

Exhaust System - I6 3.2L Petrol -

Lubricants, Fluids, Sealers and Adhesives

Item	Specification
Heated oxygen sensor (H02S) removal*	WD40 or Suitable alternative
Heated oxygen sensor (H02S) threads	Apply suitable high temperature anti-seize compound to threads of sensor

* Apply to area around sensor threads prior to attempting to remove sensor

General Specification

Item	Specification
Catalytic converters - location	Fitted in the front section of the exhaust system
Exhaust manifolds	Manifold assemblies (2) with three fabricated branches merging into an integral catalytic converter are fitted to the cylinder head.
Exhaust system	stainless steel exhaust system supplied as two separate assemblies. Front section incorporating two catalytic converters and a rear section incorporating centre and rear silencers

Torque Specifications

Description	Nm	lb-ft
Catalyst monitor sensor	45	33
Catalytic converter to exhaust manifold bolts*	30	22
Catalytic converter to centre muffler nuts and retaining clamp	24	18
Exhaust manifold bolts	A	A
Exhaust manifold heatshield bolts	10	7
Exhaust support brackets to front subframe / floor bolts	24	18
Exhaust support bracket to centre bearing carrier bolts	24	18
Exhaust tail pipe trim screws	3	2
Front muffler service sleeve clamp nuts	40	28
Heated oxygen sensor (H02S)+	45	33

* It is not appropriate to either fit or remove these fixings using air tools due to a risk of cold welding/snapping.

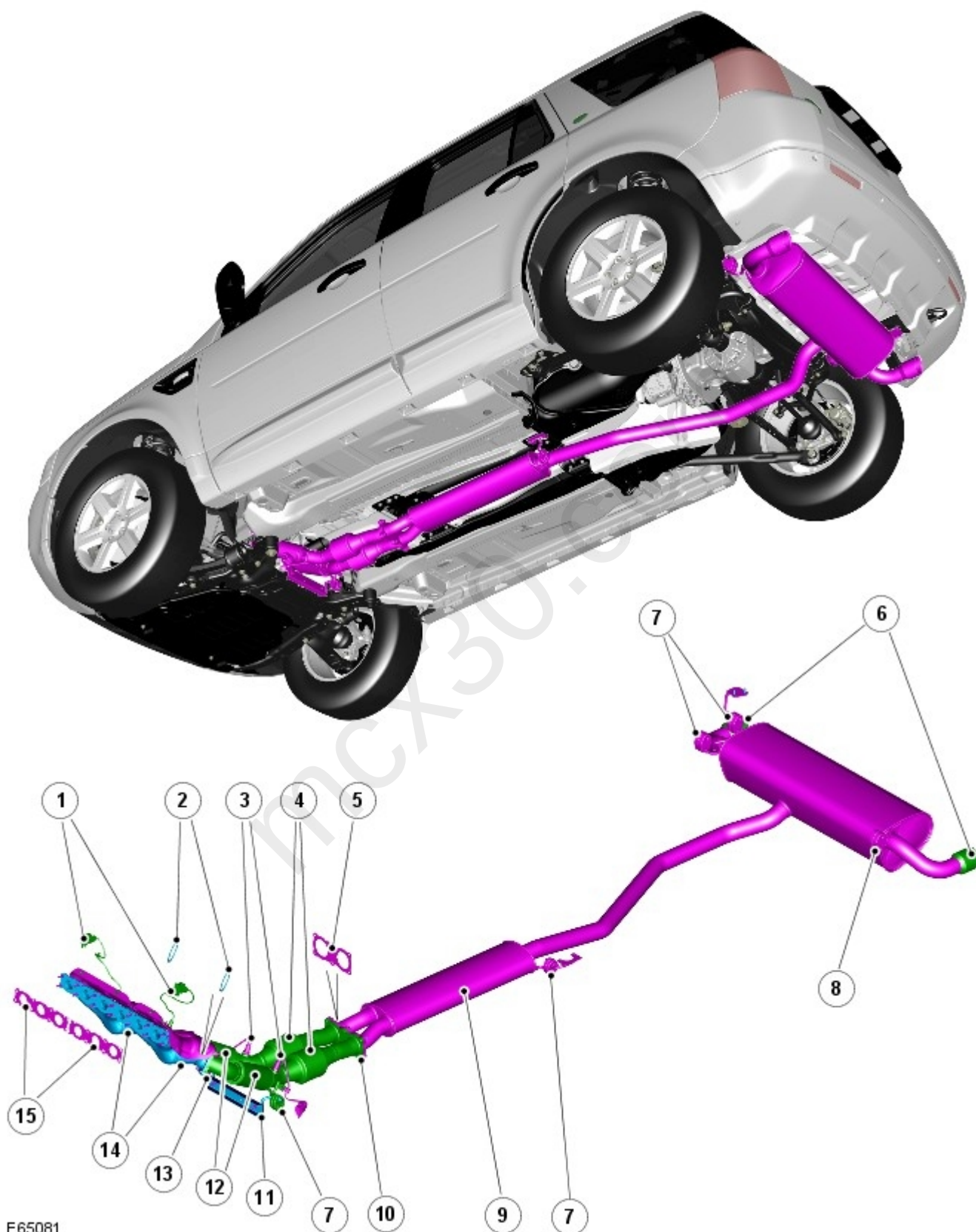
+ Apply anti-seize lubricant to threads of sensor - See Lubricants

A = refer to procedure for correct torque sequence

Exhaust System - I6 3.2L Petrol - Exhaust System

Description and Operation

COMPONENT LOCATION



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Item	Part Number	Description
1	-	Heated Oxygen Sensor (HO2S) - Pre-Catalyst (2 off)
2	-	Gasket (2 off)
3	-	HO2S - Post catalyst (2 off)
4	-	Flexible coupling

5	-	Gasket
6	-	Tailpipe finisher (optional)
7	-	Mounting rubber (6 off)
8	-	Rear muffler
9	-	Centre muffler
10	-	Flange
11	-	Bracket
12	-	Catalytic converter (2 off)
13	-	Flange
14	-	Catalytic converter (2 off)
15	-	Exhaust manifold gaskets

OVERVIEW

The 3.2L SI6 exhaust system is fabricated from stainless steel and is supplied as two separate assemblies; a front section incorporating two catalytic converters and a rear section incorporating centre and rear silencers.

EXHAUST MANIFOLDS

The exhaust manifold comprises two separate manifold assemblies. One manifold is used for cylinders 1 to 3 and the second manifold is used for cylinders 4 to 6. The manifolds are sealed to the cylinder head with a gasket and secured with 14 bolts.

Each manifold comprises three fabricated branches which merge into an integral catalytic converter. A threaded boss is positioned where the three branches merge and provides for the fitment of a pre-catalyst HO2S. The catalytic converter outlets have offset flanges which mate with corresponding flanges on the front section exhaust system.

A bracket on each outlet flange allows for the attachment of an exhaust manifold heat shield.

FRONT SECTION

The front section has two flanged pipes which mate with the offset flanges of the exhaust manifolds. The flanges are sealed with gaskets and secured with bolts. The flanges are connected via curved pipes to decouplers which provide a flexible joint in the system. The outlet from each decoupler comprises a curved pipe with a threaded boss which provides for the fitment of a post-catalyst HO2S.

Each pipe is connected into a smaller catalytic converter which in turn is connected to a double flange which mates with the rear section of the exhaust system.

Two mounting rubbers are located at the rear of the flexible coupling and are attached to a bracket mounted on the front subframe.

REAR SECTION

The rear section has a double flange which mates with the double flange of the front section. The double flanges of each section are sealed with a gasket and secured with studs, washers and nuts. Two short pipes from the double flange connect into the centre muffler.

The centre muffler is a fabricated unit with a capacity of 7.6 liters. The muffler comprises a pair of perforated baffle tubes contained within the muffler body. The two baffle tubes merge into one single tube which provides the outlet from the muffler. A rubber mounting is attached to the rear of the muffler and attaches to a hanger bracket located on the underside of the vehicle floorpan.

A single pipe from the rear of the centre muffler is routed along the underside of the vehicle body to the rear muffler. The pipe enters the rear muffler through a connection in the forward face of the muffler.

The rear muffler is a fabricated unit with a capacity of 29.3 liters. The rear muffler is positioned transversely at the rear of the vehicle, forward of the rear bumper. The muffler comprises baffle plates and perforated baffle tubes. Each end of the muffler body has an outlet which direct exhaust gasses to exit at the rear of the vehicle. The muffler is supported by a single rubber mounting on the Left Hand (LH) side and by two rubber mountings on the Right Hand (RH) side.

CATALYTIC CONVERTERS

The catalytic converters are fitted in the front section of the exhaust system, after the HO2S.

The HO2S monitors the exhaust gasses leaving the engine. The engine management system uses this information to provide accurately metered quantities of fuel to the combustion chambers to ensure the most efficient use of fuel and to minimise the exhaust emissions.

In the catalytic converters, the exhaust gases are passed through honeycombed ceramic elements coated with a special surface treatment called 'washcoat'. The washcoat increases the surface area of the ceramic elements by a factor of approximately 7000. On top of the washcoat is a coating containing platinum, which is the active constituent for converting harmful emissions into inert by-products. The platinum adds oxygen to the carbon monoxide and the hydrocarbons in the exhaust gases, to convert them into carbon dioxide and water respectively.

Exhaust System - I6 3.2L Petrol - Exhaust System

Diagnosis and Testing

Principles of Operation

For a detailed description of the exhaust system, refer to the relevant Description and Operation section in the workshop manual. REFER to:

[Exhaust System](#) (309-00A Exhaust System - I6 3.2L Petrol, Description and Operation),
[Exhaust System](#) (309-00B Exhaust System - TD4 2.2L Diesel, Description and Operation).

Inspection and Verification



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

1. **1.** Verify the customer concern.
2. **2.** Visually inspect for system integrity and obvious signs of mechanical damage.

Visual Inspection

Mechanical
● Leaks ● Metal fatigue ● Pipes, mufflers and catalytic converters ● Joints ● Mountings ● Clearance around components

3. **3.** If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
4. **4.** If the cause is not visually evident, verify the symptom and refer to the Symptom Chart.

Symptom Chart

Symptom	Possible Cause	Action
Excessively noisy/leaking exhaust	● Exhaust system/components	● Inspect exhaust system, refer to Visual Inspection above ● Rectify leaks or Install new components as necessary. Refer to Removal and Installation instructions in this section
Loss of power	● Restricted exhaust system ● Fuel system ● Ignition system ● Electronic engine control	● Install new exhaust components as necessary. Refer to Removal and Installation instructions in this section ● For fuel system tests. REFER to: Fuel Tank and Lines (310-01A Fuel Tank and Lines - I6 3.2L Petrol, Diagnosis and Testing). ● For ignition system tests. REFER to: Engine Ignition (303-07A Engine Ignition, Diagnosis and Testing). ● For electronic engine control tests. REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - I6 3.2L Petrol, Diagnosis and Testing) / Electronic Engine Controls - 2.2L Duratorq-TDCi (DW) Diesel (303-14 Electronic Engine Controls - 3.2L, Diagnosis and Testing).

Exhaust System - I6 3.2L Petrol - Rear Muffler

Removal and Installation

Special Tool(s)

	100-051 Cutter, Exhaust Pipe
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Removal

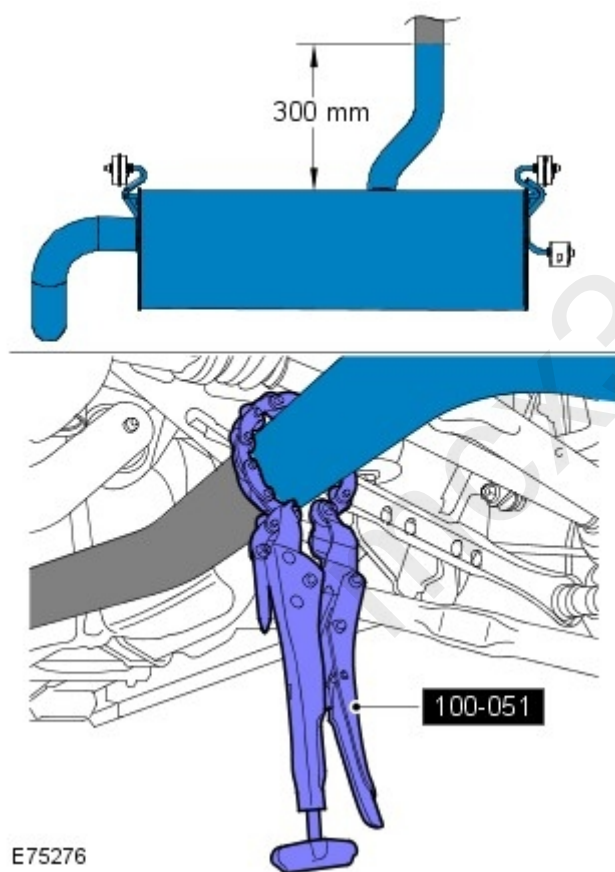
- NOTE: Removal steps in this procedure may contain installation details.

1.  **WARNING:** Make sure to support the vehicle with axle stands.

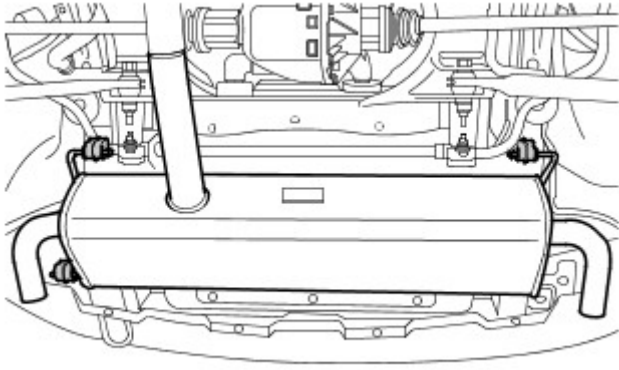
Raise the vehicle on a lift.

2. Using the special tool, cut the exhaust pipe at a distance of 300mm from the front of the rear muffler.

Special Tool(s): [100-051](#)



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3.  **WARNING:** This step requires the aid of another technician.

Installation

1. Install the rear muffler and tighten the service sleeve.

Torque: 40 Nm

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Exhaust System - I6 3.2L Petrol - Front Muffler

Removal and Installation

Special Tool(s)

	100-051 Cutter, Exhaust Pipe
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Removal

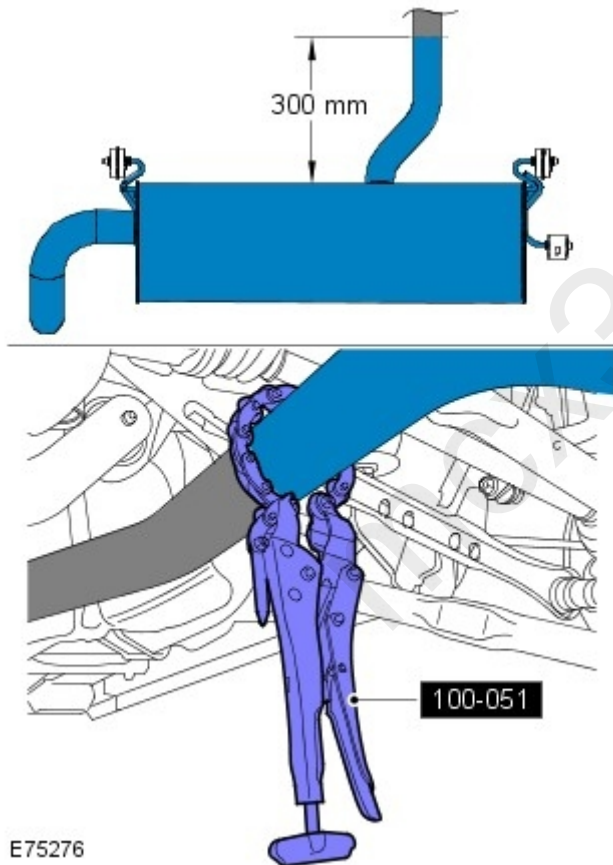
- NOTE: Removal steps in this procedure may contain installation details.

- 1.  WARNING:** Make sure to support the vehicle with axle stands.

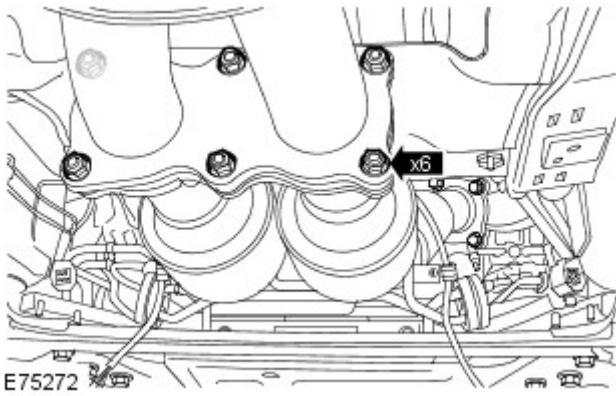
Raise the vehicle on a lift.

- Using the special tool, cut the exhaust pipe at a distance of 300mm from the front of the rear muffler.

Special Tool(s): [100-051](#)

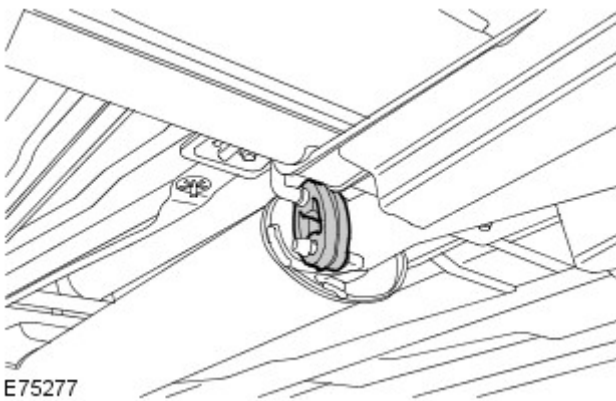


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3. **3.** NOTE: Discard the gasket.

Torque: 25 Nm



- 4.

Installation

1. **1.** NOTE: Install a new gasket.

Install the front muffler and tighten the service sleeve.

Torque: 40 Nm

Exhaust System - I6 3.2L Petrol - Catalytic Converter

Removal and Installation

Special Tool(s)

 310-121 E53465	310-121 Wrench, H02S
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Removal

- NOTE: Removal steps in this procedure may contain installation details.

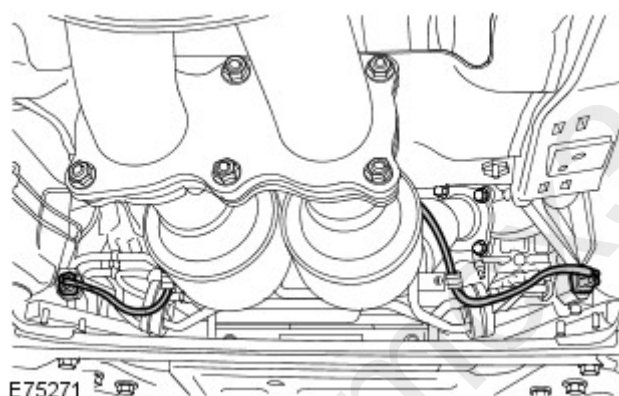
1.  **WARNING:** Make sure to support the vehicle with axle stands.

Raise the vehicle on a lift.

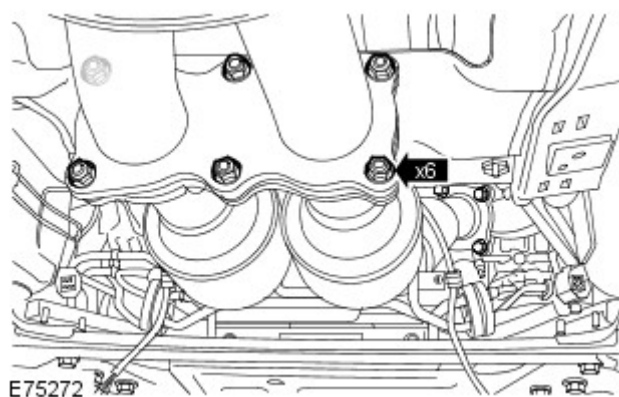
2. Remove the front splash shield.

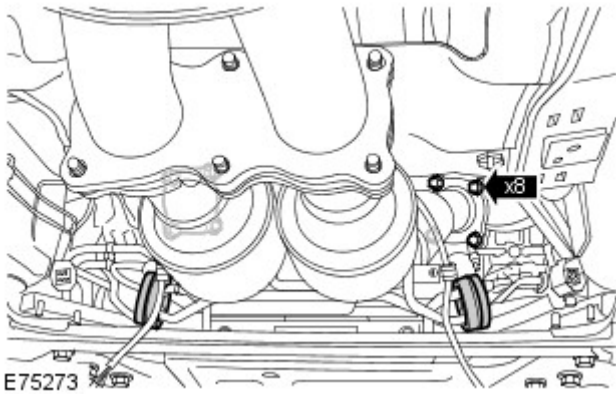
Refer to: [Engine Undershield](#) (501-02 Front End Body Panels, Removal and Installation).

3.



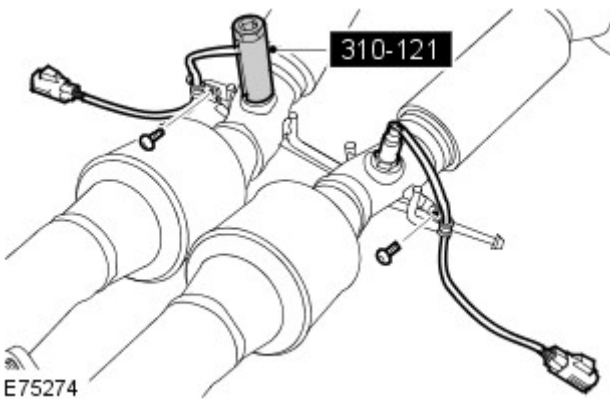
4. Torque: 25 Nm





5. **5.**  **CAUTION:** Discard the bolts.

Torque: 27 Nm



6. *Special Tool(s):* [310-121](#)

Torque:

M18 45 Nm

M5 6 Nm

Installation

1. To install, reverse the removal procedure.

2. **2.** **NOTE:** For NAS vehicles only.

If required, carry out a long drive cycle.

Refer to: Powertrain Control Module (PCM) Long Drive Cycle Self-Test (303-14 Electronic Engine Controls - 3.2L, General Procedures).

Exhaust System - I6 3.2L Petrol - Exhaust System

Removal and Installation

Removal



WARNING: Observe due care when working near a hot exhaust system.

- **NOTE:** Removal steps in this procedure may contain installation details.

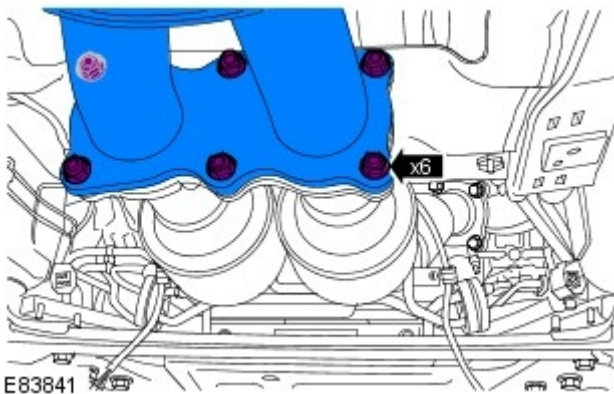
All vehicles

1.  **WARNING:** Do not work on or under a vehicle supported only by a jack. Always support the vehicle on safety stands.

Raise and support the vehicle.

Vehicles with petrol engine

2. Torque: 25 Nm

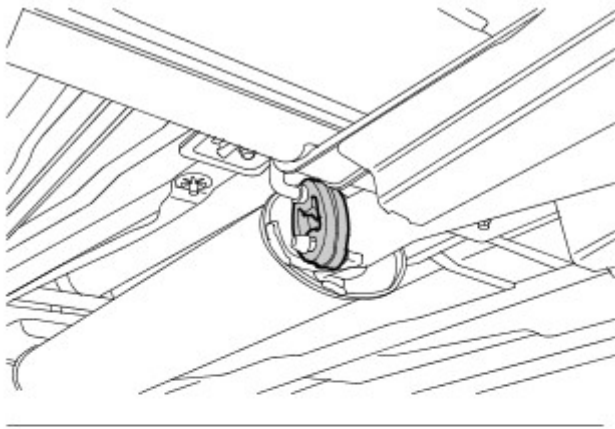


Vehicles with diesel engine

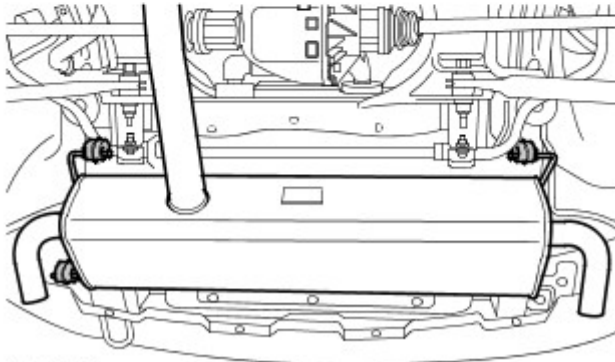
3. Torque: 40 Nm



All vehicles



4.  **WARNING:** This step requires the aid of another technician.



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Vehicles with petrol engine

5. Remove and discard the gasket.

All vehicles

6. **6. NOTE:** Do not disassemble further if the component is removed for access only.

Remove the rubber mounts.

Installation

1. To install, reverse the removal procedure.