

John Deere 4045, 6068, 6090 LIGHT LOAD EGR VALVE & COOLER SOOT DEPOSITS

WORK SAFELY!

Only a qualified service technician with proper training should perform this procedure. Follow all shop safety rules while performing this procedure.



John Deere Tier 4 Final & 4 Interim engines may experience heavy Unburnt Fuel (**Soot**) deposits in the Exhaust Gas Recirculation (**EGR**) Valve & Cooler due to Light Loading situations, thus causing the specific EGR fault codes: SPN 2659 FMI 1 or 18- NOx Based EGR Flow Correction Low.

Normal EGR Valve & Cooler Operation in the System

- The EGR valve opens so exhaust gas can recirculate back into the intake manifold. This lowers combustion temperatures and, therefore, lowers oxides of Nitrogen (NOx) emissions.

Effects on EGR system in Light Loading Situations

- The ECU derates the engine.
- EGR flow measured by pressure differential is significantly higher than EGR flow measured by temperature differential, and the EGR flow correction factor has reached the minimum limit.
- Soot deposits begin accumulating in the EGR valve & Cooler.
- Poor Engine Performance.
- NOx Emissions related fault codes
- Low DOC outlet temp. during a regeneration process.

ECU's Fault Detection of EGR System

- The valve is opened by the ECU when the engine is at operating temperature and under load. The valve is located at the entrance of the intake manifold, where exhaust gas and intake air are mixed. The valve is normally closed. If the Valve fails to open when meeting the desired engine temperature, a fault will come active.

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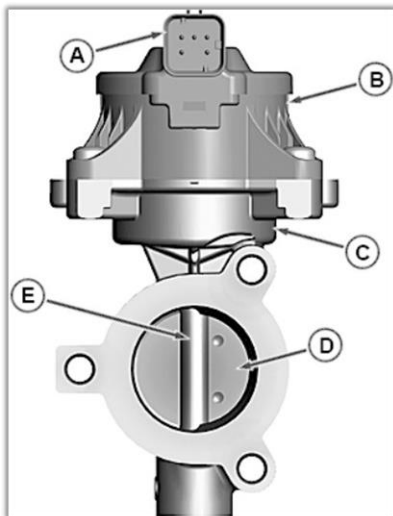
Corrective Action for EGR Valve and Emission related fault codes.

1. Remove the valve to clean off the deposits, (one electrical plug and 3 bolts), (1 Band-Clamp on cooler side for easy cooler inspection). (Note: Gaskets can be reused), Ref. Fig. 1 & 2.
2. Remove unwanted deposits using a flat blade screwdriver. Once deposits have been cleared, confirm the butterfly valve moves freely.
3. These EGR faults will self-clear at the next power (operator key or toggle switch) cycle if the valve motor is able to operate properly. (NOTE: If EGR Valve requires replacement, the new valve needs to be calibrated via engine software.)

PLEASE NOTE:

REMOVE AND INSPECT THE EGR VALVE & EGR COOLER FLEX PIPING AT 750 HOURS AS PART OF A STANDARD MAINTENANCE SCHEDULE.

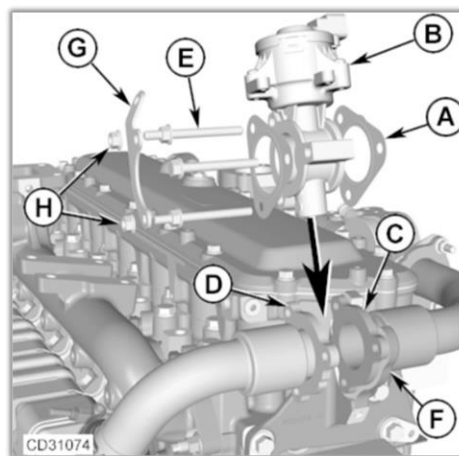
Fig. 1



Legend

- A – Electrical Connector
- B – Electric Motor
- C – Clutch Housing
- D – Butterfly
- E – Motor Shaft

Fig. 2



Legend

- | | |
|----------------------------------|-------------------------------------------------|
| A – Gasket | H – Nuts (2) |
| B – EGR Valve | I – Heat Shield |
| C – EGR Valve to Venturi Pipe | J – Spacer |
| D – EGR Cooler to EGR Valve Pipe | K – Clamp |
| E – Cap Screw (3) | L – Exhaust Manifold Pressure Sensor Connection |
| F – EGR Bracket | M – Cap Screw |
| G – Sensor Bracket | N – Nut |
| | O – Exhaust Manifold Pressure Sensor |

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EGR Cooler internal inspection

When suspecting an EGR Cooler with soot buildup or an internal rupture, it is recommended removing the flex elbow piping for easy access to complete a visual inspection.

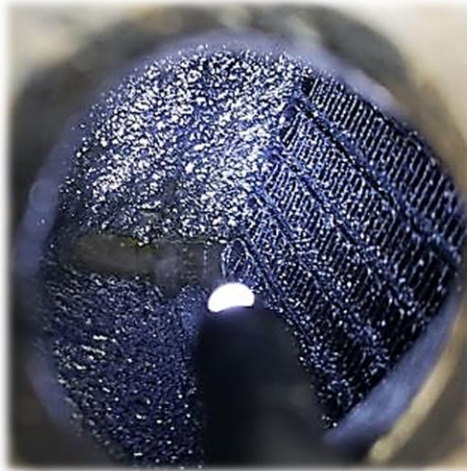
- Check for active or stored low coolant codes or low surge tank. If coolant loss is visible or DTC history indicates coolant loss, inspect for external leaks.
- Pressure test cooling system while inspecting for additional coolant buildup in the EGR cooler.
- **Note:** If EGR cooler is failed and a new cooler is installed, load banking is recommended, 2 hours of operation at a load of 75% of the generator's nameplate rating to verify engine reliability.
- Ensure to bleed coolant system at highest engine point after repairs.

If there is no coolant loss or low coolant DTC's, DO NOT replace the EGR cooler unless extreme soot buildup is present.

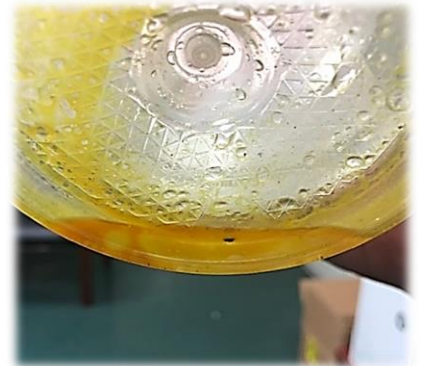
Due to the cooler efficiency, condensation will build in the cooler that is often mistaken as coolant. The condensation has a yellow tint - this is not coolant.



**Clean Cooler with
Condensation**



**Dirty Cooler with
Condensation**



**Condensation in Water
Bottle for Visual**