International Aero Engines

SERVICE BULLETIN

ENGINE - FUEL AND CONTROL - TO PROVIDE A NEW ELECTRONIC ENGINE CONTROL (EEC) WITH THE SCN11G/J SOFTWARE CONFIGURATION - CATEGORY CODE 8 - MOD.ENG-73-0027

1. Planning Information

A. Effectivity

(1) Aircraft: Airbus A320

(2) Engine: V2500-A1 Engines before Serial Nos.V0223.

NOTE: This Service Bulletin must be incorporated concurrently on both the engines on the aircraft.

If service Bulletin V2500-ENG-75-0025 is incorporated on the engine(s) when you do this bulletin, it must be removed when this Service Bulletin is incorporated.

B. Reason

(1) Condition

The current Electronic Engine Control (EEC) with SCN11E sofware logic does not meet the future customer take-off bump rating requirements and the revised aircraft approach idle requirements. Nuisance fault messages are generated because of the aircraft and the EEC interfacing problems and the actuator cross check tolerances.

(2) Background

Some customers require take-off bump ratings that are not given in the present SCN11E software logic. Airbus has requested that the approach idle be increased to improve the go-around time and that some of the nuisance faults be eliminated to decrease the line maintenance trouble shooting that is not necessary.

(3) Objective

To meet the performance requirements of all customers in the areas of bump ratings, acceleration times and Active Clearance Control (ACC) scheduling (ACC scheduling improves the Thrust Specified Fuel Consumption (TSFC). This will also eliminate the nuisance faults which causes trouble shooting that is not necessary. This will be accomplished by the introduction of the new SCN11G/J software logic.

(4) Substantiation

The closed loop bench testing for the software certification was accomplished at Pratt and Whitney and Hamilton Standard. The flight simulation and flight testing of the SCN11G/J software was accomplished at Airbus in Toulouse, France.

(5) Effects of Bulletin on Workshop Procedures:

Removal/Installation	Not affected
Disassembly/Assembly	Not affected
Cleaning	Not affected
Inspection/Check	Not affected
Repair	Not affected
Testing	Not affected

(6) Supplemental Information:

None.

C. Description

(1) The provide a new Electronic Engine Control (EEC) with the SCN11G/J software logic.

D. Approval

The Part Number Changes and/or part modifications described in Sections 2 and 3 of this Service Bulletin have been shown to comply with the applicable Federal Aviation Regulations and are FAA-APPROVED for the Engine Model listed.

E. Compliance

Category Code 8

Accomplish based upon experience with the prior configuration.

F. Manpower

Estimated Manhours to incorporate the full intent of this Bulletin:

Venue	Estimated Manhours
(1) In service	TOTAL 2 hours 46 minutes
(a) To gain access	21 minutes
(b) To embody	1 hour 55 minutes
(c) To return engine to flyable status	30 minutes

TOTAL: 2 hours, 46 minutes

(2) At overhaul Not Applicable

G. Material Price and Availability

(1) Modification kit not required.

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

H. Tooling - Price and Availability

The following tool is required to accomplish Sub-division 2 of this Service Bulletin:

Tool No.	Qty	Description	Function	Avail.
IAE 1J12018	1	EEC Harness Wrench	Torque Data Entry Plug	(1)

(1) Indicates that Tool Design Aperture Cards are currently available from IAE.

I. Weight and Balance

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

J. Electrical Load Data

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

K. References

(1) Internal Reference No.

EC90VZ008

(2) Other References

V2500-ENG-75-0025 (Engine - HP/LP Active Clearance Control Ducts - To Provide a Front Duct Cover Assembly for Controlled Service Use).

Hamilton Standard Service Bulletin EEC150-73-17.

V2500 Engine Illustrated Parts Catalog.

A320 Aircraft Maintenance Manual.

V2500 standard Practices Manual.

L. Other Publications Affected

(1) The V2500 Illustrated Parts Catalog, Chapter/Section 73-22-34, Figure 1 and Chapter/Section 73-22-35, Figure 1 to add the new parts.

2. Accomplishment Instructions

A. The Source Demonstration requirements of this rework means that any facility not authorised to accomplish this rework either utilize the Authorized Rework Vendors listed below or contact IAE Technical Service to determine if a qualification program can be initiated at their facility.

IAE-INTERNATIONAL AERO ENGINES AG
Corporate Center II
628 Hebron Ave.
Glastonbury, CT 06033-2595 USA
ATTN: Drector Technical Services

B. Authorized Rework Vendors for this bulletin are listed below:

Hamilton Support Systems
Customer Service Center
97 Newberry Road
East Windsor, CT USA 06088

or

Pratt & Whitney Overhaul/Repair Center Europe (PWORCE)
Maastricht Airport
P.O. Box 269
6190 AG BEEK
The Netherlands

C. The designation by IAE of an authorized rework vendor indicates that the vendor has demonstrated the necessary capability to enable it to carry out the rework. However, IAE makes no warranties or representations concerning the qualifications or quality of the vendors to carry out the rework, and accepts no responsibility whatsoever for any work that may be carried out by a rework vendor, other than when IAE is listed as the vendor. Authorized rework vendors do not act as agents or representatives of IAE.

D. Pre-Requisite Instructions

(1) On the aircraft panel 115VU, put a warning notice to tell the persons not to start the engine.

(2) On the aircraft panel 50VU. make sure that the "ON" legend on the ENG FADEC GND PWR button switch is OFF and install a warning notice.

(3) Open the Fan Cowls by the use of the approved procedures in Reference (4), Chapter/Section 71-13-00, (TASK 71-13-00-010-010).

(4) Open the Thrust Reverser Halves by the use of the approved procedure in Reference (4), Chapter/Section 78-32-00, (TASK 78-32-00-010-010).

E. Removal Instructions

(1) Disconnect the Data Entry Plug Assembly from the EEC. Use the IAE 1J12018 EEC Harness Wrench.

(2) Remove the 2A2166, 2A21899, 2A2284 or 2A2285 Electronic Engine Control by the approved procedure in Reference (4), Chapter/Section 73-22-34, Removal/Installation. Refer to Figure 1.

F. Rework Instructions

(1) Do a modification to 2A2189 Electronic Engine Control (See Reference (3) Chapter/Section 73-22-34, Figure Item Item No.01-280) and identify as follows:

	Procedure	Supplementary Information	
(a)	Send the Electronic Engine Control to the approved vendor to be modified	See Figure 1	
(b)	Mark the new part number adjacent to the old part number	Old Part Number 2A2189	New Part Number 2A2356
		Refer to the approved procedure in Reference (5) Control No./ TASK No.70-09-00-400-501	

NOTE: If the part was identified with the new part number at the vendor this step is not necessary.

(2) Do a modification to 2A2166 Electronic Engine Control (See Reference (3) Chapter/Section 73-22-34, Figure Item No.01-280) and identify as follows:

	Procedure	Supplementary Information	
(a)	Send the Electronic Engine Control to the approved vendor to be modified	See Figure 1	
(b)	Mark the new part number adjacent to the old part number	Old Part Number 2A2166	New Part Number 2A2390
		Refer to the approved procedure in Reference (5) Control No./ TASK No.70-09-00-400-501	

NOTE: If the part was identified with the new part number at the vendor this step is not necessary.

(3) Do a modification to 2A2284 Electronic Engine Control (See Reference (3) Chapter/Section 73-22-34, Figure Item No. 01-280) and identify as follows:

Procedure	Supplementary Information	
(a) Send the Electronic Engine Control to the approved vendor to be modified	See Figure 1	
(b) Mark the new part number adjacent to the old part number	Old Part Number 2A2284	New Part Number 2A2391
	Refer to the approved procedure in Reference (5) Control No./ TASK No.70-09-00-400-501	

NOTE: If the part was identified with the new part number at the vendor this step is not necessary.

(4) Do a modification to 2A2285 Electronic Engine Control (See Reference (3) Chapter/Section 73-22-34, Figure Item No.01-280) and identify as follows:

Procedure	Supplementary Information	
(a) Send the Electronic Engine Control to the approved vendor to be modified	See Figure 1	
(b) Mark the new part number adjacent to the old part number	Old Part Number 2A2285	New Part Number 2A2392
	Refer to the approved procedure in Reference (5) Control No./ TASK No. 70-09-00-400-501	

NOTE: If the part was identified with the new part number at the vendor this step is not necessary.

(5) Remove the Active Clearance Control (ACC) Front Duct Cover Assembly. Refer to Reference (1) and Figure 2.

(a) Locate the Front ACC Duct.

(b) Remove the two 4W0102 Bolts from the Front Duct Cover Assembly.

(c) Remove the 2A3637 Front Duct Cover Assembly.

NOTE: When you incorporate this Service Bulletin with the new SCN11G/J software logic, the Front Duct Cover Assembly given in Reference (1) must be removed.

G. Installation Instructions

(1) Install 2A2356, 2A2390, 2A2391 or 2A2392 Electronic Engine Control by the approved procedure in Reference (4), Chapter/Section 73-22-34, Removal/Installation by Figure 1 except as follows:

(a) Connect the Data Entry Plug Assembly to the EEC.

(b) Tighten and torque the Data Entry Plug Assembly to 32 lbfin (3,6 Nm). Use the IAE 1J12018 EEC Harness Wrench. See Reference (5), Chapter/Section 70-41-00, (TASK 70-41-00-400-501).

H. Post-Requisite Instructions

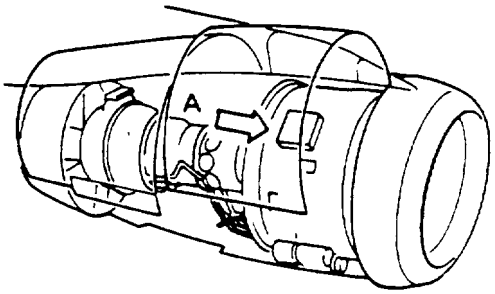
(1) Close the Thrust Reverser Halves by the use of the approved procedure in Reference (4), Chapter/Section 78-32-00, (TASK 78-32-00-410-010).

(5) Close the Fan Cowls by use of the approved procedure in Reference (4), Chapter/Section 71-13-00, (TASK 71-13-00-410-010).

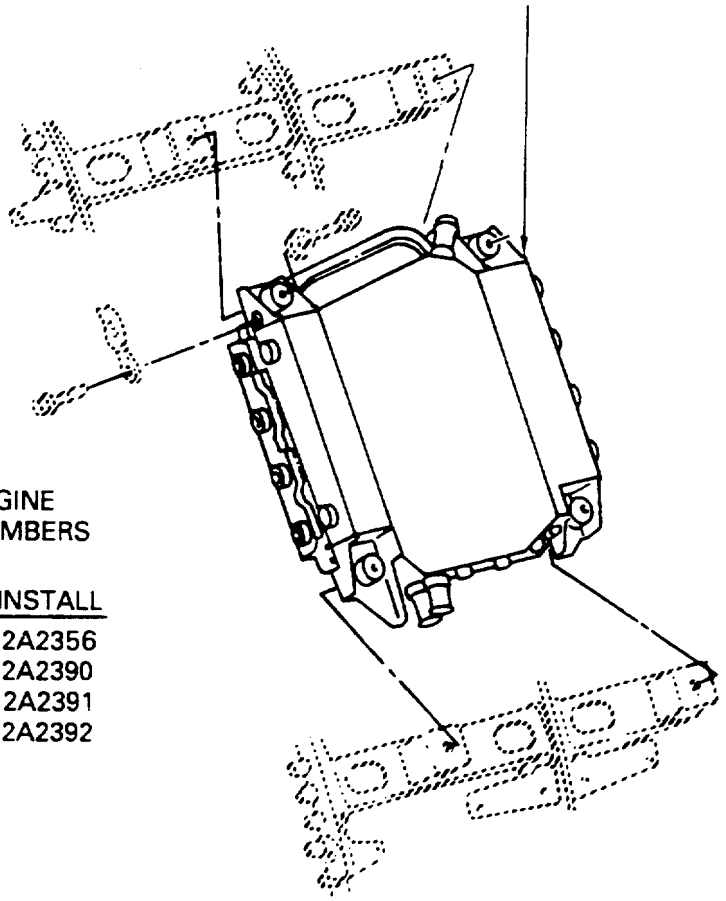
(3) Remove the warning notices.

I. Recording Instructions

(1) A record of accomplishment is necessary.



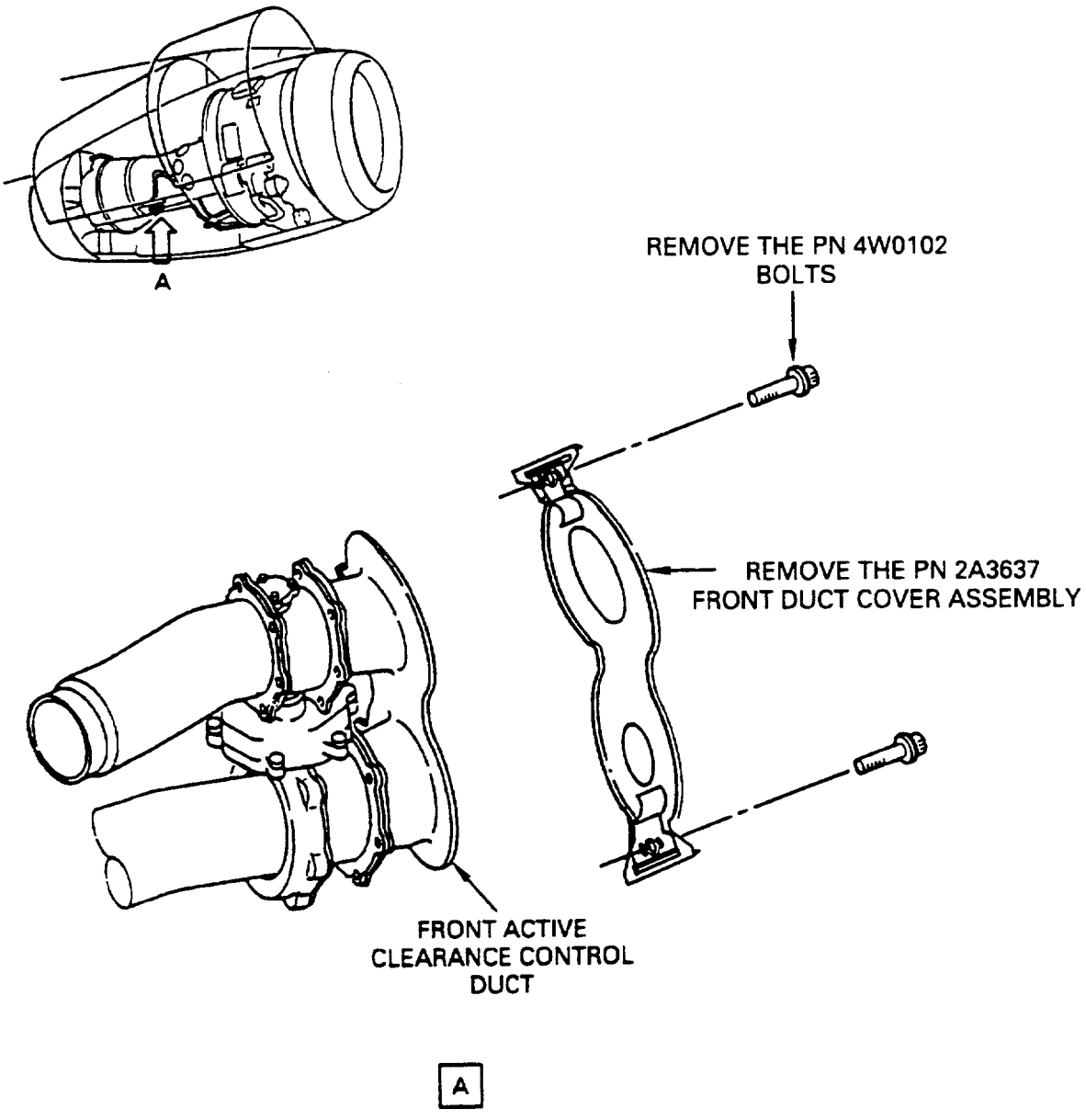
REMOVE THE APPLICABLE PART NUMBER* ELECTRONIC ENGINE CONTROL, DO A MODIFICATION, IDENTIFY AND INSTALL THE APPLICABLE PART NUMBER*
(1 Off)



*ELECTRONIC ENGINE CONTROL PART NUMBERS

REMOVE	INSTALL
2A2189	2A2356
2A2166	2A2390
2A2284	2A2391
2A2285	2A2392

Location of Electronic Engine Control (EEC)
Fig.1



Location of the ACC Front Duct Cover Assembly
Fig.2

3. Material Information

Applicability: For each V2500 Engine to incorporate this Bulletin.

A. Kits associated with this Bulletin:

None.

B. Parts affected by this Bulletin:

New Part No. (ATA No.)	Qty	Est'd Unit Price ($)	Keyword	Old Part No. (IPC No.)	Instructions Disposition
Applicability: For each V2500 Engine that incorporates V2500-ENG-0007, V2500-ENG-73-0015, V2500-ENG-73-0024 and V2500-ENG-70-0056 to incorporate this Bulletin.					
2A2392 (73-22-34)	1	-	Control - Electronic Engine	2A2285 (01-280)	(1D)(A)(B) (C)
Applicability: For each V2500 Engine that incorporates V2500-ENG-0007, V2500-ENG-73-0015 and V2500-ENG-73-0024 but not incorporating V2500-ENG-70-0056 to incorporate this Bulletin.					
2A2390 (73-22-34)	1	-	Control - Electronic Engine	2A2166 (01-280)	(1D)(A)(B) (D)
Applicability: For each V2500 Engine that incorporates V2500-ENG-0007 and V2500-ENG-73-0015 but not incorporating V2500-ENG-73-0024 and V2500-ENG-70-0056 to incorporate this Bulletin.					
2A2356 (73-22-34)	1	-	Control - Electronic Engine	2A2189 (01-280)	(1D)(A)(B) (E)
Applicability: For each V2500 Engine that incorporates V2500-ENG-0007, V2500-ENG-73-0015 and V2500-ENG-70-0056 but not incorporating V2500-ENG-73-0024 to incorporate this Bulletin.					
2A2391 (73-22-34)	1	-	Control - Electronic Engine	2A2284 (01-280)	(1D)(A)(B) (F)

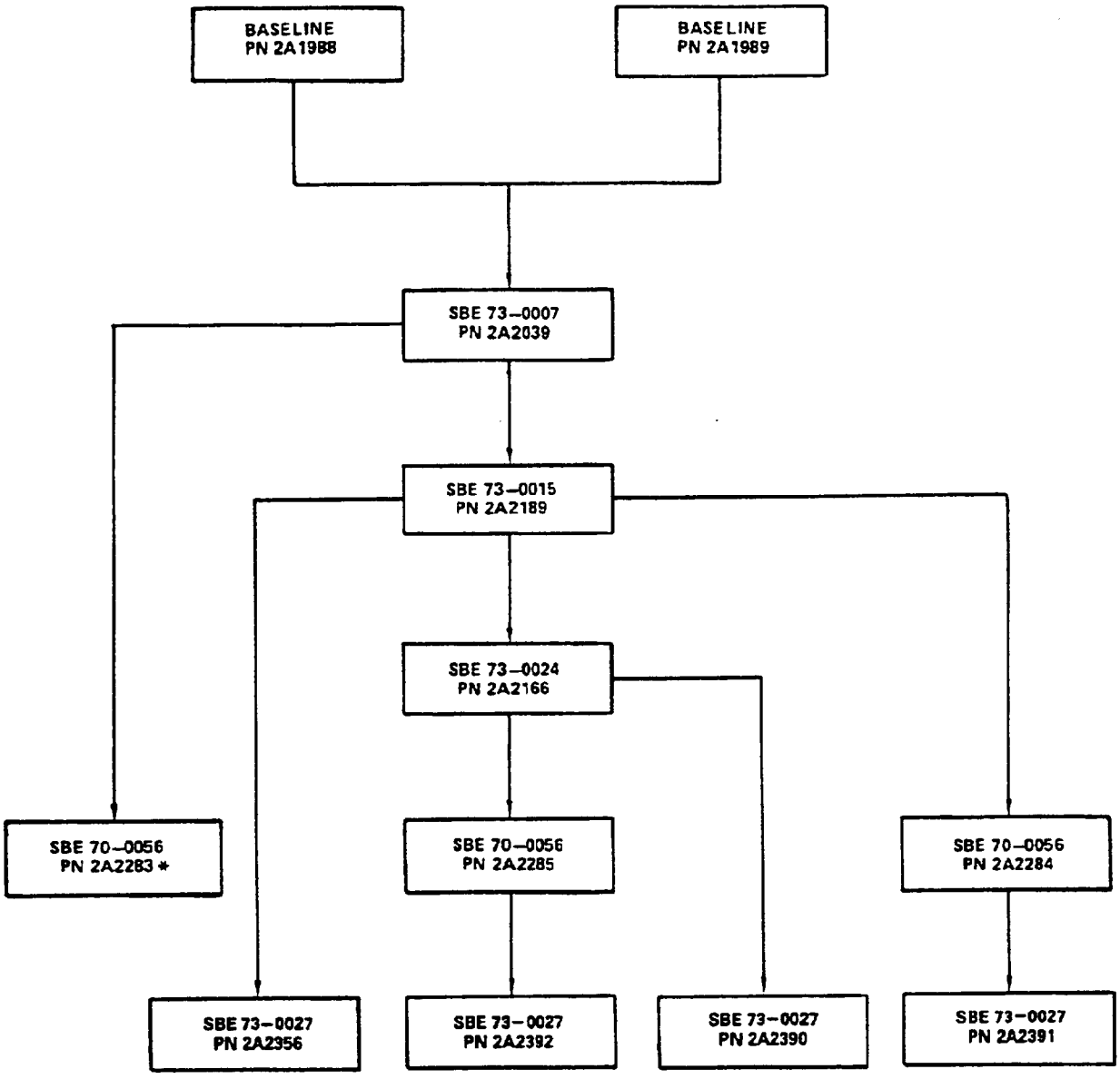
C. Instruction/Disposition Code Statements:

(1D) The new parts can be obtained through modification by the approved procedure in Reference (1). Purchase the new parts from or return the old parts for modification to the approved vendor given in the Accomplishment Instructions

The new Hamilton Standard part numbers are given in notes (C)(D)(E) and (F)

(A) New part is currently available
(B) Old part will no longer be available
(C) HSD P/L 798300-14-037
(D) HSD P/L 798300-10-037
(E) HSD P/L 798300-8-037
(F) HSD P/L 798300-12-037

NOTE: The estimated 1991 unit prices shown are provided for planning purposes only and do not constitute a firm quotation. Consult the IAE Price Catalog or contact IAE's Spare Parts Sales Department for information concerning firm prices.



Family Tree - Electronic Engine Control (EEC)
Fig.3

UNITED TECHNOLOGIES
HAMILTON STANDARD

SERVICE BULLETIN

CIRCULATE PROMPTLY

ENGINE FUEL AND CONTROL - EEC150-1 ELECTRONIC ENGINE CONTROL - INCORPORATION OF NEW SOFTWARE CONFIGURATION

1. Planning Information

A. Effectivity

All Hamilton Standard EEC150-1 Electronic Engine Controls Not Incorporating Modification Number	Serial Number of First Production Incorporation
798300-8-037 798300-10-037 798300-12-037 798300-14-037	None at this time. No production unit incorporating this modification has been shipped at time of publication.

NOTE: The EEC150-1 Electronic Engine Control is used on the A320 equipped with IAE V2500 engines.

B. Reason

(1) Objective. Provide SCN 11G/J software that incorporates new bump ratings, a higher approach idle, improved active clearance control scheduling and elimination of nuisance fault messages.

(2) Situation. The current software does not provide all the take-off bump ratings that operators require. Airbus has requested improvements in go-around time. Operators require elimination of nuisance fault messages to improve troubleshooting effectiveness.

(3) Observation. Not Applicable.

(4) Background. Not Applicable.

(5) Substantiation. Successful software certification testing at Hamilton Standard and Pratt & Whitney.

C. Description

Processor board assemblies are removed from the unit. New software is incorporated by reprogramming the EPROMs. After EPROM reprogramming, the unit is reassembled and tested.

D. Compliance

Category 4 - Accomplish on a planned basis when Electronic Engine Control is at a maintenance base capable of compliance with the accomplishment instructions regardless of other planned maintenance.

E. Approval

The part number changes and/or part modifications described in paragraph 2. of this Service Bulletin have been shown to comply with the applicable Federal Aviation Regulations and are FAA Approved for the Electronic Engine Controls listed.

F. Manpower

Approximately 8 man-hours are required to reprogram each unit. This includes disassembly, assembly and testing.

G. Material - Cost and Availability

The new parts required to accomplish this Service Bulletin are listed in Section 3, Material Information. These parts are available at the prices and lead times indicated and can be obtained from Hamilton Standard by issuing a purchase order for the quantity requested. Purchase orders for this Service Bulletin should be addressed to:

United Technologies Corporation
Hamilton Standard Division
Attention: Commercial After-Market Business
Mail Stop: 1504
One Hamilton Road
Windsor Locks, CT 06096-1010

This program is funded by IAE. The purchase order must refer to this Service Bulletin and IAE Service Bulletin V2500-ENG-73-0027 to ensure accountability.

Units returned to Hamilton Standard will be modified at no charge to the operator. Return unit to:

United Technologies Corporation
Hamilton Standard Division
Attention: Hamilton Support Systems
Customer Service Center
Electronic Service Center
97 Newberry Road
East Windsor, CT 06088

H. Tooling

None

I. Weight and Balance

None

J. Electrical Load Data

Not affected

K. References

IAE Service Bulletin No. V2500-ENG-73-0027
Component Maintenance Manual 73-22-34 (TR73-3)

L. Other Publications Affected

Component Maintenance Manual 73-22-34 (TR73-3)
Illustrated Parts Catalog 73-22-34

2. Accomplishment Instructions

A. Reprogram the EEC using the following instructions or return the EEC for reprogramming to:

Pratt & Whitney Overhaul/Repair Center Europe (PWORCE)
Maastricht Airport
P.O. Box 269
6190 AG BEEK
The Netherlands

or:

United Technologies Corporation
Hamilton Standard Division
Attention: Hamilton Support Systems
Customer Support Center
Electronics Service Center
97 Newberry Road
East Windsor, CT 06088

B. Determine the requirements for Service Bulletin incorporation by checking the units and spare assemblies for the following part numbers:

Assembly	HS Part Number
EEC150-1	798300-8-XXX 798300-10-XXX 798300-12-XXX 798300-14-XXX
Processor/Input Module-Channel A	793610-X
Processor/Input Module-Channel B	793612-X

(XXX) indicates software configuration

(X) indicates hardware configuration

CAUTION: OBEY THE ESDS PRECAUTIONS IN REPAIR 1 IN CMM 73-22-34. THE EEC150-1 CONTAINS ESDS COMPONENTS WHICH MAY BE EASILY DAMAGED.

C. Reprogram the units according to REPAIR 5 (TR73-3) of Component Maintenance Manual 73-22-34. Use the program and version number shown below with the indicated checksums.

	Channel A	Channel B
Application Program:	Y805881	Y805882
Application Version Number:	E-065	E-065
Application Checksum:	E353	6C46
.PAR Checksums:		
PN 798300-8-037	DC4A	B3BC
PN 798300-10-037	B2DC	B13F
PN 798300-12-037	DC4A	B3BC
PN 798300-14-037	B2DC	B13F
Engine Trim Program:	Y806086	Y806086
Engine Trim Version Number:	065	065

D. Reidentify the assemblies as shown below. Refer to REPAIR 4 (TR73-3) of Component Maintenance Manual 73-22-34 for instructions to replace the identification plates.

Assembly	New HS Part Number	New IAE Part Number
EEC150-1	798300-8-037	2A2356
	798300-10-037	2A2390
	798300-12-037	2A2391
	798300-14-037	2A2392
Processor/Input Module-Channel A	793610-X-037	N/A
Processor/Input Module-Channel B	793612-X-037	N/A

3. Material Information

The basis for the following data is per EEC150-1. Any prices shown herein are the net prices F.O.B. Hamilton Standard, One Hamilton Road, Windsor Locks, CT 06096-1010 in effect as of date of bulletin and are based on the condition that United Technologies Corporation's Standard Terms and Conditions of Sale pertaining to commercial contracts in effect when the order is accepted will apply. These prices are firm subject to ninety days notice of change, except that corrections, additions, or deletions shall be effective immediately and in the event prices for these parts are included in a related general parts price list, prices shown in such parts price list shall be deemed to have superseded the prices shown herein on the effective date of such price list. Quantities ordered must be in accordance with the specified Minimum Sales Quantity (MSQ) or multiples thereof. Lead times listed herein apply to all orders placed for modification parts, are based on the number of days from acceptance of order, and are subject to change without notice. Lead times for parts ordered as replenishment for inventory will be established in accordance with Hamilton Standard's current product support policy. The maintenance/overhaul factors (M/OH) shown are estimated replacement percentages for the individual parts based on 100 maintenance actions (usage between overhauls) and 100 overhauls, respectively. These estimated factors are furnished for your convenience and they shall not constitute either representations or guarantees.

NOTE: The tabulation below includes code numbers in the "Instructions/Disposition" column identified as "I/D Code". These code numbers designate the following dispositions.

1. Added Part
2. Scrap Part
3. Rework and Reidentify Part
4. Use for Other Applications

A. New Parts Required

New PN	Qty	Unit Price	Lead Time M/OH	MSQ	Nomenclature	Old PN	I/D Code
751333-1	1	1.70	270	020	Plate, Identification	751333-1	2
777613-1	6	.43	210	100	Cover (UV Protective)	777613-1	2

Hamilton Standard Internal Reference Number 215673, 220491
Hamilton Standard Internal Identification Number EEC15073.17
Hamilton Standard Reference V2500,A320
IAE Engineering Change Number 90VZ008