

# RENAULT

## 1 Engine and peripherals

**10A ENGINE AND CYLINDER BLOCK ASSEMBLY**

**11A TOP AND FRONT OF ENGINE**

**12A FUEL MIXTURE**

**12B TURBOCHARGING**

**13A FUEL SUPPLY**

**13B DIESEL INJECTION**

**13C PREHEATING**

**14A ANTIPOLLUTION**

**16A STARTING - CHARGING**

**17A IGNITION**

**17B PETROL INJECTION**

---

**X79**

---

**NOVEMBER 2009**

**EDITION ANGLAISE**

---

"The repair procedures given by the manufacturer in this document are based on the technical specifications current when it was prepared.

The procedures may be modified as a result of changes introduced by the manufacturer in the production of the various component units and accessories from which the vehicles are constructed".

All rights reserved by Renault.

Copying or translating, in part or in full, of this document or use of the service part reference numbering system is forbidden without the prior written authority of Renault.

**19A COOLING**

**19B EXHAUST**

**19C TANK**

**19D ENGINE MOUNTING**

---

**X79**

---

**NOVEMBER 2009**

**EDITION ANGLAISE**

---

"The repair procedures given by the manufacturer in this document are based on the technical specifications current when it was prepared.

The procedures may be modified as a result of changes introduced by the manufacturer in the production of the various component units and accessories from which the vehicles are constructed".

All rights reserved by Renault.

Copying or translating, in part or in full, of this document or use of the service part reference numbering system is forbidden without the prior written authority of Renault.

# DUSTER - Chapitre 1

## Contents

	Pages		
<b>10A</b>		<b>11A</b>	<b>TOP AND FRONT OF ENGINE</b>
<b>ENGINE AND CYLINDER BLOCK ASSEMBLY</b>			
Crankshaft seal on timing end: Removal - Refitting	10A-1	Pressure at end of compression: Check	11A-1
Crankshaft seal, gearbox end: Removal - Refitting	10A-5	Accessories belt: Removal - Refitting	11A-2
Lower cover: Removal - Refitting	10A-9	Crankshaft accessories pulley: Removal - Refitting	11A-10
Conrod bearing shell: Removal - Refitting	10A-24	Timing belt: Removal - Refitting	11A-17
Engine oil: Draining - Refilling	10A-32	Rocker cover: Removal - Refitting	11A-42
Oil filter: Removal - Refitting	10A-34	Camshaft: Removal - Refitting	11A-49
Oil-coolant heat exchanger: Removal - Refitting	10A-37	Camshaft seal, timing end: Removal - Refitting	11A-56
Oil pressure sensor: Removal - Refitting	10A-42	Oil decanter: Removal - Refitting	11A-68
Oil pump: Removal - Refitting	10A-44		
Oil pressure: Check	10A-46	<b>12A</b>	<b>FUEL MIXTURE</b>
Multifunction support: Removal - Refitting	10A-48		
Engine - gearbox assembly: Removal - Refitting	10A-54	Air inlet: Description	12A-1
Flywheel: Removal - Refitting	10A-75	Air resonator: Removal - Refitting	12A-2
		Air filter: Removal - Refitting	12A-3
		Air filter unit: Removal - Refitting	12A-6
		Air flowmeter: Removal - Refitting	12A-10

---

# Contents

<b>12A</b>	<b>FUEL MIXTURE</b>		<b>13B</b>	<b>DIESEL INJECTION</b>	
	Throttle valve: Removal - Refitting	12A-11		Crankshaft position sensor: Removal - Refitting	13B-8
	Inlet distributor: Removal - Refitting	12A-12		High pressure pump: Removal - Refitting	13B-9
	Injector holder shim: Removal - Refitting	12A-14		Flow actuator: Removal - Refitting	13B-14
	Exhaust manifold: Removal - Refitting	12A-16		Venturi: Removal - Refitting	13B-16
				High pressure pipe: Check	13B-18
				High pressure pipe between pump and rail: Removal - Refitting	13B-19
<b>12B</b>	<b>TURBOCHARGING</b>			High pressure pipe between rail and injector: Removal - Refitting	13B-22
	Turbocharger: Removal - Refitting	12B-1		Injector rail: Removal - Refitting	13B-25
	Turbocharger oil pipe: Removal - Refitting	12B-4		Fuel temperature sensor: Removal - Refitting	13B-28
	Intercooler: Removal - Refitting	12B-8		Injector leak flow: Check	13B-30
				Diesel injector: Removal - Refitting	13B-32
<b>13A</b>	<b>FUEL SUPPLY</b>			Accelerometer: Removal - Refitting	13B-37
	Fuel circuit: Operating diagram	13A-1			
	Manual priming pump: Removal - Refitting	13A-3	<b>13C</b>	<b>PREHEATING</b>	
	Diesel filter: Removal - Refitting	13A-5		Pre-postheating unit: Removal - Refitting	13C-1
	Fuel pressure: Check	13A-9		Heater plugs: Removal - Refitting	13C-2
	Fuel flow: Check	13A-11			
<b>13B</b>	<b>DIESEL INJECTION</b>		<b>14A</b>	<b>ANTIPOLLUTION</b>	
	Diesel injection: List and location of components	13B-1		Exhaust gas recirculation: List and location of components	14A-1
	Diesel injection computer: Removal - Refitting	13B-5		Fuel vapour absorber: Removal - Refitting	14A-2
	Camshaft position sensor: Removal - Refitting	13B-7			

---

# Contents

<b>14A</b>	<b>ANTI POLLUTION</b>		<b>19A</b>	<b>COOLING</b>	
	Exhaust gas recirculation solenoid valve: Removal - Refitting	14A-4		Engine cooling system: Operating diagram	19A-1
	Exhaust gas cooler: Removal - Refitting	14A-7		Engine cooling system: Specifications	19A-2
	Exhaust gas recirculation assembly: Removal - Refitting	14A-9		Engine cooling system: Check	19A-3
	Exhaust gas recirculation rigid pipe: Removal - Refitting	14A-12		Engine cooling circuit: List and location of components	19A-5
				Cooling system: Draining - Refilling	19A-6
				Cooling radiator: Removal - Refitting	19A-9
				Coolant pump: Removal - Refitting	19A-13
<b>16A</b>	<b>STARTING - CHARGING</b>			Thermostat: Removal - Refitting	19A-19
	Alternator: Removal - Refitting	16A-1		Water chamber: Removal - Refitting	19A-22
	Starter: Removal - Refitting	16A-8		Engine cooling fan assembly: Removal - Refitting	19A-27
	Alternator pulley: Removal - Refitting	16A-12		Coolant pump inlet pipe: Removal - Refitting	19A-34
				Expansion bottle: Removal - Refitting	19A-38
				Coolant temperature sensor: Removal - Refitting	19A-40
<b>17A</b>	<b>IGNITION</b>				
	Coils: Removal - Refitting	17A-1			
<b>17B</b>	<b>PETROL INJECTION</b>		<b>19B</b>	<b>EXHAUST</b>	
	Petrol injection: List and location of components	17B-1		Exhaust: List and location of components	19B-1
	Oxygen sensors: Removal - Refitting	17B-4		Exhaust: Precautions for the repair	19B-6
	Throttle valve potentiometer: Removal - Refitting	17B-6		Catalytic converter: Removal - Refitting	19B-10
	Petrol injection computer: Removal - Refitting	17B-7		Expansion chamber: Removal - Refitting	19B-17
	Crankshaft position sensor: Removal - Refitting	17B-9			
	Injector rail - Injectors: Removal - Refitting	17B-10			

---

# Contents

## **19B** EXHAUST

Intermediate pipe: Removal - Refitting	19B-18
Silencer: Removal - Refitting	19B-20

## **19C** TANK

Fuel tank: Draining	19C-1
Fuel tank: Removal - Refitting	19C-3
Fuel level sensor module: Removal - Refitting	19C-8

## **19D** ENGINE MOUNTING

Suspended engine mounting: Tightening torque	19D-1
Left-hand suspended engine mounting: Removal - Refitting	19D-2
Right-hand suspended engine mounting: Removal - Refitting	19D-4
Lower engine tie-bar: Removal - Refitting	19D-8

---

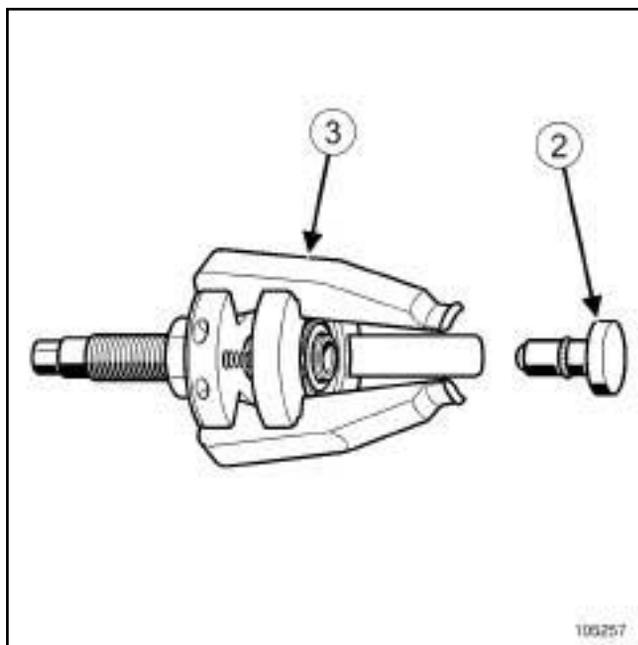
K9K

### REMOVAL

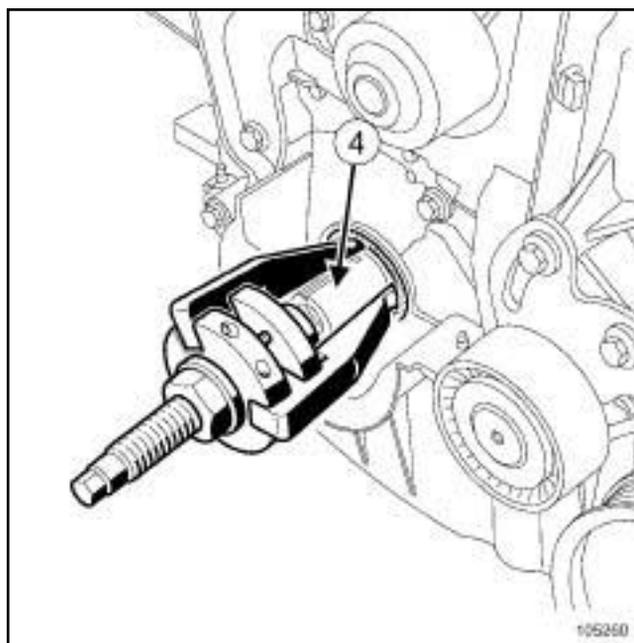
#### I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove:
  - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
  - the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-17) ,
  - the timing belt sprocket (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-17) .

#### II - REMOVAL OPERATION

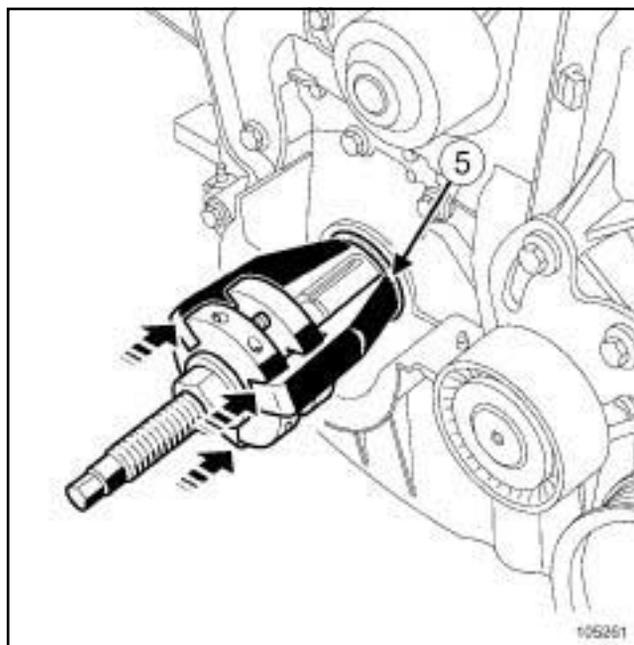


- Fit the end piece (2) onto the tool (3) .



105260

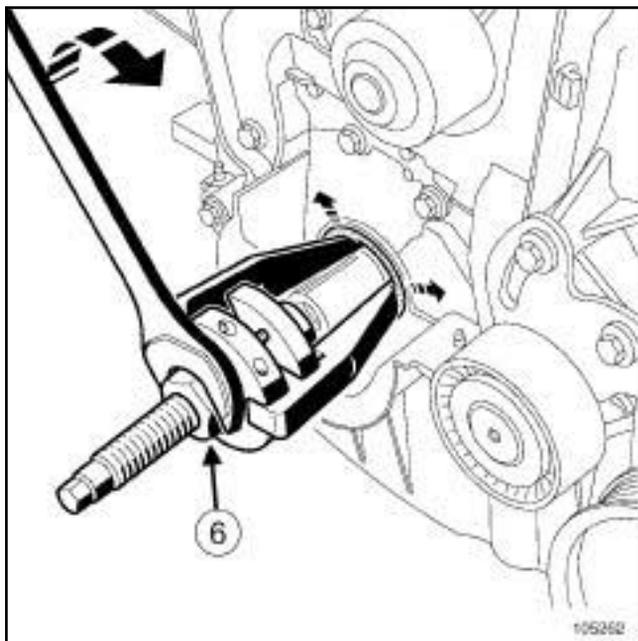
- Position the jaws of the tool onto the crankshaft nose (4) .



105261

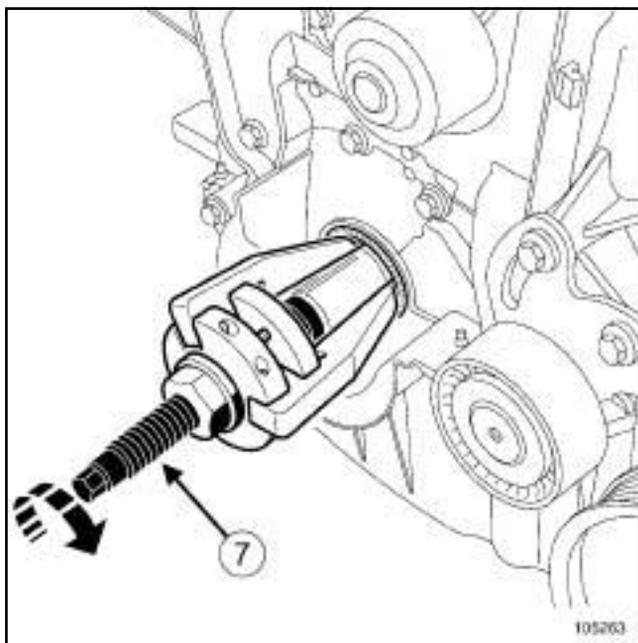
- Push on the tool until contact is made between the ends (5) of the jaws and the crankshaft seal.

K9K



105262

- Separate the jaws by screwing the nut of the tool (6).



105263

- Screw down the threaded rod (7) of the.
- Refit the crankshaft seal at the timing end using the tool.

### REFITTING

#### I - REFITTING PREPARATION OPERATION

- parts always to be replaced: Crankshaft seal on timing end.

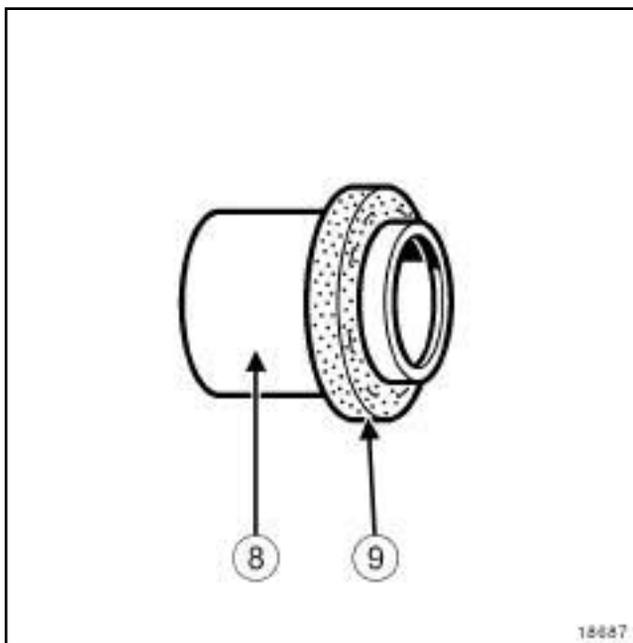
#### WARNING

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

- Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:

- the crankshaft seal mating face,
- the crankshaft seal housing in the crankshaft closure panel.

#### II - REFITTING OPERATION



18687

- 

#### Note:

This type of seal is extremely fragile.

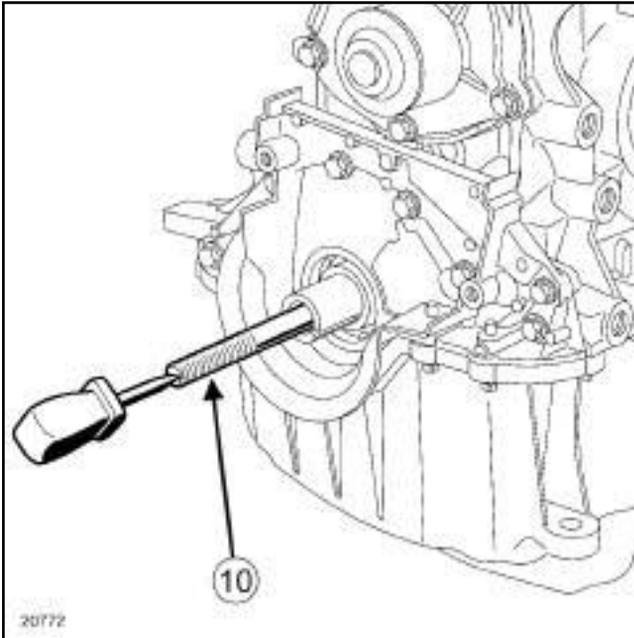
Only touch the protective part (8) when handling the gasket. It is strictly forbidden to touch the seal (9); this is to prevent any oil leaks once the oil seal is fitted to the engine.

# ENGINE AND CYLINDER BLOCK ASSEMBLY

## Crankshaft seal on timing end: Removal - Refitting

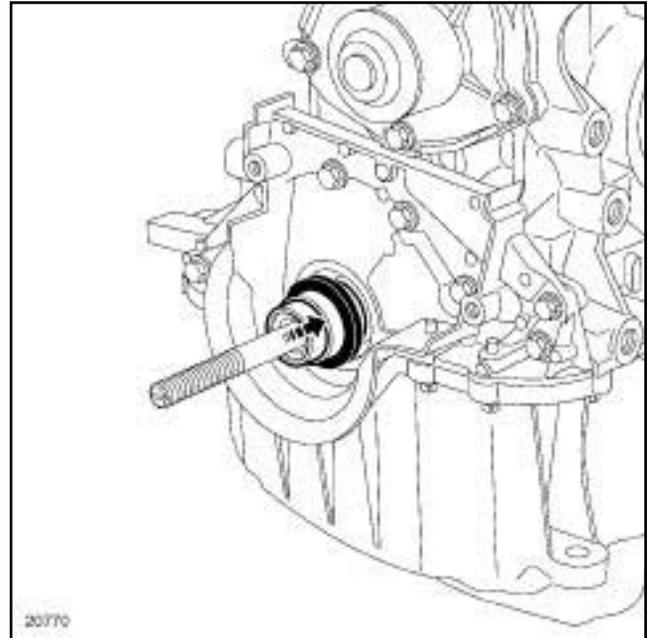
# 10A

K9K



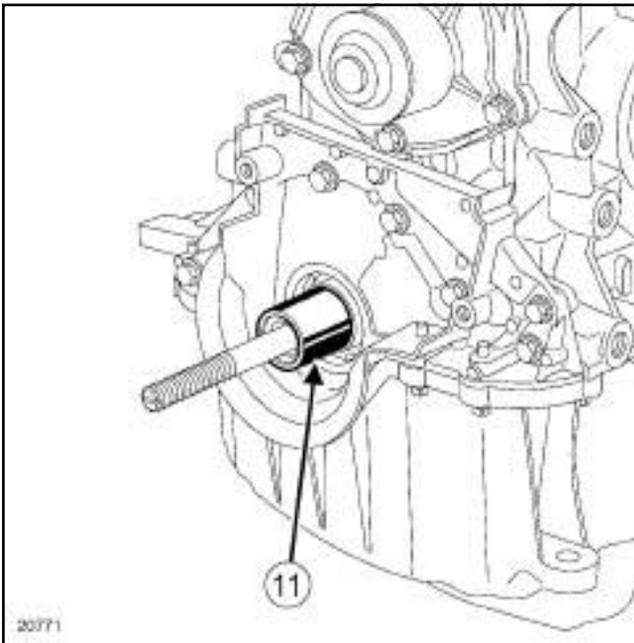
20772

- Screw the threaded rod (10) of the into the crankshaft.



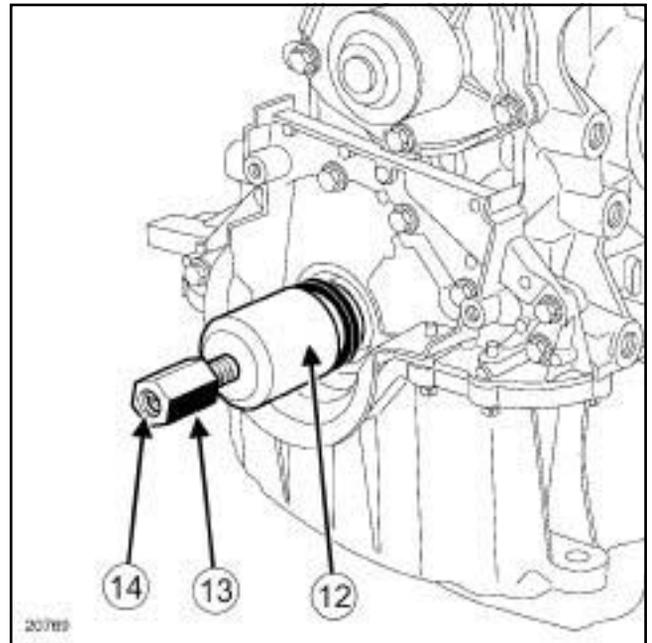
20770

- Fit the protector with the new seal in place on the spacer, taking care not to touch the seal.



20771

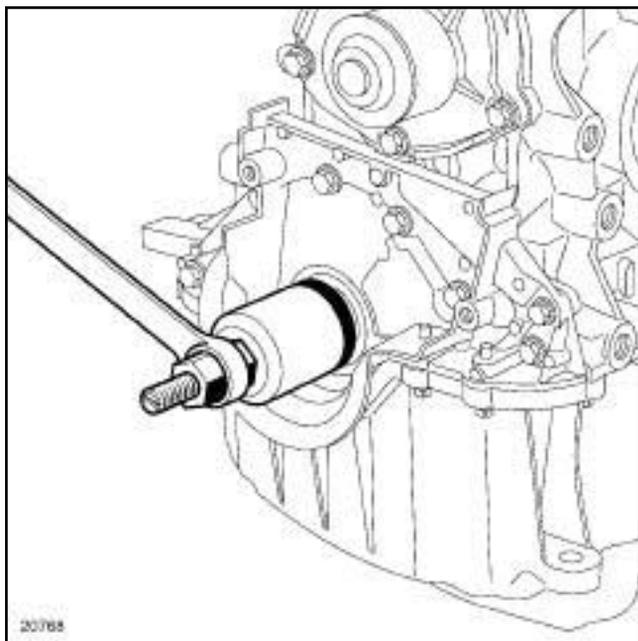
- On the crankshaft, fit the spacer (11) of the.



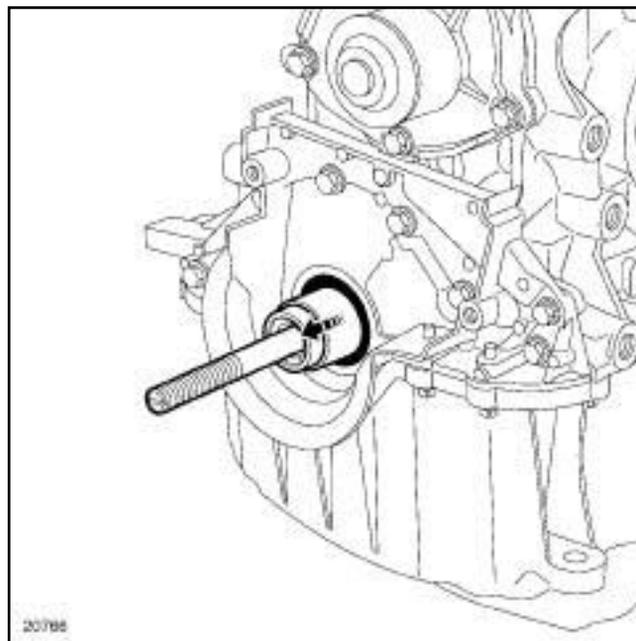
20769

- Fit the cover (12) and nut (13) (with the thread (14) of the nut towards the outside of the engine) of the.

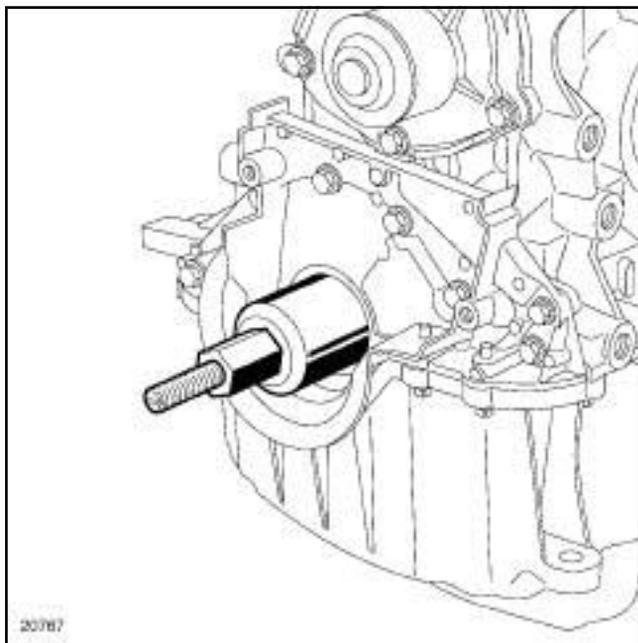
K9K



20768



20766



20767

- ❑ Screw on the nut until the cover touches the spacer.

- ❑ Remove the nut, the cup, the protector and the threaded rod.

### III - FINAL OPERATION

- ❑ Refit:
  - the timing belt sprocket (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-17) ,
  - the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-17) ,
  - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).
- ❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

K4M or K9K

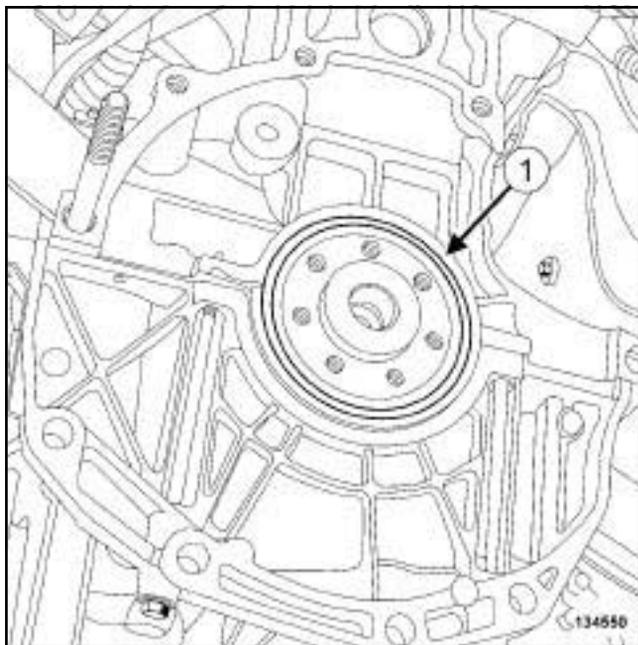
### REMOVAL

#### I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove:
  - the gearbox (see **Manual gearbox: Removal - Refitting**) (21A, Manual gearbox),
  - the clutch (see **Pressure plate - Disc: Removal - Refitting**) (20A, Clutch),
  - the flywheel (see **10A, Engine and cylinder block assembly, Flywheel: Removal - Refitting**, page **10A-75**) (20A, Clutch).

#### II - REMOVAL OPERATION

K4M



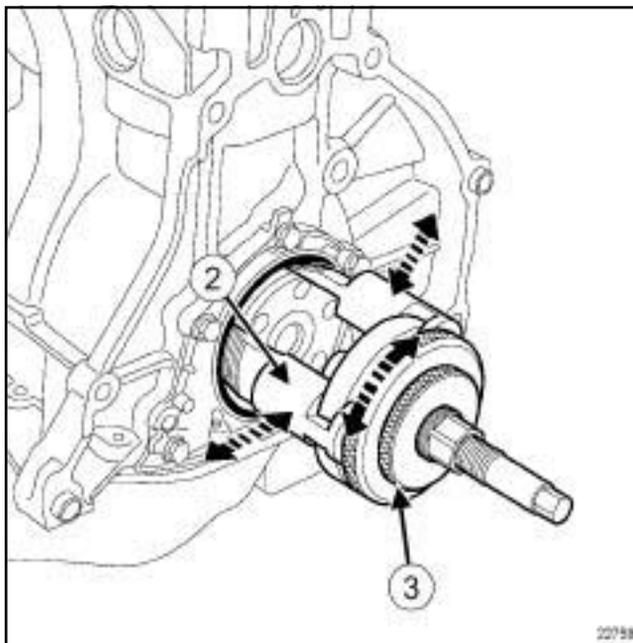
134550

- Remove the crankshaft seal (1) at the gearbox end using a screwdriver.

Note:

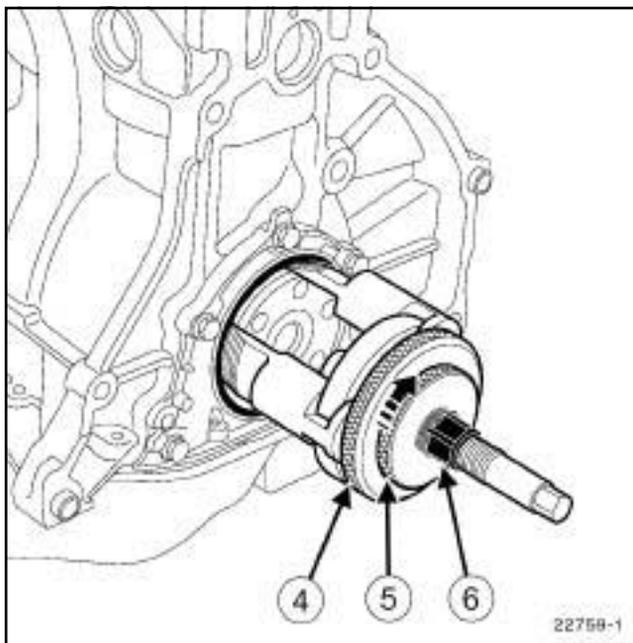
Take care not to damage the crankshaft mating face.

K9K



22758

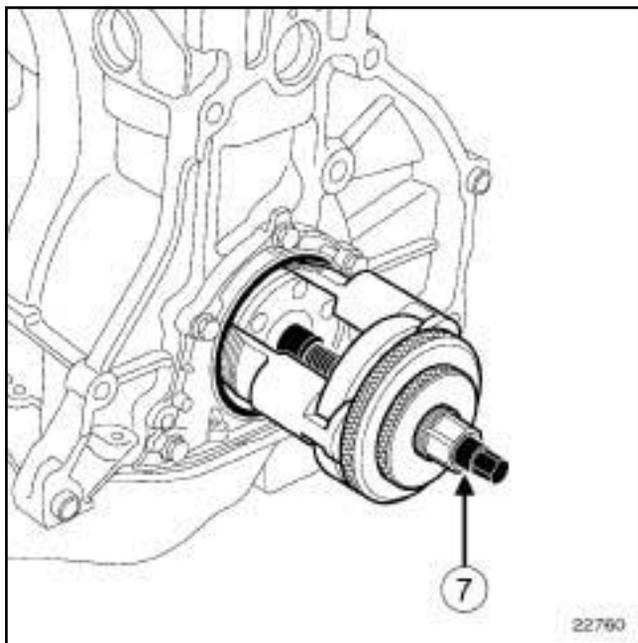
- Fit the extractor to the shaft, adjusting the fingers (2) to the diameter of the shaft using the knurled plate (3).



22758-1

- Screw knurled plate (5) until it is locked to knurled plate (4) to keep the fingers in position on the shaft.
- Screw the extractor into the seal using the hexagonal nut (6).

K4M or K9K



22760

- ❑ Extract the crankshaft seal at the gearbox end by screwing the threaded rod (7) .

## REFITTING

### I - REFITTING PREPARATION OPERATION

- ❑ **parts always to be replaced: Crankshaft seal on gearbox end.**

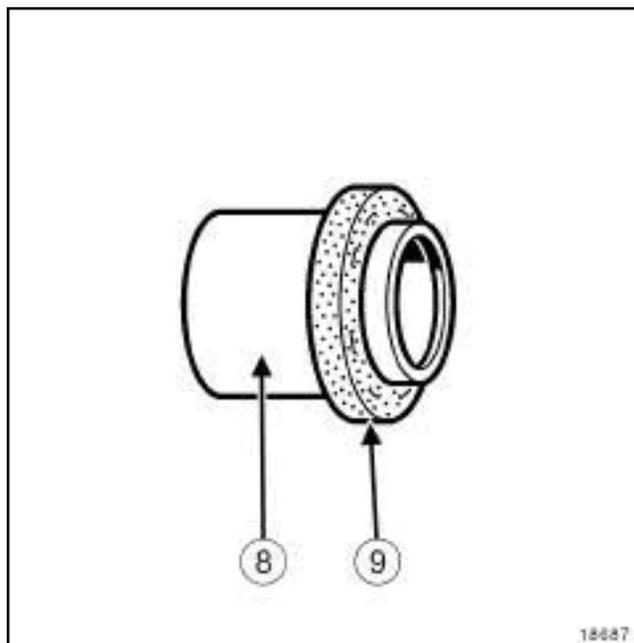
#### WARNING

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

- ❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:
  - the crankshaft seal mating face,
  - the crankshaft seal housing on the cylinder block.

### II - REFITTING OPERATION

K9K



18687

18687

- ❑

#### Note:

This type of seal is extremely fragile.

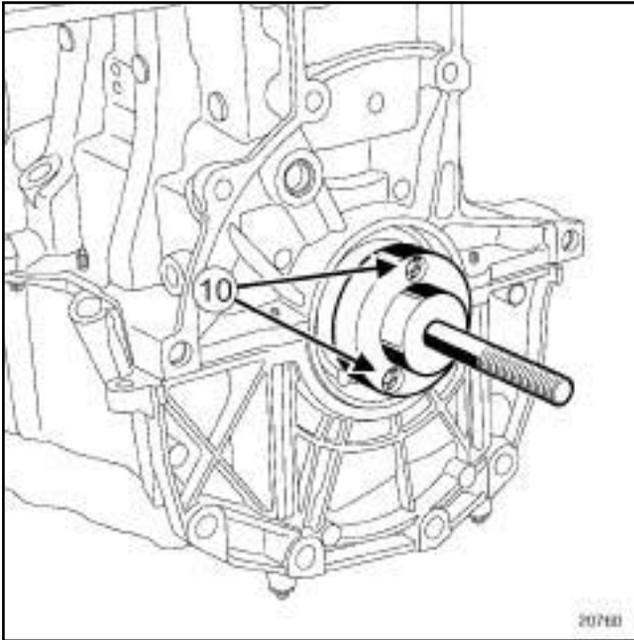
Only touch the protective part (8) when handling the gasket. It is strictly forbidden to touch the seal (9) ; this is to prevent any oil leaks once the oil seal is fitted to the engine.

# ENGINE AND CYLINDER BLOCK ASSEMBLY

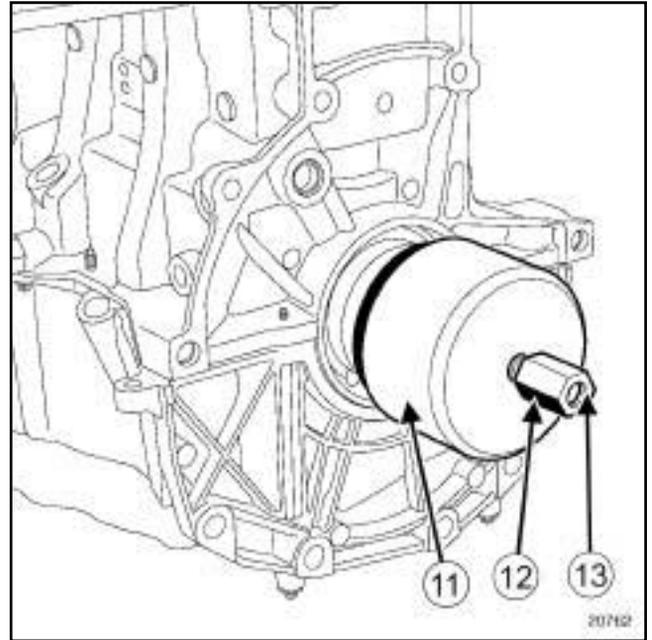
## Crankshaft seal, gearbox end: Removal - Refitting

# 10A

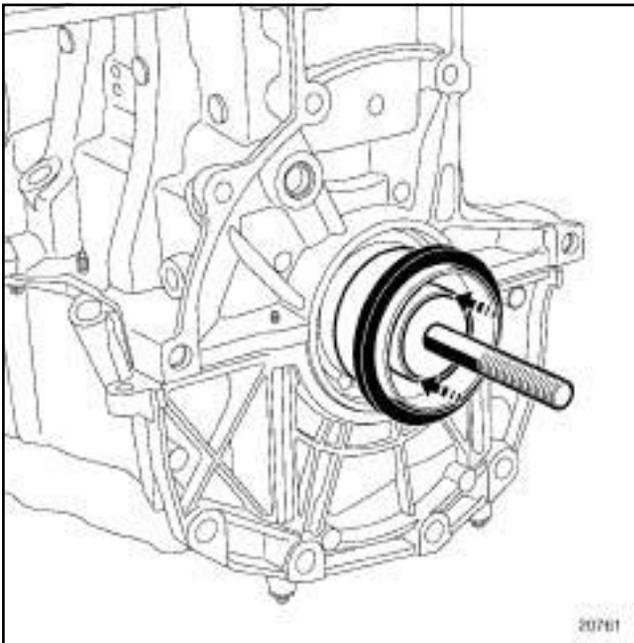
K4M or K9K



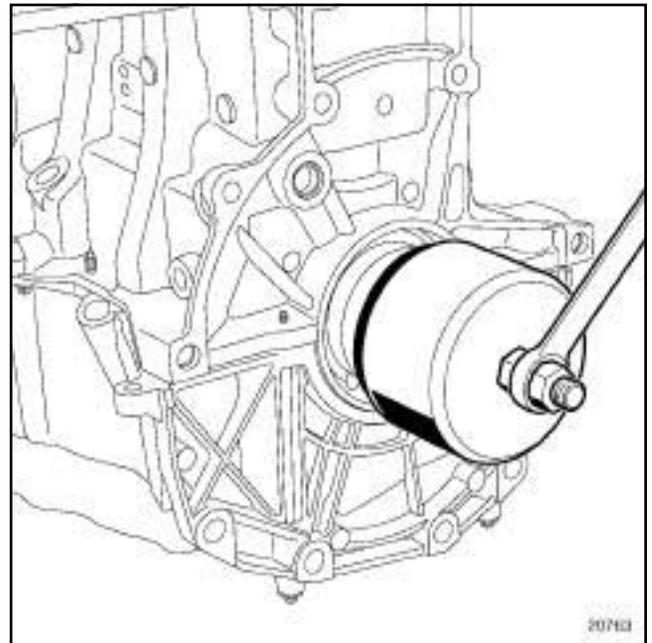
- Mount theon the crankshaft, securing it using bolts (10) .



- Fit the cover (11) and nut (12) (with the thread (13) of the nut towards the outside of the engine) of the.

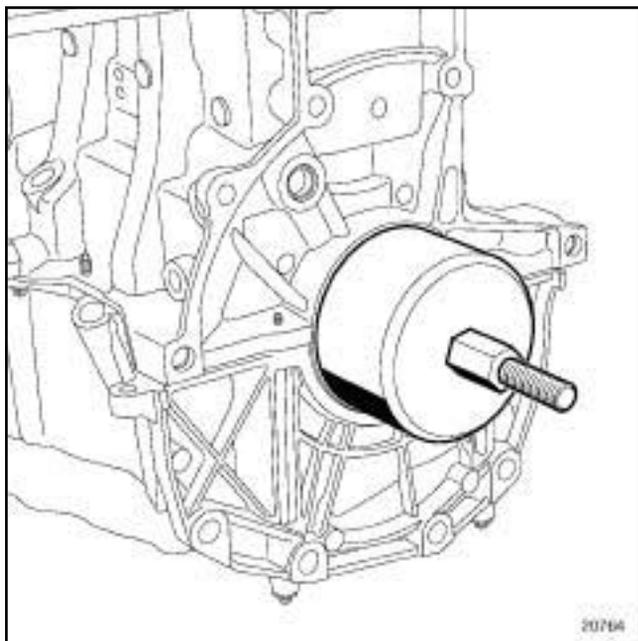


- Fit the protector with its seal in place on the, taking care not to touch the seal.

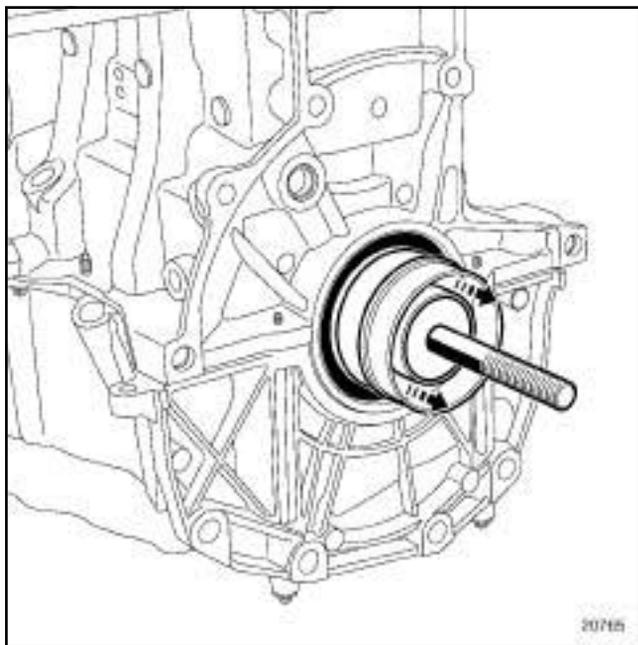


- Tighten the nut until the cover touches the cylinder block.

K4M or K9K



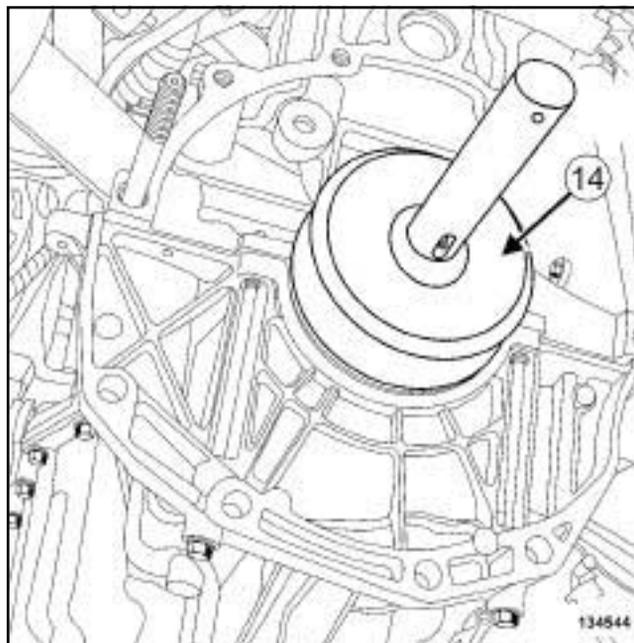
20764



20765

- ❑ Remove the nut, the cover, the protector and the base plate.

K4M



134544

- ❑ Refit the crankshaft seal at the gearbox end, using the tool (14).

### III - FINAL OPERATION

- ❑ Refit:
  - the flywheel (see **10A, Engine and cylinder block assembly, Flywheel: Removal - Refitting**, page **10A-75**) (20A, Clutch),
  - the clutch (see **Pressure plate - Disc: Removal - Refitting**) (20A, Clutch),
  - the gearbox (see **Manual gearbox: Removal - Refitting**) (21A, Manual gearbox).
- ❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- ❑ Perform the following operations:
  - fill the manual gearbox (see **Manual gearbox oils: Draining - Filling**) (21A, Manual gearbox),
  - bleed the clutch control circuit (see **Clutch circuit: Bleed**) (37A, Mechanical component controls).

## Lower cover: Removal - Refitting

K9K

### Special tooling required

**Tav. 1747** Threaded rods for carrying out subframe operations.

### Tightening torques

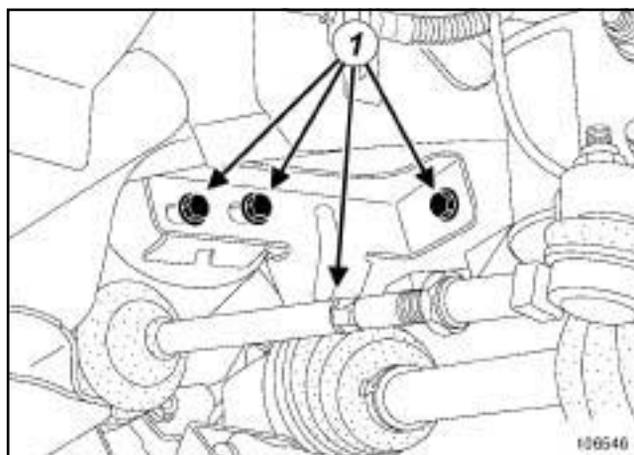
oil pump bolts	<b>25 N.m</b>
sump bolts on the cylinder block	<b>14 N.m</b>
sump bolts on the gear-box	<b>44 N.m</b>
sump bolts on the multi-function support	<b>25 N.m</b>
power assisted steering pump support bolt on the sump	<b>25 N.m</b>
bracket bolts	<b>62 N.m</b>
relay bearing bolts	<b>44 N.m</b>
right-hand driveshaft flange bolt(s) on the relay bearing	<b>21 N.m</b>
front axle subframe tie-rod upper bolts	<b>21 N.m</b>
power-assisted steering low pressure pipe bolt on the front axle subframe	<b>25 N.m</b>

## REMOVAL

### I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove the front bumper (see **Front bumper assembly: Exploded view**) and (see **Exterior body front trim assembly: Exploded view**) (55, Exterior protection).
- Remove:
  - the engine undertray bolts,
  - the engine undertray.
- Drain the engine oil (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page **10A-32**).

- Remove:
  - the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
  - the front wheel arch side liners,
  - the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page **19D-8**).
- Extract the lower arm ball joints from the stub axle carrier (see **Front driveshaft lower arm: Removal - Refitting**) (31A, Front axle components).
- Remove (see **Steering box: Removal - Refitting**) (36A, Steering assembly):
  - the heat shield bolts on the steering box,
  - the steering box heat shield,
  - the steering box bolts on the front axle subframe.
- Attach the steering rack to the body.

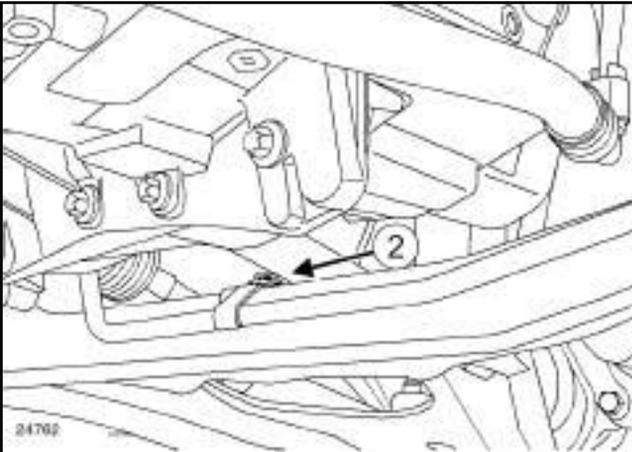


106546

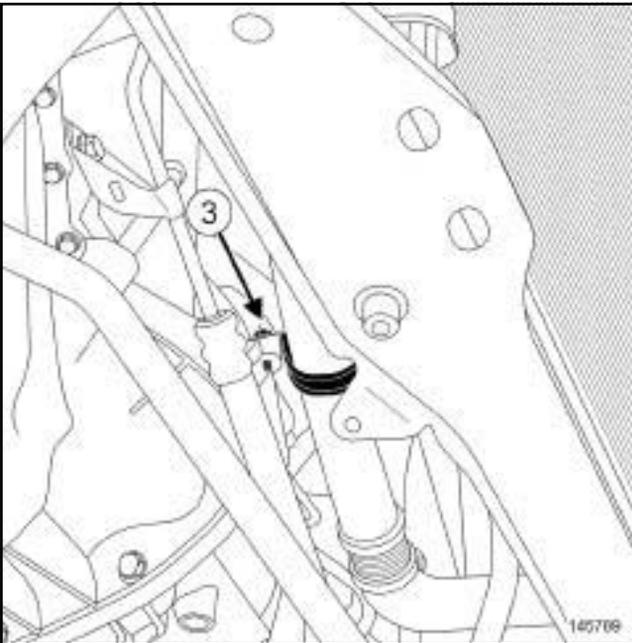
- Remove:
  - the catalytic converter upstream strut bolts (1),
  - the catalytic converter upstream strut.

## Lower cover: Removal - Refitting

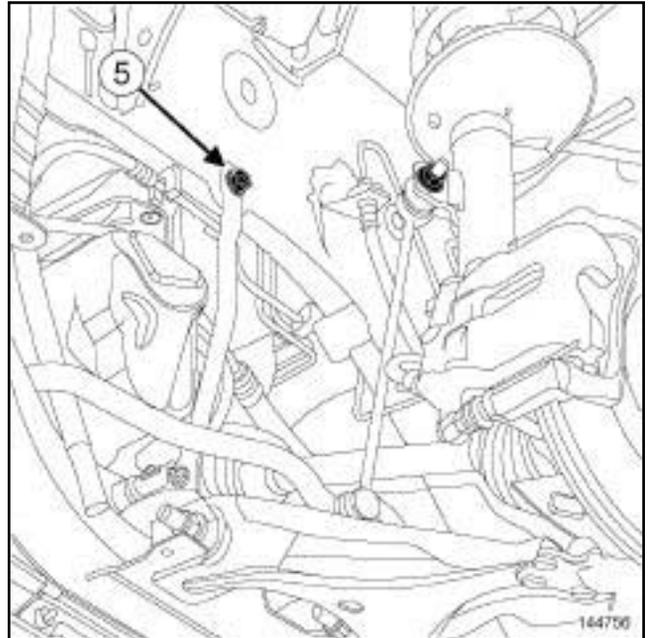
K9K



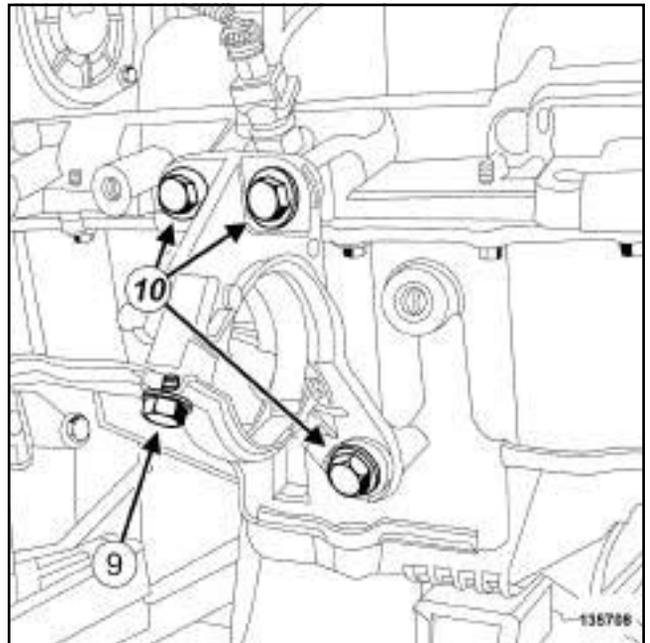
- ❑ Remove the power-assisted steering low pressure pipe bolt (2) on the front axle subframe.



- ❑ Remove the cooling pipe support bolt (3) on the sump.



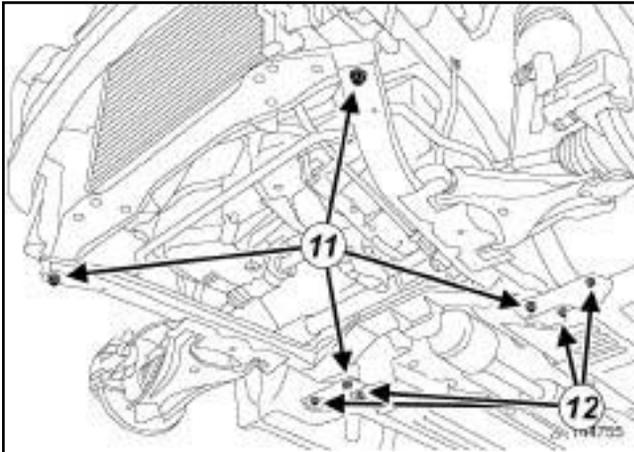
- ❑ Remove the front axle subframe tie-rod upper bolts (5).



- ❑ Remove:
  - the right-hand driveshaft flange bolt (9) on the relay bearing,
  - the bolts (10) from the relay bearing,
  - the relay bearing.

## Lower cover: Removal - Refitting

K9K



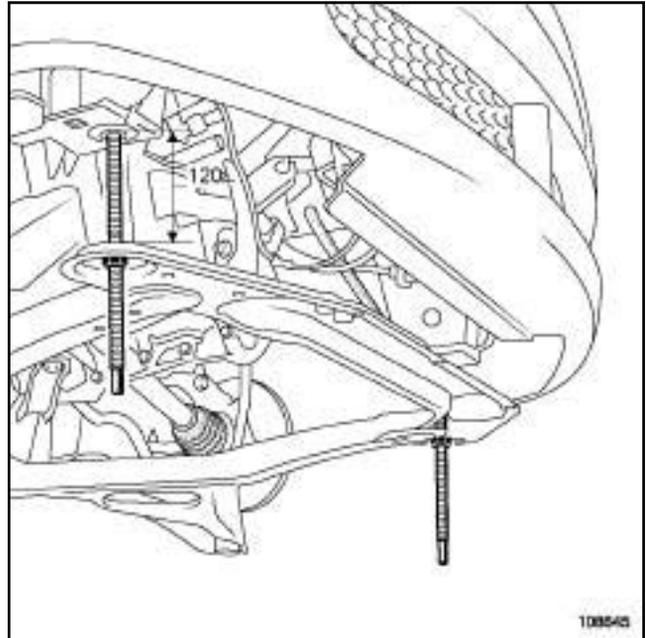
144755

 Remove:

- the bracket bolts (12) ,
- one by one, the front axle subframe bolts (11) and replace them in turn with the threaded rods of the (Tav. 1747).

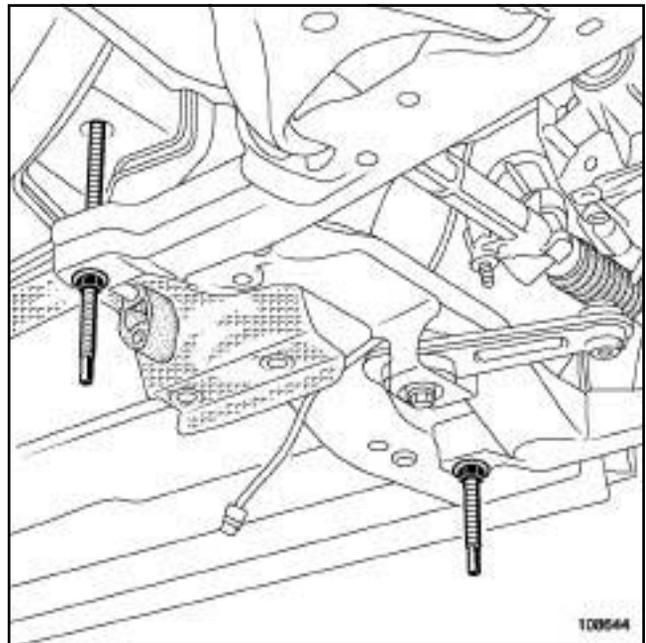
## Note:

Make sure the threaded rod of the (Tav. 1747) is sufficiently screwed into the threaded hole and that the nut of the tool is correctly resting on the front axle subframe.



108645

108645



108644

108644

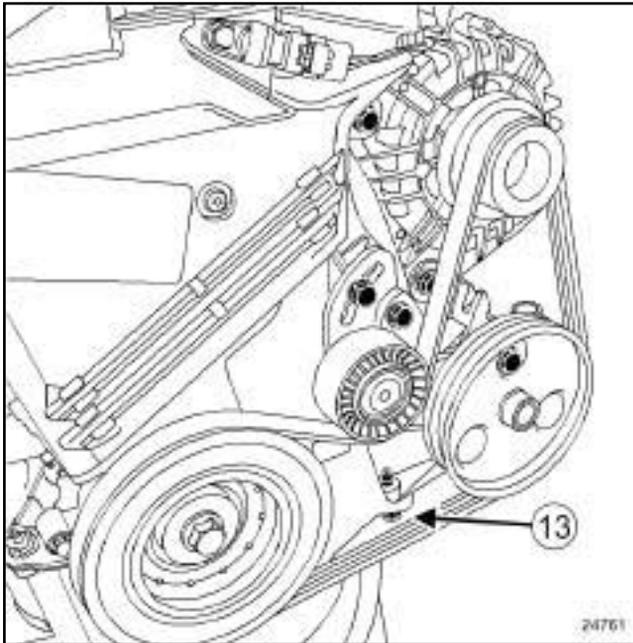
- 
- Lower the front axle subframe 120 mm, gradually loosening the nuts of the (Tav. 1747).

## Lower cover: Removal - Refitting

K9K

### II - REMOVAL OPERATION

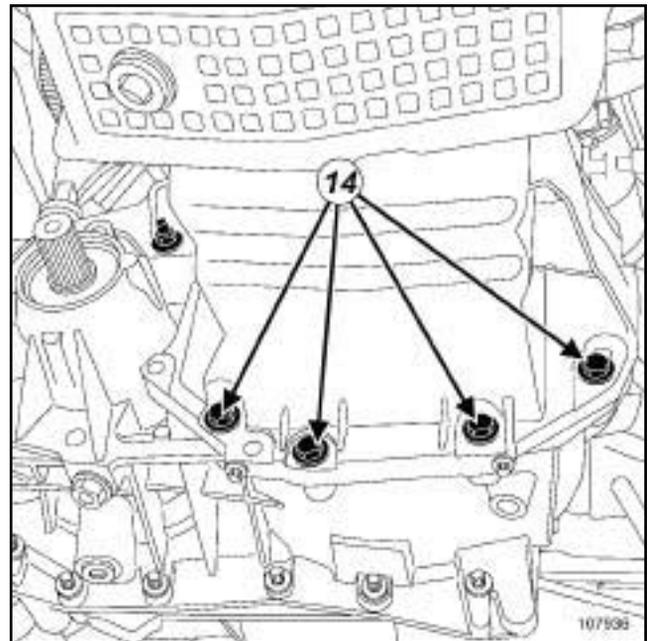
#### STANDARD HEATING RECIRCULATION



- Remove the power-assisted steering pump support bolt (13) on the sump.

#### AIR CONDITIONING

- Remove the bolt from the sump on the multifunction support.



107936

- Remove:
  - the engine-gearbox coupling bolts (14) ,
  - the sump bolts,
  - the sump.

#### Note:

If the sump cannot be extracted because it is in contact with the oil pump strainer, do not force the removal of the sump as this may damage the oil splash plate.

Loosen the oil pump bolts by a few turns (the tip of your finger should pass between the bolt head and the oil pump casing) using 10 mm and 13 mm open-jawed spanners and while tilting the sump towards the front of the vehicle.

### REFITTING

#### I - REFITTING PREPARATION OPERATION

- parts always to be replaced: engine oil sump seal.
- parts always to be replaced: Front sub-frame bolt.

#### WARNING

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

## Lower cover: Removal - Refitting

K9K

- Clean the cylinder block joint face using **SUPER CLEANING AGENT FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

**WARNING**

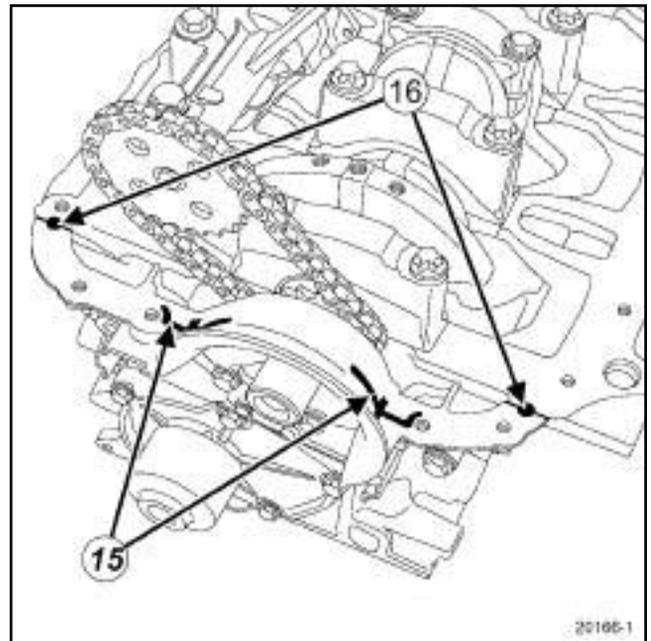
To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

- Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to degrease:

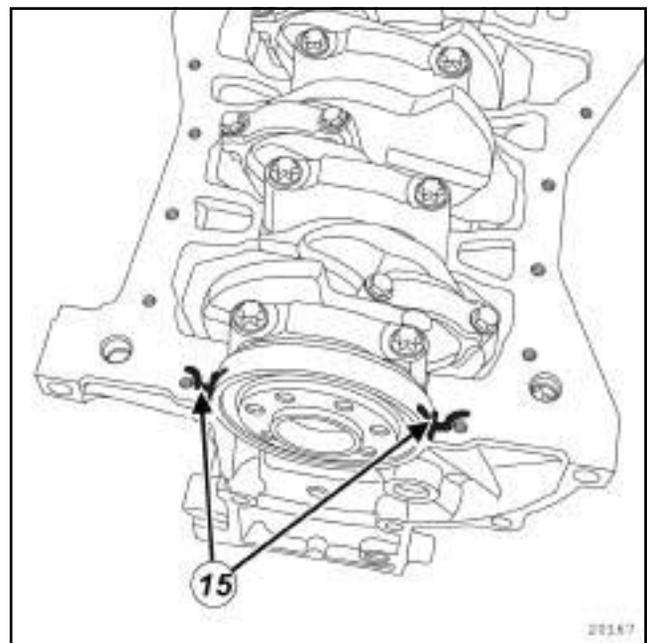
- the sump joint face if it is to be reused,
- the cylinder block gasket face.

**WARNING**

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).



20166



20167

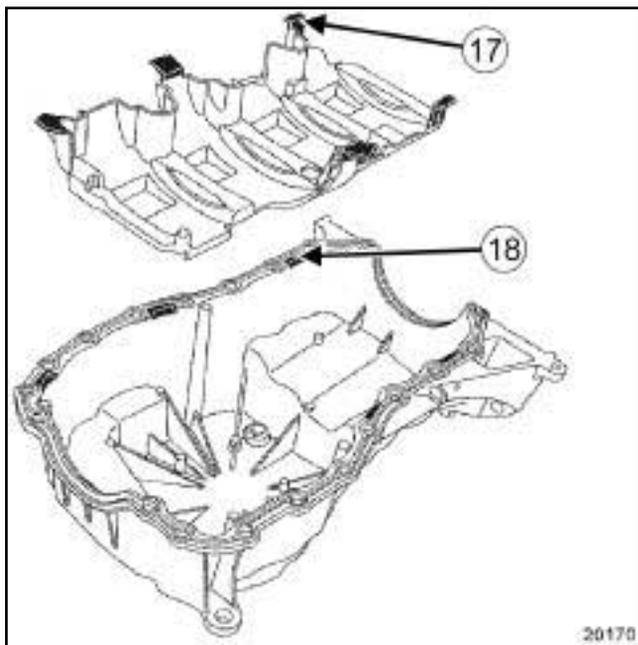
- Apply:

- four beads (15) of **SILICONE ADHESIVE SEALANT** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) with a diameter of **5 mm**,
- two drops (16) of **SILICONE ADHESIVE SEALANT** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) with a diameter of **5 mm** at the intersection between the cylinder block and the crankshaft closure panel.

## Lower cover: Removal - Refitting

K9K

## II - REFITTING OPERATION



20170



## Note:

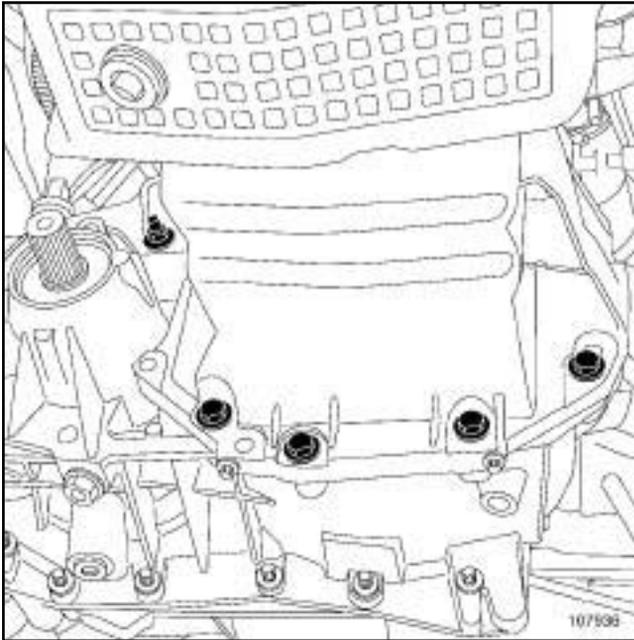
When refitting the sump, ensure that:

- the oil splash plate tabs (17) are positioned correctly in the slots (18) ,
- the coupling faces of the sump and cylinder block are correctly aligned, to prevent the clutch housing being deformed when fitting the gear-box.

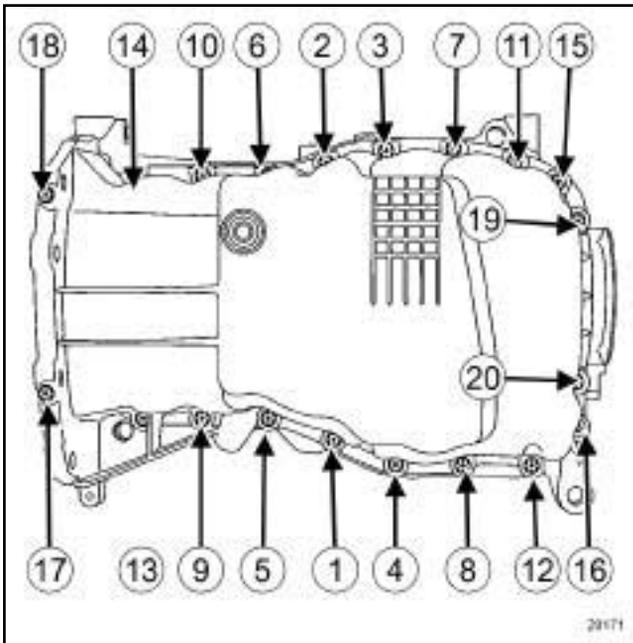
Refit the oil splash plate.

## Lower cover: Removal - Refitting

K9K



107936



20171

- Refit the oil sump fitted with a new seal.

### Note:

If the oil pump was loosened beforehand in order to extract the sump, position the sump in order to slide the oil pump strainer into the oil splash plate of the sump.

Position a component jack to support the sump.

Lean the sump towards the front of the vehicle in order to access the oil pump bolts.

Torque tighten the **oil pump bolts (25 N.m)** using the small torque wrench **77 11 226 888**.

### Note:

Before pressing the sump on the cylinder block, check that the sump seal is still in place and that it has not come out of the grooves on the sides.

- Tighten until contact:
  - the sump bolts on the cylinder block,
  - the sump bolts on the gearbox.
- Torque tighten:
  - in order the **sump bolts on the cylinder block (14 N.m)**,
  - the **sump bolts on the gearbox (44 N.m)**.

### AIR CONDITIONING

- Refit the sump bolt on the multifunction support.
- Torque tighten the **sump bolts on the multifunction support (25 N.m)**.

### STANDARD HEATING RECIRCULATION

- Refit the power-assisted steering pump support on the sump.
- Torque tighten the **power assisted steering pump support bolt on the sump (25 N.m)**.

### III - FINAL OPERATION

- Fit the front axle subframe.
- Refit the brackets.
- Torque tighten the **bracket bolts (62 N.m)**.

## Lower cover: Removal - Refitting

K9K

- One by one, remove the threaded rods of the (**Tav. 1747**) and replace them in turn with new front axle subframe bolts.
- Refit:
  - the relay bearing bolts,
  - the right-hand driveshaft flange bolt(s) on the relay bearing.
- Tighten to torque and in order:
  - the **relay bearing bolts (44 N.m)**,
  - the **right-hand driveshaft flange bolt(s) on the relay bearing (21 N.m)**.
- Refit the front axle subframe tie-rod upper bolts.
- Torque tighten the **front axle subframe tie-rod upper bolts (21 N.m)**.
- Refit the cooling pipe support bolt on the sump.
- Refit the power-assisted steering low pressure pipe bolt on the front axle subframe.
- Torque tighten the **power-assisted steering low pressure pipe bolt on the front axle subframe (25 N.m)**.
- Refit the catalytic converter upstream stay (see **19B, Exhaust, Catalytic converter: Removal - Refitting**, page **19B-10**).
- Refit the steering box bolts on the front axle subframe (see **Steering box: Removal - Refitting**) (36A, Steering assembly).
- Refit:
  - the steering box heat shield,
  - the lower arm ball joints (see **Front driveshaft lower arm: Removal - Refitting**) (31A, Front axle components),
  - the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page **19D-8**).
- Refit the front bumper (see **Front bumper assembly: Exploded view**) and (see **Exterior body front trim assembly: Exploded view**) (55, Exterior protection).
- Refit:
  - the engine undertray,
  - the front wheel arch side liners,
  - the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).
- Top up the engine oil (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page **10A-32**).

## Lower cover: Removal - Refitting

K4M

### Special tooling required

**Tav. 1747** Threaded rods for carrying out subframe operations.

### Tightening torques

sump bolts on the cylinder block	<b>14 N.m</b>
sump bolts on the gear-box	<b>44 N.m</b>
sump bolt on the multi-function support	<b>25 N.m</b>
bracket bolts	<b>62 N.m</b>
front axle subframe bolts	<b>110 N.m</b>
relay bearing bolts	<b>44 N.m</b>
right-hand driveshaft flange bolt(s) on the relay bearing	<b>21 N.m</b>
front axle subframe tie-rod upper bolts	<b>21 N.m</b>
power-assisted steering low pressure pipe bolt on the front axle subframe	<b>21 N.m</b>
steering box bolts on the front axle subframe	<b>105 N.m</b>

## REMOVAL

### I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove the front bumper (see **Front bumper assembly: Exploded view**) and (see **Exterior body front trim assembly: Exploded view**) (55A, Exterior protection).
- Remove:
  - the engine undertray bolts,
  - the engine undertray.
- Drain the engine oil (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page **10A-32**).

### Remove:

- the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front wheel arch side liners,
- the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page **19D-8**).

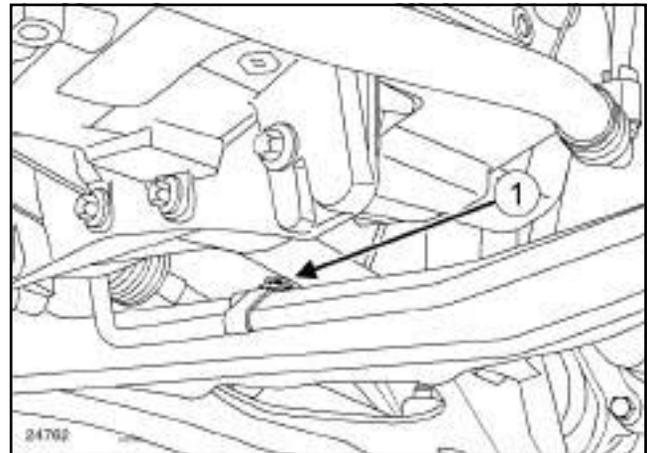
- Extract the lower arm ball joints from the stub axle carrier (see **Front driveshaft lower arm: Removal - Refitting**) (31A, Front axle components).

- Unclip the downstream oxygen sensor wiring on the heat shield on the steering box.

- Remove (see **Steering box: Removal - Refitting**) (36A, Steering assembly):

- the heat shield bolts on the steering box,
- the steering box heat shield,
- the steering box bolts on the front axle subframe.

- Attach the steering rack to the body.

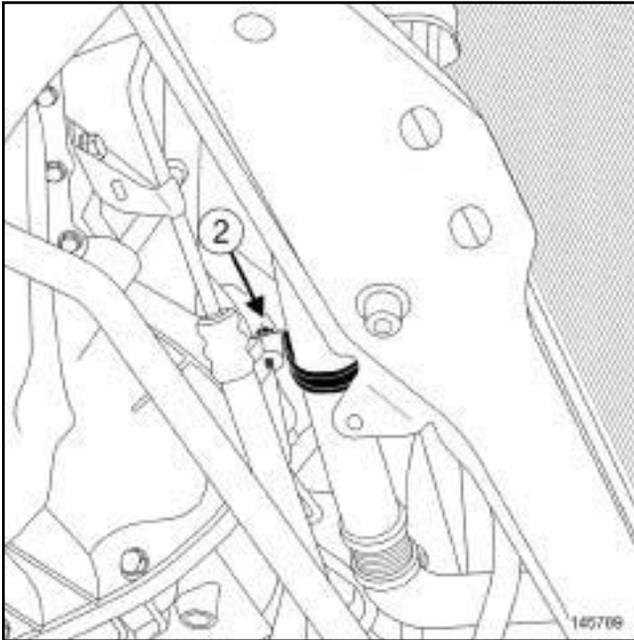


24762

- Remove the power-assisted steering low pressure pipe bolt (1) on the front axle subframe.

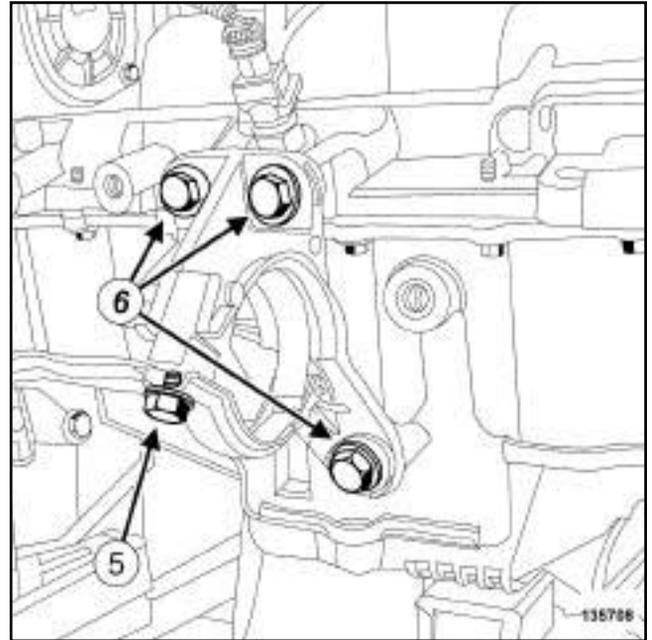
## Lower cover: Removal - Refitting

K4M



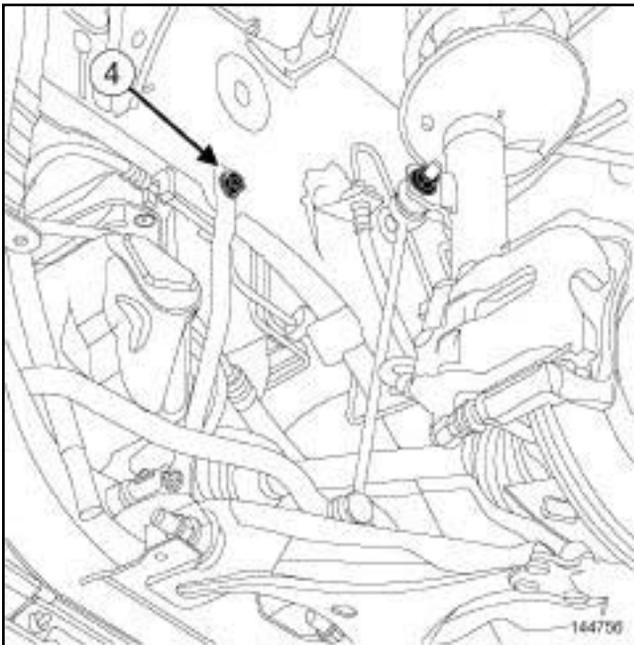
145789

- ❑ Remove the cooling pipe support bolt (2) on the sump.



135708

- ❑ Remove:
  - the right-hand driveshaft flange bolt (5) on the relay bearing,
  - the bolts (6) from the relay bearing,
  - the relay bearing.

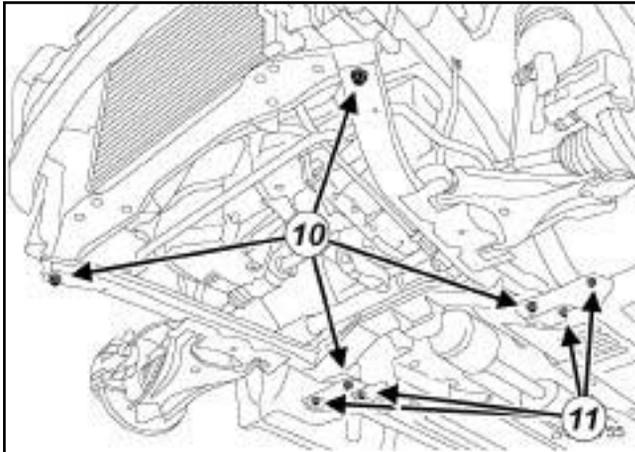


144756

- ❑ Remove the front axle subframe tie-rod upper bolts (4).

## Lower cover: Removal - Refitting

K4M



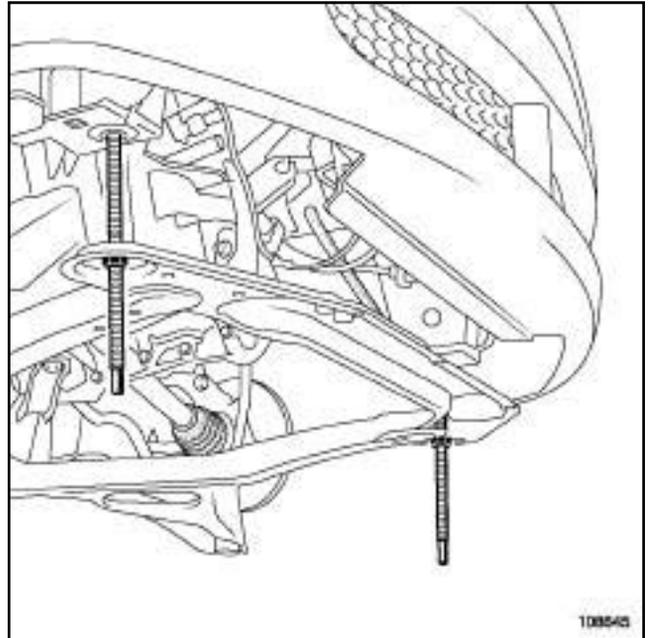
144755

 Remove:

- the bracket bolts (11) ,
- one by one, the front axle subframe bolts (10) and replace them in turn with the threaded rods of the (Tav. 1747).

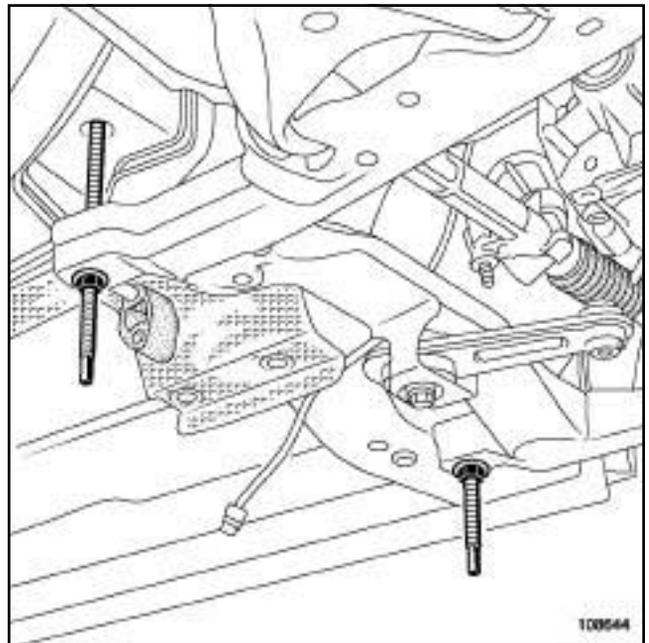
## Note:

Make sure the threaded rod of the (Tav. 1747) is sufficiently screwed into the threaded hole and that the nut of the tool is correctly resting on the front axle subframe.



108643

108645



108644

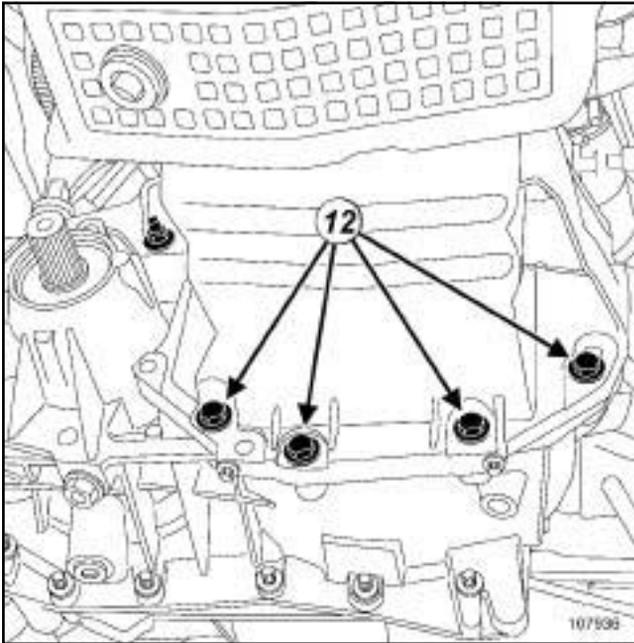
108644

- 
- Lower the front axle subframe by at least
- 120 mm**
- , gradually loosening the nuts of the (Tav. 1747).

## Lower cover: Removal - Refitting

K4M

## II - REMOVAL OPERATION



107936

- Remove:
  - the sump bolt from the multifunction support,
  - the engine-gearbox coupling bolts (12) ,
  - the sump bolts on the cylinder block,
  - the sump,
  - the oil splash plate.

## REFITTING

## I - REFITTING PREPARATION OPERATION

- parts always to be replaced: engine oil sump seal.
- parts always to be replaced: Front sub-frame bolt.

**WARNING**

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

- Clean the cylinder block joint face using **SUPER CLEANING AGENT FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).

**WARNING**

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

- Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to degrease:

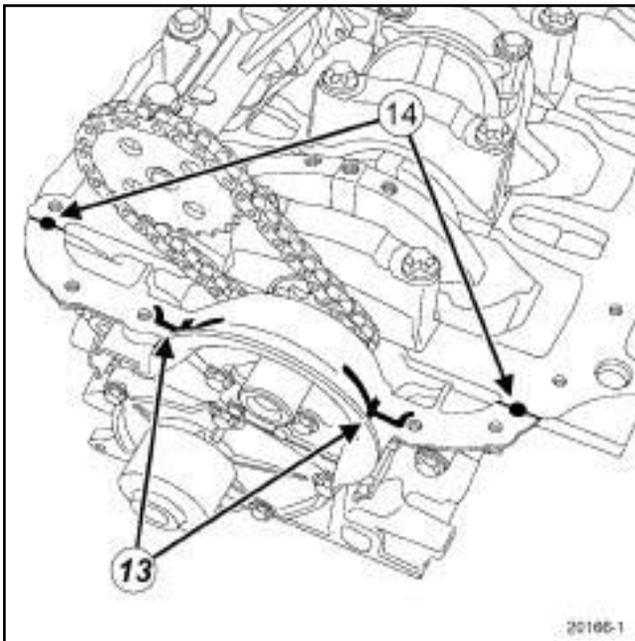
- the sump joint face if it is to be reused,
- the cylinder block gasket face.

**WARNING**

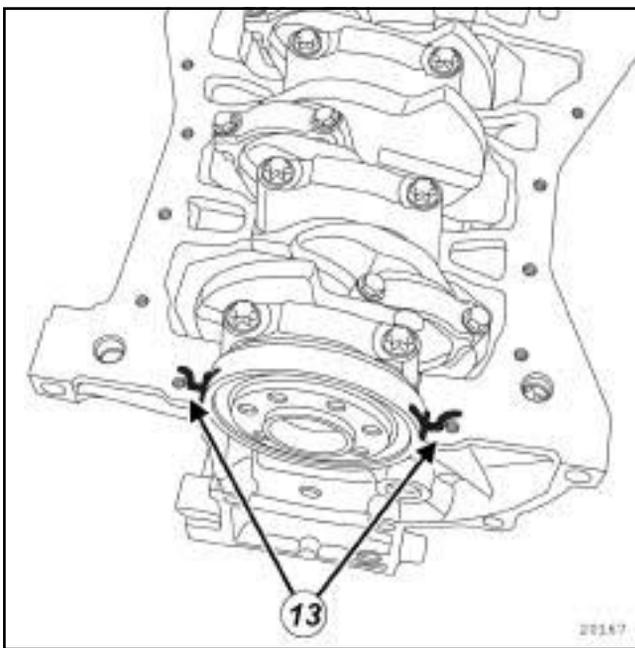
Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

## Lower cover: Removal - Refitting

K4M



20166

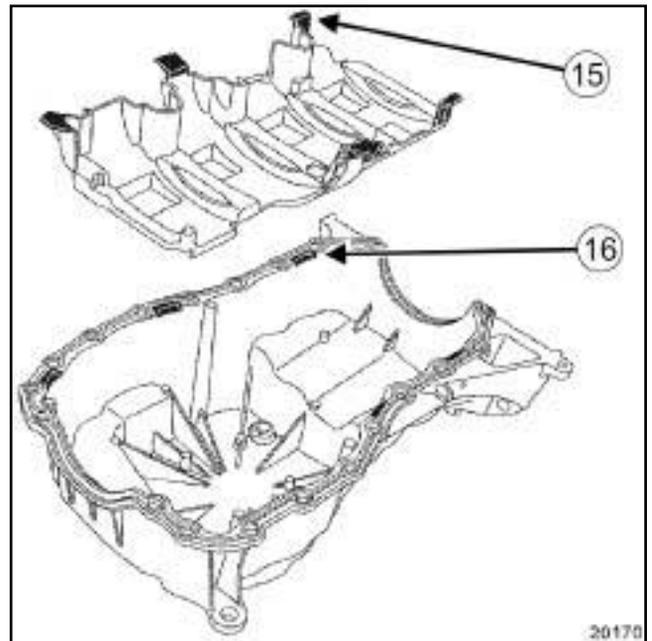


20167

□ Apply:

- four beads (13) of **SILICONE ADHESIVE SEALANT** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) with a diameter of **5 mm**,
- two drops (14) of **SILICONE ADHESIVE SEALANT** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) with a diameter of **5 mm** at the intersection between the cylinder block and the crankshaft closure panel.

### II - REFITTING OPERATION



20170

□

Note:

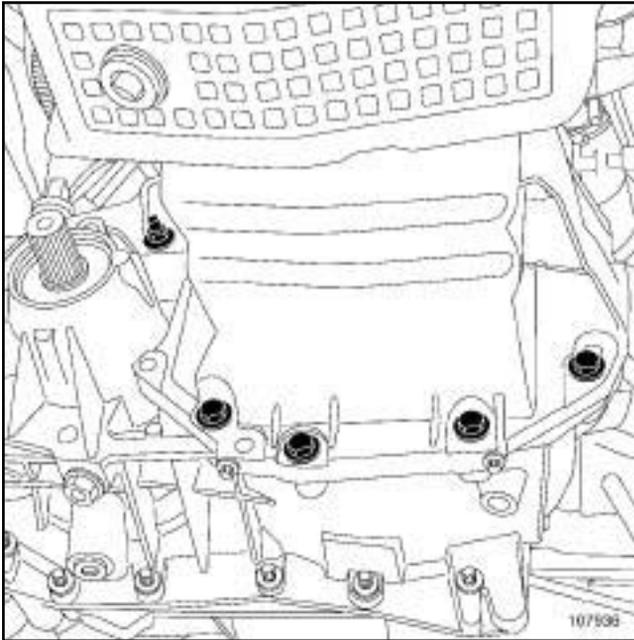
When removing the sump, ensure that:

- the oil splash plate tabs (15) are positioned correctly in the slots (16) ,
- the coupling faces of the sump and cylinder block are correctly aligned, to prevent the clutch housing being deformed when fitting the gear-box.

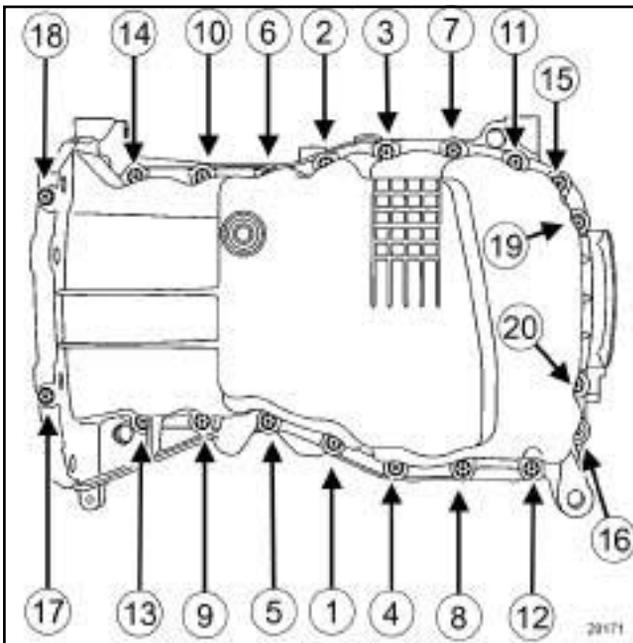
Refit the oil splash plate.

## Lower cover: Removal - Refitting

K4M



107936



20171

- Refit the oil sump fitted with a new seal.
- Tighten until contact:
  - the sump bolts on the cylinder block,
  - the bolts from the sump on the gearbox,
  - the sump bolts from the multifunction support.
- Torque tighten:
  - in order the **sump bolts on the cylinder block (14 N.m)**,
  - the **sump bolts on the gearbox (44 N.m)**,

- the **sump bolt on the multifunction support (25 N.m)**.

### III - FINAL OPERATION

- Fit the front axle subframe.
- Refit the brackets.
- Torque tighten the **bracket bolts (62 N.m)**.
- One by one, remove the threaded rods of the (**Tav. 1747**) and replace them in turn with new front axle subframe bolts.

K4M

- Torque tighten the **front axle subframe bolts (110 N.m)**.
- Refit:
  - the relay bearing bolts,
  - the right-hand driveshaft flange bolt(s) on the relay bearing.
- Tighten to torque and in order:
  - the **relay bearing bolts (44 N.m)**,
  - the **right-hand driveshaft flange bolt(s) on the relay bearing (21 N.m)**.
- Refit the front axle subframe tie-rod upper bolts.
- Torque tighten the **front axle subframe tie-rod upper bolts (21 N.m)**.
- Refit the cooling pipe support bolt on the sump.
- Refit the power-assisted steering low pressure pipe bolt on the front axle subframe.
- Torque tighten the **power-assisted steering low pressure pipe bolt on the front axle subframe (21 N.m)**.
- Refit the steering box bolts on the front axle subframe.
- Tighten to torque the **steering box bolts on the front axle subframe (105 N.m)**.
- Refit:
  - the steering box heat shield,
  - the lower arm ball joints (see **Front driveshaft lower arm: Removal - Refitting**) (31A, Front axle components),
  - the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-8) .

## Lower cover: Removal - Refitting

K4M

- Refit the front bumper (see **Front bumper assembly: Exploded view**) and (see **Exterior body front trim assembly: Exploded view**) (55A, Exterior protection).
- Refit:
  - the engine undertray,
  - the front wheel arch side liners,
  - the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).
- Top up the engine oil (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page **10A-32**).

# ENGINE AND CYLINDER BLOCK ASSEMBLY

## Conrod bearing shell: Removal - Refitting

# 10A

K9K

### Equipment required

safety strap(s)
component jack
indelible pencil
torque wrench
Diagnostic tool

### Tightening torques

con rod cap bolts	20 N.m + 45° ± 6°
oil pump bolts	25 N.m

### IMPORTANT

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **Vehicle: Precautions for the repair**).

### IMPORTANT

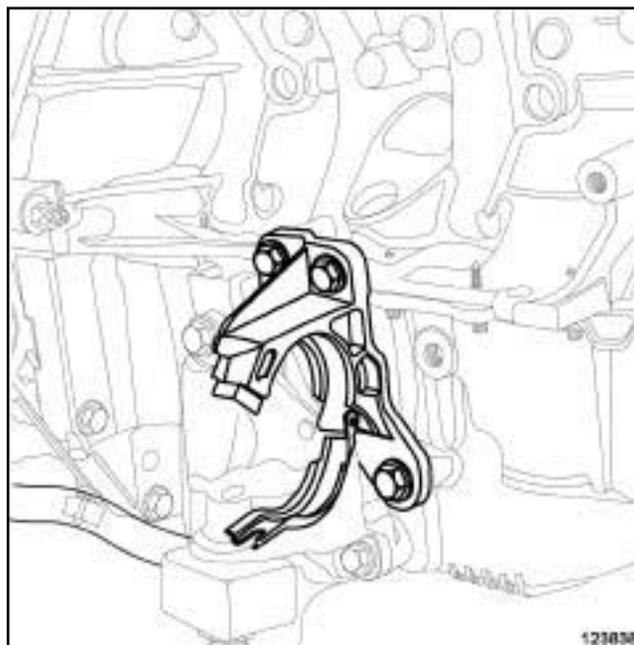
Wear leaktight gloves (Nitrile type) for this operation.

## REMOVAL

### I - REMOVAL PREPARATION OPERATION

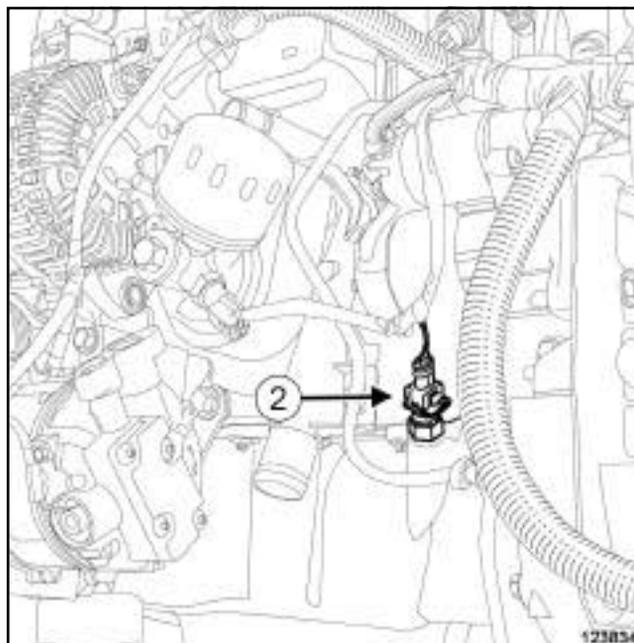
- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove the engine undertray.
- Drain the oil from the engine (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page 10A-32).
- Remove the oil filter (see **10A, Engine and cylinder block assembly, Oil filter: Removal - Refitting**, page 10A-34).
- Remove the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-8).

- Strap the radiator to the vehicle using **safety strap(s)**.
- Remove the front axle subframe (see **Front axle subframe: Removal - Refitting**) (31A, Front axle components).



123834

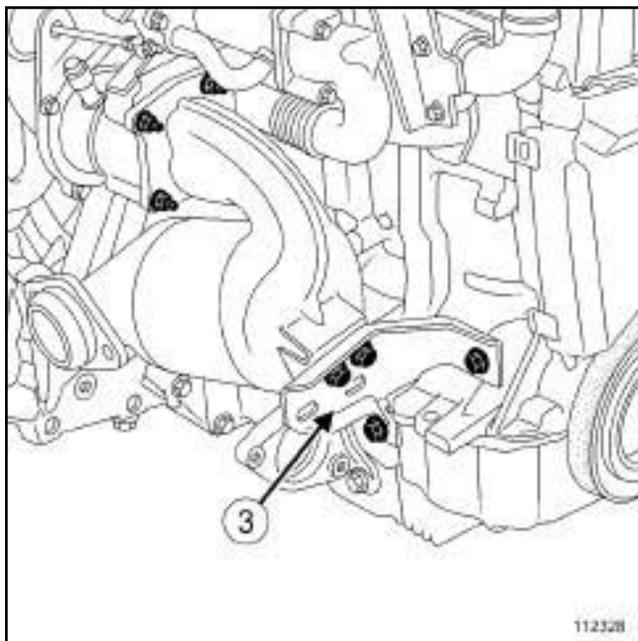
- Remove the relay bearing of the front right-hand wheel driveshaft.



123834

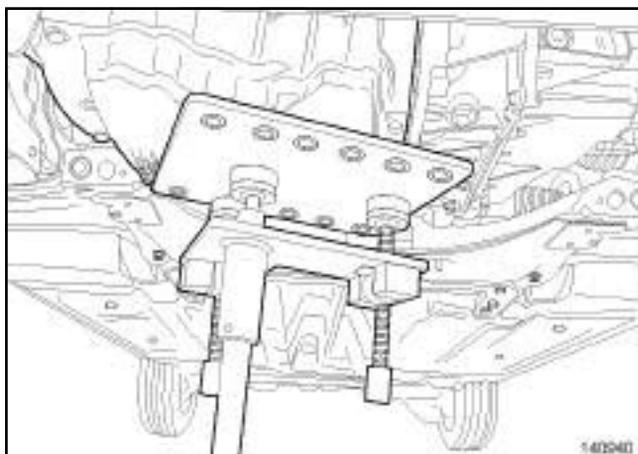
- Disconnect the oil level sensor connector (if equipped) (2).

K9K



112328

- ❑ Remove the catalytic converter upstream stay (3) .



140940

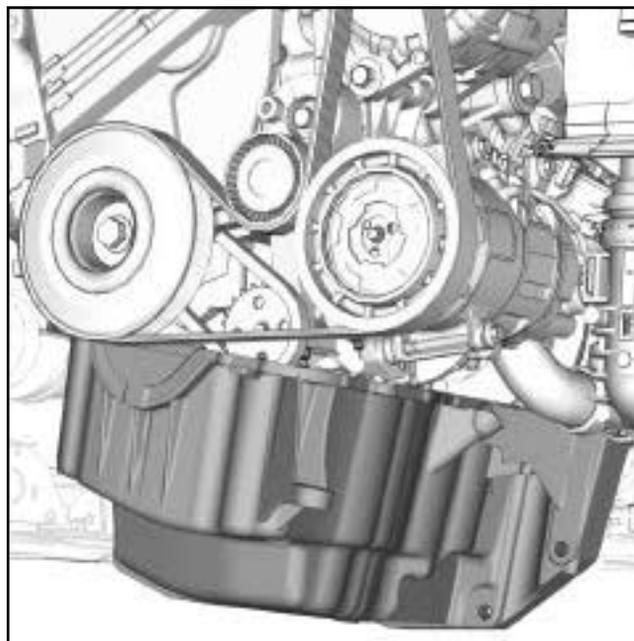
❑

### WARNING

Failure to observe the following procedure may damage the oil pump strainer.

Undo the bolts of the engine oil sump.

- ❑ Fit a **component jack** to support the engine oil sump.
- ❑ Remove the bolts from the engine oil sump.
- ❑ Detach the engine oil sump, while supporting it with the **component jack**.

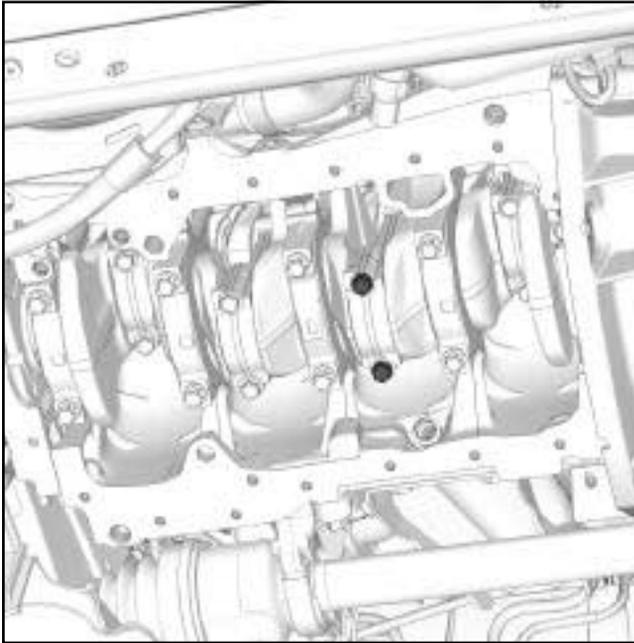


140917

- ❑ Tilt the engine oil sump forwards in order to access the oil pump bolts.
- ❑ Partially loosen the oil pump bolts **3 mm to 5 mm**.
- ❑ Detach the oil pump from its position in order to remove the engine oil sump.
- ❑ Remove:
  - the engine oil sump,
  - the engine oil sump seal,
  - the oil pump.

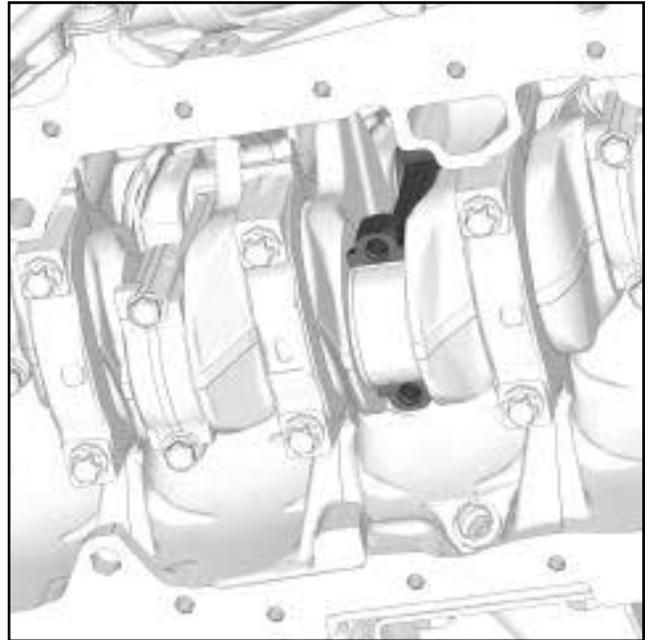
K9K

## II - REMOVAL OPERATION FOR THE CON ROD BEARING SHELLS NO.2



139306

- Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean the big ends.
- Mark the position of the con rod cap in relation to the con rod body using a **indelible pencil**.
- Position the crankshaft at Top Dead Centre.



139300

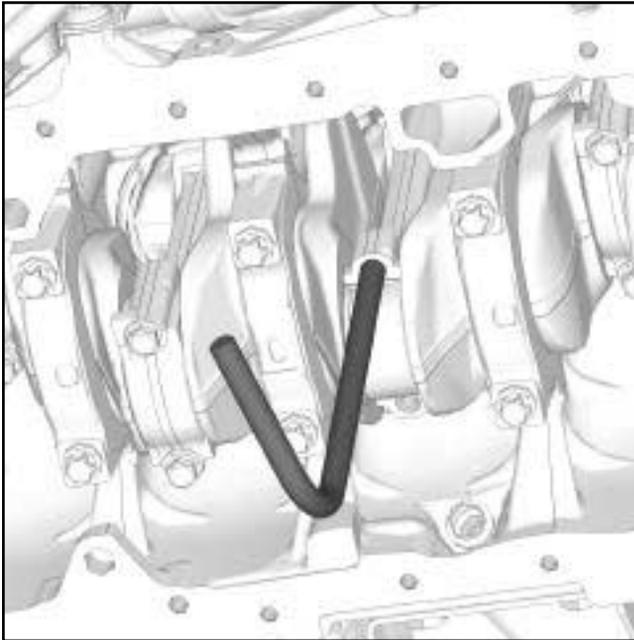
- Remove:
  - the con rod bolts,
  - the con rod cap,
  - the lower con rod bearing shell.

**Note:**

If reusing the con rod bearing shells, mark the position of the lower con rod bearing shell in relation to the con rod cap.

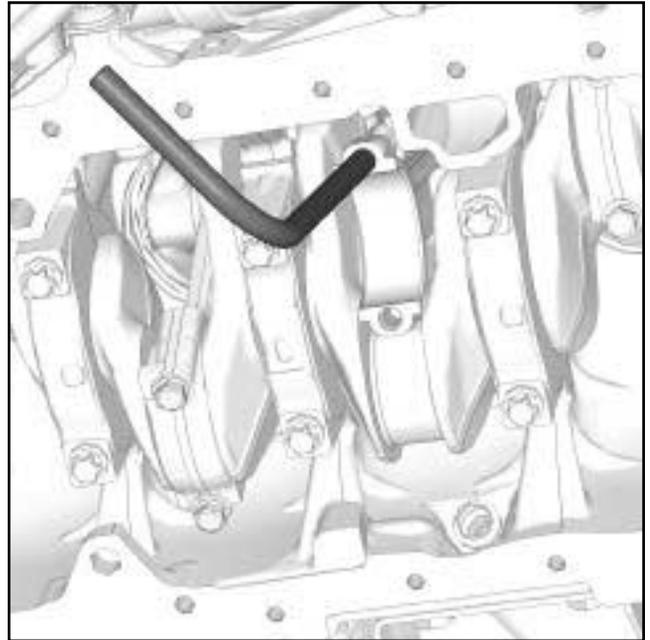
- Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - products) to clean the bearing mating face on the con rod cap.

K9K



139310

- Fit the tie rod of the tool on the con rod body.
- Push the con rod upwards to release the con rod from the crankpin.
- Turn the crankshaft **90°** clockwise (timing end).



139315

### WARNING

Failure to observe the following procedure may damage the piston base cooling jets.

Pull the con rod - piston assembly using the tie rod of the tool, taking care not to allow the piston to touch the piston base cooling jets.

- Remove the upper con rod bearing shell.

### Note:

If reusing the con rod bearing shells, mark the position of the upper con rod bearing shell in relation to the con rod body.

- Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - products) to clean the bearing mating face on the con rod body.

## REFITTING

### I - REFITTING OPERATION FOR THE CON ROD BEARING SHELLS ON CYLINDER NO.2

- parts always to be replaced: con rod cap bolts

K9K

□

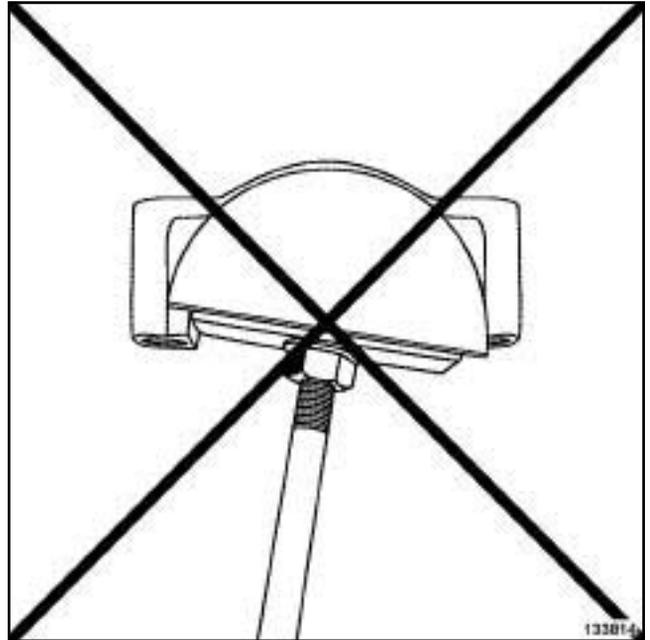
## Note:

Always replace con rod bearing shells with a width of **20 mm** by con rod bearing shells with a width of **18 mm**.

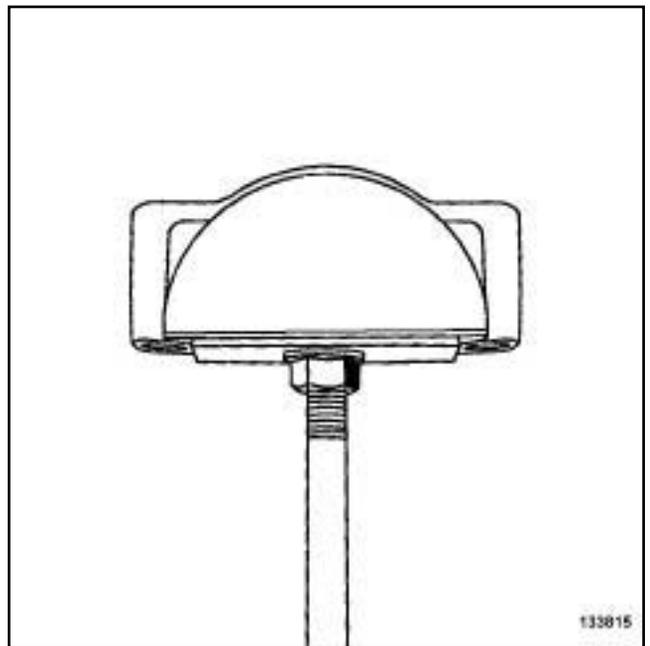
If the set of con rod bearing shells only includes con rod bearing shells which are **18mm** wide, only use the head of the tool with the marking "**K9K SUP**".

Fit the head of the tool with the marking "**K9K INF**" on the threaded sleeve of the tool.

- Position the lower con rod bearing shell on the tool.



133814



133815

133815

□

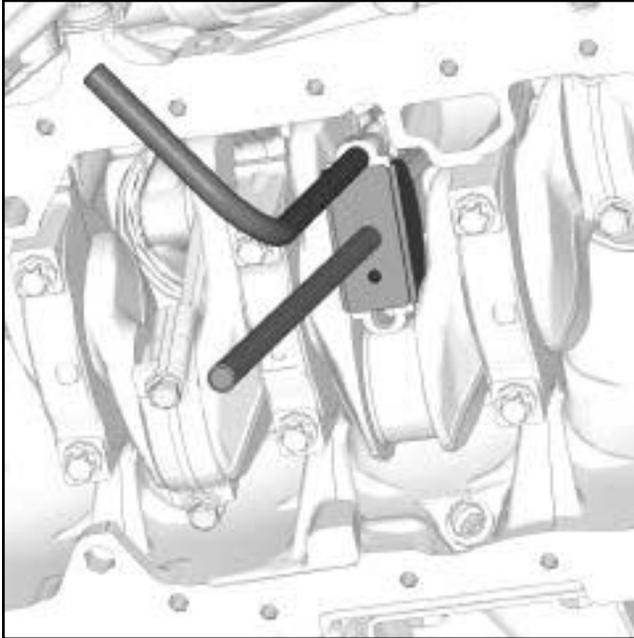
## Note:

The contact surface between the bearing shell and the con rod must be dry and free of grease.

Fit the lower con rod bearing shell on the con rod cap using the tool.

- Position the lower con rod bearing shell so that the ends do not protrude beyond the con rod cap.
- Lubricate the surface of the con rod bearing shell (crankshaft end) using new engine oil.

K9K



139318

- Remove the tool head with the marking " **K9K INF** " and fit the head with the marking " **K9K SUP** ".
- Position the upper con rod bearing shell on the tool.
- Fit the upper con rod bearing shell on the con rod body using the tool.
- Position the upper con rod bearing shell so that the ends do not protrude beyond the con rod body.
- Lubricate the surface of the con rod bearing shell (crankshaft end) using new engine oil.
- Push the con rod - piston assembly back up into place.
- Turn the crankshaft **90°** anticlockwise.
- Lubricate the crankpin with new engine oil.
- Pull the con rod - piston assembly to position the con rod on the crankshaft.
- 

**Note:**

Before refitting the con rod cap, ensure that there are no impurities (filings, cloth lint, etc.) on the con rod body or cap surfaces.

**Refit:**

- the con rod cap according to the mark made during removal,
- the new con rod bolts.
- Torque and angle tighten the **con rod cap bolts (20 N.m + 45° ± 6°)**.

**II - REMOVAL - REFITTING OPERATIONS FOR THE CON ROD BEARING SHELLS ON CYLINDERS NO.3, 1 AND 4**

- Perform the same removal - refitting operations as for the con rod bearing shells on cylinder no. 2.

**Note:**

For removing and refitting the con rod bearing shells on cylinders no. 1 and no. 4, position the pistons at Bottom Dead Centre before performing the same removal and refitting operations as for the con rod bearing shells on cylinder no. 2.

**III - FINAL OPERATION**

- parts always to be replaced: engine oil sump seal**

**parts always to be replaced: Oil filter**

**parts always to be replaced: Drain plug seal on engine oil sump**

**WARNING**

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

**WARNING**

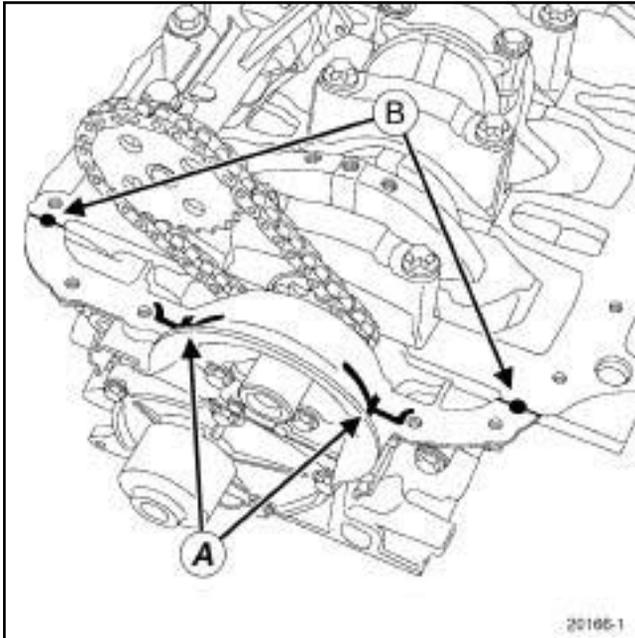
To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

- Use a wooden spatula or an **ABRASIVE PAD** to clean the joint face of the cylinder block and engine oil sump.
- Refit the oil pump.
- Fit without tightening the oil pump bolts, while keeping a clearance of **3 mm to 5 mm**.
- Fit the engine oil sump seal.

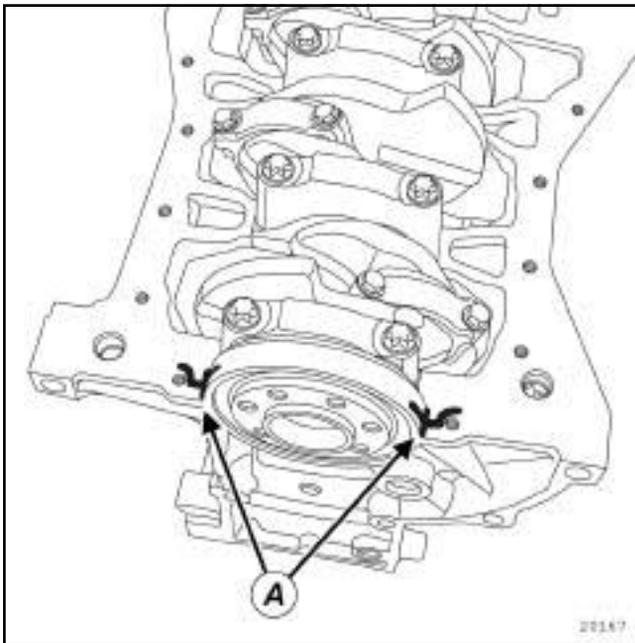
**WARNING**

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

K9K

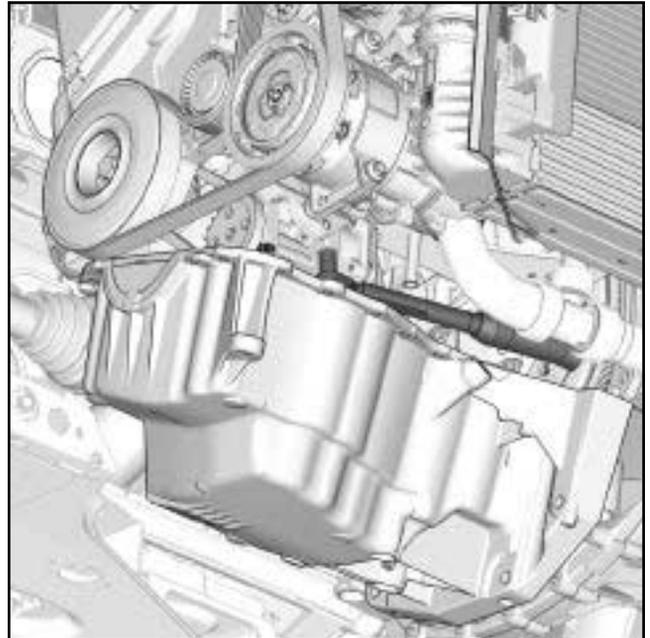


20166



20167

- Apply **SILICONE ADHESIVE SEALANT** (see **Vehicle: Parts and consumables for the repair**) :
  - four beads with a diameter of **5 mm** at (A) ,
  - two drops with a diameter of **5 mm** at (B) .
- Fit the engine oil sump while supporting it using a **component jack**.



140918

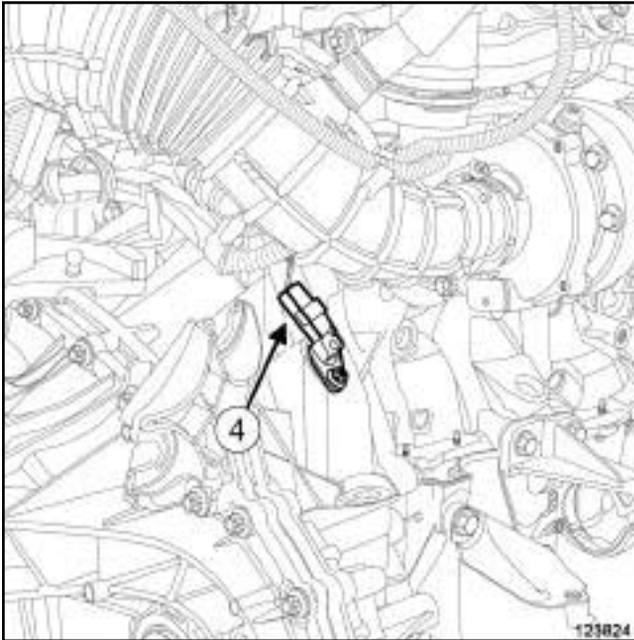
- Tilt the engine oil sump forwards in order to access the oil pump bolts.
- Torque tighten the **oil pump bolts (25 N.m)** using the **torque wrench PROSTEEL**, part number **77 11 226 888** starting with the **13 mm** bolt.

Note:

Check that the engine oil sump seal is definitely in place before tightening the engine oil sump bolts.

- Refit the engine oil sump bolts.
- Torque tighten in order the engine oil sump bolts (see **10A, Engine and cylinder block assembly, Lower cover: Removal - Refitting**, page **10A-9**) .
- Refit the catalytic converter upstream stay (see **19B, Exhaust, Catalytic converter: Removal - Refitting**, page **19B-10**) .
- Connect the connector to the oil level sensor.
- Refit the relay bearing of the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) .
- Refit the front axle subframe (see **Front axle subframe: Removal - Refitting**) (31A, Front axle components).
- Remove the **safety strap(s)** from the radiator.
- Refit the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page **19D-8**) .

K9K



123824

- Disconnect the crankshaft position sensor (4) to prevent the engine from starting.
- Refit the oil filter (see 10A, **Engine and cylinder block assembly, Oil filter: Removal - Refitting**, page 10A-34)
- Fill up the engine oil (see 10A, **Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page 10A-32) .
- Start the engine using the starter until the engine oil warning light goes out.
- Connect the crankshaft position sensor.
- Refit the engine undertray.
- Clear the present faults using the **Diagnostic tool**.

## Engine oil: Draining - Refilling

K4M or K9K

### Equipment required

- oil recovery tray
- oil change wrench
- torque wrench
- oil change end piece with an 8 mm square drive

### Tightening torques

- |            |               |
|------------|---------------|
| drain plug | <b>20 N.m</b> |
|------------|---------------|

## DRAINING

### I - AVERAGE CAPACITY OF ENGINE OIL

K4M

- 4.7 litres** (without oil filter replacement).
- 4.8 litres** (with oil filter replacement).

K9K

- 4.0 litres** (without oil filter replacement).
- 4.1 litres** (with oil filter replacement).

### II - RECOMMENDATIONS FOR REPAIR

#### WARNING

Always check the oil level using the dipstick.  
Do not exceed the maximum level on the dipstick (could destroy the engine).  
Correct the engine oil level if necessary before delivering the vehicle to the customer.

#### Note:

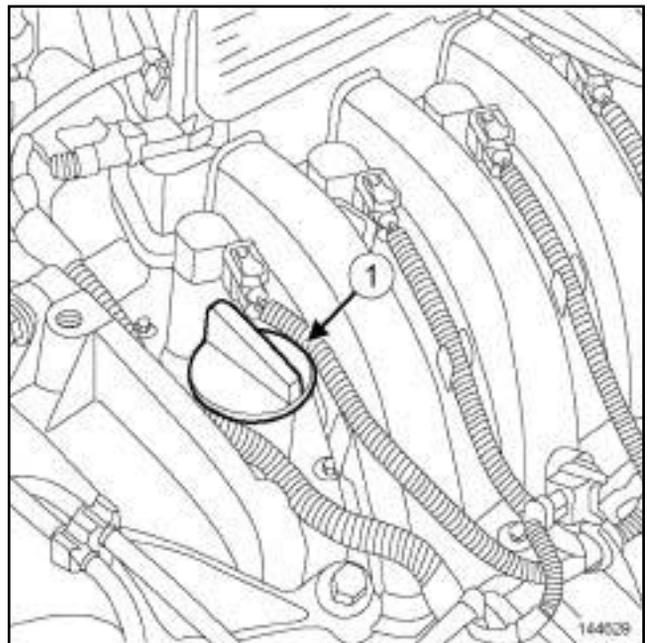
When filling up the engine oil, always leave at least **10 minutes** for the oil to drain down before checking with a dipstick.

### III - PARTS AND CONSUMABLES FOR REPAIR

- parts always to be replaced: Drain plug seal on engine oil sump.
- Consumable:
  - Engine oil (see **Engine oil: Specifications**).

### IV - OIL SERVICE

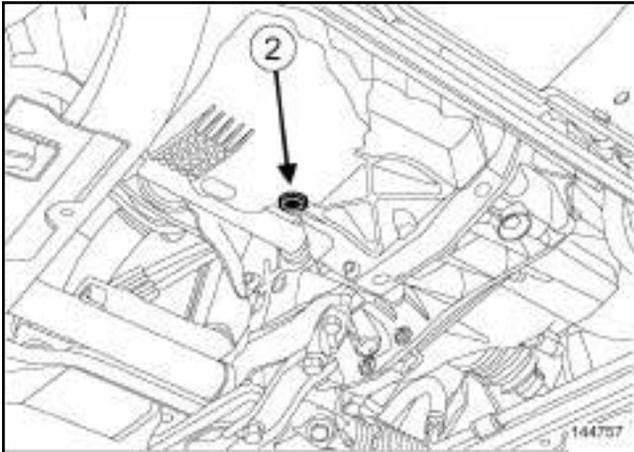
- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).



144629

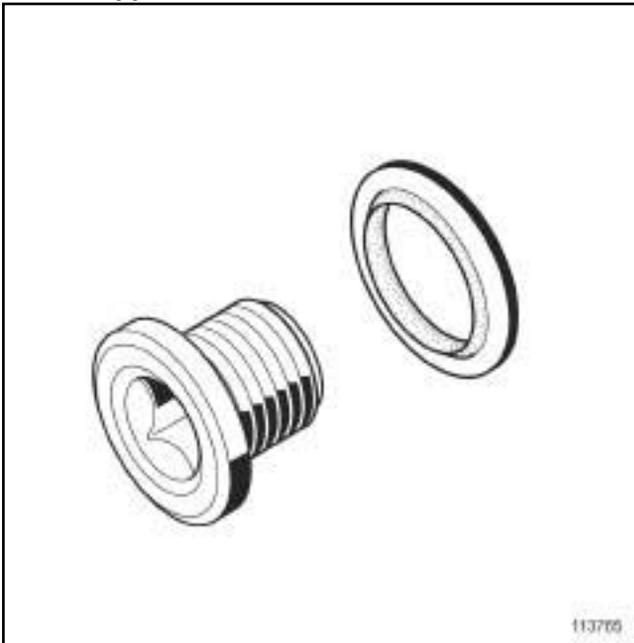
- Remove:
  - the engine oil filler cap (1),
  - the dipstick.
- Place the **oil recovery tray** under the engine.

K4M or K9K



144757

- Remove the drain plug (2) using theor a **oil change wrench**.
- Let the engine oil flow out completely.
- Remove the drain plug seal.

**Rubber-lipped seal**

113765

- Refit a new seal to the drain plug (no direction of fitting).
- Refit the drain plug.
- Torque tighten the **drain plug (20 N.m)** using a **torque wrench** fitted with a **oil change end piece with an 8 mm square drive**.
- Clean any oil run-off from the engine oil sump using a cloth.
- Remove the **oil recovery tray**.

**V - FILLING**

- Fill the engine with oil, respecting the recommended quantity.
- Wait at least **10 minutes**.
- Check the oil level using the dipstick.
- Top up the engine oil level if necessary.
- Refit:
  - the engine oil filler cap,
  - the dipstick.

## Oil filter: Removal - Refitting

K9K

### Special tooling required

**Mot. 1329** Oil filter removing tool (76 mm diameter)

### WARNING

Always check the oil level using the dipstick.

Do not exceed the maximum level on the dipstick (could destroy the engine).

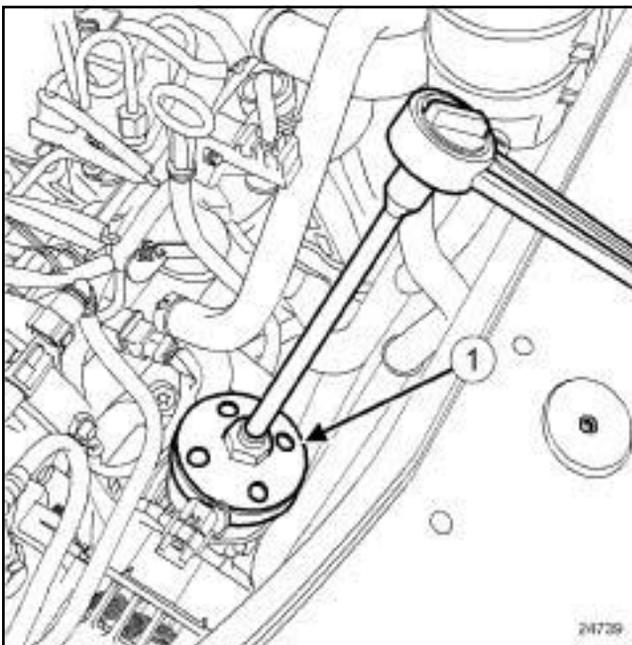
Correct the engine oil level if necessary before delivering the vehicle to the customer.

### Note:

When topping up the engine oil, always leave at least 10 minutes for the oil to drain down before checking with a dipstick.

## REMOVAL

### OPERATION FOR REMOVAL OF PART CONCERNED



24739

- Position the **(Mot. 1329)** (1) with an extension piece and a ratchet on the oil filter.
- Remove the oil filter.

## REFITTING

### I - REFITTING PREPARATION OPERATION

- parts always to be replaced: Oil filter.**
- Lubricate the new oil filter seal with new engine oil.

### II - REFITTING OPERATION FOR PART CONCERNED

- Tighten the oil filter by hand until the oil filter seal makes contact with the oil filter support.
- Tighten the oil filter 3/4 of a turn manually or using the tool **(Mot. 1329)**.

### III - FINAL OPERATION

- Wipe any oil run-off with a cloth.
- Check the oil level with the dipstick.
- Top up the oil level (if necessary).

K4M

### Special tooling required

**Mot. 1329** Oil filter removing tool (76 mm diameter)

### Equipment required

oil recovery tray

### IMPORTANT

Wear leaktight gloves (Nitrile type) for this operation.

### WARNING

Always check the oil level using the dipstick.

Do not exceed the maximum level on the dipstick (could destroy the engine).

Correct the engine oil level if necessary before delivering the vehicle to the customer.

### Note:

When filling up the engine oil, always leave at least **10 minutes** for the oil to drain down before checking with a dipstick.

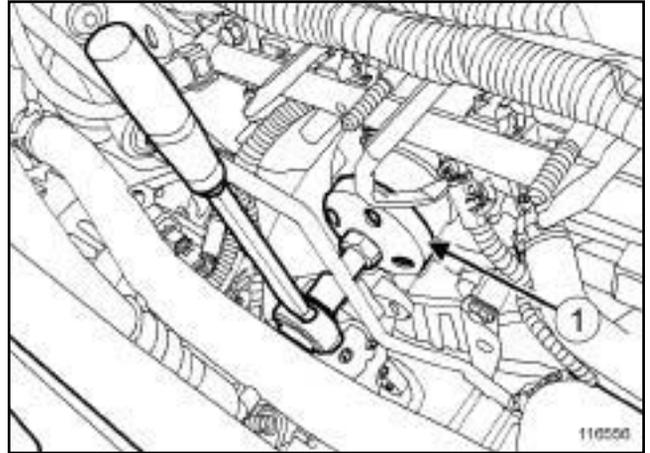
When removing the oil filter, check that the oil filter seal is not still stuck to the cylinder block or the oil filter support.

## REMOVAL

### I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove:
  - the engine undertray bolts,
  - the engine undertray.
- Place the **oil recovery tray** under the engine.
- Remove the injector rail protector.

### II - REMOVAL OPERATION



116556

- Remove the oil filter using the **(Mot. 1329) (1)**.

## REFITTING

### I - REFITTING PREPARATION OPERATION

- parts always to be replaced: Oil filter.**
- Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease the cylinder block joint face.
- Lubricate the oil filter seal with new engine oil.

### II - REFITTING OPERATION

- Fit a new oil filter.
- Tighten the oil filter until it makes contact with the engine.
- Manually tighten the oil filter by 3/4 of a turn.

### III - FINAL OPERATION

- Refit the injector rail protector.
- Remove the **oil recovery tray**.
- Wipe any oil run-off with a cloth.
- Top up with engine oil recommended by the manufacturer (see **Engine oil: Specifications**).
- Start the engine and wait until the oil pressure warning light goes out on the instrument panel.
- Check for leaks from the oil filter.
- Refit the engine undertray.
- Wait at least **10 minutes**.
- Check the oil level using the dipstick.

K4M

- Top up the engine oil level to the dipstick if necessary (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page **10A-32**)

# ENGINE AND CYLINDER BLOCK ASSEMBLY

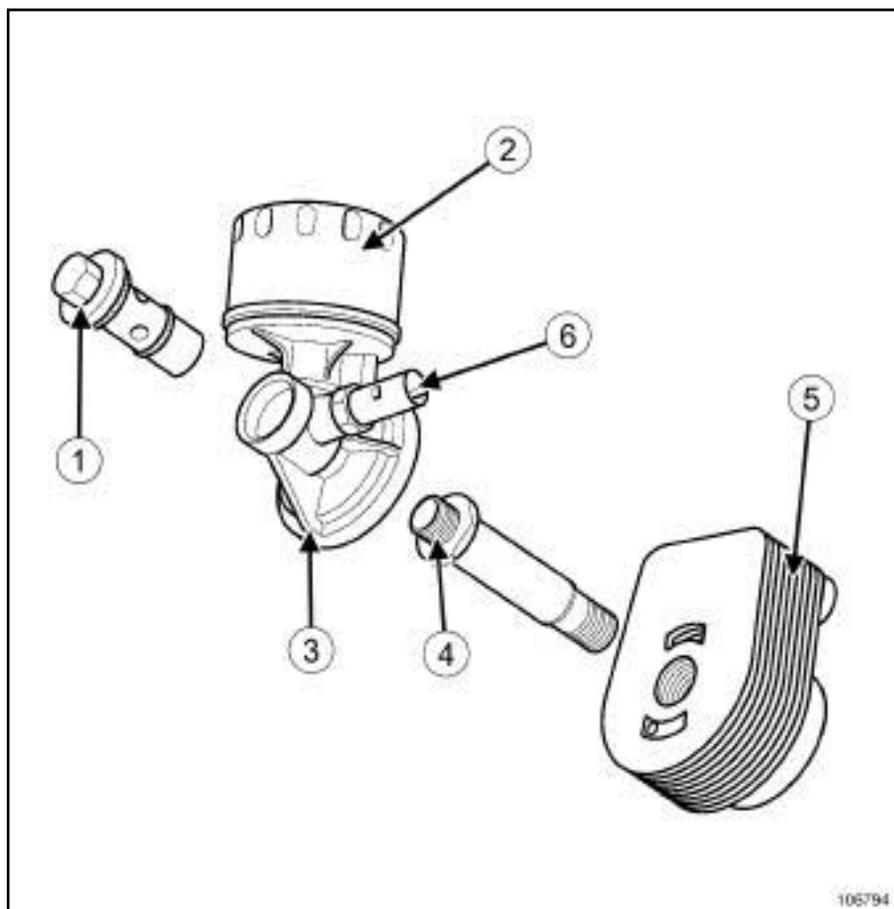
## Oil-coolant heat exchanger: Removal - Refitting

# 10A

K9K, and 796

### Tightening torques

oil heat exchanger bolt	39 N.m
oil filter support bolt	28 N.m



106794  
106794

- (1) Oil filter holder mounting bolt
- (2) Oil filter
- (3) Oil filter holder
- (4) Coolant - oil heat exchanger mounting bolts
- (5) Coolant - oil heat exchanger
- (6) Oil pressure sensor

## REMOVAL

### REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove:
  - the engine cover,

- the engine undertray,
- the closure panel component under the diesel filter.

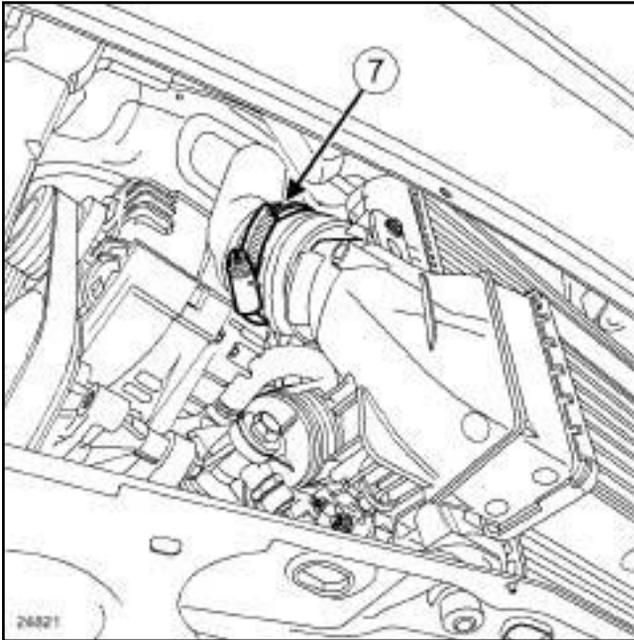
- Drain the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-6) .

# ENGINE AND CYLINDER BLOCK ASSEMBLY

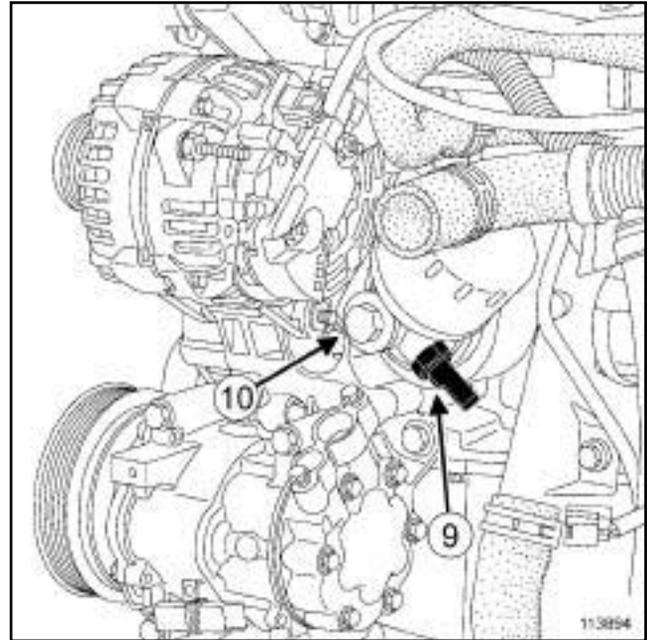
## Oil-coolant heat exchanger: Removal - Refitting

# 10A

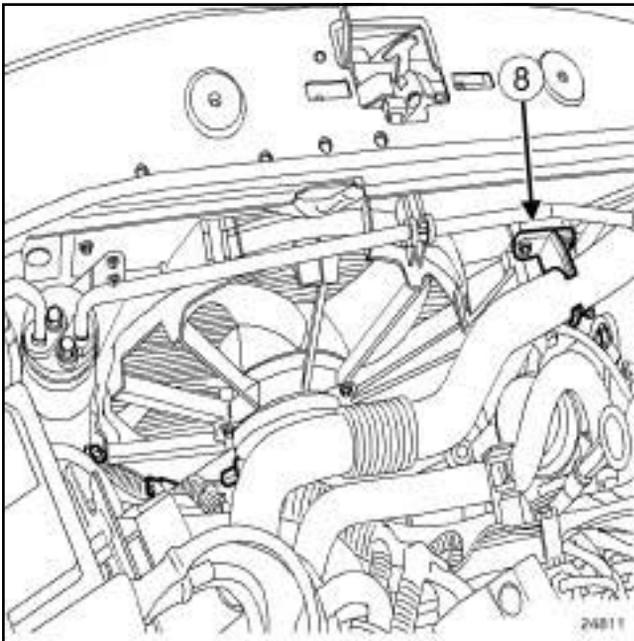
K9K, and 796



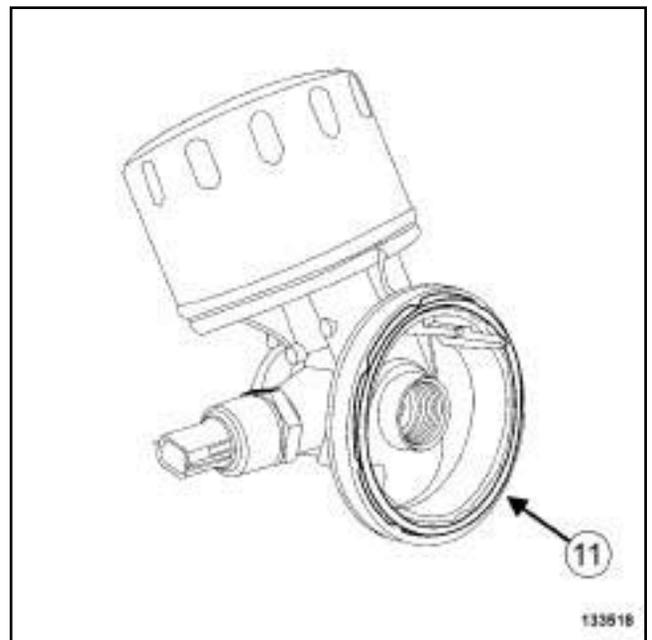
- ❑ Disconnect the air outlet duct (7) on the intercooler.



- ❑ Disconnect the oil pressure sensor connector (9) .
- ❑ Place a container under the engine on the oil filter side.
- ❑ Remove the bolt (10) from the oil filter support.
- ❑ Remove the oil filter support.



- ❑ Move aside the air outlet duct.
- ❑ Remove the air outlet duct support (8) from the fan assembly mounting.



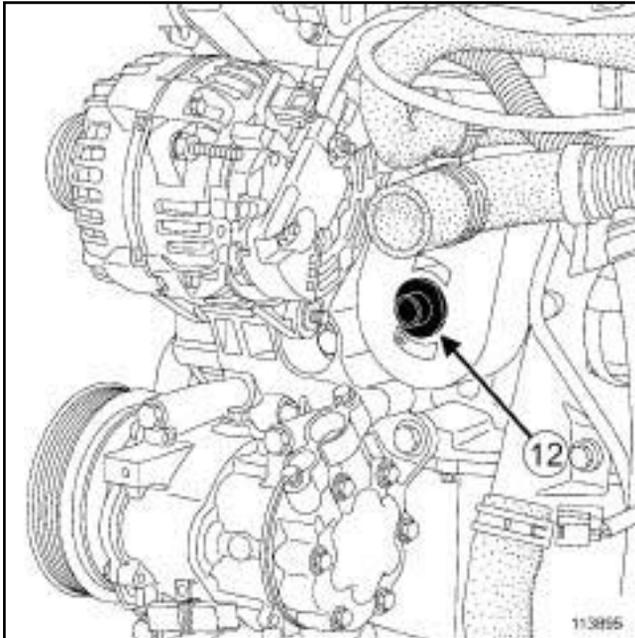
- ❑ Remove the seal (11) from the oil filter support.

# ENGINE AND CYLINDER BLOCK ASSEMBLY

## Oil-coolant heat exchanger: Removal - Refitting

# 10A

K9K, and 796



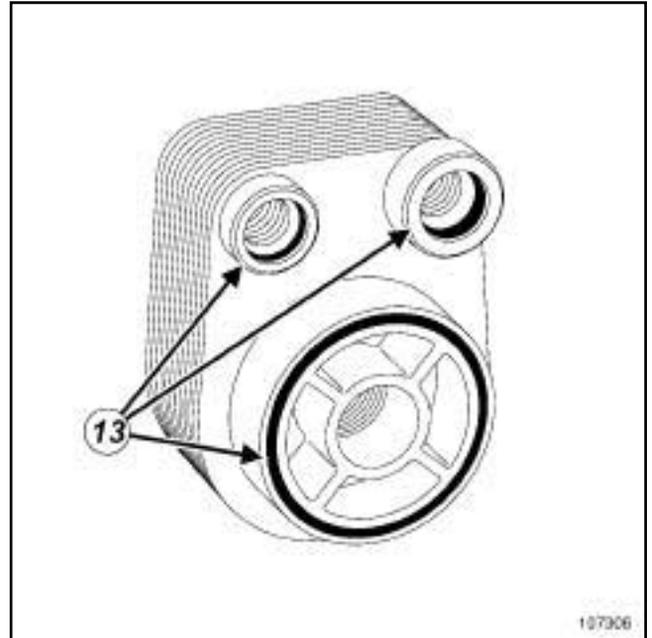
113895

- ❑ Remove:
  - the bolt (12) from the oil-coolant heat exchanger,
  - the oil-water heat exchanger.
- ❑ Using a clean cloth, clean up any oil and coolant runs on the cylinder block and on the oil filter support.

### REFITTING

#### I - REFITTING PREPARATION OPERATION

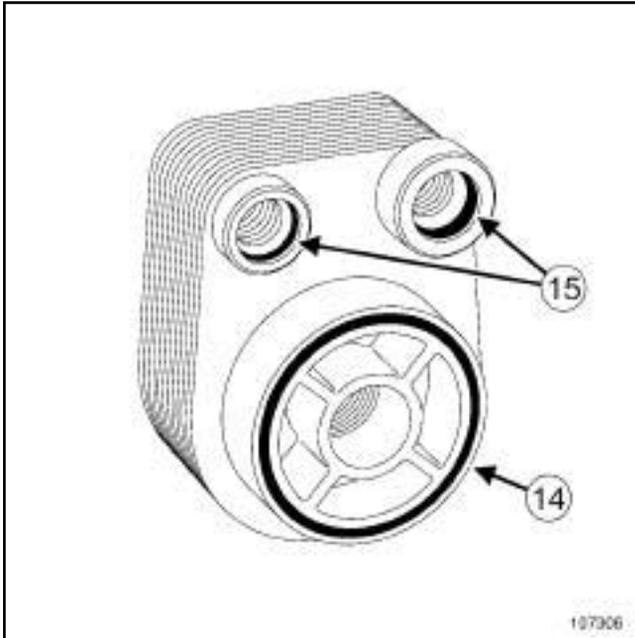
- ❑ **parts always to be replaced: coolant-engine oil heat exchanger seal on the cylinder block.**
- ❑ Always replace:
  - the seals of the oil filter support bolt,
  - the oil filter support seal.



107306

- ❑ Remove the oil-water heat exchanger seals (13) .
- ❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:
  - the housing of each seal in the oil-water heat exchanger if it is to be reused,
  - the oil-coolant heat exchanger seal face if it is to be reused,
  - the mating face of each seal on the coolant pump inlet pipe,
  - the joint face on the cylinder block,
  - the housing of each oil filter support seal,
  - the housing of each seal in the oil filter support.

K9K, and 796



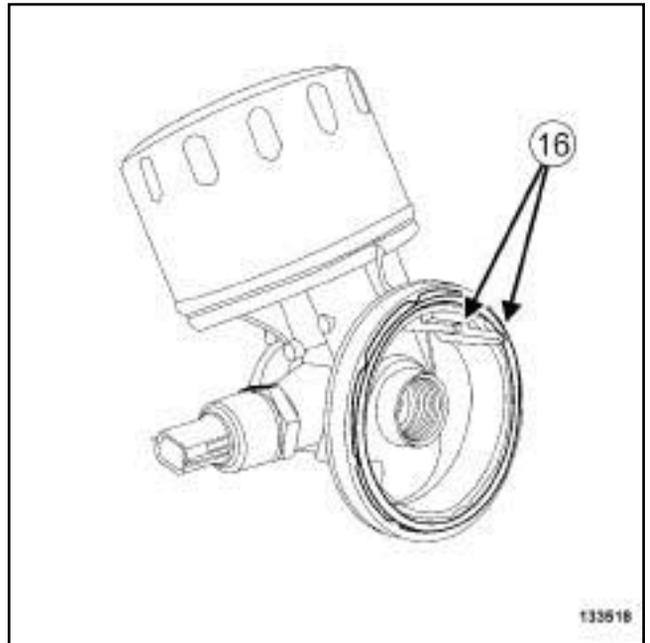
107306

- Refit new seals (14) and (15) on the oil-water heat exchanger.
- Apply soapy water to the two seals (15) in contact with the coolant pump inlet pipe.

### II - REFITTING OPERATION FOR PART CONCERNED

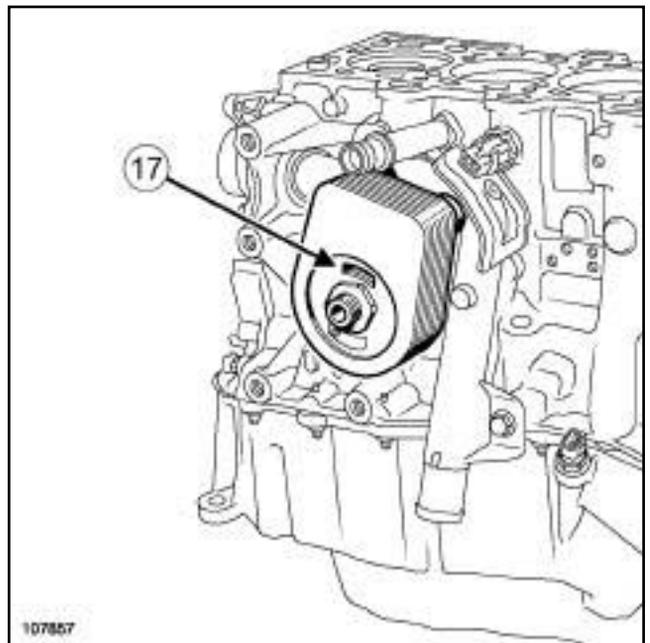
- Refit the oil-water heat exchanger.
- Torque tighten the **oil heat exchanger bolt (39 N.m)**.

### III - FINAL OPERATION



133518

133518



107857

- Refit:
  - a new seal in the housing of the oil filter support,
  - the oil filter support, positioning the lug (16) in the hole (17) of the oil-water heat exchanger.
- Refit the oil filter holder bolt.
- Torque tighten the **oil filter support bolt (28 N.m)**.
- Connect the oil pressure sensor connector.
- Refit the air outlet duct support on the fan assembly mounting.

# ENGINE AND CYLINDER BLOCK ASSEMBLY

## Oil-coolant heat exchanger: Removal - Refitting

# 10A

K9K, and 796

- Connect the air outlet duct to the intercooler.
- Fill the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page **19A-6**).
- Refit:
  - the closure panel component under the diesel filter,
  - the engine undertray,
  - the engine cover.
- Bleed the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page **19A-6**).

K9K

### Tightening torques

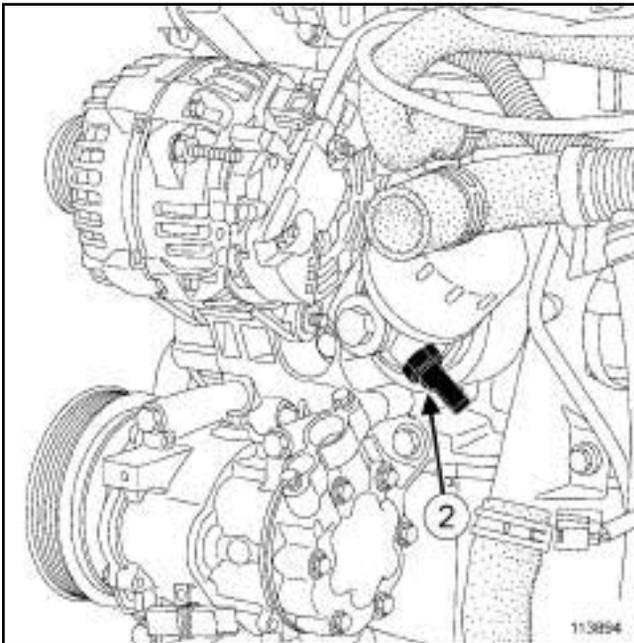
oil pressure sensor	33 N.m
---------------------	--------

## REMOVAL

### I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove the engine undertray.

### II - OPERATION FOR REMOVAL OF PART CONCERNED



113894

- Disconnect the oil pressure sensor connector.
- Remove the oil pressure sensor (2) using the.

## REFITTING

### I - REFITTING OPERATION FOR PART CONCERNED

- Refit the oil pressure sensor.
- Torque tighten the **oil pressure sensor (33 N.m)**.
- Connect the oil pressure sensor connector.

### II - FINAL OPERATION

- Refit the engine undertray.

K4M

### Tightening torques

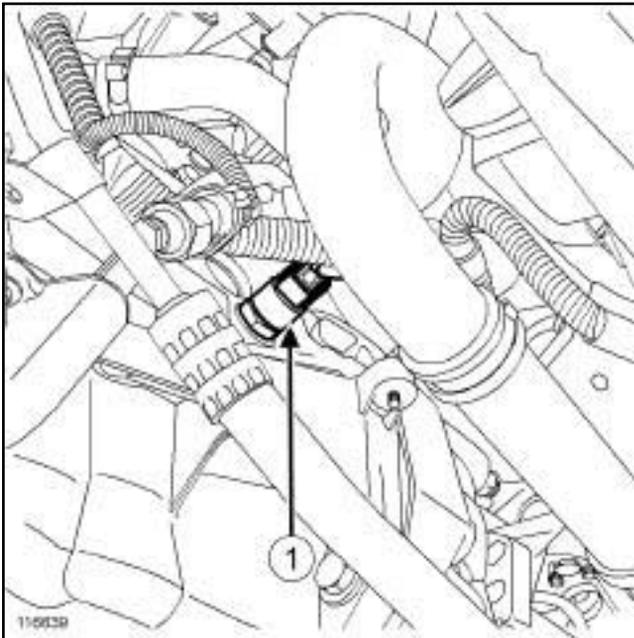
oil pressure sensor	35 N.m
---------------------	--------

## REMOVAL

### I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove:
  - the engine undertray bolts,
  - the engine undertray.

### II - REMOVAL OPERATION



116639

- Disconnect the oil pressure sensor connector (1) .
- Remove the oil pressure sensor.

## REFITTING

### I - REFITTING OPERATION

- Degrease the mating face of the oil pressure sensor on the cylinder block using **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).
- Refit the oil pressure sensor.
- Torque tighten the **oil pressure sensor (35 N.m)**.

### II - FINAL OPERATION

- Connect the oil pressure sensor connector.
- Refit the engine undertray.

## Oil pump: Removal - Refitting

K9K

Tightening torques 

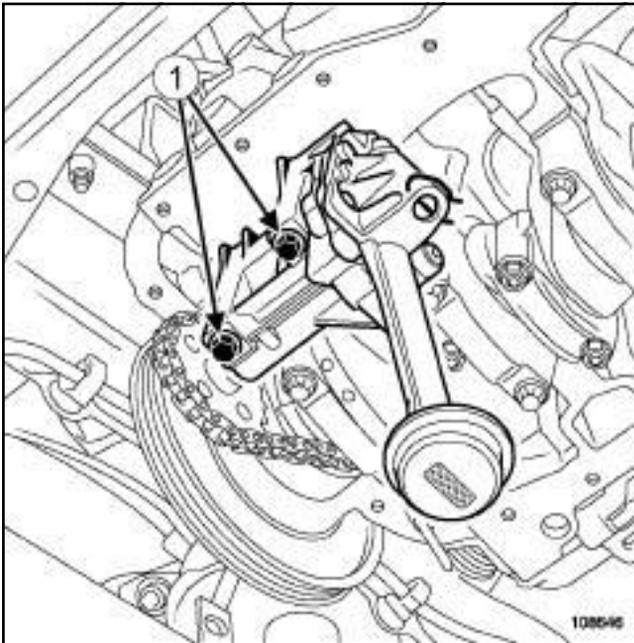
oil pump bolts	25 N.m
----------------	--------

## REMOVAL

## I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Drain the engine oil (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page 10A-32) .
- Remove the sump (see **10A, Engine and cylinder block assembly, Lower cover: Removal - Refitting**, page 10A-9) .

## II - OPERATION FOR REMOVAL OF PART CONCERNED



108646

- Remove:
  - the oil pump bolts (1) ,
  - the oil pump.

## REFITTING

## I - REFITTING PREPARATION OPERATION

- Check for oil pump centering rings on the cylinder block.

## II - REFITTING OPERATION FOR PART CONCERNED

- Refit the oil pump.
- Torque tighten the **oil pump bolts (25 N.m)**.

## III - FINAL OPERATION

- Refit the sump (see **10A, Engine and cylinder block assembly, Lower cover: Removal - Refitting**, page 10A-9) .
- Top up the engine oil (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page 10A-32) .

## Oil pump: Removal - Refitting

K4M

Tightening torques 

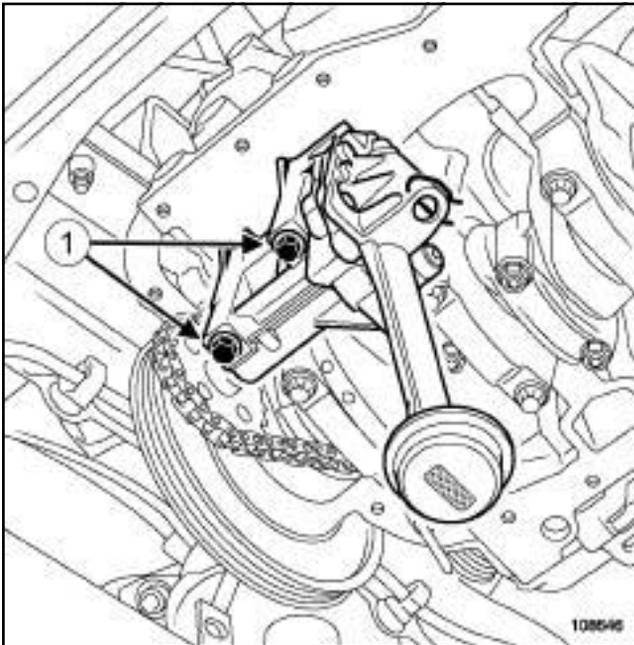
oil pump bolts	25 N.m
----------------	--------

## REMOVAL

## I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Drain the engine oil (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page 10A-32) .
- Remove the sump (see **10A, Engine and cylinder block assembly, Lower cover: Removal - Refitting**, page 10A-9) .

## II - REMOVAL OPERATION



108646

- Remove:
  - the oil pump bolts (1) ,
  - the oil pump.

## REFITTING

## I - REFITTING PREPARATION OPERATION

- Check for centering rings on the oil pump.

## II - REFITTING OPERATION

- Refit the oil pump.
- Torque tighten the **oil pump bolts (25 N.m)**.

## III - FINAL OPERATION

- Refit the sump (see **10A, Engine and cylinder block assembly, Lower cover: Removal - Refitting**, page 10A-9) .
- Top up the engine oil (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page 10A-32) .

## Oil pressure: Check

K4M or K9K

### Oil pressure tables:

Engine	Minimum oil pressure (bar)		Maximum oil pressure (bar)
	Idling speed	3000 rpm	3000 rpm
D4D, D4F	1.5	3.9	5.3
K7J, K7M	1.3	3.7	5.0

Engine	Minimum oil pressure (bar)		Maximum oil pressure (bar)
	Idling speed	4000 rpm	4000 rpm
K4M	0.5	3.1	4.4
K9K	0.8	3.4	5.2

### End pieces to be used:

Engine	End pieces
D4D, D4F	C + F
K4M, K7J, K7M, K9K	E + C + F

### I - REMOVAL PREPARATION OPERATION

#### WARNING

Always check the oil level using the dipstick.

Do not exceed the maximum level on the dipstick (could destroy the engine).

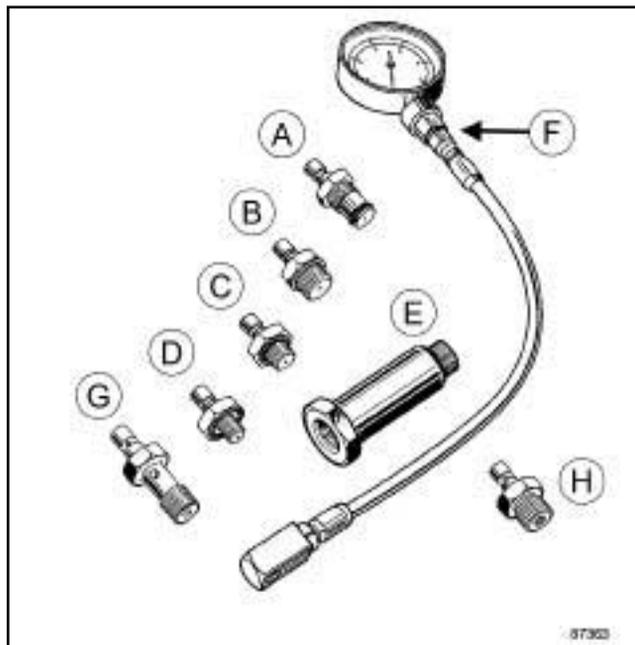
Correct the engine oil level if necessary before delivering the vehicle to the customer.

#### Note:

When topping up the engine oil, always leave at least **10 minutes** before checking the level with a dipstick.

### II - CHECK

- Remove the oil pressure sensor (see 10A, Engine and cylinder block assembly, Oil pressure sensor: Removal - Refitting, page 10A-42).



87363

- In place of the oil pressure sensor, fit the with suitable adapters using their a **22 mm** long socket.
- Start the vehicle.
- Monitor the engine oil pressure as the oil temperature rises (approximately **80°C** or the first time the engine cooling fan is activated); it should not be less than the pressure at idle speed.
- If the oil pressure is lower than the pressure at idle speed, check that:
  - the oil filter is not clogged,
  - dirt or swarf is not present in the engine oil,
  - the oil pump is in good condition and being correctly driven.
- Check the oil pressure in comparison with the values given in the table above.
- Switch off the engine.
- Remove the with the end pieces.
- Refit the oil pressure sensor (see 10A, Engine and cylinder block assembly, Oil pressure sensor: Removal - Refitting, page 10A-42).
- Wipe any oil run-off with a cloth.
- Wait at least **10 minutes**.
- Check the oil level using the dipstick.

## Oil pressure: Check

K4M or K9K

- Top up the engine oil level if necessary (see **Engine oil: Specifications**) .
- Start the vehicle and check that there are no oil leaks at the oil pressure sensor.

K4M, and POWER ASSISTED STEERING, and AIR CONDITIONING

Tightening torques 	
multifunction support bolts on the cylinder block	<b>44 N.m</b>
lower bolt of the multifunction support on the sump	<b>25 N.m</b>

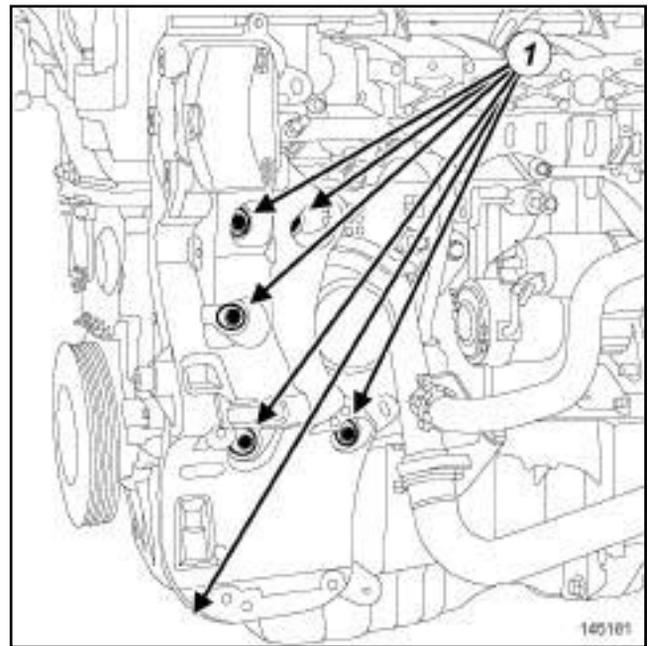
## REMOVAL

### I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove:
  - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
  - the front right-hand wheel arch side liner,
  - the injector rail protector,
  - the engine undertray bolts,
  - the engine undertray.
- Remove the front bumper (see **Front bumper assembly: Exploded view**) and (see **Exterior body front trim assembly: Exploded view**) (55A, Exterior protection).
- Disconnect fuel supply pipe on the injector rail.
- Remove:
  - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page **11A-2**),
  - the alternator (see **16A, Starting - Charging, Alternator: Removal - Refitting**, page **16A-1**).
- Remove (see **Power-assisted steering pump: Removal - Refitting**) (36B, Power-assisted steering):
  - the bolt from the power-assisted steering high pressure pipe on the cylinder block,
  - the bolts from the power-assisted steering pump on the multifunction support (without opening the circuit).
- Attach the power-assisted steering pump to the front end panel.
- Disconnect the connector from the air conditioning compressor.

- Remove the air conditioning compressor bolts (without opening the circuit) (see **Compressor: Removal - Refitting**) (62A, Air conditioning).
- Attach the air conditioning compressor to the sub-frame.

### II - REMOVAL OPERATION

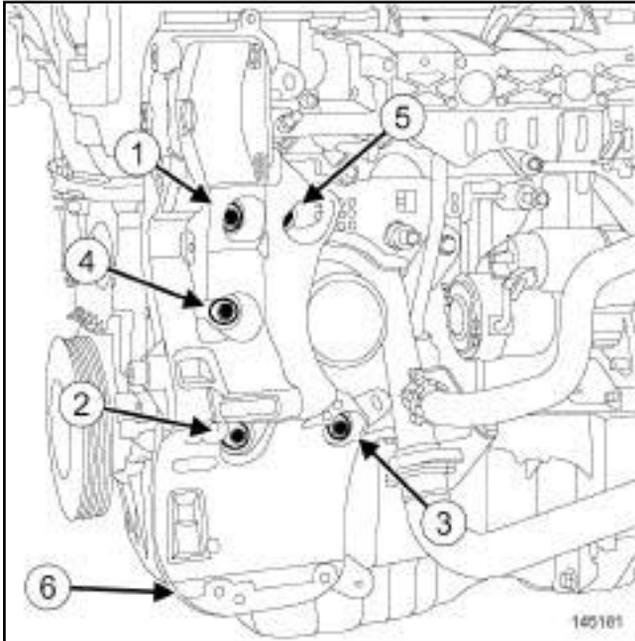


- Remove:
  - the multifunction support bolts (1),
  - the multifunction support.

K4M, and POWER ASSISTED STEERING, and AIR CONDITIONING

## REFITTING

## I - REFITTING OPERATION



145181

- Refit the multifunction support.
  - Position bolts (1) to (6) without tightening them.
  - Pretighten the multifunction support bolts (1) and (2) on the cylinder block **5 N.m.**
  - Loosen bolts (1) and (2) of the multifunction support by one half-turn.
  - Pretighten the multifunction support bolt (6) on the sump **5 N.m.**
  - Pretighten the multifunction support bolts (1) and (2) on the cylinder block **5 N.m.**
  - Pretighten in order (3) , (4) , (5) , (6) the multifunction support bolts on the cylinder block (**5 N.m.**).
  - Torque tighten in order (1) , (2) , (3) , (4) , (5) the **multifunction support bolts on the cylinder block (44 N.m.)**.
  - Torque tighten the **lower bolt of the multifunction support on the sump (25 N.m) (6)** .
- Refit (see **Power-assisted steering pump: Removal - Refitting**) (36B, Power-assisted steering):
    - the power-assisted steering pump,
    - the bolt of the power-assisted steering high pressure pipe on the cylinder block.
  - Refit:
    - the alternator (see **16A, Starting - Charging, Alternator: Removal - Refitting**, page 16A-1) ,
    - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-2) .
  - Connect the fuel supply pipe on the injector rail.
  - Refit the front bumper (see **Front bumper assembly: Exploded view**) and (see **Exterior body front trim assembly: Exploded view**) (55A, Exterior protection).
  - Refit:
    - the engine undertray,
    - the injector rail protector.
  - Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

## II - FINAL OPERATION

- Refit the air conditioning compressor (see **Compressor: Removal - Refitting**) (62A, Air conditioning).
- Connect the air conditioning compressor connector.

K4M, and STANDARD HEATING RECIRCULATION

Tightening torques 	
multifunction support bolts on the cylinder block	44 N.m
multifunction support bolt on the sump	25 N.m

## REMOVAL

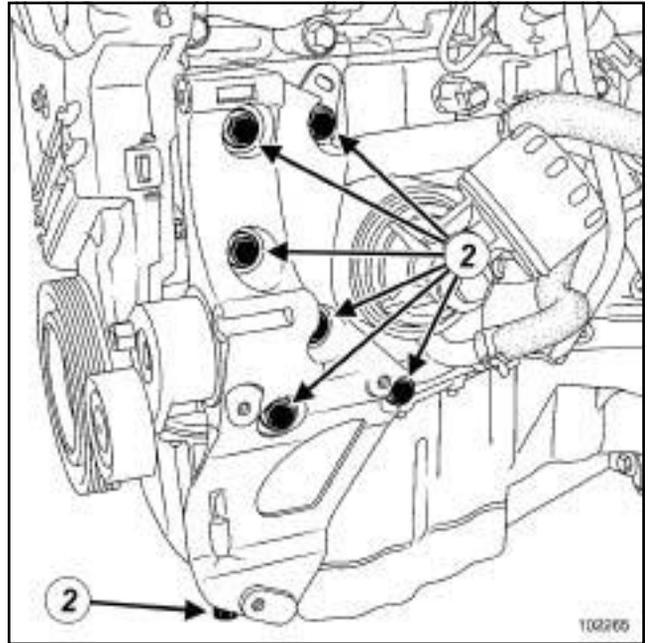
### I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove:
  - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
  - the front right-hand wheel arch side liner,
  - the engine undertray bolts,
  - the engine undertray.
- Remove the front bumper (see **Front bumper assembly: Exploded view**) and (see **Exterior body front trim assembly: Exploded view**) (55A, Exterior protection).
- Remove:
  - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-2) ,
  - the alternator (see **16A, Starting - Charging, Alternator: Removal - Refitting**, page 16A-1) .

### POWER ASSISTED STEERING

- Remove (see **Power-assisted steering pump: Removal - Refitting**) (36B, Power-assisted steering):
  - the power-assisted steering pump bolts,
  - the high pressure pipe bolt on the cylinder block.
- Attach the power-assisted steering pump to the front end panel.

### II - REMOVAL OPERATION



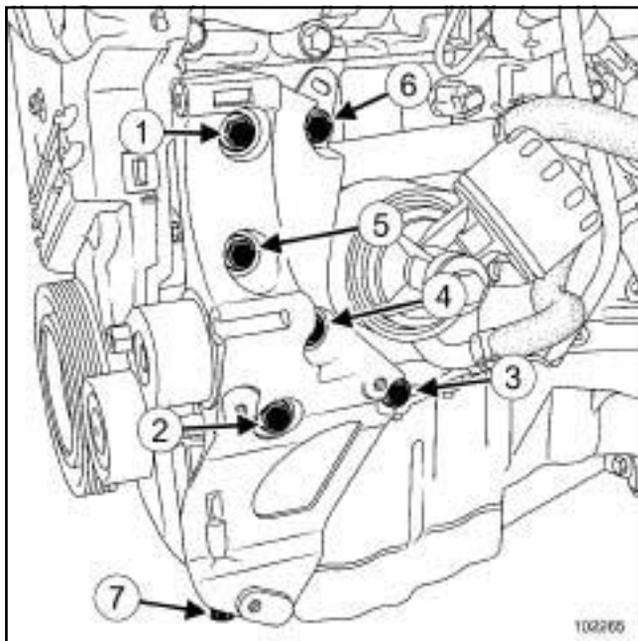
102265

- Remove:
  - the multifunction support bolts (2) ,
  - the multifunction support.

K4M, and STANDARD HEATING RECIRCULATION

## REFITTING

## I - REFITTING OPERATION



102265

- Refit the multifunction support.
- Position bolts (1) to (7) without tightening them.
- Pretighten the multifunction support bolts (1) and (2) on the cylinder block **5 N.m.**
- Loosen bolts (1) and (2) a half-turn.
- Pretighten the multifunction support bolt (7) on the sump **5 N.m.**
- Pretighten the multifunction support bolts (1) and (2) on the cylinder block **5 N.m.**
- Pretighten the multifunction support bolts (3) , (4) , (5) , (6) on the cylinder block **5 N.m.**
- Torque tighten in order (1), (2), (3), (4), (5), (6) the **multifunction support bolts on the cylinder block (44 N.m).**
- Torque tighten the **multifunction support bolt on the sump (25 N.m) (7) .**

## II - FINAL OPERATION

## POWER ASSISTED STEERING

- Refit (see **Power-assisted steering pump: Removal - Refitting**) (36B, Power-assisted steering):
  - the power-assisted steering pump,
  - the power-assisted steering pump bolts,

- the high pressure pipe bolt on the cylinder block.

 Refit:

- the alternator (see **16A, Starting - Charging, Alternator: Removal - Refitting**, page 16A-1) ,
- the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-2) .

- Refit the front bumper (see **Front bumper assembly: Exploded view**) and (see **Exterior body front trim assembly: Exploded view**) (55A, Exterior protection).

- Refit the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

K9K

Tightening torques 	
multifunction support bolts on the cylinder block	<b>44 N.m</b>
multifunction support bolt on the sump	<b>25 N.m</b>

## REMOVAL

### I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove:
  - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
  - the front right-hand wheel arch side liner,
  - the engine undertray bolts,
  - the engine undertray,
  - the front bumper (see **Front bumper assembly: Exploded view**) and (see **Exterior body front trim assembly: Exploded view**) (55A, Exterior protection),
  - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page **11A-2**),
  - the alternator (see **16A, Starting - Charging, Alternator: Removal - Refitting**, page **16A-1**).

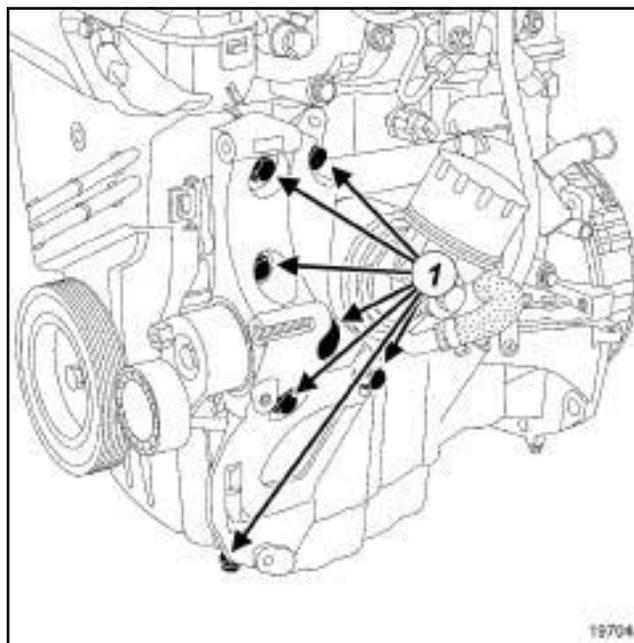
### POWER ASSISTED STEERING, and STANDARD HEATING RECIRCULATION

- Remove the bolts from the power-assisted steering pump on the multifunction support (without opening the circuit) (see **Power-assisted steering pump: Removal - Refitting**) (36B, Power-assisted steering).
- Attach the power-assisted steering pump to the front end panel.

### AIR CONDITIONING

- Disconnect the air conditioning compressor connector.
- Remove the air conditioning compressor bolts (without opening the circuit) (see **Compressor: Removal - Refitting**) (62A, Air conditioning).
- Attach the air conditioning compressor to the lower front cross member.
- Unpick the wiring harness on the multifunction support.

### II - REMOVAL OPERATION

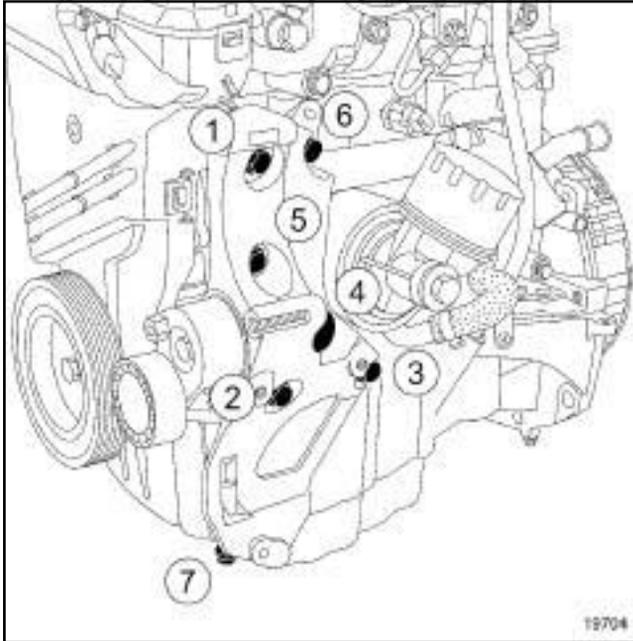


- Remove:
  - the multifunction support bolts (1),
  - the multifunction support.

K9K

### REFITTING

#### REFITTING OPERATION



19704

- Refit the multifunction support.
- Position bolts (1) to (7) without tightening them.
- Pretighten the multifunction support bolts (1) and (2) on the cylinder block **5 N.m**.
- Loosen bolts (1) and (2) a half-turn.
- Pretighten the multifunction support bolt (7) on the sump **5 N.m**.
- Pretighten the multifunction support bolts (1) and (2) on the cylinder block **5 N.m**.
- Pretighten the multifunction support bolts (3) , (4) , (5) , (6) on the cylinder block **5 N.m**.
- Torque tighten in order (1) , (2) , (3) , (4) , (5) , (6) the **multifunction support bolts on the cylinder block (44 N.m)**.
- Torque tighten the **multifunction support bolt on the sump (25 N.m) (7)** .
- Proceed in the reverse order to removal.

K4M

### Special tooling required

<b>Mot. 1448</b>	Remote operation pliers for hose clips.
<b>Mot. 1390</b>	Support for removal - refitting of engine - gearbox assembly

### Equipment required

refrigerant charging station

### Tightening torques

nut on the rubber pad support of the left-hand suspended engine mounting	<b>62 N.m</b>
exhaust flange bolts	<b>21 N.m</b>
front axle subframe tie-rod upper bolts	<b>21 N.m</b>
anti-roll bar tie rod upper bolts	<b>37 N.m</b>
earth strap bolt on the gearbox	<b>21 N.m</b>
power-assisted steering low pressure pipe bolt on the front axle sub-frame	<b>21 N.m</b>
power-assisted steering pipe bolts on the gearbox support	<b>21 N.m</b>
power-assisted steering pipe bolts on the gearbox	<b>21 N.m</b>
power-assisted steering pipe bolt on the cylinder block	<b>21 N.m</b>

### IMPORTANT

Wear cut-resistant gloves during the operation.

## REMOVAL

### I - REMOVAL PREPARATION OPERATION



#### IMPORTANT

To prevent the vehicle from falling, lash it to the vehicle lift using a strap.

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

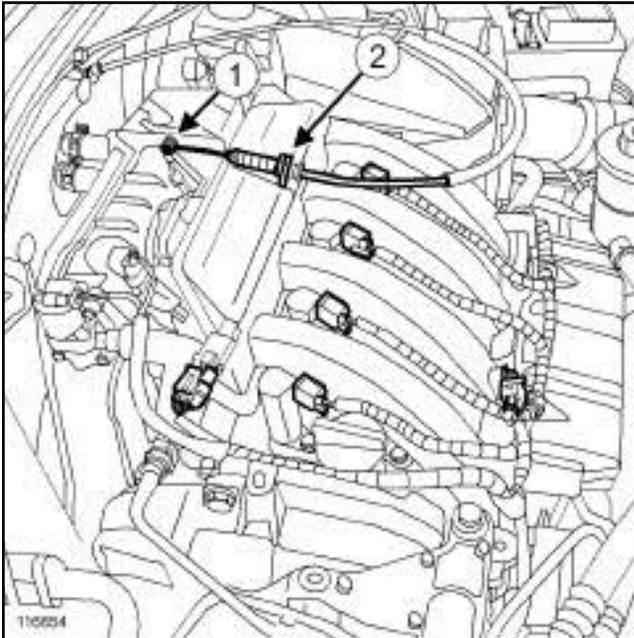
### AIR CONDITIONING

- Drain the refrigerant circuit using the tool **refrigerant charging station** (see **Refrigerant circuit: Draining - Filling**) (62A, Air conditioning).

- Remove:

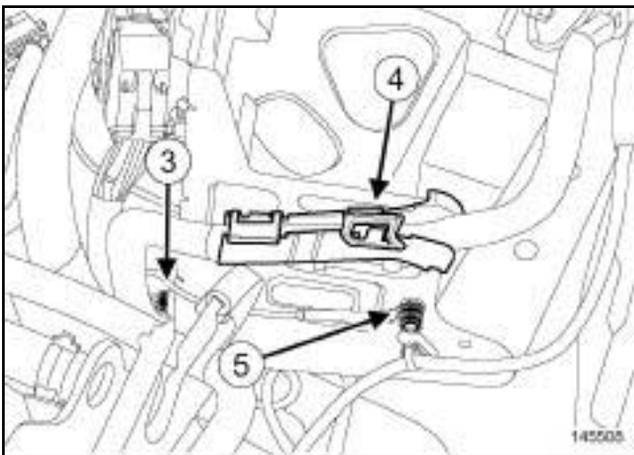
- the air inlet sleeve,
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the air resonator (see **12A, Fuel mixture, Air resonator: Removal - Refitting**, page 12A-2) ,
- the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-6) ,
- the injector rail protector,
- the battery tray,
- the injection computer (see **17B, Petrol injection, Petrol injection computer: Removal - Refitting**, page 17B-7) .

K4M



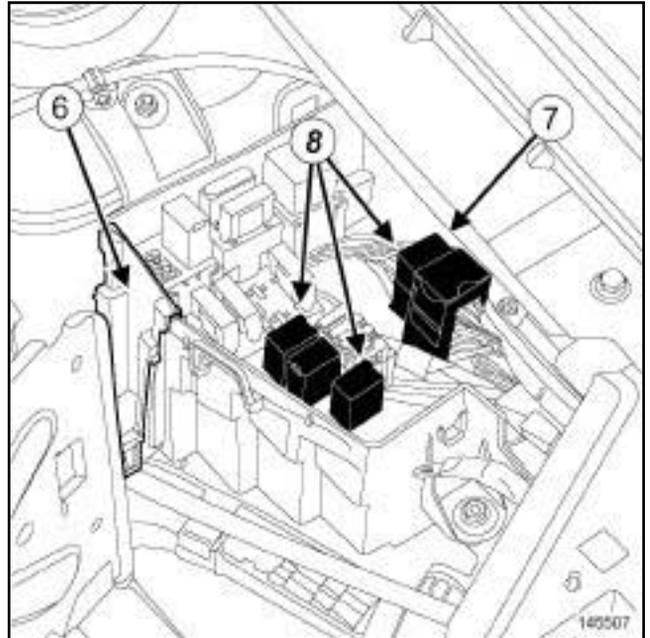
116654

- Disconnect the accelerator cable on the throttle valve at (1) .
- Remove the accelerator cable from the inlet distributor at (2) .



145508

- Remove the engine wiring bolt (3) on the battery mounting.
- Unclip the battery wiring at (4) .
- Remove the earth strap bolt (5) on the battery mounting.

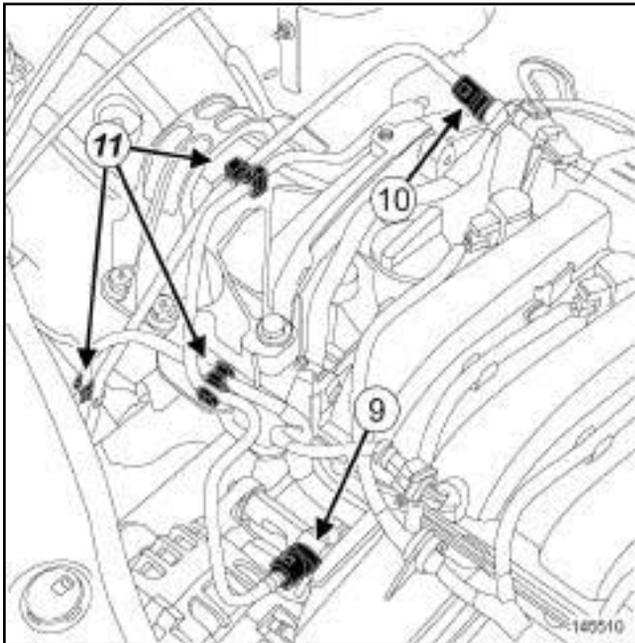


145507

- Remove the fuse and relay box cover.
- Remove the side protector (6) of the fuse and relay box.
- Disconnect the engine harness - front wiring connector (7) .
- Unclip the engine harness fuse holders and relays (8) from their mountings on the fuse and relay box in the engine compartment.
- Position the engine harness, fuses and relays on the engine.
- Remove:
  - the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
  - the engine undertray bolts,
  - the engine undertray,
  - the front bumper (see **Front bumper assembly: Exploded view**) and (see **Exterior body front trim assembly: Exploded view**) (55A, Exterior protection),
  - the front wheel arch liners (see **Exterior body front trim assembly: Exploded view**) (55A, Exterior protection).
- Drain:
  - the engine oil if necessary (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page 10A-32) ,
  - the gearbox oil (see **Manual gearbox oils: Draining - Filling**) (21A, Manual gearbox),

K4M

- the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page 19A-6) .



145510

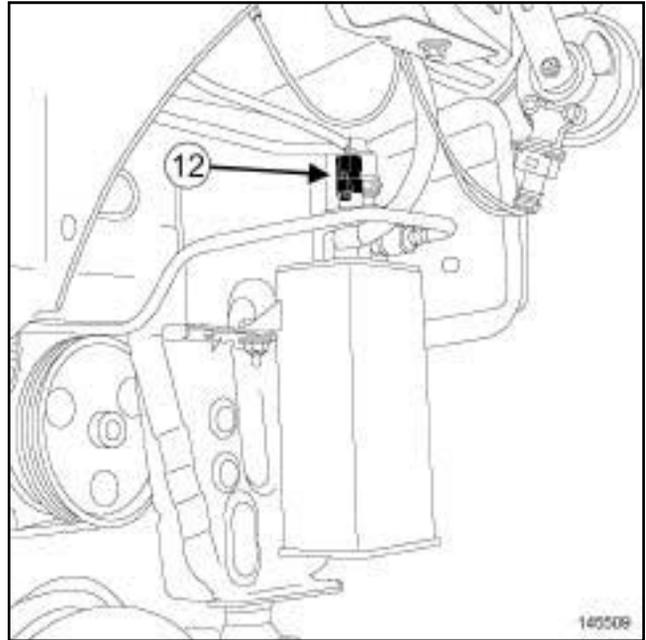
Disconnect:

- the fuel supply pipe (9) on the injector rail,
- the petrol vapour rebreather pipe (10) .

**WARNING**

To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

- Fit blanking plugs on the fuel supply pipe.
- Unclip the pipes at (11) .

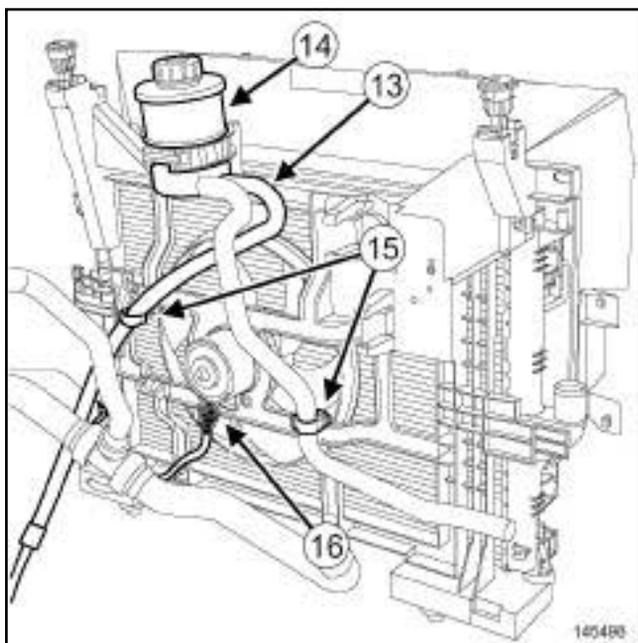


145509

- Disconnect the connector (12) from the fuel vapour recirculation solenoid valve.
- Disconnect (see **Power-assisted steering pump: Removal - Refitting**) (36B, Power-assisted steering):
  - the power-assisted steering low pressure hose on the power-assisted steering pump using the (**Mot. 1448**) and drain the circuit,
  - the power-assisted steering high pressure pipe on the power-assisted steering pump,
  - the connector from the power-assisted steering pressure switch.

K4M

### STANDARD HEATING RECIRCULATION



145498

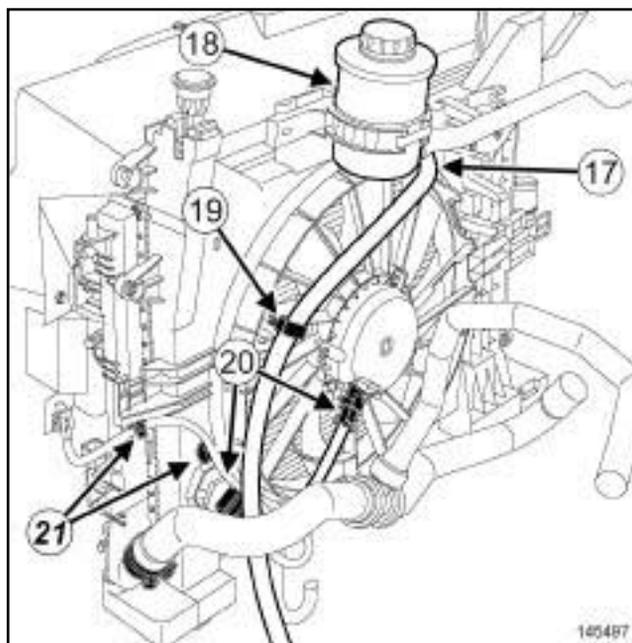
#### Remove:

- the power-assisted steering low pressure pipe (13) on the oil reservoir using the **(Mot. 1448)**,
- the power assisted steering oil reservoir (14) ,
- the bolt of the power-assisted steering high pressure pipe on the cylinder block.

Unclip the power-assisted steering pipes on the fan assembly mounting at (15) .

Disconnect the fan assembly connector (16) .

### AIR CONDITIONING



145497

#### Remove:

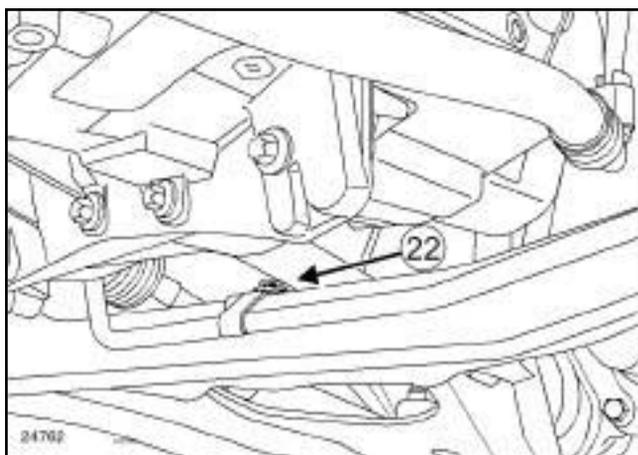
- the power-assisted steering low pressure pipe (17) on the oil reservoir using the **(Mot. 1448)**,
- the power assisted steering oil reservoir (18) ,
- the bolt of the power-assisted steering high pressure pipe on the cylinder block.

Unclip the power-assisted steering pipes on the fan assembly mounting at (19) .

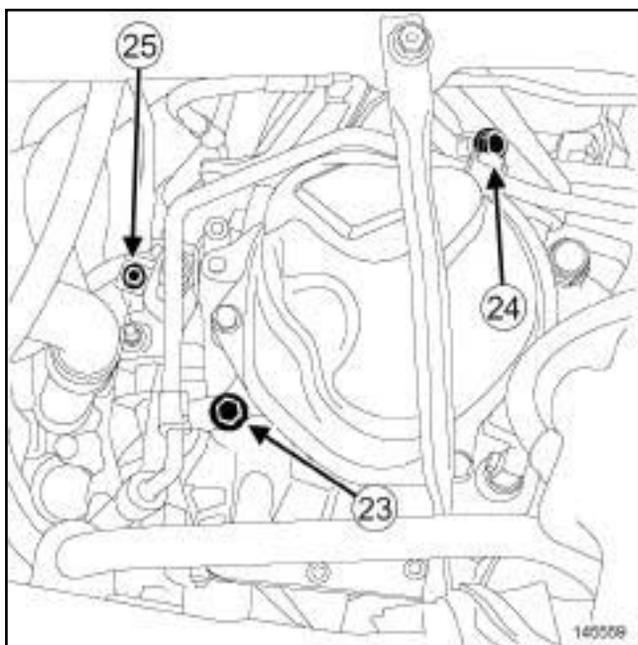
Disconnect the connectors (20) from the fan assembly.

Unclip the fan assembly wiring at (21) .

K4M



- ❑ Remove the power-assisted steering low pressure pipe bolt (22) on the front axle subframe.



- ❑ Remove:
  - the power-assisted steering high pressure pipe bolt (23) on the gearbox,
  - the power-assisted steering high pressure pipe bolt (24) on the gearbox support,
  - the earth strap bolt (25) on the gearbox.

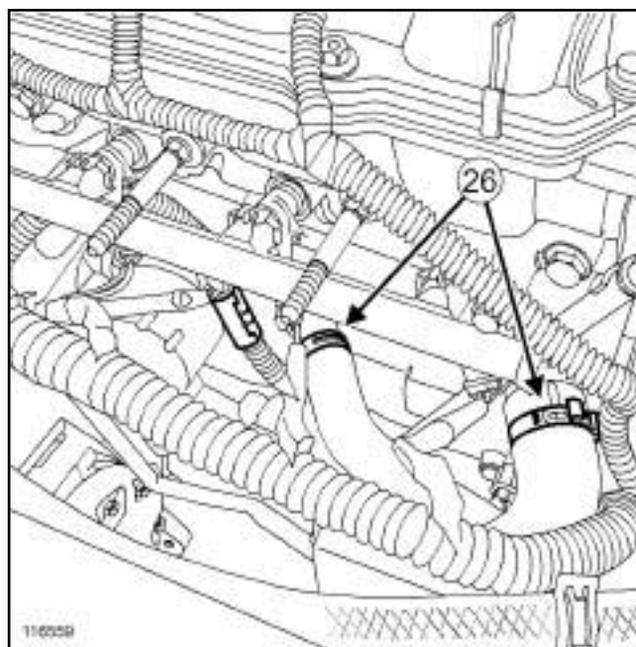
### AIR CONDITIONING

- ❑ Remove (see **Compressor: Removal - Refitting**) (62A, Air conditioning):
  - the pipe retaining bracket bolt on the compressor,
  - the pipe union bolts on the compressor.

#### Note:

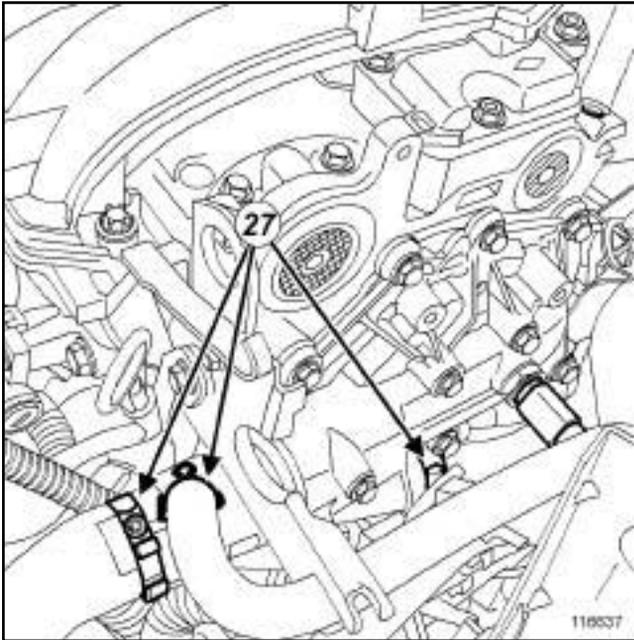
Plugs must be fitted on the hoses to prevent moisture from entering the system.

- ❑ Disconnect the compressor pipes.
- ❑ Fit blanking plugs in the pipe openings.
- ❑ Disconnect the air conditioning pressostat connector.



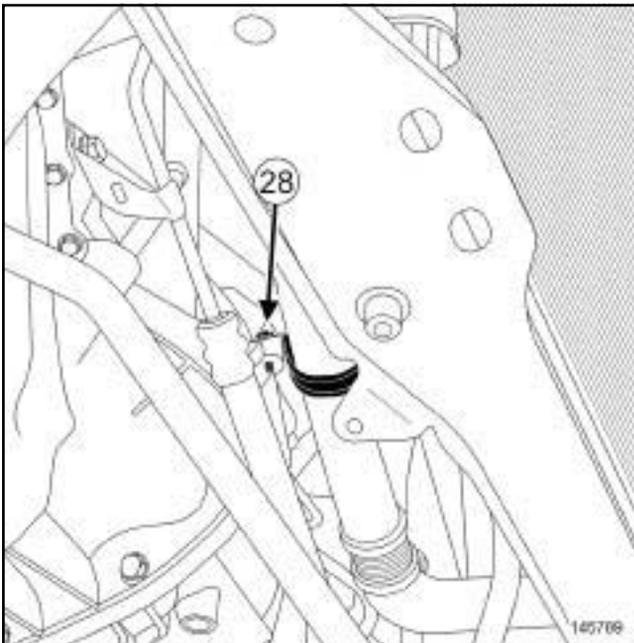
- ❑ Move aside the cooling hose clips (26) on the coolant pump inlet pipe using the **(Mot. 1448)**.
- ❑ Disconnect:
  - the cooling hoses on the coolant pump inlet pipe,
  - the vacuum pipe on the inlet distributor chamber.

K4M



116637

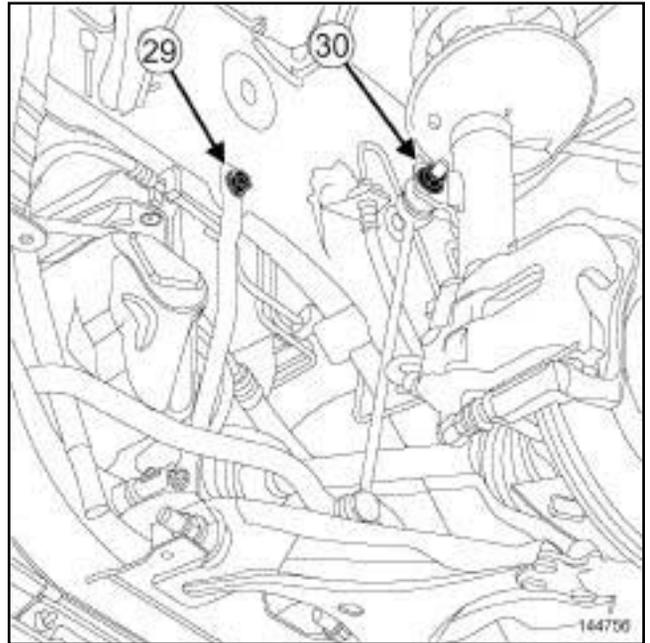
- Move aside the clips (27) of the coolant hoses on the water chamber using the (Mot. 1448).
- Disconnect the cooling hoses from the water chamber.
- Unclip the downstream oxygen sensor wiring on the steering box heat shield.
- Disconnect the downstream oxygen sensor connector.



145789

- Remove the cooling pipe support bolt (28) on the sump.

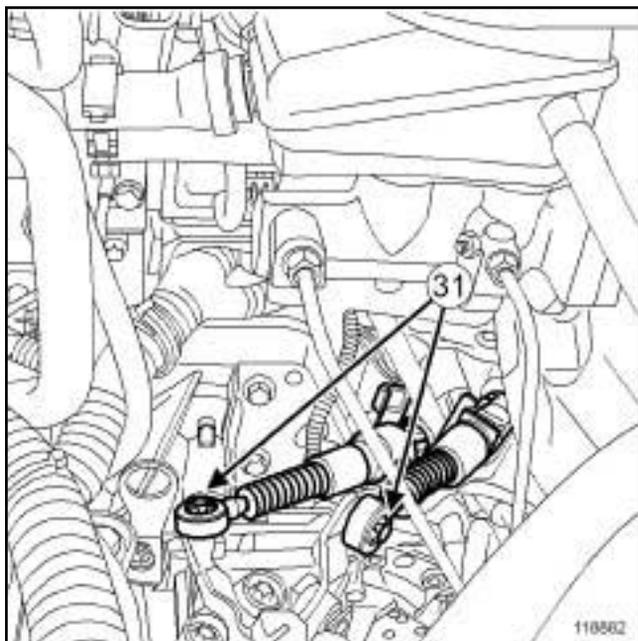
- Remove (see ) (36A, Steering assembly):
  - the heat shield bolts on the steering box,
  - the steering box heat shield,
  - the steering box bolts on the front axle subframe.
- Attach the steering rack to the body.



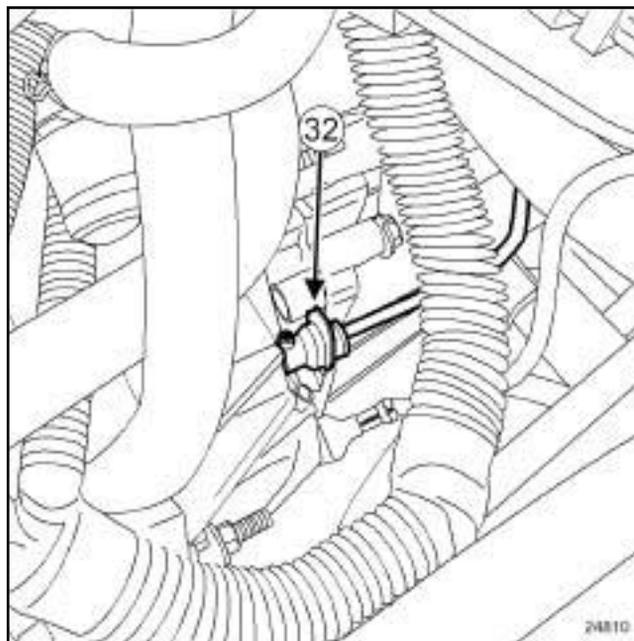
144756

- Remove:
  - the front axle subframe tie-rod upper bolts (29) ,
  - the anti-roll bar tie rod upper bolts (30) ,
  - the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (29A, Driveshaft),
  - the front left-hand wheel driveshaft (see **Front left-hand driveshaft: Removal - Refitting**) (29A, Transmission).
- Pass the power-assisted steering low pressure pipe over the gearbox cover.

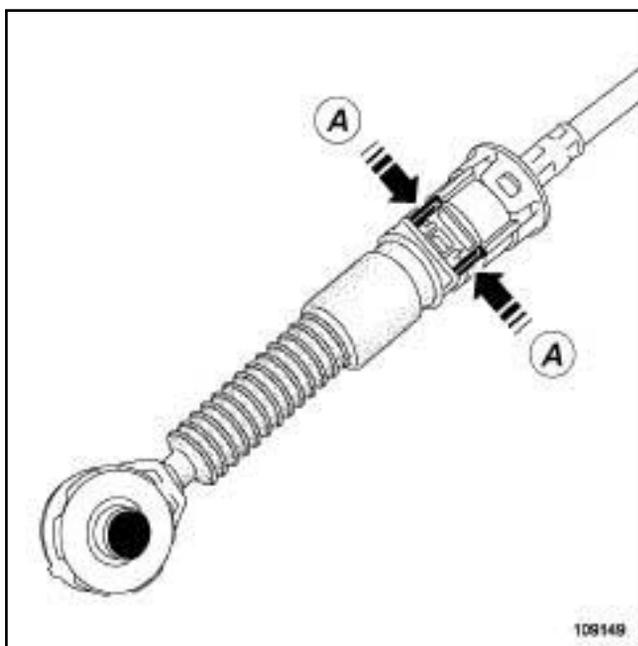
K4M



118882



24810



109149

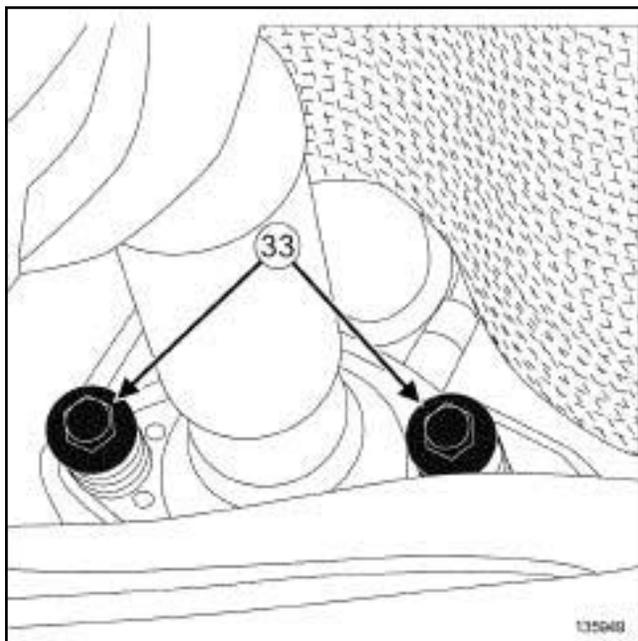
- Unclip:
  - the gear control cables on the gearbox at (31) using a screwdriver,
  - the gear control cables from the sleeve stops by pressing at (A) .
- Move the gear control cables away from the gearbox.

### WARNING

Do not pull the clip. If it is incorrectly handled in any way, the pipe will need to be replaced.

- Disconnect the clutch control pipe on the clutch slave cylinder by pressing the clip (32) .
- Recover the brake fluid in a container.
- Fit blanking plugs on the pipe openings.
- Remove the lower engine tie-bar (see 19D, **Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-8) .

K4M



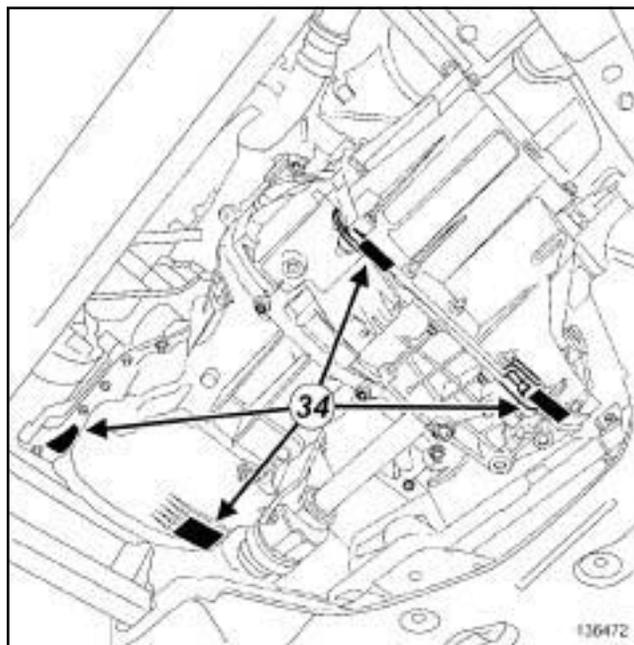
- Remove:
  - the bolts (33) from the exhaust flange,
  - the exhaust bracket ring.
- Move aside the exhaust pipe.

Note:

Pull the exhaust pipe backwards.

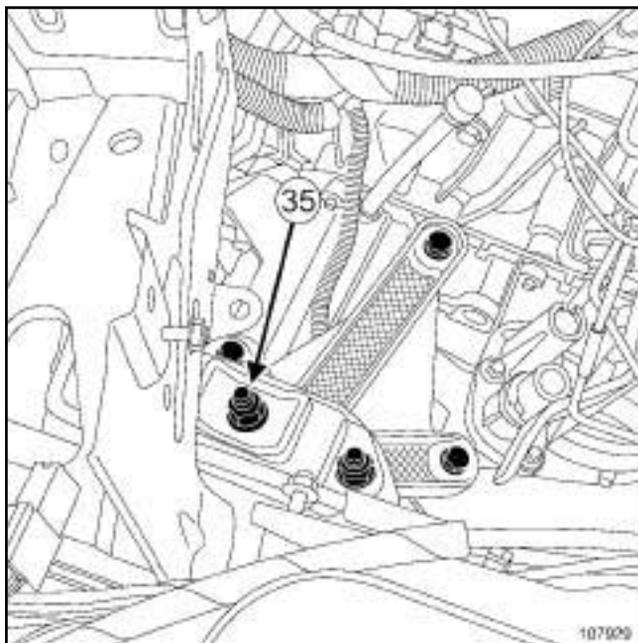
- Remove the front axle subframe (see **Front axle subframe: Removal - Refitting**) (31A, Front axle components).

### II - REMOVAL OPERATION



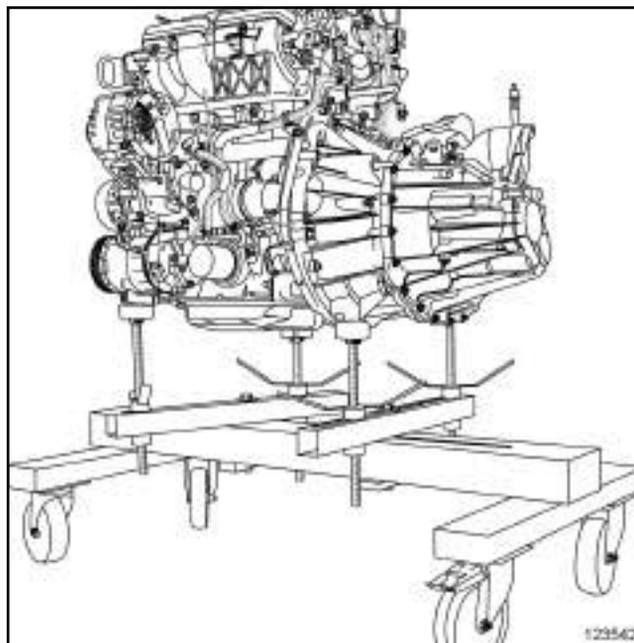
- Mark the positions of the suspended engine mountings on the body.
- Support the engine - gearbox assembly on the engine marks (34) using the **(Mot. 1390)**.
- Remove the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page **19D-4**).

K4M



107929

- Remove the nut (35) on the rubber pad support of the left-hand suspended engine mounting.
- Strike the gearbox stud with a copper hammer to separate the engine - gearbox assembly from the body.



123542

- Lift the vehicle to remove the engine - gearbox assembly.

**Note:**

Ensure that no component obstructs the movement of the body around the engine - gearbox assembly.

- Remove the engine - gearbox assembly.

## REFITTING

### I - REFITTING PREPARATION OPERATION

- For standard engine replacements (see **Engine: Standard replacement**) (Technical Note 6006A, 10A, Engine and peripherals).
- parts always to be replaced: ring between exhaust manifold and catalytic converter**

### II - REFITTING OPERATION

- Fit the engine - gearbox assembly.
- Refit the nut on the rubber pad support of the left-hand suspended engine mounting.
- Torque tighten the **nut on the rubber pad support of the left-hand suspended engine mounting (62 N.m)**.
- Refit the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting, page 19D-4**).

K4M

- Remove the **(Mot. 1390)** from the engine - gearbox assembly.

### III - FINAL OPERATION

- Proceed in the reverse order to removal.
- Torque tighten:
  - the **exhaust flange bolts (21 N.m)**,
  - the **front axle subframe tie-rod upper bolts (21 N.m)**,
  - the **anti-roll bar tie rod upper bolts (37 N.m)**,
  - the **earth strap bolt on the gearbox (21 N.m)**,
  - the **power-assisted steering low pressure pipe bolt on the front axle subframe (21 N.m)**,
  - the **power-assisted steering pipe bolts on the gearbox support (21 N.m)**,
  - the **power-assisted steering pipe bolts on the gearbox (21 N.m)**,
  - the **power-assisted steering pipe bolt on the cylinder block (21 N.m)**.
- Perform the following operations:
  - top up the engine oil (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page **10A-32**),
  - fill up the gearbox oil (see **Manual gearbox oils: Draining - Filling**) (21A, Manual gearbox),
  - fill and bleed the cooling circuit (see **19A, Cooling, Cooling system: Draining - Refilling**, page **19A-6**),
  - bleed the clutch circuit (see **Clutch circuit: Bleed**) (37A, Mechanical component controls).

- Check that there are no leaks.

### AIR CONDITIONING

- Fill the refrigerant circuit using the tool **refrigerant charging station** (see **Refrigerant circuit: Draining - Filling**) (62A, Air conditioning).
- Fill up the power-assisted steering circuit.
- First, bleed the power-assisted steering circuit by turning the steering wheel fully from left to right with the engine off.
- Bleed the power-assisted steering circuit by turning the steering wheel fully from lock to lock with the engine running.
- Top up the oil in the power-assisted steering oil reservoir.

# ENGINE AND CYLINDER BLOCK ASSEMBLY

## Engine - gearbox assembly: Removal - Refitting

# 10A

K9K, and 796

### Special tooling required

<b>Mot. 1448</b>	Remote operation pliers for hose clips.
<b>Mot. 1390</b>	Support for removal - refitting of engine - gearbox assembly

### Equipment required

refrigerant charging station

### Tightening torques

nut on the rubber pad support of the left-hand suspended engine mounting	<b>62 N.m</b>
exhaust flange bolts	<b>21 N.m</b>
front axle subframe tie-rod upper bolts	<b>21 N.m</b>
anti-roll bar tie rod upper bolts	<b>37 N.m</b>
earth strap bolt on the gearbox	<b>21 N.m</b>
power-assisted steering low pressure pipe bolt on the front axle subframe	<b>21 N.m</b>
power-assisted steering pipe bolts on the gearbox support	<b>21 N.m</b>
power-assisted steering pipe bolts on the gearbox	<b>21 N.m</b>
power-assisted steering pipe bolt on the cylinder block	<b>21 N.m</b>

### IMPORTANT

Wear cut-resistant gloves during the operation.

## REMOVAL

### I - REMOVAL PREPARATION OPERATION



#### IMPORTANT

To prevent the vehicle from falling, lash it to the vehicle lift using a strap.

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

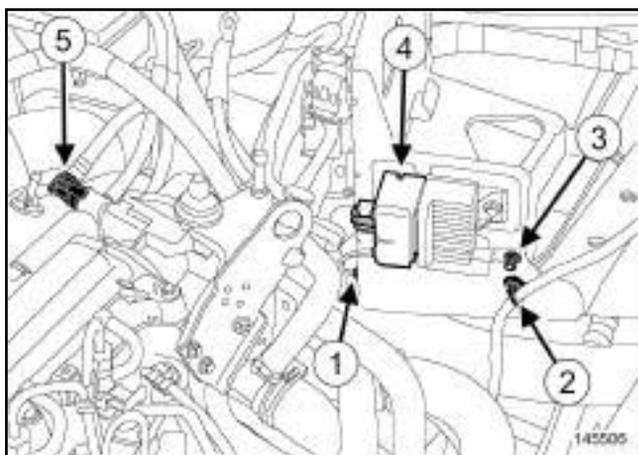
### AIR CONDITIONING

- Drain the refrigerant circuit using the tool **refrigerant charging station** (see **Refrigerant circuit: Draining - Filling**) (62A, Air conditioning).

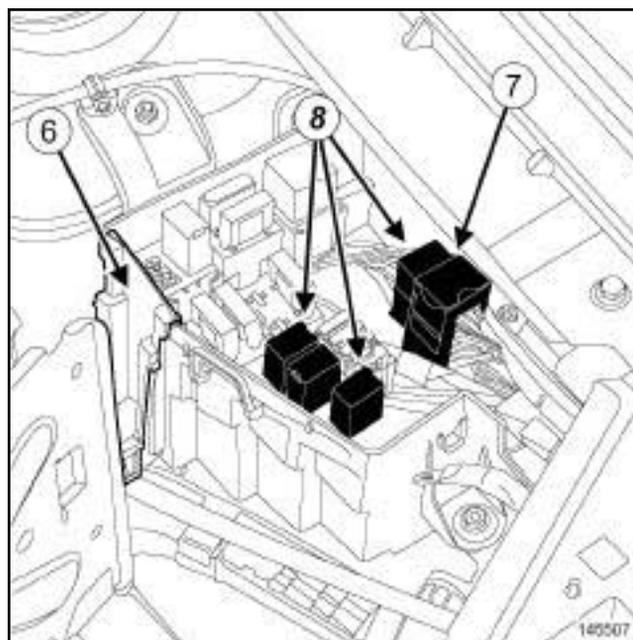
- Remove:

- the engine cover,
- the air inlet sleeve,
- the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-6) ,
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the battery tray,
- the injection computer (see **17B, Petrol injection, Petrol injection computer: Removal - Refitting**, page 17B-7) .

K9K, and 796



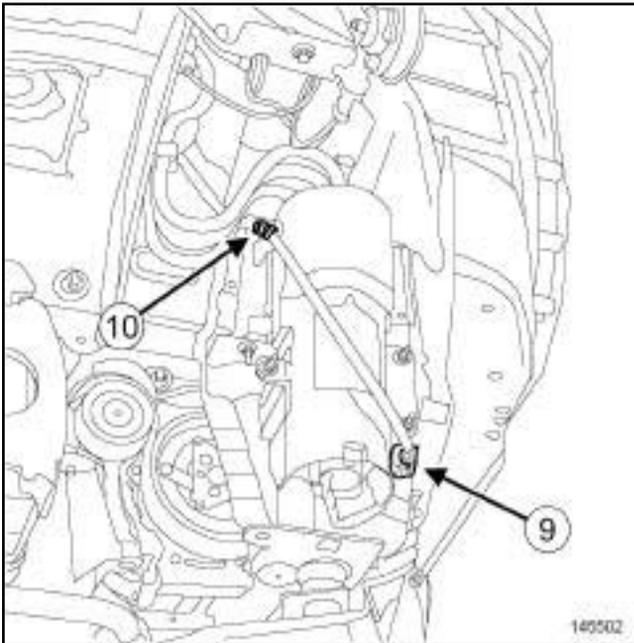
- Remove the engine wiring bolt (1) on the battery mounting.
- Unclip the battery wiring at (2) .
- Remove the earth strap bolt (3) on the battery mounting.
- Disconnect the connector (4) from the pre-postheating unit.
- Disconnect the non-return valve (5) at the vacuum pump.



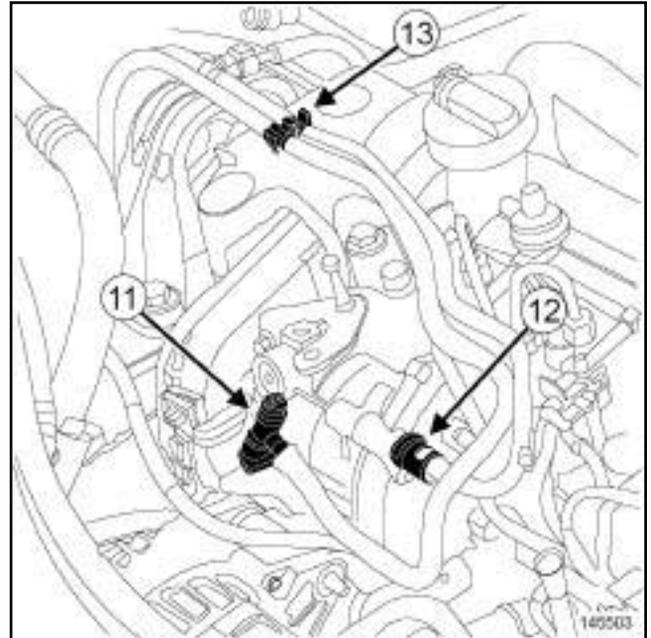
- Remove the fuse and relay box cover.
- Remove the side protector (6) of the fuse and relay box.
- Disconnect the engine harness - front wiring connector (7) .
- Unclip the engine harness fuse holders and relays (8) from their mountings on the fuse and relay box in the engine compartment.
- Position the engine harness, fuses and relays on the engine.
- Remove:
  - the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
  - the engine undertray bolts,
  - the engine undertray,
  - the front bumper (see **Front bumper assembly: Exploded view**) and (see **Exterior body front trim assembly: Exploded view**) (55A, Exterior protection),
  - the front wheel arch liners (see **Exterior body front trim assembly: Exploded view**) (55A, Exterior protection).
- Drain:
  - the engine oil if necessary (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page 10A-32) ,
  - the gearbox oil (see **Manual gearbox oils: Draining - Filling**) (21A, Manual gearbox),

K9K, and 796

- the cooling system (see **19A, Cooling, Cooling system: Draining - Refilling**, page **19A-6**).



- Disconnect the connector (9) from the water detection sensor on the diesel filter.
- Unclip the water detection connector on the diesel filter mounting at (10).



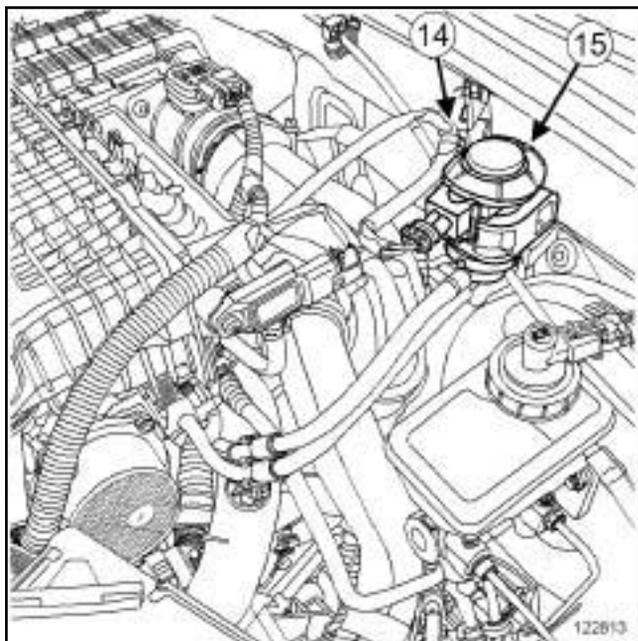
- Disconnect:
  - the fuel supply pipe (11),
  - the fuel return pipe (12).

### WARNING

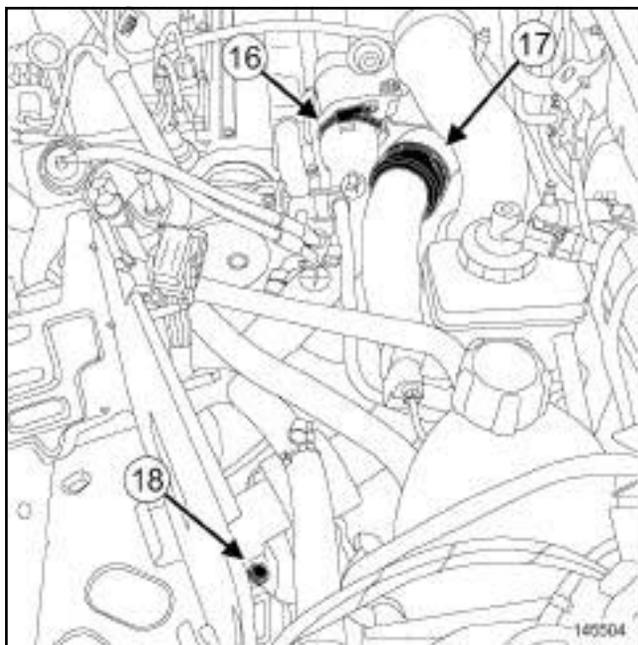
To avoid any corrosion or damage, protect the areas on which fuel is likely to run.

- Fit blanking plugs on the fuel supply pipe.
- Unclip the pipes at (13).
- Disconnect the intercooler ducts (see **12B, Turbo-charging, Intercooler: Removal - Refitting**, page **12B-8**).

K9K, and 796



122813



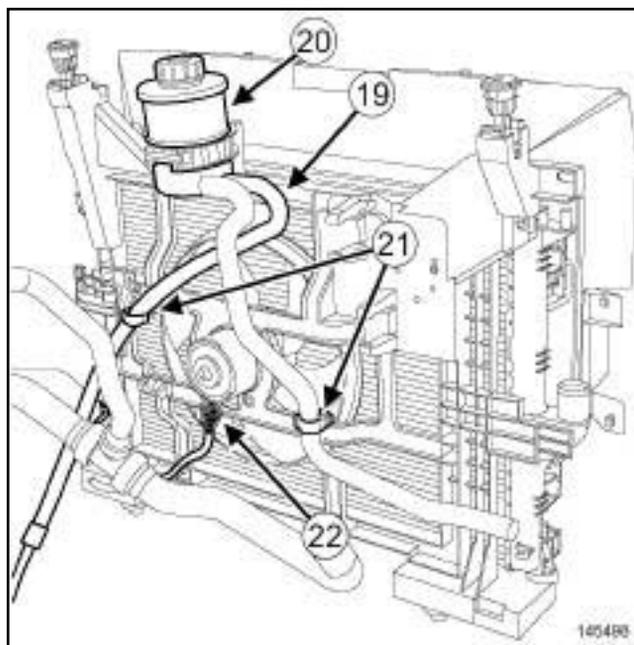
145504

- Unclip:
  - the turbocharger control solenoid valve wiring at (14) ,
  - the turbocharger control solenoid valve (15) from its support.
- Disconnect:
  - the air duct (16) on the EGR assembly,
  - the air duct between the turbocharger and the inter-cooler at (17) .
- Remove:

- the air duct nut (18) on the gearbox,
- the intercooler air ducts.

- Disconnect (see **Power-assisted steering pump: Removal - Refitting**) (36B, Power-assisted steering):
  - the power-assisted steering low pressure hose on the power-assisted steering pump using the (**Mot. 1448**) and drain the circuit,
  - the power-assisted steering high pressure pipe on the power-assisted steering pump,
  - the connector from the power-assisted steering pressure switch.

### STANDARD HEATING RECIRCULATION

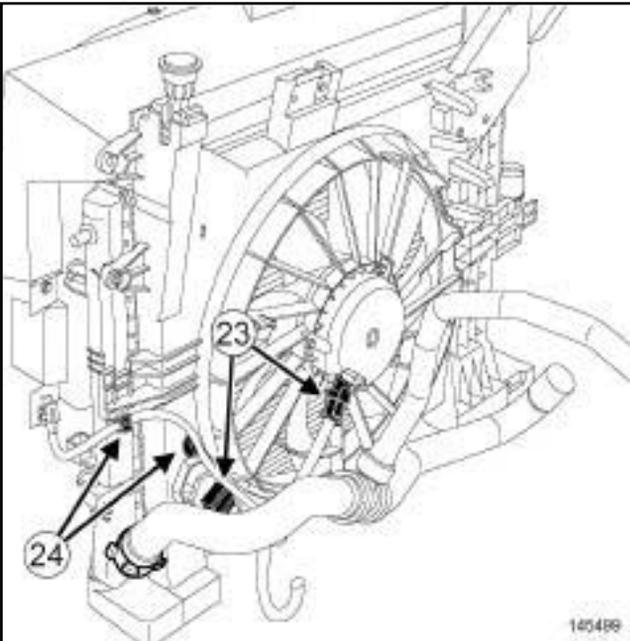


145498

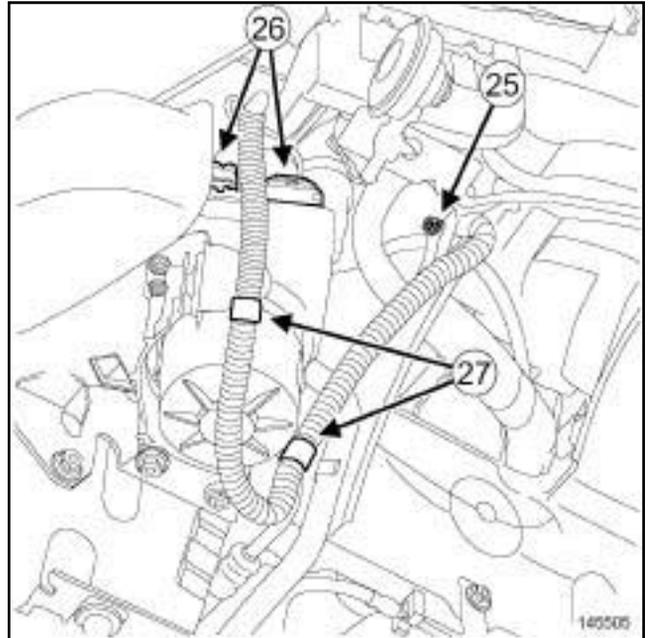
- Remove:
  - the power-assisted steering low pressure pipe (19) on the oil reservoir using the (**Mot. 1448**),
  - the power assisted steering oil reservoir (20) ,
  - the bolt of the power-assisted steering high pressure pipe on the cylinder block.
- Unclip the power-assisted steering pipes on the fan assembly mounting at (21) .
- Disconnect the fan assembly connector (22) .

K9K, and 796

### AIR CONDITIONING

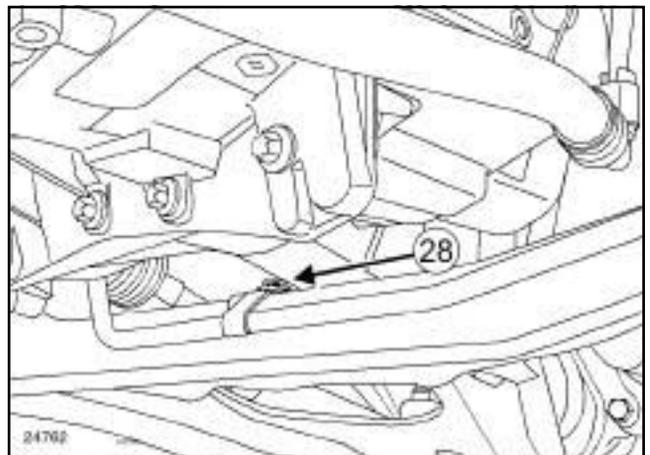


- Remove the power-assisted steering high pressure pipe bolt on the cylinder block.
- Disconnect the connectors (23) from the fan assembly.
- Unclip the fan assembly wiring at (24) .



145505

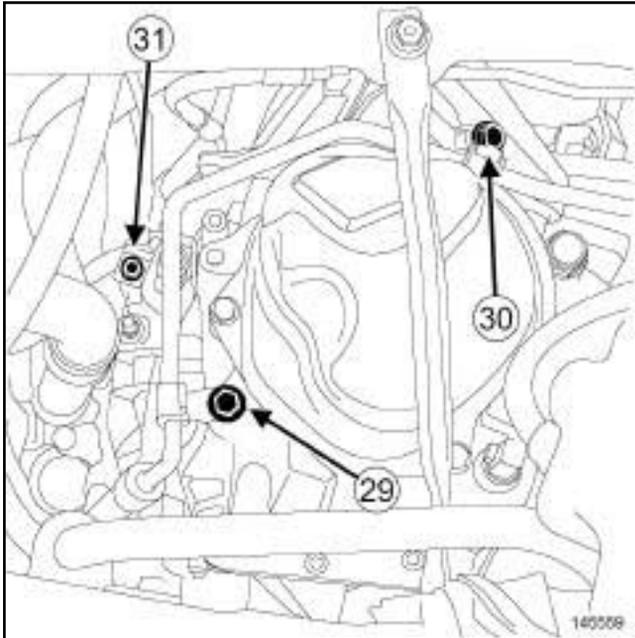
- Remove the earth strap bolt (25) on the body.
- Disconnect the pump assembly connectors (26) .
- Unclip the pump assembly wiring at (27) .



24762

- Remove the power-assisted steering low pressure pipe bolt (28) on the front axle subframe.

K9K, and 796



145559

Remove:

- the power-assisted steering high pressure pipe bolt (29) on the gearbox,
- the power-assisted steering high pressure pipe bolt (30) on the gearbox support,
- the earth strap bolt (31) on the gearbox.

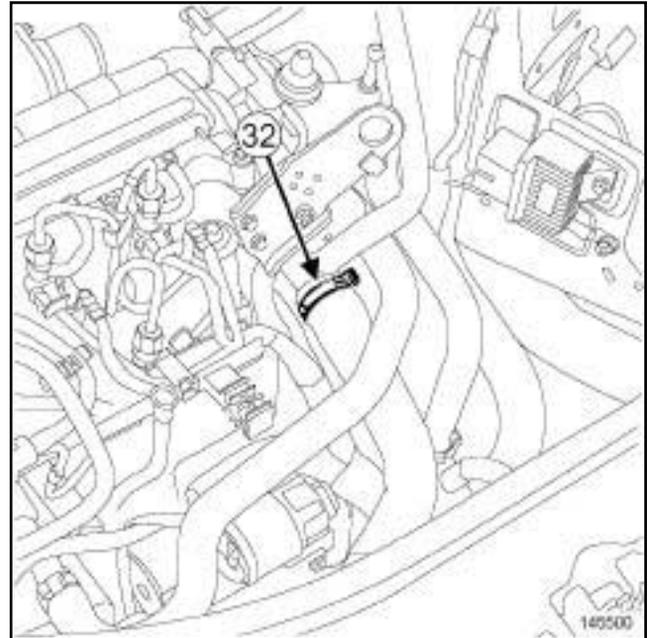
### AIR CONDITIONING

- Remove the bolts from the pipe unions on the compressor.
- Disconnect the compressor pipes.

**Note:**

Plugs must be fitted on the hoses to prevent moisture from entering the system.

- Fit blanking plugs in the pipe openings.
- Disconnect the air conditioning pressostat connector.
- Remove the expansion bottle nuts.
- Move aside the expansion bottle.



145500

- Move aside the cooling hose clip (32) on the water chamber using the (Mot. 1448).
- Disconnect the cooling hose on the water chamber.



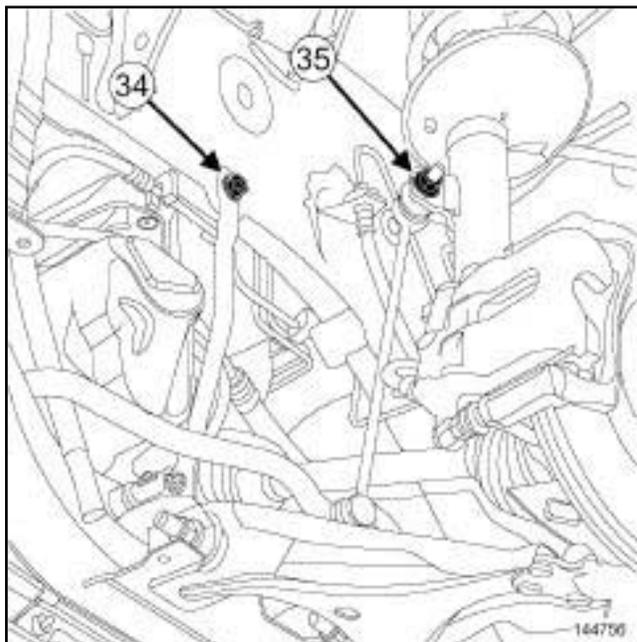
145501

- Move aside the cooling hose clips (33) on the heating radiator using the (Mot. 1448).
- Disconnect the cooling hoses on the heating radiator.
- Remove the cooling hoses from their mountings.
- Remove (see ) (36A, Steering assembly):
  - the steering box heat shield bolts,

K9K, and 796

- the steering box heat shield,
- the steering box bolts on the front axle subframe.

□ Attach the steering rack to the body.



144756

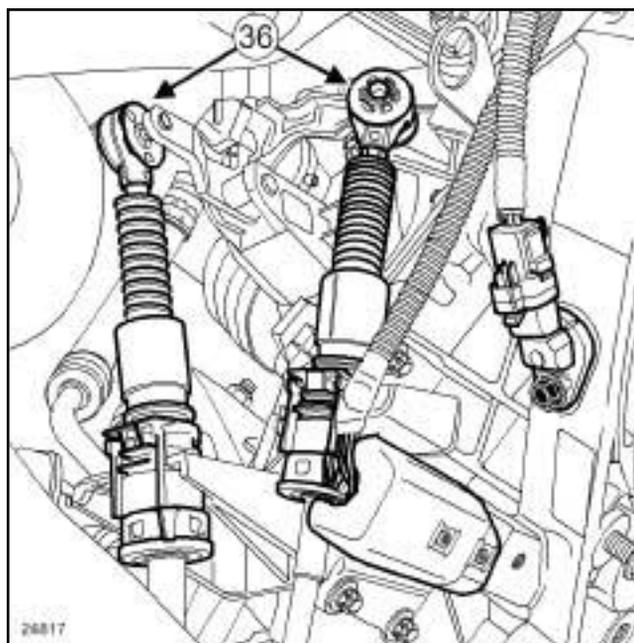
□ Remove:

- the front axle subframe tie-rod upper bolts (34) ,
- the anti-roll bar tie rod upper bolts (35) .

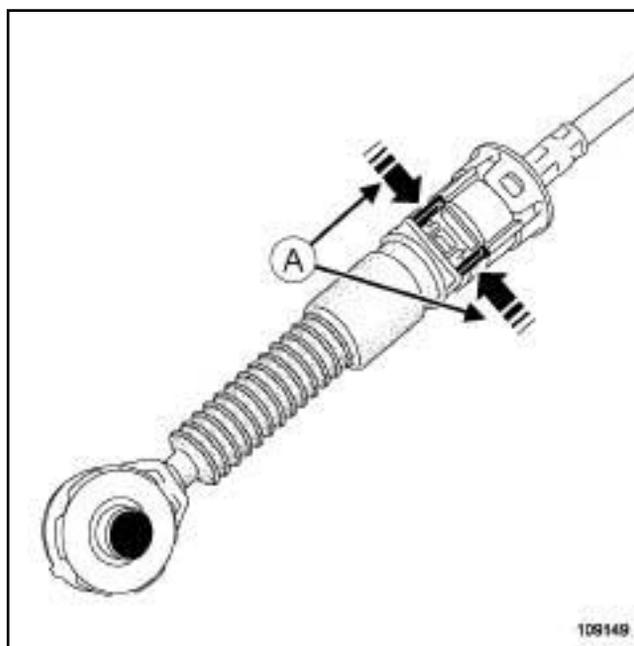
□ Remove:

- the front right-hand wheel driveshaft (see **Front right-hand driveshaft: Removal - Refitting**) (29A, Driveshaft),
- the front left-hand wheel driveshaft (see **Front left-hand driveshaft: Removal - Refitting**) (29A, Transmission).

□ Pass the power-assisted steering low pressure pipe over the gearbox cover.



24817



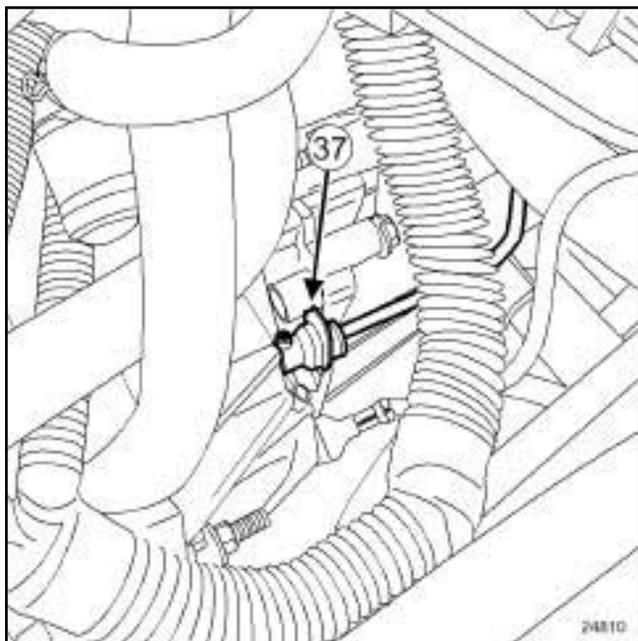
109149

□ Unclip:

- the gear control cables on the gearbox at (36) using a screwdriver,
- the gear control cables from the sleeve stops by pressing at (A) .

□ Move the gear control cables away from the gearbox.

K9K, and 796



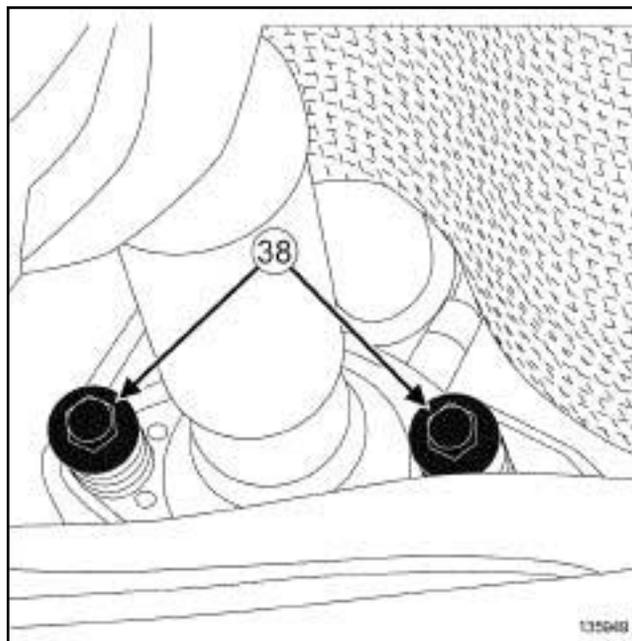
24810



### WARNING

Do not pull the clip. If it is incorrectly handled in any way, the pipe will need to be replaced.

- Disconnect the clutch control pipe on the clutch slave cylinder by pressing the clip (37) .
- Recover the brake fluid in a container.
- Fit blanking plugs in the pipe openings.
- Remove the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-8) .



135949

- Remove:
  - the bolts (38) from the exhaust flange,
  - the exhaust bracket ring.
- Move aside the exhaust pipe.

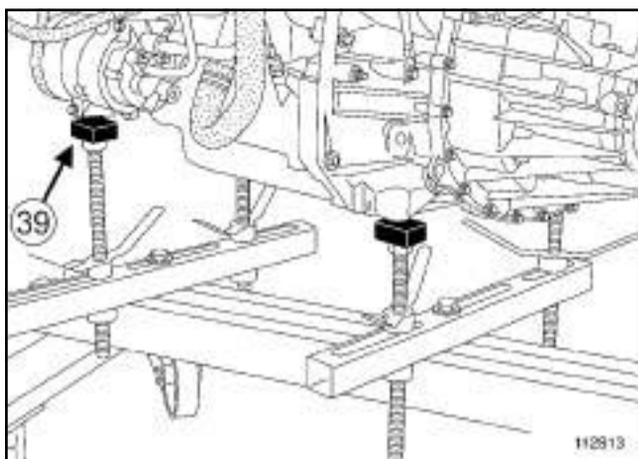
### Note:

Pull the exhaust pipe backwards.

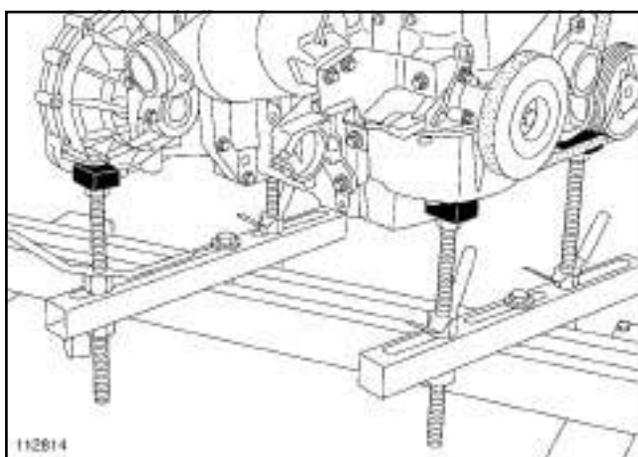
- Remove the front axle subframe (see **Front axle subframe: Removal - Refitting**) (31A, Front axle components).

K9K, and 796

### II - REMOVAL OPERATION



112813



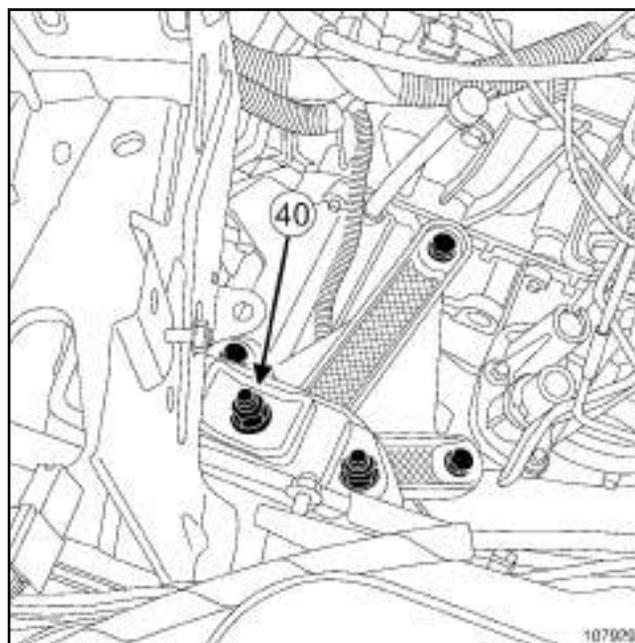
112814

□

Note:

Ensure that the **(Mot. 1390)** is correctly positioned on the multifunction support at **(39)**.

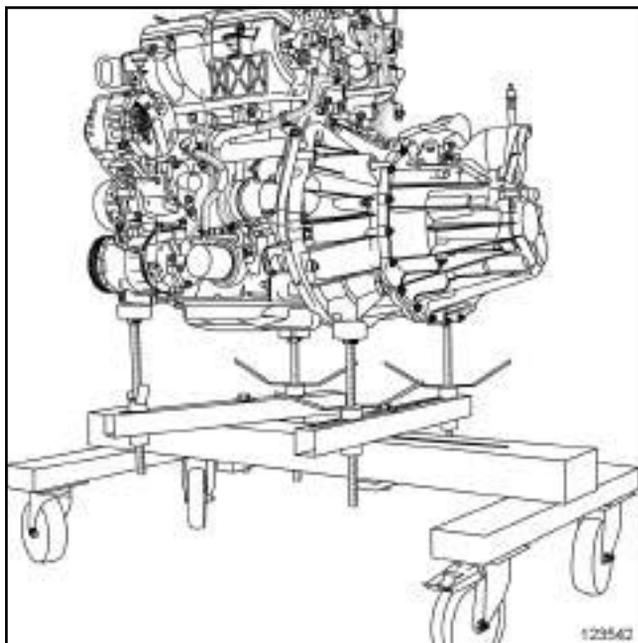
- Position the **(Mot. 1390)** under the engine - gearbox assembly.
- Remove the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting, page 19D-4**).



107929

- Remove the nut **(40)** on the rubber pad support of the left-hand suspended engine mounting.
- Strike the gearbox stud with a copper hammer to separate the engine - gearbox assembly from the body.

K9K, and 796



123542

- Lift the vehicle to remove the engine - gearbox assembly.

#### Note:

Ensure that no component obstructs the movement of the body around the engine - gearbox assembly.

- Remove the engine - gearbox assembly.

## REFITTING

### I - REFITTING PREPARATION OPERATION

- For standard engine replacements (see **Engine: Standard replacement**) (Technical Note 6006A, 10A, Engine and peripherals).
- parts always to be replaced: ring between exhaust manifold and catalytic converter**

### II - REFITTING OPERATION

- Fit the engine - gearbox assembly.
- Refit the nut on the rubber pad support of the left-hand suspended engine mounting.
- Torque tighten the **nut on the rubber pad support of the left-hand suspended engine mounting (62 N.m)**.
- Refit the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting, page 19D-4**).

- Remove the **(Mot. 1390)** from the engine - gearbox assembly.

### III - FINAL OPERATION

- Proceed in the reverse order to removal.
- Torque tighten:
  - the **exhaust flange bolts (21 N.m)**,
  - the **front axle subframe tie-rod upper bolts (21 N.m)**,
  - the **anti-roll bar tie rod upper bolts (37 N.m)**,
  - the **earth strap bolt on the gearbox (21 N.m)**,
  - the **power-assisted steering low pressure pipe bolt on the front axle subframe (21 N.m)**,
  - the **power-assisted steering pipe bolts on the gearbox support (21 N.m)**,
  - the **power-assisted steering pipe bolts on the gearbox (21 N.m)**,
  - the **power-assisted steering pipe bolt on the cylinder block (21 N.m)**.
- Perform the following operations:
  - top up the engine oil (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling, page 10A-32**),
  - fill up the gearbox oil (see **Manual gearbox oils: Draining - Filling**) (21A, Manual gearbox),
  - fill and bleed the cooling circuit (see **19A, Cooling, Cooling system: Draining - Refilling, page 19A-6**),
  - bleed the clutch circuit (see **Clutch circuit: Bleed**) (37A, Mechanical component controls).

### AIR CONDITIONING

- Fill the refrigerant circuit using the tool **refrigerant charging station** (see **Refrigerant circuit: Draining - Filling**) (62A, Air conditioning).

- Fill up the power-assisted steering circuit.
- First, bleed the power-assisted steering circuit by turning the steering wheel fully from left to right with the engine off.
- Bleed the power-assisted steering circuit by turning the steering wheel fully from lock to lock with the engine running.
- Top up the oil in the power-assisted steering oil reservoir.

# ENGINE AND CYLINDER BLOCK ASSEMBLY

## Engine - gearbox assembly: Removal - Refitting

# 10A

---

K9K, and 796

---

- Check that there are no leaks.

|

## Flywheel: Removal - Refitting

K4M

### Tightening torques

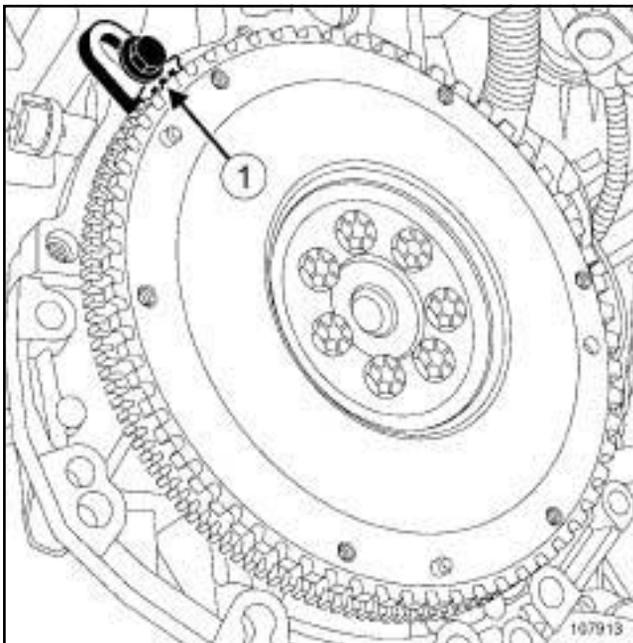
flywheel bolts	25 N.m + 50° ± 6°
----------------	-------------------

## REMOVAL

### I - REMOVAL PREPARATION OPERATION

- Remove:
  - the gearbox (see **Manual gearbox: Removal - Refitting**) ,
  - the clutch pressure plate (see **Pressure plate - Disc: Removal - Refitting**) .

### II - REMOVAL OPERATION

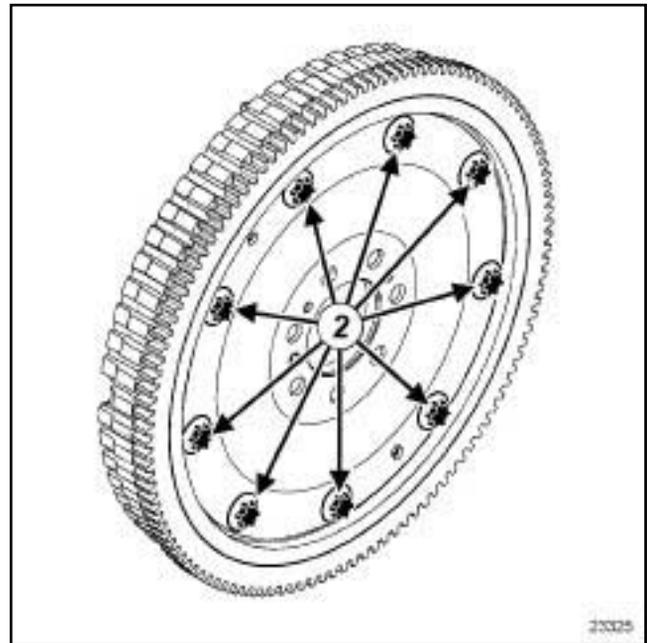


- Lock the engine using the (1) .
- Remove:
  - the flywheel bolts,
  - the flywheel,
  - the.

## REFITTING

### I - REFITTING PREPARATION OPERATION

- Check the condition of the flywheel.
- On the crankshaft, clean the flywheel bolt threading.
- Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:
  - the flywheel bearing face if reusing,
  - the crankshaft bearing face.
- parts always to be replaced: Flywheel bolts.**
- Coat the new flywheel bolts using **FRENETANCHE** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).



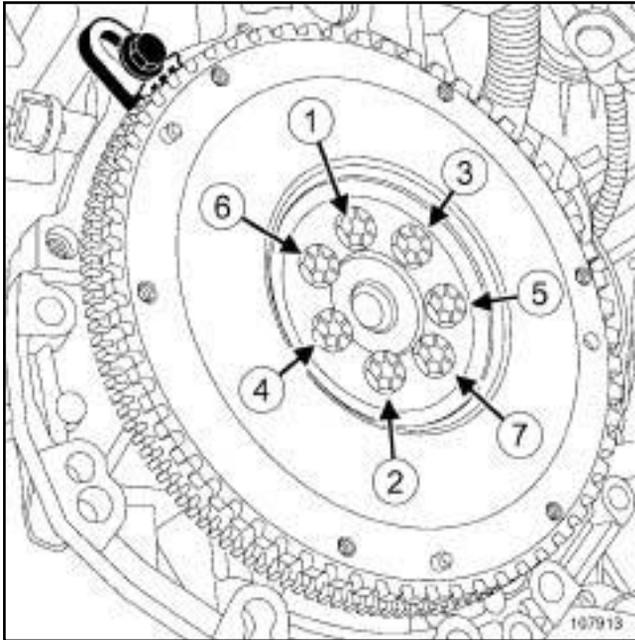
### WARNING

Do not remove the bolts (2) from the flywheel drive plate.

### II - REFITTING OPERATION

- Refit the flywheel.

K4M



107913

- Screw in the new flywheel bolts without tightening them.
- Lock the engine using the.
- Torque tighten in order the **flywheel bolts (25 N.m + 50° ± 6°)**.
- Remove the tool.

### III - FINAL OPERATION

- Refit:
  - the clutch pressure plate (see **Pressure plate - Disc: Removal - Refitting**) ,
  - the gearbox (see **Manual gearbox: Removal - Refitting**) .

## Flywheel: Removal - Refitting

K9K

### Tightening torques

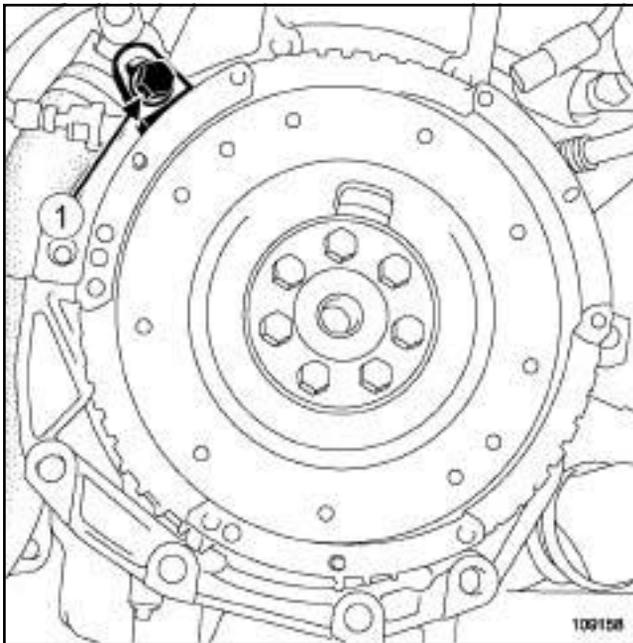
flywheel bolts	55 N.m
----------------	--------

## REMOVAL

### I - REMOVAL PREPARATION OPERATION

- Remove:
  - the manual gearbox (see **Manual gearbox: Removal - Refitting**) ,
  - the clutch pressure plate (see **Pressure plate - Disc: Removal - Refitting**) .

### II - OPERATION FOR REMOVAL OF PART CONCERNED



109158

- Lock the flywheel with the(1).
- Remove the flywheel bolts.
- Remove:
  - the flywheel,
  - the.

## REFITTING

### I - REFITTING PREPARATION OPERATION

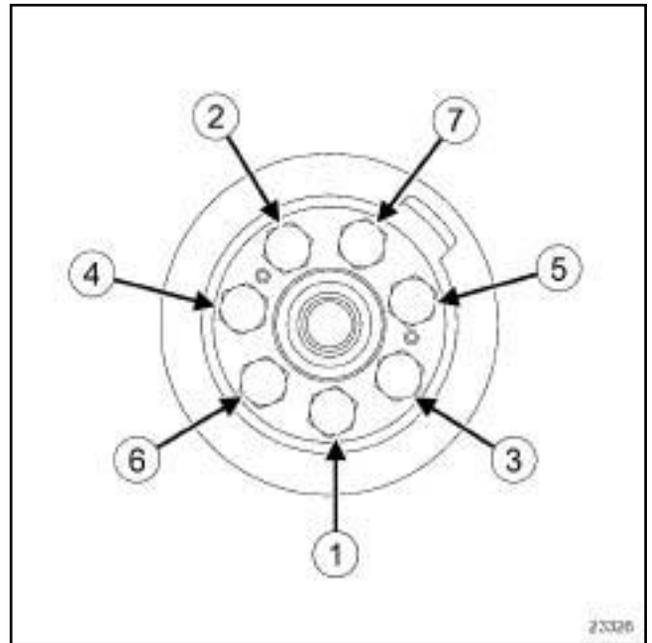
- Check the condition of the flywheel.
- parts always to be replaced: Flywheel bolts.**

- Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:

- the crankshaft bearing face on the flywheel if re-used,
- the flywheel pressure face on the crankshaft,
- the flywheel threading.

### II - REFITTING OPERATION FOR PART CONCERNED

- Refit the flywheel.
- Coat the new flywheel bolts with **FRENETCH** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).



23326

- Lock the flywheel using tool.
- Tighten to torque and in order the **flywheel bolts (55 N.m)**.

### III - FINAL OPERATION

- Refit:
  - the clutch pressure plate (see **Pressure plate - Disc: Removal - Refitting**) ,
  - the manual gearbox (see **Manual gearbox: Removal - Refitting**) .

# TOP AND FRONT OF ENGINE

## Pressure at end of compression: Check

# 11A

K4M

### Equipment required

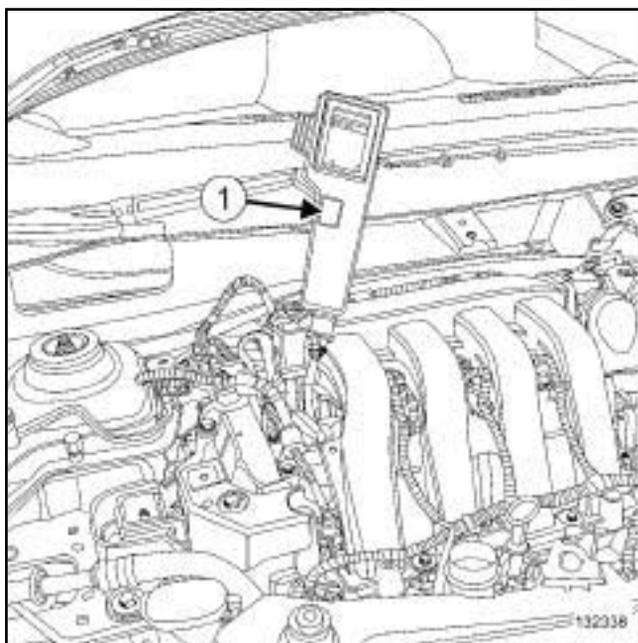
petrol compression gauge

Diagnostic tool

## CHECK

### I - PREPARATION OPERATION FOR CHECK

- Remove:
  - the coils (see **17A, Ignition, Coils: Removal - Refitting**, page **17A-1**),
  - the spark plugs (see **Plugs: Removal - Refitting**).



132338

- Connect a **petrol compression gauge (1)**.
- Put the vehicle under starting conditions:
  - gear lever in neutral position for manual gearbox,
  - gear lever in position P (park) for an automatic gearbox.
- Disconnect the injector connectors.

### II - TEST OPERATION

- Activate the starter until the needle of the petrol compression gauge stabilises.
- Measure the compression of the engine, cylinder by cylinder.

- Fully depress the accelerator pedal in order to open the throttle valve during the compression measurements.

#### Note:

It is necessary to wait for at least **10 seconds** before starting the engine each time (the starter will not run due to its thermal protection).

### III - FINAL OPERATION

- Disconnect the **petrol compression gauge**.
- Refit:
  - the spark plugs (see **Plugs: Removal - Refitting**),
  - the coils (see **17A, Ignition, Coils: Removal - Refitting**, page **17A-1**).
- Connect the injector connectors.
- Using the **Diagnostic tool**, check that there are no faults stored in the computer.
- Start the vehicle.

# TOP AND FRONT OF ENGINE

## Accessories belt: Removal - Refitting

# 11A

K9K, and STANDARD HEATING RECIRCULATION

### Equipment required

offset spanner

### Tightening torques

new accessories belt	40 N.m
tensioning roller bolt	

### WARNING

Do not run the engine without the accessories belt to avoid damaging the crankshaft accessories pulley.

### WARNING

In order to avoid any refrigerant leaks, do not damage (deform, twist, etc.) the pipe.

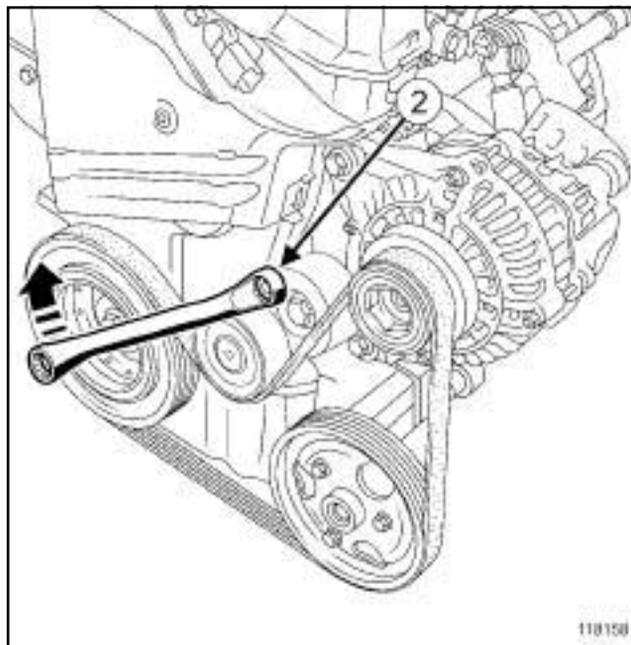
## REMOVAL

### I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove:
  - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
  - the front wheel arch side liner,
  - the front right-hand wheel arch liner partially (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
  - the plastic shield underneath the diesel filter.

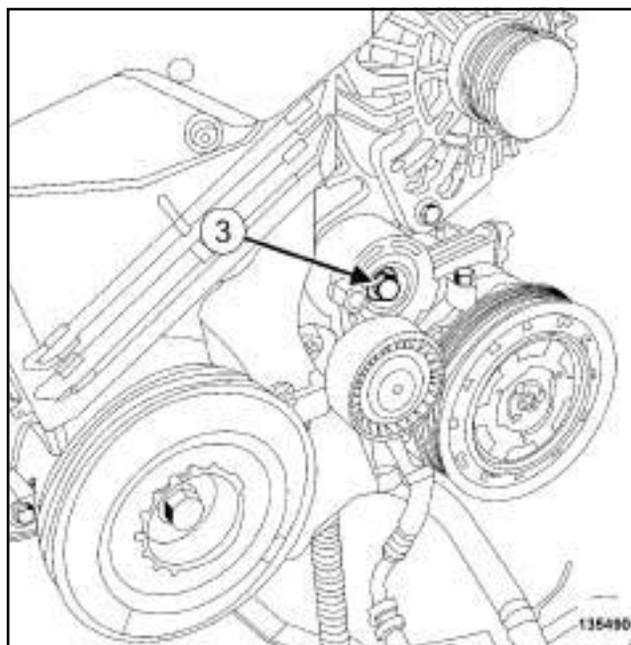
### II - OPERATION FOR REMOVAL OF PART CONCERNED

#### Auto tensioner



118158

- Turn the accessories belt tensioning roller clockwise at (2) using a **16 mm offset spanner**.
- Remove the accessories belt.



135490

- Remove:
  - the accessories belt tensioning roller bolt (3) ,
  - the accessories belt tension wheel.

# TOP AND FRONT OF ENGINE

## Accessories belt: Removal - Refitting

# 11A

K9K, and STANDARD HEATING RECIRCULATION

### REFITTING

#### I - REFITTING PREPARATION OPERATION

##### WARNING

Only use brushes with plastic or non-corrosive metal (brass) bristles.

- Use a brush to remove any deposits from the crankshaft accessories pulley V-grooves.
- parts always to be replaced: Accessories belt**
- parts always to be replaced: Accessories belt tensioning roller**
- parts always to be replaced: Accessories tensioning roller bolt**

#### II - REFITTING OPERATION FOR PART CONCERNED

- Refit a new accessories belt tensioning roller.

##### Auto tensioner

- Torque tighten the **new accessories belt tensioning roller bolt (40 N.m)**.
- Refit a new accessories belt.
- Rotate the crankshaft clockwise through two revolutions (timing end).

#### III - FINAL OPERATION

- Refit:
  - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
  - the front wheel arch side liner,
  - the plastic shield underneath the diesel filter,
  - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

# TOP AND FRONT OF ENGINE

## Accessories belt: Removal - Refitting

# 11A

K9K, and AIR CONDITIONING

### Tightening torques

tensioning roller bolt	40 N.m
------------------------	--------

#### WARNING

Do not run the engine without the accessories belt to avoid damaging the crankshaft accessories pulley.

#### WARNING

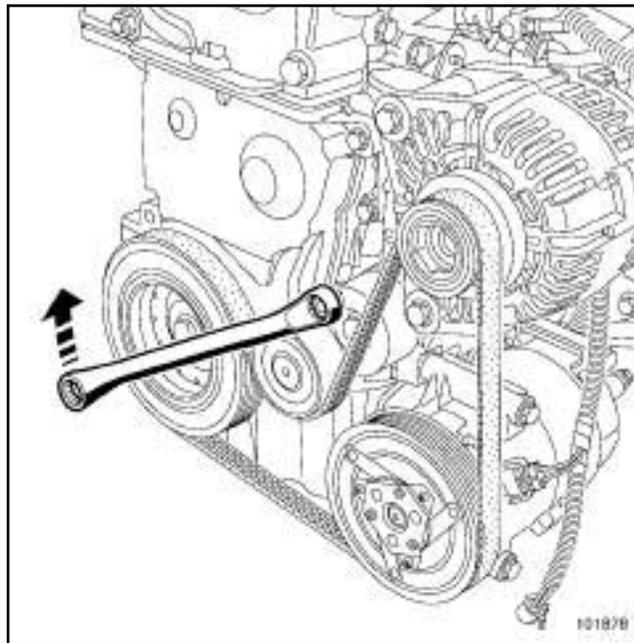
In order to avoid any refrigerant leaks, do not damage (deform, twist, etc.) the pipe.

## REMOVAL

### I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove:
  - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
  - the front right-hand wheel arch side liner,
  - the front right-hand wheel arch liner partially (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
  - the plastic shield underneath the diesel filter.

### II - REMOVAL OPERATION



101878

- Rotate the accessories belt auto tensioner clockwise using a **16 mm** offset wrench.
- Remove:
  - the accessories belt,
  - the accessories belt tension wheel.

## REFITTING

### I - REPAIR PREPARATION OPERATION

- parts always to be replaced: Accessories belt.**
- parts always to be replaced: Accessories belt tensioning roller**
- parts always to be replaced: Accessories tensioning roller bolt**

#### WARNING

Only use brushes with plastic or non-corrosive metal (brass) bristles.

- To remove all deposits, use a brush to clean the grooves of:
  - the crankshaft pulley,
  - the air conditioning compressor pulley,
  - the alternator pulley,
- Refit a new tensioning roller fitted with a new bolt.
- Tighten to torque the **tensioning roller bolt (40 N.m)**.

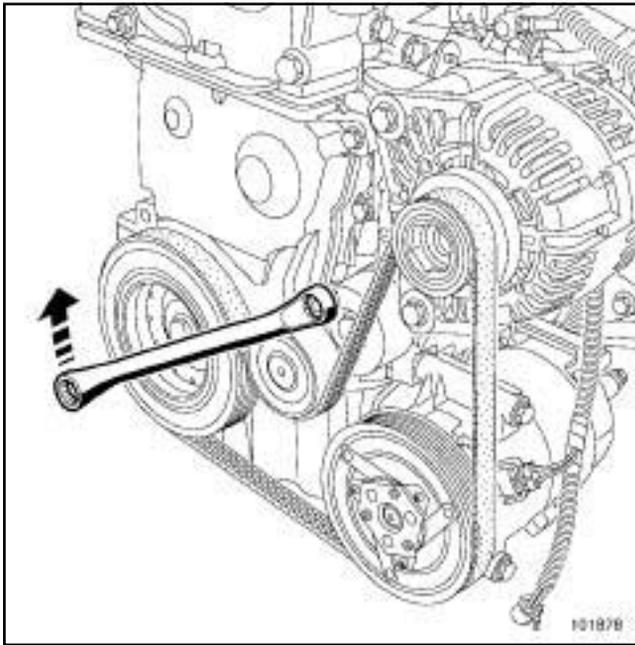
# TOP AND FRONT OF ENGINE

## Accessories belt: Removal - Refitting

# 11A

K9K, and AIR CONDITIONING

### II - REFITTING OPERATION FOR PART CONCERNED



101878

- Rotate the tensioning roller clockwise using a **16 mm** offset wrench.
- Refit a new accessories belt.
- Turn the crankshaft two revolutions clockwise (timing end) to position the accessories belt correctly.

### III - FINAL OPERATION

- Refit:
  - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
  - the front right-hand wheel arch side liner,
  - the plastic shield underneath the diesel filter,
  - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

# TOP AND FRONT OF ENGINE

## Accessories belt: Removal - Refitting

# 11A

K4M, and POWER ASSISTED STEERING, and AIR CONDITIONING

### Tightening torques

the automatic tensioning roller mounting bolts	<b>21 N.m</b>
the fixed roller mounting bolt	<b>21 N.m</b>

#### IMPORTANT

Wear cut-resistant gloves during the operation.

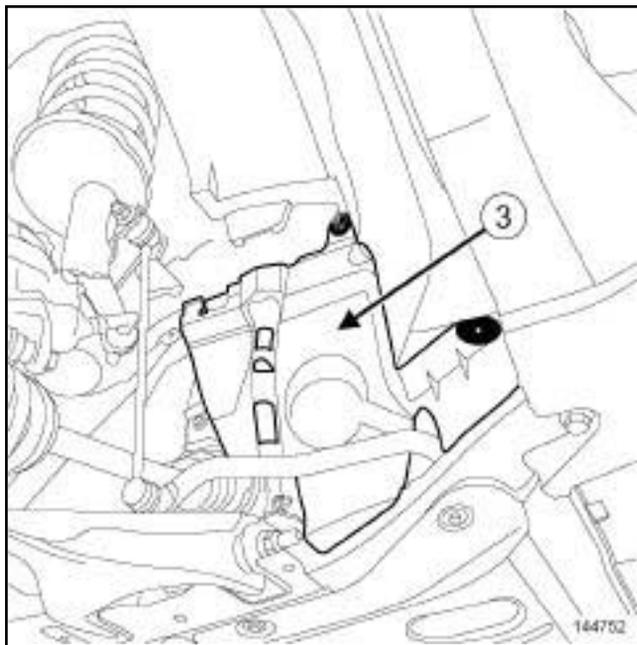
#### WARNING

Do not run the engine without the accessories belt to avoid damaging the crankshaft accessories pulley.

## REMOVAL

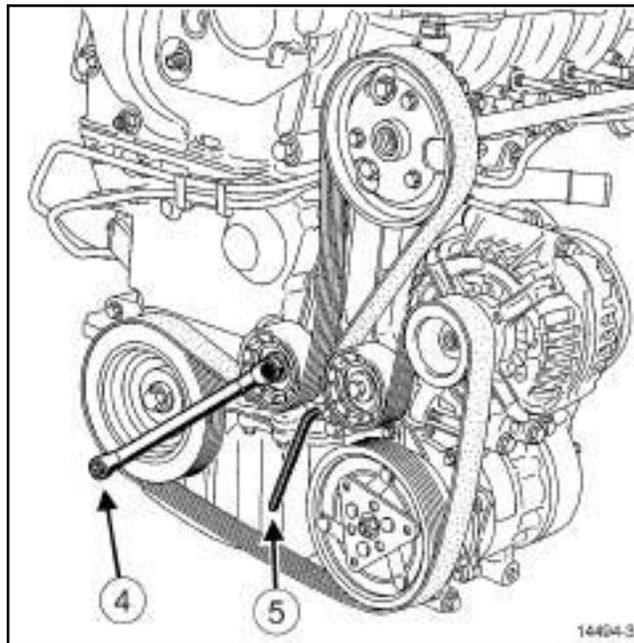
### I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).



- Remove the front right-hand wheel arch side liner (3)

### II - REMOVAL OPERATION



- Turn the accessories belt auto tensioner anti-clockwise using a spanner (4) (16 mm), to relax the belt.
- Lock the auto tensioner using a 6 mm Allen key (5).
- Remove:
  - the accessories belt,
  - the auto tensioner bolts,
  - the auto tensioner,
  - the fixed roller bolt,
  - the fixed roller.

## REFITTING

### I - REFITTING PREPARATION OPERATION

- parts always to be replaced: **Accessories belt**
- parts always to be replaced: **Accessories belt tensioning roller**
- parts always to be replaced: **Accessories fixed roller**
- Use a brush to remove any deposits from the crankshaft pulley V-grooves.

### II - REFITTING OPERATION

- Refit:
  - a new fixed roller,
  - a new automatic tensioner.

# TOP AND FRONT OF ENGINE

## Accessories belt: Removal - Refitting

# 11A

K4M, and POWER ASSISTED STEERING, and AIR CONDITIONING

- Torque tighten:
  - **the automatic tensioning roller mounting bolts (21 N.m),**
  - **the fixed roller mounting bolt (21 N.m).**
- Turn the accessories belt auto tensioner clockwise using a **16 mm** spanner.
- Lock the auto tensioner using a **6 mm** Allen key.
- Refit a new accessories belt.
- Unlock the auto tensioner.
- Turn the crankshaft two revolutions clockwise to position the accessories belt correctly.

### III - FINAL OPERATION

- Proceed in the reverse order to removal.

# TOP AND FRONT OF ENGINE

## Accessories belt: Removal - Refitting

# 11A

K4M, and STANDARD HEATING RECIRCULATION

### Tightening torques

auto tensioner bolts	40 N.m
----------------------	--------

### IMPORTANT

Wear cut-resistant gloves during the operation.

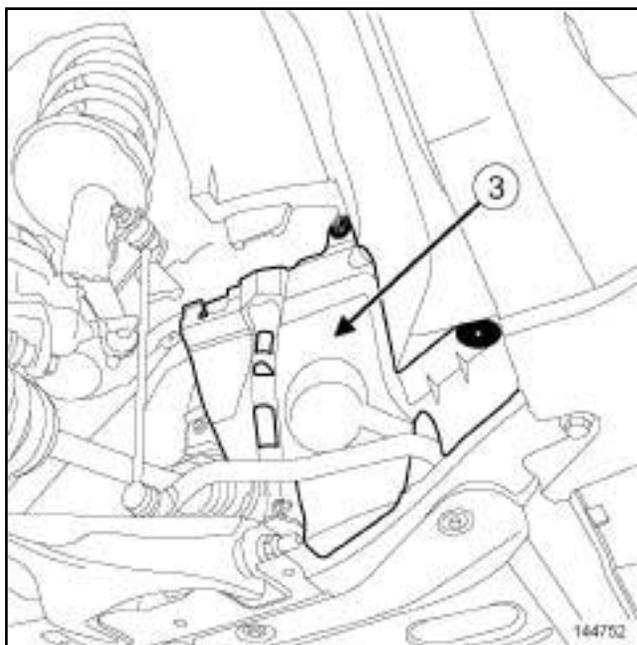
### WARNING

Do not run the engine without the accessories belt to avoid damaging the crankshaft accessories pulley.

## REMOVAL

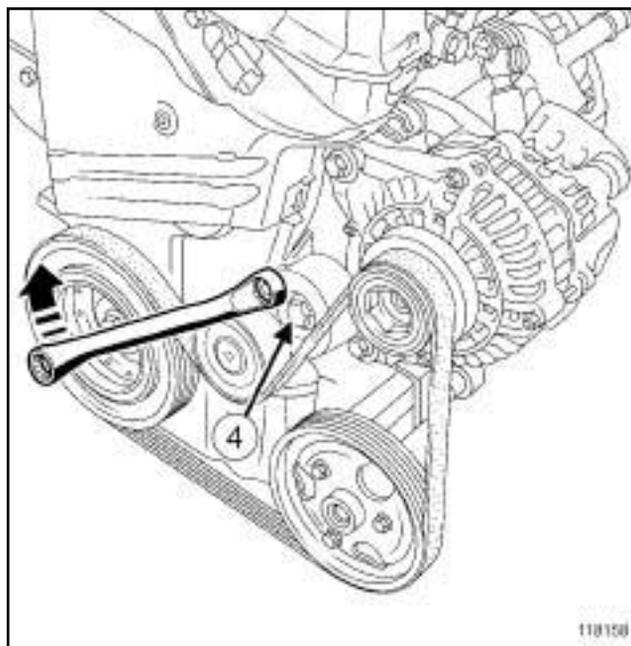
### I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).



- Remove the front right-hand wheel arch side liner (3)

### II - REMOVAL OPERATION



- Pivot the accessories belt auto tensioner clockwise.
- Remove:
  - the accessories belt,
  - the tensioning roller bolt (4) ,
  - the tensioning roller.

## REFITTING

### I - REFITTING PREPARATION OPERATION

- parts always to be replaced: **Accessories belt**
- parts always to be replaced: Accessories belt tensioning roller**
- Use a brush to remove any deposits from the crankshaft pulley V-grooves.

### II - REFITTING OPERATION

- Refit a new tensioning roller.
- Torque tighten the **auto tensioner bolts (40 N.m)**.
- Pivot the accessories belt auto tensioner clockwise.
- Refit a new accessories belt.
- Turn the crankshaft two revolutions clockwise to position the accessories belt correctly.

### III - FINAL OPERATION

- Refit the front right-hand wheel arch side liner.

# TOP AND FRONT OF ENGINE

## Accessories belt: Removal - Refitting

11A

---

K4M, and STANDARD HEATING RECIRCULATION

---

- Refit the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

# TOP AND FRONT OF ENGINE

## Crankshaft accessories pulley: Removal - Refitting

# 11A

K9K

### Special tooling required

**Mot. 1489** TDC locating pin.

### Tightening torques

accessories pulley bolt **120 N.m + 95° ±15°**

TDC pin plug **25 N.m**

### IMPORTANT

Wear cut-resistant gloves during the operation.

### WARNING

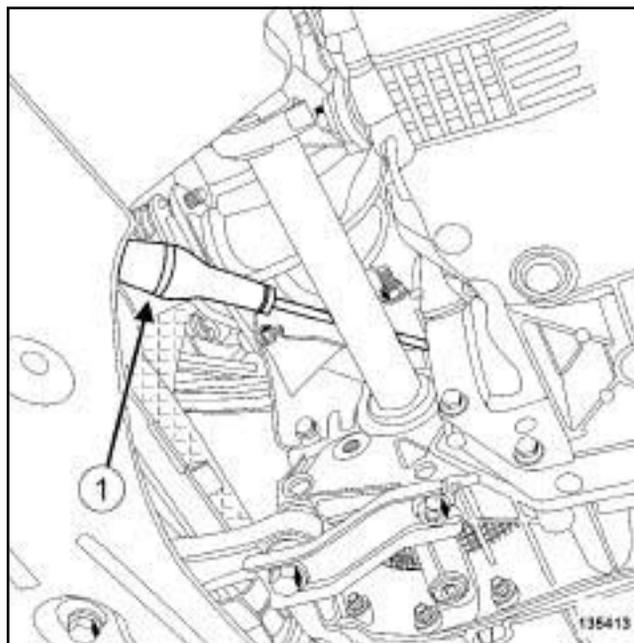
Do not run the engine without the accessories belt to avoid damaging the crankshaft accessories pulley.

## REMOVAL

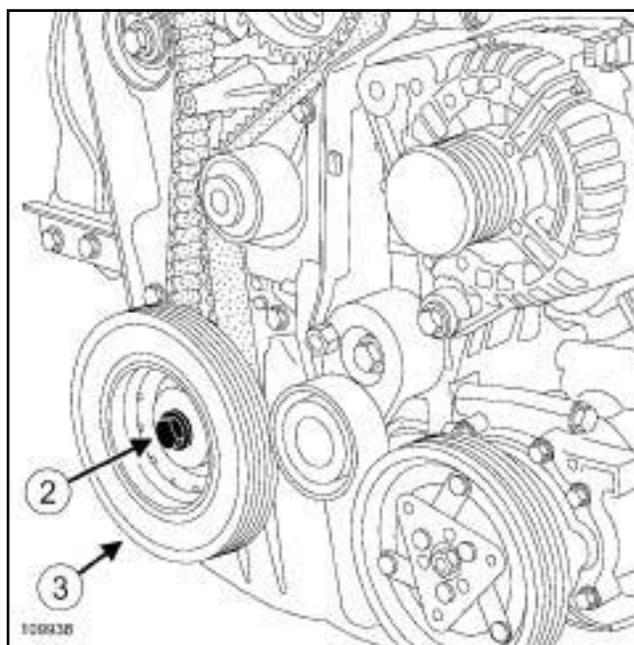
### I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Remove:
  - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
  - the front right-hand wheel arch side liner,
  - the front right-hand wheel arch partially (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
  - the plastic shield underneath the diesel filter,
  - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page **11A-2**).

### II - REMOVAL OPERATION



135413



109938

- Remove:
  - the crankshaft accessories pulley bolt (2), locking the flywheel using a large screwdriver (1),
  - the crankshaft accessories pulley (3).

# TOP AND FRONT OF ENGINE

## Crankshaft accessories pulley: Removal - Refitting

# 11A

K9K

### REFITTING

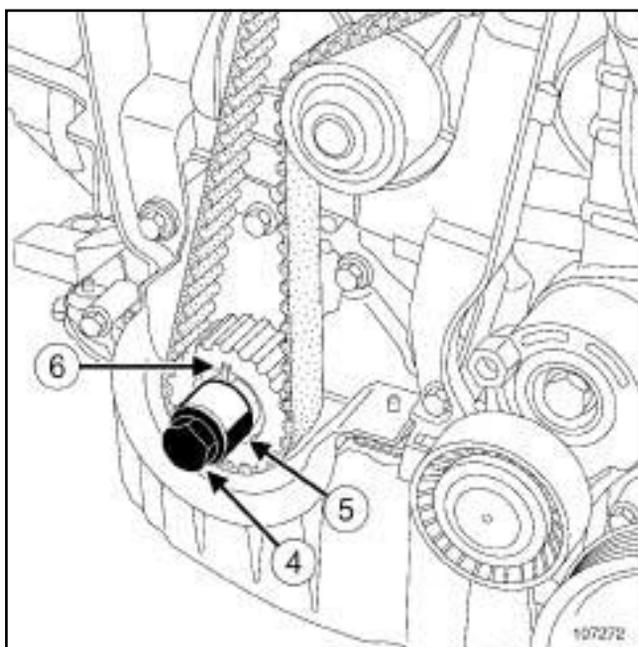
#### I - REFITTING PREPARATION OPERATION

- ❑ parts always to be replaced: Crankshaft accessories pulley bolts.

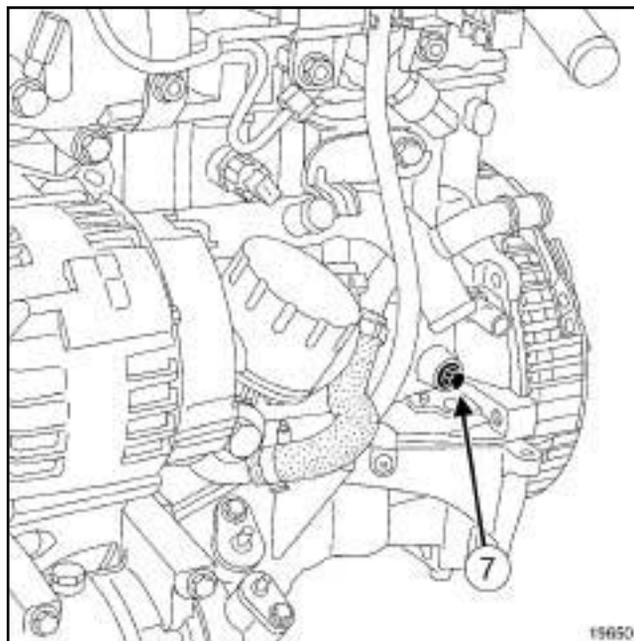
#### WARNING

Only use brushes with plastic or non-corrosive metal (brass) bristles.

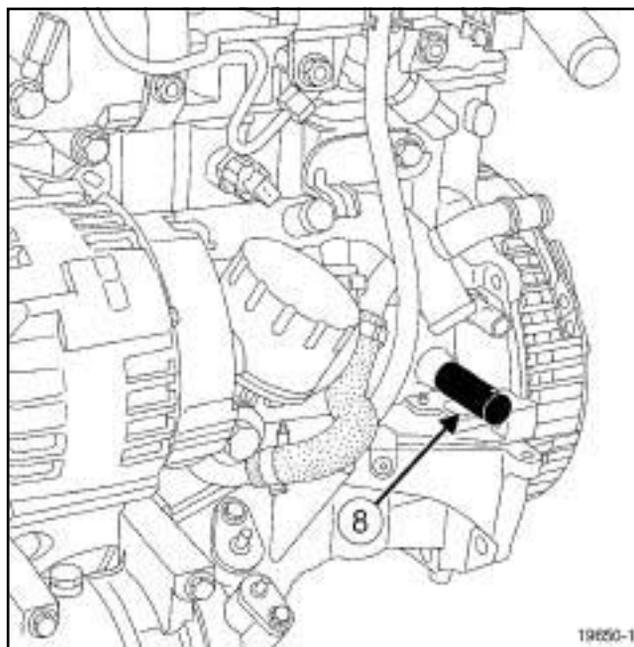
- ❑ If reusing the crankshaft accessories pulley, clean the crankshaft accessories pulley V-grooves with a brush to eliminate any deposits.



- ❑ Refit the old crankshaft accessories pulley bolt (4) with a spacer (5) .
- ❑ Turn the crankshaft clockwise (timing end) using the old bolt of the crankshaft accessories pulley, until the collet (6) of the crankshaft timing pinion is almost vertical and facing upwards.



- ❑ Remove the TDC setting pin plug (7) .

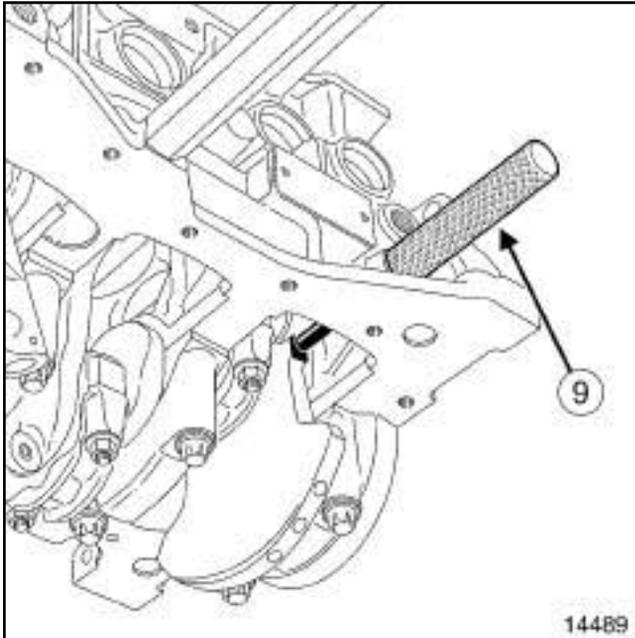


- ❑ Screw the TDC setting pin (**Mot. 1489**) (8) into the cylinder block.
- ❑ Remove the old bolt from the crankshaft accessories pulley fitted with its spacer.

#### II - REFITTING OPERATION

- ❑ Refit the accessories crankshaft pulley with a new bolt.

K9K



14489

- Turn the crankshaft clockwise (timing end) smoothly using the bolt of the crankshaft accessories pulley, until the crankshaft presses against the tool (**Mot. 1489**) (9) .
- Torque and angle tighten (with the crankshaft in contact with the TDC setting pin) the **accessories pulley bolt (120 N.m + 95° ±15°)**.
- Remove the TDC setting rod (**Mot. 1489**).

### III - FINAL OPERATION

- Apply a drop of **silicone adhesive sealant** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to the thread of the TDC setting pin plug.
- Torque tighten the **TDC pin plug (25 N.m)**.
- Refit:
  - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting, page 11A-2**) ,
  - the front right-hand wheel arch side liner,
  - the front right-hand wheel arch (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
  - the plastic shield underneath the diesel filter,
  - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).

K4M

### Tightening torques

new crankshaft accessories pulley bolt	40 N.m + 145° ± 15°
TDC pin plug	25 N.m

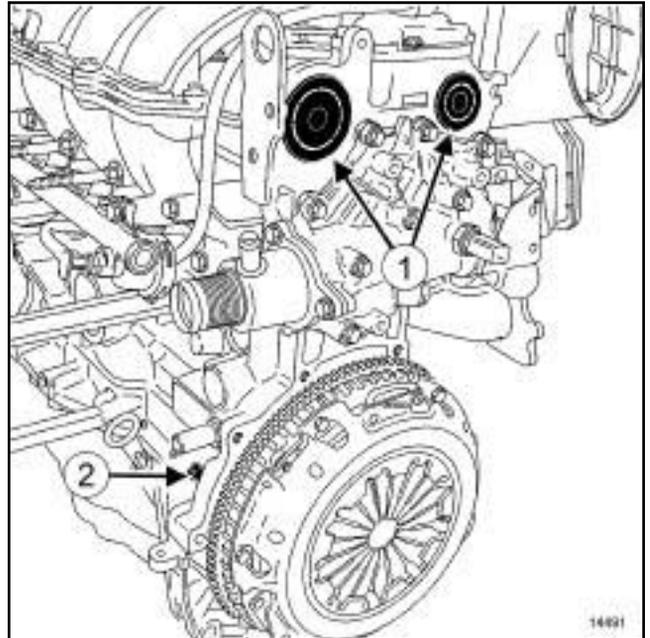
### IMPORTANT

Wear cut-resistant gloves during the operation.

## REMOVAL

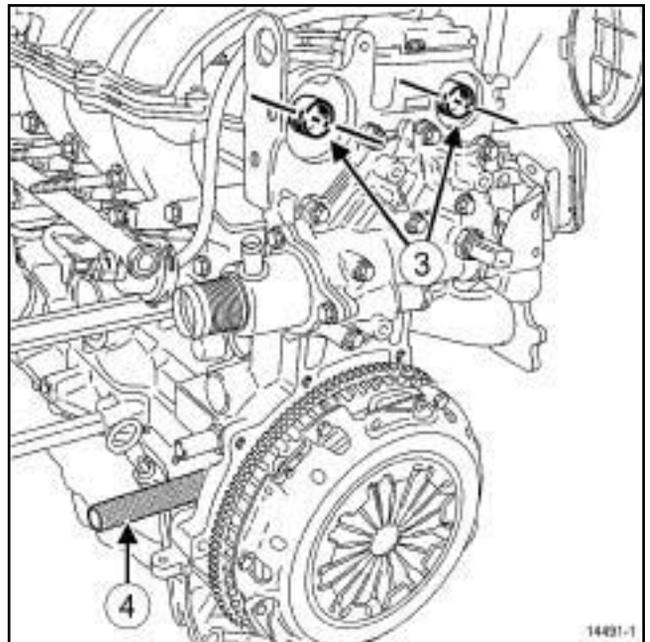
### I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove:
  - the air inlet duct,
  - the air resonator (see **12A, Fuel mixture, Air resonator: Removal - Refitting**, page 12A-2),
  - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
  - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-2).



14491

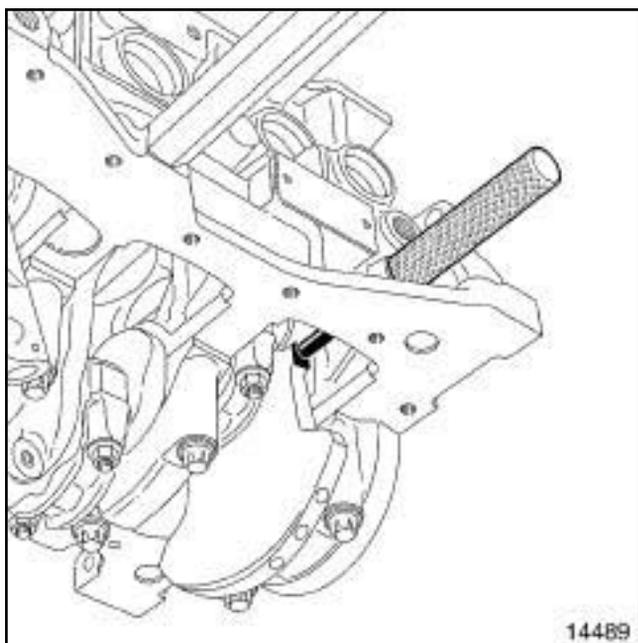
- Pierce the centre of the plugs (1) at the camshaft ends with a screwdriver.
- Remove:
  - the plugs from the camshaft ends with a screwdriver,
  - the TDC setting pin plug (2).



14491-1

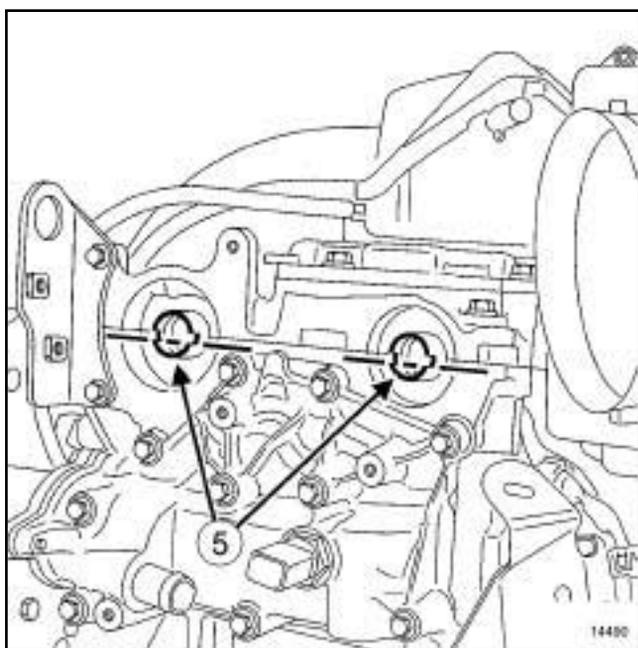
- Position the camshaft grooves (3) almost horizontally and offset towards the bottom turning the crankshaft in the operating direction (clockwise at timing end).
- Screw in the TDC setting pin (4).

K4M



14489

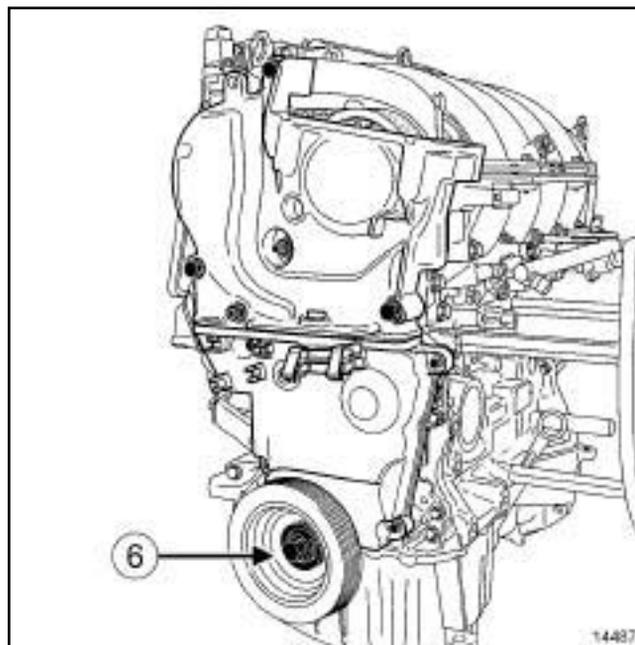
- Turn the crankshaft in its operating direction (clockwise at timing end), until the crankshaft presses against the TDC setting pin.



14490

- The camshaft grooves (5) must be horizontal and offset downwards.
- Remove the TDC setting pin.
- Lock the flywheel using a screwdriver.

### II - REMOVAL OPERATION



14487

- Remove the crankshaft accessories pulley bolt (6).

### REFITTING

#### I - REFITTING PREPARATION OPERATION

- parts always to be replaced: Crankshaft accessories pulley bolts
- 

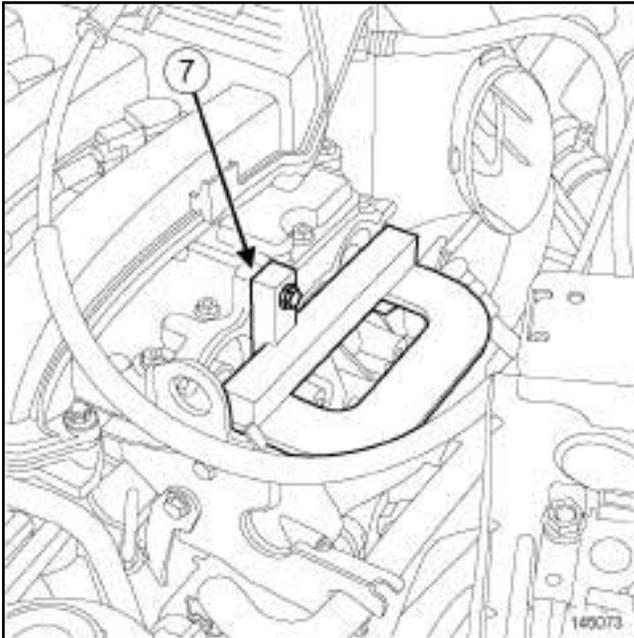
#### WARNING

Be sure to degrease:

- the end of the crankshaft,
- the bearing face of the crankshaft accessories pulley.

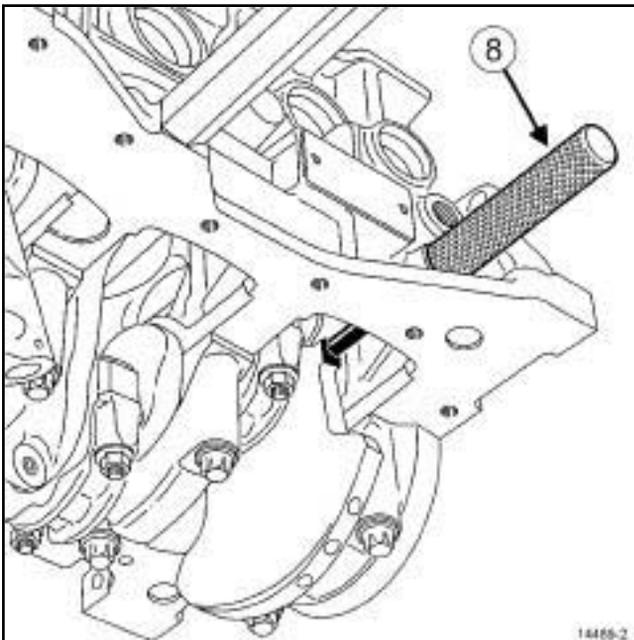
This is to prevent timing slippage.

K4M



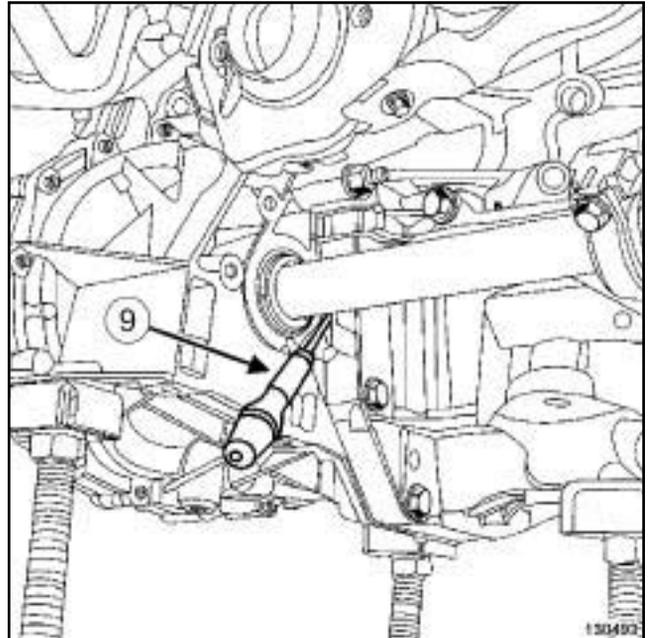
145073

- Position the setting tool.
- Secure the ends of the camshafts using an M6 bolt (7) .



14489-2

- Screw in the TDC setting pin (8) .
- Check that the crankshaft is pressing against the TDC tool.
- The crankshaft groove must be upwards.



130493

- If the crankshaft is not pressing against the TDC tool, bring the crankshaft back by turning the fly-wheel using a screwdriver (9) .

## II - REFITTING OPERATION

- Refit the crankshaft accessories pulley.
- Torque and angle tighten the **new crankshaft accessories pulley bolt (40 N.m + 145° ± 15°)**.

## III - FINAL OPERATION

- Remove:
  - the TDC tool,
  - the setting tool.
- Refit:
  - a new inlet camshaft plug using the,
  - a new exhaust camshaft plug using the.
- Place a drop of **SILICONE ADHESIVE SEALANT** (see **Vehicle: Parts and consumables for the repair**) on the threading of the TDC pin plug.
- Refit the TDC setting pin plug.
- Torque tighten the **TDC pin plug (25 N.m)**.
- Refit:
  - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting, page 11A-2**) ,
  - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),

# TOP AND FRONT OF ENGINE

## Crankshaft accessories pulley: Removal - Refitting

# 11A

K4M

- the air resonator (see **12A, Fuel mixture, Air resonator: Removal - Refitting**, page **12A-2**),
  - the air inlet duct.
- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

# TOP AND FRONT OF ENGINE

## Timing belt: Removal - Refitting

# 11A

K4M

Tightening torques 	
timing fixed roller bolt	50 N.m
new crankshaft accessories pulley bolt	40 N.m + 145° ± 15°
timing tension wheel nut	27 N.m
lower timing cover bolts	12 N.m
nut of each camshaft sprocket	30 N.m + 84° ± 4°
TDC pin plug	20 N.m
upper timing cover bolts	46 N.m
upper timing cover nuts	46 N.m
flywheel end lifting eye bolts	10 N.m

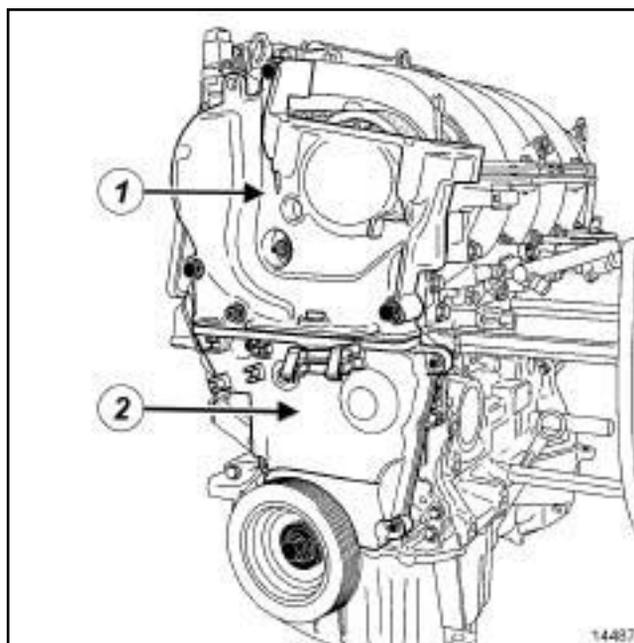
### IMPORTANT

Wear cut-resistant gloves during the operation.

## REMOVAL

### I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove:
  - the air inlet duct,
  - the air resonator (see **12A, Fuel mixture, Air resonator: Removal - Refitting**, page 12A-2) ,
  - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
  - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-2) ,
  - the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page 11A-10) ,
  - the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-4) .



### Remove:

- the upper timing cover bolts (1) ,
- the upper timing cover,
- the lower timing cover bolts (2) ,
- the lower timing cover.

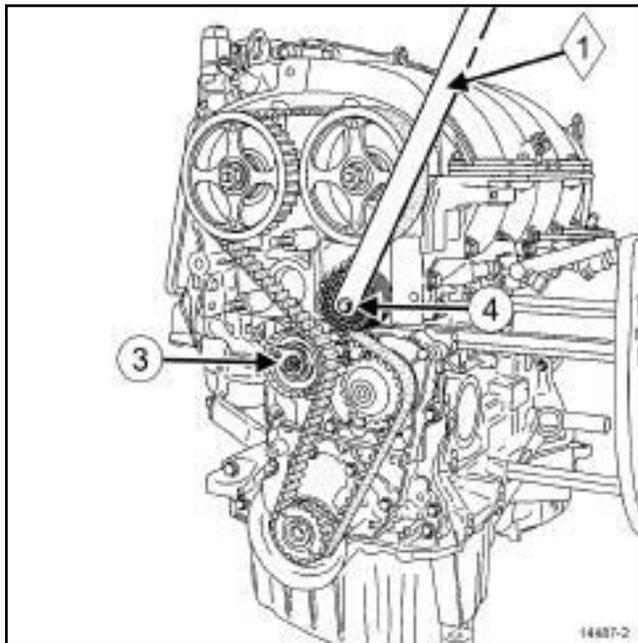
# TOP AND FRONT OF ENGINE

## Timing belt: Removal - Refitting

# 11A

K4M

### II - REMOVAL OPERATION



- Loosen the nut (3) of the timing tensioning roller.

Note:

Do not drop the crankshaft timing sprocket when removing the timing belt.

- Remove:
  - the timing fixed roller bolt (4) using the tool (1) ,
  - the timing fixed roller,
  - the timing belt,
  - the timing tensioning roller nut,
  - the timing tensioning roller,
  - the crankshaft timing sprocket.

### REFITTING - PROCEDURE 1

#### I - REFITTING PREPARATION OPERATION

- parts always to be replaced: Timing belt,
- parts always to be replaced: Timing belt tensioning roller,
- parts always to be replaced: Crankshaft accessories pulley bolts,
- parts always to be replaced: Inlet camshaft cap,
- parts always to be replaced: Timing fixed roller,
- parts always to be replaced: Exhaust camshaft cap.

### II - REFITTING OPERATION FOR PART CONCERNED

- The first procedure applies to replacing any timing face component which has a crankshaft timing sprocket without a collet and which does not require one or more of the camshaft sprockets to be loosened.

#### 1 - Adjusting the timing

□

#### WARNING

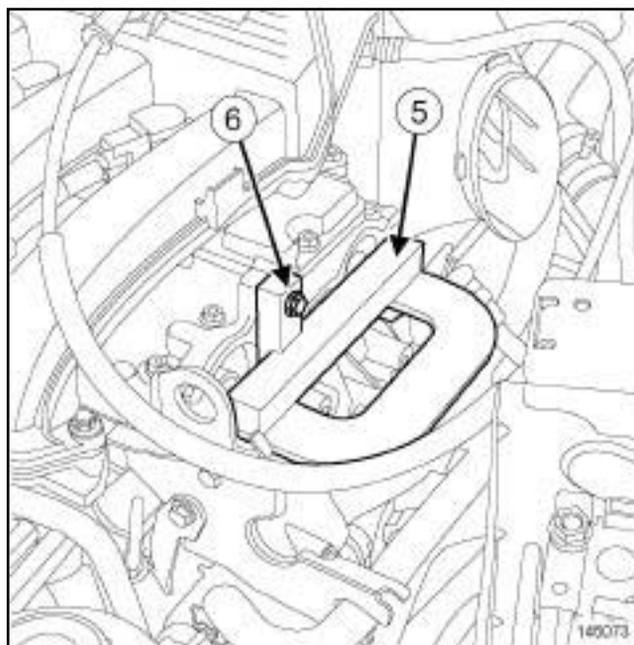
Be sure to degrease:

- the end of the crankshaft (timing end),
- the timing sprocket pressure faces and bore of the crankshaft,
- the crankshaft accessories pulley bearing faces,
- the camshaft ends (timing end),
- the camshaft sprocket bores and bearing faces.

This is to avoid timing slippage.

This slippage leads to engine damage.

- Set the camshaft grooves horizontally and below the centre line by turning the camshafts with their necessary.



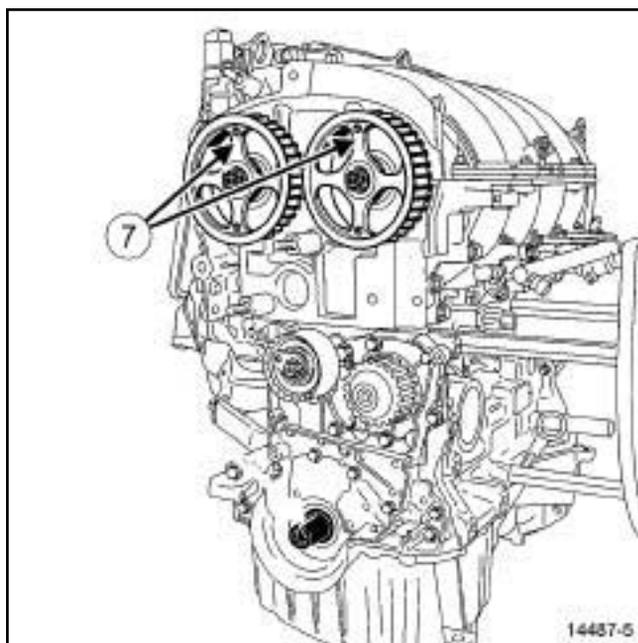
- Fit:
  - the (5) onto the ends of the camshafts,
  - a lifting eye bolt (6) to secure the.

# TOP AND FRONT OF ENGINE

## Timing belt: Removal - Refitting

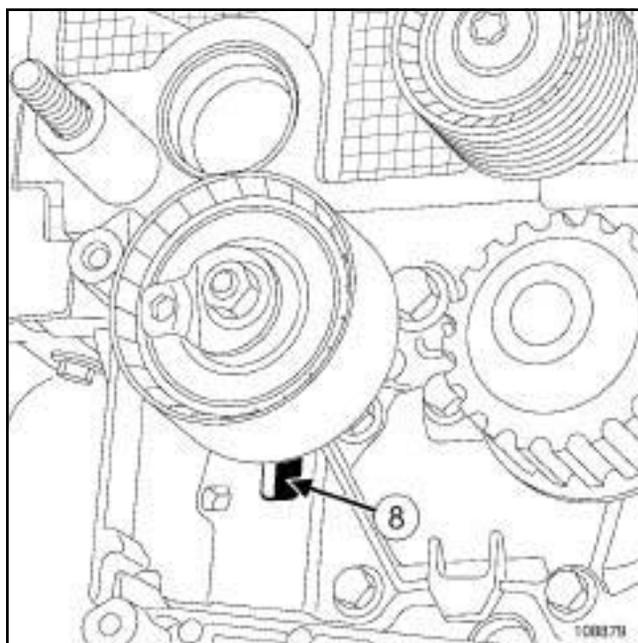
# 11A

K4M

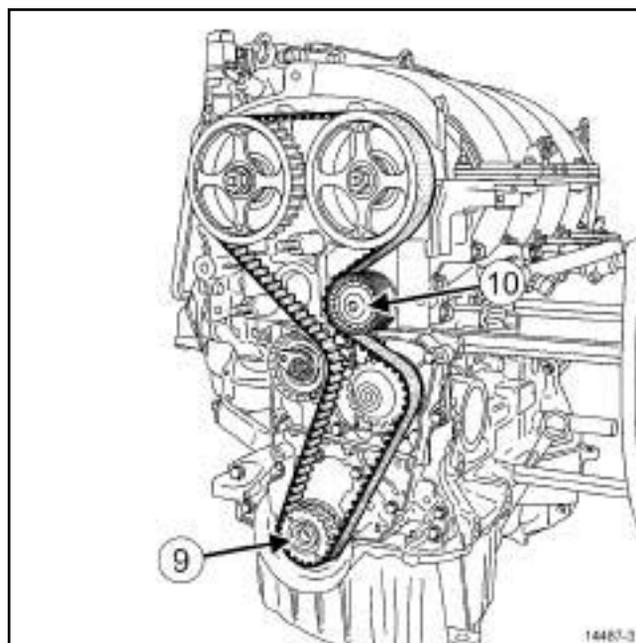


- ❑ Position the RENAULT badge (7) engraved on the stem of each camshaft sprocket vertically and pointing upwards.

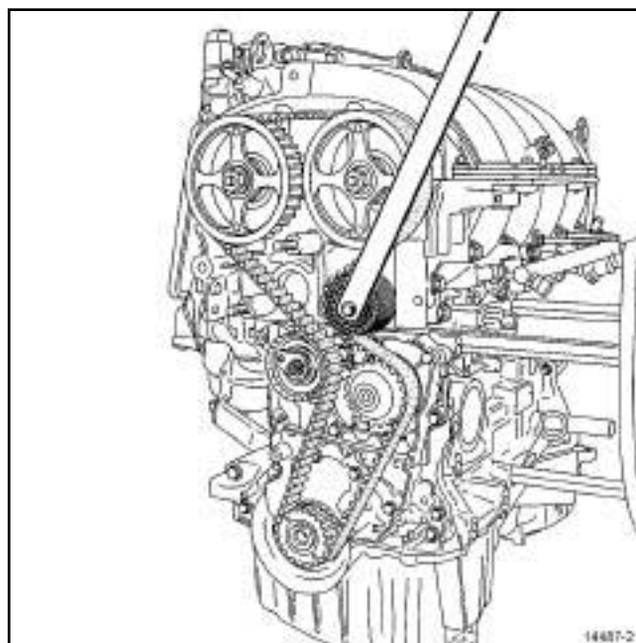
### 2 - Refitting



- ❑ Refit a new timing tensioning roller by positioning the lug of the timing tensioning roller in the groove (8) .
- ❑ Screw on the timing tensioning roller nut without tightening it.



- ❑ Refit:
  - the crankshaft timing sprocket (9) ,
  - a new timing belt,
  - a new timing fixed roller (10) .



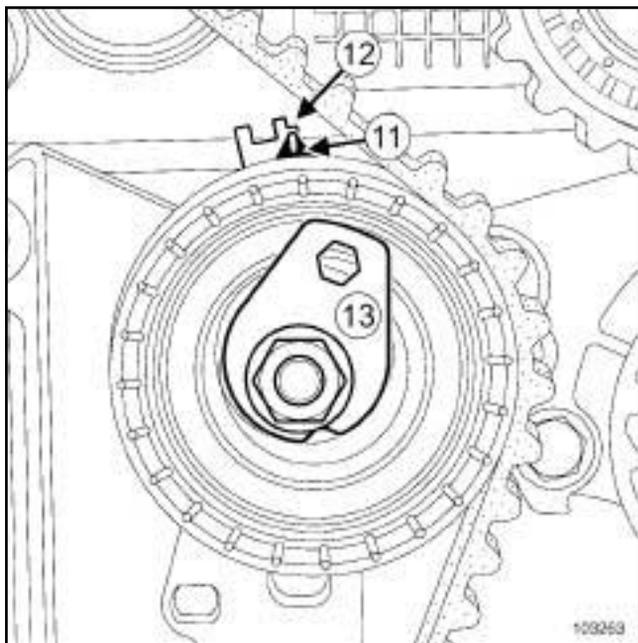
- ❑ Torque tighten the **timing fixed roller bolt (50 N.m)** using the tool.

# TOP AND FRONT OF ENGINE

## Timing belt: Removal - Refitting

# 11A

K4M



103263

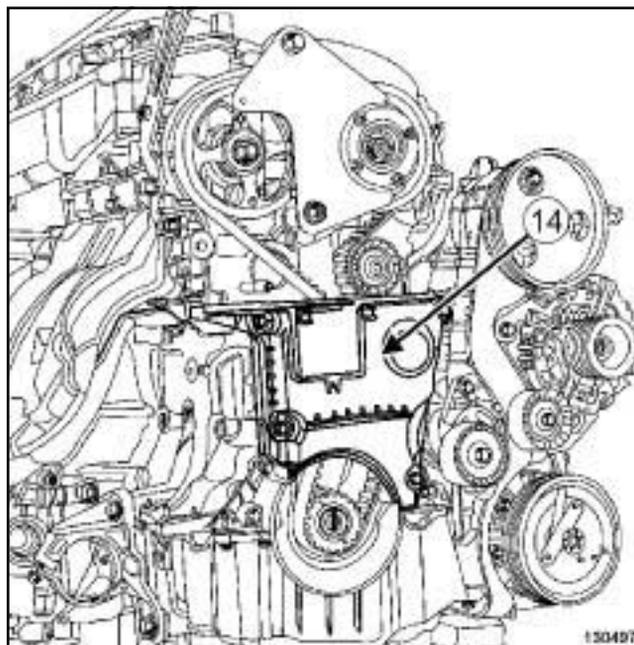
- Position the adjustable index (11) opposite the mark (12) , by turning the eccentric (13) clockwise using a 6 mm Allen key.
- Torque tighten the **timing tensioning roller nut (7 N.m)**.
- Refit the toolon the cylinder block.

Note:

There are two types of lower timing cover:

- without a timing flap,
- with a timing flap.

*a - Lower timing cover with a timing flap*



130497

- Refit the lower timing cover (14) .
- Tighten to torque the **lower timing cover bolts (12 N.m)**.

*b - continuation of the refitting procedure regardless of the type of lower timing cover*

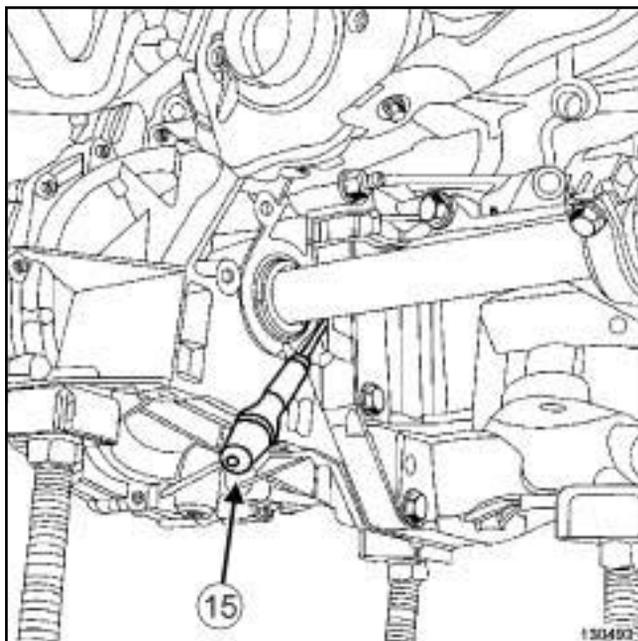
- Refit a new crankshaft accessories pulley.

# TOP AND FRONT OF ENGINE

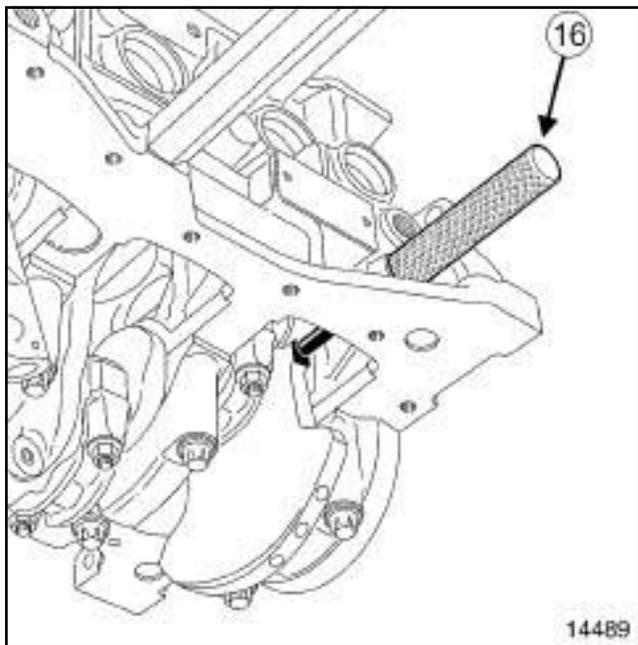
## Timing belt: Removal - Refitting

# 11A

K4M



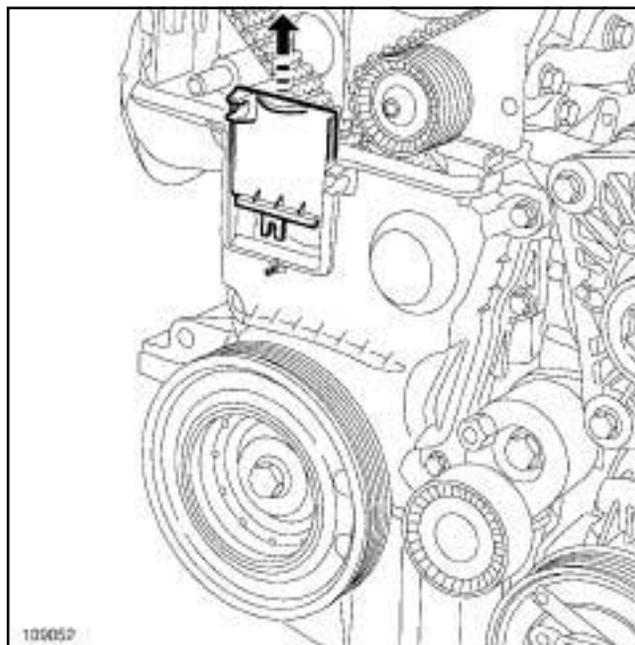
130493



14489

- Use a screwdriver (15) to check that the flywheel does not turn (clockwise at the timing end), otherwise bring the crankshaft back into contact with the tool (16) using the screwdriver; the crankshaft groove should be at the top.
- Torque and angle tighten a **new crankshaft accessories pulley bolt (40 N.m + 145° ± 15°)** (crankshaft in contact with the tool).

### c - Lower timing cover with a timing flap



109052

- Remove the timing flap from the lower timing cover.

### d - continuation of the refitting procedure regardless of the type of lower timing cover

- Remove:
  - the bolt of the tool,
  - the setting tool,
  - the from the cylinder block.

### 3 - Checking the tension

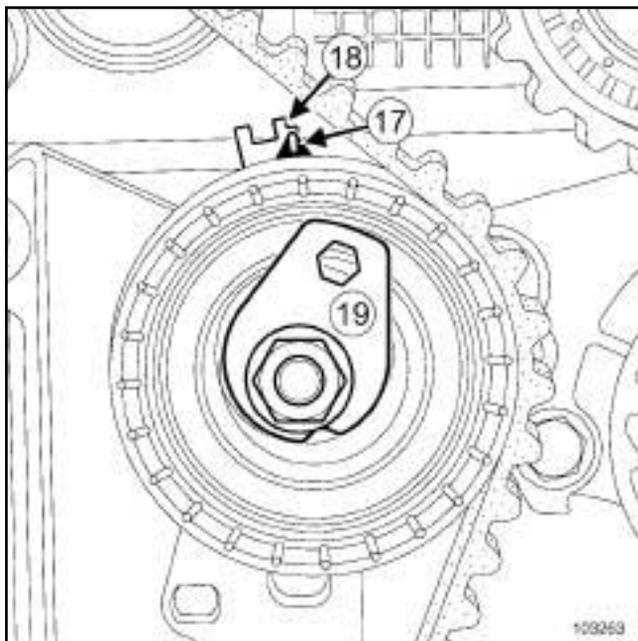
- Rotate the crankshaft twice clockwise at the timing end and before aligning the marks made previously by the operator (on the camshaft dephaser), screw the tool into the cylinder block.
- Move the crankshaft slowly and smoothly until it comes into contact with the tool.
- Remove the tool from the cylinder block.

# TOP AND FRONT OF ENGINE

## Timing belt: Removal - Refitting

# 11A

K4M

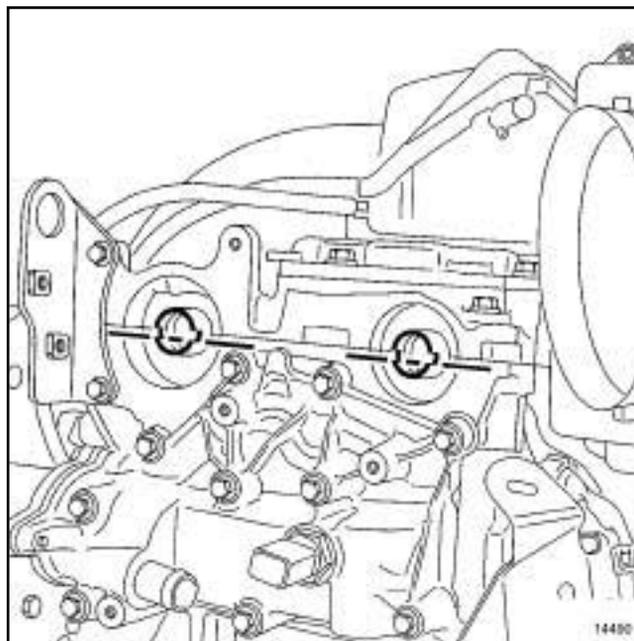


103263

- Check that the adjustable index (17) is opposite the notch (18), if this is not the case:
  - loosen the timing tensioning roller nut by up to one turn while holding the eccentric with a **6 mm** Allen key,
  - gradually move the adjustable index marker (17) opposite the mark (18) turning the eccentric cam (19) clockwise.
- Torque tighten the **timing tension wheel nut (27 N.m)**.

#### 4 - Checking the timing

- Ensure that the index and the notch on the timing tensioning roller are in the correct position before checking the timing.
- Screw tool into the cylinder block.
- Move the crankshaft slowly and smoothly until it comes into contact with the tool.



14490

- Position (without forcing) the camshaft setting tool (the camshaft end grooves must be horizontal and offset towards the bottom).

#### Note:

The timing adjustment and tensioning operation must be repeated if the camshaft setting tool does not engage.

- Remove:
  - the setting tool,
  - the from the cylinder block.

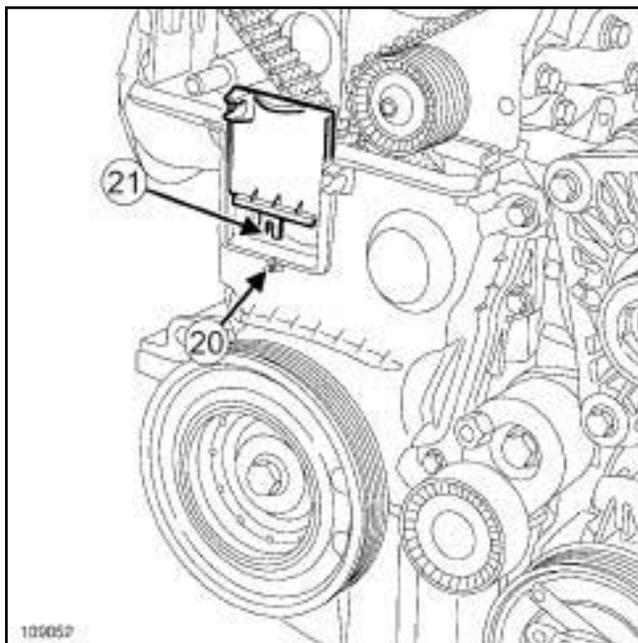
# TOP AND FRONT OF ENGINE

## Timing belt: Removal - Refitting

# 11A

K4M

### a - Lower timing cover with a timing flap



- Refit the lower timing cover flap, checking that the locating pin (20) fits properly in the notch (21) .

### b - Lower timing cover without a timing flap

- Refit the lower timing cover.
- Tighten to torque the **lower timing cover bolts (12 N.m)**.

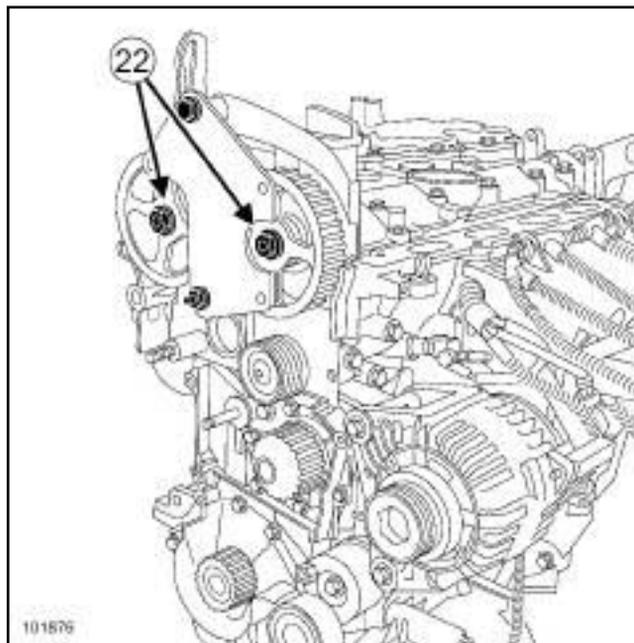
## REFITTING -PROCEDURE 2

### I - REFITTING PREPARATION OPERATION

- parts always to be replaced: Timing belt,
- parts always to be replaced: Timing belt tensioning roller,
- parts always to be replaced: Timing fixed roller,
- parts always to be replaced: Crankshaft accessories pulley,
- parts always to be replaced: camshaft timing sprocket nut,
- parts always to be replaced: Crankshaft accessories pulley bolts,
- parts always to be replaced: Inlet camshaft cap,
- parts always to be replaced: Exhaust camshaft cap.

### II - REFITTING OPERATION

- The second procedure is used when replacing any timing face component which has a crankshaft timing sprocket with or without a collet, that requires one or more of the camshaft sprockets to be loosened.



- Fit the tool on the camshaft sprockets using the tool.
- Loosen the nuts (22) of each camshaft sprocket.
- Remove:
  - the tool from the cylinder block,
  - every camshaft sprocket nut,
  - the camshaft sprockets.

# TOP AND FRONT OF ENGINE

## Timing belt: Removal - Refitting

# 11A

K4M

### 1 - Adjusting the timing

□

Note:

If the stud loosens with the nut (see **11A, Top and front of engine, Camshaft: Removal - Refitting**, page **11A-49**) (11A, Top and front of engine).

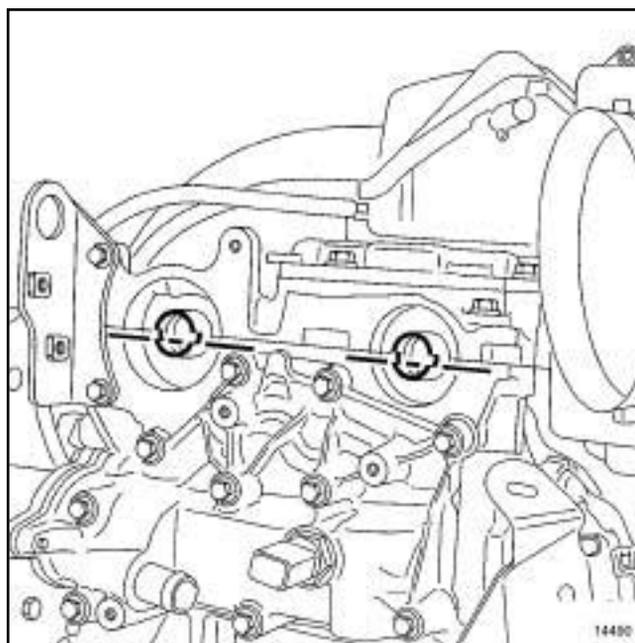
#### WARNING

Always degrease:

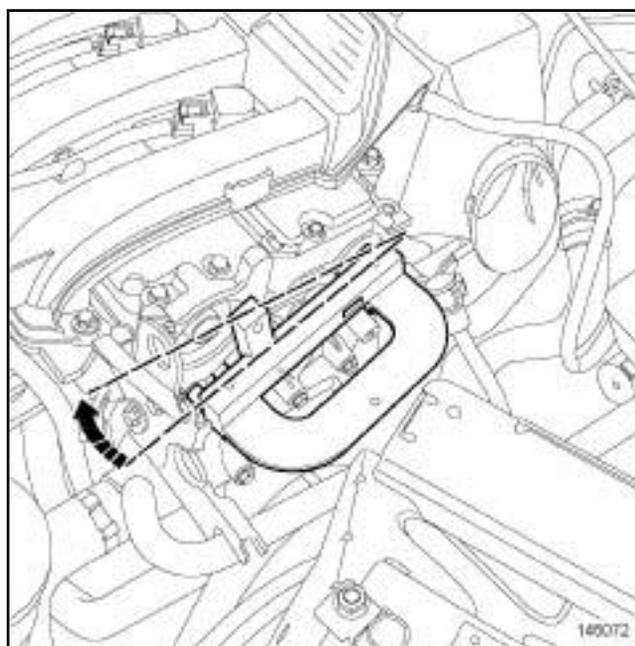
- the end of the crankshaft (timing end),
- the timing sprocket pressure faces and bore of the crankshaft,
- the crankshaft accessories pulley bearing faces,
- the camshaft ends (timing end),
- the camshaft sprocket bores and bearing faces.

This is to avoid timing slippage.

This slippage leads to engine damage.



14490



145072

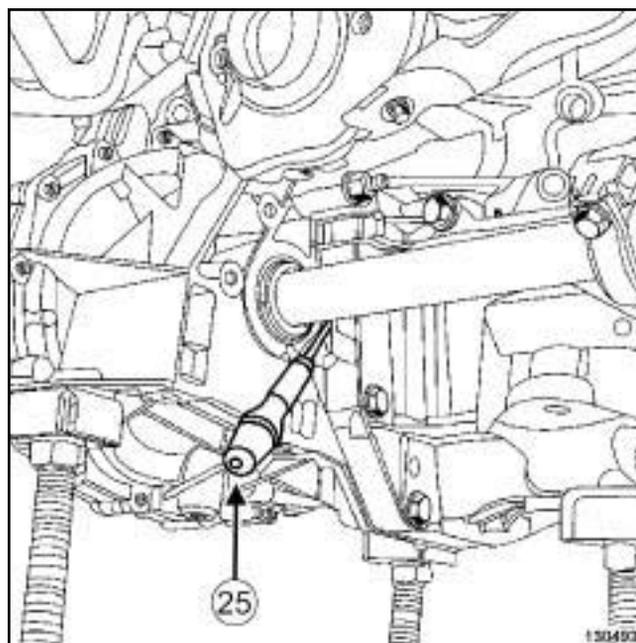
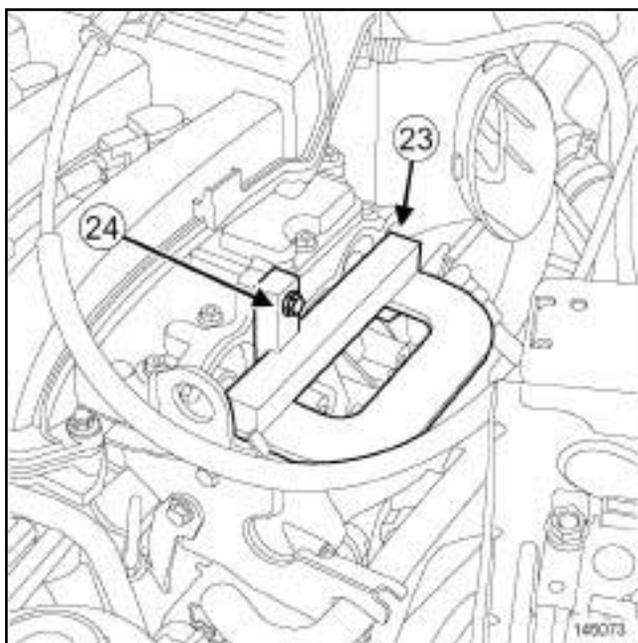
- Position the camshaft grooves horizontally and below the centre line, by turning the camshafts with their necessary.

# TOP AND FRONT OF ENGINE

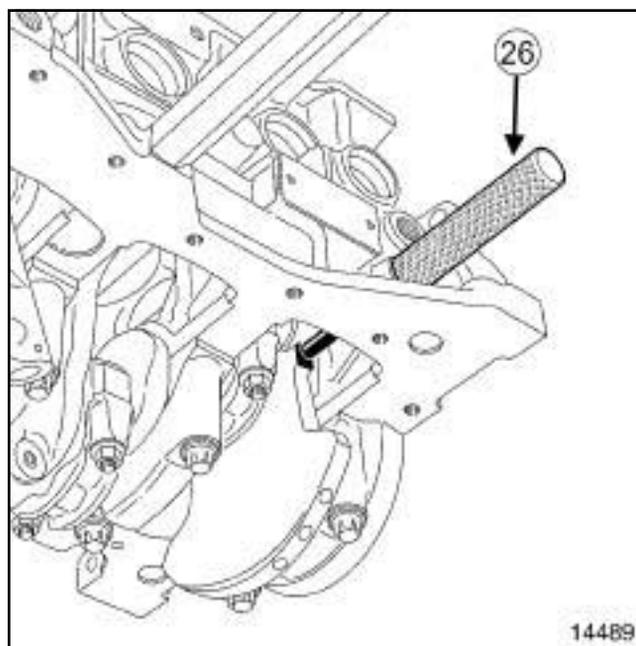
## Timing belt: Removal - Refitting

# 11A

K4M



- Fit:
  - the (23) onto the ends of the camshafts,
  - an M6 bolt (24) to hold the.
- Refit:
  - the crankshaft timing sprocket,
  - the camshaft sprockets,
  - every camshaft sprocket nut.



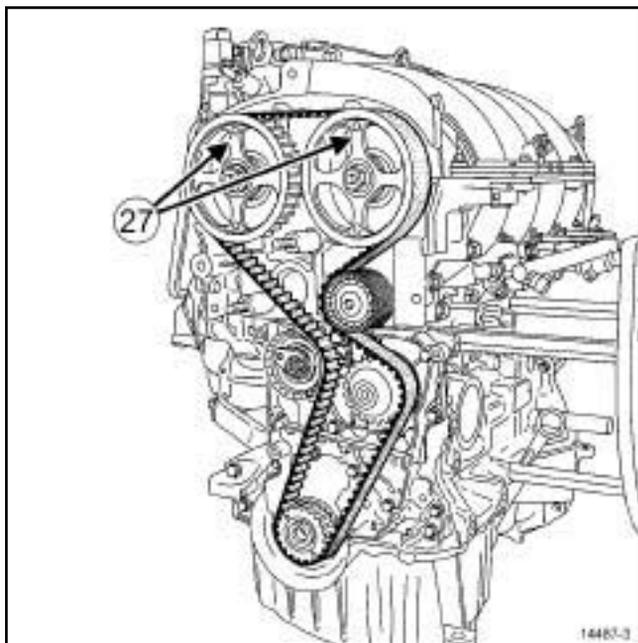
- Refit the tool on the cylinder block.
- Use a screwdriver (25) to check that the flywheel does not turn (clockwise at the timing end), otherwise bring the crankshaft back into contact with the tool (26) using the screwdriver; the crankshaft groove should be at the top.

# TOP AND FRONT OF ENGINE

## Timing belt: Removal - Refitting

# 11A

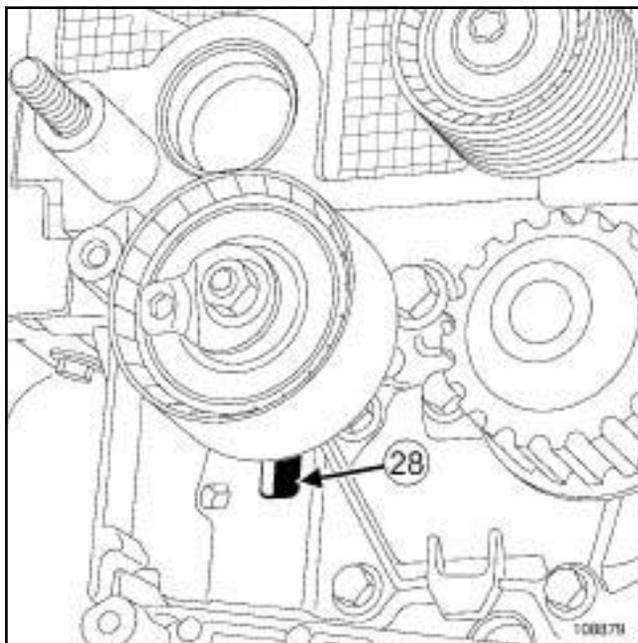
K4M



14487-3

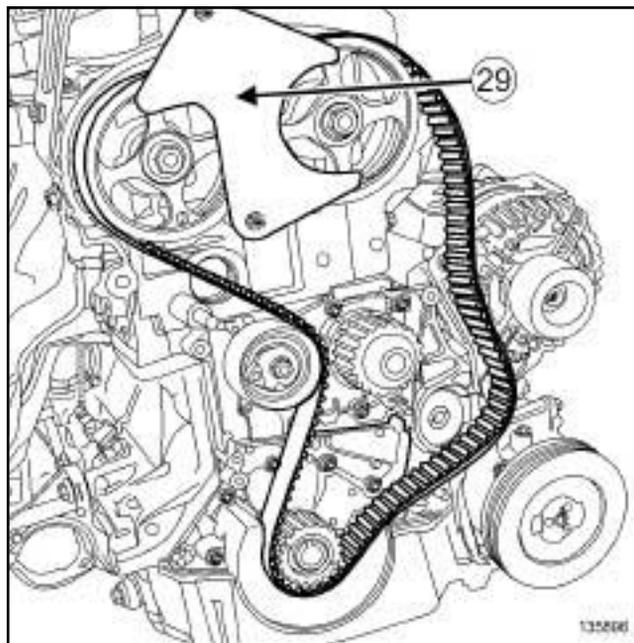
- ❑ Position the RENAULT badge (27) etched on the stem of each camshaft sprocket vertically and pointing upwards.

### 2 - Refitting



108879

- ❑ Refit a new timing tensioning roller by positioning the lug of the timing tensioning roller in the groove (28) .
- ❑ Screw on the timing tensioning roller nut without tightening it.



135896

- ❑ Refit a new timing belt starting with the sprocket of each camshaft (without moving the sprocket of each camshaft).
- ❑ Fit the tool (29) on the camshaft sprockets (use the bolt and nut of the upper timing cover to fit the tool).

#### Note:

Take care to properly tighten the timing belt between the two camshaft sprockets.

#### Note:

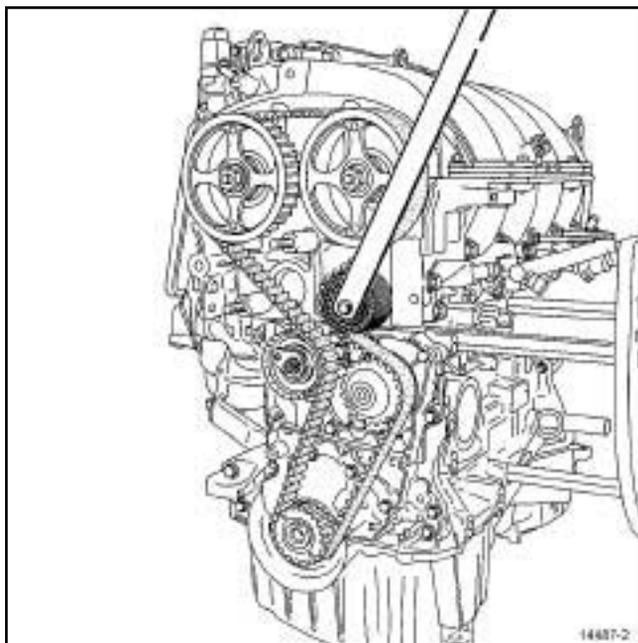
If the engine is equipped with a crankshaft timing sprocket with a collet, take care to properly tighten the timing belt between the exhaust camshaft sprocket and the crankshaft timing sprocket.

# TOP AND FRONT OF ENGINE

## Timing belt: Removal - Refitting

# 11A

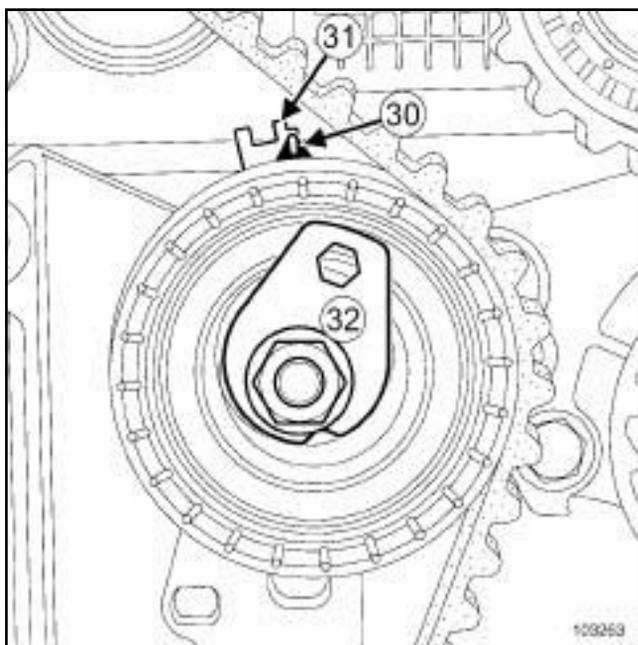
K4M



14487-2

- Refit a new timing fixed roller.
- Torque tighten the **timing fixed roller bolt (50 N.m)** using the tool.

### 3 - Timing belt tension



103263

- Position the adjustable index (30) opposite the mark (31), by turning the eccentric (32) clockwise using an Allen key.

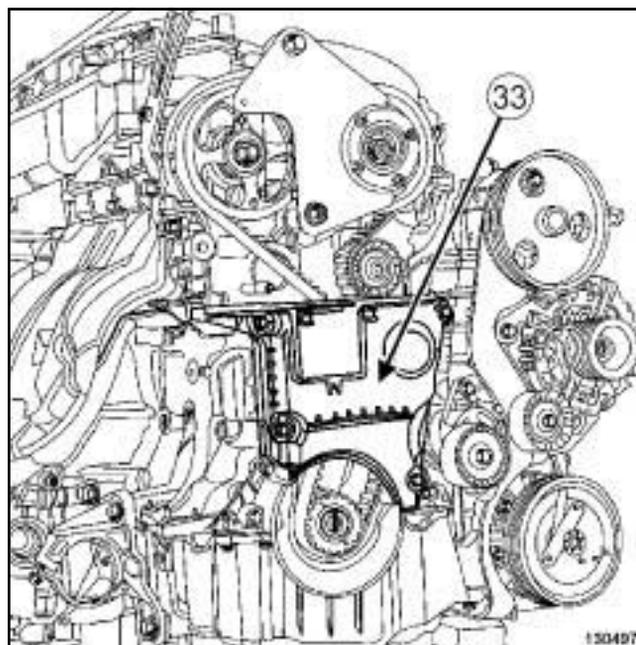
- Torque tighten the **timing tensioning roller nut (7 N.m)**.

Note:

There are two types of lower timing cover:

- without a timing flap,
- with a timing flap.

### a - Lower timing cover with a timing flap



130497

- Refit the lower timing cover (33).
- Tighten to torque the **lower timing cover bolts (12 N.m)**.

### b - continuation of the refitting procedure regardless of the type of lower timing cover

- Refit a new crankshaft accessories pulley.
- Torque and angle tighten:
  - the **new bolt of the crankshaft accessories pulley (40 N.m + 145° ± 15°)**,
  - the **nut of each camshaft sprocket (30 N.m + 84° ± 4°)**.

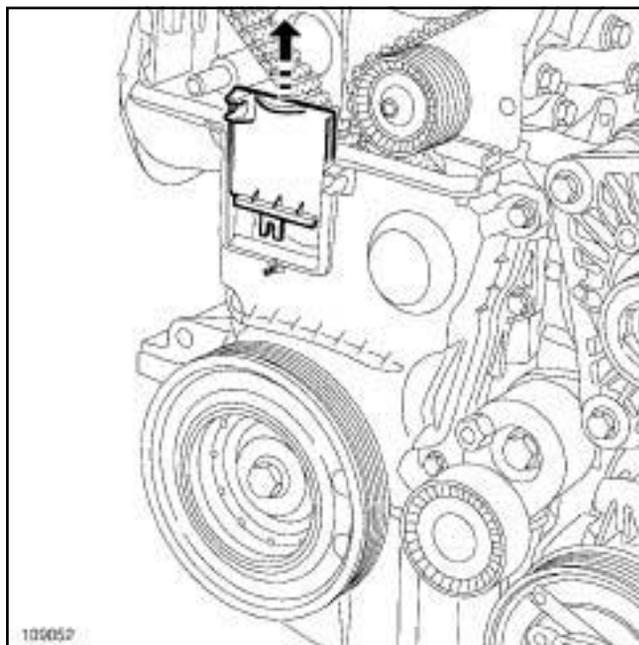
# TOP AND FRONT OF ENGINE

## Timing belt: Removal - Refitting

# 11A

K4M

### c - Lower timing cover with a timing flap



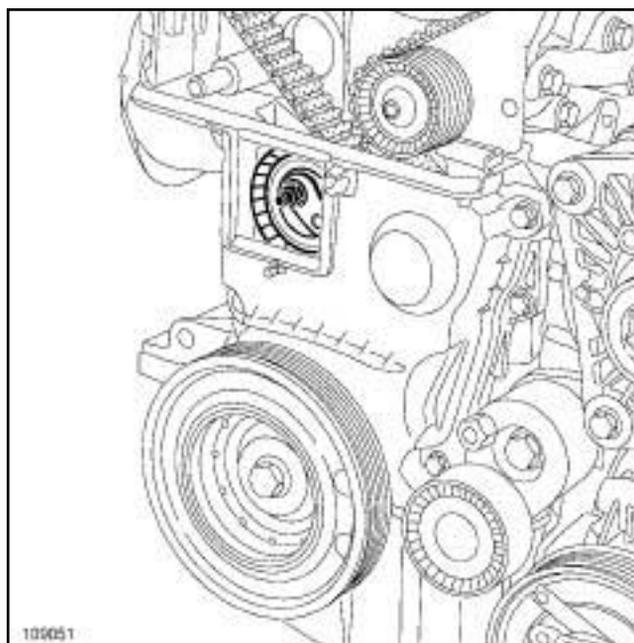
- ❑ Remove the timing flap from the lower timing cover.

### d - continuation of the refitting procedure regardless of the type of lower timing cover

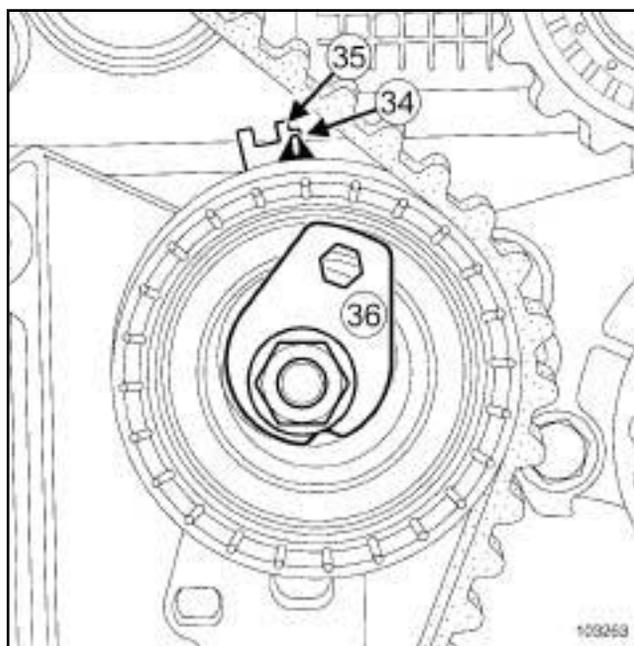
- ❑ Remove:
  - the bolt of the tool,
  - the,
  - the tool from the cylinder block,
  - the.

### 4 - Checking the tension

- ❑ Rotate the crankshaft twice clockwise at the timing end and before aligning the marks made previously by the operator (on the camshaft dephaser), screw the tool into the cylinder block.
- ❑ Move the crankshaft slowly and smoothly until it comes into contact with the tool.
- ❑ Remove the tool from the cylinder block.



109051



103263

- ❑ Check that the adjustable index (34) is opposite the notch (35), if this is not the case:
  - loosen the timing tensioning roller nut by up to one turn while holding the eccentric with an Allen key,
  - gradually move the adjustable index marker (34) opposite the mark (35) turning the eccentric cam (36) clockwise.
- ❑ Torque tighten the **timing tensioning roller nut (27 N.m)**.

# TOP AND FRONT OF ENGINE

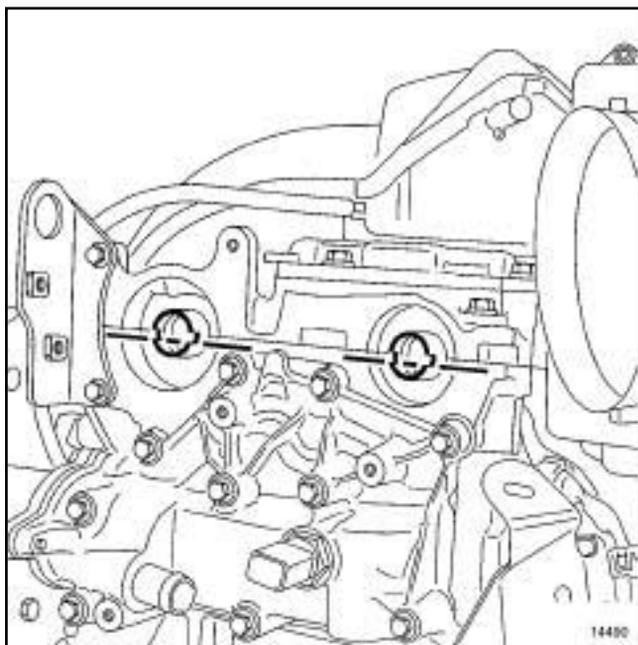
## Timing belt: Removal - Refitting

# 11A

K4M

### 5 - Checking the timing

- Ensure that the index and the notch on the timing tensioning roller are in the correct position before checking the timing.
- Screw tool into the cylinder block.
- Move the crankshaft slowly and smoothly until it comes into contact with the tool.



14490

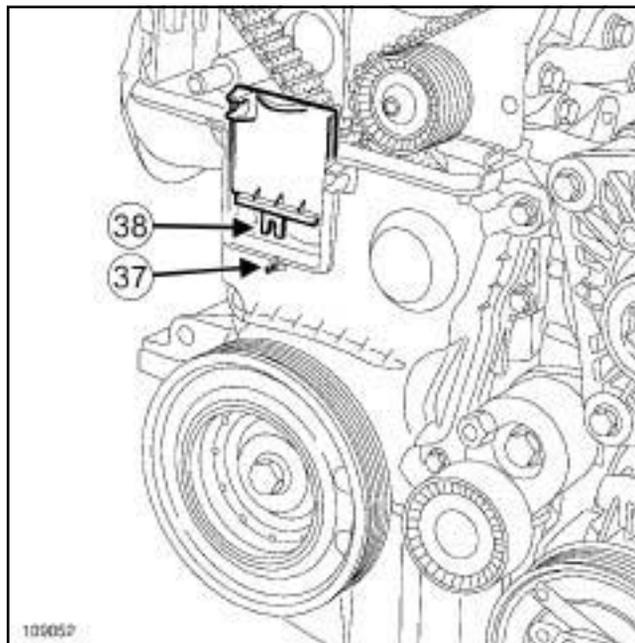
- Position (without forcing) the (the camshaft end grooves must be horizontal and offset downwards).

#### Note:

If the cannot be engaged, readjust the timing and the tension.

- Remove:
  - the setting tool,
  - the from the cylinder block.

### a - Lower timing cover with a timing flap



109052

- Refit the lower timing cover flap, checking that the locating pin (37) fits properly in the notch (38) .

### b - Lower timing cover without a timing flap

- Refit the lower timing cover.
- Tighten to torque the **lower timing cover bolts (12 N.m)**.

### III - FINAL OPERATION

- Apply a drop of **SILICONE ADHESIVE SEALANT** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to the thread of the TDC pin plug.
- Tighten to torque the **TDC pin plug (20 N.m)**.
- Refit the upper timing cover.
- Torque tighten:
  - the **upper timing cover bolts (46 N.m)**,
  - the **upper timing cover nuts (46 N.m)**.
- Refit:
  - a new inlet camshaft plug using the,
  - a new exhaust camshaft plug using the,
  - the engine lifting eye at the flywheel end.
- Torque tighten the **flywheel end lifting eye bolts (10 N.m)**.

# TOP AND FRONT OF ENGINE

## Timing belt: Removal - Refitting

# 11A

K4M

Refit:

- the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page **19D-4**),
- the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page **11A-2**),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the air resonator (see **12A, Fuel mixture, Air resonator: Removal - Refitting**, page **12A-2**),
- the air inlet duct.

- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

# TOP AND FRONT OF ENGINE

## Timing belt: Removal - Refitting

# 11A

K9K, and 796

### Special tooling required

<b>Mot. 1453</b>	Engine anchorage support with multiple adjustments and retaining straps.
<b>Mot. 1489</b>	TDC locating pin.
<b>Mot. 1430</b>	Set of 5 crankshaft and camshaft pulley timing pins.

### Tightening torques

timing belt tensioning roller bolt	<b>27 N.m</b>
accessories pulley M14 bolt	<b>120 N.m + 95° ± 15°</b>
timing belt tensioning roller bolt	<b>27 N.m</b>
TDC pin plug	<b>25 N.m</b>
right-hand suspended engine mounting bolts	<b>25 N.m</b>

### IMPORTANT

To avoid all risk of damage to the systems, apply the safety and cleanliness instructions and operation recommendations before carrying out any repair (see **Engine: Precautions for the repair**).

### IMPORTANT

Wear protective gloves during every operation.

### WARNING

Never run the engine in the opposite direction to that of normal operation.

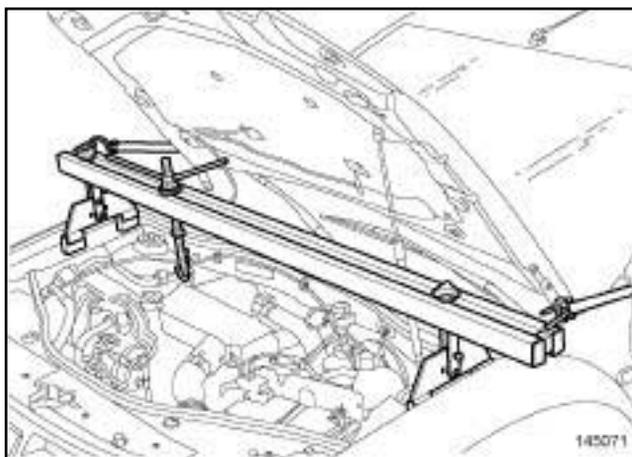
### WARNING

Do not run the engine without the accessories belt to avoid damaging the crankshaft accessories pulley.

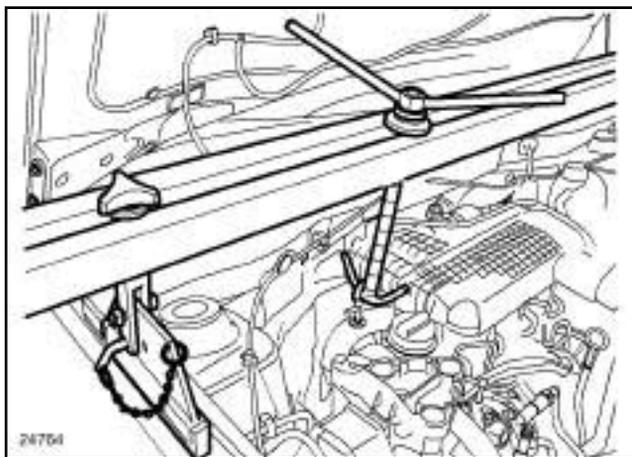
## REMOVAL

### I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).



145071  
145071



24764

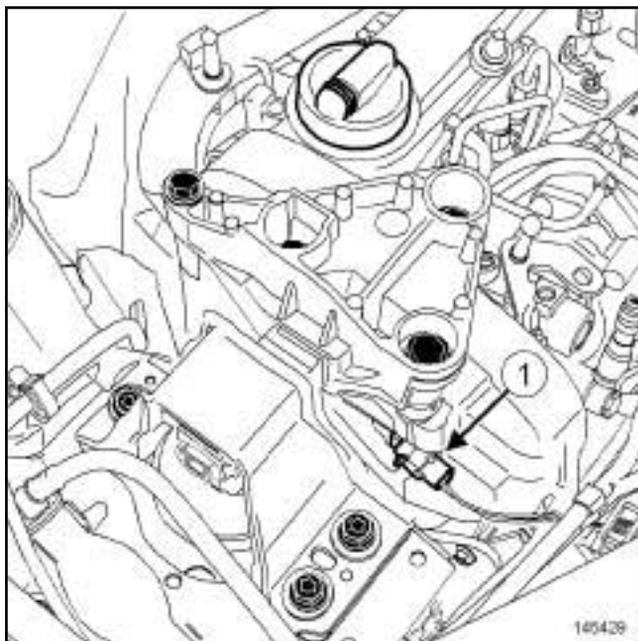
- Fit the engine support tool (**Mot. 1453**) with the retaining belt, taking the timing end lifting eye as an anchoring point.

# TOP AND FRONT OF ENGINE

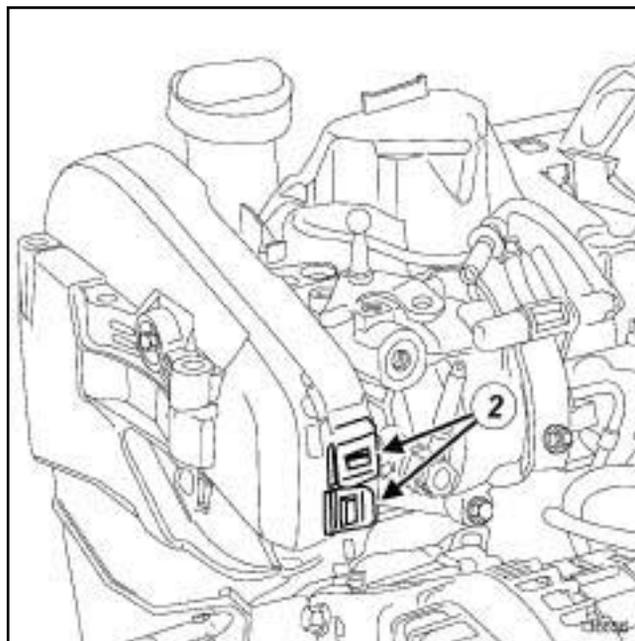
## Timing belt: Removal - Refitting

# 11A

K9K, and 796

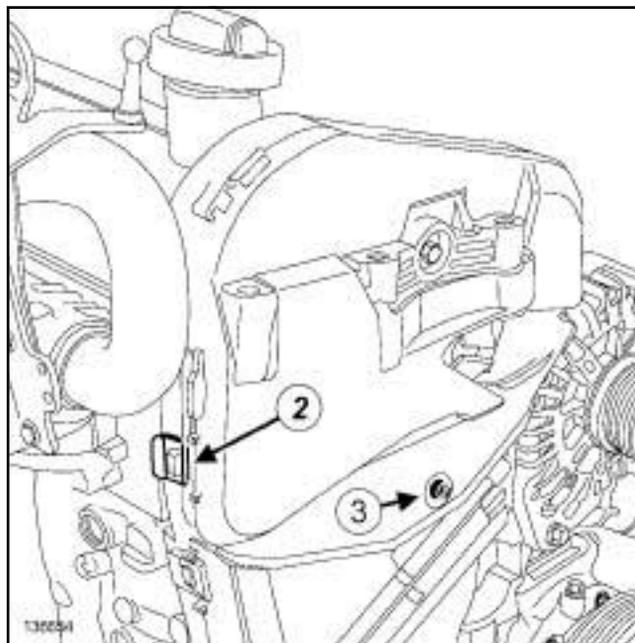


145429



136656

- Mark the position of the suspended engine mounting in relation to the body.
- Remove:
  - the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page **19D-4**),
  - the camshaft position sensor (1) (see **13B, Diesel injection, Camshaft position sensor: Removal - Refitting**, page **13B-7**),
  - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page **11A-2**).



136654

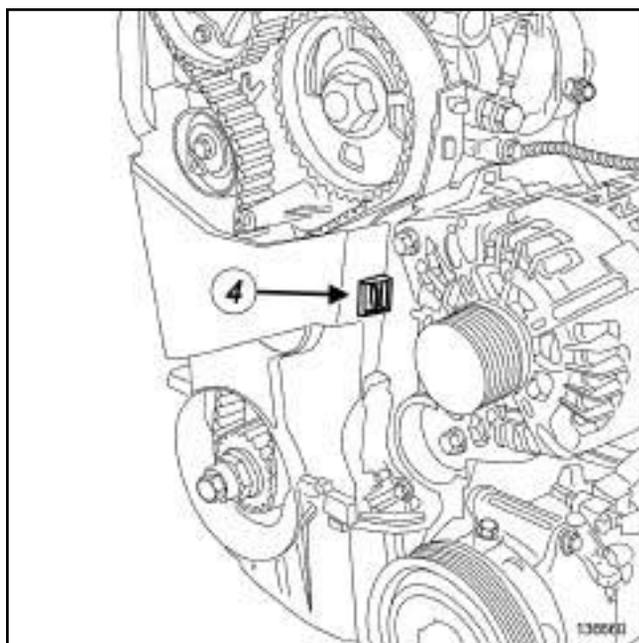
- Remove:
  - the bolt (3) from the upper timing cover,
  - the upper timing cover by unclipping the three tabs (2).

# TOP AND FRONT OF ENGINE

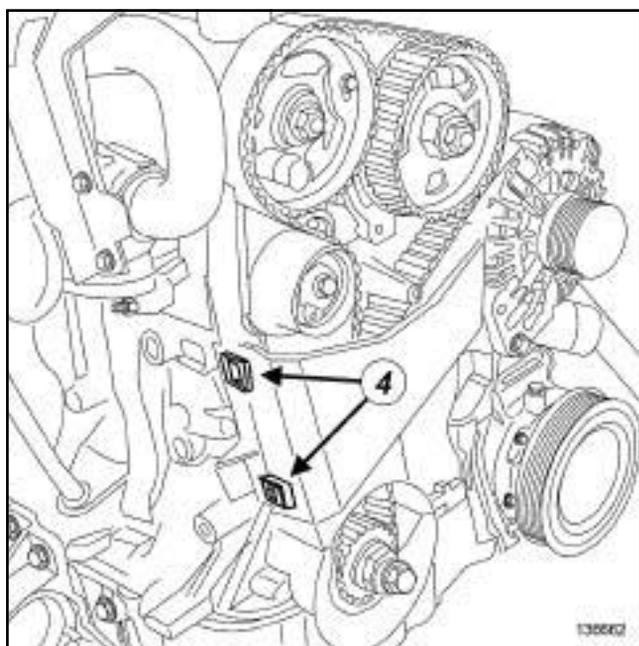
## Timing belt: Removal - Refitting

# 11A

K9K, and 796

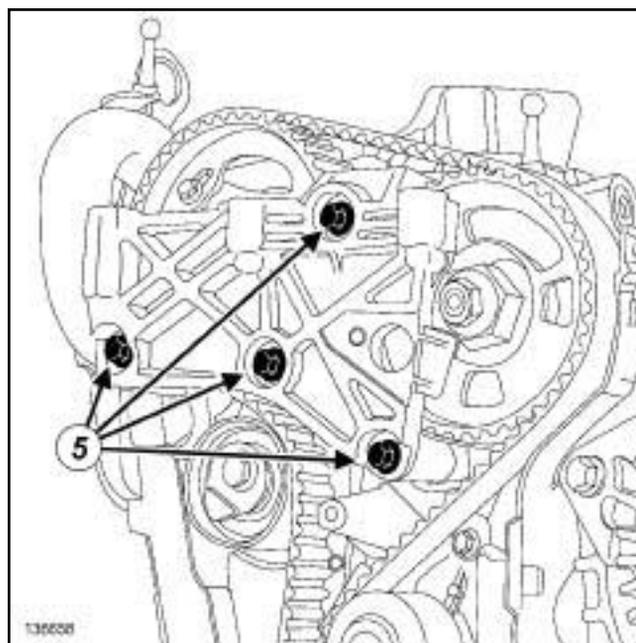


136660



136662

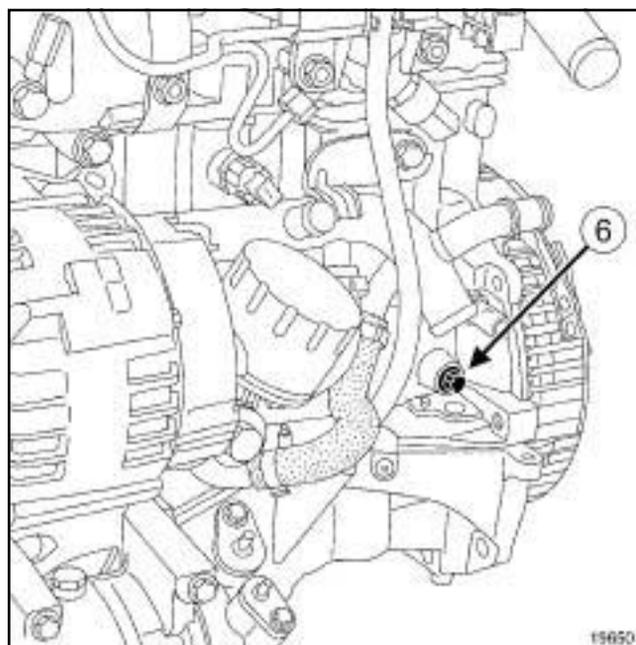
- Unclip the three tabs (4) .
- Remove the lower timing cover.



136658

- Remove:
  - the bolts (5) from the right-hand suspended engine mounting support on the cylinder head,
  - the right-hand pendulum suspension support.

### II - REMOVAL OPERATION



19650

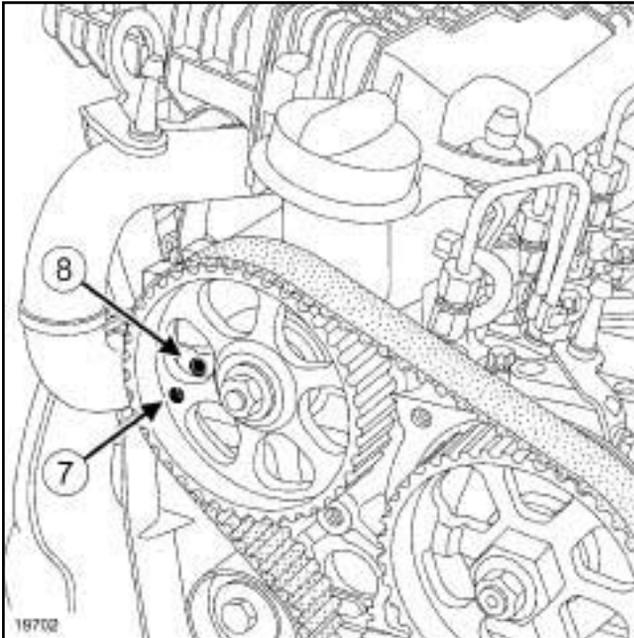
- Remove the TDC pin plug (6) using a 14 female torx socket.

# TOP AND FRONT OF ENGINE

## Timing belt: Removal - Refitting

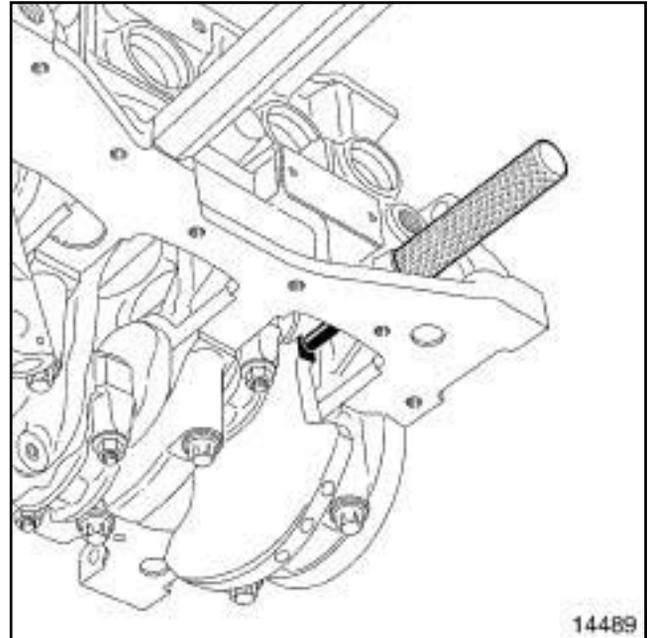
# 11A

K9K, and 796



19702

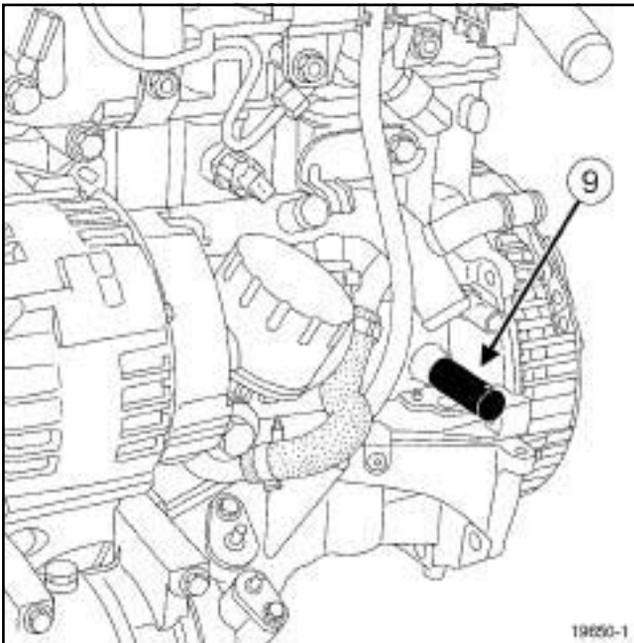
- ❑ Turn the crankshaft to position the camshaft pulley hole (7) almost opposite the cylinder head hole (8) .



14489

14489

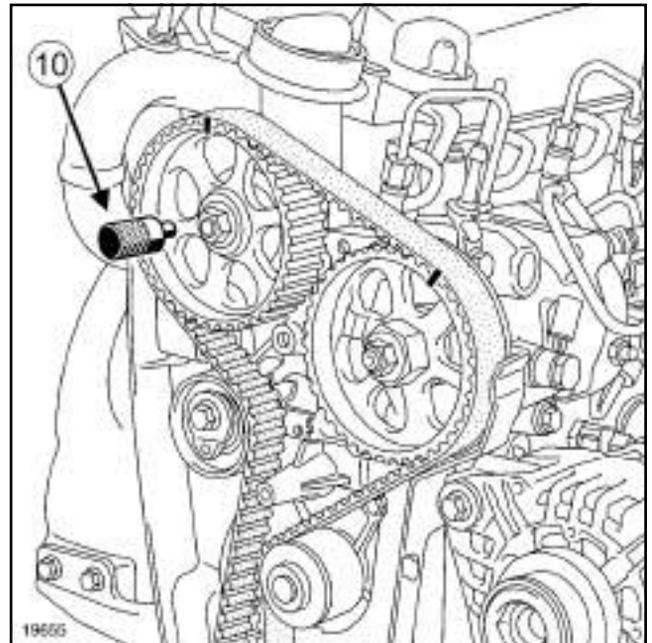
- ❑ Turn the crankshaft clockwise (timing end) smoothly until the crankshaft is against the **(Mot. 1489)**.



19650-1

19650-1

- ❑ Screw tool **(Mot. 1489)** (9) into the cylinder block.



19655

19655

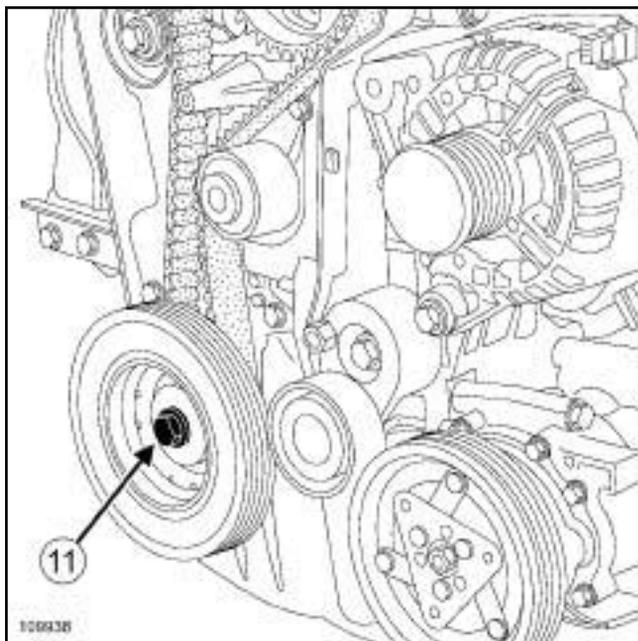
- ❑ Insert the **(Mot. 1430)** (10) in the holes of the camshaft pulley and cylinder head.
- ❑ Remove:
  - the **(Mot. 1430)**,
  - the **(Mot. 1489)**.

# TOP AND FRONT OF ENGINE

## Timing belt: Removal - Refitting

# 11A

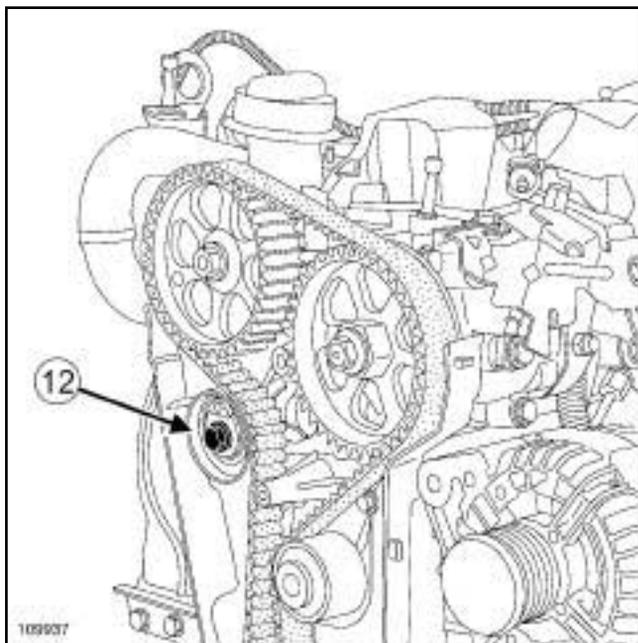
K9K, and 796



109938

Remove:

- the bolt (11) from the crankshaft accessories pulley, locking the flywheel using a large screwdriver,
- the crankshaft accessories pulley.



109937

Undo the timing belt tensioning roller bolt (12) .

- Loosen the timing belt tensioning roller by turning the eccentric cam using a **6 mm** Allen key.

Remove:

- the timing belt taking care not to let the crankshaft timing sprocket fall out.

- the timing belt tensioning roller.

### REFITTING

#### I - REFITTING PREPARATION OPERATION

##### WARNING

The belt must be replaced with a new one if it has been removed.

##### WARNING

When replacing the belt, always replace the tension wheels and idler pulleys.

##### WARNING

Always degrease:

- the end of the crankshaft (timing end),
- the timing sprocket pressure faces and bore of the crankshaft,
- the contact surfaces of the crankshaft accessories pulley.

This is to avoid timing slippage.

This slippage leads to engine damage.

#### II - PARTS AND CONSUMABLES FOR THE REPAIR

- parts always to be replaced: Crankshaft accessories pulley bolts,
- parts always to be replaced: Timing belt tensioning roller,
- parts always to be replaced: Timing belt.

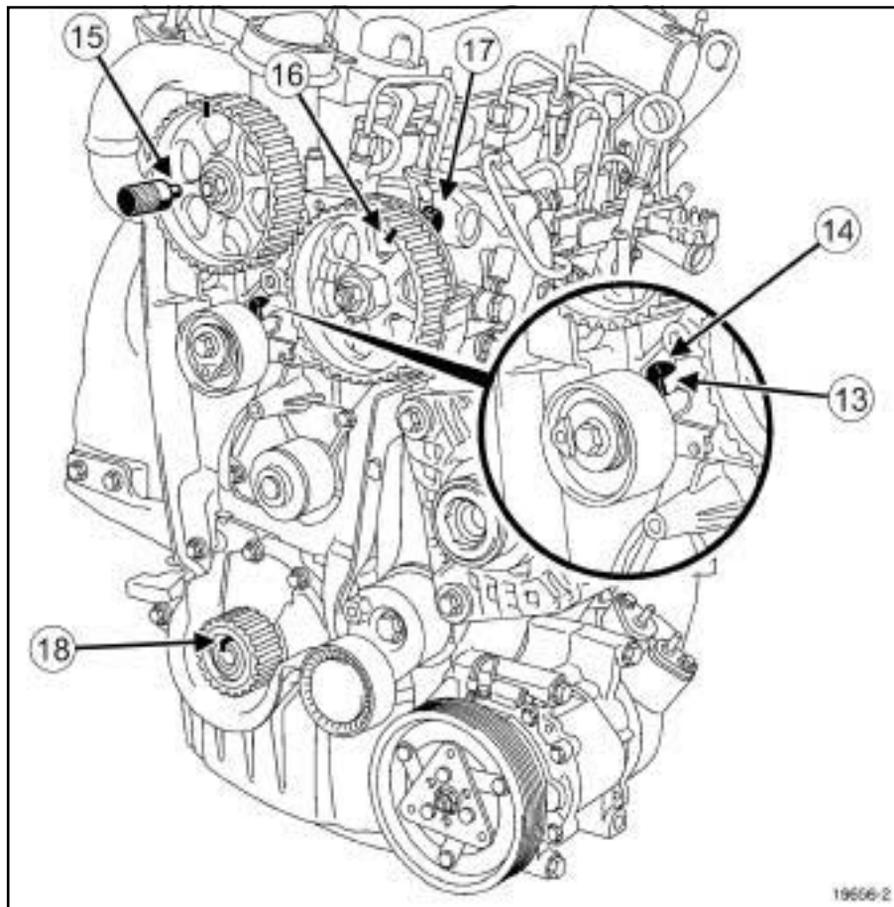
# TOP AND FRONT OF ENGINE

## Timing belt: Removal - Refitting

# 11A

K9K, and 796

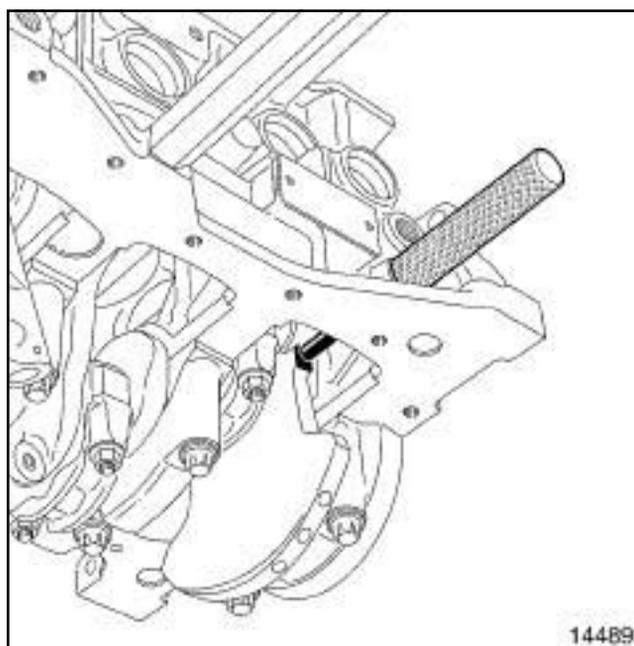
### III - REFITTING OPERATION



19656-2

19656-2

- ❑ Refit:
  - the crankshaft timing sprocket,
  - a new timing belt tensioning roller.
- ❑ Put the tensioning roller lug (13) in the cylinder head groove (14) .
- ❑ Engage the (Mot. 1430) in the camshaft pulley hole and the cylinder head hole at (15) , turning the camshaft using an 18 mm offset wrench if necessary.
- ❑ Check that high-pressure pump pulley marking (16) is opposite the bolt head (17) .



14489

14489

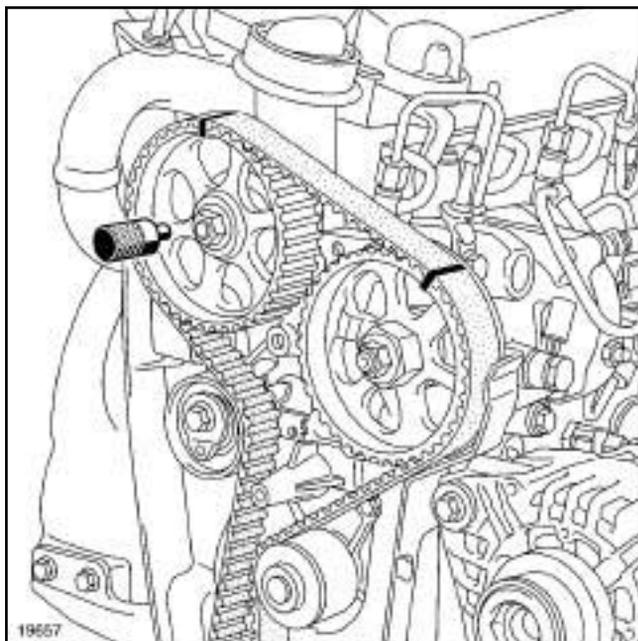
- ❑ Refit the (Mot. 1489).
- ❑ Place the crankshaft against the (Mot. 1489) (the crankshaft groove (18) must be upwards).

# TOP AND FRONT OF ENGINE

## Timing belt: Removal - Refitting

# 11A

K9K, and 796

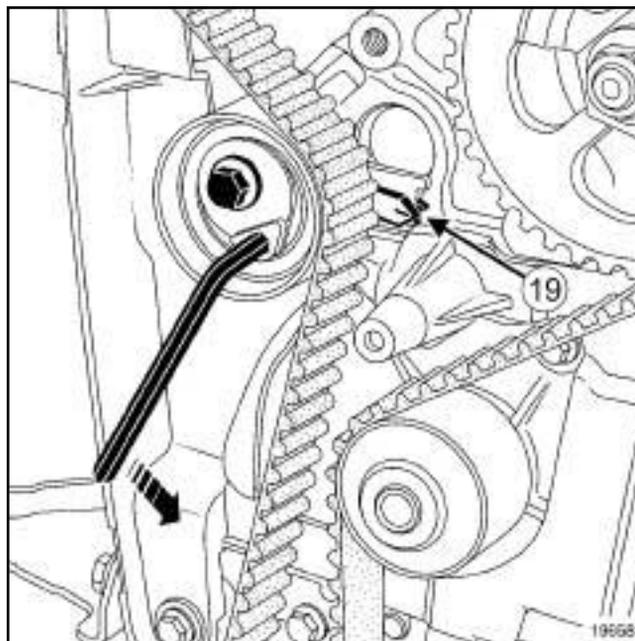


19657

- ❑ Fit the new timing belt, starting with the crankshaft sprocket, aligning the marks on the belt with those on the camshaft and high pressure pump pulleys.

### Note:

There must be **19 timing belt tooth grooves** between the marks of the camshaft and high pressure pump pulleys and **51 timing belt tooth grooves** between the marks of the crankshaft timing sprocket and the high pressure pump pulley.



19658

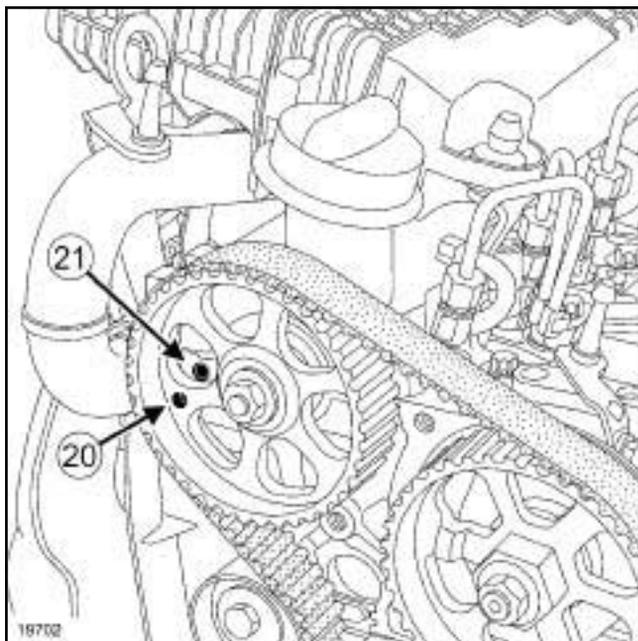
- ❑ Position the timing belt tensioning roller adjustable index opposite the lug (19) by turning the eccentric cam anti-clockwise using a **6 mm** Allen key.
- ❑ Torque tighten the **timing belt tensioning roller bolt (27 N.m)**.
- ❑ Refit the accessories crankshaft pulley with a new bolt.
- ❑ Torque and angle tighten (crankshaft against the **(Mot. 1489)**) the **accessories pulley M14 bolt (120 N.m + 95° ± 15°)**.
- ❑ Remove:
  - the **(Mot. 1430)**,
  - the **(Mot. 1489)**.

# TOP AND FRONT OF ENGINE

## Timing belt: Removal - Refitting

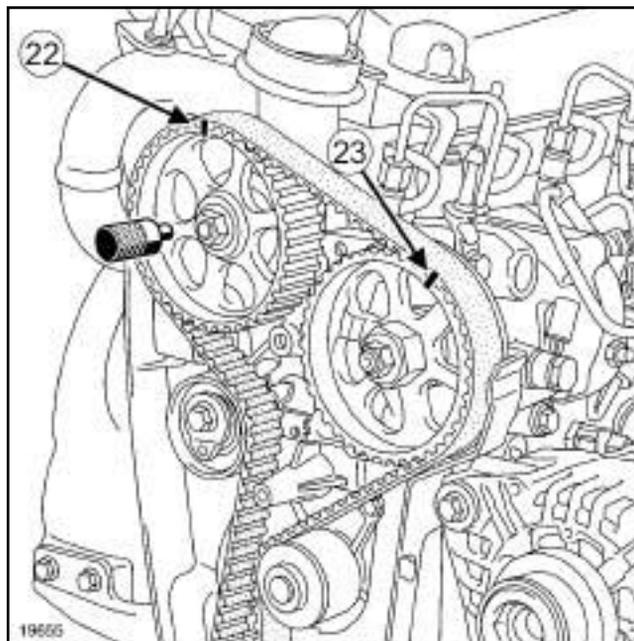
# 11A

K9K, and 796



19702

- Rotate the crankshaft clockwise through two revolutions (timing end).
- Before the camshaft pulley hole (20) is opposite the cylinder head hole (21), screw the (Mot. 1489) into the cylinder block.
- Bring the crankshaft slowly and smoothly into contact with the tool (Mot. 1489).



19655

- Set the camshaft pulley using the (Mot. 1430).

Note:

There should be **19 belt tooth grooves** between the marks on the camshaft pulley (22) and the high pressure pump pulley (23).

- Remove:
  - the (Mot. 1489),
  - the (Mot. 1430).

Note:

After rotating the crankshaft through two revolutions, the tensioning roller adjustable index may be in one of two positions.

The rotation of the tension wheel eccentric depends on the position.

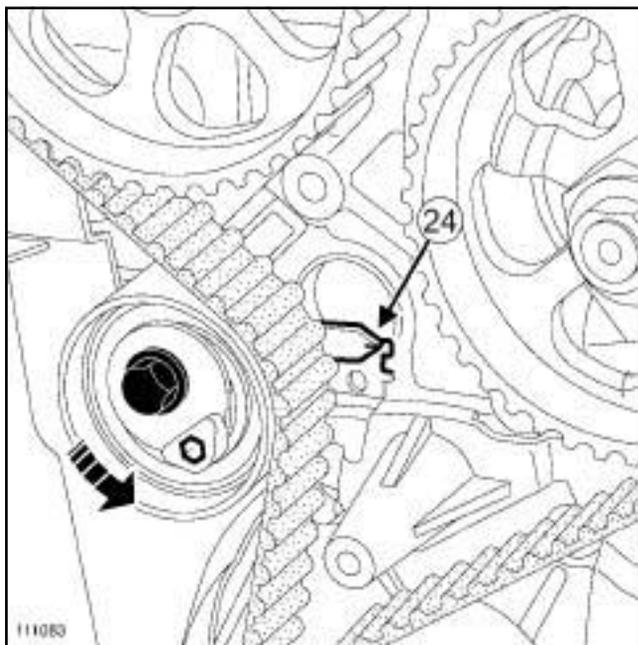
# TOP AND FRONT OF ENGINE

## Timing belt: Removal - Refitting

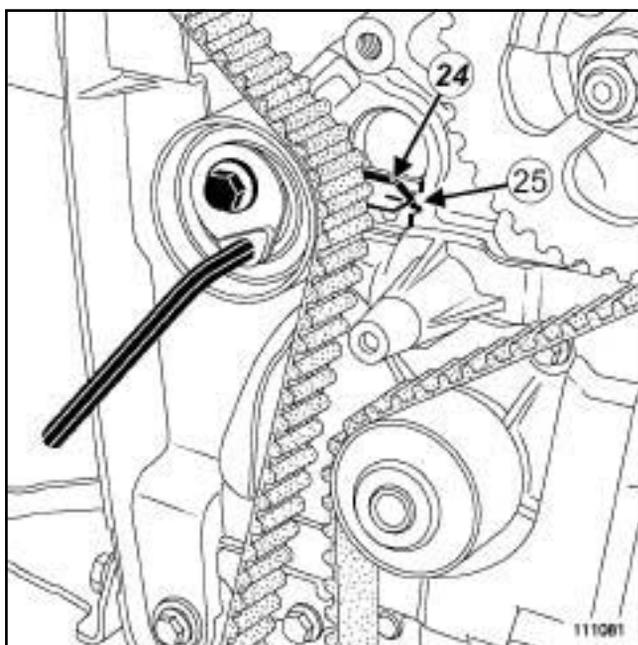
# 11A

K9K, and 796

### 1 - First position



111083



111081

- Loosen the tensioning roller bolt by no more than one turn, holding it with a **6 mm Allen key**.
- Gradually align the adjustable index marker (24) in the middle of the timing window (25), turning the key anti-clockwise.

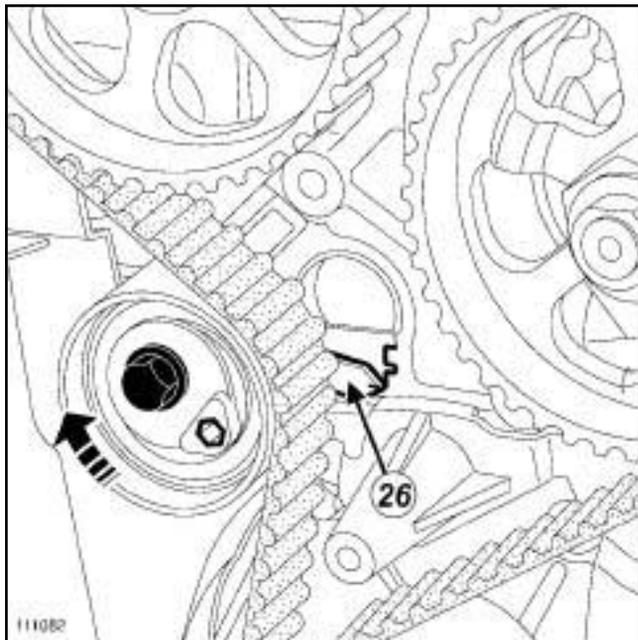
# TOP AND FRONT OF ENGINE

## Timing belt: Removal - Refitting

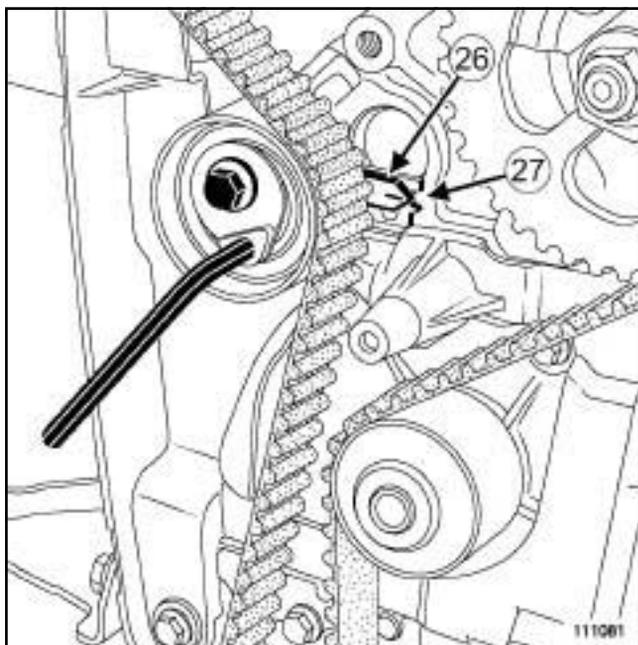
# 11A

K9K, and 796

### 2 - Second position



111082

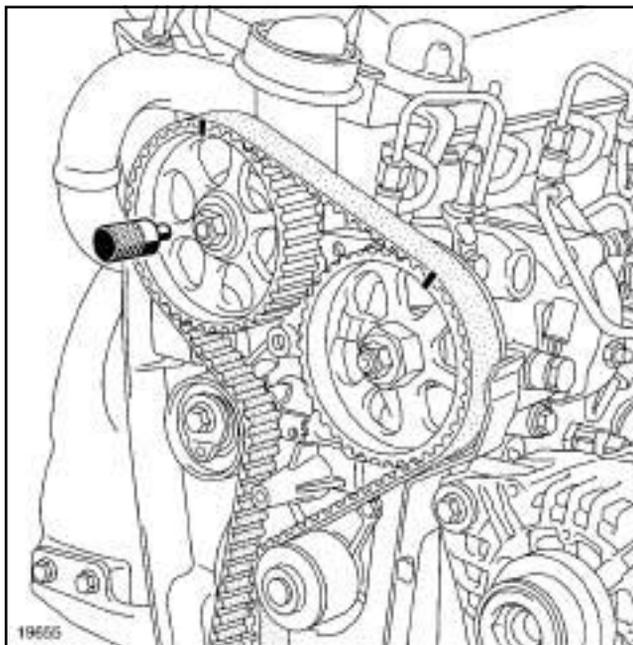


111081

- Loosen the tensioning roller bolt by one turn, holding it with a **6 mm** Allen key.
- Gradually align the adjustable index marker (26) in the middle of the timing window (27), turning the key clockwise.
- Torque tighten the **timing belt tensioning roller bolt (27 N.m)**.
- Rotate the crankshaft clockwise through two revolutions (timing end).
- Before the camshaft pulley hole is opposite the cylinder head hole, screw the **(Mot. 1489)** into the cylinder

der block.

- Bring the crankshaft slowly and smoothly into contact with the tool **(Mot. 1489)**.



19655

- Set the camshaft pulley using the **(Mot. 1430)**.
- If the tool **(Mot. 1430)** does not engage, repeat the timing belt refitting operation.
- Remove:
  - the **(Mot. 1489)**,
  - the **(Mot. 1430)**.

### IV - FINAL OPERATION

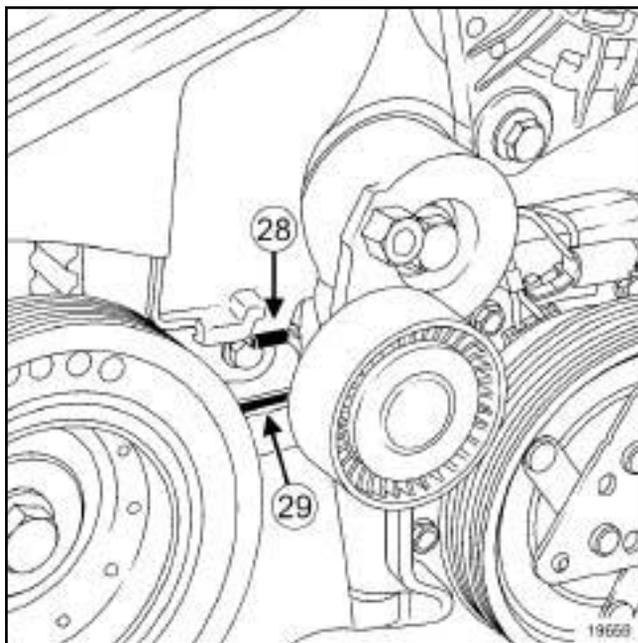
- Place a drop of **SILICONE ADHESIVE SEALANT** (see **Vehicle: Parts and consumables for the repair**) on the threading of the TDC pin plug.
- Torque tighten the **TDC pin plug (25 N.m)**.
- Refit the right-hand suspended engine mounting support on the cylinder head.
- Torque tighten the **right-hand suspended engine mounting bolts (25 N.m)**.

# TOP AND FRONT OF ENGINE

## Timing belt: Removal - Refitting

# 11A

K9K, and 796



19659

- Refit the lower timing cover, positioning the tab (28) in the opening (29) on the inner cover.
- Clip on the lower timing cover.
- Refit:
  - the upper timing cover,
  - the upper timing cover bolt.
- Clip on the upper timing cover.
- Refit:
  - the camshaft position sensor (see 13B, Diesel injection, Camshaft position sensor: Removal - Refitting, page 13B-7) ,
  - the accessories belt (see 11A, Top and front of engine, Accessories belt: Removal - Refitting, page 11A-2) ,
  - the right-hand suspended engine mounting (see 19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting, page 19D-4) , observing the marks made during removal.
- Remove the engine support tool (Mot. 1453).
- Refit the front right-hand wheel (see Wheel: Removal - Refitting) (35A, Wheels and tyres).
- Connect the battery (see Battery: Removal - Refitting) (80A, Battery).

# TOP AND FRONT OF ENGINE

## Rocker cover: Removal - Refitting

# 11A

K4M

Tightening torques 	
rocker cover bolts 22, 23, 20 and 13	8 N.m
rocker cover bolts 1 to 12, 14 to 19, 21 to 24	15 N.m
rocker cover bolts 22, 23, 20 and 13	15 N.m
flywheel end lifting eye bolts on the rocker cover	11 N.m

## REMOVAL

### I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove:
  - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
  - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-2) ,
  - the air resonator (see **12A, Fuel mixture, Air resonator: Removal - Refitting**, page 12A-2) ,
  - the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-17) ,
  - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-6) ,
  - the throttle valve (see **12A, Fuel mixture, Throttle valve: Removal - Refitting**, page 12A-11) ,
  - the inlet distributor (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page 12A-12) ,
  - the timing end camshaft seals (see **11A, Top and front of engine, Camshaft seal, timing end: Removal - Refitting**, page 11A-56) ,
  - the ignition coils (see **17A, Ignition, Coils: Removal - Refitting**, page 17A-1) ,
  - the oil decanter (see **11A, Top and front of engine, Oil decanter: Removal - Refitting**, page 11A-68) ,
  - the flywheel end lifting eye on the rocker cover.

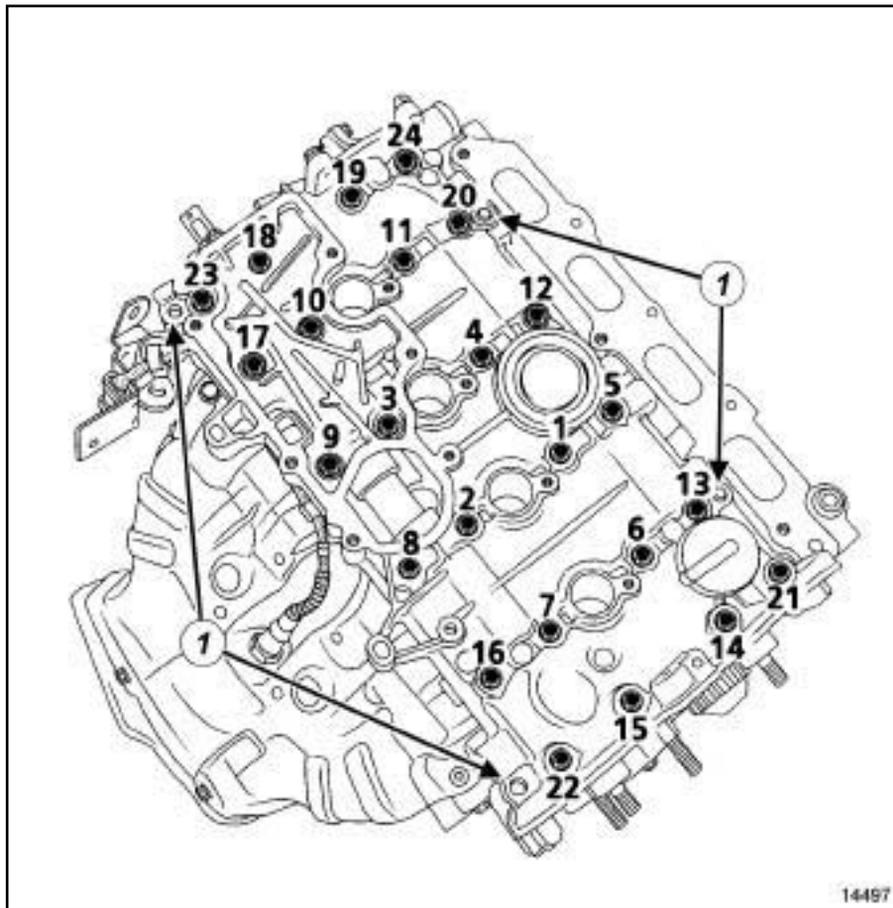
# TOP AND FRONT OF ENGINE

## Rocker cover: Removal - Refitting

# 11A

K4M

### II - REMOVAL OPERATION



14497

14497

- Remove the rocker cover bolts.
- Remove the rocker cover vertically by tapping the lugs (1) with a copper hammer.
- Remove the rocker cover.

# TOP AND FRONT OF ENGINE

## Rocker cover: Removal - Refitting

# 11A

K4M

### REFITTING

#### I - REFITTING PREPARATION OPERATION



##### IMPORTANT

Wear cut-resistant gloves during the operation.

##### IMPORTANT

Wear goggles with side protectors for this operation.

##### WARNING

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

##### WARNING

Do not allow this product to drip onto the paintwork.

Clean the cylinder head carefully to prevent foreign bodies from entering the oil supply and return galleries.

Failure to follow this advice could lead to the blocking of the various oil inlet galleries, which would quickly result in engine damage.

##### Note:

The gasket faces on the rocker cover must be clean, dry and free from grease (avoid finger marks).

- Clean the gasket face of the rocker cover and cylinder head with **SUPER CLEANING AGENT FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to dissolve any pieces of seal that are still attached.
- Apply the product to the section to be cleaned.
- Wait approximately fifteen minutes, then remove any residue with a wooden spatula.
- Lubricate the cylinder head camshaft bearings with engine oil.

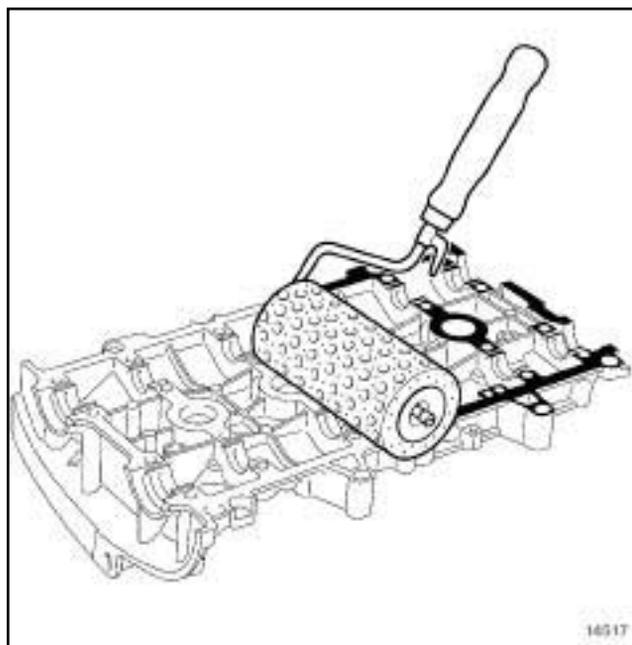


##### WARNING

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.)

##### Note:

Do not put oil on the gasket face of the cylinder head cover.



14517

14517

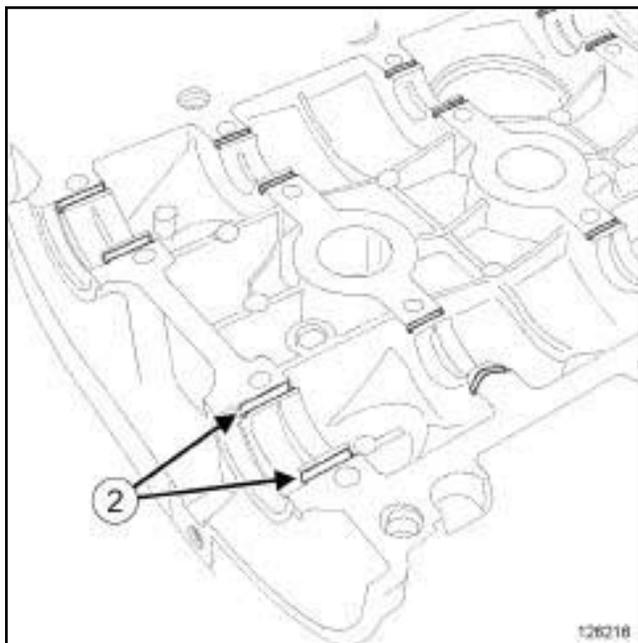
- Using a stipple roller, apply **RESIN ADHESIVE** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to the gasket face until it is well coated.

# TOP AND FRONT OF ENGINE

## Rocker cover: Removal - Refitting

# 11A

K4M



126216

- Use a cloth to remove any **RESIN GLUE** in the bearing channels (2) on the rocker cover.

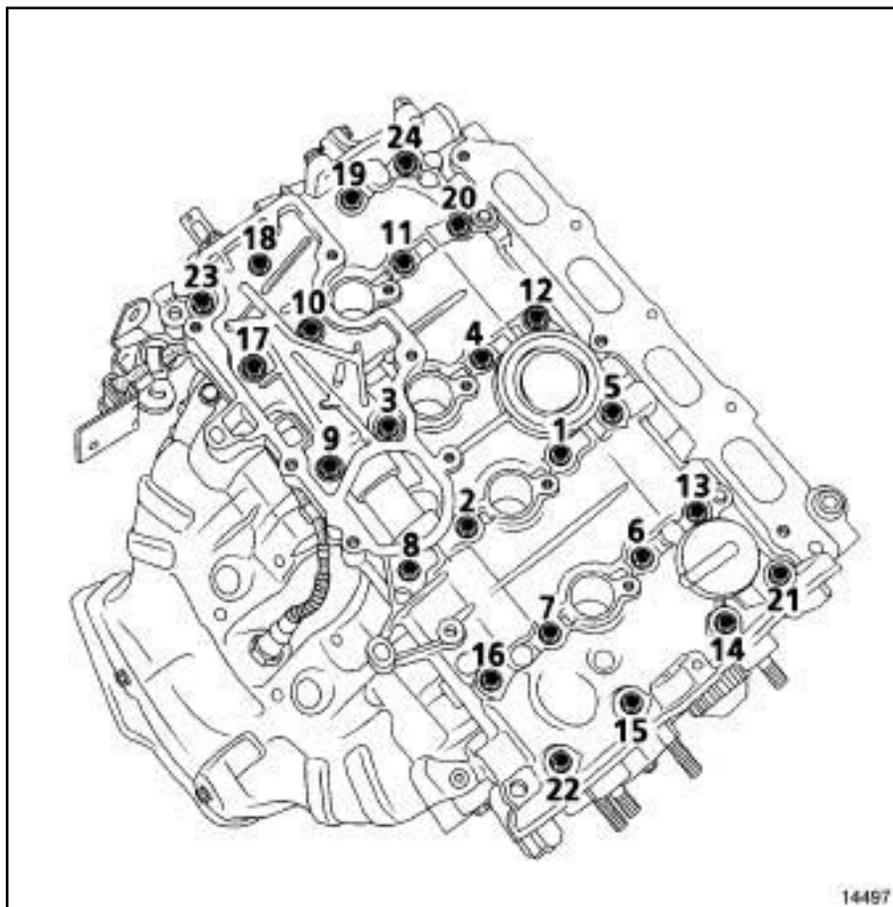
# TOP AND FRONT OF ENGINE

## Rocker cover: Removal - Refitting

# 11A

K4M

### II - REFITTING OPERATION



14497

- Refit the rocker cover.
- Tighten to torque and in order:
  - **rocker cover bolts 22, 23, 20 and 13 (8 N.m)**,
  - **rocker cover bolts 1 to 12, 14 to 19, 21 to 24 (15 N.m)**.
- Loosen bolts 22, 23, 20 and 13, in order.
- Torque tighten in order **rocker cover bolts 22, 23, 20 and 13 (15 N.m)**.

### III - FINAL OPERATION

- Refit the flywheel end lifting eye.
- Torque tighten the **flywheel end lifting eye bolts on the rocker cover (11 N.m)**.
- Refit:
  - the oil decanter (see **11A, Top and front of engine, Oil decanter: Removal - Refitting, page 11A-68**) ,
  - the ignition coils (see **17A, Ignition, Coils: Removal - Refitting, page 17A-1**) ,

- the camshaft seals (see **11A, Top and front of engine, Camshaft seal, timing end: Removal - Refitting, page 11A-56**) ,
  - the inlet distributor (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting, page 12A-12**) ,
  - the throttle valve (see **12A, Fuel mixture, Throttle valve: Removal - Refitting, page 12A-11**) ,
  - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting, page 12A-6**) ,
  - the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting, page 11A-17**) ,
  - the air resonator (see **12A, Fuel mixture, Air resonator: Removal - Refitting, page 12A-2**) ,
  - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting, page 11A-2**) ,
  - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).
- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

# TOP AND FRONT OF ENGINE

## Rocker cover: Removal - Refitting

# 11A

K9K

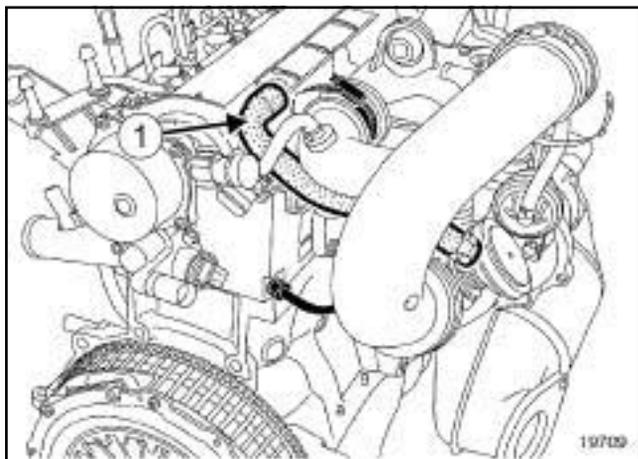
### Tightening torques

rocker cover bolts	12 N.m
--------------------	--------

## REMOVAL

### I - REMOVAL PREPARATION OPERATION

- Remove the air filter unit (see 12A, **Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-6) .



- Remove the oil vapour rebreathing hose (1) .

### II - REMOVAL OPERATION

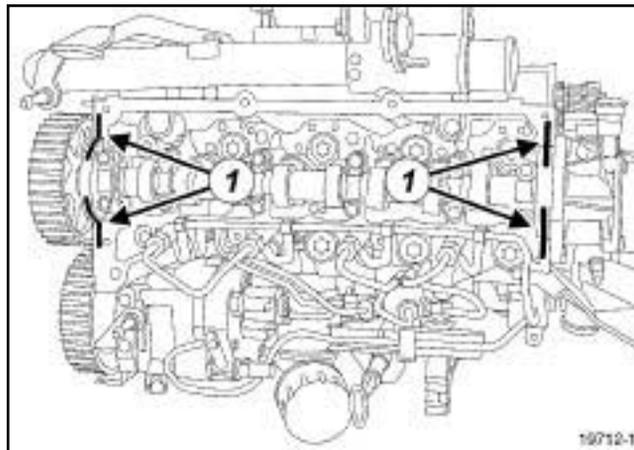
- Remove:
  - the rocker cover bolts,
  - the rocker cover,
  - the rocker cover seal.

## REFITTING

### I - REFITTING PREPARATION OPERATION

- Clean the cylinder head joint face using **GREY ABRASIVE PADS** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).
- Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to degrease:
  - the cylinder head joint face,
  - the housing of the rocker cover seal, if reusing.
- parts always to be replaced: rocker cover seal.**

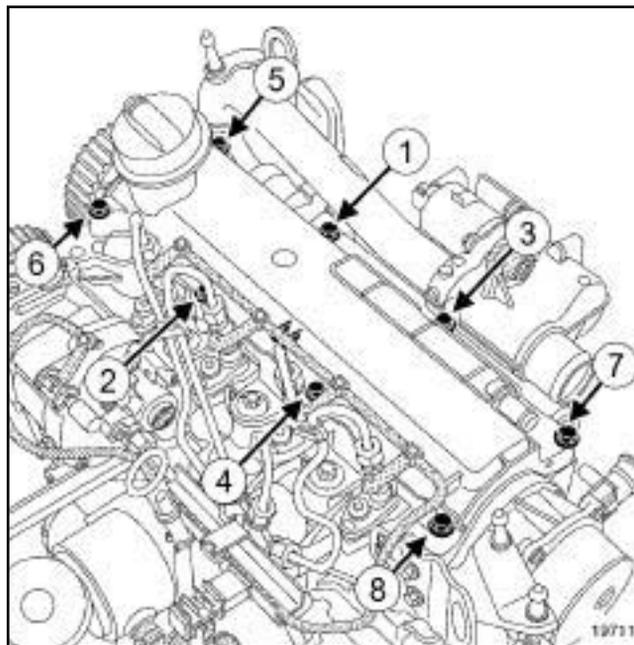
### II - REFITTING OPERATION



#### WARNING

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

- Deposit four beads (1) of **SILICONE ADHESIVE SEALANT** that are **2 mm** in diameter and **10 mm** long.
- Refit:
  - the rocker cover,
  - the rocker cover bolts.



- Torque tighten in order the **rocker cover bolts (12 N.m)**.

# TOP AND FRONT OF ENGINE

## Rocker cover: Removal - Refitting

# 11A

K9K

### III - FINAL OPERATION

- Connect the oil vapour rebreathing pipe.
- Refit the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page **12A-6**).

# TOP AND FRONT OF ENGINE

## Camshaft: Removal - Refitting

# 11A

K4M

### Equipment required

roller-type stud removal tool

### Tightening torques

the camshaft dowel	8 N.m
--------------------	-------

## REMOVAL

### I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove:
  - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
  - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-2) ,
  - the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-4) ,
  - the air resonator (see **12A, Fuel mixture, Air resonator: Removal - Refitting**, page 12A-2) ,
  - the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-17) ,
  - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-6) ,
  - the throttle valve (see **12A, Fuel mixture, Throttle valve: Removal - Refitting**, page 12A-11) ,
  - the inlet distributor (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page 12A-12) ,
  - the ignition coils (see **17A, Ignition, Coils: Removal - Refitting**, page 17A-1) ,
  - the rocker cover (see **11A, Top and front of engine, Rocker cover: Removal - Refitting**, page 11A-42) ,
  - the timing end camshaft seals (see **11A, Top and front of engine, Camshaft seal, timing end: Removal - Refitting**, page 11A-56) .

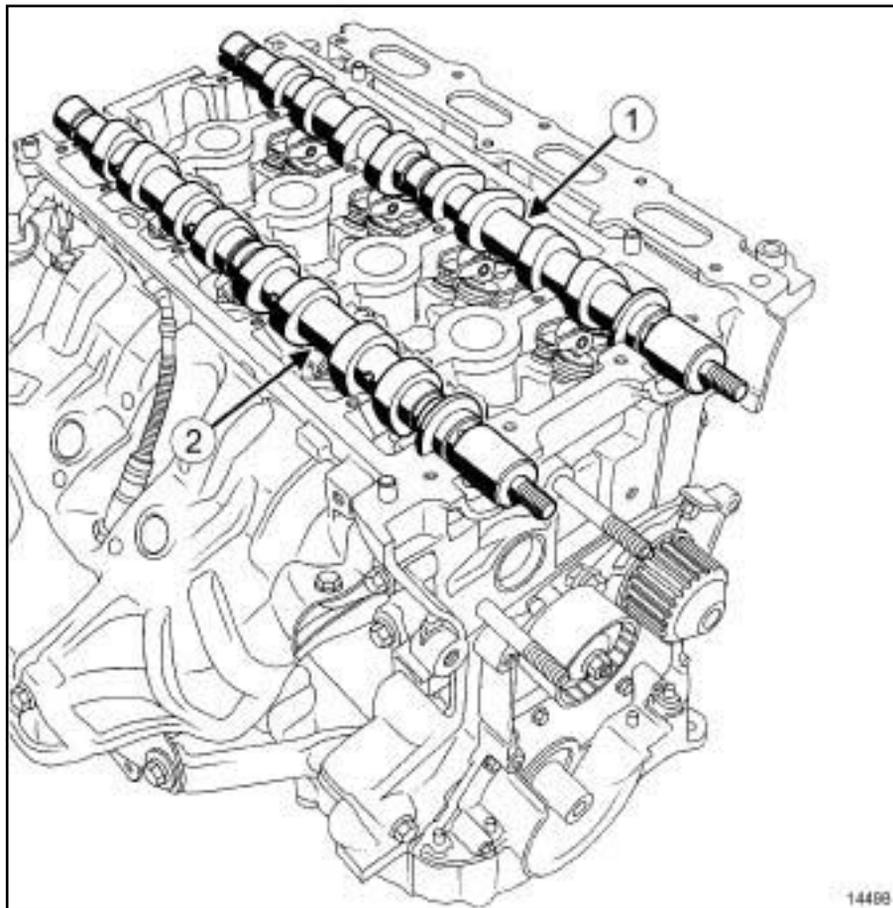
# TOP AND FRONT OF ENGINE

## Camshaft: Removal - Refitting

# 11A

K4M

### II - REMOVAL OPERATION



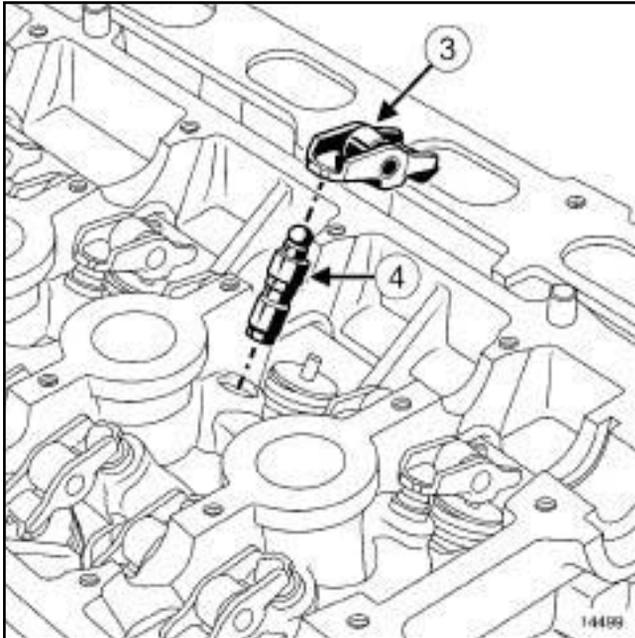
14498

14498

#### □ Remove:

- the inlet camshaft (1) ,
- the exhaust camshaft (2) .

K4M



14499

- Remove:
  - the valve rockers (3) ;
  - the hydraulic tappets (4) .

Note:

To prevent any risk of unpriming the hydraulic tappets make sure that they are vertical.

## REFITTING

### I - REFITTING PREPARATION OPERATION

- Refit the camshafts while positioning them correctly (see ) (Technical Note 6023A, 10A, Engine and peripherals).

Note:

It is essential to reprime the hydraulic tappets as these may become drained if removed for a long time.

- To check if re-priming is necessary, press the top of the tappet with your thumb. If the tappet piston depresses, immerse the tappets in a container full of diesel then reprime them.

### Replacing a camshaft dowel

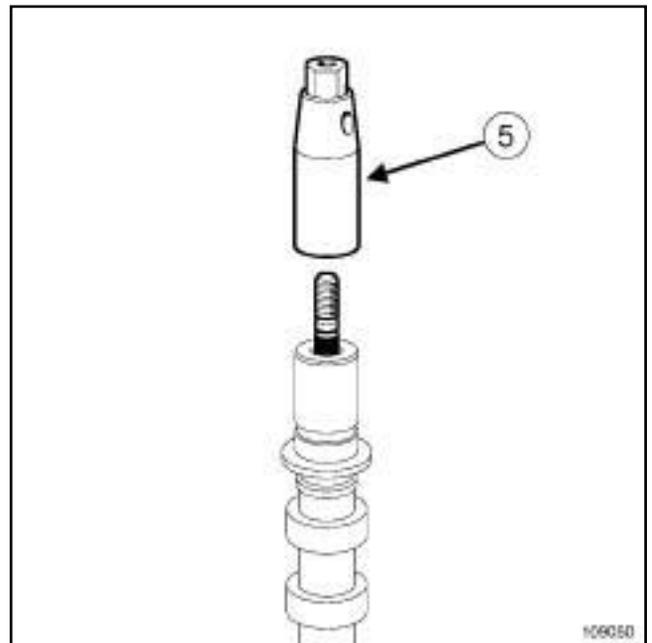
- 

Note:

It is essential to replace the camshaft dowel if it comes loose at the same time as the nut.

#### a - Removal

- Place the camshaft in a vice with **aluminium jaws**.



109050

109050

- Remove the dowel using a **roller-type stud removal tool (5)** .

#### b - Cleaning the camshaft

- 

Note:

Clean the thread hole of the camshaft carefully to prevent foreign bodies from entering the latter.

Failure to follow this advice could lead to the blocking of the oil inlet holes, which would quickly result in engine damage.

#### c - Refitting

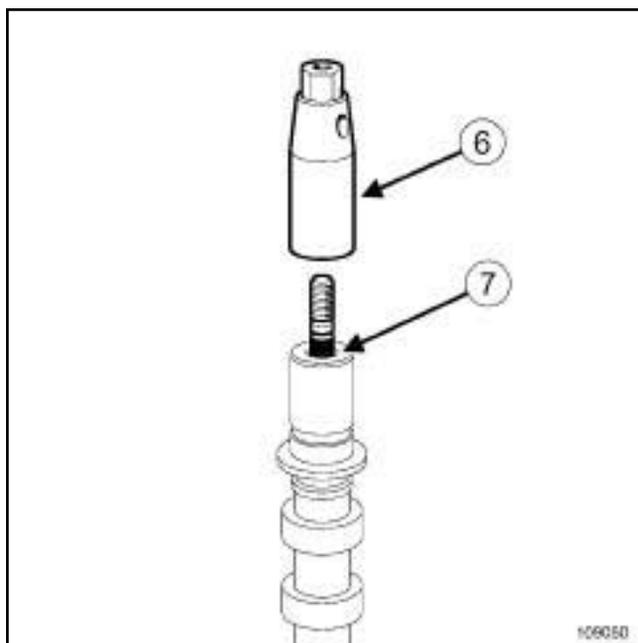
- Place the camshaft in a vice with **aluminium jaws**.

# TOP AND FRONT OF ENGINE

## Camshaft: Removal - Refitting

# 11A

K4M



109050

- Refit the new camshaft dowel (precoated section (7) on the camshaft side).
- Torque tighten the camshaft dowel (8 N.m) using a roller-type stud removal tool (6) .

### II - REFITTING OPERATION

- Refit:
  - the hydraulic tappets,
  - the valve rockers,
  - the inlet camshaft, by lubricating the inlet camshaft bearings,
  - the exhaust camshaft, by lubricating the exhaust camshaft bearings.

### III - FINAL OPERATION

- Refit:
  - the rocker cover (see 11A, Top and front of engine, Rocker cover: Removal - Refitting, page 11A-42) ,
  - the camshaft seals (see 11A, Top and front of engine, Camshaft seal, timing end: Removal - Refitting, page 11A-56) ,
  - the ignition coils (see 17A, Ignition, Coils: Removal - Refitting, page 17A-1) ,
  - the inlet distributor (see 12A, Fuel mixture, Inlet distributor: Removal - Refitting, page 12A-12) ,
  - the throttle valve (see 12A, Fuel mixture, Throttle valve: Removal - Refitting, page 12A-11) ,

- the air filter unit (see 12A, Fuel mixture, Air filter unit: Removal - Refitting, page 12A-6) ,
- the timing belt (see 11A, Top and front of engine, Timing belt: Removal - Refitting, page 11A-17) ,
- the air resonator (see 12A, Fuel mixture, Air resonator: Removal - Refitting, page 12A-2) ,
- the right-hand suspended engine mounting (see 19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting, page 19D-4) ,
- the accessories belt (see 11A, Top and front of engine, Accessories belt: Removal - Refitting, page 11A-2) ,
- the front right-hand wheel (see Wheel: Removal - Refitting) (35A, Wheels and tyres).

- Connect the battery (see Battery: Removal - Refitting) (80A, Battery).

# TOP AND FRONT OF ENGINE

## Camshaft: Removal - Refitting

# 11A

K9K

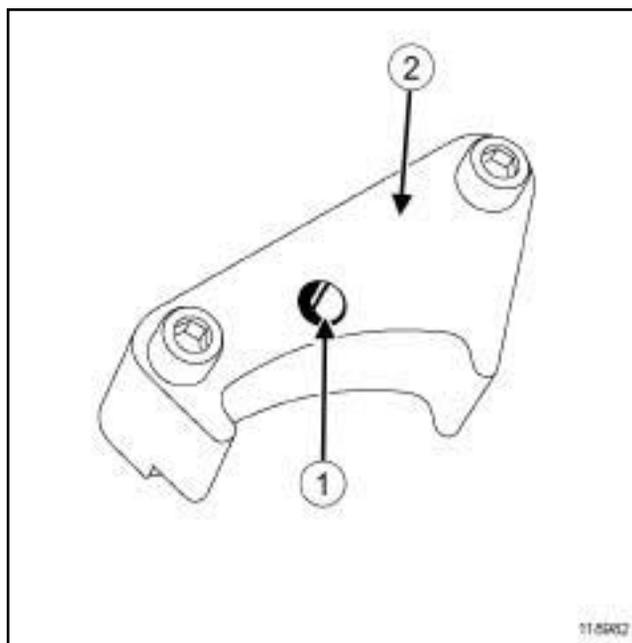
### Tightening torques

bolts of the camshaft bearings	10 N.m
--------------------------------	--------

## REMOVAL

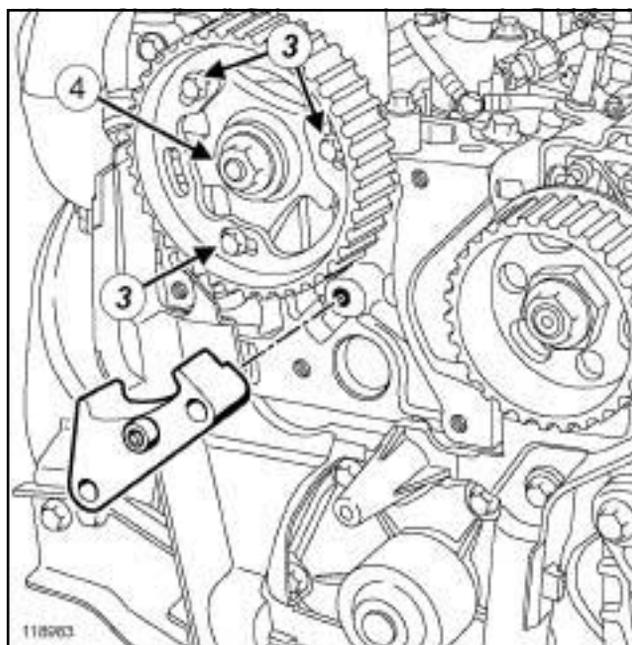
### I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove:
  - the air filter box (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-6) ,
  - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
  - the front right-hand wheel arch liner partially (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
  - the engine undertray bolts,
  - the engine undertray,
  - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-2) ,
  - the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-4) ,
  - the camshaft position sensor (see **13B, Diesel injection, Camshaft position sensor: Removal - Refitting**, page 13B-7) ,
  - the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page 11A-10) ,
  - the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-17) ,
  - the vacuum pump (see **Vacuum pump: Removal - Refitting**) (37A, Mechanical component controls),
  - the rocker cover (see **11A, Top and front of engine, Rocker cover: Removal - Refitting**, page 11A-42) .



118982

- Increase the hole (1) of the (2) using an **8.5 mm** drill bit.



118983

- Undo the camshaft pulley hub bolts (3) .
- Fit then the cylinder head to lock the camshaft pulley wheel.
- Tighten the camshaft pulley hub bolts (3) .
- Remove:
  - the nut (4) from the camshaft pulley,
  - the,
  - the camshaft pulley.

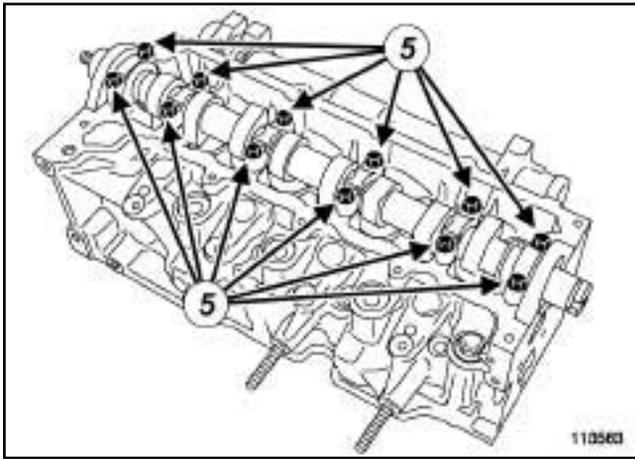
# TOP AND FRONT OF ENGINE

## Camshaft: Removal - Refitting

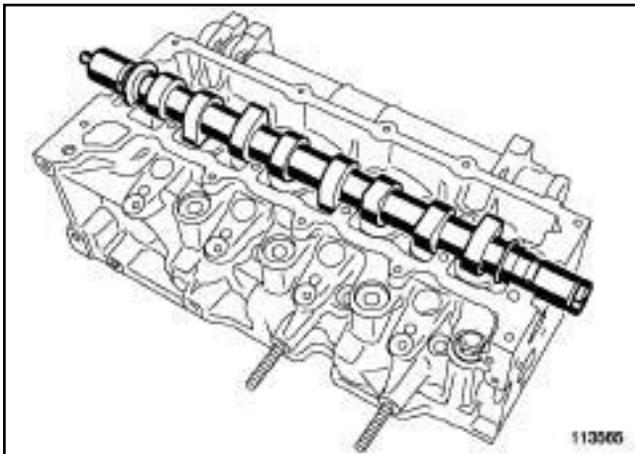
# 11A

K9K

### II - OPERATION FOR REMOVAL OF PART CONCERNED



113563



113565

- Mark the position of the camshaft bearings.
- Remove:
  - the camshaft bearing bolts (5) ,
  - the camshaft bearings,
  - the camshaft,
  - the timing end camshaft seal.

### REFITTING

#### I - REFITTING PREPARATION OPERATION

- parts always to be replaced: Camshaft seal on timing end.

#### WARNING

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

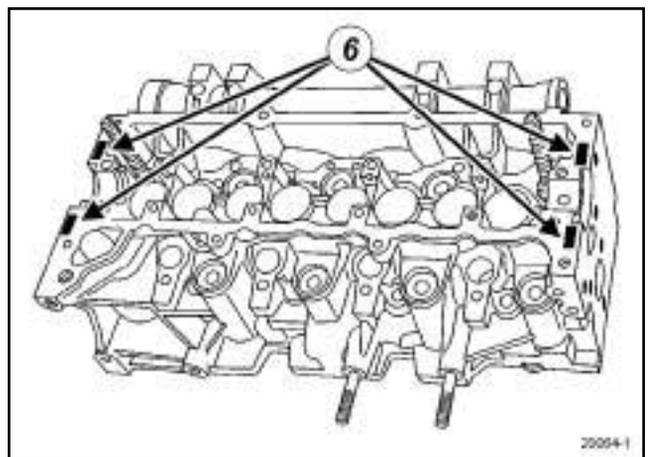
#### WARNING

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

- Use **GREY ABRASIVE PADS** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean the bearing faces of the camshaft bearings.

- Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:

- the bearing faces of the camshaft bearings on the cylinder head,
- the bearing faces of the camshaft bearings on the camshaft bearings.



20064-1

- 

#### WARNING

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mixture of sealant and fluid could damage certain components (engine, radiator, etc.).

# TOP AND FRONT OF ENGINE

## Camshaft: Removal - Refitting

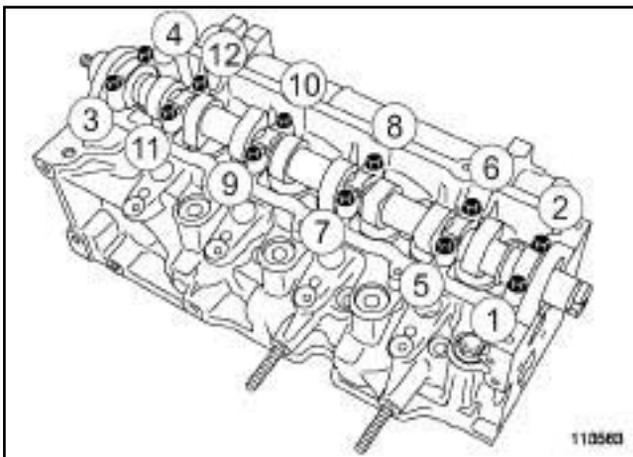
# 11A

K9K

- ❑ Apply four beads (6) of **RESIN ADHESIVE** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) 7 mm in diameter on the cylinder head.

### II - REFITTING OPERATION FOR PART CONCERNED

- ❑ Fit the camshaft in place by placing the camshaft groove on the timing end vertically and facing upwards.
- ❑ Refit the camshaft bearings, observing their original positions (bearing **No. 1** at the flywheel end).



113563

- ❑ Refit the camshaft bearing bolts (1) , (3) , (4) and (2) in order.
- ❑ Tighten the camshaft bearing bolts (1) , (3) , (4) and (2) in order.
- ❑ Refit the camshaft bearing bolts in order.
- ❑ Tighten to torque and in order the **bolts of the camshaft bearings (10 N.m)**.
- ❑ Check and adjust (if necessary) the valve clearance (see **Valves: Adjustment**) .

### III - FINAL OPERATION

- ❑ Refit:
  - the camshaft seal (see **11A, Top and front of engine, Camshaft seal, timing end: Removal - Refitting**, page 11A-56) ,
  - the rocker cover (see **11A, Top and front of engine, Rocker cover: Removal - Refitting**, page 11A-42) ,
  - the vacuum pump (see **Vacuum pump: Removal - Refitting**) (37A, Mechanical component controls),
  - the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-17) ,

- the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page 11A-10) ,
  - the camshaft position sensor (see **13B, Diesel injection, Camshaft position sensor: Removal - Refitting**, page 13B-7) ,
  - the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-4) ,
  - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-2) ,
  - the engine undertray,
  - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
  - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
  - the air filter box (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-6) .
- ❑ Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

# TOP AND FRONT OF ENGINE

## Camshaft seal, timing end: Removal - Refitting

# 11A

K4M

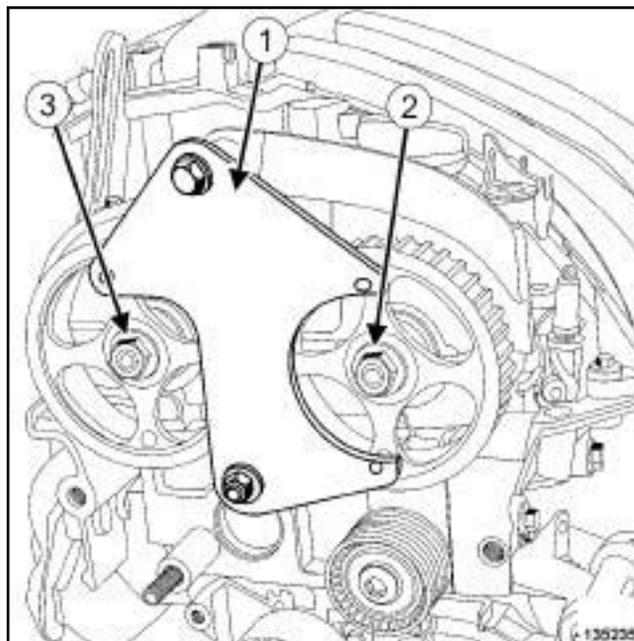
### Tightening torques

inlet camshaft hub nut	30 N.m + 84° ± 4°
exhaust camshaft hub nut	30 N.m + 84° ± 4°

## REMOVAL

### I - REMOVAL PREPARATION OPERATION

- Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).
- Disconnect the battery (see **Battery: Removal - Refitting**) (80A, Battery).
- Remove:
  - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
  - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-6) ,
  - the throttle valve (see **12A, Fuel mixture, Throttle valve: Removal - Refitting**, page 12A-11) ,
  - the air inlet distributor (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page 12A-12) ,
  - the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-4) ,
  - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-2) ,
  - the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-17) .



- Fit the locking tool (1) on the camshaft pulleys.
- Remove:
  - the inlet camshaft pulley nut (2) ,
  - the exhaust camshaft pulley nut (3) ,
  - the,
  - the inlet camshaft pulley,
  - the exhaust camshaft pulley.

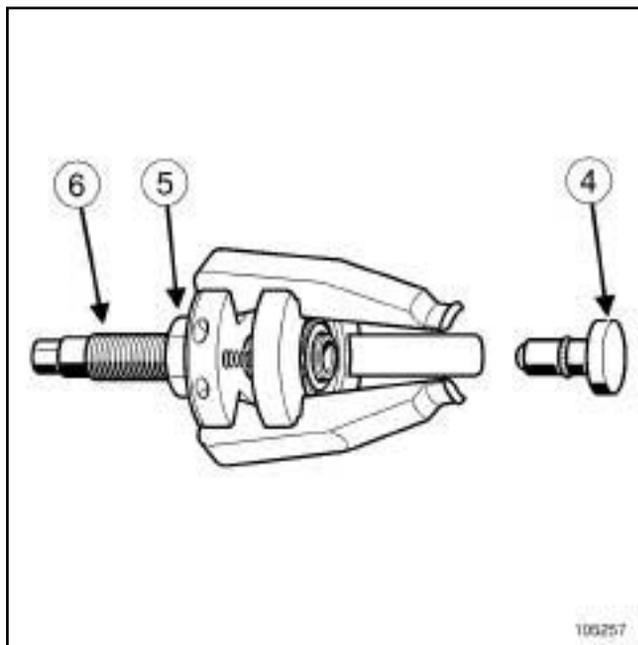
# TOP AND FRONT OF ENGINE

## Camshaft seal, timing end: Removal - Refitting

# 11A

K4M

### II - REMOVAL OPERATION



105257

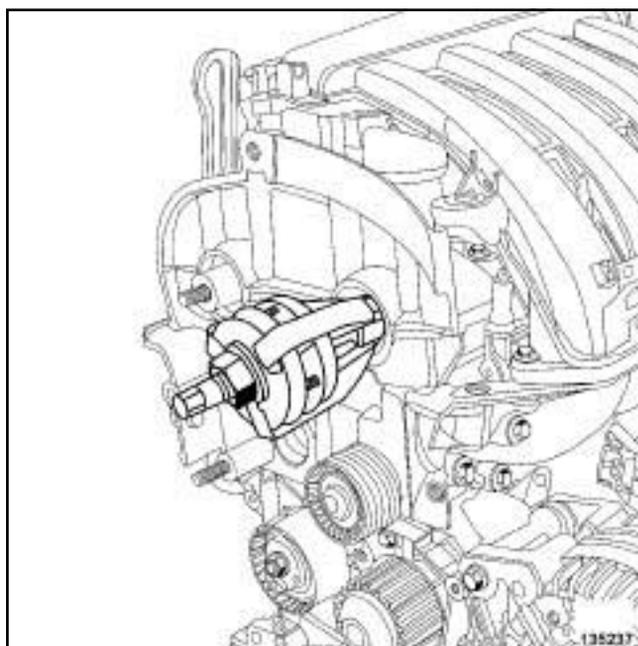
□

Note:

The inlet and exhaust camshaft seals are removed using the.

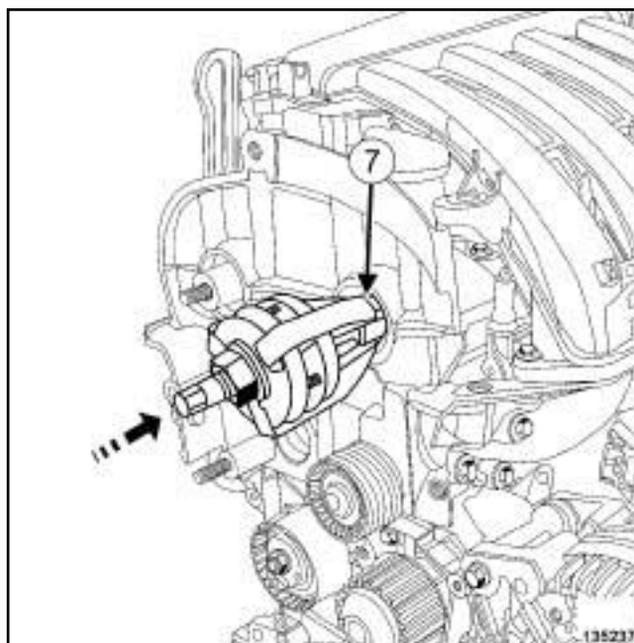
□ Always remove the end piece (4) of the tool.

□ Loosen bolts (5) and (6) fully from the.



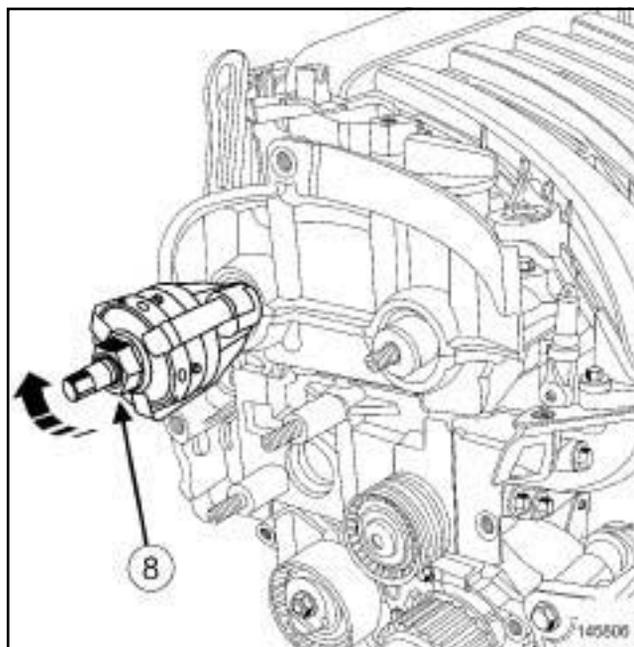
135237

□ Position the claws of the tool on the camshaft.



135237

□ Push the tool until contact is made between the ends of the claws (7) and the camshaft seal.



145806

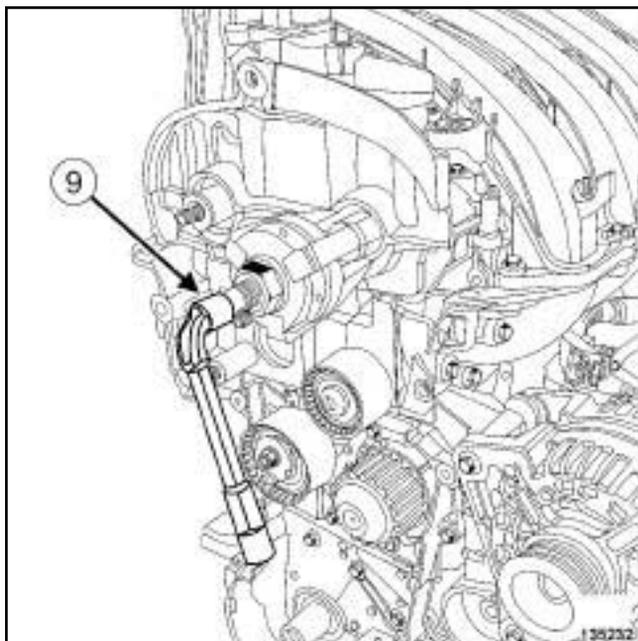
□ Separate the claws by turning the nut (8) clockwise using an open-jawed spanner.

# TOP AND FRONT OF ENGINE

## Camshaft seal, timing end: Removal - Refitting

# 11A

K4M



135232

- Remove the camshaft seal by turning the bolt (9) clockwise.
- Repeat the previous operations for the other camshaft seal.

### REFITTING

#### I - REFITTING PREPARATION OPERATION

- parts always to be replaced: Camshaft seal on timing end
- parts always to be replaced: Exhaust camshaft pulley nut
- Always replace the inlet camshaft pulley nut.

#### WARNING

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

#### WARNING

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

- Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:

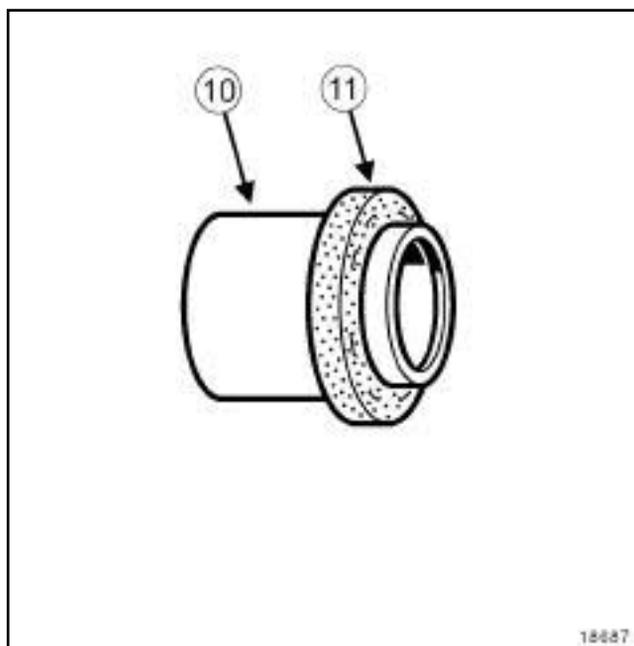
- the seal mating face of each camshaft,
- the camshaft seal housings.

#### Note:

It is strictly forbidden to lubricate the outer diameter of the ring before fitting.

#### II - REFITTING OPERATION

##### Fitting the camshaft seal.



18687

18687

#### Note:

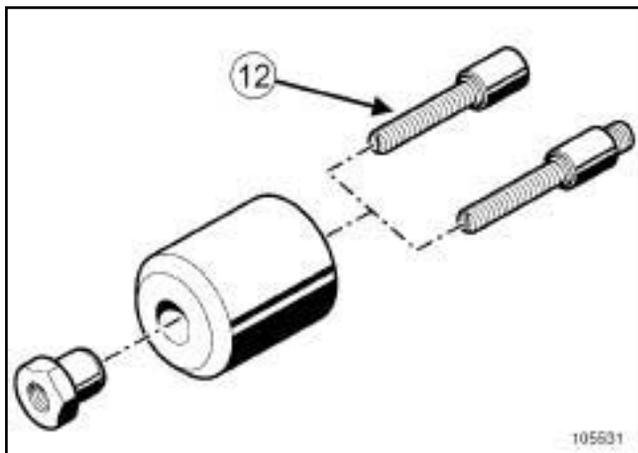
Always hold the camshaft seal with the protector (10) when handling, as this type of seal is very fragile. It is strictly forbidden to touch seal; (11) this is to prevent any oil leaks once the oil seal is fitted to the engine.

# TOP AND FRONT OF ENGINE

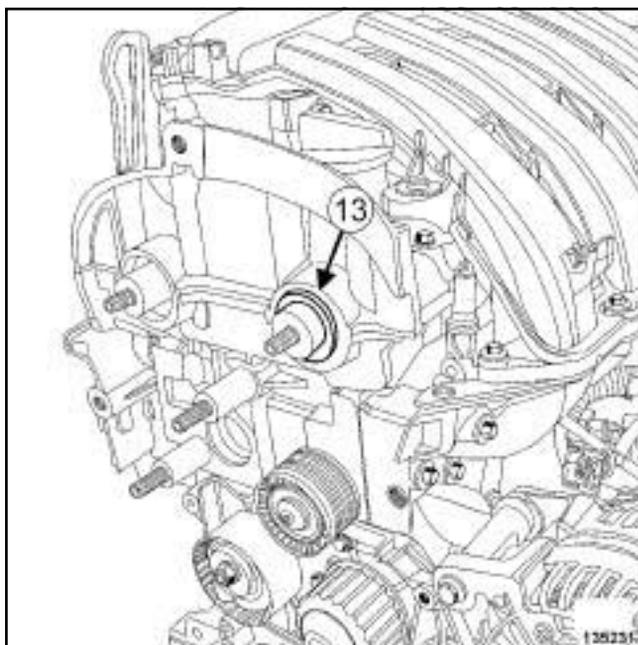
## Camshaft seal, timing end: Removal - Refitting

# 11A

K4M

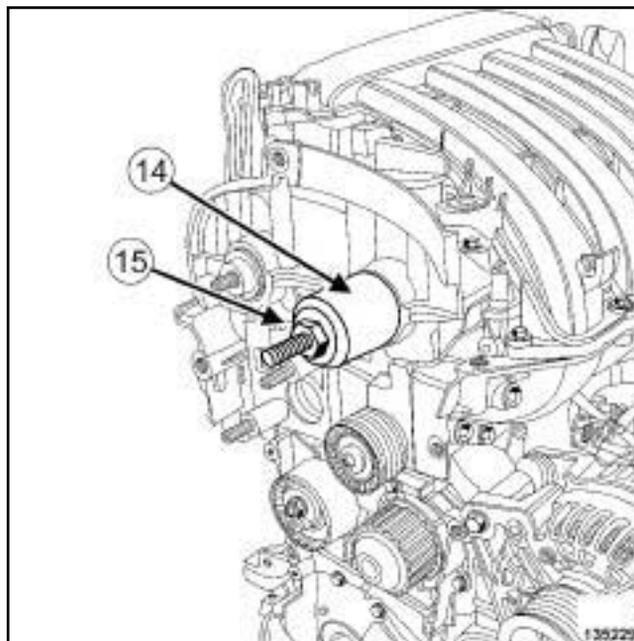


105531



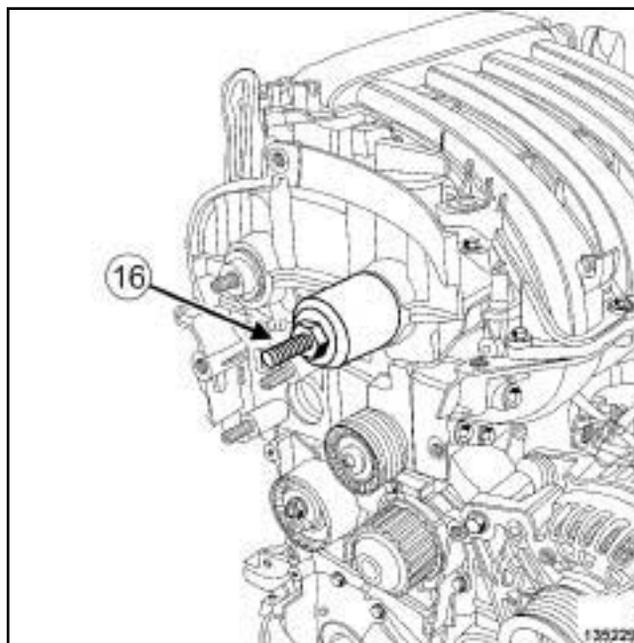
135231

- Fit the protector fitted with a new seal (13) on the inlet and exhaust camshaft, taking care not to touch the seal.
- Screw on the stud (12) of the tool on the inlet and exhaust camshafts.



135229

- Fit the cover (14) and the collar nut (15) of the.



135229

- Screw on the collar nut until the cover touches the cylinder head.
- Remove:
  - the nut,
  - the cover,
  - the threaded rod (16) .

# TOP AND FRONT OF ENGINE

## Camshaft seal, timing end: Removal - Refitting

# 11A

K4M

### III - FINAL OPERATION

- Refit:
  - the inlet camshaft pulley with a new nut,
  - the exhaust camshaft pulley with a new nut.
- Fit the locking tool on the camshaft pulleys.
- Torque tighten:
  - the **inlet camshaft hub nut (30 N.m + 84° ± 4°)**,
  - the **exhaust camshaft hub nut (30 N.m + 84° ± 4°)**.
- Remove the locking tool.
- Refit:
  - the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-17) ,
  - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-2) ,
  - the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-4) ,
  - the inlet distributor (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page 12A-12) ,
  - the throttle valve (see **12A, Fuel mixture, Throttle valve: Removal - Refitting**, page 12A-11) ,
  - the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-6) ,
  - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).
- Connect the battery (see **Battery: Removal - Refitting**) (80A, Battery).

# TOP AND FRONT OF ENGINE

## Camshaft seal, timing end: Removal - Refitting

# 11A

K9K

### Special tooling required

**Mot. 1430** Set of 5 crankshaft and camshaft pulley timing pins.

### Tightening torques

camshaft stud **12 N.m**

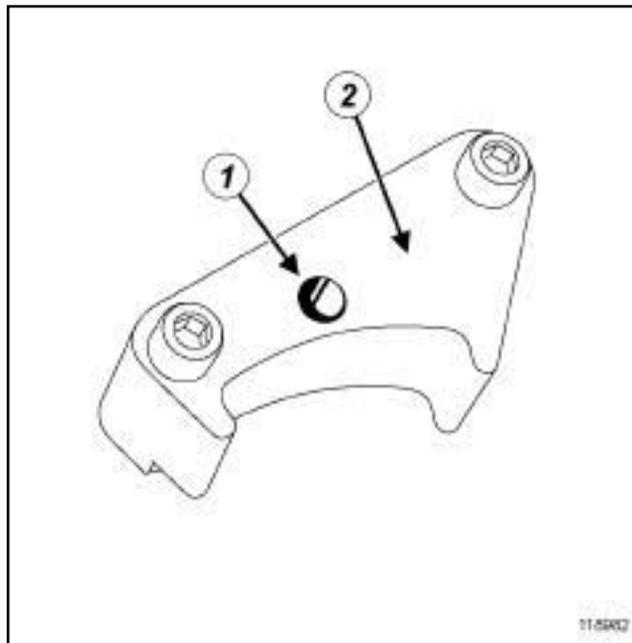
camshaft pulley nut **30 N.m + 86° ± 6°.**

## REMOVAL

### I - REMOVAL PREPARATION OPERATION

- Remove the front engine cover.
- Remove:
  - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
  - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
  - the engine undertray bolts,
  - the engine undertray,
  - the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-4),
  - the camshaft position sensor (see **13B, Diesel injection, Camshaft position sensor: Removal - Refitting**, page 13B-7),
  - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-2),
  - the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page 11A-10),
  - the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-17),
  - the **(Mot. 1430)**.

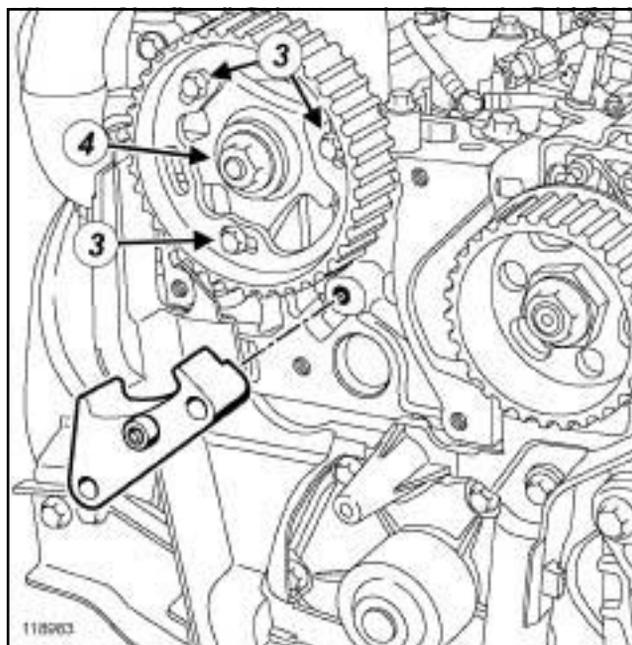
### II - REMOVAL OPERATION



118982

118982

- Increase the hole (1) of the (2) using an **8.5 mm** drill bit.



118983

118983

- Undo the camshaft pulley hub bolts (3).
- Fit theon the cylinder head to lock the camshaft pulley wheel.
- Tighten the camshaft pulley hub bolts (3).
- Remove:
  - the nut (4) from the camshaft pulley,
  - the,

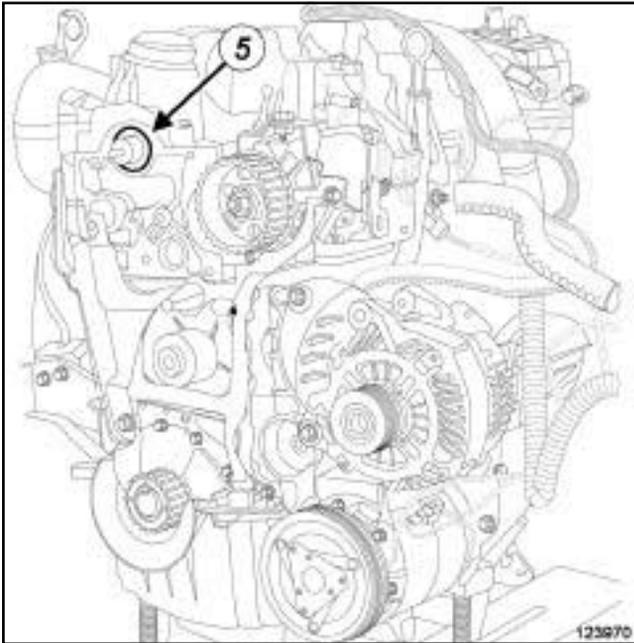
# TOP AND FRONT OF ENGINE

## Camshaft seal, timing end: Removal - Refitting

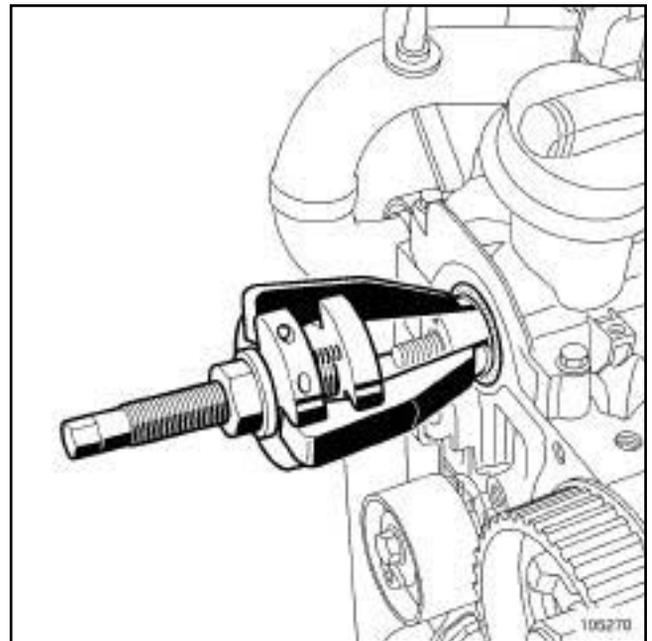
# 11A

K9K

- the camshaft pulley.

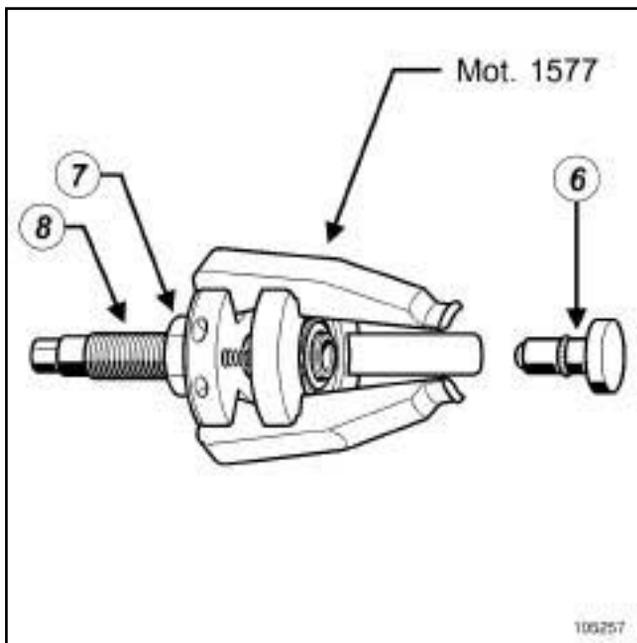


123970



105270

☐ Position the claws of the tool on the camshaft.



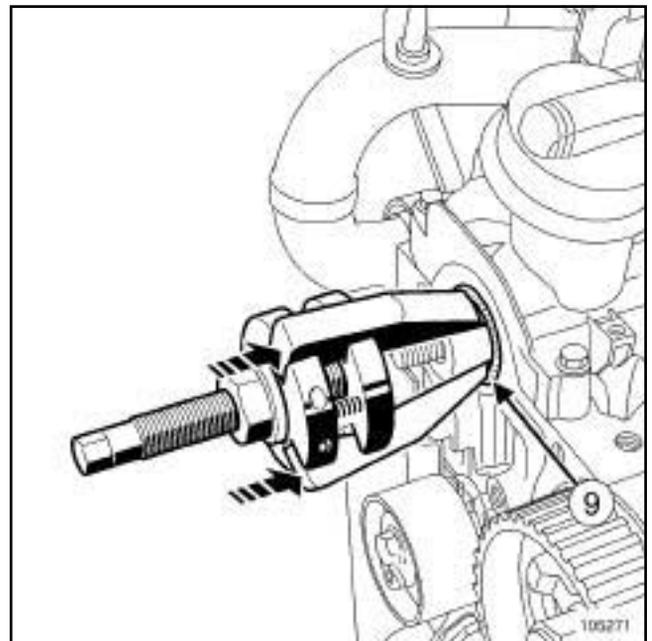
105257

☐

Note:

The camshaft seal is removed using the.

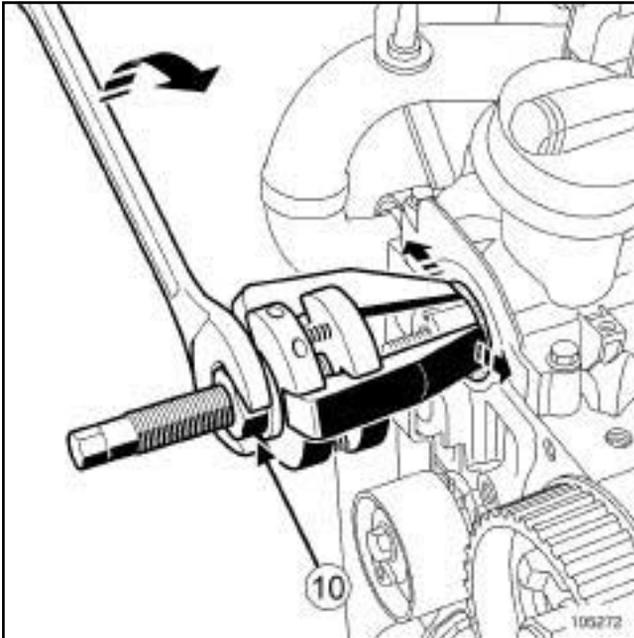
- ☐ Remove the camshaft seal (5) making sure that the end piece (6) of the tool is always removed.
- ☐ Loosen bolts (7) and (8) fully from the.



105271

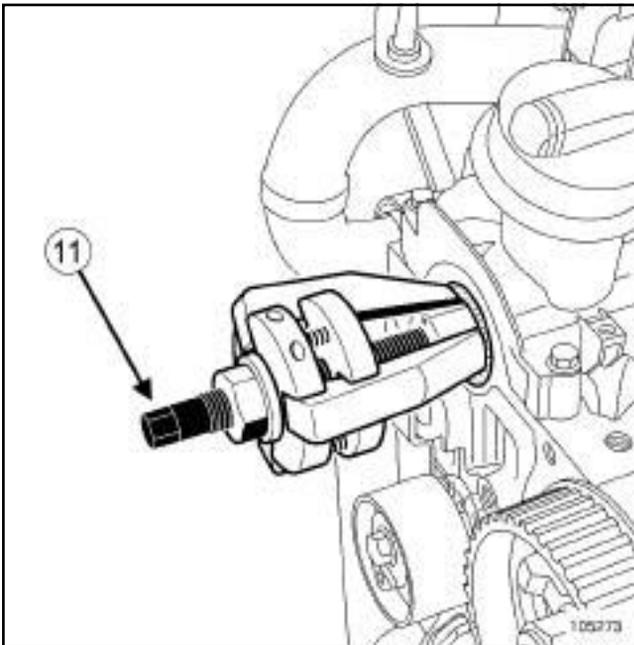
☐ Push the tool until contact is made between the ends (9) of the claws and the camshaft seal.

K9K



105272

- Separate the claws by turning the bolt (10) clockwise using an open-jawed spanner.



105273

- Remove the camshaft seal by turning the bolt (11) clockwise.

## REFITTING

## I - REFITTING PREPARATION OPERATION

- Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean and degrease:
  - the camshaft seal housing in the cylinder head,
  - the camshaft seal mating face on the camshaft.

**WARNING**

Do not scrape the joint faces of the aluminium, any damage caused to the joint face will result in a risk of leaks.

**WARNING**

To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

- parts always to be replaced: Camshaft seal on timing end.**
- parts always to be replaced: camshaft timing sprocket nut.**
- parts always to be replaced: camshaft timing sprocket stud (if loosened).**

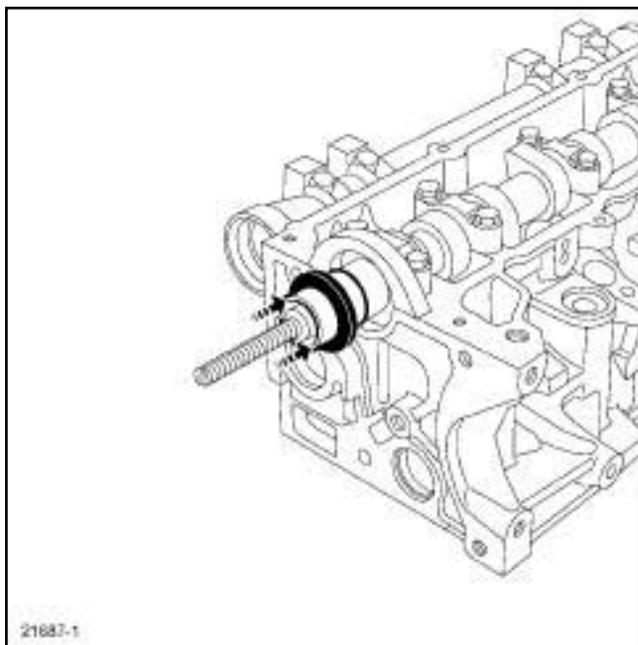
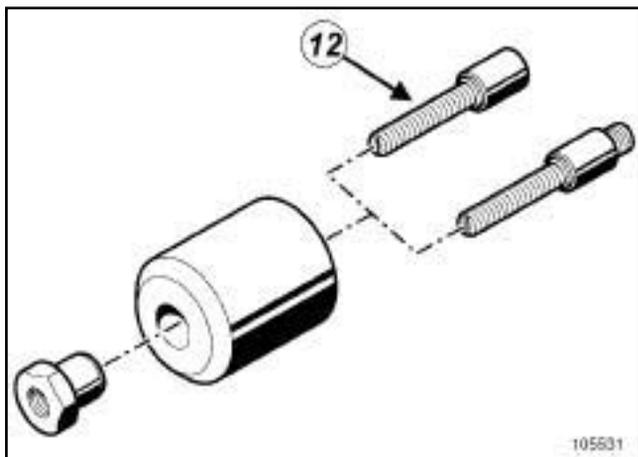
# TOP AND FRONT OF ENGINE

## Camshaft seal, timing end: Removal - Refitting

# 11A

K9K

### II - REFITTING OPERATION FOR PART CONCERNED



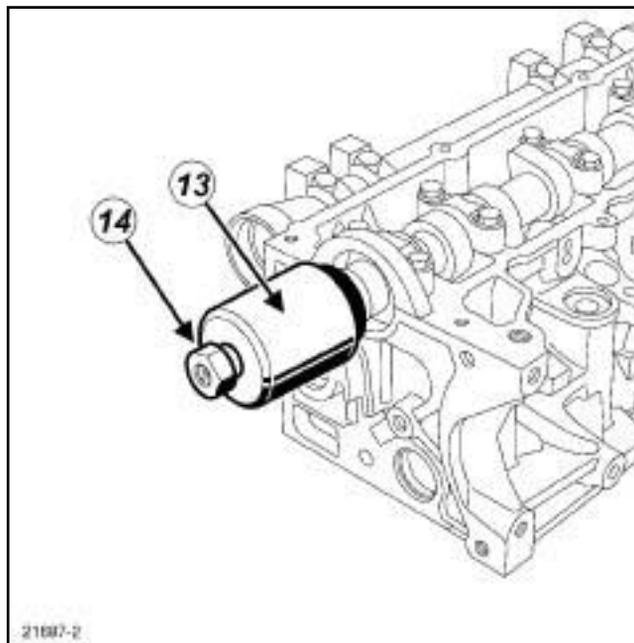
- Screw the stud (12) of the onto the camshaft.
- Fit a new camshaft seal on the camshaft.

#### Note:

For camshaft seals delivered fitted to a protective sleeve:

- do not remove the camshaft seal from its protective sleeve,
- fit the sleeve fitted with the camshaft seal to the camshaft,
- push the protective sleeve towards the cylinder head until the camshaft seal reaches its limit on the cylinder head,
- fit the seal on the camshaft by following the recommendations below.

### 1 - First fitting of the camshaft seal



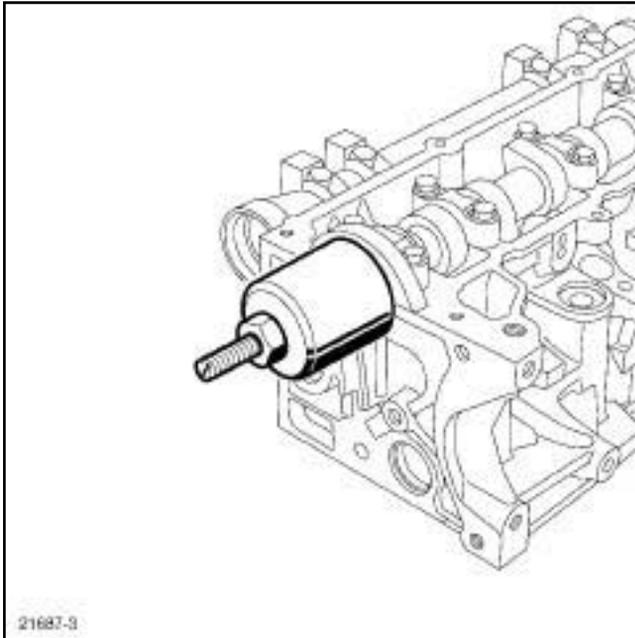
- Fit the cover (13) and the collar nut (14) of the.

# TOP AND FRONT OF ENGINE

## Camshaft seal, timing end: Removal - Refitting

# 11A

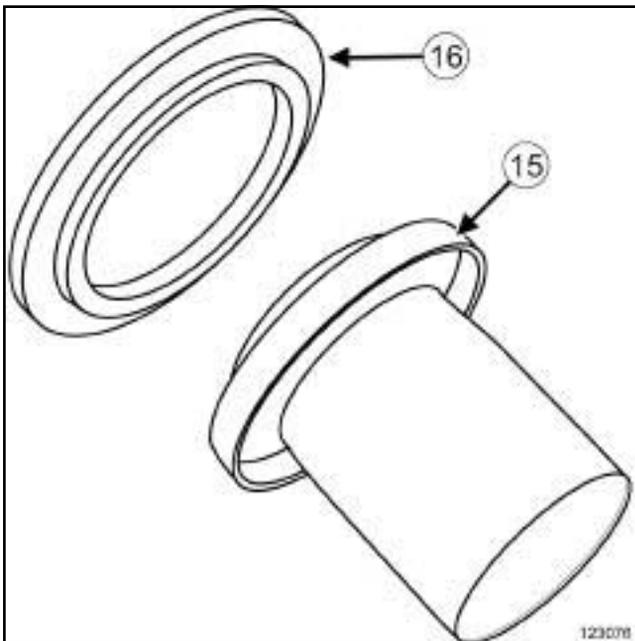
K9K



21687-3

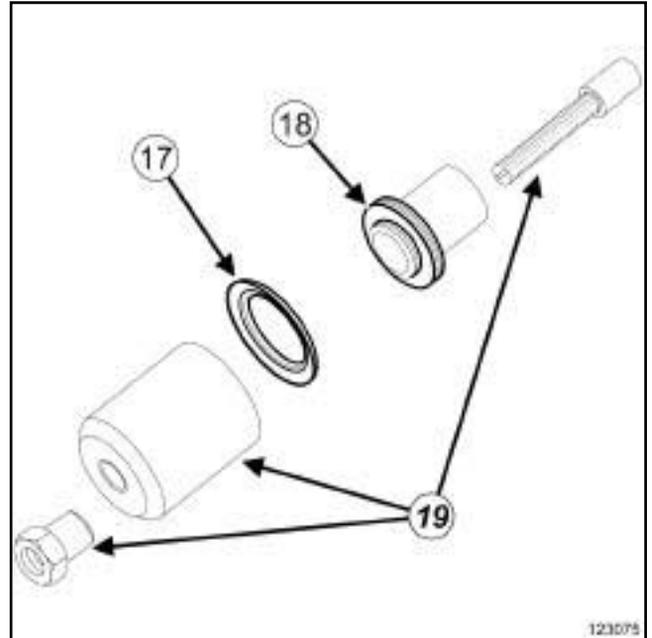
- ❑ Screw on the collar nut until the cover touches the cylinder head.

### 2 - Second fitting of the camshaft seal



123076

- ❑ Depending on the case, the Parts Department delivers seals (15) equipped with a spacer (16) amongst other things.



123075

- ❑

Note:

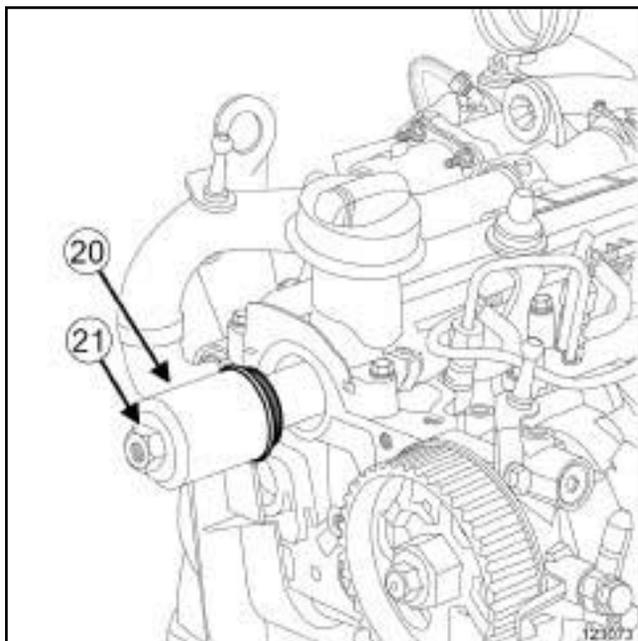
The spacer (17) is used to fit the seal (18) and is used in addition to the tool (19).

# TOP AND FRONT OF ENGINE

## Camshaft seal, timing end: Removal - Refitting

# 11A

K9K

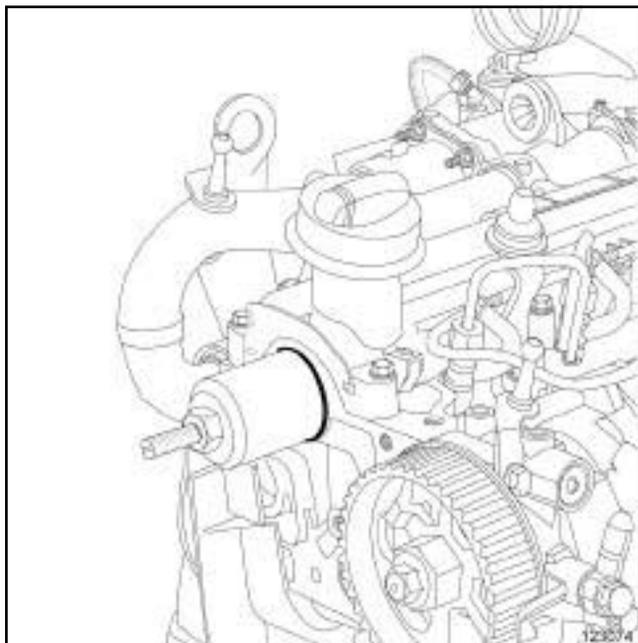


123073

- Position the bell (20) fitted with the spacer on the camshaft seal side and then position the collared nut (21) of the tool.

### Note:

The spacer fits on the bell of the tool so that the internal edge of the spacer is on the side of the camshaft seal.

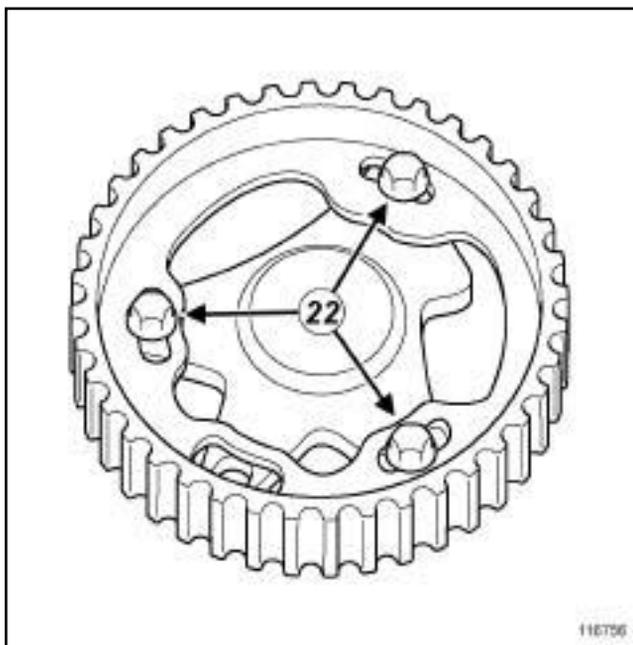


123074

- Screw on the collar nut until the spacer fitted on the cover touches the cylinder head.

### 3 - Continued for both methods

- Remove:
  - the collar nut from the,
  - the cover from the,
  - the stud of the,
  - the protective sleeve and the spacer, if fitted then throw them away.
- Torque tighten the **camshaft stud (12 N.m)**
- Refit:
  - the camshaft pulley,
  - a new camshaft pulley nut.



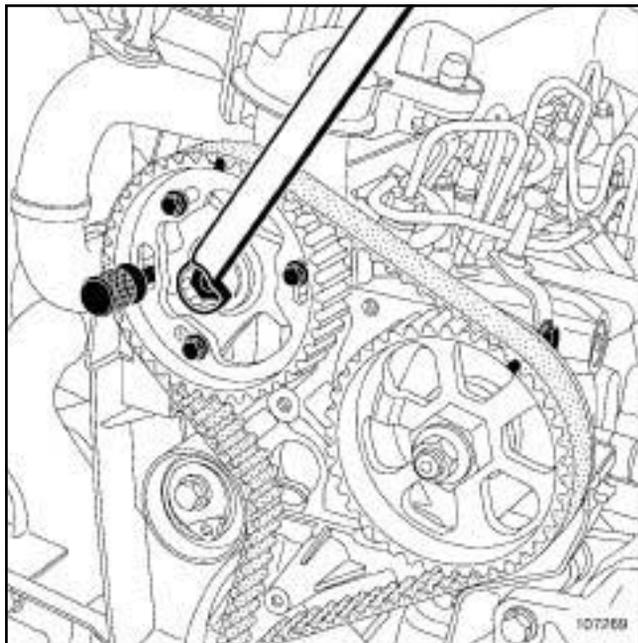
116756

116756

- Undo the camshaft pulley hub bolts (22) .
- Fit then the cylinder head to lock the camshaft pulley wheel.
- Tighten:
  - the camshaft pulley hub bolts,
  - to torque and angle the **camshaft pulley nut (30 N.m + 86° ± 6°)**
- Remove the tool.

K9K

### III - FINAL OPERATION



107269

- Set the camshaft pulley hub using the tool (**Mot. 1430**).

Note:

If the pin (**Mot. 1430**) does not engage, turn the camshaft pulley hub using an **18 mm** offset wrench to facilitate the setting of the camshaft pulley hub.

- Refit:
  - the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-17) .
  - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-2) ,
  - the camshaft position sensor (see **13B, Diesel injection, Camshaft position sensor: Removal - Refitting**, page 13B-7) ,
  - the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-4) ,
  - the engine undertray,
  - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
  - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres).
- Refit the engine cover.

# TOP AND FRONT OF ENGINE

## Oil decanter: Removal - Refitting

# 11A

K4M

### Tightening torques

new oil separator bolts	15 N.m
-------------------------	--------

## REMOVAL

### I - REMOVAL PREPARATION OPERATION

Remove:

- the air resonator (see 12A, Fuel mixture, Air resonator: Removal - Refitting, page 12A-2) ,

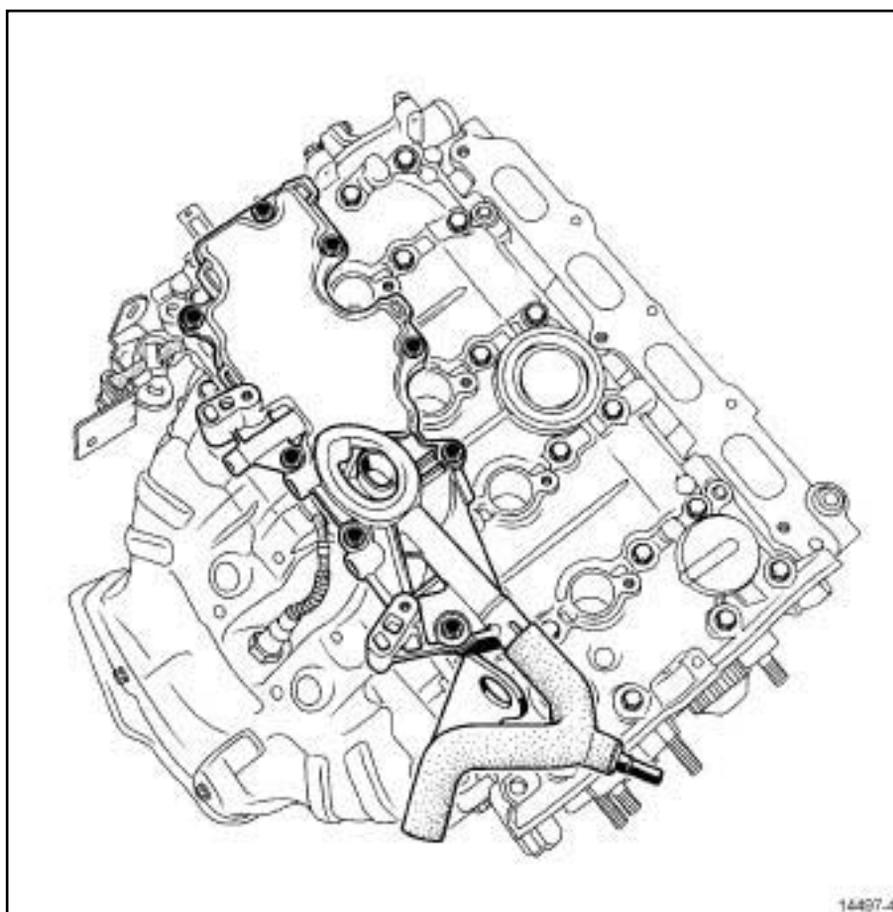
- the air filter unit (see 12A, Fuel mixture, Air filter unit: Removal - Refitting, page 12A-6) ,

- the throttle valve (see 12A, Fuel mixture, Throttle valve: Removal - Refitting, page 12A-11) ,

- the inlet distributor (see 12A, Fuel mixture, Inlet distributor: Removal - Refitting, page 12A-12) ,

- the ignition coils (see 17A, Ignition, Coils: Removal - Refitting, page 17A-1) .

### II - REMOVAL OPERATION



14497-4

Remove:

- the oil decanter bolts,
- the oil decanter.