

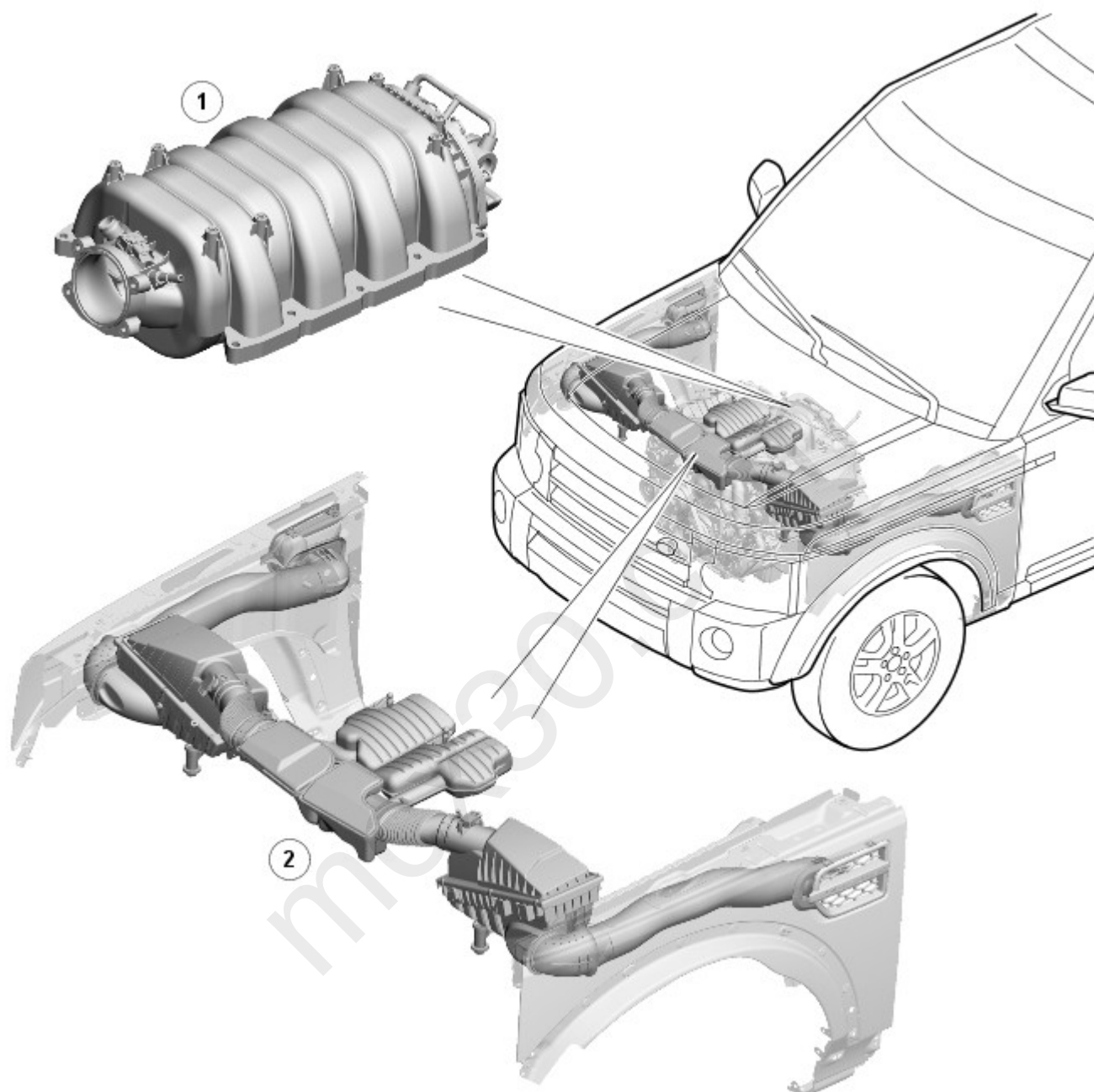
Intake Air Distribution and Filtering - V8 5.0L Petrol -

Description	Nm	lb-ft	lb-in
Air Cleaner Outlet Pipe T-Connector clip	3.5	-	31
Air Cleaner Outlet clips	3.5	-	31
Throttle body retaining studs	17	13	-
Intake manifold retaining bolts	25	18	-
Manifold absolute pressure (MAP) sensor	5	-	44

Intake Air Distribution and Filtering - V8 5.0L Petrol - Intake Air Distribution and Filtering

Description and Operation

COMPONENT LOCATION



E123715

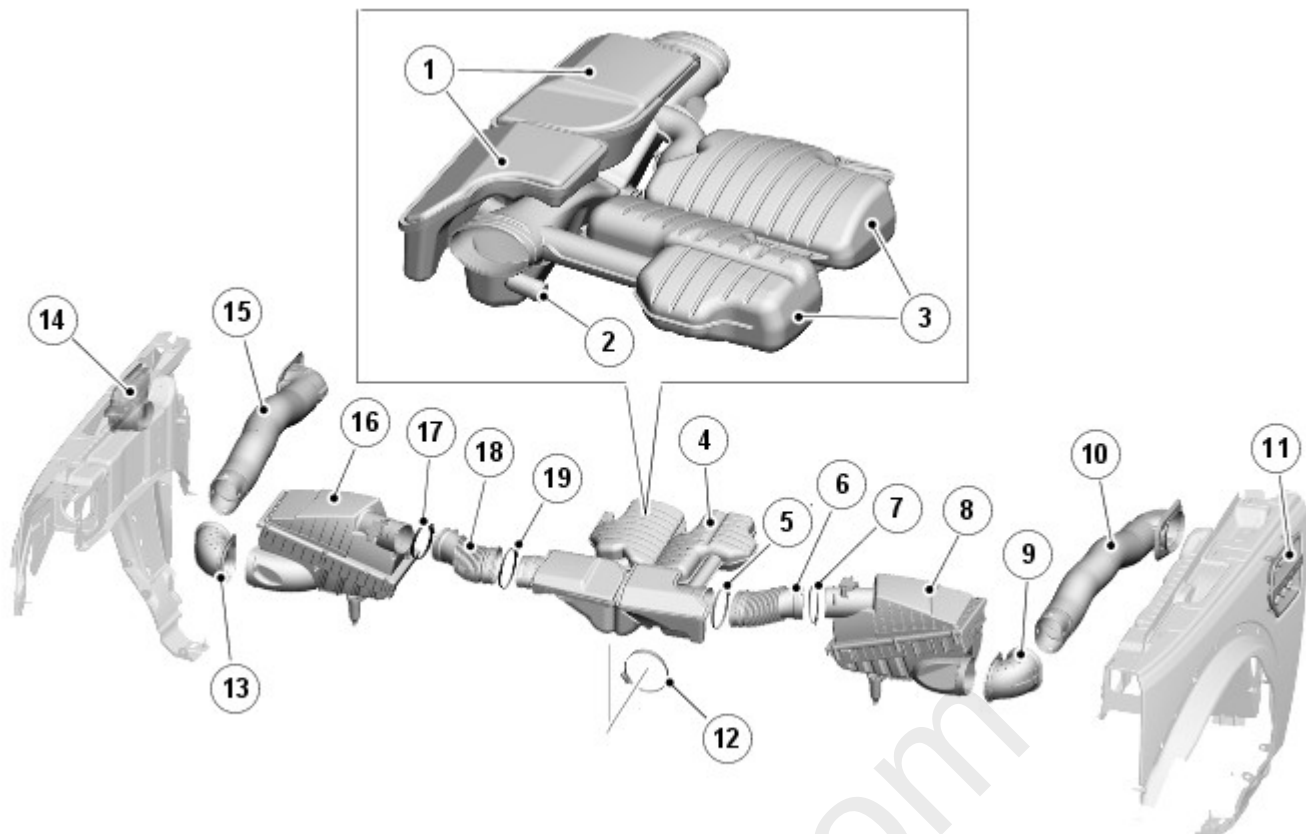
Item	Part Number	Description
1	-	Intake manifold
2	-	Air intakes, air cleaners and air ducts

INTRODUCTION

The intake air distribution and cleaning system comprises:

- Dual air intakes, air cleaners and air ducts.
- An intake manifold.

AIR INTAKES, AIR CLEANERS AND AIR DUCTS



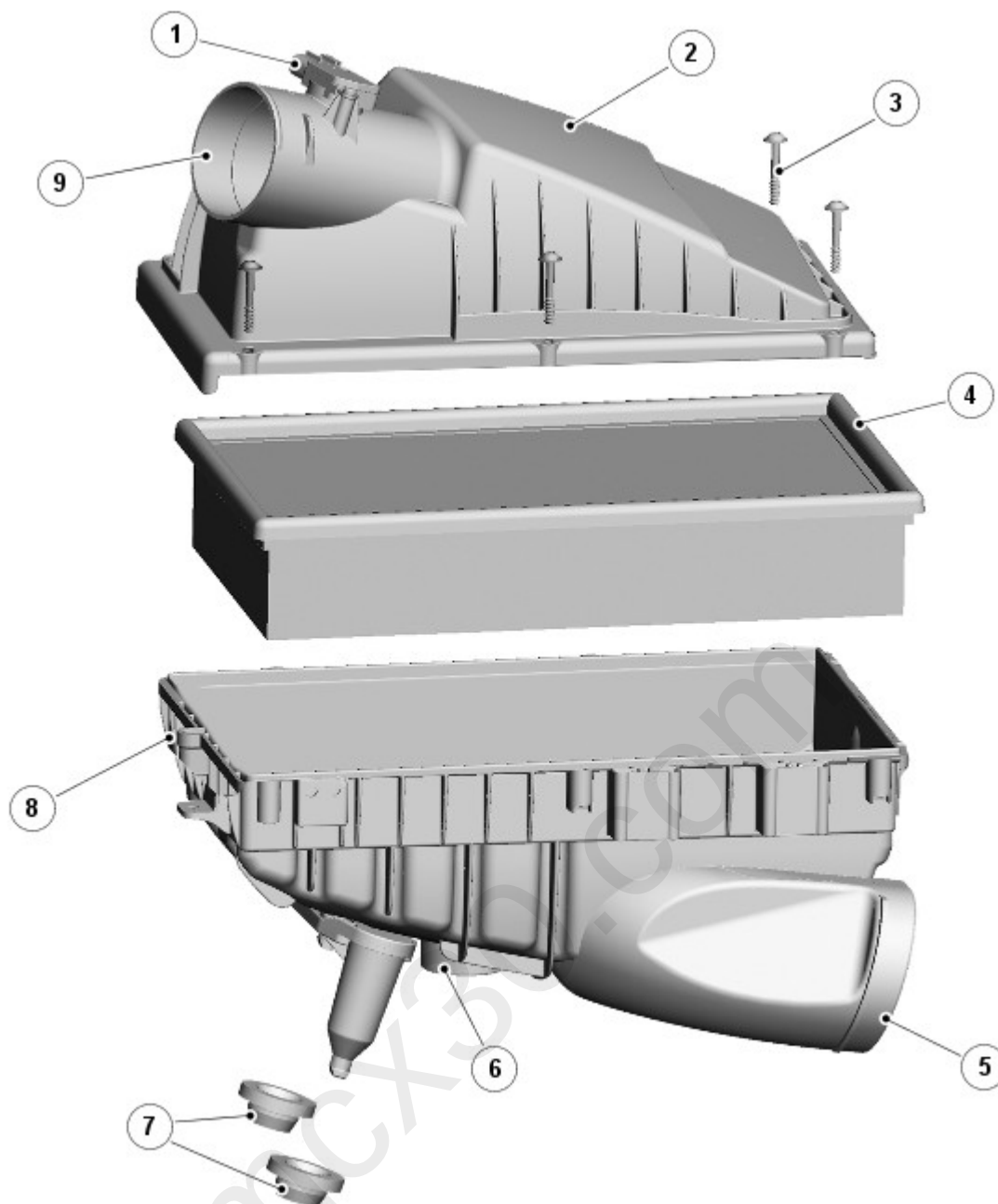
E123716

Item	Part Number	Description
1	-	Resonators
2	-	Full load breather connector stub
3	-	Resonators
4	-	Clean air duct
5	-	Hose clamp
6	-	LH (left hand) clean air convolute
7	-	Hose clamp
8	-	LH air cleaner
9	-	LH dirty air duct
10	-	LH air intake hose
11	-	LH air intake
12	-	Hose clamp
13	-	RH (right hand) dirty air duct
14	-	RH air intake
15	-	RH air intake hose
16	-	RH air cleaner
17	-	Hose clamp
18	-	RH clean air convolute
19	-	Hose clamp

Air is supplied to the air cleaners through the air intakes, air intake hoses and dirty air ducts in the fenders.

The air cleaners are located in the engine compartment, forward of the suspension housings. Two isolators locate each air cleaner on the related front side member. Each air cleaner consists of an air cleaner element installed in a tray and enclosed with a cover secured by six screws. Air inlet and outlet connections are incorporated into the tray and cover respectively. The bottom of the tray incorporates a drain valve to prevent the accumulation of water in the air cleaner. The air outlet connection incorporates a **MAFT (mass air flow and temperature)** sensor.

Air Cleaner



E121098

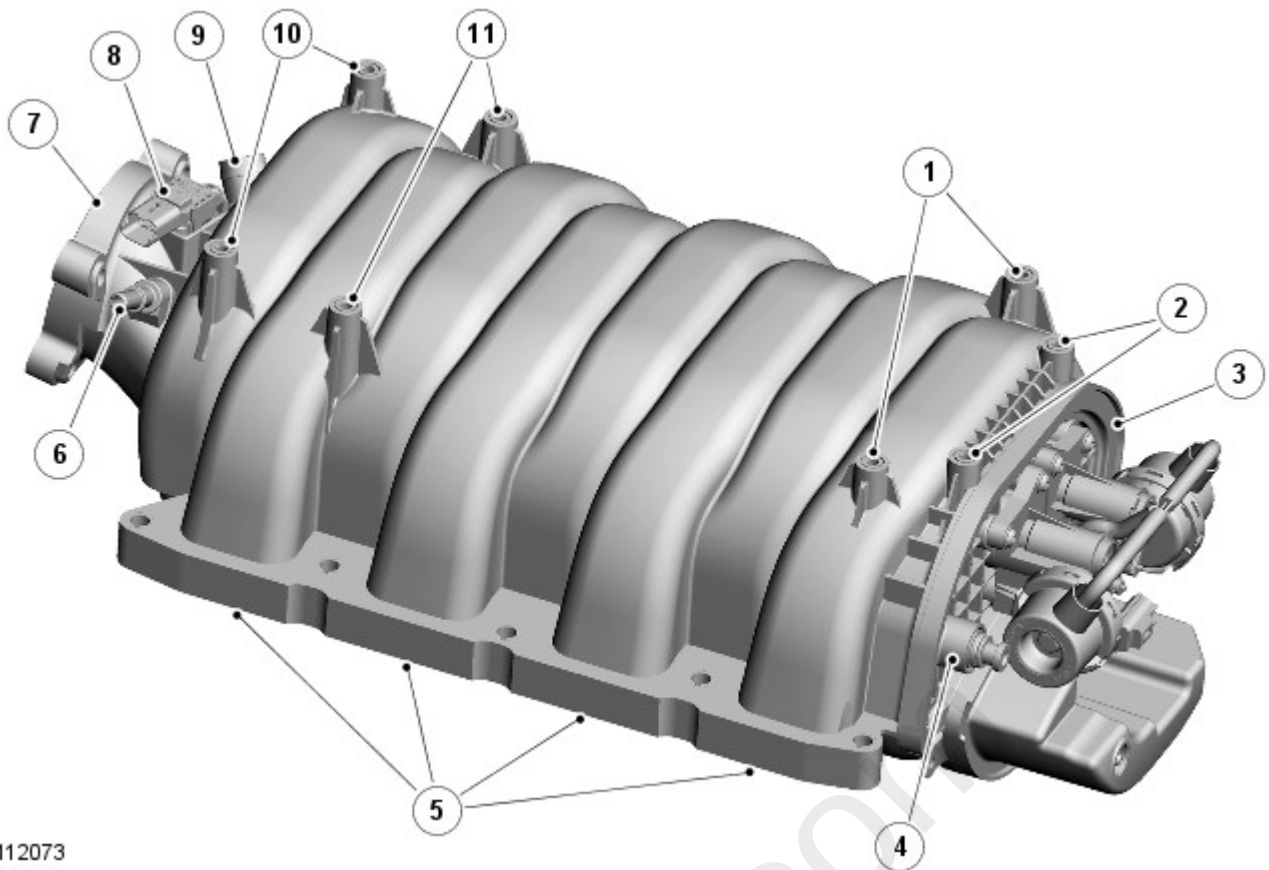
Item	Part Number	Description
1	-	MAFT sensor
2	-	Cover
3	-	Screw (6 off)
4	-	Air cleaner element
5	-	Inlet connection
6	-	Drain valve
7	-	Isolators
8	-	Tray
9	-	Outlet connection

The clean air convolutes and the clean air duct direct the air from the air cleaners into the electric throttle. Hose clamps connect the clean air convolutes and the clean air duct together, and to the air cleaners and the electric throttle.

The clean air duct also incorporates the following:

- Resonators, to reduce air induction noise.
- A connector stub for the engine full load breather pipe.

INTAKE MANIFOLD



E112073

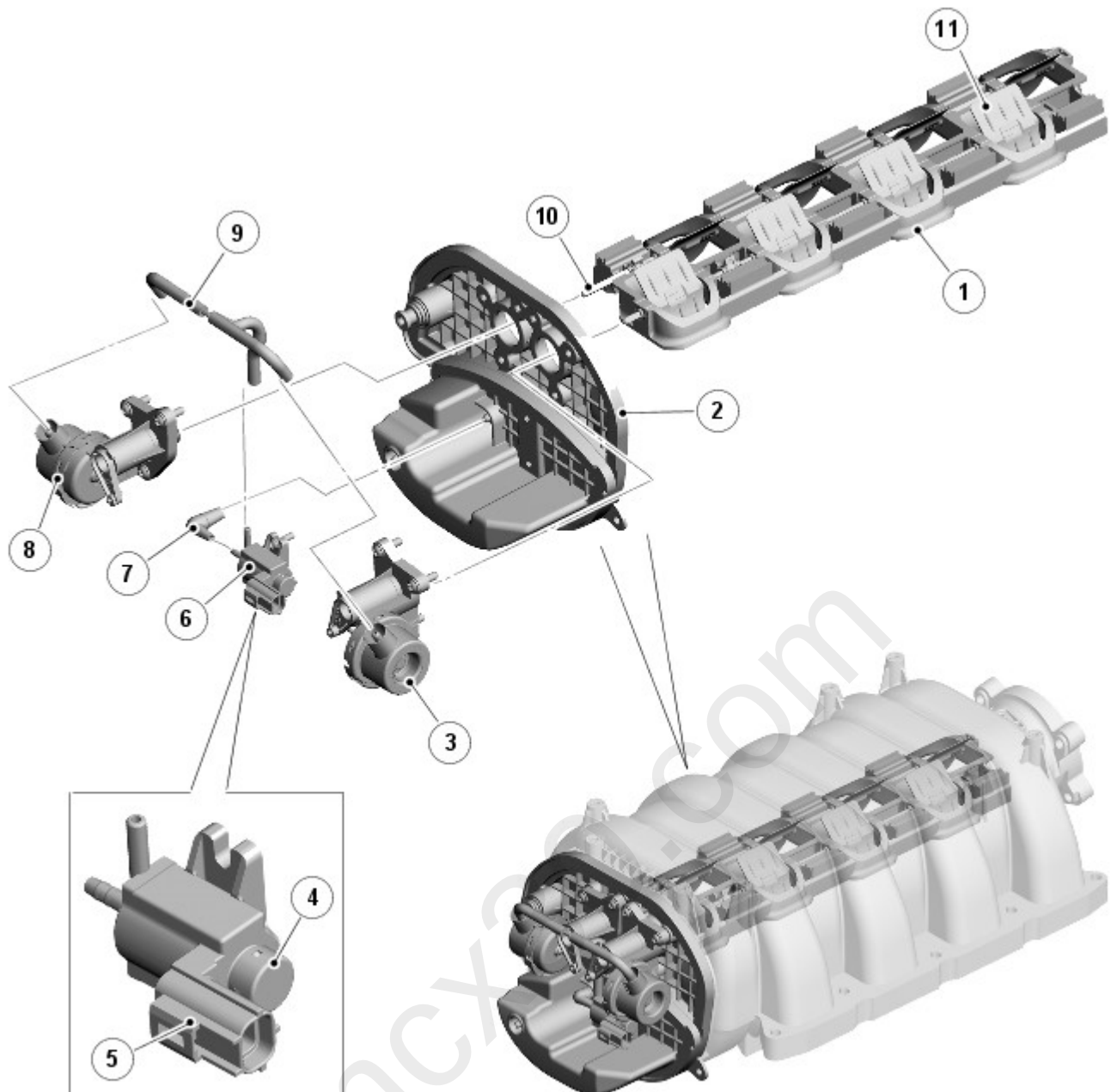
Item	Part Number	Description
1	-	Engine cover rear attachment points
2	-	Engine harness shield attachment points
3	-	Cover plate
4	-	Brake booster vacuum connection
5	-	Outlet ports
6	-	Evaporative emissions connection
7	-	Inlet port
8	-	MAP (manifold absolute pressure) sensor
9	-	Part load breather connection
10	-	Fuel crossover tube attachment points
11	-	Engine cover front attachment points

The intake manifold is installed between the cylinder heads and directs air from the electric throttle to the individual cylinders. The inlet port connects to a central chamber in the intake manifold. Eight separate tracts connect the central chamber to the outlet ports. A cover plate seals the rear of the intake manifold.

The intake manifold incorporates:

- A stub pipe for connection of the part load breather.
- A stub pipe for connection of the evaporative emissions system.
- A **MAP (manifold absolute pressure)** sensor.
- A vacuum connection for the brake booster.
- Threaded inserts to provide attachment points for the electric throttle, fuel crossover tube, engine cover and an engine harness shield.
- Compression limiters in the cylinder head attachment points.
- Seals in the inlet and outlet ports.
- A VIS (variable intake system).

Variable Intake System



E112074

Item	Part Number	Description
1	-	Cassette
2	-	Cover plate
3	-	RH pneumatic actuator
4	-	Vent cap
5	-	Electrical connector
6	-	Tuning valve
7	-	Vacuum connector
8	-	LH pneumatic actuator
9	-	Vacuum hoses
10	-	Drive shaft
11	-	Flap valve

The VIS changes the length of the tracts in the intake manifold to improve the air flow to the cylinders, which improves the engine power and torque.

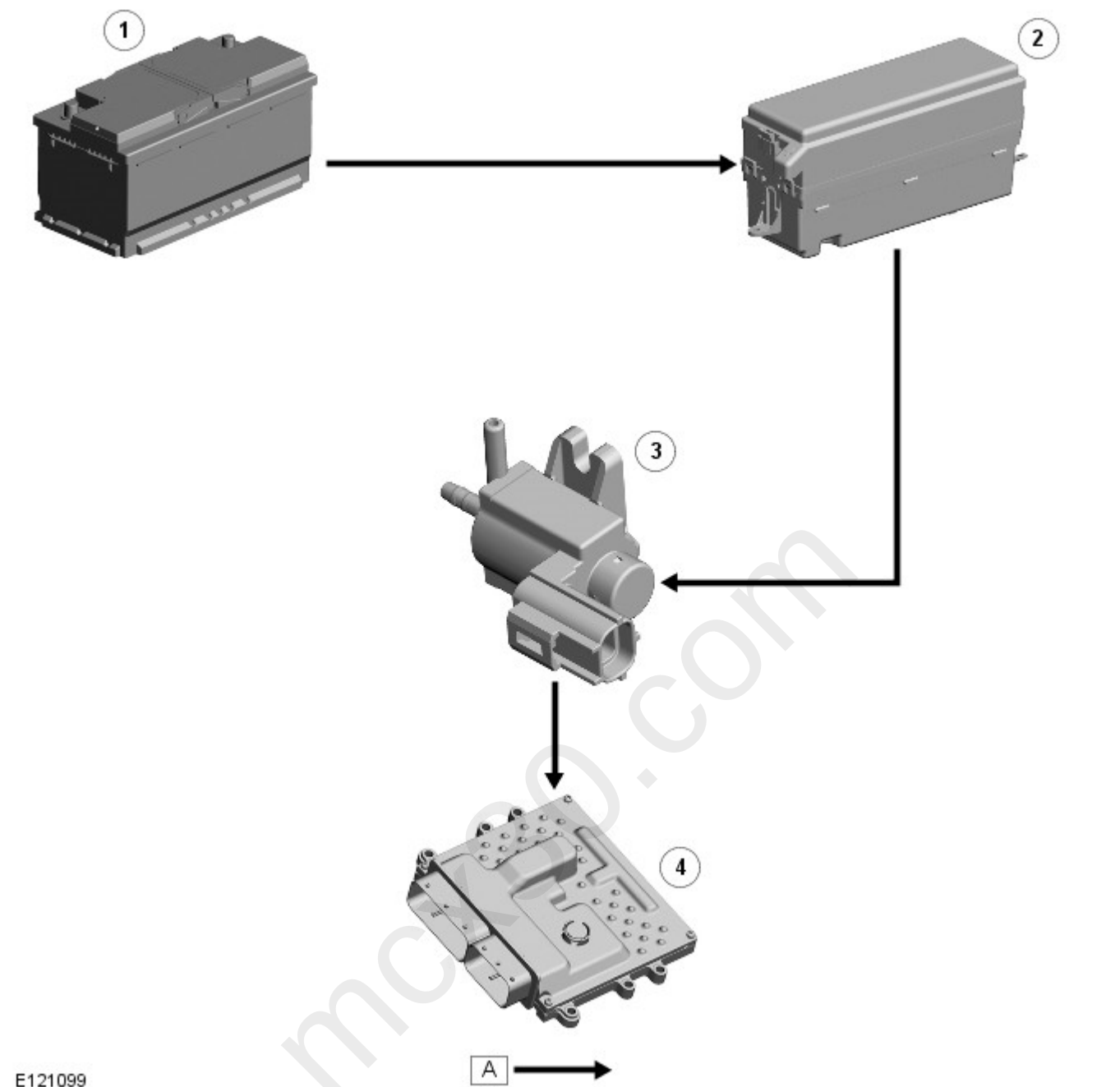
A cassette in the intake manifold contains eight flap valves, each located in an opening part-way along one of the tracts. Two drive shafts connect the flap valves together in two groups of four. Each drive shaft is connected to a pneumatic actuator installed on the cover plate of the intake manifold.

A tuning valve, also installed on the cover plate, controls the application of vacuum pressure to the pneumatic actuators. The tuning valve is a normally-closed solenoid-operated valve installed in the vacuum line between the cover plate and the pneumatic actuators. A vent cap on the tuning valve allows atmospheric pressure into the vacuum line to the pneumatic actuators when the tuning valve is closed.

The [ECM \(engine control module\)](#) controls the operation of the tuning valve.

CONTROL DIAGRAM (VARIABLE INTAKE SYSTEM)

• NOTE: A = Hardwired



Item	Part Number	Description
1	-	Battery
2	-	EJB (engine junction box) (ECM relay)
3	-	Tuning valve
4	-	ECM

OPERATION

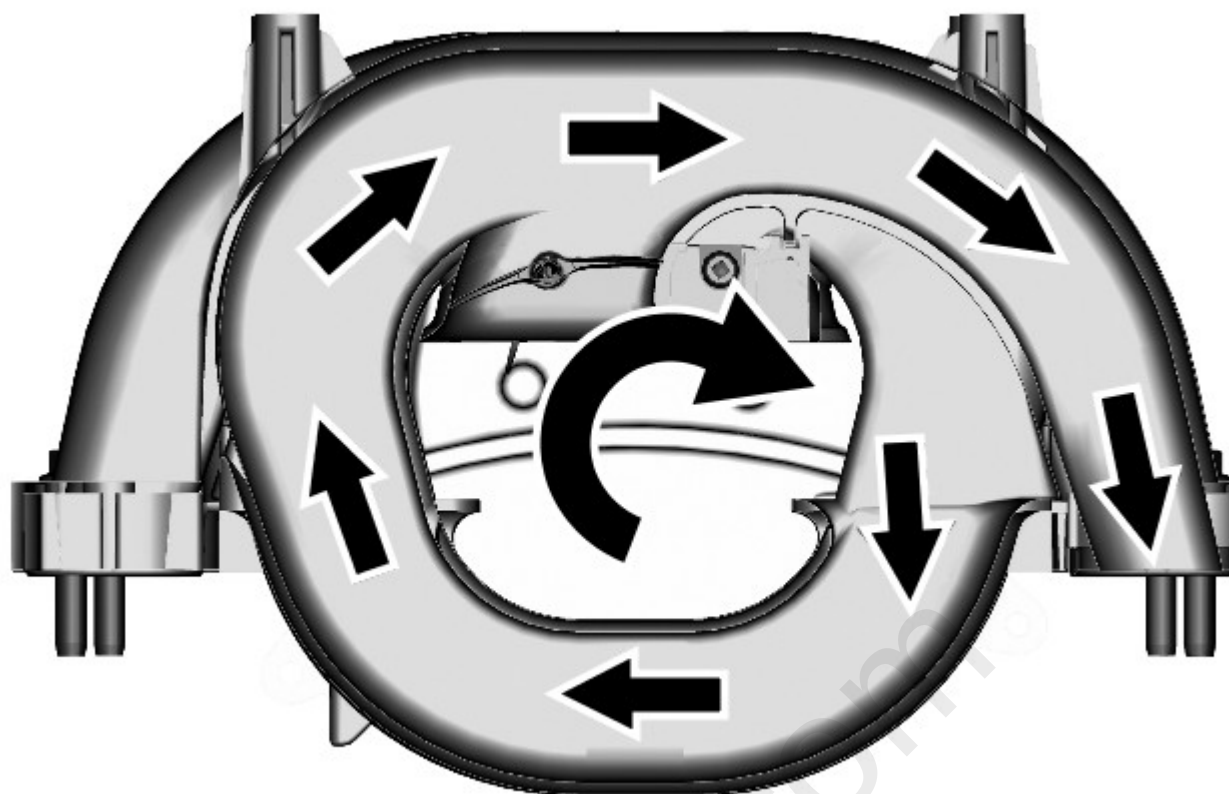
Variable Intake System

The flap valves can be set to one of two positions, to produce short or long intake tracts in the intake manifold. Long intake tracts are produced with the flap valves closed. Short intake tracts are produced with the flap valves open. The flap valves are closed at engine speeds up to 4700 rev/min and open at engine speeds of 4700 rev/min and above, with a hysteresis of 50 rev/min.

The tuning valve receives a power feed from the EMS relay in the [EJB \(engine junction box\)](#), and is connected to ground through the [ECM](#). To close the flap valves, the [ECM](#) connects the tuning valve to ground. The energized tuning valve blanks off the atmospheric vent and opens the vacuum line between the cover plate and the pneumatic actuators. The depression in the intake manifold is sensed at the pneumatic actuators, which turn the drive shafts and move the flap valves to the closed position.

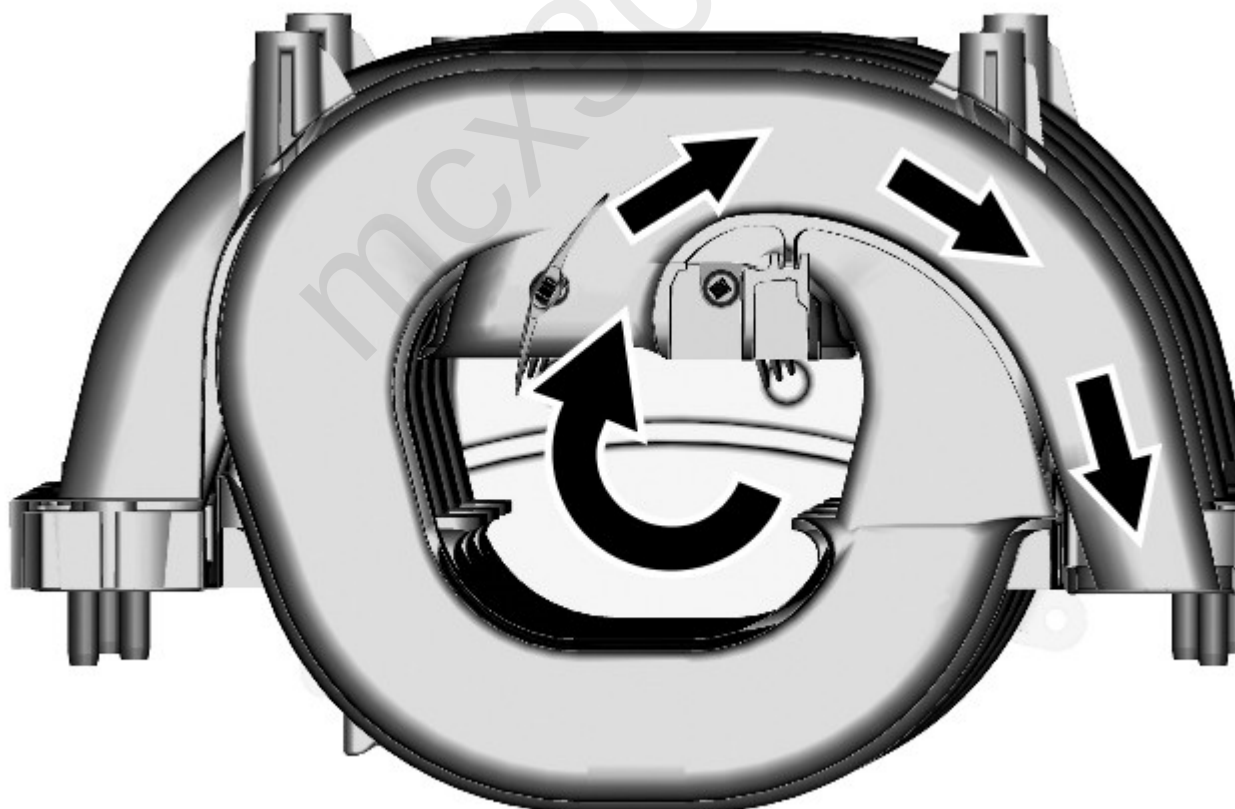
To open the flap valves, the [ECM](#) disconnects the ground connection and the tuning valve is de-energized closed. Atmospheric pressure is sensed at the pneumatic actuators through the vent cap on the intake manifold tuning valve and the flap valves move to the open position.

Flap Valves Closed



E 106750

Flap Valves Open



E106751

Intake Air Distribution and Filtering - V8 5.0L Petrol - Intake Air Distribution and Filtering

Diagnosis and Testing

Principles of Operation

For a detailed description of the intake air distribution and filtering system and operation, refer to the relevant Description and Operation section of the workshop manual. REFER to: [Intake Air Distribution and Filtering](#) (303-12D Intake Air Distribution and Filtering - V8 5.0L 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. **1.** Verify the customer concern.
2. **2.** Visually inspect for obvious signs of mechanical or electrical damage.

Visual Inspection

Mechanical	Electrical
• Hoses and ducts (damage/connections) • Air cleaner element (contaminated/blocked) • Restricted air intake • Supercharger • Supercharger (cooling fan) drive belt • Supercharger seals and gaskets • Charge air coolers (damage/connection)	• Mass Air Flow (MAF) sensor • Manifold Absolute Pressure (MAP) sensor • Manifold Absolute Pressure/Temperature (MAPT) sensor • Throttle body • Harness (security/damage) • Connections (security/damage)

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, alternatively check for Diagnostic Trouble Codes (DTCs) and refer to the DTC Index.

Symptom Chart

Symptom	Possible Causes	Action
Vehicle does not start/hard starting/poor performance	• Restricted/Blocked air intake • Restricted/Blocked air cleaner element	Clear the restriction. Replace the air cleaner element as necessary. Refer to the relevant workshop manual section.
Excessive intake noise	• Intake pipe disconnected/damaged after the air cleaner • Air cleaner assembly incorrectly assembled/damaged	Check the intake system and hoses for correct installation/damage. Refer to the relevant workshop manual section.
Lack of boost	• Supercharger drive belt broken/slipping • Supercharger fault • Supercharger air intake fault • Major air leakage (after the supercharger)	Check the supercharger and drive belt. Check the charge air coolers. Refer to the relevant workshop manual section.
Noise	• Supercharger drive belt slipping • Supercharger fault • Major air leakage (after the supercharger)	Check the supercharger and drive belt. Remove the supercharger drive belt and recheck for noise. Turn the supercharger by hand and check for excessive resistance. Check for excessive play at the supercharger pulley. Check the charge air coolers. Refer to the relevant workshop manual section.

DTC Index

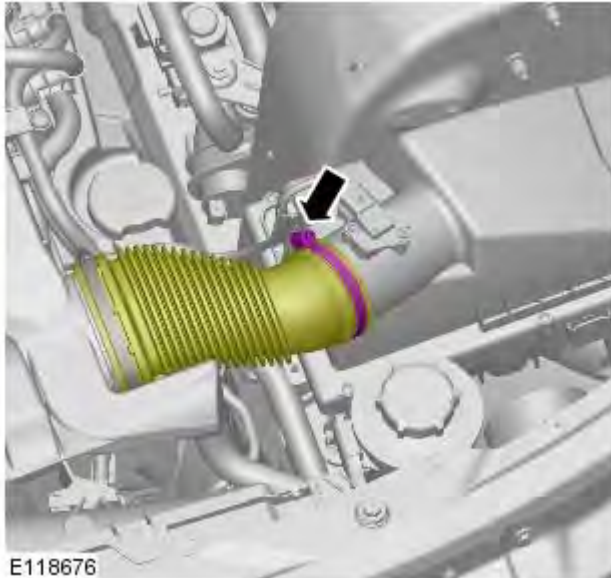
For a list of Diagnostic Trouble Codes (DTCs) that could be logged on this vehicle, please refer to Section 100-00. REFER to: [Diagnostic Trouble Code \(DTC\) Index - V8 5.0L Petrol, DTC: Engine Control Module \(PCM\)](#) (100-00 General Information, Description and Operation).

Intake Air Distribution and Filtering - V8 5.0L Petrol - Air Cleaner Element

Removal and Installation

Removal

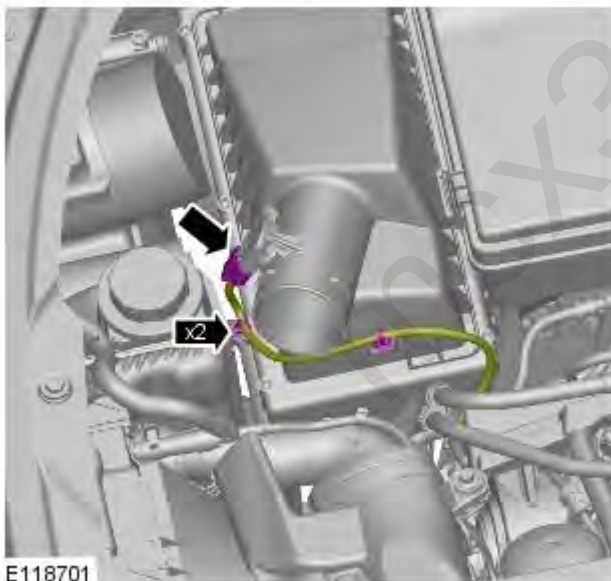
- NOTE: Removal steps in this procedure may contain installation details.
- NOTE: Air cleaner elements must be renewed in pairs.



1. **1.** NOTE: Left-hand shown, right-hand similar.

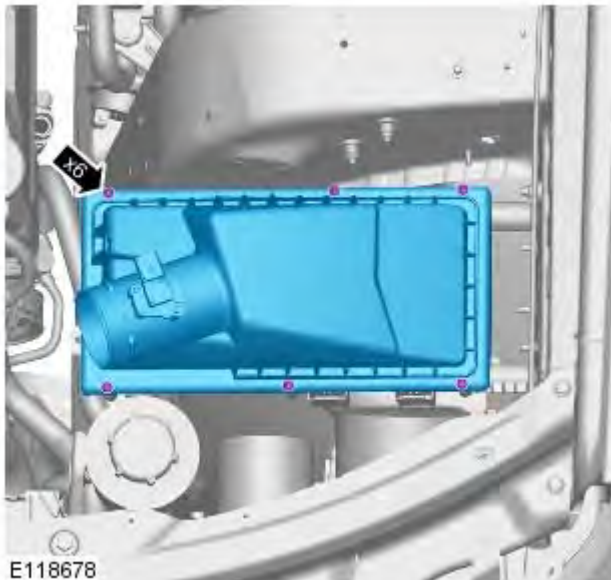
- NOTE: Some variation in the illustrations may occur, but the essential information is always correct.

Torque: 3.5 Nm



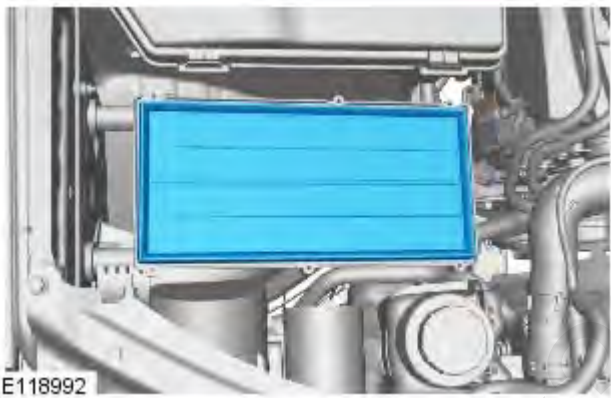
2. **2.** NOTE: Left-hand shown, right-hand similar.

- NOTE: Some variation in the illustrations may occur, but the essential information is always correct.



3. **3.** NOTE: Some variation in the illustrations may occur, but the essential information is always correct.

- NOTE: Left-hand shown, right-hand similar.



4. **4.** NOTE: Some variation in the illustrations may occur, but the essential information is always correct.

- NOTE: Right-hand shown, left-hand similar.

- Repeat the above procedure for the other side.

Installation

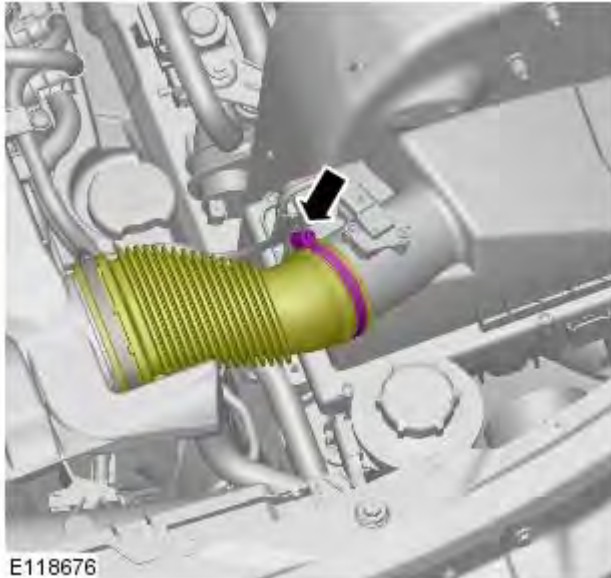
1. To install reverse the removal procedure.

Intake Air Distribution and Filtering - V8 5.0L Petrol - Air Cleaner LH

Removal and Installation

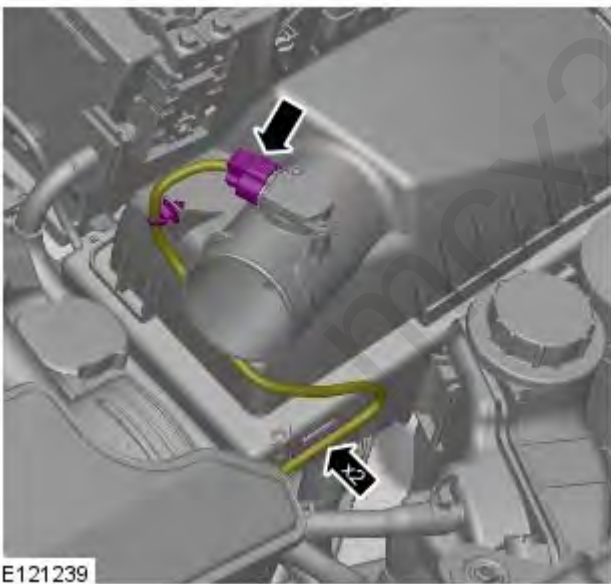
Removal

- NOTE: Removal steps in this procedure may contain installation details.
- NOTE: The ignition must be switched off.

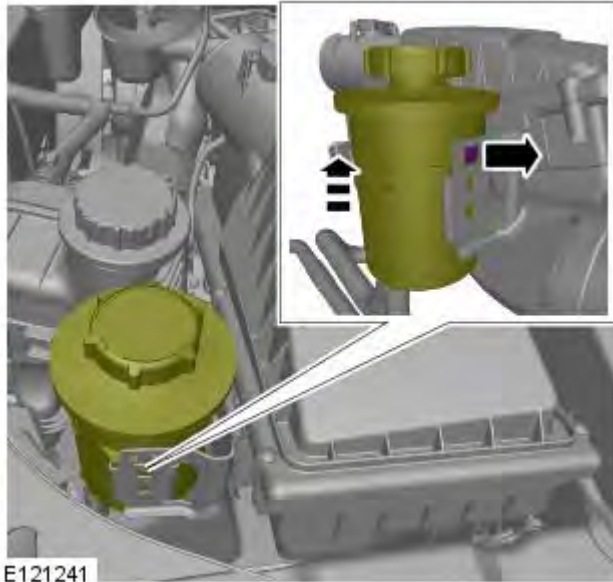


1. **1.** NOTE: Some variation in the illustrations may occur, but the essential information is always correct.

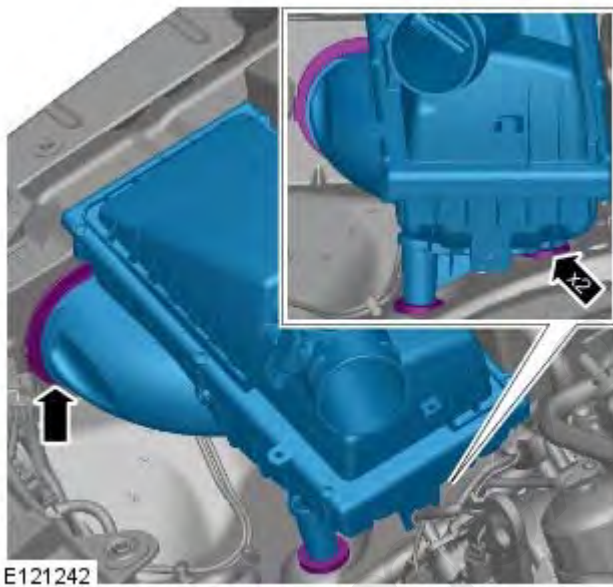
Torque: 3.5 Nm



- 2.



3.



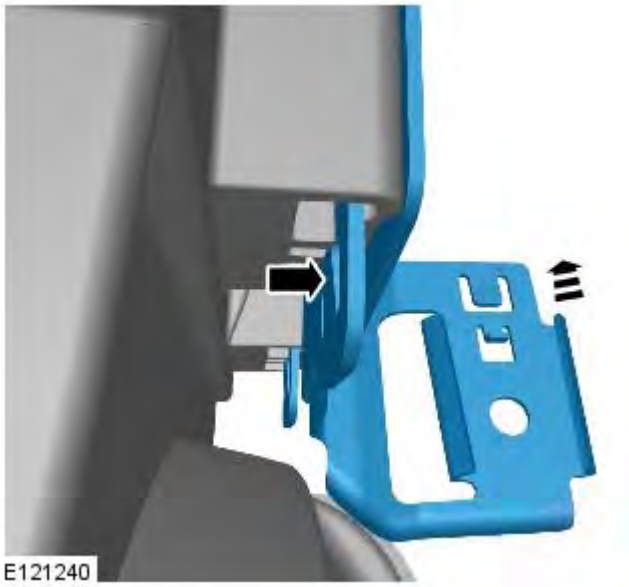
4. **4.** NOTE: Right-hand shown, left-hand similar.



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

- NOTE: Some variation in the illustrations may occur, but the essential information is always correct.

6.



7.



Installation

1. To install reverse the removal procedure.

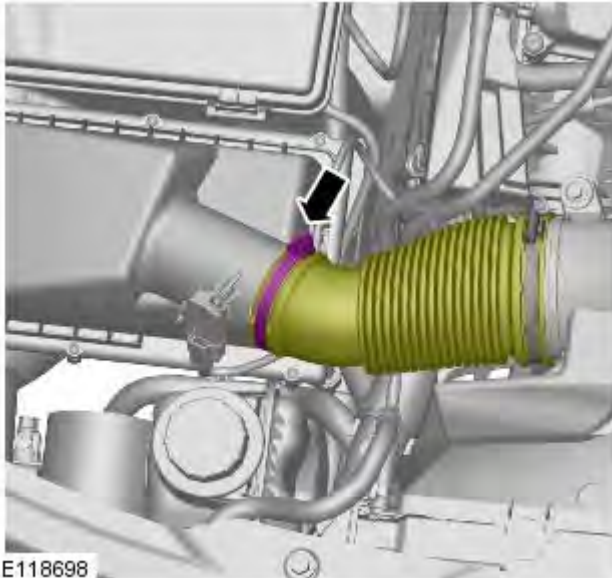
Intake Air Distribution and Filtering - V8 5.0L Petrol - Air Cleaner RH

Removal and Installation

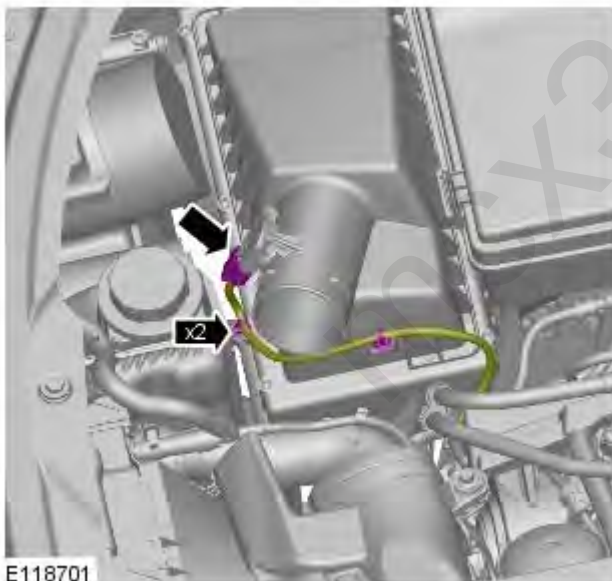
Removal

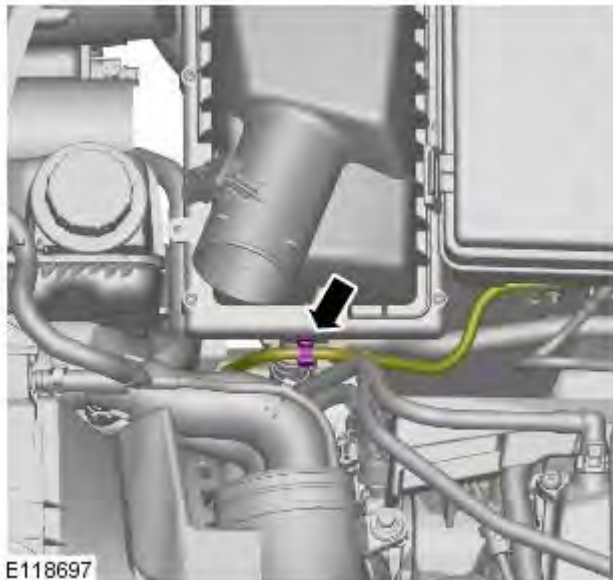
- NOTE: Removal steps in this procedure may contain installation details.
- NOTE: Some variation in the illustrations may occur, but the essential information is always correct.

1. Torque: 3.5 Nm

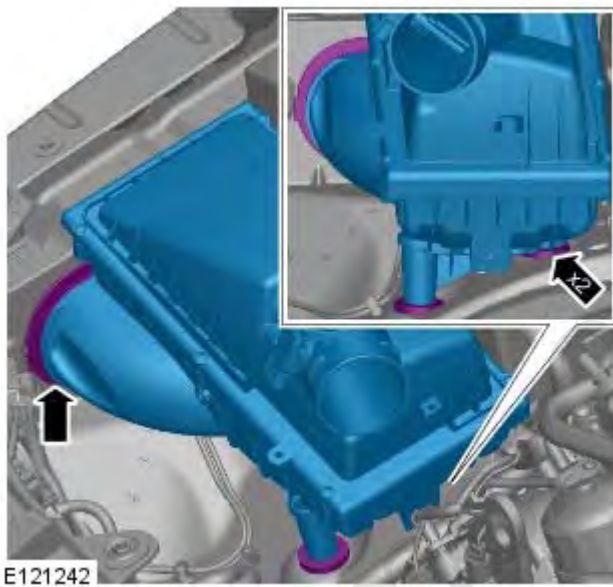


2.





3.



4.



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

6.



E121597

Installation

1. To install reverse the removal procedure.

mcx30.com

Intake Air Distribution and Filtering - V8 5.0L Petrol - Air Cleaner Outlet

Pipe LH

Removal and Installation

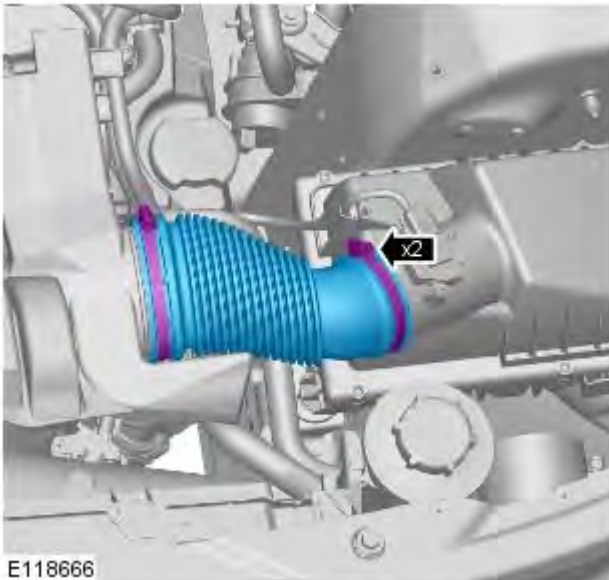
Removal

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

1. Refer to: [Engine Cover - V8 5.0L Petrol](#) (501-05 Interior Trim and Ornamentation, Removal and Installation).

2. **2.** NOTE: Some variation in the illustrations may occur, but the essential information is always correct.

Torque: 3.5 Nm



Installation

1. To install reverse the removal procedure.

Intake Air Distribution and Filtering - V8 5.0L Petrol - Air Cleaner Outlet Pipe RH

Removal and Installation

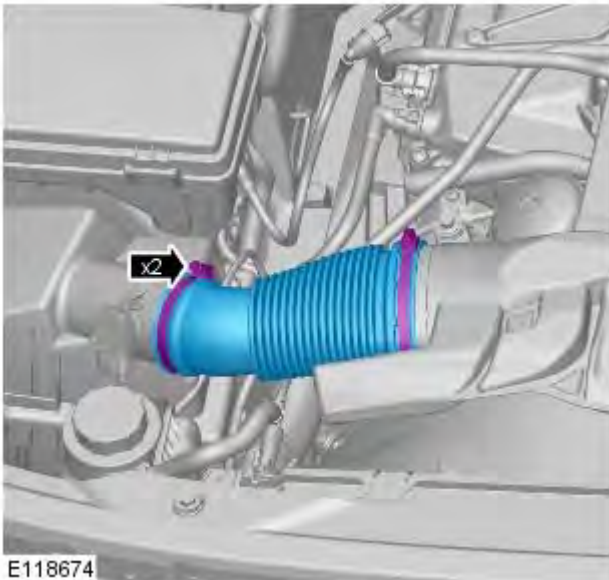
Removal

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

1. Refer to: [Engine Cover - V8 5.0L Petrol](#) (501-05 Interior Trim and Ornamentation, Removal and Installation).

2. **2.** NOTE: Some variation in the illustrations may occur, but the essential information is always correct.

Torque: 3.5 Nm



Installation

1. To install reverse the removal procedure.

Intake Air Distribution and Filtering - V8 5.0L Petrol - Air Cleaner Outlet

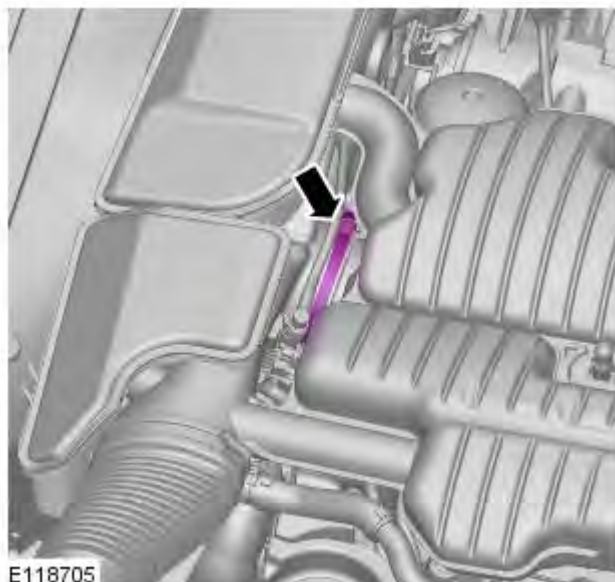
Pipe T-Connector

Removal and Installation

Removal

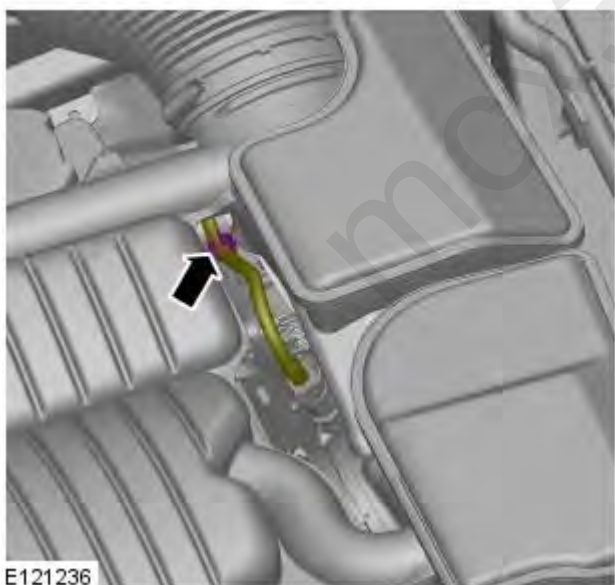
- NOTE: Removal steps in this procedure may contain installation details.

1. Refer to: [Engine Cover - V8 5.0L Petrol](#) (501-05 Interior Trim and Ornamentation, Removal and Installation).

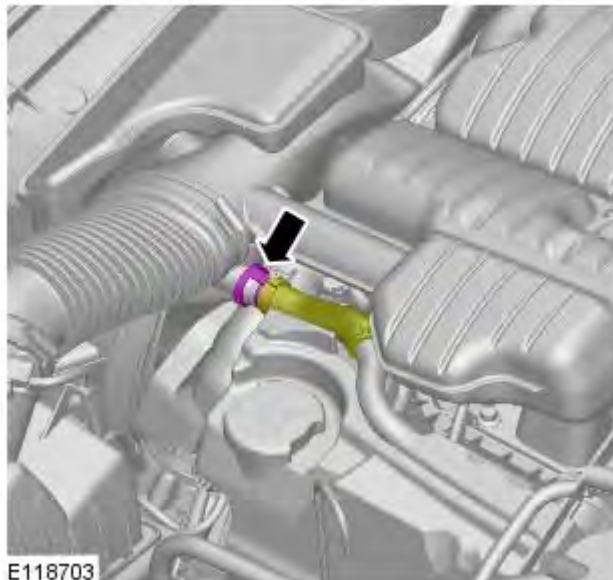


2. **2.** NOTE: Some variation in the illustrations may occur, but the essential information is always correct.

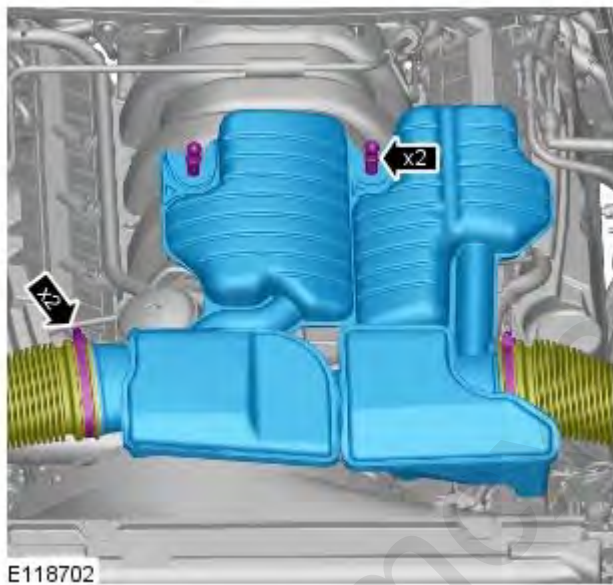
Torque: 3.5 Nm



- 3.



4. **4.** NOTE: Some variation in the illustrations may occur, but the essential information is always correct.



5. Torque: 3.5 Nm

Installation

1. To install reverse the removal procedure.