

TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

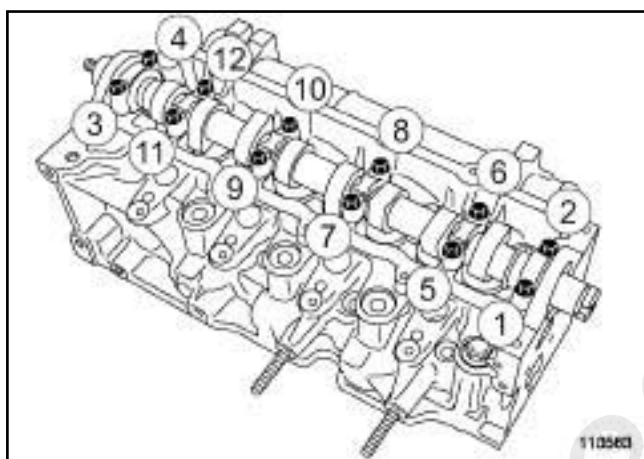
11A

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

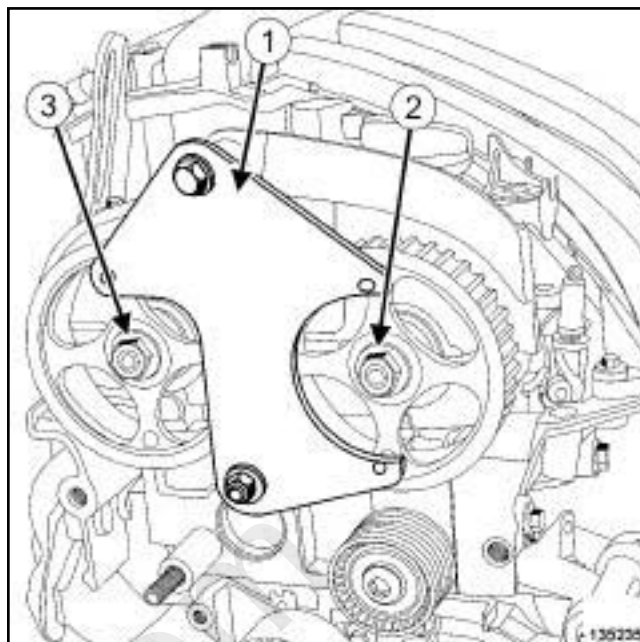
K4M

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.

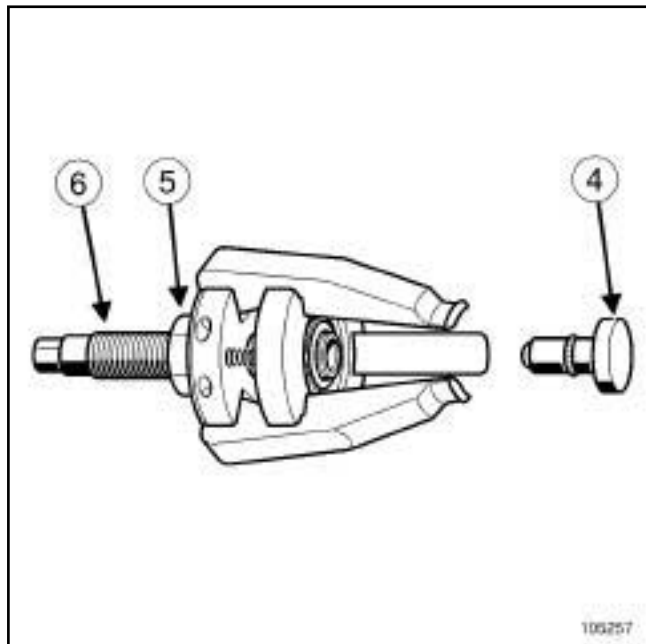
TOP AND FRONT OF ENGINE

Camshaft seal, timing end: Removal - Refitting

11A

K4M

II - REMOVAL OPERATION



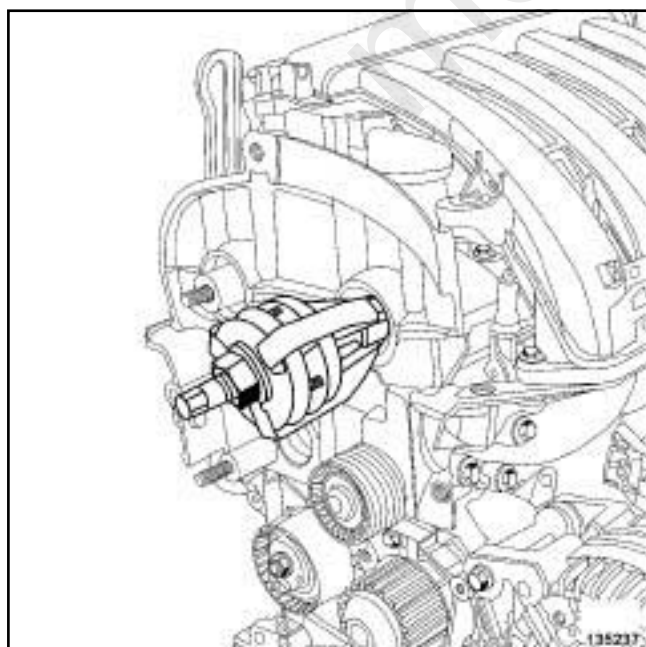
105257



Note:

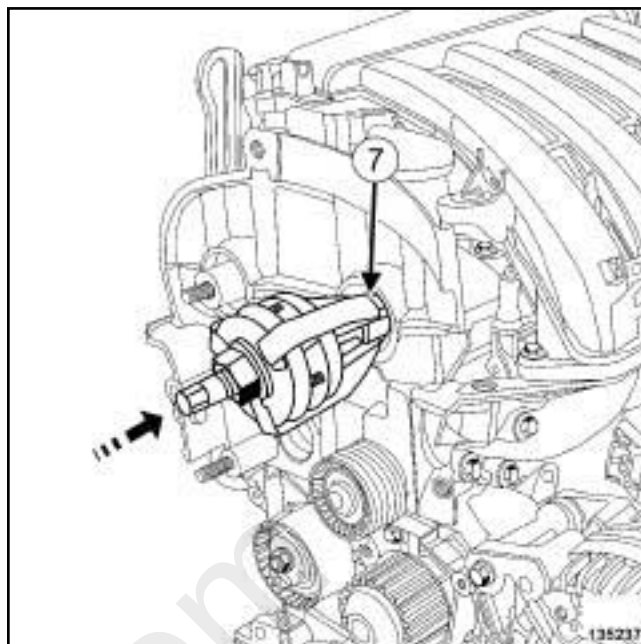
The inlet and exhaust camshaft seals are removed using the.

- Always remove the end piece (4) of the tool.
- Loosen bolts (5) and (6) fully from the.



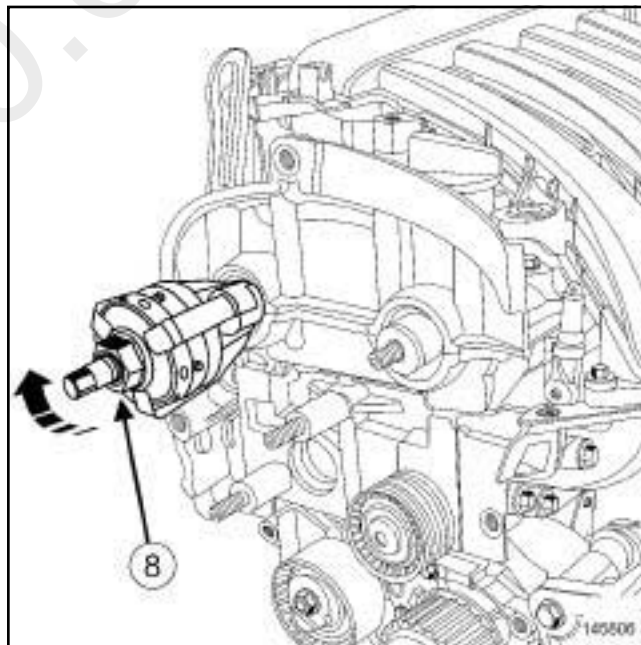
135237

- 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

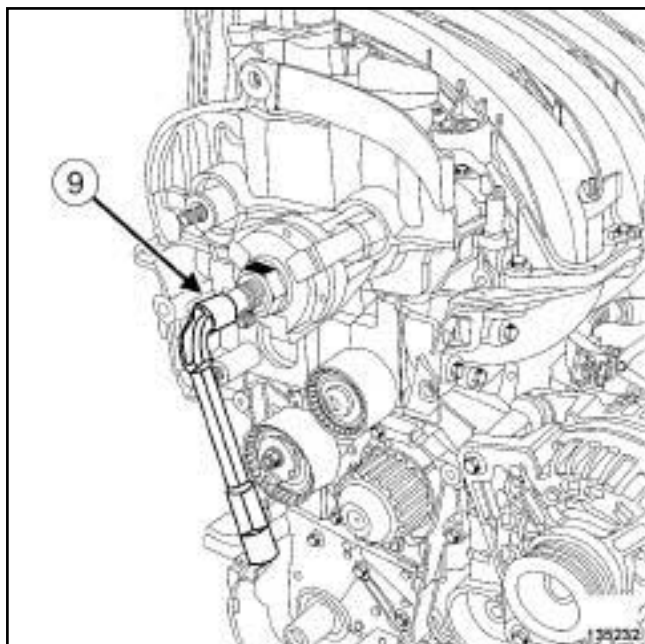
- Separate the claws by turning the nut (8) clockwise using an open-jawed spanner.

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:

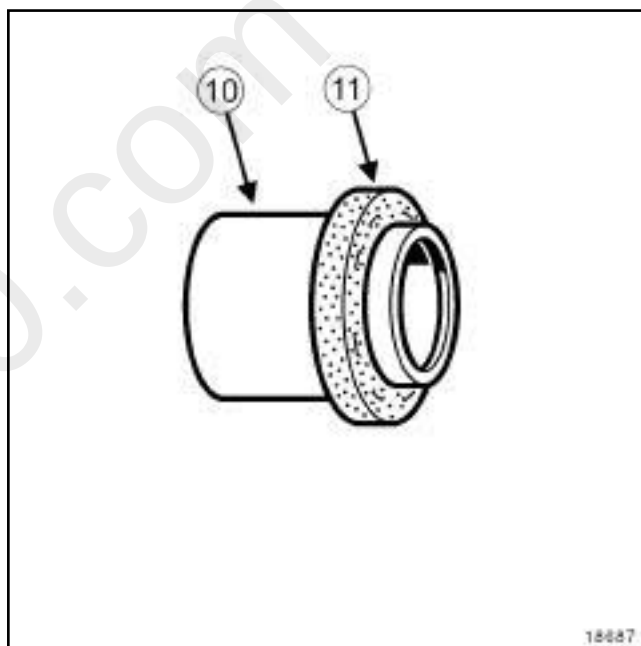
- the seal mating face of each camshaft,
- the camshaft seal housings.

Note:

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

II - REFITTING OPERATION

Fitting the camshaft seal.



18447

18687

☐

Note:

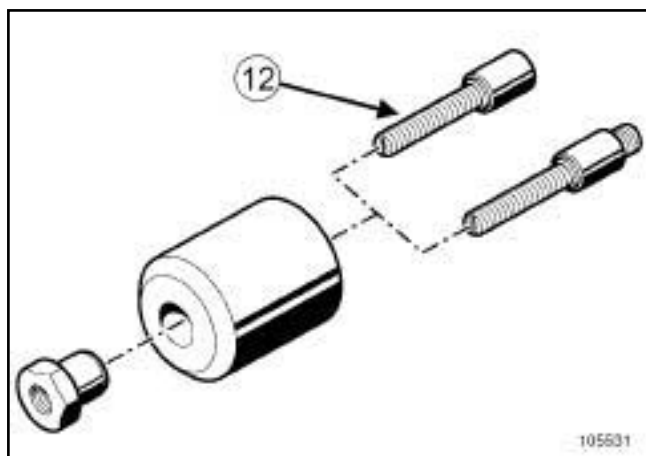
Always hold the camshaft seal with the protector (10) when handling, as this type of seal is very fragile. It is strictly forbidden to touch seal; (11) this is to prevent any oil leaks once the oil seal is fitted to the engine.

TOP AND FRONT OF ENGINE

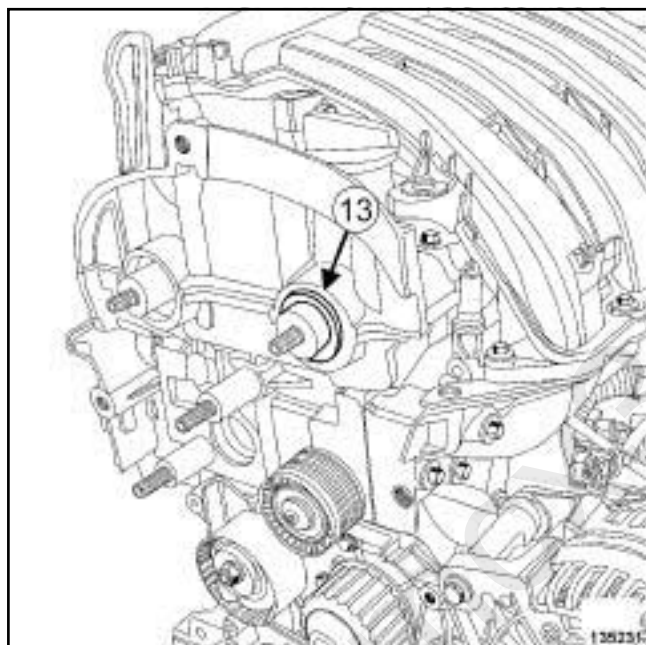
Camshaft seal, timing end: Removal - Refitting

11A

K4M

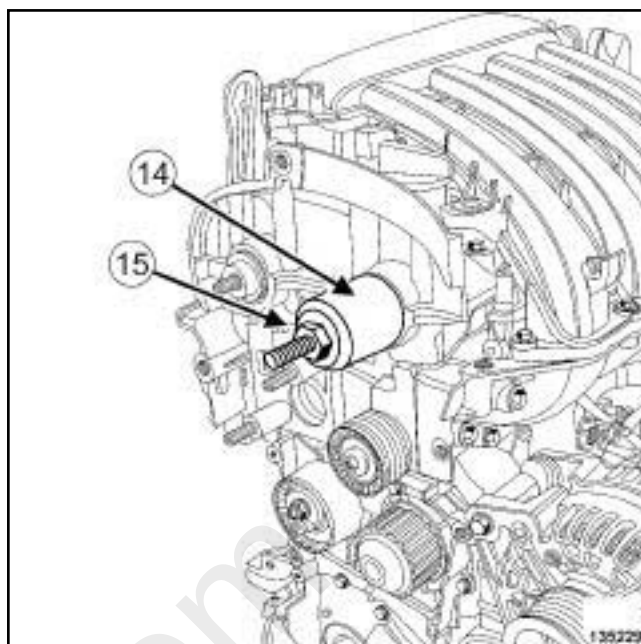


105531



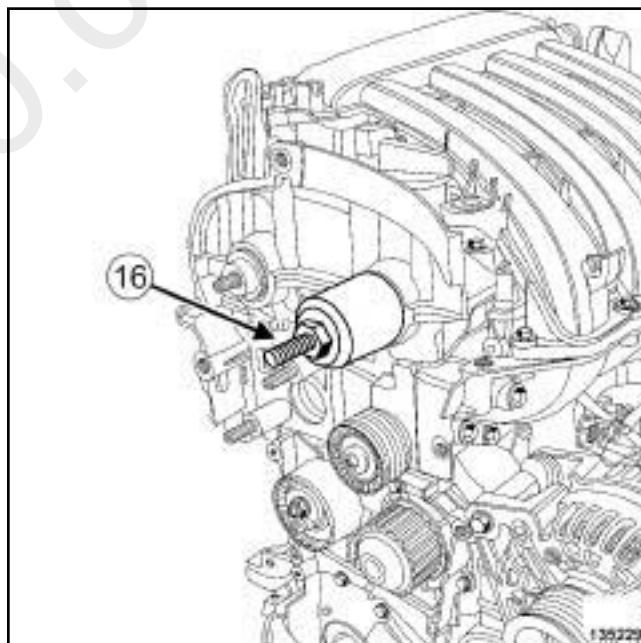
135231

- ☐ 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**

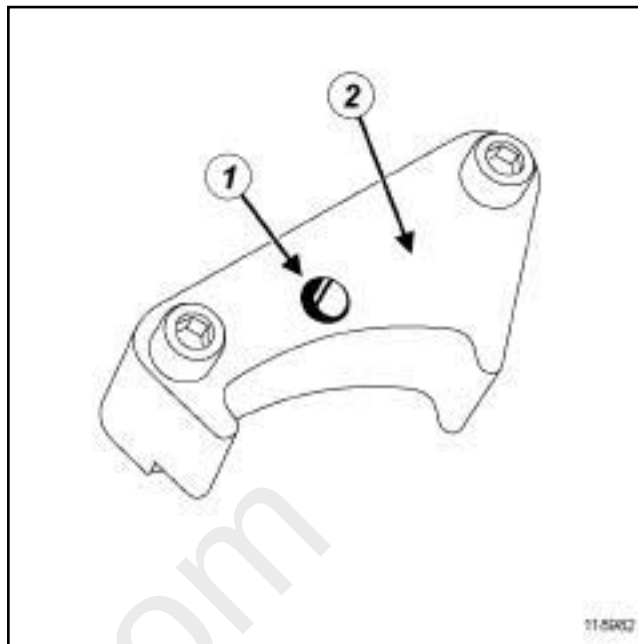
camshaft pulley nut **30 N.m + 86° ± 6°.**

REMOVAL

I - REMOVAL PREPARATION OPERATION

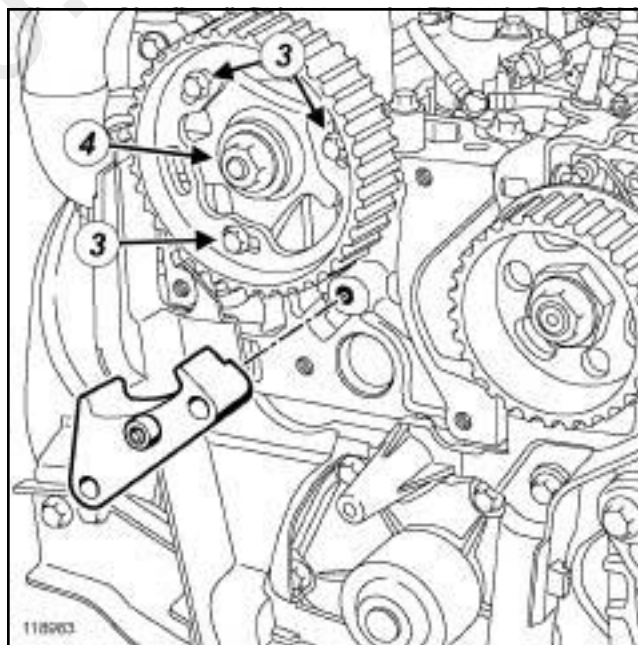
- ☐ Remove the front engine cover.
- ☐ Remove:
 - the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
 - the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
 - the engine undertray bolts,
 - the engine 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

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



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,

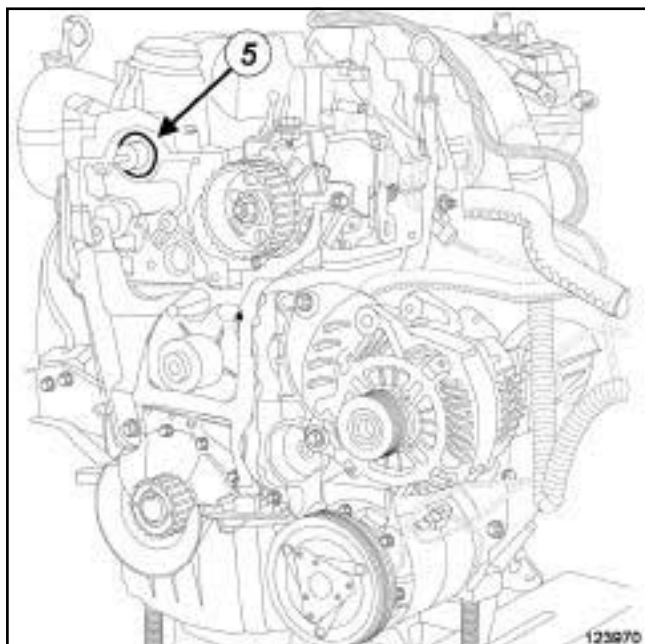
TOP AND FRONT OF ENGINE

Camshaft seal, timing end: Removal - Refitting

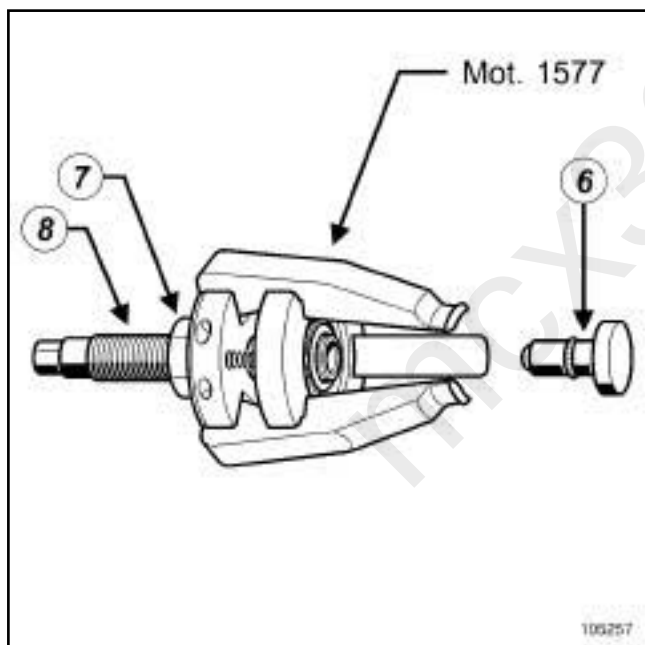
11A

K9K

- the camshaft pulley.



123970



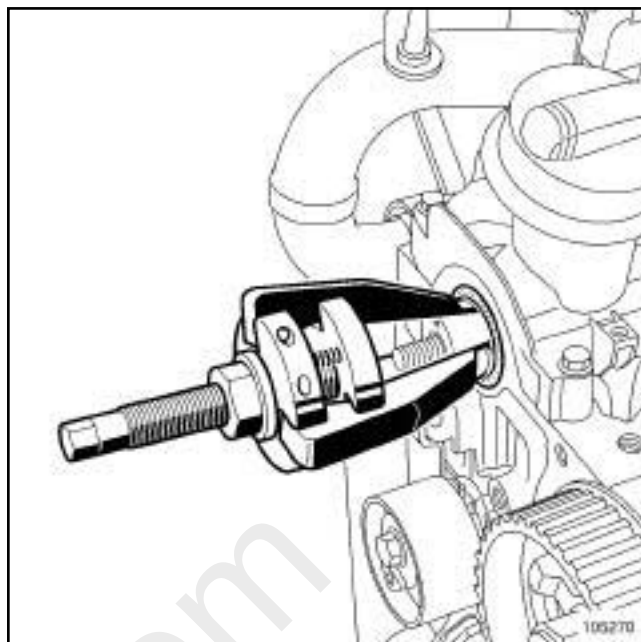
105257

□

Note:

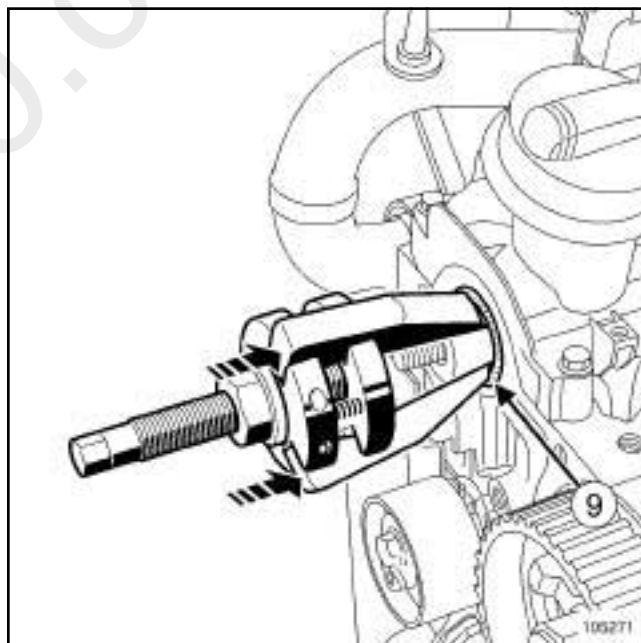
The camshaft seal is removed using the.

- 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.



105270

- Position the claws of the tool on the camshaft.



105271

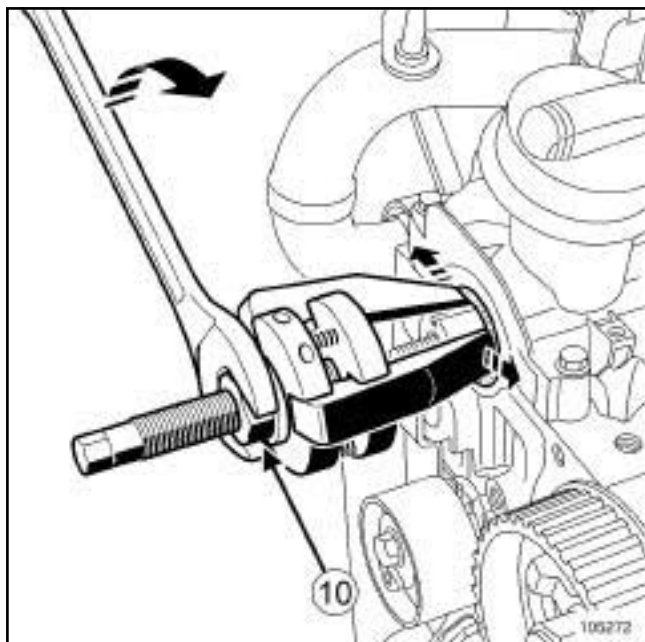
- Push the tool until contact is made between the ends (9) of the claws and the camshaft seal.

TOP AND FRONT OF ENGINE

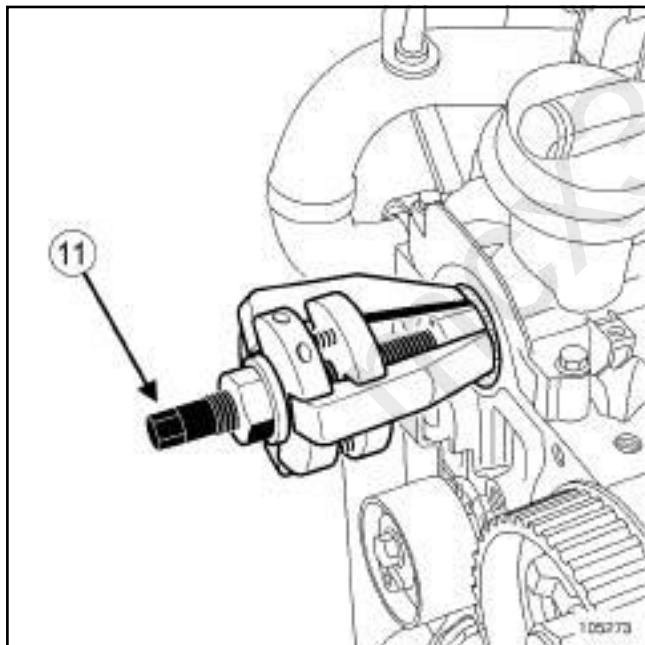
Camshaft seal, timing end: Removal - Refitting

11A

K9K



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



- ❑ 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).**

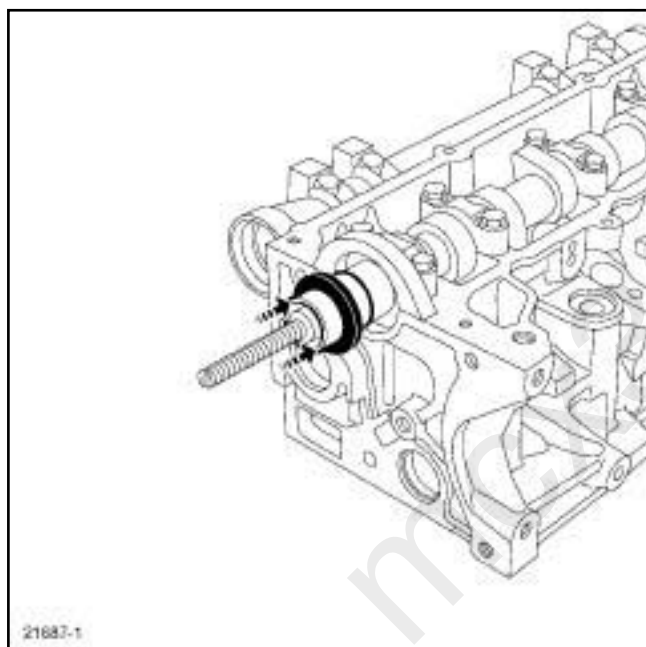
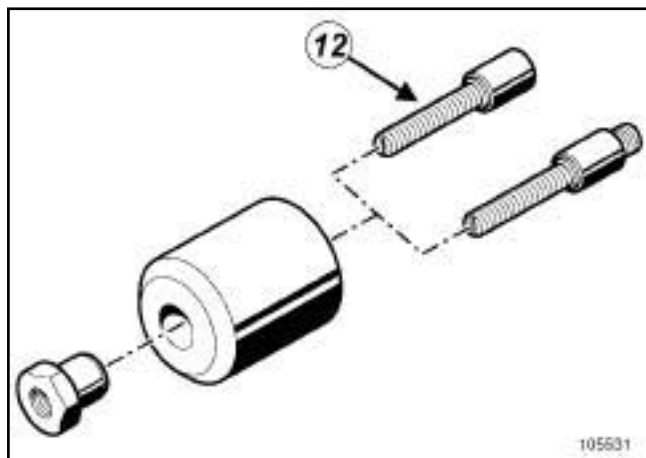
TOP AND FRONT OF ENGINE

Camshaft seal, timing end: Removal - Refitting

11A

K9K

II - REFITTING OPERATION FOR PART CONCERNED



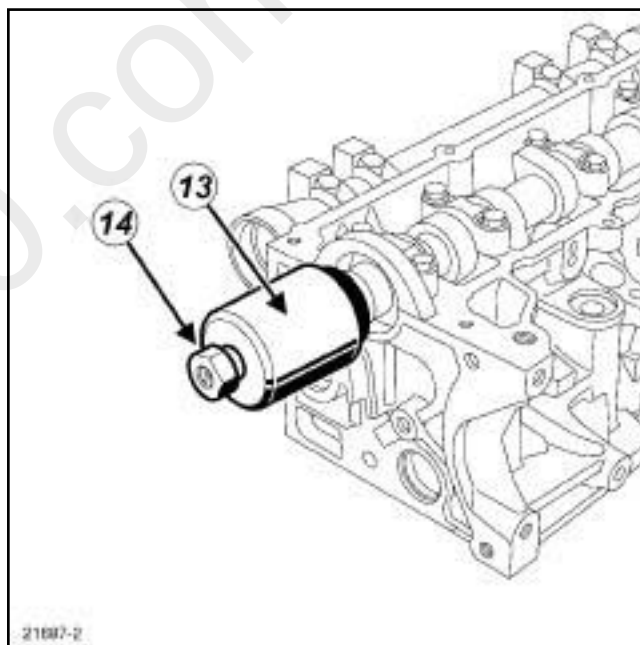
- ☐ Screw the stud (12) of the onto the camshaft.
- ☐ Fit a new camshaft seal on the camshaft.

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



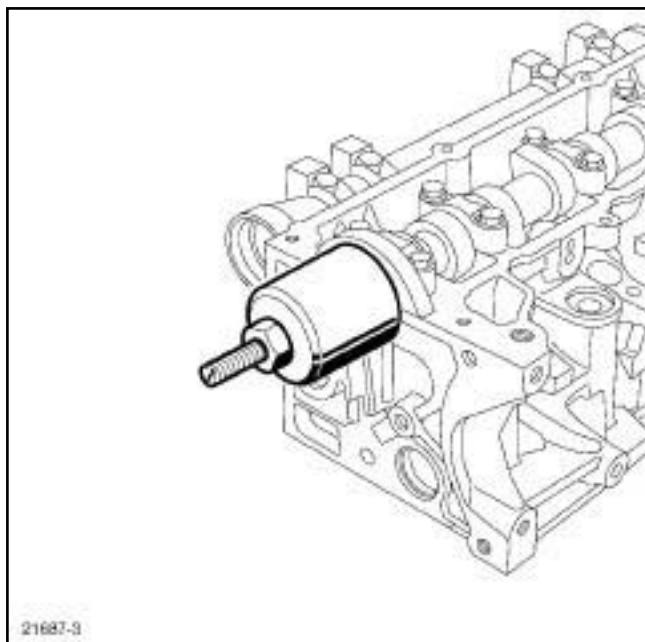
- ☐ Fit the cover (13) and the collar nut (14) of the.

TOP AND FRONT OF ENGINE

Camshaft seal, timing end: Removal - Refitting

11A

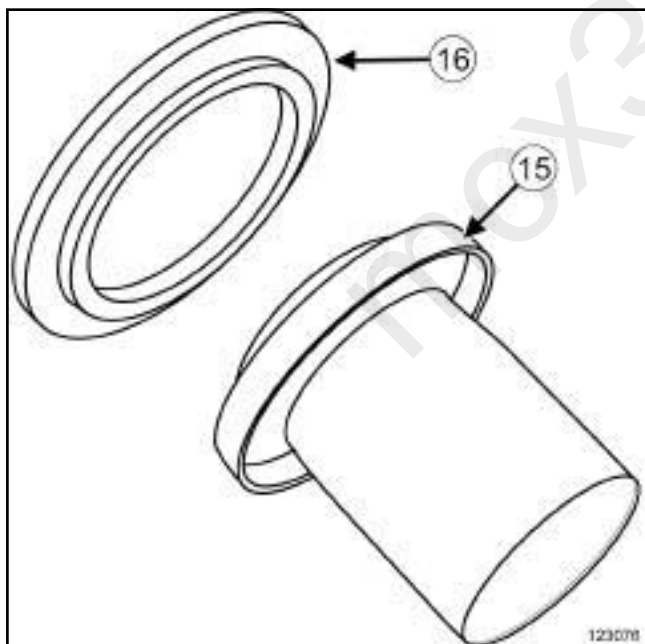
K9K



21687-3

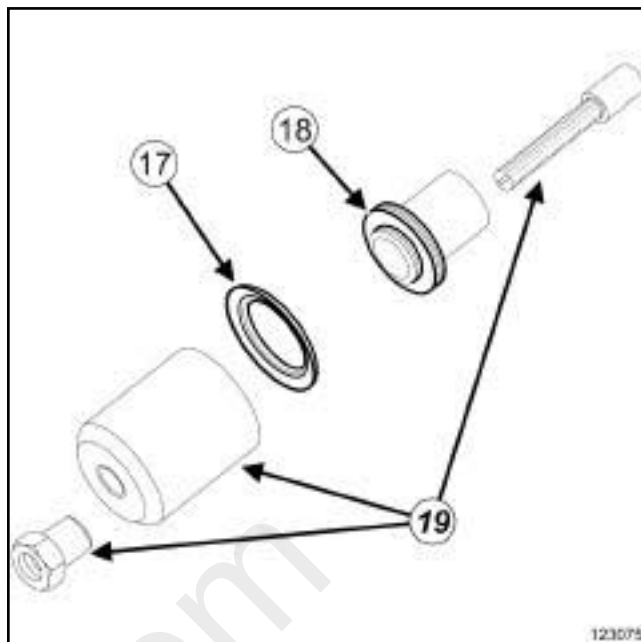
- ❑ Screw on the collar nut until the cover touches the cylinder head.

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:

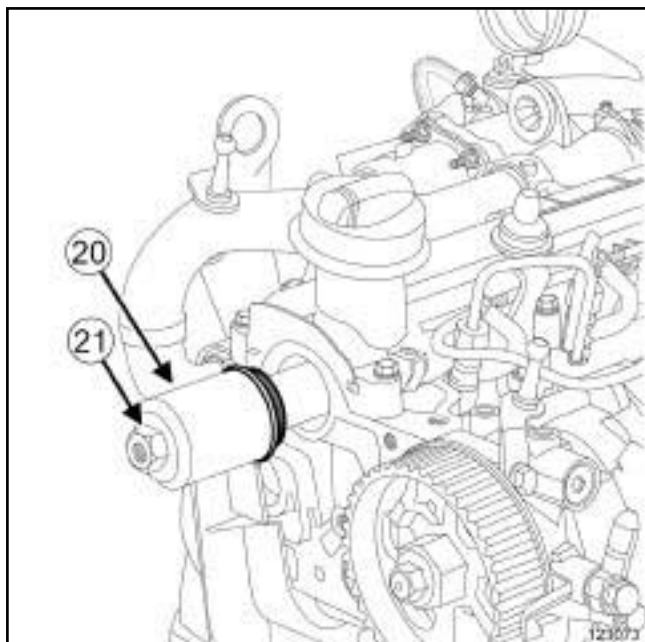
The spacer (17) is used to fit the seal (18) and is used in addition to the tool (19) .

TOP AND FRONT OF ENGINE

Camshaft seal, timing end: Removal - Refitting

11A

K9K

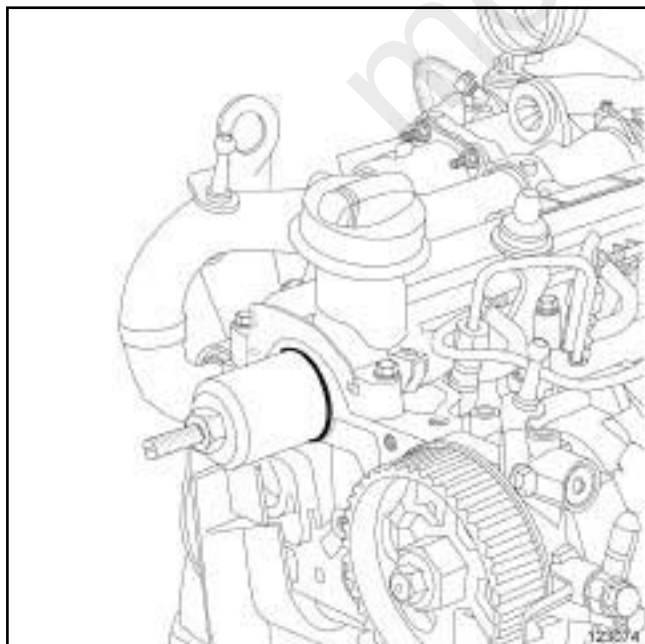


123073

- 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.

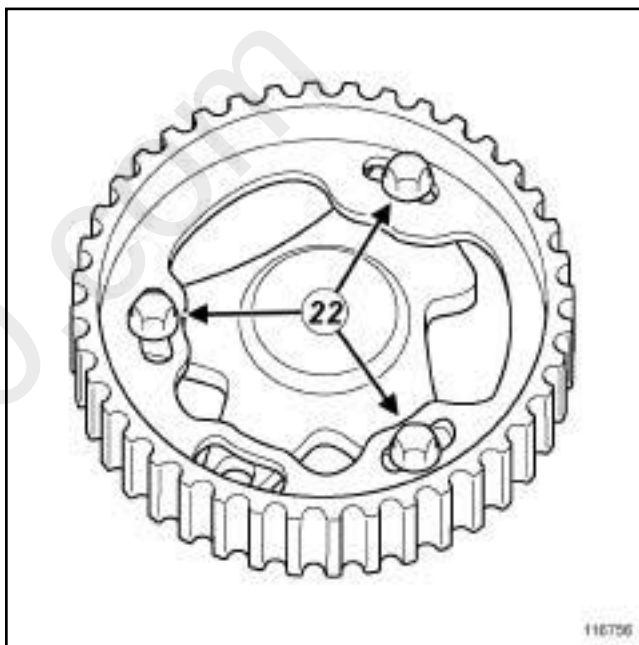


123074

- 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

- 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.