ENGINE - FUEL AND CONTROL - PROVIDE AN ELECTRONIC ENGINE CONTROL (EEC) WITH IMPROVED PRINTED CIRCUIT BOARDS - CATEGORY CODE 6 - MOD.ENG-73-0024

1. Planning Information

A. Effectivity

(1) Aircraft: Airbus A320

(2) Engine: V2500-A1 Engine before Serial No.V0122

B. Reason

(1) Condition

The previous manufacturing process had low yields of SCN11E circuit boards. The current SCN11E circuit boards are original configuration boards which have been modified to incorporate SCN11E features.

(2) Background

SCN11E software was introduced because customer requirements changed and also because it was found that SCN10D software, in conjunction with the airframes computers, could cause erroneous fault messages. Last minute circuit board revisions to accomodate Category 3 autolanding requirements and the logic used to synthesize PB resulted in the need for improved printed SCN11E circuit boards.

(3) Objective

To incorporate improved circuit board design and SCN11E software into the Electronic Engine Control (EEC).

(4) Substantiation

Qualification testing and Flight Testing of the Electronic Engine Control (EEC).

(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) Controls with SCN11E software have been modified to incorporate improved printed circuit boards.

D. Approval

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

E. Compliance

Category Code 6.

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

F. Manpower

Estimated Manhours to incorporate the full intent of this Bulletin:

Venue	Estimated Manhours
(1) In Service	Not applicable
(2) At Overhaul	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

None.

I. Weight and Balance

(1)	Weight change	None
(2)	Moment arm	No effect
(3)	Datum	Engine front mount Centerline (Powerplant station P.P.S.100)

J. Electrical Load Data

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

K. Reference

(1) Internal Reference No.

90VA032

(2) Other References

Hamilton Standard Service Bulletins EEC150-73-3, EEC150-73-12 and EEC150-73-13.

IAE Service Bulletin No.V2500-ENG-73-0015 - Engine -Fuel and Control - Incorporate a New Electronic Engine Control (EEC) Configuration and Rework the Data Entry Plug to the SCN11E Software Configuration.

V2500 Engine Manual.

L. Other Publications Affected

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

2. Accomplishment Instructions

A. Rework Instructions

(1) Do a modification of the 2A2189 Electronic Engine Control (1 off) by the approved procedure given in Reference (1).

(2) Identify 2A2189 Electronic Engine Control as 2A2166 by the approved procedure given in Reference (1).

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

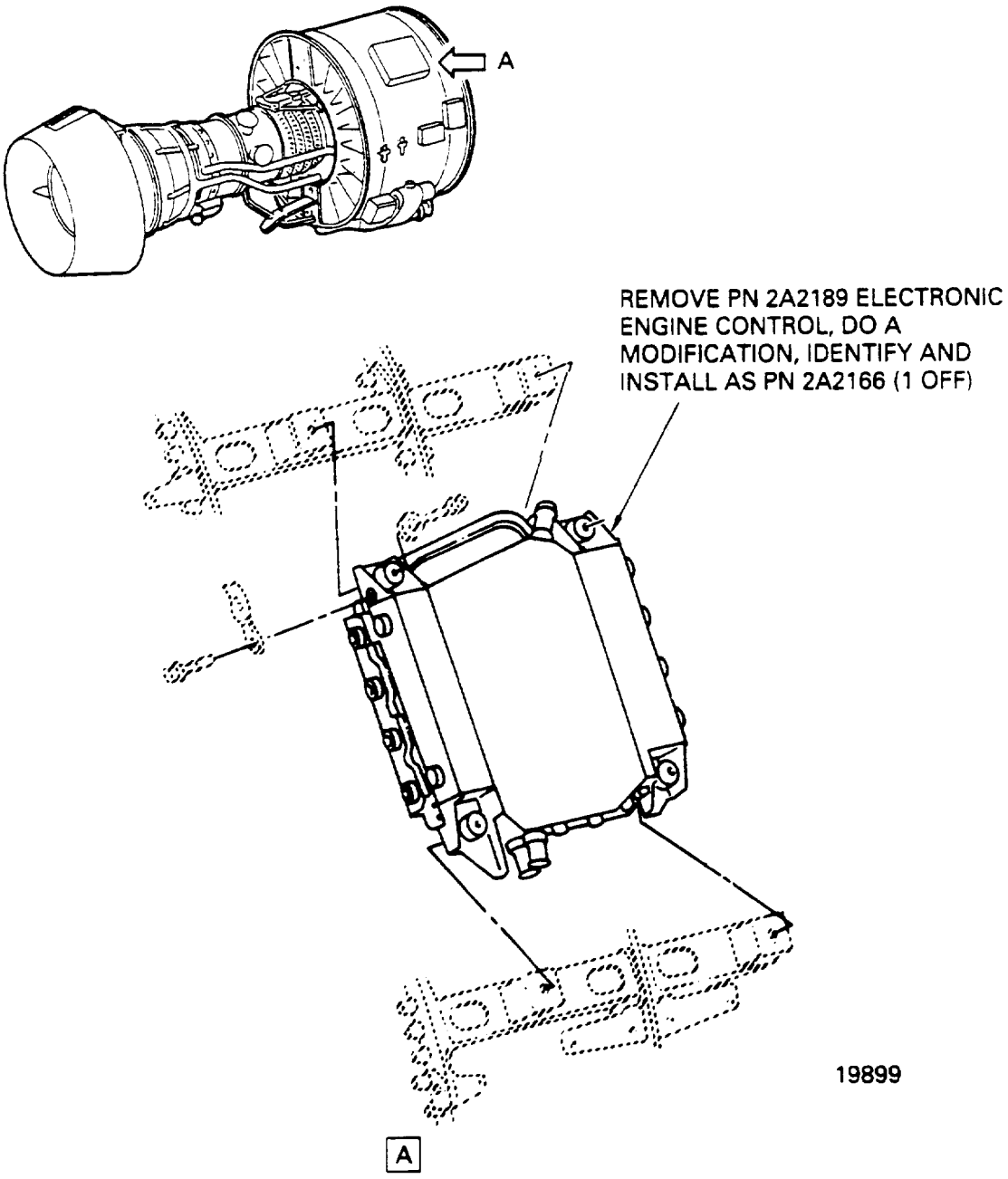
B. Assembly Instructions

(1) Install 2A2166 Electronic Engine Control (1 off) by the approved procedure given in Refernce (3), Chapter/Section 70-00-32, Installation-02.

NOTE: The 2A2189 Electronic Engine Control can be used as a replacement part for removed controls if 2A2166 is not available.

C. Recording Instructions

(1) A record of accomplishment is necessary.



Location of Electronic Engine Control (EEC)
Fig.1

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
2A2166 (73-22-34)	1		Control, Electronic Engine	2A2189 (01-280)	(1D) (A) (B)

C. Instructions/Disposition Code Statements:

(1D) The New part 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:

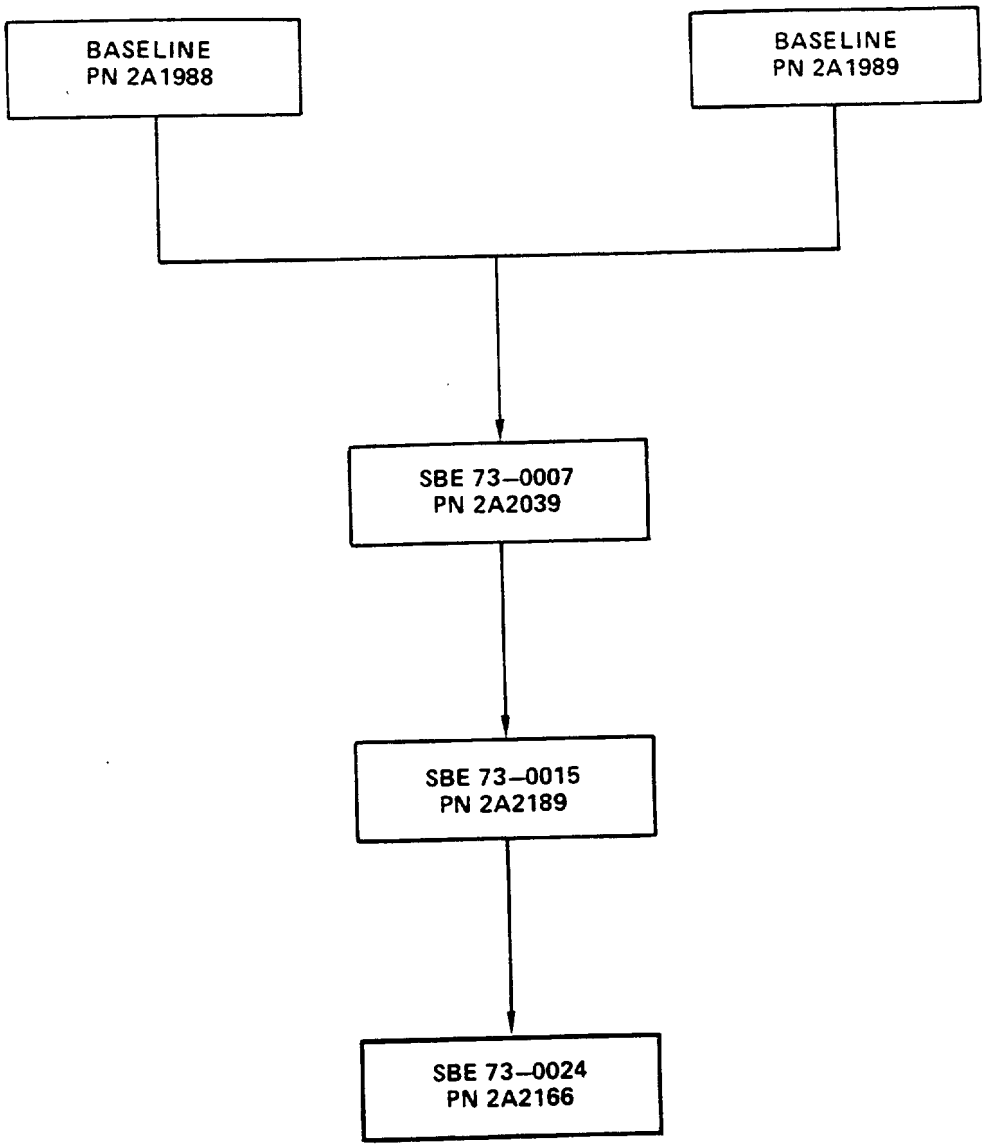
Hamilton Support Systems
Customer Service Cent
97 Newberry Road
East Windsor, CT 06088 USA
HSD P/L 798300-10-032-L14

or

Pratt and Whitney Overhaul/Repair Center Europe (PWORCE)
Maastricht Airport
P.O. Box 269
6190 AG BEEK
The Netherlands
HSD P/L 798300-10-032-L14

(A) New part is currently available.
(B) The Old part will continue be available.

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.2

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SERVICE BULLETIN

CIRCULATE PROMPTLY

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

73-0024
↓
EEC150-73-12
(not this SB?)

1. Planning Information

A. Effectivity

All Hamilton Standard EEC150-1
Electronic Engine Control Part Numbers

798300-8-XXX

NOTE: The EEC150-1 Electronic Engine Control is used on Airbus A320 aircraft equipped with IAE V2500 engines. (XXX) Indicates Software configuration.

B. Reason

(1) Objective. To increase the timing margin of the application program.

(2) Situation. EEC150-1 program instructions stored in memory can have long execution times.

(3) Observation. Changing memory parity from a packed format to an unpacked format shortens program instruction execution times.

(4) Background. Unpacked parity is incorporated via new Channel A and B Processor/Input Modules containing memory in the unpacked format.

(5) Substantiation. Extensive testing has demonstrated increased performance with unpacked parity.

C. Description

The EEC150-1 is disassembled. The Channel A and B Processor/Input Modules are replaced with new Processor/Input Modules containing memory having unpacked parity. The EEC150-1 is then reassembled and a functional test performed.

D. Compliance

Category 6 - Accomplish when the EEC150-1 is sufficiently disassembled to afford access to the Processor/Input Modules.

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 1 man-hour is required to accomplish this Service Bulletin. This estimate does not include functional testing.

G. Material - Cost and Availability

New parts required to accomplish this Service Bulletin are listed in Section 3, Material Information and are available at the prices and lead times indicated. Orders for new or spare parts 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

H. Tooling

None

I. Weight and Balance

None

J. Electrical Load Data

Not affected

K. Reference

Component Maintenance Manual 73-22-34 (TR 73-3)
IAE Service Bulletin 73-0024

L. Other Publications Affected

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

2. Accomplishment Instructions

CAUTION: UNIT CONTAINS ELECTROSTATIC DISCHARGE SENSITIVE (ESDS) DEVICES. REFER TO REPAIR 1 OF COMPONENT MAINTENANCE MANUAL (CMM) 73-22-34 FOR SPECIAL HANDLING CONSIDERATIONS.

A. Disassemble EEC150-1, PN 798300-8-XXX, to the point necessary to remove Channel A Processor/Input Module, PN 793610-14-XXX, and Channel B Processor/Input Module, PN 793612-14-XXX, per DISASSEMBLY section of CMM 73-22-34.

CAUTION: THE EEC150-1 WILL NOT FUNCTION IF THE CHANNEL A AND B PROCESSOR/INPUT MODULES ARE NOT PROGRAMMED TO THE SAME SOFTWARE CONFIGURATION. ENSURE BOTH REPLACEMENT PROCESSOR/INPUT MODULES CONTAIN THE SAME SOFTWARE CONFIGURATION.

B. Replace Channel A Processor/Input Module, PN 793610-14-XXX, with new Channel A Processor/Input Module, PN 793610-40-XXX.

C. Replace Channel B Processor/Input Module, PN 793612-14-XXX, with new Channel B Processor/Input Module, PN 793612-40-XXX.

D. Reassemble EEC150-1 per ASSEMBLY section of CMM 73-22-34.

E. Incorporation of this modification is indicated by Hamilton Standard part number and modification number. Reidentify EEC150-1 by marking a new unit identification plate REPAIR 4 (TR 73-3) of CMM 73-22-34 as follows:

(1) Change the part number to 798300-10-XXX.

(2) Add "L11" to the "Mod Data" portion of the new identification plate.

F. Perform a functional test per CMM 73-22-34 or return to Hamilton Standard for functional testing.

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	240	-/2	020	Plate, Identification	751333-1	2
793610-40-XXX	1	36050.00	630	-/4	001	Module, Processor/ Input, Channel A	793610-14-XXX	4

A. New Parts Required (Continued)

New PN	Qty	Unit Price	Lead Time	M/OH	MSQ	Nomenclature	Old PN	I/D Code
793612-40-XXX	1	34009.00	630	-/4	001	Module, Processor/ Input, Channel B	793612-14-XXX	4

Hamilton Standard Internal Reference 189912-4, -5, 192711-6, -7
Hamilton Standard Internal Document Identification Number EEC15073.3
Hamilton Standard Reference IAE, V2500, A320
IAE Internal Reference Number 90VA032

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SERVICE BULLETIN

CIRCULATE PROMPTLY

ENGINE FUEL AND CONTROL - EEC150-1 ELECTRONIC ENGINE CONTROL - INCORPORATION OF NEW CHANNEL A PROCESSOR/INPUT MODULE

1. Planning Information

A. Effectivity

All Hamilton Standard Electronic Engine Controls Not Incorporating Stock List Number	Serial Number of First Production Incorporation
798300-10-XXX L10	Not available at time of publication.

(XXX) Indicates Software Configuration

B. Reason

(1) Objective. To replace the Channel A Processor/Input Module.

(2) Situation. The existing Channel A Processor/Input Module is extensively reworked.

(3) Observation. New Channel A Processor/Input Module incorporates modifications made to previous Channel A Processor/Input Modules.

(4) Background. Replacement of the Channel A Processor/Input Module improves the manufacture of EEC150-1 units.

(5) Substantiation. None.

C. Description

The EEC150-1 is disassembled to remove the Channel A Processor/Input Module. The Channel A Processor/Input Module is replaced with a new Channel A Processor/Input Module containing a new circuit board. The EEC150-1 is then reassembled and a functional test is performed.

D. Compliance

Category 7 - Accomplish when supply of superseded parts has been depleted.

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 2 man-hours are required to accomplish this Service Bulletin. This estimate does not include functional 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. Orders for new or spare parts should be addressed to:

United Technologies Corporation
Hamilton Standard Division
Attention: Division Spares
Mail Stop: 1-2-B7
One Hamilton Road
Windsor Locks, CT 06096-1010

H. Tooling

None

I. Weight and Balance

None

J. Electrical Load Data

Not Affected

K. Reference

Component Maintenance Manual 73-22-34

L. Other Publications Affected

Component Maintenance Manual 73-22-34
Illustrated Parts Catalog 73-22-34

2. Accomplishment Instructions

CAUTION: UNIT CONTAINS ELECTROSTATIC DISCHARGE SENSITIVE (ESDS) DEVICES. REFER TO REPAIR 1 OF COMPONENT MAINTENANCE MANUAL (CMM) 73-22-34 FOR SPECIAL HANDLING CONSIDERATIONS.

A. Disassemble the EEC150-1 to the point necessary to remove the Channel A Processor/Input Module per DISASSEMBLY section of CMM 73-22-34.

CAUTION: THE EEC150-1 UNIT WILL NOT FUNCTION IF THE CHANNEL A AND B PROCESSOR/INPUT MODULES ARE NOT PROGRAMMED THE SAME SOFTWARE CONFIGURATION. ENSURE THAT THE CHANNEL A AND B PROCESSOR/INPUT MODULES WILL BE AT THE SAME SOFTWARE CONFIGURATION AFTER THE CHANNEL A PROCESSOR/INPUT MODULE IS REPLACED.

B. Replace Channel A Processor/Input Module, PN 793610-16-XXX, with new Channel A Processor/Input Module, PN 793610-40-XXX.

C. Reassemble EEC150-1 per ASSEMBLY section of CMM 73-22-34.

D. Incorporation of this Service Bulletin is indicated by Hamilton Standard modification Number. Reidentify the EEC150-1 by adding "L10" per REPAIR 4, (TR 73-2), of CMM 73-22-34.

E. Perform a functional test per TESTING AND TROUBLESHOOTING section of CMM 73-22-34 or return EEC150-1 to Hamilton Standard for testing.

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	240	-/2	020	Plate, Identification	751333-1	2
793610-40-027	1	36050.00	630	-/4	001	Module, Processor/Input, Channel A	793610-16-XXX	4

Hamilton Standard Internal Reference Number 192711-6
Hamilton Standard Internal Document Number EEC15073.12
Hamilton Standard Reference IAE, V2500, A320

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SERVICE BULLETIN

CIRCULATE PROMPTLY

ENGINE FUEL AND CONTROL - EEC150-1 ELECTRONIC ENGINE CONTROL - INCORPORATION OF NEW CHANNEL B PROCESSOR/INPUT MODULE

1. Planning Information

A. Effectivity

All Hamilton Standard Electronic Engine Controls Not Incorporating Stock List Number	Serial Number of First Production Incorporation
798300-10-XXX L11	Not available at time of publication.

(XXX) Indicates Software Configuration

B. Reason

(1) Objective. To replace the Channel B Processor/Input Module.

(2) Situation. The existing Channel B Processor/Input Module is extensively reworked.

(3) Observation. New Channel B Processor/Input Module incorporates modifications made to previous Channel B Processor/Input Modules.

(4) Background. Replacement of the Channel B Processor/Input Module improves the manufacture of EEC150-1 units.

(5) Substantiation. None.

C. Description

The EEC150-1 is disassembled to remove the Channel B Processor/Input Module. The Channel B Processor/Input Module is replaced with a new Channel B Processor/Input Module containing a new circuit board. The EEC150-1 is then reassembled and a functional test is performed.

D. Compliance

Category 7 - Accomplish when supply of superseded parts has been depleted.

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 2 man-hours are required to accomplish this Service Bulletin. This estimate does not include functional 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. Orders for new or spare parts should be addressed to:

United Technologies Corporation
Hamilton Standard Division
Attention: Division Spares
Mail Stop: 1-2-B7
One Hamilton Road
Windsor Locks, CT 06096-1010

H. Tooling

None

I. Weight and Balance

None

J. Electrical Load Data

Not Affected

K. Reference

Component Maintenance Manual 73-22-34

L. Other Publications Affected

Component Maintenance Manual 73-22-34
Illustrated Parts Catalog 73-22-34.

2. Accomplishment Instructions

CAUTION: UNIT CONTAINS ELECTROSTATIC DISCHARGE SENSITIVE (ESDS) DEVICES. REFER TO REPAIR 1 OF COMPONENT MAINTENANCE MANUAL (CMM) 73-22-34 FOR SPECIAL HANDLING CONSIDERATIONS.

A. Disassemble the EEC150-1 to the point necessary to remove the Channel B Processor/Input Module per DISASSEMBLY section of CMM 73-22-34.

CAUTION: THE EEC150-1 UNIT WILL NOT FUNCTION IF THE CHANNEL A AND B PROCESSOR/INPUT MODULES ARE NOT PROGRAMMED THE SAME SOFTWARE CONFIGURATION. ENSURE THAT THE CHANNEL A AND B PROCESSOR/INPUT MODULES WILL BE AT THE SAME SOFTWARE CONFIGURATION AFTER THE CHANNEL B PROCESSOR/INPUT MODULE IS REPLACED.

B. Replace Channel B Processor/Input Module, PN 793612-16-XXX, with new Channel B Processor/Input Module, PN 793612-40-XXX.

C. Reassemble EEC150-1 per ASSEMBLY section of CMM 73-22-34.

D. Incorporation of this Service Bulletin is indicated by Hamilton Standard modification Number. Reidentify the EEC150-1 by adding "L11" per REPAIR 4, (TR 73-2), of CMM 73-22-34.

E. Perform a functional test per TESTING AND TROUBLESHOOTING section of CMM 73-22-34 or return EEC150-1 to Hamilton Standard for testing.

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	240	-/2	020	Plate, Identification	751333-1	2
793612-40-027	1	34009.00	630	-/4	001	Module, Processor/Input, Channel B	793612-16-XXX	4

Hamilton Standard Internal Reference Number 192711-7
Hamilton Standard Internal Document Number EEC15073.13
Hamilton Standard Reference IAE, V2500, A320