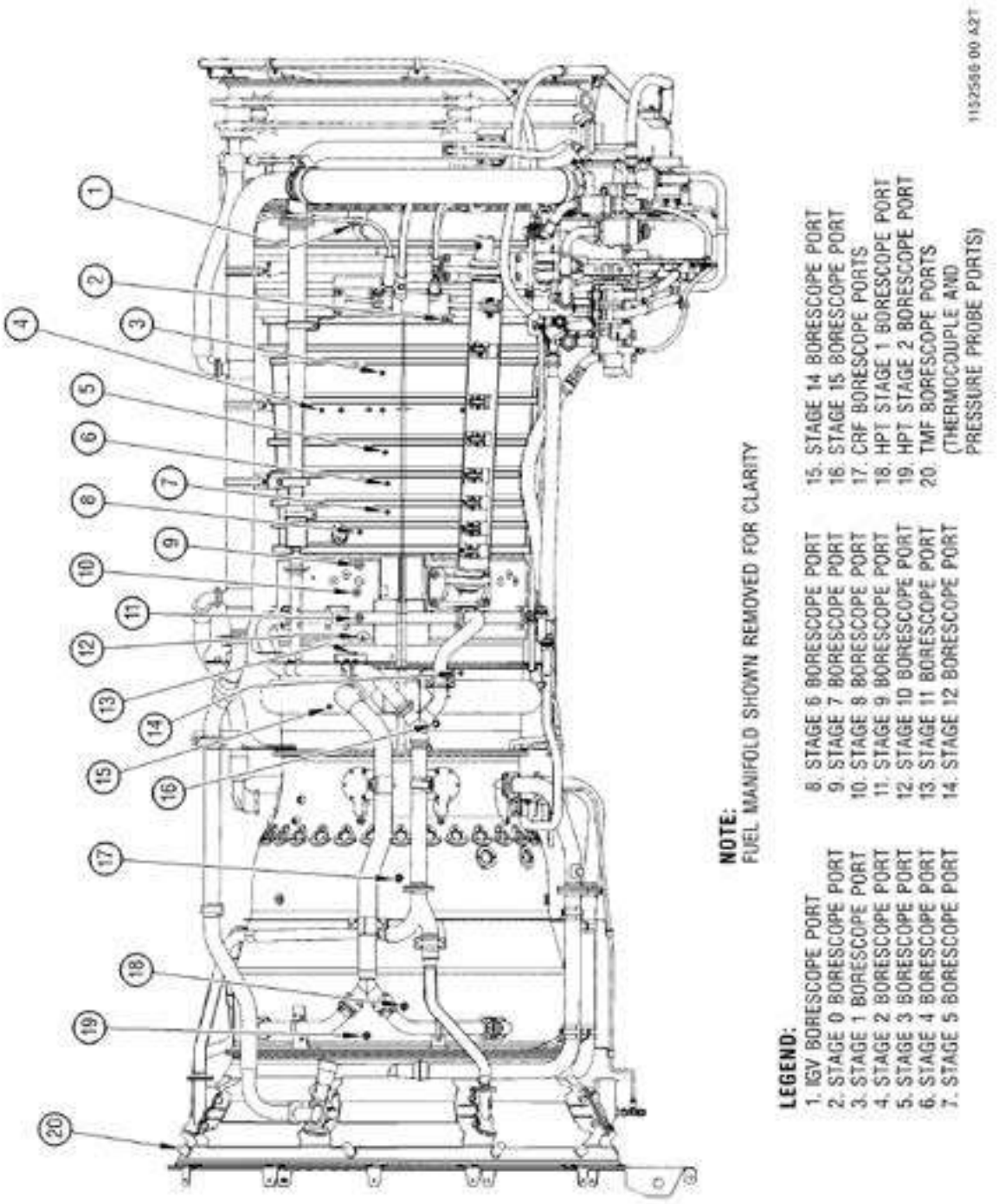



*Figure 1: Position of Borescope Inspection Ports.*

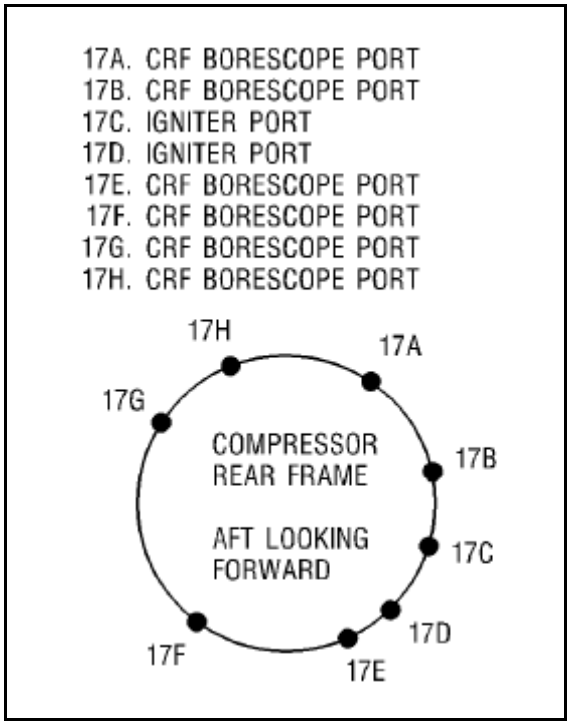



*Figure 2: Position of Borescope Inspection Ports.*

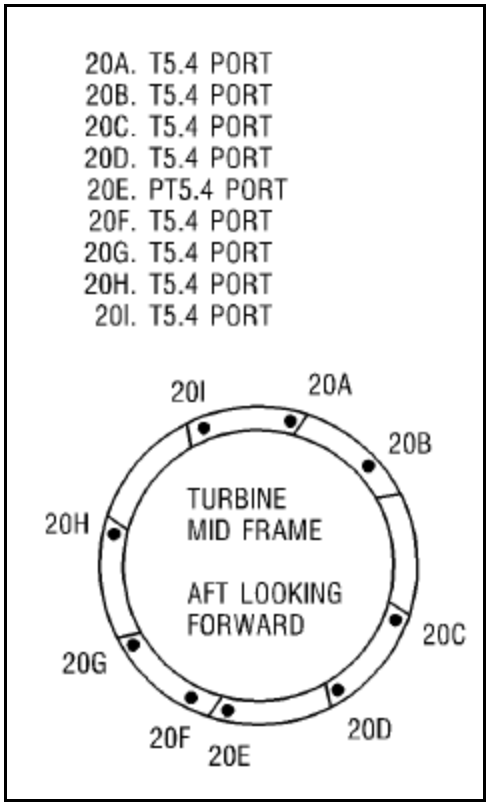



*Figure 3: Position of Borescope Inspection Ports.*

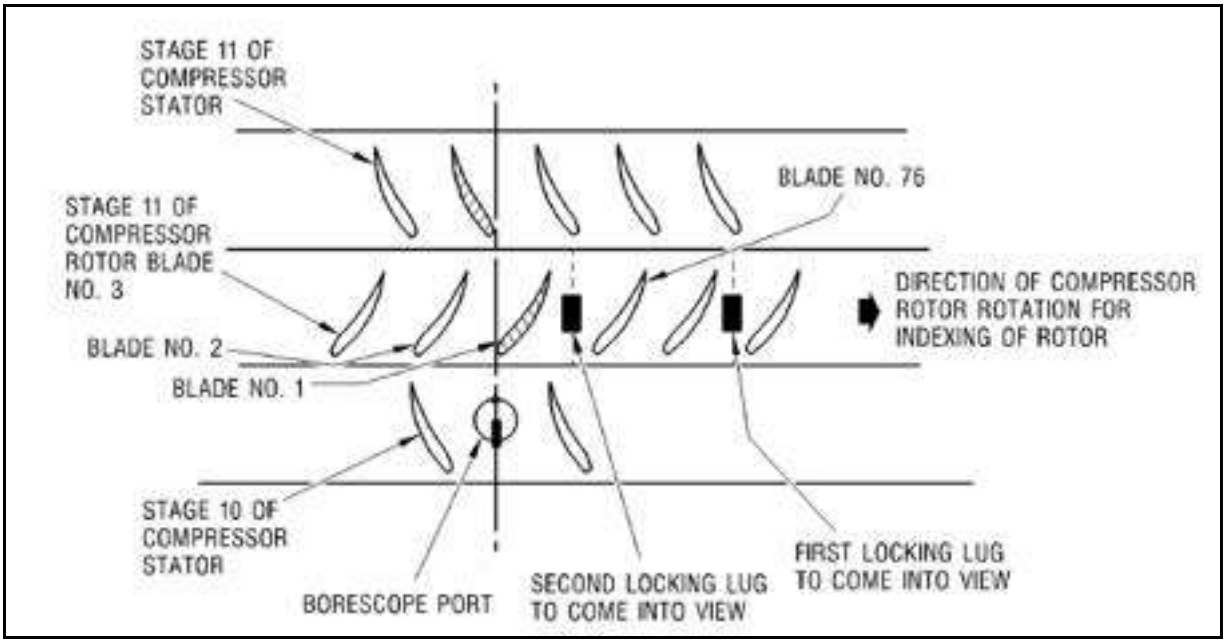



*Figure 4: Zero indexing of HPC rotor and HPT rotor*

## 4.1 Compressor Section

| Port | T.E. | L.E. | blades | Remarks: | photo no: |
|---|---|---|---|---|---|
| 1 | IGV | | | | 1 |
| 1 | | 0 | 36 | | 2,3 |
| 2 | 0 | | 36 | | 4 |
| 2 | | 1 | 26 | | 6,7 |
| 3 | 1 | | 26 | | 9,10 |
| 3 | | 2 | 26 | | 11,12 |
| 4 | 2 | | 26 | | 13 |
| 4 | | 3 | 42 | | 14 |
| 5 | 3 | | 42 | | 15,16 |
| 5 | | 4 | 45 | | 17,18 |
| 6 | 4 | | 45 | | 19, 20 |
| 6 | | 5 | 48 | | 21, 22 |
| 7 | 5 | | 48 | | 23, 24 |
| 7 | | 6 | 54 | | 25, 26 |
| 8 | 6 | | 54 | Blades contacting tip | |
| 8 | | 7 | 56 | Blades contacting tip | |
| 9 | 7 | | 56 | | 27 |
| 9 | | 8 | 64 | | 28 |
| 10 | 8 | | 64 | | 29,30 |
| 10 | | 9 | 66 | | 31 |
| 11 | 9 | | 66 | | 32, 33 |
| 11 | | 10 | 66 | | 35, 36 |
| 12 | 10 | | 66 | | 37, 38 |
| 12 | | 11 | 76 | | 39, 40 |
| 13 | 11 | | 76 | | 41, 42 |
| 13 | | 12 | 76 | | 43, 44 |
| 14 | 12 | | 76 | | 45, 46 |
| 14 | | 13 | 76 | | 47, 48 |
| 15 | 14 | | 76 | Inside bleed manifold | |
| 15 | | 15 | 76 | Inside bleed manifold | |
| 16 | 15 | | 76 | | 49, 50 |
| 16 | | 16 | 76 | | 51, 52 |

**Notes:**

The HPC Section is serviceable. No damages were found.



Picture 1. CFF & IGV




Picture 2. Stage 0 Leading edge tip




Picture 3. Stage 0 Leading edge base



Picture 4. Stage 0 Trailing edge tip



Picture 5. Stage 0 Weep hole




Picture 6. Stage 1 Leading edge tip



Picture 7. Stage 1 Leading edge base



Picture 8. Stage 1 weep hole



Picture 9. Stage 1 Trailing edge tip



Picture 10. Stage 1 Trailing base



Picture 11. Stage 2 Leading edge tip



Picture12. Stage 2 Leading edge base




Picture 13. Stage 2 Trailing edge tip



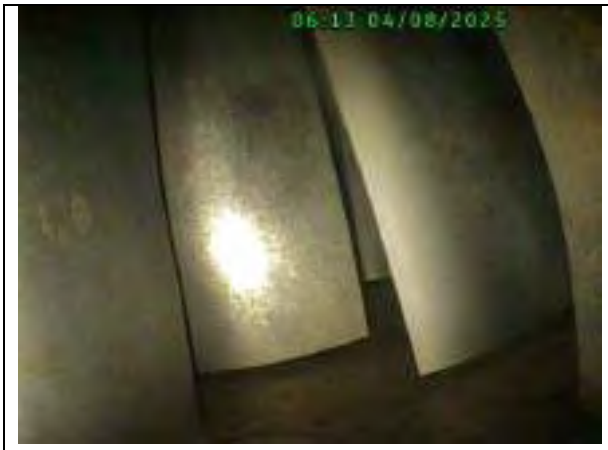

Picture 14. Stage 3 Leading edge tip




Picture 15. Stage 3 Trailing edge tip



Picture 16. Stage 3 Trailing edge base




Picture 17. Stage 4 Leading edge tip



Picture 18. Stage 4 Leading edge base



Picture 19. Stage 4 Trailing edge tip



Picture 20. Stage 4 Trailing edge base



Picture 21. Stage 5 Leading edge tip



Picture 22. Stage 5 Leading edge base



Picture 23. Stage 5 Trailing edge tip



Picture 24. Stage 5 Trailing edge base



Picture 25. Stage 6 Leading edge tip



Picture 26. Stage 6 Leading edge base



Picture 27. Stage 7 Trailing edge tip



Picture 28. Stage 8 Leading edge tip



Picture 29. Stage 8 Trailing edge tip



Picture 30. Stage 8 Trailing edge base



Picture 31. Stage 9 Leading edge



Picture 32. Stage 9 Trailing edge tip



Picture 33. Stage 9 Trailing base



Picture 34. Stage 9 Bleed manifold



Picture 35. Stage 10 Leading edge tip



Picture 36. Stage 10 Leading edge base



Picture 37. Stage 10 Trailing edge tip



Picture 38. Stage 10 Trailing edge base



Picture 39. Stage 11 Leading edge tip



Picture 40. Stage 11 Leading edge base



Picture 41. Stage 11 Trailing edge tip



Picture 42. Stage 11 Trailing edge base




Picture 43. Stage 12 Leading edge tip



Picture 44. Stage 12 Leading edge base



Picture 45. Stage 12 Trailing edge tip



Picture 46. Stage 12 Trailing edge base




Picture 47. Stage 13 Leading edge tip



Picture 48. Stage 13 Leading edge base



Picture 49. Stage 15 Trailing edge tip



Picture 50. Stage 15 Leading edge base



Picture 51. Stage 16 Leading edge tip



Picture 52. Stage 16 Leading edge base

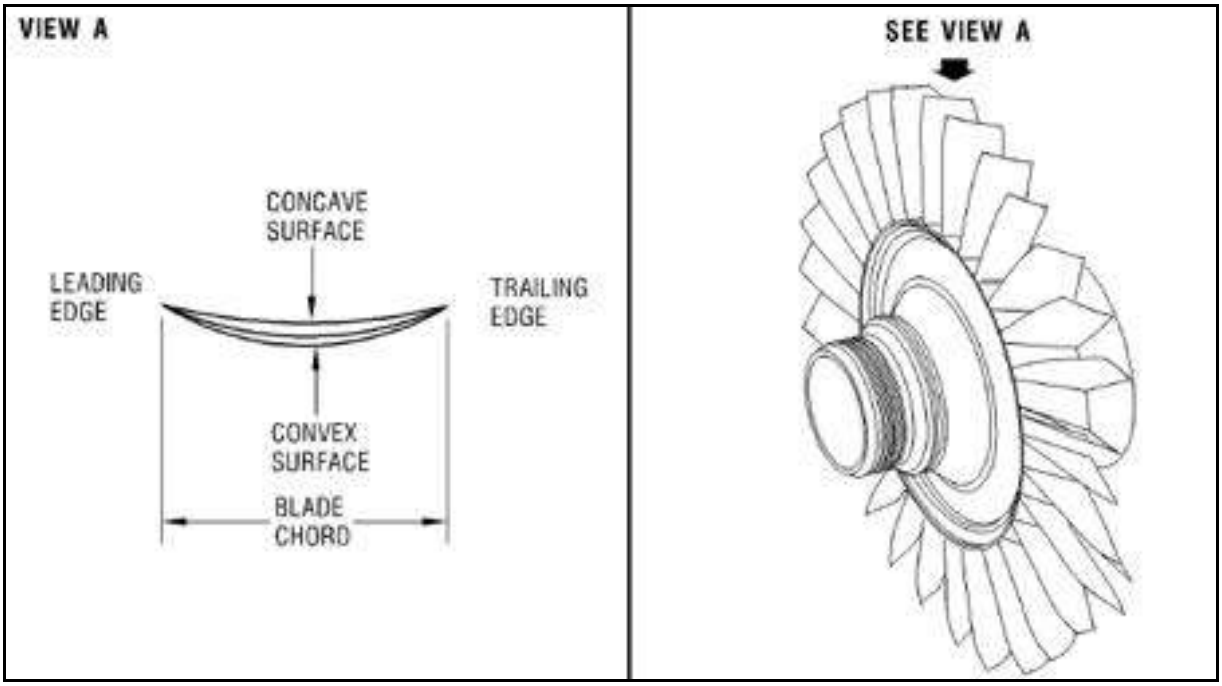



*Figure 5: HPC stage 0 BLISK*

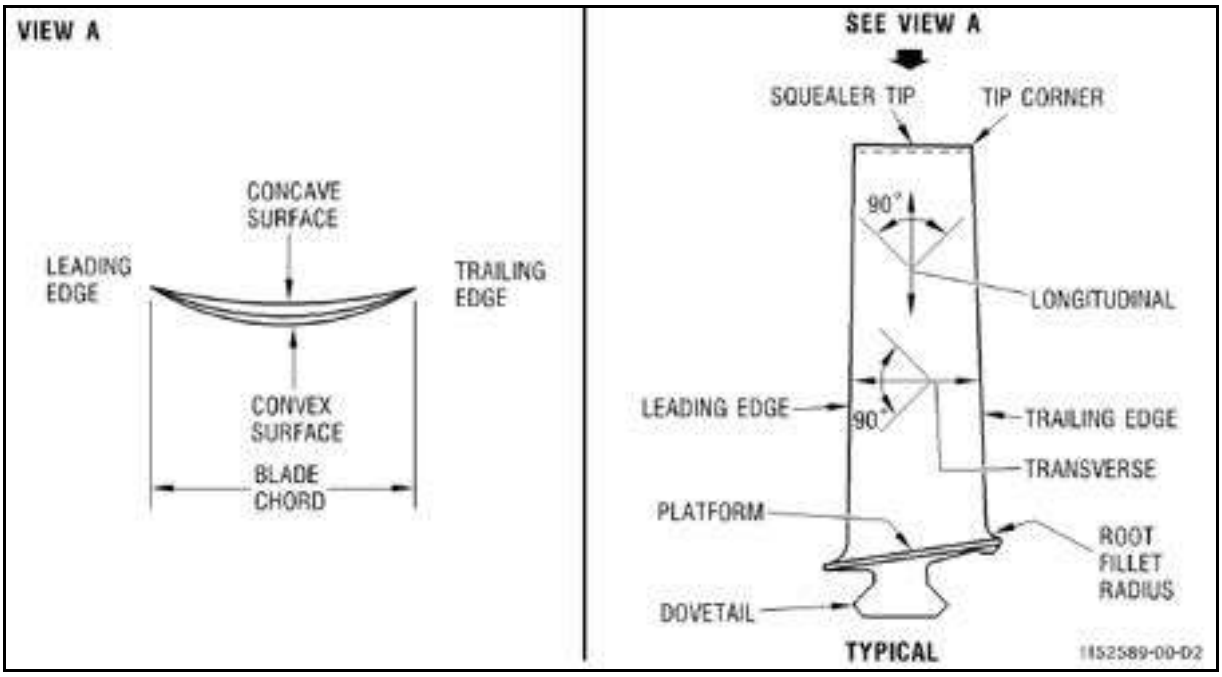



*Figure 6: Compressor Rotor Blades*

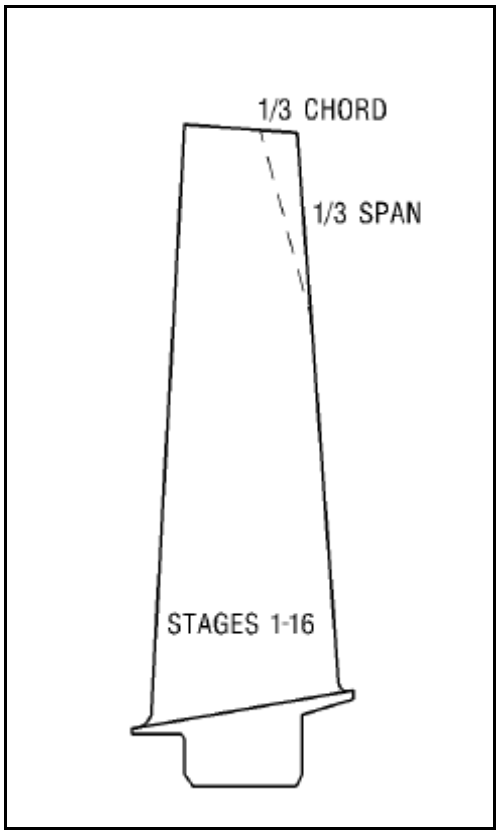



*Figure 7: Tip Trailing Edge Inspection*

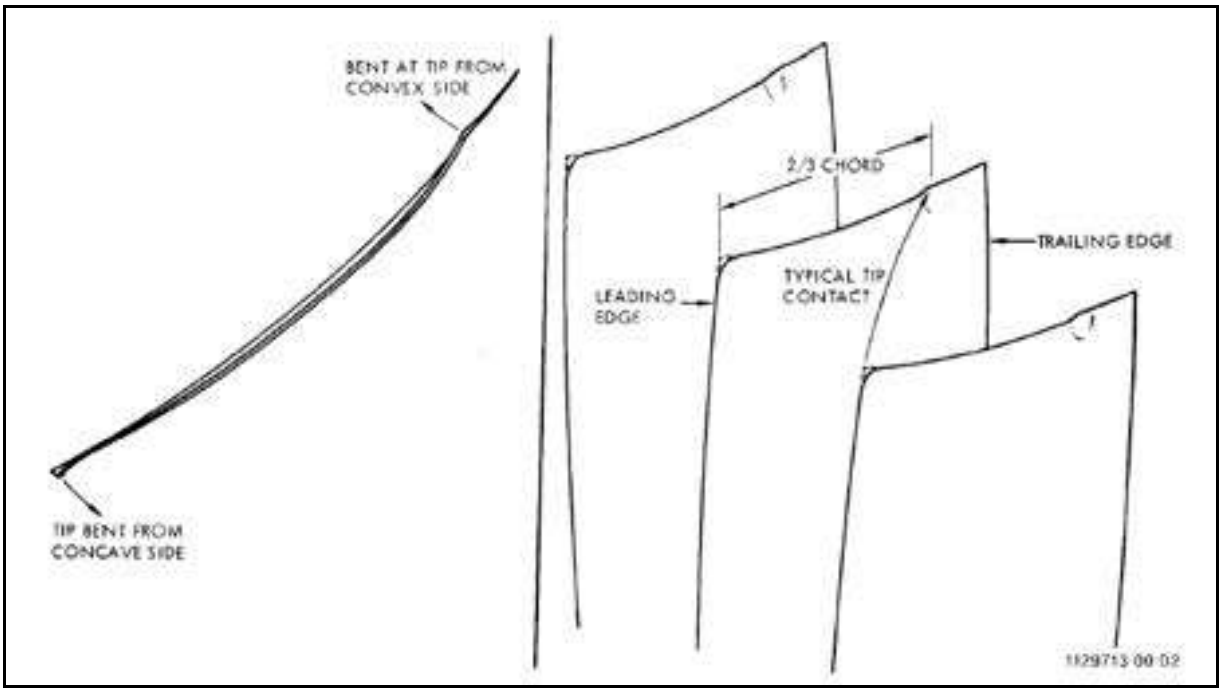


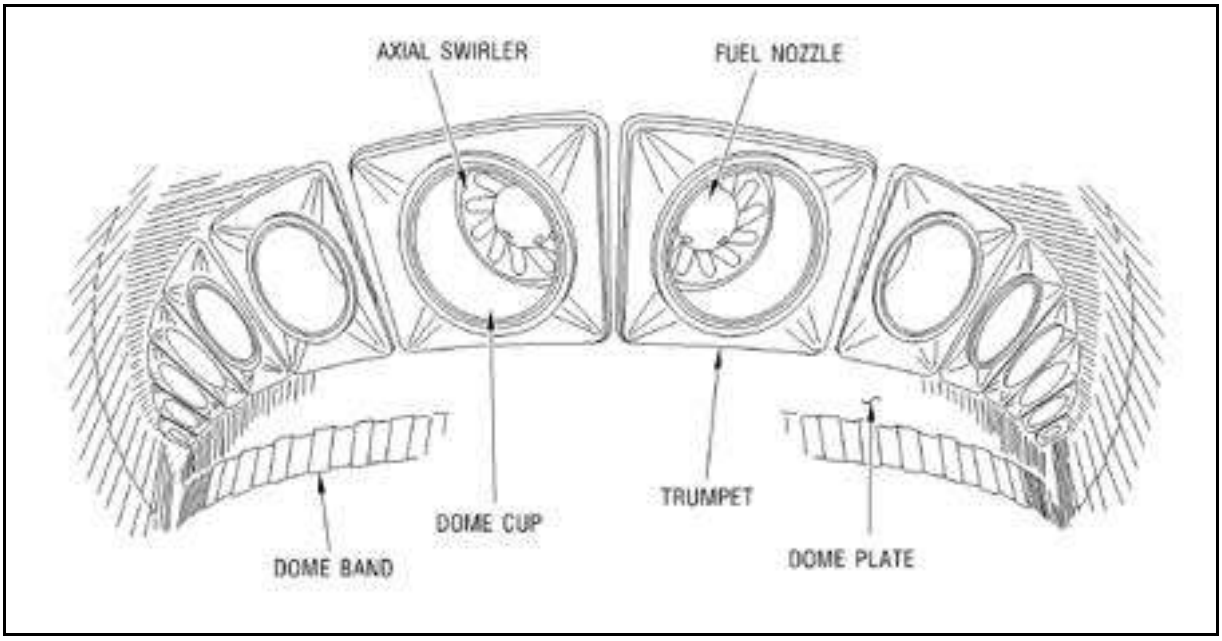

*Figure 8: Tip Clanging Contact (HPCR stage 3 through 6)*

## 4.2 Combustor and 1St Stage Nozzle Section

| Port | Condition observed | Photo no: |
|---|---|---|
| **17A** | | |
| **17B** | | |
| **17C** | | |
| **17D** | **See below notes.** | |
| **17E** | | |
| **17F** | | |
| **17G** | | |
| **17H** | | |
| **17** | 1st stage nozzle (leading edge): | |

**Notes:**

The Combustor section is serviceable according to GEK105054 Volume II WP40600 Table 7.



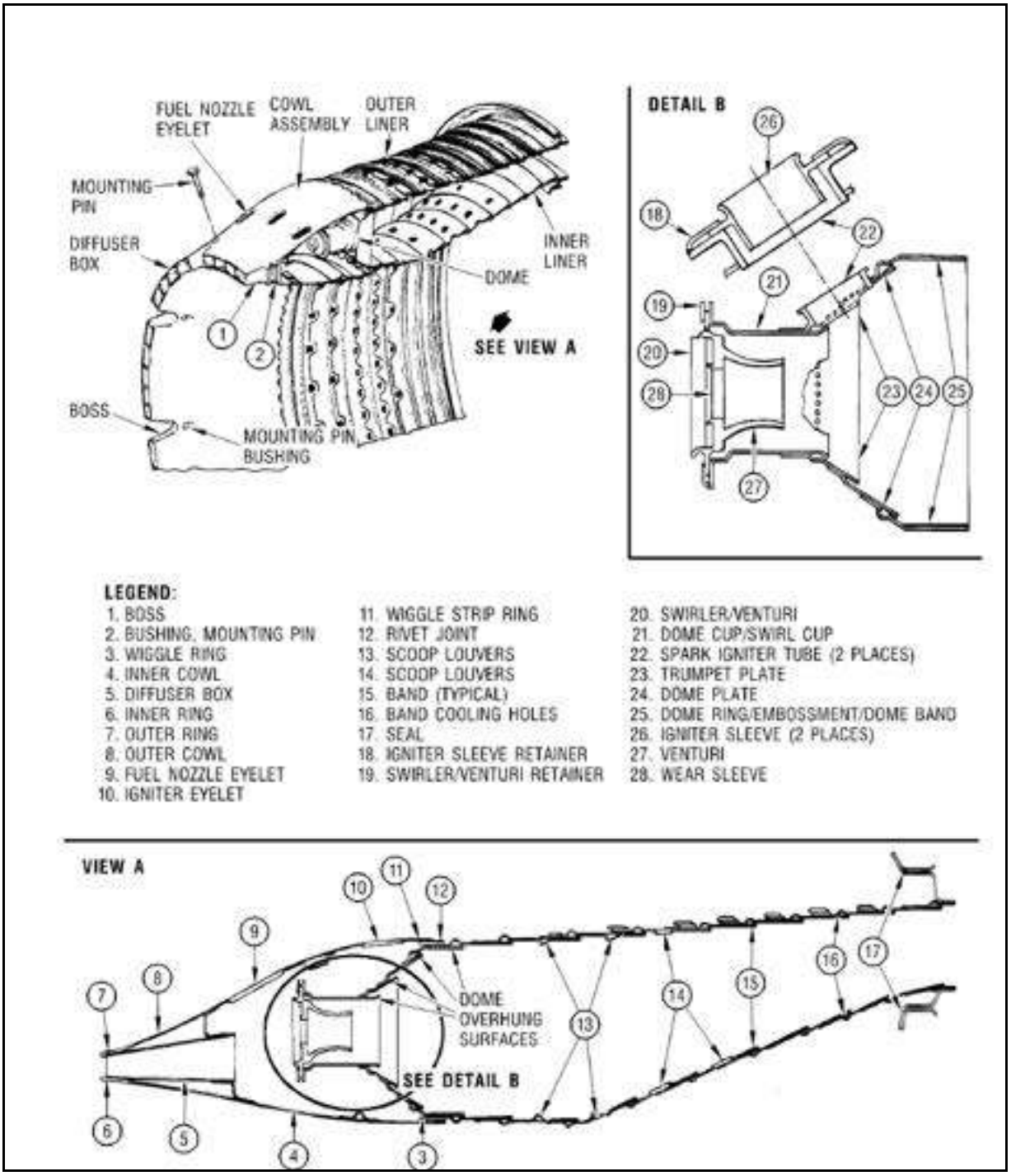



*Figure 9: SAC Combustor Inspection*

*Figure 10: SAC Combustor Inspection*

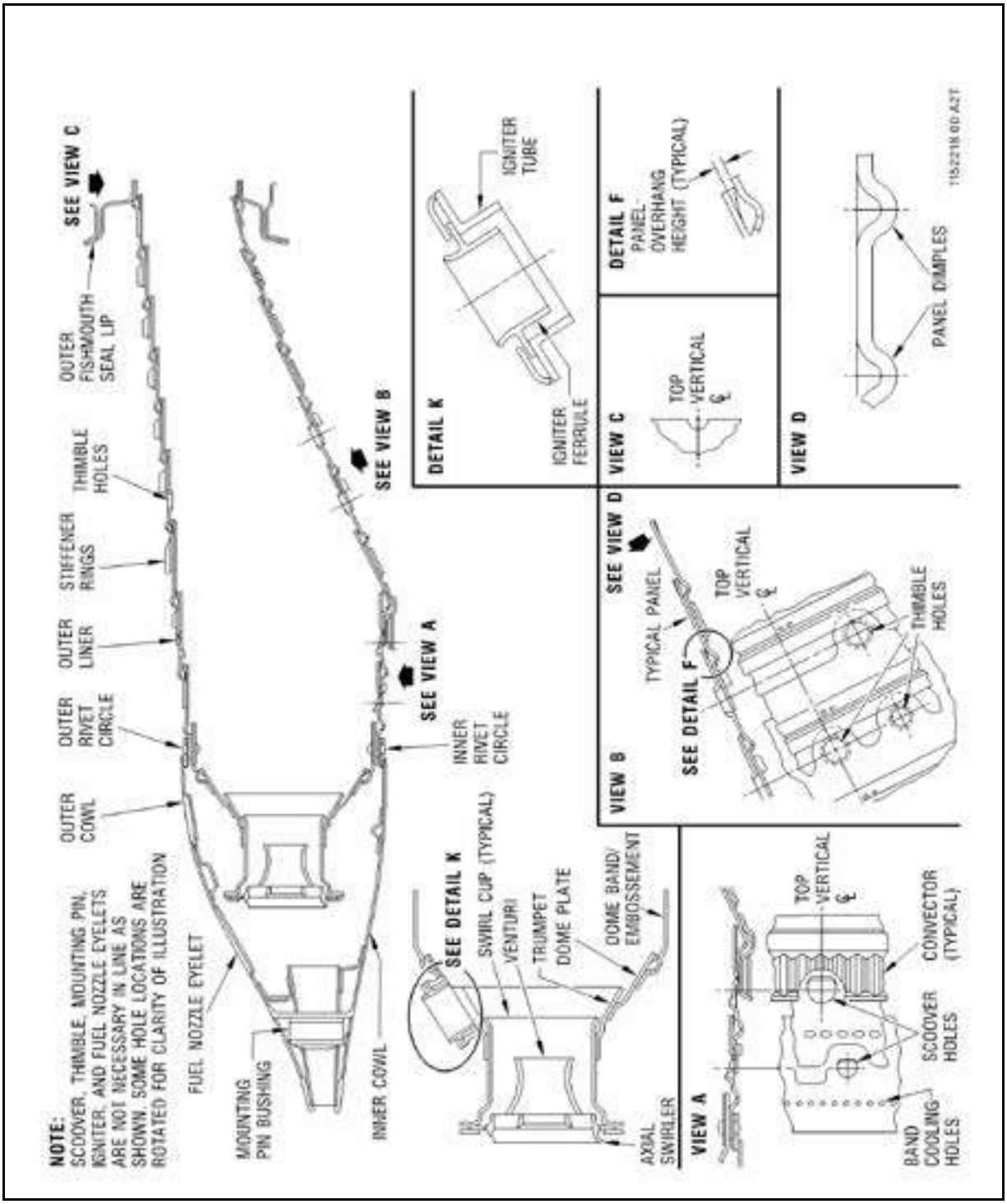



*Figure 11: SAC Combustor Inspection*

**Borescope Pictures**



Picture 53. Upper igniter ferrule



Picture 54. Lower igniter ferrule



Picture 55. Outer rivets band



Picture 56. Inner rivets band



Picture 57. Combustor liners



Picture 58. Combustor liners

| | | |
|---|---|---|
|  | |  |
| Picture 59. Combustor dome splash plates | | Picture 60. Fuel Nozzle tip |

| | | |
|---|---|---|
|  | |  |
| Picture 61. Combustor liners and HPT nozzle interference | | Picture 62. . Combustor liners and HPT nozzle interference |

## 4.3 Turbine Section

| | turbine stage | | | | |
|---|---|---|---|---|---|
| **Port** | **L.E.** | **T.E.** | **blades** | **Remarks:** | **photo no:** |
| **18** | **1** | | **88** | | |
| **19** | | **1** | **88** | **See below notes.** | |
| **19** | **2** | | **90** | | |
| **20** | | **2** | | | |

**Notes:**

The High Pressure Turbine section is serviceable according to GEK105054 Volume II WP40600 Table 8.

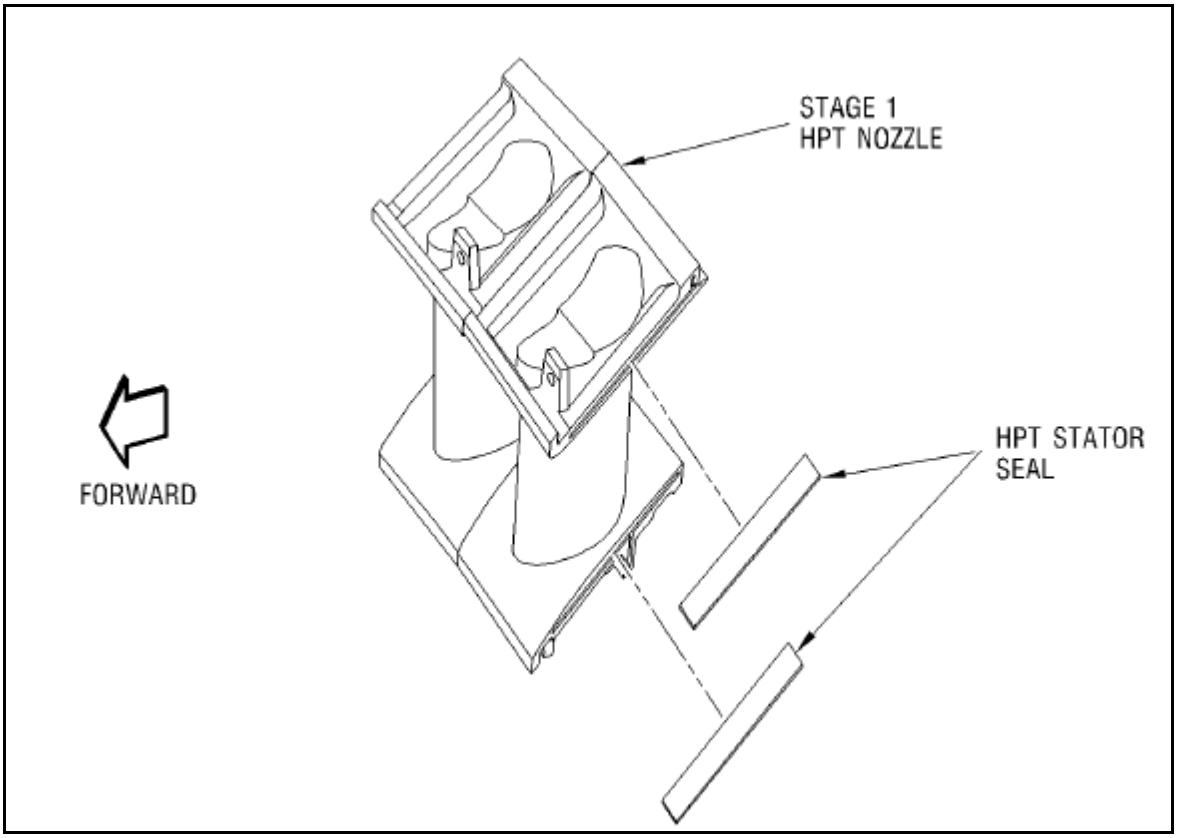



*Figure 12: Stage 1 HPT Nozzle Seal Displacement*

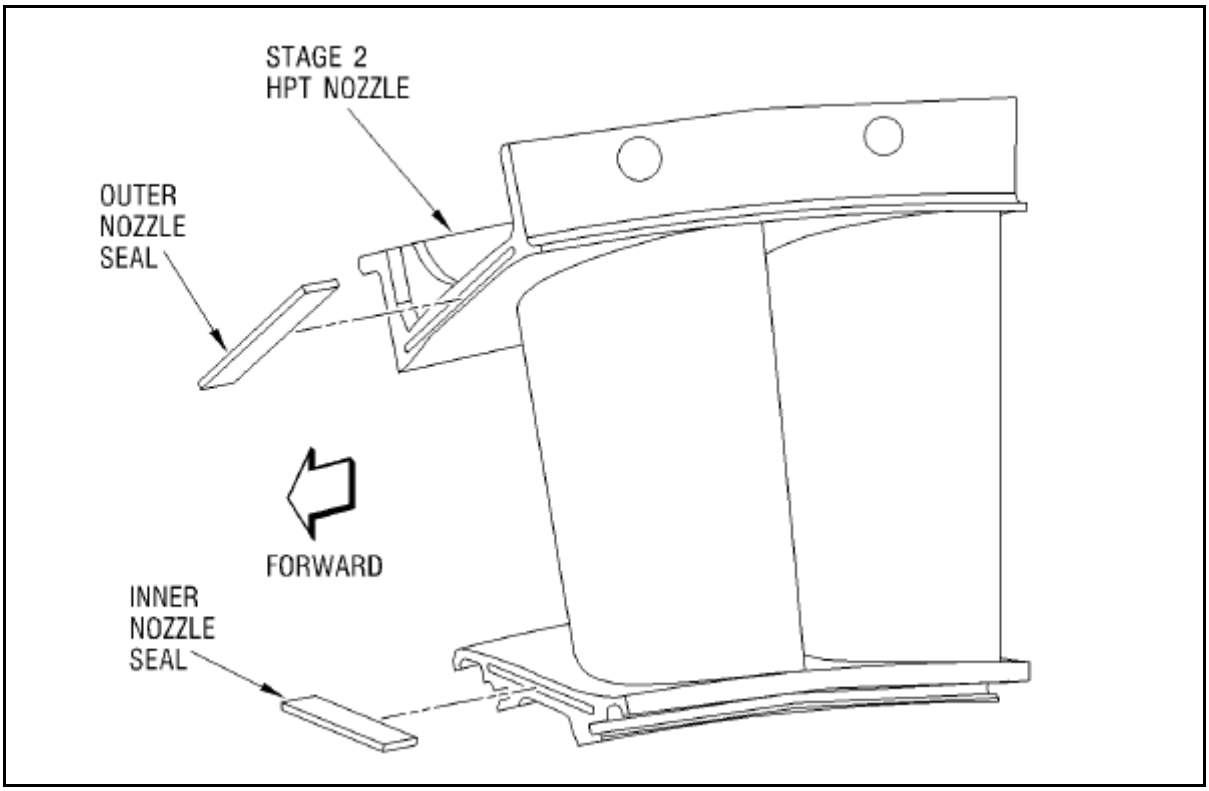



*Figure 13: Stage 2 HPT Nozzle Seal Displacement*

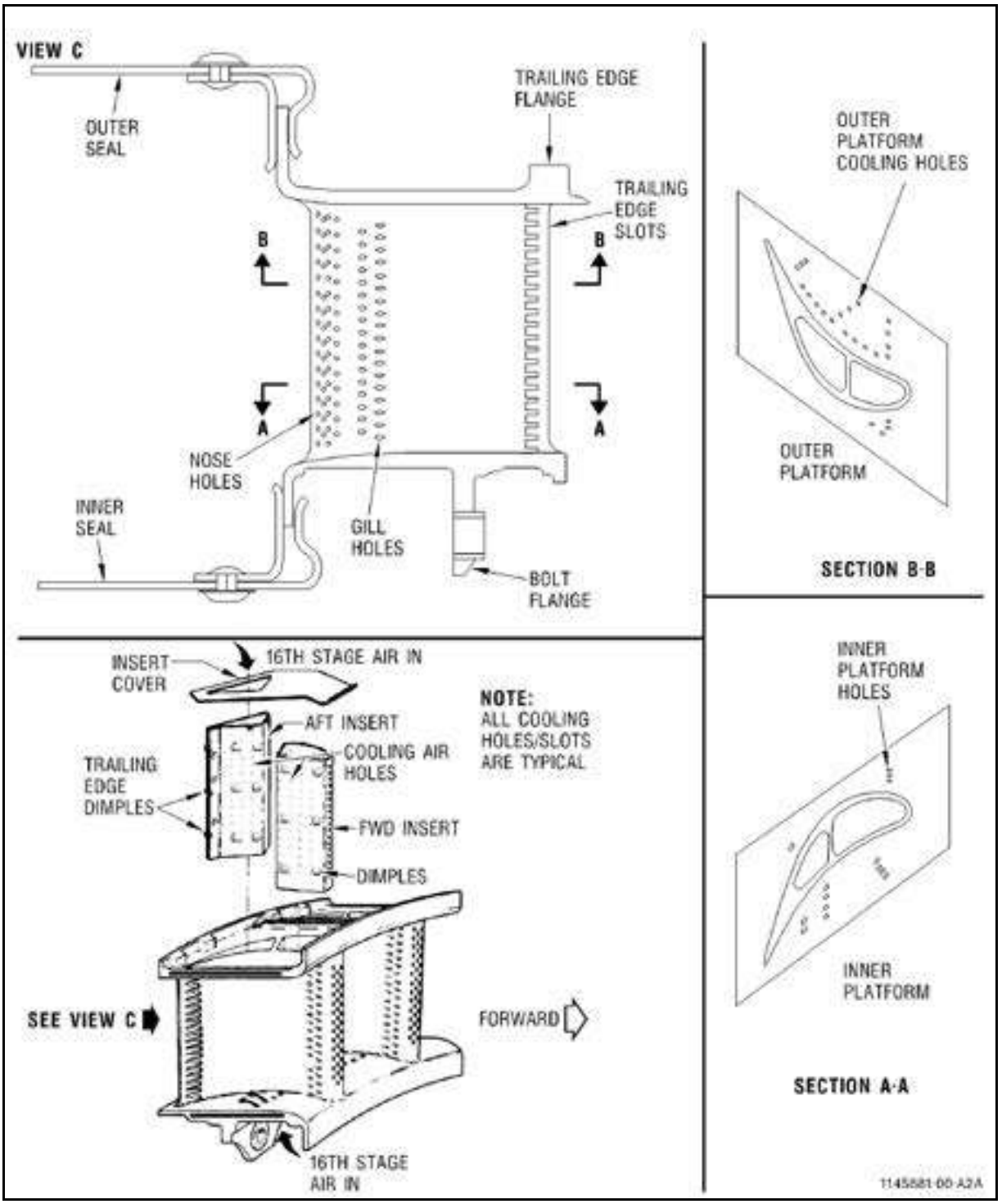



*Figure 14: HPT Stage 1 Nozzle*

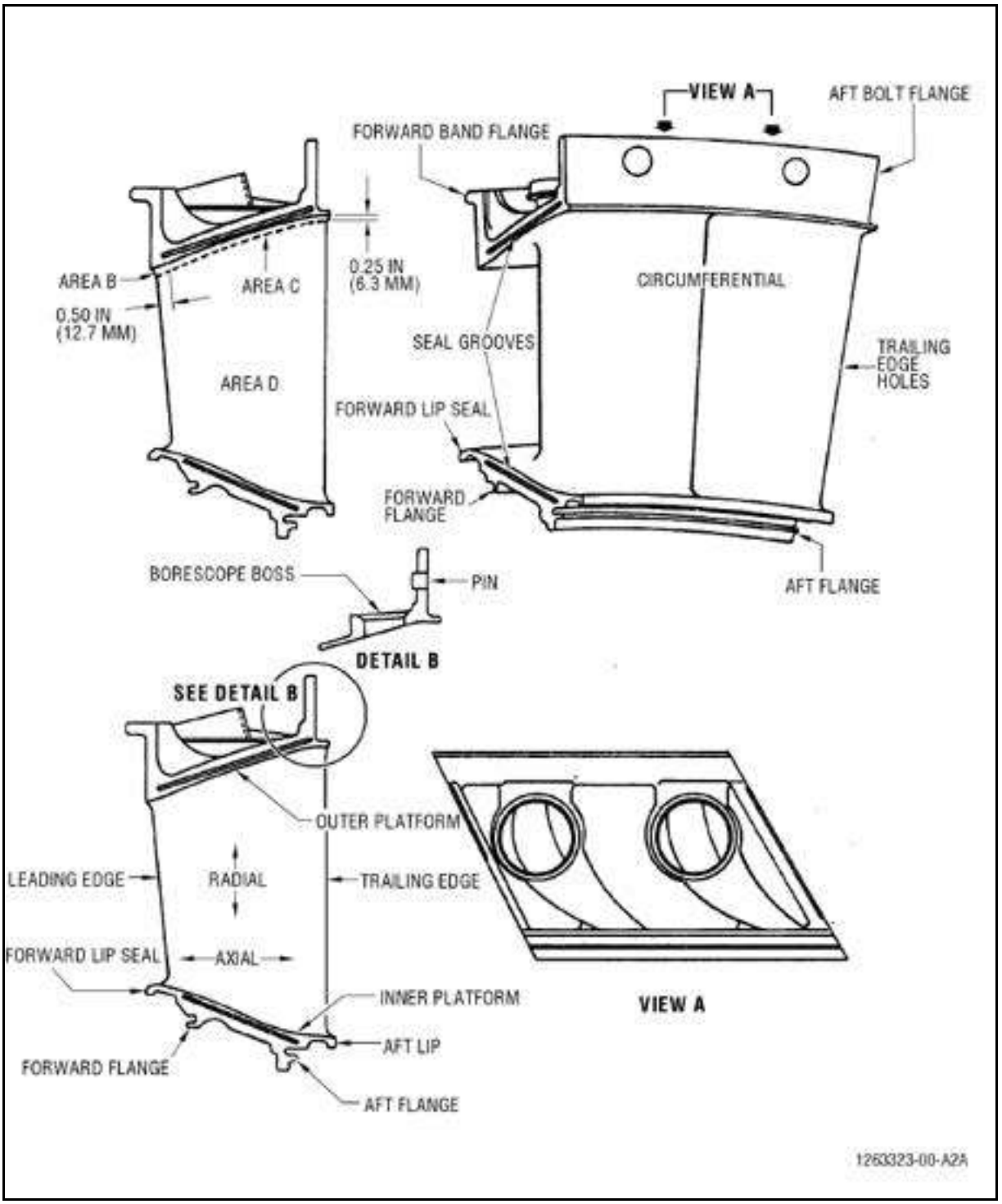



*Figure 15: HPT Stage 2 Nozzle*

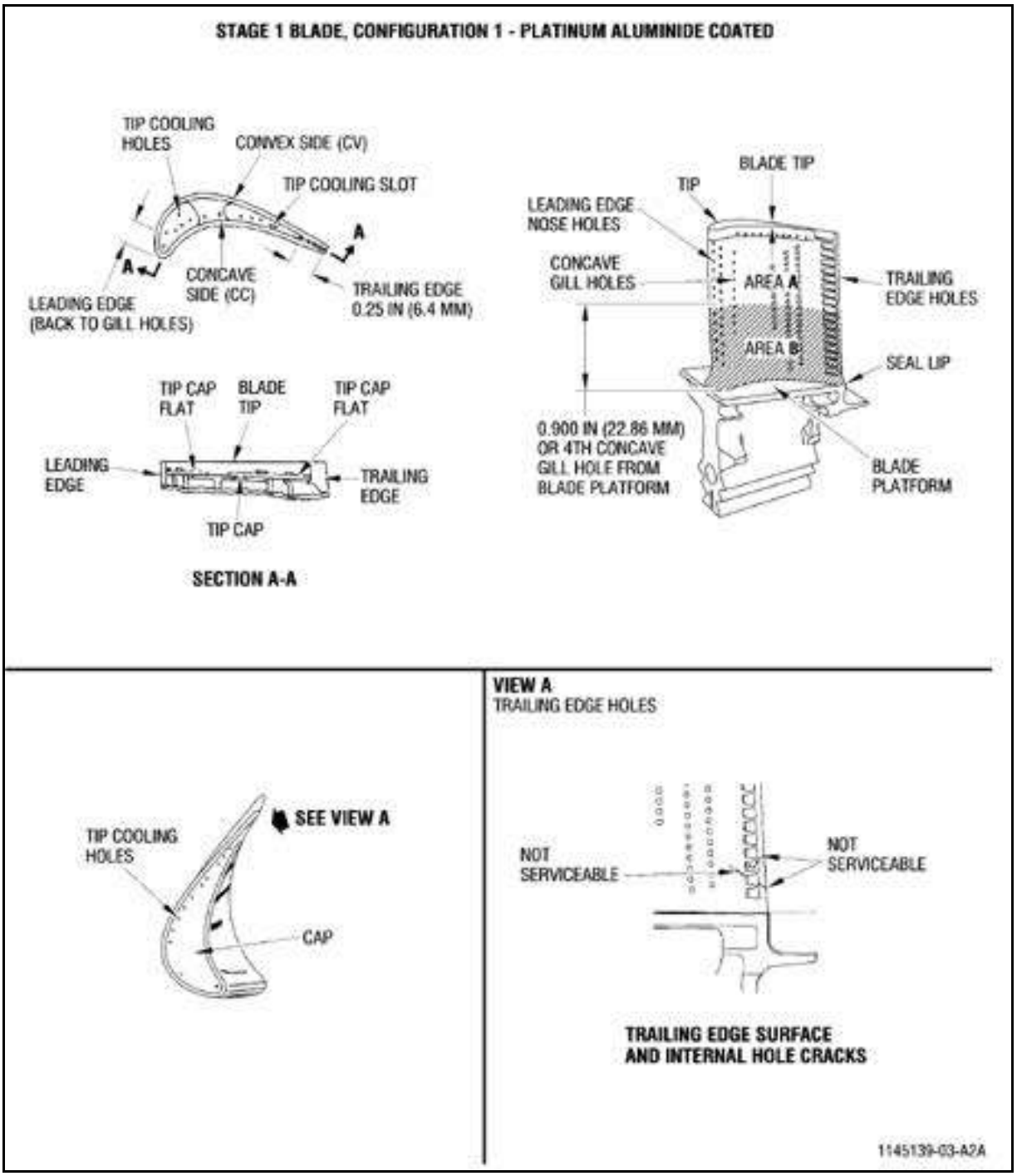



*Figure 16: HPT Stage 1 Rotor Blades Inspection Areas (Platinum Aluminide Coated Blades)*

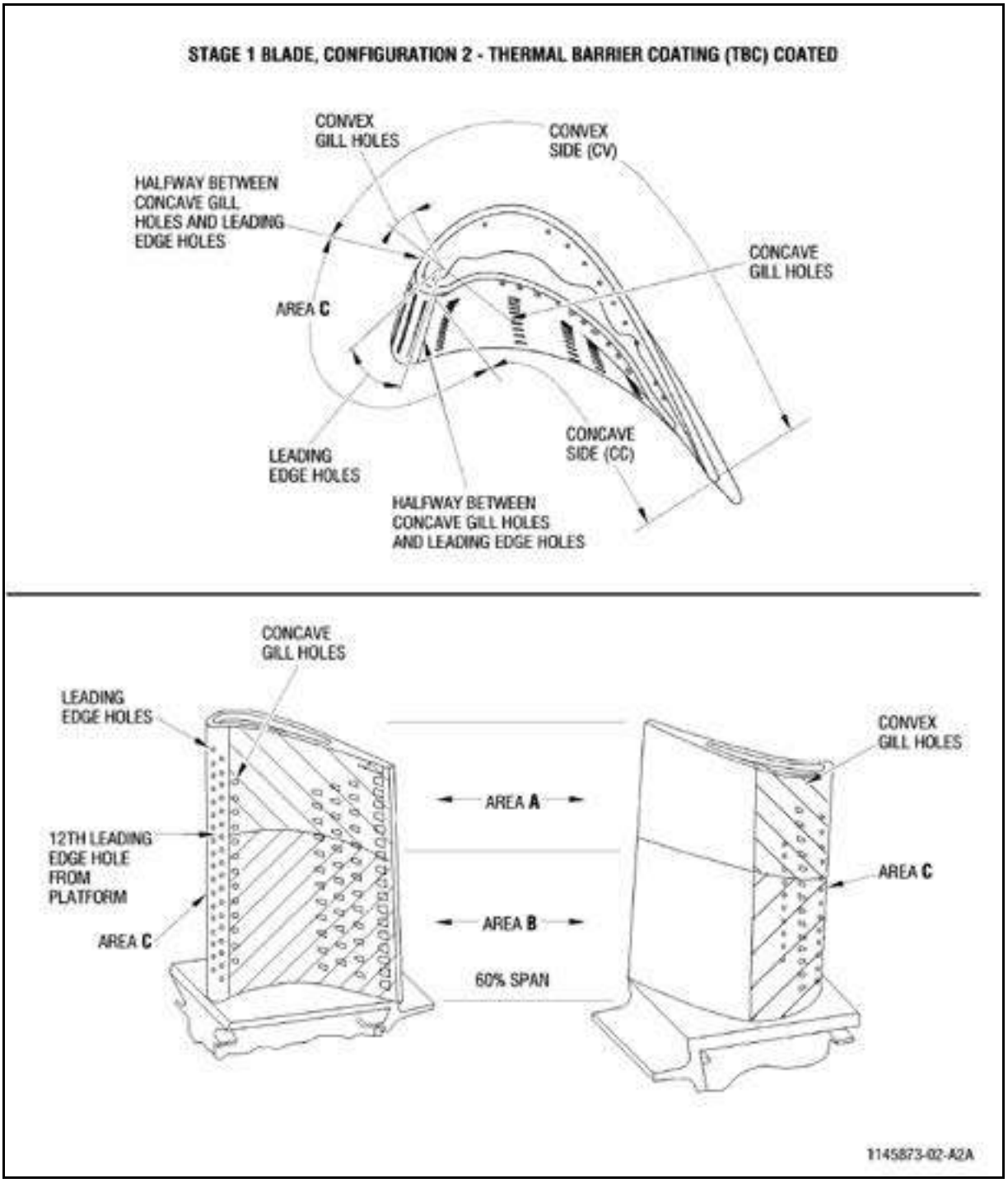



*Figure 17: HPT Stage 1 Rotor Blades Inspection Areas (TBC Coated Blades)*

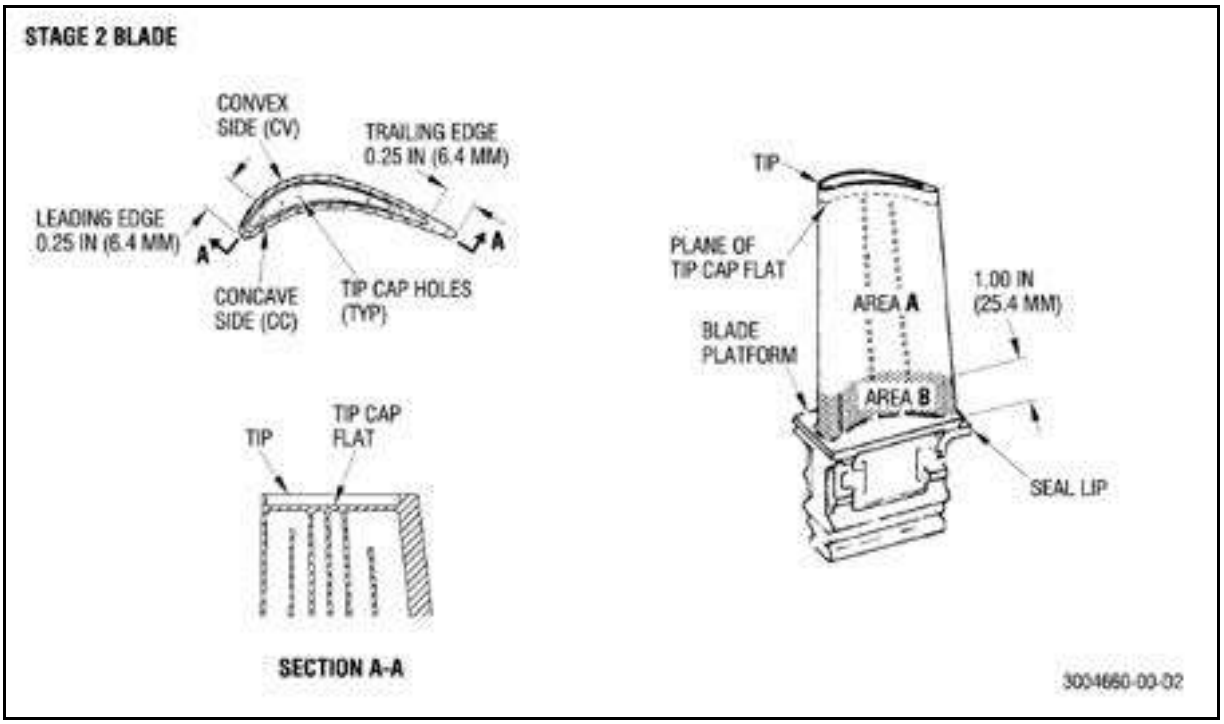



*Figure 18: HPT Stage 2 Rotor Blades Inspection Areas*

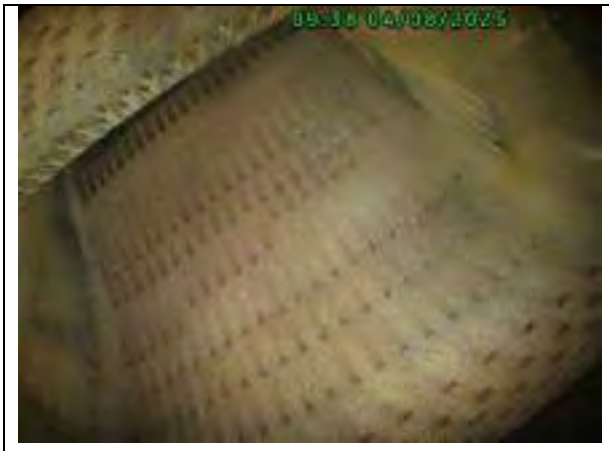
**Borescope Pictures**



Picture 63: Stage1 Nozzle leading edge



Picture 64: Stage1 Nozzles Leading edge



Picture 65: Stage1 Nozzle airfoil concave side



Picture 66: Stage1 Nozzle airfoil concave side



Picture 67: Stage1 Nozzles airfoil concave



Picture 68: Stage1 Nozzle airfoil concave



Picture 69: Stage1 Nozzle airfoil concave side



Picture 70: Stage1 Nozzle airfoil convex side



Picture 71: Stage1 Nozzle trailing edge concave



Picture 72: Stage1 Nozzle trailing edge concave



Picture 73: Stage1 Nozzle trailing edge



Picture 74: Stage1 Nozzle trailing edge convex.



Picture 75: Stage1 Blades leading edge tip



Picture 76: Stage1 Blades leading edge tip



Picture 77: Stage 1 Blades leading edge base



Picture 78: Stage 1 Blades leading edge base



Picture 79: Stage 1 Blades trailing edge tip



Picture 80: Stage 1 Blades trailing edge root



Picture 81: Stage 2 Blades leading edge tip



Picture 82: Stage 2 Honeycomb seals



Picture 83: Stage 2 Blades leading edge root



Picture 84: Stage 2 Blades and stage 2 nozzles



Picture 85: Stage 2 Blades trailing edge



Picture 86: Stage 2 Blades trailing edge

## 4.4 LPT Section

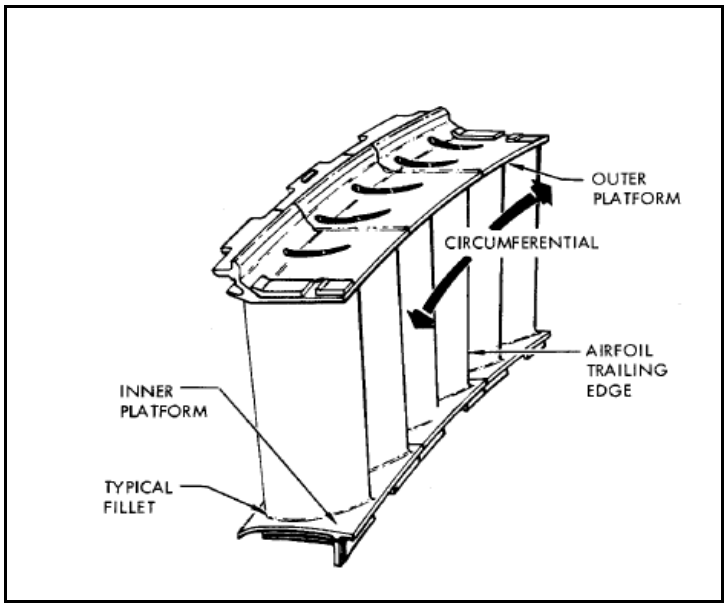



*Figure 19: Power Turbine Nozzles*

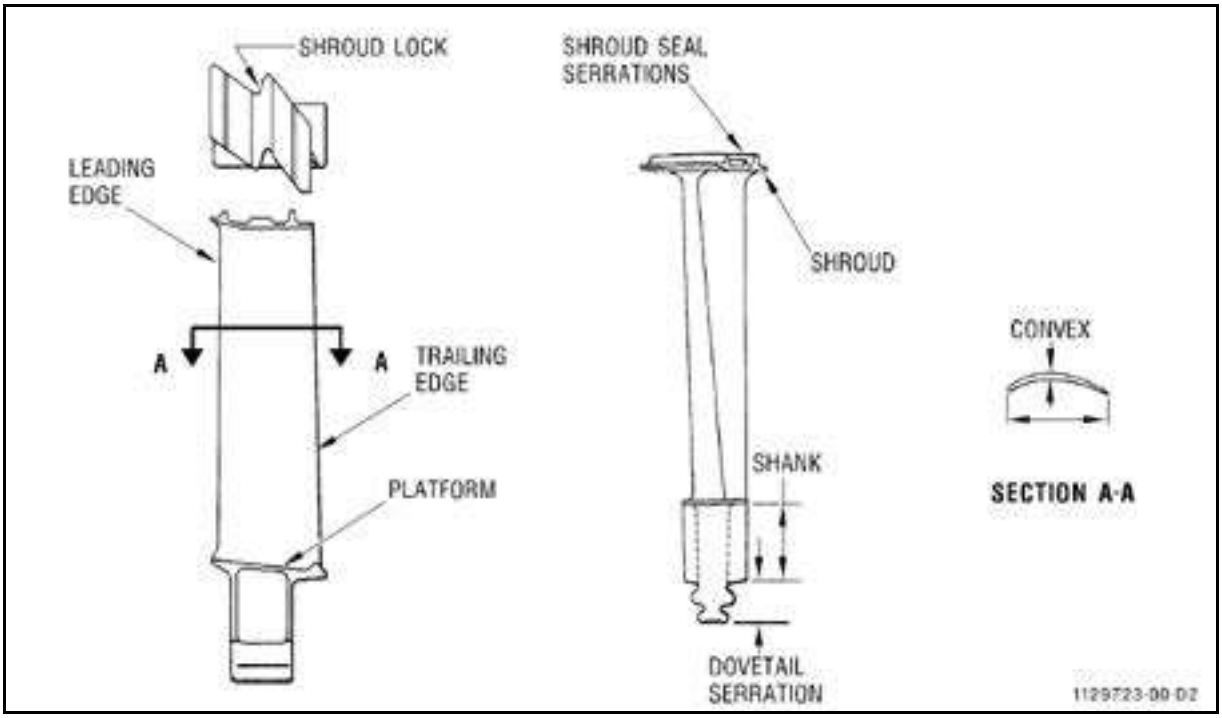



*Figure 20: Power Turbine Rotor Blades*

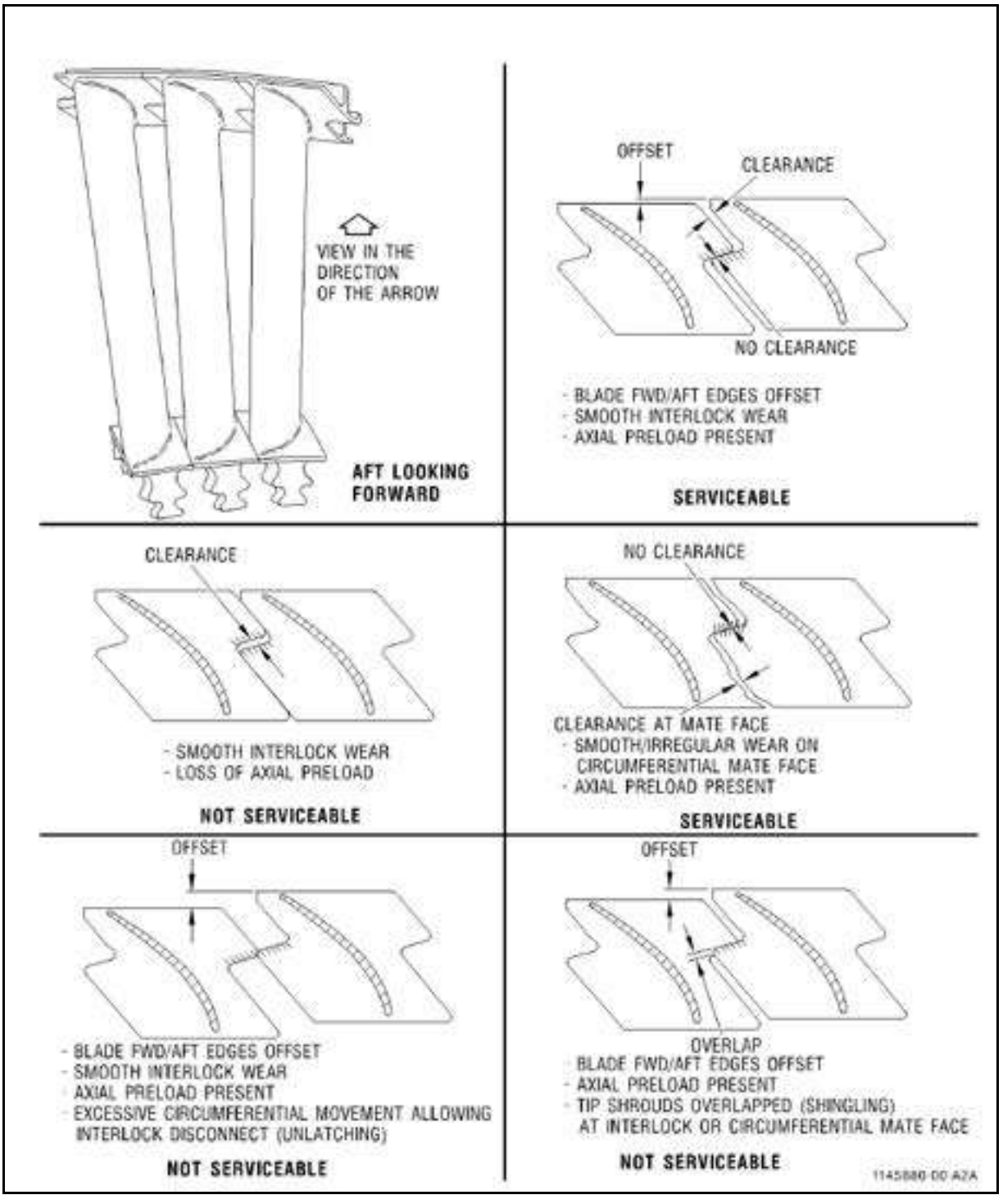



*Figure 21: LPT Rotor Blade Circumferential Inspection*

**Notes:**

The LPT stage 1 accessible nozzles and blades did not show any damage. Minor damage on honeycomb seal

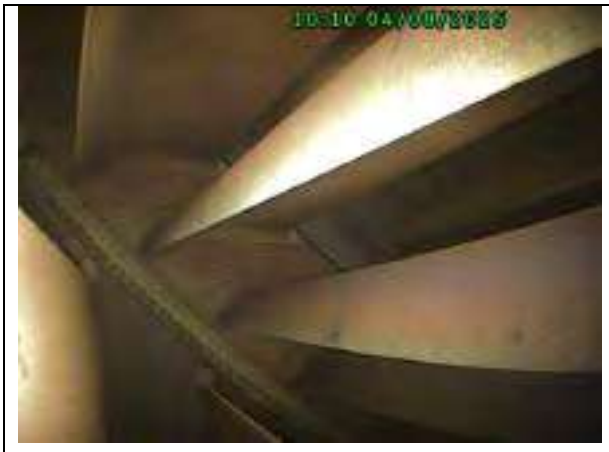
**Borescope Pictures**



Picture 87: STG1 LPT nozzles



Picture 88: TMF and LPT Inlet



Picture 89: Stage 1 Blades



Picture 90: LPT Stage 1 Blades tip interlock

# BORESCOPE INSPECTION REPORT
# TM2500 GEN. 6-7
## *7LM2500 – PK – MDWG05*

## NEW FORTRESS ENERGY

## SJTPP, PR

## PACKAGE # 7250393

## UNIT #3

| | | | |
|---|---|---|---|
| **Visit Date:** | 08/06/2025 | **Total Starts:** | 929 |
| **Engine S/N:** | 557-240 | **GG Hours:** | 14052 |
| **Power Turbine S/N:** | 557-240 | **PT Hours:** | 14052 |
| **SOM GT Field Engineer:** | Daniel Arroyo | **New Fortress Representative:** | Jonathan Rodriguez |



## TABLE OF CONTENTS


1 Conclusions and Recommendations 3

2 Outage Data 4

3 Borescope Inspection Checklist 4

4 Borescope Inspection Record 6

4.1 Compressor Section

4.2 Combustor and 1St Stage Nozzle Section

4.3 Turbine Section

4.4 LPT Section

## 1. Conclusions and Recommendations

**Purpose of visit:**

The purpose of this visit was to perform a borescope inspection of the Engine in accordance with GEK105054, WP 406 00.

1.1 The HPC is serviceable according to GEK105054, WP 406 00 Table 4. No damages were found.
1.2 The Combustor section is serviceable according to GEK105054, WP40600 Table 7.
1.3 The High Pressure Turbine section is NOT serviceable according to GEK105054, WP406 00 Table 8. The HPT 1st stage nozzles (all nozzles affected) showed excessive corrosion, parent metal deformation in both concave and convex airfoil sides. The coolilng passasges are exposed in some nozzles. The TE showed sevre burnt distress.
It's recommended to minimize or to avoid the operation of this engine burning Diesel fuel.
1.4 The LPT is serviceable according to GEK105054, WP40600.

## 2. Outage Data

### Engine Data

| | | | | | |
|---|---|---|---|---|---|
| **ESN:** | 557-240 | **Engine Fired Hours:** | 14052 | **Package Hours:** | 14052 |
| **Model:** | 7LM2500-PK-MDWG05 | **Engine Fired starts:** | 929 | **Package Fired Starts:** | 929 |

**MAINTENANCE DATA**

| WP, SB, SL, PB, PL Performed | GEK105054, REV 11 | Date completed | Comments |
|---|---|---|---|
| WP 406 00 | Borescope Inspection | 06August25 | Not Serviceable |

5

**Parts Data**

| Description | PN Removed | SN Removed | Qty | Disposition | PN Installed | SN Installed |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

## 3. Borescope Inspection Checklist

**Date unit out of operation:** 08/06/2025
**Date unit into operation:** 08/06/2025
**Last inspection date:**

**Type of Fuel:** Gas / Diesel
**Type of NOx suppression:** Water Injection
**Type of outage:** Schedules BSI

**Inspection of gas turbine:**

| WATERWASH: | HIGH PRESSURE COMPRESSOR: |
|---|---|
| ☒ PERFORMED WATER WASH | ☒ HPC BORESCOPE INSPECTION |
| **COMBUSTOR:** | **HIGH PRESSURE TURBINE** |
| ☒ COMBUSTOR BORESCOPE INSPECTION | ☒ HPT STAGE 1 & 2 NOZZLE BORESCOPE INSPECTION |
| | ☒ HPT BLADE BORESCOPE INSPECTION |
| **LOW PRESSURE TURBINE:** | |
| ☒ LPT BORESCOPE INSPECTION | |

☒ ***Please verify all borescope plugs have been reinstalled***

## 4. Borescope Inspection Record

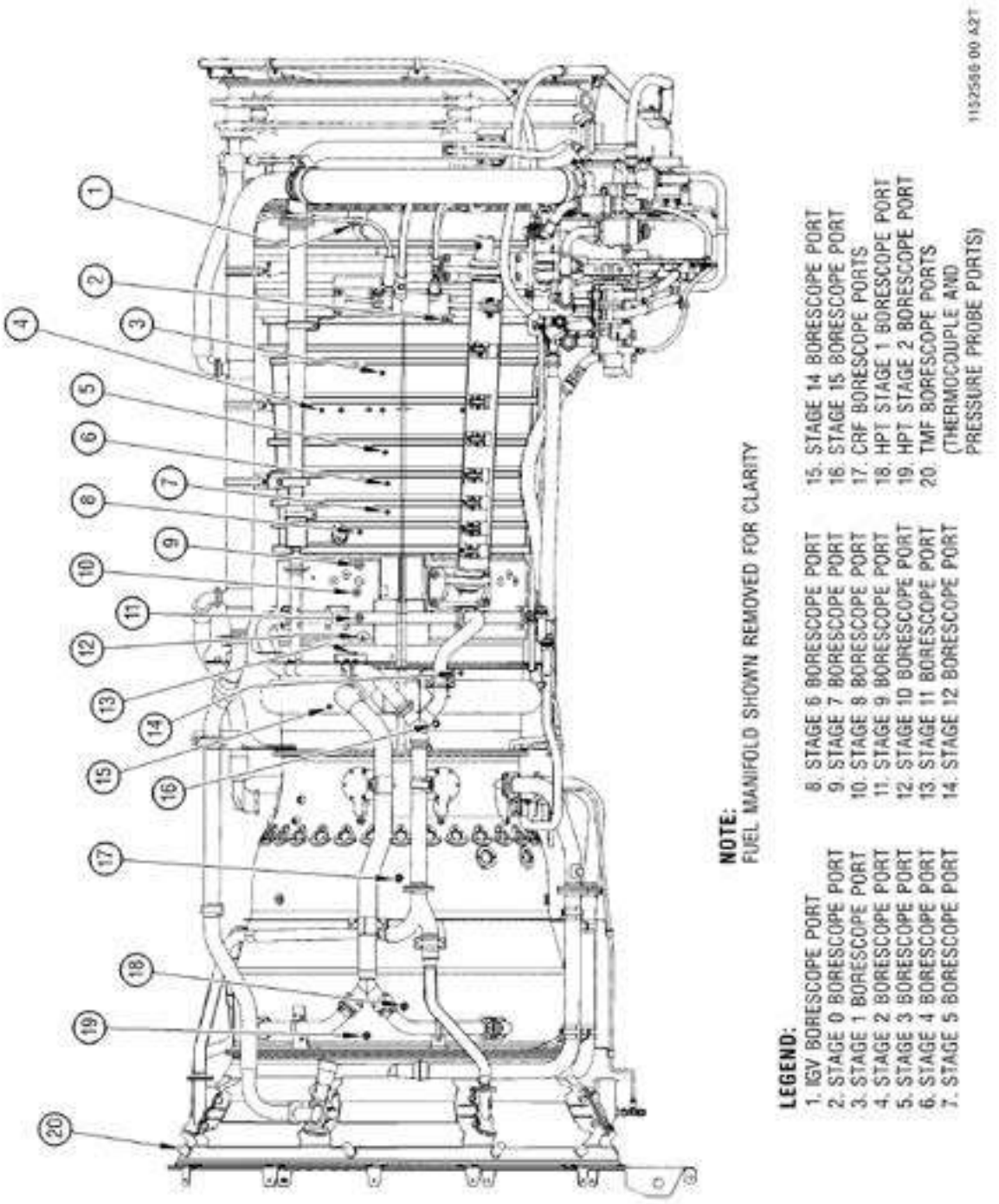



*Figure 1: Position of Borescope Inspection Ports.*

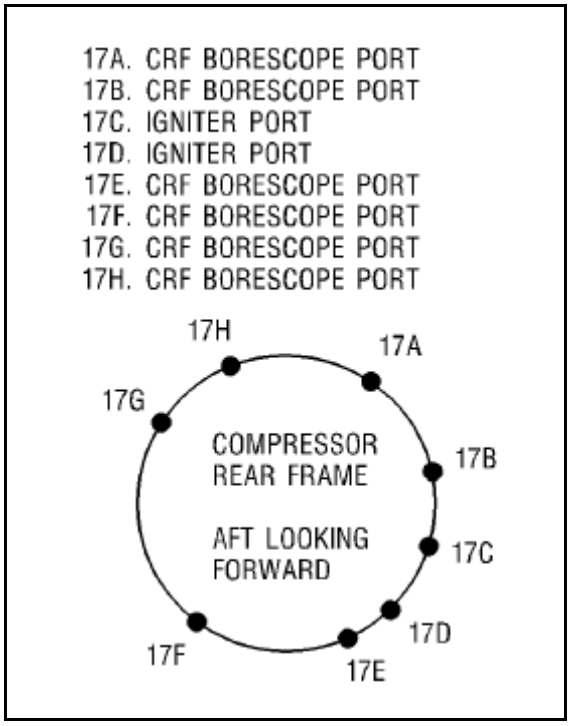



*Figure 2: Position of Borescope Inspection Ports.*

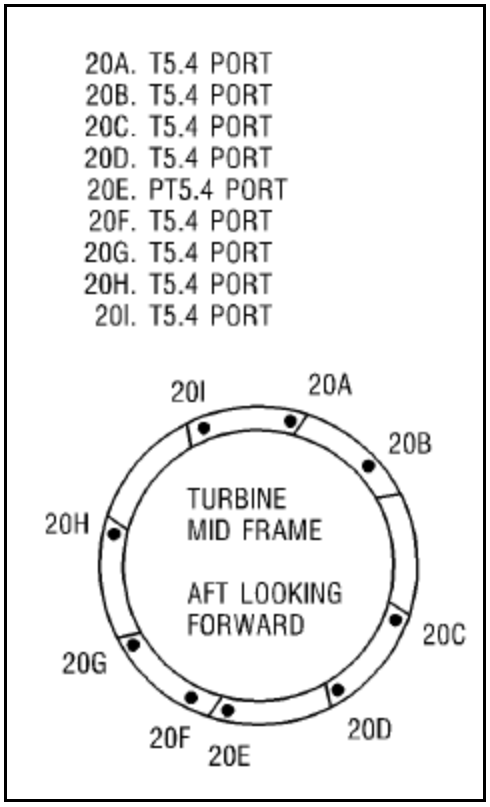



*Figure 3: Position of Borescope Inspection Ports.*

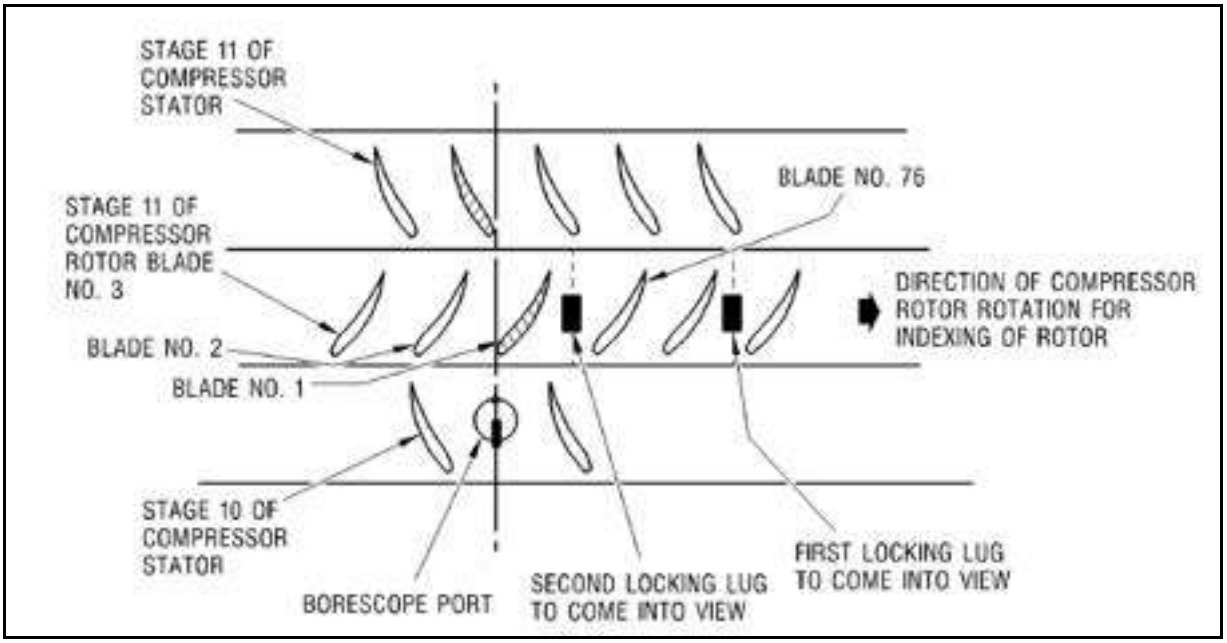



*Figure 4: Zero indexing of HPC rotor and HPT rotor*

## 4.1 Compressor Section

| Port | T.E. | L.E. | blades | Remarks: | photo no: |
|---|---|---|---|---|---|
| 1 | IGV | | | | 1 |
| 1 | | 0 | 36 | | 2,3 |
| 2 | 0 | | 36 | | 4 |
| 2 | | 1 | 26 | | 6,7 |
| 3 | 1 | | 26 | | 9,10 |
| 3 | | 2 | 26 | | 11,12 |
| 4 | 2 | | 26 | | 13 |
| 4 | | 3 | 42 | | 14 |
| 5 | 3 | | 42 | | 15,16 |
| 5 | | 4 | 45 | | 17,18 |
| 6 | 4 | | 45 | | 19, 20 |
| 6 | | 5 | 48 | | 21, 22 |
| 7 | 5 | | 48 | | 23, 24 |
| 7 | | 6 | 54 | | 25, 26 |
| 8 | 6 | | 54 | Blades contacting tip | |
| 8 | | 7 | 56 | Blades contacting tip | |
| 9 | 7 | | 56 | | 27 |
| 9 | | 8 | 64 | | 28 |
| 10 | 8 | | 64 | | 29,30 |
| 10 | | 9 | 66 | | 31 |
| 11 | 9 | | 66 | | 32, 33 |
| 11 | | 10 | 66 | | 35, 36 |
| 12 | 10 | | 66 | | 37, 38 |
| 12 | | 11 | 76 | | 39, 40 |
| 13 | 11 | | 76 | | 41, 42 |
| 13 | | 12 | 76 | | 43, 44 |
| 14 | 12 | | 76 | | 45, 46 |
| 14 | | 13 | 76 | | 47, 48 |
| 15 | 14 | | 76 | Inside bleed manifold | |
| 15 | | 15 | 76 | Inside bleed manifold | |
| 16 | 15 | | 76 | | 49, 50 |
| 16 | | 16 | 76 | | 51, 52 |

**Notes:**



Picture 1. CFF & IGV



Picture 2. Stage 0 Leading edge tip



Picture 3. Stage 0 Leading edge base



Picture 4. Stage 0 Trailing edge tip



Picture 5. Stage 0 Weep hole



Picture 6. Stage 1 Leading edge tip



Picture 7. Stage 1 Leading edge base



Picture 8. Stage 1 weep hole



Picture 9. Stage 1 Trailing edge tip



Picture 10. Stage 1 Trailing base



Picture 11. Stage 2 Leading edge tip



Picture12. Stage 2 Leading edge base



Picture 13. Stage 2 Trailing edge tip




Picture 14. Stage 3 Leading edge tip



Picture 15. Stage 3 Trailing edge tip



Picture 16. Stage 3 Trailing edge base




Picture 17. Stage 4 Leading edge tip



Picture 18. Stage 4 Leading edge base



Picture 19. Stage 4 Trailing edge tip



Picture 20. Stage 4 Trailing edge base



Picture 21. Stage 5 Leading edge tip



Picture 22. Stage 5 Leading edge base



Picture 23. Stage 5 Trailing edge tip



Picture 24. Stage 5 Trailing edge base



Picture 25. Stage 6 Leading edge tip



Picture 26. Stage 6 Leading edge base



Picture 27. Stage 7 Trailing edge tip



Picture 28. Stage 8 Leading edge tip



Picture 29. Stage 8 Trailing edge tip



Picture 30. Stage 8 Trailing edge base



Picture 31. Stage 9 Leading edge



Picture 32. Stage 9 Trailing edge tip



Picture 33. Stage 9 Trailing base



Picture 34. Stage 9 Bleed manifold



Picture 35. Stage 10 Leading edge tip



Picture 36. Stage 10 Leading edge base



Picture 37. Stage 10 Trailing edge tip



Picture 38. Stage 10 Trailing edge base



Picture 39. Stage 11 Leading edge tip



Picture 40. Stage 11 Leading edge base



Picture 41. Stage 11 Trailing edge tip minor



Picture 42. Stage 11 Trailing edge base




Picture 43. Stage 12 Leading edge tip



Picture 44. Stage 12 Leading edge base




Picture 45. Stage 12 Trailing edge tip



Picture 46. Stage 12 Trailing edge base




Picture 47. Stage 13 Leading edge tip



Picture 48. Stage 13 Leading edge base



Picture 49. Stage 15 Trailing edge tip



Picture 50. Stage 15 Leading edge base



Picture 51. Stage 16 Leading edge tip



Picture 52. OGV'S

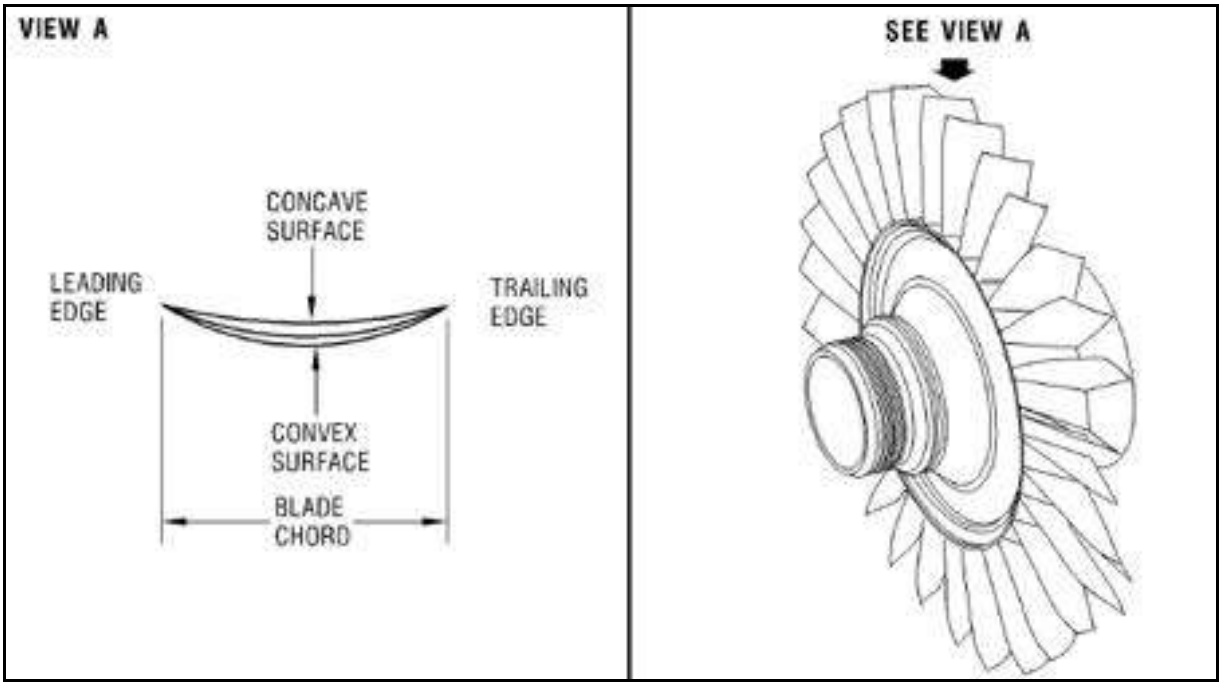



*Figure 5: HPC stage 0 BLISK*

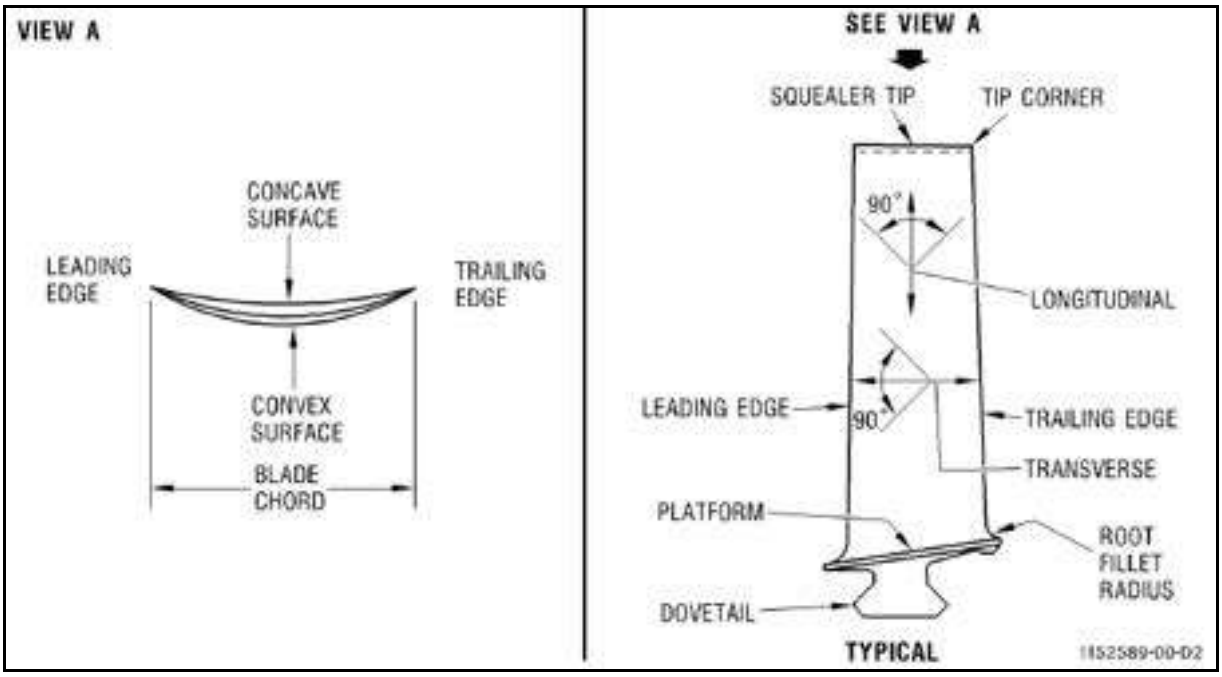



*Figure 6: Compressor Rotor Blades*

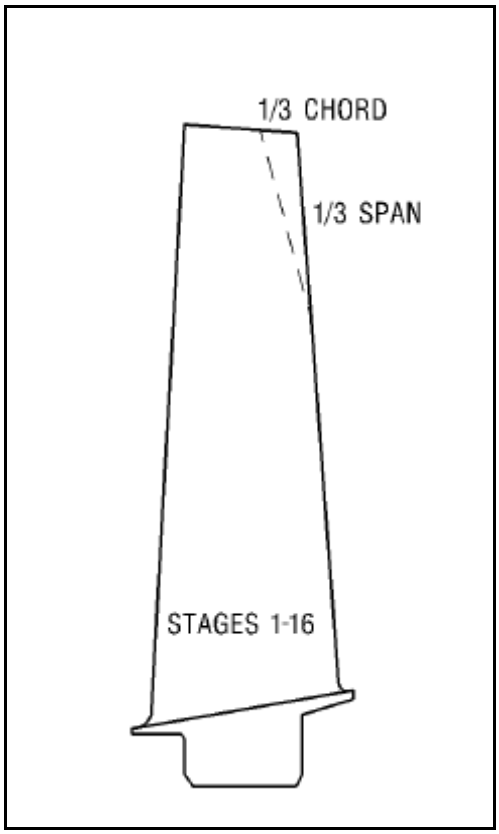



*Figure 7: Tip Trailing Edge Inspection*

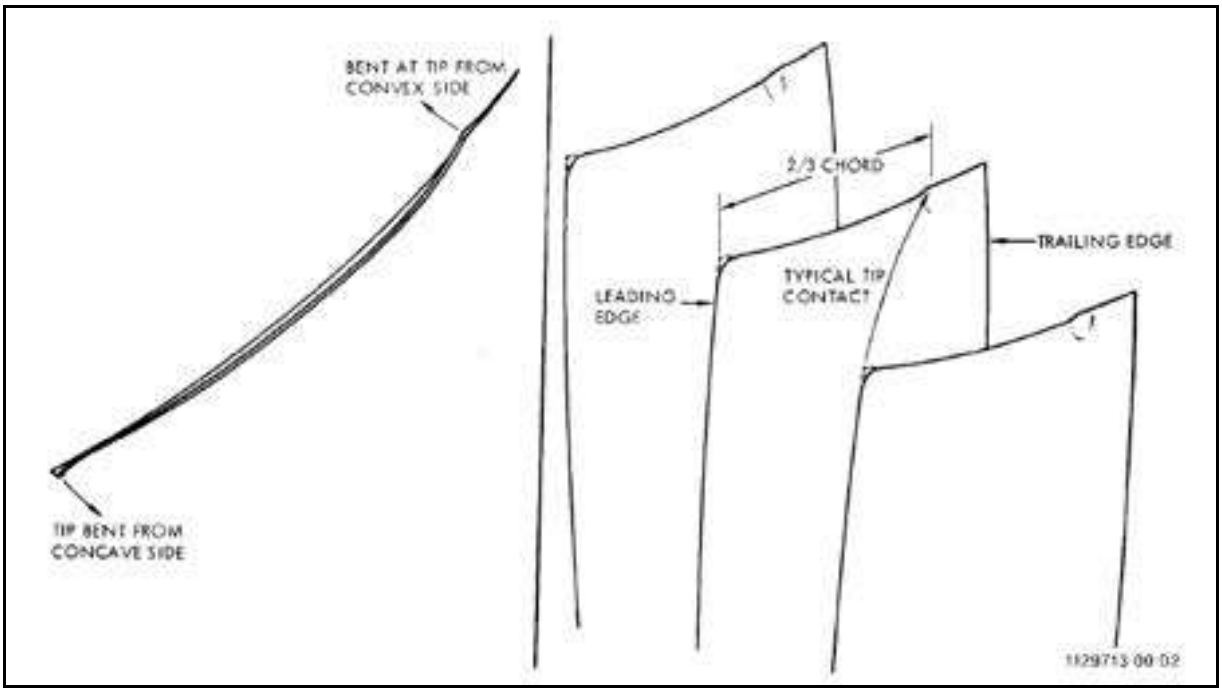


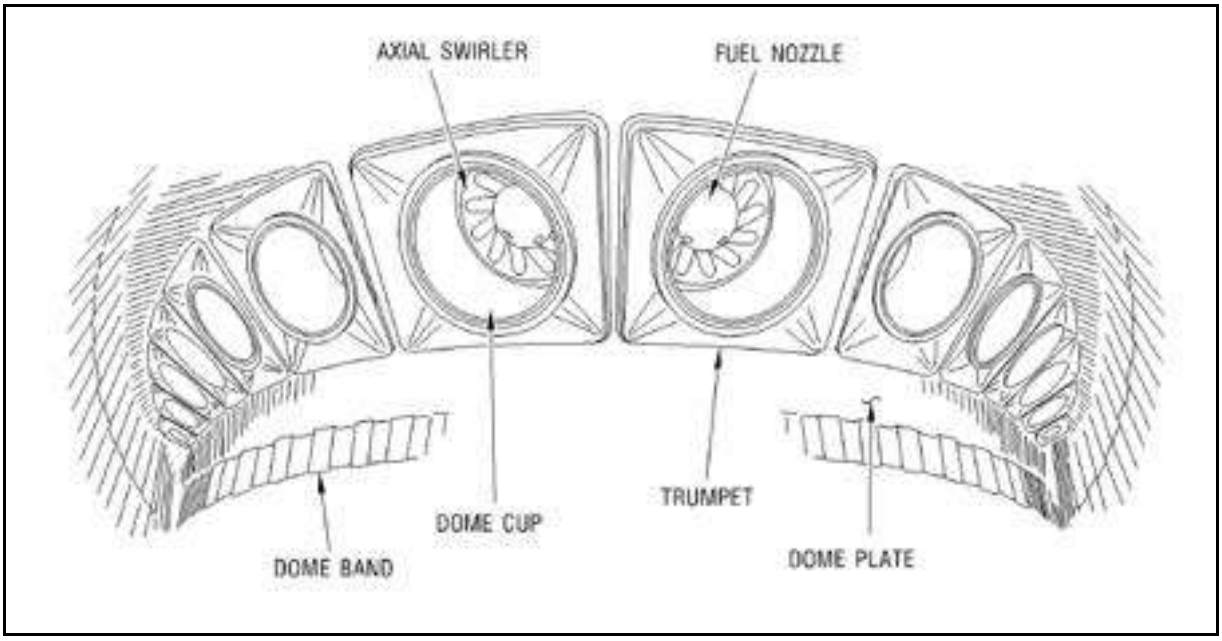

*Figure 8: Tip Clanging Contact (HPCR stage 3 through 6)*

## 4.2 Combustor and 1St Stage Nozzle Section

| Port | Condition observed | Photo no: |
|---|---|---|
| **17A** | | |
| **17B** | | |
| **17C** | | |
| **17D** | **See below notes.** | |
| **17E** | | |
| **17F** | | |
| **17G** | | |
| **17H** | | |
| **17** | 1st stage nozzle (leading edge): | |

**Notes:**

The Combustor section is serviceable according to GEK105054, WP40600 Table 7.



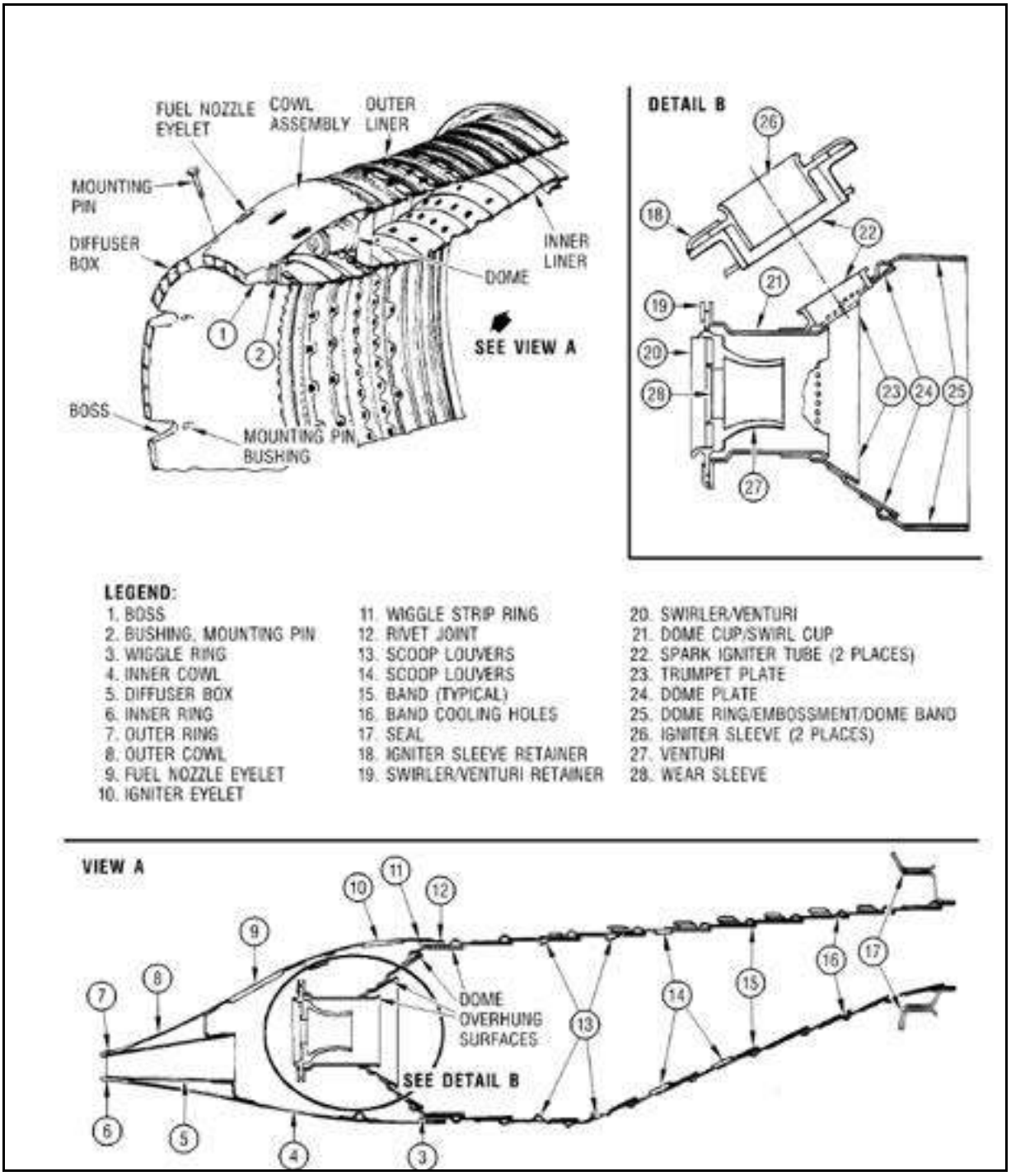



*Figure 9: SAC Combustor Inspection*

*Figure 10: SAC Combustor Inspection*

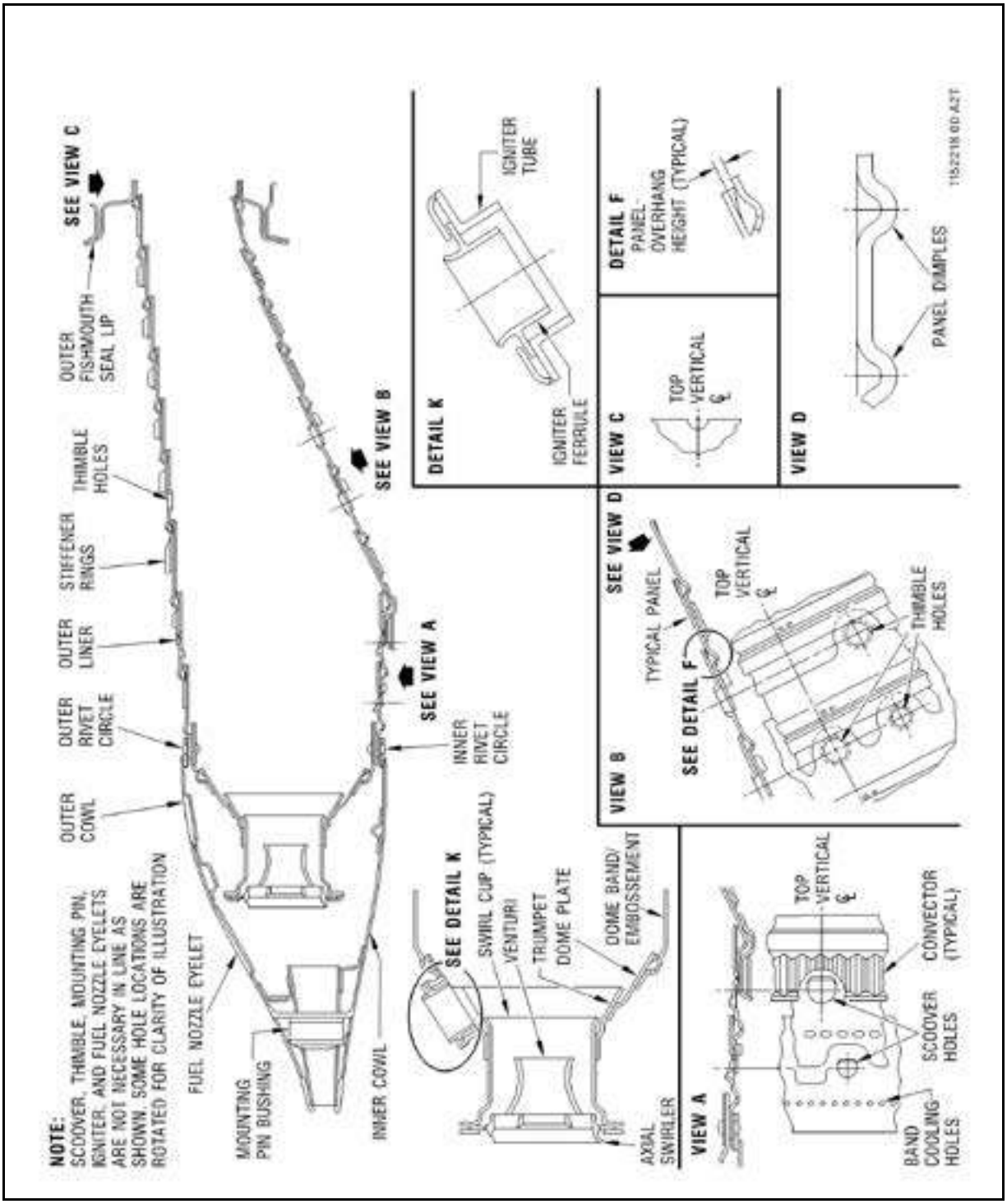



*Figure 11: SAC Combustor Inspection*

**Borescope Pictures**



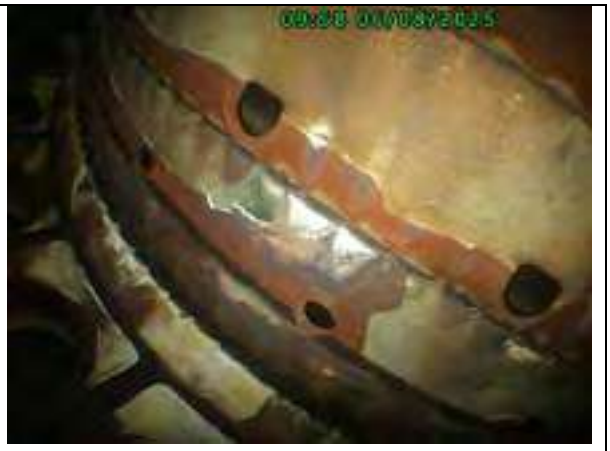
Picture 53. Upper igniter ferrule



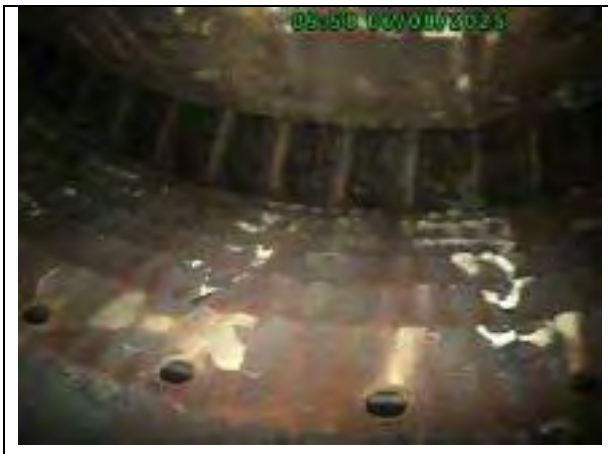
Picture 54. Lower igniter ferrule



Picture 55. Outer rivets band



Picture 56. Inner rivets band



Picture 57. Combustor liners



Picture 58. Combustor liners



Picture 59. Combustor dome splash plates



Picture 60. Fuel Nozzle tip



Picture 61. Combustor liners and HPT nozzle interference



Picture 62. . Combustor liners and HPT nozzle interference

## 4.3 Turbine Section

| | turbine stage | | | | |
|---|---|---|---|---|---|
| **Port** | **L.E.** | **T.E.** | **blades** | **Remarks:** | **photo no:** |
| **18** | **1** | | **88** | | |
| **19** | | **1** | **88** | **See below notes.** | |
| **19** | **2** | | **90** | | |
| **20** | | **2** | | | |

**Notes:**

The High Pressure Turbine section is NOT serviceable according to GEK105054, WP40600 Table 8. Due to stage 1 nozzles condition

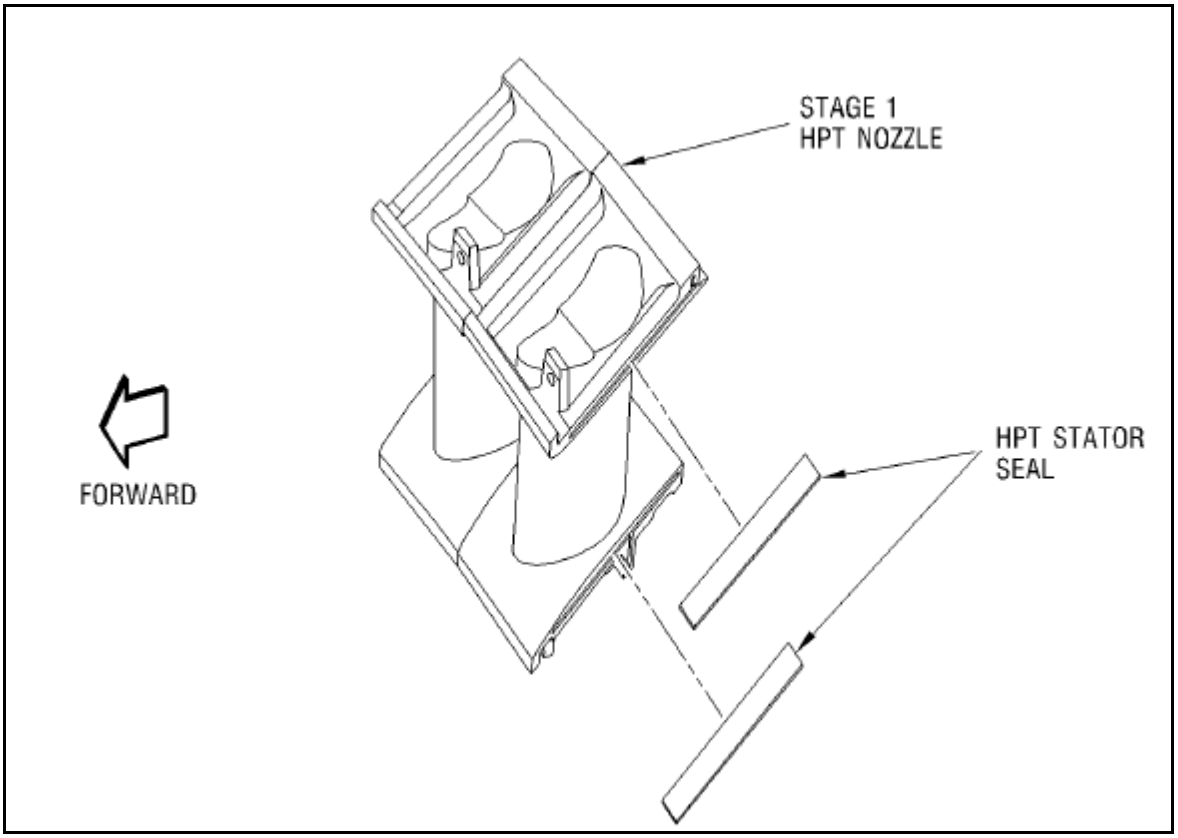



*Figure 12: Stage 1 HPT Nozzle Seal Displacement*

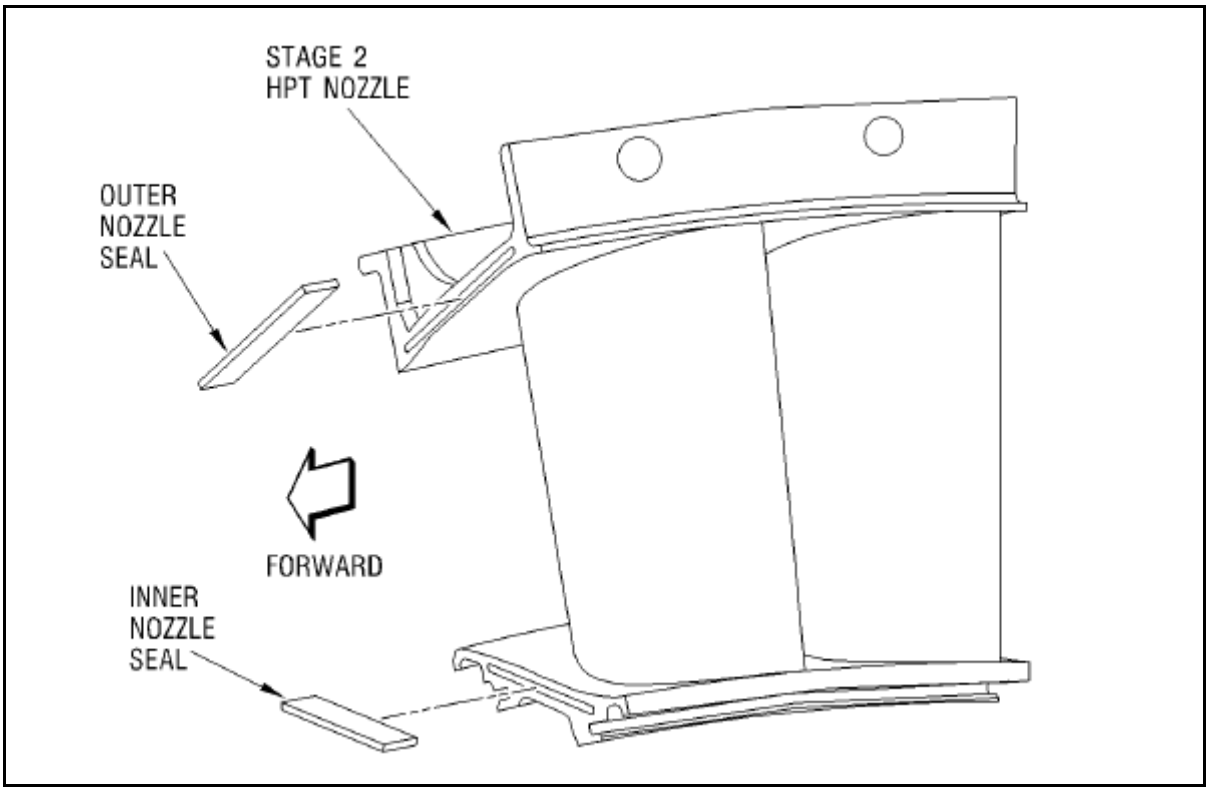



*Figure 13: Stage 2 HPT Nozzle Seal Displacement*

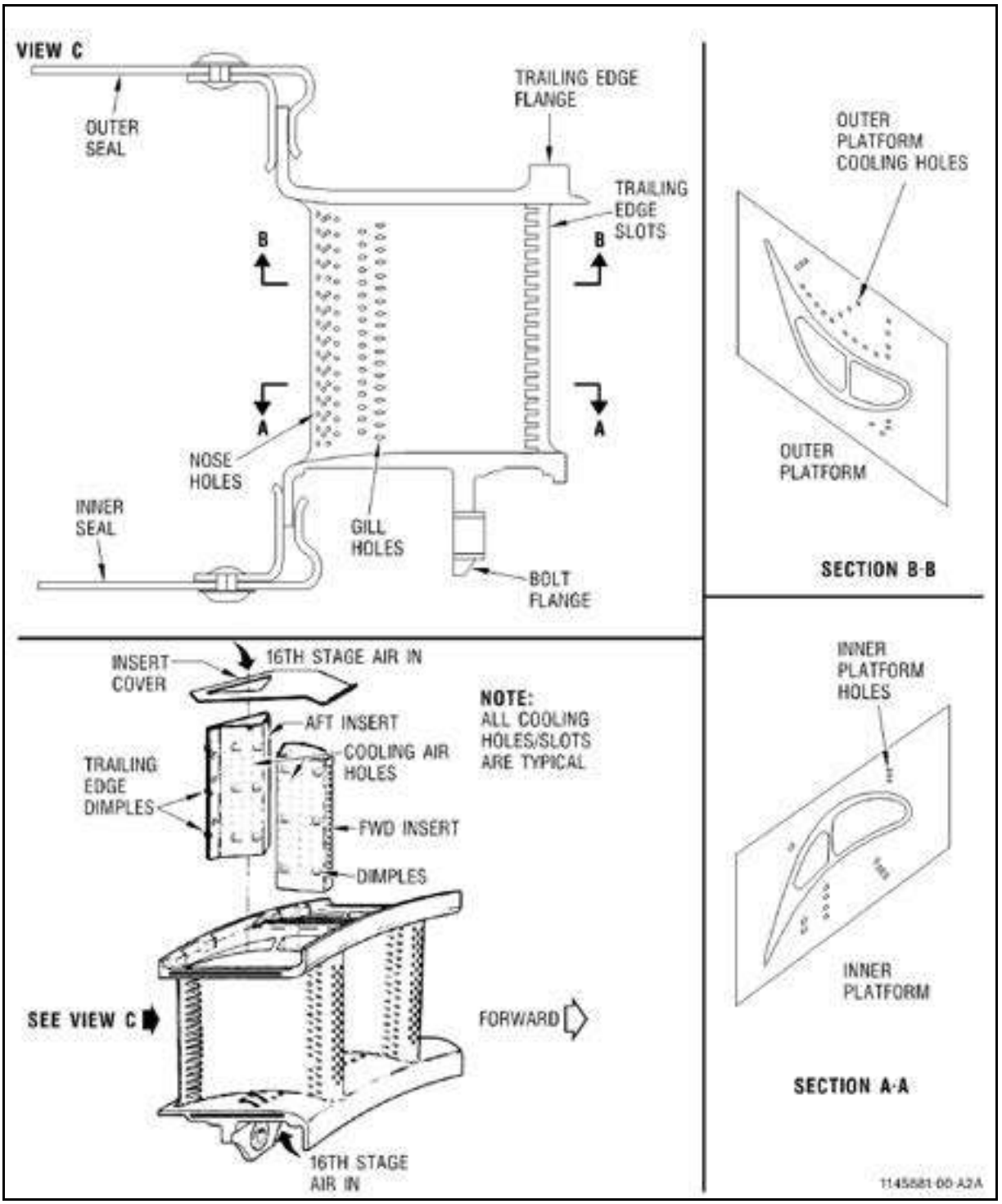



*Figure 14: HPT Stage 1 Nozzle*

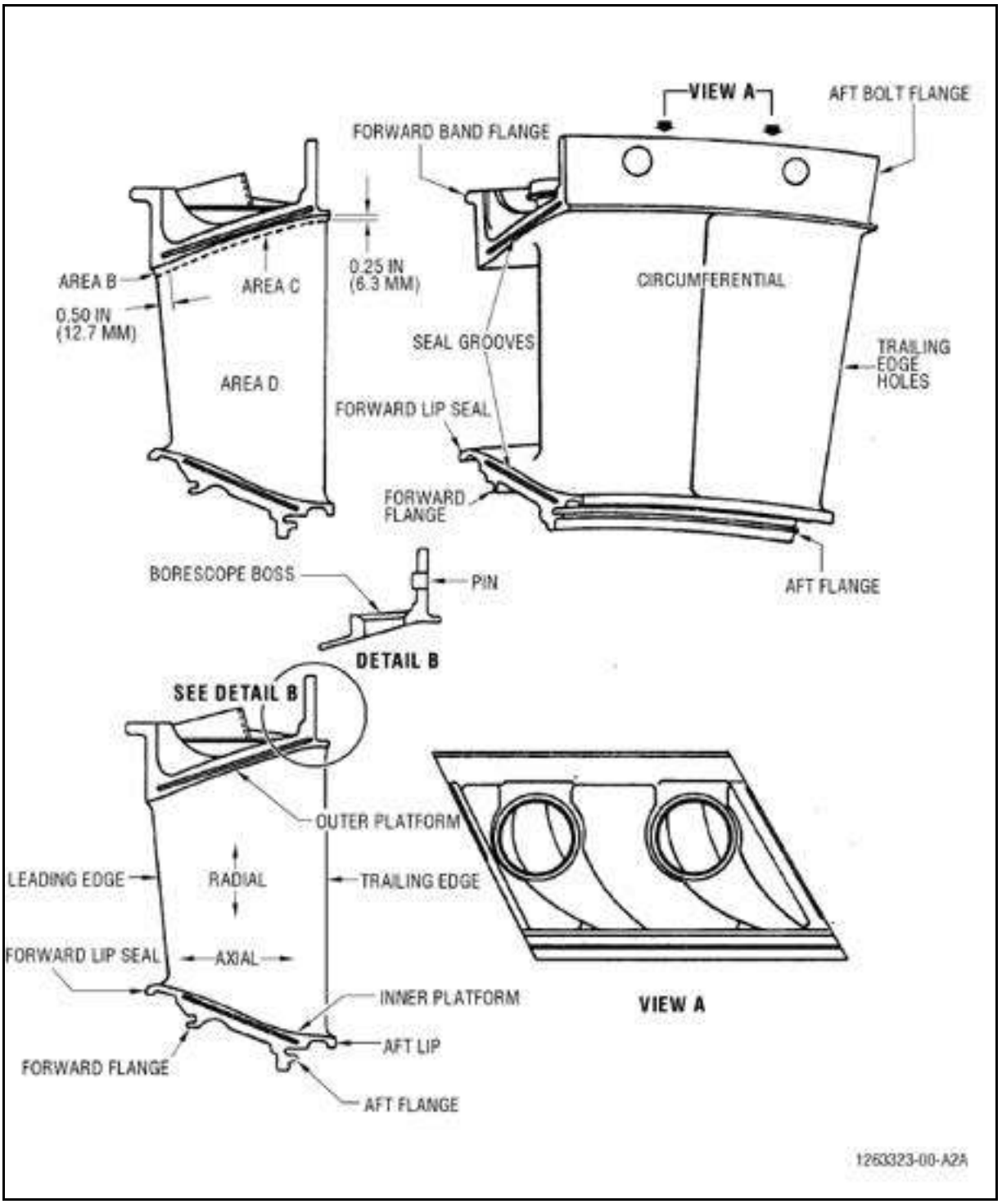



*Figure 15: HPT Stage 2 Nozzle*

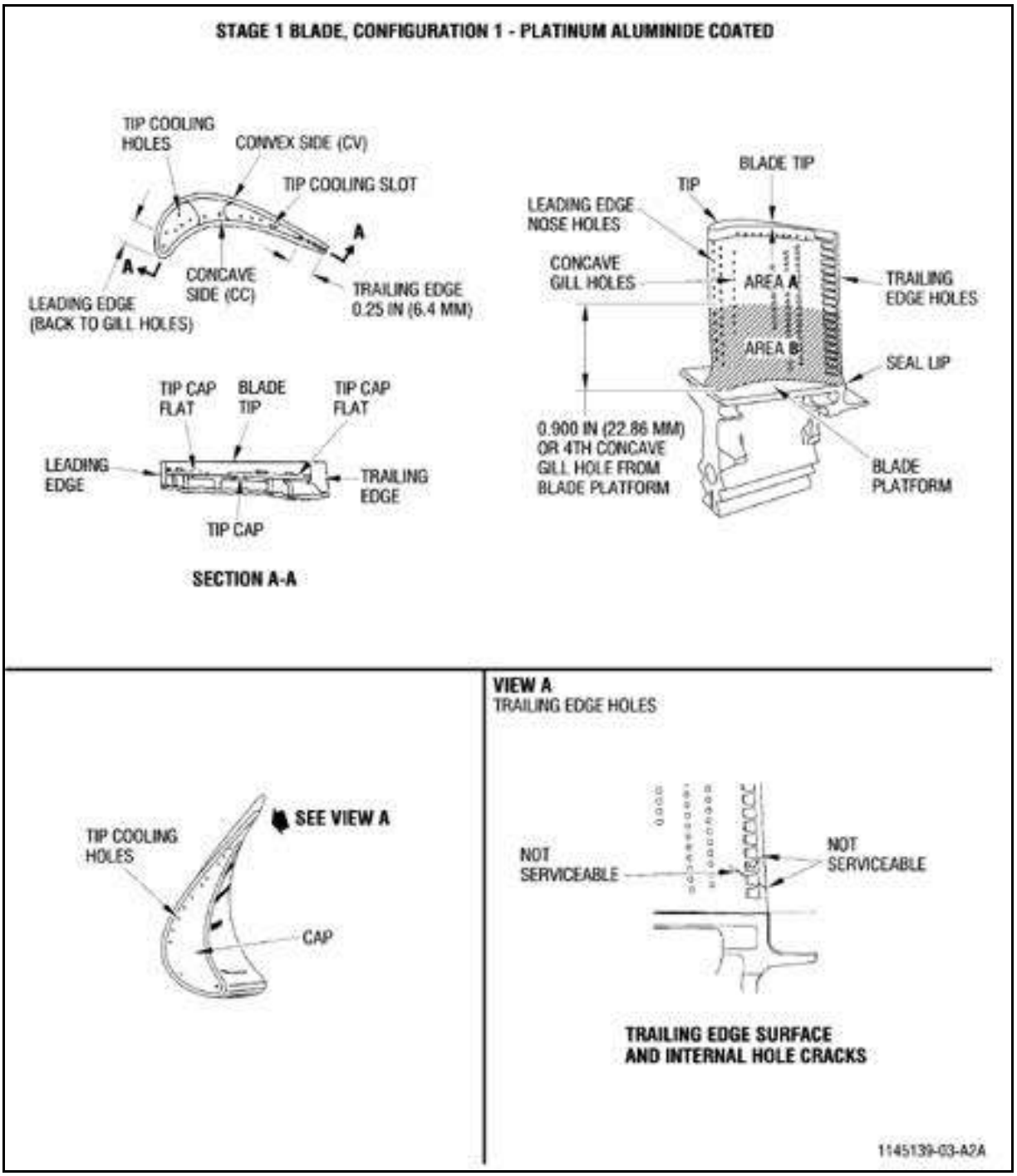



*Figure 16: HPT Stage 1 Rotor Blades Inspection Areas (Platinum Aluminide Coated Blades)*

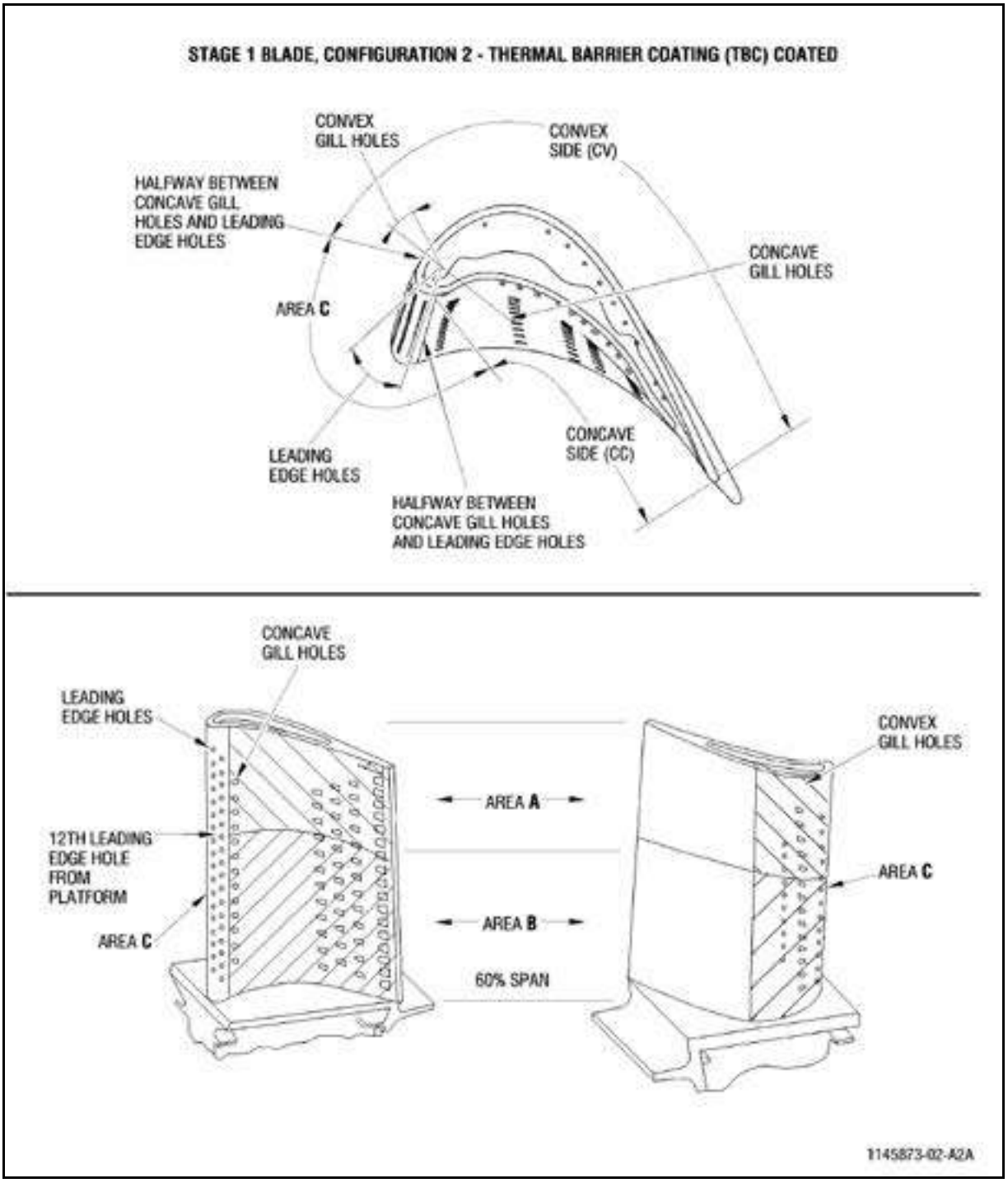



*Figure 17: HPT Stage 1 Rotor Blades Inspection Areas (TBC Coated Blades)*

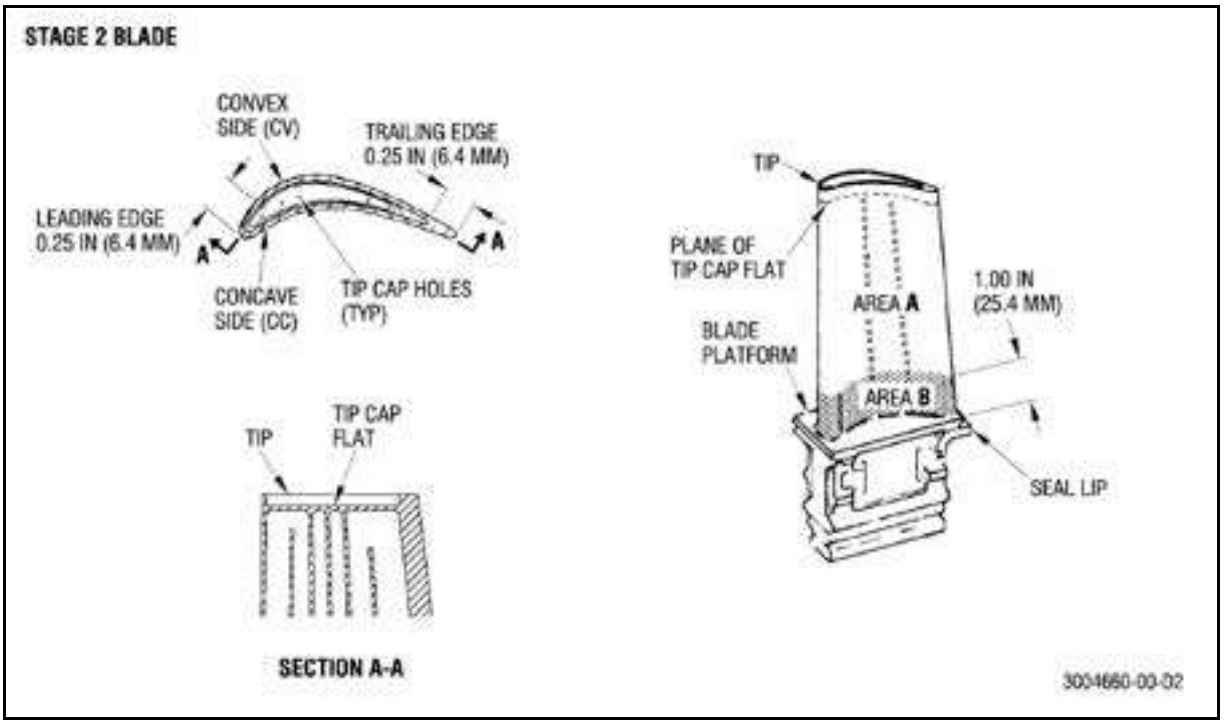



*Figure 18: HPT Stage 2 Rotor Blades Inspection Areas*

**Borescope Pictures**



Picture 63: Stage1 Nozzle leading edge



Picture 64: Stage1 Nozzles Leading edge



Picture 65: Stage1 Nozzle airfoil concave side



Picture 66: Stage1 Nozzle airfoil concave side



Picture 67: Stage1 Nozzles airfoil concave



Picture 68: Stage1 Nozzle airfoil concave



Picture 69: Stage1 Nozzle airfoil concave side



Picture 70: Stage1 Nozzle airfoil convex side



Picture 71: Stage1 Nozzle trailing edge concave



Picture 72: Stage1 Nozzle trailing edge concave



Picture 73: Stage1 Nozzle trailing edge



Picture 74: Stage1 Nozzle trailing edge and



Picture 75: Stage1 Blades leading edge tip



Picture 76: Stage1 Blades leading edge convex



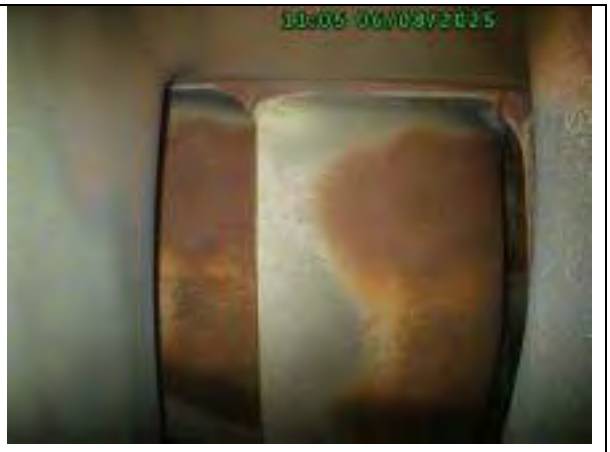
Picture 77: Stage 1 Blades leading edge base



Picture 78: Stage 1 Blades leading edge base



Picture 79: Stage 1 Blades trailing edge tip



Picture 80: Stage 1 Blades trailing edge root



Picture 81: Stage 2 Blades leading edge tip



Picture 82: Stage 2 Honeycomb seals



Picture 83: Stage 2 Blades leading edge root



Picture 84: Stage 2 Blades and stage 2 nozzles



Picture 85: Stage 2 Blades trailing edge



Picture 86: Stage 2 Blades trailing edge

## 4.4 LPT Section

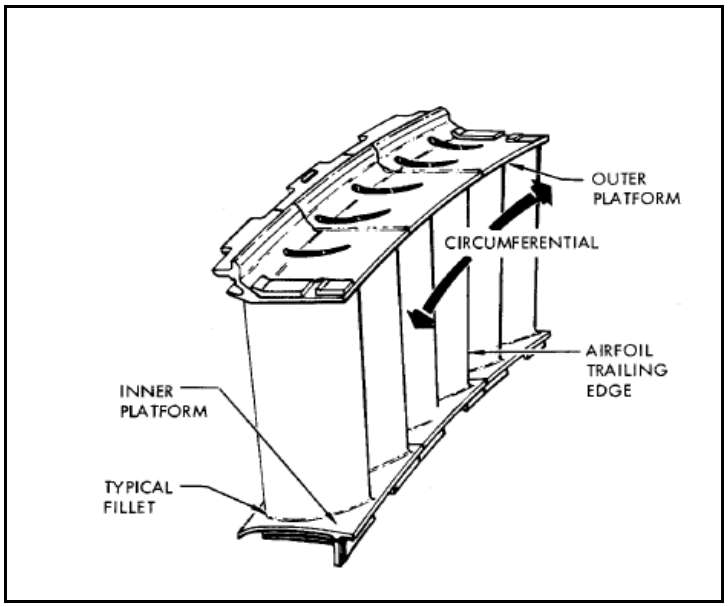



*Figure 19: Power Turbine Nozzles*

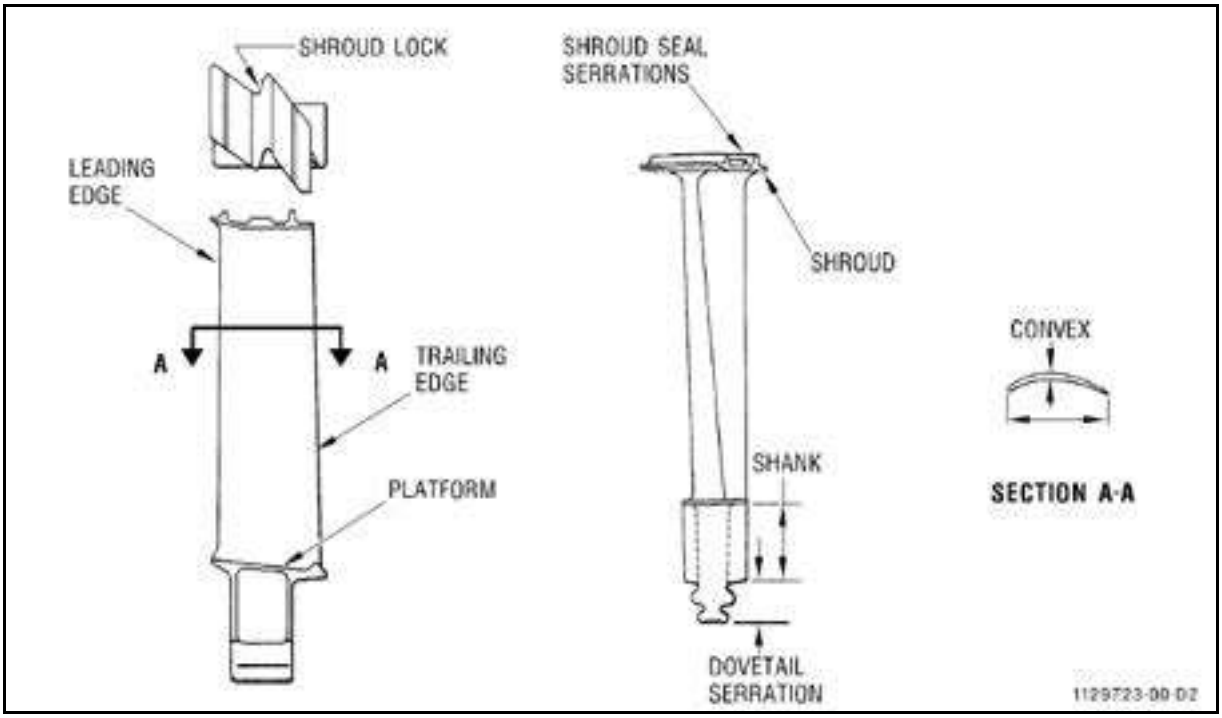



*Figure 20: Power Turbine Rotor Blades*

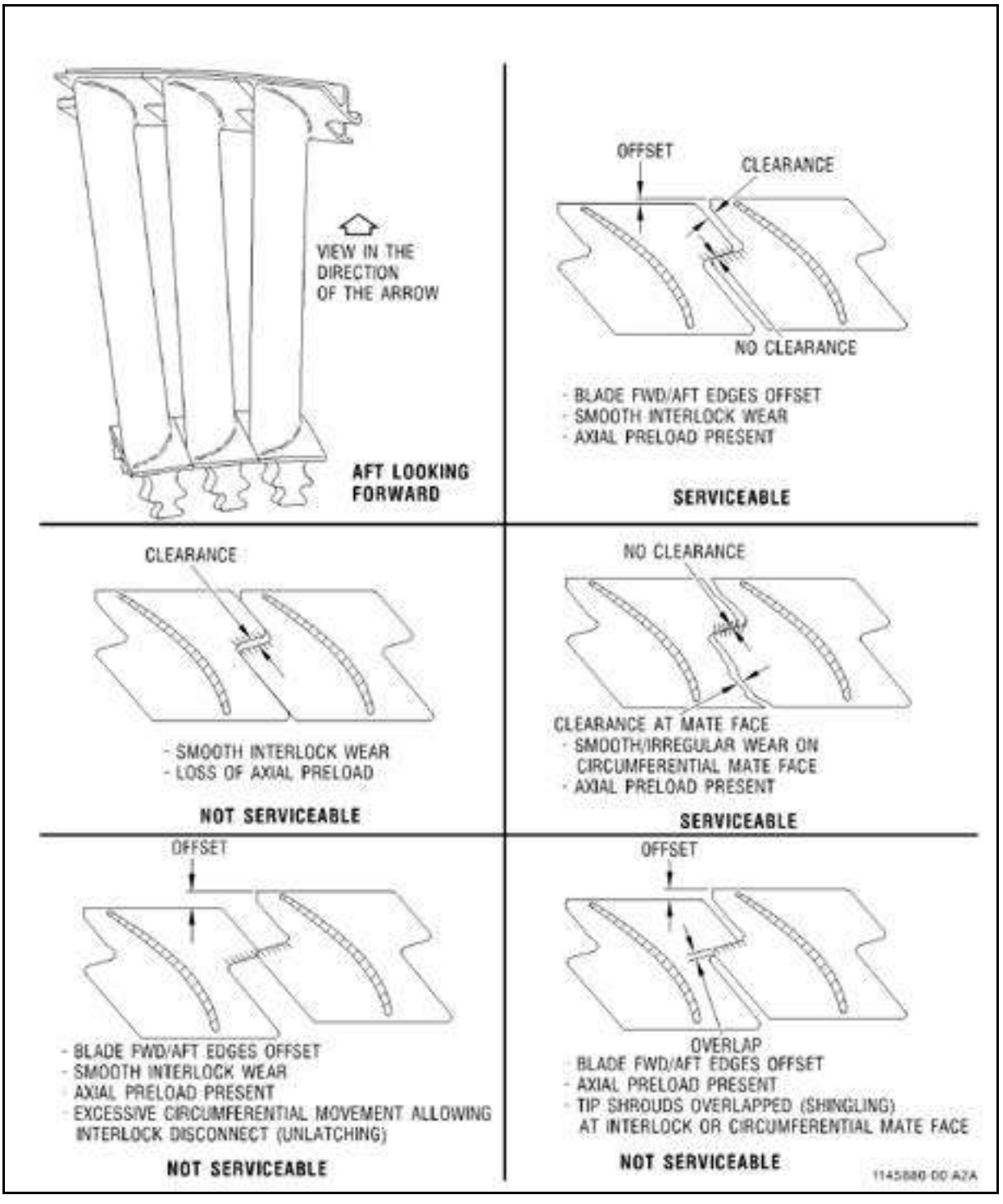



*Figure 21: LPT Rotor Blade Circumferential Inspection*

**Notes:**

The LPT stage 1 accessible nozzles and blades did not show any damage.

**Borescope Pictures**



Picture 87: STG1 LPT nozzles



Picture 88: TMF and LPT Inlet



Picture 89: Stage 1 Blades



Picture 90: LPT Stage 1 Blades tip interlock

# BORESCOPE INSPECTION REPORT
# TM2500 GEN. 6-7
## *7LM2500 – PK – MDWG05*

## NEW FORTRESS ENERGY

## SJTPP, PR

## PACKAGE # 7253293

## UNIT #4

| | | | |
|---|---|---|---|
| **Visit Date:** | 08/07/2025 | **Total Starts:** | |
| **Engine S/N:** | 557-266 | **GG Hours:** | |
| **Power Turbine S/N:** | 557-266 | **PT Hours:** | |
| **SOM GT Field Engineer:** | Daniel Arroyo | **New Fortress Representative:** | Jonathan Rodriguez |



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1 Conclusions and Recommendations 3

2 Outage Data 4

3 Borescope Inspection Checklist 4

4 Borescope Inspection Record 6

4.1 Compressor Section

4.2 Combustor and 1St Stage Nozzle Section

4.3 Turbine Section

4.4 LPT Section

## 1. Conclusions and Recommendations

**Purpose of visit:**

The purpose of this visit was to perform a borescope inspection of the Engine in accordance with GEK105054, WP 406 00.

1.1 The HPC is serviceable according to GEK105054, WP 406 00 Table 4. No damages were found.
1.2 The Combustor section is serviceable according to GEK105054, WP40600 Table 7.
1.3 The High Pressure Turbine section is serviceable according to GEK105054, WP406 00 Table 8.
1.4 The LPT is serviceable according to GEK105054, WP40600.

## 2. Outage Data

### Engine Data

| | | | | | |
|---|---|---|---|---|---|
| **ESN:** | 557-266 | **Engine Fired Hours:** | | **Package Hours:** | |
| **Model:** | 7LM2500-PK-MDWG05 | **Engine Fired starts:** | | **Package Fired Starts:** | |

**MAINTENANCE DATA**

| WP, SB, SL, PB, PL Performed | GEK105054, REV 11 | Date completed | Comments |
|---|---|---|---|
| WP 406 00 | Borescope Inspection | 07AUG25 | Serviceable |

**Parts Data**

| Description | PN Removed | SN Removed | Qty | Disposition | PN Installed | SN Installed |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

## 3. Borescope Inspection Checklist

**Date unit out of operation:** 08/07/2025
**Date unit into operation:**
**Last inspection date:**

**Type of Fuel:** Natural Gas / Diesel
**Type of NOx suppression:** Water Injection
**Type of outage:** Scheduled BSI

**Inspection of gas turbine:**

| WATERWASH: | HIGH PRESSURE COMPRESSOR: |
|---|---|
| ☒ PERFORMED WATER WASH | ☒ HPC BORESCOPE INSPECTION |
| **COMBUSTOR:** | **HIGH PRESSURE TURBINE** |
| ☒ COMBUSTOR BORESCOPE INSPECTION | ☒ HPT STAGE 1 & 2 NOZZLE BORESCOPE INSPECTION |
| | ☒ HPT BLADE BORESCOPE INSPECTION |
| **LOW PRESSURE TURBINE:** | |
| ☒ LPT BORESCOPE INSPECTION | |

☒ ***Please verify all borescope plugs have been reinstalled***

## 4. Borescope Inspection Record

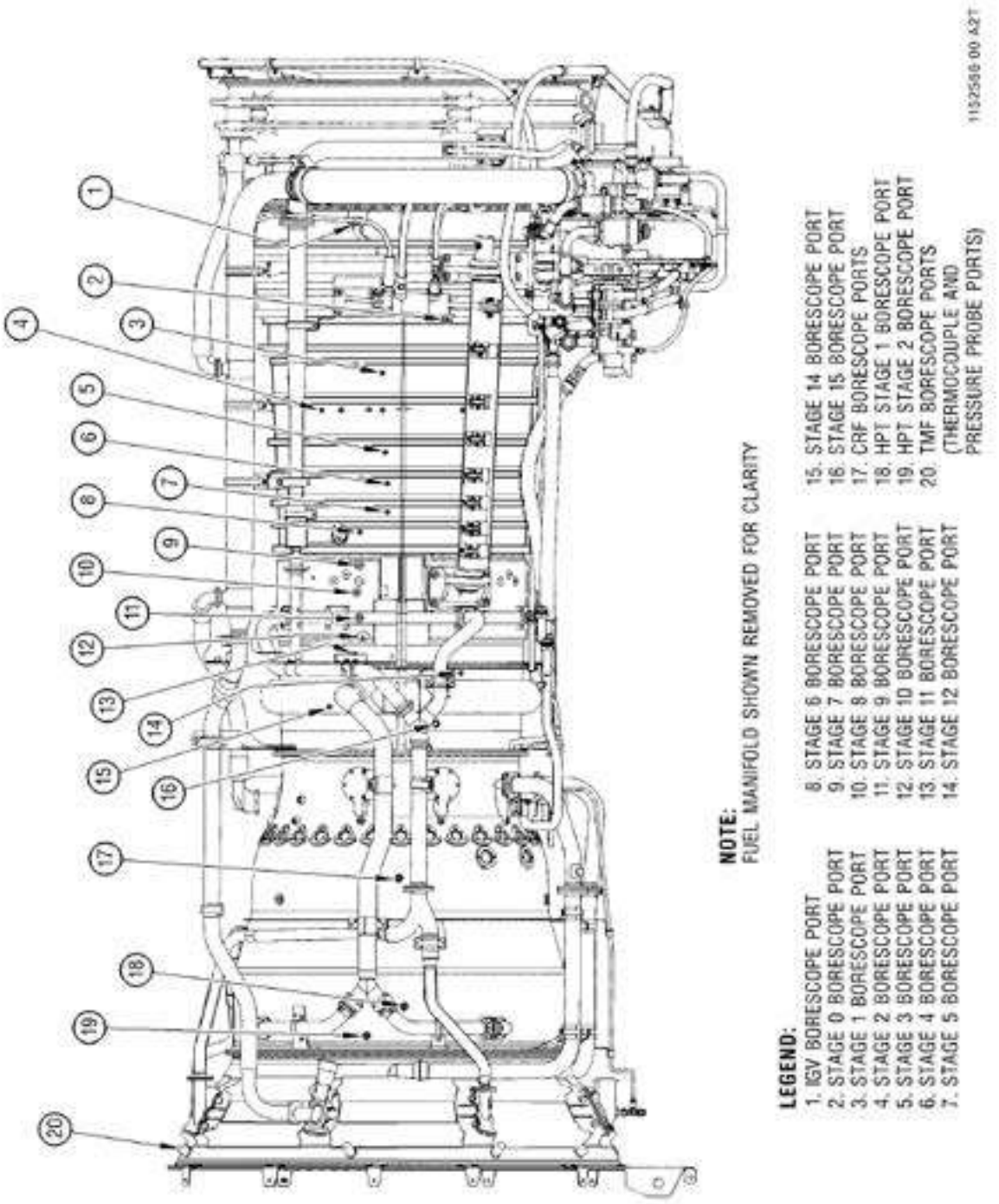



*Figure 1: Position of Borescope Inspection Ports.*

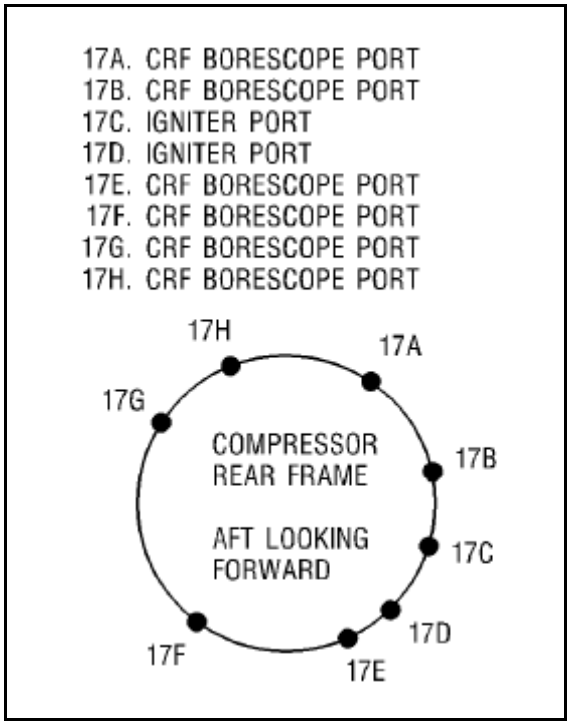



*Figure 2: Position of Borescope Inspection Ports.*

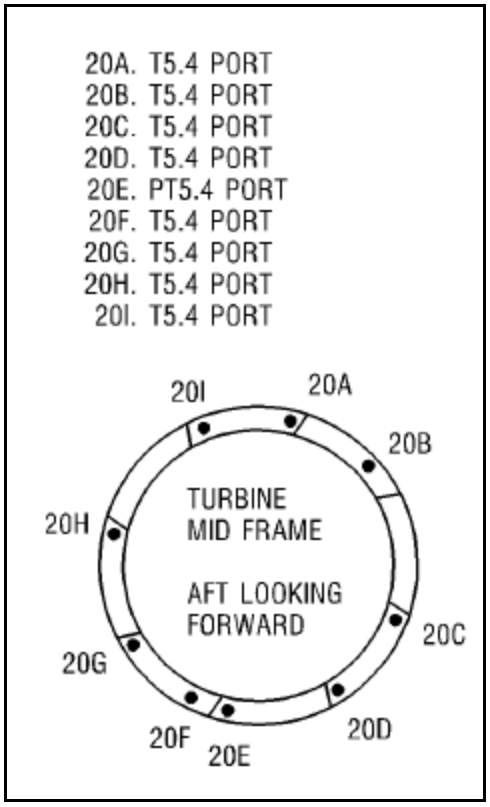



*Figure 3: Position of Borescope Inspection Ports.*

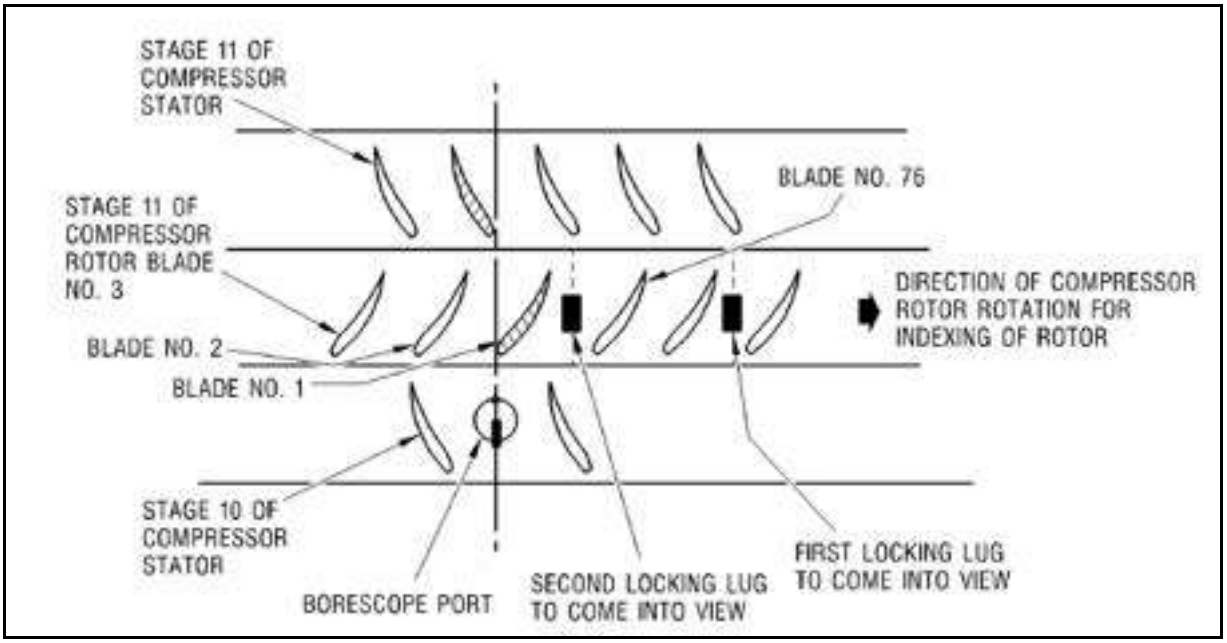



*Figure 4: Zero indexing of HPC rotor and HPT rotor*

## 4.1 Compressor Section

| Port | T.E. | L.E. | blades | Remarks: | photo no: |
|---|---|---|---|---|---|
| 1 | IGV | | | | 1 |
| 1 | | 0 | 36 | | 2,3 |
| 2 | 0 | | 36 | | 4 |
| 2 | | 1 | 26 | | 6,7 |
| 3 | 1 | | 26 | | 9,10 |
| 3 | | 2 | 26 | | 11,12 |
| 4 | 2 | | 26 | | 13 |
| 4 | | 3 | 42 | | 14 |
| 5 | 3 | | 42 | | 15,16 |
| 5 | | 4 | 45 | | 17,18 |
| 6 | 4 | | 45 | | 19, 20 |
| 6 | | 5 | 48 | | 21, 22 |
| 7 | 5 | | 48 | | 23, 24 |
| 7 | | 6 | 54 | | 25, 26 |
| 8 | 6 | | 54 | Blades contacting tip | |
| 8 | | 7 | 56 | Blades contacting tip | |
| 9 | 7 | | 56 | | 27 |
| 9 | | 8 | 64 | | 28 |
| 10 | 8 | | 64 | | 29,30 |
| 10 | | 9 | 66 | | 31 |
| 11 | 9 | | 66 | | 32, 33 |
| 11 | | 10 | 66 | | 35, 36 |
| 12 | 10 | | 66 | | 37, 38 |
| 12 | | 11 | 76 | | 39, 40 |
| 13 | 11 | | 76 | | 41, 42 |
| 13 | | 12 | 76 | | 43, 44 |
| 14 | 12 | | 76 | | 45, 46 |
| 14 | | 13 | 76 | | 47, 48 |
| 15 | 14 | | 76 | Inside bleed manifold | |
| 15 | | 15 | 76 | Inside bleed manifold | |
| 16 | 15 | | 76 | | 49, 50 |
| 16 | | 16 | 76 | | 51, 52 |

**Notes:**

The HPC section is Serviceable.



Picture 1. CFF & IGV



Picture 2. Stage 0 Leading edge tip



Picture 3. Stage 0 Leading edge base



Picture 4. Stage 0 Trailing edge tip



Picture 5. Stage 0 Weep hole



Picture 6. Stage 1 Leading edge tip



Picture 7. Stage 1 Leading edge base



Picture 8. Stage 1 weep hole



Picture 9. Stage 1 Trailing edge tip



Picture 10. Stage 1 Trailing base



Picture 11. Stage 2 Leading edge tip



Picture12. Stage 2 Leading edge base



Picture 13. Stage 2 Trailing edge tip



Picture 14. Stage 3 Leading edge tip



Picture 15. Stage 3 Trailing edge tip



Picture 16. Stage 3 Trailing edge base



Picture 17. Stage 4 Leading edge tip



Picture 18. Stage 4 Leading edge base



Picture 19. Stage 4 Trailing edge tip



Picture 20. Stage 4 Trailing edge base



Picture 21. Stage 5 Leading edge tip



Picture 22. Stage 5 Leading edge base



Picture 23. Stage 5 Trailing edge tip



Picture 24. Stage 5 Trailing edge base



Picture 25. Stage 6 Leading edge tip



Picture 26. Stage 6 Leading edge base



Picture 27. Stage 7 Trailing edge tip



Picture 28. Stage 8 Leading edge tip



Picture 29. Stage 8 Trailing edge tip



Picture 30. Stage 8 Trailing edge base



Picture 31. Stage 9 Leading edge



Picture 32. Stage 9 Trailing edge tip



Picture 33. Stage 9 Trailing base



Picture 34. Stage 9 Bleed manifold



Picture 35. Stage 10 Leading edge tip



Picture 36. Stage 10 Leading edge base



Picture 37. Stage 10 Trailing edge tip



Picture 38. Stage 10 Trailing edge base



Picture 39. Stage 11 Leading edge tip



Picture 40. Stage 11 Leading edge base



Picture 41. Stage 11 Trailing edge tip



Picture 42. Stage 11 Trailing edge base




Picture 43. Stage 12 Leading edge tip




Picture 44. Stage 12 Leading edge base




Picture 45. Stage 12 Trailing edge tip




Picture 46. Stage 12 Trailing edge base




Picture 47. Stage 13 Leading edge tip




Picture 48. Stage 13 Leading edge base

| | | |
|---|---|---|
|  | |  |
| Picture 49. Stage 15 Trailing edge tip | | Picture 50. Stage 15 Leading edge base |

| | | |
|---|---|---|
|  | |  |
| Picture 51. Stage 16 Leading edge tip | | Picture 52. OGV'S |

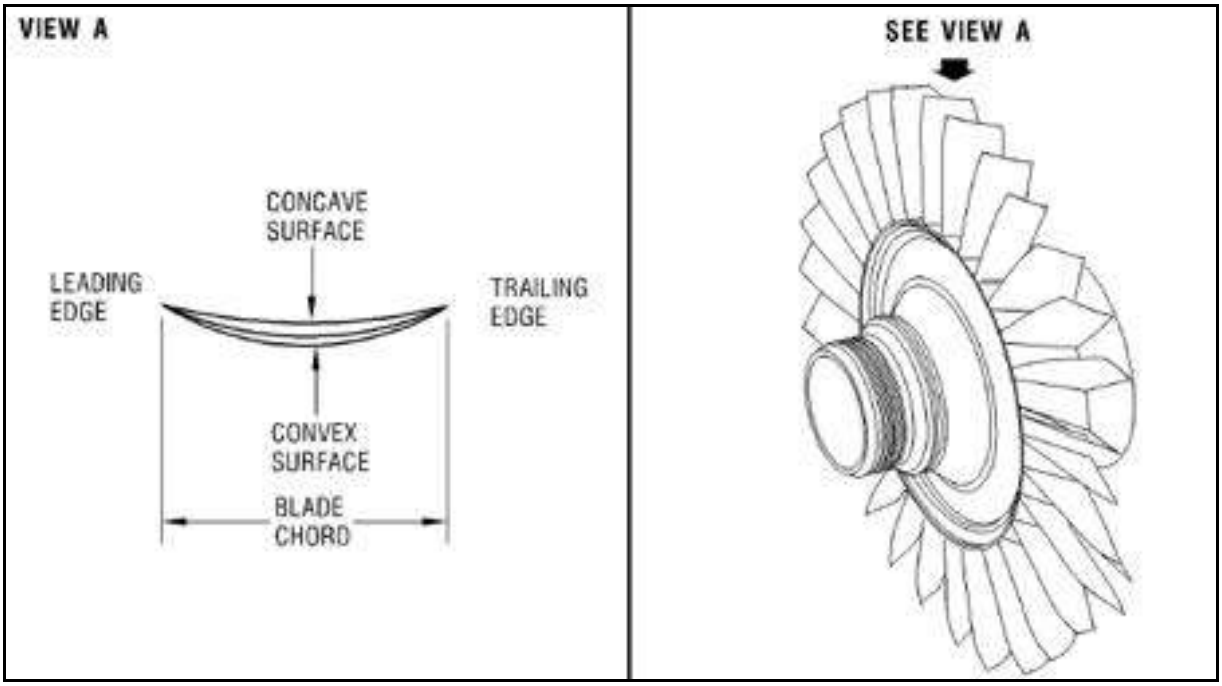



*Figure 5: HPC stage 0 BLISK*

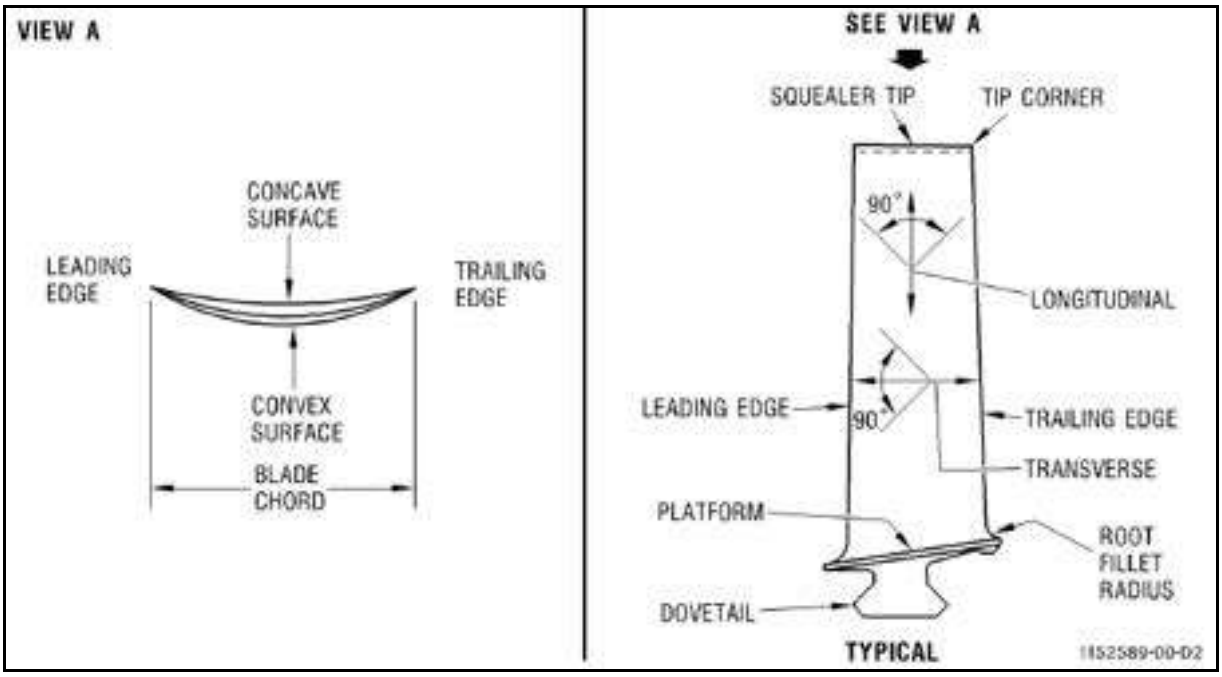



*Figure 6: Compressor Rotor Blades*

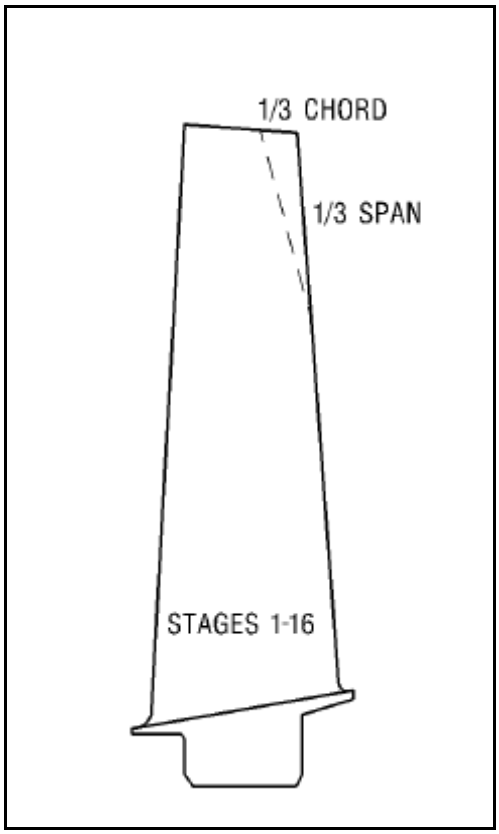



*Figure 7: Tip Trailing Edge Inspection*

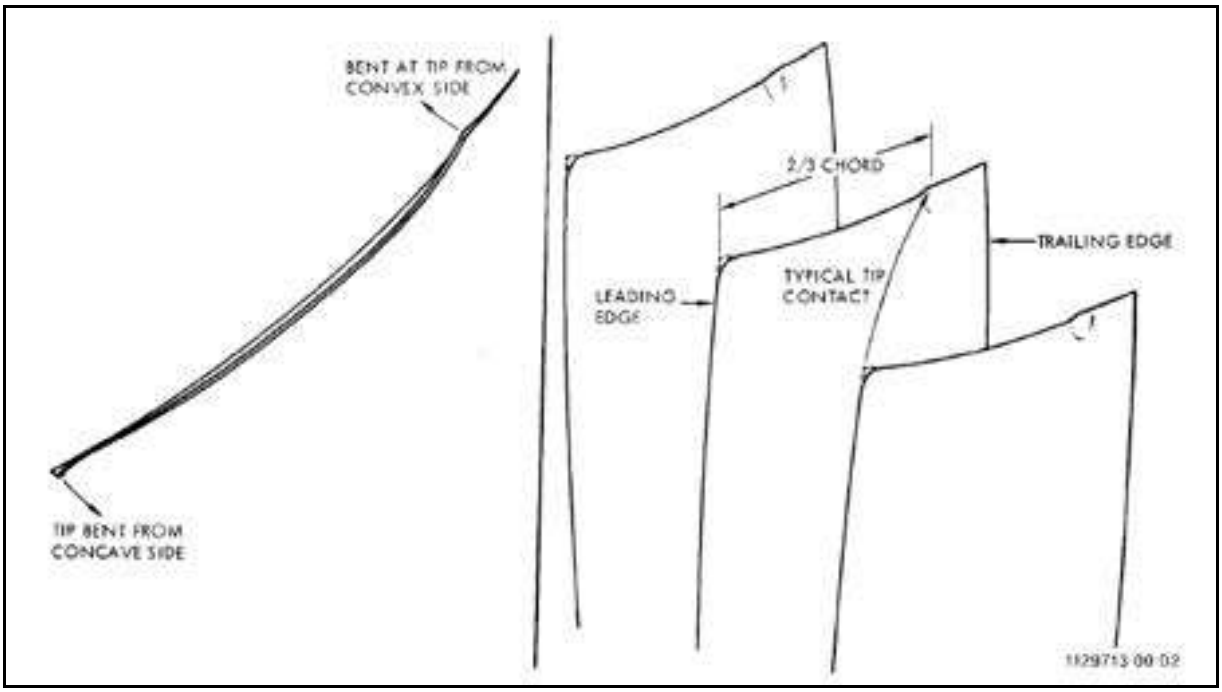


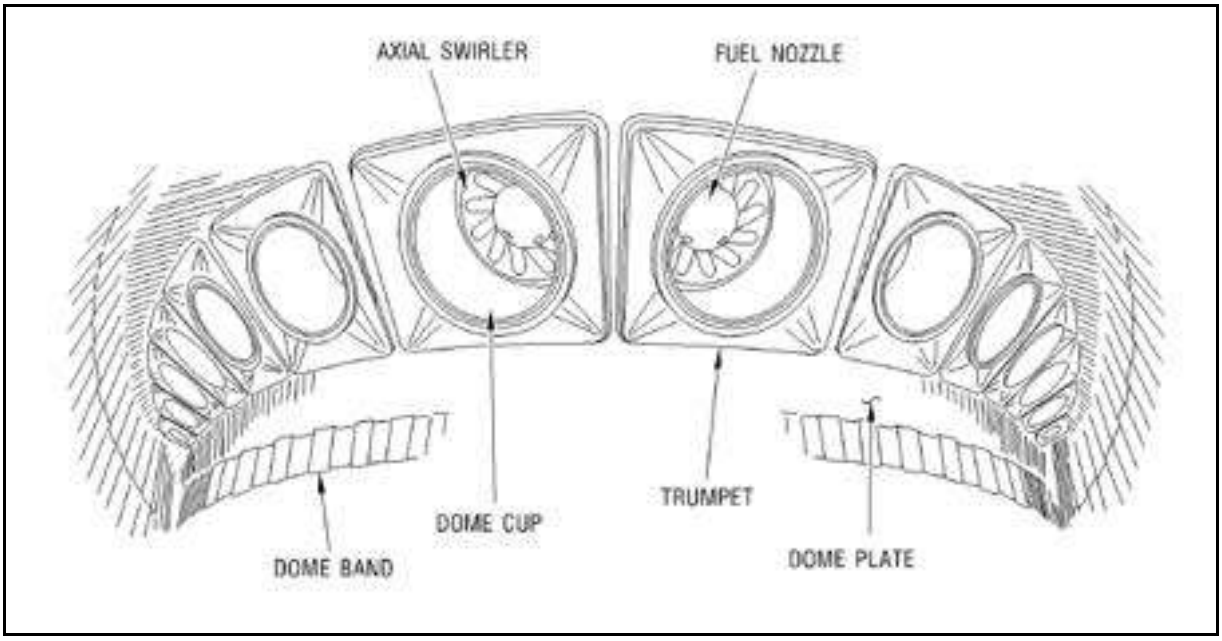

*Figure 8: Tip Clanging Contact (HPCR stage 3 through 6)*

## 4.2 Combustor and 1St Stage Nozzle Section

| Port | Condition observed | Photo no: |
|---|---|---|
| **17A** | | |
| **17B** | | |
| **17C** | | |
| **17D** | **See below notes.** | |
| **17E** | | |
| **17F** | | |
| **17G** | | |
| **17H** | | |
| **17** | 1st stage nozzle (leading edge): | |

**Notes:**

The Combustor section is serviceable according to GEK105054 Volume II WP40600 Table 7.



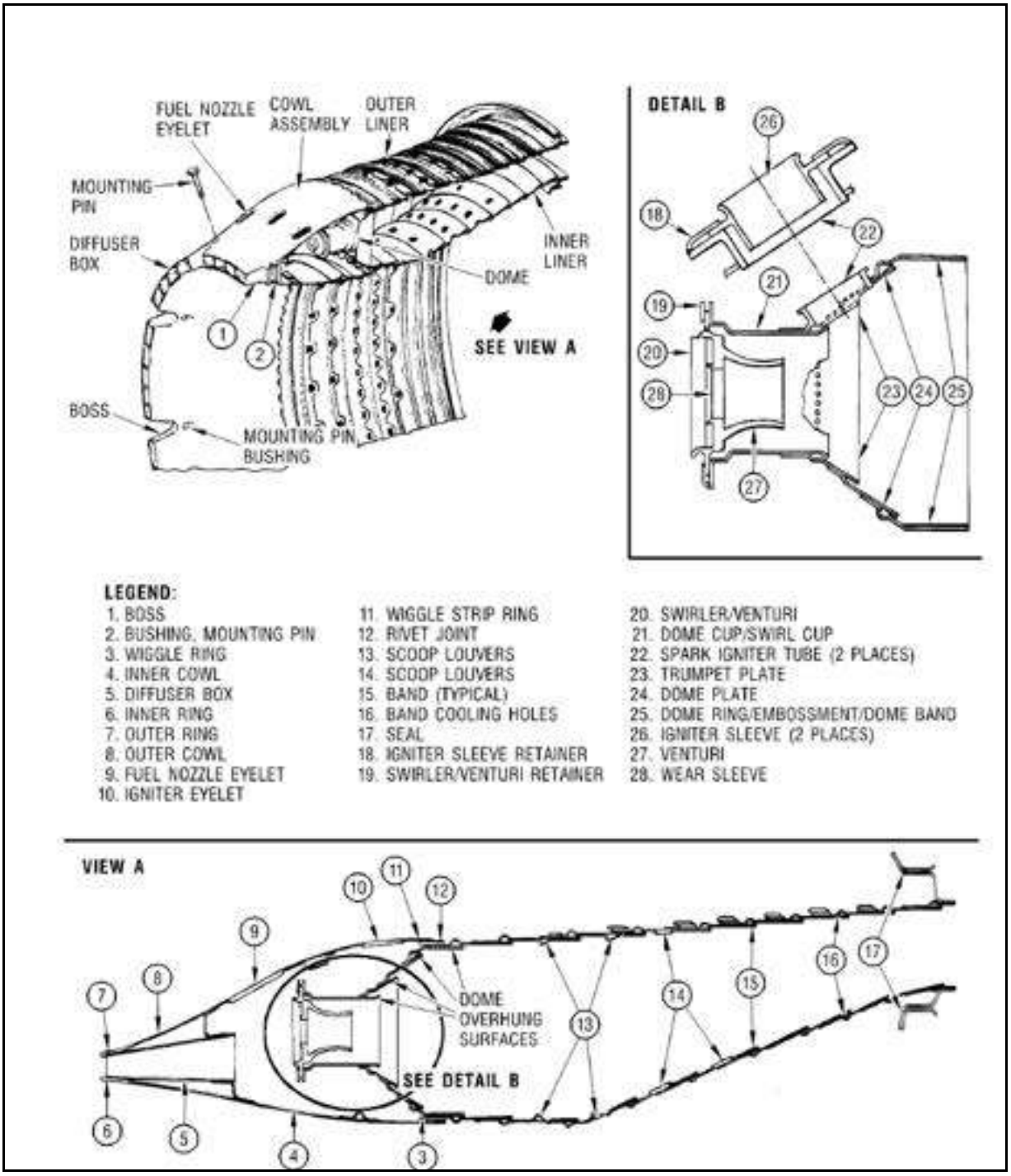



*Figure 9: SAC Combustor Inspection*

*Figure 10: SAC Combustor Inspection*

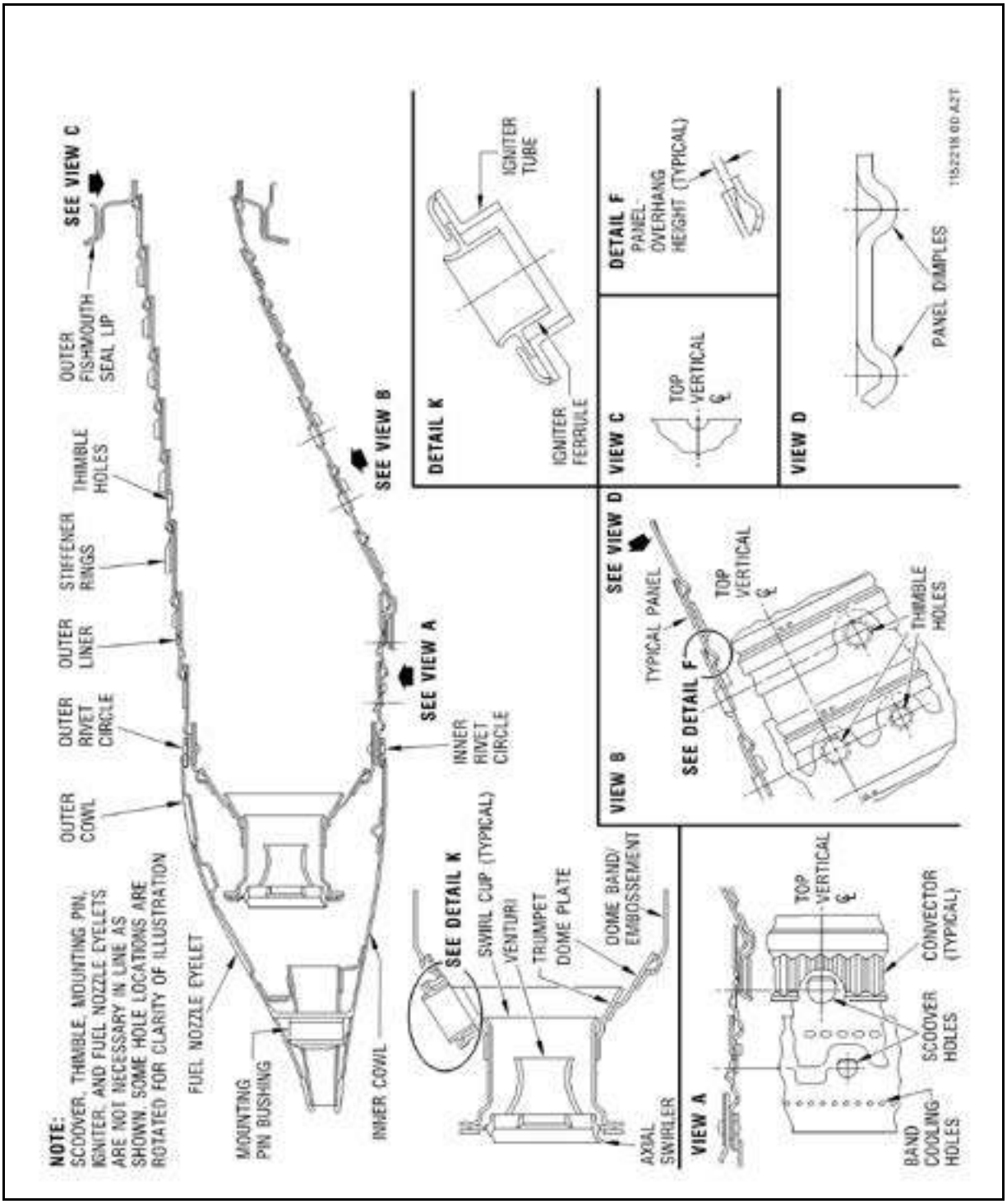



*Figure 11: SAC Combustor Inspection*

**Borescope Pictures**



Picture 53. Upper igniter ferrule



Picture 54. Lower igniter ferrule



Picture 55. Outer rivets band



Picture 56. Inner rivets band



Picture 57. Combustor liners



Picture 58. Combustor liners



Picture 59. Combustor dome splash plates



Picture 60. Fuel Nozzle tip



Picture 61. Combustor liners and HPT nozzle interference



Picture 62. . Combustor liners and HPT nozzle interference

## 4.3 Turbine Section

| | turbine stage | | | | |
|---|---|---|---|---|---|
| **Port** | **L.E.** | **T.E.** | **blades** | **Remarks:** | **photo no:** |
| **18** | **1** | | **88** | | |
| **19** | | **1** | **88** | **See below notes.** | |
| **19** | **2** | | **90** | | |
| **20** | | **2** | | | |

**Notes:**

The High Pressure Turbine section is serviceable according to GEK105054 WP40600 Table 8.

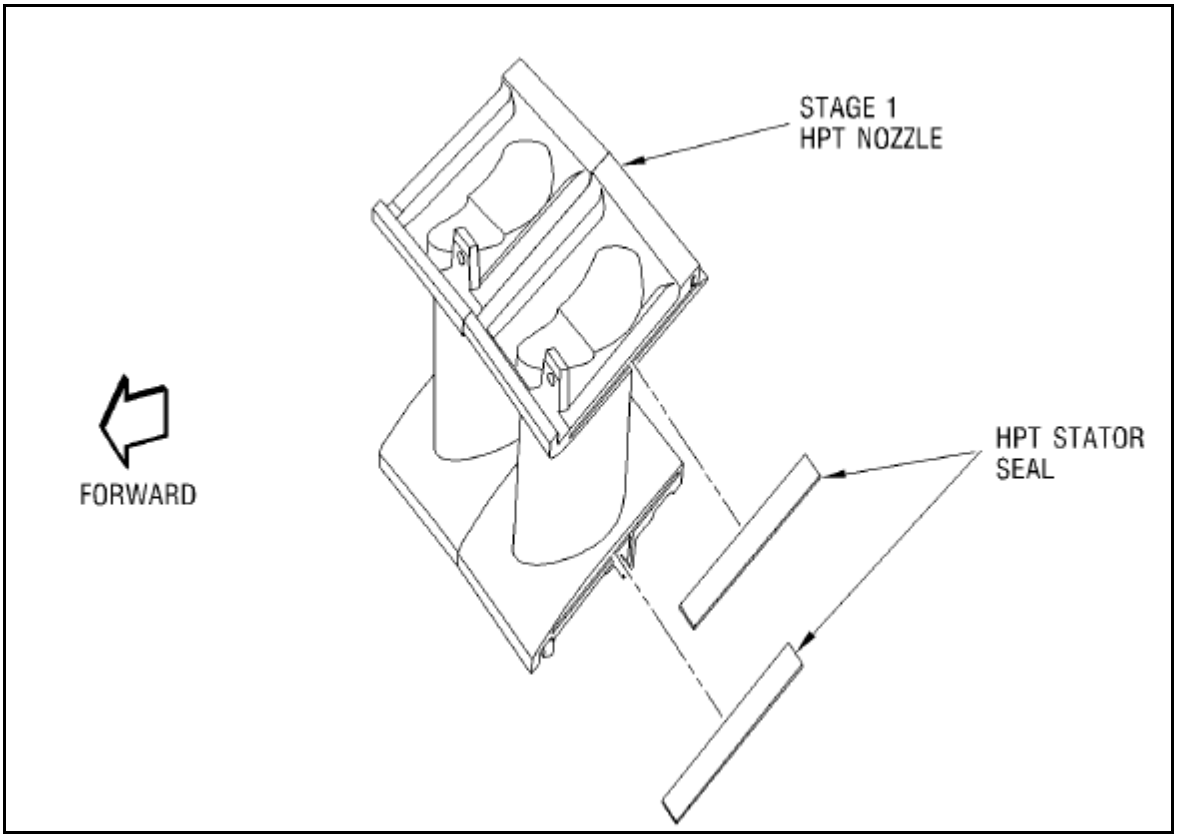



*Figure 12: Stage 1 HPT Nozzle Seal Displacement*

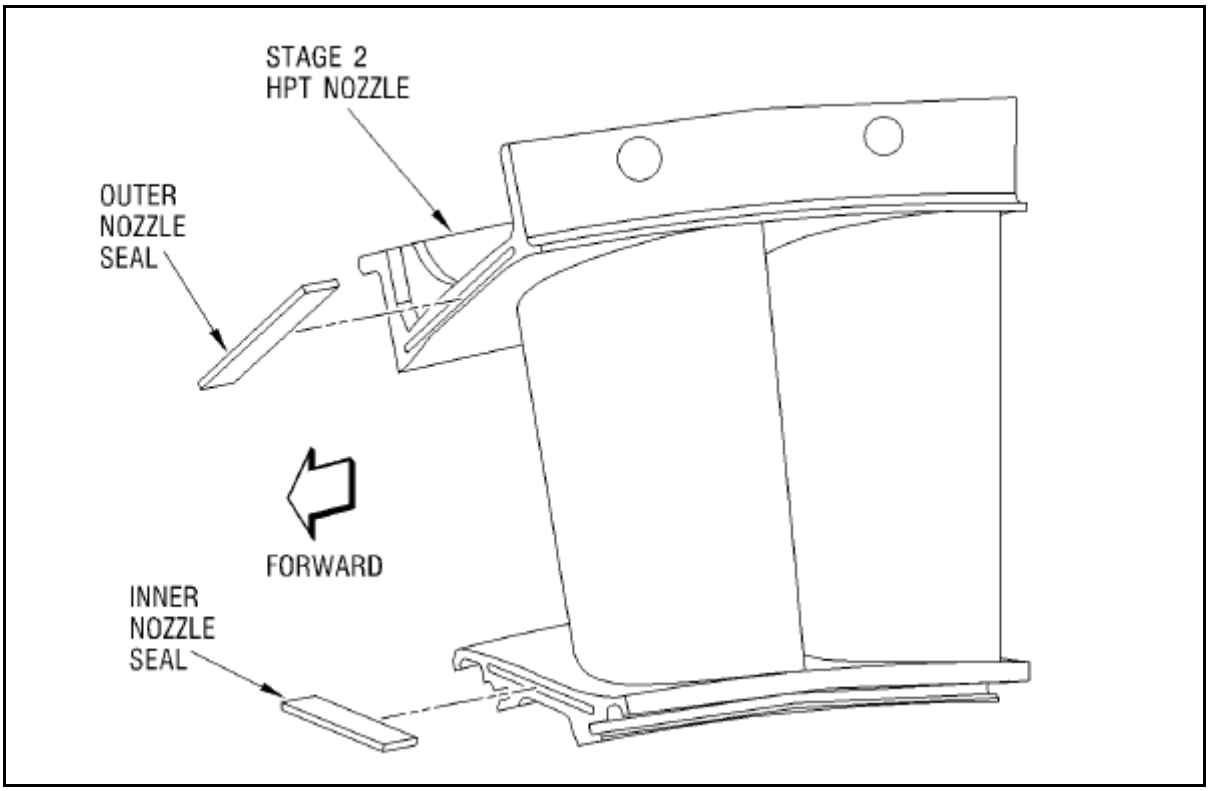



*Figure 13: Stage 2 HPT Nozzle Seal Displacement*

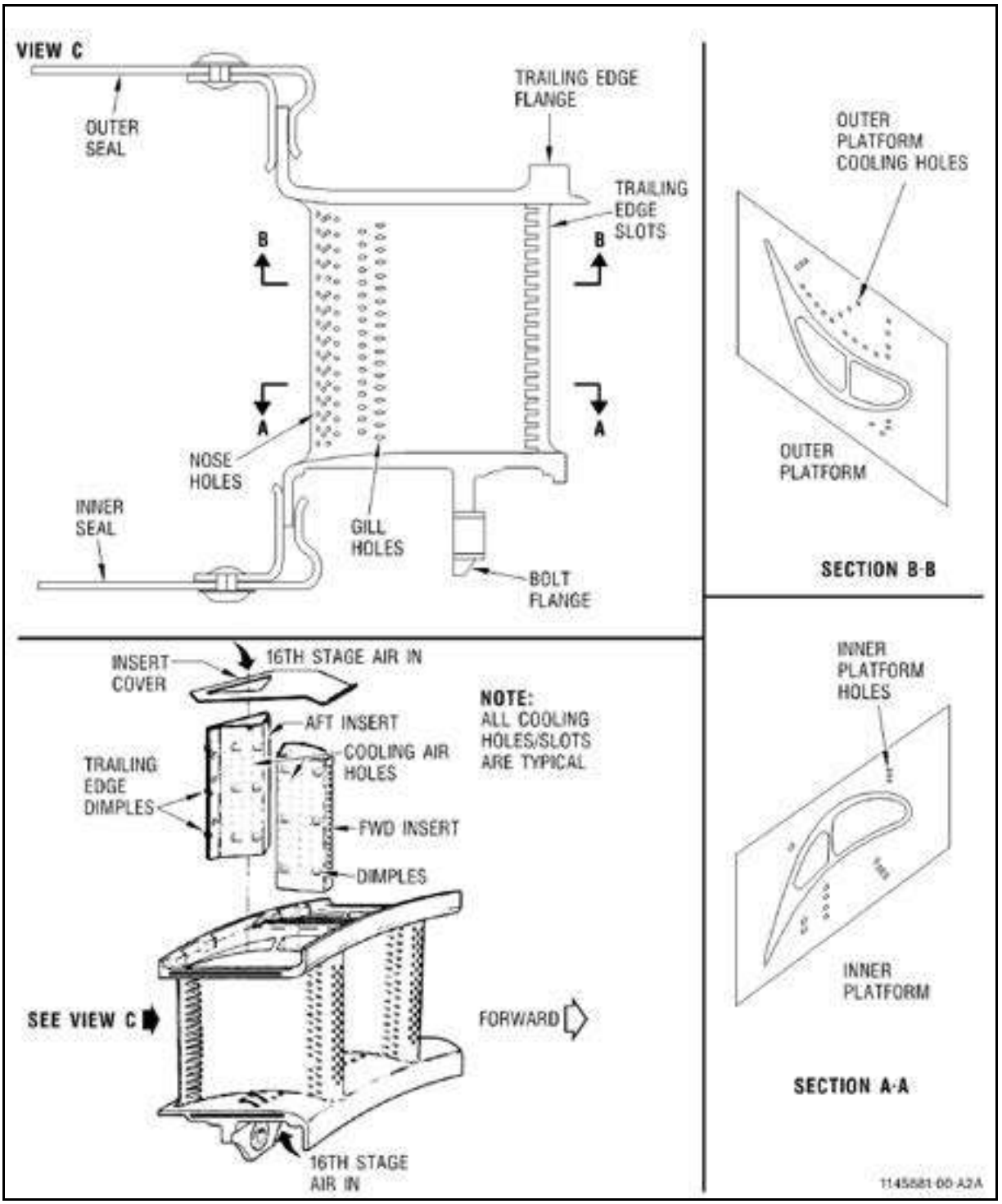



*Figure 14: HPT Stage 1 Nozzle*

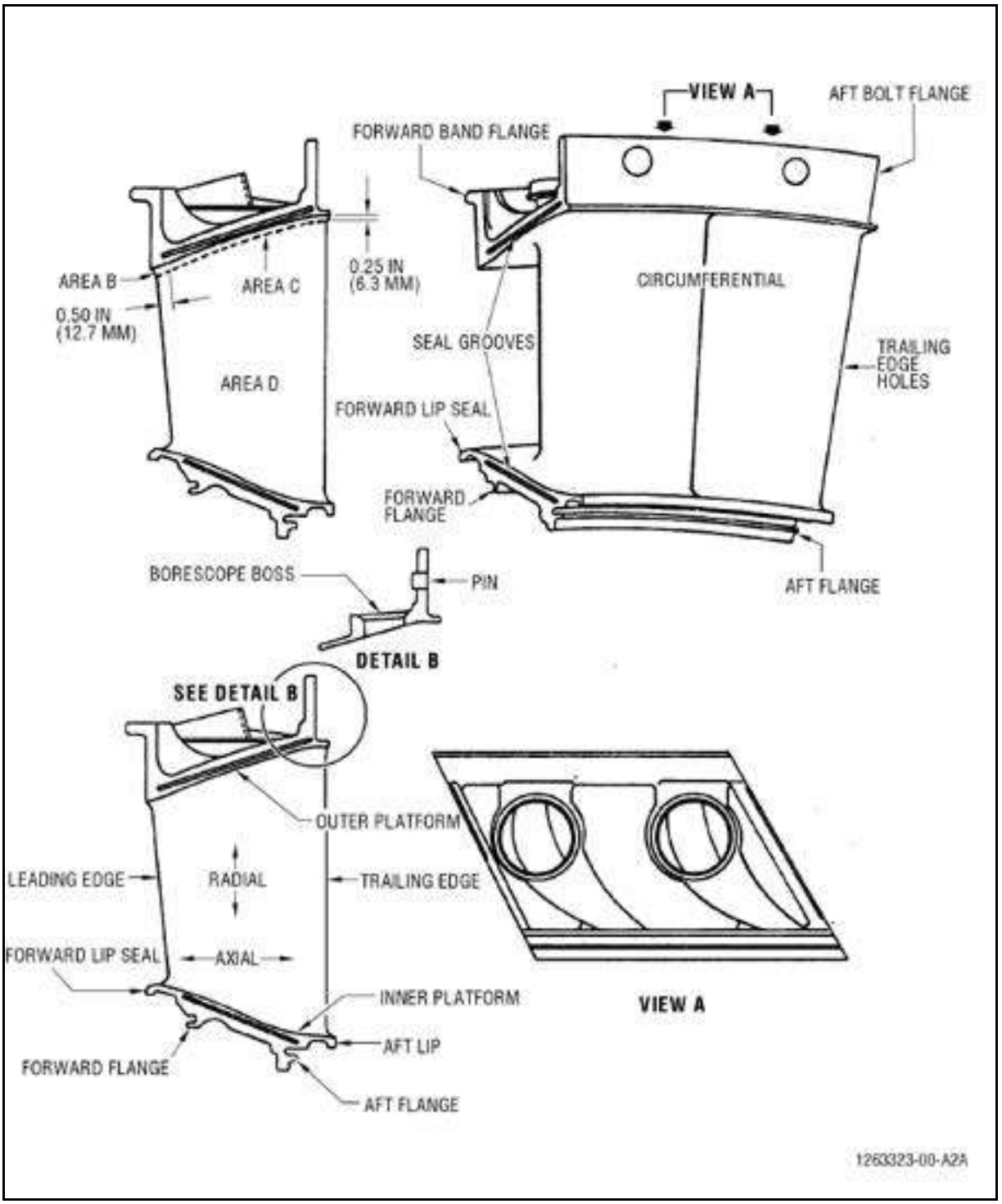



*Figure 15: HPT Stage 2 Nozzle*

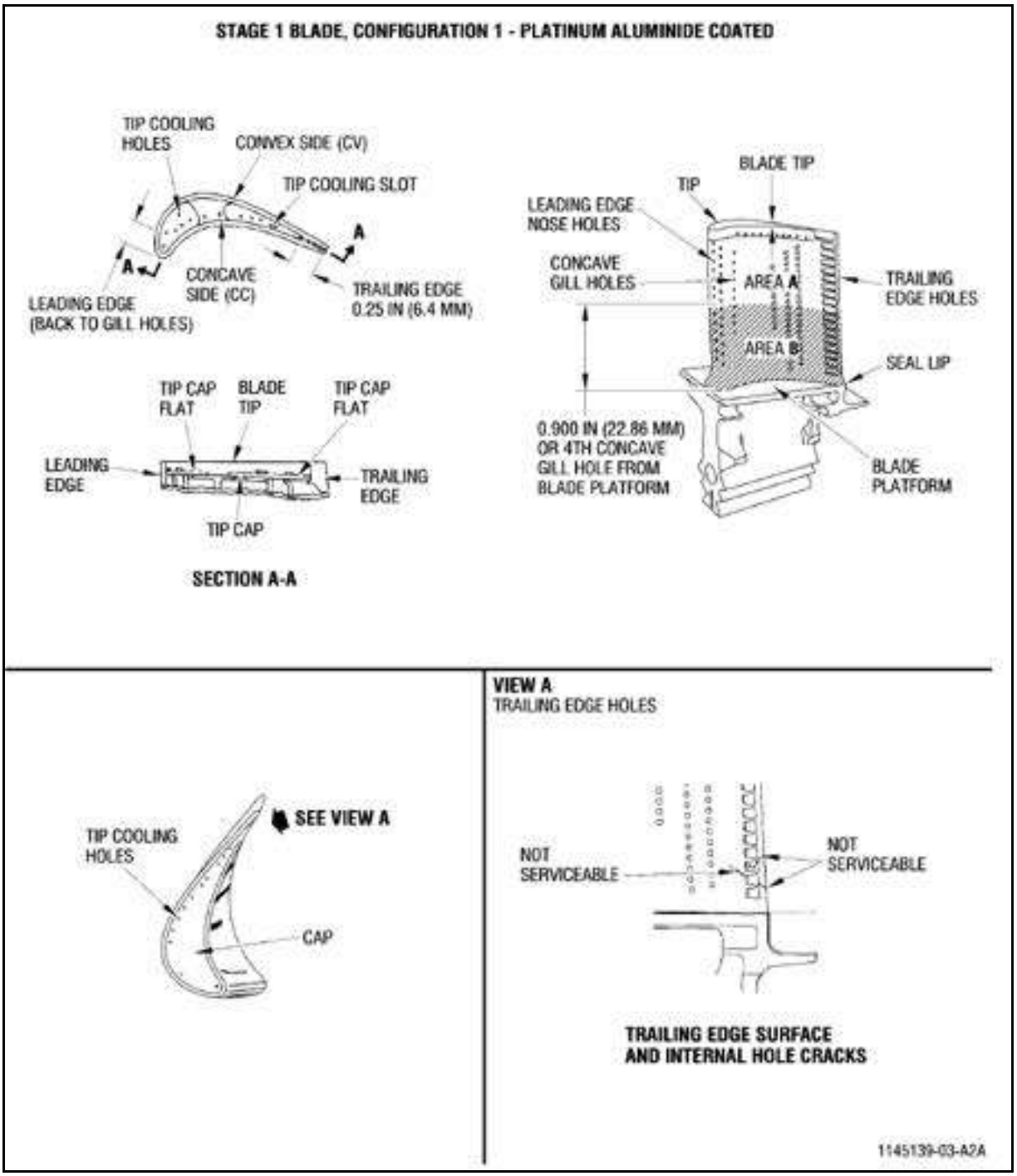



*Figure 16: HPT Stage 1 Rotor Blades Inspection Areas (Platinum Aluminide Coated Blades)*

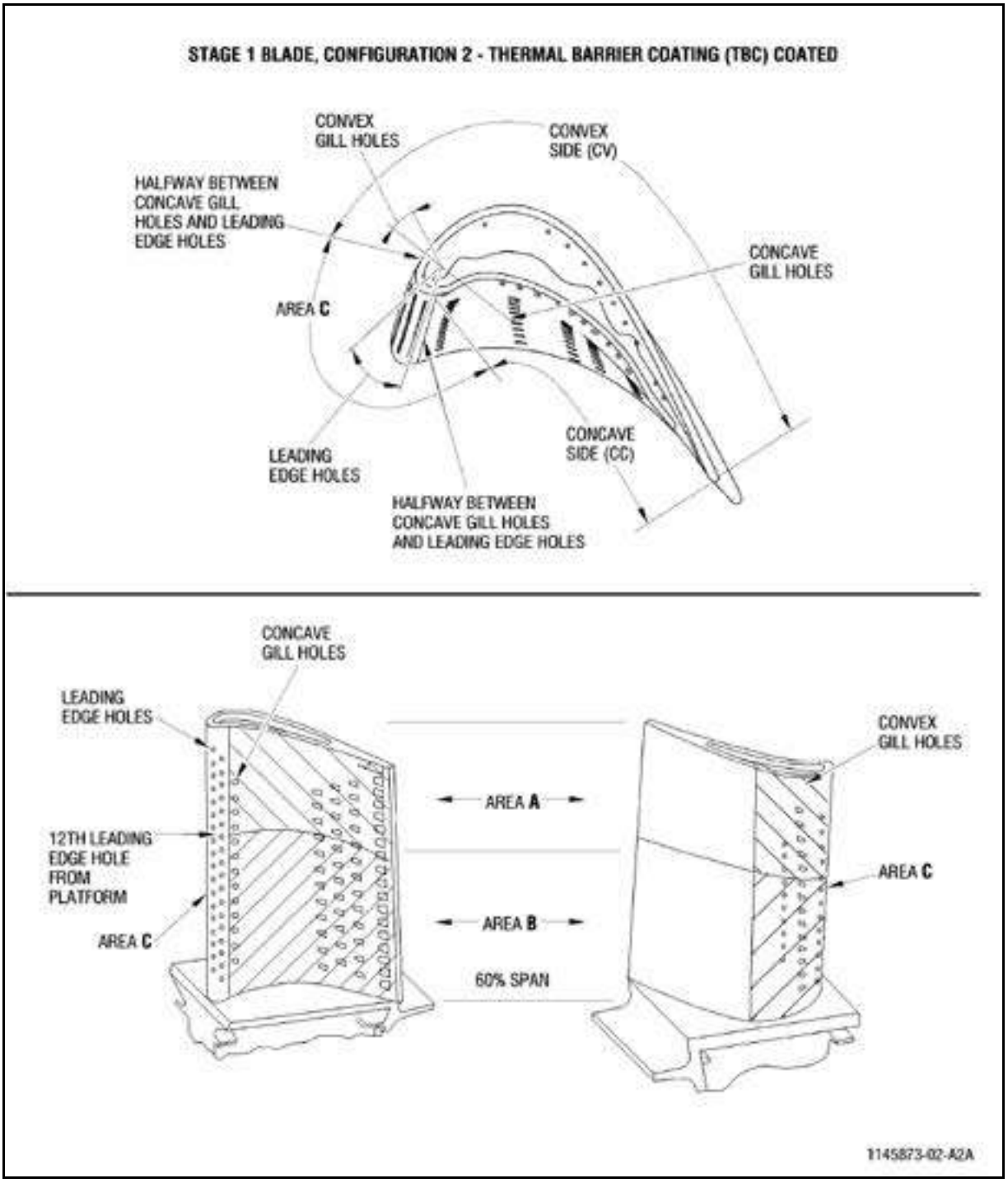



*Figure 17: HPT Stage 1 Rotor Blades Inspection Areas (TBC Coated Blades)*

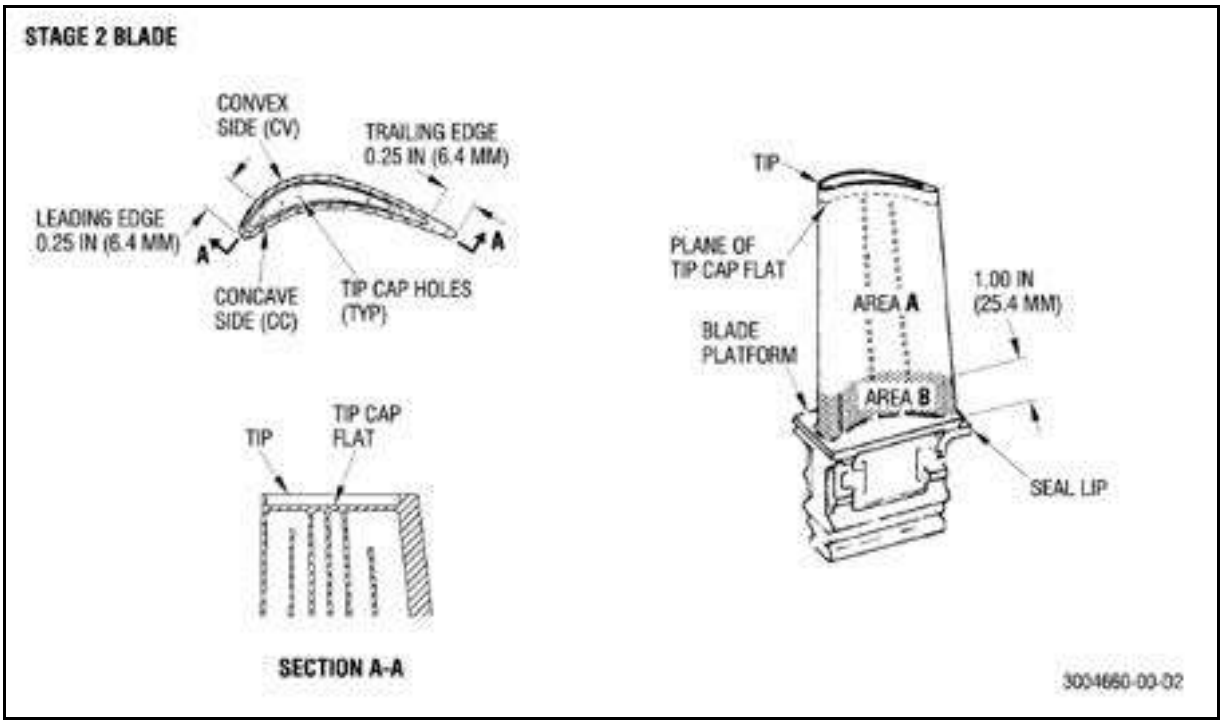



*Figure 18: HPT Stage 2 Rotor Blades Inspection Areas*

**Borescope Pictures**



Picture 63: Stage1 Nozzle leading edge



Picture 64: Stage1 Nozzles Leading edge

]



Picture 65: Stage1 Nozzle airfoil concave side



Picture 66: Stage1 Nozzle airfoil concave side



Picture 67: Stage1 Nozzles airfoil concave



Picture 68: Stage1 Nozzle airfoil concave

| | | |
|---|---|---|
|  | |  |
| Picture 69: Stage1 Nozzle airfoil concave side | | Picture 70: Stage1 Nozzle airfoil convex side |
|  | |  |
| Picture 71: Stage1 Nozzle trailing edge concave | | Picture 72: Stage1 Nozzle trailing edge convex |



Picture 73: Stage1 Nozzle trailing edge



Picture 74: Stage1 Nozzle trailing edge and



Picture 75: Stage1 Blades leading edge tip



Picture 76: Stage1 Blades leading edge convex



Picture 77: Stage 1 Blades leading edge base



Picture 78: Stage 1 Blades leading edge base



Picture 79: Stage 1 Blades trailing edge tip



Picture 80: Stage 1 Blades trailing edge root



Picture 81: Stage 2 Blades leading edge tip



Picture 82: Stage 2 Honeycomb seals



Picture 83: Stage 2 Blades leading edge root



Picture 84: Stage 2 Blades and stage 2 nozzles

| | | |
|---|---|---|
|  | |  |
| Picture 85: Stage 2 Blades trailing edge | | Picture 86: Stage 2 Blades trailing edge |

## 4.4 LPT Section

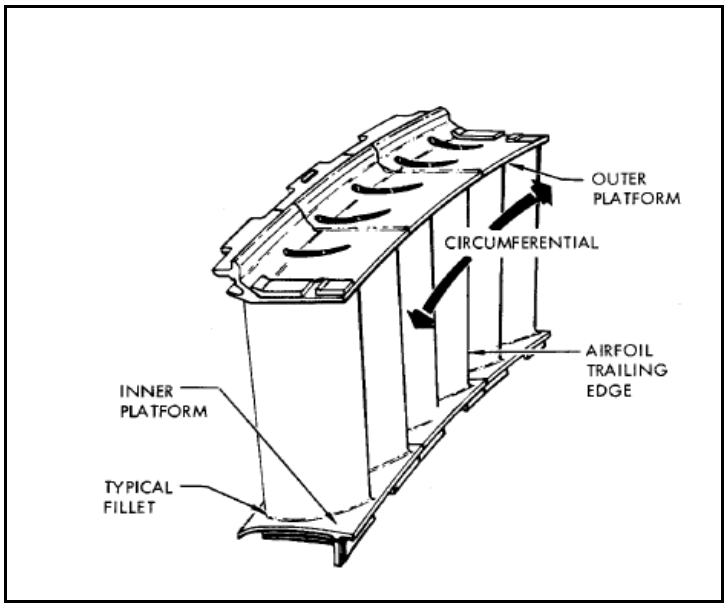



*Figure 19: Power Turbine Nozzles*

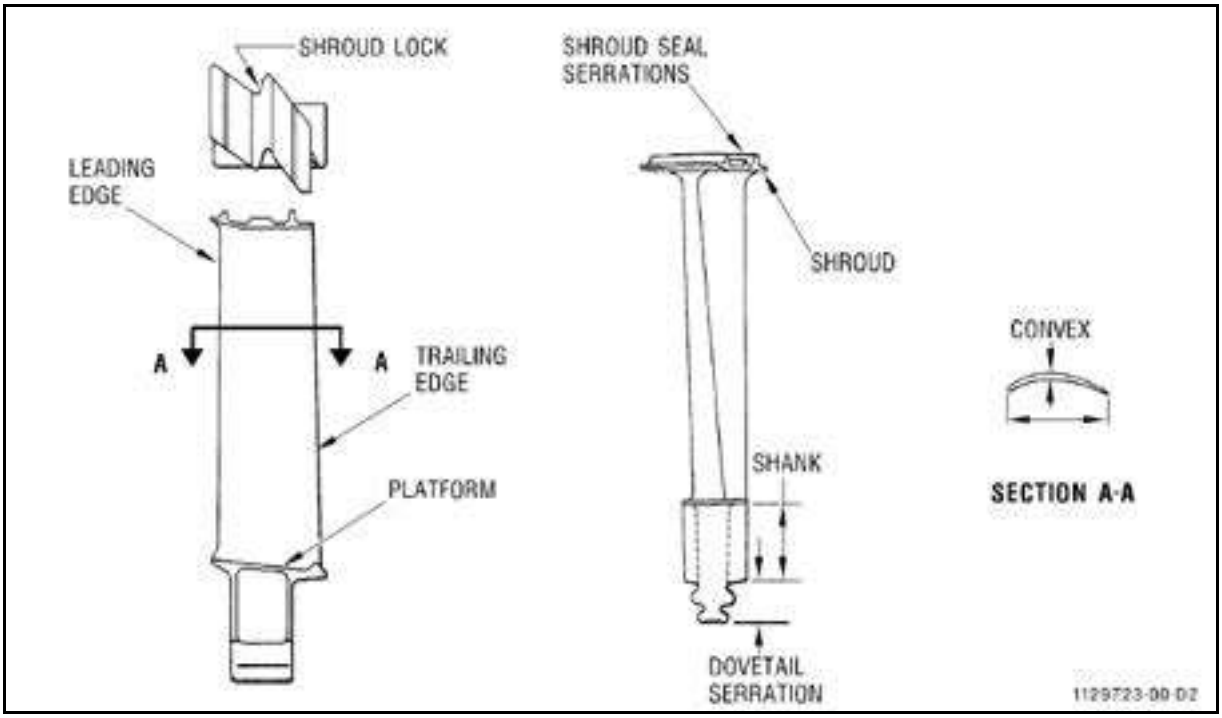



*Figure 20: Power Turbine Rotor Blades*

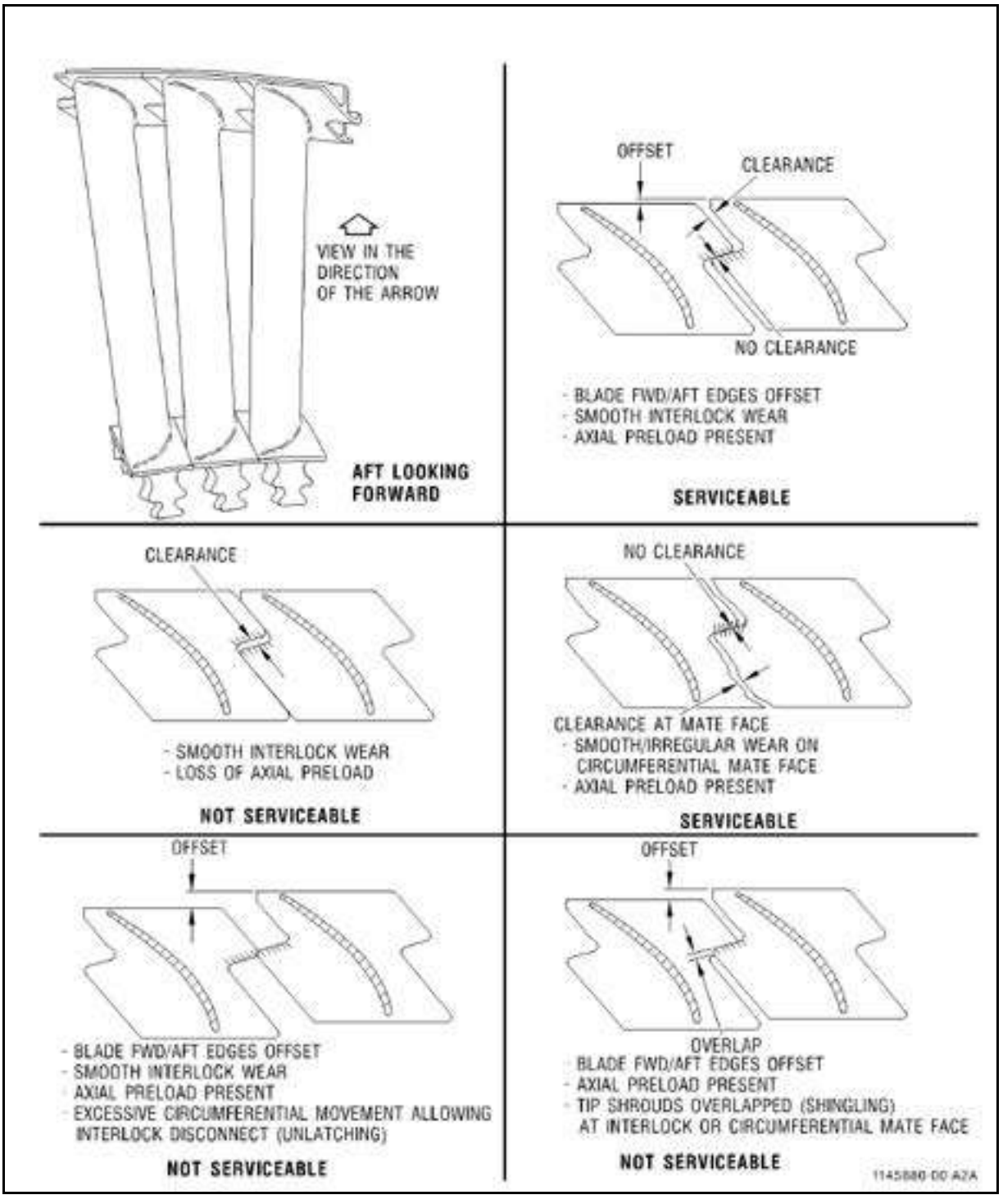



*Figure 21: LPT Rotor Blade Circumferential Inspection*

**Notes:**

The LPT stage 1 accessible nozzles and blades did not show any damage.

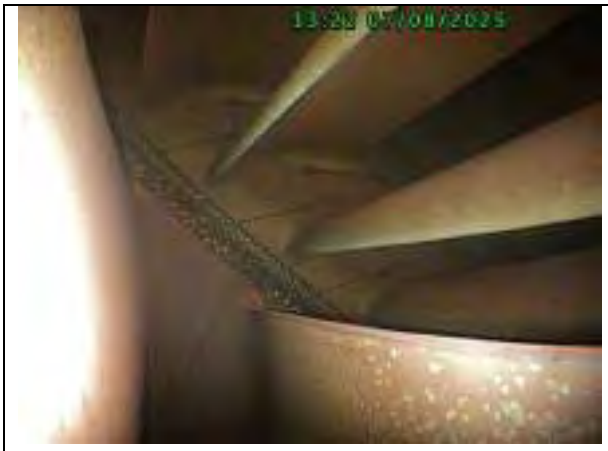
**Borescope Pictures**



Picture 87: STG1 LPT nozzles



Picture 88: TMF and LPT Inlet



Picture 89: Stage 1 Blades



Picture 90: LPT Stage 1 Blades tip interlock

# BORESCOPE INSPECTION REPORT
# TM2500 GEN. 6-7
## *7LM2500 – PK – MDWG05*

## NEW FORTRESS ENERGY

## SJTPP, PR

## PACKAGE # 7251579

## UNIT #5

| | | | |
|---|---|---|---|
| **Visit Date:** | 08/08/2025 | **Total Starts:** | 1095 |
| **Engine S/N:** | 557-252 | **GG Hours:** | 16253 |
| **Power Turbine S/N:** | 557-252 | **PT Hours:** | 16253 |
| **SOM GT Field Engineer:** | Daniel Arroyo | **New Fortress Representative:** | Jonathan Rodriguez |



## TABLE OF CONTENTS


1 Conclusions and Recommendations 3

2 Outage Data 4

3 Borescope Inspection Checklist 4

4 Borescope Inspection Record 6

4.1 Compressor Section

4.2 Combustor and 1St Stage Nozzle Section

4.3 Turbine Section

4.4 LPT Section

## 1. Conclusions and Recommendations

**Purpose of visit:**

The purpose of this visit was to perform a borescope inspection of the Engine in accordance with GEK105054, WP 406 00.

1.1 The HPC is serviceable according to GEK105054, WP 406 00 Table 4. No damages were found.

1.2 The Combustor section is serviceable according to GEK105054, WP40600 Table 7. Found 2 cracks on combustor dome band at upper and lower igniters location

1.3 The High Pressure Turbine section is serviceable according to GEK105054, WP406 00 Table 8.

1.4 The LPT is serviceable according to GEK105054, WP40600.

## 2. Outage Data

### Engine Data

| | | | | | |
|---|---|---|---|---|---|
| **ESN:** | 557-252 | **Engine Fired Hours:** | 16253 | **Package Hours:** | 16253 |
| **Model:** | 7LM2500-PK-MDWG05 | **Engine Fired starts:** | 1095 | **Package Fired Starts:** | 1095 |

**MAINTENANCE DATA**

| WP, SB, SL, PB, PL Performed | GEK105054, REV 11 | Date completed | Comments |
|---|---|---|---|
| WP 406 00 | Borescope Inspection | 08AUG25 | Serviceable |

**Parts Data**

| Description | PN Removed | SN Removed | Qty | Disposition | PN Installed | SN Installed |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

## 3. Borescope Inspection Checklist

**Date unit out of operation:** 08/08/2025
**Date unit into operation:** 08/08/2025
**Last inspection date:**

**Type of Fuel:** Natural Gas / Diesel
**Type of outage:** Scheduled BSI

**Type of NOx suppression:** Water Injection

**Inspection of gas turbine:**

| WATERWASH: | HIGH PRESSURE COMPRESSOR: |
|---|---|
| ☒ PERFORMED WATER WASH | ☒ HPC BORESCOPE INSPECTION |
| **COMBUSTOR:** | **HIGH PRESSURE TURBINE** |
| ☒ COMBUSTOR BORESCOPE INSPECTION | ☒ HPT STAGE 1 & 2 NOZZLE BORESCOPE INSPECTION |
| | ☒ HPT BLADE BORESCOPE INSPECTION |
| **LOW PRESSURE TURBINE:** | |
| ☒ LPT BORESCOPE INSPECTION | |

☒ ***Please verify all borescope plugs have been reinstalled***

## 4. Borescope Inspection Record

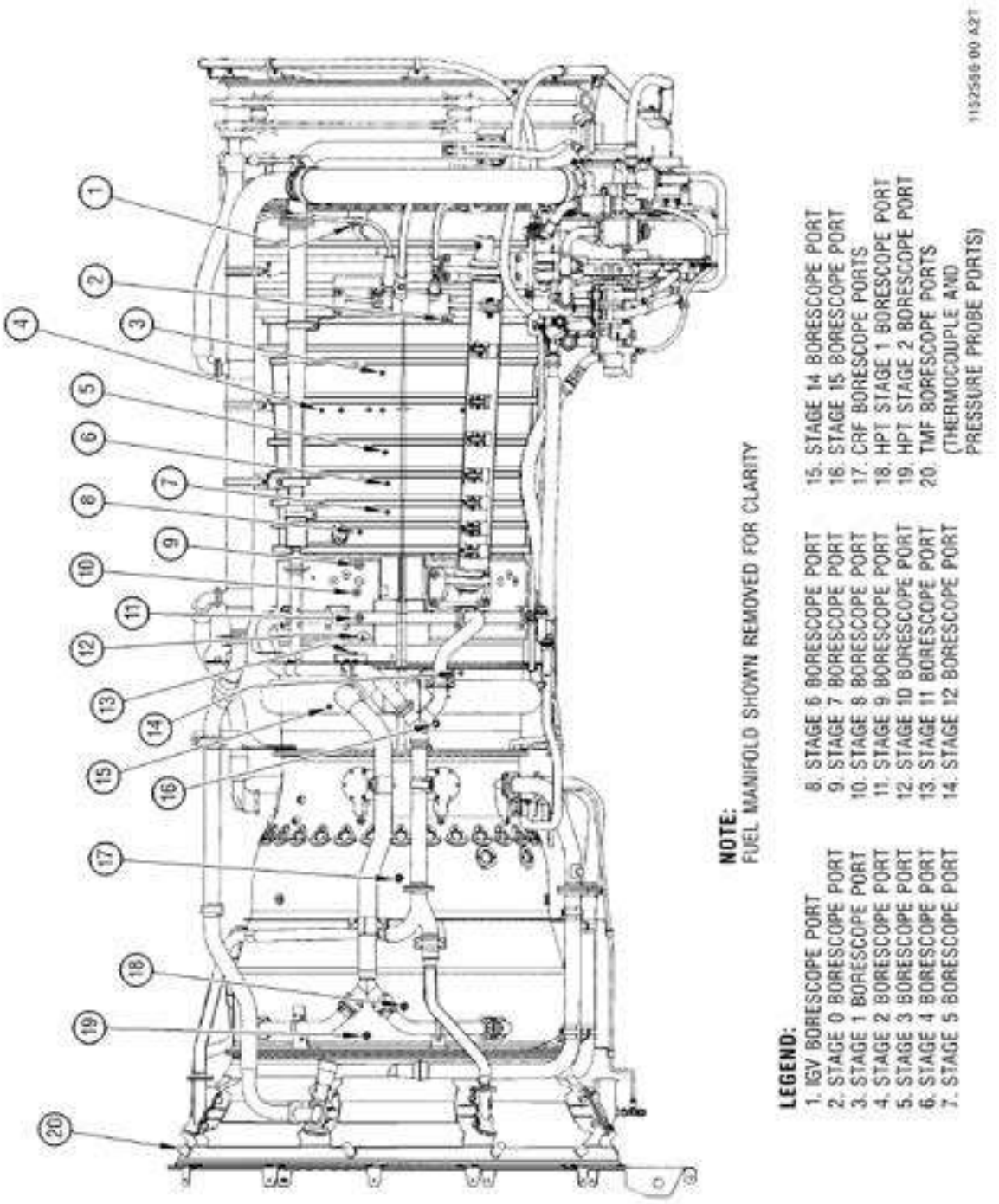



*Figure 1: Position of Borescope Inspection Ports.*

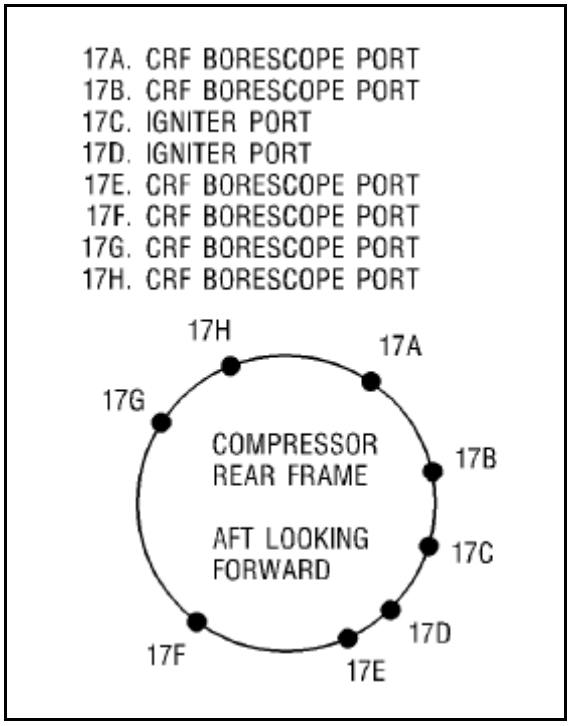



*Figure 2: Position of Borescope Inspection Ports.*

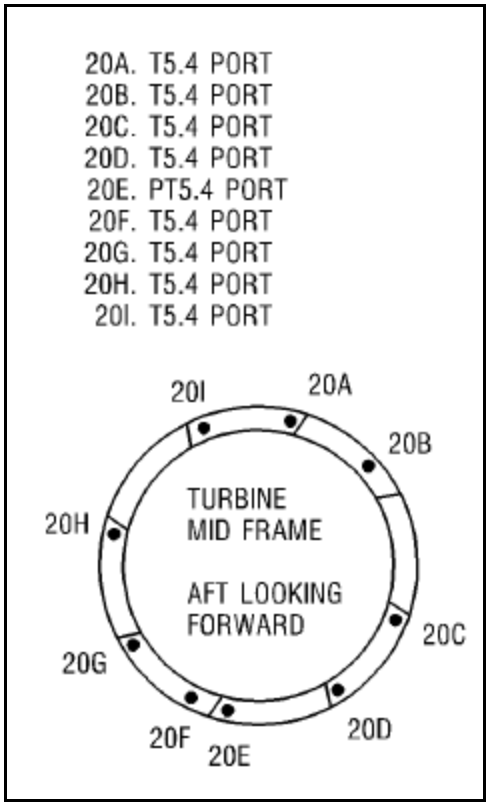



*Figure 3: Position of Borescope Inspection Ports.*

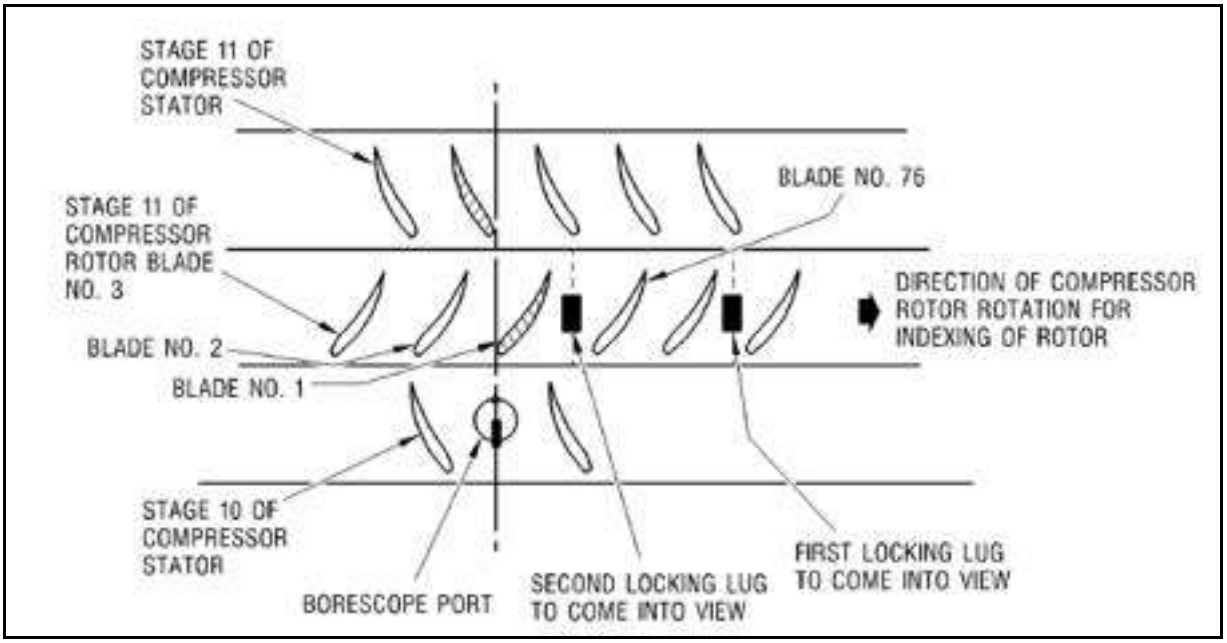



*Figure 4: Zero indexing of HPC rotor and HPT rotor*

## 4.1 Compressor Section

| Port | T.E. | L.E. | blades | Remarks: | photo no: |
|---|---|---|---|---|---|
| 1 | IGV | | | | 1 |
| 1 | | 0 | 36 | | 2,3 |
| 2 | 0 | | 36 | | 4 |
| 2 | | 1 | 26 | | 6,7 |
| 3 | 1 | | 26 | | 9,10 |
| 3 | | 2 | 26 | | 11,12 |
| 4 | 2 | | 26 | | 13 |
| 4 | | 3 | 42 | | 14 |
| 5 | 3 | | 42 | | 15,16 |
| 5 | | 4 | 45 | | 17,18 |
| 6 | 4 | | 45 | | 19, 20 |
| 6 | | 5 | 48 | | 21, 22 |
| 7 | 5 | | 48 | | 23, 24 |
| 7 | | 6 | 54 | | 25, 26 |
| 8 | 6 | | 54 | Blades contacting tip | |
| 8 | | 7 | 56 | Blades contacting tip | |
| 9 | 7 | | 56 | | 27 |
| 9 | | 8 | 64 | | 28 |
| 10 | 8 | | 64 | | 29,30 |
| 10 | | 9 | 66 | | 31 |
| 11 | 9 | | 66 | | 32, 33 |
| 11 | | 10 | 66 | | 35, 36 |
| 12 | 10 | | 66 | | 37, 38 |
| 12 | | 11 | 76 | | 39, 40 |
| 13 | 11 | | 76 | | 41, 42 |
| 13 | | 12 | 76 | | 43, 44 |
| 14 | 12 | | 76 | | 45, 46 |
| 14 | | 13 | 76 | | 47, 48 |
| 15 | 14 | | 76 | Inside bleed manifold | |
| 15 | | 15 | 76 | Inside bleed manifold | |
| 16 | 15 | | 76 | | 49, 50 |
| 16 | | 16 | 76 | | 51, 52 |

**Notes:**

The HPC section is Serviceable.



Picture 1. CFF & IGV



Picture 2. Stage 0 Leading edge tip



Picture 3. Stage 0 Leading edge base



Picture 4. Stage 0 Trailing edge tip



Picture 5. Stage 0 Weep hole



Picture 6. Stage 1 Leading edge tip



Picture 7. Stage 1 Leading edge base



Picture 8. Stage 1 weep hole



Picture 9. Stage 1 Trailing edge tip



Picture 10. Stage 1 Trailing base



Picture 11. Stage 2 Leading edge tip



Picture12. Stage 2 Leading edge base



Picture 13. Stage 2 Trailing edge tip



Picture 14. Stage 3 Leading edge tip



Picture 15. Stage 3 Trailing edge tip



Picture 16. Stage 3 Trailing edge base



Picture 17. Stage 4 Leading edge tip



Picture 18. Stage 4 Leading edge base



Picture 19. Stage 4 Trailing edge tip



Picture 20. Stage 4 Trailing edge base



Picture 21. Stage 5 Leading edge tip



Picture 22. Stage 5 Leading edge base



Picture 23. Stage 5 Trailing edge tip



Picture 24. Stage 5 Trailing edge base



Picture 25. Stage 6 Leading edge tip



Picture 26. Stage 6 Leading edge base



Picture 27. Stage 7 Trailing edge tip



Picture 28. Stage 8 Leading edge tip



Picture 29. Stage 8 Trailing edge tip



Picture 30. Stage 8 Trailing edge base



Picture 31. Stage 9 Leading edge



Picture 32. Stage 9 Trailing edge tip



Picture 33. Stage 9 Trailing base



Picture 34. Stage 9 Bleed manifold



Picture 35. Stage 10 Leading edge tip



Picture 36. Stage 10 Leading edge base



Picture 37. Stage 10 Trailing edge tip



Picture 38. Stage 10 Trailing edge base



Picture 39. Stage 11 Leading edge tip



Picture 40. Stage 11 Leading edge base



Picture 41. Stage 11 Trailing edge tip



Picture 42. Stage 11 Trailing edge base




Picture 43. Stage 12 Leading edge tip



Picture 44. Stage 12 Leading edge base



Picture 45. Stage 12 Trailing edge tip



Picture 46. Stage 12 Trailing edge base




Picture 47. Stage 13 Leading edge tip



Picture 48. Stage 13 Leading edge base



Picture 49. Stage 15 Trailing edge tip



Picture 50. Stage 15 Leading edge base



Picture 51. Stage 16 Leading edge tip



Picture 52. OGV'S

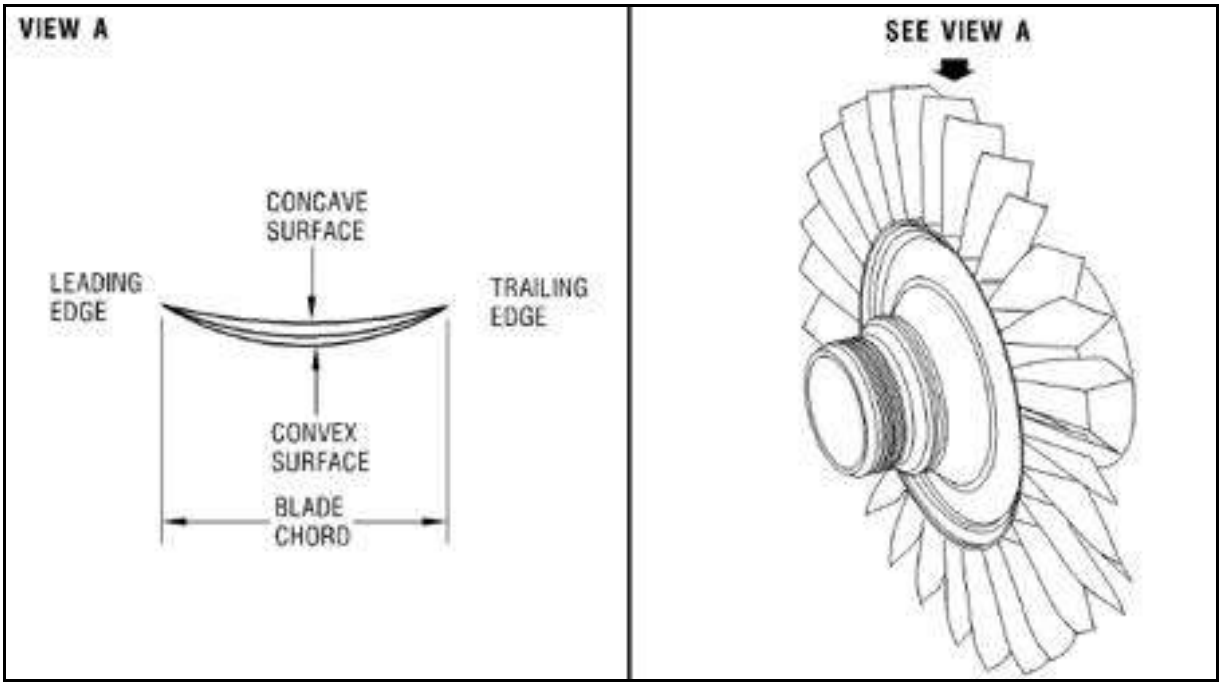



*Figure 5: HPC stage 0 BLISK*

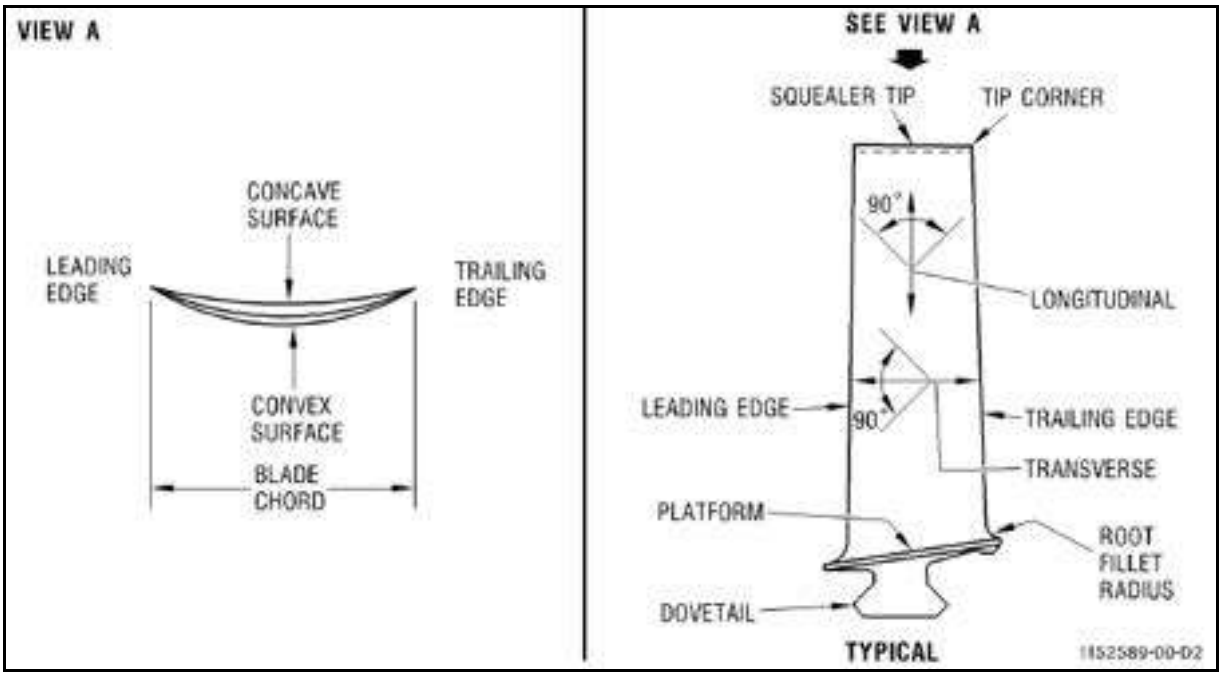



*Figure 6: Compressor Rotor Blades*

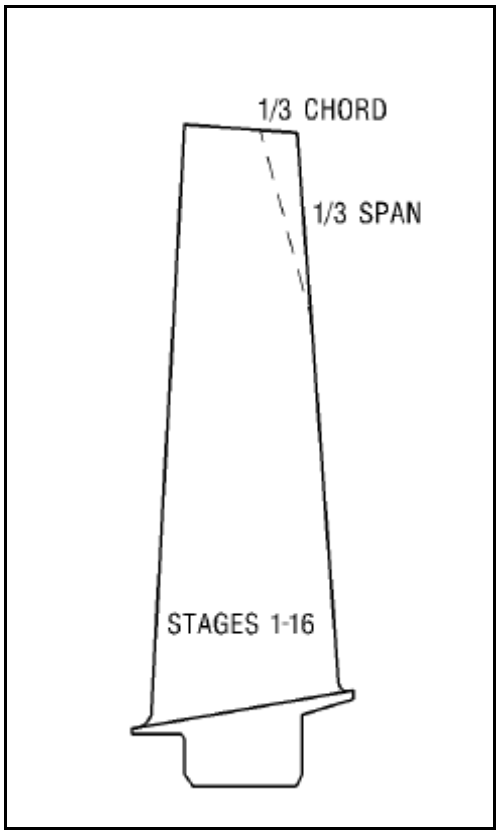



*Figure 7: Tip Trailing Edge Inspection*

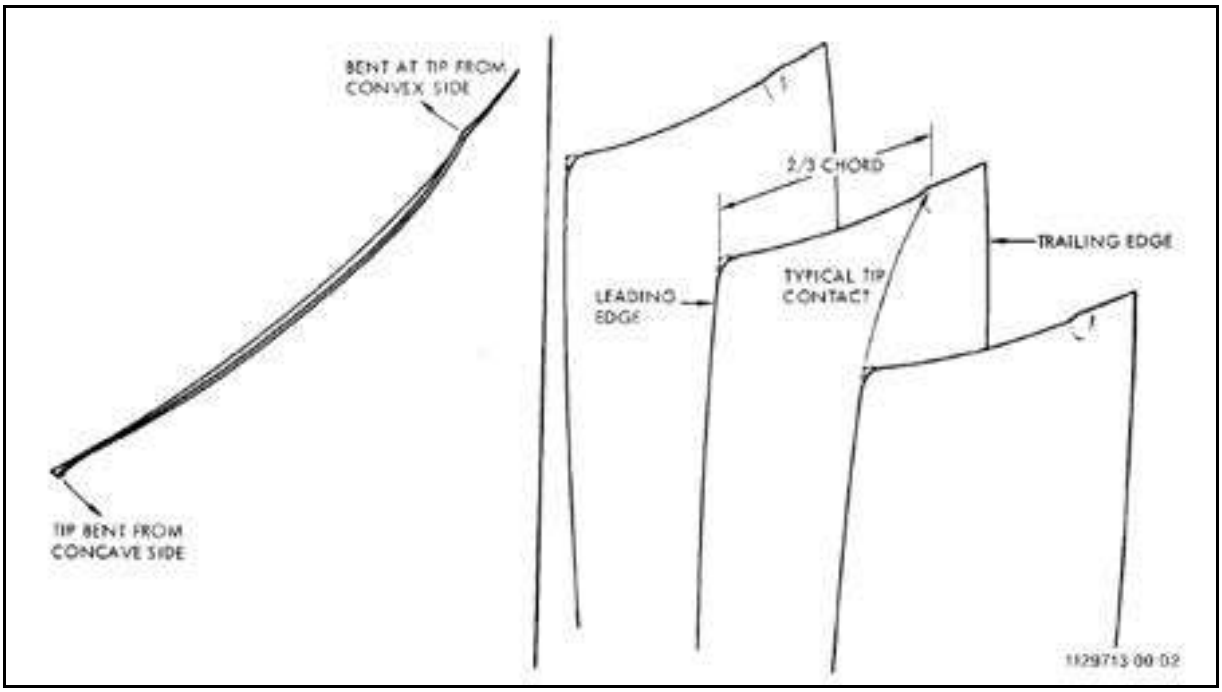


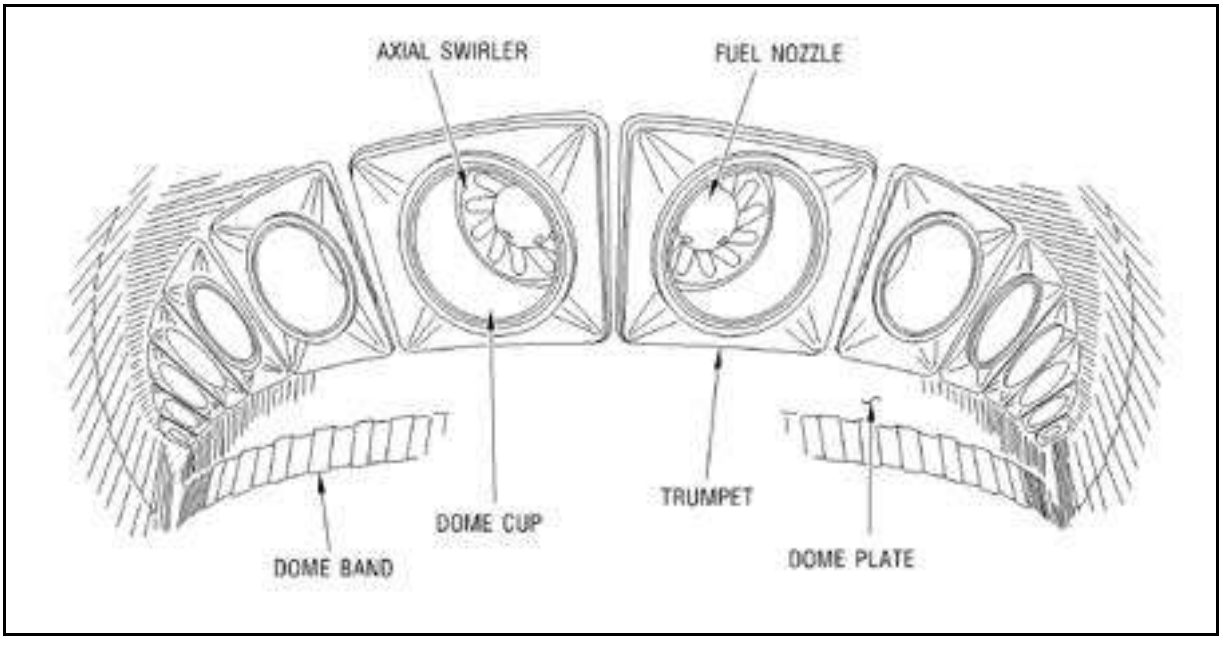

*Figure 8: Tip Clanging Contact (HPCR stage 3 through 6)*

## 4.2 Combustor and 1St Stage Nozzle Section

| Port | Condition observed | Photo no: |
|---|---|---|
| **17A** | | |
| **17B** | | |
| **17C** | | |
| **17D** | **See below notes.** | |
| **17E** | | |
| **17F** | | |
| **17G** | | |
| **17H** | | |
| **17** | 1st stage nozzle (leading edge): | |

**Notes:**

The Combustor section is serviceable according to GEK105054 Volume II WP40600 Table 7.
Found 2 cracks on combustor dome band at upper and lower igniters location



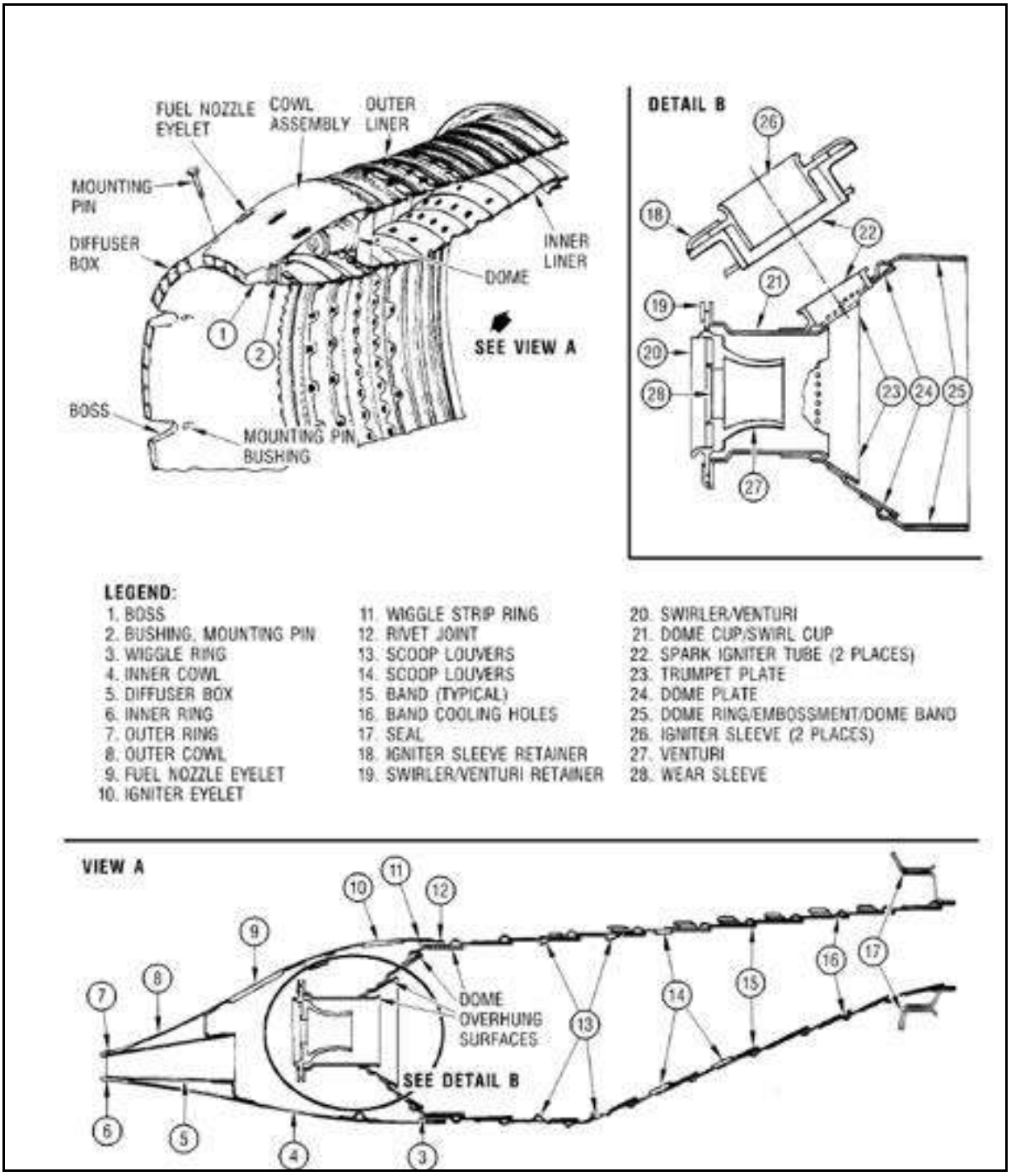



*Figure 9: SAC Combustor Inspection*

*Figure 10: SAC Combustor Inspection*

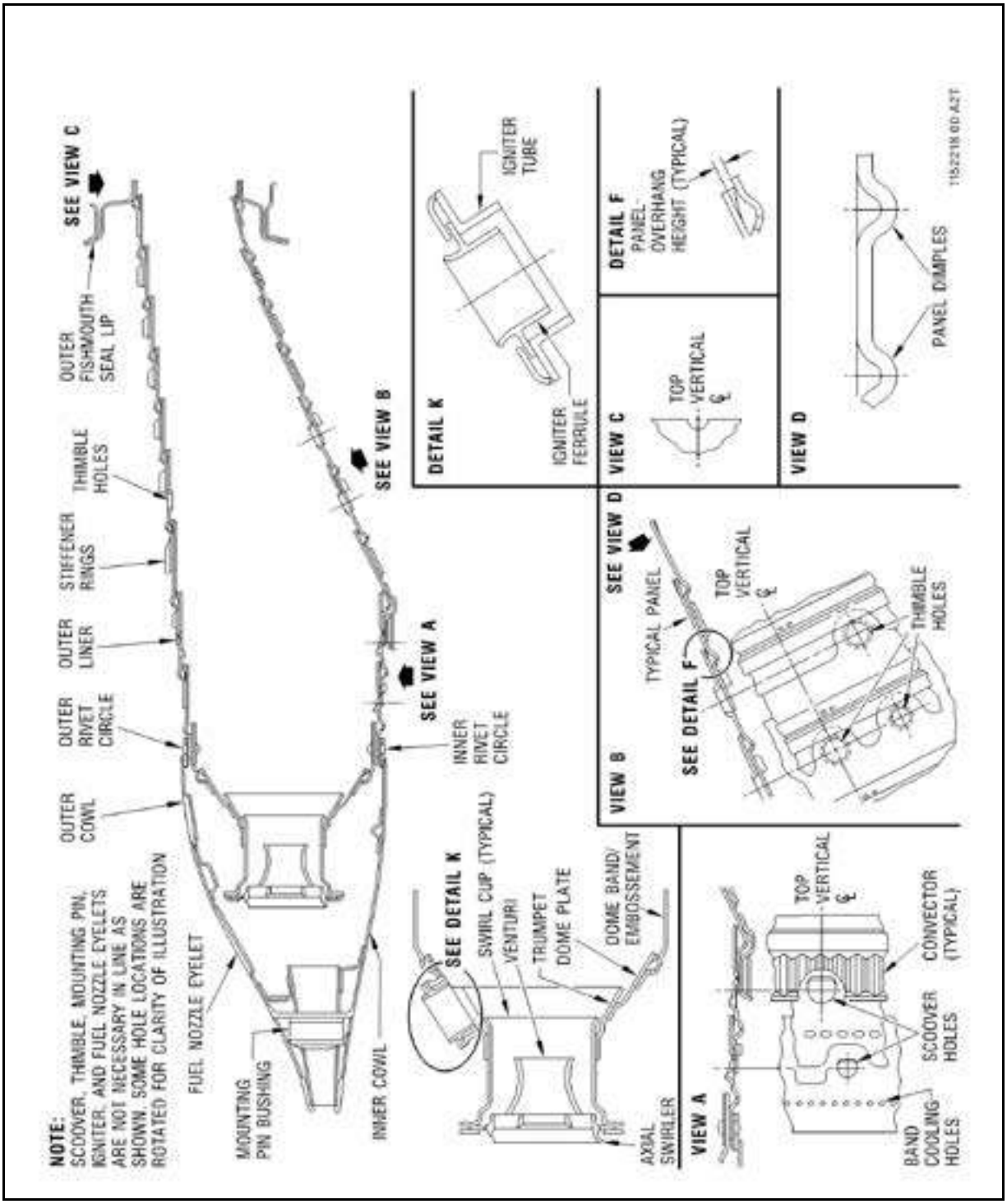



*Figure 11: SAC Combustor Inspection*

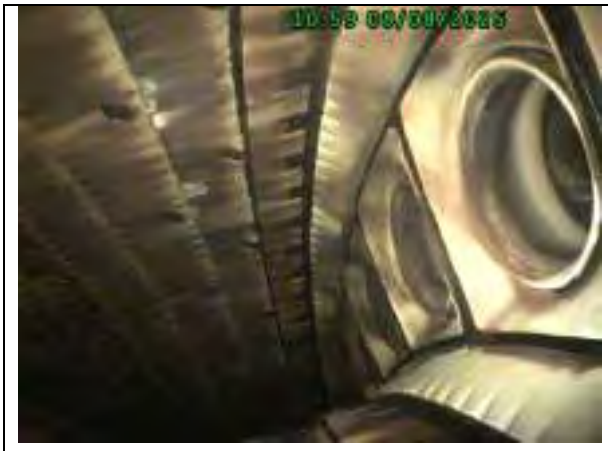
**Borescope Pictures**



Picture 53. Upper igniter ferrule



Picture 54. Lower igniter ferrule



Picture 55. Outer rivets band



Picture 56. Inner rivets band



Picture 57. Combustor liners



Picture 58. Combustor crack



Picture 59. Combustor crack



Picture 60. Fuel Nozzle tip



Picture 61. Combustor liners and HPT nozzle interference



Picture 62. . Combustor liners and HPT nozzle interference

## 4.3 Turbine Section

| | turbine stage | | | | |
|---|---|---|---|---|---|
| **Port** | **L.E.** | **T.E.** | **blades** | **Remarks:** | **photo no:** |
| **18** | **1** | | **88** | | |
| **19** | | **1** | **88** | **See below notes.** | |
| **19** | **2** | | **90** | | |
| **20** | | **2** | | | |

**Notes:**

The High Pressure Turbine section is serviceable according to GEK105054 Volume II WP40600 Table 8.

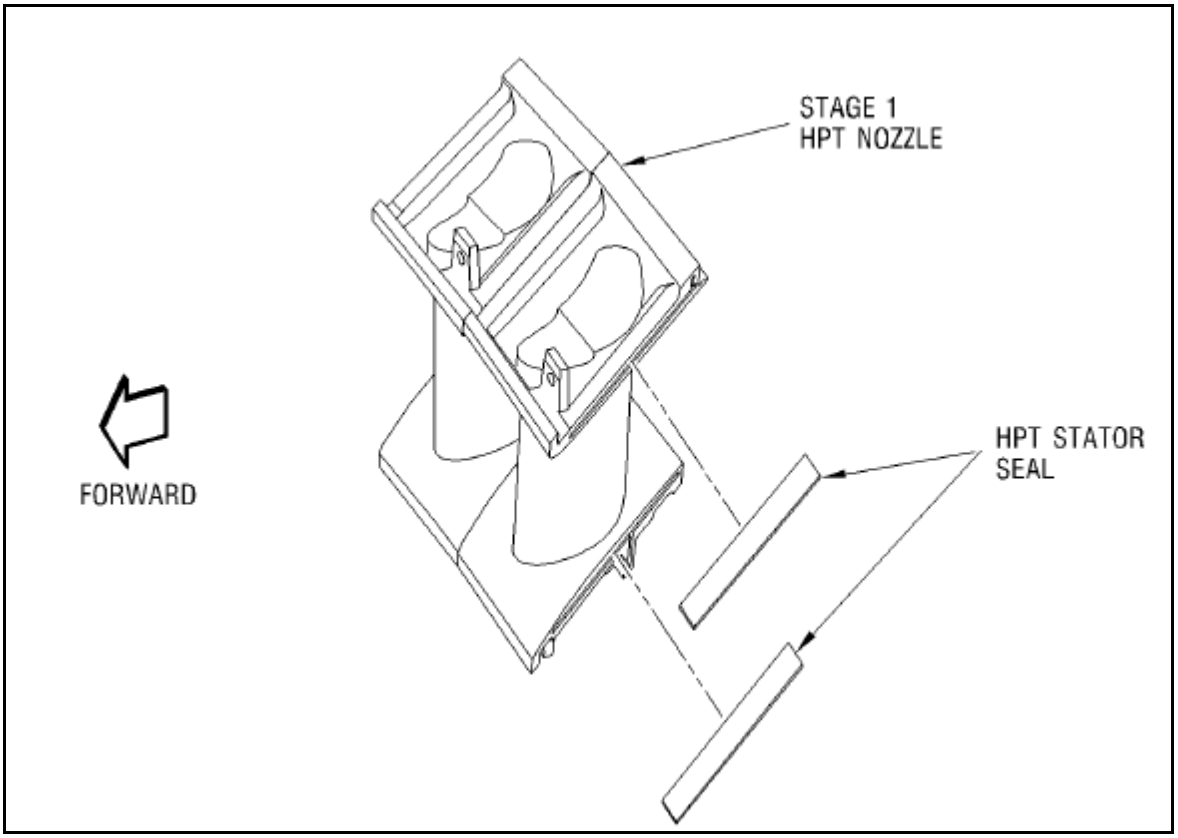



*Figure 12: Stage 1 HPT Nozzle Seal Displacement*

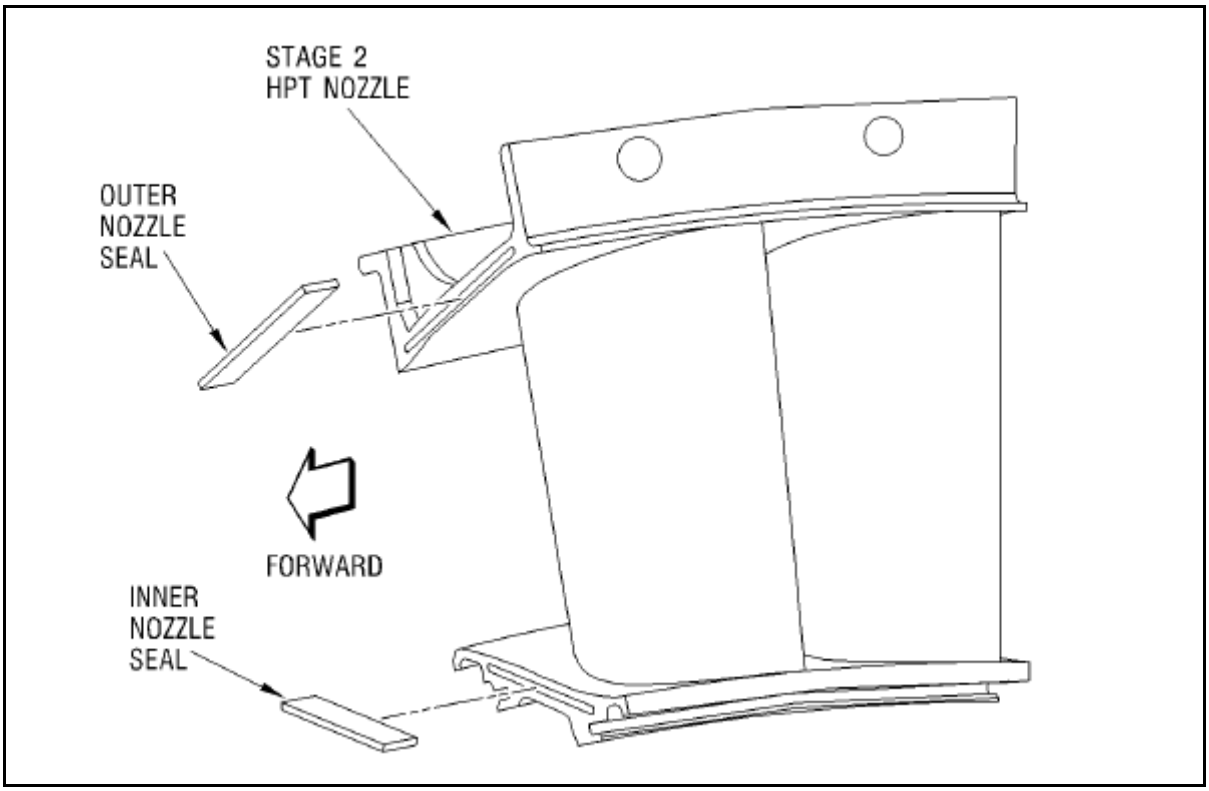



*Figure 13: Stage 2 HPT Nozzle Seal Displacement*

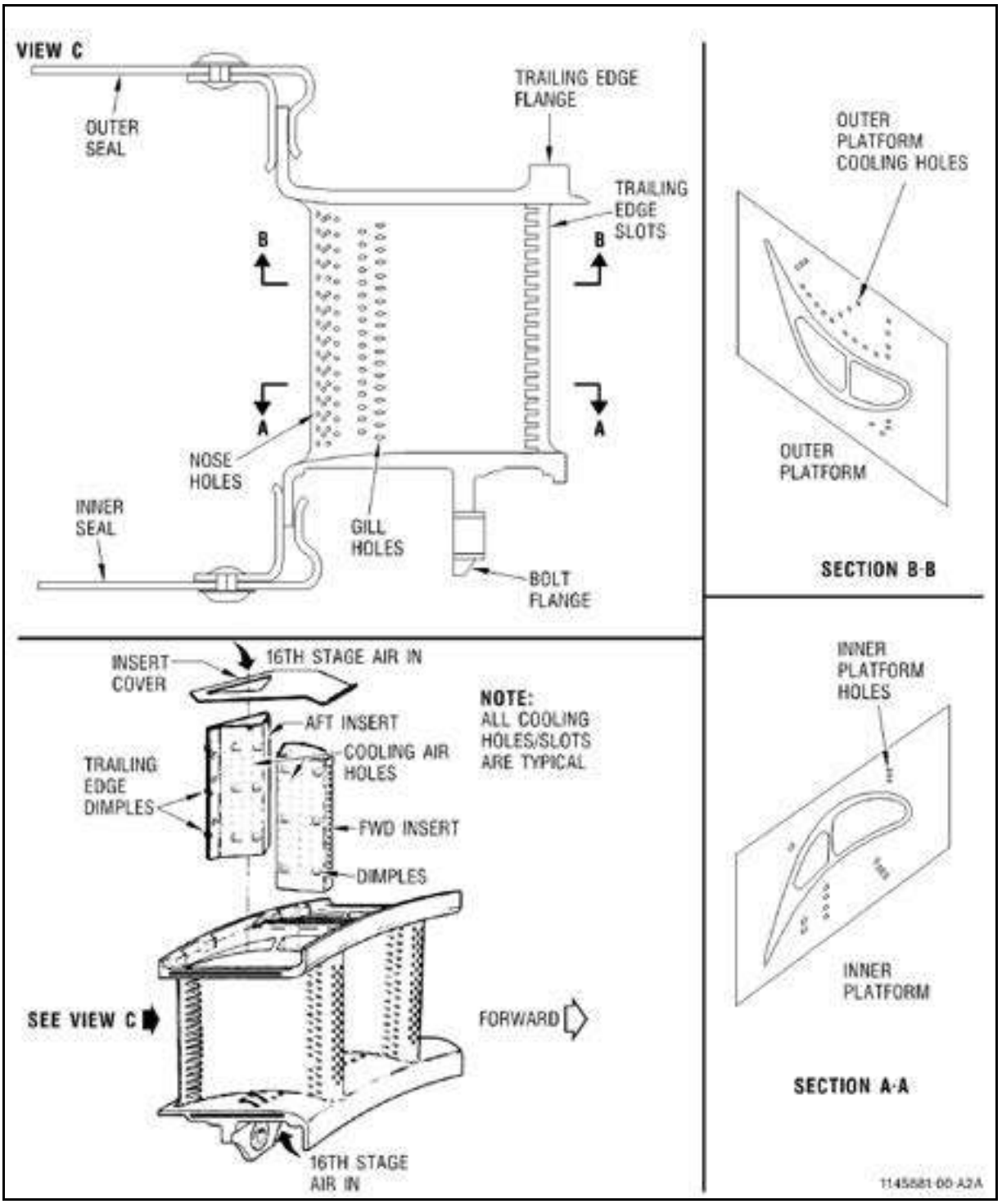



*Figure 14: HPT Stage 1 Nozzle*

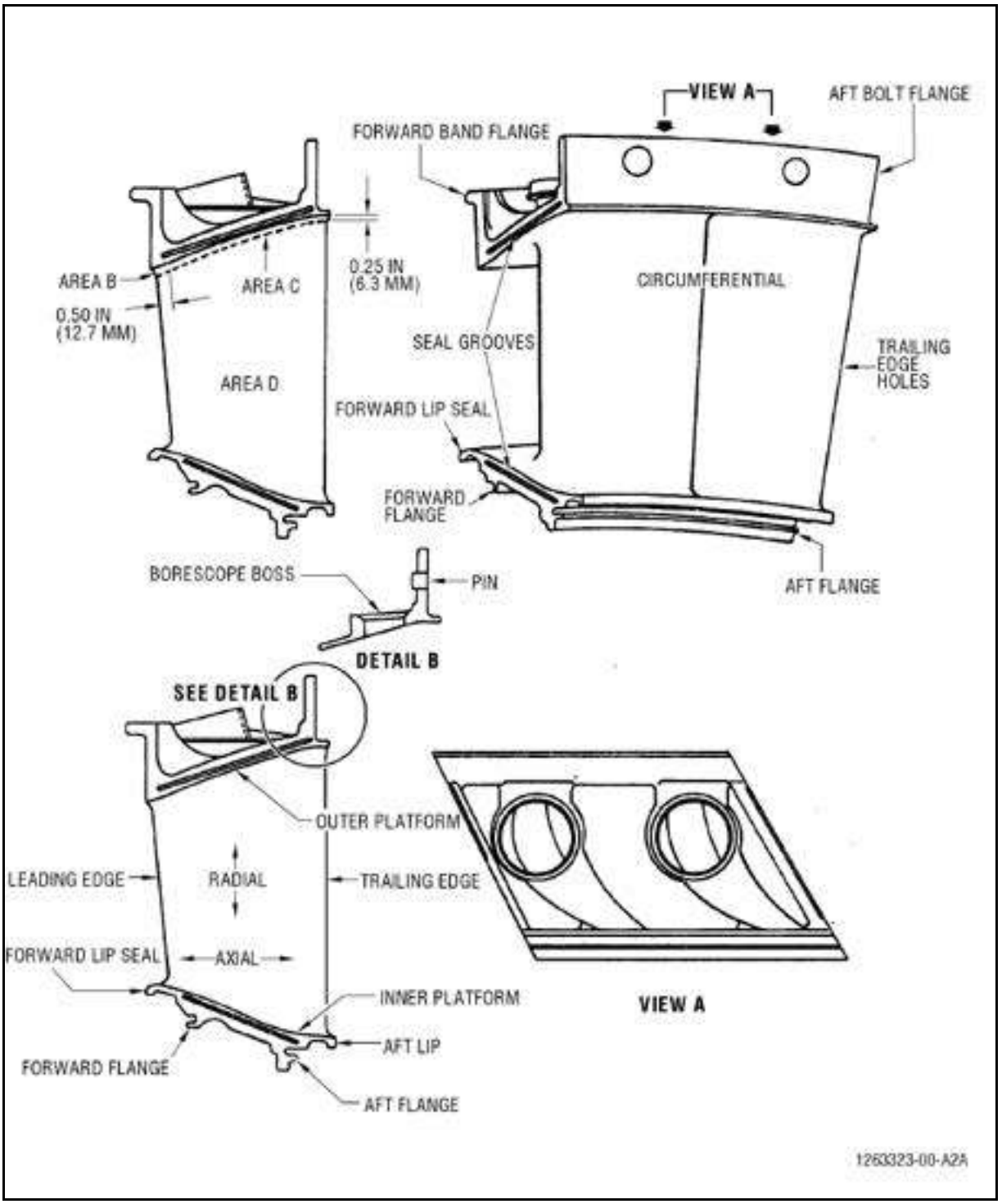



*Figure 15: HPT Stage 2 Nozzle*

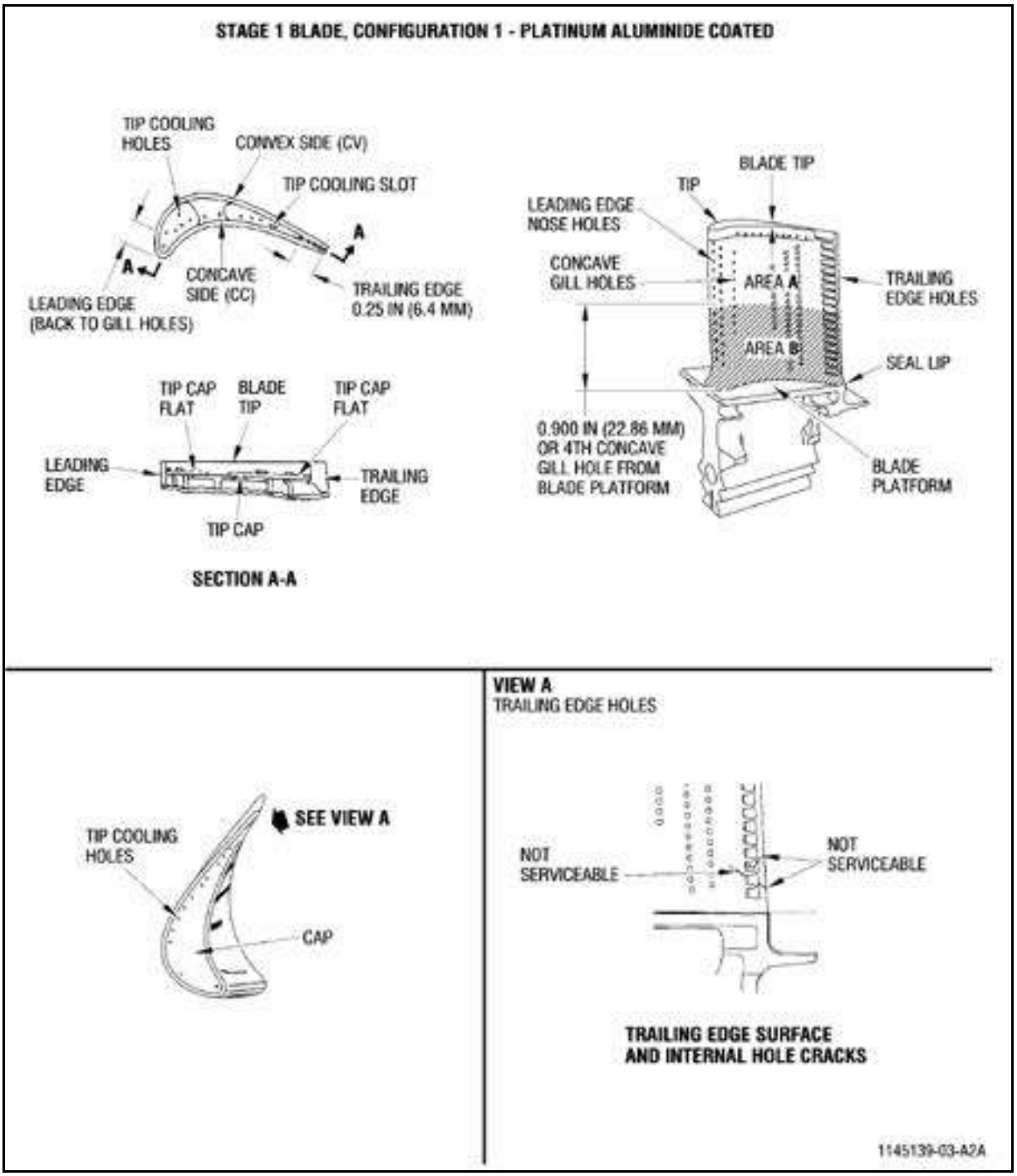



*Figure 16: HPT Stage 1 Rotor Blades Inspection Areas (Platinum Aluminide Coated Blades)*

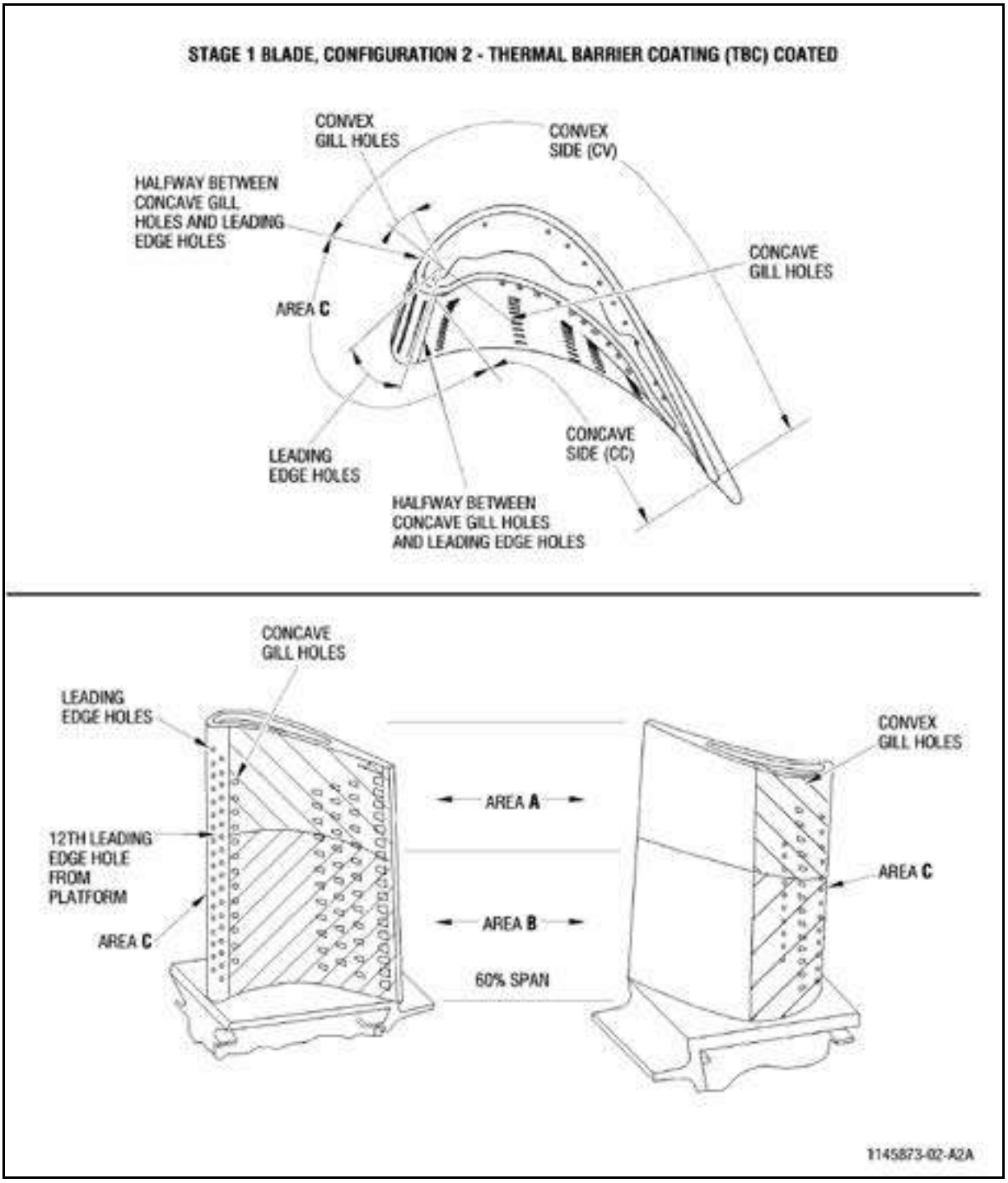



*Figure 17: HPT Stage 1 Rotor Blades Inspection Areas (TBC Coated Blades)*

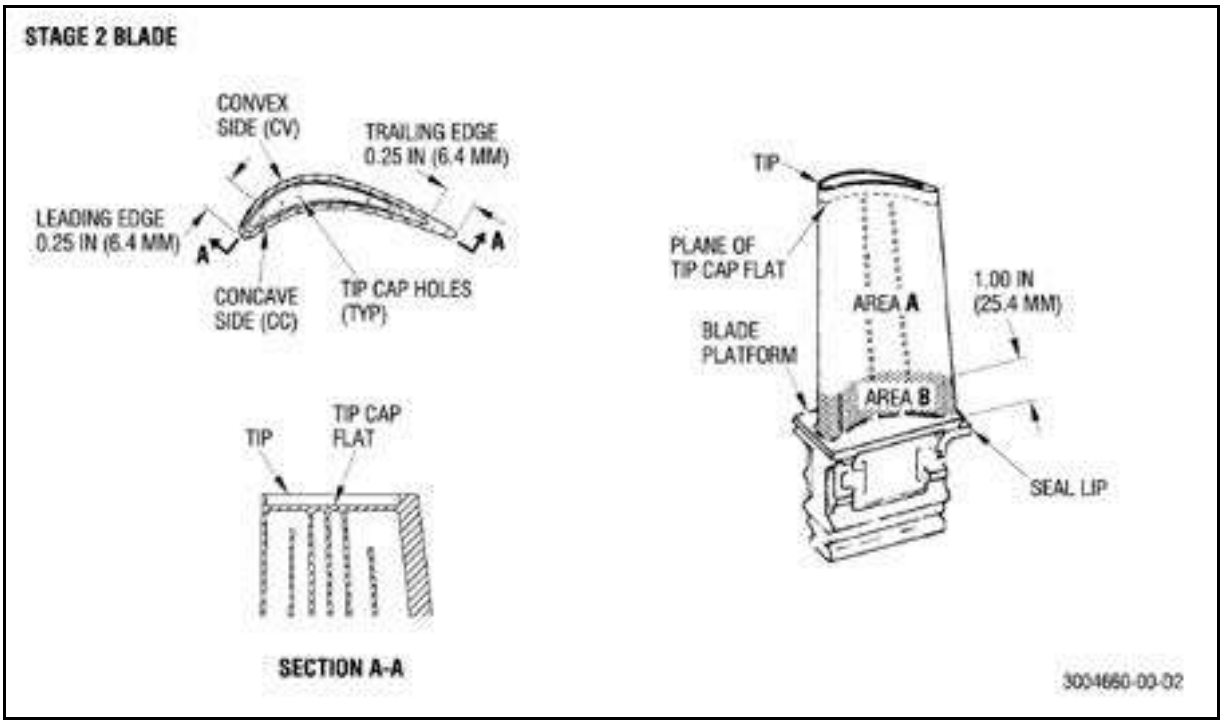



*Figure 18: HPT Stage 2 Rotor Blades Inspection Areas*

**Borescope Pictures**

| | | |
|---|---|---|
|  | |  |
| Picture 63: Stage1 Nozzle leading edge | | Picture 64: Stage1 Nozzles Leading edge |

| | | |
|---|---|---|
| ]<br> | |  |
| Picture 65: Stage1 Nozzle airfoil concave side | | Picture 66: Stage1 Nozzle airfoil concave side |
|  | |  |
| Picture 67: Stage1 Nozzles airfoil concave | | Picture 68: Stage1 Nozzle airfoil concave |

| | | |
|---|---|---|
|  | |  |
| Picture 69: Stage1 Nozzle airfoil concave side | | Picture 70: Stage1 Nozzle airfoil convex side |
|  | |  |
| Picture 71: Stage1 Nozzle trailing edge concave | | Picture 72: Stage1 Nozzle trailing edge convex |



Picture 73: Stage1 Nozzle trailing edge



Picture 74: Stage1 Nozzle trailing edge and



Picture 75: Stage1 Blades leading edge tip



Picture 76: Stage1 Blades leading edge convex



Picture 77: Stage 1 Blades leading edge base



Picture 78: Stage 1 Blades leading edge base



Picture 79: Stage 1 Blades trailing edge tip



Picture 80: Stage 1 Blades trailing edge root



Picture 81: Stage 2 Blades leading edge tip



Picture 82: Stage 2 Honeycomb seals



Picture 83: Stage 2 Blades leading edge root



Picture 84: Stage 2 Blades and stage 2 nozzles

| | | |
|---|---|---|
|  | |  |
| Picture 85: Stage 2 Blades trailing edge | | Picture 86: Stage 2 Blades trailing edge |

## 4.4 LPT Section

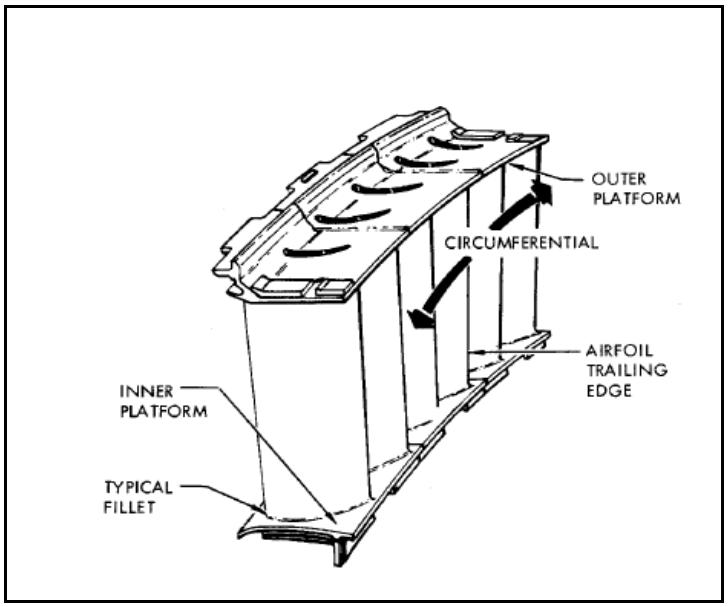



*Figure 19: Power Turbine Nozzles*

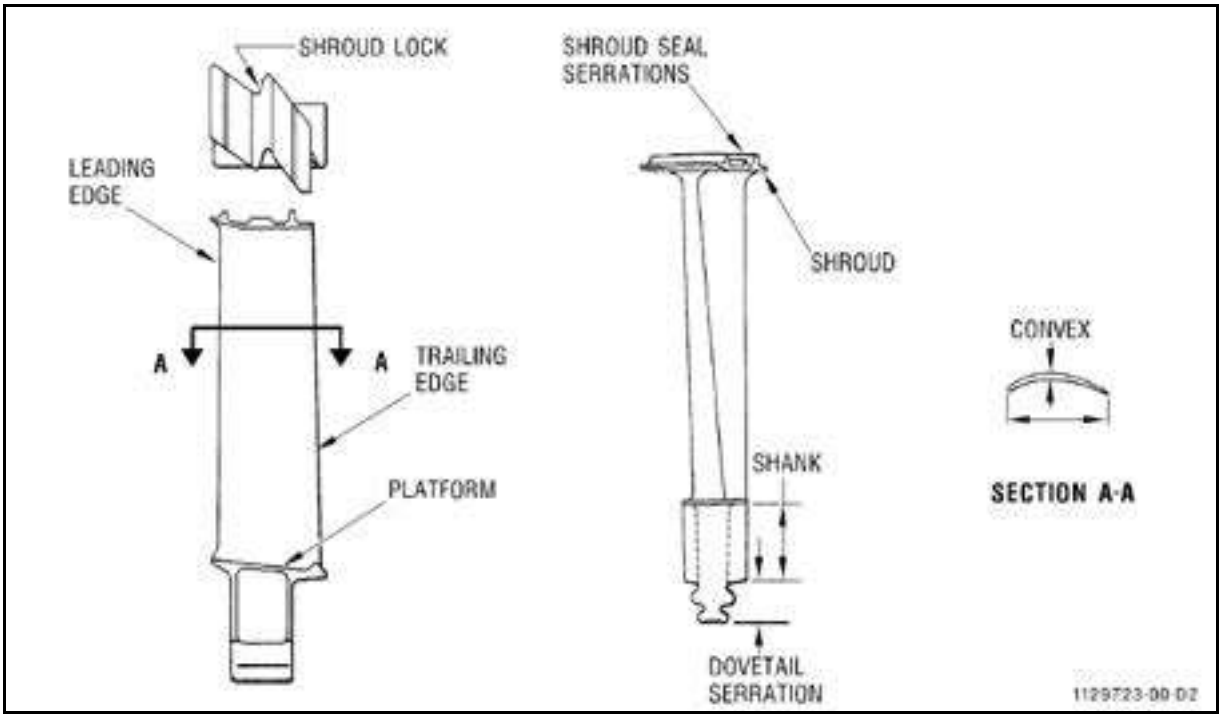



*Figure 20: Power Turbine Rotor Blades*

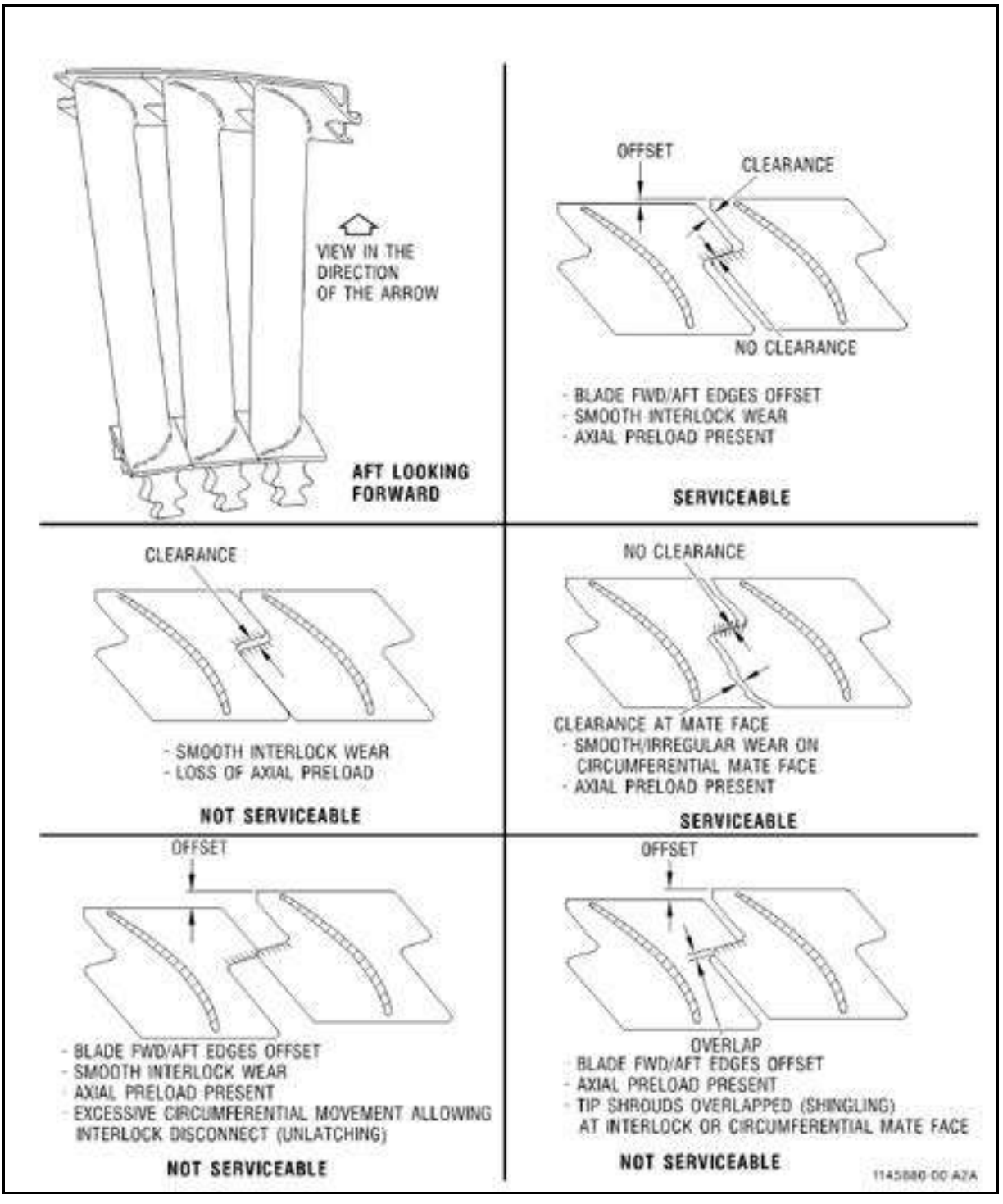



*Figure 21: LPT Rotor Blade Circumferential Inspection*

**Notes:**

The LPT stage 1 accessible nozzles and blades did not show any damage.

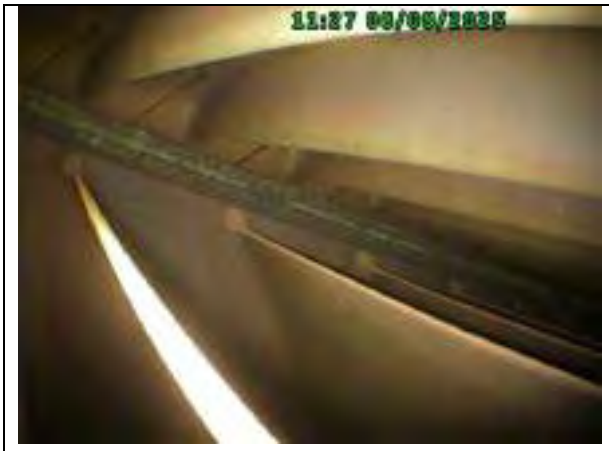
**Borescope Pictures**



Picture 87: STG1 LPT nozzles



Picture 88: TMF and LPT Inlet



Picture 89: Stage 1 Blades



Picture 90: LPT Stage 1 Blades tip interlock

# BORESCOPE INSPECTION REPORT
# TM2500 GEN. 6-7
## *7LM2500 – PK – MDWG05*

## NEW FORTRESS ENERGY

## SJTPP, PR

## PACKAGE # 7251614

## UNIT #6

| | | | |
|---|---|---|---|
| **Visit Date:** | 08/11/2025 | **Total Starts:** | 419 |
| **Engine S/N:** | 557-254 | **GG Hours:** | 13422 |
| **Power Turbine S/N:** | 557-254 | **PT Hours:** | 13422 |
| **SOM GT Field Engineer:** | Daniel Arroyo | **New Fortress Representative:** | Jonathan Rodriguez |



## TABLE OF CONTENTS


1 Conclusions and Recommendations 3

2 Outage Data 4

3 Borescope Inspection Checklist 4

4 Borescope Inspection Record 6

4.1 Compressor Section

4.2 Combustor and 1St Stage Nozzle Section

4.3 Turbine Section

4.4 LPT Section

## 1. Conclusions and Recommendations

**Purpose of visit:**

The purpose of this visit was to perform a borescope inspection of the Engine in accordance with GEK105054, WP 406 00.

1.1 The HPC is serviceable according to GEK105054, WP 406 00 Table 4. No damages were found.

1.2 The Combustor section is serviceable according to GEK105054, WP40600 Table 7.

1.3 The High Pressure Turbine section is NOT serviceable according to GEK105054, WP406 00 Table 8. The HPT 1st stage nozzles (all nozzles affected) showed excessive corrosion, parent metal deformation in both concave and convex airfoil sides. The coolilng passasges are exposed in some nozzles. The TE showed sevre burnt distress.
It's recommended to minimize or to avoid the operation of this engine burning Diesel fuel until the Hot Section can be repaired.

1.4 The LPT is serviceable according to GEK105054, WP40600.

## 2. Outage Data

### Engine Data

| | | | | | |
|---|---|---|---|---|---|
| **ESN:** | 557-254 | **Engine Fired Hours:** | 13422 | **Package Hours:** | 13422 |
| **Model:** | 7LM2500-PK-MDWG05 | **Engine Fired starts:** | 419 | **Package Fired Starts:** | 419 |

**MAINTENANCE DATA**

| WP, SB, SL, PB, PL Performed | GEK105054, REV 11 | Date completed | Comments |
|---|---|---|---|
| WP 406 00 | Borescope Inspection | 11AUG25 | Not Serviceable |

**Parts Data**

| Description | PN Removed | SN Removed | Qty | Disposition | PN Installed | SN Installed |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

## 3. Borescope Inspection Checklist

**Date unit out of operation:** 08/11/2025
**Date unit into operation:** 08/11/2025
**Last inspection date:**

**Type of Fuel:** Natural Gas / Diesel
**Type of outage:** Scheduled BSI

**Type of NOx suppression:** Water Injection

**Inspection of gas turbine:**

| WATERWASH: | HIGH PRESSURE COMPRESSOR: |
|---|---|
| ☒ PERFORMED WATER WASH | ☒ HPC BORESCOPE INSPECTION |
| **COMBUSTOR:** | **HIGH PRESSURE TURBINE** |
| ☒ COMBUSTOR BORESCOPE INSPECTION | ☒ HPT STAGE 1 & 2 NOZZLE BORESCOPE INSPECTION |
| | ☒ HPT BLADE BORESCOPE INSPECTION |
| **LOW PRESSURE TURBINE:** | |
| ☒ LPT BORESCOPE INSPECTION | |

☒ ***Please verify all borescope plugs have been reinstalled***

## 4. Borescope Inspection Record

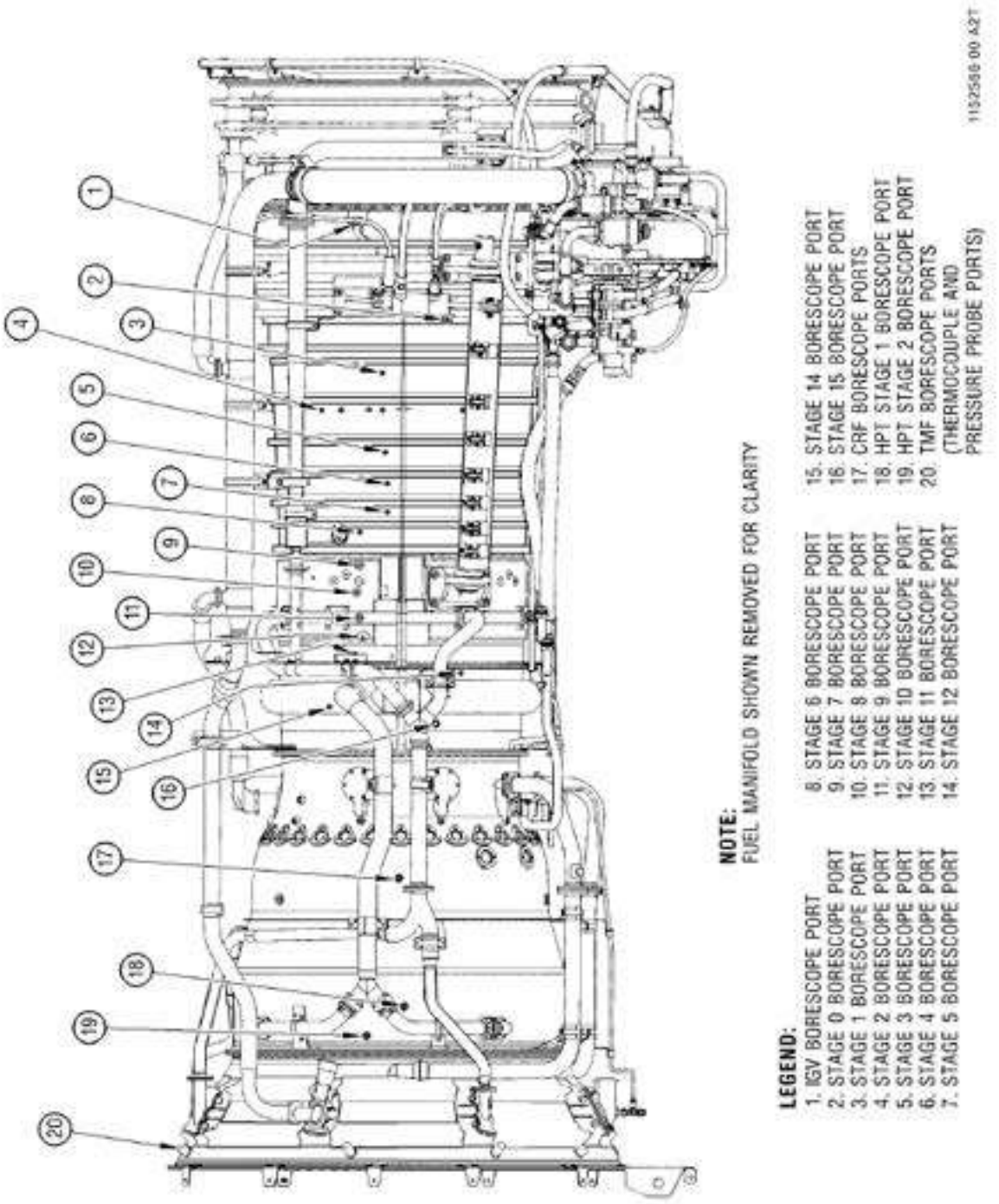



*Figure 1: Position of Borescope Inspection Ports.*

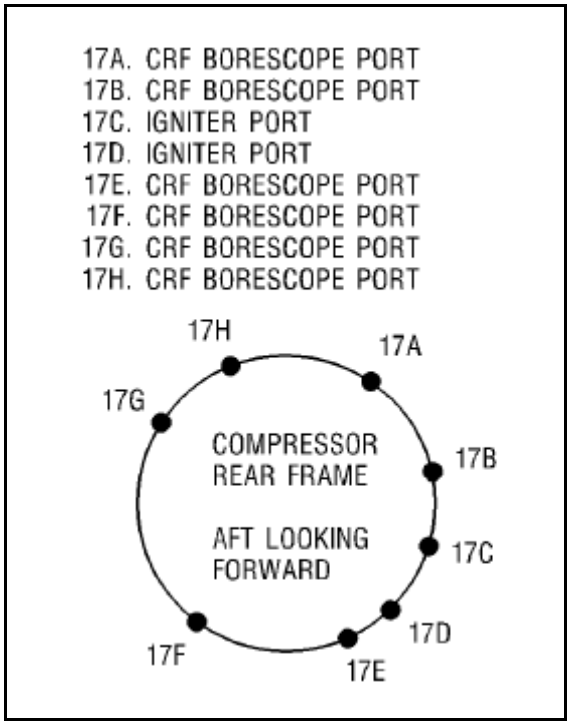



*Figure 2: Position of Borescope Inspection Ports.*

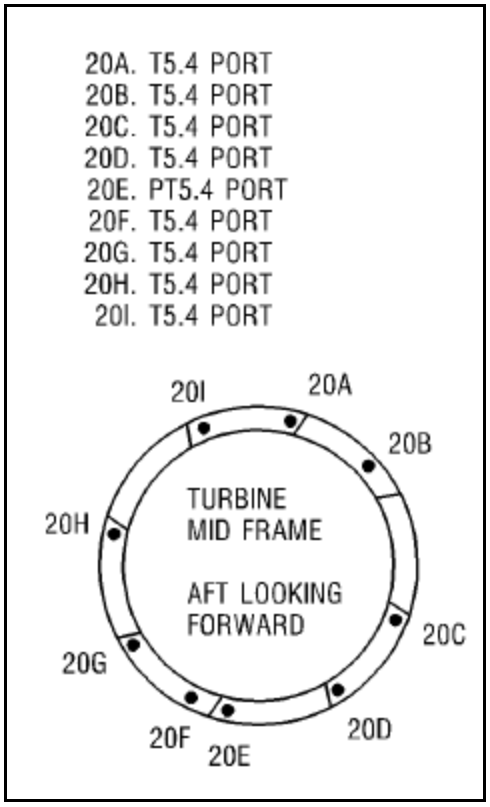



*Figure 3: Position of Borescope Inspection Ports.*

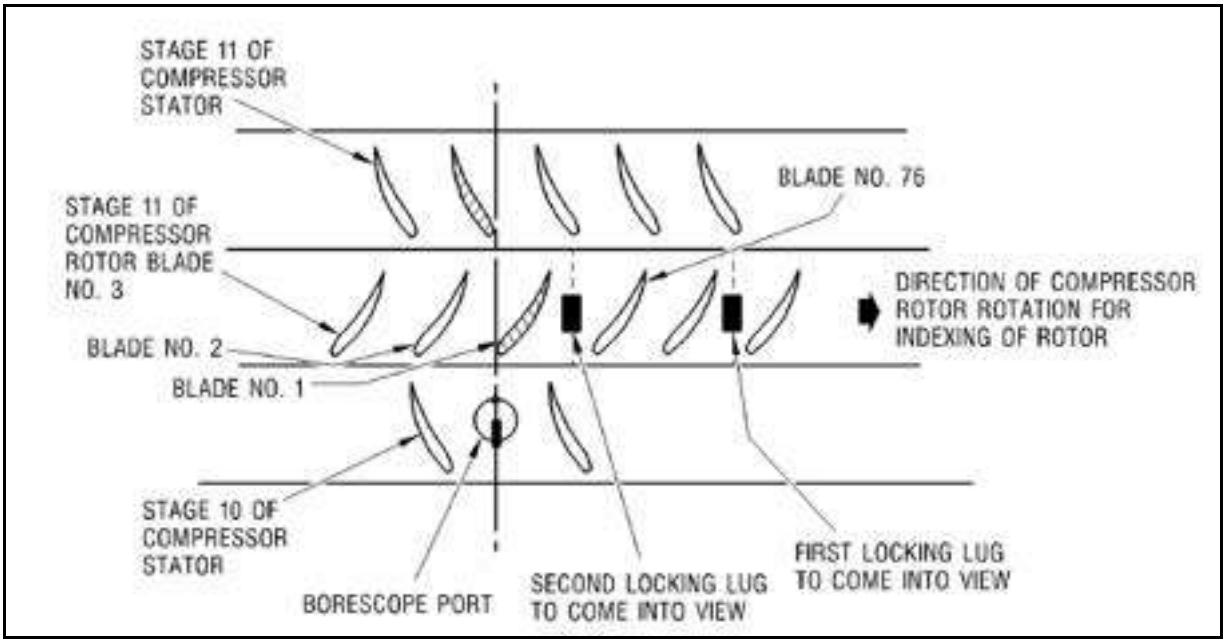



*Figure 4: Zero indexing of HPC rotor and HPT rotor*

## 4.1 Compressor Section

| Port | T.E. | L.E. | blades | Remarks: | photo no: |
|---|---|---|---|---|---|
| 1 | IGV | | | | 1 |
| 1 | | 0 | 36 | | 2,3 |
| 2 | 0 | | 36 | | 4 |
| 2 | | 1 | 26 | | 6,7 |
| 3 | 1 | | 26 | | 9,10 |
| 3 | | 2 | 26 | | 11,12 |
| 4 | 2 | | 26 | | 13 |
| 4 | | 3 | 42 | | 14 |
| 5 | 3 | | 42 | | 15,16 |
| 5 | | 4 | 45 | | 17,18 |
| 6 | 4 | | 45 | | 19, 20 |
| 6 | | 5 | 48 | | 21, 22 |
| 7 | 5 | | 48 | | 23, 24 |
| 7 | | 6 | 54 | | 25, 26 |
| 8 | 6 | | 54 | Blades contacting tip | |
| 8 | | 7 | 56 | Blades contacting tip | |
| 9 | 7 | | 56 | | 27 |
| 9 | | 8 | 64 | | 28 |
| 10 | 8 | | 64 | | 29,30 |
| 10 | | 9 | 66 | | 31 |
| 11 | 9 | | 66 | | 32, 33 |
| 11 | | 10 | 66 | | 35, 36 |
| 12 | 10 | | 66 | | 37, 38 |
| 12 | | 11 | 76 | | 39, 40 |
| 13 | 11 | | 76 | | 41, 42 |
| 13 | | 12 | 76 | | 43, 44 |
| 14 | 12 | | 76 | | 45, 46 |
| 14 | | 13 | 76 | | 47, 48 |
| 15 | 14 | | 76 | Inside bleed manifold | |
| 15 | | 15 | 76 | Inside bleed manifold | |
| 16 | 15 | | 76 | | 49, 50 |
| 16 | | 16 | 76 | | 51, 52 |

**Notes:**

The HPC section is Serviceable.



Picture 1. CFF & IGV



Picture 2. Stage 0 Leading edge tip



Picture 3. Stage 0 Leading edge base



Picture 4. Stage 0 Trailing edge tip



Picture 5. Stage 0 Weep hole



Picture 6. Stage 1 Leading edge tip



Picture 7. Stage 1 Leading edge base



Picture 8. Stage 1 weep hole



Picture 9. Stage 1 Trailing edge tip



Picture 10. Stage 1 Trailing base



Picture 11. Stage 2 Leading edge tip



Picture12. Stage 2 Leading edge base



Picture 13. Stage 2 Trailing edge tip



Picture 14. Stage 3 Leading edge tip



Picture 15. Stage 3 Trailing edge tip



Picture 16. Stage 3 Trailing edge base



Picture 17. Stage 4 Leading edge tip



Picture 18. Stage 4 Leading edge base



Picture 19. Stage 4 Trailing edge tip



Picture 20. Stage 4 Trailing edge base



Picture 21. Stage 5 Leading edge tip



Picture 22. Stage 5 Leading edge base



Picture 23. Stage 5 Trailing edge tip



Picture 24. Stage 5 Trailing edge base



Picture 25. Stage 6 Leading edge tip



Picture 26. Stage 6 Leading edge base



Picture 27. Stage 7 Trailing edge tip



Picture 28. Stage 8 Leading edge tip



Picture 29. Stage 8 Trailing edge tip



Picture 30. Stage 8 Trailing edge base



Picture 31. Stage 9 Leading edge



Picture 32. Stage 9 Trailing edge tip



Picture 33. Stage 9 Trailing base



Picture 34. Stage 9 Bleed manifold



Picture 35. Stage 10 Leading edge tip



Picture 36. Stage 10 Leading edge base



Picture 37. Stage 10 Trailing edge tip



Picture 38. Stage 10 Trailing edge base



Picture 39. Stage 11 Leading edge tip



Picture 40. Stage 11 Leading edge base



Picture 41. Stage 11 Trailing edge tip



Picture 42. Stage 11 Trailing edge base



Picture 43. Stage 12 Leading edge tip



Picture 44. Stage 12 Leading edge base



Picture 45. Stage 12 Trailing edge tip



Picture 46. Stage 12 Trailing edge base



Picture 47. Stage 13 Leading edge tip



Picture 48. Stage 13 Leading edge base



Picture 49. Stage 15 Trailing edge tip



Picture 50. Stage 15 Leading edge base



Picture 51. Stage 16 Leading edge tip



Picture 52. OGV'S

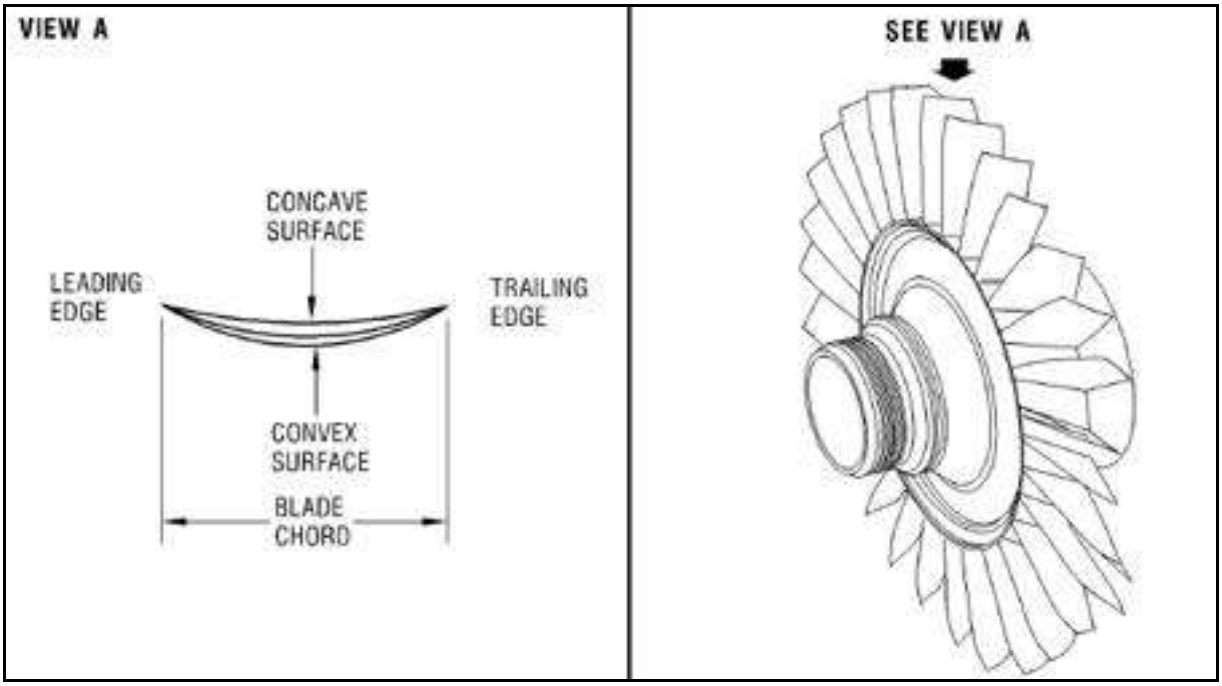



*Figure 5: HPC stage 0 BLISK*

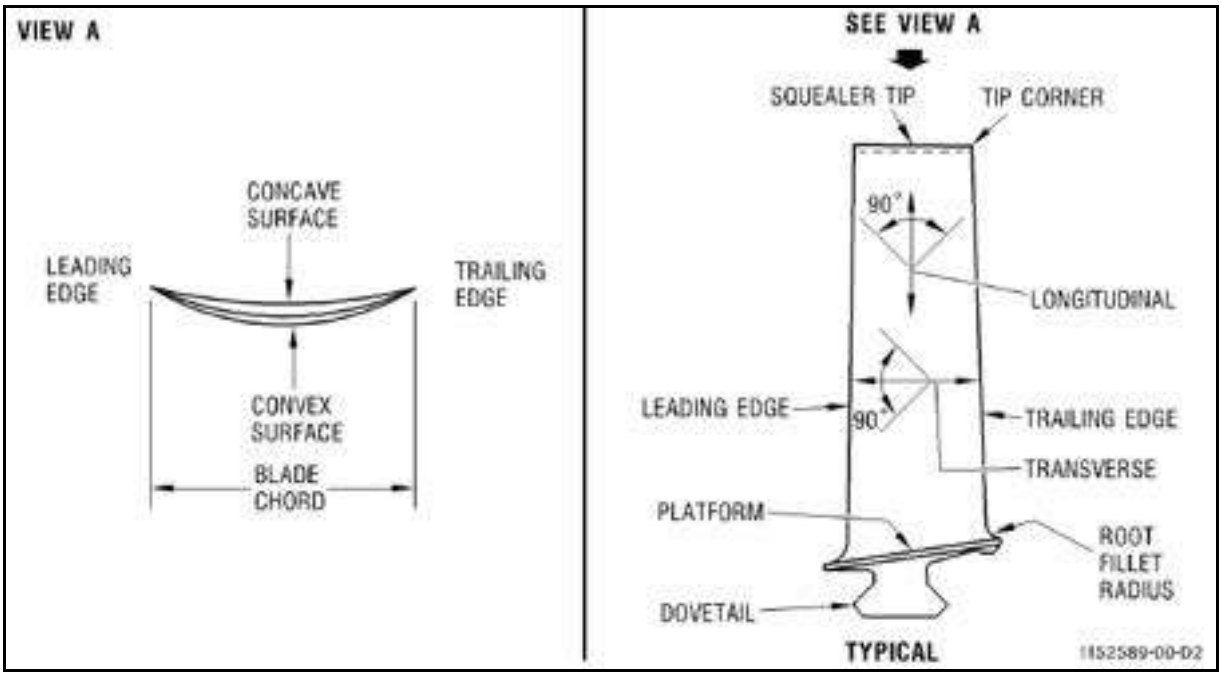



*Figure 6: Compressor Rotor Blades*

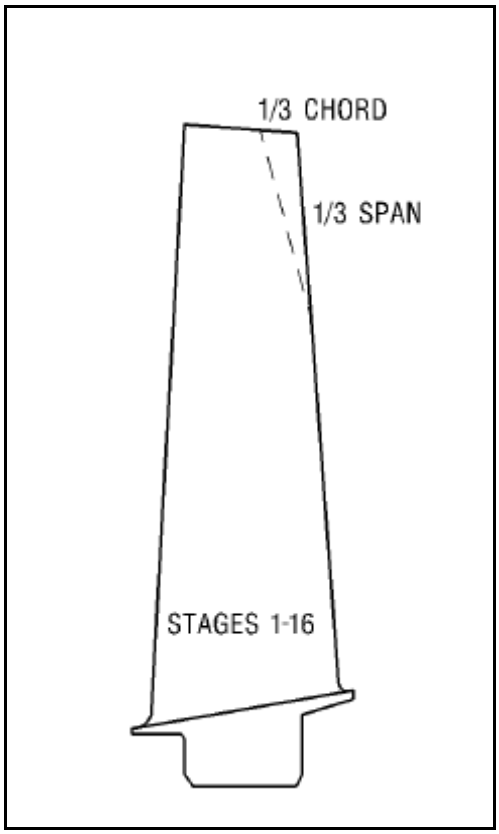



*Figure 7: Tip Trailing Edge Inspection*

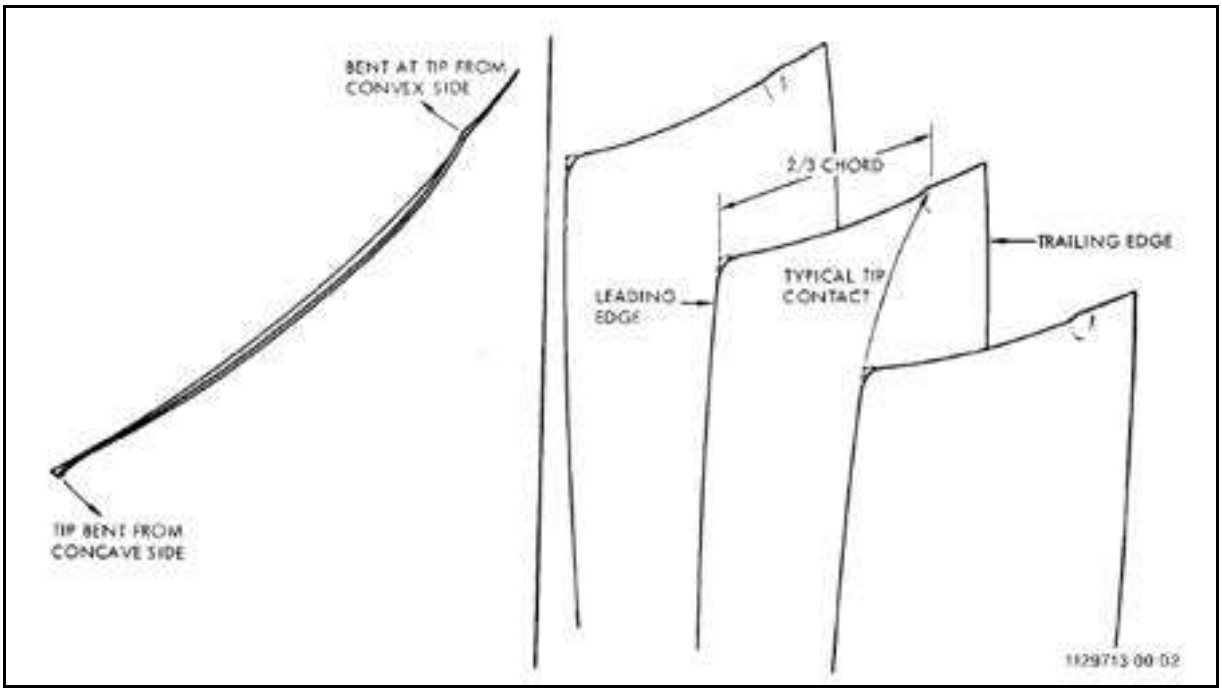


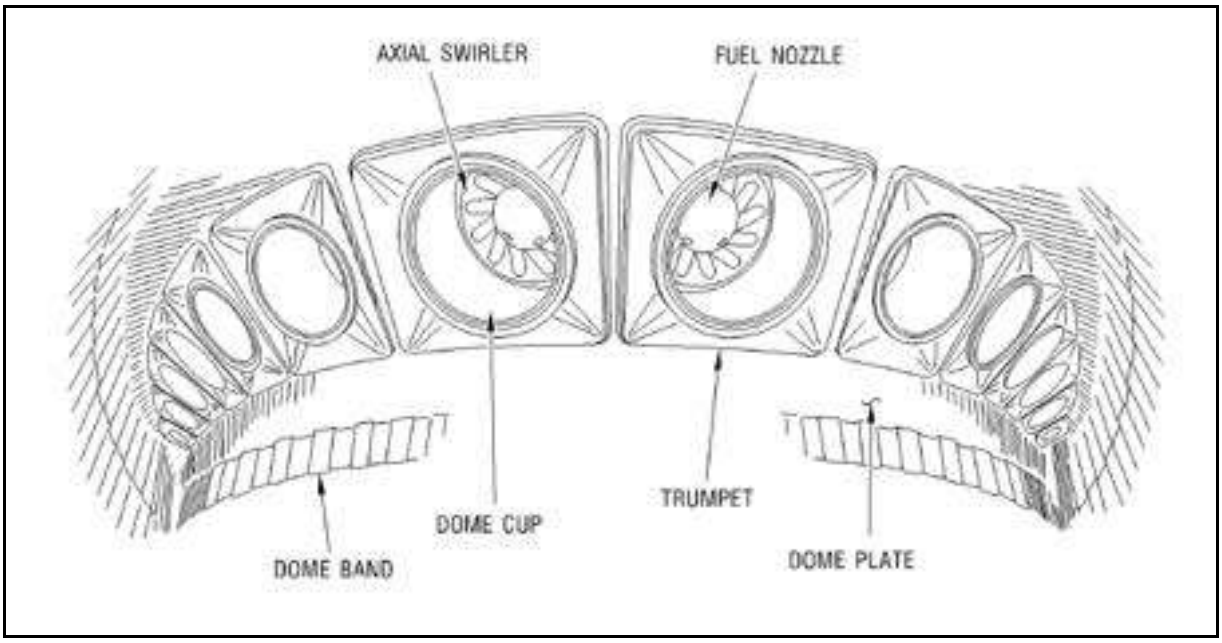

*Figure 8: Tip Clanging Contact (HPCR stage 3 through 6)*

## 4.2 Combustor and 1St Stage Nozzle Section

| Port | Condition observed | Photo no: |
|---|---|---|
| **17A** | | |
| **17B** | | |
| **17C** | | |
| **17D** | **See below notes.** | |
| **17E** | | |
| **17F** | | |
| **17G** | | |
| **17H** | | |
| **17** | 1st stage nozzle (leading edge): | |

**Notes:**

The Combustor section is serviceable according to GEK105054 Volume II WP40600 Table 7.



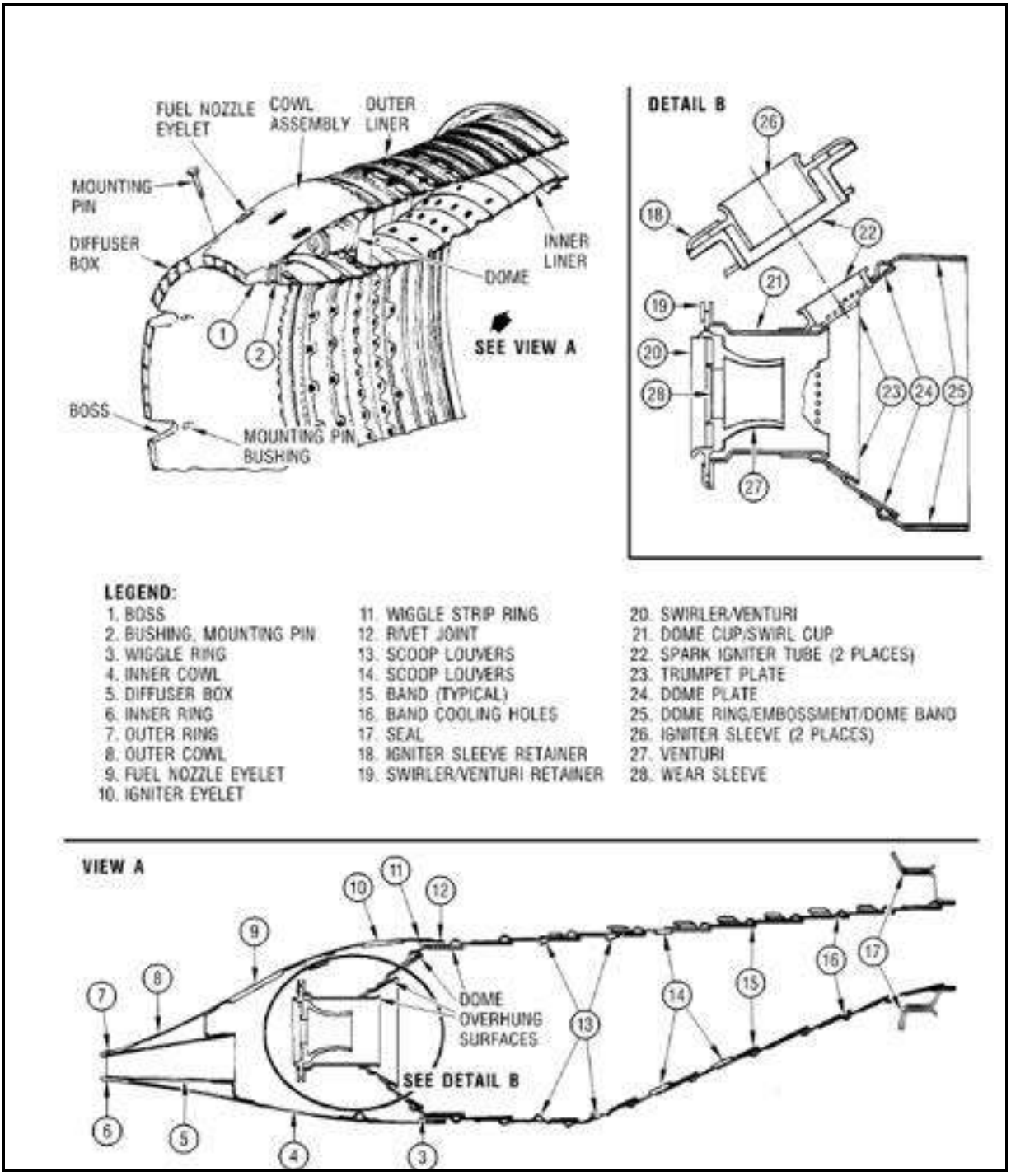



*Figure 9: SAC Combustor Inspection*

*Figure 10: SAC Combustor Inspection*

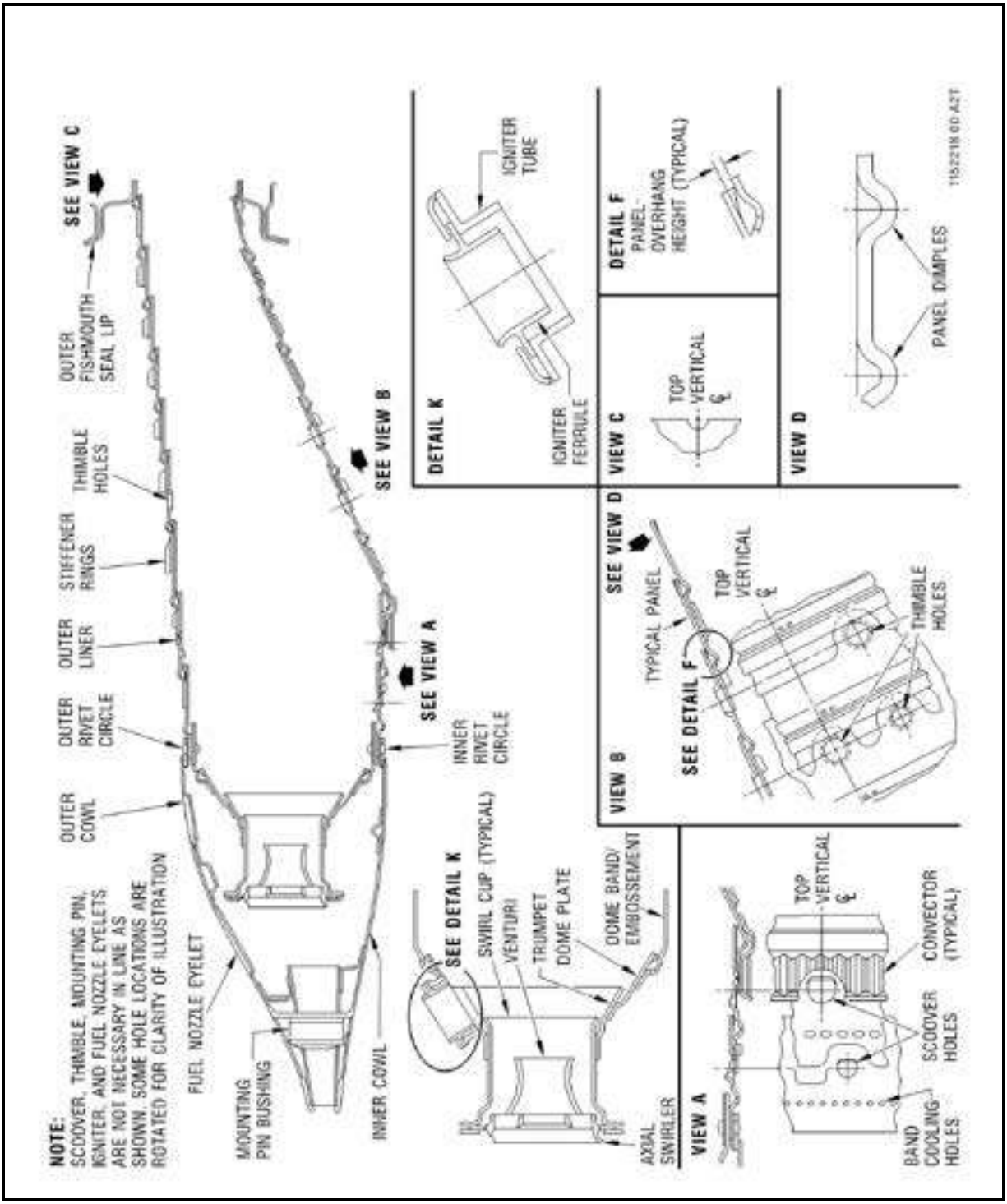



*Figure 11: SAC Combustor Inspection*

**Borescope Pictures**



Picture 53. Upper igniter ferrule



Picture 54. Lower igniter ferrule



Picture 55. Outer rivets band



Picture 56. Inner rivets band



Picture 57. Combustor liners



Picture 58. Combustor liners

| | | |
|---|---|---|
|  | |  |
| Picture 59. Combustor liner | | Picture 60. Fuel Nozzle tip |

| | | |
|---|---|---|
|  | |  |
| Picture 61. Combustor liners and HPT nozzle interference | | Picture 62. . Combustor liners and HPT nozzle interference |

## 4.3 Turbine Section

| | turbine stage | | | | |
|---|---|---|---|---|---|
| **Port** | **L.E.** | **T.E.** | **blades** | **Remarks:** | **photo no:** |
| **18** | **1** | | **88** | | |
| **19** | | **1** | **88** | **See below notes.** | |
| **19** | **2** | | **90** | | |
| **20** | | **2** | | | |

**Notes:**

The High Pressure Turbine section is NOT serviceable according to GEK105054 Volume II WP40600 Table 8 due to HPT stage one nozzles condition.

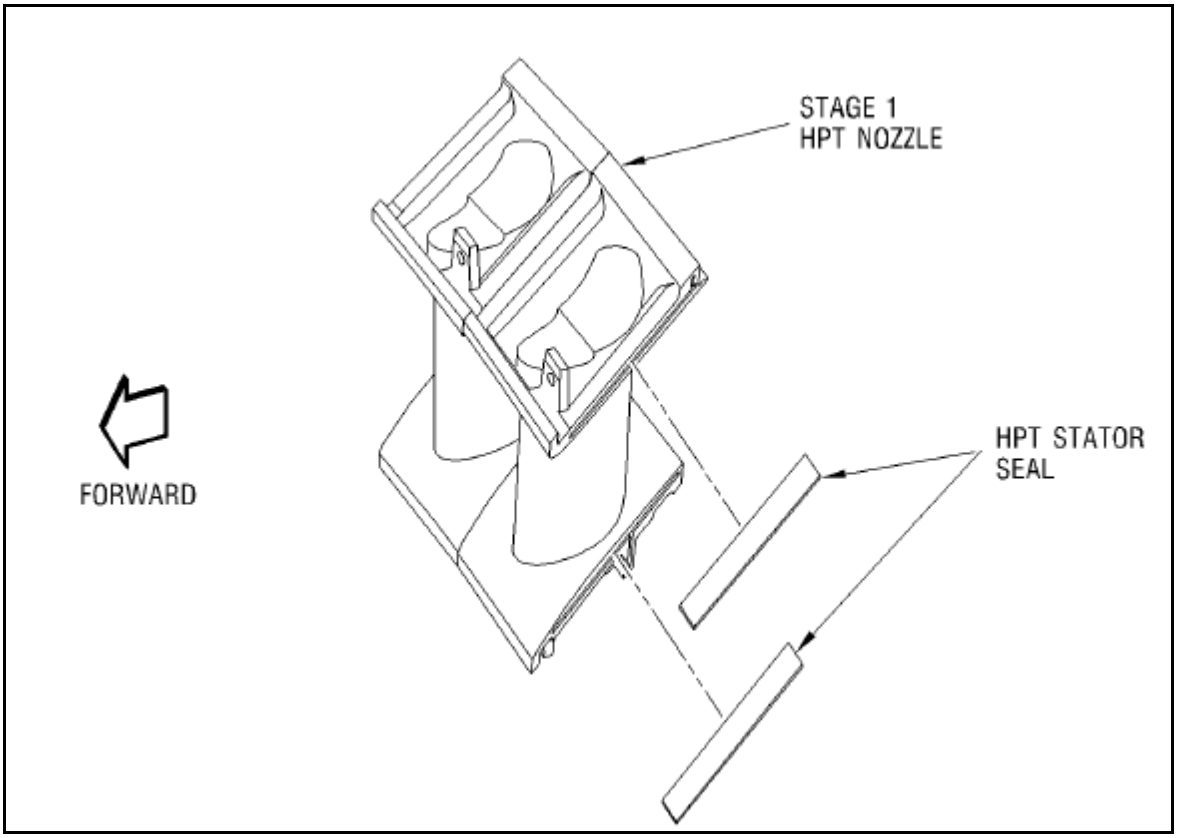



*Figure 12: Stage 1 HPT Nozzle Seal Displacement*

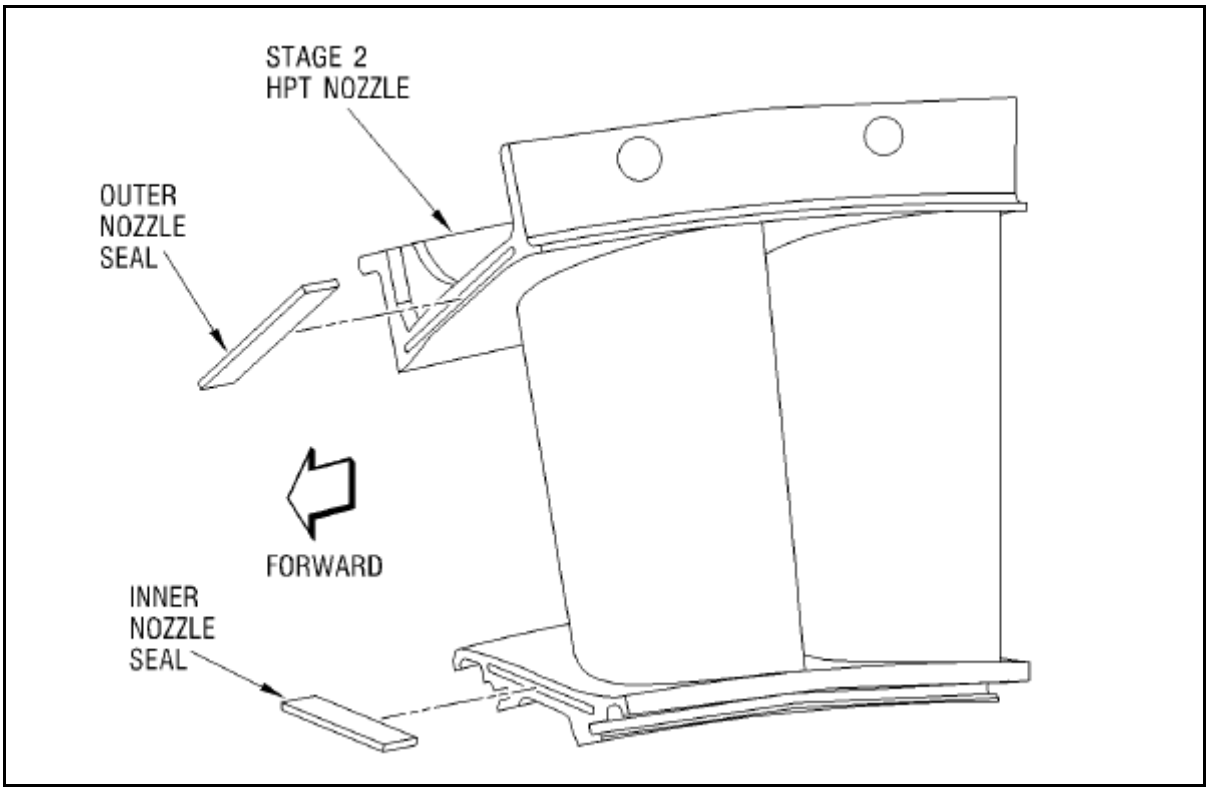



*Figure 13: Stage 2 HPT Nozzle Seal Displacement*

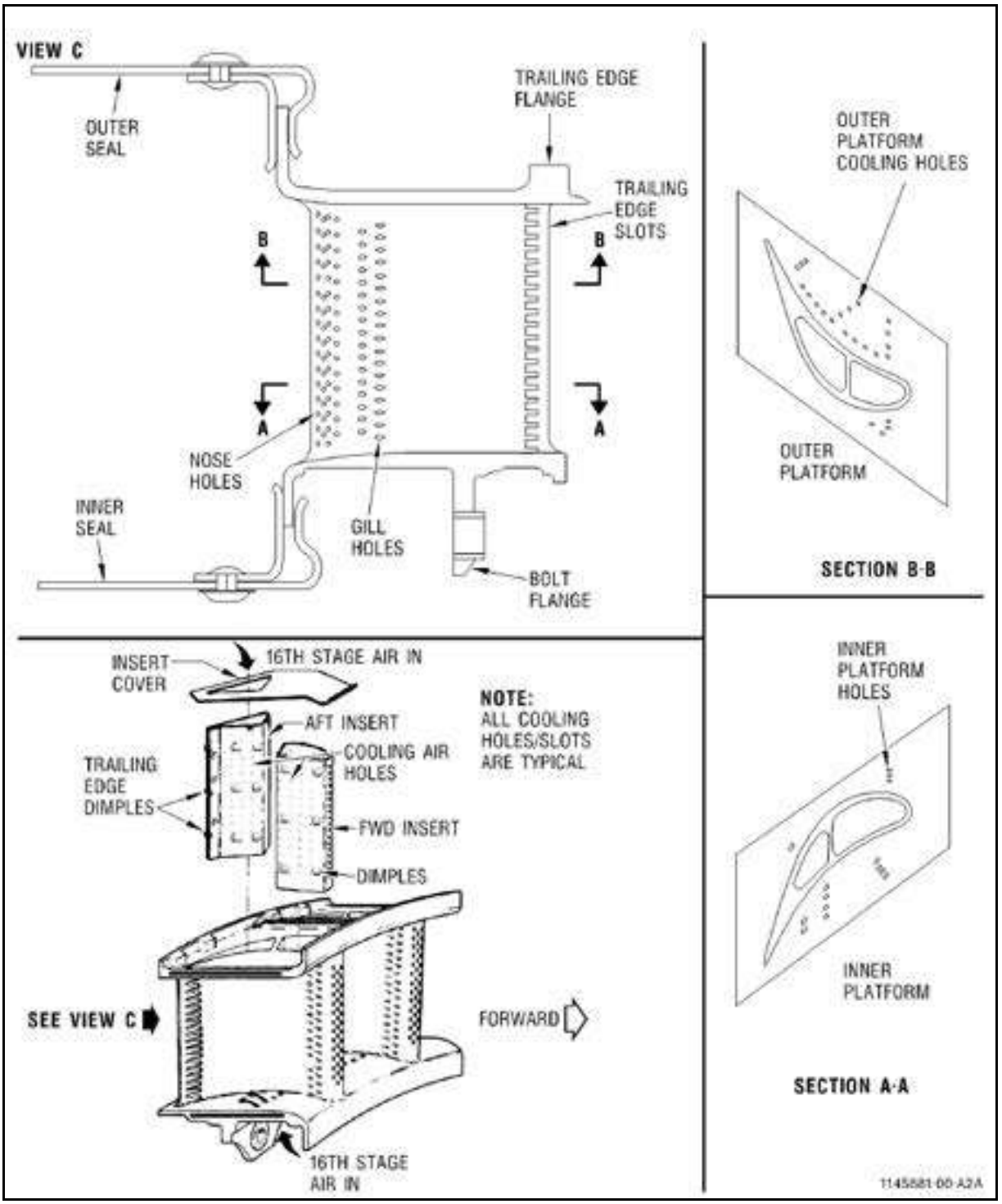



*Figure 14: HPT Stage 1 Nozzle*

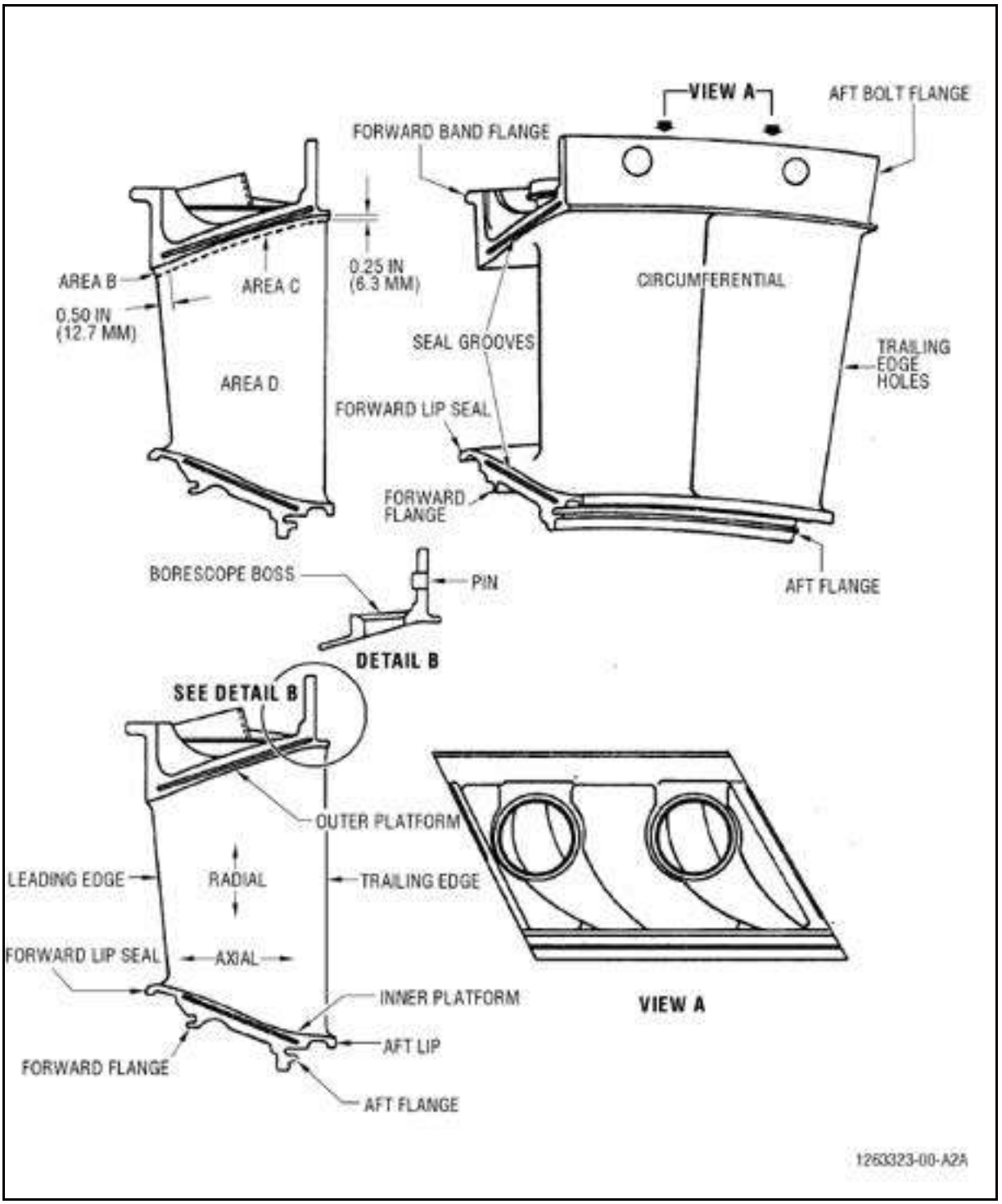



*Figure 15: HPT Stage 2 Nozzle*

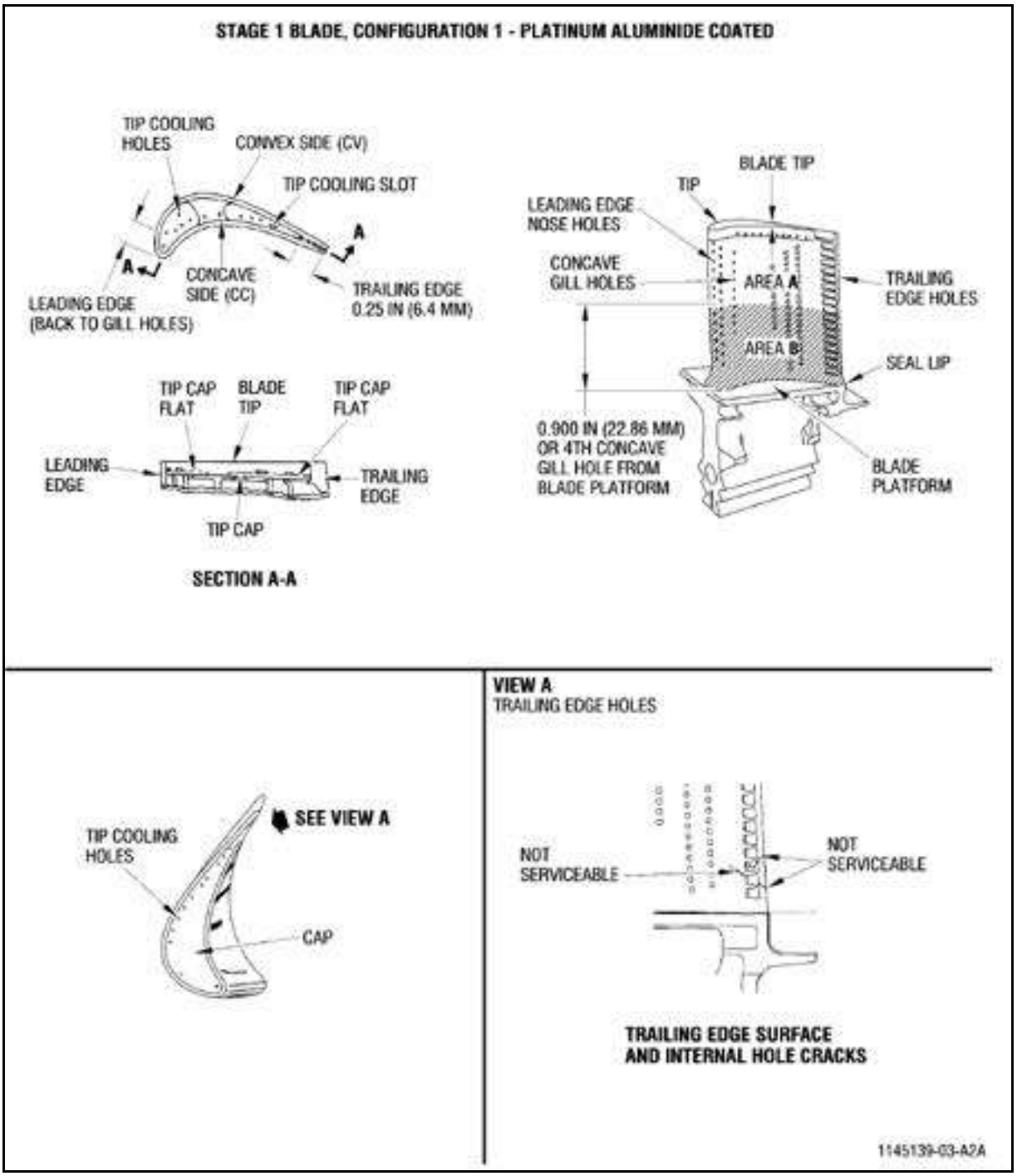



*Figure 16: HPT Stage 1 Rotor Blades Inspection Areas (Platinum Aluminide Coated Blades)*

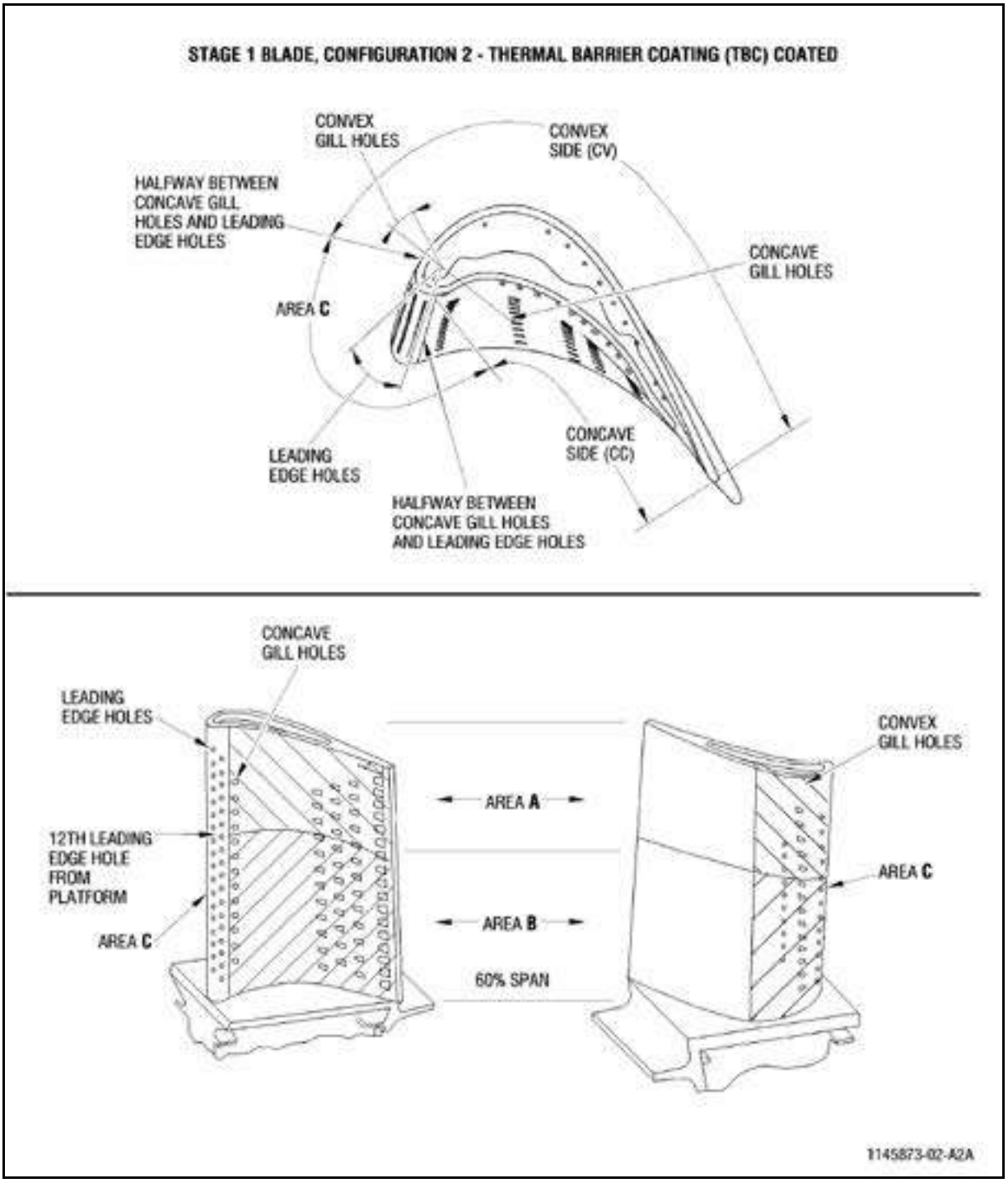



*Figure 17: HPT Stage 1 Rotor Blades Inspection Areas (TBC Coated Blades)*

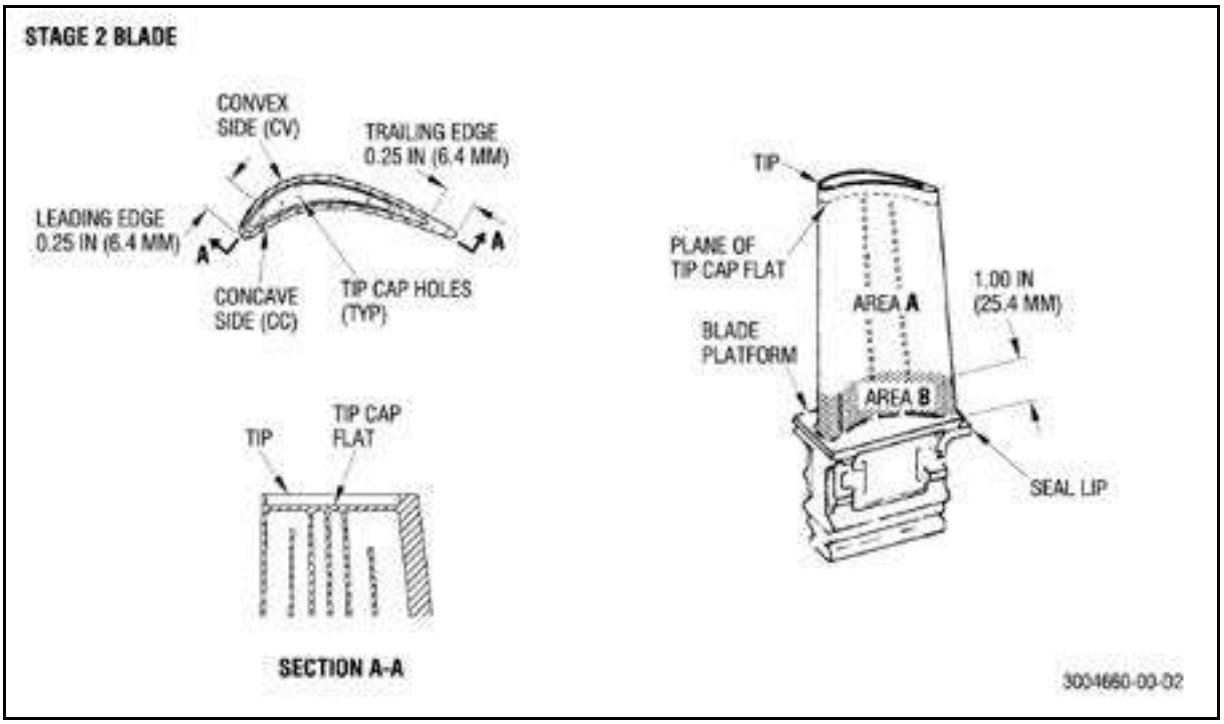



*Figure 18: HPT Stage 2 Rotor Blades Inspection Areas*

**Borescope Pictures**



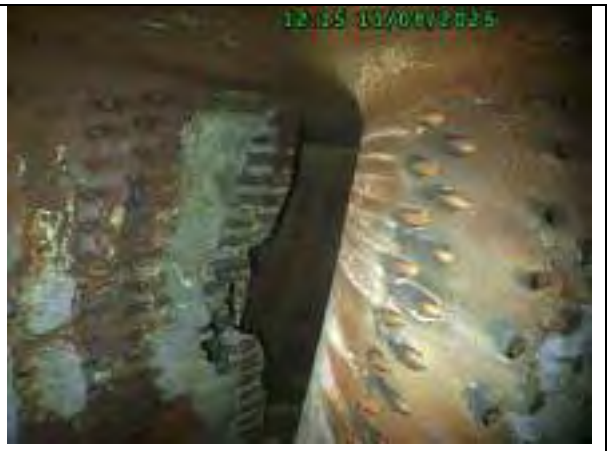

Picture 63: Stage1 Nozzle leading edge




Picture 64: Stage1 Nozzles Leading edge




Picture 65: Stage1 Nozzle airfoil concave side




Picture 66: Stage1 Nozzle airfoil concave side




Picture 67: Stage1 Nozzles airfoil concave



Picture 68: Stage1 Nozzle airfoil concave



Picture 69: Stage1 Nozzle airfoil concave side



Picture 70: Stage1 Nozzle airfoil convex side



Picture 71: Stage1 Nozzle trailing edge concave



Picture 72: Stage1 Nozzle trailing edge convex



Picture 73: Stage1 Nozzle trailing edge



Picture 74: Stage1 Nozzle trailing edge and



Picture 75: Stage1 Blades leading edge tip



Picture 76: Stage1 Blades leading edge convex



Picture 77: Stage 1 Blades leading edge base



Picture 78: Stage 1 Blades leading edge base



Picture 79: Stage 1 Blades trailing edge tip



Picture 80: Stage 1 Blades trailing edge root



Picture 81: Stage 2 Blades leading edge tip



Picture 82: Stage 2 Honeycomb seals



Picture 83: Stage 2 Blades leading edge root



Picture 84: Stage 2 Blades and stage 2 nozzles



Picture 85: Stage 2 Blades trailing edge



Picture 86: Stage 2 Blades trailing edge

## 4.4 LPT Section

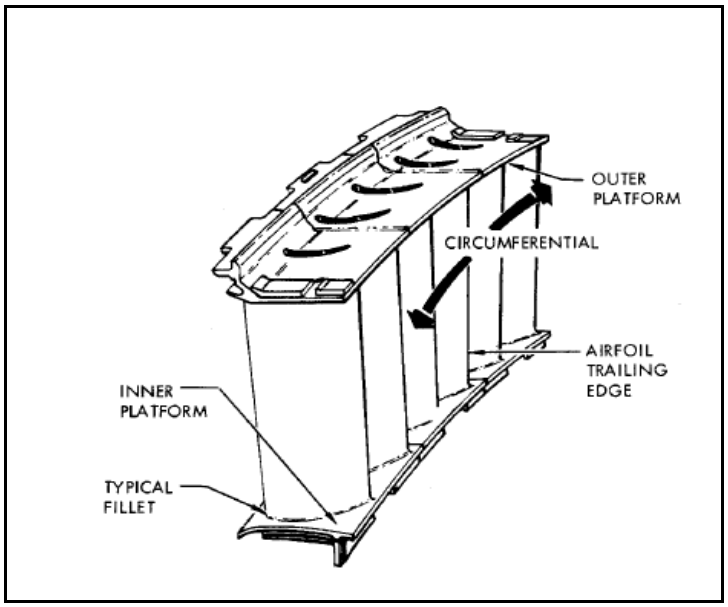



*Figure 19: Power Turbine Nozzles*

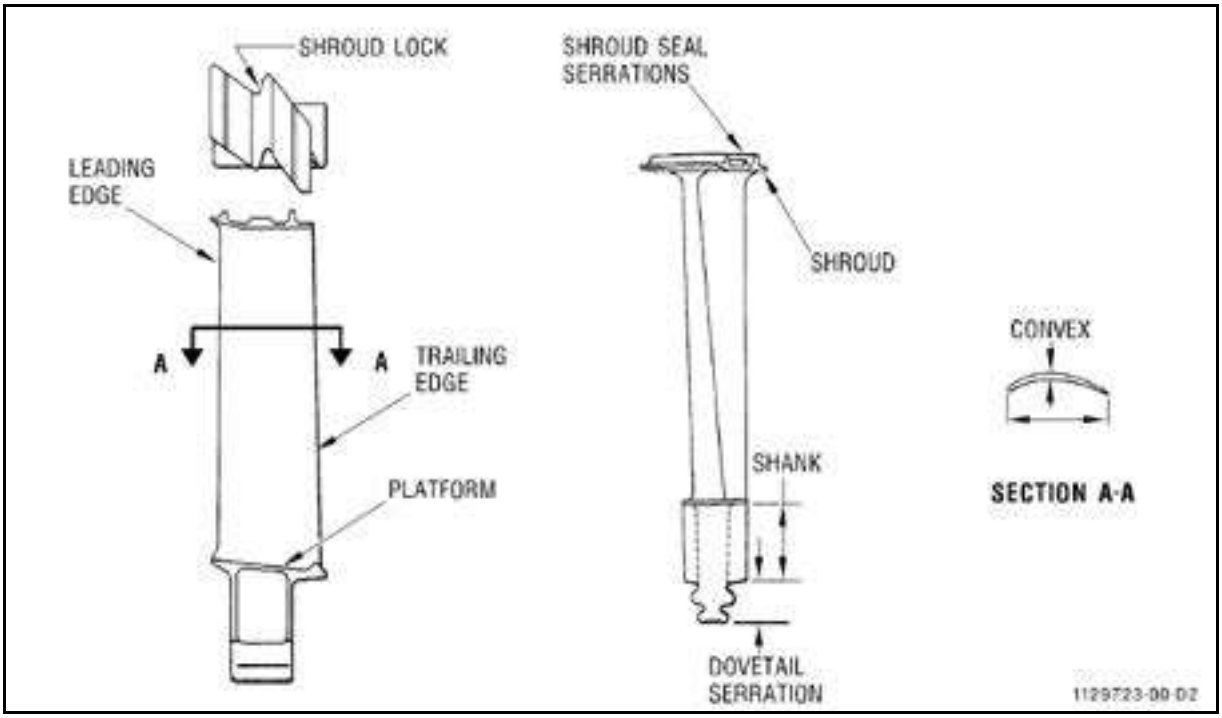



*Figure 20: Power Turbine Rotor Blades*

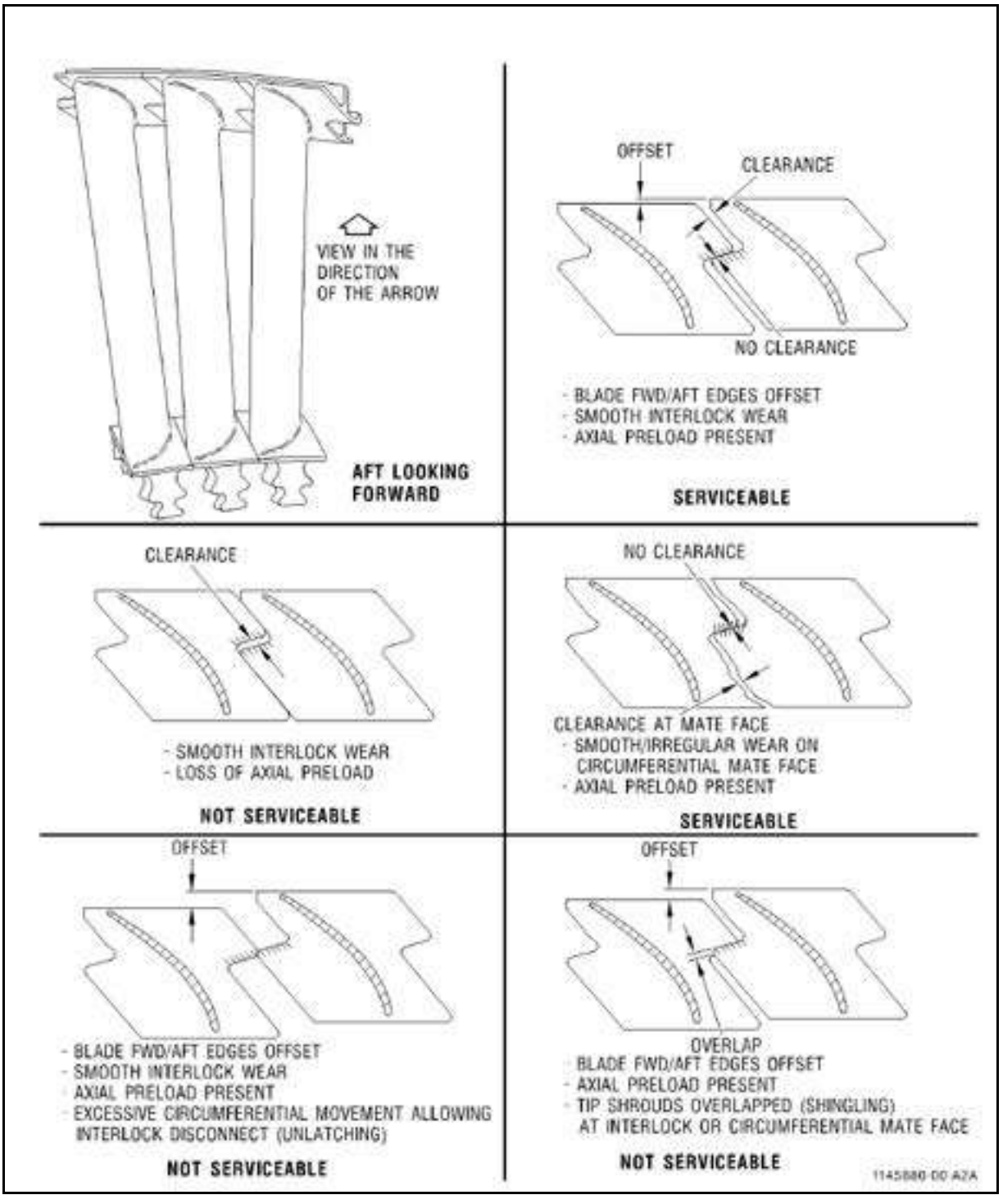



*Figure 21: LPT Rotor Blade Circumferential Inspection*

**Notes:**

The LPT stage 1 accessible nozzles and blades did not show any damage.

**Borescope Pictures**



Picture 87: STG1 LPT nozzles



Picture 88: TMF and LPT Inlet



Picture 89: Stage 1 Blades



Picture 90: LPT Stage 1 Blades tip interlock

# BORESCOPE INSPECTION REPORT
# TM2500 GEN. 6-7
## *7LM2500 – PK – MDWG05*

## NEW FORTRESS ENERGY

## SJTPP, PR

## PACKAGE # 7250394

## UNIT #7

| | | | |
|---|---|---|---|
| **Visit Date:** | 08/12/2025 | **Total Starts:** | 373 |
| **Engine S/N:** | 557-230 | **GG Hours:** | 13736 |
| **Power Turbine S/N:** | 557-230 | **PT Hours:** | 13736 |
| **SOM GT Field Engineer:** | Daniel Arroyo | **New Fortress Representative:** | Jonathan Rodriguez |



## TABLE OF CONTENTS


1 Conclusions and Recommendations 3

2 Outage Data 4

3 Borescope Inspection Checklist 5

4 Borescope Inspection Record 6

4.1 Compressor Section

4.2 Combustor and 1St Stage Nozzle Section

4.3 Turbine Section

4.4 LPT Section

## 1. Conclusions and Recommendations

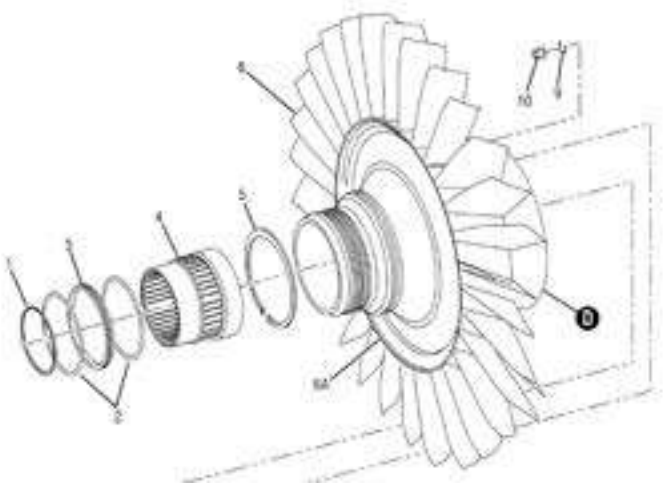
**Purpose of visit:**

The purpose of this visit was to perform a borescope inspection of the Engine in accordance with GEK105054, WP 406 00.

1.1 The HPC is serviceable according to GEK105054, WP 406 00 Table 4. No damages were found.

**Please note the following (Refer to Picture 8):**

During the inspection of the rotor weep holes, it was detected a metallic pice that seems to be loose inside the rotor hub. This piece could be part of the Encased Plain Seal (Item 1) or part of the Retaining Ring (Item 5) showed in the IPB Figure 9 " HPC Rotor Assembly Breakdown". Any of the parts mentioned could have broken, and the piece seen in the weep hole could be a detached fragment.
Regardless of the consequences that may arise from the breakage of the aforementioned parts, there is a risk that a fragment may be propelled into the HPC air path causing a DOD.



1.2 The Combustor section is serviceable according to GEK105054, WP40600 Table 7.

1.3 The High Pressure Turbine section is serviceable according to GEK105054, WP406 00 Table 8.

1.4 The LPT is serviceable according to GEK105054, WP40600.

## 2. Outage Data

### Engine Data

| ESN: | 557-230 | Engine Fired Hours: | 13736 | Package Hours: | 13736 |
|---|---|---|---|---|---|
| Model: | 7LM2500-PK-MDWG05 | Engine Fired starts: | 373 | Package Fired Starts: | 373 |

**MAINTENANCE DATA**

| WP, SB, SL, PB, PL Performed | GEK105054, REV 11 | Date completed | Comments |
|---|---|---|---|
| WP 406 00 | Borescope Inspection | 12AUG25 | Serviceable |

5

**Parts Data**

| Description | PN Removed | SN Removed | Qty | Disposition | PN Installed | SN Installed |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

## 3. Borescope Inspection Checklist

**Date unit out of operation:** 08/12/2025
**Date unit into operation:** 08/12/2025
**Last inspection date:**

**Type of Fuel:** Natural Gas / Diesel
**Type of outage:** Scheduled BSI

**Type of NOx suppression:** Water Injection

**Inspection of gas turbine:**

| WATERWASH: | HIGH PRESSURE COMPRESSOR: |
|---|---|
| ☒ PERFORMED WATER WASH | ☒ HPC BORESCOPE INSPECTION |
| **COMBUSTOR:** | **HIGH PRESSURE TURBINE** |
| ☒ COMBUSTOR BORESCOPE INSPECTION | ☒ HPT STAGE 1 & 2 NOZZLE BORESCOPE INSPECTION |
| | ☒ HPT BLADE BORESCOPE INSPECTION |
| **LOW PRESSURE TURBINE:** | |
| ☒ LPT BORESCOPE INSPECTION | |

☒ ***Please verify all borescope plugs have been reinstalled***

## 4. Borescope Inspection Record

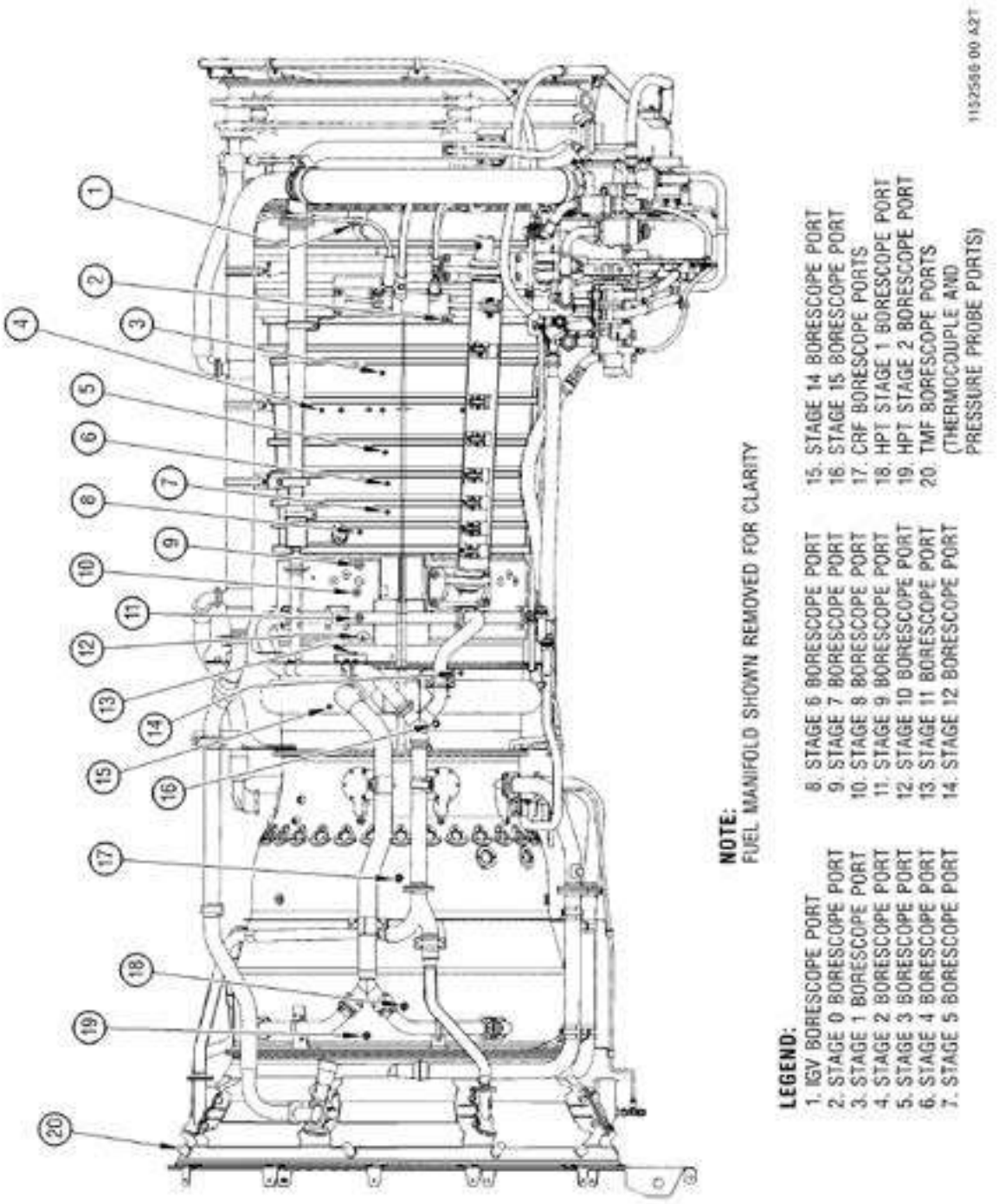



*Figure 1: Position of Borescope Inspection Ports.*

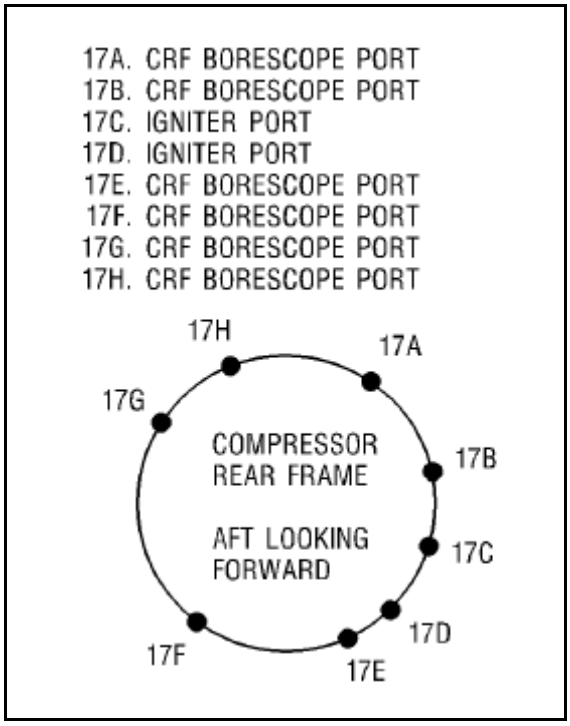



*Figure 2: Position of Borescope Inspection Ports.*

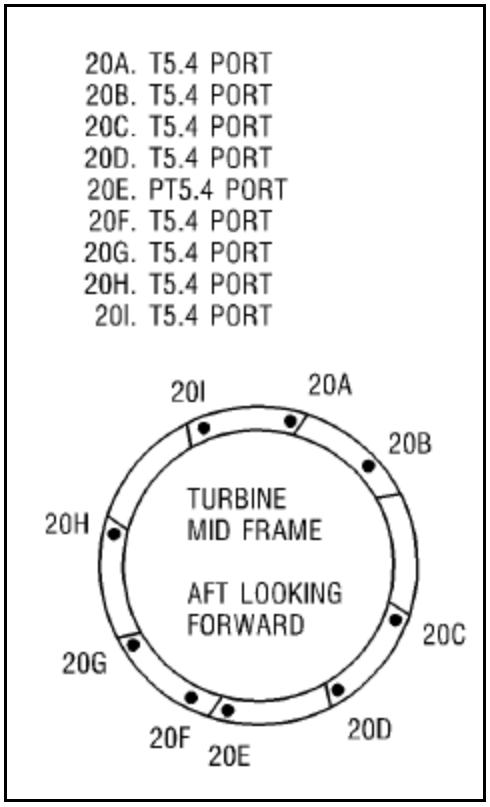



*Figure 3: Position of Borescope Inspection Ports.*

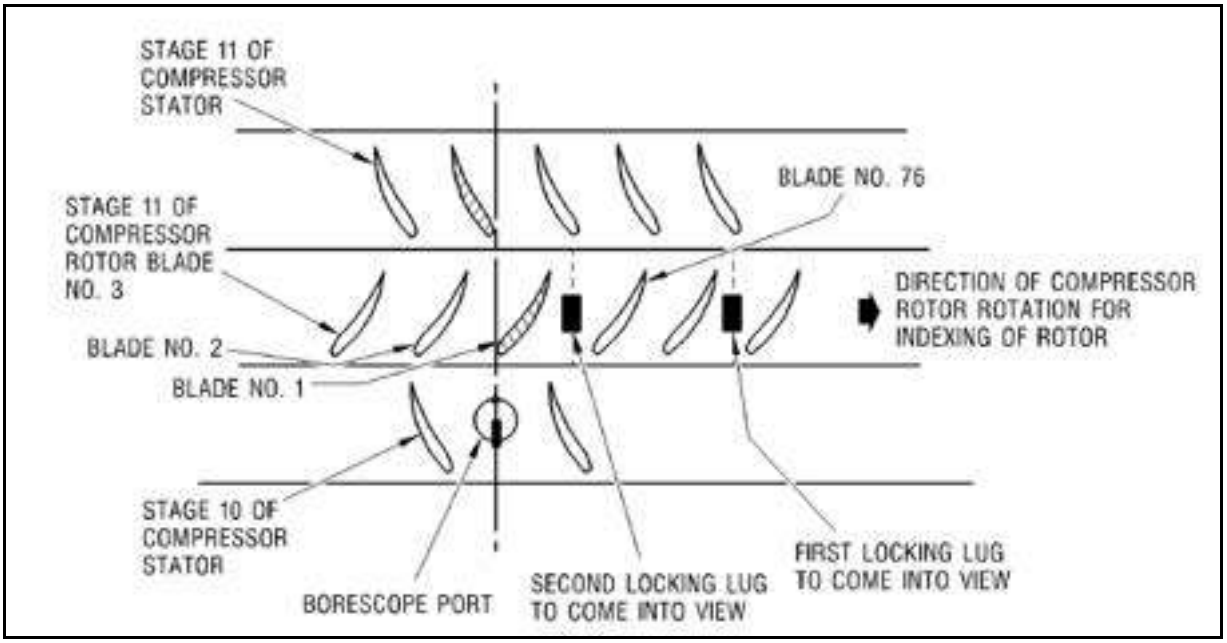



*Figure 4: Zero indexing of HPC rotor and HPT rotor*

## 4.1 Compressor Section

| Port | T.E. | L.E. | blades | Remarks: | photo no: |
|---|---|---|---|---|---|
| 1 | IGV | | | | 1 |
| 1 | | 0 | 36 | | 2,3 |
| 2 | 0 | | 36 | | 4 |
| 2 | | 1 | 26 | | 6,7 |
| 3 | 1 | | 26 | | 9,10 |
| 3 | | 2 | 26 | | 11,12 |
| 4 | 2 | | 26 | | 13 |
| 4 | | 3 | 42 | | 14 |
| 5 | 3 | | 42 | | 15,16 |
| 5 | | 4 | 45 | | 17,18 |
| 6 | 4 | | 45 | | 19, 20 |
| 6 | | 5 | 48 | | 21, 22 |
| 7 | 5 | | 48 | | 23, 24 |
| 7 | | 6 | 54 | | 25, 26 |
| 8 | 6 | | 54 | Blades contacting tip | |
| 8 | | 7 | 56 | Blades contacting tip | |
| 9 | 7 | | 56 | | 27 |
| 9 | | 8 | 64 | | 28 |
| 10 | 8 | | 64 | | 29,30 |
| 10 | | 9 | 66 | | 31 |
| 11 | 9 | | 66 | | 32, 33 |
| 11 | | 10 | 66 | | 35, 36 |
| 12 | 10 | | 66 | | 37, 38 |
| 12 | | 11 | 76 | | 39, 40 |
| 13 | 11 | | 76 | | 41, 42 |
| 13 | | 12 | 76 | | 43, 44 |
| 14 | 12 | | 76 | | 45, 46 |
| 14 | | 13 | 76 | | 47, 48 |
| 15 | 14 | | 76 | Inside bleed manifold | |
| 15 | | 15 | 76 | Inside bleed manifold | |
| 16 | 15 | | 76 | | 49, 50 |
| 16 | | 16 | 76 | | 51, 52 |

**Notes:**

The HPC section is Serviceable.



Picture 1. CFF & IGV



Picture 2. Stage 0 Leading edge tip



Picture 3. Stage 0 Leading edge base



Picture 4. Stage 0 Trailing edge tip



Picture 5. Stage 0 Weep hole



Picture 6. Stage 1 Leading edge tip



Picture 7. Stage 1 Leading edge base



Picture 8. Stage 1 weep hole



Picture 9. Stage 1 Trailing edge tip



Picture 10. Stage 1 Trailing base



Picture 11. Stage 2 Leading edge tip



Picture12. Stage 2 Leading edge base



Picture 13. Stage 2 Trailing edge tip



Picture 14. Stage 3 Leading edge tip



Picture 15. Stage 3 Trailing edge tip



Picture 16. Stage 3 Trailing edge base



Picture 17. Stage 4 Leading edge tip



Picture 18. Stage 4 Leading edge base



Picture 19. Stage 4 Trailing edge tip



Picture 20. Stage 4 Trailing edge base



Picture 21. Stage 5 Leading edge tip



Picture 22. Stage 5 Leading edge base



Picture 23. Stage 5 Trailing edge tip



Picture 24. Stage 5 Trailing edge base



Picture 25. Stage 6 Leading edge tip



Picture 26. Stage 6 Leading edge base



Picture 27. Stage 7 Trailing edge tip



Picture 28. Stage 8 Leading edge tip



Picture 29. Stage 8 Trailing edge tip



Picture 30. Stage 8 Trailing edge base



Picture 31. Stage 9 Leading edge



Picture 32. Stage 9 Trailing edge tip



Picture 33. Stage 9 Trailing base



Picture 34. Stage 9 Bleed manifold



Picture 35. Stage 10 Leading edge tip



Picture 36. Stage 10 Leading edge base



Picture 37. Stage 10 Trailing edge tip



Picture 38. Stage 10 Trailing edge base



Picture 39. Stage 11 Leading edge tip



Picture 40. Stage 11 Leading edge base



Picture 41. Stage 11 Trailing edge tip



Picture 42. Stage 11 Trailing edge base



Picture 43. Stage 12 Leading edge tip



Picture 44. Stage 12 Leading edge base



Picture 45. Stage 12 Trailing edge tip



Picture 46. Stage 12 Trailing edge base



Picture 47. Stage 13 Leading edge tip



Picture 48. Stage 13 Leading edge base

| | | |
|---|---|---|
|  | |  |
| Picture 49. Stage 15 Trailing edge tip | | Picture 50. Stage 15 Leading edge base |

| | | |
|---|---|---|
|  | |  |
| Picture 51. Stage 16 Leading edge tip | | Picture 52. OGV'S |

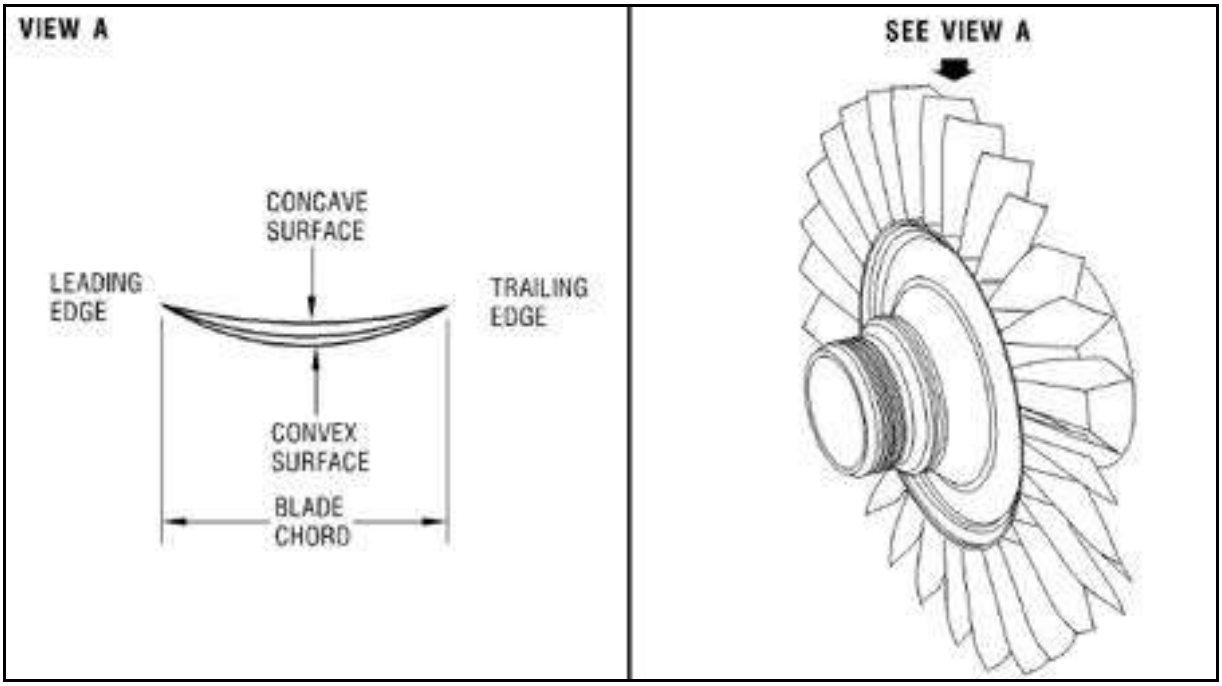



*Figure 5: HPC stage 0 BLISK*

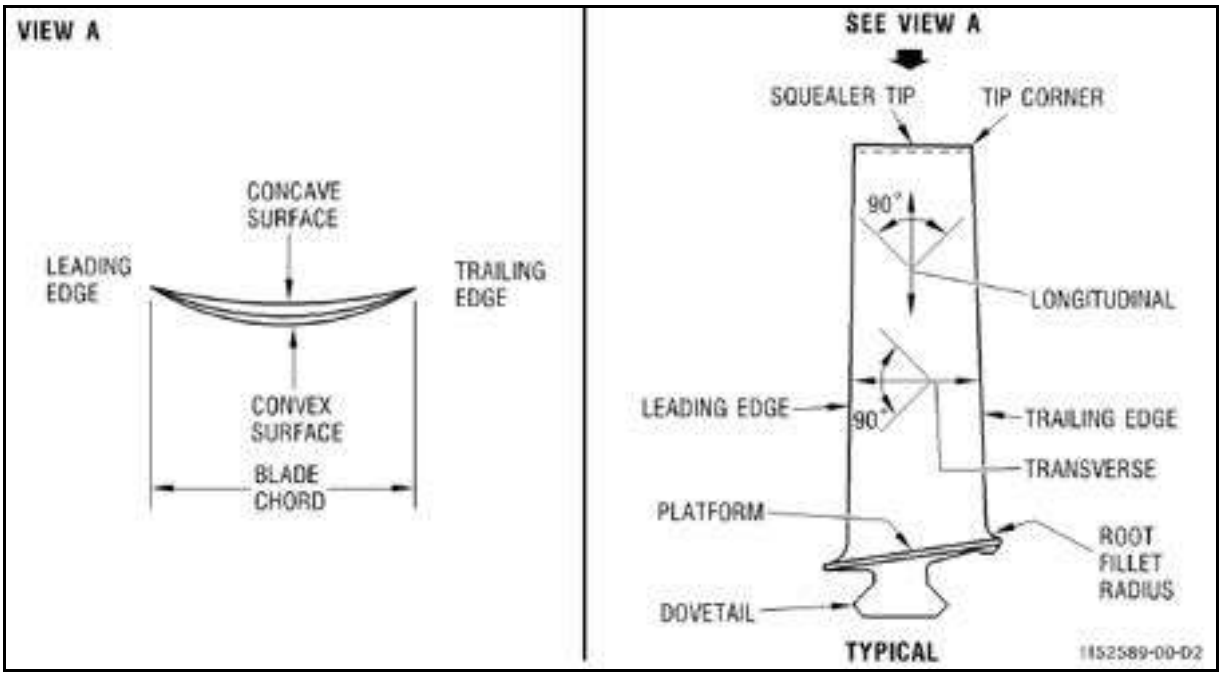



*Figure 6: Compressor Rotor Blades*

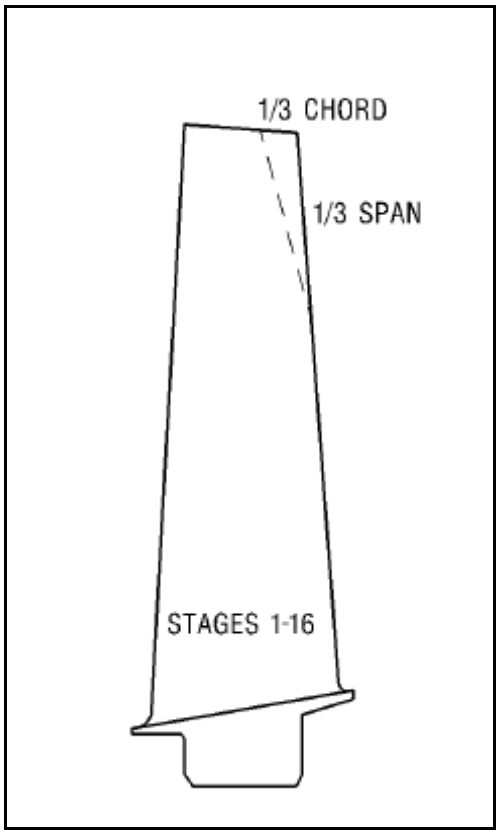



*Figure 7: Tip Trailing Edge Inspection*

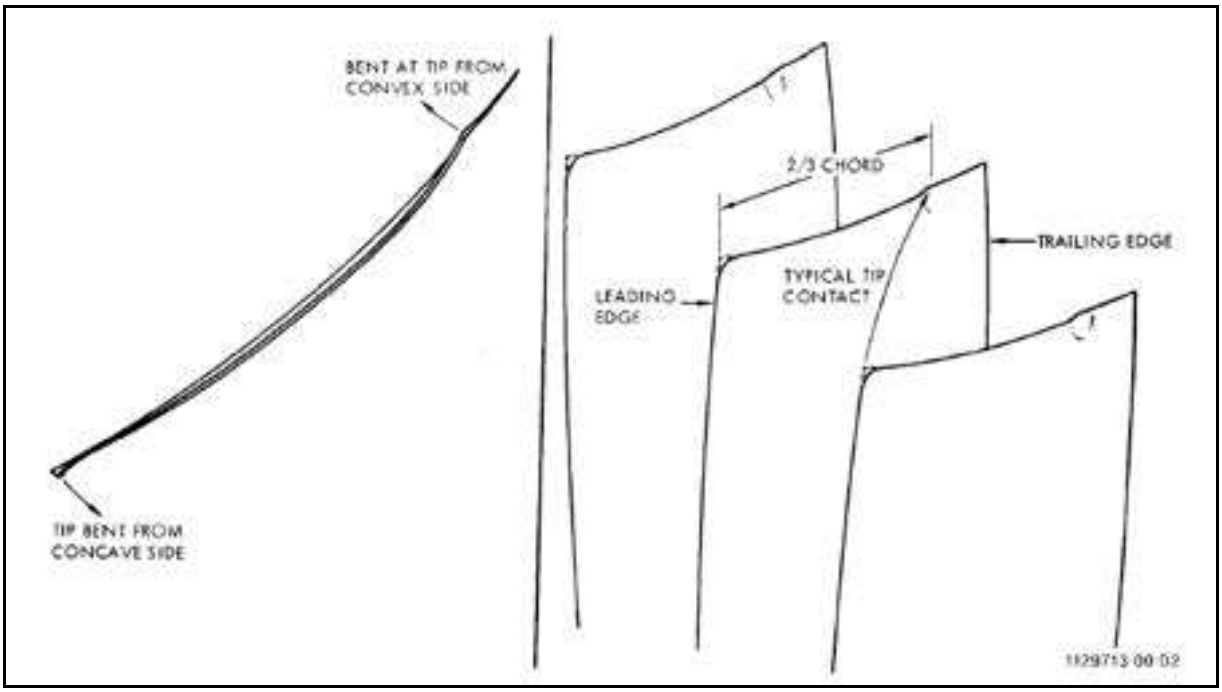


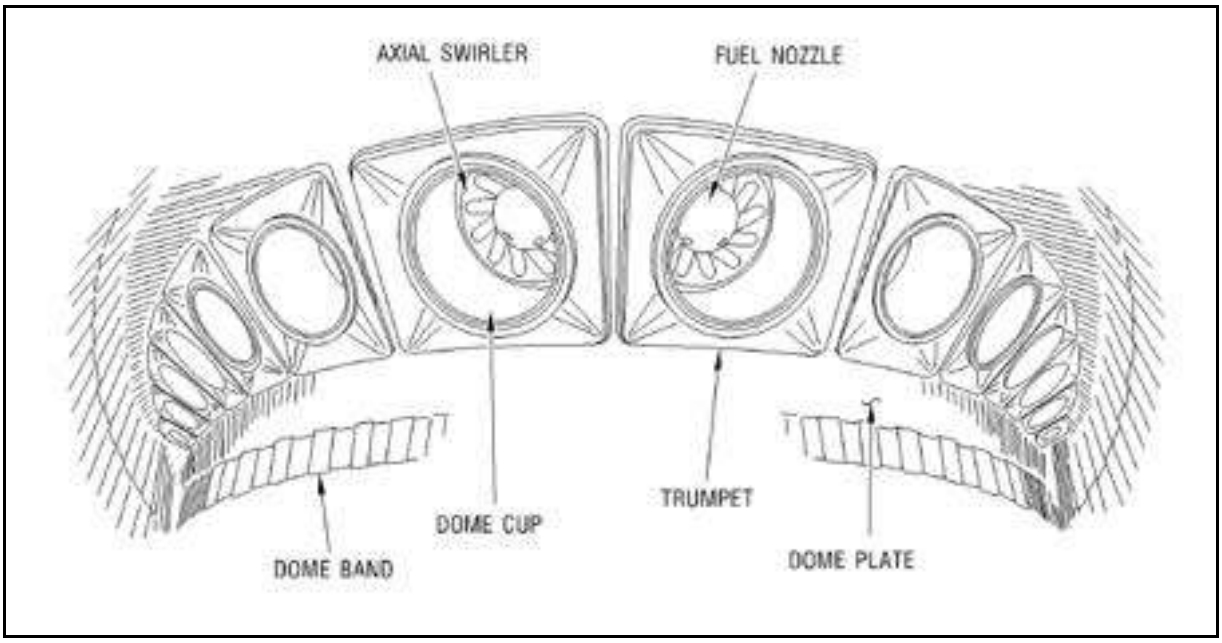

*Figure 8: Tip Clanging Contact (HPCR stage 3 through 6)*

## 4.2 Combustor and 1St Stage Nozzle Section

| Port | Condition observed | Photo no: |
|---|---|---|
| **17A** | | |
| **17B** | | |
| **17C** | | |
| **17D** | **See below notes.** | |
| **17E** | | |
| **17F** | | |
| **17G** | | |
| **17H** | | |
| **17** | 1st stage nozzle (leading edge): | |

**Notes:**

The Combustor section is serviceable according to GEK105054 Volume II WP40600 Table 7.



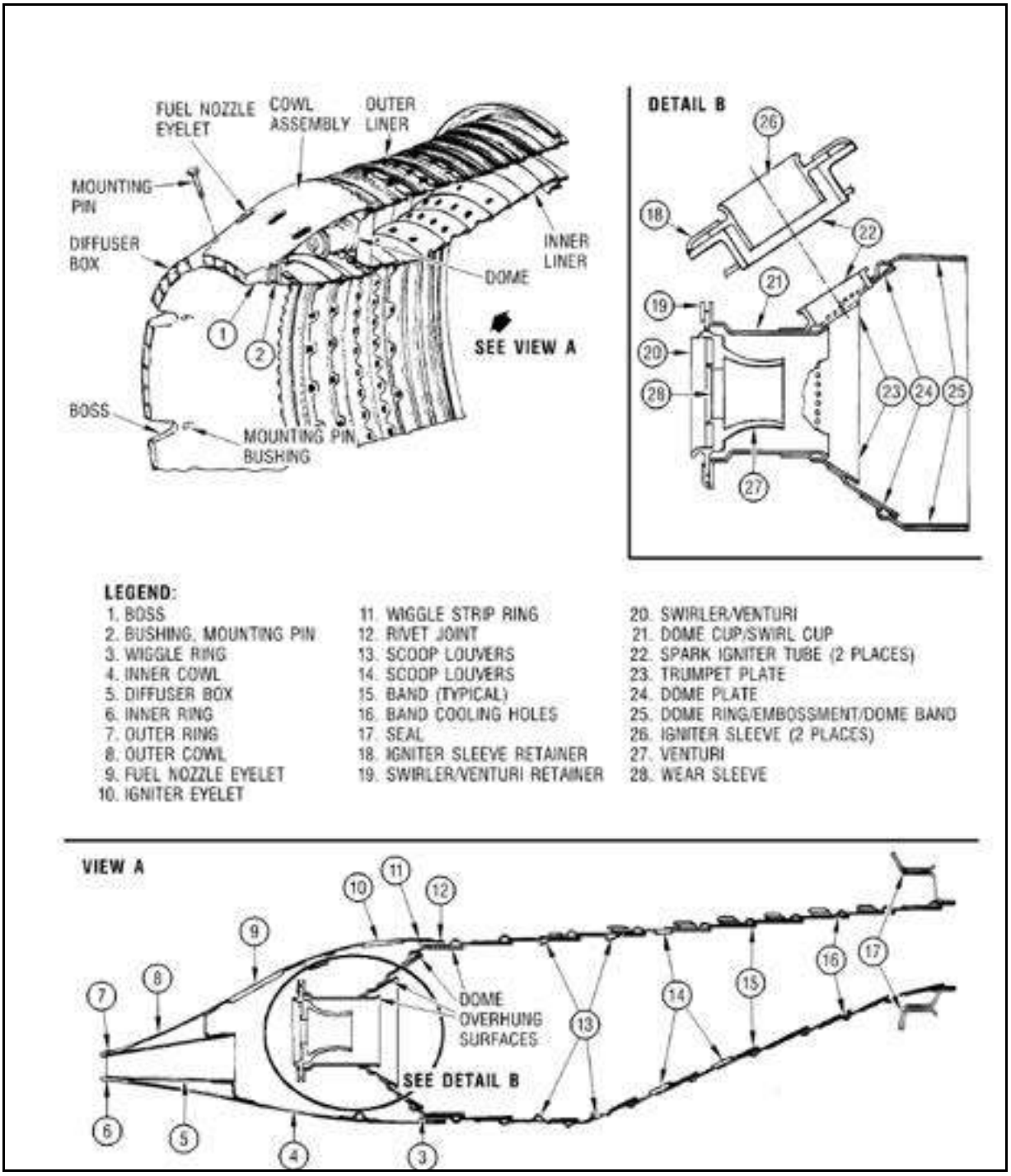



*Figure 9: SAC Combustor Inspection*

*Figure 10: SAC Combustor Inspection*

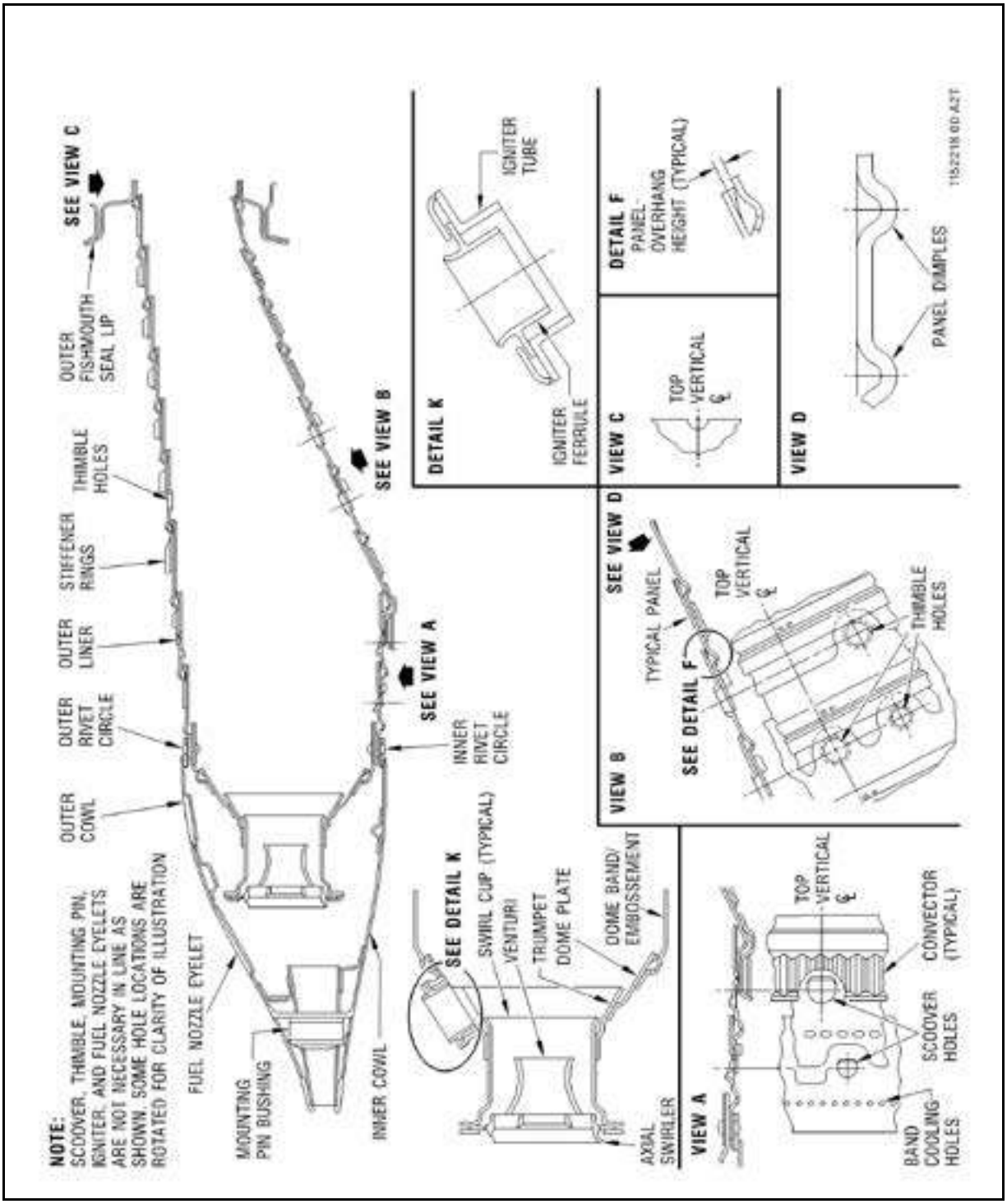



*Figure 11: SAC Combustor Inspection*

**Borescope Pictures**



Picture 53. Upper igniter ferrule



Picture 54. Lower igniter ferrule



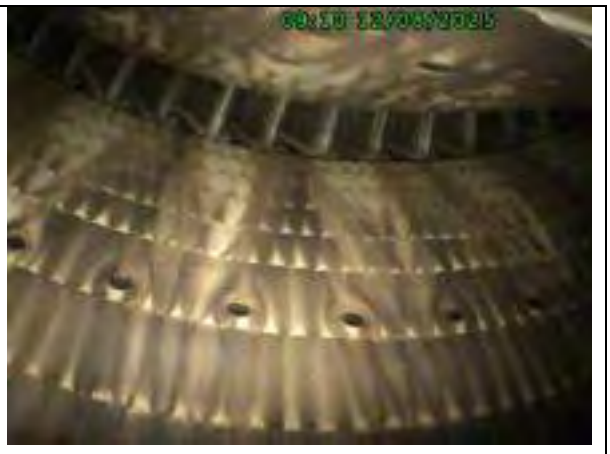
Picture 55. Outer rivets band



Picture 56. Inner rivets band



Picture 57. Combustor liners



Picture 58. Combustor liners



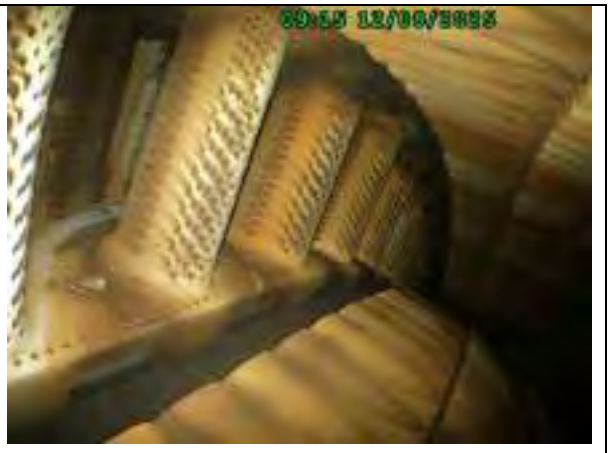
Picture 59. Combustor liner



Picture 60. Fuel Nozzle tip



Picture 61. Combustor liners and HPT nozzle interference



Picture 62. . Combustor liners and HPT nozzle interference

## 4.3 Turbine Section

| | turbine stage | | | | |
|---|---|---|---|---|---|
| **Port** | **L.E.** | **T.E.** | **blades** | **Remarks:** | **photo no:** |
| **18** | **1** | | **88** | | |
| **19** | | **1** | **88** | **See below notes.** | |
| **19** | **2** | | **90** | | |
| **20** | | **2** | | | |

**Notes:**

The High Pressure Turbine section is serviceable according to GEK105054 Volume II WP40600 Table 8.

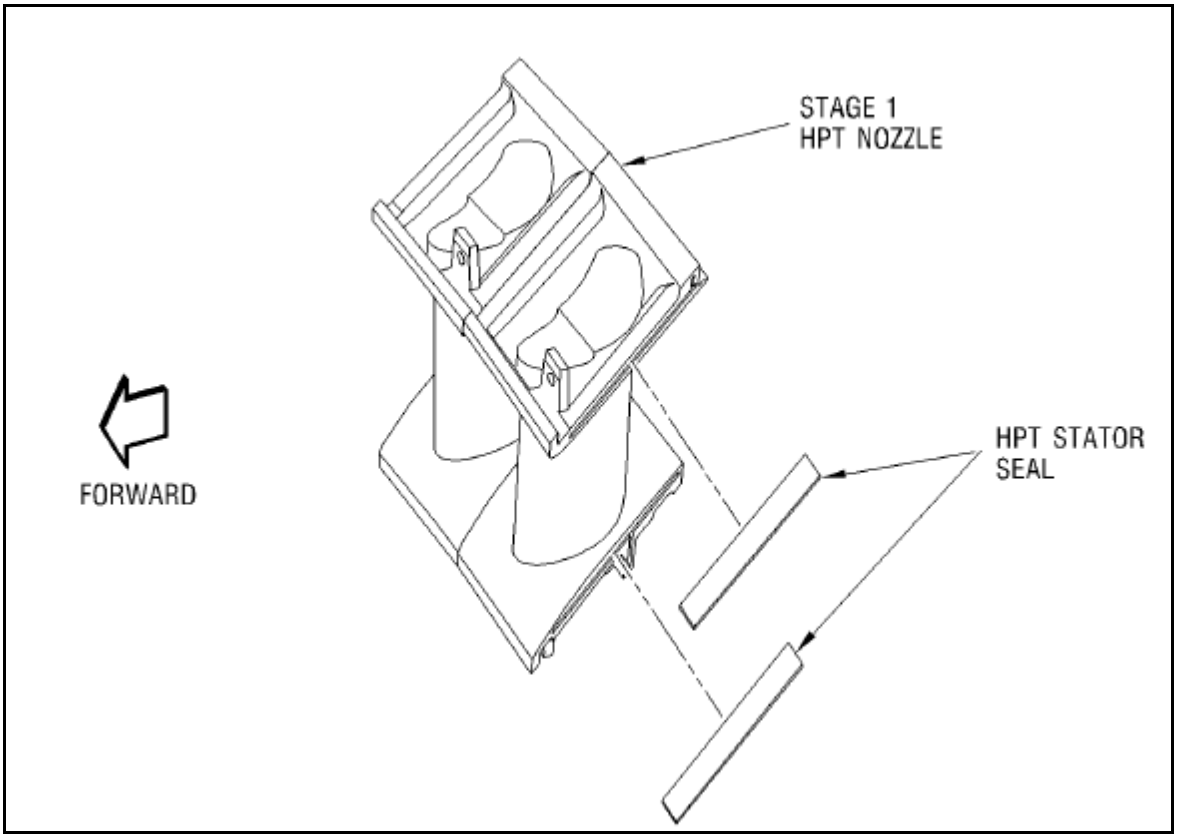



*Figure 12: Stage 1 HPT Nozzle Seal Displacement*

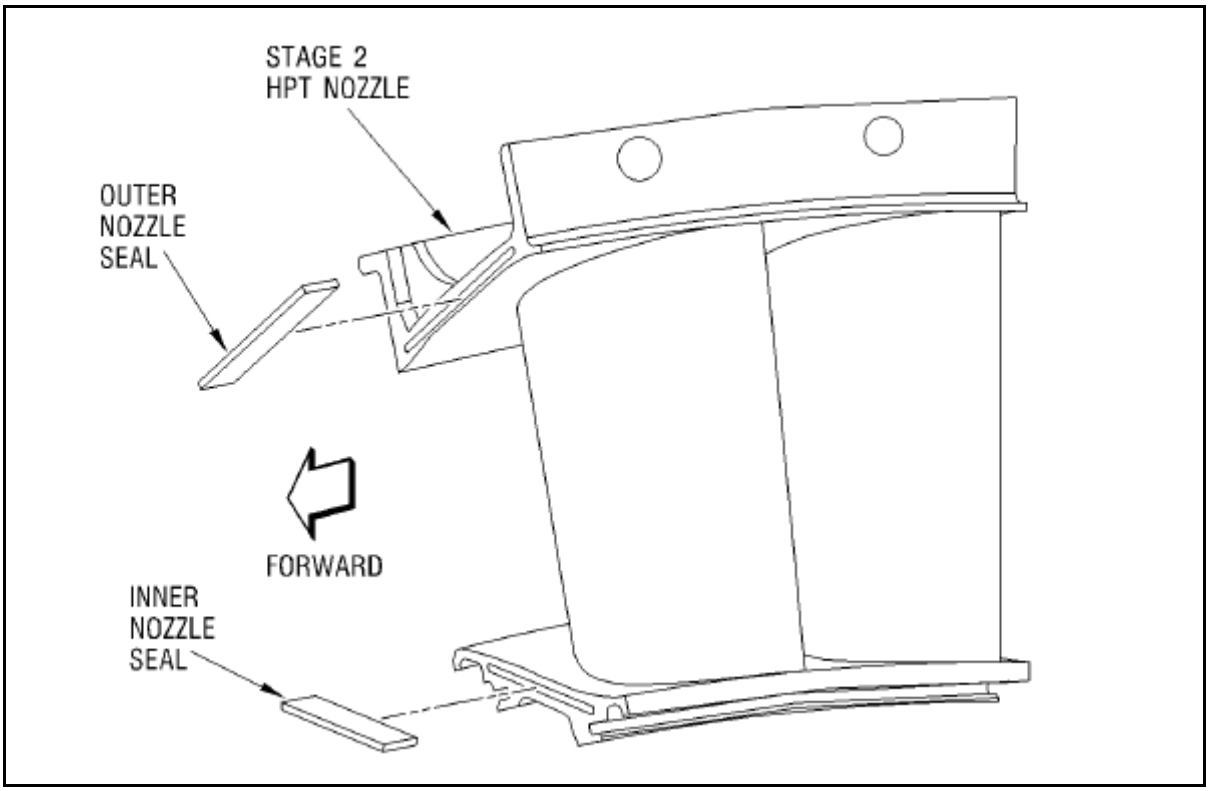



*Figure 13: Stage 2 HPT Nozzle Seal Displacement*

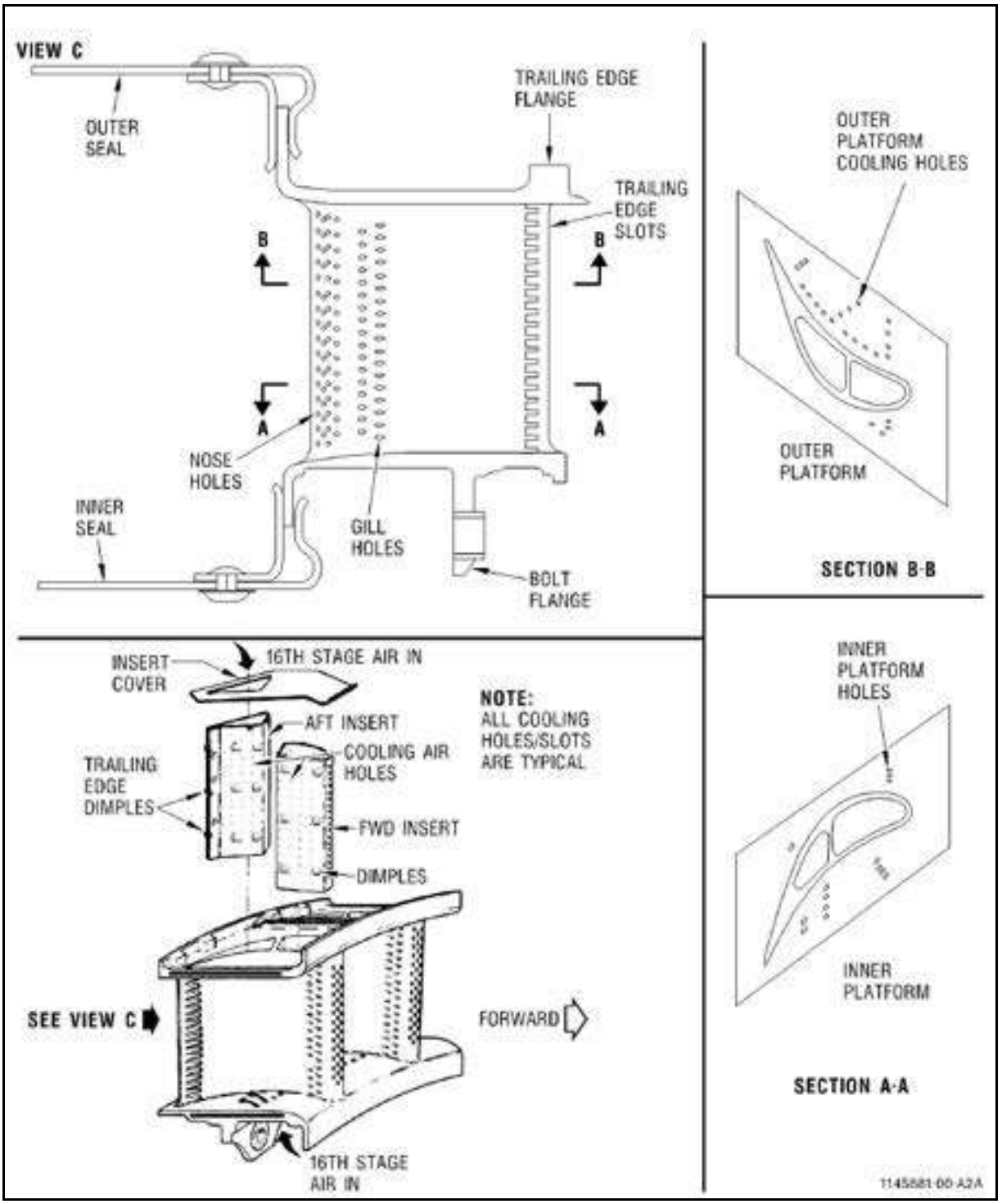



*Figure 14: HPT Stage 1 Nozzle*

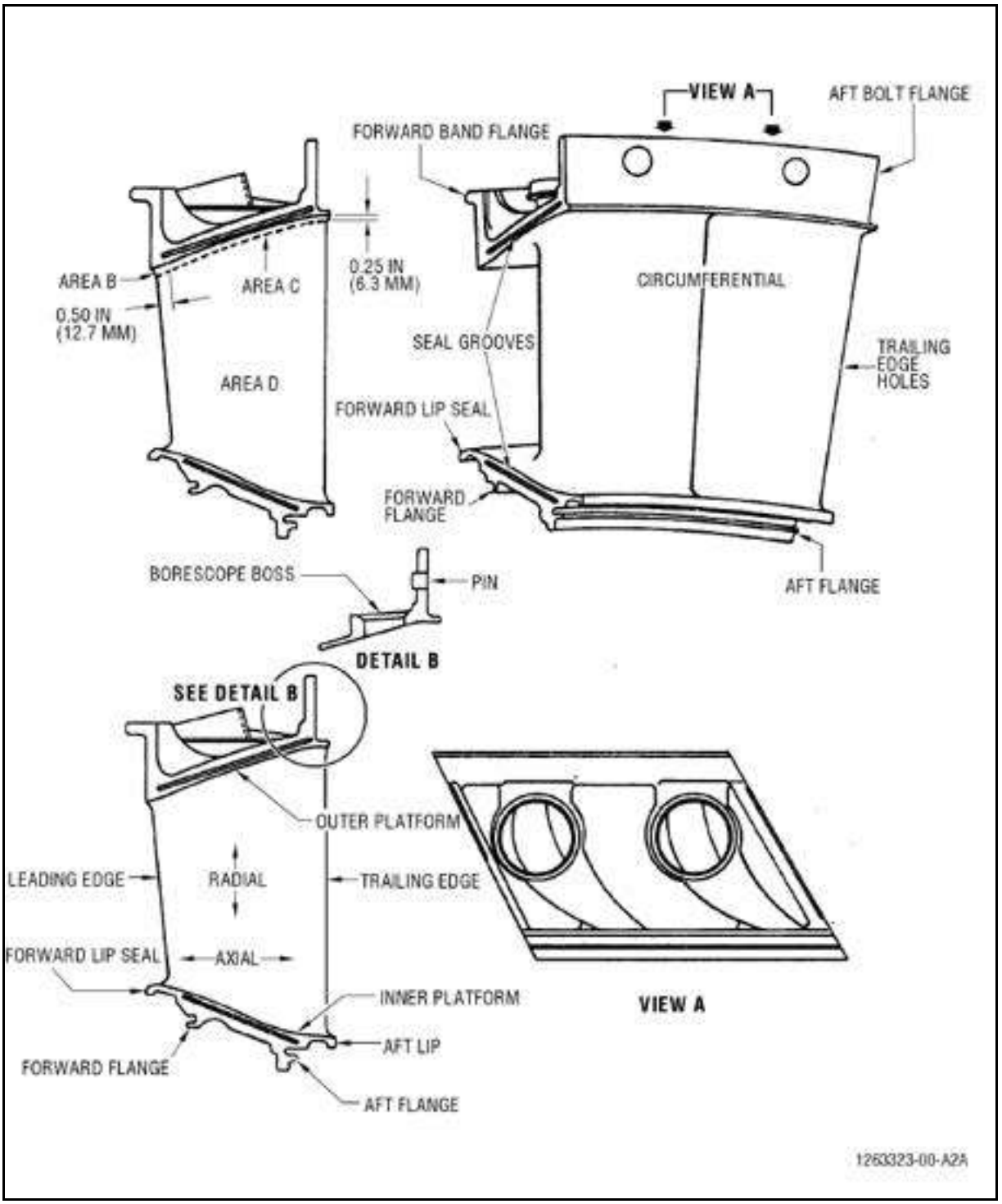



*Figure 15: HPT Stage 2 Nozzle*

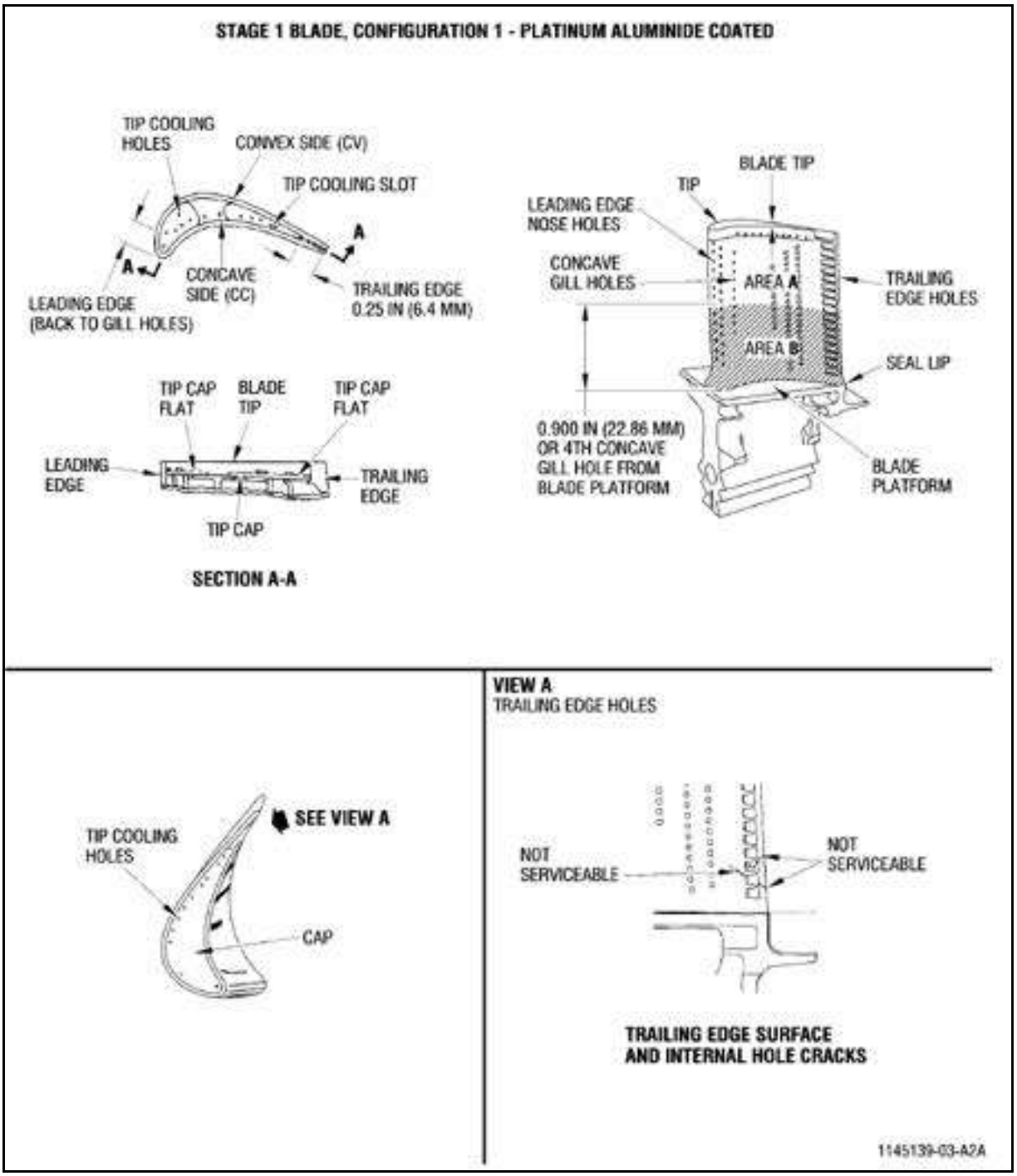



*Figure 16: HPT Stage 1 Rotor Blades Inspection Areas (Platinum Aluminide Coated Blades)*

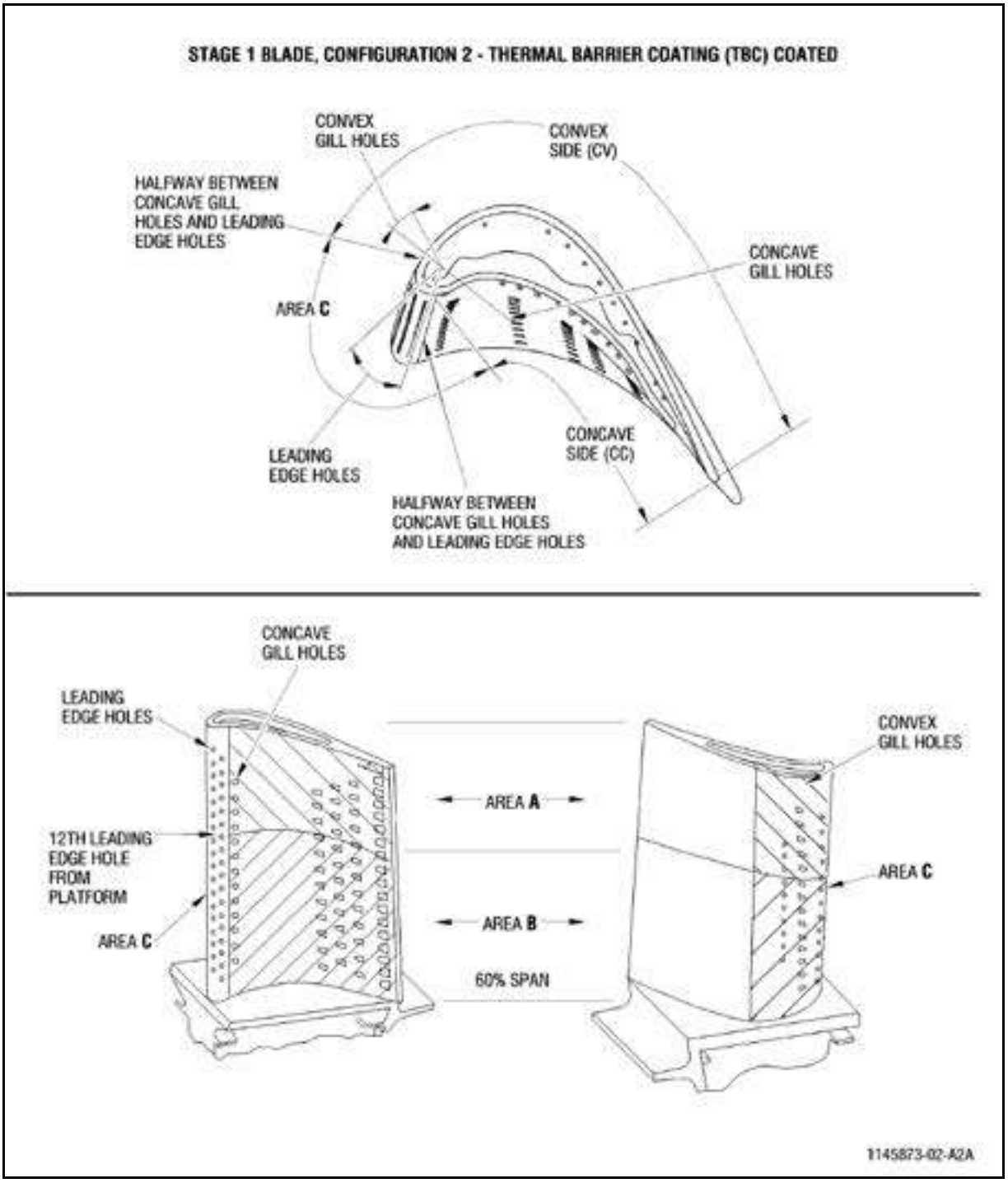



*Figure 17: HPT Stage 1 Rotor Blades Inspection Areas (TBC Coated Blades)*

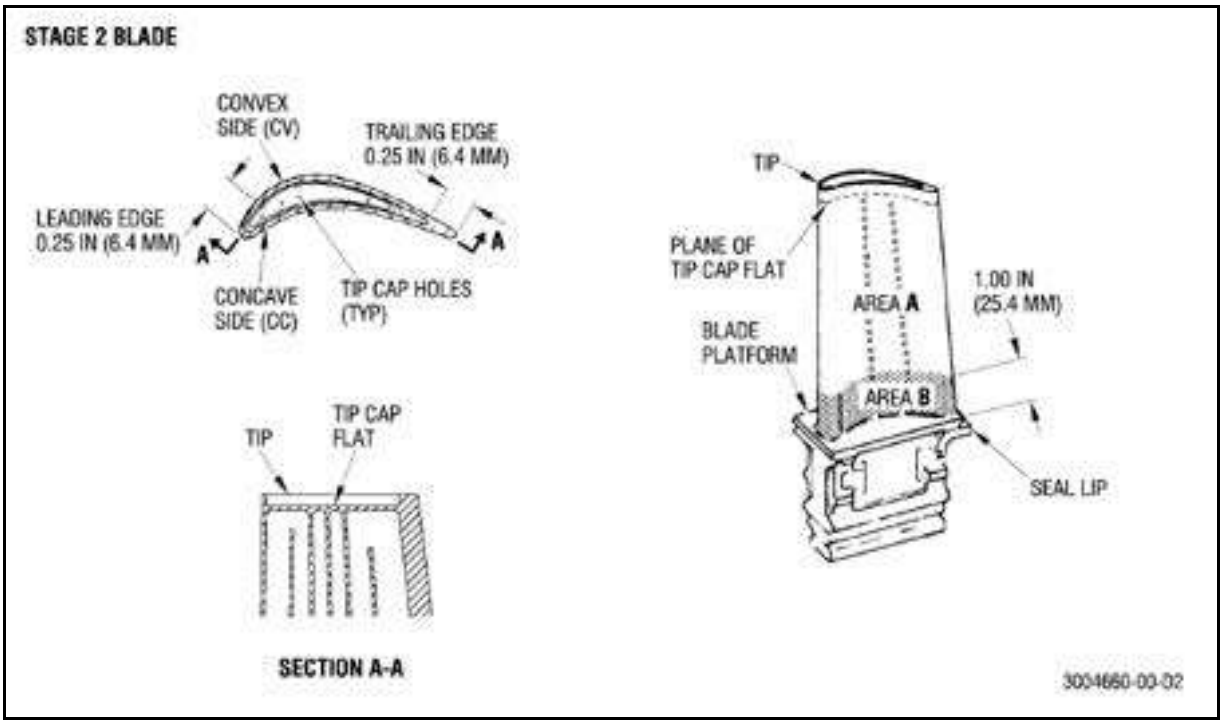



*Figure 18: HPT Stage 2 Rotor Blades Inspection Areas*

**Borescope Pictures**



Picture 63: Stage1 Nozzle leading edge



Picture 64: Stage1 Nozzles Leading edge



Picture 65: Stage1 Nozzle airfoil concave side



Picture 66: Stage1 Nozzle airfoil concave side



Picture 67: Stage1 Nozzles airfoil concave



Picture 68: Stage1 Nozzle airfoil concave



Picture 69: Stage1 Nozzle airfoil concave side



Picture 70: Stage1 Nozzle airfoil convex side



Picture 71: Stage1 Nozzle trailing edge concave



Picture 72: Stage1 Nozzle trailing edge convex



Picture 73: Stage1 Nozzle trailing edge



Picture 74: Stage1 Nozzle trailing edge and



Picture 75: Stage1 Blades leading edge tip



Picture 76: Stage1 Blades leading edge convex



Picture 77: Stage 1 Blades leading edge base



Picture 78: Stage 1 Blades leading edge base



Picture 79: Stage 1 Blades trailing edge tip



Picture 80: Stage 1 Blades trailing edge root



Picture 81: Stage 2 Blades leading edge tip



Picture 82: Stage 2 Honeycomb seals



Picture 83: Stage 2 Blades leading edge root



Picture 84: Stage 2 Blades and stage 2 nozzles



Picture 85: Stage 2 Blades trailing edge



Picture 86: Stage 2 Blades trailing edge

## 4.4 LPT Section

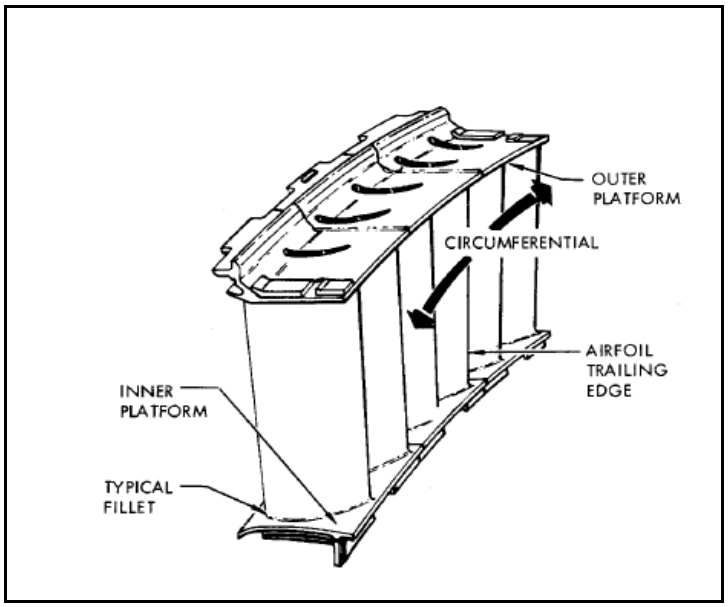



*Figure 19: Power Turbine Nozzles*

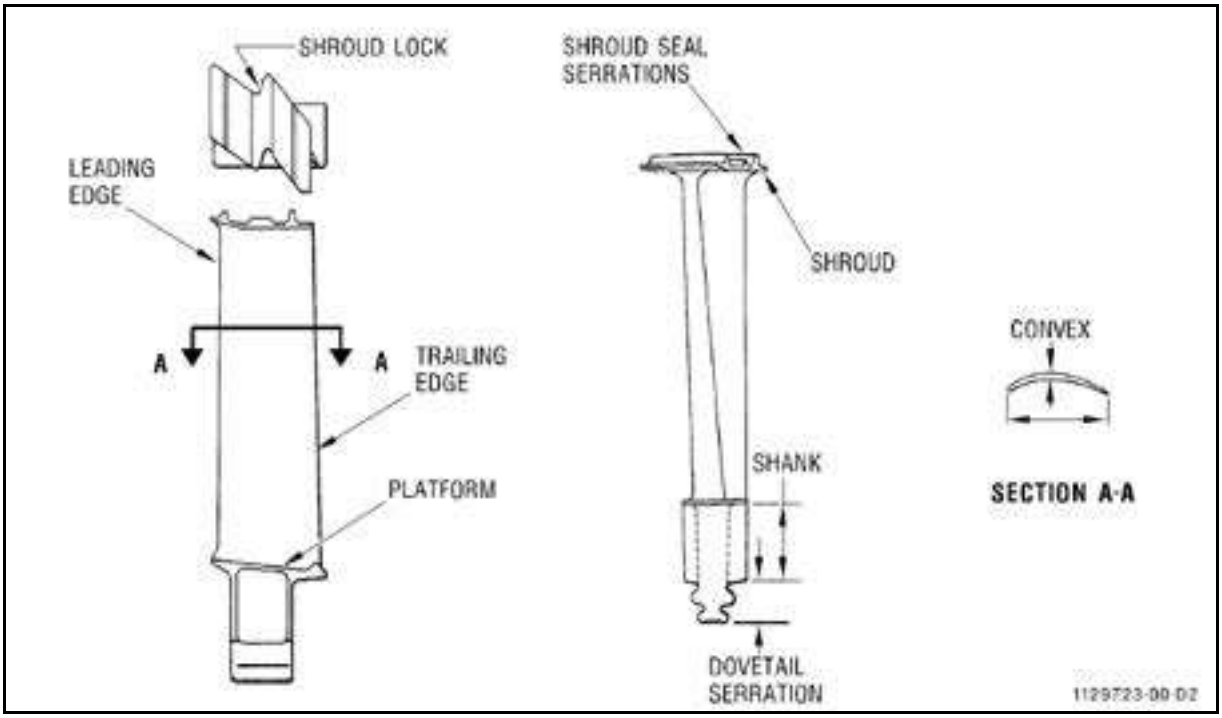



*Figure 20: Power Turbine Rotor Blades*

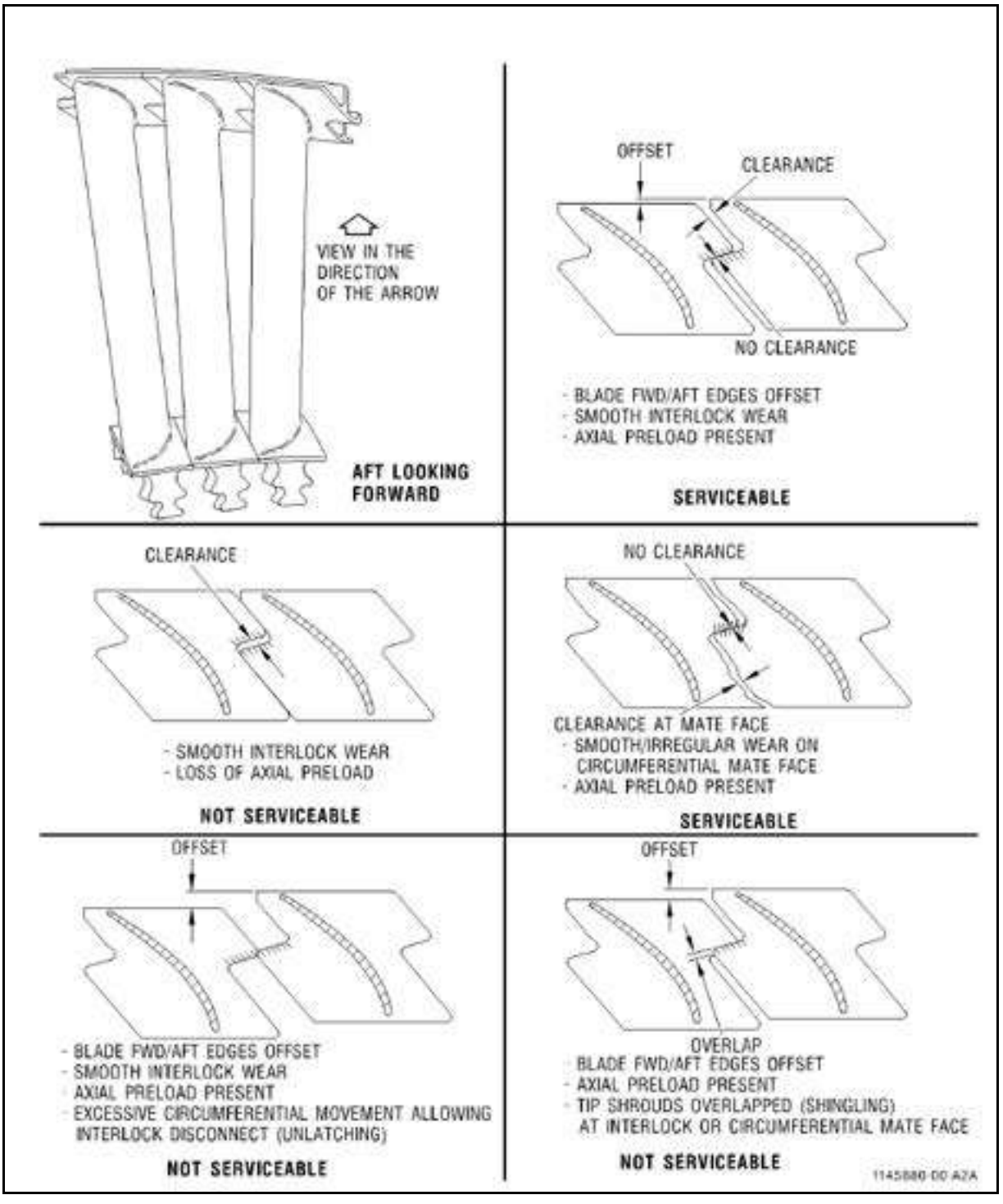



*Figure 21: LPT Rotor Blade Circumferential Inspection*

**Notes:**

The LPT stage 1 accessible nozzles and blades did not show any damage.

**Borescope Pictures**



Picture 87: STG1 LPT nozzles



Picture 88: TMF and LPT Inlet



Picture 89: Stage 1 Blades



Picture 90: LPT Stage 1 Blades tip interlock

# BORESCOPE INSPECTION REPORT
# TM2500 GEN. 6-7
## *7LM2500 – PK – MDWG05*

## NEW FORTRESS ENERGY

## SJTPP, PR

## PACKAGE # 7251611

## UNIT #8

| | | | |
|---|---|---|---|
| **Visit Date:** | 08/13/2025 | **Total Starts:** | 883 |
| **Engine S/N:** | 557-242 | **GG Hours:** | 15618 |
| **Power Turbine S/N:** | 557-242 | **PT Hours:** | 15618 |
| **SOM GT Field Engineer:** | Daniel Arroyo | **New Fortress Representative:** | Jonathan Rodriguez |



## TABLE OF CONTENTS


1 Conclusions and Recommendations 3

2 Outage Data 4

3 Borescope Inspection Checklist 4

4 Borescope Inspection Record 6

4.1 Compressor Section

4.2 Combustor and 1St Stage Nozzle Section

4.3 Turbine Section

4.4 LPT Section

## 1. Conclusions and Recommendations

**Purpose of visit:**

The purpose of this visit was to perform a borescope inspection of the Engine in accordance with GEK105054, WP 406 00.

1.1 The HPC is serviceable according to GEK105054, WP 406 00 Table 4. No damages were found.

1.2 The Combustor section is serviceable according to GEK105054, WP40600 Table 7.

1.3 The High Pressure Turbine section is Not Serviceable according to GEK105054, WP406 00 Table 8 Paragraph 6c . It was found one (1) Stage 1 Blade (refer to picture 75) with a hole at the Leading Edge Area A, where the cooling passage is exposed. It's recommended to keep this damage under monitoring by means of periodic borescope inspections, at least initially every 1.000 hours.

1.4 The LPT is serviceable according to GEK105054, WP40600.

## 2. Outage Data

### Engine Data

| | | | | | |
|---|---|---|---|---|---|
| **ESN:** | 557-242 | **Engine Fired Hours:** | 15618 | **Package Hours:** | 15618 |
| **Model:** | 7LM2500-PK-MDWG05 | **Engine Fired starts:** | 883 | **Package Fired Starts:** | 883 |

**MAINTENANCE DATA**

| WP, SB, SL, PB, PL Performed | GEK105054, REV 11 | Date completed | Comments |
|---|---|---|---|
| WP 406 00 | Borescope Inspection | 13AUG25 | No Serviceable |

**Parts Data**

| Description | PN Removed | SN Removed | Qty | Disposition | PN Installed | SN Installed |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

## 3. Borescope Inspection Checklist

**Date unit out of operation:** 08/13/2025
**Date unit into operation:** 08/13/2025
**Last inspection date:**

**Type of Fuel:** Natural Gas / Diesel
**Type of outage:** Scheduled BSI

**Type of NOx suppression:** Water Injection

**Inspection of gas turbine:**

| WATERWASH: | HIGH PRESSURE COMPRESSOR: |
|---|---|
| ☐ PERFORMED WATER WASH | ☒ HPC BORESCOPE INSPECTION |
| **COMBUSTOR:** | **HIGH PRESSURE TURBINE** |
| ☒ COMBUSTOR BORESCOPE INSPECTION | ☒ HPT STAGE 1 & 2 NOZZLE BORESCOPE INSPECTION |
| | ☒ HPT BLADE BORESCOPE INSPECTION |
| **LOW PRESSURE TURBINE:** | |
| ☒ LPT BORESCOPE INSPECTION | |

☒ ***Please verify all borescope plugs have been reinstalled***

## 4. Borescope Inspection Record

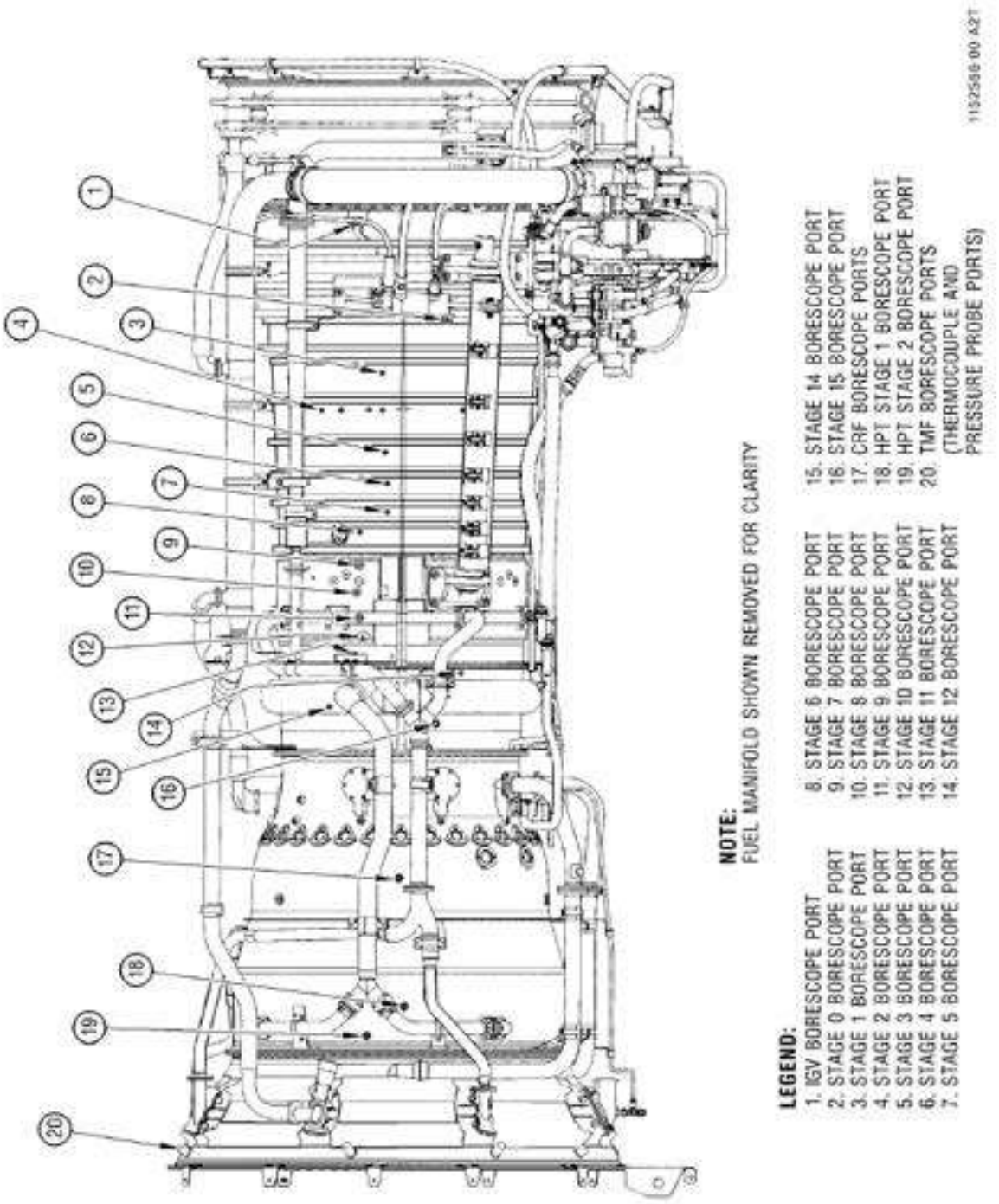



*Figure 1: Position of Borescope Inspection Ports.*

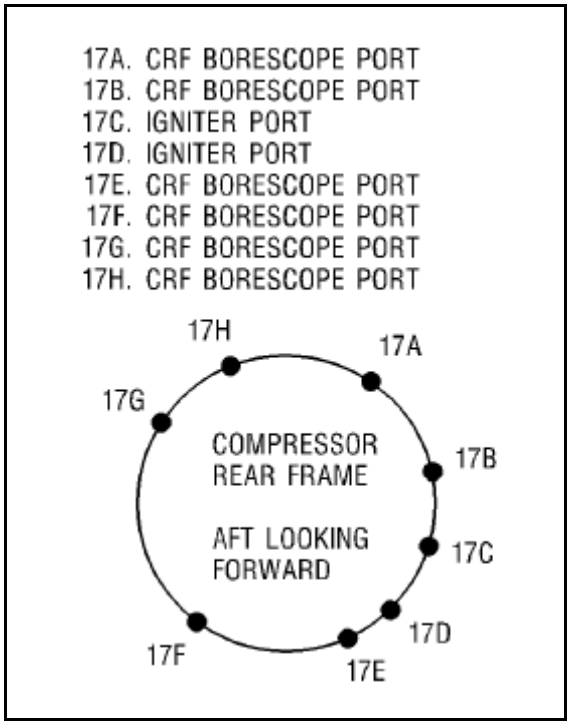



*Figure 2: Position of Borescope Inspection Ports.*

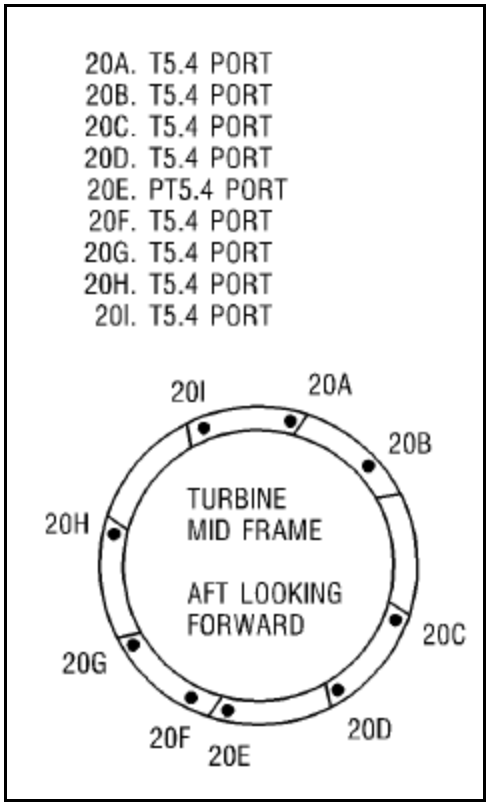



*Figure 3: Position of Borescope Inspection Ports.*

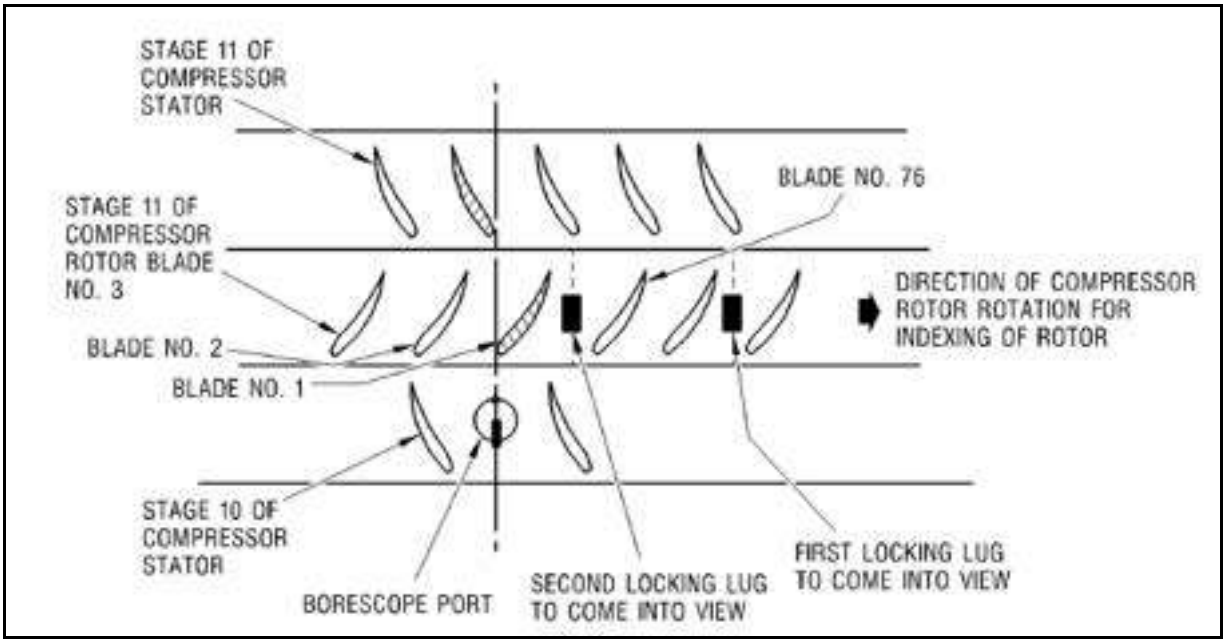



*Figure 4: Zero indexing of HPC rotor and HPT rotor*

## 4.1 Compressor Section

| Port | T.E. | L.E. | blades | Remarks: | photo no: |
|---|---|---|---|---|---|
| 1 | IGV | | | | 1 |
| 1 | | 0 | 36 | | 2,3 |
| 2 | 0 | | 36 | | 4 |
| 2 | | 1 | 26 | | 6,7 |
| 3 | 1 | | 26 | | 9,10 |
| 3 | | 2 | 26 | | 11,12 |
| 4 | 2 | | 26 | | 13 |
| 4 | | 3 | 42 | | 14 |
| 5 | 3 | | 42 | | 15,16 |
| 5 | | 4 | 45 | | 17,18 |
| 6 | 4 | | 45 | | 19, 20 |
| 6 | | 5 | 48 | | 21, 22 |
| 7 | 5 | | 48 | | 23, 24 |
| 7 | | 6 | 54 | | 25, 26 |
| 8 | 6 | | 54 | Blades contacting tip | |
| 8 | | 7 | 56 | Blades contacting tip | |
| 9 | 7 | | 56 | | 27 |
| 9 | | 8 | 64 | | 28 |
| 10 | 8 | | 64 | | 29,30 |
| 10 | | 9 | 66 | | 31 |
| 11 | 9 | | 66 | | 32, 33 |
| 11 | | 10 | 66 | | 35, 36 |
| 12 | 10 | | 66 | | 37, 38 |
| 12 | | 11 | 76 | | 39, 40 |
| 13 | 11 | | 76 | | 41, 42 |
| 13 | | 12 | 76 | | 43, 44 |
| 14 | 12 | | 76 | | 45, 46 |
| 14 | | 13 | 76 | | 47, 48 |
| 15 | 14 | | 76 | Inside bleed manifold | |
| 15 | | 15 | 76 | Inside bleed manifold | |
| 16 | 15 | | 76 | | 49, 50 |
| 16 | | 16 | 76 | | 51, 52 |

**Notes:**

The HPC Section is serviceable.



Picture 1. CFF & IGV



Picture 2. Stage 0 Leading edge tip



Picture 3. Stage 0 Leading edge base



Picture 4. Stage 0 Trailing edge tip



Picture 5. Stage 0 Weep hole



Picture 6. Stage 1 Leading edge tip



Picture 7. Stage 1 Leading edge base



Picture 8. Stage 1 weep hole



Picture 9. Stage 1 Trailing edge tip



Picture 10. Stage 1 Trailing base



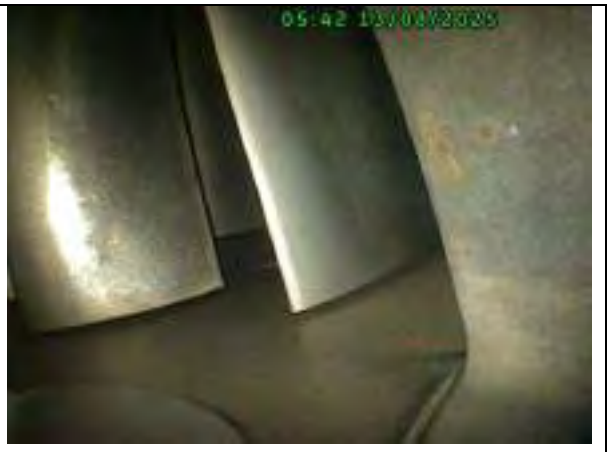
Picture 11. Stage 2 Leading edge tip



Picture12. Stage 2 Leading edge base



Picture 13. Stage 2 Trailing edge tip



Picture 14. Stage 3 Leading edge tip



Picture 15. Stage 3 Trailing edge tip



Picture 16. Stage 3 Trailing edge base



Picture 17. Stage 4 Leading edge tip



Picture 18. Stage 4 Leading edge base



Picture 19. Stage 4 Trailing edge tip



Picture 20. Stage 4 Trailing edge base



Picture 21. Stage 5 Leading edge tip



Picture 22. Stage 5 Leading edge base



Picture 23. Stage 5 Trailing edge tip



Picture 24. Stage 5 Trailing edge base



Picture 25. Stage 6 Leading edge tip



Picture 26. Stage 6 Leading edge base



Picture 27. Stage 7 Trailing edge tip



Picture 28. Stage 8 Leading edge tip



Picture 29. Stage 8 Trailing edge tip



Picture 30. Stage 8 Trailing edge base



Picture 31. Stage 9 Leading edge



Picture 32. Stage 9 Trailing edge tip



Picture 33. Stage 9 Trailing base



Picture 34. Stage 9 Bleed manifold



Picture 35. Stage 10 Leading edge tip



Picture 36. Stage 10 Leading edge base



Picture 37. Stage 10 Trailing edge tip



Picture 38. Stage 10 Trailing edge base



Picture 39. Stage 11 Leading edge tip



Picture 40. Stage 11 Leading edge base



Picture 41. Stage 11 Trailing edge tip



Picture 42. Stage 11 Trailing edge base



Picture 43. Stage 12 Leading edge tip



Picture 44. Stage 12 Leading edge base



Picture 45. Stage 12 Trailing edge tip



Picture 46. Stage 12 Trailing edge base



Picture 47. Stage 13 Leading edge tip



Picture 48. Stage 13 Leading edge base



Picture 49. Stage 15 Trailing edge tip



Picture 50. Stage 15 Leading edge base



Picture 51. Stage 16 Leading edge tip



Picture 52. OGV'S

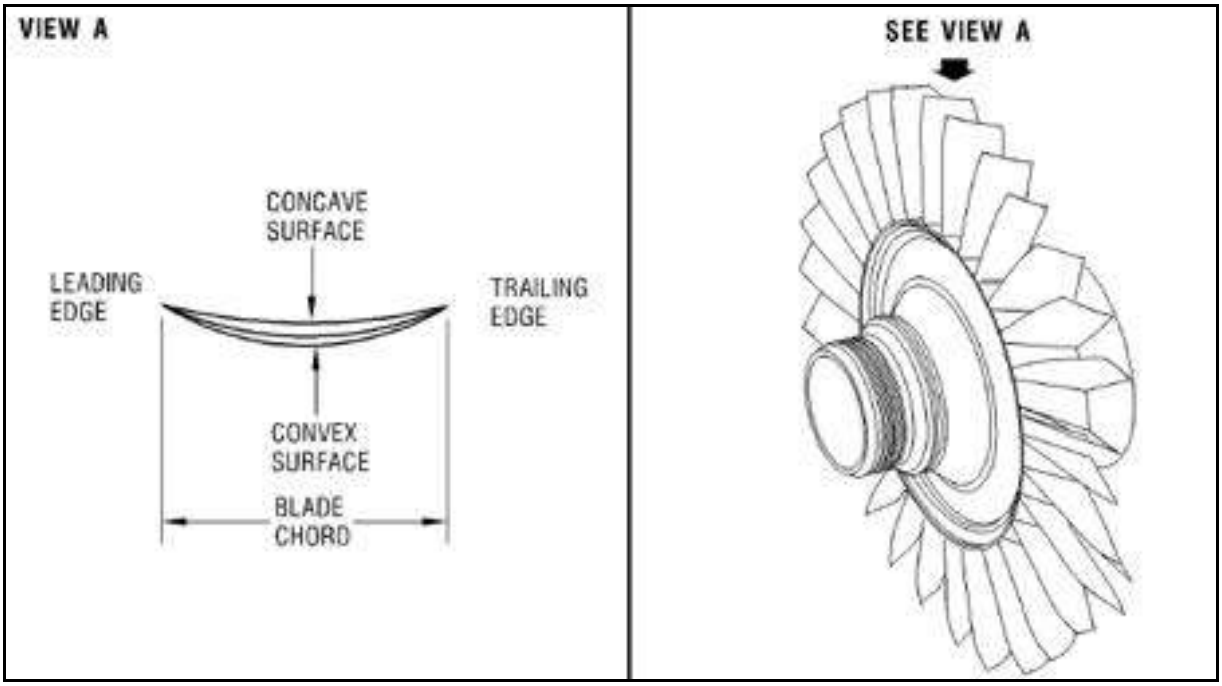



*Figure 5: HPC stage 0 BLISK*

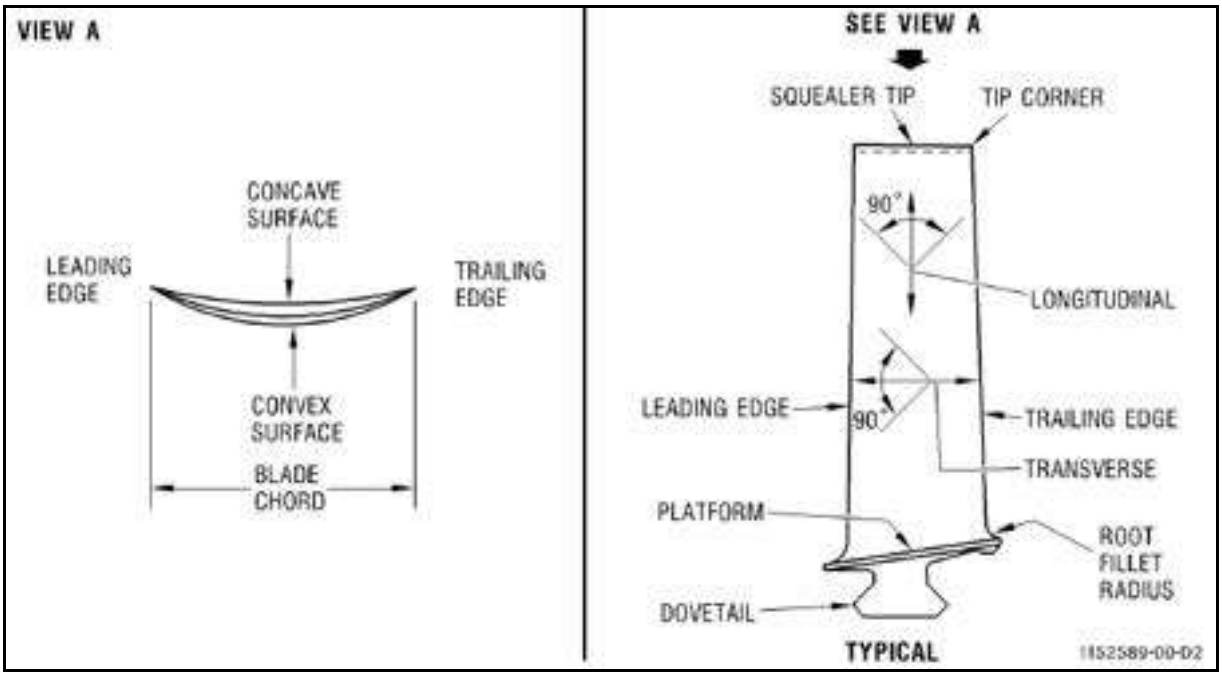



*Figure 6: Compressor Rotor Blades*

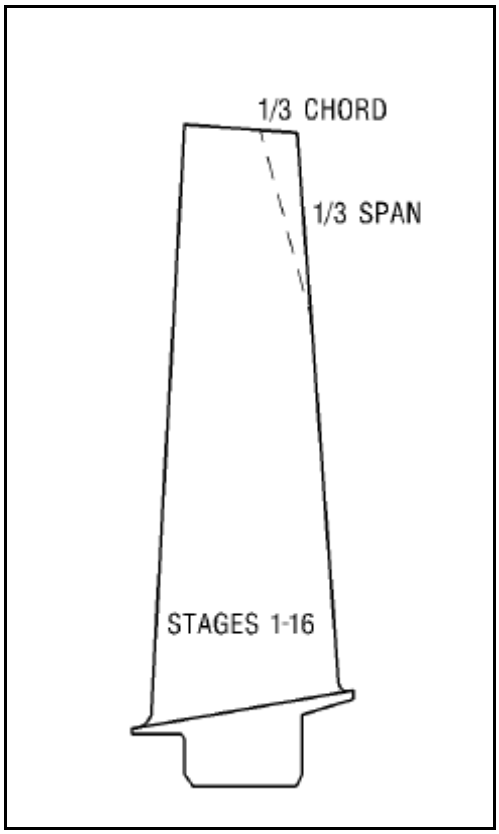



*Figure 7: Tip Trailing Edge Inspection*

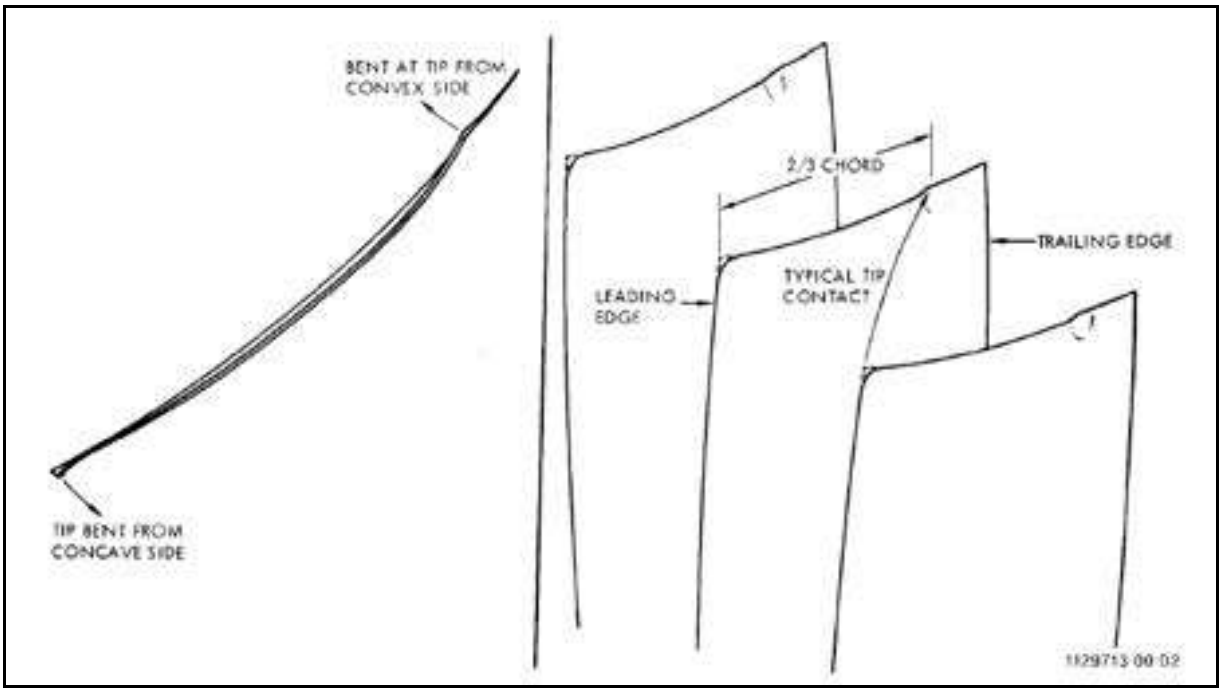


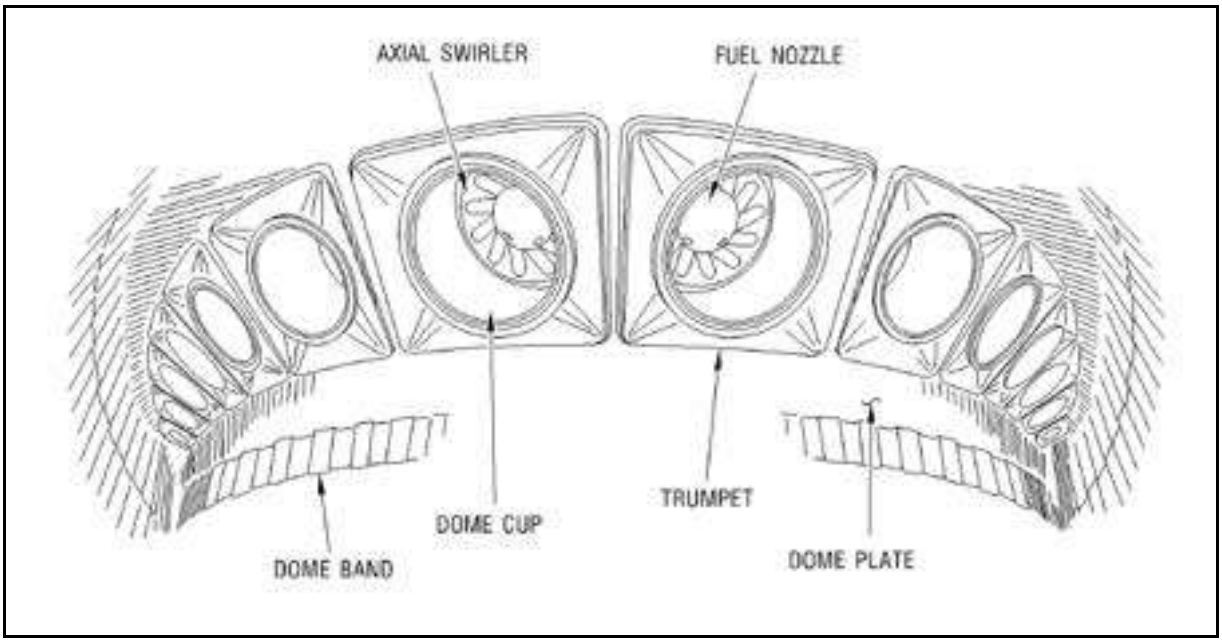

*Figure 8: Tip Clanging Contact (HPCR stage 3 through 6)*

## 4.2 Combustor and 1St Stage Nozzle Section

| Port | Condition observed | Photo no: |
|---|---|---|
| **17A** | | |
| **17B** | | |
| **17C** | | |
| **17D** | **See below notes.** | |
| **17E** | | |
| **17F** | | |
| **17G** | | |
| **17H** | | |
| **17** | 1st stage nozzle (leading edge): | |

**Notes:**

The Combustor section is serviceable according to GEK105054 Volume II WP40600 Table 7.



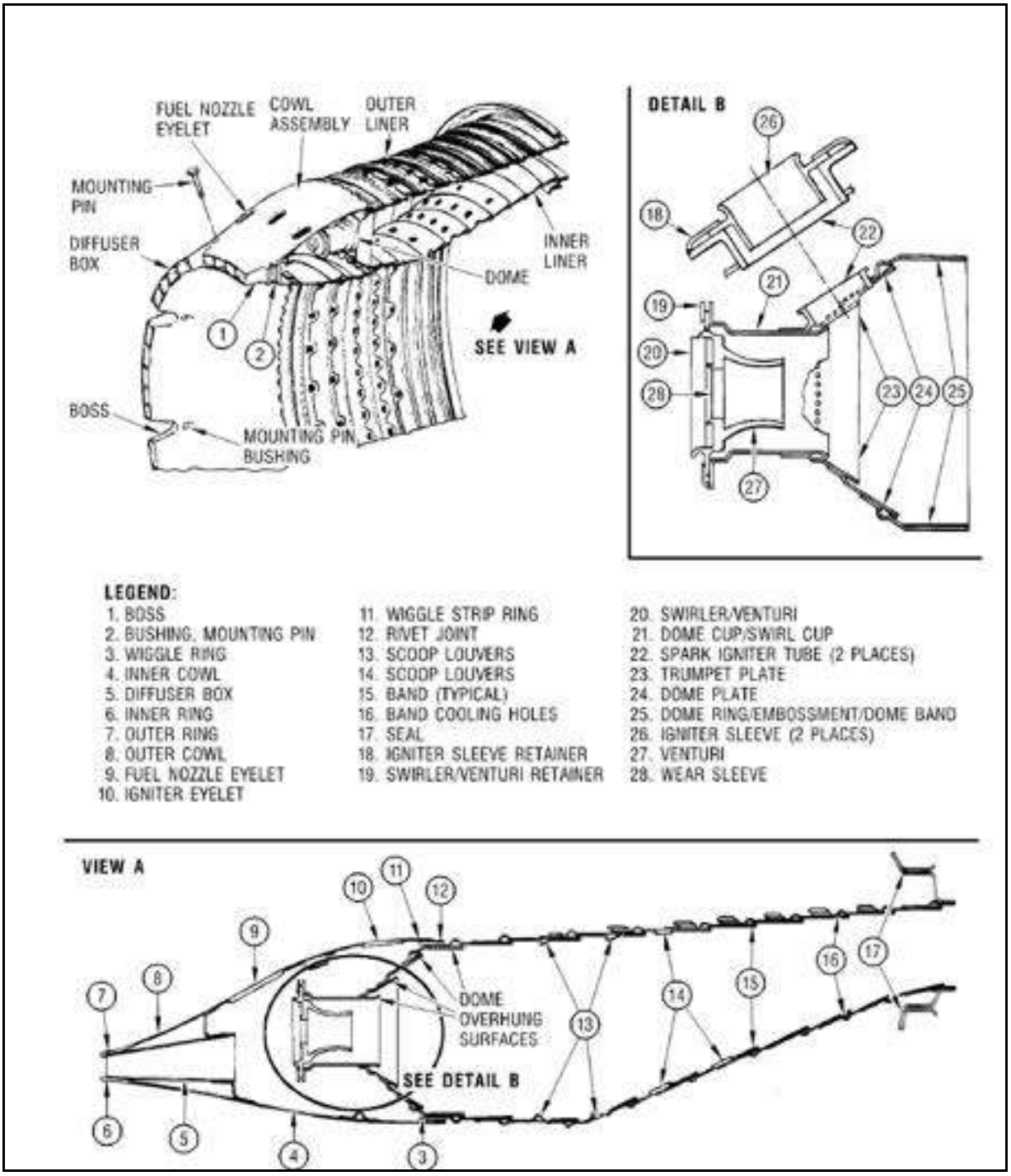



*Figure 9: SAC Combustor Inspection*

*Figure 10: SAC Combustor Inspection*

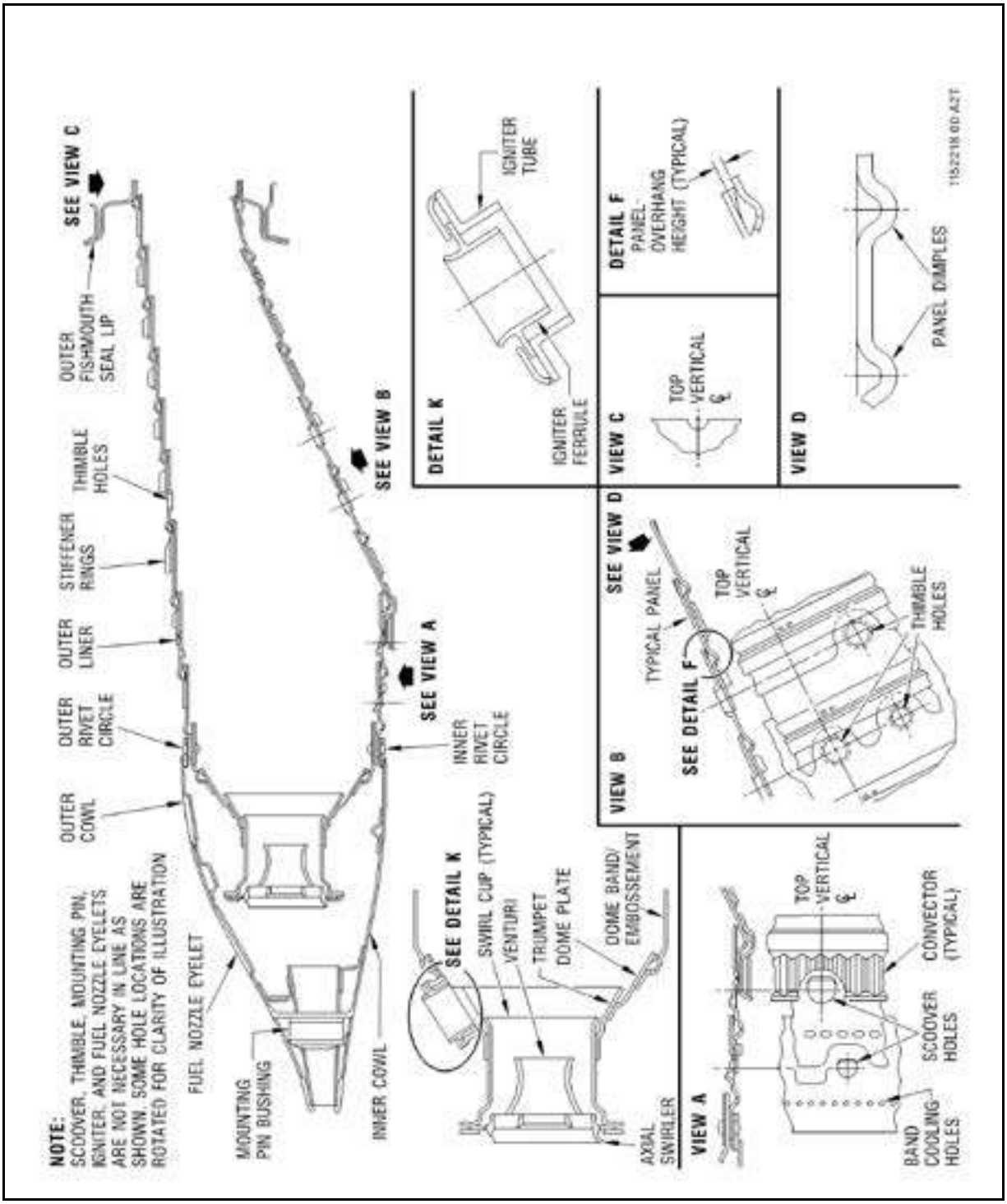
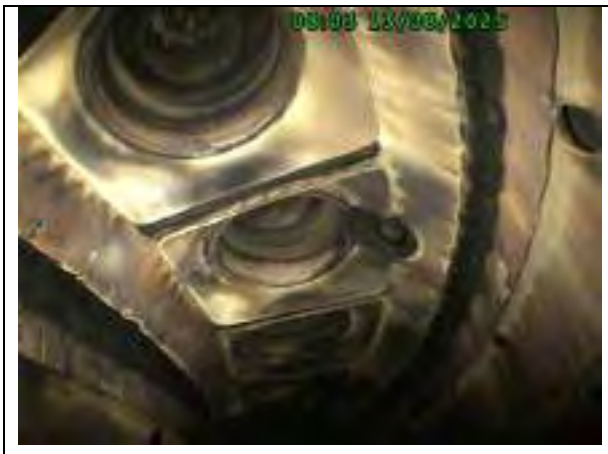



*Figure 11: SAC Combustor Inspection*

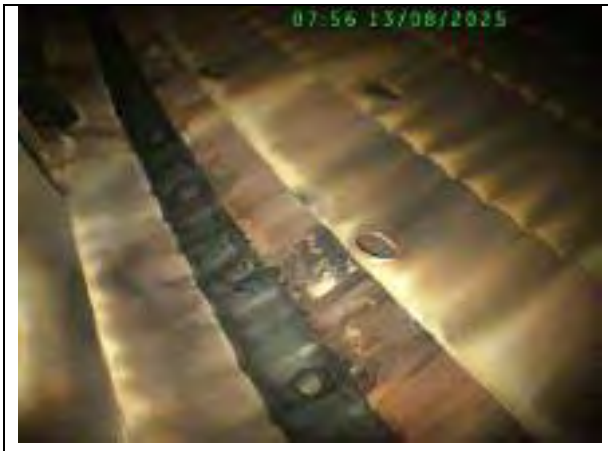
**Borescope Pictures**



Picture 53. Upper igniter ferrule



Picture 54. Lower igniter ferrule



Picture 55. Outer rivets band



Picture 56. Inner rivets band



Picture 57. Combustor liners



Picture 58. Combustor liners



Picture 59. Combustor splash plates



Picture 60. Fuel Nozzle tip



Picture 61. Combustor liners and HPT nozzle interference



Picture 62. . Combustor liners and HPT nozzle interference

## 4.3 Turbine Section

| | turbine stage | | | | |
|---|---|---|---|---|---|
| **Port** | **L.E.** | **T.E.** | **blades** | **Remarks:** | **photo no:** |
| **18** | **1** | | **88** | | |
| **19** | | **1** | **88** | **See below notes.** | |
| **19** | **2** | | **90** | | |
| **20** | | **2** | | | |

**Notes:**

The High Pressure Turbine section is serviceable according to GEK105054 Volume II WP40600 Table 8.

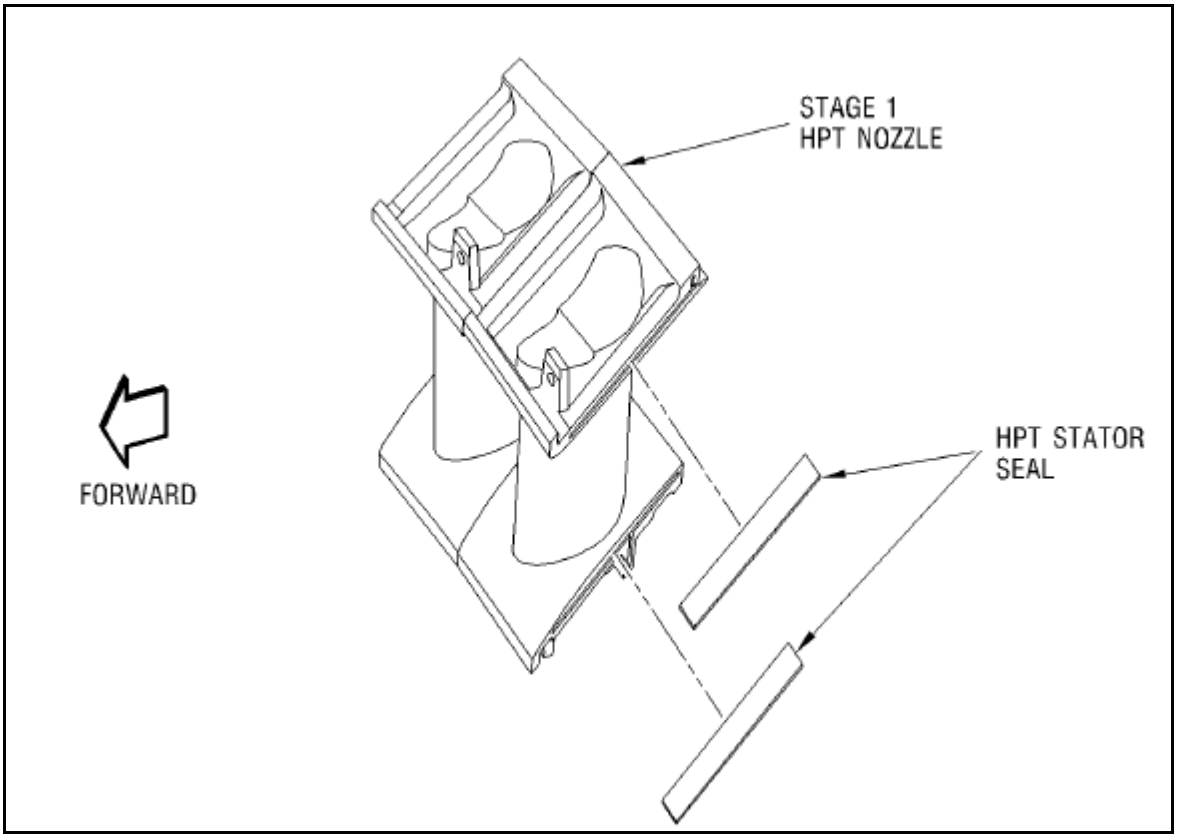



*Figure 12: Stage 1 HPT Nozzle Seal Displacement*

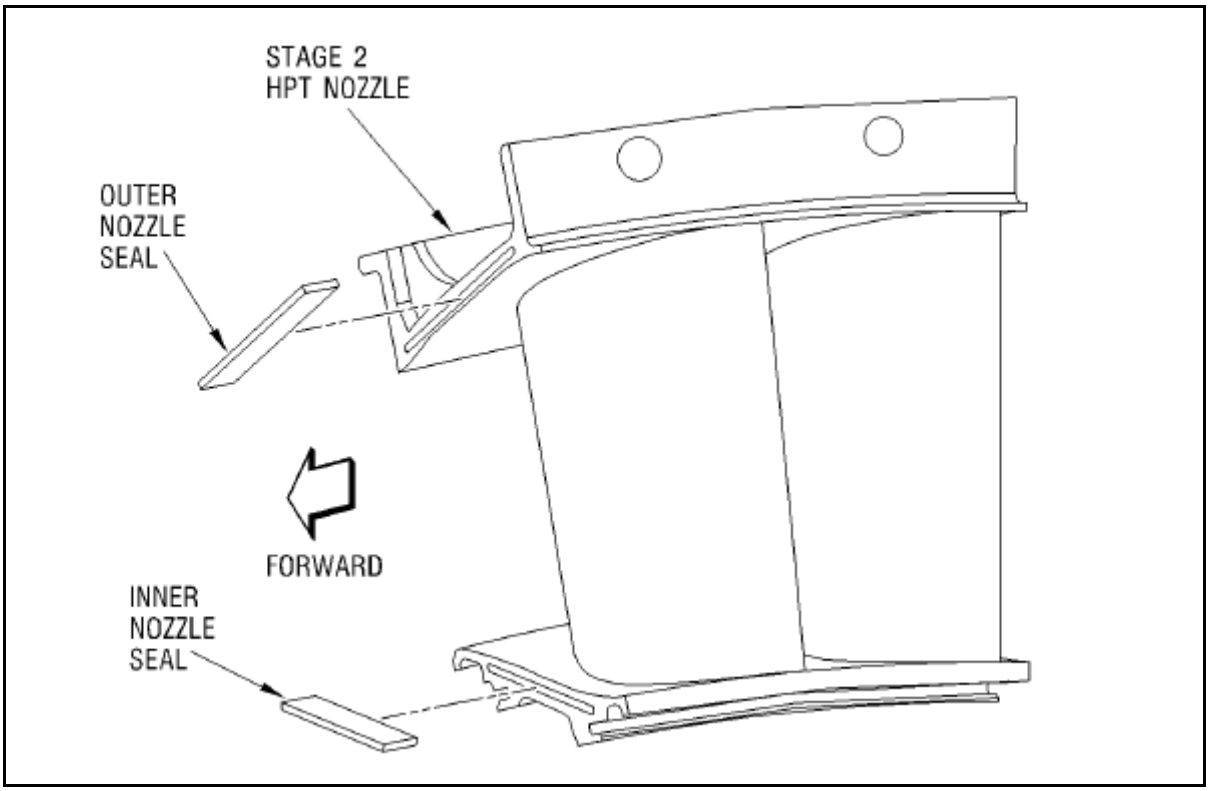



*Figure 13: Stage 2 HPT Nozzle Seal Displacement*

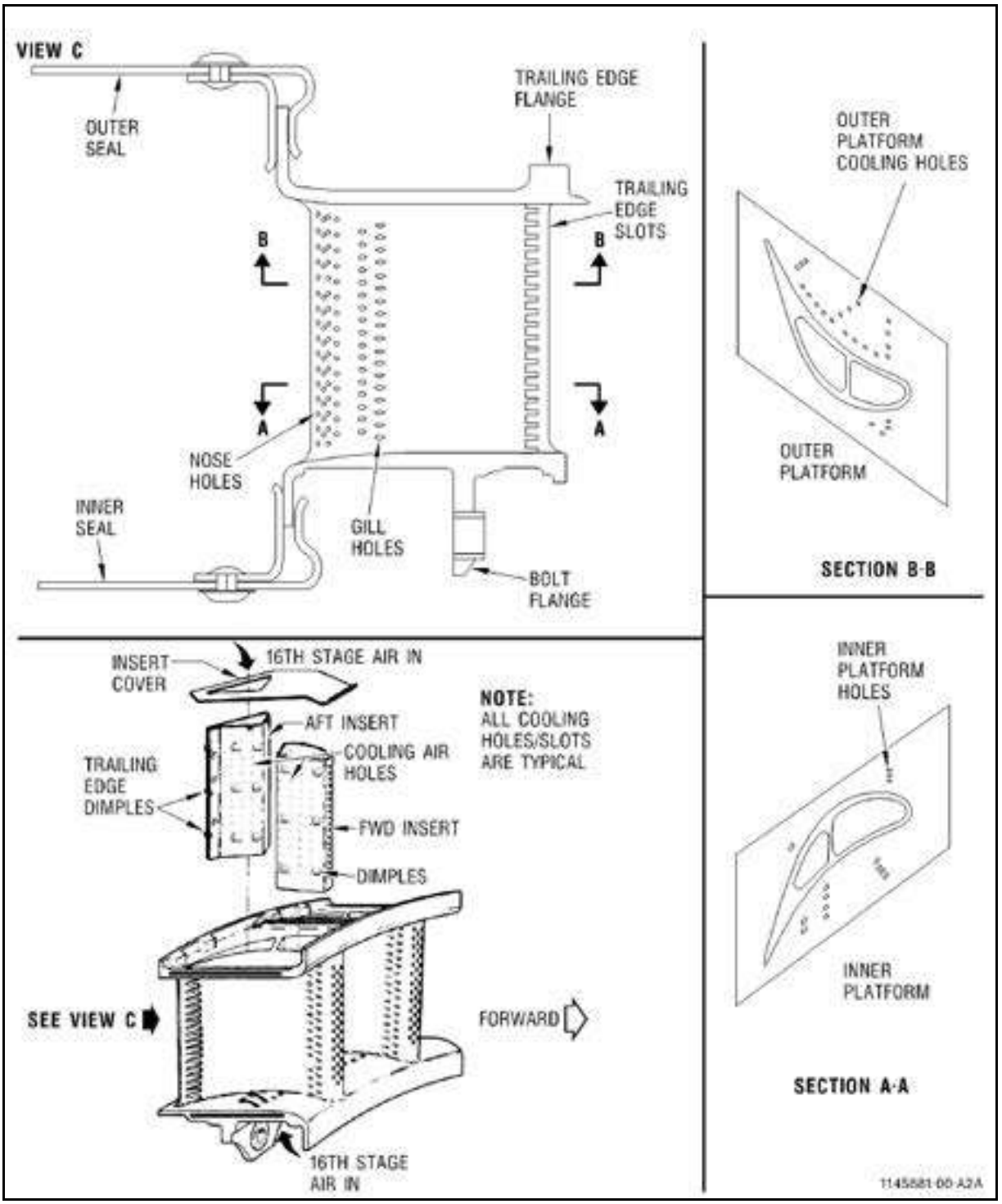



*Figure 14: HPT Stage 1 Nozzle*

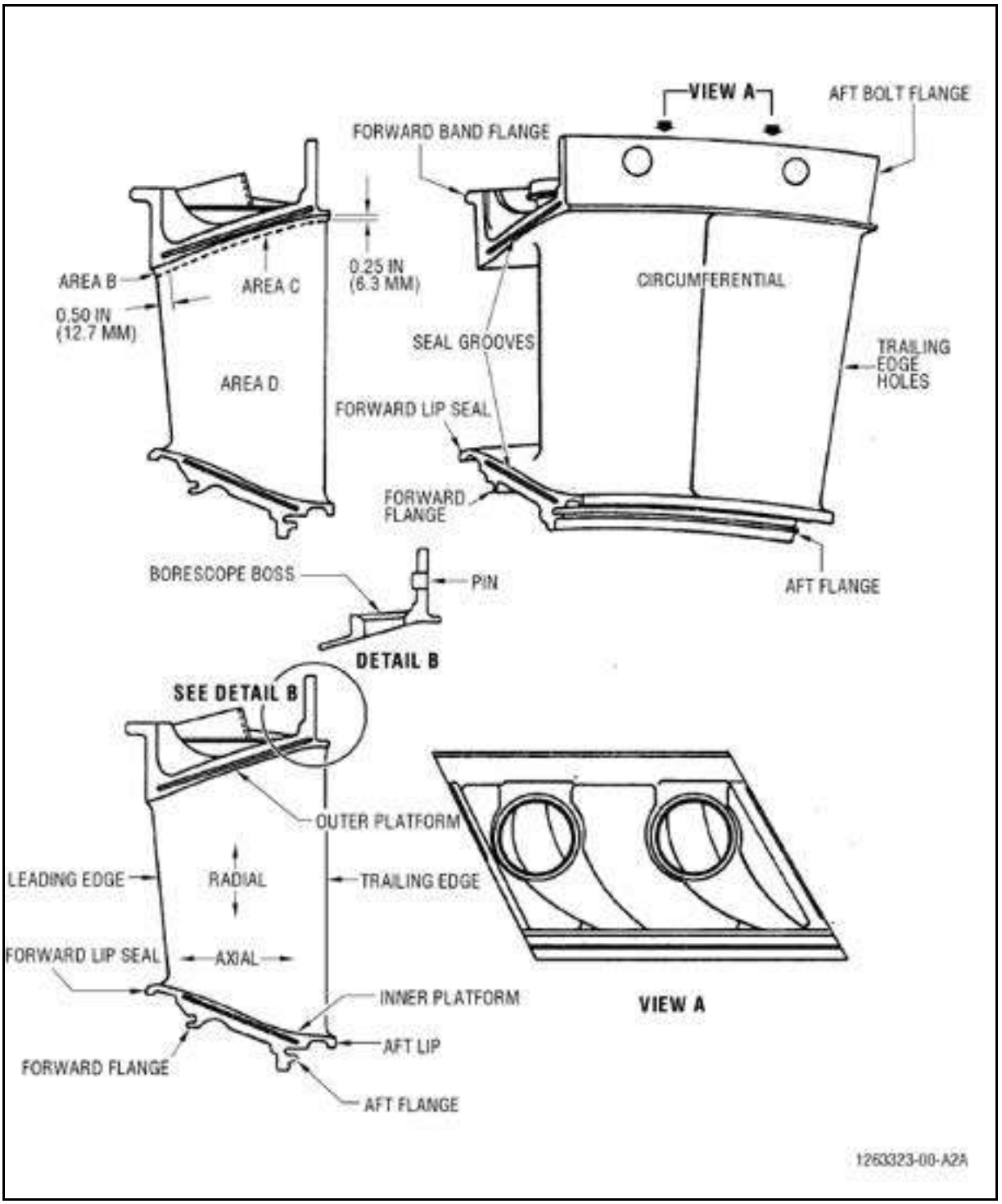



*Figure 15: HPT Stage 2 Nozzle*

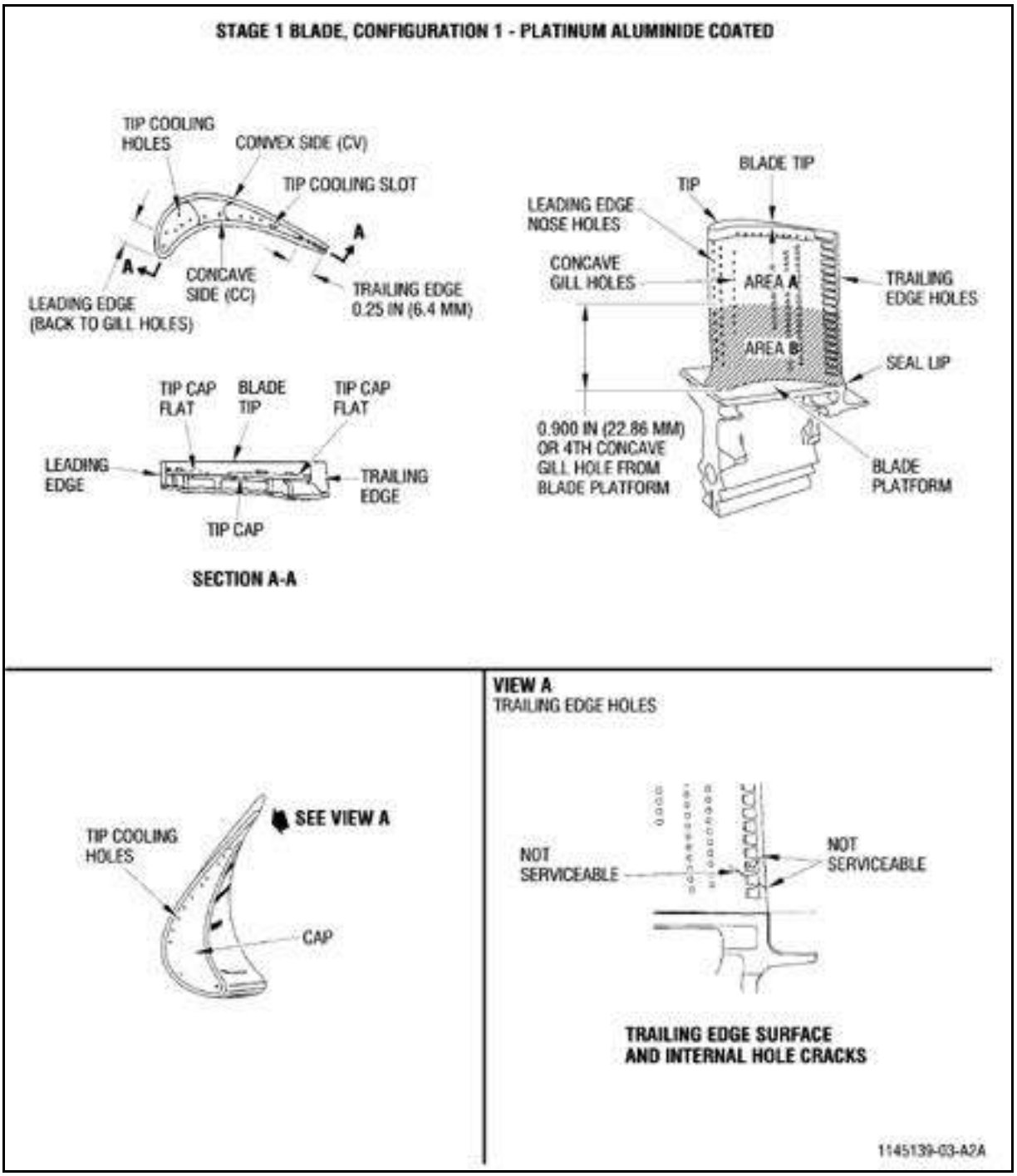



*Figure 16: HPT Stage 1 Rotor Blades Inspection Areas (Platinum Aluminide Coated Blades)*

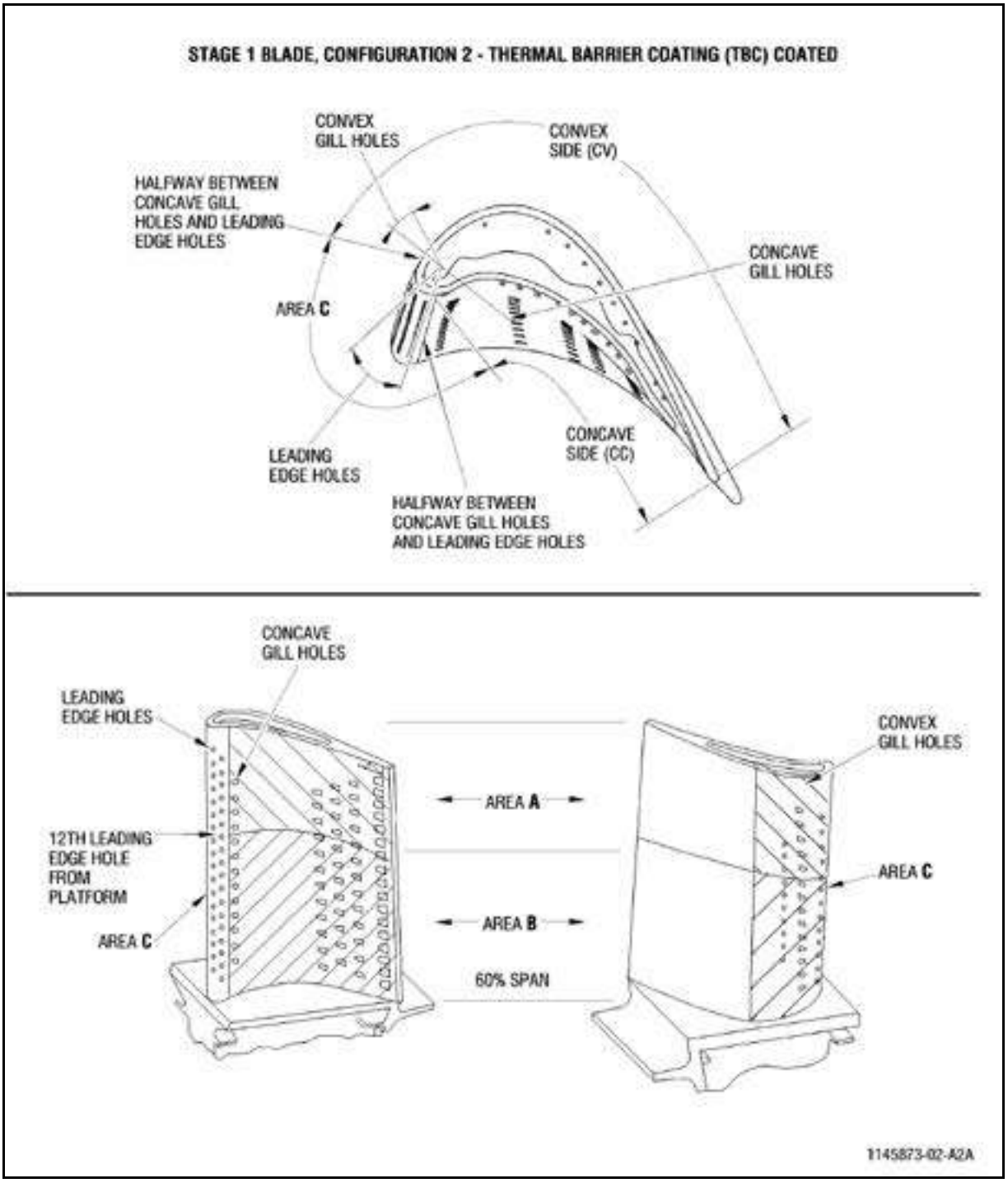



*Figure 17: HPT Stage 1 Rotor Blades Inspection Areas (TBC Coated Blades)*

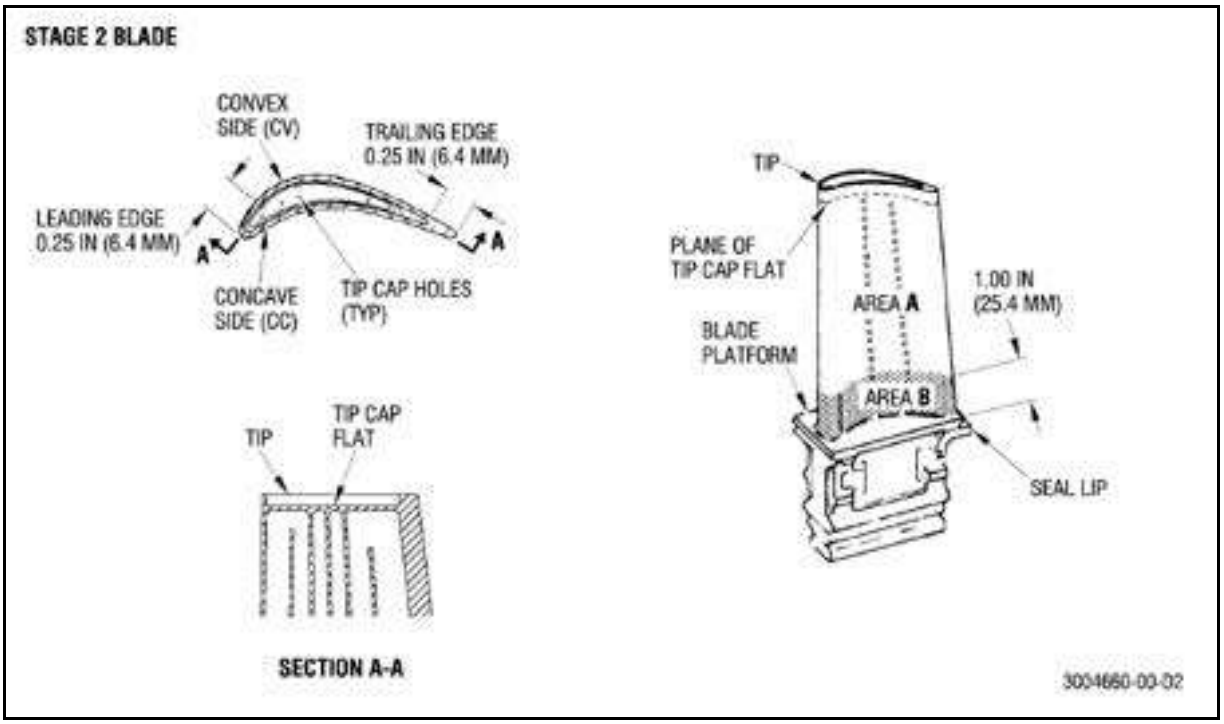



*Figure 18: HPT Stage 2 Rotor Blades Inspection Areas*

**Borescope Pictures**



Picture 63: Stage1 Nozzle leading edge



Picture 64: Stage1 Nozzles Leading edge



Picture 65: Stage1 Nozzle airfoil concave side



Picture 66: Stage1 Nozzle airfoil concave side



Picture 67: Stage1 Nozzles airfoil concave



Picture 68: Stage1 Nozzle airfoil concave



Picture 69: Stage1 Nozzle airfoil concave side



Picture 70: Stage1 Nozzle airfoil convex side



Picture 71: Stage1 Nozzle trailing edge concave



Picture 72: Stage1 Nozzle trailing edge convex



Picture 73: Stage1 Nozzle trailing edge



Picture 74: Stage1 Nozzle trailing edge and



Picture 75: Stage1 Blades leading edge tip damage



Picture 76: Stage1 Blades leading edge convex



Picture 77: Stage 1 Blades leading edge base



Picture 78: Stage 1 Blades leading edge base



Picture 79: Stage 1 Blades trailing edge tip



Picture 80: Stage 1 Blades trailing edge root



Picture 81: Stage 2 Blades leading edge tip



Picture 82: Stage 2 Honeycomb seals



Picture 83: Stage 2 Blades leading edge root



Picture 84: Stage 2 Blades and stage 2 nozzles



Picture 85: Stage 2 Blades trailing edge



Picture 86: Stage 2 Blades trailing edge

## 4.4 LPT Section

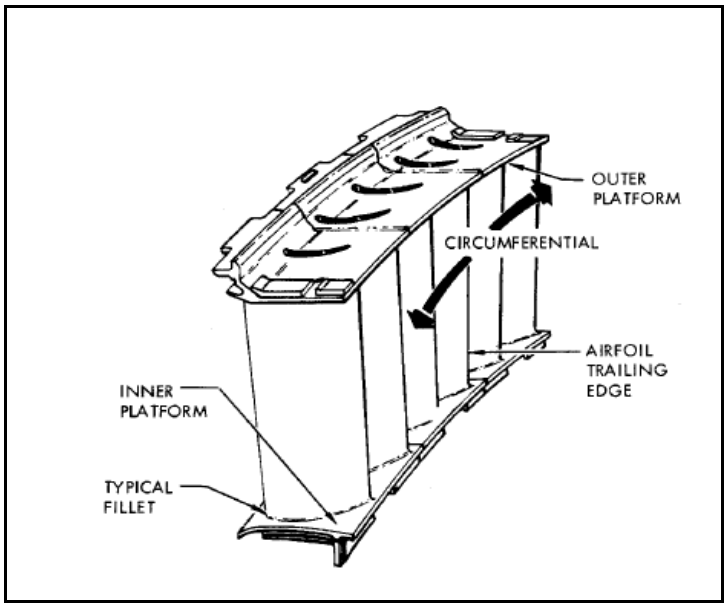



*Figure 19: Power Turbine Nozzles*

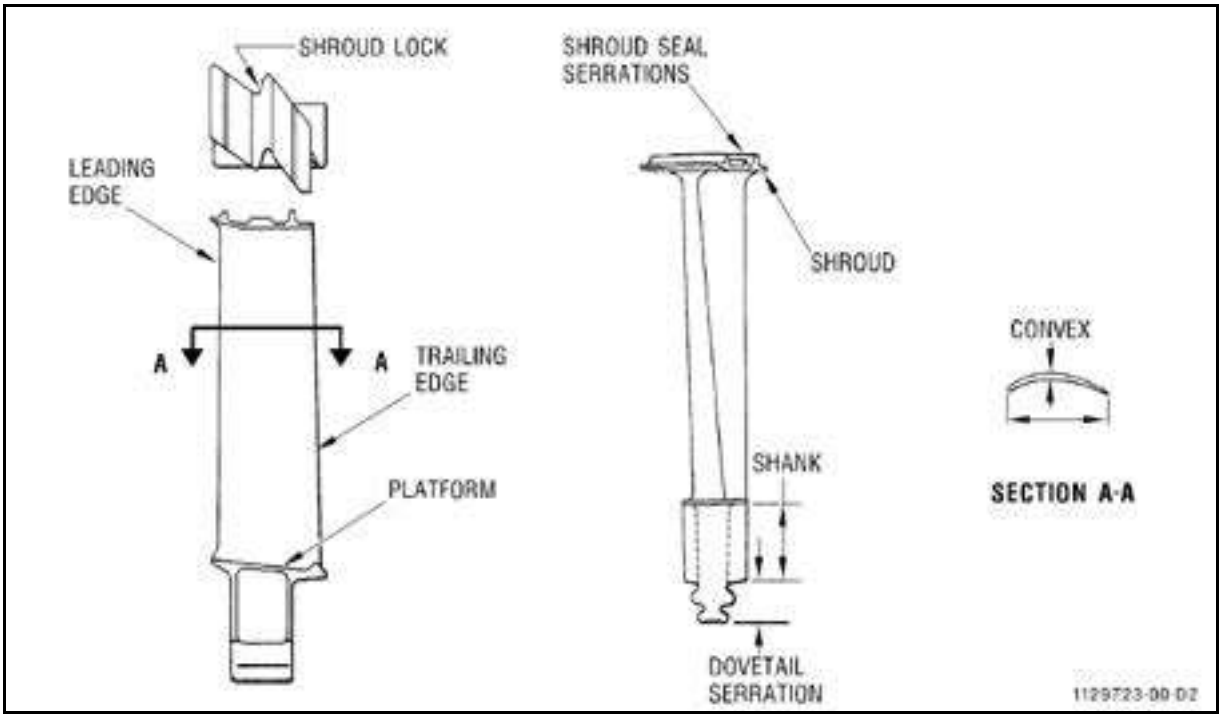



*Figure 20: Power Turbine Rotor Blades*

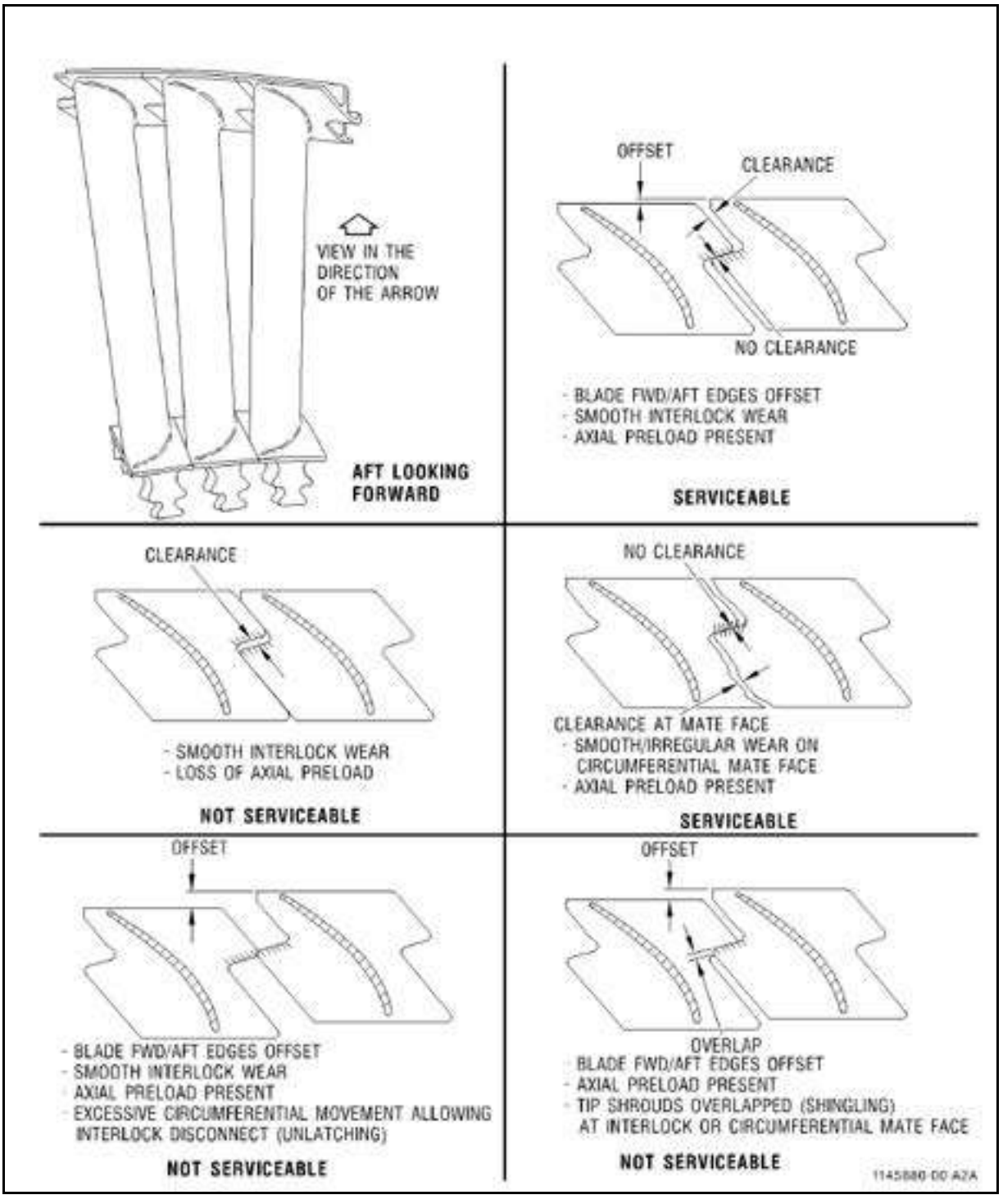



*Figure 21: LPT Rotor Blade Circumferential Inspection*

**Notes:**

The LPT stage 1 accessible nozzles and blades did not show any damage.

**Borescope Pictures**



Picture 87: STG1 LPT nozzles



Picture 88: TMF and LPT Inlet



Picture 89: Stage 1 Blades



Picture 90: LPT Stage 1 Blades tip interlock

# BORESCOPE INSPECTION REPORT
# TM2500 GEN. 6-7
## *7LM2500 – PK – MDWG05*

## NEW FORTRESS ENERGY

## SJTPP, PR

## PACKAGE # 7253290

## UNIT #10

| | | | |
|---|---|---|---|
| **Visit Date:** | 08/14/2025 | **Total Starts:** | 706 |
| **Engine S/N:** | 557-262 | **GG Hours:** | 16133 |
| **Power Turbine S/N:** | 557-262 | **PT Hours:** | 16133 |
| **SOM GT Field Engineer:** | Daniel Arroyo | **New Fortress Representative:** | Jonathan Rodriguez |



## TABLE OF CONTENTS


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2 Outage Data 4

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4 Borescope Inspection Record 6

4.1 Compressor Section

4.2 Combustor and 1St Stage Nozzle Section

4.3 Turbine Section

4.4 LPT Section

## 1. Conclusions and Recommendations

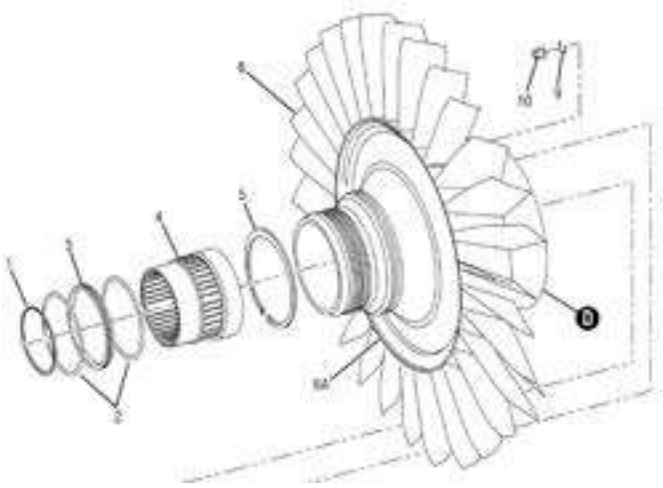
**Purpose of visit:**

The purpose of this visit was to perform a borescope inspection of the Engine in accordance with GEK105054, WP 406 00.

1.1 The HPC is serviceable according to GEK105054, WP 406 00 Table 4. No damages were found.

**Please note the following (Refer to Picture 8):**

During the inspection of the rotor weep holes, it was detected a metallic pice that seems to be loose inside the rotor hub. This piece could be part of the Encased Plain Seal (Item 1) or part of the Retaining Ring (Item 5) showed in the IPB Figure 9 " HPC Rotor Assembly Breakdown". Any of the parts mentioned could have broken, and the piece seen in the weep hole could be a detached fragment.
Regardless of the consequences that may arise from the breakage of the aforementioned parts, there is a risk that a fragment may be propelled into the HPC air path causing a DOD.



1.2 The Combustor section is serviceable according to GEK105054, WP40600 Table 7.

1.3 The High Pressure Turbine section is serviceable according to GEK105054, WP406 00 Table 8.

1.4 The LPT is serviceable according to GEK105054, WP40600.

## 2. Outage Data

### Engine Data

| ESN: | 557-262 | Engine Fired Hours: | 16133 | Package Hours: | 16133 |
|---|---|---|---|---|---|
| Model: | 7LM2500-PK-MDWG05 | Engine Fired starts: | 706 | Package Fired Starts: | 706 |

**MAINTENANCE DATA**

| WP, SB, SL, PB, PL Performed | GEK105054, REV 11 | Date completed | Comments |
|---|---|---|---|
| WP 406 00 | Borescope Inspection | 14AUG25 | Serviceable |

**Parts Data**

| Description | PN Removed | SN Removed | Qty | Disposition | PN Installed | SN Installed |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

## 3. Borescope Inspection Checklist

**Date unit out of operation:** 08/14/2025
**Date unit into operation:** 08/14/2025
**Last inspection date:**

**Type of Fuel:** Natural Gas / Diesel
**Type of NOx suppression:** Water Injection
**Type of outage:** Scheduled BSI

**Inspection of gas turbine:**

| WATERWASH: | HIGH PRESSURE COMPRESSOR: |
|---|---|
| ☒ PERFORMED WATER WASH | ☒ HPC BORESCOPE INSPECTION |
| **COMBUSTOR:** | **HIGH PRESSURE TURBINE** |
| ☒ COMBUSTOR BORESCOPE INSPECTION | ☒ HPT STAGE 1 & 2 NOZZLE BORESCOPE INSPECTION |
| | ☒ HPT BLADE BORESCOPE INSPECTION |
| **LOW PRESSURE TURBINE:** | |
| ☒ LPT BORESCOPE INSPECTION | |

☒ ***Please verify all borescope plugs have been reinstalled***

## 4. Borescope Inspection Record

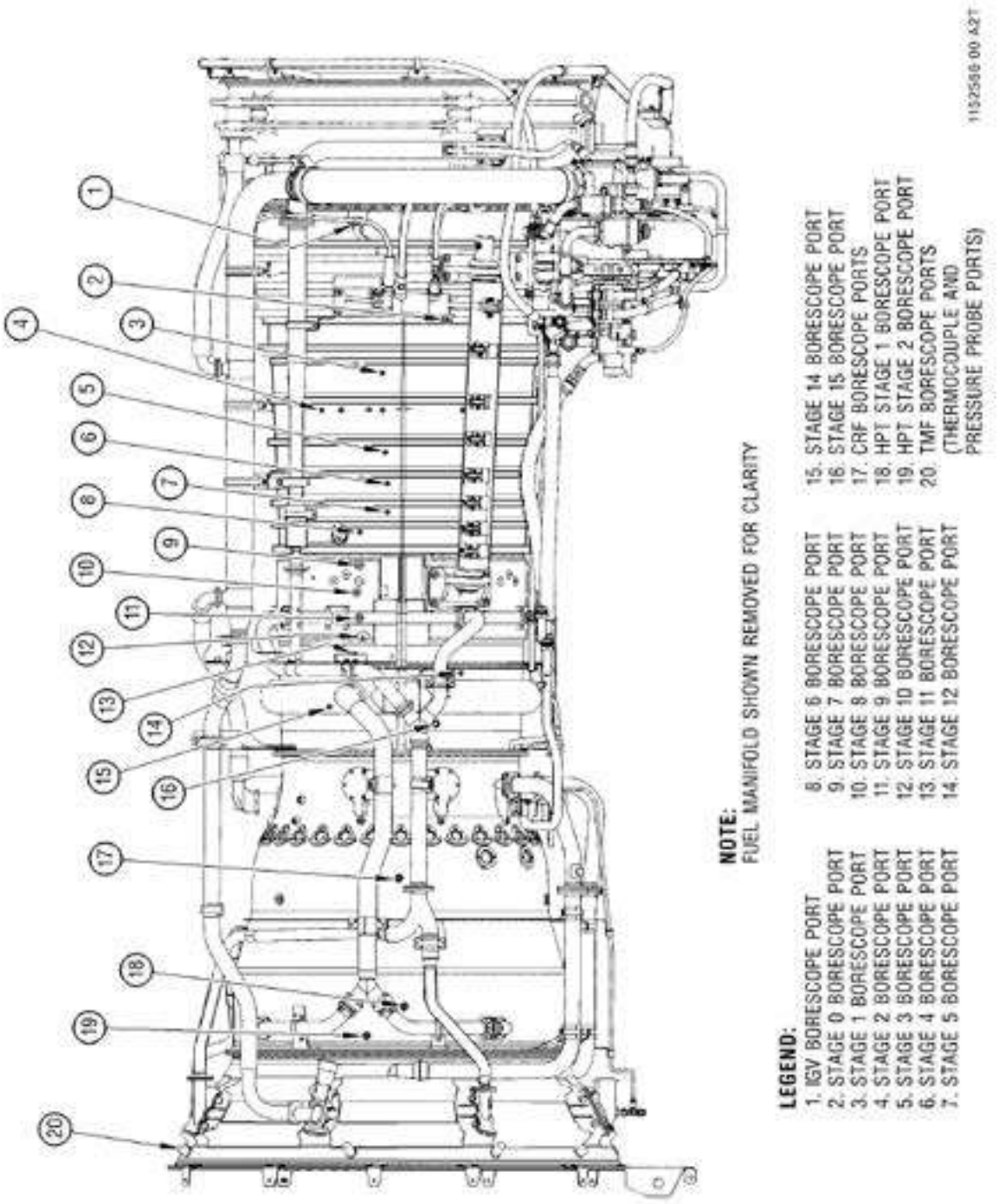



*Figure 1: Position of Borescope Inspection Ports.*

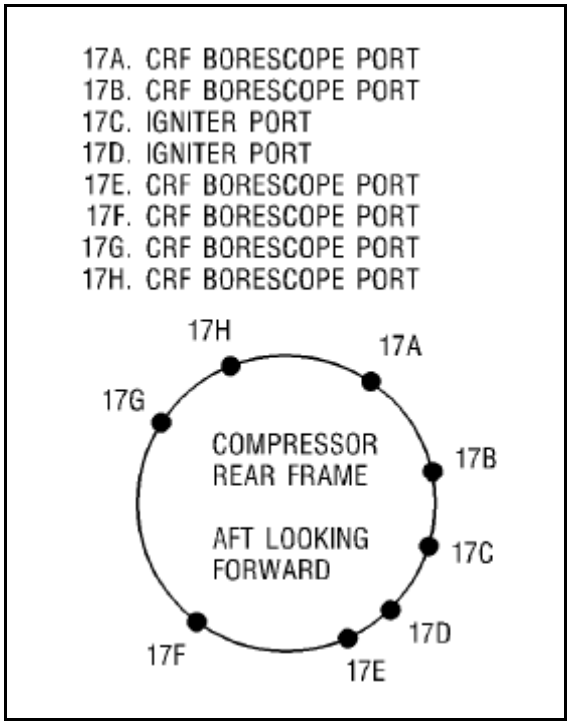



*Figure 2: Position of Borescope Inspection Ports.*

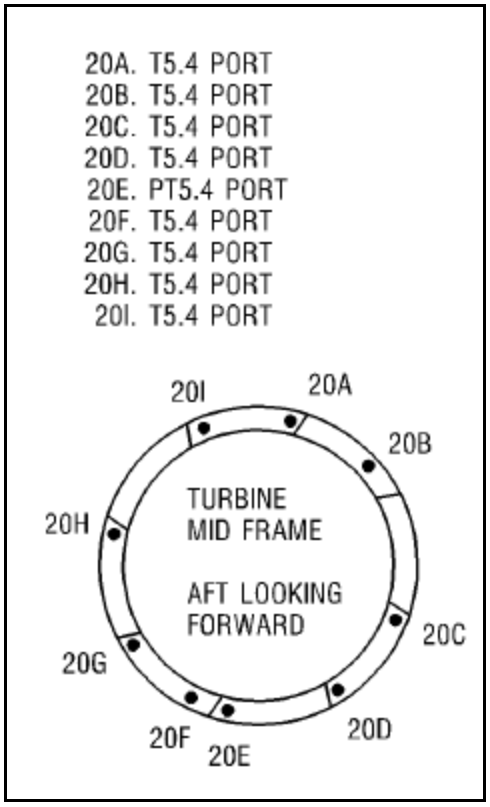



*Figure 3: Position of Borescope Inspection Ports.*

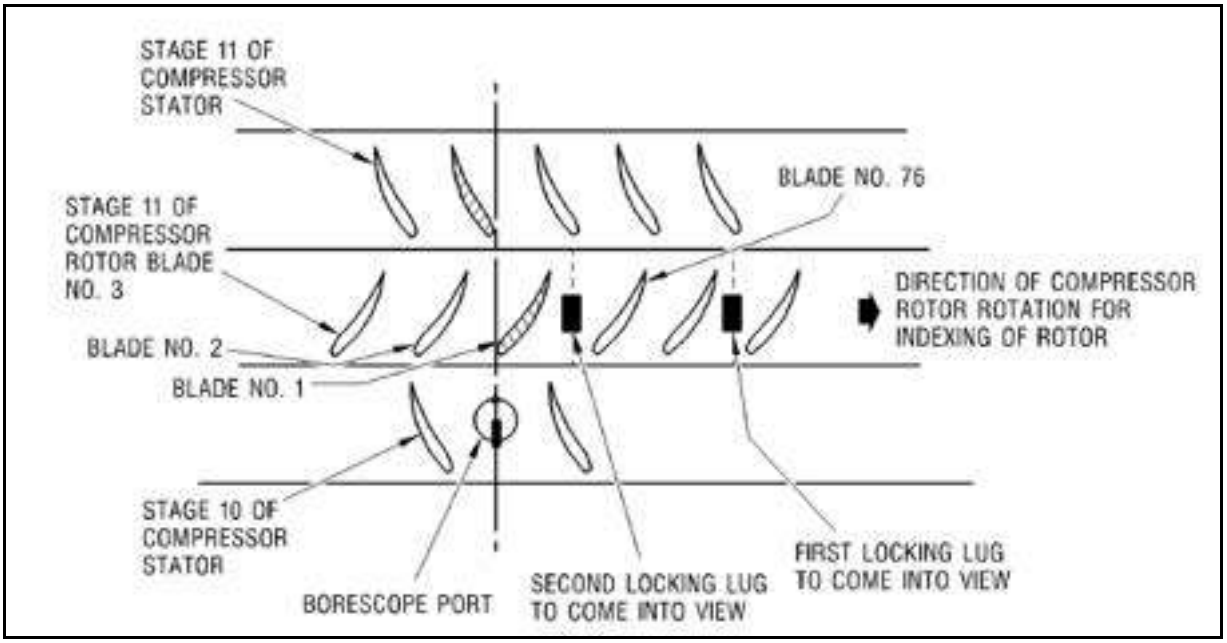



*Figure 4: Zero indexing of HPC rotor and HPT rotor*

## 4.1 Compressor Section

| Port | T.E. | L.E. | blades | Remarks: | photo no: |
|---|---|---|---|---|---|
| 1 | IGV | | | | 1 |
| 1 | | 0 | 36 | | 2,3 |
| 2 | 0 | | 36 | | 4 |
| 2 | | 1 | 26 | | 6,7 |
| 3 | 1 | | 26 | | 9,10 |
| 3 | | 2 | 26 | | 11,12 |
| 4 | 2 | | 26 | | 13 |
| 4 | | 3 | 42 | | 14 |
| 5 | 3 | | 42 | | 15,16 |
| 5 | | 4 | 45 | | 17,18 |
| 6 | 4 | | 45 | | 19, 20 |
| 6 | | 5 | 48 | | 21, 22 |
| 7 | 5 | | 48 | | 23, 24 |
| 7 | | 6 | 54 | | 25, 26 |
| 8 | 6 | | 54 | Blades contacting tip | |
| 8 | | 7 | 56 | Blades contacting tip | |
| 9 | 7 | | 56 | | 27 |
| 9 | | 8 | 64 | | 28 |
| 10 | 8 | | 64 | | 29,30 |
| 10 | | 9 | 66 | | 31 |
| 11 | 9 | | 66 | | 32, 33 |
| 11 | | 10 | 66 | | 35, 36 |
| 12 | 10 | | 66 | | 37, 38 |
| 12 | | 11 | 76 | | 39, 40 |
| 13 | 11 | | 76 | | 41, 42 |
| 13 | | 12 | 76 | | 43, 44 |
| 14 | 12 | | 76 | | 45, 46 |
| 14 | | 13 | 76 | | 47, 48 |
| 15 | 14 | | 76 | Inside bleed manifold | |
| 15 | | 15 | 76 | Inside bleed manifold | |
| 16 | 15 | | 76 | | 49, 50 |
| 16 | | 16 | 76 | | 51, 52 |

**Notes:**

The HPC Section is Serviceable.



Picture 1. CFF & IGV



Picture 2. Stage 0 Leading edge tip



Picture 3. Stage 0 Leading edge base



Picture 4. Stage 0 Trailing edge tip



Picture 5. Stage 0 Weep hole




Picture 6. Stage 1 Leading edge tip



Picture 7. Stage 1 Leading edge base



Picture 8. Stage 1 weep hole



Picture 9. Stage 1 Trailing edge tip



Picture 10. Stage 1 Trailing base



Picture 11. Stage 2 Leading edge tip



Picture12. Stage 2 Leading edge base



Picture 13. Stage 2 Trailing edge tip



Picture 14. Stage 3 Leading edge tip



Picture 15. Stage 3 Trailing edge tip



Picture 16. Stage 3 Trailing edge base



Picture 17. Stage 4 Leading edge tip



Picture 18. Stage 4 Leading edge base



Picture 19. Stage 4 Trailing edge tip



Picture 20. Stage 4 Trailing edge base



Picture 21. Stage 5 Leading edge tip



Picture 22. Stage 5 Leading edge base



Picture 23. Stage 5 Trailing edge tip



Picture 24. Stage 5 Trailing edge base



Picture 25. Stage 6 Leading edge tip



Picture 26. Stage 6 Leading edge base



Picture 27. Stage 7 Trailing edge tip



Picture 28. Stage 8 Leading edge tip



Picture 29. Stage 8 Trailing edge tip



Picture 30. Stage 8 Trailing edge base



Picture 31. Stage 9 Leading edge



Picture 32. Stage 9 Trailing edge tip



Picture 33. Stage 9 Trailing base



Picture 34. Stage 9 Bleed manifold



Picture 35. Stage 10 Leading edge tip



Picture 36. Stage 10 Leading edge base



Picture 37. Stage 10 Trailing edge tip



Picture 38. Stage 10 Trailing edge base



Picture 39. Stage 11 Leading edge tip



Picture 40. Stage 11 Leading edge base



Picture 41. Stage 11 Trailing edge tip



Picture 42. Stage 11 Trailing edge base



Picture 43. Stage 12 Leading edge tip



Picture 44. Stage 12 Leading edge base



Picture 45. Stage 12 Trailing edge tip



Picture 46. Stage 12 Trailing edge base



Picture 47. Stage 13 Leading edge tip



Picture 48. Stage 13 Leading edge base



Picture 49. Stage 15 Trailing edge tip



Picture 50. Stage 15 Leading edge base



Picture 51. Stage 16 Leading edge tip



Picture 52. OGV'S

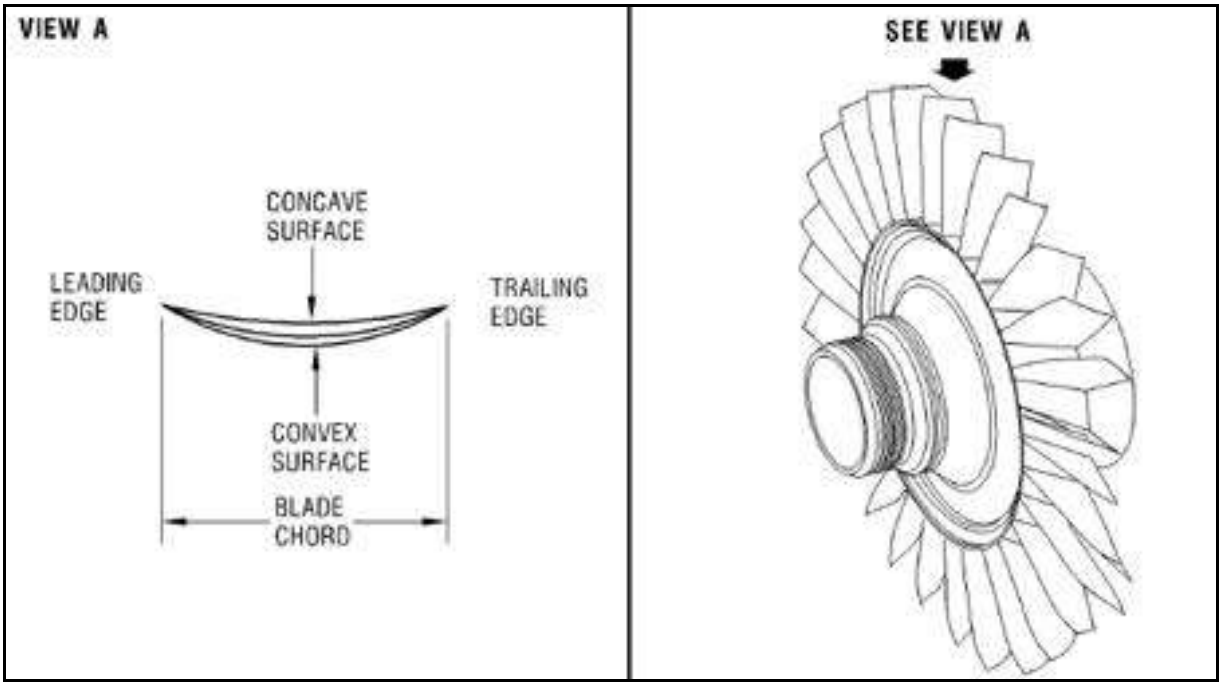



*Figure 5: HPC stage 0 BLISK*

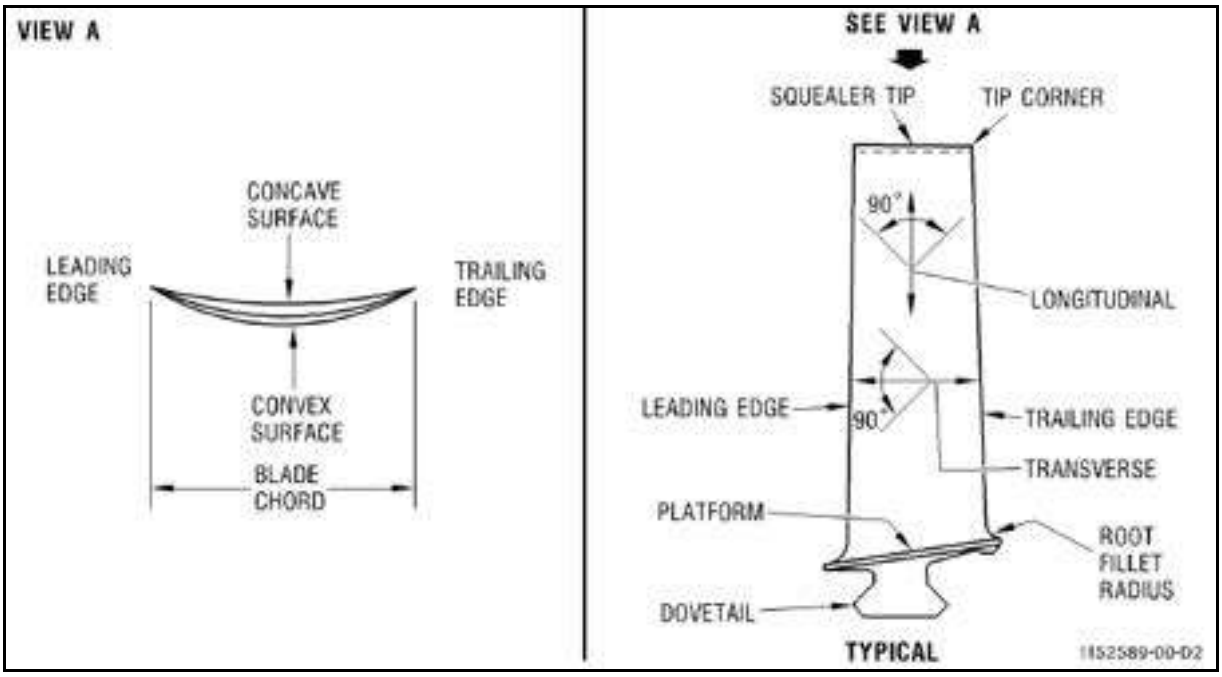



*Figure 6: Compressor Rotor Blades*

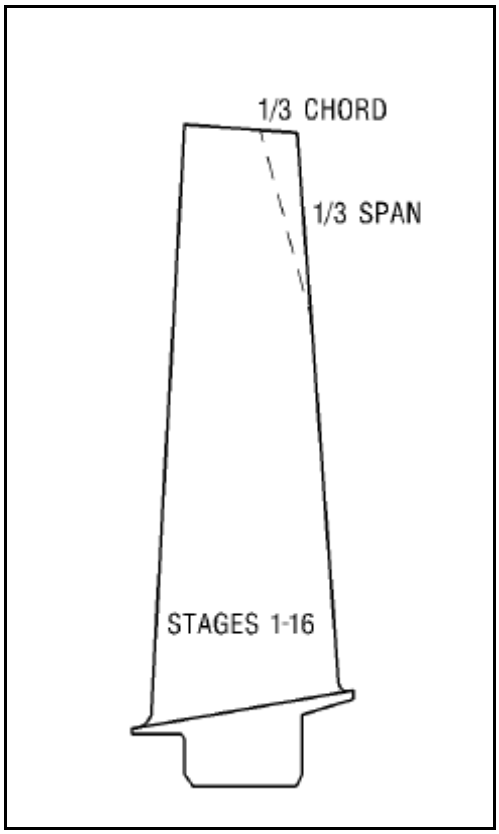



*Figure 7: Tip Trailing Edge Inspection*

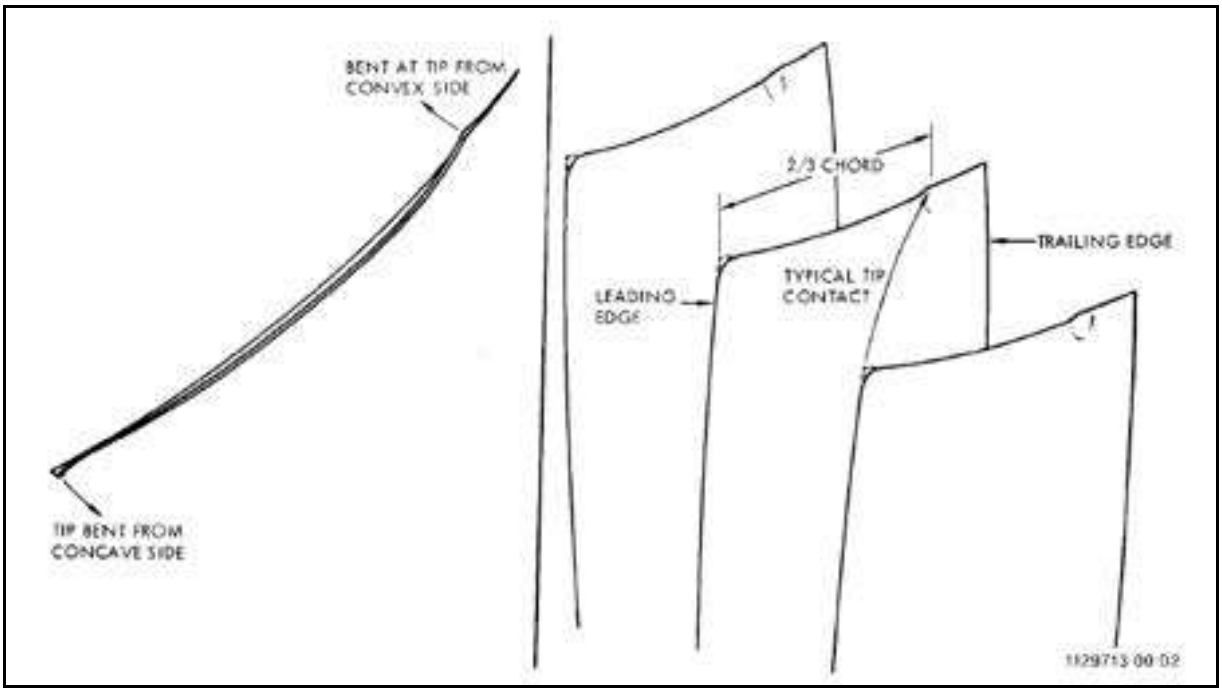


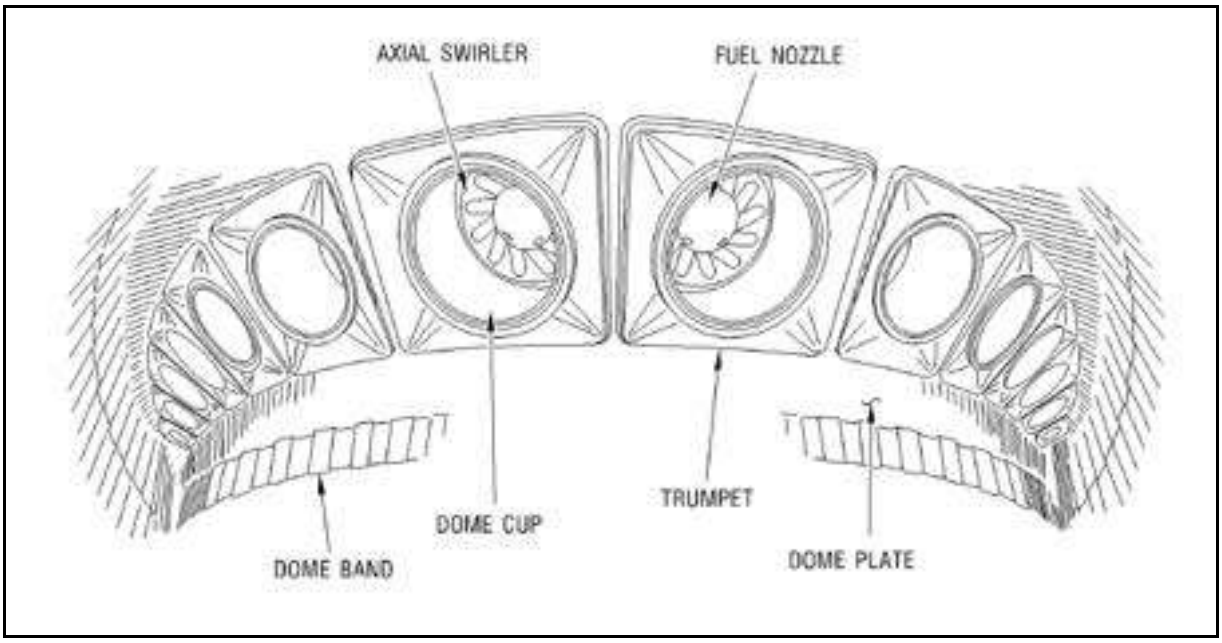

*Figure 8: Tip Clanging Contact (HPCR stage 3 through 6)*

## 4.2 Combustor and 1St Stage Nozzle Section

| Port | Condition observed | Photo no: |
|---|---|---|
| **17A** | | |
| **17B** | | |
| **17C** | | |
| **17D** | **See below notes.** | |
| **17E** | | |
| **17F** | | |
| **17G** | | |
| **17H** | | |
| **17** | 1st stage nozzle (leading edge): | |

**Notes:**

The Combustor section is serviceable according to GEK105054 Volume II WP40600 Table 7.



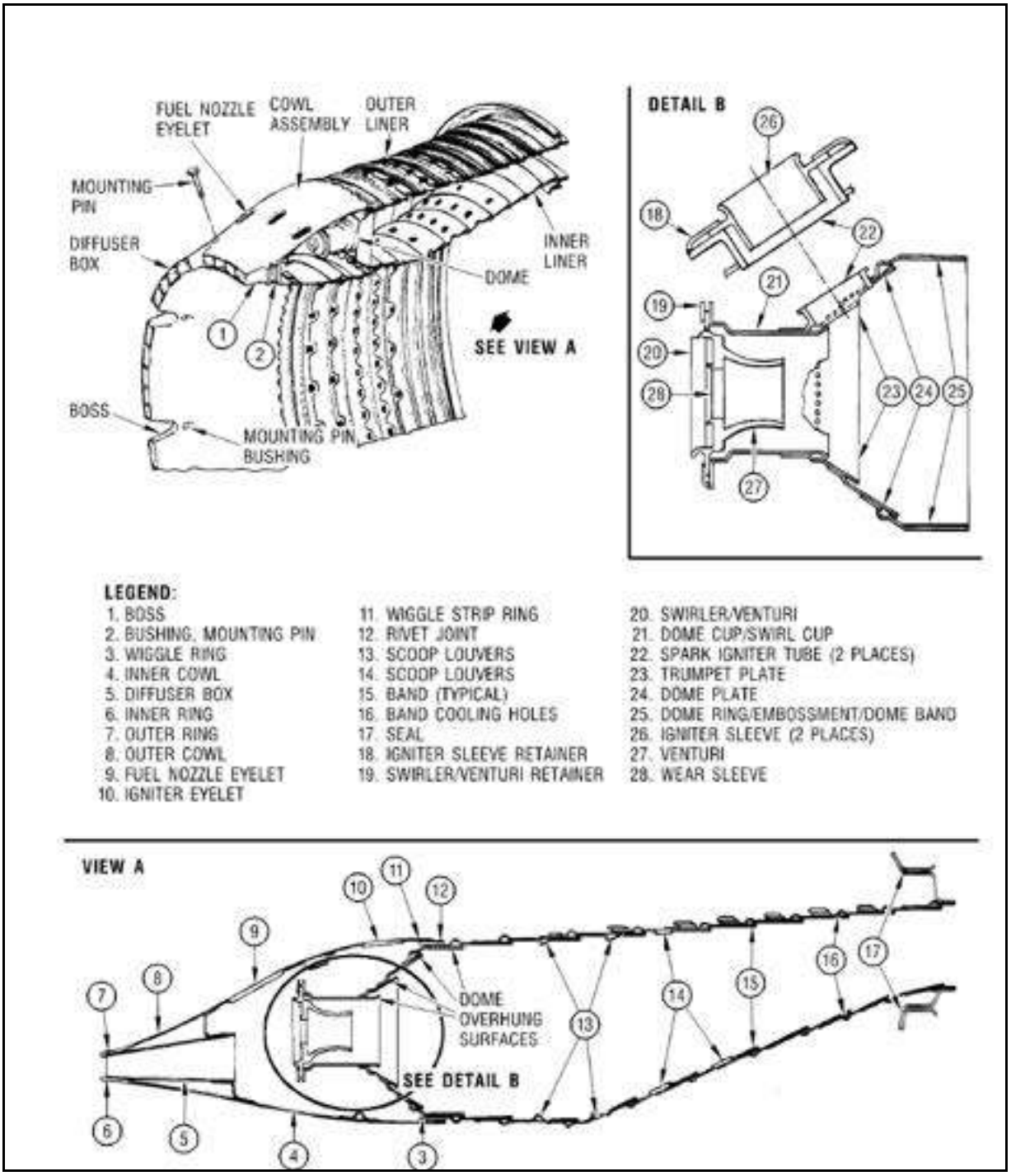



*Figure 9: SAC Combustor Inspection*

*Figure 10: SAC Combustor Inspection*

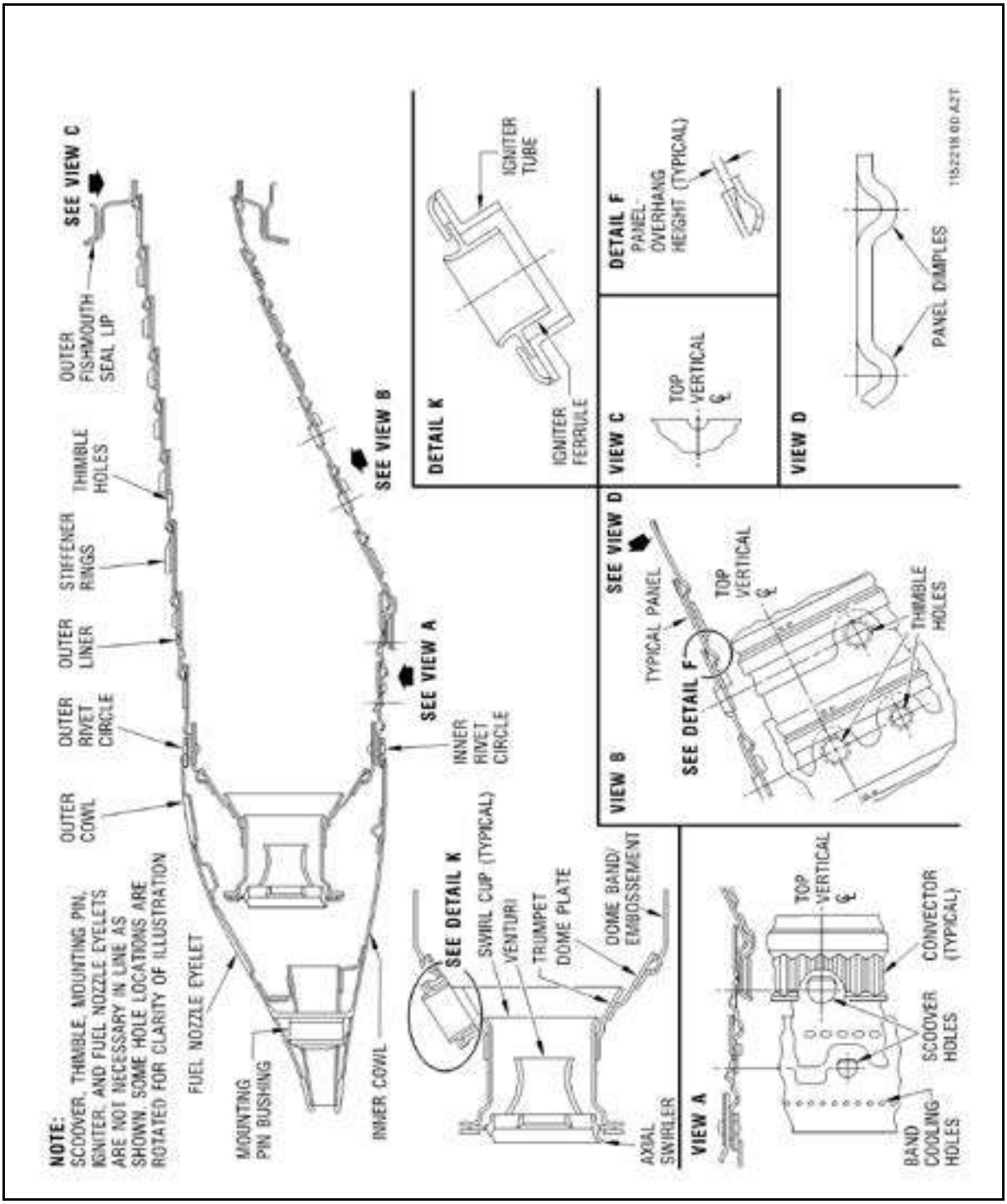
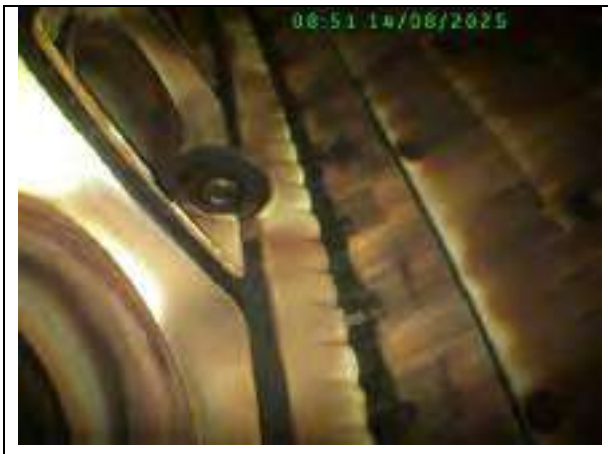



*Figure 11: SAC Combustor Inspection*

**Borescope Pictures**




Picture 53. Upper igniter ferrule




Picture 54. Lower igniter ferrule




Picture 55. Outer rivets band



Picture 56. Inner rivets band



Picture 57. Combustor liners




Picture 58. Combustor liners

| | | |
|---|---|---|
|  | |  |
| Picture 59. Combustor splash plates | | Picture 60. Fuel Nozzle tip |

| | | |
|---|---|---|
|  | |  |
| Picture 61. Combustor liners and HPT nozzle interference | | Picture 62. . Combustor liners and HPT nozzle interference |

## 4.3 Turbine Section

| | turbine stage | | | | |
|---|---|---|---|---|---|
| **Port** | **L.E.** | **T.E.** | **blades** | **Remarks:** | **photo no:** |
| **18** | **1** | | **88** | | |
| **19** | | **1** | **88** | **See below notes.** | |
| **19** | **2** | | **90** | | |
| **20** | | **2** | | | |

**Notes:**

The High Pressure Turbine section is serviceable according to GEK105054 Volume II WP40600 Table 8.

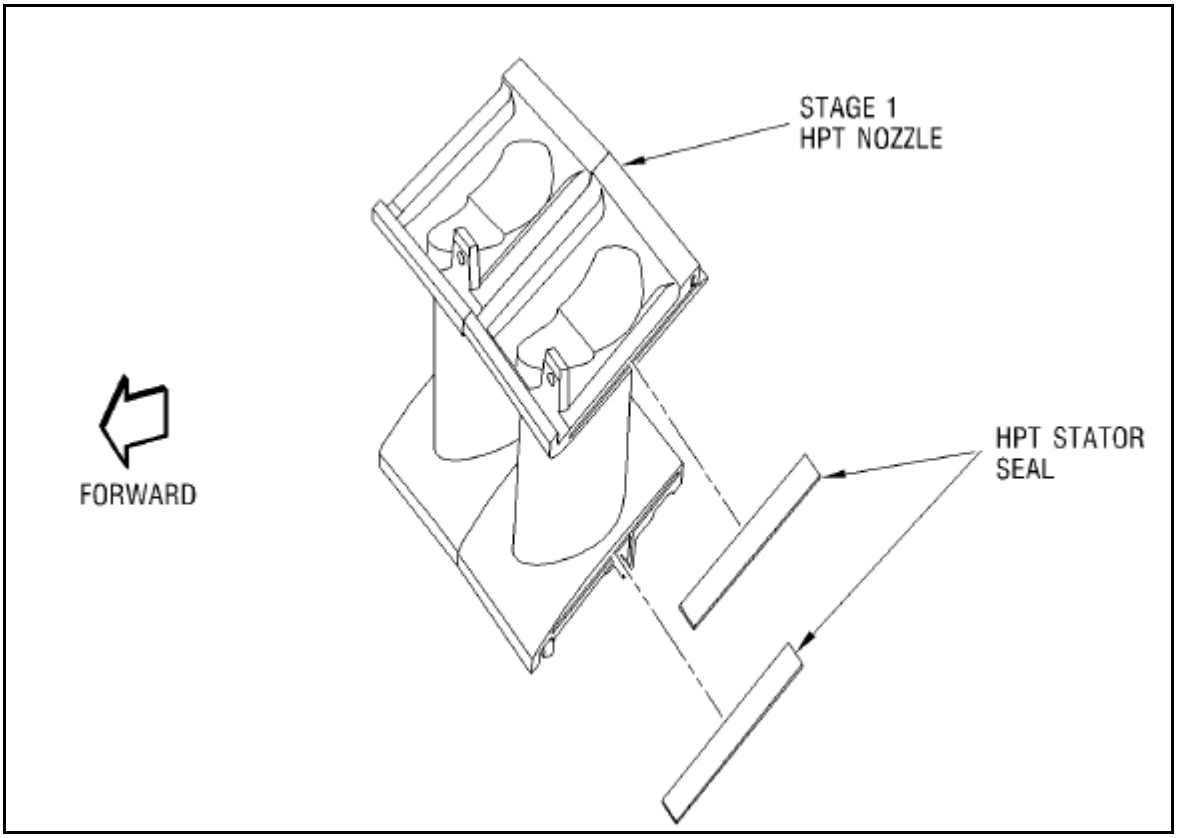



*Figure 12: Stage 1 HPT Nozzle Seal Displacement*

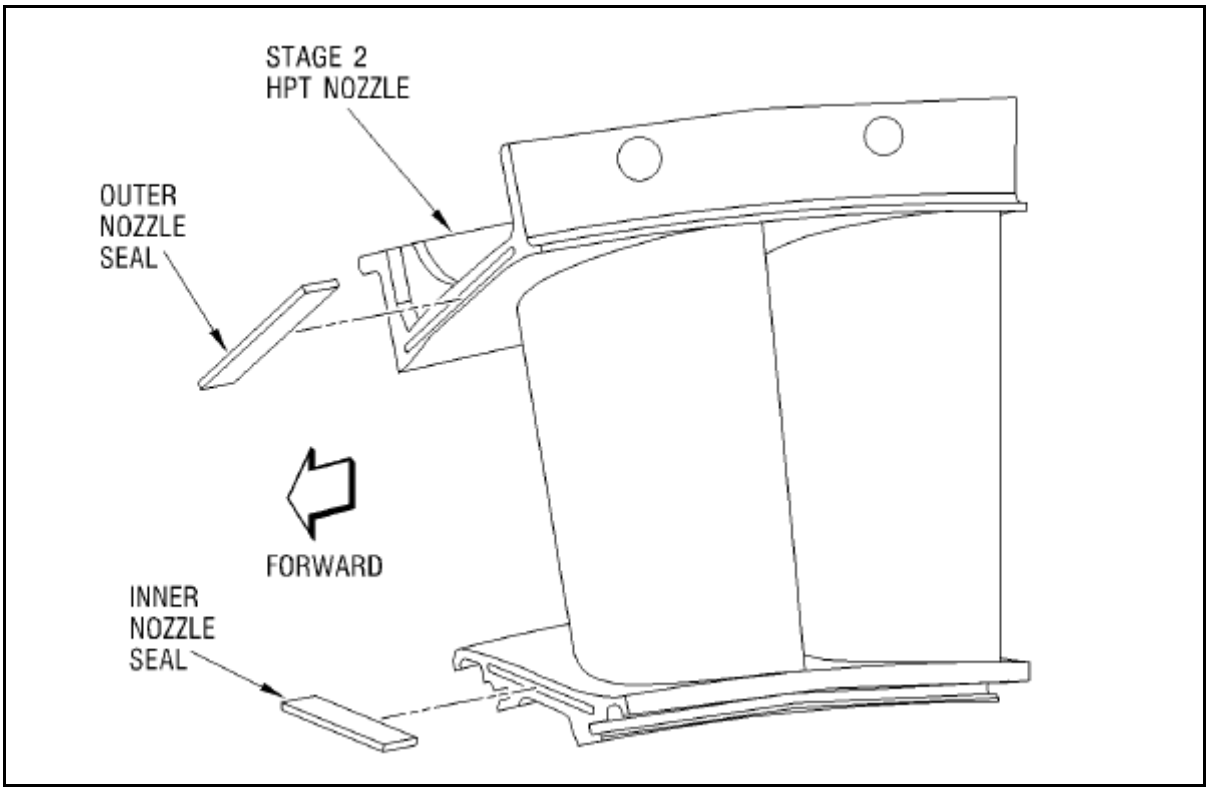



*Figure 13: Stage 2 HPT Nozzle Seal Displacement*

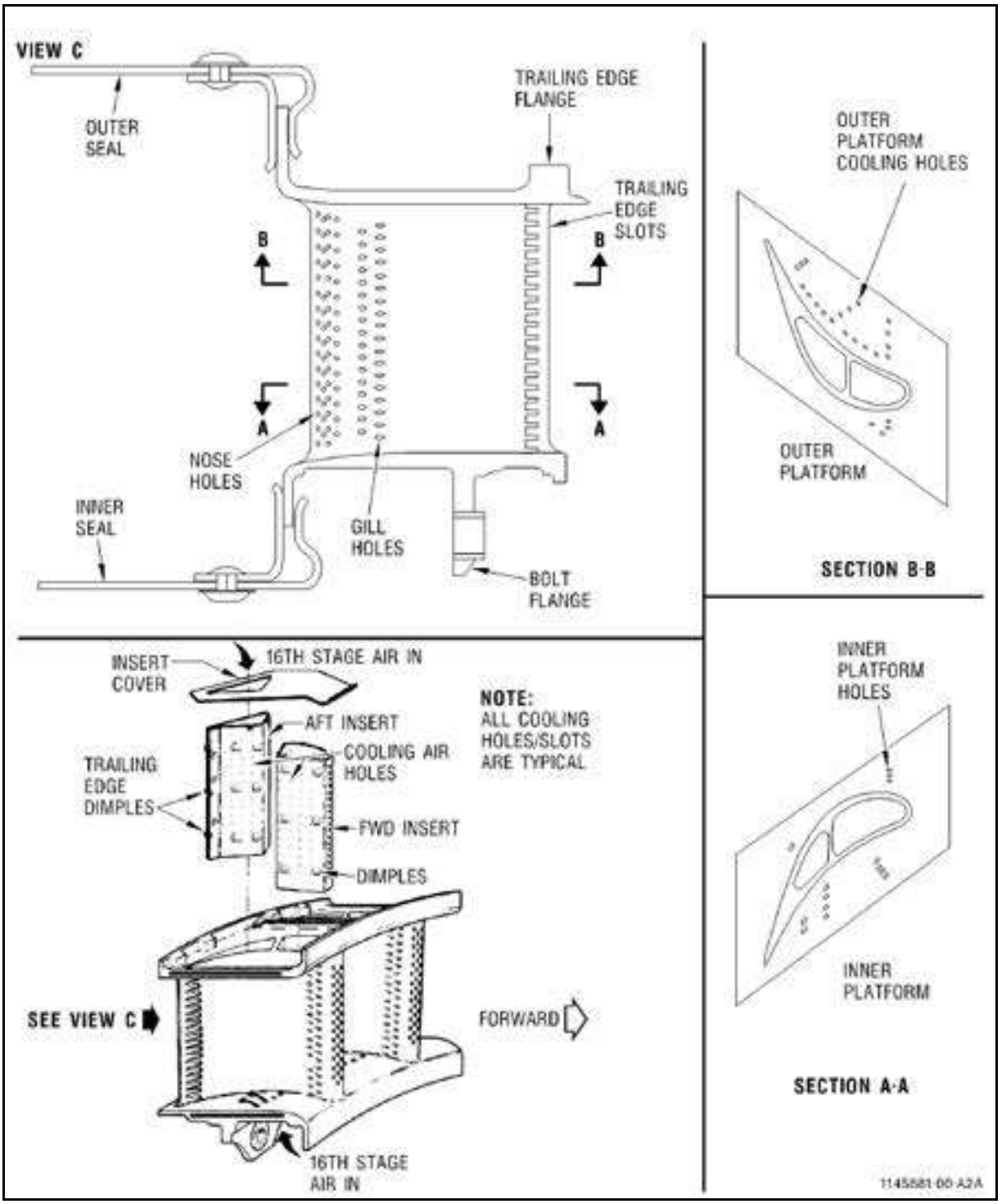



*Figure 14: HPT Stage 1 Nozzle*

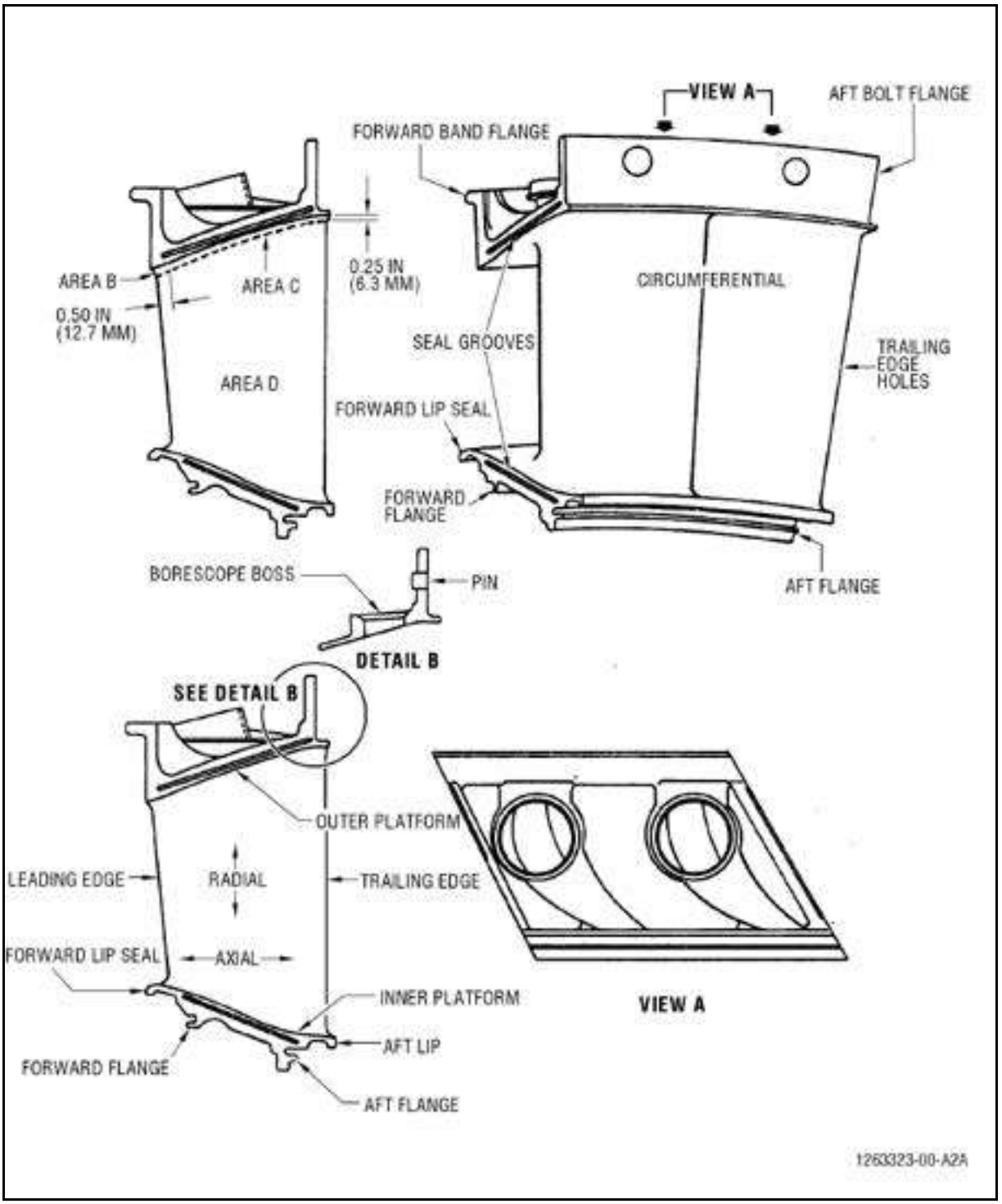



*Figure 15: HPT Stage 2 Nozzle*

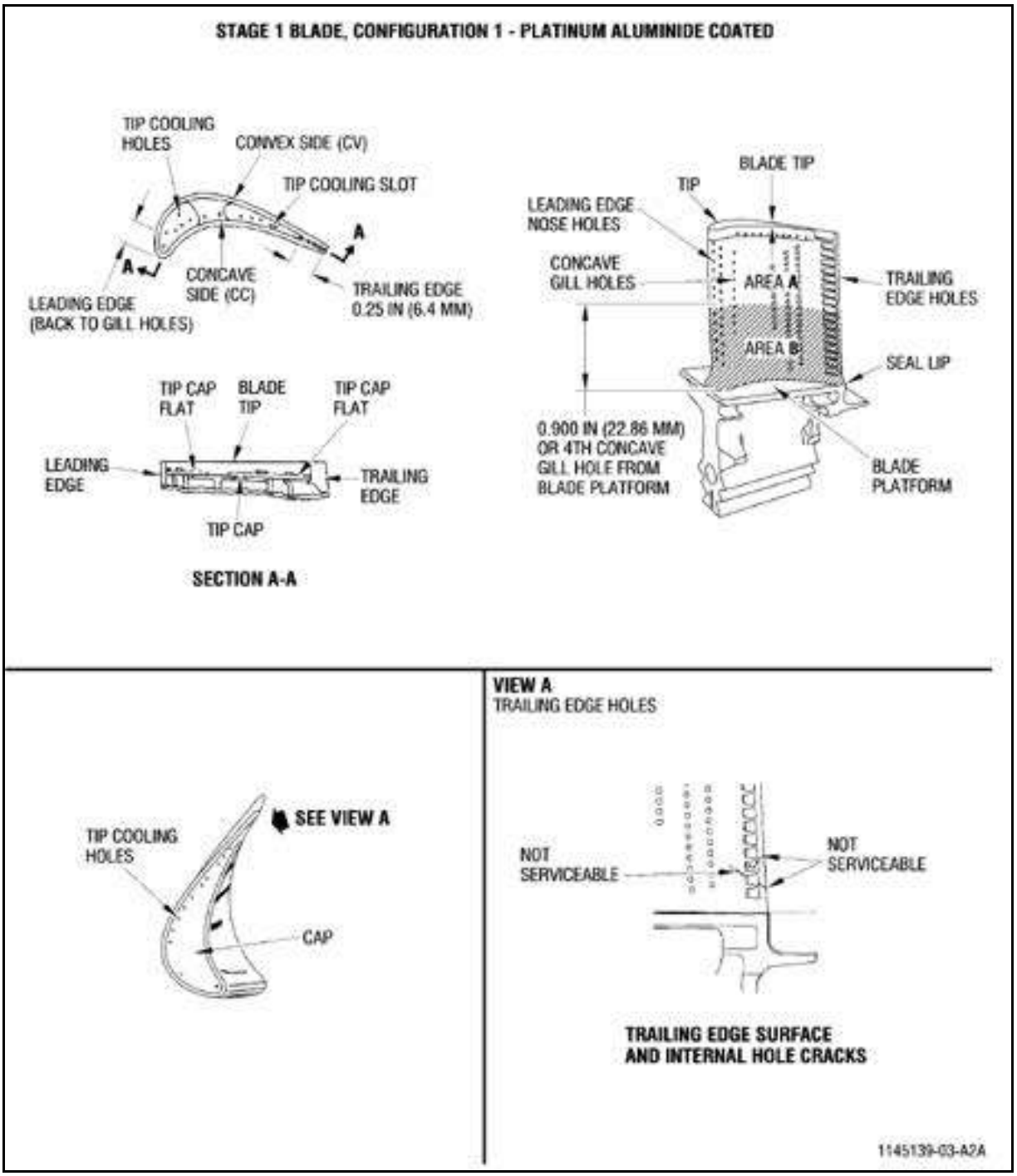



*Figure 16: HPT Stage 1 Rotor Blades Inspection Areas (Platinum Aluminide Coated Blades)*

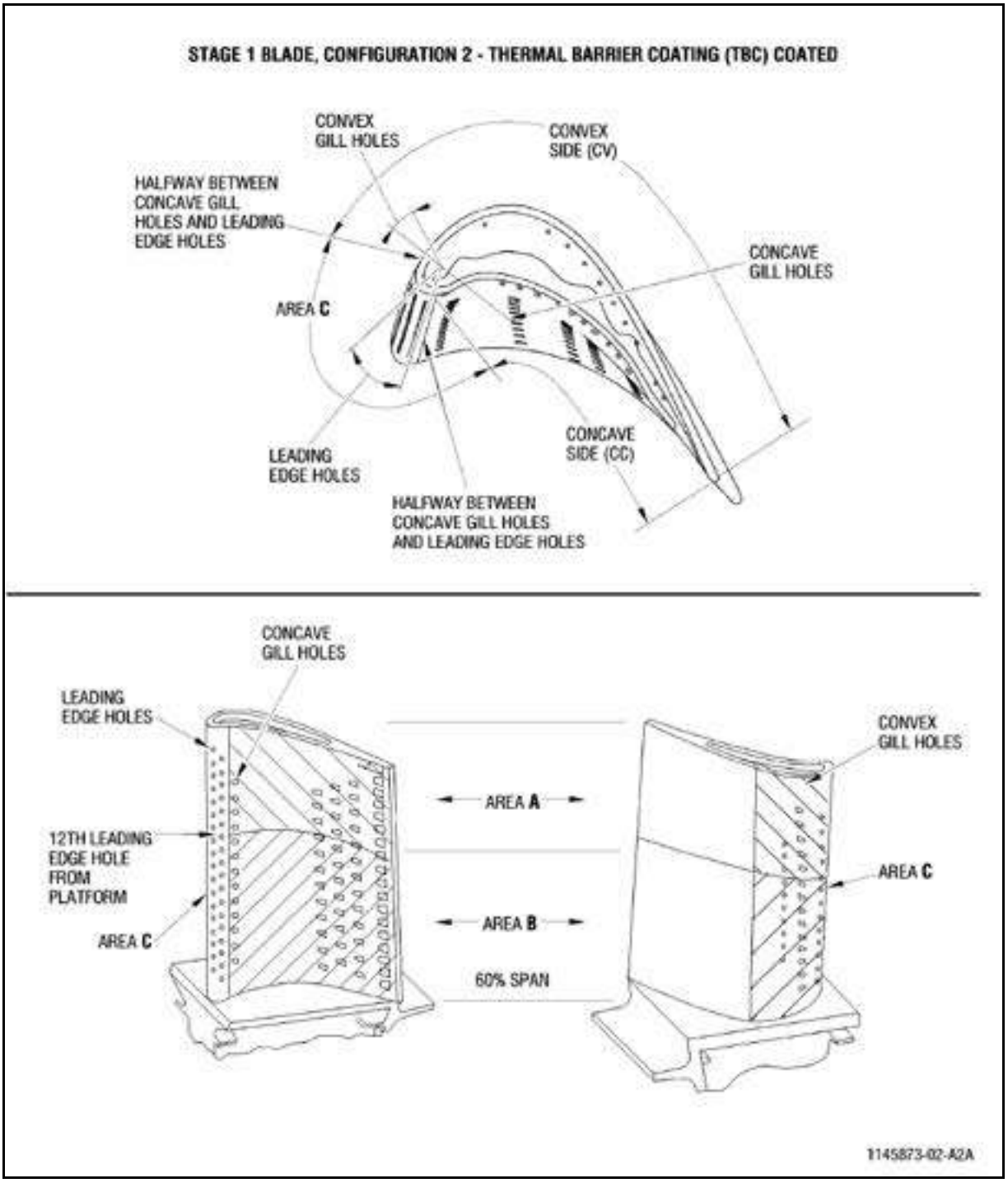



*Figure 17: HPT Stage 1 Rotor Blades Inspection Areas (TBC Coated Blades)*

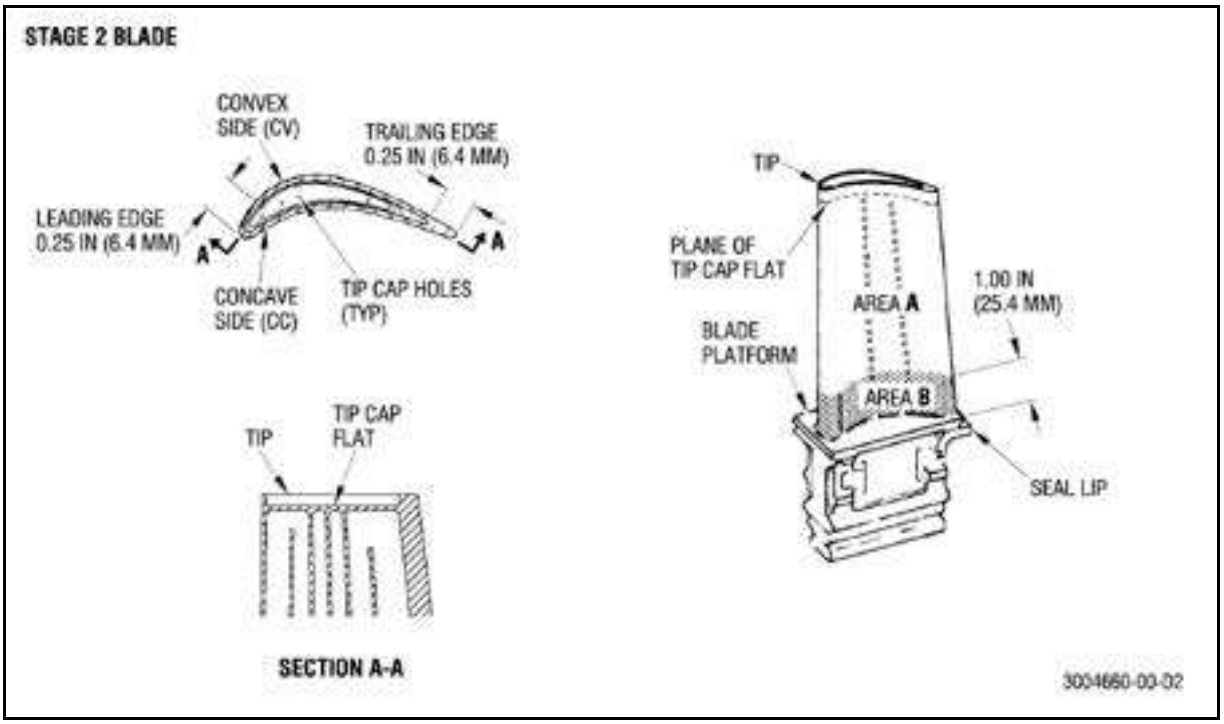



*Figure 18: HPT Stage 2 Rotor Blades Inspection Areas*

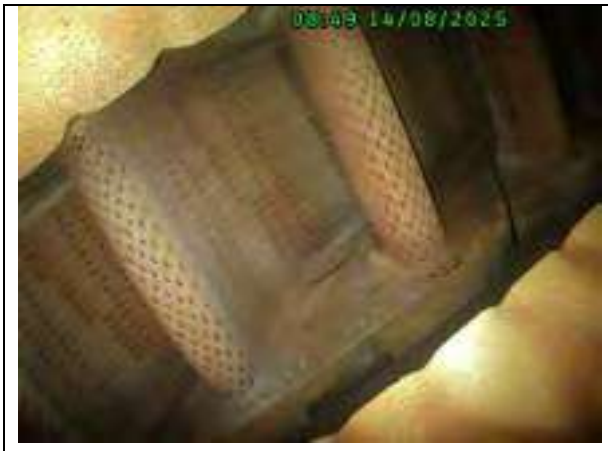
**Borescope Pictures**



Picture 63: Stage1 Nozzle leading edge



Picture 64: Stage1 Nozzles Leading edge



Picture 65: Stage1 Nozzle airfoil concave side



Picture 66: Stage1 Nozzle airfoil concave side



Picture 67: Stage1 Nozzles airfoil concave



Picture 68: Stage1 Nozzle airfoil convex




Picture 69: Stage1 Nozzle crack




Picture 70: Stage1 Nozzle crack




Picture 71: Stage1 Nozzle trailing edge concave




Picture 72: Stage1 Nozzle trailing edge convex




Picture 73: Stage1 Nozzle trailing edge




Picture 74: Stage1 Nozzle trailing edge and



Picture 75: Stage1 Blades leading edge tip



Picture 76: Stage1 Blades leading edge tip



Picture 77: Stage 1 Blades leading edge base



Picture 78: Stage 1 Blades leading edge base



Picture 79: Stage 1 Blades trailing edge tip



Picture 80: Stage 1 Blades trailing edge root



Picture 81: Stage 2 Blades leading edge tip



Picture 82: Stage 2 Honeycomb seals



Picture 83: Stage 2 Blades leading edge root



Picture 84: Stage 2 Blades and stage 2 nozzles



Picture 85: Stage 2 Blades trailing edge



Picture 86: Stage 2 Blades trailing edge

## 4.4 LPT Section

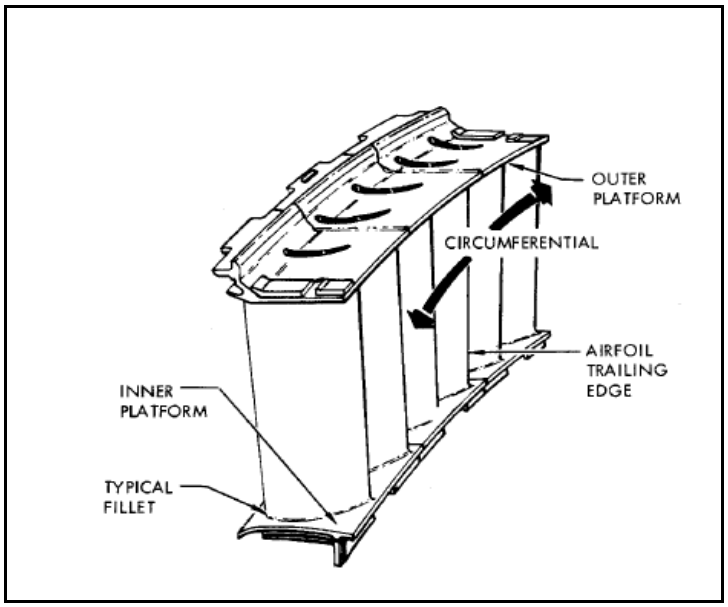



*Figure 19: Power Turbine Nozzles*

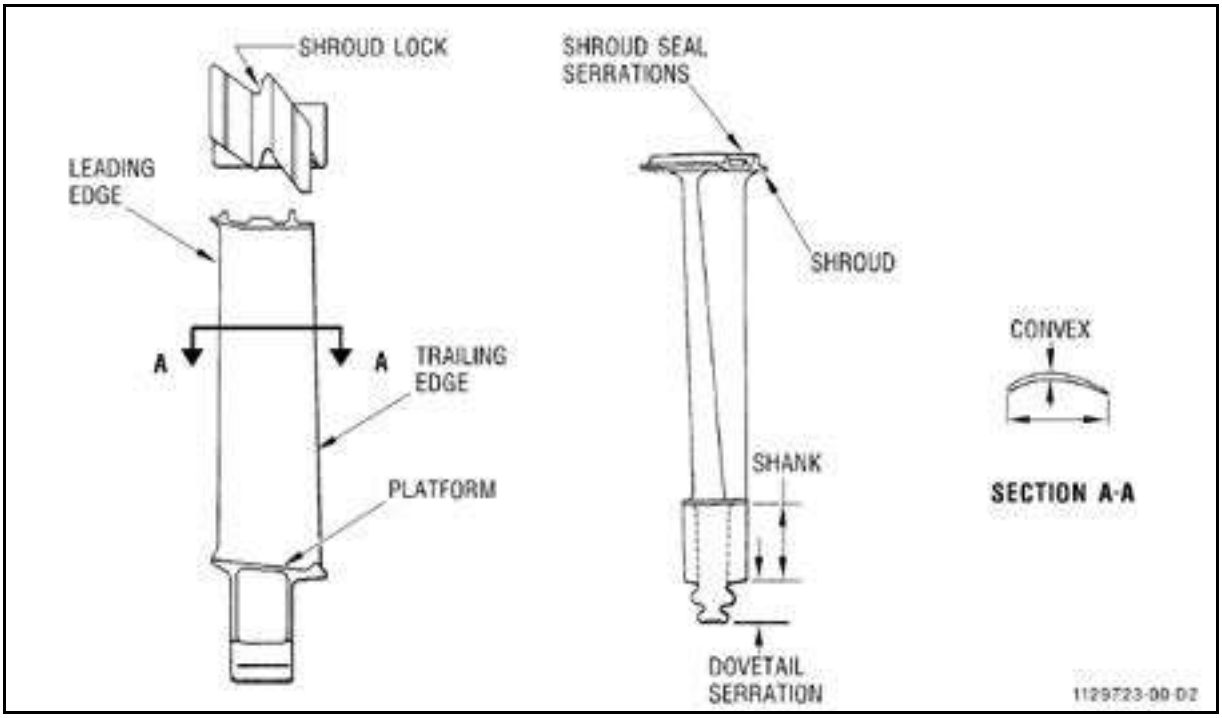



*Figure 20: Power Turbine Rotor Blades*

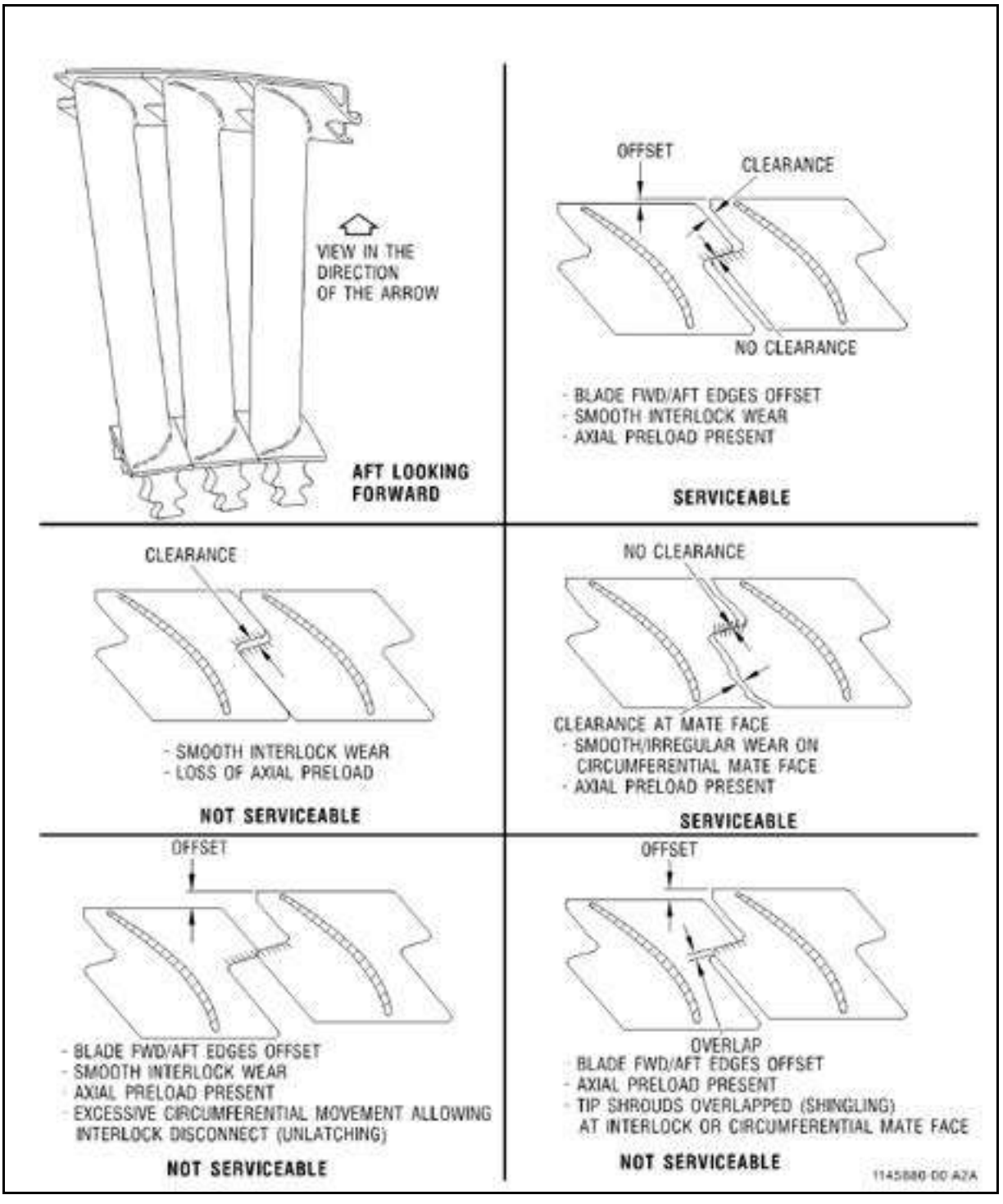



*Figure 21: LPT Rotor Blade Circumferential Inspection*

**Notes:**

The LPT stage 1 accessible nozzles and blades did not show any damage.

**Borescope Pictures**



Picture 87: STG1 LPT nozzles



Picture 88: TMF and LPT Inlet



Picture 89: Stage 1 Blades



Picture 90: LPT Stage 1 Blades tip interlock

Exhibit 11

*Confidential*
*Draft – Subject to Update*
*March 5, 2024*

**NFE Response to P3A March 4, 2024 Request**

1. **Service Bulletins**: please provide the service bulletins (SBs) or Technical Information Letters that GE, as the Original Equipment Manufacturer, delivers in support of the installed base fleet. In particular, please provide:

    - The list of SBs applicable to each of the gas turbines Depot Inspection Reports: *Already provided. Please see subfolder No. 1.c in "02-05-2024 Requests"*

    - Evidence showing which SBs were complete and which SBs were not complete: *Please see the file uploaded to the Box Folder "03-04-2024 Requests." The items highlighted in green are confirmed complete. The items highlighted in orange are in the process of being inspected to confirm reception. This is a subset of the priority categories, "ALERT" and "CAMPAIGN" from the SBs initially provided.*

2. **Depot Inspection Reports**: per the technical team's understanding, the engines should have received full service shop inspections by TCE. Please provide the reports related to these inspections. *NFE does not have depot inspection reports because there have not been any depot visits to date. Please clarify the basis for your understanding on this point.*

3. **Most Recent Borescope Inspection Reports**: please provide the most recent borescope inspection reports for each units. *Please see the files uploaded to the Box Folder. We have provided the Borescope Inspections for San Juan Units 1, 5, 7,8, 9, 10, which were conducted prior to the hot section replacements for those same units. For additional documentation related to the hot section replacements, we have also provided:*

    - *Hot Section Replacement Field Reports from Siemens for San Juan Units 9 & 10 and a Notice Letter from GE, equivalent to a Certificate of Conformance, for these two Hot Section Replacements.*

    - *Hot Section Replacement Field Reports from Siemens for San Juan Units 7 & 8 and a Certificate of Conformance from Siemens for these two Hot Section Replacements.*

    - *Hot Section Replacement Field Reports from Pro Energy for San Juan Units 1 and 5.*

    *We have also provided the Borescope Inspections for San Juan Units 2, 3, 4, and 6 and Palo Seco Unit 1. We are currently in the process of completing the next round of borescope inspection on the remaining units and will provide documentation once it becomes available.*

PROENERGY

# LM2500+ Hot Section Exchange REPORT

## NewFortress Energy

**Unit Number:** Unit 5
**Title:** Engine removal and Hot section Exchange
**ESN:** 557-252
**Job Number:** AA23-1611 FS
**Date:** 8/02/2023-8/14/2023

# BACKGROUND

| Information | |
|---|---|
| **Site Location:** | San Juan, Puerto Rico |
| **Job Dates:** | 8/02/2023-8/14/2023 |
| **Performed by:** | Alejandro Valdes, Ignacio Garcia, Luis Canever, Walter Perin, Leonardo Sosa. |
| **Package-Type:** | TM2500 |
| **Package S/N** | N/A |
| **Package Hours** | N/A |
| **Engine Hours:** | 4116 |
| **Fired Starts:** | 695 |
| **Fuel Type:** | Dual Fuel |
| **Generator Type:** | Brush |
| **Generator S/N:** | N/A |
| **Customer Contact:** | Daniel Mcguire (336)339-2363 |
| **PE FS Manager** | Alice Marconi |
| **PE CS Manager** | David Evinrude |

## Job Description

### LM2500+ SAC Engine removal and hot section swap

## Daily work Performed

**8-2-23:**

Shift starts @ 0800. Completed EHS and JSA. Complete the site safety orientation. Meet with customer contact Daniel McGuire to go over the work plan. Walk down the site. Started looking for hot section parts on shipping containers, 4 each HPTR assembly were located, 2 rotors are located on the bottom row on the orange container, and the other 2 rotors are located on the light blue container against the wall. Unable to access the top row of containers, the customer is waiting on the port authorities to move the 8 containers to ground level.

**8-3-23:**

Shift starts @ 0700. Completed EHS and JSA. The customer is requesting the passport information and training certificates of the rest of the TA. Completed port facility safety training. The Port Authority started moving the shipping containers at 3pm. Located 2 combustor assemblies, 2 HPT 1-Stage nozzle assemblies, and 2 box label stg-2 nozzles, these 2 boxes will need to be open to verify the labels.

**8-4-23:**

Shift starts @ 0700. Completed EHS and JSA. The rest of the TA arrived today to site, completed site safety training. Unloaded all parts from container # 517603. No lift fixture found on this container. Container # 517603 verified 2 sets of combustor assembly, 2 sets of HPT 1-stg nozzles assembly, 2 sets of HPT 2-stg nozzles assembly. Loaded all boxes back on container # 517603, all 6 boxes with the hot section parts were loaded last on the container.

**8-5-23:**

Shift starts @ 0700. Completed EHS and JSA. Removed all boxes from container # 525060 to access the 2 HPTR assemblies. Verified condition of the 2 HPTR assemblies. Loaded all boxes back onto container # 525060. The 2 HPTR boxes were loaded last.

**8-7-23:**

Shift starts @ 0700. Completed EHS and JSA. Tool arrived on site at 1pm. Unloaded all tooling, inventory all tooling. The blue engine stand is missing the CFF front support. Send an email to expedite the delivery of the CFF support.

**8-8-23:**

Shift starts @ 0700. Completed EHS and JSA. All fuel nozzles J-tubes and fuel nozzles were removed. Fuel nozzles were numbered and bagged. All holes on the combustor outer case were covered, as well as the liquid and water manifolds. All piping connected to the PT was disconnected and covered. Loosen all the hardware of the 2 cross beams inside the package. Beams are ready to be removed. Set all the job boxes and toolboxes around the work area. Filter house is ready to come off the trailer. Lighting and bad weather in the area delayed the lift. The CFF support tool arrived at 4:30pm. The Filter house and roof panel removal was postponed until tomorrow at 7am due to the heavy traffic from the airport to the Port and bad weather in the area.

**8-9-23:**
Shift starts @ 0700. Completed EHS and JSA. Removed Filter house module. Removed Roof panel. Installed lift fixture on the HPC and on the TMF lift points. During the removal process the CG was not set correctly the GG was hangup on the #6 oil seal, and extra point of lift was added from the crane to the forward of the GG lift fixture this help us correct the CG. The was tilt face down about 25 degrees to clear the PT shaft and CFF the inlet plenum. Lower the engine on the blue stand, the VSV pump was removed to be able to clear the front support. Removed all the hardware on the TMF flange, disconnected all piping attached to the TMF. Afternoon rain delayed the removal of the TMF assembly. Costumer provided a tarp to cover the engine from the rain and a canopy to keep the tools out of the weather. The area was red tape overnight. Attended the daily work scope review meeting.

**8-10-23:**
Shift starts @ 0700. Completed EHS and JSA. Removed TMF assembly and put aside, cover it keep it away from the weather. Measured concentricity of #5 bearing at .0045". Removed #5 bearing nut and removed inner race. Removed oil tube, had to go out and buy 3 small ¼ shackles to pull the oil tube out. Removed HPTR assembly and set aside. Removed 2-stg blades to remove the 2-stg nozzles assembly. Removed HPT 1-stg nozzles assembly. Removed Combustor assembly. Moved all new assemblies from storage containers to unit 5. Cleaned oil tube and prep for installation. Installed new combustor assembly, torqued all 10 pins. Installed new HPT 1-stg nozzles, secure with 6 bolts. Set old combustor and HPT 1-stg nozzles on the shipping boxes.

**8-11-23:**
Shift starts @ 0700. Completed EHS and JSA. Completed the installation of the HPT 1-stg nozzles. Installed HPT 2-stg nozzles on the HPTR. Installed all 30 fuel nozzles. Installed HPTR and torqued by GEK 112859 WP201. The HPTR only reaches 21 degrees at 10000 ft-lb. The HPTR assembly was removed to clean the coupling nut, a very small amount of anti-seize was applied and retorqued to achieved 21 degrees at 10000 ft-lb. The damage #6 bearing oil seal was changed on the TMF assembly. Installed oil tube and #5 bearing nut.

**Parts Installed**
Combustor P/N 9655M41G07 S/N FDBH0863
1-stg Nozzles P/N L47658G01 S/N FCP5HFHM
2-stg Nozzles P/N L50008G07 S/N GEVL545K
HPTR P/N L50009G05 S/N APV2014G

**8-12-23:**
Shift starts @ 0700. Completed EHS and JSA. Removed #5 bearing. Removed oil tube. Removed HPTR assembly. Cleaned HPTR coupling nut with alcohol and red Scotch-Brite; removed all high material and debris. Cleaned the threats on the HPC shaft. Installed HPTR and torqued per GEK 112859 WP201. Installed #5 bearing, measured concentricity at .004".

**8-13-23:**
Shift starts @ 0700. Completed EHS and JSA. Completed installation of #5 bearing nut. Installed TMF and torqued all the circumference hardware. Connected all external piping to the TMF. Installed the lift on the GG and adjusted the CG. Prep the turbine enclosure for GG install. Lift and set GG inside the turbine enclosure. Torqued all bolts on the TMF to PT flange. Lower the GG on the front leg support,

torqued nuts. Removed lift fixture bracket support from the CRF flange, start installation of the fuel nozzles J-tubes. Connected all tubing going to the PT. Installed roof panel and cover the inlet plenum. Work was stopped multiple times due to weather conditions.

**8-14-23:**

Shift starts @ 0700. Completed EHS and JSA. Installed roof panel. Installed filter house. Completed Installation of lube oil hoses. Connected all electrical connection at the lube and scavenge pump. Installed clutch and starter assembly. Connected T54 cables, and P54 sensing line. Connected sensing lines at the primary, secondary fuel manifolds, P25, and PS3. Completed installation center body and inlet duct. Connected main gas manifold line. Connected primary and secondary fuel lines. Installed gas manifold flex hoses, 30 each. Connected inlet plenum outer boot. Connected electrical cables, T3, and flame detector.

**8-15-23:**

Shift starts @ 0700. Completed EHS and JSA. Cleaned FOD sock, and inlet plenum. The costumer performed a crank to check for leaks, the unit was release for first fire.

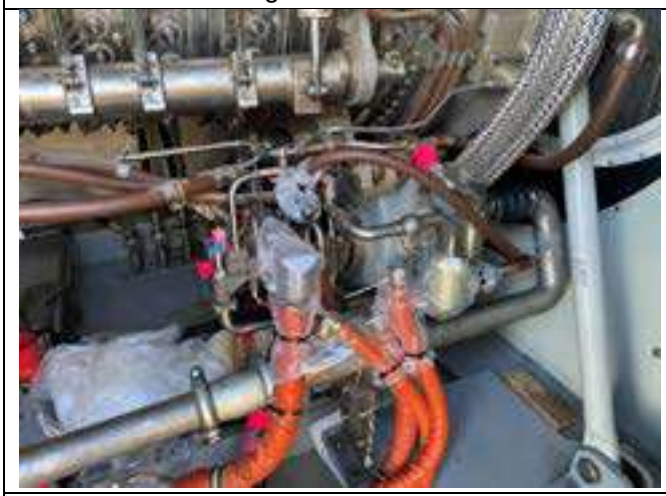
## Field Work




Engine Data Plate



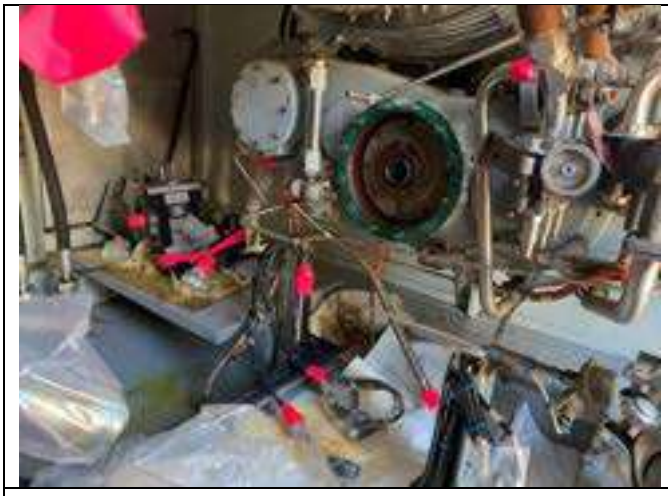
As found engine HPC inlet



As found oil lines



As found fuel lines

| | | |
|---|---|---|
|  | |  |
| As found Auxiarily Gearbox | | As found PT area |
|  | |  |
| PT supported inside the TM | | GG coming out of the package |

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|  | |  |
| Damage #6 bearing oil seal | | VSV controller removed |
|  | |  |
| GG on the maintenance stand | | GG on the maintenance stand |

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|  | |  |
| Removed TMF | | HPTR |
|  | |  |
| #5 bearing | | HPT 1-stage nozzles |

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| HPT 2-stage nozzles | | Combustor |
|  | |  |
| Combustor liners | | CDP seal |

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|  | |  |
| New Combustor installed | | New HPT 1-stage nozzles installed |
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| HPT 2-stage nozzles installed | | HPTR installed |

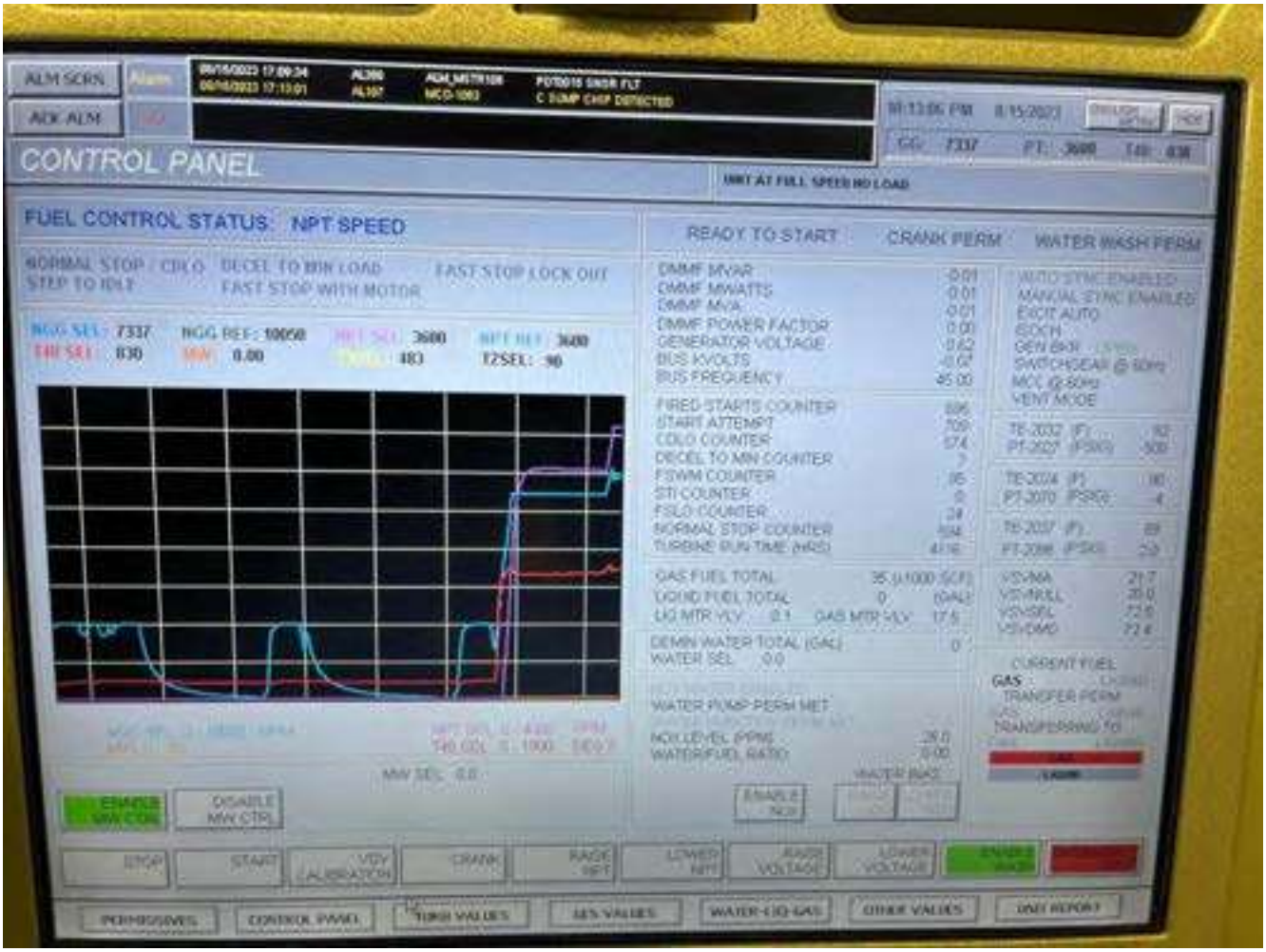
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|  | |  |
| #5 bearing runout .004” | | #5 bearing nut |
|  | |  |
| Removing damage #6 bearing oil seal | | New #6 bearing oil seal installed |

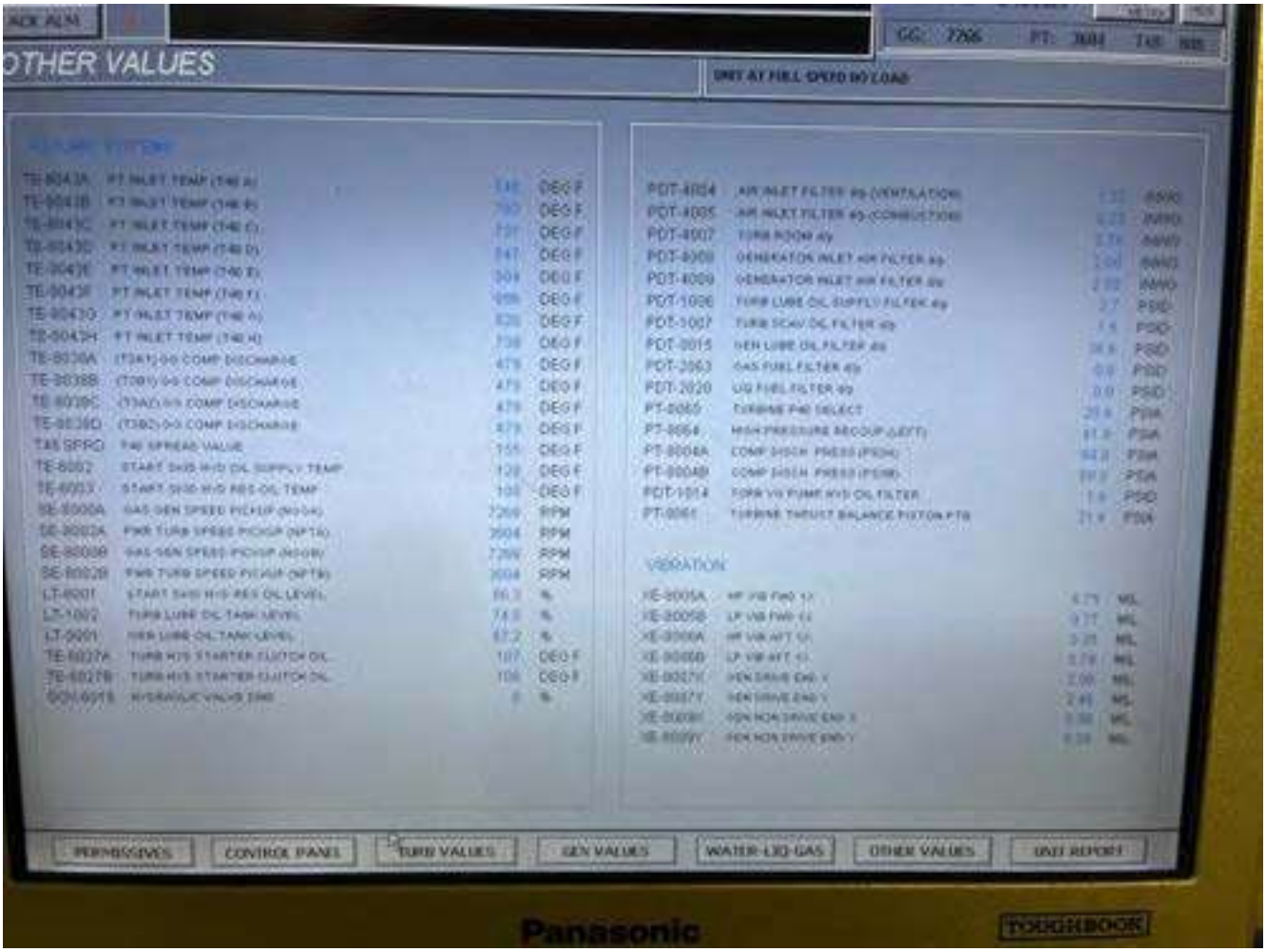
| | | |
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|  | |  |
| TMF #5 bearing area | | TMF installed |
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| HPC IGV area | | Inlet FOD screen, inside the inlet |

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| Inlet area vacuumed | | Inlet duct outer boot |
|  | |  |
| Front bolt mount right side ALF | | Front bolt left side ALF |

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|  | |  |
| L&S Pump, oil hoses | | Primary & Secondary fuel lines, Main gas line |
|  | |  |
| Auxiliary gearbox | | TMF oil lines |

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|  | |  |
| ALF Right side | | ALF Left side |
|  | |  |
| Engine lifted by crane during install | | Right side AFT supports installed |


ALM SCRN
ACK ALM
CONTROL PANEL
FUEL CONTROL STATUS: NPT SPEED
READY TO START
CRANK PERM
WATER WASH PERM
STOP
START
CRANK
PERMISSIVES
CONTROL PANEL
TURB VALUES
GEN VALUES
WATER-LIQ-GAS
OTHER VALUES


OTHER VALUES
VIBRATION
PERMISSIVES
CONTROL PANEL
TURB VALUES
GEN VALUES
WATER-LIQ-GAS
OTHER VALUES
UNIT REPORT
Panasonic
TOUGHBOOK

## PARTS USED

- **Combustor**: P/N 9655M41G07 S/N FDBH0863
- **1-stg Nozzles**: P/N L47658G01 S/N FCP5HFHM
- **2-stg Nozzles**: P/N L50008G07 S/N GEVL545K
- **HPTR**: P/N L50009G05 S/N APV2014G

# Field Service Report

# NFE

San Juan, Puerto Rico

## Summary

Performed Hot Section exchange on LM2500+ unit 7 engine ESN 557-230 at customer site at San Juan Puerto Rico, includes combustion chamber, HPT stage 1, stage 2 nozzles, and HPT rotor.

Replaced hot section modules installed, and run engine, during engine test run and NOX water injection found water leak on J tubes around at 6 o'clock and a loose T48 connection. Retightened "J" tubes and run engine, no more issues noted.

## Customer information

Operating conditions. "Engine returned to service and operating.

| | | | |
|---|---|---|---|
| **Customer** | *NFE* | **Contract No:** | *PO NPRL100072* |
| **End User** | *NFE* | **Project No:** | *EA324031Z00A31BIL* |
| **Location** | *San Juan, Puerto Rico* | **Project Manager:** | *Manuel Perez* |
| **Customer Rep:** | *Rafael Aguilera.*<br>*Nerio Cabrera* | **Siemens Rep:** | *Javier Salazar, Rune Johansen, Robert Carlton.* |
| **Customer Contact:** | *Rafael Aguilera* | | |

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|---|---|---|---|
| **Customer Tag:** | *UNK* | **Machine No:** | *LM2500 +* |
| **Model:** | *LM2500+ SAC* | **Engine SN:** | *557-230* |
| **No of Starts:** | *46* | **Fired/ Run Hours:** | *2403* |
| **Manual Reference:** | *GEK 105054* | **WP References** | *See below* |
| **Driver:** | *LM2500 Gas Turbine* | **Driven:** | *Generator Brush* |
| **Manufacturer** | *GE* | | |
| **Control system:** | *Woodward* | **Software type:** | *UNK* |
| **HMI type:** | *DR* | **Software type:** | *UNK* |

## Scope

Engine removed from enclosure and transfer to the maintenance dolly and perform hot section replacement per GEK manuals 105054 and 105055.

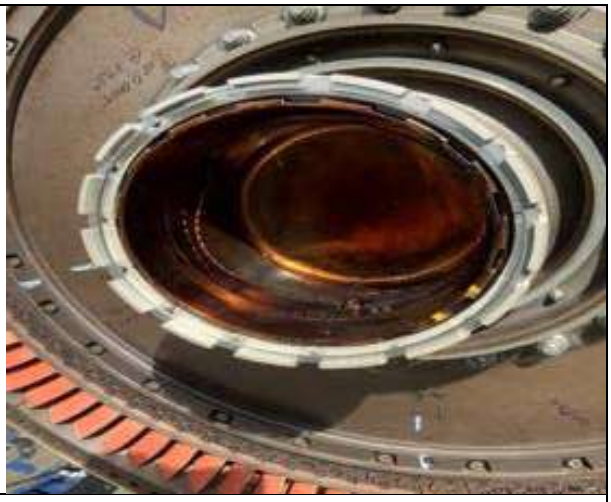
The following work was performed by WP'S:

WP 200 00 Turbine Mid Frame replacement.
WP 201 01 HPT stage 2 nozzle replacement
WP 202 00 HPT rotor blade replacement
WP 205 00 Center body replacement
WP 201 00 High pressure rotor replacement.
WP 201 02 HPT stage 1 nozzle replacement
WP 203 00 annular combustor replacement.
WP 301 00 GG assembly replacement

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|  | |  |
| Gas generator on the maintenance dolly and lift fixture | | TMF removed from gas generator. No damage noted on TMF vanes or LPT 1 stage nozzles. Reinstalled TMF |
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| Engine transfer form enclosure to maintenance dolly | | HPT rotor assembly removed from engine. |
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| Stage 1 nozzle removed, deteriorated airfoil vanes, | | HPT stage 2 nozzle ready to be remove from HPT rotor. |

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|  | |  |
| Removed old combustor | | Overhauled combustor ready to be install. |
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| Replaced gang channel on seal support | | Seal support gang channel replaced. |
|  | |  |
| New HPT rotor ready for installation | | HPT stage 1 nozzle replaced and installed. |

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| Installed and torque HPT rotor. Final torque 9700 FT/LBS at 29 degrees. Concentricity run out 0.004” | | Installed # 5 bearing inner race and torque retainer nut to 450 Ft/LBS. Lock ring install. |
|  | |  |
| Reassemble GG by installing TMF, no damage found on LPT stage 1 nozzles. Thermocouples serviceable. | | GG was assembled and move it to enclosure for installation. |
|  | |  |
| Power turbine # 6 bearing and LPT stage 1 blades, no damage noted. Serviceable. | | Completed GG generator Installation and connected package/engine interface connections. |

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# Daily Log

## Monday 8, January

Travel to site.

## Tuesday 9, January

Disconnect package /engine interface connections, removed fuel gas system. Tooling did not arrive yet.

## Wednesday 10, January

Waiting for Hot section tooling and lift fixture.

## Thursday 11, January

Tooling no released yet.

## Friday 12, January

Tool arrived at site, did tools inventory, and prepare GG for removal from enclosure. 5 TON chain fall did not arrive, customer was able to get an 8-ton chain fall.

## Saturday 13, January

Removed engine from enclosure and disassemble hot section.

## Sunday 14 January

Continue assemble HPT stage 1 nozzle; during assembly found nozzle support gang channel with 3 anchors nut falling off from the gang channel, replaced gang channel, HSE tooling did not come in with a rivet squeezer, customer was able to find one rivet squeezer locally.

## Monday 15, January

Continue assembling stage1 nozzle and install HPT stage nozzle into HPT rotor.  Removed, inspected and re-installed all 30 fuel nozzles per WP 101  01.

## Tuesday 16, January

Installed HPT rotor and torque nut to *9750 FT/LBS at 29 degrees,* checked HPT rotor concentricity, run out was 0.004 inch the maximum allowable is 0.010. Turbine Mid Frame also installed. Gas generator assembly completed and transfer engine to enclosure, connected package /engine interface connections, installed roof and Filter house.

## Wednesday 17, January

Remove LOTO and run engine to base load reaching 26 MW'S with all parameters normal. Customer replaced HP recoup orifice plates from P04 to P03. Power thrust balance reading within limits no orifice plate required.

Completed

## Mechanical Details

Modules replaced.

| | PN removed | SN Removed | PN Installed | SN Installed |
|---|---|---|---|---|
| Combustor | 9101M29G29 | SAMG9M | 9101M29G84 | GGM9R677 |
| Stage 1 nozzle | L47658G01 | FCPEGLLW | L50027G05 | FCP5AML5 |
| Stage 2 nozzle | L5009G07 | GEVL48KP | L50008G03 | GEVKWFP4 |
| HPT rotor | L31304G10 | APV3953F | L50009G02 | APV2877D |

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## Other notes

All work performed outside and used a mobile crane to perform the whole work.

## Tooling

Hot section tooling arrives with missing rivet squeezer gun, customer was able to lend us the squeezer gun and bearing heater to perform the work and preventing for delaying the Hot section replacement also, an 8-ton chain fall.

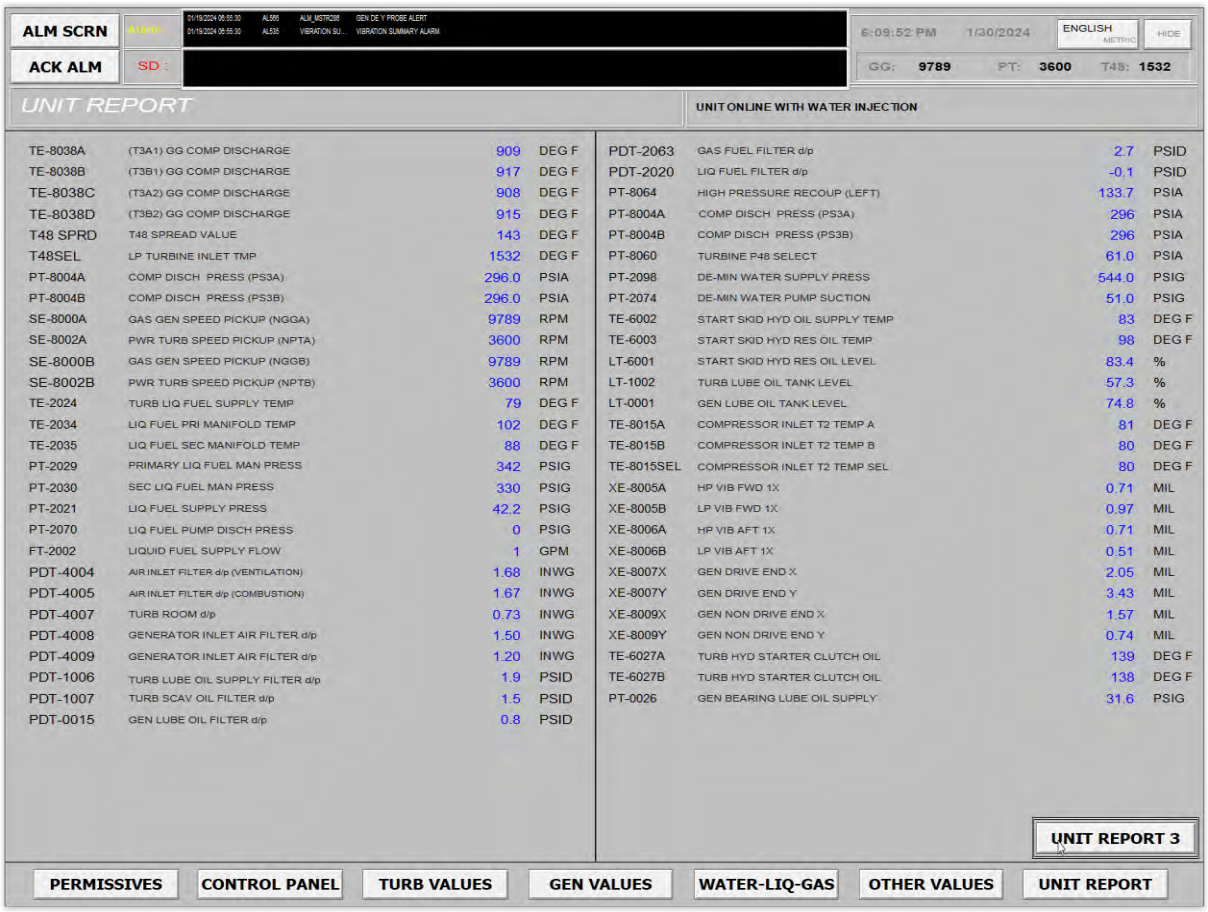
- Conditions All tools serviceable
- Applicability yes
- Missing One 5-ton chain fall, rivet squeezer gun, temperature gun reader, bearing heater all these items arrived later.
- Kits consumables items bought locally (tape, Zip bags, tie-wraps, latex gloves, RTV silicone.

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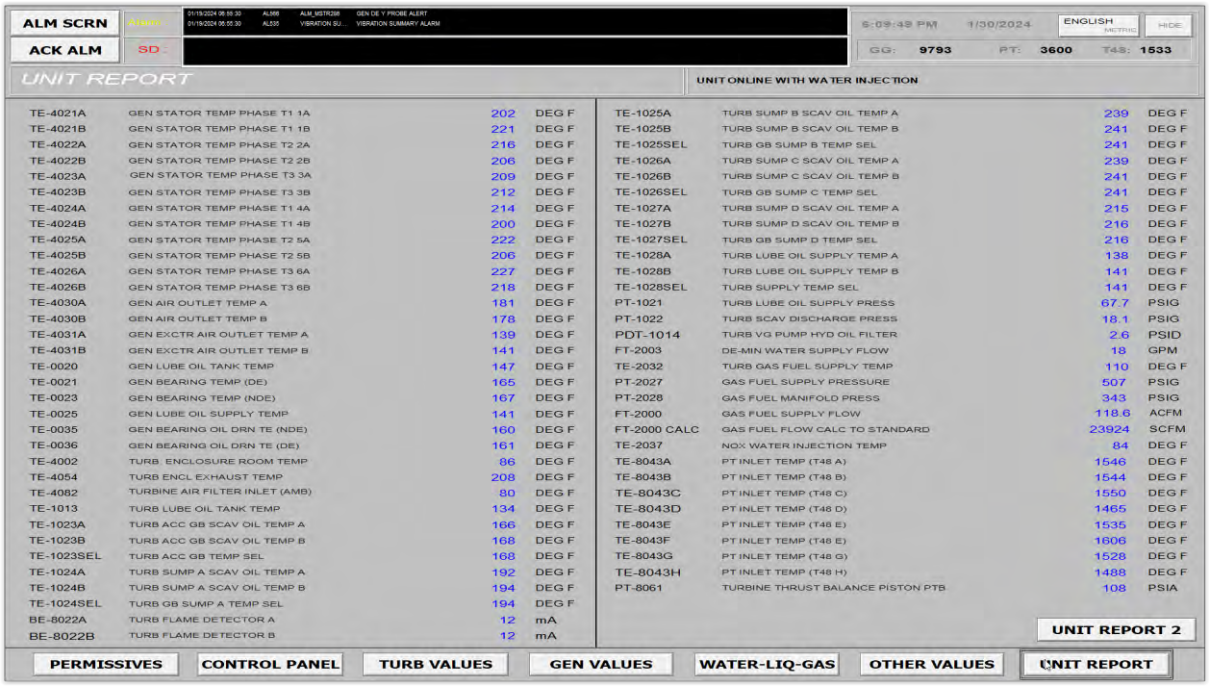
# Engine run data.

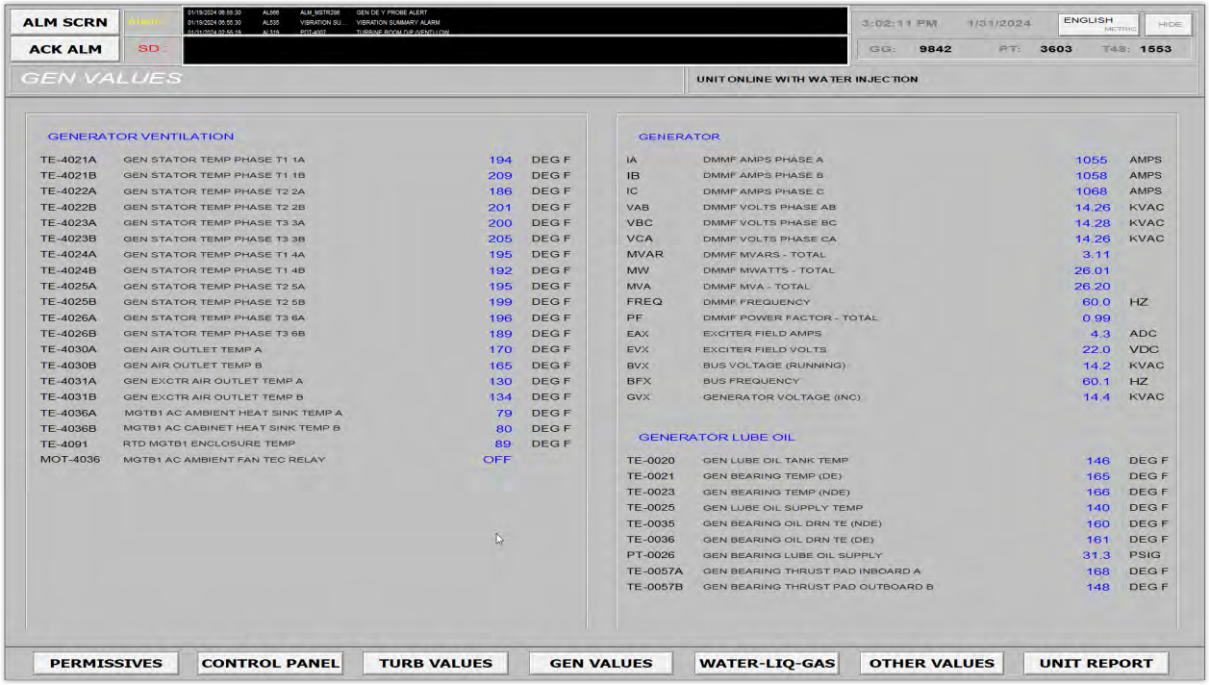


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# Field Service Report

# NFE

San Juan, Puerto Rico

ESN 557-242 unit 8

## Summary

Performed Hot Section exchange on LM2500+ unit 8 engine ESN 557-242 at customer site at San Juan Puerto Rico, includes combustion chamber, HPT stage 1, stage 2 nozzles, and HPT rotor.

Replaced hot section modules, installed GG into the package, run engine and increase load to a full power but engine only reach 22.5 MW's on T48 control all other parameters reading normal. Shutdown engine and troubleshoot low engine performance, verified T3, T2 and PSE sensor, checked all T48 thermocouples and recalibrated VSV system, run engine still low performance.

*Reviewed hot section modules installation and noticed on the photos taken during engine assembly found that in the HPT stage 1 nozzle module it was missing the inner seal on the stator vanes.*

Removed GG from enclosure and disassembled hot section; a technician from Chromalloy brought the missing part and installed on the HPT stage 1 nozzle, reassemble hot section and installed engine performed high speed crank, calibrated VSV system and run engine and checked for oil, gas or air leaks; no leaks found ramp up engine to base load and engine reached 26 MWs.

The loss of power during the first run was caused by the missing inner seal on the HPT stage 1 nozzle.

## Customer information

Operating conditions. "Engine returned to service and operating.

| | | | |
|---|---|---|---|
| **Customer** | *NFE* | **Contract No:** | |
| **End User** | *NFE* | **Project No:** | *EA324031Z00A31BIL* |
| **Location** | *San Juan, Puerto Rico* | **Project Manager:** | *Manuel Perez* |
| **Customer Rep:** | *Rafael Aguilera.*<br>*Nerio Cabrera* | **Siemens Rep:** | *Javier Salazar, Rune Johansen, Robert Carlton.* |
| **Customer Contact:** | *Rafael Aguilera* | | |

| | | | |
|---|---|---|---|
| **Customer Tag:** | *UNK* | **Machine No:** | *LM2500 +* |
| **Model:** | *LM2500+ SAC* | **Engine SN:** | *557-242* |
| **No of Starts:** | *565* | **Fired/ Run Hours:** | *5580* |
| **Manual Reference:** | *GEK 105054* | **WP References** | *See below* |
| **Driver:** | *LM2500 Gas Turbine* | **Driven:** | *Generator Brush* |
| **Manufacturer** | *GE* | | |
| **Control system:** | *Woodward* | **Software type:** | *UNK* |
| **HMI type:** | *DR* | **Software type:** | *UNK* |

## Scope

Engine removed from enclosure and transfer to the maintenance dolly and perform hot section replacement per GEK manuals 105054 and 105055.

The following work was performed by WP'S:

WP 200 00 Turbine Mid Frame replacement.
201 01 HPT stage 2 nozzle replacement
WP 202 00 HPT rotor blade replacement
WP 205 00 Center body replacement
WP 201 00 High pressure rotor replacement.
WP 201 02 HPT stage 1 nozzle replacement
WP 203 00 annular combustor replacement.
WP 301 00 GG assembly replacement



Filter house getting removed from the package unit 8



Enclosure roof being lifted.



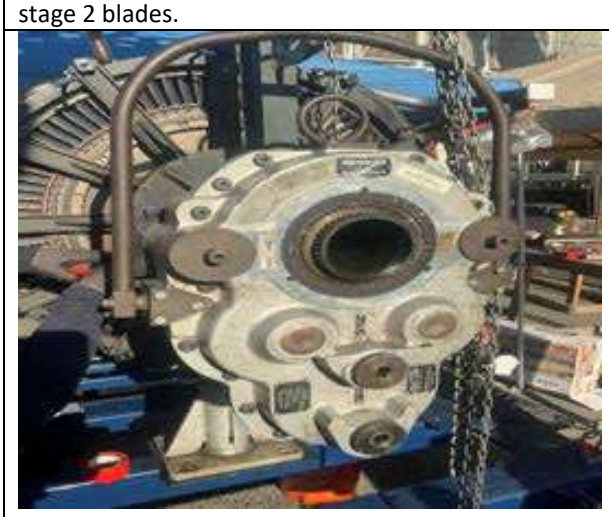
GG getting removed from engine enclosure and transfer to maintenance dolly.



GG and lift fixture on the maintenance dolly.

| | | |
|---|---|---|
|  | |  |
| LPT stays in the engine enclosure and supported by two chain falls. Inspected LPT stage 1 blades and honeycomb seals, no damage noted. | | Started to disassemble GG, TMF removed and transferred from horizontal to vertical position, LPT stage 1 nozzle vanes no damage noted, T48 TC serviceable |
|  | |  |
| HPT rotor concentricity check prior removal from GG | | Removed HPT rotor and stage 2 nozzle. |
|  | |  |
| HPT stage 2 nozzle assembly removed from GG | | Stage 1 nozzle vanes TE as found. |

| | | |
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|  | |  |
| Removed combustor chamber from GG. | | HPT stage 1 nozzle LE vanes as found. |
|  | |  |
| Replaced seal support gang nut channel | | Combustor installed on GG 557-242 |
|  | |  |
| HPT rotor stage 1 getting install, and arrived with missing inner seal; unfortunately, nobody saw the discrepancy. | | Completed assembled stage 1 nozzle first installation, |

| | | | |
|---|---|---|---|
|  | |  | |
| HPT rotor removed from ESN 557-242 stage 1 and stage 2 blades. | | Overhauled HPT rotor, ready to install. | |
|  | |  | |
| Assembled HPT rotor and torque nut to 7800 Ft at angle of 29 degrees concentricity check 0.0035 inches maximum allowed 0.010 inches | | Installed # bearing race and torqued nut. To 500 FT/LBS | |
|  | |  | |
| TMF getting aligned and installed. | | GG assembly completed and move to the engine enclosure | |

| | | |
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|  | |  |
| PT and GG attached, working on package/engine interface connections. | | Gas turbine assembly completed and ready for start. |

Removed GG after low power performance and disassemble HPT hot section area to install HPT stage 1 nozzle inner seal on stator vanes.,



HPT rotor removed to access stage 1 nozzle.



HPT stage 1 nozzle removed and confirmed inner seal missing.



New inner seal was delivered and installed by Chromalloy Technician.



Stage 1 nozzle Inner seal stator vanes installed and ready to assemble hot section.



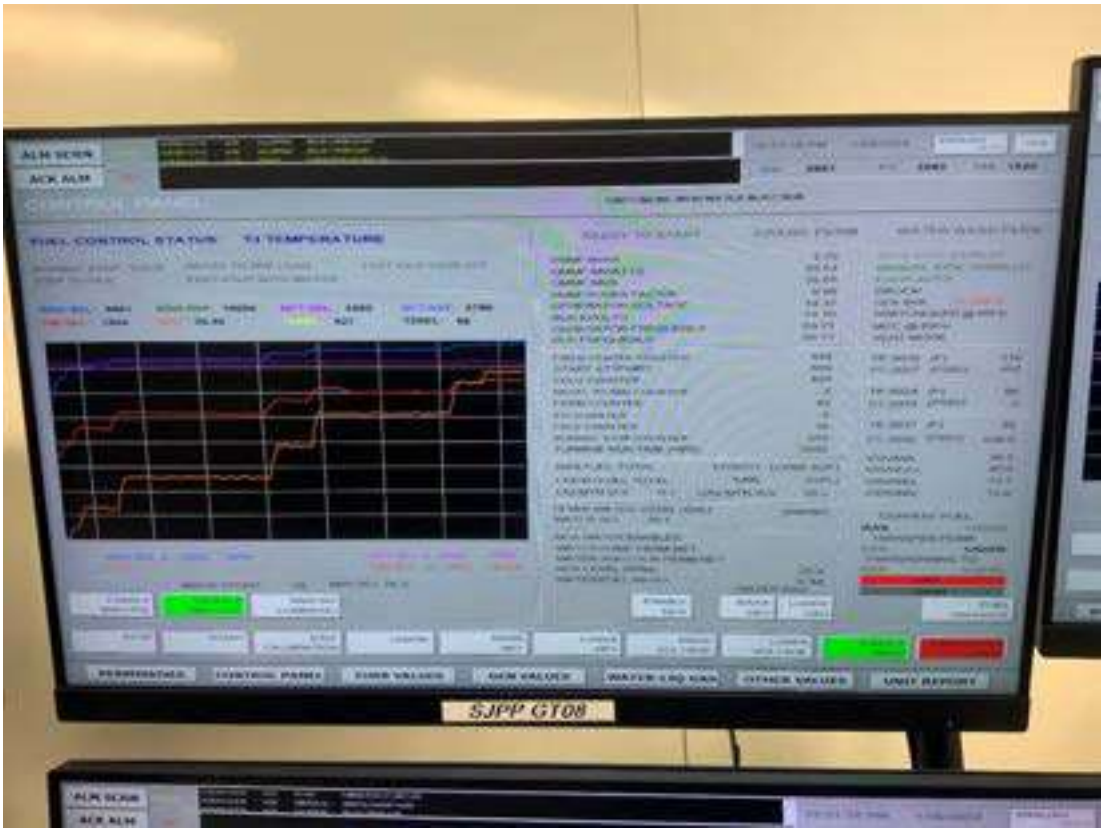
Reassemble stage 1 nozzle and installed.



HPT rotor and TMF reinstalled. Per WP 201 00 and 200 00. Respectively.



GG installed and all package/engine interface connections completed and engine ready for another test run.




Run engine after we installed the HPT stage 1 inner seal and power gained four MW's.

# Daily Log

## Thursday 18, January

Run engine at unit 7, then unit 8 was release and performed LOTO done, started working on unit 8 after lunch.

## Friday 19, January.

Engine was removed from enclosure and started to disassembled GG to replace hot section.

## Saturday 20, January

Started to assemble hot section HPT rotor nut final torque 7600 at 28.5 degrees concentricity check 0.0035 inches. TMF install and GG assembly completed.

## Sunday 21, January

Completed GG installation into the package and finish all engine interface connections.

## Monday 22, January

Clear all LOTO and started engine no leaks noted during engine warm up cycle, proceed to bring power up but engine only reach 22 MWs with T48 max limit; shutdown and troubleshoot engine no discrepancies were found on sensors, submitted run data information to engineering, by discussing with other Siemens- energy technician onsite we came to the conclusion and verified with photos taken during hot assembly that inner seal on HPT stage 1 nozzle was missing, notified to engineering regarding the issue found, it was decided to shut down and remove engine to install HPT stage 1nozzle inner seal.

## Tuesday 23, January

Removed engine again to install missing seal on HPT stage 1 nozzle.

## Wednesday 24, January

Hot section disassembled and waiting for the inner seal that will be hand carry and install by a Chromalloy technician. Inner seal arrived late afternoon.

## Thursday 25, January

Installed inner seal on stage 1 nozzle and assemble hot section torque nut to 7900 *FT/LBS at 29 degrees,* checked HPT rotor concentricity, run out was 0.004 inch. Completed GG assembly and transfer engine to enclosure, connected package /engine interface connections, installed roof and Filter house.

## Friday 26, January

Completed engine/package interface connections and clear LOTO, verified VSV calibration system,; no abnormalities noted, run engine by increasing power in increments of 5 megawatts when engine reached 18 it was noticed engine was performing much better and accelerate up to 26 megawatts. It made a big difference in power with the inner seal install.

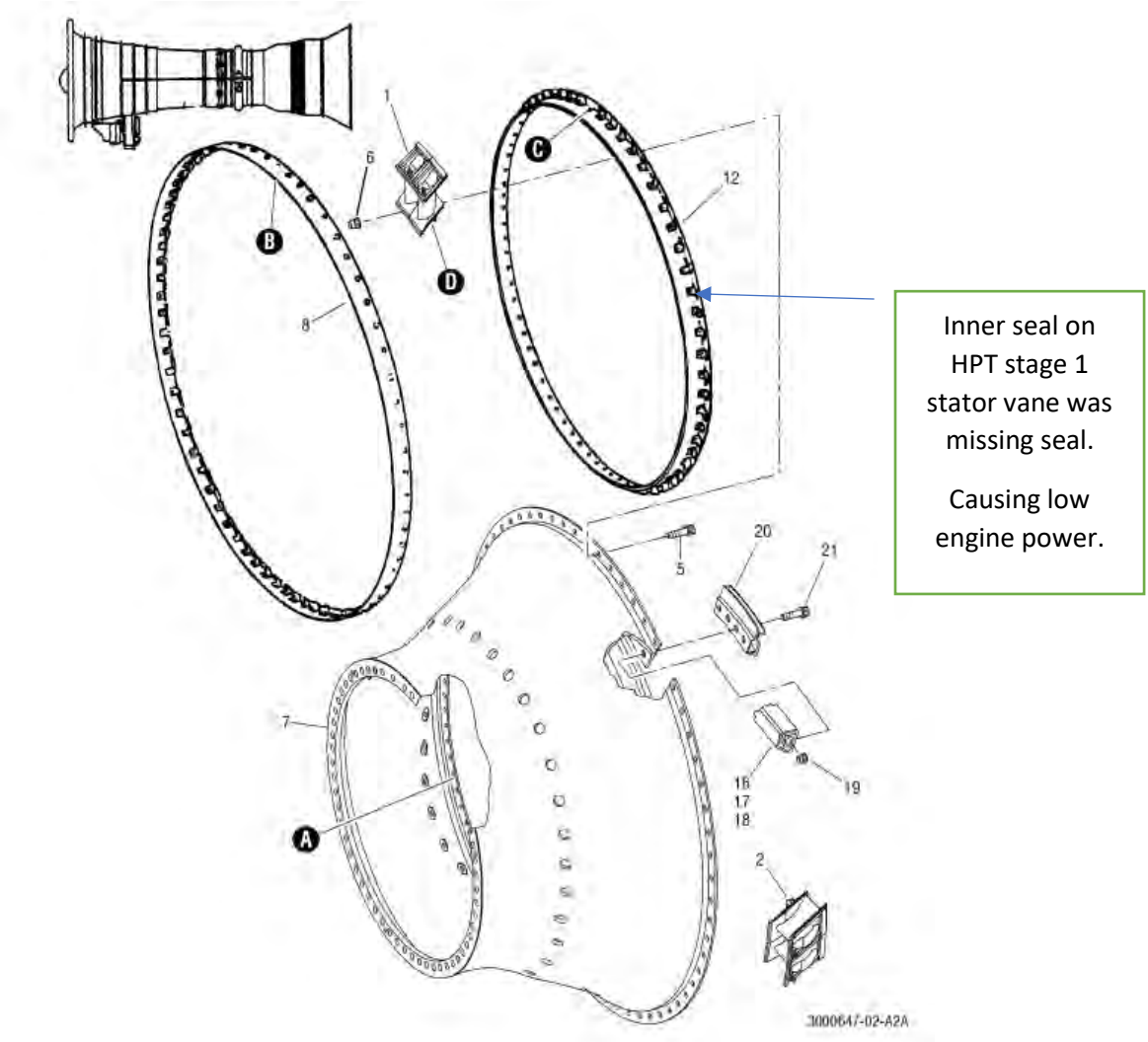
## Mechanical Details

Modules replaced.

| | PN removed | SN Removed | PN Installed | SN Installed |
|---|---|---|---|---|
| Combustor | 9016M53G16 | GGM9KEMG | 9101M29G84 | GGM99CNY |
| Stage 1 nozzle | L47658G01 | FCP5GRR49 | L47658G01 | FCP54AOP |
| Stage 2 nozzle | L50008G07 | GEVLADP4 | L50008G03 | GEVL25J4 |
| HPT rotor | L31304G10 | APV551F | L50009G01 | APV87512 |

.

## Other notes




Inner seal on HPT stage 1 stator vane was missing seal.

Causing low engine power.

HPT stage 1 nozzle module build up

## Recommendations/observations

Recommend when torquing HPT rotor to use a Dial indicator torque from 0 to 600 Ft/ LBS.

## Engine run data.

# Field Service Report

# NFE

San Juan, Puerto Rico

Unit 10 ESN 557-262

## Summary

Performed Hot Section exchange on LM2500+ unit 10 engine ESN 557-262 at customer site at San Juan Puerto Rico, includes combustion chamber, HPT stage 1, stage 2 nozzles, and HPT rotor. This was the last unit out of four units that we performed HSE starting on January 12, 2024.

Replaced hot section modules, installed GG into the package, engine performed well with no issues to report. All modules installed on this engine were acquired from GE Aero Alliance.

No oil or any other leaks noted during engine run. Engine performed well and returned to service.

## Customer information

Operating conditions. “Engine returned to service and operating normal.

| | | | |
|---|---|---|---|
| **Customer** | *NFE* | **Contract No:** | |
| **End User** | *NFE* | **Project No:** | *EA324031Z00A31BIL* |
| **Location** | *San Juan, Puerto Rico* | **Project Manager:** | *Manuel Perez* |
| **Customer Rep:** | *Rafael Aguilera.*<br>*Nerio Cabrera* | **Siemens Rep:** | *Javier Salazar, Rune Johansen.* |
| **Customer Contact:** | *Rafael Aguilera* | | |

| | | | |
|---|---|---|---|
| **Customer Tag:** | *UNK* | **Machine No:** | *LM2500 +* |
| **Model:** | *LM2500+ SAC* | **Engine SN:** | *557-262* |
| **No of Starts:** | *407* | **Fired/ Run Hours:** | *5562* |
| **Manual Reference:** | *GEK 105054* | **WP References** | *See below* |
| **Driver:** | *LM2500 Gas Turbine* | **Driven:** | *Generator Brush* |
| **Manufacturer** | *GE* | | |
| **Control system:** | *Woodward* | **Software type:** | *UNK* |
| **HMI type:** | *DR* | **Software type:** | *UNK* |

## Scope

Engine removed from enclosure and transfer to the maintenance dolly to perform hot section replacement per GEK manuals 105054 and 105055.

The following work was performed by WP’S:

WP 200 00 Turbine Mid Frame replacement.
WP 201 00 High pressure rotor replacement.
WP 201 01 HPT stage 2 nozzle replacement
WP 201 02 HPT stage 1 nozzle replacement

Report completed by:- Javier Salazar – FSR Siemens-energy.

WP 202 00 HPT rotor blade replacement
WP 205 00 Center body replacement

WP 203 00 annular combustor replacement.
WP 301 00 GG assembly replacement




Filter house and roof removed from unit 10 to gain access to the gas generator and perform HSE.



Power turbine stage 1 blades inspected; no damage found. PT supported by a sling and 2 chain falls.



TMF LPT stage 1 nozzles vanes trailing edge, no discrepancies noted. Still attach it to the GG.



TMF forward side, just removed from GG.



HPT rotor assembly and stage 2 nozzle removed



HPT rotor closer view, stage 1 blade leading edge.

Report completed by:- Javier Salazar – FSR Siemens-energy.

SIEMENS energy

| | | |
|---|---|---|
|  | |  |
| HPT stage 1 nozzle, same condition as previous ones removed from unit 7, 8 and 9. Unserviceable. | | HPT stage 1 nozzle vanes as found. Leading edge area. |
|  | |  |
| Combustor removed. | | Installed new combustor in CRF. |
|  | |  |
| HPT stage 1 nozzle installed | | HPT stage 1 completed installed and torqued bolts |

Report completed by:- Javier Salazar – FSR Siemens-energy.

| | | |
|---|---|---|
|  | |  |
| *HPT rotor with missing TBC material on thermal shield serrations, GE engineering and customer approved installation on ESN 557-262. Unit 10* | | HPT rotor and stage 2 nozzle assemble and installed on engine. Final torque 9000 FT/LBS at 29 degrees, Concentricity run out 0.0045 inches |
|  | |  |
| Complete HPT rotor assembly, # 5 bearing nut torqued and lock ring installed. | | TMF ready to be install on gas generator. |
|  | |  |
| Gas generators assembly completed. | | Installed into the enclosure and package/engine interface connections completed. |

Report completed by:- Javier Salazar – FSR Siemens-energy.

| | | |
|---|---|---|
|  | |  |
| Completed engine installation and cleaned package. Right side area. | | Engine left side, all connections completed. Ready to start engine. |
|  | | Intentionally left in blank |
| Preparing roof for installation on the package. | | . |
| Intentionally left in blank | | Intentionally left in blank |
| | | |

# Daily Log

### Friday 02, February

Verified LOTO, removed GG from engine enclosure and started to disassembly GG; removed TMF, HPT rotor module, all 30-fuel nozzles were removed.

### Saturday 03, February

Continue removing stage 1 nozzle, combustor, replaced stage 1 nozzle seal support gang nut channel installed new combustor, stage 1 nozzle, assemble HPT rotor and stage nozzle and installed module and torque HPT rotor nut to 9000 FT/LBS at 29 degrees, concentricity run out reading 0.0045 inches. HPT rotor was installed with the approval of the GE engineering and customer, this rotor had a minor discrepancy on the thermal shield serrations 2 and 3 lack of coating on some area.

### Sunday 04, February

Completed TMF installation and torque CRF/TMF bolts. Transferred gas generator to engine enclosure, joint power turbine to Gas generator and torque bolts, started package/ engine interface connections, installed roof and filter house, clean up package. Gas generator installation completed removed lock from the LOTO box. End of the shift.

### Monday 05, February

Performed one more final Gas turbine inspection and were ready to do high engine speed crank and VSV system calibration, during high speed crank no leaks noted. Run engine to the maximum allowed power in increments of 5 MW's, engine perform well and check again for any leaks, no leaks found. Engine reach 24.3 MWs with OAT 93 degrees F.

Inventory and loaded HSE tooling in the tool container, ready to be ship.

.

# Mechanical Details:

Modules replaced.

| | PN removed | SN Removed | PN Installed | SN Installed |
|---|---|---|---|---|
| Combustor | 9016M53G16 | GGM9L2FE | 9101M29G84 | GGM9JJ62 |
| Stage 1 nozzle | L49638G01 | FCP5H35F | L50027G05 | FCP56M75 |
| Stage 2 nozzle | L50008G07 | GEVL4LHC | L50008G01 | GEVKWG4D |
| HPT rotor | L31304G10 | APV1281F | L50009G02 | APV8351B |

.

Report completed by:- Javier Salazar – FSR Siemens-energy.

## Other notes:

HPT rotor with the thermal shield serrations coating missing, was approved by GE and the customer assembled and installed on unit 10.

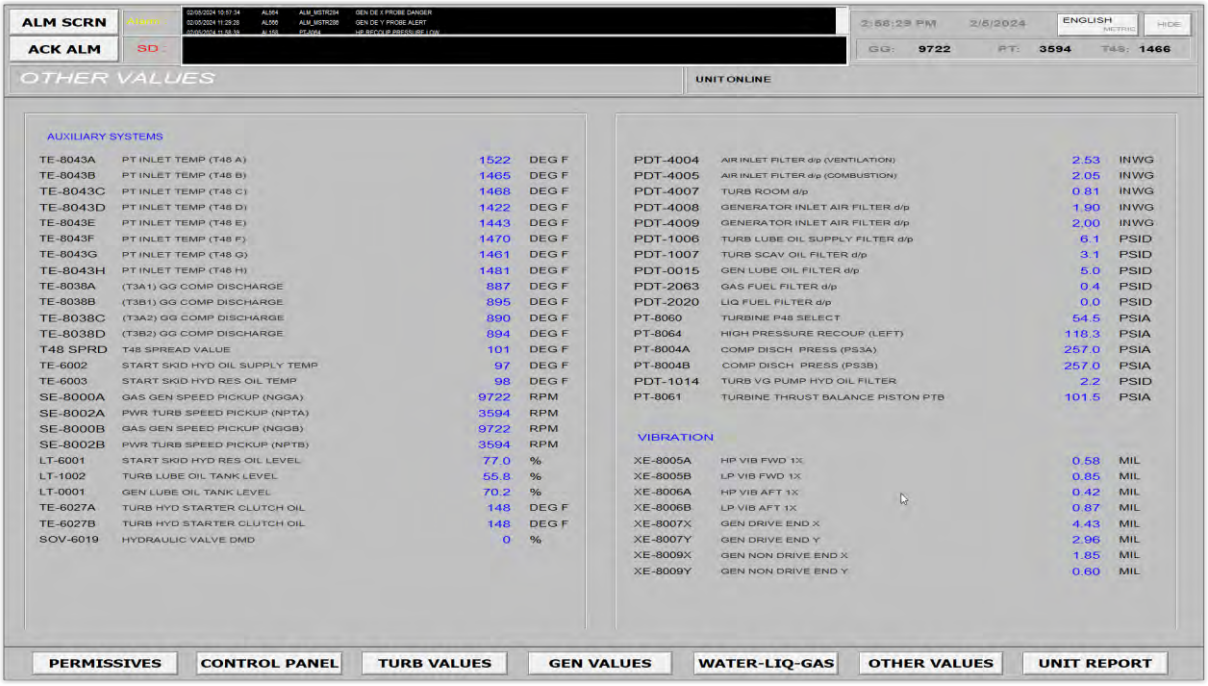
## Recommendations/observations

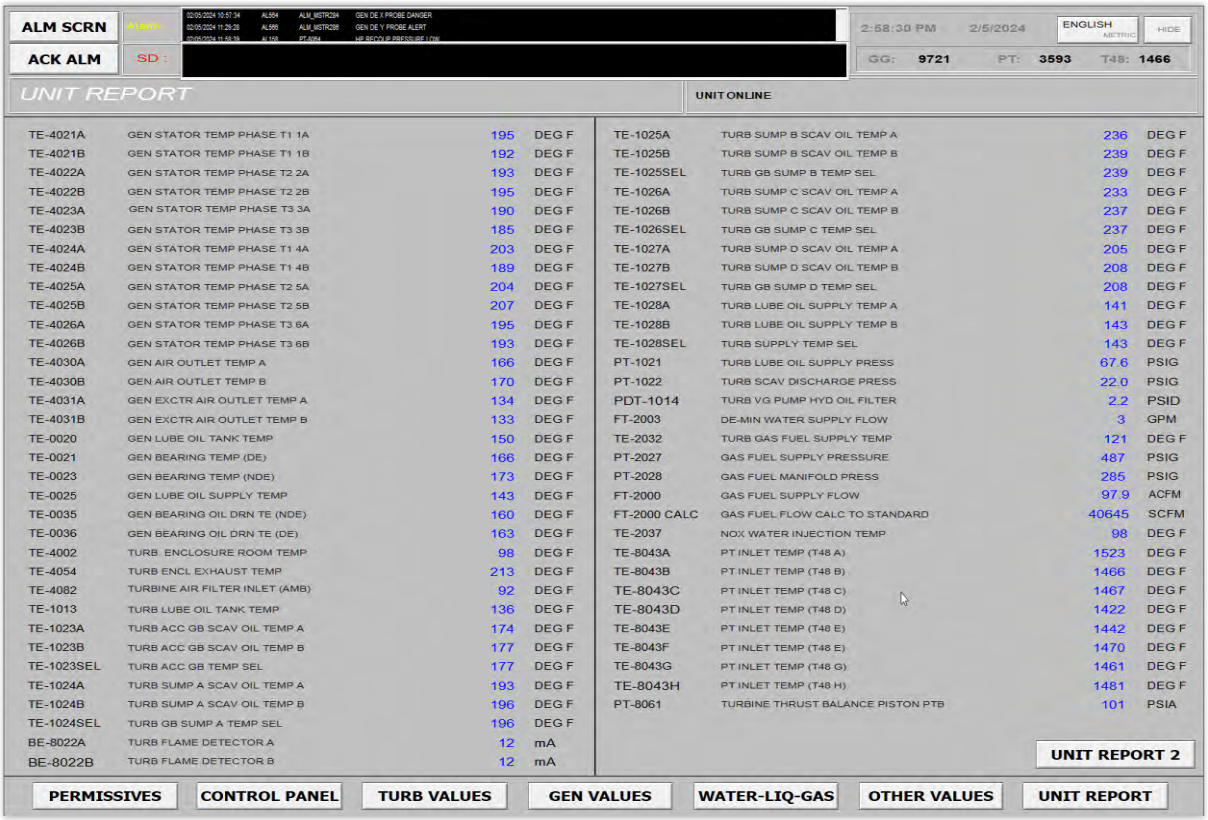
Monitor HP recoup orifice plates installed on engine are P03. Monitor PT thrust balance orifice plate.

## Engine run data.




Report completed by:- Javier Salazar – FSR Siemens-energy.




Report completed by:- Javier Salazar – FSR Siemens-energy.

# Field Service Report

# NFE

San Juan, Puerto Rico

Unit 9 ESN 557-260

## Summary

Performed Hot Section exchange on LM2500+ unit 9 engine ESN 557-260 at customer site at San Juan Puerto Rico, includes combustion chamber, HPT stage 1, stage 2 nozzles, and HPT rotor.

Replaced hot section modules, installed GG into the package, engine performed well with no issues to report. All modules installed on this engine were acquired from GE Aero Alliance.

No gas, oil or water leaks noted during engine run. Engine performed well and returned to service.

## Customer information

Operating conditions. “Engine returned to service and operating normal.

| | | | |
|---|---|---|---|
| **Customer** | *NFE* | **Contract No:** | |
| **End User** | *NFE* | **Project No:** | *EA324031Z00A31BIL* |
| **Location** | *San Juan, Puerto Rico* | **Project Manager:** | *Manuel Perez* |
| **Customer Rep:** | *Rafael Aguilera.*<br>*Nerio Cabrera* | **Siemens Rep:** | *Javier Salazar, Rune Johansen.* |
| **Customer Contact:** | *Rafael Aguilera* | | |

| | | | |
|---|---|---|---|
| **Customer Tag:** | *UNK* | **Machine No:** | *LM2500 +* |
| **Model:** | *LM2500+ SAC* | **Engine SN:** | *557-260* |
| **No of Starts:** | *631* | **Fired/ Run Hours:** | *5469* |
| **Manual Reference:** | *GEK 105054* | **WP References** | *See below* |
| **Driver:** | *LM2500 Gas Turbine* | **Driven:** | *Generator Brush* |
| **Manufacturer** | *GE* | | |
| **Control system:** | *Woodward* | **Software type:** | *UNK* |
| **HMI type:** | *DR* | **Software type:** | *UNK* |

## Scope

Engine removed from enclosure and transfer to the maintenance dolly to perform hot section replacement per GEK manuals 105054 and 105055.

The following work was performed by WP’S:

WP 200 00 Turbine Mid Frame replacement.
201 01 HPT stage 2 nozzle replacement
WP 201 00 High pressure rotor replacement.
WP 201 02 HPT stage 1 nozzle replacement

Report completed by:- Javier Salazar – FSR Siemens-energy.

WP 202 00 HPT rotor blade replacement
WP 203 00 annular combustor replacement.
WP 205 00 Center body replacement
WP 301 00 GG assembly replacement



Unit 9 removed from enclosure, transferred to Maintenance dolly for hot section replacement.



Power turbine stage 1 blades inspected; no damage found.



TMF forward view removed from GG, T48 thermocouples serviceable.



TMF aft view power turbine stage 1 nozzles vanes, no nicks, dents or damage noted.



TMF forward view No. 5 bearing area, air/oil seals in good condition.



HPT rotor removed, visible stage 1 blades.

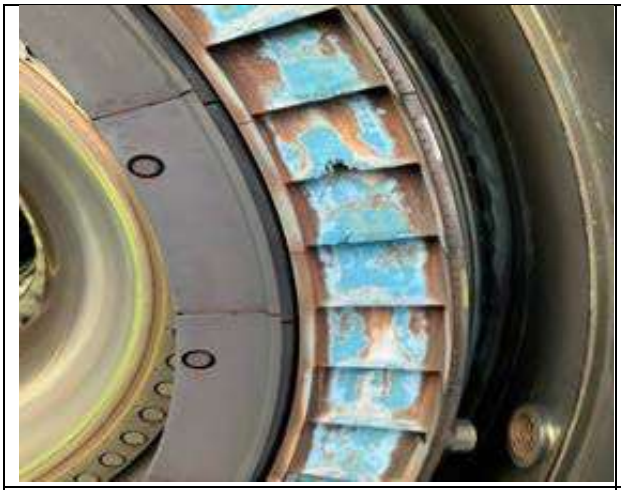
Report completed by:- Javier Salazar – FSR Siemens-energy.



HPT rotor assembly and stage 2 nozzle removed from GG 557-260



HPT stage 1 nozzle vanes as found. TE area.



HPT stage 1 nozzle vanes TE. Deteriorated vanes. Replaced stage 1 nozzle assy.



HPT rotor assy. stage 1 and stage 2 blades exposed



HPT stage 2 nozzle assy. Vanes Leading edge.



HPT stage 2 nozzle Trailing edge airfoils.

Report completed by:- Javier Salazar – FSR Siemens-energy.

SIEMENS energy

| | | |
|---|---|---|
|  | |  |
| Combustion chamber 557-260 | | Combustor inner and outer liners; dome area |
|  | |  |
| New combustor chamber for ESN 557-260 | | Overhauled HPT stage 1 nozzle module from GE aero alliance to be installed on 557-260 |
|  | |  |
| HPT rotor assembly as received from GE aero alliance. It was not installed on unit 9. Missing partial coating on thermal shield serrations. | | Installed different HPT rotor and stage 2 nozzle from GE aero Alliance that was supposed to be install on unit 10. No discrepancies on this assembly |

Report completed by:- Javier Salazar – FSR Siemens-energy.

| | | |
|---|---|---|
|  | |  |
| Stage 1 nozzle installed and ready to install HPT rotor | | HPT rotor installed and torqued to 8700 FT/LBS at angle 29 degrees. |
|  | |  |
| Assembled gas generator and TMF installed. | | GG installed unto the package, started engine/package interface connections. |
|  | |  |
| Package roof getting to be installed on unit 9 | | Filter house getting lift and aligned for installation. Unit 9 |

Report completed by:- Javier Salazar – FSR Siemens-energy.

# Daily Log

### Sunday 28, January

Verified LOTO, removed GG from engine enclosure and started to disassembly GG; removed TMF, HPT rotor module, stage 1 nozzle and all 30 fuel nozzles were removed.

### Monday 29, January.

Old combustor removed, install new combustor, HPT stage 1 nozzle; 30 fuel nozzles torqued and lockwire bolts, unable to install HPT rotor due to some issues with thermal shield coating instead we use the HPT rotor and stage 2 nozzle that was assigned to unit 10. Customer requested to GE engineering disposition regarding the HPT rotor thermal shield discrepancy.

### Tuesday 30, January

Started to assemble hot section HPT rotor nut final torque 8700 FT/LBS at 29 degrees concentricity check 0.0035 inches. TMF install and GG assembly completed.

### Wednesday 31, January

Completed GG installation into the package and finish all engine/package interface connections. Clear LOTO and released engine, end of shift.

### Thursday 01, February

Performed engine high speed crank, calibrated VSV system and checked for leaks, started unit and during warm up cycle checked for any type of leaks, no leaks noted.

Ramp up engine on increments of 5 MWs, at 15 MWs engine oil supply temperature was getting higher than normal, customer decided to shutdown engine to trouble shoot the problem. Found oil Thermostatic check valve stock on closed position, replaced valve and re-start engine check oil supply temperature reading normal, this time continue engine to full maximum power allow it and engine reach 26.3 MWs .

# Mechanical Details

Modules replaced.

| | PN removed | SN Removed | PN Installed | SN Installed |
|---|---|---|---|---|
| Combustor | 9016M53G10 | GGM9L05M | 9101M29G84 | GGM9R52H |
| Stage 1 nozzle | L476458G01 | FCPBHIER | L50027G05 | FCP5GG8C |
| Stage 2 nozzle | L50008G07 | GEVL4KNL | L50008G01 | GEVKWEFR |
| HPT rotor | L31304G10 | APV6393F | L50009G02 | APV4025C |

.

Report completed by:- Javier Salazar – FSR Siemens-energy.

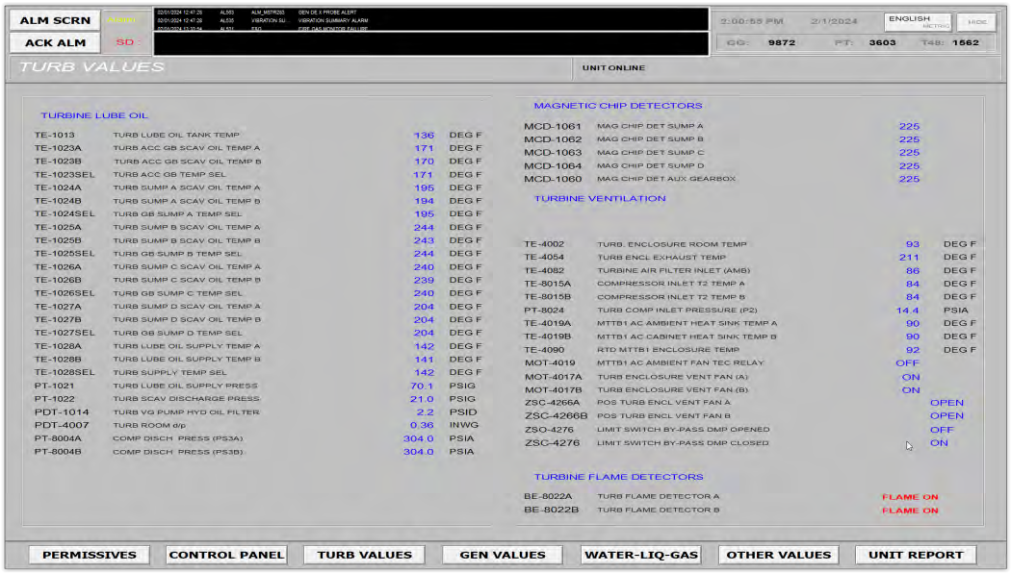
## Other notes:

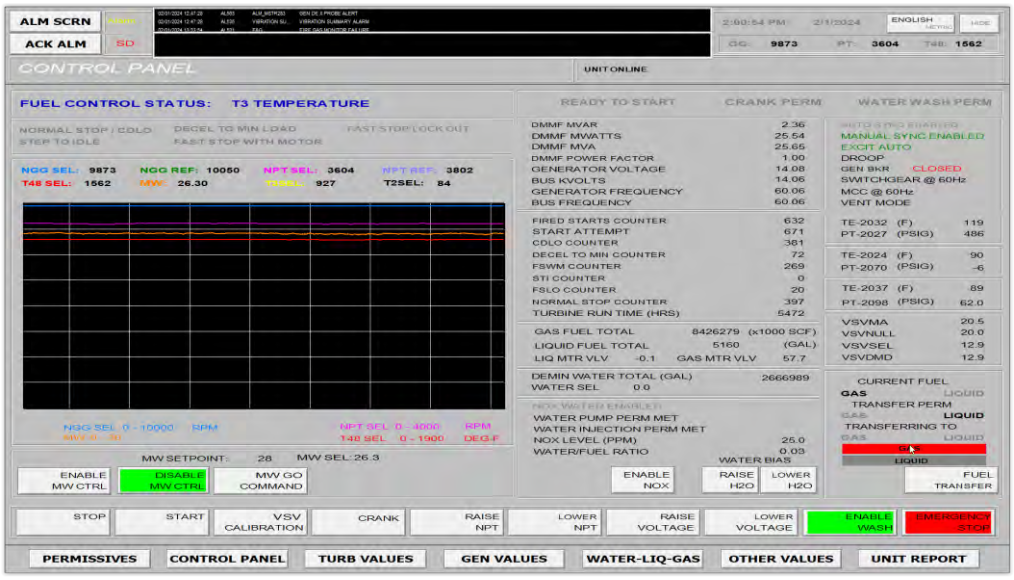
Brush generator with vibrations high on the exciter drive end, customer trim balance generator with the assistant of a technical balance specialist.

## Recommendations/observations

Monitor engine HP recoup and PT thrust balance.

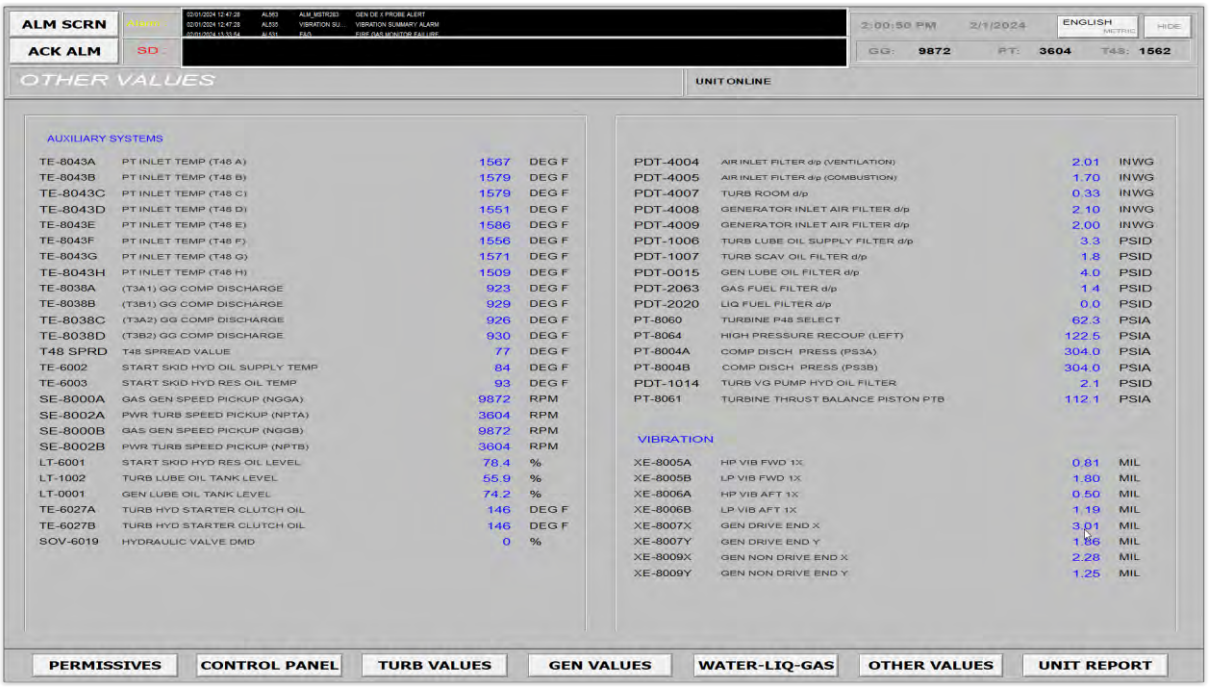
## Engine run data.




Report completed by:- Javier Salazar – FSR Siemens-energy.

SIEMENS energy




Report completed by:- Javier Salazar – FSR Siemens-energy.

GE VERNOVA

NFE Power PR LLC
954 Ponce de Leon
Suite 406, San Juan Puerto Rico
00907, Puerto Rico

Attention: Daniel McGuire

**Ref.** This letter ("Notice letter") is referred to proposal 1659945 Rev 3 ("Proposal") described on records and signed between **NFE POWER PR LLC.** ("Owner"), and **GE VERNOVA OPERATIONS, LLC (BEFORE KNOWN AS GE PACKAGED POWER, LLC)** ("GEVO" or "Contractor" and together with Owner hereinafter referred as the "Parties"). Further reference is made to the order acknowledgement dated December 20, 2023 ("OA") referred to the Proposal and the purchase order issued by Owner (NPRL10071 Rev 1) ("PO").

1. Hot Section assembly follow latest configuration and would be assured of a high-quality product backed by GEVO´s warranty.

2. Modules are expected to fulfill planned time life.

3. Regarding the above provisions, GEVO hereby confirms Owner that the warranty offered under the terms and conditions set forth in the Proposal are valid.

GE Vernova Operations, LLC
(before known as GE Packaged Power, LLC)

Marco Antonio Sandoval Martínez

# *BORESCOPE INSPECTION REPORT*
# *TM2500 GEN. 6-7*
# *LM2500+ SAC*

## NFE PALO SECO POWER PLANT

## *PACKAGE # 7251610*

## *UNIT #1*

| | | | |
|---|---|---|---|
| **Visit Date:** | 01/26/2024 | **Total Starts:** | 425 |
| **Engine S/N:** | 557 - 259 | **GG Hours:** | 7054 |
| **Power Turbine S/N:** | 557 - 259 | **PT Hours:** | 7054 |
| **PPG GT Field Engineer:** | JC Requena H | **NFE Representative:** | Lance Florent |



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4.3 Turbine Section.....18
4.4 LPT Section .....27

## 1. Conclusions and Recommendations

**Purpose of visit:**
The purpose of this visit was to perform a borescope inspection of the Engine Hot Section in accordance with GEK105054, WP 406 00.

1.1 The Combustor section condition remains the same than last BSI. Nothing to remark.

1.2 The HPT stage 1 and 2 Blades condition remains the same than last BSI. Nothing to remark.

1.3 The HPT stage 2 Nozzles condition remains the same than last BSI. Nothing to remark.

1.4 The HPT 1st stage nozzles condition didn't degradate dramatically after 1800 hours of operation. Minor increase of the trailing edge burnt areas is observed. The most significant change is observed at some nozzles inner platforms showing burnt distress already.

It's recommended to inspect again the condition of the engine hot section after 1500 / 2000 hours of operation.

## 2. Outage Data

**ENGINE DATA**

| | | | | | |
|---|---|---|---|---|---|
| **ESN:** | 557-259 | **Engine Fired Hours:** | 7054 | **Package Hours:** | 7054 |
| **Model:** | 7LM2500-PK-MDWG05 | **Engine Fired starts:** | 425 | **Package Fired Starts:** | 425 |

**MAINTENANCE DATA**

| WP, SB, SL, PB, PL Performed | GEK105054, REV 11 | Date completed | Comments |
|---|---|---|---|
| WP 406 00 | Borescope Inspection | 26JAN24 | Not Serviceable |

**PARTS DATA**

| Description | PN Removed | SN Removed | Qty | Disposition | PN Installed | SN Installed |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |

## 3. Borescope Inspection Checklist

**Date unit out of operation:** 26JAN24
**Date unit into operation:** 26JAN24
**Last inspection date:** 09NOV23; 5215 Hrs.

**Type of Fuel:** Gas
**Type of outage:** Scheduled

**Type of NOx suppression:** Water Injection

**Inspection of gas turbine:**

| WATERWASH: | HIGH PRESSURE COMPRESSOR: |
|---|---|
| ☐ PERFORMED WATER WASH | ☐ HPC BORESCOPE INSPECTION |
| **COMBUSTOR:** | **HIGH PRESSURE TURBINE** |
| ☒ COMBUSTOR BORESCOPE INSPECTION | ☒ HPT STAGE 1 & 2 NOZZLE BORESCOPE INSPECTION |
| | ☒ HPT BLADE BORESCOPE INSPECTION |
| **LOW PRESSURE TURBINE:** | |
| ☐ LPT BORESCOPE INSPECTION | |

☒ ***Please verify all borescope plugs have been reinstalled***

## 4. Borescope Inspection Record

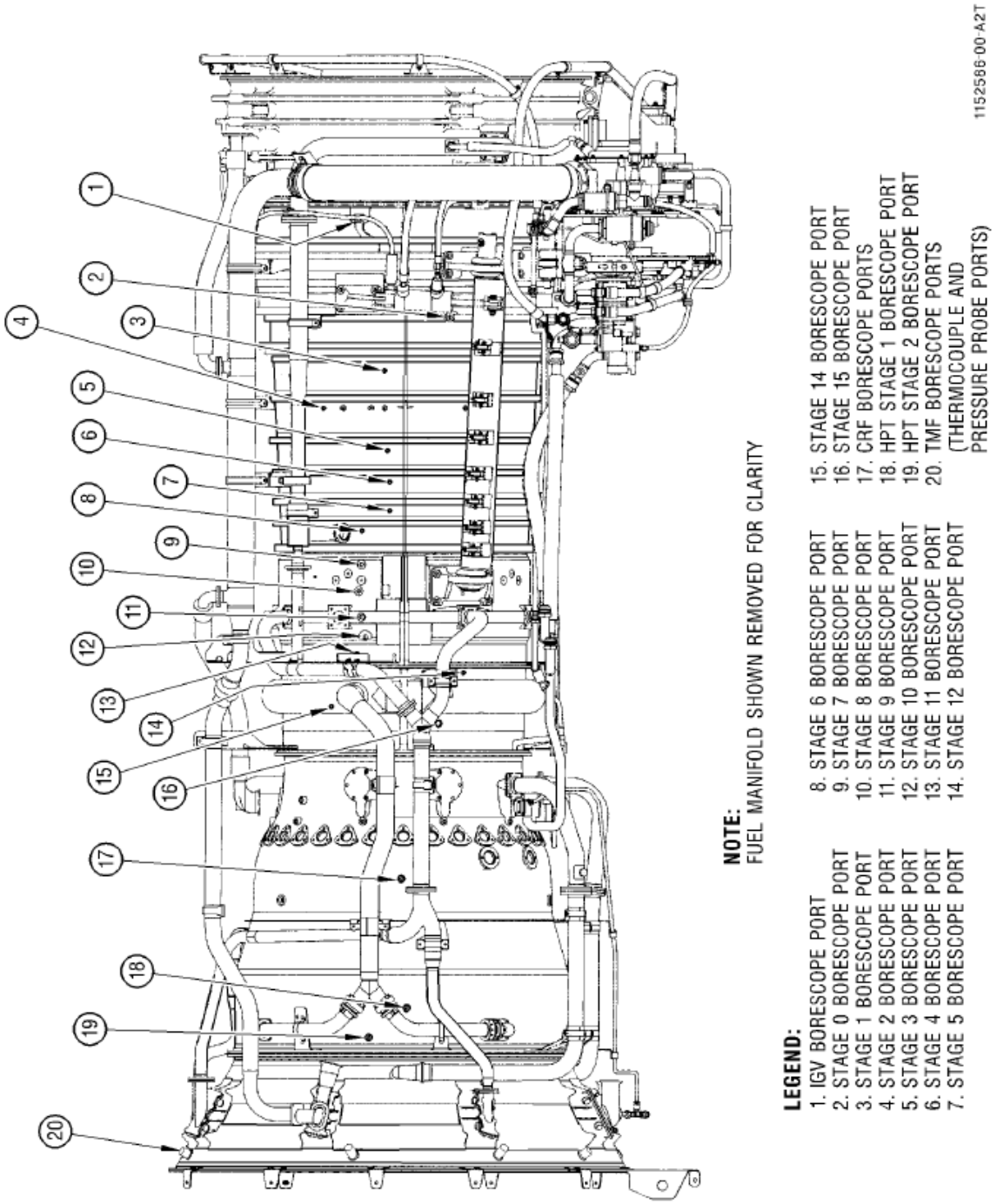



Figure 1: Position of Borescope Inspection Ports.

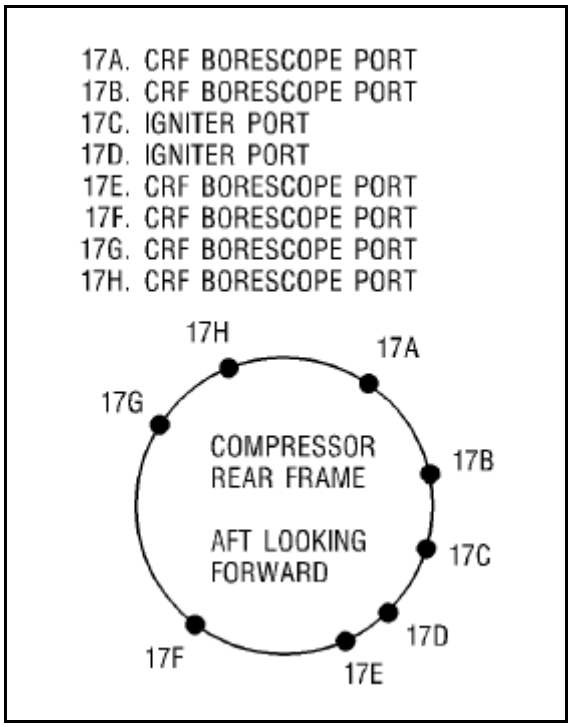


Figure 2: Position of Borescope Inspection Ports.

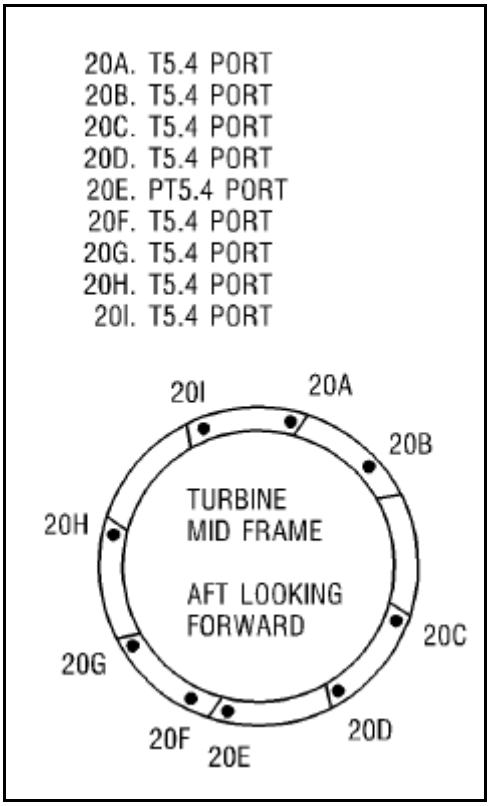


Figure 3: Position of Borescope Inspection Ports.

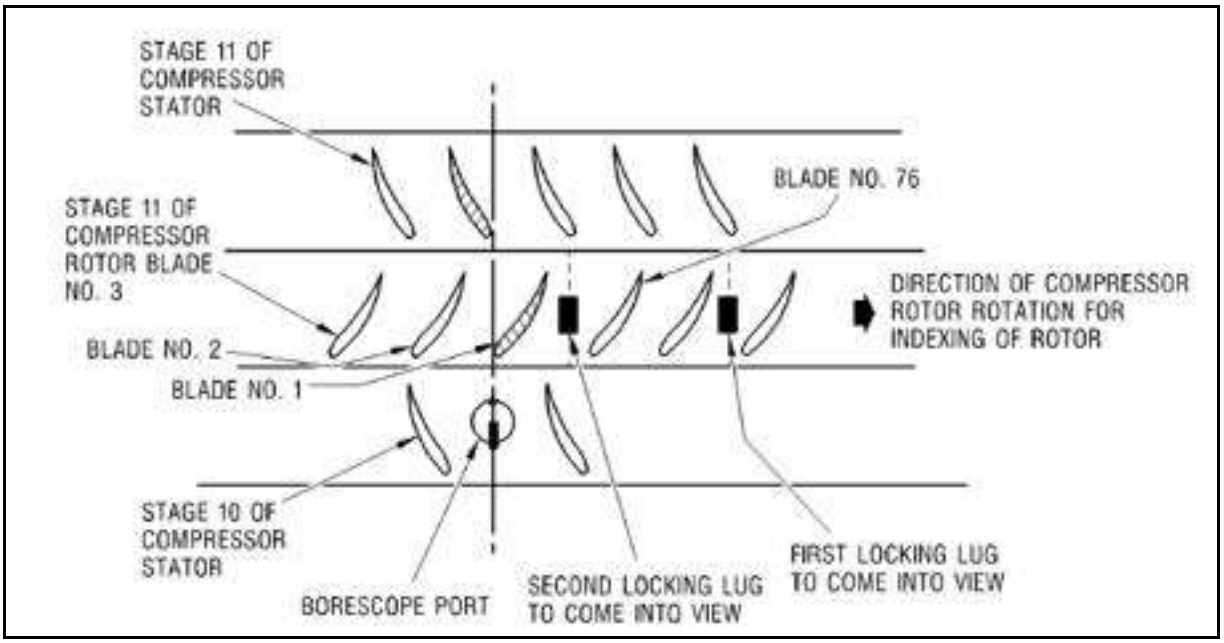


Figure 4: Zero indexing of HPC rotor and HPT rotor

## 4.1 Compressor Section

| Port | T.E. | L.E. | blades | Remarks: | photo no: |
|---|---|---|---|---|---|
| 1 | IGV | | | | |
| 1 | | 0 | 36 | | |
| 2 | 0 | | 36 | | |
| 2 | | 1 | 26 | | |
| 3 | 1 | | 26 | | |
| 3 | | 2 | 26 | | |
| 4 | 2 | | 26 | | |
| 4 | | 3 | 42 | | |
| 5 | 3 | | 42 | | |
| 5 | | 4 | 45 | | |
| 6 | 4 | | 45 | | |
| 6 | | 5 | 48 | | |
| 7 | 5 | | 48 | | |
| 7 | | 6 | 54 | | |
| 8 | 6 | | 54 | Blades contacting tip | |
| 8 | | 7 | 56 | Blades contacting tip | |
| 9 | 7 | | 56 | | |
| 9 | | 8 | 64 | | |
| 10 | 8 | | 64 | | |
| 10 | | 9 | 66 | | |
| 11 | 9 | | 66 | | |
| 11 | | 10 | 66 | | |
| 12 | 10 | | 66 | | |
| 12 | | 11 | 76 | | |
| 13 | 11 | | 76 | | |
| 13 | | 12 | 76 | | |
| 14 | 12 | | 76 | | |
| 14 | | 13 | 76 | | |
| 15 | 14 | | 76 | Inside bleed manifold | |
| 15 | | 15 | 76 | Inside bleed manifold | |
| 16 | 15 | | 76 | | |
| 16 | | 16 | 76 | | |

**Notes:**
The HPC Section was not inspected

.

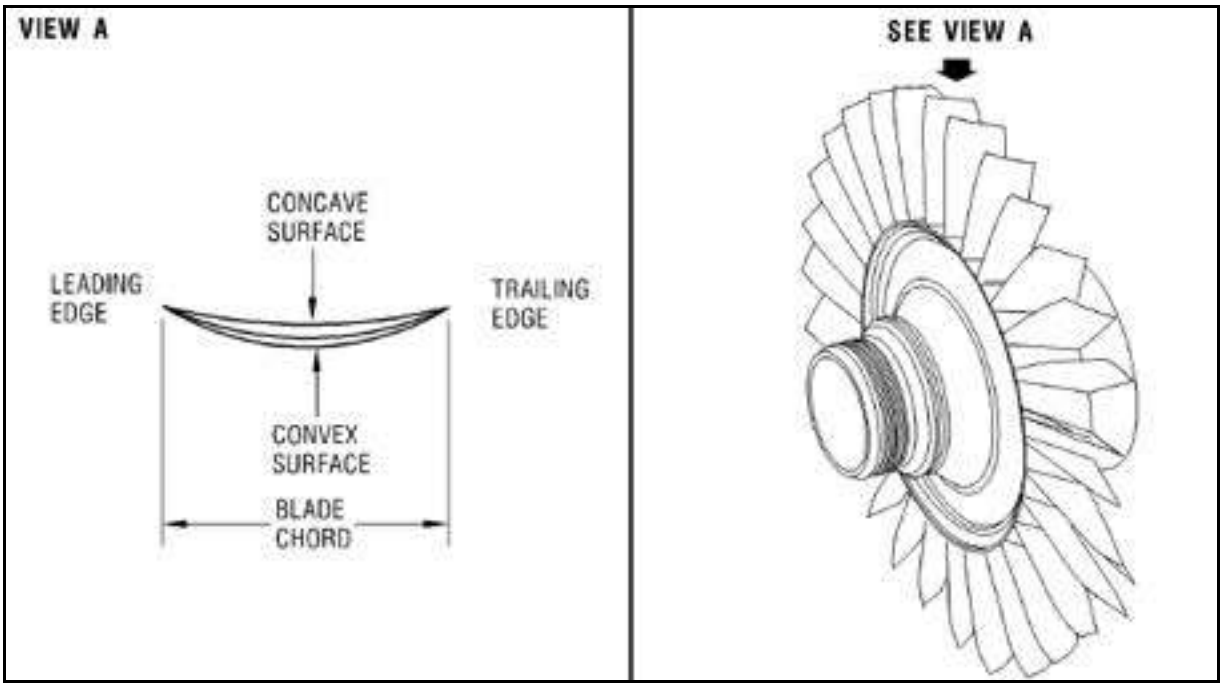



Figure 5: HPC stage 0 BLISK

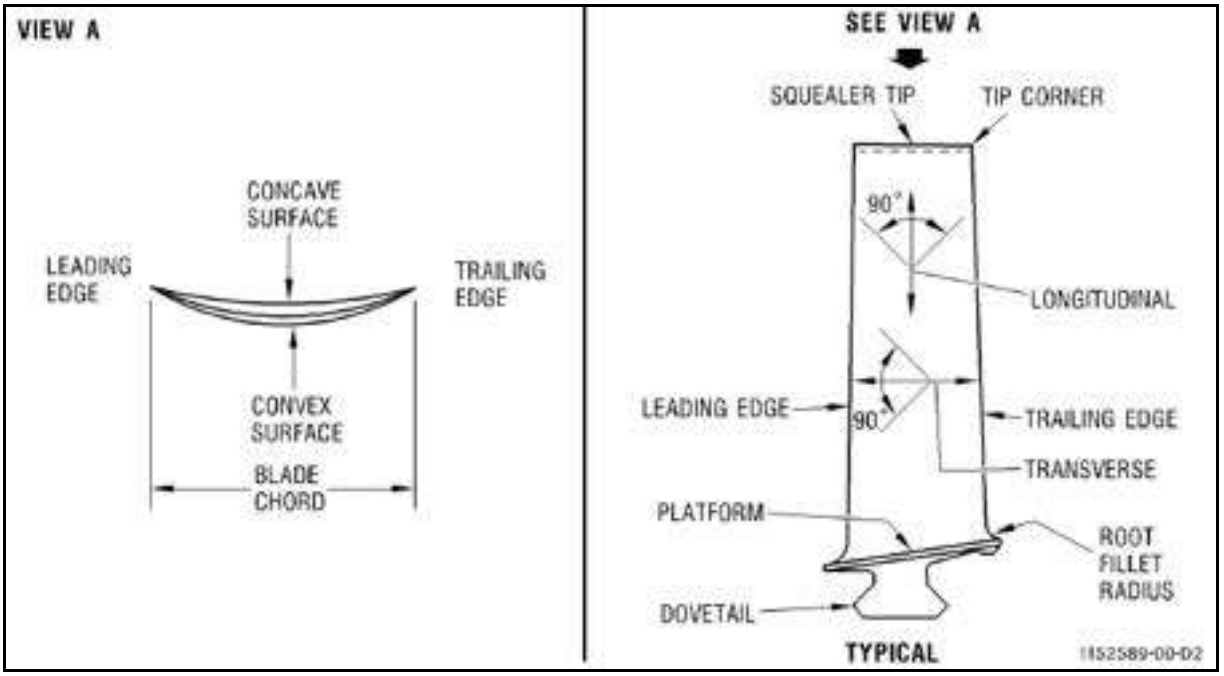



Figure 6: Compressor Rotor Blades

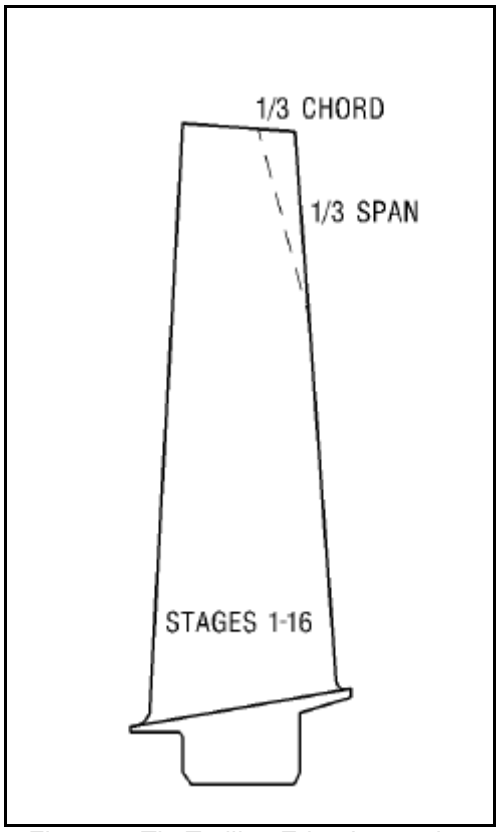


Figure 7: Tip Trailing Edge Inspection

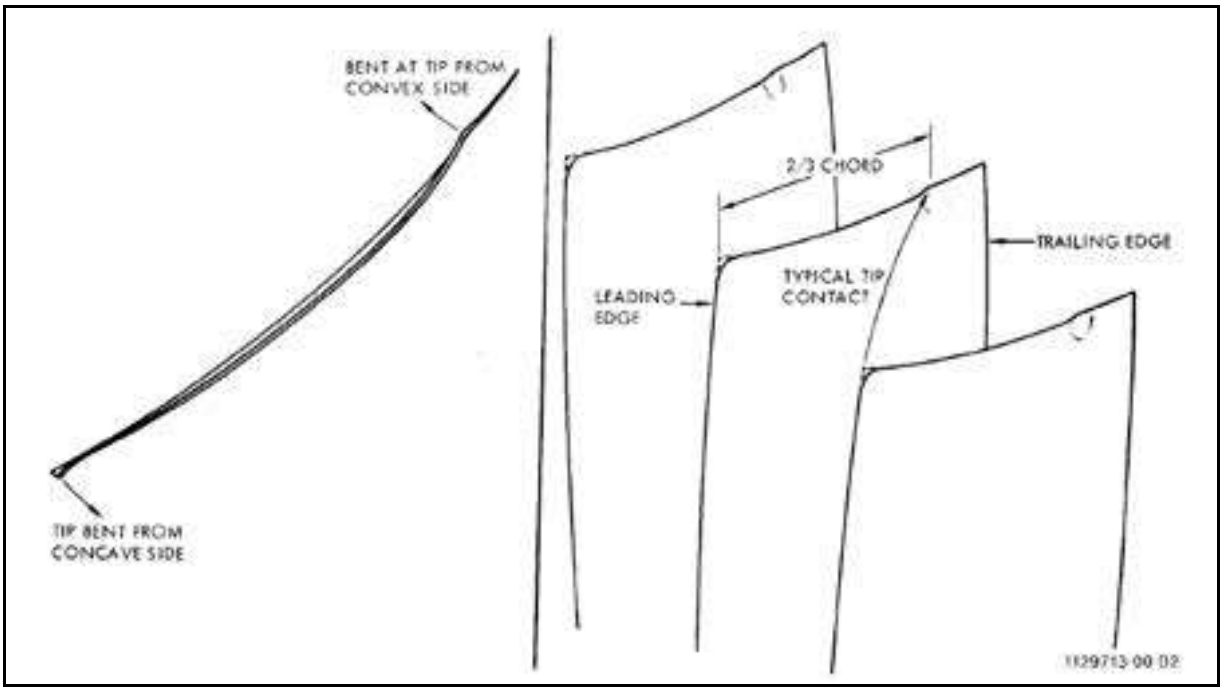
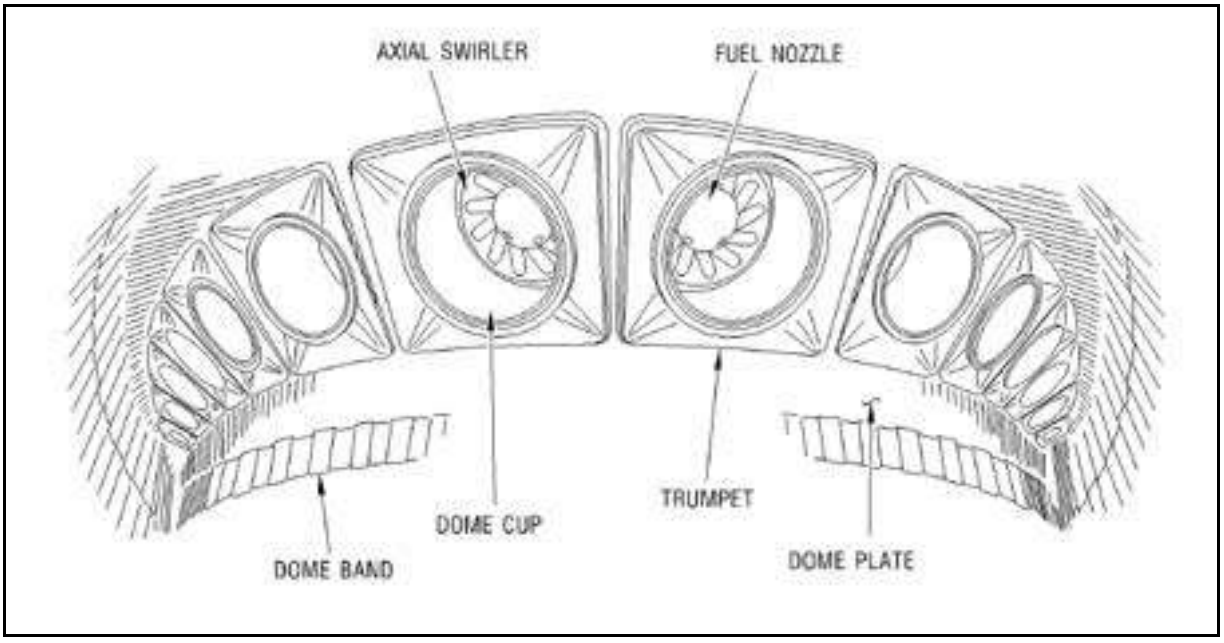


Figure 8: Tip Clanging Contact (HPCR stage 3 through 6)

## 4.2 Combustor and 1St Stage Nozzle Section

| Port | Condition observed | Photo no: |
|---|---|---|
| **17A** | | |
| **17B** | | |
| **17C** | | |
| **17D** | **See below notes.** | |
| **17E** | | |
| **17F** | | |
| **17G** | | |
| **17H** | | |
| **17** | 1st stage nozzle (leading edge): | |

**Notes:**
The Combustor section is serviceable according to GEK 105054 Volume II WP406 00 Table 7.



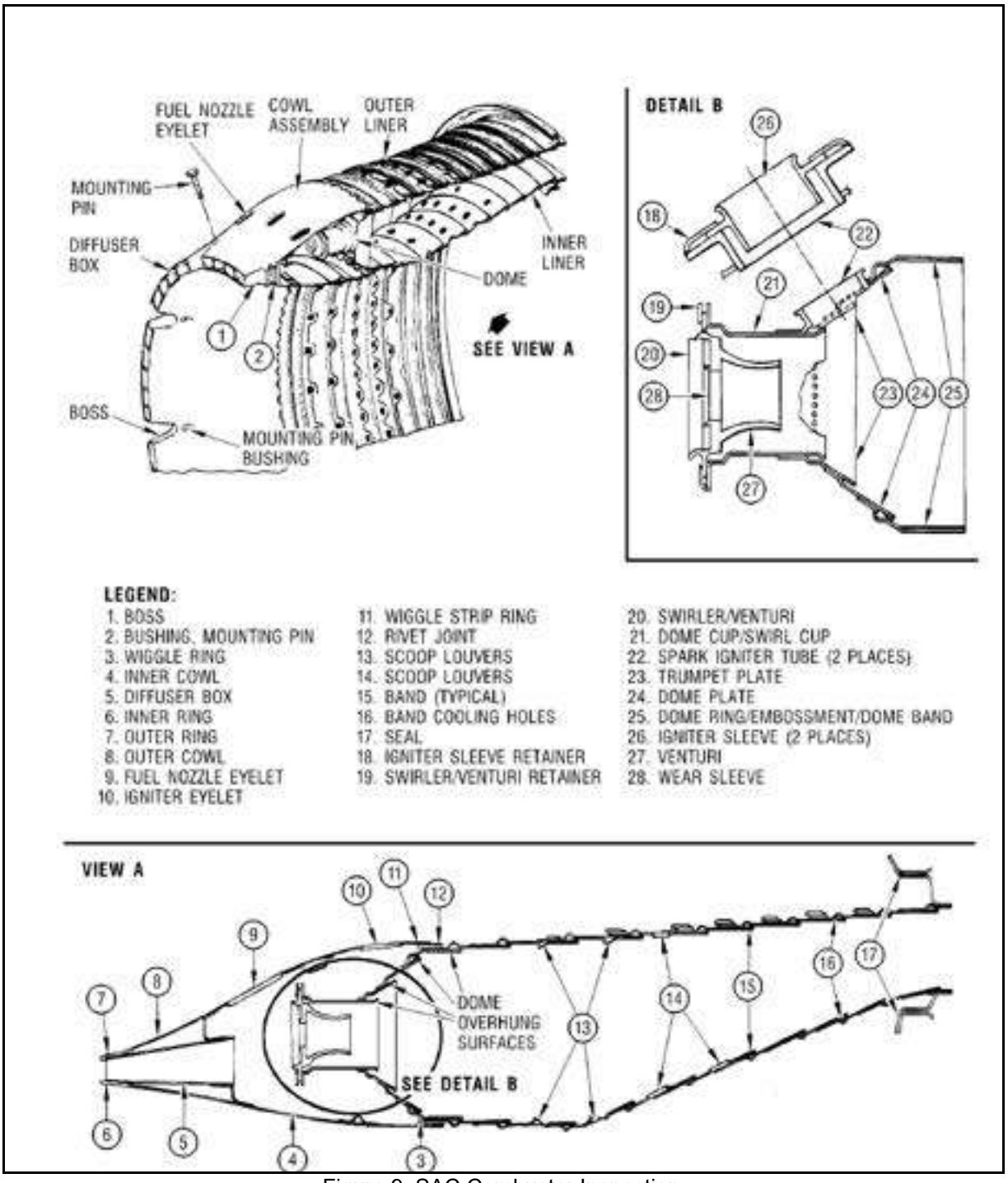



Figure 9: SAC Combustor Inspection

Figure 10: SAC Combustor Inspection

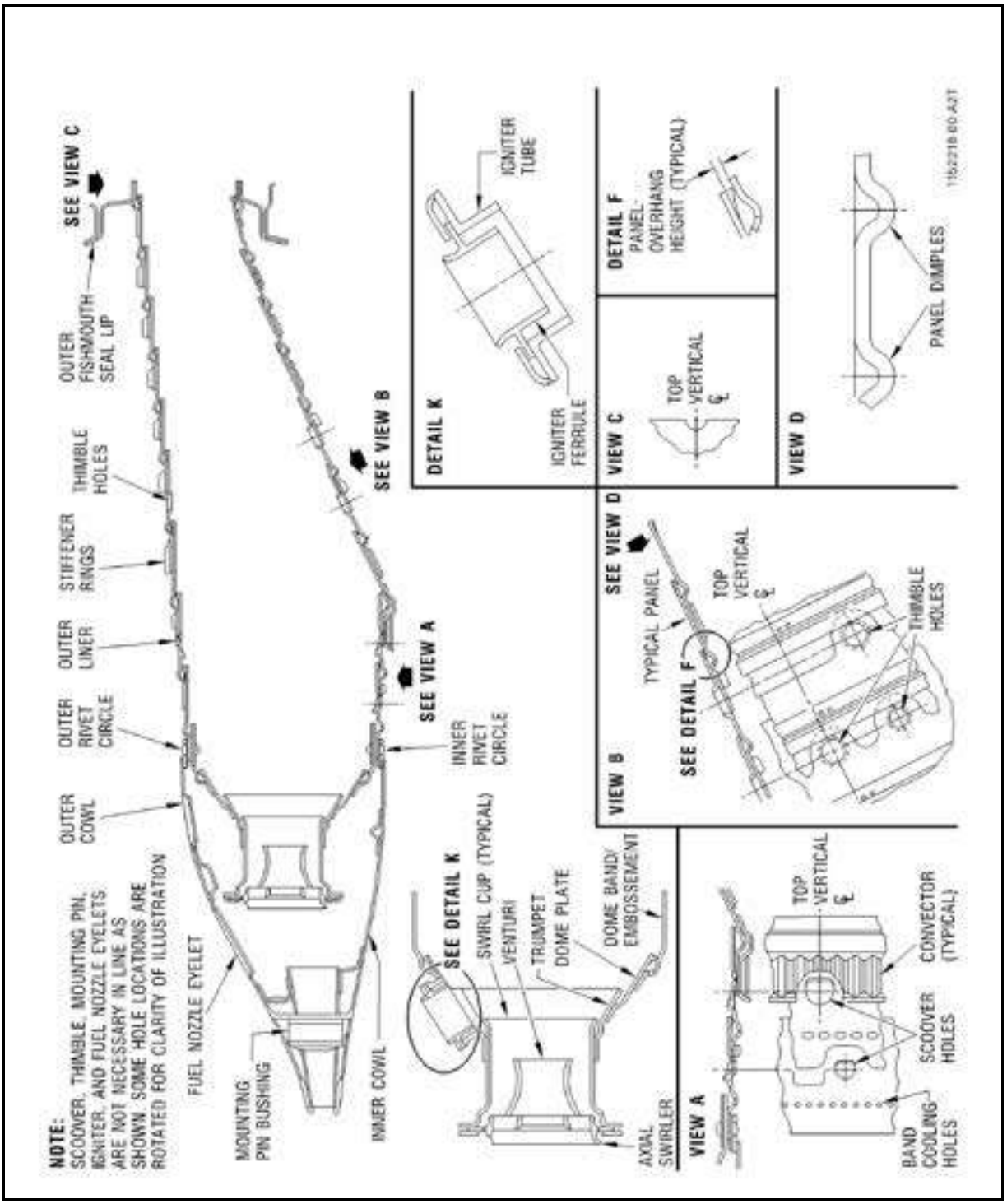



Figure 11: SAC Combustor Inspection

**Borescope Pictures**



Picture 1. Combustor dome



Picture 2. Combustor dome



Picture 3. Splash plates



Picture 4. Splash plates



Picture 5. Outer liner



Picture 6. Inner liner



Picture 7. Inner liner



Picture 8. Combustor liners with HPT nozzles interference



Picture 9. Combustor liners and HPT nozzles



Picture 10. Combustor liners and HPT Nozzles

## 4.3 Turbine Section

| | turbine stage | | | | |
|---|---|---|---|---|---|
| **Port** | **L.E.** | **T.E.** | **blades** | **Remarks:** | **photo no:** |
| **18** | **1** | | **88** | | |
| **19** | | **1** | **88** | **See below notes.** | |
| **19** | **2** | | **90** | | |
| **20** | | **2** | | | |

**Notes:**
The High Pressure Turbine section is not serviceable according to GEK 1050554 Volume II WP406 00 Table 8 paragraph g due to the 1st stage nozzles condition

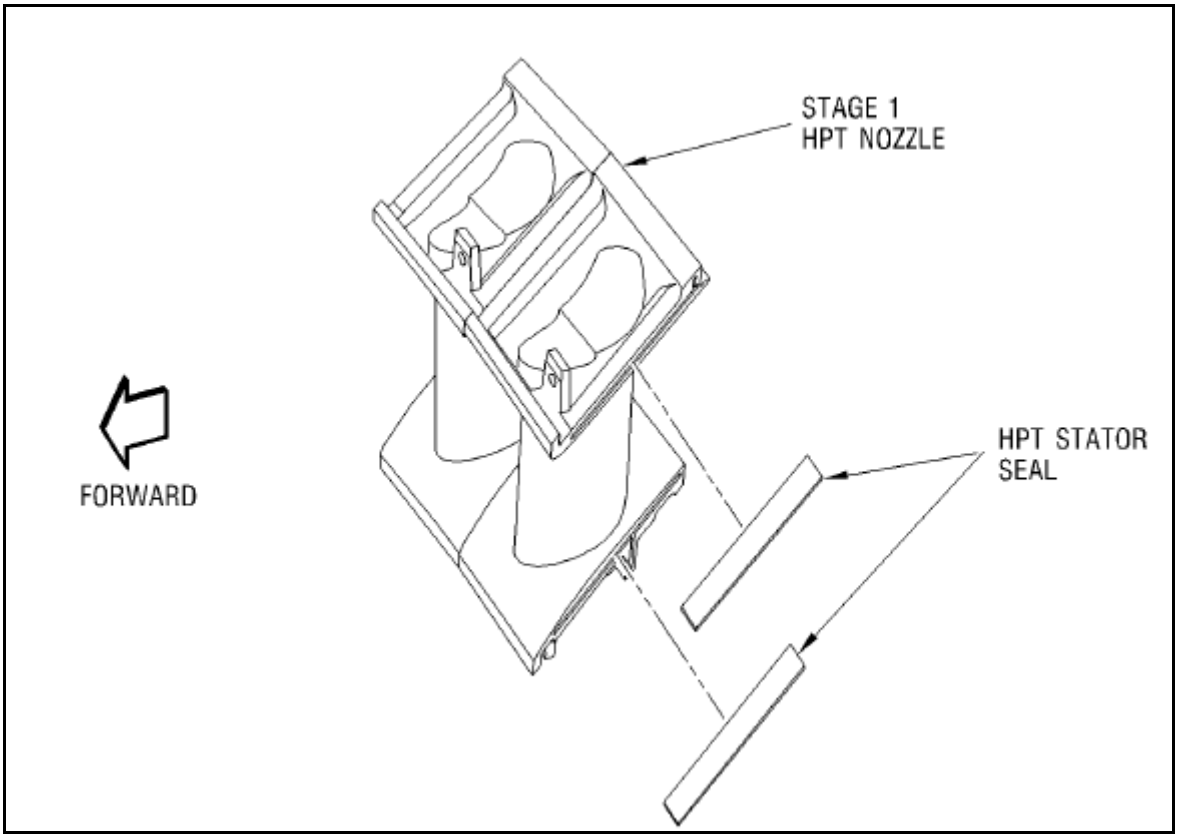



Figure 12: Stage 1 HPT Nozzle Seal Displacement

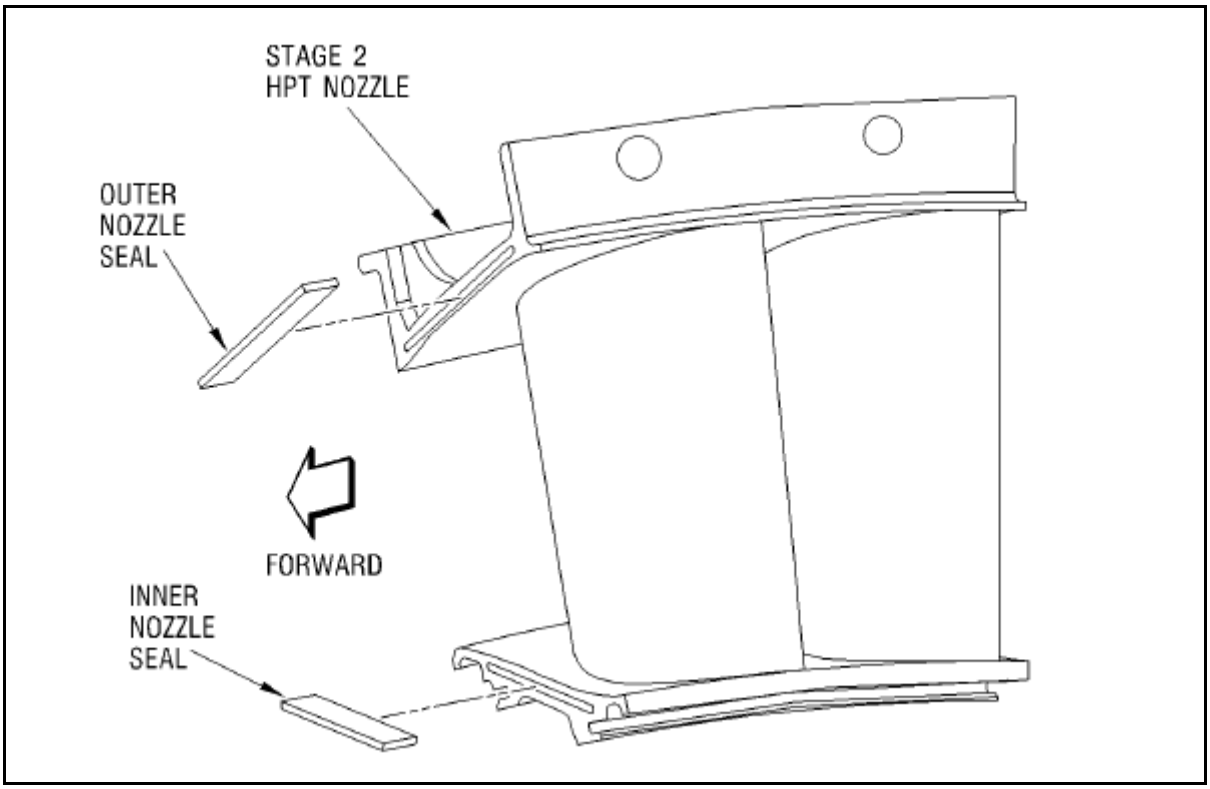


Figure 13: Stage 2 HPT Nozzle Seal Displacement

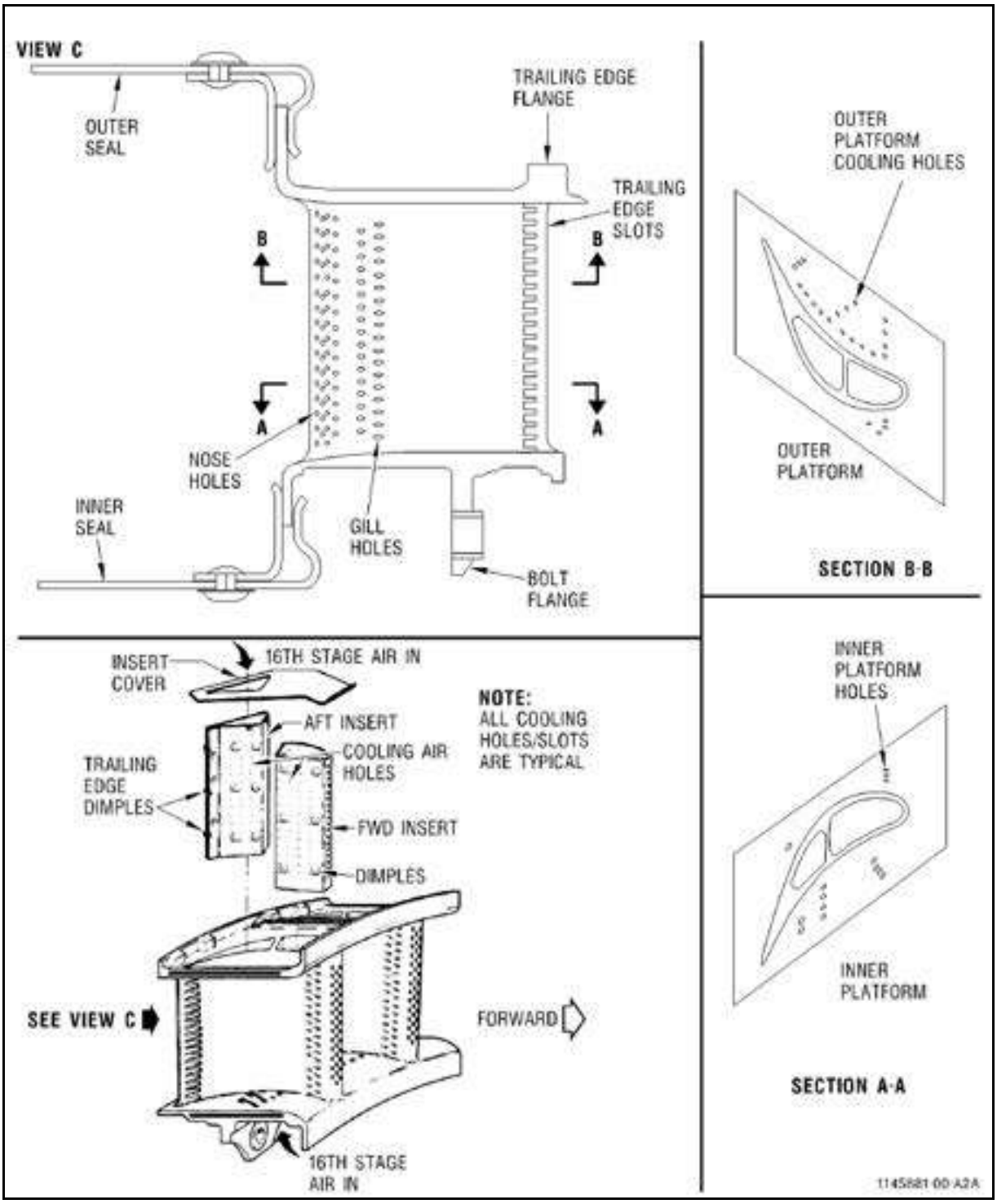



Figure 14: HPT Stage 1 Nozzle

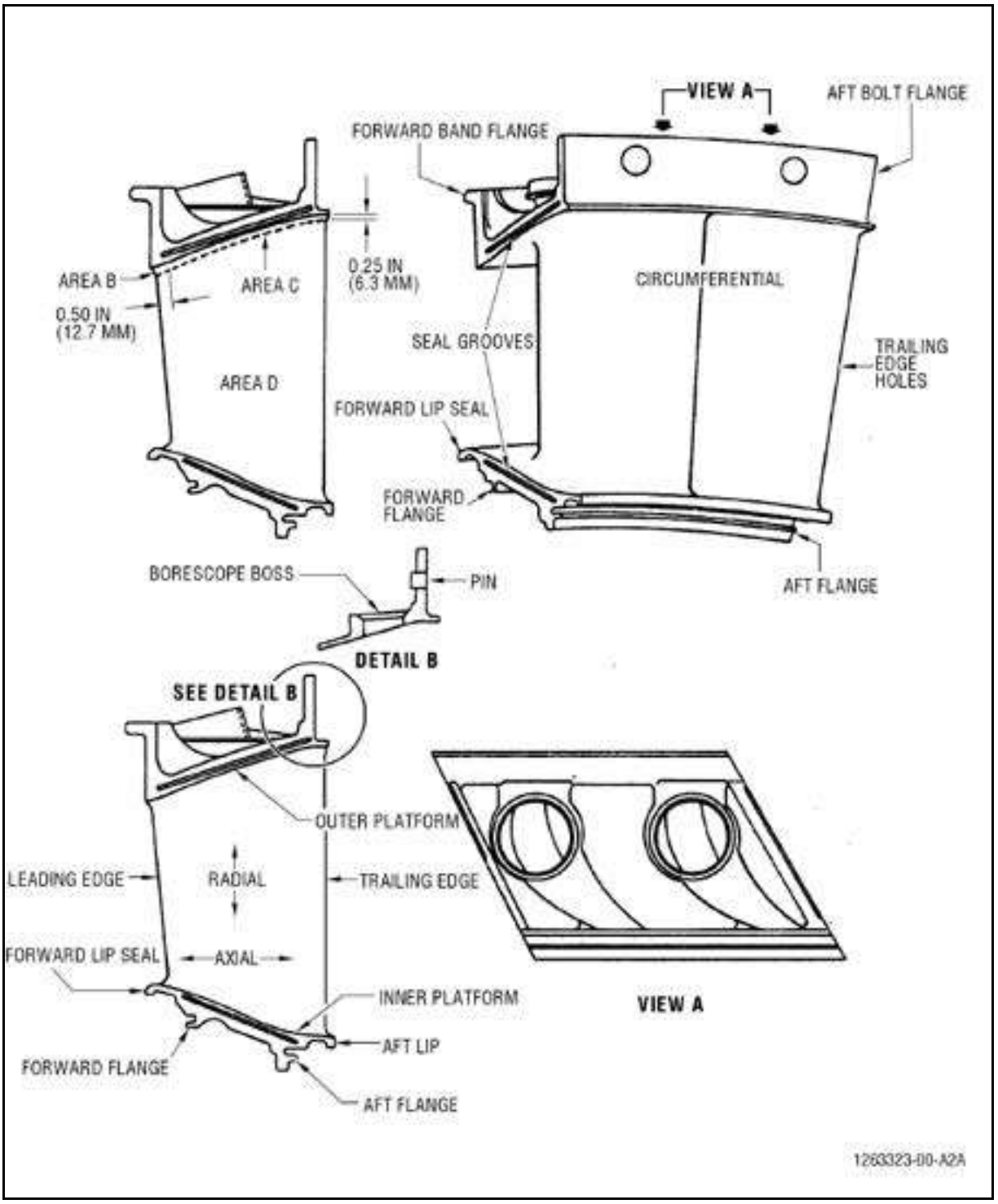



Figure 15: HPT Stage 2 Nozzle

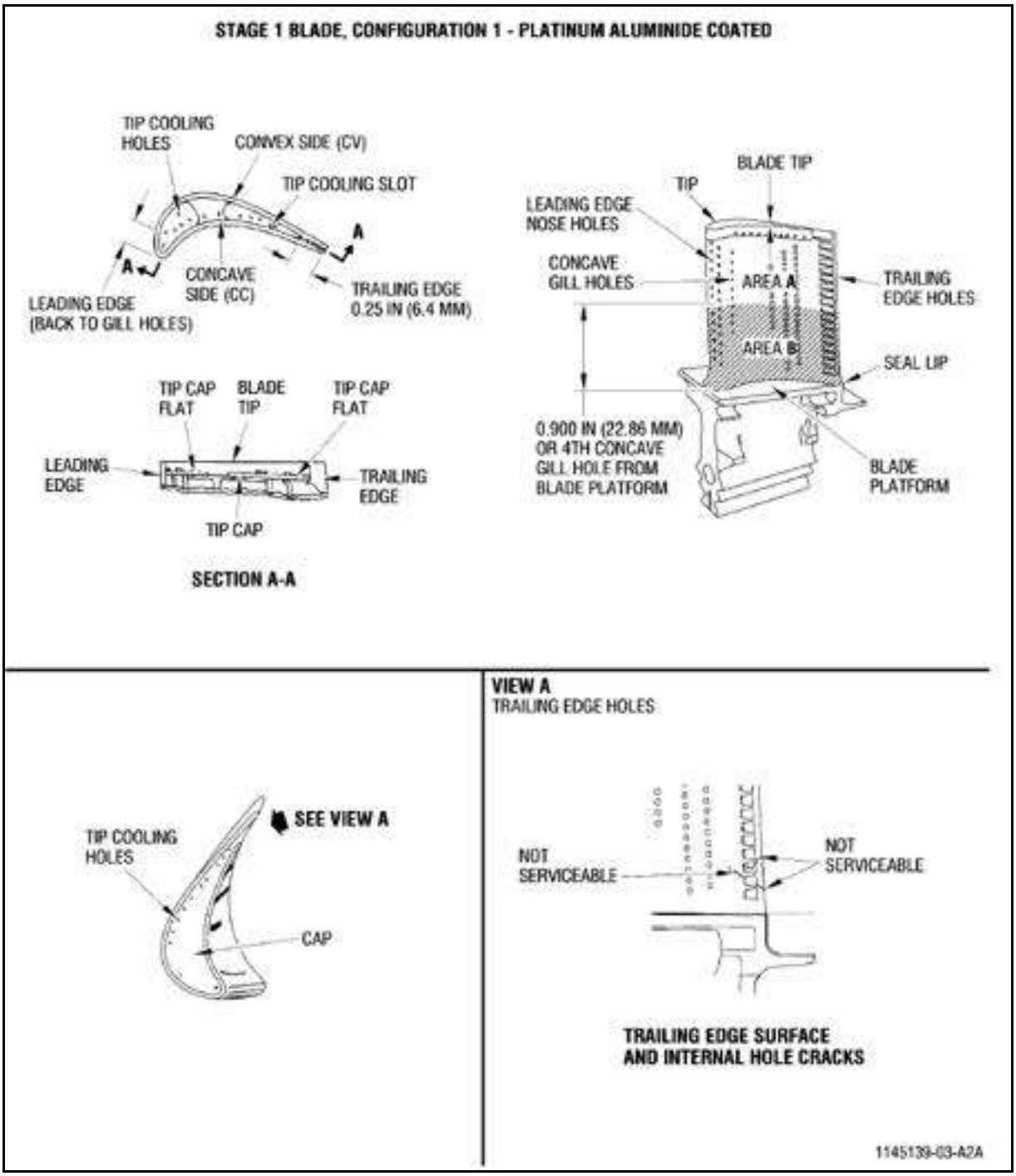



Figure 16: HPT Stage 1 Rotor Blades Inspection Areas (Platinum Aluminide Coated Blades)

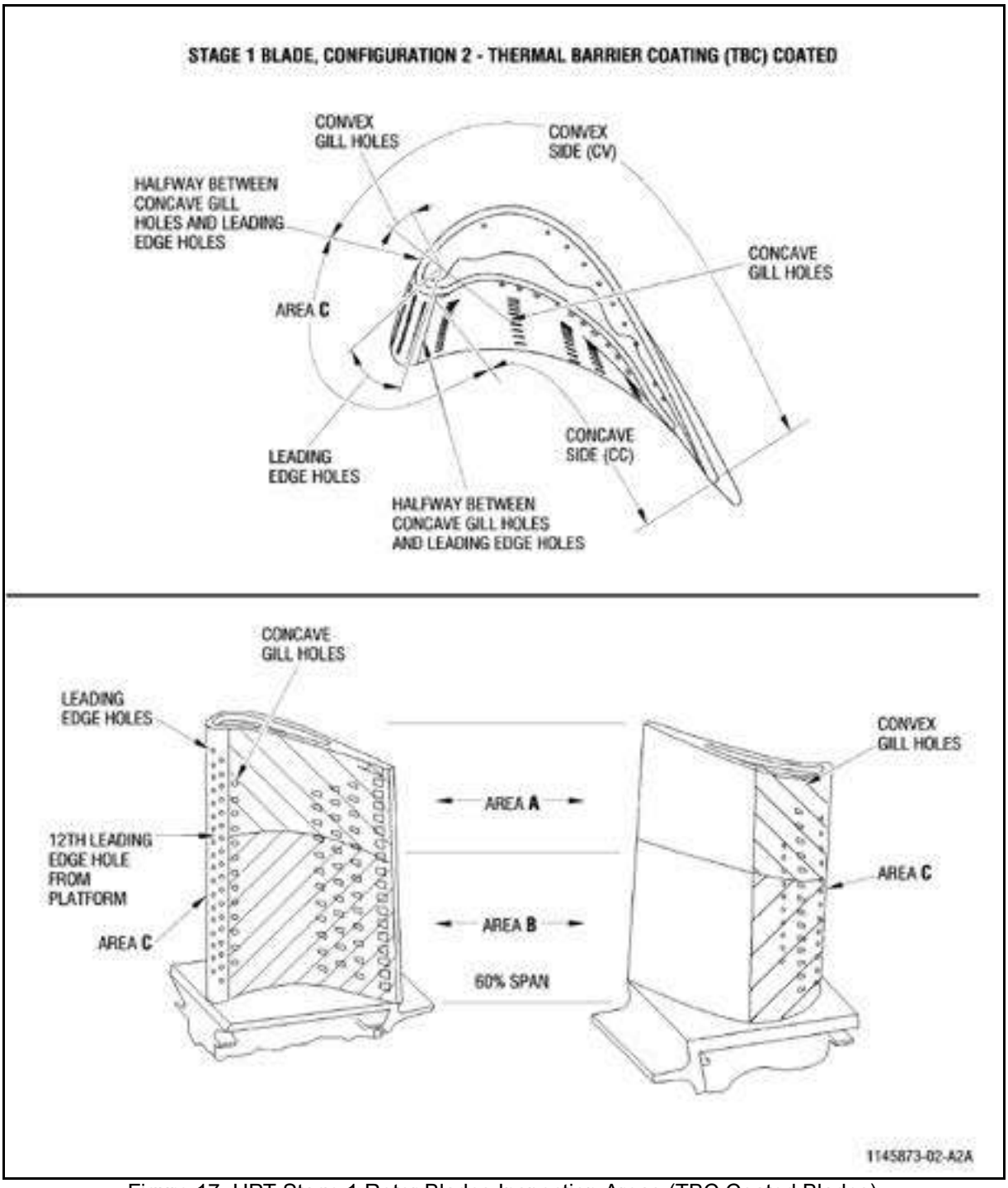


Figure 17: HPT Stage 1 Rotor Blades Inspection Areas (TBC Coated Blades)

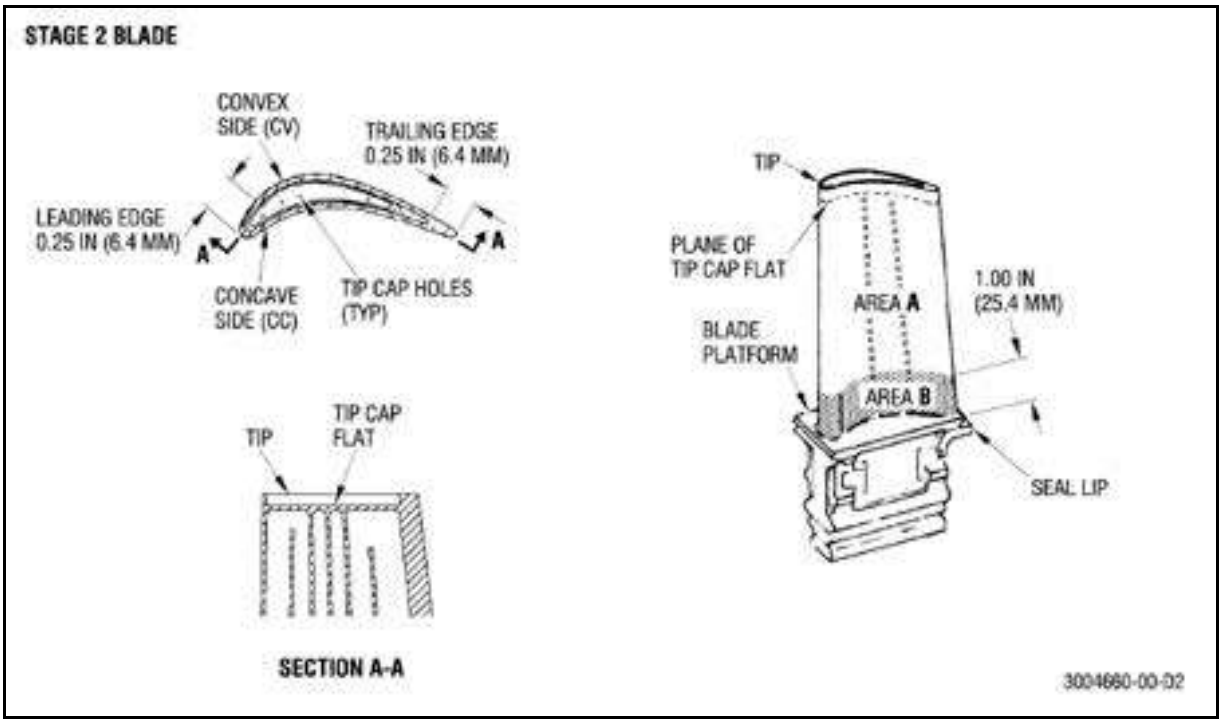



Figure 18: HPT Stage 2 Rotor Blades Inspection Areas

**Borescope Pictures**



Picture 11: HPT Stage 1 Nozzles leading edge



Picture 12: HPT Stage 1 Nozzles leading edge



Picture 13: HPT Stage 1 Nozzles leading edge



Picture 14: HPT Stage 1 Nozzles leading edge



Picture 15: HPT Stage 1 Nozzle concave side



Picture 16: HPT Stage 1 Nozzle concave side



Picture 17: HPT Stage 1 nozzle inner platform



Picture 18: HPT Stage 1 nozzles inner platforms



Picture 19: Stage 1 Nozzles Trailing edge



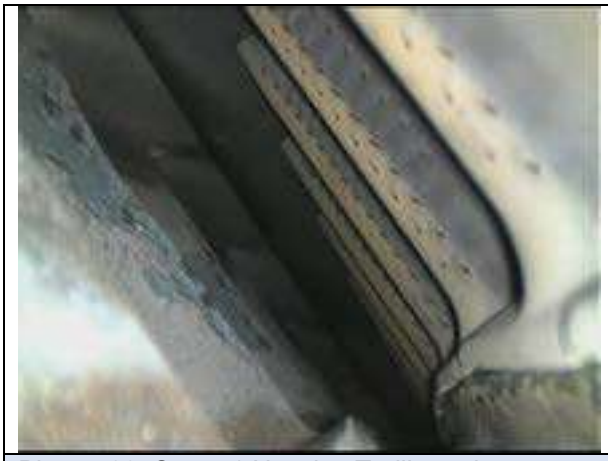
Picture 20: Stage 1 Nozzles Trailing edge



Picture 21: Stage 1 Nozzles Trailing edge



Picture 22: Stage 1 Nozzles Trailing edge



Picture 23: Stage 1 Nozzles Trailing edge



Picture 24: Stage 1 Nozzles Trailing edge



Picture 25: Stage 1 Nozzles trailing edge



Picture 26: Stage 1 Blades leading edge concave



Picture 27: Stage 1 Blades leading edge convex



Picture 28: Stage 1 Blades trailing edge concave



Picture 29: Stage 1 Blades trailing edge convex



Picture 30: Stage 2 Nozzles trailing edge. Blades leading edge



Picture 31: Stage 2 Blades leading edge



Picture 32: Stage 2 Blades trailing edge



Picture 33: Stage 2 Blades trailing edge



Picture 34: TMF LPT Inlet

## 4.4 LPT Section

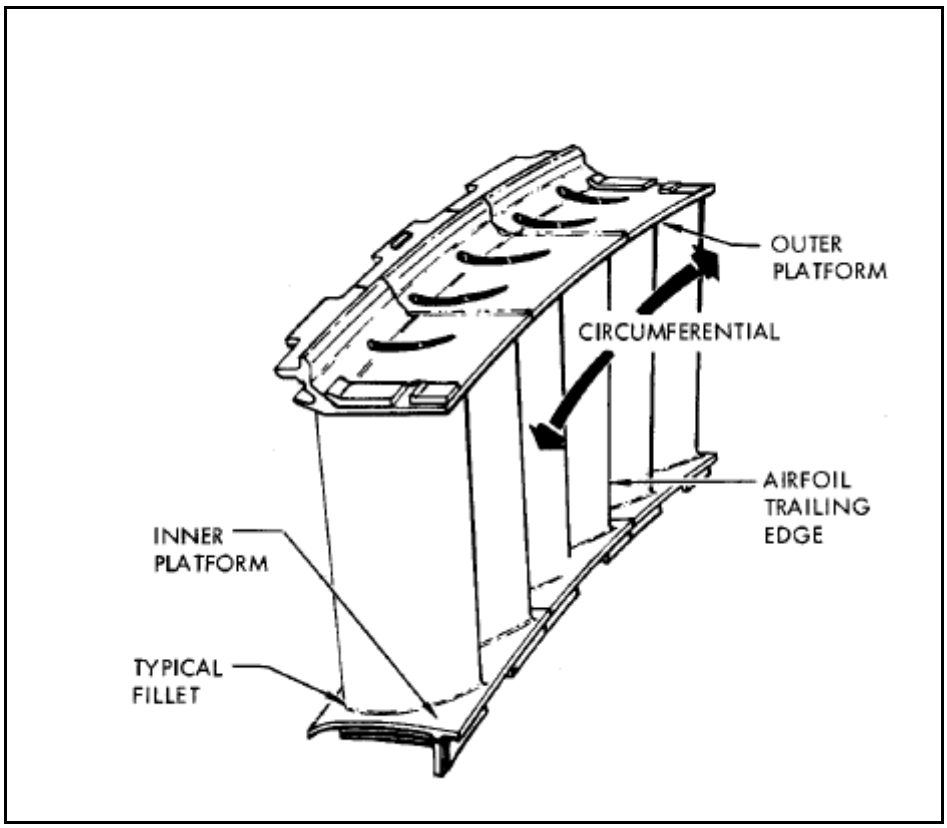



Figure 19: Power Turbine Nozzles

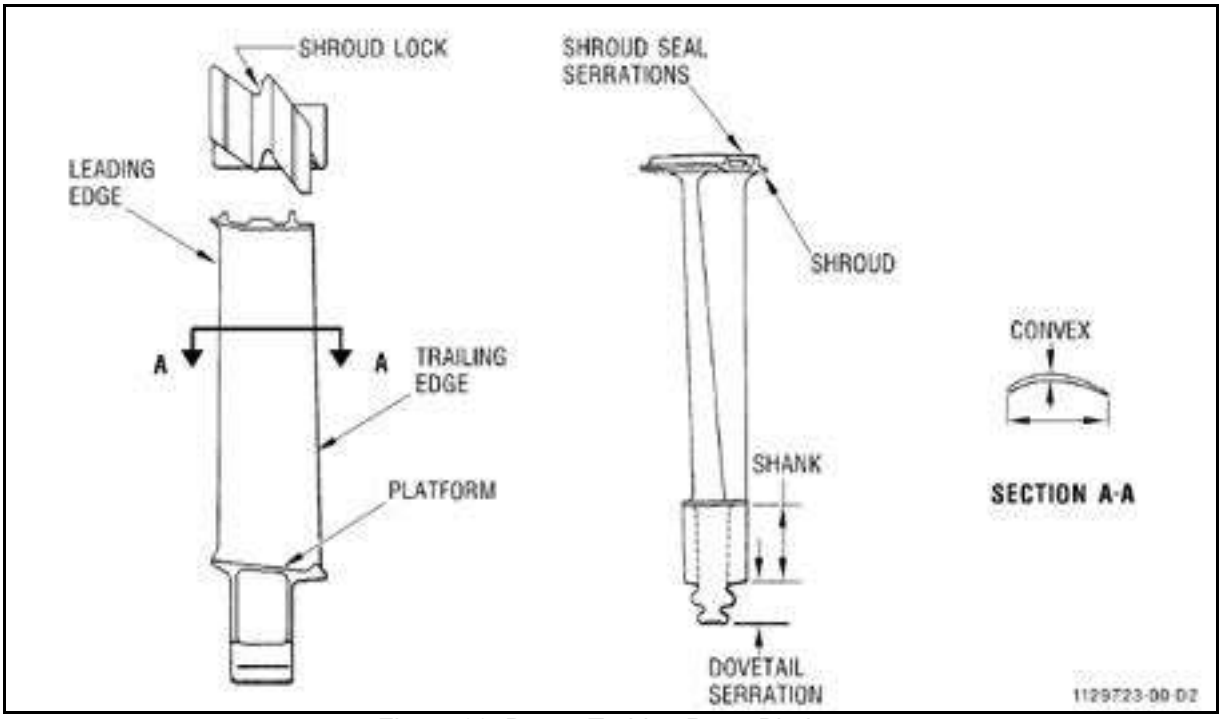



Figure 20: Power Turbine Rotor Blades

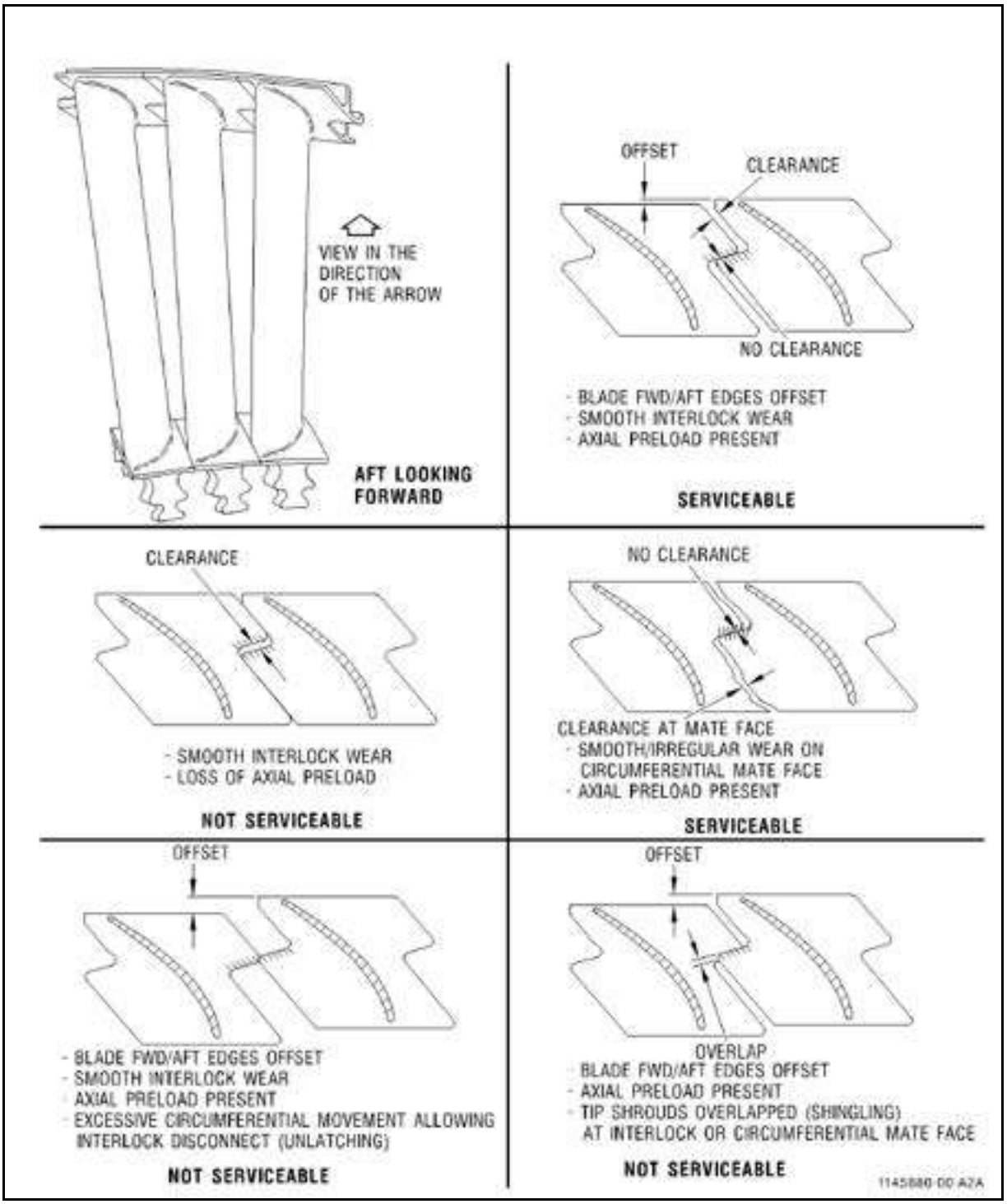


Figure 21: LPT Rotor Blade Circumferential Inspection

**Notes:**

The LPT was not inspected.

# *BORESCOPE INSPECTION REPORT*
# *TM2500 GEN. 6-7*
# *7LM2500 – PK – MDWG05*

## NFE SAN JUAN POWER PLANT

## *PACKAGE # 7253162*

## *UNIT #2*

| | | | |
|---|---|---|---|
| **Visit Date:** | 11/30/2023 | **Total Starts:** | 582 |
| **Engine S/N:** | 557 – 251 | **GG Hours:** | 4160 |
| **Power Turbine S/N:** | 557 - 251 | **PT Hours:** | 4160 |
| **PPG GT Field Engineer:** | JC Requena H | **NFE Representative:** | Lance Florent |



# TABLE OF CONTENTS

1 Conclusions and Recommendations .....3
2 Outage Data .....4
3 Borescope Inspection Checklist.....5
4 Borescope Inspection Record.....6
4.1 Compressor Section .....9
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4.3 Turbine Section.....18
4.4 LPT Section .....27

## 1. Conclusions and Recommendations

**Purpose of visit:**
The purpose of this visit was to perform a borescope inspection of the Engine Hot Section in accordance with GEK105054, WP 406 00.

1.1 The HPT 1st stage nozzles (all nozzles affected) are corroded. The gill holes are clogged mainly at the center of the span. The trailing edge slots are also partilly clogged. This is limitng the nozzles cooling capability for that reason, it's highly recomended to keep under close monitoring the stage 1 nozzles by periodical BSI to asses the evolution of this issue.

The nozzles TE showed minor erosion.

The 1st stage blades were found in good condition, minor tip rubing marks.
The shrouds showed rubbing marks; serviceable.

**The HPT stage 1 nozzles are not serviceable according to GEK105054 Work Package 406 00, Table 8 paragraph g.**

1.2 The Combustor section is serviceable according to GEK105054 Volume II WP406 00 Table 7.

The Combustor liners showed discoloration and minor erosion, both liners are affceted by TBC loss.
The dome assembly and trumpets were found in good condition; the carbon material build up reported during previous BSI has disapeared.
The inner and outer rivet bands were found in good condition.
The igniter ferrules were found in good condition.

1.3 The 2nd stage vanes and blades and the honeycomb seals were found in good condition.

## 2. Outage Data

**ENGINE DATA**

| | | | | | |
|---|---|---|---|---|---|
| **ESN:** | 557-251 | **Engine Fired Hours:** | 4160 | **Package Hours:** | 4160 |
| **Model:** | 7LM2500-PK-MDWG05 | **Engine Fired starts:** | 582 | **Package Fired Starts:** | 582 |

**MAINTENANCE DATA**

| WP, SB, SL, PB, PL Performed | GEK105054, REV 11 | Date completed | Comments |
|---|---|---|---|
| WP 406 00 | Borescope Inspection | 04DEC23 | Not Serviceable |

**PARTS DATA**

| Description | PN Removed | SN Removed | Qty | Disposition | PN Installed | SN Installed |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |

## 3. Borescope Inspection Checklist

**Date unit out of operation:** 04DEC23
**Date unit into operation:** 04DEC23
**Last inspection date:** 03JUN23; TCT

**Type of Fuel:** Gas
**Type of outage:** Scheduled

**Type of NOx suppression:** Water Injection

**Inspection of gas turbine:**

| WATERWASH: | HIGH PRESSURE COMPRESSOR: |
|---|---|
| ☒ PERFORMED WATER WASH | ☐ HPC BORESCOPE INSPECTION |
| **COMBUSTOR:** | **HIGH PRESSURE TURBINE** |
| ☒ COMBUSTOR BORESCOPE INSPECTION | ☒ HPT STAGE 1 & 2 NOZZLE BORESCOPE INSPECTION |
| | ☒ HPT BLADE BORESCOPE INSPECTION |
| **LOW PRESSURE TURBINE:** | |
| ☒ LPT BORESCOPE INSPECTION | |

☒ ***Please verify all borescope plugs have been reinstalled***

## 4. Borescope Inspection Record

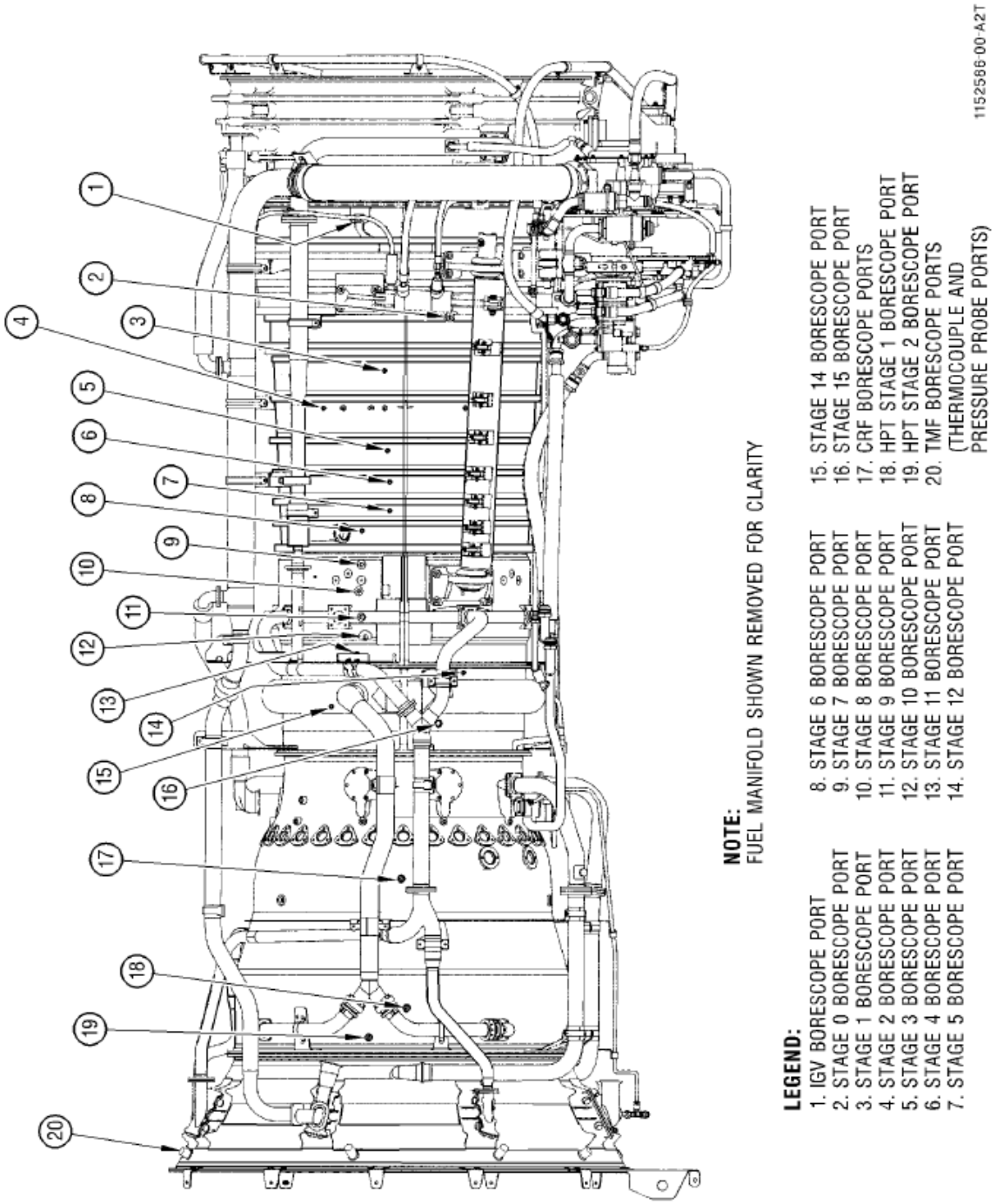



Figure 1: Position of Borescope Inspection Ports.

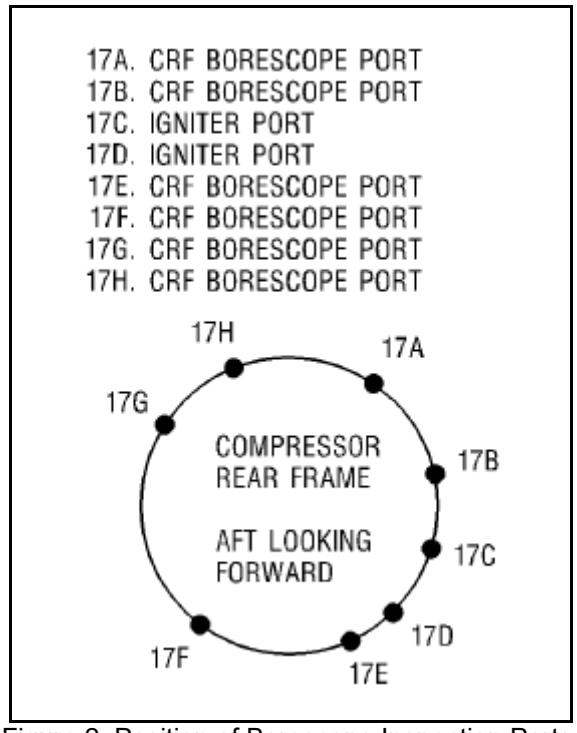


Figure 2: Position of Borescope Inspection Ports.

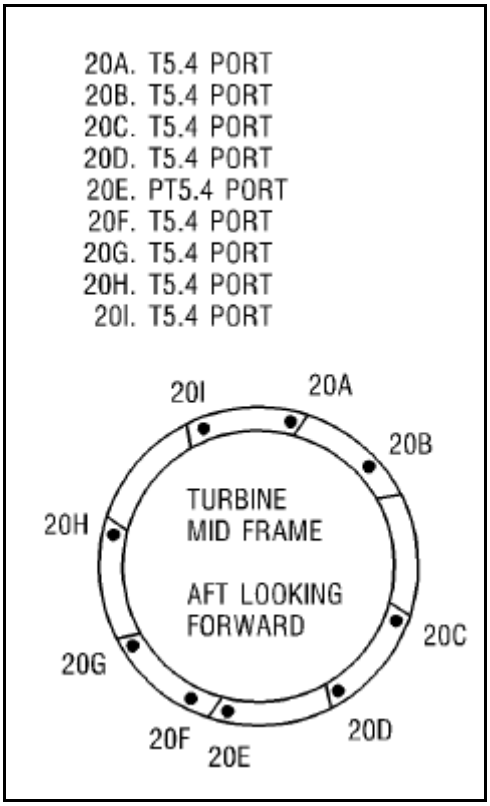


Figure 3: Position of Borescope Inspection Ports.

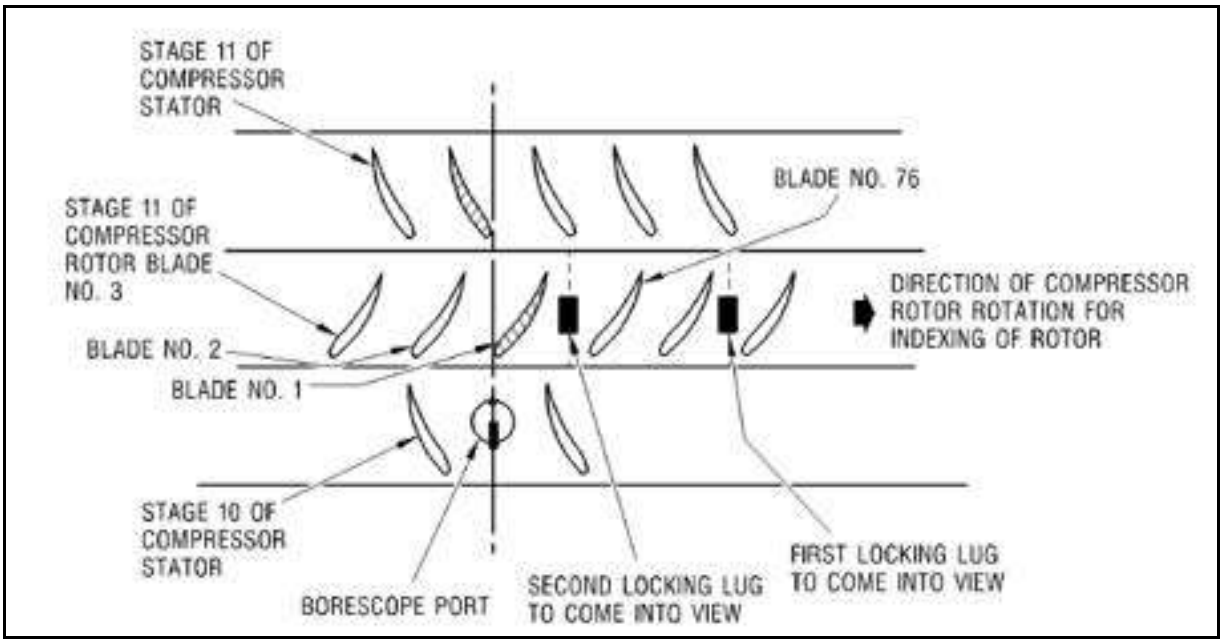


Figure 4: Zero indexing of HPC rotor and HPT rotor

## 4.1 Compressor Section

| Port | T.E. | L.E. | blades | Remarks: | photo no: |
|---|---|---|---|---|---|
| 1 | IGV | | | | |
| 1 | | 0 | 36 | | |
| 2 | 0 | | 36 | | |
| 2 | | 1 | 26 | | |
| 3 | 1 | | 26 | | |
| 3 | | 2 | 26 | | |
| 4 | 2 | | 26 | | |
| 4 | | 3 | 42 | | |
| 5 | 3 | | 42 | | |
| 5 | | 4 | 45 | | |
| 6 | 4 | | 45 | | |
| 6 | | 5 | 48 | | |
| 7 | 5 | | 48 | | |
| 7 | | 6 | 54 | | |
| 8 | 6 | | 54 | Blades contacting tip | |
| 8 | | 7 | 56 | Blades contacting tip | |
| 9 | 7 | | 56 | | |
| 9 | | 8 | 64 | | |
| 10 | 8 | | 64 | | |
| 10 | | 9 | 66 | | |
| 11 | 9 | | 66 | | |
| 11 | | 10 | 66 | | |
| 12 | 10 | | 66 | | |
| 12 | | 11 | 76 | | |
| 13 | 11 | | 76 | | |
| 13 | | 12 | 76 | | |
| 14 | 12 | | 76 | | |
| 14 | | 13 | 76 | | |
| 15 | 14 | | 76 | Inside bleed manifold | |
| 15 | | 15 | 76 | Inside bleed manifold | |
| 16 | 15 | | 76 | | |
| 16 | | 16 | 76 | | |

**Notes:**
The HPC Section was not inspected

.

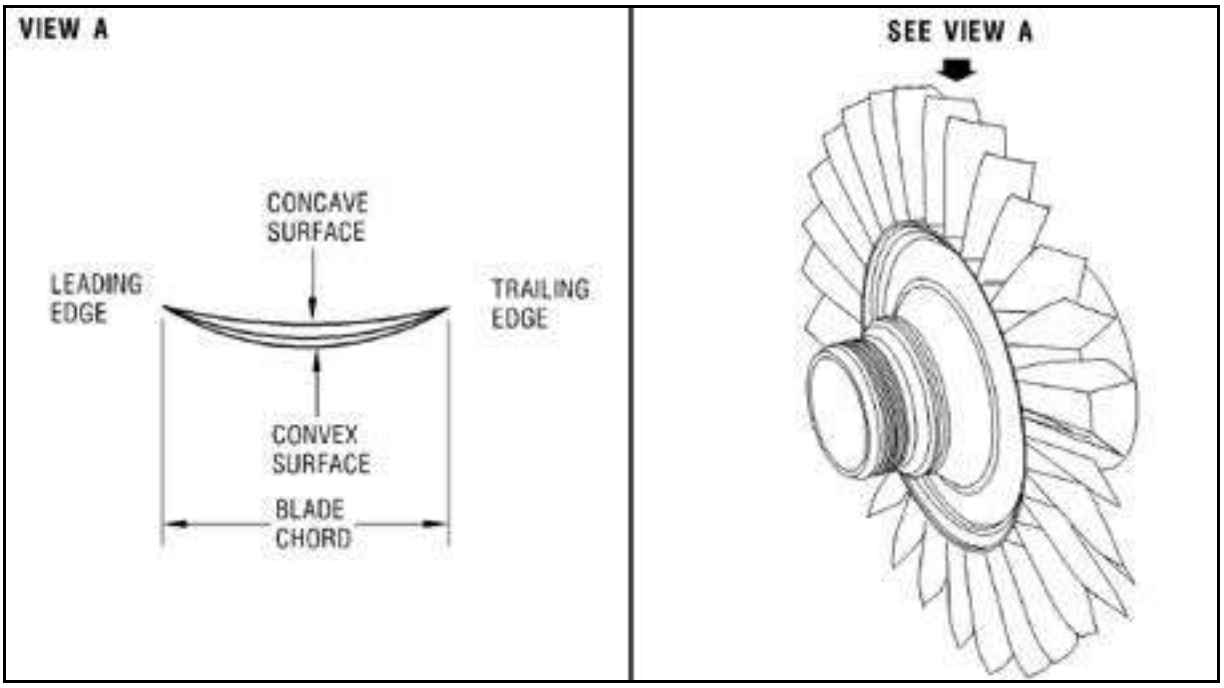



Figure 5: HPC stage 0 BLISK

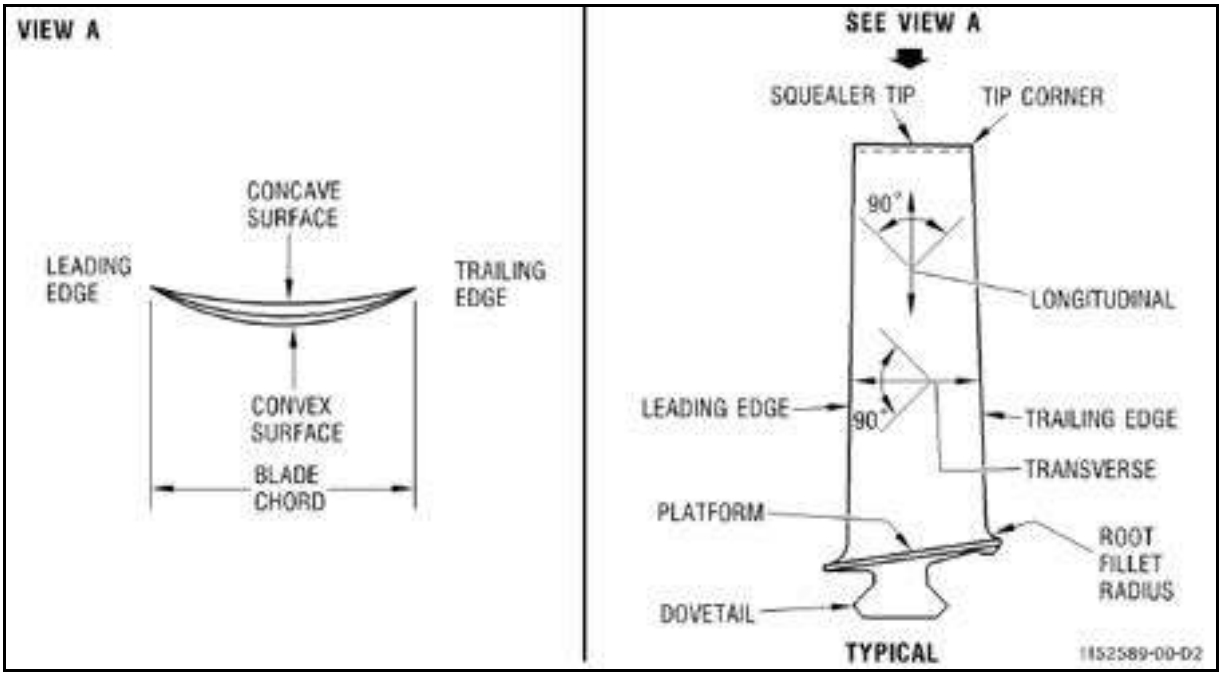



Figure 6: Compressor Rotor Blades

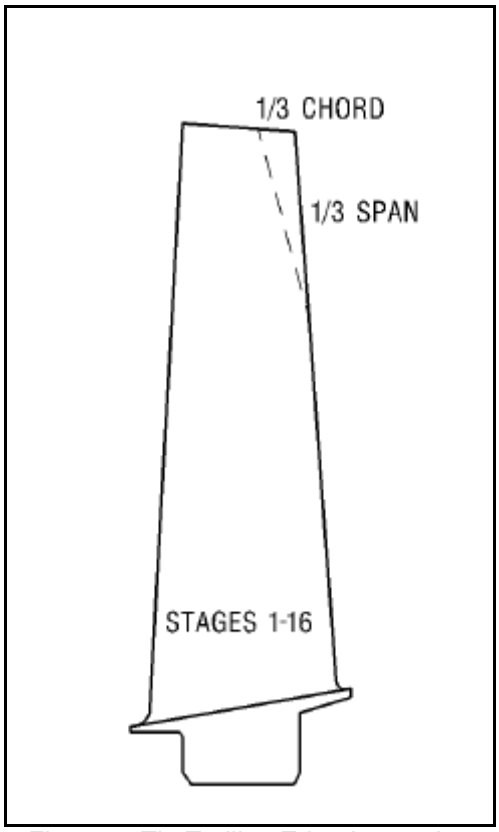


Figure 7: Tip Trailing Edge Inspection

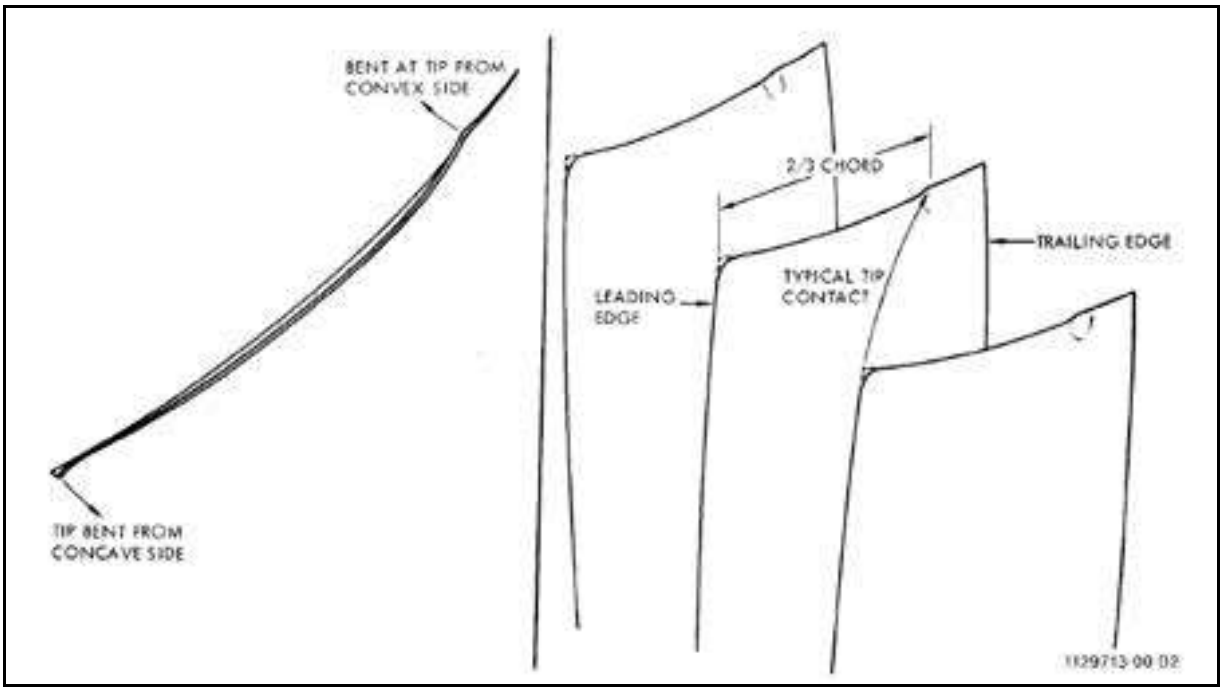


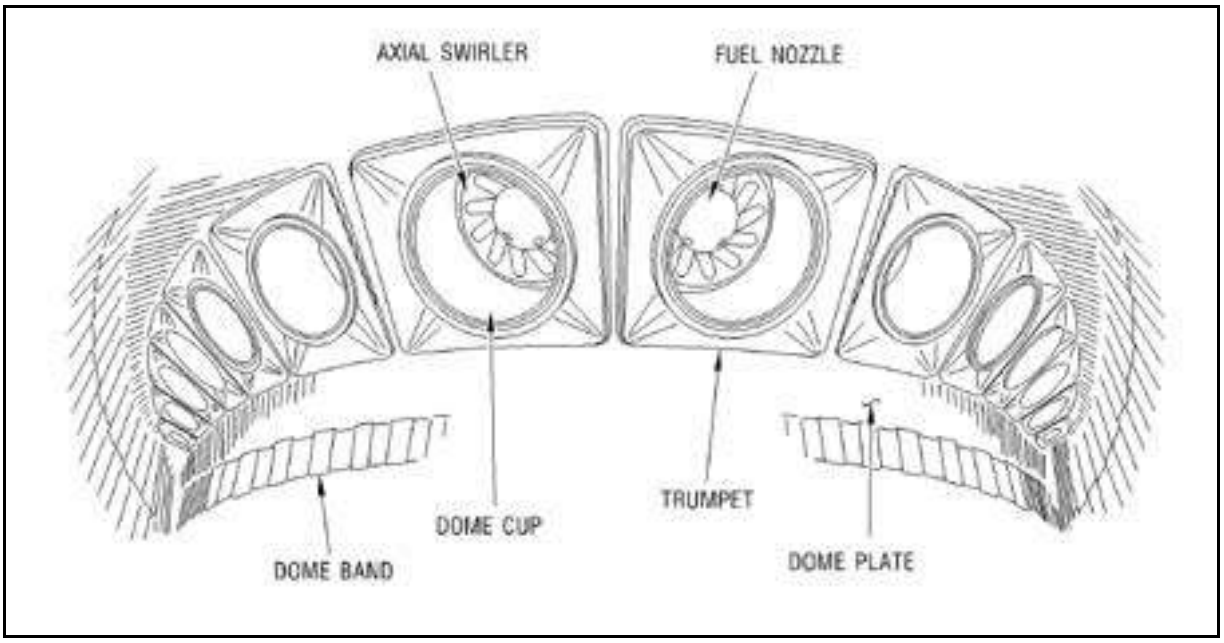
Figure 8: Tip Clanging Contact (HPCR stage 3 through 6)

4.2 Combustor and 1St Stage Nozzle Section

| Port | Condition observed | Photo no: |
|---|---|---|
| **17A** | | |
| **17B** | | |
| **17C** | | |
| **17D** | **See below notes.** | |
| **17E** | | |
| **17F** | | |
| **17G** | | |
| **17H** | | |
| **17** | 1st stage nozzle (leading edge): | |

**Notes:**
The Combustor section is serviceable according to GEK 105054 Volume II WP406 00 Table 7.

The Combustor liners showed discoloration and minor erosion, both liners are affceted by TBC loss.
The dome assembly and trumpets were found in good condition; the carbon material build up reported during previous BSI has disapeared.
The inner and outer rivet bands were found in good condition.
The igniter ferrules were found in good condition.



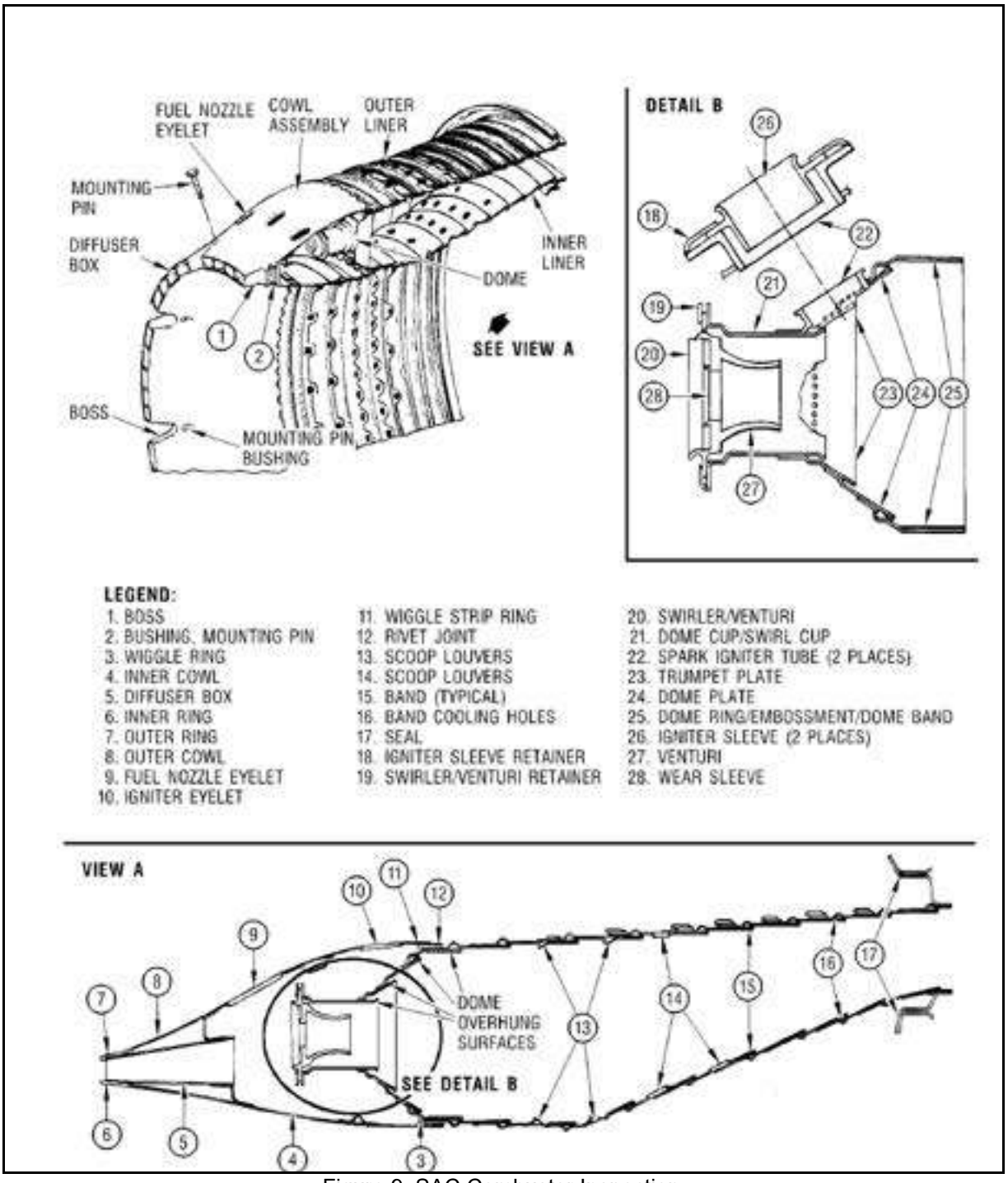



Figure 9: SAC Combustor Inspection

Figure 10: SAC Combustor Inspection

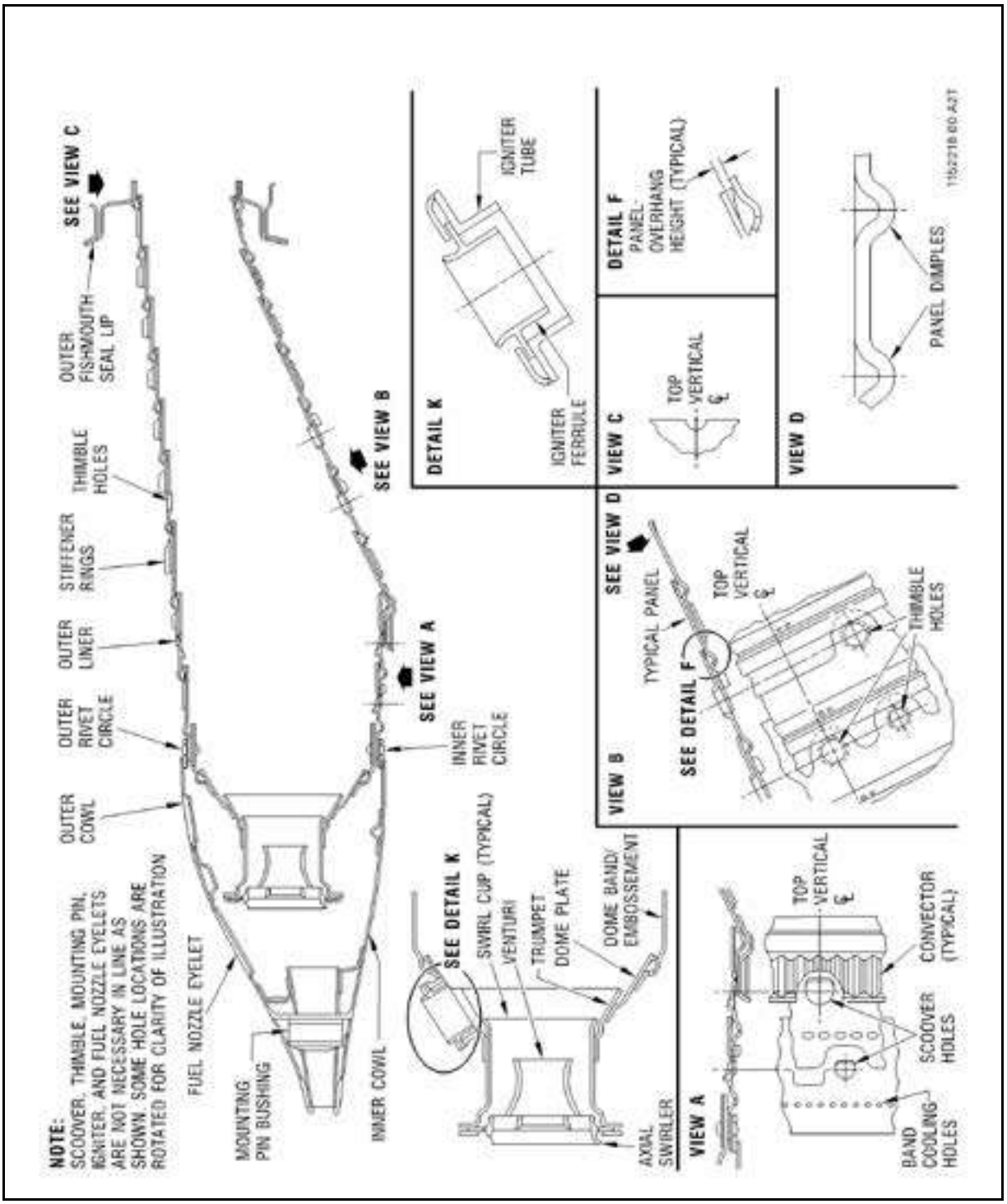



Figure 11: SAC Combustor Inspection

**Borescope Pictures**



Picture 1. Upper igniter ferrule



Picture 2. Upper igniter



Picture 3. Lower igniter ferrule



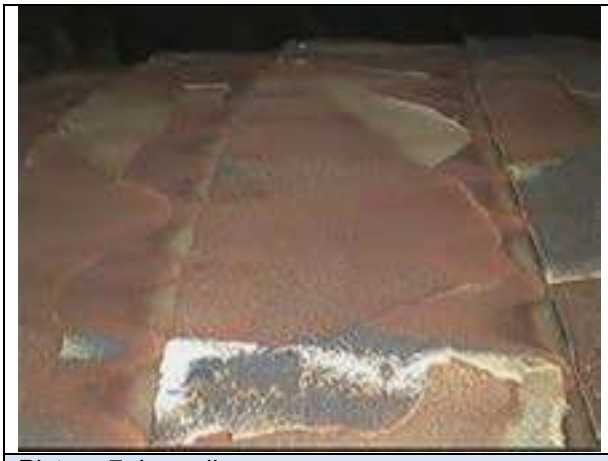
Picture 4. Lower igniter



Picture 5. Outer rivets band



Picture 6. Outer liner



Picture 7. Inner liner



Picture 8. Inner rivets band



Picture 9. Outer liner



Picture 10. Inner liner TBC flacking off



Picture 11. Combustor dome



Picture 12. Fuel nozzle tip and swirler



Picture 13. Combustor liners and HPT nozzles



Picture 14. Combustor liners and HPT nozzles

## 4.3 Turbine Section

| | turbine stage | | | | |
|---|---|---|---|---|---|
| **Port** | **L.E.** | **T.E.** | **blades** | **Remarks:** | **photo no:** |
| **18** | **1** | | **88** | | |
| **19** | | **1** | **88** | **See below notes.** | |
| **19** | **2** | | **90** | | |
| **20** | | **2** | | | |

**Notes:**
**The High Pressure Turbine section is not serviceable according to GEK 105054 Volume II WP406 00 Table 8 paragraph g due to the 1st stage nozzles condition**

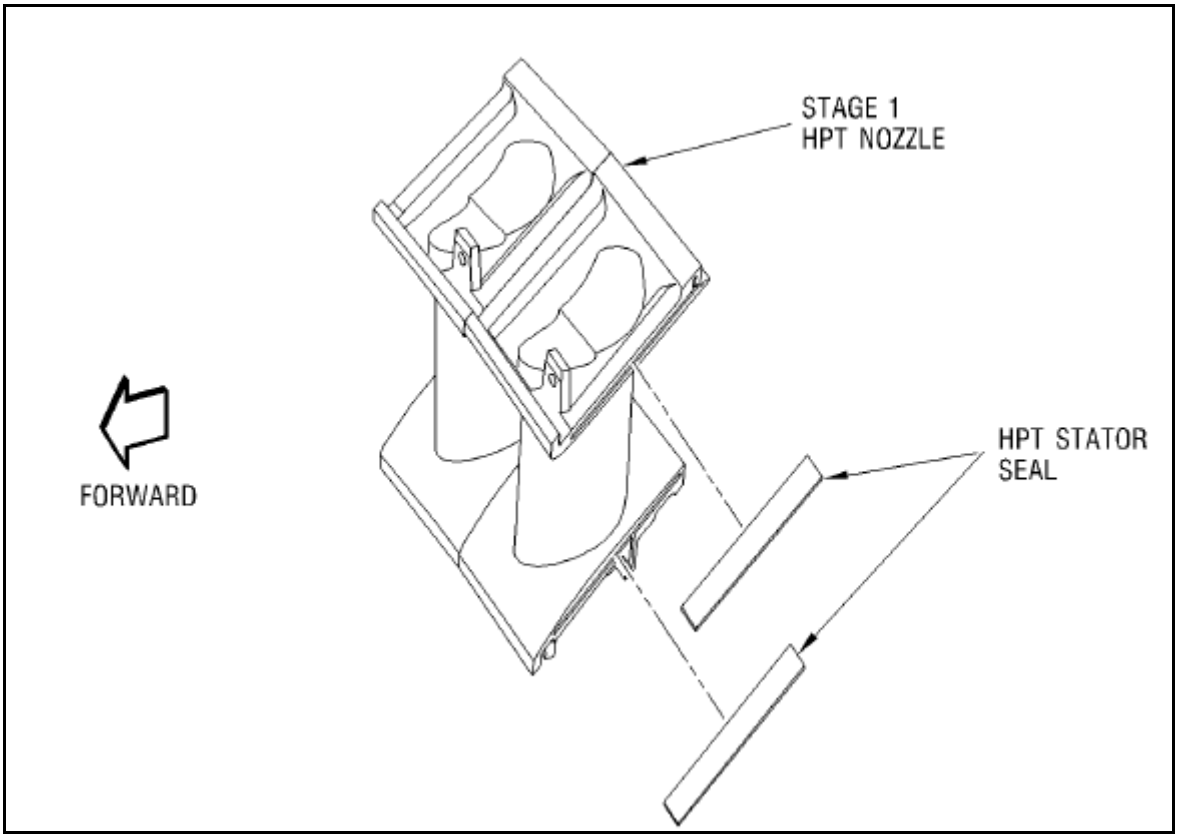



Figure 12: Stage 1 HPT Nozzle Seal Displacement

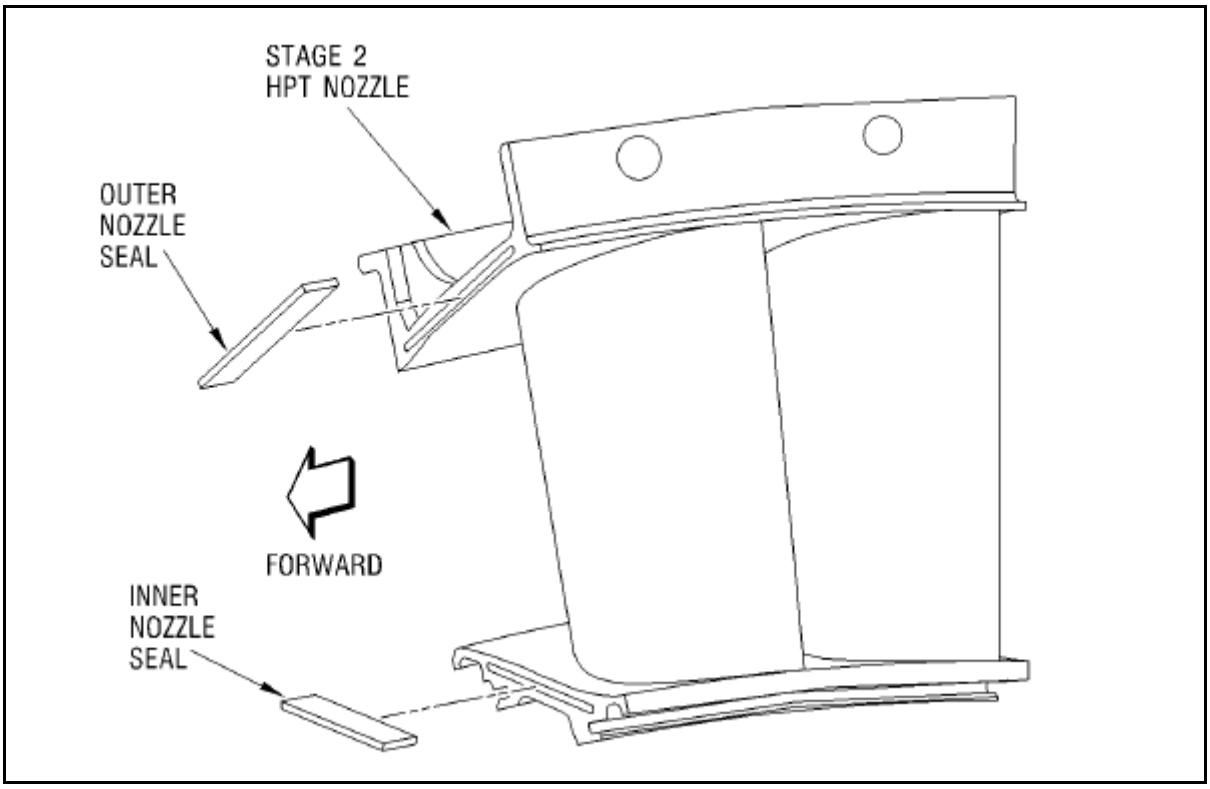


Figure 13: Stage 2 HPT Nozzle Seal Displacement

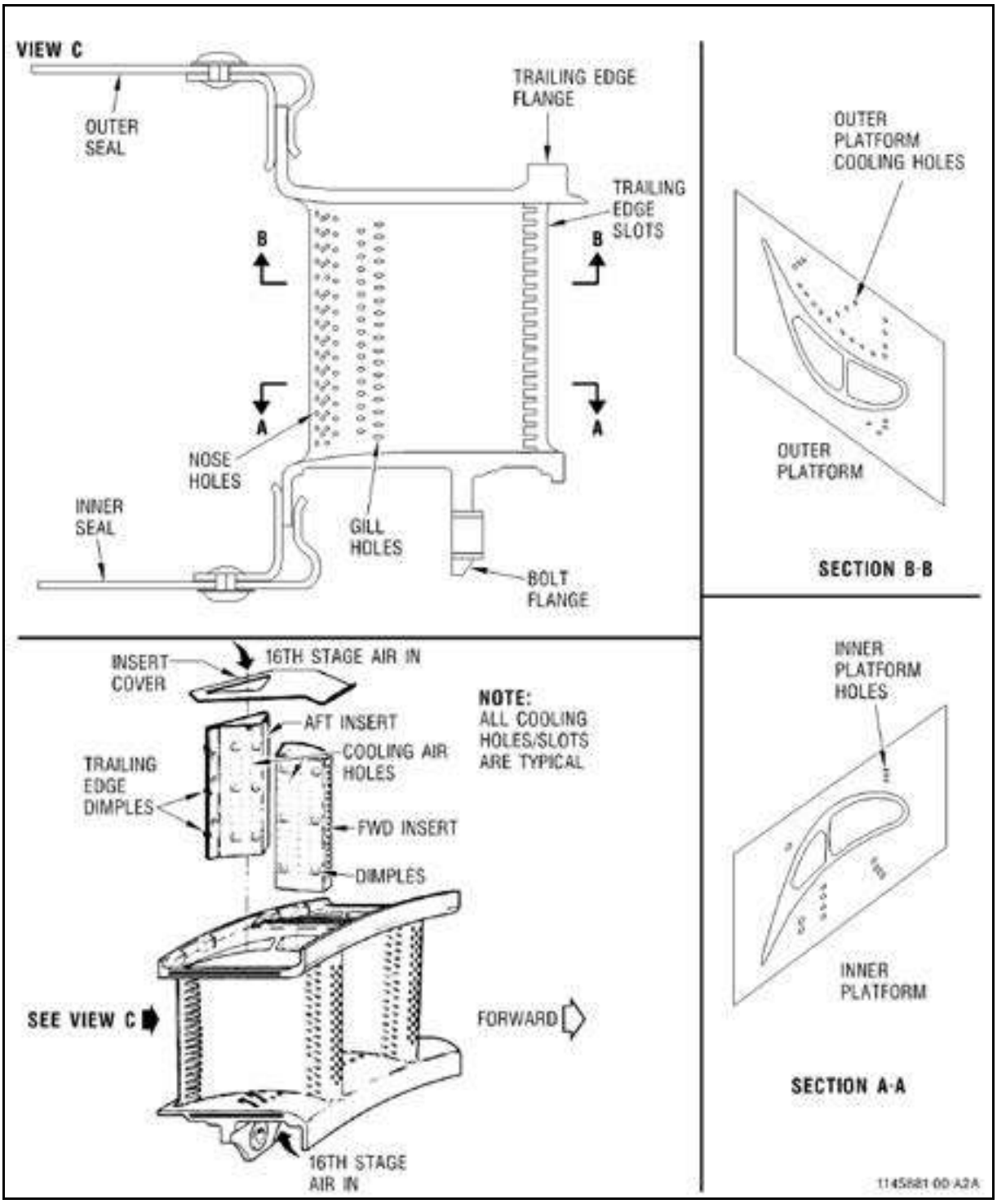



Figure 14: HPT Stage 1 Nozzle

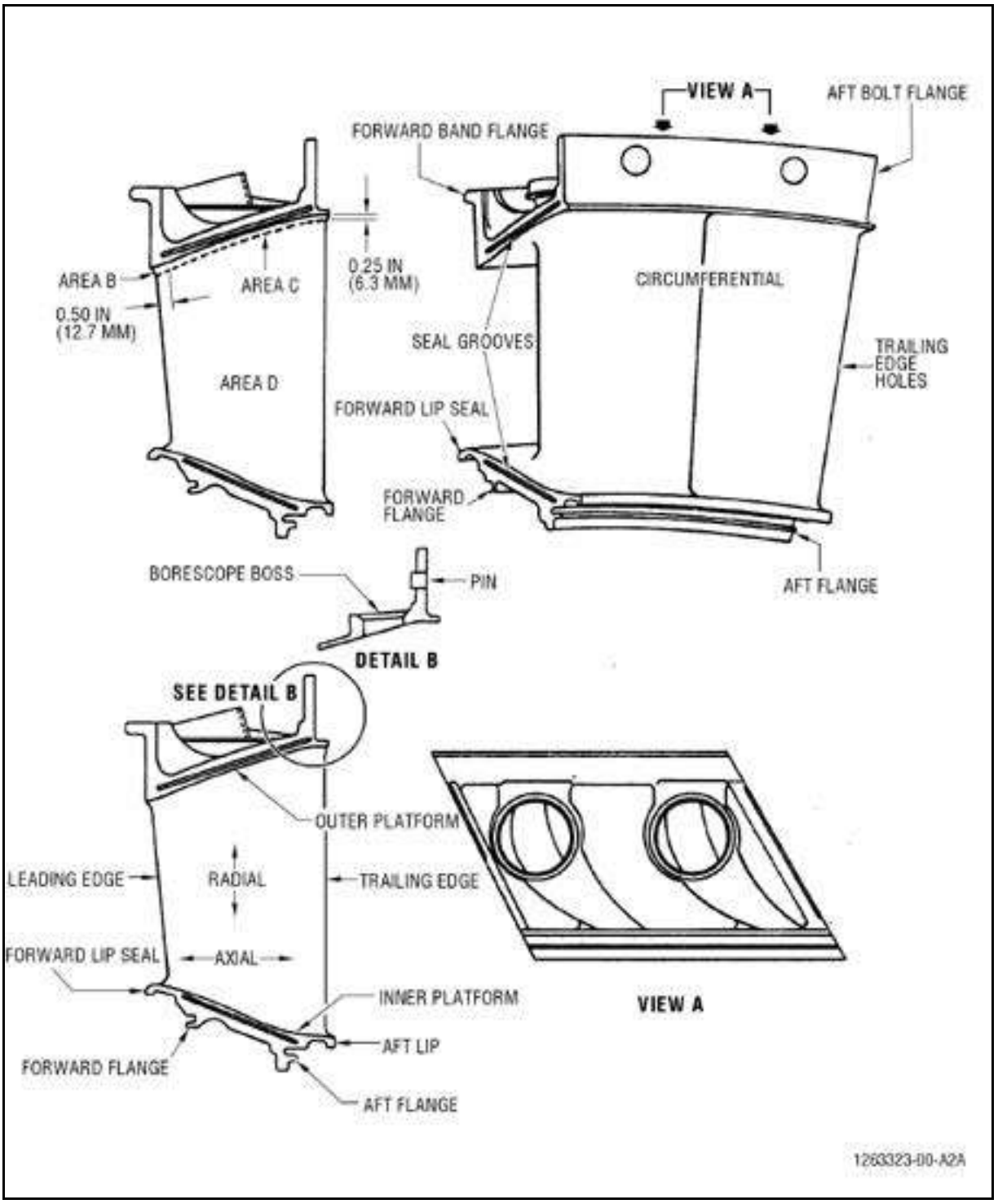



Figure 15: HPT Stage 2 Nozzle

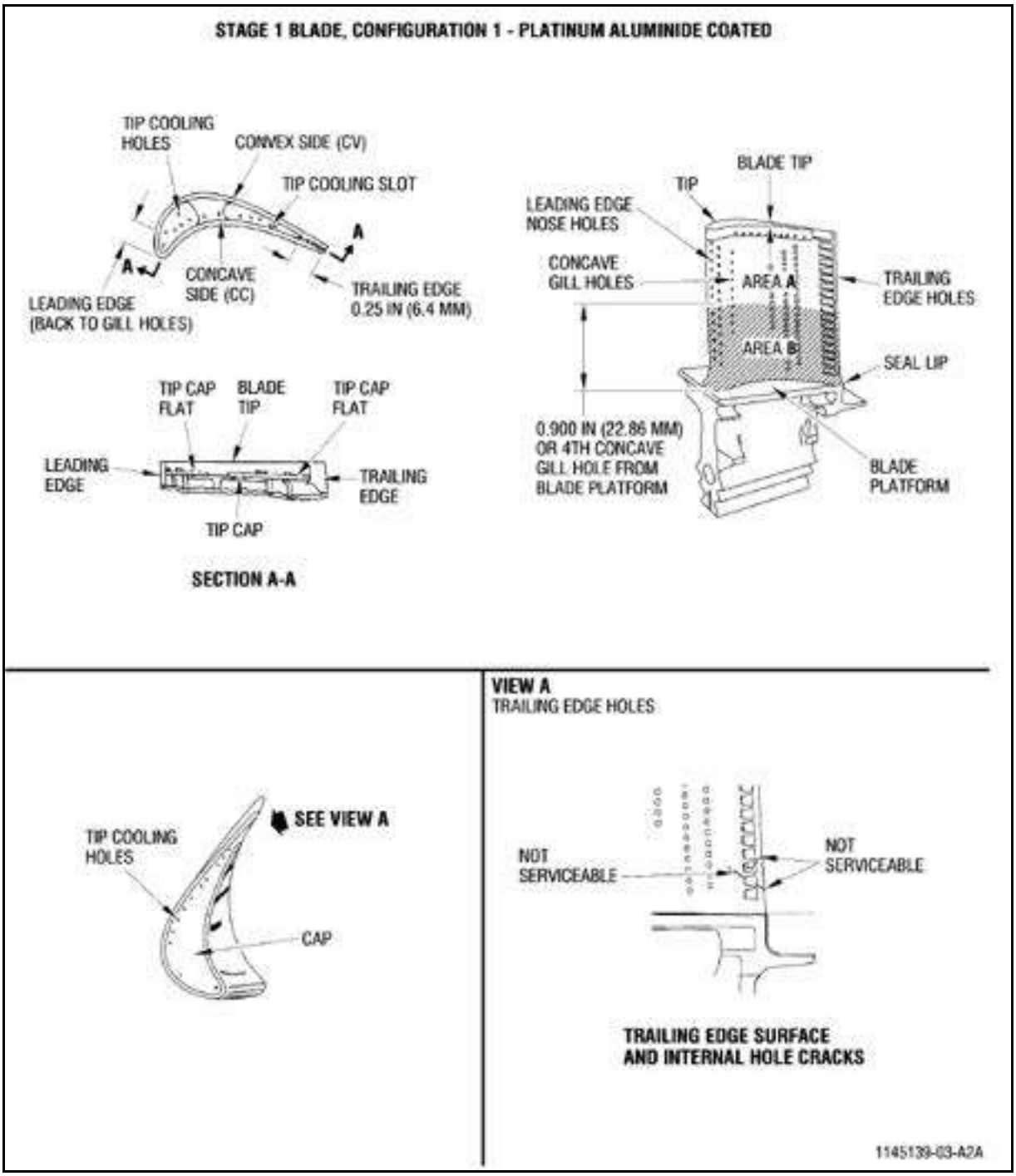



Figure 16: HPT Stage 1 Rotor Blades Inspection Areas (Platinum Aluminide Coated Blades)

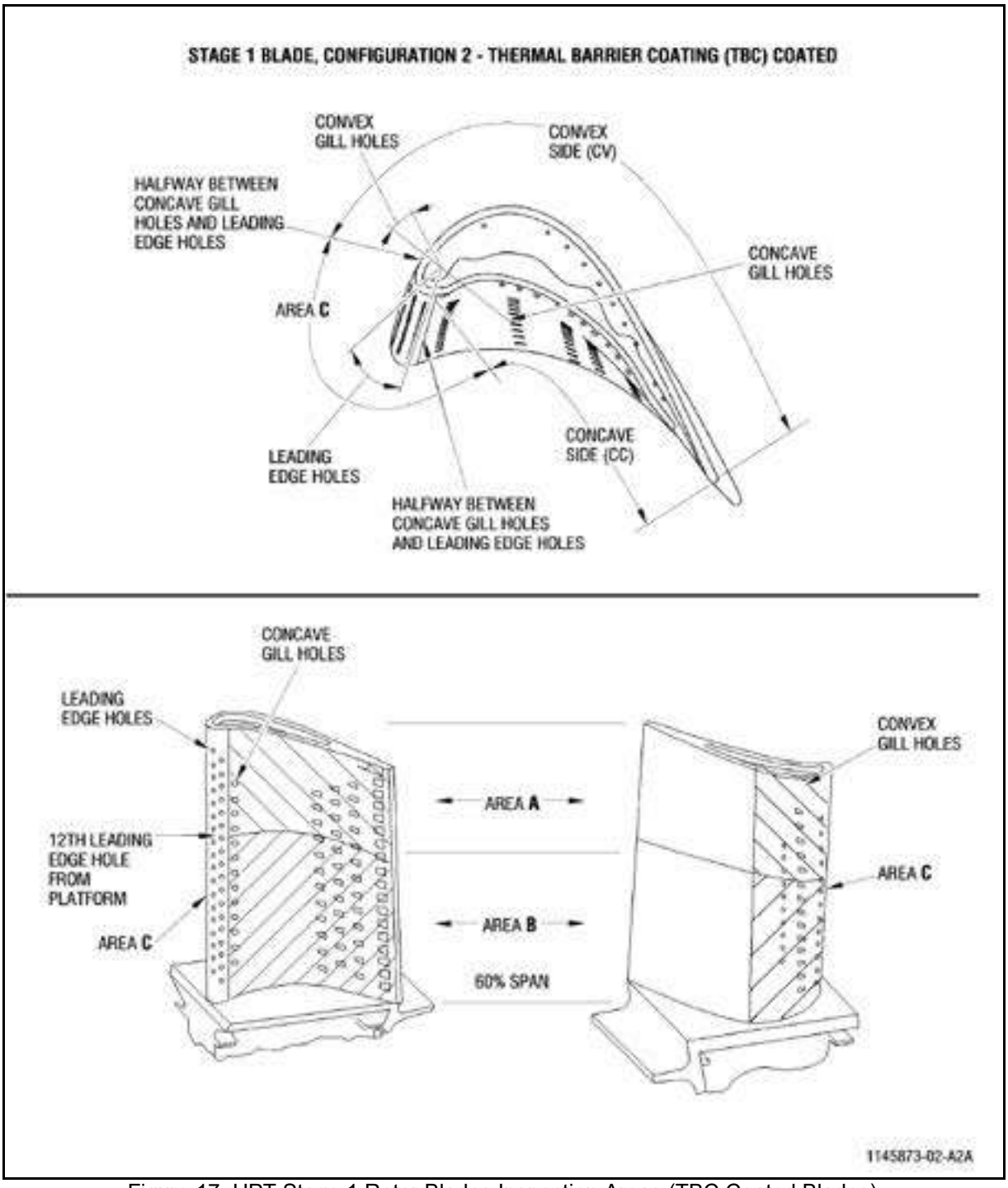


Figure 17: HPT Stage 1 Rotor Blades Inspection Areas (TBC Coated Blades)

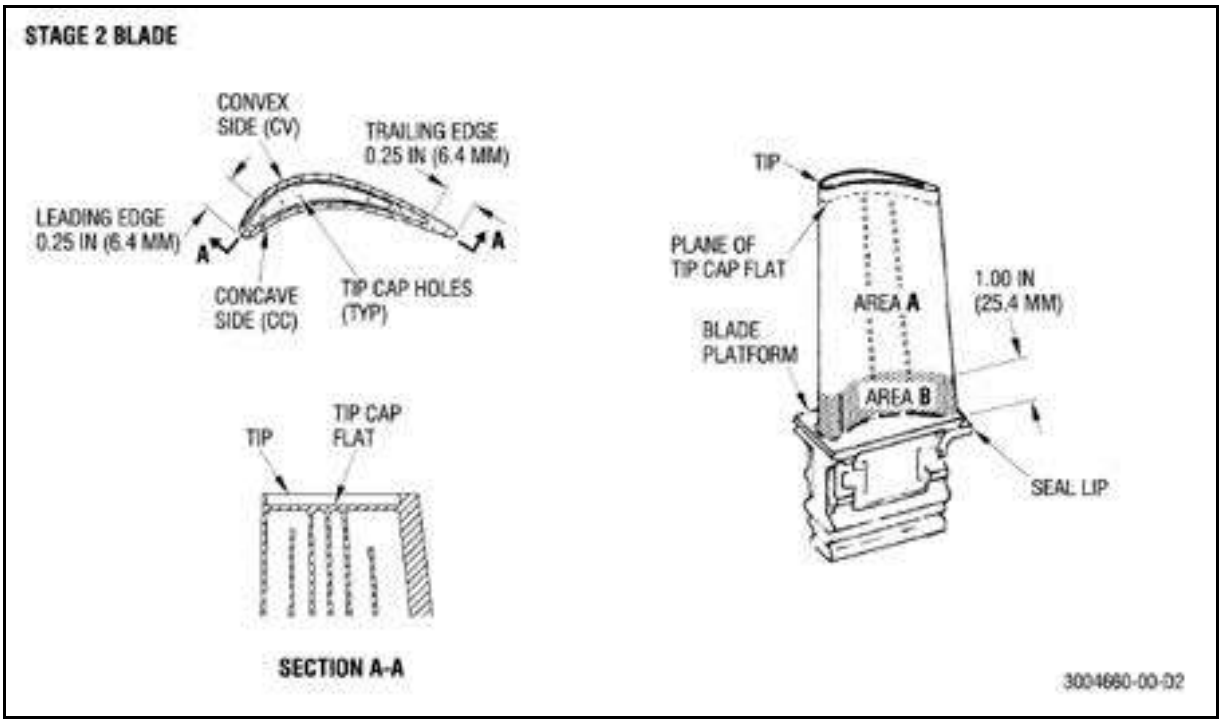



Figure 18: HPT Stage 2 Rotor Blades Inspection Areas

**Borescope Pictures**



Picture 15: Stage1 Nozzles leading edge



Picture 16: Stage1 Nozzle leading edge



Picture 17: Stage1 Nozzles leading edge. Convex



Picture 18: Stage1 Nozzles leading edge. Convex



Picture 19: Stage1 Nozzles concave side



Picture 20: Stage1 Nozzles concave side



Picture 21: Stage1 nozzles concave side



Picture 22: Stage1 Nozzle trailing edge minor erosion



Picture 23: Stage1 Nozzle trailing edge minor erosion



Picture 24: Stage1 Nozzle trailing edge minor erosion



Picture 25: Stage1 Nozzle trailing edge minor erosion



Picture 26: Stage1 Nozzle trailing edge minor erosion



Picture 27: Stage1 Nozzle trailing edge erosion



Picture 28: Stage1 Nozzle trailing edge. Blades leading edge



Picture 29: Stage1 Nozzle concave side. Gill holes clogged at the center of the span



Picture 30: Stage1 Nozzle concave side



Picture 31: Stage1 Nozzle trailing edge slots clogged



Picture 32: Stage1 Nozzle trailing edge slots clogged



Picture 33: Stage1 Blades leading edge



Picture 34: Stage1 Blades leading edge



Picture 35: Stage1 Blades trailing edge concave



Picture 36: Stage1 Blades trailing edge convex



Picture 37: Stage 2 Nozzles trailing edge. Blades leading edge



Picture 38: Stage 2 Blades leading edge



Picture 39: Stage 2 Blades leading edge



Picture 40: Stage 2 Blades leading edge



Picture 41: Stage 2 Blades trailing edge



Picture 42: Stage 2 Blades trailing edge and honeycomb seals

## 4.4 LPT Section

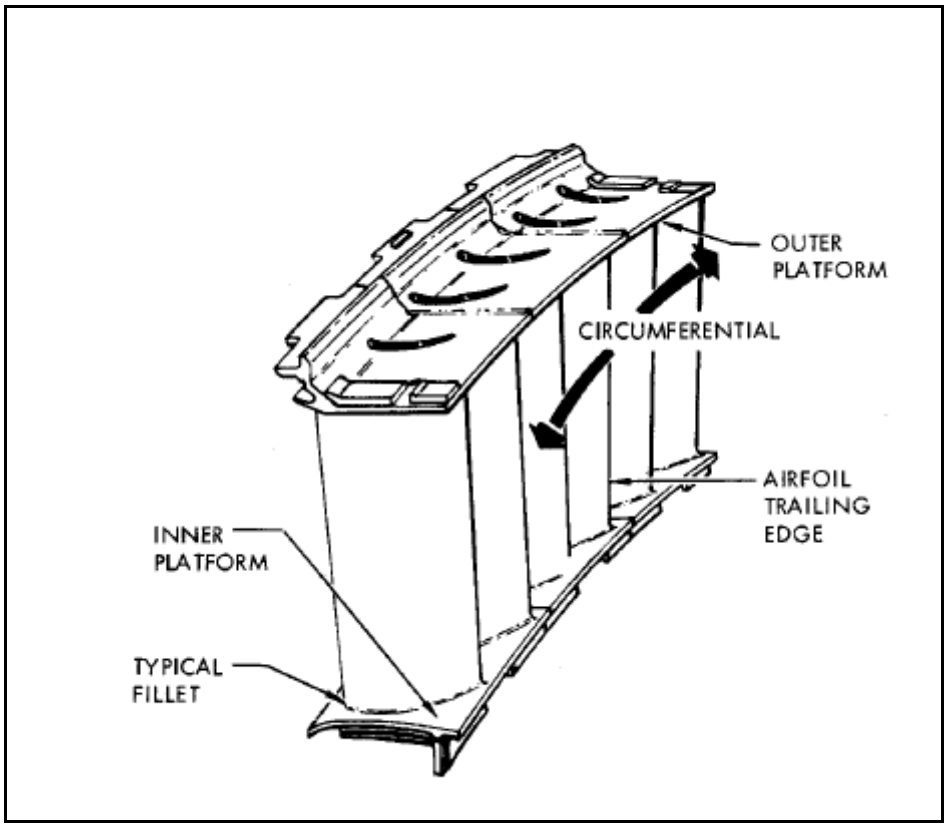



Figure 19: Power Turbine Nozzles

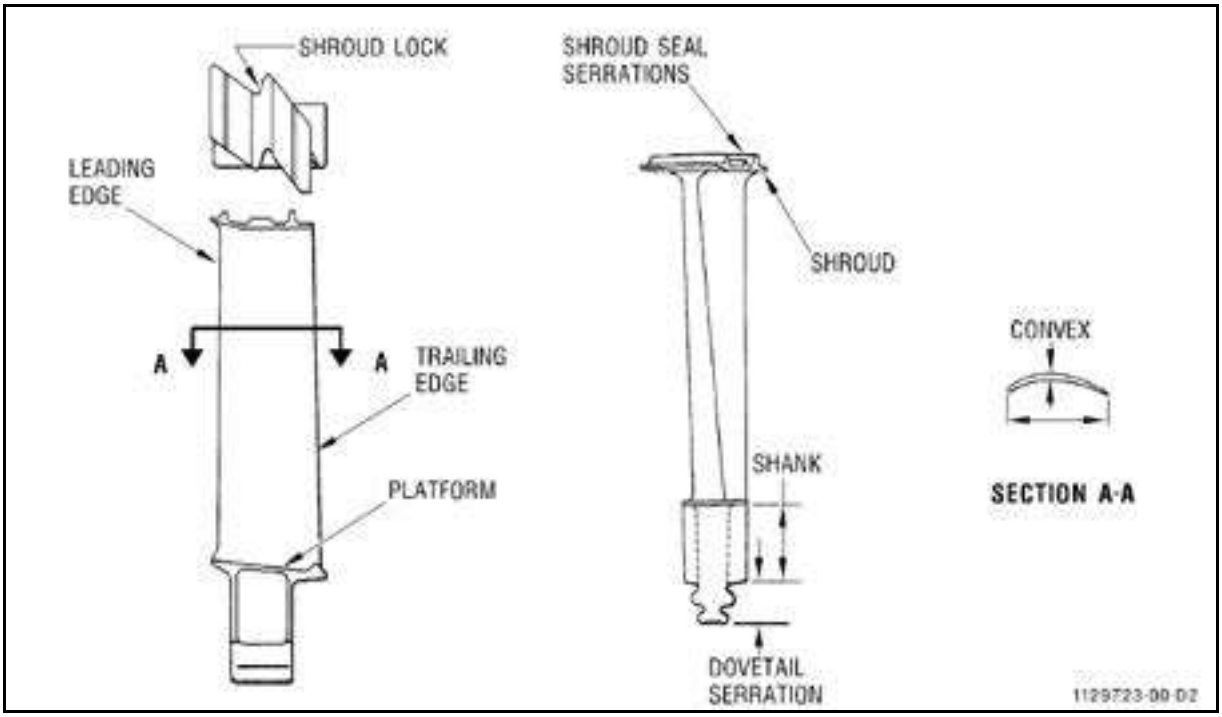



Figure 20: Power Turbine Rotor Blades

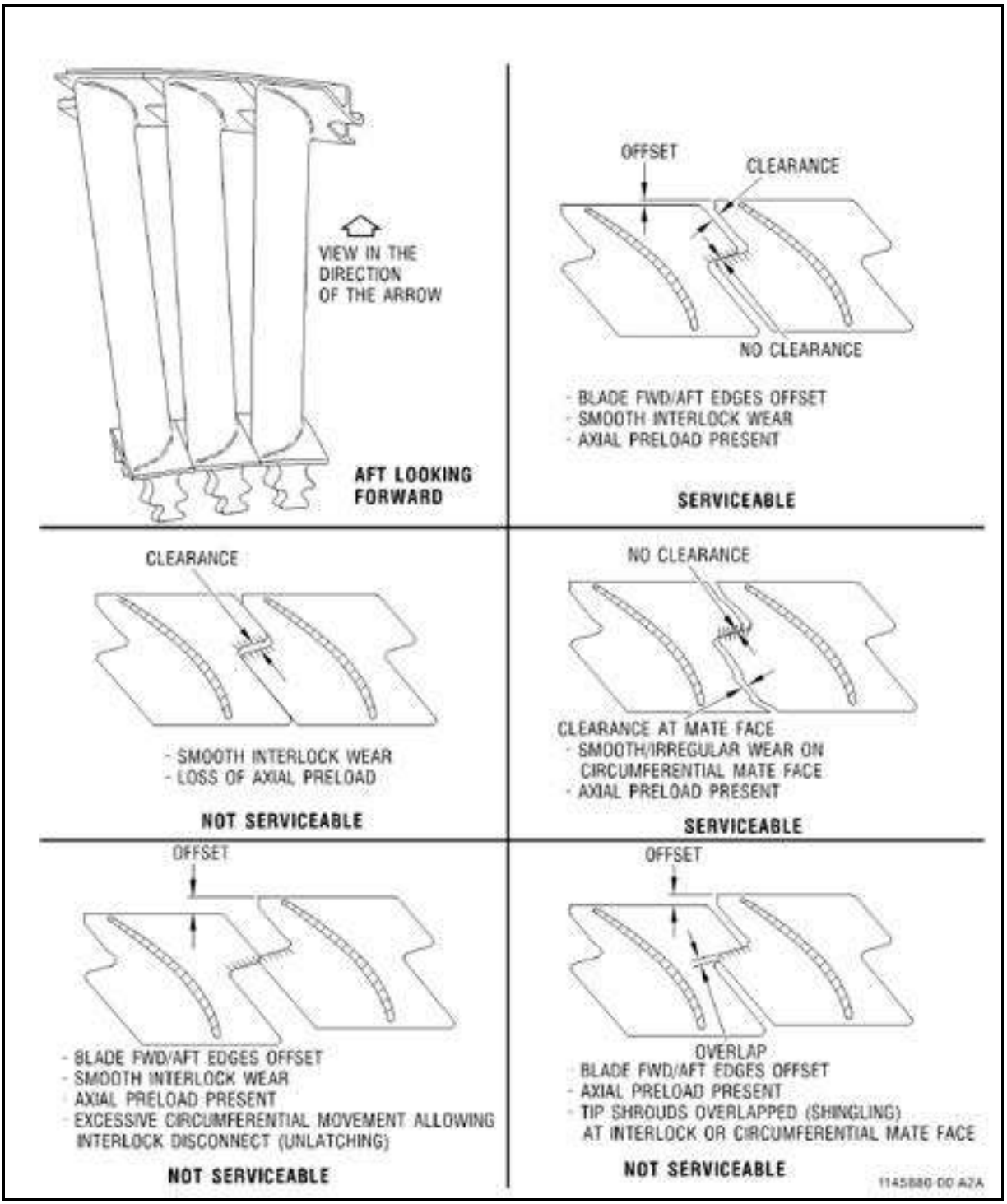


Figure 21: LPT Rotor Blade Circumferential Inspection

**Borescope Pictures**



Picture 43: TMF. LPT Inlet



Picture 44: LPT Inlet nozzles



Picture 45: LPT nozzles trailing edge. Blades leading edge



Picture 46: LPT stage 1 Blades tip interlock

**Notes:**

The LPT stage 1 accessible nozzles and blades did not show any damage.

# *BORESCOPE INSPECTION REPORT*
# *TM2500 GEN. 6-7*
# *7LM2500 – PK – MDWG05*

## NFE SAN JUAN POWER PLANT

## *PACKAGE # 7251614*

## *UNIT #6*

| | | | |
|---|---|---|---|
| **Visit Date:** | 12/01/2023 | **Total Starts:** | 94 |
| **Engine S/N:** | 557 – 254 | **GG Hours:** | 1751 |
| **Power Turbine S/N:** | 557 - 254 | **PT Hours:** | 1751 |
| **PPG GT Field Engineer:** | JC Requena H | **NFE Representative:** | Lance Florent |



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4.2 Combustor and 1St Stage Nozzle Section.....12
4.3 Turbine Section.....18
4.4 LPT Section .....27

## 1. Conclusions and Recommendations

**Purpose of visit:**
The purpose of this visit was to perform a borescope inspection of the Engine Hot Section in accordance with GEK105054, WP 406 00.

1.1 The Combustor section is serviceable according to GEK105054 Volume II WP406 00 Table 7.

The Combustor liners showed discoloration and minor erosion, both liners are affceted by TBC loss.
The dome assembly and trumpets were found in good condition; the carbon material build up reported during previous BSI has disapeared.
The inner and outer rivet bands were found in good condition.
The igniter ferrules were found in good condition.

1.2 The High Pressure Turbine section is serviceable according to GEK105054 Volume II WP406 00 Table 8.

The stage 1 nozzles are affected by incipient corrosion but the hill holes on the concave side are still in good condition as well as the trailing edge slots.
Some stage 1 nozzles showed hot spots on convex side airfoil, refer to pictures 23 to 27. This damage is serviceable however, it would be desirable to assess the evolution of these nozzles after 12 weeks of operation.

The 2nd stage vanes and blades and the honeycomb seals were found in good condition.

## 2. Outage Data

**ENGINE DATA**

| | | | | | |
|---|---|---|---|---|---|
| **ESN:** | 557-254 | **Engine Fired Hours:** | 1874 | **Package Hours:** | 1874 |
| **Model:** | 7LM2500-PK-MDWG05 | **Engine Fired starts:** | 94 | **Package Fired Starts:** | 94 |

**MAINTENANCE DATA**

| WP, SB, SL, PB, PL Performed | GEK105054, REV 11 | Date completed | Comments |
|---|---|---|---|
| WP 406 00 | Borescope Inspection | 01DEC23 | Serviceable |

**PARTS DATA**

| Description | PN Removed | SN Removed | Qty | Disposition | PN Installed | SN Installed |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |

## 3. Borescope Inspection Checklist

**Date unit out of operation:** 01DEC23
**Date unit into operation:** 01DEC23
**Last inspection date:** 19MAY23; TCT

**Type of Fuel:** Gas
**Type of outage:** Scheduled

**Type of NOx suppression:** Water Injection

**Inspection of gas turbine:**

| WATERWASH: | HIGH PRESSURE COMPRESSOR: |
|---|---|
| ☒ PERFORMED WATER WASH | ☐ HPC BORESCOPE INSPECTION |
| **COMBUSTOR:** | **HIGH PRESSURE TURBINE** |
| ☒ COMBUSTOR BORESCOPE INSPECTION | ☒ HPT STAGE 1 & 2 NOZZLE BORESCOPE INSPECTION |
| | ☒ HPT BLADE BORESCOPE INSPECTION |
| **LOW PRESSURE TURBINE:** | |
| ☒ LPT BORESCOPE INSPECTION | |

☒ ***Please verify all borescope plugs have been reinstalled***

## 4. Borescope Inspection Record

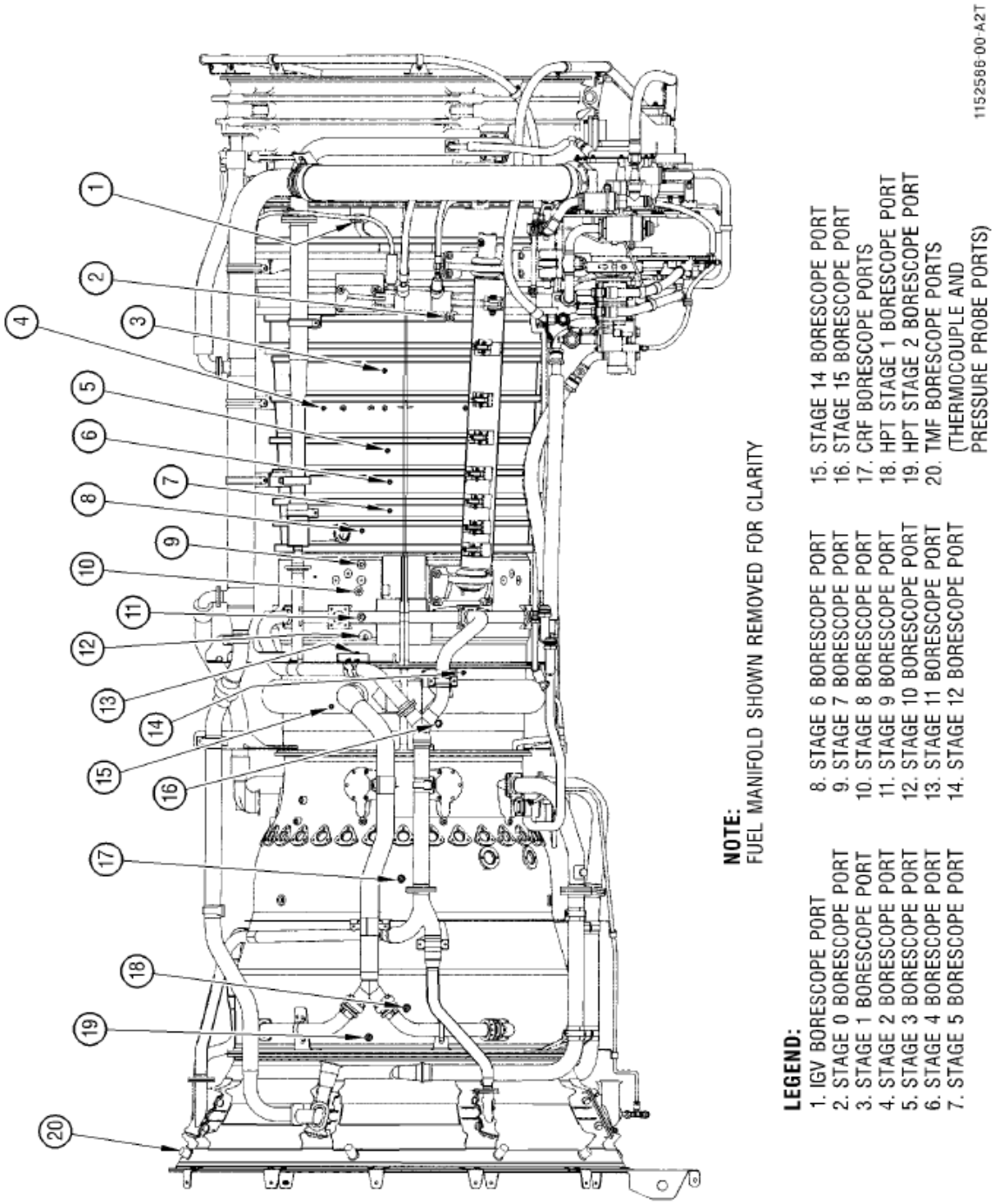



Figure 1: Position of Borescope Inspection Ports.

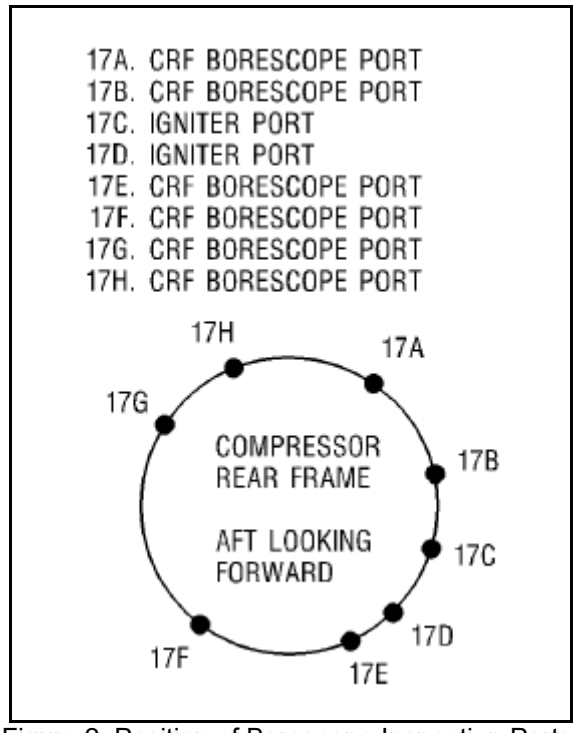


Figure 2: Position of Borescope Inspection Ports.

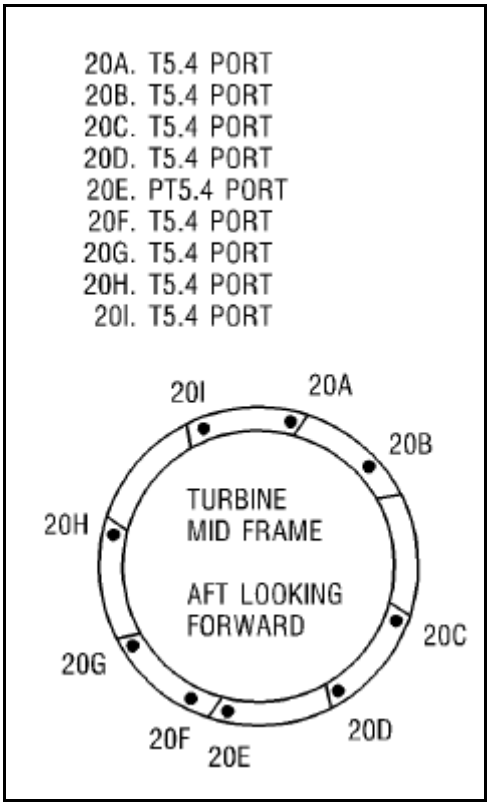


Figure 3: Position of Borescope Inspection Ports.

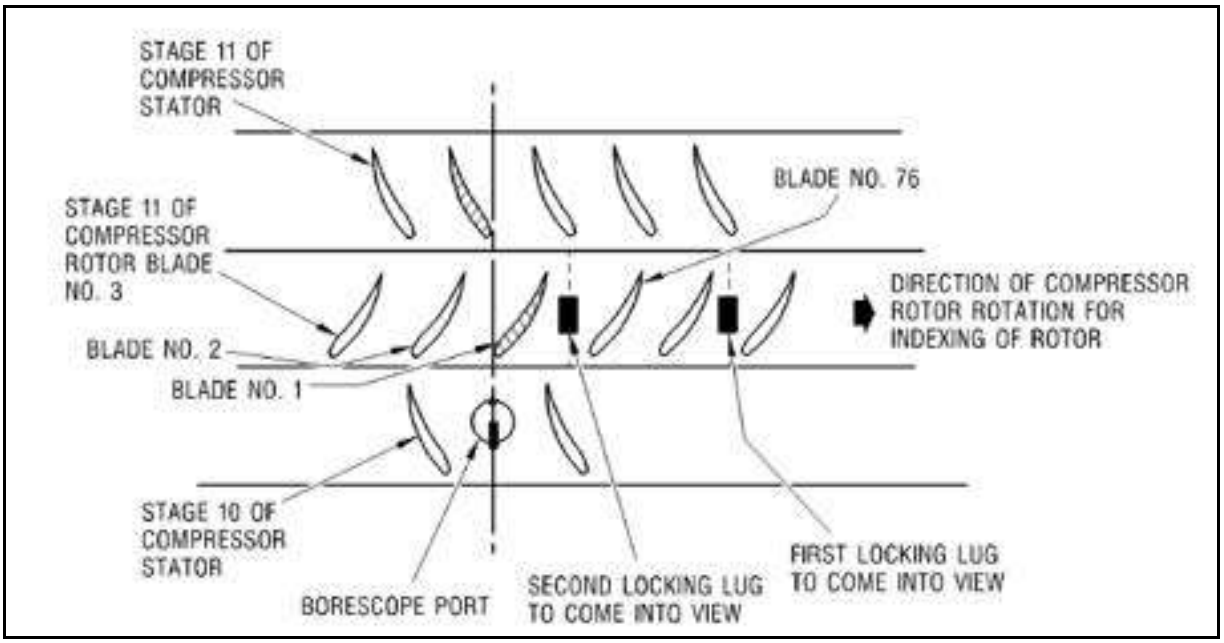


Figure 4: Zero indexing of HPC rotor and HPT rotor

Compressor Section

| Port | T.E. | L.E. | blades | Remarks: | photo no: |
|---|---|---|---|---|---|
| 1 | IGV | | | | |
| 1 | | 0 | 36 | | |
| 2 | 0 | | 36 | | |
| 2 | | 1 | 26 | | |
| 3 | 1 | | 26 | | |
| 3 | | 2 | 26 | | |
| 4 | 2 | | 26 | | |
| 4 | | 3 | 42 | | |
| 5 | 3 | | 42 | | |
| 5 | | 4 | 45 | | |
| 6 | 4 | | 45 | | |
| 6 | | 5 | 48 | | |
| 7 | 5 | | 48 | | |
| 7 | | 6 | 54 | | |
| 8 | 6 | | 54 | Blades contacting tip | |
| 8 | | 7 | 56 | Blades contacting tip | |
| 9 | 7 | | 56 | | |
| 9 | | 8 | 64 | | |
| 10 | 8 | | 64 | | |
| 10 | | 9 | 66 | | |
| 11 | 9 | | 66 | | |
| 11 | | 10 | 66 | | |
| 12 | 10 | | 66 | | |
| 12 | | 11 | 76 | | |
| 13 | 11 | | 76 | | |
| 13 | | 12 | 76 | | |
| 14 | 12 | | 76 | | |
| 14 | | 13 | 76 | | |
| 15 | 14 | | 76 | Inside bleed manifold | |
| 15 | | 15 | 76 | Inside bleed manifold | |
| 16 | 15 | | 76 | | |
| 16 | | 16 | 76 | | |

**Notes:**
The HPC Section was not inspected

.

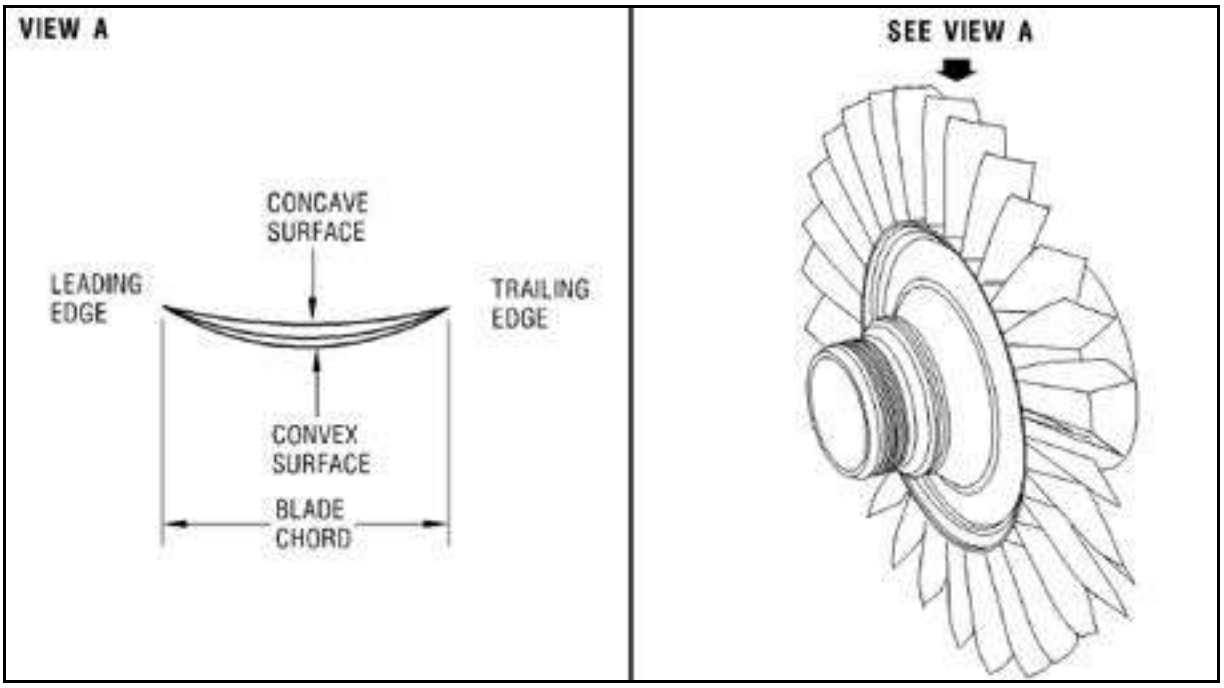



Figure 5: HPC stage 0 BLISK

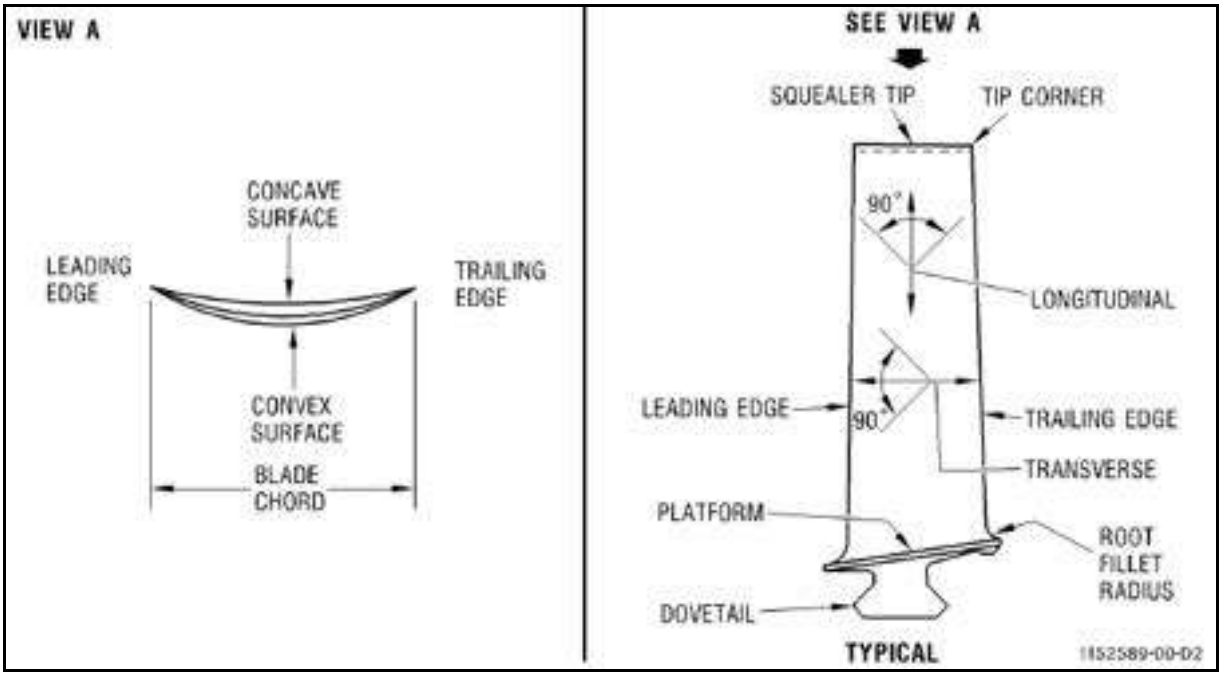



Figure 6: Compressor Rotor Blades

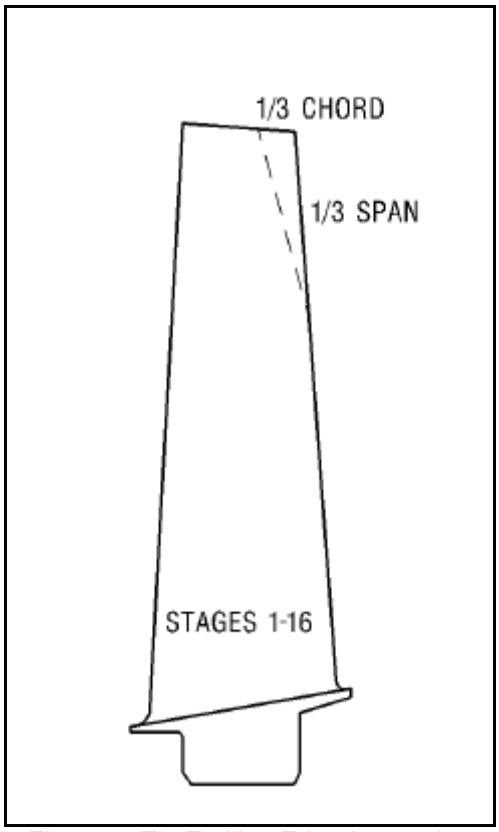


Figure 7: Tip Trailing Edge Inspection

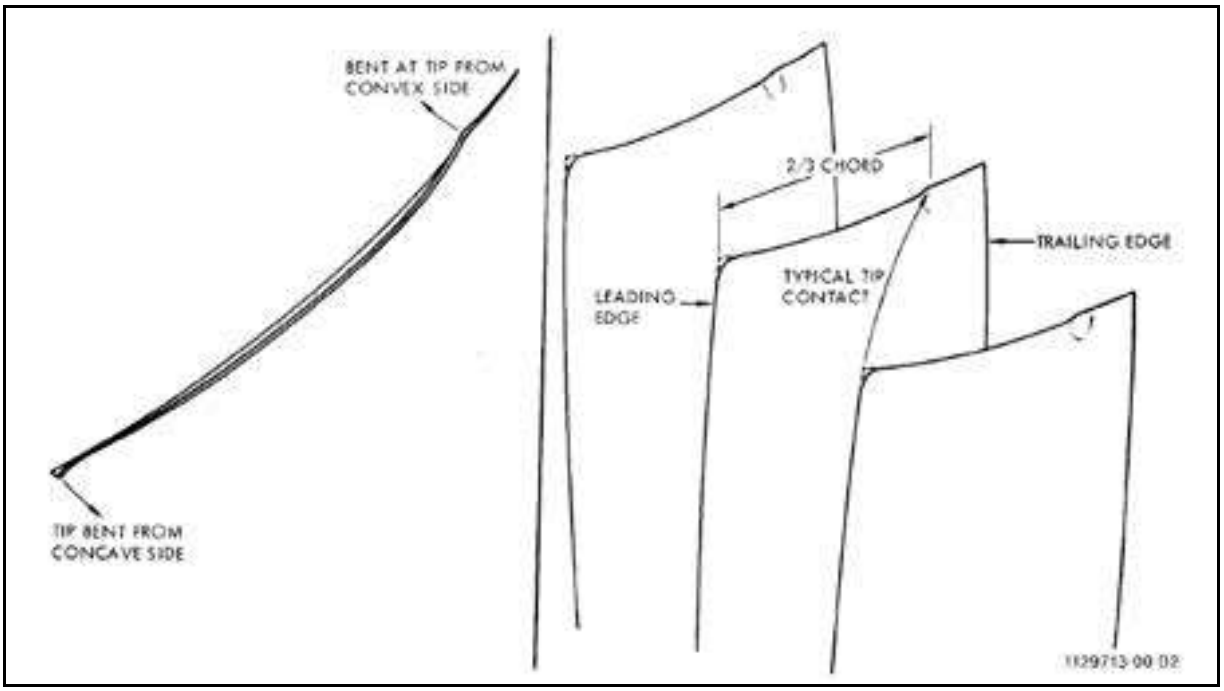


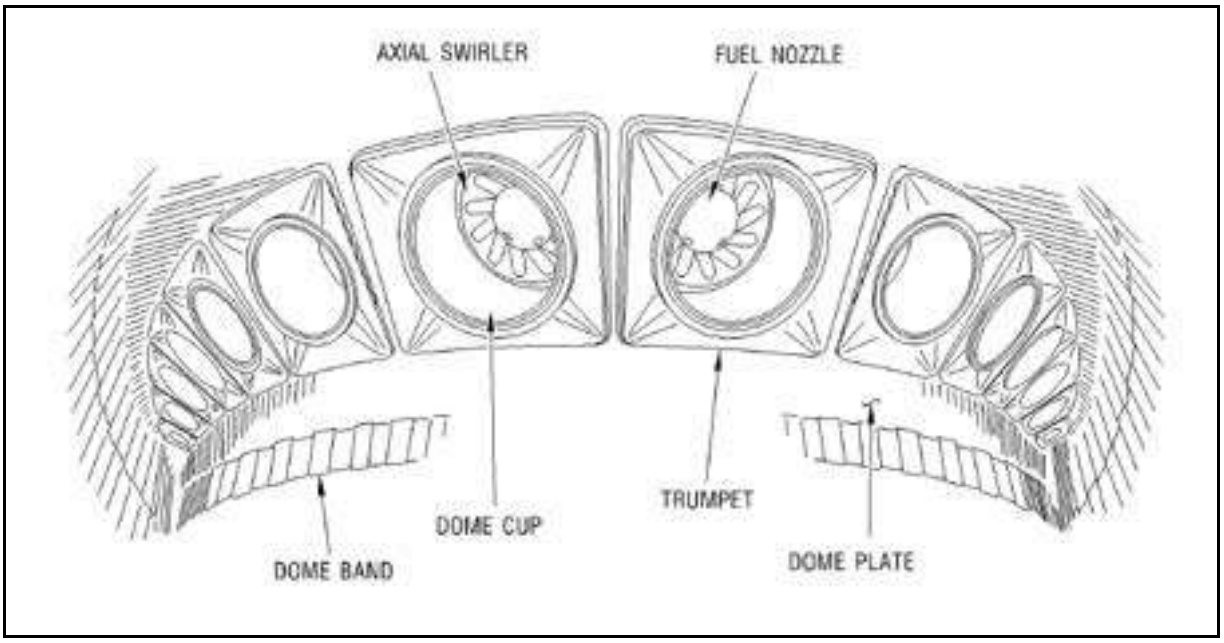
Figure 8: Tip Clanging Contact (HPCR stage 3 through 6)

Combustor and 1St Stage Nozzle Section

| Port | Condition observed | Photo no: |
|---|---|---|
| **17A** | | |
| **17B** | | |
| **17C** | | |
| **17D** | **See below notes.** | |
| **17E** | | |
| **17F** | | |
| **17G** | | |
| **17H** | | |
| **17** | 1st stage nozzle (leading edge): | |

**Notes:**
The Combustor section is serviceable according to GEK 105054 Volume II WP406 00 Table 7.

The Combustor liners showed discoloration and minor erosion, both liners are affceted by TBC loss.
The dome assembly and trumpets were found in good condition; the carbon material build up reported during previous BSI has disapeared.
The inner and outer rivet bands were found in good condition.
The igniter ferrules were found in good condition.



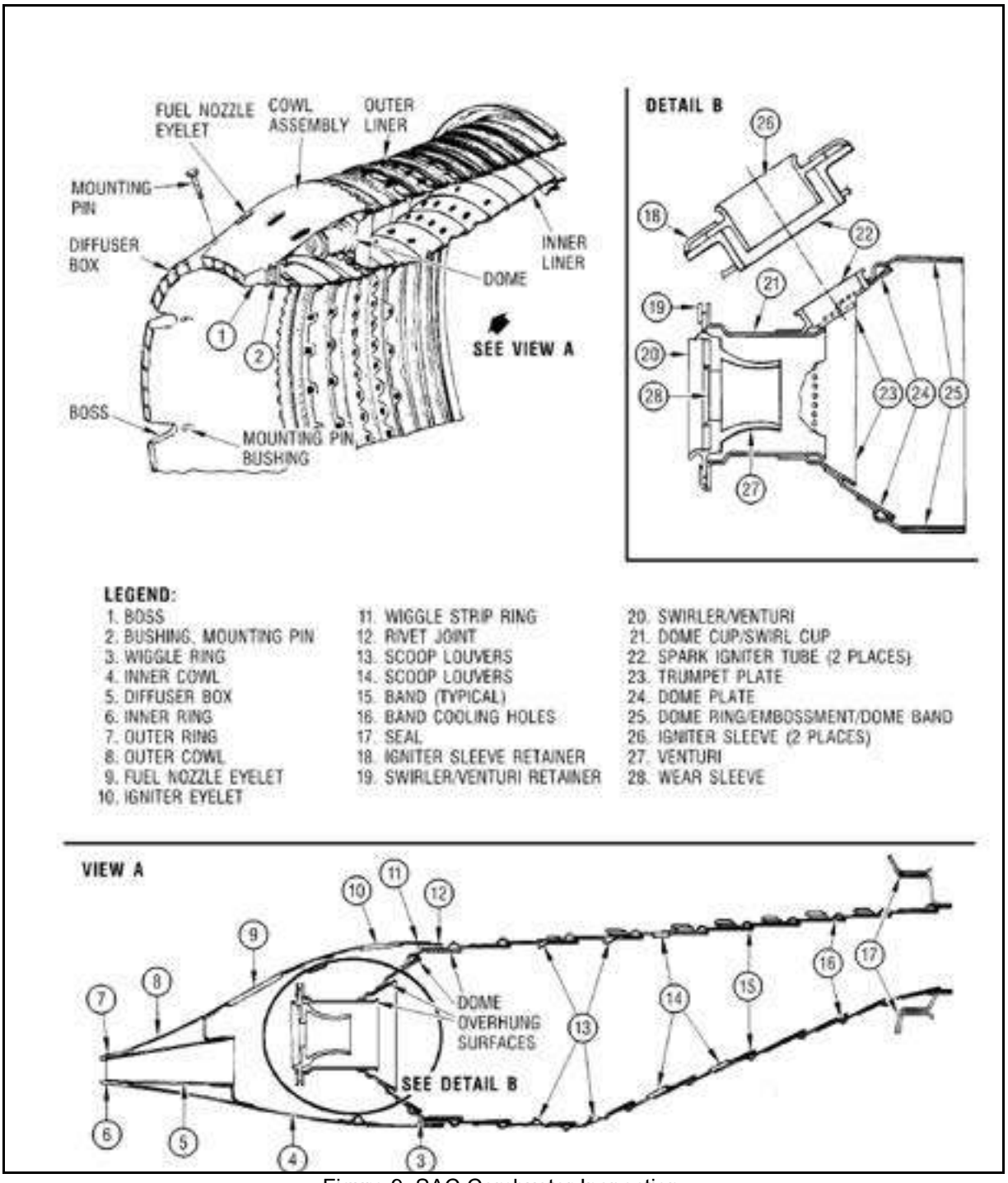



Figure 9: SAC Combustor Inspection

Figure 10: SAC Combustor Inspection

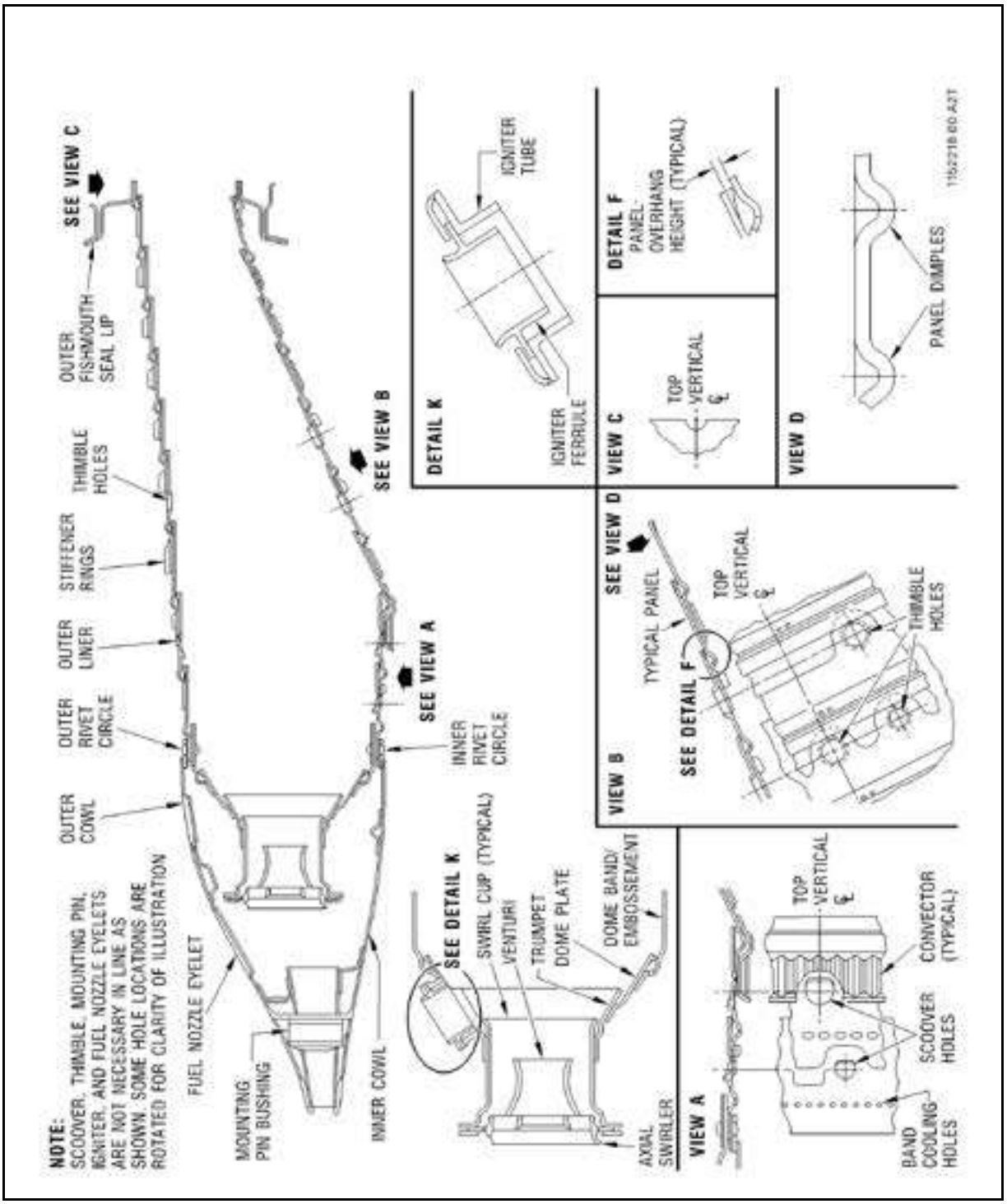



Figure 11: SAC Combustor Inspection

**Borescope Pictures**



Picture 1. Upper igniter ferrule



Picture 2. Upper igniter



Picture 3. Lower igniter ferrule



Picture 4. Lower igniter



Picture 5. Outer rivets band



Picture 6. Combustor dome



Picture 7. Combustor dome



Picture 8. Inner rivets band



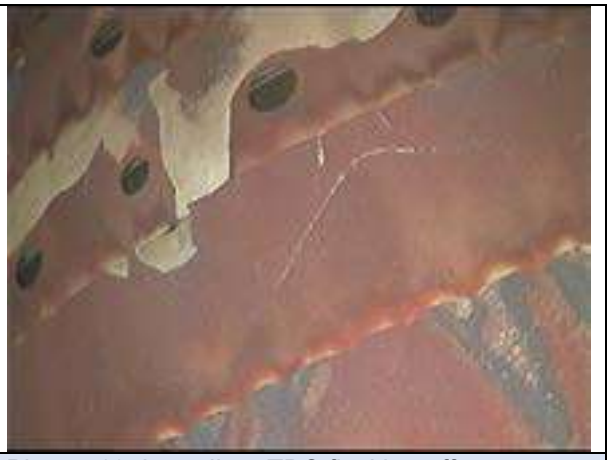
Picture 9. Splash plate. Typical



Picture 10. Fuel nozzle tip and swirler



Picture 11. Outer liner TBC flacking off



Picture 12. Inner liner TBC flacking off



Picture 13. Inner liner TBC flacking off



Picture 14. Combustor liners and HPT interference



Picture 15. Combustor liners and HPT interference



Picture 16. Combustor and HPT Stage 1 Nozzles

Turbine Section

| | turbine stage | | | | |
|---|---|---|---|---|---|
| **Port** | **L.E.** | **T.E.** | **blades** | **Remarks:** | **photo no:** |
| **18** | **1** | | **88** | | |
| **19** | | **1** | **88** | **See below notes.** | |
| **19** | **2** | | **90** | | |
| **20** | | **2** | | | |

**Notes:**
The High Pressure Turbine section is serviceable according to GEK 105054 Volume II WP406 00 Table 8.
The stage 1 nozzles are affected by incipient corrosion but the hill holes on the concave side are still in good condition as well as the trailing edge slots.
Some stage 1 nozzles showed hot spots on convex side airfoil, refer to pictures 23 to 27.
This damage is serviceable however, it would be desirable to assess the evolution of these nozzles after 12 weeks of operation.

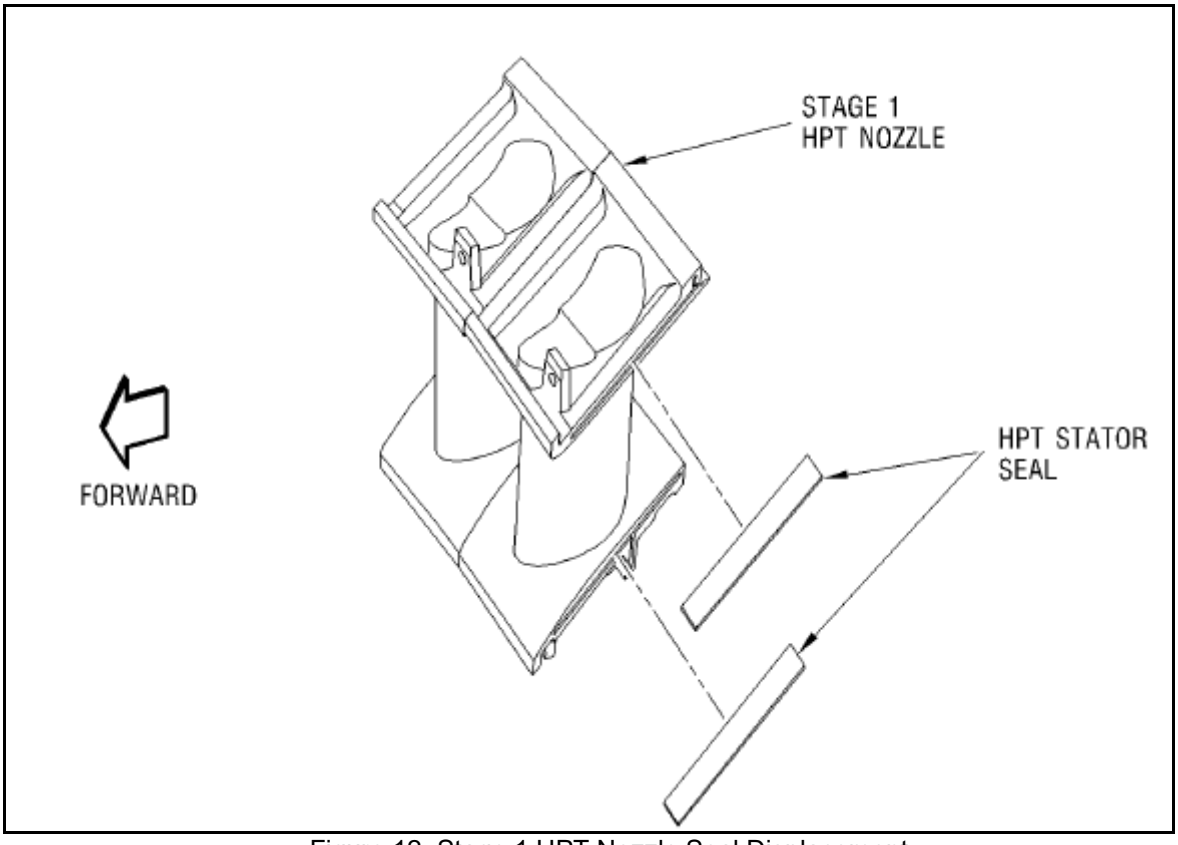


Figure 12: Stage 1 HPT Nozzle Seal Displacement

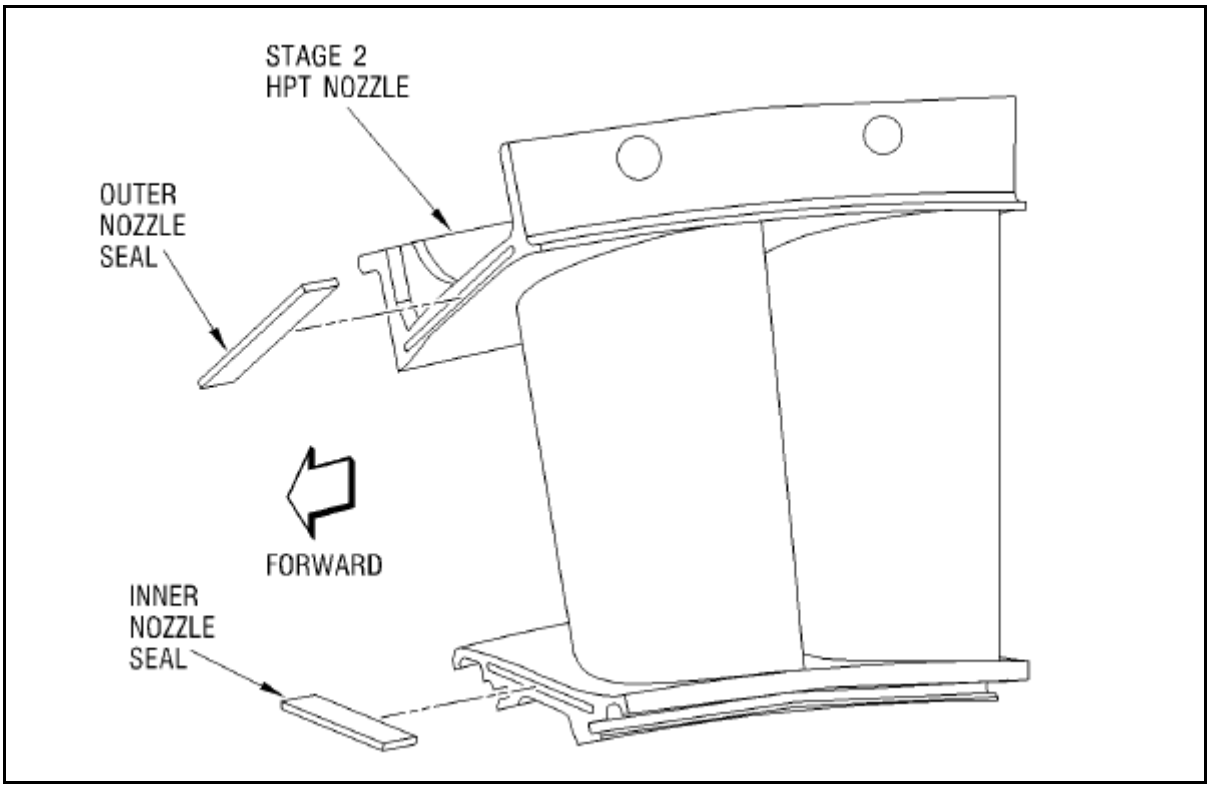


Figure 13: Stage 2 HPT Nozzle Seal Displacement

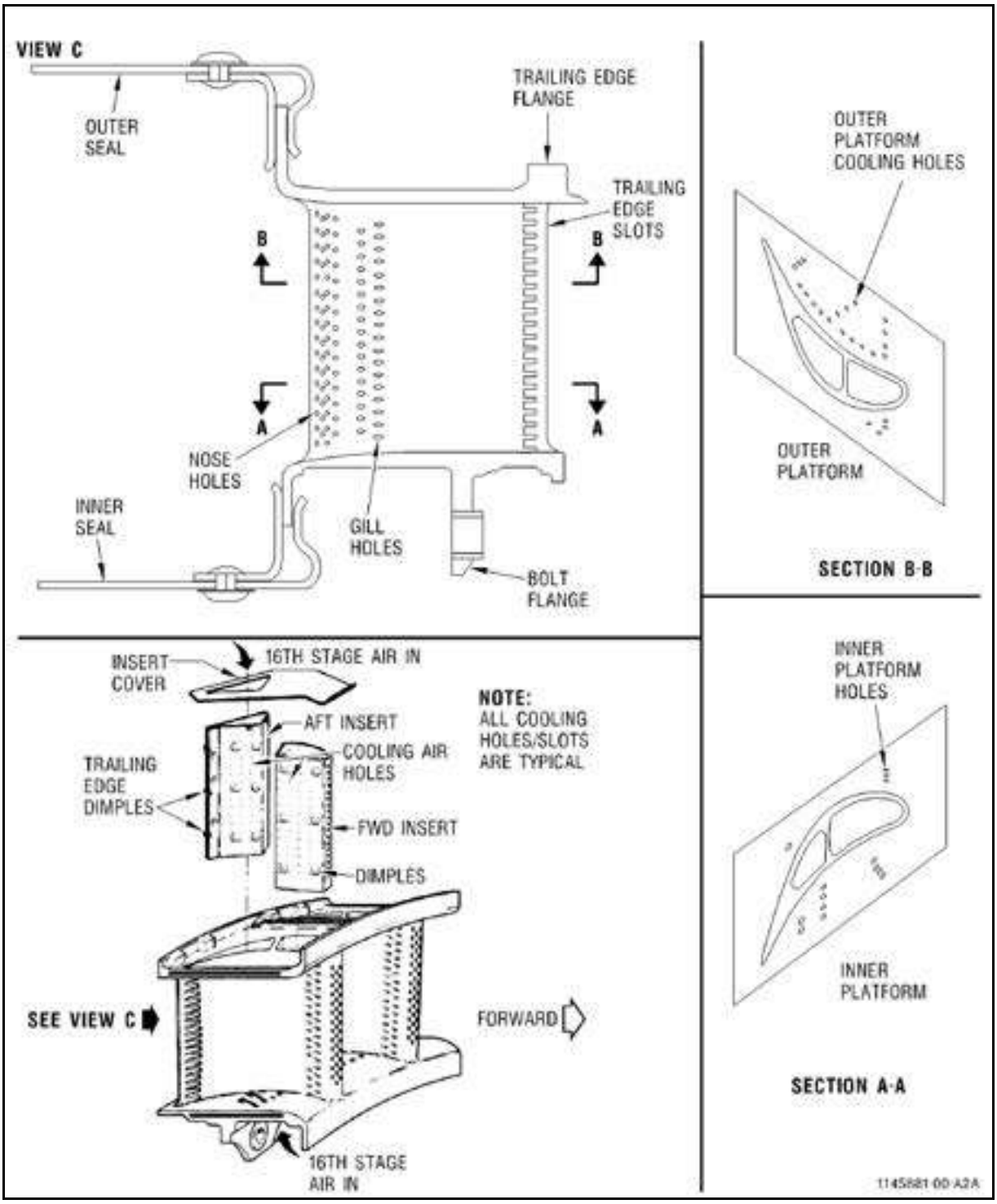



Figure 14: HPT Stage 1 Nozzle

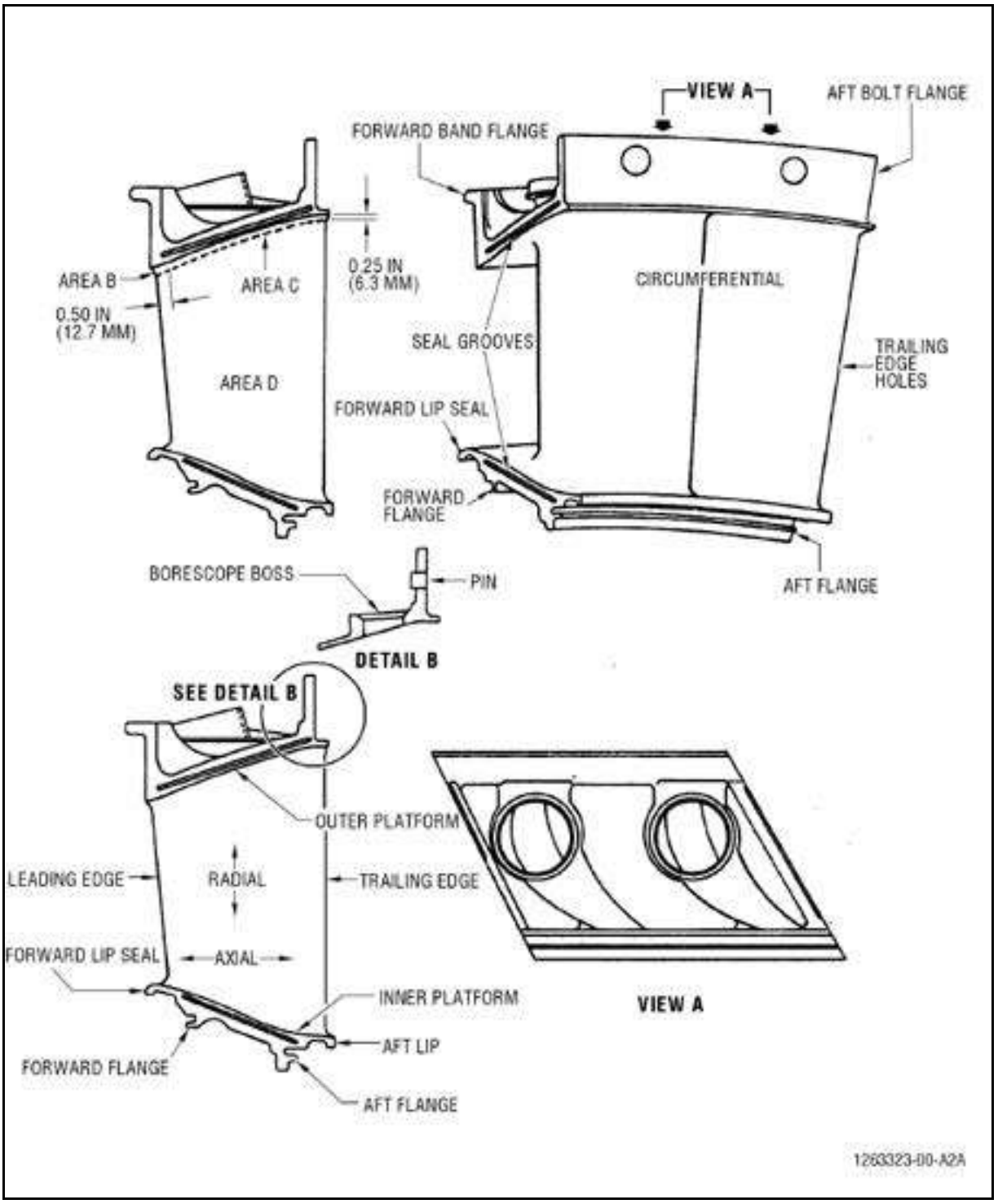



Figure 15: HPT Stage 2 Nozzle

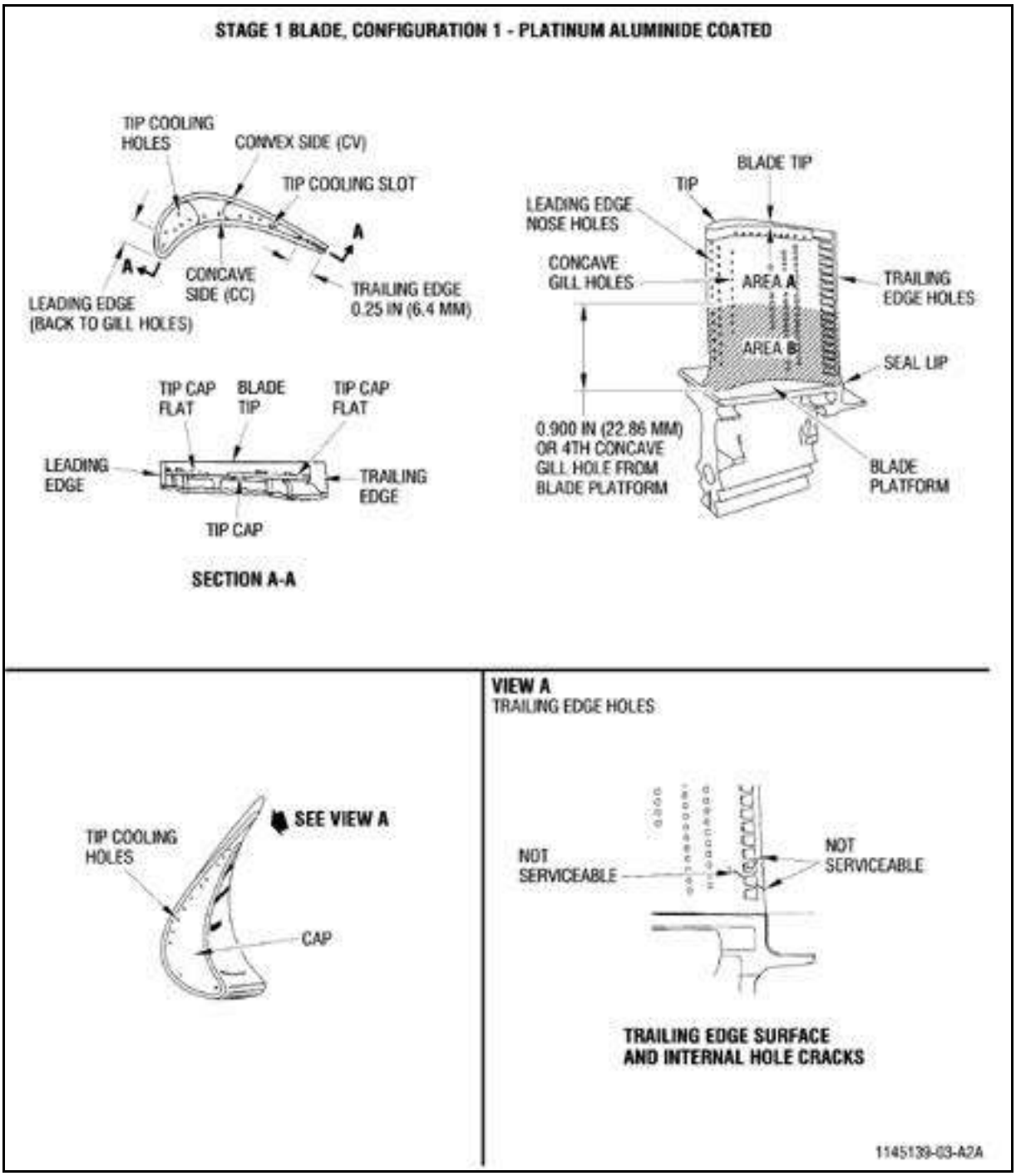



Figure 16: HPT Stage 1 Rotor Blades Inspection Areas (Platinum Aluminide Coated Blades)

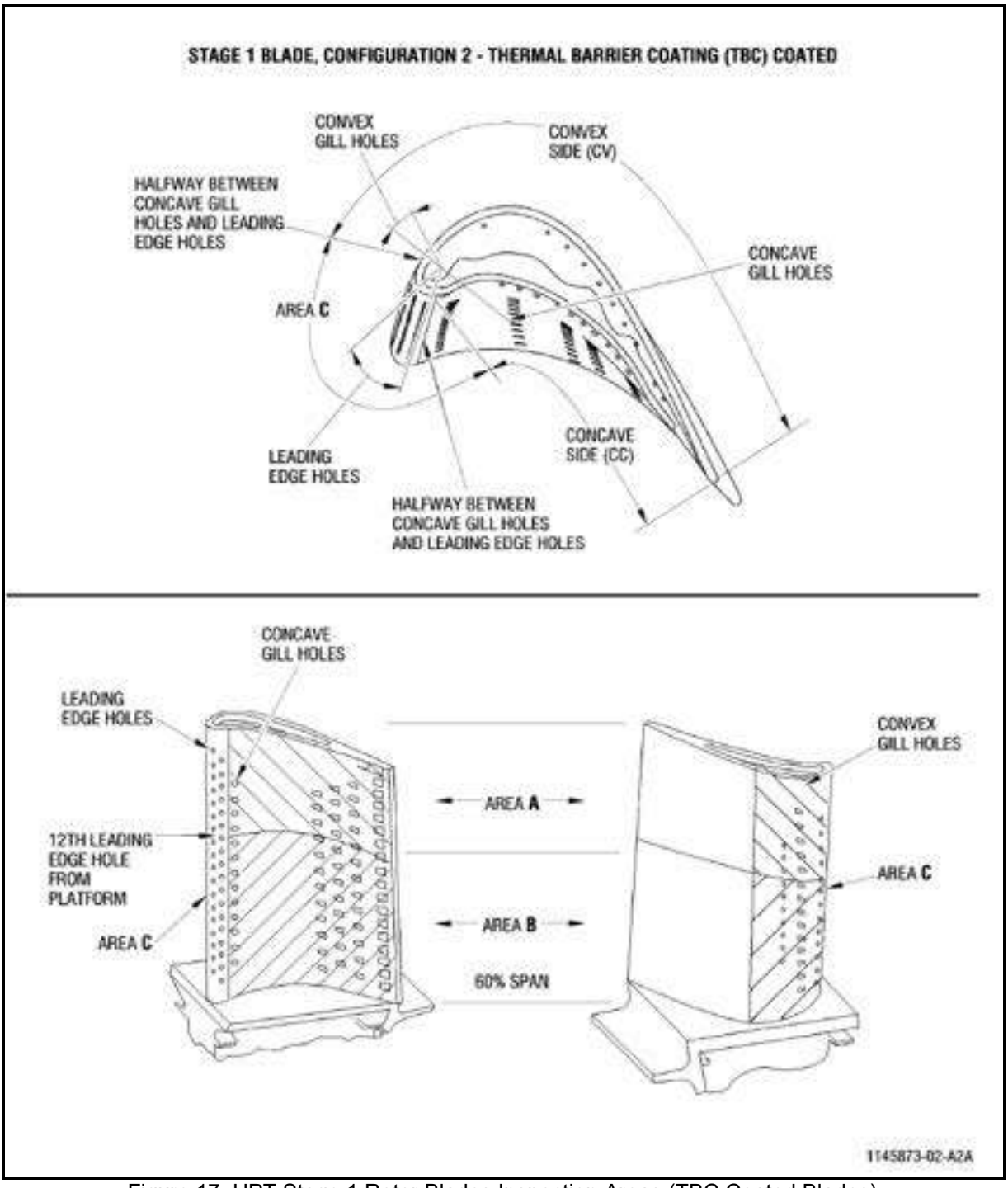


Figure 17: HPT Stage 1 Rotor Blades Inspection Areas (TBC Coated Blades)

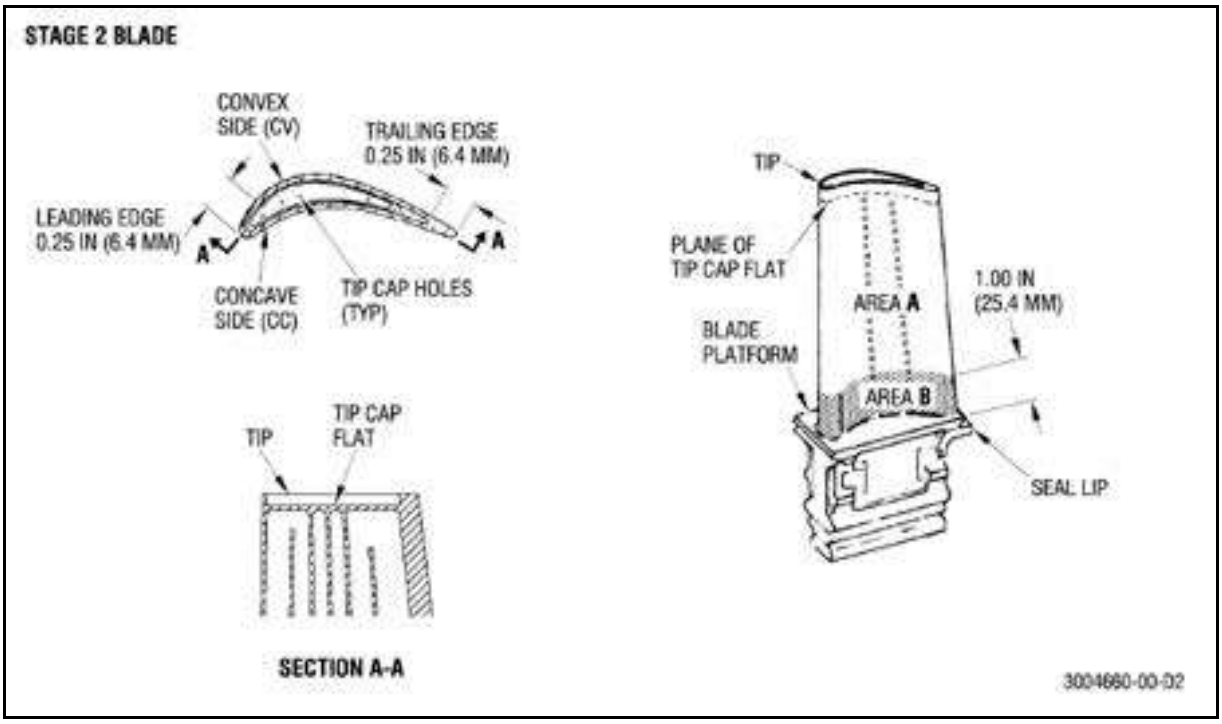



Figure 18: HPT Stage 2 Rotor Blades Inspection Areas

**Borescope Pictures**



Picture 17: Stage1 Nozzles leading edge. Gill holes visible



Picture 18: Stage1 Nozzle leading edge



Picture 19: Stage1 Nozzles leading edge



Picture 20: Stage1 Nozzles concave side



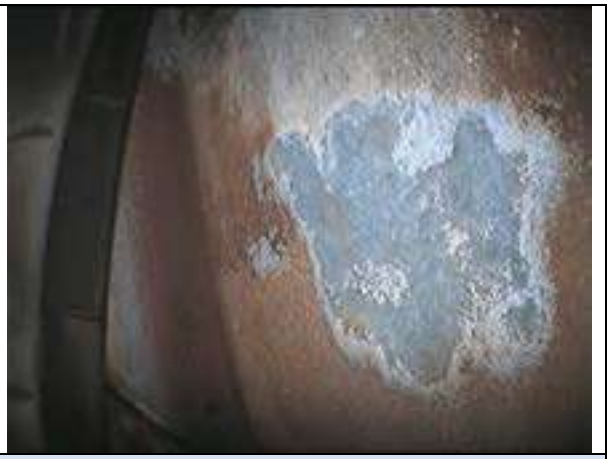
Picture 21: Stage1 Nozzles trailing edge. Blades leading edge



Picture 22: Stage1 Nozzles trailing edge. Blades leading edge



Picture 23: Stage1 nozzles convex side



Picture 24: Stage1 Nozzle convex side



Picture 25: Stage1 Nozzle convex side



Picture 26: Stage1 Nozzle convex side



Picture 27: Stage1 Nozzle convex side



Picture 28: Stage1 Nozzle trailing. Blades leading edge



Picture 31: Stage1 Blades leading edge



Picture 32: Stage1 Blades leading edge and shrouds



Picture 33: Stage1 Blades trailing edge



Picture 34: Stage1 Blades trailing edge



Picture 35: Stage2 Nozzles trailing edge. Blades leading edge



Picture 36: Stage2 Nozzles trailing edge. Blades leading edge



Picture 37: Stage 2 Blades and honeycomb seals



Picture 38: Stage2 Blades leading edge



Picture 39: Stage 2 Blades trailing edge



Picture 40: Stage 2 Blades trailing edge



Picture 41: Stage 2 Blades trailing edge



Picture 42: Stage 2 Blades trailing edge

LPT Section

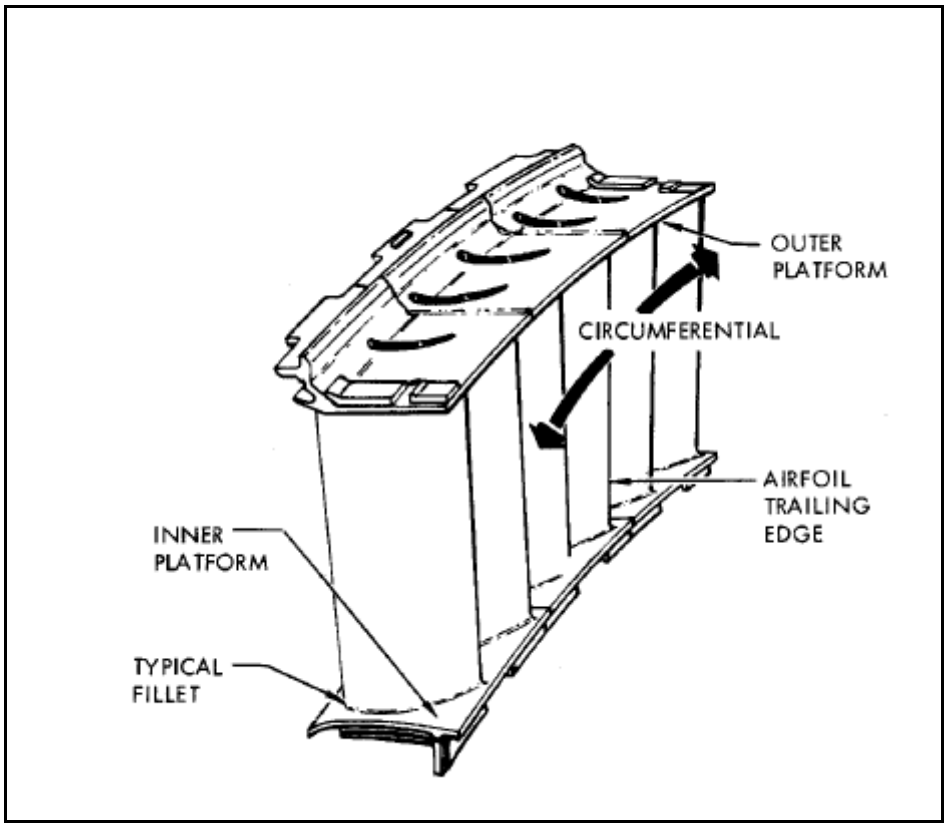



Figure 19: Power Turbine Nozzles

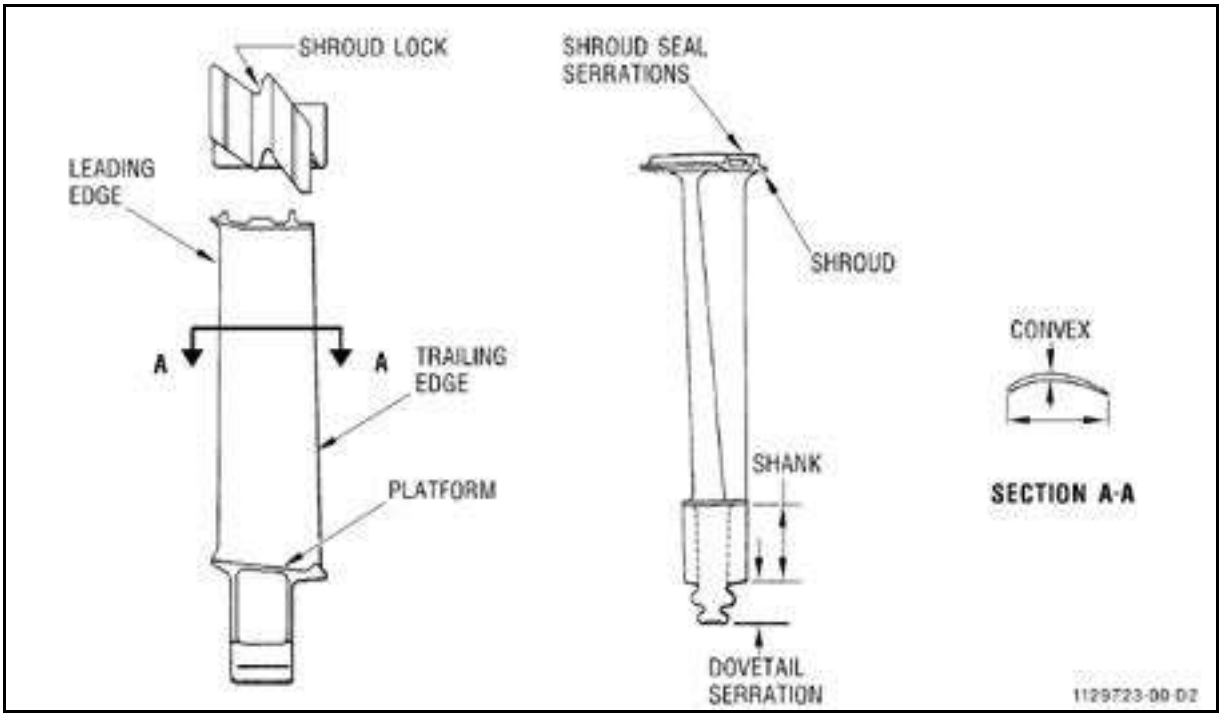



Figure 20: Power Turbine Rotor Blades

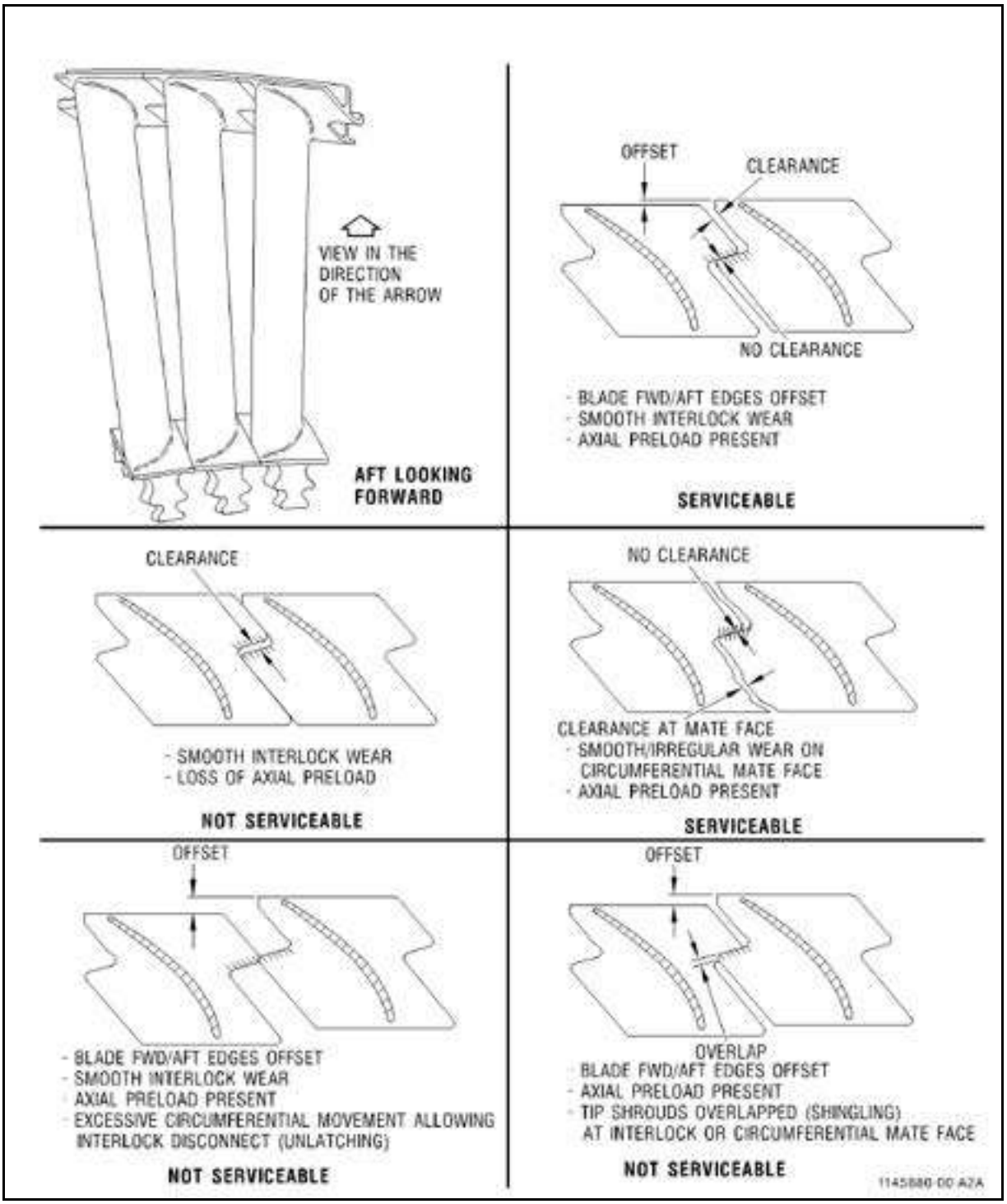


Figure 21: LPT Rotor Blade Circumferential Inspection

**Borescope Pictures**



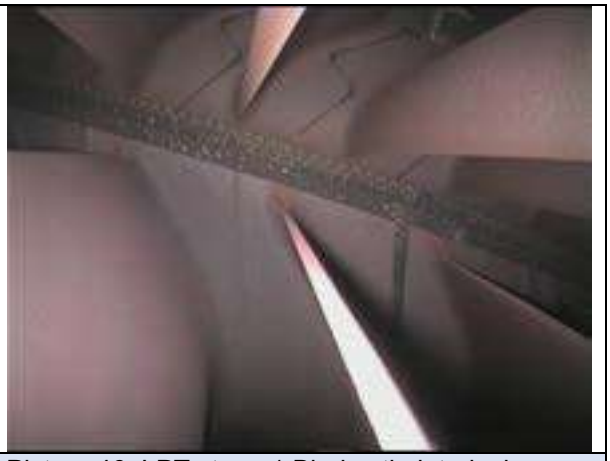
Picture 43: TMF. LPT Inlet



Picture 44: TMF. LPT Inlet



Picture 45: LPT nozzles trailing edge. Blades leading edge



Picture 46: LPT stage 1 Blades tip interlock

**Notes:**

The LPT stage 1 accessible nozzles and blades did not show any damage.

# *BORESCOPE INSPECTION REPORT*
# *TM2500 GEN. 6-7*
# *7LM2500 – PK – MDWG05*

## NFE SAN JUAN POWER PLANT

## *PACKAGE # 7251611*

## *UNIT #8*

| | | | |
|---|---|---|---|
| **Visit Date:** | 01/05/2024 | **Total Starts:** | 520 |
| **Engine S/N:** | 557 – 242 | **GG Hours:** | 5176 |
| **Power Turbine S/N:** | 557 - 242 | **PT Hours:** | 5176 |
| **PPG GT Field Engineer:** | JC Requena H | **NFE Representative:** | Lance Florent |



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3 Borescope Inspection Checklist ..... 5
4 Borescope Inspection Record..... 6
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4.2 Combustor and 1St Stage Nozzle Section .....12
4.3 Turbine Section .....18
4.4 LPT Section.....27

## 1. Conclusions and Recommendations

**Purpose of visit:**
The purpose of this visit was to perform a borescope inspection of the Engine Hot Section in accordance with GEK105054, WP 406 00.

1.1 The Combustor section condition remains the same than last BSI. Nothing to remark.

1.2 The HPT stage 1 and 2 Blades condition remains the same than last BSI. Nothing to remark.

1.3 The HPT stage 2 Nozzles condition remains the same than last BSI. Nothing to remark.

1.4 The degradation of the HPT stage 1 nozzles has increased after 971 hours of operation significantly. Some of the more eroded areas are already developing cracks and some of the nozzles showed severe base material erosion on the leading edge inner platform area.

## 2. Outage Data

**ENGINE DATA**

| | | | | | |
|---|---|---|---|---|---|
| **ESN:** | 557-242 | **Engine Fired Hours:** | 5176 | **Package Hours:** | 5176 |
| **Model:** | 7LM2500-PK-MDWG05 | **Engine Fired starts:** | 520 | **Package Fired Starts:** | 520 |

**MAINTENANCE DATA**

| WP, SB, SL, PB, PL Performed | GEK105054, REV 11 | Date completed | Comments |
|---|---|---|---|
| WP 406 00 | Borescope Inspection | 05JAN24 | Not Serviceable |

**PARTS DATA**

| Description | PN Removed | SN Removed | Qty | Disposition | PN Installed | SN Installed |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |

## 3. Borescope Inspection Checklist

**Date unit out of operation:** 05JAN24
**Date unit into operation:** 05JAN24
**Last inspection date:** 24NOV23; 4205 Hrs

**Type of Fuel:** Gas
**Type of outage:** Scheduled

**Type of NOx suppression:** Water Injection

**Inspection of gas turbine:**

| WATERWASH: | HIGH PRESSURE COMPRESSOR: |
|---|---|
| ☐ PERFORMED WATER WASH | ☐ HPC BORESCOPE INSPECTION |
| **COMBUSTOR:** | **HIGH PRESSURE TURBINE** |
| ☒ COMBUSTOR BORESCOPE INSPECTION | ☒ HPT STAGE 1 & 2 NOZZLE BORESCOPE INSPECTION |
| | ☒ HPT BLADE BORESCOPE INSPECTION |
| **LOW PRESSURE TURBINE:** | |
| ☐ LPT BORESCOPE INSPECTION | |

☒ ***Please verify all borescope plugs have been reinstalled***

## 4. Borescope Inspection Record

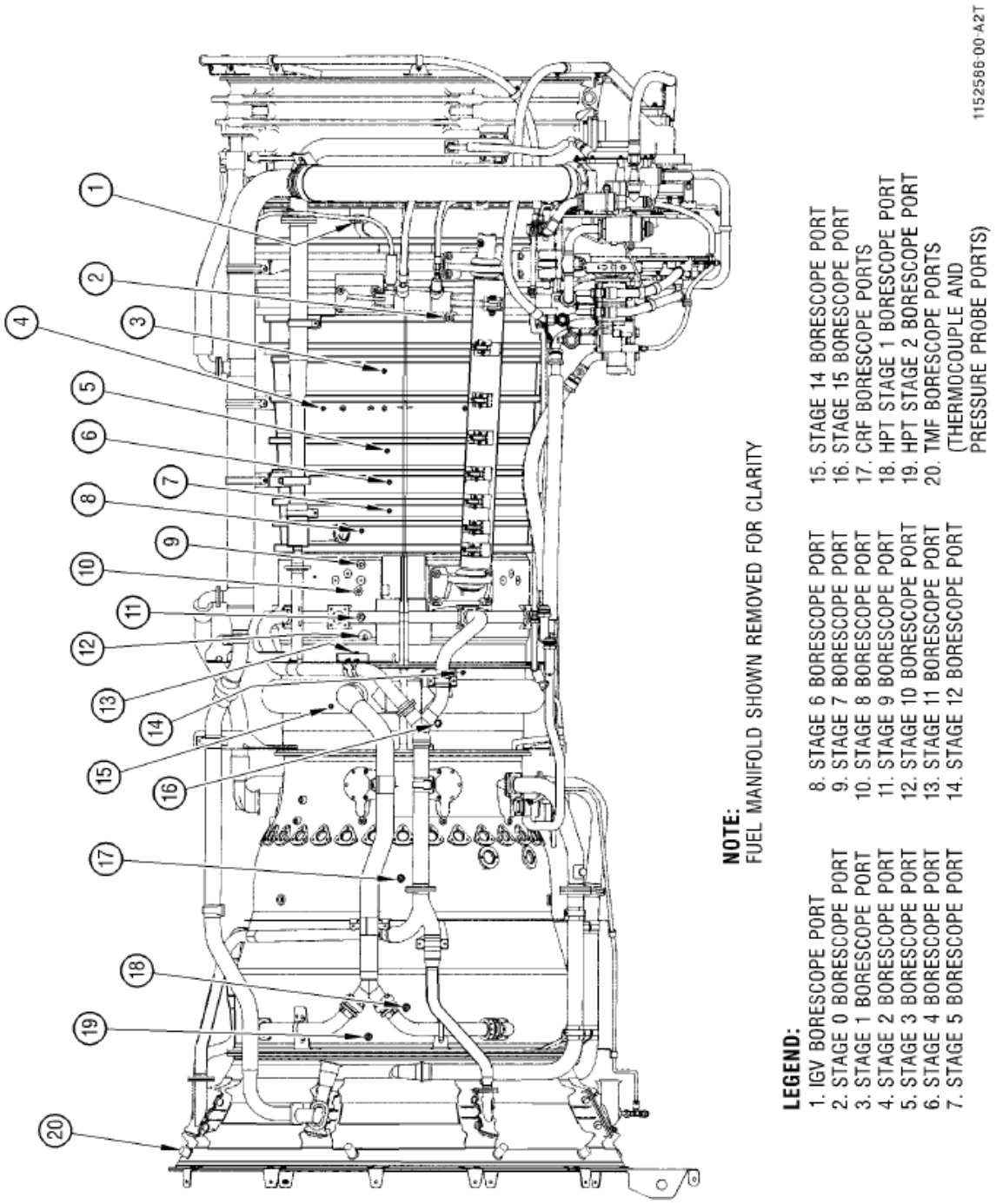



Figure 1: Position of Borescope Inspection Ports.

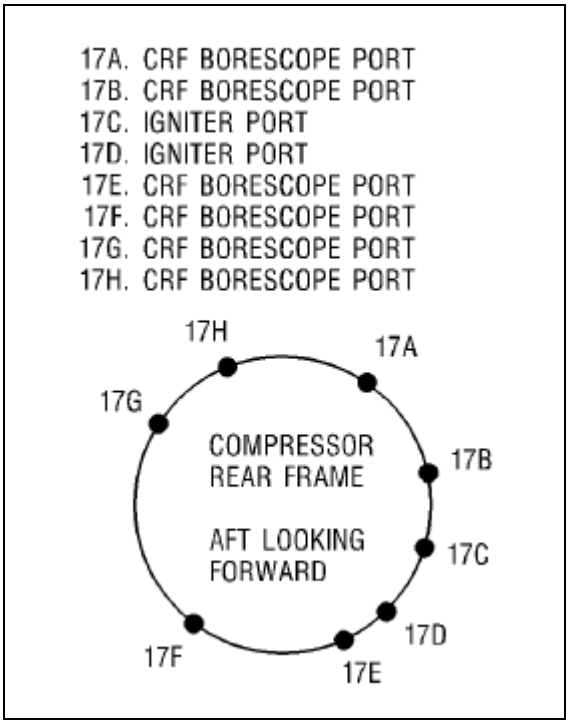


Figure 2: Position of Borescope Inspection Ports.

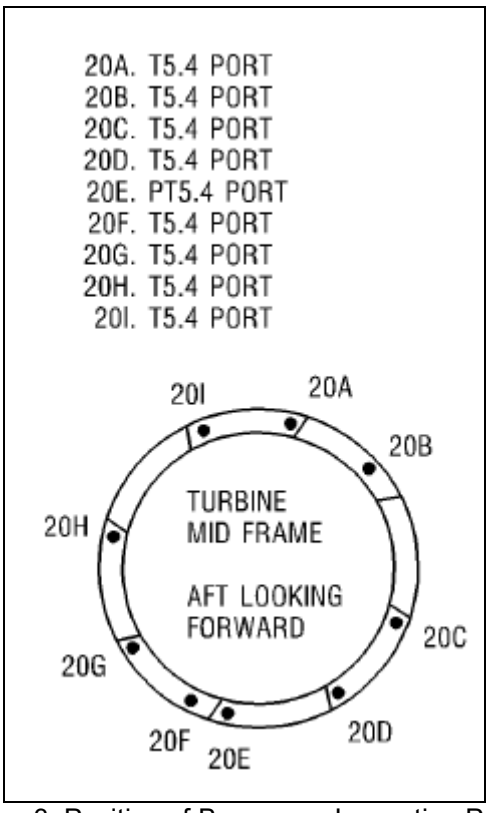


Figure 3: Position of Borescope Inspection Ports.

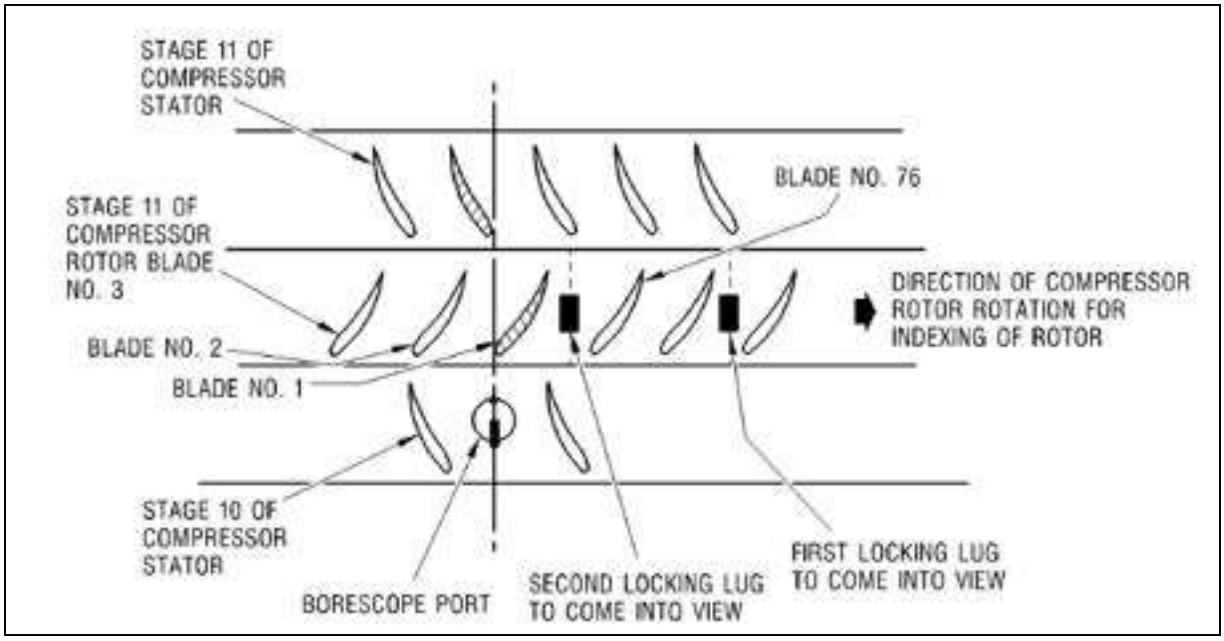



Figure 4: Zero indexing of HPC rotor and HPT rotor

4.1 Compressor Section

| Port | T.E. | L.E. | blades | Remarks: | photo no: |
|---|---|---|---|---|---|
| 1 | IGV | | | | |
| 1 | | 0 | 36 | | |
| 2 | 0 | | 36 | | |
| 2 | | 1 | 26 | | |
| 3 | 1 | | 26 | | |
| 3 | | 2 | 26 | | |
| 4 | 2 | | 26 | | |
| 4 | | 3 | 42 | | |
| 5 | 3 | | 42 | | |
| 5 | | 4 | 45 | | |
| 6 | 4 | | 45 | | |
| 6 | | 5 | 48 | | |
| 7 | 5 | | 48 | | |
| 7 | | 6 | 54 | | |
| 8 | 6 | | 54 | Blades contacting tip | |
| 8 | | 7 | 56 | Blades contacting tip | |
| 9 | 7 | | 56 | | |
| 9 | | 8 | 64 | | |
| 10 | 8 | | 64 | | |
| 10 | | 9 | 66 | | |
| 11 | 9 | | 66 | | |
| 11 | | 10 | 66 | | |
| 12 | 10 | | 66 | | |
| 12 | | 11 | 76 | | |
| 13 | 11 | | 76 | | |
| 13 | | 12 | 76 | | |
| 14 | 12 | | 76 | | |
| 14 | | 13 | 76 | | |
| 15 | 14 | | 76 | Inside bleed manifold | |
| 15 | | 15 | 76 | Inside bleed manifold | |
| 16 | 15 | | 76 | | |
| 16 | | 16 | 76 | | |

**Notes:**
The HPC Section was not inspected

.

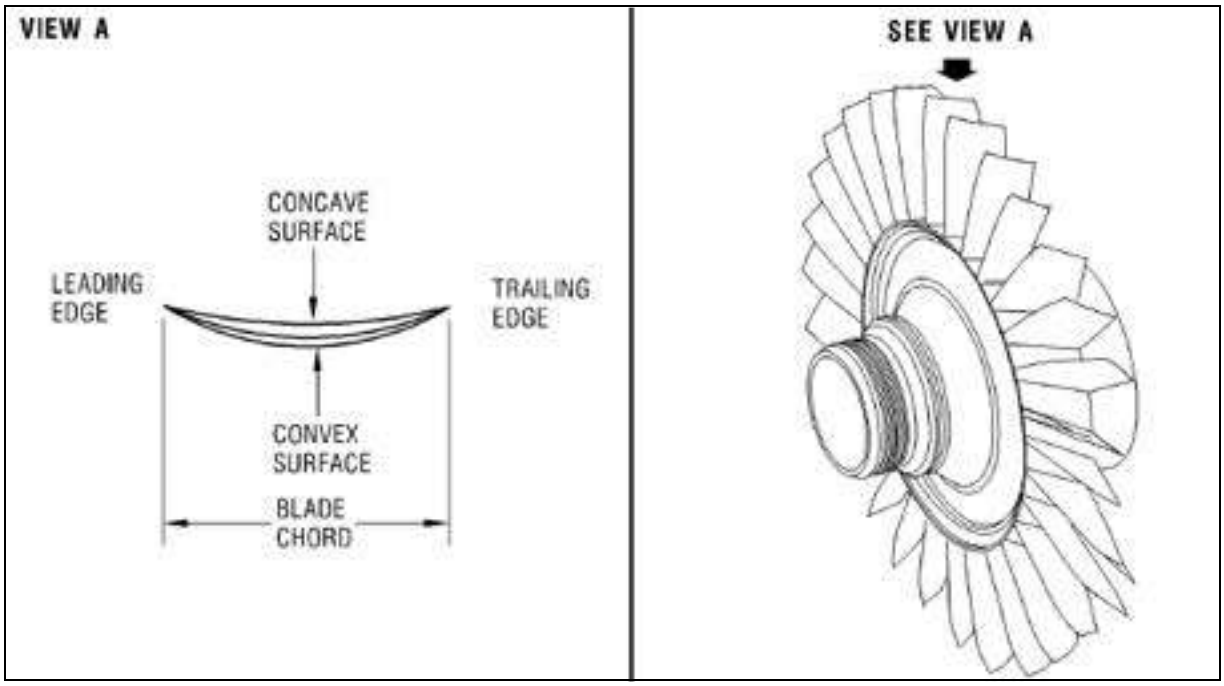



Figure 5: HPC stage 0 BLISK

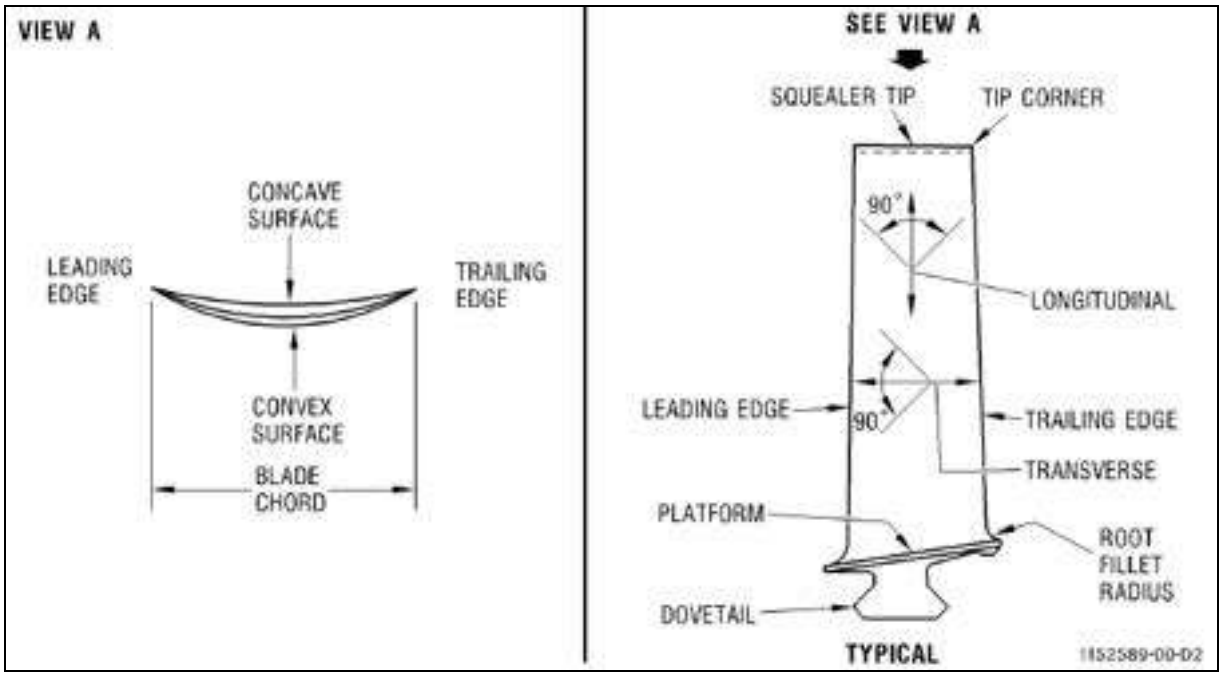



Figure 6: Compressor Rotor Blades

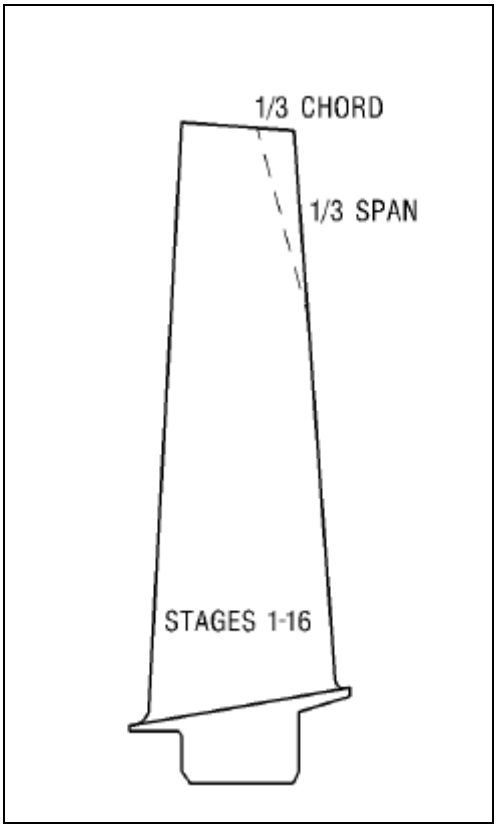


Figure 7: Tip Trailing Edge Inspection

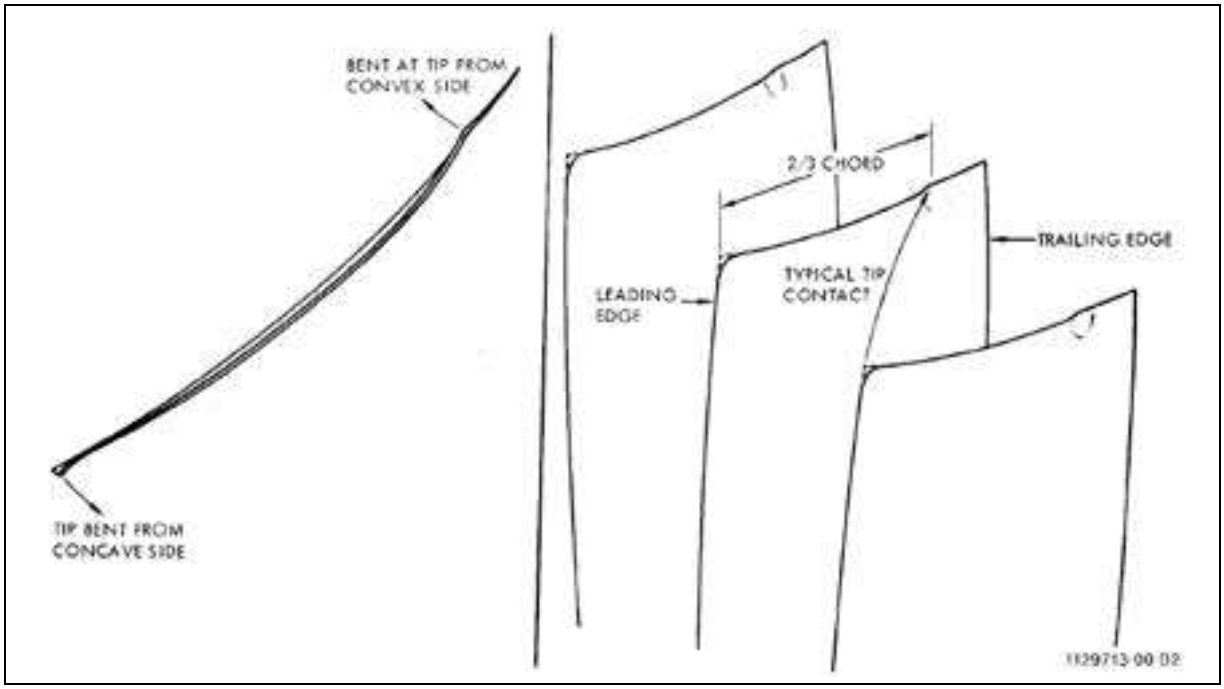
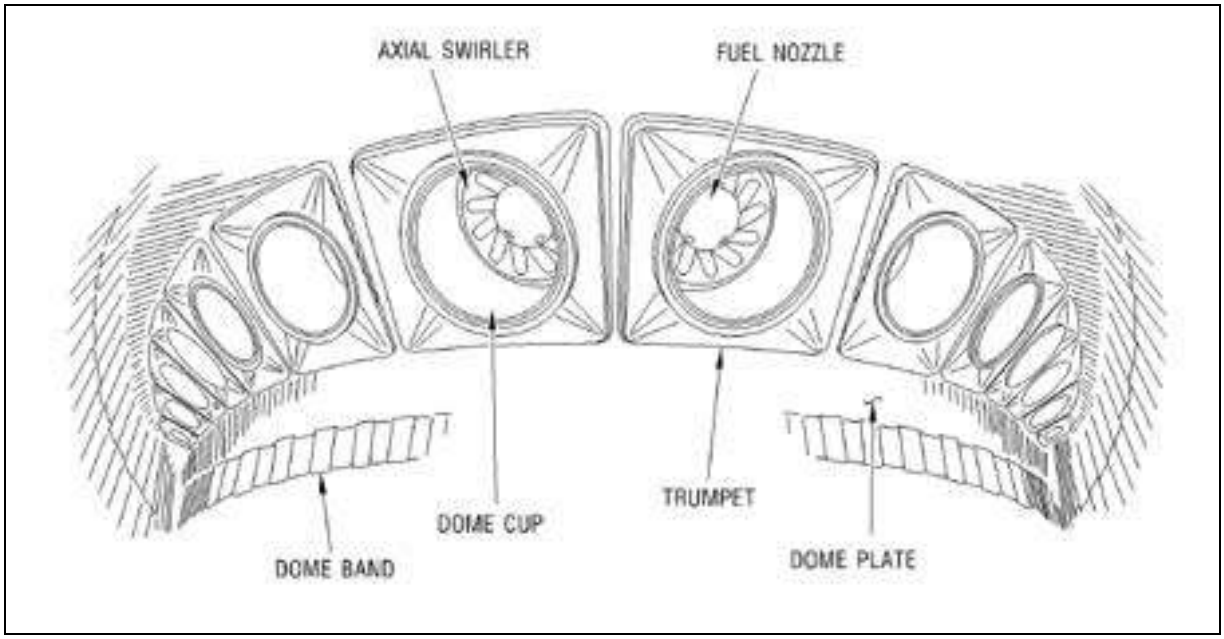


Figure 8: Tip Clanging Contact (HPCR stage 3 through 6)

4.2 Combustor and 1St Stage Nozzle Section

| Port | Condition observed | Photo no: |
|---|---|---|
| **17A** | | |
| **17B** | | |
| **17C** | | |
| **17D** | **See below notes.** | |
| **17E** | | |
| **17F** | | |
| **17G** | | |
| **17H** | | |
| **17** | 1st stage nozzle (leading edge): | |

**Notes:**
The Combustor section is serviceable according to GEK105054 Volume II WP40600 Table 7.



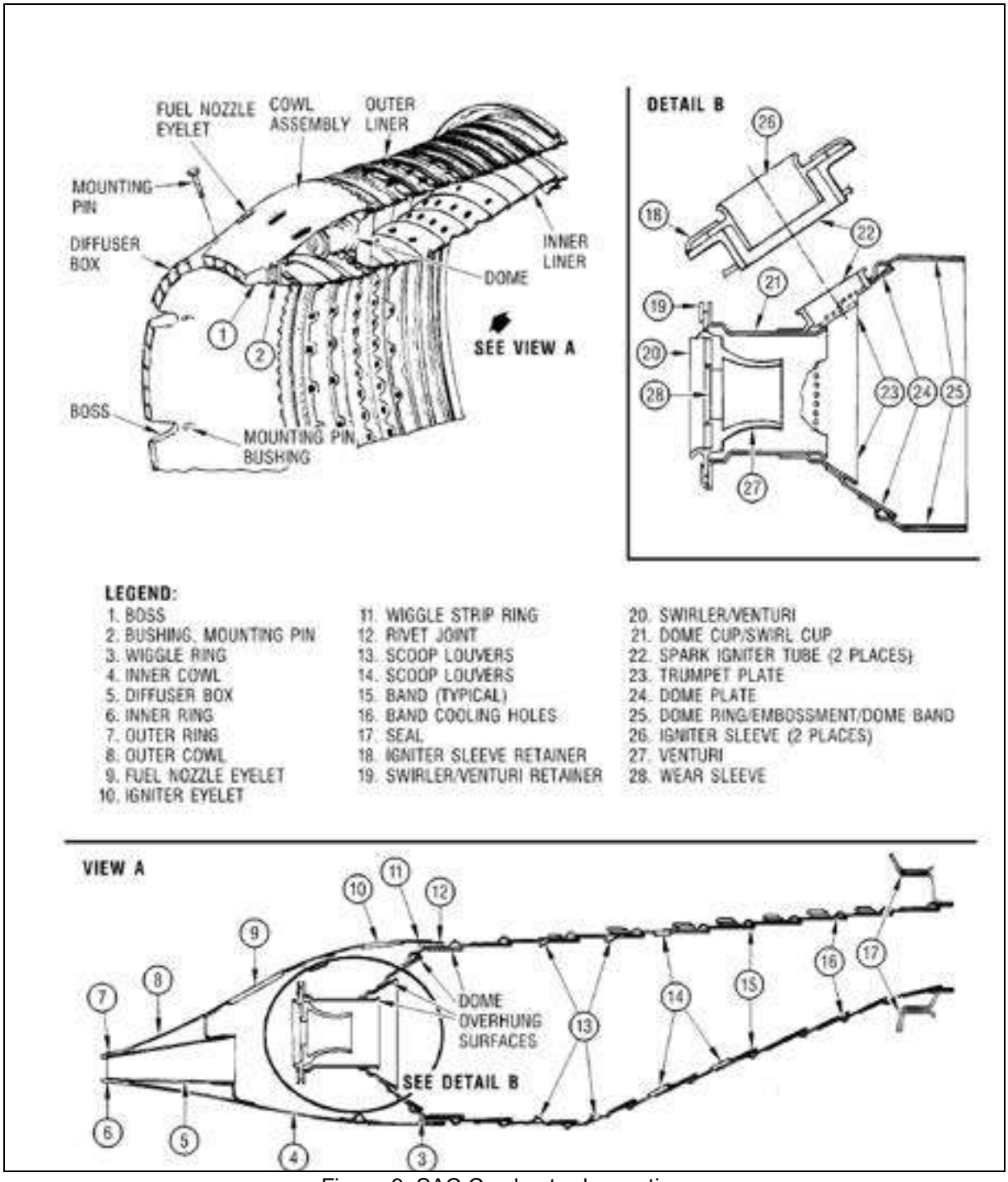



Figure 9: SAC Combustor Inspection

Figure 10: SAC Combustor Inspection

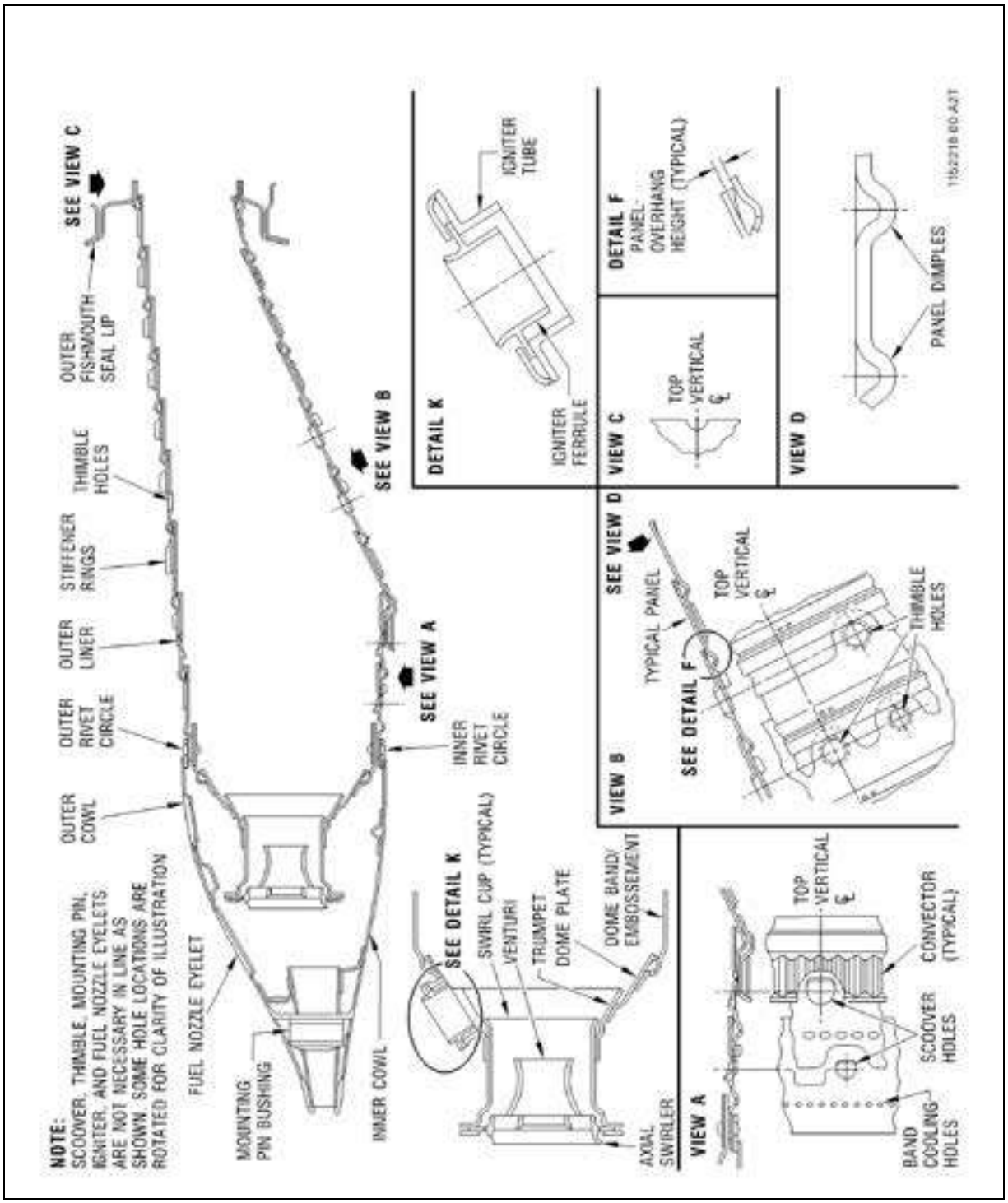



Figure 11: SAC Combustor Inspection

**Borescope Pictures**



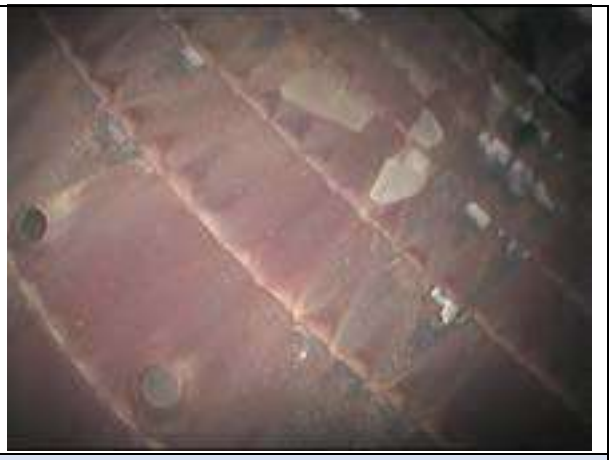
Picture 1. Combustor dome and inner liner



Picture 2. Combustor outer liner



Picture 3. Combustor dome



Picture 4. Combustor Inner liner



Picture 5. Combustor liners with HPT nozzles interference



Picture 6. Combustor liners and HPT Stage 1 Nozzles

## 4.3 Turbine Section

| | turbine stage | | | | |
|---|---|---|---|---|---|
| **Port** | **L.E.** | **T.E.** | **blades** | **Remarks:** | **photo no:** |
| **18** | **1** | | **88** | | |
| **19** | | **1** | **88** | **See below notes.** | |
| **19** | **2** | | **90** | | |
| **20** | | **2** | | | |

**Notes:**
**The High Pressure Turbine section is not serviceable according to GEK105054 Volume II WP406 00 Table 8 paragraph g due to the 1st stage nozzles condition**

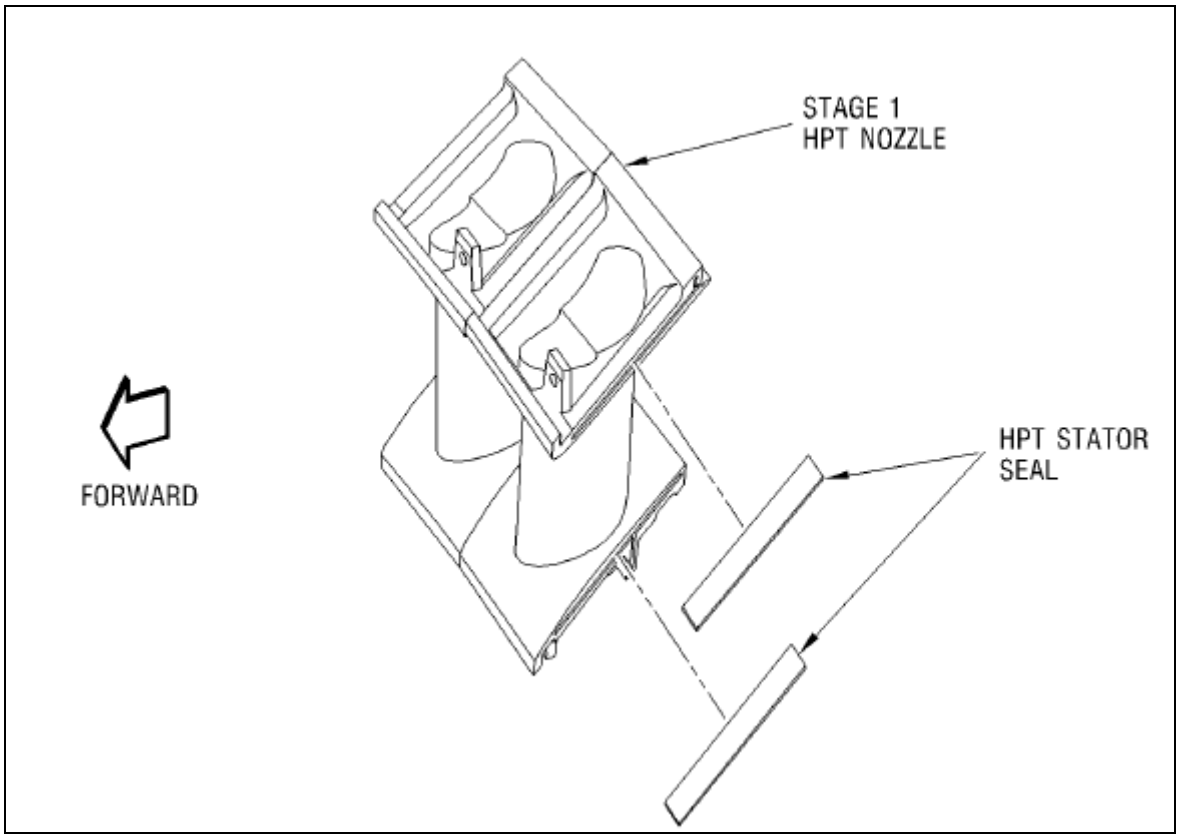



Figure 12: Stage 1 HPT Nozzle Seal Displacement

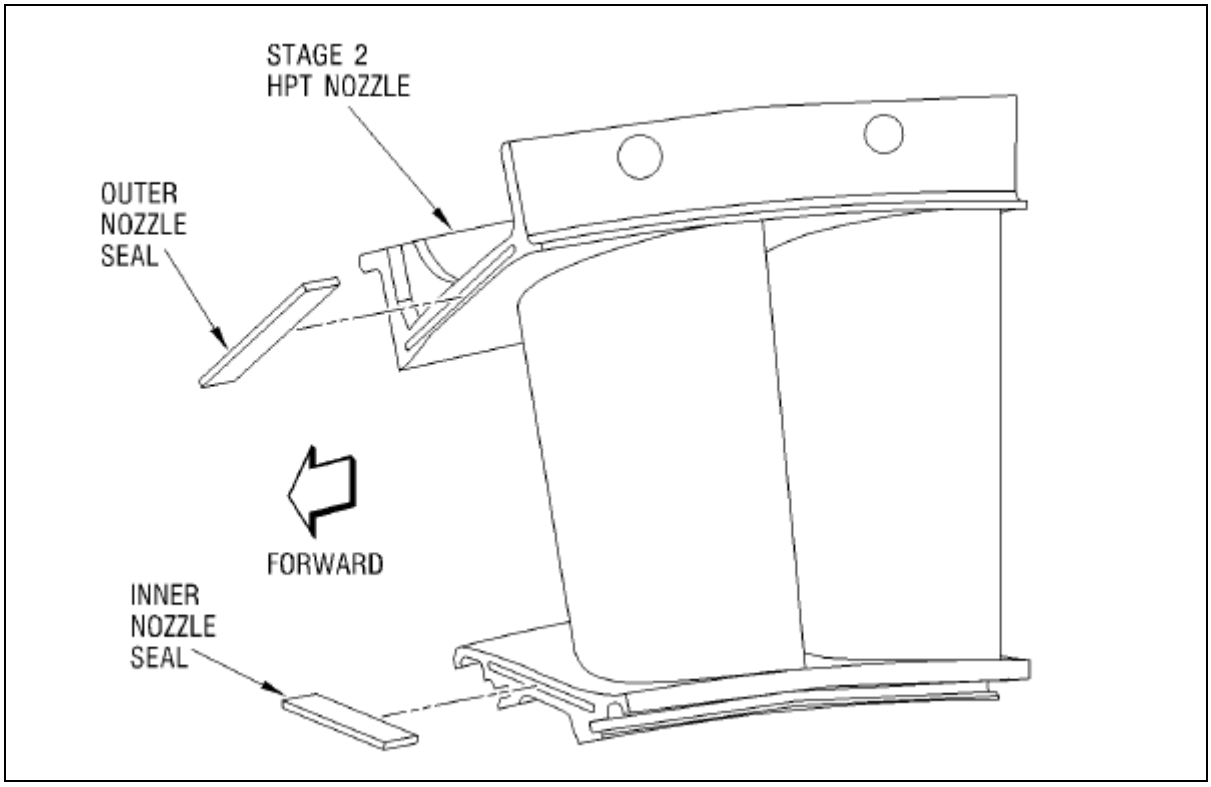


Figure 13: Stage 2 HPT Nozzle Seal Displacement

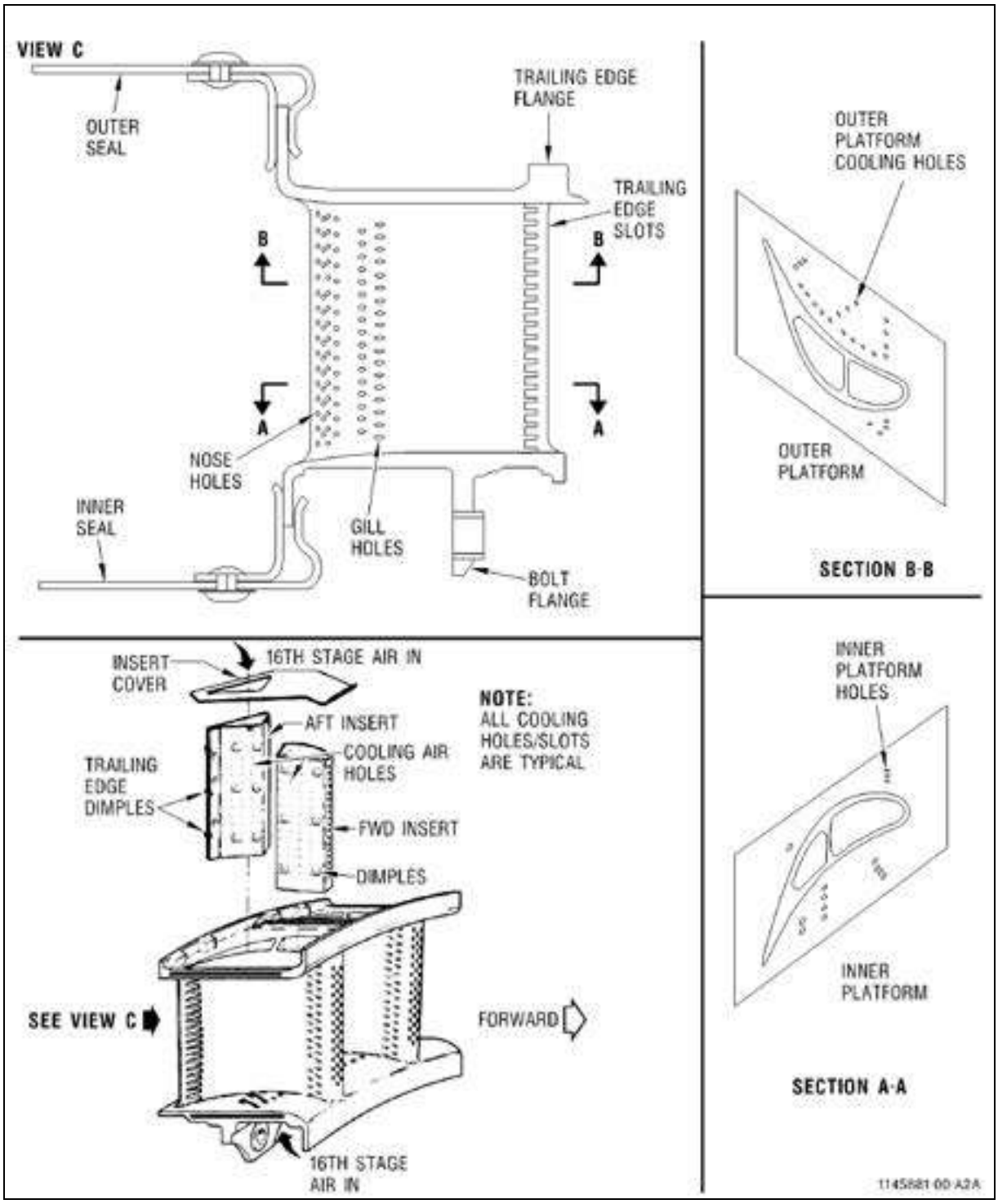



Figure 14: HPT Stage 1 Nozzle

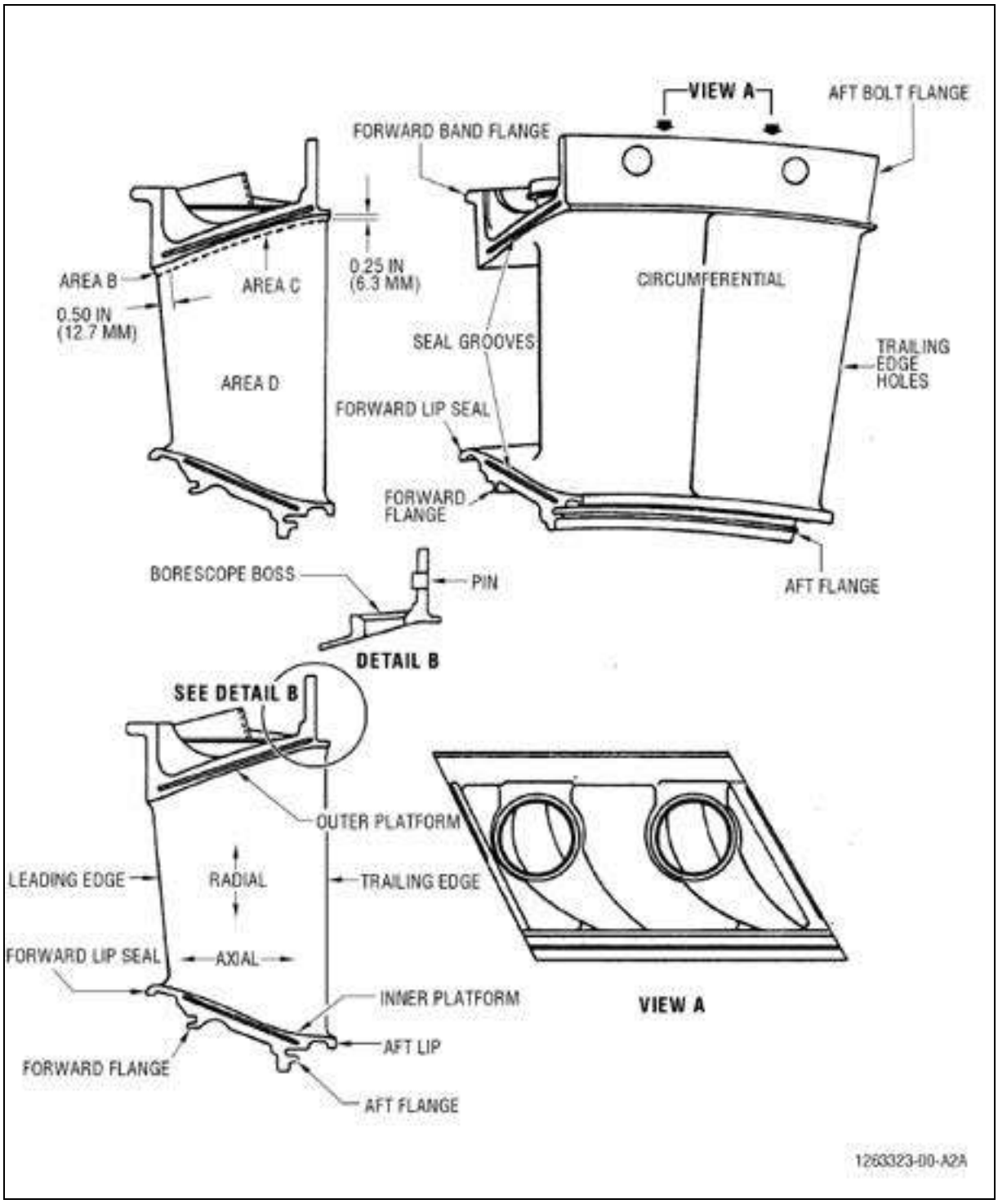



Figure 15: HPT Stage 2 Nozzle

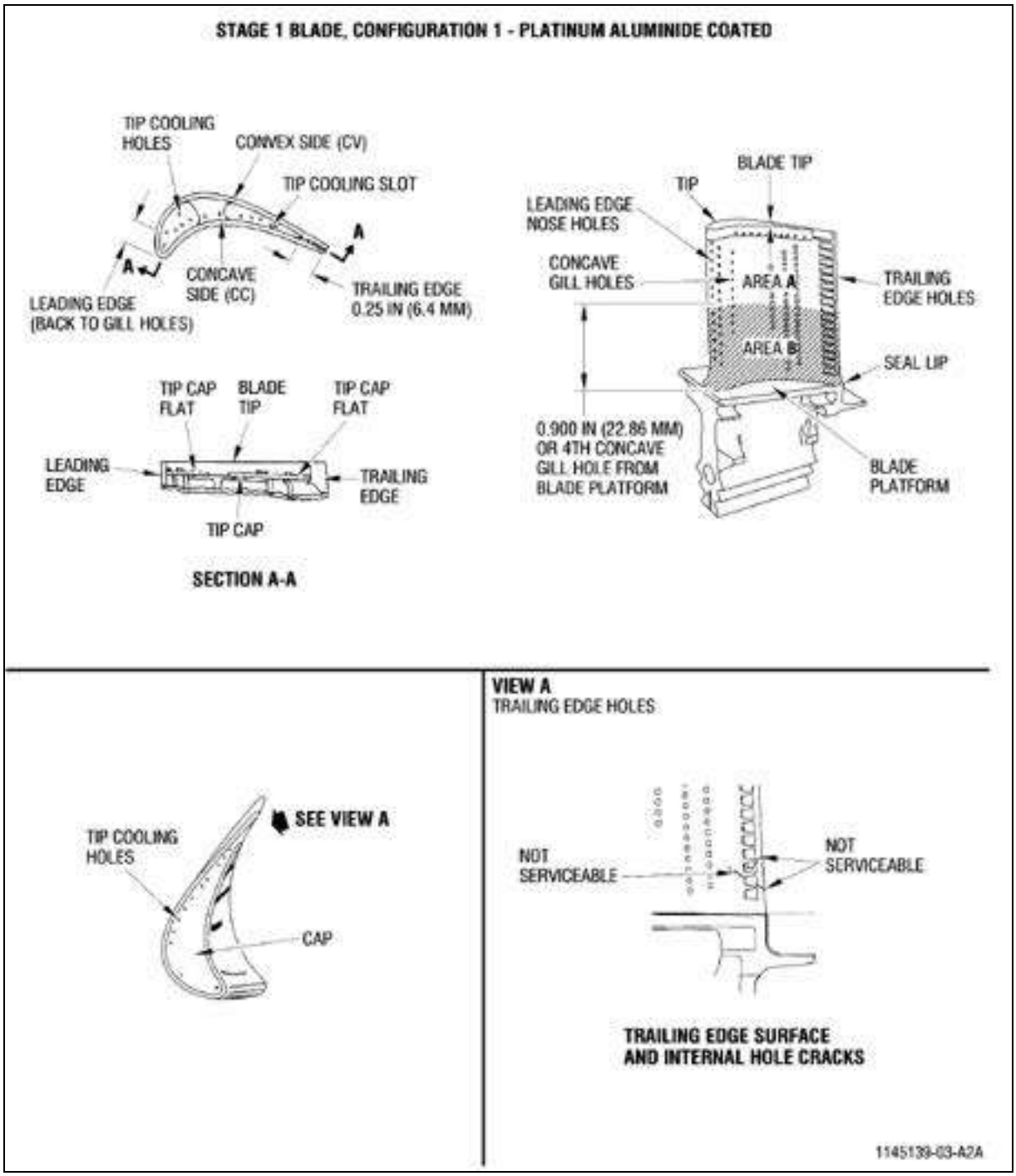



Figure 16: HPT Stage 1 Rotor Blades Inspection Areas (Platinum Aluminide Coated Blades)

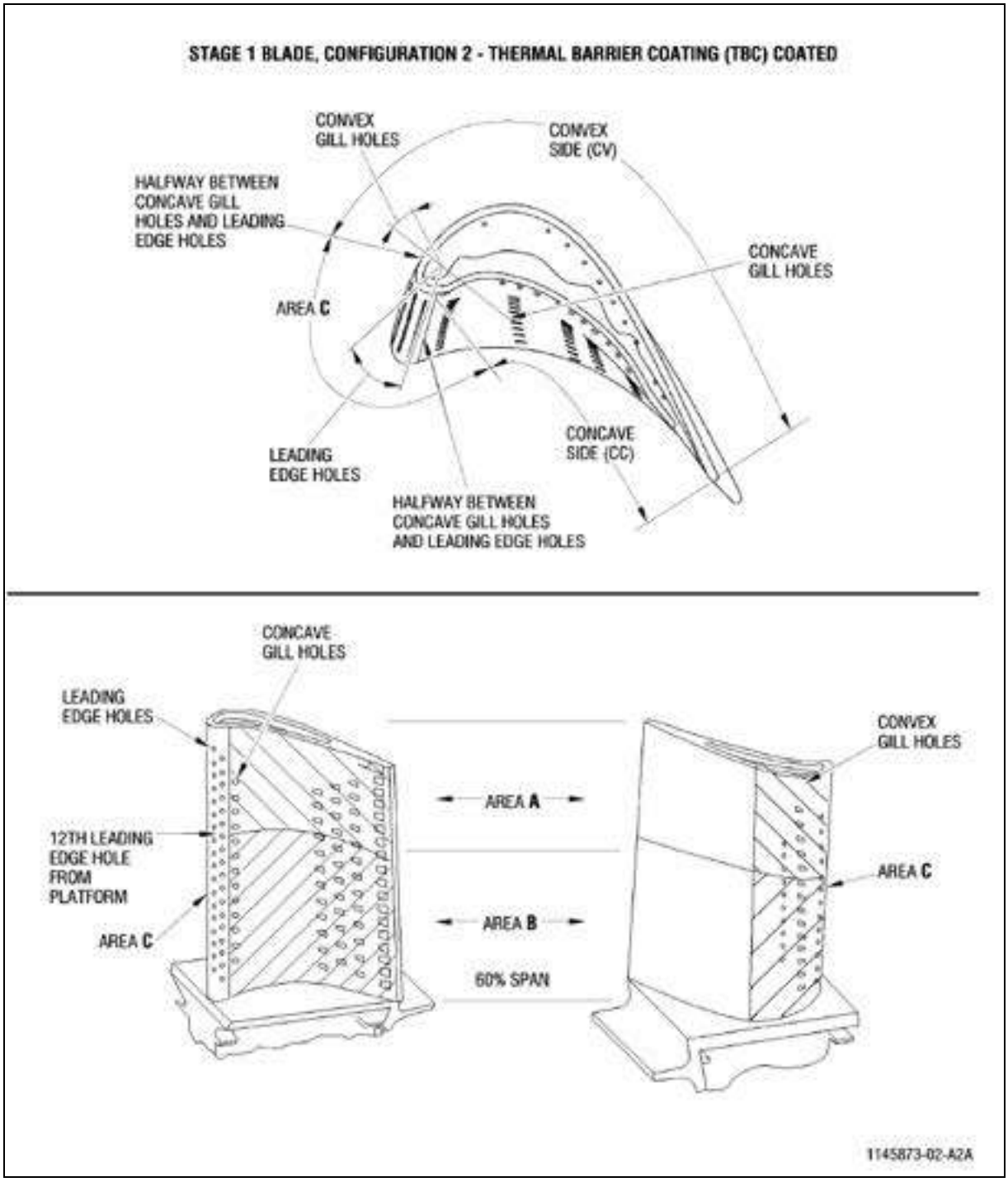


Figure 17: HPT Stage 1 Rotor Blades Inspection Areas (TBC Coated Blades)

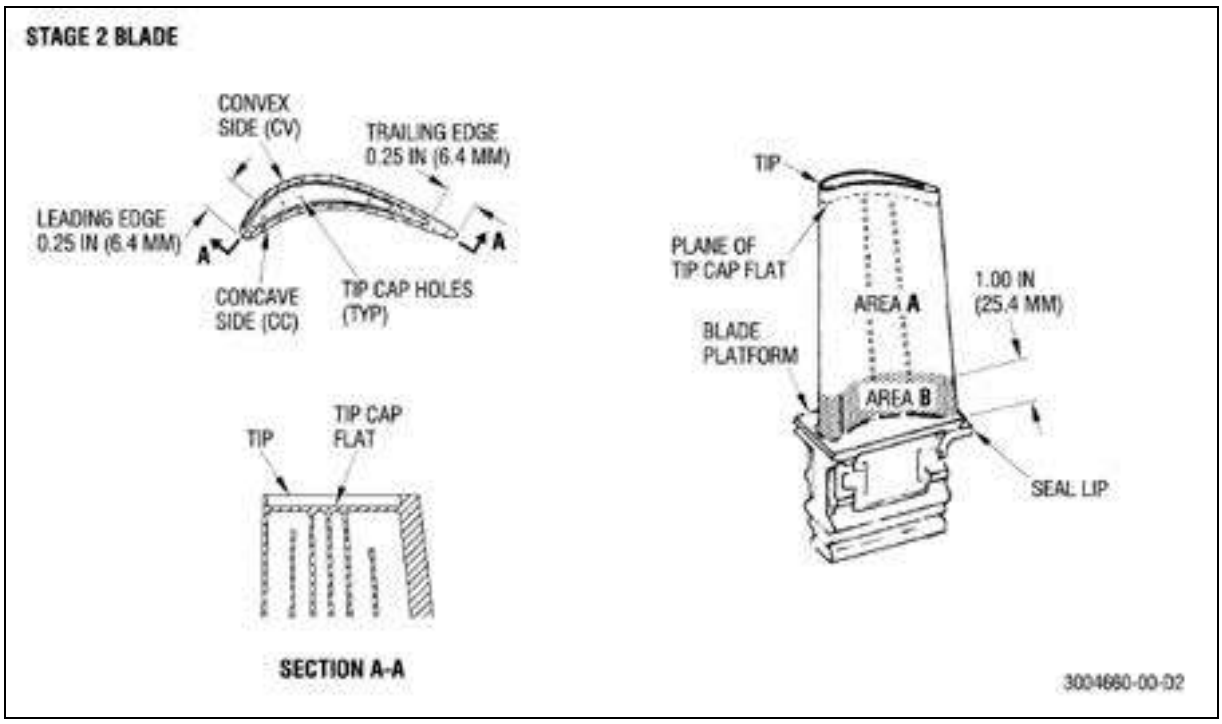



Figure 18: HPT Stage 2 Rotor Blades Inspection Areas

**Borescope Pictures**



Picture 7: Stage1 Nozzles leading edge



Picture 8: Stage1 Nozzle leading edge inner platform area



Picture 9: Stage1 Nozzle leading edge



Picture 10: Stage1 Nozzle concave side



Picture 11: Stage1 Nozzle leading edge inner platform area severe erosion



Picture 12: Stage1 Nozzle leading edge inner platform area severe erosion



Picture 13: Stage1 Nozzle leading edge erosion and cracks



Picture 14: Stage1 Nozzle leading edge erosion and cracks



Picture 15: Stage1 Nozzle airfoil concave side cracks



Picture 16: Stage1 Nozzle inner platform area cracks



Picture17: Stage1 Nozzle trailing edge area cracks



Picture 18: Stage1 Nozzle trailing edge burnt material



Picture 19: Stage1 Nozzle trailing edge deformation



Picture 20: Stage1 Nozzle trailing edge burnt material



Picture 21: Stage1 Nozzle trailing edge burnt material



Picture 22: Stage1 Nozzle trailing edge burnt material and deformation



Picture 23: Stage1 Blades leading edge



Picture 24: Stage1 Blades leading edge



Picture 25: Stage 1 Blades trailing edge



Picture 26: Stage 1 Blades trailing edge



Picture 27: Stage 2 Nozzles and Blades



Picture 28: Stage 2 Blades leading edge



Picture 29: Stage 2 Blades trailing edge



Picture 30: Stage 2 Blades trailing edge

## 4.4 LPT Section

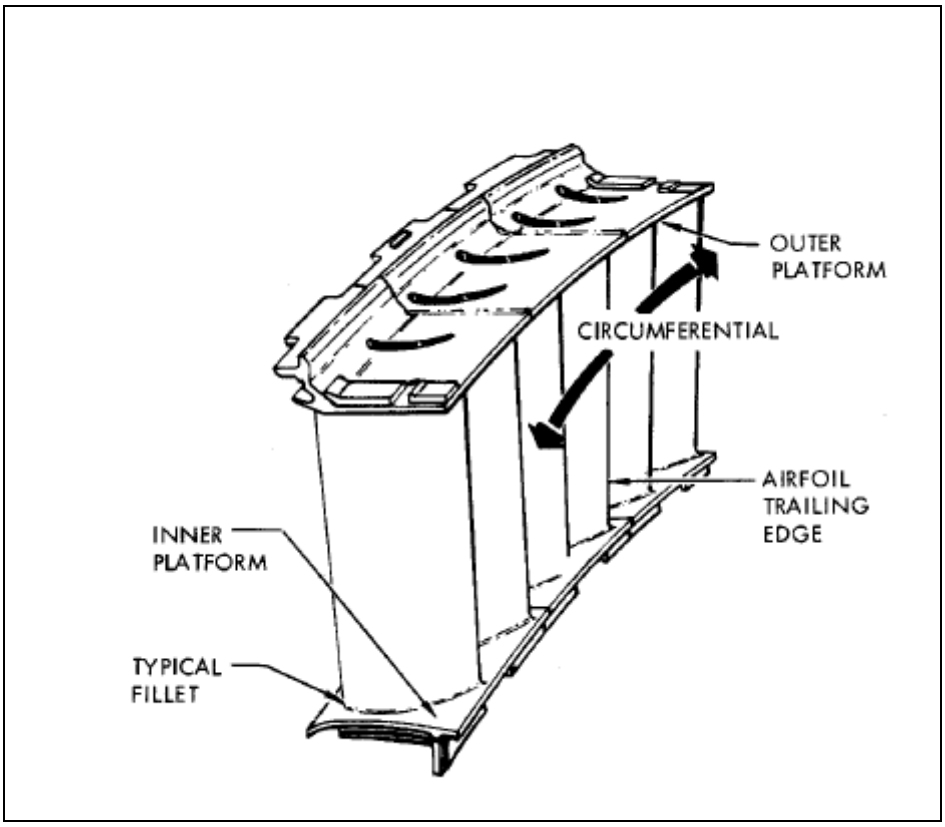



Figure 19: Power Turbine Nozzles

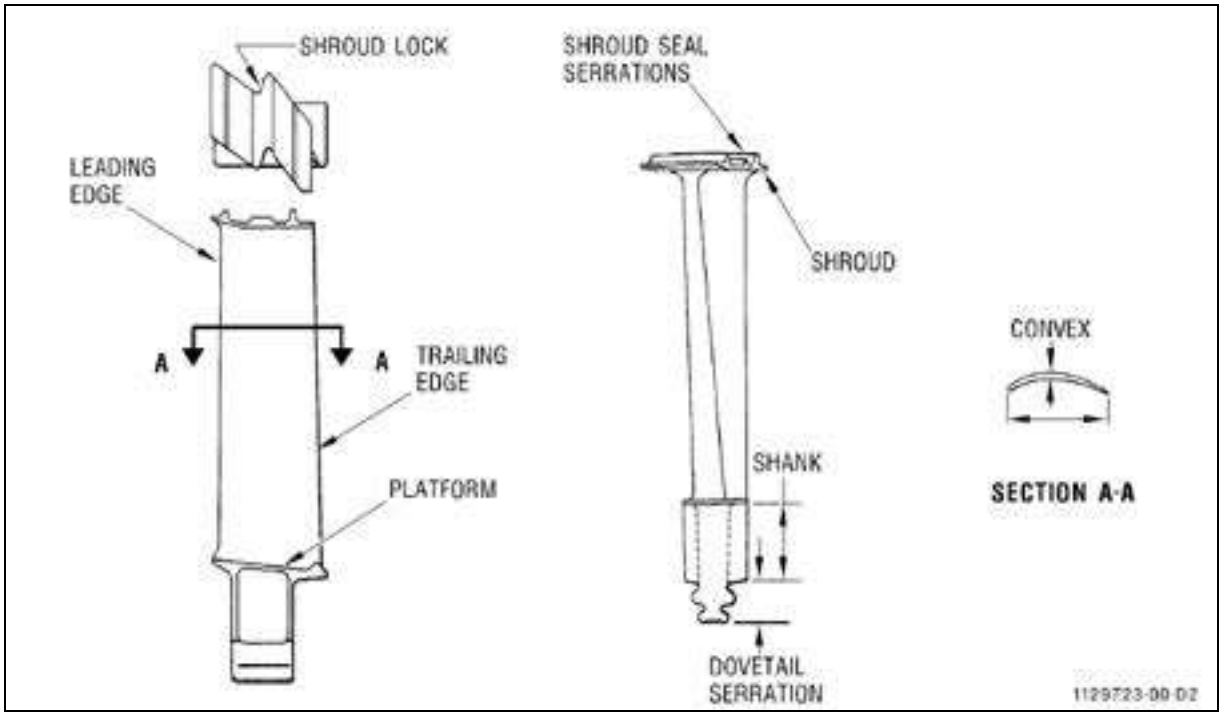



Figure 20: Power Turbine Rotor Blades

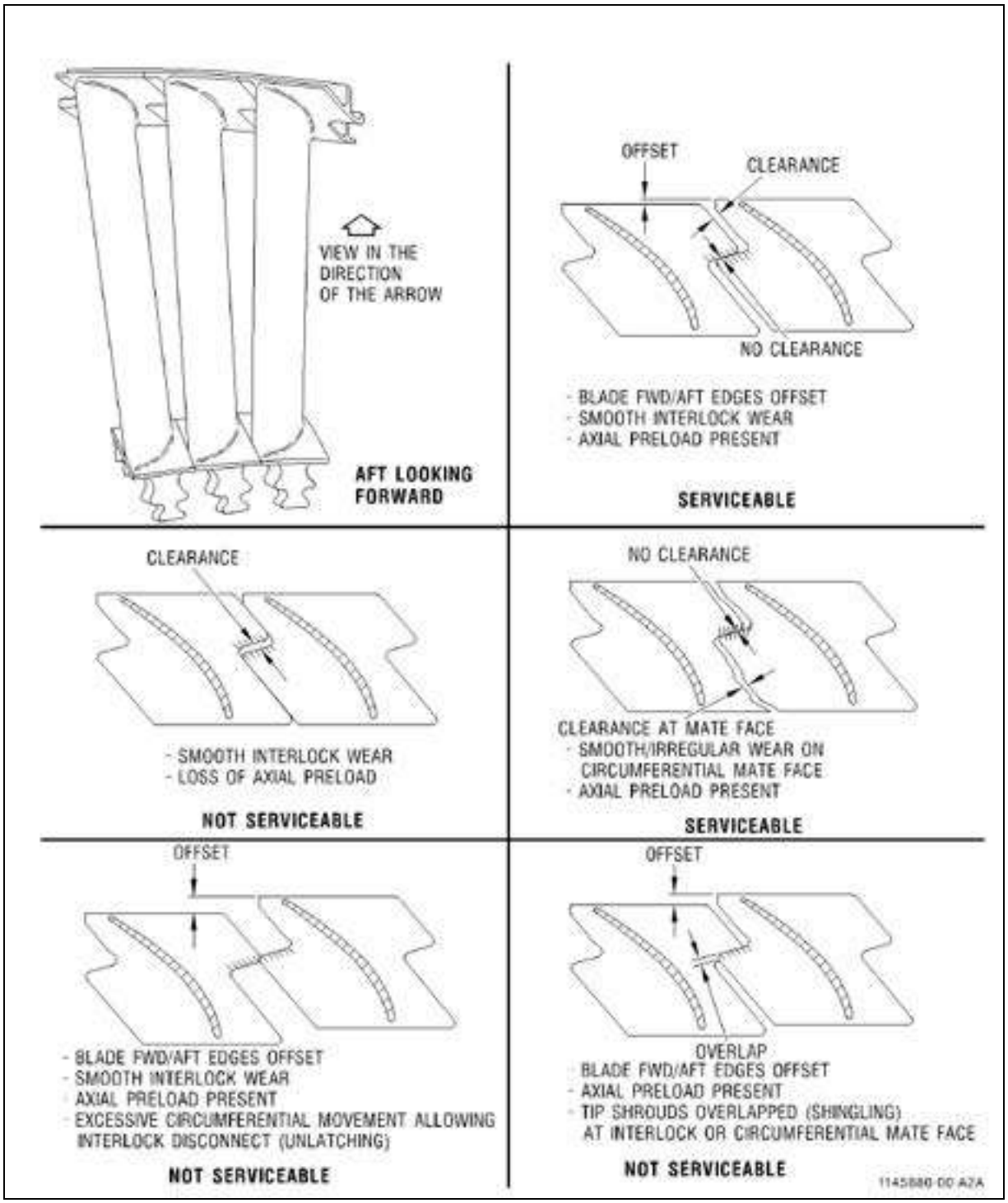


Figure 21: LPT Rotor Blade Circumferential Inspection

**Notes:**

The LPT wasn’t inspected.

# *BORESCOPE INSPECTION REPORT*
# *TM2500 GEN. 6-7*
# *7LM2500 – PK – MDWG05*

## NFE SAN JUAN POWER PLANT

## *PACKAGE # 7253290*

## *UNIT #10*

| | | | |
|---|---|---|---|
| **Visit Date:** | 01/07/2024 | **Total Starts:** | 406 |
| **Engine S/N:** | 557 – 262 | **GG Hours:** | 4985 |
| **Power Turbine S/N:** | 557 - 262 | **PT Hours:** | 4985 |
| **PPG GT Field Engineer:** | JC Requena H | **NFE Representative:** | Lance Florent |



# TABLE OF CONTENTS


1 Conclusions and Recommendations .....3
2 Outage Data .....4
3 Borescope Inspection Checklist.....5
4 Borescope Inspection Record.....6
4.1 Compressor Section .....9
4.2 Combustor and 1St Stage Nozzle Section.....12
4.3 Turbine Section.....18
4.4 LPT Section .....27

## 1. Conclusions and Recommendations

**Purpose of visit:**
The purpose of this visit was to perform a borescope inspection of the Engine Hot Section in accordance with GEK105054, WP 406 00.

1.1 The Combustor section condition remains the same than last BSI. Nothing to remark.

1.2 The HPT stage 1 and 2 Blades condition remains the same than last BSI. Nothing to remark.

1.3 The HPT stage 2 Nozzles condition remains the same than last BSI. Nothing to remark.

1.4 The HPT 1st stage nozzles degradation showed minor evolution of the damages found during the previous BSI. The trailing edge areas that were affected by burnt distress have slightly increased after 876 hours of operation.

Most of the nozzles cooling gill holes in the concave side of the airfoil are still visible and not clogged.

## 2. Outage Data

**ENGINE DATA**

| | | | | | |
|---|---|---|---|---|---|
| **ESN:** | 557-262 | **Engine Fired Hours:** | 4985 | **Package Hours:** | 4985 |
| **Model:** | 7LM2500-PK-MDWG05 | **Engine Fired starts:** | 406 | **Package Fired Starts:** | 406 |

**MAINTENANCE DATA**

| WP, SB, SL, PB, PL Performed | GEK105054, REV 11 | Date completed | Comments |
|---|---|---|---|
| WP 406 00 | Borescope Inspection | 07JAN24 | Not Serviceable |

**PARTS DATA**

| Description | PN Removed | SN Removed | Qty | Disposition | PN Installed | SN Installed |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |

## 3. Borescope Inspection Checklist

**Date unit out of operation:** 07JAN24
**Date unit into operation:** 07JAN24
**Last inspection date:** 30NOV23; 4109 Hrs.

**Type of Fuel:** Gas
**Type of outage:** Scheduled

**Type of NOx suppression:** Water Injection

**Inspection of gas turbine:**

| WATERWASH: | HIGH PRESSURE COMPRESSOR: |
|---|---|
| ☐ PERFORMED WATER WASH | ☐ HPC BORESCOPE INSPECTION |
| **COMBUSTOR:** | **HIGH PRESSURE TURBINE** |
| ☒ COMBUSTOR BORESCOPE INSPECTION | ☒ HPT STAGE 1 & 2 NOZZLE BORESCOPE INSPECTION |
| | ☒ HPT BLADE BORESCOPE INSPECTION |
| **LOW PRESSURE TURBINE:** | |
| ☐ LPT BORESCOPE INSPECTION | |

☒ ***Please verify all borescope plugs have been reinstalled***

## 4. Borescope Inspection Record

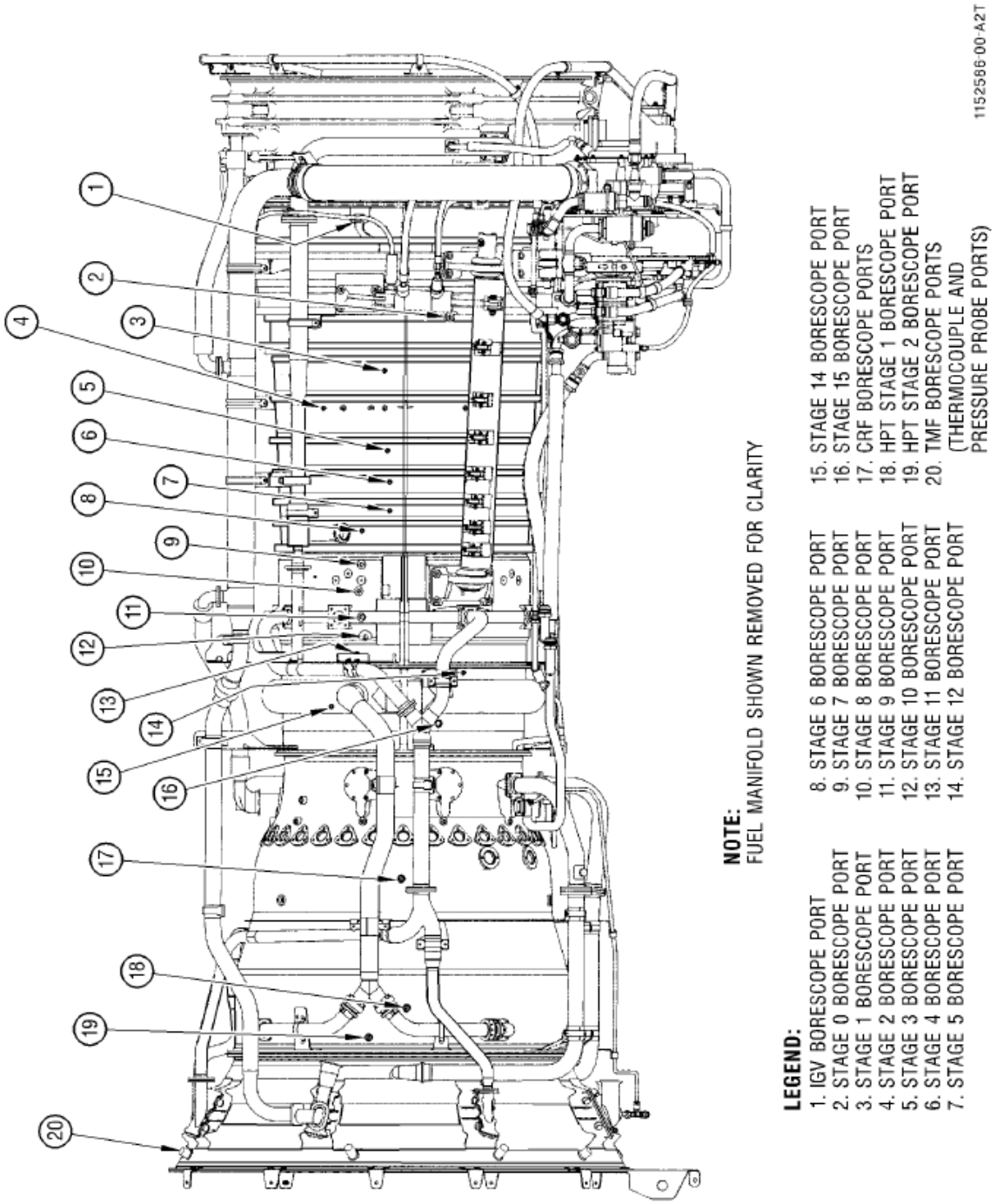



Figure 1: Position of Borescope Inspection Ports.

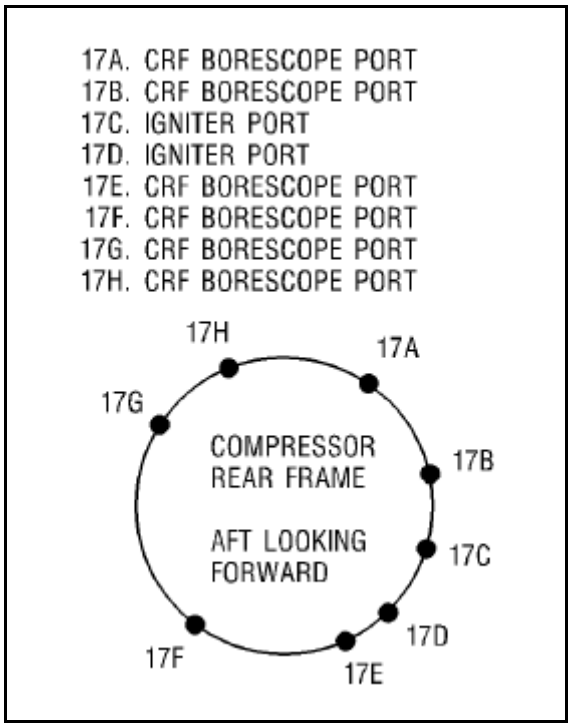


Figure 2: Position of Borescope Inspection Ports.

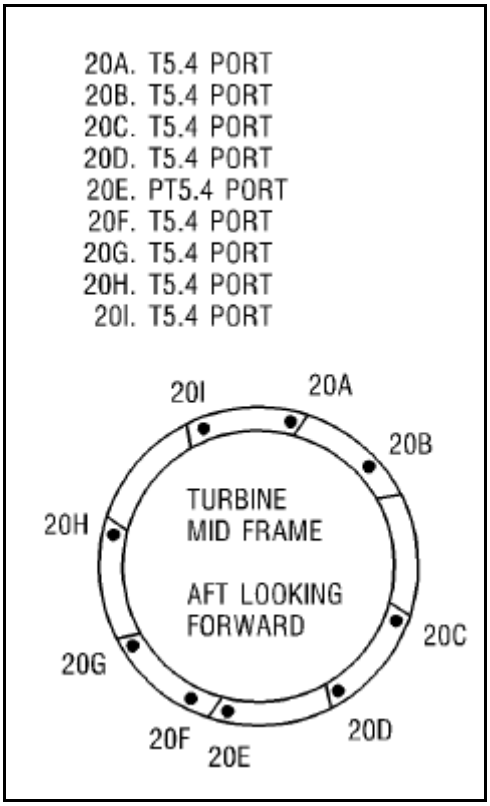


Figure 3: Position of Borescope Inspection Ports.

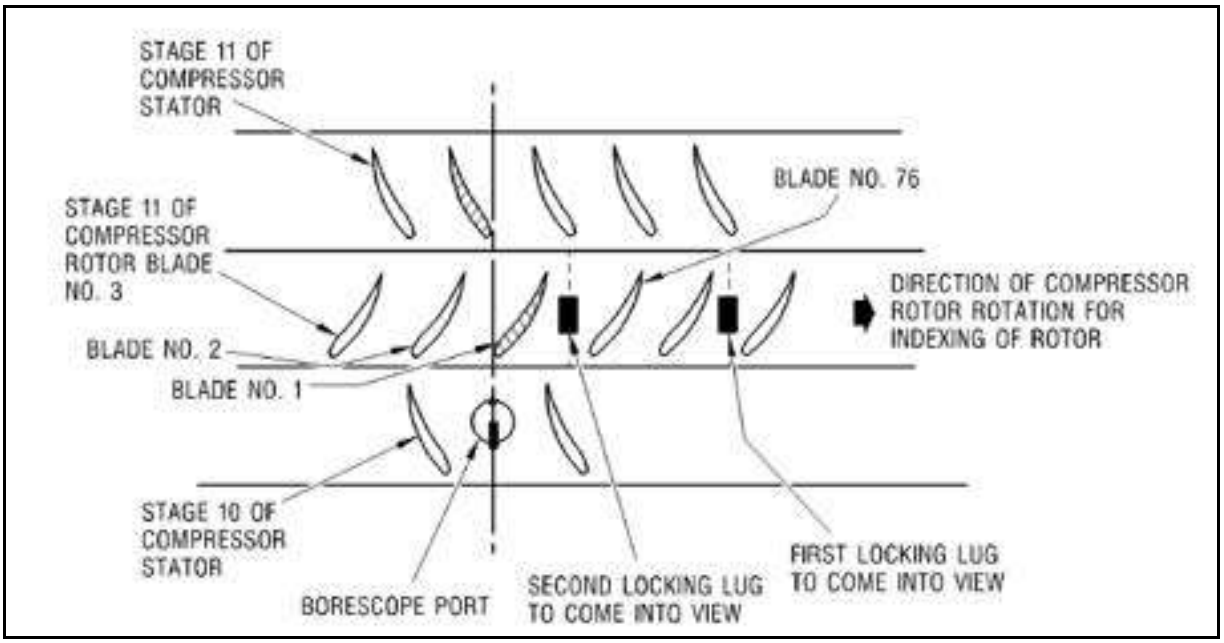


Figure 4: Zero indexing of HPC rotor and HPT rotor

## 4.1 Compressor Section

| Port | T.E. | L.E. | blades | Remarks: | photo no: |
|---|---|---|---|---|---|
| 1 | IGV | | | | |
| 1 | | 0 | 36 | | |
| 2 | 0 | | 36 | | |
| 2 | | 1 | 26 | | |
| 3 | 1 | | 26 | | |
| 3 | | 2 | 26 | | |
| 4 | 2 | | 26 | | |
| 4 | | 3 | 42 | | |
| 5 | 3 | | 42 | | |
| 5 | | 4 | 45 | | |
| 6 | 4 | | 45 | | |
| 6 | | 5 | 48 | | |
| 7 | 5 | | 48 | | |
| 7 | | 6 | 54 | | |
| 8 | 6 | | 54 | Blades contacting tip | |
| 8 | | 7 | 56 | Blades contacting tip | |
| 9 | 7 | | 56 | | |
| 9 | | 8 | 64 | | |
| 10 | 8 | | 64 | | |
| 10 | | 9 | 66 | | |
| 11 | 9 | | 66 | | |
| 11 | | 10 | 66 | | |
| 12 | 10 | | 66 | | |
| 12 | | 11 | 76 | | |
| 13 | 11 | | 76 | | |
| 13 | | 12 | 76 | | |
| 14 | 12 | | 76 | | |
| 14 | | 13 | 76 | | |
| 15 | 14 | | 76 | Inside bleed manifold | |
| 15 | | 15 | 76 | Inside bleed manifold | |
| 16 | 15 | | 76 | | |
| 16 | | 16 | 76 | | |

**Notes:**
The HPC Section was not inspected

.

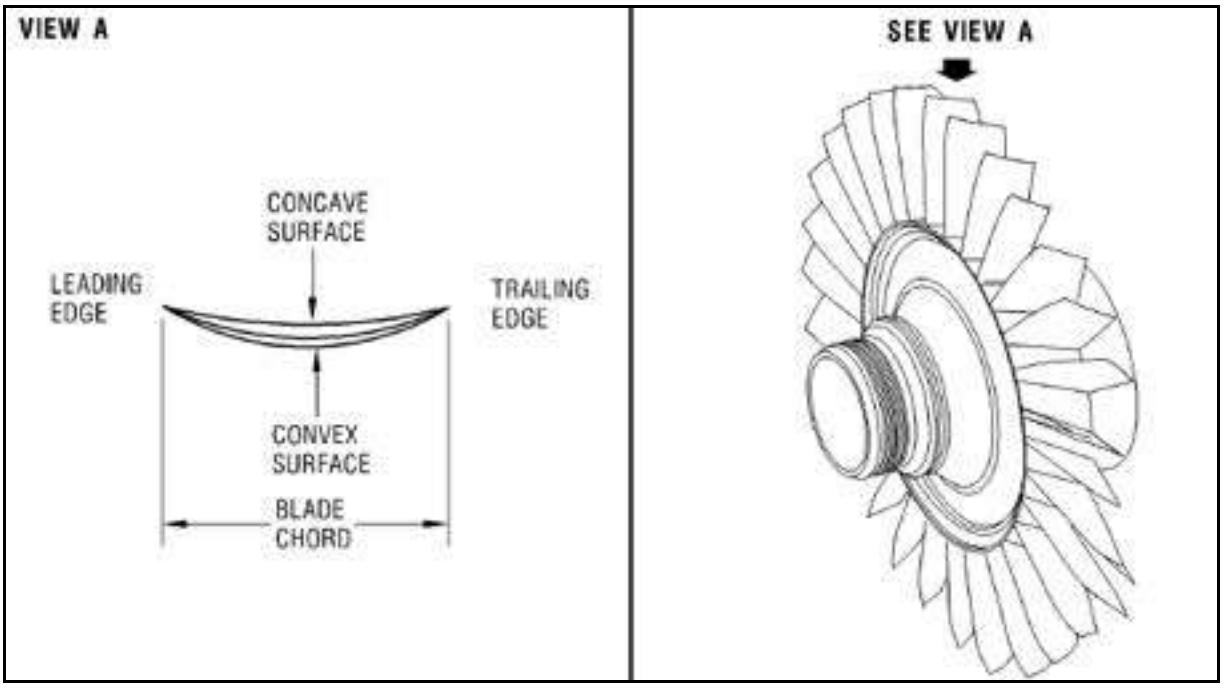



Figure 5: HPC stage 0 BLISK

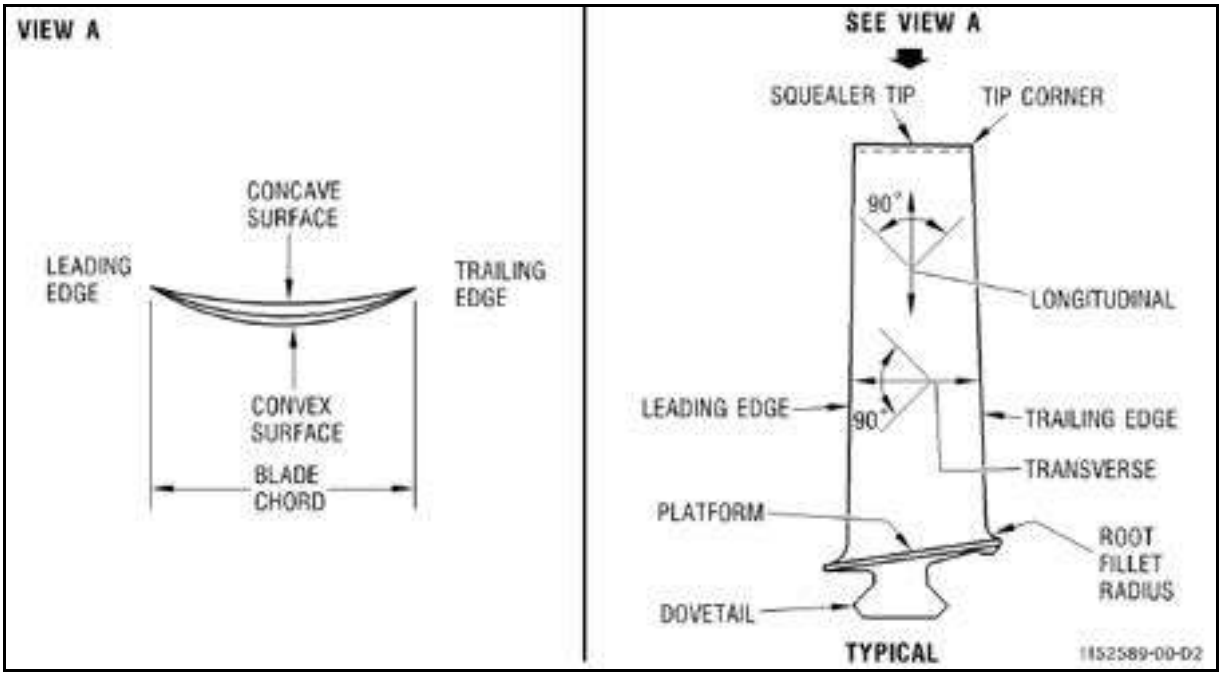



Figure 6: Compressor Rotor Blades

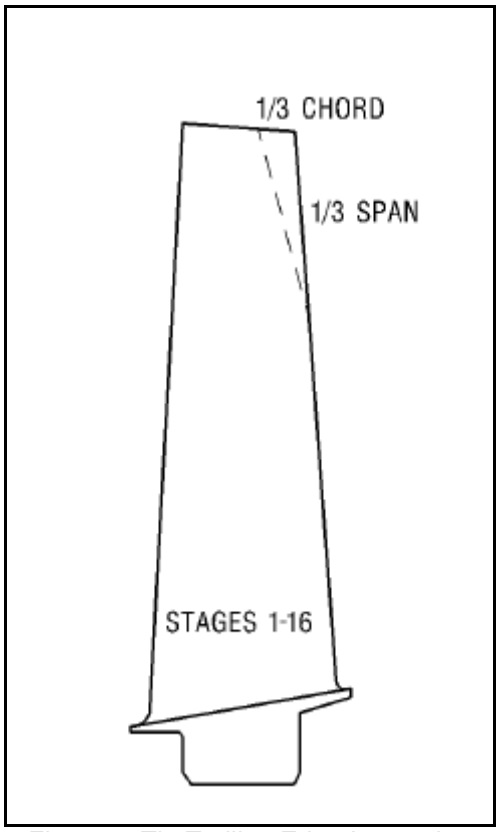


Figure 7: Tip Trailing Edge Inspection

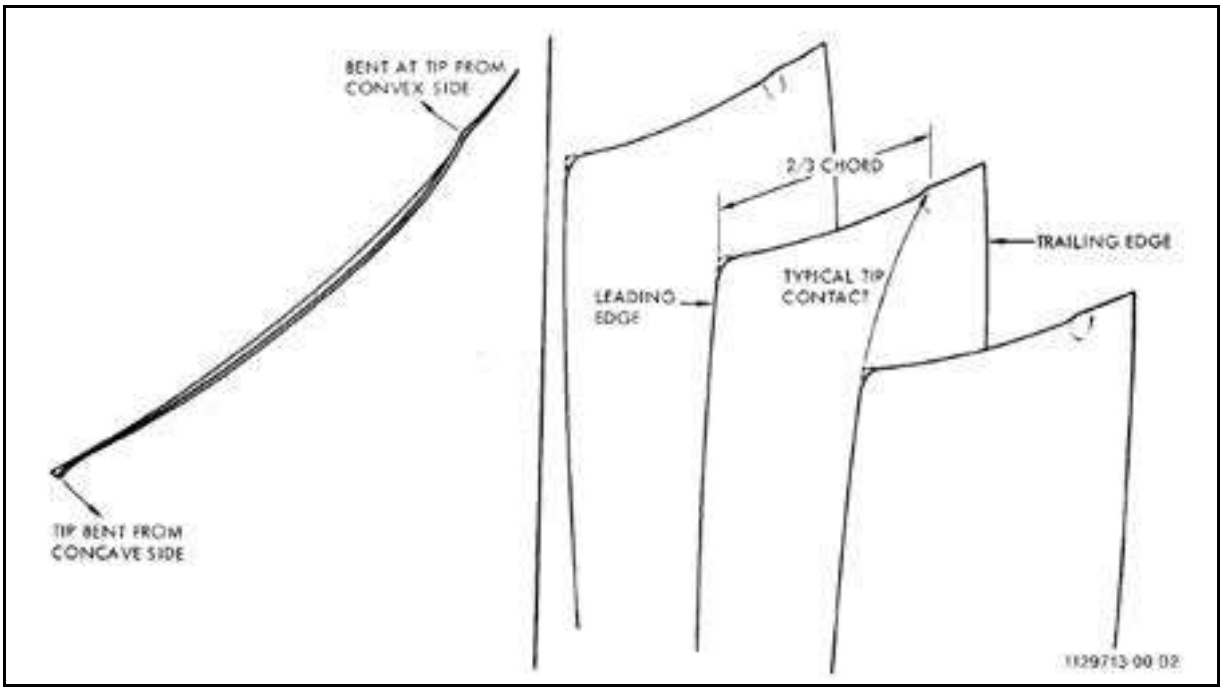
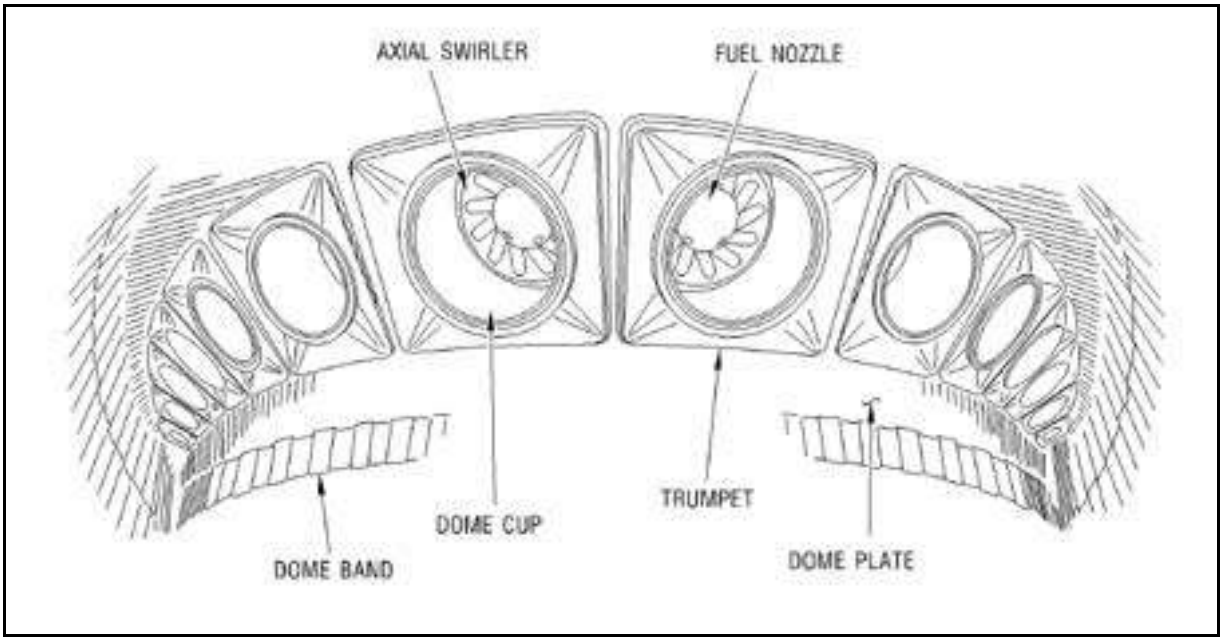


Figure 8: Tip Clanging Contact (HPCR stage 3 through 6)

4.2 Combustor and 1St Stage Nozzle Section

| Port | Condition observed | Photo no: |
|---|---|---|
| **17A** | | |
| **17B** | | |
| **17C** | | |
| **17D** | **See below notes.** | |
| **17E** | | |
| **17F** | | |
| **17G** | | |
| **17H** | | |
| **17** | 1st stage nozzle (leading edge): | |

**Notes:**
The Combustor section is serviceable according to GEK105054 Volume II WP4000 Table 7.



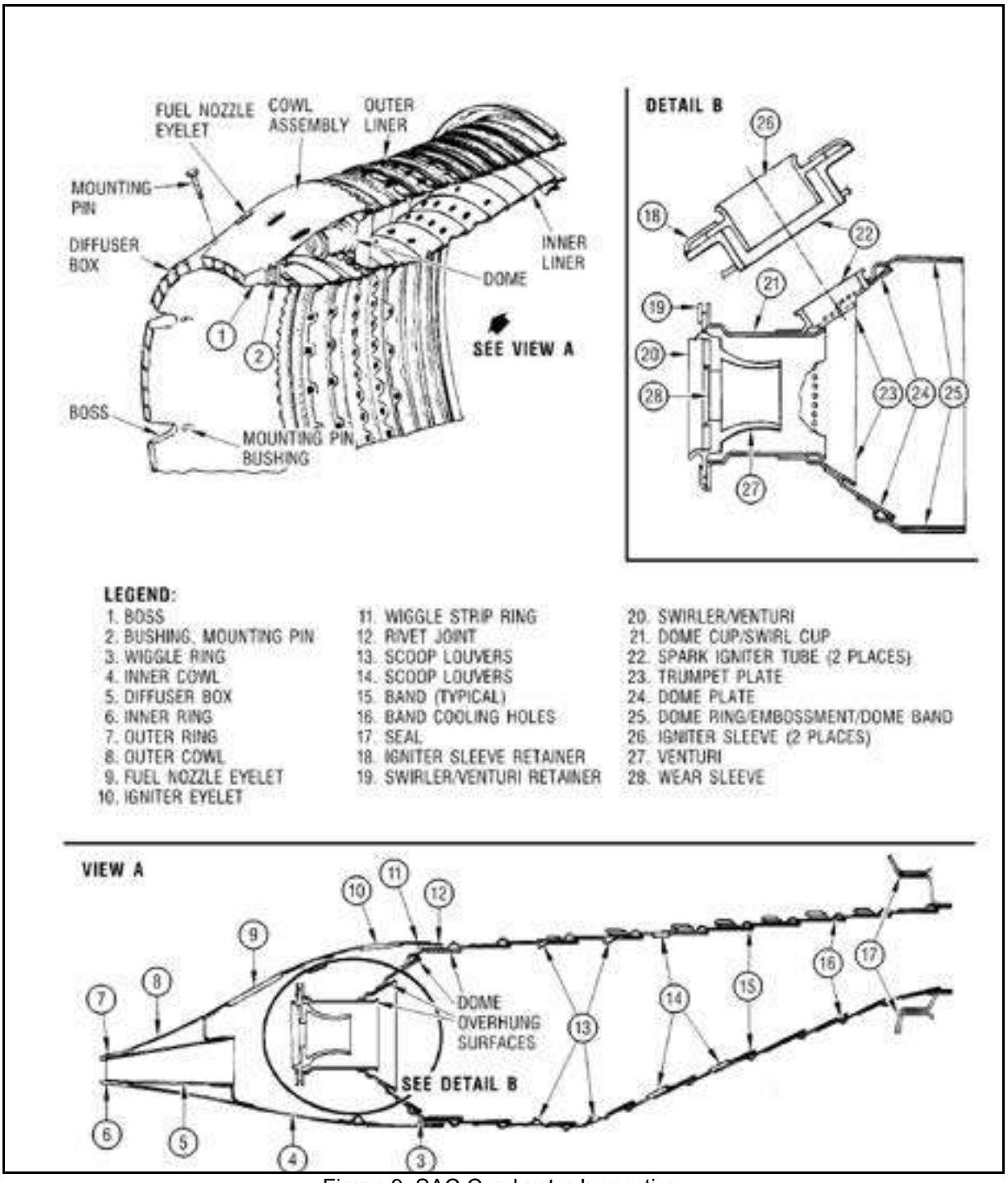



Figure 9: SAC Combustor Inspection

Figure 10: SAC Combustor Inspection

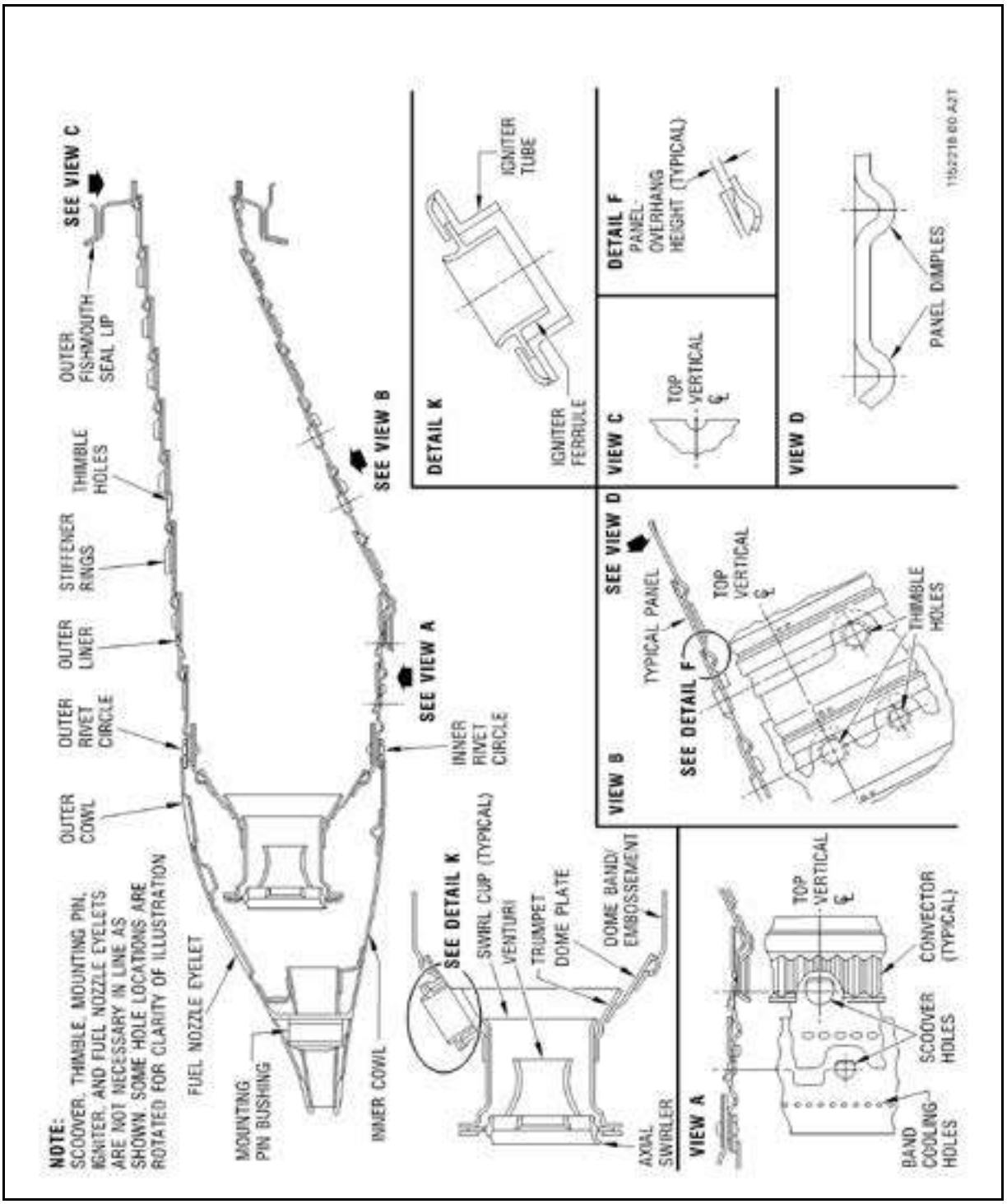



Figure 11: SAC Combustor Inspection

**Borescope Pictures**



Picture 1. Combustor dome



Picture 2. Combustor liners



Picture 3. Combustor outer liner



Picture 4. Combustor to HPT interference area



Picture 5. Combustor dome



Picture 6. Combustor dome

## 4.3 Turbine Section

| | turbine stage | | | | |
|---|---|---|---|---|---|
| **Port** | **L.E.** | **T.E.** | **blades** | **Remarks:** | **photo no:** |
| **18** | **1** | | **88** | | |
| **19** | | **1** | **88** | **See below notes.** | |
| **19** | **2** | | **90** | | |
| **20** | | **2** | | | |

**Notes:**
**The High Pressure Turbine section is not serviceable according to GEK 105054 Volume II WP406 00 Table 8 paragraph g due to the 1st stage nozzles condition**

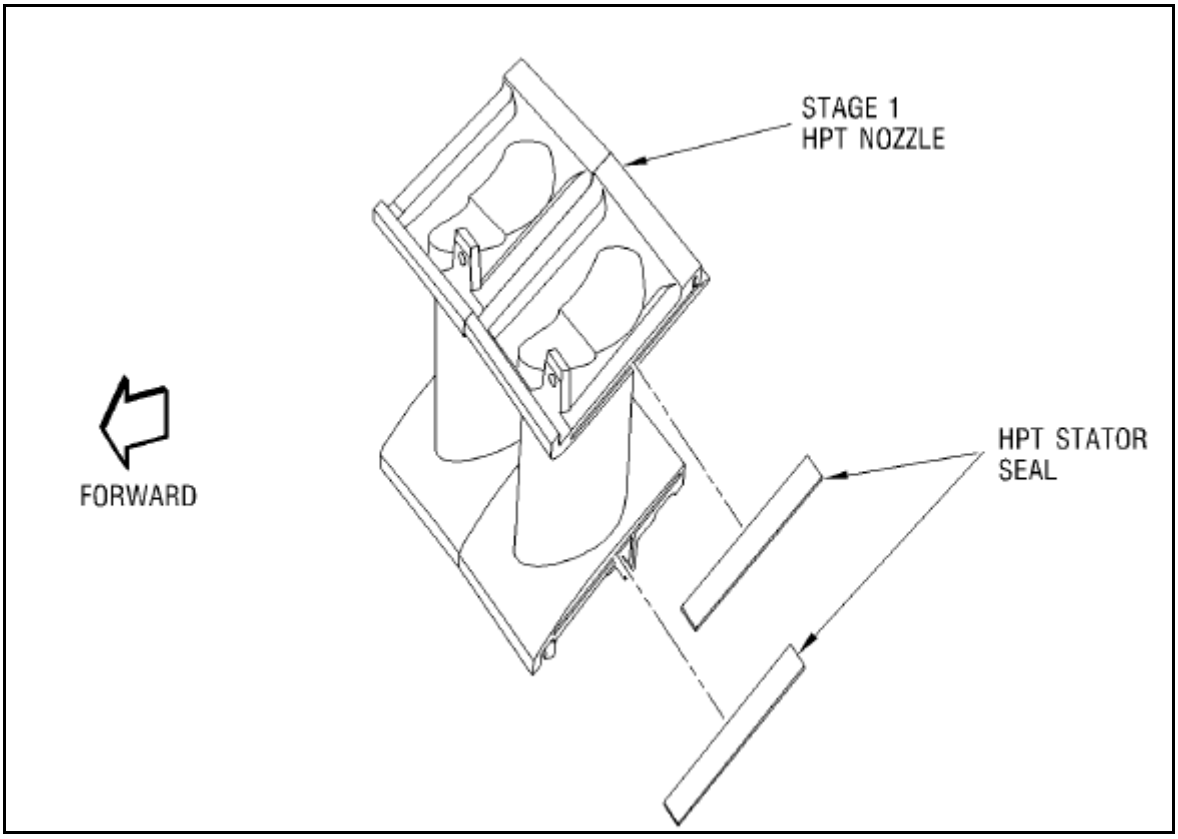



Figure 12: Stage 1 HPT Nozzle Seal Displacement

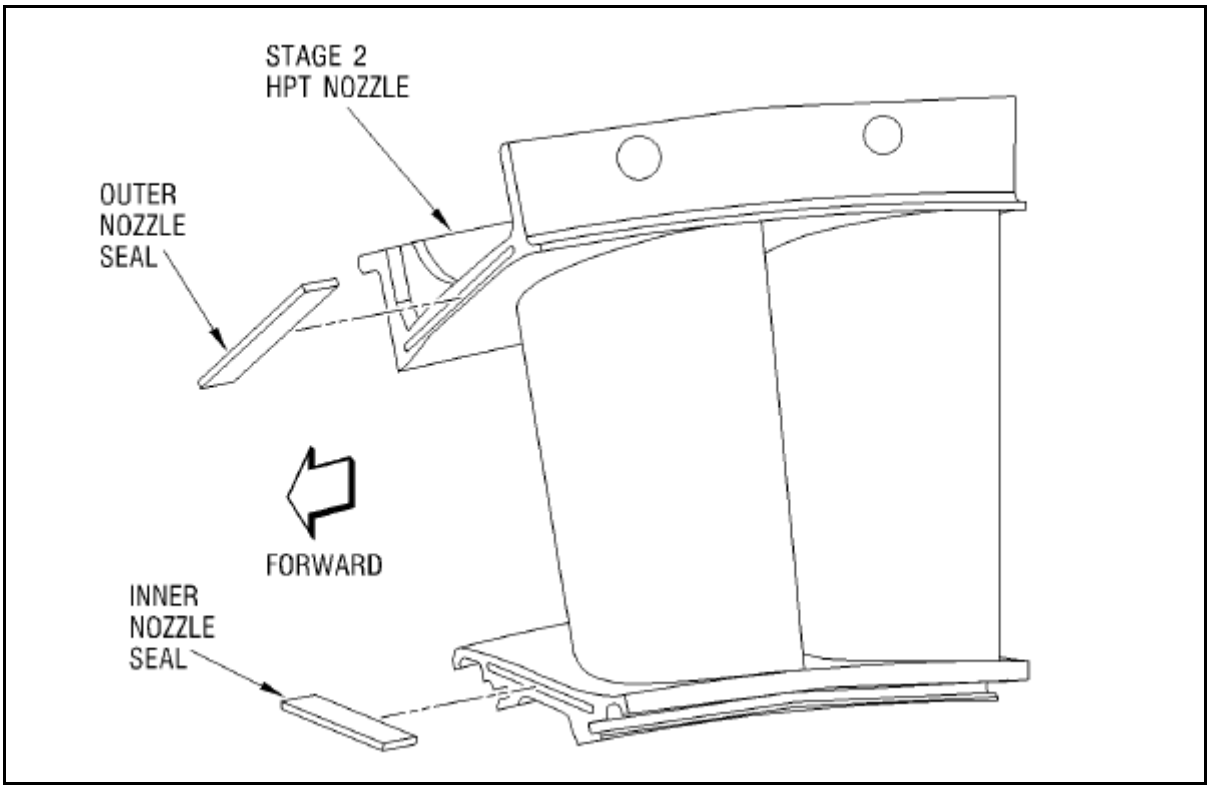


Figure 13: Stage 2 HPT Nozzle Seal Displacement

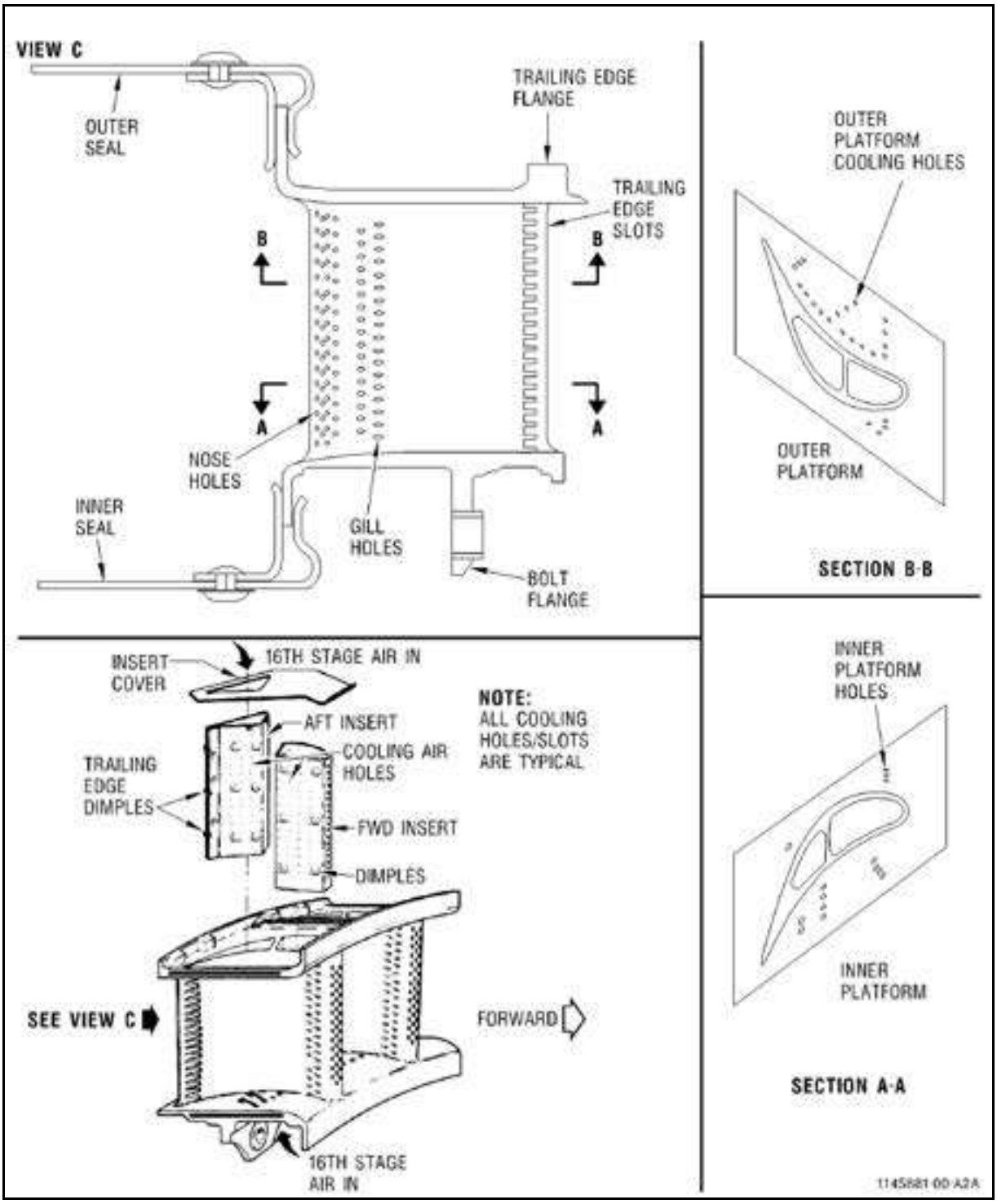



Figure 14: HPT Stage 1 Nozzle

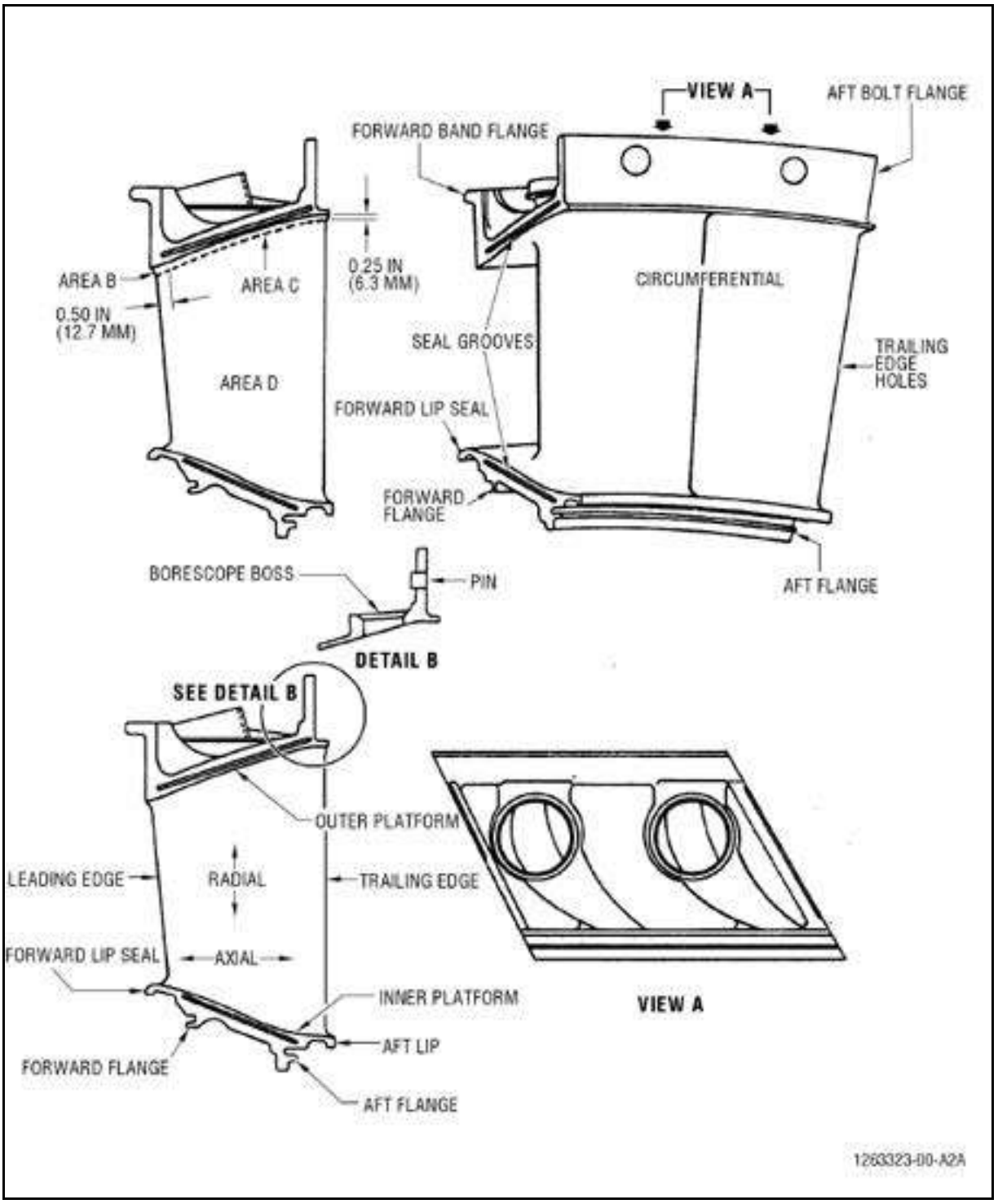



Figure 15: HPT Stage 2 Nozzle

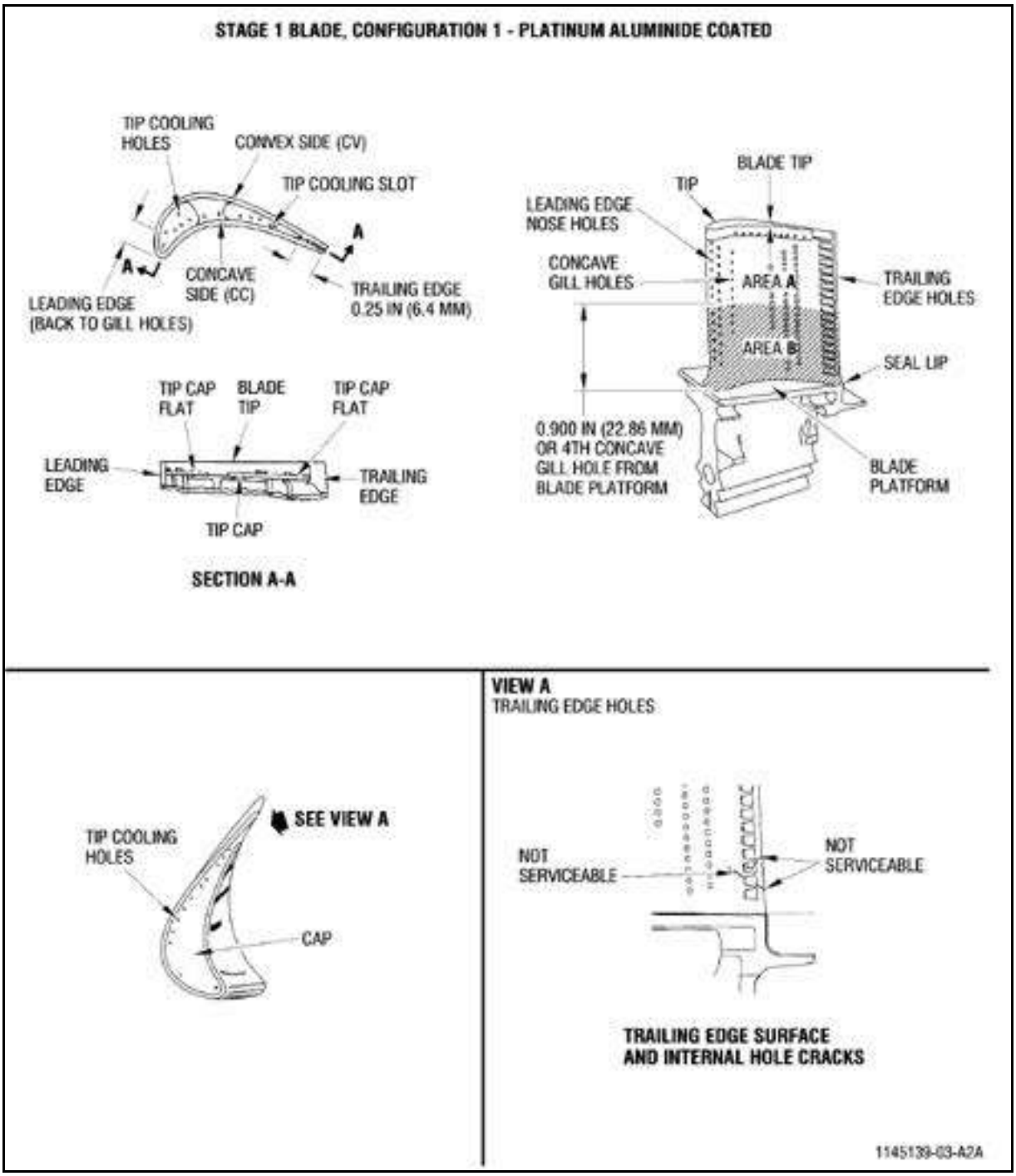



Figure 16: HPT Stage 1 Rotor Blades Inspection Areas (Platinum Aluminide Coated Blades)

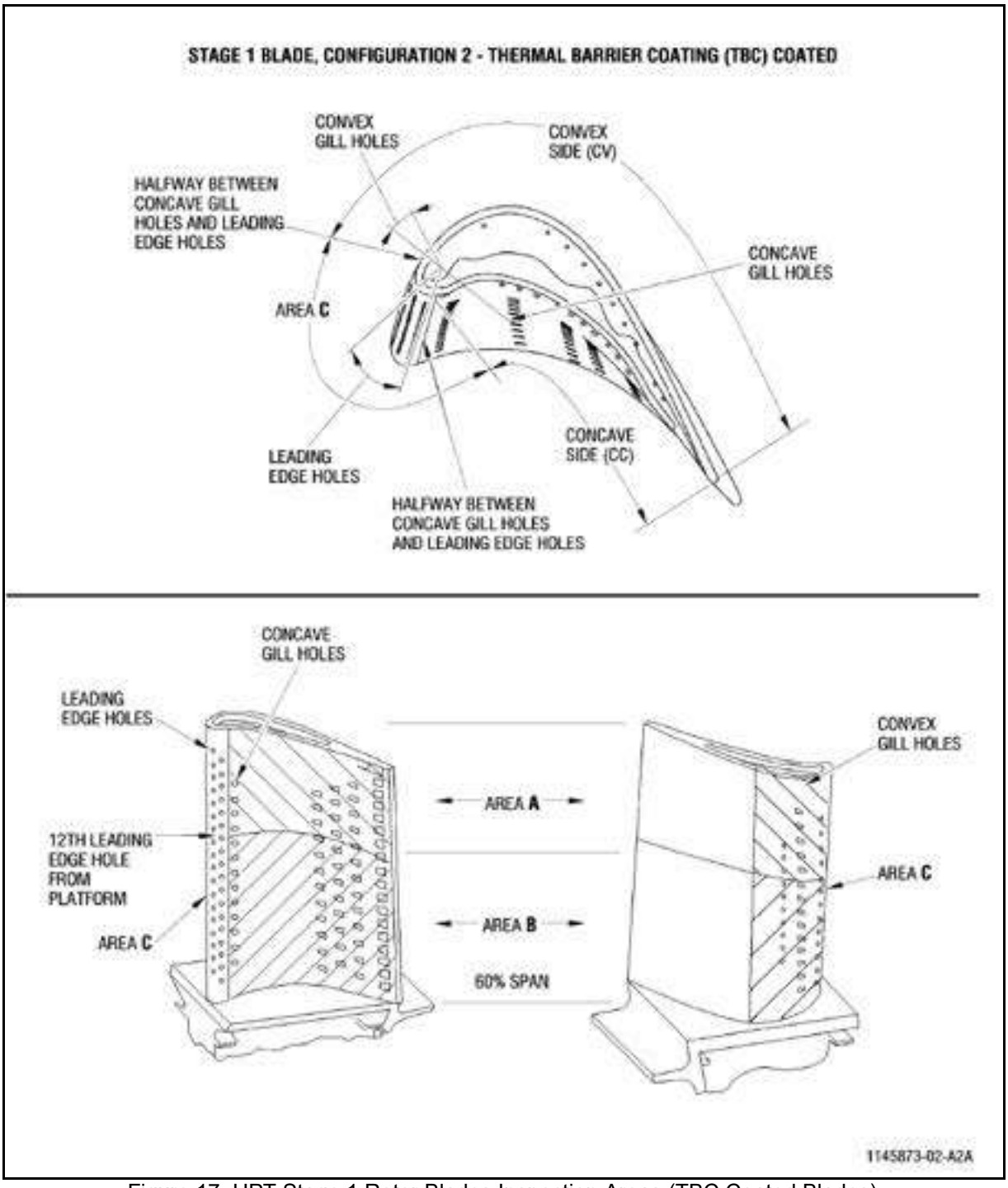


Figure 17: HPT Stage 1 Rotor Blades Inspection Areas (TBC Coated Blades)

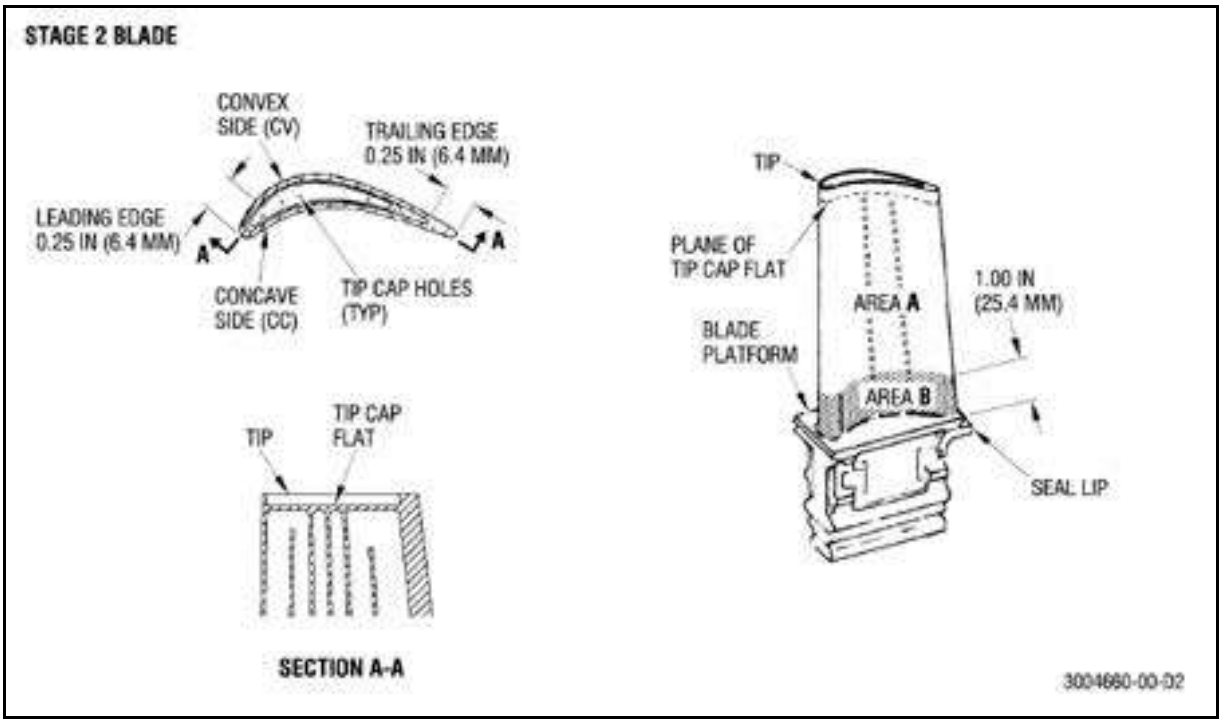



Figure 18: HPT Stage 2 Rotor Blades Inspection Areas

**Borescope Pictures**



Picture 7: Trailing edge burnt are comparison. 30NOV23



Picture 8: Trailing edge burnt are comparison. 07JAN24



Picture 9: Stage1 Nozzles leading edge. Outer platform



Picture 10: Stage1 Nozzles leading edge. Inner platform



Picture 11: Stage1 Nozzles concave side. Gill holes visible



Picture 12: Stage1 Nozzles trailing edge cooling slots



Picture 13: Stage1 nozzles concave side



Picture 14: Stage1 Nozzle leading edge



Picture 15: Stage1 Nozzle leading edge



Picture 16: Stage1 Nozzle leading edge



Picture 17: Stage1 Nozzle inner platform cooling holes



Picture 18: Stage1 Nozzle leading edge



Picture 19: Stage1 Nozzle concave side cracks



Picture 20: Stage1 Nozzle concave side cracks



Picture 21: Stage1 Nozzle leading edge



Picture 22 Stage1 Nozzle leading edge cooling holes



Picture 23: Stage1 Nozzle trailing edge burnt material



Picture 24: Stage1 Nozzle trailing edge convex side



Picture 25: Stage1 Nozzle trailing edge burnt material



Picture 26: Stage1 Nozzle trailing edge burnt material



Picture 27: Stage1 Nozzle trailing edge burnt material



Picture 28: Stage1 Nozzle trailing edge burnt material



Picture 29: Stage 1 Nozzle trailing edge burnt material



Picture 30: Stage 1 Nozzles trailing edge



Picture 31: Stage 1 Nozzles trailing edge



Picture 32: Stage 1 Nozzle inner platform hole



Picture 33: Stage 1 Baldes trailing edge



Picture 34: Stage 1 Blades trailing edge



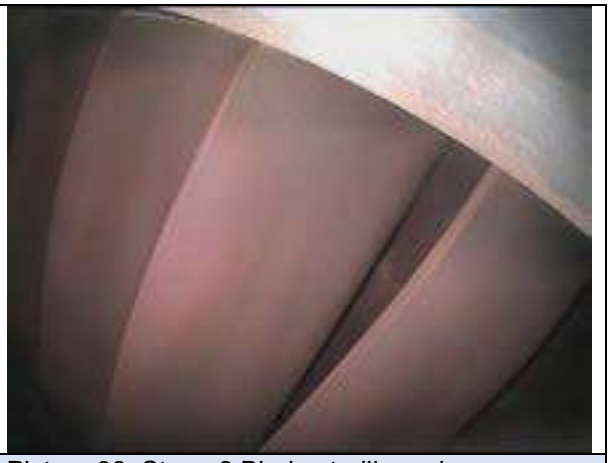
Picture 35: Stage 2 Nozzles trailing edge



Picture 36: Stage 2 Blades and honeycomb seals



Picture 37: Stage 2 Blades trailing edge



Picture 38: Stage 2 Blades trailing edge

## 4.4 LPT Section

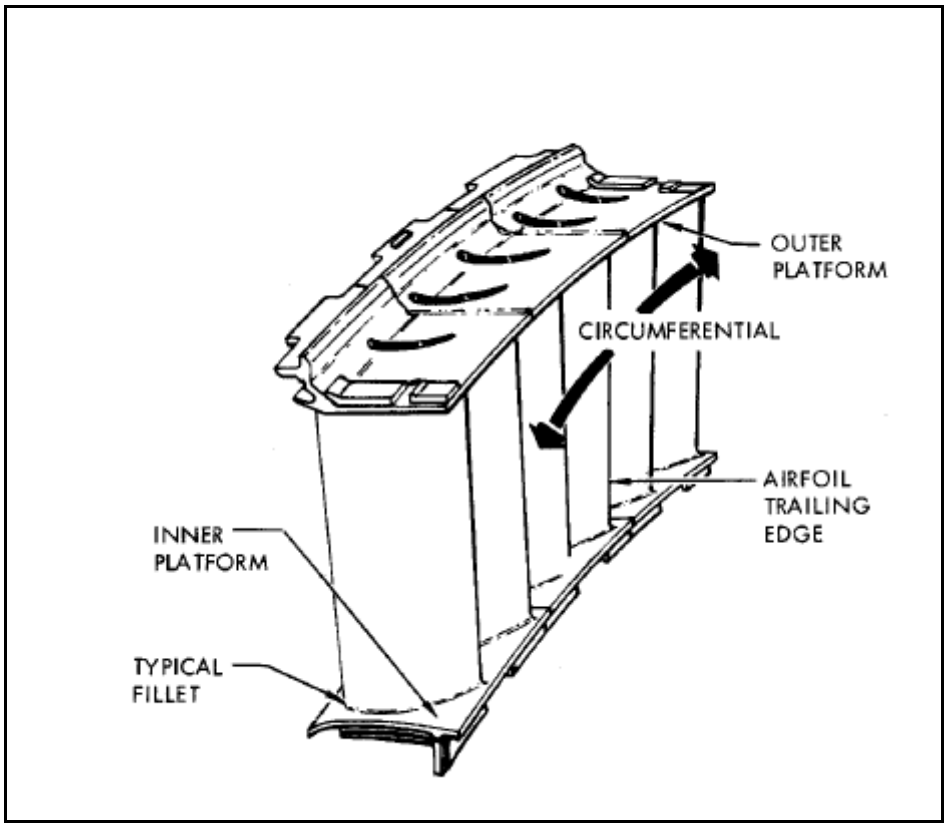



Figure 19: Power Turbine Nozzles

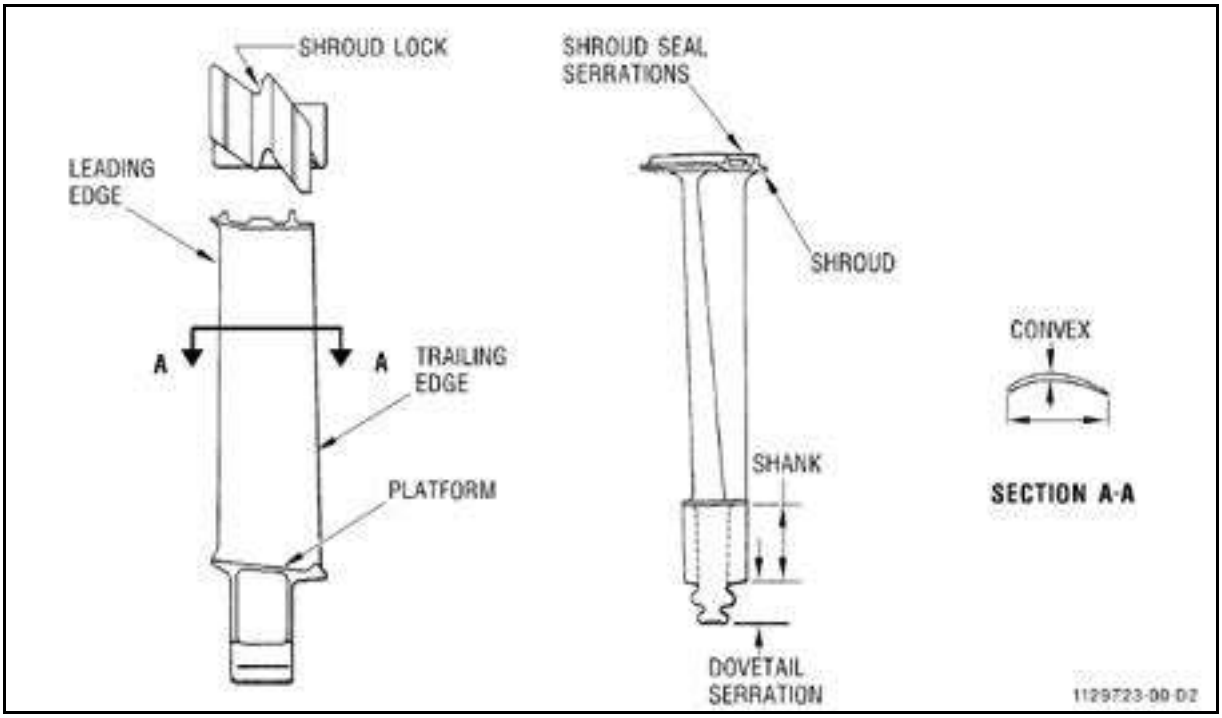



Figure 20: Power Turbine Rotor Blades

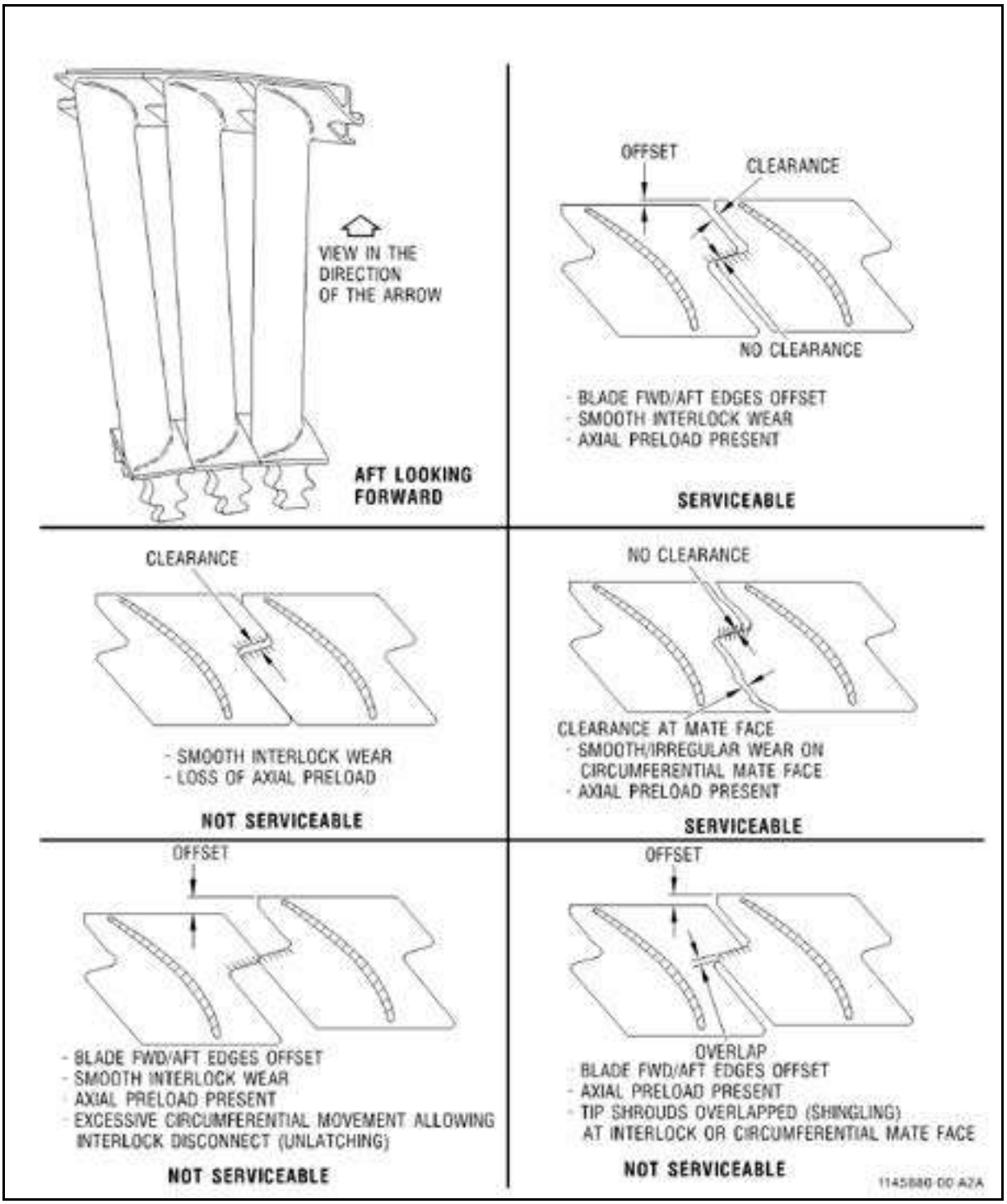


Figure 21: LPT Rotor Blade Circumferential Inspection

**Notes:**

The LPT was not inspected.

Exhibit 13

## Fuel Nozzle Exchange Record

Updated 20-Oct-26

| Site | Unit | Unit Current Hours | Last Replaced Hours | Before Last Hours | Comments | Vendor - Cost |
|---|---|---|---|---|---|---|
| Palo Seco | TM01 | 18,954 | | 9,423 | | |
| | TM02 | 21,773 | | N/A | | |
| | TM03 | 42,843 | | N/A | | |
| | TM04 | 43,187 | | N/A | | |
| San Juan | TM01 | 16,173 | | 12,812 | | |
| | TM02 | 18,743 | | N/A | | |
| | TM03 | 18,800 | | N/A | | |
| | TM04 | 16,129 | | 10,660 | | |
| | TM05 | 21,454 | | 17,314 | | |
| | TM06 | 16,822 | | N/A | | |
| | TM07 | 18,948 | | 16,545 | | |
| | TM08 | 16,778 | | 11,291 | | |
| | TM09 | 12,294 | | N/A | | |
| | TM10 | 21,682 | 19,640 | 16,120 | Changed due to High temperature Spread | GESA - $182,890 |

Exhibit 14

**From:** Jaime Lopez Santiago <jaime.lopez@genera-pr.com>
**Sent on:** Monday, 28 July 2025 20:18:10 UTC
**To:** Luis Basalo (C) <lbasalo@newfortressenergy.com>
**CC:** jonrodriguez <jonrodriguez@newfortressenergy.com>; Ferdinand Correa Mendez <Ferdinand.Correa@genera-pr.com>; Joaquin A Quinoy Ortiz <joaquin.quinoy@genera-pr.com>; Vladimir Scutt <vladimir.scutt@genera-pr.com>; Rafael Aguilera <raguilera@newfortressenergy.com>
**Subject:** RE: Update: TM's Coupons

Muchas gracias

---

**From:** Luis Basalo (C) <lbasalo@newfortressenergy.com>
**Sent:** Monday, July 28, 2025 4:15 PM
**To:** Jaime Lopez Santiago <jaime.lopez@genera-pr.com>
**Cc:** jonrodriguez <jonrodriguez@newfortressenergy.com>; Ferdinand Correa Mendez <Ferdinand.Correa@genera-pr.com>; Joaquin A Quinoy Ortiz <joaquin.quinoy@genera-pr.com>; Vladimir Scutt <vladimir.scutt@genera-pr.com>; Rafael Aguilera <raguilera@newfortressenergy.com>
**Subject:** RE: Update: TM's Coupons

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Saludos Jaime.

El archivo que se envió, y este que incluyo, tienen dos (2) pestanas. Una de SJTPP y otra de PSTPP. De todas formas, inclui el nombre oficial de las Turbinas como lo solicitaste.

Nota, que en al Hoja de SJTPP, se identifican 9 unidades; y en la hoja de PSTPP, se identifican 4.

déjame saber si tienes otra duda.

Saludos,

---

**From:** Jaime Lopez Santiago <jaime.lopez@genera-pr.com>
**Sent:** Monday, July 28, 2025 2:59 PM
**To:** Luis Basalo (C) <lbasalo@newfortressenergy.com>
**Cc:** Jonathan Rodriguez <jonrodriguez@newfortressenergy.com>; Ferdinand Correa Mendez <Ferdinand.Correa@genera-pr.com>; Joaquin A Quinoy Ortiz <joaquin.quinoy@genera-pr.com>; Vladimir Scutt <vladimir.scutt@genera-pr.com>; Rafael Aguilera <raguilera@newfortressenergy.com>
**Subject:** RE: Update: TM's Coupons

Saludos basalo,

Necesitamos que el programa de boroscopicas nos indique las unidades por su nombre. Ademas tenemos diez unidades en programa enviado y las unidades para realizar boroscipocas son 13.

SJTM 01, 02, 03, 04, 05, 06,07,08 y 10. La unidad nueve necesita HOT SECTION REPLACEMENT.
PSTM 01, 02, 03 y 04

Gracias

**Jaime Lopez Santiago**
**Manager Peakers**

**Cell:** +1 787-307-0568
250 Munoz Rivera Ave, Suite 1200
San Juan, PR 00918
www.genera-pr.com

---

**From:** Luis Basalo (C) <lbasalo@newfortressenergy.com>
**Sent:** Monday, July 28, 2025 10:25 AM
**To:** Jaime Lopez Santiago <jaime.lopez@genera-pr.com>
**Cc:** jonrodriguez <jonrodriguez@newfortressenergy.com>; Ferdinand Correa Mendez <Ferdinand.Correa@genera-pr.com>; Joaquin A Quinoy Ortiz <joaquin.quinoy@genera-pr.com>; Vladimir Scutt <vladimir.scutt@genera-pr.com>; Rafael Aguilera <raguilera@newfortressenergy.com>
**Subject:** RE: Update: TM's Coupons

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Good morning Jaime,

UPDATE on the requested items:

1. We need specifics on the TMs information/update requested. We have provided updates in last call and emails. If additional information is required, please advise.
2. The proposed Borescope Inspection Schedule is attached. Please provide GENERA's approval to proceed as noted.
3. There is no plan to execute any more coupons per the March 15, 2024 Asset Purchase Agreement between the Puerto Rico Electric Power Authority and NFE Power LLC, as the balance of the coupons expired on March 15, 2025.

Regards,

***Luis M. Basalo***
(M) +1-913-708-4532

www.newfortressenergy.com

**From:** Luis Basalo (C)
**Sent:** Tuesday, July 22, 2025 10:49 AM
**To:** 'Jaime Lopez Santiago' <jaime.lopez@genera-pr.com>
**Cc:** Jonathan Rodriguez <jonrodriguez@newfortressenergy.com>; Ferdinand Correa Mendez <Ferdinand.Correa@genera-pr.com>; Joaquin A Quinoy Ortiz <joaquin.quinoy@genera-pr.com>; Vladimir Scutt <vladimir.scutt@genera-pr.com>; Rafael Aguilera <raguilera@newfortressenergy.com>
**Subject:** RE: Update: TM's Coupons

Hello Jaime,

See comments below in RED.

***Luis M. Basalo***
(M) +1-913-708-4532

www.newfortressenergy.com

---

**From:** Jaime Lopez Santiago <jaime.lopez@genera-pr.com>
**Sent:** Tuesday, July 22, 2025 9:19 AM
**To:** Luis Basalo (C) <lbasalo@newfortressenergy.com>; Rafael Aguilera <raguilera@newfortressenergy.com>
**Cc:** Jonathan Rodriguez <jonrodriguez@newfortressenergy.com>; Ferdinand Correa Mendez <Ferdinand.Correa@genera-pr.com>; Joaquin A Quinoy Ortiz <joaquin.quinoy@genera-pr.com>; Vladimir Scutt <vladimir.scutt@genera-pr.com>
**Subject:** Update: TM's Coupons

Hi Basalo,

As you know we are in Hurricane Season, and we want to prepare TM's Units to respond during emergencies.

Based on that we need some information to improve the response:

1. An update of the Actual condition of the units. [@Jaime Lopez advise on specific TMs information requested]
2. Borescope inspection Schedule. [We will provide a Borescope Inspection Schedule by EOW]
3. Update, when the recommended coupons agreed during TM's negotiation " Units TM2500 for San Juan and Palo Seco" will be carried out. [Status of Coupon will be provided by EOW]

As soon as you have the information better.

Thanks

**Jaime Lopez Santiago**
**Manager Peakers**

**Cell:** +1 787-307-0568
250 Munoz Rivera Ave, Suite 1200
San Juan, PR 00918
www.genera-pr.com

| | |
|---|---|
| **From:** | Luis Basalo (C) |
| **To:** | Jaime Lopez Santiago |
| **Cc:** | Omar Aponte Sosa; Ferdinand Correa; William Rios Mera; Rafael Aguilera; Lance Florent; Vivian Florent; Daniel McGuire; Danny Hernandez |
| **Subject:** | TM 2500 SJ & PS SCHEDULES MAINTENANCE - Updated |
| **Date:** | Monday, May 6, 2024 6:05:22 PM |
| **Attachments:** | image003.png<br>image004.png<br>image005.png<br>TM2500 MAINTENANCE SCHEDULE 260506.xlsx |

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Jaime,

Updated TM2500 SJ & PS maintenance schedule for your information and use.

Regards,

**Luis M. Basalo**

700 NW 1st Ave. Suite 700 Miami, FL 33136
www.newfortressenergy.com

---

**From:** Jaime Lopez Santiago <jaime.lopez@genera-pr.com>
**Sent:** Monday, May 6, 2024 5:25 PM
**To:** Luis Basalo (C) <lbasalo@newfortressenergy.com>
**Cc:** Omar Aponte <omar.aponte@genera-pr.com>; Ferdinand Correa Mendez <Ferdinand.Correa@genera-pr.com>; William Rios <william.rios@genera-pr.com>; Rafael Aguilera <raguilera@newfortressenergy.com>; Lance Florent <lflorent@newfortressenergy.com>; Vivian Florent <vflorent@newfortressenergy.com>; Daniel McGuire <dmcguire@newfortressenergy.com>; daniel@genera-pr.com
**Subject:** RE: Urgent - TM 2500 SJ & PS SCHEDULES MAINTENANCE

Saludos Basalo,

Please update maintenance schedule as discussed to submit to LUMA and coordinate departures.

Thank

**Jaime L. Lopez Santiago PE**
Manager Gas Turbines - Peakers



American International Plaza
250 Muñoz Rivera Ave, Suite 1200
San Juan, PR 00918
www.genera-pr.com

---

**From:** Luis Basalo (C) <lbasalo@newfortressenergy.com>
**Sent:** Friday, April 26, 2024 6:06 PM
**To:** Jaime Lopez Santiago <jaime.lopez@genera-pr.com>
**Cc:** Omar Aponte Sosa <omar.aponte@genera-pr.com>; Ferdinand Correa Mendez <Ferdinand.Correa@genera-pr.com>; William Rios Mera <William.Rios@genera-pr.com>; Rafael Aguilera <raguilera@newfortressenergy.com>; Lance Florent <lflorent@newfortressenergy.com>; Vivian Florent <vflorent@newfortressenergy.com>
**Subject:** Fwd: Urgent - TM 2500 SJ & PS SCHEDULES MAINTENANCE

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Good afternoon Jaime,

Attached is the proposed schedule for the Semi-Annual Inspection and the maintenance required by the sale of the GT. NFE is using this schedule to coordinate parts and contractors.

Regards,

**Luis Basalo**
Superintendent

www.newfortressenergy.com

---

**From:** Jaime Lopez Santiago <jaime.lopez@genera-pr.com>
**Sent:** Friday, April 26, 2024 11:04 AM
**To:** Daniel McGuire <dmcguire@newfortressenergy.com>
**Cc:** Luis Basalo (C) <lbasalo@newfortressenergy.com>; Rafael Aguilera <raguilera@newfortressenergy.com>; Omar Aponte <omar.aponte@genera-pr.com>; daniel@genera-pr.com; Ferdinand Correa Mendez <Ferdinand.Correa@genera-pr.com>; William Rios <william.rios@genera-pr.com>
**Subject:** Urgent - TM 2500 SJ & PS SCHEDULES MAINTENANCE

Hi Dan,

Eng. Daniel Hernandez request ASAP an official schedule (Excel File or PDF) from your team that include the Annual inspection Projection (Base Load operation) for all units and the seven-coupon execution agreed during the TM 2500 units acquisition process.

As example I included a file only for reference.

Thanks

**Jaime L. Lopez Santiago PE**
Manager Gas Turbines - Peakers

American International Plaza
250 Muñoz Rivera Ave, Suite 1200
San Juan, PR 00918
www.genera-pr.com

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## GT TM2500 SJ & PS Sites

## Units Program

Date: May 6, 2024

Manager

| Quantity | Location | Unit Name | Capacity | Semi annual Inspection (Dates) | Major Maintenance (7 coupons) - date |
|---|---|---|---|---|---|
| 1 | TM2500 SJ | SJ GT01 | 25 | 08MAY2024 | N/A |
| 2 | TM2500 SJ | SJ GT02 | 25 | **22APR2024 (A)** | 11NOV2024 / HOT GAS - 7days |
| 3 | TM2500 SJ | SJ GT03 | 25 | 10MAY2024 | 16DEC2024 / HOT GAS - 7days |
| 4 | TM2500 SJ | SJ GT04 | 25 | 12MAY2024 | 13JAN2025 / HOT GAS - 7days |
| 5 | TM2500 SJ | SJ GT05 | 25 | 14MAY2024 | N/A |
| 6 | TM2500 SJ | SJ GT06 | 25 | 16MAY2024 | 10FEB2025 / HOT GAS - 7days |
| 7 | TM2500 SJ | SJ GT07 | 25 | 18MAY2024 | N/A |
| 8 | TM2500 SJ | SJ GT08 | 25 | 20MAY2024 | N/A |
| 9 | TM2500 SJ | SJ GT09 | 25 | 22MAY2024 | N/A |
| 10 | TM2500 SJ | SJ GT10 | 25 | **06MAY2024 (A)** | N/A |
| 11 | TM2500 PS | PS GT01 | 25 | 13MAY2024 | 13MAY2024 / HOT GAS - 7 days |
| 12 | TM2500 PS | PS GT02 | 25 | **16APR2024(A)** | 16APR2024(A) / STG16 RPL |
| 13 | TM2500 PS | PS GT03 | 20 | 20MAY2024 | N/A |
| 14 | TM2500 PS | PS GT04 | 20 | **22APR2024 (A)** | 22APR2024 (A) / STG16 RPL |

Exhibit 15

| | |
|---|---|
| **From:** | Legal | Genera PR |
| **To:** | Eliezer J Pimentel Lopez |
| **Cc:** | Cristina Ribas Morera |
| **Subject:** | FW: P3A - Temporary Units - Acknowledgment |
| **Date:** | Monday, October 26, 2026 5:33:59 PM |

44.G

**From:** Pironi, Belen <bpironi@cgsh.com>
**Sent:** Thursday, March 14, 2024 2:11 PM
**To:** Katiuska Bolanos Lugo <kbolanos@genera-pr.com>; Kevin D. Futch <kevin.futch@genera-pr.com>
**Cc:** Cooper, Richard J. <rcooper@cgsh.com>; Kordula, Chantal E. <ckordula@cgsh.com>; Martini, Carla <camartini@cgsh.com>; Fontanés Gómez, Fermín E. (AAPP) <Fermin.Fontanes@p3.pr.gov>; Gerardo.Loran <Gerardo.Loran@p3.pr.gov>; Batista Bustelo, Sebastian (AAPP) <sbatista@cor3.pr.gov>
**Subject:** P3A - Temporary Units - Acknowledgment

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Dear Genera team –

On behalf of the P3A, we want to reiterate our appreciation for assisting the P3A in the process for the acquisition of the temporary generation equipment. We also want to acknowledge receipt of your request to amend the O&M agreement between PREPA and NFE (the "OMA") in your letter dated February 8, 2024, which the P3A is willing to review and discuss in good faith. The discussion of a potential amendment to the OMA and required approvals would take time and should be handled independently from the process for the acquisition of the temporary generation units. As discussed with P3A, as it relates to the temporary generation equipment, PREB's order is very clear in terms of the treatment of these assets under the OMA. Therefore, P3A proposes that PREPA and Genera sign the attached acknowledgment of PREB's order in lieu of an amendment to the OMA.

Further, we understand that Genera has certain concerns with operating the assets while there is a process ongoing with EPA to negotiate a consent decree for the temporary generation assets and will propose a side letter with certain safeguards. Please send us the draft at your earliest convenience for our review and consideration.

We remain at your disposal should you have any questions or if you'd like to discuss.

Kind regards,

Belén
For the Cleary team

**Belén Pironi**
Cleary Gottlieb Steen & Hamilton LLP
One Liberty Plaza, New York NY 10006
T: +1 212 225 2305
bpironi@cgsh.com | clearygottlieb.com

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Thank You.

---

Exhibit 16

Global Energy Services Alliance LLC

PO Box 10601
Corpus Christi, TX 78460

# Invoice

| Date | Invoice # |
|---|---|
| 4/28/2025 | 25FS0428NFE |

| Bill To | Ship To |
|---|---|
| NFE Power PR LLC<br>954 Ponce de Leon<br>San Juan 000907<br>Puerto Rico | Edif 1211 Muelle C<br>San Juan, PR 00920<br>United States |

| P.O. No. | Terms |
|---|---|
| NPRL10392 | Net 30 |

| Line | Description | Quantity | Rate | Amount |
|---|---|---|---|---|
| 1 | Milestone Payment - 10% upon Purchase Order Receipt (3,551,680.00 * 10% = 355,168) | 1 | 355,168.00 | 355,168.00 |
| 2 | Milestone Payment - 20% upon Induction (3,551,680.00 * 20% = 710,336.00) | 1 | 710,336.00 | 710,336.00 |

Remit to:
Plains Capital Bank
Routing: 111322994
Account: 7315032000

Thank you for your business.

**Total** USD 1,065,504.00

Marsh

# INVOICE

**Marsh USA LLC**
New York NY
(212) 345-6000

| | |
|---|---|
| Page | 1 of 2 |
| **Invoice Total** | **830,070.28 USD** |
| Invoice No. | 182768239576 |
| Invoice Date | 02/19/2024 |
| Effective Date | 05/10/2023 |
| Client No. | 1827630974 |
| Installment No. | |

Billed To: **James Rhodes / Risk Management**
New Fortress Energy Inc
1500 Post Oak Blvd, 17th Floor
Houston, TX 77056

**If you are not currently receiving invoices via e-mail but would like to do so, please notify your Marsh client team.**

# Remittance Copy

NO

Marsh earns and retains interest income on premium payments held by Marsh on behalf of insurers during the period between receipt of such payments from clients and the time such payments are remitted to the applicable insurer, where permitted by law.

*Detach and remit this portion with your payment*

| Client No. | Invoice No. | Payment Due | Invoice Total | Amount Paid |
|---|---|---|---|---|
| 1827630974 | 182768239576 | Immediate | 830,070.28 USD | |

**Thank you for your prompt payment.**

**Please indicate Invoice Number 182768239576 on your remittance.**

**Additionally, for ACH or wire payments, e-mail remittance detail to: FiduciaryserviceRequestUS@marsh.com**

By ACH:
**Bank Name:** Bank of America
**ACH Routing No:** 071000039
**Account Title:** Marsh USA LLC
**Account Number:** 8188063077

By Wire:
**Bank Name:** Bank of America
**Wire Routing Number:** 026009593
**Account Title:** Marsh USA LLC
**Account Number:** 8188063077

By Mail:
Marsh USA LLC
P.O. Box 846015
Dallas, TX 75284-6015 USA

182768239576 4 008300702869

Marsh

# INVOICE

**Marsh USA LLC**
New York NY
(212) 345-6000

| | |
|---|---|
| Page | 2 of 2 |
| **Invoice Total** | **830,070.28 USD** |
| Invoice No. | 182768239576 |
| Invoice Date | 02/19/2024 |
| Effective Date | 05/10/2023 |
| Client No. | 1827630974 |
| Installment No. | |

Billed To:

**James Rhodes / Risk Management**
New Fortress Energy Inc
1500 Post Oak Blvd, 17th Floor
Houston, TX 77056

**Endorsement**
Policy Holder: **New Fortress Energy Inc**
Billing Effective Date: **05/10/2023**

| Insurer | Policy No./ Project No. | Expiration Date | Description/Type of Coverage | Item | Amount |
|---|---|---|---|---|---|
| LLOYDS OF LON | B0509ENGBO2350668 | 12/31/2023 | Enrgy Prop Onshore | PREMIUM | 170,084.90 |
| QBE UK | B0509ENGBO2350668 | 12/31/2023 | Enrgy Prop Onshore | PREMIUM | 23,491.20 |
| Convex Group | B0509ENGBO2350668 | 12/31/2023 | Enrgy Prop Onshore | PREMIUM | 44,045.90 |
| SCOR (UK) RE | B0509ENGBO2350668 | 12/31/2023 | Enrgy Prop Onshore | PREMIUM | 146,459.50 |
| ZURICH INS CO | B0509ENGBO2350668 | 12/31/2023 | Enrgy Prop Onshore | PREMIUM | 44,045.90 |
| Helvetia Global Solutions | B0509ENGBO2350743 | 12/31/2023 | Enrgy Prop Onshore | PREMIUM | 182,864.50 |
| Helvetia Global Solutions | B0509ENGBO2350743 | 12/31/2023 | Enrgy Prop Onshore | FED EXCISE TAX | 7,314.58 |
| LLOYDS OF LON | B0509ENGBO2350746 | 12/31/2023 | Enrgy Prop Onshore | PREMIUM | 21,076.10 |
| LLOYDS OF LON | B0509ENGBO2350748 | 12/31/2023 | Enrgy Prop Onshore | PREMIUM | 46,184.50 |
| LLOYDS OF LON | B0509ENGBO2350750 | 12/31/2023 | Enrgy Prop Onshore | PREMIUM | 11,127.20 |
| LLOYDS OF LON | B0509ENGBO2350751 | 12/31/2023 | Enrgy Prop Onshore | PREMIUM | 14,918.00 |
| LLOYDS OF LON | B0509ENGBO2350752 | 12/31/2023 | Enrgy Prop Onshore | PREMIUM | 35,872.80 |
| GREAT LAKES | B0509ENGBO2350745 | 12/31/2023 | Enrgy Prop Onshore | PREMIUM | 82,585.20 |

**Invoice Comments:**

San Juan Extension from 12/31/2023-5/1/2024

NO

**Invoice Total** 830,070.28

Marsh earns and retains interest income on premium payments held by Marsh on behalf of insurers during the period between receipt of such payments from clients and the time such payments are remitted to the applicable insurer, where permitted by law.

# Invoice

PIC

GENERA PR LLC
Agustin Stahl Carr
174 A-10
Bayamon, Puerto Rico 00956

Invoice #: 2072024
Invoice Date: 2/7/2024
Page: 1

2024

WSB said

**Please Remit to:**

PIC Group, Inc
P.O. BOX 934890
Atlanta, GA 31193-4890

**Billing Inquiries, please contact:**

Accounts Receivable Manager
(770) 850-0100
ar@picgroupinc.com

**Or Wire Transfer to:**

Wells Fargo Bank, NA
ABA#: 121000248
Swift#: WFBIUS6S
ChipsID: 0407
Acct# 2000042842761
PIC Group, Inc

NO

7 2024 invoices?

| | |
|---|---|
| Customer #: | GENE001 |
| Project Name: | Genera |
| Project #: | |
| Contact: | |
| Purchase Order: | |
| Reference #: | Settlement and Mutual Release Agreement |

| | |
|---|---|
| Invoice #: | 20702024 |
| Invoice Date: | 2/7/2024 |
| Payment Terms: | Due Upon Receipt |
| Total Due: | $2,307,037.77 |

| | Date | Rate | Billing Amount |
|---|---|---|---|
| **FIXED FEE** | | | |
| Settlement and Mutual Release Agreement | 2/7/2024 | $2,307,037.77 | $2,307,037.77 |
| | **Total Due** | | **$2,307,037.77** |

NO

There was a settlement agreement

**Trelleborg Westbury Ltd**
Commerce Business Centre
West Wilts Trading Estate
Westbury
Wiltshire BA13 4LS ENGLAND

Tel: +44 (0)1373 827100
Fax: +44 (0)1373 858877

# Proforma Invoice 1104c



*Invoice To:* **NFEnergia LLC**
954 Ponce De Leon
San Juan 00907
Puerto Rico

*Deliver To:*

2024

| *Invoice Date* | *Order Date* | *Your Order No:* | *Ship Via:* | *Payment Terms* |
|---|---|---|---|---|
| **24/10/2024** | **21/05/2024** | **NFENG10849** | | **As per M.P.A** |

| *Order Qty* | *Part ID/Description* | *Rev* | *U/M* | *Unit Price* | *Extd Price* |
|---|---|---|---|---|---|

1 x HPNG Hose Transfer System Ref QT-001543

Total Contract Value $3,042,345.60

Line 1 $597,275.10
Line 2 $597,275,10
Line 3 $199,091.70
Line 4 $199,091.70
Line 5 $1449,612.00

Qui manque ? Dinde ?

**Invoice in respect of Line 1**

**Payment Terms:**

20% on receipt of PO
30% After submission for approval of technical drawings
30% Upon completion of manufacture and FAT and ready for shipment
10% on BOL date
10% upon submission of final documentation

**PAYMENT DETAILS**

**Please transfer payment in USD ($) to:**

NO

**BANKERS:** Skandinaviska Enskilda Banken AB (publ)
106 40 Stockholm, Sverige

**ACCOUNT:** Trelleborg Westbury Ltd
**ACCOUNT NO:** 57468281521
**SWIFT/BIC:** ESSESESS
**IBAN NO:** SE1250000000057468281521

**THIS IS NOT A VAT INVOICE**

| | |
|---|---|
| **20% of Contract Price Due** | **$597,275.10** |
| **VAT Rate** | **0%** |
| **VAT Total** | **£0.00** |
| **Total** | **$597,275.10** |

**All prices are in USD**

# INVOICE

| | |
|---|---|
| Invoice Number | 20 |
| Invoice Date | 01-Apr-24 |
| Currency Code | USD |
| Page | 1 of 1 |

From: 835
Saavi Power Mobile Solutions, LLC
Weslayan Tower
24 Greenway Plaza - Suite 1205 Houston, Texas 77046
Teléfono:+52 (55) 5279-4858

Tax ID 81-3834399

Bill to: 2241248
NFE Power PR LLC
111 W 19th St, 8th Floor
New York, NY 1011

Tax ID 66-0943155

*Remittance information:*

| | |
|---|---|
| Beneficiary: | Saavi Power Mobile Solutions, LLC |
| Account Number: | H10-740-049836 |
| Bank: | Mizuho Bank, Ltd., New York Branch |
| ABA Number: | 26004307 |
| Swift Code: | MHCBUS33 |

Invoice related to the period of April-24
Reference: PO NPRL10067

*Description of Services:*
Rent Payment - Equipment Lease Date as of February 27,2023

| Item | Unit Price | Units | Total |
|---|---|---|---|
| Unit Lease Payment | 790,030.04 | 3 | 2,370,090.13 |
| Supervisory fee | -57,861.36 | 1 | -57,861.36 |
| Fixed Rent | N/A | N/A | 2,312,228.77 |
| Total before IVU | | | 2,312,228.77 |
| IVU @ 4% | | | 92,489.15 |
| **Total Invoice** | | | **2,404,717.93** |

Marsh

# INVOICE

**Marsh USA LLC**
New York NY
(212) 345-6000

| | |
|---|---|
| Page | 1 of 2 |
| **Invoice Total** | **650,134.67 USD** |
| Invoice No. | 182763162778 |
| Invoice Date | 02/16/2024 |
| Effective Date | 03/09/2023 |
| Client No. | 1827630974 |
| Installment No. | |

Billed To:
**James Rhodes / Risk Management**
New Fortress Energy Inc
1500 Post Oak Blvd, 17th Floor
Houston, TX 77056

**If you are not currently receiving invoices via e-mail but would like to do so, please notify your Marsh client team.**

# Remittance Copy

NO

Marsh earns and retains interest income on premium payments held by Marsh on behalf of insurers during the period between receipt of such payments from clients and the time such payments are remitted to the applicable insurer, where permitted by law.

*Detach and remit this portion with your payment*

| Client No. | Invoice No. | Payment Due | Invoice Total | Amount Paid |
|---|---|---|---|---|
| 1827630974 | 182763162778 | Immediate | 650,134.67 USD | |

**Thank you for your prompt payment.**

**Please indicate Invoice Number 182763162778 on your remittance.**

**Additionally, for ACH or wire payments, e-mail remittance detail to: FiduciaryserviceRequest.US@marsh.com**

By ACH:
**Bank Name:** Bank of America
**ACH Routing No:** 071000039
**Account Title:** Marsh USA LLC
**Account Number:** 8188063077

By Wire:
**Bank Name:** Bank of America
**Wire Routing Number:** 026009593
**Account Title:** Marsh USA LLC
**Account Number:** 8188063077

By Mail:
Marsh USA LLC
P.O. Box 846015
Dallas, TX 75284-6015 USA

182763162778 006501346740

Marsh

# INVOICE

**Marsh USA LLC**
New York NY
(212) 345-6000

| | |
|---|---|
| Page | 2 of 2 |
| **Invoice Total** | **650,134.67 USD** |
| Invoice No. | 182763162778 |
| Invoice Date | 02/16/2024 |
| Effective Date | 03/09/2023 |
| Client No. | 1827630974 |
| Installment No. | |

Billed To:
**James Rhodes / Risk Management**
New Fortress Energy Inc
1500 Post Oak Blvd, 17th Floor
Houston, TX 77056

**Endorsement**
Policy Holder: **New Fortress Energy Inc**
Billing Effective Date: **03/09/2023**

| Insurer | Policy No./ Project No. | Expiration Date | Description/Type of Coverage | Item | Amount |
|---|---|---|---|---|---|
| MS Amlin | B0509ENGBO2350399 | 10/15/2023 | Enrgy Prop Onshore | PREMIUM | 119,896.11 |
| GREAT LAKES | B0509ENGBO2350432 | 10/15/2023 | Enrgy Prop Onshore | PREMIUM | 68,512.14 |
| ZURICH INS CO | B0509ENGBO2350411 | 10/15/2023 | Enrgy Prop Onshore | PREMIUM | 104,185.41 |
| LLOYDS OF LON | B0509ENGBO2350474 | 10/15/2023 | Enrgy Prop Onshore | PREMIUM | 91,465.61 |
| Helvetia Global Solutions | B0509ENGBO2350478 | 10/15/2023 | Enrgy Prop Onshore | PREMIUM | 149,464.70 |
| LLOYDS OF LON | B0509ENGBO2350479 | 10/15/2023 | Enrgy Prop Onshore | PREMIUM | 20,974.06 |
| LLOYDS OF LON | B0509ENGBO2350431 | 10/15/2023 | Enrgy Prop Onshore | PREMIUM | 32,267.58 |
| LLOYDS OF LON | B0509ENGBO2350430 | 10/15/2023 | Enrgy Prop Onshore | PREMIUM | 11,985.10 |
| Convex Group | B0509ENGBO2350477 | 10/15/2023 | Property Onshore/Upstream | PREMIUM | 51,383.96 |

**Invoice Comments:**

Palo Seco Policy Extension to May 2024

NO

| | |
|---|---|
| **Invoice Total** | 650,134.67 |

Marsh earns and retains interest income on premium payments held by Marsh on behalf of insurers during the period between receipt of such payments from clients and the time such payments are remitted to the applicable insurer, where permitted by law.

# STARFISH PPS LLC

FY 2025
- In Excess -

## INVOICE

1419 VANDERBILT DR.
TYLER, TX 75703

| Date | Invoice # |
|---|---|
| 5/14/2025 | 18597 |

| Bill To | Ship To |
|---|---|
| NFE Power PR LLC | PALO SECO POWER PLANT<br>PR 165 KM 31.8<br>TOA BAJA, PUERTO RICO 00949 |

| P.O. Number | Terms | Ship | SEA QUOTE # |
|---|---|---|---|
| NPRL10411 | PREPAYMENT | 5/14/2025 | 25-955 |

| CLIN | Description | Part Number | QTY | Price Each | Amount |
|---|---|---|---|---|---|
| 1 | VALVE, WATER, ATEX, OVERHAULED, EXCHANGE<br>HTS: 8481.8.9020<br>ECCN:2A994<br>ORIGIN: USA<br>SN'S - 15289108, 15336784, 15173905<br><br>Pickup to be arranged and paid for by buyer after payment and cores have been received. | 8915-1023 | 3 | 65,000.00 | 195,000.00 |

check remittance:
1419 Vanderbilt, Tyler, TX 75703
ACH/Wire remittance:
JP Morgan Chase Bank
100 Independence Place, Tyler, TX 75703
ABA: 111000614
Account: 712115534
SWIFT: CHASUS33

All prices in USD. Thank you for your business.

| | |
|---|---|
| **Tax (8.25%)** | $0.00 |
| **Total** | $195,000.00 |
| **Payments/Credits** | $0.00 |
| **Balance Due** | $195,000.00 |

No Pkg

SIEMENS energy

# Down Payment Request

| | |
|---|---|
| Down Payment No. | 563P0090799157 |
| Date | Nov. 6, 2024 |
| Customer Number | 1002088089 |


Siemens Energy, Inc. Houston
1200 West Sam Houston Parkway North, Houston, TX 77043, USA


NFE POWER PR LLC
PONCE DE LEON AV. 954
SAN JUAN PR 00907
USA


| | |
|---|---|
| Name | Edward Graham |
| Department | SE FIN GS D AGT OPS1 |
| Telephone | +1 (407) 416-5835 |
| Fax | |
| E-mail | edward.k.graham@siemens-energy.com |


| | |
|---|---|
| Your PO number | NPRL10333 |
| Date of PO | Sep. 18, 2024 |
| Sales document | EA369540 |
| Our Tax reg. No. | 13-3987280-16 |

**Goods Receiver**
NFE POWER PR LLC
PONCE DE LEON AV. 954
00907 SAN JUAN
USA

**Customer / recipient of benefits**
NFE POWER PR LLC
PONCE DE LEON AV. 954
00907 SAN JUAN
USA

| Item | Designation | Quantity | | Price in USD per Unit | Total in USD |
|---|---|---|---|---|---|
| 2000 | INT-REPAIR_IPS | 1 | PC | 690,000.00 | 690,000.00 |
| | Material: INT-REPAIR_IPS | | | | |
| | PR0090799 | 0.00% | | TAX | 0.00 |
| | | **Net Value:** | | | **690,000.00** |
| | | **Taxes:** | | | |
| | | **PR0090799** | | | **0.00** |
| | | **Invoice amount (USD):** | | | **690,000.00** |

**Terms of delivery:**
FCA San Diego, CA, USA
Incoterms® 2020

**Terms of payment:**
Up to Nov. 6, 2024 without deduction

**Bank details:**
Payment shall be effected to the following bank account (incl. indication of complete invoice-no.):

Siemens Energy, Inc. Houston


Office Address:
1200 West Sam Houston Parkway North
Houston, TX 77043
USA

Tel : +1 (281) 436-6782
Fax: +1
siemens-energy.com



Siemens Energy, Inc
1209 Orange st, Wilmington DE 19801 USA
Company Registration: 13-3987280

Siemens Energy is a trademark licensed by Siemens AG.

No Pass

SIEMENS energy

# Down Payment Request

| | |
|---|---|
| Down Payment No. | 563P0090799158 |
| Date | Nov. 6, 2024 |
| Customer Number | 1002088089 |

Siemens Energy, Inc. Houston
1200 West Sam Houston Parkway North, Houston, TX 77043, USA

NFE POWER PR LLC
PONCE DE LEON AV. 954
SAN JUAN PR 00907
USA



| | |
|---|---|
| Name | Edward Graham |
| Department | SE FIN GS D AGT OPS1 |
| Telephone | +1 (407) 416-5835 |
| Fax | |
| E-mail | edward.k.graham@siemens-energy.com |



| | |
|---|---|
| Your PO number | NPRL10335 |
| Date of PO | Sep. 18, 2024 |
| Sales document | EA368992 |
| Our Tax reg. No. | 13-3987280-16 |

**Goods Receiver**
NFE POWER PR LLC
PONCE DE LEON AV. 954
00907 SAN JUAN
USA

**Customer / recipient of benefits**
NFE POWER PR LLC
PONCE DE LEON AV. 954
00907 SAN JUAN
USA

| Item | Designation | Quantity | | Price in USD per Unit | Total in USD |
|---|---|---|---|---|---|
| 1000 | INT-REPAIR_IPS | 1 | PC | 690,000.00 | 690,000.00 |
| | Material: INT-REPAIR_IPS | | | | |
| | PR0090799 | 0.00% | TAX | | 0.00 |
| | | **Net Value:** | | | **690,000.00** |
| | | **Taxes:** | | | |
| | | **PR0090799** | | | **0.00** |
| | | **Invoice amount (USD):** | | | **690,000.00** |

**Terms of delivery:**
FCA San Diego, CA, USA
Incoterms® 2020

**Terms of payment:**
Up to Nov. 6, 2024 without deduction

**Bank details:**
Payment shall be effected to the following bank account (incl. indication of complete invoice-no.):

Siemens Energy, Inc. Houston

Office Address:
1200 West Sam Houston Parkway North
Houston, TX 77043
USA

Tel : +1 (281) 436-6782
Fax: +1
siemens-energy.com

Siemens Energy, Inc
1209 Orange st, Wilmington DE 19801 USA
Company Registration: 13-3987280

Siemens Energy is a trademark licensed by Siemens AG.

SIEMENS energy

# Down Payment Request

| | |
|---|---|
| Down Payment No. | 563P0090799173 |
| Date | Nov. 6, 2024 |
| Customer Number | 1002088089 |


Siemens Energy, Inc. Houston
1200 West Sam Houston Parkway North, Houston, TX 77043, USA


NFE POWER PR LLC
PONCE DE LEON AV. 954
SAN JUAN PR 00907
USA


| | |
|---|---|
| Name | Edward Graham |
| Department | SE FIN GS D AGT OPS1 |
| Telephone | +1 (407) 416-5835 |
| Fax | |
| E-mail | edward.k.graham@siemens-energy.com |


| | |
|---|---|
| Your PO number | NPRL10334 |
| Date of PO | Sep. 18, 2024 |
| Sales document | EA368991 |
| Our Tax reg. No. | 13-3987280-16 |

**Goods Receiver**
NFE POWER PR LLC
PONCE DE LEON AV. 954
00907 SAN JUAN
USA

**Customer / recipient of benefits**
NFE POWER PR LLC
PONCE DE LEON AV. 954
00907 SAN JUAN
USA

| Item | Designation | Quantity | | Price in USD per Unit | Total in USD |
|---|---|---|---|---|---|
| 1000 | INT-REPAIR_IPS | 1 | PC | 690,000.00 | 690,000.00 |
| | Material: INT-REPAIR_IPS | | | | |
| | PR0090799 | 0.00% | TAX | | 0.00 |
| | | **Net Value:** | | | **690,000.00** |
| | | **Taxes:** | | | |
| | | **PR0090799** | | | **0.00** |
| | | **Invoice amount (USD):** | | | **690,000.00** |

**Terms of delivery:**
FCA San Diego, CA, USA
Incoterms® 2020

**Terms of payment:**
Up to Nov. 6, 2024 without deduction

**Bank details:**
Payment shall be effected to the following bank account (incl. indication of complete invoice-no.):

Siemens Energy, Inc. Houston


Office Address:
1200 West Sam Houston Parkway North
Houston, TX 77043
USA
Tel : +1 (281) 436-6782
Fax: +1
siemens-energy.com





Siemens Energy is a trademark licensed by Siemens AG.

## GENERA PR LLC

PREB CASE NO: NEPR-MI-2024-0005

**46 b) & d) Number of incoices rejected**

| | Invoice Num | Invoice Date | Supplier | Amount | Reason for Rejection |
|---|---|---|---|---|---|
| 1) | 25FS0428NFE | 4/28/2025 | Global Energy Services Alliance LLC | $ 1,065,504.00 | Duplicated Invoice |
| 2) | 182768239576 | 2/19/2024 | Marsh | $ 830,070.28 | Unrelated to TM2500 |
| 3) | 2072024 | 2/7/2024 | PIC | $ 2,307,037.77 | Duplicated Invoice |
| 4) | 1104c | 24/10/24 | Trelleborg | $ 597,275.10 | FY Closed |
| 5) | 20 | 1-Apr-24 | Saavi Power Mobile Solutions | $ 2,404,717.93 | Unrelated to TM2500 |
| 6) | 18263462778 | 2/16/2024 | Marsh | $ 650,134.67 | Unrelated to TM2500 |
| 7) | 18597 | 5/14/2025 | Starfish PPS LLC | $ 195,000.00 | Exceeded Accrual FY limit |
| 8) | 563P0090799157 | 11/6/2024 | Siemens Energy | $ 690,000.00 | Exceeded Accrual FY limit |
| 9) | 563P0090799158 | 11/6/2024 | Siemens Energy | $ 690,000.00 | Exceeded Accrual FY limit |
| 10) | 563P0090799173 | 11/6/2024 | Siemens Energy | $ 690,000.00 | Exceeded Accrual FY limit |
| | | | | $ 10,119,739.75 | |

Exhibit 17

## GENERA PR LLC

PREB CASE NO: NEPR-MI-2024-0005

**46 b) & d) Number of incoices rejected**

| | Invoice Num | Invoice Date | Supplier | Amount | Reason for Rejection |
|---|---|---|---|---|---|
| 1) | 25FS0428NFE | 4/28/2025 | Global Energy Services Alliance LLC | $ 1,065,504.00 | Duplicated Invoice |
| 2) | 182768239576 | 2/19/2024 | Marsh | $ 830,070.28 | Unrelated to TM2500 |
| 3) | 2072024 | 2/7/2024 | PIC | $ 2,307,037.77 | Duplicated Invoice |
| 4) | 1104c | 24/10/24 | Trelleborg | $ 597,275.10 | FY Closed |
| 5) | 20 | 1-Apr-24 | Saavi Power Mobile Solutions | $ 2,404,717.93 | Unrelated to TM2500 |
| 6) | 18263462778 | 2/16/2024 | Marsh | $ 650,134.67 | Unrelated to TM2500 |
| 7) | 18597 | 5/14/2025 | Starfish PPS LLC | $ 195,000.00 | Exceeded Accrual FY limit |
| 8) | 563P0090799157 | 11/6/2024 | Siemens Energy | $ 690,000.00 | Exceeded Accrual FY limit |
| 9) | 563P0090799158 | 11/6/2024 | Siemens Energy | $ 690,000.00 | Exceeded Accrual FY limit |
| 10) | 563P0090799173 | 11/6/2024 | Siemens Energy | $ 690,000.00 | Exceeded Accrual FY limit |
| | | | | $ 10,119,739.75 | |

Exhibit 18

| FILE NUMBER | JOB TITLE | HOURLY COST | ENTITY |
|---|---|---|---|
| 302462 | Field Operations Technician | 41.31 | NFE ENERGIA LLC |
| 302397 | Field Operations Technician | 42.76 | NFE ENERGIA LLC |
| 302132 | Field Operations Technician | 45.10 | NFE ENERGIA LLC |
| 302565 | Field Operations Technician | 50.06 | NFE ENERGIA LLC |
| 303053 | Field Operations Technician | 38.22 | NFE ENERGIA LLC |
| 303068 | Field Operations Technician | 44.93 | NFE ENERGIA LLC |
| 302401 | Field Operations Technician | 44.93 | NFE ENERGIA LLC |
| 302399 | Field Operations Technician | 39.25 | NFE ENERGIA LLC |
| 302460 | Field Operations Technician | 37.26 | NFE ENERGIA LLC |
| 302504 | Field Operations Technician | 46.37 | NFE ENERGIA LLC |
| 302502 | Field Operations Technician | 42.36 | NFE ENERGIA LLC |
| 303031 | Field Operations Technician | 38.22 | NFE ENERGIA LLC |
| 303063 | Field Operations Technician | 42.36 | NFE ENERGIA LLC |
| 302143 | Field Operations Technician | 55.76 | NFE ENERGIA LLC |
| 302456 | Field Operations Technician | 49.83 | NFE ENERGIA LLC |
| 302458 | Field Operations Technician | 47.11 | NFE ENERGIA LLC |
| 302930 | Field Operations Technician | 53.87 | NFE ENERGIA LLC |
| 303058 | Field Operations Technician | 38.22 | NFE ENERGIA LLC |
| 302072 | Field Supervisor | 65.04 | NFE ENERGIA LLC |
| 302995 | Field Supervisor | 61.24 | NFE ENERGIA LLC |
| 302567 | Field Supervisor | 63.02 | NFE ENERGIA LLC |
| 302089 | Field Supervisor | 65.32 | NFE ENERGIA LLC |
| 302074 | Field Supervisor | 61.47 | NFE ENERGIA LLC |
| 302182 | Field Supervisor | 61.93 | NFE ENERGIA LLC |
| 302113 | Field Supervisor | 60.68 | NFE ENERGIA LLC |
| 302111 | Field Supervisor | 61.24 | NFE ENERGIA LLC |
| 302195 | Field Supervisor | 62.85 | NFE ENERGIA LLC |
| 302411 | Power Manager | 78.01 | NFE ENERGIA LLC |
| 302808 | Sr. Gas Turbine SME | 106.11 | NFE ENERGIA LLC |
| 302584 | Sr. Gas Turbine SME | 71.91 | NFE ENERGIA LLC |

| FILE NUMBER | JOB TITLE | HOURLY COST | ENTITY |
|---|---|---|---|
| 302462 | Field Operations Technician | $49.31 | NFE Energia LLC |
| 302397 | Field Operations Technician | $52.29 | NFE Energia LLC |
| 302132 | Field Operations Technician | $53.01 | NFE Energia LLC |
| 302565 | Field Operations Technician | $50.06 | NFE Energia LLC |
| 302401 | Field Operations Technician | $53.42 | NFE Energia LLC |
| 302407 | Field Operations Technician | $36.38 | NFE Energia LLC |
| 302399 | Field Operations Technician | $50.06 | NFE Energia LLC |
| 302545 | Field Operations Technician | $53.87 | NFE Energia LLC |
| 302460 | Field Operations Technician | $51.36 | NFE Energia LLC |
| 302504 | Field Operations Technician | $44.57 | NFE Energia LLC |
| 302502 | Field Operations Technician | $47.34 | NFE Energia LLC |
| 302143 | Field Operations Technician | $55.76 | NFE Energia LLC |
| 302547 | Field Operations Technician | $47.34 | NFE Energia LLC |
| 302456 | Field Operations Technician | $49.83 | NFE Energia LLC |
| 302458 | Field Operations Technician | $47.12 | NFE Energia LLC |
| 302930 | Field Operations Technician | $53.87 | NFE Energia LLC |
| 302072 | Field Supervisor | $65.05 | NFE Energia LLC |
| 302567 | Field Supervisor | $63.02 | NFE Energia LLC |
| 302089 | Field Supervisor | $65.32 | NFE Energia LLC |
| 302074 | Field Supervisor | $61.48 | NFE Energia LLC |
| 302182 | Field Supervisor | $61.94 | NFE Energia LLC |
| 302113 | Field Supervisor | $60.68 | NFE Energia LLC |
| 302111 | Field Supervisor | $61.25 | NFE Energia LLC |
| 302195 | Field Supervisor | $62.86 | NFE Energia LLC |
| 302411 | Power Manager | $65.26 | NFE Energia LLC |
| 302103 | Power Manager | $87.57 | NFE Energia LLC |
| 302808 | Sr. Gas Turbine SME | $62.04 | NFE Energia LLC |
| 302584 | Sr. Gas Turbine SME | $53.87 | NFE Energia LLC |
| 302081 | Sr. Management Power Generation | $92.86 | NFE Energia LLC |

| FILE NUMBER | JOB TITLE | HOURLY COST | ENTITY |
|---|---|---|---|
| 302808 | Sr. Gas Turbine SME | 52.14 | NFE Energia LLC |
| 302584 | Sr. Gas Turbine SME | 45.19 | NFE Energia LLC |

| FILE NUMBER | TITLE |
|---|---|
| 302072 | SUP-OPER - Supervisor de Operaciones |
| 302397 | SUP-OPER - Supervisor de Operaciones |
| 302995 | SUP-OPER - Supervisor de Operaciones |
| 302567 | SUP-OPER - Supervisor de Operaciones |
| 302195 | SUP-OPER - Supervisor de Operaciones |
| 303053 | TEC-OM - Tecnico de Operaciones y Mantenimiento |
| 303068 | TEC-OM - Tecnico de Operaciones y Mantenimiento |
| 302401 | TEC-OM - Tecnico de Operaciones y Mantenimiento |
| 302399 | TEC-OM - Tecnico de Operaciones y Mantenimiento |
| 302460 | TEC-OM - Tecnico de Operaciones y Mantenimiento |
| 302502 | TEC-OM - Tecnico de Operaciones y Mantenimiento |
| 302074 | TEC-OM - Tecnico de Operaciones y Mantenimiento |
| 303063 | TEC-OM - Tecnico de Operaciones y Mantenimiento |
| 302930 | TEC-OM - Tecnico de Operaciones y Mantenimiento |
| 303058 | TEC-OM - Tecnico de Operaciones y Mantenimiento |

Exhibit 19

| Site | Turbine Number | GG SERIAL | PT SERIAL Number |
|---|---|---|---|
| PS | GT01 | 557-259 | 557-259 |
| PS | GT02 | 557-121 | 557-121 |
| PS | GT03 | 481-559 | 481-559 |
| PS | GT04 | 481-717 | 481-717 |
| SJU | GT01 | 557-238 | 557-238 |
| SJU | GT02 | 557-251 | 557-251 |
| SJU | GT03 | 557-258 | 557-258 |
| SJU | GT04 | 557-268 | 557-268 |
| SJU | GT05 | 557-252 | 557-252 |
| SJU | GT06 | 557-254 | 557-254 |
| SJU | GT07 | 557-230 | 557-230 |
| SJU | GT08 | 557-242 | 557-242 |
| SJU | GT09 | 557-266 | 557-266 |
| SJU | GT10 | 557-262 | 557-262 |