

SS 1034797 M2,108SD, 114SD Coolant Level Sensor P/N 06-93316-002

Applicable Vehicles:

Applies to all M2, 108 / 114 SD vehicles utilizing the Low Coolant Level (LCL) sensor 06-93316-002.

Issue:

The Call Center has received several calls pertaining to this LCL sensor introduced to in 2018. The purpose of this solution is to bring better awareness to the sensor functions, fault codes generated, along with providing testing procedures used to validate the sensors condition.

Background:

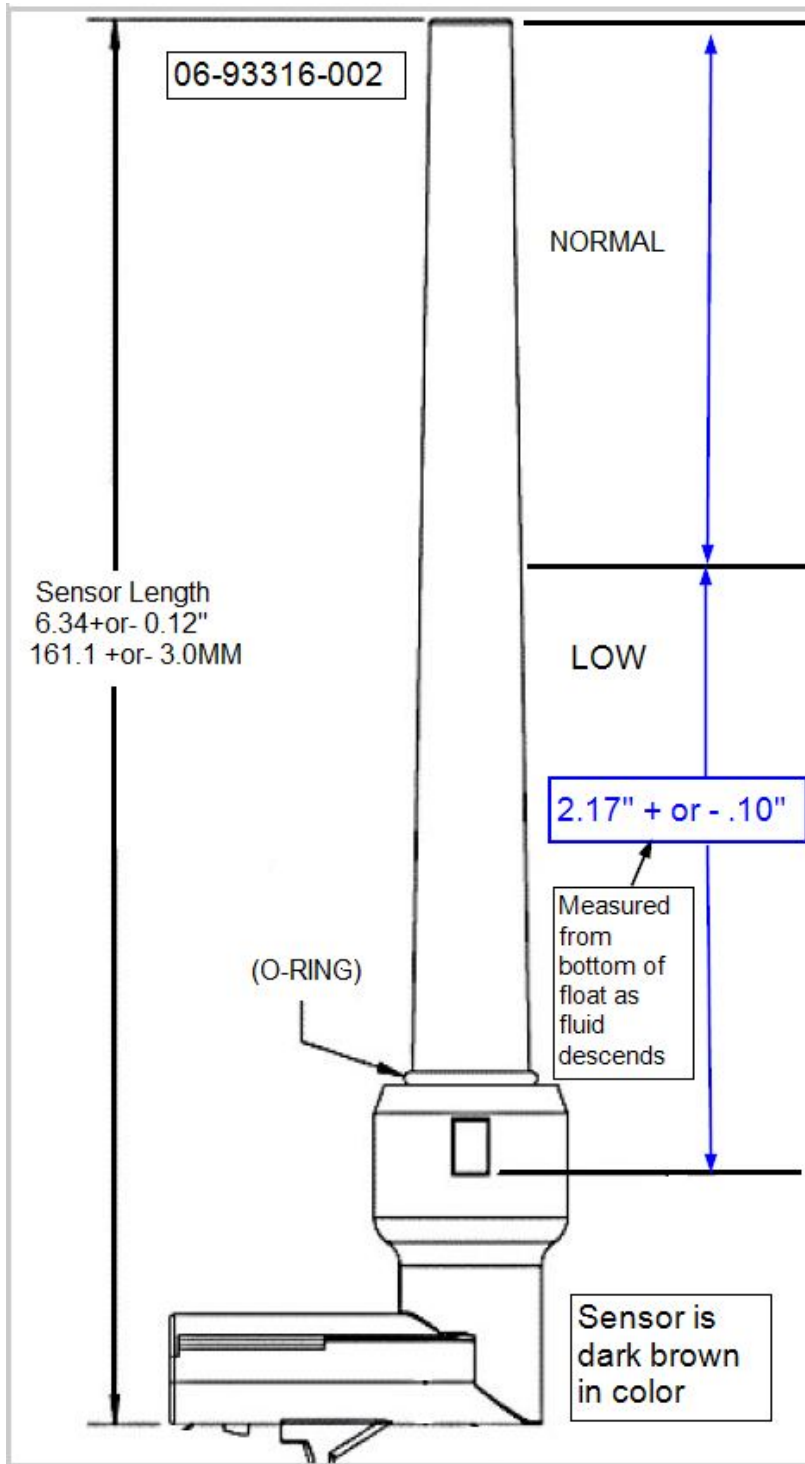
The sensor mounts in the bottom of the surge tank and utilizes a dry fit installation, meaning the sensor can be removed without draining the engine coolant. The sensor sits vertically in the tank and uses a float with two magnets (mounted in the tank) to open and close switches in sensor to determine coolant level. The sensor only has two values, normal and low used to monitor coolant level. The sensor has an external O-ring used to help hold engagement of the sensor when locked in place. It is important that the sensor have this O-ring when mounting the sensor into the tank. There are other versions of the LCL sensor 06-93316 base part number, however, only the -002 (Dark Brown in color) is currently used on the M2, 108SD and 114SD vehicles.

Sensor Information:

06-93316-002 - Resistance Values

Resistance (Ohms)	Level
133 + or - 3	Normal
1200 + or- 60	Low

Sensor measurements

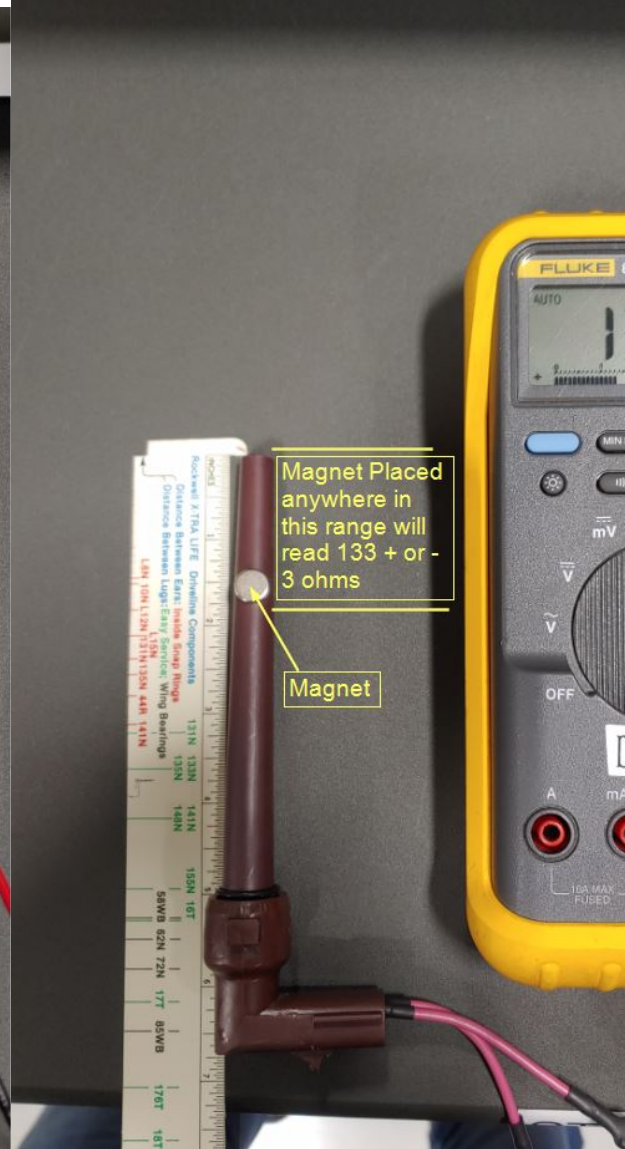
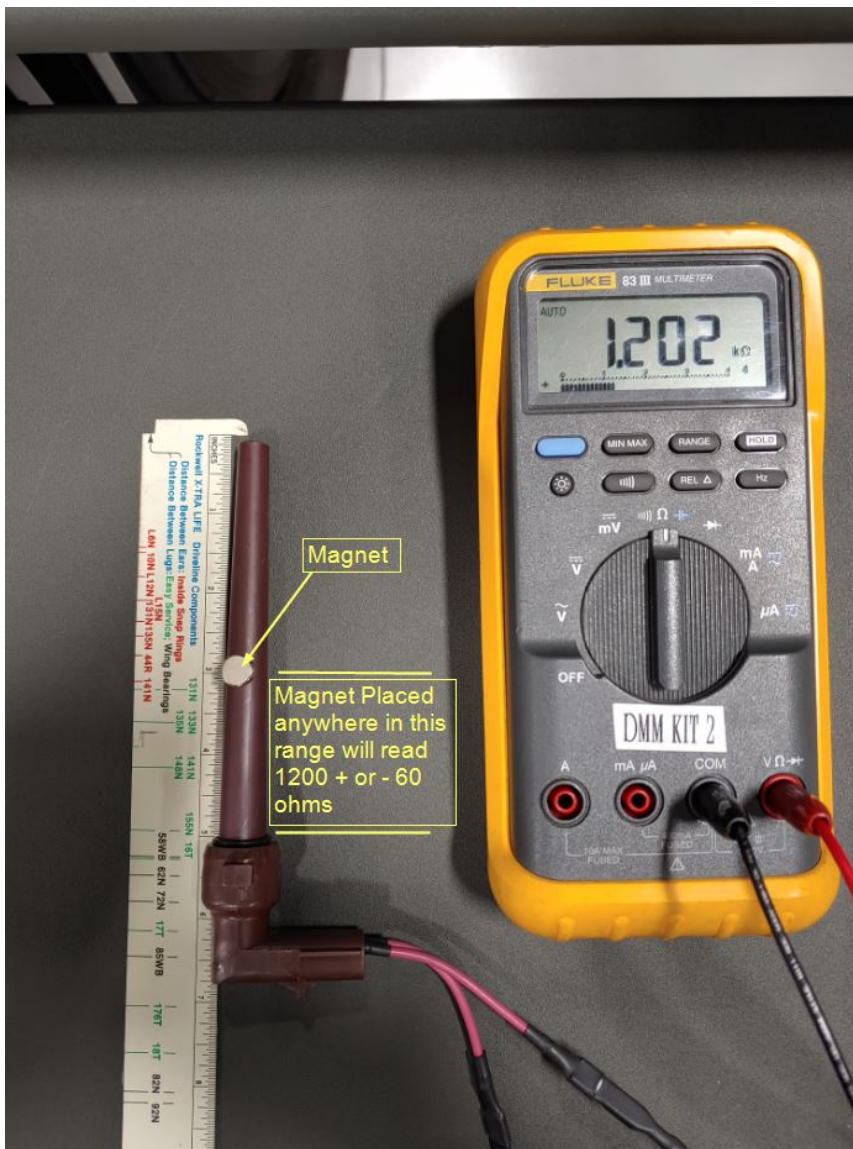


Sensor Testing:

A magnet can be used to move the switches with in the sensor. If no magnet is around the sensor it will read 1200 + or - 60 ohms. If a magnet is placed on the upper portion of the sensor as pictured in the sensor measurements for "Normal" then the ohms reading should be 133 + or - 3 ohms. If the magnet is moved to the bottom of the sensor "Low" then it will read 1200 +or- 60 ohms. Reference the pictures below for examples of sensor testing.

Example coolant level (LOW)
(Normal)

Example coolant level
Example coolant sensor out of tank (no magnet)



Codes that are generated with each engine:

Even though the same sensor is used with both the Cummins and Detroit engines, the codes generated for coolant level will appear different.

Cummins LCL Codes:

SPN/FMI 111/3-Coolant level Voltage Above Normal Shorted High

SPN/FMI 111/18- Coolant level low

SPN/FMI 111/4-Coolant level Open Circuit or Shorted low

Detroit LCL Codes:

SPN/FMI 111/3-Coolant level Voltage Above Normal Shorted High

SPN/FMI 111/1-Coolant level Critical low

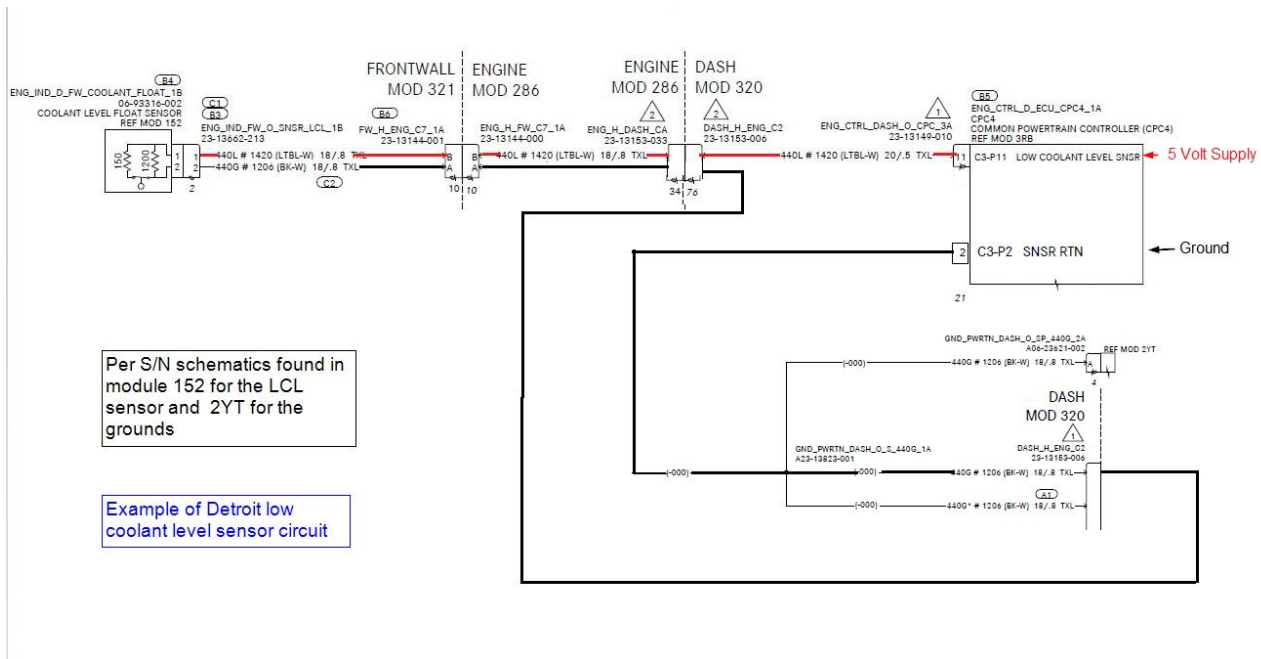
SPN/FMI 111/4-Coolant level Open Circuit or Shorted low

Circuit checks to validate wiring integrity:

Both Cummins and Detroit use 5 volt supply for the low coolant level sensor returning to a shared ground. It is important that if the LCL sensor tests good and coolant level fault codes are showing in the service tool, that we validate that all connections between the 5 volt supply and ground are good and no added resistance is present. Also make sure to perform a visual inspection of the wiring, ensuring that there are no chafed wires. If chafed wires are found during an inspection, make sure to repair the wires using the procedures noted in FTL Service Bulletin 54-290, making sure to add the appropriately sized twist tube to the chafed area. Make sure to inspect connector pins and terminal looking for any visual damage or corrosion.

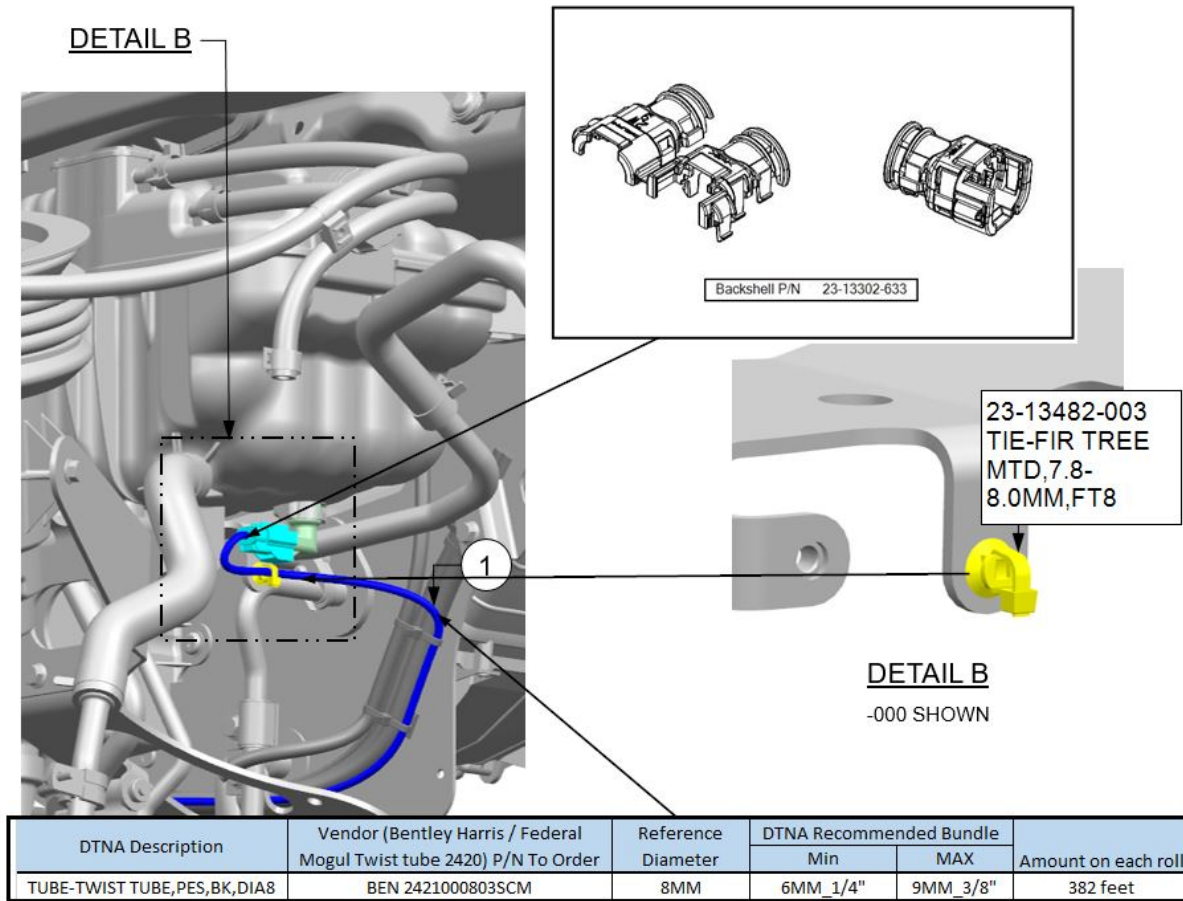
Example of Cummins LCL wiring Circuit:

Example of Detroit LCL wiring Circuit:



Extra harness support, 8MM twist tube, along with a backshell can be added at the LCL sensor, if damage is found in that area. See below illustrations for added components.

Extra harness support for ISB, L9, DDE5, DD8, ISLE5 and MBE900 engines.



-000 SHOWN, B6.7, L9, DD5, DD8, ISLE5, MBE900

Extra harness support for X12 engines

