

# TOP AND FRONT OF ENGINE

## Camshaft: Removal - Refitting

# 11A

M4R

- ☐ Refit the «engine and gearbox» assembly (see **10A, Engine and cylinder block assembly, Engine - gearbox assembly: Removal - Refitting**, page **10A-162**) .
- ☐ Top up the engine oil (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page **10A-13**) .

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# TOP AND FRONT OF ENGINE

## Camshaft seal, timing end: Removal - Refitting

# 11A

K9K

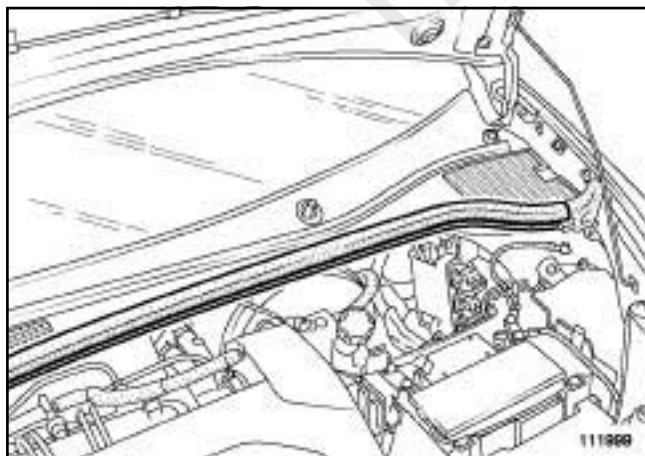
| Special tooling required |                                                     |
|--------------------------|-----------------------------------------------------|
| <b>Mot. 799-01</b>       | Timing gear wheel immobiliser.                      |
| <b>Mot. 1577</b>         | Lip seal extractor (shaft diameter 28 mm to 42 mm). |
| <b>Mot. 1632</b>         | Tool for fitting camshaft PTFE seal                 |

| Tightening torques  |                          |
|------------------------------------------------------------------------------------------------------|--------------------------|
| camshaft hub bolt                                                                                    | <b>30 N.m + 86° ± 6°</b> |
| camshaft hub bolt                                                                                    | <b>30 N.m + 86° ± 6°</b> |
| camshaft pulley bolts                                                                                | <b>14 N.m</b>            |

## REMOVAL

### I - REMOVAL PREPARATION OPERATION

- ☐ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).
- ☐ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).
- ☐ Remove the front engine cover.



111999

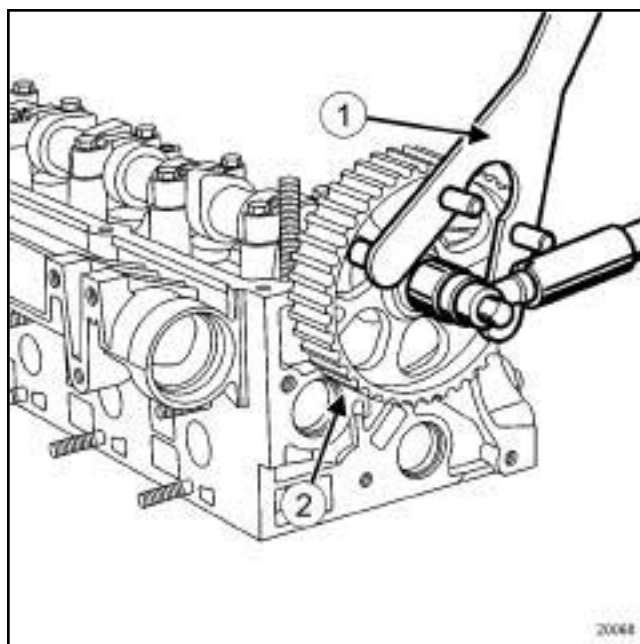
- ☐ Remove:

- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),

- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the engine undertray,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front section of the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-13) ,
- the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-22) ,
- the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-48) .

### II - OPERATION FOR REMOVAL OF PART CONCERNED

#### FACTORY FITTING:



20068

- ☐ Immobilise the camshaft hub using the (**Mot. 799-01**) (1) .

- ☐ Remove:

- the nut from the camshaft pulley,
- the camshaft pulley (2) .

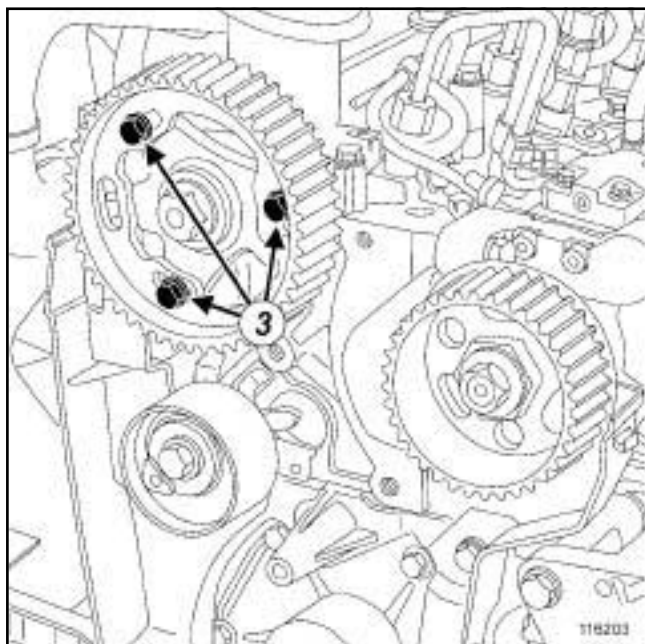
# TOP AND FRONT OF ENGINE

## Camshaft seal, timing end: Removal - Refitting

# 11A

K9K

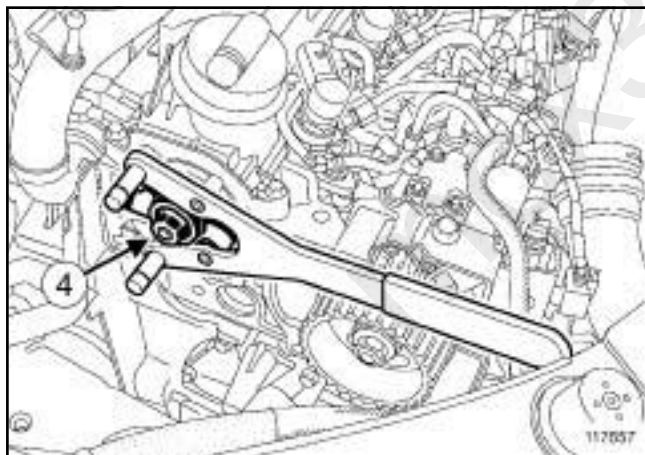
### RETRO-FITTING:



116203

#### ❑ Remove:

- the camshaft pulley bolts (3) ,
- the camshaft pulley.



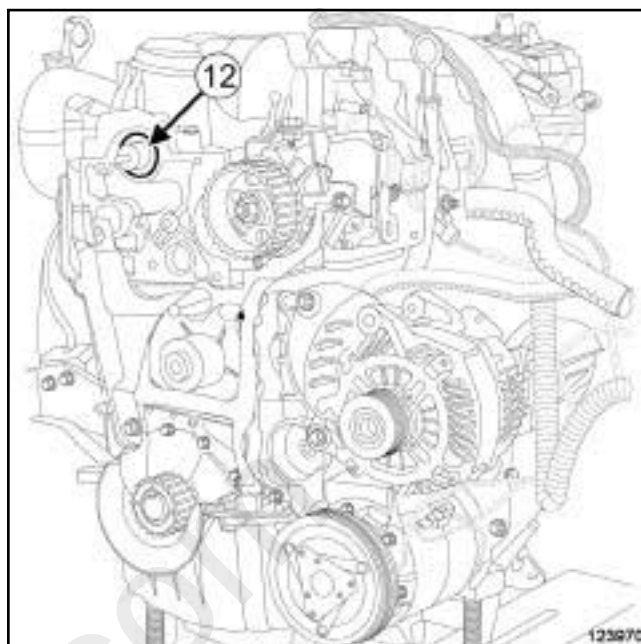
117657

#### ❑ Immobilise the camshaft hub using the (Mot. 799-01).

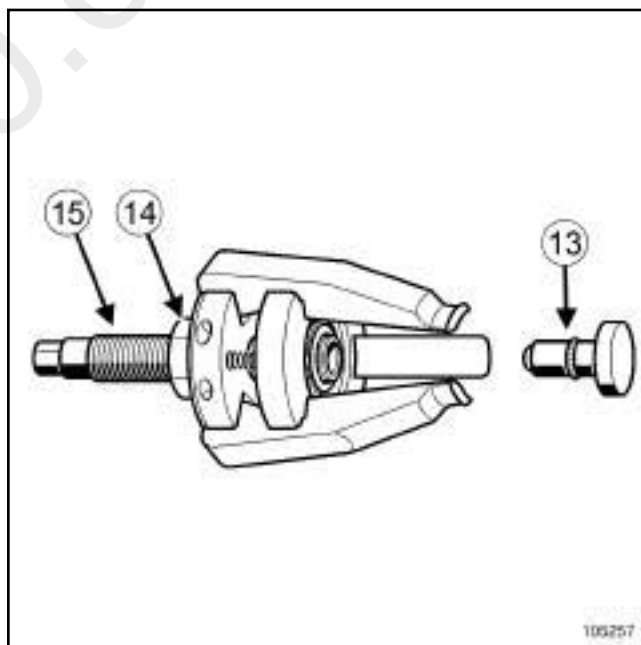
#### ❑ Remove:

- the camshaft hub nut (4) ,
- the camshaft hub.

### REMOVAL OPERATION FOR THE PART CONCERNED, FOR BOTH FITTINGS



123970



105257

#### ❑

#### Note:

The camshaft seal is removed using the (Mot. 1577).

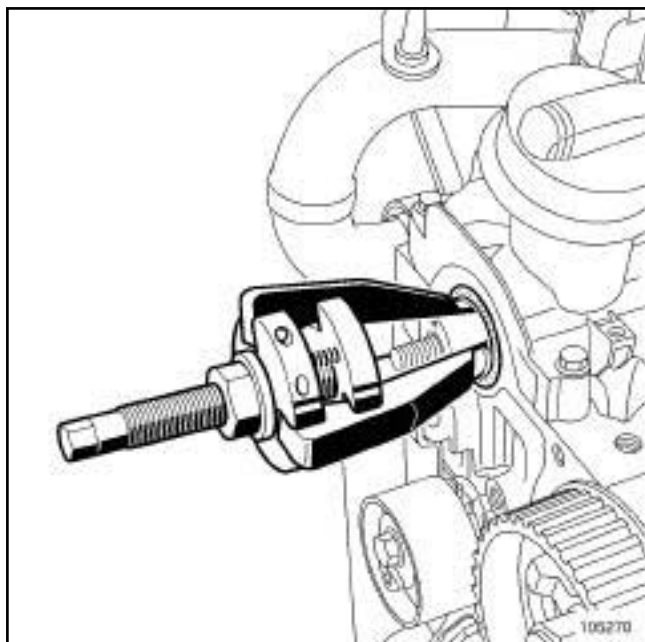
- ❑ Remove the camshaft seal (12) making sure that the end piece (13) of the tool (Mot. 1577) is always removed.
- ❑ Loosen bolts (14) and (15) fully from the (Mot. 1577).

# TOP AND FRONT OF ENGINE

## Camshaft seal, timing end: Removal - Refitting

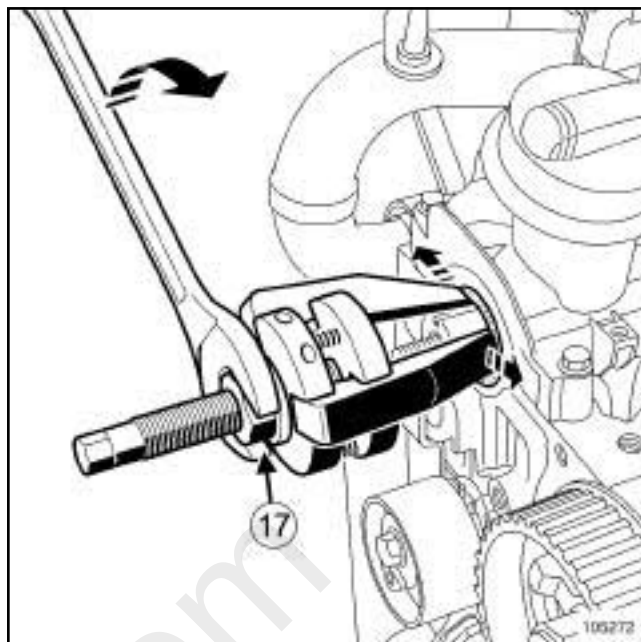
# 11A

K9K



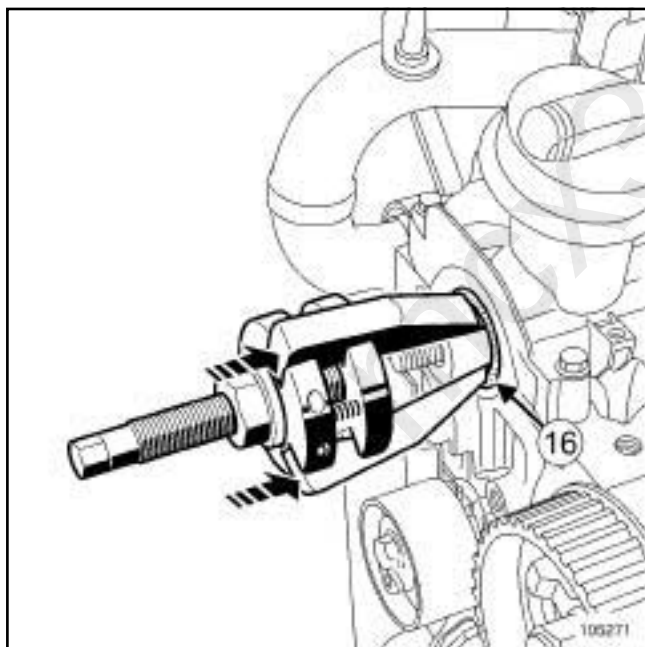
105270

- ❑ Position the claws of the (**Mot. 1577**) on the camshaft.



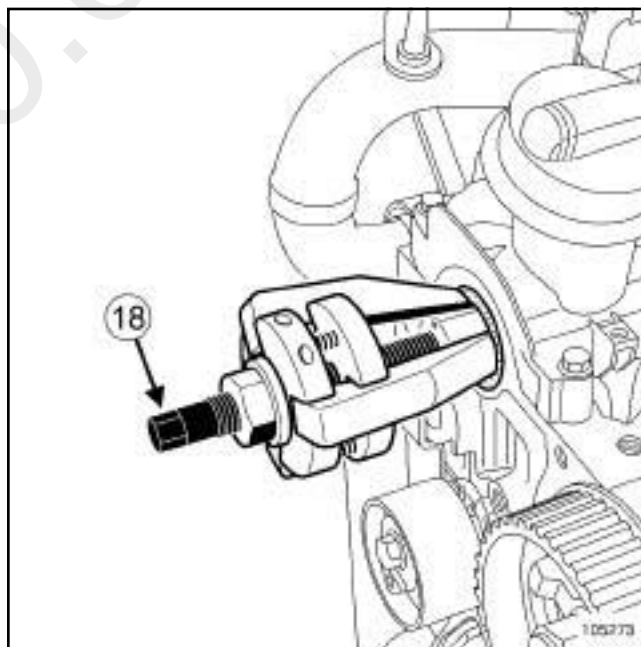
105272

- ❑ Separate the claws by turning the bolt (**17**) clockwise using an open-jawed spanner.



105271

- ❑ Push the tool (**Mot. 1577**) until contact is made between the ends (**16**) of the claws and the camshaft seal.



105273

- ❑ Remove the camshaft seal by turning the bolt (**18**) clockwise.

# TOP AND FRONT OF ENGINE

## Camshaft seal, timing end: Removal - Refitting

# 11A

K9K

### REFITTING

#### I - REFITTING PREPARATION OPERATION

- ☐ It is essential to replace the camshaft seal.

Note:

Always replace any camshaft pulley studs which were loosened during the operation.

Do not touch or soil the pre-coated section of the new stud as this may cause oil to leak out from the camshaft. In this case, torque tighten the **camshaft stud 12 N.m.**

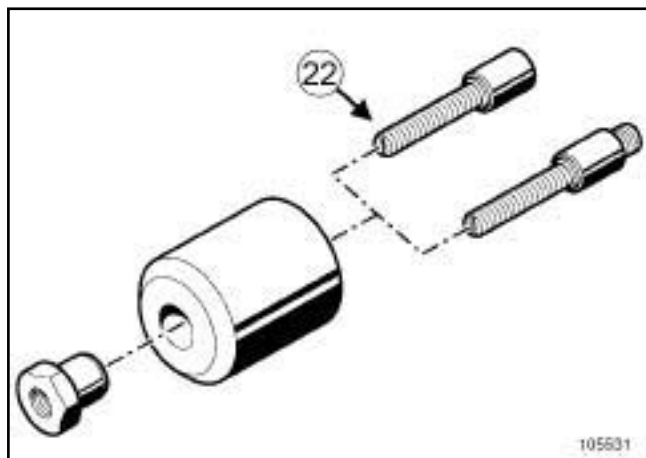
# TOP AND FRONT OF ENGINE

## Camshaft seal, timing end: Removal - Refitting

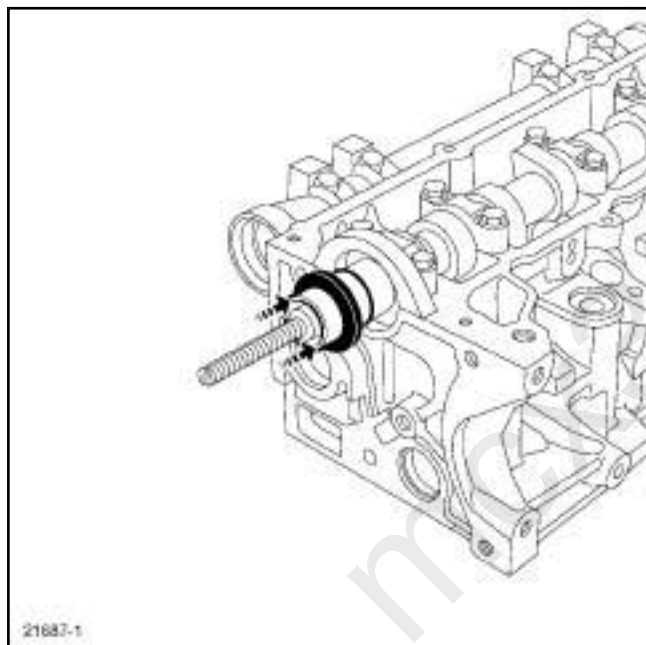
# 11A

K9K

### II - REFITTING OPERATION FOR PART CONCERNED



105531



21687-1

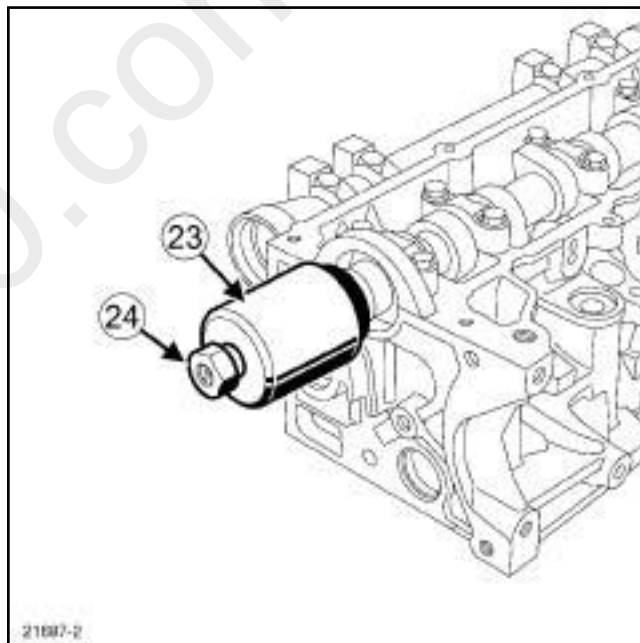
- ☐ Screw the stud (22) of the (Mot. 1632) onto the camshaft.
- ☐ Fit a new camshaft seal on the camshaft.

#### 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



21687-2

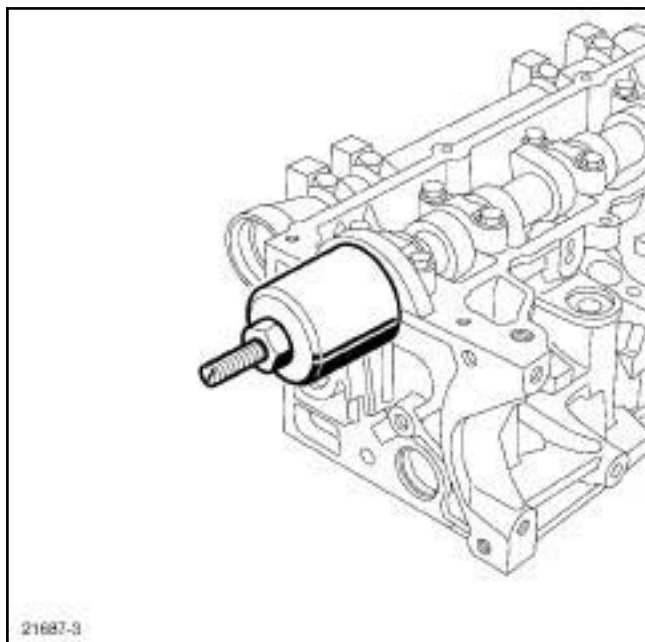
- ☐ Fit the cover (23) and the collar nut (24) of the (Mot. 1632).

# TOP AND FRONT OF ENGINE

## Camshaft seal, timing end: Removal - Refitting

# 11A

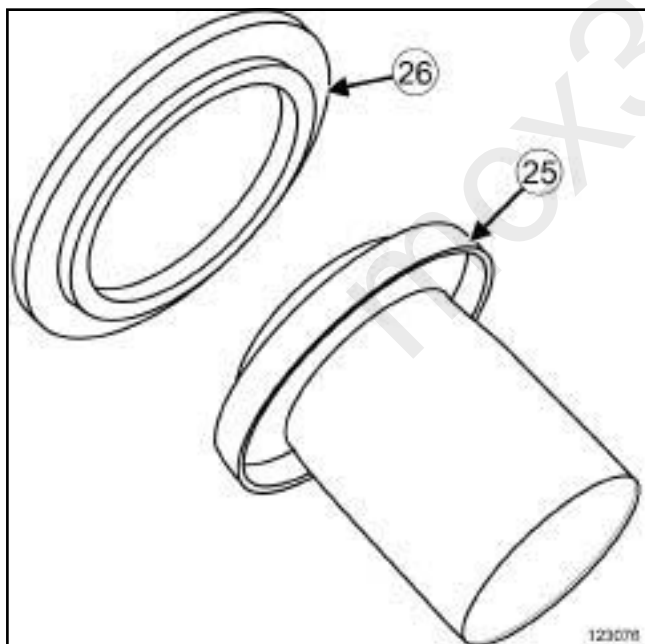
K9K



21687-3

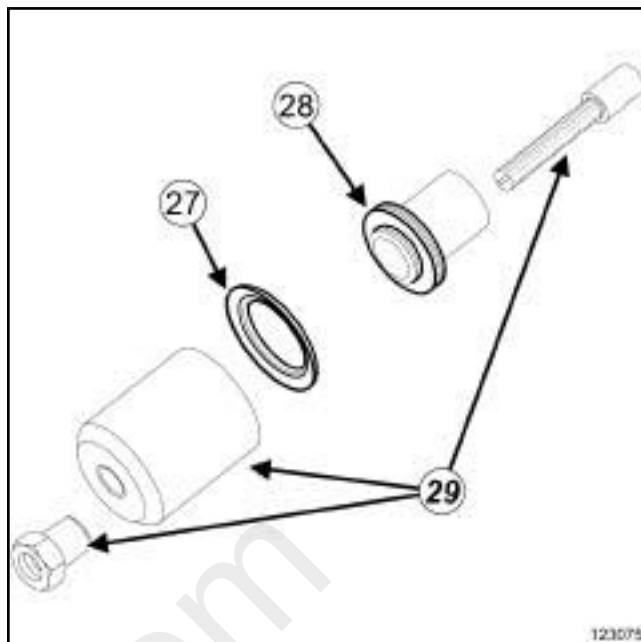
- ❑ Screw on the collar nut until the cover touches the cylinder head.

### 2 - Second fitting of the camshaft seal



123076

- ❑ Depending on the case, the Parts Department delivers seals (25) equipped with a spacer (26) amongst other things.



123075

- ❑

#### Note:

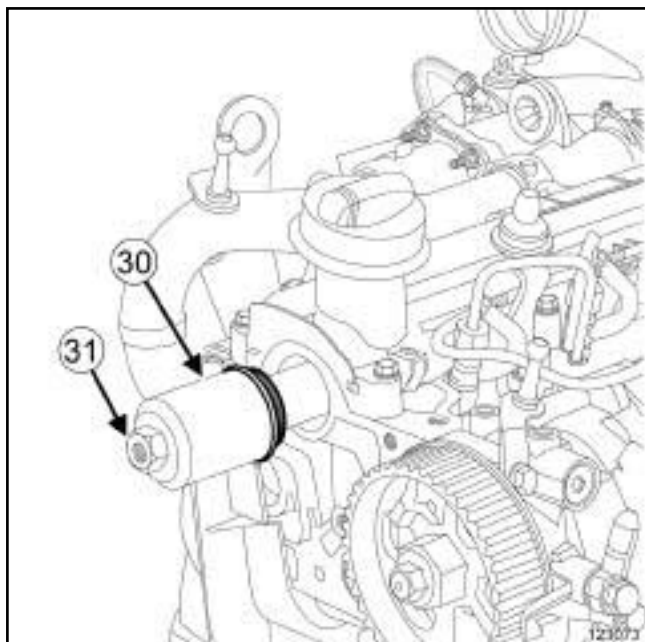
The spacer (27) is used to fit the seal (28) and is used in addition to the tool (Mot. 1632) (29) .

# TOP AND FRONT OF ENGINE

## Camshaft seal, timing end: Removal - Refitting

# 11A

K9K

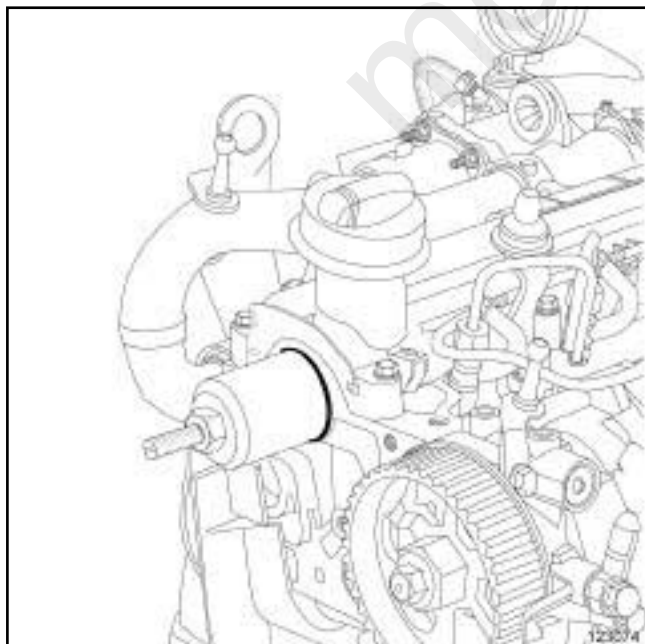


123073

- ❑ Position the bell (30) fitted with the spacer on the camshaft seal side and then position the collared nut (31) of the tool (Mot. 1632).

Note:

The spacer fits on the bell of the tool (Mot. 1632) 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 (Mot. 1632),
- the cover from the (Mot. 1632),
- the stud of the (Mot. 1632),
- the protective sleeve and the spacer, if fitted then throw them away.

### FACTORY FITTING:

- ❑ Refit:

- the camshaft pulley,
- the camshaft pulley nut.

Note:

When replacing the camshaft pulley, the Parts Department supplies a camshaft pulley in two parts.

- ❑ Immobilise the camshaft hub using the (Mot. 799-01).

- ❑ Torque tighten the **camshaft hub bolt** (30 N.m +  $86^\circ \pm 6^\circ$ ), locking the hub using the tool (Mot. 799-01).

### RETRO-FITTING:

- ❑ Refit:

- the camshaft hub,
- the camshaft hub nut.

- ❑ Immobilise the camshaft hub using the (Mot. 799-01).

- ❑ Torque tighten the **camshaft hub bolt** (30 N.m +  $86^\circ \pm 6^\circ$ ), locking the hub using the tool (Mot. 799-01).

- ❑ Refit:

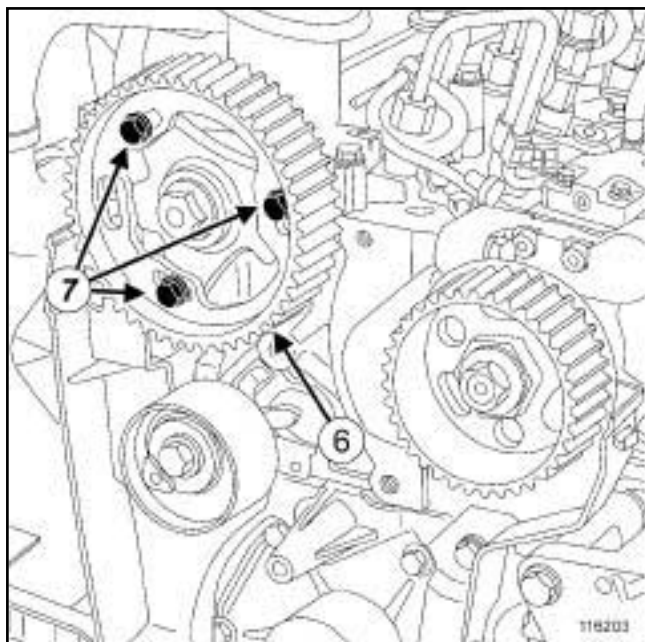
- the camshaft pulley,
- the camshaft pulley bolts.

# TOP AND FRONT OF ENGINE

## Camshaft seal, timing end: Removal - Refitting

# 11A

K9K



116203

- ☐ Position the pulley (6) in the centre of the ellipses (7)
- ☐ Tighten to torque the **camshaft pulley bolts (14 N.m)**.

### III - FINAL OPERATION

- ☐ Refit:
  - the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-48) ,
  - the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-22) ,
  - the lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page 19D-13) ,
  - the front section of the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
  - the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
  - the engine undertray,
  - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
  - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- ☐ Refit the engine cover.

- ☐ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

# TOP AND FRONT OF ENGINE

## Camshaft seal, timing end: Removal - Refitting

# 11A

F4R

| Special tooling required |                                                              |
|--------------------------|--------------------------------------------------------------|
| <b>Mot. 1801</b>         | Camshaft sprocket locking tool F4 engines.                   |
| <b>Mot. 1509-01</b>      | Adapter kit for tool Mot.1509 or Mot.1801                    |
| <b>Mot. 1577</b>         | Lip seal extractor (shaft diameter 28 mm to 42 mm).          |
| <b>Mot. 1814</b>         | Tool for fitting the PTFE seal to the inlet camshaft F4R/830 |
| <b>Mot. 1512</b>         | Tool for fitting exhaust camshaft seals (28 x 47).           |

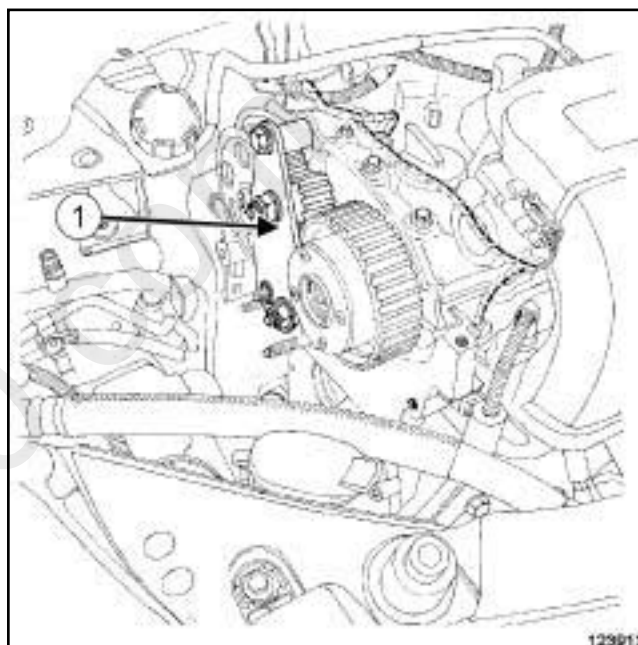
| Tightening torques  |              |
|------------------------------------------------------------------------------------------------------|--------------|
| toothed sprocket nuts                                                                                | <b>80 Nm</b> |
| exhaust camshaft pulley nut                                                                          | <b>30 Nm</b> |
| intake camshaft pulley nut                                                                           | <b>30 Nm</b> |
| inlet camshaft dephaser blanking cover                                                               | <b>25 Nm</b> |

## REMOVAL

### I - REMOVAL PREPARATION OPERATION

- ☐ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).
- ☐ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).
- ☐ Remove:
  - the engine undertray bolts,
  - the engine undertray,
  - the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
  - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
  - the right-hand protector bolts,
  - the right-hand protector,

- the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the rear suspended engine mounting (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page **19D-13**) ,
- the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page **11A-48**) .



123913

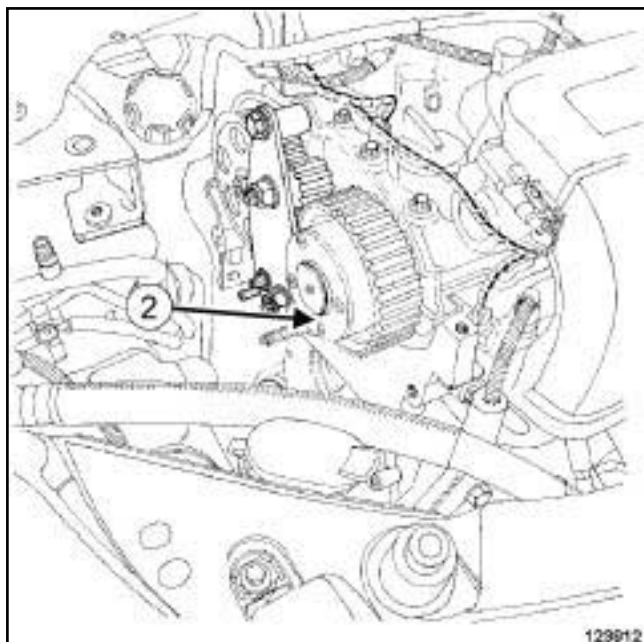
- ☐ Position the **(Mot. 1801) (1)** equipped with the tool **(Mot. 1509-01)**.
- ☐ Tighten the bolt and the collar nut.
- ☐ Torque tighten the **toothed sprocket nuts (80 Nm)**.
- ☐ Remove:
  - the camshaft pulley nuts,
  - the **(Mot. 1801)** fitted with the **(Mot. 1509-01)**,
  - the camshaft pulleys.

# TOP AND FRONT OF ENGINE

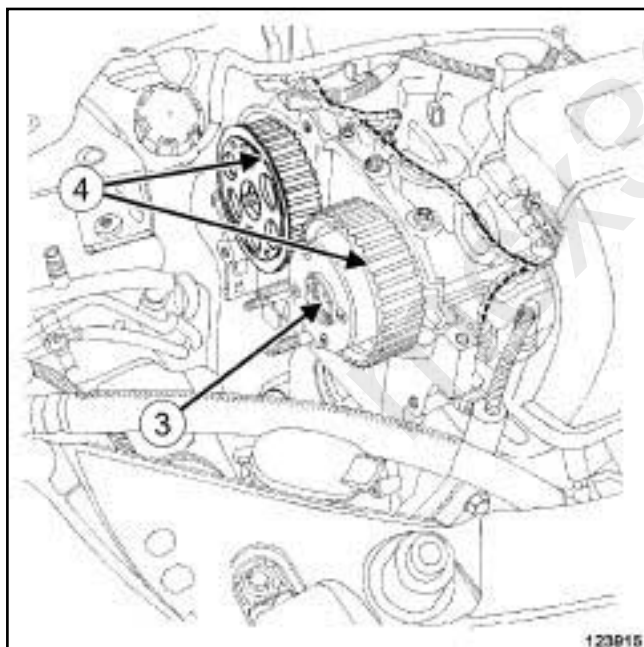
## Camshaft seal, timing end: Removal - Refitting

# 11A

F4R

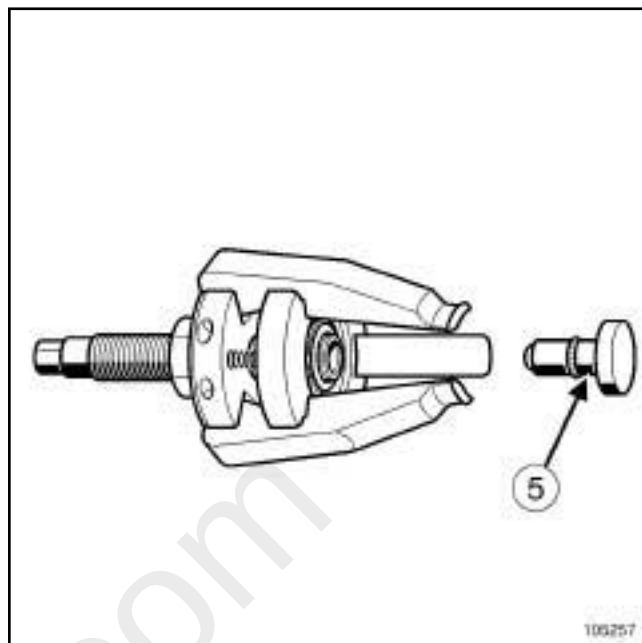


- ❑ Remove the intake camshaft dephaser blanking cover (2) .

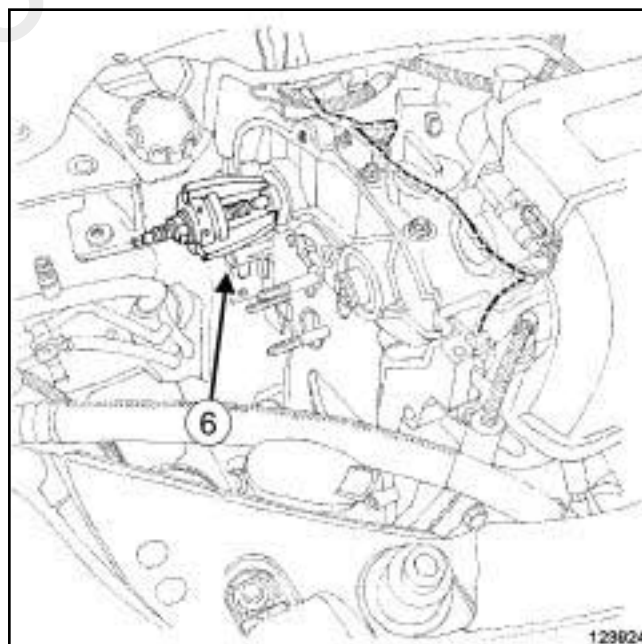


- ❑ Remove:
  - the camshaft pulley nuts (3) ,
  - the (Mot. 1801) fitted with the (Mot. 1509-01),
  - the camshaft pulleys (4) .

### II - OPERATION FOR REMOVAL OF PART CONCERNED



- ❑ Remove the end piece (5) from the (Mot. 1577).
- ❑ Position the (Mot. 1577).



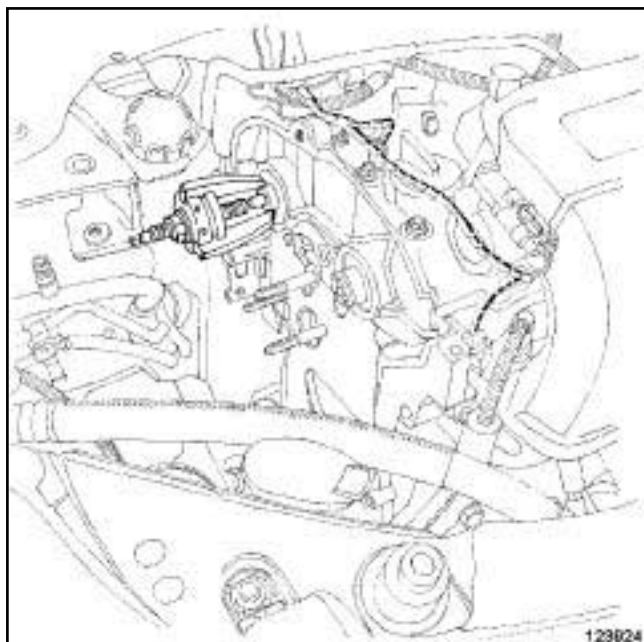
- ❑ Position the claws (6) of the tool (Mot. 1577) on the camshaft.

# TOP AND FRONT OF ENGINE

## Camshaft seal, timing end: Removal - Refitting

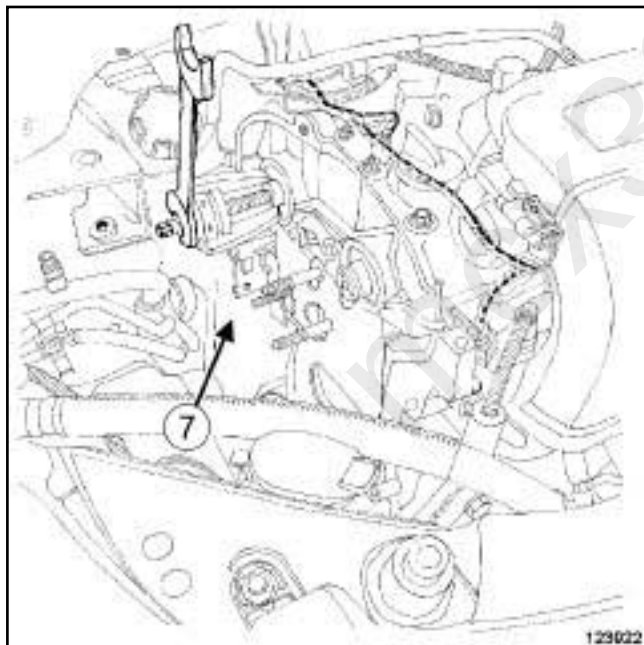
# 11A

F4R



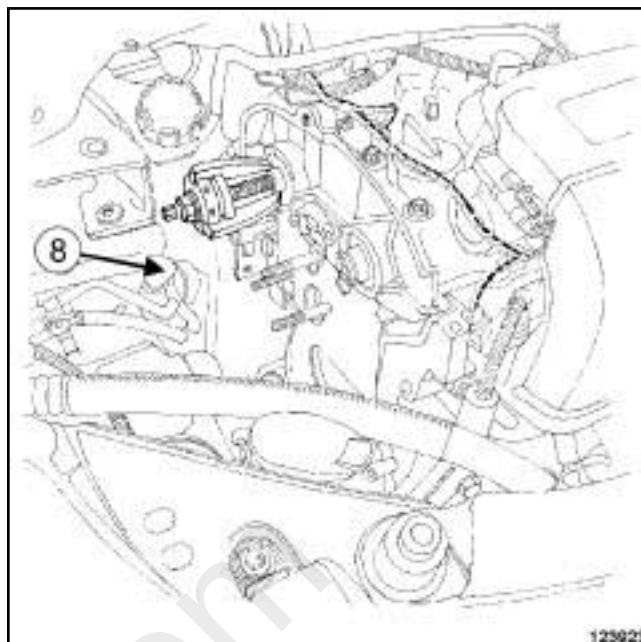
123924

- ❑ Push the tool (**Mot. 1577**) until contact is made between the ends of the claws and the camshaft seal.



123922

- ❑ Separate the claws by screwing the bolt using an open-jawed spanner (**7**) .

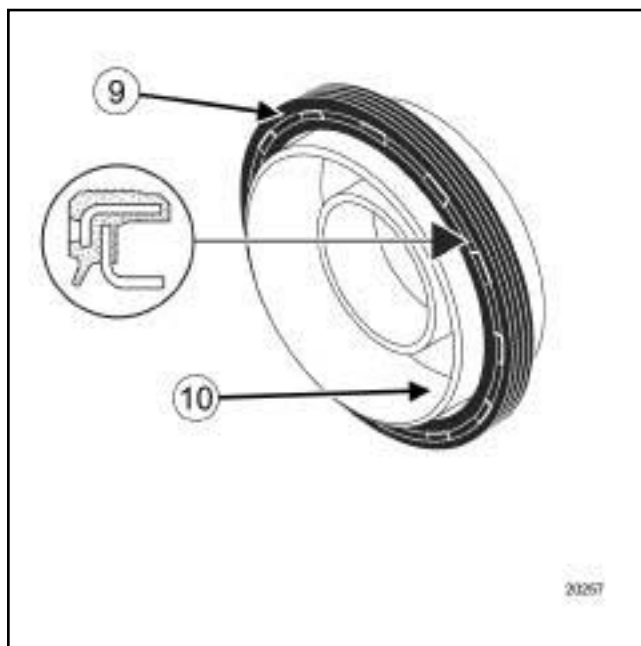


123923

- ❑ Remove the camshaft seal by screwing the bolt (**8**) .
- ❑ Repeat the previous operations in order to remove the other camshaft seal.

## REFITTING

### I - REFITTING PREPARATION OPERATION



20257

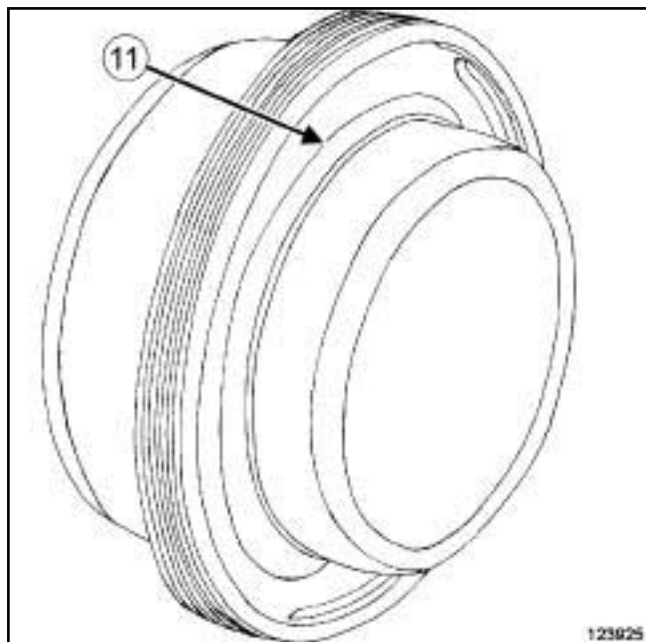
- ❑ The seals on these engines come fitted with an elastomer flat lip seal (**9**) and a protector (**10**) (also used to fit the seal on the engine).

# TOP AND FRONT OF ENGINE

## Camshaft seal, timing end: Removal - Refitting

# 11A

F4R



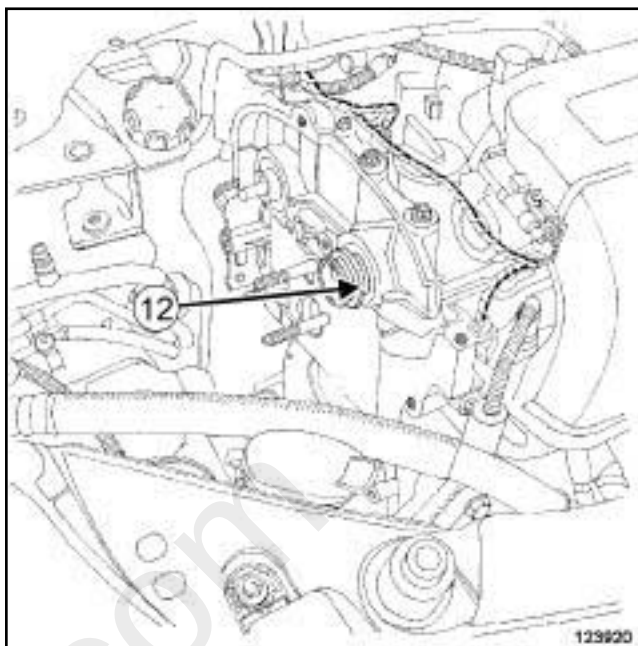
123925



### Note:

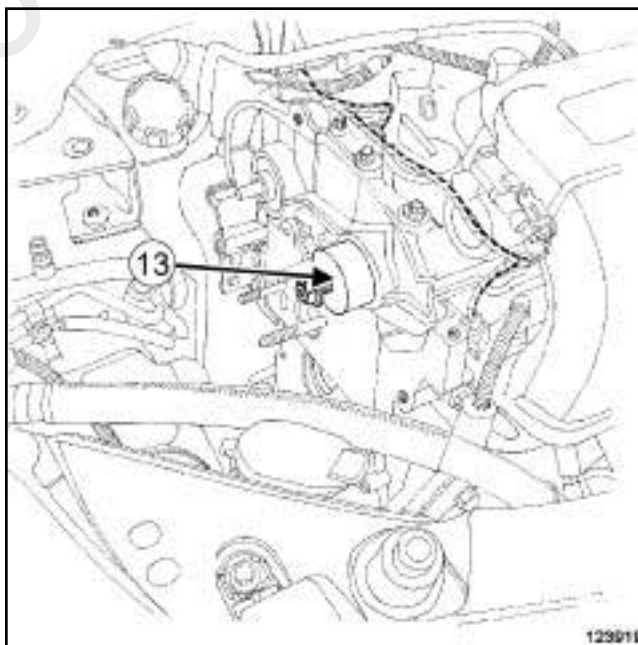
This type of seal is very delicate. When handling, it is essential to grip the seal using its protector. It is strictly forbidden to touch seal; **(11)** this is to prevent any oil leaks once the oil seal is fitted to the engine.

## II - REFITTING OPERATION FOR PART CONCERNED



123920

- Fit the seal **(12)** and protector on the camshaft, being careful not to touch the seal.



123919

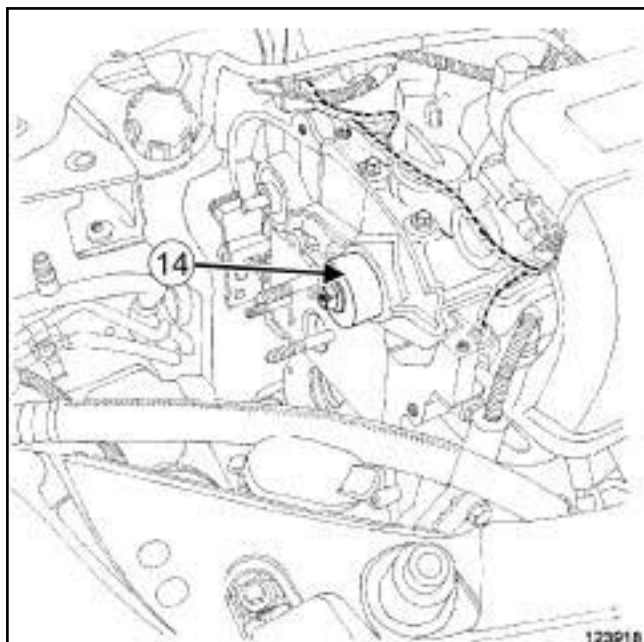
- Position the **(Mot. 1814)** **(13)** .

# TOP AND FRONT OF ENGINE

## Camshaft seal, timing end: Removal - Refitting

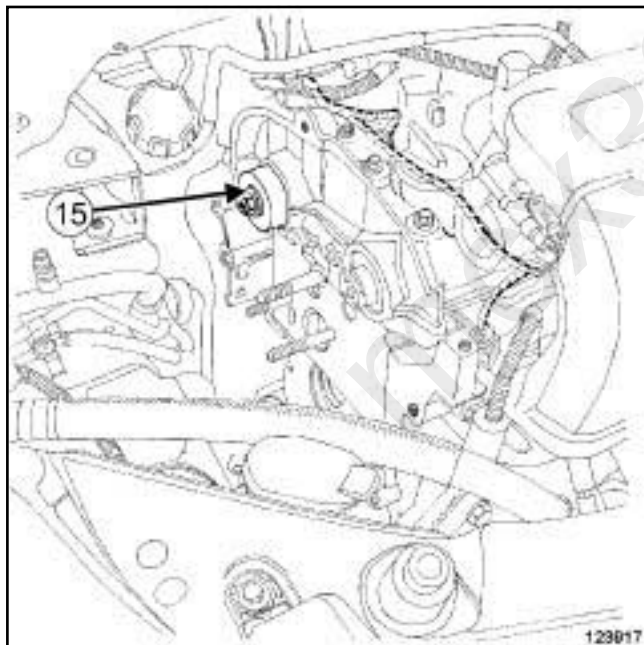
# 11A

F4R



123918

- ☐ Tighten the nut (14) until the tool comes in contact against the cylinder head.



123917

- ☐ Repeat the previous operations for refitting the exhaust camshaft seal with the tool (Mot. 1512).
- ☐ Remove:
  - the (Mot. 1814),
  - the tool (Mot. 1512).

### III - FINAL OPERATION.

#### ☐ Refit:

- the camshaft pulleys,
- the (Mot. 1801) fitted with the (Mot. 1509-01),
- the camshaft pulley nuts.

#### ☐ Tighten to torque:

- the **exhaust camshaft pulley nut (30 Nm)**,
- the **intake camshaft pulley nut (30 Nm)**.

#### ☐ Refit the inlet camshaft dephaser blanking cover.

#### ☐ Torque tighten the **inlet camshaft dephaser blanking cover (25 Nm)**.

#### ☐ Refit:

- the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page **11A-48**) ,
- the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the rear suspended engine mounting (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page **19D-13**) ,
- the right-hand protector,
- the right-hand protector bolts,
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 392, 55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 393, 35A, Wheels and tyres),
- the engine undertray,
- the engine undertray bolts.

#### ☐ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

# TOP AND FRONT OF ENGINE

## Camshaft seal, timing end: Removal - Refitting

# 11A

K4M

| Special tooling required |                                                     |
|--------------------------|-----------------------------------------------------|
| Mot. 1577                | Lip seal extractor (shaft diameter 28 mm to 42 mm). |
| Mot. 1632                | Tool for fitting camshaft PTFE seal                 |

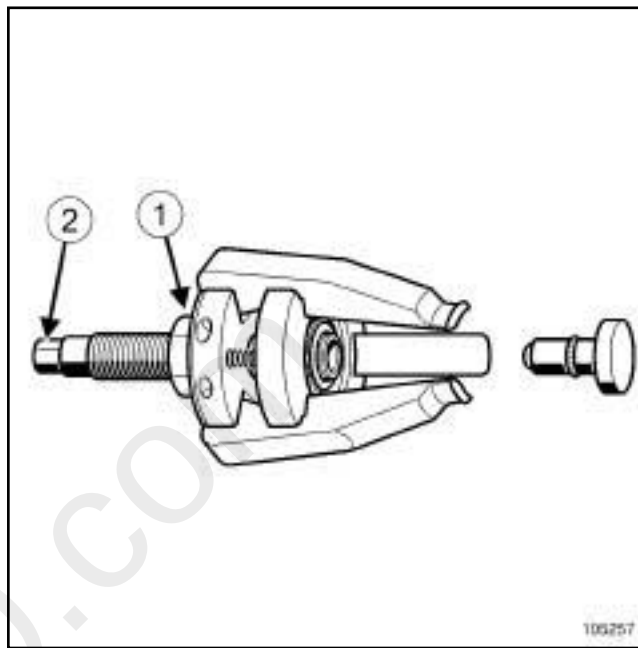
## REMOVAL

### 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 engine undertray bolts,
  - the engine undertray,
  - 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 front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
  - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-5) ,
  - the throttle valve (see **12A, Fuel mixture, Throttle valve: Removal - Refitting**, page 12A-33) ,
  - the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
  - the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
  - the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
  - the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page 19D-22) ,
  - the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page 11A-31) ,
  - the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-48) ,

- the camshaft dephaser (see **11A, Top and front of engine, Camshaft dephaser: Removal - Refitting**, page 11A-234) .

### II - OPERATION FOR REMOVAL OF PART CONCERNED



105257

☐

Note:

The camshaft seal is removed from the timing end using the **(Mot. 1577)**.

- ☐ Completely unscrew the nut (1) and the bolt **(Mot. 1577)** of the (2) .

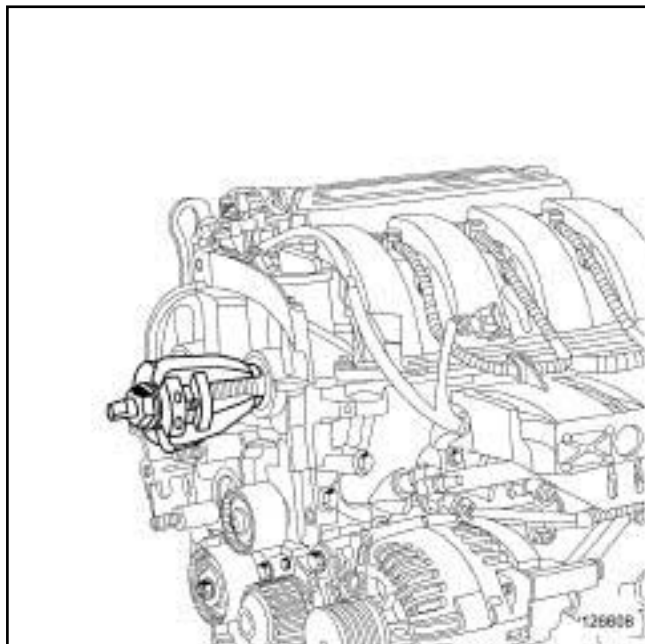
# TOP AND FRONT OF ENGINE

## Camshaft seal, timing end: Removal - Refitting

# 11A

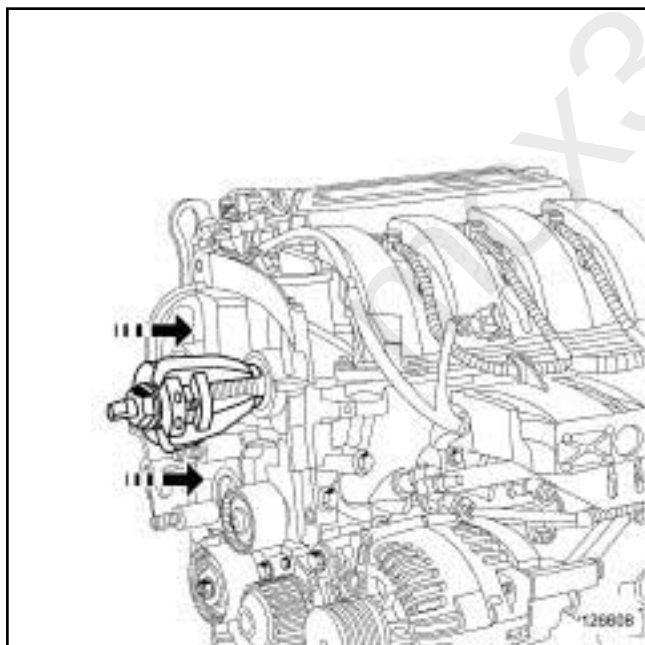
K4M

Removing the seal on the exhaust side and inlet side



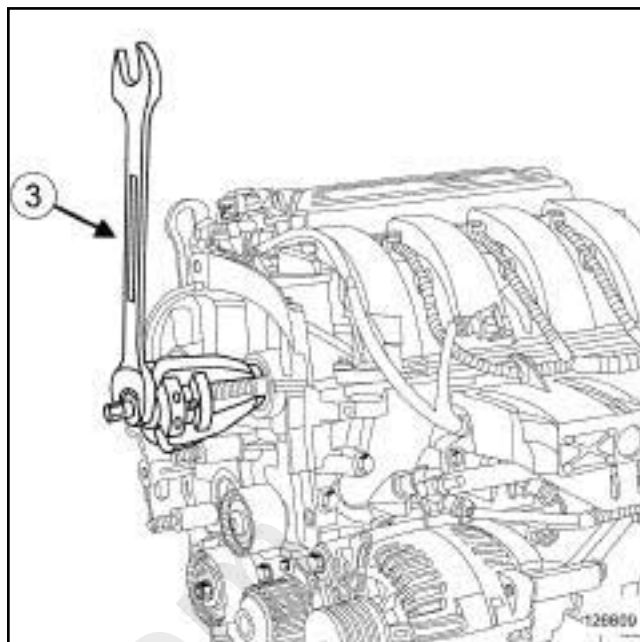
126608

- ❑ Position the claws of the **(Mot. 1577)** on the camshaft.



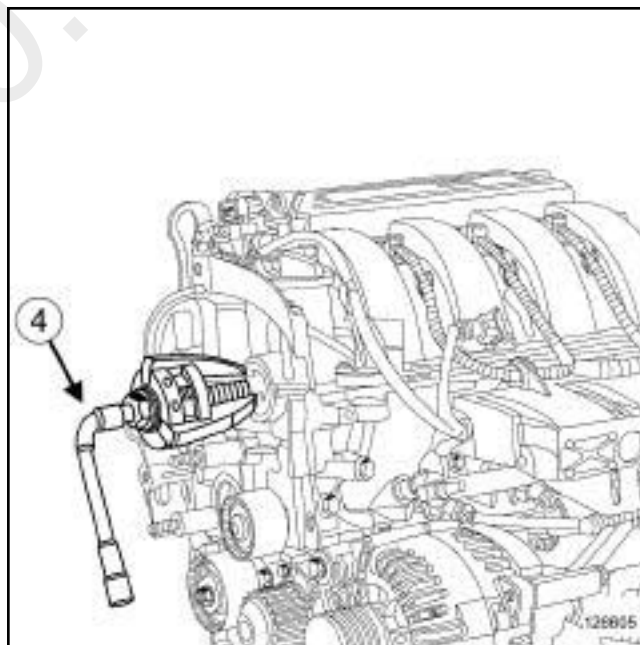
126608

- ❑ Push the tool **(Mot. 1577)** until contact is made between the ends of the claws and the camshaft seal.



126609

- ❑ Separate the claws by turning the nut **(3)** clockwise using an open-jawed spanner.



126605

- ❑ Remove the camshaft seal by turning the bolt clockwise using a spanner **(4)**.

## REFITTING

### I - REFITTING PREPARATION OPERATION

- ❑ parts always to be replaced: Camshaft seal on timing end (10,02,02,02).

# TOP AND FRONT OF ENGINE

## Camshaft seal, timing end: Removal - Refitting

# 11A

K4M

- ❑ 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.

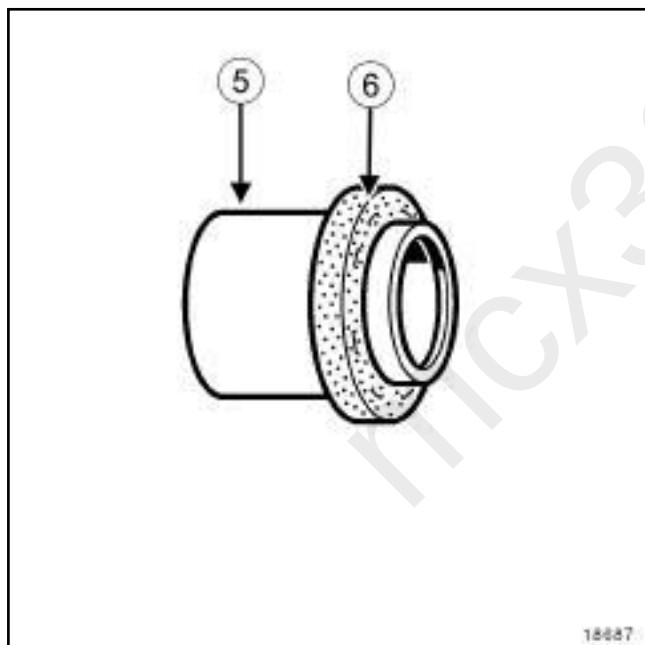
### WARNING

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).

## II - REFITTING OPERATION FOR PART CONCERNED



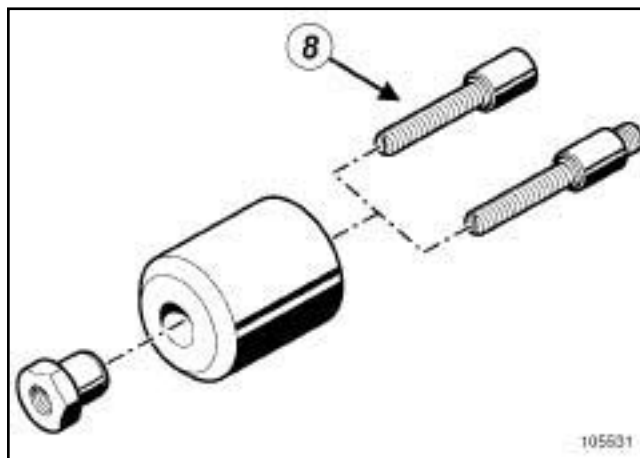
18687

❑

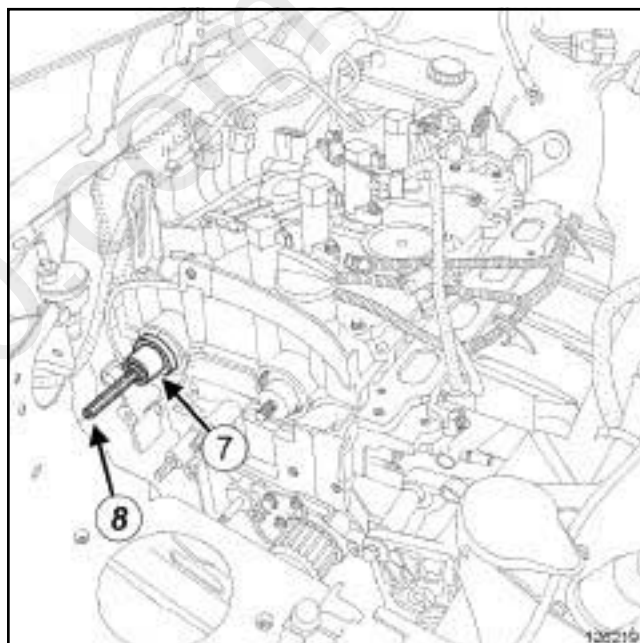
### Note:

Always hold the camshaft seal with the protector (5) when handling, as this type of camshaft seal is very FRAGILE. Touching the camshaft seal (6) is strictly forbidden in order to avoid any oil leaks once the camshaft seal is fitted on the engine.

## 1 - Refitting the exhaust side seal



105531



126219

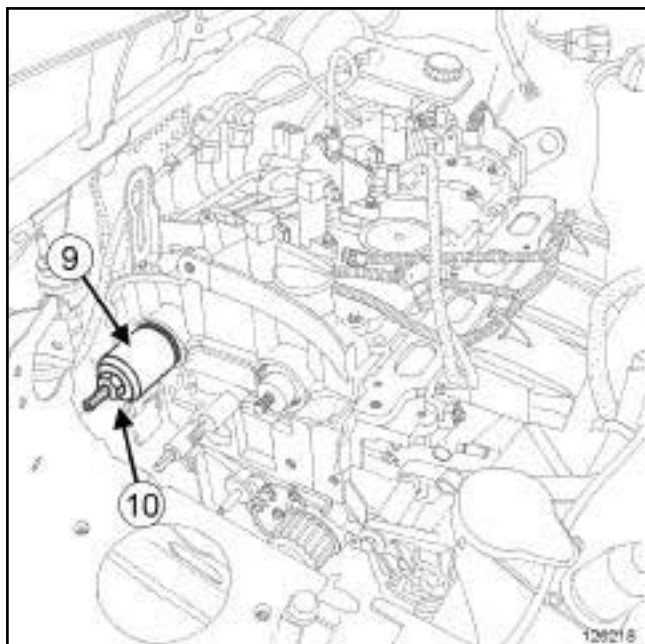
- ❑ Position the protector fitted with a new seal (7) on the camshaft (taking care not to touch the seal).
- ❑ Screw the stud (8) of the (**Mot. 1632**) onto the camshaft.

# TOP AND FRONT OF ENGINE

## Camshaft seal, timing end: Removal - Refitting

# 11A

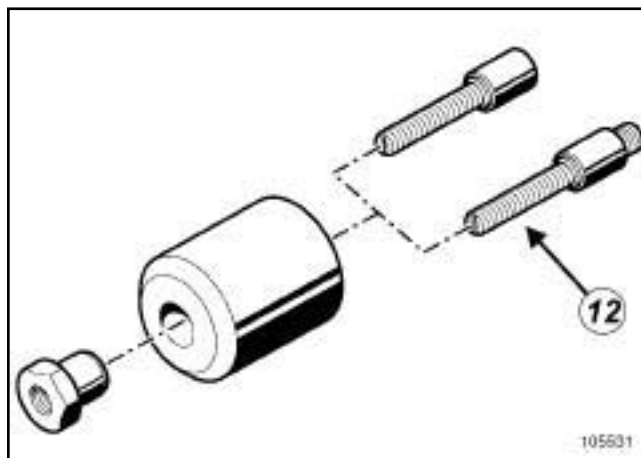
K4M



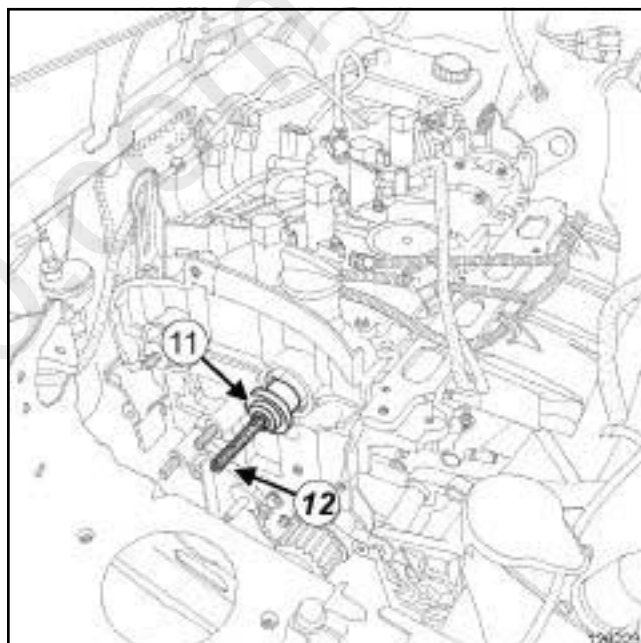
126218

- ☐ Fit the cover (9) and the collar nut (10) of the (Mot. 1632).
- ☐ Screw on the collar nut until the cover touches the cylinder head.
- ☐ Remove:
  - the collar nut from the (Mot. 1632),
  - the cover from the (Mot. 1632),
  - the stud of the (Mot. 1632),
  - the camshaft seal protector.

### 2 - Refitting the inlet side seal



105531



126223

- ☐ Position the protector fitted with a new seal (11) on the camshaft (taking care not to touch the seal).
- ☐ Remove the camshaft seal protector.
- ☐ Screw the stud (12) of the (Mot. 1632) onto the camshaft.