



Technical Service Bulletin

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Fuel Accuracy Troubleshooting Guide

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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

- ISL9 CM2150 SN
- ISX15 CM2250 SN
- X15 CM2350 X123B
- X15 CM2450 X124B
- X15 CM2450 X134B
- X15 CM2450 X142B
- X15 CM2450 X154B

Issue

This TSB provides instructions to detect the root cause of fuel consumption accuracy issues reported by customers. When comparing fuel consumption values in electronic service tool to customer measurements (vehicle mileage divided by liters of fuel filled) the results differ by more than +/- 3 percent. The root cause determined by investigations is inaccuracy in measurement performed by the end user.

Verification

Step 1: Gather and review value and calculation method provided by the end used.


$$\text{Fuel Accuracy (\%)} = \frac{\text{Fuel filled} - \text{Fuel reported by ECM}}{\text{Fuel filled}} \times 100$$

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Calculation Method

- Review and confirm method used by end user to calculate fuel accuracy.
- If average value from fleet is out of the specified by Cummins® (+/-3%), continue to step 2.
- If average value from fleet is under values specified by Cummins® (+/-3%), notify the end user that value meets Cummins® specified values.

Step 2: Review end user fuel consumption information.

- Fuel consumption data (real measurement vs ECM reported)
- Operator names for each trip performed
- Customer routes
- Gross Combined Weight (GCW)
- Kilometers from unit odometer
- Number of affected units
- Truck model affected
- Does the end user have self-consumption?

With the information gathered, most critical units will be defined.

Step 3: Review measurement method according to Fuel Consumption Test Procedure es175-005-010-tr.

- Confirm that powertrain coincides with information provided by end user.
- Confirm that fuel supply pumps used by end user are certified.
- Review general connections of fuel system to discard leakages or external factors.

- Review customer method to calculate the fuel supply pump correction factor.

Step 4: Review maintenance information related to engine.

Review the fuel system:

- Correct primary fuel filter (Filter capacity 7-10 micron and WIF included). Check Owner's Manual for correct fuel filter part numbers.
- If maintenance schedule information is available, review primary fuel filter purge and change interval information.

If units meet the Cummins® maintenance recommendations, perform a physical test to measure fuel accuracy with the units that are most out of the expected fuel accuracy value.

Step 5: Perform fuel consumption test.

Once steps 1 through 4 are completed, perform fuel consumption test to measure and confirm the engine fuel consumption accuracy. After the test it is required to complete a report that describes the test conditions, observations, and vehicle profile.

Before the test, record information below from unit:

- OEM:
- VIN:
- ENGINE:
- ESN:
- HP:
- GEAR:
- TIRE/DIAMETER:
- KM ODOMETER:
- Gross Combined Weight (GCW):
- ROUTE:

Before the test, review and record the condition of the following:

- Air filter
- Fuel filters
- Fuel lines
- Fault codes

Before the test, it is also recommended to review and record the condition of the following if possible to ensure the safety and performance of the vehicle and to prevent test interruption:

- Oil level
- Coolant level
- Vehicle shock absorber
- Tire pressure

If an issue or leak is detected on the unit, or the operator is **not** able to perform the test, the test will **not** be performed until issues are resolved. It is expected to have ideal conditions for the test with competent operators.

Fill and mark the fuel tank(s) to 95% full during initial fill. It is recommended to use ¼ inch hose to confirm the fuel tank is 95% full. Mark the level on the hose. See Figure 1.

The audit jar **must** be used during initial fill to calculate the fuel supply correction factor. See Figure 2.

- Initial fill: Refers to filling the fuel tank at the start of the test. The fuel tank **must** be at 95% of the fuel tank capacity. Filling more than 95% capacity could lead to expansion of fuel from fuel temperature and can cause fuel spillage and leakage.

Download and reset trip information.

For the final fill (and intermediate fills if applicable), calculate the fuel supply correction factor with the audit jar. See Figure 2.

- Final fill: Is the refilling of the fuel tank after finishing fuel consumption test. The fuel tank **must** be filled to 95% capacity and fuel **must** be cold. Performing the final fill with high fuel temperature could cause a volume decrease when the temperature decreases.

Audit Jar Instructions:

- Audit Jar: Use the audit jar to audit the fuel supply pump to ensure that the volume filled in the tank will be accurate versus the volume calculated on the ECM. The audit **must** be performed during the initial fill and if the final fill is performed in another fuel supply pump, that pump **must** be audited to know the fuel pump correction factor.
 - Example:
 - Program the fuel supply pump and fill the audit jar, the volume showed on the display is know as "Vb", volume supplied by pump, and the volume registered on the audit jar is know as "Vr" real volume showed on the audit jar.
 - Calculation is made next:
 - FCB= Fuel pump factor correction
 - $FCB = Vr/Vb$
 - Example:
 - $Vr=19.850$
 - $Vb=20$
 - $FCB = 19.850/20 = 0.992$
 - From using the audit jar and performing the fuel pump correction factor calculation, the supply pump fill relation is not a one-to-one relationship. Filling a truck with 500 liters of fuel and applying the correction factor (500×0.992) results in 496 liters; a difference of 4 liters is caused by fuel supply pump calibration.

Resolution

Share the test results and recommendations with the end user.

Note : Fuel usage factor is an editable parameter (+/-20% or +/-5) from the nominal 100% depending on the Service Model Name. Cummins Inc. is not responsible for how external users use this feature.

Steps for adjusting Fuel usage factor with INSITE™ electronic service tool. See Figure 3.

1. Connect with electronic service tool
2. Go to Features and Parameters
3. Enter calculated value
4. Make sure the change is properly made.

Appendix



Figure 1, 1/4 Hose To Confirm Fuel Level



Figure 2, Audit Jar And Scale For Checking Fuel Supply Pump

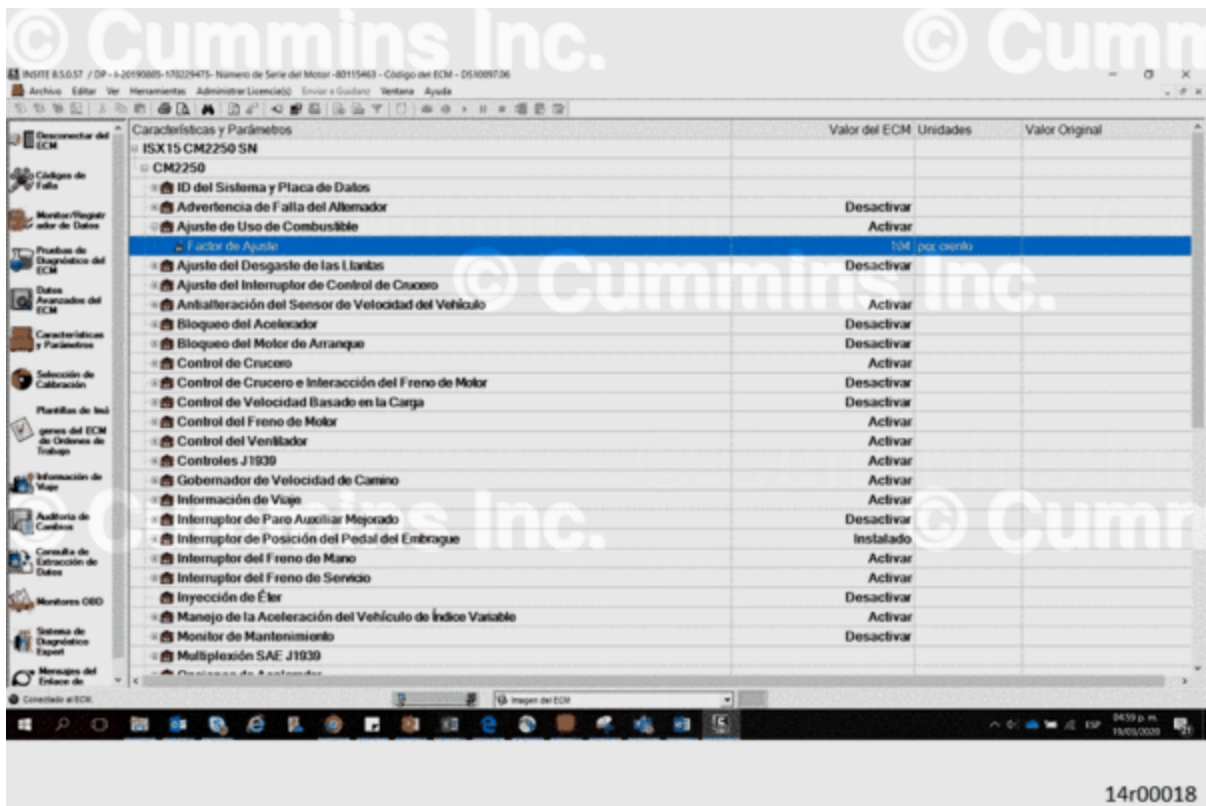


Figure 3, Adjust Fuel Usage Factor

Document History

Date	Details
2020-5-13	Module Created
2021-6-25	Added ISL9 CM2150 SN to Product Affected section.
2021-7-7	Updated.
2021-7-7	Updated.
2021-9-13	Added X15 CM2350 X123B.
2023-4-18	Added X15 CM2450 X124B and X15 CM2450 X134B.
2026-6-29	Added X15 CM2450 X154B.

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