PRATT & WHITNEY CANADA

SERVICE BULLETIN

P&WC S.B. No. 41020R2
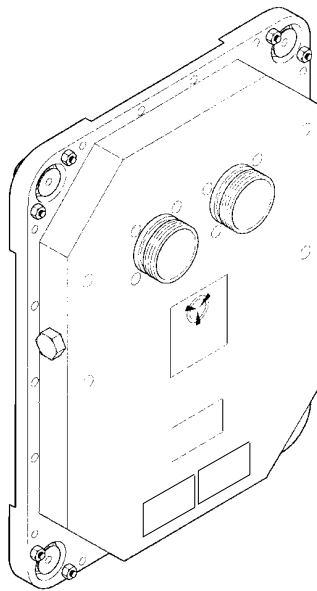
BULLETIN INDEX LOCATOR
73-20-10

TURBOSHAFT ENGINE
ELECTRONIC ENGINE CONTROL - REPROGRAMMING/REPLACEMENT OF

MODEL APPLICATION

PT6C-67C

Compliance: CATEGORY 8

Summary: To meet customer requirements, introduce new Engine Electronic Control (EEC) software with improved training logic, start logic and category "A" features.

Sep 14/2005
Revision No. 2: Jan 09/2007

PT6C-72-41020
Cover Sheet

Pratt & Whitney Canada
A United Technologies Company

09 January 2007

P&WC S.B. No. 41020R2

REVISION TRANSMITTAL SHEET
TURBOSHAFT ENGINE MODEL PT6C

SUBJECT: Pratt & Whitney Canada Service Bulletin No. PT6C-72-41020, Rev. No. 2, dated Jan 09/2007 (P&WC S.B. No. 41020R2) ELECTRONIC ENGINE CONTROL - REPROGRAMMING/REPLACEMENT OF

Replace your existing copy of this service bulletin with the attached revised bulletin. Destroy the superseded copy.

Please retain this Revision Transmittal Sheet with the revised bulletin.

SUMMARY: This revision is issued to revise the accomplishment instructions to include a DCU download and reset procedure when the EEC is replaced.

EFFECT OF REVISION ON PRIOR ACCOMPLISHMENT:

None.

NOTE: A black bar in the left margin indicates a change in that line of text or figure.

REVISION HISTORY:

Original Issue: Sep 14/2005
Revision No. 1: Nov 15/2005
Revision No. 2: Jan 09/2007

TURBOSHAFT ENGINE
ELECTRONIC ENGINE CONTROL - REPROGRAMMING/REPLACEMENT OF

1. Planning Information

   A. Effectivity

   PT6C-67C Engines which are before and include Serial No. PCE-KB0121.

   NOTE: The above effectivity list does not identify engines that have been converted
   from one engine model to another via an engine conversion service bulletin. To
   clarify the effectivity of converted engines, refer to the original engine
   effectivity above. For the parts embodied during the engine conversion, refer to
   conversion service bulletin.

   B. Concurrent Requirements

   This service bulletin must be incorporated on both engines of the same aircraft.

   C. Reason

   (1) Problem

   The current production EEC software does not meet the latest customer
   requirements.

   (2) Cause

   Based on customer feedback, the current production EEC software does not meet
   customer requirements for category "A" operation, training logic and start logic.

   (3) Solution

   Introduce a new EEC with redesigned software. The new EEC software provides
   the following enhancements:

   • Category "A" features; to improve aircraft cat."A" operation.

   • Training logic; to better simulate engine "one engine inoperative" response, by
   twin engine training.

   • Start logic; to reduce engine start temperatures. Also, the opportunity is taken to
   improve field troubleshooting logic.

   D. Description

   Replace the EEC with a new one or reprogram EEC on airframe.

   E. Compliance

   CATEGORY 8 - This service bulletin is optional and can be done at the discretion of
   the operator.

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1. Planning Information (Cont'd)

    F. Approval

        Transport Canada has reviewed and approved the technical contents of this Service Bulletin.

    G. Weight and Balance

        None.

    H. Electrical Load Data

        Not changed.

    I. Software Accomplishment Summary

        HSER 20983-003

    J. References

        Applicable PT6C Technical Manuals
        Hamilton Sundstrand CSB EEC67-1-73-3
        Hamilton Sundstrand CSB EEC67-1-73-4

    K. Publications Affected

        Applicable PT6C Technical Manuals
        Component Maintenance Manual P/N Hamilton Sundstrand 73-22-06

    L. Interchangeability and Intermixability of Parts

        Interchangeability - Refer to Para. 2.D.

        Intermixability - Not changed.

2. Material Information

    A. Industry Support Information

        Not applicable.

    B. Material - Cost and Availability

        You can get the procurable parts listed in Para. 2.D. from any Pratt & Whitney Canada Parts Distribution Center.

        The estimated total cost of new parts needed to replace old parts is $Quote (US, 2005).

2. Material Information (Cont'd)

    The new parts are available.

    C. Manpower

    Once you have access to the part, an estimate of 1.0 man-hours is required to include this service bulletin at maintenance.

    No more man-hours are necessary to include this service bulletin at overhaul.

    D. Material Necessary for Each Engine

    The quantity of materials listed in this section is on a per engine basis.

New P/N	Keyword	Old P/N	Qty	Est. Unit List Price ($US, 2005)	Instructions Disposition
	Engine Control, Electronic Supplier Code (73030) P&WC P/N 3059071-02	822835-5-102	1		(A)(B)(C)
822835-5-105	Engine Control, Electronic Supplier Code (73030) P&WC P/N 3059071-05		1	Quote	(A)(B)

Consumable Materials :

(Field and Original Equipment Manufacturer (OEM) aircrafts EEC reprogramming only)

69253C4	EEC Identification Plate	AR		(D)
822815-2	EEC Software Identification Plate	AR		(E)
	Isopropyl Alcohol	AR		(F)
	Lint-Free Cloth	AR		(F)
	Hard Rubber Roller or Wooden Dowel	AR		(F)
	Red, Fine-Ballpoint Pen (Permanent-Indelible Ink Type)	1		(F)
	Black or Blue, Ballpoint Pen (Permanent-Indelible Ink Type)	1		(F)

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New P/N	Keyword	Old P/N	Qty	Est. Unit List Price ($US, 2005)	Instructions Disposition
	Small Ruler or Straight Edged Item		1		(F)

(A) ONE WAY INTERCHANGEABLE - (ATA 200 Explanation Code 01):
The old part can only replace the old part; the new part can replace the old and the new part.

(B) To get the new part it is possible to reprogram to the old part, or you can get the new part from any Pratt & Whitney Canada Distribution Center.

(C) Return the old part(s) to:

Hamilton Sundstrand
A United Technologies Company
Dock W
One Hamilton Road
Windsor Locks CT
USA   06096-1010

(D) Part required for EEC reprogrammed at OEM and can be procured at Hamilton Sundstrand Ref. CMM 822835 73-22-06.

(E) Part required for field aircraft EEC reprogramming and can be procured at Hamilton Sundstrand Ref. CMM 822835 73-22-06.

(F) Commercially Available.

E.   Reidentified Parts

The following list of parts can be reworked:

OLD P/N	NEW P/N
822835-5-102	822835-5-105
(PWC P/N 3059071-02)	(PWC P/N 3059071-05)

NOTE: ''Reworked'' consist of reprogramming the EEC.

F.   Tooling - Price and Availability

Tool No.	Nomenclature	Est. Price ($US, 2004)	Delivery
PWC64570 Rev A	GBS - Harness		Quote

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Tool No.	Nomenclature	Est. Price ($US, 2004)	Delivery
	OR		
PWC64285 Rev G	EEC/T - Harness	Quote	
PWC64412	Switch Box	Quote	
PWC64656	Adaptor Cable RS232 (DB-25 to DE-9)	Quote	
PWC90035	Converter RS 422 to RS232	Quote	
1004332-3	Hamilton Sundstrand Programming CD-ROM	Quote	
Model CF-71 Toughbook	Panasonic Laptop Computer	Quote	
	OR		
Model CF-72 Toughbook	Panasonic Laptop Computer	Quote	
3058089	GBS PT6C-67C Transfer Module Software	Quote	

NOTE: The tools listed above are required to do the EEC reprogramming for field and OEM aircraft.

3. Accomplishment Instructions

A. Remove the parts listed under old P/N in Para. 2.D., Material Information, per the applicable aircraft maintenance or overhaul manual instructions.

NOTE: It is possible to program the EEC with the new software version while it is still installed on the aircraft. Contact your local P&WC representative for more information and refer to Para. 4.

B. Install the new or modified EEC listed under New P/N in Para. 2.D., Material Information, per the applicable maintenance or overhaul manual instructions.

C. For the installation of a new EEC, carry out DCU download and re-set procedure in accordance with paragraph 4.C below.

NOTE: This procedure is to be done under the direct supervision of a P&WC Representative using P&WC supplied tooling as defined in paragraph 2.F. above.

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3. Accomplishment Instructions (Cont'd)

    D. Write accomplishment of P&WC S.B. No. 41020 in the applicable engine module log book.

4. Appendix

    A. The EEC may be reprogrammed under the direct supervision of a P&WC Trained Representative using P&WC supplied tooling as defined in paragraph 2.F. above. This procedure can be accomplished while the EEC's are installed on the aircraft as follows:

        (1) Check for normal indications on the Aircraft Instrumentation Display System per rotorcraft flight manual. If required, isolate and correct the EEC faults indications per the engine maintenance manual.

        (2) Turn the electrical power supply to the EEC to the OFF position.

        (3) Set up the tools and do all connections to the EEC and the laptop as shown (Ref. Fig. 1).

            NOTE: 1. Use the Panasonic laptop, COM1 (RS232) . The port configuration is interrupt to 4, address to 3F8.

            NOTE: 2. The laptop battery should be fully charged if a 110 V outlet electrical supply is not used.

        (4) Apply the power to the Panasonic laptop and proceed as follows when the main menu appears:

            (a) Select the MS-DOS application from the main menu.

            (b) Select to run the EEC reprogramming Item #4 from the selection on the screen.

                NOTE: C:\ prompt should appear.

            (c) Insert the Hamilton Sundstrand CD-ROM P/N 1004332-1 program in the laptop CD-ROM drive.

            (d) At the C:\ prompt, Type: CD\LDRC67C and then press ENTER.

                NOTE: 1. C:\LDRC67C prompt should appear.

                NOTE: 2. The CD-ROM drive of the Panasonic laptop is mapped as the L drive.

4. Appendix (Cont'd)

    (e) At the prompt, Type: HPN67C and then press ENTER to start the hardware identification.

        NOTE: 1. Type the PWC trained representative name when the computer message **Enter the operator's name** will appear, then press ENTER.

        NOTE: 2. The EEC part number entry to be made is the current part number shown on the Hamilton Sundstrand identification plate (822835-5-102).

        NOTE: 3. When it is requested to enter the EEC serial number, you may have to do an additional 0 digit entry at the end to accommodate the program requirement of 9 digits entry (XXXXXXXXX).

    (f) Continue to proceed with the instructions that follow on the screen.

        NOTE: 1. Ignore ″Connect Cables to LRU″.

        NOTE: 2. LRU signifies the EEC.

        NOTE: 3. Switch Box PWC64412 is used to set the BOOT and the COM discretes to ″TEST MODE SETTING″ (Set to ON) or to ″APP. MODE SETTING″ (Set to OFF) as requested on the laptop screen.

        NOTE: 4. The BOOT and the COM discretes may be referred as "TEST" discrete.

    (g) Press ENTER after the script has terminated and has displayed:
Part number update has been completed SUCCESSFULLY.

    (h) Proceed with instructions that follow on the screen:

        1 At the prompt, Type: C:\ and then press ENTER.

        2 At the prompt, Type: CD\LDRC67C and then press ENTER.

    (i) At the prompt, Type: PT6C67C and then press ENTER to start the software download.

    (j) Record the PWC trained representative name when the computer message **Enter the operator's name** appears, then press ENTER.

    (k) Press the Y key when the following warning computer message appears:
**This process will clear the Fault memory in the unit.
Do you wish to proceed?**

4. Appendix (Cont'd)

    (l) Press the Y key when following computer message appears:
    Hamilton Sundstrand Hardware Part#
    822835-5-105.
    Does this list contains the part number that the LRU is being reprogrammed to?

    (m) Continue to proceed with the instructions that follow on the screen.

        NOTE: 1. Ignore ″Connect Cables to LRU″.

        NOTE: 2. LRU signifies the EEC.

        NOTE: 3. Switch Box PWC64412 is used to set the BOOT and the COM discretes to ″TEST MODE SETTING″ (Set to ON) or to ″APP. MODE SETTING″ (Set to OFF) as requested on the laptop screen.

        NOTE: 4. The BOOT and the COM discretes may be referred as ″TEST″ discrete.

        NOTE: 5. The reprogramming starts after you press the Y key.

    (n) Make sure that the information displayed on the laptop screen correspond to EEC that you are reprogramming.

        NOTE: A message with new instructions will appear only after few minutes.

    (o) Continue to proceed with the instructions that appear on the screen.

        NOTE: The software downloading time is approximately 20 minutes.

  (5) Confirm no error present, reprogramming successful.

    NOTE: When the reprogramming is completed the Memory Loader creates a LOG file in the C:\MEMLDR directory. The file is named LOGXXXXX.LOG where XXXXX is a sequential number (i.e. LOG00000; LOG00001; ...). Print latest file and attach it to a Field Service Report.

B. **EEC REIDENTIFICATION PROCEDURE:**
Use the consumable materials listed Para. 2.D., to do the reidentification of the EEC as follows :

  (1) If the EEC is reprogrammed at the **Aircraft Original Equipment Manufacturer (OEM)**, reidentify as follows, otherwise if EEC is reprogrammed in the field, proceed with step (2):

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4. Appendix (Cont'd)

  (a) Make sure that the data stamped (e.g.: EEC Serial Number and New Part Number) on new EEC replacement identification plate received from Hamilton Sundtrand applies to reprogrammed EEC.

  (b) If required, record any data not already printed on the new plate and advise Hamilton Sundtrand representative.

  CAUTION: Do not use sharp tools to remove the old plate .

  CAUTION: Make sure that data (EEC Serial Number and Part Numbers) stamped on new EEC replacement identification plate correspond to EEC which has been reprogrammed.

  (c) Carefully remove the old EEC identification plate.

  (d) Clean the area where the new plate will be attached (Ref. Fig. 2) with isopropyl alcohol and wipe dry with a clean, lint-free cloth. Make sure to fully remove the old adhesive.

  (e) Let the area dry thoroughly.

  (f) Remove the paper from the back of the new EEC identification plate.

  (g) Carefully position above mounting location and put the new plate in position on EEC.

  (h) Use a soft rubber roller or equivalent soft tool to apply pressure on the new plate to contact firmly with the EEC housing. Make sure there are no air bubbles caught between identification plate and EEC housing.

  NOTE: Do not disturb the plate surface for 72 hours while curing.

  (i) Proceed with step E..

 (2) If the EEC is reprogrammed in the **field** proceed as follows (Ref. Fig. 2 and Fig. 3):

 NOTE: Apply enough pressure to the pen to indent into the aluminum surface.

  (a) Use the red pen with the small straight edge to indent a single red line through the customer number located in the CUSTOMER NO. section on the identification plate .

  (b) Locate the old software configuration in the PART NO. section (Ref: 822835-5-102). The software configuration is the last three digits of the part number.

  NOTE: 1. 102 = Old software configuration.

  NOTE: 2. Single center digit 5 = Hardware configuration.

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4. Appendix (Cont'd)

(c) Indent a single red line through the old software configuration 102.

(d) Identify the software configuration on the EEC Software Identification Plate for field aircraft engine as follows:

NOTE: The EEC software identification plate must include the new software configuration 105 and the date of the incorporation of this new configuration.

1 Use the black or the blue pen to write the new software configuration 105 in the first S/W NO. section available.

2 With the same pen, write the date in the adjacent DATE section.

C. **DCU DOWNLOAD AND RESET PROCEDURE:**
Do a DCU download and reset as follows:

NOTE: The New EEC software increases the size of the One Engine Inoperative (OEI), FAULT and EVENT buffers in Data Collection Unit (DCU).

(1) Set up the tools and do all connections to the DCU and the laptop per Maintenance Manual Section 77-40-01.

(2) Reset the power to the Panasonic laptop.

(3) Select the WINDOWS 98 application from the main menu.

(4) Select to run the P&WC GBS TM program from the desktop icon.

(5) Configure the GBS program window by selecting following items from the dropdown lists:

• Engine: PT6C-67C

• DCU Part No.: 3058669-02V.503

• EEC/PMU Part No.: 3059071-02V.503

(6) Select DCU program from the GBS program window.

NOTE: Make sure that the electrical power is supply to the DCU.

(7) Select "DCU OPTIONS" from the DCU window tool bar menu.

(8) Select "Change DCU content" from the DCU OPTIONS Pop Down menu.

NOTE: The DCU summary page will be displayed for review.

4. Appendix (Cont'd)

    (9)   Select "Copy DCU to a File" function from the DCU summary page window to save a DCU file.

         NOTE: 1. Note the file name.

         NOTE: 2. A block range limits menu will display "The start block number is zero "0". The end block number is five hundred forty nine "549". Make sure that these limits are correct then select "OK" and press enter.

    (10)   Select "Print" function from the DCU summary page window to print a hardcopy of the saved DCU summary page if printer is available otherwise, write screen data manually for reference.

    (11)   Review DCU data for any required maintenance events using GBS Lite.

    (12)   Place copy of saved DCU summary file in engine log book.

    (13)   Forward copy of DCU file to your local P&WC field service representative.

    (14)   Do a DCU reset as follows:

        (a)   Select "Init" option or Press F7 from the DCU summary page window.

        (b)   Select "BUFFER RESET" and "OPEN".

           NOTE: This operation will reset the DCU BUFFER and takes approximately 60 seconds to complete.

        (c)   From DCU summary page window verify the "SETLEXPIND" parameter value and proceed as follows:

           1   If "SETLEXPIND" parameter value is "0" no additional action is required and proceed with step (d).

           2   If "SETLEXPIND" parameter value is different of "0" proceed as follows:

              a   Make sure that the appropriate maintenance action task has been done prior to set back the "SETLEXPIND" value to "0" per next steps.

                 NOTE: Contact service engineering representative for further instructions.

              b   Select "Init" option or Press F7 from the DCU summary page window.

              c   Select "SETLEXPIND RESET" and "OPEN".

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4. Appendix (Cont'd)

>> <u>d</u>   Press F5 to write data.

>   (d) Select "Copy DCU to a File" function from the DCU summary page window to save the reset data DCU file.

>>   <u>NOTE</u>: 1. Note the new reset data file name.

>>   <u>NOTE</u>: 2. A block range limits menu will display "The start block number is zero "0". The end block number is five hundred forty nine "549". Make sure that these limits are correct then select "OK" and press enter.

>   (e) Select "Print" function from the DCU summary page window to print a hardcopy of the saved reset DCU summary page if printer is available otherwise, write screen data manually for reference..

>   (f) Compare content of DCU summary page recorded in step (e) with previous recorded one at step (10).

>   (g) Make sure that there is no difference between the two files.

>>   <u>NOTE</u>:   The SETLEXPIND data may differ if it was originally different than "0" and the maintenance task was performed to reset this value to "0".

>   (h) Place copy of saved DCU summary file in engine log book.

>   (i) Forward copy of DCU file to your local P&WC field service representative.

D. Do an operational check of the EEC per applicable maintenance manual instructions (Ref. : POWER PLANT - ADJUSTMENT/TEST, Section 71-00-00).
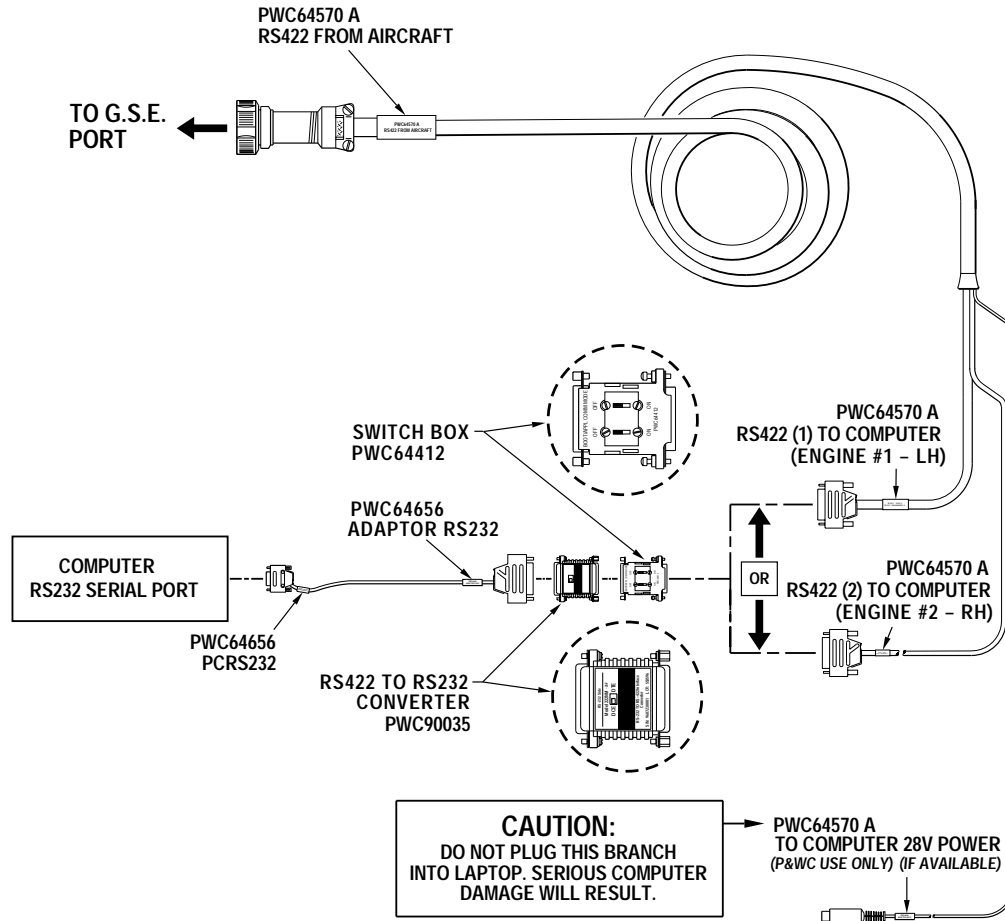
E. Verify that the accomplishment of P&WC S.B. No. 41020 is recorded in the applicable engine module log book when engine run testing is accomplished and when appropriate aircraft logbook entries are made.
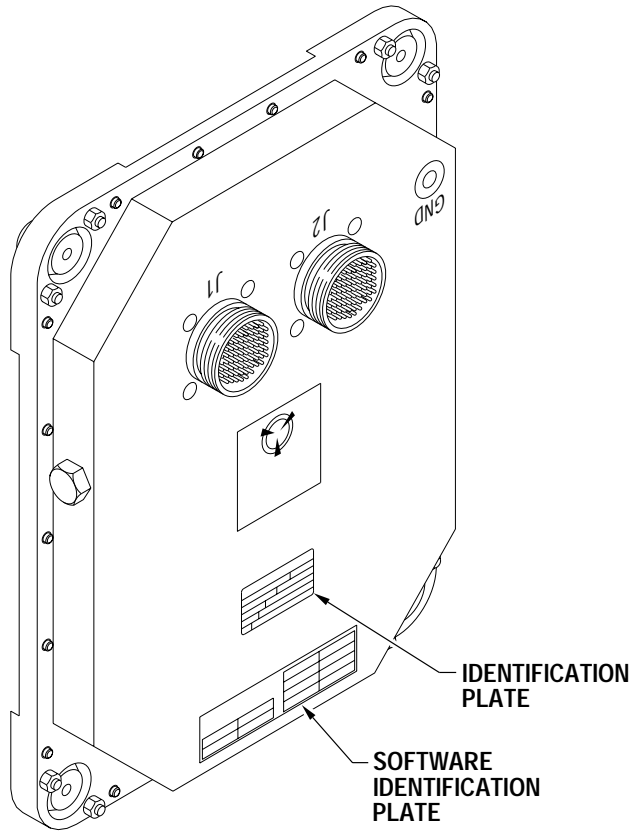
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GSE port is located on the bottom hand side of the baggage compartment behind the quick access panel.

PWC64570 A
RS422 FROM AIRCRAFT

TO G.S.E. PORT

SWITCH BOX
PWC64412

PWC64656
ADAPTOR RS232

COMPUTER
RS232 SERIAL PORT

PWC64656
PCRS232

RS422 TO RS232
CONVERTER
PWC90035

PWC64570 A
RS422 (1) TO COMPUTER
(ENGINE #1 – LH)

OR

PWC64570 A
RS422 (2) TO COMPUTER
(ENGINE #2 – RH)

CAUTION:
DO NOT PLUG THIS BRANCH
INTO LAPTOP. SERIOUS COMPUTER
DAMAGE WILL RESULT.

PWC64570 A
TO COMPUTER 28V POWER
(P&WC USE ONLY) (IF AVAILABLE)

C102375

Tools Set Up
Figure 1

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C100785

Identification Plates Location on EEC
Figure 2

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E.E.C. IDENTIFICATION PLATE

E.E.C. SOFTWARE IDENTIFICATION PLATE

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Identification Plates
Figure 3

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