

TOP AND FRONT OF ENGINE

Camshaft dephaser: Removal - Refitting

11A

D4F, and 764

- ☐ Fit the new timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page **11A-48**) .
- ☐ Refit the new camshaft dephaser blanking cover.
- ☐ Torque tighten the **camshaft dephaser blanking cover (15 Nm)**.
- ☐ Remove the **(Mot. 1054)**.

III - FINAL OPERATION.

- ☐ Refit:
 - the lower timing cover,
 - the lower timing cover bolt.
- ☐ Torque tighten the **lower timing cover bolt (10 Nm)**.
- ☐ Refit:
 - the timing intermediate housing,
 - the timing intermediate housing bolts.
- ☐ Torque tighten the **timing intermediate housing bolts (10 Nm)**.
- ☐ Refit:
 - the upper timing cover,
 - the upper timing cover.
- ☐ Tighten to torque the **upper timing cover bolts (33 Nm)**.
- ☐ Refit the right-hand suspended engine mounting (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) .
- ☐ Remove the engine support tool **(Mot. 1672)**.
- ☐ Refit:
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page **11A-5**) ,
 - 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).
- ☐ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

11A

D4F, and 740 or 742 or 764

Special tooling required	
Mot. 799-01	Timing gear wheel immobiliser.
Mot. 1381	Camshaft seal extractor tool 30 x 42 x 7.
Mot. 1605	Tool for fitting cylinder head plugs.
Mot. 1587	Tool for fitting camshaft "PTFE" seal.

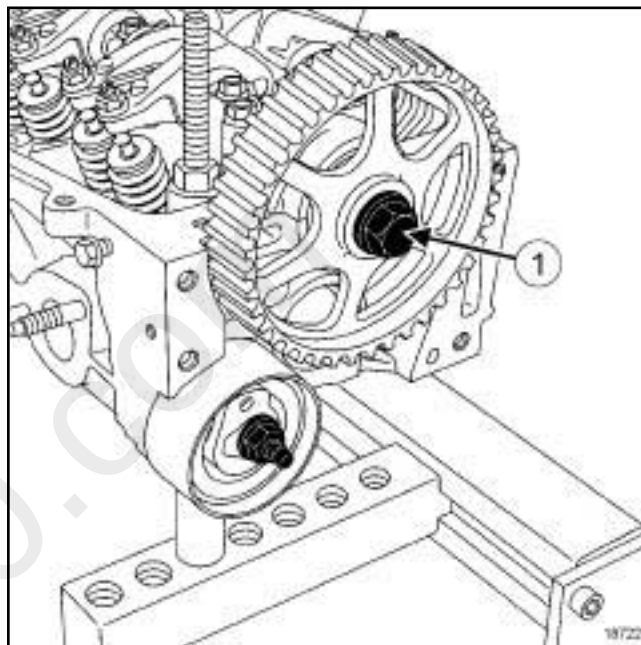
Tightening torques 	
mounting bolts of camshaft bearing cap no. 5	9 N.m
camshaft bearing cap mounting bolt	7 N.m + 50° ± 6°
camshaft pulley mounting bolt	30 N.m + 45° ± 6

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 air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-17) ,
 - the intake distributor (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page 12A-46) ,
 - the ignition coil (see **17A, Ignition, Coils: Removal - Refitting**, page 17A-2) ,
 - the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-5) ,
 - the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page 11A-31) ,

- the right-hand suspended mounting support (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) ,
- the rocker cover (see **11A, Top and front of engine, Rocker cover: Removal - Refitting**, page 11A-183) .



18722

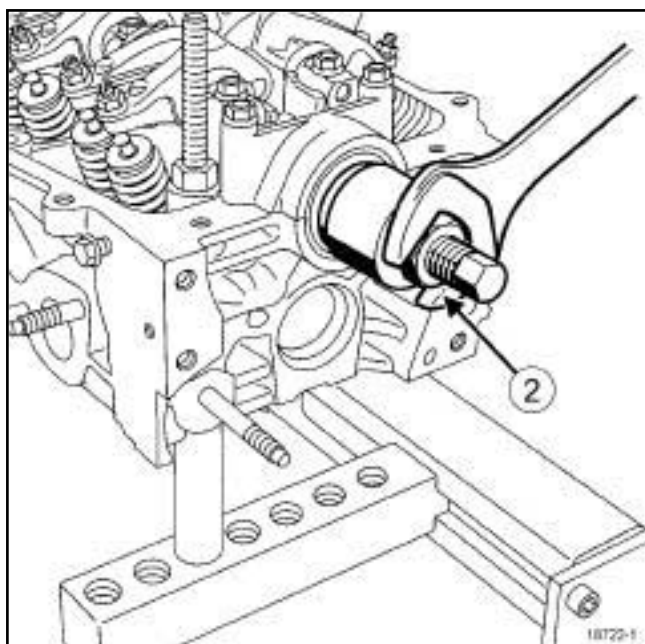
- ☐ Remove:
 - the camshaft pulley mounting bolt using the (**Mot. 799-01**),
 - the camshaft pulley.

TOP AND FRONT OF ENGINE

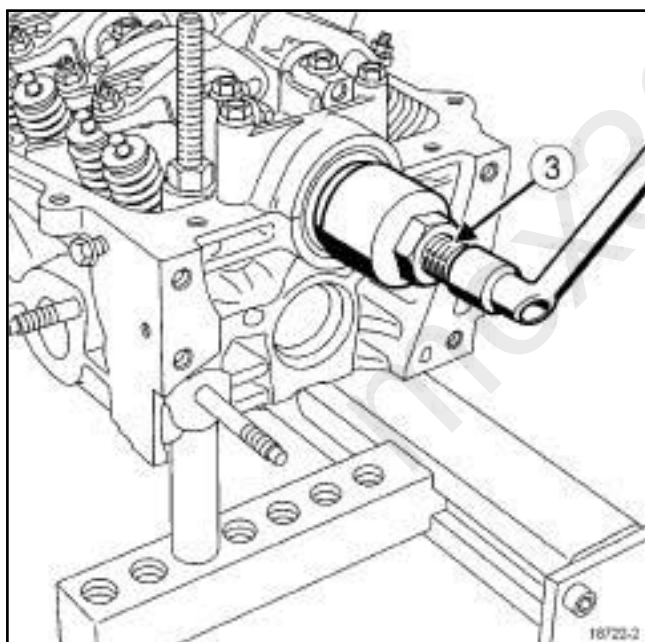
Camshaft: Removal - Refitting

11A

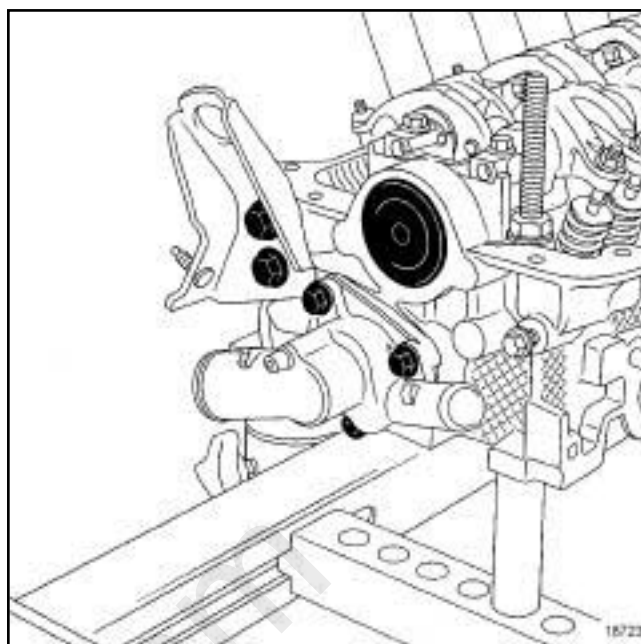
D4F, and 740 or 742 or 764



- ❑ Position the **(Mot. 1381) (2)** .

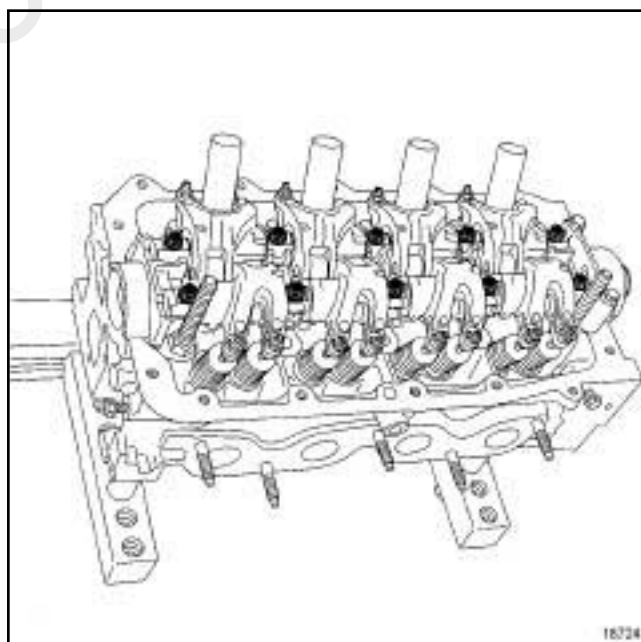


- ❑ Tighten the bolt **(3)** of the **(Mot. 1381)**.
- ❑ Remove the lip seal.



- ❑ Remove the camshaft seal cap.

II - OPERATION FOR REMOVAL OF PART CONCERNED



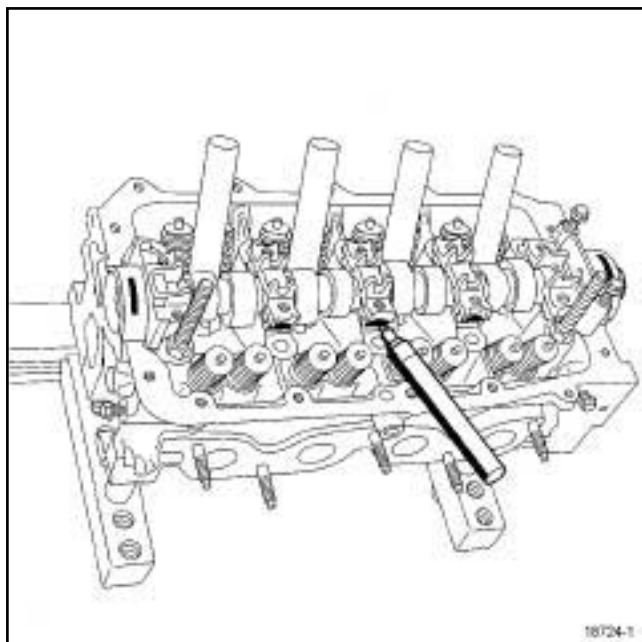
- ❑ Remove:
 - the camshaft mounting bolts,
 - the camshafts.

TOP AND FRONT OF ENGINE

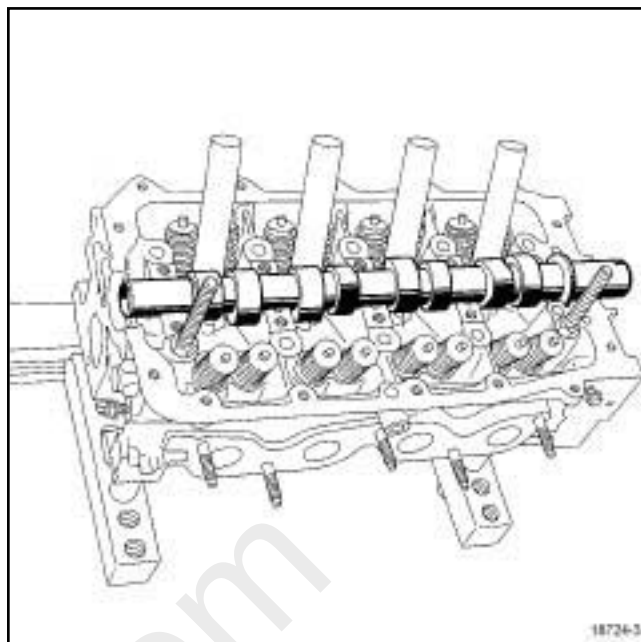
Camshaft: Removal - Refitting

11A

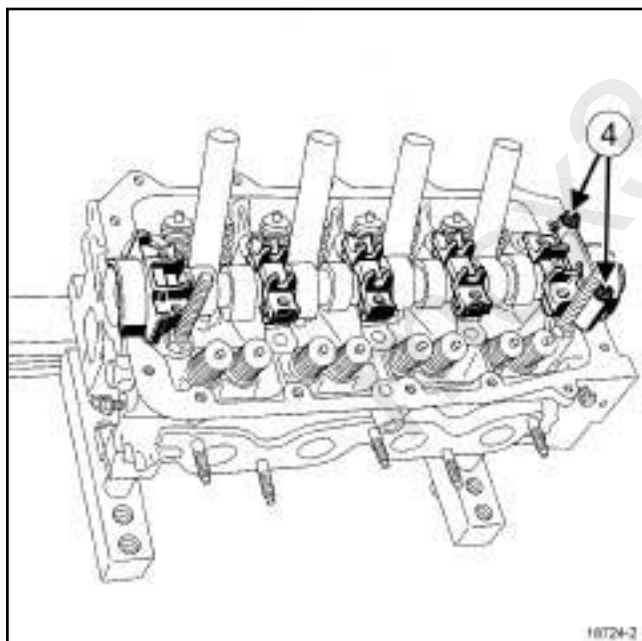
D4F, and 740 or 742 or 764



- ❑ Mark the camshaft bearing caps with an indelible marker pen.



- ❑ Remove the camshaft.



- ❑ Remove:
 - the mounting bolts (4) from camshaft bearing cap no. 5,
 - the camshaft bearing caps.

TOP AND FRONT OF ENGINE

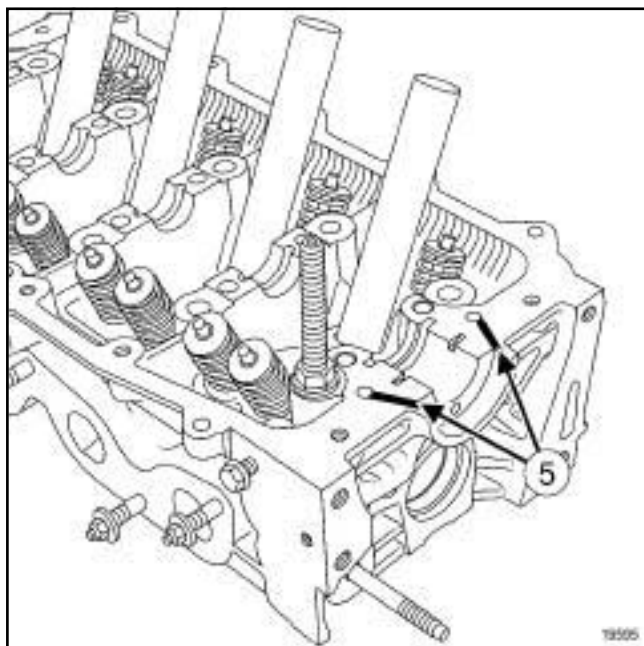
Camshaft: Removal - Refitting

11A

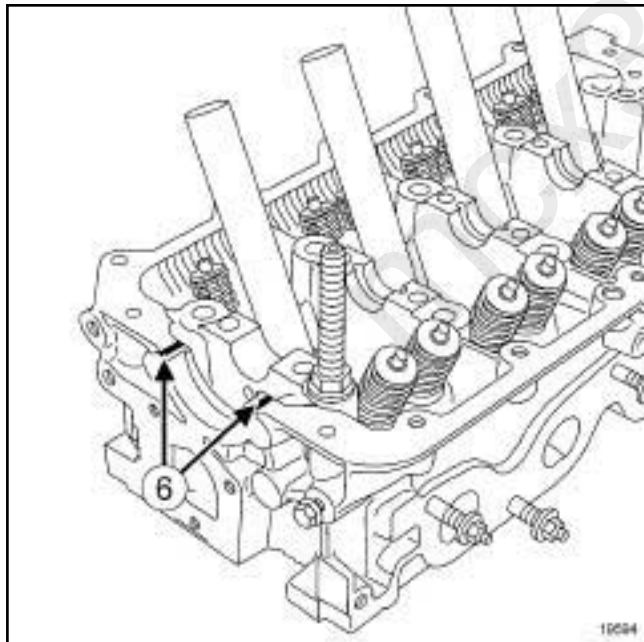
D4F, and 740 or 742 or 764

REFITTING

I - REFITTING PREPARATION OPERATION



19595



19594

□ Apply:

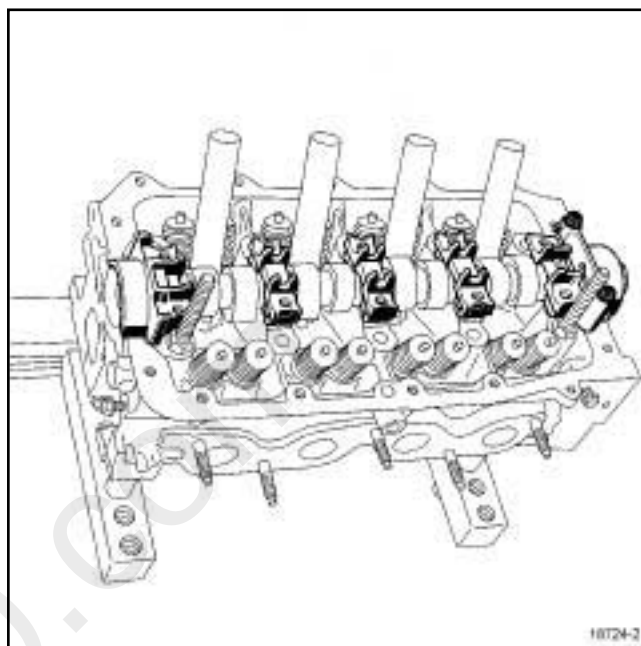
- two beads (5) of **RHODORSEAL 5661** with a width of **2 mm** on cylinder head bearing no. 5,
- two drops (6) of **RHODORSEAL 5661** to cylinder head bearing no. 1.

□ Apply a blob of oil to the camshaft bearings.

II - REFITTING OPERATION FOR PART CONCERNED

□ Refit:

- the camshaft,
- the camshaft bearing caps.



18724-2

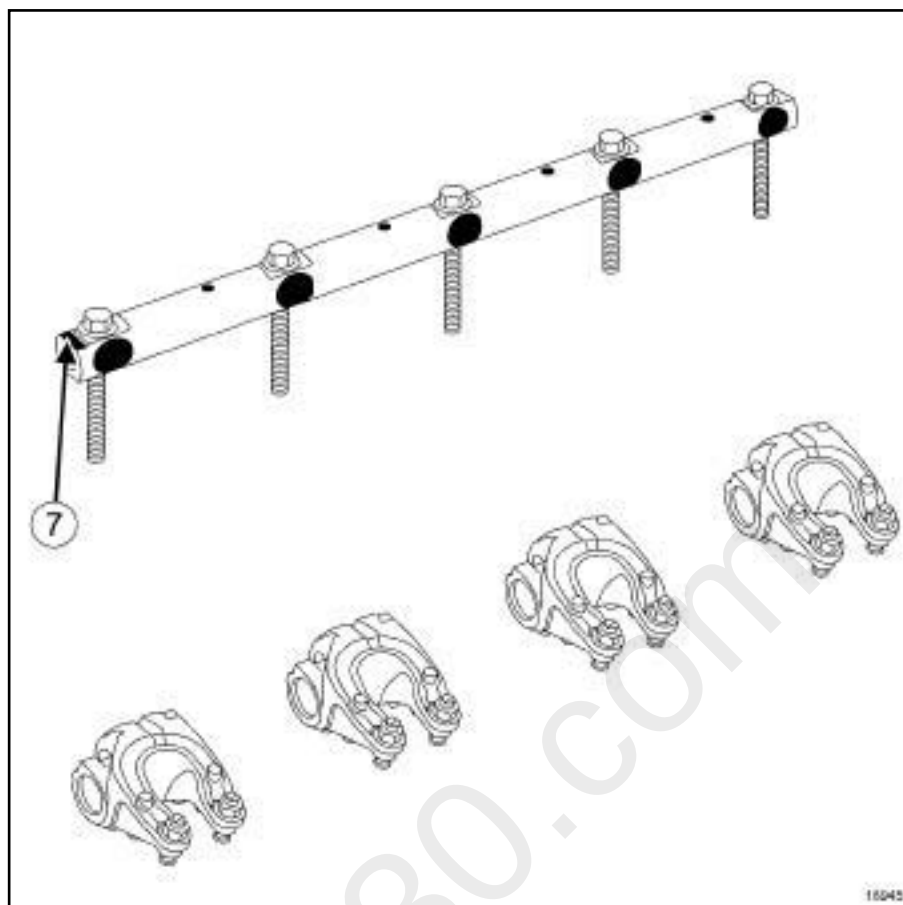
□ Torque tighten the **mounting bolts of camshaft bearing cap no. 5** (9 N.m).

TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

11A

D4F, and 740 or 742 or 764



18945

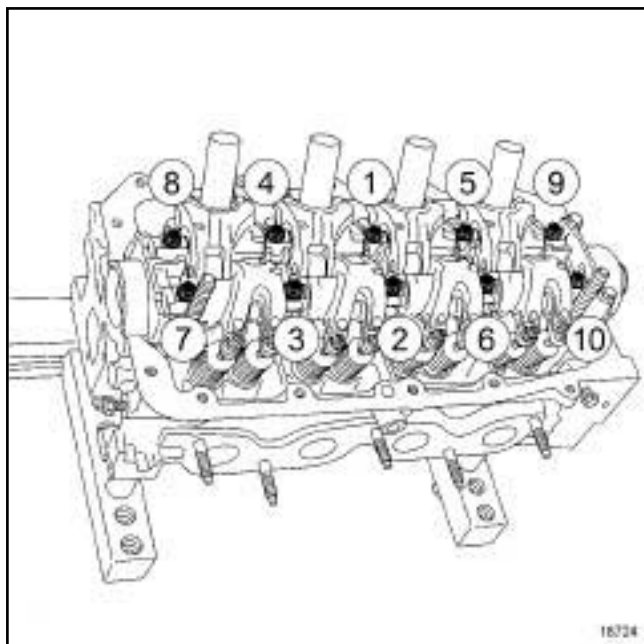
- ❑ Refit the camshafts, positioning:
 - the rails in relation to the tappets,
 - the marks (7) on the flywheel end.

TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

11A

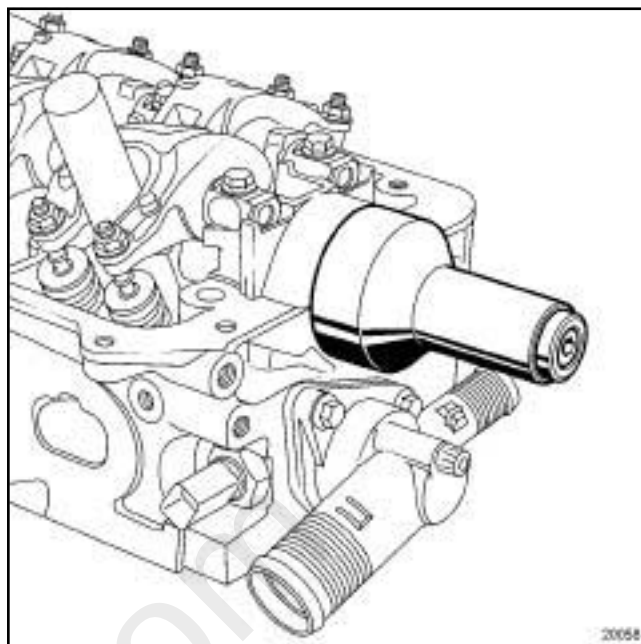
D4F, and 740 or 742 or 764



18724

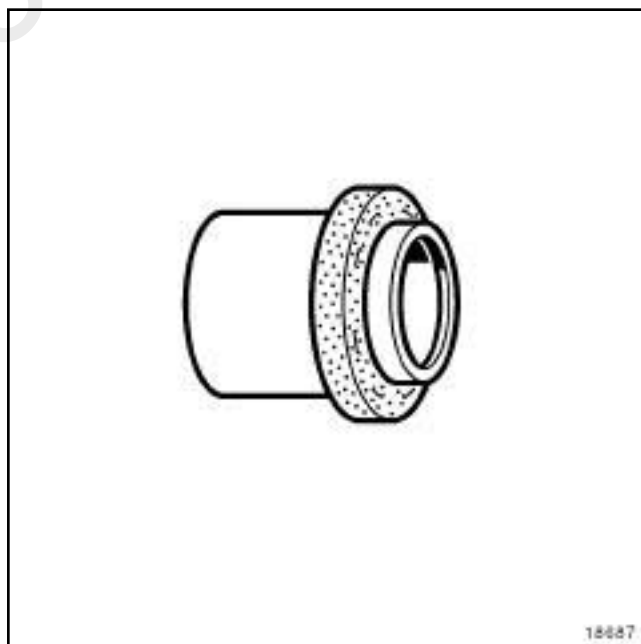
- ☐ Pretighten in order and to torque the mounting bolts of the camshaft bearing caps (**5 N.m**).
- ☐ Loosen the mounting bolt (1) .
- ☐ Torque and angle tighten the **camshaft bearing cap mounting bolt** (**7 N.m + 50° ± 6°**).
- ☐ Repeat these two operations for each bolt from (2) to (10) .

III - FINAL REFITTING



20058

- ☐ Ensure that the seal bearing surfaces are clean.
- ☐ Refit the seal cap to the end of the camshaft using the (**Mot. 1605**).



18687

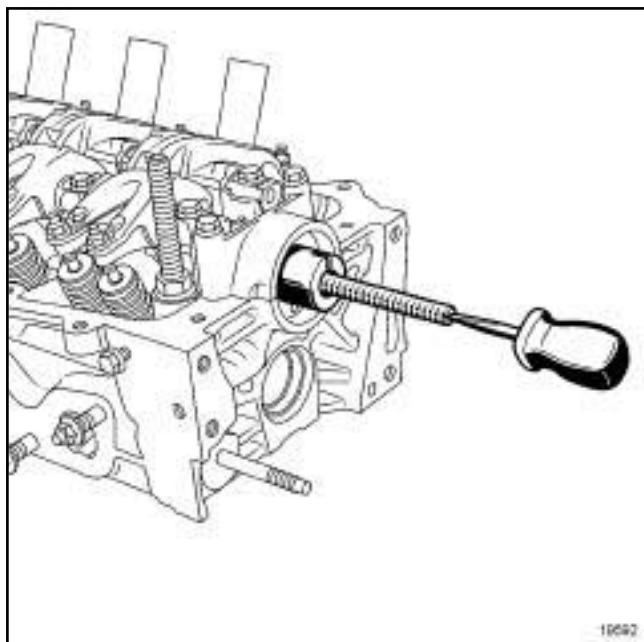
- ☐ Fit the lip seal.

TOP AND FRONT OF ENGINE

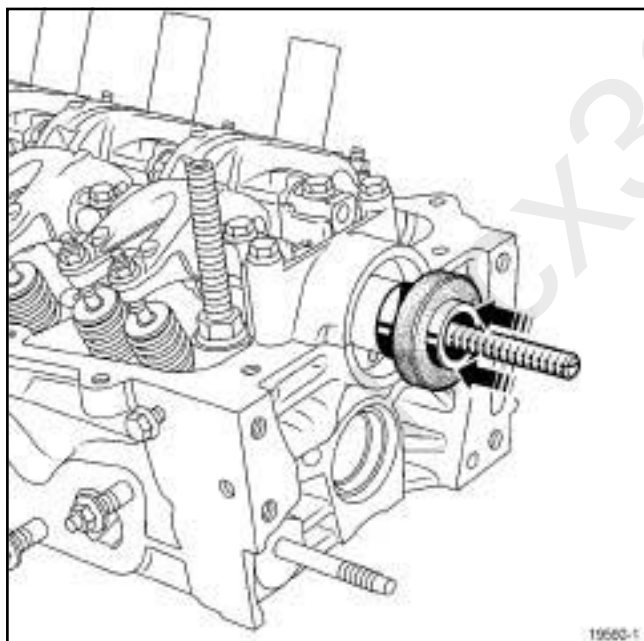
Camshaft: Removal - Refitting

11A

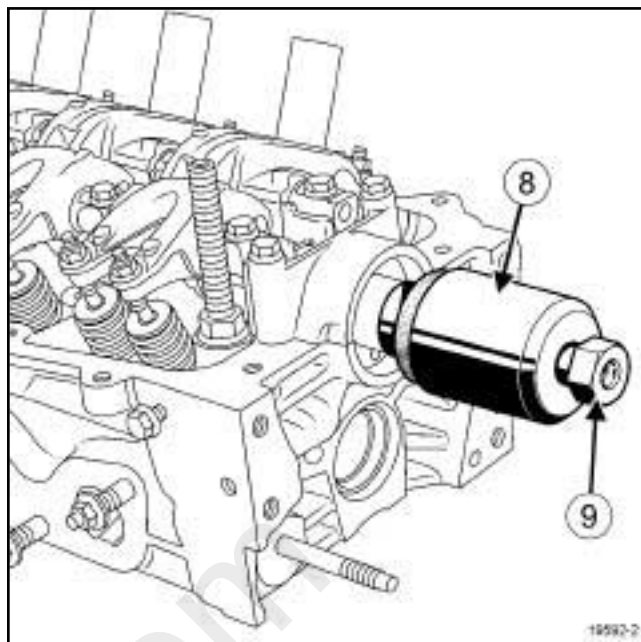
D4F, and 740 or 742 or 764



- ❑ Screw the threaded rod of the (**Mot. 1587**) into the camshaft.



- ❑ Fit the seal gasket and protector on the camshaft. Be careful not to touch the seal.



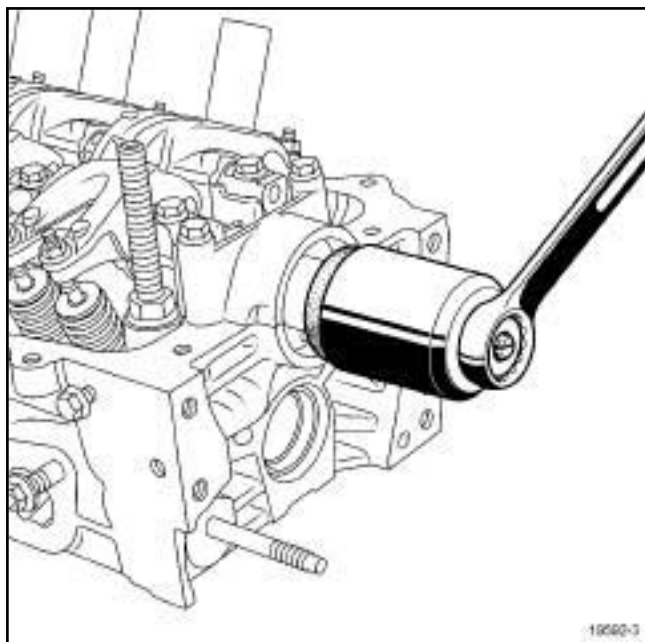
- ❑ Fit the cover (**8**) and the collar nut (**9**) of the (**Mot. 1587**).

TOP AND FRONT OF ENGINE

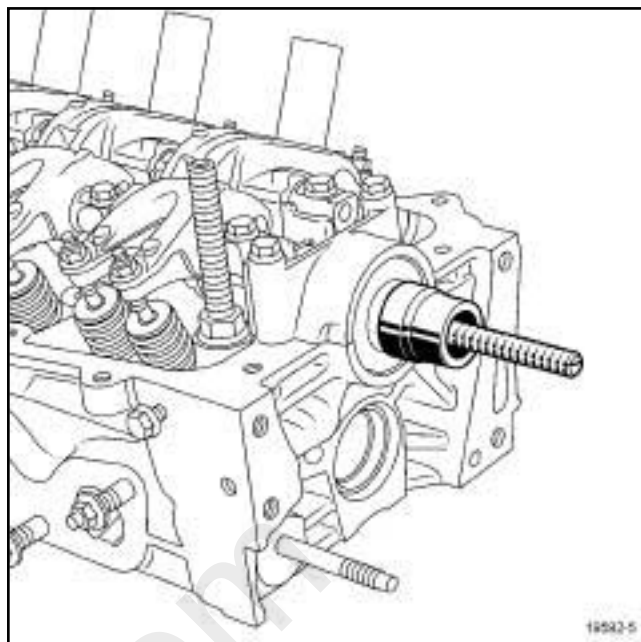
Camshaft: Removal - Refitting

11A

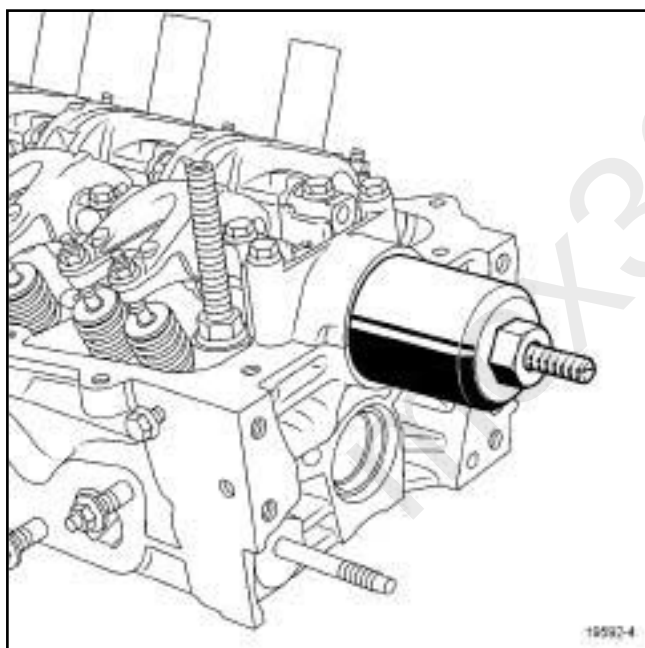
D4F, and 740 or 742 or 764



19592-3



19592-5

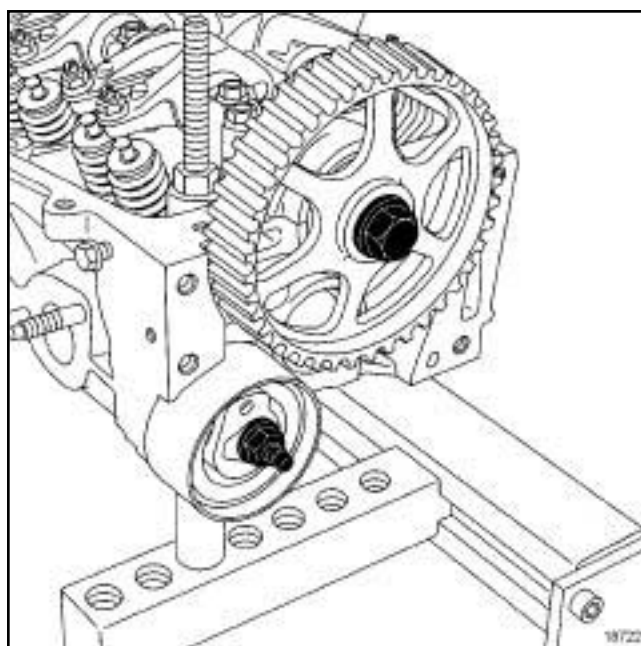


19592-4

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

☐ Remove:

- the nut from the,
- the cover from the,
- the seal protector,
- the threaded rod of the.



18722

- ☐ The camshaft pulley mounting bolt must always be replaced.
- ☐ Refit the camshaft pulley.
- ☐ Torque tighten the **camshaft pulley mounting bolt** (30 N.m + 45° ± 6) using the (Mot. 799-01).

TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

11A

D4F, and 740 or 742 or 764

❑ Refit:

- the rocker cover (see **11A, Top and front of engine, Rocker cover: Removal - Refitting**, page **11A-183**) ,
- the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page **11A-48**) ,
- the right-hand suspended mounting support (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 accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the ignition coil (see **17A, Ignition, Coils: Removal - Refitting**, page **17A-2**) ,
- the intake distributor (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page **12A-46**) ,
- the air filter box (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page **12A-17**) .

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

TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

11A

K4M

Equipment required

roller-type stud removal tool

Tightening torques

camshaft dowel	0.8 daN.m
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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,
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the battery tray (see **Battery: Removal - Refitting**) (80A, Battery),
- the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-17) ,
- 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 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 coils (see **17A, Ignition, Coils: Removal - Refitting**, page 17A-2) ,
- the throttle valve (see **12A, Fuel mixture, Throttle valve: Removal - Refitting**, page 12A-33) ,
- the intake distributor (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page 12A-46) .

K4M, and 862

☐ Remove the oil separator (see **11A, Top and front of engine, Oil decanter: Removal - Refitting**, page 11A-302) .

☐ Remove:

- 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 accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-5) ,
- 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) ,
- the rocker cover (see **11A, Top and front of engine, Rocker cover: Removal - Refitting**, page 11A-183) .

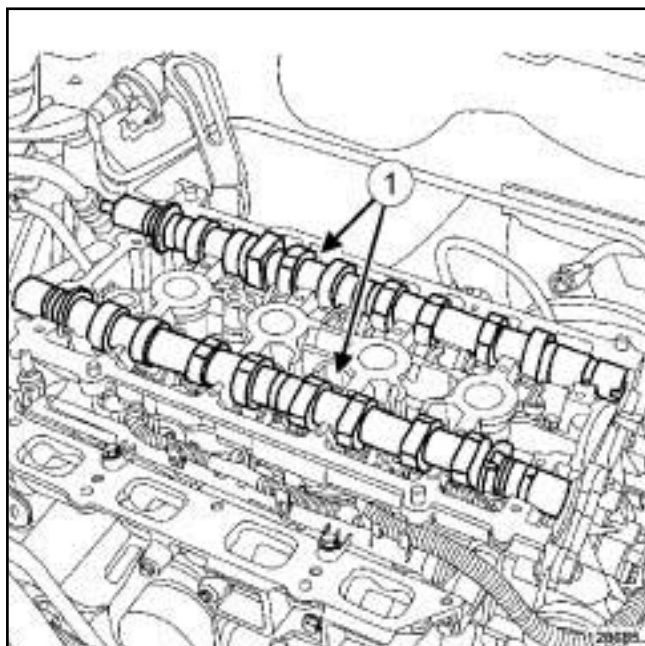
TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

11A

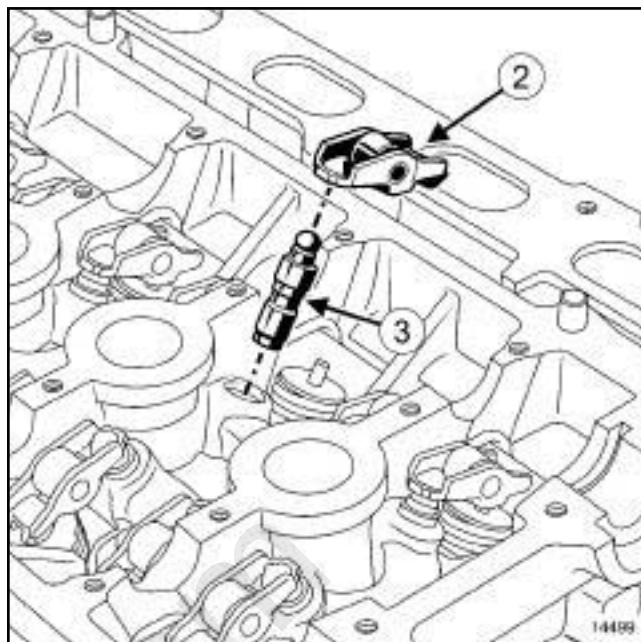
K4M

II - OPERATION FOR REMOVAL OF PART CONCERNED



❑ Remove:

- the camshafts (1) ,
- the camshaft seals on the timing end.



❑ Remove:

- the valve rockers (2) ,
- the hydraulic tappets (3) .

Note:

Always keep the hydraulic tappets vertical or immerse them in a bath of clean engine oil or diesel to avoid any risk of depriming the hydraulic tappets.

REFITTING

I - REFITTING PREPARATION OPERATION



Note:

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

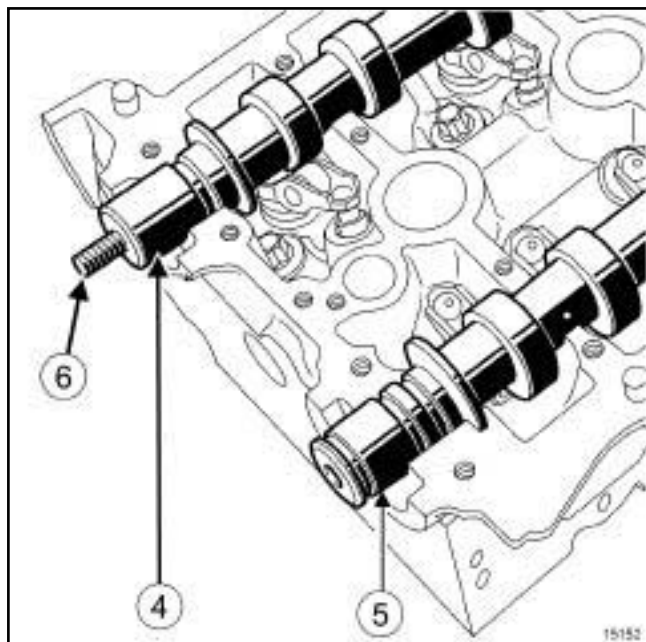
To check if re-priming is necessary, press the top of the tappet with your thumb. If the tappet piston depresses, immerse the tappets in a container full of new oil or diesel, then reprime them.

TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

11A

K4M



- (4) Exhaust camshaft
(5) Inlet camshaft

❑

Note:

The camshafts are identified by the pulley mountings.

Replacing a camshaft dowel

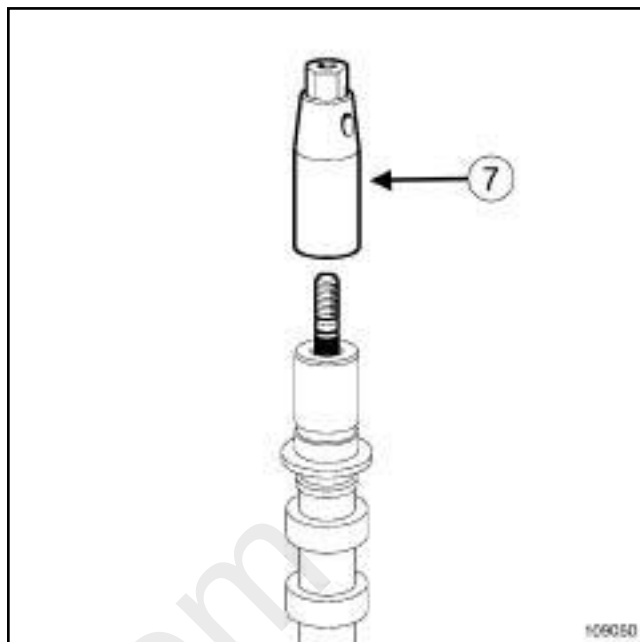
❑

Note:

It is essential to replace the camshaft dowel (6) if it comes loose at the same time as the nut.

a - Removal

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



- ❑ Remove the dowel using a **roller-type stud removal tool (7)**.

b - Cleaning the camshaft

❑

Note:

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

WARNING

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

c - Refitting

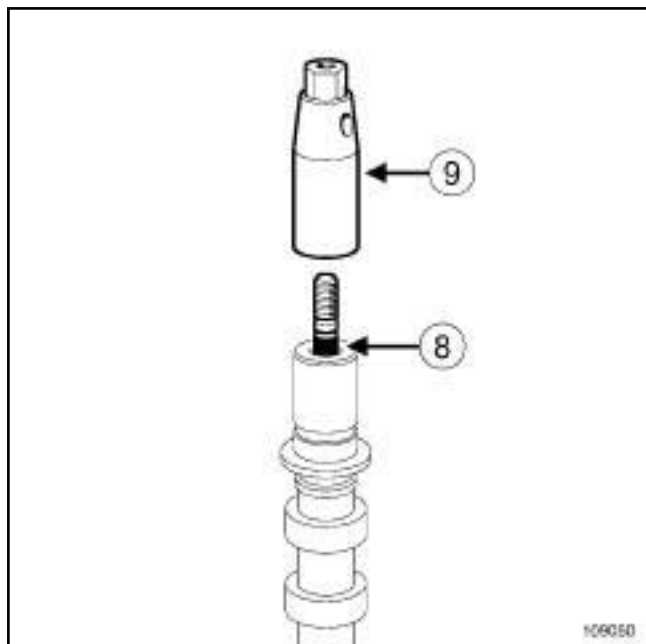
- ❑ Place the camshaft in a vice with aluminium jaws.

TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

11A

K4M



109050

- ☐ Refit the new camshaft dowel (precoated section (8) on the camshaft side).
- ☐ Torque tighten the **camshaft dowel (0.8 daN.m)** using a **roller-type stud removal tool (9)**.

II - REFITTING OPERATION FOR PART CONCERNED

- ☐ 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-183**),
 - the camshaft seals on the timing end (see **11A, Top and front of engine, Camshaft seal, timing end: Removal - Refitting**, page **11A-284**),
 - the camshaft dephaser (see **11A, Top and front of engine, Camshaft dephaser: Removal - Refitting**, page **11A-234**),
 - the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page **11A-48**),

- the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**),
- 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 lower engine tie-bar (see **19D, Engine mounting, Lower engine tie-bar: Removal - Refitting**, page **19D-13**).

K4M, and 862

- ☐ Refit the oil separator (see **11A, Top and front of engine, Oil decanter: Removal - Refitting**, page **11A-302**).

☐ Refit:

- the inlet manifold (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page **12A-46**),
- the throttle valve (see **12A, Fuel mixture, Throttle valve: Removal - Refitting**, page **12A-33**),
- the coils (see **17A, Ignition, Coils: Removal - Refitting**, page **17A-2**),
- 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 scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
- the air filter unit (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page **12A-17**),
- the battery tray (see **Battery: Removal - Refitting**) (80A, Battery),
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the engine undertray.

TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

11A

K4J

REMOVAL

I - REMOVAL PREPARATION OPERATION

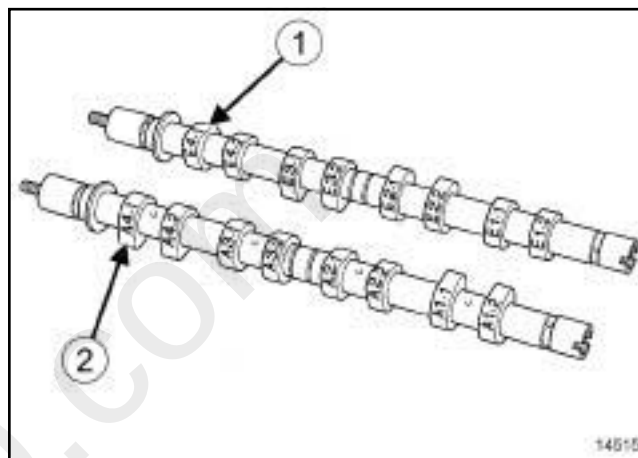
- ☐ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).
- ☐ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).
- ☐ Remove:
 - the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
 - the battery tray (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
 - the air filter box (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page 12A-17) ,
 - 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 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 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 right-hand suspended mounting support (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) ,
 - the intake distributor (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page 12A-46) ,
 - the ignition coils (see **17A, Ignition, Coils: Removal - Refitting**, page 17A-2) ,
 - the spark plugs (see **17A, Ignition, Plugs: Removal - Refitting**, page 17A-11) ,
 - the rocker cover (see **11A, Top and front of engine, Rocker cover: Removal - Refitting**, page 11A-183) ,

II - OPERATION FOR REMOVAL OF PART CONCERNED

- ☐ Remove:
 - the inlet camshaft,
 - the exhaust camshaft.

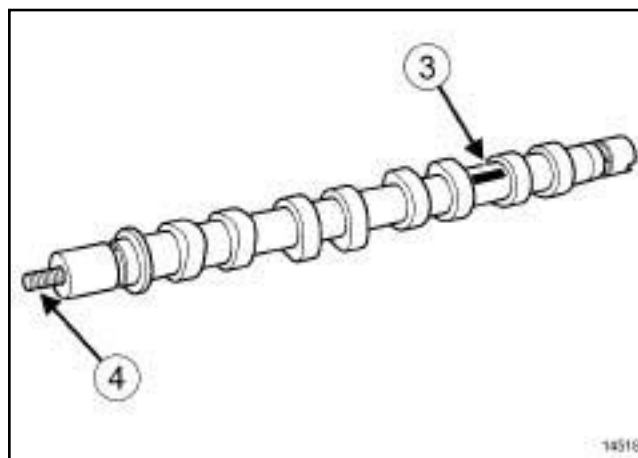
REFITTING

I - REFITTING PREPARATIONS OPERATION



14515

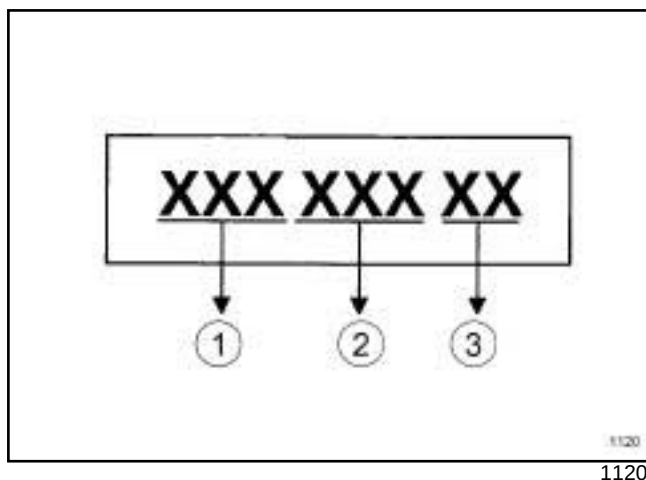
- (1) E 4 -1 = Exhaust camshaft
- (2) A 4 - 1 = Inlet camshaft



14518

- ☐ The camshaft can be identified by an etching (3) .

K4J



- ☐ Numbers (1) and (2) are only used by the supplier.
- ☐ Number (3) identifies the camshafts:
 - AM = Inlet
 - EM = Exhaust
- ☐ It is essential to replace the camshaft stud (4) if the stud becomes loose with the nut (see **11A, Top and front of engine, Camshaft: Removal - Refitting**, page **11A-247**) (Technical Note 3887A, 11A, Top and front of engine).

II - REFITTING OPERATION FOR PART CONCERNED

- ☐ Refit:
 - the inlet camshaft,
 - the exhaust camshaft.

III - FINAL OPERATION

- ☐ Refit:
 - the rocker cover (see **11A, Top and front of engine, Rocker cover: Removal - Refitting**, page **11A-183**) ,
 - the spark plugs (see **17A, Ignition, Plugs: Removal - Refitting**, page **17A-11**) ,
 - the ignition coils (see **17A, Ignition, Coils: Removal - Refitting**, page **17A-2**) ,
 - the intake distributor (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page **12A-46**) ,
 - the timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page **11A-48**) ,
 - the right-hand suspended mounting support (see **19D, Engine mounting, Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,

- the throttle valve (see **12A, Fuel mixture, Throttle valve: Removal - Refitting**, page **12A-33**) ,
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page **11A-5**) ,
 - the air filter box (see **12A, Fuel mixture, Air filter unit: Removal - Refitting**, page **12A-17**) ,
 - 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 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),
 - the battery tray (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
 - the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).
- ☐ Connect the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery).

TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

11A

K9K

Special tooling required

Mot. 799-01 Timing gear wheel immobiliser.

Tightening torques

camshaft bearing bolts **10 N.m**

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

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

REMOVAL

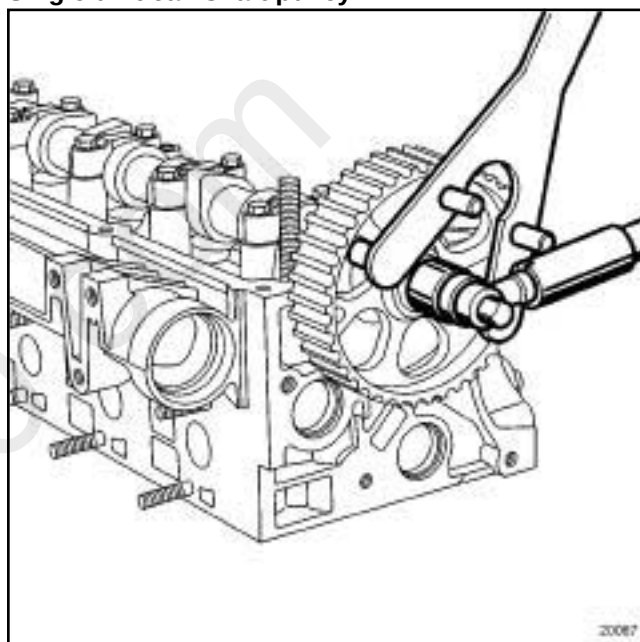
I - REMOVAL PREPARATION OPERATION

- ☐ 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 cover,
 - 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 wheel arch liners (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
 - 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 timing belt (see **11A, Top and front of engine, Timing belt: Removal - Refitting**, page 11A-48) ,

- the damper valve (see **12A, Fuel mixture, Damper valve: Removal - Refitting**, page 12A-31) (K9K/764, 772, if equipped),
- the vacuum pump (see **Vacuum pump: Removal - Refitting**) (MR 392, 37A, Mechanical component controls),
- the rocker cover (see **11A, Top and front of engine, Rocker cover: Removal - Refitting**, page 11A-183) .

1 - First fitting of camshaft pulley

Single unit camshaft pulley



20067

- ☐ Immobilise the single unit camshaft pulley using the tool (**Mot. 799-01**).
- ☐ Remove:
 - the nut from the camshaft pulley,
 - the camshaft pulley.

TOP AND FRONT OF ENGINE

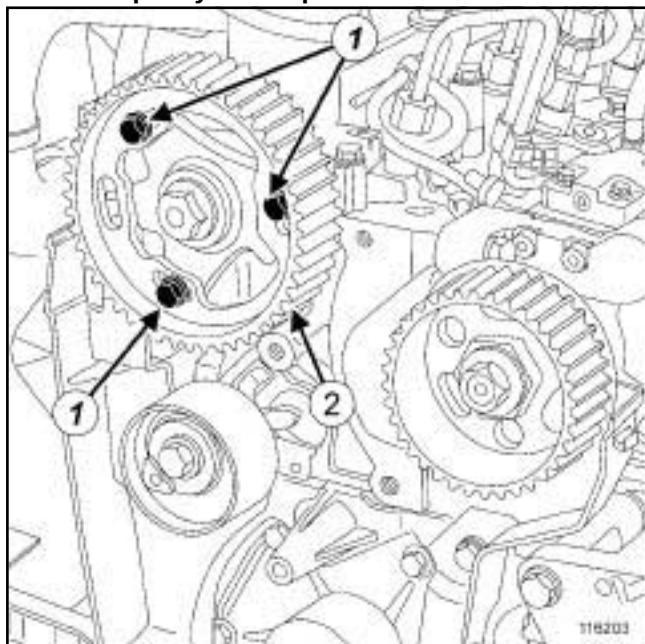
Camshaft: Removal - Refitting

11A

K9K

2 - Second fitting of camshaft pulley

Camshaft pulley in two parts

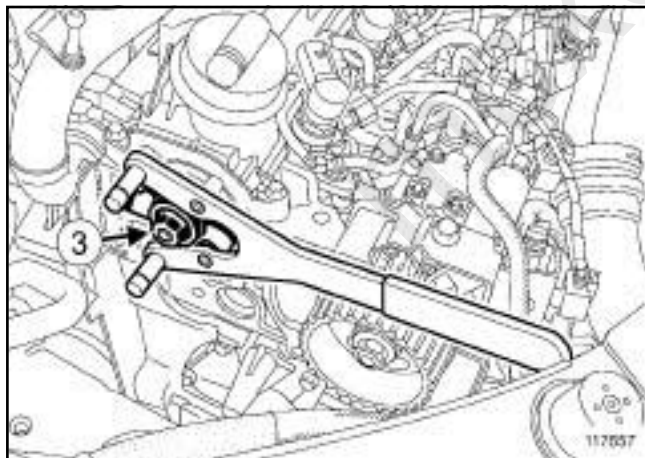


116203

❑ Remove:

- the camshaft pulley wheel bolts (1) ,
- the camshaft pulley wheel (2) .

❑ Gently turn the camshaft anti-clockwise.

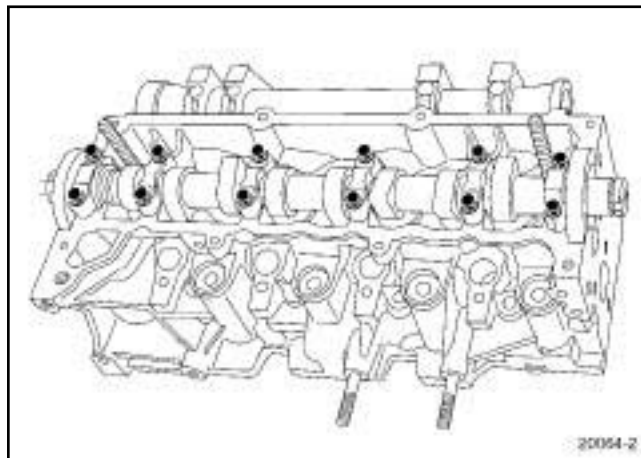


117657

❑ Remove:

- the camshaft hub nut (3) using the (Mot. 799-01),
- the camshaft hub.

II - OPERATION FOR REMOVAL OF PART CONCERNED



20064-2
20064-2

❑ Remove:

- the camshaft bearing bolts,
- the camshaft bearings,
- the camshaft,
- the camshaft seal.

TOP AND FRONT OF ENGINE

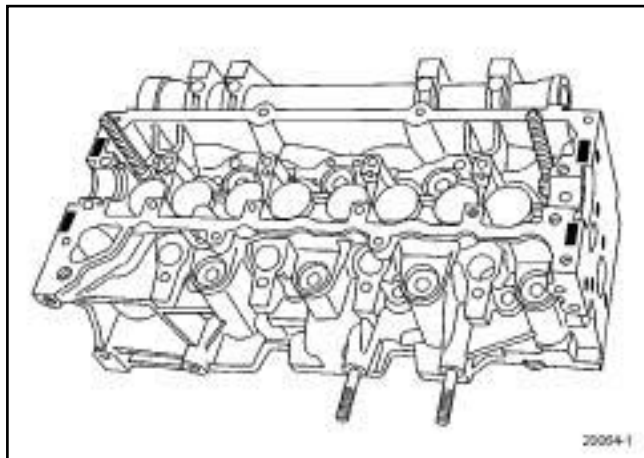
Camshaft: Removal - Refitting

11A

K9K

REFITTING

I - REFITTING PREPARATION OPERATION



20064-1

- It is essential to replace the camshaft stud if the stud becomes loose with the nut (see **11A, Top and front of engine, Camshaft: Removal - Refitting, page 11A-247**) (Technical Note 3887A, 11A, Top and front of engine).

Note:

The cylinder head gasket faces and camshaft bearings No.1 and No.6 must be clean, dry and free of grease (avoid finger marks).

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.).

- Apply four beads of **RESIN ADHESIVE, 1 mm** wide to cylinder head bearings no.1 and no.6.

II - REFITTING OPERATION FOR PART CONCERNED

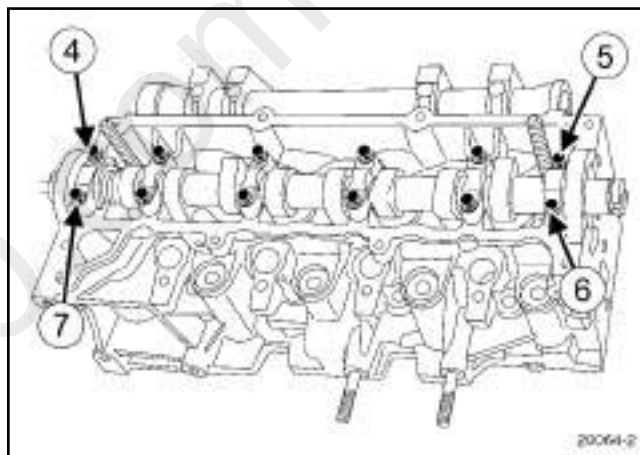
Refit:

- the camshaft,
- the camshaft bearings (observing their original positions, no.1 flywheel end).

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.**



20064-2

- Pretighten camshaft bearing bolts (4), (5), (6) and (7).
- Tighten to torque **bolts (4), (5), (6) and (7) on the camshaft bearings (10 N.m).**
- Pretighten the camshaft intermediate bearing bolts.
- Torque tighten the **camshaft bearing bolts (10 N.m).**

III - FINAL OPERATION

- Refit the camshaft seal (see **11A, Top and front of engine, Camshaft seal, timing end: Removal - Refitting, page 11A-284**).

TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

11A

K9K

1 - First fitting of camshaft pulley

❑ Refit:

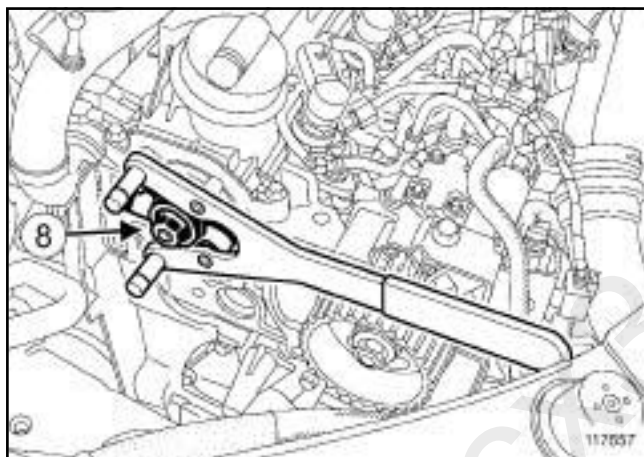
- the camshaft pulley,
- a new nut on the camshaft pulley.

Note:

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

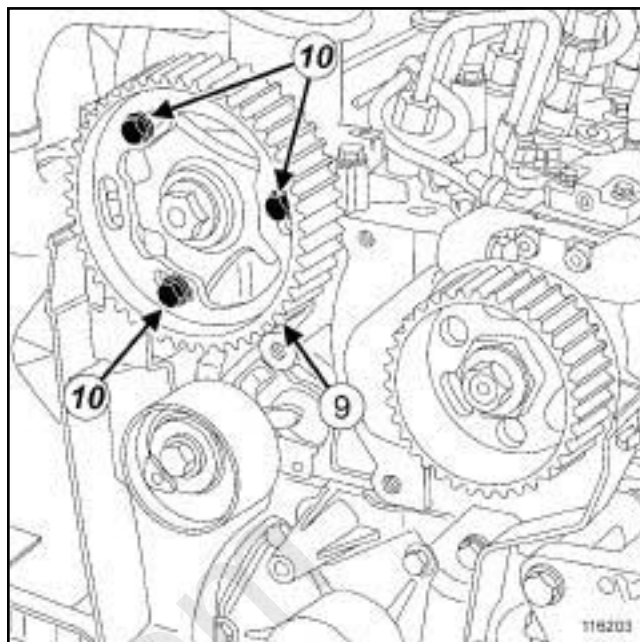
- ❑ Torque and angle tighten the **camshaft pulley nut** ($30 \text{ N.m} + 86^\circ \pm 6^\circ$), locking the pulley with the tool (Mot. 799-01).

2 - Second fitting of camshaft pulley



117657

- ❑ The camshaft hub nut (8) must always be replaced.
- ❑ Refit the camshaft hub.
- ❑ Torque and angle tighten the **camshaft hub nut** ($30 \text{ N.m} + 86^\circ \pm 6^\circ$), locking the hub using the tool (Mot. 799-01).



116203

❑ Refit:

- the camshaft pulley wheel (9) ,
- the camshaft pulley wheel bolts (10) .

❑ Refit:

- the rocker cover (see **11A, Top and front of engine, Rocker cover: Removal - Refitting**, page **11A-183**) ,
- the vacuum pump (see **Vacuum pump: Removal - Refitting**) (MR 392, 37A, Mechanical component controls),
- the damper valve (see **12A, Fuel mixture, Damper valve: Removal - Refitting**, page **12A-31**) (K9K/764, 772, if equipped),
- 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 accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front section of the front wheel arch liners (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,

TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

11A

K9K

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

TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

11A

D4F, and 784

Special tooling required

Mot. 1672	Lower engine support.
Mot. 799-01	Timing gear wheel immobiliser.
Mot. 1381	Camshaft seal extractor tool 30 x 42 x 7.
Mot. 1587	Tool for fitting camshaft "PTFE" seal.

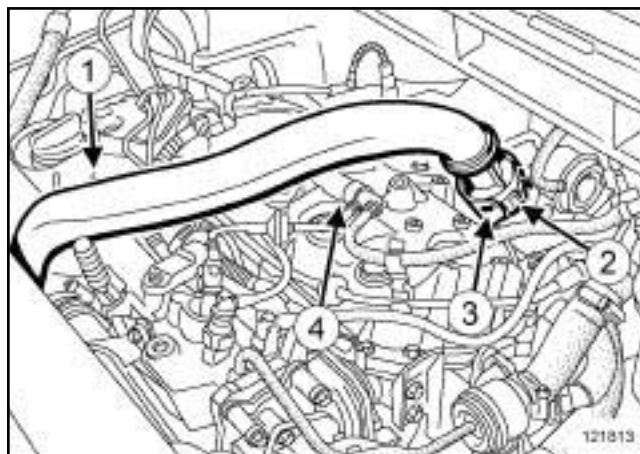
Tightening torques

bolts on camshaft bearing No.5	9 Nm
camshaft bearing cap bolt	7 Nm + 50° ± 6°
camshaft pulley bolt	30 Nm + 45° ± 6°
heat shield bolts	8 Nm

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.



121813

- ☐ Remove the bolt (1) from the intercooler air inlet pipe on the intake distributor.
- ☐ Remove the intercooler inlet pipe clip (2) from the turbocharger.

Note:

If the thermal protection clip (3) is removed, the intercooler air inlet pipe must also be replaced.

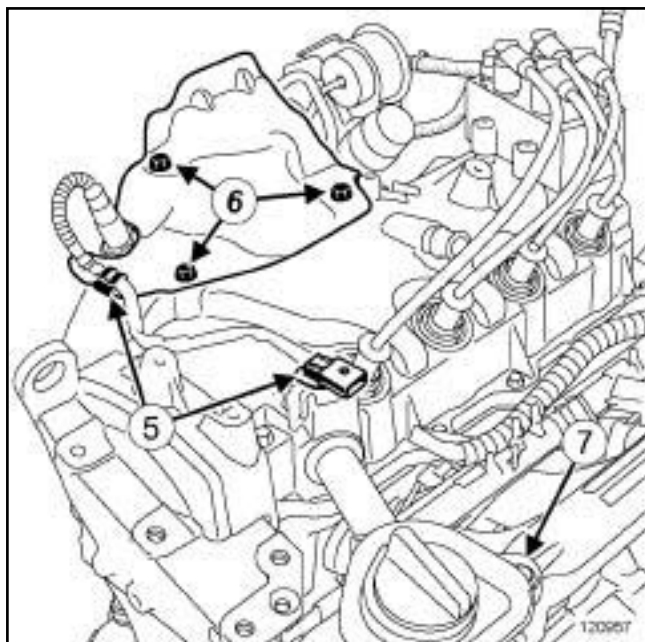
- ☐ Move the intercooler inlet air pipe to one side.
- ☐ Disconnect the oil vapour rebreathing circuit union (4).

TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

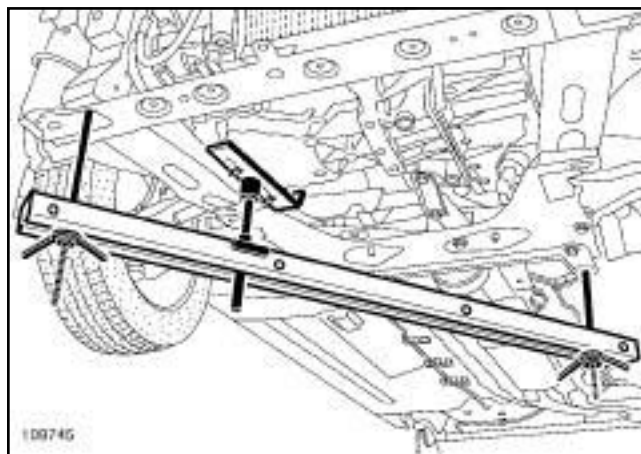
11A

D4F, and 784



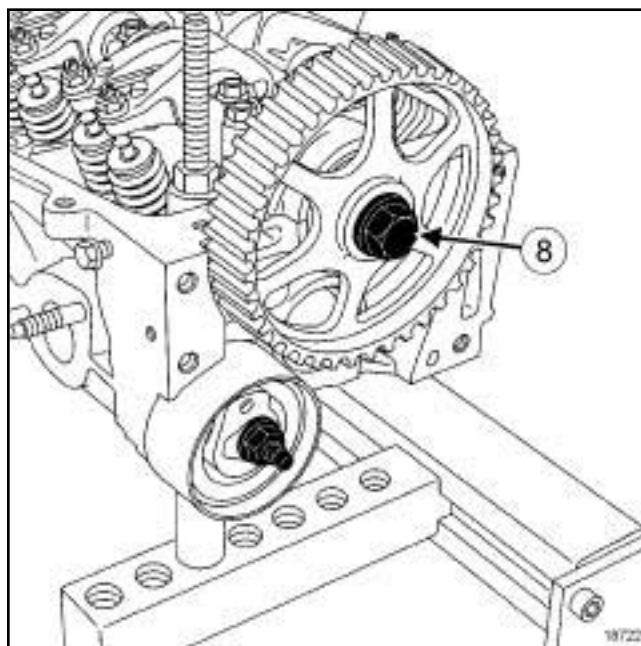
120957

- ❑ Disconnect the upstream oxygen sensor connector.
- ❑ Unpick the wiring harness from the upstream oxygen sensor at (5) .
- ❑ Remove:
 - the bolts (6) from the heat shield,
 - the heat shield,
 - the filler neck bolt (7) ,
 - the filler neck,
 - the ignition coil (see **17A, Ignition, Coils: Removal - Refitting**, page 17A-2) ,
 - the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
 - the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page 11A-5) .



109745

- ❑ Set up engine support tool (**Mot. 1672**).
- ❑ Remove:
 - 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) ,
 - the rocker cover (see **11A, Top and front of engine, Rocker cover: Removal - Refitting**, page 11A-183) .



18722

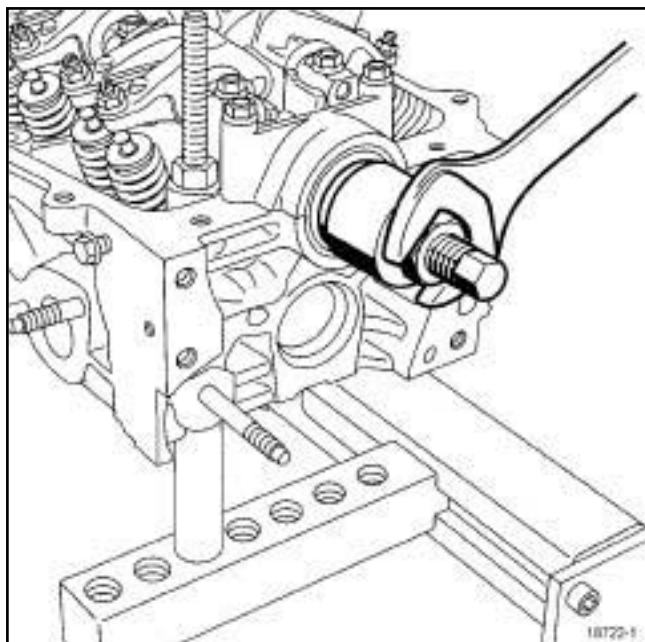
- ❑ Remove:
 - the camshaft pulley bolt (8) using the (**Mot. 799-01**),
 - the camshaft pulley.

TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

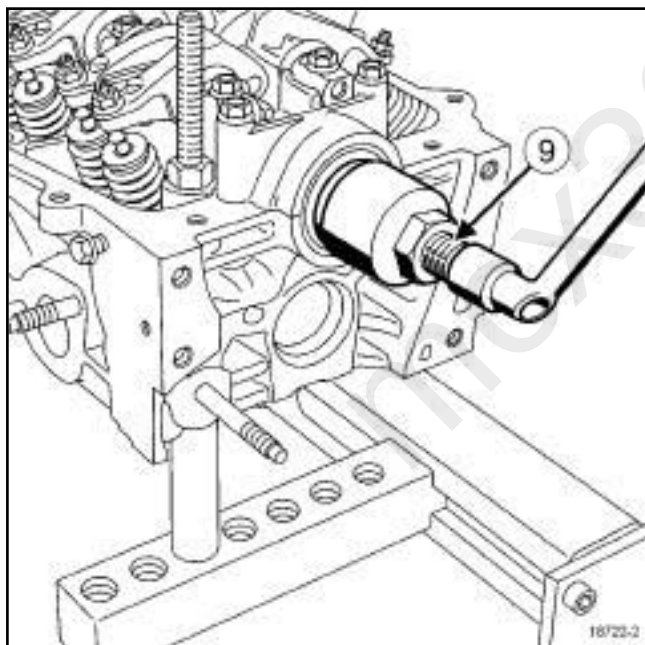
11A

D4F, and 784



18722-1

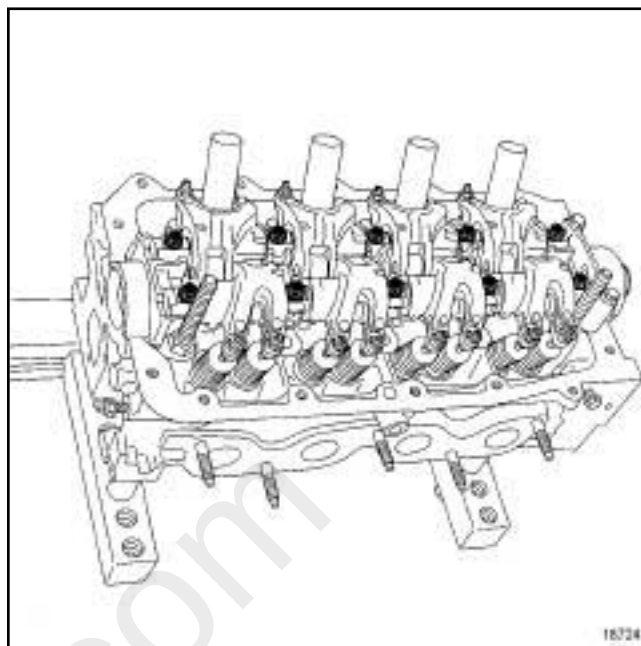
- Position the (Mot. 1381).



18722-2

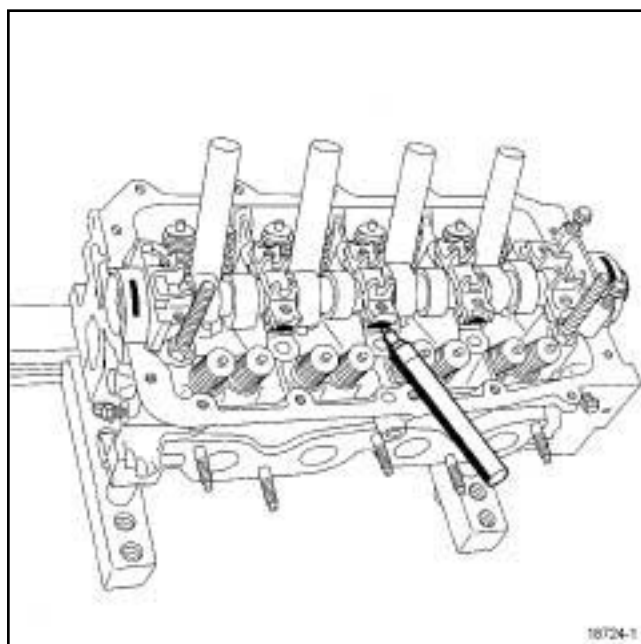
- Remove the seal by tightening the bolt (9) on the (Mot. 1381).

II - OPERATION FOR REMOVAL OF PART CONCERNED



18724

- Remove:
 - the camshaft bolts,
 - the camshafts.



18724-1

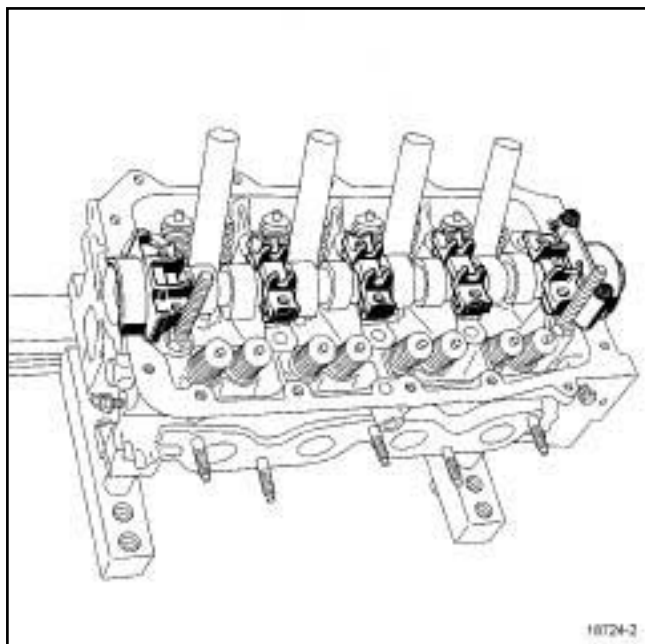
- Mark the camshaft bearing caps with a permanent marker pen.

TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

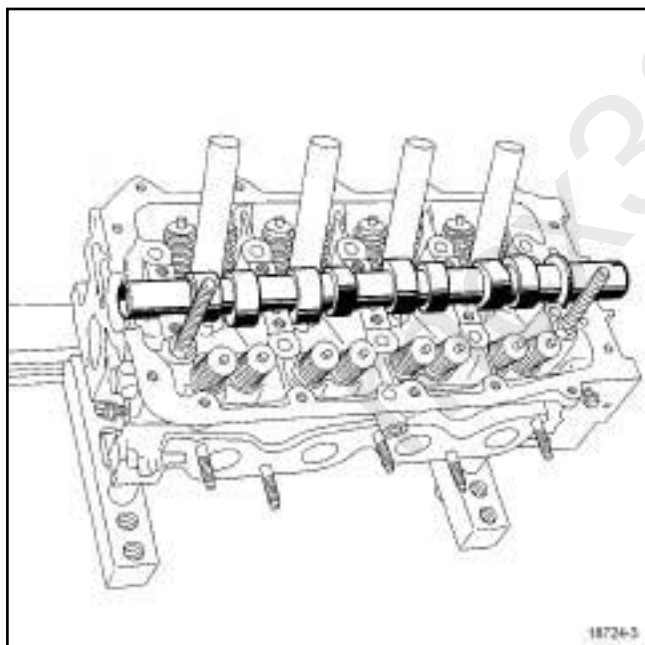
11A

D4F, and 784



18724-2

- ❑ Remove the camshaft bearing caps.



18724-3

- ❑ Remove the camshaft.

REFITTING

I - REFITTING PREPARATIONS OPERATION

- ❑ Always replace:
 - the camshaft seal,
 - the camshaft pulley bolt.

- ❑ Clean the joint faces with **SUPER CLEANER FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (MR 392, 04B, Consumables - Products) to dissolve any part of the joint still remaining.

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.

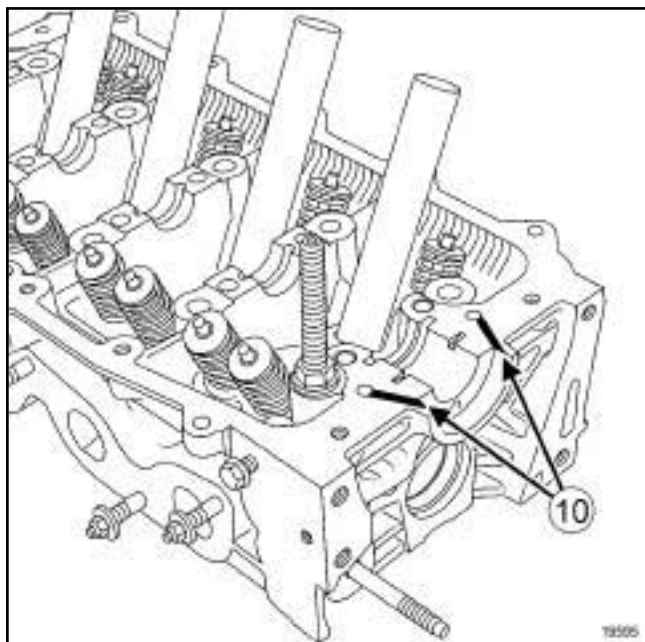
Failure to follow this advice could lead to the blocking of the various oil inlet galleries, which would quickly result in engine damage.

TOP AND FRONT OF ENGINE

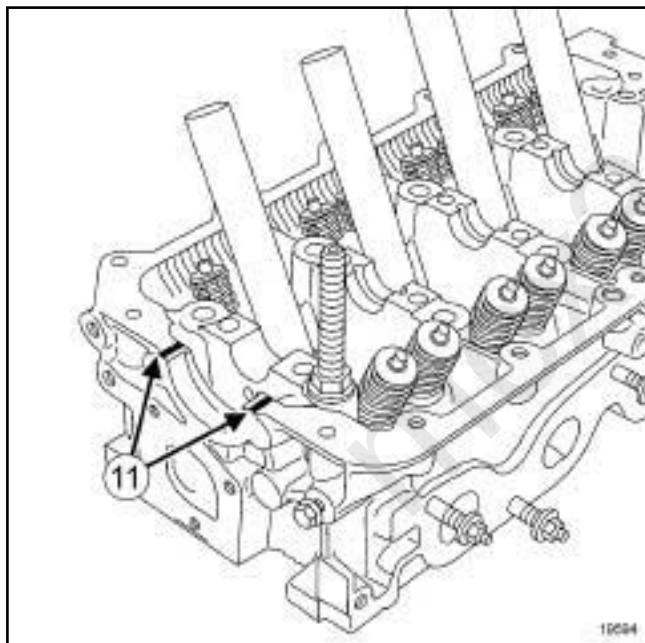
Camshaft: Removal - Refitting

11A

D4F, and 784



19595



19594

☐ Apply:

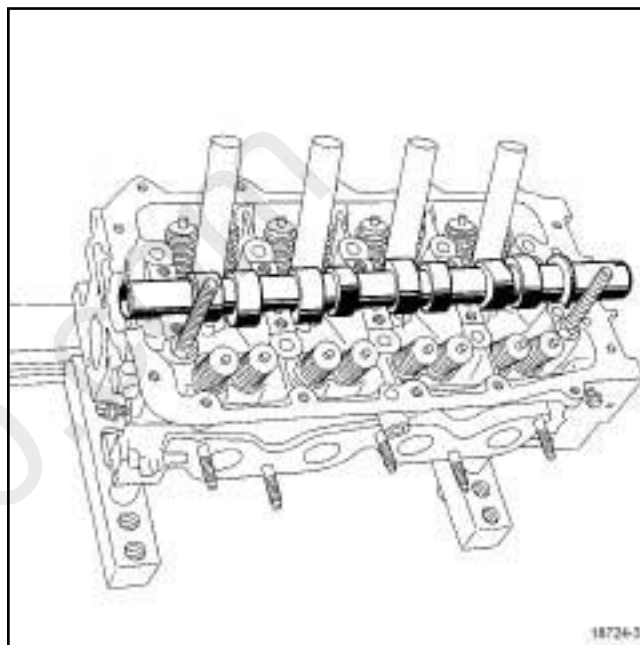
- two beads (10) of **MASTIXO** (see **Vehicle: Parts and consumables for the repair**) (MR 392, 04B, Consumables - Products) with a width of **2 mm** to bearing No.5 on the cylinder head,
- two drops (11) of **MASTIXO** to bearing No.1 on the cylinder head.

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.).

- ☐ Apply a blob of oil to the camshaft bearings.

II - REFITTING OPERATION FOR PART CONCERNED



18724-3

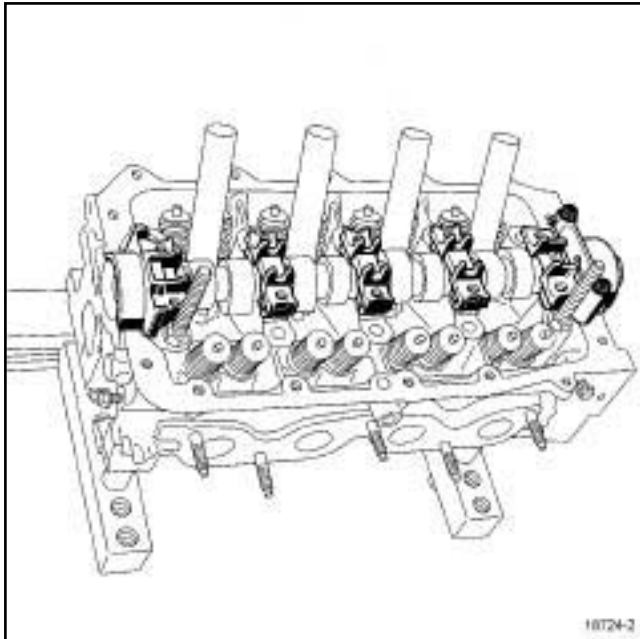
- ☐ Refit the camshaft.

TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

11A

D4F, and 784



18724-2

- ☐ Refit the camshaft bearing caps.
- ☐ Torque tighten the **bolts on camshaft bearing No.5** (9 Nm).

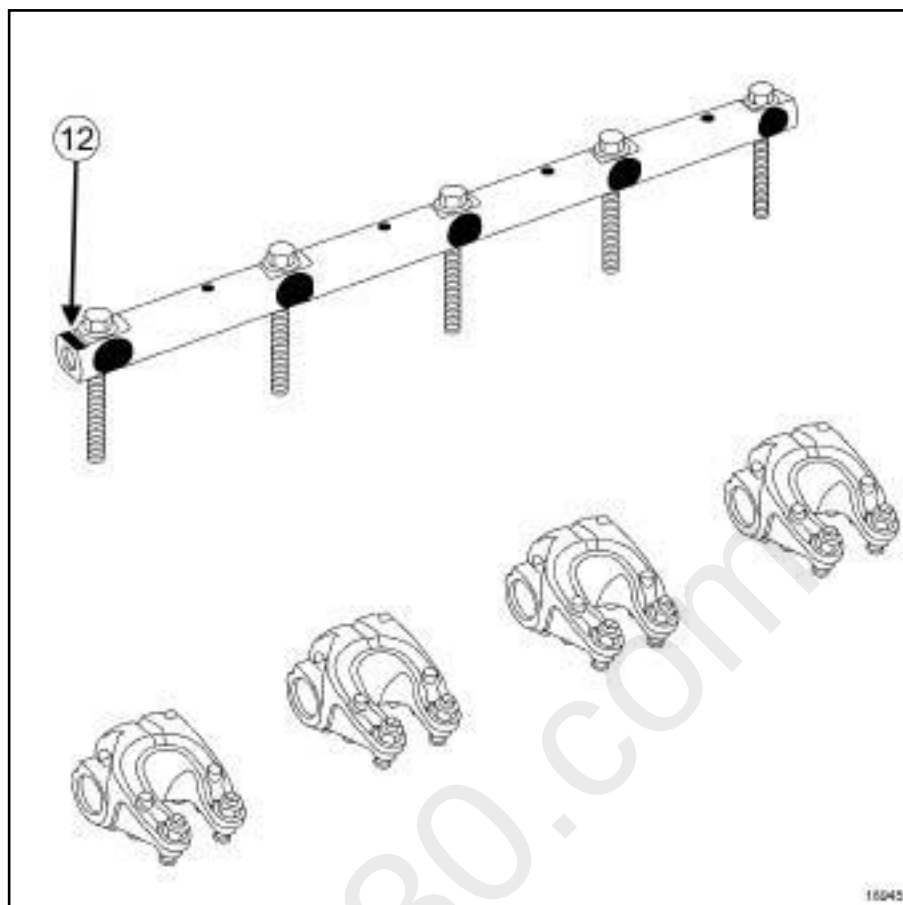
TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

11A

D4F, and 784

Inlet camshaft



18945

❑ Refit the inlet camshaft by positioning:

- the rails in relation to the tappets,
- the marking **(12)** on the timing end.

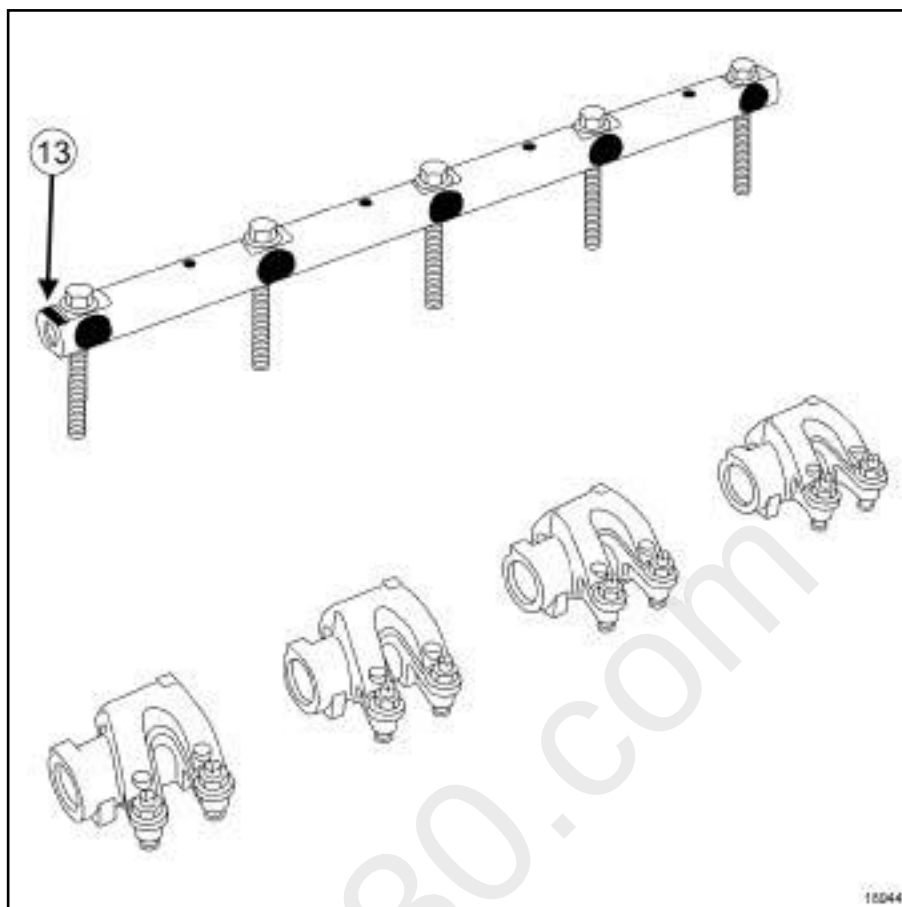
TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

11A

D4F, and 784

Exhaust camshaft



18944

❑ Refit the exhaust camshaft by positioning:

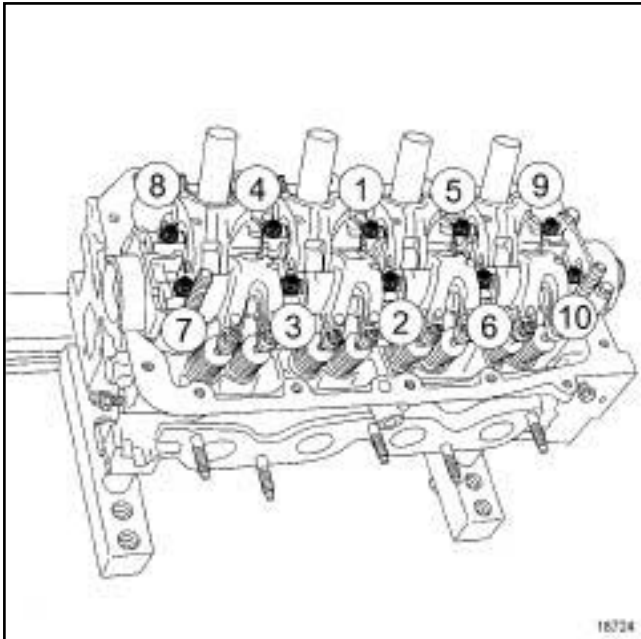
- the rails in relation to the tappets,
- the marking (13) on the flywheel end.

TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

11A

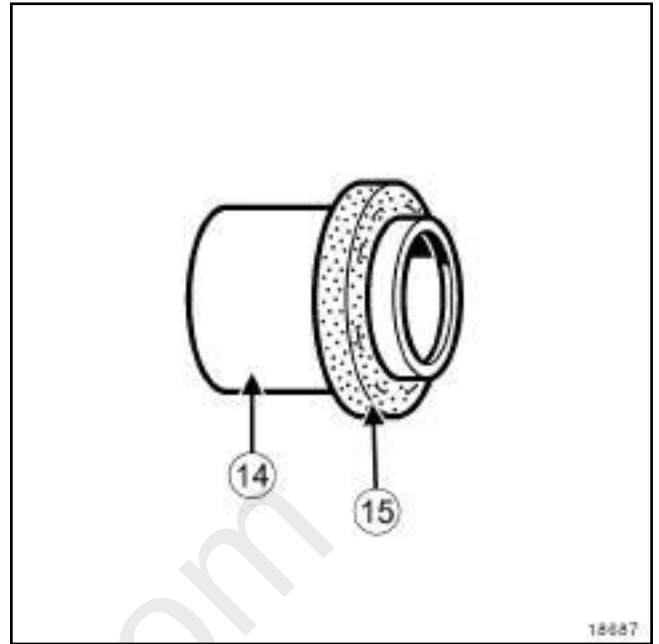
D4F, and 784



18724

- ☐ Tighten to torque and in order the **camshaft bearing cap bolts (5 Nm)**.
- ☐ Completely loosen bolt (1) .
- ☐ Torque and angle tighten the **camshaft bearing cap bolt (7 Nm + 50° ± 6°)**.
- ☐ Carry out the previous operations for each bolt from (2) to (10) .

III - FINAL OPERATION.



18687

- ☐ Prepare the camshaft seal with its protector.

Note:

This type of seal is extremely fragile. Only touch the protective part (14) when handling the gasket. It is strictly forbidden to touch the seal (15) ; this is to prevent any oil leaks once the oil seal is fitted to the engine.

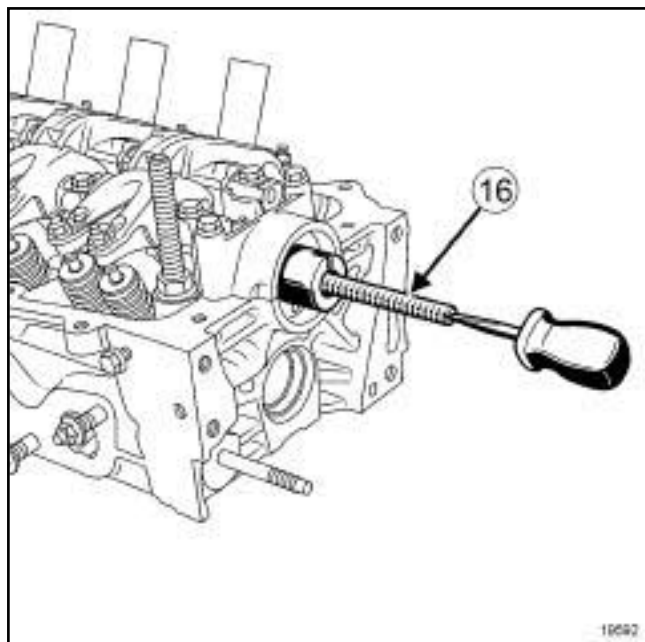
- ☐ Fit the seal using the (Mot. 1587).

TOP AND FRONT OF ENGINE

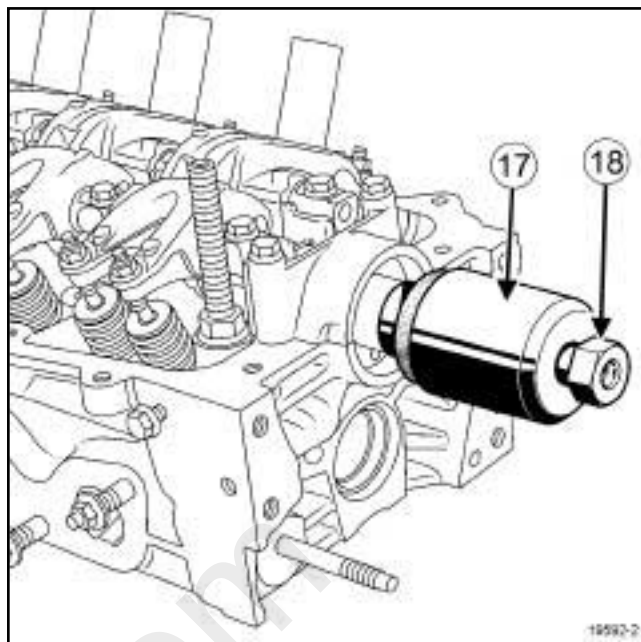
Camshaft: Removal - Refitting

11A

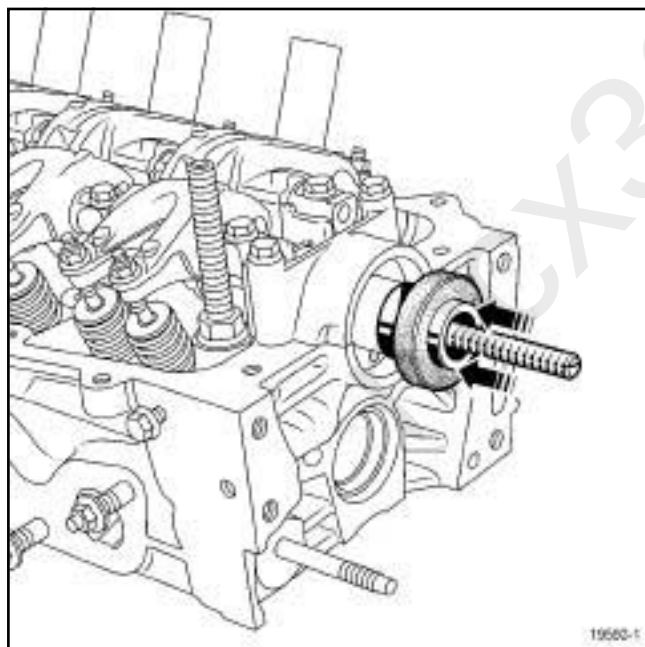
D4F, and 784



- ❑ Fit the threaded rod (16) of the (Mot. 1587) into the camshaft.



- ❑ Fit the cover (17) and the collar nut (18) of the (Mot. 1587).



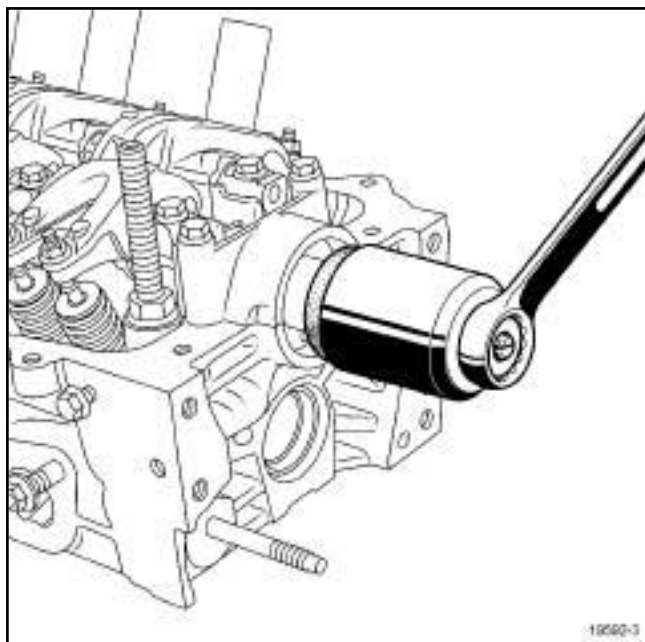
- ❑ Fit the seal gasket and protector on the camshaft. Be careful not to touch the seal.

TOP AND FRONT OF ENGINE

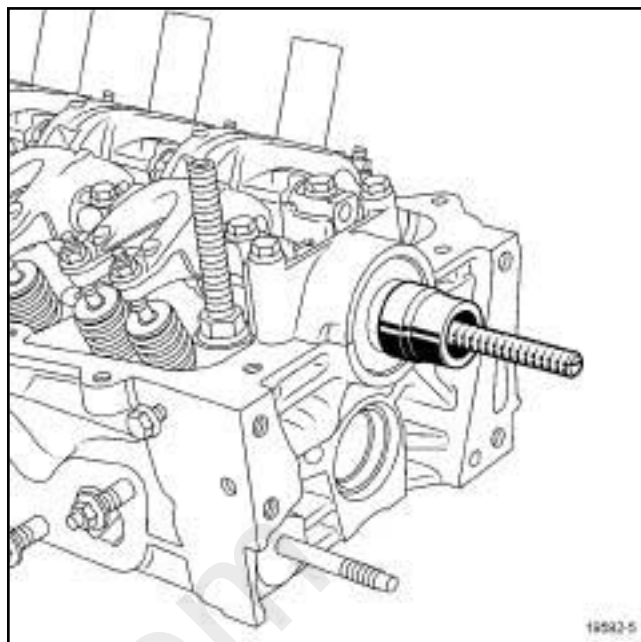
Camshaft: Removal - Refitting

11A

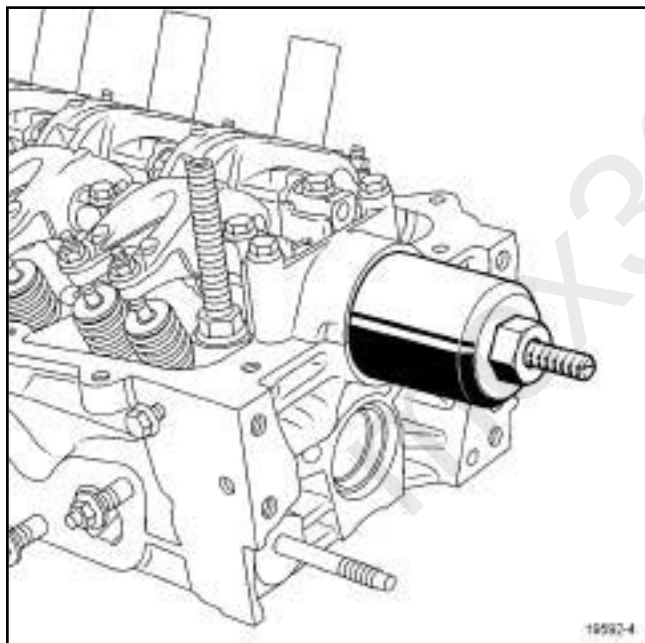
D4F, and 784



19592-3



19592-5

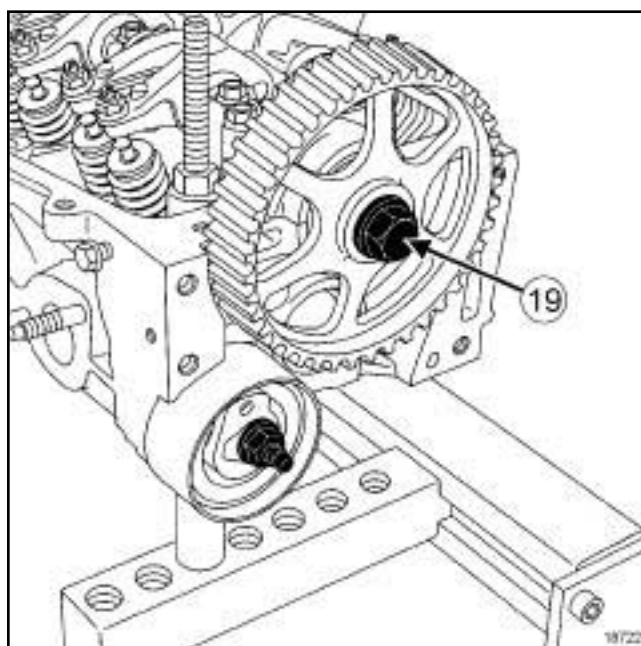


19592-4

- ☐ Tighten the collar nut until the cover comes into contact with the cylinder head.

Remove:

- the nut **(18)** ,
- the cover **(17)** ,
- the guard **(14)** ,
- the threaded rod **(16)** .



18722

Refit:

- the camshaft pulley,
- the new camshaft pulley bolt **(19)** .

- ☐ Torque and angle tighten the **camshaft pulley bolt** (**30 Nm + 45° ± 6°**) using the **(Mot. 799-01)**.

D4F, and 784

☐ Refit:

- the rocker cover (see **11A, Top and front of engine, Rocker cover: Removal - Refitting**, page **11A-183**) ,
- 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**) .

☐ Remove the engine support tool (**Mot. 1672**).

☐ Refit:

- the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the ignition coil (see **17A, Ignition, Coils: Removal - Refitting**, page **17A-2**) ,
- the filler neck,
- the filler neck bolt,
- the heat shield,
- the heat shield bolts.

☐ Torque tighten the **heat shield bolts (8 Nm)**.

☐ Clip the upstream oxygen sensor wiring harness into place.

☐ Connect:

- upstream oxygen sensor connector,
- the oil vapour rebreathing circuit union.

☐ Refit the intercooler air inlet pipe.

☐ Clip the intercooler air inlet pipe onto the turbocharger.

☐ Refit:

- the intercooler air inlet pipe bolt on the intake distributor,
- the engine cover.

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

TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

11A

M4R

Special tooling required

Mot. 919-02	Flywheel locking tool.
Mot. 1716	Removes housing with silicone seals.

Tightening torques

cylinder head cover bolts (first initial torque)	2 N.m
cylinder head cover bolts (second initial torque)	6 N.m
cylinder head cover bolts	10 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 **Engine: Precautions for the repair**) .

WARNING

It is strictly forbidden to apply any pressure to the engine oil sump. Damage to the sump will irreparably damage the engine by:

- blocking the strainer,
- raising the oil level above maximum, with a risk of engine racing.

REMOVAL

I - REMOVAL PREPARATION OPERATION

- ☐ Remove the « engine and gearbox » assembly (see **10A, Engine and cylinder block assembly, Engine - gearbox assembly: Removal - Refitting**, page **10A-162**) .

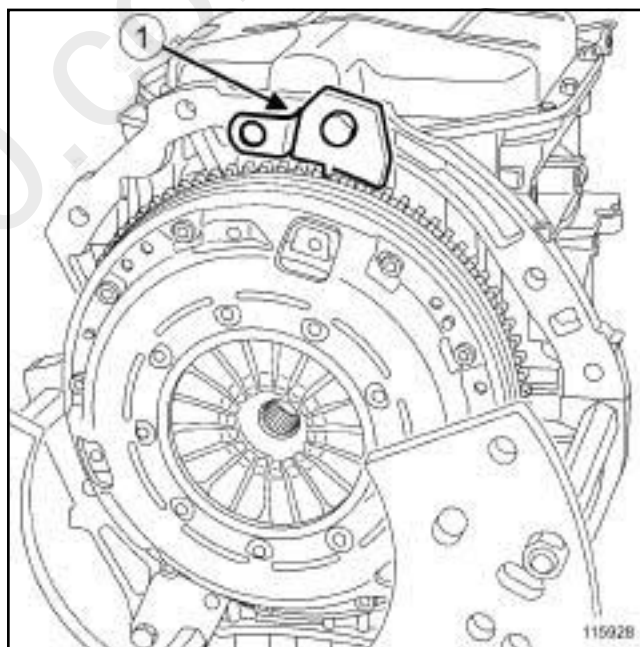
M4R, and 700

- ☐ Disconnect the manual gearbox from the engine (see **Manual gearbox: Removal - Refitting**) (21A, Manual gearbox).

M4R, and 701

- ☐ Disconnect the automatic gearbox from the engine (see **Automatic gearbox: Removal - Refitting**) (23A, Automatic transmission).
- ☐ Place the engine on the component support (see **Engine support equipment: Use**) .
- ☐ Drain the engine (see **10A, Engine and cylinder block assembly, Engine oil: Draining - Refilling**, page **10A-13**) .
- ☐ Remove the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page **11A-5**) .

M4R, and 700

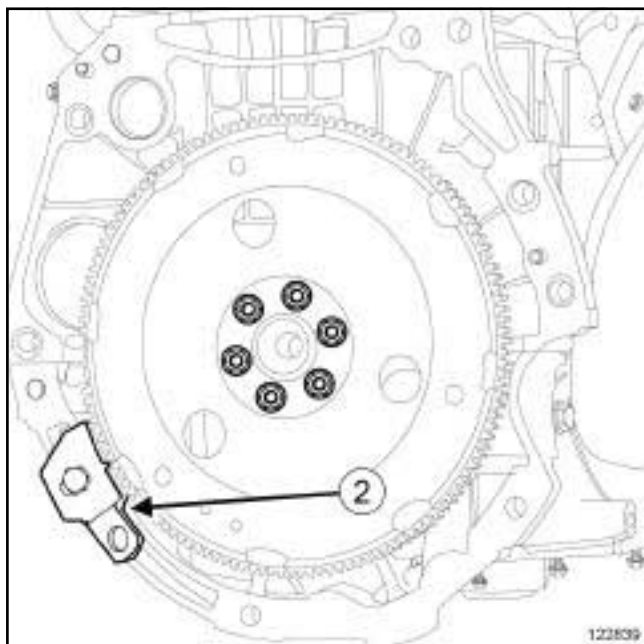


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- ☐ Immobilise the flywheel by fitting the tool (**Mot. 919-02**) (1) on the cylinder block.

M4R

M4R, and 701



122839

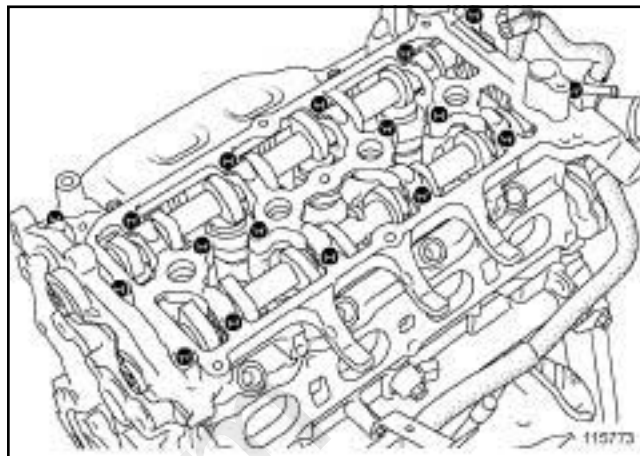
- ☐ Immobilise the drive plate by fitting the tool (**Mot. 919-02**) (2) on the cylinder block.

- ☐ Remove:

- the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**) ,
- the (**Mot. 919-02**),
- the crankshaft seal on the timing side (see **10A, Engine and cylinder block assembly, Crankshaft seal on timing end: Removal - Refitting**, page **10A-1**) ,
- the timing chain (see **11A, Top and front of engine, Timing chain: Removal - Refitting**, page **11A-170**) ,
- the throttle valve (see **12A, Fuel mixture, Throttle valve: Removal - Refitting**, page **12A-33**) ,
- the inlet distributor (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page **12A-46**) ,
- the ignition coils (see **17A, Ignition, Coils: Removal - Refitting**, page **17A-2**) ,
- the rocker cover (see **11A, Top and front of engine, Rocker cover: Removal - Refitting**, page **11A-183**) ,
- the timing sprockets (see **Timing sprocket: Removal - Refitting**) ,

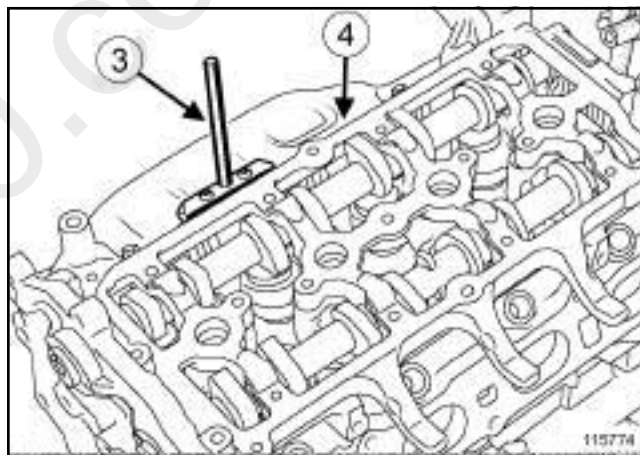
- the injector rail (see **13B, Diesel injection, Injector rail: Removal - Refitting**, page **13B-64**) .

II - CAMSHAFT REMOVAL OPERATION



115773

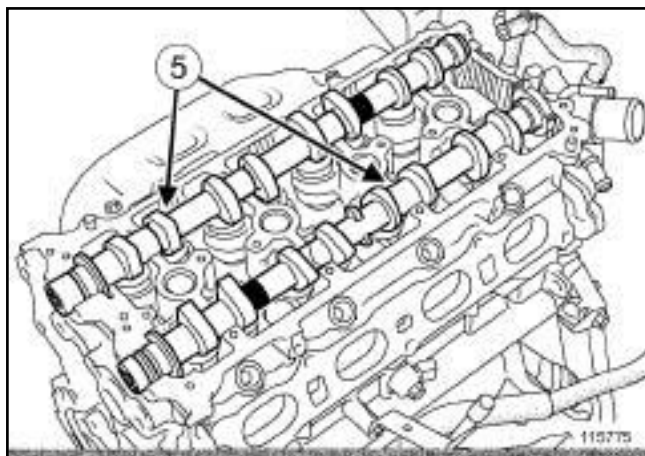
- ☐ Remove the cylinder head cover bolts.



115774

- ☐ Detach the cylinder head cover using the tool (**Mot. 1716**) (3) .
- ☐ Remove the cylinder head cover (4) .

M4R



115775

- ❑ Remove the camshafts (5) .

REFITTING

I - REFITTING PREPARATION 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.

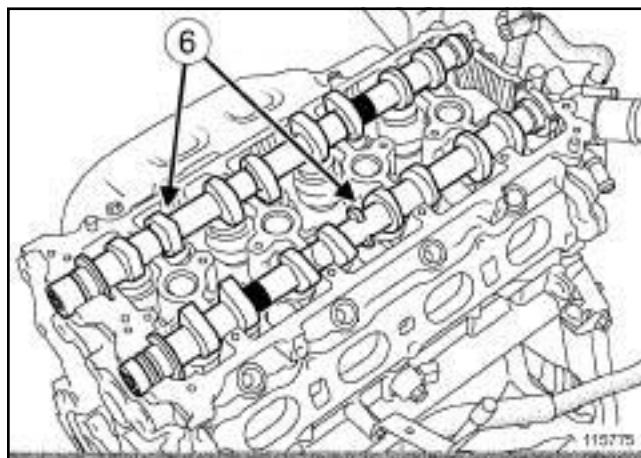
- ❑ Clean the joint faces of the cylinder head cover with **SUPER CLEANING AGENT FOR JOINT FACES** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products).
- ❑ Remove the residue using a plastic spatula.
- ❑ Finish cleaning the joint faces using a **GREY ABRASIVE PAD**, part number **77 01 405 943**.

WARNING

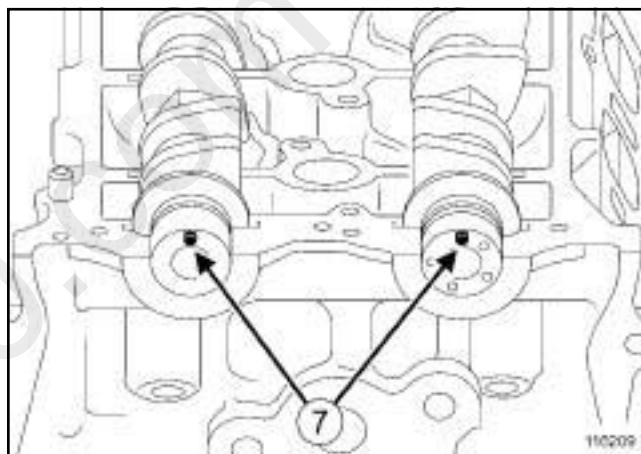
To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

- ❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and consumables for the repair**) (04B, Consumables - Products) to clean:
 - the cylinder head cover,
 - the camshafts.

II - CAMSHAFT REFITTING OPERATION



115775



116209

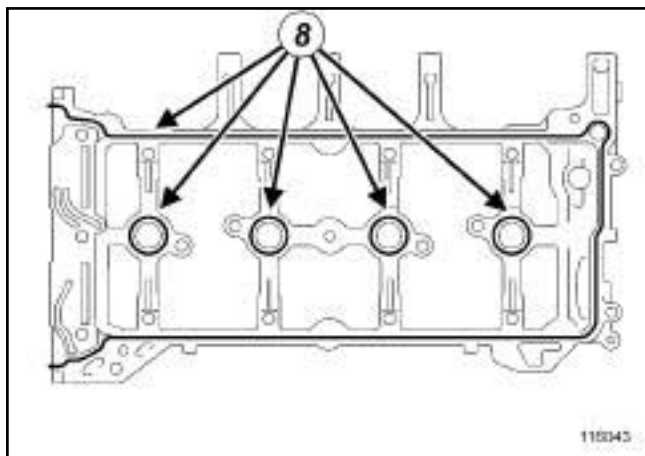
- ❑ Refit the camshafts (6) (see **Camshaft: Check**) , placing the lugs (7) upwards.

TOP AND FRONT OF ENGINE

Camshaft: Removal - Refitting

11A

M4R



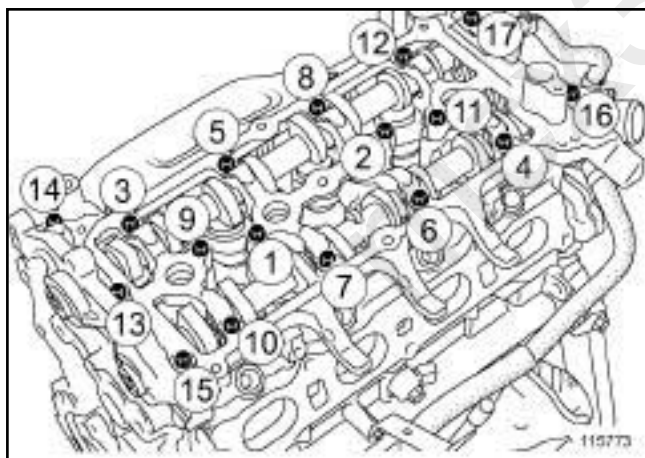
116043



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.).

- ☐ Apply a bead of **SILICONE ADHESIVE SEALANT** with a diameter of **4 mm (8)** around the edge of the joint face of the cylinder head cover and the plug wells.



115773

- ☐ Refit:
 - the cylinder head cover,
 - the cylinder head cover bolts.
- ☐ Pretighten to torque and in order:
 - the **cylinder head cover bolts (first initial torque) (2 N.m)**,
 - the **cylinder head cover bolts (second initial torque) (6 N.m)**.
- ☐ Torque tighten in order the **cylinder head cover bolts (10 N.m)**.

III - FINAL OPERATION

☐ Refit:

- the injector rail (see **13B, Diesel injection, Injector rail: Removal - Refitting**, page **13B-64**) ,
 - the timing sprockets (see **Timing sprocket: Removal - Refitting**) ,
 - the rocker cover (see **11A, Top and front of engine, Rocker cover: Removal - Refitting**, page **11A-183**) ,
 - the ignition coils (see **17A, Ignition, Coils: Removal - Refitting**, page **17A-2**) ,
 - the inlet distributor (see **12A, Fuel mixture, Inlet distributor: Removal - Refitting**, page **12A-46**) ,
 - the throttle valve (see **12A, Fuel mixture, Throttle valve: Removal - Refitting**, page **12A-33**) ,
 - the timing chain (see **11A, Top and front of engine, Timing chain: Removal - Refitting**, page **11A-170**) ,
 - the crankshaft seal on the timing side (see **10A, Engine and cylinder block assembly, Crankshaft seal on timing end: Removal - Refitting**, page **10A-1**) .
- ☐ Immobilise the flywheel or the drive plate using the tool (**Mot. 919-02**).
 - ☐ Refit the crankshaft accessories pulley (see **11A, Top and front of engine, Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**) .
 - ☐ Remove the tool (**Mot. 919-02**).
 - ☐ Refit the accessories belt (see **11A, Top and front of engine, Accessories belt: Removal - Refitting**, page **11A-5**) .
 - ☐ Remove the engine from the component support (see **Engine support equipment: Use**) .

M4R, and 700

- ☐ Connect the manual gearbox to the engine (see **Manual gearbox: Removal - Refitting**) (21A, Manual gearbox).

M4R, and 701

- ☐ Connect the automatic gearbox to the engine (see **Automatic gearbox: Removal - Refitting**) (23A, Automatic transmission).