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V2500-A5/D5 SERIES PROPULSION SYSTEMS SERVICE BULLETIN

This document transmits the Initial Issue of Service Bulletin V2500-ENG-72-0538 and the Initial Issue of the Supplement

Service Bulletin Initial Issue

Remove	Incorporate	Reason for change
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Supplement Initial Issue

Remove	Incorporate	Reason for change
	Pages 1 to 1 of the Supplement	Initial Issue.

V2500-ENG-72-0538

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International Aero Engines

SERVICE BULLETIN

ENGINE – HIGH PRESSURE (HP) COMPRESSOR –VARIABLE INLET GUIDE VANES (VIGV) AND VARIABLE STAGE VANES (VSV) ACTUATING MECHANISM – INTRODUCTION OF SIMPLIFIED CONTROL RODS

1. Planning Information

A. Effectivity

(1) Airbus A319

(a) V2522-A5, V2524-A5, V2527M-A5 Engines prior to Serial No. V12696 and Serial Nos. V12698 and V12722.

(2) Airbus A320

(a) V2524-A5, V2527-A5, V2527E-A5 Engines prior to Serial No. V12696 and Serial Nos. V12698 and V12722.

(3) Airbus A321

(a) V2530-A5, V2533-A5 Engines prior to Serial No. V12696 and Serial Nos. V12698 and V12722.

(4) Boeing MD-90

(a) V2525-D5, V2528-D5 Engines prior to Serial No.V20286.

B. Concurrent Requirements

None.

C. Reason

(1) Problem

The current design of the High Pressure (HP) compressor variable inlet guide vane (VIGV) control rod and the HP compressor variable stage vane (VSV) actuator, stages 3, 4 and 5 control rods is different.

The design of the VIGV control rod only uses male control rod end bearings, which are threaded into the control rods. One end of the control rod has a left hand thread and a left hand threaded control rod end bearing. Only the VIGV control rod assembly uses locking washers.

The design of the VSV actuator and stages 3, 4 and 5 control rods only uses female control rod end bearings, which are threaded onto the control rods. One end of the control rod has left hand thread and a left hand threaded control rod end bearing. The control rod end bearings are locked to the VSV control rods by lock nuts and secured by locking wire.

A new and easier procedure for the assembly of the VIGV/VSV control rod assemblies has been identified.

(2) Evidence

The problem has been experienced on engines in service.

(3) Objective

Incorporation of this Service Bulletin is designed to improve the maintainability.

(4) Substantiation

The changes introduced by this Service Bulletin were the subject of satisfactory engineering analysis. This Service Bulletin complies with the applicable engine certification basis.

(5) Effect of Bulletin on:

(a) Operation

Not affected.

(b) Maintenance

Affected (Refer to paragraph 1.0. Other Publication Affected).

(c) Overhaul

Affected (Refer to paragraph 1.0. Other Publication Affected).

(d) Repair Schemes

Not affected.

(e) Interchangeability

Not affected.

(f) Fits and Clearances

Not affected.

D. Description

This Service Bulletin introduces a new design of VIGV/VSV control rod assembly to replace the current installed VIGV/VSV control rod assembly, except the VSV control rod for the actuator. The new design keeps the same key dimensions i.e. overall length and width with similar adjustment compared to the current standard. The dimensions of the VSV control rod end bearings are the same as the current design, making them compatible with the existing unison rings and crankshaft designs.

The new VSV control rods for stages 3, 4 and 5 have female threads. The control rod for the VIGV already has female threads. The bearings in the new VIGV/VSV control rod ends are unchanged making them compatible with the existing unison rings and crankshaft designs.

The thread of the VSV control rod end bearings has changed from female to male for stages 3, 4 and 5, as this commonises the control rod end bearings. The VIGV control rod end bearings already have male threads. The VSV control rod end bearing thread diameters are reduced from 0.375" to 0.3125" on stages 3, 4 and 5. The diameter of the VIGV rod and the thread pitch and form remain unchanged.

NOTE: For Engines which got this Service Bulletin incorporated during new production, the new HP compressor assembly becomes the HP compressor assembly number 4W6513 and the new HP compressor module becomes the HP compressor module number 4W6514.

For Engines which got this Service Bulletin incorporated during "In Service" or "Overhaul" Maintenance, the current HP compressor assembly number 4W6508 and the HP compressor module number 4W6509 remain unchanged.

E. Compliance

Category Code 7

Accomplish when supply of superseded parts has been depleted.

F. Approval

The part number changes and/or part modifications described in sections 2 and 3 of this Service Bulletin have been shown to comply with the applicable Federal Aviation Regulations and are FAA-APPROVED for the engine models listed.

G. Manpower

(1) In Service

Total - 4 Hours.

(a) To gain access - 20 Minutes.

(b) To embody - 3 Hours 20 Minutes.

(c) To return the engine to a serviceable status - 20 Minutes.

(2) At Overhaul

Not affected.

H. Material Price and Availability

Modification kit is not required; parts supplied as single line items.

For prices and availability of spares, refer to supplement to this Service Bulletin.

I. Tooling Price and Availability

Special tools are not required.

J. Industry Support Information

Not applicable.

K. Weight and Balance

(1) Weight Change

None.

(2) Moment Arm

No effect.

(3) Datum

Engine Front Mount Centreline (Power Plant Station (PPS) 100).

L. Electrical Load Data

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

M. Software Accomplishment Summary

Not applicable.

N. References

(1) A319/A320/A321 Aircraft Maintenance Manual, Chapters 71-13-00 and 78-32-00 Opening/Closing.

A319/A320/A321 Aircraft Maintenance Manual, Chapter 75-32-42 Removal/Installation.

(2) MD 90 Aircraft Maintenance Manual, Chapters 71-13-00 and 78-32-00 Opening/Closing.

MD 90 Aircraft Maintenance Manual, Chapters 75-31-02 Removal/Installation.

(3) IAE V2500 Engine Manuals (E-V2500-1IA and -3IA), Chapters 72-00-40 and 72-41-00.

(4) IAE V2500 Standard Practices/Procedures Manual (SPP-V2500-1IA), Chapters 70-41-01 and 70-44-00.

(5) Internal Reference No.

Engineering Change No. 05VR002 and 05VR002B.

(6) ATA Locator - 72-41-34.

O. Other Publications Affected

(1) A319/A320/A321 Aircraft Maintenance Manual, Chapter 75-32-42.

(2) MD 90 Aircraft Maintenance Manual, Chapter 75-31-02.

(3) IAE V2500 Engine Manuals (E-V2500-1IA and E-V2500-3IA), Chapters 70-30-00, 72-00-40, 72-41-00 and 72-41-34.

(4) IAE V2500 Engine Illustrated Parts Catalogue (S-V2500-2IA, S-V2500-2IB, S-V2500-3IA, S-V2500-3IB, S-V2500-3IC, S-V2500-5IA, S-V2500-5IB, S-V2500-6IA, S-V2500-6IB, S-V2500-7IA, S-V2500-7IB), Chapter 72-41-34 will be amended to incorporate the new part numbers (Refer to 2. Material Information).

P. Interchangeability of Parts

Not affected.

2. Material Information

A. The kit required consists of the following parts:

None.

B. Parts to be reworked:

None.

C. New production parts:

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT	OLD PART NO.	INSTR DISP
72-41-34						
01-189	NAS509L6C	1	Nut, Jam	-	A234-6LW	(1)(S1)
01-194	NAS509-5C	1	Nut, Jam	-	A234-5RW	(1)(S1)
01-195	01-412 -05E037	1	Bearing, Rod End	-	01-412 -05E025	(1)(S1)
01-200	6A8647	1	Rod, A/O Control Rod VIGV	-	6A4519	(1)(S1)
01-238	6A4579	1	Washer, Locking	-	-	(2)
01-239	NAS509L5C	1	Nut, Jam	-	A234-6LW	(2)(S1)
01-240	11-412 -05E037	1	Bearing, Rod End	-	12-412 -05E002	(2)(S1)
01-244	NAS509-5C	1	Nut, Jam	-	A234-6RW	(2)(S1)
01-245	01-412 -05E037	1	Bearing, Rod End	-	02-412 -05E002	(2)(S1)
01-246	6A4579	1	Washer, Locking	-	-	(2)
01-250	6A8691	1	Rod, A/O Control Rod Stage 3	-	6A2564	(2)(S1)
01-288	6A4579	1	Washer, Locking	-	-	(3)
01-289	NAS509L5C	1	Nut, Jam	-	A234-6LW	(3)(S1)

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT	OLD PART NO.	INSTR DISP
01-290	11-412 -05E037	1	Bearing, Rod End	-	12-412 -05E002	(3)(S1)
01-293	6A4579	1	Washer, Locking	-	-	(3)
01-294	NAS509-5C	1	Nut, Jam	-	A234-6RW	(3)(S1)
01-295	01-412 -05E037	1	Bearing, Rod End	-	02-412 -05E002	(3)(S1)
01-300	6A8690	1	Rod, A/O Control Rod Stage 4	-	6A4515	(3)(S1)
01-338	6A4579	1	Washer, Locking	-	-	(4)
01-339	NAS509L5C	1	Nut, Jam	-	A234-6LW	(4)(S1)
01-340	11-412 -05E037	1	Bearing, Rod End	-	12-412 -05E002	(4)(S1)
01-344	NAS509-5C	1	Nut, Jam	-	A234-6RW	(4)(S1)
01-345	01-412 -05E037	1	Bearing, Rod End	-	02-412 -05E002	(4)(S1)
01-346	6A4579	1	Washer, Locking	-	-	(4)
01-350	6A8689	1	Rod, A/O Control Rod Stage 5	-	6A3530	(4)(S1)

D. Redundant parts:

None.

E. Instruction disposition codes:

(1) This part is part of the modification group 01 (VIGV control rod assembly). To have interchangeability between the old and new standards, this part must be changed at the same time with the other parts of this modification group, together with the unchanged parts (72-41-34, 01-188; 01-189; 01-190 and 01-196) of the VIGV control rod assembly.

(2) This part is part of the modification group 02 (stage 3 control rod assembly). To have interchangeability between the old and new standards, this part must be changed at the same time with the other parts of this modification group.

(3) This part is part of the modification group 03 (stage 4 control rod assembly). To have interchangeability between the old and new standards, this part must be changed at the same time with the other parts of this modification group.

(4) This part is part of the modification group 04 (stage 5 control rod assembly). To have interchangeability between the old and new standards, this part must be changed at the same time with the other parts of this modification group.

(S1) Old and new parts are not interchangeable.

3. Accomplishment Instructions

A. Rework Instructions

(1) None.

B. Assembly Instructions

PART 1 - APPLICABLE FOR ENGINES 'IN SERVICE'

(1) General

CAUTION: IN ORDER TO REDUCE THE POTENTIAL FOR MULTIPLE ENGINE IN-FLIGHT SHUT DOWN, POWER LOSS, OR OTHER ANOMALIES DUE TO MAINTENANCE ERROR, IAE RECOMMENDS THAT OPERATORS AVOID PERFORMING MAINTENANCE ON MULTIPLE ENGINES INSTALLED ON THE SAME AIRCRAFT AT THE SAME TIME. IF IT IS NOT POSSIBLE TO AVOID MAINTENANCE ON MORE THAN ONE ENGINE AT THE SAME TIME, IAE RECOMMENDS THAT ADDITIONAL CONTROLS BE APPLIED IN ORDER TO ENSURE THAT MAINTENANCE TASKS HAVE BEEN COMPLETED AS DEFINED. MAINTENANCE GUIDELINES SHOULD BE REVISED WHERE POSSIBLE, TO PROMOTE THIS RECOMMENDATION.

WARNING: DO NOT TOUCH THE ENGINE COMPONENTS FOR A SHORT TIME AFTER THE ENGINE IS SHUT DOWN. THE COMPONENTS STAY HOT AND CAN CAUSE INJURY.

(a) Obey all the WARNINGS and CAUTIONS in the procedures that are referred to.

(b) Consumable Materials

(i) Refer to the table that follows:

MATERIAL NO.	DESIGNATION
V02-126	Lockwire
V10-123	High Temperature Anti-Seize Compound

For the details of the consumable material with the consumable material number V02-119 given in the table above refer to the Aircraft Maintenance Manual, Chapter 70-30-00.

The details of the consumable material with the consumable material number V10-123 given in the table above are as follows:

MATERIAL NO.	RRD REFERENCE (OMAT NO.)	MATERIAL	MANUFACTURER'S REFERENCE AND/OR SPECIFICATION	SUPPLIER CODE
V10-123	4/62	ROCOL ASC251	High Temperature Anti-Seize Compound	IAE200 IAE391 IAE392 IAE393 IAE394 K0567

The material number given in the table above will be included in the Aircraft Maintenance Manual, Chapter 70-30-00.

For the supplier name and address of the supplier codes IAE200, IAE391, IAE392, IAE393 and K0567 of the consumable material given in the table above refer to the Aircraft Maintenance Manual, Chapter 70-30-00.

For the supplier names and addresses of the supplier codes IAE394 of the consumable material given in the table above refer to the table that follow:

FEDERAL CODE	SUPPLIER CODE	SUPPLIER ADDRESS
Not Applicable	IAE394	LALONDE LALONDE ASSOCIATES. 768 WESTGATE ROAD UNIT 2 OAKVILLE ONTARIO LGL 5N2 CANADA Phone: 1-905-847-8707 Fax: 1-905-847-5584

(ii) For further consumable materials refer also to the related Manual tasks given in this instruction.

(c) Tools and Equipment

(i) Refer to the related Manual tasks given in this instruction.

(d) Refer to the Aircraft Maintenance Manual, Chapter 70-23-11 for all torque procedures.

(e) Refer to the Aircraft Maintenance Manual, Chapter 70-40-11 for the use of locking devices.

(2) Get access to the lower area of the High Pressure (HP) compressor front case

(a) For V2500-A5 Engines:

(i) Open the fan cowl doors (Refer to the Aircraft Maintenance Manual, Chapter 71-13-00).

(ii) Open the thrust reverser halves (Refer to the Aircraft Maintenance Manual, Chapter 78-32-00).

(b) For V2500-D5 Engines:

(i) Open the fan cowl doors (Refer to the Aircraft Maintenance Manual, Chapter/Task 71-13-00-010-801).

(ii) Open the thrust reverser halves (Refer to the Aircraft Maintenance Manual, Chapter/Task 78-32-00-010-801).

(3) Replace the parts of the VIGV control rod assembly (Refer to Figure 1, Sheet 1)

(a) Remove the VIGV control rod assembly from the engine (Refer to the applicable Aircraft Maintenance Manual, Chapter 75-32-42 (V2500-A5) or Chapter/Task 75-31-02-020-802 (V2500-D5)).

(b) Disassemble the VIGV control rod assembly

(i) Remove the two locking washers (72-41-34, 01-188) and (72-41-34, 01-196), the two old nuts (72-41-34, 01-189), P/N A234-6LW and (72-41-34, 01-194), P/N A234-5RW, the old RH rod end bearing (72-41-34, 01-195), P/N 01-412-05E025 and the old control rod (72-41-34, 01-200), P/N 6A4519.

(c) Loosely assemble the VIGV control rod assembly

(i) Apply a thin layer of high temperature anti-seize compound (Material No. V10-123) to the threads of the two locknuts (72-41-34, 01-189) and (72-41-34, 01-194) and the female threads of the control rod (72-41-34, 01-200).

(ii) Install the two locking washers (72-41-34, 01-188) and (72-41-34, 01-196), the two new nuts (72-41-34, 01-189), P/N NAS509L6C and (72-41-34, 01-194), P/N NAS509-5C and the new RH rod end bearing (72-41-34, 01-195), P/N 01-412-05E037 to the new control rod (72-41-34, 01-200), P/N 6A8647.

(d) Install the VIGV control rod assembly to the engine (Refer to the Aircraft Maintenance Manual, Chapter 75-32-42 (V2500-A5) or Chapter/Task 75-31-02-420-802 (V2500-D5))

(i) If necessary, adjust the VIGV control rod assembly (Refer to Figure 2)

(1) Remove the locking wire from the VIGV control rod assembly.

(2) Release the two locknuts (72-41-34, 01-189) and (72-41-34, 01-194).

NOTE: The locknut (72-41-34, 01-189) has left hand thread.

(3) Turn the center part of the control rod (72-41-34, 01-200), to adjust the length of the VIGV control rod assembly, until the bolt can be easily installed.

(4) With the bolt installed examine the sighting holes to make sure that the control rod is in safety.

(5) Torque the locknut (72-41-34, 01-189) to between 290 and 370 lbf in. (33 and 42 Nm).

(6) Torque the locknut (72-41-34, 01-194) to between 180 and 220 lbf in. (20 and 25 Nm).

(7) Make sure that the control rod end bearings (72-41-34, 01-190) and (72-41-34, 01-195) are aligned to less then 5 degrees.

(8) Safety the locknut (72-41-34, 01-189) with the locking washer (72-41-34, 01-188) and the locknut (72-41-34, 01-194) with the locking washer (72-41-34, 01-196) to the control rod (72-41-34, 01-200) with lockwire (Material No. V02-126).

NOTE: The locknut (72-41-34, 01-189) has left hand thread.

(4) Replace the stage 3 control rod assembly (Refer to Figure 1, Sheet 2)

(a) Remove the old stage 3 control rod assembly from the engine (Refer to the Aircraft Maintenance Manual, Chapter 75-32-42 (V2500-A5) or Chapter/Task 75-31-02-020-802 (V2500-D5)).

(b) Remove the old stage 3 control rod assembly

(i) Remove the two old nuts (72-41-34, 01-239), P/NA234-6LW and (72-41-34, 01-244), P/N A234-6RW, the old LH rod end bearing (72-41-34, 01-240), P/N 12-412-05E002, the old RH rod end bearing (72-41-34, 01-245), P/N 02-412-05E002 and the old control rod (72-41-34, 01-250), P/N 6A2564.

(c) Loosely assemble the stage 3 control rod assembly

(i) Apply a thin layer of high temperature anti-seize compound (Material No. V10-123) to the threads of the two locknuts (72-41-34, 01-239) and (72-41-34, 01-244) and the female threads of the control rod (72-41-34, 01-250).

(ii) Install the new LH rod end bearing (72-41-34, 01-240), P/N 11-412-05E037, the new nut (72-41-34, 01-239), P/N NAS509L5C, the new locking washer (72-41-34, 01-238), P/N 6A4579 and the new RH rod end bearing (72-41-34, 01-245), P/N 01-412-05E037, the new nut (72-41-34, 01-244), P/N NAS509-5C, the new locking washer (72-41-34, 01-246), P/N 6A4579 to the new control rod (72-41-34, 01-250), P/N 6A8691.

(d) Install the stage 3 control rod assembly to the engine (Refer to the Aircraft Maintenance Manual, Chapter 75-32-42 (V2500-A5) or Chapter/Task 75-31-02-420-802 (V2500-D5))

(i) If necessary, adjust the stage 3 control rod assembly (Refer to Figure 2)

(1) Remove the locking wire from the stage 3 control rod assembly.

(2) Release the two locknuts (72-41-34, 01-239) and (72-41-34, 01-244).

NOTE: The locknut (72-41-34, 01-239) has left hand thread.

(3) Turn the center part of the control rod (72-41-34, 01-250), to adjust the length of the control rod assembly, until the bolt can be easily installed.

(4) With the bolt installed examine the sighting holes to make sure that the control rod is in safety.

(5) Torque the two locknuts (72-41-34, 01-239) and (72-41-34, 01-244) to between 180 and 220 lbf in. (20 and 25 Nm).

(6) Make sure that the control rod end bearings (72-41-34, 01-240) and (72-41-34, 01-245) are aligned to less then 5 degrees.

(7) Safety the locknut (72-41-34, 01-239) with the locking washer (72-41-34, 01-238) and the locknut (72-41-34, 01-244) with the locking washer (72-41-34, 01-246) to the control rod (72-41-34, 01-250) with lockwire (Material No. V02-126).

NOTE: The locknut (72-41-34, 01-239) has left hand thread.

(5) Replace the stage 4 control rod assembly (Refer to Figure 1, Sheet 2)

(a) Remove the old stage 4 control rod assembly from the engine (Refer to the Aircraft Maintenance Manual, Chapter 75-32-42 (V2500-A5) or Chapter/Task 75-31-02-020-802 (V2500-D5)).

(b) Remove the old stage 4 control rod assembly

(i) Remove the two old nuts (72-41-34, 01-289), P/N A234-6LW and (72-41-34, 01-294), P/N A234-6RW, the old LH rod end bearing (72-41-34, 01-290), P/N 12-412-05E002, the old RH rod end bearing (72-41-34, 01-295), P/N 02-412-05E002 and the old control rod (72-41-34, 01-300), P/N 6A4515.

(c) Loosely assemble the stage 4 control rod assembly

(i) Apply a thin layer of high temperature anti-seize compound (Material No. V10-123) to the threads of the two locknuts (72-41-34, 01-289) and (72-41-34, 01-294) and the female threads of the control rod (72-41-34, 01-300).

(ii) Install the new LH rod end bearing (72-41-34, 01-290), P/N 11-412-05E037, the new nut (72-41-34, 01-289), P/N NAS509L5C, the new locking washer (72-41-34, 01-288), P/N 6A4579 and the new RH rod end bearing (72-41-34, 01-295), P/N 01-412-05E037, the new nut (72-41-34, 01-294), P/N NAS509-5C, the new locking washer (72-41-34, 01-293), P/N 6A4579 to the new control rod (72-41-34, 01-300), P/N 6A8690.

(d) Install the stage 4 control rod assembly to the engine (Refer to the Aircraft Maintenance Manual, Chapter 75-32-42 (V2500-A5) or Chapter/Task 75-31-02-420-802 (V2500-D5))

(i) If necessary, adjust the stage 4 control rod assembly (Refer to Figure 2)

(1) Remove the locking wire from the stage 4 control rod assembly.

(2) Release the two locknuts (72-41-34, 01-289) and (72-41-34, 01-294).

NOTE: The locknut (72-41-34, 01-289) has left hand thread.

(3) Turn the center part of the control rod (72-41-34, 01-300), to adjust the length of the control rod assembly, until the bolt can be easily installed.

(4) With the bolt installed examine the sighting holes to make sure that the control rod is in safety.

(5) Torque the two locknuts (72-41-34, 01-289) and (72-41-34, 01-294) to between 180 and 220 lbf in. (20 and 25 Nm).

(6) Make sure that the control rod end bearings (72-41-34, 01-290) and (72-41-34, 01-295) are aligned to less then 5 degrees.

(7) Safety the locknut (72-41-34, 01-289) with the locking washer (72-41-34, 01-288) and the locknut (72-41-34, 01-294) with the locking washer (72-41-34, 01-293) to the control rod (72-41-34, 01-300) with lockwire (Material No. V02-126).

NOTE: The locknut (72-41-34, 01-289) has left hand thread.

(6) Replace the stage 5 control rod assembly (Refer to Figure 1, Sheet 3)

(a) Remove the old stage 5 control rod assembly from the engine (Refer to the Aircraft Maintenance Manual, Chapter 75-32-42 (V2500-A5) or Chapter/Task 75-31-02-020-802 (V2500-D5)).

(b) Remove the old stage 5 control rod assembly

(i) Remove the two old nuts (72-41-34, 01-339), P/N A234-6LW and (72-41-34, 01-344), P/N A234-6RW, the old LH rod end bearing (72-41-34, 01-340), P/N 12-412-05E002, the old RH rod end bearing (72-41-34, 01-345), P/N 02-412-05E002 and the old control rod (72-41-34, 01-350), P/N 6A3530.

(c) Loosely assemble the stage 5 control rod assembly

(i) Apply a thin layer of high temperature anti-seize compound (Material No. V10-123) to the threads of the two locknuts (72-41-34, 01-339) and (72-41-34, 01-344) and the female threads of the control rod (72-41-34, 01-350).

(ii) Install the new LH rod end bearing (72-41-34, 01-340), P/N 11-412-05E037, the new nut (72-41-34, 01-339), P/N NAS509L5C, the new locking washer (72-41-34, 01-338), P/N 6A4579 and the new RH rod end bearing (72-41-34, 01-345), P/N 01-412-05E037, the new nut (72-41-34, 01-344), P/N NAS509-5C, the new locking washer (72-41-34, 01-346), P/N 6A4579 to the new control rod (72-41-34, 01-350), P/N 6A8689.

(d) Install the stage 5 control rod assembly to the engine (Refer to the Aircraft Maintenance Manual, Chapter 75-32-42 (V2500-A5) or Chapter/Task 75-31-02-420-802 (V2500-D5))

(i) If necessary, adjust the stage 5 control rod assembly (Refer to Figure 2)

(1) Remove the locking wire from the stage 5 control rod assembly.

(2) Release the two locknuts (72-41-34, 01-339) and (72-41-34, 01-344).

NOTE: The locknut (72-41-34, 01-339) has left hand thread.

(3) Turn the center part of the control rod (72-41-34, 01-350), to adjust the length of the control rod assembly, until the bolt can be easily installed.

(4) With the bolt installed examine the sighting holes to make sure that the control rod is in safety.

(5) Torque the two locknuts (72-41-34, 01-339) and (72-41-34, 01-344) to between 180 and 220 lbf in. (20 and 25 Nm).

(6) Make sure that the control rod end bearings (72-41-34, 01-340) and (72-41-34, 01-345) are aligned to less then 5 degrees.

(7) Safety the locknut (72-41-34, 01-339) with the locking washer (72-41-34, 01-338) and the locknut (72-41-34, 01-344) with the locking washer (72-41-34, 01-346) to the control rod (72-41-34, 01-350) with lockwire (Material No. V02-126).

NOTE: The locknut (72-41-34, 01-339) has left hand thread.

(7) Make sure that the work area is clean and clear of tools, equipment and other unwanted materials.

(8) Close the access to the lower area of the HP compressor front right case

(a) For V2500-A5 Engines:

(i) Close the thrust reverser halves (Refer to the Aircraft Maintenance Manual, Chapter 78-32-00).

(ii) Close the fan cowl doors (Refer to the Aircraft Maintenance Manual, Chapter 71-13-00).

(b) For V2500-D5 Engines:

(i) Close the thrust reverser halves (Refer to the Aircraft Maintenance Manual, Chapter/Task 78-32-00-410-801).

(ii) Close the fan cowl doors (Refer to the Aircraft Maintenance Manual, Chapter/Task 71-13-00-410-801).

PART 2 - APPLICABLE FOR ENGINES 'AT OVERHAUL'

(1) General

(a) Obey all the WARNINGS and CAUTIONS in the procedures that are referred to.

(b) Consumable Materials

(i) Refer to the table that follows:

COMAT NO.	DESIGNATION
02-126	Lockwire
10-123	High Temperature Anti-Seize Compound

For the details of the consumable material with given in the table above refer to the Overhaul Processes and Consumable Index.

(ii) For further consumable materials refer also to the related Manual tasks given in this instruction.

(c) Tools and Equipment

(i) Refer to the related Manual tasks given in this instruction.

(d) Refer to the Standard Practices/Processes Manual, Chapter 70-41-01 for all torque procedures.

(e) Refer to the Standard Practices/Processes Manual, Chapter 70-42-05 for the use of lockwire.

(2) Replace the parts of the VIGV control rod assembly (Refer to Figure 1, Sheet 1)

(a) Remove the VIGV control rod assembly from the engine (Refer to the Engine Manual, Chapter 72-41-00).

(b) Disassemble the VIGV control rod assembly

(i) Remove the two locking washers (72-41-34, 01-188) and (72-41-34, 01-196), the two old nuts (72-41-34, 01-189), P/N A234-6LW and (72-41-34, 01-194), P/N A234-5RW, the old RH rod end bearing (72-41-34, 01-195), P/N 01-412-05E025 and the old control rod (72-41-34, 01-200), P/N 6A4519.

(c) Loosely assemble the VIGV control rod assembly

(i) Apply a thin layer of high temperature anti-seize compound (CoMat 10-123) to the threads of the two locknuts (72-41-34, 01-189) and (72-41-34, 01-194) and the female threads of the control rod (72-41-34, 01-200).

(ii) Install the two locking washers (72-41-34, 01-188) and (72-41-34, 01-196), the two new nuts (72-41-34, 01-189), P/N NAS509L6C and (72-41-34, 01-194), P/N NAS509-5C and the new RH rod end bearing (72-41-34, 01-195), P/N 01-412-05E037 to the new control rod (72-41-34, 01-200), P/N 6A8647.

(d) Install the VIGV control rod assembly to the engine (Refer to the Engine Manual, Chapter 72-41-00).

(i) If necessary, adjust the VIGV control rod assembly (Refer to Figure 2).

(1) Remove the locking wire from the VIGV control rod assembly.

(2) Release the two locknuts (72-41-34, 01-189) and (72-41-34, 01-194).

NOTE: The locknut (72-41-34, 01-189) has left hand thread.

(3) Turn the center part of the control rod (72-41-34, 01-200), to adjust the length of the control rod assembly, until the bolt can be easily installed.

(4) With the bolt installed examine the sighting holes to make sure that the control rod is in safety.

(5) Torque the locknut (72-41-34, 01-189) to between 290 and 370 lbf in. (33 and 42 Nm).

(6) Torque the locknut (72-41-34, 01-194) to between 180 and 220 lbf in. (20 and 25 Nm).

(7) Make sure that the control rod end bearings (72-41-34, 01-190) and (72-41-34, 01-195) are aligned to less then 5 degrees.

(8) Safety the locknut (72-41-34, 01-189) with the locking washer (72-41-34, 01-188) and the locknut (72-41-34, 01-194) with the locking washer (72-41-34, 01-196) to the control rod (72-41-34, 01-200) with lockwire (CoMat 02-126).

NOTE: The locknut (72-41-34, 01-189) has left hand thread.

(3) Replace the stage 3 control rod assembly (Refer to Figure 1, Sheet 2)

(a) Remove the old stage 3 control rod assembly from the engine (Refer to the Engine Manual, Chapter 72-41-00).

(b) Remove the old stage 3 control rod assembly

(i) Remove the two old nuts (72-41-34, 01-239), P/NA234-6LW and (72-41-34, 01-244), P/N A234-6RW, the old LH rod end bearing (72-41-34, 01-240), P/N 12-412-05E002, the old RH rod end bearing (72-41-34, 01-245), P/N 02-412-05E002 and the old control rod (72-41-34, 01-250), P/N 6A2564.

(c) Loosely assemble the stage 3 control rod assembly

(i) Apply a thin layer of high temperature anti-seize compound (CoMat 10-123) to the threads of the two locknuts (72-41-34, 01-239) and (72-41-34, 01-244) and the female threads of the control rod (72-41-34, 01-250).

(ii) Install the new LH rod end bearing (72-41-34, 01-240), P/N 11-412-05E037, the new nut (72-41-34, 01-239), P/N NAS509L5C, the new locking washer (72-41-34, 01-238), P/N 6A4579 and the new RH rod end bearing (72-41-34, 01-245), P/N 01-412-05E037, the new nut (72-41-34, 01-244), P/N NAS509-5C, the new locking washer (72-41-34, 01-246), P/N 6A4579 to the new control rod (72-41-34, 01-250), P/N 6A8691.

(d) Install the stage 3 control rod assembly to the engine (Refer to the Engine Manual, Chapter 72-41-00).

(i) If necessary, adjust the stage 3 control rod assembly (Refer to Figure 2).

(1) Remove the locking wire from th stage 3 control rod assembly.

(2) Release the two locknuts (72-41-34, 01-239) and (72-41-34, 01-244).

NOTE: The locknut (72-41-34, 01-239) has left hand thread.

(3) Turn the center part of the control rod (72-41-34, 01-250), to adjust the length of the control rod assembly, until the bolt can be easily installed.

(4) With the bolt installed examine the sighting holes to make sure that the control rod is in safety.

(5) Torque the two locknuts (72-41-34, 01-239) and (72-41-34, 01-244) to between 180 and 220 lbf in. (20 and 25 Nm).

(6) Make sure that the control rod end bearings (72-41-34, 01-240) and (72-41-34, 01-245) are aligned to less then 5 degrees.

(7) Safety the locknut (72-41-34, 01-239) with the locking washer (72-41-34, 01-238) and the locknut (72-41-34, 01-244) with the locking washer (72-41-34, 01-246) to the control rod (72-41-34, 01-250) with lockwire (CoMat 02-126).

NOTE: The locknut (72-41-34, 01-239) has left hand thread.

(4) Replace the stage 4 control rod assembly (Refer to Figure 1, Sheet 2)

(a) Remove the old stage 4 control rod assembly from the engine (Refer to the Engine Manual, Chapter 72-41-00).

(b) Remove the old stage 4 control rod assembly

(i) Remove the two old nuts (72-41-34, 01-289), P/N A234-6LW and (72-41-34, 01-294), P/N A234-6RW, the old LH rod end bearing (72-41-34, 01-290), P/N 12-412-05E002, the old RH rod end bearing (72-41-34, 01-295), P/N 02-412-05E002 and the old control rod (72-41-34, 01-300), P/N 6A4515.

(c) Loosely assemble the stage 4 control rod assembly

(i) Apply a thin layer of high temperature anti-seize compound (CoMat 10-123) to the threads of the two locknuts (72-41-34, 01-289) and (72-41-34, 01-294) and the female threads of the control rod (72-41-34, 01-300).

(ii) Install the new LH rod end bearing (72-41-34, 01-290), P/N 11-412-05E037, the new nut (72-41-34, 01-289), P/N NAS509L5C, the new locking washer (72-41-34, 01-288), P/N 6A4579 and the new RH rod end bearing (72-41-34, 01-295), P/N 01-412-05E037, the new nut (72-41-34, 01-294), P/N NAS509-5C, the new locking washer (72-41-34, 01-293), P/N 6A4579 to the new control rod (72-41-34, 01-300), P/N 6A8690.

(d) Install the stage 4 control rod assembly to the engine (Refer to the Engine Manual, Chapter 72-41-00).

(i) If necessary, adjust the stage 4 control rod assembly (Refer to Figure 2).

(1) Remove the locking wire from th stage 4 control rod assembly.

(2) Release the two locknuts (72-41-34, 01-289) and (72-41-34, 01-294).

NOTE: The locknut (72-41-34, 01-289) has left hand thread.

(3) Turn the center part of the control rod (72-41-34, 01-300), to adjust the length of the control rod assembly, until the bolt can be easily installed.

(4) With the bolt installed examine the sighting holes to make sure that the control rod is in safety.

(5) Torque the two locknuts (72-41-34, 01-289) and (72-41-34, 01-294) to between 180 and 220 lbf in. (20 and 25 Nm).

(6) Make sure that the control rod end bearings (72-41-34, 01-290) and (72-41-34, 01-295) are aligned to less then 5 degrees.

(7) Safety the locknut (72-41-34, 01-289) with the locking washer (72-41-34, 01-288) and the locknut (72-41-34, 01-294) with the locking washer (72-41-34, 01-293) to the control rod (72-41-34, 01-300) with lockwire (CoMat 02-126).

NOTE: The locknut (72-41-34, 01-289) has left hand thread.

(5) Replace the stage 5 control rod assembly (Refer to Figure 1, Sheet 3)

(a) Remove the old stage 5 control rod assembly from the engine (Refer to the Engine Manual, Chapter 72-41-00).

(b) Remove the old stage 5 control rod assembly

(i) Remove the two old nuts (72-41-34, 01-339), P/N A234-6LW and (72-41-34, 01-344), P/N A234-6RW, the old LH rod end bearing (72-41-34, 01-340), P/N 12-412-05E002, the old RH rod end bearing (72-41-34, 01-345), P/N 02-412-05E002 and the old control rod (72-41-34, 01-350), P/N 6A3530.

(c) Loosely assemble the stage 5 control rod assembly

(i) Apply a thin layer of high temperature anti-seize compound (CoMat 10-123) to the threads of the two locknuts (72-41-34, 01-339) and (72-41-34, 01-344) and the female threads of the control rod (72-41-34, 01-350).

(ii) Install the new LH rod end bearing (72-41-34, 01-340), P/N 11-412-05E037, the new nut (72-41-34, 01-339), P/N NAS509L5C, the new locking washer (72-41-34, 01-338), P/N 6A4579 and the new RH rod end bearing (72-41-34, 01-345), P/N 01-412-05E037, the new nut (72-41-34, 01-344), P/N NAS509-5C, the new locking washer (72-41-34, 01-346), P/N 6A4579 to the new control rod (72-41-34, 01-350), P/N 6A8689.

(d) Install the stage 5 control rod assembly to the engine (Refer to the Engine Manual, Chapter 72-41-00).

(i) If necessary, adjust the stage 5 control rod assembly (Refer to Figure 2).

(1) Remove the locking wire from the stage 5 control rod assembly.

(2) Release the two locknuts (72-41-34, 01-339) and (72-41-34, 01-344).

NOTE: The locknut (72-41-34, 01-339) has left hand thread.

(3) Turn the center part of the control rod (72-41-34, 01-350), to adjust the length of the control rod assembly, until the bolt can be easily installed.

(4) With the bolt installed examine the sighting holes to make sure that the control rod is in safety.

(5) Torque the two locknuts (72-41-34, 01-339) and (72-41-34, 01-344) to between 180 and 220 lbf in. (20 and 25 Nm).

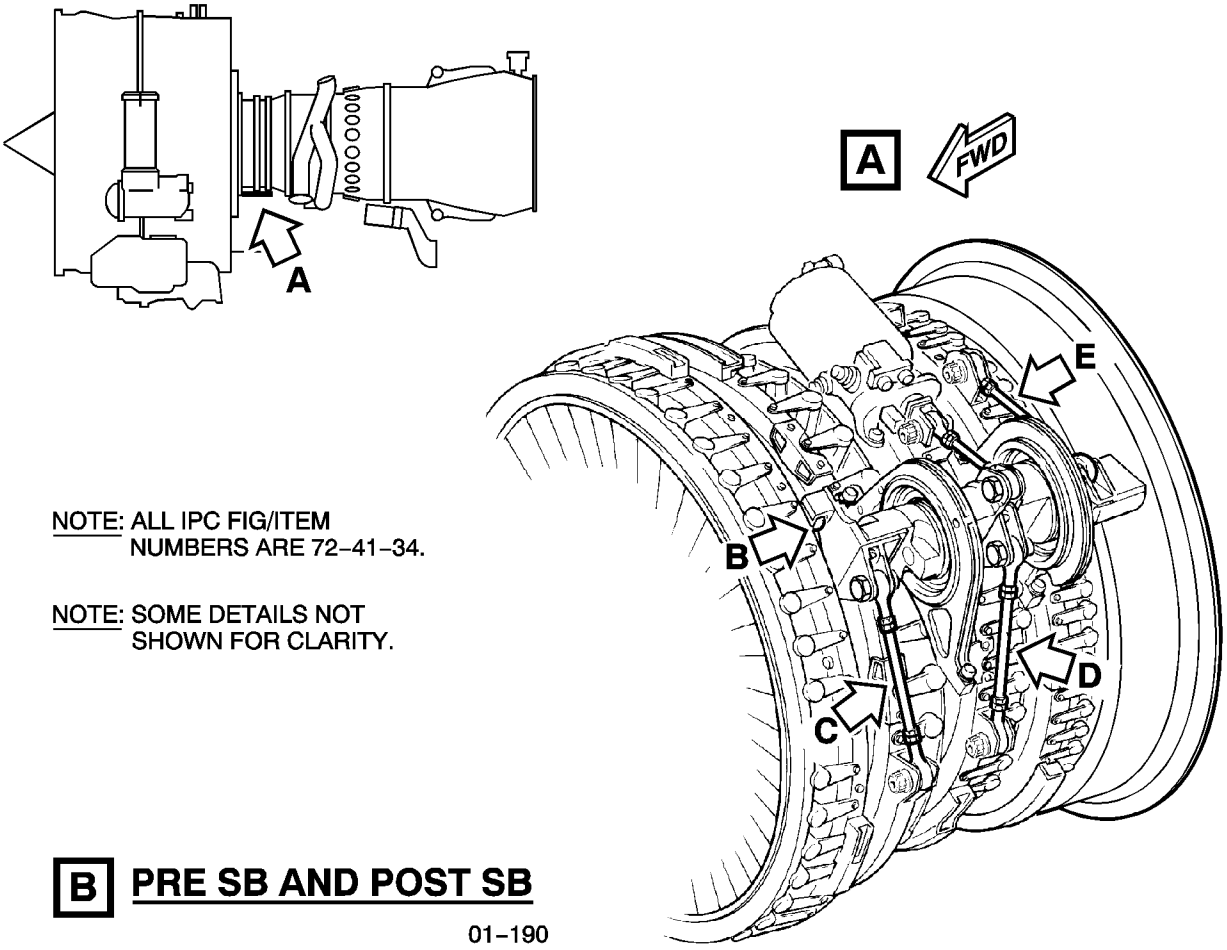
(6) Make sure that the control rod end bearings (72-41-34, 01-340) and (72-41-34, 01-345) are aligned to less then 5 degrees.

(7) Safety the locknut (72-41-34, 01-339) with the locking washer (72-41-34, 01-338) and the locknut (72-41-34, 01-344) with the locking washer (72-41-34, 01-346) to the control rod (72-41-34, 01-350) with lockwire (CoMat 02-126).

NOTE: The locknut (72-41-34, 01-339) has left hand thread.

C. Recording Instructions

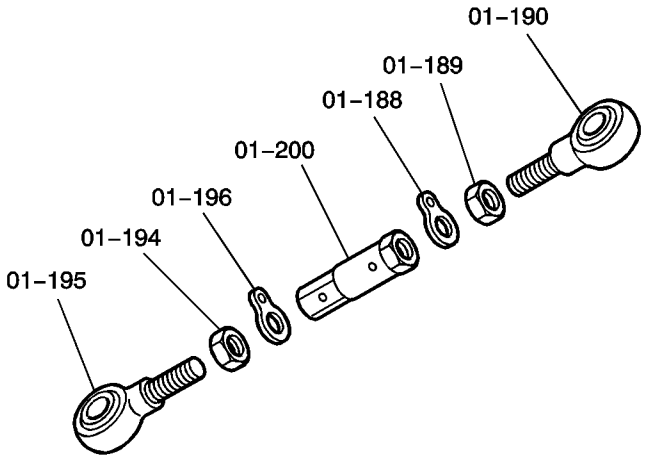
(1) A record of accomplishment is necessary.



NOTE: ALL IPC FIG/ITEM NUMBERS ARE 72-41-34.

NOTE: SOME DETAILS NOT SHOWN FOR CLARITY.

B PRE SB AND POST SB



VIGV CONTROL ROD

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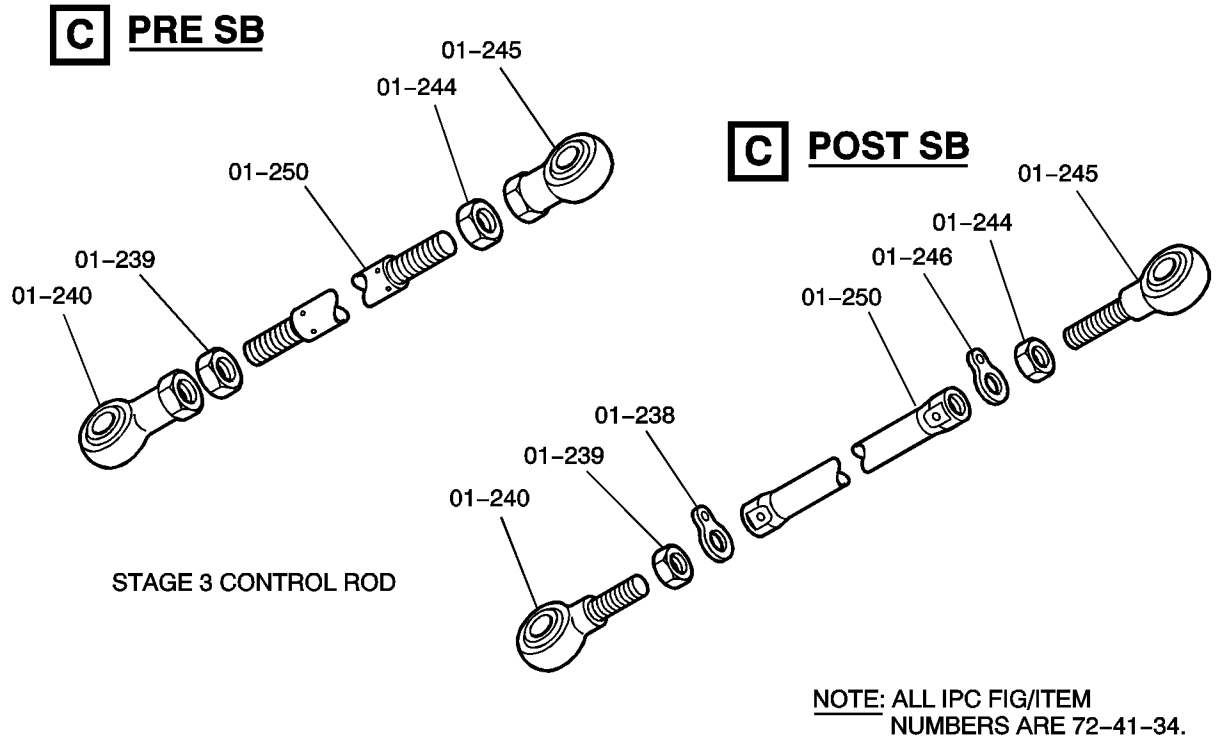
VIGV and VSV control rods
Figure 1 (Sheet 1 of 3)



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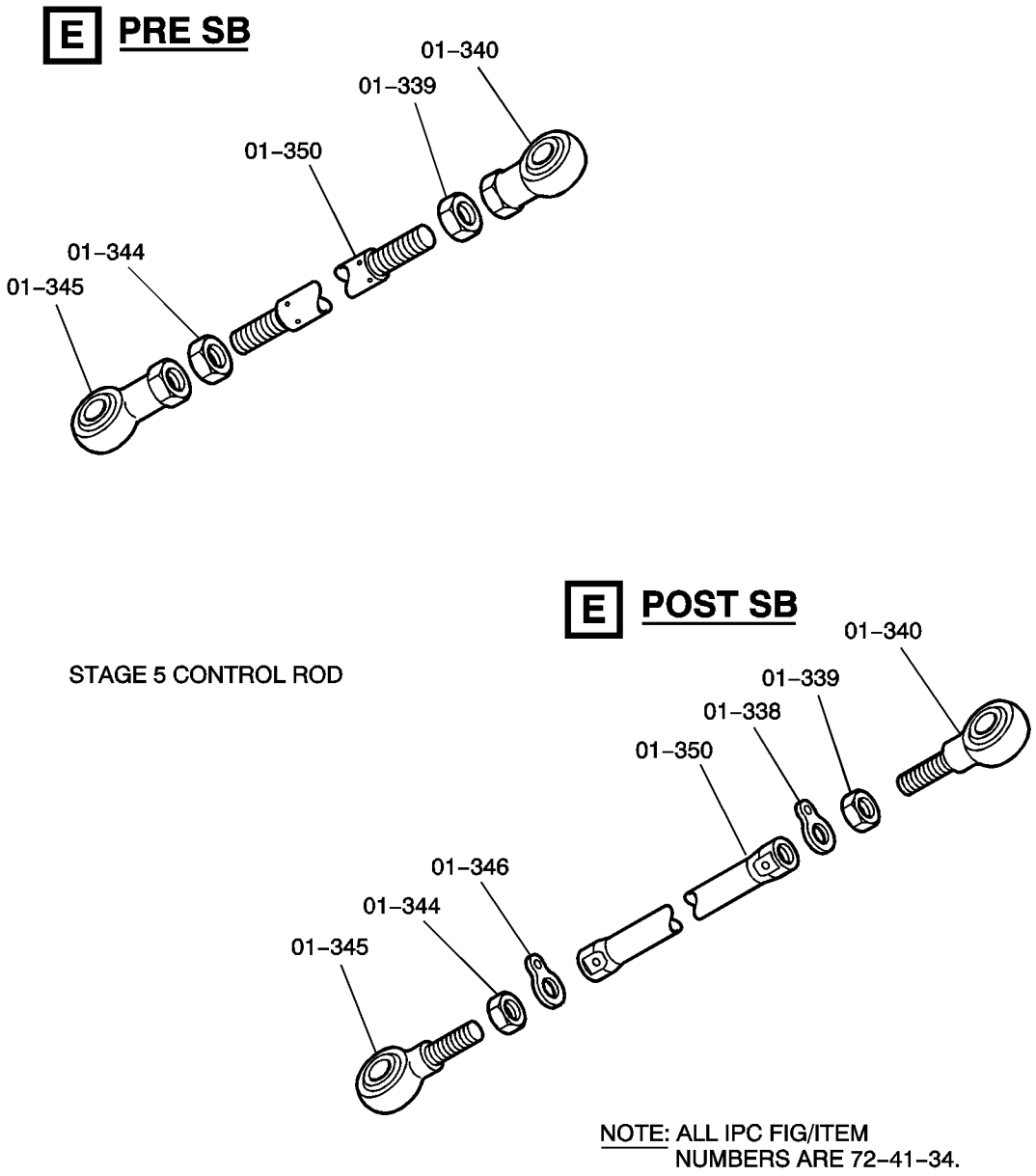
VIGV and VSV control rods
Figure 1 (Sheet 2 of 3)



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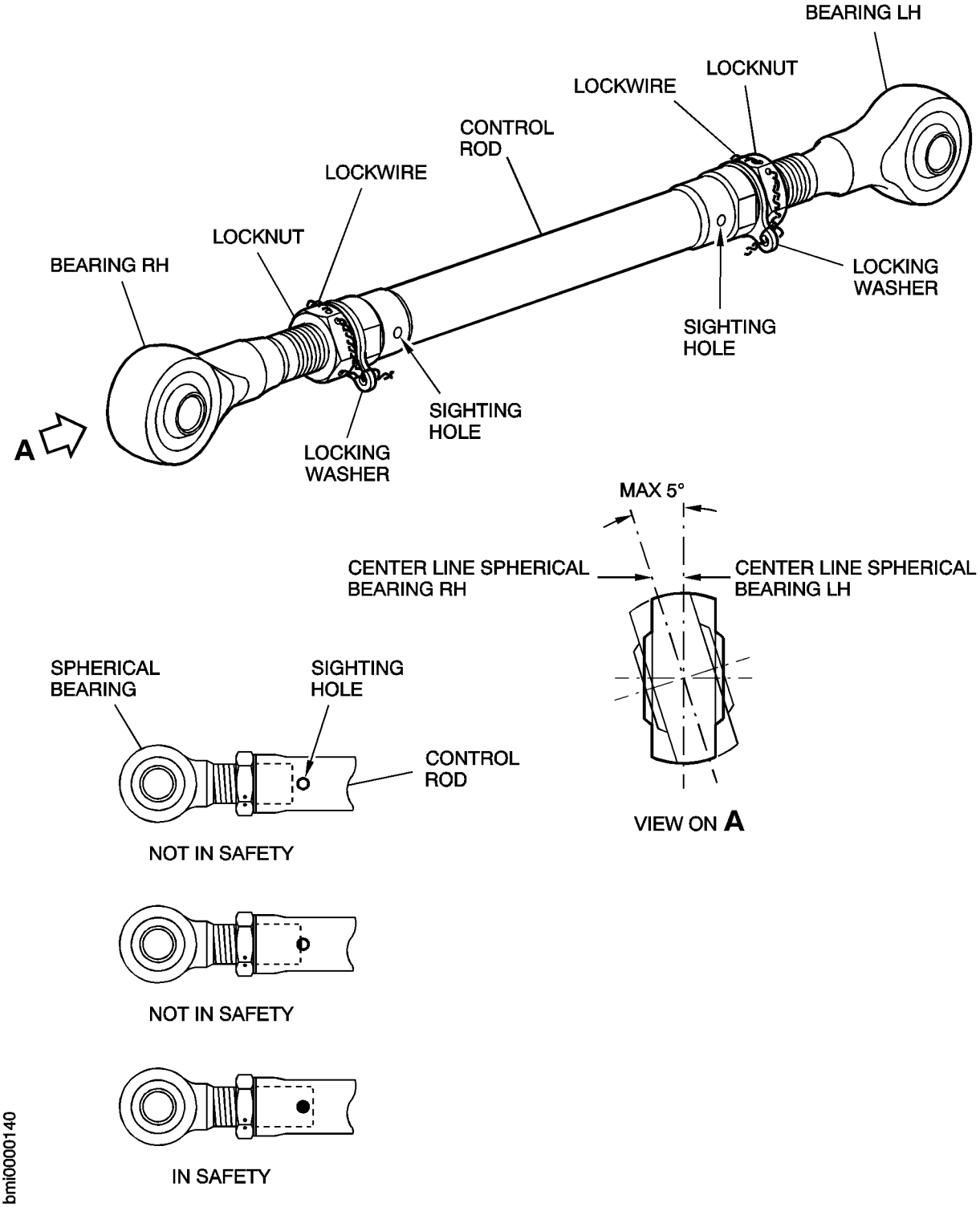
VIGV and VSV control rods
Figure 1 (Sheet 3 of 3)



Adjustment of the control rods
Figure 2

International Aero Engines

SERVICE BULLETIN

ENGINE – HIGH PRESSURE (HP) COMPRESSOR –VARIABLE INLET GUIDE VANES (VIGV) AND VARIABLE STAGE VANES (VSV) ACTUATING MECHANISM – INTRODUCTION OF SIMPLIFIED CONTROL RODS

SUPPLEMENT – PRICES AND AVAILABILITY

The prices (if shown) are for estimating purposes only and as such are given in good faith, without commercial liability for advanced planning purposes only. Refer to IAE Spares and/or current price catalogue for current prices.

1. Modification Kit:

Not applicable.

2. New Production Parts:

Part No.	Description	Unit Price US Dollars
NAS509L5C	Nut, Jam	13.80
NAS509L6C	Nut, Jam	13.80
01-412-05E037	Bearing, Rod End	798.00
11-412-05E037	Bearing, Rod End	305.00
6A8647	Rod, A/O Control Rod VIGV	585.00
6A8689	Rod, A/O Control Rod Stage 5	146.00
6A8690	Rod, A/O Control Rod Stage 4	1206.00
6A8691	Rod, A/O Control Rod Stage 3	1040.00

3. Tools

None.