Technical Service Bulletin

Technical Service Bulletin: TSB210187	**Released Date**: 28-Nov-2022
Fault Codes 3868, 4572 and 4677 Caused by Diesel Exhaust Fluid (DEF) Header Malfunction	

Fault Codes 3868, 4572 and 4677 Caused by Diesel Exhaust Fluid (DEF) Header Malfunction

Warranty Statement

The information in this document has no effect on present warranty coverage or repair practices, nor does it authorize TRP or Campaign actions.

Contents

Product Affected

- B6.7 CM2350 B121B (Excluding engines built in 2021)
- B6.7 CM2450 B155B
- ISB6.7 CM2350 B101 (Engines built in 2016 **only**)
- ISL9 CM2350 L101 (Engines built in 2016 **only**)
- L9 CM2350 L116B
- L9 CM2350 L123B
- L9 CM2450 L126B
- ISX12 CM2350 X102
- ISX15 CM2350 X101 (Engines built in 2016 **only**)
- X12 CM2350 X119B
- X12 CM2450 X137B
- X15 CM2350 X114B
- X15 CM2350 X116B
- X15 CM2450 X124B
- X15 CM2450 X134B

Note : As supply has recovered for some OEMs and their DEF header parts have become more readily available, the TRPs will be discontinued in stages, and ESNs will be removed from eligibility. As this occurs, repair for DEF header Fault Code(s) 3868, 4572 and/or 4677 need to return to normal repair practices. See Step 9 for updated list of participating OEMs.

Issue

Symptom:

- A combination of one or all DEF header fault code(s) 3868, 4572 and/or 4677 are logged.

Note : These ECM calibrations will **only** address DEF header sensor malfunctions that are logging one or combination of DEF header fault code(s) 3868, 4572 and/or 4677.

- Engine has a DEF header malfunction and replacement is **not** available.

Root Cause:

- DEF header replacement parts are **not** available and DEF header part shortages have necessitated the release of an ECM calibration code that allows the engine to operate normally without engine torque and vehicle speed limits until a DEF header is available for final repair.

Verification

- Verify one or all DEF header datalink Fault Codes 3868, 4572 and/or 4677 are logged.
- Verify published troubleshooting has been completed.
- Verify DEF header part is **not** available for the repair.
    - Important: Several additional OEMs have been added to TRP2484 and may have a unique pre-authorization process. Engines installed in OEM chassis that require pre-authorization will **not** appear eligible on QSOL until proper steps are followed. Reference Table 1, OEM Pre-authorization Process, below.

Resolution

- Because of the lack of DEF header part availability, new ECM calibration codes are being made available that allows the engine to operate normally without engine torque and vehicle speed limits until a DEF header is available for final repair.
- Along with the download of the new ECM calibration, the OEM wiring harness at the DEF header will need to be cut at least 4 inches on the DEF header side of the wiring harness and heat shrink repaired.
    - In some failure conditions the DEF header sensor can produce faults intermittently. The DEF header sensor **must** be removed electrically from the OEM harness to prevent intermittent faults as this can lead to additional warning and de-rate events.
    - The intent of the below procedure electrically removes the DEF header sensor from the circuit. The DEF header **must** remain in the tank and connected to the DEF and coolant lines as they are still required for vehicle operation.

Important: The steps below **must** be followed in order. The DEF header sensor pigtail on the DEF header must be disconnected from OEM wiring harness prior to the download of the new ECM calibration.

At no point is the DEF header removed from the DEF tank during this procedure.

1. Turn the keyswitch off and verify the DEF header is disconnected from the OEM harness. If the DEF header sensor is still connected this could result in shorting of the power circuit.
2. Turn keyswitch on and start the ECM calibration download.
    a. These products have new corresponding engine ECM calibrations codes that align with the repair.
        i. A Fleet Count will be required to install the new ECM calibration code.
        ii. An ECM code lookup tool and complete listing of ECM codes are located at the following link:

Note :
https://quickserve.cummins.com/qs3/qsol/service/def_header_ecm_tools.html (https://quickserve.cummins.com/qs3/qsol/service/def_header_ecm_tools.html)

3. While the ECM calibration is downloading, use wire cutters to cut the DEF header pigtail harness at least four inches from the connector. See Figure 1 below. Once cut, the pigtail can be moved to a bench for ease of installation.

Note : For Blue Bird™ chassis **only;** do **not** cut the DEF header pigtail. Install the DEF header connector cover onto the OEM harness connector. The repair location **must** reference Blue Bird™document SU2201 for instructions. Instructions can be found in the following link. See below for further details.https://vantage.blue-bird.com/Portal/Trouble-Shooting.aspx (https://vantage.blue-bird.com/Portal/Trouble-Shooting.aspx)

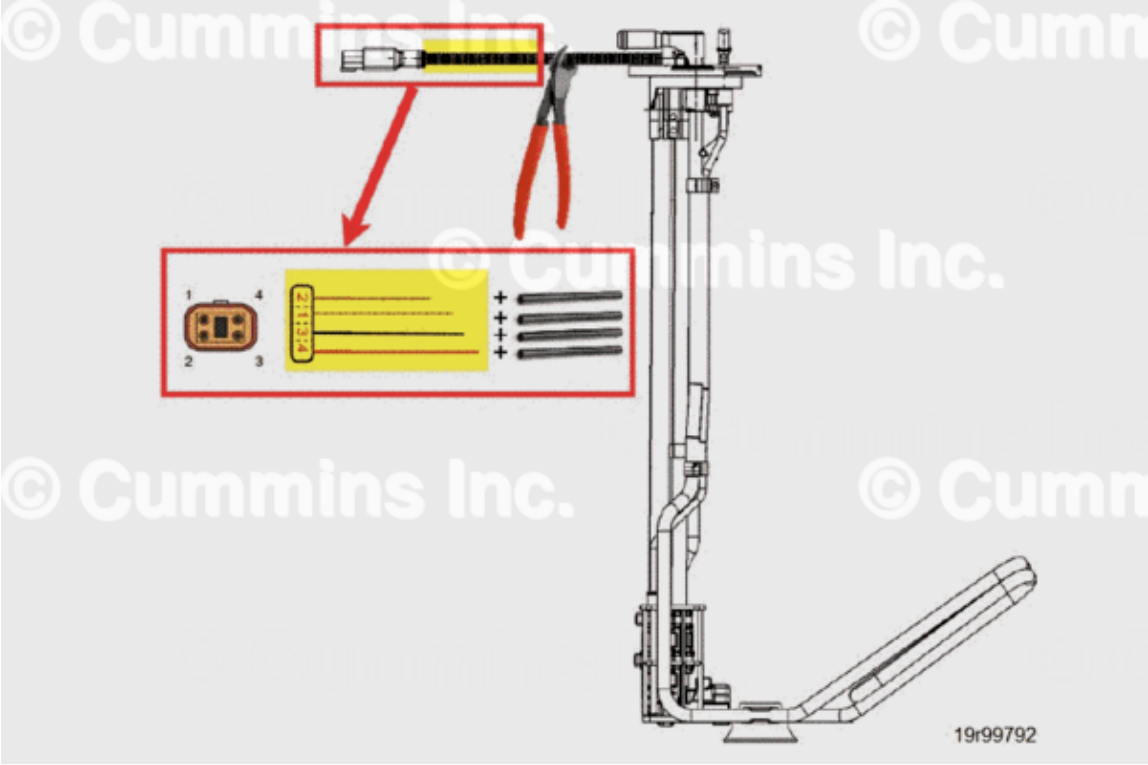


Figure 1, DEF Header Pigtail Harness Cut Location.

4. Remove the wire loom from the pigtail end.

5. Loop each wire and apply heat shrink tubing to each end of the wire. See Figure 2 below.

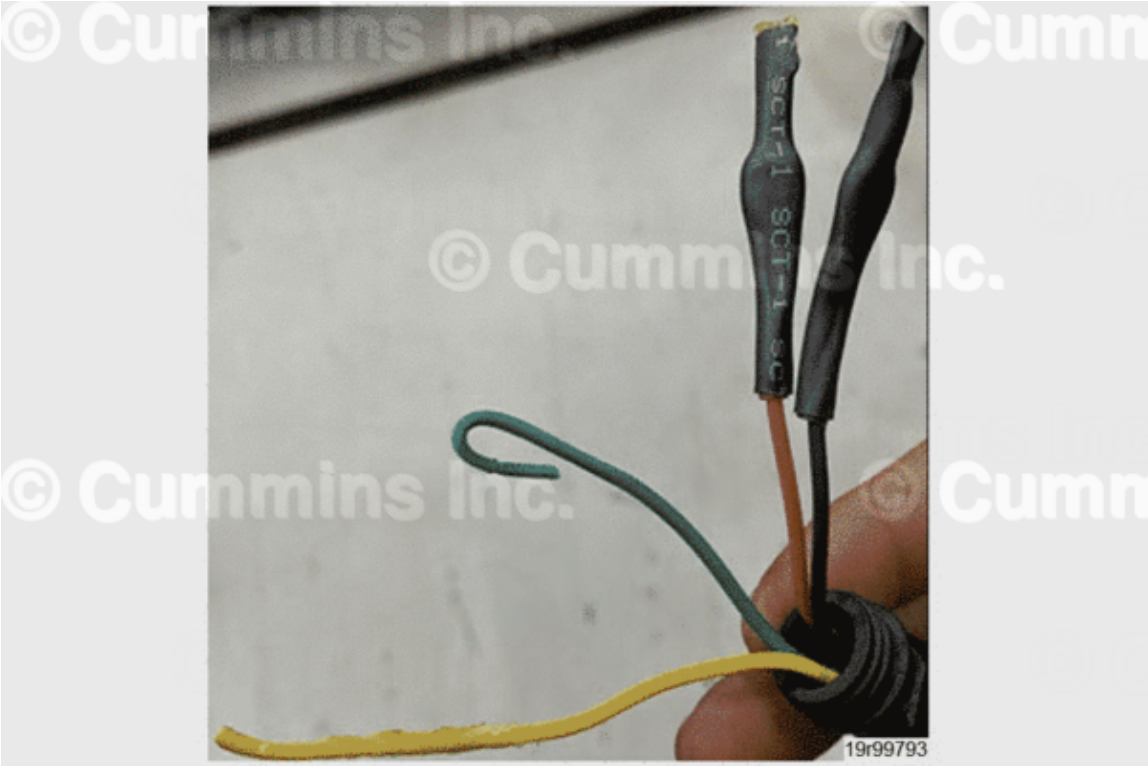


Figure 2, Heat Shrink Applied To Looped Wire.

6. Use a heat gun to apply heat to each piece of heat shrink tubing, verify glue is extruded from the end and sealed by pinching the end of each piece with pliers. See Figure 3 below.



Figure 3, Pliers Used to Pinch and Verify Glue Extruding.

7. After the four wires are sealed, reconnect the pigtail to the OEM wiring harness connector.

8. Secure the wiring harness using a zip tie. See Figure 4 below.

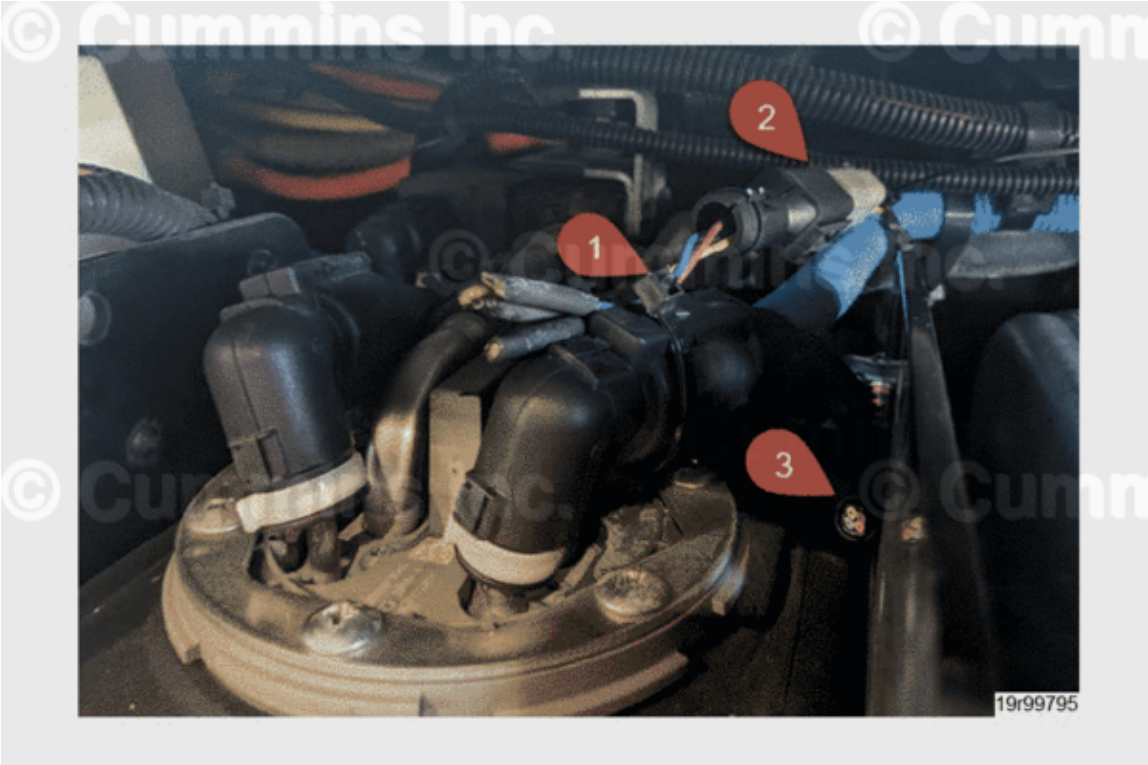


Figure 4, OEM Wiring Harness.

1. Zip tie securing the harness
2. Pigtail connected to chassis connector
3. Harness to DEF header left unsealed

9. Verify new ECM calibration code download is completed.

- Downloading this ECM calibration code and cutting of the DEF sensor header harness **must** be filed in accordance with one of the appropriate TRPs. See appropriate TRP for further details.
  - TRP2488 – discontinued.
  - TRP2490 – qualified engine installed in DTNA (Freightliner, Freightliner Custom Chassis, Thomas Bus, and Western Star) chassis.
  - TRP2489 – qualified engines installed in Navistar® chassis
  - TRP2484 – qualified engines installed in the following chassis types.
    - E One, Spartan Fire, Ferrara Fire, KME, Capacity, Hines and Crane Carrier, Blue Bird, Tico, Tiffin, Oshkosh Mixers, and Airport Snow Removal, Sutphen, Gillig, ENC bus (ElDorado), Grande West (Vicinity) Bus, Temsa Bus, Rosenbauer, Van Hool, Kalmar Ottawa, Nova Bus, New Flyer Industries (MCI Coach, New Flyer and ADL), ARBOC Specialty Vehicles, Shyft Group/Spartan RV, Dennis Eagle, Seagrave, Grove/Manitowac, Hino, and HME.
    - Additional chassis types will be added as they become eligible.
- Unauthorized download of this ECM calibration code is considered tampering of emission control devices on Cummins products. Cummins Inc. prohibits tampering of emissions control devices on

Cummins® products in any capacity. Reference Warranty Memo 1633 for additional details. See link below.

Note :
https://quickserve.cummins.com/protected/files/qsol/en/warranty/memos/m1633.pdf (https://quickserve.cummins.com/protected/files/qsol/en/warranty/memos/m1633.pdf)

Table 1, OEM Pre-authorization Process

Important: Once pre-authorization is obtained, email must be sent to T2484@cummins.com with the following item: 1) evidence pre-authorization was received, 2) ESN, 3) OEM and 4) current ECM code

OEM	Pre-authorization
ARBOC Specialty Vehicles	Repair locations must contact Brad Fisher: work: 574-822-5997 cell: 574-536-2420 email bfisher@ARBOCsv.com
Blue Bird	Do **not** cut the DEF Header pigtail as noted in step 3. Disconnect the header harness and install provided connector cover onto the chassis harness. The repair location **must** reference Blue Bird™ document SU2201 for instructions. The document can be found in the following URL: https://vantage.blue-bird.com/Portal/Trouble-Shooting.aspx Contact a local Blue Bird™ dealer for connector cover and anauthorization code **prior** to performing the repair. A list of Blue Bird™ dealers can be found in the following URL: https://www.blue-bird.com/find-a-dealer
Capacity	For Capacity Trucks, pre-authorization **must** be obtained. Pre-authorization is available by sending requests to rev.solutions@revgroup.com or by contacting Casandra Brown at 903-475-0665.
E-One	For E-One fire trucks and chassis, pre-authorization **must** be obtained. Pre-authorization is available through E-ONE Customer Support by calling 352-237-1122
Ferrara Fire	For Ferrara fire trucks and chassis, pre-authorization **must** be obtained. Pre-authorization is available by sending requests to ffawarrantysubmission@ferrarafire.com

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Grove/Manitowac	Before installing the temporary calibration the repair location **must** verify a replacement DEF sensor is **not** available. It is ideal to replace the sensor, if a sensor is available, to prevent a repeat visit to revert to the original calibration. Preauthorization can be obtained by contacting warranty.team@manitowoc.com
Hines and Crane Carrier (Battle Motors)	The repair location **must** obtain pre-authorization prior to repair. Pre-authorization can be obtained by contacting Michael Cox at mcox@battlemotors.com
HME	Pre-Authorization: The repair location **must** obtain pre-authorization prior to repair. Pre-authorization can be obtained by contacting Greg Geukes at ggeukes@hmetruck.com.
Kalmar Ottawa	Authorization code is required prior to repair. Kalmar dealers **must** enter a request in the Kalmar Case Management system (salesforce). All non-Kalmar repair locations **must** contact the appropriate Kalmar regional support area manager. The name and contact information is below:
	U.S. regions:
	Northeast - Christopher Pruitt 1-785-214-3401
	Southeast - Warren Chase 1-785-691-5811
	Midwest - Rufino Borrero 1-785-521-8002
	Western - Lee Diggle 1-785-893-4474
	Backup :
	Mike Conroy - 1-785-214-2988
	Brian Goudreau - 1-785-214-3119
KME	For KME fire trucks and chassis, pre-authorization **must** be obtained. Pre-authorization is available through KME Customer Product Support by calling 570-669-5215

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Link-Belt	The repair facility **boldmust/bold** verify a replacement DEF sensor or tank is **boldnot/bold** available. If no replacement is available, preauthorization **boldmust/bold** be obtained to install the temporary calibration. Contact linkbelt.DEF@linkbelt.com
MCI Coach	The repair location must contact their local MCI product support representative or MCI Emergency Roadside Assistance (1-800-241-2947) to determine if they are eligible to receive an authorization code.
New Flyer and ADL	The repair location **must** contact their local New Flyer product support representative to determine if they are eligible to receive an authorization code.
Nova Bus	Authorization code is required prior to repair. The repair location **must** contact their local Customer Support Manager. A list of local support managers is available in the following links (First link is for Canada. Second link is for U.S.):
	Note : https://novabus.com/parts_and_service/#customer-support-managers
	Note : https://us.novabus.com/parts_and_service/#customer-support-managers
Seagrave	Repair locations **must** send an email to service@seagrave.com, requesting authorization for the TRP. Repair locations will need to provide the five digit Seagrave sales order number, which is located on the tag in the driver’s side door jamb.
Shyft Group/Spartan RV	The repair location must obtain pre-authorization by contacting Scott Wixson at scott.wixson@spartanrvchassis.com .

Table 1, OEM Pre-authorization Process	
Important: Once pre-authorization is obtained, email must be sent to T2484@cummins.com with the following item: 1) evidence pre-authorization was received, 2) ESN, 3) OEM and 4) current ECM code	
Spartan Fire	For Spartan fire trucks and chassis, pre-authorization **must** be obtained. Pre-authorization is available through Spartan Customer Product Support by calling 1-800-867-6478.

Customer Communication

- This communication is for information purposes **only** and to help provide clear communication to the customer.
  - Because of a global shortage of parts in the industry, as a result of unprecedented demand in the wake of the global pandemic and other events beyond the manufacturers' control, an ECM calibration code solution is being provided that reduces the inducement levels when DEF header datalink communication faults are detected. Fault codes 3868, 4572 and/or 4677 could be active but no amber check engine light illuminated indicating there is no communication between the engine and DEF header, however the vehicle will be allowed to operate normally without engine torque and vehicle speed limits.
  - DEF Level indicator will **not** provide an accurate reading and is **not** indicative of amount of DEF available in the tank. See Table 1.
  - The DEF fluid level in the tank will need to be manually inspected to allow proper vehicle operation.
  - By agreeing to this repair, one is agreeing to make the vehicle available at a later date once DEF header parts are available. A future communication will be sent to make these arrangements.
- DEF quality, DEF temperature and DEF level in the electronic service tool will **not** read correctly.
  - Fault Codes 3868, 4572 and/or 4677 will still be active.
- Running an engine that is **not** properly maintained such as without DEF or improper DEF quality are conditions that are consider customer abuse. Reference Responsibilities procedure in the Warranty Administration Manual.

Note : https://quickserve.cummins.com/qs3/pubsys2/xml/en/procedures/111/111-502-003.html (https://quickserve.cummins.com/qs3/pubsys2/xml/en/procedures/111/111-502-003.html)

Table 1, Changes to ECM Calibration Code with New ECM Calibration Code with No Torque Or Speed Inducement(s) with any Combination of Affected Fault Codes		
Item	**With Existing ECM Calibration Code**	**With New ECM Calibration Code**

Table 1, Changes to ECM Calibration Code with New ECM Calibration Code with No Torque Or Speed Inducement(s) with any Combination of Affected Fault Codes

Item	With Existing ECM Calibration Code	With New ECM Calibration Code
FC3868	Amber lamp and Malfunction indicator lamp (MIL)/Torque and speed inducement	No lamps/ no torque and speed inducement
FC4572	Amber lamp and MIL/Torque and speed inducement	No lamps/ no torque and speed inducement
FC4677	Amber lamp and MIL/Torque and speed inducement	No lamps/ no torque and speed inducement
DEF Level	DEF gauge is not accurate/Electronic service tool is not accurate	DEF gauge is not accurate/Electronic service tool is not accurate
DEF Temperature	Electronic service tool is not accurate	Electronic service tool is not accurate
DEF Quality	Electronic service tool is not accurate	Electronic service tool is not accurate

Document History

Date	Details
2021-8-26	Module Created
2021-9-16	Updated Resolution section and updated Table 4 and Table 6.
2021-9-17	Added B6.7 CM2350 B121B, deleted Tables 2, 3, 4, 5, 6, 7, and 8, and added link to PDF that includes all ECM calibration codes.
2021-9-19	Added mention of Tiffin in Resolution section.
2021-9-23	Added reference to TRP2488 and TRP2490. Added Note in issue section.
2021-9-27	Added mention of Oshkosh in Resolution section.
2021-9-28	Added mention of Stuphen in Resolution section.
2021-9-30	Fixed typo.
2021-10-18	Added Gillig and exclusion of engines built in 2021 for B6.7 CM2350 B121B.

Date	Details
2021-10-21	Updated Product Affected with ISX15 CM2350 X101
2021-10-28	Added L9 CM2350 L123B and Nova Bus.
2021-10-29	Removed ISX15 CM2350 X101 and L9 CM2350 L123B. Added instruction for Nova Bus.
2021-11-5	Add 2 SMNs
2021-11-5	Non-Product Problem Solving (PPS)
2021-11-8	Added ISL9 CM2350 L101.
2021-11-8	Updated Product Affected with (Engines built in 2016 **only**) for select engines.
2021-11-12	Added L9 CM2350 L123B.
2021-11-15	Added ISB6.7 CM2350 B101 (Engines built in 2016 **only**). Added ENC bus and ADL.
2021-11-17	Added Grande West (Vicinity) Bus
2021-12-2	Added OEMs and Kalmar contact information.
2021-12-13	Added Temsa Bus to Step 9.
2022-1-20	Added Rosenbauer to Step 9.
2022-3-30	Added Van Hool.
2022-4-6	Added note for Blue Bird™ chassis and added Table 1.
2022-8-11	Added Blue Bird to Table 1. Added Hines and Crane Carrier
2022-8-30	Updated Table 1 with Link-Belt.
2022-10-7	Added E One, Spartan Fire, Ferrara Fire, KME, Capacity. Updated Table 1.
2022-11-10	Added note about supply recovery and TRP2488 – discontinued.

Last Modified: 28-Nov-2022