



TECHNICAL SERVICE BULLETIN

Ground Fault Detected Displayed After Performing The Test Function And/OR Breaker Tripped Message Displayed - Built On Or Before 06-Dec-2021

22-2243

24 June 2022

Model:

Ford 2021 F-150	Built on or before 06-Dec-2021
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Issue: Some 2021 F-150 vehicles built on or before 06-Dec-2021 equipped with a Pro-Power Onboard inverter system may experience Ground Fault Detected message displayed after performing the test function and/or Breaker Tripped message displayed that indicates the incorrect breaker location. This may be due to the software in the accessory protocol interface module (APIM). To correct the condition, follow the Service Procedure to reprogram the APIM. The APIM software update that addresses the symptom listed in this bulletin may have been sent via Ford Power-Up software updates delivered over-the-air (OTA) to connected vehicles that have automatic updates enabled through the touchscreen. Enter the vehicle identification number (VIN) in Professional Technician System (PTS) and check the OTA Dashboard under the Connected Vehicle tab for OTA update history. If an update to the APIM has successfully completed recently and the customer is reporting the symptoms are no longer present, this article may not apply.

Action: Follow the Service Procedure to correct the condition on vehicles that meet all of the following criteria:

- 2021 F-150
- Built on or before 06-Dec-2021
- One or more of the following customer symptoms:
 - Ground Fault Detected message displayed after performing the test function
 - Breaker Tripped message displayed that indicates the incorrect breaker location

Warranty Status: Eligible under provisions of New Vehicle Limited Warranty (NVLW)/Service Part Warranty (SPW)/Special Service Part (SSP)/Extended Service Plan (ESP) coverage. Limits/policies/prior approvals are not altered by a TSB. NVLW/SPW/SSP/ESP coverage limits are determined by the identified causal part and verified using the OASIS part coverage tool.

Labor Times

Description	Operation No.	Time
2021 F-150: Reprogram The Appropriate Modules As Required By The Software Update And Service Procedure (Do Not Use With Any Other Labor Operations)	MT222243	Actual Time

Repair/Claim Coding

Causal Part:	14G670
Condition Code:	04

Service Procedure

NOTE: Ask the customer to bring their spare key fob to assist in the Ford Diagnosis and Repair System (FDRS) programming. The time required to complete this procedure varies depending on several factors including the number of module software updates required, available internet bandwidth, universal serial bus (USB) flash drive variability, and the potential that controller area network (CAN) flashing (software update via the data link connector [DLC] with FDRS) may be required. It is recommended to connect to the internet with an ethernet cable and use a USB 3.0 capable flash drive when performing software updates.

NOTE: The following modules may require more than one software update: gateway module (GWM), telematic control unit (TCU), APIM, instrument panel cluster (IPC) and/or image processing module A (IPMA).

1. Start an FDRS session and navigate to Toolbox tab > Datalogger > body control module (BCM) and select the BATT_SOC parameter identification (PID). Verify the PID reads 80% or higher. If the state of charge (SOC) is less than 80%, charge the battery then navigate back to Toolbox tab > BCM > Reset Battery Monitor Sensor Learned Values application. Perform the battery monitor sensor (BMS) reset.
 - (1). If the battery is unable to achieve an 80% SOC then a new battery may be required. Use the Rotunda GR-190, GRX-3590 or DCA-800 testers to verify if replacement is required. If the battery is replaced, fully charge the new battery. Disconnect the Rotunda charger and perform a BMS reset using the FDRS scan tool.
2. Reconnect the battery charger and set it to maintain a vehicle voltage of 12.6 – 13.6 volts. A low battery state of charge while performing a software update to any module may result in a repeat Restart Required message in the vehicle center display screen or a message on the FDRS saying Part Number Validation Failed or DID Validation Failed.
3. Close all the doors on the vehicle. If a door must be left open during the service procedure, the door latch should be mechanically latched to simulate a closed door.
4. Are there any updates available for the GWM, TCU, APIM, IPC and/or IPMA modules?
 - (1). Yes - proceed to Step 5.
 - (2). No - this article does not apply. Refer to WSM, Section 415-00.

NOTE: IPC software updates are only required on F-150 vehicles equipped with the high-level IPC, 12-in. display and all Mustang Mach-E vehicles.

5. Perform the Module Software Updating Procedure outlined below for the following modules: GWM, TCU, APIM, IPC and IPMA. Perform a network test after each software update using the latest software level of the FDRS scan tool. This refreshes the list of modules that have available software updates based current module software levels. Continue performing software updates to the GWM, TCU, APIM, IPC and IPMA until all available software updates for those modules are complete. If any error conditions are experienced during programming, refer to WSM Section 418-01A > General Procedures > Module Programming for the Error Condition Table.
6. If the in-vehicle touchscreen does not indicate that the USB flash drive has started to download, this may require recovery of the APIM. Refer to related TSBs/SSMs for APIM recovery using the FDRS service tool.

Module Software Updating Procedure

The following instructions apply when performing a software update on any of the following modules:

- GWM
- TCU
- APIM
- IPC

NOTE: A blank 64GB or larger USB flash drive is required, and a USB 3.0 USB flash drive is recommended for fastest software installation. Make sure the USB flash drive being used is formatted as exFAT file system. To confirm the USB flash drive is formatted as exFAT, hold down the Windows icon keyboard key and press the E keyboard key. Right click on the USB flash drive, then select Properties. If File System under the General tab is not exFAT, the drive must be formatted. To format the USB flash drive, right click on the USB flash drive, select Format, select exFAT for the File System, and select Default Allocation Size for the Allocation Unit Size. De-selecting Quick Format is not necessary, and results in a more lengthy operation.

1. Using the FDRS, begin module programming by selecting the SW Updates tab then download and run the application for desired module. Follow all on-screen instructions carefully.
2. When prompted, connect the USB flash drive to the FDRS.

NOTE: It may take up to 5 minutes for the vehicle to recognize the USB flash drive.

3. When prompted by the FDRS, safely remove/eject the USB flash drive from the diagnostic scan tool and connect it to the USB hub to install the software into the module. When the USB software update begins the touchscreen displays a message stating Do Not Remove USB. The update starts automatically and may take 10 minutes or longer to complete. If the message stating Do Not Remove USB does not display on the touchscreen within 5 minutes of the USB drive being connected to the vehicle's USB hub select Did The Update Install Successfully > No on the FDRS and follow the on-screen instructions to either attempt USB programming again or perform CAN programming for the module.

4. When the pop-up stating Restart Required appears on the touchscreen, turn the ignition off. Open and close the driver's door, and wait for 10 minutes. Restart the engine (key-on engine running [KOER]). The update is still in process at this time.
5. Once the pop-up stating Update Successful appears on the touchscreen, select Close, remove the USB flash drive from the USB hub and connect it to the FDRS, and select Yes on FDRS indicating the update installed successfully. This initiates the remaining automated configuration steps and reports the module assembly, vehicle interface processor (VIP), calibration, customer interface processor (CIP), and application software levels to the Ford online database. Failure to follow this step results in an inaccurate database as well as omitted, improperly installed, or improperly configured applications (features) such as navigation (if equipped). It is normal for the module to reset during this step.

IPMA Software Updating Procedure

When performing the IPMA software update, additional modules receive software updates. Depending on vehicle features, the coordinated software update includes the IPMA, power steering control module (PSCM), cruise control module (CCM) and/or camera module - rear (CMR).

1. Reprogram the IPMA using the latest FDRS software level. Follow all on-screen instructions carefully to complete all coordinated module software updates.
2. Perform the FDRS Image Processing Module A (IPMA) Alignment procedure.
3. Perform the appropriate FDRS camera alignment procedure.
4. For vehicles equipped with 360 degree cameras, perform the IPMA - 360 Degree View Camera Alignment procedure.
5. For all other vehicles, perform the IPMA - Pro Trailer Backup Assist Camera Alignment procedure. This procedure should be performed on all vehicles without 360 degree cameras, even if the vehicle is not equipped with Pro Trailer Backing Assist™ (PTBA).

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NOTE: The information in Technical Service Bulletins is intended for use by trained, professional technicians with the knowledge, tools, and equipment to do the job properly and safely. It informs these technicians of conditions that may occur on some vehicles, or provides information that could assist in proper vehicle service. The procedures should not be performed by "do-it-yourselfers". Do not assume that a condition described affects your car or truck. Contact a Ford or Lincoln dealership to determine whether the Bulletin applies to your vehicle. Warranty Policy and Extended Service Plan documentation determine Warranty and/or Extended Service Plan coverage unless stated otherwise in the TSB article. The information in this Technical Service Bulletin (TSB) was current at the time of printing. Ford Motor Company reserves the right to supersede this information with updates. The most recent information is available through Ford Motor Company's on-line technical resources.