

**Fuel Charging and Controls - 1.6L Duratorq-TDCi (66kW/90PS) - DV/1.6L Duratorq-TDCi (74kW/100PS 81kW/110PS) - DV - Fuel Injectors—VIN Plate Emission Level Code: K**

Focus 2004.75 (07/2004-)



## Removal and Installation

### Special Tool(s) / General Equipment

	Hand Pressure Pump with Adapter Kit 310-110
	Gauge Bolt Angle 303-174 (21-540)
Pneumatic vacuum gun	
Worldwide Diagnostic System (WDS) (418-F224)	

### WARNINGS:

 Do not smoke or carry lighted tobacco or open flame of any type when working on or near any fuel related components. Highly flammable mixtures are always present and may ignite. Failure to follow these instructions may result in personal injury.

 This procedure involves fuel handling. Be prepared for fuel spillage at all times and always observe fuel handling precautions. Failure to follow these instructions may result in personal injury.

 Do not carry out any repairs to the fuel injection system with the engine running. The fuel pressure within the system can be as high as 1600 bar. Failure to follow this instruction may result in personal injury.

 Wait at least one minute after the engine stops before commencing any repair to the fuel injection system. Failure to follow this instruction may result in personal injury.

### CAUTIONS:

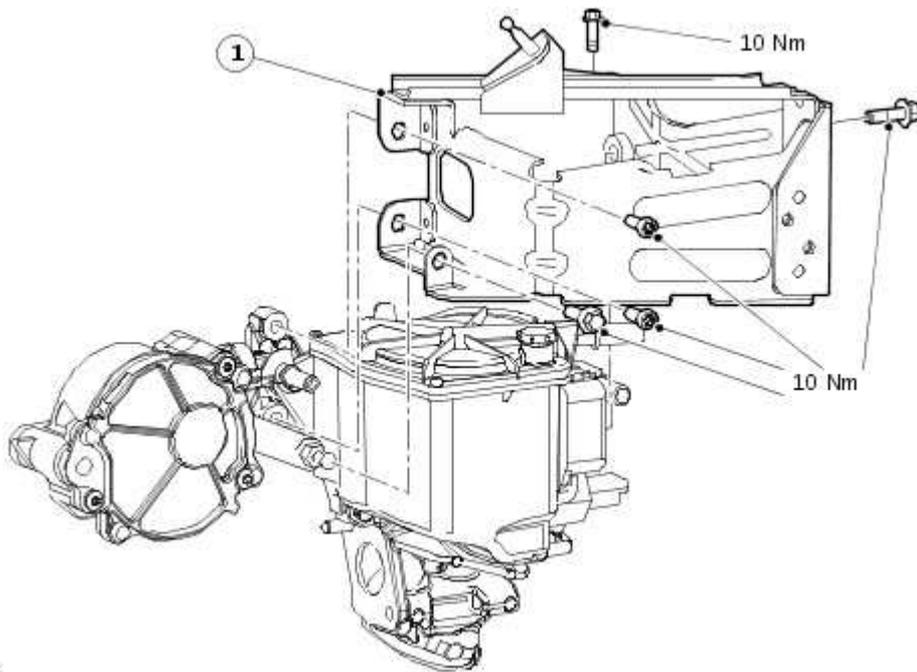
 Diesel fuel injection equipment is manufactured to very precise tolerances and fine clearances. It is therefore essential that absolute cleanliness is observed when working with these components. Always install blanking plugs to any open orifices or lines.

 Do not disassemble fuel injectors or clean the nozzles, even with an ultrasonic cleaner. Always install new fuel injectors when required.

 Always carry out the cleaning process before carrying out any repairs to the fuel injection system components to prevent foreign matter ingress to the components.

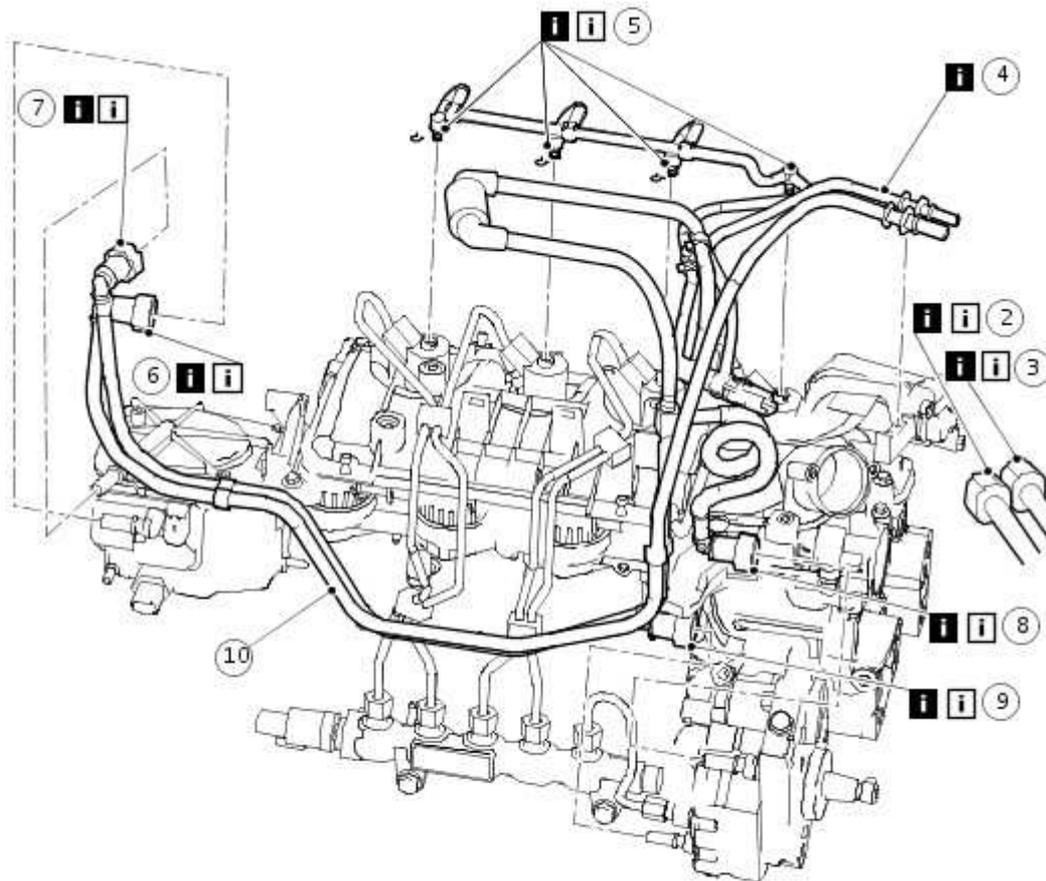
1. Remove the Exhaust Gas Recirculation (EGR) cooler.  
For additional information, refer to: [Exhaust Gas Recirculation \(EGR\) Cooler \(303-08D Engine Emission Control - 1.6L Duratorq-TDCi \(66kW/90PS\) - DV/1.6L Duratorq-TDCi \(74kW/100PS 81kW/110PS\) - DV, Removal and Installation\)](#).

2. Remove the components in the order indicated in the following illustration(s) and table(s).



E44966

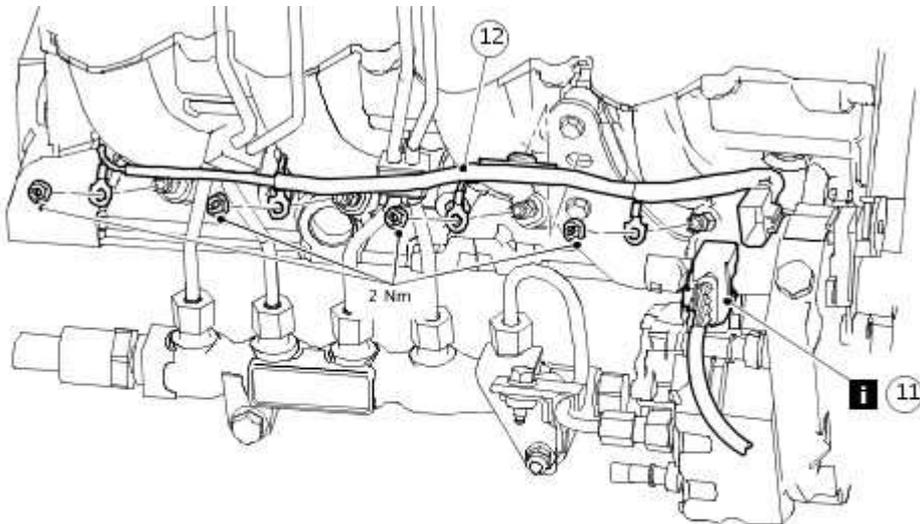
Item	Part Number	Description
1	-	Fuel filter shield



E44961

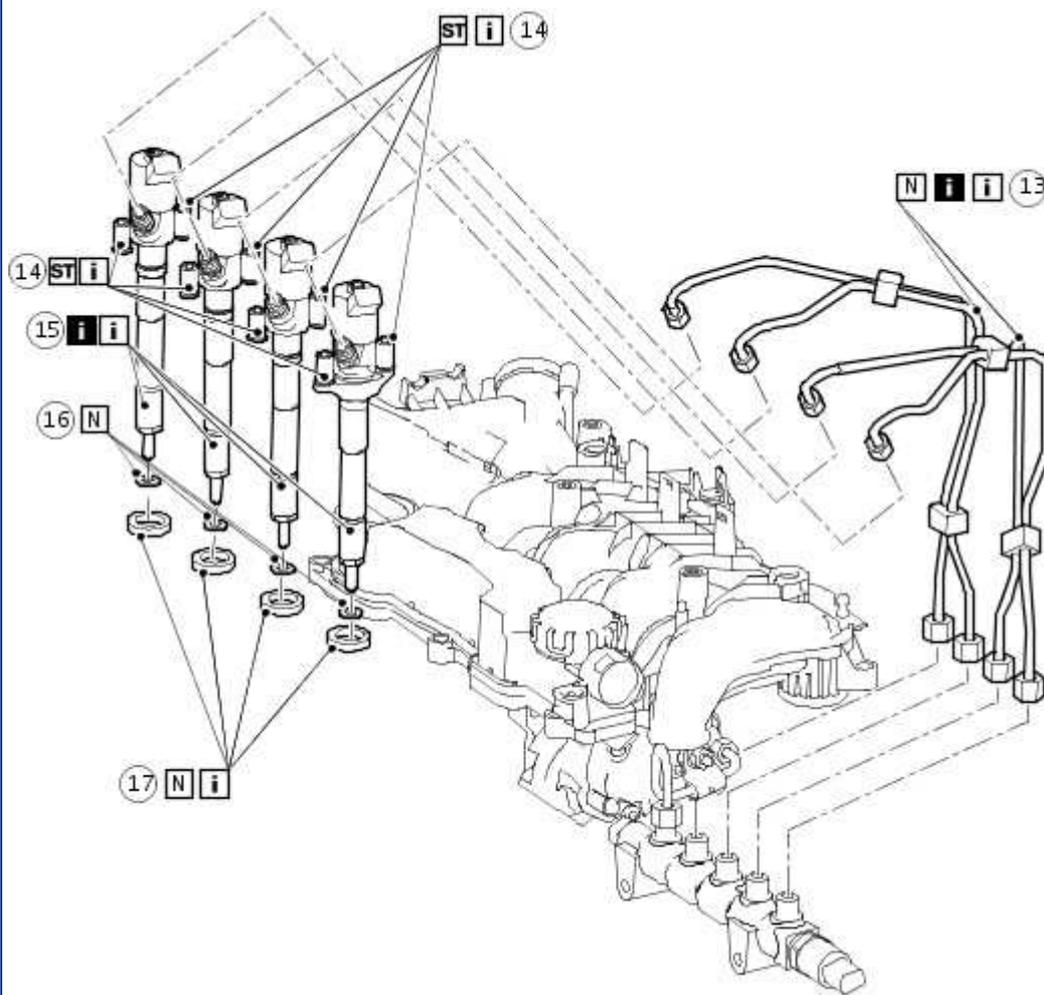
Item	Part Number	Description
-	-	-

2		Fuel supply line quick release coupling <a href="#">See Removal Detail</a> <a href="#">See Installation Detail</a>
3	-	Fuel line quick release coupling <a href="#">See Removal Detail</a> <a href="#">See Installation Detail</a>
4	-	Fuel filter fuel supply line and fuel pump fuel return line retaining clip <a href="#">See Removal Detail</a>
5	-	Fuel injector fuel return line connections <a href="#">See Removal Detail</a> <a href="#">See Installation Detail</a>
6	-	Fuel line quick release coupling <a href="#">See Removal Detail</a> <a href="#">See Installation Detail</a>
7	-	Fuel line quick release coupling <a href="#">See Removal Detail</a> <a href="#">See Installation Detail</a>
8	-	Fuel line quick release coupling <a href="#">See Removal Detail</a> <a href="#">See Installation Detail</a>
9	-	Fuel line quick release coupling <a href="#">See Removal Detail</a> <a href="#">See Installation Detail</a>
10	-	Fuel injection system fuel supply and return lines



E44962

Item	Part Number	Description
11	-	Glow plug wire electrical connector <a href="#">See Removal Detail</a>
12	-	Glow plug wire



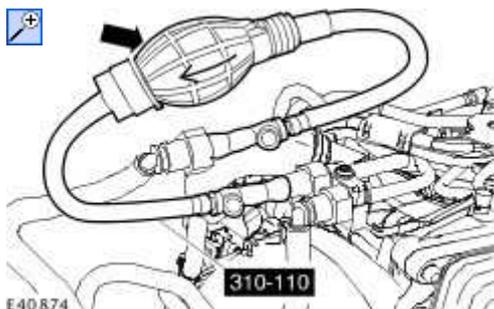
E44976

Item	Part Number	Description
13	-	Fuel injector high-pressure fuel supply lines <a href="#">See Removal Detail</a> <a href="#">See Installation Detail</a>
14	-	Fuel injector retaining bracket retaining nuts <a href="#">See Installation Detail</a>
15	-	Fuel injectors <a href="#">See Removal Detail</a> <a href="#">See Installation Detail</a>
16	-	Fuel injector to cylinder head sealing washers <a href="#">See Removal Detail</a> <a href="#">See Installation Detail</a>
17	-	Fuel injector seals <a href="#">See Installation Detail</a>

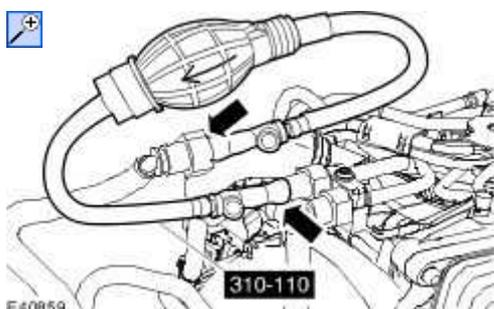
**3.** To install, reverse the removal procedure.

**4.** Using the special tool, prime the fuel system.

- Operate the hand pump until it becomes firm when squeezed.
- Squeeze and hold the hand pump for 10 seconds.
- Release the hand pump.
- Squeeze and hold the hand pump for a further 10 seconds.
- Release the hand pump.



5.  **CAUTION:** Do not operate the starter motor for longer than 10 seconds at a time. After 10 seconds, turn the ignition to position 0 and allow the starter motor to cool for 30 seconds before attempting to start the engine again. Start the engine and allow to idle until it reaches normal operating temperature.
6. Stop the engine.
7. Remove the hand pressure pump and connect the fuel supply line quick release coupling.



8. **NOTE:** If new injectors are being installed, use WDS Program Module Routine and program the new fuel injector calibration codes into the powertrain control module (PCM). Failure to follow this instruction may cause injector ticking noise, combustion noise and possibly incorrect engine emissions. Using WDS, Module Programming function. Program the PCM with the new fuel injector calibration codes.

## Removal Details

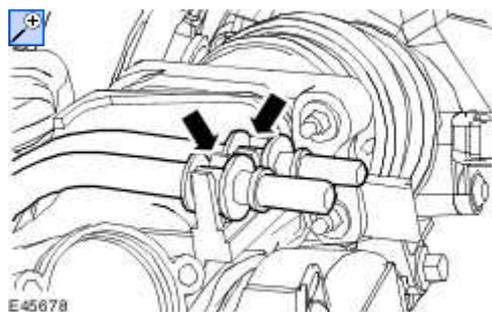
### Item 2 : Fuel supply line quick release coupling

1. Clean the fuel injector, fuel injection supply manifold, high-pressure fuel supply line and surrounding areas.  
For additional information, refer to: [Fuel Injection Component Cleaning](#) (303-04L Fuel Charging and Controls - 2.0L Duratorq-TDCi (100kW/136PS) - DW/2.0L Duratorq-TDCi (81kW/110PS) - DW, General Procedures).
2. Detach the fuel supply line quick release coupling.  
For additional information, refer to: [Quick Release Coupling](#) (310-00A Fuel System - General Information, General Procedures).
3. Install new blanking plugs to the open ends of the fuel supply line and fuel filter fuel supply line.

### Item 3 : Fuel line quick release coupling

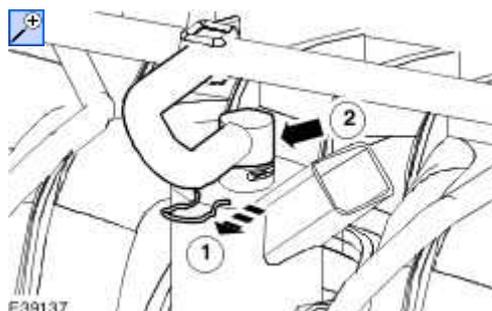
1. Detach the quick release couplings.  
For additional information, refer to: [Quick Release Coupling](#) (310-00A Fuel System - General Information, General Procedures).
2. Install new blanking plugs to the open ends of the fuel supply line, fuel filter, fuel pump and fuel supply line.

## Item 4 : Fuel filter fuel supply line and fuel pump fuel return line retaining clip



1. Detach the fuel filter fuel supply line and fuel pump fuel return line from the intake manifold.

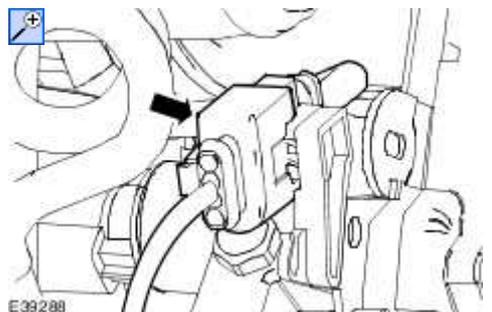
## Item 5 : Fuel injector fuel return line connections



1. Detach the fuel return line from the fuel injector.
  - Remove the fuel return line retaining clip.

2. Install blanking plugs to the open ends of the fuel return lines and the fuel injectors.

## Item 11 : Glow plug wire electrical connector



1. Disconnect the glow plug loom electrical connector and detach the glow plug wire electrical connector from the retaining bracket.

## Item 13 : Fuel injector high-pressure fuel supply lines

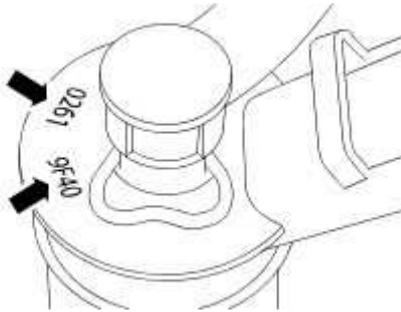
**⚠ CAUTION:** Make sure that the high-pressure fuel supply line remains in contact with both the fuel injector and the fuel injection supply manifold until both unions have been detached and cleaned. Failure to follow this instruction may result in foreign matter ingress to the fuel injection system.

1. Clean the fuel injector, fuel injection supply manifold, high-pressure fuel supply line and surrounding areas.  
For additional information, refer to: [Quick Release Coupling \(310-00A Fuel System - General Information, General Procedures\)](#).
2. Detach the high-pressure fuel supply line unions from the fuel injector and the fuel injection supply manifold.
3. Using the [pneumatic vacuum gun](#), vacuum foreign material from the high-pressure fuel supply line, the fuel injector and the fuel injection supply manifold.
4. Remove and discard the high-pressure fuel supply lines.
5. Install new blanking plugs to the open threaded ports on the fuel injectors and the fuel injection supply manifold.

## Item 15 : Fuel injectors



**CAUTION:** The fuel injector calibration codes must be accurately recorded from the fuel injectors.



E46662

1. **NOTE:** The example shown is **not** a valid calibration code and is to indicate the location of the code only. Make a note of the fuel injector calibration codes and their cylinder locations.

2. Make a note of the position of the fuel injector threaded union before removal.

Item 16 : Fuel injector to cylinder head sealing washers



E124858

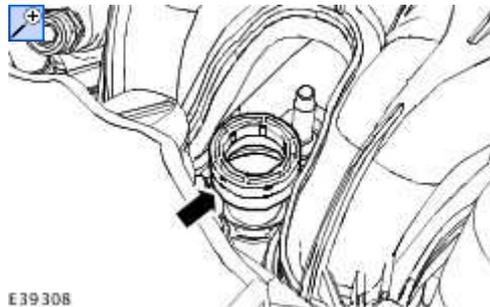
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### Installation Details

Item 17 : Fuel injector seals



**CAUTION:** Do not use excessive force to press the new fuel injection seal onto the fuel injector tube. Failure to follow this instruction may result in damage to the fuel injector seal.



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1. Press the new fuel injector seal onto the fuel injector tube.

Item 16 : Fuel injector to cylinder head sealing washers

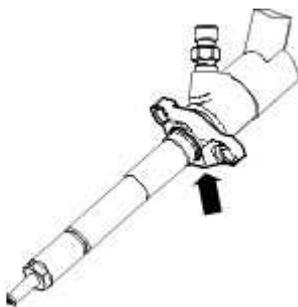


E72924

1. **NOTE:** Make sure that a new component is installed.

Item 15 : Fuel injectors

1. Make sure the fuel injector retaining bracket retaining clip is correctly installed.



E39289

2. Remove and discard the blanking cap from the injector nozzle.
3. **NOTE:** If the original fuel injectors are to be installed, they must be matched to the cylinders they were removed from. Install the fuel injector so that the threaded union is in the same position as when removed.
4. Record the fuel injector calibration codes and the respective cylinder locations of all new fuel injectors.

Item 14 : Fuel injector retaining bracket retaining nuts

1. Install the fuel injector retaining bracket retaining nuts finger tight.

Item 13 : Fuel injector high-pressure fuel supply lines

#### CAUTIONS:



Remove the blanking plugs from the high-pressure fuel supply line, the fuel injector and the fuel injection supply manifold at the last possible moment. Failure to follow this instruction may result in foreign matter ingress to the fuel injection system.



Do not allow the unions to hit the ends of the high-pressure fuel supply line. Failure to follow this instruction may result in damage to the ends of the line and allow foreign material to enter the fuel injection system.



Make sure the tool used to tighten the high-pressure fuel supply line unions is used at the top of the unions as this is where there is most material. Failure to follow this instruction may result in damage to the unions.

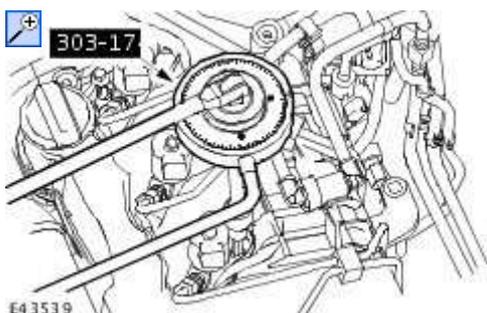
**NOTE:** Maintain pressure on the high-pressure fuel supply line to keep the line in contact with the fuel injector cone and fuel injection supply manifold while installing the unions.

**NOTE:** If it is not possible to correctly install the new high-pressure fuel supply line, it will be necessary to remove the remaining high-pressure fuel supply lines and to loosen the fuel injection supply manifold to allow correct alignment.

1. Using the **pneumatic vacuum gun**, vacuum foreign material from the area around the fuel injectors and the fuel injection supply manifold.
2. Remove and discard the blanking plugs from the high-pressure fuel supply lines, the fuel injection supply manifold and the fuel injectors.
3. Install the fuel injector high-pressure fuel supply lines.
  - Finger tighten the high-pressure fuel supply line unions.
4. **NOTE:** Tighten the fuel injector retaining bracket nuts so that the fuel injector retaining bracket remains level. Using the special tool tighten the fuel injector retaining bracket nuts in two stages.
  1. Stage 1: 4Nm
  2. Stage 2: 75 degrees



303-17



E43539

5.  **CAUTION:** Individual high-pressure fuel supply lines must have **both** unions tightened to Stage 1 and then Stage 2 before continuing on to the next high-pressure fuel supply line. Failure to follow this instruction may result in damage to the high-pressure fuel supply lines.

Tighten the high-pressure fuel supply line unions in two stages.

- Stage 1: 20Nm
- Stage 2: 25Nm

#### Item 9 : Fuel line quick release coupling

1. Remove and discard the blanking plugs from the fuel line quick release couplings and fuel components.
2. Connect the fuel line quick release couplings.  
For additional information, refer to: [Quick Release Coupling \(310-00A Fuel System - General Information, General Procedures\)](#).

#### Item 5 : Fuel injector fuel return line connections

1. Remove and discard the blanking plugs from the fuel injectors and the fuel injector return line connections.

#### Item 2 : Fuel supply line quick release coupling

1. **NOTE:** Make sure the hand pressure pump arrow indicating the direction of fuel flow is pointing towards the fuel filter.  
Remove and discard the blanking plugs. Install the special tool between the fuel tank fuel supply line quick release coupling and the fuel injection fuel supply pipe union.

