



Technical Service Bulletin

Technical Service Bulletin: TSB180095	Released Date: 25-Feb-2021
Repeat Occurrences or Troubleshooting Exhausted: Fault Codes 1682, 3574, and 3596.	

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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

- ISB6.7 CM2250
- ISB6.7 CM2350 B101
- ISC8.3 CM2250
- ISL9 CM2250
- ISL9 CM2350 L101
- ISX12 CM2350 X102
- ISX12/ISX11.9 CM2250
- ISX15 CM2250
- ISX15 CM2350 X101
- L9 CM2350 L119B

Issue

Symptom:

- Repeat occurrences of Fault Codes 1682, 3574, or 3596.
- Diesel exhaust fluid (DEF) pressure issues can appear to be on a “timer” with a certain amount of hours or miles before the fault codes become active.
- Troubleshooting might have been exhausted and DEF system might perform well in the shop.
- Multiple aftertreatment diesel exhaust fluid (DEF) dosing units might have been replaced but fault code 1682, 3574, or 3596 occurrences persist.
- DEF tank might have been cleaned but problem persists.

Root Cause:

- DEF system is contaminated with debris.
- In some instances, DEF tanks are cleaned and DEF dosing units or intake lines are flushed or even replaced, but these actions are **not** performed simultaneously. Subsequent testing or operation between component cleaning causes cross contamination of previously cleaned components and repeat fault code occurrences.

Verification

If any combination of symptoms listed in Issue section are present, proceed to Resolution section below.

Resolution

Debris can impact DEF pressure and aftertreatment DEF dosing unit performance in two ways:

1. Debris builds up in intake fitting screen of aftertreatment DEF dosing unit and restricts flow into pump. Debris can be paper, fibers, or smaller particles of sand, rock, or dirt that build up over time.
 - Visual inspection of intake fitting screen alone might **not** identify this issue. At key off, purge cycle can push debris out of intake screen and into intake line or DEF tank head.
 - DEF dosing unit suction test is intended to evaluate pump performance and can **only** detect a blocked intake fitting that is 100 percent blocked.
 - DEF dosing unit intake restriction test will **not** identify this issue even if the fitting is restricted at time test is performed, because the intake fitting is downstream of restriction measurement.
2. Debris collects on the pump intake valve in aftertreatment DEF dosing unit and prevents the intake valve from sealing properly. This form of debris will be small because debris has to pass through the 103 micron aftertreatment DEF dosing unit intake screen to get to the intake valve. Particles larger than 40 microns can cause pump performance issues (a human hair is approximately 50-70 microns wide).
 - Inspection of DEF through tank fill port is **only** intended to catch gross contamination of system.

- o If debris is present on the pump intake valve of DEF dosing unit, the DEF dosing unit suction test will fail. Debris can cause intermittent pressure fluctuations as it moves on and off of intake valve, and the DEF dosing unit suction test might pass even though debris is present in the system.

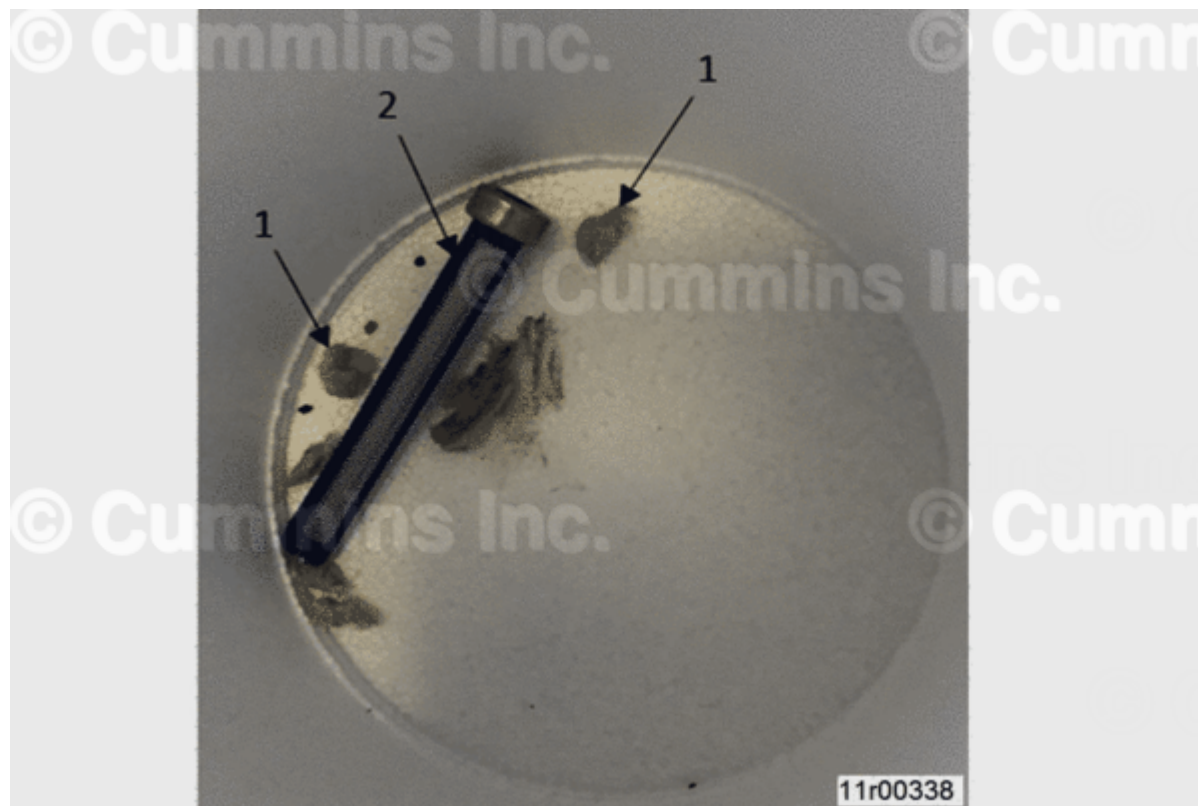


Figure 1, Example of Debris Found in Intake of DEF System Causing Flow Blockage.

1. Paper debris.
2. Aftertreatment DEF dosing unit intake fitting screen.

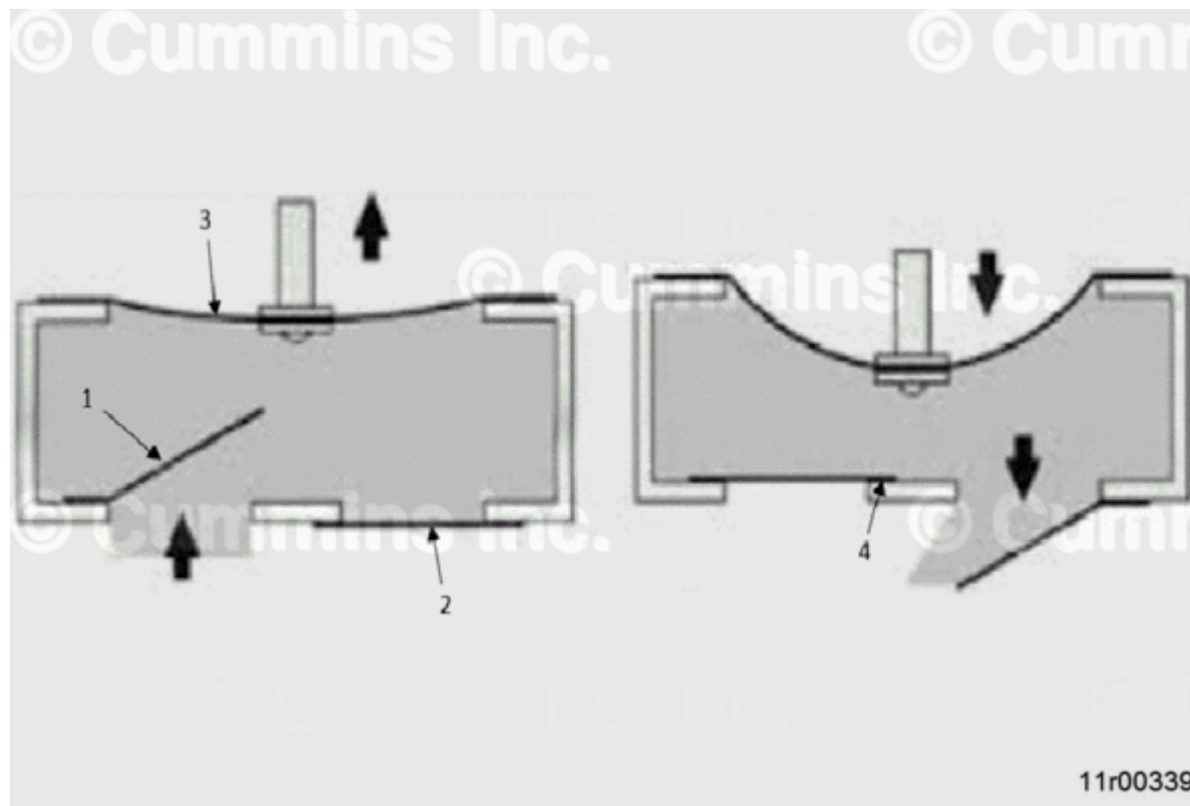


Figure 2, Typical Operation of Diaphragm Style Pump in Aftertreatment DEF Dosing Unit.

1. Intake valve (membrane style).
2. Outlet valve (membrane style).
3. Pump diaphragm.
4. Location where debris builds up causing intake valve **not** to seal.

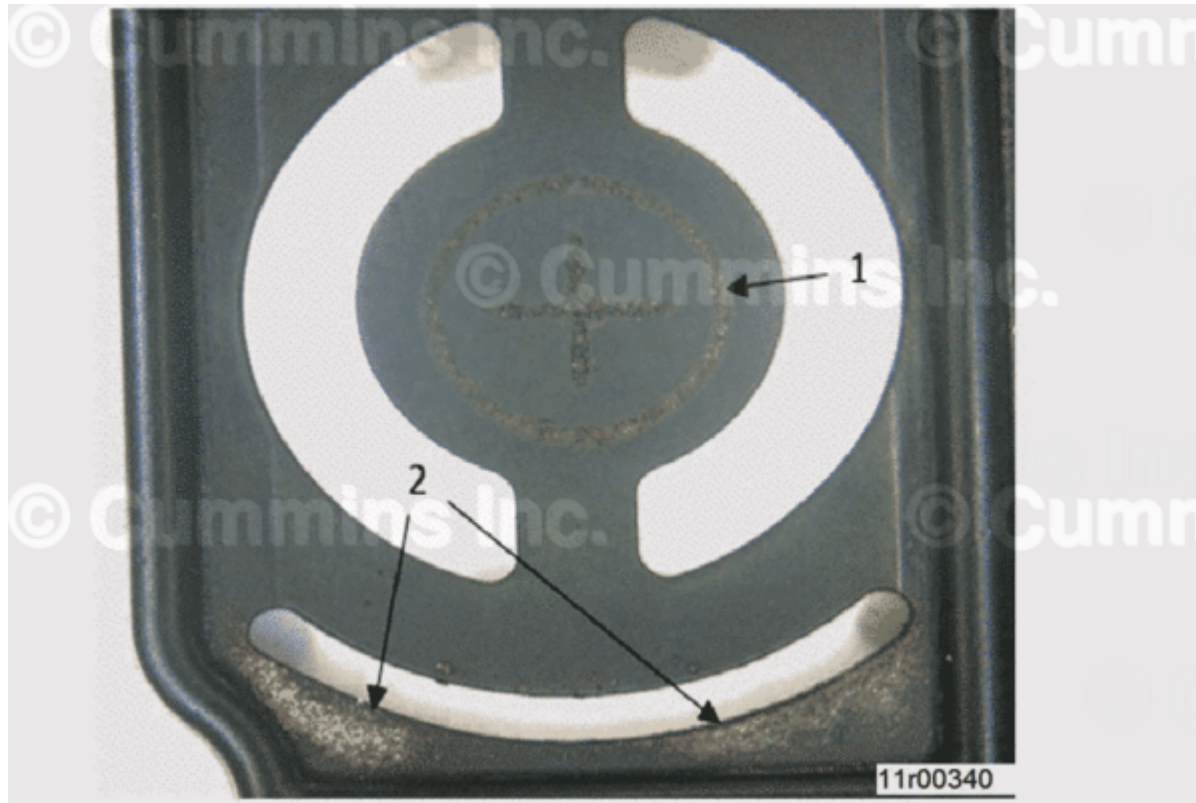


Figure 3, Debris Build Up on Aftertreatment DEF Dosing Unit Pump Intake Valve Plate. Intake Membrane (Valve) Seals Over this Plate On Pump Pressure Stroke.

1. Debris causing pump performance issue. This is what is flushed out when performing dosing unit non-air flush.
2. Loose debris that settled on the edge of the valve plate.

Perform following steps simultaneously:

- Drain DEF tank and discard DEF. See equipment manufacturer service information.
- Steam clean inside of DEF tank and then rinse thoroughly with clean water. If the design of the tank does **not** allow all of the water to drain out, use a wet/dry shop vacuum to remove any remaining water. Make sure any vacuum attachments used are clean.
- Inspect the inside of the tank and verify there is no remaining debris.
- Remove and discard DEF tank filter.
- Rinse DEF tank header and flush tank header pickup tube with clean water.

- Flush intake line with clean water.
- Remove and replace aftertreatment DEF dosing unit intake fitting. Before removing intake fitting, verify area around fitting on aftertreatment dosing unit is clean so dirt is **not** knocked into intake port.
- Remove and discard aftertreatment DEF dosing unit filter. See corresponding Service Manual. Reference Procedure 011-060 in Section 11.
- Perform aftertreatment DEF dosing unit non-air flush three times. See corresponding Service Manual. Reference Procedure 011-058 in Section 11.
- Perform the aftertreatment diesel exhaust fluid dosing unit suction test. See corresponding Service Manual. Reference Procedure 011-121 in Section 11. If out of specification, replace the DEF dosing unit. See corresponding Service Manual. Reference Procedure 011-058 in Section 11.
- Install new DEF dosing unit filter. See corresponding Service Manual. Reference Procedure 011-060 in Section 11.
- Install new DEF tank filter. See equipment manufacturer service information.
- Reassemble DEF tank, DEF tank header, and reconnect intake line. See equipment manufacturer service information.
- Fill DEF tank with clean DEF.

Other Considerations:

- If shop tap water is cloudy or contains visible impurities, flush internal DEF system components with bottled or distilled water.
- For optimal DEF system reliability, Cummins Inc. recommends using a 40 micron DEF tank filter with gradient depth filter media. If the DEF tank does **not** have a 40 micron gradient depth filter, contact original equipment manufacturer (OEM) or DEF tank manufacturer for part availability.

Document History

Date	Details
2018-7-11	Module Created
2021-2-25	Added L9 CM2350 L119B.

Last Modified: 25-Feb-2021
