ENGINE – FUEL AND CONTROL – TO PROVIDE A NEW A1SCN13/Q ELECTRONIC ENGINE CONTROL (EEC)
SOFTWARE – CATEGORY CODE 4 – MOD.ENG-73-0112

1. Planning Information

   A. Effectivity

      (1) Aircraft: Airbus A320

      (2) Engine: V2500-A1 Engines through Serial No. V0361

      For engines specified which incorporate this Service Bulletin the Bump
      configurations which follow are applicable.

      BUMP 00 (No Thrust Bump)

      BUMP 04 (No Thrust Bump)

      BUMP 07 (Improved Consolidated Thrust Bump)*

      *The Flight Operations Manual will have specific instructions for Aircraft
      which have Engines with these Thrust Bump Configurations.

      CAUTION: THE INTERMIX OF ELECTRONIC ENGINE CONTROLS MUST BE DONE BY THE
               INSTRUCTIONS GIVEN IN REFERENCE (3), AIRBUS SERVICE BULLETIN
               A320-73-1056.

      If Service Bulletin V2500-ENG-75-0025, specified in Reference (1) is
      incorporated on the engine(s) it must be removed when this Service Bulletin is
      incorporated.

      You must contact your IAE Representative when you incorporate this Service
      Bulletin. You must obey the contractual obligations when you change from a no
      thrust bump configuration (other than 00 or 04).

   B. Reason

      (1) Condition:

         (a) 1.0 HEAT MANAGEMENT SYSTEM ENHANCEMENTS

            1 1.1 IDG OIL CONTROLLING TEMPERATURE LIMIT: Durability of
               the airframe supplied IDG needs to be improved.

            2 1.2 MODULATING VALVE CYCLING: Unnecessary cycling of the
               Air Modulating Valve can occur following Heat Management
               System Mode Changes.

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3   1.3 NUISANCE FLIP MODE FAULT: A nuisance Flip Mode Fault, "HMS – IDG OVTMP W/RCIRC", can be erroneously set due to an external EEC reset.

(b) 2.0 AUTOSTART LOGIC ENHANCEMENTS

1   2.1 AUTOSTART IMPACT FOLLOWING DRY CRANKING: An autostart which is initiated following a manual dry crank without resetting or depowering the EEC, can result in ignition and fuel being commanded "ON" prematurely during the subsequent autostart.

2   2.2 NUISANCE LOW STARTEER AIR PRESSURE FAULT: A nuisance "ENG 1(2) START FAULT, LO START PRESS" fault can be set following a manual dry crank that exceeds 50 seconds.

3   2.3 STARTER VALVE FEEDBACK FAULT ACCOMMODATION: Current EEC autostart logic does not optimally accommodate a local failure of the Starter Air Valve feedback.

4   2.4 AUTOSTART CRANK LOGIC REFINEMENT: Ground autostarts with 50 second dry crank incorporated may, in some conditions, result in an abnormal command of fuel and ignition which can lead to an unsuccessful autostart. Manual starts are not affected.

(2)   Background:

(a) 1.0 HEAT MANAGEMENT SYSTEM ENHANCEMENTS

1   1.1 IDG OIL CONTROLLING TEMPERATURE LIMIT: To try and improve the IDG reliability, the typical IDG oil temperature is being moved from the upper part of the specification range to the middle.

2   1.2 MODULATING VALVE CYCLING: When the Heat Management System transitions from a non-recirculation mode, the Fuel-Back-To-Tank valve is commanded open and the controlling temperature limits are set to lower values. However, since the additional cooling effect of returning fuel to tank does not take effect immediately, the Air Modulating Valve can also be commanded open to provide additional cooling in attempting to achieve lower limits.

3   1.3 NUISANCE FLIP MODE FAULT: Current EEC logic allow the setting of this fault immediately after an EEC reset if the conditions for setting it exist at the time of the reset, even if those conditions have not existed for the required period of time.

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(b) 2.0 AUTOSTART LOGIC ENHANCEMENTS

1   2.1 AUTOSTART IMPACT FOLLOWING DRY CRANKING: The ignition
and fuel pressurization timer can get set and latched
during a manual dry crank which exceeds 50 seconds. This
will result in ignition and fuel being commanded "ON" at
the initiation of the subsequent autostart if the timer is
not cleared by resetting or depowering the EEC.

2   2.2 NUISANCE LOW STARTER AIR PRESSURE FAULT: The Hung
Starter Flag can get set and latched during a manual dry
crank which exceeds 50 seconds. Once the flag is latched,
a nuisance flag fault is set when the crank is terminated
and N2 drops below 10%.

3   2.3 STARTER VALVE FEEDBACK FAULT ACCOMMODATION: The
accommoation of a local Starter Air Valve feedback
failure could be improved.

4   2.4 AUTOSTART CRANK LOGIC REFINEMENT: Maximum motoring
speeds achieved during V2500-A5 ground starts on newer
A321/A320/A319 aircraft are higher than anticipated under
low altitude, cold temperature conditions. This higher
motoring speed can result in the current autostart logic
allowing fuel pressurization with an attendant delayed
ignition command.

(3)   Objective:

(a) 1.0 HEAT MANAGEMENT SYSTEM ENHANCEMENTS

1   1.1 IDG OIL CONTROLLING TEMPERATURE LIMIT: Though specific
design enhancements are being pursued to the IDG itself,
changes have been incorporated to the EEC Heat Management
logic that will reduce the typical controlling limit for
the IDG Oil Temperature from 100 C to 85 C when Fuel-Back-To-Tank
is allowed. The mode change temperature limit of 100 C, as
well as the controlling limits in mode where no when
Fuel-Back-To-Tank is allowed, remain unchanged.

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2   1.2 MODULATING VALVE CYCLING: Changes have been incorporated
in the EEC Heat Management logic that will close the
Air Modulating Valve for 2 minutes following a change from a
non-recirculation mode to a recirculation mode. This gives
the Back-To-Tank valve a chance to open and reduce the Heat
Management System fluid temperatures to the lower limits
applicable in recirculation modes before utilizing the Air
Modulating Valve, thus avoiding unnecessary cycling of the
Air Modulating Valve and the potential for a performance impact.

2   1.3 NUISANCE FLIP MODE FAULT: Modify the EEC logic so that an
EEC reset wil not set the associated Flip Mode fault unless
the conditions have been satisfied for the required period of time.

(b) 2.0 AUTOSTART LOGIC ENHANCEMENTS

1   2.1 AUTOSTART IMPACT FOLLOWING DRY CRANKING: Modify the
EEC logic to accommodate the potential lack of an EEC
reset by clearing the ignition and fuel pressurization
timer as necessary for all start modes.

2   2.2 NUISANCE LOW STARTER AIR PRESSURE FAULT: Modify the
EEC logic to accommodate the potential lack of an EEC
reset at the conclusion of a dry crank by clearing the
Hunt Starter Flag as necessary for all start modes.

3   2.3 STARTER VALVE FEEDBACK FAULT ACCOMMODATION: Modify the
EEC autostart logic to utilize the starter air valve
command and disable the feedback in the event of a detected
starter air valve feedback disagreement between channels.

4   2.4 AUTOSTART CRANK LOGIC REFINEMENT: As a precaution,
increase the V2500-A1 ground autostart ignition/fuel
pressurization N2 speed trip to a level which can not be
achieved under any potential ambient conditions. This
insures that ignition/fuel pressurization will always be
commanded by the ignition speed timer as originally intended.

(4) Substantiation

This change has been fully tested on the closed loop bench and run on
Engine V0046/V0113 A320, Aircraft 114, using the applicable trims on
April 25, 1997.

(5) Effects of Bulletin on Workshop Procedures:

Removal/Installation   Not affected

Disassembly/Assembly   Not affected

V2500-ENG-73-0112
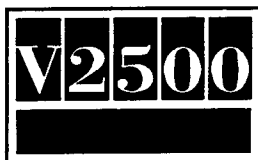
Cleaning	Not affected
Inspection/Check	Not affected
Repair	Not affected
Testing	Not affected

(6) Supplemental Information

None.

C. Description

(1) To provide a new Electronic Engine Control (EEC) with A1SCN13/Q software logic.

D. Approval

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

The technical information including design data contained in this SB has been approved under the authority of AIB Design Organisation Approval No F.JA.02 granted by the DGAC.

E. Compliance

Category 4

Accomplish at the first visit of an engine or module to a maintenance base capable of compliance with the accomplishment instructions regardless of the planned maintenance action or the reason for engine removal.

F. Manpower

Estimated Manhours to incorporate the full intent of this Bulletin:

Venue	Estimated Manhours
(1) In service	TOTAL: 1 hour 21 minutes

    (a) To gain access

            (i)   Install the warning notices .. 5 minutes

            (ii) Open the fan cowls   ..   .. 7 minutes

            (iii) Remove the EEC   ..   .. .. 23 minutes

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TOTAL 35 minutes

(b) To remove the ACC Front
     Duct Cover Assembly, if required,
     Reference (1)   .. .. 5 minutes

(c) To retain to flyable status

          (i)   Install the EEC .. .. .. 28 minutes

          (ii) Close the fan cowls   .. .. 8 minutes

          (iii) Remove the warning notices .. 5 minutes

                              TOTAL 41 minutes

    (2) At overhaul .. ..   Not applicable

G. Material - Price and Availability

    (1) Modification kit is not required.

    (2) This Service Bulletin will be done at no cost to the operator.

    (3) 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
                                   (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.

         97VZ008

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(2) Other References

IAE V2500 Service Bulletins:

V2500-ENG-70-0336 (Information - Provide A New Electronic Engine Control With SCN12B/N Software And Featuring Hardware Common to The A5)

V2500-ENG-70-0056 (Information - Fuel And Control - To Announce A Hinged Heat Shield Configuration for the (EEC) electronic Engine Control)

V2500-ENG-73-0007 (Engine - Fuel And Control dezelon - Incorporate A New Electronic Engine Control (EEC) Configuration)

V2500-ENG-73-0015 (Engine - Fuel And Control - Incorporate A New Electronic Engine Control (EEC) Configuration And Rework The Data Entry Plug Assembly To The SCN11E Software Configuration)

V2500-ENG-73-0024 (Engine - Fuel And Control - Provide An Electronic Engine Control (EEC) With improved Printed Circuit Boards)

V2500-ENG-73-0027 (Engine - Fuel And Control - Provide An Electronic Engine Control (EEC) With The SCN 11G/J Software Configuration)

V2500-ENG-73-0037 (Engine - Fuel And Control - Provide A New Electronic Engine Control (EEC) With The SCN 12A Software Configuration)

V2500-ENG-73-0044 (Engine - Fuel And Control - Provide A New Electronic Engine Control (EEC) With The SCN 12B Software Configuration)

V2500-ENG-73-0069 (Engine - Fuel And Control - Provide A New Electronic Engine Control (EEC) With The SCN 12C Software Configuration)

V2500-ENG-73-0082 (Engine - Fuel and Control - Provide A New Electronic Engine Control (EEC) With The SCN 12D Software Configuration)

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 EEC-150-20-73-31/EEC-150-1-73-18.

Airbus Service Bulletin A320-73-1056 (Aircraft Mod. 26609).

V2500-ENG-73-0112

V2500 Aircraft Maintenance Manual.

The V2500 Engine Illustrated Parts Catalog (S-V2500-1IA), Chapter/Section 73-22-34.

The V2500 Engine Manual (E-V2500-1IA), Chapter/Section 71-00-00, Testing-11.

L. Other Publications Affected

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

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2. Accomplishment Instructions

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

IAE—INTERNATIONAL AERO ENGINES AG
400 Main Street M/S 121-10
East Hartford, CT 06108 USA

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

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

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 standards 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 EDG FADEC GND PWR push button switch is OFF and install a warning notice.

(3) Open the fan cowls by use of the approved procedure in Reference (5) Chapter/Section 71-13-00, (TASK 71-13-00-010-010).

E. Removal Instructions

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(1) Remove the 808050-04-048 (2A3224), 798300-15-048 (2A3225), 798300-16-048 (2A3226), 798300-17-048 (2A3227) or 798300-18-048 (2A3228) Electronic Engine Control by the procedure given in Reference (4), Chapter/Section 73-22-34, Removal/Installation. Refer to Figure 1.

F. Rework Instructions

(1) Do a modification of the 808050-04-048 (2A3224), 798300-15-048 (2A3225), 798300-16-048 (2A3226), 798300-17-048 (2A3227) or 798300-18-048 (2A3228) Electronic Engine Control (See Reference (5), Chapter/Section 73-21-34, Fig/Item No. 01-280) and reidentify by the procedures given in Reference (2).

Procedure	Supplementary Information
(a) Send the Electronic Engine Control to the approved vendor to be modified. See Paragraph 2.B.	See Figure 1.

(2) Remove the Active Clearance Control (ACC) Front Duct Cover Assembly. Refer to V2500-ENG-75-0025 specified in 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 SCN13/Q software logic, the Front Duct Cover Assembly given in V2500-ENG-75-0025 must be removed. See Reference (1).

G. Installation Instructions

(1) Install the Electronic Engine Control the 808050-04-050 (2A3289), 798300-15-050 (2A3290), 798300-16-050 (2A3291), 798300-17-050 (2A3292) or 798300-18-050 (2A3293) (1 off) by the approved procedure given in Reference (4), Chapter/Section 73-22-34, Removal/Installation.

CAUTION: MAKE SURE THAT THE DTA RECORD ON THE DEP BACKSHELL AGREES WITH THE DATA RECORD ON THE ENGINE IDENTIFICATION PLATE.

(2) Install the Data Entry Plug (with the applicable wire combination). See Reference (4), Chapter/Section 73-22-35, Removal/Installation.

NOTE: Before you incorporate this Service Bulletin do a check of the Data Entry Plug configurations in use. Make sure you have one of the permitted Bump configurations given in this Service Bulletin.

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NOTE: If you have a Bump configuration in use that is not one of the permitted Bump configurations given, you must change the wire configuration to one of the approved Bump configurations specified. Use the procedure specified in Reference (6), Chapter/Section 71-00-00 Testing-11. You must change the engine records to include this modification.

When you change the wire configuration of the Data Entry Plug assembly you must do a check to make sure the new configuration is correct. Use the electrical connector specified. See Reference (6), Chapter/Section 71-00-00, Testing-11.

   (a) Install a Data Entry Plug with the 00/04 Bump configuration for engines that will not use the Thrust Bump.

   (b) Install a Data Entry Plug with the 07 Bump configuration for engines that will use the Improved Consolidated Thrust Bump.

      NOTE: When you either change or replace the Data Entry Plug Assembly to incorporate a Bump configuration you must install a new Engine Identification Plate. Contact your IAE representative to get a new Engine Identification Plate.

H. Post-Requisite Instructions

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

   (2) Remove the warning notices.

I. Recording Instructions

   (1) A record of accomplishment is necessary.
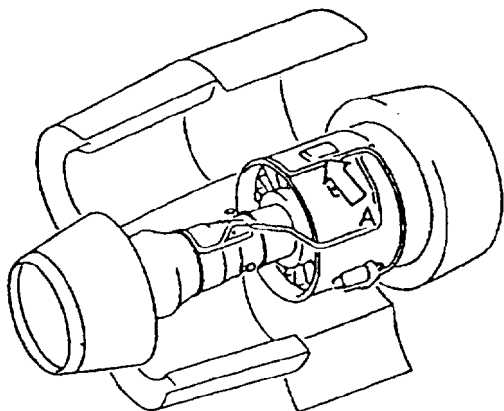
REMOVE THE ELECTRONIC ENGINE
CONTROL AND INSTALL THE NEW
ELECTRONIC ENGINE CONTROL
(EEC) OR OBTAIN THE NEW EEC BY
THE INSTRUCTIONS GIVEN IN THE
TEXT

FWD
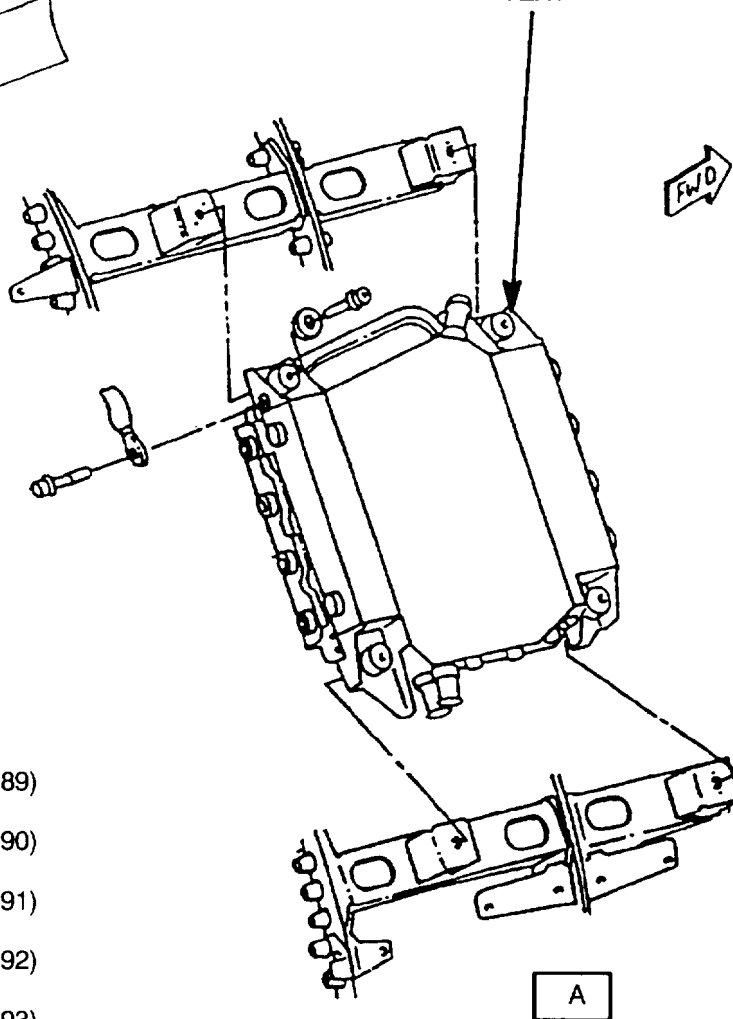
*NEW PART NUMBER

808050-04-050   (2A3289)
OR
798300-15-050   (2A3290)
OR
798300-16-050   (2A3291)
OR
798300-17-050   (2A3292)
OR
798300-18-050   (2A3293)

A

de000e7843

Location of the Electronic Engine Control (EEC)
Fig.1

V2500-ENG-73-0112

Printed in Great Britain

REMOVE THE PN 4W0102
BOLTS

REMOVE THE PN 2A3637
FRONT DUCT COVER ASSEMBLY

FRONT ACTIVE
CLEARANCE CONTROL
DUCT

A
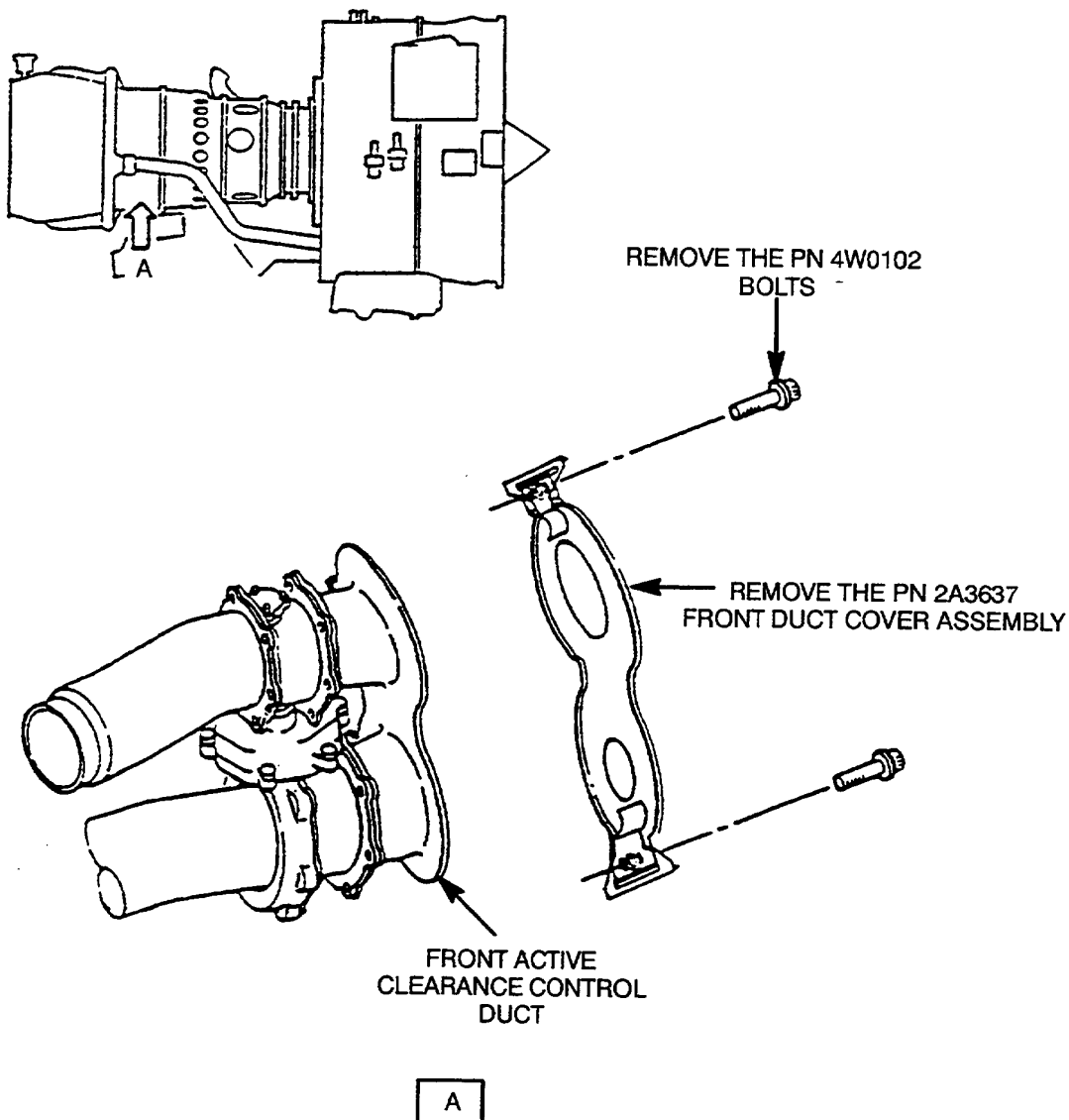
E7723

Location of the ACC Front Duct Cover Assembly
Fig.2

V2500-ENG-73-0112

Printed in Great Britain

3. Material Information

A. Kit associated with this bulletin.

None

B. Parts affected by this bulletin.

```
New                      Est'd              Old
Part No.                 Unit               Part No.      Instructions
(ATA No.)    Qty         Price ($)  Keyword (IPC No.)     Disposition
-------------------------------------------------------------------------
```

Applicability: For each V2500 Engine to incorporate this Service Bulletin that incorporates V2500-ENG-70-0056, V2500-ENG-70-0336, V2500-ENG-73-0007, V2500-ENG-73-0015, V2500-ENG-73-0024, V2500-ENG-73-0027, V2500-ENG-73-0032, V2500-ENG-73-0037, V2500-ENG-73-0044, V2500-ENG-73-0069 and V2500-ENG-73-0112.

```
808050-04-050  1                    Control,    808050-04-048 (S1)(1D)(A)(B)
(2A3289)                             Electronic  (2A3224)
(73-22-34)                           Engine      (01-280)
```

Applicability: For each V2500 Engine to incorporate this Service Bulletin that incorporates V2500-ENG-73-0007, V2500-ENG-73-0015, V2500-ENG-73-0027, V2500-ENG-73-0032, V2500-ENG-73-0037, V2500-ENG-73-0044, V2500-ENG-73-0069 and V2500-ENG-73-0112, but does not incorporate V2500-ENG-70-0056, V2500-ENG-70-0336 and V2500-ENG-73-0024.

```
798300-15-050  1                    Control,    798300-15-048 (S1)(1D)(A)(B)
(2A3290)                             Electronic  (2A3225)
(73-22-34)                           Engine      (01-280)
```

Applicability: For each V2500 Engine to incorporate this Service Bulletin that incorporates V2500-ENG-73-0007, V2500-ENG-73-0015, V2500-ENG-73-0024, V2500-ENG-73-0027, V2500-ENG-73-0032, V2500-ENG-73-0037, V2500-ENG-73-0044, V2500-ENG-73-0069 and V2500-ENG-73-0112, but does not incorporate V2500-ENG-70-0056 and V2500-ENG-70-0336.

```
798300-16-050  1                    Control,    798300-16-048 (S1)(1D)(A)(B)
(2A3291)                             Electronic  (2A3226)
(73-22-34)                           Engine      (01-280)
```

Applicability: For each V2500 Engine to incorporate this Service Bulletin that incorporates V2500-ENG-70-0056, V2500-ENG-73-0007, V2500-ENG-73-0015, V2500-ENG-73-0027, V2500-ENG-73-0032, V2500-ENG-73-0037, V2500-ENG-73-0044, V2500-ENG-73-0112 and V2500-ENG-73-0069, but does not incorporate V2500-ENG-70-0336 and V2500-ENG-73-0024.

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798300-17-050	1	Control,	798300-17-048 (S1)(1D)(A)(B)
(2A3292)		Electronic	(2A3227)
(73-22-34)		Engine	(01-280)

Applicability: For each V2500 Engine to incorporate this Service Bulletin that incorporates V2500-ENG-70-0056, V2500-ENG-73-0007, V2500-ENG-73-0015, V2500-ENG-73-0024, V2500-ENG-73-0027, V2500-ENG-73-0032, V2500-ENG-73-0037, V2500-ENG-73-0044, V2500-ENG-73-0069 and V2500-ENG-73-0112 but does not incorporate V2500-ENG-70-0336.

798300-18-050	1	Control,	798300-18-046 (S1)(1D)(A)(B)
(2A3293)		Electronic	(2A3228)
(73-22-34)		Engine	(01-280)

C. Instructions/Disposition Code Statements:

(S1) This Service Bulletin may be intermixed with A1SCN12A/B/C/D on either of the engines on the aircraft.

(1D) You can obtain the new part by modification. Use the approved procedure given in Reference (2). Purchase new parts from or return the old parts for modification to the approved vendor given in the Accomplishment Instructions.

(A) The new part is currently available.

(B) The old part will no longer be supplied.

NOTE: The estimated 1997 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.

V2500-ENG-73-0112

MODIFICATIONS

BASE LINE

PART NUMBER CHANGE

```
                          ┌─────────────────────┐
                          │ 798300−8−026, L7    │
                          │      (2A1988)       │
                          │         OR          │
                          │ 798300−8−026, L7    │
                          │      (2A1989)       │
                          └─────────────────────┘
                                    │
V2500−ENG−73−0007                   ▼                    CONTINUED ON
PROVIDES SCN10D           ┌─────────────────────┐          SHEET 2
SOFTWARE                  │ 798300−027, L7      │──────────────────────► (A)
                          │      (2A2039)       │
                          └─────────────────────┘
                                    │
V2500−ENG−73−0015                   ▼                    CONTINUED ON
PROVIDES SCN11E           ┌─────────────────────┐          SHEET 2
SOFTWARE AND A            │ 798300−8−032, L12   │──────────────────────► (B)
MULTIPLE BUMP             │      (2A2189)       │
                          └─────────────────────┘
                                    │
V2500−ENG−73−0024                   ▼
PROVIDES SCN11E           ┌─────────────────────┐
SOFTWARE AND PRINTED      │ 798300−10−032, L12  │────────────────────────┐
CIRCUIT BOARDS            │      (2A2166)       │              │         │
                          └─────────────────────┘              │         │
                                    │                          │         │
V2500−ENG−70−0056                   ▼                          │         │
PROVIDES HINGED           ┌─────────────────────┐              │         │
FIRE SHIELDS              │ 798300−14−032       │──┐           │         │
                          │      (2A2285)       │  │           │         │
                          └─────────────────────┘  │           │         │
                                    │              │           ▼         │
V2500−ENG−73−0027                   ▼              │  ┌─────────────────────┐
PROVIDES SCN11G           ┌─────────────────────┐  │  │ 798300−10−037       │
SOFTWARE                  │ 798300−14−037       │  │  │      (2A2390)       │
                          │      (2A2392)       │  │  └─────────────────────┘
                          └─────────────────────┘  │           │          │
                                    │              │           ▼          │
V2500−ENG−73−0032                   ▼              │  ┌─────────────────────┐
PROVIDES SCN11H           ┌─────────────────────┐  │  │ 798300−10−038       │◄─┘
SOFTWARE                  │ 798300−14−038       │◄─┘  │      (2A2478)       │
                          │      (2A2480)       │     └─────────────────────┘
                          └─────────────────────┘              │
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CONTINUED ON   │   CONTINUED ON   │
SHEET 3   ▼ (C)   SHEET 3   ▼ (D)   E7724

Family Tree − Electronic Engine Control (EEC) Ref. Catalog Sequence No. 73-22-34. Fig.
01 Item 280
Fig.3 (Sheet 1)

V2500−ENG−73−0112
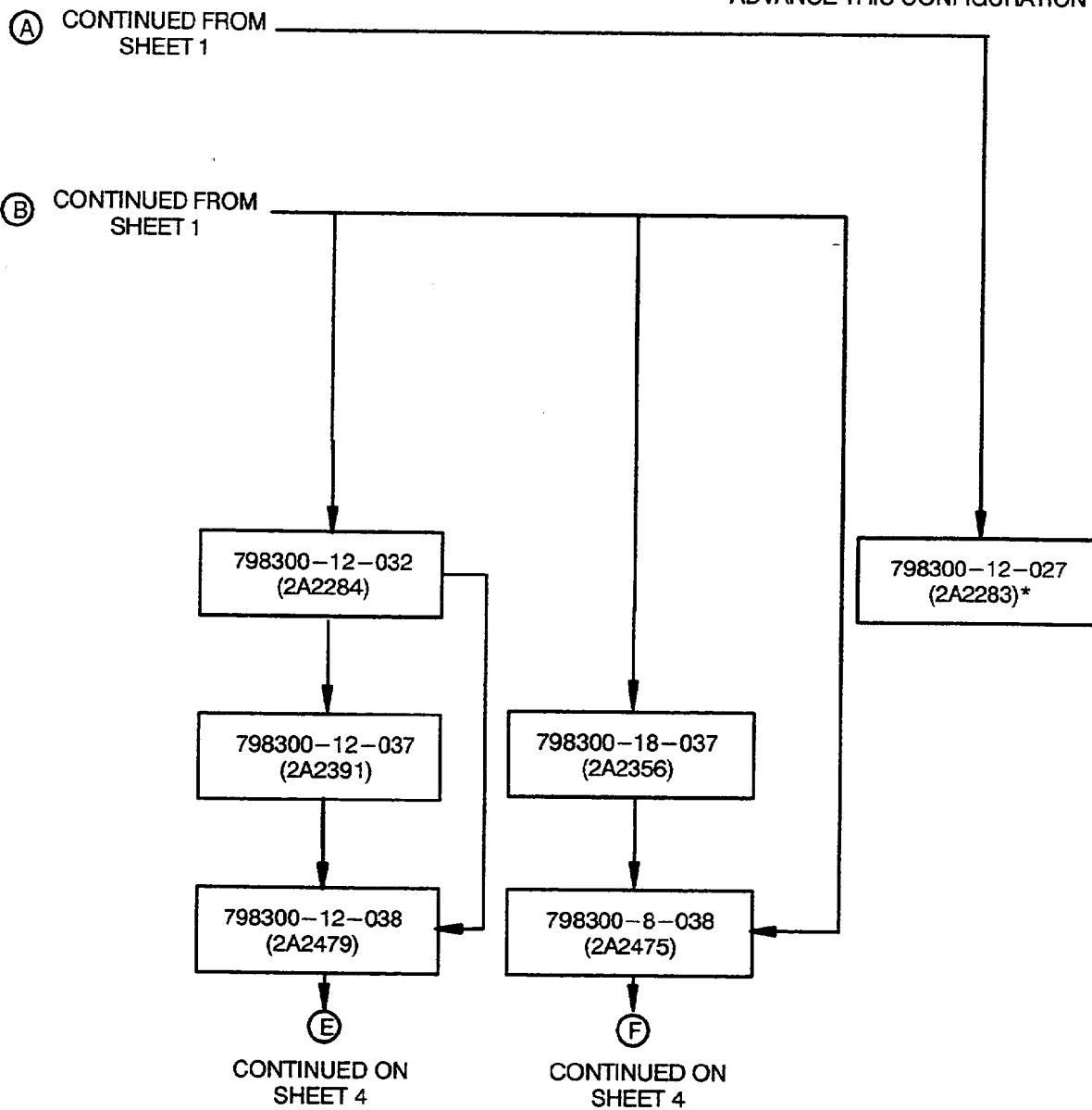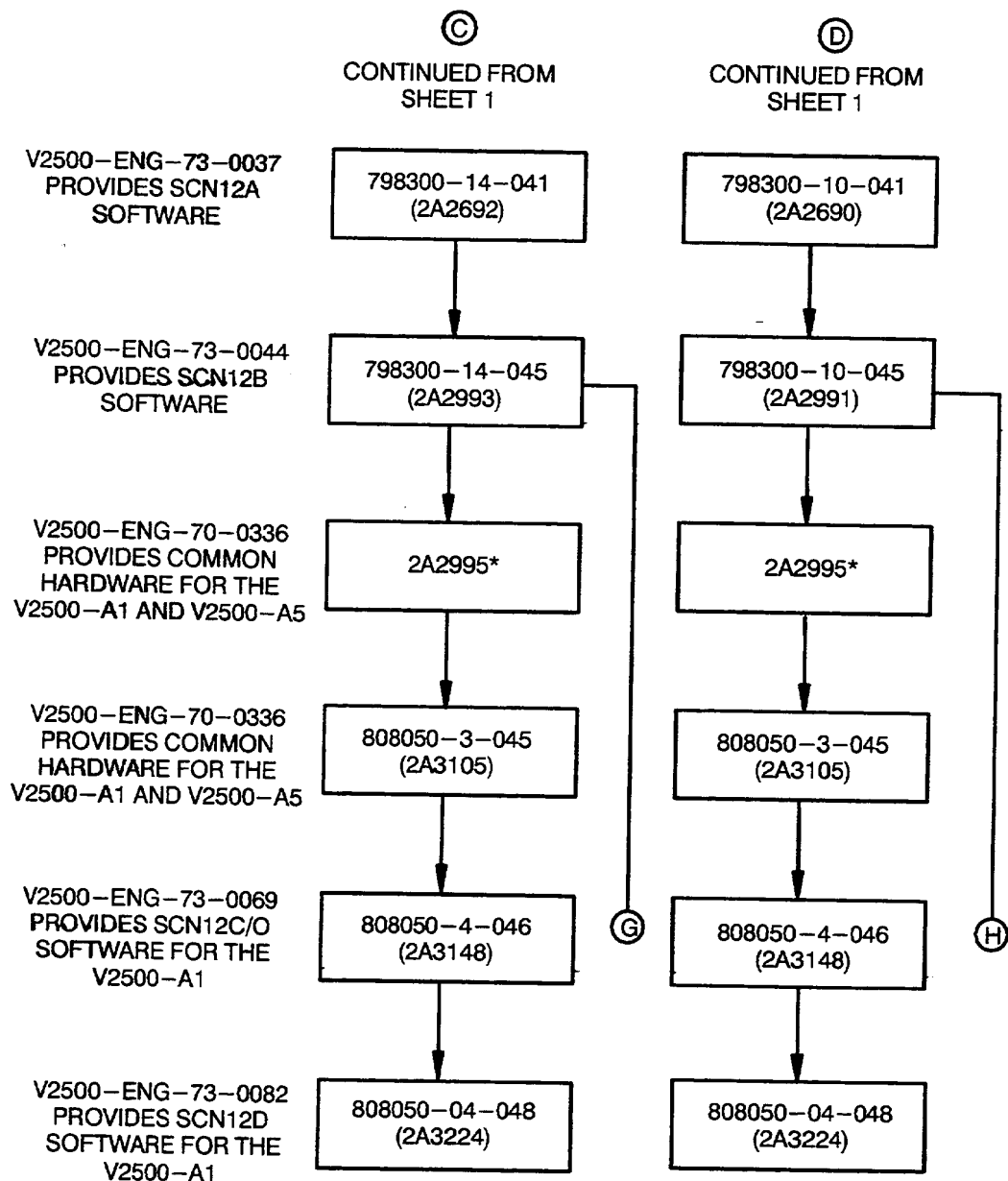
Printed in Great Britain

PART NUMBER CHANGE

*THERE IS NO PROCEDURE TO
ADVANCE THIS CONFIGURATION

(A) CONTINUED FROM
SHEET 1

(B) CONTINUED FROM
SHEET 1

798300−12−032
(2A2284)

798300−12−027
(2A2283)*

798300−12−037
(2A2391)

798300−18−037
(2A2356)

798300−12−038
(2A2479)

798300−8−038
(2A2475)

(E)

(F)

CONTINUED ON
SHEET 4

CONTINUED ON
SHEET 4

E7725

Family Tree − Electronic Engine Control (EEC) Ref. Catalog Sequence No. 73−22−34. Fig.
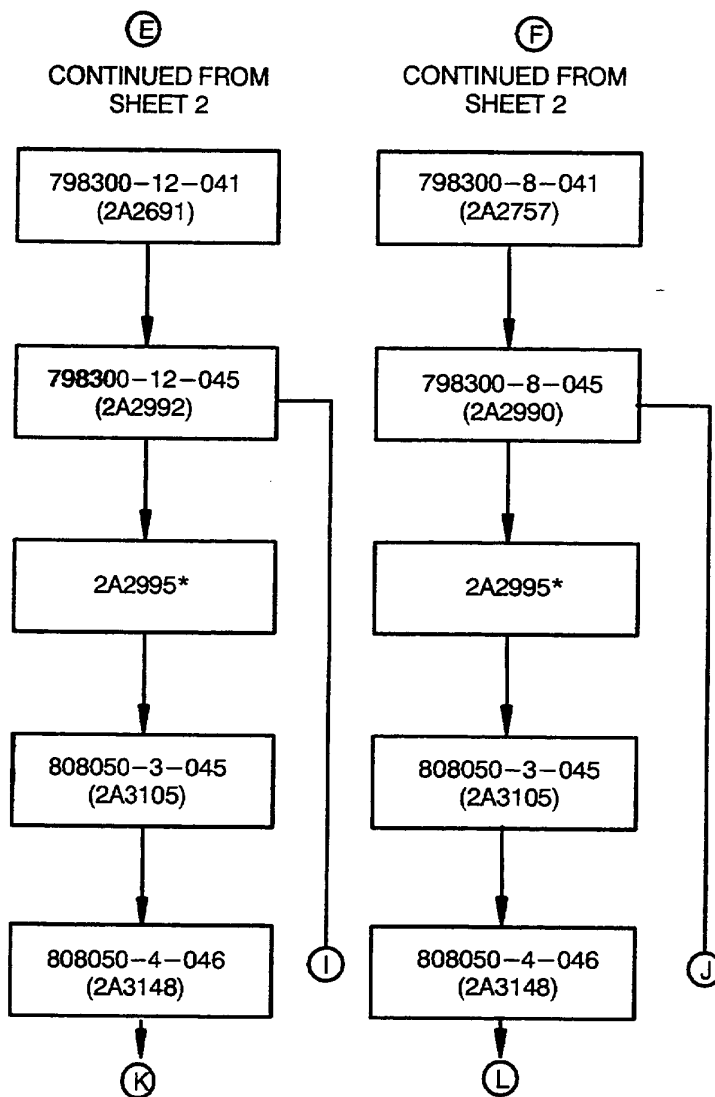01 Item 280
Fig.3 (Sheet 2)

V2500−ENG−73−0112

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MODIFICATIONS   PART NUMBER CHANGE

Ⓒ   Ⓓ

CONTINUED FROM   CONTINUED FROM
SHEET 1   SHEET 1

V2500-ENG-73-0037 PROVIDES SCN12A SOFTWARE	798300-14-041 (2A2692)	798300-10-041 (2A2690)
V2500-ENG-73-0044 PROVIDES SCN12B SOFTWARE	798300-14-045 (2A2993)	798300-10-045 (2A2991)
V2500-ENG-70-0336 PROVIDES COMMON HARDWARE FOR THE V2500-A1 AND V2500-A5	2A2995*	2A2995*
V2500-ENG-70-0336 PROVIDES COMMON HARDWARE FOR THE V2500-A1 AND V2500-A5	808050-3-045 (2A3105)	808050-3-045 (2A3105)
V2500-ENG-73-0069 PROVIDES SCN12C/O SOFTWARE FOR THE V2500-A1	808050-4-046 (2A3148) Ⓖ	808050-4-046 (2A3148) Ⓗ
V2500-ENG-73-0082 PROVIDES SCN12D SOFTWARE FOR THE V2500-A1	808050-04-048 (2A3224)	808050-04-048 (2A3224)

*THIS PART IS SHOWN FOR THE RECORD ONLY   Ⓖ AND Ⓗ CONTINUED ON SHEET 5

E7726

Family Tree - Electronic Engine Control (EEC) Ref. Catalog Sequence No. 73-22-34. Fig.
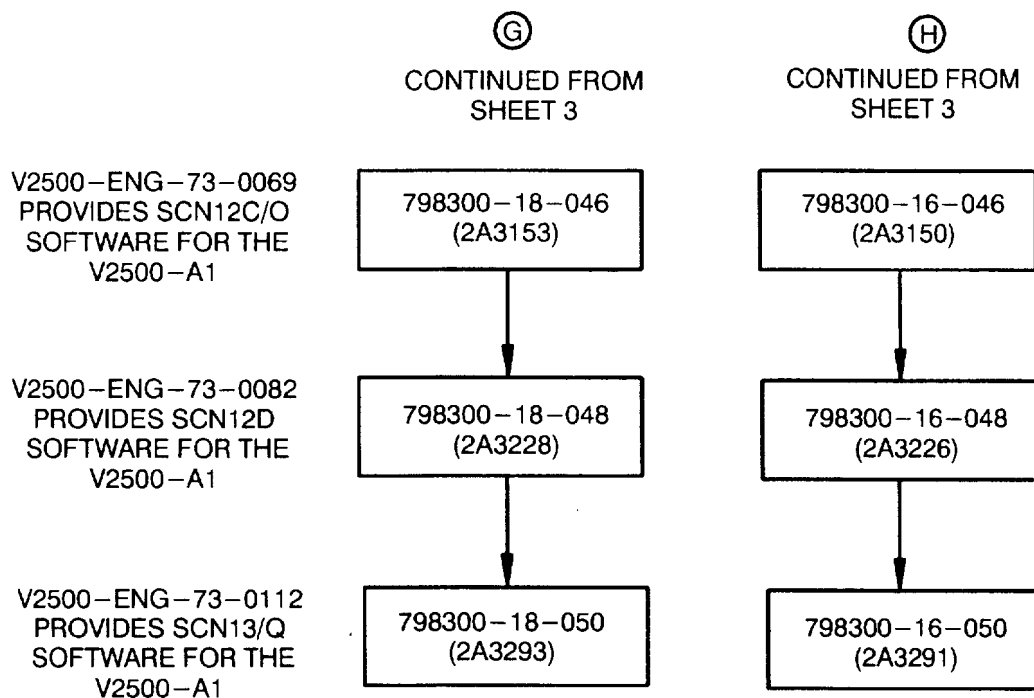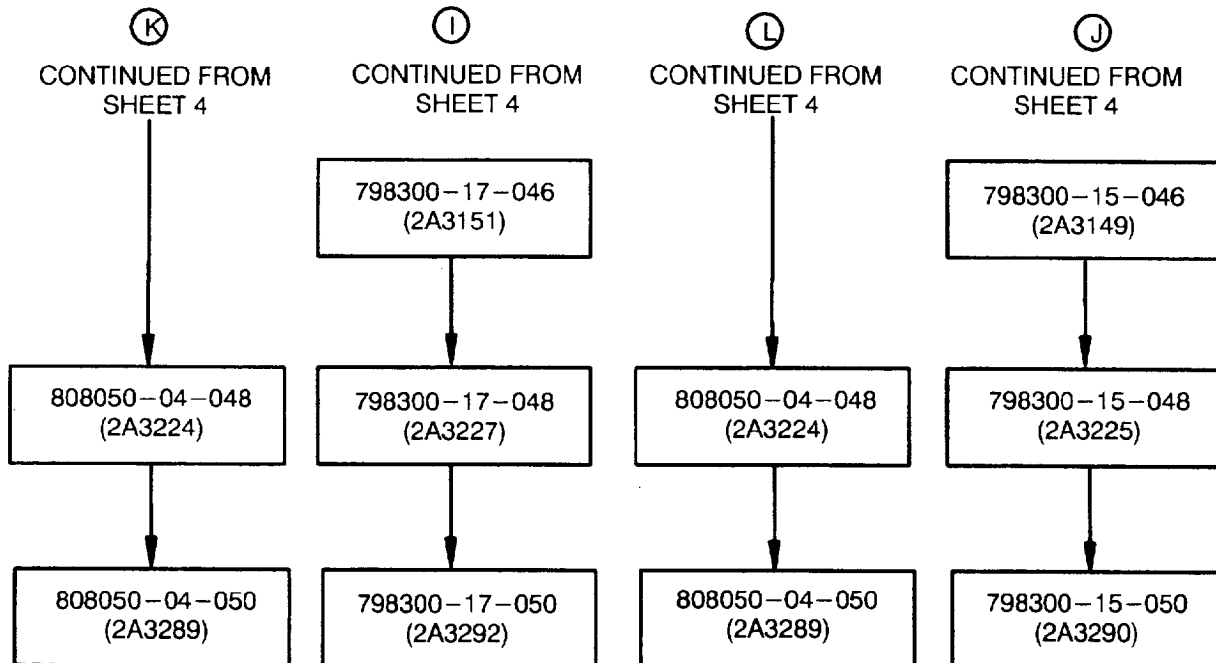01 Item 280
Fig.3 (Sheet 3)

V2500-ENG-73-0112

PART NUMBER CHANGE

Ⓔ
CONTINUED FROM
SHEET 2

```
┌─────────────────┐
│  798300-12-041  │
│    (2A2691)     │
└─────────────────┘
         │
         ▼
┌─────────────────┐
│  798300-12-045  │──────────┐
│    (2A2992)     │          │
└─────────────────┘          │
         │                   │
         ▼                   │
┌─────────────────┐          │
│     2A2995*     │          │
└─────────────────┘          │
         │                   │
         ▼                   │
┌─────────────────┐          │
│  808050-3-045   │          │
│    (2A3105)     │          │
└─────────────────┘          │
         │                   │
         ▼                   ▼
┌─────────────────┐          Ⓘ
│  808050-4-046   │
│    (2A3148)     │
└─────────────────┘
         │
         ▼
         Ⓚ
```

Ⓕ
CONTINUED FROM
SHEET 2

```
┌─────────────────┐
│  798300-8-041   │
│    (2A2757)     │
└─────────────────┘
         │
         ▼
┌─────────────────┐
│  798300-8-045   │──────────┐
│    (2A2990)     │          │
└─────────────────┘          │
         │                   │
         ▼                   │
┌─────────────────┐          │
│     2A2995*     │          │
└─────────────────┘          │
         │                   │
         ▼                   │
┌─────────────────┐          │
│  808050-3-045   │          │
│    (2A3105)     │          │
└─────────────────┘          │
         │                   │
         ▼                   ▼
┌─────────────────┐          Ⓙ
│  808050-4-046   │
│    (2A3148)     │
└─────────────────┘
         │
         ▼
         Ⓛ
```

Ⓘ Ⓙ Ⓚ AND Ⓛ CONTINUED ON SHEET 6

*THIS PART IS SHOWN FOR THE RECORD ONLY

E7727

Family Tree - Electronic Engine Control (EEC) Ref. Catalog Sequence No. 73-22-34. Fig.
01 Item 280
Fig.3 (Sheet 4)

V2500-ENG-73-0112

Printed in Great Britain

MODIFICATIONS   PART NUMBER CHANGE

Ⓖ   Ⓗ

CONTINUED FROM   CONTINUED FROM
SHEET 3   SHEET 3

V2500-ENG-73-0069
PROVIDES SCN12C/O
SOFTWARE FOR THE
V2500-A1

| 798300-18-046 | 798300-16-046 |
| (2A3153) | (2A3150) |

V2500-ENG-73-0082
PROVIDES SCN12D
SOFTWARE FOR THE
V2500-A1

| 798300-18-048 | 798300-16-048 |
| (2A3228) | (2A3226) |

V2500-ENG-73-0112
PROVIDES SCN13/Q
SOFTWARE FOR THE
V2500-A1

| 798300-18-050 | 798300-16-050 |
| (2A3293) | (2A3291) |

de000e7844

Family Tree – Electronic Engine Control (EEC) Ref. Catalog Sequence No. 73-22-34. Fig.
01 Item 280
Fig.3 (Sheet 5)

V2500-ENG-73-0112

Printed in Great Britain

PART NUMBER CHANGE

Ⓚ
CONTINUED FROM
SHEET 4

Ⓘ
CONTINUED FROM
SHEET 4

Ⓛ
CONTINUED FROM
SHEET 4

Ⓙ
CONTINUED FROM
SHEET 4

798300-17-046 (2A3151)		798300-15-046 (2A3149)

808050-04-048 (2A3224)	798300-17-048 (2A3227)	808050-04-048 (2A3224)	798300-15-048 (2A3225)

808050-04-050 (2A3289)	798300-17-050 (2A3292)	808050-04-050 (2A3289)	798300-15-050 (2A3290)

de000e7845

Family Tree - Electronic Engine Control (EEC) Ref. Catalog Sequence No. 73-22-34. Fig. 01 Item 280
Fig.3 (Sheet 6)

V2500-ENG-73-0112

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SERVICE BULLETIN

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ENGINE FUEL AND CONTROL - EEC150-20 - ELECTRONIC ENGINE CONTROL - INCORPORATION OF NEW SOFTWARE: A1 SCN13

1. Planning Information

A. Effectivity

<u>Hamilton Standard EEC150-20 Electronic Engine Controls</u>

808050-4-XXX

NOTE: Following incorporation of this Service Bulletin, the EEC150-20 can be installed on Airbus A320 aircraft that use the IAE V2500-A1 engine.
XXX - Identifies all available software configurations.

B. Reason

The purpose of this Service Bulletin is to allow the V2500-A1 operators to install new software in the EEC150-20.

(1) Problem

(a) <u>IDG OIL CONTROLLING TEMPERATURE LIMIT</u>

Durability of the airframe supplied IDG needs to be improved.

(b) <u>AIR MODULATING VALVE CYCLING</u>

Unnecessary cycling of the Air Modulating Valve can occur following Heat Management System mode changes.

(c) <u>NUISANCE FLIP MODE FAULT</u>

A nuisance Flip Mode fault, "HMS - IDG OVTMP W/RECIRC@", can be erroneously set due to an external EEC reset.

(d) <u>AUTOSTART IMPACT FOLLOWING DRY CRANKING</u>

An autostart which is initiated following a manual dry crank, without resetting or depowering the EEC, can result in ignition and fuel being commanded "ON" prematurely during the subsequent autostart.

(e) <u>NUISANCE LOW STARTER AIR PRESSURE FAULT</u>

A nuisance "ENG 1 (2) START FAULT, LO START AIR PRESS" fault can be set following a manual DRY CRANK that exceeds 50 seconds.

(f) STARTER VALVE FEEDBACK FAULT ACCOMMODATION

Current EEC autostart logic does not optimally accommodate a local failure of the Starter Air Valve feedback.

(g) AUTOSTART CRANK LOGIC REFINEMENT

Ground autostarts with 50 second dry crank incorporation may, in some conditions, result in an abnormal command of fuel and ignition which can lead to an unsuccessful autostart. Manual starts are not affected.

(2) Cause

(a) IDG OIL CONTROLLING TEMPERATURE LIMIT

To try and improve the IDG reliability, the typical IDG oil temperature is being moved from the upper part of the specification range to the middle.

(b) AIR MODULATING VALVE CYCLING

When the Heat Management System transitions from a non-recirculation mode to a recirculation mode, the Fuel-Back-To-Tank valve is commanded open and the controlling temperature limits are set to lower values. However, since the additional cooling effect of returning fuel to tank does not take effect immediately, the Air Modulating Valve can also be commanded open to provide additional cooling in attempting to achieve the lower limits.

(c) NUISANCE FLIP MODE FAULT

Current EEC logic allows the setting of this fault immediately after an EEC reset if the conditions for setting it exist at the time of the reset, even if those conditions have not existed for the required period of time.

(d) AUTOSTART IMPACT FOLLOWING DRY CRANKING

The ignition and fuel pressurization timer can get set and latched during a manual dry crank which exceeds 50 seconds. This will result in ignition and fuel being commanded "ON" at the initiation of the subsequent autostart if the timer is not cleared by resetting or depowering the EEC.

(e) NUISANCE LOW STARTER AIR PRESSURE FAULT

The Hung Start Flag can get set and latched during a manual dry crank which exceeds 50 seconds. Once the flag is latched, a nuisance fault is set when the crank is terminated and N2 drops below 10%.

(f) STARTER VALVE FEEDBACK FAULT ACCOMMODATION

The accommodation of a local Starter Air Valve feedback failure could be improved.

(g) <u>AUTOSTART CRANK LOGIC REFINEMENT</u>

Maximum motoring speeds achieved during V2500-A5 ground starts on newer A321/A320/A319 aircraft are higher than anticipated under low altitude, cold temperature conditions. This higher motoring speed can result in the current autostart logic allowing fuel pressurization with an attendant delayed ignition command.

(3) Solution

(a) <u>IDG OIL CONTROLLING TEMPERATURE LIMIT</u>

Though specific design enhancements are being pursued to the IDG itself, changes have been incorporated to the EEC Heat Management logic that will reduce the typical controlling limit for the IDG Oil Temperature from 100 C to 85 C when Fuel-Back-To-Tank is allowed. The mode change temperature limit of 100 C, as well as the controlling limits in mode where no when Fuel-Back-To-Tank is allowed, remain unchanged.

(b) <u>AIR MODULATING VALVE CYCLING</u>

Changes have been incorporated in the EEC Heat Management logic that will close the Air Modulating Valve for 2 minutes following a change from a non-recirculation mode to a recirculation mode. This gives the Back-To-Tank valve a chance to open and reduce the Heat Management System fluid temperatures to the lower limits applicable in recirculation modes before utilizing the Air Modulating Valve, thus avoiding unnecessary cycling of the Air Modulating Valve and the potential for a performance impact.

(c) <u>NUISANCE FLIP MODE FAULT</u>

Modify the EEC logic so that an EEC reset will not set the associated Flip Mode fault unless the conditions have been satisfied for the required period of time.

(d) <u>AUTOSTART IMPACT FOLLOWING DRY CRANKING</u>

Modify the EEC logic to accommodate the potential lack of an EEC reset by clearing the ignition and fuel pressurization timer as necessary for all start modes.

(e) <u>NUISANCE LOW STARTER AIR PRESSURE FAULT</u>

Modify the EEC logic to accommodate the potential lack of an EEC reset at the conclusion of a dry crank by clearing the Hung Start Flag as necessary for all start modes.

(f) <u>STARTER VALVE FEEDBACK FAULT ACCOMMODATION</u>

Modify the EEC autostart logic to utilize the starter air valve command and disable the feedback in the event of a detected starter air valve feedback disagreement between channels.

(g) <u>AUTOSTART CRANK LOGIC REFINEMENT</u>

As a precaution, increase the V2500-A1 ground autostart ignition/fuel pressurization N2 speed trip to a level which can not be achieved under any potential ambient conditions. This insures that ignition/fuel pressurization will always be commanded by the ignition speed timer as originally intended.

C. Description

You do not open the EEC150-20 to install the released software. The EEC150-20 is reprogrammed with Airbus (A1)/SCN13software and reidentified with the new part number. A functional test of the EEC150-20 is not required.

D. Compliance

Category 4 - Accomplish on a planned basis when an installed EEC150-20 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 are given in Paragraphs 2 and 3 of this service bulletin. They obey the applicable Federal Aviation Regulations and are FAA-approved for the EEC150-20 Electronic Engine Control.

F. Manpower

Approximately 1 man-hour is necessary to do these service bulletin procedures.

G. Material - Cost and Availability

(1) IAE funds this program. The hard copy, no-charge purchase order to perform this Service Bulletin must refer to the HS Service Bulletin number EEC150-20-73-18 and the IAE Service Bulletin Number V2500-ENG-73-0112:

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

(b) Pratt & Whitney
Overhaul and Repair Center - Europe (PWORCE)
Maastricht Airport
PO Box 269
6190 AG BEEK
Maastricht Airport
The Netherlands

(2) You can do these Service Bulletins at your own location at your own cost and expense using the "Alternate Reprogramming Method" described in the accomplishment instructions. If you d these Service Bulletin procedures with the "Alternate Reprogramming Method" you need to obtain the software diskette used to reprogram the EEC. Refer to Material Information to order the Reprogramming Diskette.

(3) One Reprogramming Diskette can be used to modify approximately 40 EEC150-20 units. The software loader utility used to reprogram the EEC creates a log file on the Reprogramming Diskette.

(4) The new parts required to accomplish this Service Bulletin are listed in Section 2, Material Information. These parts are available at no cost to the operator. Lead times can be obtained from Hamilton Standard by issuing a hard copy, no-charge purchase order for the quantity requested. Purchase orders for parts must refer to HS Service Bulletin number EEC150-20-73-18, the IAE Service Bulletin number V2500-ENG-73-0112 and be addressed to:

Hamilton Standard
A United Technologies Company
Attn: Manager Commercial Spares
Mail Stop: 2MGGHH10
One Hamilton Road
Windsor Locks, CT. 06096-1010
USA
Facsimile: 860-654-6905

H. Tooling

NOTE: The following tools and equipment are necessary to perform the "Alternate Reprogramming Method" procedures.

(1) IBM compatible computer, with the following minimum requirements:

   (a) 80286 processor

   (b) 512 Kbytes RAM

   (c) 1.44 Mbyte, 3.5" floppy disk drive

   (d) Dual channel RS-422 asynchronous communication board (HS recommends Model DS202 by Qua Tech Incorporated) with the following set-up:
   Channel A EEC - COM3 (base address 2E8, IRQ level 5)
   Channel B EEC - COM3 (base address 3E8, IRQ level 5

   (e) MSDOS operating system (version 3.0 or higher)

NOTE: THE IBM COMPUTER DATE/TIME MUST BE CURRENT PRIOR TO PERFORMING THIS PROCEDURE.

(2) Hamilton Standard diskette called out in the Service Bulletin which is being incorporated. This diskette contains the EEC150-20 application code, trims, memory clear utilities and software loader.

(3) EEC150-20 communications cables as defined in Table 1.

    (4) 28VDC, 5.0 +/- 0.5A power supply and associated power cables as defined in Table 2.

I. **Weight and Balance**

No affect.

J. **Electrical Load Data**

No affect.

K. **References**

E9137 Standard Electronic Practices Manual
Component Maintenance Manual CMM 73-28-01
IAE Service Bulletin Number V2500-ENG-73-0112
Hamilton Standard Service Bulletin EEC150-20-73-16
Hamilton Standard Service Bulletin EEC150-20-73-18

L. **Other Publications Affected**

Illustrated Parts Catalog 73-28-01

M. **Additional Data**

None

2. Material Information

A. This Service Bulletin change uses the parts in the list for each EEC150-20 that incorporates this Service Bulletin.

B. Any parts that usually are discarded when you disassemble the EEC150-20 are not in the list.

C. In the list of parts for this change, MSQ is the Minimum Sales Quantity. The parts that have an entry in this area of the list are supplied only in this quantity, or a multiple of this quantity.

D. In the list of parts for this change, the Key Word is a one-word name for the part.

E. In the list of parts for this change, the Instruction Codes tell you what to do with the parts. A short list under the list of parts tells you about the instruction codes that are used in the list.

F. New Parts Required

Table 1. New Parts

New PN	Qty	MSQ	Estimated Price	Key Word	PN Before this SB	Instruction Code
751333-1	1	20	1.80	Plate	751333-1	A

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Table 1. New Parts

New PN	Qty	MSQ	Estimated Price	Key Word	PN Before this SB	Instruction Code
819191-13	1	1	0.00	Diskette, Reprogramming	819191-6	A, B, C
820378-7	1	1	0.00	Diskette, S-record	820378-6	A, B, C

Instruction Code A: The service bulletin change adds the New PN to the EEC150-20.

Instruction Code B: One reprogramming diskette can modify approximately 40 EEC150-20 units. You should order the proper quantity of diskettes to modify your fleet of EEC150-20 units.

Instruction Code C: The reprogramming diskette is provided to you at no charge by IAE. See your local IAE service representative for ordering information.

3. Accomplishment Instructions

CAUTION: REFER TO THE E9137 STANDARD ELECTRONIC PRACTICES MANUAL FOR SPECIAL PRECAUTIONS. ELECTROSTATIC DISCHARGE (ESD) CAN CAUSE DAMAGE TO THE ELECTRONIC COMPONENTS IN THE EEC150-20.

NOTE: The Alternate Reprogramming Method procedures may be used whenever the EEC electrical connectors are disconnected from the aircraft. If the EEC is reprogrammed using 28 VDC power from the aircraft, refer to the engine service bulletin.

NOTE: Refer to the E9137 Standard Electronic Practices Manual to do the procedure unless otherwise noted.

A. If you use the Alternate Reprogramming Method, skip to step 3.B. Otherwise refer to CMM 73-28-01, section 200 (ATLAS) to reprogram the EEC150-20. Use the program and version number shown below:

Replace Y805881-082 with Y805881-084
Replace Y805882-082 with Y805882-084
Replace Y806086-082 with Y806086-084

If you do not use the Alternate Reprogramming Method of programming, skip to step 3.AO.

B. If you use the Alternate Reprogramming Method, verify that the model number on the identification plate of the unit is EEC150-20.

C. Record the current unit part number and the unit serial number from the nameplate. You will enter this information into the computer.

D. Plug in all necessary equipment, but do not turn the equipment on.

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E. Connect the programming harness connector marked P1 to the EEC connector marked J1. Ensure that the red engagement stripe on the EEC connector J1 is fully covered. Connections are given in Table 2.

F. Connect the programming harness connector marked P7 (Table 2) to the EEC connector marked J7. Ensure the red engagement stripe on the EEC connector J7 is fully covered. If the computer and power supply connections to the cables are permanent, skip to step 3.J.

G. Connect the programming harness connector marked CH A UART to the IBM compatible computer UART board connectors for the channel A RS-422 port (COM3). Ensure that these connectors are properly mated.

H. Connect the programming harness connector marked CH B UART to the IBM compatible computer UART board connectors for the channel A RS-422 port (COM4). Ensure that these connectors are properly mated.

NOTE: UART connections can differ for different IBM compatible computers.

NOTE: It is important to verify that the connectors are correctly installed for correct loader operation. HS recommends labeling the RS-422 COM3 port as CH A UART and COM4 port as CH B UART on the computer to reduce errors.

I. Connect the opposite end of P3 and P9 (Table 3) cables to the 28 VDC supply.

J. Connect the power supply harness connector marked P3 to the EEC connector marked J3. Ensure that the red engagement stripes on EEC connector J3 are fully covered.

K. Connect the power supply harness connector marked P9 to the EEC connector marked J9. Ensure that the red engagement stripes on EEC connector J9 are fully covered.

L. Locate the BOOT/BITE switches for Channel A and Channel B. Set the BOOT/BITE switches ON (closed).

M. Turn on the 28 VDC power supply to the EEC.

N. Turn on power to the IBM compatible computer.

O. Wait for the MSDOS prompt C:\> to appear on the IBM compatible computer.

NOTE: The procedure assumes the floppy disk is in drive A. If the floppy drive in your computer has another designation, substitute that designation in the procedure.

P. Obtain the Hamilton Standard reprogramming diskette PN 820375-7. Ensure that the write protection tab of the diskette is covering the "hole."

Q. Insert the diskette into the floppy drive designated A on the IBM compatible computer. The display shows C:\>.

R. Type **a:**, then press the RETURN key (ENTER key on some computers). The display shows A:\>.

S. Type **LDR150**, then press RETURN. This starts the UART programming utility. Several messages appear, including the program identification, version number, time, and the UTC/P&W document property rights notice.

> **NOTE:** If there is a configuration error on the diskette, the program displays the appropriate error message and aborts the programming process. See Table 4 for a summary of error code descriptions and troubleshooting suggestions.

T. The UART programming utility LDR150 displays the following message: Enter operator's name performing download:[]>. The field between the brackets is always empty the first time the program is executed. Subsequent execution displays the last name entered.

   (1) If this is not the first execution of the program, and the displayed name is unchanged, press RETURN and go to step V.

   (2) If this is the first program execution (no name is displayed), or if the operator's name changes, enter the new name and press RETURN.

U. The LDR150 program displays this message:

   WARNING - EEC Fault Memory Will Be Cleared By This Program. If an EEC Fault Dump is Required Prior to Programming, Enter Q to Quit or C to Continue [Q/C]:

   (1) If a fault dump is already accomplished, or is not required, type C, then press RETURN, and go to step V.

   (2) If a fault dump is required, or if you want to stop the programming procedure, type Q, then press RETURN. If the programming procedure is stopped, turn off 28 VDC power to the EEC and go to step 3.AK.

V. The LDR150 program displays this message: ENTER THE 9 CHARACTER EEC SERIAL NUMBER: [xxxx-xxxx].

W. Enter the nine character EEC serial number, from the nameplate, and press RETURN.

> **NOTE:** For steps 3.X and Y, precede the middle part number digit with a zero. For example, enter 808050-4-026 as 808050-04-026.

X. The LDR150 program display shows: ENTER THE 13 CHARACTER CURRENT EEC HW PART NO.: [XXXXXX-XX-XXX]. Enter the part number and press RETURN.

Y. The LDR150 program display shows: ENTER THE 13 CHARACTER SB EEC HW PART NO.: [XXXXXX-XX-XXX]. Enter the new part number given in this service bulletin and press RETURN.

Z. The LDR150 program display shows: ENTER TRIM CHECKSUM VALUE FOR XXXXXX.XXX:>. The XXXXXX.XXX designation is the name of the Trim File being loaded into the EEC. Enter the trim checksum value 27628 and press RETURN.

AA. The LDR150 program display shows: DO YOU WISH TO ENTER THE ABOVE ENTRIES [Y/N/Q]:

   (1) To proceed with the programming process, type N, then press RETURN. Go to step 3. AB.

    (2) To correct any errors in the data entered, type Y, then press RETURN. Go to step 3. T.

    (3) To quit the programming process, type Q, then press RETURN. Turn off the 28 VDC power to the EEC and continue with step 3. AL.

AB. At this point, the screen is initialized to display the activity of the programming process. Status messages scroll across the screen. If an error occurs, see Table 4 for a summary of error code descriptions and troubleshooting suggestions.

AC. The LDR150 program display shows:

Turn off the BITE and BOOT switches to the EEC
                  then
Turn Off POWER to the EEC and wait at least 5 seconds
                  then
Turn On Power to the EEC

Press the RETURN Key When Ready to Continue

    (1) Locate the BOOT/BITE switches on your test equipment, and set them to OFF (open).

AD. Switch off the 28 VDC power to the EEC wait 5 seconds, then switch power on.

AE. On the IBM compatible computer, press RETURN.

AF. Wait until the LDR150 program display shows:

Turn ON the BITE and BOOT switches to the EEC
                  then
Turn Off POWER to the EEC and wait at least 5 seconds
                  then
...Press the RETURN Key When Ready to Continue

    (1) Locate the BOOT/BITE switches on your test equipment, and set the BOOT/BITE switches to OFF (open).

AG. Switch off the 28 VDC power supply to the EEC, wait 5 seconds, then switch power on.

AH. On the IBM compatible computer, press RETURN.

AI. Wait until the LDR150 display shows:

Turn Off POWER to the EEC
... Press the RETURN Key When Ready to Continue

    (1) Switch off the 28 VDC power supply to the EEC.

AJ. On the IBM compatible computer, press the RETURN key.

AK. The LDR150 program displays the status of the programming process. Record the name of the log file for hard copy report of the process.

(1) If programming is successful, the following message is displayed:

EEC REPROGRAMMING SUCCESSFULLY COMPLETED
Record the log file name VLXXXX.LOG for later printout

If desired, record the log file name VLXXXX.LOG for later printout.

(2) If the programming is unsuccessful, the following message is displayed:

DOWNLOAD PROCESS ABORTED - ERROR CODE X
Record the log file name VLXXXX.LOG for later printout.

If desired, record the log file name VLXXXX.LOG for later printout.

The X refers to the type of error that caused the process to abort. Table 4 describes the error codes and action to be taken.

AL. Press RETURN to stop the program and return to the MSDOS prompt: A:\>.

AM. If a printer is available, a paper copy of the log file can be generated by the IBM computer:

NOTE: If no printer is available, you can move the diskette to a system with a printer and do the next three steps.

At the MSDOS prompt, type PRINT   VLXXXX.LOG.
(1) Press RETURN.

(2) Do not proceed to the next step until the file is printed.

AN. Disconnect the EEC electrical connectors from the J1, J3, J7, and J9 connectors.

AO. Put the information shown below on a new identification plate.

NOTE: EEC150-20 assemblies reprogrammed at one of the addresses given in 1.G.1 are returned with their assemblies reidentified.

NOTE: If HS Service Bulletin EEC150-20-73-16 (reference K.) is incorporated, ignore items (1) and (2) and go to (3).

(1) Put the new end assembly part number in the PART NO. area of the of the new identification plate.

PART NUMBER BEFORE THIS SERVICE BULLETIN	PART NUMBER AFTER THIS SERVICE BULLETIN
808050-4-YYY	808050-4-050

(2) Put the new IAE part number in the CI NO. area of the new identification plate.

EEC150-20 END ASSEMBLY	NEW IAE PART NUMBER
808050-4-050	2A3289

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(3) Put the date and last three digits of the new part number (3.AO. (1)) on the identification plate per HS Service Bulletin EEC150-20-73-16, using a ballpoint pen or equivalent tool.

Table 2. Communication Connections

EEC SIGNAL NAME	EEC CONNECTOR	QUA-TECH CONNECTOR	QUA-TECH SIGNAL NAME
UART IN LINE B CHA	P1-b	PA-2	TXD+
UART IN LINE A CHA	P1-H	PA-7	TXD-
UART OUT LINE A CHA	P1-c	PA-4	RXD+
UART OUT LINE B CHA	P1-J	PA-8	RXD-
BOOT DISC CHA	P1-D	N/A	N/A
BITE DISC CHA	P1-Z	N/A	N/A
BOOT/BITE RTN CHA	P1-m	N/A	N/A
UART IN LINE B CHB	P7-b	PB-2	TXD+
UART IN LINE A CHB	P7-H	PB-7	TXD-
UART OUT LINE A CHB	P7-c	PB-4	RXD+
UART OUT LINE B CHB	P7-J	PB-8	RXD-
BOOT DISC CHB	P7-D	N/A	N/A
BITE DISC CHB	P7-Z	N/A	N/A
BOOT/BITE RTN CHB	P7-m	N/A	N/A

Table 3. Power Supply Connections

EEC SIGNAL NAME	EEC CONNECTOR	POWER SUPPLY
GTP CHA	P3-m	+28 VDC
GTP RTN CHA	P3-r	+28 VDC RTN

Table 3. Power Supply Connections

EEC SIGNAL NAME	EEC CONNECTOR	POWER SUPPLY
GTP CHB	P9-m	+28 VDC
GTP RTN CHB	P9-r	+28 VDC RTN

Table 4. Error Code Definitions

ERROR CODE	ERROR TYPE	ACTION
E1	EEC VERIFY ERROR - Data verify error in EEC - Compare failed or location could not be programmed.	Try procedure three times; if still bad return EEC unit.
E2	COMMUNICATION ERROR - Communication problem between EEC and IBM compatible computer.	Check BITE, cables, power supply, UART board, and EEC. Retry three times.
E3	CONFIGURATION ERROR - Configuration data comparison failed. (Possible hardware PN mismatch, EEC compatibility mismatch, trim checksum mismatch)	Operator data entered incorrectly or incorrect data on existing nameplate. Check data - retry with the correct information.
E4	SYSTEM PROBLEM - Poor operating environment, bad disk, or program aborted by the operator	If the process was not terminated by the operator, check that the disk is not write protected, or replace disk and retry.

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