RENAULT

1 Engine and peripherals

11A TOP AND FRONT OF ENGINE

MEGRM2A/2/1

X84, and B84 or C84 or E84 or G84 or K84 or L84 or S84

77 11 318 022 **APRIL 2009** **Edition Anglaise**

Mégane II - Section 1

11A TOP AND FRONT OF ENGINE

K4J or K4M or K9K

Tightening torques ▽	
tensioning roller bolt	**40 N.m**

IMPORTANT
Wear protective gloves throughout the operation.

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

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

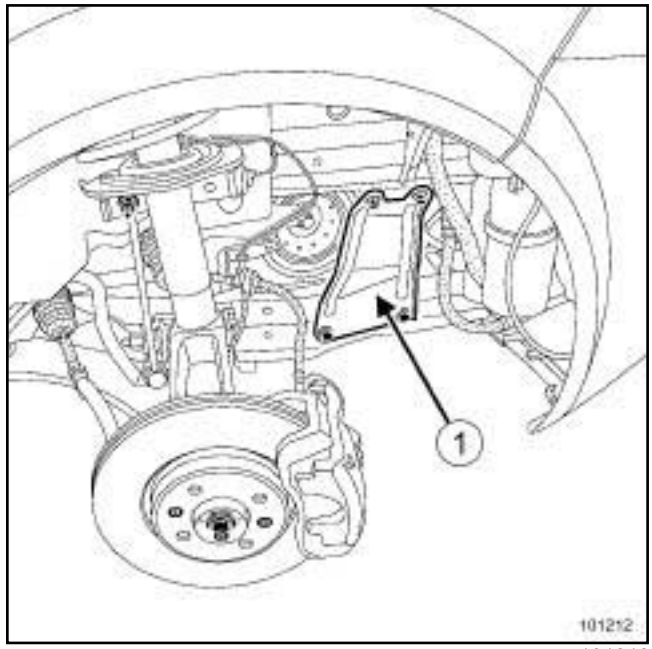
REMOVAL

I - REMOVAL PREPARATION OPERATION

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

❏ Remove:

- the engine covers,
- the front right-hand wheel,
- the front section of the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection).



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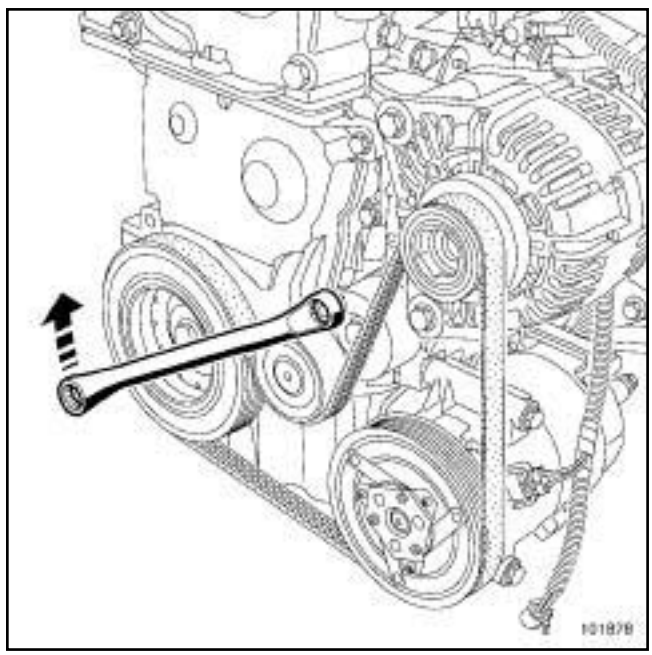
❏ Remove:

- the right-hand side reinforcement bolts,
- the right-hand side reinforcement (**1**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



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❏ Turn the accessories belt auto tensioner clockwise using a **16 mm** spanner.

❏ Remove:

- the accessories belt,

K4J or K4M or K9K

- the tensioning roller bolt,
- the tensioning roller.

REFITTING

I - REMOVAL PREPARATION OPERATION

❑ **parts always to be replaced: Accessories belt (10,10,01,03)**.

❑ **parts always to be replaced: Accessories belt tensioning roller (10,10,01,04)**.

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

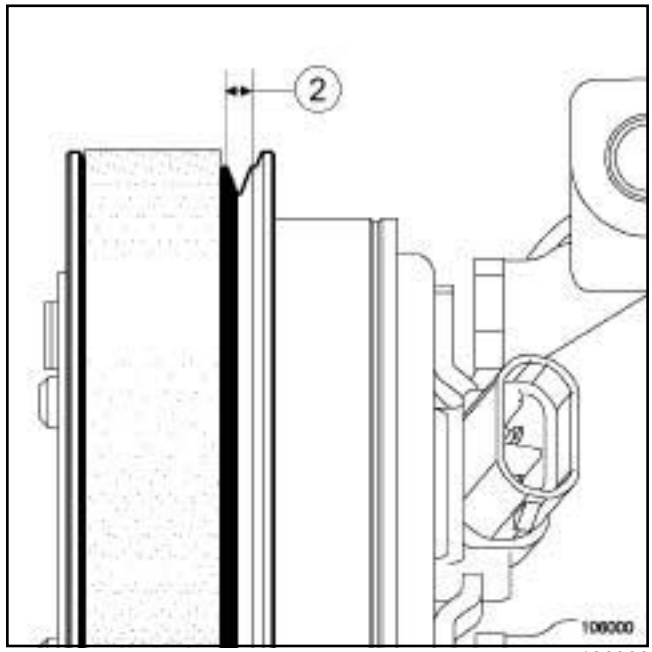
❑ Use a brush to remove any deposits from the crankshaft pulley V-grooves.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Refit the new tensioning roller.

❑ Tighten to torque the **tensioning roller bolt (40 N.m)**.

K4J, and AIR CONDITIONING or CLIMA TE CONTROL – K4M, and AIR CONDITIONING or CLIMATE CONTROL – K9K, and AIR CONDITIONING or CLIMATE CONTROL



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❑

Note:
The accessories belt has f ve teeth, while the air conditioning compressor pulle y has six g rooves. When f tting the accessories belt, it is essential to check that groove (**2**) remains free.

❑ Refit the new accessories belt.

❑ Rotate the crankshaft twice to position the accessories belt correctly.

III - FINAL OPERATION

❑ Refit the right-hand side reinforcement (see **Radiator support cross member: Removal - Refitting**) (41A, Front lower structure).

❑ Refit:

- the front section of 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 engine covers.

F4R – F9Q

Tightening torques ▽	
new tensioning roller mounting bolt	**50 N.m**

IMPORTANT
Wear protective gloves during the operation.

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

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

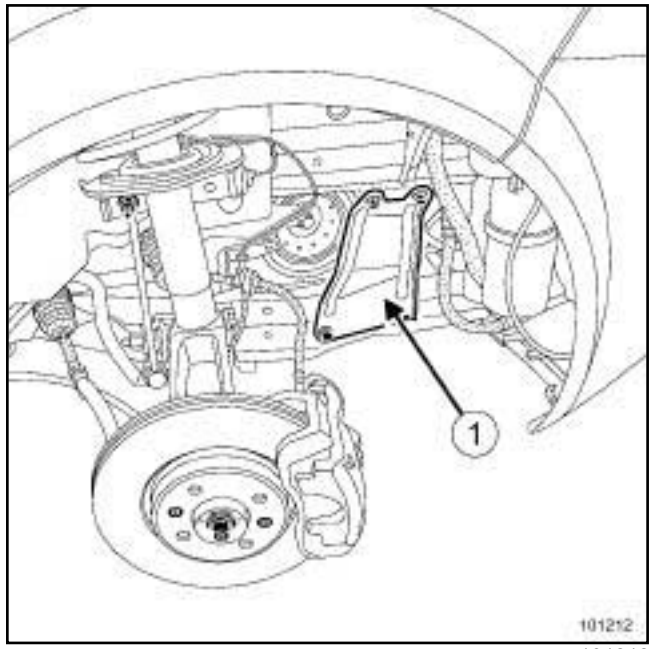
REMOVAL

I - REMOVAL PREPARATION OPERATION

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

❏ Remove:

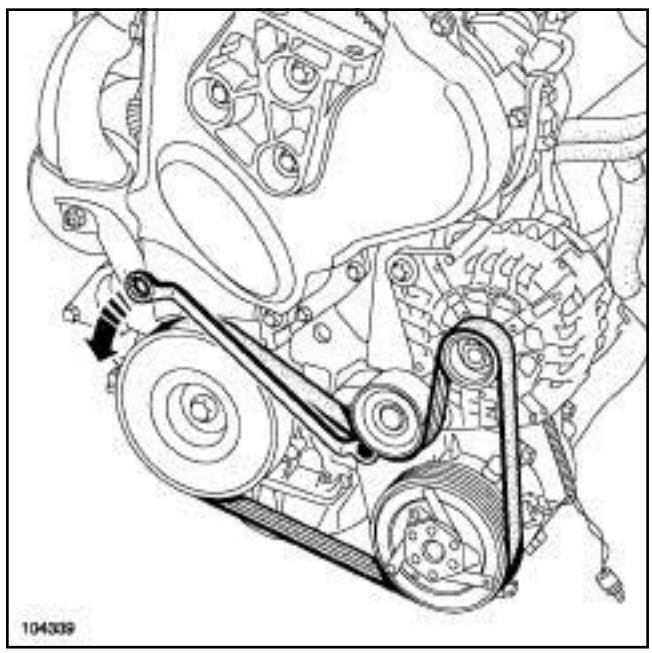
- the engine covers,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection).



101212

❏ Remove the right-hand side reinforcement (**1**) .

II - REMOVAL OF ACCESSORIES BELT



104339

❏ Turn the accessories belt auto tensioner anti-clockwise using a **16 mm** spanner.

❏ Remove:

- the accessories belt,
- the tensioning roller.

F4R – F9Q

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: Accessories belt (10,10,01,03)**

parts always to be replaced: Accessories belt tensioning roller (10,10,01,04)

parts always to be replaced: Accessories tensioning roller bolt (10,10,01,09)

❑

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

❑ Use a brush to remove any deposits from the crankshaft pulley V-grooves.

II - REFITTING THE ACCESSORIES BELT

❑ Refit the tension wheel.

❑ Torque tighten the **new tensioning roller mounting bolt (50 N.m)**.

❑ Refit the accessories belt.

❑ Rotate the crankshaft twice to position the accessories belt correctly.

III - FINAL OPERATION

❑ Refit the right-hand side reinforcement.

❑ Refit:

- the right-hand side reinforcement ,
- 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 engine covers.

B84 or C84 or G84 or S84, and F4R, and 770 or 771 or 776

Essential special tooling	
Mot. 1453	Multiple-adjusting engine mounting support with retaining straps.
Mot. 1672	Lower engine support.
Mot. 1054	TDC setting pin.
Mot. 1509	Camshaft sprocket locking tool.
Mot. 1509-01	Conversion kit for tool Mot.1509 or Mot.1801
Mot. 799-01	Timing gear wheel immobiliser.
Mot. 1496	Tool for setting camshaft.
Mot. 1487	Tool for removing the camshaft covers (57 mm diameter).
Mot. 1448	Long nose pliers for hose clips.

Tightening torques ▽	
toothed sprocket nuts	**80 Nm**
toothed sprocket nuts	**80 Nm**
fixed roller mounting bol	**50 Nm**
tensioning roller nut	**7 Nm**
toothed sprocket nuts	**80 Nm**
old inlet camshaft dephaser mounting bolt	**30 Nm**
old exhaust camshaft pulley nut	**30 Nm**
toothed sprocket nuts	**80 Nm**
old inlet and exhaust camshaft pulley nuts	**30 Nm**
toothed sprocket nuts	**80 Nm**
toothed sprocket nuts	**80 Nm**
tensioning roller nut	**28 Nm**
toothed sprocket nuts	**80 Nm**

Tightening torques ▽	
inlet camshaft dephaser mounting bolt	**30 Nm**
exhaust camshaft pulley nut	**30 Nm**
inlet camshaft dephaser mounting bolt	**100 Nm**
camshaft pulley dephaser blanking cover	**25 Nm**
exhaust camshaft pulley nut	**86° ± 6°**
toothed sprocket nuts	**80 Nm**
inlet and exhaust camshaft pulley nut	**86° ± 6°**
nuts	**80 Nm**
inlet and exhaust camshaft pulley nuts	**30 Nm + 86° ± 6°**
crankshaft accessories pulley bolt	**40 Nm + 110° ± 10°**
lower timing cover M6 bolts	**80 Nm**
lower timing cover M8 bolts	**20 Nm**
upper timing cover M8 bolts	**18 Nm**
upper timing cover M10 bolts	**38 Nm**
wheel bolts	**110 Nm**
battery cover bolts	**4 Nm**

Note:

The timing belt method is the same for engines with or without camshaft dephaser.

WARNING

Never turn the engine in the opposite direction to its normal operating direction.

B84 or C84 or G84 or S84, and F4R, and 770 or 771 or 776

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

WARNING
On the F4R engine , it is essential to fit the crankshaft sprocket with the integrated collet.

WARNING
Replace the following parts when they are removed:
- the camshaft pulley nuts,
- the crankshaft accessories pulley,
- the crankshaft accessories pulley bolt.

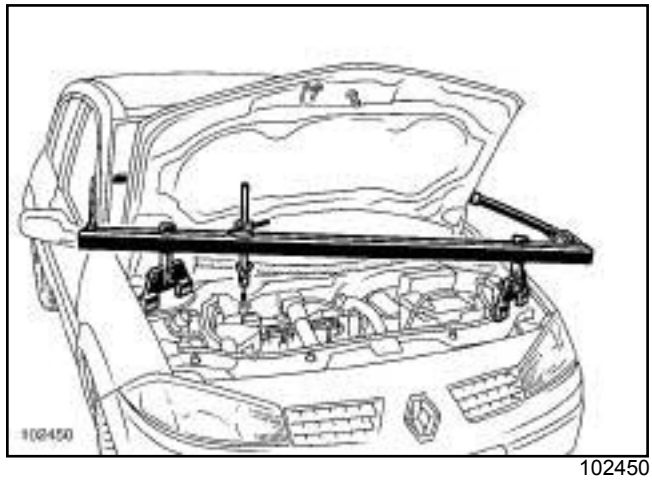
WARNING
When replacing the belt, be sure to replace the tension wheels and inertia reel.

REMOVAL

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 364, 02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 364, 80A, Battery).

❑ Remove:
- the battery (see **Battery: Removal - Refitting**) (MR 364, 80A, Battery),
- the front right-hand wheel,
- the front right-hand wheel arch liner,
- the engine covers.



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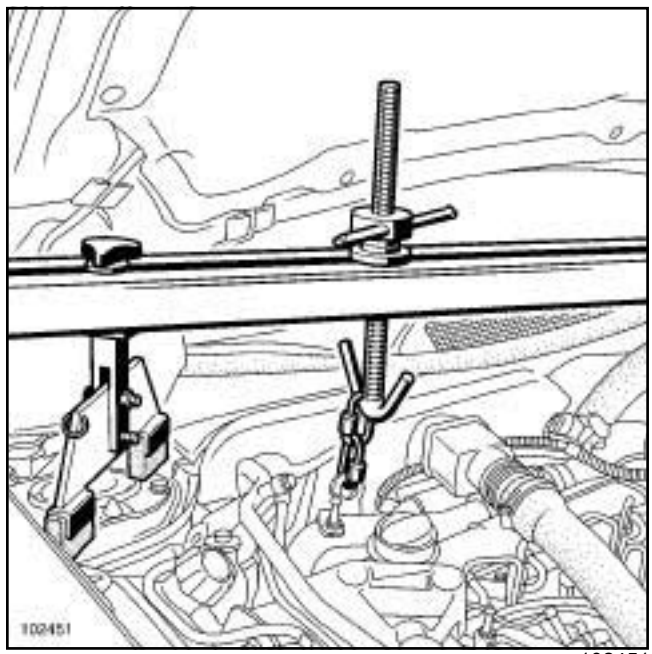

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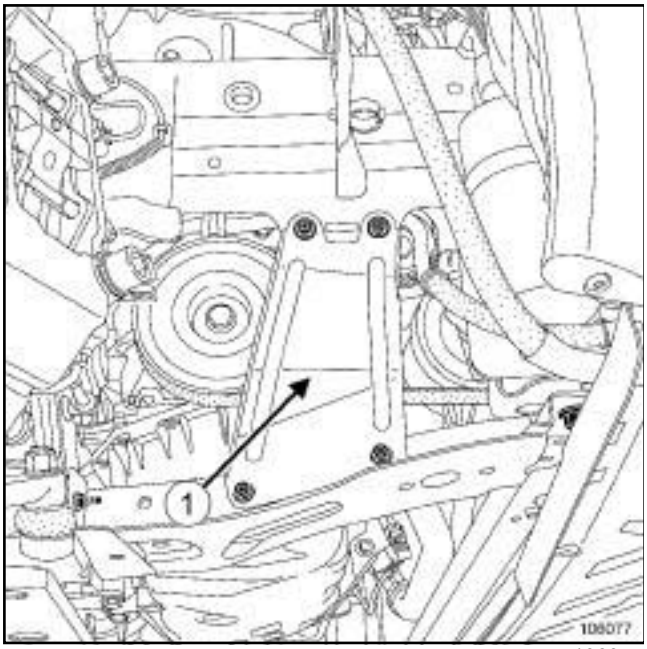
❑ Position the **(Mot. 1453)** andwith their retaining belts.

B84 or C84 or G84 or S84, and F4R, and 770 or 771 or 776

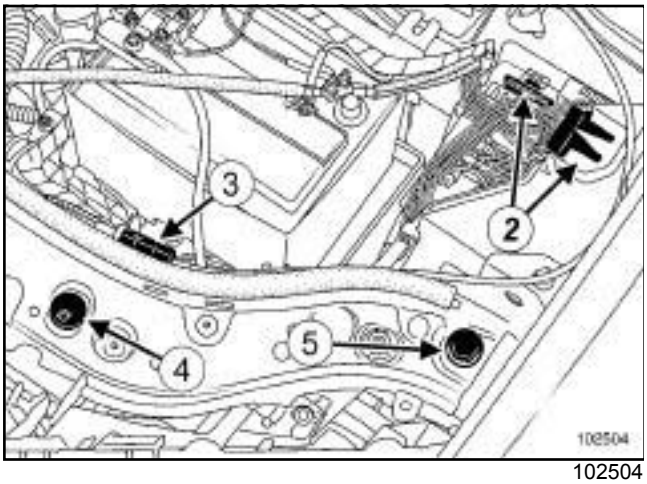


106077

❏ Remove:

- the radiator cross member right-hand side reinforcement (**1**) ,
- the lower engine tie-bar.

F4R, and 776



102504

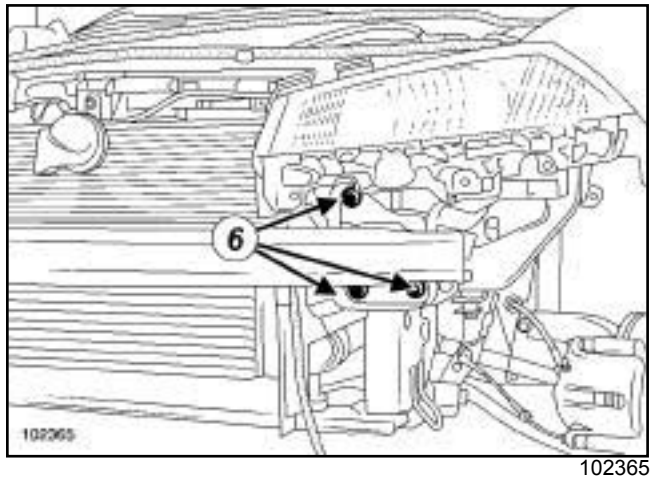
❏ Disconnect the connectors (**2**) .

❏ Unclip the bonnet opening cable (**3**) .

❏ Remove:

- the clip (**4**) ,
- the fastening (**5**) ,
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 365, 55A, Exterior protection).

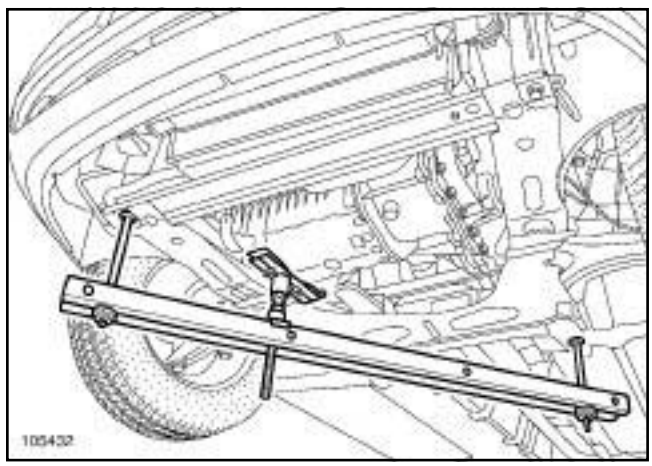
❏ Disconnect the screen washer pipes.



102365

❏ Remove:

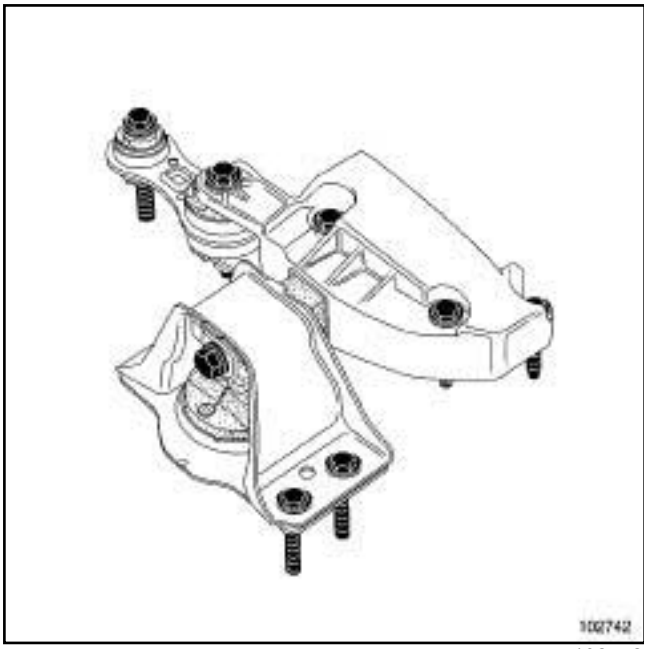
- the mounting bolts (**6**) from the front end panel,
- the front end panel,
- the front right-hand driveshaft (see **Front right-hand wheel driveshaft: Removal - Refitting**) (MR 364, 29A, Driveshafts).



105432

❏ Position the **(Mot. 1672)** using the retaining straps.

B84 or C84 or G84 or S84, and F4R, and 770 or 771 or 776



102742

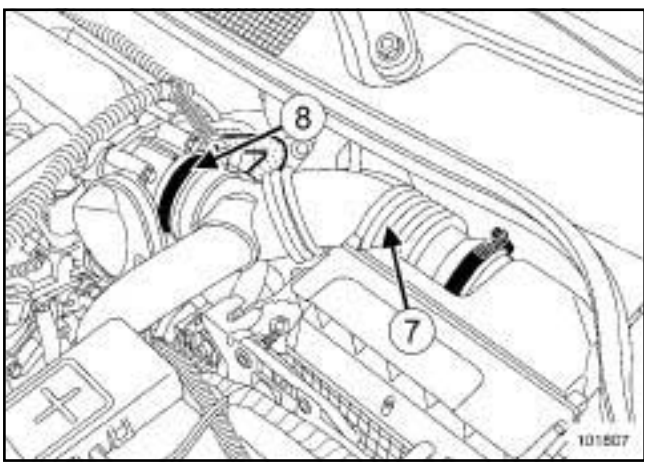
❏ Mark the suspended engine mounting in relation to the body.

❏ Remove the suspended engine mounting assembly.

Note:
Be careful not to bend the air conditioning pipe.

❏ Remove the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-4**) .

F4R, and 770 or 771

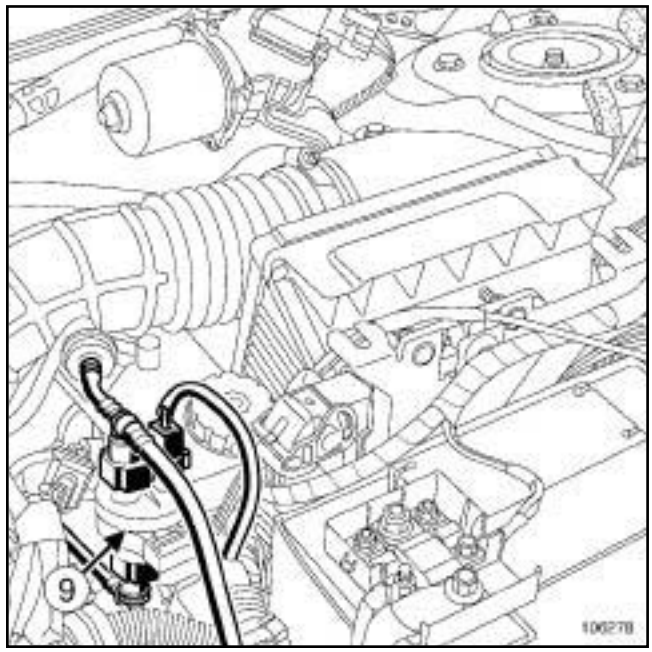


101807

❏ Remove:

- the air filter outlet duct (**7**) ,
- the throttle valve (**8**) ,
- the connector from the lifting bracket.

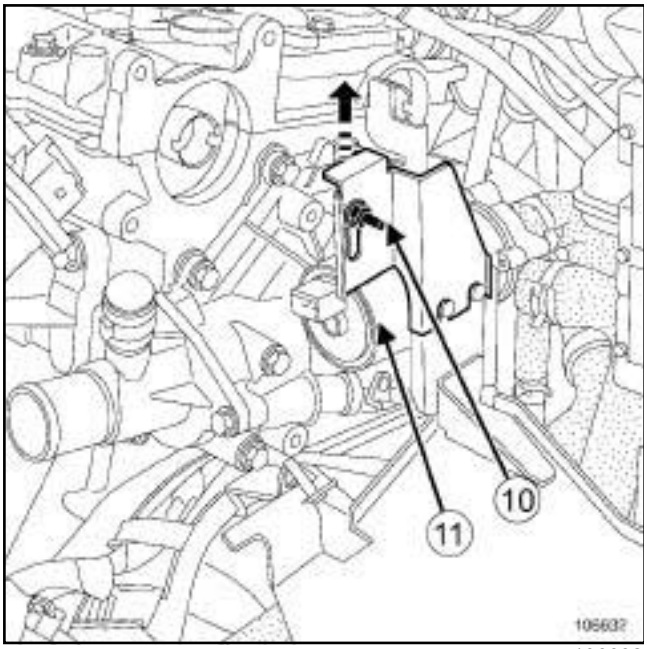
F4R, and 776



106278

❏ Remove the fuel vapour recirculation solenoid valve (**9**) .

B84 or C84 or G84 or S84, and F4R, and 770 or 771 or 776



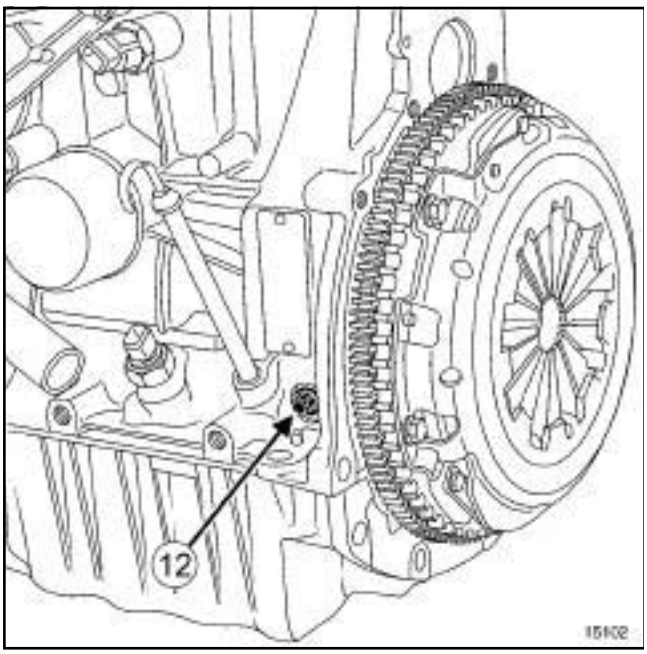
106632

❏ Loosen the nut (**10**) .

❏ Pull the mounting bracket away from the electric coolant pump.

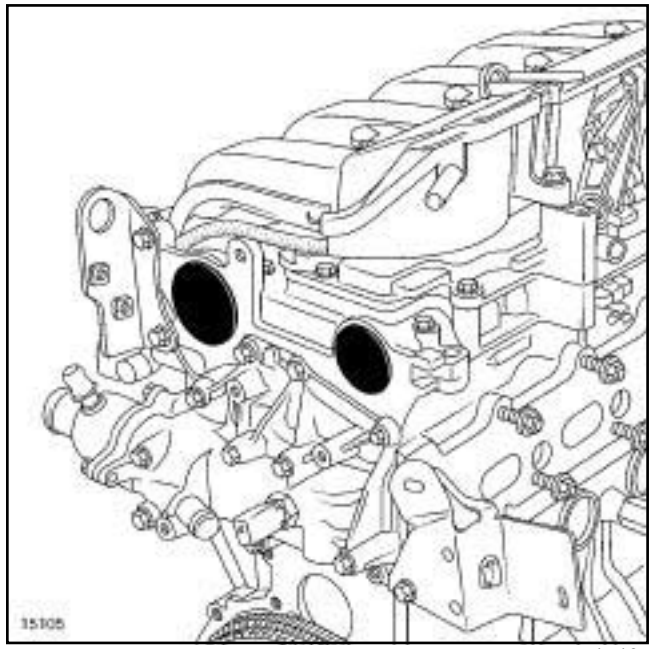
❏ Move the electric coolant pump (**11**) to one side.

❏ Disconnect the mounting bracket from the wiring harness.



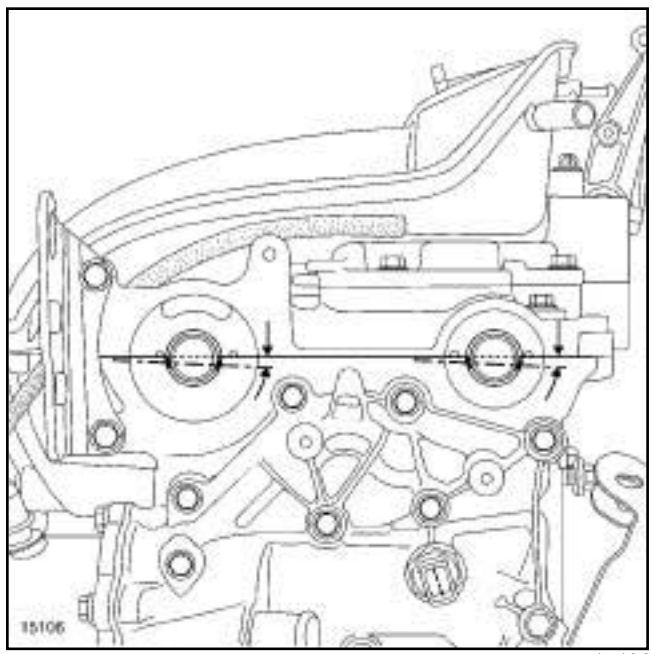
15102

❏ Remove the TDC setting pin plug (**12**) .


15105

❏ Remove the camshaft sealing plugs.

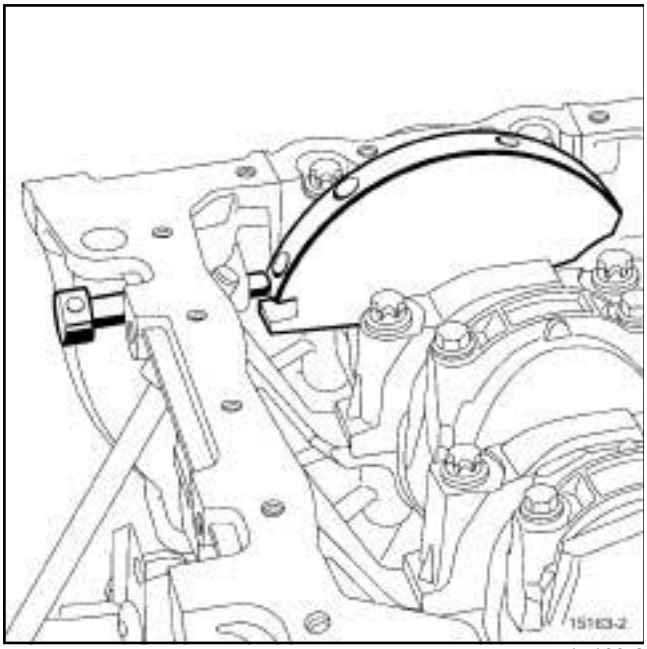
I - ADJUSTING THE TIMING


15106

❏ Rotate the engine clockwise (timing end) so that the camshaft grooves are offset below the centre line and almost horizontal, as shown in the drawing.

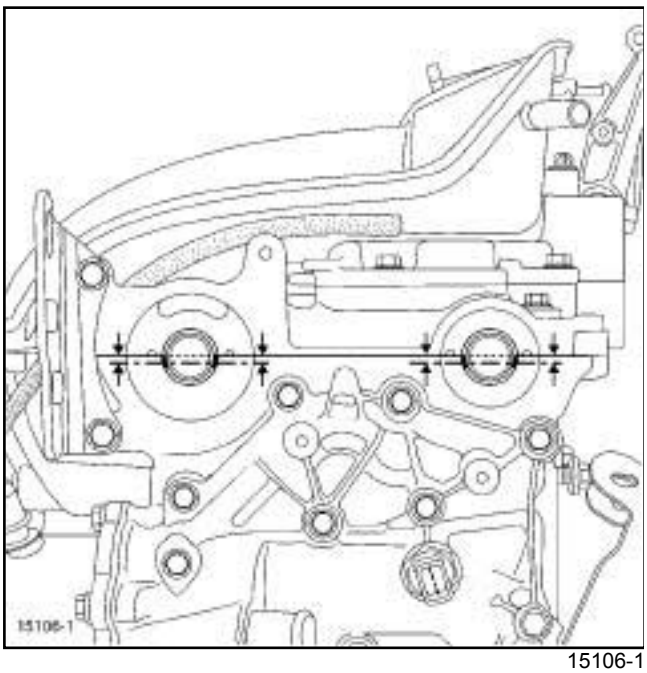
❏ Insert the TDC setting pin **(Mot. 1054)** so that it is between the balancing hole and the crankshaft setting groove.

B84 or C84 or G84 or S84, and F4R, and 770 or 771 or 776



15163-2

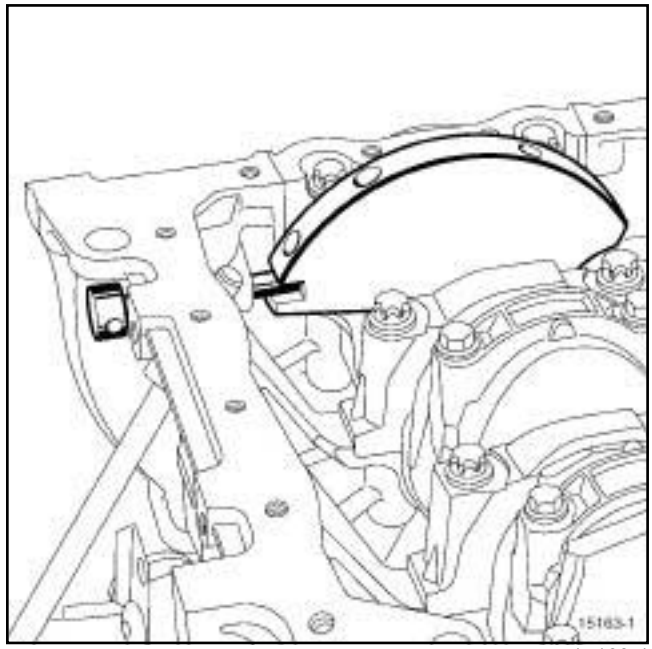
❑ Carefully turn the engine in the same direction, inserting the TDC setting pin **(Mot. 1054)** as far as the setting point.



15106-1

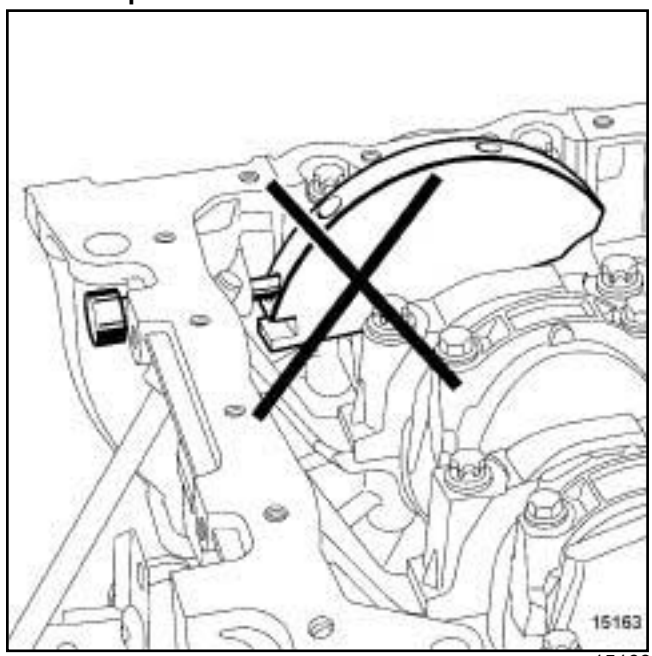
❑ At the setting point, the camshaft grooves must be horizontal and offset below the centre line, as shown in the drawing.

Correct position



15163-1

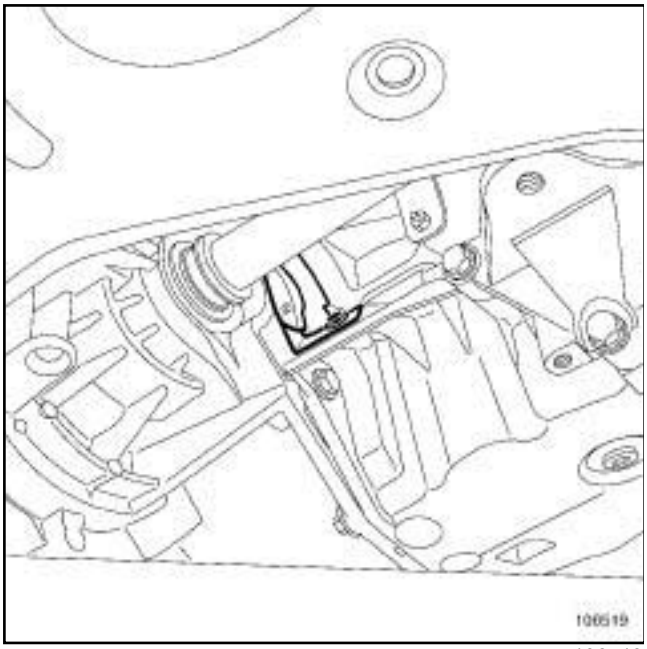
Incorrect position



15163

❑ Remove the TDC setting pin **(Mot. 1054)**.

B84 or C84 or G84 or S84, and F4R, and 770 or 771 or 776



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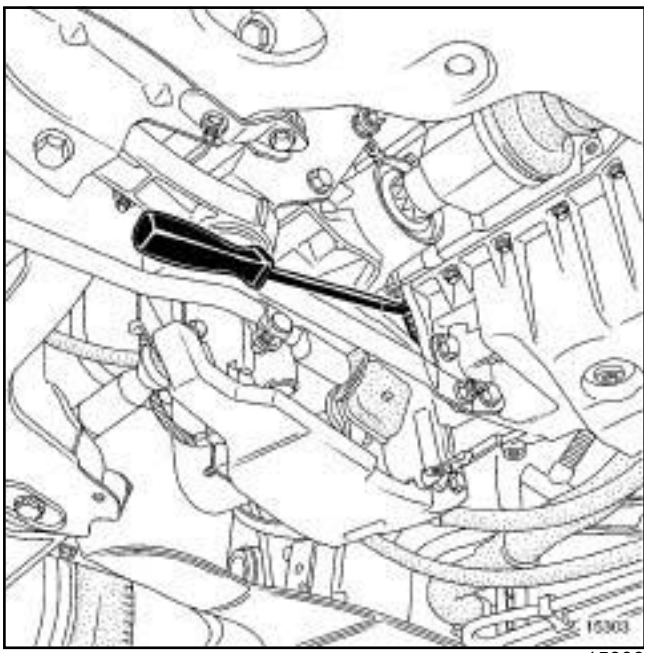


15303

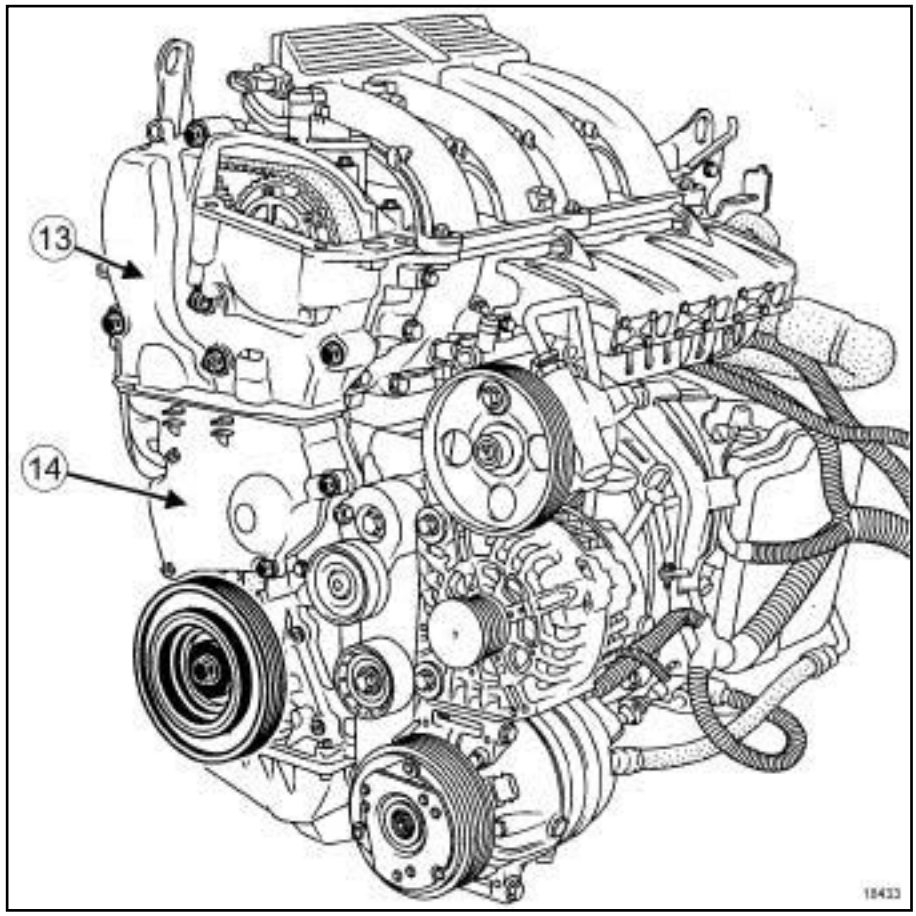
❏ Remove:

- the engine flywheel guard,
- the crankshaft pulley, locking the flywheel with a screwdriver.

❏ Refit the TDC setting pin **(Mot. 1054)**.

B84 or C84 or G84 or S84, and F4R, and 770 or 771 or 776

F4R, and 770 or 771



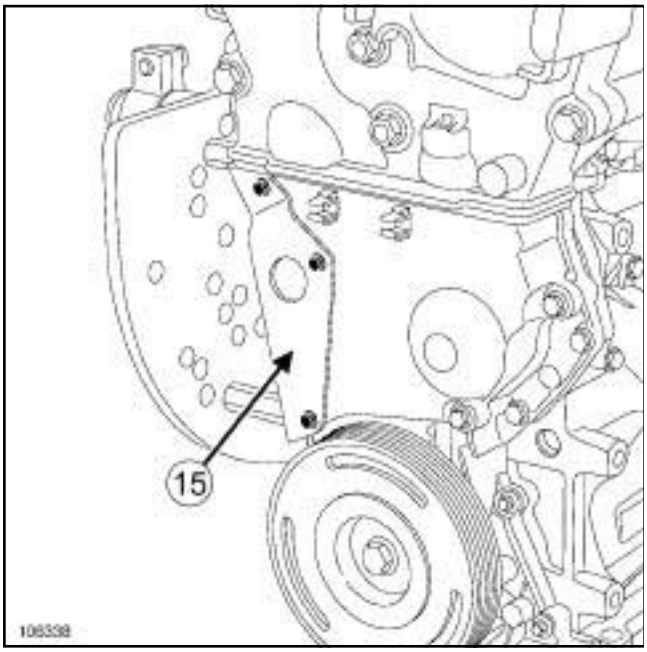
18433

❑ Remove:

- the upper timing cover (**13**) ,
- the lower timing cover (**14**) .

B84 or C84 or G84 or S84, and F4R, and 770 or 771 or 776

F4R, and 776



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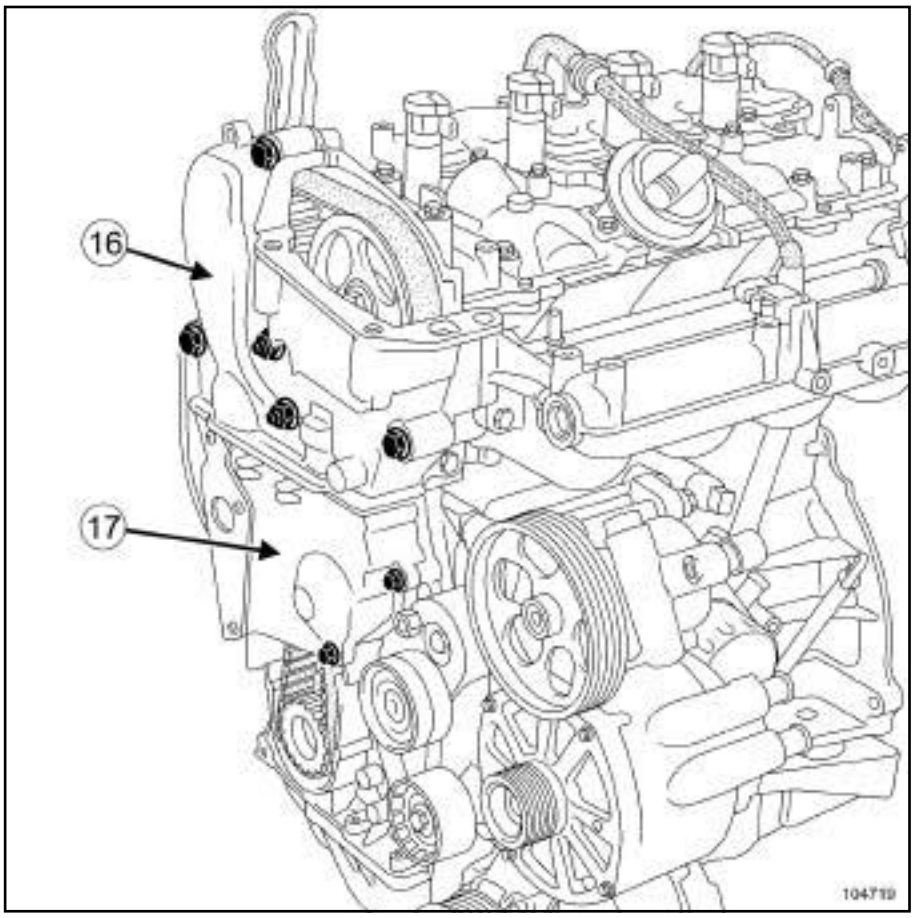


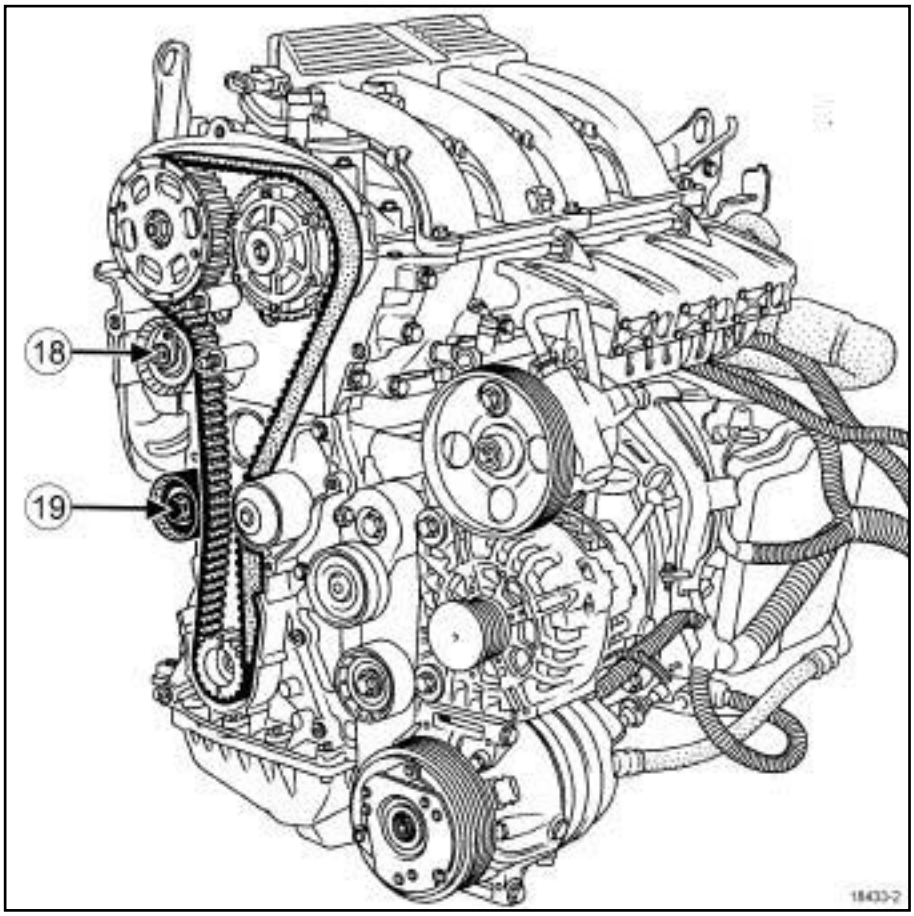
104719

❑ Remove:

- the heat shield (**15**) ,
- the upper timing cover (**16**) ,

B84 or C84 or G84 or S84, and F4R, and 770 or 771 or 776

- the lower timing cover (**17**) .



18433-2

❏ Slacken the timing belt by undoing the tensioning roller nut (**18**) .

❏ Remove:

- the fixed roller (**19**) ,
- the timing belt,
- the crankshaft timing sprocket.

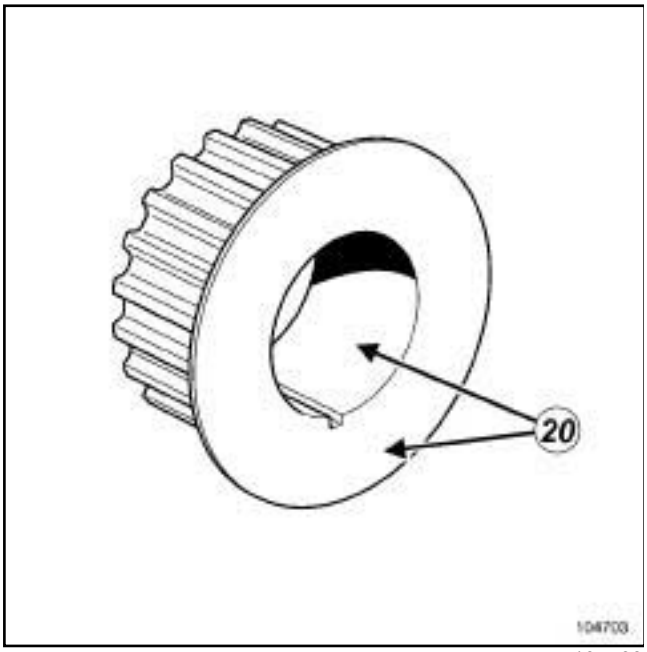
WARNING
When replacing the timing belt, be sure to replace the tension wheel and rollers.

WARNING
A belt which has been removed MUST be replaced.

WARNING
Never turn the engine in the opposite direction to its normal operating direction.

B84 or C84 or G84 or S84, and F4R, and 770 or 771 or 776

II - ADJUSTING THE TIMING



104703

❑

WARNING

Always degrease:

- the end of the crankshaft (timing end),
- the timing sproc ket bore and contact surfaces (**20**) ,
- the bearing faces of the crankshaft accessories pulley,

This is to prev ent slippage between the timing gear and the crankshaft.

This slippage causes engine damage.

WARNING

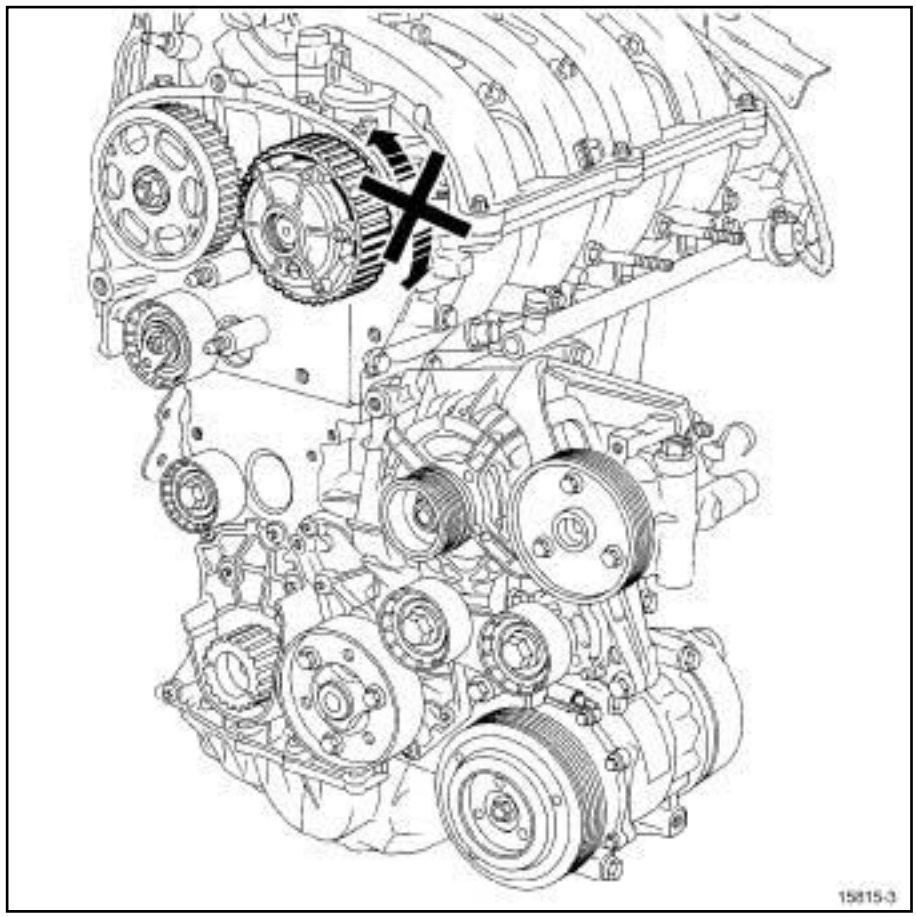
Never turn the engine in the opposite direction to its normal operating direction.

WARNING

In this case, the old camshaft pulley nuts must be removed in order to correctly set the belt tension.

B84 or C84 or G84 or S84, and F4R, and 770 or 771 or 776

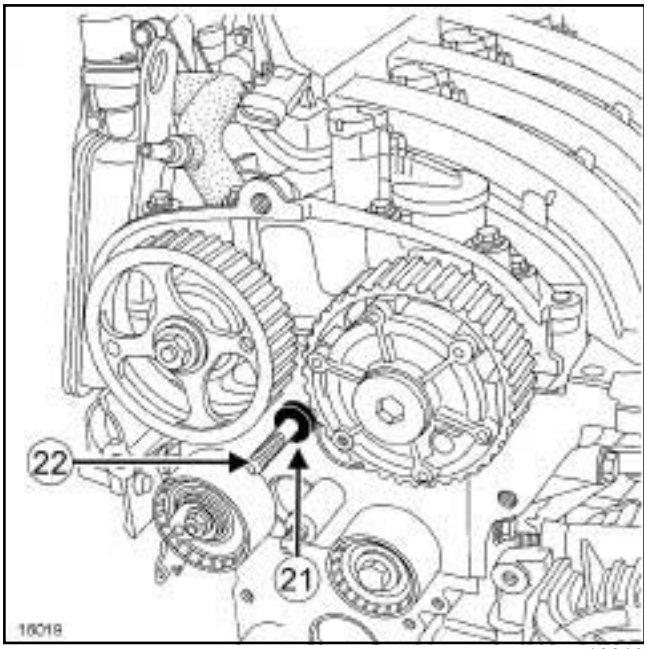
F4R, and 770 or 771



15815-3

❑ Check that the camshaft dephaser wheel is correctly locked (no rotation of the wheel to the left or to the right).

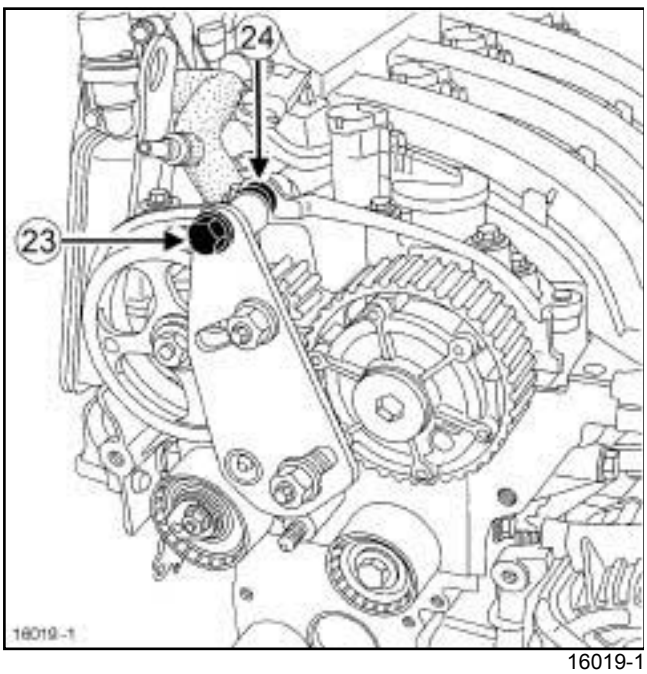
B84 or C84 or G84 or S84, and F4R, and 770 or 771 or 776



16019

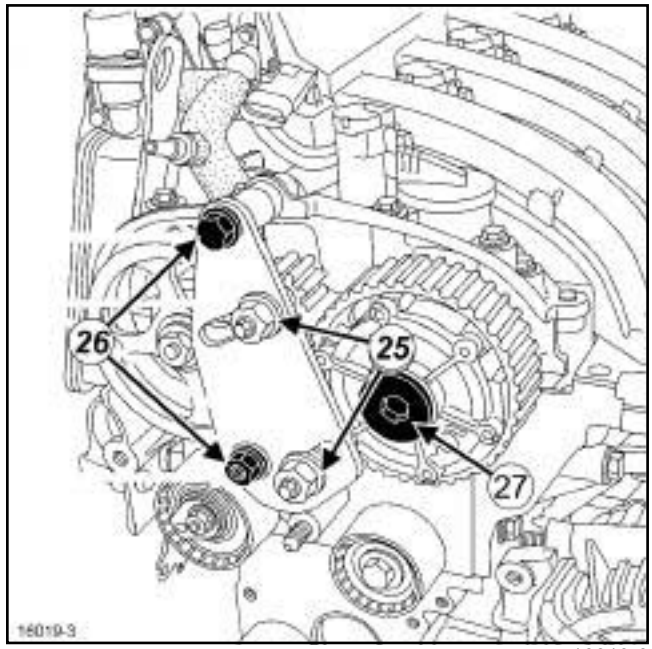
❏ Fit the **(Mot. 1509)** with the sprocket **(Mot. 1509-01)**.

❏ Fit the spacer (**21**) of tool **(Mot. 1509-01)** on the stud (**22**) .



16019-1

❏ Fit the upper bolt (**23**) while positioning the spacer (**24**) **(Mot. 1509-01)** between the tool and the rocker cover (do not tighten the bolt).



16019-3

❏ Tighten the bolt and the collar nut (**25**) .

❏ Bring the toothed sprockets of the **(Mot. 1509)** into contact with the camshaft pulleys.

❏ Tighten the **toothed sprocket nuts (80 Nm)** (**26**) .

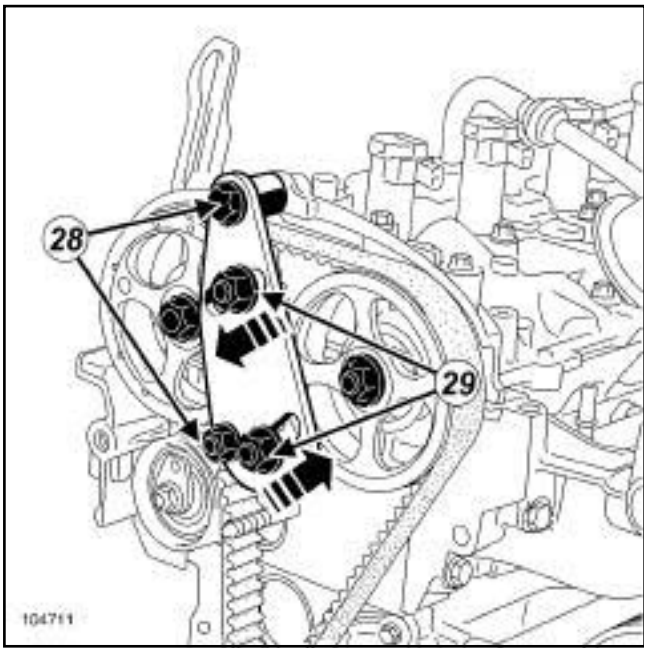
❏ Remove:

- the inlet camshaft dephaser blanking cover (**27**) ,
- the inlet camshaft dephaser mounting bolt,
- the exhaust camshaft pulley nut,
- the **(Mot. 1509)**,
- the camshaft pulleys.

❏ Undo the stud with the nut, if necessary (see **11A**, **Top and front of engine**, **Camshaft: Removal - Refitting**, page **11A-172**) (Technical Note 3884A, 10A, Top and front of engine).

B84 or C84 or G84 or S84, and F4R, and 770 or 771 or 776

F4R, and 776



104711

❏ Fit the **(Mot. 1509)** with the toothed sprocket **(Mot. 1509-01)**.

❏ Tighten the bolt and the shouldered nut (**28**) .

❏ Bring the toothed sprockets into contact with the camshaft pulleys.

❏ Tighten the **toothed sprocket nuts (80 Nm)** (**29**) .

❏ Remove:

- the camshaft pulley nuts,
- the **(Mot. 1509)**,
- the camshaft pulleys.

❏ Undo the stud with the nut, if necessary (see **11A**, **Top and front of engine**, **Camshaft: Removal - Refitting**, page **11A-172**) (Technical Note 3884A, 10A, Top and front of engine).

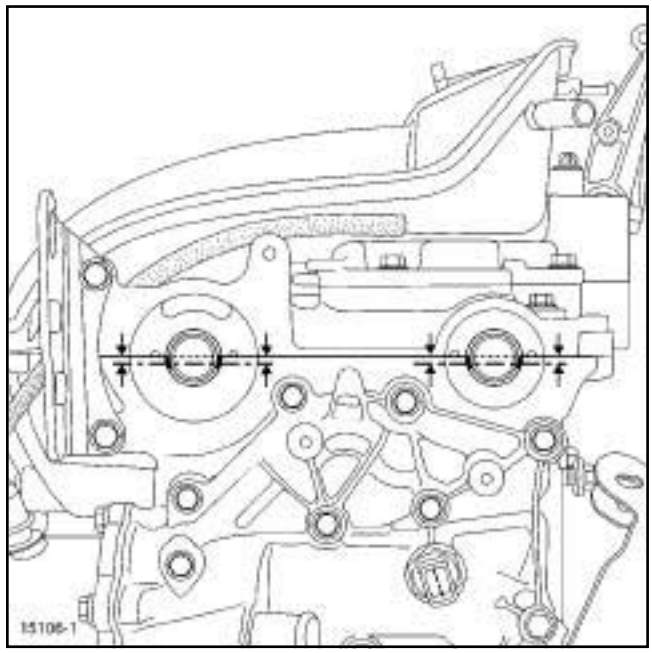
❏ Refit the degreased camshaft pulleys with the old mountings.

❏ Torque tighten the old mountings to **(15 Nm max)** using the **(Mot. 799-01)**.

WARNING

When removing the timing belt, it is essential to replace:

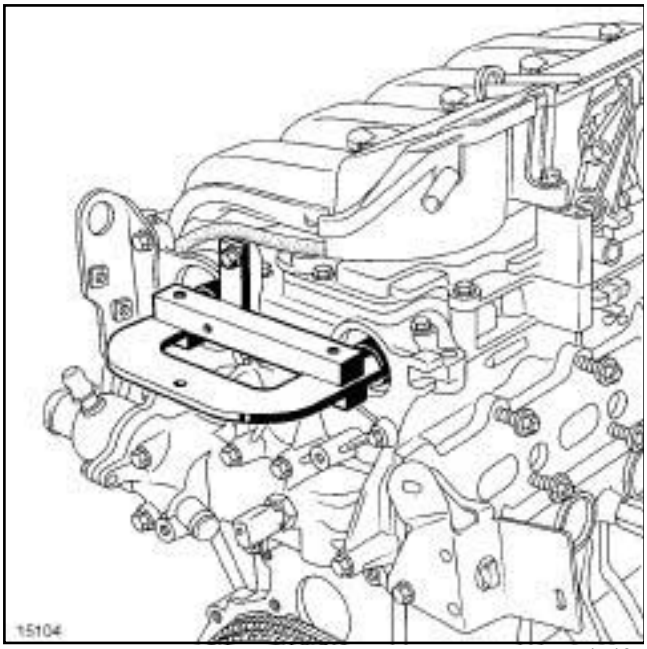
- the crankshaft accessories pulley,
- the tensioning roller and fi ed roller,
- the accessories and timing belts.



15106-1

❏ Position the grooves offset horizontally below the centre-line as shown above by turning the camshafts using the **(Mot. 799-01)**.

B84 or C84 or G84 or S84, and F4R, and 770 or 771 or 776



15104

❏ Position the **(Mot. 1496)**, attaching it to the end of the camshafts.

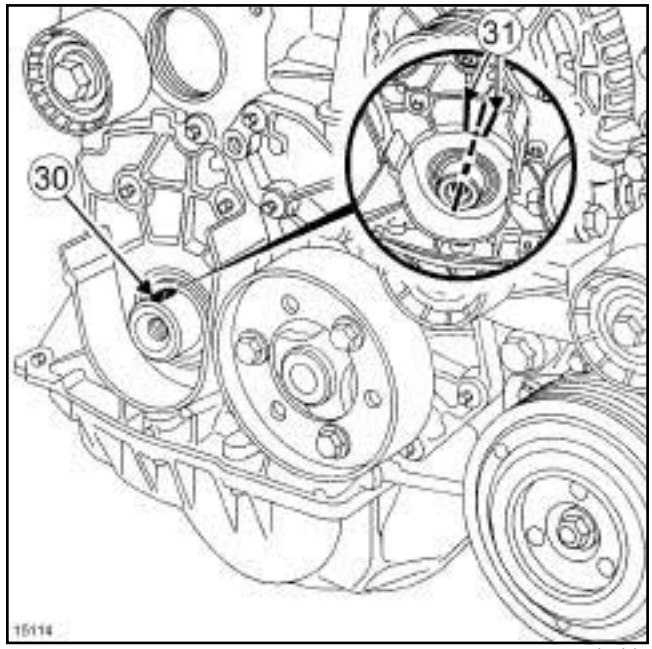
F4R, and 770 or 771

❏ Undo:

- the exhaust camshaft pulley nut,
- the inlet camshaft dephaser pulley bolt,

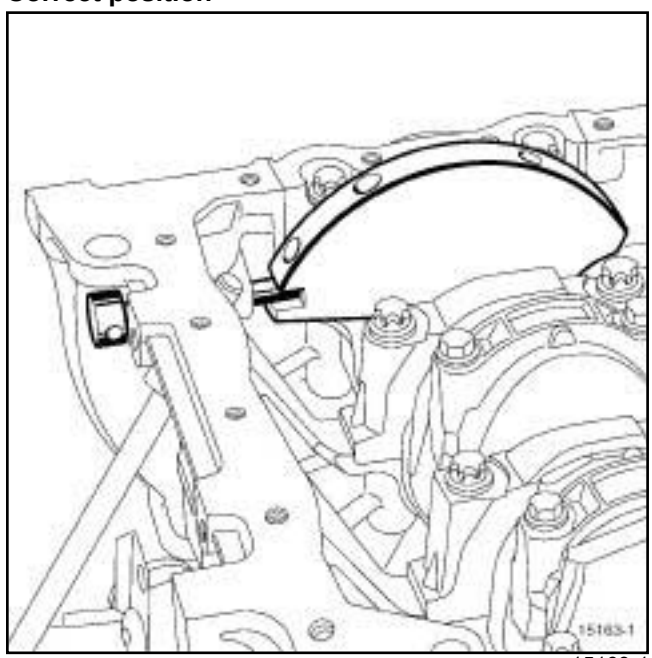
F4R, and 776

❏ Loosen the camshaft pulley nuts.



15114

Correct position



15163-1

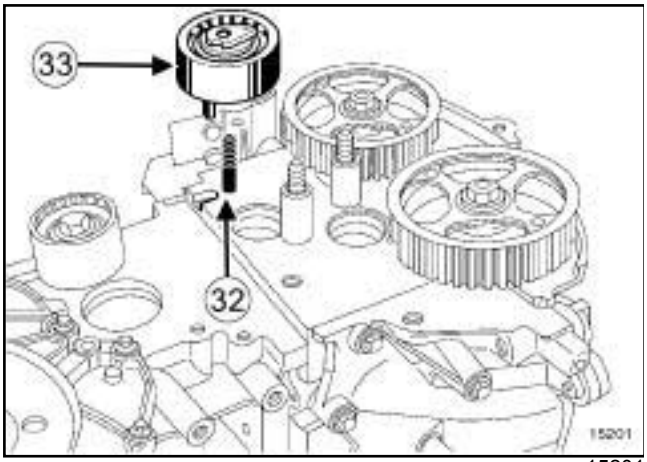
❏

WARNING

Check that the crankshaft is correctly centred.

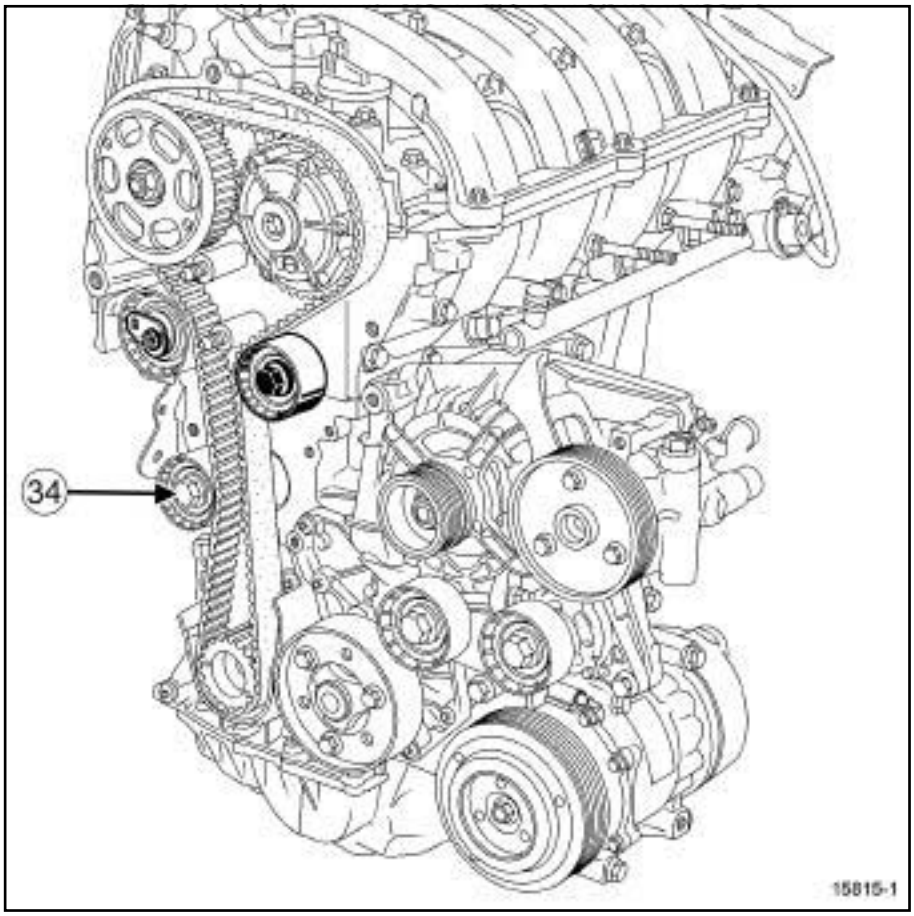
The crankshaft groove (**30**) must be between the two ribs (**31**) .

B84 or C84 or G84 or S84, and F4R, and 770 or 771 or 776



15201

❏ Refit the tensioning roller, correctly positioning (**32**) of the tensioning roller in the groove (**33**) .



15815-1

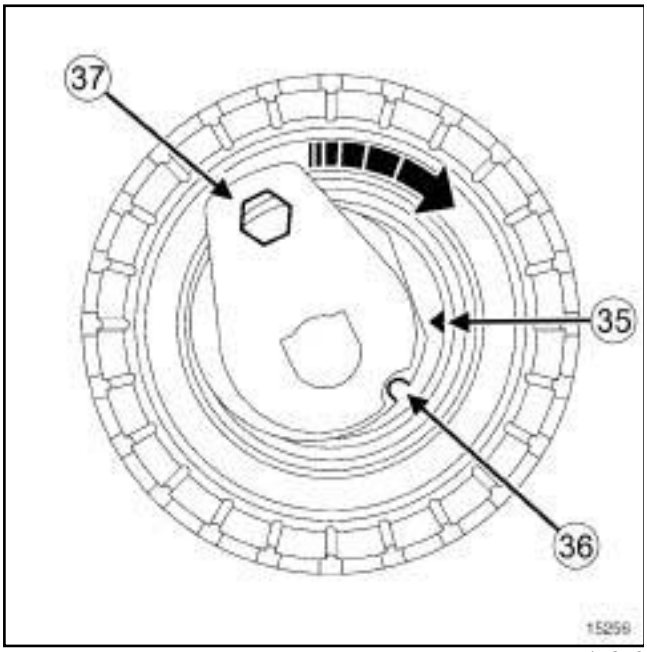
❏ Refit:

- the timing sprocket,
- the timing belt,
- the fixed roller (**34**) .

❏ Torque tighten the **fixed roller mounting bolt (50 Nm)**.

B84 or C84 or G84 or S84, and F4R, and 770 or 771 or 776

III - ADJUSTING THE TENSION



15256

❑

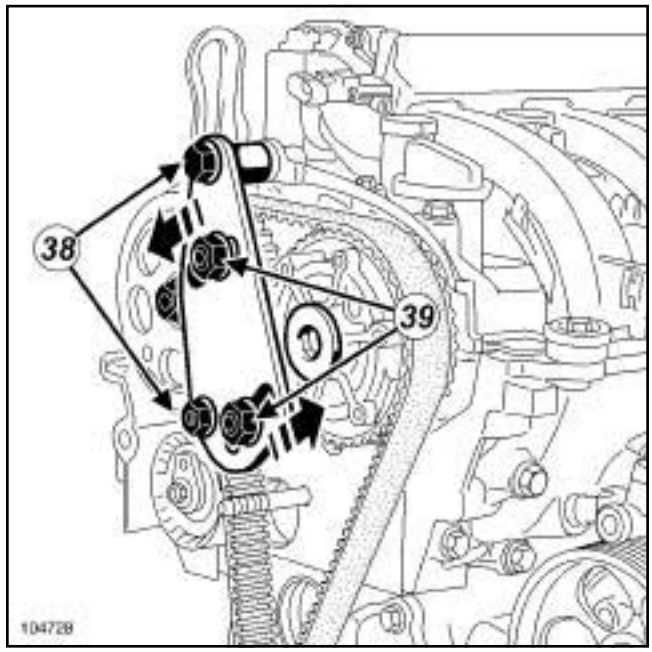
Note:

Do not rotate the tensioning roller anticlockwise.

❑ Align the marks (**35**) and (**36**) of the tensioning roller using a **6 mm** Allen key at (**37**) .

❑ Torque tighten the **tensioning roller nut (7 Nm)**.

F4R, and 770 or 771



104728

❑ Fit the **(Mot. 1509)** with the toothed sprocket **(Mot. 1509-01)** to lock the camshaft pulleys.

❑ Tighten the bolt and the shouldered nut (**38**) .

❑ Bring the toothed sprocket nuts into contact with the camshaft pulleys.

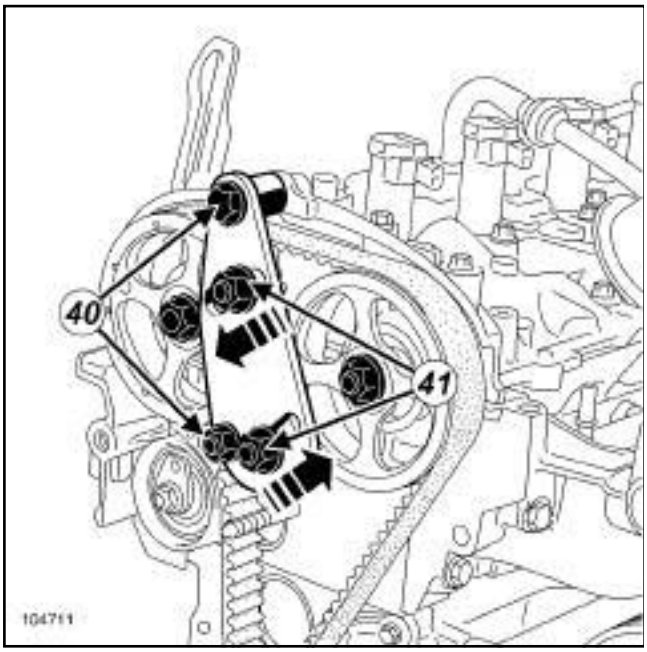
❑ Torque tighten:

- the **toothed sprocket nuts (80 Nm)** (**39**) ,
- the **old inlet camshaft dephaser mounting bolt (30 Nm)**,
- the **old exhaust camshaft pulley nut (30 Nm)**.

❑ Remove the **(Mot. 1509)** fitted with the **(Mot. 1509-01)**.

B84 or C84 or G84 or S84, and F4R, and 770 or 771 or 776

F4R, and 776



104711

❏ Fit the camshaft pulley setting tool **(Mot. 1509)**.

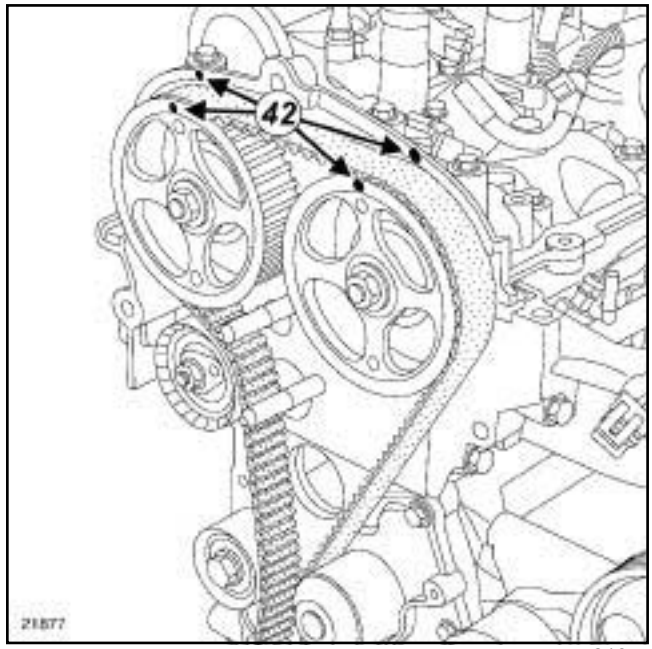
❏ Tighten the bolt and collar nut (**40**) .

❏ Bring the toothed sprocket nuts into contact with the camshaft pulleys.

❏ Torque tighten:

- the **toothed sprocket nuts (80 Nm)** (**40**) ,
- the **old inlet and exhaust camshaft pulley nuts (30 Nm)** (**41**) ,

❏ Remove the **(Mot. 1509)** fitted with the **(Mot. 1509-01)**.



21877

❏ Make a pencil mark (**42**) between the camshaft pulleys and the camshaft bearing plug.

❏ Remove the following tools:

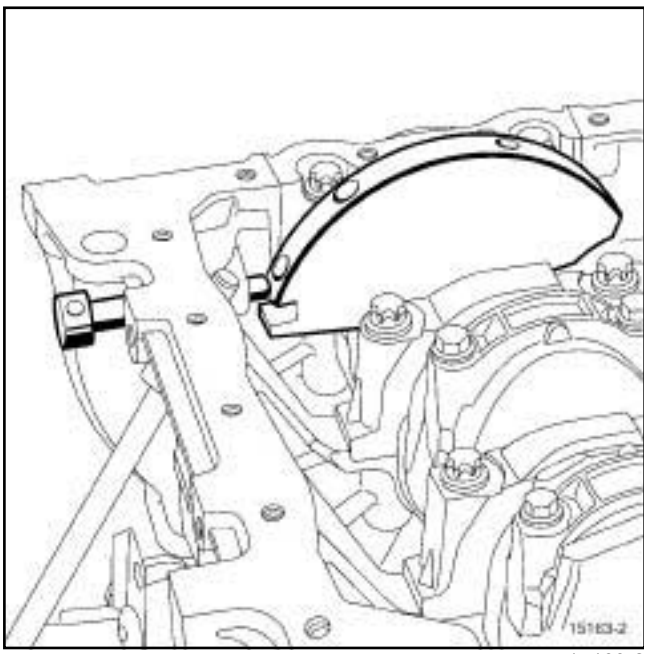
- TDC setting pin **(Mot. 1054)**,
- camshaft setting tool **(Mot. 1496)**.

❏ Rotate the crankshaft clockwise through two revolutions (timing end).

B84 or C84 or G84 or S84, and F4R, and 770 or 771 or 776

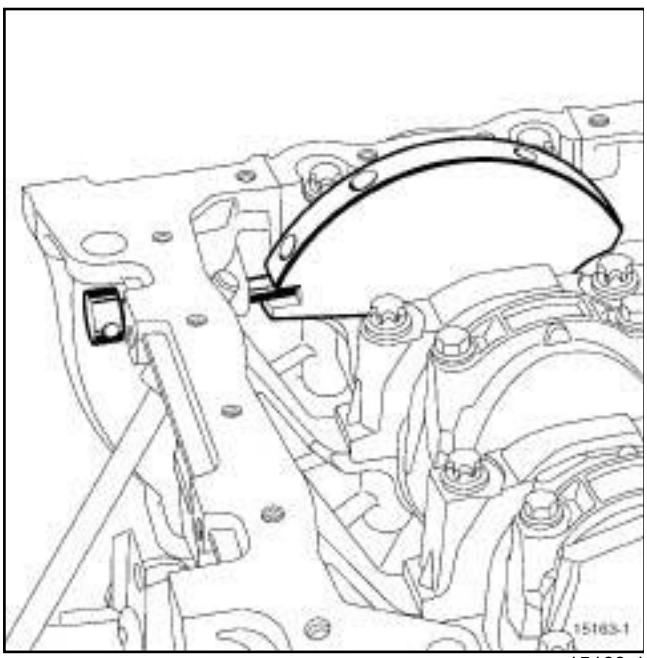
IV - CHECKING THE TIMING AND THE TENSION

1 - Checking the tension



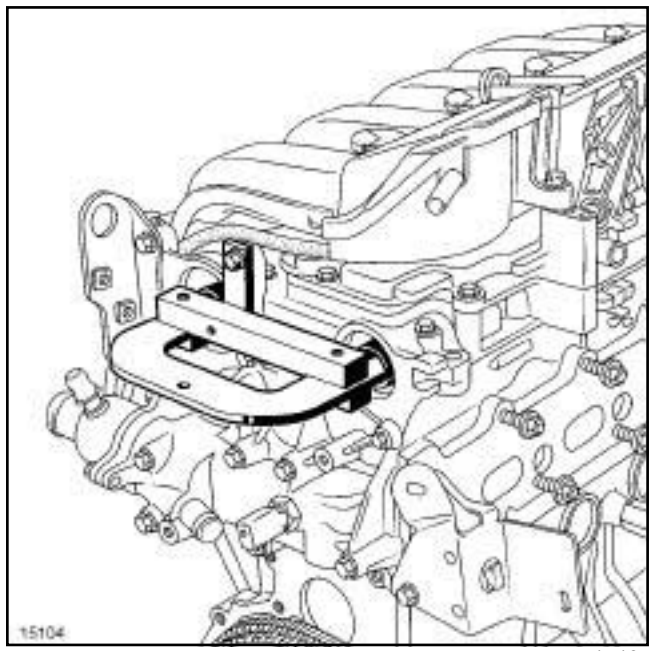
15163-2

❏ Before the end of the second revolution (i.e. half a tooth before alignment of the marks made previously by the operator), insert the crankshaft TDC setting pin **(Mot. 1054)** (so that it is between the balancing hole and the timing hole).



15163-1

❏ Bring the timing to its setting point.

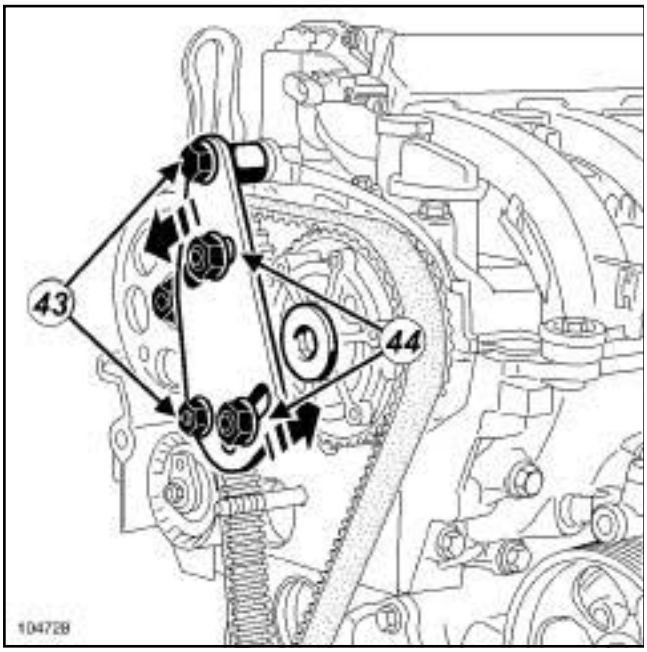


15104

❏ Position the camshaft setting tool **(Mot. 1496)**.

B84 or C84 or G84 or S84, and F4R, and 770 or 771 or 776

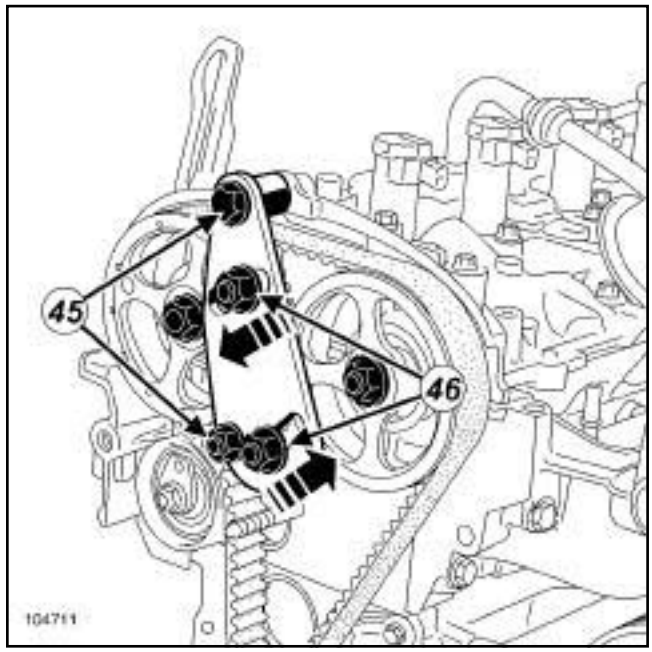
F4R, and 770 or 771



104728

- ❏ Fit the **(Mot. 1509)** with the toothed sprocket **(Mot. 1509-01)** for locking the camshaft pulleys.
- ❏ Tighten the bolt and collar nut (**43**) .
- ❏ Offer up the sprocket nuts against the camshaft pulleys.
- ❏ Tighten the **toothed sprocket nuts (80 Nm)** (**44**) .
- ❏ Undo:
  - the old inlet camshaft dephaser pulley mounting bolt,
  - the old exhaust camshaft pulley nut.
- ❏ Remove the **(Mot. 1509)** fitted with a sprocket **(Mot. 1509-01)** for locking the camshaft pulleys.

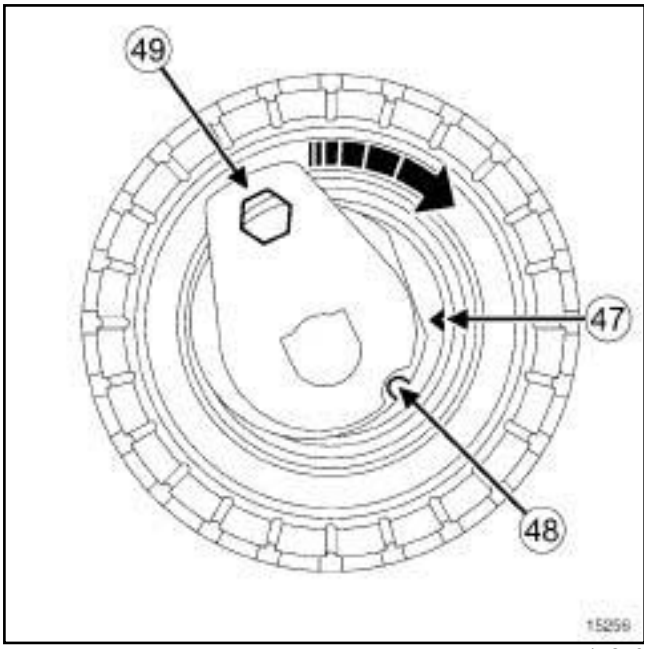
F4R, and 776



104711

- ❏ Fit the camshaft pulley locking tool **(Mot. 1509)**.
- ❏ Tighten the bolt and collar nut (**45**) .
- ❏ Offer up the sprocket nuts against the camshaft pulleys.
- ❏ Tighten the **toothed sprocket nuts (80 Nm)** (**46**) .
- ❏ Undo:
  - the old inlet camshaft pulley nut,
  - the old exhaust camshaft pulley nut.
- ❏ Remove the camshaft pulley locking tool **(Mot. 1509)**.

B84 or C84 or G84 or S84, and F4R, and 770 or 771 or 776

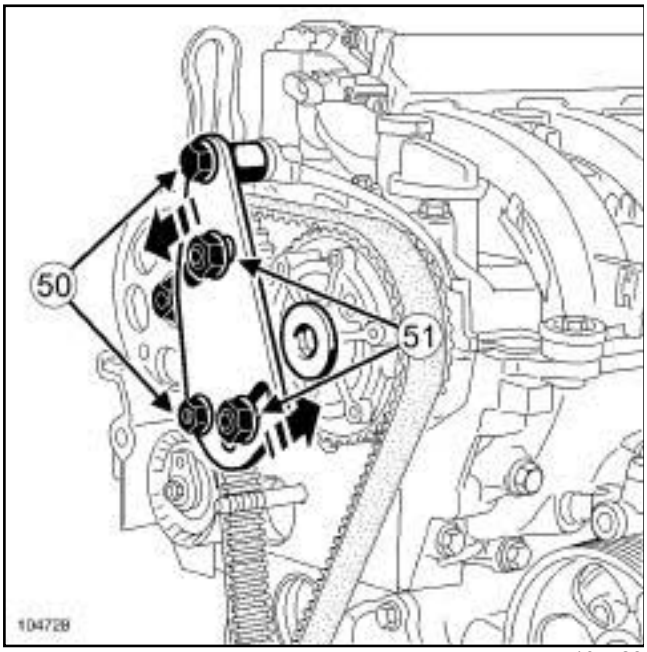


15256

- ❏ Align mark (**47**) with mark (**48**) by loosening the tensioning roller nut a maximum of one turn, holding it with a **6 mm** Allen key (**49**) .
- ❏ Fully tighten the **tensioning roller nut (28 Nm)**.

B84 or C84 or G84 or S84, and F4R, and 770 or 771 or 776

F4R, and 770 or 771



104728

❑ Position the **(Mot. 1509)** fitted with the toothed sprocket for locking the camshaft pulleys.

❑ Tighten the bolt and collar nut (**50**) .

❑ Bring the toothed sprocket nuts into contact with the camshaft pulleys.

❑ Tighten the **toothed sprocket nuts (80 Nm)** (**51**) .

❑ Remove:

- the old inlet camshaft pulley dephaser bolt,
- a new nut on the exhaust camshaft pulley.

❑ Refit:

- a new bolt on the inlet camshaft pulley,
- a new nut on the exhaust camshaft pulley.

❑ Torque tighten:

- the **inlet camshaft dephaser mounting bolt (30 Nm)**,
- the **exhaust camshaft pulley nut (30 Nm)**.

❑ Remove the camshaft setting tool **(Mot. 1496)**.

❑ Torque tighten:

- the **inlet camshaft dephaser mounting bolt (100 Nm)**,
- the **camshaft pulley dephaser blanking cover (25 Nm)**

❑ Angle tighten the **exhaust camshaft pulley nut (86° ± 6°)**.

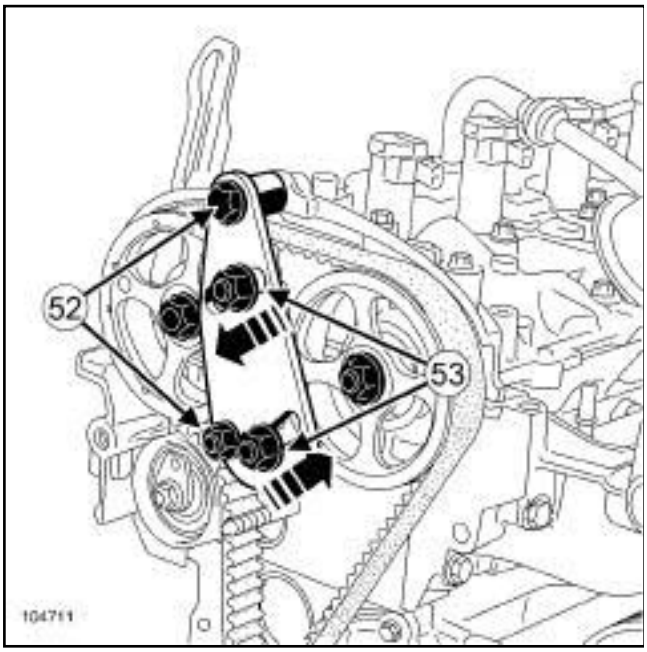
❑ Remove the following tools:

- TDC setting pin **(Mot. 1054)**,
- camshaft pulley locking tool **(Mot. 1509)** with toothed sprockets **(Mot. 1509-01)**.

❑ Rotate the crankshaft clockwise through two revolutions (timing end).

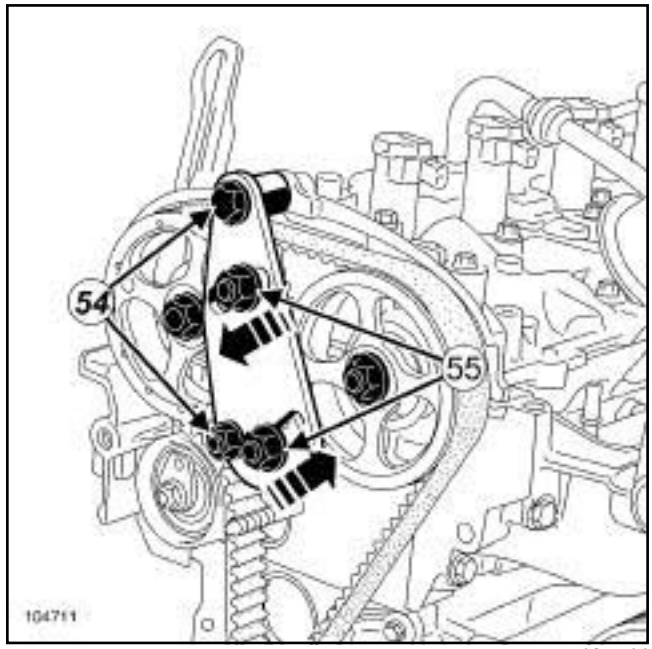
B84 or C84 or G84 or S84, and F4R, and 770 or 771 or 776

F4R, and 776



104711

- ❏ Fit the camshaft pulley locking tool **(Mot. 1509)**.
- ❏ Tighten the bolt and collar nut (**52**) .
- ❏ Bring the toothed sprocket nuts into contact with the camshaft pulleys.
- ❏ Tighten the **toothed sprocket nuts (80 Nm)** (**53**) .
- ❏ Remove:
  - the old inlet camshaft pulley nut,
  - the old exhaust camshaft pulley nut.
- ❏ Refit a new nut onto the inlet and exhaust camshaft pulley.
- ❏ Torque tighten the **inlet and exhaust camshaft pulley nut 30 Nm**.
- ❏ Remove the camshaft setting tool **(Mot. 1496)**.
- ❏ Angle tighten the **inlet and exhaust camshaft pulley nut (86° ± 6°)**.
- ❏ Remove the following tools:
  - TDC setting pin **(Mot. 1054)**,
  - camshaft pulley locking tool **(Mot. 1509)**.
- ❏ Rotate the crankshaft clockwise through two revolutions (timing end).

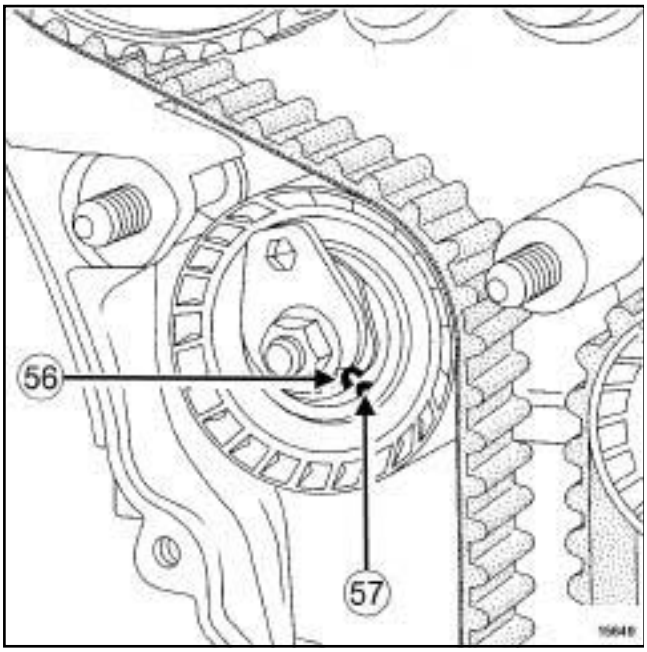


104711

- ❏ Fit the camshaft locking tool **(Mot. 1509)** while tightening the **nuts (80 Nm)** (**54**) .
- ❏ Tighten the bolt and the shouldered nut (**55**) .
- ❏ Remove the old camshaft pulley nuts and replace them with new ones.
- ❏ Torque and angle tighten the **inlet and exhaust camshaft pulley nuts (30 Nm + 86° ± 6°)**.
- ❏ Remove the following tools:
  - the **(Mot. 1496)**,
  - camshaft pulley locking tool **(Mot. 1509)**.
  - the TDC setting pin **(Mot. 1054)**.
- ❏ Rotate the crankshaft clockwise through two revolutions.

B84 or C84 or G84 or S84, and F4R, and 770 or 771 or 776

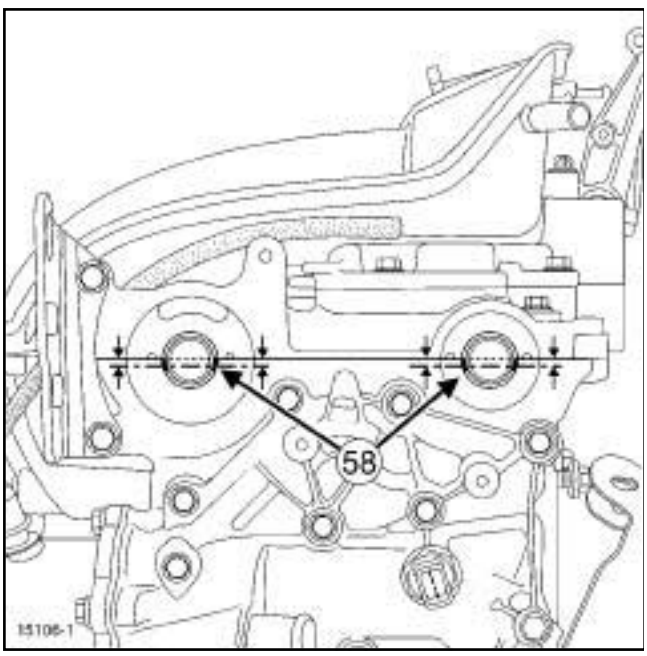
2 - Checking the timing



15649

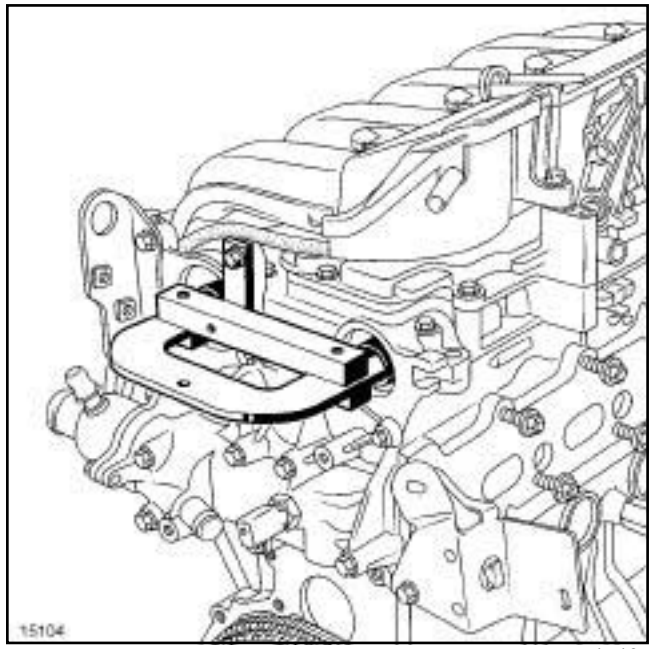
❏ Before the end of the second revolution (i.e. half a tooth before alignment of the marks made previously by the operator), insert the crankshaft TDC setting pin (**(Mot. 1054)** so that it is between the balancing hole and the timing hole).

❏ Check that mark (**56**) is aligned with mark (**57**) on the tensioning roller before checking the timing adjustment.



15106-1

❏ The offset grooves (**58**) must be aligned horizontally below the centreline.



15104

❏ Position the camshaft setting tool **(Mot. 1496)** without forcing it. If the tool does not engage, repeat the timing and tension setting procedure.

REFITTING

❏ Refit:

- the lower timing cover,
- the upper timing cover.

WARNING
The crankshaft accessories pulley and bolt must be replaced.

B84 or C84, and F4R, and 774

Essential special tooling	
Mot. 1672	Lower engine support.
Mot. 1487	Tool for removing the camshaft covers (57 mm diameter).
Mot. 1488	Tool for removing the camshaft covers (43 mm diameter).
Mot. 1054	TDC setting pin.
Mot. 1509	Camshaft sprocket locking tool.
Mot. 799-01	Timing gear wheel immobiliser.
Mot. 1496	Tool for setting camshaft.

Tightening torques ▽	
toothed sprocket nuts	**80 Nm**
camshaft pulley nuts	**15 Nm**
fixed roller bolt	**50 Nm**
old inlet camshaft pulley nut	**30 Nm**
old exhaust camshaft pulley nut	**30 Nm**
tensioning roller nut	**28 Nm**
toothed sprocket nuts of the tool (Mot. 1509)	**80 Nm**
inlet camshaft pulley nut	**86° ± 6**
exhaust camshaft pulley nut	**86° ± 6°**
crankshaft accessories pulley bolt	**40 Nm + 110° ± 10°**
suspended mounting linkage mounting bolts	**105 Nm**
bolts securing the suspended engine mounting cover on the engine	**62 Nm**
wheel bolts	**110 Nm**
battery cover bolts	**4 Nm**

WARNING
Never turn the engine in the opposite direction to its normal operating direction.

WARNING

Replace the following parts when they are removed:

- the belt (timing and accessories),
- the camshaft pulley nuts,
- the crankshaft accessories pulley bolt.

WARNING
When replacing the timing belt, the tensioning roller, the fixed roller and the crankshaft accessories pulley bolts must be replaced.

REMOVAL

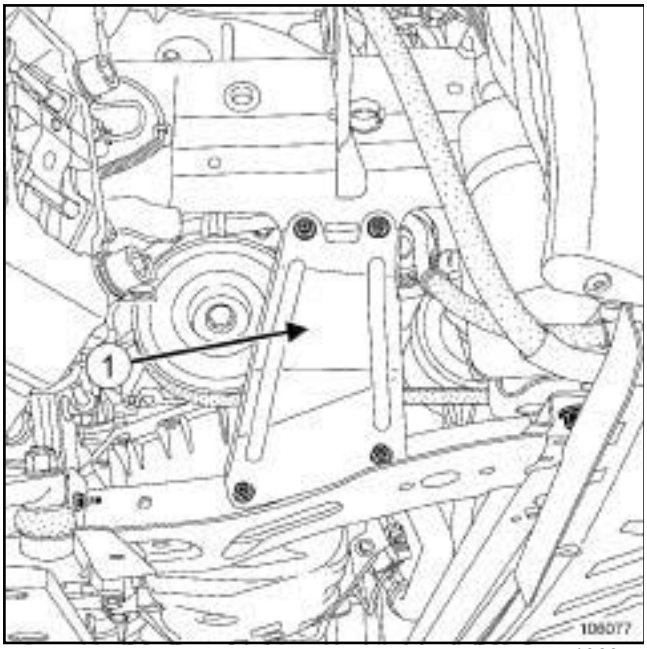
❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 364, 02A, Lifting equipment).

❑ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 364, 80A, Battery).

❑ Remove:

- the battery,
- the battery tray,
- the engine covers,
- the front right-hand wheel,
- the front right-hand wheel arch,

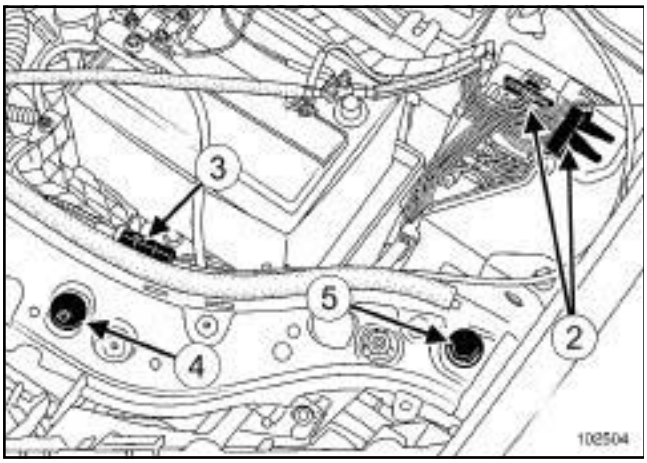
B84 or C84, and F4R, and 774



106077

❏ Remove:

- the radiator cross member right-hand side reinforcement (**1**) ,
- the bumper mountings,
- the bumper.



102504

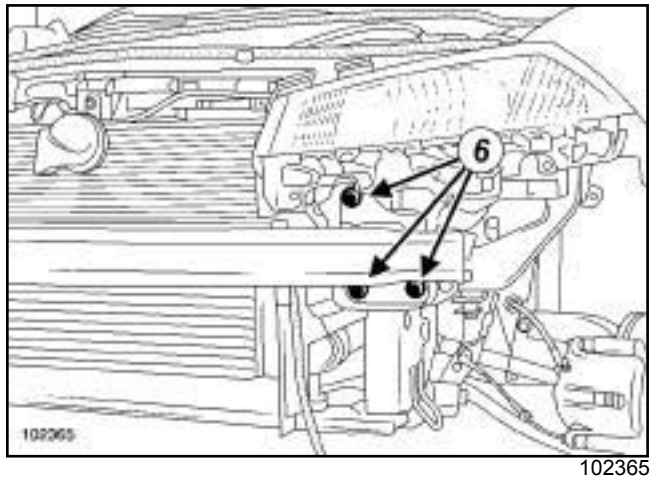
❏ Disconnect the two connectors (**2**) .

❏ Unclip the bonnet opening cable (**3**) .

❏ Remove:

- the clip (**4**) ,
- the mounting (**5**) .

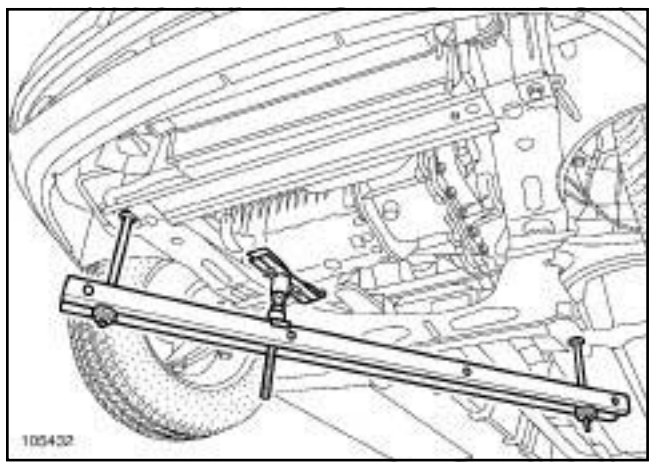
❏ Disconnect the screen washer pipes.



102365

❏ Remove:

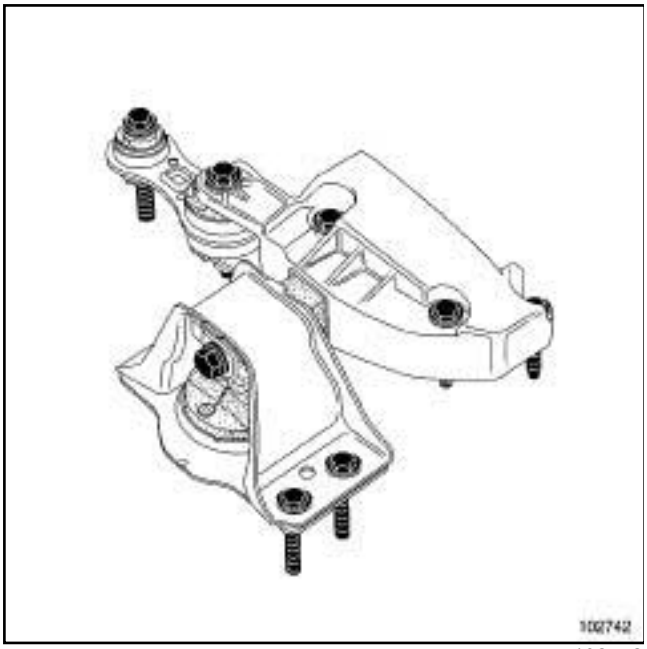
- the front end panel mountings (**6**) ,
- the front end panel,
- the front right-hand wheel driveshaft (see **Front right-hand wheel driveshaft: Removal - Refitting**) (MR 364, 29A, Driveshafts).



105432

❏ Position the **(Mot. 1672)**.

B84 or C84, and F4R, and 774



102742

❏ Remove the lower engine tie-bar.

❏ Mark the engine support mounting bolts.

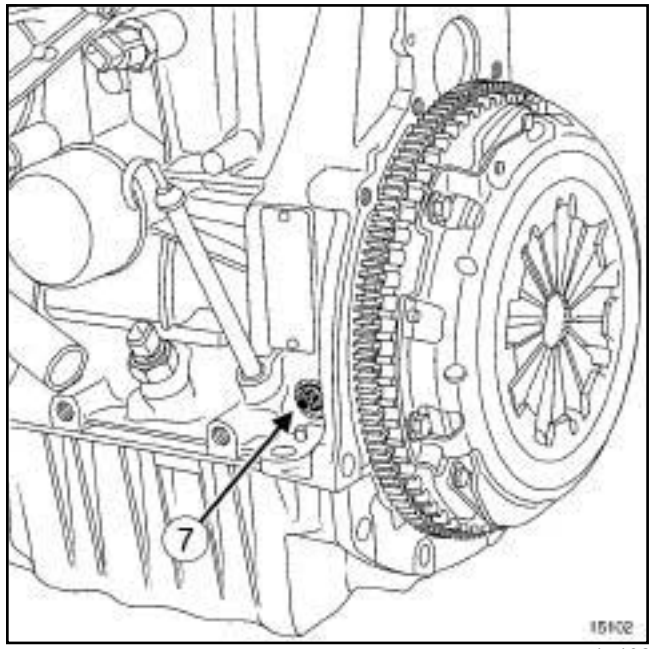
❏ Make a mark on the suspended engine mounting in relation to the body.

❏ Remove the « suspended mounting - engine » assembly.

Note:

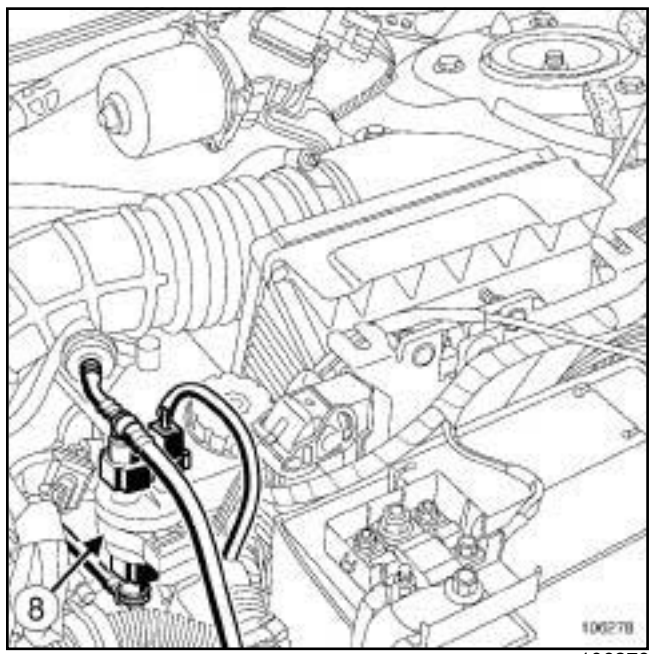
Be careful not to bend the air conditioning pipe.

❏ Remove the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-4**) .



15102

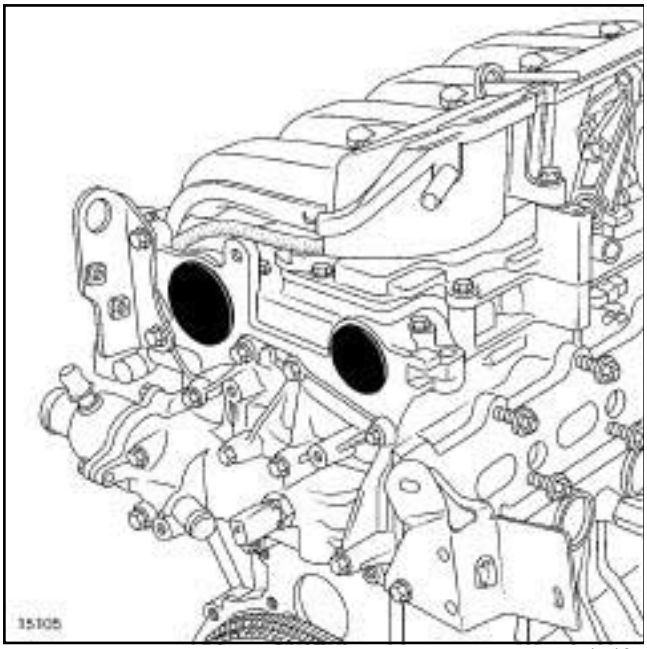
❏ Remove the TDC pin plug (**7**) .



106278

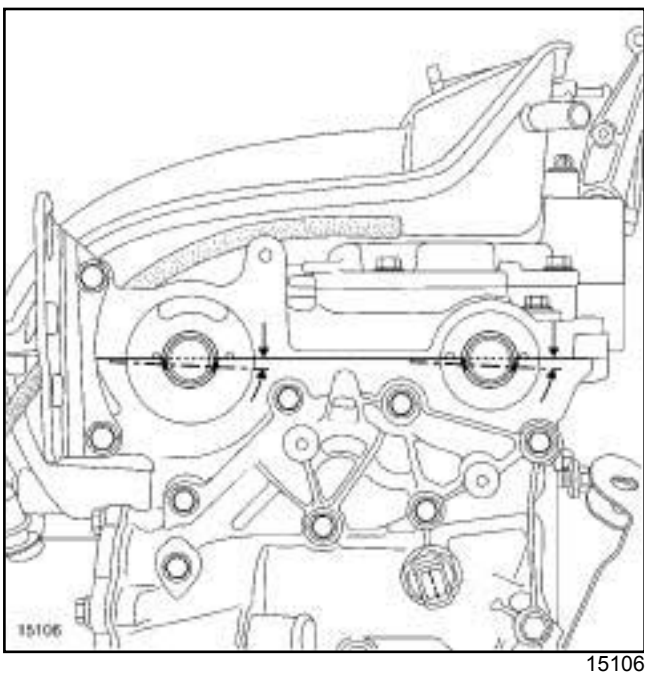
❏ Remove fuel vapour recirculation solenoid valve (**8**) .

B84 or C84, and F4R, and 774



15105

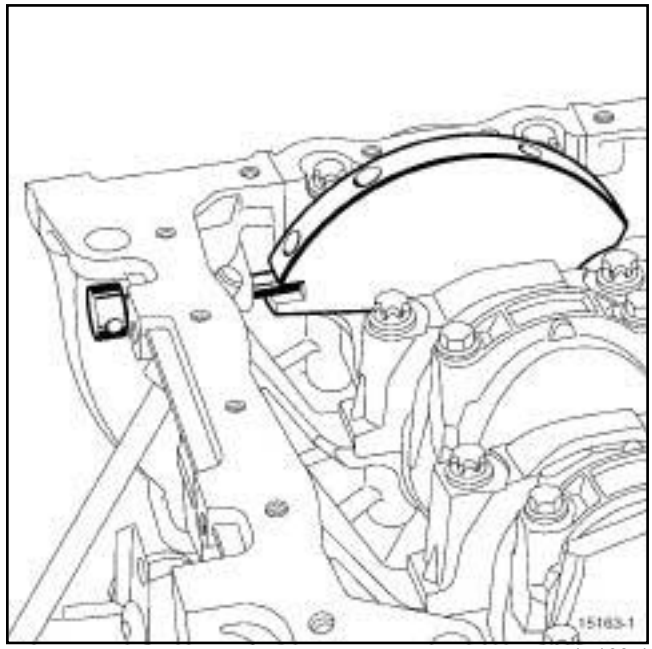
❏ Remove the camshaft sealing plugs using the **(Mot. 1487)** and **(Mot. 1488)**.



15106

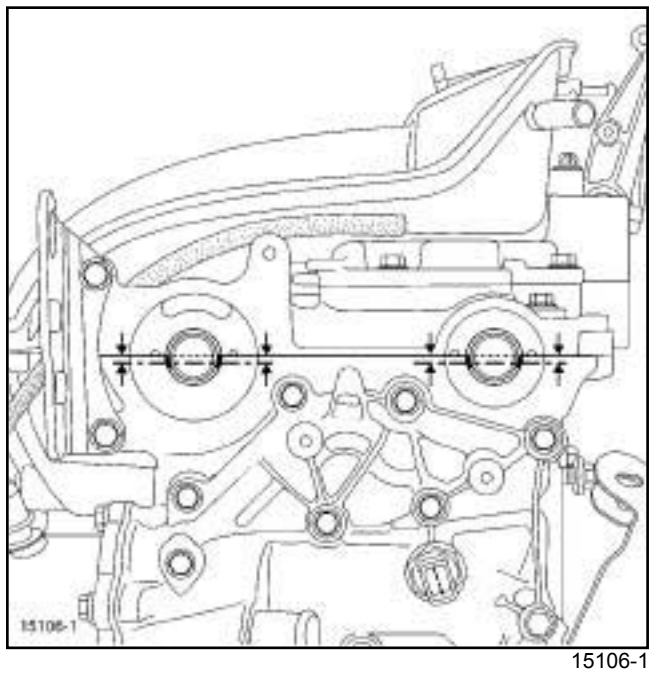
❏ Rotate the engine clockwise (timing end) so that the camshaft grooves are offset below the centre line and almost horizontal.

❏ Insert the TDC setting pin **(Mot. 1054)** so that it is between the balancing hole and the crankshaft setting groove.



15163-1

❏ Gently turn the engine in the same direction, inserting the TDC setting pin **(Mot. 1054)** as far as the setting point.

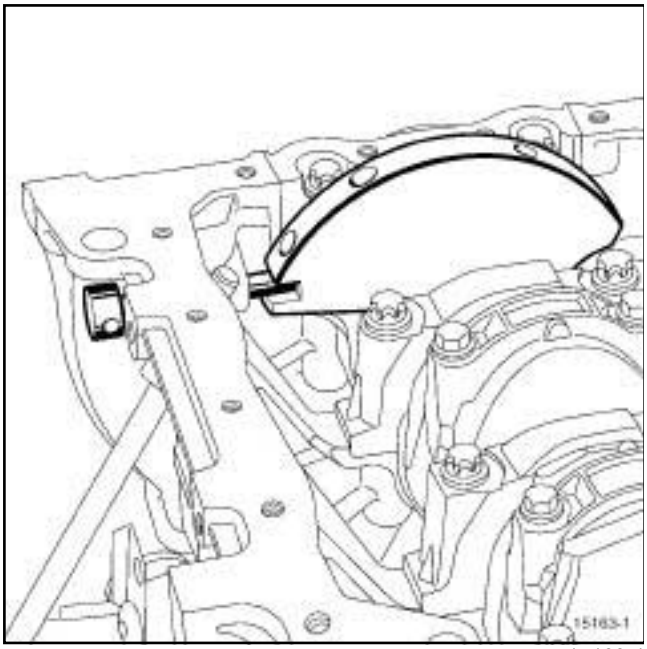


15106-1

❏ At the setting point the camshaft grooves must be horizontal and offset below the centre line.

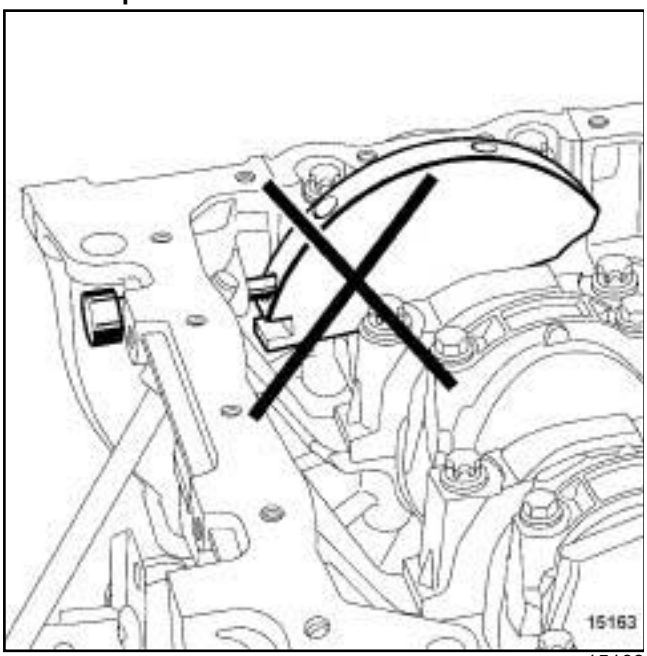
B84 or C84, and F4R, and 774

Correct position



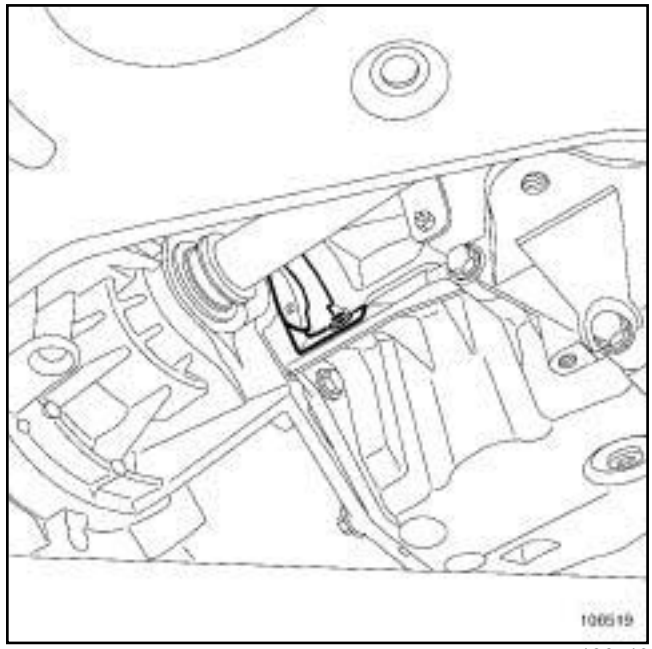
15163-1

Incorrect position



15163

❏ The pin is in the balancing hole.

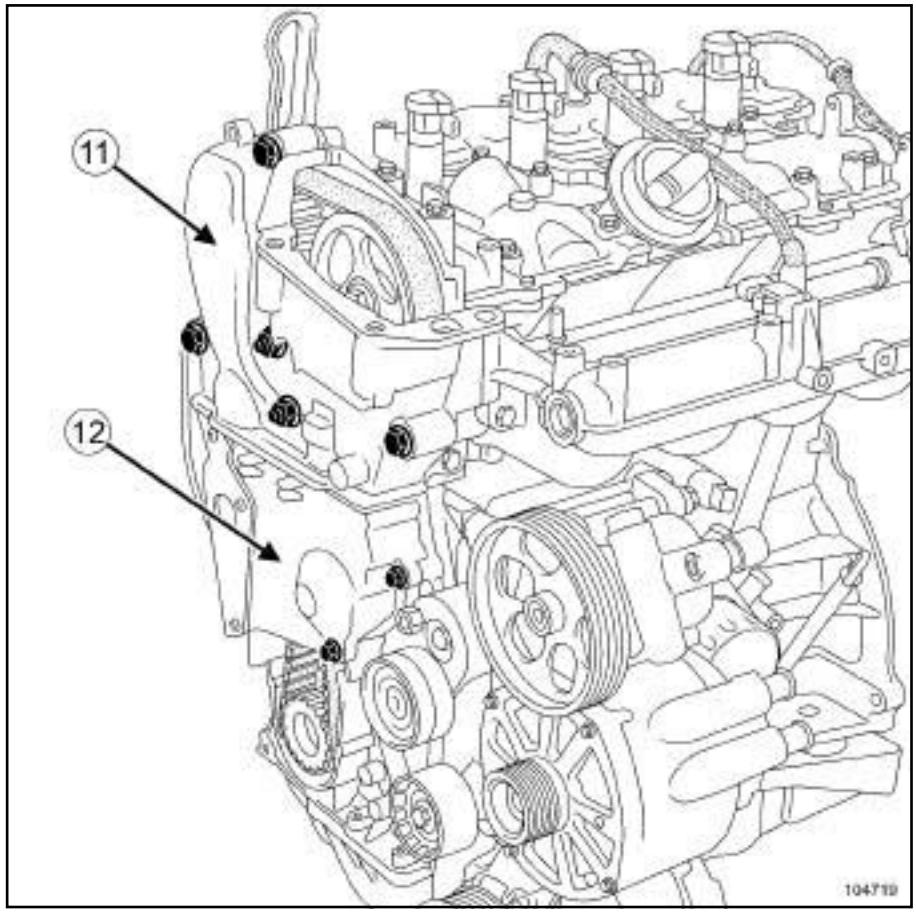


106519

❏ Remove:

- the flywheel protector,
- the crankshaft pulley, locking the flywheel with a screwdriver.

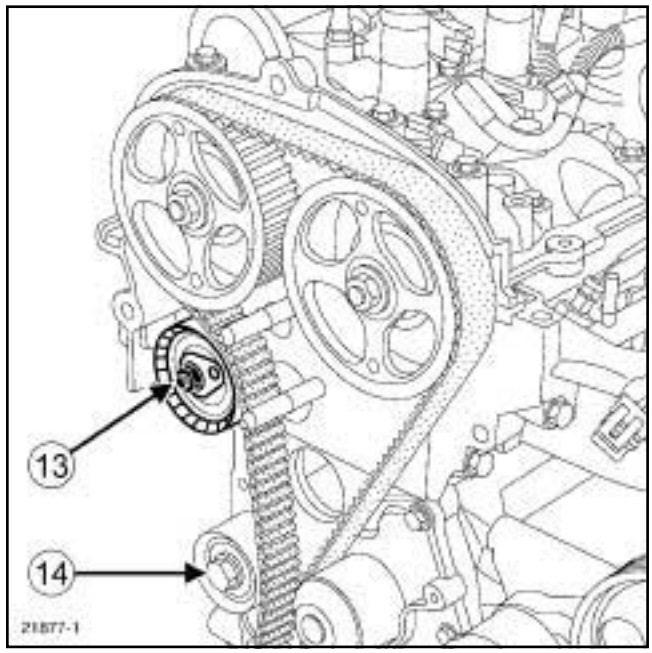
B84 or C84, and F4R, and 774



104719

❏ Remove:

- the upper timing cover (**11**) ,
- the timing intermediate housing (**12**) ,
- the lower timing cover.



21877-1

❏ Slacken the timing belt by undoing the tensioning roller nut (**13**) .

❏ Remove:

- the tensioning roller,

B84 or C84, and F4R, and 774

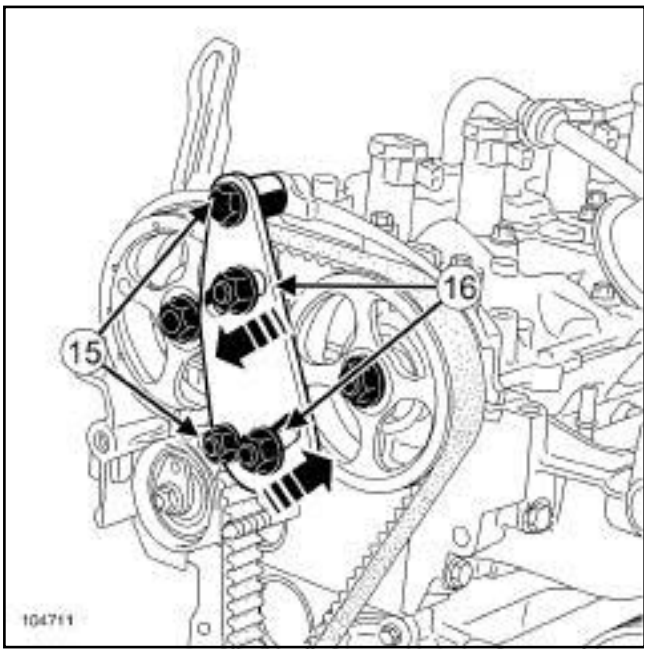
- the fixed roller (**14**) ,
- the timing belt,
- the crankshaft timing sprocket.

REFITTING

❑

WARNING
Never turn the engine in the opposite direction to its normal operating direction.

WARNING
It is compulsory to remove the old camshaft pulley nuts to give the belt the correct tension.



104711

❑ Fit the **(Mot. 1509)**.

❑ Tighten the bolt and the collar nut (**15**) .

❑ Offer up the sprocket nuts against the camshaft pulleys.

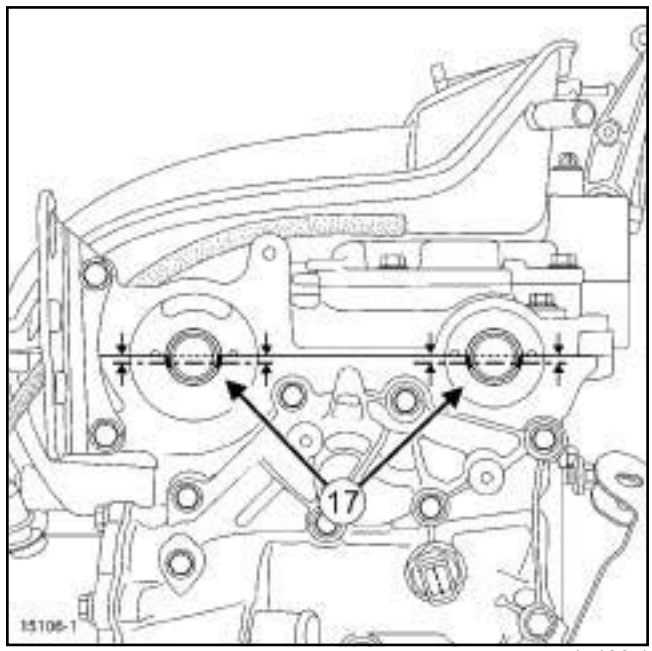
❑ Torque tighten the **toothed sprocket nuts (80 Nm)** at (**16**) .

❑ Remove:

- the camshaft pulley nuts,
- the camshaft pulleys.

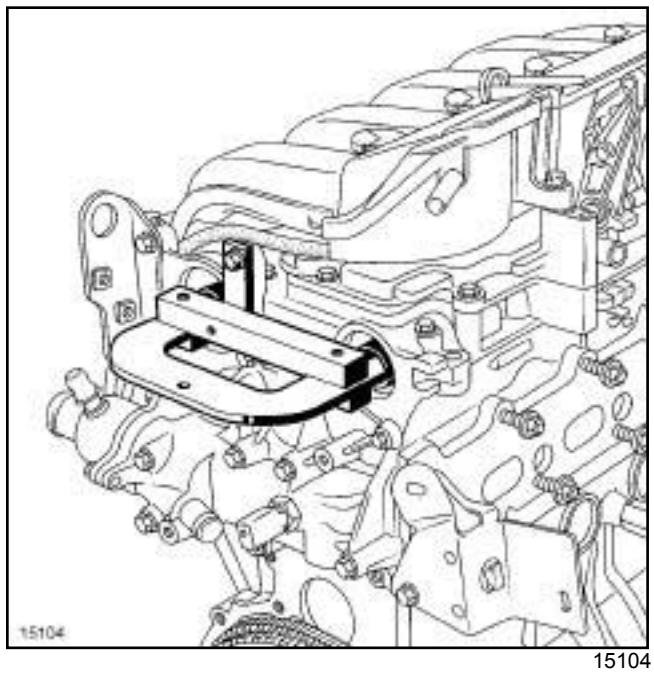
❑ Refit the degreased camshaft pulleys with their old nuts.

❑ Torque tighten the **camshaft pulley nuts (15 Nm)** using the **(Mot. 799-01)**.



15106-1

❑ Position the offset grooves (**17**) horizontally below the centre line as shown by rotating the camshafts using the **(Mot. 799-01)**.

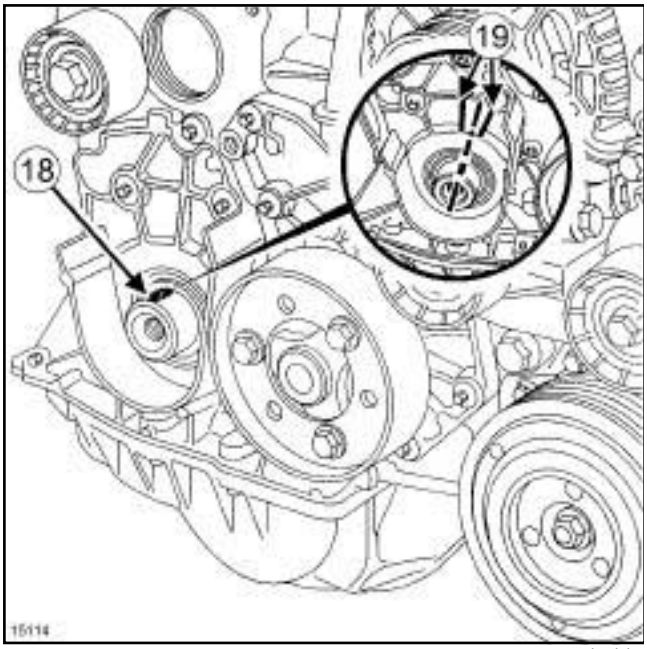


15104

❑ Fit the **(Mot. 1496)** on the ends of the camshafts.

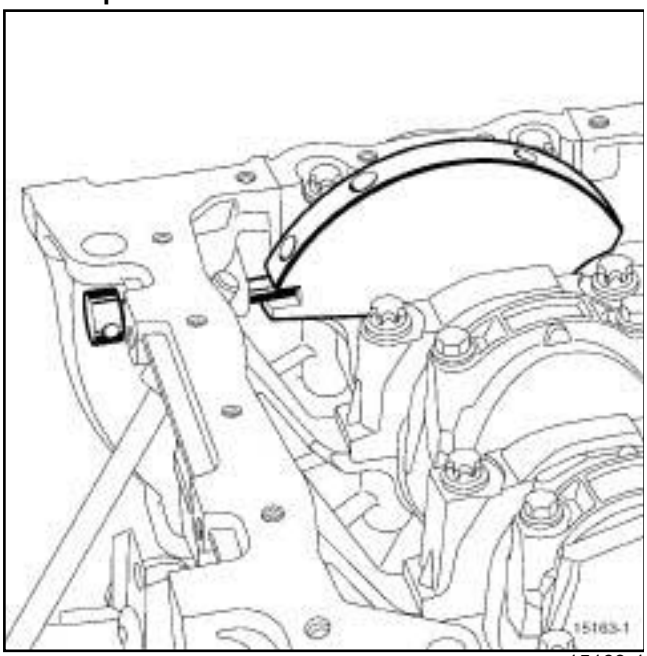
❑ Loosen the camshaft pulley nuts.

B84 or C84, and F4R, and 774



15114

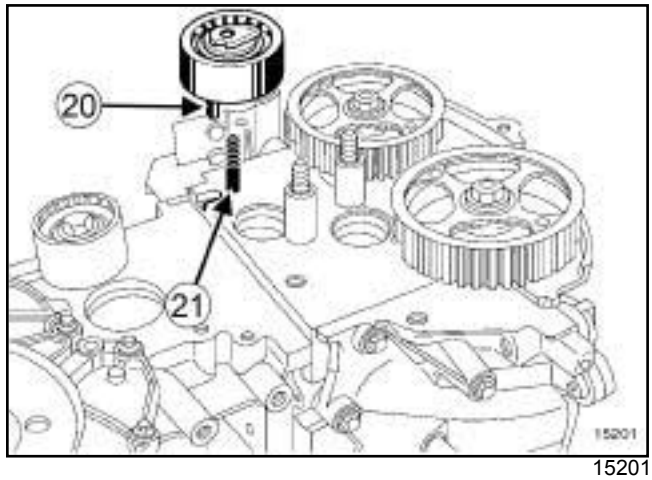
Correct position



15163-1

❏ Check that the crankshaft is timed properly.

WARNING
The crankshaft groove (**18**) must be between the two ribs (**19**) .

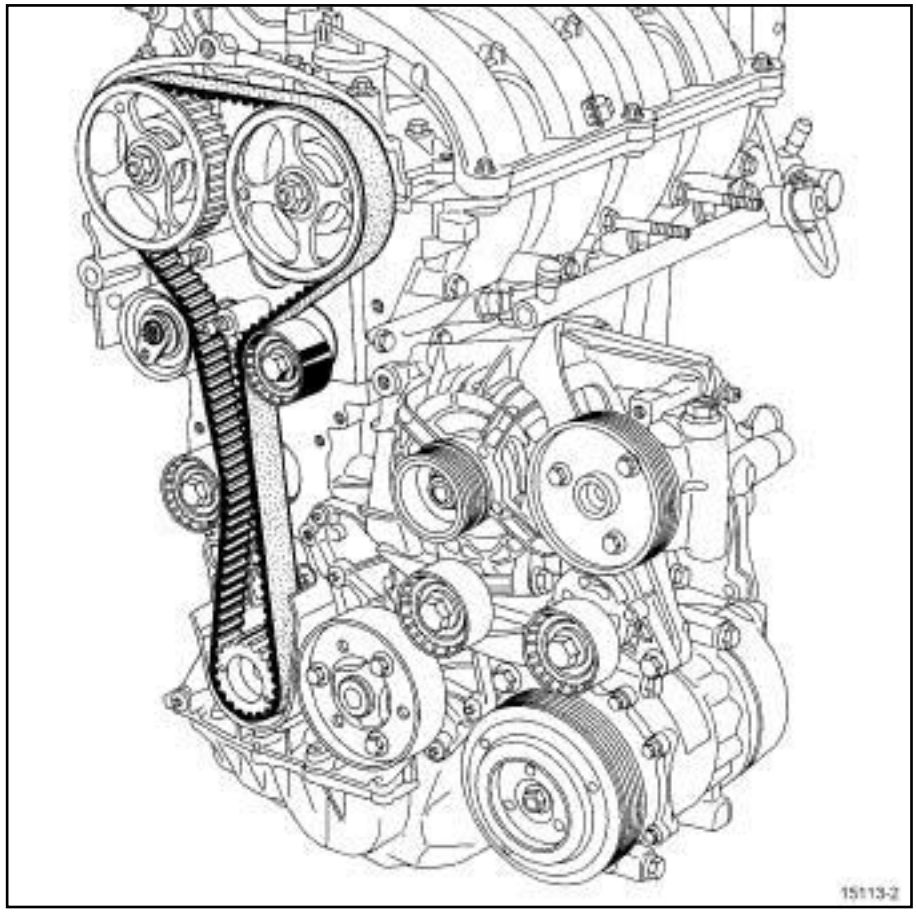


15201

❏ Refit:

- a new tensioning roller, positioning the tensioning roller lug (**20**) correctly in the groove (**21**) ,
- a crankshaft sprocket with integrated key.

B84 or C84, and F4R, and 774



15113-2

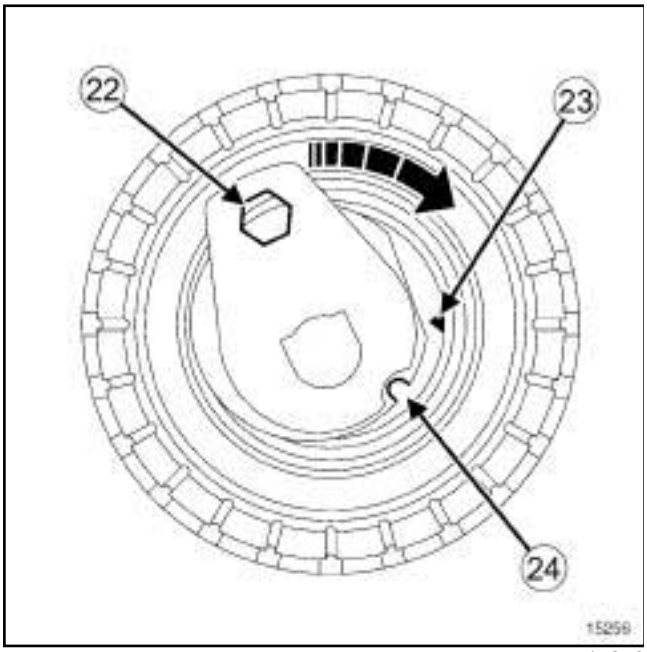
❏ Refit:

- the new belt,
- the new fixed roller.

❏ Torque tighten the **fixed roller bolts (50 Nm)**.

B84 or C84, and F4R, and 774

I - BELT TENSION

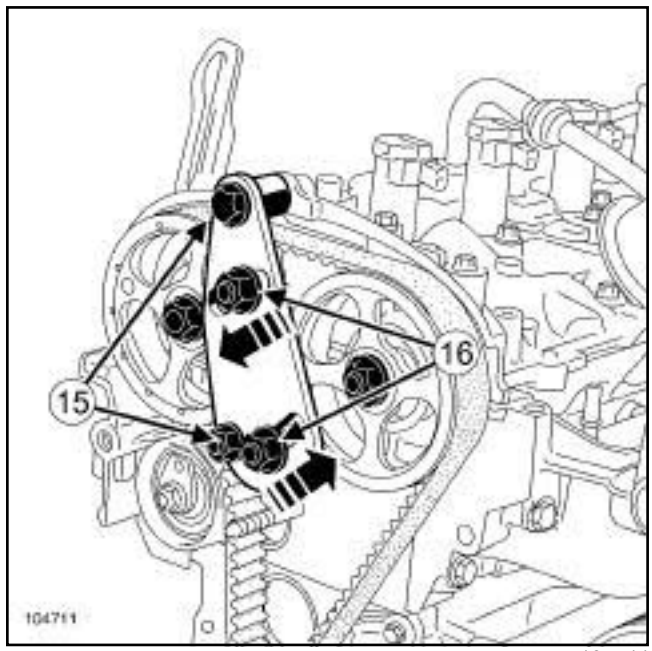


15256

❑

WARNING
Do not rotate the tensioning roller anti-clockwise.

❑ Align the marks (**24**) and (**23**) of the tensioning roller using a **6 mm** Allen key at (**22**) .



104711

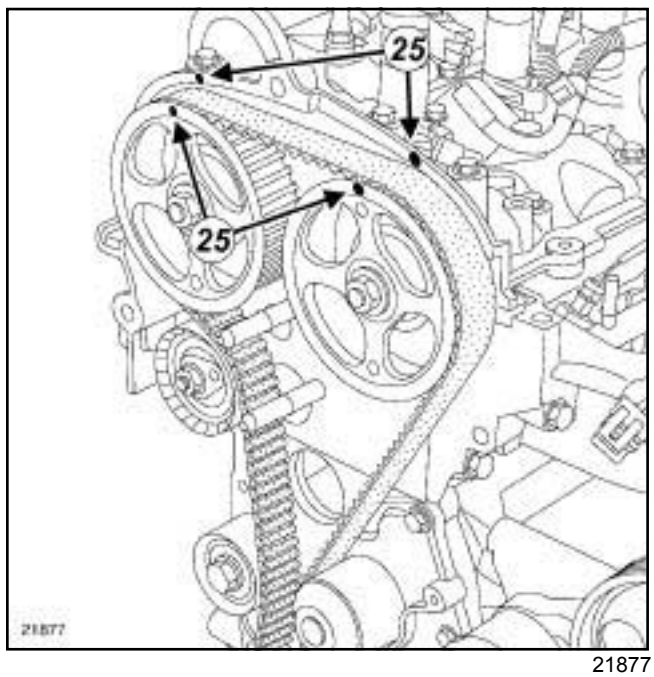
❑ Fit the camshaft pulley locking tool **(Mot. 1509)**.

❑ Tighten the bolt and the collar nut (**15**) .

❑ Bring the cog nuts against the camshaft pulley using the **(Mot. 1509)**.

❑ Torque tighten:

- the **toothed sprocket nuts (80 Nm)** at (**16**) ,
- the **old inlet camshaft pulley nut (30 Nm)**,
- the **old exhaust camshaft pulley nut (30 Nm)**.



21877

❑ Use a pencil to make marks (**25**) between the camshaft pulleys and the rocker cover.

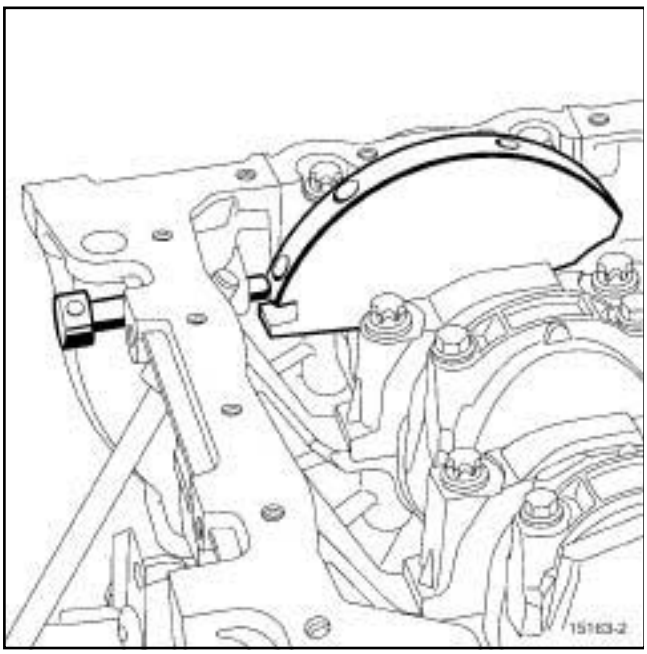
B84 or C84, and F4R, and 774

❏ Remove the following tools:

- TDC setting pin **(Mot. 1054)**,
- camshaft setting tool **(Mot. 1496)**,
- camshaft pulley setting tool **(Mot. 1509)**.

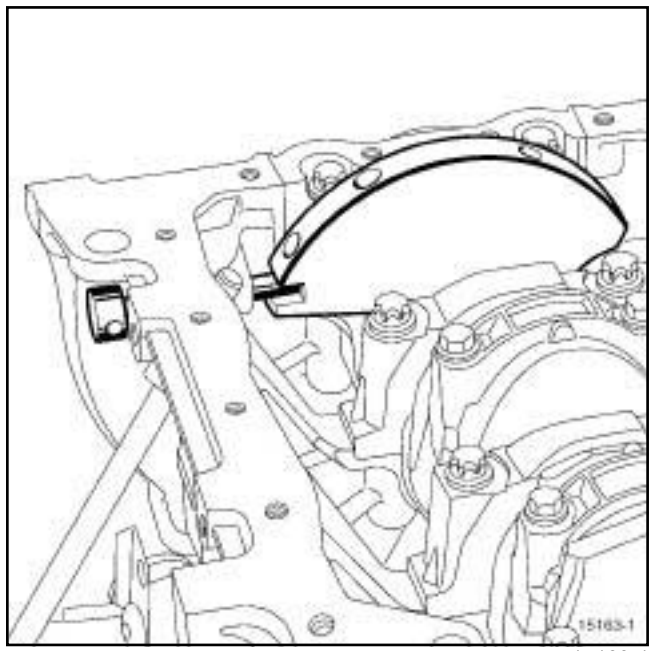
❏ Rotate the crankshaft clockwise through two revolutions (timing end).

II - CHECKING THE TIMING AND TENSION



15163-2

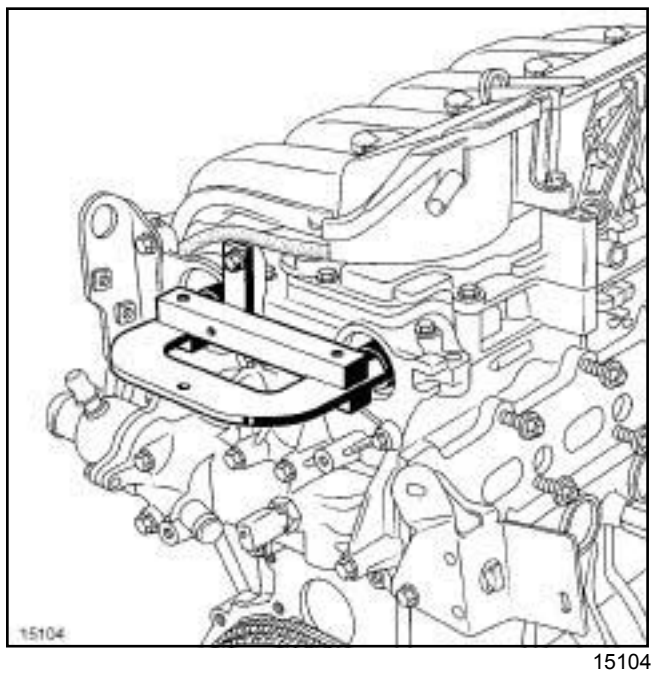
❏ Before completing two turns (half a tooth before alignment of the marks made previously by the operator), insert the TDC setting pin **(Mot. 1054)** (so that it is between the balancing hole and the timing hole).



15163-1

❏ Move the timing to its setting point.

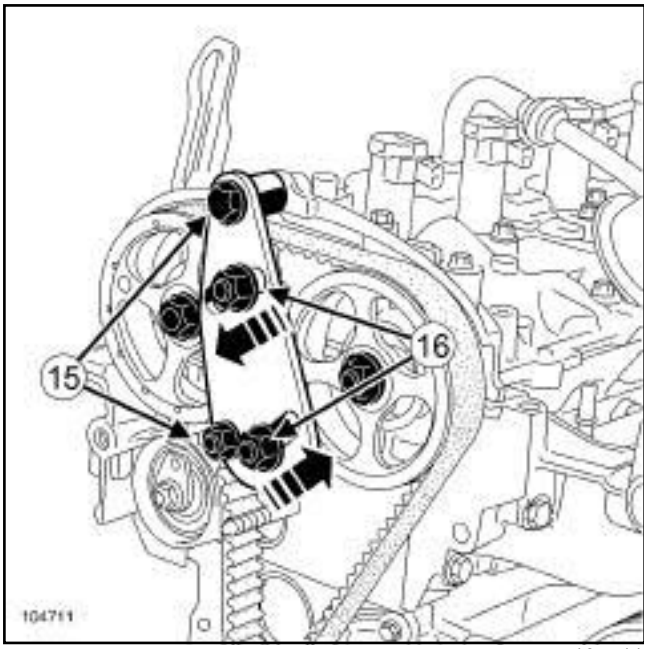
❏ Check that the tensioning roller marks are correctly aligned, otherwise repeat the tensioning procedure as follows:



15104

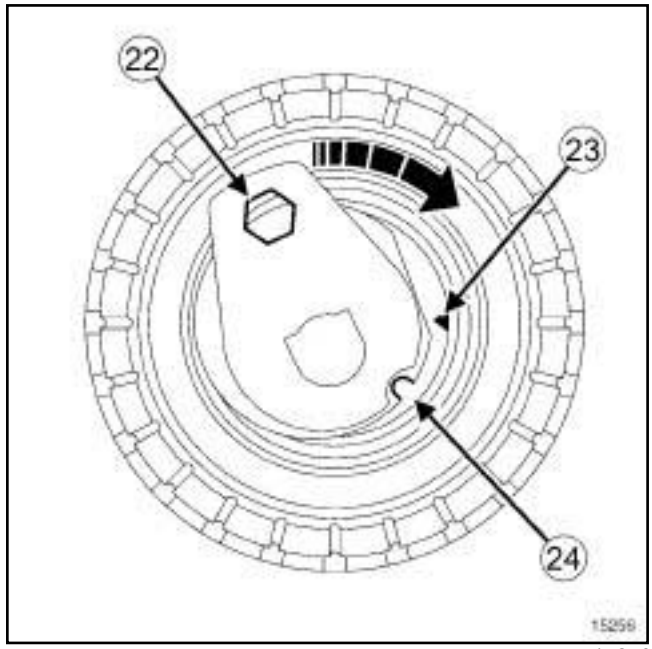
❏ Position the camshaft setting tool **(Mot. 1496)**.

B84 or C84, and F4R, and 774



104711

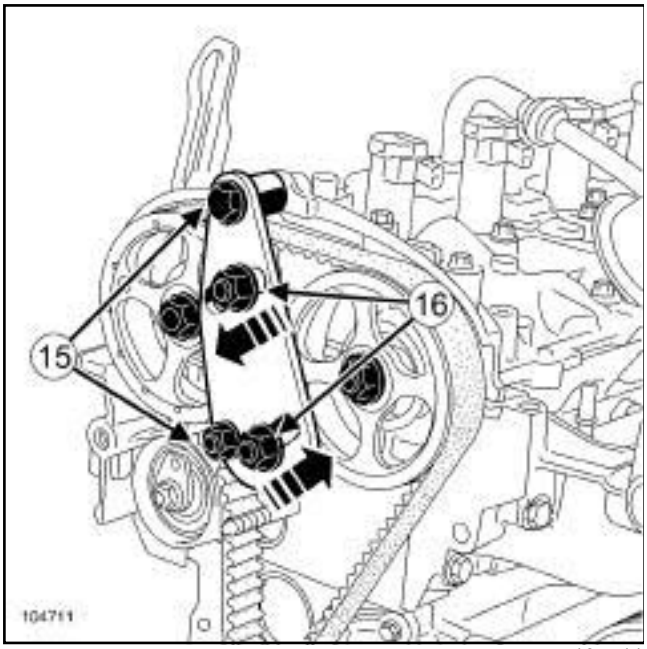
- ❏ Fit the camshaft pulley setting tool **(Mot. 1509)**.
- ❏ Tighten the bolt and the collar nut (**15**) .
- ❏ Bring the cog nuts against the camshaft pulley using the **(Mot. 1509)**.
- ❏ Torque tighten the **toothed sprocket nuts (80 Nm)** at (**16**) .
- ❏ Undo:
  - the old inlet camshaft pulley nut,
  - the old exhaust camshaft pulley nut.
- ❏ Remove the camshaft pulley locking tool **(Mot. 1509)**.



15256

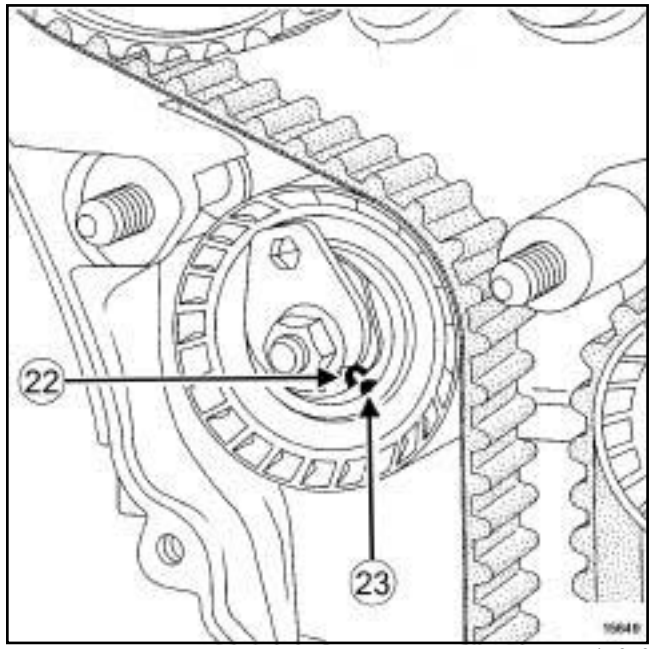
- ❏ Align the marks (**24**) and (**23**) of the tensioning roller using a **6 mm** Allen key at (**22**) .
- ❏ Fully torque tighten the **tensioning roller nut (28 Nm)**.

B84 or C84, and F4R, and 774



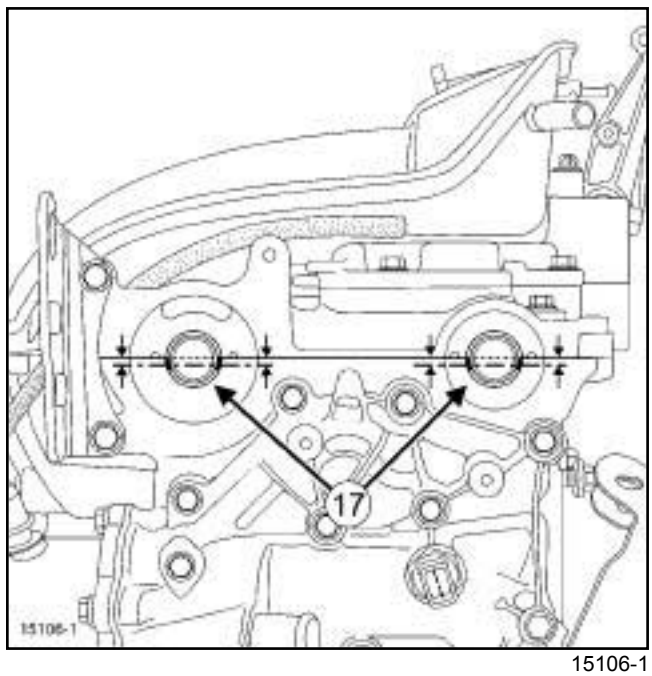
104711

- ❏ Fit the camshaft pulley locking tool **(Mot. 1509)**.
- ❏ Tighten the bolt and the collar nut (**15**) .
- ❏ Offer up the sprocket nuts against the camshaft pulleys.
- ❏ Torque tighten the **toothed sprocket nuts of the tool (Mot. 1509) (80 Nm)** at (**16**) .
- ❏ Remove:
  - the old inlet camshaft pulley nut,
  - the old exhaust camshaft pulley nut.
- ❏ Refit new nuts on the camshaft pulleys.
- ❏ Torque tighten:
  - the **inlet camshaft pulley nut (30 Nm)**,
  - the **exhaust camshaft pulley nut (30 Nm)**.
- ❏ Remove the camshaft setting tool **(Mot. 1496)**.
- ❏ Angle tighten:
  - the **inlet camshaft pulley nut (86° ± 6)**,
  - the **exhaust camshaft pulley nut (86° ± 6°)**.
- ❏ Remove the following tools:
  - TDC setting pin **(Mot. 1054)**,
  - camshaft pulley setting tool **(Mot. 1509)**.
- ❏ Rotate the crankshaft clockwise through two revolutions (timing end).



15649

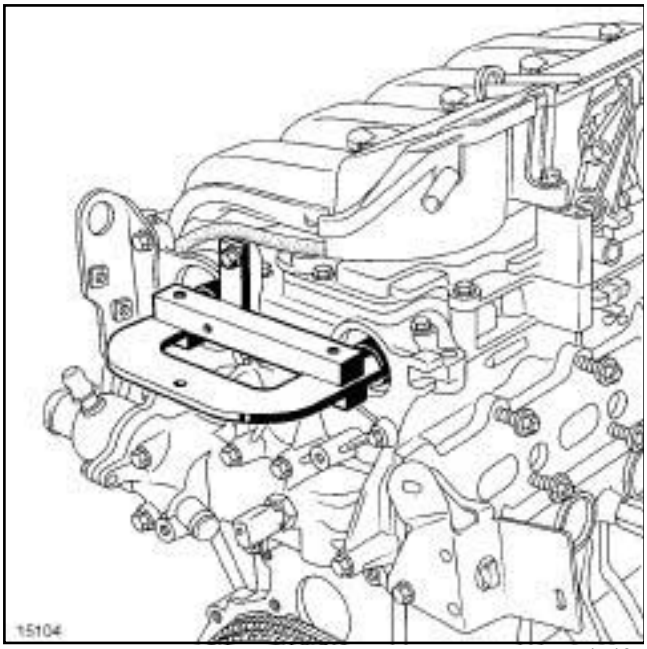
- ❏ Before completing two turns (half a tooth before alignment of the marks made previously by the operator), insert the crankshaft TDC setting pin **(Mot. 1054)** so that it is between the balancing hole and the timing hole.
- ❏ Check that the tensioning roller marks (**22**) and (**23**) are in the correct position before checking the timing setting.



15106-1

- ❏ Check that the offset grooves (**17**) are aligned horizontally below the centre line.

B84 or C84, and F4R, and 774



15104

❑ Fit the camshaft setting tool **(Mot. 1496)** (without forcing it).

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

❑ Refit:

- the lower timing cover,
- the intermediate cover,
- the upper timing cover.

WARNING
The crankshaft accessories pulley and bolt must be replaced.

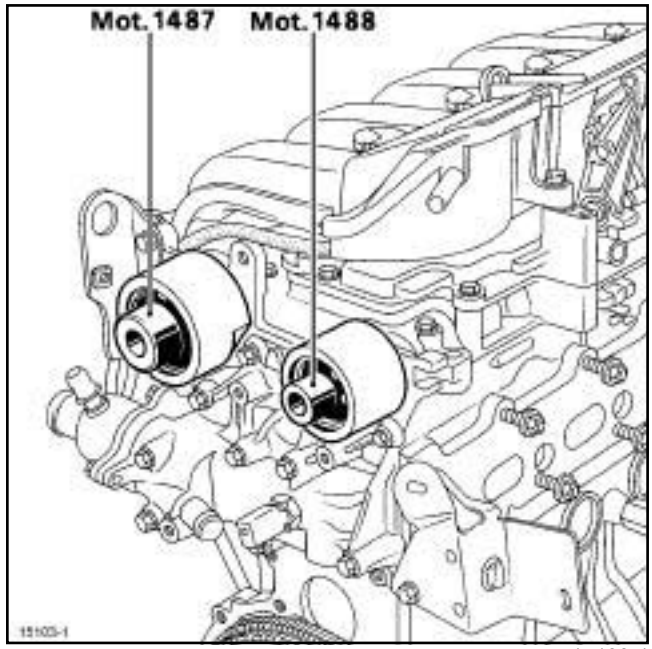
❑ Lock the flywheel using a screwdriver.

❑ Torque and angle tighten the **crankshaft accessories pulley bolt (40 Nm + 110° ± 10°)**.

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

❑ Refit:

- the crankshaft accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-4**) ,
- the TDC pin plug, placing a drop of **MASTIXO** on the thread hole.



15103-1

❑ Refit:

- new sealing plugs:
  - to the inlet camshaft **(Mot. 1487)**,
  - to the exhaust camshaft **(Mot. 1488)**,
- the suspended engine mounting, observing the marks (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-20**) ,
- the front right-hand driveshaft (see **Front right-hand wheel driveshaft: Removal - Refitting**) (MR 364, 29A, Driveshafts).

❑ Proceed in the reverse order to removal.

❑ Torque tighten:

- the **suspended mounting linkage mounting bolts (105 Nm)**,
- the **bolts securing the suspended engine mounting cover on the engine (62 Nm)**,
- the **wheel bolts (110 Nm)**,

❑ Connect the battery (see **Battery : Removal - Refitting**) (MR 364, 80A, Battery).

❑ Torque tighten the **battery cover bolts (4 Nm)**.

K4M, and 760 or 761 or 812 or 813

Essential special tooling	
Mot. 1489	TDC locating pin.
Mot. 1368	Tool for tightening tensioner bolt. 8 mm Torx wrench, 12.7 mm square
Mot. 799-01	Timing gear wheel immobiliser.
Mot. 1496	Tool for setting camshaft.
Mot. 1750	Addition to retaining camshaft setting tool Mot. 1496 .
Mot. 1490-01	Locking and adjusting camshaft pulleys.
Mot. 1487	Tool for removing the camshaft covers (57 mm diameter).
Mot. 1488	Tool for removing the camshaft covers (43 mm diameter).

Tightening torques ▽	
timing tension wheel nut	**27 N.m**
timing f xed roller bolt	**50 N.m**
lower timing cover bolts	**12 N.m**
new crankshaft accessories pulley bolt	**40 N.m + 145° ± 15°**
exhaust camshaft sprocket nut	**30 N.m + 84° ± 4**
camshaft dephaser bolt	**100 N.m**
TDC pin plug	**20 N.m**
upper timing cover bolts	**46 N.m**
upper timing cover nuts	**46 N.m**
fl wheel end lifting ey e bolts	**10 N.m**

IMPORTANT
Wear protective gloves during the operation.

REMOVAL

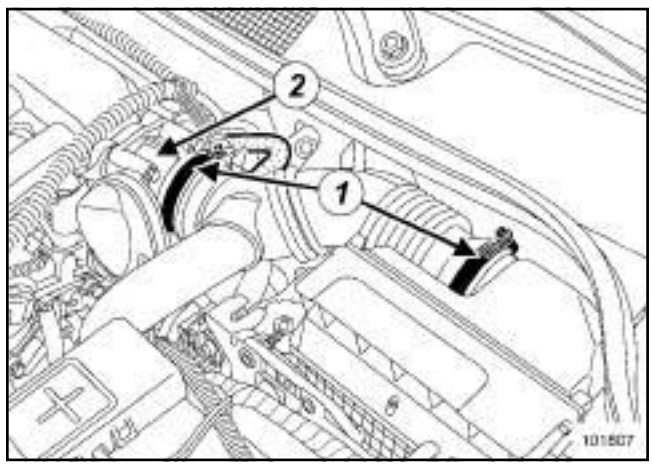
I - REMOVAL PREPARATION OPERATION

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

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

❑ Remove:

- the 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 front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front section of 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 accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-4**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-20**) .

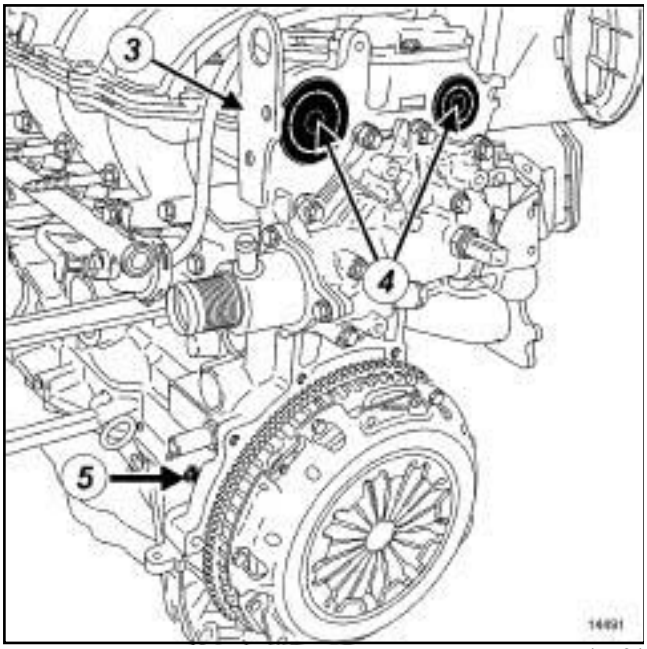


101807

❑ Remove:

- the air pipe at the outlet of the air filter unit (**1**) ,
- the throttle valve (**2**) ,
- the connector on the lifting bracket.

K4M, and 760 or 761 or 812 or 813



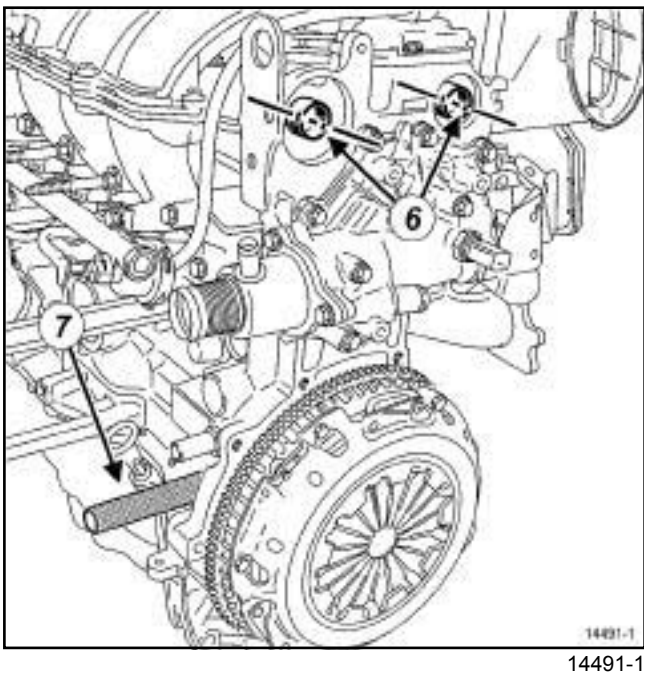
14491

❏ Remove the engine lifting eye (**3**) on the flywheel side.

❏ Pierce the middle of the plug (**4**) at the end of each camshaft with a screwdriver.

❏ Remove:

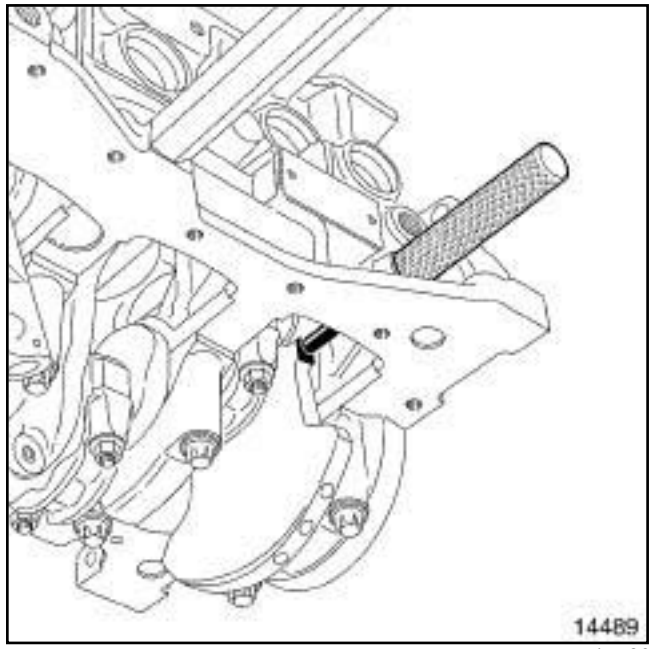
- the camshaft plugs using a screwdriver,
- the TDC pin plug (**5**) .



14491-1

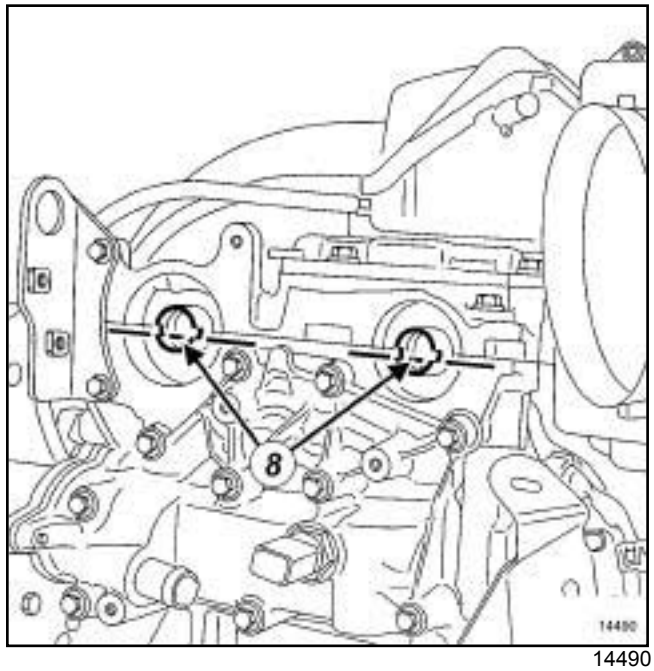
❏ Position the camshaft grooves (**6**) almost horizontally and offset downwards, turning the crankshaft in its normal operating direction (clockwise, timing end).

❏ Screw tool **(Mot. 1489)** (**7**) into the cylinder block.



14489

❏ Turn the crankshaft in its operating direction (clockwise at timing end), until the crankshaft presses against the tool **(Mot. 1489)**.



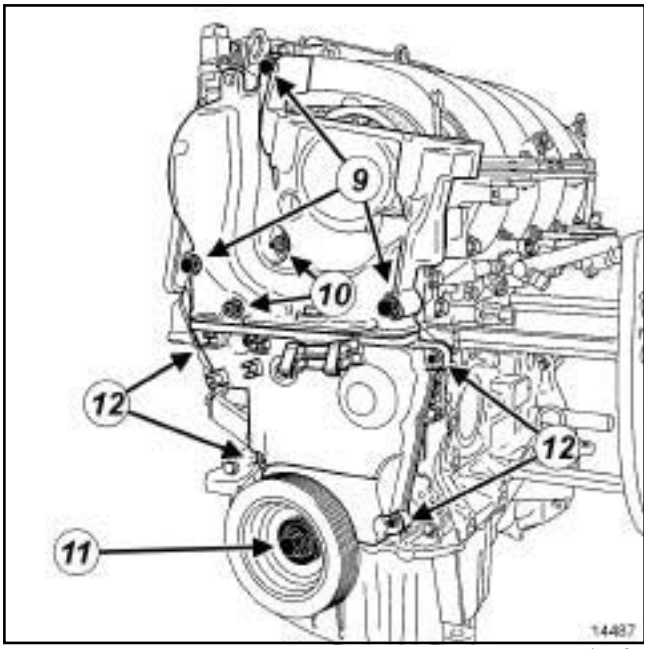
14490

❏ Check that the camshaft grooves are horizontal and offset downwards.

❏ Remove the tool **(Mot. 1489)** from the cylinder block.

❏ Lock the flywheel using a screwdriver.

K4M, and 760 or 761 or 812 or 813

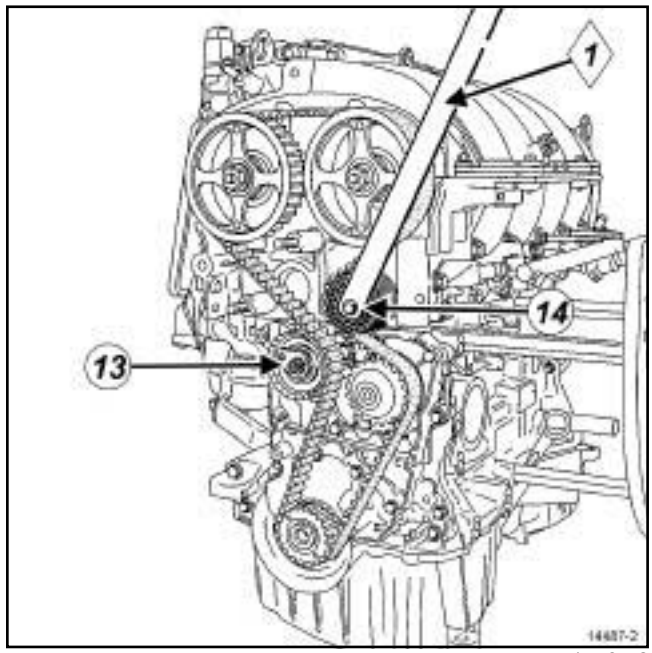


14487

❑ Remove:

- the bolts (**9**) from the upper timing cover,
- the upper timing cover nuts (**10**) ,
- the upper timing cover,
- the crankshaft accessories pulley bolt (**11**) ,
- the crankshaft accessories pulley,
- the bolts (**12**) on the lower timing cover,
- the lower timing cover.

II - OPERATION FOR REMOVAL OF PART CONCERNED



14487-2

❑ Undo the timing tension wheel nut (**13**) .

Note:

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

❑ Remove:

- the timing fixed roller bolt (**14**) using the tool **(Mot. 1368)** (**1**) ,
- the timing pulley,
- the timing belt,
- the timing tensioning roller,
- the crankshaft timing sprocket.

K4M, and 760 or 761 or 812 or 813

REFITTING - PROCEDURE 1

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: Timing belt (10,02, 04,02)**,

parts always to be replaced: Timing belt tensioning roller (10,02,04,04),

parts always to be replaced: Timing fixed roller (10,02,04,05),

parts always to be replaced: Crankshaft accessories pulley bolts (10,03,03,10),

parts always to be replaced: Inlet camshaft cap (10,02,02,11),

parts always to be replaced: Exhaust camshaft cap (10,02,02,12),

parts always to be replaced: Throttle valve seal (11,04,06,25).

II - REFITTING OPERATION FOR PART CONCERNED

❑ The first procedure applies to replacing any timing face component which has a crankshaft timing sprocket without a collet and which does not require the exhaust camshaft sprocket or camshaft dephaser to be loosened.

1 - Adjusting the timing

❑

WARNING

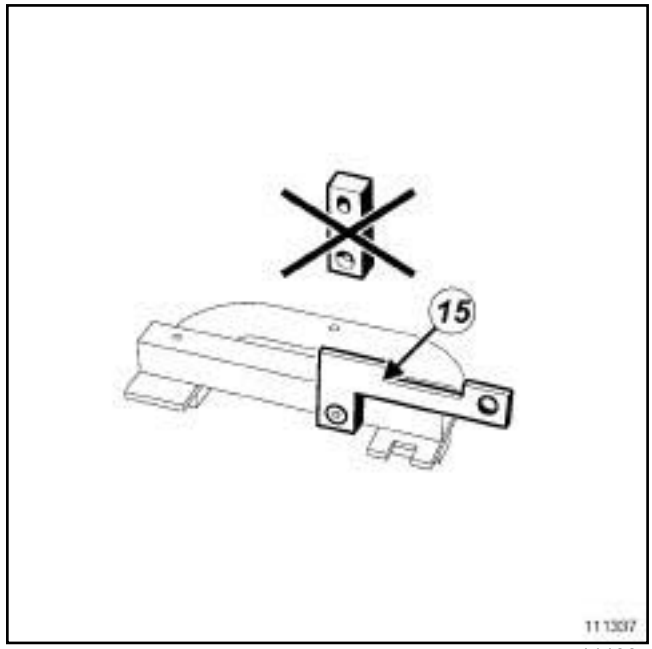
Be sure to degrease:

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

This is to avoid timing slippage.

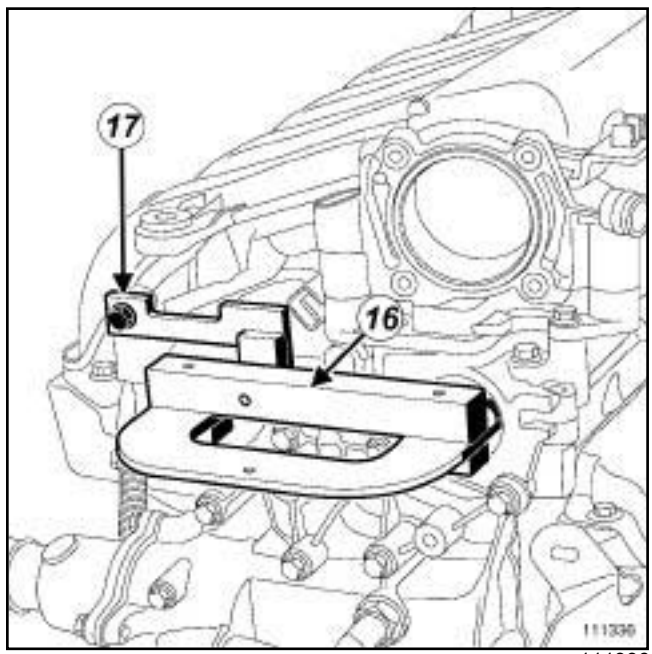
This slippage leads to engine damage.

❑ Set the camshaft grooves horizontally and below the centre line by turning the camshafts with the **(Mot. 799-01)** if necessary.



111337

❑ Fit the **(Mot. 1496)** with the **(Mot. 1750)** (**15**) .

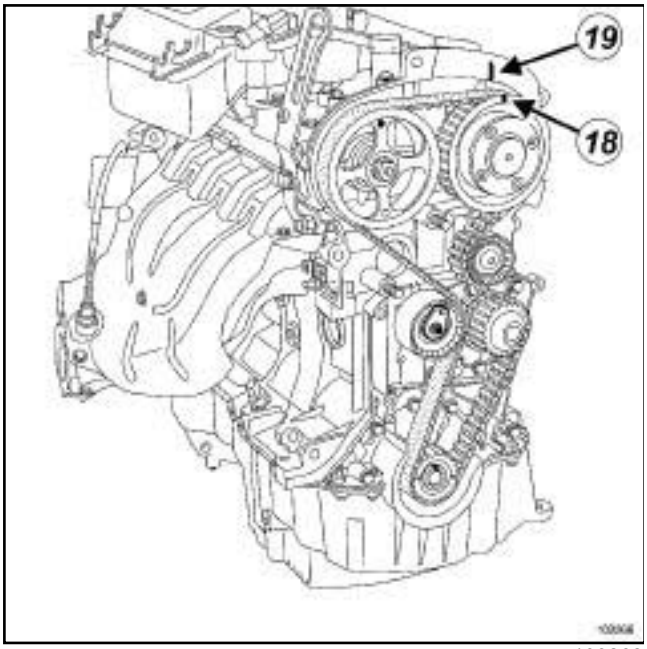


111336

❑ Fit:

- the **(Mot. 1496)** (**16**) fitted with the **(Mot. 1750)** on the end of the camshaft,
- a lifting eye bolt (**17**) to secure the tool **(Mot. 1496)** equipped with the tool **(Mot. 1750)**.

K4M, and 760 or 761 or 812 or 813

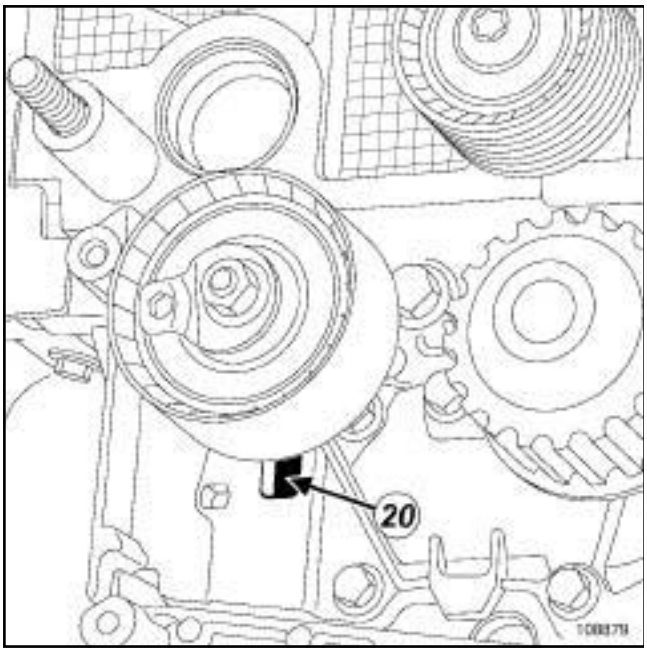


103268

❑ Check that the mark (**18**) on the camshaft dephaser is vertical and pointing upwards.

❑ Make a mark (**19**) with a pencil between the camshaft dephaser gear and the rocker cover.

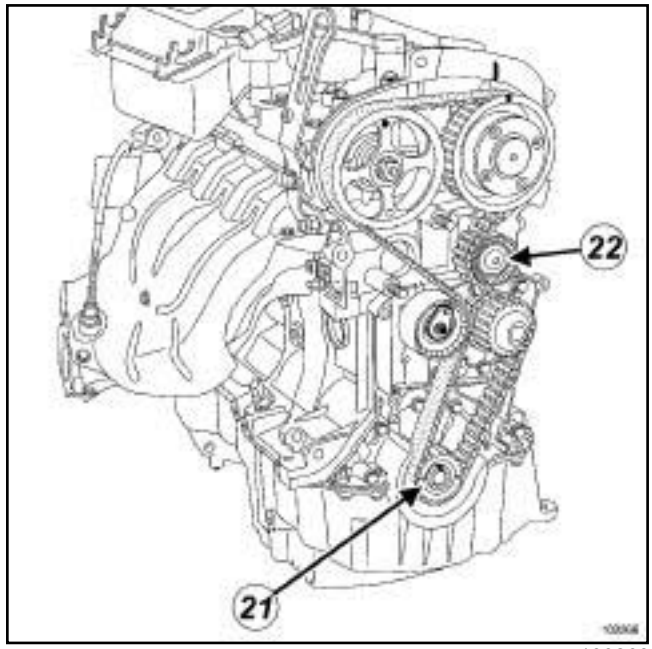
2 - Refitting



108879

❑ Refit a new timing tensioning roller by positioning the lug of the timing tensioning roller in the groove (**20**) .

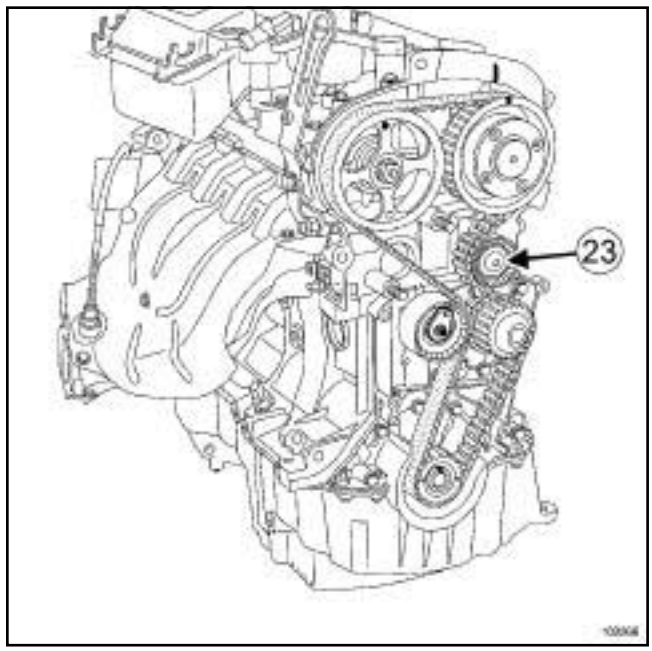
❑ Fit the timing tensioning roller nut without tightening it.



103268

❑ Refit:

- the crankshaft timing sprocket (**21**) ,
- a new timing belt,
- a new timing fixed roller (**22**) .

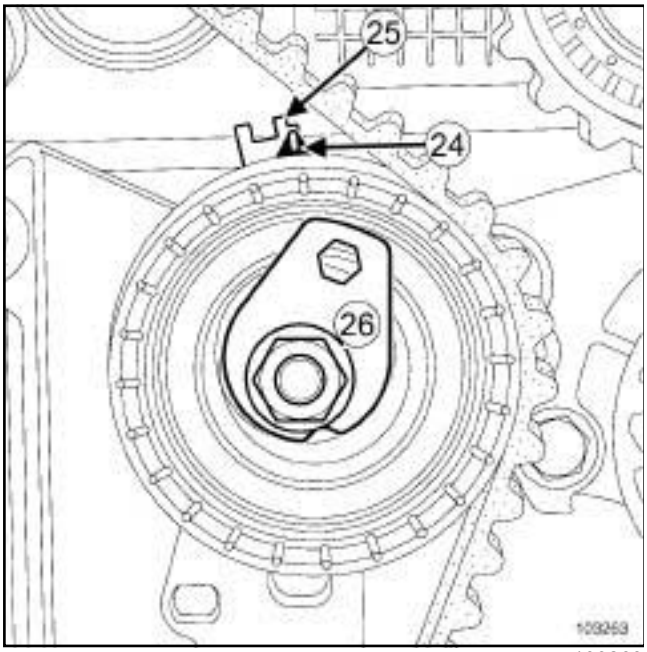


103268

❑ Torque tighten the **timing fixed roller bolt (50 N.m)** (**23**) .

K4M, and 760 or 761 or 812 or 813

3 - Timing belt tension



103263

❏ Position the adjustable index (**24**) opposite the mark (**25**) , by turning the eccentric (**26**) clockwise using a **6 mm** Allen key.

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

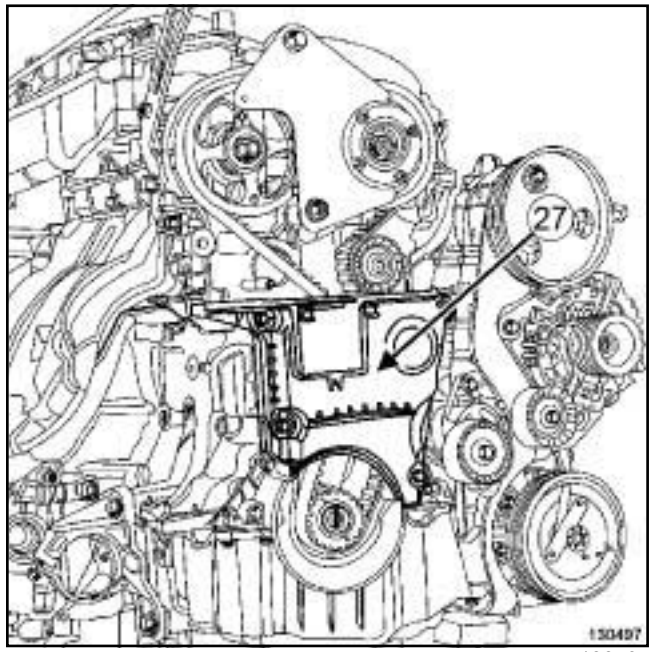
❏ Refit the tool **(Mot. 1489)** on the cylinder block.

Note:

There are two types of lower timing cover:

- without a timing fla ,
- with a timing fla .

a - Lower timing cover with a timing flap



130497

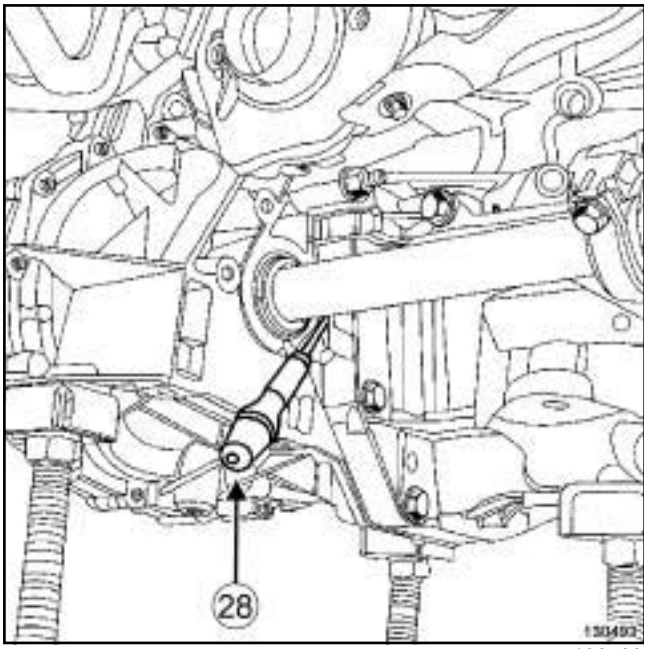
❏ Refit the lower timing cover (**27**) .

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

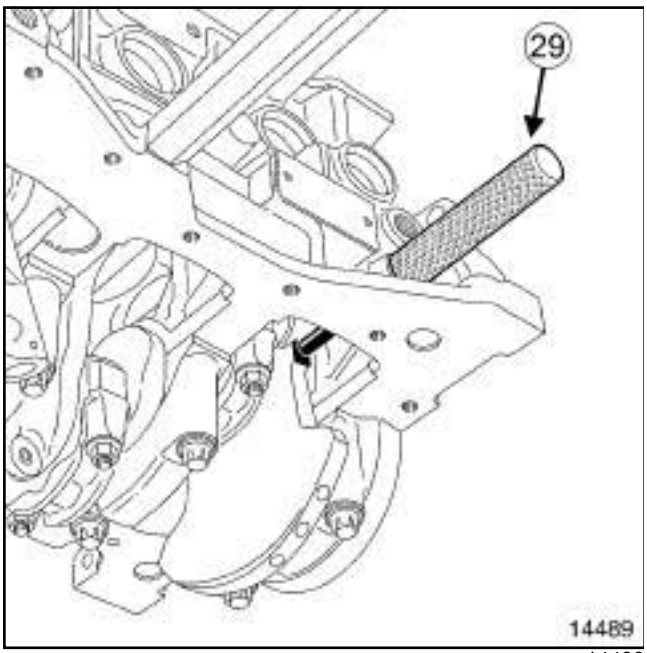
b - continuation of the refitting procedure regardless of the type of lower timing cover

❏ Refit a new crankshaft accessories pulley.

K4M, and 760 or 761 or 812 or 813



130493

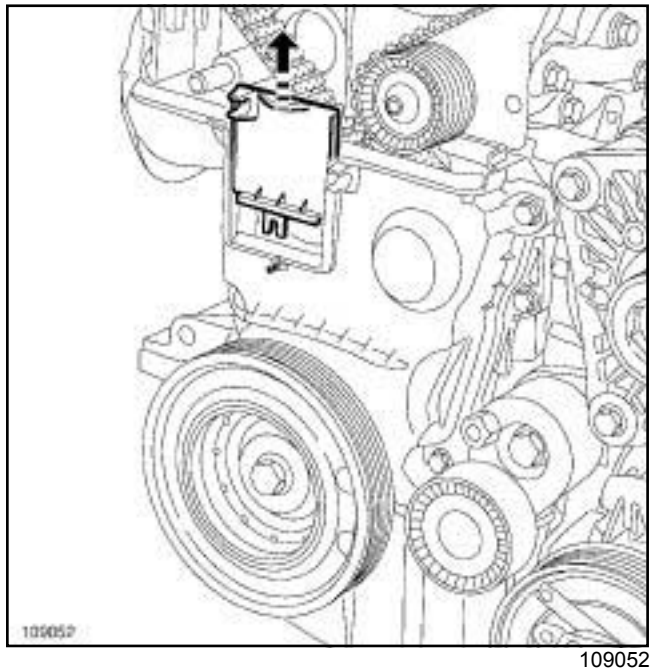


14489

❏ Use a screwdriver (**28**) to check that the flywheel does not turn (clockwise at the timing end), otherwise bring the crankshaft back into contact with the tool **(Mot. 1489)** (**29**) using the screwdriver; the crankshaft groove should be at the top.

❏ Torque and angle tighten a **new crankshaft accessories pulley bolt (40 N.m + 145° ± 15°)** (crankshaft in contact with the tool **(Mot. 1489)**).

c - Lower timing cover with a timing flap



109052

❏ Remove the timing flap from the lower timing cover.

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

❏ Remove:

- the lifting eye bolt from the **(Mot. 1496)**,
- the timing tool **(Mot. 1496)** fitted with the **(Mot. 1750)**,
- the tool **(Mot. 1489)** from the cylinder block.

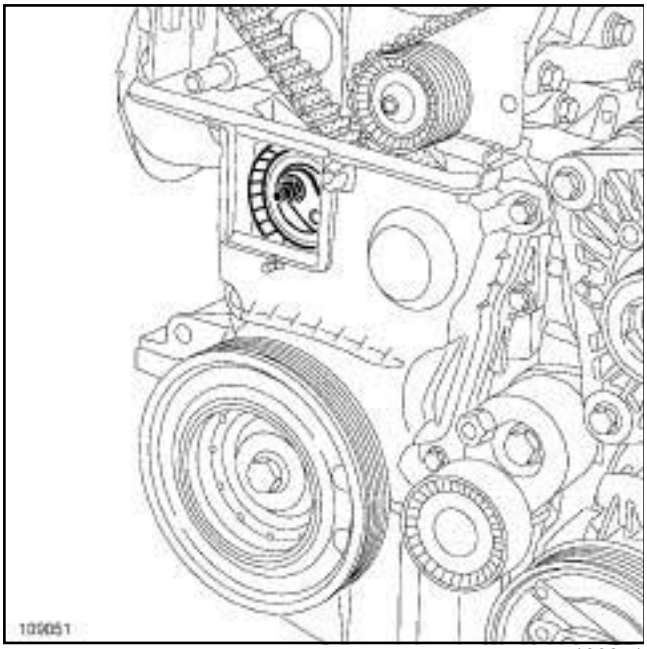
4 - Checking the tension

❏ Rotate the crankshaft twice clockwise at the timing end and before aligning the marks made previously by the operator (on the camshaft dephaser), screw the tool **(Mot. 1489)** into the cylinder block.

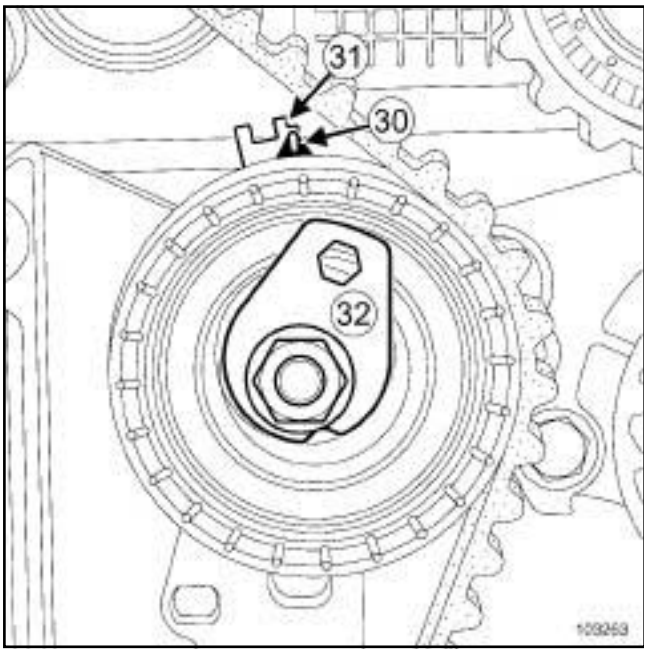
❏ Move the crankshaft slowly and smoothly until it comes into contact with the tool **(Mot. 1489)**.

❏ Remove the tool **(Mot. 1489)** from the cylinder block.

K4M, and 760 or 761 or 812 or 813



109051



103263

❏ Check through the lower timing cover window that the adjustable index (**30**) is opposite the notch (**31**) , if this is not the case:

- loosen the timing tensioning roller nut by up to one turn while holding the eccentric with a **6 mm** Allen key,
- gradually move the adjustable index marker (**30**) opposite the mark (**31**) turning the eccentric cam (**32**) clockwise.

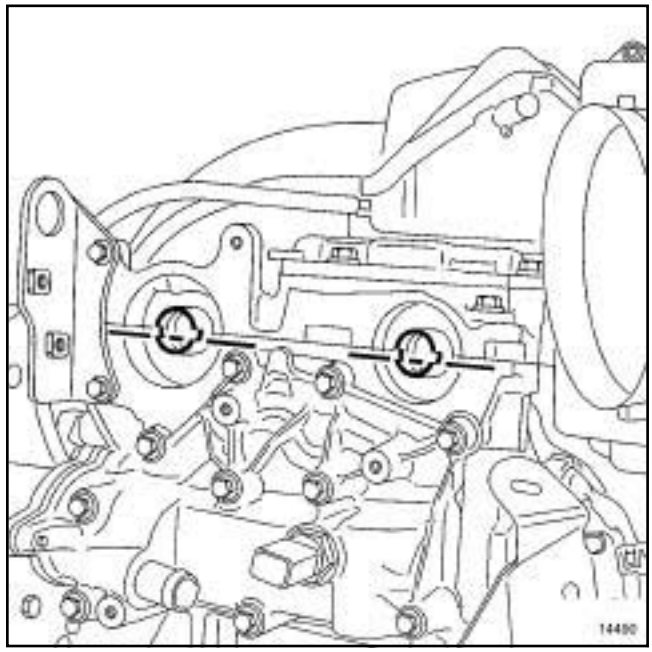
❏ Torque tighten the **timing tension wheel nut (27 N.m)**.

5 - Checking the timing

❏ Ensure that the index and the notch on the timing tensioning roller are in the correct position before checking the timing.

❏ Screw tool **(Mot. 1489)** into the cylinder block.

❏ Move the crankshaft slowly and smoothly until it comes into contact with the tool **(Mot. 1489)**.



14490

❏ Position (without forcing) the camshaft setting tool **(Mot. 1496)** fitted with the **(Mot. 1750)** (the camshaft end grooves must be horizontal and offset towards the bottom).

Note:

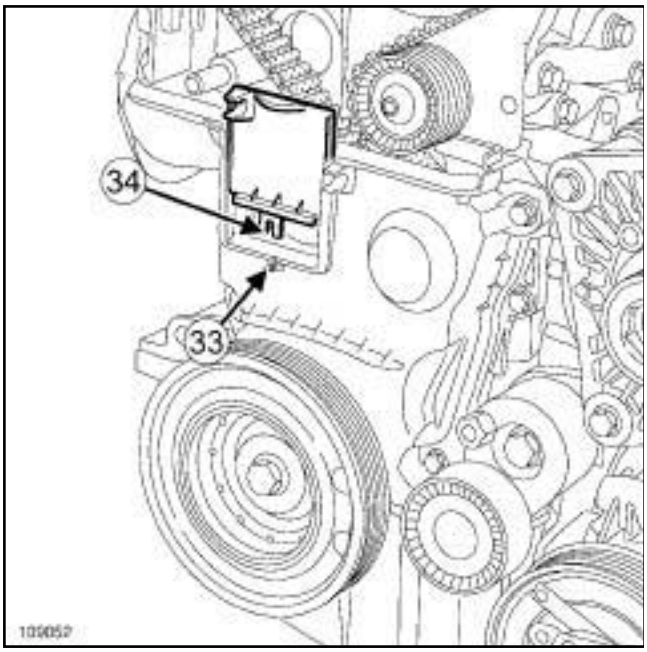
The timing adjustment and tensioning operation must be repeated if the camshaft setting tool does not engage.

❏ Remove:

- the timing tool **(Mot. 1496)** fitted with the **(Mot. 1750)**,
- the tool **(Mot. 1489)** from the cylinder block.

K4M, and 760 or 761 or 812 or 813

a - Lower timing cover with a timing flap



109052

❑ Refit the lower timing cover flap, checking that the locating pin (**33**) fits properly in the notch (**34**) .

b - Lower timing cover without a timing flap

❑ Refit the lower timing cover.

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

REFITTING -PROCEDURE 2

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: Timing belt (10,02, 04,02)**,

parts always to be replaced: Timing belt tensioning roller (10,02,04,04),

parts always to be replaced: Timing fixed roller (10,02,04,05),

parts always to be replaced: Crankshaft accessories pulley (10,03,03,07),

parts always to be replaced: Crankshaft accessories pulley bolts (10,03,03,10),

parts always to be replaced: Inlet camshaft cap (10,02,02,11),

parts always to be replaced: Exhaust camshaft cap (10,02,02,12),

parts always to be replaced: Throttle valve seal (11,04,06,25).

II - REFITTING OPERATION FOR PART CONCERNED

❑ The second procedure is used when replacing any timing face component which has a crankshaft timing sprocket with or without a collet, that requires the exhaust camshaft sprocket or camshaft dephaser to be loosened.

❑ Remove the camshaft dephaser (see **11A**, **Top and front of engine**, **Camshaft dephaser: Removal - Refitting**, page **11A-298**) .

1 - Adjusting the timing

❑

Note:

If the stud loosens with the n ut (see **11A**, **Top and front of engine**, **Camshaft: Removal - Refitting**, page **11A-172**) (Technical Note 3887A,11A, Top and front of engine).

WARNING

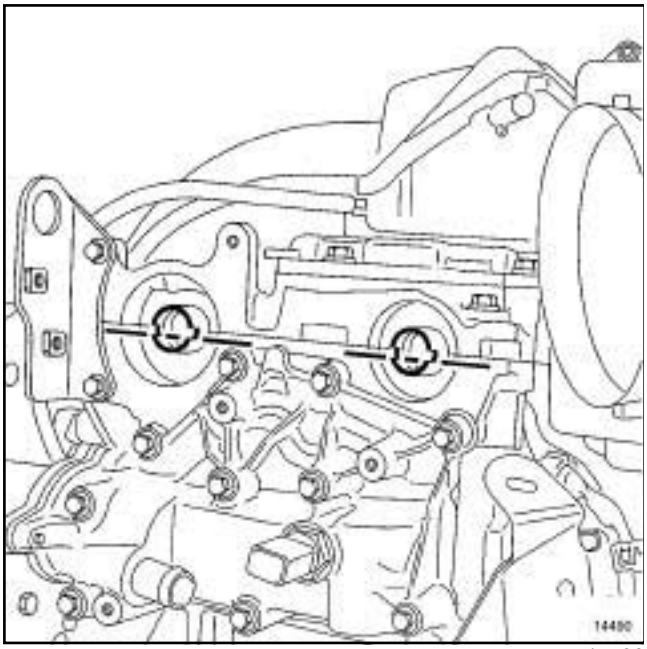
Always degrease:

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

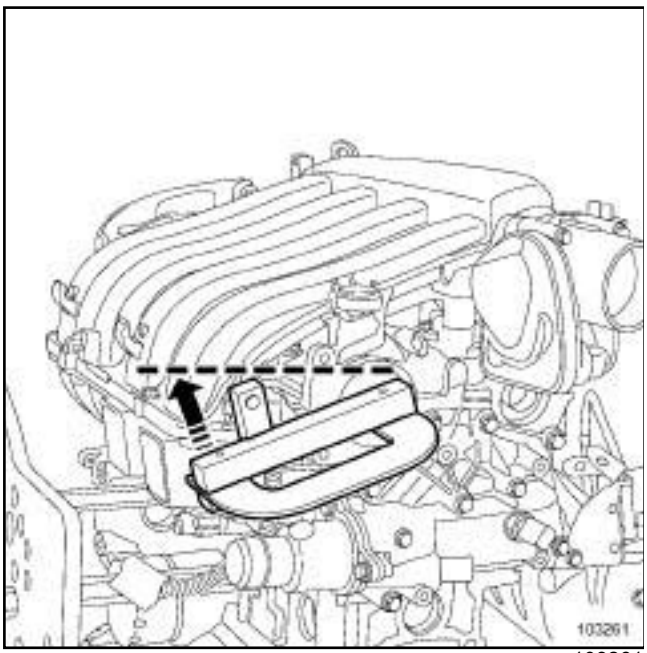
This is to avoid timing slippage.

This slippage leads to engine damage.

K4M, and 760 or 761 or 812 or 813

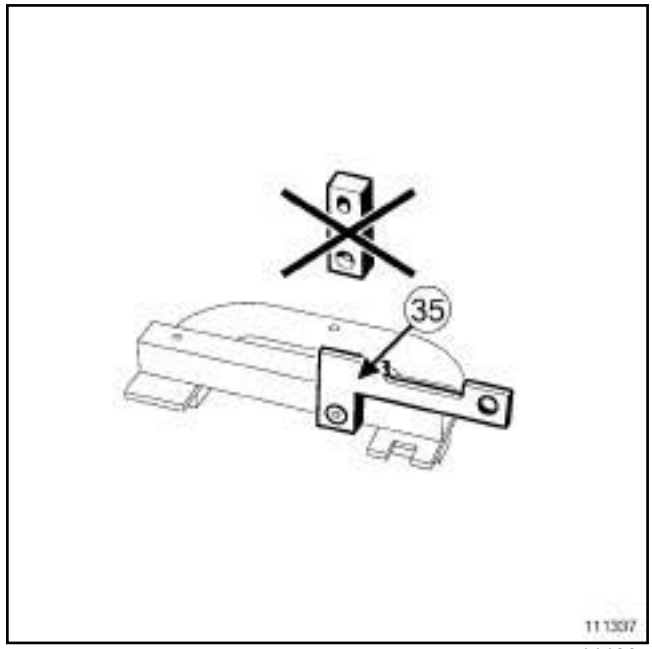


14490



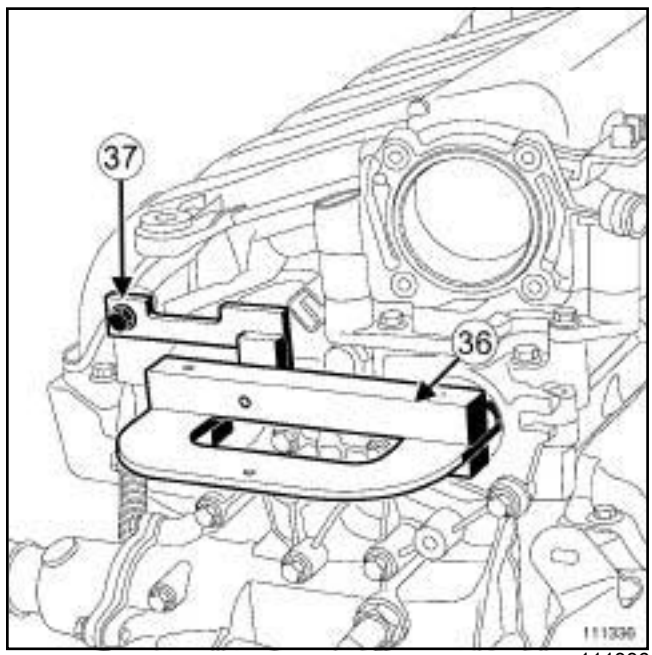
103261

❑ Position the camshaft grooves horizontally and below the centre line, by turning the camshafts with the **(Mot. 1496)** if necessary.



111337

❑ Fit the **(Mot. 1496)** with the **(Mot. 1750)** (**35**) .



111336

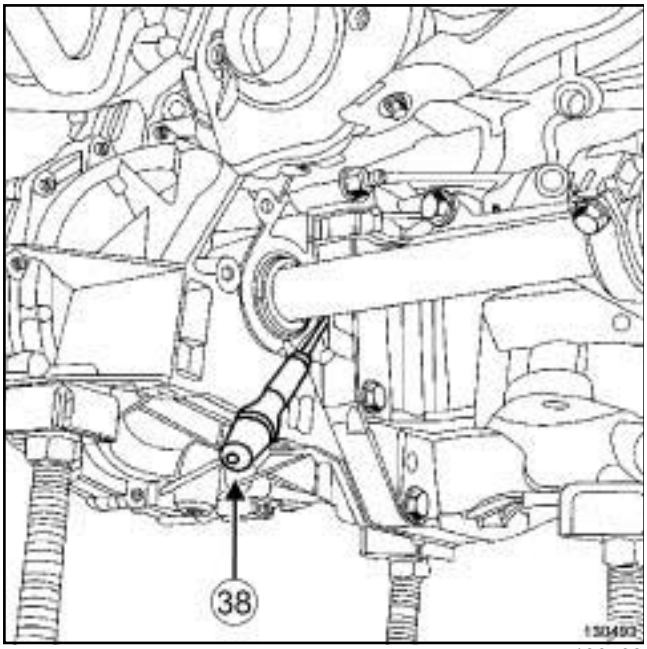
❑ Fit:

- the **(Mot. 1496)** (**36**) fitted with the **(Mot. 1750)** on the end of the camshaft,
- a lifting eye bolt (**37**) to secure the tool **(Mot. 1496)** equipped with the tool **(Mot. 1750)**.

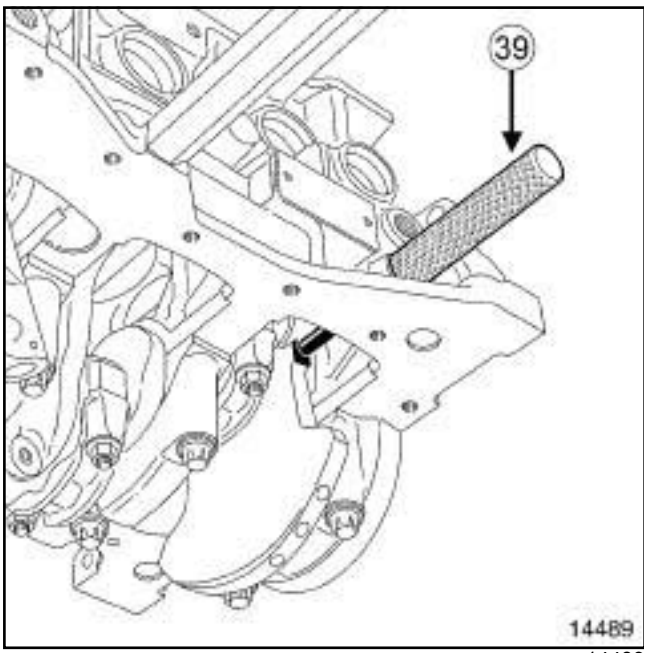
❑ Refit:

- the camshaft dephaser (see **11A**, **Top and front of engine**, **Camshaft dephaser: Removal - Refitting**, page **11A-298**) ,
- the crankshaft timing sprocket.

K4M, and 760 or 761 or 812 or 813



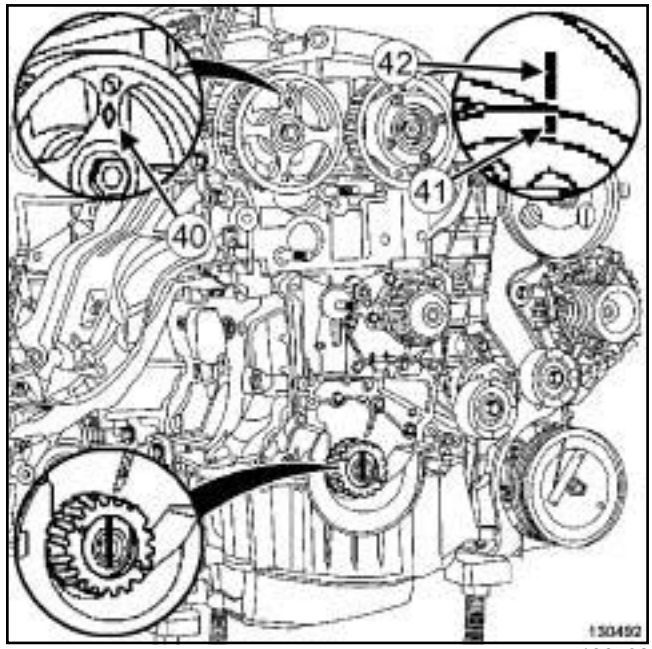
130493



14489

❏ Refit the tool **(Mot. 1489)** on the cylinder block.

❏ Use a screwdriver (**38**) to check that the flywheel does not turn (clockwise at the timing end), otherwise bring the crankshaft back into contact with the tool **(Mot. 1489)** (**39**) using the screwdriver; the crankshaft groove should be at the top.



130492

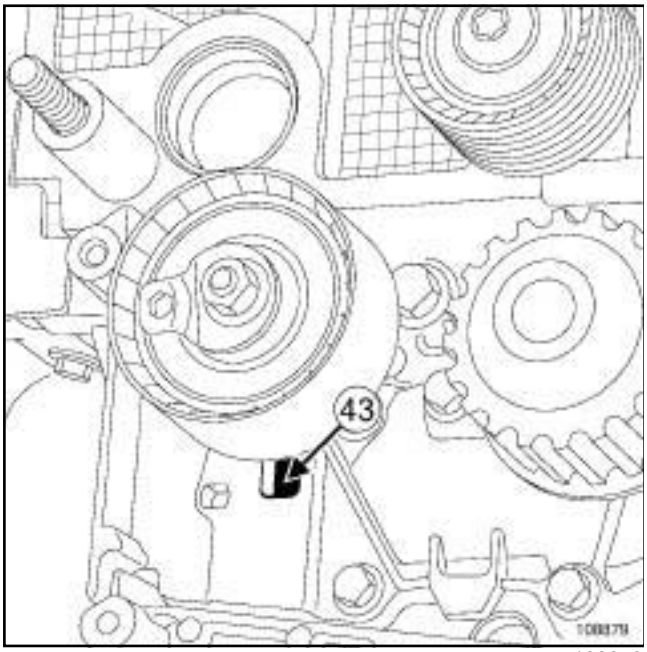
❏ Position:

- the RENAULT badge (**40**) etched on the stem of the exhaust camshaft sprocket vertically and pointing upwards,
- the camshaft dephaser mark (**41**) vertically and pointing upwards.

❏ Make a mark (**42**) with a pencil between the camshaft dephaser gear and the rocker cover.

K4M, and 760 or 761 or 812 or 813

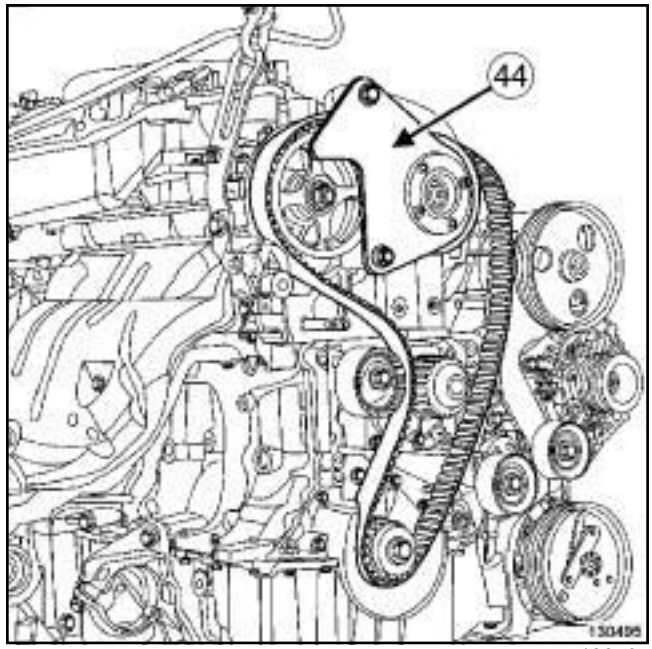
2 - Refitting



108879

❏ Refit a new timing tensioning roller by positioning the lug of the timing tensioning roller in the groove (**43**) .

❏ Fit the timing tensioning roller nut without tightening it.



130495

❏ Refit a new timing belt starting with the sprocket of each camshaft (without moving the sprocket of each camshaft).

❏ Fit the tool **(Mot. 1490-01)** (**44**) on the camshaft sprockets (use the bolt and nut of the upper timing cover to fit the tool **(Mot. 1490-01)**).

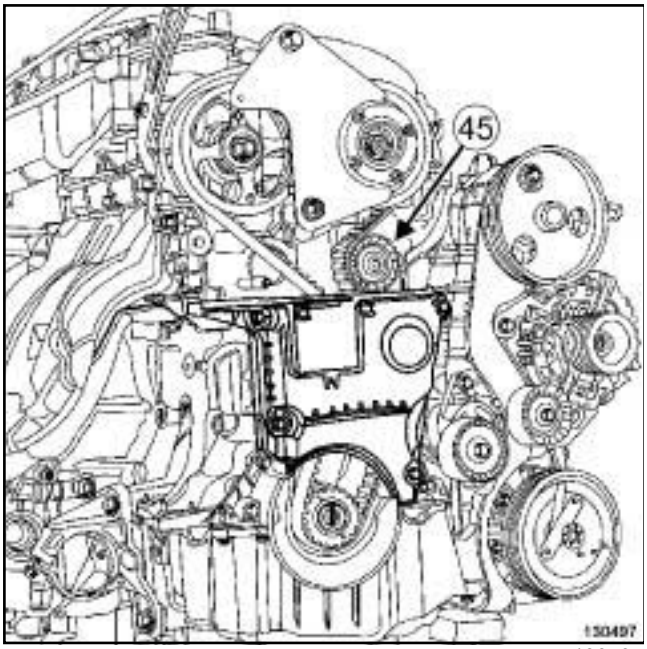
Note:

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

Note:

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

K4M, and 760 or 761 or 812 or 813

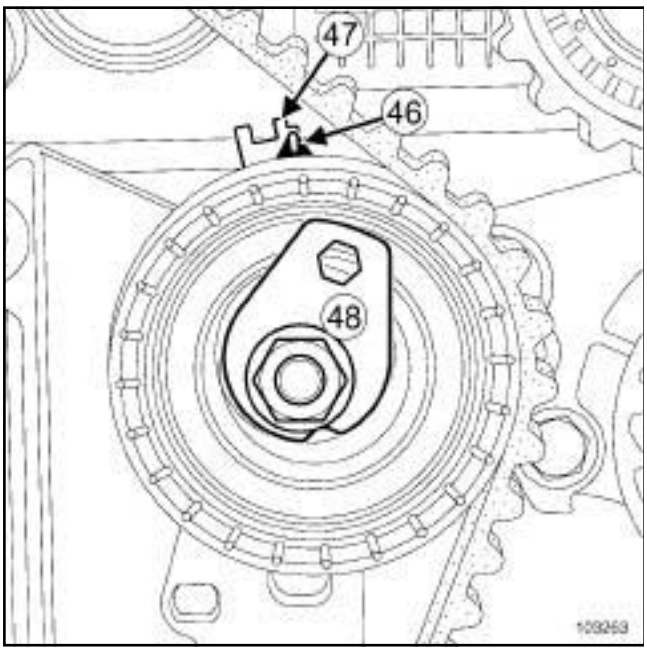


130497

❑ Refit a new timing fixed roller (**45**) .

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

3 - Timing belt tension



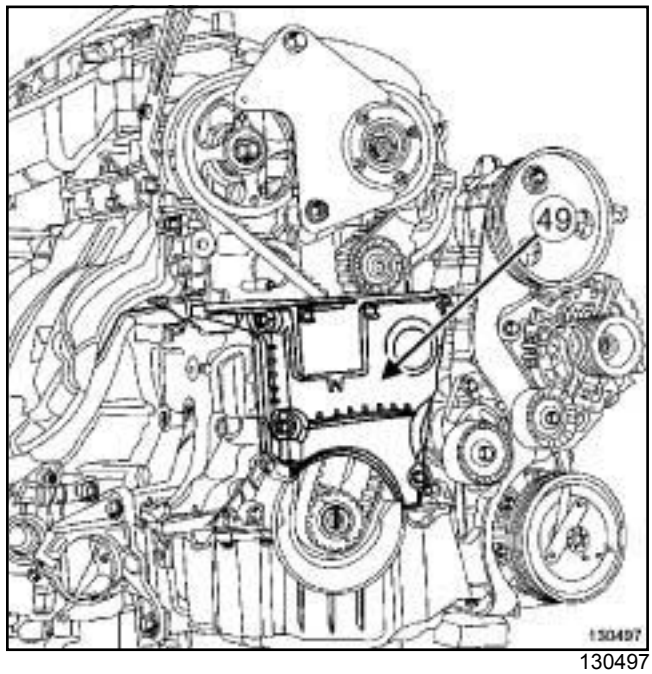
103263

❑ Position the adjustable index (**46**) opposite the mark (**47**) , by turning the eccentric (**48**) clockwise using an Allen key.

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

Note:
There are two types of lower timing cover:
- without a timing fla ,
- with a timing fla .

a - Lower timing cover with a timing flap



130497

❑ Refit the lower timing cover (**49**) .

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

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

❑ Refit a new crankshaft accessories pulley.

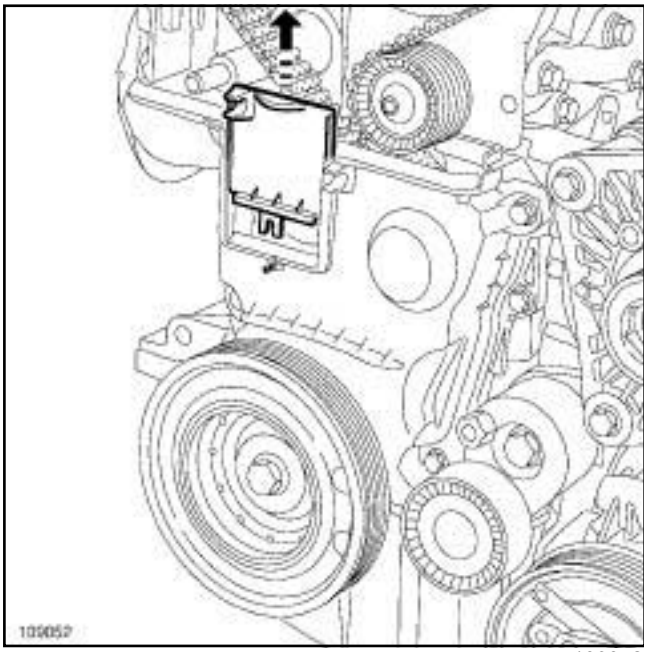
❑ Torque tighten:

- and angle tighten a **new crankshaft accessories pulley bolt (40 N.m + 145° ± 15°)**,
- and angle tighten the **exhaust camshaft sprocket nut (30 N.m + 84° ± 4)**,
- the **camshaft dephaser bolt (100 N.m)**.

❑ Refit the camshaft dephaser plug.

K4M, and 760 or 761 or 812 or 813

c - Lower timing cover with a timing flap



109052

❏ Refit the timing flap on the lower timing cover.

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

❏ Remove:

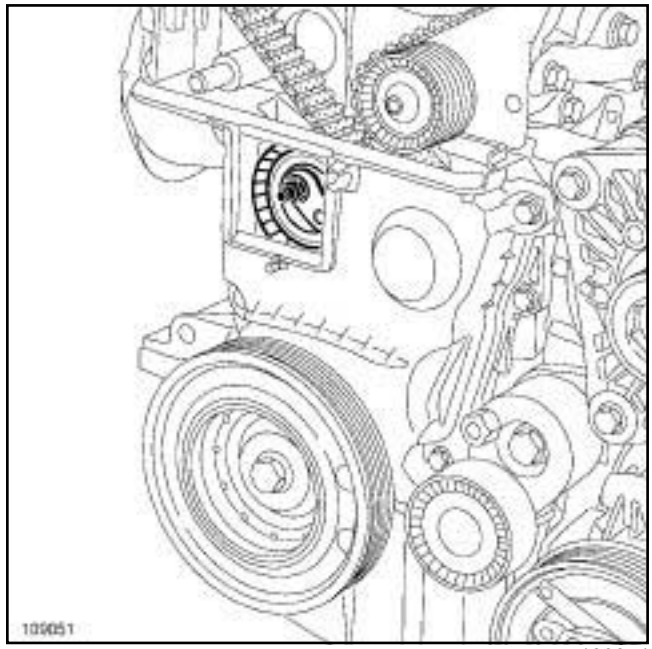
- the lifting eye bolt from the **(Mot. 1496)**,
- the **(Mot. 1496)** fitted with the **(Mot. 1750)**,
- the tool **(Mot. 1489)** from the cylinder block,
- the **(Mot. 1490-01)**.

4 - Checking the tension

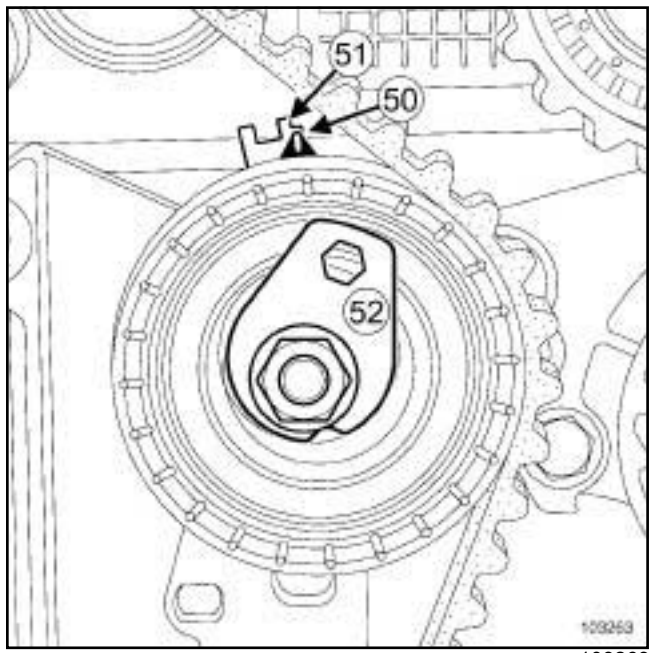
❏ Rotate the crankshaft twice clockwise at the timing end and before aligning the marks made previously by the operator (on the camshaft dephaser), screw the tool **(Mot. 1489)** into the cylinder block.

❏ Move the crankshaft slowly and smoothly until it comes into contact with the tool **(Mot. 1489)**.

❏ Remove the tool **(Mot. 1489)**.



109051



103263

❏ Check through the lower timing cover window that the adjustable index (**50**) is opposite the notch (**51**) , if this is not the case:

- loosen the timing tensioning roller nut by up to one turn while holding the eccentric with an Allen key,
- gradually move the adjustable index marker (**50**) opposite the mark (**51**) turning the eccentric cam (**52**) clockwise.

❏ Torque tighten the **timing tensioning roller nut (27 N.m)**.

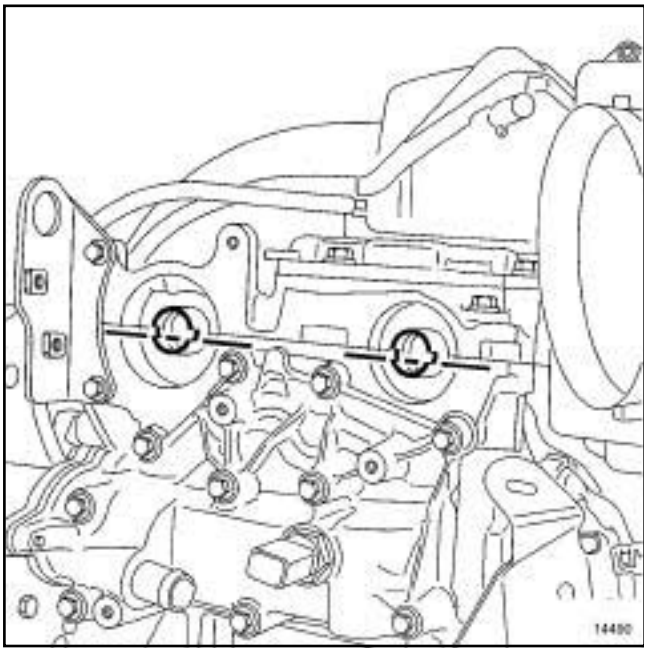
K4M, and 760 or 761 or 812 or 813

5 - Checking the timing

❑ Ensure that the index and the notch on the timing tensioning roller are in the correct position before checking the timing.

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

❑ Move the crankshaft slowly and smoothly until it comes into contact with the tool **(Mot. 1489)**.



14490

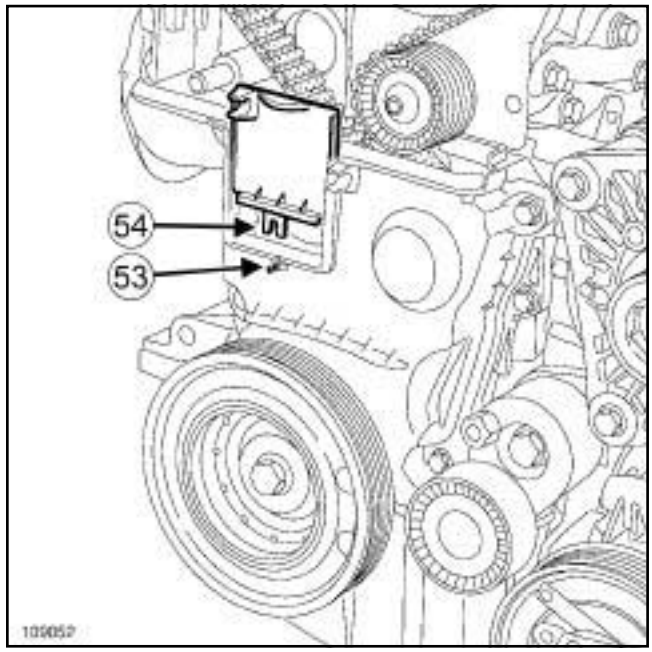
❑ Position (without forcing) the tool **(Mot. 1496)** equipped with the tool **(Mot. 1750)** (the camshaft end grooves must be horizontal and offset downwards).

> Note:
>
> If the tool **(Mot. 1496)** equipped with the tool **(Mot. 1750)** cannot be engaged, readjust the timing and the tension.

❑ Remove:

- the timing tool **(Mot. 1496)** fitted with the **(Mot. 1750)**,
- the tool **(Mot. 1489)** from the cylinder block.

a - Lower timing cover with a timing flap



109052

❑ Refit the lower timing cover flap, checking that the locating pin (**53**) fits properly in the notch (**54**) .

b - Lower timing cover without a timing flap

❑ Refit the lower timing cover.

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

III - FINAL OPERATION

❑ Apply a drop of **SILICONE ADHESIVE SEALANT** (see **Vehicle: Parts and ingredients for the repairwork**) (04B, Consumables - Products) to the thread of the TDC setting pin plug.

❑ Tighten to torque the **TDC pin plug (20 N.m)**.

❑ Refit the upper timing cover.

❑ Torque tighten:

- the **upper timing cover bolts (46 N.m)**,
- the **upper timing cover nuts (46 N.m)**.

❑ Refit:

- a new inlet camshaft plug using the **(Mot. 1487)**,
- a new exhaust camshaft plug using the **(Mot. 1488)**,
- the eye for lifting the engine at the flywheel end.

❑ Torque tighten the **flywheel end lifting eye bolts (10 N.m)**.

K4M, and 760 or 761 or 812 or 813

❏ Refit:

- the connector from the lifting bracket,
- the throttle valve,
- the air pipe at the outlet of the air filter unit,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-20**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-4**) ,
- the engine undertray,
- the front section of 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 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).

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

B84 or C84 or G84 or S84, and K4M, and 680 or 762 or 764 or 768 or 788 or 856 – B84 or C84 or G84 or K84 or L84 or S84, and K4J

Essential special tooling	
Mot. 1489	TDC locating pin.
Mot. 1368	Tool for tightening tensioner bolt. 8 mm Torx wrench, 12.7 mm square
Mot. 799-01	Timing gear wheel immobiliser.
Mot. 1496	Tool for setting camshaft.
Mot. 1750	Addition to retaining camshaft setting tool Mot. 1496 .
Mot. 1490-01	Locking and adjusting camshaft pulleys.
Mot. 1487	Tool for removing the camshaft covers (57 mm diameter).
Mot. 1488	Tool for removing the camshaft covers (43 mm diameter).

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

IMPORTANT
Wear protective gloves during the operation.

REMOVAL

I - REMOVAL PREPARATION OPERATION

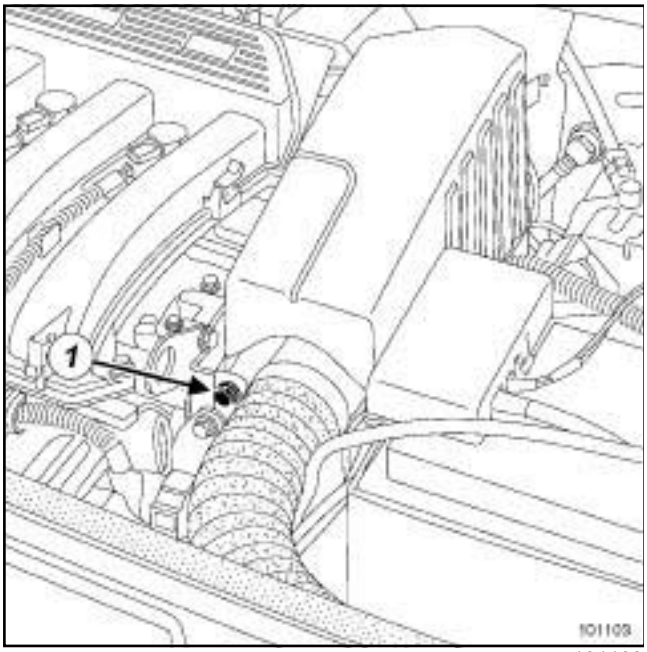
❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (02A, Lifting equipment).

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

❑ Remove:

- the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
- the scuttle panel grille (56A, Exterior equipment), (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-20**)
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the front section of 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 accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-4**) .
- (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-20**)

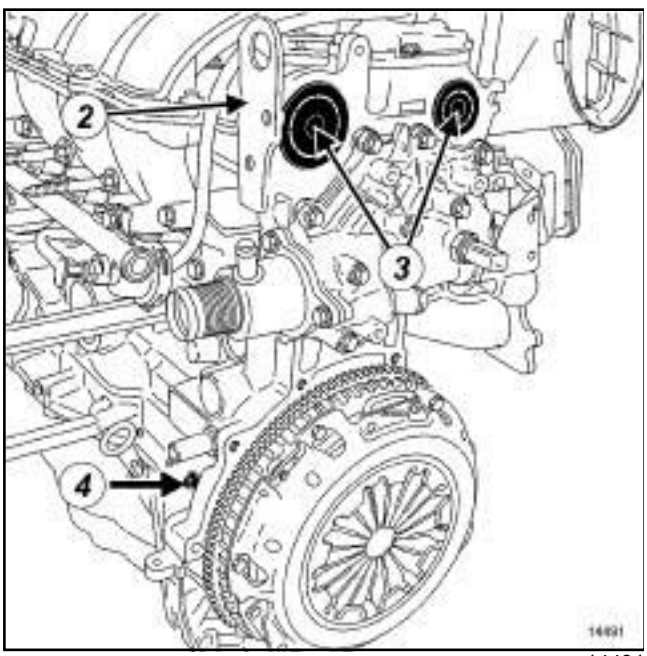
B84 or C84 or G84 or S84, and K4M, and 680 or 762 or 764 or 768 or 788 or 856 – B84 or C84 or G84 or K84 or L84 or S84, and K4J



101103

❑ Remove:

- the bolt (**1**) from the air resonator,
- the air resonator.



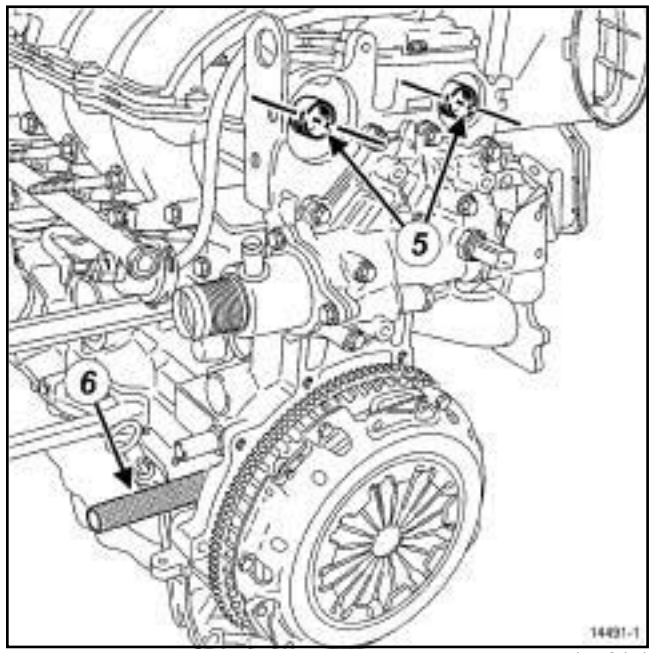
14491

❑ Remove the engine lifting eye (**2**) on the flywheel side.

❑ Pierce the middle of the plug (**3**) at the end of each camshaft with a screwdriver.

❑ Remove:

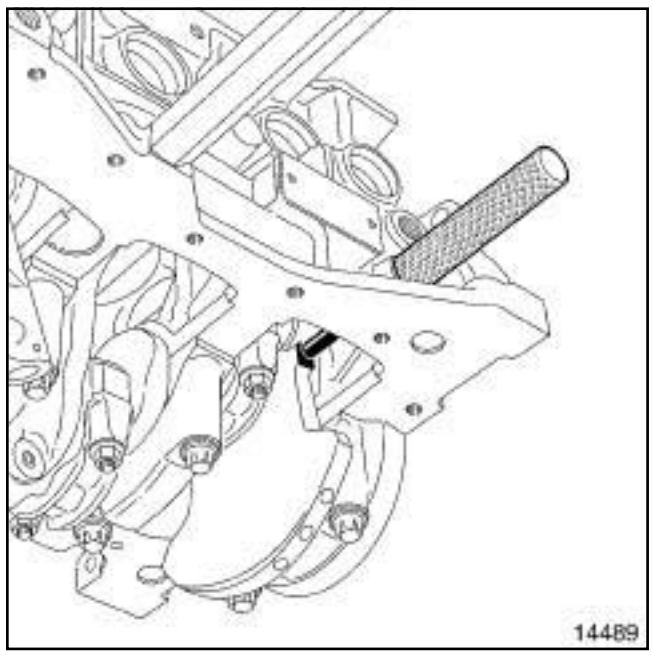
- the plug at the end of each camshaft with a screwdriver,
- the TDC pin plug (**4**) .



14491-1

❑ Position the camshaft grooves (**5**) almost horizontally and offset towards the bottom turning the crankshaft in the operating direction (clockwise at timing end).

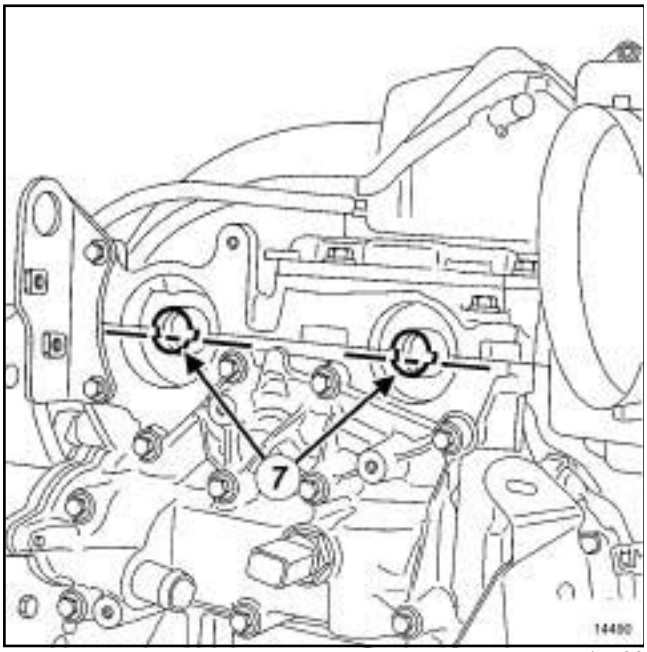
❑ Screw tool (**6**) **(Mot. 1489)** into the cylinder block.



14489

❑ Turn the crankshaft in its operating direction (clockwise at timing end), until the crankshaft comes into contact with the tool **(Mot. 1489)**.

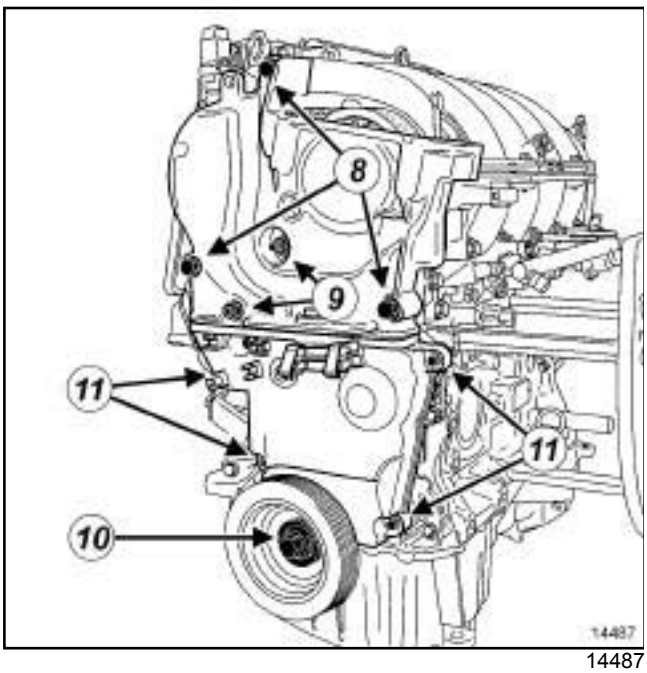
B84 or C84 or G84 or S84, and K4M, and 680 or 762 or 764 or 768 or 788 or 856 – B84 or C84 or G84 or K84 or L84 or S84, and K4J



14490

❏ The camshaft grooves (**7**) must be horizontal and offset downwards.

❏ Remove the tool **(Mot. 1489)** from the cylinder block.

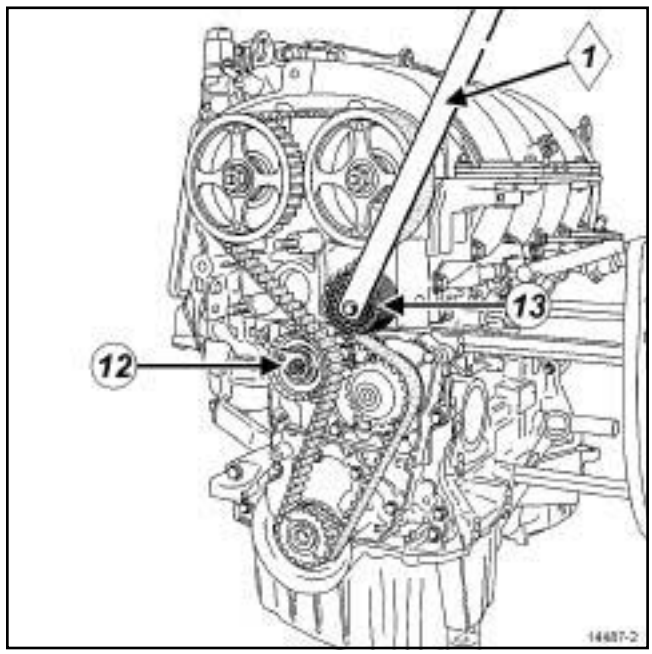


14487

❏ Remove:

- the bolts (**8**) from the upper timing cover,
- the upper timing cover nuts (**9**) ,
- the upper timing cover,
- the crankshaft accessories pulley bolt (**10**) ,
- the crankshaft accessories pulley,
- the bolts (**11**) on the lower timing cover,
- the lower timing cover.

II - OPERATION FOR REMOVAL OF PART CONCERNED



14487-2

❏ Undo the timing tension wheel nut (**12**) .

Note:

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

❏ Remove:

- the bolt of the timing fixed roller (**13**) using the tool **(Mot. 1368)** (**1**) ,
- the timing fixed roller,
- the timing belt,
- the timing tensioning roller nut,
- the timing tensioning roller,
- the crankshaft timing sprocket.

B84 or C84 or G84 or S84, and K4M, and 680 or 762 or 764 or 768 or 788 or 856 – B84 or C84 or G84 or K84 or L84 or S84, and K4J

REFITTING - PROCEDURE 1

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: Timing belt (10,02, 04,02)**,

parts always to be replaced: Timing belt tensioning roller (10,02,04,04),

parts always to be replaced: Timing fixed roller (10,02,04,05),

parts always to be replaced: Crankshaft accessories pulley bolts (10,03,03,10),

parts always to be replaced: Inlet camshaft cap (10,02,02,11),

parts always to be replaced: Exhaust camshaft cap (10,02,02,12).

II - REFITTING OPERATION FOR PART CONCERNED

❑ The first procedure is used when replacing any timing component which has a crankshaft timing sprocket without a collet and which does not require one or more camshaft sprockets to be loosened.

1 - Adjusting the timing

❑

WARNING

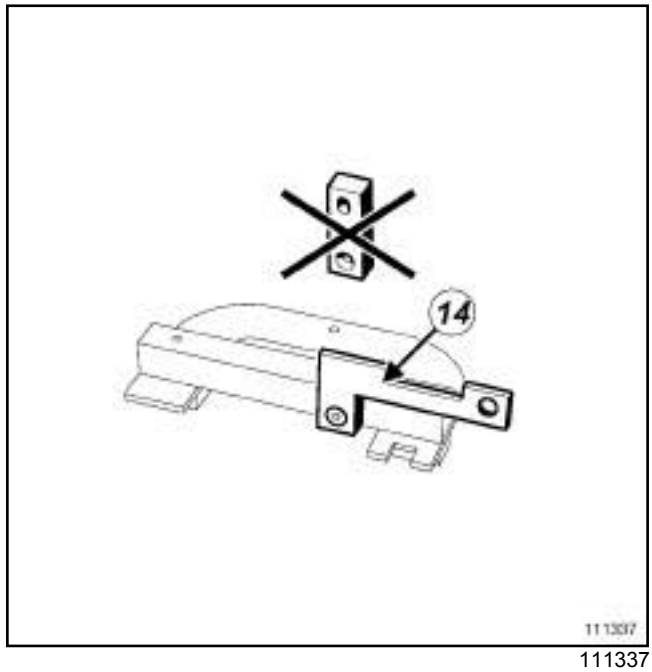
Be sure to degrease:

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

This is to avoid timing slippage.

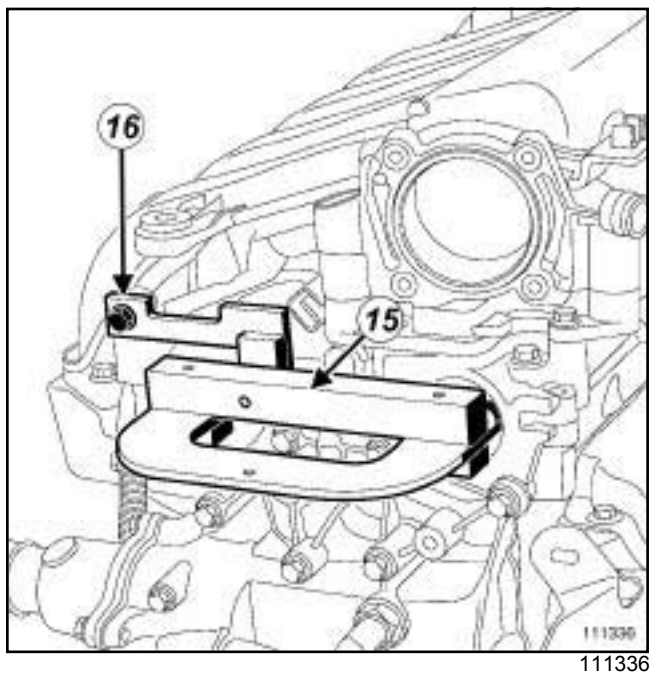
This slippage leads to engine damage.

❑ Set the camshaft grooves horizontally and below the centre line by turning the camshafts with the **(Mot. 799-01)** if necessary.



111337

❑ Fit the **(Mot. 1496)** with the **(Mot. 1750)** (**14**) .

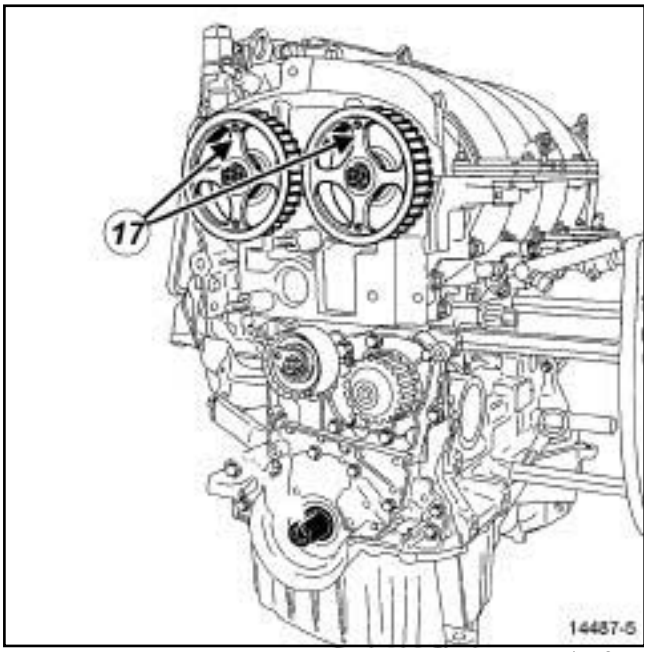


111336

❑ Fit:

- the **(Mot. 1496)** (**15**) fitted with the **(Mot. 1750)** on the end of the camshaft,
- a lifting eye bolt (**16**) to secure the tool **(Mot. 1496)** equipped with the tool **(Mot. 1750)**.

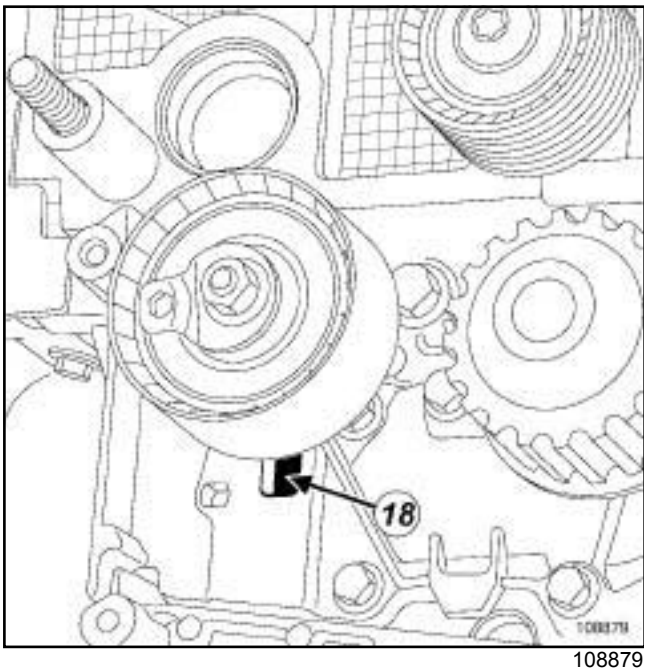
B84 or C84 or G84 or S84, and K4M, and 680 or 762 or 764 or 768 or 788 or 856 – B84 or C84 or G84 or K84 or L84 or S84, and K4J



14487-5

❏ Position the RENAULT badge (**17**) etched on the stem of each camshaft sprocket vertically and pointing upwards.

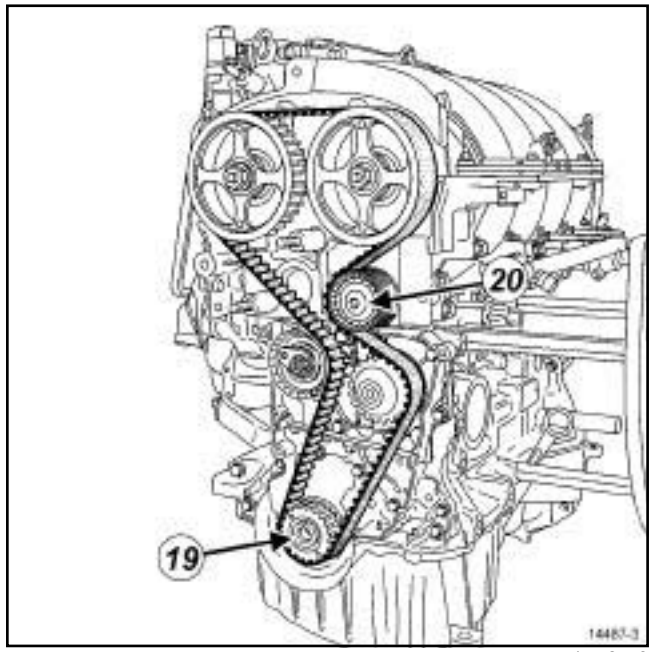
2 - Refitting



108879

❏ Refit a new timing tensioning roller by positioning the lug of the timing tensioning roller in the groove (**18**) .

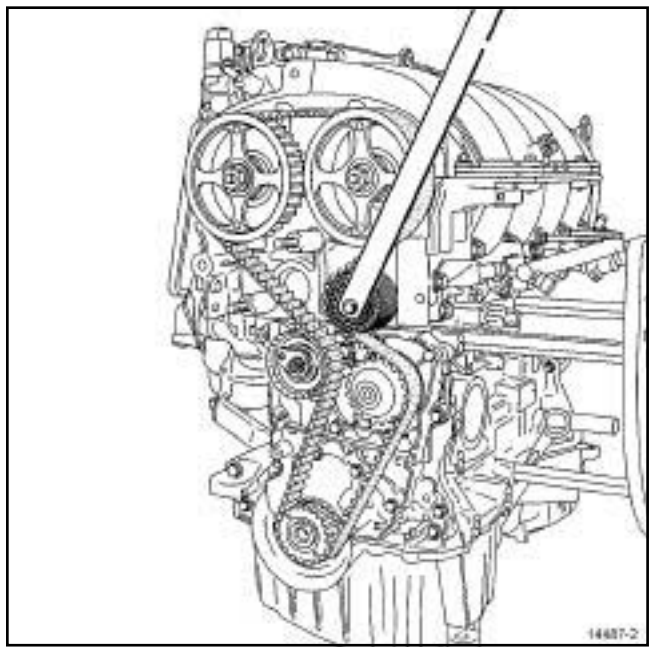
❏ Fit the timing tensioning roller nut without tightening it.



14487-3

❏ Refit:

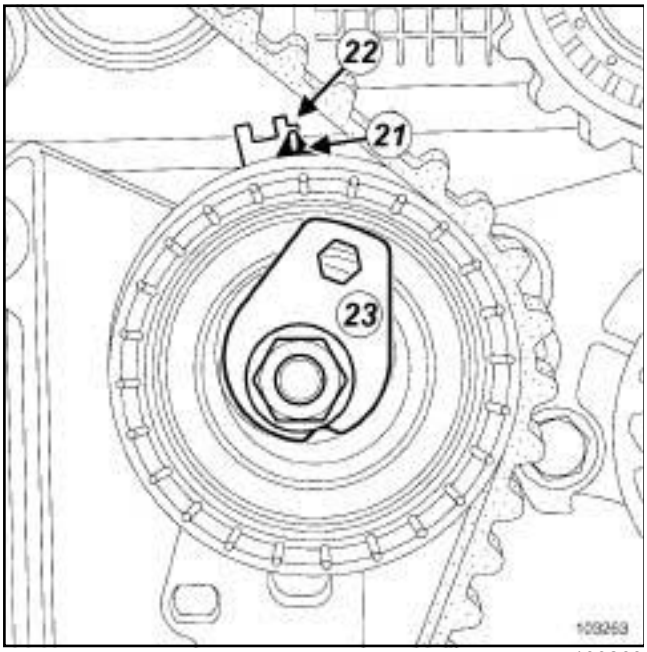
- the crankshaft timing sprocket (**19**) ,
- a new timing belt,
- a new timing fixed roller (**20**) .



14487-2

❏ Torque tighten the **timing fixed roller bolt (50 N.m)** using the tool **(Mot. 1368)**.

B84 or C84 or G84 or S84, and K4M, and 680 or 762 or 764 or 768 or 788 or 856 – B84 or C84 or G84 or K84 or L84 or S84, and K4J



103263

❏ Position the adjustable index (**21**) opposite the mark (**22**) , by turning the eccentric (**23**) clockwise using a **6 mm** Allen key.

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

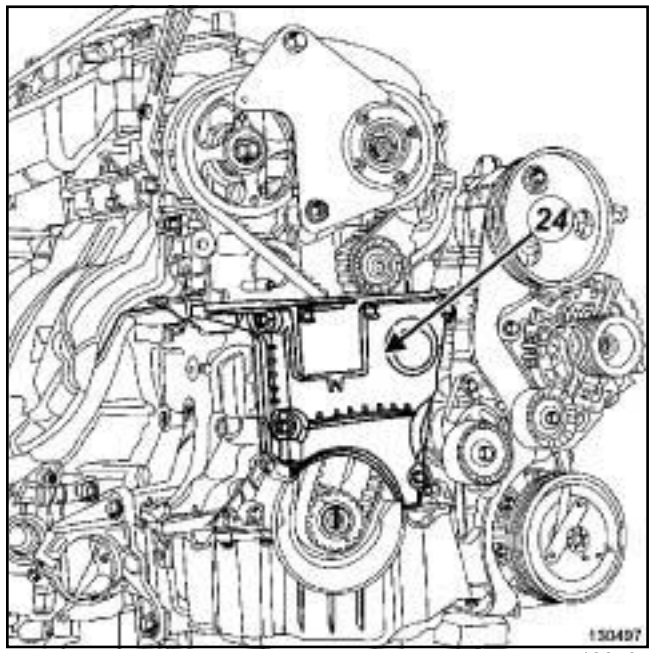
❏ Refit the tool **(Mot. 1489)** on the cylinder block.

Note:

There are two types of lower timing cover:

- without a timing fla ,
- with a timing fla .

a - Lower timing cover with a timing flap



130497

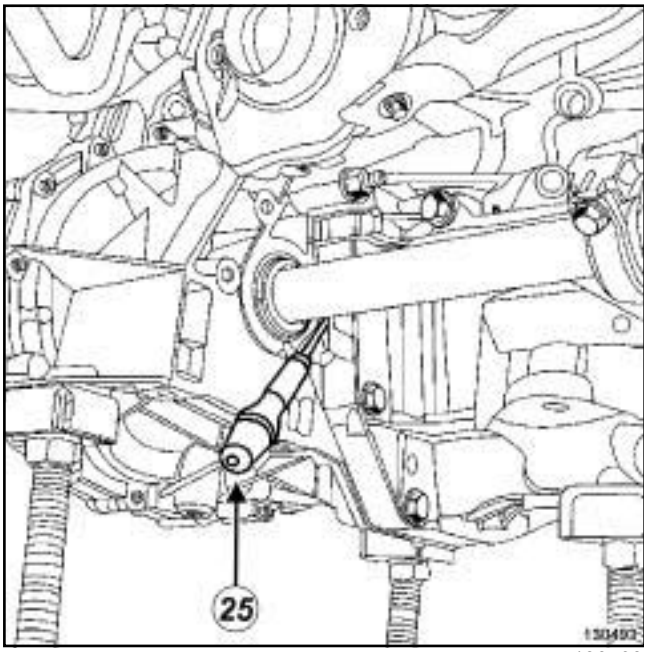
❏ Refit the lower timing cover (**24**) .

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

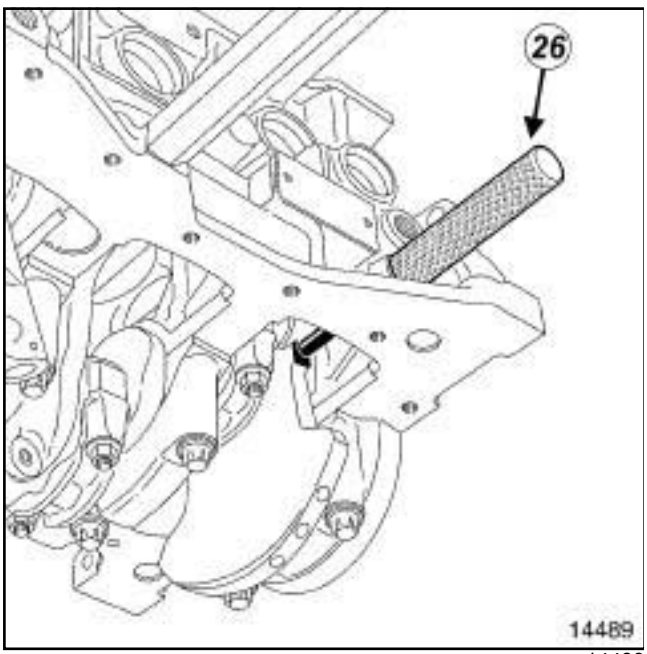
b - continuation of the refitting procedure regardless of the type of lower timing cover

❏ Refit a new crankshaft accessories pulley.

B84 or C84 or G84 or S84, and K4M, and 680 or 762 or 764 or 768 or 788 or 856 – B84 or C84 or G84 or K84 or L84 or S84, and K4J



130493

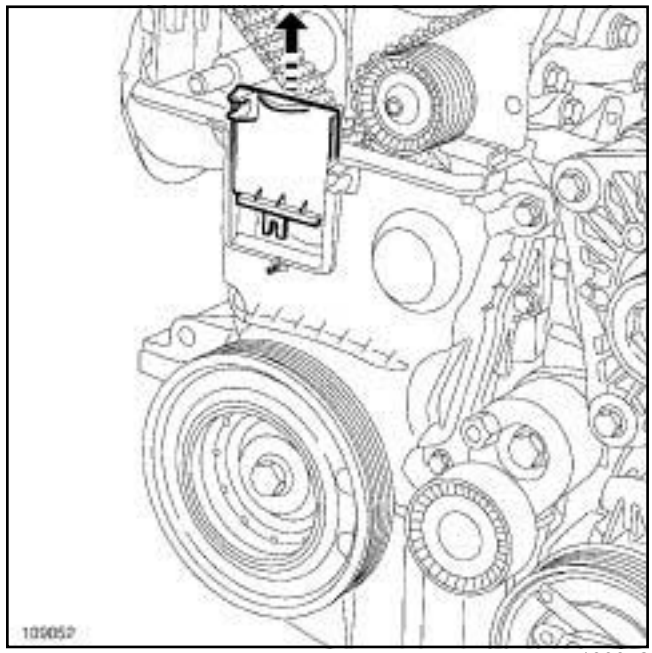


14489

❑ Use a screwdriver (**25**) to check that the flywheel does not turn (clockwise at the timing end), otherwise bring the crankshaft back into contact with the tool **(Mot. 1489)** (**26**) using the screwdriver; the crankshaft groove should be at the top.

❑ Torque and angle tighten a **new crankshaft accessories pulley bolt (40 N.m + 145° ± 15°)** (crankshaft in contact with the tool **(Mot. 1489)**).

c - Lower timing cover with a timing flap


109052

❑ Remove the timing flap from the lower timing cover.

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

❑ Remove:

- the lifting eye bolt from the **(Mot. 1496)**,
- the timing tool **(Mot. 1496)** fitted with the **(Mot. 1750)**,
- the tool **(Mot. 1489)** from the cylinder block.

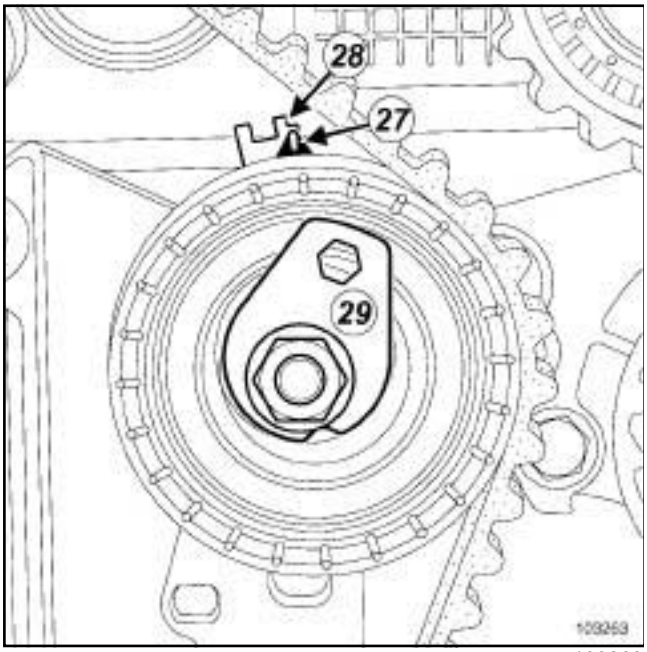
3 - Checking the tension

❑ Rotate the crankshaft twice clockwise at the timing end and before aligning the marks made previously by the operator (on the camshaft dephaser), screw the tool **(Mot. 1489)** into the cylinder block.

❑ Move the crankshaft slowly and smoothly until it comes into contact with the tool **(Mot. 1489)**.

❑ Remove the tool **(Mot. 1489)** from the cylinder block.

B84 or C84 or G84 or S84, and K4M, and 680 or 762 or 764 or 768 or 788 or 856 – B84 or C84 or G84 or K84 or L84 or S84, and K4J



103263

❏ Check that the adjustable index (**27**) is opposite the notch (**28**) , if this is not the case:

- loosen the timing tensioning roller nut by up to one turn while holding the eccentric with a **6 mm** Allen key,
- gradually move the adjustable index marker (**27**) opposite the mark (**28**) turning the eccentric cam (**29**) clockwise.

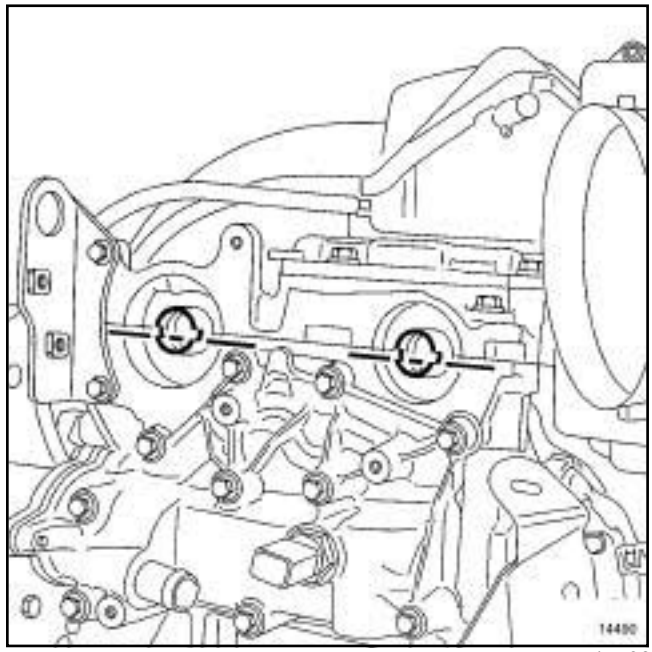
❏ Torque tighten the **timing tension wheel nut (27 N.m)**.

4 - Checking the timing

❏ Ensure that the index and the notch on the timing tensioning roller are in the correct position before checking the timing.

❏ Screw tool **(Mot. 1489)** into the cylinder block.

❏ Move the crankshaft slowly and smoothly until it comes into contact with the tool **(Mot. 1489)**.


14490

❏ Position (without forcing) the camshaft setting tool **(Mot. 1496)** fitted with the **(Mot. 1750)** (the camshaft end grooves must be horizontal and offset towards the bottom).

Note:

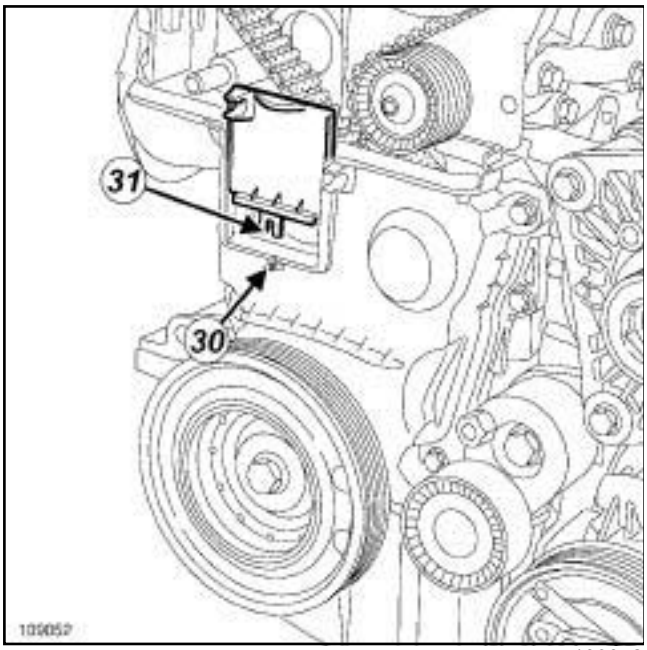
The timing adjustment and tensioning operation must be repeated if the camshaft setting tool does not engage.

❏ Remove:

- the timing tool **(Mot. 1496)** fitted with the **(Mot. 1750)**,
- the tool **(Mot. 1489)** from the cylinder block.

B84 or C84 or G84 or S84, and K4M, and 680 or 762 or 764 or 768 or 788 or 856 – B84 or C84 or G84 or K84 or L84 or S84, and K4J

a - Lower timing cover with a timing flap



109052

❑ Refit the lower timing cover flap, checking that the locating pin (**30**) fits properly in the notch (**31**) .

b - Lower timing cover without a timing flap

❑ Refit the lower timing cover.

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

REFITTING -PROCEDURE 2

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: Timing belt (10,02, 04,02)**,

parts always to be replaced: Timing belt tensioning roller (10,02,04,04),

parts always to be replaced: Timing fixed roller (10,02,04,05),

parts always to be replaced: Crankshaft accessories pulley (10,03,03,07),

parts always to be replaced: Crankshaft accessories pulley bolts (10,03,03,10),

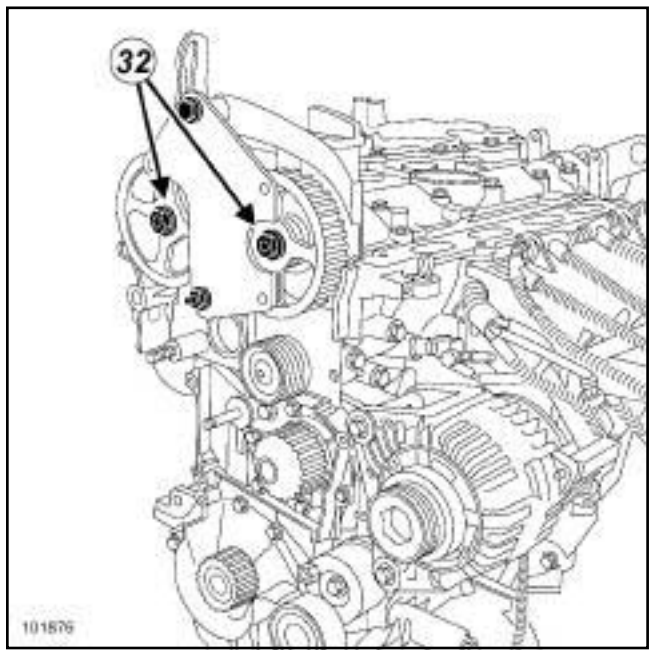
parts always to be replaced: camshaft timing sprocket nut (10,02,02,18),

parts always to be replaced: Inlet camshaft cap (10,02,02,11),

parts always to be replaced: Exhaust camshaft cap (10,02,02,12).

II - REFITTING OPERATION FOR PART CONCERNED

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



101876

❑ Fit the tool **(Mot. 1490-01)** on the camshaft sprockets using the tool **(Mot. 799-01)**.

❑ Loosen the nuts (**32**) of each camshaft sprocket.

❑ Remove:

- the tool **(Mot. 1490-01)** from the cylinder block,
- every camshaft sprocket nut,
- the camshaft sprockets.

B84 or C84 or G84 or S84, and K4M, and 680 or 762 or 764 or 768 or 788 or 856 – B84 or C84 or G84 or K84 or L84 or S84, and K4J

1 - Adjusting the timing

❑

Note:

If the stud loosens with the nut (see **11A**, **Top and front of engine**, **Camshaft: Removal - Refitting**, page **11A-172**) (Technical Note 3887A,11A, Top and front of engine).

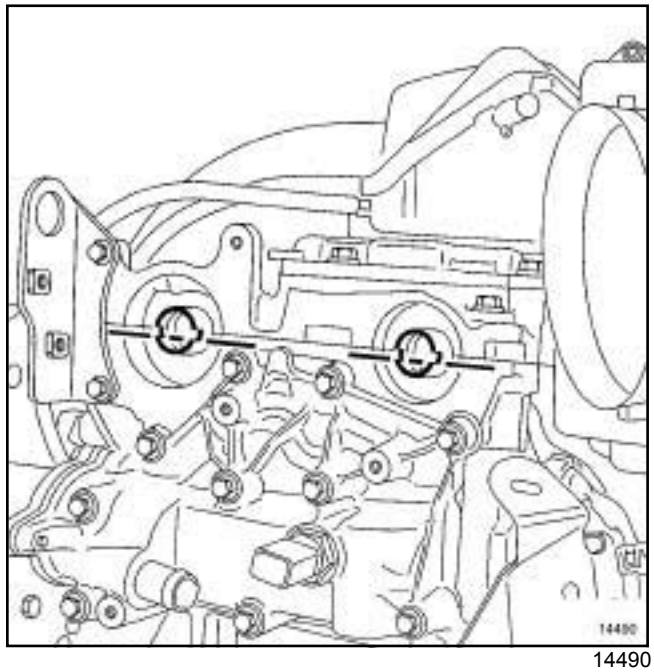
WARNING

Always degrease:

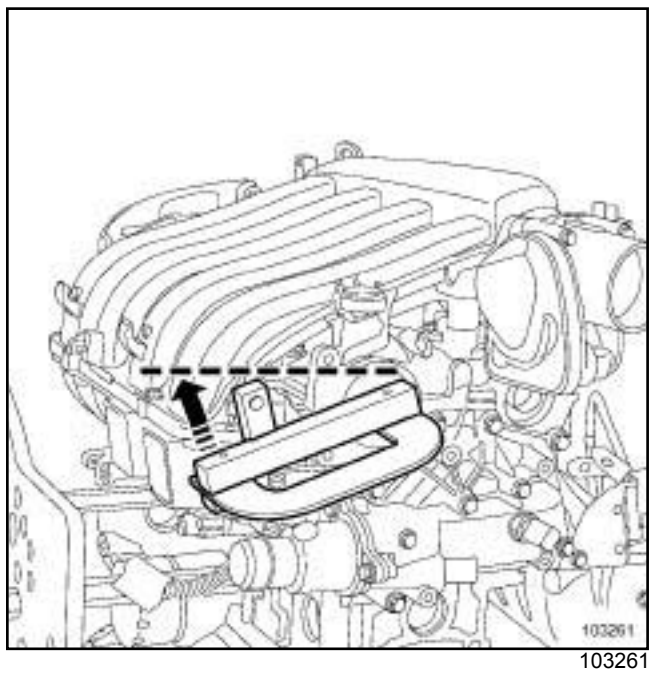
- the end of the crankshaft (timing end),
- the timing sprocket pressure faces and bore of the crankshaft,
- the cr ankshaft accessories pulle y bearing faces,
- the camshaft ends (timing end),
- the camshaft sprocket bores and bearing faces.

This is to avoid timing slippage.

This slippage leads to engine damage.



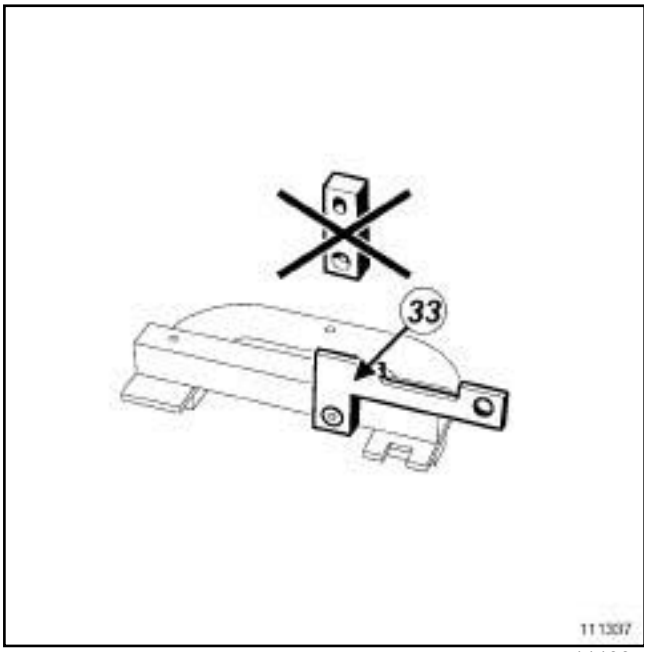
14490



103261

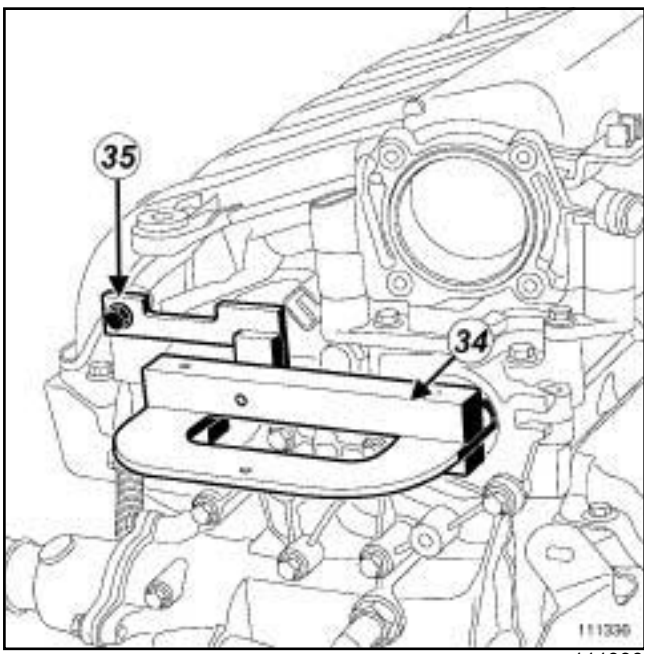
❑ Position the camshaft grooves horizontally and below the centre line, by turning the camshafts with the **(Mot. 1496)** if necessary.

B84 or C84 or G84 or S84, and K4M, and 680 or 762 or 764 or 768 or 788 or 856 – B84 or C84 or G84 or K84 or L84 or S84, and K4J



111337

❏ Fit the **(Mot. 1496)** with the **(Mot. 1750)** (**33**) .



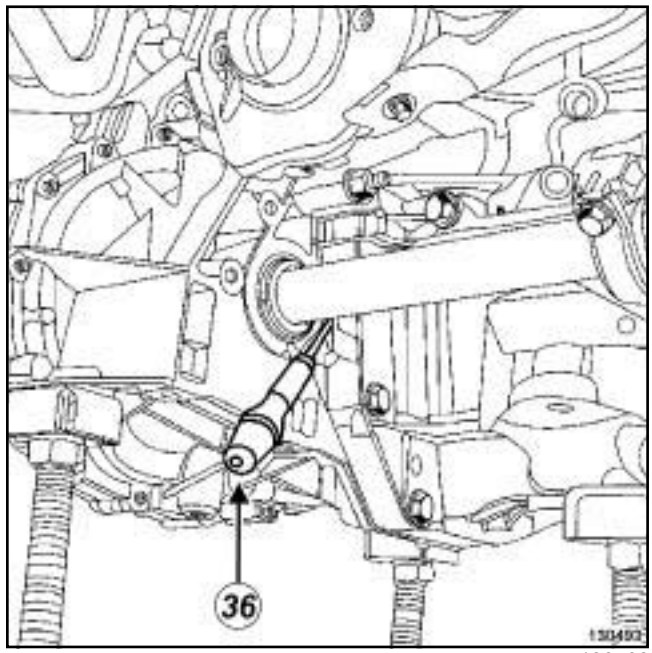
111336

❏ Fit:

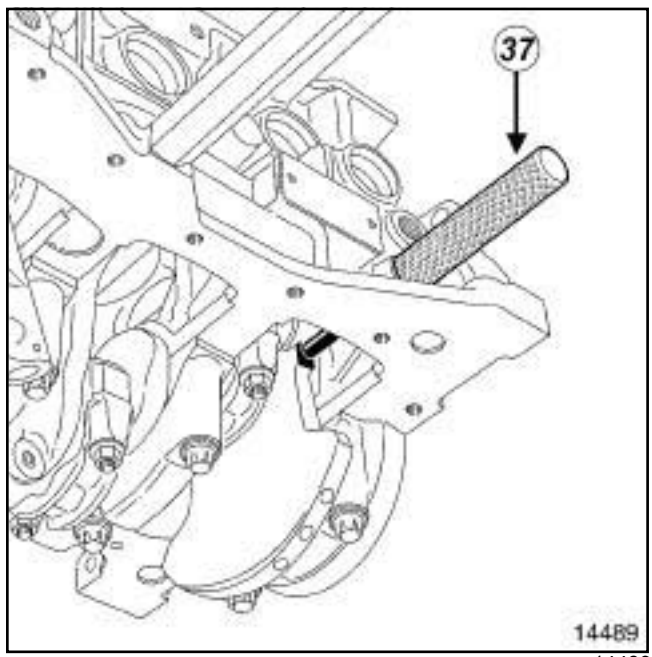
- the **(Mot. 1496)** (**34**) fitted with the **(Mot. 1750)** on the end of the camshaft,
- a lifting eye bolt (**35**) to secure the tool **(Mot. 1496)** equipped with the tool **(Mot. 1750)**.

❏ Refit:

- the crankshaft timing sprocket,
- the camshaft sprockets,
- every camshaft sprocket nut.



130493

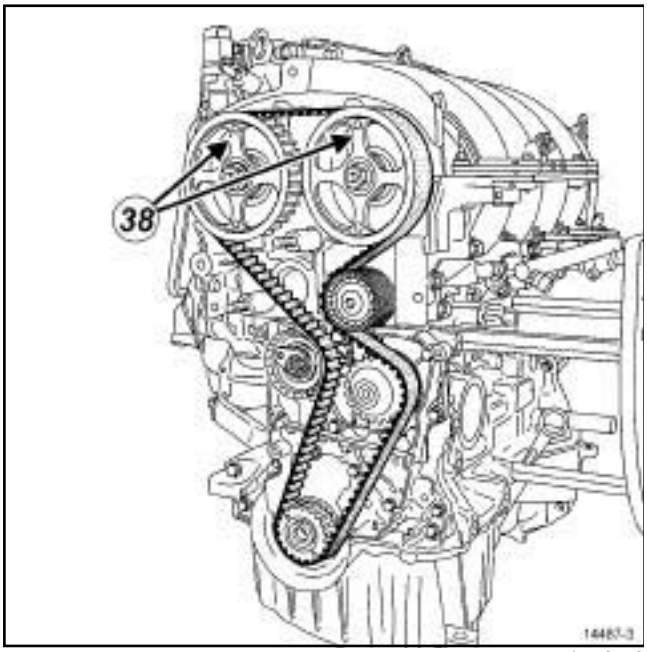


14489

❏ Refit the tool **(Mot. 1489)** on the cylinder block.

❏ Use a screwdriver (**36**) to check that the flywheel does not turn (clockwise at the timing end), otherwise bring the crankshaft back into contact with the tool **(Mot. 1489)** (**37**) using the screwdriver; the crankshaft groove should be at the top.

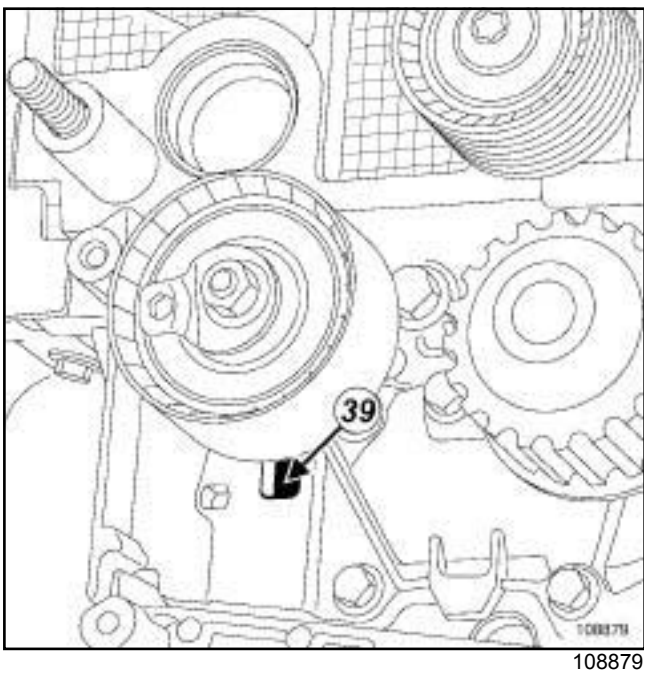
B84 or C84 or G84 or S84, and K4M, and 680 or 762 or 764 or 768 or 788 or 856 – B84 or C84 or G84 or K84 or L84 or S84, and K4J



14487-3

❏ Position the RENAULT badge (**38**) etched on the stem of each camshaft sprocket vertically and pointing upwards.

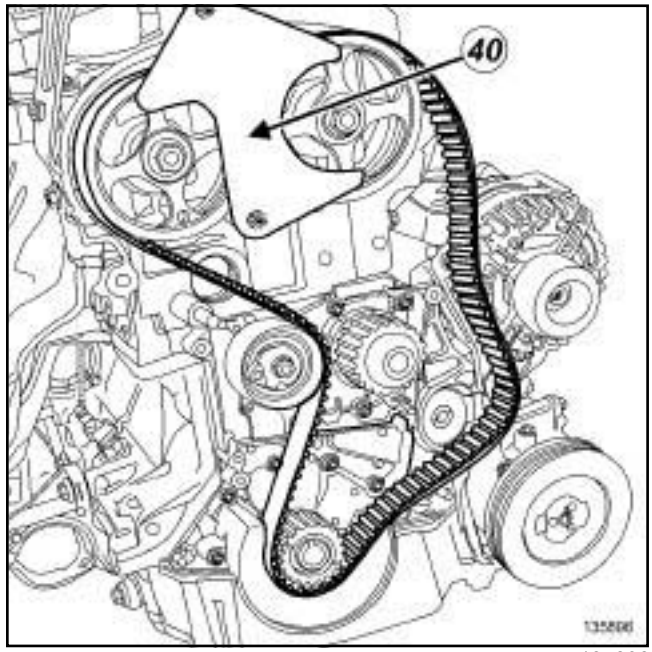
2 - Refitting



108879

❏ Refit a new timing tensioning roller by positioning the lug of the timing tensioning roller in the groove (**39**) .

❏ Fit the timing tensioning roller nut without tightening it.



135896

❏ Refit a new timing belt starting with the sprocket of each camshaft (without moving the sprocket of each camshaft).

❏ Fit the tool **(Mot. 1490-01)** (**40**) on the camshaft sprockets (use the bolt and nut of the upper timing cover to fit the tool **(Mot. 1490-01)**).

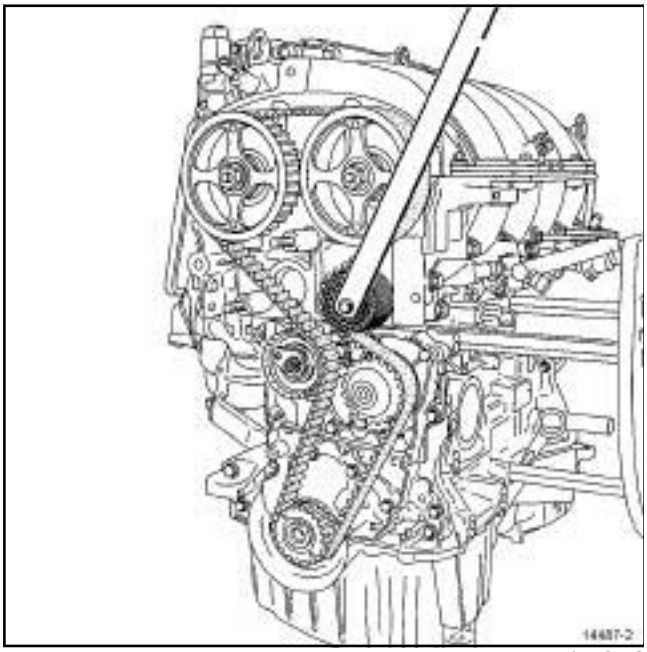
Note:

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

Note:

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

B84 or C84 or G84 or S84, and K4M, and 680 or 762 or 764 or 768 or 788 or 856 – B84 or C84 or G84 or K84 or L84 or S84, and K4J

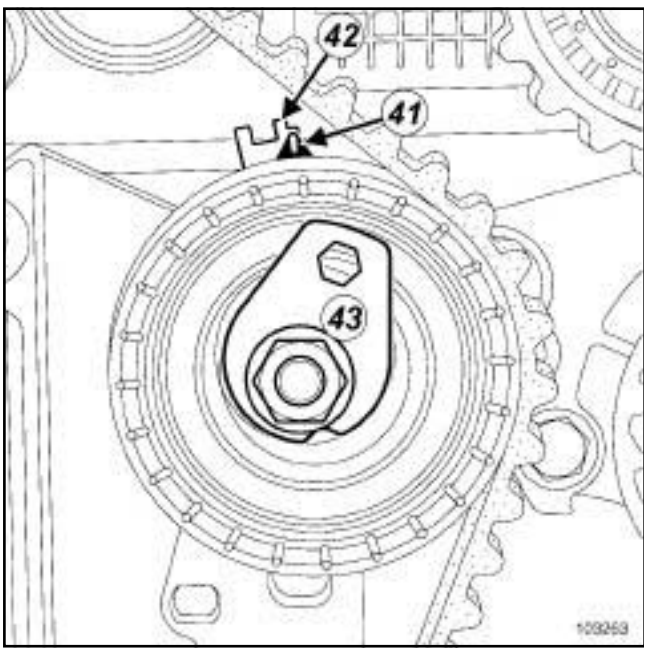


14487-2

❏ Refit a new timing fixed roller.

❏ Torque tighten the **timing fixed roller bolt (50 N.m)** using the tool **(Mot. 1368)**.

3 - Timing belt tension



103263

❏ Position the adjustable index (**41**) opposite the mark (**42**) , by turning the eccentric (**43**) clockwise using an Allen key.

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

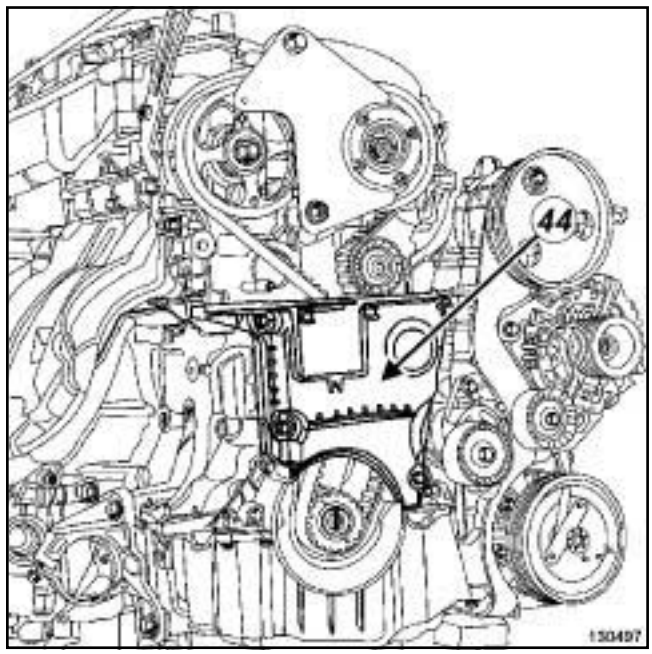
Note:

There are two types of lower timing cover:

- without a timing fla ,

- with a timing fla .

a - Lower timing cover with a timing flap



130497

❏ Refit the lower timing cover (**44**) .

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

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

❏ Refit a new crankshaft accessories pulley.

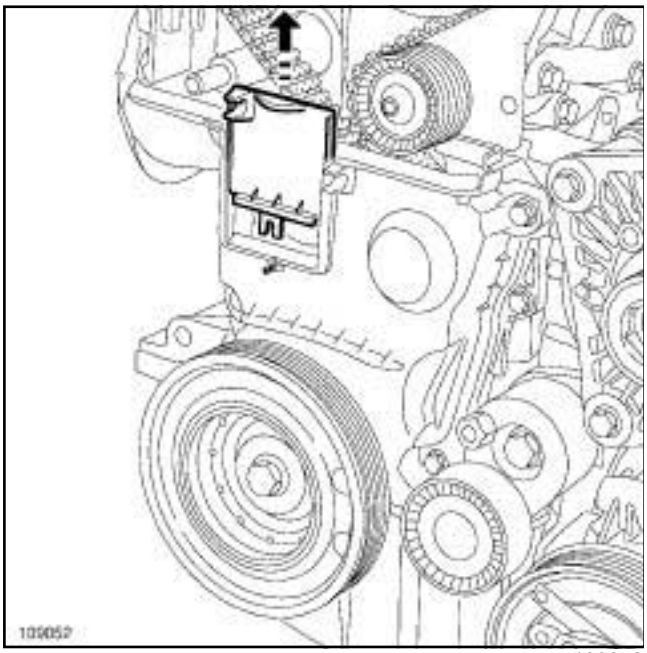
❏ Torque and angle tighten:

- a **crankshaft accessories pulley bolt (40 N.m + 145° ± 15°)**,

- the **nut of each camshaft sprocket (30 N.m + 84° ± 4°)**.

B84 or C84 or G84 or S84, and K4M, and 680 or 762 or 764 or 768 or 788 or 856 – B84 or C84 or G84 or K84 or L84 or S84, and K4J

c - Lower timing cover with a timing flap



109052

❏ Remove the timing flap from the lower timing cover.

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

❏ Remove:

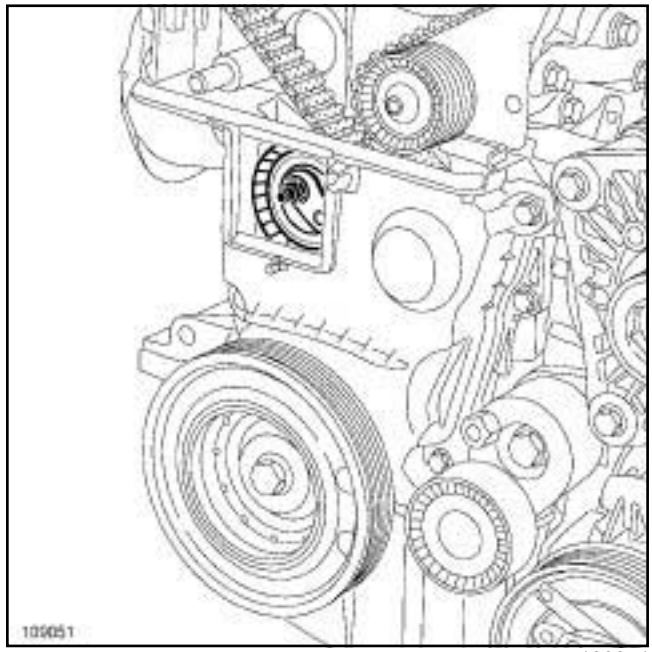
- the lifting eye bolt from the **(Mot. 1496)**,
- the **(Mot. 1496)** fitted with the **(Mot. 1750)**,
- the tool **(Mot. 1489)** from the cylinder block,
- the **(Mot. 1490-01)**.

4 - Checking the tension

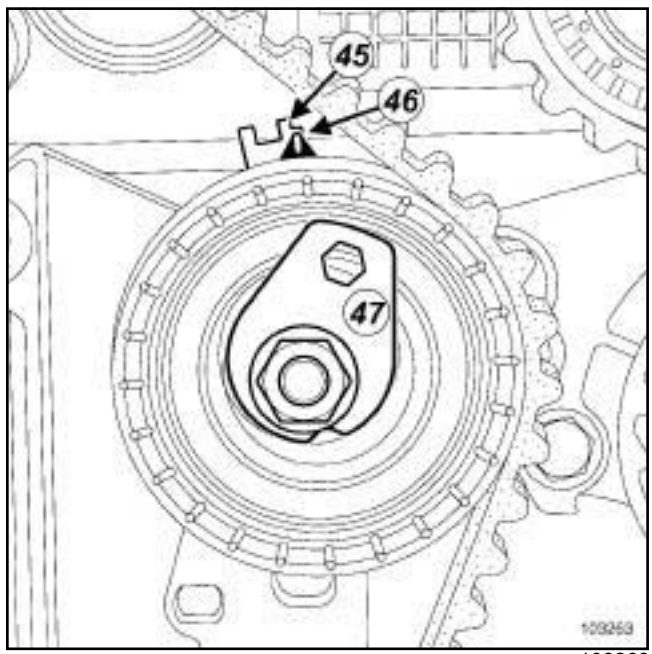
❏ Rotate the crankshaft twice clockwise at the timing end and before aligning the marks made previously by the operator (on the camshaft dephaser), screw the tool **(Mot. 1489)** into the cylinder block.

❏ Move the crankshaft slowly and smoothly until it comes into contact with the tool **(Mot. 1489)**.

❏ Remove the tool **(Mot. 1489)** from the cylinder block.



109051



103263

❏ Check that the adjustable index (**46**) is opposite the notch (**45**) , if this is not the case:

- loosen the timing tensioning roller nut by up to one turn while holding the eccentric with an Allen key,
- gradually move the adjustable index marker (**46**) opposite the mark (**45**) turning the eccentric cam (**47**) clockwise.

❏ Torque tighten the **timing tensioning roller nut (27 N.m)**.

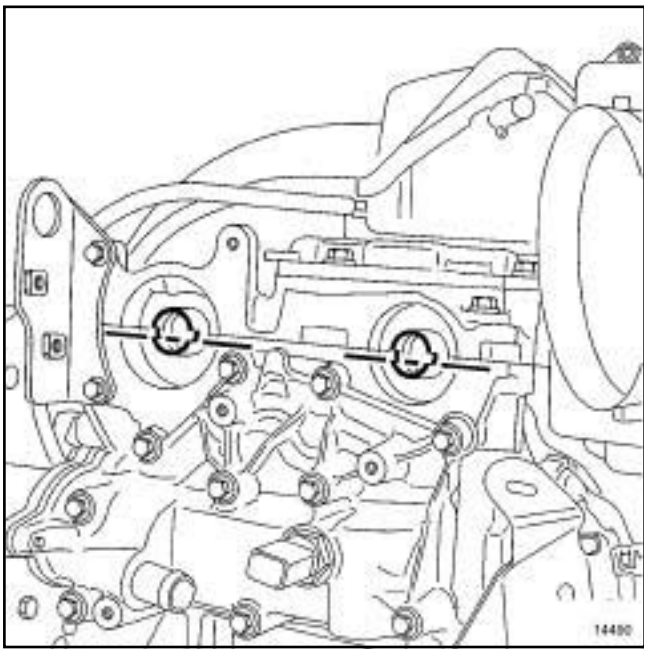
B84 or C84 or G84 or S84, and K4M, and 680 or 762 or 764 or 768 or 788 or 856 – B84 or C84 or G84 or K84 or L84 or S84, and K4J

5 - Checking the timing

❑ Ensure that the index and the notch on the timing tensioning roller are in the correct position before checking the timing.

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

❑ Move the crankshaft slowly and smoothly until it comes into contact with the tool **(Mot. 1489)**.



14490

❑ Position (without forcing) the tool **(Mot. 1496)** equipped with the tool **(Mot. 1750)** (the camshaft end grooves must be horizontal and offset downwards).

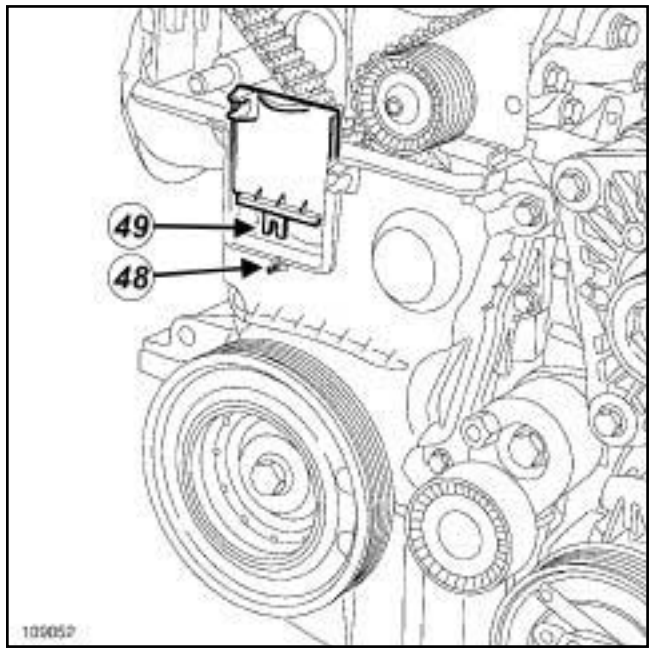
Note:

If the tool **(Mot. 1496)** equipped with the tool **(Mot. 1750)** cannot be engaged, readjust the timing and the tension.

❑ Remove:

- the timing tool **(Mot. 1496)** fitted with the **(Mot. 1750)**,
- the tool **(Mot. 1489)** from the cylinder block.

a - Lower timing cover with a timing flap



109052

❑ Refit the lower timing cover flap, checking that the locating pin (**48**) fits properly in the notch (**49**) .

b - Lower timing cover without a timing flap

❑ Refit the lower timing cover.

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

III - FINAL OPERATION

❑ Apply a drop of **SILICONE ADHESIVE SEALANT** (see **Vehicle: Parts and ingredients for the repairwork**) (04B, Consumables - Products) to the thread of the TDC setting pin plug.

❑ Tighten to torque the **TDC pin plug (20 N.m)**.

❑ Refit the upper timing cover.

❑ Torque tighten:

- the **upper timing cover bolts (46 N.m)**,
- the **upper timing cover nuts (46 N.m)**.

❑ Refit:

- a new inlet camshaft plug using the **(Mot. 1487)**,
- a new exhaust camshaft plug using the **(Mot. 1488)**,
- the eye for lifting the engine at the flywheel end.

❑ Torque tighten the **flywheel end lifting eye bolts (10 N.m)**.

B84 or C84 or G84 or S84, and K4M, and 680 or 762 or 764 or 768 or 788 or 856 – B84 or C84 or G84 or K84 or L84 or S84, and K4J

❏ Refit:

- the air resonator,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-4**) ,
- the engine undertray,
- the front section of 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 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).

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

F4R

Essential equipment
diagnostic tool

I - REMOVAL PREPARATION OPERATION

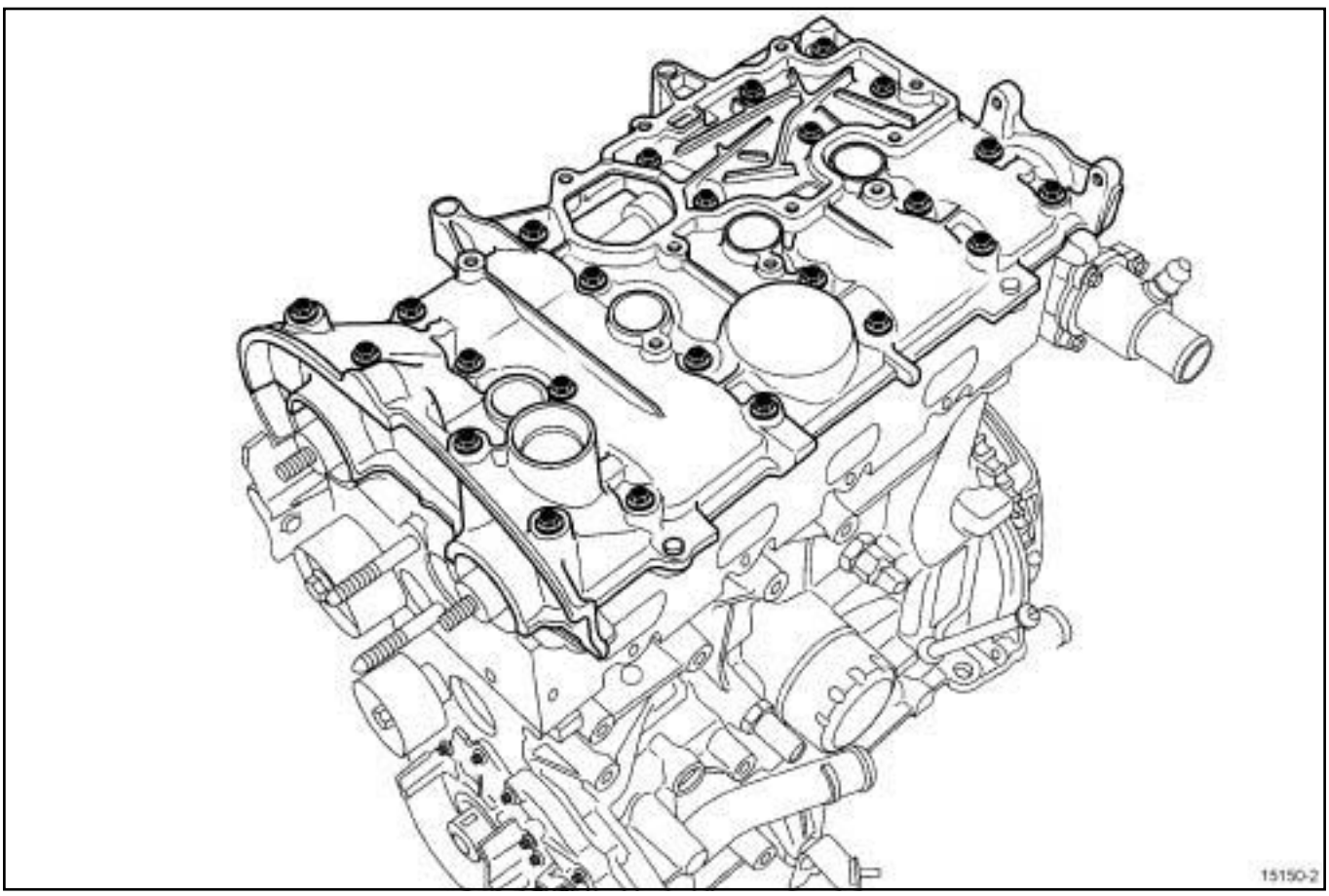
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 364, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 364, 80A, Battery).

❏ Remove:

- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-40**) ,
- the intake distributor (see **12A**, **Fuel mixture**, **Inlet manifold: Removal - Refitting**, page **12A-49**) ,
- the ignition coils (see **17A**, **Ignition**, **Coils Removal - Refitting**, page **17A-1**) ,
- the oil decanter (see **11A**, **Top and front of engine**, **Oil decanter: Removal - Refitting**, page **11A-301**) ,
- the battery (see **Battery: Removal - Refitting**) (MR 364, 80A, Battery),
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-11**) ,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 364, 35A, Wheels and tyres),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-4**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-18**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED

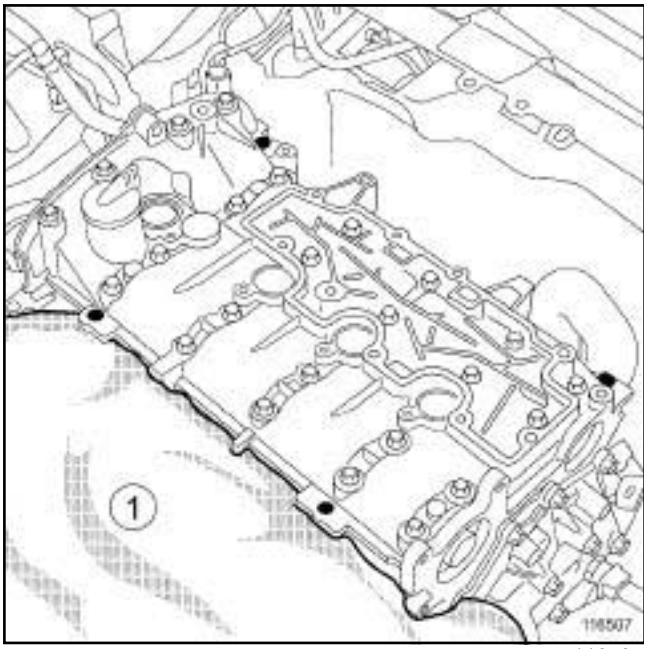


15150-2

❏ Undo all of the rocker cover bolts.

❏ Remove the rocker cover bolts.

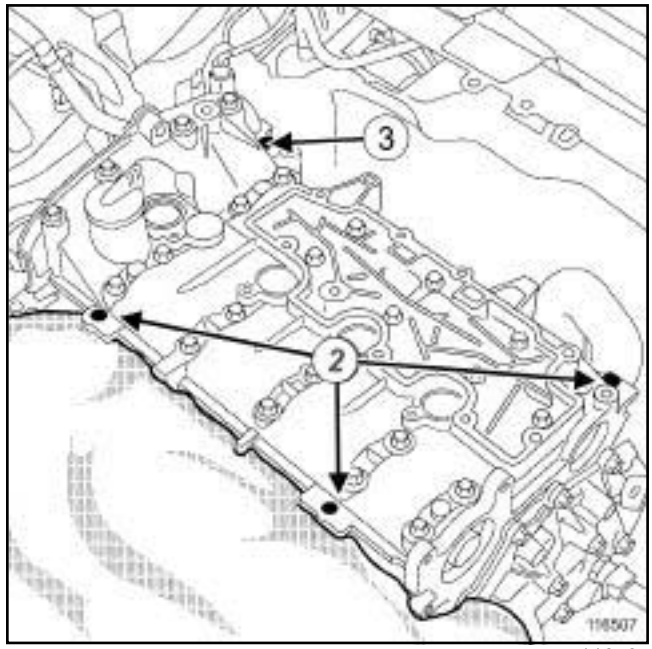
F4R



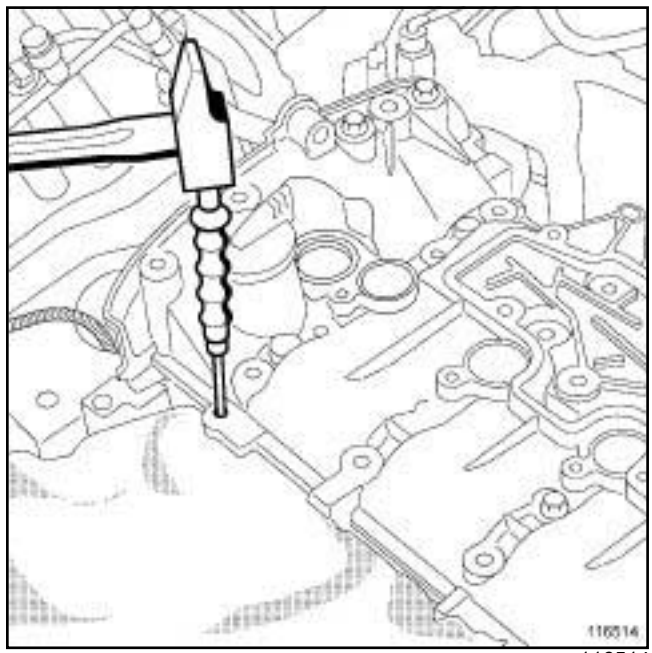
116507

❑ Using a clean cloth (**1**) , protect:

- the injector holder plate pipe openings to prevent any impurities from entering,
- the injector rail,
- the camshaft position sensor location.



116507



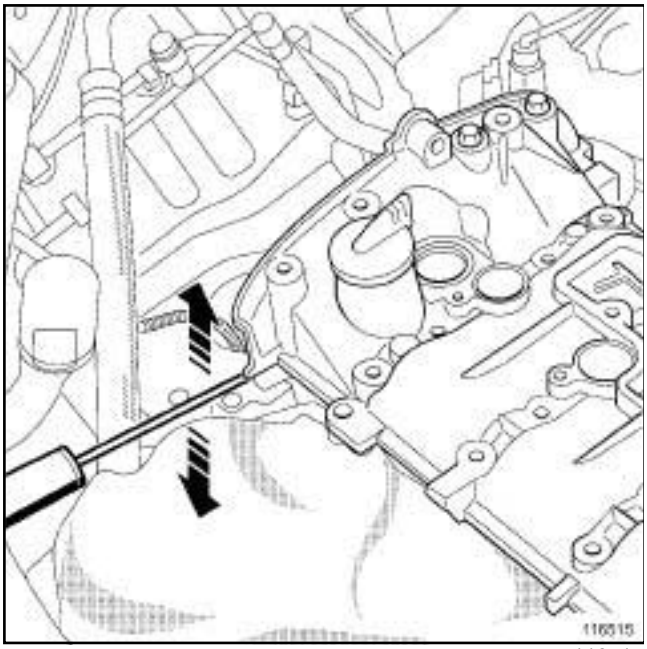
116514

❑ Remove the rocker cover centring devices (**2**) using a hammer and a drift to knock them downwards.

Note:

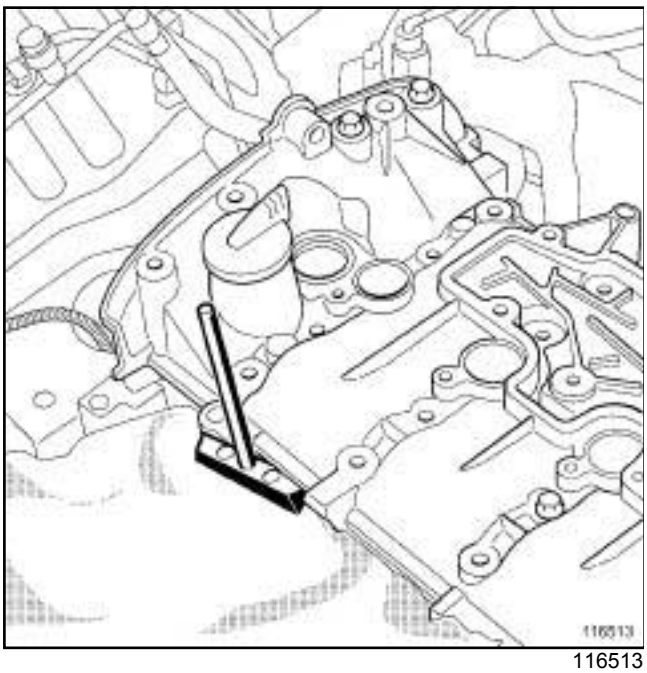
The centring device (**3**) must not be removed under any circumstances. Not following these instructions could damage the cylinder head.

F4R



116515

❑ Press a flat-blade screwdriver onto the injector holder plate and use it to gently remove the adhesive from the rocker cover.



116513

❑ Remove the rocker cover using the.

❑ Remove the rocker cover.

I - REFITTING PREPARATIONS OPERATION

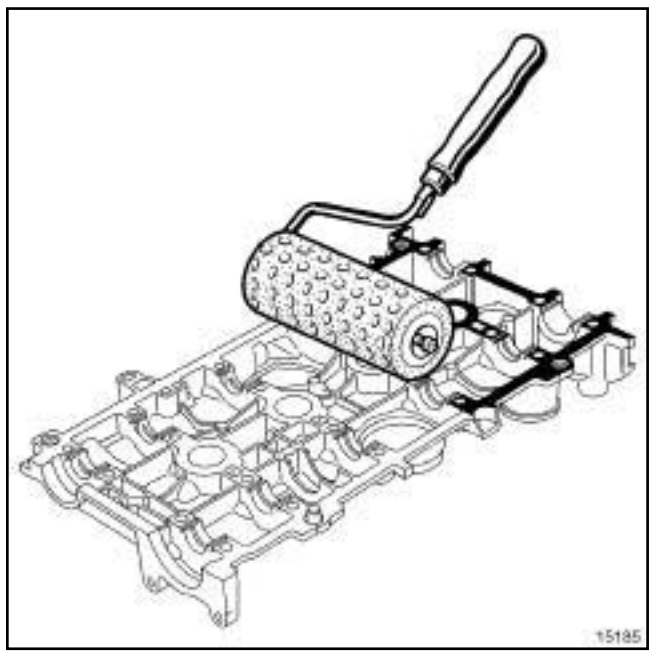
❑ Refit the centring devices on the cylinder head using a hammer and drift.

WARNING

The joint faces must be clean, dr y and free from grease (avoid f nger marks).

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

II - OPERATION FOR REFITTING PART CONCERNED



15185

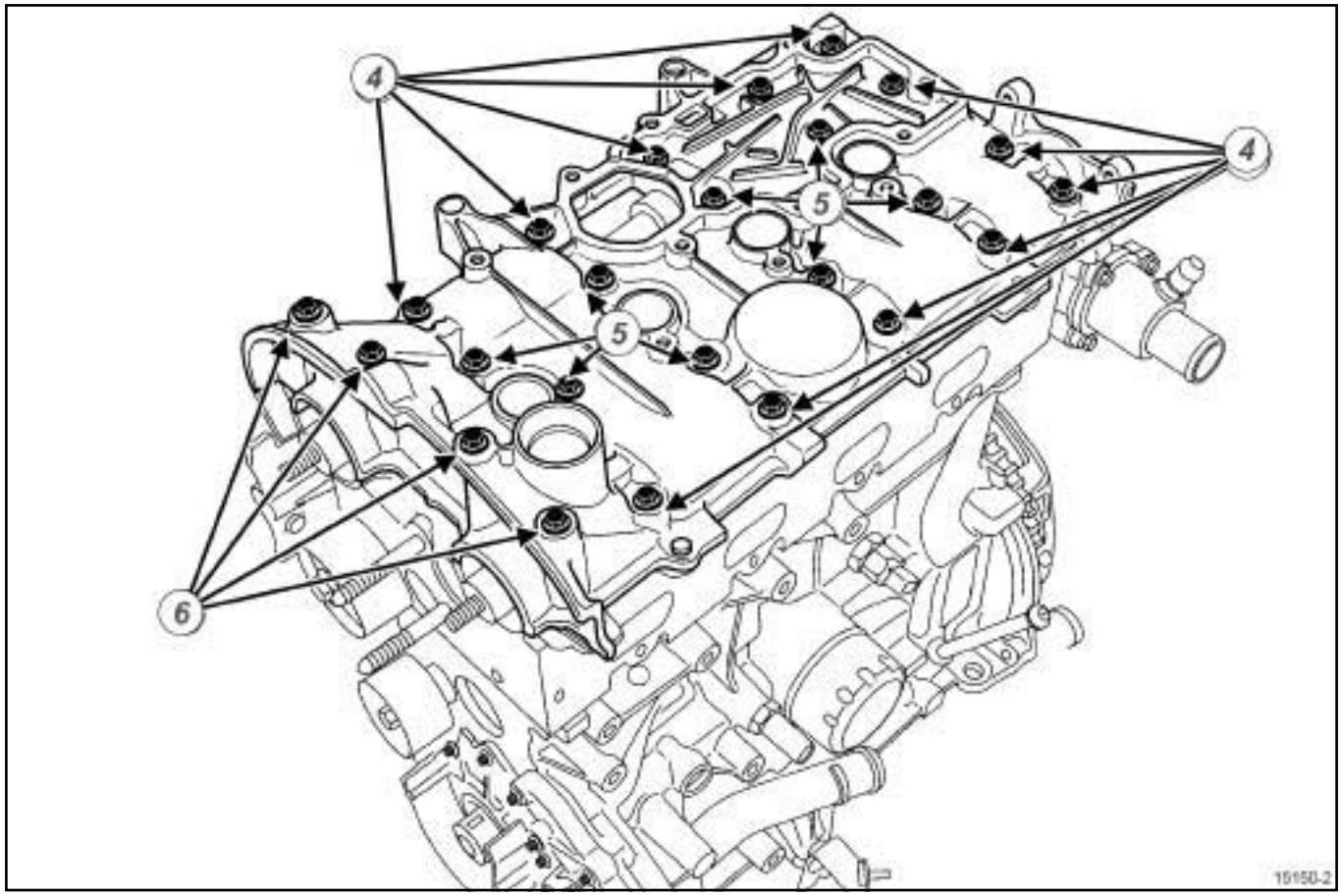
❑ Remove any **« RESIN ADHESIVE »** (see **Packaging**) (MR 364, 04B, Products-consumables) on the rocker cover bearings using a cloth.

❑ Apply some **« RESIN ADHESIVE »** to the rocker cover gasket face using a stipple roller.

❑ Fit the rocker cover.

F4R

Position of the bolts



15150-2

(**4**) « short » bolts

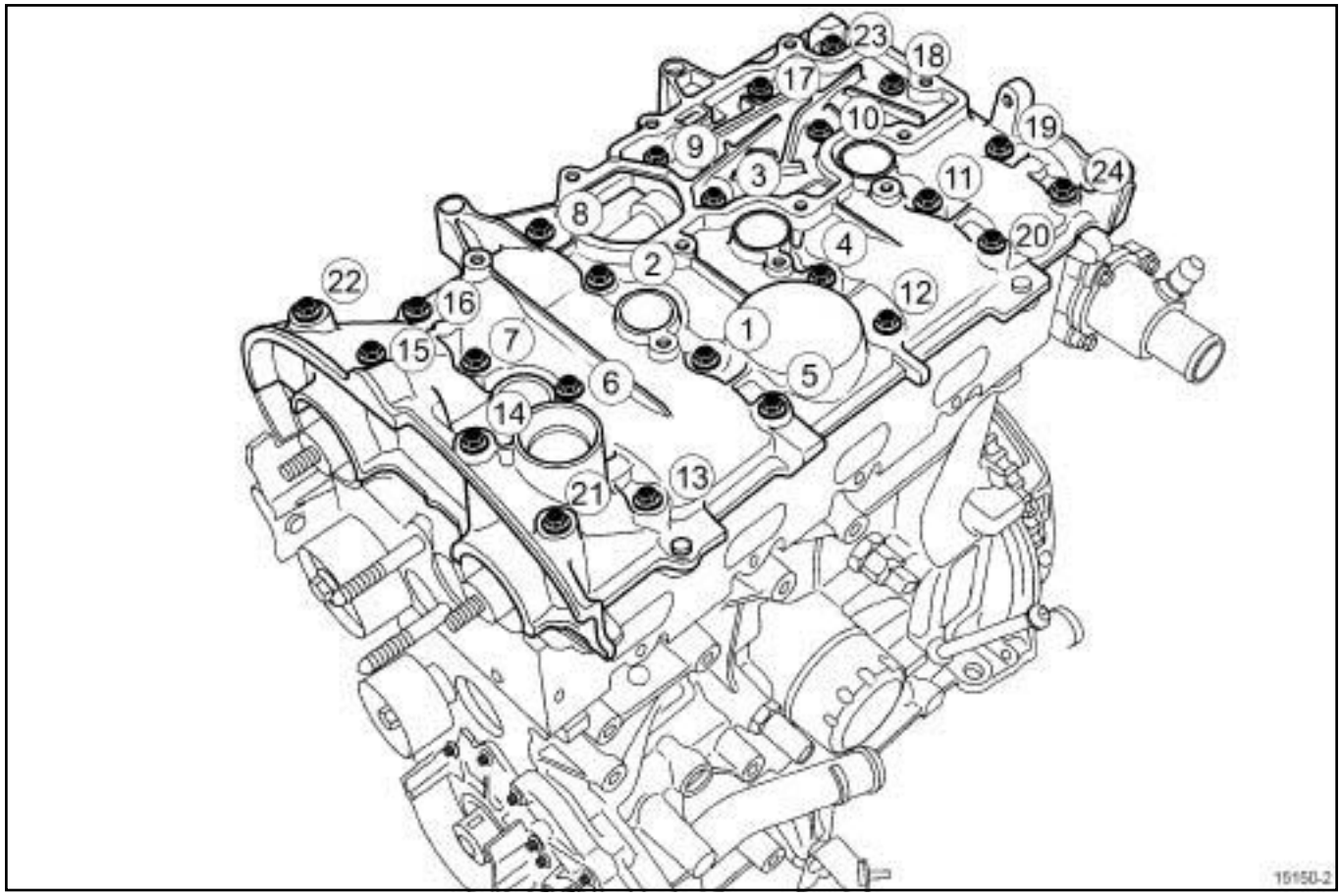
(**5**) « medium » bolts

(**6**) « long » bolts

❑ Position the rocker cover bolts.

F4R

Rocker cover bolt tightening order



15150-2

❑ Tighten to torque and in order the **rocker cover bolts** (**22**) , (**23**) , (**20**) , (**13**) **(8 Nm)** to correctly position the rocker cover.

❑ Tighten to torque and in order the **rocker cover bolts** (**1**) to (**12**) , (**14**) to (**19**) , (**21**) and (**24**) **(12 Nm)**.

❑ Tighten to torque and in order the rocker cover bolts (**22**) , (**23**) , (**20**) , (**13**) **(12 Nm)**.

III - FINAL OPERATION.

❑ Refit:

- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-18**) .
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-4**) .
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 364, 35A, Wheels and tyres),
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-11**) ,
- the oil decanter (see **11A**, **Top and front of engine**, **Oil decanter: Removal - Refitting**, page **11A-301**) ,
- the ignition coils (see **17A**, **Ignition**, **Coils Removal - Refitting**, page **17A-1**) ,
- the intake distributor (see **12A**, **Fuel mixture**, **Inlet manifold: Removal - Refitting**, page **12A-49**) ,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-40**) .

❑ Connect the battery (see **Battery: Removal - Refitting**) (MR 364, 80A, Battery).

❑ Using the **diagnostic tool**, check that there are no faults stored by the injection computer and clear them if necessary.

F4R, and 774 or 776

REMOVAL

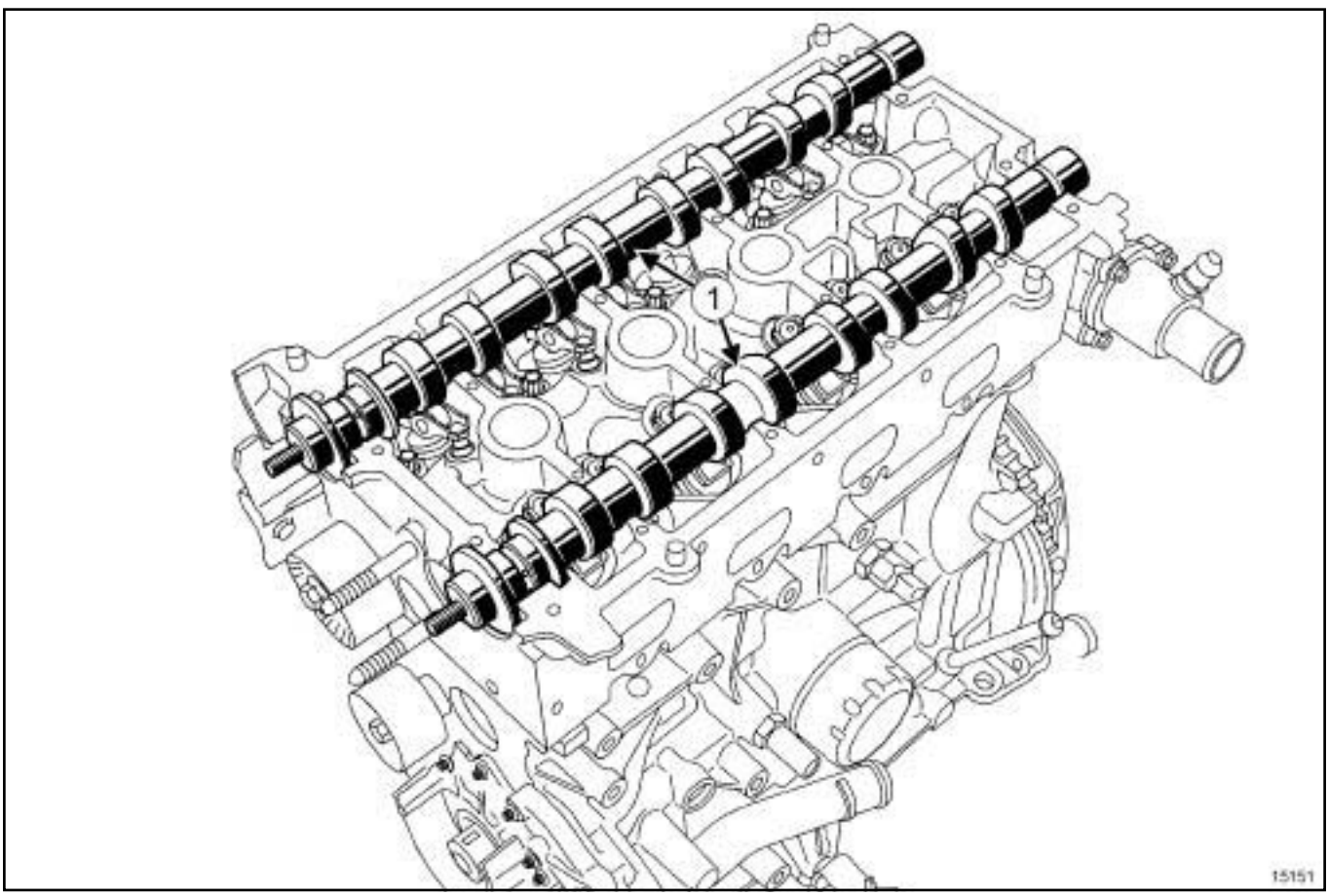
I - REMOVAL PREPARATION OPERATION

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

❑ Remove:

- the engine covers,
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-11**) ,
- 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 throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-40**) ,
- the inlet distributor (see **12A**, **Fuel mixture**, **Inlet manifold: Removal - Refitting**, page **12A-49**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-4**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-18**) ,
- the coils (see **17A**, **Ignition**, **Coils Removal - Refitting**, page **17A-1**) ,
- the oil separator (see **11A**, **Top and front of engine**, **Oil decanter: Removal - Refitting**, page **11A-301**) ,
- the rocker cover (see **11A**, **Top and front of engine**, **Rocker cover: Removal - Refitting**, page **11A-158**) .

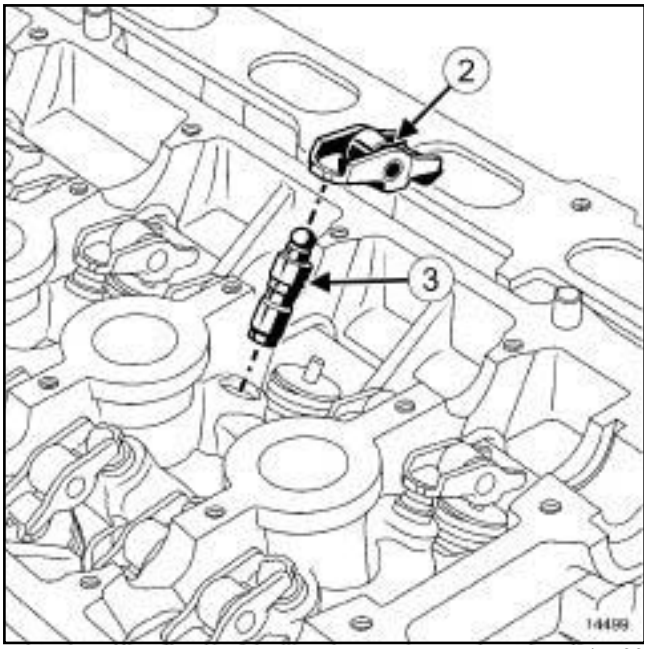
II - OPERATION FOR REMOVAL OF PART CONCERNED



15151

❑ Remove the camshafts (**1**) .

F4R, and 774 or 776



14499

❑ Remove:

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

Note:

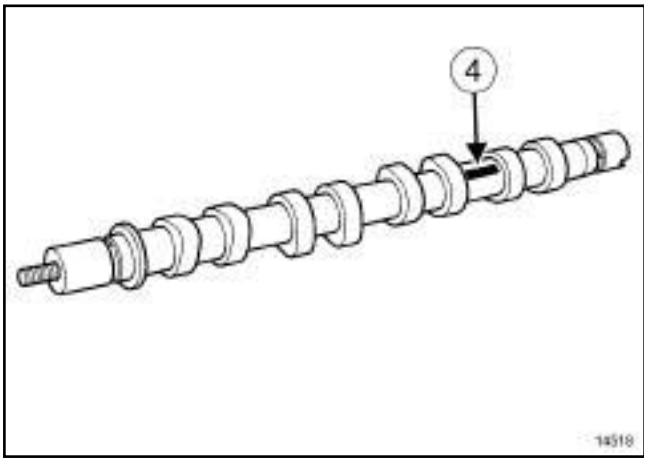
To prevent any risk of unpriming the hydraulic tappets make sure that they are vertical.

F4R, and 774 or 776

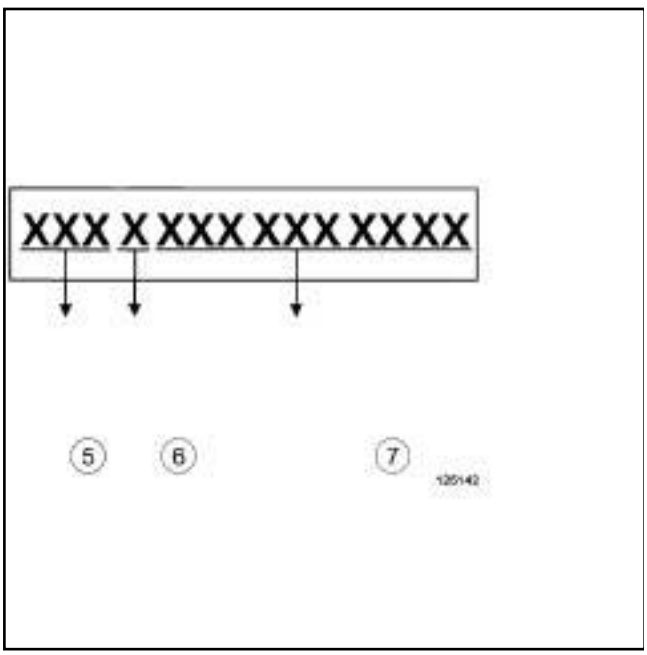
REFITTING

I - REFITTING PREPARATION OPERATION

Camshaft marking



14518



125579

❏ The camshafts can be identified by a marking at (**4**) :

- the mark (**5**) corresponds to the engine type,
- the mark (**6**) serves to distinguish the inlet camshaft from the exhaust camshaft:
- A: Inlet
- E: Exhaust
- The mark (**7**) is for the supplier's use only.

Note:

If the exhaust camshaft stud is loosened (see **11A**, **Top and front of engine**, **Camshaft: Removal - Refitting**, page **11A-172**) (Technical Note 3884A, Replacing F4 camshaft pulley studs).

Note:

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

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

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-158**) ,
- the oil separator (see **11A**, **Top and front of engine**, **Oil decanter: Removal - Refitting**, page **11A-301**) ,
- the coils (see **17A**, **Ignition**, **Coils Removal - Refitting**, page **17A-1**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-18**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-4**) ,
- the inlet distributor (see **12A**, **Fuel mixture**, **Inlet manifold: Removal - Refitting**, page **12A-49**) ,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-40**) ,

F4R, and 774 or 776

- 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 unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-11**) ,
- the battery (see **Battery : Removal - Refitting**) (80A, Battery),
- the engine covers.

B84 or C84 or E84 or K84 or L84, and F4R

REMOVAL

❏ Remove the « engine and gearbox » assembly (see **10A**, **Engine and cylinder block assembly**, **Engine/gearbox assembly: Removal - Refitting**, page **10A-97**) .

Note:

Removal and refitting of the turbocharger requi res careful application of the repair procedures to ensure that the system is sealed correctly . Failure to comply with these instr uctions may have serious safety-related consequences for the driver.

❏ Remove the cylinder head (see **Cylinder head: Removal - Refitting**) (Technical Note 6027A, 10A, Engine and peripherals).

REFITTING

❏ Refit the cylinder head (see **Cylinder head: Removal - Refitting**) (Technical Note 6027A, 10A, Engine and peripherals).

❏ Refit the « engine and gearbox» assembly (see **10A**, **Engine and cylinder block assembly**, **Engine/gearbox assembly: Removal - Refitting**, page **10A-97**) .

B84 or C84 or E84 or K84 or L84, and K4M, and 764 or 768 or 788 or 856 – B84 or C84 or E84 or K84 or L84, and K4J

Essential special tooling	
Mot. 1672	Lower engine support.
Mot. 1453	Multiple-adjusting engine mounting support with retaining straps.
Mot. 1453-01	Additional winder nut on engine lift support Mot. 1453.
Mot. 1490-01	Locking and adjusting camshaft pulleys.
Mot. 1573	Cylinder head support
Mot. 104	Cylinder head aligning tool
Ele. 1382	Set of plug wrenches 16 & 21 mm torque 17.5 & 28 N.m + square adapter 9-9.52 for wrench Ele. 1086
Mot. 1491	Camshaft oil seal fitting tool.
Mot. 1632	Tool for fitting PTFE camshaft seal
Mot. 1487	Tool for removing the camshaft covers (57 mm diameter).
Mot. 1488	Tool for removing the camshaft covers (43 mm diameter).

Essential equipment
cylinder head testing tool

Tightening torques ▽	
cylinder head bolts	**20 Nm**
cylinder head bolts	**240° ± 6°**
rocker cover bolts 22, 23, 20 and 13	**8 Nm**
rocker cover bolts 1 to 12, 14 to 19, 21 to 24	**12 Nm**
rocker cover bolts 22, 23, 20 and 13	**12 Nm**
(new) oil decanter bolts in the untapped housing	**15 Nm**
(new or original) oil decanter bolts in the tapped housing	**10 Nm**
spark plugs	**25 to 30 Nm**
coil bolts (if holes already tapped)	**12 Nm**
coil bolts (if holes not tapped)	**15 Nm**
intake distributor bolts	**9 Nm**

REMOVAL

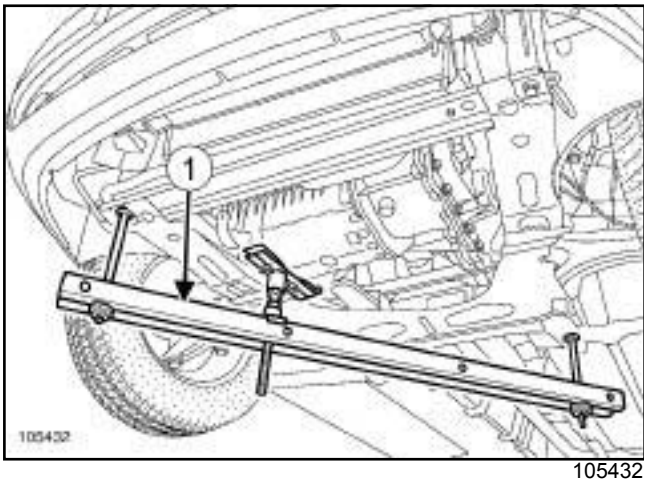
❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 364, 02A, Lifting equipment).

❑ Remove:

- the battery (see **Battery: Removal - Refitting**) (MR 364, 80A, Battery),
- the engine covers,
- the engine undertray,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-4**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-18**) ,
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 365, 55A, Exterior protection).

❑ Drain the engine cooling system (see **19A**, **Cooling**, **Cooling circuit: Draining - Refilling**, page **19A-15**) .

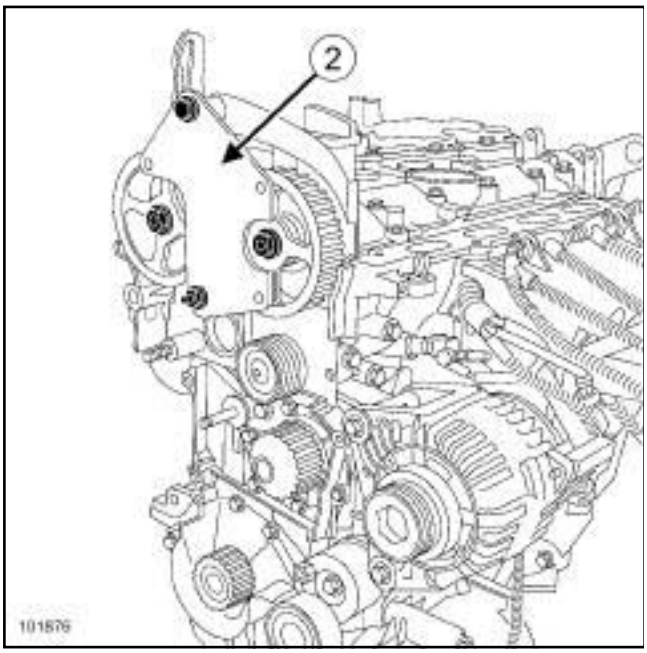
B84 or C84 or E84 or K84 or L84, and K4M, and 764 or 768 or 788 or 856 – B84 or C84 or E84 or K84 or L84, and K4J



105432

❏ Fit the engine mounting **(Mot. 1672)**.

❏ Remove the **(Mot. 1453)** then the **(Mot. 1453-01)**.



101876

❏ Remove the camshaft pulleys using the camshaft pulley locking tool (**2**) **(Mot. 1490-01)**.

❏ If the camshaft sprocket stud loosens with the nut, if necessary see (**Camshaft)** (Technical Note 3887A, 11A, Top and front of engine).

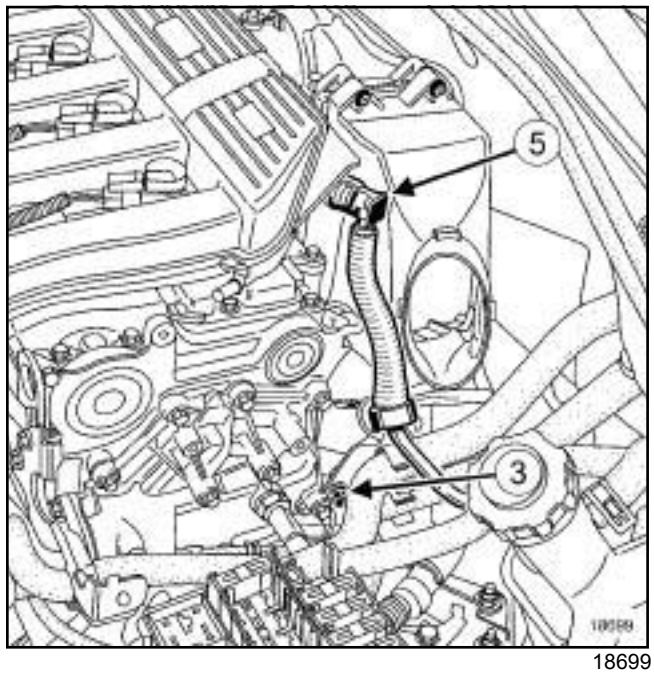
Note:

Be careful of petrol splashing out when disconnecting the fuel supply union.

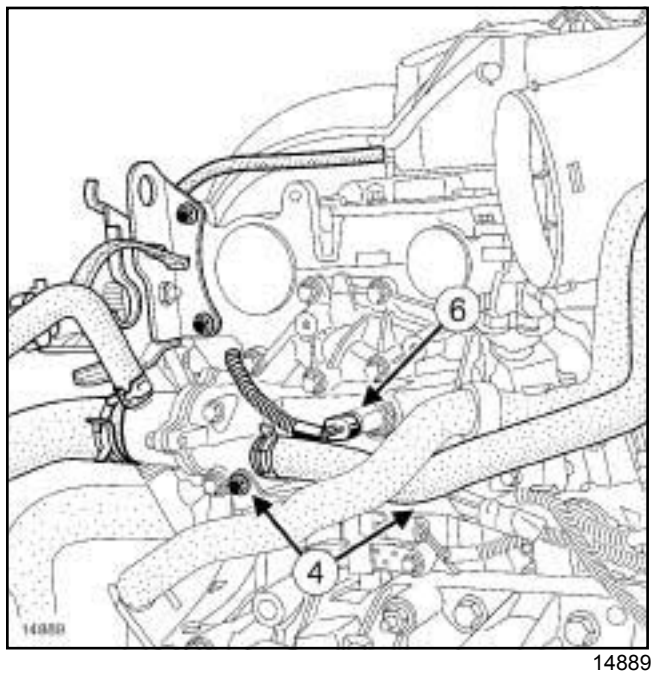
❏ Remove:

- the injection rail protector,
- the fuel supply pipe from the injection rail.

❏ Move the fuel supply pipe aside.



18699



14889

❏ Remove the bracket bolt (**3**) .

❏ Move the bracket to one side.

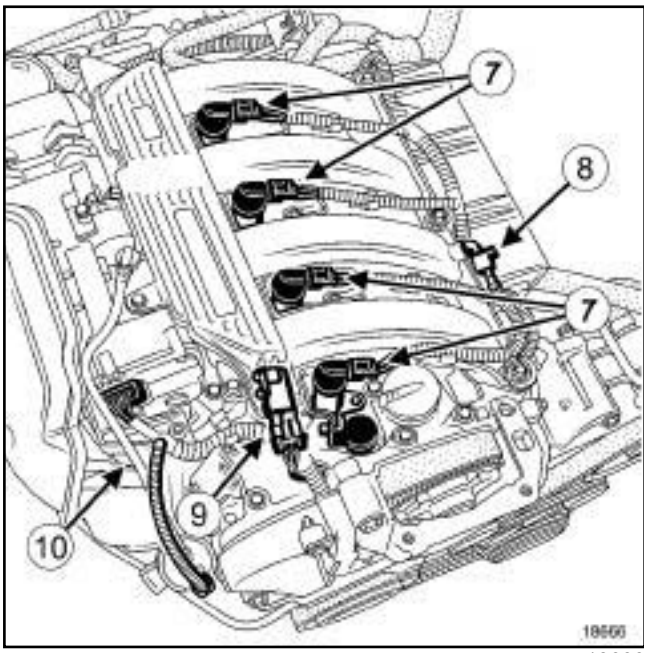
❏ Remove the electric wiring harness bracket bolt (**4**) .

❏ Disconnect:

- the brake servo vacuum pipe (**5**) from the intake distributor,
- the coolant temperature sensor connector (**6**) ,
- the water chamber hoses.

B84 or C84 or E84 or K84 or L84, and K4M, and 764 or 768 or 788 or 856 – B84 or C84 or E84 or K84 or L84, and K4J

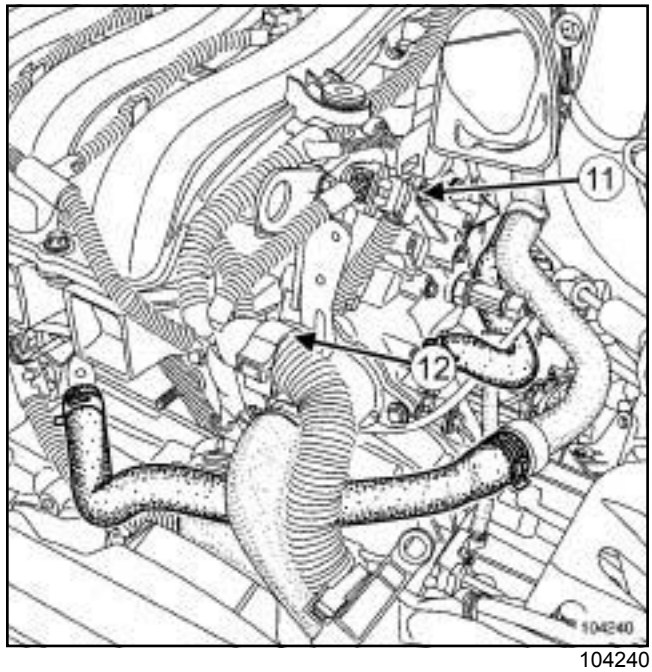
❏ Move the bracket/wiring harness assembly aside.



18666

❏ Disconnect:

- the ignition coil connectors (**7**) ,
- the connector (**8**) from the air temperature sensor,
- the intake distributor pressure sensor connector (**9**) ,
- the fuel vapour recirculation solenoid valve pipe (**10**) ,
- the catalytic converter upstream oxygen sensor connector.



104240

❏ Disconnect the injector connector (**11**) .

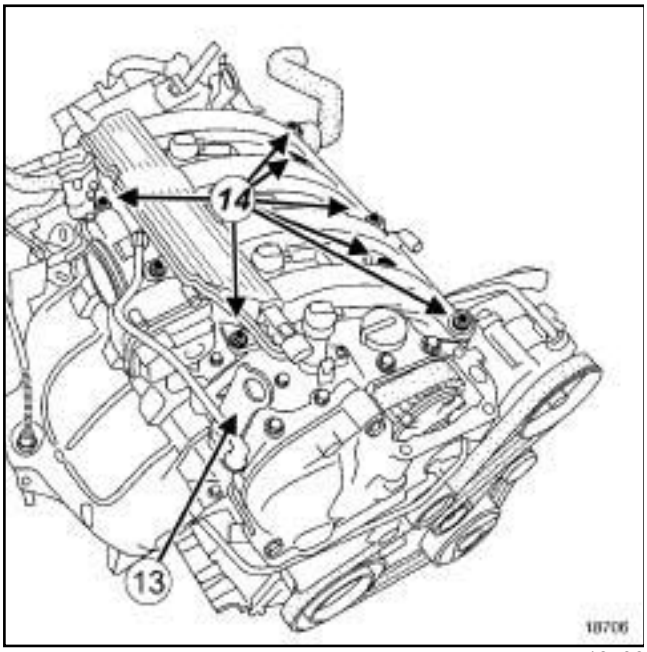
❏ Unfasten clip (**12**) .

❏ Move the wiring harness to one side.

❏ Remove:

- the ignition coils,
- the plugs,
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-11**) ,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-40**) .

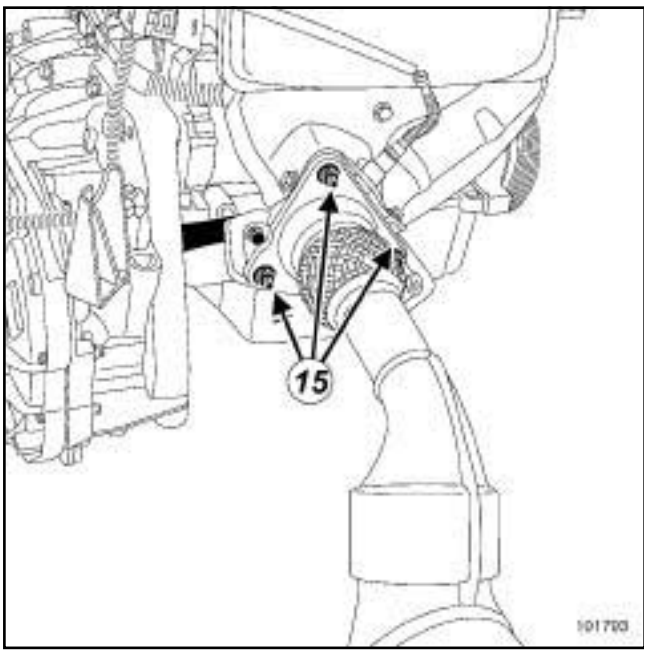
B84 or C84 or E84 or K84 or L84, and K4M, and 764 or 768 or 788 or 856 – B84 or C84 or E84 or K84 or L84, and K4J



18706

❏ Remove:

- the lifting bracket (**13**) ,
- the intake distributor bolts (**14**) ,
- the intake distributor.

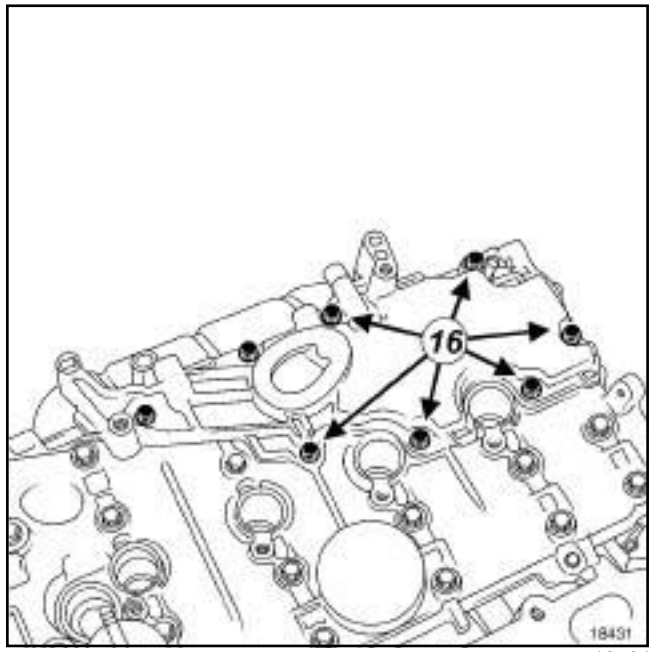


101793

❏ Remove:

- the gearbox - catalytic converter stay bolts,
- the catalytic converter/gearbox stay,
- the nuts (**15**) from the exhaust pipe.

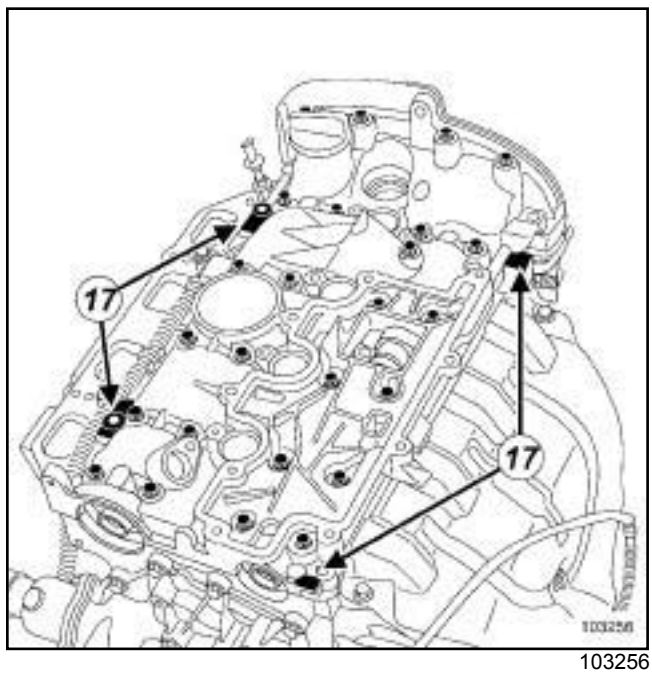
❏ Move the exhaust pipe aside.



18431

❏ Remove:

- the bolts (**16**) from the oil decanter,
- the oil separator.



103256

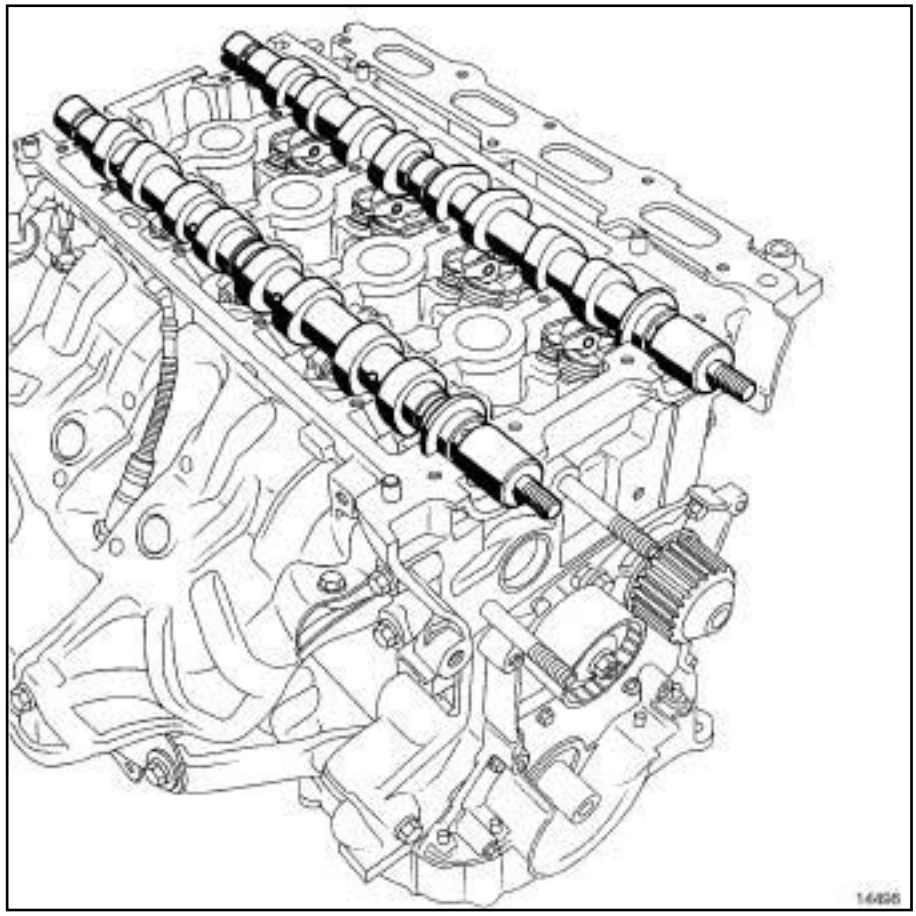
❏ Remove the rocker cover bolts.

❏ Remove the rocker cover vertically by tapping the lugs (**17**) with a copper hammer.

Note:

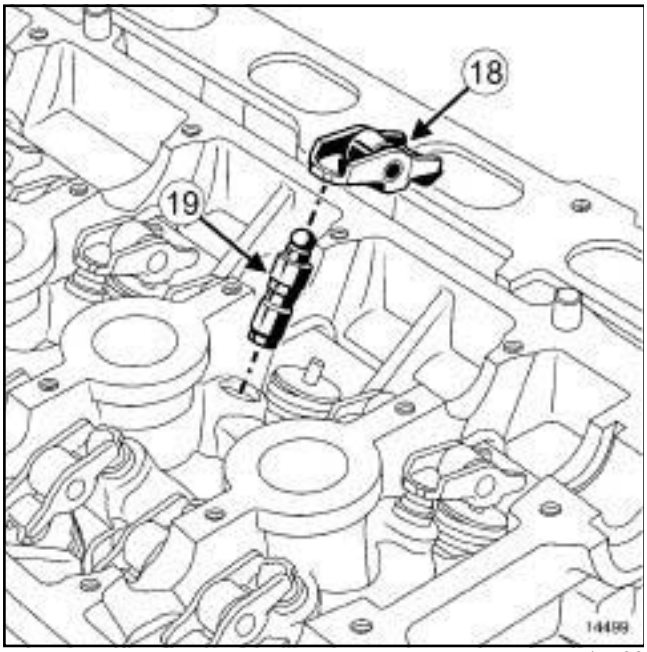
Do not damage the aluminium surfaces.

B84 or C84 or E84 or K84 or L84, and K4M, and 764 or 768 or 788 or 856 – B84 or C84 or E84 or K84 or L84, and K4J


14498

❑ Remove the inlet and exhaust camshafts.

B84 or C84 or E84 or K84 or L84, and K4M, and 764 or 768 or 788 or 856 – B84 or C84 or E84 or K84 or L84, and K4J



14499

❑ Remove:

- the valve rockers (**18**) ,
- the hydraulic tappets (**19**) .

Note:

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

❑ Remove:

- the cylinder head bolts,
- the cylinder head.

❑ Mount the cylinder head on the cylinder head support **(Mot. 1573)**.

❑ Remove the cylinder head gasket from the cylinder block.

I - CLEANING THE CYLINDER HEAD

❑

IMPORTANT
Wear latex gloves during the operation.

IMPORTANT
Wear goggles with side protectors for this operation.

WARNING
Do not scratch the aluminium joint faces: any surface damage to the joint faces may cause leaks.

❑ Clean the joint faces with **SUPER CLEANER FOR JOINT FACES** (see **Vehicle: Parts and ingredients for the repairwork**) (MR 364, 04B, Consumables - Products) to dissolve any part of the seal still remaining on the sump and cylinder block.

❑ Apply the product to the section to be cleaned; Wait approximately ten minutes, then remove the residue using a wooden spatula.

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.

II - CHECKING THE GASKET FACE

❑ Use a ruler and set of feeler gauges to check that there is no gasket face bow.

Maximum distortion: **0.05 mm**

WARNING
No regrinding of the cylinder head is permitted.

❑ Test the cylinder head to detect any possible cracks using **cylinder head testing tool**.

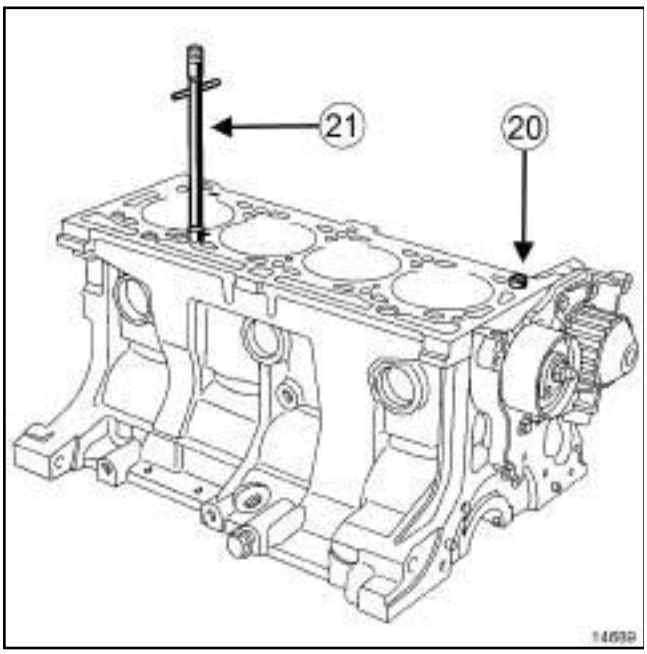
❑ For the procedure for stripping down the cylinder head (see **Cylinder head: stripping - rebuilding** (Technical Note 6023A, 10A, Engine and peripherals).

B84 or C84 or E84 or K84 or L84, and K4M, and 764 or 768 or 788 or 856 – B84 or C84 or E84 or K84 or L84, and K4J

❏ Position the pistons at mid-stroke to prevent any contact with the valves when refitting the camshafts.

❏ It is imperative to degrease:

- the cylinder head combustion face,
- the cylinder block combustion face.



14689

❏ Check that the centring dowel (**20**) is on the cylinder block.

❏ Set up the **(Mot. 104)** (**21**) on the cylinder block.

REFITTING

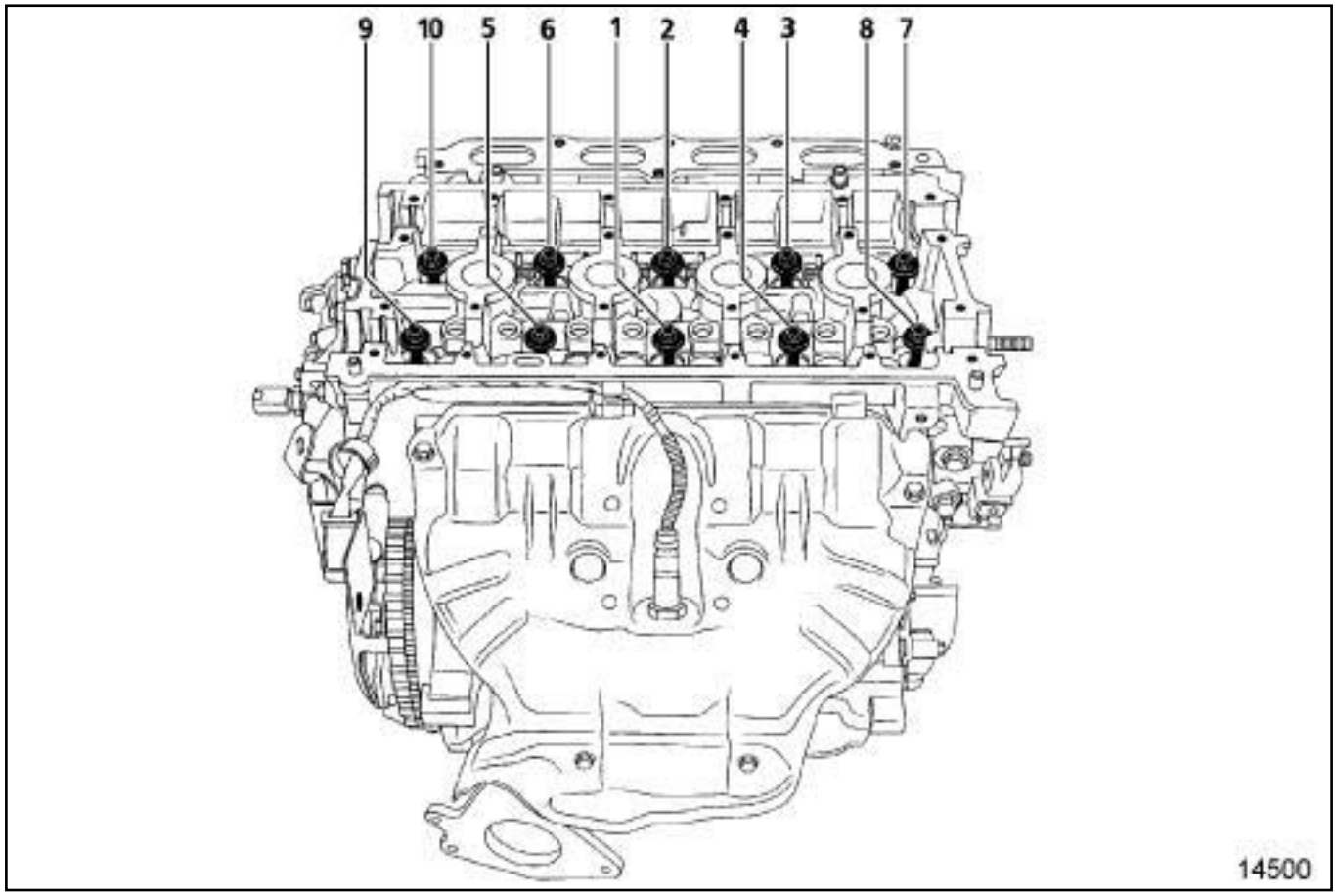
❏ Fit the new cylinder head gasket.

❏ Refit the cylinder head.

WARNING
In order to ensure that the bolts are correctly tightened, use a syringe to remove any oil which may be in the cylinder head holes.

WARNING
Do not oil the new bolts. The bolts must be oiled if reused.

B84 or C84 or E84 or K84 or L84, and K4M, and 764 or 768 or 788 or 856 – B84 or C84 or E84 or K84 or L84, and K4J



14500

❑

WARNING
The joint faces must be clean, dry and free from grease (avoid finger marks).

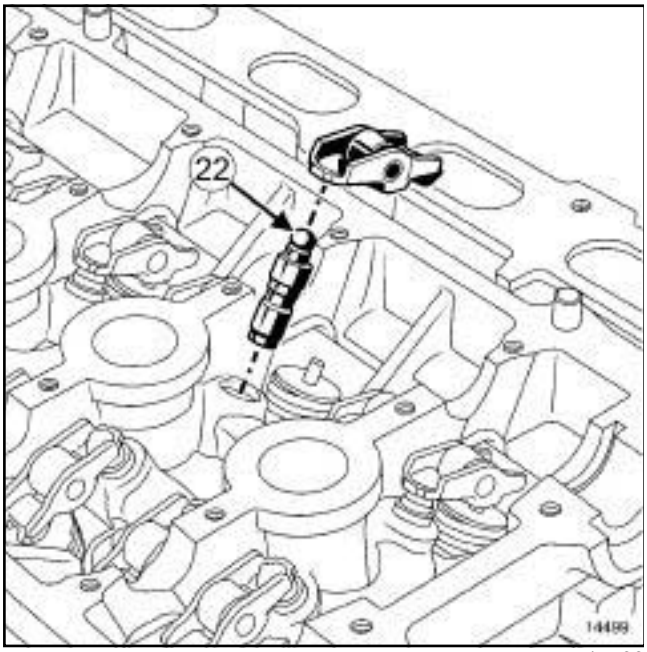
❑ Tighten to torque and in order the **cylinder head bolts (20 Nm)**.

❑ Check that all of the cylinder head bolts are tightened to the correct torque **(20 Nm)**.

❑ Angle tighten in order the **cylinder head bolts (240° ± 6°)**.

WARNING
Do not retighten the cylinder head bolts after applying this procedure.

B84 or C84 or E84 or K84 or L84, and K4M, and 764 or 768 or 788 or 856 – B84 or C84 or E84 or K84 or L84, and K4J



14499

❑ Reprime the hydraulic tappets (hydraulic tappets may empty after a long down time).

To check if repriming is necessary, press the top of the tappet (**22**) with your thumb.

If the tappet piston depresses:

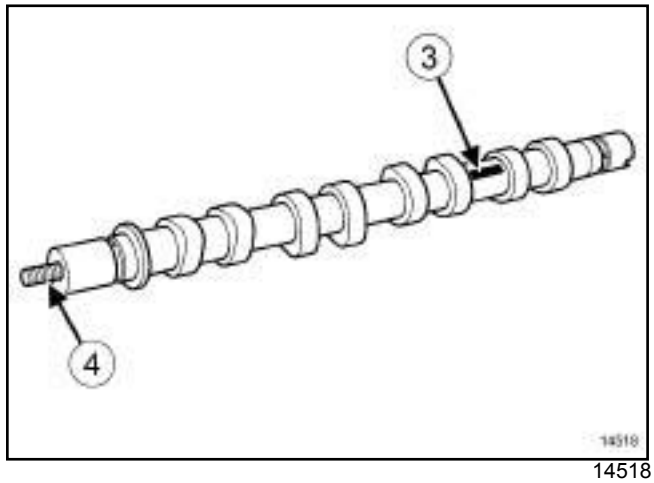
- immerse the tappets in a container of diesel fuel,
- refit the hydraulic tappets.

❑ Refit:

- the valve rockers,
- the camshafts, oiling the bearings.

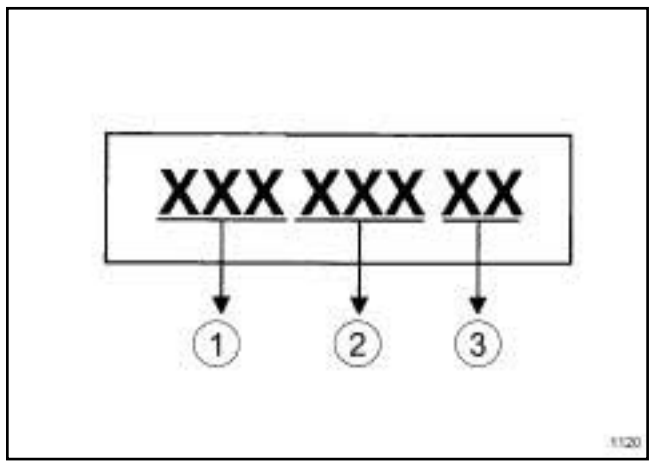
I - CAMSHAFT MARKING

IDENTIFICATION OF THE CAMSHAFTS



14518

❑ The camshaft can be identified by an etching (**3**) .



1120

❑ Marks (**1**) and (**2**) are for the supplier's use only.

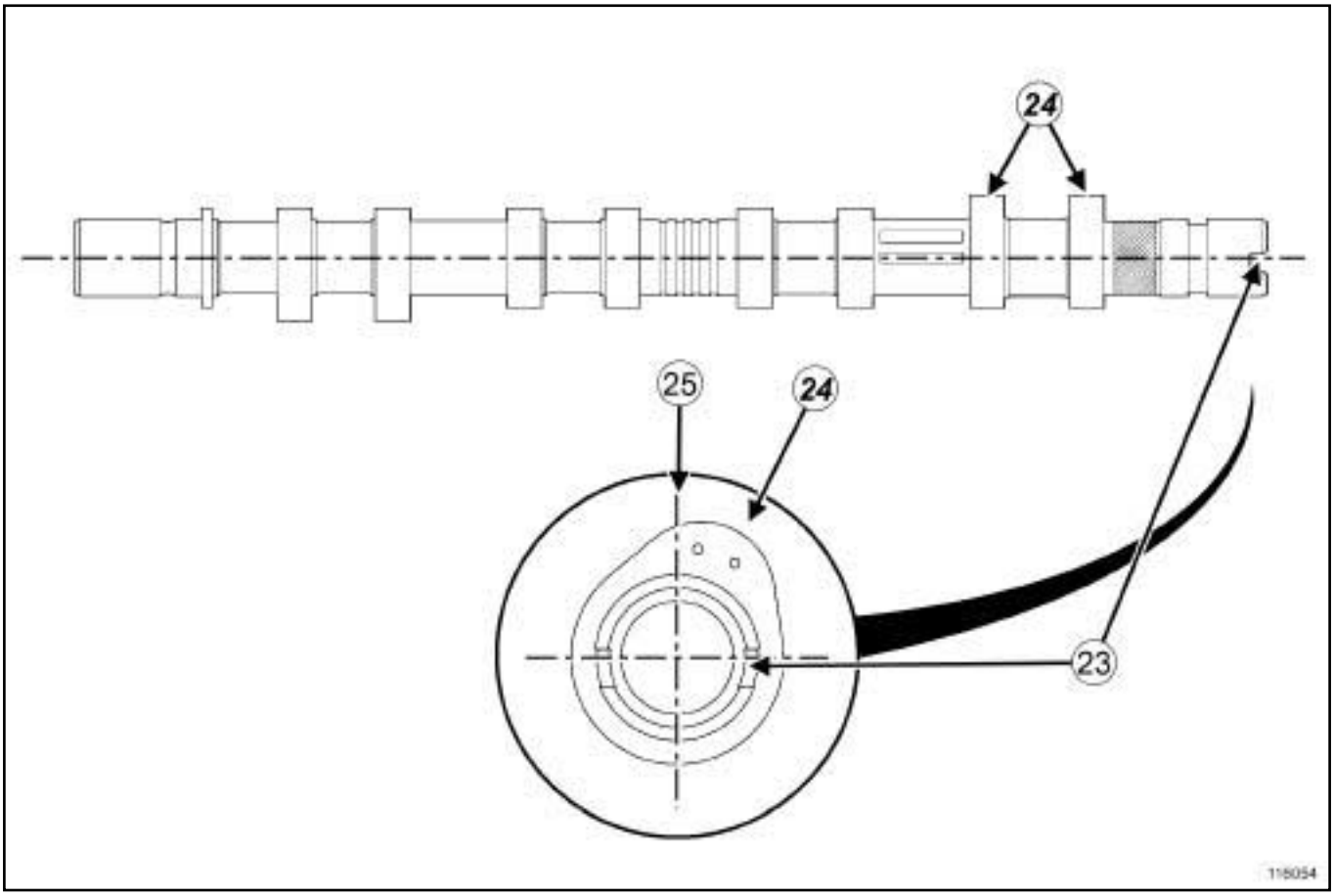
❑ Mark (**3**) identifies the camshafts:

- AM = Inlet,
- EM = Exhaust.

❑ The camshaft dowel ***(4)*** must be replaced if the dowel loosens with the nut (see **Camshaft**) (Technical Note 3887A, 11A, Top and front of engine).

B84 or C84 or E84 or K84 or L84, and K4M, and 764 or 768 or 788 or 856 – B84 or C84 or E84 or K84 or L84, and K4J

Inlet camshaft:



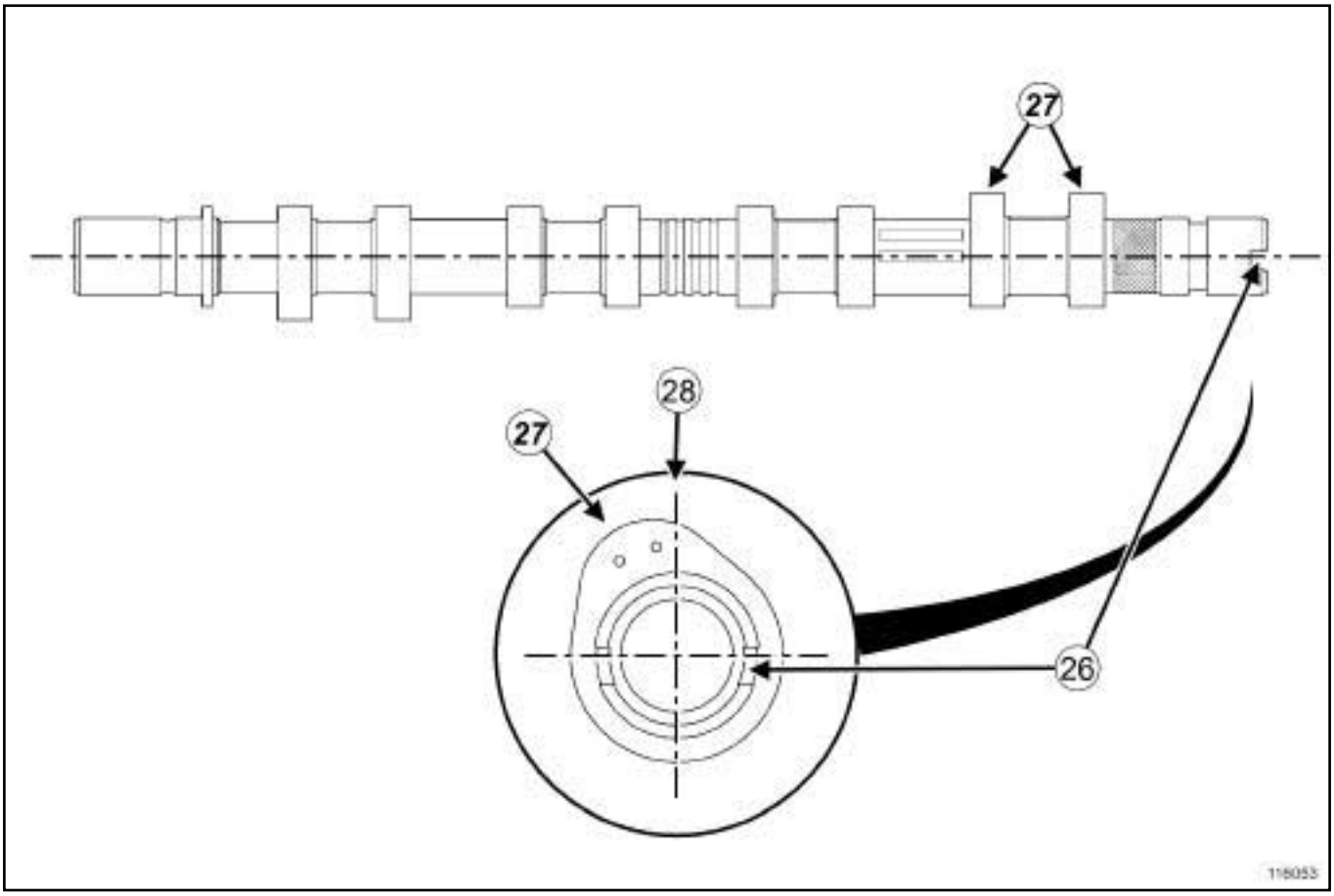
116054

❑ Position the groove (**23**) horizontally in the end of the camshaft (groove below the centre line of the camshaft).

The cams (**24**) for cylinder no. 1 must be located to the right of the vertical axis (**25**) , flywheel end view.

B84 or C84 or E84 or K84 or L84, and K4M, and 764 or 768 or 788 or 856 – B84 or C84 or E84 or K84 or L84, and K4J

Outlet camshaft:

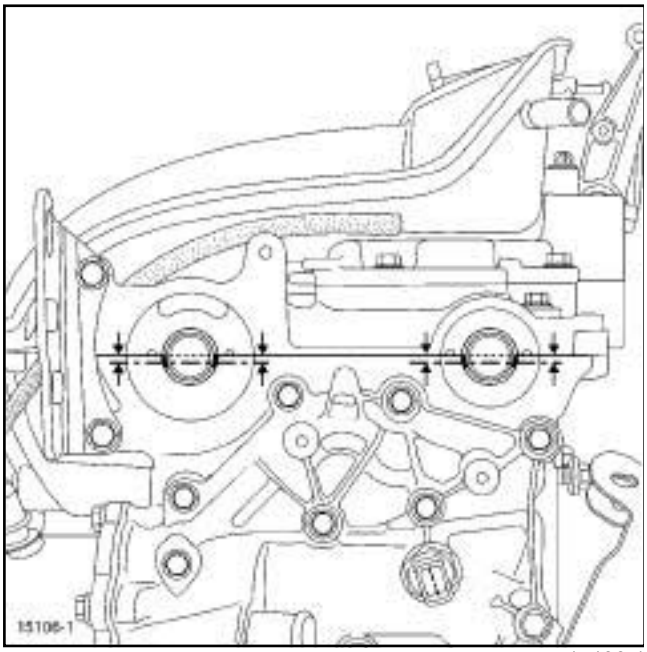


116053

❑ Position the groove (**26**) horizontally in the end of the camshaft (groove below the centre line of the camshaft).

The cams (**27**) for cylinder no. 1 must be located to the left of the vertical axis (**28**) , flywheel end view.

B84 or C84 or E84 or K84 or L84, and K4M, and 764 or 768 or 788 or 856 – B84 or C84 or E84 or K84 or L84, and K4J

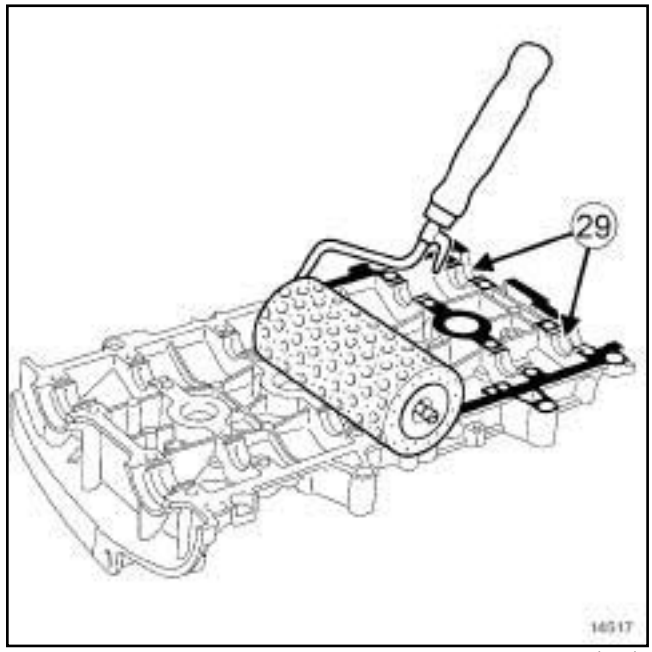


15106-1

❑ Position the camshaft grooves horizontally and offset downwards.

WARNING
The joint faces must be clean, dry and free from 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.).



14517

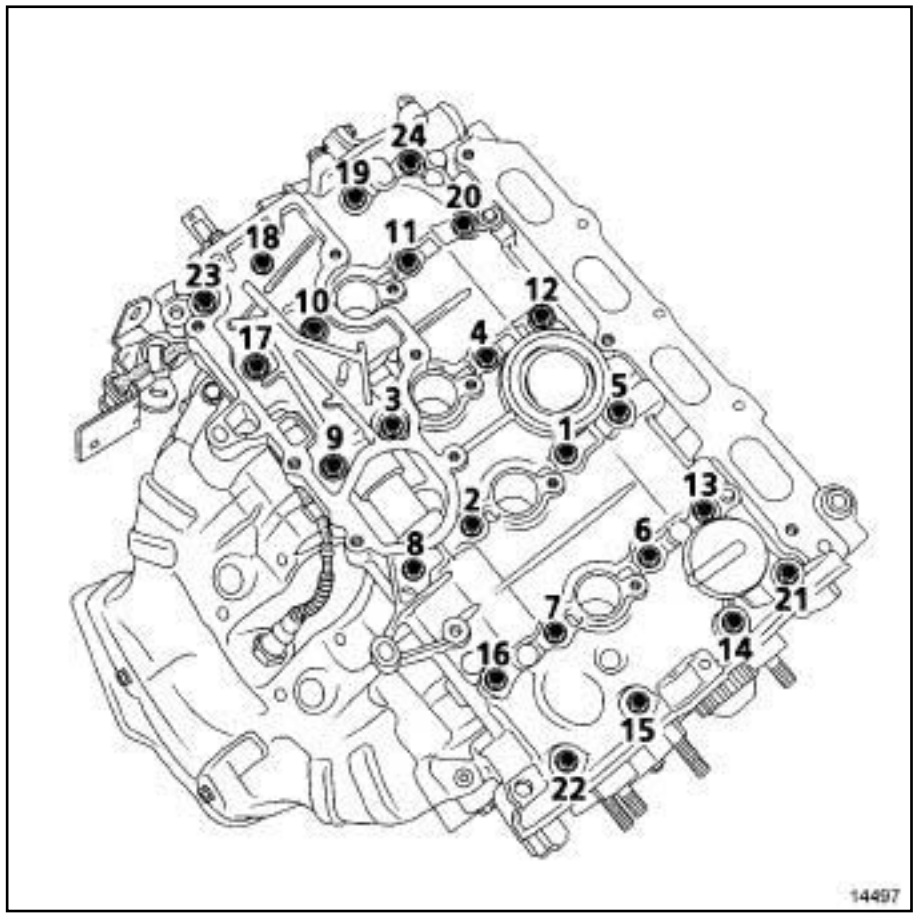
❑ Use a stipple roller to apply **RESIN ADHESIVE** (see **Vehicle: Parts and ingredients for the repairwork**) (MR 364, 04B, Consumables - Products) to the camshaft rocker cover joint face until the joint face is well covered.

❑ Using a cloth, remove the **RESIN ADHESIVE** at (**29**) from the six camshaft rocker cover bearings.

❑ Refit the camshaft rocker cover.

B84 or C84 or E84 or K84 or L84, and K4M, and 764 or 768 or 788 or 856 – B84 or C84 or E84 or K84 or L84, and K4J

II - TIGHTENING PROCEDURE



14497

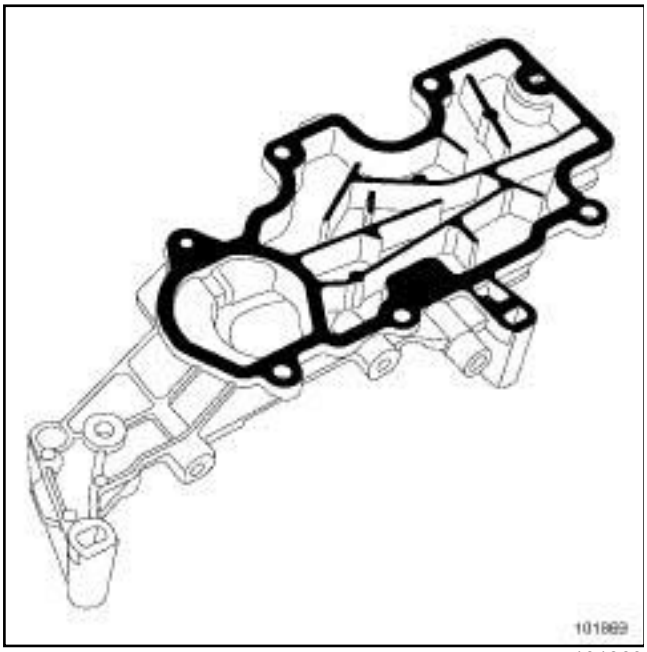
❏ Torque tighten and in order:

- **rocker cover bolts 22, 23, 20 and 13 (8 Nm)**,
- **rocker cover bolts 1 to 12, 14 to 19, 21 to 24 (12 Nm)**.

❏ Loosen bolts **22, 23, 20 and 13** in order.

❏ Torque tighten in order **rocker cover bolts 22, 23, 20 and 13 (12 Nm)**.

B84 or C84 or E84 or K84 or L84, and K4M, and 764 or 768 or 788 or 856 – B84 or C84 or E84 or K84 or L84, and K4J



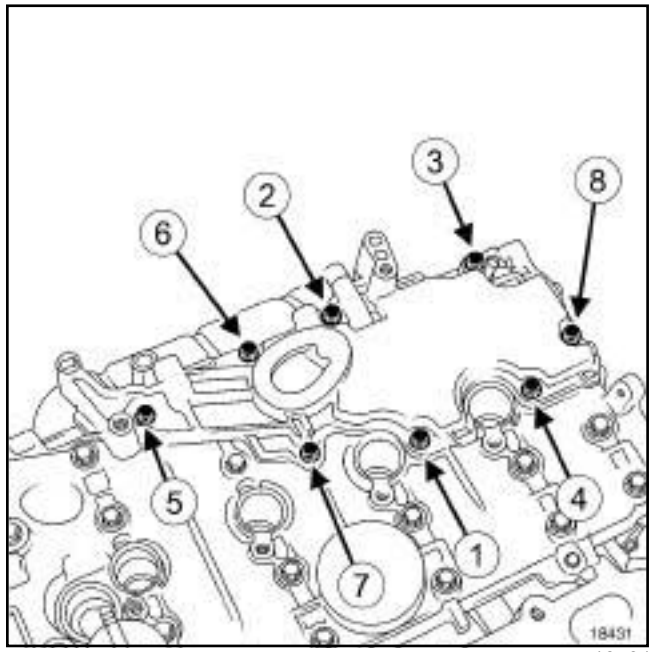
101869

❑

WARNING
the gasket faces must be clean, dr y and free of grease.

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

❑ Use a stipple roller to apply **RESIN ADHESIVE** (see **Vehicle: Parts and ingredients for the repairwork**) (MR 364, 04B, Consumables - Products) to the joint face until it is well covered.



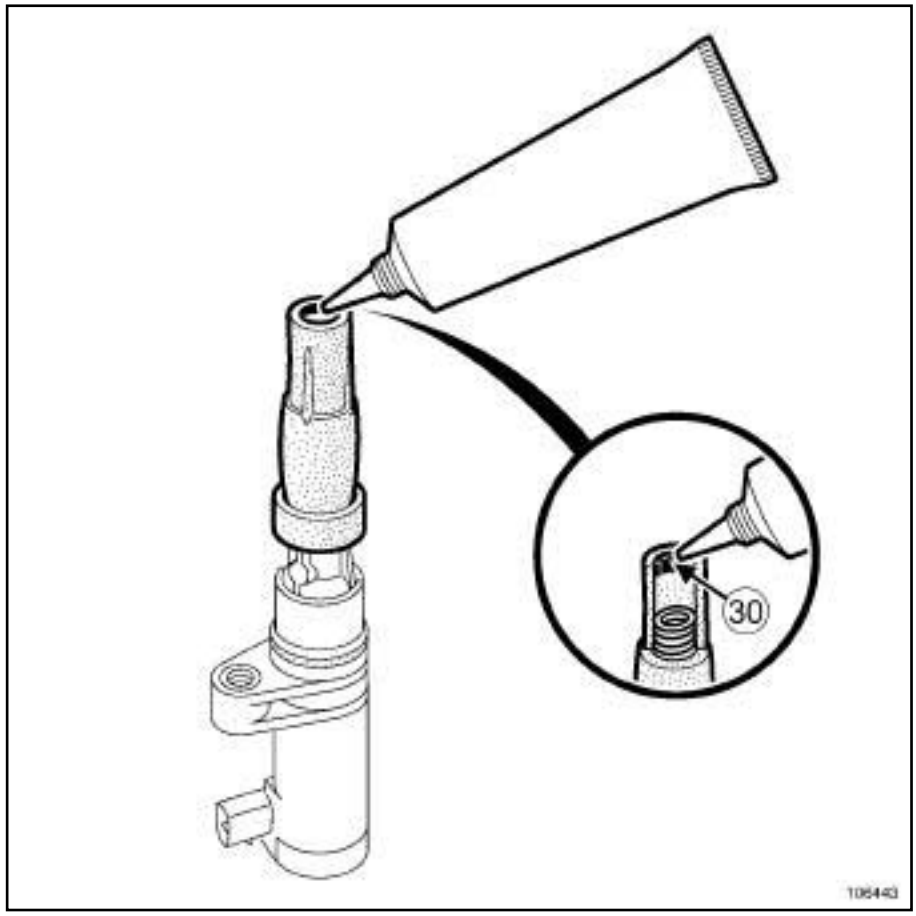
18431

❑ Refit the oil decanter.

❑ Torque tighten and in order:

- the **(new) oil decanter bolts in the untapped housing (15 Nm)**,
- the **(new or original) oil decanter bolts in the tapped housing (10 Nm)**.

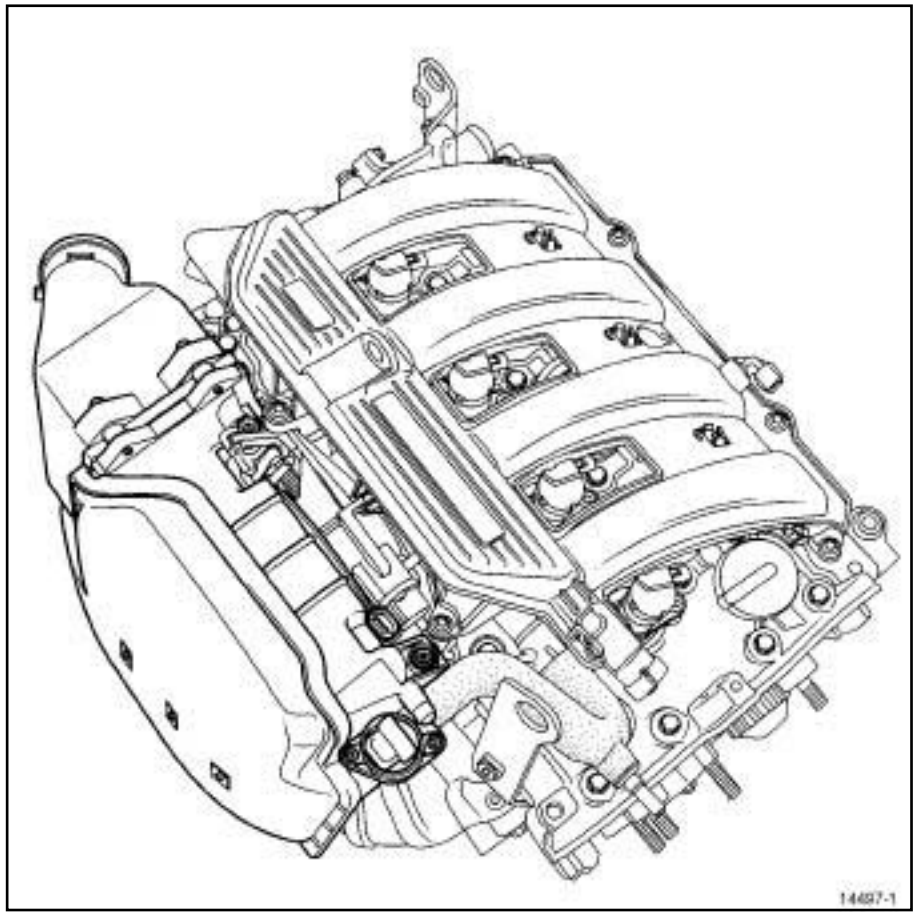
B84 or C84 or E84 or K84 or L84, and K4M, and 764 or 768 or 788 or 856 – B84 or C84 or E84 or K84 or L84, and K4J



106443

- ❏ Apply a bead (**30**) of **FLUOSTAR 2L** (see **Vehicle: Parts and ingredients for the repairwork**) (MR 364, 04B, Consumables - Products) with a diameter of **2 mm** to the four ignition coils on the inner edge of the high-tension cap.
- ❏ Refit the plugs.
- ❏ Torque tighten the **spark plugs (25 to 30 Nm)** using the spark plug spanner set **(Ele. 1382)**.
- ❏ Refit the coils.
- ❏ Torque tighten:
  - the **coil bolts (if holes already tapped) (12 Nm)**,
  - the **coil bolts (if holes not tapped) (15 Nm)**.
- ❏ Always replace all the plenum chamber seals.

B84 or C84 or E84 or K84 or L84, and K4M, and 764 or 768 or 788 or 856 – B84 or C84 or E84 or K84 or L84, and K4J



14497-1

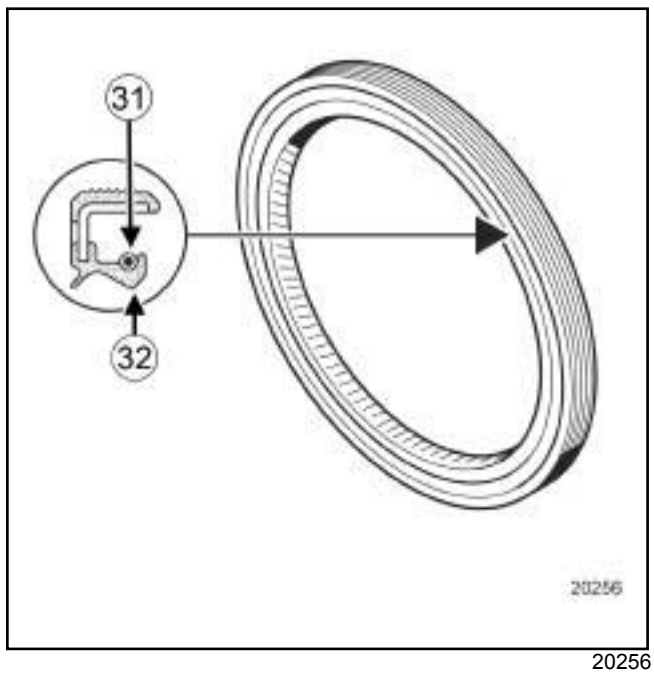
❑ Torque tighten in order the **intake distributor bolts (9 Nm)**.

❑ Refit:

- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-40**) ,
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-11**) .

III - REPLACING THE CAMSHAFT SEALS

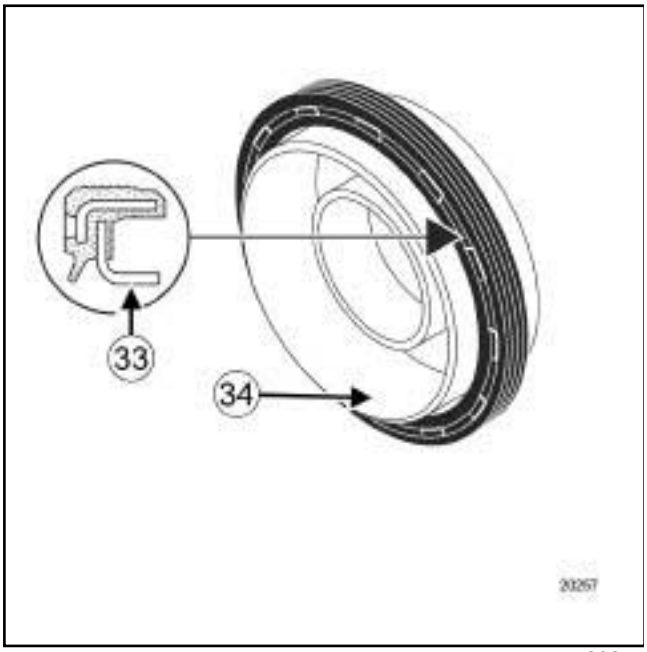
❑ There are two types of elastomer camshaft seals which are easy to identify.



20256

❑ The first type of elastomer seal is fitted with a spring (**31**) and a lip seal (**32**) in a « V » shape.

B84 or C84 or E84 or K84 or L84, and K4M, and 764 or 768 or 788 or 856 – B84 or C84 or E84 or K84 or L84, and K4J



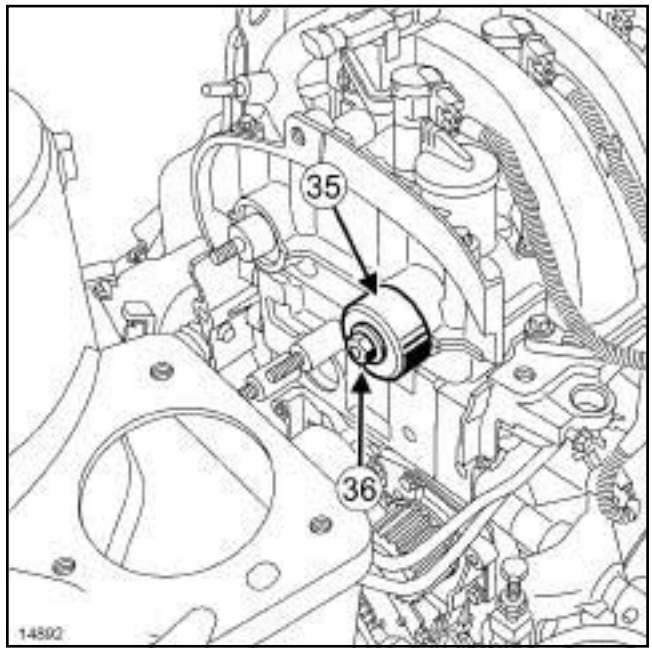
20257

❏ The second type of elastomer seal is fitted with a flat lip seal (**33**) and a protector (**34**) (which also assists in fitting the seal to the engine).

Note:

Both seal versions can be f tted on the same engine. They are not interchangeabl e. It is essential to use the same type of seal when replacing it, except when one or more camshafts are replaced.

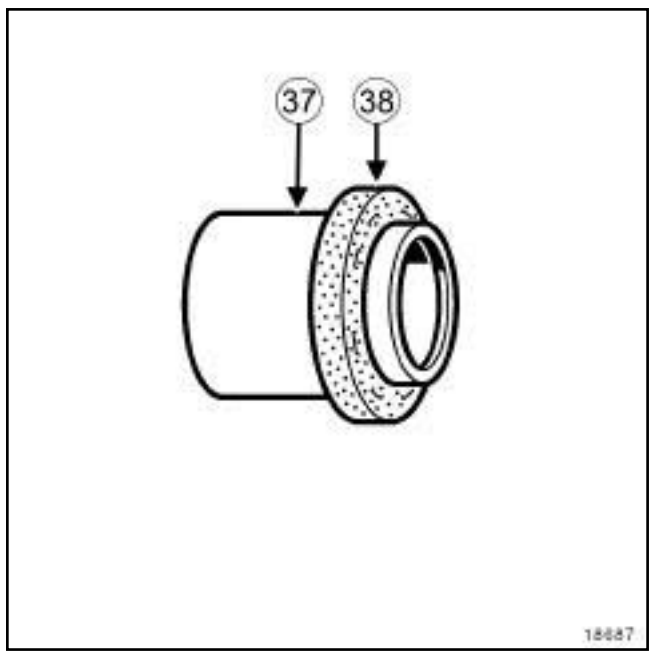
1 - Fitting the first seal type to the inlet camshaft



14892

❏ Fit the seals using the **(Mot. 1491)** (**35**) and the old nuts (**36**) .

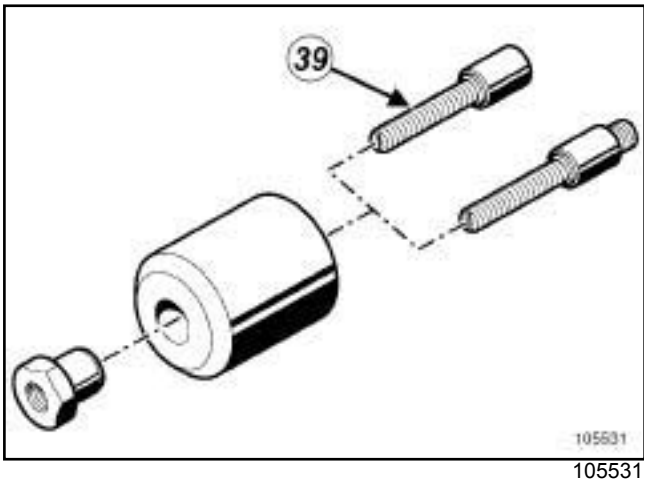
2 - Tool for fitting inlet camshaft seals



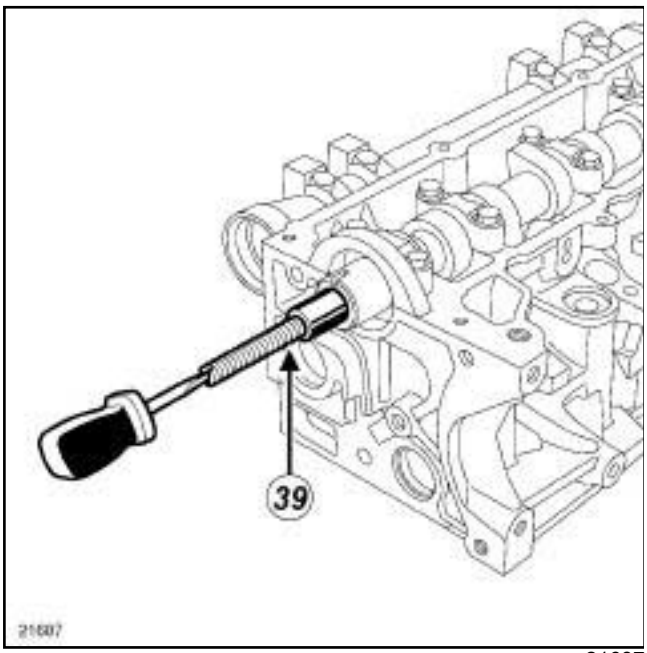
18687

❏ When handling, be sure to hold the seal by the protector (**37**) , as this type of seal is highly fragile. It is strictly forbidden to touch the elastomer seal (**38**) in order to prevent any oil leaks once the seal is fitted to the engine.

B84 or C84 or E84 or K84 or L84, and K4M, and 764 or 768 or 788 or 856 – B84 or C84 or E84 or K84 or L84, and K4J

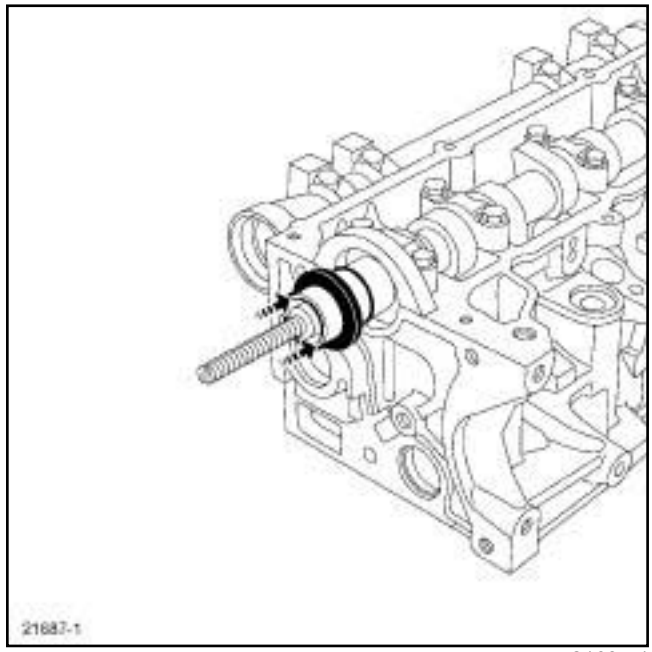


105531



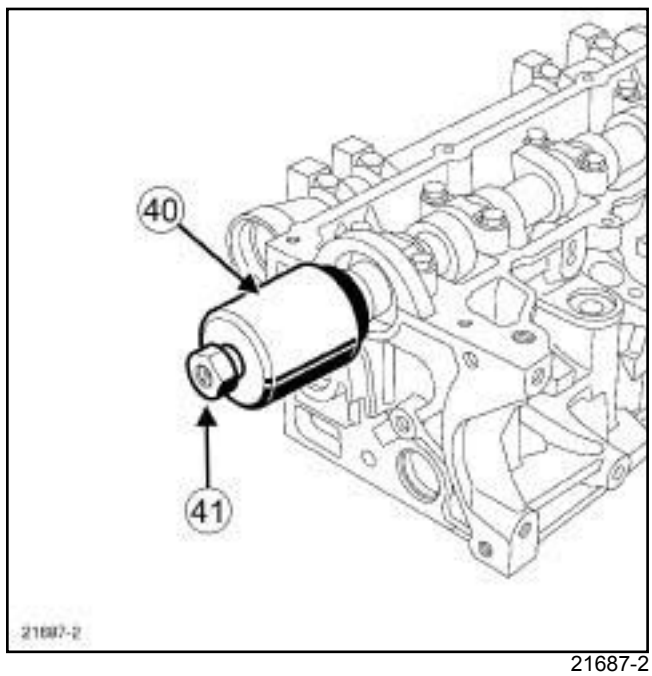
21687

❑ Screw the stud (**39**) of the **(Mot. 1632)** onto the camshaft.



21687-1

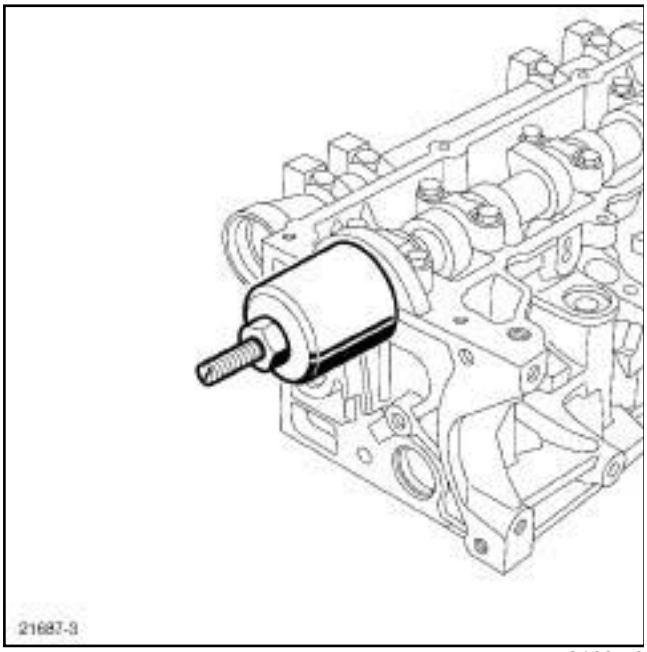
❑ Fit the protector, with a seal, to the camshaft.



21687-2

❑ Fit the cover (**40**) and the collar nut (**41**) of the **(Mot. 1632)**.

B84 or C84 or E84 or K84 or L84, and K4M, and 764 or 768 or 788 or 856 – B84 or C84 or E84 or K84 or L84, and K4J



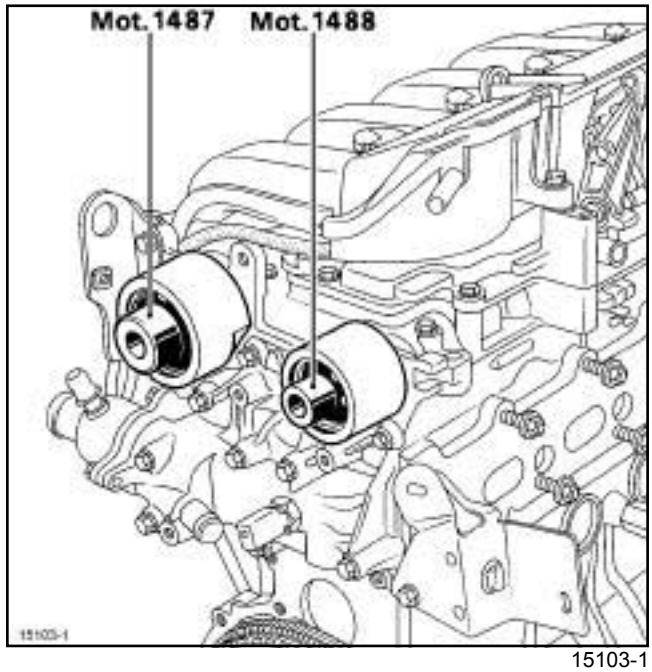
21687-3

❏ Screw on the collar nut until the cover touches the cylinder head.

❏ Remove the nut, the cup, the protector and the threaded rod.

IV - REFITTING

❏ Refit the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-18**) .



15103-1

❏ Refit:

- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-4**) ,
- new inlet camshaft sealing plugs using the **(Mot. 1487)**,
- the new exhaust camshaft sealing plugs using tool **(Mot. 1488)**.

❏ Proceed in the reverse order to removal.

❏ Fill the cooling system (see **19A**, **Cooling**, **Cooling circuit: Draining - Refilling**, page **19A-15**) .

❏ Connect the battery (see **Battery : Removal - Refitting**) (MR 364, 80A, Battery).

❏ Bleed the cooling system (see **19A**, **Cooling**, **Cooling circuit: Draining - Refilling**, page **19A-15**) .

K4M, and 760 or 761 or 812 or 813

Essential special tooling	
Mot. 1672	Lower engine support.
Mot. 1453	Multiple-adjusting engine mounting support with retaining straps.
Mot. 1669	Fitting cam follower tappet.
Mot. 1453-01	Additional winder nut on engine lift support Mot. 1453.
Mot. 1490-01	Locking and adjusting camshaft pulleys.
Mot. 1573	Cylinder head support
Mot. 1513	Tool for refitting camshaft dephaser solenoid valve lip seal.
Mot. 1632	Tool for fitting PTFE camshaft seal
Mot. 1487	Tool for removing the camshaft covers (57 mm diameter).
Mot. 1488	Tool for removing the camshaft covers (43 mm diameter).

Tightening torques ▽	
cylinder head bolts (initial torque)	**20 N.m**
cylinder head bolts	**240° ± 6°**
rocker cover bolts 22, 23, 20 and 13	**12 N.m**
oil decanter bolts	**15 N.m**
camshaft dephaser solenoid valve bolt	**10 N.m**
intake distributor bolts	**9 N.m**

IMPORTANT
Wear protective gloves during the operation.

REMOVAL

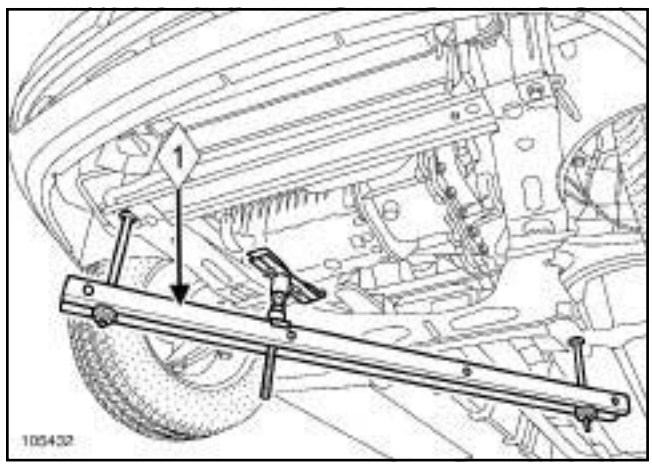
I - REMOVAL PREPARATION OPERATION

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

❑ Remove:

- the engine covers,
- the engine undertray,
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-4**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-18**) ,
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection).

❑ Drain the engine cooling system (see **19A**, **Cooling**, **Cooling circuit: Draining - Refilling**, page **19A-15**) .

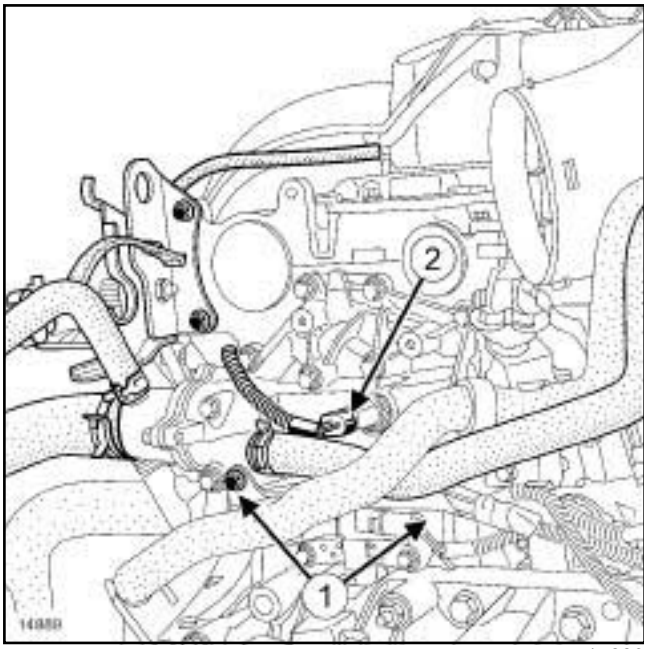


105432

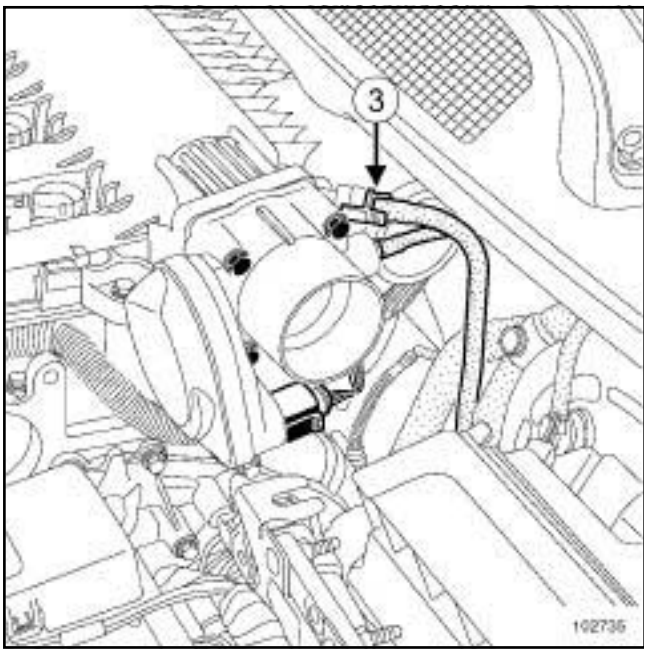
❑ Fit the engine support (**1**) **(Mot. 1672)**.

❑ Remove the **(Mot. 1453)** then the **(Mot. 1669)**.

K4M, and 760 or 761 or 812 or 813



14889



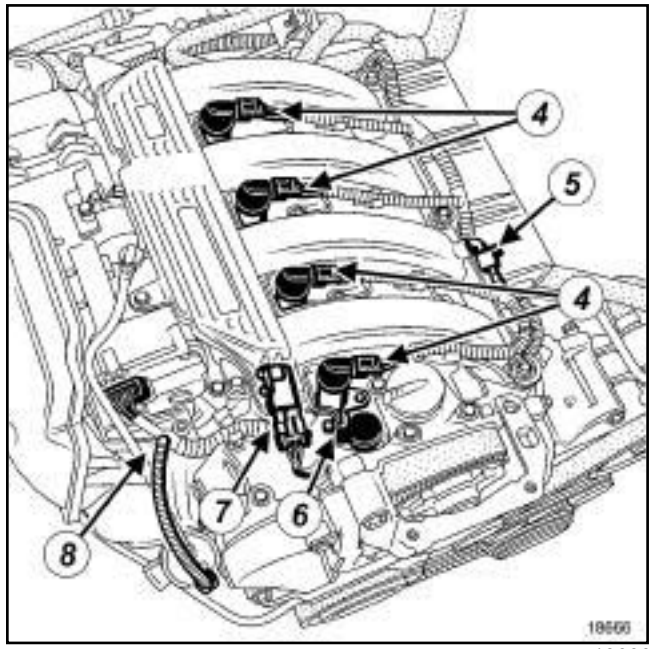
102735

❏ Remove the bolt (**1**) from the electrical wiring mounting.

❏ Disconnect:

- the coolant temperature sensor connector (**2**) ,
- the water chamber pipes using the tool **(Mot. 1453)** or **(Mot. 1453-01)** or **(Mot. 1490-01)**,
- the brake servo vacuum pipe (**3**) from the inlet distributor side.

❏ Separate the wiring bracket assembly.

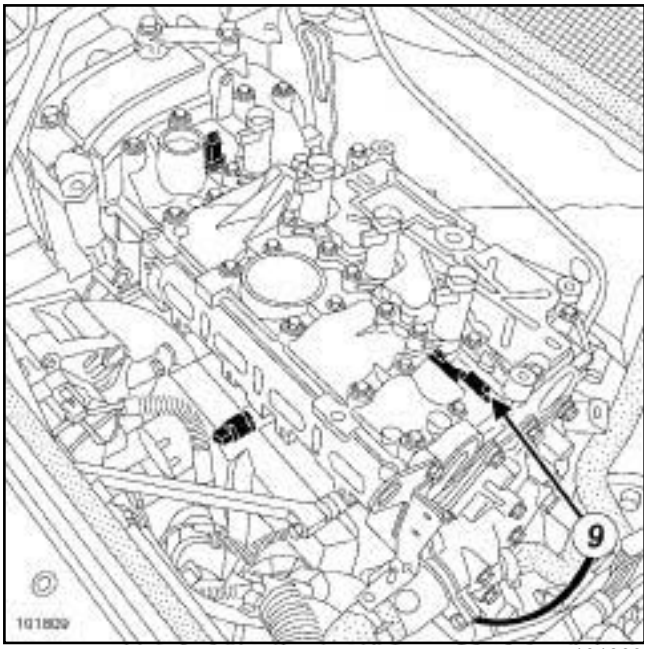


18666

❏ Disconnect:

- the ignition coil connectors (**4**) ,
- the connector (**5**) from the air temperature sensor,
- the camshaft dephaser solenoid valve connector (**6**) ,
- the inlet distributor pressure sensor connector (**7**) ,
- the fuel vapour recirculation solenoid valve pipe (**8**) .

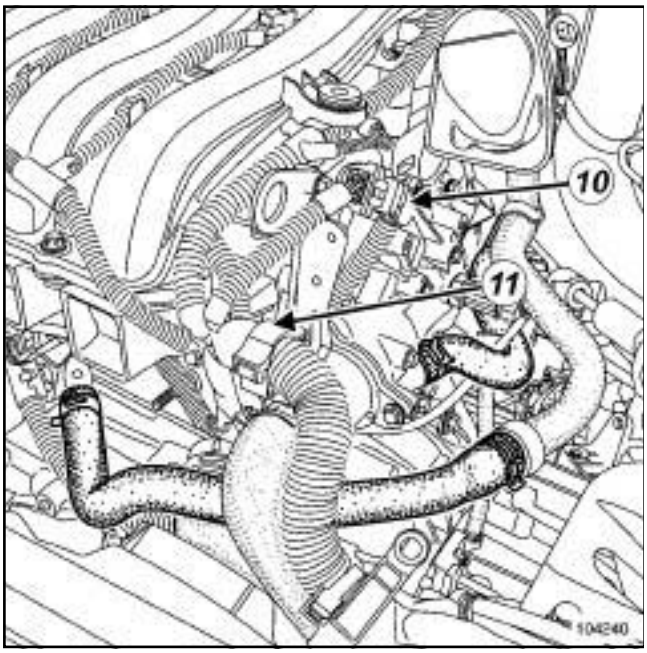
K4M, and 760 or 761 or 812 or 813



101809

❑ Disconnect:

- the connector (**9**) from the camshaft position sensor,
- the catalytic converter upstream oxygen sensor connector.



104240

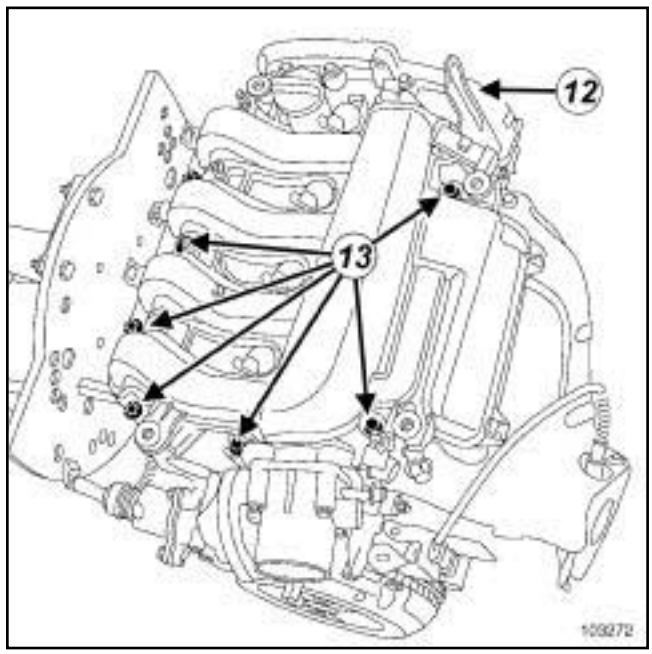
❑ Disconnect the injector connector (**10**) .

❑ Unfasten clip (**11**) .

❑ Move the electrical wiringto one side.

❑ Remove:

- the ignition coils (see **17A**, **Ignition**, **Coils Removal - Refitting**, page **17A-1**) ,
- the spark plugs (see **17A**, **Ignition**, **Spark plugs: Removal - Refitting**, page **17A-3**) ,
- the dephaser solenoid valve (see **Camshaft dephaser solenoid valve: Removal - Refitting**) ,
- the camshaft position sensor (see **Camshaft position sensor: Removal - Refitting**) .

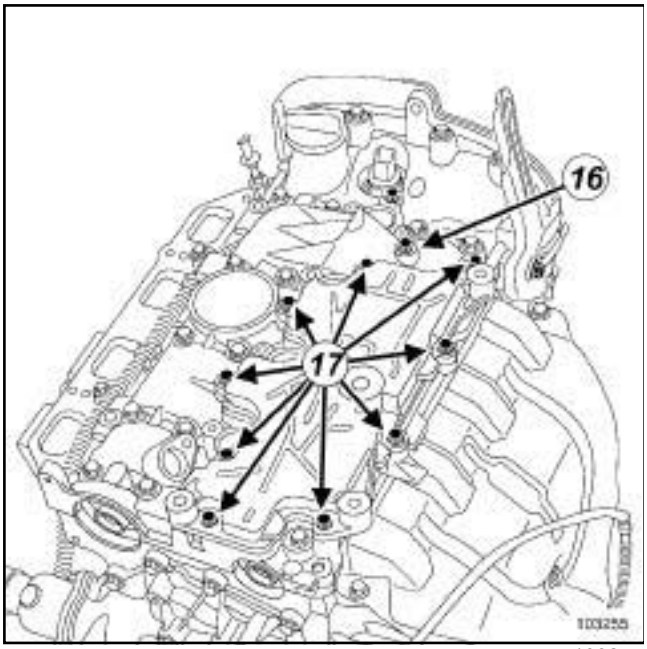


103272

❑ Remove:

- the lifting bracket (**12**) ,
- the inlet distributor bolts (**13**) ,
- the inlet distributor.

K4M, and 760 or 761 or 812 or 813



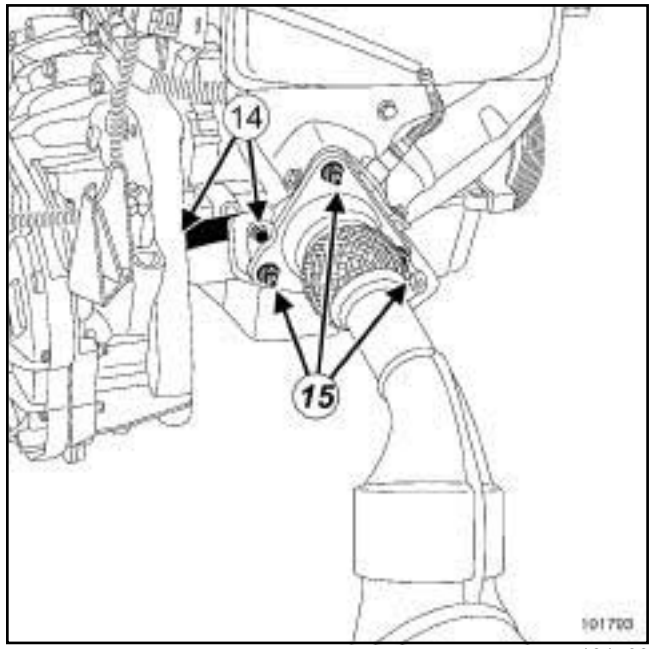
103255

❑

WARNING
Do not remove the bolt (**16**) as it acts as a stop for the squared cam tappet.

❑ Remove:

- the bolts (**17**) from the oil separator,
- the oil separator.



101793

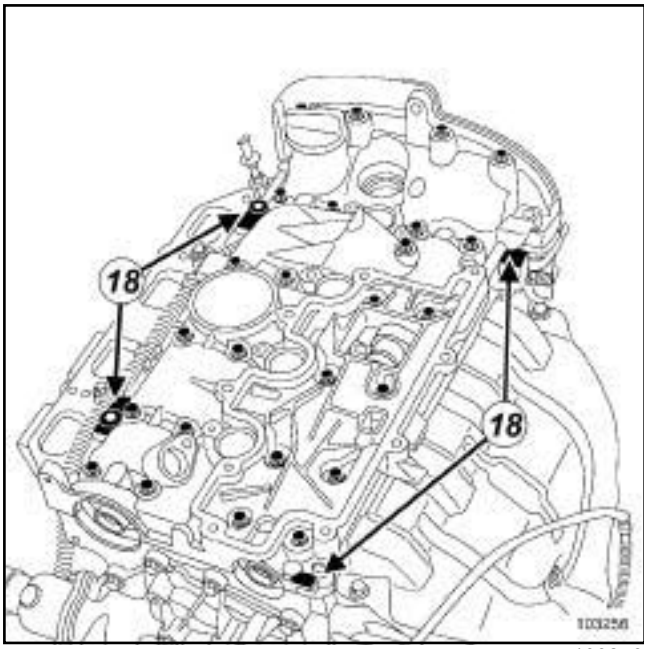
❑ Remove:

- the catalytic converter - gearbox stay bolts (**14**) ,
- the catalytic converter/gearbox strut,
- the nuts (**15**) from the exhaust pipe.

❑ Move the exhaust pipe to one side.

❑ Remove the camshaft pulleys using the **(Mot. 1490-01)**.

K4M, and 760 or 761 or 812 or 813

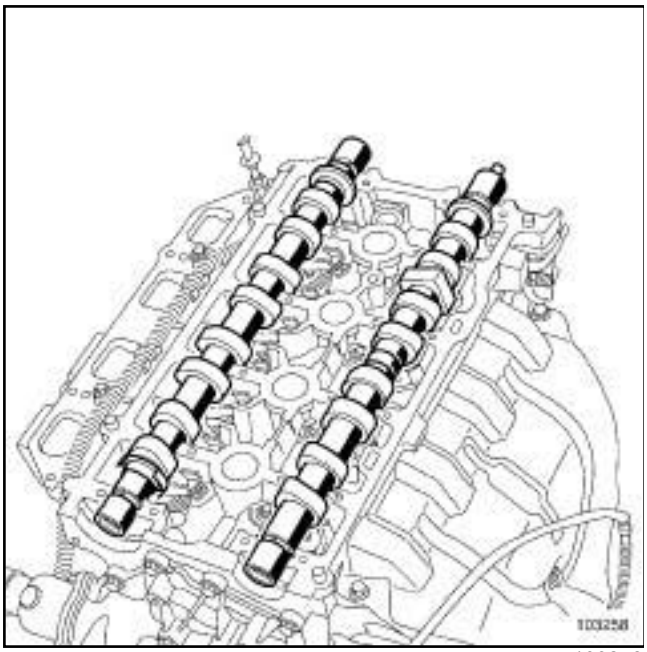


103256

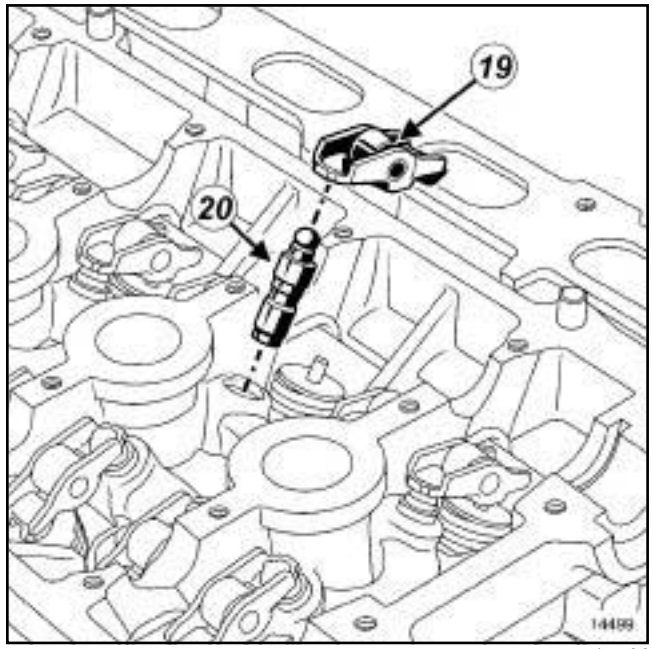
❑ Remove:

- the rocker cover bolts,
- detach the rocker cover vertically by tapping the lugs (**18**) with a copper hammer.

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


103258

❑ Remove the inlet and exhaust camshafts



14499

❑ Remove:

- the valve rockers (**19**) ,
- the hydraulic tappets (**20**) .

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

II - OPERATION FOR REMOVAL OF PART CONCERNED

❑ Remove:

- the cylinder head bolts,
- the cylinder head.

❑ Mount the cylinder head on the cylinder head support **(Mot. 1573)**.

❑ Remove the cylinder head gasket from the cylinder block.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: cylinder head bolts (10,02,01,14)**.

❑ **parts always to be replaced: Cylinder head gasket (10,02,01,04)**.

K4M, and 760 or 761 or 812 or 813

❑ **parts always to be replaced: ring between exhaust manifold and catalytic converter (10,08,02, 20)**.

1 - Cleaning the cylinder head joint face

❑

IMPORTANT
Wear goggles with side protectors for this operation.

IMPORTANT
Wear leaktight gloves (Nitrile type) for this operation.

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

WARNING
Do not allow this product to dr ip onto the paintwork.

Clean the cylinder head carefully to avoid an y foreign bodies entering the oil retur n and supply pipes.

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

WARNING
To ensure proper sealing, the gask et surfaces must be clean, dry and not greasy (avoid any f ngerer marks).

WARNING
Protect the oilway so that f oreign bodies do not enter the oil pipes in the cylinder head.

Failure to follow this instruction could lead to the blocking of the oilways, resulting in a rapid deterioration of the camshaft.

❑ Use **SUPER CLEANING AGENT FOR JOINT FACES** (see **Vehicle: Parts and ingredients for the repairwork**) (04B, Consumables - Products) to clean:

- the cylinder head gasket face if being reused,
- the cylinder block gasket face.

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

- the cylinder head gasket face if being reused,
- the cylinder block gasket face.

2 - Checking the gasket face

❑ Check for gasket face deformation using a ruler and a set of shims.

WARNING
No regrinding of the cylinder head is permitted.

❑ The maximum deformation is **0.05 mm**.

Note:

If the cylinder head is faulty:

- strip down the cylinder head (see **Stripping the cylinder head**) (Technical Note 6023A, 10A, Engine and peripherals),
- test the cylinder head in order to detect an y possible cracks using the cylinder head test kit (see **Cylinder head testing equipment: Use**) (Technical Note 6026A, 11A, Top and front of engine),
- rebuild the cylinder head (see **Rebuilding the cylinder head**) (Technical Note 6023A, 10A, Engine and peripherals).

II - REFITTING OPERATION FOR PART CONCERNED

❑ Bring the pistons to mid-stroke position to prevent any risk of contact with the valves when tightening the cylinder head.

WARNING
To ensure proper sealing, the gask et surfaces must be clean, dry and not greasy (avoid any f ngerer marks).

❑ Check that the centring dowel is present on the cylinder block.

K4M, and 760 or 761 or 812 or 813

❑ Fit:

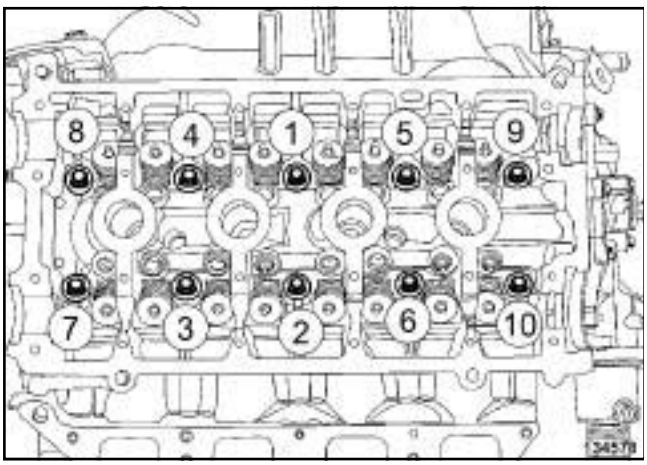
- a new cylinder head gasket,
- the cylinder head equipped with new bolts on the cylinder block.

WARNING

In order to ensure that the bolts are correctly tightened, use a syringe to remove any oil which may be in the cylinder head mounting holes.

WARNING

Do not oil the new bolts. Be sure to oil bolts being reused.



134578

❑ Without tightening, fit the cylinder head bolts in order.

❑ Pretighten to torque and in order the **cylinder head bolts (initial torque) (20 N.m)**.

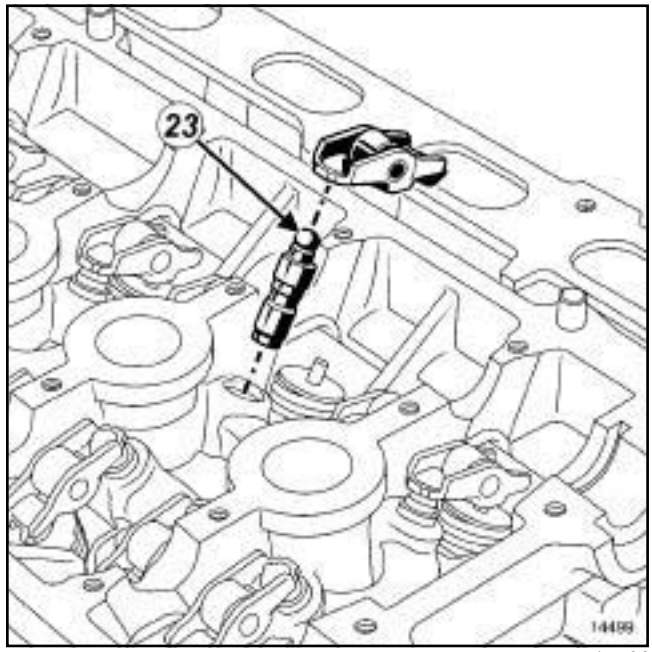
❑ Check that all the cylinder head bolts are tightened to the correct torque of **20 N.m**.

❑ Angle tighten in order the **cylinder head bolts (240° ± 6°)**.

Note:

Do not retighten the cylinder head bolts after applying this procedure.

III - FINAL OPERATION



14499

❑ Reprime the hydraulic tappets (hydraulic tappets may empty after a long down time).

To check if repriming is necessary, press the top of the tappet (**23**) with your thumb.

If the tappet piston depresses:

- immerse the tappets in a container of diesel fuel,
- refit the hydraulic tappets.

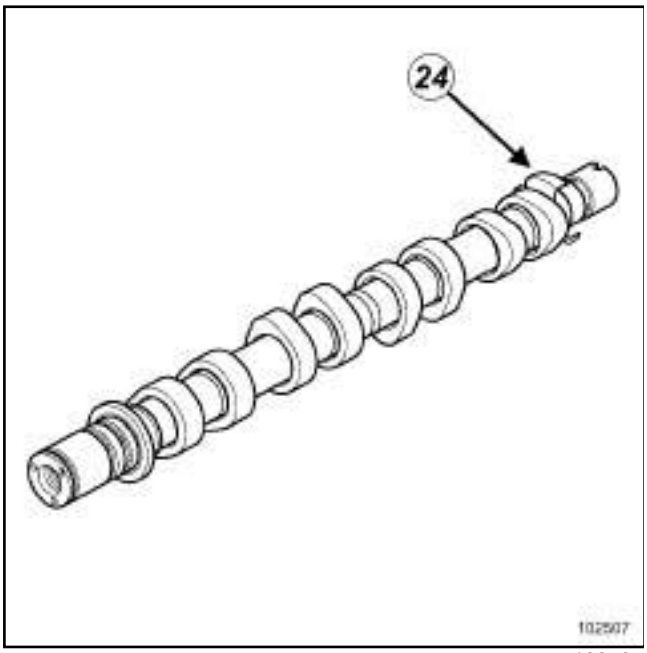
❑ Refit:

- the valve rockers,
- the camshafts, oiling the bearings.

K4M, and 760 or 761 or 812 or 813

CAMSHAFT MARKINGS

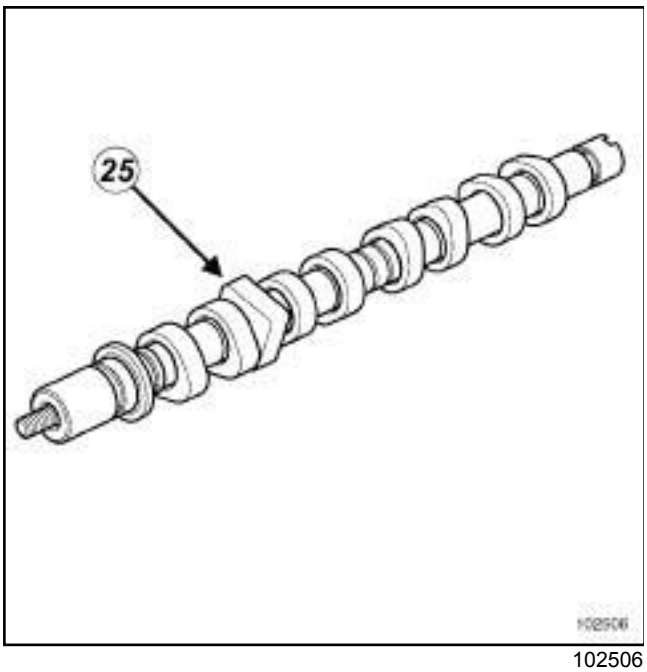
Inlet camshaft



102507

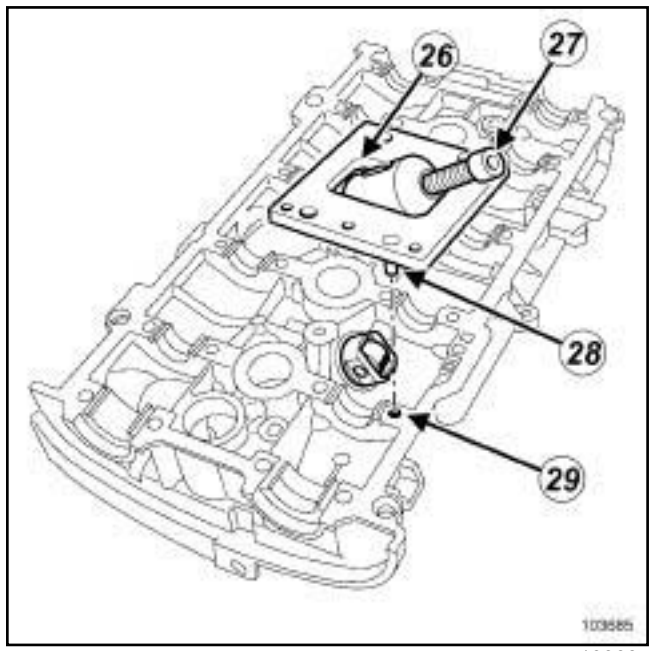
(**24**) The inlet camshaft is f tted with the camshaft sensor target.

Exhaust camshaft



102506

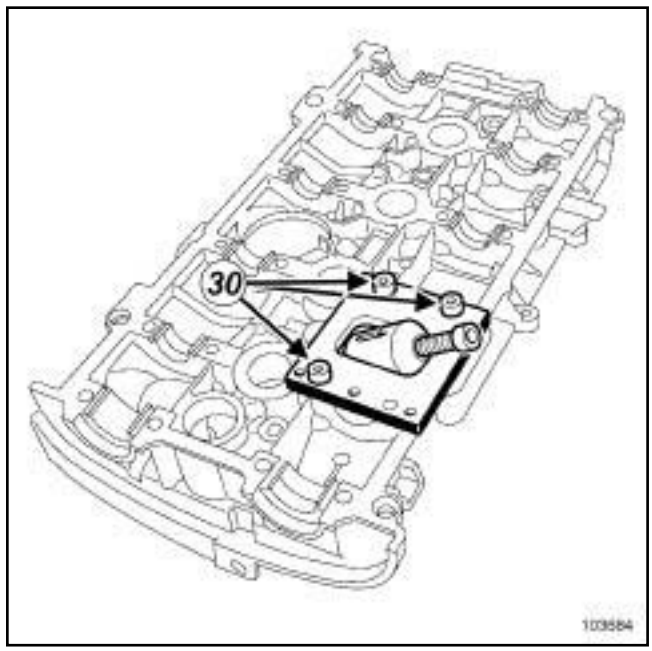
(**25**) The exhaust camshaft is fitte with the square cam.



103685

❑ Position the pin (**26**) of the **(Mot. 1669)** against the bottom of the groove by loosening the bolt (**27**) .

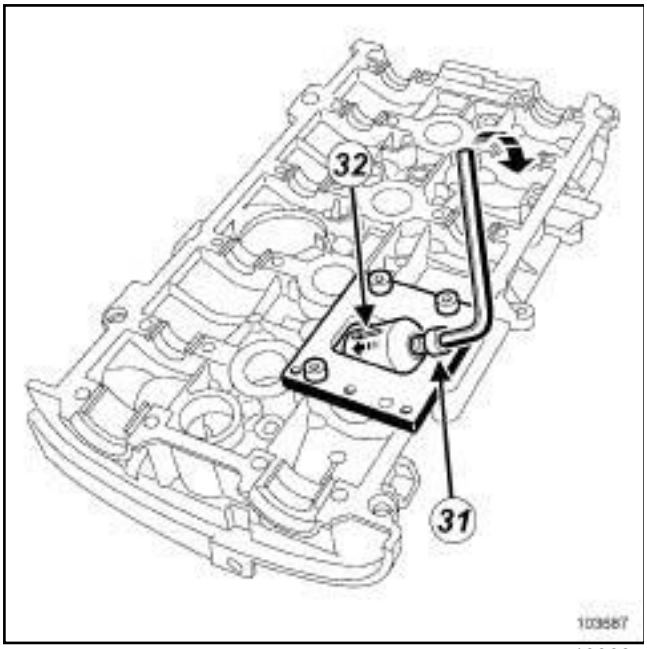
❑ Position the **(Mot. 1669)** on the rocker cover, correctly positioning the pin (**28**) in the hole (**29**) in the rocker cover.



103684

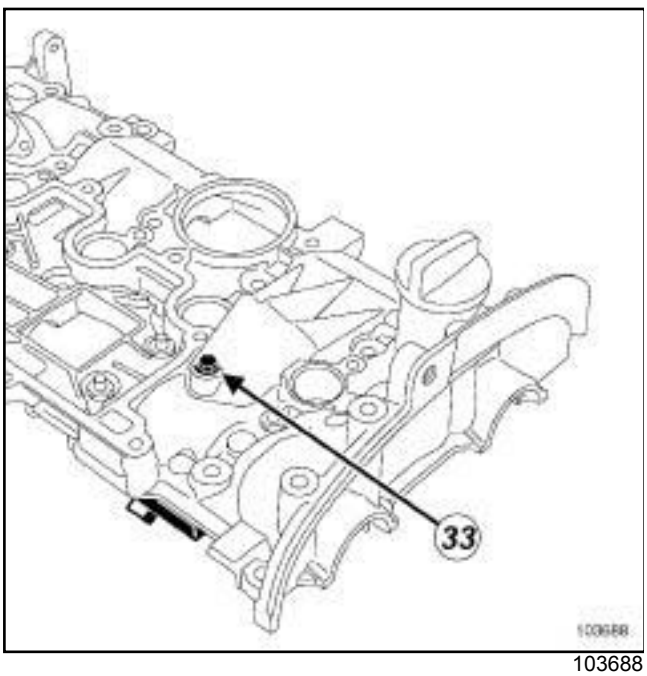
❑ Fit the **(Mot. 1669)** for the rocker cover using the bolts (**30**) .

K4M, and 760 or 761 or 812 or 813



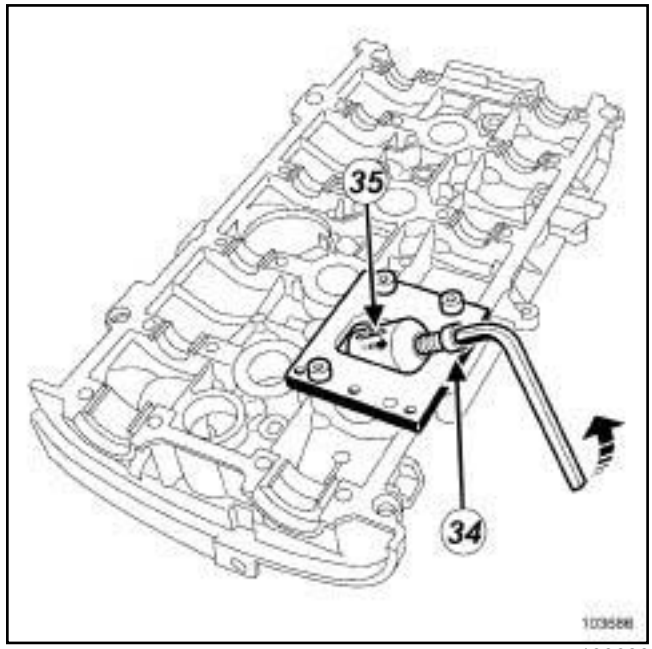
103687

❑ Fit the bolt (**31**) until the pin (**32**) is against the bottom of the groove.



103688

❑ Position the bolt of the **(Mot. 1669)** in place of the original bolt at (**33**) to hold the tappet in the compressed position.

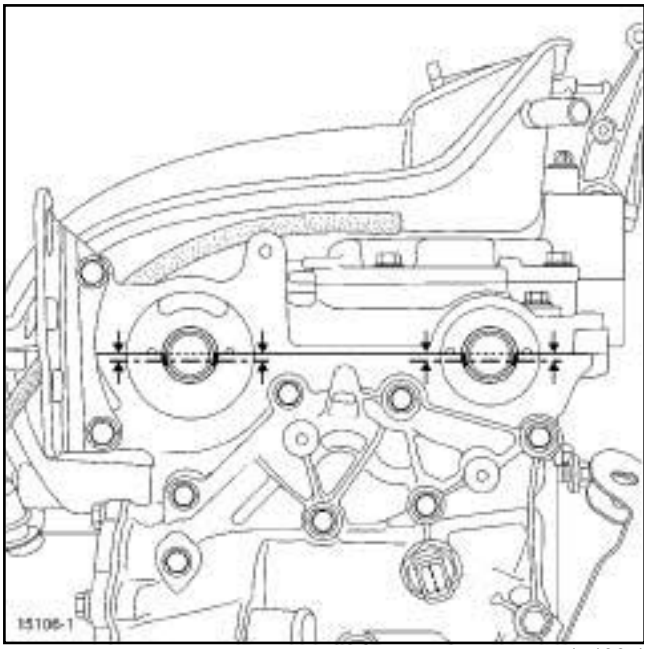


103686

❑ Undo the bolt (**34**) until the pin (**35**) is against the bottom of the groove.

❑ Remove the **(Mot. 1669)** from the rocker cover.

K4M, and 760 or 761 or 812 or 813



15106-1

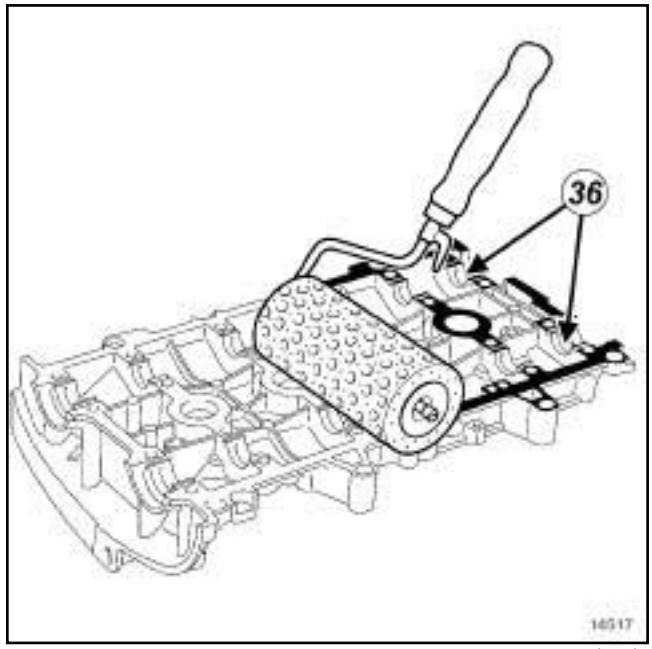
❑ Position the camshaft grooves horizontally and offset downwards.

WARNING

To ensure proper sealing, the gask et surfaces must be clean, dry and not greasy (avoid any f n-ger marks).

WARNING

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



14517

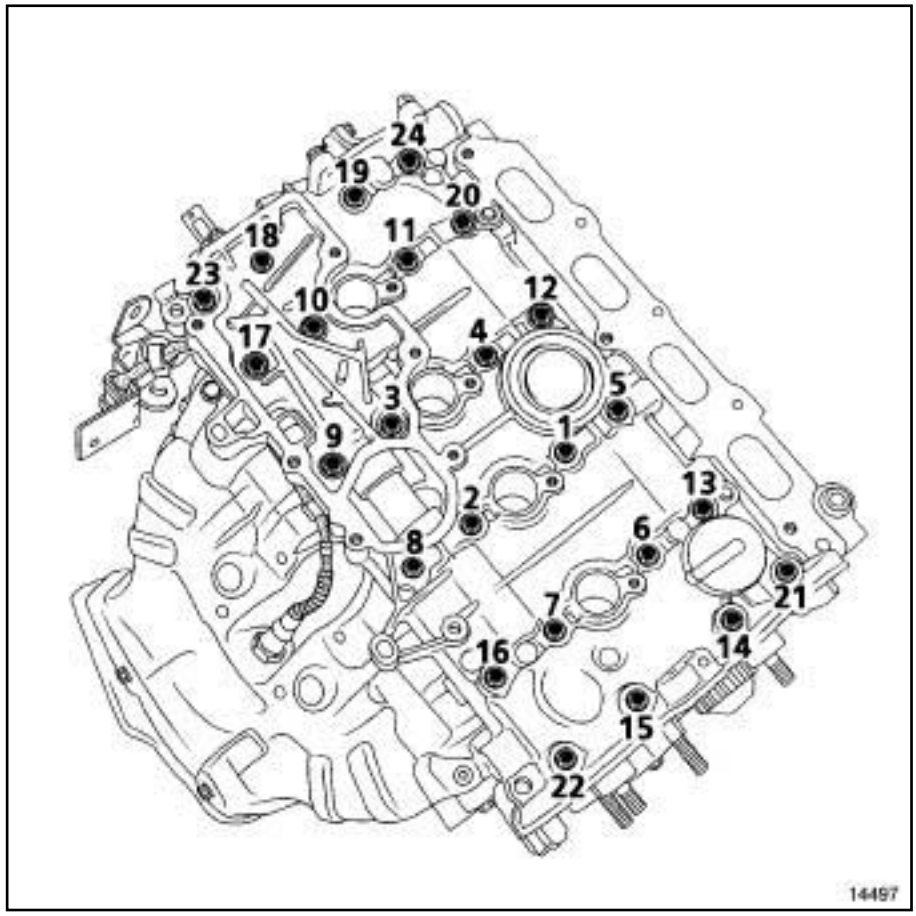
❑ Use a stipple roller to apply **RESIN ADHESIVE** (see **Vehicle: Parts and ingredients for the repairwork**) (04B, Consumables - Products) to the camshaft rocker cover joint face until the joint face turns reddish in colour.

❑ Use a cloth to remove the **RESIN ADHESIVE** (see **Vehicle: Parts and ingredients for the repairwork**) (04B, Consumables - Products) at (**36**) on the six camshaft rocker cover bearings.

❑ Refit the camshaft rocker cover.

K4M, and 760 or 761 or 812 or 813

TIGHTENING THE ROCKER COVER



14497

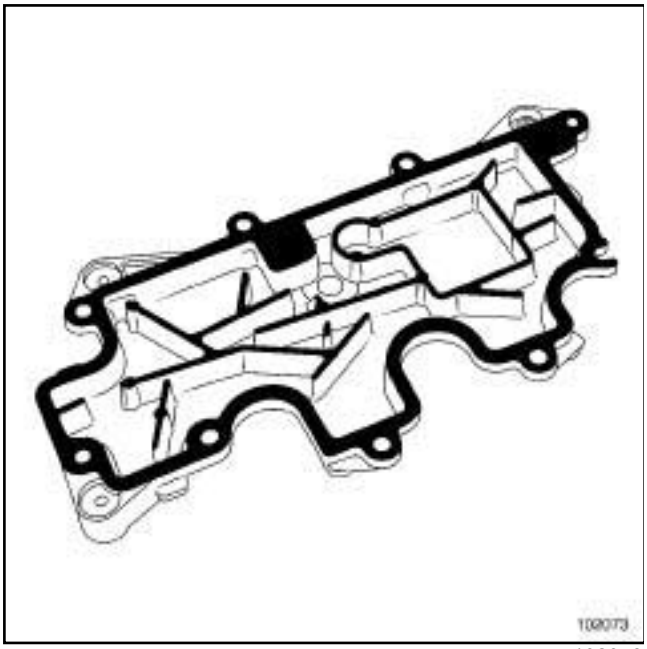
❏ Tighten to torque and in order:

- the **rocker cover bolts 22, 23, 20, 13 (8 N.m)**,
- the **rocker cover bolts 1 to 12, 14 to 19, 21 to 24 (12 N.m)**.

❏ Loosen bolts 22, 23, 20 and 13, in order.

❏ Torque tighten in order the **rocker cover bolts 22, 23, 20 and 13 (12 N.m)**.

K4M, and 760 or 761 or 812 or 813



102073

❑

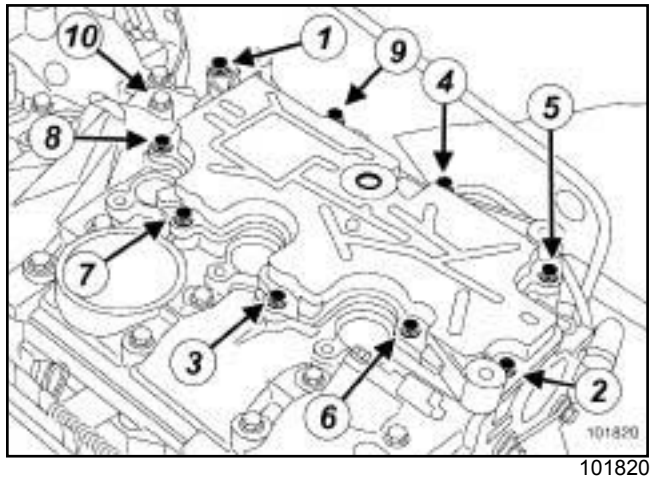
WARNING

To ensure proper sealing, the gask et surfaces must be clean, dry and not greasy (avoid any f n-ger marks).

WARNING

Applying excess sealant could cause it to be squeezed out when parts are tightened. A mix-ture of sealant and f uid could damage certain components (engine, radiator, etc.).

❑ Use a stipple roller to apply **RESIN ADHESIVE** (see **Vehicle: Parts and ingredients for the repai-rwork**) (04B, Consumables - Products) to the joint face until it is well covered.



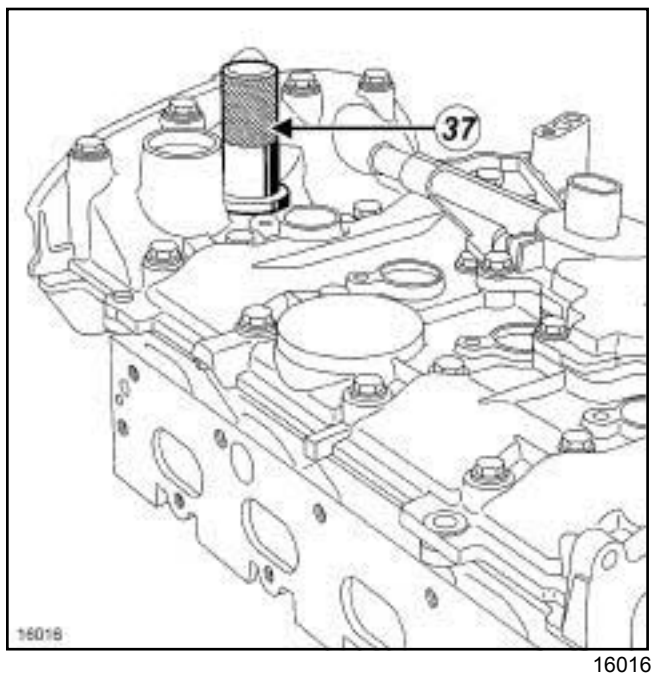
101820

❑ Refit the oil decanter.

❑ Torque tighten in order the **oil decanter bolts (15 N.m)**.

❑ Remove the bolt from the **(Mot. 1669)** to release the tappet.

❑ Refit the original bolt, applying a drop of **FRENE-TANCHE** (see **Vehicle: Parts and ingredients for the repairwork**) (04B, Consumables - Products).



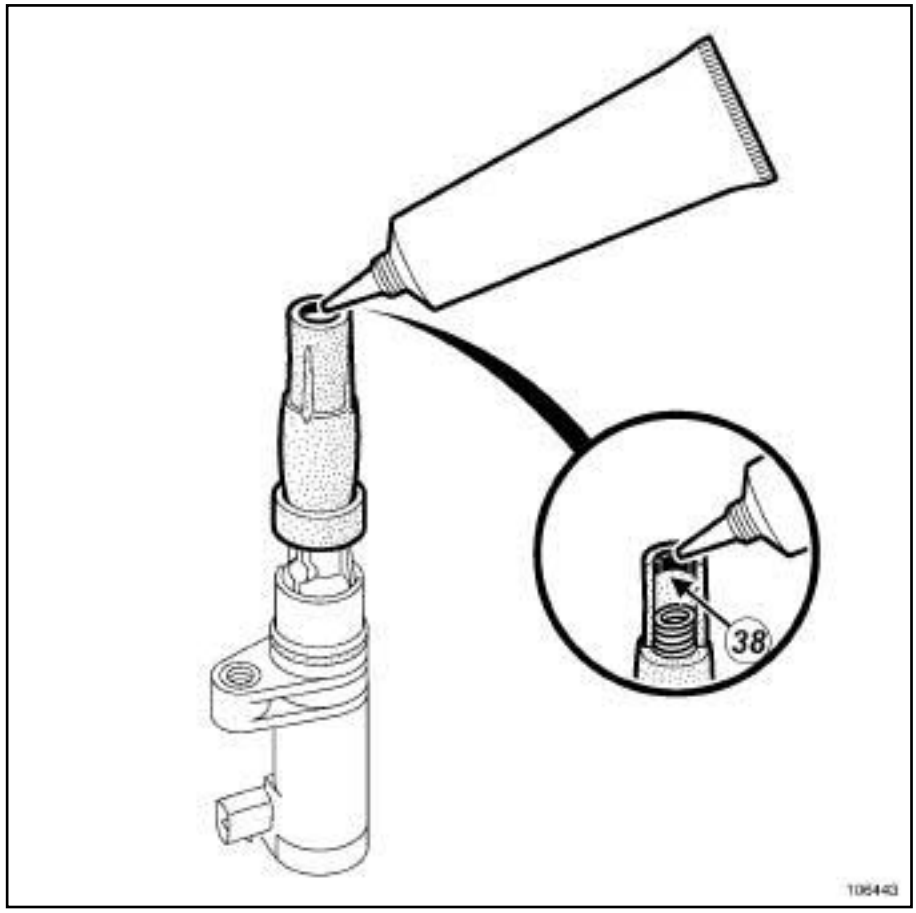
16016

❑ Refit:

- the camshaft dephaser solenoid valve seal using the **(Mot. 1513)** (**37**) ,
- the camshaft dephaser solenoid valve.

❑ Torque tighten the **camshaft dephaser solenoid valve bolt (10 N.m)**.

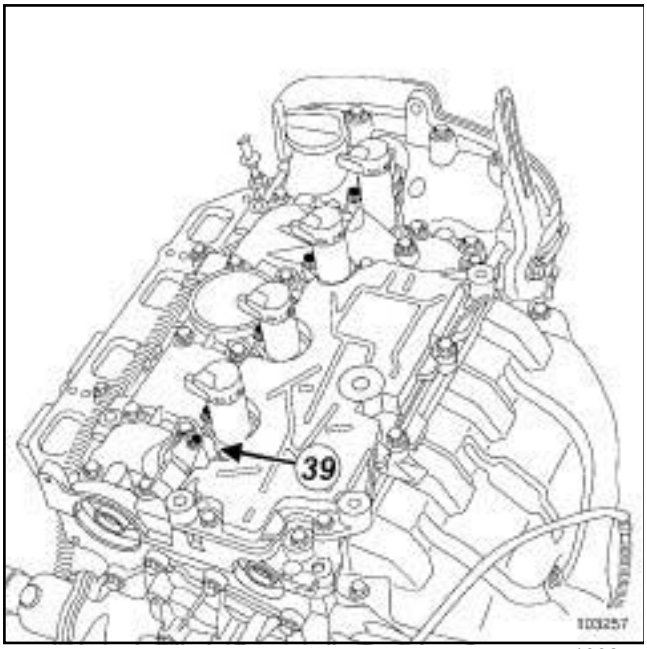
K4M, and 760 or 761 or 812 or 813



106443

❑ Apply a bead (**38**) of **FLUOSTAR 2L** (see **Vehicle: Parts and ingredients for the repairwork**) (04B, Consumables - Products) **2 mm** in diameter on the internal perimeter of the high tension caps on the four ignition coils.

K4M, and 760 or 761 or 812 or 813

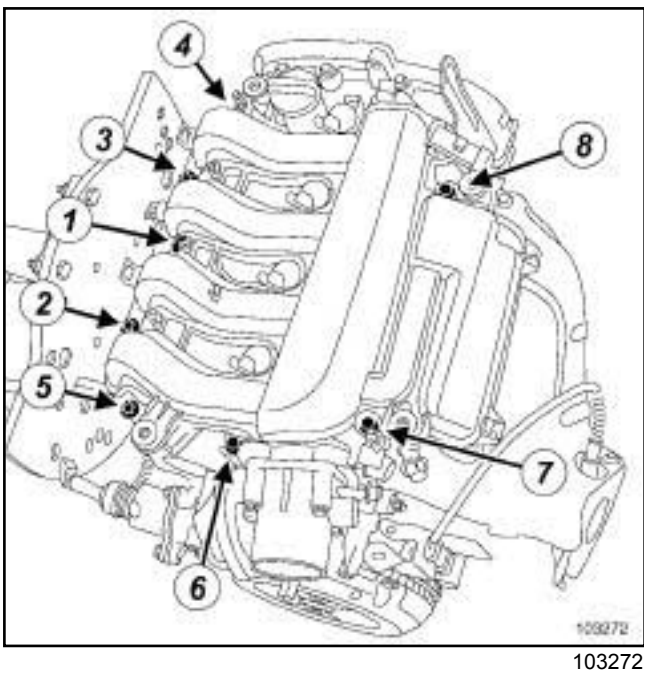


103257

❑ Refit:

- the spark plugs (see **17A**, **Ignition**, **Spark plugs: Removal - Refitting**, page **17A-3**) ,
- the ignition coils (see **17A**, **Ignition**, **Coils Removal - Refitting**, page **17A-1**) ,
- the camshaft position sensor (see **Camshaft position sensor: Removal - Refitting**) .

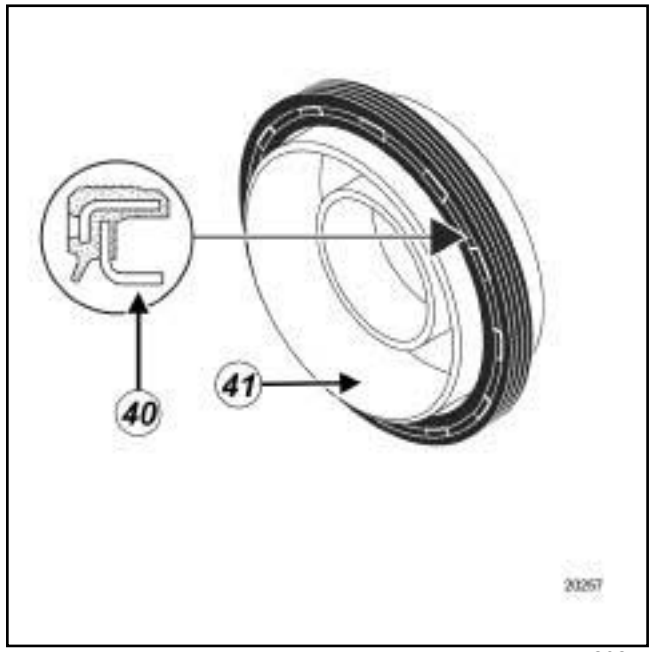
❑ Always replace all the inlet distributor seals.



103272

❑ Torque tighten in order the **intake distributor bolts (9 N.m)**.

REPLACING THE CAMSHAFT SEALS

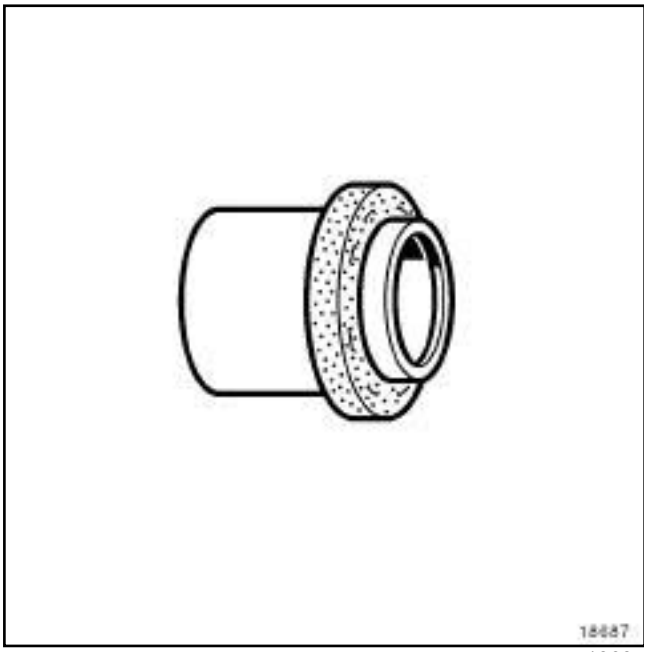


20257

❑ The elastomer seal on these engines is fitted with a flat lip seal (**40**) and a protector (**41**) (also assists in fitting the seal to the engine).

K4M, and 760 or 761 or 812 or 813

a - Fitting the exhaust camshaft seal

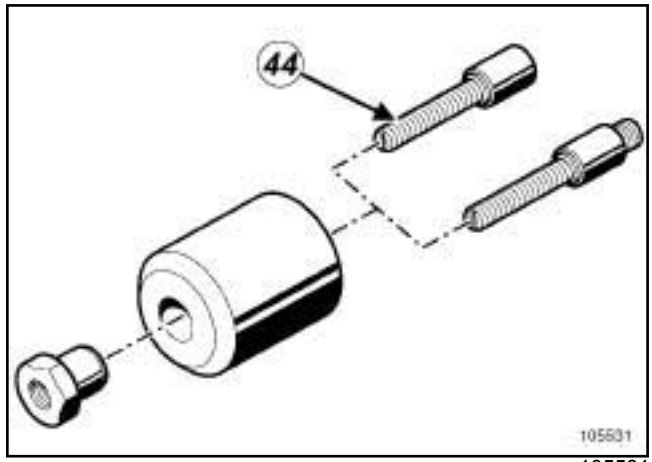


18687

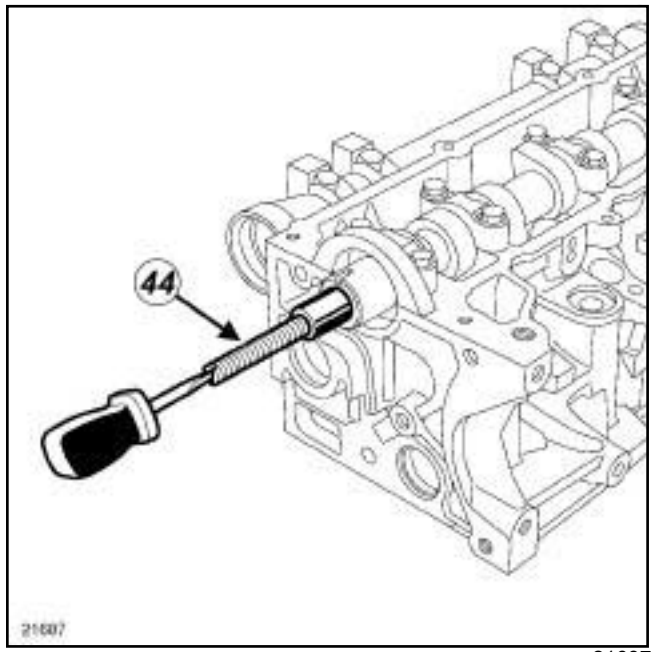
❑

WARNING

It is very important to hold the protector when handling the seal, as this type of seal is very fragile. It is strictly forbidden to touch the elastomer sealin order to prevent any oil leaks once the seal is fitted to the engine.



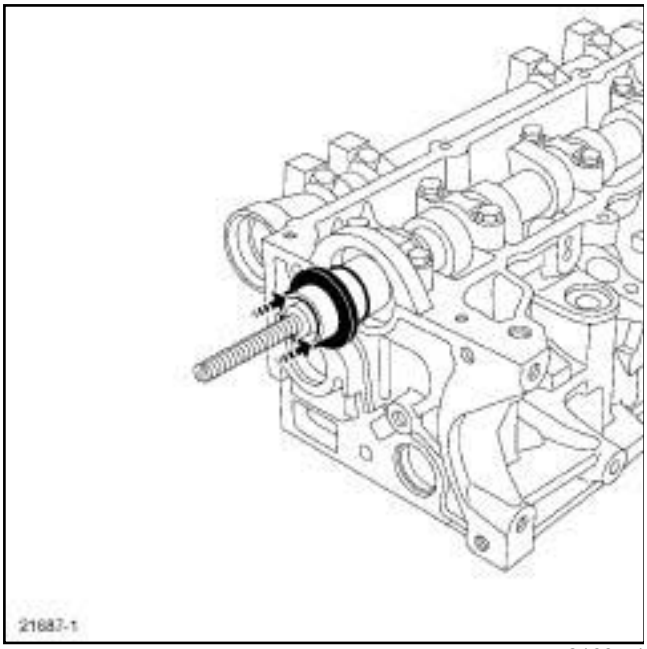
105531



21687

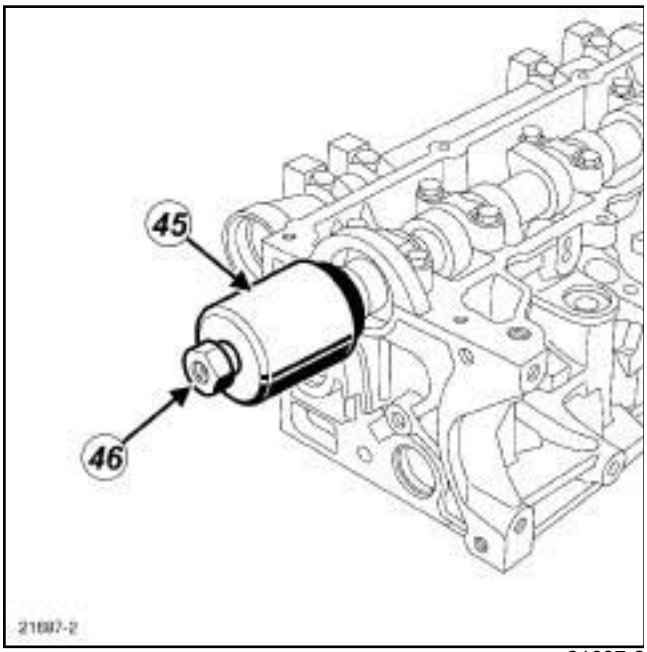
❑ Screw the stud (**44**) of the **(Mot. 1632)** onto the camshaft.

K4M, and 760 or 761 or 812 or 813



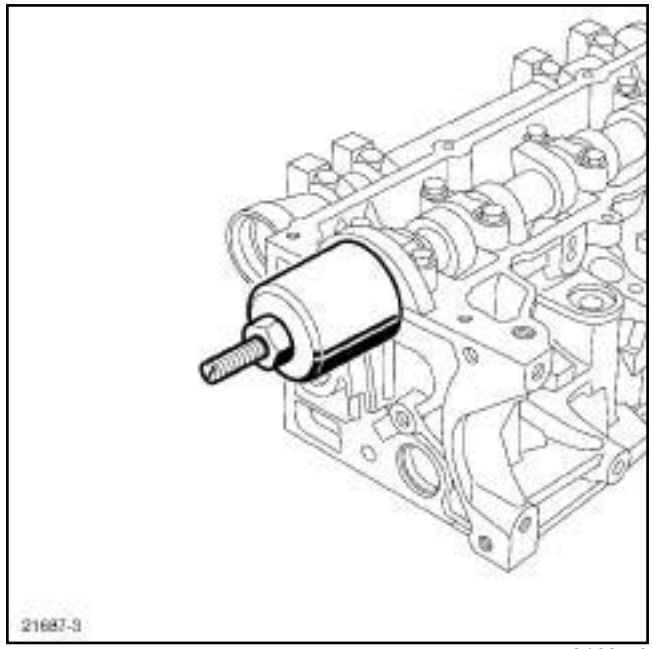
21687-1

❑ Fit the protector, with a seal, to the camshaft.



21687-2

❑ Fit the cover (**45**) and the collar nut (**46**) of the **(Mot. 1632)**.



21687-3

❑ Screw in collar nut until the cover touches the cylinder head.

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

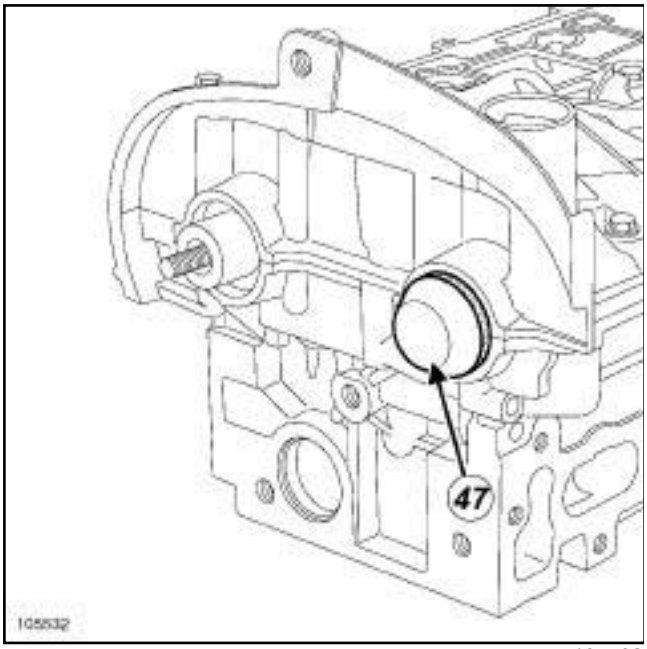
b - Fitting the inlet camshaft seal

❑

WARNING

It is very important to hold the protector when handling the seal, as this type of seal is very fragile. In order to prevent any oil leaks once the seal is fitted to the engine, it is strictly forbidden to touch the elastomer seal.

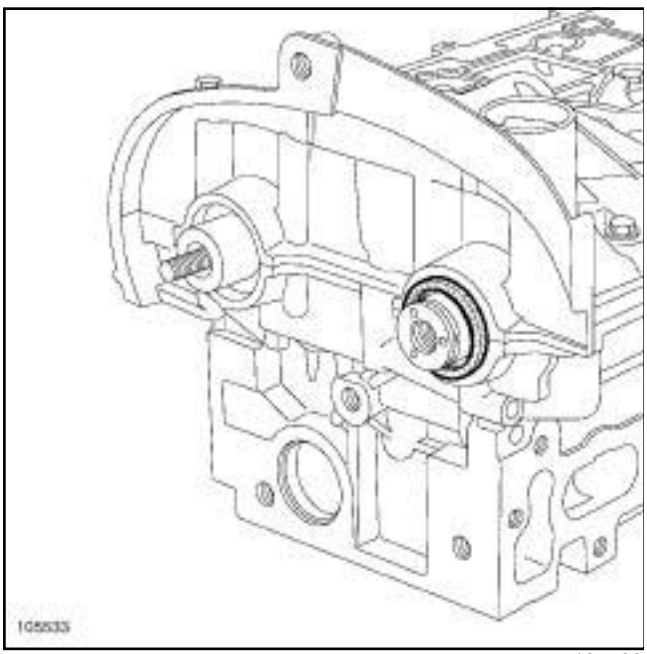
K4M, and 760 or 761 or 812 or 813



105532

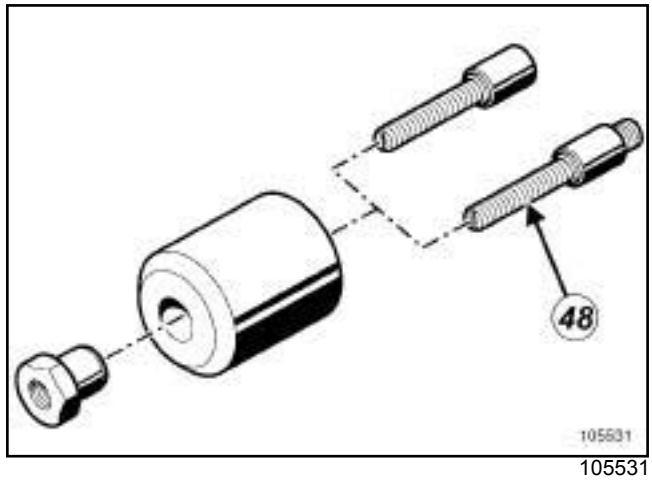
❑ Fit the protector (**47**) ,with a seal, to the camshaft.

❑ Push the centre of the protector to force the seal into its housing.

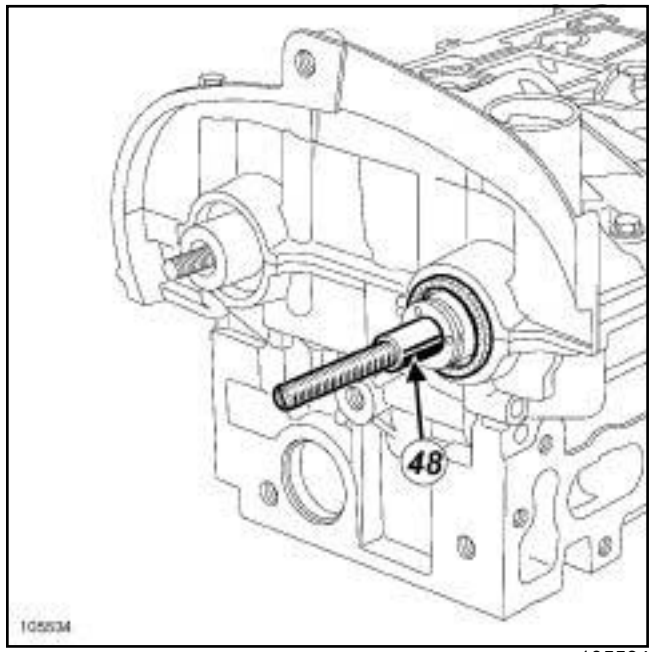


105533

❑ Remove the seal protector, taking care not to drop the seal.



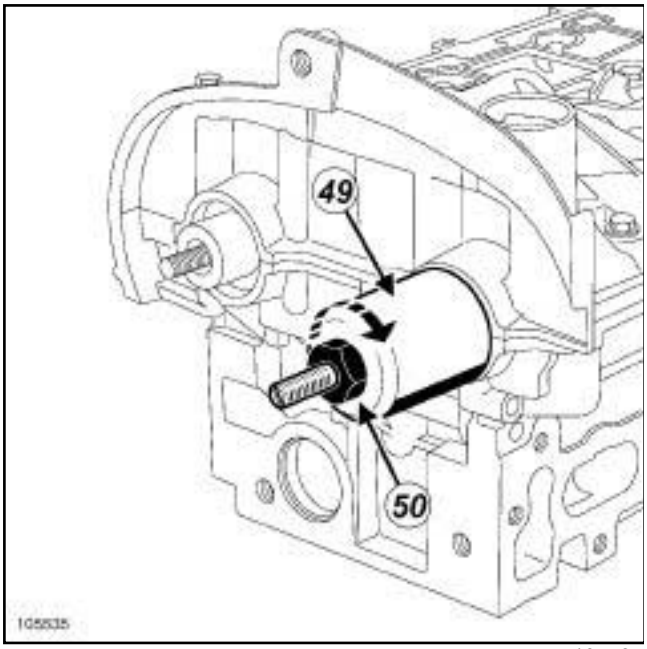
105531



105534

❑ Screw the stud (**48**) of the **(Mot. 1632)** onto the camshaft.

K4M, and 760 or 761 or 812 or 813



105535

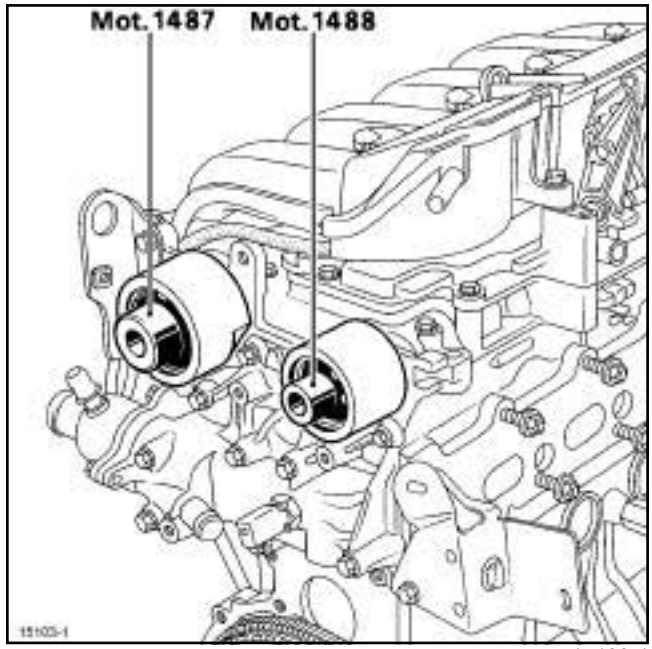
❑ Fit the cover (**49**) and the collar nut (**50**) of the **(Mot. 1632)**.

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

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

❑ Refit the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-18**) .

WARNING
Follow the second procedure in the timing belt refitting procedur .



15103-1

❑ Refit:

- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-4**) ,
- new inlet camshaft sealing plugs using the **(Mot. 1487)**,
- new exhaust camshaft sealing plugs using tool **(Mot. 1488)**,

❑ Proceed in the reverse order to removal.

❑ Refit:

- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the battery (see **Battery: Removal - Refitting**) (80A, Battery).

❑ Fill and bleed the cooling system (see **19A**, **Cooling**, **Cooling circuit: Draining - Refilling**, page **19A-15**) .

❑ Refit:

- the engine undertray,
- the engine covers.

F4R, and 770 or 771 or 776

Essential special tooling	
Mot. 1672	Lower engine support.
Mot. 1509	Camshaft sproc ket locking tool.
Mot. 1509-01	Conversion kit f or tool Mot.1509 or Mot.1801
Mot. 1448	Long nose pliers for hose clips.
Mot. 1517	Camshaft seal f tting tool.
Mot. 1512	Exhaust camshaft oil seal f t-ting tool (28 x 47).

Essential equipment
workshop hoist
load balancer
cylinder head rule
set of feeler gauges
cylinder head testing tool

Tightening torques ▽	
nuts	**80 N.m**
cylinder head bolts (ini-tial torque)	**30 N.m**
cylinder head bolts	**230° ± 6°**
new or original oil sepa-rator bolts (in tapped holes)	**10 N.m**
new oil separ ator bolts (in non-tapped holes)	**15 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 **13B**, **Diesel injection**, **Diesel injection: Precautions for repair**, page **13B-12**) ,
- (see **Vehicle: Precautions for repair**) (01D, Mechanical introduction).

IMPORTANT

Use the diagnostic tool before any operation is carried out on the injection circuit to check:

- that the rail is not under pressure,
- that the fuel temperature is not too high.

Working on the circuit with the engine r unning is strictly forbidden.

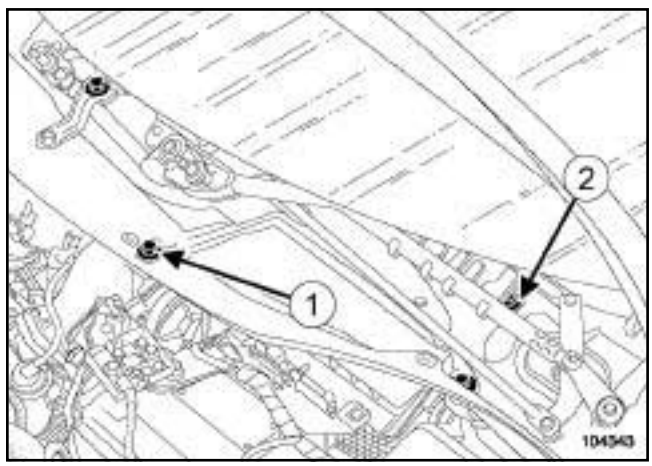
REMOVAL

I - REMOVAL PREPARATION OPERATION

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

❑ Remove:

- the engine covers,
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery),
- the bonnet (see **Bonnet: Removal - Refitting**) (48A, Non-side opening elements),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (55A, Exterior protection).

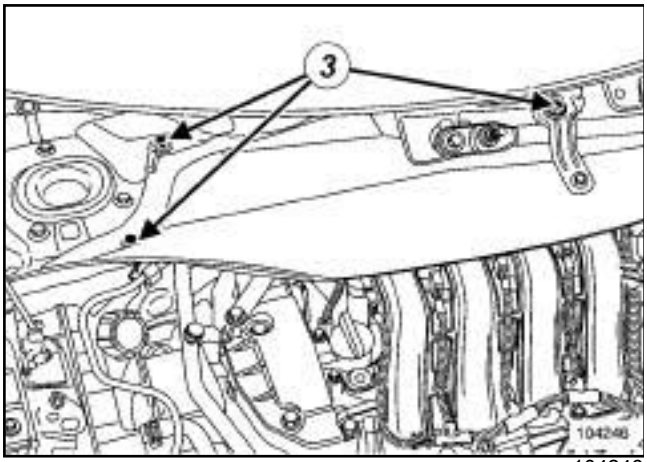


104343

❑ Remove:

- the air filter access panel bolts (**1**) ,
- the air filter access panel,
- the bolt (**2**) from the scuttle panel partition.

F4R, and 770 or 771 or 776



104246

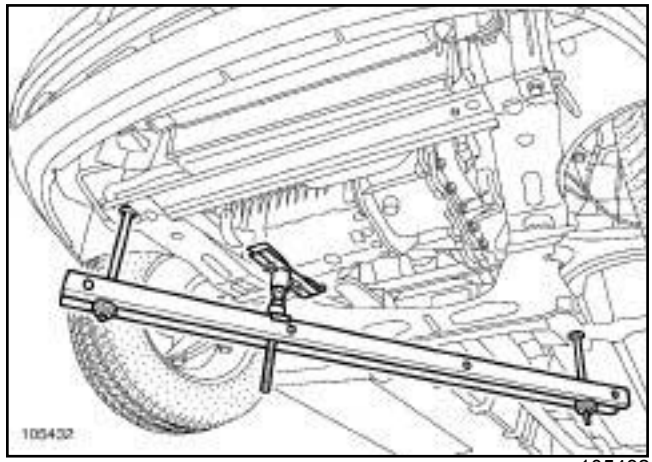
❑ Remove:

- the bolts (**3**) from the scuttle panel partition,
- the scuttle panel partition,
- the windscreen wiper mechanism (see **Windscreen wiper mechanism: Removal - Refitting**) (85A, Wiping - Washing),
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the engine undertray bolts,
- the engine undertray.

❑ Drain the engine cooling system (see **19A**, **Cooling**, **Cooling circuit: Draining - Refilling**, page **19A-15**) .

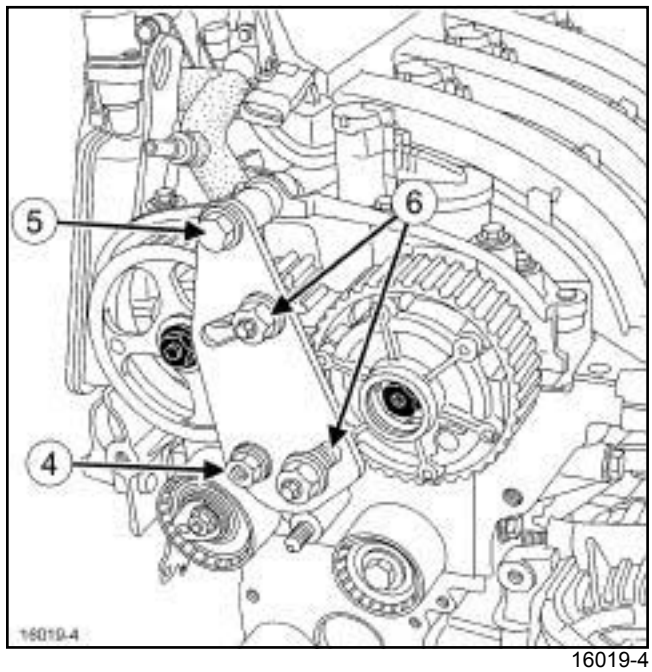
❑ Remove:

- the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-4**) ,
- the catalytic pre-converter (see **19B**, **Exhaust**, **Catalytic pre-converter: Removal - Refitting**, page **19B-29**) ,
- the starter (see **16A**, **Starting - Charging**, **Starter: Removal - Refitting**, page **16A-21**) .



105432

❑ Fit the engine support **(Mot. 1672)**.



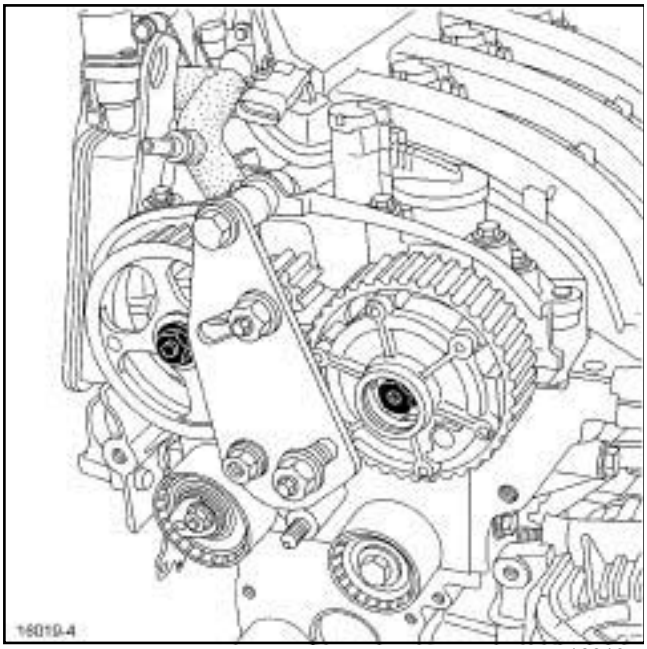
16019-4

❑ Fit the **(Mot. 1509)** with the sprocket **(Mot. 1509-01)**.

❑ Tighten the collar nut (**4**) and the bolt (**5**) , then bring the sprockets of the tool **(Mot. 1509)** into contact with the camshaft pulleys whilst torque tightening the **nuts (80 N.m)** (**6**) .

❑ Remove the blanking cover from the inlet camshaft dephaser using a **14 mm** Allen key.

F4R, and 770 or 771 or 776

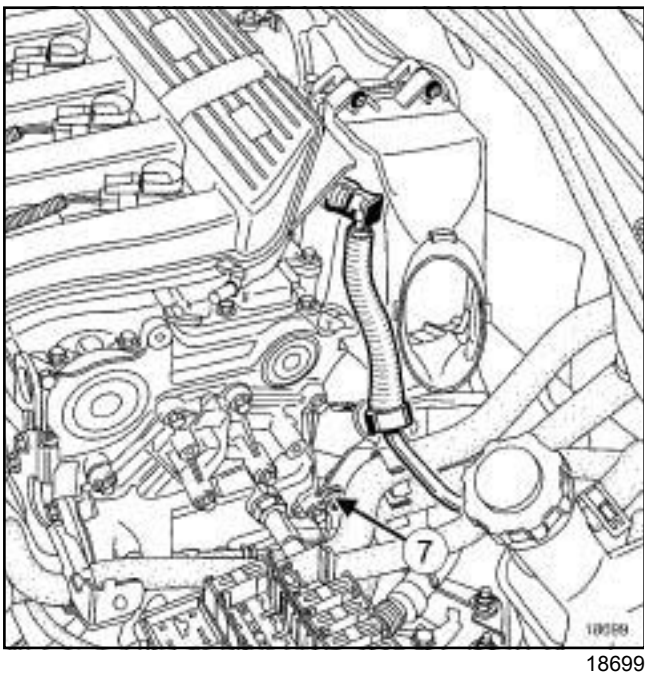


16019-4

❏ Remove:

- the exhaust camshaft pulley nut,
- the inlet camshaft dephaser bolt.

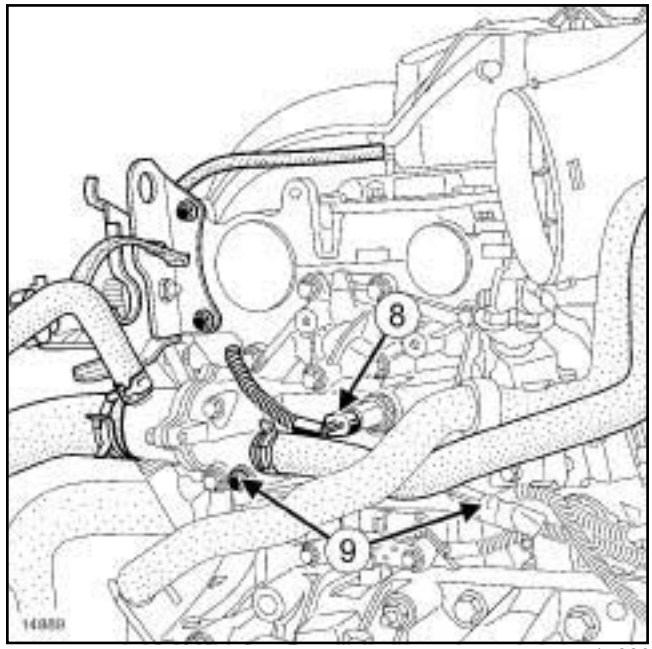
❏ Loosen the stud from the nut if necessary (see **11A**, **Top and front of engine**, **Camshaft: Removal - Refitting**, page **11A-172**) .



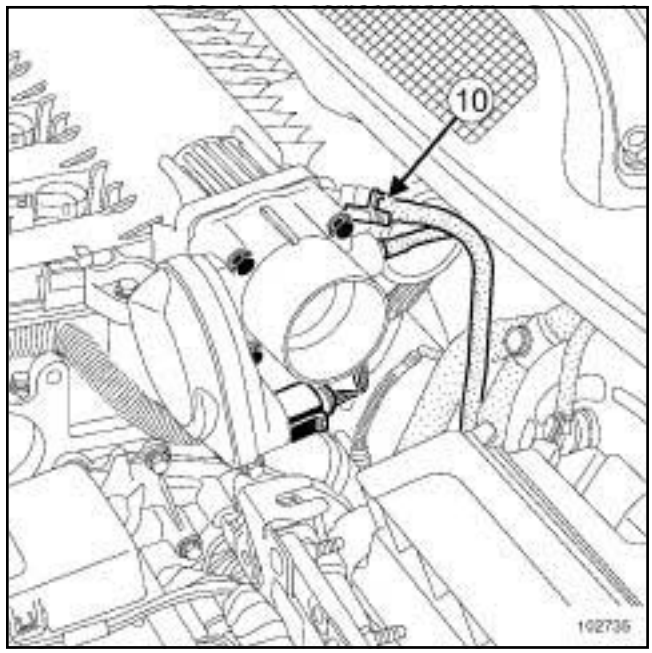
18699

❏ Remove the bracket bolt (**7**) .

❏ Remove the bracket.



14889



102735

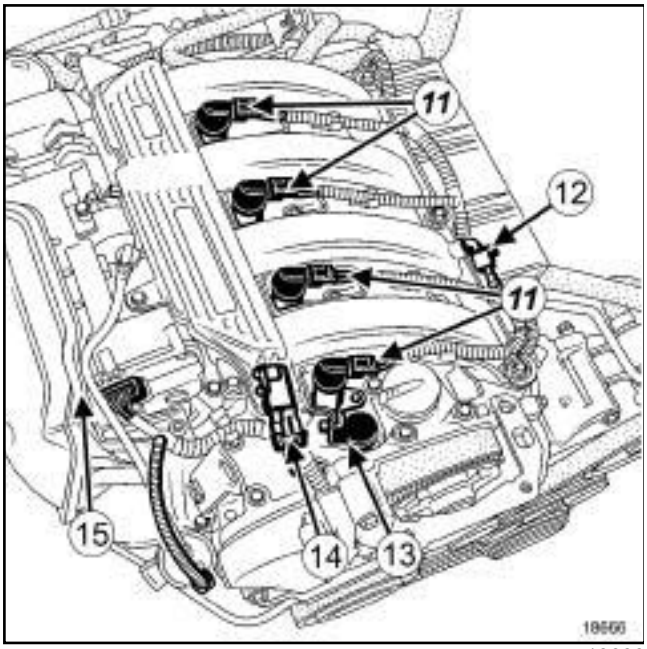
❏ Remove the bolts (**8**) from the electrical wiring support.

❏ Disconnect:

- the coolant temperature sensor connector (**9**) ,
- the water chamber pipes using the tool **(Mot. 1448)**,
- the brake servo vacuum pipe (**10**) from the inlet distributor side.

❏ Separate the wiring bracket assembly.

F4R, and 770 or 771 or 776



18666

❏ Disconnect:

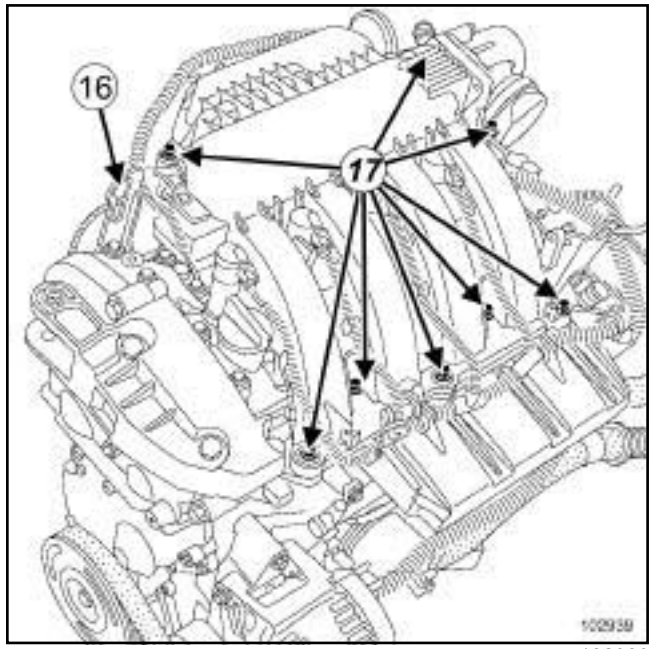
- the ignition coil connectors (**11**) ,
- the connector (**12**) from the air temperature sensor,
- the camshaft dephaser connector (**13**) ,
- the inlet distributor pressure sensor connector (**14**) ,
- the fuel vapour recirculation solenoid valve pipe (**15**) ,
- the injector connectors,
- the upstream oxygen sensor connector.

❏ Unclip the electrical wiring clip.

❏ Move the electrical wiringto one side.

❏ Remove:

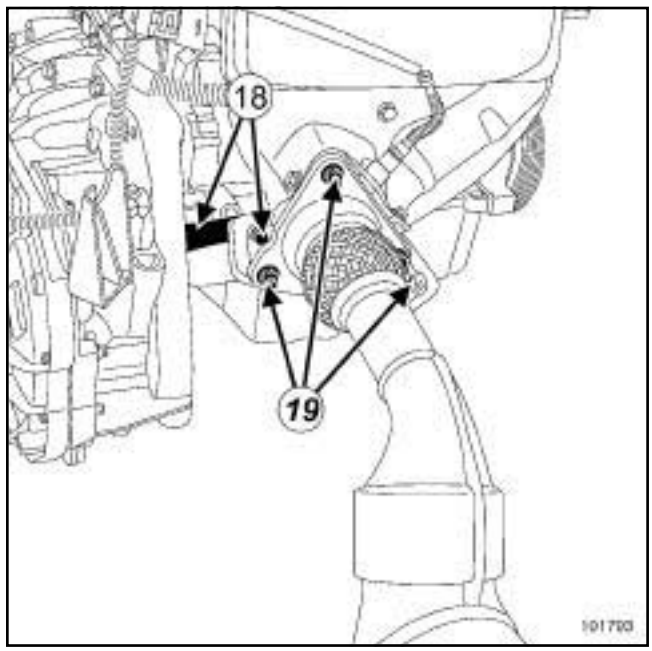
- the ignition coils,
- the spark plugs,
- the dephaser solenoid valve.



102939

❏ Remove:

- the engine lifting bracket (**16**) on the timing end,
- the inlet distributor bolts (**17**) ,
- the inlet distributor.

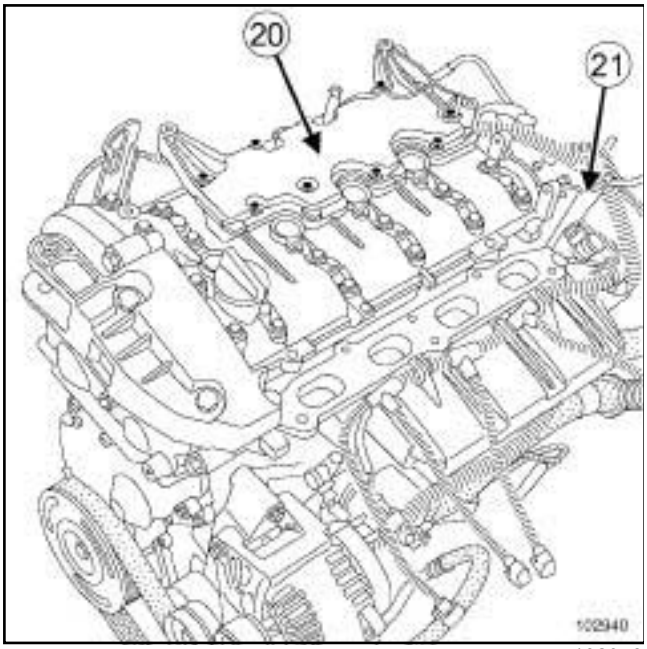


101793

❏ Remove:

- the catalytic converter - gearbox stay bolts (**18**) ,
- the catalytic converter/gearbox strut,
- the nuts (**19**) from the exhaust pipe.

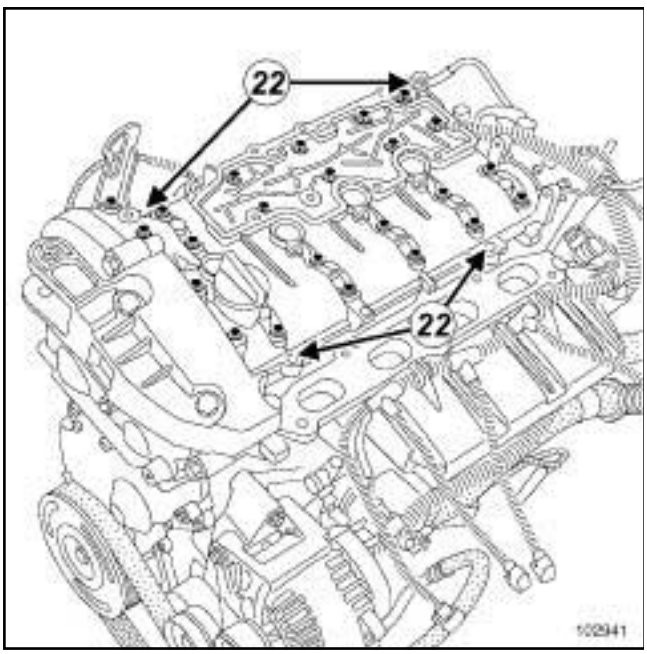
F4R, and 770 or 771 or 776



102940

❏ Remove:

- the oil separator bolts,
- the oil separator (**20**) ,
- the lifting bracket on the flywheel end (**21**) .



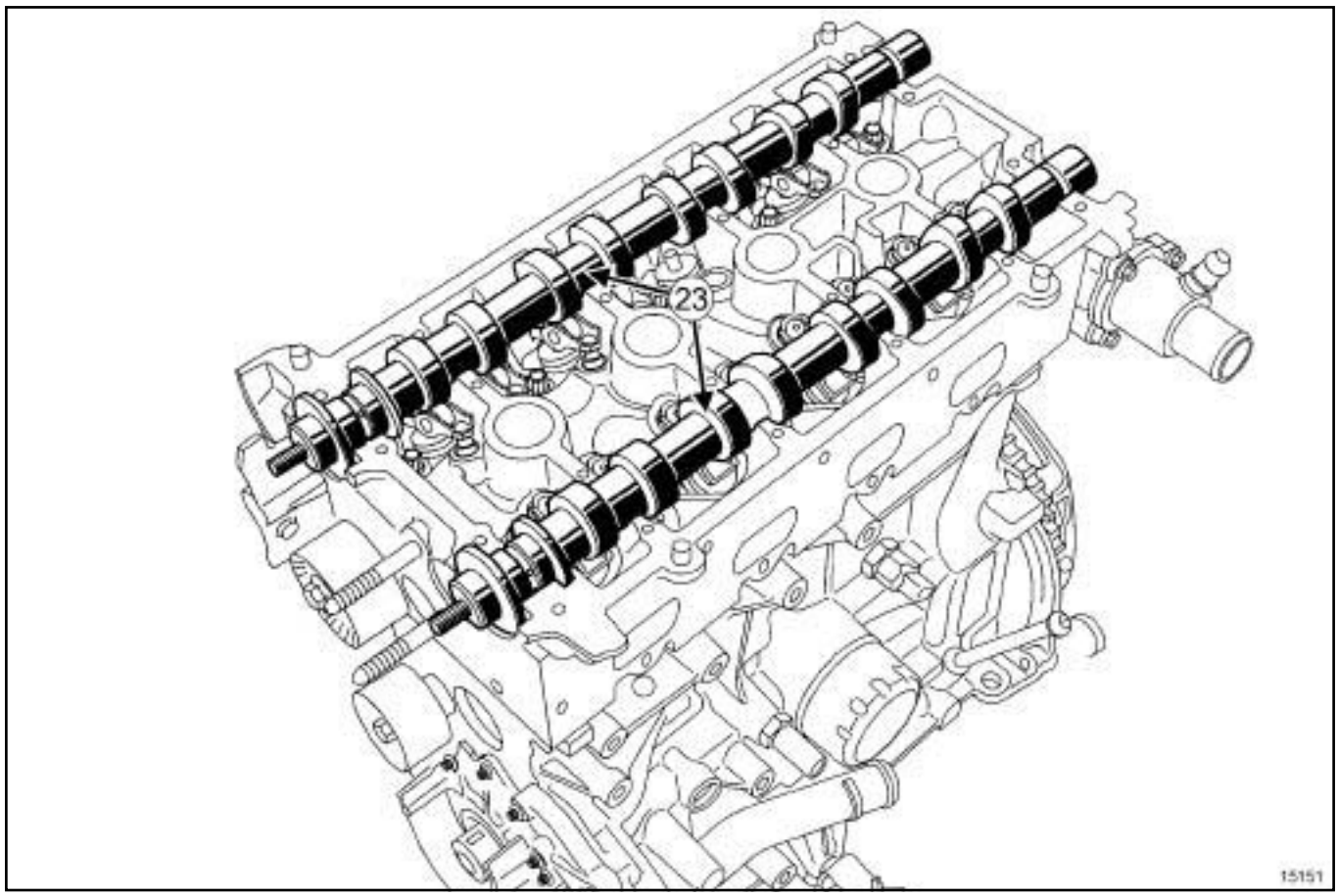
102941

❏ Remove the rocker cover bolts.

❏ Remove the rocker cover vertically by tapping the lugs (**22**) with a copper hammer.

❏ Remove the camshaft seals.

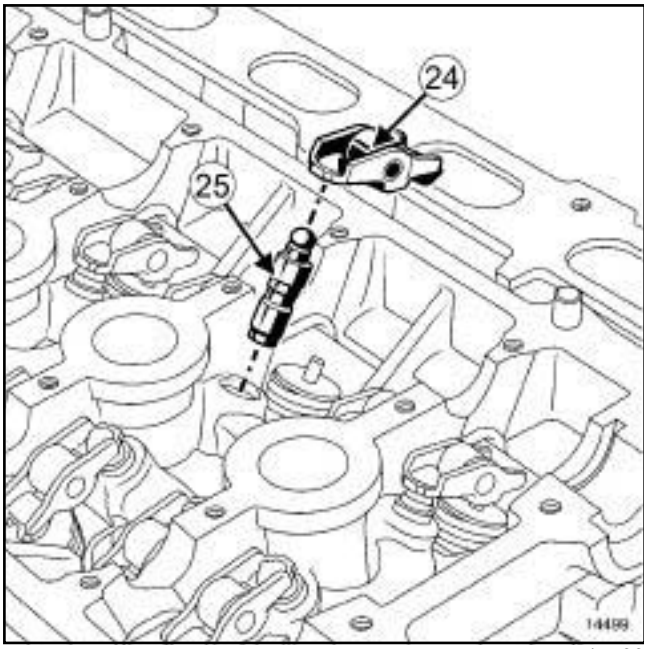
F4R, and 770 or 771 or 776



15151

❑ Remove the inlet and exhaust camshafts (**23**)

F4R, and 770 or 771 or 776



14499

❑ Remove:

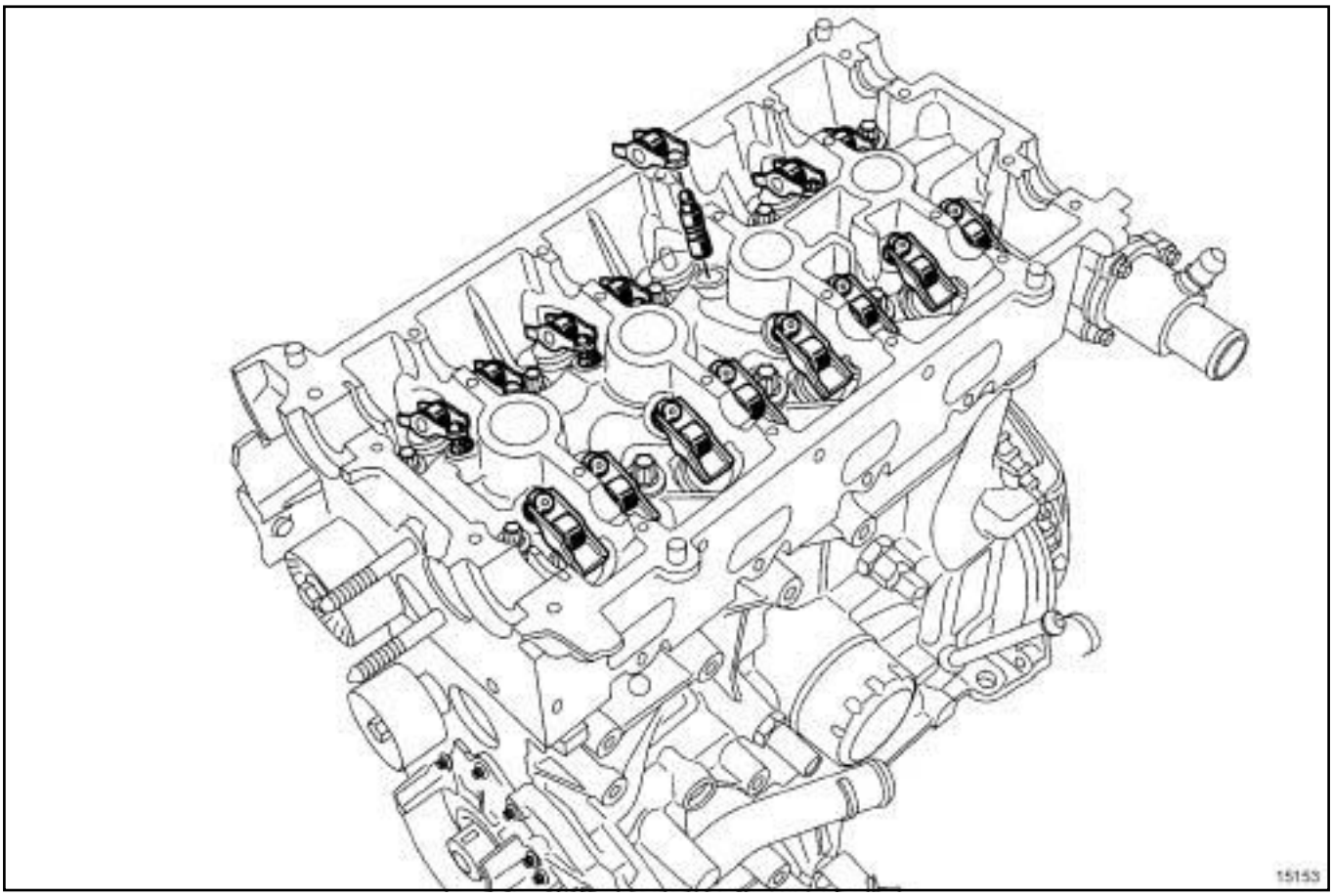
- the valve rockers (**24**) ,
- the hydraulic tappets (**25**) .

Note:

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

F4R, and 770 or 771 or 776

II - OPERATION FOR REMOVAL OF PART CONCERNED



15153

❏ Remove the cylinder head bolts.

❏ Recover the stem caps for the bolts on the cylinder head.

❏ Remove:

- the cylinder head using a **workshop hoist** and a **load balancer**.
- the cylinder head gasket.

F4R, and 770 or 771 or 776

REFITTING

I - REFITTING PREPARATION OPERATION

❑

IMPORTANT
Wear goggles with side protectors for this operation.

IMPORTANT
Wear leaktight gloves (Nitrile type) for this operation.

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

WARNING
Do not allow this product to dr ip onto the paintwork.

Clean the cylinder head carefully to avoid an y foreign bodies entering the oil retur n and supply pipes.

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

WARNING
To ensure proper sealing, the gask et surfaces must be clean, dry and not greasy (avoid any f ngerm arks).

❑ **parts always to be replaced: cylinder head bolts (10,02,01,14)**.

❑ **parts always to be replaced: Cylinder head gasket (10,02,01,04)**.

1 - Cleaning the cylinder head joint face

❑

WARNING
Protect the oilway so that f oreign bodies do not enter the oil pipes in the cylinder head.

Failure to follow this instruction could lead to the blocking of the oilways, resulting in a rapid deterioration of the camshaft.

❑ Clean the joint face using **GREY ABRASIVE PADS** (see **Vehicle: Parts and ingredients for the repairwork**) (04B, Consumables - Products):

- the cylinder head,

- of the cylinder block.

❑ Use a **SURFACE CLEANER** (see **Vehicle: Parts and ingredients for the repairwork**) (04B, Consumables - Products) and **CLEAN CLOTHS** to degrease the joint faces:

- of the cylinder head,

- of the cylinder block.

2 - Checking the gasket face

❑ Check with a **cylinder head rule** and a **set of feeler gauges** to determine if the joint face has been deformed.

WARNING
No regrinding of the cylinder head is permitted.

❑ The maximum deformation is **0.05 mm.**

Note:

If the cylinder head is faulty:

-strip the cylinder head (see **Cylinder head:Stripping - Restoring**) (Technical Note 6027A, 10A, Engine and cylinder block assembly),

-test the cylinder head f or any cracks using the **cylinder head testing tool** (see **Cylinder head testing equipment: Use**) (Technical Note 6026A, 11A, Top and front of engine),

-rebuild the cylinder head (see **Cylinder head:Stripping - Restoring**) (Technical Note 6027A, 10A, Engine and cylinder block assembly).

II - REFITTING OPERATION FOR PART CONCERNED

❑ Using a syringe, extract any oil which may have entered the cylinder head holes.

F4R, and 770 or 771 or 776

❑ Refit:

- a new cylinder head gasket,
- the cylinder head using a **workshop hoist** and a **load balancer**.

Note:

During this operation, be careful not to damage the windscreen.

WARNING

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

❑ Refit the stem caps for the bolts on the cylinder head.

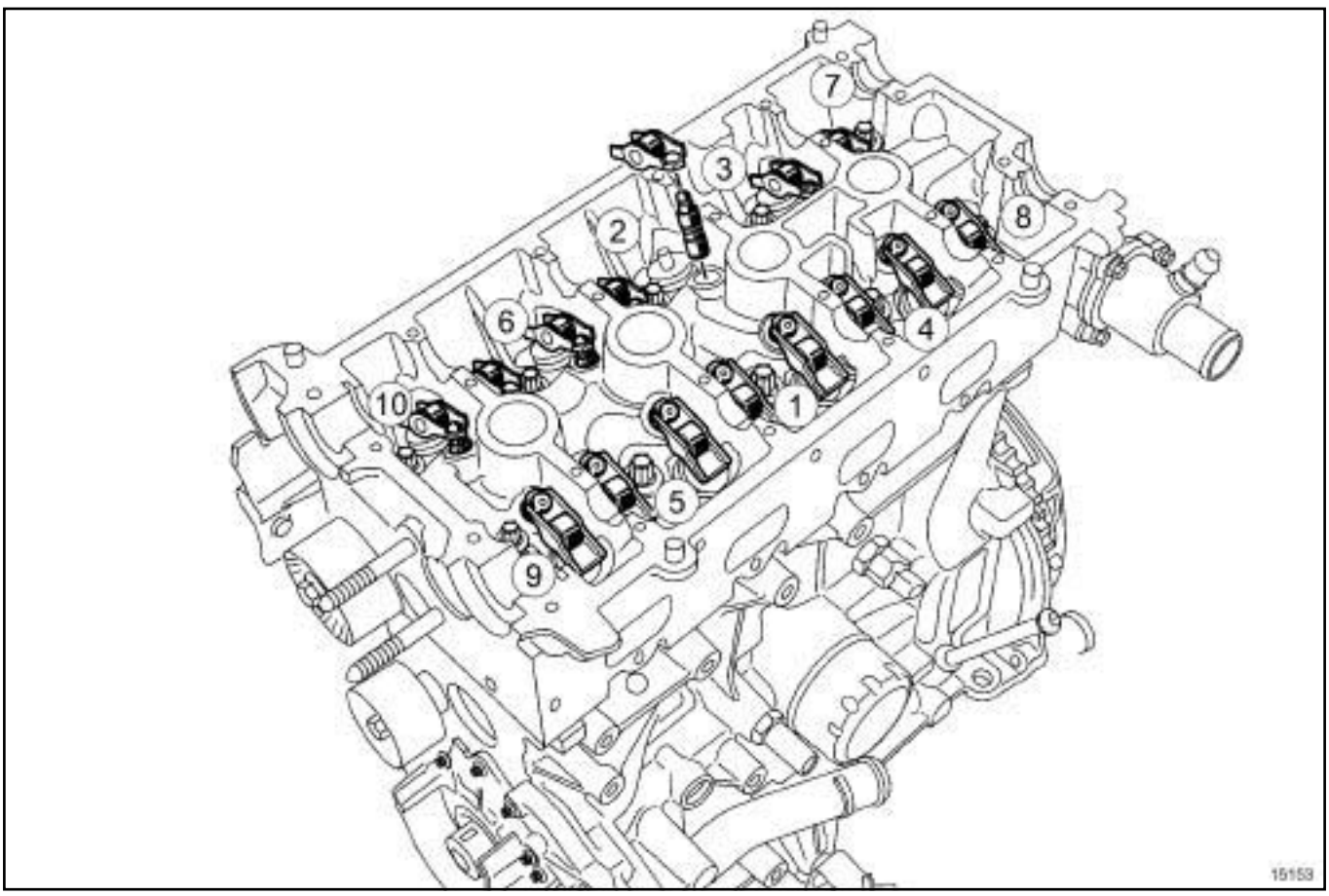
WARNING

In order to ensure that the bolts are correctly tightened, use a syringe to remove any oil which may be in the cylinder head mounting holes.

WARNING

Do not oil the new bolts. Be sure to oil bolts being reused.

❑ Refit new cylinder head bolts.



15153

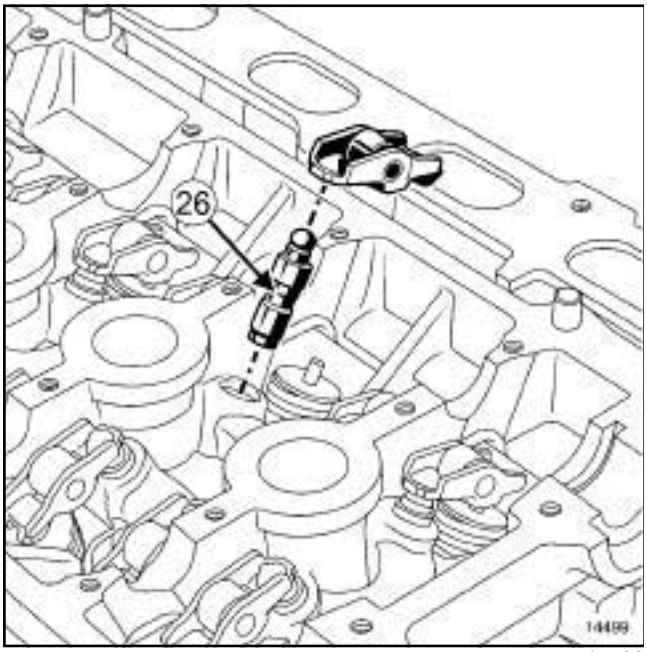
❑ Tighten to torque and in order the **cylinder head bolts (initial torque) (30 N.m)**.

❑ Check that all the cylinder head bolts are correctly torque tightened **30 N.m**.

❑ Angle tighten in order the **cylinder head bolts (230° ± 6°)**.

F4R, and 770 or 771 or 776

III - FINAL OPERATION



14499

❏ Reprime the hydraulic tappets (hydraulic tappets may empty after a long down time).

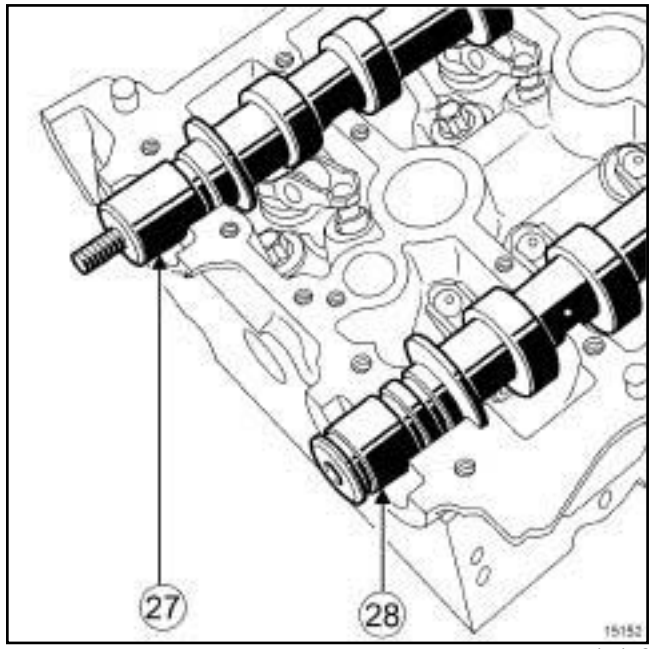
To check or reprime a hydraulic tappet, press the top of the tappet at (**26**) with the thumb.

If the tappet piston depresses:

- insert the tappets in a container of diesel fuel or new engine oil,
- refit the hydraulic tappets.

❏ Refit:

- the valve rockers,
- the camshafts, oiling the bearings.



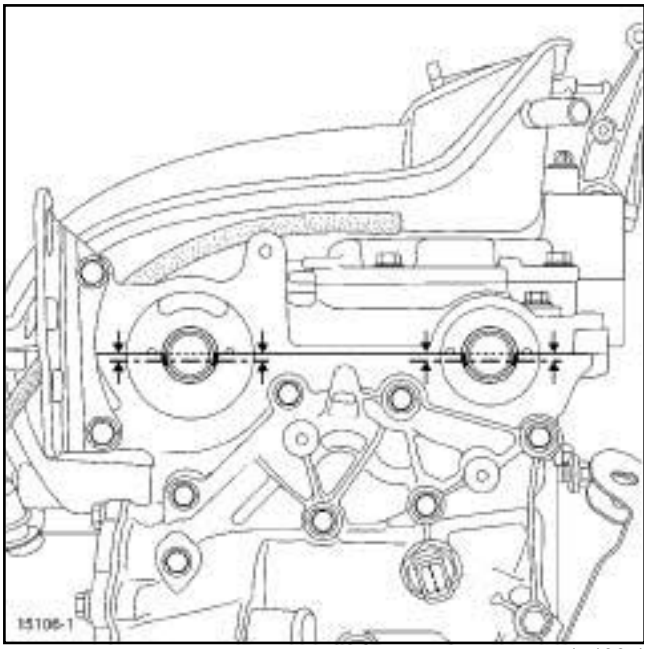
15152

❏ The camshafts are identified by the pulley mountings.

Detailed view of the pulley mountings:

- (**27**) : exhaust camshaft,
- (**28**) : inlet camshaft.

F4R, and 770 or 771 or 776

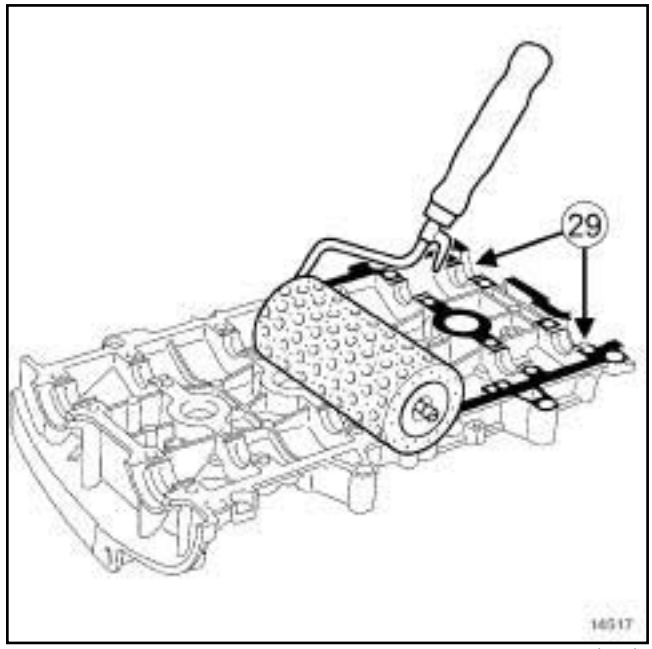


15106-1

❑ Position the camshaft grooves as shown in the diagram.

WARNING

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



14517

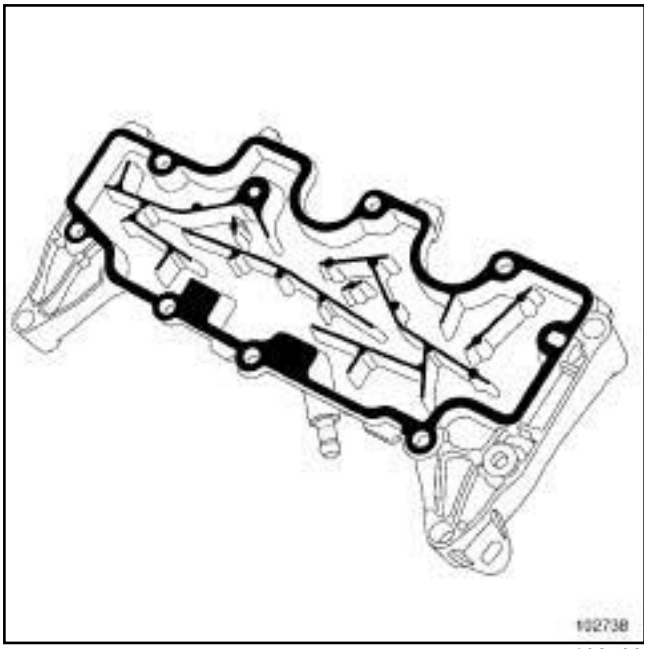
❑ Apply **RESIN ADHESIVE** to the rocker cover joint face using the (stipple) roller (see **Vehicle: Parts and ingredients for the repairwork**) (04B, Consumables - Products).

Note:

Using a cloth, remo ve the **RESIN ADHESIVE** at (**29**) from the camshaft rocker cover bearings.

❑ Refit the rocker cover (see **11A**, **Top and front of engine**, **Rocker cover: Removal - Refitting**, page **11A-158**) .

F4R, and 770 or 771 or 776



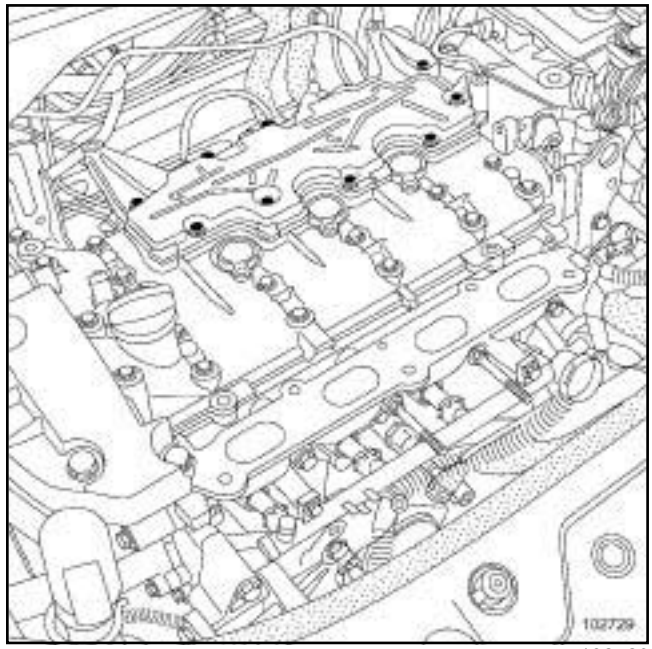
102738

❑

WARNING
To ensure proper sealing, the gask et surfaces must be clean, dry and not greasy (avoid any f n-ger marks).

❑ Apply **RESIN ADHESIVE** to the oil separator joint face using the (stipple) roller (see **Vehicle: Parts and ingredients for the repairwork**) (04B, Consumables - Products).

❑ Refit the lifting bracket on the flywheel end.



102729

❑ Refit the oil separator.

❑ Tighten to torque and in order:

- the **new or original oil separator bolts (in tapped holes) (10 N.m)**,
- the **new oil separator bolts (in non-tapped holes) (15 N.m)**.

❑ Refit:

- the exhaust pipe,
- the catalytic converter/gearbox strut,
- the spark plugs (see **17A**, **Ignition**, **Spark plugs: Removal - Refitting**, page **17A-3**) ,
- the ignition coils (see **17A**, **Ignition**, **Coils Removal - Refitting**, page **17A-1**) ,
- the inlet distributor with a new seal (see **12A**, **Fuel mixture**, **Inlet manifold: Removal - Refitting**, page **12A-49**) ,
- the camshaft dephaser solenoid valve.

❑ Replace the camshaft seals.

- use the **(Mot. 1517)** for the inlet camshaft seal,
- use the **(Mot. 1512)** for the exhaust camshaft seal.

❑ Refit the electrical wiring clip.

❑ Connect:

- the upstream oxygen sensor connector,
- the injector connectors,
- the fuel vapour recirculation solenoid valve pipe,
- the inlet distributor pressure sensor connector,

F4R, and 770 or 771 or 776

- the camshaft dephaser connector,
- the air temperature sensor connector,
- the ignition coil connectors.
- the brake servo vacuum pipe on the inlet distributor side,
- the water chamber pipes using the tool **(Mot. 1448)**,
- the coolant temperature sensor connector.

❑ Refit:

- the electrical wiring support,
- the exhaust camshaft pulley.
- the blanking cover of the inlet camshaft dephaser,
- the scuttle panel partition,
- the windscreen wiper mechanism (see **Windscreen wiper mechanism: Removal - Refitting**) (85A, Wiping - Washing),
- the front bumper (see **Front bumper: Removal - Refitting**) (55A, Exterior protection),
- the starter (see **16A**, **Starting - Charging**, **Starter: Removal - Refitting**, page **16A-21**) ,
- the catalytic pre-converter (see **19B**, **Exhaust**, **Catalytic pre-converter: Removal - Refitting**, page **19B-29**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-4**) ,
- the front wheels (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the air filter access panel,
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (55A, Exterior protection),
- the bonnet (see **Bonnet: Removal - Refitting**) (48A, Non-side opening elements),
- the battery tray (see **Battery tray: Removal - Refitting**) (80A, Battery),
- the battery (see **Battery : Removal - Refitting**) (80A, Battery),
- the engine covers.

❑ Fill and bleed the cooling system (see **19A**, **Cooling**, **Cooling circuit: Draining - Refilling**, page **19A-15**) .

❑ Refit the engine undertray.

F4R, and 774 or 776

Tightening torques ▽	
cylinder head bolts	**30 N.m**
cylinder head bolts	**180° ± 25°**

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-97**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-4**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-18**) ,
- the coils (see **17A**, **Ignition**, **Coils Removal - Refitting**, page **17A-1**) ,
- the oil separator (see **11A**, **Top and front of engine**, **Oil decanter: Removal - Refitting**, page **11A-301**) ,
- the rocker cover (see **11A**, **Top and front of engine**, **Rocker cover: Removal - Refitting**, page **11A-158**) ,
- the camshafts (see **11A**, **Top and front of engine**, **Camshaft: Removal - Refitting**, page **11A-172**) .

F4R, and 774

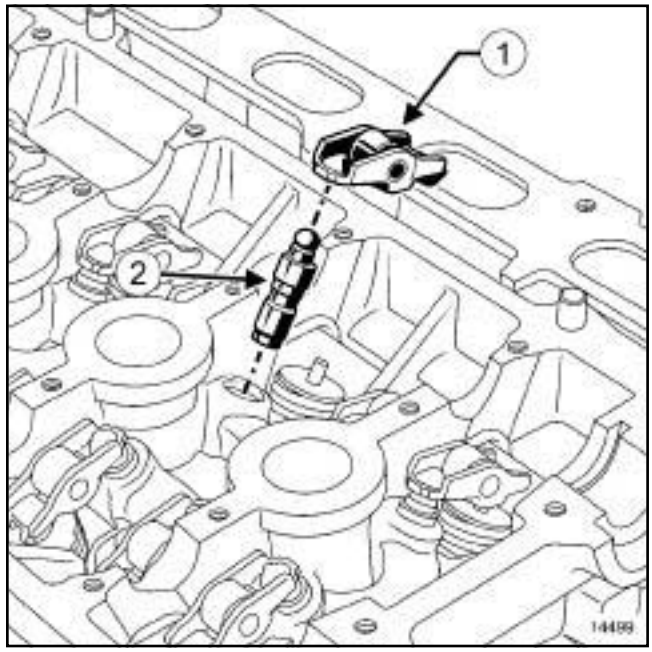
❑ Remove the catalytic converter (see **19B**, **Exhaust**, **Catalytic converter: Removal - Refitting**, page **19B-46**) .

F4R, and 776

❑ Remove the catalytic pre-converter (see **19B**, **Exhaust**, **Catalytic converter: Removal - Refitting**, page **19B-46**) .

❑ Remove:

- the turbocharger (see **12B**, **Turbocharging**, **Turbocharger: Removal - Refitting**, page **12B-4**) ,
- the exhaust manifold (see **12A**, **Fuel mixture**, **Exhaust manifold: Removal - Refitting**, page **12A-73**) ,
- the inlet distributor (see **12A**, **Fuel mixture**, **Inlet manifold: Removal - Refitting**, page **12A-49**) ,
- the water chamber (see **19A**, **Cooling**, **Plenum chamber: Removal - Refitting**, page **19A-45**) .



14499

❑

Note:

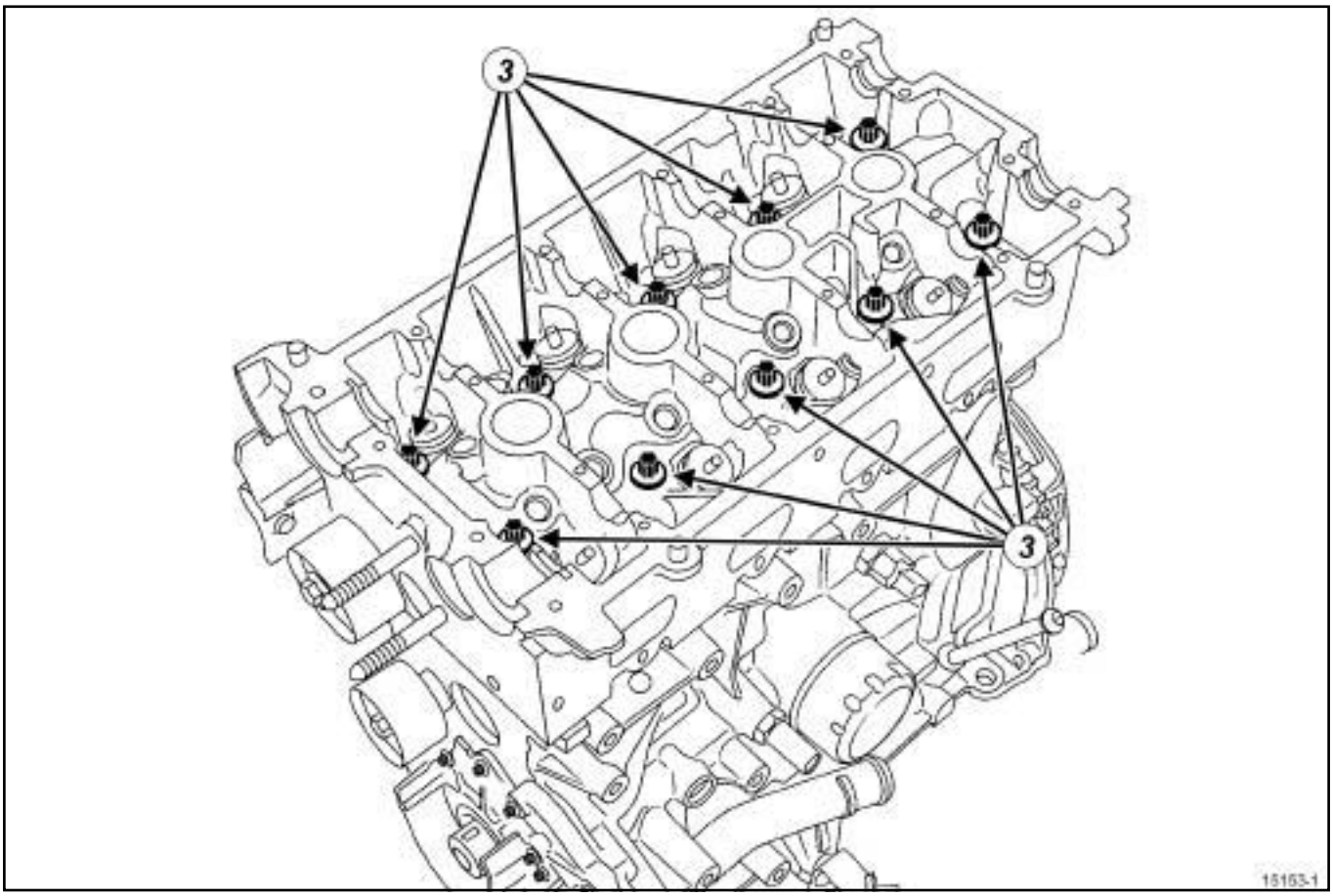
To prevent any risk of unpriming the hydraulic tappets, always make sure that they are vertical.

❑ Remove:

- the valve rockers (**1**) ,
- the hydraulic tappets (**2**) .

F4R, and 774 or 776

II - OPERATION FOR REMOVAL OF PART CONCERNED



15153-1

❑ Remove:

- the cylinder head bolts (**3**) ,
- the cylinder head,
- the cylinder head gasket.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: Cylinder head gasket (10,02,01,04)**.

❑ **parts always to be replaced: cylinder head bolts (10,02,01,14)**.

F4R, and 774 or 776

1 - Cleaning the cylinder head joint face

❑

IMPORTANT
Wear goggles with side protectors for this operation.

IMPORTANT
Wear leaktight gloves (Nitrile type) for this operation.

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

WARNING
Do not allow this product to dr ip onto the paintwork.

Clean the cylinder head carefully to avoid an y foreign bodies entering the oil retur n and supply pipes.

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

WARNING
To ensure proper sealing, the gask et surfaces must be clean, dry and not greasy (avoid any f ngerer marks).

WARNING
Protect the oilway so that f oreign bodies do not enter the oil pipes in the cylinder head.

Failure to follow this instruction could lead to the blocking of the oilways, resulting in a rapid deterioration of the camshaft.

❑ Clean the joint faces with **SUPER CLEANING AGENT FOR JOINT FACES** (see **Vehicle: Parts and ingredients for the repairwork**) (04B, Consumables - Products):

- the cylinder head gasket face if being reused,

- the cylinder block gasket face.

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

- the cylinder head gasket face if being reused,

- the cylinder block gasket face.

2 - Checking the gasket face

❑ Check for gasket face deformation using a ruler and a set of shims.

WARNING
No regrinding of the cylinder head is permitted.

❑ The maximum deformation is **0.05 mm**.

Note:

If the cylinder head is faulty:

-strip the cylinder head (see **Stripping the cylinder head**) (Technical Note 6027A, 10A, Engine and cylinder block assembly),

-test the cylinder head in order to detect any possible cracks using the cylinder head test kit (see **Cylinder head testing equipment: Use**) (Technical Note 6026A, 11A, Top and front of engine),

-rebuild the cylinder head (see **Rebuilding the cylinder head**) (Technical Note 6027A, 10A, Engine and cylinder block assembly).

II - REFITTING OPERATION FOR PART CONCERNED

❑ Bring the pistons to mid-stroke position to prevent any risk of contact with the valves when tightening the cylinder head.

WARNING
To ensure proper sealing, the gask et surfaces must be clean, dry and not greasy (avoid any f ngerer marks).

WARNING
In order to ensure that the bolts are correctly tightened, use a syringe to remo ve any oil which may be in the cylinder head mounting holes.

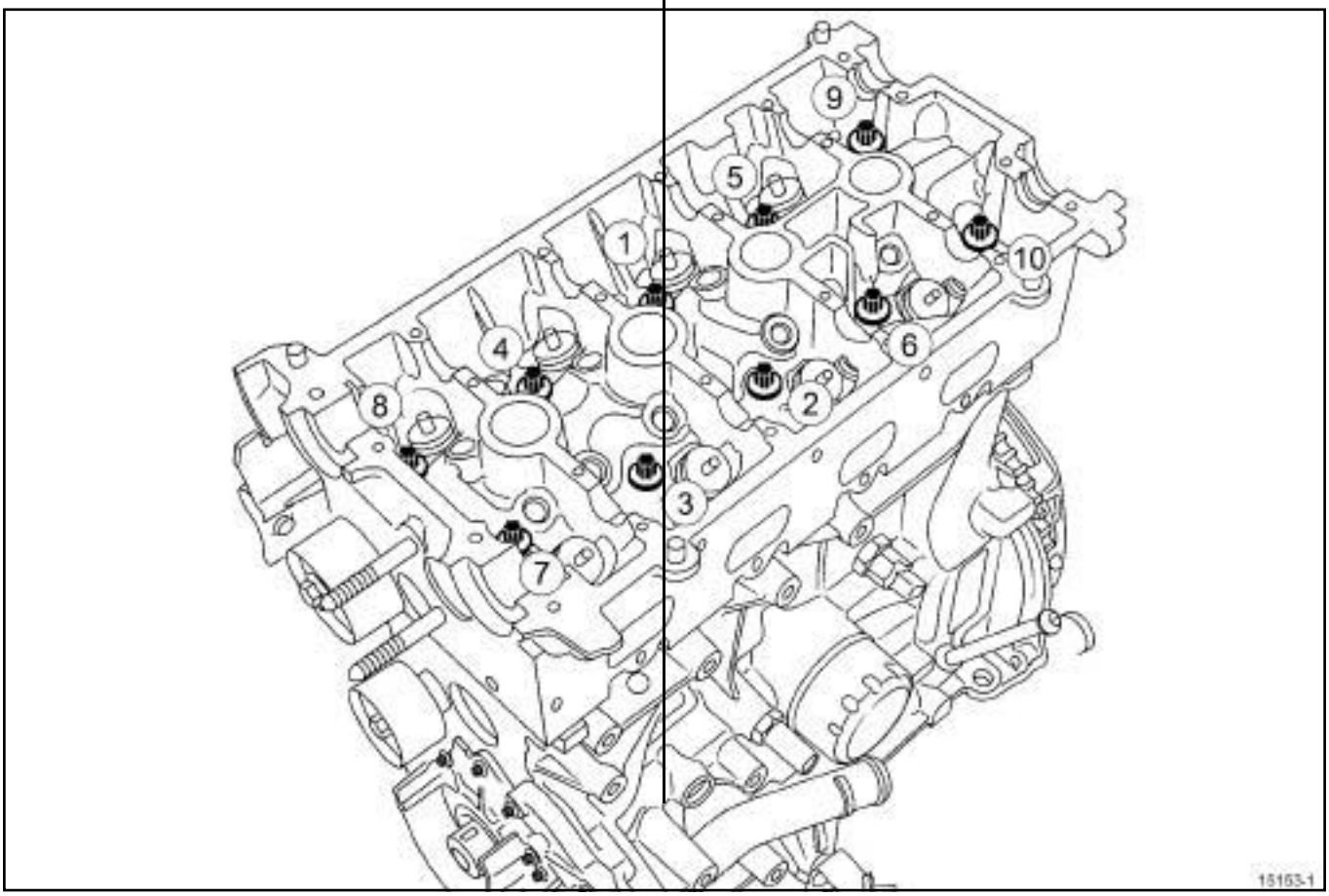
WARNING
Do not oil the new bolts. Be sure to oil bolts being reused.

F4R, and 774 or 776

❑ Check that the centring devices are present and in good condition on the cylinder block.

❑ Fit:

- a new cylinder head gasket,
- the cylinder head equipped with new bolts on the cylinder block.



15153-1

❑ Fit the new cylinder head bolts in order without tightening.

❑ Pretighten in order and to torque the **cylinder head bolts (30 N.m)**.

❑ Check that all new cylinder head bolts are correctly tightened to a torque of **30 N.m**.

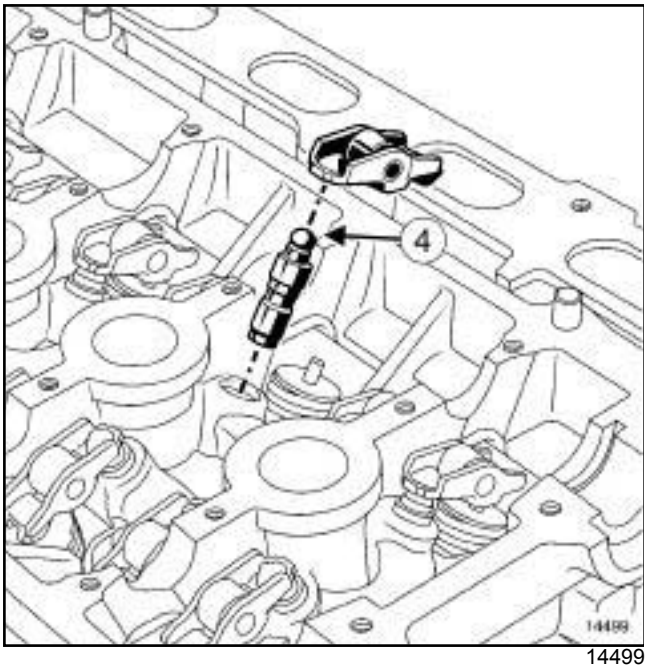
❑ Angle tighten in order the **cylinder head bolts (180° ± 25°)**.

Note:

Do not retighten the cylinder head bolts after applying this procedure.

F4R, and 774 or 776

III - FINAL OPERATION



14499

❑

Note:

Because this engine is equipped with hydraulic tappets, there is no valve clearance adjustment.

❑ Reprime the hydraulic tappets (hydraulic tappets may empty if they have been removed for some time).

❑ To check if repriming is necessary, press the top of the tappet (**4**) with your thumb.

❑ If the tappet piston sinks, dip the tappet in a container filled with diesel.

❑ Press on the top of the tappet to expel air bubbles.

❑ Refit:

- the hydraulic tappets,
- the valve rockers.
- the water chamber (see **19A**, **Cooling**, **Plenum chamber: Removal - Refitting**, page **19A-45**) ,
- the inlet distributor (see **12A**, **Fuel mixture**, **Inlet manifold: Removal - Refitting**, page **12A-49**) ,
- the exhaust manifold (see **12A**, **Fuel mixture**, **Exhaust manifold: Removal - Refitting**, page **12A-73**) ,
- the turbocharger (see **12B**, **Turbocharging**, **Turbocharger: Removal - Refitting**, page **12B-4**) .

F4R, and 776

❑ Refit the catalytic pre-converter (see **19B**, **Exhaust**, **Catalytic converter: Removal - Refitting**, page **19B-46**) .

F4R, and 774

❑ Refit the catalytic converter (see **19B**, **Exhaust**, **Catalytic converter: Removal - Refitting**, page **19B-46**) .

❑ Refit:

- the camshafts (see **11A**, **Top and front of engine**, **Camshaft: Removal - Refitting**, page **11A-172**) ,
- the rocker cover (see **11A**, **Top and front of engine**, **Rocker cover: Removal - Refitting**, page **11A-158**) ,
- the oil separator (see **11A**, **Top and front of engine**, **Oil decanter: Removal - Refitting**, page **11A-301**) ,
- the coils (see **17A**, **Ignition**, **Coils Removal - Refitting**, page **17A-1**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-18**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-4**) ,
- the « engine and gearbox » assembly (see **10A**, **Engine and cylinder block assembly**, **Engine/gearbox assembly: Removal - Refitting**, page **10A-97**) .

F4R, and 774 or 776

K4M, and 760 or 761 or 766 or 812 or 813

Essential special tooling	
Mot. 1496	Tool for setting camshaft.

Tightening torques ▽	
inlet camshaft dephaser pulley bolt	**100 Nm**
inlet camshaft dephaser blanking cover	**15 Nm**

REMOVAL

I - REMOVAL PREPARATION OPERATION

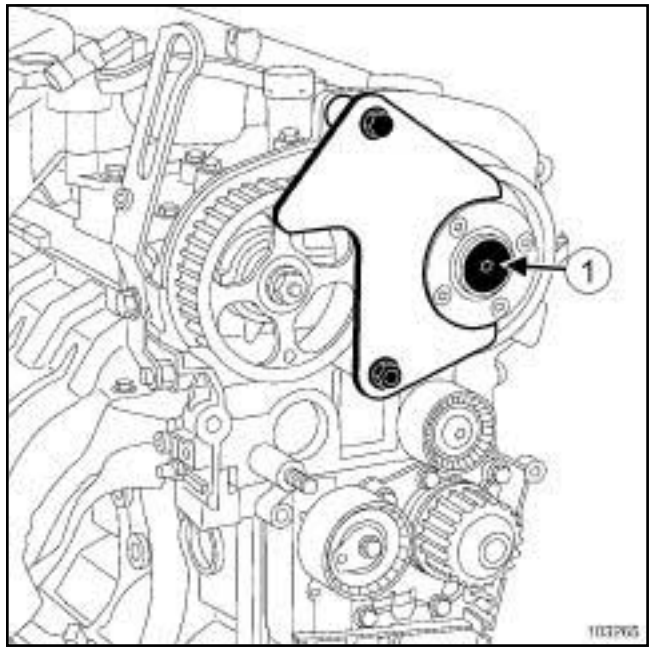
❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 364, 02A, Lifting equipment).

❏ Disconnect the battery (see **Battery: Removal - Refitting**) (MR 364, 80A, Battery).

❏ Remove:

- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 365, 55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-4**) ,
- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-18**) .

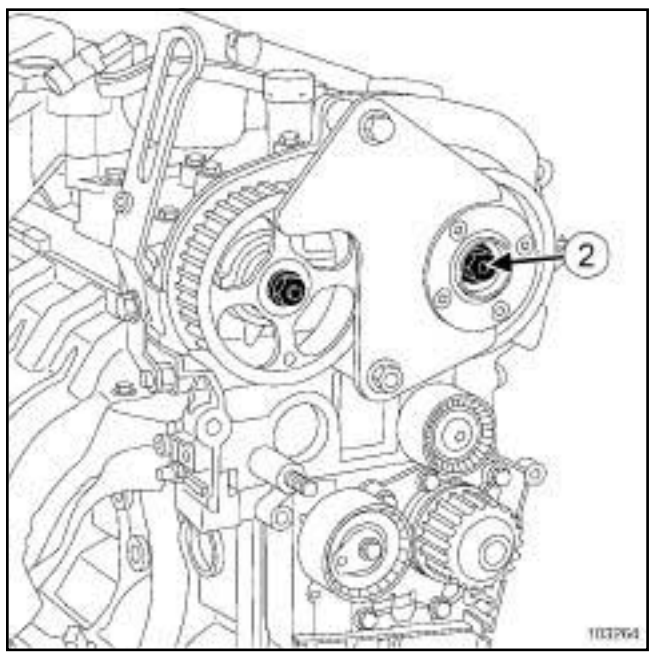
II - REMOVAL OPERATION FOR PART CONCERNED



103265

❏ Position the **(Mot. 1496)**.

❏ Remove the inlet camshaft dephaser blanking cover (**1**) .



103264

❏ Remove:

- the bolt (**2**) from the inlet camshaft pulley dephaser,
- the **(Mot. 1496)**,
- the inlet camshaft dephaser pulley.

K4M, and 760 or 761 or 766 or 812 or 813

REFITTING

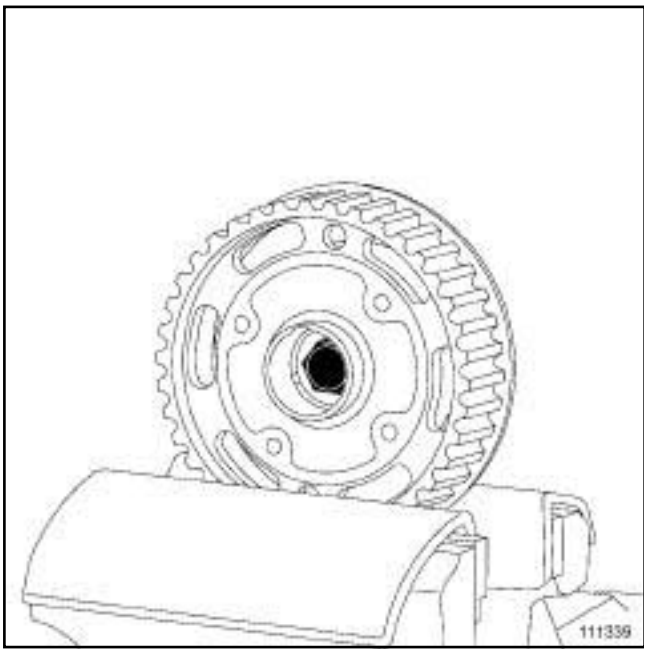
I - REFITTING PREPARATION OPERATION

❑

WARNING
Failure to observe the following procedure can lead to the destruction of the engine.

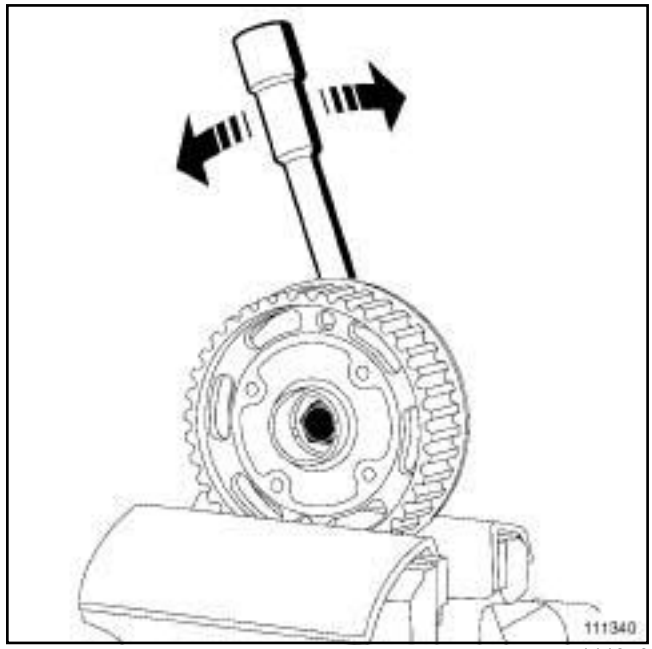
❑ If fitting a new inlet camshaft dephaser, check that it is locked by following the procedure described below:

❑ Fit a bolt to the inlet camshaft dephaser hub and tighten it.



111339

❑ Place the inlet camshaft dephaser in a vice fitted with jaws.



111340

❑ Mechanically lock the dephaser by rotating it to the left or to the right using a tubular hexagon box spanner.

❑ Check that the inlet camshaft dephaser is correctly locked (no rotation of the hub in relation to the wheel to the left or right).

❑ If there is a rotation of the hub in relation to the wheel, the camshaft dephaser is faulty and must be replaced.

❑ Grease the end of the inlet camshaft (timing end) and clean the bores and bearing faces of the inlet camshaft dephaser.

II - REFITTING OPERATION FOR PART CONCERNED

❑ Position the **(Mot. 1496)**.

❑ Refit the inlet camshaft dephaser pulley bolt.

❑ Tighten to torque the **inlet camshaft dephaser pulley bolt (100 Nm)**.

❑ Refit the new inlet camshaft dephaser blanking cover.

❑ Tighten to torque the **inlet camshaft dephaser blanking cover (15 Nm)**.

❑ Remove the **(Mot. 1496)**.

III - FINAL OPERATION.

❑ Refit:

- the timing belt (see **11A**, **Top and front of engine**, **Timing belt: Removal - Refitting**, page **11A-18**) ,

K4M, and 760 or 761 or 766 or 812 or 813

- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-4**) ,
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 365, 55A, Exterior protection).

❑ Connect the battery (see **Battery : Removal - Refitting**) (MR 364, 80A, Battery).

F4R, and 774 or 776

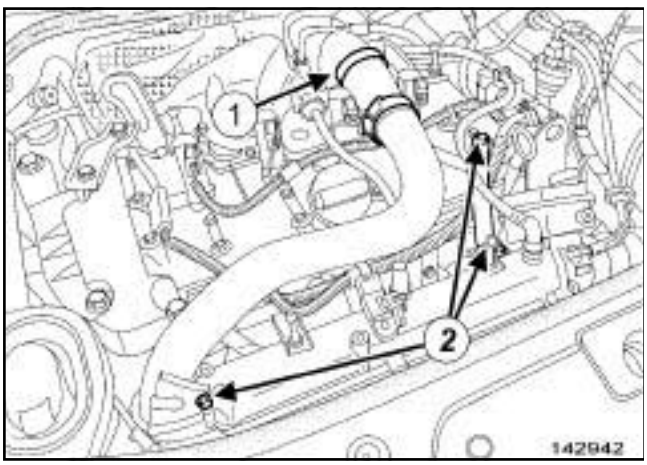
Tightening torques ▽	
oil separator bolts	**12 N.m**
clip of the intercooler air inlet pipe on the turbo-charger	**5.5 N.m**

IMPORTANT
Wear leaktight gloves (Nitrile type) for this operation.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❏ Remove the front engine cover.



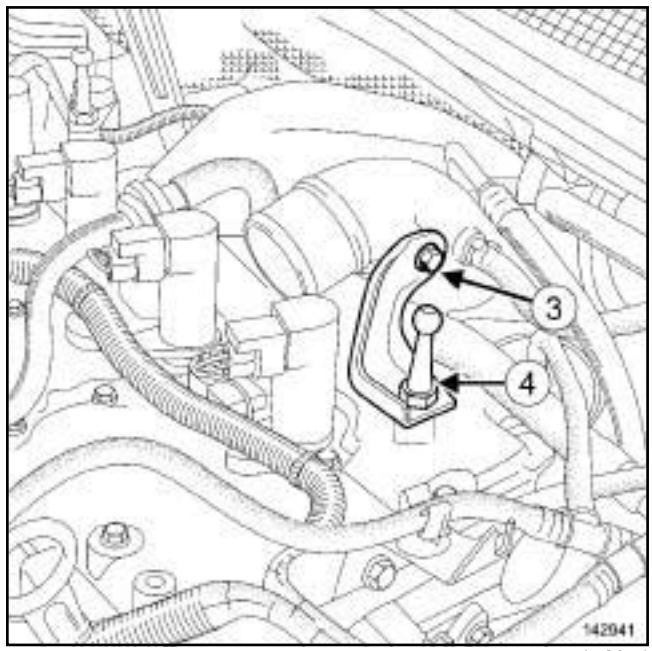
142942

❏ Loosen the clip (**1**) of the intercooler air inlet pipe on the turbocharger.

❏ Remove the bolts (**2**) from the intercooler air inlet pipe.

❏ Disconnect the intercooler air inlet pipe from the turbocharger.

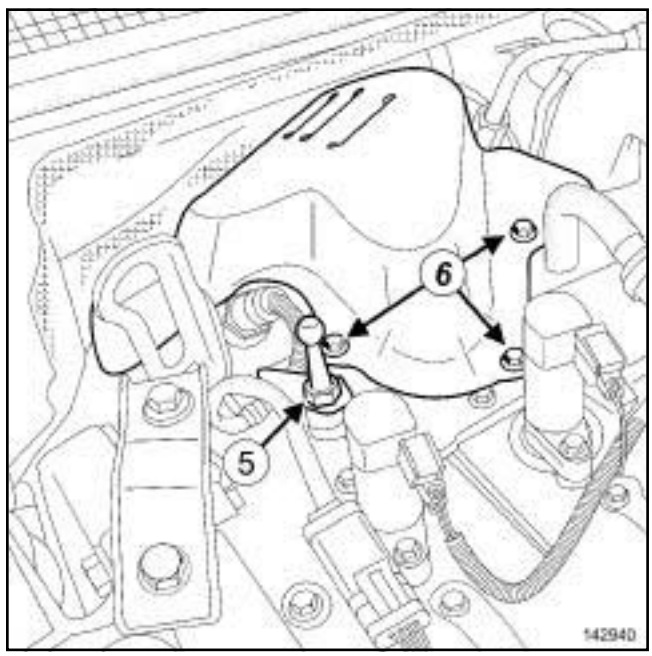
❏ Move aside the intercooler air inlet pipe.



142941

❏ Remove:

- the bolt (**3**) of the turbocharger retaining bracket,
- the positioning pin of the engine cover (**4**) ,
- the turbocharger retaining bracket.



142940

❏ Remove the positioning pin (**5**) from the engine cover.

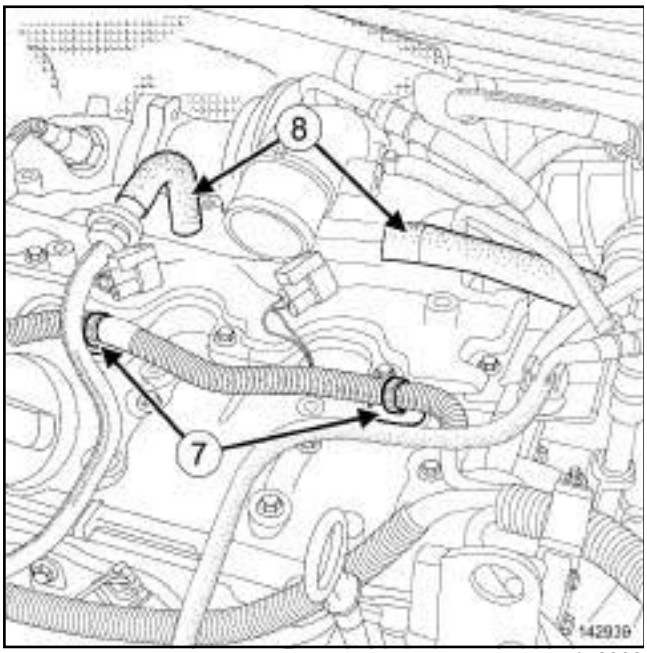
❏ Unclip the wiring from the upstream oxygen sensor.

❏ Remove:

- the bolts (**6**) from the turbocharger heat shield,
- the turbocharger heat shield.

F4R, and 774 or 776

- The coils (see **17A**, **Ignition**, **Coils Removal - Refitting**, page **17A-1**) of the turbocharger heat shield,

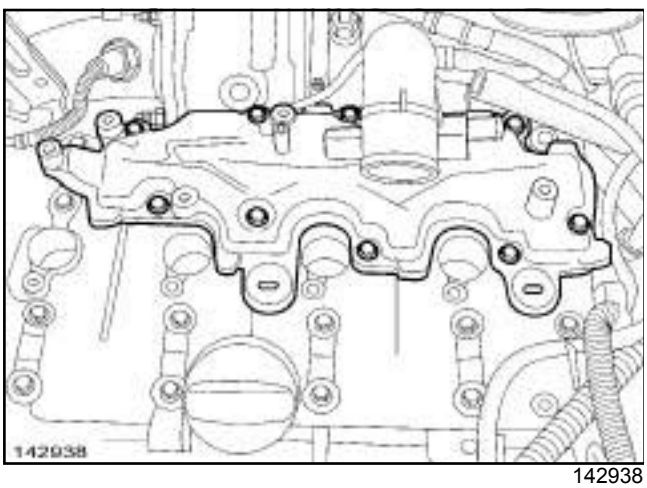


142939

❑ Unclip the coil wiring from the oil decanter at (**7**) .

❑ Disconnect the oil vapour rebreathing pipes (**8**) from the oil decanter.

II - OPERATION FOR REMOVAL OF PART CONCERNED



142938

❑ Remove:

- the oil decanter bolts,
- the oil decanter.

REFITTING

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: oil decanter bolt (11,04,06,23)**.

WARNING
When cleaning parts, it is essential that the parts do not impact on each other, otherwise their mating faces may be damaged and therefore their adjustments may be altered, which could damage the engine.

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

❑ Use **SUPER CLEANING AGENT FOR JOINT FACES** (see **Vehicle: Parts and ingredients for the repairwork**) (04B, Consumables - Products) to clean the joint face:

- of the oil decanter in case of reuse,
- of the rocker cover.

❑ Use **SURFACE CLEANER** (see **Vehicle: Parts and ingredients for the repairwork**) (04B, Consumables - Products) to degrease the joint face:

- of the oil decanter in case of reuse,
- of the rocker cover.

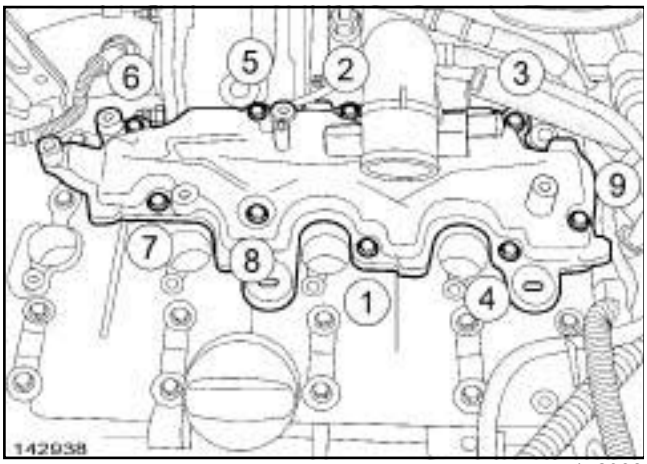
WARNING
To ensure proper sealing, the gasket surfaces must be clean, dry and not greasy (avoid any finger marks).

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 **RESIN ADHESIVE** (see **Vehicle: Parts and ingredients for the repairwork**) (04B, Consumables - Products) using a stipple roller on the joint face of the oil separator until the joint face is completely coated.

F4R, and 774 or 776

II - REFITTING OPERATION FOR PART CONCERNED



142938

❏ Refit:

- the oil separator,
- new bolts on the oil separator.

❏ Torque tighten in order the **oil separator bolts (12 N.m)**.

III - FINAL OPERATION

❏ Connect the oil vapour rebreathing pipes to the oil decanter.

❏ Clip the coil wiring onto the oil decanter.

❏ Refit:

- the coils (see **17A**, **Ignition**, **Coils Removal - Refitting**, page **17A-1**) ,
- the turbocharger heat shield,
- the turbocharger heat shield bolts.

❏ Attach the upstream oxygen sensor wiring.

❏ Refit:

- the turbocharger retaining bracket,
- the bolt of the turbocharger retaining bracket,
- the positioning pins of the engine cover.

❏ Fit the intercooler air inlet pipe.

❏ Connect the intercooler air inlet pipe on the turbocharger.

❏ Refit the bolts on the intercooler air inlet pipe.

❏ Torque tighten the **clip of the intercooler air inlet pipe on the turbocharger (5.5 N.m)**.

❏ Refit the engine cover.