P U B L I C A T I O N T R A N S M I T T A L

International Aero Engines

628 Hebron Avenue, Suite 400
Glastonbury, CT 06033, USA.
Tel: +1 (860) 368-3823
Fax: +1 (860) 755-6876

DATE: Sep. 19/13

V2500-A1/A5/D5 SERIES PROPULSION SYSTEM NON-MODIFICATION SERVICE BULLETIN

This document transmits the Revision 4 of Non-Modification Service Bulletin V2500-ENG-72-0580.

Document History

Non-Modification Service Bulletin Revision Status

Initial Issue	Dec.19/08
Revision 1	Oct.13/09
Revision 2	Aug.12/10
Revision 3	Aug.23/11

Non-Modification Service Bulletin Revision 4

Remove	Incorporate	Reason for change
All Pages of the Non-Modification Service Bulletin.	Pages 1 to 16 of the Non-Modification Service Bulletin.	To remove references to V2500-ENG-72-0557. To attach the FAA AMOC letter.
All Pages of the Appendix.	Pages 1 to 19 of the Appendix.	To remove references to V2500-ENG-72-0557.

SERVICE BULLETIN

NON-MODIFICATION SERVICE BULLETIN - BORESCOPE INSPECTION OF HIGH PRESSURE TURBINE (HPT) STAGE 1 DUCT SEGMENTS

1. Planning Information

A. Effectivity

(1) Airbus A319

(a) V2522-A5, V2524-A5, V2527M-A5

(2) Airbus A320

(a) V2500-A1

(b) V2527-A5, V2527E-A5

(3) Airbus A321

(a) V2530-A5, V2533-A5

(4) Boeing MD-90

(a) V2525-D5, V2528-D5

B. Concurrent Requirements

There are no concurrent requirements.

C. Reason

(1) Condition:

Field experience has shown that the HPT Stage 1 Duct Segments (Blade Outer Air Seals; BOAS) pre SB 72-0483 (A5/D5) and pre SB 72-0542 (A1) can develop cracking, burning and erosion and bow radially inward. This distress can cause release of Stage 1 BOAS into the gaspath resulting in various operational impacts and collateral damage.

(2) Background:

IAE has been closely monitoring the performance of the BOAS. With accumulated time, BOAS distress and radial bowing can result in interaction between the BOAS and the HPT Stage 1 Blades. This interaction may contribute to increased blade clearances and reduced time on-wing. Initially, this type of BOAS distress was observed on certain airlines who operate in hot and sandy environments. However, BOAS distress and operational events have gradually increased across all thrust models and in environments that may not be hot and sandy.

NOTE: IAE recommends not repairing or installing pre SB 72-0542 (A1) and pre SB 72-0483 (A5/D5) Stage 1 BOAS.

(3) Objective:

This Non-Modification Service Bulletin recommends inspection intervals for performing a 360 degree Borescope Inspection (BSI) of the Stage 1 BOAS. This Non-Modification Service Bulletin is intended to identify accelerated BOAS distress.

(4) Substantiation:

The recommended inspection intervals are based on a statistical review of Stage 1 BOAS event data and hardware.

(5) Effects of Bulletin on:

(a) Removal/Installation:

Not affected.

(b) Disassembly/Assembly:

Not affected.

(c) Cleaning:

Not affected.

(d) Inspection/Check:

Not affected.

(e) Repair:

Not affected.

(f) Testing:

Not affected.

(6) Supplemental Information

None.

D. Description

This Non-Modification Service Bulletin provides recommended inspection intervals for performing a 360 degree Borescope Inspection of the Stage 1 BOAS.

This Non-Modification Service Bulletin applies to all Stage 1 BOAS that are pre SB 72-0483 (A5/D5) and pre SB 72-0542 (A1).

E. Compliance

Category 3

Pre SB 72-0483 and Pre SB 72-0542

Federal aviation regulations require that each type certificate holder provide "Instructions For Continued Airworthiness". The information contained in this Non-Mod Service Bulletin (NMSB) is a part of the data provided by IAE to meet this requirement. IAE can only verify that the information contained in this NMSB applies to parts certified and maintained per IAE's instructions for continued airworthiness. An example of parts where IAE does not have the technical knowledge to verify applicability of IAE's instructions would be parts manufactured under a Parts Manufacturer Approval (PMA), or parts repaired using techniques that were not developed and approved through IAE, even though the use of such parts and repairs may be authorized by the Federal Aviation Administration. Accordingly, owners, operators and repairers (overhaulers) of IAE products should verify applicability of IAE's documents or obtain any part specific required instructions for continued airworthiness with the PMA manufacturer or non IAE repair author for the use of such parts and repairs.

Applicability: All V2500-A1, V2500-A5 and V2500-D5 Engines.

Do the repetitive borescope inspection in accordance with Table 1. below. The criteria consist of an hour accumulation, a cycle accumulation and EGT margin. The hour and cycle accumulation begins when either repaired or new stage 1 Blade Outer Airseals (BOAS) are installed in the engine. All three criteria in the table below must be met before an operator is required to perform the 360 degree borescope inspection at the next module inspection within 1,200 flight hours for A1/A5 engines or 1,000 flight hours for D5 engines. A series of example calculations are provided below for reference.

The 360 degree borescope inspection procedure is provided in the Accomplishment Instructions. Engine cross-sections are provided for reference in Appendices A, B and C for reference. Borescope inspection limits are provided in Appendix D. If damage is identified during a module inspection, subsequent borescope inspections must be performed in accordance with the inspection limits in Appendix D. If an engine is placed on a reduced inspection, please notify your IAE field representative to have him initiate a general PSCOMM notification to IAE describing the reason for reduced inspection to the HPT non-rotating group.

Table 1. Repetitive Borescope Inspection Criteria

	Engine Model	Hours (3) (Greater Than)	Cycles (3) (Greater Than)	EGTM (1) C (Less Than)	Repetitive Borescope Interval (2)
R	A1	6,000	3,800	45	1,200 hrs
R	A5	6,000	3,500	45	1,200 hrs
R	D5	5,000	3,500	45	1,000 hrs

(1) EGTM is defined as the expected margin during a sea level take off on a 30 deg C Outside Air Temperature Day. (Reference SIL 057 latest issue).

(2) All criteria must be met before the 360 degree inspection is required.

R (3) Time and cycles are an accumulation since repair of refurbishment of the BOAS.

Example Calculations for A5 engines (calculations are similar for D5 and A1 engines):

Example No. 1 - All pre Service Bulletin 72-0483 BOAS passed HPT module interface inspection.

Action: Inspection begins once the engine EGT Margin has fallen below 45 degree C and the BOAS have accumulated greater than 6,000 hours and greater than 3,500 cycles since new or refurbishment.

Example No. 2 - All BOAS were replaced with new pre Service Bulletin 72-0483 hardware.

Action: Inspection begins once the engine EGT Margin has fallen below 45 degree C and the BOAS have accumulated greater than 6,000 hours and greater than 3,500 cycles.

Example No. 3 - All BOAS were replaced with a mixture of repaired or new pre Service Bulletin 72-0483 hardware.

Action: Inspection begins once the engine EGT Margin has fallen below 45 degree C and the BOAS have accumulated greater than 6,000 hours and greater than 3,500 cycles. A repaired BOAS is equivalent to a new BOAS that has zero time.

Example No. 4 - The HPT module received a heavy maintenance visit and some BOAS were returned to service as-is, while some were repaired or replaced with new pre Service Bulletin 72-0483 hardware.

Action: Inspection begins once the engine EGT Margin has fallen below 45 degree C and the BOAS have accumulated greater than 6,000 hours and greater than 3,500 cycles since new or repair. If a module has a mix of new, repaired and BOAS that passed piece-part inspection, then the inspections would begin based on the BOAS that passed piece-part inspection since these would be the oldest.

Example No. 5 - All BOAS were replaced with post Service Bulletin 72-0483 hardware.

Action: Engines that were previously required to perform Service Bulletin 72-0580 no longer have to inspect their BOAS once new Service Bulletin 72-0483 is incorporated.

F. Approval Data

The compliance statement and the procedures described in this Non-Modification Service Bulletin have been shown to comply with the applicable Federal Aviation Regulations and are FAA-APPROVED for the Engine Models listed.

R Revision 4 of this Service Bulletin was FAA-APPROVED as an Alternate Means Of
R Compliance (AMOC) to AD 2011-25-08.

G. Manpower

(1) In Service

(a) To gain access:

45 Minutes

(b) To perform Borescope Inspection:

1 Hour 10 Minutes

(c) To return Engine to a serviceable status:

45 Minutes

(2) Total Necessary Man-hours

2 Hours 40 Minutes

(3) At Overhaul

Not Applicable.

H. Weight and Balance

(1) Weight Change

None.

(2) Moment Arm

No Effect.

(3) Datum

Engine Front Mount Centerline (Power Plant Station (PPS) 100)

I. Electrical Load Data

This Non-Modification Service Bulletin has no effect on the aircraft electrical load.

J. Software Accomplishment Summary

Not Applicable.

K. References

(1) IAE V2500 Service Bulletin V2500-ENG-72-0464 (Engine - New First Stage Blade Outer Air Seal And HPT Vane Support (Controlled Service Use).

(2) IAE V2500 Service Bulletin V2500-ENG-72-0483 (Engine - New First Stage Duct Segments And HPT Vane Support).

(3) IAE V2500 Service Bulletin V2500-ENG-72-0542 (Engine - New First Stage Duct Segments And HPT Vane Support).

(4) V2500 Engine Illustrated Parts Catalogs (S-V2500-1IA, S-V2500-2IA, S-V2500-2IB, S-V2500-3IA, S-V2500-3IB, S-V2500-5IA, S-V2500-5IB, S-V2500-6IA, S-V2500-6IB, S-V2500-7IA, and S-V2500-7IB), Chapter/Section 72-44-10 Figure 1 Item 010 and 72-45-23 Figure 02 Items 060 and 062.

(5) V2500 Engine Manual (E-V2500-1IA), Chapter/Section 72-44-10 and 72-45-23.

(6) V2500 Engine Manual (E-V2500-3IA), Chapter/Section 72-44-10 and 72-45-23.

(7) V2500 Standard Practices/Processes Manual (E-V2500-1IA), Chapter/Section 70-09-00-400-50.

(8) V2500 Standard Practices/Processes Manual (E-V2500-3IA), Chapter/Section 70-09-00-400-501.

(9) Aircraft Maintenance Manual.

(10) Internal Reference No. - IEN 08VC282, IEN 08VC282A, IEN 08VC282B, IEN 08VC282C, EA 11VC149, EA 11VC149A, EA 11VC149B.

(11) ATA Locator - 72-00-00.

L. Other Publications Affected

None.

M. Interchangeability of Parts

Not applicable.

N. Information in the Appendix

Alternate Accomplishment Instructions (No)

Progression Charts (No)

Supplement (Yes)

Added Data (Yes)

Revision to Table of Limits (No)

Inspection Procedures (No)

2. Material Information

A. Material - Price and Availability

There is no kit provided to do this Non-Modification Service Bulletin.

B. Industry Support Program

Not Applicable.

C. The material data that follows is for each engine.

This Non-Modification Service Bulletin is for inspection only.

D. Instructions/Disposition Code Statements:

Parts Modification Conditions

Not applicable.

Spare Parts Availability

Not applicable.

Cleaning, Inspection and Repair Information

Not applicable.

E. Tooling - Price and Availability

The following special tools are required to accomplish this Non-Modification Service Bulletin.

For V2500-A1 Model:

2,5 meter or greater flex Borescope with forward viewing tip 7 mm or greater or 5 mm or less.

For V2500-A5/D5 Models:

2,5 meter or greater flex Borescope with forward viewing tip 6 mm or greater.

NOTE: Inspection may be accomplished with a 2,0 meter borescope, but it may require an experienced inspector, use of both borescope ports, or insertion of the borescope upwards then downwards to ensure proper inspection of all 38 Stage 1 BOAS around the circumference.

F. Reidentified Parts

Not Applicable.

G. Other Material Information Data

Not Applicable.

3. Accomplishment Instructions

A. For Airbus Aircraft: Perform Borescope Inspection of Stage 1 (BOAS)

(1) Job set-up procedure

(a) Safety Precautions

(i) On the center pedestal, on the ENG panel 115VU place a warning notice not to start the engine.

CAUTION: THE ENGINE IS HOT IMMEDIATELY AFTER SHUTDOWN AND CAN CAUSE BURNS AND DAMAGE TO THE BORESCOPE EQUIPMENT. INSPECTORS SHOULD WAIT UNTIL ENGINE CORE IS COOL (LESS THAN 145 DEG F (62,9 DEG C) BEFORE PERFORMING THE INSPECTION. ENGINES IN COLD ENVIRONMENTS MAY TAKE 2 - 4 HOURS TO COOL DOWN. ENGINES IN HOT ENVIRONMENTS MAY TAKE GREATER THAN 4 HOURS TO COOL DOWN.

(ii) On the overhead maintenance panel 50VU make sure that the ON legend of the ENG/FADEC GND PWR pushbutton switch is off for engine 1 and 2.

(1) Put a warning notice that indicates not to energize the FADEC for engine 1 and 2.

(2) Open the fan cowls in accordance with Reference 10, Aircraft Maintenance Manual, Task 71-13-00-010-010.

WARNING: THE THRUST REVERSER HYDRAULIC CONTROL UNIT (HCU) MUST BE DEACTIVATED BEFORE WORKING ON OR AROUND THE THRUST REVERSER. FAILURE TO DEACTIVATE THE HCU CAN RESULT IN INADVERTENT THRUST REVERSER OPERATION AND INJURY TO PERSONNEL AND/OR DAMAGE TO EQUIPMENT.

(3) Deactivate the thrust reverser.

A Deactivate the thrust reverser hydraulic control unit (HCU) in accordance with Reference 10, Aircraft Maintenance Manual, Task 78-30-00-040-012.

(4) Open the thrust reverser halves in accordance with Reference 10, Aircraft Maintenance Manual, Task 78-32-00-010-010.

(2) Procedure

(a) General

(i) Identify Borescope ports. Reference Appendix A, B, and C for Borescope Inspection port location

(b) Do a close up borescope inspection of the Stage 1 BOAS. Reference Appendix D.

(i) Get access to the Stage 1 BOAS through the T1/2L or T1/2R ports.

WARNING: MAKE SURE THE BORESCOPE PLUG IS SUFFICIENTLY COOL BEFORE YOU REMOVE IT. THE TEMPERATURE STAYS HIGH FOR A SHORT TIME AFTER ENGINE SHUTDOWN.

(1) Remove the lockwire and bolts which hold the plugs.

(2) Put the IAE 1P16184 Knocker-Puller into the center hole of the plug.

CAUTION: THE BORESCOPE PLUG CAN BE DIFFICULT TO REMOVE AND AS A RESULT IT CAN BE BROKEN. CARE SHOULD BE TAKEN WHEN REMOVING THE PLUG.

(3) Use the puller to remove the plug from the port.

(4) Remove the gasket from the plug.

(5) Remove the plug from the puller.

CAUTION: NOT USING THE RECOMMENDED BORESCOPE EQUIPMENT MAY RESULT IN DIFFICULTY DURING THE BORESCOPE REMOVAL.

(ii) Put the flexible borescope into the T1/2L or T1/2R port.

(iii) Articulate the borescope until you can see the trailing edge of the 1st Stage HPT Blades and leading edge of the 2nd Stage Vanes.

NOTE: When the borescope is in approximately 12 in. (0,30 m), withdraw the borescope to make sure there is a minimum of resistance. If there is resistance, remove the borescope and rotate the rotor for a better position.

(iv) Continue inserting the borescope around the circumference until you can see the borescope at the entrance point.

NOTE: If the available borescope is not long enough to perform the complete 360 degree inspection by flexing the borescope upward, it can be removed and the inspection can be completed by flexing the borescope downward or by accessing the other borescope port.

(v) Articulate the borescope to view the Stage 1 BOAS.

(vi) Inspect the Stage 1 BOAS as you slowly retract the scope.

NOTE: BOAS should be counted as they are inspected to ensure all 38 have been inspected and to record a location if damage is observed.

(vii) If damage is found, compare the findings with the limits in Appendix D.

NOTE: If BOAS distress is observed, make sure to articulate the borescope in order to examine the entire platform for additional distress.

NOTE: Missing BOAS requires immediate engine removal. Please contact IAE Technical Support for disposition of the HPT case, LLPs and Stage 1 BOAS support.

(viii) Continue inspecting the Stage 1 BOAS as the borescope is gently retracted and reaches the point of entry.

(ix) Remove the boresope after completing the inspection.

(3) Close-up

(a) Ensure all Inspection Equipment has been removed.

(b) Close the borescope inspection ports after the borescope inspection is completed as follows:

(i) For the T1/2L or T1/2R port, proceed as follows:

(1) Put the gasket option in the case recess.

(2) Replace the gasket if the seal is not above the case surface.

(3) Put the gasket on the plug and install it in the case.

(4) Lubricate the bolt threads with anti-seize paste or anti-seize compound. Wipe off excess paste.

(5) Install the bolts.

(6) Torque the bolts to between 75 and 85 lbf. in (8,4 and 9,6 Nm).

(7) Safety the bolts with corrosion resistant steel lockwire. (Material No. VO2-141).

(c) Close Access.

(i) Make sure that the work area is clean and clear of tool(s) and other items.

(ii) Close the thrust reverser halves in accordance with Reference 10, Aircraft Maintenance Manual, Task 78-32-00-410-010.

(d) Activate the thrust reverser HCU in accordance with Reference 10, Aircraft Maintenance Manual, Task 78-30-00-440-012.

(i) Close the fan close in accordance with Reference 10, Aircraft Maintenance Manual, Task 71-13-00-410-010.

(ii) Remove the warning notice(s).

(4) Recording Instructions

(a) A record of accomplishment is required.

B. For Boeing Aircraft: Perform Borescope Inspection of Stage 1 (BOAS)

(1) Job set-up procedure

(a) Safety Precautions

(i) Put a "DO NOT OPERATE" tag on the throttle thrust lever in accordance with Reference 10, Aircraft Maintenance Manual, Task 72-00-04-490-001.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT MAY OCCUR.

CAUTION: THE ENGINE IS HOT IMMEDIATELY AFTER SHUTDOWN AND CAN CAUSE BURNS AND DAMAGE TO THE BORESCOPE EQUIPMENT. INSPECTORS SHOULD WAIT UNTIL ENGINE CORE IS COOL (LESS THAN 145 DEGREE F (62,9 DEGREE C) BEFORE PERFORMING THE INSPECTION. ENGINES IN COLD ENVIRONMENTS MAY TAKE 2 - 4 HOURS TO COOL DOWN. ENGINES IN HOT ENVIRONMENTS MAY TAKE GREATER THAN 4 HOURS TO COOL DOWN.

(ii) Open the fan cowls in accordance with Reference 10, Aircraft Maintenance Manual, Task 71-13-00/201.

WARNING: THE THRUST REVERSER HYDRAULIC CONTROL UNIT (HCU) MUST BE DEACTIVATED BEFORE WORKING ON OR AROUND THE THRUST REVERSER. FAILURE TO DEACTIVATE THE HCU CAN RESULT IN INADVERTENT THRUST REVERSER OPERATION AND INJURY TO PERSONNEL AND/OR DAMAGE TO EQUIPMENT.

(1) Deactivate the thrust reverser.

A Deactivate the thrust reverser hydraulic control unit (HCU) in accordance with Reference 10, Aircraft Maintenance Manual, Task 78-30-00-040-801.

B Open the thrust reverser halves in accordance with Reference 10, Aircraft Maintenance Manual, Task 78-32-00-010-006.

(2) Procedure

(a) General Borescope Inspection

(i) Identify Borescope ports. Reference Appendix A, B, and C for Borescope Inspection port location.

(b) Do a close up borescope inspection of the Stage 1 Stage 1 BOAS. Reference Appendix D.

(i) Get access to the Stage 1 Stage 1 BOAS through the T1/2L or T1/2R ports.

MAKE SURE THE BORESCOPE PLUG IS SUFFICIENTLY COOL BEFORE YOU REMOVE IT. THE TEMPERATURE STAYS HIGH FOR A SHORT TIME AFTER ENGINE SHUTDOWN.

(1) Remove the lockwire and bolts which hold the plugs.

(2) Put the IAE 1P16184 Knocker-Puller into the center hole of the plug.

CAUTION: THE BORESCOPE PLUG CAN BE DIFFICULT TO REMOVE AND AS A RESULT IT CAN BE BROKEN. CARE SHOULD BE TAKEN WHEN REMOVING THE PLUG.

(3) Use the puller to remove the plug from the port.

(4) Remove the gasket from the plug.

(5) Remove the plug from the puller.

CAUTION: NOT USING THE RECOMMENDED BORESCOPE EQUIPMENT MAY RESULT IN DIFFICULTY DURING THE BORESCOPE REMOVAL.

(ii) Put the flexible borescope into the T1/2L or T1/2R port.

(iii) Articulate the borescope until you can see the trailing edge of the 1st Stage HPT Blades and leading edge of the 2nd Stage Vanes.

NOTE: When the borescope is in approximately 12 in. (0,30 m), withdraw the borescope to make sure there is a minimum of resistance. If there is resistance, remove the borescope and rotate the rotor for a better position.

(iv) Continue inserting the borescope around the circumference until you can see the borescope at the entrance point.

NOTE: If the available borescope is not long enough to perform the complete 360 degree inspection by flexing the borescope upward, it can be removed and the inspection can be completed by flexing the borescope downward by accessing the other borescope port.

(v) Articulate the borescope to view the Stage 1 BOAS.

(vi) Inspect the Stage 1 BOAS as you slowly retract the scope.

NOTE: BOAS should be counted as they are inspected to ensure all 38 have been inspected and to record a location if damage is observed.

(vii) If damage is found, compare the findings with the limits in Appendix D.

NOTE: If BOAS distress is observed, make sure to articulate the borescope in order to examine the entire platform for additional distress.

NOTE: Missing BOAS requires immediate engine removal. Please contact IAE Technical Support for disposition of the HPT case, LLPs and Stage 1 BOAS support.

(viii) Continue inspecting the Stage 1 BOAS as the borescope is gently retracted and reaches the point of entry.

(ix) Remove the boresope after completing the inspection.

(3) Close-up

(a) Ensure all Inspection Equipment has been removed.

(b) Close the borescope inspection ports after the borescope inspection is completed as follows:

(i) For the T1/2L or T1/2R port, proceed as follows:

(1) Put the gasket option in the case recess.

(2) Replace the gasket if the seal is not above the case surface.

(3) Put the gasket on the plug and install it in the case.

(4) Lubricate the bolt threads with anti-seize paste or anti-seize compound. Wipe off excess paste.

(5) Install the bolts.

(6) Torque the bolts to between 75 and 85 lbf. in (8,4 and 9,6 Nm).

(7) Safety the bolts with corrosion resistant steel lockwire. (Material No. V02-141).

(c) Close Access.

(i) Make sure that the work area is clean and clear of tool(s) and other items.

(ii) Close the thrust reverser halves in accordance with Reference 10, Aircraft Maintenance Manual, Task 78-32-00-942-001.

(d) Activate the thrust reverser HCU in accordance with Reference 10, Aircraft Maintenance Manual, Task 78-30-00-440-801.

(i) Close the fan close in accordance with Reference 10, Aircraft Maintenance Manual, Task 71-13-00/201.

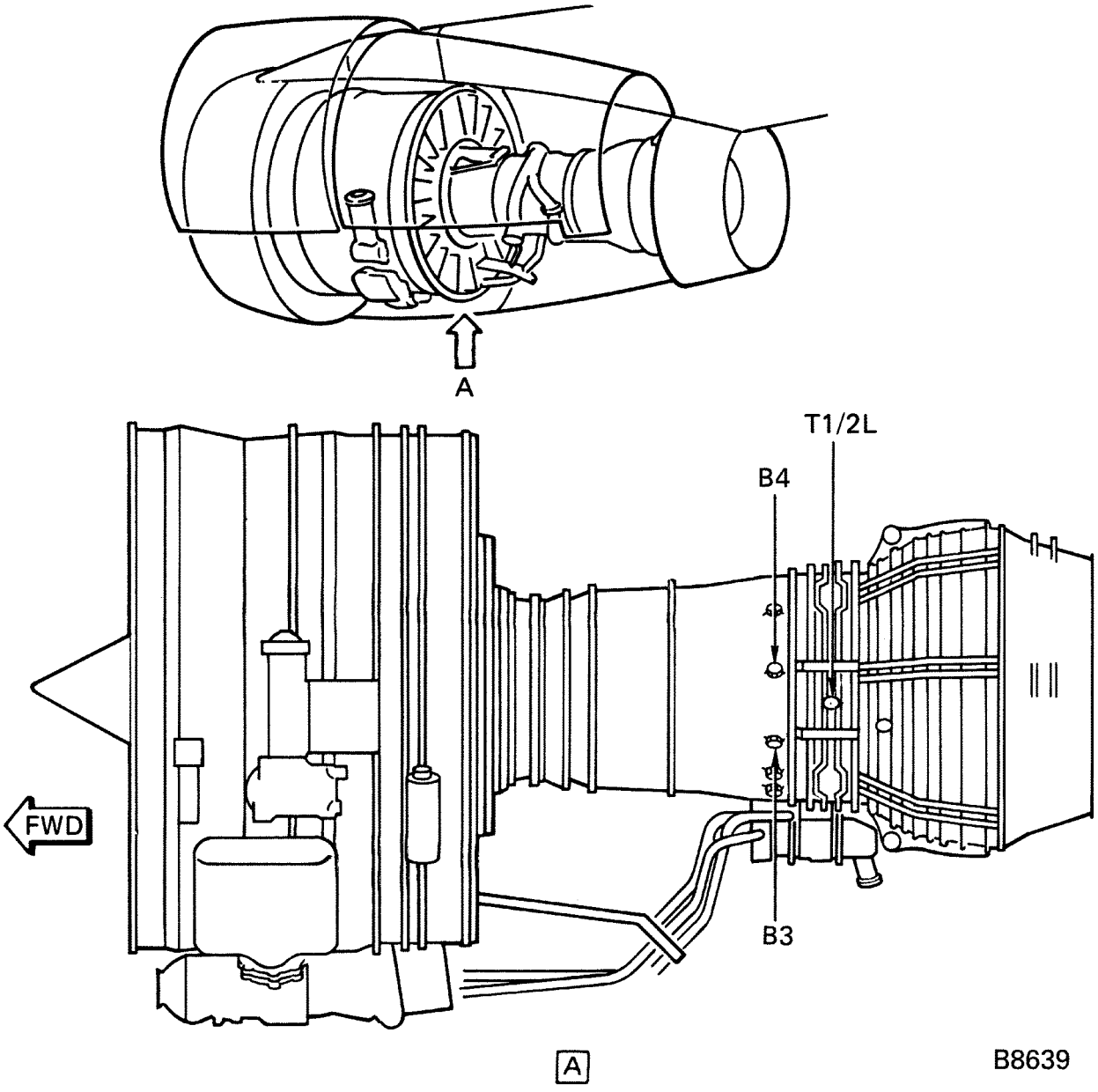
(ii) Remove the warning notice(s), safety tags and close circuit breakers in accordance with Reference 10, Aircraft Maintenance Manual, Task 78-32-00-865-001.

(4) Recording Instructions

(a) A record of accomplishment is required.

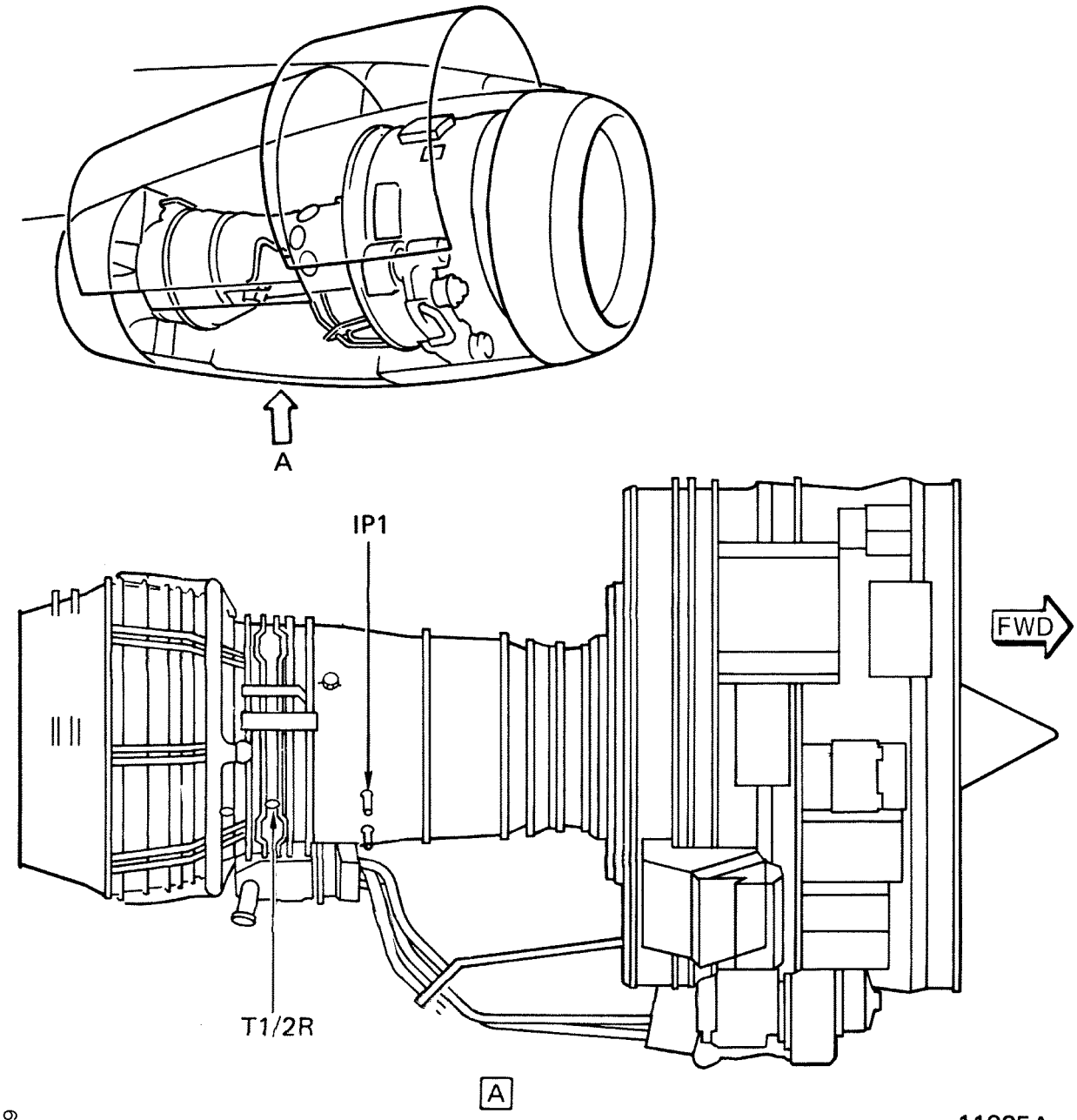
APPENDIX

1. Appendix A – HP Turbine Borescope Location for Inspection of the Stage 1 HPT Duct Segments (Left Side and Right Side)



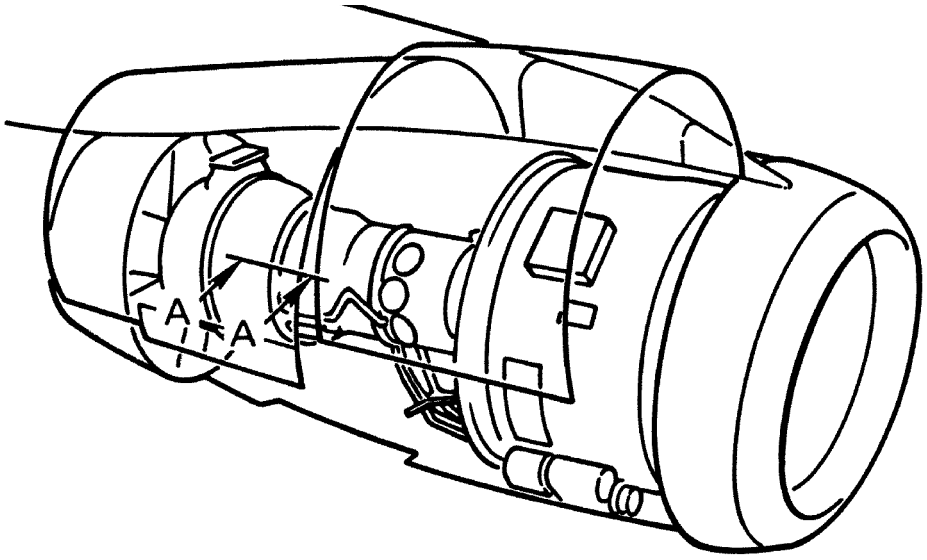
pw0b520618

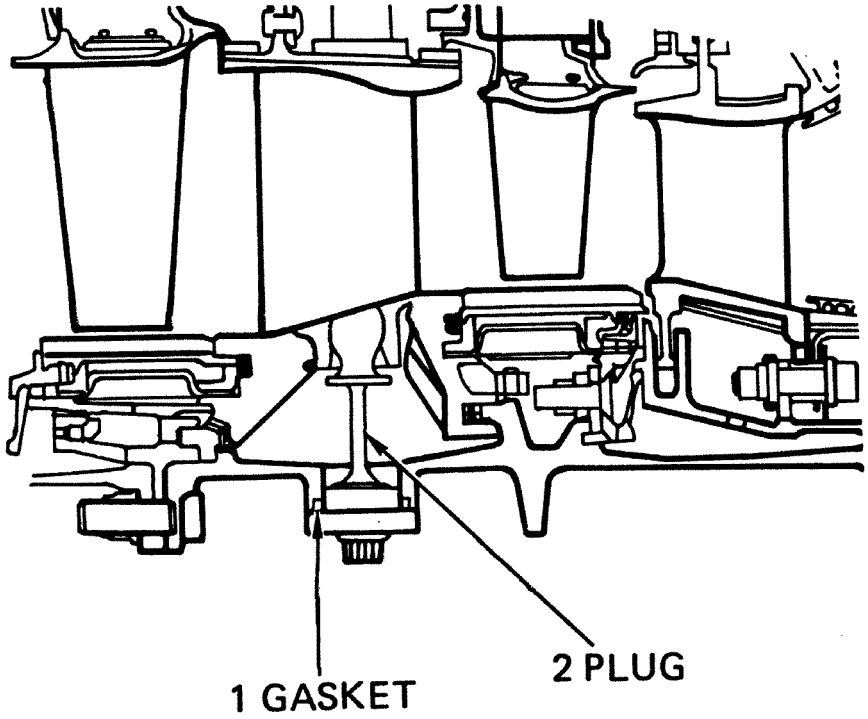
HP TURBINE BORESCOPE LOCATION FOR INSPECTION OF THE STAGE 1 HPT DUCT SEGMENTS (LEFT SIDE)
Appendix A (Sheet 1 of 2)



HP TURBINE BORESCOPE LOCATION FOR INSPECTION OF THE STAGE 1 HPT DUCT SEGMENTS (RIGHT SIDE)
Appendix A (Sheet 2 of 2)

2. Appendix B - HP Turbine Ports for Inspection of the Stage 1 HPT Duct Segments





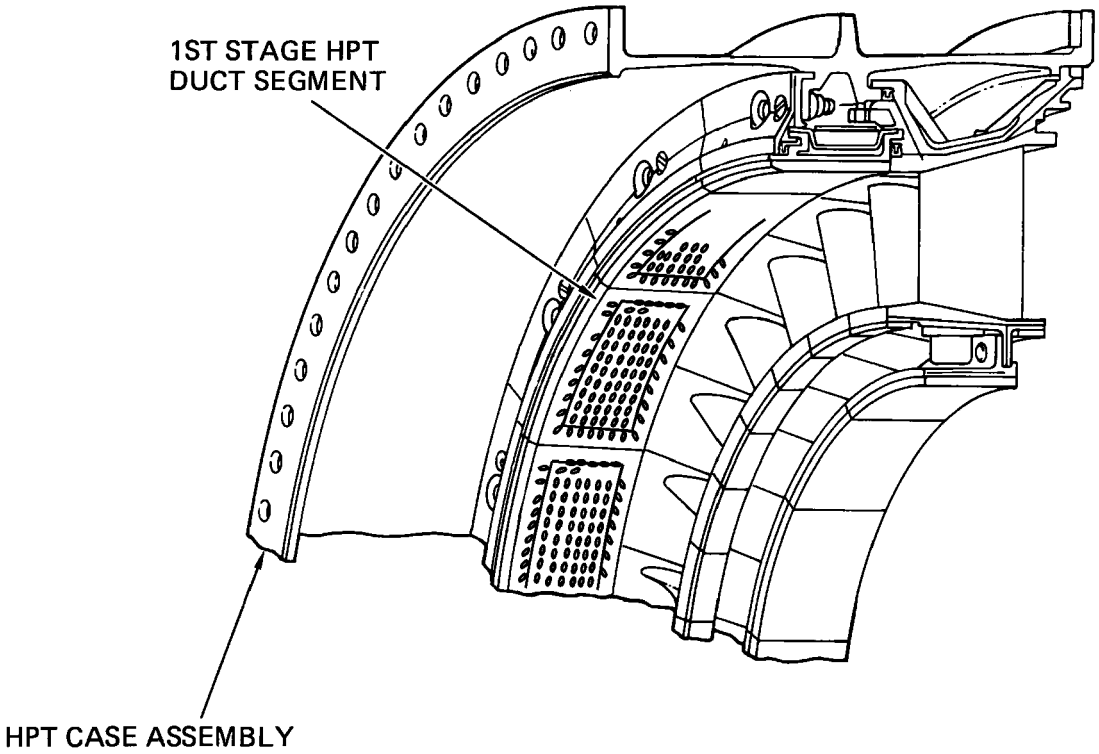
pw0b520620

SECTION A–A
(T1/2L and T1/2R)
2 LOCATIONS

11927B

HP TURBINE PORTS FOR INSPECTION OF THE STAGE 1 HPT DUCT SEGMENTS
Appendix B

3. Appendix C - Stage 1 HPT Duct Segment Inspection Locations



pw0b520621

PWC

STAGE 1 HPT DUCT SEGMENT INSPECTION LOCATIONS
Appendix C

4. Appendix D (Sheet 1 of 9) - Stage 1 HPT Duct Segment Inspection Limits

Condition	300-hr inspection	125-hr inspection	Pull in 10 cycles
Axial Cracks	Any crack longer than 0.250 in. (6,35 mm) and shorter than 0.500 in. (12,70 mm)	Any crack longer than or equal to 0.500 in. (12,70 mm) but shorter than 1.20 in. (30,48 mm)	Any crack longer than or equal to 1.20 in. (30,48 mm)
Circumferen-tial Cracks	Any crack longer than 0.375 in. (9,53 mm) and shorter than 0.500 in. (12,70 mm)	Any crack longer than or equal to 0.500 in. (12,70 mm) but shorter than 1.50 in. (38,1 mm)	Any crack longer than or equal to 1.50 in. (38,1 mm)
Intersecting Cracks * See Sheets 4, 5 and 6	Any combined crack longer than 0.250 in. (6,35 mm) and shorter than 0.500 in. (12,70 mm) axially or longer than 0.375 in. (9,53 mm) and shorter than 0.500 in. (12,70 mm) circumferentially	Any combined crack longer than or equal to 0.500 in. (12,70 mm) and shorter than 1.200 in. (30,48 mm) axially or longer than or equal to 0.500 in. (12,70 mm) and shorter than 1.500 in. (38,10 mm) circumferentially	Any combined crack longer than or equal to 1.200 in. (30,48 mm) axially or 1.500 in. (38,10 mm) circumferentially
Closed loop of cracks * See Sheet 9	Does Not Apply	Maximum length in X or Y direction less than 0.500 in. (12,70 mm)	Maximum length in X or Y direction more than or equal to 0.500 in. (12,70 mm)
Burning/ Erosion of base metal Area 1 (No Burn Through)	Any amount greater than two connecting cooling holes	Does Not Apply	Does Not Apply
Burning/ Erosion of base metal Area 2 (No Burn Through)	Shiplap burning greater than the 1st row of cooling holes and up to 2nd row of cooling holes	Shiplap burning beyond 2nd row of cooling holes	Does Not Apply
Burn Through Area 1 and 2	Does Not Apply	Less than 0.500 in. (12,70 mm) of continuous burn-through in Area 1, Area 2 or Areas 1 and 2 together	0.500 in. (12,70 mm) or more of continuous burn-through in Area 1, Area 2, or Areas 1 and 2 together
Burn through with adjoining cracks in the axial direction * See Sheet 7	Does Not Apply	Combined length of X1+X2+Z less than 1.200 in. (30,48 mm) and Z less than 0.500 in. (12,70 mm) in Area 1, Area 2 or Areas 1 and 2 together	Combined length of X1+X2+Z more than or equal to 1.200 in. (30,48 mm) or Z more than or equal to 0.500 in. (12,70 mm) in Area 1, Area 2 or Areas 1 and 2 together

Burn through with adjoining cracks in the circumferen-tial direction *See Sheet 8	Does Not Apply	Combined length of Y1+Y2+Z less than 1.500 in. (38,10 mm) and Z less than 0.500 in. (12,70 mm) in Area 1, Area 2 or Areas 1 and 2 together	Combined length of Y1+Y2+Z more than or equal to 1.500 in. (38,10 mm) or Z more than or equal to 0.500 in. (12,70 mm) in Area 1, Area 2 or Areas 1 and 2 together
Burn Through Impingement Plate	Does Not Apply	Does Not Apply	Any Amount
Lifting of LE Material	Does Not Apply	Does Not Apply	Lifting of Seal Edge
Loss of LE Material	Less than 0.300 in. (7,62 mm)	0.300 in. (7,62 mm) or more, but less than 0.500 in. (12,70 mm)	0.500 in. (12,70 mm) or more

Definitions:

Use the names which follow when you identify a HPT Stage 1 Duct segment condition seen at borescope inspection:

1) Cracks:

A linear opening that can easily be seen and which can cause the material to break.

2) Closed Loop of Cracks:

Adjoining cracks that close in on themselves. See Sheet 9.

NOTE: Individual crack limits still apply to a closed loop of cracks.

3) Intersecting Cracks:

One or more axial or circumferential cracks that intersect each other. See Sheets 4, 5 and 6.

4) Burns:

A local area where material has been removed because of heat distress.

5) Burn through:

A hole in the Duct Segment gas path side open to the cavity behind it.

NOTE: Any crack wider than 0.05 in. (1,27 mm) over the cooling pocket is considered a burn through.

6) Erosion:

A local area where material has been removed by causes other than heat distress.

7) LE Lifting:

When the Duct Segment Leading Edge has become loose and can move radially inward.

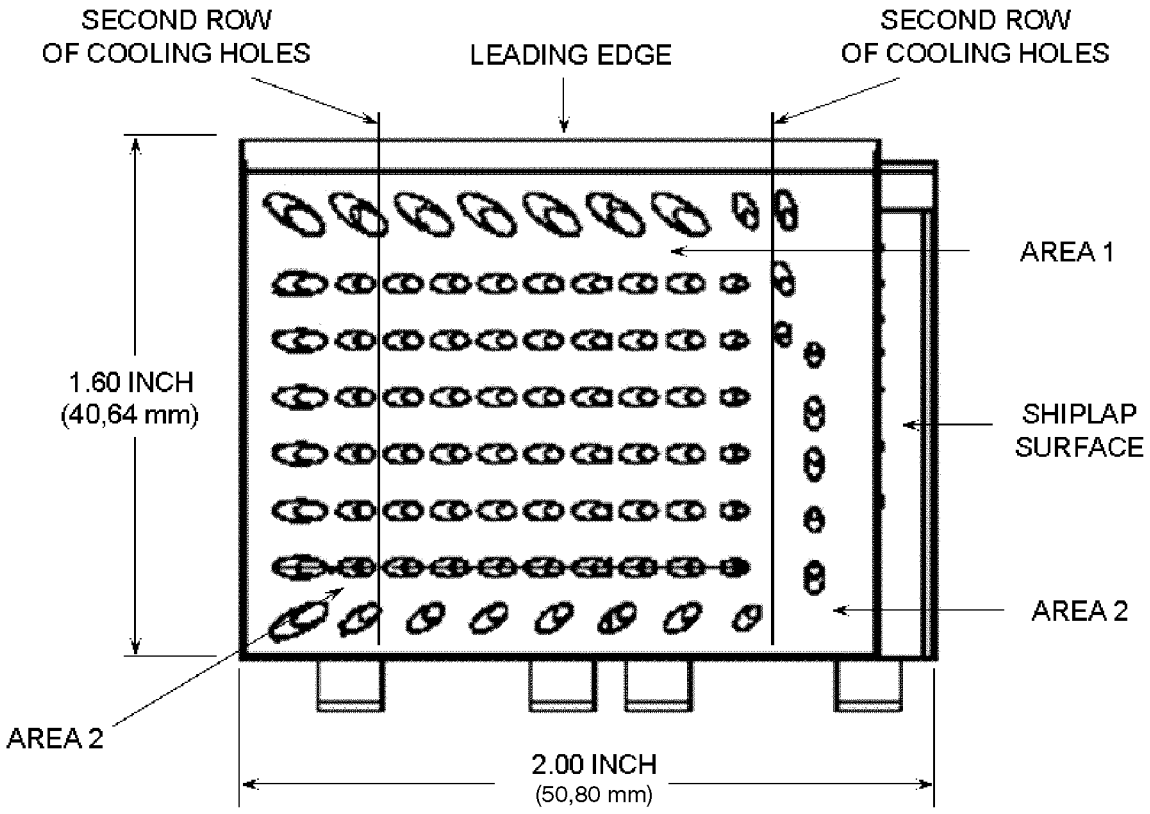
8) Impingement Plate:

The wall that seals the internal cavity from the backside of the duct segment.

9) Shiplap:

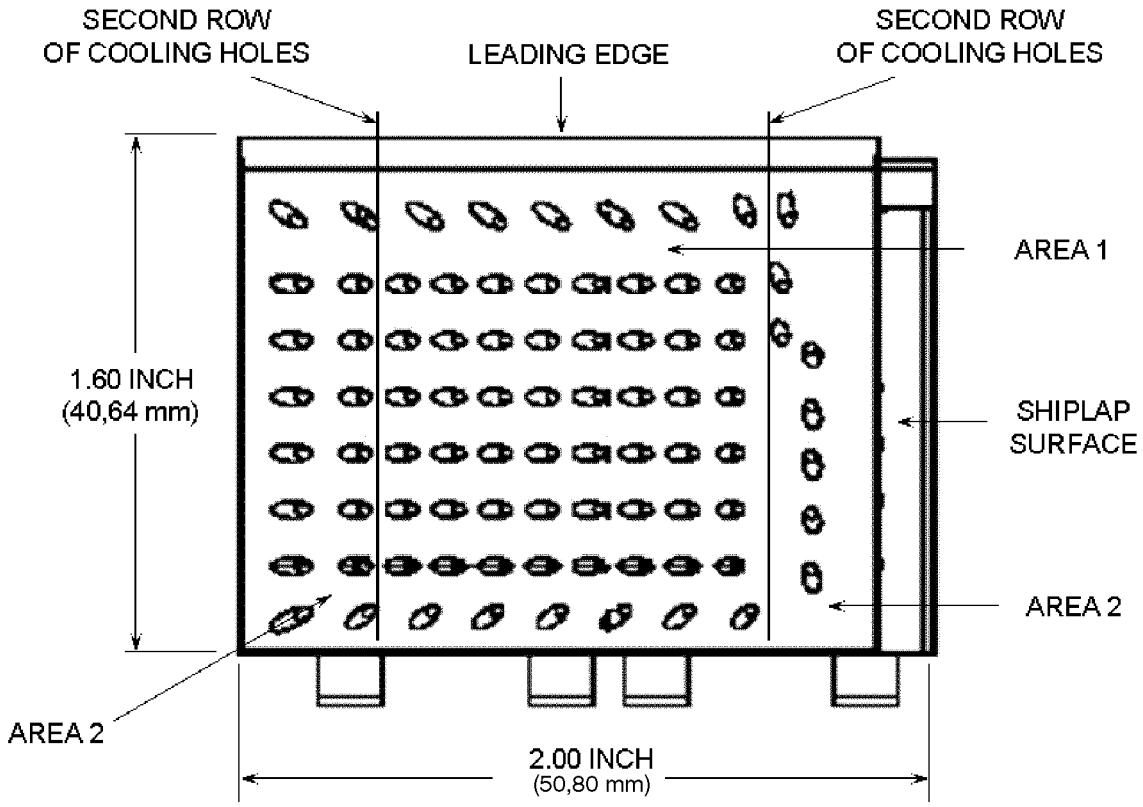
Location where adjoining duct segments overlap. See Sheets 2 and 3.

NOTE: Any crack wider than 0.05 in. (1,27 mm) over the cooling pocket is considered a burn through.



pw0b520912b

STAGE 1 BOAS PLATFORM OVERVIEW - PRE SERVICE BULLETIN
V2500-ENG-72-0542 (A1 SERIES ENGINES)
Appendix D (Sheet 2 of 9)



lpw0b520916b

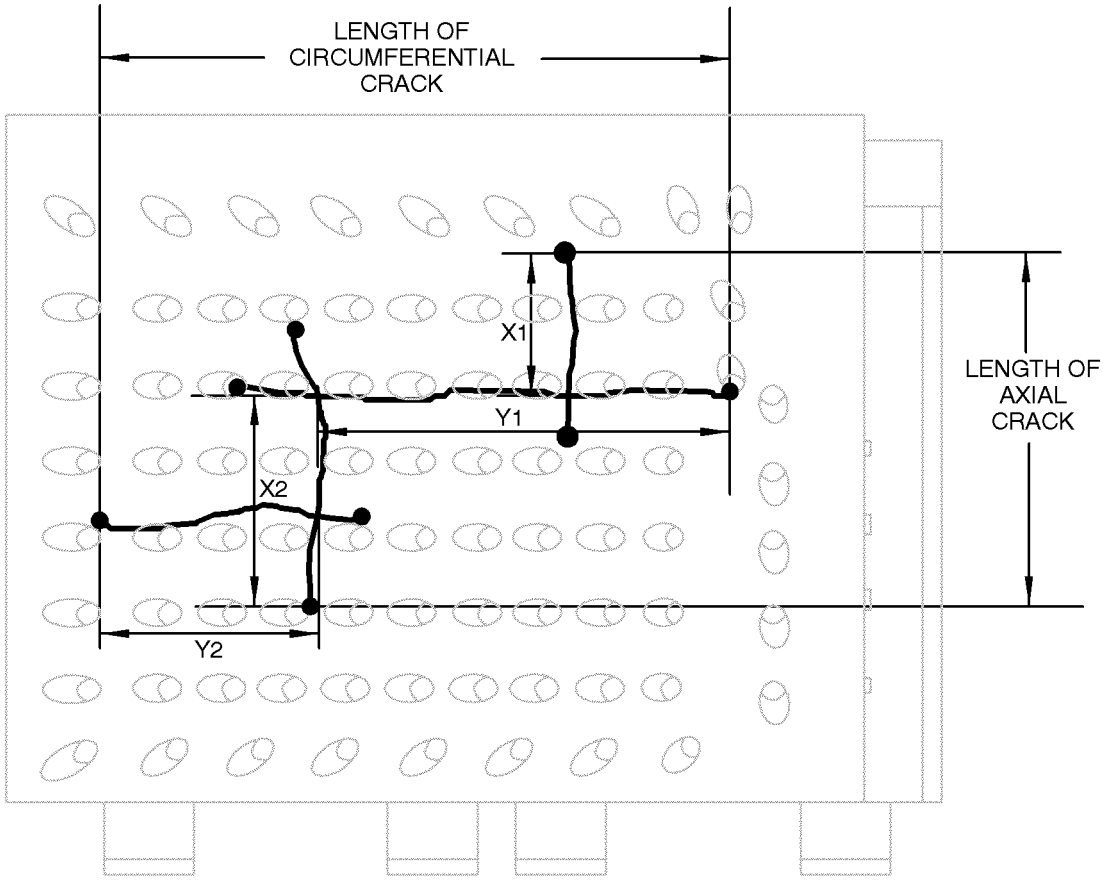
STAGE 1 BOAS PLATFORM OVERVIEW - PRE SERVICE BULLETIN
V2500-ENG-72-0483 (A5/D5 SERIES ENGINES)
Appendix D (Sheet 3 of 9)

KEY

LENGTH OF AXIAL CRACK = X1 + X2

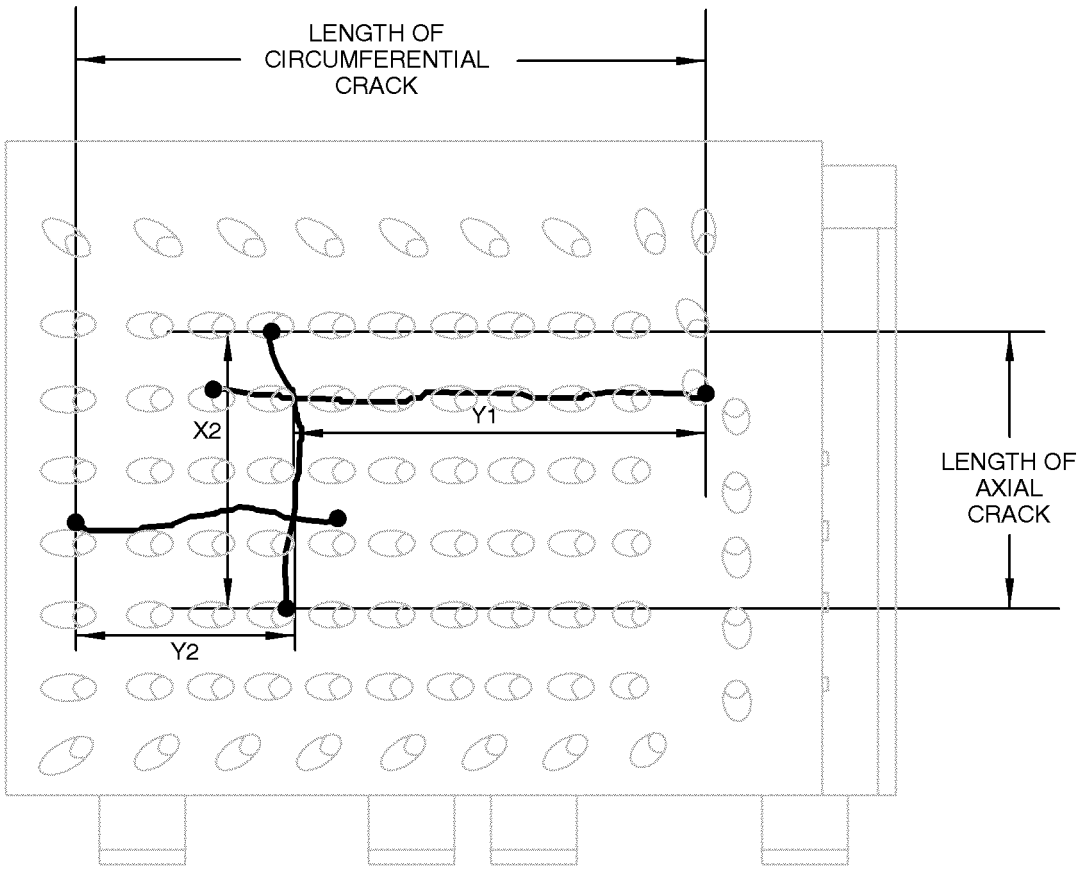
LENGTH OF CIRCUMFERENTIAL CRACK = Y1 + Y2

CRACKS =



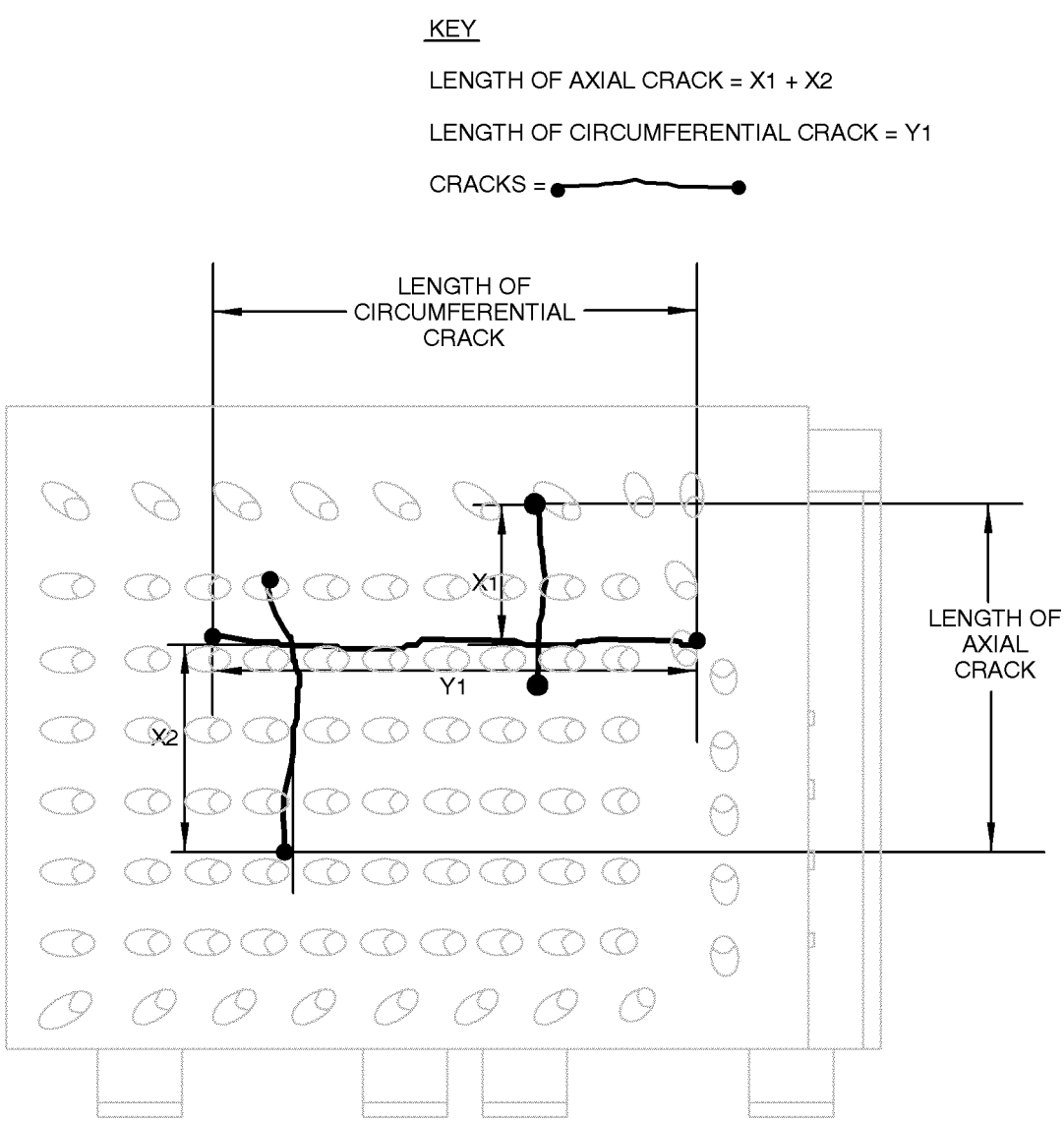
lpw0b522765

STAGE 1 BOAS PLATFORM – INTERSECTING CRACKS
Appendix D (Sheet 4 of 9)



lpw0b522766

STAGE 1 BOAS PLATFORM – INTERSECTING CRACKS
Appendix D (Sheet 5 of 9)



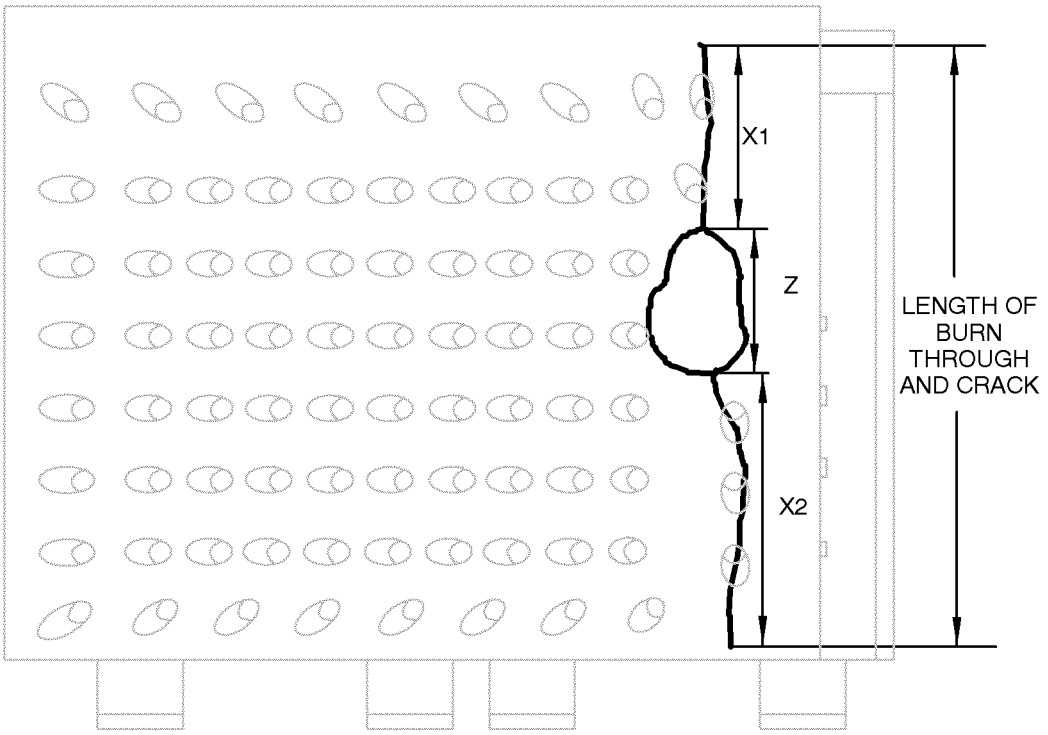
lpw0b522767

STAGE 1 BOAS PLATFORM - INTERSECTING CRACKS
Appendix D (Sheet 6 of 9)

KEY

TOTAL LENGTH = X1 + X2 + Z

LENGTH OF BURN THROUGH = Z



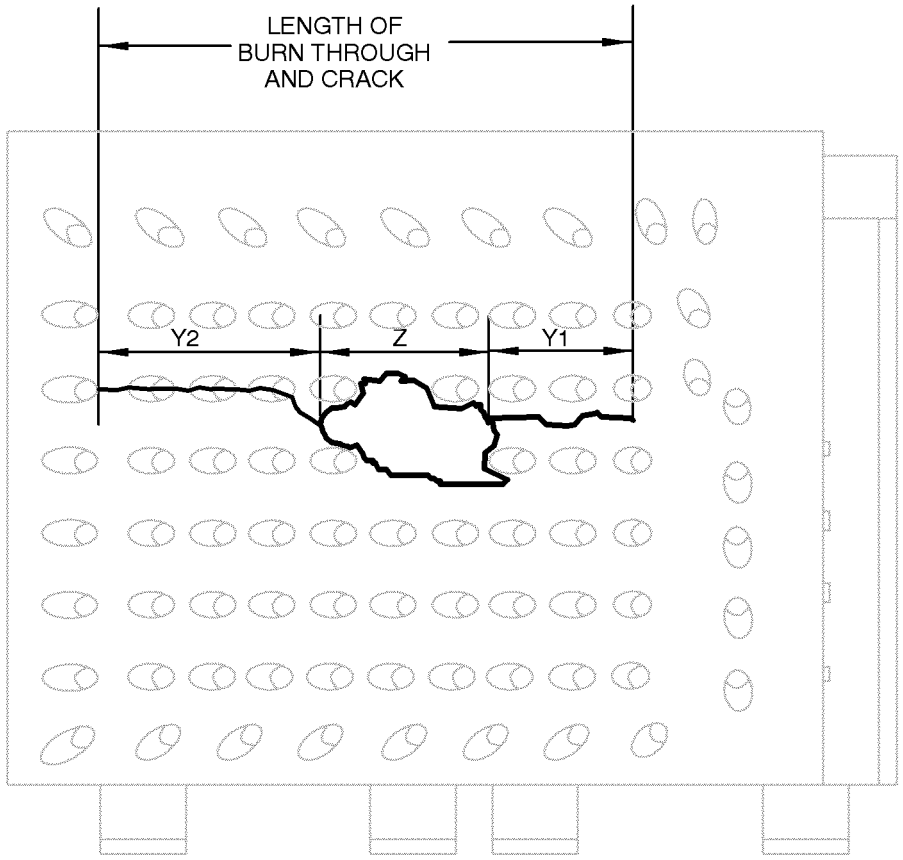
fpw0b522768

STAGE 1 BOAS PLATFORM – BURN THROUGH WITH ADJOINING CRACKS IN AXIAL DIRECTION
Appendix D (Sheet 7 of 9)

KEY

TOTAL LENGTH = Y1 + Y2 + Z

LENGTH OF BURN THROUGH = Z



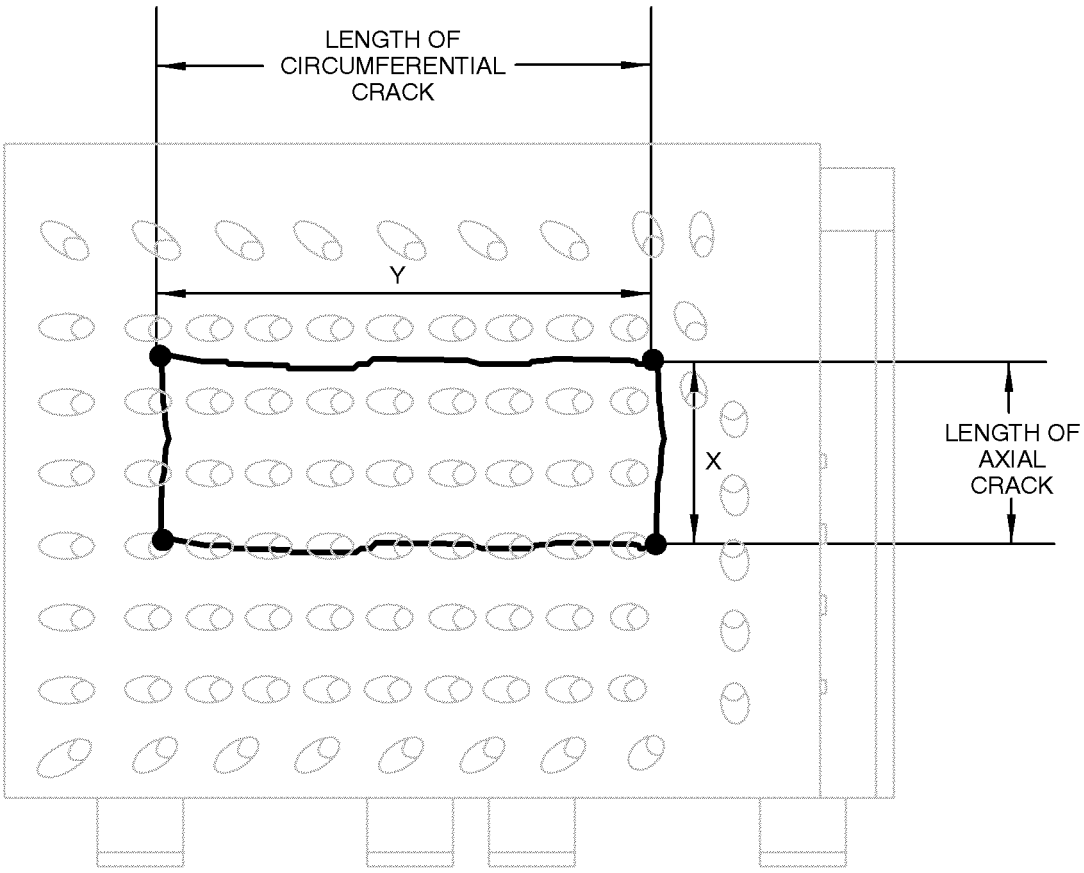
lpw0b522769

STAGE 1 BOAS PLATFORM – BURN THROUGH WITH ADJOINING CRACKS IN CIRCUMFERENTIAL DIRECTION
Appendix D (Sheet 8 of 9)

KEY

LENGTH OF AXIAL CRACK = X

LENGTH OF CIRCUMFERENTIAL CRACK = Y



NOTE: IN THIS EXAMPLE, MAXIMUM LENGTH IS Y, BECAUSE THE CIRCUMFERENTIAL CRACK IS LONGER THAN THE AXIAL CRACK.

lpw0b522770

STAGE 1 BOAS PLATFORM – CLOSED LOOP OF CRACKS
Appendix D (Sheet 9 of 9)

Added Data

Internal Reference Information

	Revision No.	Reference Document	Origination
	Original	IENO8VC282	JP/TR
	1	IENO8VC282A IENO8VC282B	JP/JDH
	2	IENO8VC282C	JP/JDH
	3	EA 11VC149 EA 11VC149A EA 11VC149B	JP/IEL
R	4	EA 13VCO56	BB/ICMS

U.S. Department
of Transportation
**Federal Aviation
Administration**

Engine and Propeller Directorate

Engine Certification Office
12 New England Executive Park
Burlington, MA 01803
(781) 238-7140, Fax: (781) 238-7199

AUG 19 2013

Mr. Karl Yeager
IAE Flight Safety, Certification and Airworthiness
400 Main Street
East Hartford, CT 06108

Dear Mr. Yaeger:

Subject: IAE global Alternative Method of Compliance
(AMOC) to Airworthiness Directive (AD) 2011-25-08

The Federal Aviation Administration (FAA) Engine Certification Office (ECO) received your letter dated June 6, 2013, requesting a global AMOC to AD 2011-25-08, paragraph F and paragraph G, for the International Aero Engines (IAE) V2500 series engines. Paragraph F of AD 2011-25-08 requires periodic borescope inspections using IAE service bulletin (SB) V2500-ENG-72-580 revision 3. Paragraph G of AD 2011-25-08 requires specific parts be installed per SB V2500-ENG-72-0542 revision 1, or SB V2500-ENG-72-0483 revision 3 as mandatory terminating action.

IAE AMOC proposal would use SB V2500-ENG-72-0580 revision 4, for compliance with paragraph F instead of SB V2500-ENG-72-0580 revision 3. The AMOC proposal would also use SB V2500-ENG-72-0483 revision 4, SB V2500-ENG-72-0562 initial release or SB V2500-ENG-72-0562 revision 1 to comply with paragraph G instead of SB V2500-ENG-72-0483 revision 3.

The ECO reviewed the supporting data for your request and determined that the substitutions and revisions to the service information are equivalent to the original references in the AD. Therefore, the FAA approves your Global AMOC to paragraph F and paragraph G of AD 2011-25-08 to use SB V2500-ENG-72-0580 revision 4, for compliance with paragraph F instead of SB V2500-ENG-72-0580 revision 3 and to use SB V2500-ENG-72-0483 revision 4, SB V2500-ENG-72-0562 initial release or SB V2500-ENG-72-0562 revision 1 to comply with paragraph G instead of SB V2500-ENG-72-0483 revision 3.

We have determined that this AMOC is of general applicability to the IAE V2500 series engine type designs, and therefore this letter is issued to IAE with the understanding that it may subsequently be distributed to operators. Operators may then use this letter, along with evidence of compliance with the terms of this letter, to document compliance to AD 2011-25-08.

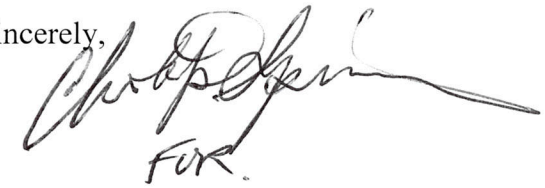
This FAA AMOC is transferable with the engine(s) to another owner or operator.

Before using this AMOC, operators must notify their appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

All provisions of FAA AD 2011-25-08 that are not specifically referenced above remain fully applicable and must be complied with accordingly.

If you have any questions or need additional information, please contact Martin Adler at 781-238-7157, fax 781-238-7199, or via electronic mail at martin.adler@faa.gov.

Sincerely,



Thomas Boudreau
Manager, Engine Certification Office