SIB 12 28 18 2020-04-14

MALFUNCTION INDICATOR LAMP (MIL) MULTIPLE MOTOR POSITION SENSOR FAULTS STORED IN EME

MODEL

This Service Information Bulletin (Revision 1) replaces SI B12 28 18 **dated October 2018.**

What's New :
- Correction
- Parts Information
- Warranty
- Attachment

MODEL

E-Series	Model Description	Production Date	Engine
F15	X5 40e PHEV Sports Activity Vehicle	All	With N20 engine

SITUATION

The following check control messages are displayed:

- CCM 34 "Malfunction indicator lamp (MIL)"
- CCM 633 "Powertrain Malfunction!"

One or more of the following faults may be stored in the EME (electrical machine electronics):
- 222014 - Motor position sensor: Acquisition of measured values or tilt sensor angle faulty
- 222021 - Motor position sensor: Phase difference between sine input and cosine input greater than threshold value
- 222022 - Motor position sensor: Engine speed exceeds threshold value
- 222029 - Motor position sensor: Offset of signal breakdown of amplitude difference between sine input and cosine input greater than threshold value
- 2223B6 - Motor position sensor: Interrupt of sine coil or cosine coil or excitation coil
- 222724 - Longitudinal dynamics level 2: Group fault torque limits (collective error moment limits)
- 222725 - Longitudinal dynamics level 2: Angle sensor fault

CAUSE

1. Chafing damage on the wiring harness leading to the EME connector.
2. Contact resistance at the EME's 58-pin signal connector A190*1B is too high.
3. The wires going to pins 41, 42, 43, 54, 55, and 56 in connector A190*1B are under tension. Vibrations may sporadically increase the resistance values of these connections outside of the acceptable range, leading to the activation of the Malfunction Indicator Lamp.

CORRECTION

1. Verify there is no chafing on the harness leading to EME connector A190*1B.
2. Change the harness routing and/or outer tape wrap to allow some slack, then release the tension at the EME connector.
3. Install new bracket and screw onto EME to support harness (torque screw to 8.5 Nm).
4. Change the cable tie direction on EME connector.
   - This repair is the same repair that is outlined in SI B65 05 18 F15 PHEV – AIR BAG LAMP ILLUMINATED- FAULT CODE 9309A0, it also addresses the issues identified in this bulletin
   - Replacing the EME will not provide a solution to this situation.

Only properly trained personnel, who have passed all applicable technical training courses, should perform any maintenance or repairs on any Hybrid or Electric Vehicle. Work performed by unqualified persons may

result in severe injury or damage to the vehicle. Additional information is found in Repair Instruction 61 00… Observe safety instructions when handling electric vehicles.

PROCEDURE

Refer to the enclosure.

- Observe the note concerning handling the wiring harnesses and the lines. Refer to Repair Operation REP 6100... Notes on handling wiring harnesses and cables.
- Use a suitable tool for the repair wiring harness. Refer to Repair Operation REP 6113... Special tools for wiring harness repairs.

PARTS INFORMATION

Only use and invoice the part numbers below that apply.

Performing a part number look-up in ETK (EPC) by VIN or model in place of using/invoicing the following part numbers may result with the wrong part numbers being invoiced and installed, this could delay the payment of claim.

Part Number	Description	Quantity
61 13 4 A03 DB3	Angle Bracket	1
61 25 7 621 147	Screw	1
61 13 8 383 722	Cable Ties	3

WARRANTY INFORMATION

During this workshop visit, the affected vehicle may also show one or more programming and encoding Technical Campaign repairs also open, the programming and encoding procedure may only be invoiced one time.

Modify the harness routing/taping, install the new bracket and wire ties as describe above and update the vehicle to the required I-level by performing and submitting for this repair.

For the other open campaign repairs, please be sure to also perform any additional work (before and/or after) these repairs require and/or close the remaining programming and encoding Technical Campaign repairs as outlined in the corresponding Service Information Bulletin.

The repair procedure in this bulletin is covered under the terms of the BMW New Vehicle Limited Warranty for Passenger Cars and Light Trucks or the BMW Certified Pre-Owned Program.

Defect Code:	**6112900100**	**F15 PHEV restraint system CC message (wiring harness to electrical machine electronics)**

Vehicle is already in the workshop

Work Pkg	Labor Operation	Description (Plus Work)	Labor Allowance
# 1	00 66 548	Performing vehicle test (with vehicle diagnosis system – checking faults) perform repair to EME, clear faults, program and encode the vehicle (Plus work – Vehicle is already in the workshop)	18 FRU

Or:

The vehicle arrives at your center and this repair is needed and performed (No other Main work will be performed/claimed during this workshop visit)

Work Pkg	Labor Operation	Description (Main work)	Labor Allowance
# 2	00 66 034	Performing vehicle test (with vehicle diagnosis system – checking faults) perform repair to EME, clear faults, program and encode the vehicle (Main work)	20 FRU

Only one of the flat rate labor operation codes listed above can be used for claim submission/reimbursement purposes. Also, only one Main work flat rate labor operation code can be claimed per workshop visit.

Claim Repair Comments

Only reference the SIB number and the work package (Pkg) number performed in the RO technician notes and in the claim comments (For example: B12 28 18 WP 1), unless otherwise required by State law.

And, as needed:

Sublet – Bulk Materials (RO and Claim Comments Required)

Sublet Code 4	Up to $5.00	Reimbursement for the repair-related bulk materials (Do not use the BMW part numbers for claim submission)

Sublet reimbursement calculation for claiming the applicable repair-related bulk materials (BMW part numbers) is at the dealer net price amount for the quantities used plus your center's handling.

Enter this material cost in sublet and itemize the amount on the repair order and in claim comment section.

Consequential Repair

When additional work and/or parts are required as a direct result of the issue described in this Service Information bulletin, claim these items under the under the defect code listed above together with the corresponding labor operations (including any additional diagnosis) listed in AIR if applicable.

Please explain the reason for this consequential repair work (the why and what) on the repair order and in the claim comments section.

Programming and Encoding - Vehicle Control Units (RO and Claim Comments Required)

The programming procedure automatically reprograms and encodes all vehicle control modules which do not have the latest software I-level. If one or more control module failures occur during this programming procedure:

- Please claim this consequential control module-related repair work (including performing the IRAP Control Unit Recovery procedure first as required, refer to the SIB in AIR) under the defect code listed in this bulletin with the applicable AIR labor operations.

Please explain this additional work (The why and what) on the repair order and in the claim comments section

For control module failures that occurred prior to performing this programming procedure:

- When covered under an applicable limited warranty, claim the applicable test plan and the corresponding control module-related repair work using the applicable defect code and labor operations in AIR (including diagnosis with separate punch times).

Supporting Materials

picture_as_pdf B122818 Attachment 1 Procedure to inspect and repair the EME connector wiring harness 2.pdf

MALFUNCTION INDICATOR LAMP (MIL) MULTIPLE MOTOR POSITION SENSOR FAULTS STORED IN EME

PROCEDURE

Inspect and repair the EME connector wiring harness: F15 PHEV

Important warning for working on the high-voltage systems on the F15 PHEV:

Only properly trained personnel, who have passed all applicable technical training courses, should perform any maintenance or repairs on any Hybrid or Electric Vehicle. Work performed by unqualified persons may result in severe injury or damage to the vehicle. Additional information is found in Repair Instruction 61 00… Observe safety instructions when handling electric vehicles.

Note: This repair overlaps with SI B65 05 18 F15 PHEV – AIR BAG LAMP ILLUMINATED FAULT CODE 9309A0.

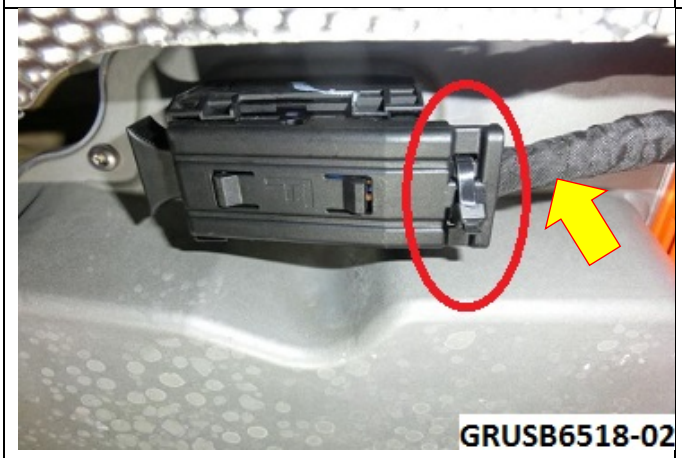
1. Position the vehicle on a lift.
2. Visually inspect the EME wiring harness for chafe marks throughout entire visible area.

If there are chafe marks on the wiring harness (arrows) per the examples below, the harness must be repaired. Go to Step 3.

3. De-energize high-voltage system. Refer to Repair Instructions 61 25 900.
4. Disconnect the 12V battery. Refer to Repair Instructions 61 20 900
5. Remove the underbody paneling on the right side. Refer to Repair Instructions 51 71 016.

6. Perform a visual inspection of connector A190*1B on the bottom of the EME.

If there are noticeable problems (e.g. damage, traces of water, etc.) contact BMW of North America's Technical Service Department by submitting a TSARA case.

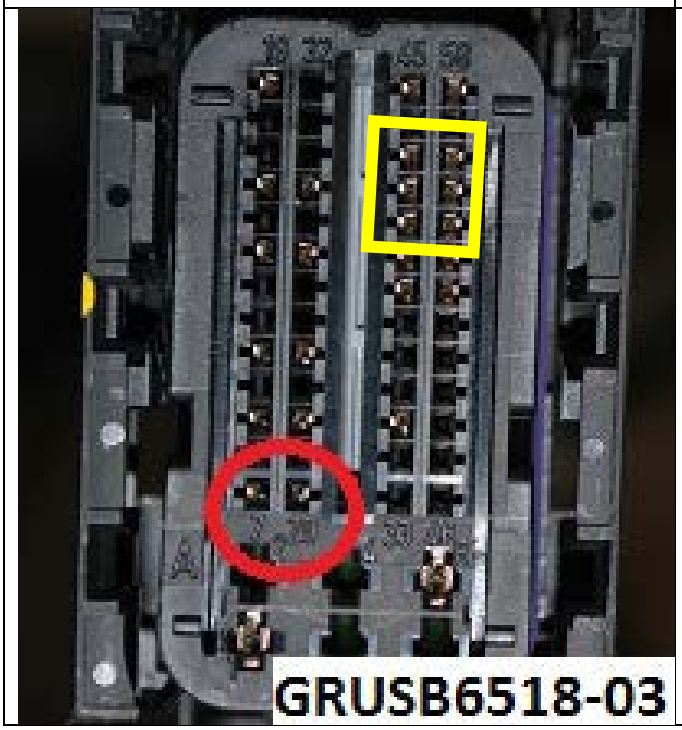


7. Remove connector A190*1B from the EME. Cut the cable tie holding the harness to the EME connector (circled).

Note:

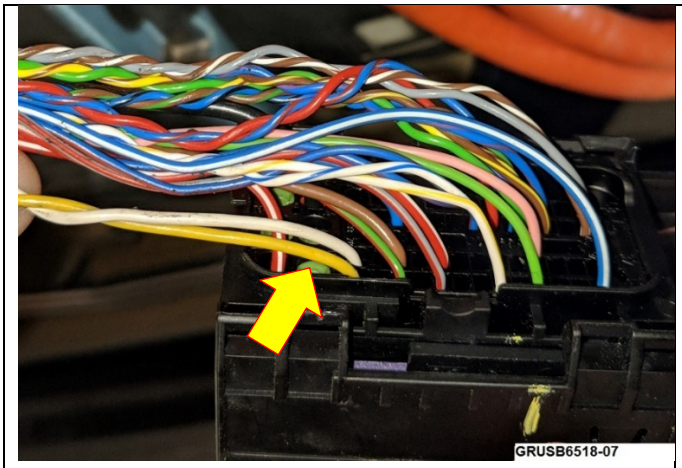
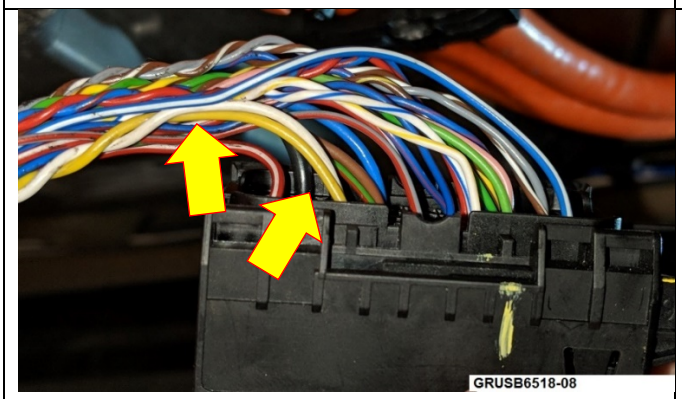
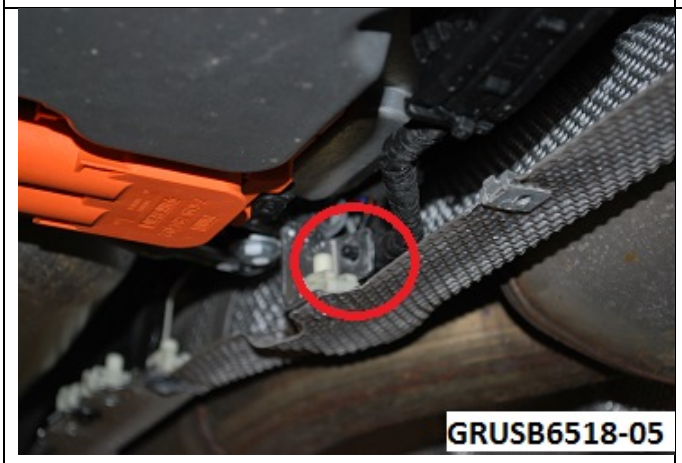
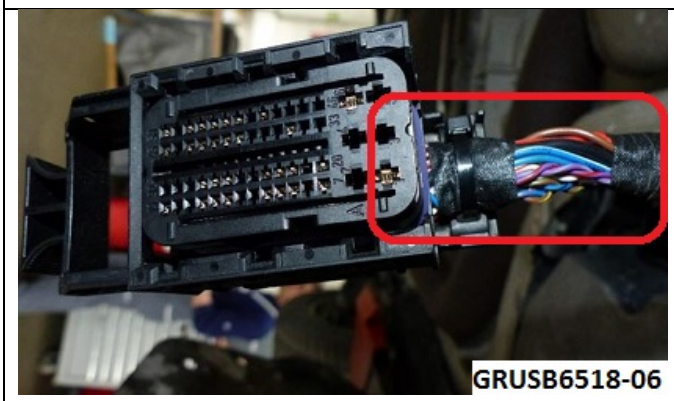
- Observe the note concerning handling the wiring harnesses and the lines. Refer to Repair Operation REP 6100... Notes on handling wiring harnesses and cables.
- Use a suitable tool for the repair wiring harness. Refer to Repair Operation REP 6113... Special tools for wiring harness repairs.

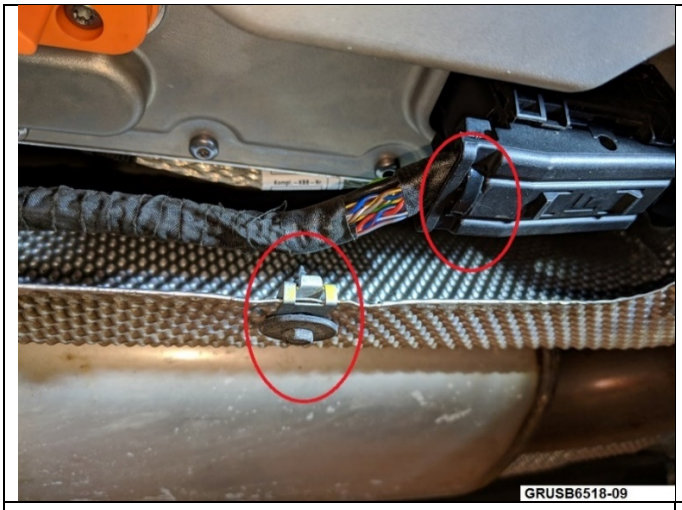
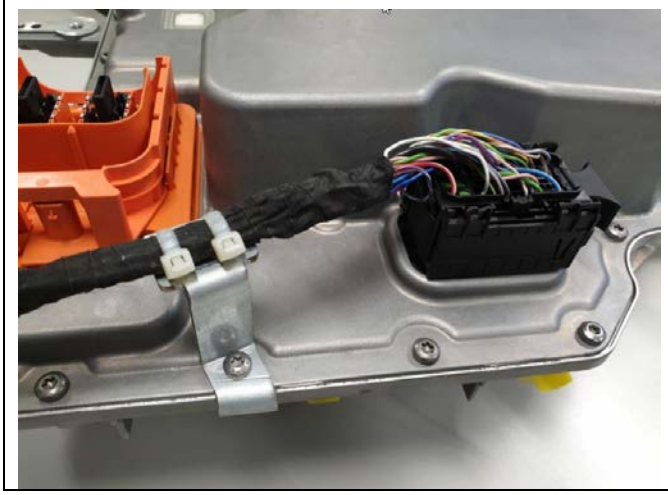
8. Remove the wiring harness tape wrapping from the connector (arrow).



9. Release the connector cover.

- Examine pins 41, 42, 43, 54, 55, and 56 at the EME connector (outlined in yellow)
- Also examine pins 7 and 20 (outlined in red) which are for the ACSM signal
- Notify technical support via a TSARA case if there is visual/water damage to these pins.

	10. Remove the last 8" of tape from the harness at the EME connector to reduce the pull tension of this connection at the EME. Note: The two wires white and yellow are under strong tension, thus are entering the connector at a tight angle (arrow).
	**11. The wires between the cable tie location and the EME electrical connector/pins should NOT be under tension!** The white and yellow wires have been reformed in a larger radius (arrows) to enable a partial relief bend. This eliminates tension on the electrical pins.
	12. If more slack is needed at the connector to enable the larger radius relief bend, locate the last body tie down approx. 6” back from this EME connector. Slightly pull on the harness carefully.
	13. Wrap Fabric-tape (P/N 61 13 6 902 588) twice around the wiring harness at the location where the cable tie will be fastened. There should be a 2” or larger gap (circled) between this wrap for the cable tie, and where the harness’ main wrap begins.

	14. When reinstalling the cable tie (P/N 61 13 8 383 722) on the end of the EME connector, point the end of the tie upwards so it can't rub on the underbody panel of the vehicle (right circle). Also check to make certain there is minimal tension on the harness so that it won't droop and contact the tip of the underbody panel hold down screw (left circle).
	15. Remove bolt from EME. Install the new angle bracket and screw into the EME as shown here. • 61 13 4 A03 DB3 Angle Bracket • 61 25 7 621 147 Screw The screw must be **torqued to 8.5 Nm**. If the heat shield blocks access to this screw, gently bend it out of the way, and then after screw and bracket are installed, bend it back into position.
	16. The wiring harness is then laid onto the new angle bracket and secured with two new cable ties as shown here. • 61 13 8 383 722 Cable Ties There must be some slack between the angle bracket and the EME electrical connector. This slack functions as strain relief and prevents vibrations in the harness/underbody from being transmitted to the EME electrical connector.

17. Reinstall the underbody paneling on the right side (refer to Repair Operation 51 71 016).
18. Reconnect the vehicle battery (refer to Repair Operation 61 20 900).
19. Reconnect the high-voltage system (refer to Repair Operation 61 25 900).
20. Clear the fault memory.
21. Briefly drive the vehicle in electric mode to verify that the MIL no longer illuminates.
22. Fully charge the high-voltage battery as a courtesy to the customer.