

Exhaust System - V6 4.0L Petrol -

Recommended Lubricant

Item	Specification
HO2S threads	Use a high temperature resistant anti-seize compound

General Specifications

Item	Specification
Exhaust manifolds	Fabricated, air gapped with exhaust gas recirculation (EGR) tapping on left hand manifold
Exhaust system	Twin, stainless steel pipes throughout with stainless steel mufflers
Catalytic converters - type/location	Close coupled cascade - located in each down pipe with pre and post catalyst sensors in both pipes

Torque Specifications

Description	Nm	lb-ft
** HO2S	45	33
Catalytic converter retaining clamp	55	40
Catalytic converter to muffler nuts and retaining clamp	48	35
Tailpipe clamps	55	40
* Catalytic converter to exhaust manifold bolts	22	16

*** New bolts must be installed**

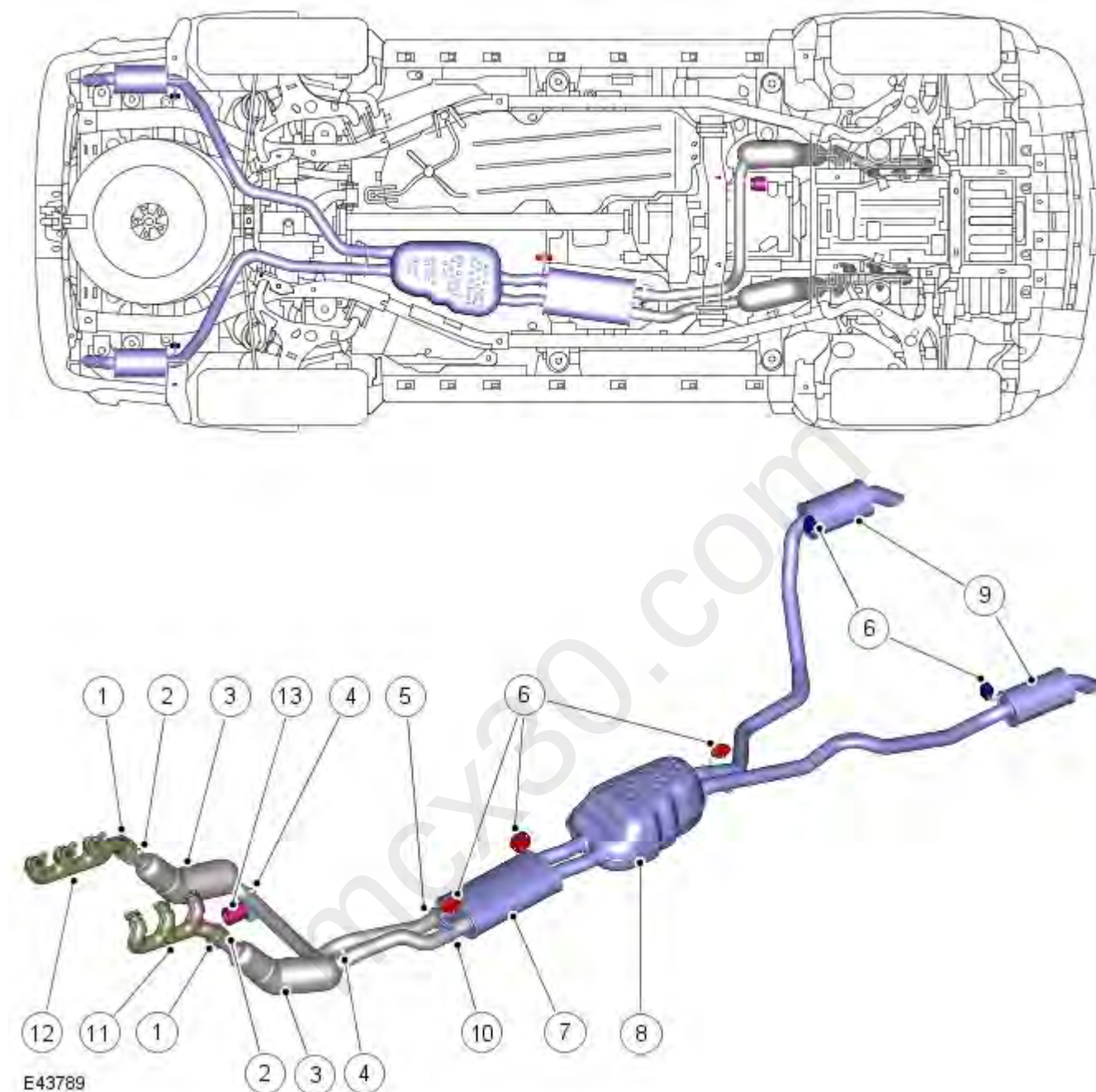
**** Apply suitable high temperature resistant anti-seize compound**

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Exhaust System - V6 4.0L Petrol - Exhaust System

Description and Operation

4.0L V6 Exhaust System Component Location



Item	Part Number	Description
1	-	Flange - manifold to front section
2	-	Pre catalyst heated oxygen sensor location
3	-	Catalyst
4	-	Post catalyst heated oxygen sensor location
5	-	Flange - RH front section to rear section
6	-	Mounting rubber (5 off)
7	-	Silencer - Front
8	-	Silencer - Centre
9	-	Silencer - Rear
10	-	Clamp - LH front section to rear section
11	-	LH manifold
12	-	RH manifold
13	-	Mass damper

GENERAL

The 4.0L V6 exhaust system is fabricated from stainless steel and is supplied as three separate assemblies; a LH front section incorporating a catalytic converter, a RH front section incorporating a catalytic converter and a rear section

incorporating a front silencer (non-NAS only), a centre silencer and two rear silencers.

The system is attached to the underside of the body with five mounting rubbers which are located on mild steel hanger bars that are welded to the system. The mounting rubbers locate on corresponding hangers which are welded to the underside of the vehicle body. The system is routed mainly on the inside of the LH chassis longitudinal before splitting near the rear differential to exit at each side of the rear of the vehicle.

The system has service repair items available. Indentations in the rear section, between the center and the rear silencers, show the cut points for the service replacement rear silencers or front section. When a service repair section is used, the joint is connected using a sleeve and two clamps to connect the pipes at the cut points.

FRONT SECTION

Both front sections have a welded flange with two holes which provide for the attachment with two bolts to the LH and RH exhaust manifolds. The flange is sealed by a tapered seat in the flange and a machined cone on the manifold.

The flange is welded to a short, straight pipe, which in turn is welded to the body of the catalytic converter. The pipe has a threaded boss which is welded over a hole in the pipe to provide location for the pre catalyst heated oxygen sensor (HO2S).

On the LH front section, the converter outlet pipe is a 55 mm (2.16 in) diameter tube, with a 1.5 mm (0.06 in) wall thickness, which is welded to the converter body. The rear of the outlet pipe is inserted into the flared end of the rear section. A clamp is used to compress and secure the joint.

On the RH front section, the converter outlet pipe is a 55 mm (2.16 in) diameter tube, with a 1.5 mm (0.06 in) wall thickness, which is welded to the converter body. The rear of the pipe curves left, under the transmission and then curves again to run parallel to the LH pipe. The end of the pipe has a welded flange with two holes which locate on two studs on the rear section and is secured with nuts. A metal gasket is used to seal the joint between the front and rear section flanges.

Both the LH and RH converter outlet pipes have a threaded boss which is welded over a hole in the pipe to provide location for the post catalyst HO2S.

REAR SECTION

The rear section has a short 55 mm (2.16 in) diameter tube, with a 1.5 mm (0.06 in) wall thickness, which is flared to an inside diameter of 55 mm (2.16 in) to locate the LH front section. The tube is welded to the front silencer assembly. A second short 55 mm (2.16 in) diameter tube, with a 1.5 mm (0.06 in) wall thickness, has a welded flange with captive studs to provide attachment for the flange on the RH front section. This tube is also welded to the front silencer assembly.

The front silencer comprises a single skin and two end plates which are welded together which give a capacity of 6.4 litres (390.5 in³). The silencer contains baffles and perforated tubes which reduce noise as the exhaust gases pass through the silencer. A hanger bar is welded to the front of the silencer and provides for the location of a mounting rubber.

The silencer has two short 55 mm (2.16 in) diameter outlet pipes, with a 1.5 mm (0.06 in) wall thickness, which connect to the centre silencer.

The centre silencer comprises two pressed stainless steel shells which are welded together to give a capacity of 25.2 litres (1538 in³). The silencer contains baffles and perforated tubes which reduce noise as the exhaust gasses pass through the silencer. A hanger bar is welded to the front right hand side of the silencer and provides location for a mounting rubber.

The silencer has two 55 mm (2.16 in) diameter outlet pipes, with a 1.5 mm (0.06 in) wall thickness, which are curved to pass around the rear suspension components.

Each outlet pipe terminates in a welded joint with the tail silencers. The outlet pipes have a hanger bar which provides for the location of a mounting rubber.

A hanger bar is welded to the front face of each rear silencer and provides for the location of a mounting rubber. The silencer is a circular fabrication with a baffle tube which is surrounded with glass fibre to provide further noise suppression. Each silencer has a capacity of 2.7 litres (165 in³).

The silencers each have an outlet pipe which is 55 mm (2.2 in) diameter, with a wall thickness of 1.2 mm (0.05 in). Each outlet pipe is curved downwards to direct exhaust gasses away from the rear of the vehicle.

CATALYTIC CONVERTER

The engine management system provides accurately metered quantities of fuel to the combustion chambers to ensure the most efficient use of fuel and to minimise the exhaust emissions.

To further reduce the carbon monoxide and hydrocarbons content of the exhaust gases, a catalytic converter is integrated into the front pipe of the exhaust system. In the catalytic converter 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 metals, which are the active constituent for converting harmful emissions into inert by-products. The metals add oxygen to the carbon monoxide and the hydrocarbons in the exhaust gases, to convert them into carbon dioxide and water respectively.

Exhaust System - V6 4.0L Petrol - Exhaust System

Diagnosis and Testing

Principle of Operation

For a detailed description of the exhaust system, refer to the relevant Description and Operation section of the workshop manual. REFER to: [Exhaust System](#) (309-00C Exhaust System - V6 4.0L Petrol, 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 checked and/or the donor vehicle.

- **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

1. Verify the customer concern.
2. Visually inspect for obvious signs of mechanical or electrical damage.

Visual Inspection

Mechanical	Electrical
• Leaks • Metal fatigue • Pipes • Catalytic converter • Muffler(s) • Joints • Mountings • Clearance around components	• Fuses • Wiring harness • Electrical connector(s) • Sensor(s) • Engine Control Module (ECM)

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. If the cause is not visually evident, verify the symptom and refer to the Symptom Chart, alternatively check for Diagnostic Trouble Codes (DTCs) and refer to the DTC Index.

Symptom Chart

Symptom	Possible Causes	Action
Noisy or leaking exhaust	• Exhaust system/components	Install new components as necessary. Refer to the relevant section of the workshop manual.
Lack of power	• Air intake system fault • Restricted exhaust system • Low fuel pressure	Check the air intake system. Check for a blocked catalytic converter or muffler, install new components as necessary. Check the fuel pressure. Refer to the relevant section of the workshop manual.

DTC Index

For a list of Diagnostic Trouble Codes (DTCs) that could be logged on this vehicle, please refer to Section 100-00.

Exhaust System - V6 4.0L Petrol - Catalytic Converter LH

Removal and Installation

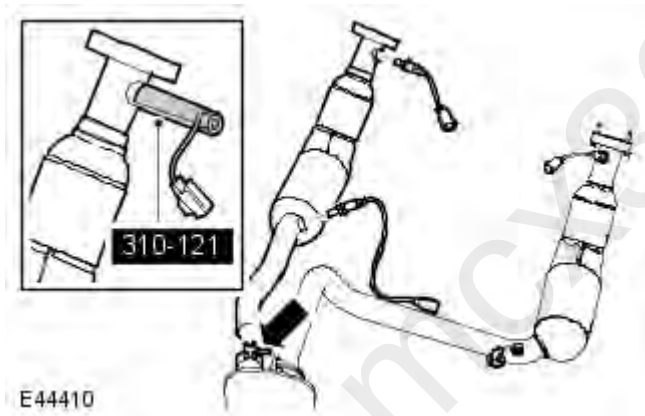
Special Tool(s)	
 E53465	Wrench, HO2S
	310-121 (LRT-19-014)

Removal

1. Disconnect the battery ground cable.
For additional information, refer to: [Specifications](#) (414-00 Battery and Charging System - General Information, Specifications).
2.  **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.
3. Remove the exhaust system.
For additional information, refer to: [Exhaust System](#) (309-00C Exhaust System - V6 4.0L Petrol, Removal and Installation).
4. Remove the catalytic converter.
 - Remove the nut and release the retaining clamp.
5. **NOTE:** Do not disassemble further if the component is removed for access only.

Using the special tool, remove both HO2S from the catalytic converter.



Installation

1.  **CAUTION:** Make sure the anti-seize compound does not contact the HO2S tip.

Using the special tool, install the HO2S to the catalytic converter and tighten to 45 Nm (33 lb.ft).
 - Clean the components.
 - Apply an anti-seize compound to the thread of the HO2S.
2. **NOTE:** Do not tighten the retaining clamp at this stage.

Position the catalytic converter to the front muffler.
 - Clean the components.
 - Install the nut.
3. Install the exhaust system.
For additional information, refer to: [Exhaust System](#) (309-00C Exhaust System - V6 4.0L Petrol, Removal and Installation).
4. Tighten the catalytic converter retaining clamp to 55 Nm (40

lb.ft).

5. Connect the battery ground cable.

For additional information, refer to: [Specifications](#) (414-00 Battery and Charging System - General Information, Specifications).

6. NOTE: For NAS vehicles only.

If required, carry out a long drive cycle.

For additional information, refer to: Powertrain Control Module (PCM) Long Drive Cycle Self-Test (303-14A, General Procedures).

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Exhaust System - V6 4.0L Petrol - Catalytic Converter RH

Removal and Installation

Special Tool(s)	
 E53465	Wrench, HO2S
	310-121 (LRT-19-014)

Removal

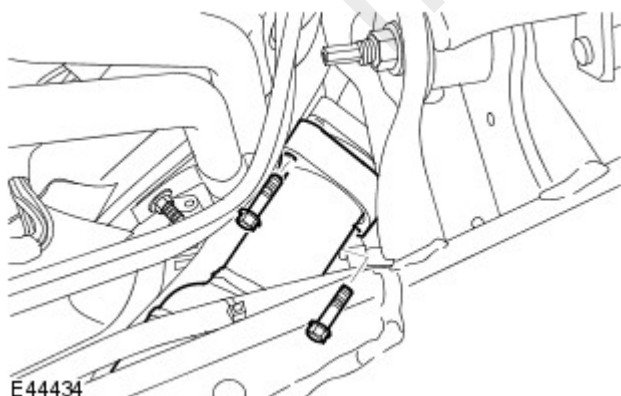
1. Disconnect the battery ground cable.
For additional information, refer to: [Specifications](#) (414-00 Battery and Charging System - General Information, Specifications).
2.  **WARNING:** Do not work on or under a vehicle supported only by a jack. Always support the vehicle on safety stands.

Raise and support the vehicle.

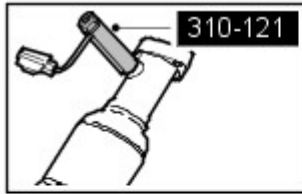
3. Remove the transmission crossmember.
For additional information, refer to: [Transmission Support Crossmember - V8 5.0L Petrol](#) (502-02 Full Frame and Body Mounting, Removal and Installation).
4. Release the RH rear HO2S wiring harness.
 - Disconnect the electrical connector.



5. Disconnect the catalytic converter from the exhaust manifold.
 - Remove and discard the 2 bolts.



6. Remove the catalytic converter.
 - Remove the 2 nuts.
 - Discard the gasket.



E44411

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

Using the special tool, remove both HO2S from the catalytic converter.

Installation

1.  **CAUTION:** Make sure the anti-seize compound does not contact the HO2S tip.

Using the special tool, install the HO2S to the catalytic converter and tighten to 45 Nm (33 lb.ft).

- Clean the components.
- Apply an anti-seize compound to the thread of the HO2S.

2. Position the catalytic converter to the front muffler.

- Clean the components.
- Install a new gasket.
- Tighten the nuts to 55 Nm (40 lb.ft).

3. Position the catalytic converter to the exhaust manifold.

- Clean the components.
- Tighten the new bolts to 22 Nm (16 lb.ft).

4. Install the transmission crossmember.

For additional information, refer to: [Transmission Support Crossmember - V8 5.0L Petrol](#) (502-02 Full Frame and Body Mounting, Removal and Installation).

5.  **CAUTION:** Make sure the HO2S wiring harness is not twisted more than 180 degrees and is not in contact with either the exhaust or driveshaft.

Connect the HO2S electrical connector.

- Attach the HO2S wiring harness.

6. Connect the battery ground cable.

For additional information, refer to: [Specifications](#) (414-00 Battery and Charging System - General Information, Specifications).

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

If required, carry out a long drive cycle.

For additional information, refer to: Powertrain Control Module (PCM) Long Drive Cycle Self-Test (303-14A, General Procedures).

Exhaust System - V6 4.0L Petrol - Exhaust System

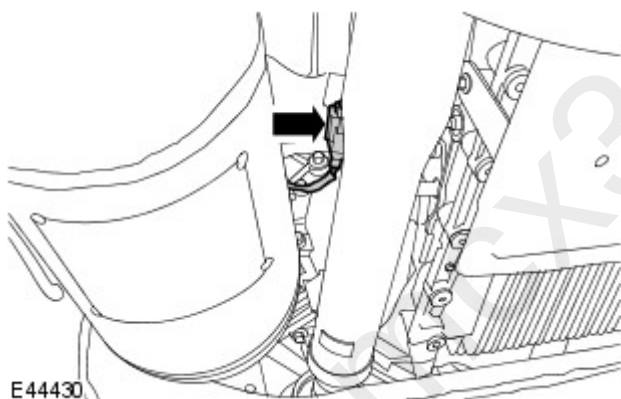
Removal and Installation

Special Tool(s)	
 E53465	Wrench, HO2S
	310-121 (LRT-19-014)

Removal

1. Disconnect the battery ground cable.
For additional information, refer to: [Specifications](#) (414-00 Battery and Charging System - General Information, Specifications).
2.  **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.
3. Remove the engine undershield.
For additional information, refer to: [Engine Undershield](#) (501-02 Front End Body Panels, Removal and Installation).
4. Remove the transmission crossmember.
For additional information, refer to: [Transmission Support Crossmember - V8 5.0L Petrol](#) (502-02 Full Frame and Body Mounting, Removal and Installation).
5. Release the LH front HO2S wiring harness.
 - Disconnect the electrical connector.



6. Release the RH front HO2S wiring harness.
 - Disconnect the electrical connector.

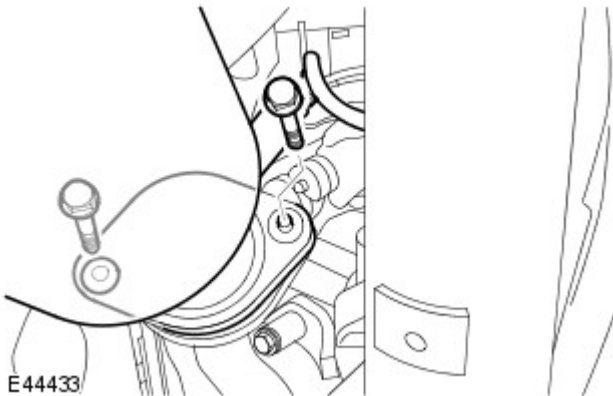


7. Release the LH rear HO2S wiring harness.
 - Disconnect the electrical connector.



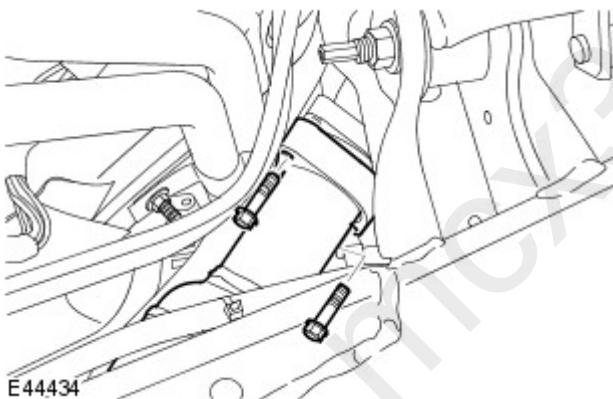
8. Release the RH rear HO2S wiring harness.

- Disconnect the electrical connector.



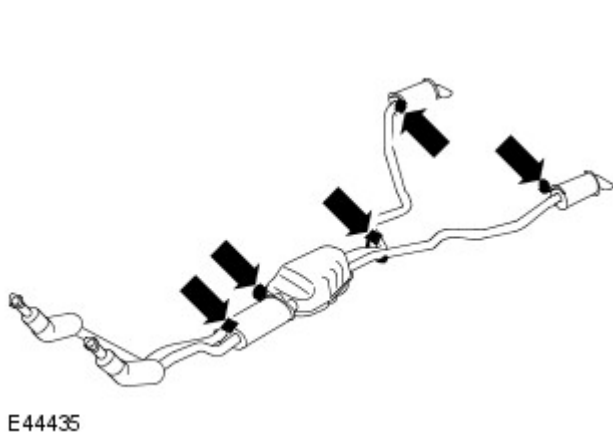
9. Disconnect the LH catalytic converter from the exhaust manifold.

- Remove and discard the 2 bolts.



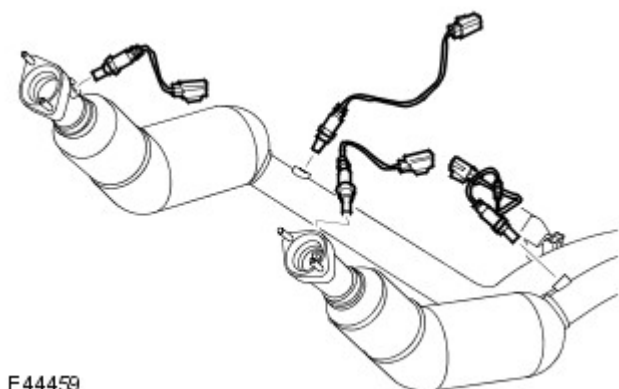
10. Disconnect the RH catalytic converter from the exhaust manifold.

- Remove and discard the 2 bolts.



11. With assistance, remove the exhaust system.

- Disconnect the 5 exhaust hangers.



E44459

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

Using the special tool, remove the 4 HO2S from the catalytic converters.

Installation

1.  **CAUTION:** Make sure the anti-seize compound does not contact the HO2S tip.

Using the special tool, install the HO2S to the catalytic converters and tighten to 45 Nm (33 lb.ft).

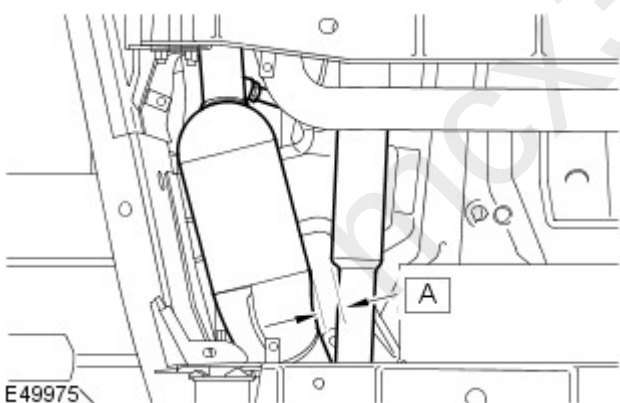
- Clean the components.
- Apply an anti-seize compound to the thread of the HO2S.

2. With assistance, install the exhaust system.

- Attach the exhaust hangers.

3. Position the RH catalytic converter to the exhaust manifold.

- Clean the components.
- Tighten the new bolts to 22 Nm (16 lb.ft).



E49975

4.  **CAUTION:** Make sure there is a clearance (A) of 25 mm to 30 mm between the closest points of the LH catalytic converter and the front driveshaft.

Position the LH catalytic converter to the exhaust manifold.

- Clean the components.
- Tighten the new bolts to 22 Nm (16 lb.ft).

5.  **CAUTION:** Make sure the HO2S wiring harness is not twisted more than 180 degrees and is not in contact with either the exhaust or driveshaft.

Connect the HO2S electrical connectors.

- Attach the HO2S wiring harnesses.

6. Install the transmission crossmember.
For additional information, refer to: [Transmission Support Crossmember - V8 5.0L Petrol](#) (502-02 Full Frame and Body Mounting, Removal and Installation).

7. Install the engine undershield.
For additional information, refer to: [Engine Undershield](#) (501-02 Front End Body Panels, Removal and Installation).

8. Connect the battery ground cable.
For additional information, refer to: [Specifications](#) (414-00 Battery and Charging System - General Information,

Specifications).

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Exhaust System - V6 4.0L Petrol - Muffler

Removal and Installation

Special Tool(s)	
	Pipe cutter-exhaust
	100-051 (LRT-99-027)

Removal

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

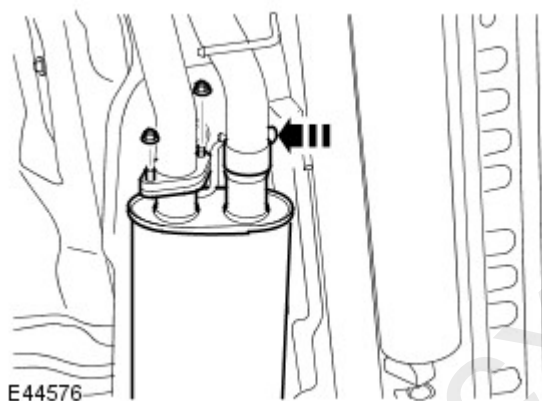
Raise and support the vehicle.

- Disconnect the RH catalytic converter from the muffler assembly.

- Remove the 2 nuts.
- Discard the gasket.

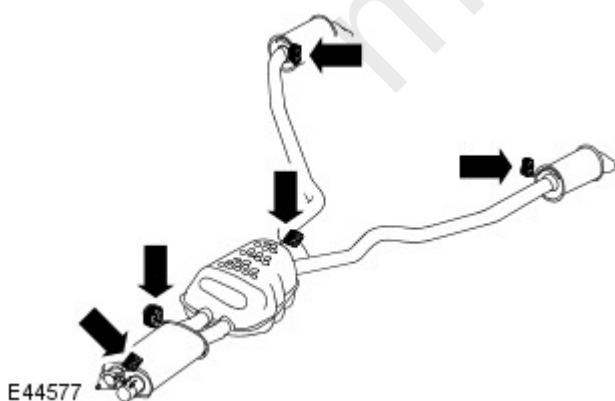
- Disconnect the LH catalytic converter from the muffler assembly.

- Remove the nut and release the retaining clamp.



- With assistance, remove the muffler assembly.

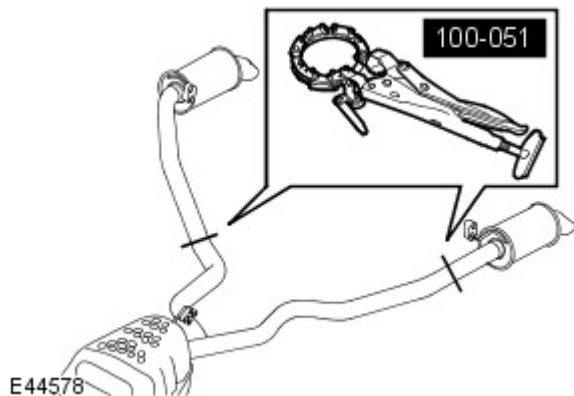
- Disconnect the 5 exhaust hangers.



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

Remove the LH tail pipe.

- Using 100-051, cut the tail pipe at the point indicated by a depression in the pipe.



6. Remove the RH tail pipe.

- Using 100-051, cut the tail pipe at the point indicated by a depression in the pipe.

Installation

1. NOTE: Do not tighten the retaining clamp at this stage.

Position the RH tail pipe to the muffler assembly.

- Clean the components.
- Install the retaining clamp.

2. NOTE: Do not tighten the retaining clamp at this stage.

Position the LH tail pipe to the muffler assembly.

- Clean the components.
- Install the retaining clamp.

3. With assistance, install the muffler assembly.

- Attach the exhaust hangers.
- Install a new gasket.
- Tighten the catalytic converter nuts and clamp to 48 Nm (35 lb.ft).

4. Align both tail pipes and tighten the retaining clamps to 55 Nm (40 lb.ft).

Exhaust System - V6 4.0L Petrol - Tailpipe

Removal and Installation

Special Tool(s)	
	Pipe cutter-exhaust
	100-051 (LRT-99-027)

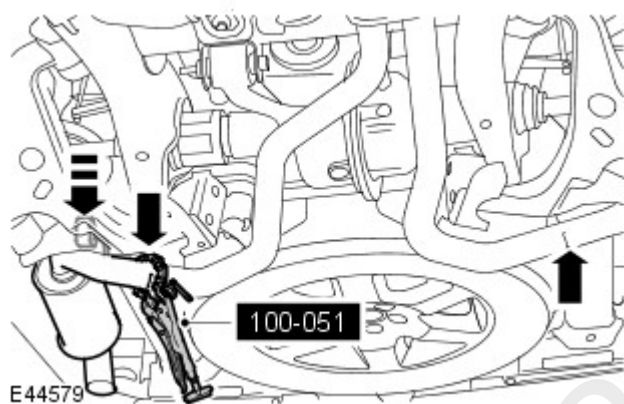
Removal

-  **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.

- Remove the tail pipe.

- Using 100-051, cut the tail pipe at the point indicated by a depression in the pipe.
- Disconnect from the exhaust hanger.



Installation

- NOTE:** Do not tighten the retaining clamp at this stage.

Install the tail pipe.

- Clean the components.
- Install the retaining clamp.

- Align the tail pipe and tighten the retaining clamp to 55 Nm (40 lb.ft).