

**** SOLUTION ****

Title	Mack Chassis - Particulate Matter (PM) Sensor Diagnostic Trouble Codes (DTC) Illuminating The Malfunction Indicator Lamp (MIL); Tech Tip TT-014-2016 - US14+OBD16, US17+OBD16 And Newer Emissions, Common Model Year 2017 And Newer - To Be Used For EVERY Visit
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Mack Models

Mack Model	LR , MRU - TerraPro , TE - TerraPro , AN - Anthem , CHU - Pinnacle, Axle back , CXU - Pinnacle, Axle front , GR - Granite , GU - Granite , PI - Pinnacle , TD - Titan
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Emission Standard

Emission Standard	US14+OBD16 , US17+OBD16 , US17+OBD18 , US17+OBD19
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Engine family

Engine family	MP7 , MP8 , MP10
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**** SOLUTION ****

Cause	With the implementation of US14+OBD16 Emissions controls (Model Year 2017), a new sensor was required to monitor particulate matter (PM)—soot—levels in exhaust that has already passed through the Emissions Aftertreatment System. Excessive particulate levels at this stage can indicate a damaged or failed Diesel Particulate Filter (DPF). The PM sensor's only purpose is monitoring and is not used in any EATS (regeneration and NOx conversion) functions. Codes set by the sensor <u>will not</u> affect performance or cause a Derate.
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The PM sensor is located after the exhaust muffler (SCR) and very close to NOx sensor after the SCR (NOx2).

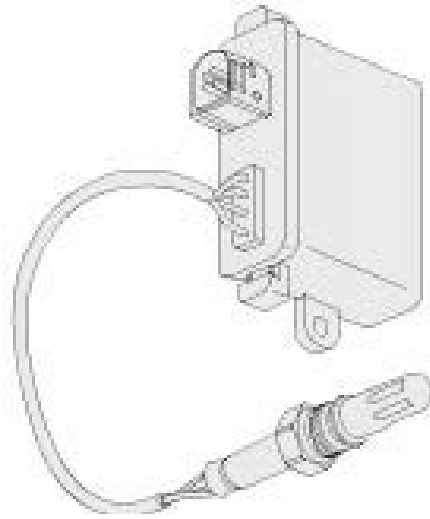
Solution

This Solution is relevant regardless of previous visits and sensor replacements. At this time, multiple sensor failures are not uncommon, regardless of how new the sensor is. The same procedure should be followed for every instance.

PLEASE NOTE: Instructions have been updated as of 20 June 2019. If diagnostics indicate that sensor replacement is required, please follow FSB 284 - 068 Exhaust Particulate Sensor, Repair (2016) or FSB 284 - 069 (2017) Exhaust Particulate Sensor, Repair. An eService case is not required

Precautions

1. The PM sensor is a smart sensor (12V supply and CAN lines) **with an orientation tab as seen below:**



Installation torque of 50 Nm +/- 5

Nm

2. PM sensors need to be handled carefully. Dropping them most likely results in permanent damage to the sensor. Keep cap on the sensor until ready to install the sensor to avoid any contamination.

3. NEVER (DO NOT) apply anti-seize to install the PM sensor. *If for some reason someone applied it before this repair, thoroughly clean the threads and sealing surfaces while replacing the sensor.*

4. A removed PM sensor should be capped immediately (cap from replacement sensor) and packaged carefully, if returning to warranty or investigation purposes.

Repair

IMPORTANT:

- **If a chassis arrives with a derate warning active, the PM sensor is not the source of the derate and there is a separate existing issue.**
- **Prior to installing a new sensor for any of the steps below, gently shake the sensor and ensure it does not rattle. If noise is heard, another sensor should be used.**

1. Verify the chassis emissions level

- Details can be found in the Product Details box on the Product tab in PTT as seen below:



- **For US17+OBD16 (Common Rail Fuel System) Chassis setting DTCs P24DA or P1031 ONLY:**

- Software improvements have been released to address this code. Refer to CBR Solution [K00527512](#).

- **For US17+OBD16 Chassis setting any other codes for the PM Sensor,** Proceed with instructions below.

- **For US14+OBD16 (Commonly 2017 model year):** Proceed with instructions below.

2. Check the DTC Status

Only troubleshoot PM sensor faults if the fault is *Active* or *Confirmed* as shown below.

Detailed status information	
Title	Value
Confirmed DTC	True
Pending DTC	False

3. Follow the set of instructions for the relevant DTC(s):

- **P1033, P1034, P24D0 or U02A3 fault codes (*Confirmed* or *Active*)**

- These PM sensor fault codes require connections and wiring harness checks for power supply and CAN communications. Repair can be verified with just KEY ON as diagnostics run immediately.

- **If wiring harness and connections check isolates the problem to the sensor:**

1. Remove the sensor from the exhaust.
2. Obtain a new sensor. Gently shake the new sensor to ensure it does not rattle.
NOTE: A sensor that rattles should **not** be installed.
3. Install the new sensor.
4. Clear the DTCs and release the vehicle.

• **P1031 and P24DA (both fault codes and only these fault codes *Active*)**

- **If the vehicle has PM sensor part number 22733524 or older:**

1. Replace the PM sensor with the latest part. Gently shake the new sensor to ensure it does not rattle.

NOTE: A sensor that rattles should **not** be installed.

2. Update the Engine Control Module (EMS) software and clear all codes.
3. Release the vehicle.

- **If the PM sensor is the current part number:**

1. Verify that the EMS software is current.
2. Remove the sensor from the exhaust.
3. Obtain a new sensor. Gently shake the new sensor to ensure it does not rattle.

NOTE: A sensor that rattles should **not** be installed.

4. Install the new sensor.
5. Clear the DTCs and release the vehicle.

• **All other PM sensor fault codes (*Confirmed or Active*)**

P24B3, P24AF, P2AB0, P24B1, P24B0, P24DA, P24B7, P24B5, P24D1, P24FC, P24AE, P24B4, and P1032. (Highlighted are common faults).

1. Verify that the EMS software is current.
2. Remove the sensor from the exhaust.
3. Obtain a new sensor. Gently shake the new sensor to ensure it does not rattle.

NOTE: A sensor that rattles should **not** be installed.

4. Install the new sensor.
5. Clear the DTCs and release the vehicle.

Internal comments (BO)

• **If a Diagnostic Monitor fails, DO NOT PERFORM A REGEN . Perform the following steps:**

1. Turn the vehicle's ignition OFF.
2. Restart Premium Tech Tool.
3. Reconnect to the vehicle with PTT.
4. Start the engine.
5. Rerun the Diagnostic Monitor.

NA_Sister solutions

[K00527512](#), [K14122525](#), [K47547856](#)

Campaign code

FSB284-067

Solution visibility

Dealer distribution

Function(s)/component(s) affected

Function affected

1 1 0 EMS , 2 1 0 ACM , TT , SCR , DPF

Function Group

Function Group

254 catalytic converter; exhaust emission control equipment , 258 emissions after-

Customer effect

Main customer effect soot , diagnostics/methodology , fault code/display

Fault Codes And Error Codes

OBDS Diagnostic Trouble Codes (P, U, B Format) P1031 , P1032 , P1033 , P1034 , P249C , P24AE , P24AF , P24B0 , P24B1 , P24B3 , P24B4 , P24B5 , P24B7 , P24D0 , P24D1 , P24DA-00 , P24FC , P2AB0

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