SUBMIT PCR

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GIV-MSG3

REGISTRATION	SERIAL NO.	TITLE	
N675RW	**1046**	**NO. 1 ENGINE - TAY LIFE MANAGEMENT - NON-AIRLINE ENGINES - NON-MODIFICATION SERVICE BULLETIN, SERVICE BULLETIN (OPTIONAL)**	**TAY-70-1050 R11** **887306**
AIRFRAME HOURS	AIRFRAME CYCLES		OPERATOR
7823	**3532**		**HIGHLANDS GROUP, LLC**
ENGINE MODEL	ENGINE SERIAL	FREQUENCY: -	
TAY611-8 (MSG3)	**16204**	ACCOMPLISHED:	PARENT CODE / OPERATION
ENGINE HOURS	ENGINE CYCLES	NEXT DUE:	
		REMAINS:	
		REQUIREMENTS REFERENCE	TASK TYPE
		TAY-70-1050 R11	**Service Information (SB)**
		PROCEDURE REFERENCE	AUTHORITY
			PART 91.409(F)(3)

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MAT'L COST: _____ LABOR HRS: _____

COMPLIANCE REMARKS

MAINTENANCE NOTES

RTS STATEMENT

TECHNICIAN SIGNATURE	CERTIFICATE#	COMPLIANCE DATE
INSPECTED BY	**CERTIFICATE#**	**DATE**

WORK ORDER: _____

FACILITY: _____

CERTIFICATE: _____

WID: 50879155-1

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

Date May 26/20

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TAY SERIES PROPULSION SYSTEM SERVICE BULLETIN

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This document transmits Revision 11 of Non-Modification Service Bulletin TAY-70-1050.

Document History

Non-Modification Service Bulletin Revision Status

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Revision 8	Jan. 9/06
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Non-Modification Service Bulletin Revision 11

Remove	Incorporate	Reason for change
All pages of the Non-Modification Service Bulletin.	Pages 1 to 9 Non-Modification Service Bulletin.	To add a reference to Appendix 5. To add fixed overhaul life and listed soft times to the Non-Modification Service Bulletin. To add some new Service Bulletins, some new Non-Modification Service Bulletin to Appendix 2, 2A, 4, 4A, 6, 7, 9 and 10. To delete some Service Bulletins, some Non-Modification Service Bulletins from Appendix 6, 7 and 10. To add a reference to Appendix 5 to Appendix 1, 2A, 3, 4A, 6, 7, 8, 10, 11 and 13. To add instructions to strip Module 04 HP turbine to Appendix 1. To add instructions to strip HP compressor rotor to Appendix 2. To add an instruction to do a borescope inspection of Module 02 IP compressor, instructions to strip HP compressor rotor and instructions to allow the inspection of the HP turbine discs to Appendix 2A. To change 24 table entries, to add fixed operational life hours and to add soft time requirements to Appendix 5. To delete a note from Appendix 2 and 2A. To add an instruction to replace the igniter plugs to Appendix 1, 2A and 6.
All pages of Appendix 1.	Pages 1 to 12 of Appendix 1.	To add a reference to Appendix 5 and an instruction to track the lives of accessory units. To add instructions to strip Module 04 HP turbine to expose the bladed HP turbine stage 1 and 2 discs, examine and repair specific parts. To delete a note from Appendix 2 and 2A. To add an instruction to replace the igniter plugs.

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Remove	Incorporate	Reason for change
All pages of Appendix 2.	Pages 1 to 3 of Appendix 2.	To add a new Non-Modification Service Bulletin. To add instructions to strip the HP compressor rotor and to delete a note.
All pages of Appendix 2A.	Pages 1 to 13 of Appendix 2A.	To add a new Non-Modification Service Bulletin. To add a reference to Appendix 5 and an instruction to track the lives of accessory units. To add an instruction to do a borescope inspection of Module 02 IP compressor, to add instructions to strip the HP compressor rotor, to add an instruction to allow the inspections of the HP turbine discs. To delete a note and minor editorial changes. To add an instruction to replace the igniter plugs.
All pages of Appendix 3.	Pages 1 to 10 of Appendix 3.	To add a reference to Appendix 5 and an instruction to track the lives of accessory units.
All pages of Appendix 4.	Pages 1 to 3 of Appendix 4.	To add a new Non-Modification Service Bulletin.
All pages of Appendix 4A.	Pages 1 to 12 of Appendix 4A.	To add a new Non-Modification Service Bulletin. To add a reference to Appendix 5 and an instruction to track the lives of accessory units.
All pages of Appendix 5.	Pages 1 to 5 of Appendix 5.	To change 24 table entries. To add fixed operational life hours and to add soft time requirements.
All pages of Appendix 6.	Pages 1 to 7 of Appendix 6.	To delete a Non-Modification Service Bulletin, to delete a Service Bulletin, to add a new Non-Modification Service Bulletin. To add a reference to Appendix 5. To add an instruction to replace the igniter plugs.

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Remove	Incorporate	Reason for change
All pages of Appendix 7.	Pages 1 to 6 of Appendix 7.	To delete a Service Bulletin, to add a new Non-Modification Service Bulletin. To add a reference to Appendix 5.
All pages of Appendix 8.	Pages 1 to 9 of Appendix 8.	To add a reference to Appendix 5 and an instruction to track the lives of accessory units.
All pages of Appendix 9.	Pages 1 to 3 of Appendix 9.	To add a new Non-Modification Service Bulletin.
All pages of Appendix 10.	Pages 1 to 6 of Appendix 10.	To delete a Service Bulletin, to add a new Non-Modification Service Bulletin. To add a reference to Appendix 5.
All pages of Appendix 11.	Pages 1 to 8 of Appendix 11.	To add a reference to Appendix 5 and an instruction to track the lives of accessory units.
All pages of Appendix 12.	Pages 1 to 3 of Appendix 12.	Not changed.
All pages of Appendix 13.	Pages 1 to 4 of Appendix 13.	To add a reference to Appendix 5.

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TAY LIFE MANAGEMENT - NON-AIRLINE ENGINES - NON-MODIFICATION SERVICE BULLETIN

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1. Planning Information

A. Effectivity

Tay 611-8 Engines.

Tay 620-15 Engines.

Tay 650-15 Engines.

Tay 651-54 Engines.

B. Introduction

This Non-Modification Service Bulletin presents a basic engine life management programme suitable for the Tay engine in aircraft which are engaged in non-airline operations.

Revision 9 of this Non-Modification Service Bulletin had been issued to introduce a new High Pressure (HP) turbine stage 1 blade life. The recommended Service Bulletin lists had been reviewed and updated.

R Revision 10 of this Non-Modification Service Bulletin had been issued to update the recommended Service Bulletin lists. Some figure item numbers have been added to Appendix 6, Appendix 7, Appendix 10 and Appendix 13. The replacement of the piston seal rings (75-32-06, 05-470 and 05-490) and the felt piston wiper washer (75-32-06, 05-510) have been added when the Airflow Control Regulator and Actuator will be reworked. An instruction to either crack test or replace the fuel spray nozzles associated double ended unions at overhaul has been added to Appendix 1, Appendix 2A, Appendix 3 and Appendix 4A.

R Revision 11 of this Non-Modification Service Bulletin has been issued to
R update the recommended Service Bulletin lists. A reference to Appendix 5 has
R been added to Appendix 1, 2A, 3, 4A, 6, 7, 8, 10, 11 and 13. Instruction to
R replace the igniter plugs have been added to Appendix 1, 2A and 6. Instruction
R to strip Module 04 HP turbine have been added to Appendix 1. Instruction to
R strip the HP compressor rotor have been added to Appendix 2. An instruction to
R do a borescope inspection of the Module 02 IP compressor. Instruction to strip
R HP compressor rotor and instructions to allow the inspection of the HP turbine
R discs have been added to Appendix 2A. Fixed operational life hours and soft
R time requirements have been added to Appendix 5.

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C. Compliance

OPTIONAL

This Non-Modification Service Bulletin is introduced for information only.

D. General

NOTE: It is important to understand that the existence of this Non-Modification Service Bulletin does not automatically constitute authority to apply it. It is the responsibility of the Operator to gain any necessary approval from his national aviation authority.

R (1) The recommended overhaul life for the Tay engine is 8000 hours.
R Recommendations for maintenance and overhaul of engine mounted
R accessories are given in Appendix 5.

R (2) Engines will require a mid-life rework which will consist of a rework of the Combustion and HP Turbine Module. The recommended life for mid-life rework is 4000 hours.

(3) If both engines installed on the same aircraft have similar operating hours (i.e. less than 100 hours difference) and are required to be reworked, if one of those engines is likely to exceed its approved release life, prior to re-installation of the other engine, then a life extension of 200 hours is permissible. This life extension will then provide the necessary time for the removed engine to undergo rework at an engine overhaul facility.

(4) The life management programme is based on features common to the majority of Operators. Where previous experience of a certain type of environment of operating condition suggests that a particular Operator may have a life limiting feature not applicable to others, a separate programme may be established for that Operator (refer to 1.D.).

(5) Any life recommended is contingent upon the Mandatory Life Limited (Group A) parts lives not being exceeded. It is the Operators responsibility to monitor all lives and ensure they are not exceeded. Group A lives are published in Chapter 05-10-01 of the Time Limits Manual.

(6) During mid-life rework and at full overhaul, the part numbers, quantities and times since new of the HP1 turbine blades, to be incorporated at engine build, should be recorded in the engine log book. This will ensure that an accurate monitor of HP1 turbine blade life is maintained.

(7) During overhaul or mid-life rework, HP Turbine Stage 1 blades which would exceed 20000 hours life during the next engine release life, should undergo full overhaul processing, i.e. stripping of aluminised coating and penetrant inspection.

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(8) The Service Bulletins listed in the appendices of this Non-Modification Service Bulletin are those which Rolls-Royce recommends for embodiment at mid-life, calendar rework and full overhaul in the interests of increased engine reliability and engine/component improved lives.

(9) At full overhaul the engine log book should be reviewed to ensure that all the Service Bulletins recommended at mid-life overhaul have been embodied. Any which are missing should be embodied, unless the missing Service Bulletins are superseded by those being fitted at full overhaul.

(10) It is the responsibility of the Operator to schedule engines into an authorized overhaul facility before expiry of either the Hours Life or the Calendar Life of the engine, whichever comes first.

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E. Life Growth

(1) An Operator with either a single or multi-aircraft fleet will be required to submit at least one engine sample (refer to 1.D.(3) below), for both the mid-life rework and full overhaul inspections, as part of his life growth programme. The engine sample will require a detailed life assessment inspection by an authorised Tay engine overhaul facility, to establish if further life is capable in that particular operation.

(2) The authorised overhaul facility's life assessment report and recommendations, together with any other relevant operational evidence, will be required by the Operator when making an application to the relevant Licensing Authority for an increase in engine life.

(3) Any increase in engine life will be based on the features found within an individual Operator's engine. Any change in ownership of the aircraft/engines will result in previously increased life intervals reverting to the fleet-wide recommended lives listed in this Non-Modification Service Bulletin. In such cases the engine life remaining will be pro-rated to the fleet-wide recommended life. If the new Operator then wishes to increase this engine life, he will be required to submit further engine samples as indicated in step D.(1) above.

(4) Any increase in engine life is contingent upon major rotating component (Group A) lives not being exceeded. Each Group A life is defined in terms of flights, which include an allowance for take-off, speed change and thrust reverser operation and may vary dependent upon modification standard. These lives are published in Chapter 05 of the appropriate Time Limits and Maintenance Manuals.

(5) It is intended that engine growth should proceed in 500 hour stages, in conjunction with the requirements detailed in 1.D.(1) above.

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(6) This life growth procedure can be repeated until such time as the Operator's desired life is achieved or a life limiting feature is established, at which time the life will be stabilised until:

(a) Modifications have been embodied to eliminate the limiting feature.

(b) A schedule of intermediate rework has been established which, at a determined point in engine life, renews or repairs those components which are life limiting, allowing the remainder of the engine to proceed on the life growth programme.

(7) It is requested that Operators give notice of subsequent life increased to:

Service Support Manager - Tay, Spey & Dart
Rolls-Royce Deutschland
Eschenweg 11
15827 Blankenfelde-Mahlow
Germany

F. Mid-life and Calendar Life Rework Package

The mid-life and calendar life modification and rework packages applicable to each engine mark are appended to this Non-Modification Service Bulletin. The following table gives a guide to the effectivity of each package.

NOTE: Service experience has demonstrated that corrosion can be more prevalent on the low utilisation type of operation. It is thus important to monitor ongoing service experience particularly in relation to the integrity of Group A parts and also establish individual Operator corrosion experience. Rolls-Royce should always therefore be advised if:

(1) Extensive corrosion attack is evident, particularly affecting Group A parts.

(2) Any Group A parts are rejected for corrosion pitting. (Rolls-Royce may wish those parts returned for more detailed examination).

Should either (1) or (2) apply, Rolls-Royce will review corrosion preventative measures with the affected Operator.

	Tay 611-8	Tay 620-15	Tay 650-15	Tay 651-54
Mid-life rework	Appendix 1	Appendix 3	Appendix 8	Appendix 11
Calendar life rework	Appendix 2	Appendix 4	Appendix 9	Appendix 12
Calendar life rework for Low Utilisation Operators	Appendix 2A	Appendix 4A		
Full overhaul	Appendix 6	Appendix 7	Appendix 10	Appendix 13

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G. Aircraft with Low Utilisation

(1) The calendar life of an engine is 10 years from the date of manufacture, overhaul or from a mid-life rework which includes the calendar life rework package. This includes any period of time which the engine may have been stored.

(2) Operators with low annual aircraft utilisation may have engines reaching this calender life limit before the overhaul life or even the mid-life rework is attained. Such engines may be reworked in accordance with Appendix 2A or Appendix 4A only of this Non-Modification Service Bulletin. This work package will allow the engine to be released for a further 10 years or the balance of the engines release life to mid-life or overhaul, whichever comes first.

(3) For engines approaching a mid-life rework at calendar lives greater than 5 years, for economic reasons it is beneficial to have the additional calendar life rework package carried out. This will allow the engine to be released for a further 10 years calendar life or to complete an overhaul life.

(4) The requirement for this additional work package is to ensure that all parts which could affect engine integrity not normally seen during the turbine mid-life rework are free of corrosion and that certain perishable seals and diaphragms are replaced.

(5) At a maximum of 20 years or on completion of the approved overhaul life in hours as agreed by the Operator's Airworthiness Authority, the engine and its accessories must be completely overhauled.

H. Full Engine Overhaul

R At 8000 hours from new or overhaul, or at 4000 hours since the last mid-life
R rework, whichever occurs first, a full overhaul of engine and accessories with a fixed overhaul life is required.

When an engine requires full overhaul, it should be refurbished in accordance with the procedure detailed in the relevant Engine Manuals.

I. Accessories

During the life of an engine it is possible that accessories may not retain the same running times as the engine (possibly as a result of unit changes). In the interests of reliability, it is recommended that engine accessory
R units, which have achieved the recommended overhaul lives or exceeded their
R listed soft times, should be reworked in accordance with the manufactures procedures.

A list of the 'Rolls-Royce responsibility engine mounted accessories' can be found in Appendix 5.

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J. Transfer from Airline Operation to Non-airline Operation

Where an aircraft or engine is transferred from an airline to a non-airline operation the following transfer rules should be used:

(1) Remaining hours before rework on the engines involved:

That proportion remaining of the release life of an airline engine since its last performance restoration shop visit should be applied to the relevant non-airline release life.

The fractional life achieved in airline operation is transposed into the life achieved in non-airline operation. This is achieved by carrying out a pro-rata calculation in accordance with the formula that follows. This formula is to be used for both engines approaching mid-life and overhaul:

$$\text{Achieved life in non-airline operation} = \frac{A}{B} \times C$$

(a) Abbreviations:

A	Life achieved in airline operation (cycles)
B	Due refurbishment or overhaul in airline operation cycles

NOTE: Figure B should not exceed 14000 cycles for the due refurbishment (mid-life) and 22000 cycles for the due overhaul.

C	Due mid-life or overhaul in non-airline operation (hours)

NOTE: Airline engines are scheduled for refurbishment and overhaul based on cycles, not hours utilisation. Therefore, the achieved fractional life in airline operation is calculated in cycles.

(b) Explanations:

[1] Life achieved in airline operation (cycles) is available in the engine log book or any electronic maintenance records.

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[2] Due refurbishment or overhaul in airline operation (cycles) will be available in the applicable Operators Engine Managment Programme (EMP). If the engine has been operated to significantly different EMPs, the total fractional life achieved is to be the sum of the individual fractional lives achieved at each of the differing EMP lives.

NOTE: Non-airline mid-life is equivalent to an airline Level 3 refurbishment on module 04.

NOTE: Non-airline overhaul is equivalent to an airline Level 3 or 4 overhaul on all modules.

[3] Due mid-life or overhaul in non-airline operation is 4000 hours for mid-life and 8000 hours for overhaul, unless otherwise agreed with the local Airworthiness Authority.

(c) Examples:

First example:

An engine has completed 6000 cycles in airline operations and is now required to transfer to non-airline operation. The engine has not received a shop visit. The engine is due a scheduled airline module 04 refurbishment shop visit at 12000 cycles.

6000 cycles / 12000 cycles x 4000 hours = 2000 hours

In this instance the engine has achieved 50% of its release life. The engine has therefore a pro-rated non-airline achieved life of 2000 hours and hence a residual life of 2000 hours in the non-airline operation.

Second example:

An engine has completed 15000 cycles in airline operations and is now required to transfer to non-airline operation. The engine received Level 3 refurbishment on module 04 at 12000 cycles. The engine is due a scheduled overhaul at 20000 cycles. The level 3 refurbishment is discounted and the overhaul figure is used.

15000 cycles / 20000 cycles x 8000 hours = 6000 hours

In this instance the engine has achieved 75% of its release life. The engine has therefore a pro-rated non-airline achieved life of 6000 hours and hence a residual life of 2000 hours in the non-airline operation.

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Third example:

An engine has completed 30000 cycles in airline operations and is now required to transfer to non-airline operation. The engine received a Level 3 or 4 overhaul on all modules at 20000 cycles. The engine is due a scheduled mid-life at 32000 cycles (12000 cycles since overhaul). The cycles since overhaul figure is used to calculate the figure until due mid-life.

10000 cycles / 12000 cycles x 4000 hours = 3334 hours (rounded up)

In this instance the engine has achieved 83,33% of its release life. The engine has therefore a pro-rated non-airline achieved life of 3334 hours and hence a residual life of 666 hours in the non-airline operation.

(2) Repeat inspection Service Bulletins:

The engine log book should be checked to make sure that the Operator is aware of repeat inspection Service Bulletins, e.g. Non-Modification Service Bulletin 72-1485 - Engine - HP turbine / HP compressor shaft spline flank wear inspection.

The aim of this Non-Modification Service Bulletin is to estimate the combined wear on the spline flanks of the HP turbine and HP compressor shafts. This is recommended at repeat intervals of 5000 cycles.

(3) Mandatory / Alert Service Bulletins and Non-Modification Service Bulletins:

All Mandatory / Alert Service Bulletins and Non-Modification Service Bulletins should be checked for embodiment at the time of transfer, e.g. Non-Modification Service Bulletin 76-1434 - Emergency fuel shut off system - Inspection of emergency fuel shut off cable.

If there is no record in the engine log book of embodiment, carry out this Non-Modification Service Bulletin.

(4) Engine Calendar Life:

The 10 year calendar life starts from new or the time of the last shop visit that inspected all Group A parts.

(5) Group A Parts:

Any replacement Group A part or module which has been transferred from another engine must be considered when setting the calendar life datum of the engine. The calendar life datum of the engine is from the date of inspection of all Group A parts.

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If for example one Group A part was transferred and was inspected earlier than all the other Group A parts, the calendar life datum can be reset by piece part inspection of the affected part.

(6) Calendar Life Extension:

Extensions of up to two years on the expiry of the 10 year calendar life will be supported if the Operator can provide evidence that the fleet in which the engines were operated did not exhibit corrosion beyond expected levels. It is the responsibility of the new Operator to provide this evidence to Rolls-Royce Deutschland for evaluation.

K. Approval

R This Non-Modification Service Bulletin TAY-70-1050 was approved on May 26/20.

2. Material Information

None.

3. Accomplishment Instructions

None.

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APPENDIX 1

MID-LIFE REWORK

EFFECTIVITY - TAY 611-8

NOTE: Operators should note that the agreement of the Local Licensing Authority must be obtained for any proposed deviation from this Non-Modification Service Bulletin.

At 4000 hours from new, or overhaul, a rework is required as detailed below.

The rework package will be developed with service experience.

Any component(s) inspected and found to be in excess of Engine Manual limits, may warrant further inspection, engine strip or rework other than that stated in this work package.

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R Recommendations for maintenance and overhaul of engine mounted accessory units are
R given in Appendix 5.

R Accessory units that have been fitted to an engine at intermediate time require to
R have their lives tracked to ensure that they are overhauled at the required
R interval.

A. Module 01 - LP Compressor

Item

(1) Visually inspect for obvious damage.

(2) The following Service Bulletin is recommended for embodiment:

72-1528 Engine - LP compressor rotating fairing - Introduction of an LP compressor rotor spinner assembly with a dowel pin installed in the spinner flange.

(3) Rework in accordance with Engine Manual as necessary. Accomplishment of Repair Scheme HRS3629 LPC rotor blade - Restore L/E profile or of the Non-Modification Service Bulletin that follows is recommended:

72-1603 Non-Mod Service Bulletin — Engine - Low Pressure (LP) compressor (fan) blades - Instruction of a repair to the LP compressor (fan) blade leading edge profile.

(4) Replace blades in as-received position as annotated in log book.

(5) Check balance, if necessary.

(6) Rebalance rotor assembly, if necessary.

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B. Module 02 - IP Compressor

Item

(1) Visually inspect for obvious damage.

(2) The following Service Bulletin and Repair Scheme is recommended for embodiment:

72-1045	Engine - IP compressor air splitter - Introduction of strengthened annular ring. (To reduce secondary damage to engine in event of rearward movement of LP fan blades due to tang failure.)
HRS3390	IP compressor inlet guide vane - Re-apply filler material. (To prevent secondary IP compressor damage due to hard filler release.)

C. Module 03 - HP Compressor

Item

(1) Check HP rotor for freedom of rotation.

(2) Check bleed valve hardware for binding, corrosion, wear, damage, freedom of movement.

(3) Visually inspect for obvious damage and excessive corrosion.

(4) The following Service Bulletin and Non-Modification Service Bulletin are recommended for embodiment:

72-1496 Non-Mod Service Bulletin	Engine - HP compressor stage 7 and 12 air off-take clamp inspection.
72-A1653	Engine - High Pressure (HP) compressor vanes stages 4 to 11 - Introduction of a new setting procedure to increase the minimum vane tip clearance.
72-1704	Engine - Air guide tube drive shaft and fittings - High Pressure (HP) compressor - Introduction of revised torque tightening procedure for the Low Pressure (LP) thrust bearing outer ring spanner nut.

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72-1719 Non-Mod Service Bulletin — Engine - High Pressure (HP) compressor discs, blades and spacers stages 6 to 9 - Replacement of HP compressor rotor discs.

Note: The Non-Modification Service Bulletin above is only applicable to a specific list of engine serial numbers identified.

72-1730 Non-Mod Service Bulletin — Engine - High Pressure (HP) compressor vanes-stages 4 to 11 - Inspection of the HP compressor stage 7 stator vanes.

Note: The Non-Modification Service Bulletin above is only applicable to a specific list of engine serial numbers identified.

72-1731 Non-Mod Service Bulletin — Engine - High Pressure (HP) compressor vanes-stages 4 to 11 - Inspection of the HP compressor stage 7 stator vanes.

Note: The Non-Modification Service Bulletin above is only applicable to a specific list of engine serial numbers identified.

D. Module 04 - Combustion and HP Turbine

Item

(1) Remove module from engine.

(2) Visually inspect for obvious damage.

R (3) Bulk strip Module 04 to expose the bladed HP turbine Stage 1 and 2 discs, the HP turbine Nozzle Guide Vanes (NGV).

R (4) Carry out the following items:

R (a) Clean and visually examine the combustion liner and discharge nozzle in assembled condition.

R (b) Strip the HP bearing support sufficiently to restore flatness of the rear oil seal housing and plate.

R (c) Visually examine the bearing support and roller bearing. Pay attention for oil leakage.

R (d) Visually examine the anti friction rings for cracks.

R (e) Piece part inspect the HP turbine stage 1 nozzle vanes.

R (f) Piece part inspect the HP turbine stage 2 nozzle vanes.

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R (g) Visually examine the HP turbine stage 1 nozzle case assembly.

R (h) Piece part inspect the HP turbine stage 1 disc.

R NOTE: If the Maintenance Repair and Overhaul (MRO) facility can
R demonstrate that the HP turbine stage 1 disc has been replaced
R with a new zero cyclic disc at the last full overhaul shop
R visit it is permitted to visually inspect the disc in bladed
R condition in accordance with the bladed disc inspection task
R during this shop visit only. For example, if the turbine disc
R has been replaced with new at the 20 year overhaul shop visit,
R then at the 30 year calendar life shop visit the disc can be
R visually inspected in bladed condition. The disc must then be
R piece part inspected at the 40 year calendar life shop visit
R and all following calendar life shop visits.

R (i) Piece part inspect the HP turbine stage 2 disc.

R NOTE: If the MRO facility can demonstrate that the HP turbine stage 2
R disc has been replaced with a new zero cyclic disc at the last
R full overhaul shop visit it is permitted to visually inspect
R the disc in bladed condition in accordance with the bladed disc
R inspection task during this shop visit only. For example, if
R the turbine disc has been replaced with new at the 20 year
R overhaul shop visit, then at the 30 year calendar life shop
R visit the disc can be visually inspected in bladed condition.
R The disc must then be piece part inspected at the 40 year
R calendar life shop visit and all following calendar life shop
R visits.

R (j) Piece part inspect the HP turbine shaft.

R (k) Visually examine all other removed or exposed components for damage or
R wear.

R NOTE: HP turbine stage 1 blades should be visually inspected only and
R do not require full overhaul processing unless they will exceed
R 20000 hours during the next engine release life.

(5) The following Service Bulletins and Non-Modification Service Bulletin are recommended for embodiment:

72-1060 Engine - HP turbine case and rotor - Increased clearance between HP stage 1 rotor blades and nozzle vanes. (To overcome possible axial rubs.)

72-1111 Engine - HP turbine bearing and support - Bearing flexible support stop ring with increased axial clearance. (To eliminate a possible source of HP order vibration.)

72-1143 Engine - High energy igniter adaptors - Revised procedure for setting igniter immersion depth. (To extend igniter life.)

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72-1389 Non-Mod Service Bulletin — Engine - Inspection of combustion liner Y ring weld. (Inspection requirements for combustion liners identified as being in a specific serial number range.)

72-1819 Non-Mod Service Bulletin — Engine - Turbine rotor discs and shaft - High Pressure (HP) - Inspection of the HP turbine stage 2 disc sleeve serial number.

Note: The Non-Modification Service Bulletin above is applicable for Engine Serial Number 18189.

(6) Re-assemble module in accordance with Engine Manual.

E. Module 05 - LP Turbine

Item

(1) Remove module from engine.

(2) Visually inspect for obvious damage.

(3) Rework to Engine Manual as necessary.

(4) Crack test engine mount rear links.

(5) The following Service Bulletins are recommended for embodiment:

72-1117 — Engine - LP turbine - Disc driving flange dowel bolts with tapered and square heads. (To prevent disc damage during assembly/disassembly.)

72-1160 — Engine - LP turbine bearing support - Application of jointing compound to bearing support flange and overspeed control arm body mating faces. (To prevent oil leakage.)

72-1195 — Engine - LP turbine case and vanes - LP turbine interstage seals with increased tolerances and improved anti-frettage coating. (To prevent rubs and fast rundown times.)

72-1358 — Engine - LP turbine case and vanes - Re-introduction of three piece intrascope blanking plug assembly at LP1 and LP3 nozzle guide vane positions. (To prevent secondary LP turbine damage due to intrascope blanking plug failure.)

72-1364 — Engine - LP turbine rotor discs and shaft - Rear oil tube steady with reduced outside diameter. (To prevent seizure of the rear oil tube within the air guide tube eliminating failures at the rear oil tube and ensuring satisfactory operation of the emergency fuel shut-off cock mechanism.)

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72-1455 Engine - LP nozzle case and vanes - Introduction of LP turbine stage 1 NGV and seal support assembly with honeycomb seal.

72-1590 Engine - Turbine nozzle case and vanes-LP - Deletion of the dowel pins and retainer plates which are installed in the LP turbine stage 1 static air seal.

72-A1696 Non-Mod Service Bulletin Engine - Turbine nozzle case and vanes - HP and LP - Inspection of the bolts which are installed in the LPT stage 1 static air seal and of the bolts which are installed in the HPT stage 1 air seal support.

Note: The Non-Modification Service Bulletin above is only applicable to a specific list of engine serial numbers identified.

F. Module 06 - HS Gearbox

Item

(1) Visually inspect gearbox mounts, link and accessory features.

(2) Inspect for signs of oil leakage.

(3) Clean accessory mount pads.

(4) Remove existing grease and debris from starter drive splines.

(5) Inspect splines of starter drive gear in accordance with the Engine Manual.

NOTE: Care must be taken when applying fresh grease to the splines as too much grease can result in an end load on the starter drive front bearing and cause the bearing to fail.

(6) The following Service Bulletin is recommended for embodiment:

72-1112 Engine - Main oil pumps - LP turbine bearing return oil transfer tube with by-pass hole. (To overcome oil spillage and smoke emission.)

G. Module 07 - Intermediate Casing

Item

(1) Inspect intermediate case for damage, corrosion and general condition.

(2) Inspect Inlet Guide Vane (IGV) actuating mechanism for freedom of movement and range of travel.

(3) Inspect engine trunnion mounting flange bore location for damage.

(4) Inspect intermediate case mounting lug for damage.

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(5) Rework to Engine Manual as necessary.

(6) The following Service Bulletins and Non-Modification Service Bulletins are recommended for embodiment:

72-1122	Engine - LP compressor - Front bearing locating ring with copper plated bore. (To improve bearing location and prevent debris generation.)
72-1296 Non-Mod Service Bulletin	Engine - Replacement of high speed gearbox drive driven bevel gearshaft JR27127. (To ensure that low fatigue strength gearshafts are removed from service.)
72-1341 Non-Mod Service Bulletin	Engine - Replacement of high speed gearbox drive driven bevel gearshaft JR27127. (To ensure that low fatigue strength gearshafts are removed from service.)
72-1480	Engine high speed gearbox driving assembly - Introduction of increased torque on the internal gearbox bevel gear retaining nut.

(7) Re-assemble module in accordance with Engine Manual.

H. Non-Modular Items

Item

(1) Inspect nose cone spinner and fairing.

(2) Inspect rubber tip nose cap.

(3) Inspect LP compressor case assembly.

Crack test engine mount taper pins and adaptors.

Crack test engine front (trunnion) mount.

(4) Inspect clamps for missing or deteriorated rubber cushions. Replace as necessary.

(5) Inspect transmitters, switches, thermocouples and electrical connectors for general condition and security.

(6) Inspect engine by-pass ducts for general condition.

(7) Inspect LP air offtake panel (ATA Chapter 72-71-02, IPC Fig/Item No. 02-400) for signs of delamination.

(8) Inspect LP exhaust mixer for general condition.

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(9) Inspect Engine Fuel Shut-Off (EFSO) cable assembly for strands integrity.

(10) Check main oil filter, scavenge filters and magnetic chip detectors and pop-up indicator.

(11) Check IGV freedom and do a bleed valve pull-off check.

R (12) Visually examine the combustion outer case assembly (72-40-30, 01-100).

(13) Discard the fuel tube of pre Service Bulletin 73-1194 standard or pre Service Bulletin 73-1592 standard and replace it with the fuel tube of post Service Bulletin 73-1592 standard.

(14) The following Service Bulletins and Non-Modification Service Bulletins are recommended for embodiment:

71-1100 Power plant - Electrical harness (light duty) - Removal of rear portion of harness clip support tube. (To prevent a foul with aircraft cross-over starter ducting.)

71-1110 Power plant - Drain tubes and fittings - Restrictor plate fitted in internal gearbox to drains tank vent line. (To prevent fuel leakage from overboard vent.)

71-1147 Power plant - Various - Collector and ejector system to prevent oil accumulation in by-pass duct. (To catch oil and prevent staining of engine cowling and by-pass ducts.)

72-1144 Engine - Accessories mount - Accessory suspension bracket modified to clear installation foul.

72-1196 Engine - By-pass duct - Modified starter ducting support brackets. (To prevent a foul with the RH engine supporting link.)

72-1429 Engine - LP compressor rotating fairing - Introduction of revised nose cone fairing assembly produced by super plastic blow forming. (Supersedes Service Bulletin 72-1376.)

Note: The Service Bulletin above is recommended for embodiment only in engines post Service Bulletin 72-1039.

72-1639 Non-Mod Service Bulletin Engine - Low Pressure (LP) compressor case and vanes - Repeat visual inspection of the ice impact panels and instruction of minimum ice impact panel configuration on installed engines.

Note: The Non-Modification Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

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72-1644 Non-Mod Service Bulletin — Engine - Low Pressure (LP) support tube and front retaining ring - Inspection of the front fuel cut-off ring installation.

72-A1650 — Engine - Low Pressure (LP) compressor case and vanes - Introduction of modified ice impact panels with additional retention features.

Note: The Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

73-1084 — Engine - Fuel and control - Fuel system tubes - Modified tubes between high idle solenoid and fuel flow regulator. (To avoid failure of tubes in the event of vibration.)

73-1085 — Engine - Fuel and control - Fuel spray nozzles - Retaining bolts for No.10 fuel nozzle in low expansion steel. (To prevent loss of bolt torque.)

73-1142 — Engine - Fuel and control - Fuel system tubes - LP fuel pump to FCOC tubes with sliding joint. (To reduce stresses in tubes and prevent possible failure.)

73-1149 — Engine - Fuel and control - Fuel system tubes - Burner primary fuel supply tube re-set to clear aircraft duct clamp.

73-1165 Non-Mod Service Bulletin — Engine - Fuel and control - Inspection of fuel flow regulator scheduling governor housing seal plate. (To ensure there are no units in service with unsupported rubber seal.)

73-1192 — Engine - Fuel and control - Introduction of thicker washers at the FFR to LP governor fuel tube connector (FFR end). (To prevent potential fuel leak.)

73-1194 Part 1 to Part 3 — Engine - Fuel and control - Introduction of modified connectors to LP fuel system. (To prevent connector frettage and fuel leaks.)

Note: Part 4 of Service Bulletin 73-1194 must not be embodied as it is superseded by the embodiment of Service Bulletin 73-1592.

73-1592 — Engine fuel and control - Fuel system tubes - Introduction of a fuel flowmeter to HP fuel pump tube assembly with a new routing and installation.

74-1259 — Ignition - Engine - Starting system - Introduction of an alternative high energy igniter plug type Y183-5 manufactured by S.L. Auburn.

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75-1199 Air - Air tubes and fittings - P3 air tube - Split connection to FFR with increased flexibility. (To prevent P3 air leaks causing engine handling problems or slow accelerations and low power.)

76-1083 Engine controls - Emergency fuel shut down system - Rear cable guide plate in stainless steel. (To prevent failure of the guide plate.)

76-1098 Engine controls - Control linkage - FCU and SOV. (To improve linkage integrity and avoid failures due to excessive vibration.)

76-1130 Engine controls - Control linkage - Reorientation of pilot's lever angle (PLA) transducer. (To eliminate a foul with transducer connector and the stowed cowl door jury strut.)

76-1139 Engine controls - Control linkage - Redesigned throttle relay lever and support bracket. (To provide a more robust location for PLA transducer.)

76-1203 Engine controls - Control linkage - Throttle relay lever with relief for PLA transducer. (To alleviate rotor and bearing wear and inaccurate readings.)

76-1319 Non-Mod Service Bulletin Engine controls - Adjustment of the spindle retaining plate on the throttle relay lever bracket to prevent oscillation of the spindle. (To prevent throttle stagger and low EPR on take-off and minimize wear on bracket assemblies.)

76-1466 Engine controls - LP shaft failure system - Introduction of pulley wheel at EFSO cable rear guide location.

79-1089 Oil - Oil filter differential pressure indicator - Seal rings fitted at indicator electrical connector. (To eliminate false warnings from differential pressure switch.)

79-1175 Oil - Oil system tubes - LP turbine bearing oil feed tube with sliding joint. (To prevent tube failure in event of severe vibration.)

79-1189 Oil - Oil system tubes - LP turbine bearing oil return tube reset at by-pass duct flange. (To prevent possible foul with aircraft bleed air regulating valve.)

79-1411 Oil - Oil-Tank - Introduction of revised oil tank assembly with deleted fuel pipe support bracket.

79-1796 Oil - Oil Tank - Introduction of an oil fill instruction label on the oil tank to prevent oil overfilling.

Note: The Service Bulletin above is recommended for embodiment only in engines post Service Bulletin TAY-79-1463.

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I. Accessories

Item

R (1) Overhaul fuel spray nozzles

(a) Crack test the double ended unions (73-11-06, 01-095) and (73-11-06, 01-295) during the overhaul of the fuel spray nozzles (Refer to the Component Maintenance Manual Spray Nozzles, Chapter 73-11-06, TASK 73-11-06-200-000).

(b) As an alternative to step I.(1)(a) you can install replacement double ended unions (73-11-06, 01-095) and (73-11-06, 01-295).

(2) Test and inspect TGT thermocouples.

(3) Test and inspect TGT thermocouple harness.

(4) Carry out a functional test on the LP cooling air outlet switch.

(5) Remove existing grease and debris from splines of starter quillshaft.

NOTE: Care must be taken when applying fresh grease to the splines as too much grease can result in an end load on the starter drive front bearing and cause the bearing to fail.

(6) Replace the two spherical bearings (72-35-23, 03-170) and (75-32-09, 07-110) of the Airflow Control Regulator (AFCR) connecting link assembly.

R (7) Replace the igniter plugs with new.

(8) The following Service Bulletins are recommended for embodiment:

73-1131 Engine - Fuel and control - Fuel flow regulator - Introduction of a test schedule amendment of redefine setting of the minimum flow stop. (To prevent slow accelerations and surge during severe handling conditions.)

73-1166 Engine - Fuel and control - Fuel flow regulator - Introduction of a Spey type lever housing seal plate. (To eliminate the possibility of overboard fuel leak.)

73-1280 Engine - Fuel and control - Shut-off cock - Introduction of a shut-off cock with the cold start facility deleted. (To prevent 'hot' starts due to inadvertent selection of cold start fuel flow.)

73-1378 Engine - Fuel and control - Fuel flow regulator - Introduction of a P3P accumulator unit
(Only required on engines with Service Bulletin 72-1347 (LP turbine stage 1 NGVs with increased throat area) embodied).

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73-1405 Engine - Fuel and control - Fuel flow regulator - Introduction of P3P accumulator valve with air filter plug
(Only required on engines with Service Bulletin 73-1378 (standard accumulator unit fitted) embodied).

75-1275 Air - Airflow control regulator - Rear mount bracket and piston push rod machined to increase clearance with adjacent parts. (To prevent fouls with AFCR linkage.)

(9) Check the FFR drive end coupling end float. The coupling should move freely inwards under hand pressure. If there is no movement the drive end is to be removed for incorporation of Service Bulletin 73-1211.

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APPENDIX 2

ADDITIONAL CALENDAR LIFE REWORK PACKAGE

EFFECTIVITY – TAY 611-8

Calendar Life Rework

To release engines for a further period of 10 years the following work package should be incorporated in addition to the work package detailed in Appendix 1. This package will be developed with service experience.

A. Module 01 – LP Compressor

Do the inspection of the LP compressor rotor blades in accordance with the Engine Manual, Chapter 72-31-12, TASK 72-31-12-200-000.

The following Non-Modification Service Bulletin is recommended for embodiment:

72-1783 Non-Mod Service Bulletin — Engine – Fan Blades – Ultrasonic inspection of fan blade roots.

B. Module 02 – IP Compressor

Item

(1) Remove module from engine.

(2) Perform interface inspection on interface with Module 07.

(3) Strip module sufficiently to allow visual inspection of stator vane locating rings (if Service Bulletin 72-1252 Part 2 is not incorporated).

(4) Borescope inspect Module 02 – IP Compressor in accordance with the Engine Manual, Chapter 71-00-00, TASK 71-00-00-200-000.

(5) Rework to Engine Manual as necessary.

(6) The following Service Bulletin is recommended for embodiment (if Service Bulletin 72-1252 Part 2 is not incorporated):

72-1252 Part 1 — Engine – IP compressor air splitter and inlet guide vanes – Splitter fairing and stator retaining rings with improved corrosion protection. (To prevent corrosion cracking of splitter fairing and stator retaining rings.)

(7) Re-assemble module in accordance with Engine Manual.

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C. Module 03 - HP Compressor

Item

(1) Remove module from engine.

R (2) Strip the HP compressor module as necessary to visually examine the bladed
R HP compressor rotor.

R NOTE: It is not required to disassemble the rotor.

R NOTE: It is not required to disassemble the bearing from the LP copressor
R drive shaft.

(3) Inspect HP compressor case assembly.

(4) Rework to Engine Manual as necessary.

(5) The following Service Bulletin is recommended for embodiment:

72-1115 Engine - HP compressor rotor - Stages 4 to 12 disc spacers with protective coating deleted from outer rim axial faces.

R (6) The following Non-Modification Service Bulletin is recommended for
R embodiment only if possible without additional disassembly:

R 72-1838 Engine - High Pressue (HP) compressor discs, blades and spacers
R Non-Mod - Borescope inspection of the HP compressor stage 5 rotor disc
R Service for undercut and holes.
R Bulletin

R (7) Re-assemble module in accordance with Engine Manual.

D. Module 04 - Combustion and HP Turbine

Not applicable.

E. Module 05 - LP Turbine

Item

(1) Remove module from engine.

(2) Strip module sufficiently to allow visual inspection of all Group A components.

F. Module 06 - HS Gearbox

Not applicable.

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G. Module 07 - Intermediate Casing

Item

(1) The following Service Bulletin is recommended for embodiment:

72-1399 Engine - Intermediate case assembly - Front flange bore - Additional corrosion protection. (Epoxy barrier coating into OGV location bore to provide insulation between the magnesium and titanium components.)

H. Non-Modular Items

Not applicable.

I. Accessories

The following units require rework:

(1) Airflow Control Regulator and Actuator

Item

(a) Remove unit from engine.

(b) Disassemble sufficiently to replace the diaphragm (75-32-05, 03-435), the piston seal rings (75-32-06, 05-470 and 05-490) and the felt piston wiper washer (75-32-06, 05-510).

(c) Rebuild and test.

(d) Re-install unit on engine.

(2) RPM Signal Generator

Item

(a) Remove unit from engine.

(b) Disassemble sufficiently to replace the diaphragm.

(c) Rebuild and test.

(d) Re-install unit on engine.

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APPENDIX 2A

CALENDAR LIFE REWORK PACKAGE FOR LOW UTILISATION OPERATORS

EFFECTIVITY – TAY 611-8

Operators with low utilisation (as defined in paragraph 1.G.(2)), may elect to conduct the following work package in order to release the engine for a further 10 years calendar life or the balance of the hours remaining to mid-life or overhaul, whichever comes first.

R Recommendations for maintenance and overhaul of engine mounted accessory units are
R given in Appendix 5.

R Accessory units that have been fitted to an engine at intermediate time require to
R have their lives tracked to ensure that they are overhauled at the required
R interval.

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NOTE: All removed parts are to be visually inspected for signs of corrosion and if necessary reworked in accordance with the applicable manual.

A. Module 01 – LP Compressor

Item

(1) Visually inspect for obvious damage.

(2) The following Service Bulletin is recommended for embodiment:

72-1528 Engine – LP compressor rotating fairing – Introduction of an LP compressor rotor spinner assembly with a dowel pin installed in the spinner flange.

(3) Remove fan blades from disc and perform ultrasonic inspection of blade root (refer to the Engine Manual, Chapter 72-31-12, TASK 72-31-12-200-000).

The following Non-Modification Service Bulletin is recommended for embodiment:

72-1783 Non-Mod Service Bulletin — Engine – Fan Blades – Ultrasonic inspection of fan blade roots.

(4) Rework in accordance with Engine Manual as necessary. Accomplishment of Repair Scheme HRS3629 LPC rotor blade – Restore L/E profile or of the Non-Modification Service Bulletin that follows is recommended:

72-1603 Non-Mod Service Bulletin — Engine – Low Pressure (LP) compressor (fan) blades – Instruction of a repair to the LP compressor (fan) blade leading edge profile.

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(5) Replace blades in as-received position as annotated in log book.

(6) Check balance, if necessary.

(7) Rebalance rotor assembly, if necessary.

B. Module 02 - IP Compressor

Item

(1) Remove module from engine.

(2) Perform interface inspection on interface with Module 07.

(3) Strip module sufficiently to allow visual inspection of stator vane
R locating rings (if Service Bulletin 72-1252 Part 2 is not incorporated).

R (4) Borescope inspect Module 02 - IP Compressor in accordance with the Engine
R Manual, Chapter 71-00-00, TASK 71-00-00-200-000.

(5) Rework to Engine Manual as necessary.

(6) The following Service Bulletin and Repair Scheme is recommended for embodiment:

72-1045 Engine - IP compressor air splitter - Introduction of strengthened annular ring. (To reduce secondary damage to engine in event of rearward movement of LP fan blades due to tang failure.)

HRS3390 IP compressor inlet guide vane - Re-apply filler material. (To prevent secondary IP compressor damage due to hard filler release.)

(7) The following Service Bulletin is recommended for embodiment (if Service Bulletin 72-1252 Part 2 is not incorporated):

72-1252 Part 1 Engine - IP compressor air splitter and inlet guide vanes - Splitter fairing and stator retaining rings with improved corrosion protection. (To prevent corrosion cracking of splitter fairing and stator retaining rings.)

(8) Re-assemble module in accordance with Engine Manual.

C. Module 03 - HP Compressor

Item

(1) Remove module from engine.

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R (2) Strip the HP compressor module as necessary to visually examine the bladed
R HP compressor rotor.

R NOTE: It is not required to disassemble the rotor.

R NOTE: It is not required to disassemble the bearing from the LP compressor
R drive shaft.

(3) Inspect HP compressor case assembly.

(4) Check bleed valve hardware for binding, corrosion, wear, damage, freedom of movement.

(5) Rework to Engine Manual as necessary.

(6) The following Service Bulletins and Non-Modification Service Bulletin are recommended for embodiment:

72-1115	Engine - HP compressor rotor - Stages 4 to 12 disc spacers with protective coating deleted from outer rim axial faces.
72-1496 Non-Mod Service Bulletin	Engine - HP compressor stage 7 and 12 air off-take clamp inspection.
72-A1653	Engine - High Pressure (HP) compressor vanes stages 4 to 11 - Introduction of a new setting procedure to increase the minimum vane tip clearance.
72-1704	Engine - Air guide tube drive shaft and fittings - High Pressure (HP) compressor - Introduction of revised torque tightening procedure for the Low Pressure (LP) thrust bearing outer ring spanner nut.
72-1719 Non-Mod Service Bulletin	Engine - High Pressure (HP) compressor discs, blades and spacers stages 6 to 9 - Replacement of HP compressor rotor discs.

Note: The Non-Modification Service Bulletin above is only applicable to a specific list of engine serial numbers identified.

72-1730 Non-Mod Service Bulletin	Engine - High Pressure (HP) compressor vanes-stages 4 to 11 - Inspection of the HP compressor stage 7 stator vanes.

Note: The Non-Modification Service Bulletin above is only applicable to a specific list of engine serial numbers identified.

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72-1731 Non-Mod Service Bulletin — Engine - High Pressure (HP) compressor vanes-stages 4 to 11 - Inspection of the HP compressor stage 7 stator vanes.

Note: The Non-Modification Service Bulletin above is only applicable to a specific list of engine serial numbers identified.

R (7) The following Non-Modification Service Bulletin is recommended for R embodiment only if possible without additional disassembly:

R 72-1838 Non-Mod Service Bulletin — Engine - High Pressure (HP) compressor discs, blades and spacers - Borescope inspection of the HP compressor stage 5 rotor disc for undercut and holes.

(8) Re-assemble module in accordance with Engine Manual.

D. Module 04 - Combustion and HP Turbine

Item

(1) Remove module from engine.

(2) Visually inspect for obvious damage.

R (3) Strip module sufficiently to allow piece part inspection of the HP turbine R discs.

R NOTE: If the MRO facility can demonstrate that the HP turbine stage 1 disc R and /or HP turbine stage 2 has been replaced with a new zero cyclic R disc at the last full overhaul shop visit it is permitted to R visually inspect the disc in bladed condition in accordance with the R bladed disc inspection task during this shop visit only. For R example, if the turbine disc has been replaced with new at the 20 R year overhaul shop visit, then at the 30 year calendar life shop R visit the disc can be visually inspected in bladed condition. The R disc must then be piece part inspected at the 40 year calendar life R shop visit and all following calendar life shop visits.

(4) Visually inspect for obvious damage and excessive corrosion.

(5) Rework to Engine Manual as necessary.

NOTE: HP turbine stage 1 blades should be visually inspected only and do not require full overhaul processing unless they will exceed 20000 hours during the next engine release life.

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(6) The following Service Bulletins and Non-Modification Service Bulletin are recommended for embodiment:

72-1060	Engine - HP turbine case and rotor - Increased clearance between HP stage 1 rotor blades and nozzle vanes. (To overcome possible axial rubs.)
72-1111	Engine - HP turbine bearing and support - Bearing flexible support stop ring with increased axial clearance. (To eliminate a possible source of HP order vibration.)
72-1143	Engine - High energy igniter adaptors - Revised procedure for setting igniter immersion depth. (To extend igniter life.)
72-1389 Non-Mod Service Bulletin	Engine - Inspection of combustion liner Y ring weld. (Inspection requirements for combustion liners identified as being in a specific serial number range.)
72-1819 Non-Mod Service Bulletin	Engine - Turbine rotor discs and shaft - High Pressure (HP) - Inspection of the HP turbine stage 2 disc sleeve serial number.

Note: The Non-Modification Service Bulletin above is applicable for Engine Serial Number 18189.

(7) Re-assemble module in accordance with Engine Manual.

E. Module 05 - LP Turbine

Item

(1) Remove module from engine.

(2) Visually inspect for obvious damage.

(3) Strip module sufficiently to allow visual inspection of all Group A components.

(4) Visually inspect for obvious damage and excessive corrosion.

(5) Rework to Engine Manual as necessary.

(6) Crack test engine mount rear links.

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(7) The following Service Bulletins are recommended for embodiment:

72-1117	Engine - LP turbine - Disc driving flange dowel bolts with tapered and square heads. (To prevent disc damage during assembly/disassembly.)
72-1160	Engine - LP turbine bearing support - Application of jointing compound to bearing support flange and overspeed control arm body mating faces. (To prevent oil leakage.)
72-1195	Engine - LP turbine case and vanes - LP turbine interstage seals with increased tolerances and improved anti-frettage coating. (To prevent rubs and fast rundown times.)
72-1358	Engine - LP turbine case and vanes - Re-introduction of three piece intrascope blanking plug assembly at LP1 and LP3 nozzle guide vane positions. (To prevent secondary LP turbine damage due to intrascope blanking plug failure.)
72-1364	Engine - LP turbine rotor discs and shaft - Rear oil tube steady with reduced outside diameter. (To prevent seizure of the rear oil tube within the air guide tube eliminating failures at the rear oil tube and ensuring satisfactory operation of the emergency fuel shut-off cock mechanism.)
72-1455	Engine - LP nozzle case and vanes - Introduction of LP turbine stage 1 NGV and seal support assembly with honeycomb seal.
72-1590	Engine - Turbine nozzle case and vanes-LP - Deletion of the dowel pins and retainer plates which are installed in the LP turbine stage 1 static air seal.
72-A1696 Non-Mod Service Bulletin	Engine - Turbine nozzle case and vanes - HP and LP - Inspection of the bolts which are installed in the LPT stage 1 static air seal and of the bolts which are installed in the HPT stage 1 air seal support.

Note: The Non-Modification Service Bulletin above is only applicable to a specific list of engine serial numbers identified.

F. Module 06 - HS Gearbox

(1) Visually inspect gearbox mounts, link and accessory features.

(2) Inspect for signs of oil leakage.

(3) Clean accessory mount pads.

(4) Remove existing grease and debris from starter drive splines.

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(5) Inspect splines of starter drive gear in accordance with the Engine Manual.

NOTE: Care must be taken when applying fresh grease to the splines as too much grease can result in an end load on the starter drive front bearing and cause the bearing to fail.

(6) The following Service Bulletin is recommended for embodiment:

72-1112 Engine - Main oil pumps - LP turbine bearing return oil transfer tube with by-pass hole. (To overcome oil spillage and smoke emission.)

G. Module 07 - Intermediate Casing

Item

(1) Inspect intermediate case for damage, corrosion and general condition.

(2) Inspect Inlet Guide Vane (IGV) actuating mechanism for freedom of movement and range of travel.

(3) Inspect engine trunnion mounting flange bore location for damage.

(4) Inspect intermediate case mounting lug for damage.

(5) Rework to Engine Manual as necessary.

(6) The following Service Bulletins and Non-Modification Service Bulletins are recommended for embodiment:

72-1122 Engine - LP compressor - Front bearing locating ring with copper plated bore. (To improve bearing location and prevent debris generation.)

72-1296 Non-Mod Service Bulletin Engine - Replacement of high speed gearbox drive driven bevel gearshaft JR27127. (To ensure that low fatigue strength gearshafts are removed from service.)

72-1341 Non-Mod Service Bulletin Engine - Replacement of high speed gearbox drive driven bevel gearshaft JR27127. (To ensure that low fatigue strength gearshafts are removed from service.)

72-1399 Engine - Intermediate case assembly - Front flange bore - Additional corrosion protection. (Epoxy barrier coating into OGV location bore to provide insulation between the magnesium and titanium components.)

72-1480 Engine high speed gearbox driving assembly - Introduction of increased torque on the internal gearbox bevel gear retaining nut.

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(7) Re-assemble module in accordance with Engine Manual.

H. Non-Modular Items

Item

(1) Inspect nose cone spinner and fairing.

(2) Inspect rubber tip nose cap.

(3) Inspect LP compressor case assembly.

Crack test engine mount taper pins and adaptors.

Crack test engine front (trunnion) mount.

(4) Inspect clamps for missing or deteriorated rubber cushions. Replace as necessary.

(5) Inspect transmitters, switches, thermocouples and electrical connectors for general condition and security.

(6) Inspect engine by-pass ducts for general condition.

(7) Inspect LP air offtake panel (ATA Chapter 72-71-02, IPC Fig/Item No. 02-400) for signs of delamination.

(8) Inspect LP exhaust mixer for general condition.

(9) Inspect Engine Fuel Shut-Off (EFSO) cable assembly for strands integrity.

(10) Check main oil filter, scavenge filters and magnetic chip detectors and pop-up indicator.

(11) Check IGV freedom and do a bleed valve pull-off check.

(12) Discard the fuel tube of pre Service Bulletin 73-1194 standard or pre Service Bulletin 73-1592 standard and replace it with the fuel tube of post Service Bulletin 73-1592 standard.

(13) The following Service Bulletins and Non-Modification Service Bulletins are recommended for embodiment:

71-1100 Power plant - Electrical harness (light duty) - Removal of rear portion of harness clip support tube. (To prevent a foul with aircraft cross-over starter ducting.)

71-1110 Power plant - Drain tubes and fittings - Restrictor plate fitted in internal gearbox to drains tank vent line. (To prevent fuel leakage from overboard vent.)

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71-1147 Power plant - Various - Collector and ejector system to prevent oil accumulation in by-pass duct. (To catch oil and prevent staining of engine cowling and by-pass ducts.)

72-1144 Engine - Accessories mount - Accessory suspension bracket modified to clear installation foul.

72-1196 Engine - By-pass duct - Modified starter ducting support brackets. (To prevent a foul with the RH engine supporting link.)

72-1429 Engine - LP compressor rotating fairing - Introduction of revised nose cone fairing assembly produced by super plastic blow forming. (Supersedes Service Bulletin 72-1376.)

Note: The Service Bulletin above is recommended for embodiment only in engines post Service Bulletin 72-1039.

72-1639 Non-Mod Service Bulletin Engine - Low Pressure (LP) compressor case and vanes - Repeat visual inspection of the ice impact panels and instruction of minimum ice impact panel configuration on installed engines.

Note: The Non-Modification Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

72-1644 Non-Mod Service Bulletin Engine - Low Pressure (LP) support tube and front retaining ring - Inspection of the front fuel cut-off ring installation.

72-A1650 Engine - Low Pressure (LP) compressor case and vanes - Introduction of modified ice impact panels with additional retention features.

Note: The Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

73-1084 Engine - Fuel and control - Fuel system tubes - Modified tubes between high idle solenoid and fuel flow regulator. (To avoid failure of tubes in the event of vibration.)

73-1085 Engine - Fuel and control - Fuel spray nozzles - Retaining bolts for No.10 fuel nozzle in low expansion steel. (To prevent loss of bolt torque.)

73-1142 Engine - Fuel and control - Fuel system tubes - LP fuel pump to FCOC tubes with sliding joint. (To reduce stresses in tubes and prevent possible failure.)

73-1149 Engine - Fuel and control - Fuel system tubes - Burner primary fuel supply tube re-set to clear aircraft duct clamp.

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73-1165 Non-Mod Service Bulletin — Engine - Fuel and control - Inspection of fuel flow regulator scheduling governor housing seal plate. (To ensure there are no units in service with unsupported rubber seal.)

73-1192 — Engine - Fuel and control - Introduction of thicker washers at the FFR to LP governor fuel tube connector (FFR end). (To prevent potential fuel leak.)

73-1194 Part 1 to Part 3 — Engine - Fuel and control - Introduction of modified connectors to LP fuel system. (To prevent connector frettage and fuel leaks.)

Note: Part 4 of Service Bulletin 73-1194 must not be embodied as it is superseded by the embodiment of Service Bulletin 73-1592.

73-1592 — Engine fuel and control - Fuel system tubes - Introduction of a fuel flowmeter to HP fuel pump tube assembly with a new routing and installation.

74-1259 — Ignition - Engine - Starting system - Introduction of an alternative high energy igniter plug type Y183-5 manufactured by S.L. Auburn.

75-1034 — Air - Air tubes and fittings - EPR manifold with increased diameter drain holes.

75-1199 — Air - Air tubes and fittings - P3 air tube - Split connection to FFR with increased flexibility. (To prevent P3 air leaks causing engine handling problems or slow accelerations and low power.)

76-1083 — Engine controls - Emergency fuel shut down system - Rear cable guide plate in stainless steel. (To prevent failure of the guide plate.)

76-1098 — Engine controls - Control linkage - FCU and SOV. (To improve linkage integrity and avoid failures due to excessive vibration.)

76-1130 — Engine controls - Control linkage - Reorientation of pilot's lever angle (PLA) transducer. (To eliminate a foul with transducer connector and the stowed cowl door jury strut.)

76-1139 — Engine controls - Control linkage - Redesigned throttle relay lever and support bracket. (To provide a more robust location for PLA transducer.)

76-1203 — Engine controls - Control linkage - Throttle relay lever with relief for PLA transducer. (To alleviate rotor and bearing wear and inaccurate readings.)

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76-1319 Non-Mod Service Bulletin — Engine controls - Adjustment of the spindle retaining plate on the throttle relay lever bracket to prevent oscillation of the spindle. (To prevent throttle stagger and low EPR on take-off and minimize wear on bracket assemblies.)

76-1466 — Engine controls - LP shaft failure system - Introduction of pulley wheel at EFSO cable rear guide location.

79-1089 — Oil - Oil filter differential pressure indicator - Seal rings fitted at indicator electrical connector. (To eliminate false warnings from differential pressure switch.)

79-1175 — Oil - Oil system tubes - LP turbine bearing oil feed tube with sliding joint. (To prevent tube failure in event of severe vibration.)

79-1189 — Oil - Oil system tubes - LP turbine bearing oil return tube reset at by-pass duct flange. (To prevent possible foul with aircraft bleed air regulating valve.)

79-1411 — Oil - Oil-Tank - Introduction of revised oil tank assembly with deleted fuel pipe support bracket.

79-1796 — Oil - Oil Tank - Introduction of an oil fill instruction label on the oil tank to prevent oil overfilling.

Note: The Service Bulletin above is recommended for embodiment only in engines post Service Bulletin Tay-79-1463.

I. Accessories

Item

(1) The following units require rework:

(a) Airflow Control Regulator and Actuator

Item

[1] Remove unit from engine.

[2] Disassemble sufficiently to replace the diaphragm (75-32-05, 03-435), the piston seal rings (75-32-06, 05-470 and 05-490) and the felt piston wiper washer (75-32-06, 05-510).

[3] Rebuild and test.

[4] Re-install unit on engine.

(b) Replace the two spherical bearings (72-35-23, 03-170) and (75-32-09, 07-110) of the Airflow Control Regulator (AFCR) connecting link assembly.

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(c) RPM Signal Generator

Item

[1] Remove unit from engine.

[2] Disassemble sufficiently to replace the diaphragm.

[3] Rebuild and test.

[4] Re-install unit on engine.

(2) Visually inspect the fuel spray nozzles and clean, if required, in accordance with the Component Maintenance Manual Spray Nozzles

(a) Crack test the double ended unions (73-11-06, 01-095) and (73-11-06, 01-295) during the inspection of the fuel spray nozzles (Refer to the Component Maintenance Manual Spray Nozzles, Chapter 73-11-06, TASK 73-11-06-200-000).

(b) As an alternative to step I.(2)(a) you can install replacement double ended unions (73-11-06, 01-095) and (73-11-06, 01-295).

(3) Conduct external visual inspection of TGT thermocouples.

(4) Conduct external visual inspection of TGT thermocouple harness.

(5) Carry out a functional test on the LP cooling air outlet switch.

(6) Remove existing grease and debris from splines of starter quillshaft.

NOTE: Care must be taken when applying fresh grease to the splines as too much grease can result in an end load on the starter drive front bearing and cause the bearing to fail.

R (7) Replace the igniter plugs with new.

(8) The following Service Bulletins are recommended for embodiment:

73-1131 Engine - Fuel and control - Fuel flow regulator - Introduction of a test schedule amendment of redefine setting of the minimum flow stop. (To prevent slow accelerations and surge during severe handling conditions.)

73-1166 Engine - Fuel and control - Fuel flow regulator - Introduction of a Spey type lever housing seal plate. (To eliminate the possibility of overboard fuel leak.)

73-1280 Engine - Fuel and control - Shut-off cock - Introduction of a shut-off cock with the cold start facility deleted. (To prevent 'hot' starts due to inadvertent selection of cold start fuel flow.)

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73-1378 Engine - Fuel and control - Fuel flow regulator - Introduction of a P3P accumulator unit.
(Only required on engines with Service Bulletin 72-1347 (LP turbine stage 1 NGVs with increased throat area) embodied.)

73-1405 Engine - Fuel and control - Fuel flow regulator - Introduction of P3P accumulator valve with air filter plug.
(Only required on engines with Service Bulletin 73-1378 (standard accumulator unit fitted) embodied.)

75-1275 Air - Airflow control regulator - Rear mount bracket and piston push rod machined to increase clearance with adjacent parts. (To prevent fouls with AFCR linkage.)

(9) Check the FFR drive end coupling end float. The coupling should move freely inwards under hand pressure. If there is no movement the drive end is to be removed for incorporation of Service Bulletin 73-1211.

NOTE: Service experience has demonstrated that corrosion can be more prevalent on the low utilisation type of operation. It is thus important to monitor ongoing service experience, particularly in relation to the integrity of Group A parts and also establish individual Operator corrosion experience. Rolls-Royce should always therefore be advised if:

(1) Extensive corrosion attack is evident, particularly affecting Group A parts.

(2) Any Group A parts are rejected for corrosion pitting (Rolls-Royce may wish those parts to be returned for more detailed examination).

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APPENDIX 3

MID-LIFE REWORK

EFFECTIVITY - TAY 620-15

At 4000 hours from new, or overhaul, a rework is required as detailed below.

The rework package will be developed with service experience.

Any component(s) inspected and found to be in excess of Engine Manual limits, may warrant further inspection, engine strip or rework other than that stated in this work package.

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R Recommendations for maintenance and overhaul of engine mounted accessory units are R given in Appendix 5.

R Accessory units that have been fitted to an engine at intermediate time require to R have their lives tracked to ensure that they are overhauled at the required R interval.

A. Module 01 - LP Compressor

Item

(1) Visually inspect for obvious damage.

R (2) The following Service Bulletin and Non-Modification service Bulletins are recommended for embodiment:

72-1528	Engine - LP compressor rotating fairing - Introduction of an LP compressor rotor spinner assembly with a dowel pin installed in the spinner flange.
72-A1782 Non-Mod Service Bulletin	Engine - Low Pressure (LP) compressor rotor blades - Instruction of a repair to the LP compressor (fan) blade leading edge profile.
72-1787 Non-Mod Service Bulletin	Engine - Low Pressure (LP) compressor rotor blades - Measurement of the chordal width and the leading edge thickness of selected LP compressor (fan) blades.

(3) Remove fan blades from disc and perform ultrasonic inspection of blade root (refer to the Engine Manual, Chapter 72-31-12, TASK 72-31-12-200-000).

NOTE: The inspection check of the fan blades is mandated in Non-Modification Service Bulletin 72-1442.

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(4) Rework in accordance with Engine Manual as necessary. Accomplishment of Repair Scheme HRS3629 LPC rotor blade - Restore L/E profile or of the Non-Modification Service Bulletin that follows is recommended:

72-1603 Non-Mod Service Bulletin	Engine - Low Pressure (LP) compressor (fan) blades - Instruction of a repair to the LP compressor (fan) blade leading edge profile.

(5) Replace blades in as-received position as annotated in log book.

(6) Check balance, if necessary.

(7) Rebalance rotor assembly, if necessary.

B. Module 02 - IP Compressor

Item

(1) Visually inspect for obvious damage.

(2) The following Service Bulletin and Repair Scheme is recommended for embodiment:

72-1045	Engine - IP compressor air splitter - Introduction of strengthened annular ring. (To reduce secondary damage to engine in event of rearward movement of LP fan blades due to tang failure.)
HRS3390	IP compressor inlet guide vane - Re-apply filler material. (To prevent secondary IP compressor damage due to hard filler release.)

C. Module 03 - HP Compressor

Item

(1) Check HP rotor for freedom of rotation.

(2) Check bleed valve hardware for binding, corrosion, wear, damage, freedom of movement.

(3) Visually inspect for obvious damage and excessive corrosion.

R (4) The following Service Bulletins and Non-Modification Service Bulletins are recommended for embodiment:

72-1496 Non-Mod Service Bulletin	Engine - HP compressor stage 7 and 12 air off-take clamp inspection.

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72-A1653 Engine - High Pressure (HP) compressor vanes stages 4 to 11 - Introduction of a new setting procedure to increase the minimum vane tip clearance.

72-1704 Engine - Air guide tube drive shaft and fittings - High Pressure (HP) compressor - Introduction of revised torque tightening procedure for the Low Pressure (LP) thrust bearing outer ring spanner nut.

72-A1740 Non-Mod Service Bulletin Engine - High Pressure (HP) compressor rotor discs - Decrease of time limits manual maximum approved lives of the HP compressor stages 1, 3, 6, 7 and 12 rotor discs.

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D. Module 04 - Combustion and HP Turbine

Item

(1) Remove module from engine.

(2) Visually inspect for obvious damage.

(3) Strip module as per Engine Manual.

(4) Overhaul module as per Engine Manual.

NOTE: HP turbine stage 1 blades should be visually inspected only and do not require full overhaul processing unless they will exceed 20000 hours during the next engine release life.

(5) The following Service Bulletins are recommended for embodiment:

72-1060 Engine - HP turbine case and rotor - Increased clearance between HP stage 1 rotor blades and nozzle vanes. (To overcome possible axial rubs.)

72-1111 Engine - HP turbine bearing and support - Bearing flexible support stop ring with increased axial clearance. (To eliminate a possible source of HP order vibration.)

72-1143 Engine - High energy igniter adaptors - Revised procedure for setting igniter immersion depth. (To extend igniter life.)

(6) Re-assemble module in accordance with Engine Manual.

E. Module 05 - LP Turbine

Item

(1) Remove module from engine.

(2) Visually inspect for obvious damage.

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(3) Rework to Engine Manual as necessary.

(4) Crack test engine mount rear links.

(5) The following Service Bulletins and Non-Modification Service Bulletin are recommended for embodiment:

72-1117	Engine - LP turbine - Disc driving flange dowel bolts with tapered and square heads. (To prevent disc damage during assembly/disassembly.)
72-1160	Engine - LP turbine bearing support - Application of jointing compound to bearing support flange and overspeed control arm body mating faces. (To prevent oil leakage.)
72-1195	Engine - LP turbine case and vanes - LP turbine interstage seals with increased tolerances and improved anti-frettage coating. (To prevent rubs and fast rundown times.)
72-1358	Engine - LP turbine case and vanes - Re-introduction of three piece intrascope blanking plug assembly at LP1 and LP3 nozzle guide vane positions. (To prevent secondary LP turbine damage due to intrascope blanking plug failure.)
72-1364	Engine - LP turbine rotor discs and shaft - Rear oil tube steady with reduced outside diameter. (To prevent seizure of the rear oil tube within the air guide tube eliminating failures at the rear oil tube and ensuring satisfactory operation of the emergency fuel shut-off cock mechanism.)
72-1455	Engine - LP nozzle case and vanes - Introduction of LP turbine stage 1 NGV and seal support assembly with honeycomb seal.
72-1557 Non-Mod Service Bulletin	Engine - Low Pressure (LP) turbine rotor discs - Sample inspection requirements for Tay Operators.
72-1590	Engine - Turbine nozzle case and vanes-LP - Deletion of the dowel pins and retainer plates which are installed in the LP turbine stage 1 static air seal.

F. Module 06 - HS Gearbox

Item

(1) Visually inspect gearbox mounts, link and accessory features.

(2) Inspect for signs of oil leakage.

(3) Clean accessory mount pads.

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(4) The following Service Bulletin and Non-Modification Service Bulletin is recommended for embodiment:

72-1112 Engine - Main oil pumps - LP turbine bearing return oil transfer tube with by-pass hole. (To overcome oil spillage and smoke emission.)

72-1401 Non-Mod Service Bulletin Engine - High speed gearbox HSGB - Inspection and re-lubrication of starter drive splines.

G. Module 07 - Intermediate Casing

Item

(1) Inspect intermediate case for damage, corrosion and general condition.

(2) Inspect Inlet Guide Vane (IGV) actuating mechanism for freedom of movement and range of travel.

(3) Inspect engine trunnion mounting flange bore location for damage.

(4) Inspect intermediate case mounting lug for damage.

(5) Rework to Engine Manual as necessary.

(6) The following Service Bulletins are recommended for embodiment:

72-1122 Engine - LP compressor - Front bearing locating ring with copper plated bore. (To improve bearing location and prevent debris generation.)

72-1480 Engine high speed gearbox driving assembly - Introduction of increased torque on the internal gearbox bevel gear retaining nut.

(7) Re-assemble module in accordance with Engine Manual.

H. Non-Modular Items

Item

(1) Inspect nose cone spinner and fairing.

(2) Inspect rubber tip nose cap.

(3) Inspect LP compressor case assembly.

Crack test engine mount taper pins and adaptors.

Crack test engine front (trunnion) mount.

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(4) Inspect clamps for missing or deteriorated rubber cushions. Replace as necessary.

(5) Inspect transmitters, switches, thermocouples and electrical connectors for general condition and security.

(6) Inspect engine by-pass ducts for general condition.

(7) Inspect LP exhaust mixer for general condition.

(8) Inspect Engine Fuel Shut-Off (EFSO) cable assembly for strands integrity.

(9) Check main oil filter, scavenge filters and magnetic chip detectors and pop-up indicator.

(10) Check IGV freedom and do a bleed valve pull-off check.

(11) Discard the fuel tube of pre Service Bulletin 73-1194 standard or pre Service Bulletin 73-1592 standard and replace it with the fuel tube of post Service Bulletin 73-1592 standard.

(12) The following Service Bulletins and Non-Modification Service Bulletins are recommended for embodiment:

71-1109 Power plant - Electrical harness (light duty) - PLA transducer connector with revised wiring arrangement. (To provide compatibility with aircraft circuitry.)

71-1110 Power plant - Drain tubes and fittings - Restrictor plate fitted in internal gearbox to drains tank vent line. (To prevent fuel leakage from overboard vent.)

71-1158 Power plant - Electrical harness (light duty) - Fitment of lightning strike protective sleeving to harness looms. (To guard against electrical interference.)

71-1163 Power plant - Electrical harness (light duty) - Reorientation of keyway on power lever angle (PLA) transducer connector. (To prevent a foul between harness and aircraft cowl door ferry strut.)

72-1026 Engine - Compressor intermediate case - Fitment of setting spacers at IGV linkage external stop. (To ensure correct HP speed/thrust relationship.)

72-1148 Engine - By-pass duct - Deletion of sealing compound from fairings adjacent to air cooled oil cooler. (To ensure unrestricted drainage to overboard drain connector.)

72-1429 Engine - LP compressor rotating fairing - Introduction of revised nose cone fairing assembly produced by super plastic blow forming. (Supersedes Service Bulletin 72-1376.)

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Note: The Service Bulletin above is recommended for embodiment only in engines post Service Bulletin 72-1039.

72-1638 Non-Mod Service Bulletin — Engine - Low Pressure (LP) compressor case and vanes - Repeat visual inspection of the ice impact panels and instruction of minimum ice impact panel configuration on installed engines.

Note: The Non-Modification Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

72-A1643 — Engine - Low Pressure (LP) compressor case and vanes - Introduction of modified ice impact panels with additional retention features.

Note: The Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

72-1646 Non-Mod Service Bulletin — Engine - Low Pressure (LP) support tube and front retaining ring - Inspection of the front fuel cut-off ring installation.

73-1084 — Engine - Fuel and control - Fuel system tubes - Modified tubes between high idle solenoid and fuel flow regulator. (To avoid failure of tubes in the event of vibration.)

73-1085 — Engine - Fuel and control - Fuel spray nozzles - Retaining bolts for No.10 fuel nozzle in low expansion steel. (To prevent loss of bolt torque.)

73-1142 — Engine - Fuel and control - Fuel system tubes - LP fuel pump to FCOC tubes with sliding joint. (To reduce stresses in tubes and prevent possible failure.)

73-1165 Non-Mod Service Bulletin — Engine - Fuel and control - Inspection of fuel flow regulator scheduling governor housing seal plate. (To ensure there are no units in service with unsupported rubber seal.)

73-1192 — Engine - Fuel and control - Introduction of thicker washers at the FFR to LP governor fuel tube connector (FFR end). (To prevent potential fuel leak.)

73-1194 Part 1 to Part 3 — Engine - Fuel and control - Introduction of modified connectors to LP fuel system. (To prevent connector frettage and fuel leaks.)

Note: Part 4 of Service Bulletin 73-1194 must not be embodied as it is superseded by the embodiment of Service Bulletin 73-1592.

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73-1592 Engine fuel and control - Fuel system tubes - Introduction of a fuel flowmeter to HP fuel pump tube assembly with a new routing and installation.

74-1259 Ignition - Engine - Starting system - Introduction of an alternative high energy igniter plug type Y183-5 manufactured by S.L. Auburn.

75-1034 Air - Air tubes and fittings - EPR manifold with increased diameter drain holes.

75-1055 Air - Air tubes and fittings - Introduction of non-flowing EPR manifold system and modified pressure rakes. (To ensure no engines are in service with pre Service Bulletin standard.)

75-1199 Air - Air tubes and fittings - P3 air tube - Split connection to FFR with increased flexibility. (To prevent P3 air leaks causing engine handling problems or slow accelerations and low power.)

76-1083 Engine controls - Emergency fuel shut down system - Rear cable guide plate in stainless steel. (To prevent failure of the guide plate.)

76-1098 Engine controls - Control linkage - FCU and SOV. (To improve linkage integrity and avoid failures due to excessive vibration.)

76-1139 Engine controls - Control linkage - Redesigned throttle relay lever and support bracket. (To provide a more robust location for PLA transducer.)

76-1203 Engine controls - Control linkage - Throttle relay lever with relief for PLA transducer. (To alleviate rotor and bearing wear and inaccurate readings.)

76-1208 Engine controls - Control linkage - Introduction of throttle relay lever mounting bracket with increased clearance for aircraft control rod.

76-1319 Non-Mod Service Bulletin Engine controls - Adjustment of the spindle retaining plate on the throttle relay lever bracket to prevent oscillation of the spindle. (To prevent throttle stagger and low EPR on take-off and minimize wear on bracket assemblies.)

76-1434 Non-Mod Service Bulletin Emergency fuel shut off system - Inspection of emergency fuel shut off cable.

76-1466 Engine controls - LP shaft failure system - Introduction of pulley wheel at EFSO cable rear guide location.

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79-1089 Oil - Oil filter differential pressure indicator - Seal rings fitted at indicator electrical connector. (To eliminate false warnings from differential pressure switch.)

79-1175 Oil - Oil system tubes - LP turbine bearing oil feed tube with sliding joint. (To prevent tube failure in event of severe vibration.)

79-1411 Oil - Oil-Tank - Introduction of revised oil tank assembly with deleted fuel pipe support bracket.

I. Accessories

Item

(1) Overhaul fuel spray nozzles.

(a) Crack test the double ended unions (73-11-06, 01-095) and (73-11-06, 01-295) during the overhaul of the fuel spray nozzles (Refer to the Component Maintenance Manual Spray Nozzles, Chapter 73-11-06, TASK 73-11-06-200-000).

(b) As an alternative to step I.(1)(a) you can install replacement double ended unions (73-11-06, 01-095) and (73-11-06, 01-295).

(2) Test and inspect TGT thermocouples.

(3) Test and inspect TGT thermocouple harness.

(4) Remove existing grease and debris from splines of starter quillshaft.

NOTE: Care must be taken when applying fresh grease to the splines as too much grease can result in an end load on the starter drive front bearing and cause the bearing to fail.

(5) Replace the two spherical bearings (72-35-23, 03-170) and (75-32-09, 07-110) of the Airflow Control Regulator (AFCR) connecting link assembly.

(6) The following Service Bulletins and Non-Modification Service Bulletin are recommended for embodiment:

36-1325 Pneumatic system - HP bleed valve sensing switch - Introduction of integral plunger action switch. (To eliminate the possibility of manipulation of the actuating arm or deformation due to incorrect gap adjustment thus ensuring correct selection of stage 7 to stage 12 HP engine bleed.)

73-1166 Engine - Fuel and control - Fuel flow regulator - Introduction of a Spey type lever housing seal plate. (To eliminate the possibility of overboard fuel leak.)

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73-1280 Engine - Fuel and control - Shut-off cock - Introduction of a shut-off cock with the cold start facility deleted. (To prevent 'hot' starts due to inadvertent selection of cold start fuel flow.)

73-1315 Engine - Fuel and control - Fuel flow regulator - Introduction of increased reverse thrust. (To maintain maximum (emergency) reverse thrust with the introduction of Fokker aircraft modification F100-78-010.)

73-1630 Non-Mod Service Bulletin Engine fuel and control - Fuel flow regulator (Type CASC512) - Re-calibration of fuel flow regulator.

75-1275 Air - Airflow control regulator - Rear mount bracket and piston push rod machined to increase clearance with adjacent parts. (To prevent fouls with AFCR linkage.)

75-1736 Air - Airflow control regulator and attachment fittings - Introduction of revised scheduling limits for the Variable Inlet Guide Vanes (VIGV) and Handling Bleed Valve (HBV).

77-1267 Engine indicating - Oil pressure transmitter - Introduction of kulite oil pressure transmitter with output transient overload protection.

(7) Check the FFR drive end coupling end float. The coupling should move freely inwards under hand pressure. If there is no movement the drive end is to be removed for incorporation of Service Bulletin 73-1211.

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APPENDIX 4

ADDITIONAL CALENDAR LIFE REWORK PACKAGE

EFFECTIVITY - TAY 620-15

Calendar Life Rework

To release engines for a further period of 10 years the following work package should be incorporated in addition to the work package detailed in Appendix 3. This package will be developed with service experience.

A. Module 01 - LP Compressor

Not applicable.

B. Module 02 - IP Compressor

Item

(1) Remove module from engine.

(2) Perform interface inspection on interface with Module 07.

(3) Strip module sufficiently to allow visual inspection of stator vane locating rings (if Service Bulletin 72-1252 Part 2 is not incorporated) and IP compressor shaft.

(4) Rework to Engine Manual as necessary.

(5) The following Service Bulletin is recommended for embodiment (if Service Bulletin 72-1252 Part 2 is not incorporated):

72-1252 Part 1	Engine - IP compressor air splitter and inlet guide vanes - Splitter fairing and stator retaining rings with improved corrosion protection. (To prevent corrosion cracking of splitter fairing and stator retaining rings.)

(6) Re-assemble module in accordance with Engine Manual.

C. Module 03 - HP Compressor

Item

(1) Remove module from engine.

(2) Strip module sufficiently to allow visual inspection of all Group A components.

(3) Inspect HP compressor case assembly.

(4) Rework to Engine Manual as necessary.

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(5) The following Service Bulletin is recommended for embodiment:

72-1115 Engine - HP compressor rotor - Stages 4 to 12 disc spacers with protective coating deleted from outer rim axial faces.

R (6) The following Non-Modification Service Bulletin is recommended for
R embodiment only if possible without additional disassembly:

R 72-1838 Engine - High Pressue (HP) compressor discs, blades and spacers
R Non-Mod - Borescope inspection of the HP compressor stage 5 rotor disc
R Service for undercut and holes.
R Bulletin

R (7) Re-assemble module in accordance with Engine Manual.

D. Module 04 - Combustion and HP Turbine

Not applicable.

E. Module 05 - LP Turbine

Item

(1) Remove module from engine.

(2) Strip module sufficiently to allow visual inspection of all Group A components.

F. Module 06 - HS Gearbox

Not applicable.

G. Module 07 - Intermediate Casing

(1) The following Service Bulletin is recommended for embodiment:

72-1399 Engine - Intermediate case assembly - Front flange bore - Additional corrosion protection. (Epoxy barrier coating into OGV location bore to provide insulation between the magnesium and titanium components.)

H. Non-Modular Items

Not applicable.

I. Accessories

The following units require rework:

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(1) Airflow Control Regulator and Actuator

Item

(a) Remove unit from engine.

(b) Disassemble sufficiently to replace the diaphragm (75-32-05, 03-435), the piston seal rings (75-32-06, 05-470 and 05-490) and the felt piston wiper washer (75-32-06, 05-510).

(c) Rebuild and test.

(d) Re-install unit on engine.

(2) RPM Signal Generator

Item

(a) Remove unit from engine.

(b) Disassemble sufficiently to replace the diaphragm.

(c) Rebuild and test.

(d) Re-install unit on engine.

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APPENDIX 4A

CALENDAR LIFE REWORK PACKAGE FOR LOW UTILISATION OPERATORS

EFFECTIVITY - TAY 620-15

Operators with low utilisation (as defined in paragraph 1.G.(2)), may elect to conduct the following work package in order to release the engine for a further 10 years calendar life or the balance of the hours remaining to mid-life or overhaul, whichever comes first.

NOTE: All removed parts are to be visually inspected for signs of corrosion and if necessary reworked in accordance with the applicable manual.

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R Recommendations for maintenance and overhaul of engine mounted accessory units are
R given in Appendix 5.

R Accessory units that have been fitted to an engine at intermediate time require to
R have their lives tracked to ensure that they are overhauled at the required
R interval.

A. Module 01 - LP Compressor

Item

(1) Visually inspect for obvious damage.

(2) The following Service Bulletin is recommended for embodiment:

72-1528	Engine - LP compressor rotating fairing - Introduction of an LP compressor rotor spinner assembly with a dowel pin installed in the spinner flange.
72-A1782 Non-Mod Service Bulletin	Engine - Low Pressure (LP) compressor rotor blades - Instruction of a repair to the LP compressor (fan) blade leading edge profile.
72-1787 Non-Mod Service Bulletin	Engine - Low Pressure (LP) compressor rotor blades - Measurement of the chordal width and the leading edge thickness of selected LP compressor (fan) blades.

(3) Remove fan blades from disc and perform ultrasonic inspection of blade root (refer to the Engine Manual, Chapter 72-31-12, TASK 72-31-12-200-000).

NOTE: The inspection check of the fan blades is mandated in Non-Modification Service Bulletin 72-1442.

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(4) Rework in accordance with Engine Manual as necessary. Accomplishment of Repair Scheme HRS3629 LPC rotor blade - Restore L/E profile or of the Non-Modification Service Bulletin that follows is recommended:

72-1603 Non-Mod Service Bulletin	Engine - Low Pressure (LP) compressor (fan) blade - Instruction of a repair to the LP compressor (fan) blade leading edge profile.

(5) Replace blades in as-received position as annotated in log book.

(6) Check balance, if necessary.

(7) Rebalance rotor assembly, if necessary.

B. Module 02 - IP Compressor

Item

(1) Remove module from engine.

(2) Perform interface inspection on interface with Module 07.

(3) Strip module sufficiently to allow visual inspection of stator vane locating rings (if Service Bulletin 72-1252 Part 2 is not incorporated) and the IP compressor shaft.

(4) Rework to Engine Manual as necessary.

(5) The following Service Bulletin and Repair Scheme is recommended for embodiment:

72-1045	Engine - IP compressor air splitter - Introduction of strengthened annular ring. (To reduce secondary damage to engine in event of rearward movement of LP fan blades due to tang failure.)
HRS3390	IP compressor inlet guide vane - Re-apply filler material. (To prevent secondary IP compressor damage due to hard filler release.)

(6) The following Service Bulletin is recommended for embodiment (if Service Bulletin 72-1252 Part 2 is not incorporated):

72-1252 Part 1	Engine - IP compressor air splitter and inlet guide vanes - Splitter fairing and stator retaining rings with improved corrosion protection. (To prevent corrosion cracking of splitter fairing and stator retaining rings.)

(7) Re-assemble module in accordance with Engine Manual.

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C. Module 03 - HP Compressor

Item

(1) Remove module from engine.

(2) Strip module sufficiently to allow visual inspection of all Group A components.

(3) Inspect HP compressor case assembly.

(4) Check bleed valve hardware for binding, corrosion, wear, damage, freedom of movement.

(5) Rework to Engine Manual as necessary.

(6) The following Service Bulletins and Non-Modification Service Bulletin are recommended for embodiment:

72-1115	Engine - HP compressor rotor - Stages 4 to 12 disc spacers with protective coating deleted from outer rim axial faces.
72-1496 Non-Mod Service Bulletin	Engine - HP compressor stage 7 and 12 air off-take clamp inspection.
72-A1653	Engine - High Pressure (HP) compressor vanes stages 4 to 11 - Introduction of a new setting procedure to increase the minimum vane tip clearance.
72-1704	Engine - Air guide tube drive shaft and fittings - High Pressure (HP) compressor - Introduction of revised torque tightening procedure for the Low Pressure (LP) thrust bearing outer ring spanner nut.
72-A1740 Non-Mod Service Bulletin	Engine - High Pressure (HP) compressor rotor discs - Decrease of time limits manual maximum approved lives of the HP compressor stages 1, 3, 6, 7 and 12 rotor discs.

R (7) The following Non-Modification Service Bulletin is recommended for
R embodiment only if possible without additional disassembly:

R 72-1838 R Non-Mod R Service R Bulletin	Engine - High Pressure (HP) compressor discs, blades and spacers - Borescope inspection of the HP compressor stage 5 rotor disc for undercut and holes.

(8) Re-assemble module in accordance with Engine Manual.

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D. Module 04 - Combustion and HP Turbine

Item

(1) Remove module from engine.

(2) Visually inspect for obvious damage.

(3) Strip module sufficiently to allow visual inspection of all Group A components.

(4) Visually inspect for obvious damage and excessive corrosion.

(5) Rework to Engine Manual as necessary.

NOTE: HP turbine stage 1 blades should be visually inspected only and do not require full overhaul processing unless they will exceed 20000 hours during the next engine release life.

(6) The following Service Bulletins are recommended for embodiment:

72-1060 Engine - HP turbine case and rotor - Increased clearance between HP stage 1 rotor blades and nozzle vanes. (To overcome possible axial rubs.)

72-1111 Engine - HP turbine bearing and support - Bearing flexible support stop ring with increased axial clearance. (To eliminate a possible source of HP order vibration.)

72-1143 Engine - High energy igniter adaptors - Revised procedure for setting igniter immersion depth. (To extend igniter life.)

(7) Re-assemble module in accordance with Engine Manual.

E. Module 05 - LP Turbine

Item

(1) Remove module from engine.

(2) Visually inspect for obvious damage.

(3) Strip module sufficiently to allow visual inspection of all Group A components.

(4) Visually inspect for obvious damage and excessive corrosion.

(5) Rework to Engine Manual as necessary.

(6) Crack test engine mount rear links.

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(7) The following Service Bulletins and Non-Modification Service Bulletin are recommended for embodiment:

72-1117	Engine - LP turbine - Disc driving flange dowel bolts with tapered and square heads. (To prevent disc damage during assembly/disassembly.)
72-1160	Engine - LP turbine bearing support - Application of jointing compound to bearing support flange and overspeed control arm body mating faces. (To prevent oil leakage.)
72-1195	Engine - LP turbine case and vanes - LP turbine interstage seals with increased tolerances and improved anti-frettage coating. (To prevent rubs and fast rundown times.)
72-1358	Engine - LP turbine case and vanes - Re-introduction of three piece intrascope blanking plug assembly at LP1 and LP3 nozzle guide vane positions. (To prevent secondary LP turbine damage due to intrascope blanking plug failure.)
72-1364	Engine - LP turbine rotor discs and shaft - Rear oil tube steady with reduced outside diameter. (To prevent seizure of the rear oil tube within the air guide tube eliminating failures at the rear oil tube and ensuring satisfactory operation of the emergency fuel shut-off cock mechanism.)
72-1455	Engine - LP nozzle case and vanes - Introduction of LP turbine stage 1 NGV and seal support assembly with honeycomb seal.
72-1557 Non-Mod Service Bulletin	Engine - Low Pressure (LP) turbine rotor discs - Sample inspection requirements for Tay Operators.
72-1590	Engine - Turbine nozzle case and vanes-LP - Deletion of the dowel pins and retainer plates which are installed in the LP turbine stage 1 static air seal.

F. Module 06 - HS Gearbox

(1) Visually inspect gearbox mounts, link and accessory features.

(2) Inspect for signs of oil leakage.

(3) Clean accessory mount pads.

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(4) The following Service Bulletin and Non-Modification Service Bulletin is recommended for embodiment:

72-1112	Engine - Main oil pumps - LP turbine bearing return oil transfer tube with by-pass hole. (To overcome oil spillage and smoke emission.)
72-1401 Non-Mod Service Bulletin	Engine - High speed gearbox HSGB - Inspection and re-lubrication of starter drive splines.

G. Module 07 - Intermediate Casing

Item

(1) Inspect intermediate case for damage, corrosion and general condition.

(2) Inspect Inlet Guide Vane (IGV) actuating mechanism for freedom of movement and range of travel.

(3) Inspect engine trunnion mounting flange bore location for damage.

(4) Inspect intermediate case mounting lug for damage.

(5) Rework to Engine Manual as necessary.

(6) The following Service Bulletins are recommended for embodiment:

72-1122	Engine - LP compressor - Front bearing locating ring with copper plated bore. (To improve bearing location and prevent debris generation.)
72-1399	Engine - Intermediate case assembly - Front flange bore - Additional corrosion protection. (Epoxy barrier coating into OGV location bore to provide insulation between the magnesium and titanium components.)
72-1480	Engine high speed gearbox driving assembly - Introduction of increased torque on the internal gearbox bevel gear retaining nut.

(7) Re-assemble module in accordance with Engine Manual.

H. Non-Modular Items

Item

(1) Inspect nose cone spinner and fairing.

(2) Inspect rubber tip nose cap.

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(3) Inspect LP compressor case assembly.

Crack test engine mount taper pins and adaptors.

Crack test engine front (trunnion) mount.

(4) Inspect clamps for missing or deteriorated rubber cushions. Replace as necessary.

(5) Inspect transmitters, switches, thermocouples and electrical connectors for general condition and security.

(6) Inspect engine by-pass ducts for general condition.

(7) Inspect LP exhaust mixer for general condition.

(8) Inspect Engine Fuel Shut-Off (EFSO) cable assembly for strands integrity.

(9) Check main oil filter, scavenge filters and magnetic chip detectors and pop-up indicator.

(10) Check IGV freedom and do a bleed valve pull-off check.

(11) Discard the fuel tube of pre Service Bulletin 73-1194 standard or pre Service Bulletin 73-1592 standard and replace it with the fuel tube of post Service Bulletin 73-1592 standard.

(12) The following Service Bulletins and Non-Modification Service Bulletins are recommended for embodiment:

71-1109 Power plant - Electrical harness (light duty) - PLA transducer connector with revised wiring arrangement. (To provide compatibility with aircraft circuitry.)

71-1110 Power plant - Drain tubes and fittings - Restrictor plate fitted in internal gearbox to drains tank vent line. (To prevent fuel leakage from overboard vent.)

71-1158 Power plant - Electrical harness (light duty) - Fitment of lightning strike protective sleeving to harness looms. (To guard against electrical interference.)

71-1163 Power plant - Electrical harness (light duty) - Reorientation of keyway on power lever angle (PLA) transducer connector. (To prevent a foul between harness and aircraft cowl door ferry strut.)

72-1026 Engine - Compressor intermediate case - Fitment of setting spacers at IGV linkage external stop. (To ensure correct HP speed/thrust relationship.)

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72-1148 Engine - By-pass duct - Deletion of sealing compound from fairings adjacent to air cooled oil cooler. (To ensure unrestricted drainage to overboard drain connector.)

72-1429 Engine - LP compressor rotating fairing - Introduction of revised nose cone fairing assembly produced by super plastic blow forming. (Supersedes Service Bulletin 72-1376.)

Note: The Service Bulletin above is recommended for embodiment only in engines post Service Bulletin 72-1039.

72-1638 Non-Mod Service Bulletin Engine - Low Pressure (LP) compressor case and vanes - Repeat visual inspection of the ice impact panels and instruction of minimum ice impact panel configuration on installed engines.

Note: The Non-Modification Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

72-A1643 Engine - Low Pressure (LP) compressor case and vanes - Introduction of modified ice impact panels with additional retention features.

Note: The Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

72-1646 Non-Mod Service Bulletin Engine - Low Pressure (LP) support tube and front retaining ring - Inspection of the front fuel cut-off ring installation.

73-1084 Engine - Fuel and control - Fuel system tubes - Modified tubes between high idle solenoid and fuel flow regulator. (To avoid failure of tubes in the event of vibration.)

73-1085 Engine - Fuel and control - Fuel spray nozzles - Retaining bolts for No.10 fuel nozzle in low expansion steel. (To prevent loss of bolt torque.)

73-1142 Engine - Fuel and control - Fuel system tubes - LP fuel pump to FCOC tubes with sliding joint. (To reduce stresses in tubes and prevent possible failure.)

73-1165 Non-Mod Service Bulletin Engine - Fuel and control - Inspection of fuel flow regulator scheduling governor housing seal plate. (To ensure there are no units in service with unsupported rubber seal.)

73-1192 Engine - Fuel and control - Introduction of thicker washers at the FFR to LP governor fuel tube connector (FFR end). (To prevent potential fuel leak.)

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73-1194 Part 1 to Part 3	Engine - Fuel and control - Introduction of modified connectors to LP fuel system. (To prevent connector frettage and fuel leaks.)

Note: Part 4 of Service Bulletin 73-1194 must not be embodied as it is superseded by the embodiment of Service Bulletin 73-1592.

73-1592	Engine fuel and control - Fuel system tubes - Introduction of a fuel flowmeter to HP fuel pump tube assembly with a new routing and installation.
74-1259	Ignition - Engine - Starting system - Introduction of an alternative high energy igniter plug type Y183-5 manufactured by S.L. Auburn.
75-1034	Air - Air tubes and fittings - EPR manifold with increased diameter drain holes.
75-1055	Air - Air tubes and fittings - Introduction of non-flowing EPR manifold system and modified pressure rakes. (To ensure no engines are in service with pre Service Bulletin standard.)
75-1199	Air - Air tubes and fittings - P3 air tube - Split connection to FFR with increased flexibility. (To prevent P3 air leaks causing engine handling problems or slow accelerations and low power.)
76-1083	Engine controls - Emergency fuel shut down system - Rear cable guide plate in stainless steel. (To prevent failure of the guide plate.)
76-1098	Engine controls - Control linkage - FCU and SOV. (To improve linkage integrity and avoid failures due to excessive vibration.)
76-1139	Engine controls - Control linkage - Redesigned throttle relay lever and support bracket. (To provide a more robust location for PLA transducer.)
76-1203	Engine controls - Control linkage - Throttle relay lever with relief for PLA transducer. (To alleviate rotor and bearing wear and inaccurate readings.)
76-1208	Engine controls - Control linkage - Introduction of throttle relay lever mounting bracket with increased clearance for aircraft control rod.
76-1319 Non-Mod Service Bulletin	Engine controls - Adjustment of the spindle retaining plate on the throttle relay lever bracket to prevent oscillation of the spindle. (To prevent throttle stagger and low EPR on take-off and minimize wear on bracket assemblies.)

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76-1434 Non-Mod Service Bulletin — Emergency fuel shut off system - Inspection of emergency fuel shut off cable.

76-1466 — Engine controls - LP shaft failure system - Introduction of pulley wheel at EFSO cable rear guide location.

79-1089 — Oil - Oil filter differential pressure indicator - Seal rings fitted at indicator electrical connector. (To eliminate false warnings from differential pressure switch.)

79-1175 — Oil - Oil system tubes - LP turbine bearing oil feed tube with sliding joint. (To prevent tube failure in event of severe vibration.)

79-1411 — Oil - Oil-Tank - Introduction of revised oil tank assembly with deleted fuel pipe support bracket.

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I. Accessories

(1) The following units require rework:

(a) Airflow Control Regulator and Actuator

Item

[1] Remove unit from engine.

[2] Disassemble sufficiently to replace the diaphragm (75-32-05, 03-435), the piston seal rings (75-32-06, 05-470 and 05-490) and the felt piston wiper washer (75-32-06, 05-510).

[3] Rebuild and test.

[4] Re-install unit on engine.

(b) Replace the two spherical bearings (72-35-23, 03-170) and (75-32-09, 07-110) of the Airflow Control Regulator (AFCR) connecting link assembly.

(c) RPM Signal Generator

Item

[1] Remove unit from engine.

[2] Disassemble sufficiently to replace the diaphragm.

[3] Rebuild and test.

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[4] Re-install unit on engine.

(2) Visually inspect the fuel spray nozzles and clean, if required in accordance with the Component Maintenance Manual Spray Nozzles

(a) Crack test the double ended unions (73-11-06, 01-095) and (73-11-06, 01-295) during the inspection of the fuel spray nozzles (Refer to the Component Maintenance Manual Spray Nozzles, Chapter 73-11-06, TASK 73-11-06-200-000).

(b) As an alternative to step I.(2)(a) you can install replacement double ended unions (73-11-06, 01-095) and (73-11-06, 01-295).

(3) Conduct external visual inspection of TGT thermocouples.

(4) Conduct external visual inspection of TGT thermocouple harness.

(5) Remove existing grease and debris from splines of starter quillshaft.

NOTE: Care must be taken when applying fresh grease to the splines as too much grease can result in an end load on the starter drive front bearing and cause the bearing to fail.

(6) The following Service Bulletins and Non-Modification Service Bulletin are recommended for embodiment:

36-1325	Pneumatic system - HP bleed valve sensing switch - Introduction of integral plunger action switch. (To eliminate the possibility of manipulation of the actuating arm or deformation due to incorrect gap adjustment thus ensuring correct selection of stage 7 to stage 12 HP engine bleed.)
73-1166	Engine - Fuel and control - Fuel flow regulator - Introduction of a Spey type lever housing seal plate. (To eliminate the possibility of overboard fuel leak.)
73-1280	Engine - Fuel and control - Shut-off cock - Introduction of a shut-off cock with the cold start facility deleted. (To prevent 'hot' starts due to inadvertent selection of cold start fuel flow.)
73-1315	Engine - Fuel and control - Fuel flow regulator - Introduction of increased reverse thrust. (To maintain maximum (emergency) reverse thrust with the introduction of Fokker aircraft modification F100-78-010.)
73-1630 Non-Mod Service Bulletin	Engine fuel and control - Fuel flow regulator (Type CASC512) - Re-calibration of fuel flow regulator.

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75-1275 Air - Airflow control regulator - Rear mount bracket and piston push rod machined to increase clearance with adjacent parts. (To prevent fouls with AFCR linkage.)

75-1736 Air - Airflow control regulator and attachment fittings - Introduction of revised scheduling limits for the Variable Inlet Guide Vanes (VIGV) and Handling Bleed Valve (HBV).

77-1267 Engine indicating - Oil pressure transmitter - Introduction of kulite oil pressure transmitter with output transient overload protection.

(7) Check the FFR drive end coupling end float. The coupling should move freely inwards under hand pressure. If there is no movement the drive end is to be removed for incorporation of Service Bulletin 73-1211.

NOTE: Service experience has demonstrated that corrosion can be more prevalent on the low utilisation type of operation. It is thus important to monitor ongoing service experience, particularly in relation to the integrity of Group A parts and also establish individual Operator corrosion experience. Rolls-Royce should always therefore be advised if:

(1) Extensive corrosion attack is evident, particularly affecting Group A parts.

(2) Any Group A parts are rejected for corrosion pitting (Rolls-Royce may wish those parts to be returned for more detailed examination).

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APPENDIX 5

ROLLS-ROYCE RESPONSIBILITY ENGINE MOUNTED ACCESSORIES

NOTE: The ATA reference is applicable to the appropriate Rolls-Royce Illustrated Parts Catalog. The Vendor may have a different ATA reference.

	Unit	ATA Ref	Manufacturer	Tay 611-8	Tay 620-15	Tay 650-15	Tay 651-54
	IDG oil cooler (air cooled)	24-13-01	Stewart Warner	-	-	-	*
	HP bleed valve sensing switch	36-11-01	Honeywell	-	*	*	-
	Air non-return valve (2 off)	36-11-02	FR HiTemp	-	*	*	-
	EPR trim plug	71-50-01	Pyle National	*	*	*	*
	EPR trim plug cover	71-50-01	Glenair	*	*	*	*
	Trim balance probe	72-35-43	Smiths	*	*	*	*
	Drains ejector pump	73-11-01	Goodrich	+	+	+	+
	Fuel drain valve	73-11-03	Auto Valve Inc.	*	*	*	*
	LP fuel filter element	73-11-03	Aircraft Porous Media	*	*	*	*
	LP fuel filter element	73-11-03	Automotive Industries	*	*	*	*
	LP fuel pump	73-11-04	FR HiTemp	*	*	*	*
R	HP fuel pump	73-11-05	Goodrich	#	#	#	#
	Fuel spray nozzles	73-11-06	Parker Hannifin	-	-	+	+
	Fuel spray nozzles	73-11-06	Rolls-Royce	+	+	-	-
R	HP fuel shut off valve	73-11-07	Goodrich	#	#	#	#
R	Fuel flow regulator	73-21-01	Goodrich	#	#	#	#
R	LP shaft governor	73-21-02	Goodrich	#	#	#	#
	Temperature control actuator	73-21-03	Smiths	*	-	-	-

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	Unit	ATA Ref	Manufacturer	Tay 611-8	Tay 620-15	Tay 650-15	Tay 651-54
	Temperature control signal amplifier	73-21-04	Smiths	*	-	-	-
R	Approach idle solenoid	73-21-06	Goodrich	++	++	++	++
R	Approach idle solenoid	73-21-06	Valve Research and Manufacturing Company	++	-	-	-
R	Fuel reset solenoid	73-21-07	Goodrich	++	-	-	-
R	Fuel reset solenoid	73-21-07	Valve Research and Manufacturing Company	++	-	-	-
	P3 accumulator	73-21-11	Goodrich	++	-	-	-
	Fuel filter differential pressure switch	73-33-01	Custom Control Sensor	*	*	*	*
	Fuel filter differential pressure switch	73-33-01	Meggitt Avionics	*	*	*	*
	Fuel low pressure warning switch	73-34-01	Goodrich	*	*	*	*
	High energy ignition unit	74-11-01	Unison	-	*	*	*
	High energy igniter internal leads and disconnect	74-21-01	Unison	-	-	-	*
	High energy igniter internal leads and disconnect	74-21-02	Unison	*	*	*	-
	Igniter plugs	74-21-03	Smiths	*	*	*	*
	Igniter plugs (alternative)	74-21-03	Auburn	*	*	*	-
	LP cooling air outlet temperature switch	75-21-02	Fenwal	++	++	++	++
	HP compressor airflow control regulator	75-32-01	Rolls-Royce	+	+	+	+

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Unit	ATA Ref	Manufacturer	Tay 611-8	Tay 620-15	Tay 650-15	Tay 651-54
Airflow control RPM signal transmitter	75-32-20	Goodrich	+	+	+	+
T26 thermal unit	75-32-40	Meggit Avionics	*	*	*	*
PLA transducer	76-11-02	M.P.C. Products	*	-	-	-
Engine rating and identity plug	77-41-03	Bendix	-	*	*	-
Engine rating and identity plug	77-41-03	Matrix	-	*	*	-
Engine rating and identity plug	77-41-03	Pyle National	-	*	*	-
Fuel temperature bulb	77-42-02	Weston	-	*	*	-
Fuel temperature bulb	77-42-02	Coltec	-	-	-	*
LP and HP RPM tacho generator	77-43-01	Smiths	*	*	*	*
EPR probes	77-44-01	Rolls-Royce	*	*	*	*
TGT thermocouples	77-45-01	Weston	*	*	*	*
TGT thermocouple harness (Circ.)	77-45-02	Weston	*	*	*	*
TGT thermocouple harness (Radial)	77-45-02	Weston	*	*	*	*
TGT thermocouple junction box	77-45-03	Rolls-Royce	*	*	*	*
Oil pressure transmitter	77-47-01	Kulite	-	*	*	-
Oil pressure transmitter	77-47-01	Smiths	*	-	-	-
Oil temperature transmitter	77-47-02	Lewis	*	-	-	*
Oil temperature transmitter	77-47-02	Weston	-	*	*	-
Oil tank contents transmitter	79-10-01	FR HiTemp	-	*	*	*

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	Unit	ATA Ref	Manufacturer	Tay 611-8	Tay 620-15	Tay 650-15	Tay 651-54
R	Oil pressure filler	79-10-01	Triumph Activation	+	+	+	+
	Oil tank	79-10-01	Rolls-Royce	*	*	*	*
	Oil filter element	79-21-01	Automotive Industries	*	*	*	*
	Magnetic chip detectors	79-21-02	Vactric	*	*	*	*
	Oil cooler assembly	79-22-01	Rolls-Royce	+	+	+	+
	Oil low pressure warning switch	79-32-01	Vibrometer	*	*	*	*
	Indicator assembly filter maintenance	79-33-01	Pall Aerospace	*	*	*	*
	Oil filter differential pressure sensing switch	79-33-01	Pall Aerospace	*	*	*	*
	Air starter	80-11-01	Allied Signal	-	+	+	+
	Starter control valve	80-11-01	Allied Signal	-	+	+	+

* Accessory with no overhaul life. These items are subject of repetitive maintenance, inspection checks or tests, or normal crew observation to determine their continued serviceability.
Overhaul action on these items is therefore limited to the requirement to prove their serviceability for fitment.

R + Accessory with fixed overhaul life of 8000 hours.

++ Accessory with no fixed overhaul life - functional test only at engine overhaul life.

\- Technical responsibility for Accessory not Rolls-Royce or Accessory type not fitted in this application.

R # Accessory with a soft time. When the engine is in the shop and the accessory
R soft time has been exceeded then rework the unit in accordance with the
R Component Management Programme. Where no Component Management Programme exists
R then overhaul the unit. Where the soft time has not been exceeded functional
R test unit only during pass-off test. Accessory soft times are listed below.

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R A. Accessory soft times

R (1) The following accessory units are operated On Condition and do not have a
R Hard Life . In order to maintain unit in-service reliability these units
R are managed by soft lives. The soft life is only applicable if the unit is
R installed on an engine that is undergoing a shop visit. When a unit Time
R Since New (TSN) or Time Since Overhaul (TSO) has exceeded the soft life
R then rework the unit in accordance with the Component Management Programme.
R Where no Component Management Programme exists then overhaul the unit. The
R list of TAY accessories, which are subject to a soft life are listed in the
R table below.

	Unit	ATA	Soft Time (TSN/TSO)
R	HP fuel pump	73-11-05	10,000
R	HP fuel shut off valve	73-11-07	10,000
R	Fuel flow regulator	73-21-01	8,000
R	LP shaft governor	73-21-02	10,000

R NOTE: Engines operated in accordance with NMSB TAY-70-1517 should use the
R accessory unit soft times published in NMSB TAY-70-1517.

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APPENDIX 6

FULL OVERHAUL

EFFECTIVITY - TAY 611-8

At 8000 hours from new or overhaul or 4000 hours from mid-life rework, an overhaul is required as detailed below.

R Recommendations for maintenance and overhaul of engine mounted accessory units are
R given in Appendix 5.

Accessory units that have been fitted to an engine at intermediate time require to have their lives tracked to ensure that they are overhauled at the required interval.

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A. Overhaul

(1) Inspect and rework all modules, accessories and other non-modular items in accordance with the Engine Manual except for the following:

(a) HP turbine stage 1 blades should be visually inspected only and do not require full overhaul processing unless they exceed 20000 hours during the next engine release life.

(b) The following parts should be visually inspected only and do not require full overhaul:

R [1] Plate (72-33-00, 01-100).

R [2] Plate (72-33-31, 01-038).

R [3] Plate (72-33-33, 03-042).

R [4] Accessory suspension bracket (72-34-20, 01-065).

R [5] Housing (72-35-47, 03-265).

R [6] Lever (72-35-60, 01-230).

R [7] Lever (72-37-21, 01-150).

R [8] Cover assembly (72-37-21, 01-222).

R [9] Ring (72-37-42, 02-250).

R [10] Plate (72-41-23, 03-670).

R [11] Plate (72-41-23, 03-700).

R [12] Seat (72-52-21, 01-410).

R [13] Carrier assembly (72-52-21, 01-600).

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R [14] Plate (72-52-34, 04-230).

[15] HS gearbox front housing assembly (72-61-10, 02-004).

[16] HS gearbox front mount cover assembly (72-61-10, 02-180).

R [17] Link (72-61-10, 02-210).

[18] HS gearbox rear case assembly (72-61-11, 03-004).

[19] HS gearbox rear mount cover assembly (72-61-11, 03-210).

R [20] Cover (72-61-12, 04-040).

R [21] Mount assembly (72-61-16, 08-430).

(2) Replace the two spherical bearings (72-35-23, 03-170) and (75-32-09, 07-110) of the Airflow Control Regulator (AFCR) connecting link assembly.

(3) Replace the two bushes (75-32-08, 06-530) of the AFCR rear mount assembly.

(4) Replace OGV and outer seal housing assembly retaining bolts (72-37-41, 01-020) and (72-37-41, 01-075) with new.

NOTE: Care must be taken when applying fresh grease to the splines of the HS gearbox starter drive shaft and the starter quillshaft. Too much grease can result in an end load on the starter drive front bearing and cause the bearing to fail.

(5) Discard the fuel tube of pre Service Bulletin 73-1194 standard or pre Service Bulletin 73-1592 standard and replace it with the fuel tube of post Service Bulletin 73-1592 standard.

R (6) Replace the igniter plugs with new.

(7) The following Service Bulletins and Non-Modification Service Bulletins are recommended for embodiment:

72-1025 Engine - LP compressor - Repositioned fuel shut-off mechanism. (To prevent incorrect or inadvertent operation of system.)

72-1041 Engine - HP compressor rotor - Application of Sermetel W anti-corrosion treatment to disc spacer.

72-1121 Engine - HP compressor rotor - Disc spacers with Sermetal W protective coating replacing PL101. (To improve anti-corrosion protection.)

72-1230 Engine - Internal gearbox - Rear bearing housing with increased diameter chamfer.

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72-1296 Non-Mod Service Bulletin — Engine - Replacement of high speed gearbox drive driven bevel gearshaft JR27127. (To ensure that low fatigue strength gearshafts are removed from service.)

72-1323 — Engine - HS gearbox - Breather shaft air/oil seal with increased radial clearance.

72-1341 Non-Mod Service Bulletin — Engine - Replacement of high speed gearbox drive driven bevel gearshaft JR27127. (To ensure that low fatigue strength gearshafts are removed from service.)

72-1429 — Engine - LP compressor rotating fairing - Introduction of revised nose cone fairing assembly produced by super plastic blow forming. (Supersedes Service Bulletin 72-1376.)

Note: The Service Bulletin above is recommended for embodiment only in engines post Service Bulletin 72-1039.

72-1455 — Engine - LP nozzle case and vanes - Introduction of LP turbine stage 1 NGV and seal support assembly with honeycomb seal.

72-1472 — Engine - Generator drive shaft and bevel gear shaft assemblies - High speed gearbox dee head bolt material and torque tightening setting change.

72-1499 — Engine - High speed gearbox driving gear assembly - Internal gearbox - Interference fit of drive shaft and bevel gear.

72-1528 — Engine - LP compressor rotating fairing - Introduction of an LP compressor rotor spinner assembly with a dowel pin installed in the spinner flange.

72-1590 — Engine - Turbine nozzle case and vanes-LP - Deletion of the dowel pins and retainer plates which are installed in the LP turbine stage 1 static air seal.

72-1603 Non-Mod Service Bulletin — Engine - Low Pressure (LP) compressor (fan) blades - Instruction of a repair to the LP compressor (fan) blades leading edge profile.

72-1639 Non-Mod Service Bulletin — Engine - Low Pressure (LP) compressor case and vanes - Repeat visual inspection of the ice impact panels and instruction of minimum ice impact panel configuration on installed engines.

Note: The Non-Modification Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

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72-1644 Non-Mod Service Bulletin — Engine - Low Pressure (LP) support tube and front retaining ring - Inspection of the front fuel cut-off ring installation.

72-A1650 — Engine - Low Pressure (LP) compressor case and vanes - Introduction of modified ice impact panels with additional retention features.

Note: The Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

72-A1653 Non-Mod Service Bulletin — Engine - High Pressure (HP) compressor vanes stages 4 to 11 - Introduction of a new setting procedure to increase the minimum vane tip clearance.

72-A1696 — Engine - Turbine nozzle case and vanes - HP and LP - Inspection of the bolts which are installed in the LPT stage 1 static air seal and of the bolts which are installed in the HPT stage 1 air seal support.

Note: The Service Bulletin above is only applicable to a specific list of engine serial numbers identified.

72-1704 — Engine - Air guide tube drive shaft and fittings - High Pressure (HP) compressor - Introduction of revised torque tightening procedure for the Low Pressure (LP) thrust bearing outer ring spanner nut.

72-1719 Non-Mod Service Bulletin — Engine - High Pressure (HP) compressor discs, blades and spacers stages 6 to 9 - Replacement of HP compressor rotor discs.

Note: The Non-Modification Service Bulletin above is only applicable to a specific list of engine serial numbers identified.

72-1730 Non-Mod service Bulletin — Engine - High Pressure (HP) compressor vanes stages 4 to 11 - Inspection of the HP compressor stage 7 stator vanes.

Note: The Non-Modification Service Bulletin above is only applicable to a specific list of engine serial numbers identified.

72-1731 Non-Mod Service Bulletin — Engine - High Pressure (HP) compressor vanes stages 4 to 11 - Inspection of the HP compressor stage 7 stator vanes.

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Note: The Non-Modification Service Bulletin above is only applicable to a specific list of engine serial numbers identified.

72-1783 Non-Mod Service Bulletin — Engine - Fan Blades - Ultrasonic inspection of fan blade roots.

72-1819 Non-Mod Service Bulletin — Engine - Turbine rotor disc and shaft - High Pressure (HP) - Inspection of the HP turbine stage 2 disc sleeve serial number.

Note: The Non-Modification Service Bulletin above is applicable for Engine Serial Number 18189.

R R R R 72-1838 Non-Mod Service Bulletin — Engine - High Pressure (HP) compressor discs, blades and spacers - Borescope inspection of the HP compressor stage 5 rotor disc for undercut and holes.

73-1078 — Engine - Fuel and control - Fuel flow regulator - Introduction of an approach idle mechanism with increased range of adjustment. (To ensure ability to achieve approach idle and ground idle settings.)

73-1079 — Engine - Fuel and control - Fuel flow regulator with reduced throttle valve lever backlash. (To prevent power fluctuations when operating on auto-throttle.)

73-1131 — Engine - Fuel and control - Fuel flow regulator - Introduction of a test schedule amendment of redefine setting of the minimum flow stop. (To prevent slow accelerations and surge during severe handling conditions.)

73-1165 Non-Mod Service Bulletin — Engine - Fuel and control - Inspection of fuel flow regulator scheduling governor housing seal plate. (To ensure there are no units in service with unsupported rubber seal.)

73-1166 — Engine - Fuel and control - Fuel flow regulator - Introduction of a Spey type lever housing seal plate. (To eliminate the possibility of overboard fuel leak.)

73-1167 — Engine - Fuel and control - Fuel flow regulator - Introduction of idle reset adjuster mounting bolts with wire locking holes.

73-1194 Part 1 to Part 3 — Engine - Fuel and control - Introduction of modified connectors to LP fuel system. (To prevent connector frettage and fuel leaks.)

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Note: Part 4 of Service Bulletin 73-1194 must not be embodied as it is superseded by the embodiment of Service Bulletin 73-1592.

73-1210 Engine - Fuel and control - Fuel flow regulator - Introduction of a reduced variable metering orifice (VMO) push rod end float and improvement to the VMO and acceleration control unit (ACU) plunger and sleeves. (To improve unit reliability.)

73-1211 Engine - Fuel and control - Fuel flow regulator - Introduction of modified input drive seal retainer. (To provide greater wear resistance and prevent fuel leakage.)

73-1213 Engine - Fuel and control - Fuel flow regulator - Introduction of a two piece slider block and pin assembly. (For unit improvement with respect of engine speed for a given throttle lever position.)

73-1217 Engine - Fuel and control - Fuel flow regulator - Introduction of revised design standard of reach nut. (To improve unit reliability by preventing ACU governor movement.)

73-1219 Engine - Fuel and control - Fuel flow regulator - Introduction of an increased clearance dashpot piston within the scheduling governor. (To improve unit reliability.)

73-1281 Engine - Fuel and control - Fuel flow regulator - Introduction of a fuel flow regulator with solutions to eliminate calibration shift.

73-1301 Engine - Fuel and control - Fuel flow regulator - Introduction of a fuel flow regulator with a revised ACU governor weight arm. (To improve unit reliability by preventing arm failure.)

73-1322 Engine - Fuel and control - Fuel flow regulator - Introduction of a fuel flow regulator with a revised double datum idle design.

73-1378 Engine - Fuel and control - Fuel flow regulator - Introduction of a P3P accumulator unit. (Only required on engines with Service Bulletin 72-1347 (LP turbine stage 1 NGVs with increased throat area) embodied.)

73-1405 Engine - Fuel and control - Fuel flow regulator - Introduction of P3P accumulator valve with air filter plug (Only required on engines with Service Bulletin 73-1378 (standard accumulator unit fitted) embodied).

73-1592 Engine fuel and control - Fuel system tubes - Introduction of a fuel flowmeter to HP fuel pump tube assembly with a new routing and installation.

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76-1083 Engine controls - Emergency fuel shut down system - Rear cable guide plate in stainless steel. (To prevent failure of the guide plate.)

76-1346 Engine controls - Control linkage - Throttle relay lever support bracket with locked spindle.

76-1466 Engine controls - LP shaft failure system - Introduction of pulley wheel at EFSO cable rear guide location.

79-1426 Oil - Engine gaskets - Introduction of gasket material change to Klingersil C4430.

79-1796 Oil - Oil Tank - Introduction of an oil fill instruction label on the oil tank to prevent oil overfilling.

Note: The Service Bulletin above is recommended for embodiment only in engines post Service Bulletin TAY-79-1463.

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APPENDIX 7

FULL OVERHAUL

EFFECTIVITY - TAY 620-15

At 8000 hours from new or overhaul or 4000 hours from mid-life rework, an overhaul is required as detailed below.

R Recommendations for maintenance and overhaul of engine mounted accessory units are
R given in Appendix 5.

Accessory units that have been fitted to an engine at intermediate time require to have their lives tracked to ensure that they are overhauled at the required interval.

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A. Overhaul

(1) Inspect and rework all modules, accessories and other non-modular items in accordance with the Engine Manual.

NOTE: HP turbine stage 1 blades should be visually inspected only and do not require full overhaul processing unless they exceed 20000 hours during the next engine release life.

(2) Replace the two spherical bearings (72-35-23, 03-170) and (75-32-09, 07-110) of the Airflow Control Regulator (AFCR) connecting link assembly.

(3) Replace the two bushes (75-32-08, 06-530) of the AFCR rear mount assembly.

(4) Replace OGV and outer seal housing assembly retaining bolts (72-37-41, 01-020) and (72-37-41, 01-075) with new.

NOTE: Care must be taken when applying fresh grease to the splines of the HS gearbox starter drive shaft and the starter quillshaft. Too much grease can result in an end load on the starter drive front bearing and cause the bearing to fail.

(5) Discard the fuel tube of pre Service Bulletin 73-1194 standard or pre Service Bulletin 73-1592 standard and replace it with the fuel tube of post Service Bulletin 73-1592 standard.

(6) Replace the starter idler gearshaft (72-61-18, 10-040).

(7) The following Service Bulletins and Non-Modification Service Bulletins are recommended for embodiment:

72-1025 Engine - LP compressor - Repositioned fuel shut-off mechanism. (To prevent incorrect or inadvertent operation of system.)

72-1041 Engine - HP compressor rotor - Application of Sermetel W anti-corrosion treatment to disc spacer.

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72-1121 Engine - HP compressor rotor - Disc spacers with Sermetel W protective coating replacing PL101. (To improve anti-corrosion protection.)

72-1230 Engine - Internal gearbox - Rear bearing housing with increased diameter chamfer.

72-1401 Non-Mod Service Bulletin Engine - High speed gearbox HSGB - Inspection and re-lubrication of starter drive splines.

72-1429 Engine - LP compressor rotating fairing - Introduction of revised nose cone fairing assembly produced by super plastic blow forming. (Supersedes Service Bulletin 72-1376.)

Note: The Service Bulletin above is recommended for embodiment only in engines post Service Bulletin 72-1039.

72-1442 Non-Mod Service Bulletin Engine - Fan blades - Ultrasonic inspection of fan blade roots.

72-1455 Engine - LP nozzle case and vanes - Introduction of LP turbine stage 1 NGV and seal support assembly with honeycomb seal.

72-1472 Engine - Generator drive shaft and bevel gear shaft assemblies - High speed gearbox dee head bolt material and torque tightening setting change.

72-1499 Engine - High speed gearbox driving gear assembly - Internal gearbox - Interference fit of drive shaft and bevel gear.

72-1528 Engine - LP compressor rotating fairing - Introduction of an LP compressor rotor spinner assembly with a dowel pin installed in the spinner flange.

72-1557 Non-Mod Service Bulletin Engine - Low Pressure (LP) turbine rotor discs - Sample inspection requirements for Tay Operators.

72-1590 Engine - Turbine nozzle case and vanes-LP- Deletion of the dowel pins and retainer plates which are installed in the LP turbine stage 1 static air seal.

72-1603 Non-Mod Service Bulletin Engine - Low Pressure (LP) compressor (fan) blades - Instruction of a repair to the LP compressor (fan) blades leading edge profile.

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72-1638 Non-Mod Service Bulletin — Engine - Low Pressure (LP) compressor case and vanes - Repeat visual inspection of the ice impact panels and instruction of minimum ice impact panel configuration on installed engines.

Note: The Non-Modification Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

72-A1643 — Engine - Low Pressure (LP) compressor case and vanes - Introduction of modified ice impact panels with additional retention features.

Note: The Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

72-1646 Non-Mod Service Bulletin — Engine - Low Pressure (LP) support tube and front retaining ring - Inspection of the front fuel cut-off ring installation.

72-A1653 — Engine - High Pressure (HP) compressor vanes stages 4 to 11 - Introduction of a new setting procedure to increase the minimum vane tip clearance.

72-1704 — Engine - Air guide tube drive shaft and fittings - High Pressure (HP) compressor - Introduction of revised torque tightening procedure for the Low Pressure (LP) thrust bearing outer ring spanner nut.

72-A1740 Non-Mod Service Bulletin — Engine - High Pressure (HP) compressor rotor discs - Decrease of time limits manual maximum approved lives of the HP compressor stages 1, 3, 6, 7 and 12 rotor discs.

72-A1782 Non-Mod Service Bulletin — Engine - Low Pressure (LP) compressor rotor blades - Instruction for repair to the LP compressor (fan) blade leading edge profile.

72-1787 Non-Mod Service Bulletin — Engine - Low Pressure (LP) compressor rotor blades - Measurement of the chordal width and the leading edge thickness of selected (fan) blades.

R 72-1838 Non-Mod Service Bulletin — Engine - High Pressure (HP) compressor discs, blades and spacers - Borescope inspection of the HP compressor stage 5 rotor disc for undercut and holes.

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73-1078 Engine - Fuel and control - Fuel flow regulator - Introduction of an approach idle mechanism with increased range of adjustment. (To ensure ability to achieve approach idle and ground idle settings.)

73-1079 Engine - Fuel and control - Fuel flow regulator with reduced throttle valve lever backlash. (To prevent power fluctuations when operating on auto-throttle.)

73-1134 Engine - Fuel and control - Fuel flow regulator - Introduction of a Lucas test schedule amendment to increase engine HP RPM to achieve the take-off thrust rating.

73-1165 Non-Mod Service Bulletin Engine - Fuel and control - Inspection of fuel flow regulator scheduling governor housing seal plate. (To ensure there are no units in service with unsupported rubber seal.)

73-1166 Engine - Fuel and control - Fuel Flow regulator - Introduction of a Spey type lever housing seal plate. (To eliminate the possibility of overboard fuel leak.)

73-1167 Engine - Fuel and control - Fuel flow regulator - Introduction of idle reset adjuster mounting bolts with wire locking holes.

73-1194 Part 1 to Part 3 Engine - Fuel and control - Introduction of modified connectors to LP fuel system. (To prevent connector frettage and fuel leaks.)

Note: Part 4 of Service Bulletin 73-1194 must not be embodied as it is superseded by the embodiment of Service Bulletin 73-1592.

73-1210 Engine - Fuel and control - Fuel flow regulator - Introduction of a reduced variable metering orifice (VMO) push rod end float and improvement to the VMO and acceleration control unit (ACU) plunger and sleeves. (To improve unit reliability.)

73-1211 Engine - Fuel and control - Fuel flow regulator - Introduction of modified input drive seal retainer. (To provide greater wear resistance and prevent fuel leakage.)

73-1213 Engine - Fuel and control - Fuel flow regulator - Introduction of a two piece slider block and pin assembly. (For unit improvement with respect of engine speed for a given throttle lever position.)

73-1217 Engine - Fuel and control - Fuel flow regulator - Introduction of revised design standard of reach nut. (To improve unit reliability by preventing ACU governor movement.)

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73-1219	Engine - Fuel and control - Fuel flow regulator - Introduction of an increased clearance dashpot piston within the scheduling governor. (To improve unit reliability.)
73-1281	Engine - Fuel and control - Fuel flow regulator - Introduction of a fuel flow regulator with solutions to eliminate calibration shift.
73-1301	Engine - Fuel and control - Fuel flow regulator - Introduction of a fuel flow regulator with a revised ACU governor weight arm. (To improve unit reliability by preventing arm failure.)
73-1322	Engine - Fuel and control - Fuel flow regulator - Introduction of a fuel flow regulator with a revised double datum idle design.
73-1592	Engine fuel and control - Fuel system tubes - Introduction of a fuel flowmeter to HP fuel pump tube assembly with a new routing and installation.
73-1630 Non-Mod Service Bulletin	Engine fuel and control - Fuel flow regulator (Type CASC512) - Re-calibration of fuel flow regulator.
75-1055	Air - Air tubes and fittings - Introduction of non-flowing EPR manifold system and modified pressure rakes. (To ensure no engines are in service with pre Service Bulletin standard.)
75-1736	Air - Airflow control regulator and attachment fittings - Introduction of revised scheduling limits for the Variable Inlet Guide Vanes (VIGV) and Handling Bleed Valve (HBV).
76-1083	Engine controls - Emergency fuel shut down system - Rear cable guide plate in stainless steel. (To prevent failure of the guide plate.)
76-1346	Engine controls - Control linkage - Throttle relay lever support bracket with locked spindle.
76-1434 Non-Mod Service Bulletin	Emergency fuel shut off system - Inspection of emergency fuel shut off cable.
76-1466	Engine controls - LP shaft failure system - Introduction of pulley wheel at EFSO cable rear guide location.
77-1267	Engine indicating - Oil pressure transmitter - Introduction of kulite oil pressure transmitter with output transient overload protection.

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79-1426 Oil - Engine gaskets - Introduction of gasket material change to Klingersil C4430.

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APPENDIX 8

MID-LIFE REWORK

EFFECTIVITY - TAY 650-15

At 4000 hours from new, or overhaul, a rework is required as detailed below.

The rework package will be developed with service experience.

Any component(s) inspected and found to be in excess of Engine Manual limits, may warrant further inspection, engine strip or rework other than that stated in this work package.

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R Recommendations for maintenance and overhaul of engine mounted accessory units are
R given in Appendix 5.

R Accessory units that have been fitted to an engine at intermediate time require to
R have lives tracked to ensure that they are overhauled at the required interval.

A. Module 01 - LP Compressor

Item

(1) Visually inspect for obvious damage.

(2) The following Service Bulletin is recommended for embodiment:

72-1528	Engine - LP compressor rotating fairing - Introduction of an LP compressor rotor spinner assembly with a dowel pin installed in the spinner flange.

(3) Remove fan blades from disc and inspect in accordance with the following Non-Modification Service Bulletins:

72-1442 Non-Mod Service Bulletin	Engine - Fan blades - Ultrasonic inspection of fan blade roots (Supersedes Service Bulletin 72-1436 at the engine shop visits).
72-1603 Non-Mod Service Bulletin	Engine - Low Pressure (LP) compressor (fan) blades - Instruction of a repair to the LP compressor (fan) blade leading edge profile.
72-A1782 Non-Mod Service Bulletin	Engine - Low Pressure (LP) compressor rotor blades - Instruction of a repair to the LP compressor (fan) blade leading edge profile.

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72-1787 Non-Mod Service Bulletin — Engine - Low Pressure (LP) compressor rotor blades - Measurement of the chordal width and the leading edge thickness of selected compressor (fan) blades.

(4) Rework in accordance with Engine Manual as necessary. Accomplishment of Repair Scheme HRS3629 LPC rotor blade - Restore L/E profile is recommended.

(5) Replace blades in as-received position as annotated in log book.

(6) Check balance, if necessary.

(7) Rebalance rotor assembly, if necessary.

B. Module 02 - IP Compressor

Item

(1) Visually inspect for obvious damage.

(2) The following Repair Scheme is recommended for embodiment:

HRS3390 — IP compressor inlet guide vane - Re-apply filler material. (To prevent secondary IP compressor damage due to hard filler release.)

C. Module 03 - HP Compressor

Item

(1) Check HP rotor for freedom of rotation.

(2) Check bleed valve hardware for binding, corrosion, wear, damage, freedom of movement.

(3) Visually inspect for obvious damage and excessive corrosion.

(4) The following Service Bulletins and Non-Modification Service Bulletins are recommended for embodiment:

72-1485 Non-Mod Service Bulletin — Engine - HP turbine/HP compressor shaft spline flank wear inspection.

72-1496 Non-Mod Service Bulletin — Engine - HP compressor stage 7 and 12 air off-take clamp inspection.

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72-1498 Engine - HP rotor thrust bearing housing assembly - Introduction of revised retaining and locking features for the HP compressor outlet guide vane and outer seal spacer.

72-A1653 Engine - High Pressure (HP) compressor vanes stages 4 to 11 - Introduction of a new setting procedure to increase the minimum vane tip clearance.

72-1665 Engine - High Pressure (HP) turbine rotor discs and shaft and HP compressor rotor - Improved lubrication for the HP compressor shaft and HP turbine shaft mating splines.

72-1704 Engine - Air guide tube drive shaft and fittings - High Pressure (HP) compressor - Introduction of revised torque tightening procedure for the Low Pressure (LP) thrust bearing outer ring spanner nut.

72-A1740 Non-Mod Service Bulletin Engine - High Pressure (HP) compressor rotor discs - Decrease of time limits manual maximum approved lives of the HP compressor stages 1, 3, 6, 7 and 12 rotor discs.

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D. Module 04 - Combustion and HP Turbine

Item

(1) Remove module from engine.

(2) Visually inspect for obvious damage.

(3) Strip module as per Engine Manual.

(4) Overhaul module as per Engine Manual.

(5) The following Service Bulletins and Non-Modification Service Bulletins are recommended for embodiment:

72-1143 Engine - High energy igniter adaptors - Revised procedure for setting igniter immersion depth. (To extend igniter life.)

72-1327 Engine - HP turbine rotor discs and shafts - HP turbine shaft and coupling with hard coated abutment faces. (To prevent wear to spline and faces.)

72-1485 Non-Mod Service Bulletin Engine - HP turbine/HP compressor shaft spline flank wear inspection.

72-A1676 Non-Mod Service Bulletin Engine - High Pressure (HP) turbine rotor - HP turbine stage 1 disc reduced safe cyclic life - Engine management.

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72-1825 Non-Mod Service Bulletin — Engine - High Pressure (HP) turbine rotor discs and shaft - replacement of potential non-conforming parts of the HP turbine shaft - Non-Modification Service Bulletin.

(6) Re-assemble module in accordance with Engine Manual.

E. Module 05 - LP Turbine

Item

(1) Remove module from engine.

(2) Visually inspect for obvious damage.

(3) Rework to Engine Manual as necessary.

(4) Crack test engine mount rear links.

(5) The following Service Bulletins and Non-Modification Service Bulletin are recommended for embodiment:

72-1160 — Engine - LP turbine bearing support - Application of jointing compound to bearing support flange and overspeed control arm body mating faces. (To prevent oil leakage.)

72-1195 — Engine - LP turbine case and vanes - LP turbine interstage seals with increased tolerances and improved anti-frettage coating. (To prevent rubs and fast rundown times.)

72-1358 — Engine - LP turbine case and vanes - Re-introduction of three piece intrascope blanking plug assembly at LP1 and LP3 nozzle guide vane positions. (To prevent secondary LP turbine damage due to intrascope blanking plug failure.)

72-1364 — Engine - LP turbine rotor discs and shaft - Rear oil tube steady with reduced outside diameter. (To prevent seizure of the rear oil tube within the air guide tube eliminating failures at the rear oil tube and ensuring satisfactory operation of the emergency fuel shut-off cock mechanism.)

72-1366 Part 1 only — Engine - LP nozzle case and vanes - Introduction of front and rear nozzle cases in revised material. (Inco 718.)

72-A1524 — Engine - LP turbine discs stage 2 and stage 3 - Inspection requirements due to potential corrosion.

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72-1557 Non-Mod Service Bulletin — Engine - Low Pressure (LP) turbine rotor discs - Sample inspection requirements for Tay Operators.

F. Module 06 - HS Gearbox

Item

(1) Visually inspect gearbox mounts, link and accessory features.

(2) Inspect for signs of oil leakage.

(3) Clean accessory mount pads.

(4) The following Non-Modification Service Bulletin is recommended for embodiment:

72-1401 Non-Mod Service Bulletin — Engine - High speed gearbox HSGB - Inspection and re-lubrication of starter drive splines.

G. Module 07 - Intermediate Casing

Item

(1) Inspect intermediate case for damage, corrosion and general condition.

(2) Inspect Inlet Guide Vane (IGV) actuating mechanism for freedom of movement and range of travel.

(3) Inspect engine trunnion mounting flange bore location for damage.

(4) Inspect intermediate case mounting lug for damage.

(5) Rework to Engine Manual as necessary.

(6) The following Service Bulletin and Non-Modification Service Bulletins are recommended for embodiment:

72-1296 Non-Mod Service Bulletin — Engine - Replacement of high speed gearbox drive driven bevel gearshaft JR27127. (To ensure that low fatigue strength gearshafts are removed from service.)

72-1341 Non-Mod Service Bulletin — Engine - Replacement of high speed gearbox drive driven bevel gearshaft JR27127. (To ensure that low fatigue strength gearshafts are removed from service.)

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72-1480 Engine high speed gearbox driving assembly - Introduction of increased torque on the internal gearbox bevel gear retaining nut.

(7) Re-assemble module in accordance with Engine Manual.

H. Non-Modular Items

Item

(1) Inspect nose cone spinner and fairing.

(2) Inspect rubber tip nose cap.

(3) Inspect LP compressor case assembly.

Crack test engine mount taper pins and adaptors.

Crack test engine front (trunnion) mount.

(4) Inspect clamps for missing or deteriorated rubber cushions. Replace as necessary.

(5) Inspect transmitters, switches, thermocouples and electrical connectors for general condition and security.

(6) Inspect engine by-pass ducts for general condition.

(7) Inspect LP exhaust mixer for general condition.

(8) Inspect Engine Fuel Shut-Off (EFSO) cable assembly for strands integrity.

(9) Check main oil filter, scavenge filters and magnetic chip detectors and pop-up indicator.

(10) Check IGV freedom and do a bleed valve pull-off check.

(11) Discard the fuel tube of pre Service Bulletin 73-1194 standard or pre Service Bulletin 73-1592 standard and replace it with the fuel tube of post Service Bulletin 73-1592 standard.

(12) The following Service Bulletins and Non-Modification Service Bulletins are recommended for embodiment:

71-1110 Power plant - Drain tubes and fittings - Restrictor plate fitted in internal gearbox to drains tank vent line. (To prevent fuel leakage from overboard vent.)

72-1383 Engine - Intermediate bypass duct - Introduction of revised clipping of HE igniter leads.

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72-1429 Engine - LP compressor rotating fairing - Introduction of revised nose cone fairing assembly produced by super plastic blow forming. (Supersedes Service Bulletin 72-1376.)

72-1638 Non-Mod Service Bulletin Engine - Low Pressure (LP) compressor case and vanes - Repeat visual inspection of the ice impact panels and instruction of minimum ice impact panel configuration on installed engines.

Note: The Non-Modification Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

72-A1643 Engine - Low Pressure (LP) compressor case and vanes - Introduction of modified ice impact panels with additional retention features.

Note: The Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

73-1165 Non-Mod Service Bulletin Engine - Fuel and control - Inspection of fuel flow regulator scheduling governor housing seal plate. (To ensure there are no units in service with unsupported rubber seal.)

73-1192 Engine - Fuel and control - Introduction of thicker washers at the FFR to LP governor fuel tube connector (FFR end). (To prevent potential fuel leak.)

73-1194 Part 1 to Part 3 Engine - Fuel and control - Introduction of modified connectors to LP fuel system. (To prevent connector frettage and fuel leaks.)

Note: Part 4 of Service Bulletin 73-1194 must not be embodied as it is superseded by the embodiment of Service Bulletin 73-1592.

73-1464 Fuel and control - Fuel manifold - Airspray fuel burners - Introduction of fuel manifold connectors with increased central external diameter.

73-1592 Engine fuel and control - Fuel system tubes - Introduction of a fuel flowmeter to HP fuel pump tube assembly with a new routing and installation.

76-1139 Engine controls - Control linkage - Redesigned throttle relay lever and support bracket. (To provide a more robust location for PLA transducer.)

76-1203 Engine controls - Control linkage - Throttle relay lever with relief for PLA transducer. (To alleviate rotor and bearing wear and inaccurate readings.)

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76-1208 Engine controls - Control linkage - Introduction of throttle relay lever mounting bracket with increased clearance for aircraft control rod.

76-1319 Non-Mod Service Bulletin Engine controls - Adjustment of the spindle retaining plate on the throttle relay lever bracket to prevent oscillation of the spindle. (To prevent throttle stagger and low EPR on take-off and minimize wear on bracket assemblies.)

76-1434 Non-Mod Service Bulletin Emergency fuel shut off system - Inspection of emergency fuel shut off cable.

76-1466 Engine controls - LP shaft failure system - Introduction of pulley wheel at EFSO cable rear guide location.

79-1089 Oil - Oil filter differential pressure indicator - Seal rings fitted at indicator electrical connector. (To eliminate false warnings from differential pressure switch.)

79-1411 Oil - Oil-Tank - Introduction of revised oil tank assembly with deleted fuel pipe support bracket.

I. Accessories

Item

(1) Overhaul fuel spray nozzles.

(2) Test and inspect TGT thermocouples.

(3) Test and inspect TGT thermocouple harness.

(4) Remove existing grease and debris from splines of starter quillshaft.

NOTE: Care must be taken when applying fresh grease to the splines as too much grease can result in an end load on the starter drive front bearing and cause the bearing to fail.

(5) Replace the two spherical bearings (72-35-23, 03-170) and (75-32-09, 07-110) of the Airflow Control Regulator (AFCR) connecting link assembly.

(6) The following Service Bulletins and Non-Modification Service Bulletins are recommended for embodiment:

36-1325 Pneumatic system - HP bleed valve sensing switch - Introduction of integral plunger action switch. (To eliminate the possibility of manipulation of the actuating arm or deformation due to incorrect gap adjustment thus ensuring correct selection of stage 7 to stage 12 HP engine bleed.)

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73-1166 Engine - Fuel and control - Fuel flow regulator - Introduction of a Spey type lever housing seal plate. (To eliminate the possibility of overboard fuel leak.)

73-1207 Engine - Fuel and control - Fuel flow regulator - Revised variable metering orifice (VMO) by-pass adjuster. (To ensure no engines are in service with incorrect VMO by-pass adjuster.)

73-1220 Non-Mod Service Bulletin Engine - Fuel and control - Inspection of fuel flow regulator for pilot burner simulator fault.

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73-1280 Engine - Fuel and control - Shut-off cock - Introduction of a shut-off cock with the cold start facility deleted. (To prevent 'hot' starts due to inadvertent selection of cold start fuel flow.)

73-1315 Engine - Fuel and control - Fuel flow regulator - Introduction of increased reverse thrust. (To maintain maximum (emergency) reverse thrust with the introduction of Fokker aircraft modification F100-78-010.)

73-1459 Non-Mod Service Bulletin Engine - Fuel and control - Fuel flow regulator - Revision to the in-service life of the fuel flow regulator.

75-1275 Air - Airflow control regulator - Rear mount bracket and piston push rod machined to increase clearance with adjacent parts. (To prevent fouls with AFCR linkage.)

75-1278 Air - Airflow control regulator - Revised whirl scheduling limits for HP inlet guide vanes.

77-1267 Engine indicating - Oil pressure transmitter - Introduction of kulite oil pressure transmitter with output transient overload protection.

(7) Check the FFR drive end coupling end float. The coupling should move freely inwards under hand pressure. If there is no movement the drive end is to be removed for incorporation of Service Bulletin 73-1211.

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APPENDIX 9

ADDITIONAL CALENDAR LIFE REWORK PACKAGE

EFFECTIVITY – TAY 650–15

Calendar Life Rework

To release engines for a further period of 10 years the following work package should be incorporated in addition to the work package detailed in Appendix 8. This package will be developed with service experience.

A. Module 01 – LP Compressor

Not applicable.

B. Module 02 – IP Compressor

Item

(1) Remove module from engine.

(2) Perform interface inspection on interface with Module 07.

(3) Strip module sufficiently to allow visual inspection of stator vane locating rings (if Service Bulletin 72-1252 Part 2 is not incorporated) and IP compressor shaft.

(4) Rework to Engine Manual as necessary.

(5) The following Service Bulletin is recommended for embodiment (if Service Bulletin 72-1252 Part 2 is not incorporated):

72-1252 Part 1	Engine – IP compressor air splitter and inlet guide vanes – Splitter fairing and stator retaining rings with improved corrosion protection. (To prevent corrosion cracking of splitter fairing and stator retaining rings.)

(6) Re-assemble module in accordance with Engine Manual.

C. Module 03 – HP Compressor

Item

(1) Remove module from engine.

(2) Strip module sufficiently to allow visual inspection of all Group A components.

(3) Inspect HP compressor case assembly.

(4) Rework to Engine Manual as necessary.

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R (5) The following Non-Modification Service Bulletin is recommended for
R embodiment only if possible without additional disassembly:

R 72-1838 Engine - High Pressure (HP) compressor discs, blades and spacers
R Non-Mod - Borescope inspection of the HP compressor stage 5 rotor disc
R Service for undercut and holes.
R Bulletin

(6) Re-assemble module in accordance with Engine Manual.

D. Module 04 - Combustion and HP Turbine

Not applicable.

E. Module 05 - LP Turbine

Item

(1) Remove module from engine.

(2) Strip module sufficiently to allow visual inspection of all Group A components.

F. Module 06 - HS Gearbox

Not applicable.

G. Module 07 - Intermediate Casing

(1) The following Service Bulletin is recommended for embodiment:

72-1399 Engine - Intermediate case assembly - Front flange bore - Additional corrosion protection. (Epoxy barrier coating into OGV location bore to provide insulation between the magnesium and titanium components.)

H. Non-Modular Items

Not applicable.

I. Accessories

The following units require rework:

(1) Airflow Control Regulator and Actuator

Item

(a) Remove unit from engine.

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(b) Disassemble sufficiently to replace the diaphragm (75-32-05, 03-435), the piston seal rings (75-32-06, 05-470 and 05-490) and the felt piston wiper washer (75-32-06, 05-510).

(c) Rebuild and test.

(d) Re-install unit on engine.

(2) RPM Signal Generator

Item

(a) Remove unit from engine.

(b) Disassemble sufficiently to replace the diaphragm.

(c) Rebuild and test.

(d) Re-install unit on engine.

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APPENDIX 10

FULL OVERHAUL

EFFECTIVITY - TAY 650-15

At 8000 hours from new or overhaul or 4000 hours from mid-life rework, an overhaul is required as detailed below.

R Recommendations for maintenance and overhaul of engine mounted accessory units are
R given in Appendix 5.

Accessory units that have been fitted to an engine at intermediate time require to have their lives tracked to ensure that they are overhauled at the required interval.

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A. Overhaul

(1) Inspect and rework all modules, accessories and other non-modular items in accordance with the Engine Manual.

NOTE: Care must be taken when applying fresh grease to the splines of the HS gearbox starter drive shaft and the starter quillshaft. Too much grease can result in an end load on the starter drive front bearing and cause the bearing to fail.

(2) Replace the two spherical bearings (72-35-23, 03-170) and (75-32-09, 07-110) of the Airflow Control Regulator (AFCR) connecting link assembly.

(3) Replace the two bushes (75-32-08, 06-530) of the AFCR rear mount assembly.

(4) Discard the fuel tube of pre Service Bulletin 73-1194 standard or pre Service Bulletin 73-1592 standard and replace it with the fuel tube of post Service Bulletin 73-1592 standard.

(5) Replace the starter idler gearshaft (72-61-18, 10-040).

(6) The following Service Bulletins and Non-Modification Service Bulletins are recommended for embodiment:

72-1121	Engine - HP compressor rotor - Disc spacers with Sermetel W protective coating replacing PL101. (To improve anti-corrosion protection.)
72-1230	Engine - Internal gearbox - Rear bearing housing with increased diameter chamfer.
72-1296 Non-Mod Service Bulletin	Engine - Replacement of high speed gearbox drive driven bevel gearshaft JR27127. (To ensure that low fatigue strength gearshafts are removed from service.)

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72-1341 Non-Mod Service Bulletin	Engine - Replacement of high speed gearbox drive driven bevel gearshaft JR27127. (To ensure that low fatigue strength gearshafts are removed from service.)
72-1366 Part 1 only	Engine - LP nozzle case and vanes - Introduction of front and rear nozzle cases in revised material. (Inco 718.)
72-1401 Non-Mod Service Bulletin	Engine - High speed gearbox HSGB - Inspection and re-lubrication of starter drive splines.
72-1429	Engine - LP compressor rotating fairing - Introduction of revised nose cone fairing assembly produced by super plastic blow forming. (Supersedes Service Bulletin 72-1376.)
72-1442 Non-Mod Service Bulletin	Engine - Fan blades - Ultrasonic inspection of fan blade roots.
72-1458	Engine - HP compressor rear shaft and fittings - Introduction of HP compressor rear rotor shaft and sleeve assembly with eight oil feed holes blanked.
72-1472	Engine - Generator drive shaft and bevel gear shaft assemblies - High speed gearbox dee head bolt material and torque tightening setting change.
72-1498	Engine - HP rotor thrust bearing housing assembly - Introduction of revised retaining and locking features for the HP compressor outlet guide vane and outer seal spacer.
72-1499	Engine - High speed gearbox driving gear assembly - Internal gearbox - Interference fit of drive shaft and bevel gear.
72-A1524	Engine - LP turbine discs stage 2 and stage 3 - Inspection requirements due to potential corrosion.
72-1528	Engine - LP compressor rotating fairing - Introduction of an LP compressor rotor spinner assembly with a dowel pin installed in the spinner flange.
72-1557 Non-Mod Service Bulletin	Engine - Low Pressure (LP) turbine rotor discs - Sample inspection requirements for Tay Operators.

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72-1603 Non-Mod Service Bulletin — Engine - Low Pressure (LP) compressor (fan) blades - Instruction of a repair to the LP compressor (fan) blades leading edge profile.

72-1638 Non-Mod Service Bulletin — Engine - Low Pressure (LP) compressor case and vanes - Repeat visual inspection of the ice impact panels and instruction of minimum ice impact panel configuration on installed engines.

Note: The Non-Modification Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

72-A1643 — Engine - Low Pressure (LP) compressor case and vanes - Introduction of modified ice impact panels with additional retention features.

Note: The Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

72-A1653 — Engine - High Pressure (HP) compressor vanes stages 4 to 11 - Introduction of a new setting procedure to increase the minimum vane tip clearance.

72-1665 — Engine - High Pressure (HP) turbine rotor discs and shaft and HP compressor rotor - Improved lubrication for the HP compressor shaft and HP turbine shaft mating splines.

72-A1676 Non-Mod Service Bulletin — Engine - High Pressure (HP) turbine rotor - HP turbine stage 1 disc reduced safe cyclic life - Engine management.

72-1704 — Engine - Air guide tube drive shaft and fittings - High Pressure (HP) compressor - Introduction of revised torque tightening procedure for the Low Pressure (LP) thrust bearing outer ring spanner nut.

72-A1740 Non-Mod Service Bulletin — Engine - High Pressure (HP) compressor rotor discs - Decrease of time limits manual maximum approved lives of the HP compressor stages 1, 3, 6, 7 and 12 rotor discs.

72-A1782 Non-Mod Service Bulletin — Engine - Low Pressure (LP) compressor rotor blades - Instruction of a repair to the LP compressor (fan) blade leading edge profile.

72-1787 Non-Mod Service Bulletin — Engine - Low Pressure (LP) compressor rotor blades - Measurement of the chordal width and the leading edge thickness of selected compressor (fan) blades.

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	72-1825 Non-Mod Service Bulletin	Engine - High Pressure (HP) turbine rotor discs and shaft - replacement of potential non-conforming parts of the HP turbine shaft - Non-Modification Service Bulletin.
R R R R	72-1838 Non-Mod Service Bulletin	Engine - High Pressure (HP) compressor discs, blades and spacers - Borescope inspection of the HP compressor stage 5 rotor disc for undercut and holes.
	73-1131	Engine - Fuel and control - Fuel flow regulator - Introduction of a test schedule amendment of redefine setting of the minimum flow stop. (To prevent slow accelerations and surge during severe handling conditions.)
	73-1165 Non-Mod Service Bulletin	Engine - Fuel and control - Inspection of fuel flow regulator scheduling governor housing seal plate. (To ensure there are no units in service with unsupported rubber seal.)
	73-1166	Engine - Fuel and control - Fuel flow regulator - Introduction of a Spey type lever housing seal plate. (To eliminate the possibility of overboard fuel leak.)
	73-1167	Engine - Fuel and control - Fuel flow regulator - Introduction of idle reset adjuster mounting bolts with wire locking holes.
	73-1194 Part 1 to Part 3	Engine - Fuel and control - Introduction of modified connectors to LP fuel system. (To prevent connector frettage and fuel leaks.)

Note: Part 4 of Service Bulletin 73-1194 must not be embodied as it is superseded by the embodiment of Service Bulletin 73-1592.

	73-1207	Engine - Fuel and control - Fuel flow regulator - Revised variable metering orifice (VMO) by-pass adjuster. (To ensure no engines are in service with incorrect VMO by-pass adjuster.)
	73-1210	Engine - Fuel and control - Fuel flow regulator - Introduction of a reduced variable metering orifice (VMO) push rod end float and improvement to the VMO and acceleration control unit (ACU) plunger and sleeves. (To improve unit reliability.)
	73-1211	Engine - Fuel and control - Fuel flow regulator - Introduction of modified input drive seal retainer. (To provide greater wear resistance and prevent fuel leakage.)
	73-1213	Engine - Fuel and control - Fuel flow regulator - Introduction of a two piece slider block and pin assembly. (For unit improvement with respect of engine speed for a given throttle lever position.)

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73-1217	Engine - Fuel and control - Fuel flow regulator - Introduction of revised design standard of reach nut. (To improve unit reliability by preventing ACU governor movement.)
73-1219	Engine - Fuel and control - Fuel flow regulator - Introduction of an increased clearance dashpot piston within the scheduling governor. (To improve unit reliability.)
73-1220 Non-Mod Service Bulletin	Engine - Fuel and control - Inspection of fuel flow regulator for pilot burner simulator fault.
73-1281	Engine - Fuel and control - Fuel flow regulator - Introduction of a fuel flow regulator with solutions to eliminate calibration shift.
73-1301	Engine - Fuel and control - Fuel flow regulator - Introduction of a fuel flow regulator with a revised ACU governor weight arm. (To improve unit reliability by preventing arm failure.)
73-1322	Engine - Fuel and control - Fuel flow regulator - Introduction of a fuel flow regulator with a revised double datum idle design.
73-1459 Non-Mod Service Bulletin	Engine - Fuel and control - Fuel flow regulator - Revision to the in-service life of the fuel flow regulator.
73-1592	Engine fuel and control - Fuel system tubes - Introduction of a fuel flowmeter to HP fuel pump tube assembly with a new routing and installation.
75-1278	Air - Airflow control regulator - Revised whirl scheduling limits for HP inlet guide vanes.
76-1346	Engine controls - Control linkage - Throttle relay lever support bracket with locked spindle.
76-1434 Non-Mod Service Bulletin	Emergency fuel shut off system - Inspection of emergency fuel shut off cable.
76-1466	Engine controls - LP shaft failure system - Introduction of pulley wheel at EFSO cable rear guide location.
77-1267	Engine indicating - Oil pressure transmitter - Introduction of kulite oil pressure transmitter with output transient overload protection.

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79-1426 Oil - Engine gaskets - Introduction of gasket material change to Klingersil C4430.

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APPENDIX 11

MID-LIFE REWORK

EFFECTIVITY - TAY 651-54

At 4000 hours from new, or overhaul, a rework is required as detailed below.

The rework package will be developed with service experience.

Any component(s) inspected and found to be in excess of Engine Manual limits, may warrant further inspection, engine strip or rework other than that stated in this work package.

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R Recommendations for maintenance and overhaul of engine mounted accessory units are
R given in Appendix 5.

R Accessory units that have been fitted to an engine at intermediate time require to
R have lives tracked to ensure that they are overhauled at the required interval.

A. Module 01 - LP Compressor

Item

(1) Visually inspect for obvious damage.

(2) Remove fan blades from disc and inspect in accordance with following Non-Modification Service Bulletins:

72-1442 Non-Mod Service Bulletin	Engine - Fan blades - Ultrasonic inspection of fan blade roots.
72-1603 Non-Mod Service Bulletin	Engine - Low Pressure (LP) compressor (fan) blade - Instruction of a repair to the LP compressor (fan) blade leading edge profile.

(3) The following Service Bulletin is recommended for embodiment:

72-1528	Engine - LP compressor rotating fairing - Introduction of an LP compressor rotor spinner assembly with a dowel pin installed in the spinner flange.
72-A1782 Non-Mod Service Bulletin	Engine - Low Pressure (LP) compressor rotor blades - Instruction of a repair to the LP compressor (fan) blade leading edge profile.

(4) Rework in accordance with Engine Manual as necessary. Accomplishment of Repair Scheme HRS3629 LPC rotor blade - Restore L/E profile is recommended.

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(5) Replace blades in as-received position as annotated in log book.

(6) Check balance, if necessary.

(7) Rebalance rotor assembly, if necessary.

B. Module 02 - IP Compressor

Item

(1) Visually inspect for obvious damage.

(2) The following Repair Scheme is recommended for embodiment:

HRS3390 IP compressor inlet guide vane - Re-apply filler material. (To prevent secondary IP compressor damage due to hard filler release.)

C. Module 03 - HP Compressor

Item

(1) Check HP rotor for freedom of rotation.

(2) Check bleed valve hardware for binding, corrosion, wear, damage, freedom of movement.

(3) Visually inspect for obvious damage and excessive corrosion.

(4) The following Service Bulletins and Non-Modification Service Bulletin are recommended for embodiment:

72-1496 Non-Mod Service Bulletin — Engine - HP compressor stage 7 and 12 air off-take clamp inspection.

72-1498 — Engine - HP rotor thrust bearing housing assembly - Introduction of revised retaining and locking features for the HP compressor outlet guide vane and outer seal spacer.

72-A1653 — Engine - High Pressure (HP) compressor vanes stages 4 to 11 - Introduction of a new setting procedure to increase the minimum vane tip clearance.

72-1665 — Engine - High Pressure (HP) turbine rotor discs and shaft and HP compressor rotor - Improved lubrication for the HP compressor shaft and HP turbine shaft mating splines.

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72-1704 Engine - Air guide tube drive shaft and fittings - High Pressure (HP) compressor - Introduction of revised torque tightening procedure for the Low Pressure (LP) thrust bearing outer ring spanner nut.

D. Module 04 - Combustion and HP Turbine

Item

(1) Remove module from engine.

(2) Visually inspect for obvious damage.

(3) Strip module as per Engine Manual.

(4) Overhaul module as per Engine Manual.

(5) The following Service Bulletin and Non-Modification Service Bulletin are recommended for embodiment:

72-1327 Engine - HP turbine rotor discs and shafts - HP turbine shaft and coupling with hard coated abutment faces. (To prevent wear to spline and faces.)

72-A1676 Non-Mod Service Bulletin Engine - High Pressure (HP) turbine rotor - HP turbine rotor stage 1 disc reduced safe cyclic life - Engine management.

72-1825 Non-Mod Service Bulletin Engine - High Pressure (HP) turbine rotor discs and shaft - replacement of potential non-conforming parts of the HP turbine shaft -Non-Modification Service Bulletin.

(6) Re-assemble module in accordance with Engine Manual.

E. Module 05 - LP Turbine

Item

(1) Remove module from engine.

(2) Visually inspect for obvious damage.

(3) Rework to Engine Manual as necessary.

(4) Crack test engine mount rear links.

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(5) The following Service Bulletins and Non-Modification Service Bulletin are recommended for embodiment:

72-1358	Engine - LP turbine case and vanes - Re-introduction of three piece intrascope blanking plug assembly at LP1 and LP3 nozzle guide vane positions. (To prevent secondary LP turbine damage due to intrascope blanking plug failure.)
72-1364	Engine - LP turbine rotor discs and shaft - Rear oil tube steady with reduced outside diameter. (To prevent seizure of the rear oil tube within the air guide tube eliminating failures at the rear oil tube and ensuring satisfactory operation of the emergency fuel shut-off cock mechanism.)
72-1366 Part 1 only	Engine - LP nozzle case and vanes - Introduction of front and rear nozzle cases in revised material. (Inco 718.)
72-A1524	Engine - LP turbine discs stage 2 and stage 3 - Inspection requirements due to potential corrosion.
72-1557 Non-Mod Service Bulletin	Engine - Low Pressure (LP) turbine rotor discs - Sample inspection requirements for Tay Operators.

F. Module 06 - HS Gearbox

Item

(1) Visually inspect gearbox mounts, link and accessory features.

(2) Inspect for signs of oil leakage.

(3) Clean accessory mount pads.

(4) The following Service Bulletin and Non-Modification Service Bulletin are recommended for embodiment:

72-1401 Non-Mod Service Bulletin	Engine - High speed gearbox HSGB - Inspection and re-lubrication of starter drive splines.
72-1492 Non-Mod Service Bulletin	Engine - Auxiliary gearbox assembly. (To ensure designated engines have parts exchanged.)

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72-1585 Engine - High speed gearbox - Introduction of new bolts with increased torque value for the auxiliary gearbox constant speed drive bearing outer races.

G. Module 07 - Intermediate Casing

Item

(1) Inspect intermediate case for damage, corrosion and general condition.

(2) Inspect Inlet Guide Vane (IGV) actuating mechanism for freedom of movement and range of travel.

(3) Inspect engine trunnion mounting flange bore location for damage.

(4) Inspect intermediate case mounting lug for damage.

(5) Rework to Engine Manual as necessary.

(6) The following Service Bulletin and Non-Modification Service Bulletins are recommended for embodiment:

72-1296 Non-Mod Service Bulletin — Engine - Replacement of high speed gearbox drive driven bevel gearshaft JR27127. (To ensure that low fatigue strength gearshafts are removed from service.)

72-1341 Non-Mod Service Bulletin — Engine - Replacement of high speed gearbox drive driven bevel gearshaft JR27127. (To ensure that low fatigue strength gearshafts are removed from service.)

72-1480 Engine high speed gearbox driving assembly - Introduction of increased torque on the internal gearbox bevel gear retaining nut.

(7) Re-assemble module in accordance with Engine Manual.

H. Non-Modular Items

Item

(1) Inspect nose cone spinner and fairing.

(2) Inspect rubber tip nose cap.

(3) Inspect LP compressor case assembly.

Crack test engine mount taper pins and adaptors.

Crack test engine front (trunnion) mount.

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(4) Inspect clamps for missing or deteriorated rubber cushions. Replace as necessary.

(5) Inspect transmitters, switches, thermocouples and electrical connectors for general condition and security.

(6) Inspect engine by-pass ducts for general condition.

(7) Inspect LP air offtake panel (ATA Chapter 72-71-02, IPC Fig/Item No. 02-400) for signs of delamination.

(8) Inspect LP exhaust mixer for general condition.

(9) Inspect Engine Fuel Shut-Off (EFSO) cable assembly for strands integrity.

(10) Check main oil filter, scavenge filters and magnetic chip detectors and pop-up indicator.

(11) Check IGV freedom and do a bleed valve pull-off check.

(12) Discard the fuel tube of pre Service Bulletin 73-1194 standard or pre Service Bulletin 73-1592 standard and replace it with the fuel tube of post Service Bulletin 73-1592 standard.

(13) The following Service Bulletins and Non-Modification Service Bulletins are recommended for embodiment:

71-1110	Power plant - Drain tubes and fittings - Restrictor plate fitted in internal gearbox to drains tank vent line. (To prevent fuel leakage from overboard vent.)
71-1508	Power plant electrical harness (light duty) LT harness loom B. (To ensure terminal tags are correctly identified.)
72-1429	Engine - LP compressor rotating fairing - Introduction of revised nose cone fairing assembly produced by super plastic blow forming. (Supersedes Service Bulletin 72-1376.)
72-1638 Non-Mod Service Bulletin	Engine - Low Pressure (LP) compressor case and vanes - Repeat visual inspection of the ice impact panels and instruction of minimum ice impact panel configuration on installed engines.

Note: The Non-Modification Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

72-A1643	Engine - Low Pressure (LP) compressor case and vanes - Introduction of modified ice impact panels with additional retention features.

Note: The Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

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73-1194 Part 1 to Part 3 — Engine - Fuel and control - Introduction of modified connectors to LP fuel system. (To prevent connector frettage and fuel leaks.)

Note: Part 4 of Service Bulletin 73-1194 must not be embodied as it is superseded by the embodiment of Service Bulletin 73-1592.

73-1464 — Fuel and control - Fuel manifold - Airspray fuel burners - Introduction of fuel manifold connectors with increased central external diameter.

73-1592 — Engine fuel and control - Fuel system tubes - Introduction of a fuel flowmeter to HP fuel pump tube assembly with a new routing and installation.

76-1434 Non-Mod Service Bulletin — Emergency fuel shut off system - Inspection of emergency fuel shut off cable.

76-1466 — Engine controls - LP shaft failure system - Introduction of pulley wheel at EFSO cable rear guide location.

I. Accessories

Item

(1) Overhaul fuel spray nozzles.

(2) Test and inspect TGT thermocouples.

(3) Test and inspect TGT thermocouple harness.

(4) Remove existing grease and debris from splines of starter quillshaft.

NOTE: Care must be taken when applying fresh grease to the splines as too much grease can result in an end load on the starter drive front bearing and cause the bearing to fail.

(5) Replace the two spherical bearings (72-35-23, 03-170) and (75-32-09, 07-110) of the Airflow Control Regulator (AFCR) connecting link assembly.

(6) The following Service Bulletins are recommended for embodiment:

73-1280 — Engine - Fuel and control - Shut-off cock - Introduction of a shut-off cock with the cold start facility deleted. (To prevent 'hot' starts due to inadvertent selection of cold start fuel flow.)

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73-1476 Fuel - Fuel control system - Introduction of LP fuel system pressure relief valve and associated installation items. (Service Bulletin 73-1491 must be accomplished concurrent to realise full design intent.)

73-1491 Fuel - Fuel control system - Additional material requirement for accomplishment of LP fuel pressure relief valve system. (Must be accomplished concurrently with Service Bulletin 73-1476.)

74-1427 Ignition - High energy ignition box - Ignition mounting box modifications.

74-1428 Ignition - External High energy ignition leads - Introduction of revised high energy ignition leads.

75-1269 Air - Airflow control regulator - Revised whirl scheduling limits for HP inlet guide vanes.

75-1275 Air - Airflow control regulator - Rear mount bracket and piston push rod machined to increase clearance with adjacent parts. (To prevent fouls with AFCR linkage.)

(7) Check the FFR drive end coupling end float. The coupling should move freely inwards under hand pressure. If there is no movement the drive end is to be removed for incorporation of Service Bulletin 73-1211.

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APPENDIX 12

ADDITIONAL CALENDAR LIFE REWORK PACKAGE

EFFECTIVITY – TAY 651-54

Calendar Life Rework

To release engines for a further period of 10 years the following work package should be incorporated in addition to the work package detailed in Appendix 11. This package will be developed with service experience.

A. Module 01 – LP Compressor

Not applicable.

B. Module 02 – IP Compressor

Item

(1) Remove module from engine.

(2) Perform interface inspection on interface with Module 07.

(3) Strip module sufficiently to allow visual inspection of stator vane locating rings and all Group A components.

(4) Rework to Engine Manual as necessary.

(5) Re-assemble module in accordance with Engine Manual.

C. Module 03 – HP Compressor

Item

(1) Remove module from engine.

(2) Strip module sufficiently to allow visual inspection of all Group A components.

(3) Inspect HP compressor case assembly.

(4) Rework to Engine Manual as necessary.

(5) Re-assemble module in accordance with Engine Manual.

D. Module 04 – Combustion and HP Turbine

Not applicable.

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E. Module 05 - LP Turbine

(1) Remove module from engine.

(2) Strip module sufficiently to allow visual inspection of all Group A components.

F. Module 06 - HS Gearbox

Not applicable.

G. Module 07 - Intermediate Casing

(1) The following Service Bulletin is recommended for embodiment:

72-1399 Engine - Intermediate case assembly - Front flange bore - Additional corrosion protection. (Epoxy barrier coating into OGV location bore to provide insulation between the magnesium and titanium components.)

H. Non-Modular Items

Not applicable.

I. Accessories

The following units require rework:

(1) Airflow Control Regulator and Actuator

Item

(a) Remove unit from engine.

(b) Disassemble sufficiently to replace the diaphragm (75-32-05, 03-435), the piston seal rings (75-32-06, 05-470 and 05-490) and the felt piston wiper washer (75-32-06, 05-510).

(c) Rebuild and test.

(d) Re-install unit on engine.

(2) RPM Signal Generator

Item

(a) Remove unit from engine.

(b) Disassemble sufficiently to replace the diaphragm.

(c) Rebuild and test.

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(d) Re-install unit on engine.

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APPENDIX 13

FULL OVERHAUL

EFFECTIVITY - TAY 651-54

At 8000 hours from new or overhaul or 4000 hours from mid-life rework, an overhaul is required as detailed below.

R Recommendations for maintenance and overhaul of engine mounted accessory units are
R given in Appendix 5.

Accessory units that have been fitted to an engine at intermediate time require to have their lives tracked to ensure that they are overhauled at the required interval.

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A. Overhaul

(1) Inspect and rework all modules, accessories and other non-modular items in accordance with the Engine Manual.

NOTE: Care must be taken when applying fresh grease to the splines of the HS gearbox starter drive shaft and the starter quillshaft. Too much grease can result in an end load on the starter drive front bearing and cause the bearing to fail.

(2) Replace the two spherical bearings (72-35-23, 03-170) and (75-32-09, 07-110) of the Airflow Control Regulator (AFCR) connecting link assembly.

(3) Replace the two bushes (75-32-08, 06-530) of the AFCR rear mount assembly.

(4) Discard the fuel tube of pre Service Bulletin 73-1194 standard or pre Service Bulletin 73-1592 standard and replace it with the fuel tube of post Service Bulletin 73-1592 standard.

(5) Replace the starter idler gearshaft (72-61-18, 10-040).

(6) The following Service Bulletins and Non-Modification Service Bulletins are recommended for embodiment:

71-1508	Power plant electrical harness (light duty) LT harness loom B. (To ensure terminal tags are correctly identified.)
72-1296 Non-Mod Service Bulletin	Engine - Replacement of high speed gearbox drive driven bevel gearshaft JR27127. (To ensure that low fatigue strength gearshafts are removed from service.)
72-1341 Non-Mod Service Bulletin	Engine - Replacement of high speed gearbox drive driven bevel gearshaft JR27127. (To ensure that low fatigue strength gearshafts are removed from service.)

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72-1366 Part 1 only	Engine - LP nozzle case and vanes - Introduction of front and rear nozzle cases in revised material. (Inco 718.)
72-1401 Non-Mod Service Bulletin	Engine - High speed gearbox HSGB -Inspection and re-lubrication of starter drive splines.
72-1429	Engine - LP compressor rotating fairing - Introduction of revised nose cone fairing assembly produced by super plastic blow forming. (Supersedes Service Bulletin 72-1376.)
72-1442 Non-Mod Service Bulletin	Engine - Fan blades - Ultrasonic inspection of fan blade roots.
72-1458	Engine - HP compressor rear shaft and fittings - Introduction of HP compressor rear rotor shaft and sleeve assembly with eight oil feed holes blanked.
72-1472	Engine - Generator drive shaft and bevel gear shaft assemblies - High speed gearbox dee head bolt material and torque tightening setting change.
72-1492 Non-Mod Service Bulletin	Engine - Auxiliary gearbox assembly. (To ensure designated engines have parts exchanged.)
72-1498	Engine - HP rotor thrust bearing housing assembly - Introduction of revised retaining and locking features for the HP compressor outlet guide vane and outer seal spacer.
72-1499	Engine - High speed gearbox driving gear assembly - Internal gearbox - Interference fit of drive shaft and bevel gear.
72-A1524	Engine - LP turbine discs stage 2 and stage 3 - Inspection requirements due to potential corrosion.
72-1528	Engine - LP compressor rotating fairing - Introduction of an LP compressor rotor spinner assembly with a dowel pin installed in the spinner flange.
72-1557 Non-Mod Service Bulletin	Engine - Low Pressure (LP) turbine rotor discs - Sample inspection requirements for Tay Operators.

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72-1603 Non-Mod Service Bulletin — Engine - Low Pressure (LP) compressor (fan) blades - Instruction of a repair to the LP compressor (fan) blades leading edge profile.

72-1638 Non-Mod Service Bulletin — Engine - Low Pressure (LP) compressor case and vanes - Repeat visual inspection of the ice impact panels and instruction of minimum ice impact panel configuration on installed engines.

Note: The Non-Modification Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

72-A1643 — Engine - Low Pressure (LP) compressor case and vanes - Introduction of modified ice impact panels with additional retention features.

Note: The Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

72-A1653 — Engine - High Pressure (HP) compressor vanes stages 4 to 11 - Introduction of a new setting procedure to increase the minimum vane tip clearance.

72-1665 — Engine - High Pressure (HP) turbine rotor discs and shaft and HP compressor rotor - Improved lubrication for the HP compressor shaft and HP turbine shaft mating splines.

72-A1676 Non-Mod Service Bulletin — Engine - High Pressure (HP) turbine rotor - HP turbine stage 1 disc reduced safe cyclic life - Engine management.

72-1704 — Engine - Air guide tube drive shaft and fittings - High Pressure (HP) compressor - Introduction of revised torque tightening procedure for the Low Pressure (LP) thrust bearing outer ring spanner nut.

72-A1782 Non-Mod Service Bulletin — Engine - Low Pressure (LP) compressor rotor blades - Instruction of a repair to the LP compressor (fan) blade leading edge profile.

72-1825 Non-Mod Service Bulletin — Engine - Fuel and control - Introduction of modified connectors to LP fuel system. (To prevent connector frettage and fuel leaks.)

73-1194 Part 1 to Part 3 — Engine - Fuel and control - Introduction of modified connectors to LP fuel system. (To prevent connector frettage and fuel leaks.)

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Note: Part 4 of Service Bulletin 73-1194 must not be embodied as it is superseded by the embodiment of Service Bulletin 73-1592.

73-1281	Engine - Fuel and control - Fuel flow regulator - Introduction of a fuel flow regulator with solutions to eliminate calibration shift.
73-1301	Engine - Fuel and control - Fuel flow regulator - Introduction of a fuel flow regulator with a revised ACU governor weight arm. (To improve unit reliability by preventing arm failure.)
73-1322	Engine - Fuel and control - Fuel flow regulator - Introduction of a fuel flow regulator with a revised double datum idle design.
73-1592	Engine fuel and control - Fuel system tubes - Introduction of a fuel flowmeter to HP fuel pump tube assembly with a new routing and installation.
76-1434 Non-Mod Service Bulletin	Emergency fuel shut off system - Inspection of emergency fuel shut off cable.
76-1466	Engine controls - LP shaft failure system - Introduction of pulley wheel at EFSO cable rear guide location.
79-1426	Oil - Engine gaskets - Introduction of gasket material change to Klingersil C4430.

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Please use this form to give feedback on the quality of this Service Bulletin. The input you provide will be used to analyse areas of improvement and to take action to further improve the quality of our Service Bulletins.

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- Quality rating of the Illustration	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
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☐ 1.A.	☐ 1.I.	☐ 2.A.	☐ General
☐ 1.B.	☐ 1.J.	☐ 2.B.	☐ Get Access
☐ 1.C.	☐ 1.K.	☐ 2.C.	☐ Removal/Installation
☐ 1.D.	☐ 1.L.	☐ 2.D.	☐ Inspection
☐ 1.E.	☐ 1.M.	☐ 2.E.	☐ Test
☐ 1.F.	☐ 1.N.	☐ 2.F.	☐ Close the Access
☐ 1.G.	☐ 1.O.		☐ Log Book Entry
☐ 1.H	☐ 1.P.		

Explanatory notes:

Operator:	Overhaul Site:
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Date May 26/20

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TAY SERIES PROPULSION SYSTEM SERVICE BULLETIN

Export Control Rating: This technical information/software is not controlled under the German export control regulations.

This document transmits Revision 11 of Non-Modification Service Bulletin TAY-70-1050.

Document History

Non-Modification Service Bulletin Revision Status

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Revision 6	Dec.21/01
Revision 7	Jun. 9/05
Revision 8	Jan. 9/06
Revision 9	Jul.14/10
Revision 10	Dec. 9/19

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Non-Modification Service Bulletin Revision 11

Remove	Incorporate	Reason for change
All pages of the Non-Modification Service Bulletin.	Pages 1 to 9 Non-Modification Service Bulletin.	To add a reference to Appendix 5. To add fixed overhaul life and listed soft times to the Non-Modification Service Bulletin. To add some new Service Bulletins, some new Non-Modification Service Bulletin to Appendix 2, 2A, 4, 4A, 6, 7, 9 and 10. To delete some Service Bulletins, some Non-Modification Service Bulletins from Appendix 6, 7 and 10. To add a reference to Appendix 5 to Appendix 1, 2A, 3, 4A, 6, 7, 8, 10, 11 and 13. To add instructions to strip Module 04 HP turbine to Appendix 1. To add instructions to strip HP compressor rotor to Appendix 2. To add an instruction to do a borescope inspection of Module 02 IP compressor, instructions to strip HP compressor rotor and instructions to allow the inspection of the HP turbine discs to Appendix 2A. To change 24 table entries, to add fixed operational life hours and to add soft time requirements to Appendix 5. To delete a note from Appendix 2 and 2A. To add an instruction to replace the igniter plugs to Appendix 1, 2A and 6.
All pages of Appendix 1.	Pages 1 to 12 of Appendix 1.	To add a reference to Appendix 5 and an instruction to track the lives of accessory units. To add instructions to strip Module 04 HP turbine to expose the bladed HP turbine stage 1 and 2 discs, examine and repair specific parts. To delete a note from Appendix 2 and 2A. To add an instruction to replace the igniter plugs.

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Remove	Incorporate	Reason for change
All pages of Appendix 2.	Pages 1 to 3 of Appendix 2.	To add a new Non-Modification Service Bulletin. To add instructions to strip the HP compressor rotor and to delete a note.
All pages of Appendix 2A.	Pages 1 to 13 of Appendix 2A.	To add a new Non-Modification Service Bulletin. To add a reference to Appendix 5 and an instruction to track the lives of accessory units. To add an instruction to do a borescope inspection of Module 02 IP compressor, to add instructions to strip the HP compressor rotor, to add an instruction to allow the inspections of the HP turbine discs. To delete a note and minor editorial changes. To add an instruction to replace the igniter plugs.
All pages of Appendix 3.	Pages 1 to 10 of Appendix 3.	To add a reference to Appendix 5 and an instruction to track the lives of accessory units.
All pages of Appendix 4.	Pages 1 to 3 of Appendix 4.	To add a new Non-Modification Service Bulletin.
All pages of Appendix 4A.	Pages 1 to 12 of Appendix 4A.	To add a new Non-Modification Service Bulletin. To add a reference to Appendix 5 and an instruction to track the lives of accessory units.
All pages of Appendix 5.	Pages 1 to 5 of Appendix 5.	To change 24 table entries. To add fixed operational life hours and to add soft time requirements.
All pages of Appendix 6.	Pages 1 to 7 of Appendix 6.	To delete a Non-Modification Service Bulletin, to delete a Service Bulletin, to add a new Non-Modification Service Bulletin. To add a reference to Appendix 5. To add an instruction to replace the igniter plugs.

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Remove	Incorporate	Reason for change
All pages of Appendix 7.	Pages 1 to 6 of Appendix 7.	To delete a Service Bulletin, to add a new Non-Modification Service Bulletin. To add a reference to Appendix 5.
All pages of Appendix 8.	Pages 1 to 9 of Appendix 8.	To add a reference to Appendix 5 and an instruction to track the lives of accessory units.
All pages of Appendix 9.	Pages 1 to 3 of Appendix 9.	To add a new Non-Modification Service Bulletin.
All pages of Appendix 10.	Pages 1 to 6 of Appendix 10.	To delete a Service Bulletin, to add a new Non-Modification Service Bulletin. To add a reference to Appendix 5.
All pages of Appendix 11.	Pages 1 to 8 of Appendix 11.	To add a reference to Appendix 5 and an instruction to track the lives of accessory units.
All pages of Appendix 12.	Pages 1 to 3 of Appendix 12.	Not changed.
All pages of Appendix 13.	Pages 1 to 4 of Appendix 13.	To add a reference to Appendix 5.

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TAY LIFE MANAGEMENT - NON-AIRLINE ENGINES - NON-MODIFICATION SERVICE BULLETIN

WORK ORDER:

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1. Planning Information

A. Effectivity

Tay 611-8 Engines.

Tay 620-15 Engines.

Tay 650-15 Engines.

Tay 651-54 Engines.

B. Introduction

This Non-Modification Service Bulletin presents a basic engine life management programme suitable for the Tay engine in aircraft which are engaged in non-airline operations.

Revision 9 of this Non-Modification Service Bulletin had been issued to introduce a new High Pressure (HP) turbine stage 1 blade life. The recommended Service Bulletin lists had been reviewed and updated.

R Revision 10 of this Non-Modification Service Bulletin had been issued to update the recommended Service Bulletin lists. Some figure item numbers have been added to Appendix 6, Appendix 7, Appendix 10 and Appendix 13. The replacement of the piston seal rings (75-32-06, 05-470 and 05-490) and the felt piston wiper washer (75-32-06, 05-510) have been added when the Airflow Control Regulator and Actuator will be reworked. An instruction to either crack test or replace the fuel spray nozzles associated double ended unions at overhaul has been added to Appendix 1, Appendix 2A, Appendix 3 and Appendix 4A.

R Revision 11 of this Non-Modification Service Bulletin has been issued to
R update the recommended Service Bulletin lists. A reference to Appendix 5 has
R been added to Appendix 1, 2A, 3, 4A, 6, 7, 8, 10, 11 and 13. Instruction to
R replace the igniter plugs have been added to Appendix 1, 2A and 6. Instruction
R to strip Module 04 HP turbine have been added to Appendix 1. Instruction to
R strip the HP compressor rotor have been added to Appendix 2. An instruction to
R do a borescope inspection of the Module 02 IP compressor. Instruction to strip
R HP compressor rotor and instructions to allow the inspection of the HP turbine
R discs have been added to Appendix 2A. Fixed operational life hours and soft
R time requirements have been added to Appendix 5.

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C. Compliance

OPTIONAL

This Non-Modification Service Bulletin is introduced for information only.

D. General

NOTE: It is important to understand that the existence of this Non-Modification Service Bulletin does not automatically constitute authority to apply it. It is the responsibility of the Operator to gain any necessary approval from his national aviation authority.

R (1) The recommended overhaul life for the Tay engine is 8000 hours.
R Recommendations for maintenance and overhaul of engine mounted
R accessories are given in Appendix 5.

R (2) Engines will require a mid-life rework which will consist of a rework of the Combustion and HP Turbine Module. The recommended life for mid-life rework is 4000 hours.

(3) If both engines installed on the same aircraft have similar operating hours (i.e. less than 100 hours difference) and are required to be reworked, if one of those engines is likely to exceed its approved release life, prior to re-installation of the other engine, then a life extension of 200 hours is permissible. This life extension will then provide the necessary time for the removed engine to undergo rework at an engine overhaul facility.

(4) The life management programme is based on features common to the majority of Operators. Where previous experience of a certain type of environment of operating condition suggests that a particular Operator may have a life limiting feature not applicable to others, a separate programme may be established for that Operator (refer to 1.D.).

(5) Any life recommended is contingent upon the Mandatory Life Limited (Group A) parts lives not being exceeded. It is the Operators responsibility to monitor all lives and ensure they are not exceeded. Group A lives are published in Chapter 05-10-01 of the Time Limits Manual.

(6) During mid-life rework and at full overhaul, the part numbers, quantities and times since new of the HP1 turbine blades, to be incorporated at engine build, should be recorded in the engine log book. This will ensure that an accurate monitor of HP1 turbine blade life is maintained.

(7) During overhaul or mid-life rework, HP Turbine Stage 1 blades which would exceed 20000 hours life during the next engine release life, should undergo full overhaul processing, i.e. stripping of aluminised coating and penetrant inspection.

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(8) The Service Bulletins listed in the appendices of this Non-Modification Service Bulletin are those which Rolls-Royce recommends for embodiment at mid-life, calendar rework and full overhaul in the interests of increased engine reliability and engine/component improved lives.

(9) At full overhaul the engine log book should be reviewed to ensure that all the Service Bulletins recommended at mid-life overhaul have been embodied. Any which are missing should be embodied, unless the missing Service Bulletins are superseded by those being fitted at full overhaul.

(10) It is the responsibility of the Operator to schedule engines into an authorized overhaul facility before expiry of either the Hours Life or the Calendar Life of the engine, whichever comes first.

E. Life Growth

(1) An Operator with either a single or multi-aircraft fleet will be required to submit at least one engine sample (refer to 1.D.(3) below), for both the mid-life rework and full overhaul inspections, as part of his life growth programme. The engine sample will require a detailed life assessment inspection by an authorised Tay engine overhaul facility, to establish if further life is capable in that particular operation.

(2) The authorised overhaul facility's life assessment report and recommendations, together with any other relevant operational evidence, will be required by the Operator when making an application to the relevant Licensing Authority for an increase in engine life.

(3) Any increase in engine life will be based on the features found within an individual Operator's engine. Any change in ownership of the aircraft/engines will result in previously increased life intervals reverting to the fleet-wide recommended lives listed in this Non-Modification Service Bulletin. In such cases the engine life remaining will be pro-rated to the fleet-wide recommended life. If the new Operator then wishes to increase this engine life, he will be required to submit further engine samples as indicated in step D.(1) above.

(4) Any increase in engine life is contingent upon major rotating component (Group A) lives not being exceeded. Each Group A life is defined in terms of flights, which include an allowance for take-off, speed change and thrust reverser operation and may vary dependent upon modification standard. These lives are published in Chapter 05 of the appropriate Time Limits and Maintenance Manuals.

(5) It is intended that engine growth should proceed in 500 hour stages, in conjunction with the requirements detailed in 1.D.(1) above.

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(6) This life growth procedure can be repeated until such time as the Operator's desired life is achieved or a life limiting feature is established, at which time the life will be stabilised until:

(a) Modifications have been embodied to eliminate the limiting feature.

(b) A schedule of intermediate rework has been established which, at a determined point in engine life, renews or repairs those components which are life limiting, allowing the remainder of the engine to proceed on the life growth programme.

(7) It is requested that Operators give notice of subsequent life increased to:

Service Support Manager - Tay, Spey & Dart
Rolls-Royce Deutschland
Eschenweg 11
15827 Blankenfelde-Mahlow
Germany

F. Mid-life and Calendar Life Rework Package

The mid-life and calendar life modification and rework packages applicable to each engine mark are appended to this Non-Modification Service Bulletin. The following table gives a guide to the effectivity of each package.

NOTE: Service experience has demonstrated that corrosion can be more prevalent on the low utilisation type of operation. It is thus important to monitor ongoing service experience particularly in relation to the integrity of Group A parts and also establish individual Operator corrosion experience. Rolls-Royce should always therefore be advised if:

(1) Extensive corrosion attack is evident, particularly affecting Group A parts.

(2) Any Group A parts are rejected for corrosion pitting. (Rolls-Royce may wish those parts returned for more detailed examination).

Should either (1) or (2) apply, Rolls-Royce will review corrosion preventative measures with the affected Operator.

	Tay 611-8	Tay 620-15	Tay 650-15	Tay 651-54
Mid-life rework	Appendix 1	Appendix 3	Appendix 8	Appendix 11
Calendar life rework	Appendix 2	Appendix 4	Appendix 9	Appendix 12
Calendar life rework for Low Utilisation Operators	Appendix 2A	Appendix 4A		
Full overhaul	Appendix 6	Appendix 7	Appendix 10	Appendix 13

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G. Aircraft with Low Utilisation

(1) The calendar life of an engine is 10 years from the date of manufacture, overhaul or from a mid-life rework which includes the calendar life rework package. This includes any period of time which the engine may have been stored.

(2) Operators with low annual aircraft utilisation may have engines reaching this calender life limit before the overhaul life or even the mid-life rework is attained. Such engines may be reworked in accordance with Appendix 2A or Appendix 4A only of this Non-Modification Service Bulletin. This work package will allow the engine to be released for a further 10 years or the balance of the engines release life to mid-life or overhaul, whichever comes first.

(3) For engines approaching a mid-life rework at calendar lives greater than 5 years, for economic reasons it is beneficial to have the additional calendar life rework package carried out. This will allow the engine to be released for a further 10 years calendar life or to complete an overhaul life.

(4) The requirement for this additional work package is to ensure that all parts which could affect engine integrity not normally seen during the turbine mid-life rework are free of corrosion and that certain perishable seals and diaphragms are replaced.

(5) At a maximum of 20 years or on completion of the approved overhaul life in hours as agreed by the Operator's Airworthiness Authority, the engine and its accessories must be completely overhauled.

H. Full Engine Overhaul

R At 8000 hours from new or overhaul, or at 4000 hours since the last mid-life
R rework, whichever occurs first, a full overhaul of engine and accessories with a fixed overhaul life is required.

When an engine requires full overhaul, it should be refurbished in accordance with the procedure detailed in the relevant Engine Manuals.

I. Accessories

During the life of an engine it is possible that accessories may not retain the same running times as the engine (possibly as a result of unit changes). In the interests of reliability, it is recommended that engine accessory
R units, which have achieved the recommended overhaul lives or exceeded their
R listed soft times, should be reworked in accordance with the manufactures procedures.

A list of the 'Rolls-Royce responsibility engine mounted accessories' can be found in Appendix 5.

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J. Transfer from Airline Operation to Non-airline Operation

Where an aircraft or engine is transferred from an airline to a non-airline operation the following transfer rules should be used:

(1) Remaining hours before rework on the engines involved:

That proportion remaining of the release life of an airline engine since its last performance restoration shop visit should be applied to the relevant non-airline release life.

The fractional life achieved in airline operation is transposed into the life achieved in non-airline operation. This is achieved by carrying out a pro-rata calculation in accordance with the formula that follows. This formula is to be used for both engines approaching mid-life and overhaul:

$$\text{Achieved life in non-airline operation} = \frac{A}{B} \times C$$

(a) Abbreviations:

A	Life achieved in airline operation (cycles)
B	Due refurbishment or overhaul in airline operation cycles

NOTE: Figure B should not exceed 14000 cycles for the due refurbishment (mid-life) and 22000 cycles for the due overhaul.

C	Due mid-life or overhaul in non-airline operation (hours)

NOTE: Airline engines are scheduled for refurbishment and overhaul based on cycles, not hours utilisation. Therefore, the achieved fractional life in airline operation is calculated in cycles.

(b) Explanations:

[1] Life achieved in airline operation (cycles) is available in the engine log book or any electronic maintenance records.

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[2] Due refurbishment or overhaul in airline operation (cycles) will be available in the applicable Operators Engine Managment Programme (EMP). If the engine has been operated to significantly different EMPs, the total fractional life achieved is to be the sum of the individual fractional lives achieved at each of the differing EMP lives.

NOTE: Non-airline mid-life is equivalent to an airline Level 3 refurbishment on module 04.

NOTE: Non-airline overhaul is equivalent to an airline Level 3 or 4 overhaul on all modules.

[3] Due mid-life or overhaul in non-airline operation is 4000 hours for mid-life and 8000 hours for overhaul, unless otherwise agreed with the local Airworthiness Authority.

(c) Examples:

First example:

An engine has completed 6000 cycles in airline operations and is now required to transfer to non-airline operation. The engine has not received a shop visit. The engine is due a scheduled airline module 04 refurbishment shop visit at 12000 cycles.

6000 cycles / 12000 cycles x 4000 hours = 2000 hours

In this instance the engine has achieved 50% of its release life. The engine has therefore a pro-rated non-airline achieved life of 2000 hours and hence a residual life of 2000 hours in the non-airline operation.

Second example:

An engine has completed 15000 cycles in airline operations and is now required to transfer to non-airline operation. The engine received Level 3 refurbishment on module 04 at 12000 cycles. The engine is due a scheduled overhaul at 20000 cycles. The level 3 refurbishment is discounted and the overhaul figure is used.

15000 cycles / 20000 cycles x 8000 hours = 6000 hours

In this instance the engine has achieved 75% of its release life. The engine has therefore a pro-rated non-airline achieved life of 6000 hours and hence a residual life of 2000 hours in the non-airline operation.

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Third example:

An engine has completed 30000 cycles in airline operations and is now required to transfer to non-airline operation. The engine received a Level 3 or 4 overhaul on all modules at 20000 cycles. The engine is due a scheduled mid-life at 32000 cycles (12000 cycles since overhaul). The cycles since overhaul figure is used to calculate the figure until due mid-life.

10000 cycles / 12000 cycles x 4000 hours = 3334 hours (rounded up)

In this instance the engine has achieved 83,33% of its release life. The engine has therefore a pro-rated non-airline achieved life of 3334 hours and hence a residual life of 666 hours in the non-airline operation.

(2) Repeat inspection Service Bulletins:

The engine log book should be checked to make sure that the Operator is aware of repeat inspection Service Bulletins, e.g. Non-Modification Service Bulletin 72-1485 - Engine - HP turbine / HP compressor shaft spline flank wear inspection.

The aim of this Non-Modification Service Bulletin is to estimate the combined wear on the spline flanks of the HP turbine and HP compressor shafts. This is recommended at repeat intervals of 5000 cycles.

(3) Mandatory / Alert Service Bulletins and Non-Modification Service Bulletins:

All Mandatory / Alert Service Bulletins and Non-Modification Service Bulletins should be checked for embodiment at the time of transfer, e.g. Non-Modification Service Bulletin 76-1434 - Emergency fuel shut off system - Inspection of emergency fuel shut off cable.

If there is no record in the engine log book of embodiment, carry out this Non-Modification Service Bulletin.

(4) Engine Calendar Life:

The 10 year calendar life starts from new or the time of the last shop visit that inspected all Group A parts.

(5) Group A Parts:

Any replacement Group A part or module which has been transferred from another engine must be considered when setting the calendar life datum of the engine. The calendar life datum of the engine is from the date of inspection of all Group A parts.

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If for example one Group A part was transferred and was inspected earlier than all the other Group A parts, the calendar life datum can be reset by piece part inspection of the affected part.

(6) Calendar Life Extension:

Extensions of up to two years on the expiry of the 10 year calendar life will be supported if the Operator can provide evidence that the fleet in which the engines were operated did not exhibit corrosion beyond expected levels. It is the responsibility of the new Operator to provide this evidence to Rolls-Royce Deutschland for evaluation.

K. Approval

R This Non-Modification Service Bulletin TAY-70-1050 was approved on May 26/20.

2. Material Information

None.

3. Accomplishment Instructions

None.

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APPENDIX 1

MID-LIFE REWORK

EFFECTIVITY - TAY 611-8

NOTE: Operators should note that the agreement of the Local Licensing Authority must be obtained for any proposed deviation from this Non-Modification Service Bulletin.

At 4000 hours from new, or overhaul, a rework is required as detailed below.

The rework package will be developed with service experience.

Any component(s) inspected and found to be in excess of Engine Manual limits, may warrant further inspection, engine strip or rework other than that stated in this work package.

R Recommendations for maintenance and overhaul of engine mounted accessory units are
R given in Appendix 5.

R Accessory units that have been fitted to an engine at intermediate time require to
R have their lives tracked to ensure that they are overhauled at the required
R interval.

A. Module 01 - LP Compressor

Item

(1) Visually inspect for obvious damage.

(2) The following Service Bulletin is recommended for embodiment:

72-1528 Engine - LP compressor rotating fairing - Introduction of an LP compressor rotor spinner assembly with a dowel pin installed in the spinner flange.

(3) Rework in accordance with Engine Manual as necessary. Accomplishment of Repair Scheme HRS3629 LPC rotor blade - Restore L/E profile or of the Non-Modification Service Bulletin that follows is recommended:

72-1603 Non-Mod Service Bulletin — Engine - Low Pressure (LP) compressor (fan) blades - Instruction of a repair to the LP compressor (fan) blade leading edge profile.

(4) Replace blades in as-received position as annotated in log book.

(5) Check balance, if necessary.

(6) Rebalance rotor assembly, if necessary.

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B. Module 02 - IP Compressor

Item

(1) Visually inspect for obvious damage.

(2) The following Service Bulletin and Repair Scheme is recommended for embodiment:

72-1045	Engine - IP compressor air splitter - Introduction of strengthened annular ring. (To reduce secondary damage to engine in event of rearward movement of LP fan blades due to tang failure.)
HRS3390	IP compressor inlet guide vane - Re-apply filler material. (To prevent secondary IP compressor damage due to hard filler release.)

C. Module 03 - HP Compressor

Item

(1) Check HP rotor for freedom of rotation.

(2) Check bleed valve hardware for binding, corrosion, wear, damage, freedom of movement.

(3) Visually inspect for obvious damage and excessive corrosion.

(4) The following Service Bulletin and Non-Modification Service Bulletin are recommended for embodiment:

72-1496 Non-Mod Service Bulletin	Engine - HP compressor stage 7 and 12 air off-take clamp inspection.
72-A1653	Engine - High Pressure (HP) compressor vanes stages 4 to 11 - Introduction of a new setting procedure to increase the minimum vane tip clearance.
72-1704	Engine - Air guide tube drive shaft and fittings - High Pressure (HP) compressor - Introduction of revised torque tightening procedure for the Low Pressure (LP) thrust bearing outer ring spanner nut.

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72-1719 Non-Mod Service Bulletin — Engine - High Pressure (HP) compressor discs, blades and spacers stages 6 to 9 - Replacement of HP compressor rotor discs.

Note: The Non-Modification Service Bulletin above is only applicable to a specific list of engine serial numbers identified.

72-1730 Non-Mod Service Bulletin — Engine - High Pressure (HP) compressor vanes-stages 4 to 11 - Inspection of the HP compressor stage 7 stator vanes.

Note: The Non-Modification Service Bulletin above is only applicable to a specific list of engine serial numbers identified.

72-1731 Non-Mod Service Bulletin — Engine - High Pressure (HP) compressor vanes-stages 4 to 11 - Inspection of the HP compressor stage 7 stator vanes.

Note: The Non-Modification Service Bulletin above is only applicable to a specific list of engine serial numbers identified.

D. Module 04 - Combustion and HP Turbine

Item

(1) Remove module from engine.

(2) Visually inspect for obvious damage.

R (3) Bulk strip Module 04 to expose the bladed HP turbine Stage 1 and 2 discs, the HP turbine Nozzle Guide Vanes (NGV).

R (4) Carry out the following items:

R (a) Clean and visually examine the combustion liner and discharge nozzle in assembled condition.

R (b) Strip the HP bearing support sufficiently to restore flatness of the rear oil seal housing and plate.

R (c) Visually examine the bearing support and roller bearing. Pay attention for oil leakage.

R (d) Visually examine the anti friction rings for cracks.

R (e) Piece part inspect the HP turbine stage 1 nozzle vanes.

R (f) Piece part inspect the HP turbine stage 2 nozzle vanes.

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R (g) Visually examine the HP turbine stage 1 nozzle case assembly.

R (h) Piece part inspect the HP turbine stage 1 disc.

R NOTE: If the Maintenance Repair and Overhaul (MRO) facility can
R demonstrate that the HP turbine stage 1 disc has been replaced
R with a new zero cyclic disc at the last full overhaul shop
R visit it is permitted to visually inspect the disc in bladed
R condition in accordance with the bladed disc inspection task
R during this shop visit only. For example, if the turbine disc
R has been replaced with new at the 20 year overhaul shop visit,
R then at the 30 year calendar life shop visit the disc can be
R visually inspected in bladed condition. The disc must then be
R piece part inspected at the 40 year calendar life shop visit
R and all following calendar life shop visits.

R (i) Piece part inspect the HP turbine stage 2 disc.

R NOTE: If the MRO facility can demonstrate that the HP turbine stage 2
R disc has been replaced with a new zero cyclic disc at the last
R full overhaul shop visit it is permitted to visually inspect
R the disc in bladed condition in accordance with the bladed disc
R inspection task during this shop visit only. For example, if
R the turbine disc has been replaced with new at the 20 year
R overhaul shop visit, then at the 30 year calendar life shop
R visit the disc can be visually inspected in bladed condition.
R The disc must then be piece part inspected at the 40 year
R calendar life shop visit and all following calendar life shop
R visits.

R (j) Piece part inspect the HP turbine shaft.

R (k) Visually examine all other removed or exposed components for damage or
R wear.

R NOTE: HP turbine stage 1 blades should be visually inspected only and
R do not require full overhaul processing unless they will exceed
R 20000 hours during the next engine release life.

(5) The following Service Bulletins and Non-Modification Service Bulletin are recommended for embodiment:

72-1060 Engine - HP turbine case and rotor - Increased clearance between HP stage 1 rotor blades and nozzle vanes. (To overcome possible axial rubs.)

72-1111 Engine - HP turbine bearing and support - Bearing flexible support stop ring with increased axial clearance. (To eliminate a possible source of HP order vibration.)

72-1143 Engine - High energy igniter adaptors - Revised procedure for setting igniter immersion depth. (To extend igniter life.)

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FACILITY:
CERTIFICATE:

72-1389 Non-Mod Service Bulletin — Engine - Inspection of combustion liner Y ring weld. (Inspection requirements for combustion liners identified as being in a specific serial number range.)

72-1819 Non-Mod Service Bulletin — Engine - Turbine rotor discs and shaft - High Pressure (HP) - Inspection of the HP turbine stage 2 disc sleeve serial number.

Note: The Non-Modification Service Bulletin above is applicable for Engine Serial Number 18189.

(6) Re-assemble module in accordance with Engine Manual.

E. Module 05 - LP Turbine

Item

(1) Remove module from engine.

(2) Visually inspect for obvious damage.

(3) Rework to Engine Manual as necessary.

(4) Crack test engine mount rear links.

(5) The following Service Bulletins are recommended for embodiment:

72-1117 — Engine - LP turbine - Disc driving flange dowel bolts with tapered and square heads. (To prevent disc damage during assembly/disassembly.)

72-1160 — Engine - LP turbine bearing support - Application of jointing compound to bearing support flange and overspeed control arm body mating faces. (To prevent oil leakage.)

72-1195 — Engine - LP turbine case and vanes - LP turbine interstage seals with increased tolerances and improved anti-frettage coating. (To prevent rubs and fast rundown times.)

72-1358 — Engine - LP turbine case and vanes - Re-introduction of three piece intrascope blanking plug assembly at LP1 and LP3 nozzle guide vane positions. (To prevent secondary LP turbine damage due to intrascope blanking plug failure.)

72-1364 — Engine - LP turbine rotor discs and shaft - Rear oil tube steady with reduced outside diameter. (To prevent seizure of the rear oil tube within the air guide tube eliminating failures at the rear oil tube and ensuring satisfactory operation of the emergency fuel shut-off cock mechanism.)

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72-1455 Engine - LP nozzle case and vanes - Introduction of LP turbine stage 1 NGV and seal support assembly with honeycomb seal.

72-1590 Engine - Turbine nozzle case and vanes-LP - Deletion of the dowel pins and retainer plates which are installed in the LP turbine stage 1 static air seal.

72-A1696 Non-Mod Service Bulletin Engine - Turbine nozzle case and vanes - HP and LP - Inspection of the bolts which are installed in the LPT stage 1 static air seal and of the bolts which are installed in the HPT stage 1 air seal support.

Note: The Non-Modification Service Bulletin above is only applicable to a specific list of engine serial numbers identified.

F. Module 06 - HS Gearbox

Item

(1) Visually inspect gearbox mounts, link and accessory features.

(2) Inspect for signs of oil leakage.

(3) Clean accessory mount pads.

(4) Remove existing grease and debris from starter drive splines.

(5) Inspect splines of starter drive gear in accordance with the Engine Manual.

NOTE: Care must be taken when applying fresh grease to the splines as too much grease can result in an end load on the starter drive front bearing and cause the bearing to fail.

(6) The following Service Bulletin is recommended for embodiment:

72-1112 Engine - Main oil pumps - LP turbine bearing return oil transfer tube with by-pass hole. (To overcome oil spillage and smoke emission.)

G. Module 07 - Intermediate Casing

Item

(1) Inspect intermediate case for damage, corrosion and general condition.

(2) Inspect Inlet Guide Vane (IGV) actuating mechanism for freedom of movement and range of travel.

(3) Inspect engine trunnion mounting flange bore location for damage.

(4) Inspect intermediate case mounting lug for damage.

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(5) Rework to Engine Manual as necessary.

(6) The following Service Bulletins and Non-Modification Service Bulletins are recommended for embodiment:

72-1122	Engine - LP compressor - Front bearing locating ring with copper plated bore. (To improve bearing location and prevent debris generation.)
72-1296 Non-Mod Service Bulletin	Engine - Replacement of high speed gearbox drive driven bevel gearshaft JR27127. (To ensure that low fatigue strength gearshafts are removed from service.)
72-1341 Non-Mod Service Bulletin	Engine - Replacement of high speed gearbox drive driven bevel gearshaft JR27127. (To ensure that low fatigue strength gearshafts are removed from service.)
72-1480	Engine high speed gearbox driving assembly - Introduction of increased torque on the internal gearbox bevel gear retaining nut.

(7) Re-assemble module in accordance with Engine Manual.

H. Non-Modular Items

Item

(1) Inspect nose cone spinner and fairing.

(2) Inspect rubber tip nose cap.

(3) Inspect LP compressor case assembly.

Crack test engine mount taper pins and adaptors.

Crack test engine front (trunnion) mount.

(4) Inspect clamps for missing or deteriorated rubber cushions. Replace as necessary.

(5) Inspect transmitters, switches, thermocouples and electrical connectors for general condition and security.

(6) Inspect engine by-pass ducts for general condition.

(7) Inspect LP air offtake panel (ATA Chapter 72-71-02, IPC Fig/Item No. 02-400) for signs of delamination.

(8) Inspect LP exhaust mixer for general condition.

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(9) Inspect Engine Fuel Shut-Off (EFSO) cable assembly for strands integrity.

(10) Check main oil filter, scavenge filters and magnetic chip detectors and pop-up indicator.

(11) Check IGV freedom and do a bleed valve pull-off check.

R (12) Visually examine the combustion outer case assembly (72-40-30, 01-100).

(13) Discard the fuel tube of pre Service Bulletin 73-1194 standard or pre Service Bulletin 73-1592 standard and replace it with the fuel tube of post Service Bulletin 73-1592 standard.

(14) The following Service Bulletins and Non-Modification Service Bulletins are recommended for embodiment:

71-1100 Power plant - Electrical harness (light duty) - Removal of rear portion of harness clip support tube. (To prevent a foul with aircraft cross-over starter ducting.)

71-1110 Power plant - Drain tubes and fittings - Restrictor plate fitted in internal gearbox to drains tank vent line. (To prevent fuel leakage from overboard vent.)

71-1147 Power plant - Various - Collector and ejector system to prevent oil accumulation in by-pass duct. (To catch oil and prevent staining of engine cowling and by-pass ducts.)

72-1144 Engine - Accessories mount - Accessory suspension bracket modified to clear installation foul.

72-1196 Engine - By-pass duct - Modified starter ducting support brackets. (To prevent a foul with the RH engine supporting link.)

72-1429 Engine - LP compressor rotating fairing - Introduction of revised nose cone fairing assembly produced by super plastic blow forming. (Supersedes Service Bulletin 72-1376.)

Note: The Service Bulletin above is recommended for embodiment only in engines post Service Bulletin 72-1039.

72-1639 Non-Mod Service Bulletin Engine - Low Pressure (LP) compressor case and vanes - Repeat visual inspection of the ice impact panels and instruction of minimum ice impact panel configuration on installed engines.

Note: The Non-Modification Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

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72-1644 Non-Mod Service Bulletin — Engine - Low Pressure (LP) support tube and front retaining ring - Inspection of the front fuel cut-off ring installation.

72-A1650 — Engine - Low Pressure (LP) compressor case and vanes - Introduction of modified ice impact panels with additional retention features.

Note: The Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

73-1084 — Engine - Fuel and control - Fuel system tubes - Modified tubes between high idle solenoid and fuel flow regulator. (To avoid failure of tubes in the event of vibration.)

73-1085 — Engine - Fuel and control - Fuel spray nozzles - Retaining bolts for No.10 fuel nozzle in low expansion steel. (To prevent loss of bolt torque.)

73-1142 — Engine - Fuel and control - Fuel system tubes - LP fuel pump to FCOC tubes with sliding joint. (To reduce stresses in tubes and prevent possible failure.)

73-1149 — Engine - Fuel and control - Fuel system tubes - Burner primary fuel supply tube re-set to clear aircraft duct clamp.

73-1165 Non-Mod Service Bulletin — Engine - Fuel and control - Inspection of fuel flow regulator scheduling governor housing seal plate. (To ensure there are no units in service with unsupported rubber seal.)

73-1192 — Engine - Fuel and control - Introduction of thicker washers at the FFR to LP governor fuel tube connector (FFR end). (To prevent potential fuel leak.)

73-1194 Part 1 to Part 3 — Engine - Fuel and control - Introduction of modified connectors to LP fuel system. (To prevent connector frettage and fuel leaks.)

Note: Part 4 of Service Bulletin 73-1194 must not be embodied as it is superseded by the embodiment of Service Bulletin 73-1592.

73-1592 — Engine fuel and control - Fuel system tubes - Introduction of a fuel flowmeter to HP fuel pump tube assembly with a new routing and installation.

74-1259 — Ignition - Engine - Starting system - Introduction of an alternative high energy igniter plug type Y183-5 manufactured by S.L. Auburn.

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CERTIFICATE: _____

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75-1199	Air - Air tubes and fittings - P3 air tube - Split connection to FFR with increased flexibility. (To prevent P3 air leaks causing engine handling problems or slow accelerations and low power.)
76-1083	Engine controls - Emergency fuel shut down system - Rear cable guide plate in stainless steel. (To prevent failure of the guide plate.)
76-1098	Engine controls - Control linkage - FCU and SOV. (To improve linkage integrity and avoid failures due to excessive vibration.)
76-1130	Engine controls - Control linkage - Reorientation of pilot's lever angle (PLA) transducer. (To eliminate a foul with transducer connector and the stowed cowl door jury strut.)
76-1139	Engine controls - Control linkage - Redesigned throttle relay lever and support bracket. (To provide a more robust location for PLA transducer.)
76-1203	Engine controls - Control linkage - Throttle relay lever with relief for PLA transducer. (To alleviate rotor and bearing wear and inaccurate readings.)
76-1319 Non-Mod Service Bulletin	Engine controls - Adjustment of the spindle retaining plate on the throttle relay lever bracket to prevent oscillation of the spindle. (To prevent throttle stagger and low EPR on take-off and minimize wear on bracket assemblies.)
76-1466	Engine controls - LP shaft failure system - Introduction of pulley wheel at EFSO cable rear guide location.
79-1089	Oil - Oil filter differential pressure indicator - Seal rings fitted at indicator electrical connector. (To eliminate false warnings from differential pressure switch.)
79-1175	Oil - Oil system tubes - LP turbine bearing oil feed tube with sliding joint. (To prevent tube failure in event of severe vibration.)
79-1189	Oil - Oil system tubes - LP turbine bearing oil return tube reset at by-pass duct flange. (To prevent possible foul with aircraft bleed air regulating valve.)
79-1411	Oil - Oil-Tank - Introduction of revised oil tank assembly with deleted fuel pipe support bracket.
79-1796	Oil - Oil Tank - Introduction of an oil fill instruction label on the oil tank to prevent oil overfilling.

Note: The Service Bulletin above is recommended for embodiment only in engines post Service Bulletin TAY-79-1463.

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WORK ORDER:
FACILITY:
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I. Accessories

Item

R (1) Overhaul fuel spray nozzles

(a) Crack test the double ended unions (73-11-06, 01-095) and (73-11-06, 01-295) during the overhaul of the fuel spray nozzles (Refer to the Component Maintenance Manual Spray Nozzles, Chapter 73-11-06, TASK 73-11-06-200-000).

(b) As an alternative to step I.(1)(a) you can install replacement double ended unions (73-11-06, 01-095) and (73-11-06, 01-295).

(2) Test and inspect TGT thermocouples.

(3) Test and inspect TGT thermocouple harness.

(4) Carry out a functional test on the LP cooling air outlet switch.

(5) Remove existing grease and debris from splines of starter quillshaft.

NOTE: Care must be taken when applying fresh grease to the splines as too much grease can result in an end load on the starter drive front bearing and cause the bearing to fail.

(6) Replace the two spherical bearings (72-35-23, 03-170) and (75-32-09, 07-110) of the Airflow Control Regulator (AFCR) connecting link assembly.

R (7) Replace the igniter plugs with new.

(8) The following Service Bulletins are recommended for embodiment:

73-1131 Engine - Fuel and control - Fuel flow regulator - Introduction of a test schedule amendment of redefine setting of the minimum flow stop. (To prevent slow accelerations and surge during severe handling conditions.)

73-1166 Engine - Fuel and control - Fuel flow regulator - Introduction of a Spey type lever housing seal plate. (To eliminate the possibility of overboard fuel leak.)

73-1280 Engine - Fuel and control - Shut-off cock - Introduction of a shut-off cock with the cold start facility deleted. (To prevent 'hot' starts due to inadvertent selection of cold start fuel flow.)

73-1378 Engine - Fuel and control - Fuel flow regulator - Introduction of a P3P accumulator unit
(Only required on engines with Service Bulletin 72-1347 (LP turbine stage 1 NGVs with increased throat area) embodied).

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73-1405 Engine - Fuel and control - Fuel flow regulator - Introduction of P3P accumulator valve with air filter plug
(Only required on engines with Service Bulletin 73-1378 (standard accumulator unit fitted) embodied).

75-1275 Air - Airflow control regulator - Rear mount bracket and piston push rod machined to increase clearance with adjacent parts. (To prevent fouls with AFCR linkage.)

(9) Check the FFR drive end coupling end float. The coupling should move freely inwards under hand pressure. If there is no movement the drive end is to be removed for incorporation of Service Bulletin 73-1211.

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APPENDIX 2

ADDITIONAL CALENDAR LIFE REWORK PACKAGE

EFFECTIVITY – TAY 611-8

Calendar Life Rework

To release engines for a further period of 10 years the following work package should be incorporated in addition to the work package detailed in Appendix 1. This package will be developed with service experience.

A. Module 01 – LP Compressor

Do the inspection of the LP compressor rotor blades in accordance with the Engine Manual, Chapter 72-31-12, TASK 72-31-12-200-000.

The following Non-Modification Service Bulletin is recommended for embodiment:

72-1783 Non-Mod Service Bulletin — Engine – Fan Blades – Ultrasonic inspection of fan blade roots.

B. Module 02 – IP Compressor

Item

(1) Remove module from engine.

(2) Perform interface inspection on interface with Module 07.

(3) Strip module sufficiently to allow visual inspection of stator vane locating rings (if Service Bulletin 72-1252 Part 2 is not incorporated).

(4) Borescope inspect Module 02 – IP Compressor in accordance with the Engine Manual, Chapter 71-00-00, TASK 71-00-00-200-000.

(5) Rework to Engine Manual as necessary.

(6) The following Service Bulletin is recommended for embodiment (if Service Bulletin 72-1252 Part 2 is not incorporated):

72-1252 Part 1 — Engine – IP compressor air splitter and inlet guide vanes – Splitter fairing and stator retaining rings with improved corrosion protection. (To prevent corrosion cracking of splitter fairing and stator retaining rings.)

(7) Re-assemble module in accordance with Engine Manual.

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C. Module 03 - HP Compressor

Item

(1) Remove module from engine.

R (2) Strip the HP compressor module as necessary to visually examine the bladed
R HP compressor rotor.

R NOTE: It is not required to disassemble the rotor.

R NOTE: It is not required to disassemble the bearing from the LP copressor
R drive shaft.

(3) Inspect HP compressor case assembly.

(4) Rework to Engine Manual as necessary.

(5) The following Service Bulletin is recommended for embodiment:

72-1115 Engine - HP compressor rotor - Stages 4 to 12 disc spacers with protective coating deleted from outer rim axial faces.

R (6) The following Non-Modification Service Bulletin is recommended for
R embodiment only if possible without additional disassembly:

R 72-1838 Engine - High Pressue (HP) compressor discs, blades and spacers
R Non-Mod - Borescope inspection of the HP compressor stage 5 rotor disc
R Service for undercut and holes.
R Bulletin

R (7) Re-assemble module in accordance with Engine Manual.

D. Module 04 - Combustion and HP Turbine

Not applicable.

E. Module 05 - LP Turbine

Item

(1) Remove module from engine.

(2) Strip module sufficiently to allow visual inspection of all Group A components.

F. Module 06 - HS Gearbox

Not applicable.

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G. Module 07 - Intermediate Casing

Item

(1) The following Service Bulletin is recommended for embodiment:

72-1399 Engine - Intermediate case assembly - Front flange bore - Additional corrosion protection. (Epoxy barrier coating into OGV location bore to provide insulation between the magnesium and titanium components.)

H. Non-Modular Items

Not applicable.

I. Accessories

The following units require rework:

(1) Airflow Control Regulator and Actuator

Item

(a) Remove unit from engine.

(b) Disassemble sufficiently to replace the diaphragm (75-32-05, 03-435), the piston seal rings (75-32-06, 05-470 and 05-490) and the felt piston wiper washer (75-32-06, 05-510).

(c) Rebuild and test.

(d) Re-install unit on engine.

(2) RPM Signal Generator

Item

(a) Remove unit from engine.

(b) Disassemble sufficiently to replace the diaphragm.

(c) Rebuild and test.

(d) Re-install unit on engine.

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FACILITY: _____

CERTIFICATE: _____

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APPENDIX 2A

CALENDAR LIFE REWORK PACKAGE FOR LOW UTILISATION OPERATORS

EFFECTIVITY – TAY 611-8

Operators with low utilisation (as defined in paragraph 1.G.(2)), may elect to conduct the following work package in order to release the engine for a further 10 years calendar life or the balance of the hours remaining to mid-life or overhaul, whichever comes first.

R Recommendations for maintenance and overhaul of engine mounted accessory units are
R given in Appendix 5.

R Accessory units that have been fitted to an engine at intermediate time require to
R have their lives tracked to ensure that they are overhauled at the required
R interval.

NOTE: All removed parts are to be visually inspected for signs of corrosion and if necessary reworked in accordance with the applicable manual.

A. Module 01 – LP Compressor

Item

(1) Visually inspect for obvious damage.

(2) The following Service Bulletin is recommended for embodiment:

72-1528 Engine – LP compressor rotating fairing – Introduction of an LP compressor rotor spinner assembly with a dowel pin installed in the spinner flange.

(3) Remove fan blades from disc and perform ultrasonic inspection of blade root (refer to the Engine Manual, Chapter 72-31-12, TASK 72-31-12-200-000).

The following Non-Modification Service Bulletin is recommended for embodiment:

72-1783 Non-Mod Service Bulletin — Engine – Fan Blades – Ultrasonic inspection of fan blade roots.

(4) Rework in accordance with Engine Manual as necessary. Accomplishment of Repair Scheme HRS3629 LPC rotor blade – Restore L/E profile or of the Non-Modification Service Bulletin that follows is recommended:

72-1603 Non-Mod Service Bulletin — Engine – Low Pressure (LP) compressor (fan) blades – Instruction of a repair to the LP compressor (fan) blade leading edge profile.

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(5) Replace blades in as-received position as annotated in log book.

(6) Check balance, if necessary.

(7) Rebalance rotor assembly, if necessary.

B. Module 02 - IP Compressor

Item

(1) Remove module from engine.

(2) Perform interface inspection on interface with Module 07.

(3) Strip module sufficiently to allow visual inspection of stator vane
R locating rings (if Service Bulletin 72-1252 Part 2 is not incorporated).

R (4) Borescope inspect Module 02 - IP Compressor in accordance with the Engine
R Manual, Chapter 71-00-00, TASK 71-00-00-200-000.

(5) Rework to Engine Manual as necessary.

(6) The following Service Bulletin and Repair Scheme is recommended for embodiment:

72-1045	Engine - IP compressor air splitter - Introduction of strengthened annular ring. (To reduce secondary damage to engine in event of rearward movement of LP fan blades due to tang failure.)
HRS3390	IP compressor inlet guide vane - Re-apply filler material. (To prevent secondary IP compressor damage due to hard filler release.)

(7) The following Service Bulletin is recommended for embodiment (if Service Bulletin 72-1252 Part 2 is not incorporated):

72-1252 Part 1	Engine - IP compressor air splitter and inlet guide vanes - Splitter fairing and stator retaining rings with improved corrosion protection. (To prevent corrosion cracking of splitter fairing and stator retaining rings.)

(8) Re-assemble module in accordance with Engine Manual.

C. Module 03 - HP Compressor

Item

(1) Remove module from engine.

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R (2) Strip the HP compressor module as necessary to visually examine the bladed
R HP compressor rotor.

R NOTE: It is not required to disassemble the rotor.

R NOTE: It is not required to disassemble the bearing from the LP compressor
R drive shaft.

(3) Inspect HP compressor case assembly.

(4) Check bleed valve hardware for binding, corrosion, wear, damage, freedom of movement.

(5) Rework to Engine Manual as necessary.

(6) The following Service Bulletins and Non-Modification Service Bulletin are recommended for embodiment:

72-1115	Engine - HP compressor rotor - Stages 4 to 12 disc spacers with protective coating deleted from outer rim axial faces.
72-1496 Non-Mod Service Bulletin	Engine - HP compressor stage 7 and 12 air off-take clamp inspection.
72-A1653	Engine - High Pressure (HP) compressor vanes stages 4 to 11 - Introduction of a new setting procedure to increase the minimum vane tip clearance.
72-1704	Engine - Air guide tube drive shaft and fittings - High Pressure (HP) compressor - Introduction of revised torque tightening procedure for the Low Pressure (LP) thrust bearing outer ring spanner nut.
72-1719 Non-Mod Service Bulletin	Engine - High Pressure (HP) compressor discs, blades and spacers stages 6 to 9 - Replacement of HP compressor rotor discs.

Note: The Non-Modification Service Bulletin above is only applicable to a specific list of engine serial numbers identified.

72-1730 Non-Mod Service Bulletin	Engine - High Pressure (HP) compressor vanes-stages 4 to 11 - Inspection of the HP compressor stage 7 stator vanes.

Note: The Non-Modification Service Bulletin above is only applicable to a specific list of engine serial numbers identified.

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72-1731 Non-Mod Service Bulletin — Engine - High Pressure (HP) compressor vanes-stages 4 to 11 - Inspection of the HP compressor stage 7 stator vanes.

Note: The Non-Modification Service Bulletin above is only applicable to a specific list of engine serial numbers identified.

R (7) The following Non-Modification Service Bulletin is recommended for R embodiment only if possible without additional disassembly:

R 72-1838 Non-Mod Service Bulletin — Engine - High Pressure (HP) compressor discs, blades and spacers - Borescope inspection of the HP compressor stage 5 rotor disc for undercut and holes.

(8) Re-assemble module in accordance with Engine Manual.

D. Module 04 - Combustion and HP Turbine

Item

(1) Remove module from engine.

(2) Visually inspect for obvious damage.

R (3) Strip module sufficiently to allow piece part inspection of the HP turbine R discs.

R NOTE: If the MRO facility can demonstrate that the HP turbine stage 1 disc R and /or HP turbine stage 2 has been replaced with a new zero cyclic R disc at the last full overhaul shop visit it is permitted to R visually inspect the disc in bladed condition in accordance with the R bladed disc inspection task during this shop visit only. For R example, if the turbine disc has been replaced with new at the 20 R year overhaul shop visit, then at the 30 year calendar life shop R visit the disc can be visually inspected in bladed condition. The R disc must then be piece part inspected at the 40 year calendar life R shop visit and all following calendar life shop visits.

(4) Visually inspect for obvious damage and excessive corrosion.

(5) Rework to Engine Manual as necessary.

NOTE: HP turbine stage 1 blades should be visually inspected only and do not require full overhaul processing unless they will exceed 20000 hours during the next engine release life.

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(6) The following Service Bulletins and Non-Modification Service Bulletin are recommended for embodiment:

72-1060	Engine - HP turbine case and rotor - Increased clearance between HP stage 1 rotor blades and nozzle vanes. (To overcome possible axial rubs.)
72-1111	Engine - HP turbine bearing and support - Bearing flexible support stop ring with increased axial clearance. (To eliminate a possible source of HP order vibration.)
72-1143	Engine - High energy igniter adaptors - Revised procedure for setting igniter immersion depth. (To extend igniter life.)
72-1389 Non-Mod Service Bulletin	Engine - Inspection of combustion liner Y ring weld. (Inspection requirements for combustion liners identified as being in a specific serial number range.)
72-1819 Non-Mod Service Bulletin	Engine - Turbine rotor discs and shaft - High Pressure (HP) - Inspection of the HP turbine stage 2 disc sleeve serial number.

Note: The Non-Modification Service Bulletin above is applicable for Engine Serial Number 18189.

(7) Re-assemble module in accordance with Engine Manual.

E. Module 05 - LP Turbine

Item

(1) Remove module from engine.

(2) Visually inspect for obvious damage.

(3) Strip module sufficiently to allow visual inspection of all Group A components.

(4) Visually inspect for obvious damage and excessive corrosion.

(5) Rework to Engine Manual as necessary.

(6) Crack test engine mount rear links.

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(7) The following Service Bulletins are recommended for embodiment:

72-1117	Engine - LP turbine - Disc driving flange dowel bolts with tapered and square heads. (To prevent disc damage during assembly/disassembly.)
72-1160	Engine - LP turbine bearing support - Application of jointing compound to bearing support flange and overspeed control arm body mating faces. (To prevent oil leakage.)
72-1195	Engine - LP turbine case and vanes - LP turbine interstage seals with increased tolerances and improved anti-frettage coating. (To prevent rubs and fast rundown times.)
72-1358	Engine - LP turbine case and vanes - Re-introduction of three piece intrascope blanking plug assembly at LP1 and LP3 nozzle guide vane positions. (To prevent secondary LP turbine damage due to intrascope blanking plug failure.)
72-1364	Engine - LP turbine rotor discs and shaft - Rear oil tube steady with reduced outside diameter. (To prevent seizure of the rear oil tube within the air guide tube eliminating failures at the rear oil tube and ensuring satisfactory operation of the emergency fuel shut-off cock mechanism.)
72-1455	Engine - LP nozzle case and vanes - Introduction of LP turbine stage 1 NGV and seal support assembly with honeycomb seal.
72-1590	Engine - Turbine nozzle case and vanes-LP - Deletion of the dowel pins and retainer plates which are installed in the LP turbine stage 1 static air seal.
72-A1696 Non-Mod Service Bulletin	Engine - Turbine nozzle case and vanes - HP and LP - Inspection of the bolts which are installed in the LPT stage 1 static air seal and of the bolts which are installed in the HPT stage 1 air seal support.

Note: The Non-Modification Service Bulletin above is only applicable to a specific list of engine serial numbers identified.

F. Module 06 - HS Gearbox

(1) Visually inspect gearbox mounts, link and accessory features.

(2) Inspect for signs of oil leakage.

(3) Clean accessory mount pads.

(4) Remove existing grease and debris from starter drive splines.

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WORK ORDER:
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(5) Inspect splines of starter drive gear in accordance with the Engine Manual.

NOTE: Care must be taken when applying fresh grease to the splines as too much grease can result in an end load on the starter drive front bearing and cause the bearing to fail.

(6) The following Service Bulletin is recommended for embodiment:

72-1112 Engine - Main oil pumps - LP turbine bearing return oil transfer tube with by-pass hole. (To overcome oil spillage and smoke emission.)

G. Module 07 - Intermediate Casing

Item

(1) Inspect intermediate case for damage, corrosion and general condition.

(2) Inspect Inlet Guide Vane (IGV) actuating mechanism for freedom of movement and range of travel.

(3) Inspect engine trunnion mounting flange bore location for damage.

(4) Inspect intermediate case mounting lug for damage.

(5) Rework to Engine Manual as necessary.

(6) The following Service Bulletins and Non-Modification Service Bulletins are recommended for embodiment:

72-1122 Engine - LP compressor - Front bearing locating ring with copper plated bore. (To improve bearing location and prevent debris generation.)

72-1296 Non-Mod Service Bulletin Engine - Replacement of high speed gearbox drive driven bevel gearshaft JR27127. (To ensure that low fatigue strength gearshafts are removed from service.)

72-1341 Non-Mod Service Bulletin Engine - Replacement of high speed gearbox drive driven bevel gearshaft JR27127. (To ensure that low fatigue strength gearshafts are removed from service.)

72-1399 Engine - Intermediate case assembly - Front flange bore - Additional corrosion protection. (Epoxy barrier coating into OGV location bore to provide insulation between the magnesium and titanium components.)

72-1480 Engine high speed gearbox driving assembly - Introduction of increased torque on the internal gearbox bevel gear retaining nut.

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(7) Re-assemble module in accordance with Engine Manual.

H. Non-Modular Items

Item

(1) Inspect nose cone spinner and fairing.

(2) Inspect rubber tip nose cap.

(3) Inspect LP compressor case assembly.

Crack test engine mount taper pins and adaptors.

Crack test engine front (trunnion) mount.

(4) Inspect clamps for missing or deteriorated rubber cushions. Replace as necessary.

(5) Inspect transmitters, switches, thermocouples and electrical connectors for general condition and security.

(6) Inspect engine by-pass ducts for general condition.

(7) Inspect LP air offtake panel (ATA Chapter 72-71-02, IPC Fig/Item No. 02-400) for signs of delamination.

(8) Inspect LP exhaust mixer for general condition.

(9) Inspect Engine Fuel Shut-Off (EFSO) cable assembly for strands integrity.

(10) Check main oil filter, scavenge filters and magnetic chip detectors and pop-up indicator.

(11) Check IGV freedom and do a bleed valve pull-off check.

(12) Discard the fuel tube of pre Service Bulletin 73-1194 standard or pre Service Bulletin 73-1592 standard and replace it with the fuel tube of post Service Bulletin 73-1592 standard.

(13) The following Service Bulletins and Non-Modification Service Bulletins are recommended for embodiment:

71-1100 Power plant - Electrical harness (light duty) - Removal of rear portion of harness clip support tube. (To prevent a foul with aircraft cross-over starter ducting.)

71-1110 Power plant - Drain tubes and fittings - Restrictor plate fitted in internal gearbox to drains tank vent line. (To prevent fuel leakage from overboard vent.)

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71-1147 Power plant - Various - Collector and ejector system to prevent oil accumulation in by-pass duct. (To catch oil and prevent staining of engine cowling and by-pass ducts.)

72-1144 Engine - Accessories mount - Accessory suspension bracket modified to clear installation foul.

72-1196 Engine - By-pass duct - Modified starter ducting support brackets. (To prevent a foul with the RH engine supporting link.)

72-1429 Engine - LP compressor rotating fairing - Introduction of revised nose cone fairing assembly produced by super plastic blow forming. (Supersedes Service Bulletin 72-1376.)

Note: The Service Bulletin above is recommended for embodiment only in engines post Service Bulletin 72-1039.

72-1639 Non-Mod Service Bulletin Engine - Low Pressure (LP) compressor case and vanes - Repeat visual inspection of the ice impact panels and instruction of minimum ice impact panel configuration on installed engines.

Note: The Non-Modification Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

72-1644 Non-Mod Service Bulletin Engine - Low Pressure (LP) support tube and front retaining ring - Inspection of the front fuel cut-off ring installation.

72-A1650 Engine - Low Pressure (LP) compressor case and vanes - Introduction of modified ice impact panels with additional retention features.

Note: The Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

73-1084 Engine - Fuel and control - Fuel system tubes - Modified tubes between high idle solenoid and fuel flow regulator. (To avoid failure of tubes in the event of vibration.)

73-1085 Engine - Fuel and control - Fuel spray nozzles - Retaining bolts for No.10 fuel nozzle in low expansion steel. (To prevent loss of bolt torque.)

73-1142 Engine - Fuel and control - Fuel system tubes - LP fuel pump to FCOC tubes with sliding joint. (To reduce stresses in tubes and prevent possible failure.)

73-1149 Engine - Fuel and control - Fuel system tubes - Burner primary fuel supply tube re-set to clear aircraft duct clamp.

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73-1165 Non-Mod Service Bulletin	Engine - Fuel and control - Inspection of fuel flow regulator scheduling governor housing seal plate. (To ensure there are no units in service with unsupported rubber seal.)
73-1192	Engine - Fuel and control - Introduction of thicker washers at the FFR to LP governor fuel tube connector (FFR end). (To prevent potential fuel leak.)
73-1194 Part 1 to Part 3	Engine - Fuel and control - Introduction of modified connectors to LP fuel system. (To prevent connector frettage and fuel leaks.)

Note: Part 4 of Service Bulletin 73-1194 must not be embodied as it is superseded by the embodiment of Service Bulletin 73-1592.

73-1592	Engine fuel and control - Fuel system tubes - Introduction of a fuel flowmeter to HP fuel pump tube assembly with a new routing and installation.
74-1259	Ignition - Engine - Starting system - Introduction of an alternative high energy igniter plug type Y183-5 manufactured by S.L. Auburn.
75-1034	Air - Air tubes and fittings - EPR manifold with increased diameter drain holes.
75-1199	Air - Air tubes and fittings - P3 air tube - Split connection to FFR with increased flexibility. (To prevent P3 air leaks causing engine handling problems or slow accelerations and low power.)
76-1083	Engine controls - Emergency fuel shut down system - Rear cable guide plate in stainless steel. (To prevent failure of the guide plate.)
76-1098	Engine controls - Control linkage - FCU and SOV. (To improve linkage integrity and avoid failures due to excessive vibration.)
76-1130	Engine controls - Control linkage - Reorientation of pilot's lever angle (PLA) transducer. (To eliminate a foul with transducer connector and the stowed cowl door jury strut.)
76-1139	Engine controls - Control linkage - Redesigned throttle relay lever and support bracket. (To provide a more robust location for PLA transducer.)
76-1203	Engine controls - Control linkage - Throttle relay lever with relief for PLA transducer. (To alleviate rotor and bearing wear and inaccurate readings.)

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76-1319 Non-Mod Service Bulletin — Engine controls - Adjustment of the spindle retaining plate of the throttle relay lever bracket to prevent oscillation of the spindle. (To prevent throttle stagger and low EPR on take-off and minimize wear on bracket assemblies.)

76-1466 — Engine controls - LP shaft failure system - Introduction of pulley wheel at EFSO cable rear guide location.

79-1089 — Oil - Oil filter differential pressure indicator - Seal rings fitted at indicator electrical connector. (To eliminate false warnings from differential pressure switch.)

79-1175 — Oil - Oil system tubes - LP turbine bearing oil feed tube with sliding joint. (To prevent tube failure in event of severe vibration.)

79-1189 — Oil - Oil system tubes - LP turbine bearing oil return tube reset at by-pass duct flange. (To prevent possible foul with aircraft bleed air regulating valve.)

79-1411 — Oil - Oil-Tank - Introduction of revised oil tank assembly with deleted fuel pipe support bracket.

79-1796 — Oil - Oil Tank - Introduction of an oil fill instruction label on the oil tank to prevent oil overfilling.

Note: The Service Bulletin above is recommended for embodiment only in engines post Service Bulletin Tay-79-1463.

I. Accessories

Item

(1) The following units require rework:

(a) Airflow Control Regulator and Actuator

Item

[1] Remove unit from engine.

[2] Disassemble sufficiently to replace the diaphragm (75-32-05, 03-435), the piston seal rings (75-32-06, 05-470 and 05-490) and the felt piston wiper washer (75-32-06, 05-510).

[3] Rebuild and test.

[4] Re-install unit on engine.

(b) Replace the two spherical bearings (72-35-23, 03-170) and (75-32-09, 07-110) of the Airflow Control Regulator (AFCR) connecting link assembly.

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(c) RPM Signal Generator

Item

[1] Remove unit from engine.

[2] Disassemble sufficiently to replace the diaphragm.

[3] Rebuild and test.

[4] Re-install unit on engine.

(2) Visually inspect the fuel spray nozzles and clean, if required, in accordance with the Component Maintenance Manual Spray Nozzles

(a) Crack test the double ended unions (73-11-06, 01-095) and (73-11-06, 01-295) during the inspection of the fuel spray nozzles (Refer to the Component Maintenance Manual Spray Nozzles, Chapter 73-11-06, TASK 73-11-06-200-000).

(b) As an alternative to step I.(2)(a) you can install replacement double ended unions (73-11-06, 01-095) and (73-11-06, 01-295).

(3) Conduct external visual inspection of TGT thermocouples.

(4) Conduct external visual inspection of TGT thermocouple harness.

(5) Carry out a functional test on the LP cooling air outlet switch.

(6) Remove existing grease and debris from splines of starter quillshaft.

NOTE: Care must be taken when applying fresh grease to the splines as too much grease can result in an end load on the starter drive front bearing and cause the bearing to fail.

R (7) Replace the igniter plugs with new.

(8) The following Service Bulletins are recommended for embodiment:

73-1131 Engine - Fuel and control - Fuel flow regulator - Introduction of a test schedule amendment of redefine setting of the minimum flow stop. (To prevent slow accelerations and surge during severe handling conditions.)

73-1166 Engine - Fuel and control - Fuel flow regulator - Introduction of a Spey type lever housing seal plate. (To eliminate the possibility of overboard fuel leak.)

73-1280 Engine - Fuel and control - Shut-off cock - Introduction of a shut-off cock with the cold start facility deleted. (To prevent 'hot' starts due to inadvertent selection of cold start fuel flow.)

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73-1378 Engine - Fuel and control - Fuel flow regulator - Introduction of a P3P accumulator unit.
(Only required on engines with Service Bulletin 72-1347 (LP turbine stage 1 NGVs with increased throat area) embodied.)

73-1405 Engine - Fuel and control - Fuel flow regulator - Introduction of P3P accumulator valve with air filter plug.
(Only required on engines with Service Bulletin 73-1378 (standard accumulator unit fitted) embodied.)

75-1275 Air - Airflow control regulator - Rear mount bracket and piston push rod machined to increase clearance with adjacent parts. (To prevent fouls with AFCR linkage.)

(9) Check the FFR drive end coupling end float. The coupling should move freely inwards under hand pressure. If there is no movement the drive end is to be removed for incorporation of Service Bulletin 73-1211.

NOTE: Service experience has demonstrated that corrosion can be more prevalent on the low utilisation type of operation. It is thus important to monitor ongoing service experience, particularly in relation to the integrity of Group A parts and also establish individual Operator corrosion experience. Rolls-Royce should always therefore be advised if:

(1) Extensive corrosion attack is evident, particularly affecting Group A parts.

(2) Any Group A parts are rejected for corrosion pitting (Rolls-Royce may wish those parts to be returned for more detailed examination).

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APPENDIX 3

MID-LIFE REWORK

EFFECTIVITY - TAY 620-15

At 4000 hours from new, or overhaul, a rework is required as detailed below.

The rework package will be developed with service experience.

Any component(s) inspected and found to be in excess of Engine Manual limits, may warrant further inspection, engine strip or rework other than that stated in this work package.

R Recommendations for maintenance and overhaul of engine mounted accessory units are R given in Appendix 5.

R Accessory units that have been fitted to an engine at intermediate time require R have their lives tracked to ensure that they are overhauled at the required R interval.

A. Module 01 - LP Compressor

Item

(1) Visually inspect for obvious damage.

R (2) The following Service Bulletin and Non-Modification service Bulletins are recommended for embodiment:

72-1528	Engine - LP compressor rotating fairing - Introduction of an LP compressor rotor spinner assembly with a dowel pin installed in the spinner flange.
72-A1782 Non-Mod Service Bulletin	Engine - Low Pressure (LP) compressor rotor blades - Instruction of a repair to the LP compressor (fan) blade leading edge profile.
72-1787 Non-Mod Service Bulletin	Engine - Low Pressure (LP) compressor rotor blades - Measurement of the chordal width and the leading edge thickness of selected LP compressor (fan) blades.

(3) Remove fan blades from disc and perform ultrasonic inspection of blade root (refer to the Engine Manual, Chapter 72-31-12, TASK 72-31-12-200-000).

NOTE: The inspection check of the fan blades is mandated in Non-Modification Service Bulletin 72-1442.

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(4) Rework in accordance with Engine Manual as necessary. Accomplishment of Repair Scheme HRS3629 LPC rotor blade - Restore L/E profile or of the Non-Modification Service Bulletin that follows is recommended:

72-1603 Non-Mod Service Bulletin	Engine - Low Pressure (LP) compressor (fan) blades - Instruction of a repair to the LP compressor (fan) blade leading edge profile.

(5) Replace blades in as-received position as annotated in log book.

(6) Check balance, if necessary.

(7) Rebalance rotor assembly, if necessary.

B. Module 02 - IP Compressor

Item

(1) Visually inspect for obvious damage.

(2) The following Service Bulletin and Repair Scheme is recommended for embodiment:

72-1045	Engine - IP compressor air splitter - Introduction of strengthened annular ring. (To reduce secondary damage to engine in event of rearward movement of LP fan blades due to tang failure.)
HRS3390	IP compressor inlet guide vane - Re-apply filler material. (To prevent secondary IP compressor damage due to hard filler release.)

C. Module 03 - HP Compressor

Item

(1) Check HP rotor for freedom of rotation.

(2) Check bleed valve hardware for binding, corrosion, wear, damage, freedom of movement.

(3) Visually inspect for obvious damage and excessive corrosion.

R (4) The following Service Bulletins and Non-Modification Service Bulletins are recommended for embodiment:

72-1496 Non-Mod Service Bulletin	Engine - HP compressor stage 7 and 12 air off-take clamp inspection.

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72-A1653 Engine - High Pressure (HP) compressor vanes stages 4 to 11 - Introduction of a new setting procedure to increase the minimum vane tip clearance.

72-1704 Engine - Air guide tube drive shaft and fittings - High Pressure (HP) compressor - Introduction of revised torque tightening procedure for the Low Pressure (LP) thrust bearing outer ring spanner nut.

72-A1740 Non-Mod Service Bulletin Engine - High Pressure (HP) compressor rotor discs - Decrease of time limits manual maximum approved lives of the HP compressor stages 1, 3, 6, 7 and 12 rotor discs.

D. Module 04 - Combustion and HP Turbine

Item

(1) Remove module from engine.

(2) Visually inspect for obvious damage.

(3) Strip module as per Engine Manual.

(4) Overhaul module as per Engine Manual.

NOTE: HP turbine stage 1 blades should be visually inspected only and do not require full overhaul processing unless they will exceed 20000 hours during the next engine release life.

(5) The following Service Bulletins are recommended for embodiment:

72-1060 Engine - HP turbine case and rotor - Increased clearance between HP stage 1 rotor blades and nozzle vanes. (To overcome possible axial rubs.)

72-1111 Engine - HP turbine bearing and support - Bearing flexible support stop ring with increased axial clearance. (To eliminate a possible source of HP order vibration.)

72-1143 Engine - High energy igniter adaptors - Revised procedure for setting igniter immersion depth. (To extend igniter life.)

(6) Re-assemble module in accordance with Engine Manual.

E. Module 05 - LP Turbine

Item

(1) Remove module from engine.

(2) Visually inspect for obvious damage.

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(3) Rework to Engine Manual as necessary.

(4) Crack test engine mount rear links.

(5) The following Service Bulletins and Non-Modification Service Bulletin are recommended for embodiment:

72-1117	Engine - LP turbine - Disc driving flange dowel bolts with tapered and square heads. (To prevent disc damage during assembly/disassembly.)
72-1160	Engine - LP turbine bearing support - Application of jointing compound to bearing support flange and overspeed control arm body mating faces. (To prevent oil leakage.)
72-1195	Engine - LP turbine case and vanes - LP turbine interstage seals with increased tolerances and improved anti-frettage coating. (To prevent rubs and fast rundown times.)
72-1358	Engine - LP turbine case and vanes - Re-introduction of three piece intrascope blanking plug assembly at LP1 and LP3 nozzle guide vane positions. (To prevent secondary LP turbine damage due to intrascope blanking plug failure.)
72-1364	Engine - LP turbine rotor discs and shaft - Rear oil tube steady with reduced outside diameter. (To prevent seizure of the rear oil tube within the air guide tube eliminating failures at the rear oil tube and ensuring satisfactory operation of the emergency fuel shut-off cock mechanism.)
72-1455	Engine - LP nozzle case and vanes - Introduction of LP turbine stage 1 NGV and seal support assembly with honeycomb seal.
72-1557 Non-Mod Service Bulletin	Engine - Low Pressure (LP) turbine rotor discs - Sample inspection requirements for Tay Operators.
72-1590	Engine - Turbine nozzle case and vanes-LP - Deletion of the dowel pins and retainer plates which are installed in the LP turbine stage 1 static air seal.

F. Module 06 - HS Gearbox

Item

(1) Visually inspect gearbox mounts, link and accessory features.

(2) Inspect for signs of oil leakage.

(3) Clean accessory mount pads.

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(4) The following Service Bulletin and Non-Modification Service Bulletin is recommended for embodiment:

72-1112	Engine - Main oil pumps - LP turbine bearing return oil transfer tube with by-pass hole. (To overcome oil spillage and smoke emission.)
72-1401 Non-Mod Service Bulletin	Engine - High speed gearbox HSGB - Inspection and re-lubrication of starter drive splines.

G. Module 07 - Intermediate Casing

Item

(1) Inspect intermediate case for damage, corrosion and general condition.

(2) Inspect Inlet Guide Vane (IGV) actuating mechanism for freedom of movement and range of travel.

(3) Inspect engine trunnion mounting flange bore location for damage.

(4) Inspect intermediate case mounting lug for damage.

(5) Rework to Engine Manual as necessary.

(6) The following Service Bulletins are recommended for embodiment:

72-1122	Engine - LP compressor - Front bearing locating ring with copper plated bore. (To improve bearing location and prevent debris generation.)
72-1480	Engine high speed gearbox driving assembly - Introduction of increased torque on the internal gearbox bevel gear retaining nut.

(7) Re-assemble module in accordance with Engine Manual.

H. Non-Modular Items

Item

(1) Inspect nose cone spinner and fairing.

(2) Inspect rubber tip nose cap.

(3) Inspect LP compressor case assembly.

Crack test engine mount taper pins and adaptors.

Crack test engine front (trunnion) mount.

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(4) Inspect clamps for missing or deteriorated rubber cushions. Replace as necessary.

(5) Inspect transmitters, switches, thermocouples and electrical connectors for general condition and security.

(6) Inspect engine by-pass ducts for general condition.

(7) Inspect LP exhaust mixer for general condition.

(8) Inspect Engine Fuel Shut-Off (EFSO) cable assembly for strands integrity.

(9) Check main oil filter, scavenge filters and magnetic chip detectors and pop-up indicator.

(10) Check IGV freedom and do a bleed valve pull-off check.

(11) Discard the fuel tube of pre Service Bulletin 73-1194 standard or pre Service Bulletin 73-1592 standard and replace it with the fuel tube of post Service Bulletin 73-1592 standard.

(12) The following Service Bulletins and Non-Modification Service Bulletins are recommended for embodiment:

71-1109 Power plant - Electrical harness (light duty) - PLA transducer connector with revised wiring arrangement. (To provide compatibility with aircraft circuitry.)

71-1110 Power plant - Drain tubes and fittings - Restrictor plate fitted in internal gearbox to drains tank vent line. (To prevent fuel leakage from overboard vent.)

71-1158 Power plant - Electrical harness (light duty) - Fitment of lightning strike protective sleeving to harness looms. (To guard against electrical interference.)

71-1163 Power plant - Electrical harness (light duty) - Reorientation of keyway on power lever angle (PLA) transducer connector. (To prevent a foul between harness and aircraft cowl door ferry strut.)

72-1026 Engine - Compressor intermediate case - Fitment of setting spacers at IGV linkage external stop. (To ensure correct HP speed/thrust relationship.)

72-1148 Engine - By-pass duct - Deletion of sealing compound from fairings adjacent to air cooled oil cooler. (To ensure unrestricted drainage to overboard drain connector.)

72-1429 Engine - LP compressor rotating fairing - Introduction of revised nose cone fairing assembly produced by super plastic blow forming. (Supersedes Service Bulletin 72-1376.)

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Note: The Service Bulletin above is recommended for embodiment only in engines post Service Bulletin 72-1039.

72-1638 Non-Mod Service Bulletin	Engine - Low Pressure (LP) compressor case and vanes - Repeat visual inspection of the ice impact panels and instruction of minimum ice impact panel configuration on installed engines.

Note: The Non-Modification Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

72-A1643	Engine - Low Pressure (LP) compressor case and vanes - Introduction of modified ice impact panels with additional retention features.

Note: The Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

72-1646 Non-Mod Service Bulletin	Engine - Low Pressure (LP) support tube and front retaining ring - Inspection of the front fuel cut-off ring installation.
73-1084	Engine - Fuel and control - Fuel system tubes - Modified tubes between high idle solenoid and fuel flow regulator. (To avoid failure of tubes in the event of vibration.)
73-1085	Engine - Fuel and control - Fuel spray nozzles - Retaining bolts for No.10 fuel nozzle in low expansion steel. (To prevent loss of bolt torque.)
73-1142	Engine - Fuel and control - Fuel system tubes - LP fuel pump to FCOC tubes with sliding joint. (To reduce stresses in tubes and prevent possible failure.)
73-1165 Non-Mod Service Bulletin	Engine - Fuel and control - Inspection of fuel flow regulator scheduling governor housing seal plate. (To ensure there are no units in service with unsupported rubber seal.)
73-1192	Engine - Fuel and control - Introduction of thicker washers at the FFR to LP governor fuel tube connector (FFR end). (To prevent potential fuel leak.)
73-1194 Part 1 to Part 3	Engine - Fuel and control - Introduction of modified connectors to LP fuel system. (To prevent connector frettage and fuel leaks.)

Note: Part 4 of Service Bulletin 73-1194 must not be embodied as it is superseded by the embodiment of Service Bulletin 73-1592.

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73-1592	Engine fuel and control - Fuel system tubes - Introduction of a fuel flowmeter to HP fuel pump tube assembly with a new routing and installation.
74-1259	Ignition - Engine - Starting system - Introduction of an alternative high energy igniter plug type Y183-5 manufactured by S.L. Auburn.
75-1034	Air - Air tubes and fittings - EPR manifold with increased diameter drain holes.
75-1055	Air - Air tubes and fittings - Introduction of non-flowing EPR manifold system and modified pressure rakes. (To ensure no engines are in service with pre Service Bulletin standard.)
75-1199	Air - Air tubes and fittings - P3 air tube - Split connection to FFR with increased flexibility. (To prevent P3 air leaks causing engine handling problems or slow accelerations and low power.)
76-1083	Engine controls - Emergency fuel shut down system - Rear cable guide plate in stainless steel. (To prevent failure of the guide plate.)
76-1098	Engine controls - Control linkage - FCU and SOV. (To improve linkage integrity and avoid failures due to excessive vibration.)
76-1139	Engine controls - Control linkage - Redesigned throttle relay lever and support bracket. (To provide a more robust location for PLA transducer.)
76-1203	Engine controls - Control linkage - Throttle relay lever with relief for PLA transducer. (To alleviate rotor and bearing wear and inaccurate readings.)
76-1208	Engine controls - Control linkage - Introduction of throttle relay lever mounting bracket with increased clearance for aircraft control rod.
76-1319 Non-Mod Service Bulletin	Engine controls - Adjustment of the spindle retaining plate on the throttle relay lever bracket to prevent oscillation of the spindle. (To prevent throttle stagger and low EPR on take-off and minimize wear on bracket assemblies.)
76-1434 Non-Mod Service Bulletin	Emergency fuel shut off system - Inspection of emergency fuel shut off cable.
76-1466	Engine controls - LP shaft failure system - Introduction of pulley wheel at EFSO cable rear guide location.

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79-1089 Oil - Oil filter differential pressure indicator - Seal rings fitted at indicator electrical connector. (To eliminate false warnings from differential pressure switch.)

79-1175 Oil - Oil system tubes - LP turbine bearing oil feed tube with sliding joint. (To prevent tube failure in event of severe vibration.)

79-1411 Oil - Oil-Tank - Introduction of revised oil tank assembly with deleted fuel pipe support bracket.

I. Accessories

Item

(1) Overhaul fuel spray nozzles.

(a) Crack test the double ended unions (73-11-06, 01-095) and (73-11-06, 01-295) during the overhaul of the fuel spray nozzles (Refer to the Component Maintenance Manual Spray Nozzles, Chapter 73-11-06, TASK 73-11-06-200-000).

(b) As an alternative to step I.(1)(a) you can install replacement double ended unions (73-11-06, 01-095) and (73-11-06, 01-295).

(2) Test and inspect TGT thermocouples.

(3) Test and inspect TGT thermocouple harness.

(4) Remove existing grease and debris from splines of starter quillshaft.

NOTE: Care must be taken when applying fresh grease to the splines as too much grease can result in an end load on the starter drive front bearing and cause the bearing to fail.

(5) Replace the two spherical bearings (72-35-23, 03-170) and (75-32-09, 07-110) of the Airflow Control Regulator (AFCR) connecting link assembly.

(6) The following Service Bulletins and Non-Modification Service Bulletin are recommended for embodiment:

36-1325 Pneumatic system - HP bleed valve sensing switch - Introduction of integral plunger action switch. (To eliminate the possibility of manipulation of the actuating arm or deformation due to incorrect gap adjustment thus ensuring correct selection of stage 7 to stage 12 HP engine bleed.)

73-1166 Engine - Fuel and control - Fuel flow regulator - Introduction of a Spey type lever housing seal plate. (To eliminate the possibility of overboard fuel leak.)

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73-1280 Engine - Fuel and control - Shut-off cock - Introduction of a shut-off cock with the cold start facility deleted. (To prevent 'hot' starts due to inadvertent selection of cold start fuel flow.)

73-1315 Engine - Fuel and control - Fuel flow regulator - Introduction of increased reverse thrust. (To maintain maximum (emergency) reverse thrust with the introduction of Fokker aircraft modification F100-78-010.)

73-1630 Non-Mod Service Bulletin Engine fuel and control - Fuel flow regulator (Type CASC512) - Re-calibration of fuel flow regulator.

75-1275 Air - Airflow control regulator - Rear mount bracket and piston push rod machined to increase clearance with adjacent parts. (To prevent fouls with AFCR linkage.)

75-1736 Air - Airflow control regulator and attachment fittings - Introduction of revised scheduling limits for the Variable Inlet Guide Vanes (VIGV) and Handling Bleed Valve (HBV).

77-1267 Engine indicating - Oil pressure transmitter - Introduction of kulite oil pressure transmitter with output transient overload protection.

(7) Check the FFR drive end coupling end float. The coupling should move freely inwards under hand pressure. If there is no movement the drive end is to be removed for incorporation of Service Bulletin 73-1211.

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APPENDIX 4

ADDITIONAL CALENDAR LIFE REWORK PACKAGE

EFFECTIVITY - TAY 620-15

Calendar Life Rework

To release engines for a further period of 10 years the following work package should be incorporated in addition to the work package detailed in Appendix 3. This package will be developed with service experience.

A. Module 01 - LP Compressor

Not applicable.

B. Module 02 - IP Compressor

Item

(1) Remove module from engine.

(2) Perform interface inspection on interface with Module 07.

(3) Strip module sufficiently to allow visual inspection of stator vane locating rings (if Service Bulletin 72-1252 Part 2 is not incorporated) and IP compressor shaft.

(4) Rework to Engine Manual as necessary.

(5) The following Service Bulletin is recommended for embodiment (if Service Bulletin 72-1252 Part 2 is not incorporated):

72-1252 Part 1	Engine - IP compressor air splitter and inlet guide vanes - Splitter fairing and stator retaining rings with improved corrosion protection. (To prevent corrosion cracking of splitter fairing and stator retaining rings.)

(6) Re-assemble module in accordance with Engine Manual.

C. Module 03 - HP Compressor

Item

(1) Remove module from engine.

(2) Strip module sufficiently to allow visual inspection of all Group A components.

(3) Inspect HP compressor case assembly.

(4) Rework to Engine Manual as necessary.

WORK ORDER:

FACILITY:

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(5) The following Service Bulletin is recommended for embodiment:

72-1115 Engine - HP compressor rotor - Stages 4 to 12 disc spacers with protective coating deleted from outer rim axial faces.

R (6) The following Non-Modification Service Bulletin is recommended for
R embodiment only if possible without additional disassembly:

R 72-1838 Engine - High Pressue (HP) compressor discs, blades and spacers
R Non-Mod - Borescope inspection of the HP compressor stage 5 rotor disc
R Service for undercut and holes.
R Bulletin

R (7) Re-assemble module in accordance with Engine Manual.

D. Module 04 - Combustion and HP Turbine

Not applicable.

E. Module 05 - LP Turbine

Item

(1) Remove module from engine.

(2) Strip module sufficiently to allow visual inspection of all Group A components.

F. Module 06 - HS Gearbox

Not applicable.

G. Module 07 - Intermediate Casing

(1) The following Service Bulletin is recommended for embodiment:

72-1399 Engine - Intermediate case assembly - Front flange bore - Additional corrosion protection. (Epoxy barrier coating into OGV location bore to provide insulation between the magnesium and titanium components.)

H. Non-Modular Items

Not applicable.

I. Accessories

The following units require rework:

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(1) Airflow Control Regulator and Actuator

Item

(a) Remove unit from engine.

(b) Disassemble sufficiently to replace the diaphragm (75-32-05, 03-435), the piston seal rings (75-32-06, 05-470 and 05-490) and the felt piston wiper washer (75-32-06, 05-510).

(c) Rebuild and test.

(d) Re-install unit on engine.

(2) RPM Signal Generator

Item

(a) Remove unit from engine.

(b) Disassemble sufficiently to replace the diaphragm.

(c) Rebuild and test.

(d) Re-install unit on engine.

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APPENDIX 4A

CALENDAR LIFE REWORK PACKAGE FOR LOW UTILISATION OPERATORS

EFFECTIVITY - TAY 620-15

Operators with low utilisation (as defined in paragraph 1.G.(2)), may elect to conduct the following work package in order to release the engine for a further 10 years calendar life or the balance of the hours remaining to mid-life or overhaul, whichever comes first.

NOTE: All removed parts are to be visually inspected for signs of corrosion and if necessary reworked in accordance with the applicable manual.

R Recommendations for maintenance and overhaul of engine mounted accessory units are
R given in Appendix 5.

R Accessory units that have been fitted to an engine at intermediate time require to
R have their lives tracked to ensure that they are overhauled at the required
R interval.

A. Module 01 - LP Compressor

Item

(1) Visually inspect for obvious damage.

(2) The following Service Bulletin is recommended for embodiment:

72-1528	Engine - LP compressor rotating fairing - Introduction of an LP compressor rotor spinner assembly with a dowel pin installed in the spinner flange.
72-A1782 Non-Mod Service Bulletin	Engine - Low Pressure (LP) compressor rotor blades - Instruction of a repair to the LP compressor (fan) blade leading edge profile.
72-1787 Non-Mod Service Bulletin	Engine - Low Pressure (LP) compressor rotor blades - Measurement of the chordal width and the leading edge thickness of selected LP compressor (fan) blades.

(3) Remove fan blades from disc and perform ultrasonic inspection of blade root (refer to the Engine Manual, Chapter 72-31-12, TASK 72-31-12-200-000).

NOTE: The inspection check of the fan blades is mandated in Non-Modification Service Bulletin 72-1442.

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(4) Rework in accordance with Engine Manual as necessary. Accomplishment of Repair Scheme HRS3629 LPC rotor blade - Restore L/E profile or of the Non-Modification Service Bulletin that follows is recommended:

72-1603 Non-Mod Service Bulletin	Engine - Low Pressure (LP) compressor (fan) blade - Instruction of a repair to the LP compressor (fan) blade leading edge profile.

(5) Replace blades in as-received position as annotated in log book.

(6) Check balance, if necessary.

(7) Rebalance rotor assembly, if necessary.

B. Module 02 - IP Compressor

Item

(1) Remove module from engine.

(2) Perform interface inspection on interface with Module 07.

(3) Strip module sufficiently to allow visual inspection of stator vane locating rings (if Service Bulletin 72-1252 Part 2 is not incorporated) and the IP compressor shaft.

(4) Rework to Engine Manual as necessary.

(5) The following Service Bulletin and Repair Scheme is recommended for embodiment:

72-1045	Engine - IP compressor air splitter - Introduction of strengthened annular ring. (To reduce secondary damage to engine in event of rearward movement of LP fan blades due to tang failure.)
HRS3390	IP compressor inlet guide vane - Re-apply filler material. (To prevent secondary IP compressor damage due to hard filler release.)

(6) The following Service Bulletin is recommended for embodiment (if Service Bulletin 72-1252 Part 2 is not incorporated):

72-1252 Part 1	Engine - IP compressor air splitter and inlet guide vanes - Splitter fairing and stator retaining rings with improved corrosion protection. (To prevent corrosion cracking of splitter fairing and stator retaining rings.)

(7) Re-assemble module in accordance with Engine Manual.

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C. Module 03 - HP Compressor

Item

(1) Remove module from engine.

(2) Strip module sufficiently to allow visual inspection of all Group A components.

(3) Inspect HP compressor case assembly.

(4) Check bleed valve hardware for binding, corrosion, wear, damage, freedom of movement.

(5) Rework to Engine Manual as necessary.

(6) The following Service Bulletins and Non-Modification Service Bulletin are recommended for embodiment:

72-1115	Engine - HP compressor rotor - Stages 4 to 12 disc spacers with protective coating deleted from outer rim axial faces.
72-1496 Non-Mod Service Bulletin	Engine - HP compressor stage 7 and 12 air off-take clamp inspection.
72-A1653	Engine - High Pressure (HP) compressor vanes stages 4 to 11 - Introduction of a new setting procedure to increase the minimum vane tip clearance.
72-1704	Engine - Air guide tube drive shaft and fittings - High Pressure (HP) compressor - Introduction of revised torque tightening procedure for the Low Pressure (LP) thrust bearing outer ring spanner nut.
72-A1740 Non-Mod Service Bulletin	Engine - High Pressure (HP) compressor rotor discs - Decrease of time limits manual maximum approved lives of the HP compressor stages 1, 3, 6, 7 and 12 rotor discs.

R (7) The following Non-Modification Service Bulletin is recommended for
R embodiment only if possible without additional disassembly:

R 72-1838 R Non-Mod R Service R Bulletin	Engine - High Pressure (HP) compressor discs, blades and spacers - Borescope inspection of the HP compressor stage 5 rotor disc for undercut and holes.

(8) Re-assemble module in accordance with Engine Manual.

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D. Module 04 - Combustion and HP Turbine

Item

(1) Remove module from engine.

(2) Visually inspect for obvious damage.

(3) Strip module sufficiently to allow visual inspection of all Group A components.

(4) Visually inspect for obvious damage and excessive corrosion.

(5) Rework to Engine Manual as necessary.

NOTE: HP turbine stage 1 blades should be visually inspected only and do not require full overhaul processing unless they will exceed 20000 hours during the next engine release life.

(6) The following Service Bulletins are recommended for embodiment:

72-1060 Engine - HP turbine case and rotor - Increased clearance between HP stage 1 rotor blades and nozzle vanes. (To overcome possible axial rubs.)

72-1111 Engine - HP turbine bearing and support - Bearing flexible support stop ring with increased axial clearance. (To eliminate a possible source of HP order vibration.)

72-1143 Engine - High energy igniter adaptors - Revised procedure for setting igniter immersion depth. (To extend igniter life.)

(7) Re-assemble module in accordance with Engine Manual.

E. Module 05 - LP Turbine

Item

(1) Remove module from engine.

(2) Visually inspect for obvious damage.

(3) Strip module sufficiently to allow visual inspection of all Group A components.

(4) Visually inspect for obvious damage and excessive corrosion.

(5) Rework to Engine Manual as necessary.

(6) Crack test engine mount rear links.

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(7) The following Service Bulletins and Non-Modification Service Bulletin are recommended for embodiment:

72-1117	Engine - LP turbine - Disc driving flange dowel bolts with tapered and square heads. (To prevent disc damage during assembly/disassembly.)
72-1160	Engine - LP turbine bearing support - Application of jointing compound to bearing support flange and overspeed control arm body mating faces. (To prevent oil leakage.)
72-1195	Engine - LP turbine case and vanes - LP turbine interstage seals with increased tolerances and improved anti-frettage coating. (To prevent rubs and fast rundown times.)
72-1358	Engine - LP turbine case and vanes - Re-introduction of three piece intrascope blanking plug assembly at LP1 and LP3 nozzle guide vane positions. (To prevent secondary LP turbine damage due to intrascope blanking plug failure.)
72-1364	Engine - LP turbine rotor discs and shaft - Rear oil tube steady with reduced outside diameter. (To prevent seizure of the rear oil tube within the air guide tube eliminating failures at the rear oil tube and ensuring satisfactory operation of the emergency fuel shut-off cock mechanism.)
72-1455	Engine - LP nozzle case and vanes - Introduction of LP turbine stage 1 NGV and seal support assembly with honeycomb seal.
72-1557 Non-Mod Service Bulletin	Engine - Low Pressure (LP) turbine rotor discs - Sample inspection requirements for Tay Operators.
72-1590	Engine - Turbine nozzle case and vanes-LP - Deletion of the dowel pins and retainer plates which are installed in the LP turbine stage 1 static air seal.

F. Module 06 - HS Gearbox

(1) Visually inspect gearbox mounts, link and accessory features.

(2) Inspect for signs of oil leakage.

(3) Clean accessory mount pads.

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(4) The following Service Bulletin and Non-Modification Service Bulletin is recommended for embodiment:

72-1112	Engine - Main oil pumps - LP turbine bearing return oil transfer tube with by-pass hole. (To overcome oil spillage and smoke emission.)
72-1401 Non-Mod Service Bulletin	Engine - High speed gearbox HSGB - Inspection and re-lubrication of starter drive splines.

G. Module 07 - Intermediate Casing

Item

(1) Inspect intermediate case for damage, corrosion and general condition.

(2) Inspect Inlet Guide Vane (IGV) actuating mechanism for freedom of movement and range of travel.

(3) Inspect engine trunnion mounting flange bore location for damage.

(4) Inspect intermediate case mounting lug for damage.

(5) Rework to Engine Manual as necessary.

(6) The following Service Bulletins are recommended for embodiment:

72-1122	Engine - LP compressor - Front bearing locating ring with copper plated bore. (To improve bearing location and prevent debris generation.)
72-1399	Engine - Intermediate case assembly - Front flange bore - Additional corrosion protection. (Epoxy barrier coating into OGV location bore to provide insulation between the magnesium and titanium components.)
72-1480	Engine high speed gearbox driving assembly - Introduction of increased torque on the internal gearbox bevel gear retaining nut.

(7) Re-assemble module in accordance with Engine Manual.

H. Non-Modular Items

Item

(1) Inspect nose cone spinner and fairing.

(2) Inspect rubber tip nose cap.

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(3) Inspect LP compressor case assembly.

Crack test engine mount taper pins and adaptors.

Crack test engine front (trunnion) mount.

(4) Inspect clamps for missing or deteriorated rubber cushions. Replace as necessary.

(5) Inspect transmitters, switches, thermocouples and electrical connectors for general condition and security.

(6) Inspect engine by-pass ducts for general condition.

(7) Inspect LP exhaust mixer for general condition.

(8) Inspect Engine Fuel Shut-Off (EFSO) cable assembly for strands integrity.

(9) Check main oil filter, scavenge filters and magnetic chip detectors and pop-up indicator.

(10) Check IGV freedom and do a bleed valve pull-off check.

(11) Discard the fuel tube of pre Service Bulletin 73-1194 standard or pre Service Bulletin 73-1592 standard and replace it with the fuel tube of post Service Bulletin 73-1592 standard.

(12) The following Service Bulletins and Non-Modification Service Bulletins are recommended for embodiment:

71-1109 Power plant - Electrical harness (light duty) - PLA transducer connector with revised wiring arrangement. (To provide compatibility with aircraft circuitry.)

71-1110 Power plant - Drain tubes and fittings - Restrictor plate fitted in internal gearbox to drains tank vent line. (To prevent fuel leakage from overboard vent.)

71-1158 Power plant - Electrical harness (light duty) - Fitment of lightning strike protective sleeving to harness looms. (To guard against electrical interference.)

71-1163 Power plant - Electrical harness (light duty) - Reorientation of keyway on power lever angle (PLA) transducer connector. (To prevent a foul between harness and aircraft cowl door ferry strut.)

72-1026 Engine - Compressor intermediate case - Fitment of setting spacers at IGV linkage external stop. (To ensure correct HP speed/thrust relationship.)

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72-1148 Engine - By-pass duct - Deletion of sealing compound from fairings adjacent to air cooled oil cooler. (To ensure unrestricted drainage to overboard drain connector.)

72-1429 Engine - LP compressor rotating fairing - Introduction of revised nose cone fairing assembly produced by super plastic blow forming. (Supersedes Service Bulletin 72-1376.)

Note: The Service Bulletin above is recommended for embodiment only in engines post Service Bulletin 72-1039.

72-1638 Non-Mod Service Bulletin Engine - Low Pressure (LP) compressor case and vanes - Repeat visual inspection of the ice impact panels and instruction of minimum ice impact panel configuration on installed engines.

Note: The Non-Modification Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

72-A1643 Engine - Low Pressure (LP) compressor case and vanes - Introduction of modified ice impact panels with additional retention features.

Note: The Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

72-1646 Non-Mod Service Bulletin Engine - Low Pressure (LP) support tube and front retaining ring - Inspection of the front fuel cut-off ring installation.

73-1084 Engine - Fuel and control - Fuel system tubes - Modified tubes between high idle solenoid and fuel flow regulator. (To avoid failure of tubes in the event of vibration.)

73-1085 Engine - Fuel and control - Fuel spray nozzles - Retaining bolts for No.10 fuel nozzle in low expansion steel. (To prevent loss of bolt torque.)

73-1142 Engine - Fuel and control - Fuel system tubes - LP fuel pump to FCOC tubes with sliding joint. (To reduce stresses in tubes and prevent possible failure.)

73-1165 Non-Mod Service Bulletin Engine - Fuel and control - Inspection of fuel flow regulator scheduling governor housing seal plate. (To ensure there are no units in service with unsupported rubber seal.)

73-1192 Engine - Fuel and control - Introduction of thicker washers at the FFR to LP governor fuel tube connector (FFR end). (To prevent potential fuel leak.)

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73-1194 Part 1 to Part 3	Engine - Fuel and control - Introduction of modified connectors to LP fuel system. (To prevent connector frettage and fuel leaks.)

Note: Part 4 of Service Bulletin 73-1194 must not be embodied as it is superseded by the embodiment of Service Bulletin 73-1592.

73-1592	Engine fuel and control - Fuel system tubes - Introduction of a fuel flowmeter to HP fuel pump tube assembly with a new routing and installation.
74-1259	Ignition - Engine - Starting system - Introduction of an alternative high energy igniter plug type Y183-5 manufactured by S.L. Auburn.
75-1034	Air - Air tubes and fittings - EPR manifold with increased diameter drain holes.
75-1055	Air - Air tubes and fittings - Introduction of non-flowing EPR manifold system and modified pressure rakes. (To ensure no engines are in service with pre Service Bulletin standard.)
75-1199	Air - Air tubes and fittings - P3 air tube - Split connection to FFR with increased flexibility. (To prevent P3 air leaks causing engine handling problems or slow accelerations and low power.)
76-1083	Engine controls - Emergency fuel shut down system - Rear cable guide plate in stainless steel. (To prevent failure of the guide plate.)
76-1098	Engine controls - Control linkage - FCU and SOV. (To improve linkage integrity and avoid failures due to excessive vibration.)
76-1139	Engine controls - Control linkage - Redesigned throttle relay lever and support bracket. (To provide a more robust location for PLA transducer.)
76-1203	Engine controls - Control linkage - Throttle relay lever with relief for PLA transducer. (To alleviate rotor and bearing wear and inaccurate readings.)
76-1208	Engine controls - Control linkage - Introduction of throttle relay lever mounting bracket with increased clearance for aircraft control rod.
76-1319 Non-Mod Service Bulletin	Engine controls - Adjustment of the spindle retaining plate on the throttle relay lever bracket to prevent oscillation of the spindle. (To prevent throttle stagger and low EPR on take-off and minimize wear on bracket assemblies.)

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76-1434 Non-Mod Service Bulletin	Emergency fuel shut off system - Inspection of emergency fuel shut off cable.
76-1466	Engine controls - LP shaft failure system - Introduction of pulley wheel at EFSO cable rear guide location.
79-1089	Oil - Oil filter differential pressure indicator - Seal rings fitted at indicator electrical connector. (To eliminate false warnings from differential pressure switch.)
79-1175	Oil - Oil system tubes - LP turbine bearing oil feed tube with sliding joint. (To prevent tube failure in event of severe vibration.)
79-1411	Oil - Oil-Tank - Introduction of revised oil tank assembly with deleted fuel pipe support bracket.

I. Accessories

(1) The following units require rework:

(a) Airflow Control Regulator and Actuator

Item

[1] Remove unit from engine.

[2] Disassemble sufficiently to replace the diaphragm (75-32-05, 03-435), the piston seal rings (75-32-06, 05-470 and 05-490) and the felt piston wiper washer (75-32-06, 05-510).

[3] Rebuild and test.

[4] Re-install unit on engine.

(b) Replace the two spherical bearings (72-35-23, 03-170) and (75-32-09, 07-110) of the Airflow Control Regulator (AFCR) connecting link assembly.

(c) RPM Signal Generator

Item

[1] Remove unit from engine.

[2] Disassemble sufficiently to replace the diaphragm.

[3] Rebuild and test.

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[4] Re-install unit on engine.

(2) Visually inspect the fuel spray nozzles and clean, if required in accordance with the Component Maintenance Manual Spray Nozzles

(a) Crack test the double ended unions (73-11-06, 01-095) and (73-11-06, 01-295) during the inspection of the fuel spray nozzles (Refer to the Component Maintenance Manual Spray Nozzles, Chapter 73-11-06, TASK 73-11-06-200-000).

(b) As an alternative to step I.(2)(a) you can install replacement double ended unions (73-11-06, 01-095) and (73-11-06, 01-295).

(3) Conduct external visual inspection of TGT thermocouples.

(4) Conduct external visual inspection of TGT thermocouple harness.

(5) Remove existing grease and debris from splines of starter quillshaft.

NOTE: Care must be taken when applying fresh grease to the splines as too much grease can result in an end load on the starter drive front bearing and cause the bearing to fail.

(6) The following Service Bulletins and Non-Modification Service Bulletin are recommended for embodiment:

36-1325	Pneumatic system - HP bleed valve sensing switch - Introduction of integral plunger action switch. (To eliminate the possibility of manipulation of the actuating arm or deformation due to incorrect gap adjustment thus ensuring correct selection of stage 7 to stage 12 HP engine bleed.)
73-1166	Engine - Fuel and control - Fuel flow regulator - Introduction of a Spey type lever housing seal plate. (To eliminate the possibility of overboard fuel leak.)
73-1280	Engine - Fuel and control - Shut-off cock - Introduction of a shut-off cock with the cold start facility deleted. (To prevent 'hot' starts due to inadvertent selection of cold start fuel flow.)
73-1315	Engine - Fuel and control - Fuel flow regulator - Introduction of increased reverse thrust. (To maintain maximum (emergency) reverse thrust with the introduction of Fokker aircraft modification F100-78-010.)
73-1630 Non-Mod Service Bulletin	Engine fuel and control - Fuel flow regulator (Type CASC512) - Re-calibration of fuel flow regulator.

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75-1275 Air - Airflow control regulator - Rear mount bracket and piston push rod machined to increase clearance with adjacent parts. (To prevent fouls with AFCR linkage.)

75-1736 Air - Airflow control regulator and attachment fittings - Introduction of revised scheduling limits for the Variable Inlet Guide Vanes (VIGV) and Handling Bleed Valve (HBV).

77-1267 Engine indicating - Oil pressure transmitter - Introduction of kulite oil pressure transmitter with output transient overload protection.

(7) Check the FFR drive end coupling end float. The coupling should move freely inwards under hand pressure. If there is no movement the drive end is to be removed for incorporation of Service Bulletin 73-1211.

NOTE: Service experience has demonstrated that corrosion can be more prevalent on the low utilisation type of operation. It is thus important to monitor ongoing service experience, particularly in relation to the integrity of Group A parts and also establish individual Operator corrosion experience. Rolls-Royce should always therefore be advised if:

(1) Extensive corrosion attack is evident, particularly affecting Group A parts.

(2) Any Group A parts are rejected for corrosion pitting (Rolls-Royce may wish those parts to be returned for more detailed examination).

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APPENDIX 5

ROLLS-ROYCE RESPONSIBILITY ENGINE MOUNTED ACCESSORIES

NOTE: The ATA reference is applicable to the appropriate Rolls-Royce Illustrated Parts Catalog. The Vendor may have a different ATA reference.

	Unit	ATA Ref	Manufacturer	Tay 611-8	Tay 620-15	Tay 650-15	Tay 651-54
	IDG oil cooler (air cooled)	24-13-01	Stewart Warner	-	-	-	*
	HP bleed valve sensing switch	36-11-01	Honeywell	-	*	*	-
	Air non-return valve (2 off)	36-11-02	FR HiTemp	-	*	*	-
	EPR trim plug	71-50-01	Pyle National	*	*	*	*
	EPR trim plug cover	71-50-01	Glenair	*	*	*	*
	Trim balance probe	72-35-43	Smiths	*	*	*	*
	Drains ejector pump	73-11-01	Goodrich	+	+	+	+
	Fuel drain valve	73-11-03	Auto Valve Inc.	*	*	*	*
	LP fuel filter element	73-11-03	Aircraft Porous Media	*	*	*	*
	LP fuel filter element	73-11-03	Automotive Industries	*	*	*	*
	LP fuel pump	73-11-04	FR HiTemp	*	*	*	*
R	HP fuel pump	73-11-05	Goodrich	#	#	#	#
	Fuel spray nozzles	73-11-06	Parker Hannifin	-	-	+	+
	Fuel spray nozzles	73-11-06	Rolls-Royce	+	+	-	-
R	HP fuel shut off valve	73-11-07	Goodrich	#	#	#	#
R	Fuel flow regulator	73-21-01	Goodrich	#	#	#	#
R	LP shaft governor	73-21-02	Goodrich	#	#	#	#
	Temperature control actuator	73-21-03	Smiths	*	-	-	-

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	Unit	ATA Ref	Manufacturer	Tay 611-8	Tay 620-15	Tay 650-15	Tay 651-54
	Temperature control signal amplifier	73-21-04	Smiths	*	-	-	-
R	Approach idle solenoid	73-21-06	Goodrich	++	++	++	++
R	Approach idle solenoid	73-21-06	Valve Research and Manufacturing Company	++	-	-	-
R	Fuel reset solenoid	73-21-07	Goodrich	++	-	-	-
R	Fuel reset solenoid	73-21-07	Valve Research and Manufacturing Company	++	-	-	-
	P3 accumulator	73-21-11	Goodrich	++	-	-	-
	Fuel filter differential pressure switch	73-33-01	Custom Control Sensor	*	*	*	*
	Fuel filter differential pressure switch	73-33-01	Meggitt Avionics	*	*	*	*
	Fuel low pressure warning switch	73-34-01	Goodrich	*	*	*	*
	High energy ignition unit	74-11-01	Unison	-	*	*	*
	High energy igniter internal leads and disconnect	74-21-01	Unison	-	-	-	*
	High energy igniter internal leads and disconnect	74-21-02	Unison	*	*	*	-
	Igniter plugs	74-21-03	Smiths	*	*	*	*
	Igniter plugs (alternative)	74-21-03	Auburn	*	*	*	-
	LP cooling air outlet temperature switch	75-21-02	Fenwal	++	++	++	++
	HP compressor airflow control regulator	75-32-01	Rolls-Royce	+	+	+	+

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Unit	ATA Ref	Manufacturer	Tay 611-8	Tay 620-15	Tay 650-15	Tay 651-54
Airflow control RPM signal transmitter	75-32-20	Goodrich	+	+	+	+
T26 thermal unit	75-32-40	Meggit Avionics	*	*	*	*
PLA transducer	76-11-02	M.P.C. Products	*	-	-	-
Engine rating and identity plug	77-41-03	Bendix	-	*	*	-
Engine rating and identity plug	77-41-03	Matrix	-	*	*	-
Engine rating and identity plug	77-41-03	Pyle National	-	*	*	-
Fuel temperature bulb	77-42-02	Weston	-	*	*	-
Fuel temperature bulb	77-42-02	Coltec	-	-	-	*
LP and HP RPM tacho generator	77-43-01	Smiths	*	*	*	*
EPR probes	77-44-01	Rolls-Royce	*	*	*	*
TGT thermocouples	77-45-01	Weston	*	*	*	*
TGT thermocouple harness (Circ.)	77-45-02	Weston	*	*	*	*
TGT thermocouple harness (Radial)	77-45-02	Weston	*	*	*	*
TGT thermocouple junction box	77-45-03	Rolls-Royce	*	*	*	*
Oil pressure transmitter	77-47-01	Kulite	-	*	*	-
Oil pressure transmitter	77-47-01	Smiths	*	-	-	-
Oil temperature transmitter	77-47-02	Lewis	*	-	-	*
Oil temperature transmitter	77-47-02	Weston	-	*	*	-
Oil tank contents transmitter	79-10-01	FR HiTemp	-	*	*	*

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	Unit	ATA Ref	Manufacturer	Tay 611-8	Tay 620-15	Tay 650-15	Tay 651-54
R	Oil pressure filler	79-10-01	Triumph Activation	+	+	+	+
	Oil tank	79-10-01	Rolls-Royce	*	*	*	*
	Oil filter element	79-21-01	Automotive Industries	*	*	*	*
	Magnetic chip detectors	79-21-02	Vactric	*	*	*	*
	Oil cooler assembly	79-22-01	Rolls-Royce	+	+	+	+
	Oil low pressure warning switch	79-32-01	Vibrometer	*	*	*	*
	Indicator assembly filter maintenance	79-33-01	Pall Aerospace	*	*	*	*
	Oil filter differential pressure sensing switch	79-33-01	Pall Aerospace	*	*	*	*
	Air starter	80-11-01	Allied Signal	-	+	+	+
	Starter control valve	80-11-01	Allied Signal	-	+	+	+

* Accessory with no overhaul life. These items are subject of repetitive maintenance, inspection checks or tests, or normal crew observation to determine their continued serviceability.
Overhaul action on these items is therefore limited to the requirement to prove their serviceability for fitment.

R + Accessory with fixed overhaul life of 8000 hours.

++ Accessory with no fixed overhaul life - functional test only at engine overhaul life.

\- Technical responsibility for Accessory not Rolls-Royce or Accessory type not fitted in this application.

R # Accessory with a soft time. When the engine is in the shop and the accessory
R soft time has been exceeded then rework the unit in accordance with the
R Component Management Programme. Where no Component Management Programme exists
R then overhaul the unit. Where the soft time has not been exceeded functional
R test unit only during pass-off test. Accessory soft times are listed below.

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R A. Accessory soft times

R (1) The following accessory units are operated On Condition and do not have a
R Hard Life . In order to maintain unit in-service reliability these units
R are managed by soft lives. The soft life is only applicable if the unit is
R installed on an engine that is undergoing a shop visit. When a unit Time
R Since New (TSN) or Time Since Overhaul (TSO) has exceeded the soft life
R then rework the unit in accordance with the Component Management Programme.
R Where no Component Management Programme exists then overhaul the unit. The
R list of TAY accessories, which are subject to a soft life are listed in the
R table below.

	Unit	ATA	Soft Time (TSN/TSO)
R	HP fuel pump	73-11-05	10,000
R	HP fuel shut off valve	73-11-07	10,000
R	Fuel flow regulator	73-21-01	8,000
R	LP shaft governor	73-21-02	10,000

R NOTE: Engines operated in accordance with NMSB TAY-70-1517 should use the
R accessory unit soft times published in NMSB TAY-70-1517.

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APPENDIX 6

FULL OVERHAUL

EFFECTIVITY - TAY 611-8

At 8000 hours from new or overhaul or 4000 hours from mid-life rework, an overhaul is required as detailed below.

R Recommendations for maintenance and overhaul of engine mounted accessory units are
R given in Appendix 5.

Accessory units that have been fitted to an engine at intermediate time require to have their lives tracked to ensure that they are overhauled at the required interval.

A. Overhaul

(1) Inspect and rework all modules, accessories and other non-modular items in accordance with the Engine Manual except for the following:

(a) HP turbine stage 1 blades should be visually inspected only and do not require full overhaul processing unless they exceed 20000 hours during the next engine release life.

(b) The following parts should be visually inspected only and do not require full overhaul:

R [1] Plate (72-33-00, 01-100).

R [2] Plate (72-33-31, 01-038).

R [3] Plate (72-33-33, 03-042).

R [4] Accessory suspension bracket (72-34-20, 01-065).

R [5] Housing (72-35-47, 03-265).

R [6] Lever (72-35-60, 01-230).

R [7] Lever (72-37-21, 01-150).

R [8] Cover assembly (72-37-21, 01-222).

R [9] Ring (72-37-42, 02-250).

R [10] Plate (72-41-23, 03-670).

R [11] Plate (72-41-23, 03-700).

R [12] Seat (72-52-21, 01-410).

R [13] Carrier assembly (72-52-21, 01-600).

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R [14] Plate (72-52-34, 04-230).

[15] HS gearbox front housing assembly (72-61-10, 02-004).

[16] HS gearbox front mount cover assembly (72-61-10, 02-180).

R [17] Link (72-61-10, 02-210).

[18] HS gearbox rear case assembly (72-61-11, 03-004).

[19] HS gearbox rear mount cover assembly (72-61-11, 03-210).

R [20] Cover (72-61-12, 04-040).

R [21] Mount assembly (72-61-16, 08-430).

(2) Replace the two spherical bearings (72-35-23, 03-170) and (75-32-09, 07-110) of the Airflow Control Regulator (AFCR) connecting link assembly.

(3) Replace the two bushes (75-32-08, 06-530) of the AFCR rear mount assembly.

(4) Replace OGV and outer seal housing assembly retaining bolts (72-37-41, 01-020) and (72-37-41, 01-075) with new.

NOTE: Care must be taken when applying fresh grease to the splines of the HS gearbox starter drive shaft and the starter quillshaft. Too much grease can result in an end load on the starter drive front bearing and cause the bearing to fail.

(5) Discard the fuel tube of pre Service Bulletin 73-1194 standard or pre Service Bulletin 73-1592 standard and replace it with the fuel tube of post Service Bulletin 73-1592 standard.

R (6) Replace the igniter plugs with new.

(7) The following Service Bulletins and Non-Modification Service Bulletins are recommended for embodiment:

72-1025 Engine - LP compressor - Repositioned fuel shut-off mechanism. (To prevent incorrect or inadvertent operation of system.)

72-1041 Engine - HP compressor rotor - Application of Sermetel W anti-corrosion treatment to disc spacer.

72-1121 Engine - HP compressor rotor - Disc spacers with Sermetal W protective coating replacing PL101. (To improve anti-corrosion protection.)

72-1230 Engine - Internal gearbox - Rear bearing housing with increased diameter chamfer.

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72-1296 Non-Mod Service Bulletin — Engine - Replacement of high speed gearbox drive driven bevel gearshaft JR27127. (To ensure that low fatigue strength gearshafts are removed from service.)

72-1323 — Engine - HS gearbox - Breather shaft air/oil seal with increased radial clearance.

72-1341 Non-Mod Service Bulletin — Engine - Replacement of high speed gearbox drive driven bevel gearshaft JR27127. (To ensure that low fatigue strength gearshafts are removed from service.)

72-1429 — Engine - LP compressor rotating fairing - Introduction of revised nose cone fairing assembly produced by super plastic blow forming. (Supersedes Service Bulletin 72-1376.)

Note: The Service Bulletin above is recommended for embodiment only in engines post Service Bulletin 72-1039.

72-1455 — Engine - LP nozzle case and vanes - Introduction of LP turbine stage 1 NGV and seal support assembly with honeycomb seal.

72-1472 — Engine - Generator drive shaft and bevel gear shaft assemblies - High speed gearbox dee head bolt material and torque tightening setting change.

72-1499 — Engine - High speed gearbox driving gear assembly - Internal gearbox - Interference fit of drive shaft and bevel gear.

72-1528 — Engine - LP compressor rotating fairing - Introduction of an LP compressor rotor spinner assembly with a dowel pin installed in the spinner flange.

72-1590 — Engine - Turbine nozzle case and vanes-LP - Deletion of the dowel pins and retainer plates which are installed in the LP turbine stage 1 static air seal.

72-1603 Non-Mod Service Bulletin — Engine - Low Pressure (LP) compressor (fan) blades - Instruction of a repair to the LP compressor (fan) blades leading edge profile.

72-1639 Non-Mod Service Bulletin — Engine - Low Pressure (LP) compressor case and vanes - Repeat visual inspection of the ice impact panels and instruction of minimum ice impact panel configuration on installed engines.

Note: The Non-Modification Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

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72-1644 Non-Mod Service Bulletin — Engine - Low Pressure (LP) support tube and front retaining ring - Inspection of the front fuel cut-off ring installation.

72-A1650 — Engine - Low Pressure (LP) compressor case and vanes - Introduction of modified ice impact panels with additional retention features.

Note: The Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

72-A1653 Non-Mod Service Bulletin — Engine - High Pressure (HP) compressor vanes stages 4 to 11 - Introduction of a new setting procedure to increase the minimum vane tip clearance.

72-A1696 — Engine - Turbine nozzle case and vanes - HP and LP - Inspection of the bolts which are installed in the LPT stage 1 static air seal and of the bolts which are installed in the HPT stage 1 air seal support.

Note: The Service Bulletin above is only applicable to a specific list of engine serial numbers identified.

72-1704 — Engine - Air guide tube drive shaft and fittings - High Pressure (HP) compressor - Introduction of revised torque tightening procedure for the Low Pressure (LP) thrust bearing outer ring spanner nut.

72-1719 Non-Mod Service Bulletin — Engine - High Pressure (HP) compressor discs, blades and spacers stages 6 to 9 - Replacement of HP compressor rotor discs.

Note: The Non-Modification Service Bulletin above is only applicable to a specific list of engine serial numbers identified.

72-1730 Non-Mod service Bulletin — Engine - High Pressure (HP) compressor vanes stages 4 to 11 - Inspection of the HP compressor stage 7 stator vanes.

Note: The Non-Modification Service Bulletin above is only applicable to a specific list of engine serial numbers identified.

72-1731 Non-Mod Service Bulletin — Engine - High Pressure (HP) compressor vanes stages 4 to 11 - Inspection of the HP compressor stage 7 stator vanes.

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Note: The Non-Modification Service Bulletin above is only applicable to a specific list of engine serial numbers identified.

72-1783 Non-Mod Service Bulletin — Engine - Fan Blades - Ultrasonic inspection of fan blade roots.

72-1819 Non-Mod Service Bulletin — Engine - Turbine rotor disc and shaft - High Pressure (HP) - Inspection of the HP turbine stage 2 disc sleeve serial number.

Note: The Non-Modification Service Bulletin above is applicable for Engine Serial Number 18189.

R R R R 72-1838 Non-Mod Service Bulletin — Engine - High Pressure (HP) compressor discs, blades and spacers - Borescope inspection of the HP compressor stage 5 rotor disc for undercut and holes.

73-1078 — Engine - Fuel and control - Fuel flow regulator - Introduction of an approach idle mechanism with increased range of adjustment. (To ensure ability to achieve approach idle and ground idle settings.)

73-1079 — Engine - Fuel and control - Fuel flow regulator with reduced throttle valve lever backlash. (To prevent power fluctuations when operating on auto-throttle.)

73-1131 — Engine - Fuel and control - Fuel flow regulator - Introduction of a test schedule amendment of redefine setting of the minimum flow stop. (To prevent slow accelerations and surge during severe handling conditions.)

73-1165 Non-Mod Service Bulletin — Engine - Fuel and control - Inspection of fuel flow regulator scheduling governor housing seal plate. (To ensure there are no units in service with unsupported rubber seal.)

73-1166 — Engine - Fuel and control - Fuel flow regulator - Introduction of a Spey type lever housing seal plate. (To eliminate the possibility of overboard fuel leak.)

73-1167 — Engine - Fuel and control - Fuel flow regulator - Introduction of idle reset adjuster mounting bolts with wire locking holes.

73-1194 Part 1 to Part 3 — Engine - Fuel and control - Introduction of modified connectors to LP fuel system. (To prevent connector frettage and fuel leaks.)

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Note: Part 4 of Service Bulletin 73-1194 must not be embodied as it is superseded by the embodiment of Service Bulletin 73-1592.

73-1210 Engine - Fuel and control - Fuel flow regulator - Introduction of a reduced variable metering orifice (VMO) push rod end float and improvement to the VMO and acceleration control unit (ACU) plunger and sleeves. (To improve unit reliability.)

73-1211 Engine - Fuel and control - Fuel flow regulator - Introduction of modified input drive seal retainer. (To provide greater wear resistance and prevent fuel leakage.)

73-1213 Engine - Fuel and control - Fuel flow regulator - Introduction of a two piece slider block and pin assembly. (For unit improvement with respect of engine speed for a given throttle lever position.)

73-1217 Engine - Fuel and control - Fuel flow regulator - Introduction of revised design standard of reach nut. (To improve unit reliability by preventing ACU governor movement.)

73-1219 Engine - Fuel and control - Fuel flow regulator - Introduction of an increased clearance dashpot piston within the scheduling governor. (To improve unit reliability.)

73-1281 Engine - Fuel and control - Fuel flow regulator - Introduction of a fuel flow regulator with solutions to eliminate calibration shift.

73-1301 Engine - Fuel and control - Fuel flow regulator - Introduction of a fuel flow regulator with a revised ACU governor weight arm. (To improve unit reliability by preventing arm failure.)

73-1322 Engine - Fuel and control - Fuel flow regulator - Introduction of a fuel flow regulator with a revised double datum idle design.

73-1378 Engine - Fuel and control - Fuel flow regulator - Introduction of a P3P accumulator unit. (Only required on engines with Service Bulletin 72-1347 (LP turbine stage 1 NGVs with increased throat area) embodied.)

73-1405 Engine - Fuel and control - Fuel flow regulator - Introduction of P3P accumulator valve with air filter plug (Only required on engines with Service Bulletin 73-1378 (standard accumulator unit fitted) embodied).

73-1592 Engine fuel and control - Fuel system tubes - Introduction of a fuel flowmeter to HP fuel pump tube assembly with a new routing and installation.

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76-1083 Engine controls - Emergency fuel shut down system - Rear cable guide plate in stainless steel. (To prevent failure of the guide plate.)

76-1346 Engine controls - Control linkage - Throttle relay lever support bracket with locked spindle.

76-1466 Engine controls - LP shaft failure system - Introduction of pulley wheel at EFSO cable rear guide location.

79-1426 Oil - Engine gaskets - Introduction of gasket material change to Klingersil C4430.

79-1796 Oil - Oil Tank - Introduction of an oil fill instruction label on the oil tank to prevent oil overfilling.

Note: The Service Bulletin above is recommended for embodiment only in engines post Service Bulletin TAY-79-1463.

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APPENDIX 7

FULL OVERHAUL

EFFECTIVITY - TAY 620-15

At 8000 hours from new or overhaul or 4000 hours from mid-life rework, an overhaul is required as detailed below.

R Recommendations for maintenance and overhaul of engine mounted accessory units are
R given in Appendix 5.

Accessory units that have been fitted to an engine at intermediate time require to have their lives tracked to ensure that they are overhauled at the required interval.

A. Overhaul

(1) Inspect and rework all modules, accessories and other non-modular items in accordance with the Engine Manual.

NOTE: HP turbine stage 1 blades should be visually inspected only and do not require full overhaul processing unless they exceed 20000 hours during the next engine release life.

(2) Replace the two spherical bearings (72-35-23, 03-170) and (75-32-09, 07-110) of the Airflow Control Regulator (AFCR) connecting link assembly.

(3) Replace the two bushes (75-32-08, 06-530) of the AFCR rear mount assembly.

(4) Replace OGV and outer seal housing assembly retaining bolts (72-37-41, 01-020) and (72-37-41, 01-075) with new.

NOTE: Care must be taken when applying fresh grease to the splines of the HS gearbox starter drive shaft and the starter quillshaft. Too much grease can result in an end load on the starter drive front bearing and cause the bearing to fail.

(5) Discard the fuel tube of pre Service Bulletin 73-1194 standard or pre Service Bulletin 73-1592 standard and replace it with the fuel tube of post Service Bulletin 73-1592 standard.

(6) Replace the starter idler gearshaft (72-61-18, 10-040).

(7) The following Service Bulletins and Non-Modification Service Bulletins are recommended for embodiment:

72-1025 Engine - LP compressor - Repositioned fuel shut-off mechanism. (To prevent incorrect or inadvertent operation of system.)

72-1041 Engine - HP compressor rotor - Application of Sermetel W anti-corrosion treatment to disc spacer.

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72-1121	Engine - HP compressor rotor - Disc spacers with Sermetel W protective coating replacing PL101. (To improve anti-corrosion protection.)
72-1230	Engine - Internal gearbox - Rear bearing housing with increased diameter chamfer.
72-1401 Non-Mod Service Bulletin	Engine - High speed gearbox HSGB - Inspection and re-lubrication of starter drive splines.
72-1429	Engine - LP compressor rotating fairing - Introduction of revised nose cone fairing assembly produced by super plastic blow forming. (Supersedes Service Bulletin 72-1376.)

Note: The Service Bulletin above is recommended for embodiment only in engines post Service Bulletin 72-1039.

72-1442 Non-Mod Service Bulletin	Engine - Fan blades - Ultrasonic inspection of fan blade roots.
72-1455	Engine - LP nozzle case and vanes - Introduction of LP turbine stage 1 NGV and seal support assembly with honeycomb seal.
72-1472	Engine - Generator drive shaft and bevel gear shaft assemblies - High speed gearbox dee head bolt material and torque tightening setting change.
72-1499	Engine - High speed gearbox driving gear assembly - Internal gearbox - Interference fit of drive shaft and bevel gear.
72-1528	Engine - LP compressor rotating fairing - Introduction of an LP compressor rotor spinner assembly with a dowel pin installed in the spinner flange.
72-1557 Non-Mod Service Bulletin	Engine - Low Pressure (LP) turbine rotor discs - Sample inspection requirements for Tay Operators.
72-1590	Engine - Turbine nozzle case and vanes-LP- Deletion of the dowel pins and retainer plates which are installed in the LP turbine stage 1 static air seal.
72-1603 Non-Mod Service Bulletin	Engine - Low Pressure (LP) compressor (fan) blades - Instruction of a repair to the LP compressor (fan) blades leading edge profile.

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72-1638 Non-Mod Service Bulletin — Engine - Low Pressure (LP) compressor case and vanes - Repeat visual inspection of the ice impact panels and instruction of minimum ice impact panel configuration on installed engines.

Note: The Non-Modification Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

72-A1643 — Engine - Low Pressure (LP) compressor case and vanes - Introduction of modified ice impact panels with additional retention features.

Note: The Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

72-1646 Non-Mod Service Bulletin — Engine - Low Pressure (LP) support tube and front retaining ring - Inspection of the front fuel cut-off ring installation.

72-A1653 — Engine - High Pressure (HP) compressor vanes stages 4 to 11 - Introduction of a new setting procedure to increase the minimum vane tip clearance.

72-1704 — Engine - Air guide tube drive shaft and fittings - High Pressure (HP) compressor - Introduction of revised torque tightening procedure for the Low Pressure (LP) thrust bearing outer ring spanner nut.

72-A1740 Non-Mod Service Bulletin — Engine - High Pressure (HP) compressor rotor discs - Decrease of time limits manual maximum approved lives of the HP compressor stages 1, 3, 6, 7 and 12 rotor discs.

72-A1782 Non-Mod Service Bulletin — Engine - Low Pressure (LP) compressor rotor blades - Instruction for repair to the LP compressor (fan) blade leading edge profile.

72-1787 Non-Mod Service Bulletin — Engine - Low Pressure (LP) compressor rotor blades - Measurement of the chordal width and the leading edge thickness of selected (fan) blades.

R 72-1838 Non-Mod Service Bulletin — Engine - High Pressure (HP) compressor discs, blades and spacers - Borescope inspection of the HP compressor stage 5 rotor disc for undercut and holes.

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73-1078	Engine - Fuel and control - Fuel flow regulator - Introduction of an approach idle mechanism with increased range of adjustment. (To ensure ability to achieve approach idle and ground idle settings.)
73-1079	Engine - Fuel and control - Fuel flow regulator with reduced throttle valve lever backlash. (To prevent power fluctuations when operating on auto-throttle.)
73-1134	Engine - Fuel and control - Fuel flow regulator - Introduction of a Lucas test schedule amendment to increase engine HP RPM to achieve the take-off thrust rating.
73-1165 Non-Mod Service Bulletin	Engine - Fuel and control - Inspection of fuel flow regulator scheduling governor housing seal plate. (To ensure there are no units in service with unsupported rubber seal.)
73-1166	Engine - Fuel and control - Fuel Flow regulator - Introduction of a Spey type lever housing seal plate. (To eliminate the possibility of overboard fuel leak.)
73-1167	Engine - Fuel and control - Fuel flow regulator - Introduction of idle reset adjuster mounting bolts with wire locking holes.
73-1194 Part 1 to Part 3	Engine - Fuel and control - Introduction of modified connectors to LP fuel system. (To prevent connector frettage and fuel leaks.)

Note: Part 4 of Service Bulletin 73-1194 must not be embodied as it is superseded by the embodiment of Service Bulletin 73-1592.

73-1210	Engine - Fuel and control - Fuel flow regulator - Introduction of a reduced variable metering orifice (VMO) push rod end float and improvement to the VMO and acceleration control unit (ACU) plunger and sleeves. (To improve unit reliability.)
73-1211	Engine - Fuel and control - Fuel flow regulator - Introduction of modified input drive seal retainer. (To provide greater wear resistance and prevent fuel leakage.)
73-1213	Engine - Fuel and control - Fuel flow regulator - Introduction of a two piece slider block and pin assembly. (For unit improvement with respect of engine speed for a given throttle lever position.)
73-1217	Engine - Fuel and control - Fuel flow regulator - Introduction of revised design standard of reach nut. (To improve unit reliability by preventing ACU governor movement.)

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73-1219	Engine - Fuel and control - Fuel flow regulator - Introduction of an increased clearance dashpot piston within the scheduling governor. (To improve unit reliability.)
73-1281	Engine - Fuel and control - Fuel flow regulator - Introduction of a fuel flow regulator with solutions to eliminate calibration shift.
73-1301	Engine - Fuel and control - Fuel flow regulator - Introduction of a fuel flow regulator with a revised ACU governor weight arm. (To improve unit reliability by preventing arm failure.)
73-1322	Engine - Fuel and control - Fuel flow regulator - Introduction of a fuel flow regulator with a revised double datum idle design.
73-1592	Engine fuel and control - Fuel system tubes - Introduction of a fuel flowmeter to HP fuel pump tube assembly with a new routing and installation.
73-1630 Non-Mod Service Bulletin	Engine fuel and control - Fuel flow regulator (Type CASC512) - Re-calibration of fuel flow regulator.
75-1055	Air - Air tubes and fittings - Introduction of non-flowing EPR manifold system and modified pressure rakes. (To ensure no engines are in service with pre Service Bulletin standard.)
75-1736	Air - Airflow control regulator and attachment fittings - Introduction of revised scheduling limits for the Variable Inlet Guide Vanes (VIGV) and Handling Bleed Valve (HBV).
76-1083	Engine controls - Emergency fuel shut down system - Rear cable guide plate in stainless steel. (To prevent failure of the guide plate.)
76-1346	Engine controls - Control linkage - Throttle relay lever support bracket with locked spindle.
76-1434 Non-Mod Service Bulletin	Emergency fuel shut off system - Inspection of emergency fuel shut off cable.
76-1466	Engine controls - LP shaft failure system - Introduction of pulley wheel at EFSO cable rear guide location.
77-1267	Engine indicating - Oil pressure transmitter - Introduction of kulite oil pressure transmitter with output transient overload protection.

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79-1426 Oil - Engine gaskets - Introduction of gasket material change to Klingersil C4430.

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APPENDIX 8

MID-LIFE REWORK

EFFECTIVITY - TAY 650-15

At 4000 hours from new, or overhaul, a rework is required as detailed below.

The rework package will be developed with service experience.

Any component(s) inspected and found to be in excess of Engine Manual limits, may warrant further inspection, engine strip or rework other than that stated in this work package.

R Recommendations for maintenance and overhaul of engine mounted accessory units are
R given in Appendix 5.

R Accessory units that have been fitted to an engine at intermediate time require to
R have lives tracked to ensure that they are overhauled at the required interval.

A. Module 01 - LP Compressor

Item

(1) Visually inspect for obvious damage.

(2) The following Service Bulletin is recommended for embodiment:

72-1528	Engine - LP compressor rotating fairing - Introduction of an LP compressor rotor spinner assembly with a dowel pin installed in the spinner flange.

(3) Remove fan blades from disc and inspect in accordance with the following Non-Modification Service Bulletins:

72-1442 Non-Mod Service Bulletin	Engine - Fan blades - Ultrasonic inspection of fan blade roots (Supersedes Service Bulletin 72-1436 at the engine shop visits).
72-1603 Non-Mod Service Bulletin	Engine - Low Pressure (LP) compressor (fan) blades - Instruction of a repair to the LP compressor (fan) blade leading edge profile.
72-A1782 Non-Mod Service Bulletin	Engine - Low Pressure (LP) compressor rotor blades - Instruction of a repair to the LP compressor (fan) blade leading edge profile.

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72-1787 Non-Mod Service Bulletin — Engine - Low Pressure (LP) compressor rotor blades - Measurement of the chordal width and the leading edge thickness of selected compressor (fan) blades.

(4) Rework in accordance with Engine Manual as necessary. Accomplishment of Repair Scheme HRS3629 LPC rotor blade - Restore L/E profile is recommended.

(5) Replace blades in as-received position as annotated in log book.

(6) Check balance, if necessary.

(7) Rebalance rotor assembly, if necessary.

B. Module 02 - IP Compressor

Item

(1) Visually inspect for obvious damage.

(2) The following Repair Scheme is recommended for embodiment:

HRS3390 — IP compressor inlet guide vane - Re-apply filler material. (To prevent secondary IP compressor damage due to hard filler release.)

C. Module 03 - HP Compressor

Item

(1) Check HP rotor for freedom of rotation.

(2) Check bleed valve hardware for binding, corrosion, wear, damage, freedom of movement.

(3) Visually inspect for obvious damage and excessive corrosion.

(4) The following Service Bulletins and Non-Modification Service Bulletins are recommended for embodiment:

72-1485 Non-Mod Service Bulletin — Engine - HP turbine/HP compressor shaft spline flank wear inspection.

72-1496 Non-Mod Service Bulletin — Engine - HP compressor stage 7 and 12 air off-take clamp inspection.

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72-1498	Engine - HP rotor thrust bearing housing assembly - Introduction of revised retaining and locking features for the HP compressor outlet guide vane and outer seal spacer.
72-A1653	Engine - High Pressure (HP) compressor vanes stages 4 to 11 - Introduction of a new setting procedure to increase the minimum vane tip clearance.
72-1665	Engine - High Pressure (HP) turbine rotor discs and shaft and HP compressor rotor - Improved lubrication for the HP compressor shaft and HP turbine shaft mating splines.
72-1704	Engine - Air guide tube drive shaft and fittings - High Pressure (HP) compressor - Introduction of revised torque tightening procedure for the Low Pressure (LP) thrust bearing outer ring spanner nut.
72-A1740 Non-Mod Service Bulletin	Engine - High Pressure (HP) compressor rotor discs - Decrease of time limits manual maximum approved lives of the HP compressor stages 1, 3, 6, 7 and 12 rotor discs.

D. Module 04 - Combustion and HP Turbine

Item

(1) Remove module from engine.

(2) Visually inspect for obvious damage.

(3) Strip module as per Engine Manual.

(4) Overhaul module as per Engine Manual.

(5) The following Service Bulletins and Non-Modification Service Bulletins are recommended for embodiment:

72-1143	Engine - High energy igniter adaptors - Revised procedure for setting igniter immersion depth. (To extend igniter life.)
72-1327	Engine - HP turbine rotor discs and shafts - HP turbine shaft and coupling with hard coated abutment faces. (To prevent wear to spline and faces.)
72-1485 Non-Mod Service Bulletin	Engine - HP turbine/HP compressor shaft spline flank wear inspection.
72-A1676 Non-Mod Service Bulletin	Engine - High Pressure (HP) turbine rotor - HP turbine stage 1 disc reduced safe cyclic life - Engine management.

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72-1825 Non-Mod Service Bulletin — Engine - High Pressure (HP) turbine rotor discs and shaft - replacement of potential non-conforming parts of the HP turbine shaft - Non-Modification Service Bulletin.

(6) Re-assemble module in accordance with Engine Manual.

E. Module 05 - LP Turbine

Item

(1) Remove module from engine.

(2) Visually inspect for obvious damage.

(3) Rework to Engine Manual as necessary.

(4) Crack test engine mount rear links.

(5) The following Service Bulletins and Non-Modification Service Bulletin are recommended for embodiment:

72-1160 — Engine - LP turbine bearing support - Application of jointing compound to bearing support flange and overspeed control arm body mating faces. (To prevent oil leakage.)

72-1195 — Engine - LP turbine case and vanes - LP turbine interstage seals with increased tolerances and improved anti-frettage coating. (To prevent rubs and fast rundown times.)

72-1358 — Engine - LP turbine case and vanes - Re-introduction of three piece intrascope blanking plug assembly at LP1 and LP3 nozzle guide vane positions. (To prevent secondary LP turbine damage due to intrascope blanking plug failure.)

72-1364 — Engine - LP turbine rotor discs and shaft - Rear oil tube steady with reduced outside diameter. (To prevent seizure of the rear oil tube within the air guide tube eliminating failures at the rear oil tube and ensuring satisfactory operation of the emergency fuel shut-off cock mechanism.)

72-1366 Part 1 only — Engine - LP nozzle case and vanes - Introduction of front and rear nozzle cases in revised material. (Inco 718.)

72-A1524 — Engine - LP turbine discs stage 2 and stage 3 - Inspection requirements due to potential corrosion.

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72-1557 Non-Mod Service Bulletin — Engine - Low Pressure (LP) turbine rotor discs - Sample inspection requirements for Tay Operators.

F. Module 06 - HS Gearbox

Item

(1) Visually inspect gearbox mounts, link and accessory features.

(2) Inspect for signs of oil leakage.

(3) Clean accessory mount pads.

(4) The following Non-Modification Service Bulletin is recommended for embodiment:

72-1401 Non-Mod Service Bulletin — Engine - High speed gearbox HSGB - Inspection and re-lubrication of starter drive splines.

G. Module 07 - Intermediate Casing

Item

(1) Inspect intermediate case for damage, corrosion and general condition.

(2) Inspect Inlet Guide Vane (IGV) actuating mechanism for freedom of movement and range of travel.

(3) Inspect engine trunnion mounting flange bore location for damage.

(4) Inspect intermediate case mounting lug for damage.

(5) Rework to Engine Manual as necessary.

(6) The following Service Bulletin and Non-Modification Service Bulletins are recommended for embodiment:

72-1296 Non-Mod Service Bulletin — Engine - Replacement of high speed gearbox drive driven bevel gearshaft JR27127. (To ensure that low fatigue strength gearshafts are removed from service.)

72-1341 Non-Mod Service Bulletin — Engine - Replacement of high speed gearbox drive driven bevel gearshaft JR27127. (To ensure that low fatigue strength gearshafts are removed from service.)

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72-1480 Engine high speed gearbox driving assembly - Introduction of increased torque on the internal gearbox bevel gear retaining nut.

(7) Re-assemble module in accordance with Engine Manual.

H. Non-Modular Items

Item

(1) Inspect nose cone spinner and fairing.

(2) Inspect rubber tip nose cap.

(3) Inspect LP compressor case assembly.

Crack test engine mount taper pins and adaptors.

Crack test engine front (trunnion) mount.

(4) Inspect clamps for missing or deteriorated rubber cushions. Replace as necessary.

(5) Inspect transmitters, switches, thermocouples and electrical connectors for general condition and security.

(6) Inspect engine by-pass ducts for general condition.

(7) Inspect LP exhaust mixer for general condition.

(8) Inspect Engine Fuel Shut-Off (EFSO) cable assembly for strands integrity.

(9) Check main oil filter, scavenge filters and magnetic chip detectors and pop-up indicator.

(10) Check IGV freedom and do a bleed valve pull-off check.

(11) Discard the fuel tube of pre Service Bulletin 73-1194 standard or pre Service Bulletin 73-1592 standard and replace it with the fuel tube of post Service Bulletin 73-1592 standard.

(12) The following Service Bulletins and Non-Modification Service Bulletins are recommended for embodiment:

71-1110 Power plant - Drain tubes and fittings - Restrictor plate fitted in internal gearbox to drains tank vent line. (To prevent fuel leakage from overboard vent.)

72-1383 Engine - Intermediate bypass duct - Introduction of revised clipping of HE igniter leads.

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72-1429 Engine - LP compressor rotating fairing - Introduction of revised nose cone fairing assembly produced by super plastic blow forming. (Supersedes Service Bulletin 72-1376.)

72-1638 Non-Mod Service Bulletin Engine - Low Pressure (LP) compressor case and vanes - Repeat visual inspection of the ice impact panels and instruction of minimum ice impact panel configuration on installed engines.

Note: The Non-Modification Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

72-A1643 Engine - Low Pressure (LP) compressor case and vanes - Introduction of modified ice impact panels with additional retention features.

Note: The Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

73-1165 Non-Mod Service Bulletin Engine - Fuel and control - Inspection of fuel flow regulator scheduling governor housing seal plate. (To ensure there are no units in service with unsupported rubber seal.)

73-1192 Engine - Fuel and control - Introduction of thicker washers at the FFR to LP governor fuel tube connector (FFR end). (To prevent potential fuel leak.)

73-1194 Part 1 to Part 3 Engine - Fuel and control - Introduction of modified connectors to LP fuel system. (To prevent connector frettage and fuel leaks.)

Note: Part 4 of Service Bulletin 73-1194 must not be embodied as it is superseded by the embodiment of Service Bulletin 73-1592.

73-1464 Fuel and control - Fuel manifold - Airspray fuel burners - Introduction of fuel manifold connectors with increased central external diameter.

73-1592 Engine fuel and control - Fuel system tubes - Introduction of a fuel flowmeter to HP fuel pump tube assembly with a new routing and installation.

76-1139 Engine controls - Control linkage - Redesigned throttle relay lever and support bracket. (To provide a more robust location for PLA transducer.)

76-1203 Engine controls - Control linkage - Throttle relay lever with relief for PLA transducer. (To alleviate rotor and bearing wear and inaccurate readings.)

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76-1208 Engine controls - Control linkage - Introduction of throttle relay lever mounting bracket with increased clearance for aircraft control rod.

76-1319 Non-Mod Service Bulletin Engine controls - Adjustment of the spindle retaining plate on the throttle relay lever bracket to prevent oscillation of the spindle. (To prevent throttle stagger and low EPR on take-off and minimize wear on bracket assemblies.)

76-1434 Non-Mod Service Bulletin Emergency fuel shut off system - Inspection of emergency fuel shut off cable.

76-1466 Engine controls - LP shaft failure system - Introduction of pulley wheel at EFSO cable rear guide location.

79-1089 Oil - Oil filter differential pressure indicator - Seal rings fitted at indicator electrical connector. (To eliminate false warnings from differential pressure switch.)

79-1411 Oil - Oil-Tank - Introduction of revised oil tank assembly with deleted fuel pipe support bracket.

I. Accessories

Item

(1) Overhaul fuel spray nozzles.

(2) Test and inspect TGT thermocouples.

(3) Test and inspect TGT thermocouple harness.

(4) Remove existing grease and debris from splines of starter quillshaft.

NOTE: Care must be taken when applying fresh grease to the splines as too much grease can result in an end load on the starter drive front bearing and cause the bearing to fail.

(5) Replace the two spherical bearings (72-35-23, 03-170) and (75-32-09, 07-110) of the Airflow Control Regulator (AFCR) connecting link assembly.

(6) The following Service Bulletins and Non-Modification Service Bulletins are recommended for embodiment:

36-1325 Pneumatic system - HP bleed valve sensing switch - Introduction of integral plunger action switch. (To eliminate the possibility of manipulation of the actuating arm or deformation due to incorrect gap adjustment thus ensuring correct selection of stage 7 to stage 12 HP engine bleed.)

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73-1166	Engine - Fuel and control - Fuel flow regulator - Introduction of a Spey type lever housing seal plate. (To eliminate the possibility of overboard fuel leak.)
73-1207	Engine - Fuel and control - Fuel flow regulator - Revised variable metering orifice (VMO) by-pass adjuster. (To ensure no engines are in service with incorrect VMO by-pass adjuster.)
73-1220 Non-Mod Service Bulletin	Engine - Fuel and control - Inspection of fuel flow regulator for pilot burner simulator fault.
73-1280	Engine - Fuel and control - Shut-off cock - Introduction of a shut-off cock with the cold start facility deleted. (To prevent 'hot' starts due to inadvertent selection of cold start fuel flow.)
73-1315	Engine - Fuel and control - Fuel flow regulator - Introduction of increased reverse thrust. (To maintain maximum (emergency) reverse thrust with the introduction of Fokker aircraft modification F100-78-010.)
73-1459 Non-Mod Service Bulletin	Engine - Fuel and control - Fuel flow regulator - Revision to the in-service life of the fuel flow regulator.
75-1275	Air - Airflow control regulator - Rear mount bracket and piston push rod machined to increase clearance with adjacent parts. (To prevent fouls with AFCR linkage.)
75-1278	Air - Airflow control regulator - Revised whirl scheduling limits for HP inlet guide vanes.
77-1267	Engine indicating - Oil pressure transmitter - Introduction of kulite oil pressure transmitter with output transient overload protection.

(7) Check the FFR drive end coupling end float. The coupling should move freely inwards under hand pressure. If there is no movement the drive end is to be removed for incorporation of Service Bulletin 73-1211.

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APPENDIX 9

ADDITIONAL CALENDAR LIFE REWORK PACKAGE

EFFECTIVITY - TAY 650-15

Calendar Life Rework

To release engines for a further period of 10 years the following work package should be incorporated in addition to the work package detailed in Appendix 8. This package will be developed with service experience.

A. Module 01 - LP Compressor

Not applicable.

B. Module 02 - IP Compressor

Item

(1) Remove module from engine.

(2) Perform interface inspection on interface with Module 07.

(3) Strip module sufficiently to allow visual inspection of stator vane locating rings (if Service Bulletin 72-1252 Part 2 is not incorporated) and IP compressor shaft.

(4) Rework to Engine Manual as necessary.

(5) The following Service Bulletin is recommended for embodiment (if Service Bulletin 72-1252 Part 2 is not incorporated):

72-1252 Part 1	Engine - IP compressor air splitter and inlet guide vanes - Splitter fairing and stator retaining rings with improved corrosion protection. (To prevent corrosion cracking of splitter fairing and stator retaining rings.)

(6) Re-assemble module in accordance with Engine Manual.

C. Module 03 - HP Compressor

Item

(1) Remove module from engine.

(2) Strip module sufficiently to allow visual inspection of all Group A components.

(3) Inspect HP compressor case assembly.

(4) Rework to Engine Manual as necessary.

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R (5) The following Non-Modification Service Bulletin is recommended for
R embodiment only if possible without additional disassembly:

R	72-1838	Engine - High Pressure (HP) compressor discs, blades and spacers
R	Non-Mod	- Borescope inspection of the HP compressor stage 5 rotor disc
R	Service	for undercut and holes.
R	Bulletin	

(6) Re-assemble module in accordance with Engine Manual.

D. Module 04 - Combustion and HP Turbine

Not applicable.

E. Module 05 - LP Turbine

Item

(1) Remove module from engine.

(2) Strip module sufficiently to allow visual inspection of all Group A components.

F. Module 06 - HS Gearbox

Not applicable.

G. Module 07 - Intermediate Casing

(1) The following Service Bulletin is recommended for embodiment:

72-1399	Engine - Intermediate case assembly - Front flange bore - Additional corrosion protection. (Epoxy barrier coating into OGV location bore to provide insulation between the magnesium and titanium components.)

H. Non-Modular Items

Not applicable.

I. Accessories

The following units require rework:

(1) Airflow Control Regulator and Actuator

Item

(a) Remove unit from engine.

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(b) Disassemble sufficiently to replace the diaphragm (75-32-05, 03-435), the piston seal rings (75-32-06, 05-470 and 05-490) and the felt piston wiper washer (75-32-06, 05-510).

(c) Rebuild and test.

(d) Re-install unit on engine.

(2) RPM Signal Generator

Item

(a) Remove unit from engine.

(b) Disassemble sufficiently to replace the diaphragm.

(c) Rebuild and test.

(d) Re-install unit on engine.

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APPENDIX 10

FULL OVERHAUL

EFFECTIVITY - TAY 650-15

At 8000 hours from new or overhaul or 4000 hours from mid-life rework, an overhaul is required as detailed below.

R Recommendations for maintenance and overhaul of engine mounted accessory units are
R given in Appendix 5.

Accessory units that have been fitted to an engine at intermediate time require to have their lives tracked to ensure that they are overhauled at the required interval.

A. Overhaul

(1) Inspect and rework all modules, accessories and other non-modular items in accordance with the Engine Manual.

NOTE: Care must be taken when applying fresh grease to the splines of the HS gearbox starter drive shaft and the starter quillshaft. Too much grease can result in an end load on the starter drive front bearing and cause the bearing to fail.

(2) Replace the two spherical bearings (72-35-23, 03-170) and (75-32-09, 07-110) of the Airflow Control Regulator (AFCR) connecting link assembly.

(3) Replace the two bushes (75-32-08, 06-530) of the AFCR rear mount assembly.

(4) Discard the fuel tube of pre Service Bulletin 73-1194 standard or pre Service Bulletin 73-1592 standard and replace it with the fuel tube of post Service Bulletin 73-1592 standard.

(5) Replace the starter idler gearshaft (72-61-18, 10-040).

(6) The following Service Bulletins and Non-Modification Service Bulletins are recommended for embodiment:

72-1121	Engine - HP compressor rotor - Disc spacers with Sermetel W protective coating replacing PL101. (To improve anti-corrosion protection.)
72-1230	Engine - Internal gearbox - Rear bearing housing with increased diameter chamfer.
72-1296 Non-Mod Service Bulletin	Engine - Replacement of high speed gearbox drive driven bevel gearshaft JR27127. (To ensure that low fatigue strength gearshafts are removed from service.)

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72-1341 Non-Mod Service Bulletin	Engine - Replacement of high speed gearbox drive driven bevel gearshaft JR27127. (To ensure that low fatigue strength gearshafts are removed from service.)
72-1366 Part 1 only	Engine - LP nozzle case and vanes - Introduction of front and rear nozzle cases in revised material. (Inco 718.)
72-1401 Non-Mod Service Bulletin	Engine - High speed gearbox HSGB - Inspection and re-lubrication of starter drive splines.
72-1429	Engine - LP compressor rotating fairing - Introduction of revised nose cone fairing assembly produced by super plastic blow forming. (Supersedes Service Bulletin 72-1376.)
72-1442 Non-Mod Service Bulletin	Engine - Fan blades - Ultrasonic inspection of fan blade roots.
72-1458	Engine - HP compressor rear shaft and fittings - Introduction of HP compressor rear rotor shaft and sleeve assembly with eight oil feed holes blanked.
72-1472	Engine - Generator drive shaft and bevel gear shaft assemblies - High speed gearbox dee head bolt material and torque tightening setting change.
72-1498	Engine - HP rotor thrust bearing housing assembly - Introduction of revised retaining and locking features for the HP compressor outlet guide vane and outer seal spacer.
72-1499	Engine - High speed gearbox driving gear assembly - Internal gearbox - Interference fit of drive shaft and bevel gear.
72-A1524	Engine - LP turbine discs stage 2 and stage 3 - Inspection requirements due to potential corrosion.
72-1528	Engine - LP compressor rotating fairing - Introduction of an LP compressor rotor spinner assembly with a dowel pin installed in the spinner flange.
72-1557 Non-Mod Service Bulletin	Engine - Low Pressure (LP) turbine rotor discs - Sample inspection requirements for Tay Operators.

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72-1603 Non-Mod Service Bulletin — Engine - Low Pressure (LP) compressor (fan) blades - Instruction of a repair to the LP compressor (fan) blades leading edge profile.

72-1638 Non-Mod Service Bulletin — Engine - Low Pressure (LP) compressor case and vanes - Repeat visual inspection of the ice impact panels and instruction of minimum ice impact panel configuration on installed engines.

Note: The Non-Modification Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

72-A1643 — Engine - Low Pressure (LP) compressor case and vanes - Introduction of modified ice impact panels with additional retention features.

Note: The Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

72-A1653 — Engine - High Pressure (HP) compressor vanes stages 4 to 11 - Introduction of a new setting procedure to increase the minimum vane tip clearance.

72-1665 — Engine - High Pressure (HP) turbine rotor discs and shaft and HP compressor rotor - Improved lubrication for the HP compressor shaft and HP turbine shaft mating splines.

72-A1676 Non-Mod Service Bulletin — Engine - High Pressure (HP) turbine rotor - HP turbine stage 1 disc reduced safe cyclic life - Engine management.

72-1704 — Engine - Air guide tube drive shaft and fittings - High Pressure (HP) compressor - Introduction of revised torque tightening procedure for the Low Pressure (LP) thrust bearing outer ring spanner nut.

72-A1740 Non-Mod Service Bulletin — Engine - High Pressure (HP) compressor rotor discs - Decrease of time limits manual maximum approved lives of the HP compressor stages 1, 3, 6, 7 and 12 rotor discs.

72-A1782 Non-Mod Service Bulletin — Engine - Low Pressure (LP) compressor rotor blades - Instruction of a repair to the LP compressor (fan) blade leading edge profile.

72-1787 Non-Mod Service Bulletin — Engine - Low Pressure (LP) compressor rotor blades - Measurement of the chordal width and the leading edge thickness of selected compressor (fan) blades.

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	72-1825 Non-Mod Service Bulletin	Engine - High Pressure (HP) turbine rotor discs and shaft - replacement of potential non-conforming parts of the HP turbine shaft - Non-Modification Service Bulletin.
R R R R	72-1838 Non-Mod Service Bulletin	Engine - High Pressure (HP) compressor discs, blades and spacers - Borescope inspection of the HP compressor stage 5 rotor disc for undercut and holes.
	73-1131	Engine - Fuel and control - Fuel flow regulator - Introduction of a test schedule amendment of redefine setting of the minimum flow stop. (To prevent slow accelerations and surge during severe handling conditions.)
	73-1165 Non-Mod Service Bulletin	Engine - Fuel and control - Inspection of fuel flow regulator scheduling governor housing seal plate. (To ensure there are no units in service with unsupported rubber seal.)
	73-1166	Engine - Fuel and control - Fuel flow regulator - Introduction of a Spey type lever housing seal plate. (To eliminate the possibility of overboard fuel leak.)
	73-1167	Engine - Fuel and control - Fuel flow regulator - Introduction of idle reset adjuster mounting bolts with wire locking holes.
	73-1194 Part 1 to Part 3	Engine - Fuel and control - Introduction of modified connectors to LP fuel system. (To prevent connector frettage and fuel leaks.)

Note: Part 4 of Service Bulletin 73-1194 must not be embodied as it is superseded by the embodiment of Service Bulletin 73-1592.

	73-1207	Engine - Fuel and control - Fuel flow regulator - Revised variable metering orifice (VMO) by-pass adjuster. (To ensure no engines are in service with incorrect VMO by-pass adjuster.)
	73-1210	Engine - Fuel and control - Fuel flow regulator - Introduction of a reduced variable metering orifice (VMO) push rod end float and improvement to the VMO and acceleration control unit (ACU) plunger and sleeves. (To improve unit reliability.)
	73-1211	Engine - Fuel and control - Fuel flow regulator - Introduction of modified input drive seal retainer. (To provide greater wear resistance and prevent fuel leakage.)
	73-1213	Engine - Fuel and control - Fuel flow regulator - Introduction of a two piece slider block and pin assembly. (For unit improvement with respect of engine speed for a given throttle lever position.)

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73-1217	Engine - Fuel and control - Fuel flow regulator - Introduction of revised design standard of reach nut. (To improve unit reliability by preventing ACU governor movement.)
73-1219	Engine - Fuel and control - Fuel flow regulator - Introduction of an increased clearance dashpot piston within the scheduling governor. (To improve unit reliability.)
73-1220 Non-Mod Service Bulletin	Engine - Fuel and control - Inspection of fuel flow regulator for pilot burner simulator fault.
73-1281	Engine - Fuel and control - Fuel flow regulator - Introduction of a fuel flow regulator with solutions to eliminate calibration shift.
73-1301	Engine - Fuel and control - Fuel flow regulator - Introduction of a fuel flow regulator with a revised ACU governor weight arm. (To improve unit reliability by preventing arm failure.)
73-1322	Engine - Fuel and control - Fuel flow regulator - Introduction of a fuel flow regulator with a revised double datum idle design.
73-1459 Non-Mod Service Bulletin	Engine - Fuel and control - Fuel flow regulator - Revision to the in-service life of the fuel flow regulator.
73-1592	Engine fuel and control - Fuel system tubes - Introduction of a fuel flowmeter to HP fuel pump tube assembly with a new routing and installation.
75-1278	Air - Airflow control regulator - Revised whirl scheduling limits for HP inlet guide vanes.
76-1346	Engine controls - Control linkage - Throttle relay lever support bracket with locked spindle.
76-1434 Non-Mod Service Bulletin	Emergency fuel shut off system - Inspection of emergency fuel shut off cable.
76-1466	Engine controls - LP shaft failure system - Introduction of pulley wheel at EFSO cable rear guide location.
77-1267	Engine indicating - Oil pressure transmitter - Introduction of kulite oil pressure transmitter with output transient overload protection.

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79-1426 Oil - Engine gaskets - Introduction of gasket material change to Klingersil C4430.

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APPENDIX 11

MID-LIFE REWORK

EFFECTIVITY - TAY 651-54

At 4000 hours from new, or overhaul, a rework is required as detailed below.

The rework package will be developed with service experience.

Any component(s) inspected and found to be in excess of Engine Manual limits, may warrant further inspection, engine strip or rework other than that stated in this work package.

R Recommendations for maintenance and overhaul of engine mounted accessory units are
R given in Appendix 5.

R Accessory units that have been fitted to an engine at intermediate time require to
R have lives tracked to ensure that they are overhauled at the required interval.

A. Module 01 - LP Compressor

Item

(1) Visually inspect for obvious damage.

(2) Remove fan blades from disc and inspect in accordance with following Non-Modification Service Bulletins:

72-1442 Non-Mod Service Bulletin	Engine - Fan blades - Ultrasonic inspection of fan blade roots.
72-1603 Non-Mod Service Bulletin	Engine - Low Pressure (LP) compressor (fan) blade - Instruction of a repair to the LP compressor (fan) blade leading edge profile.

(3) The following Service Bulletin is recommended for embodiment:

72-1528	Engine - LP compressor rotating fairing - Introduction of an LP compressor rotor spinner assembly with a dowel pin installed in the spinner flange.
72-A1782 Non-Mod Service Bulletin	Engine - Low Pressure (LP) compressor rotor blades - Instruction of a repair to the LP compressor (fan) blade leading edge profile.

(4) Rework in accordance with Engine Manual as necessary. Accomplishment of Repair Scheme HRS3629 LPC rotor blade - Restore L/E profile is recommended.

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(5) Replace blades in as-received position as annotated in log book.

(6) Check balance, if necessary.

(7) Rebalance rotor assembly, if necessary.

B. Module 02 - IP Compressor

Item

(1) Visually inspect for obvious damage.

(2) The following Repair Scheme is recommended for embodiment:

HRS3390 IP compressor inlet guide vane - Re-apply filler material. (To prevent secondary IP compressor damage due to hard filler release.)

C. Module 03 - HP Compressor

Item

(1) Check HP rotor for freedom of rotation.

(2) Check bleed valve hardware for binding, corrosion, wear, damage, freedom of movement.

(3) Visually inspect for obvious damage and excessive corrosion.

(4) The following Service Bulletins and Non-Modification Service Bulletin are recommended for embodiment:

72-1496 Non-Mod Service Bulletin — Engine - HP compressor stage 7 and 12 air off-take clamp inspection.

72-1498 — Engine - HP rotor thrust bearing housing assembly - Introduction of revised retaining and locking features for the HP compressor outlet guide vane and outer seal spacer.

72-A1653 — Engine - High Pressure (HP) compressor vanes stages 4 to 11 - Introduction of a new setting procedure to increase the minimum vane tip clearance.

72-1665 — Engine - High Pressure (HP) turbine rotor discs and shaft and HP compressor rotor - Improved lubrication for the HP compressor shaft and HP turbine shaft mating splines.

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72-1704 Engine - Air guide tube drive shaft and fittings - High Pressure (HP) compressor - Introduction of revised torque tightening procedure for the Low Pressure (LP) thrust bearing outer ring spanner nut.

D. Module 04 - Combustion and HP Turbine

Item

(1) Remove module from engine.

(2) Visually inspect for obvious damage.

(3) Strip module as per Engine Manual.

(4) Overhaul module as per Engine Manual.

(5) The following Service Bulletin and Non-Modification Service Bulletin are recommended for embodiment:

72-1327 Engine - HP turbine rotor discs and shafts - HP turbine shaft and coupling with hard coated abutment faces. (To prevent wear to spline and faces.)

72-A1676 Non-Mod Service Bulletin Engine - High Pressure (HP) turbine rotor - HP turbine rotor stage 1 disc reduced safe cyclic life - Engine management.

72-1825 Non-Mod Service Bulletin Engine - High Pressure (HP) turbine rotor discs and shaft - replacement of potential non-conforming parts of the HP turbine shaft -Non-Modification Service Bulletin.

(6) Re-assemble module in accordance with Engine Manual.

E. Module 05 - LP Turbine

Item

(1) Remove module from engine.

(2) Visually inspect for obvious damage.

(3) Rework to Engine Manual as necessary.

(4) Crack test engine mount rear links.

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(5) The following Service Bulletins and Non-Modification Service Bulletin are recommended for embodiment:

72-1358	Engine - LP turbine case and vanes - Re-introduction of three piece intrascope blanking plug assembly at LP1 and LP3 nozzle guide vane positions. (To prevent secondary LP turbine damage due to intrascope blanking plug failure.)
72-1364	Engine - LP turbine rotor discs and shaft - Rear oil tube steady with reduced outside diameter. (To prevent seizure of the rear oil tube within the air guide tube eliminating failures at the rear oil tube and ensuring satisfactory operation of the emergency fuel shut-off cock mechanism.)
72-1366 Part 1 only	Engine - LP nozzle case and vanes - Introduction of front and rear nozzle cases in revised material. (Inco 718.)
72-A1524	Engine - LP turbine discs stage 2 and stage 3 - Inspection requirements due to potential corrosion.
72-1557 Non-Mod Service Bulletin	Engine - Low Pressure (LP) turbine rotor discs - Sample inspection requirements for Tay Operators.

F. Module 06 - HS Gearbox

Item

(1) Visually inspect gearbox mounts, link and accessory features.

(2) Inspect for signs of oil leakage.

(3) Clean accessory mount pads.

(4) The following Service Bulletin and Non-Modification Service Bulletin are recommended for embodiment:

72-1401 Non-Mod Service Bulletin	Engine - High speed gearbox HSGB - Inspection and re-lubrication of starter drive splines.
72-1492 Non-Mod Service Bulletin	Engine - Auxiliary gearbox assembly. (To ensure designated engines have parts exchanged.)

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72-1585 Engine - High speed gearbox - Introduction of new bolts with increased torque value for the auxiliary gearbox constant speed drive bearing outer races.

G. Module 07 - Intermediate Casing

Item

(1) Inspect intermediate case for damage, corrosion and general condition.

(2) Inspect Inlet Guide Vane (IGV) actuating mechanism for freedom of movement and range of travel.

(3) Inspect engine trunnion mounting flange bore location for damage.

(4) Inspect intermediate case mounting lug for damage.

(5) Rework to Engine Manual as necessary.

(6) The following Service Bulletin and Non-Modification Service Bulletins are recommended for embodiment:

72-1296 Non-Mod Service Bulletin — Engine - Replacement of high speed gearbox drive driven bevel gearshaft JR27127. (To ensure that low fatigue strength gearshafts are removed from service.)

72-1341 Non-Mod Service Bulletin — Engine - Replacement of high speed gearbox drive driven bevel gearshaft JR27127. (To ensure that low fatigue strength gearshafts are removed from service.)

72-1480 Engine high speed gearbox driving assembly - Introduction of increased torque on the internal gearbox bevel gear retaining nut.

(7) Re-assemble module in accordance with Engine Manual.

H. Non-Modular Items

Item

(1) Inspect nose cone spinner and fairing.

(2) Inspect rubber tip nose cap.

(3) Inspect LP compressor case assembly.

Crack test engine mount taper pins and adaptors.

Crack test engine front (trunnion) mount.

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(4) Inspect clamps for missing or deteriorated rubber cushions. Replace as necessary.

(5) Inspect transmitters, switches, thermocouples and electrical connectors for general condition and security.

(6) Inspect engine by-pass ducts for general condition.

(7) Inspect LP air offtake panel (ATA Chapter 72-71-02, IPC Fig/Item No. 02-400) for signs of delamination.

(8) Inspect LP exhaust mixer for general condition.

(9) Inspect Engine Fuel Shut-Off (EFSO) cable assembly for strands integrity.

(10) Check main oil filter, scavenge filters and magnetic chip detectors and pop-up indicator.

(11) Check IGV freedom and do a bleed valve pull-off check.

(12) Discard the fuel tube of pre Service Bulletin 73-1194 standard or pre Service Bulletin 73-1592 standard and replace it with the fuel tube of post Service Bulletin 73-1592 standard.

(13) The following Service Bulletins and Non-Modification Service Bulletins are recommended for embodiment:

71-1110	Power plant - Drain tubes and fittings - Restrictor plate fitted in internal gearbox to drains tank vent line. (To prevent fuel leakage from overboard vent.)
71-1508	Power plant electrical harness (light duty) LT harness loom B. (To ensure terminal tags are correctly identified.)
72-1429	Engine - LP compressor rotating fairing - Introduction of revised nose cone fairing assembly produced by super plastic blow forming. (Supersedes Service Bulletin 72-1376.)
72-1638 Non-Mod Service Bulletin	Engine - Low Pressure (LP) compressor case and vanes - Repeat visual inspection of the ice impact panels and instruction of minimum ice impact panel configuration on installed engines.

Note: The Non-Modification Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

72-A1643	Engine - Low Pressure (LP) compressor case and vanes - Introduction of modified ice impact panels with additional retention features.

Note: The Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

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73-1194 Part 1 to Part 3 — Engine - Fuel and control - Introduction of modified connectors to LP fuel system. (To prevent connector frettage and fuel leaks.)

Note: Part 4 of Service Bulletin 73-1194 must not be embodied as it is superseded by the embodiment of Service Bulletin 73-1592.

73-1464 — Fuel and control - Fuel manifold - Airspray fuel burners - Introduction of fuel manifold connectors with increased central external diameter.

73-1592 — Engine fuel and control - Fuel system tubes - Introduction of a fuel flowmeter to HP fuel pump tube assembly with a new routing and installation.

76-1434 Non-Mod Service Bulletin — Emergency fuel shut off system - Inspection of emergency fuel shut off cable.

76-1466 — Engine controls - LP shaft failure system - Introduction of pulley wheel at EFSO cable rear guide location.

I. Accessories

Item

(1) Overhaul fuel spray nozzles.

(2) Test and inspect TGT thermocouples.

(3) Test and inspect TGT thermocouple harness.

(4) Remove existing grease and debris from splines of starter quillshaft.

NOTE: Care must be taken when applying fresh grease to the splines as too much grease can result in an end load on the starter drive front bearing and cause the bearing to fail.

(5) Replace the two spherical bearings (72-35-23, 03-170) and (75-32-09, 07-110) of the Airflow Control Regulator (AFCR) connecting link assembly.

(6) The following Service Bulletins are recommended for embodiment:

73-1280 — Engine - Fuel and control - Shut-off cock - Introduction of a shut-off cock with the cold start facility deleted. (To prevent 'hot' starts due to inadvertent selection of cold start fuel flow.)

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73-1476 Fuel - Fuel control system - Introduction of LP fuel system pressure relief valve and associated installation items. (Service Bulletin 73-1491 must be accomplished concurrent to realise full design intent.)

73-1491 Fuel - Fuel control system - Additional material requirement for accomplishment of LP fuel pressure relief valve system. (Must be accomplished concurrently with Service Bulletin 73-1476.)

74-1427 Ignition - High energy ignition box - Ignition mounting box modifications.

74-1428 Ignition - External High energy ignition leads - Introduction of revised high energy ignition leads.

75-1269 Air - Airflow control regulator - Revised whirl scheduling limits for HP inlet guide vanes.

75-1275 Air - Airflow control regulator - Rear mount bracket and piston push rod machined to increase clearance with adjacent parts. (To prevent fouls with AFCR linkage.)

(7) Check the FFR drive end coupling end float. The coupling should move freely inwards under hand pressure. If there is no movement the drive end is to be removed for incorporation of Service Bulletin 73-1211.

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APPENDIX 12

ADDITIONAL CALENDAR LIFE REWORK PACKAGE

EFFECTIVITY - TAY 651-54

Calendar Life Rework

To release engines for a further period of 10 years the following work package should be incorporated in addition to the work package detailed in Appendix 11. This package will be developed with service experience.

A. Module 01 - LP Compressor

Not applicable.

B. Module 02 - IP Compressor

Item

(1) Remove module from engine.

(2) Perform interface inspection on interface with Module 07.

(3) Strip module sufficiently to allow visual inspection of stator vane locating rings and all Group A components.

(4) Rework to Engine Manual as necessary.

(5) Re-assemble module in accordance with Engine Manual.

C. Module 03 - HP Compressor

Item

(1) Remove module from engine.

(2) Strip module sufficiently to allow visual inspection of all Group A components.

(3) Inspect HP compressor case assembly.

(4) Rework to Engine Manual as necessary.

(5) Re-assemble module in accordance with Engine Manual.

D. Module 04 - Combustion and HP Turbine

Not applicable.

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E. Module 05 - LP Turbine

(1) Remove module from engine.

(2) Strip module sufficiently to allow visual inspection of all Group A components.

F. Module 06 - HS Gearbox

Not applicable.

G. Module 07 - Intermediate Casing

(1) The following Service Bulletin is recommended for embodiment:

72-1399 Engine - Intermediate case assembly - Front flange bore - Additional corrosion protection. (Epoxy barrier coating into OGV location bore to provide insulation between the magnesium and titanium components.)

H. Non-Modular Items

Not applicable.

I. Accessories

The following units require rework:

(1) Airflow Control Regulator and Actuator

Item

(a) Remove unit from engine.

(b) Disassemble sufficiently to replace the diaphragm (75-32-05, 03-435), the piston seal rings (75-32-06, 05-470 and 05-490) and the felt piston wiper washer (75-32-06, 05-510).

(c) Rebuild and test.

(d) Re-install unit on engine.

(2) RPM Signal Generator

Item

(a) Remove unit from engine.

(b) Disassemble sufficiently to replace the diaphragm.

(c) Rebuild and test.

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(d) Re-install unit on engine.

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APPENDIX 13

FULL OVERHAUL

EFFECTIVITY – TAY 651-54

At 8000 hours from new or overhaul or 4000 hours from mid-life rework, an overhaul is required as detailed below.

R Recommendations for maintenance and overhaul of engine mounted accessory units are
R given in Appendix 5.

Accessory units that have been fitted to an engine at intermediate time require to have their lives tracked to ensure that they are overhauled at the required interval.

A. Overhaul

(1) Inspect and rework all modules, accessories and other non-modular items in accordance with the Engine Manual.

NOTE: Care must be taken when applying fresh grease to the splines of the HS gearbox starter drive shaft and the starter quillshaft. Too much grease can result in an end load on the starter drive front bearing and cause the bearing to fail.

(2) Replace the two spherical bearings (72-35-23, 03-170) and (75-32-09, 07-110) of the Airflow Control Regulator (AFCR) connecting link assembly.

(3) Replace the two bushes (75-32-08, 06-530) of the AFCR rear mount assembly.

(4) Discard the fuel tube of pre Service Bulletin 73-1194 standard or pre Service Bulletin 73-1592 standard and replace it with the fuel tube of post Service Bulletin 73-1592 standard.

(5) Replace the starter idler gearshaft (72-61-18, 10-040).

(6) The following Service Bulletins and Non-Modification Service Bulletins are recommended for embodiment:

71-1508	Power plant electrical harness (light duty) LT harness loom B. (To ensure terminal tags are correctly identified.)
72-1296 Non-Mod Service Bulletin	Engine – Replacement of high speed gearbox drive driven bevel gearshaft JR27127. (To ensure that low fatigue strength gearshafts are removed from service.)
72-1341 Non-Mod Service Bulletin	Engine – Replacement of high speed gearbox drive driven bevel gearshaft JR27127. (To ensure that low fatigue strength gearshafts are removed from service.)

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72-1366 Part 1 only	Engine - LP nozzle case and vanes - Introduction of front and rear nozzle cases in revised material. (Inco 718.)
72-1401 Non-Mod Service Bulletin	Engine - High speed gearbox HSGB -Inspection and re-lubrication of starter drive splines.
72-1429	Engine - LP compressor rotating fairing - Introduction of revised nose cone fairing assembly produced by super plastic blow forming. (Supersedes Service Bulletin 72-1376.)
72-1442 Non-Mod Service Bulletin	Engine - Fan blades - Ultrasonic inspection of fan blade roots.
72-1458	Engine - HP compressor rear shaft and fittings - Introduction of HP compressor rear rotor shaft and sleeve assembly with eight oil feed holes blanked.
72-1472	Engine - Generator drive shaft and bevel gear shaft assemblies - High speed gearbox dee head bolt material and torque tightening setting change.
72-1492 Non-Mod Service Bulletin	Engine - Auxiliary gearbox assembly. (To ensure designated engines have parts exchanged.)
72-1498	Engine - HP rotor thrust bearing housing assembly - Introduction of revised retaining and locking features for the HP compressor outlet guide vane and outer seal spacer.
72-1499	Engine - High speed gearbox driving gear assembly - Internal gearbox - Interference fit of drive shaft and bevel gear.
72-A1524	Engine - LP turbine discs stage 2 and stage 3 - Inspection requirements due to potential corrosion.
72-1528	Engine - LP compressor rotating fairing - Introduction of an LP compressor rotor spinner assembly with a dowel pin installed in the spinner flange.
72-1557 Non-Mod Service Bulletin	Engine - Low Pressure (LP) turbine rotor discs - Sample inspection requirements for Tay Operators.

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72-1603 Non-Mod Service Bulletin	Engine - Low Pressure (LP) compressor (fan) blades - Instruction of a repair to the LP compressor (fan) blades leading edge profile.
72-1638 Non-Mod Service Bulletin	Engine - Low Pressure (LP) compressor case and vanes - Repeat visual inspection of the ice impact panels and instruction of minimum ice impact panel configuration on installed engines.

Note: The Non-Modification Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

72-A1643	Engine - Low Pressure (LP) compressor case and vanes - Introduction of modified ice impact panels with additional retention features.

Note: The Service Bulletin above is only recommended for embodiment in engines with Service Bulletin 72-1326 standard.

72-A1653	Engine - High Pressure (HP) compressor vanes stages 4 to 11 - Introduction of a new setting procedure to increase the minimum vane tip clearance.
72-1665	Engine - High Pressure (HP) turbine rotor discs and shaft and HP compressor rotor - Improved lubrication for the HP compressor shaft and HP turbine shaft mating splines.
72-A1676 Non-Mod Service Bulletin	Engine - High Pressure (HP) turbine rotor - HP turbine stage 1 disc reduced safe cyclic life - Engine management.
72-1704	Engine - Air guide tube drive shaft and fittings - High Pressure (HP) compressor - Introduction of revised torque tightening procedure for the Low Pressure (LP) thrust bearing outer ring spanner nut.
72-A1782 Non-Mod Service Bulletin	Engine - Low Pressure (LP) compressor rotor blades - Instruction of a repair to the LP compressor (fan) blade leading edge profile.
72-1825 Non-Mod Service Bulletin	Engine - Fuel and control - Introduction of modified connectors to LP fuel system. (To prevent connector frettage and fuel leaks.)
73-1194 Part 1 to Part 3	Engine - Fuel and control - Introduction of modified connectors to LP fuel system. (To prevent connector frettage and fuel leaks.)

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Note: Part 4 of Service Bulletin 73-1194 must not be embodied as it is superseded by the embodiment of Service Bulletin 73-1592.

73-1281	Engine - Fuel and control - Fuel flow regulator - Introduction of a fuel flow regulator with solutions to eliminate calibration shift.
73-1301	Engine - Fuel and control - Fuel flow regulator - Introduction of a fuel flow regulator with a revised ACU governor weight arm. (To improve unit reliability by preventing arm failure.)
73-1322	Engine - Fuel and control - Fuel flow regulator - Introduction of a fuel flow regulator with a revised double datum idle design.
73-1592	Engine fuel and control - Fuel system tubes - Introduction of a fuel flowmeter to HP fuel pump tube assembly with a new routing and installation.
76-1434 Non-Mod Service Bulletin	Emergency fuel shut off system - Inspection of emergency fuel shut off cable.
76-1466	Engine controls - LP shaft failure system - Introduction of pulley wheel at EFSO cable rear guide location.
79-1426	Oil - Engine gaskets - Introduction of gasket material change to Klingersil C4430.

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