SERVICE BULLETIN REVISION NOTICE

NON-MODIFICATION SERVICE BULLETIN — ENGINE — CONTROL RODS, ASSEMBLY OF — PROVIDE AN EDDY CURRENT INSPECTION (ECI) TO IDENTIFY ANY NON-CONFORMING MATERIAL WITHIN THE CONTROL RODS

Turbojet Engine Service Bulletin No. V2500-ENG-72-0703 Revision No. 1 dated June 27, 2019.

Revision History

Original Issue February 25, 2019

Revision 1 dated June 27, 2019

Reason for the Revision

To add additional tooling with contact information.

To remove the requirement to ECI the center of the control rod from the Accomplishment Instructions.

Effect of Revision on Prior Compliance

None.

This is a Complete Revision (Not Applicable to the SGML version)

The contents are in accordance with the list of effective pages. All pages have the current revision number. Technical changes are marked with black bars.

MODEL APPLICATION

V2500-A1, V2522-A5, V2524-A5, V2527-A5, V2527E-A5, V2527M-A5, V2530-A5, V2533-A5, V2525-D5, V2528-D5

BULLETIN ISSUE SEQUENCE

V2500 Series 72-0703

Page	Revision No.	Date
1 thru 17	1	June 27/19

A copy of this Revision Notice and any future revision notices must be filed as a permanent record with your copy of the subject bulletin.

SERVICE BULLETIN

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MODEL APPLICATION

V2500-A1, V2522-A5, V2524-A5, V2527-A5, V2527E-A5, V2527M-A5, V2530-A5, V2533-A5, V2525-D5, V2528-D5

BULLETIN ISSUE SEQUENCE

V2500 Series 72-0703

ATA NUMBER

72-41-34

Compliance Category

4, 8

P&W Distribution Code

V2500

Summary

The purpose of this Non-Modification (NMSB) Service Bulletin is to provide an Eddy Current Inspection (ECI) to determine if the Variable Stator Vane (VSV) Control Rod Assemblies, PN 6A2564 and PN 6A4515, to be referred to as control rods, were made from non-conforming material.

Planning Information

Effectivity Data

Engine Models Applicable

V2500-A1
Engine Serial Nos. V0001 thru V0361

V2522-A5, V2524-A5, V2527M-A5, V2527-A5, V2527E-A5, V2530-A5, V2533-A5 (A5 Standard and A5 SelectOne™ Retrofit Standard) that have not incorporated Reference 9, Service Bulletin No. V2500-ENG-72-0538.
Engine Serial Nos. V10001 thru V12695
Engine Serial No. V12698
Engine Serial No. V12722

V2525-D5, V2528-D5 that have not incorporated Reference 9, Service Bulletin No. V2500-ENG-72-0538.
Engine Serial Nos. V20001 thru V20285

Concurrent Requirements

There are no concurrent requirements.

Reason

1. Condition: This NMSB introduces an ECI for Control Rod, PN 6A2564 and PN 6A4515 to check for non-conforming rod end material.
2. Background: A control rod manufactured with a rod end made from a non-conforming material fractured, leading to High Pressure Compressor damage.
3. Objective: Perform an ECI to identify the presence of non-conforming material within Control Rods, PN 6A2564 and PN 6A4515.
4. Substantiation: Non-conforming material has been found on the Control Rods, PN 6A2564 and PN 6A4515. An ECI was developed and has shown the capability of detecting material non-conformance.
5. Effects of Bulletin on:

   Removal/Installation: Not Affected.

   Disassembly/Assembly: Not Affected.

   Cleaning: Not Affected.

   Inspection/Check: Affected.

   Repair: Not Affected.

   Testing: Not Affected.
6. Supplemental Information

   None.

Description

The purpose of this NMSB is to inspect the Control Rods, PN 6A2564 and PN 6A4515, by ECI to confirm that the rod ends have been manufactured with a conforming material.

Compliance

This Service Bulletin can be done when the engine is not installed on aircraft (Category 4) or the engine is installed on aircraft (Category 8).

Category 4 For Engines Not Installed On Aircraft

Accomplish at the first visit of an engine to a maintenance base capable of compliance with the accomplishment instructions regardless of the planned maintenance action.

Category 8 For Engines Installed On Aircraft

Accomplish based upon experience with the part configuration installed on the aircraft.

Approval Data

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

The aircraft Type Certificate (TC) holder has been informed of this inspection.

Manpower

1. For Engines Installed On Aircraft
   - A. Necessary to Gain and Close Access ..... 0.8 hours.
   - B. Necessary to Perform Inspection ..... 0.5 hours.
   - C. Total Necessary Man-hours ..... 1.3 hours.
2. For Engines Not Installed On Aircraft
   - A. Necessary to Perform Inspection ..... 0.5 hours.
   - B. Total Necessary Man-hours ..... 0.5 hours.

Weight and Balance

1. Weight Change

   None.
2. Moment Arm

   No Effect.
3. Datum

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

Electrical Load Data

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

Software Accomplishment Summary

Not Applicable.

References

NOTE: In 2014 IAE converted the V2500 Technical Publications to a new system. As a result of the conversion, some manuals were consolidated. All manuals received new P&W part numbers. To facilitate the use of this Service Bulletin, a Technical Publications conversion table is provided in the Appendix.

1. V2500 Standard Practices and Processes (SPM), P&W Ref. PN 2A4414, Chapter/Section 70-09-00 AND 70-11-26.
2. V2500-A1 Series Illustrated Parts Catalog, P&W Ref. PN 2A4427, Chapter/Section 72-41-34.
3. V2500-A5 Series Illustrated Parts Catalog, P&W Ref. PN 2A4428, Chapter/Section 72-41-34.
4. V2500-D5, Series Illustrated Parts Catalog, P&W Ref. PN 2A4426, Chapter/Section 72-41-34.
5. V2500 A1/A5 Series Engine Manual, P&W Ref. PN 2A4407, Chapter/Section 72-41-00.
6. V2500-D5 Series Engine Manual, P&W Ref. PN 2A4416, Chapter/Section 72-41-00.
7. V2500 A1/A5 Airbus Aircraft Maintenance Manual (AMM), Chapter/Section 71-13-00, 75-32-42, 78-30-00, and 78-32-00.
8. V2500 D5 Boeing Aircraft Maintenance Manual (AMM), Chapter/Section 71-13-00, 75-31-02, 78-30-00, and 78-32-00.
9. V2500 Service Bulletin V2500-ENG-72-0538. Engine — High Pressure (HP) Compressor — Variable Inlet Guide Vanes (VIGV) And Variable Stage Vanes (VSV) Actuating Mechanism - Introduction Of Simplified Control Rods.

Other Publications Affected

NOTE: In 2014 IAE converted the V2500 Technical Publications to a new system. As a result of the conversion, some manuals were consolidated. All manuals received new P&W part numbers. To facilitate the use of this Service Bulletin, a Technical Publications conversion table is provided in the Appendix.

1. V2500-A1 Series Illustrated Parts Catalog, P&W Ref. PN 2A4427, Chapter/Section 72-41-34.
2. V2500-A5 Series Illustrated Parts Catalog, P&W Ref. PN 2A4428, Chapter/Section 72-41-34.
3. V2500-D5, Series Illustrated Parts Catalog, P&W Ref. PN 2A4426, Chapter/Section 72-41-34.

Interchangeability of Parts

Not Applicable.

Information in the Appendix

Alternate Accomplishment Instructions (No)

Progression Charts (No)

Added Data (Yes)

Revision to Table of Limits (No)

Inspection Procedures (No)

Material Information

Material — Price and Availability

1. Part prices were not available at the time of Service Bulletin publication. Contact IAE Spares Management & Logistics for firm quotations.
2. There is no kit provided to do this Service Bulletin.
3. Part availability information is provided in material data Instructions — Disposition.

Industry Support Program

Not Applicable.

The material data that follows is for each engine.

For V2500-A1 Engines:

New PN	Qty	Estimate of Unit Price ($)	Keyword	Old PN	Instructions — Disposition
	1	1,822.00	ROD -CONTROL ROD, ASSEMBLY OF	6A2564 (72-41-34-01-250)	(4)(X)

The material data that follows is for each engine.

For V2522-A5, V2524-A5, V2527-A5, V2527E-A5, V2527M-A5, V2530-A5, V2533-A5 Engines:

New PN	Qty	Estimate of Unit Price ($)	Keyword	Old PN	Instructions — Disposition
	1	1,822.00	ROD - CONTROL, ASSEMBLY OF	6A2564 (72-41-34-01-250)	(4)(X)
	1	*	ROD - ASSEMBLY OF	6A4515 (72-41-34-01-300)	(4)(X)

The material data that follows is for each engine.

For V2525-D5, V2528-D5 Engines:

New PN	Qty	Estimate of Unit Price ($)	Keyword	Old PN	Instructions — Disposition
	1	1,822.00	ROD - A/O, CONTROL	6A2564 (72-41-34-01-250)	(4)(X)
	1	*	ROD - A/O	6A4515 (72-41-34-01-300)	(4)(X)

Instructions/Disposition Code Statements:

Parts Modification Conditions

Estimated part prices are provided when they are available at time of publication. The Estimate of Unit Price is only for planning purposes and does not constitute a firm quotation. An asterisk (*) is shown where part pricing information was unavailable. In either case, contact IAE Spares for firm quotations.

(4) Do an inspection as specified in the Accomplishment Instructions.

Spare Parts Availability

(X) See Reference 2, 3, or 4 Illustrated Parts Catalog for applicable replacement parts.

Vendor Services or Special Components/Materials

Not Applicable.

Tooling — Price and Availability

ITEM/TOOL NUMBER	DESCRIPTION
NDIP-1185 Kit	NDT TOOLING for HPC VSV Control Rod Inspection NDIP-1185.
IAE2P18880	Eddy Current Probe (2x included in NDIP-1185)
IAE2P18879	Calibration Standard (1x included in NDIP-1185)
Uniwest 72872/94032/94186	Cables/Connector (1x included in NDIP-1185)
IAE1R18254	Rigging Pin
IAE1R18423 (or IAE1R18247/IAE1R18896)	Rigging Pin
IAE1R18247 (or IAE1R18896)	Rigging Pin

Contact for firm quotations

P&W New Business Office (gppwmpendetoolsup@pw.utc.com) for items NDIP-1185 Kit, IAE2P18880, IAE2P18879, and Uniwest 72872/94032/94186.

P&W Tool Support Services (gpiaesprtlg@iaev2500.com) for items Rigging Pins.

Eddy Current Instrument with one of the applicable cables:

Instrument Name	Manufacturer	Cables/Connectors
EVi	Uniwest	Uniwest 72872
EddyView (All Types)	Uniwest	Uniwest 94032
NORTEC 600	Olympus	Uniwest 94186

NOTE: Only the above listed Eddy Current Instruments can be used for the inspection.

Reidentified Parts

Not Applicable.

Other Material Information Data

Not Applicable.

Accomplishment Instructions

Part 1: For Engines Installed On Aircraft

NOTE: NMSB incorporation on engines installed on aircraft may be desirable and should be individually evaluated.

1. Gain access to the engine as follows:

   A. Open the fan cowls as specified in Reference 7 or Reference 8, AMM, Chapter/Section 71-13-00.

   B. Deactivate the thrust reverser Hydraulic Control Unit (HCU) as specified in Reference 7 or Reference 8, AMM, Chapter/Section 78-30-00.

   C. Open the thrust reverser as specified in Reference 7 or Reference 8, AMM, Chapter/Section 78-32-00.

2. Inspect the Control Rod, PN 6A2564 for V2500-A1 engines and inspect Control Rods, PN 6A2564 and PN 6A4515 for V2500-A5 and V2500-D5 engines as follows:

   A. The inspection zones are the flats on both ends of the control rod, up the weld lines. Refer to Figure 1.

      WARNING: DO NOT COLLECT DATA FROM THE THREADED OR REDUCED DIAMETER PORTION OF THE CONTROL RODS. DATA COLLECTION FROM OTHER LOCATIONS COULD RESULT IN ERRATIC ECI RESPONSE.

   B. Prepare the VSV control rod(s) for ECI.

      (1) Clean the control rod by removing any dirt or grease by local swab using Isopropyl Alcohol (CoMat V01-124 or CoMat V01-410) or Acetone (CoMat V01-031, CoMat V01-060, or CoMat V01-393).

         NOTE: The coating present on the control rod has only a negligible effect upon the inspection. The inspection can be performed with the coating present or absent.

         CAUTION: ENSURE THE SURFACE TEMPERATURE OF THE CONTROL ROD INSPECTION ZONES DO NOT EXCEED 130°F (54°C) OR DAMAGE TO THE PROBE WILL OCCUR.

   C. Do the calibration of the eddy current equipment. Refer to Figure 2.

      (1) Turn on the eddy current instrument.

      (2) Connect the probe to the instrument via the necessary cable.

      (3) Place CoMat V02-195 Teflon Tape on the end of the probe to protect the coil.

      (4) Configure the eddy current instrument per the following:

CONFIGURATION	VALUE
Freq:	2 MHz
HP:	OFF
LP:	100 Hz
Drive:	HIGH

CONFIGURATION	VALUE
Gain:	V=H (X=Y)
Resolution:	0.2 V/DIV (Uniwest Only)

(5) NULL the probe in air.

(6) While perpendicular to the surface, ± 5 degrees, touch the tip of the probe to the metal surface of the calibration standard.

(7) Adjust the gain such that the lift-off signal is 5 Divisions ± 0.5 Divisions.

(8) Adjust the phase (rotation) such that the lift off signal from the calibration standard is vertical. Refer to Figure 2.

D. Do the ECI of the control rod. Refer to Figure 1, Figure 2, and Figure 3.

(1) While perpendicular to the surface, ± 5 degrees, touch the tip of the probe to one of the flat surfaces on the end of the control rod per the inspections zones, see Step 2.A. Refer to Figure 1.

(2) Record the phase of the signal at the locations specified above. Consider vertical phase to be 90 degrees and 0 degrees to be the right hand side of the screen. Refer to Figure 2 and Figure 3.

(3) Repeat Steps 2.D.(1) and 2.D.(2) for the flat surface on the other end of the control rod(s).

E. Acceptance and rejection criteria.

(1) Accept the rod if both ends have a phase between 180 and 225 degrees.

(2) Reject the rod if one or both rod end flats have a phase other than in step 2.E.(1).

(a) Report findings of defective rods to IAE Technical Services.

(b) Replace failed control rod as specified in Reference 7, AMM Chapter/Section 75-32-42 or Reference 8, AMM, Chapter/Section 75-31-02 or replace with a control rod that has been accepted by this NMSB.

Part 2: For Engines Not Installed On Aircraft

NOTE: If the control rod was inspected and accepted per Part 1, it is necessary to perform the inspection per Part 2 in its' entirety.

1. Install the rig pins into the control rods unison rings.

A. Use an applicable wrench on the flats of the crankshaft and move the VSV system to the high speed position (ram retracted).

B. Install the Rigging Pin, PN IAE1R18254, through the rig pin hole in the front bearing housing and the crankshaft.

C. If a control rod between the crankshaft and a unison ring is to be removed:

(1) Install the Rigging Pin, PN IAE1R18423, to align the Stage 3 unison ring to the Stage 3 control rod and/or install Rigging Pin, PN IAE1R18247 to align the Stage 4 unison ring to the Stage 4 control rod.

(2) Make sure that the rig pin engages with the hole in the compressor case.

2. Remove the control rods.

A. Remove the nut and the bolt that attach the control rod to the unison ring(s).

B. Remove the cotter pin, the nut, the washer, the spacers, and bolt that attach the control rod to the crankshaft.

C. Remove the control rod(s).

3. Eddy Current Inspection

A. The inspection zones are the flats on both ends of the control rod(s), up to the weld lines. Refer to Figure 1.

WARNING: DO NOT COLLECT DATA FROM THE THREADED OR REDUCED DIAMETER PORTION OF THE CONTROL RODS. DATA COLLECTION FROM OTHER LOCATIONS COULD RESULT IN ERRATIC ECI RESPONSE.

B. Prepare the control rods for calibration.

(1) Clean the control rod(s) by removing any dirt or grease, as specified in Reference 1, SPM, Task 70-11-26-300-503.

NOTE: The coating present on the control rod has only a negligible effect upon the inspection. The inspection can be performed with the coating present or absent.

CAUTION: ENSURE THE SURFACE TEMPERATURE OF THE CONTROL ROD INSPECTION ZONES DO NOT EXCEED 130°F (54°C) OR DAMAGE TO THE PROBE WILL OCCUR.

C. Do the calibration of the eddy current equipment. Refer to Figure 2.

(1) Turn on the eddy current instrument.

(2) Connect the probe to the instrument via the necessary cable.

(3) Place CoMat 02-195 Teflon Tape on the end of the probe to protect the coil.

(4) Configure the eddy current instrument per the following:

CONFIGURATION	VALUE
Freq:	2 MHz
HP:	OFF
LP:	100 Hz
Drive:	HIGH
Gain:	V=H (X=Y)
Resolution:	0.2 V/DIV (Uniwest Only)

(5) NULL the probe in air.

(6) While perpendicular to the surface, ± 5 degrees, touch the tip of the probe to the metal surface of the calibration standard.

(7) Adjust the gain such that the lift-off signal is 5 Divisions ± 0.5 Divisions.

(8) Adjust the phase (rotation) such that the lift off signal from the calibration standard is vertical. Refer to Figure 2.

D. Do the Eddy Current Inspection of the control rod(s). Refer to Figure 1, Figure 2, and Figure 3.

(1) While perpendicular to the surface, ± 5 degrees, touch the tip of the probe to one of the flat surfaces on the end of the control rod per the inspections zones. Refer to Step 3.A. and shown in Figure 1.

(2) Record the phase of the signal at the locations specified above. Consider vertical phase to be 90 degrees and 0 degrees to be the right hand side of the screen. Refer to Figure 2 and Figure 3.

(3) Repeat Steps 3.D.(1) and 3.D.(2) for the flat surface on the other end of the control rod(s).

E. Acceptance and rejection Criteria

(1) Accept the rod if both ends have a phase between 180 and 225 degrees.

(2) Reject the rod if one or both rod end flats have a phase other than in Step 3.E.(1).

(a) Report findings of defective rods to IAE Technical Services.

(b) Replace failed control rod, as specified in Reference 9, Service Bulletin No. V2500-ENG-72-0538 or replace with a control rod that has been accepted by this NMSB.

F. If control rod(s) pass the inspection, mark the part as having completed this Service Bulletin.

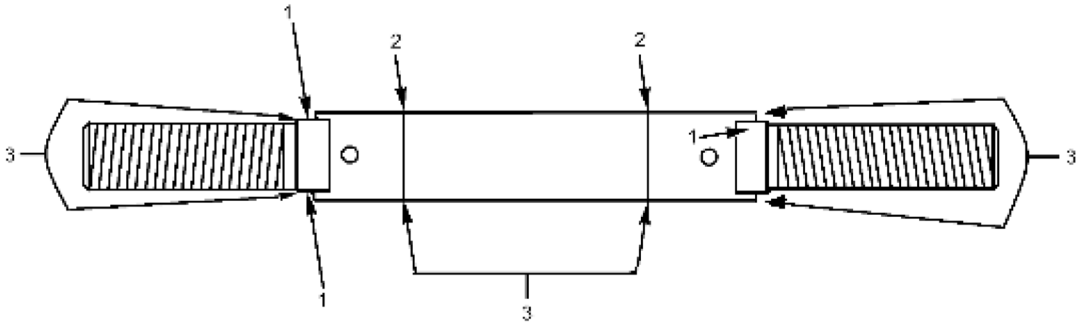
(1) Vibro-peen ”703” within the marking location shown in Figure 4, as specified in Reference 1, SPM, TASK 70-09-00-400-501, SUBTASK 70-09-00-400-001. Use the Vibro-peening equipment. Ensure high spots caused by peening are removed.

G. Install the control rod(s).

(1) Install the control rod(s), as specified in Reference 5 or 6, Engine Manual, Chapter/Section 72-41-00 or as specified in Reference 9, Service Bulletin No. V2500-ENG-72-0538.

4. Recording Instructions

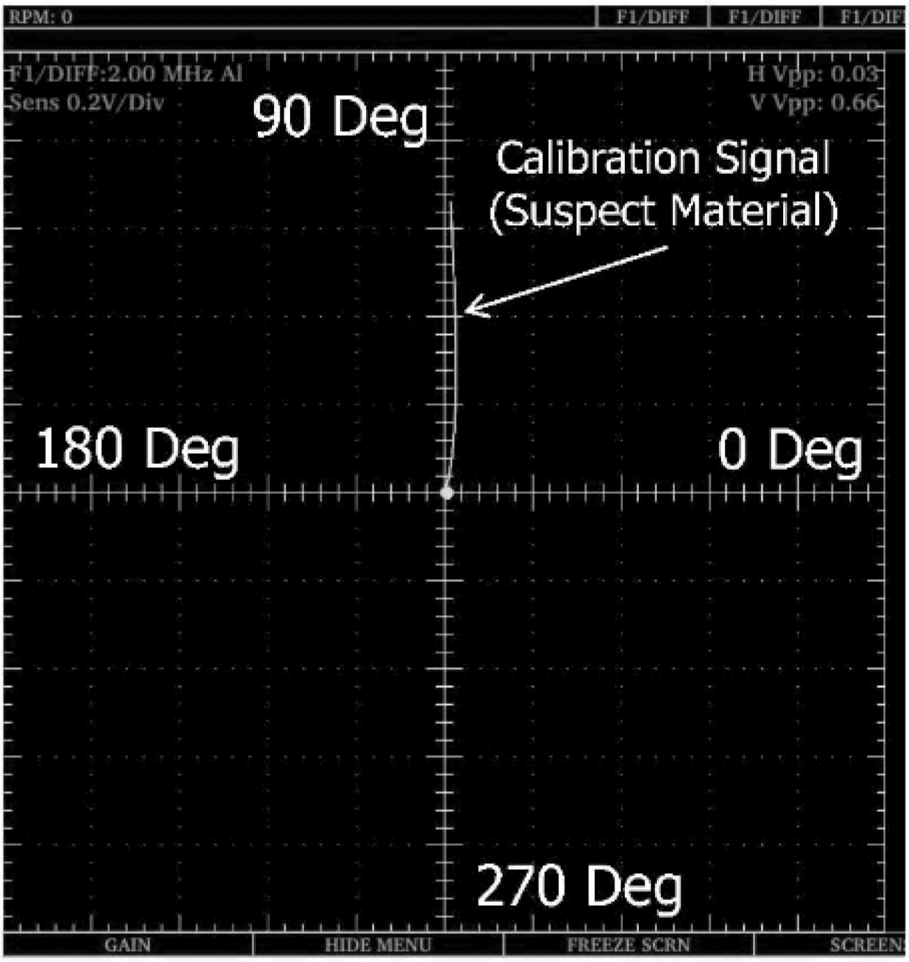
A. A record of accomplishment is required.



1. INSPECTION ZONE
2. WELD LINES
3. DO NOT INSPECT

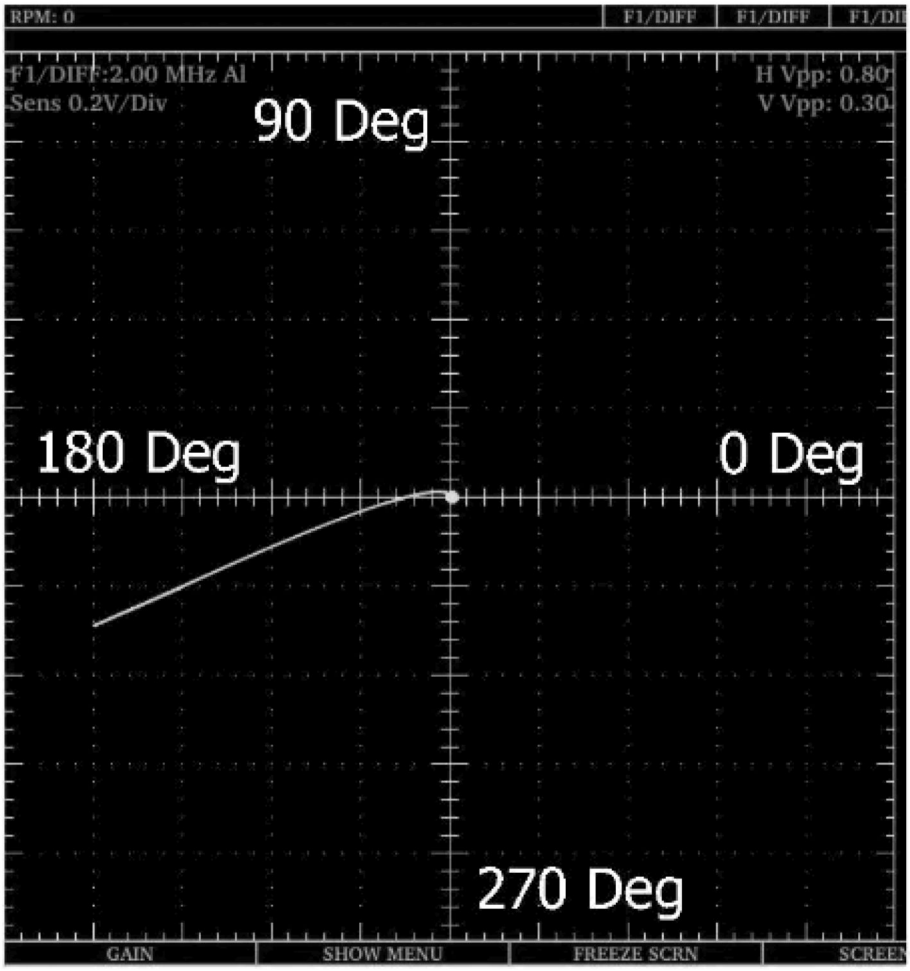
B528172

INSPECTION ZONES, TWO PER CONTROL ROD END
FIGURE 1



B528173

CALIBRATION SIGNAL (SUSPECT MATERIAL SIGNAL) WITH PHASE ANGLES
FIGURE 2



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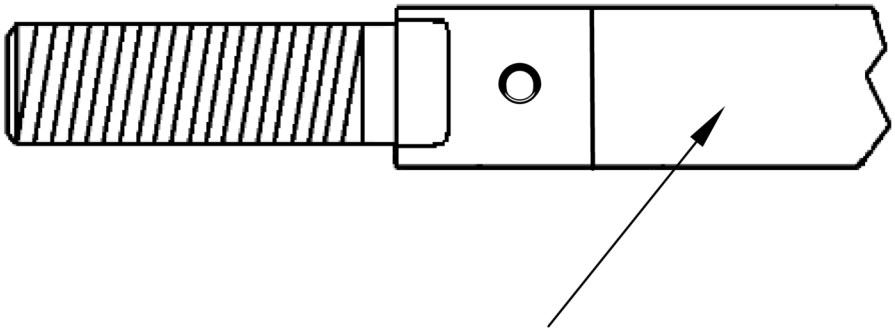
CONFORMING MATERIAL SIGNAL WITH PHASE ANGLES
FIGURE 3



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MARKING LOCATION
FIGURE 4

Appendix

Added Data

Internal Reference Information

Revision No.	Reference Document	Origination
Original	EA18VG294	DV/MJM/RCM
1	EA18VG294A	MP/RCM

Number values shown in parentheses adjacent to U.S. values are International System of units (SI) equivalents.

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Technical Publications Cross Reference Table

Publication	Engine Model(s)	IAE IETM Pub Ref	P&W Part Number
ENGINE MANUAL — A1, A5	All	E-V2500-1IA	2A4407
CMM-EHC — A1, A5	All	EHC-V2500-1IA	2A4409
CMM-FN — A1, A5	All	FN-V2500-1IA	2A4410
CMM-MMC — A1, A5	All	MECH-V2500-1IA	2A4411
CMM-THD — A1, A5	All	THD-V2500-1IA	2A4412
TLM — A1, A5	All	T-V2500-1IA	2A4408
ENGINE MANUAL — D5	All	E-V2500-3IA	2A4416
CMM-EHC — D5	All	EHC-V2500-31A	2A4418
CMM-FN — D5	All	FN-V2500-3IA	2A4419
CMM-MMC — D5	All	MECH-V2500-3IA	2A4420
CMM-THD — D5	All	THD-V2500-3IA	2A4423
TLM — D5	All	T-V2500-3IA	2A4417
SPPM (SPM) — A1, A5, D5	All	SPP-V2500-1IA	2A4414
EIPC — A1	V2500-A1102Q00	S-V2500-1IA	2A4427

Publication	Engine Model(s)	IAE IETM Pub Ref	P&W Part Number
EIPC — A5	V2522/V2524/V2527M-AQ02	S-V2500-6IA	2A4428
	V2522/V2524/V2527M-AQ03	S-V2500-6IB	
	V2522/V2524/V2527M-SQ02	S-V2500-6SA	
	V2522/V2524/V2527M-SQ03	S-V2500-6SB	
	V2522/V2524/V2527M-SQ04	S-V2500-6NA	
	V2522/V2524/V2527M-SQ05	S-V2500-6NB	
	V2527/V2527E-AQ02	S-V2500-7IA	
	V2527/V2527E-AQ03	S-V2500-7IB	
	V2527/V2527E-SQ02	S-V2500-7SA	
	V2527/V2527E-SQ03	S-V2500-7SB	
	V2527/V2527E-SQ04	S-V2500-7NA	
	V2527/V2527E-SQ05	S-V2500-7NB	
	V2530-AQ02	S-V2500-2IA	
	V2530-AQ03	S-V2500-2IB	
	V2530-SQ02	S-V2500-2SA	
	V2530-SQ03	S-V2500-2SB	
	V2530-SQ04	S-V2500-2NA	
	V2530-SQ05	S-V2500-2NB	
	V2533-AQ02	S-V2500-5IA	
	V2533-AQ03	S-V2500-5IB	
	V2533-SQ02	S-V2500-5SA	
	V2533-SQ03	S-V2500-5SB	
	V2533-SQ04	S-V2500-5NA	
	V2533-SQ05	S-V2500-5NB	
EIPC — D5	V2525/V2528-AQ02	S-V2500-3IA	2A4426
	V2525/V2528-AQ03	S-V2500-3IB	
	V2525/V2528-AQ04	S-V2500-3IC	