



Back Office - Diagnostic / Troubleshooting Procedures For Exhaust Gas Recirculation (EGR) System Components; Covers Most EGR System Diagnostic Trouble Codes (DTC), See List In Solution - US10, US10+OBD13, US14+OBD*, US17+OBD* With A Variable Geometry



> Internal Content

SOLUTION:

This solution should be used as a first-round diagnosis of EGR components. If inspection based on test results below does not reveal an issue, Guided Diagnostics should be followed.



The eService requirement for this solution was removed previously:



DO NOT open eService cases for this solution. Cases opened for tests performed below WILL BE REFUSED.

If a vehicle has any of the fault codes listed in the fault code section and no obvious issues are found from a visual inspection, follow the procedure below:

I. Initial Conditions



by starting Operation **2939-08-03-01 Exhaust Gas Recirculation Function** under the Test tab in DTT

FUNCTION UNDER THE TEST LAB III F II.

- Coolant temp **must** remain below 155 °F (68 °C) during this test. The EGR valve is commanded closed by the Engine Control Module during this time.

- Engine speed should be set to 780-840 RPM using the Cruise Control switch. 800 RPMs is ideal.

- Note that it may be necessary to set engine speed using the accelerator and the SET button initially. From there the SET and RESUME buttons should work to adjust speed.
- Certain chassis may need to have Maximum Stationary Engine Speed set to 900 before the cruise control buttons will work to adjust idle.

- VGT position should range between 6% and 14% depending on the coolant temperature.

- It is important that the turbocharger position be in the above range. If the exhaust temperature is very low, the VGT will open to 40% until the DPF outlet temperature sensor (T3) reaches 140 °F (60 °C). If the turbo position is greater than 14%, the truck should be allowed to run until position returns to between 6% and 14% before performing the checks below.

II. Checks

Both steps below should have a screenshot taken showing the parameter list as shown in the pictures for each step.

1. With initial conditions achieved, turbo speed should be checked when the EGR Position is 0%.

Should be taken with Conditions (in YELLOW) achieved and showing EGR valve at 0%.

EGR Valve Activation



Primary Parameters

0 %	EGR valve position
	EGR Differential pressure
	EGR Mass Flow
	EGR temperature
6% to 14%	VGT Nozzle position
Above 35,000 RPM	Turbocharger #1 Speed

Secondary Parameters

	Barometric pressure(BARO)
780 - 840 RPM	Engine speed
Under 155 °F (68 °C)	Engine Coolant Temperature (ECT)
	Intake Manifold Pressure
	Intake manifold temperature

- Turbocharger Speed (in LIGHT BLUE) should be greater than 35,000 RPM
- If Turbo Speed is less than 30,000 RPM, a sticking EGR valve is possible.
- If Turbo Speed is less than 20,000 RPM, a stuck EGR valve is highly likely
 - EGR differential pressure will likely show a value of at least .2 PSI (1.4 kPa).
 - The chassis may also generate excessive Parked Regeneration requests or driveability complaints.

2. Activate the EGR valve by pressing the Play button in the EGR

 Live UI activation box. The valve should open to 95%.

Should be taken with Conditions (in YELLOW) achieved and showing EGR valve at 95% just before the valve closes again OR the engine dies.

EGR Valve Activation

Primary Parameters

95 %	EGR valve position
Over .5 psi (3.45 kpa)	EGR Differential pressure
	EGR Mass Flow
	EGR temperature
6 % - 14 %	VGT Nozzle position
Under 15,000 RPM	Turbocharger #1 Speed

Secondary Parameters

	Barometric pressure(BARO)
780 - 840 RPM	Engine speed
Under 155 °F (68 °C)	Engine Coolant Temperature (ECT)
	Intake Manifold Pressure
	Intake manifold temperature

- Turbocharger speed should drop below 15,000 RPM within 10 seconds of valve activation.

- If turbo speed does not change, the EGR valve should be checked to confirm it is not stuck closed.

- If turbo speed drops but remains above 20,000 RPM, the EGR cooler is likely plugged.

- A turbo speed reaction to EGR valve activation is a normal indicator of an operational EGR valve.
- The Venturi tube should also be checked to ensure it is free of blockage (Much less likely).

- If turbo speed reacts as expected, the EGR differential pressure sensor or EGR Temperature Sensor are the likely issue for High or Low Flow codes.

- Check for clogs or excessive condensation in the EGR sensor, sensor supply tubes, or Venturi tube.
- Check for a non-plausible differential pressure value during valve activation.
 - A negative value or low value, for instance .2 PSI (1.4 kPa) or less, at full valve

Live UI ctivation is an indication of an EGR dP sensor and/or venturi tube issue.

- Check for a non-plausible EGR temperature value during valve activation.

- A temperature reading below coolant temperature or higher than exhaust temperature is an indication of an EGR temperature sensor issue.

 Tags

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Exhaust Gas Recirculation, Function Test

This test checks the function of the exhaust gas recirculation (EGR) system. It is possible to monitor the conditions which control the EGR system and control the EGR valve in order to check its function.

Exhaust Gas Recirculation (EGR) valve position %

EGR differential pressure psi

EGR Mass Flow ka/h

EGR temperature °F

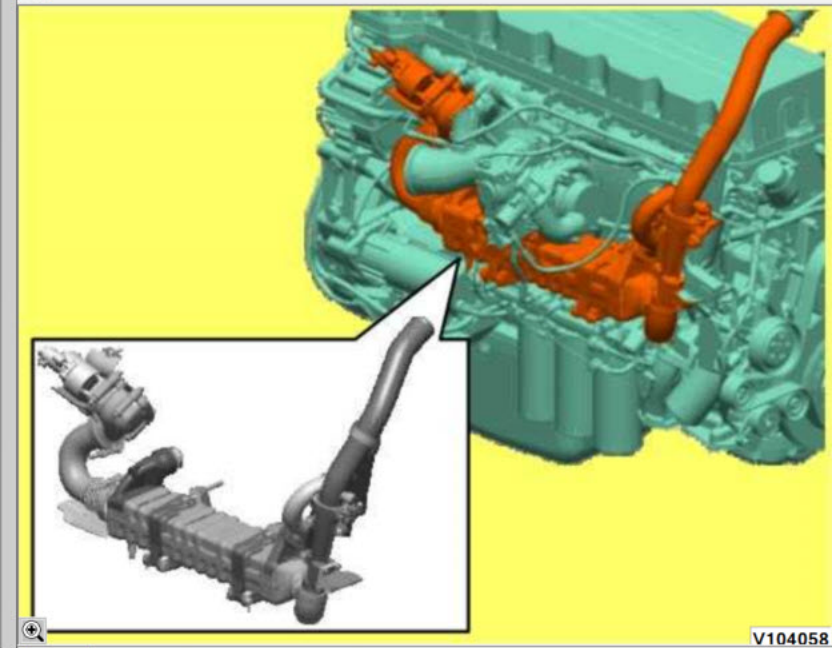
Turbocharger Status % - Turbocharger Nozzle Position
 r/min - Turbine Shaft Speed

EGR Valve Activation Status

Warm-Hold Status

Operating Conditions

- % - Engine Load
- r/min - Engine Speed
- °F - Coolant Temperature
- psi - Intake Manifold Pressure
- °F - Intake Manifold Air Temperature
- °F - Ambient Air Temperature



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