International Aero Engines

SERVICE BULLETIN

ENGINE - H.P. COMPRESSOR BLADES - STAGES 9 TO 12 ROTOR BLADES WITH PLATFORM CORNER CROPPED - CATEGORY CODE 6 - MOD.ENG-72-0172

1. Planning Information

A. Effectivity

(1) Aircraft: (a) Airbus A320
(b) Airbus A321
(c) McDonnell Douglas MD90

(2) Engine: (a) V2500-A1 Engines prior to Serial No.V0328
(b) V2500-A5 Engines prior to Serial No.V10012
(c) V2500-D5 Engines prior to Serial No.V20007

B. Reason

(1) Condition

H.P. compressor rotor blades have experienced platform corner resonant vibrations.

(2) Background

(a) Isolated instances of rotor blade corner release have occurred on A1 service engines and have involved blades in stages 7, 9, 11 and 12, causing minor damage to downstream blading.

(b) On A1 engines, S.B. V2500-ENG-72-0161 (see K) has introduced front and rear underplatform damping wires to prevent stage 7 and 8 blade resonance. The stage 9 blades have had the rear corner removed by S.B. V2500-ENG-72-0109 (see K) to increase platform resonance.

Stress analysis has confirmed that stage 10 to 12 L.H. and R.H. locking blades require to have the platform cropped and that stage 9 R.H. locking blades require to be cropped at the platform front side.

(c) A5 and D5 engines have damping wires at stages 7 and 8, and stage 9 to 12 L.H. locking blades cropped at the platform rear corner as basic features.

(3) Objective

The changes introduced by this Service Bulletin are designed to increase the reliability of the stage 9 to 12 locking blades.

(4) Substantiation

Cropping of blade platforms is an effective solution to reduce standing stresses and improve high cycle fatigue capability.

The steady stress analysis and vibration integrity of the platforms have been analysed and shown to be satisfactory.

(5) Effect of Bulletin on Workshop Procedures:

Removal/Installation	Not affected
Disassembly/Assembly	Not affected
Cleaning	Not affected
Inspection/Check	Affected (see Supplemental Information)
Repair	Not affected
Testing	Not affected

(6) Supplemental Information

Inspection/Check will be revised to add new configuration of this Service Bulletin.

C. Description

This Service Bulletin introduces the following changes:

(1) A1 engines

The stage 9 R.H. locking blades have the platform corner cropped at the front side. the cropping of the rear side platform corner applied by S.B. V2500-ENG-72-0109 is retained.

The stage 10 to 12 L.H. locking blades have the platform corner cropped at the rear side.

The stage 10 to 12 R.H. locking blades have the platform corner cropped at the front side.

(2) A5 and D5 engines

The stage 9 to 12 R.H. locking blades have the platform corner cropped at the front side.

D. Approval

The part number changes and/or part modifications described in Section 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.

E. Compliance

Category Code 6

Accomplish when the sub assembly (i.e. modules, accessories, components, build groups) is disassembled sufficiently to afford access to the affected parts and to all affected spare parts.

F. Manpower

Estimated manhours to incorporate the full intent of this Bulletin:

Venue	Estimated Manhours
(1) In Service	Not applicable
(2) At Overhaul:	
(a) A1 engine	2 hours 48 minutes
(b) A5 engine	1 hour 36 minutes
(c) D5 engine	1 hour 36 minutes

G. Material - Price and Availability

(1) Modification Kit not required.

(2) See "Material Information" section for prices and availability of future spares.

H. Tooling - Price and Availability

To be advised

I. Weight and Balance

(1) Weight change	None
(2) Moment arm	No effect
(3) Datum	Engine front mount centreline (Power Plant Station - PPS 100)

J. Electrical Load Data

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

K. References

(1) Internal Reference No.

EC92VR384

EC92VR385

(2) Other References

Service Bulletin V2500-ENG-72-0109 (Engine - H.P. compressor - Stage 9 compressor rotor blades with cut back platform)

Service Bulletin V2500-ENG-72-0161 (Engine - H.P. discs and blades - Stages 7 and 8 rotor blades with damping wires and stages 6, 7 and 8 blades with anti-fret coating).

L. Other Publications Affected

(1) Illustrated Parts Catalog, 72-41-15, will be revised to add the new part numbers.

(2) Engine Manual, 72-41-15, Inspection/Check -00, -07, -08, -09, -10, Cleaning -00, -04 and Rework will be revised.

(3) Repair Schemes VRS6015, VRS6016, VRS6017, VRS6018, VRS6056, VRS6057, VRS6058, VRS6071, VRS6072, VRS6073, VRS6074 and VRS6150 will be affected by this Bulletin.

2. Accomplishment Instructions

A. Rework Instructions

(1) Rework the following parts:

6A4367, blade, locking, R.H. - Compressor, H.P. - Stage 9 (Refer to 72-41-15, Fig./Item 02-485) and
6A846, blade, locking, R.H. - Compressor, H.P. - Stage 9 (Refer to 72-41-15, Fig./Item 02-485).

Standard Equipment

0.100 in. (2,54 mm) slip
Grinding machine
Standard workshop equipment
Vibro-engraving equipment

Consumable Materials

Not applicable

Procedure		Supplementary Information
(a)	Install the fixture on to the machine	Use IAE 3R19085 grinding fixture (A1 engine), 1 off, or IAE 3R19086 grinding fixture (A5/D5 engine), 1 off, as necessary, with a grinding machine
(b)	Set the height of the grinding fixture	Use a 0.100 in. (2,54 mm) slip
(c)	Install the rotor blade into the grinding fixture	Make sure the rotor blade is located correctly
	CAUTION: CARE MUST BE TAKEN TO ENSURE THAT NO WITNESS OF THE PLATFORM MACHINING APPEARS ON THE ROTOR BLADE DOVETAIL.	
(d)	Grind back the rotor blade platform, where shown	See Figures 4, 5 and 7, as necessary
(e)	Remove sharp edges	See Figures 4, 5 and 7. Use standard workshop equipment.
(f)	Measure the dimensions	See Figures 4, 5 and 7, as necessary

(g) (i) This procedure is alternative to step (g)(ii). Cancel the existing part number and re-identify with the new part number	Use vibro-engraving equipment. Refer to SPM TASK 70-09-00-400-501, SUBTASK 70-09-00-400-001.	Old Part No. / New Part No. 6A4367 / 6A5638 6A4846 / 6A5645
(ii) This procedure is alternative to step (g)(i). It is permissible to re-identify the blade by adding the symbol as shown in Figure 8. Do not delete the existing part number if you use this procedure.	Use vibro-engraving equipment. Refer to SPM TASK 70-09-00-400-501, SUBTASK 70-09-00-400-001.	

(2) Rework the following parts:

6A3255, blade, locking, L.H. - Compressor, H.P. - Stage 10 (Refer to 72-41-15, Fig./Item 02-570),
6A3256, blade, locking, R.H. - Compressor, H.P. - Stage 10 (Refer to 72-41-15, Fig./Item 02-585) and
6A4221, blade, locking, R.H. - Compressor, H.P. - Stage 10 (Refer to 72-41-15, Fig./Item 02-585).

Standard Equipment

0.100 in (2,54 mm) slip
Grinding machine
Standard workshop equipment
Vibro-engraving equipment

Consumable Materials

Not applicable

Procedure	Supplementary Information
(a) Install the fixture on to the machine	Use IAE 3R19087 grinding fixture (A1 engine), 1 off, or IAE 3R19088 grinding fixture (A5/D5 engine), 1 off, or IAE 3R19089 grinding fixture (A1 engine), 1 off, as necessary, with a grinding machine
(b) Set the height of the grinding fixture	Use a 0.100 in. (2,54 mm) slip

(c)	Install the rotor blade into the grinding fixture	Make sure the rotor blade is located correctly
	CAUTION: CARE MUST BE TAKEN TO ENSURE THAT NO WITNESS OF THE PLATFORM MACHINING APPEARS ON THE ROTOR BLADE DOVETAIL.	
(d)	Grind back the rotor blade platform, where shown	See Figures 2, 5 and 7, as necessary
(e)	Remove sharp edges	See Figures 2, 5 and 7. Use standard workshop equipment.
(f)	Measure the dimensions	See Figures 2, 5 and 7, as necessary
(g)	(i) This procedure is alternative to step (g)(ii). Cancel the existing part number and re-identify with the new part number.	Use vibro-engraving equipment. Refer to SPM TASK 70-09-00-400-501, SUBTASK 70-09-00-400-001. Old Part No. — New Part No. 6A3255 — 6A5639 6A3256 — 6A5640 6A4221 — 6A5646
	(ii) This procedure is alternative to step (g)(i). It is permissible to re-identify the blade by adding the symbol as shown in Figure 9. Do not delete the existing part number if you use this procedure.	Use vibro-engraving equipment. Refer to SPM TASK 70-09-00-400-501, SUBTASK 70-09-00-400-001.

(3) Rework the following parts:

6A3258, blade, locking, L.H. - Compressor, H.P. - Stage 11 (Refer to 72-41-15, Fig./Item 02-670),
6A3259, blade, locking, R.H. - Compressor, H.P. - Stage 11 (Refer to 72-41-15, Fig./Item 02-685)and
6A4253, blade, locking, R.H. - Compressor, H.P. - Stage 11 (Refer to 72-41-15, Fig./Item 02-685).

Standard Equipment

0.100 in (2,54 mm) slip
Grinding machine
Standard workshop equipment
Vibro-engraving equipment

Consumable Materials

Not applicable

Procedure	Supplementary Information
(a) Install the fixture on to the machine	Use IAE 3R19090 grinding fixture (A1 engine), 1 off, or IAE 3R19091 grinding fixture (A5/D5 engine), 1 off, or IAE 3R19092 grinding fixture (A1 engine), 1 off, as necessary, with a grinding machine
(b) Set the height of the grinding fixture	Use a 0.100 in. (2,54 mm) slip
(c) Install the rotor blade into the grinding fixture	Make sure the rotor blade is located correctly
CAUTION: CARE MUST BE TAKEN TO ENSURE THAT NO WITNESS OF THE PLATFORM MACHINING APPEARS ON THE ROTOR BLADE DOVETAIL.	
(d) Grind back the rotor blade platform, where shown	See Figures 2, 5 and 7, as necessary
(e) Remove sharp edges	See Figures 2, 5 and 7. Use standard workshop equipment.
(f) Measure the dimensions	See Figures 2, 5 and 7, as necessary
(g) (i) This procedure is alternative to step (g)(ii). Cancel the existing part number and re-identify with the new part number.	Use vibro-engraving equipment. Refer to SPM TASK 70-09-00-400-501, SUBTASK 70-09-00-400-001. Old Part No. — New Part No. 6A3258 — 6A5641 6A3259 — 6A5642 6A4253 — 6A5647
(ii) This procedure is alternative to step (g)(i). It is permissible to re-identify the blade by adding the symbol as shown in Figure 9. Do not delete the existing part number if you use this procedure.	Use vibro-engraving equipment. Refer to SPM TASK 70-09-00-400-501, SUBTASK 70-09-00-400-001.

(4) Rework the following parts:

6A3261, blade, locking, L.H. - Compressor, H.P. - Stage 12 (Refer to 72-41-15, Fig./Item 02-770),
6A3262, blade, locking, R.H. - Compressor, H.P. - Stage 12 (Refer to 72-41-15, Fig./Item 02-785) and
6A4206, blade, locking, R.H. - Compressor, H.P. - Stage 12 (Refer to 72-41-15, Fig./Item 02-785).

Standard Equipment

0.100 in (2,54 mm) slip
Grinding machine
Standard workshop equipment
Vibro-engraving equipment

Consumable Materials

Not applicable

Procedure		Supplementary Information
(a)	Install the fixture on to the machine	Use IAE 3R19093 grinding fixture (A1 engine), 1 off, or IAE 3R19094 grinding fixture (A5/D5 engine), 1 off, or IAE 3R19095 grinding fixture (A1 engine), 1 off, as necessary, with a grinding machine
(b)	Set the height of the grinding fixture	Use a 0.100 in. (2,54 mm) slip
(c)	Install the rotor blade into the grinding fixture	Make sure the rotor blade is located correctly
	CAUTION: CARE MUST BE TAKEN TO ENSURE THAT NO WITNESS OF THE PLATFORM MACHINING APPEARS ON THE ROTOR BLADE DOVETAIL.	
(d)	Grind back the rotor blade platform, where shown	See Figures 3, 6 and 7, as necessary
(e)	Remove sharp edges	See Figures 3, 6 and 7. Use standard workshop equipment.
(f)	Measure the dimensions	See Figures 3, 6 and 7, as necessary

(g)	(i)	This procedure is alternative to step (g)(ii). Cancel the existing part number and re-identify with the new part number.	Use vibro-engraving equipment. Refer to SPM TASK 70-09-00-400-501, SUBTASK 70-09-00-400-001. Old Part No. — New Part No. 6A3261 — 6A5643 6A3262 — 6A5644 6A4206 — 6A5648
	(ii)	This procedure is alternative to step (g)(i). It is permissible to re-identify the blade by adding the symbol as shown in Figure 9. Do not delete the existing part number if you use this procedure.	Use vibro-engraving equipment. Refer to SPM TASK 70-09-00-400-501, SUBTASK 70-09-00-400-001.

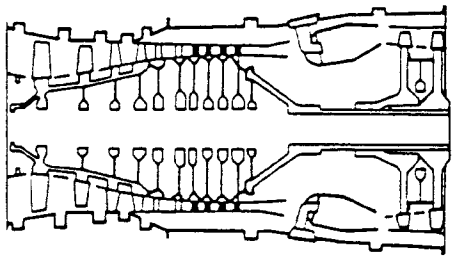
B. Assembly Instructions

(1) The new H.P. compressor rotor blades stages 9 to 12 introduced by this Service Bulletin are interchangeable with in-use H.P. compressor rotor blades stages 9 to 12.

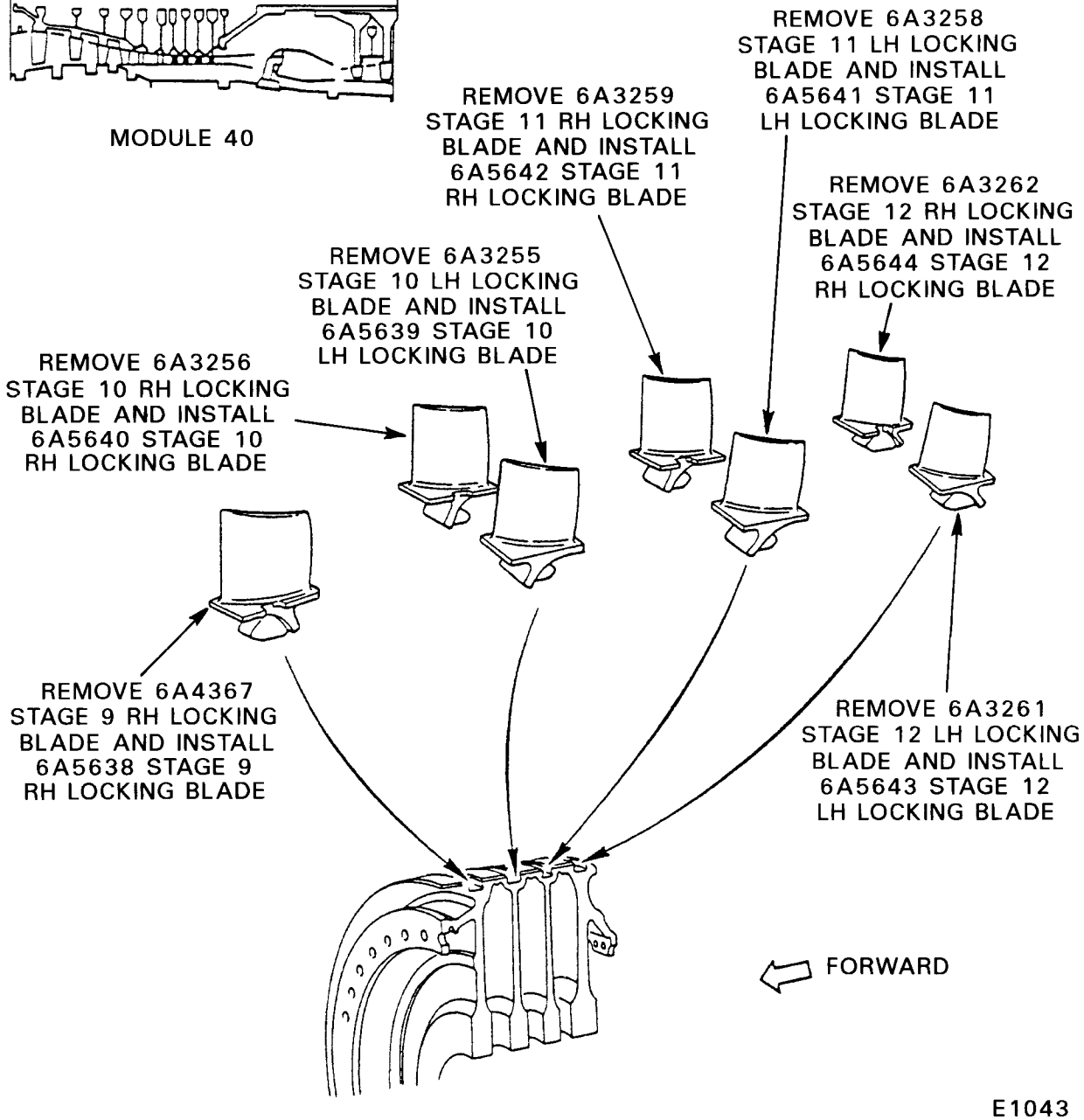
(2) Assemble by use of approved procedures, Engine Manual 72-41-10 Assembly.

C. Recording Instructions

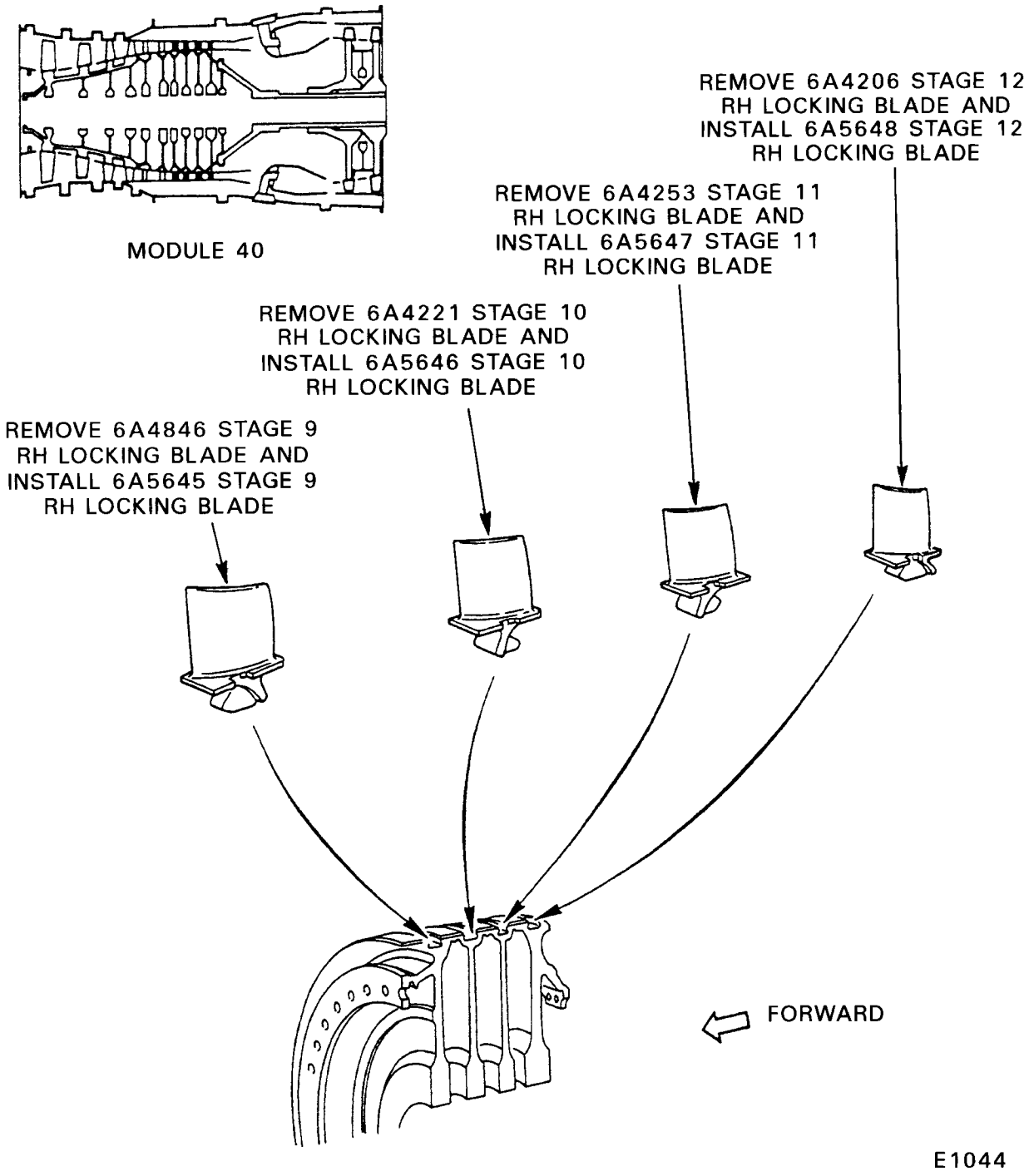
(1) A record of accomplishment is required.



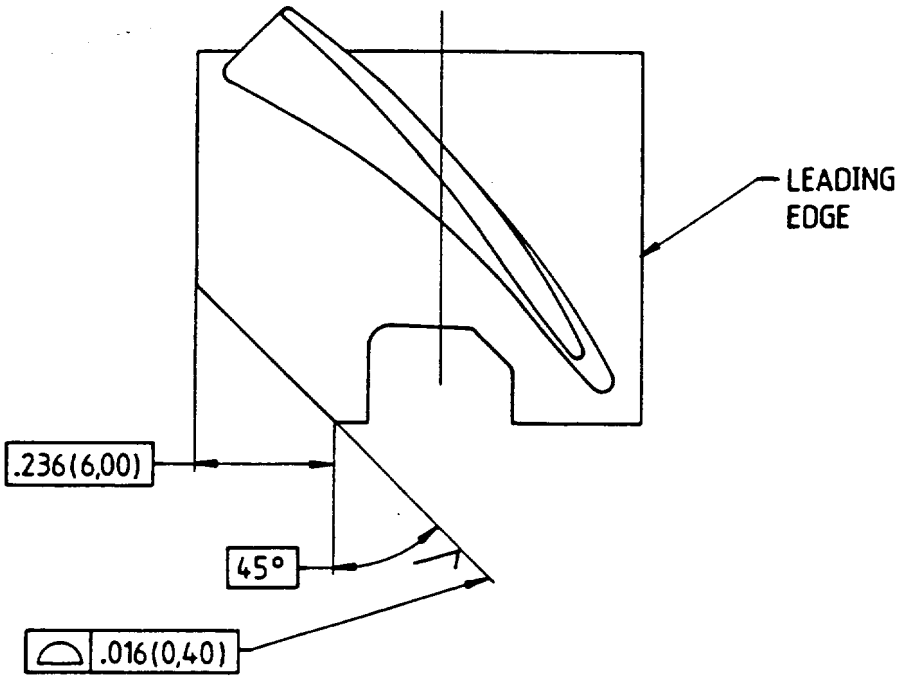
MODULE 40



Location of H.P. compressor rotor blades - Stages 9 to 12 (A1 Model)
Fig.1 (Sheet 1 of 2)



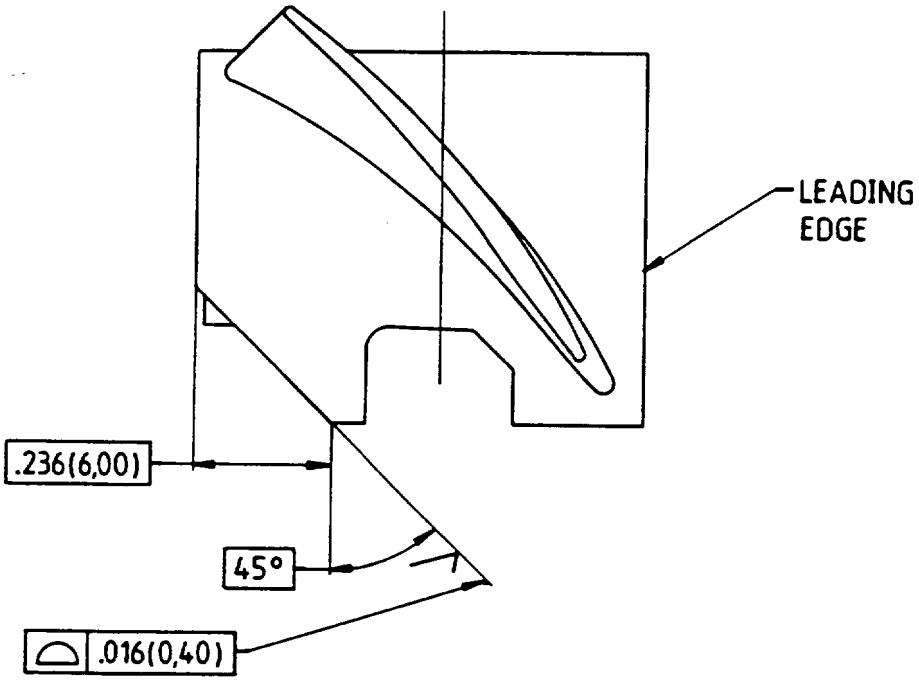
Location of H.P. compressor rotor blades - Stages 9 to 12 (A5 and D5 Models)
Fig.1 (Sheet 2 of 2)



ALL DIMENSIONS ARE IN INCHES(MILLIMETRES).
ANGULAR DIMENSIONS ARE IN DEGREES AND DECIMAL PARTS OF A DEGREE.
GEOMETRIC SYMBOLS CONFORM TO I.S.O. R1101-1969.
MACHINE SURFACE FINISH TO BE 125 MICROINCHES(3,2 MICROMETRES) U.O.S.
MACHINE WHERE MARKED ✓
BREAK SHARP EDGES .012(0,30) ±.008(0,20) U.O.S.

ded0000750

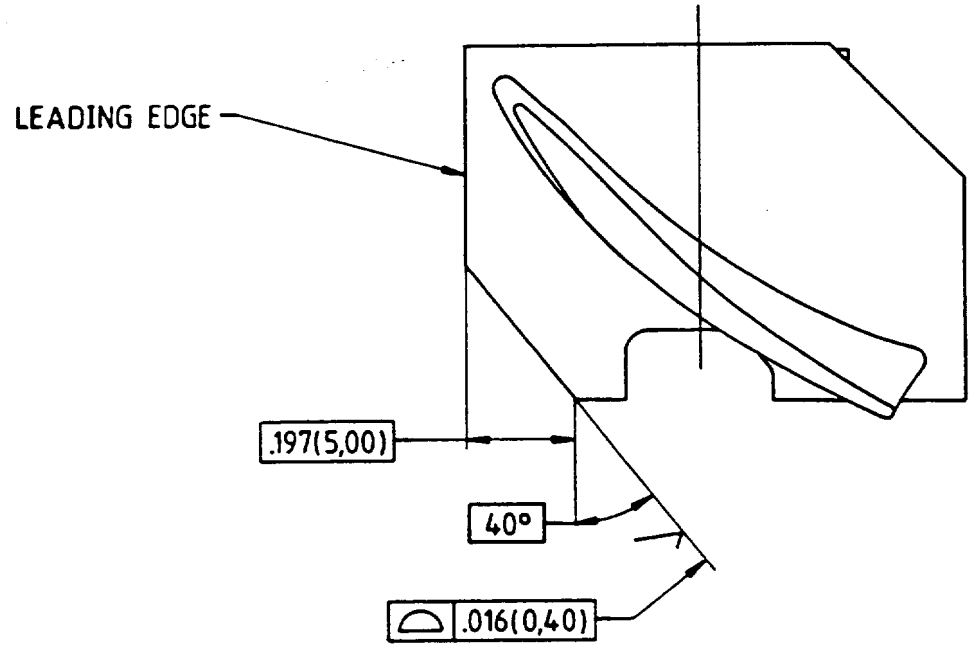
Reworking of existing H.P. compressor stages 10 and 11 L.H. locking blades (A1 Model)
Fig.2



ALL DIMENSIONS ARE IN INCHES(MILLIMETRES).
ANGULAR DIMENSIONS ARE IN DEGREES AND DECIMAL PARTS OF A DEGREE.
GEOMETRIC SYMBOLS CONFORM TO I.S.O. R1101-1969.
MACHINE SURFACE FINISH TO BE 125 MICROINCHES(3,2 MICROMETRES) U.O.S.
MACHINE WHERE MARKED ✓
BREAK SHARP EDGES .012(0,30) ± .008(0,20) U.O.S.

ded0000751

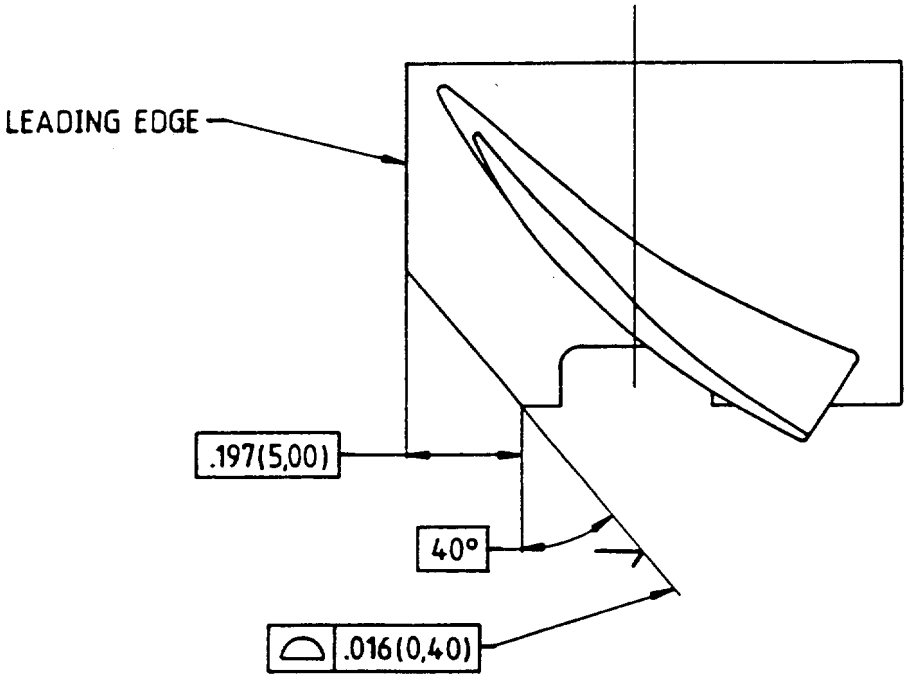
Reworking of existing H.P. compressor stage 12 L.H. locking blades (A1 Model)
Fig.3



ALL DIMENSIONS ARE IN INCHES(MILLIMETRES).
ANGULAR DIMENSIONS ARE IN DEGREES AND DECIMAL PARTS OF A DEGREE.
GEOMETRIC SYMBOLS CONFORM TO I.S.O. R1101-1969.
MACHINE SURFACE FINISH TO BE 125 MICROINCHES(3,2 MICROMETRES) U.O.S.
MACHINE WHERE MARKED ✓
BREAK SHARP EDGES .012(0,30)±.008(0,20) U.O.S.

ded0000752

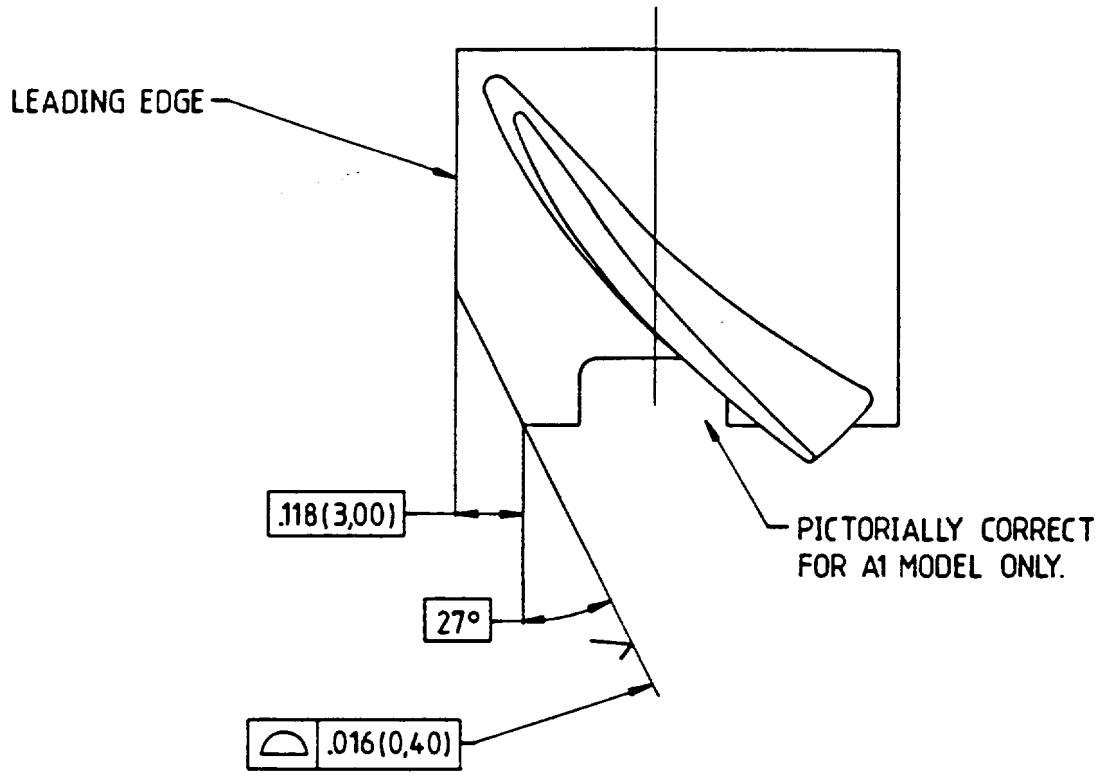
Reworking of existing H.P. compressor stage 9 R.H. locking blades (A1 Model)
Fig.4



ALL DIMENSIONS ARE IN INCHES(MILLIMETRES).
ANGULAR DIMENSIONS ARE IN DEGREES AND DECIMAL PARTS OF A DEGREE.
GEOMETRIC SYMBOLS CONFORM TO I.S.O. R1101-1969.
MACHINE SURFACE FINISH TO BE 125 MICROINCHES(3,2 MICROMETERS) U.O.S.
MACHINE WHERE MARKED ✓
BREAK SHARP EDGES .012(0,30)±.008(0,20) U.O.S.

ded0000753

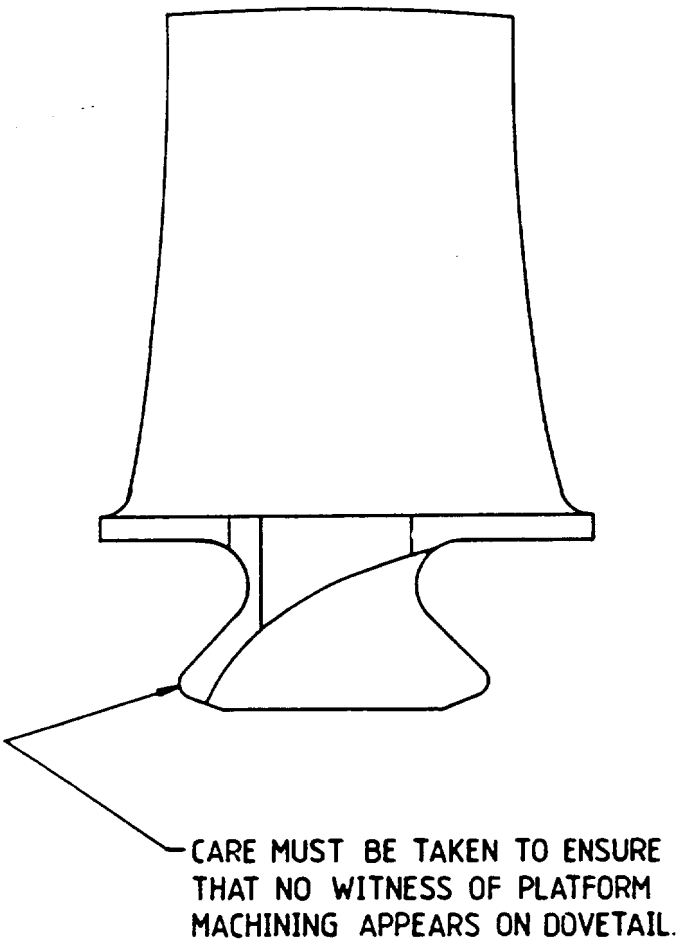
Reworking of existing H.P. compressor stage 10 and 11 R.H. locking blades (A1 Model) and stages 9, 10 and 11 R.H. locking blades (A5 and D5 Models)
Fig.5



ALL DIMENSIONS ARE IN INCHES(MILLIMETRES).
ANGULAR DIMENSIONS ARE IN DEGREES AND DECIMAL PARTS OF A DEGREE.
GEOMETRIC SYMBOLS CONFORM TO I.S.O. R1101-1969.
MACHINE SURFACE FINISH TO BE 125 MICROINCHES(3,2 MICROMETRES) U.O.S.
MACHINE WHERE MARKED ✓
BREAK SHARP EDGES .012(0,30) ± .008(0,20) U.O.S.

ded0000754

Reworking of existing H.P. compressor stage 12 R.H. locking blades (A1, A5 and D5 Models)
Fig.6

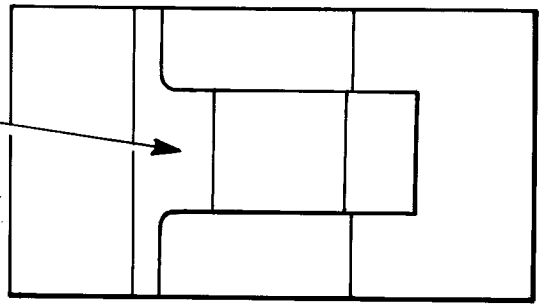


ded0000755

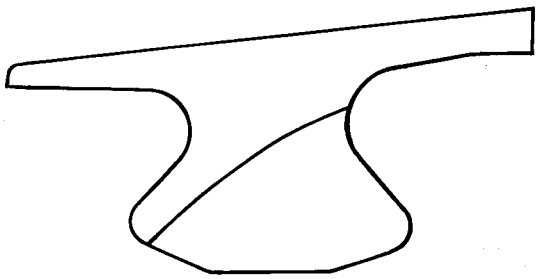
Typical view on blade platform
Fig.7

a) IF ALTERNATIVE METHOD OF BLADE IDENTIFICATION IS CHOSEN, ENGRAVE THE SYMBOL ⊠ HERE

b) IF SYMBOL ⊟ IS PRESENT, THE BLADE HAS PREVIOUSLY BEEN REWORKED TO SBE 72-0109 STANDARD. USE EXISTING SYMBOL ⊟ AND ENGRAVE THUS: ⊠



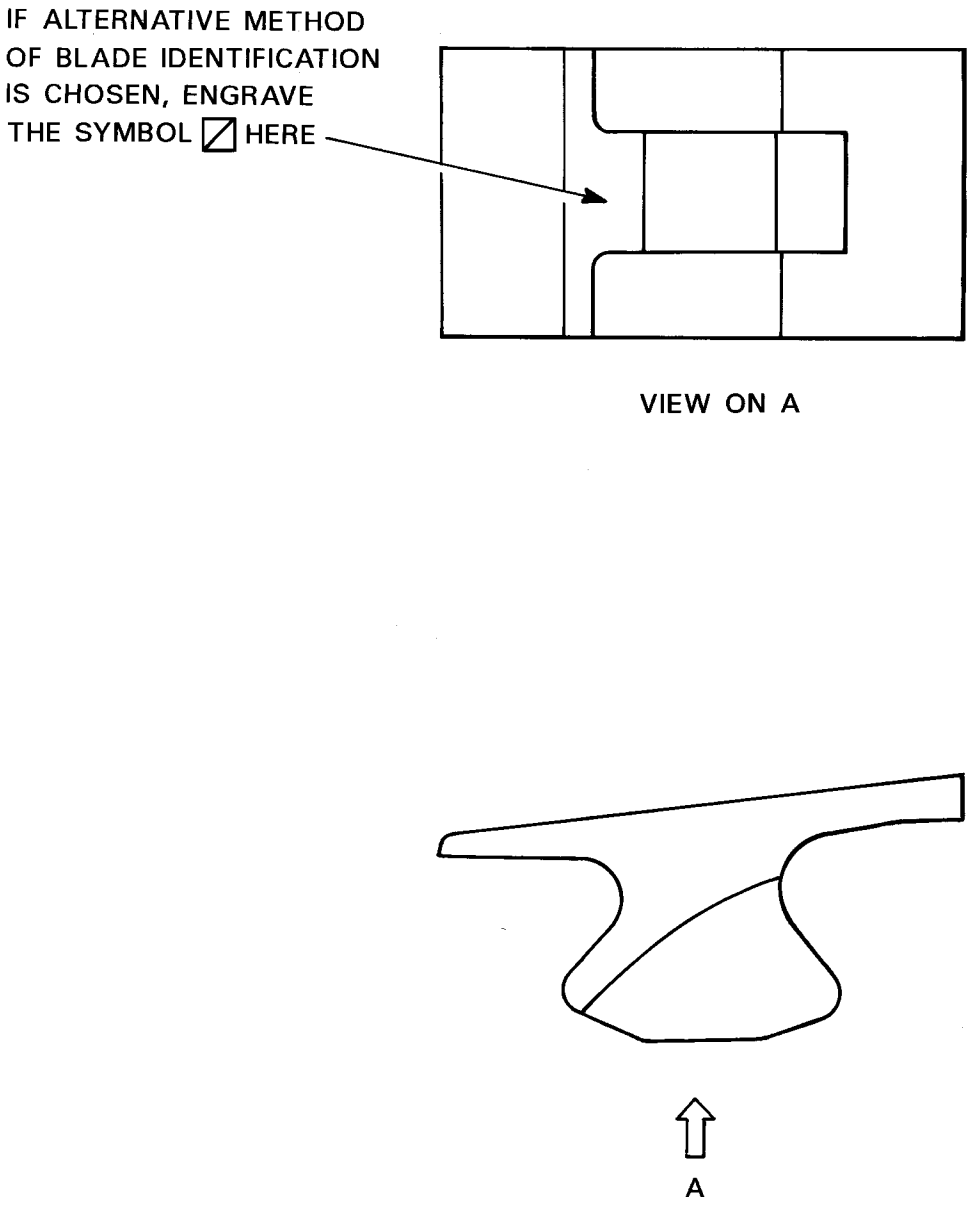
VIEW ON A



A

E3092

Reworking of existing stage 9 rotor blades
Fig.8



Reworking of existing stage 10, 11 and 12 rotor blades
Fig.9

3. Material Information

Applicability: For each V2500 Engine to incorporate this Bulletin.

A. Kits associated with this Bulletin:

None

B. Parts affected by this Bulletin:

New Part No. (ATA No.)	Qty	Est'd Unit Price ($)	Keyword	Old Part No. (IPC No.)	Instructions Disposition
A1 Model					
6A5638 (72-41-15)	2		Blade, R.H. locking - H.P. compressor stage 9	6A4367 (02-485)	(A)(B)(S1) (1D)
6A5639 (72-41-15)	2		Blade, L.H. locking - H.P. compressor stage 10	6A3255 (02-570)	(A)(B)(S1) (1D)
6A5640 (72-41-15)	2		Blade, R.H. locking - H.P. compressor stage 10	6A3256 (02-585)	(A)(B)(S1) (1D)
6A5641 (72-41-15)	2		Blade, L.H. locking - H.P. compressor stage 11	6A3258 (02-670)	(A)(B)(S1) (1D)
6A5642 (72-41-15)	2		Blade, R.H. locking - H.P. compressor stage 11	6A3259 (02-685)	(A)(B)(S1) (1D)
6A5643 (72-41-15)	2		Blade, L.H. locking - H.P. compressor stage 12	6A3261 (02-770)	(A)(B)(S1) (1D)
6A5644 (72-41-15)	2		Blade, R.H. locking - H.P. compressor stage 12	6A3262 (02-785)	(A)(B)(S1) (1D)
A5 and D5 Models					
6A5645 (72-41-15)	2		Blade, R.H. locking - H.P. compressor stage 9	6A4846 (02-485)	(A)(B)(S1) (1D)
6A5646 (72-41-15)	2		Blade, R.H. locking - H.P. compressor stage 10	6A4221 (02-585)	(A)(B)(S1) (1D)
6A5647 (72-41-15)	2		Blade, R.H. locking - H.P. compressor stage 11	6A4253 (02-685)	(A)(B)(S1) (1D)

6A5648 (72-41-15)	2	Blade, R.H. locking - H.P. compressor stage 12	6A4206 (02-785)	(A)(B)(S1) (1D)

C. Instructions/Disposition Code Statements

(A) New part is currently available

(B) Old part is no longer available

(S1) New parts can be freely mixed with old parts

(1D) Old parts may be reworked and re-identified to the new part number.

NOTE: The estimated 1993 unit prices shown are provided for planning purposes only and do not constitute a firm quotation. Consult the IAE Price Catalog or contact IAE's Spare Parts Sales Department for information concerning firm prices.