

ENGINE, ASSEMBLY - ENGINE MONITORING UNIT (EMU) SOFTWARE UPGRADE

1. PLANNING INFORMATION

A. Effectivity

(1) Engines

Only Rolls-Royce Model RR300/A1 and RR300/B1 engines with Engine Monitoring Unit (EMU) P/N RR30000553 installed are affected by this bulletin.

B. Reason

The EMU processor Flash memory is susceptible to corruption when in storage. This can lead to the inability of the EMU to power-up and operate. A software update is being made to mitigate this issue.

C. Description

This Service Bulletin (SB) gives the instructions for the procedure for the field reprogramming of the RR300 EMU to add software version SWR20554.

D. Approval

Technical aspects are FAA approved.

E. Compliance

Compliance Code 5 - To be complied with at a time when the affected part(s) are directly available for removal and an EMU loader rig is available on-site.

F. Interchangeability - Not affected

G. Material Availability - Not applicable

H. Tooling - Not applicable

(1) Laptop Computer with Windows 7 Operating System.

(2) EMUStandaloneLoader.exe (software) installed.

(3) Data Download Unit Cable - RR30000284 or P/N RR30000541.

I. Weight and Balance - Not affected

J. Electrical Load Data - Not affected

K. References

(1) Advance Engineering Memorandum (AEM) CL500026148235

Note: The document above is referenced for the internal use of Rolls-Royce only.

(2) RR300 Operation and Maintenance Manual, CSP 21009 (OMM).

(3) RR300 Line Illustrated Parts Catalog, CSP 23004 (LIPC).

(4) RR300 Engine Illustrated Parts Catalog, CSP 23006 (EIPC).

L. Other Publications Affected - None

June 30, 2016

RR300-77-003

M. Prerequisites - None

2. ACCOMPLISHMENT INSTRUCTIONS

A. EMU Portable Reprogramming System Setup

Note: Connect the EMU Standalone Loader as shown in Figure 1.

- (1) Turn on the laptop and log in.
- (2) Navigate to C:\Users\<WindowsUserName>\AppData\Local\Aero Engine Controls\Temp\Standalone_Loader_SWR18823.
- (3) Copy any previous Programming Log files to a temporary folder.
 - (a) The files follow the naming convention:
ProgramRecord_<EMU_Serial_Number>_<Date_Timestamp>.txt
- (4) Delete any previous standalone loaders (including any associated folders and shortcuts on Desktop)
 - (a) The location of SWR18823 is C:\Users\<WindowsUserName>\AppData\Local\Aero Engine Controls\Temp\
- (5) Connect the USB Drive containing the new standalone loader.
- (6) Drag and drop EMU_Standalone_Loader-SWR20554 application file from the USB device to the Desktop.
- (7) Disconnect the USB Drive containing the new standalone loader.
- (8) Connect the USB cable to the EMU.
- (9) Connect the cable to the computer.
- (10) Confirm the red light for the EMU illuminates (indication of connectivity).

B. EMU Download

Note: If any flight data is stored on the EMU, follow these steps and the steps in Paragraph E.

- (1) Launch the DDU software and log in.
- (2) Navigate to the ADVANCED tab, select "EMU to EMU Transfer".
- (3) Follow EMU to EMU Wizard instructions to start "Download from EMU".
- (4) Make sure to save the downloaded data in a file name and location you can clearly identify later.
- (5) When the wizard presents you with the option to Start Uploading EMU data, exit out of the wizard and close the DDU entirely.

C. Remove EMU from aircraft.

- (1) Gain access to engine monitoring unit (EMU).
- (2) Disconnect aircraft harness from EMU and remove EMU from aircraft
(Ref OMM Task 77-51-00-000-801).
- (3) Connect Data Download Cable (P/N RR30000284 or RR30000541) to EMU.

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- (4) Connect Data Download Cable (P/N RR30000284 or RR30000541) to laptop.
- (5) Turn on laptop (assumes EMUStandaloneLoader.exe is already installed).
- (6) Confirm the red light for the EMU illuminates (indication of connectivity).

D. EMU Reprogramming

- (1) If you performed an EMU Download unplug and plug in the EMU once again.
- (2) Launch the application EMU_Standalone_Loader-SWR20554.exe.
- (3) The application will initiate communication with the EMU and complete the programming process automatically.
- (4) A dialog screen will appear similar to the one below.
- (5) Select the box and hit a key to start the programming session.

About to replace SWRxxxxx with SWRxxxxx

If you wish to do so select this command prompt box and push any button.

If you do NOT want to do so close this window now.

Starting programming process...

Please wait as this may take a few minutes to load the EMU...

...

Programming Successful!

EMU Identifiers:

Boot ID: AEC08008

Boot CRC: B09405E1

OPS ID: AEC0133D

OPS CRC: FB871496

Exceedance Table ID: 4A000002

Exceedance Table CRC: D8314C82

Select this command prompt box and push any button to close...

- (6) Close the dialog box when prompted.
 - (7) Programming is complete.
- ### E. EMU Reprogramming Verification
- (1) The programming operation generates a LOG file as a record of the operation.
 - (2) Verify that a log file was generated in the directory below:

C:\Users\<WindowsUserName>\AppData\Local\Aero Engine
Controls\Temp\Standalone_Loader_SWR20554

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SERVICE BULLETIN

- (3) The log file for the session will be named as shown below:
"ProgramRecord_<EMU_Serial_Number>_<Date_Timestamp>.txt"
- (4) If previous log files were saved to a temporary folder in step 3 from section 3.1, move them to.
C:\Users\<WindowsUserName>\AppData\Local\Aero Engine Controls\Temp\Standalone_Loader_SWR20554
- (5) Delete the temporary folder created in step 3 from section 3.1.
- (6) Open the applicable log file and verify the serial number and the correct software load is indicated. Below is a sample log file content:

```
Programmed serial AECxxxxxxxx with SWR20554
EMU Identifiers:
Boot ID: AEC08008
Boot CRC: B09405E1
OPS ID: AEC0133D
OPS CRC: FB871496
Exceedance Table ID: 4A000002
Exceedance Table CRC: D8314C82
```

Note: If the values for ID and CRC do not agree with those above, reprogram was not successful. Also, the serial number prefix may read AEC or CDS, depending on the date of manufacture.

- (7) Disconnect the EMU and re-identify as described in the service bulletin.

F. EMU Upload

If you performed step 4 or have a previously downloaded EMU Transfer files to load into the EMU, use the following steps:

- (1) Unplug and plug in the EMU once again.
- (2) Launch the DDU software and log in.
- (3) Navigate to the ADVANCED tab, select "EMU to EMU Transfer".
- (4) Follow EMU to EMU Wizard instructions to start "Upload to EMU".
- (5) Save a backup file as prompted. This file is for use in case of a failed upload and can be deleted after the successful load.
- (6) Open the previously downloaded data file created in step 4 when prompted.
- (7) Verify the Upload completes without failure notifications.
- (8) Finish (Close) the EMU to EMU Wizard.

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G. Troubleshooting

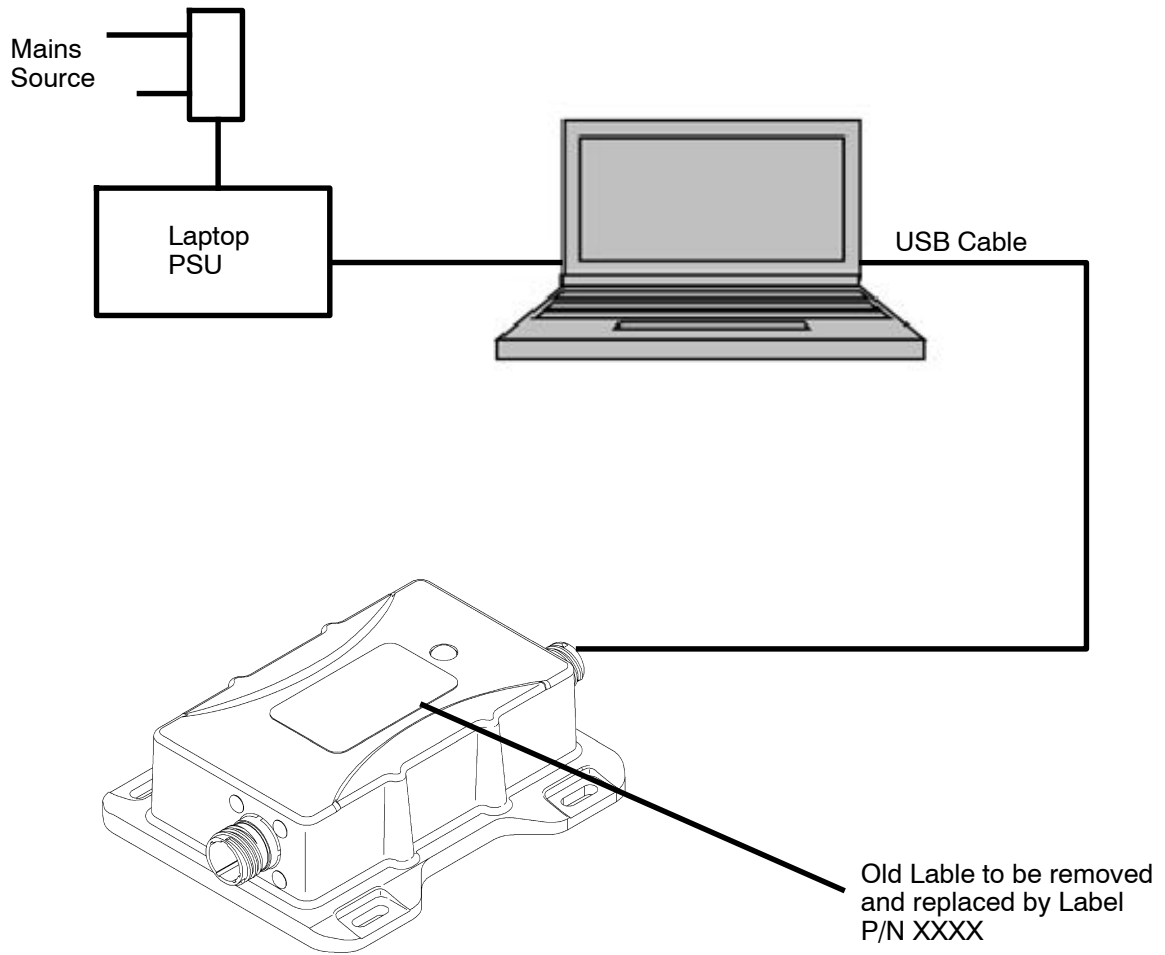
The following table details possible error messages and troubleshooting details for those error messages.

Error Message	Troubleshooting Details
<p>“Attempting recovery through bootstrap. <u>EMU not detected.</u> Make sure the EMU is connected. Select this command prompt box and push any button to close...”</p>	<p>Unplug USB from laptop, plug it back in. Close the programming application, confirm all electrical connection (verify the red light on the EMU illuminates), and re-launch the programming application. Use other USB port if problem persists.</p>
<p>“ERROR - No DFU devices on bus! Make sure the EMU is in reprogram mode, plugged into the USB port, and no other (i.e. the DDU) is using the EMU’s USB port.”</p>	
<p>“About to replace SWR (Old Number) with SWR20554. If you wish to do so select this command prompt box and push any button. If you do NOT want to do so close this window now. Starting programming process... Please wait as this may take a few minutes to load the EMU... <u>Failed to reconnect to the EMU after programming.</u> Select this command prompt box and push any button to close...”</p>	<p>Close the programming application, confirm all electrical connections (verify the red light on the EMU illuminates), and re-launch the programming application.</p>

H. Final Steps

- (1) Disconnect the EMU from the laptop.
- (2) Remove the Identification tag from the EMU.
- (3) Install the new provided Identification tag in the same location as the removed Identification tag.
- (4) Reinstall the EMU into aircraft (Ref OMM Task 77-51-00-400-801).
- (5) Apply power to aircraft to initiate an EMU self-test. The EMU requires approximately ten seconds to complete the self-test; a successful self-test will result in a steady (on) illumination of the EMU segment of the annunciator panel.
- (6) Upon completion of maintenance, record compliance to Service Bulletin 77-003 in the Engine Log Book on all applicable log cards.

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Connect the EMU Standalone Loader
Figure 1

June 30, 2016

RR300-77-003

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3. MATERIAL INFORMATION:

A. Configuration Chart

NEW P/N	Qty	NAME	Old P/N	QTY/ ENG	INSTRUCTIONS/ DISPOSITION
RR30000562	1	Engine Monitoring Unit	RR30000537	1	1, 2

INSTRUCTION/DISPOSITION NOTES

- 1. Reprogrammed
- 2. New

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