

1 05 04-18



Service Information Bulletin

SUBJECT	DATE
Fuel System - Fuel Injectors	May 2018

Additions, Revisions, or Updates


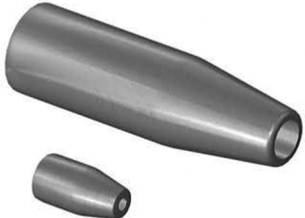
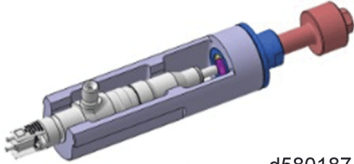

Publication Number / Title	Platform	Section Title	Change
DDC-SVC-MAN-0194	GHG17 DD5 934912(C)	Removal of the Fuel Injectors	Changes due to new tools and different steps
		Inspection of the Fuel Injectors	This is a new section
		Installation of the Fuel Injectors	Changes due to new tools and different steps
DDC-SVC-MAN-0198	GHG17 DD8	Removal of the Fuel Injectors	Changes due to new tools and different steps
		Inspection of the Fuel Injectors	This is a new section
		Installation of the Fuel Injectors	Changes due to new tools and different steps



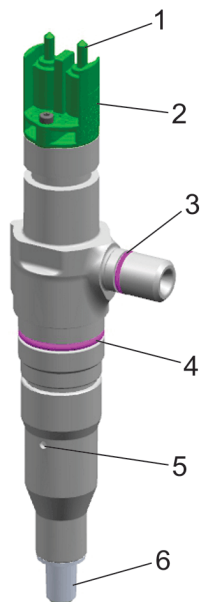
13400 Outer Drive, West, Detroit, Michigan 48239-4001
 Telephone: 313-592-5000
www.demanddetroit.com

2 Removal of the Fuel Injector

Table 1.

Service Tools Used in the Procedure		
Tool Number	Tool Name	Tool Graphic
W936589003300 or DSN930E17004	Injector Puller	 <p>d580185</p>
W936589013300	Injector Seal Installer	 <p>d580186</p>
W936589033300 or DSN930E17002	Injector Heat Protection Sleeve Tool Kit	 <p>d580187</p>
		 <p>d580188</p>

Remove as follows:



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1. Electrical Connector
2. Header With Calibration Codes
3. Injector Inlet O-ring

4. Injector Body O-ring
5. Fuel Return Port
6. Injector Tip

Figure 1. Fuel Injector**WARNING: PERSONAL INJURY**

To prevent the escape of high pressure fuel that can penetrate skin, ensure the engine has been shut down for a minimum of 10 minutes before servicing any component within the high pressure circuit. Residual high fuel pressure may be present within the circuit.

1. Shut off the engine, apply the parking brake, chock the wheels, and perform any other applicable safety steps.

**CAUTION: ELECTRICAL SHOCK**

To avoid injury from electrical shock, use care when connecting battery cables. The magnetic switch studs are at battery voltage.

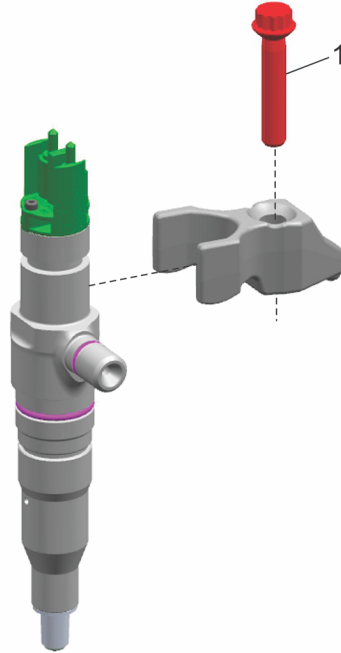
2. Disconnect the batteries.
3. Open the hood.
4. If necessary, remove the bumper end(s). Refer to the Original Equipment Manufacturer (OEM) procedures.

**WARNING: FIRE HAZARD**

Do not power wash or steam clean the engine bay in the area of vehicle electrical components, unless specified by vehicle manuals or service literature. Power washing/steam cleaning can permanently damage these components, which could result in fire, personal injury, or property damage.

5. Steam clean the rocker cover and rocker cover mounting area.
6. Remove the air compressor resonator and the rocker cover. Refer to section "Removal of the Rocker Cover".

7. Disconnect the fuel injector electrical wiring harness from the fuel injectors and position aside. Refer to section "Removal of the Fuel Injector Wiring Harness".
8. Remove the high pressure fuel injector feed lines. Refer to section "Removal of the High Pressure Fuel Injector Lines".
9. Remove the fuel injector hold-down bolt (1). Discard bolt.



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10. Using tool W936589003300 or DSN930E17004, lift the fuel injector clamp and fuel injector from its seat in the cylinder head.
11. Inspect for the copper heat protection sleeve on the injector tip; if present, remove and discard. If the copper sleeve is missing, use tool W936589033300 or DSN930E17002 to extract it from the cylinder head and discard.
12. Cover the fuel injector hole in the cylinder head to keep out foreign material.

NOTICE: Avoid cleaning (wire brushing etc.) the fuel injector tip spray holes to prevent damage and plugging.

13. Using a clean rag soaked with clean diesel fuel, carefully remove any carbon material from the fuel injector exterior.

NOTICE: Fuel injector O-ring seals, fuel injector clamp bolts and the copper heat protection sleeves are considered one-use items and cannot be reused. Any time a fuel injector is removed, the fuel injector bolt, two fuel injector O-ring seals and copper heat protection sleeve must be replaced with new parts. Failure to replace the O-ring seals, heat protection sleeve and bolt can result in leakage.

14. Inspect the fuel injector body for visible damage. Replace the fuel injector if damaged.
15. If the fuel injector is intended to be reused, remove and discard the two fuel injector O-rings and the copper sleeve.

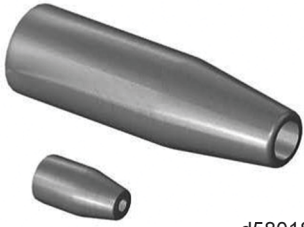
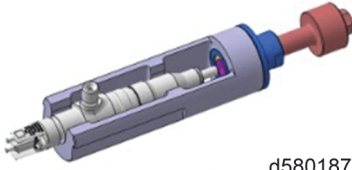
3 Inspection of the Fuel Injector

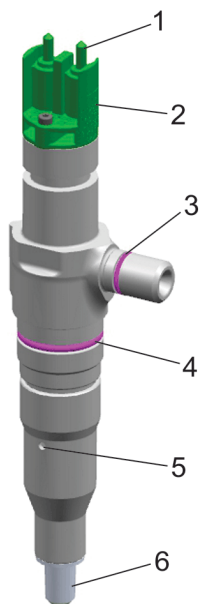
Inspect as follows:

1. Visually inspect the fuel injector body for cracks or damage. If damage is found, replace the injector.
2. Visually inspect for debris in the fuel inlet or signs of fuel contamination in the fuel inlet. If contamination is found, further troubleshooting is required.
3. Visually inspect the injector tips for cracks or damage from excessive heat. If damage is found, replace the injector.
4. Visually inspect the threads of the fuel injector inlet. If the threads are damaged, replace the injector.

4 Installation of the Fuel Injector

Table 2.

Service Tools Used in the Procedure		
Tool Number	Tool Name	Tool Graphic
W936589013300	Injector Seal Installer	 <p>d580186</p>
W936589033300	Injector Heat Protection Sleeve Tool Kit	 <p>d580187</p>



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- 1. Electrical Connector
- 2. Header With Calibration Codes
- 3. Injector Inlet O-ring

- 4. Injector Body O-ring
- 5. Fuel Return Port
- 6. Injector Tip

Figure 2. Fuel Injector

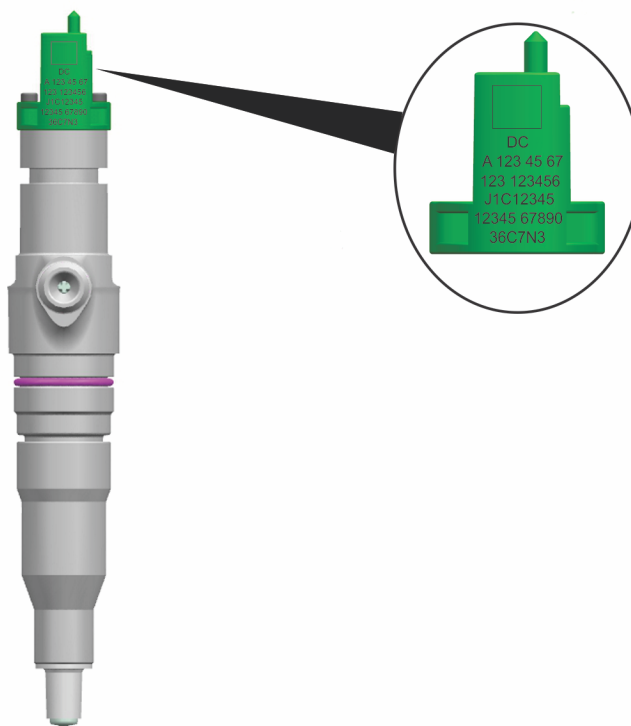
Install as follows:

NOTE: Ensure excess fuel is removed from the top of the piston dome before fuel injector installation.

1. If the fuel system, cooling system, or lubrication system is contaminated; refer to the appropriate troubleshooting.

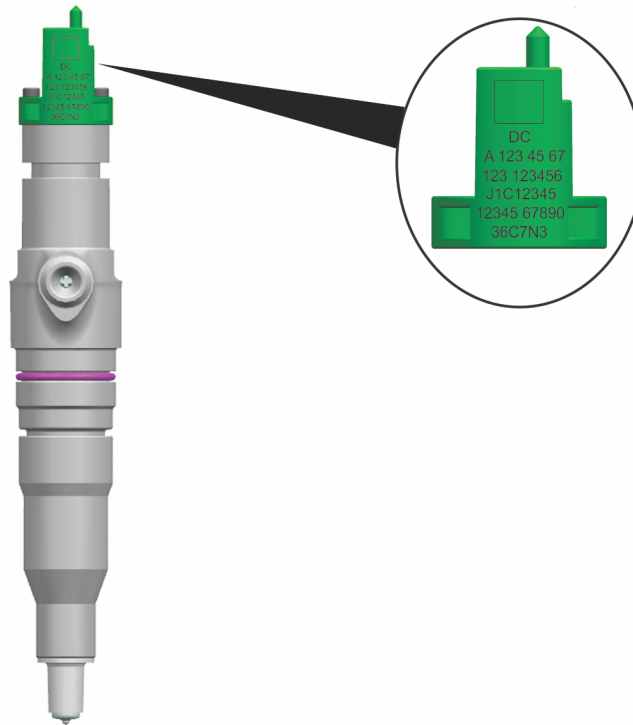
NOTICE: The inside of the fuel injector cup and cylinder head bore should be cleaned and inspected for damage or leakage of coolant before installation of the fuel injector.

2. Check to make sure the fuel injector cup and cylinder head bore are thoroughly clean.
3. If the fuel injector is being replaced, record the fuel injector calibration code, the injector part number, and note the cylinder location where the injector will be installed.



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4. If the fuel injector is being replaced, remove the fuel injector nozzle tip protector. Apply a thin coat of acid-free grease or clean engine oil to the fuel injector seal rings and then use W936589013300 (Fuel Injector O-ring Installer) to install them onto the fuel injector. Make sure they are properly seated.
5. Using tool W936589033300, install the copper heat protection sleeve on the fuel injector tip.
6. Install the fuel injector and clamp as an assembly into its respective fuel injector bore. Align the clamp over the bolt hole, install the new bolt into fuel injector clamp and snug until the fuel injector fully seats, then release the fuel injector bolt. **DO NOT** torque.
7. Install the high pressure fuel injector feed lines. Refer to section "Installation of the High Pressure Fuel Injector Lines".
8. Torque the fuel injector hold-down bolt to 25 N·m (18 lb·ft) + 90 degree torque turn.
9. Install the fuel injector wiring harness. Refer to section "Installation of the Fuel Injector Wiring Harness".
10. If the fuel injector was replaced, input the fuel injector calibration code and injector part number that were recorded earlier into DiagnosticLink[®] using the service routine.



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11. If the fuel injector was replaced because of a tip failure or leak, the EGR cooler must be cleaned. Refer to section "Cleaning of the Exhaust Gas Recirculation Cooler".
12. Install the rocker cover. Refer to section "Installation of the Rocker Cover".
13. Install the air compressor resonator. Refer to section "Installation of the Air Compressor Resonator".



CAUTION: ELECTRICAL SHOCK

To avoid injury from electrical shock, use care when connecting battery cables. The magnetic switch studs are at battery voltage.

14. Connect the batteries.




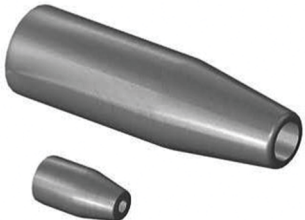
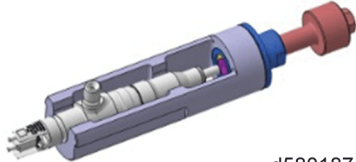

WARNING: PRESSURIZED FUEL

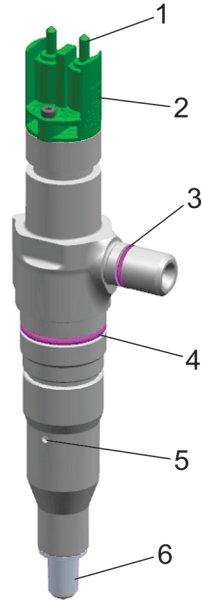
To avoid injury to eye or face, wear a face shield or goggles when conducting a pressure test.

15. Prime the fuel system. Verify repair. Refer to section "Priming the Fuel System".
16. If necessary, install the bumper end(s). Refer to the Original Equipment Manufacturer (OEM) procedures.
17. Close hood.

5 Removal of the Fuel Injector

Table 3.

Service Tools Used in the Procedure		
Tool Number	Tool Name	Tool Graphic
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- | | |
|---|---|
| <ul style="list-style-type: none"> 1. Electrical Connector 2. Header With Calibration Codes 3. Injector Inlet O-ring | <ul style="list-style-type: none"> 4. Injector Body O-ring 5. Fuel Return Port 6. Injector Tip |
|---|---|

Figure 3. Fuel Injector

Remove as follows:



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1. Shut off the engine, apply the parking brake, chock the wheels, and perform any other applicable safety steps.



CAUTION: ELECTRICAL SHOCK

To avoid injury from electrical shock, use care when connecting battery cables. The magnetic switch studs are at battery voltage.

2. Disconnect the batteries.
3. Open the hood.
4. If necessary, remove the bumper end(s). Refer to the Original Equipment Manufacturer (OEM) procedures.

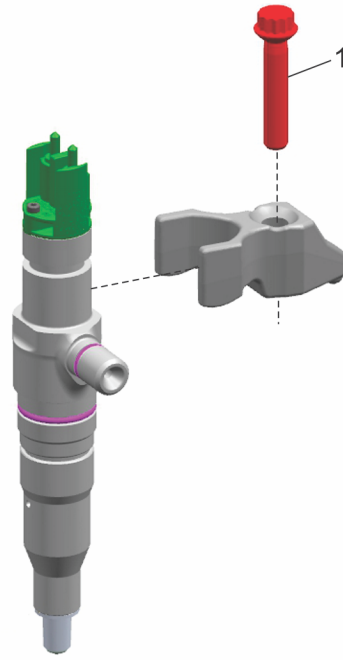


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5. Steam clean the rocker cover and rocker cover mounting area.

6. Remove the air compressor resonator and the rocker cover. Refer to section "Removal of the Rocker Cover".
7. Disconnect the fuel injector electrical wiring harness from the fuel injectors and position aside. Refer to section "Removal of the Fuel Injector Wiring Harness".
8. Remove the high pressure fuel injector feed line and discard. Refer to section "Removal of the High Pressure Fuel Injector Lines".
9. Remove the fuel injector hold-down bolt (1). Discard bolt.



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10. Using tool W936589003300 or DSN930E17004, lift the fuel injector clamp and fuel injector from its seat in the cylinder head.
11. Inspect for the copper heat protection sleeve on the injector tip; if present, remove and discard. If the copper sleeve is missing, use tool W936589033300 or DSN930E17002 to extract it from the cylinder head and discard.
12. Cover the fuel injector bore in the cylinder head to keep out foreign material.

NOTICE: Avoid cleaning (wire brushing etc.) the fuel injector tip spray holes to prevent damage and plugging.

13. Using a clean rag soaked with clean diesel fuel, carefully remove any carbon material from the fuel injector exterior.

NOTICE: The fuel injector O-ring seals, fuel injector clamp bolt and the copper heat protection sleeve are considered one-use items and cannot be reused. Any time a fuel injector is removed, the fuel injector bolt, two fuel injector O-ring seals and copper heat protection sleeve must be replaced with new parts. Failure to replace the O-ring seals, heat protection sleeve and bolt can result in leakage.

14. Inspect the fuel injector body for visible damage. Replace the fuel injector if damaged.
15. If the fuel injector is intended to be reused, remove and discard the two fuel injector O-rings and the copper sleeve.


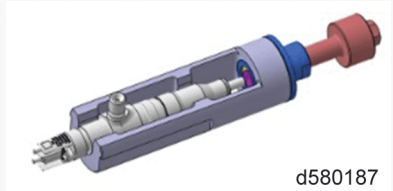
6 Inspection of the Fuel Injector

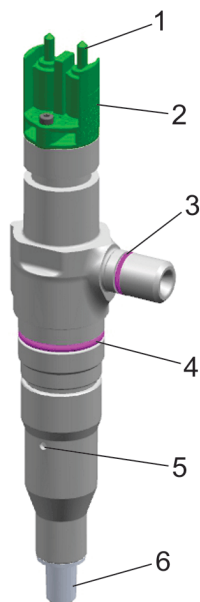
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1. Visually inspect the fuel injector body for cracks or damage. If damage is found, replace the injector.
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3. Visually inspect the injector tips for cracks or damage from excessive heat. If damage is found, replace the injector.
4. Visually inspect the threads of the fuel injector inlet. If the threads are damaged, replace the injector.

7 Installation of the Fuel Injector

Table 4.

Service Tools Used in the Procedure		
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d070116

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4. Injector Body O-ring
5. Fuel Return Port
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Figure 4. Fuel Injector

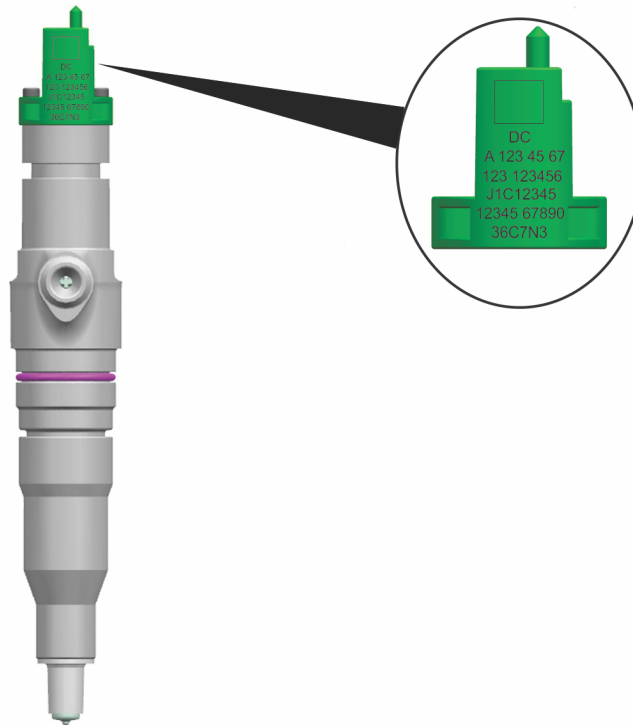
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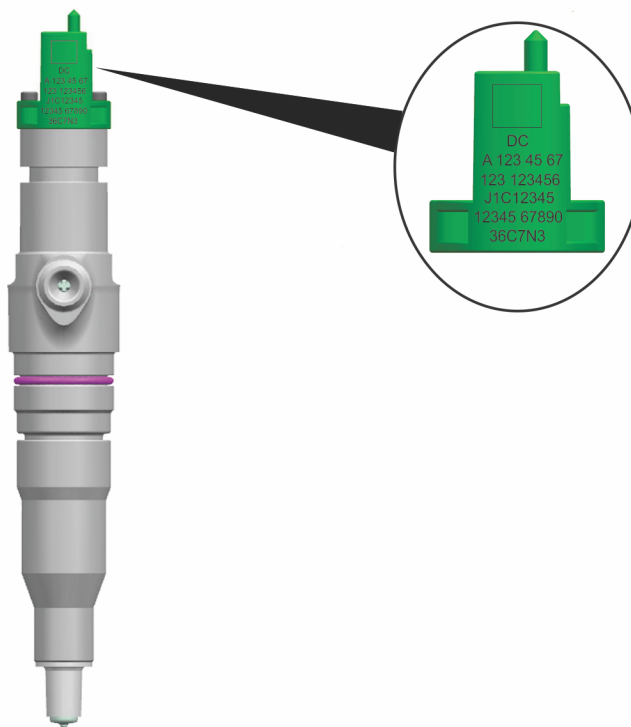
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3. If the fuel injector is being replaced, record the fuel injector calibration code, the injector part number, and note the cylinder location where the injector will be installed.



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4. If the fuel injector is being replaced, remove the fuel injector nozzle tip protector.
5. Apply a thin coat of acid-free grease or clean engine oil to the fuel injector seal rings and then use W936589013300 (Fuel Injector O-ring Installer) to install them onto the fuel injector. Make sure they are properly seated.
6. Using tool W936589033300, install the copper heat protection sleeve on the fuel injector tip.
7. Install the fuel injector and clamp as an assembly into its respective fuel injector bore. Align the clamp over the bolt hole, install the new bolt into fuel injector clamp and snug until the fuel injector fully seats, then release the fuel injector bolt. **DO NOT** torque.
8. Install the high pressure fuel injector feed line. Refer to section "Installation of the High Pressure Fuel Injector Lines".
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10. Install the fuel injector wiring harness. Refer to section "Installation of the Fuel Injector Wiring Harness".
11. If the fuel injector was replaced, input the fuel injector calibration code and injector part number that were recorded earlier into DiagnosticLink[®] using the service routine.



d070118

12. If the fuel injector was replaced because of a tip failure or leak, the EGR cooler must be cleaned. Refer to section "Installation of the Exhaust Gas Recirculation Cooler".
13. Install the rocker cover. Refer to section "Installation of the Rocker Cover".
14. Install the air compressor resonator. Refer to section "Installation of the Air Compressor Resonator".

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15. Connect the batteries.

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16. Prime the fuel system. Verify the repair and check for fuel leaks. Refer to section "Priming the Fuel System".
17. If necessary, install the bumper end(s). Refer to the Original Equipment Manufacturer (OEM) procedures.
18. Close hood.