

Description of Revisions: *This bulletin replaces the version dated July 2012. Additional fault codes are included, and the test procedure is clarified.*

General Information

NOTE: This bulletin pertains to vehicles with Cummins engines and aftertreatment systems only.

NOTE: The test procedure should be performed with the header unit installed in the DEF tank.

The Gentech diesel exhaust fluid (DEF) coolant-flow-control solenoid is an electric 12V solenoid that controls the flow of coolant through stainless steel tubes in the DEF tank. The solenoid is checked every time the truck is started and is used when the DEF temperature drops to its freezing point, 12°F (-11°C) or below. The command is controlled by the Cummins engine controller. Three fault codes may indicate a problem with the DEF tank temperature data. See [Table 1](#). If any of these fault codes are shown, perform the following test to determine if the solenoid valve functions correctly.

Gentech DEF Coolant-Flow-Sensor, Related Fault Codes	
Fault Code	Description
1679	Aftertreatment DEF tank temperature – data erratic, intermittent, or incorrect.
1683	Aftertreatment DEF tank heater – voltage above normal, or shorted to high source.
1684	Aftertreatment DEF tank heater – voltage below normal, or shorted to low source.

Table 1, Gentech DEF Coolant-Flow-Sensor, Related Fault Codes

If the solenoid valve is functioning correctly, test the rest of the system for the problem.

If the solenoid valve is not functioning correctly, replace the solenoid valve assembly.

Solenoid Test

NOTE: Wear protective gloves when working on the DEF system to protect from crystallized DEF.

1. Park the vehicle on a level surface, shut down the engine, and set the parking brakes. Chock the tires.

IMPORTANT: Gentech changed the design of the coolant flow control solenoid in March 2011. There are two different solenoids with the same part number but different resistance values. Refer to [Fig. 1](#) and [Fig. 2](#) to see the differences in the solenoid housings. The tag on the solenoid will say, "7W" or "10W".

2. Determine which style of solenoid is installed on the vehicle. See [Fig. 1](#) and [Fig. 2](#).
3. Disconnect the 2-pin solenoid connector from the harness.
4. Measure the resistance of the solenoid. The solenoid resistance should be $20\pm1\ \Omega$ for the 7-watt unit, or $13.5\pm0.7\ \Omega$ for the 10-watt unit. Wiggle the solenoid pigtail to test for an intermittent condition.

If the reading is within specification, remove the Phillips screw from the solenoid, separate the two parts of the solenoid, and check for corrosion on or around the solenoid terminals. See [Fig. 4](#).

If the solenoid resistance is out of range, or if there is corrosion, replace the solenoid valve assembly.

If the solenoid resistance is not out of range, or if there is no corrosion, troubleshoot the rest of the system.

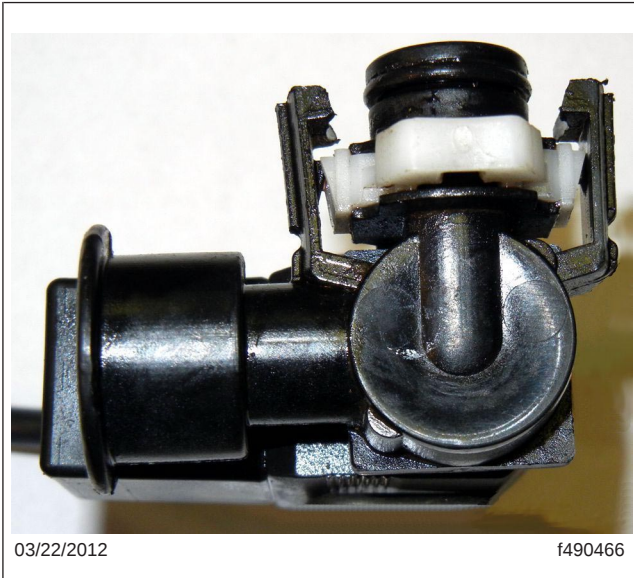


Fig. 1, 7-Watt Solenoid Valve ($20 \pm 1 \Omega$)



Fig. 2, 10-Watt Solenoid Valve ($13.5 \pm 0.7 \Omega$)

Solenoid Valve Assembly Replacement

1. Park the vehicle on a level surface, shut down the engine, and set the parking brakes. Chock the tires.
2. Using hose-pinch pliers, pinch off the rubber coolant lines connected to the DEF tank.
3. Remove the DEF tank cover, if equipped.
4. Place a catch pan under the DEF tank to catch any lost coolant.
5. Remove the retaining clip, and disconnect the coolant line at the solenoid valve.
6. Disconnect the wire harness from the solenoid. See [Fig. 5](#).
7. Remove the retaining clip.
8. Rotate the solenoid valve out of the retainer, and pull it from the header.
9. Push the the new solenoid valve into the header, and rotate it into the retainer.
10. Install the retaining clip.
11. Connect the wire harness.
12. Connect the coolant lines at the valve.
13. Remove the pinch pliers from the coolant lines.
14. Install the DEF tank cover, if equipped.
15. Check the coolant level, and add coolant as needed.

Parts

Parts are available through the PDC. See [Table 2](#) for part numbers.

Gentech DEF Coolant-Flow Solenoid, Testing and Replacement

49-10

> Constellation
Heritage
> 4700 Models

> 4800 Models
> 4900 Models

> 5900 Models
> 6900 Models

Western Star
Service Bulletin

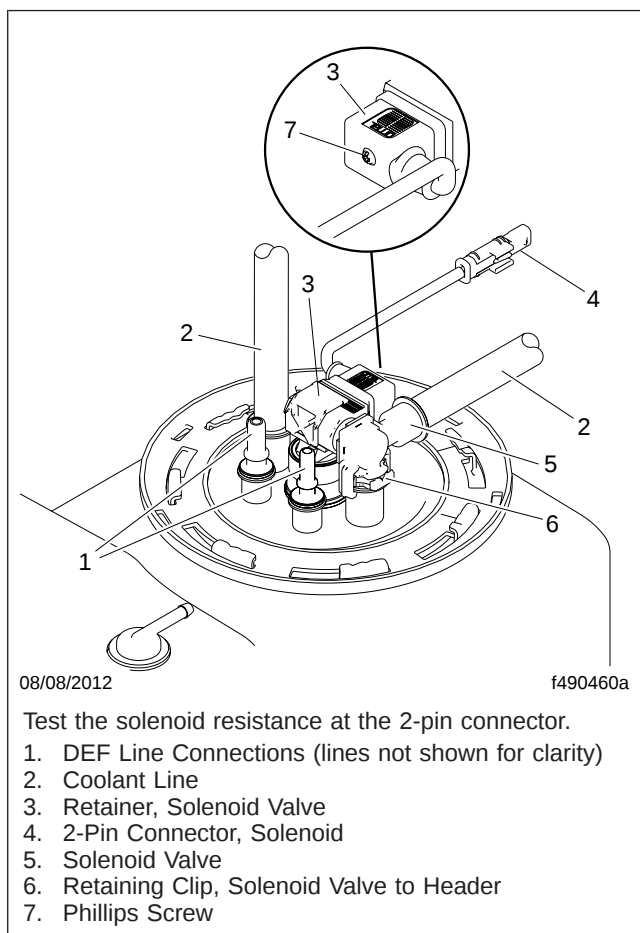


Fig. 3, DEF Coolant Flow Solenoid Installation (DEF lines not shown for clarity)

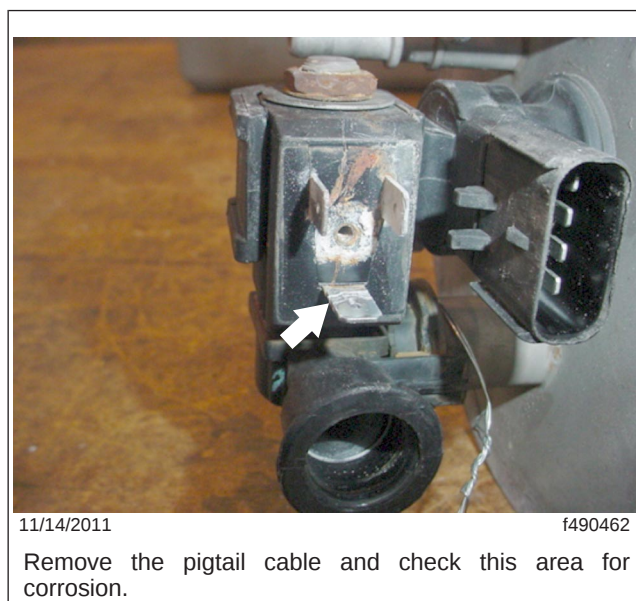


Fig. 4, Checking for Corrosion

Replacement DEF Solenoid Valves		
Part Number	Description	Where Used
04-28039-000	Solenoid Valve, LH	13- and 23-Gallon Tanks
04-28039-001	Solenoid Valve, RH	6-Gallon Tank

Table 2, Replacement DEF Solenoid Valves

Warranty

This procedure is warrantable only if the described condition exists and the repair is performed within the applicable base or extended coverage warranty period. If a failure is not found, this procedure is considered preventive and warranty does not apply.

Normal warranty applies. See [Table 3](#) for QuickClaim damage code and labor allowance information. Refer to this service bulletin by number at the beginning of the claim comments. See [Table 4](#) for OWL VMRS codes and labor allowance information. Enter this service bulletin number in the *Service Bulletin #* field.

Western Star
Service Bulletin> Constellation
Heritage
> 4700 Models> 4800 Models
> 4900 Models> 5900 Models
> 6900 Models

QuickClaim Damage Code and Labor Allowance			
Damage Code	SRT Code	Description	Time: Hours
23U-007-059	234-5005B	DEF, Coolant Flow, Solenoid, Test	0.2
23U-007-059	234-5005A	DEF, Coolant Flow, Solenoid/Valve, R/R	0.8

Table 3, QuickClaim Damage Code and Labor Allowance

OWL VMRS Codes and Labor Allowance					
Primary Failed Part	Component Code	Cause Code	SRT Code	Description	Time: Hours
04-28039-000 or 04-28039-001	043-007-018	12	234-5005B	DEF, Coolant Flow, Solenoid, Test	0.2
04-28039-000 or 04-28039-001	043-007-018	12	234-5005A	DEF, Coolant Flow, Solenoid/Valve, R/R	0.8

Table 4, OWL VMRS Codes and Labor Allowance