F4R, and STANDARD HEATING

Tightening torques ▽	
dummy pulley bolts	**21 N.m**

REMOVAL

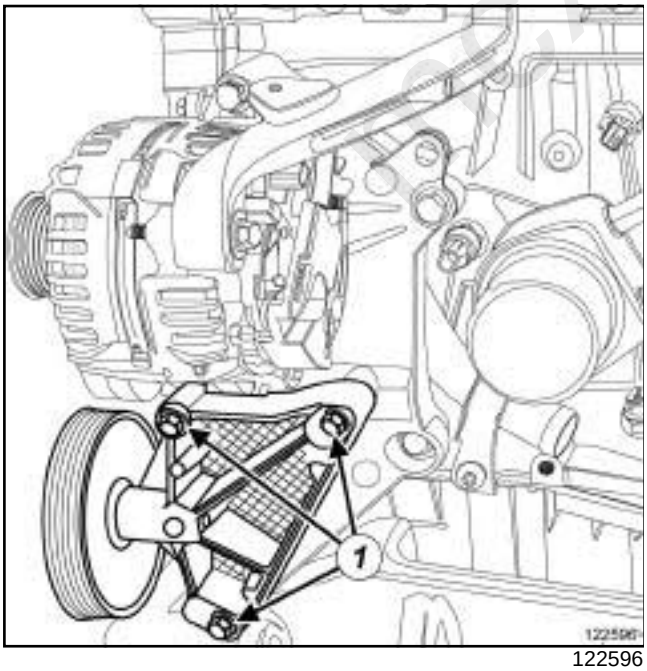
I - REMOVAL PREPARATION OPERATION

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

❑ Remove:

- the engine undertray bolts,
- the engine undertray,
- 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 accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



122596

❑ Remove:

- the dummy pulley bolts (**1**) ,
- the dummy pulley.

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Refit:

- the dummy pulley,
- the dummy pulley bolts.

❑ Torque tighten the **dummy pulley bolts (21 N.m)**.

II - FINAL OPERATION.

❑ Refit:

- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the engine undertray.

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D4F

Special tooling required	
Mot. 1672	Lower engine support.
Mot. 1054	TDC setting pin.
Mot. 799-01	Timing gear wheel immobiliser.

Tightening torques ▽	
timing tensioning roller nut	**24 Nm**
lower timing cover bolt	**10 Nm**
timing intermediate housing bolts	**10 Nm**
upper timing cover bolts	**33 Nm**

REMOVAL

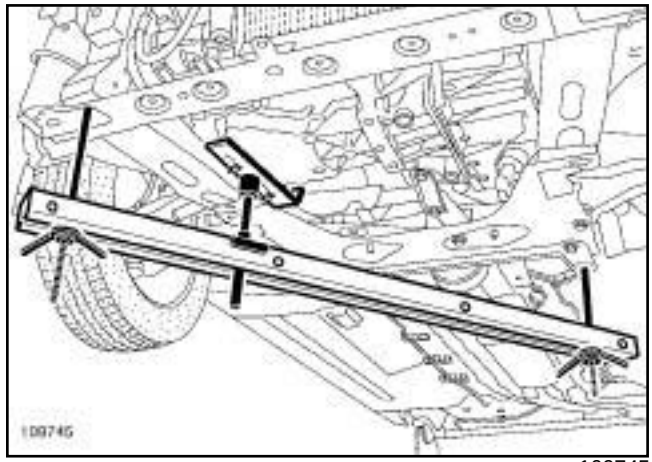
I - REMOVAL PREPARATION OPERATION

❏ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

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

❏ Remove:

- the engine cover,
- the engine undertray,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection).



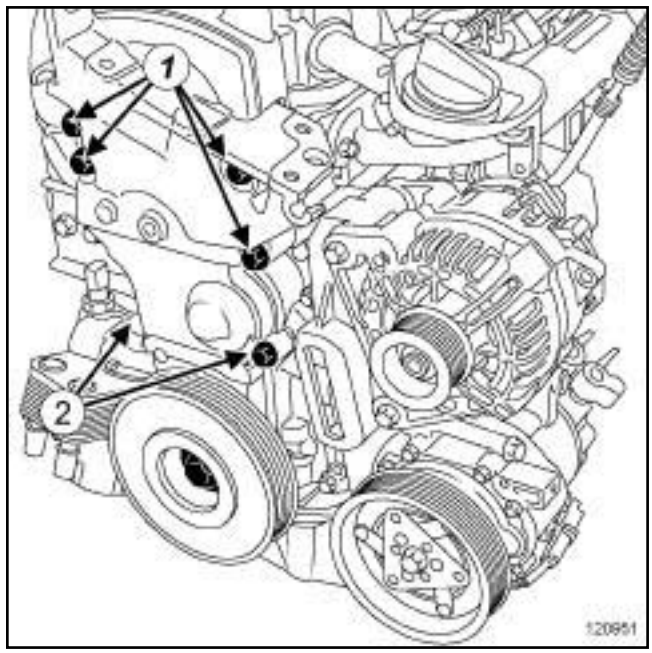
109745

❏ Fit the engine support tool **(Mot. 1672)** under the lower cover.

❏ Remove:

- the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



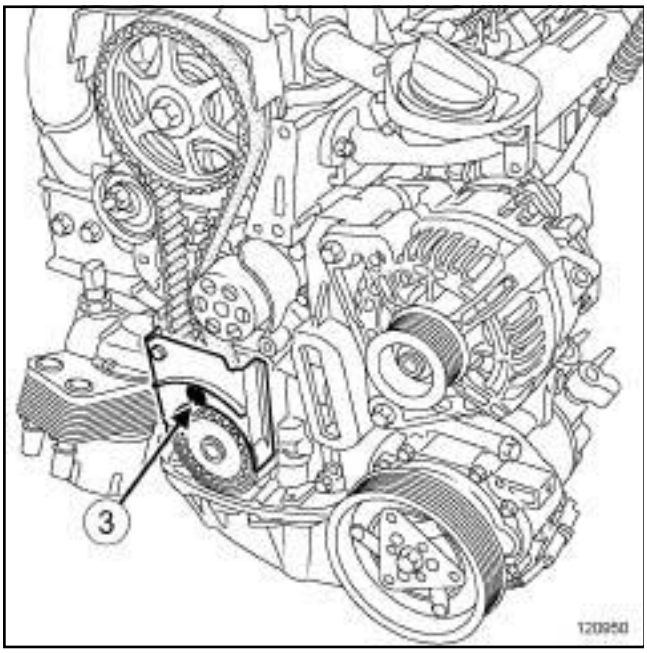
120951

❏ Remove:

- the bolts (**1**) from the upper timing cover,
- the upper timing cover,

D4F

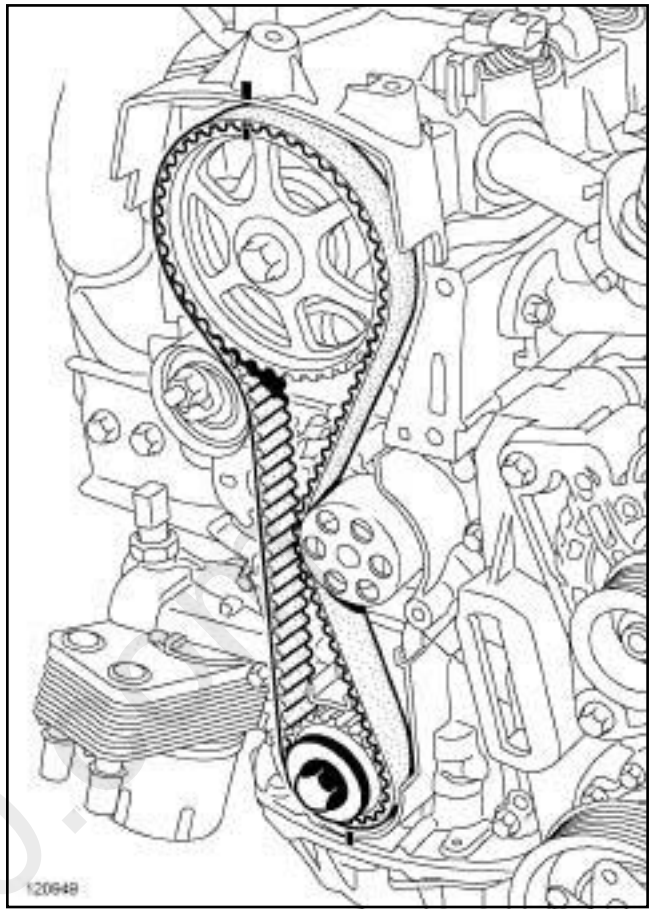
- the bolts (**2**) from the timing intermediate housing,
- the middle timing cover.



120950

❑ Remove:

- the lower timing cover bolt (**3**) ,
- the lower timing cover.



120949

❑ Refit the crankshaft accessories pulley bolt and its retaining washer.

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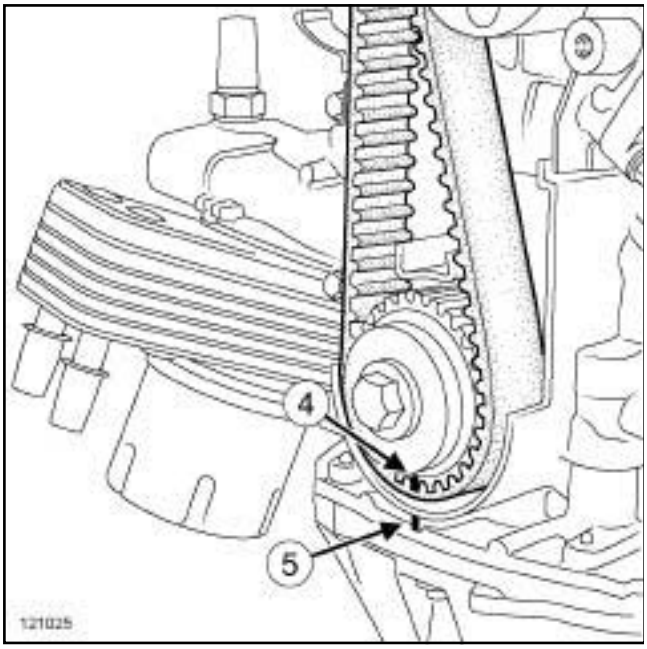
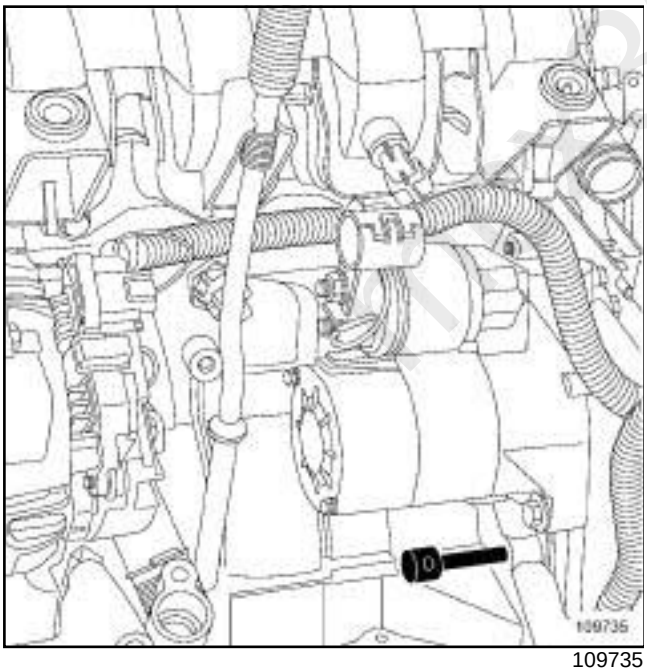


121025

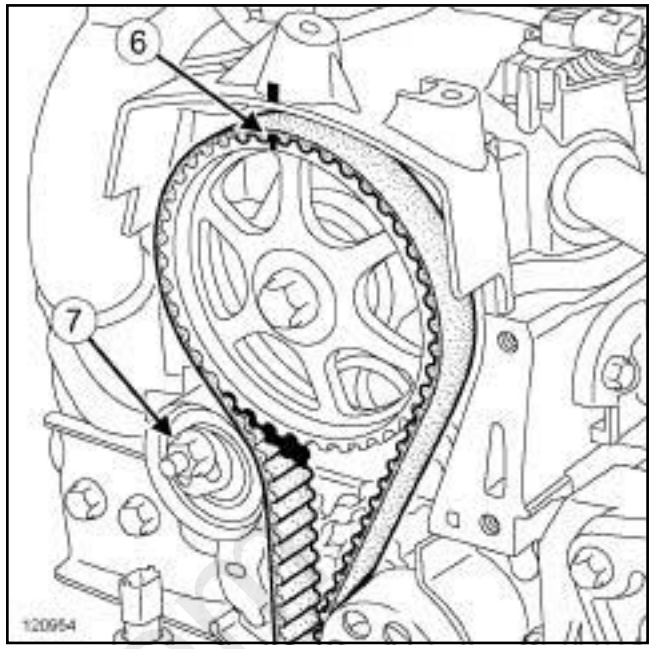
❏ Turn the crankshaft clockwise (timing end) to position the crankshaft sprocket marking (**4**) half a tooth in front of the alignment of the fixed marking (**5**) on the oil pump casing.



109735

❏ Insert **(Mot. 1054)**.

❏ Turn the crankshaft clockwise until it is stopped.



120954

❏ Check that mark (**6**) of the camshaft sprocket is vertical to the engine and aligned with the rocker cover mark.

❏ Undo the timing tension wheel nut (**7**) .

❏ Loosen the timing tension wheel by turning the eccentric cam using a **6 mm** Allen key.

❏ Remove:

- the timing belt,
- the timing tensioning roller nut,
- the timing tensioning roller.

REFITTING

I - REFITTING PREPARATIONS 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: Crankshaft accessories pulley bolts (10,03,03,10)**

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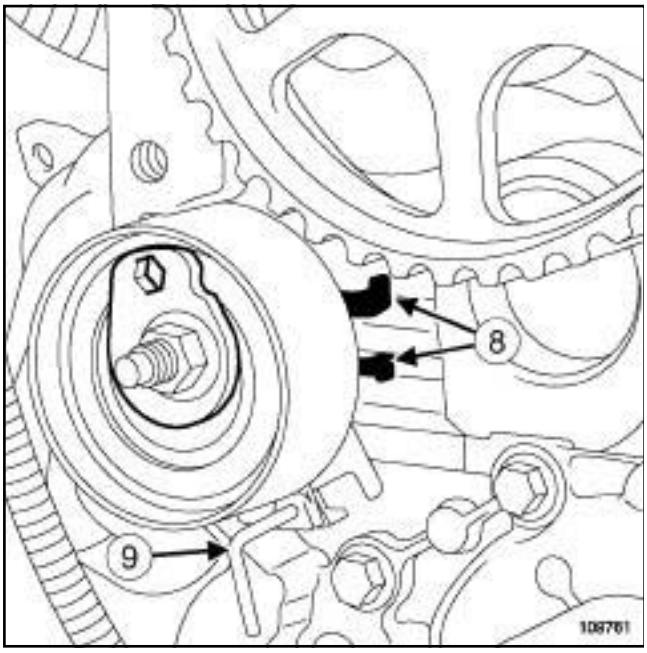
II - REFITTING OPERATION FOR PART CONCERNED

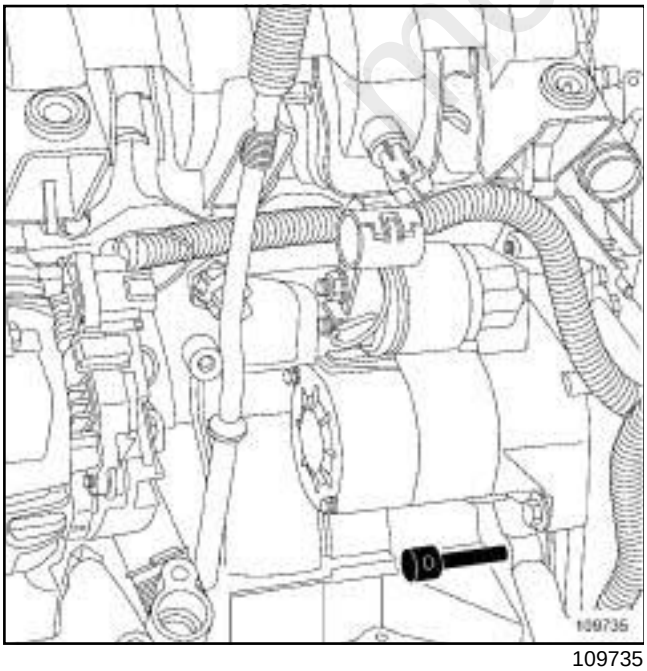


109761

❏ Refit the new tensioning roller.

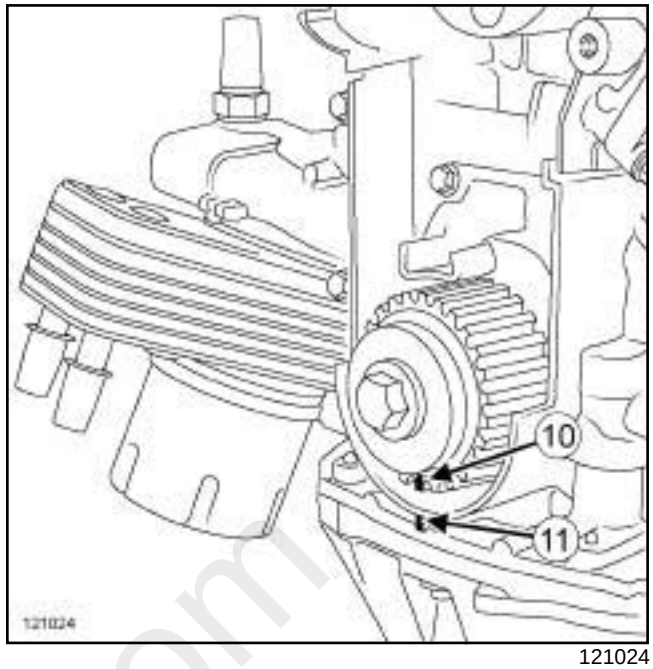
❏ Position both indexes (**8**) between the cylinder head groove.

❏ Do not remove the pin (**9**) before refitting the timing belt.



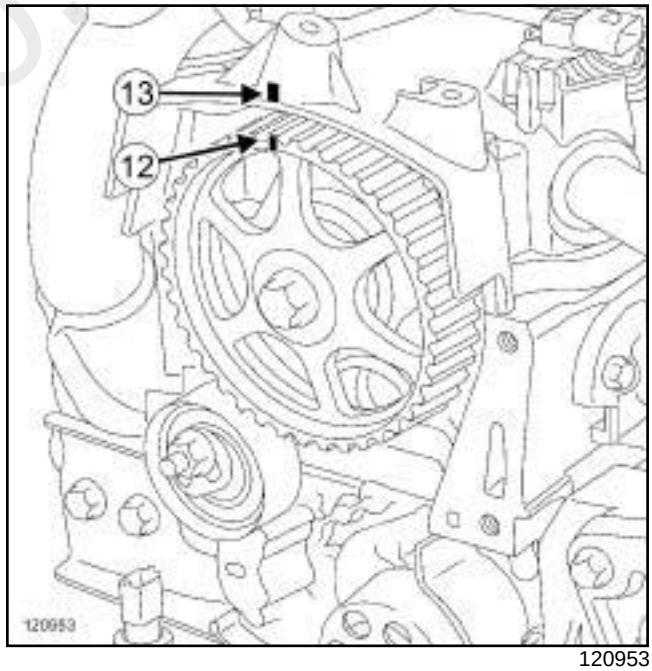
109735

❏ Check that the crankshaft is at its setting point using the **(Mot. 1054)**.



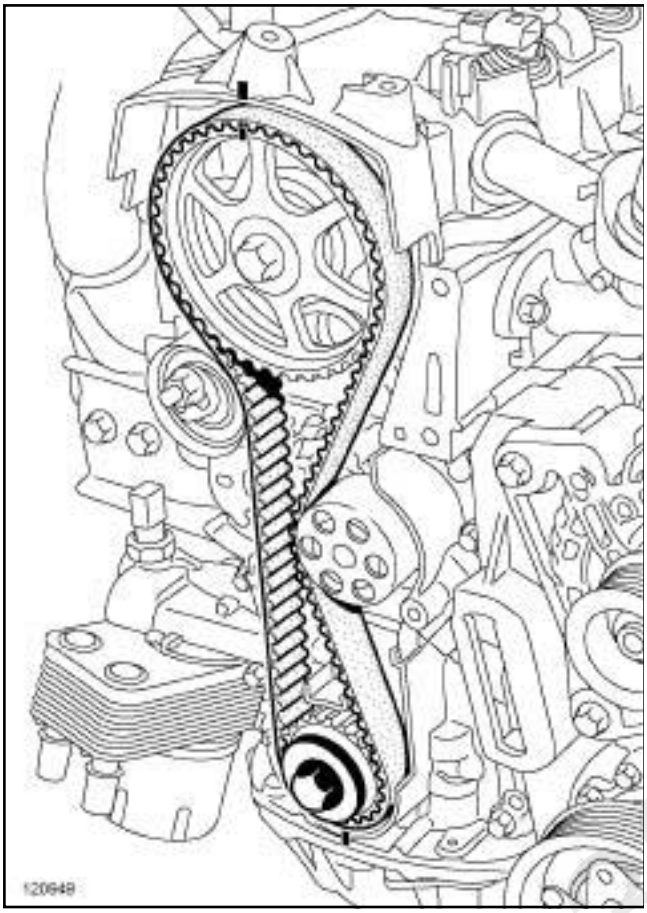
121024

❏ The mark on the crankshaft sprocket (**10**) must be aligned with the fixed marking (**11**) on the oil pump casing.



120953

❏ Align the mark on the camshaft sprocket (**12**) with the fixed marking (**13**) on the rocker cover using the **(Mot. 799-01)**.

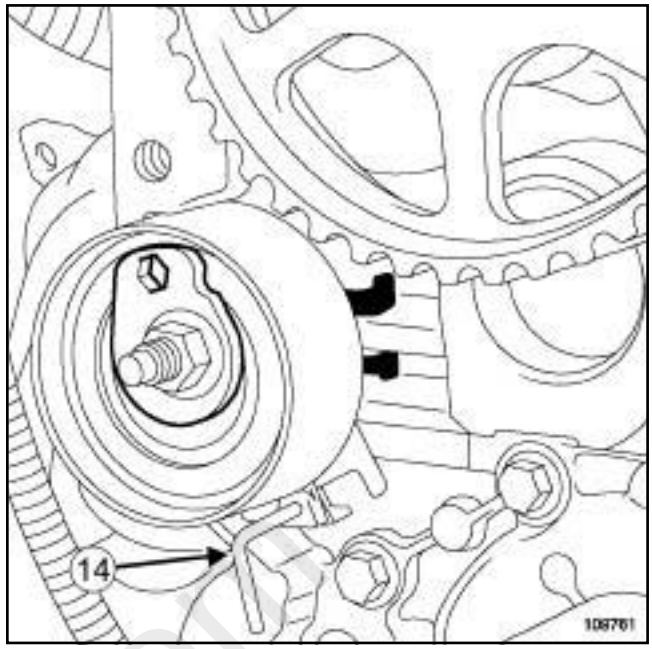


120949

❏ Torque tighten the **crankshaft accessories pulley bolt (15 Nm)**.

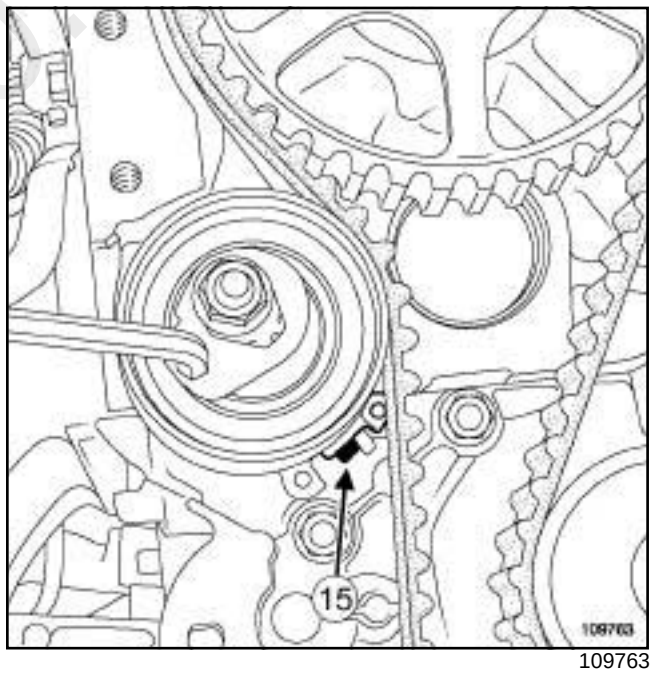
❏ Fit the timing belt, aligning the marks on the belt with those on the crankshaft sprocket and camshaft sprocket.

❏ Remove the **(Mot. 1054)**.



109761

❏ Remove the pin (**14**) from the timing tensioning roller.



109763

❏ Turn the tensioning roller eccentric in an anti-clockwise direction using a **6 mm** Allen key.

❏ Move the adjustable index (**15**) on the tensioning roller into the position indicated above.

❏ Torque tighten the **timing tensioning roller nut (24 Nm)**.

❏ Rotate the crankshaft through six revolutions in a clockwise direction (timing end).

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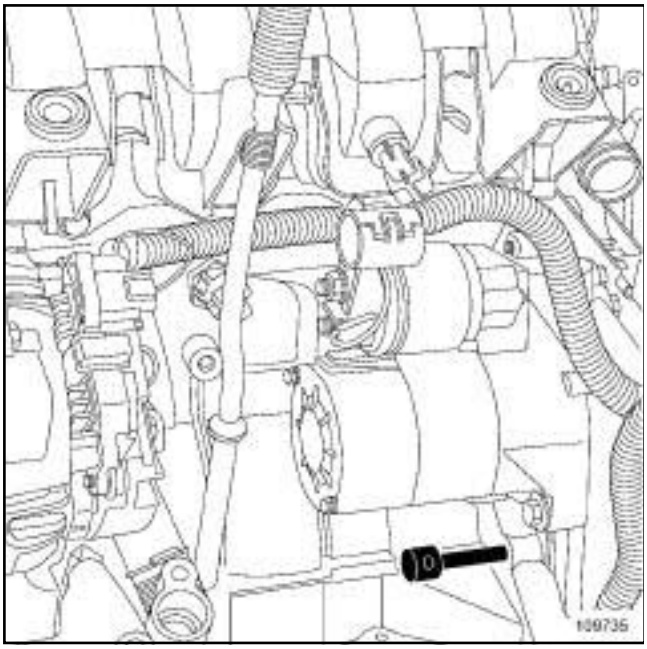
D4F



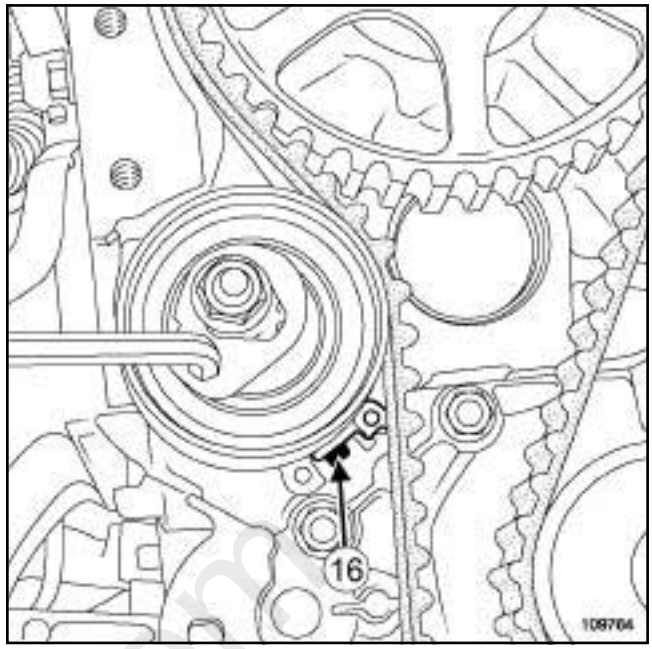
109735

❏ Insert **(Mot. 1054)**.

❏ Rotate the crankshaft to the setting point.

❏ Check that the camshaft and crankshaft sprockets markings are correctly aligned with the fixed markings.

❏ Remove the **(Mot. 1054)**.



109764

❏ Loosen the tensioning roller nut by up to one turn, holding the eccentric with a **6 mm** Allen key.

❏ Turn the adjustable index (**16**) on the tensioning roller in a clockwise direction into the position indicated above.

❏ Tighten to torque the **timing tensioning roller nut (24 Nm)**.

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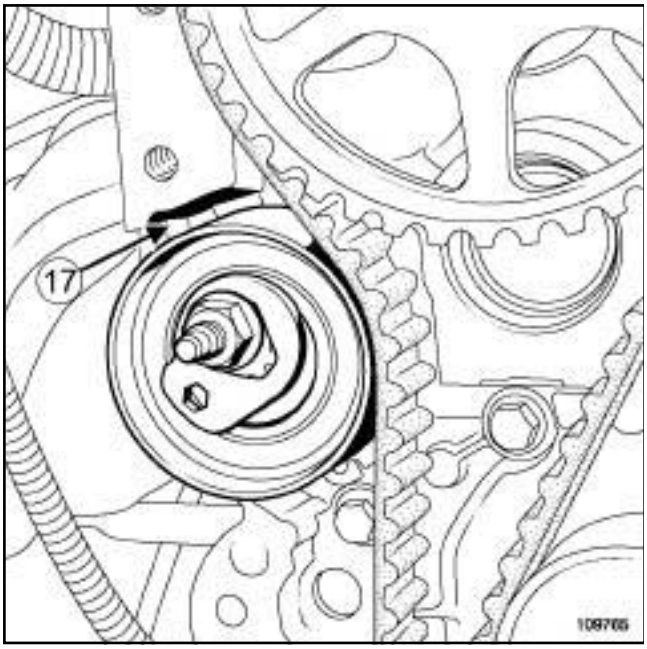
D4F



109765

❑ Check that the tensioning roller does not come into contact with the cylinder head (**17**) .

Note:

If the tensioning roller is in contact with the cylinder head:

- set the engine to Top Dead Centre,
- remove the tensioning roller and the timing belt,
- reposition the tensioning roller pin,
- repeat the timing belt refitting procedure, step by step, from the beginning.

❑ Remove the crankshaft accessories pulley bolt.

❑ Refit:

- the lower timing cover,
- the lower timing cover bolt.

❑ Torque tighten the **lower timing cover bolt (10 Nm)**.

❑ Refit:

- the timing intermediate housing,
- the timing intermediate housing bolts.

❑ Torque tighten the **timing intermediate housing bolts (10 Nm)**.

❑ Refit:

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

❑ Tighten to torque the **upper timing cover bolts (33 Nm)**.

III - FINAL OPERATION.

❑ Refit:

- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) .

❑ Remove the lower engine support tool **(Mot. 1672)**.

❑ Refit:

- the front bumper (see **Front bumper: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the engine undertray,
- the engine cover.

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

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K4M

Special tooling required	
Mot. 1368	Tool for tightening eccentric tensioning roller bolt. 8 mm Torx wrench and 12.7 mm square.
Mot. 799-01	Timing gear wheel immobiliser.
Mot. 1496	Camshaft timing tool.
Mot. 1750	Additional tool to support the camshaft adjusting tool, Mot. 1496.
Mot. 1489	TDC locating pin.
Mot. 1490-01	For locking and adjusting the camshaft pulleys.
Mot. 1487	Tool for refitting camshaft covers (57 mm diameter).
Mot. 1488	Tool for refitting camshaft covers (43 mm diameter).

Tightening torques ▽	
timing tension wheel nut	**27 N.m**
timing fixed 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**
dipstick guide tube bolt	**10 N.m**
flywheel end lifting eye bolts	**10 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

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

❑ Remove:

- the engine undertray bolts,
- the engine undertray,
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the battery tray (see **Battery: Removal - Refitting**) (80A, Battery),
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) ,
- 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 accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) .

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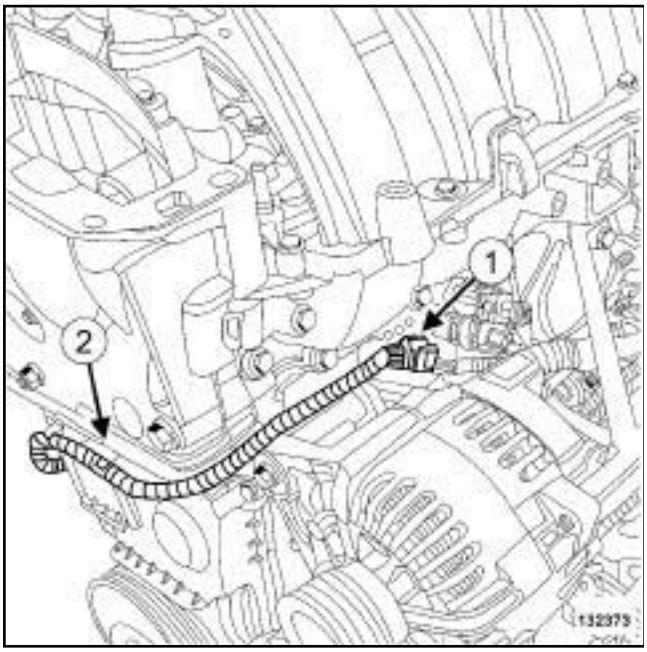
K4M

K4M, and 862

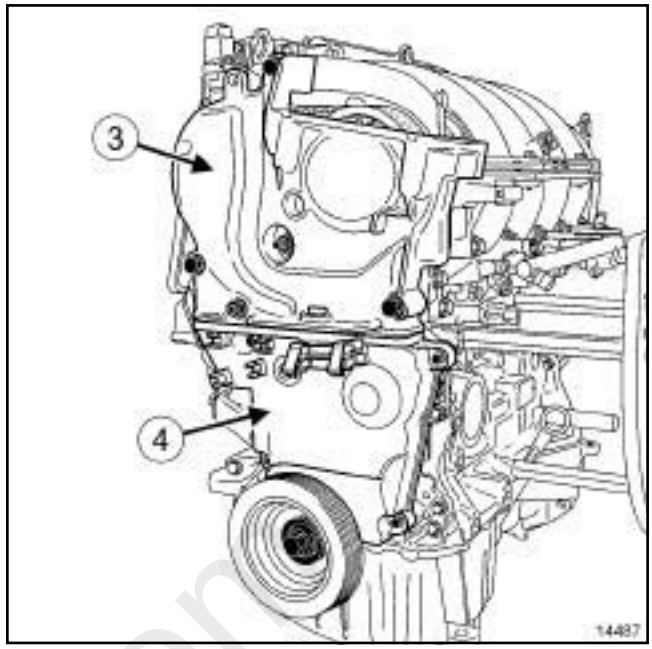


132373

❏ Disconnect the upstream oxygen sensor connector (**1**) .

❏ Unclip the wiring from the upstream oxygen sensor at (**2**) .

❏ Move the upstream oxygen sensor wiring aside.



14487

❏ Remove:

- the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the upper timing cover bolts,
- the upper timing cover nuts,
- the upper timing cover (**3**) ,
- the lower timing cover bolts,
- the lower timing cover (**4**) .

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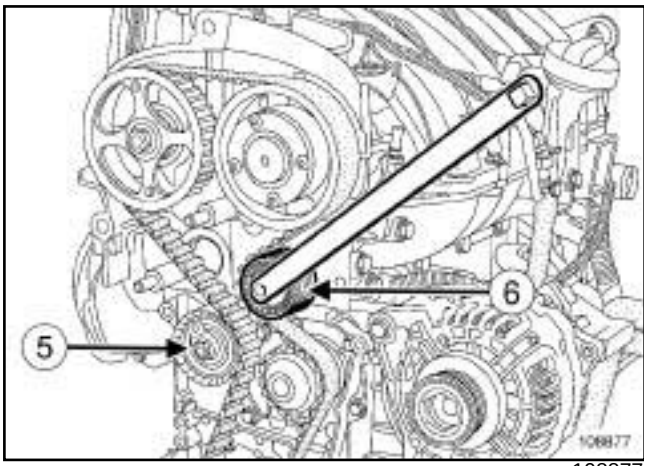
K4M

II - OPERATION FOR REMOVAL OF PART CONCERNED



108877

❑ Loosen the nut (**5**) of the timing tensioning roller.

> Note:
>
> Do not drop the crankshaft timing sprocket when removing the timing belt.

❑ Remove:

- the timing fixed roller bolt (**6**) using the tool **(Mot. 1368)**,
- the timing fixed roller,
- the timing belt,
- the timing tensioning roller nut,
- the timing tensioning roller,
- the crankshaft timing sprocket.

REFITTING - PROCEDURE 1

I - REFITTING PREPARATION OPERATION

❑ **parts always to be replaced: Timing belt (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

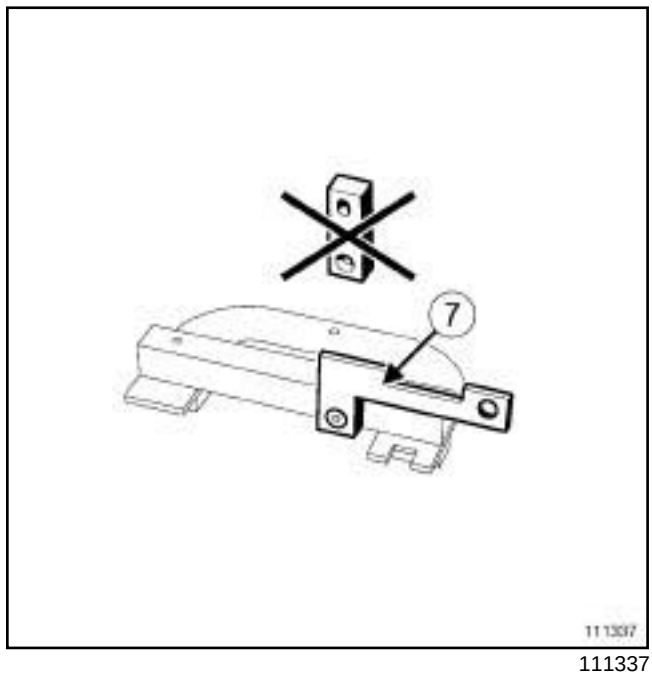
❑ The first procedure applies to replacing any timing face component which has a crankshaft timing sprocket without a collet and which does not require the exhaust camshaft sprocket or camshaft dephaser to be loosened.

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 crankshaft accessories pulley bearing faces,
> - the camshaft ends (timing end),
> - the camshaft sprocket bores and bearing faces.
>
> This is to avoid timing slippage.
>
> This slippage leads to engine damage.

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



111337

❑ Fit the **(Mot. 1496)** with the **(Mot. 1750)** (**7**) .

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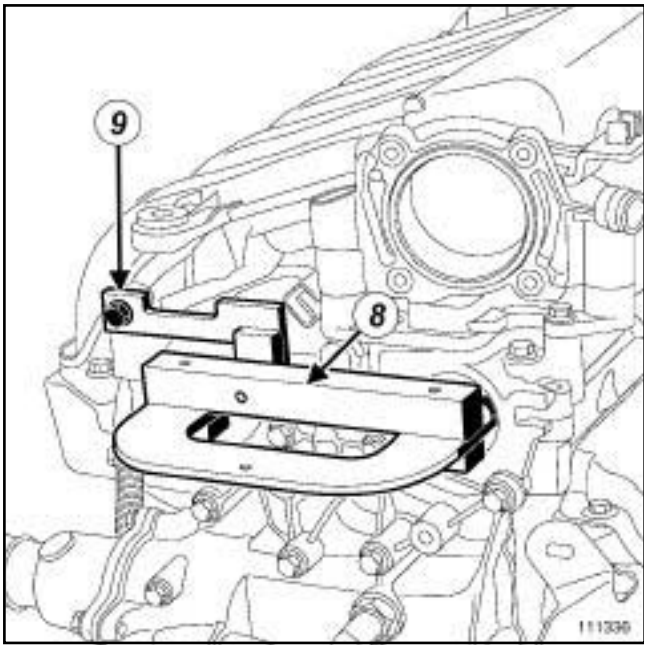
K4M

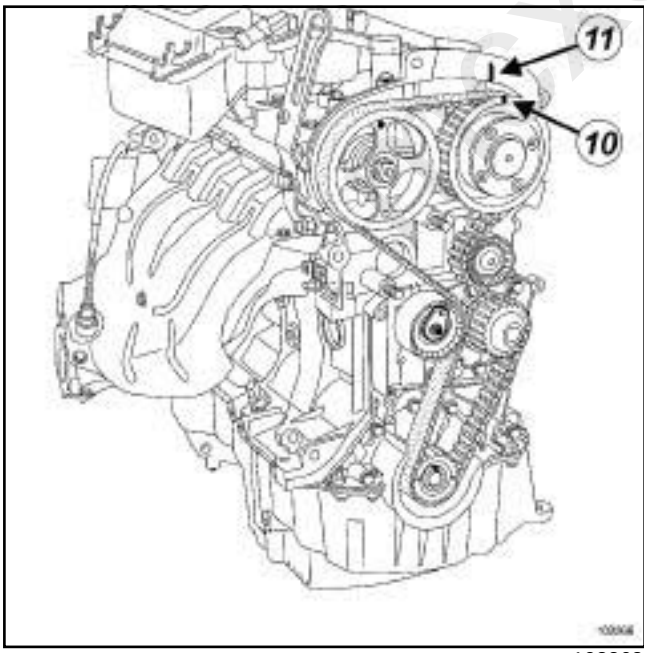


111336

❑ Fit:

- the **(Mot. 1496)** (**8**) fitted with the **(Mot. 1750)** on the end of the camshaft,

- a lifting eye bolt (**9**) to secure the tool **(Mot. 1496)** equipped with the tool **(Mot. 1750)**.

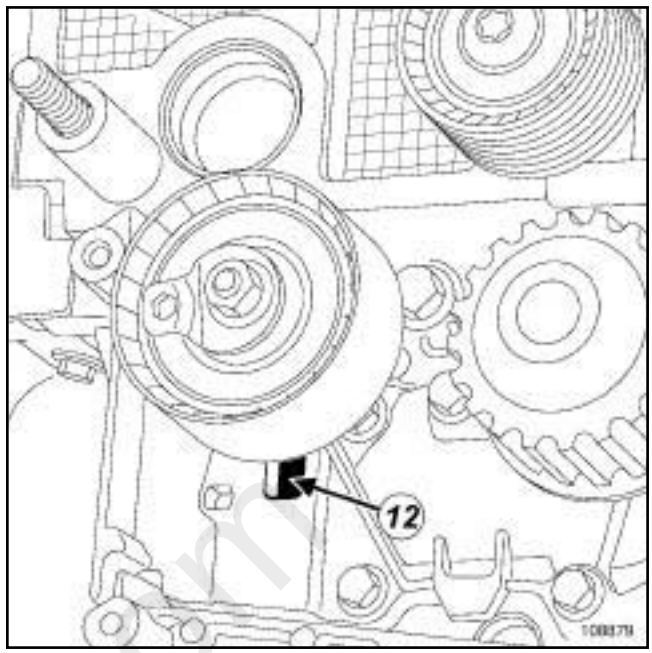


103268

❑ Check that the mark (**10**) on the camshaft dephaser is vertical and pointing upwards.

❑ Make a mark (**11**) with a pencil between the camshaft dephaser gear and the rocker cover.

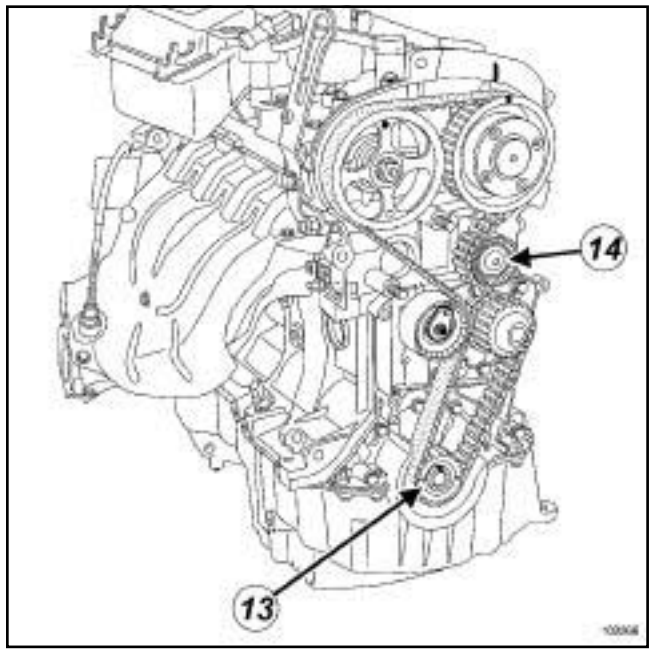
2 - Refitting



108879

❑ Refit a new timing tensioning roller by positioning the lug of the timing tensioning roller in the groove (**12**) .

❑ Screw on the timing tensioning roller nut without tightening it.



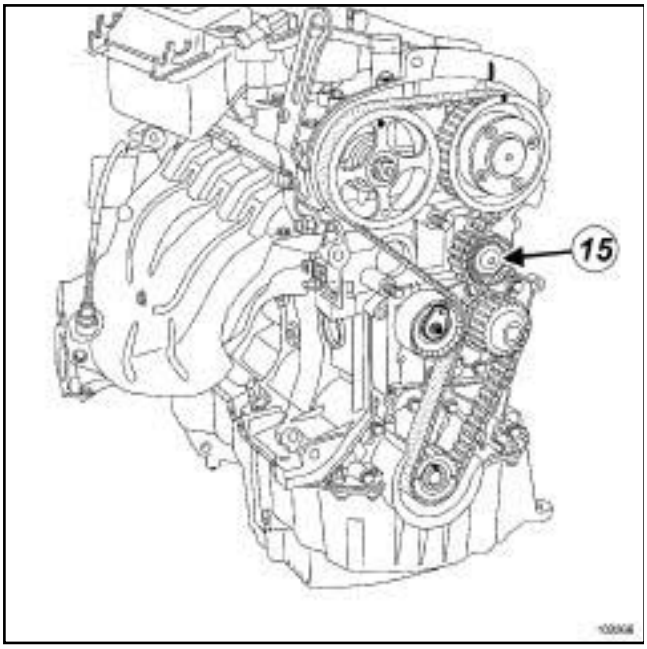
103268

❑ Refit:

- the crankshaft timing sprocket (**13**) ,

- a new timing belt,

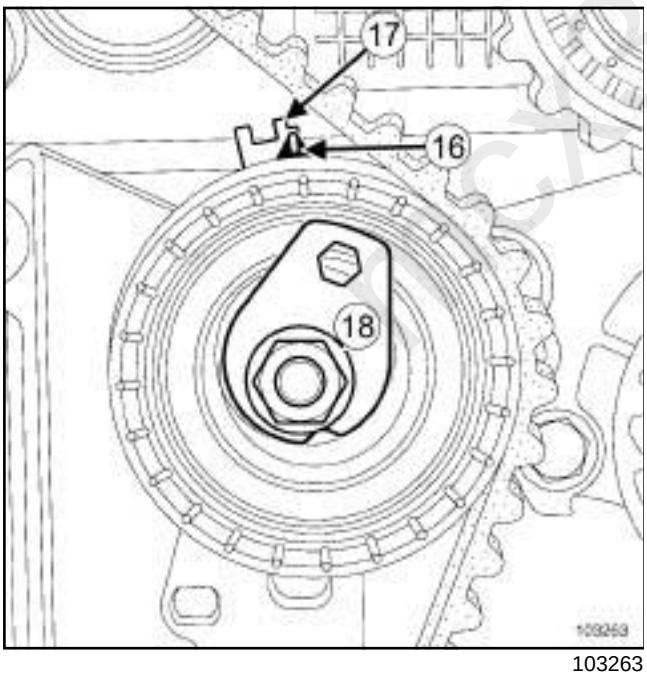
- a new timing fixed roller (**14**) .



103268

❏ Torque tighten the **timing fixed roller bolt (50 N.m)** (**15**) .

3 - Timing belt tension



103263

❏ Position the adjustable index (**16**) opposite the mark (**17**) , by turning the eccentric (**18**) clockwise using a **6 mm** Allen key.

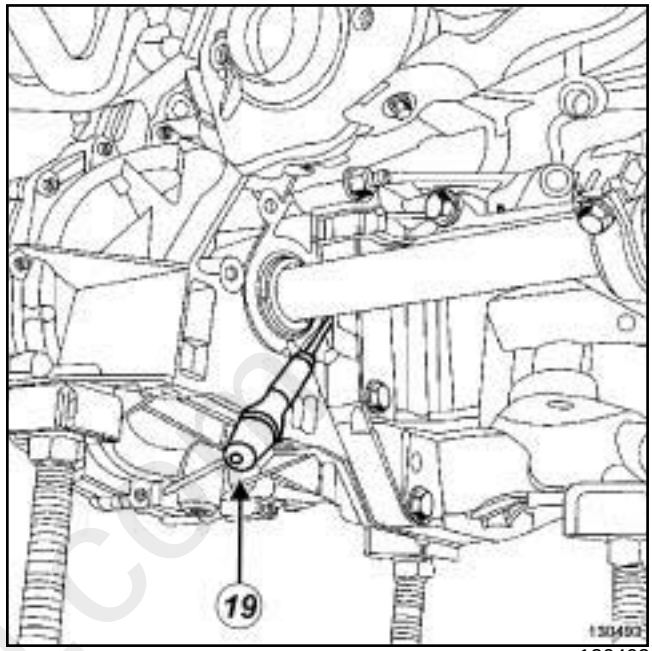
❏ Torque tighten the **timing tensioning roller nut (7 N.m)**.

❏ Refit:

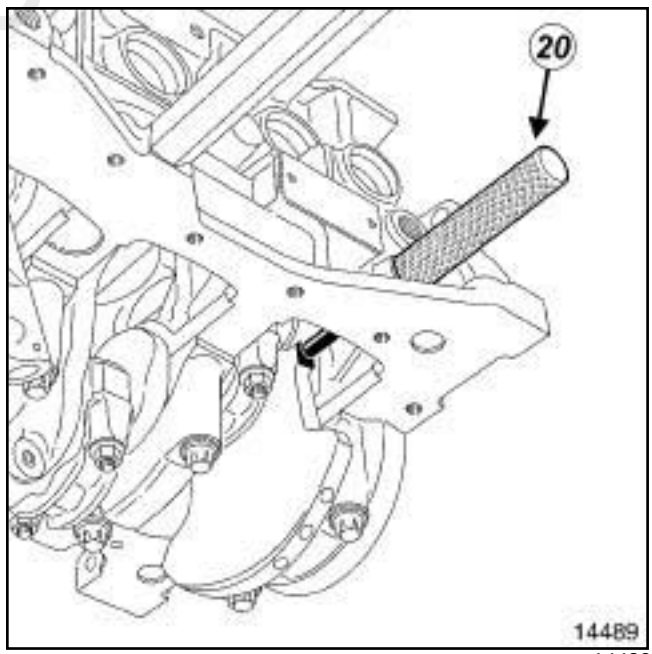
- the tool **(Mot. 1489)** in the cylinder block,
- the lower timing cover,

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

❏ Refit a new crankshaft accessories pulley.



130493

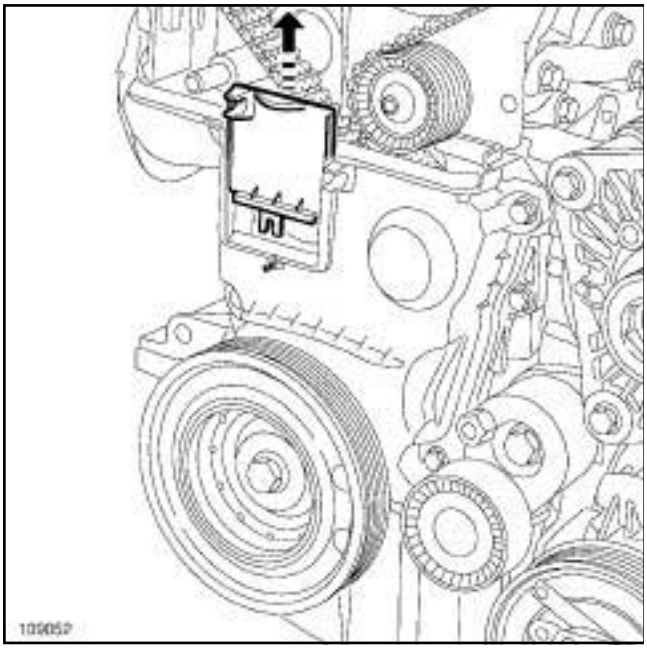


14489

❏ Use a screwdriver (**19**) 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)** (**20**) 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)**).

K4M



109052

❑ Remove:

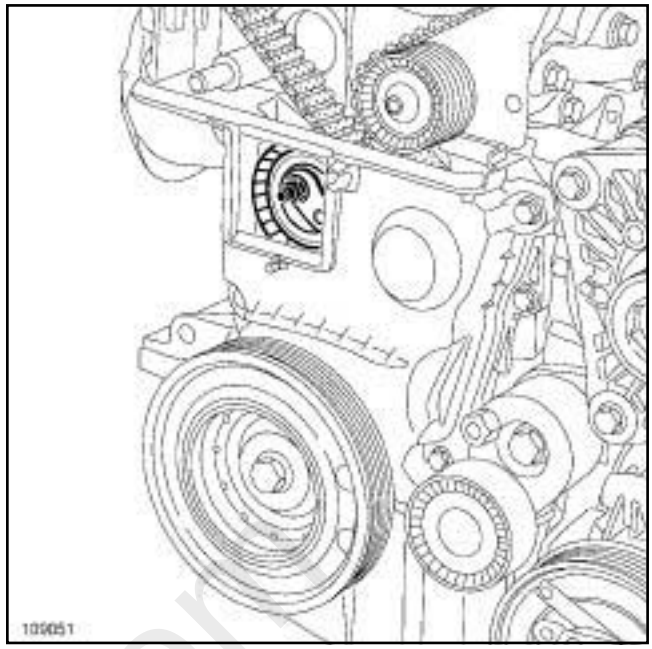
- the timing flap from the lower timing cover,
- the lifting eye bolt from the **(Mot. 1496)**,
- the timing tool **(Mot. 1496)** fitted with the **(Mot. 1750)**,
- the **(Mot. 1489)** from the cylinder block.

4 - Checking the tension

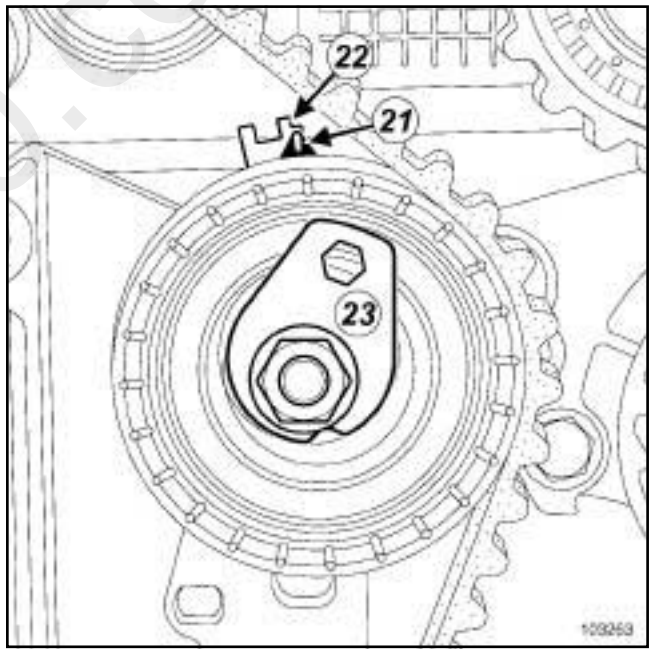
❑ Rotate the crankshaft twice clockwise at the timing end and before aligning the marks made previously by the operator (on the camshaft dephaser), screw the tool **(Mot. 1489)** into the cylinder block.

❑ 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.



109051



103263

❑ Check through the lower timing cover window that the adjustable index (**21**) is opposite the notch (**22**) , 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 (**21**) opposite the mark (**22**) turning the eccentric cam (**23**) clockwise.

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

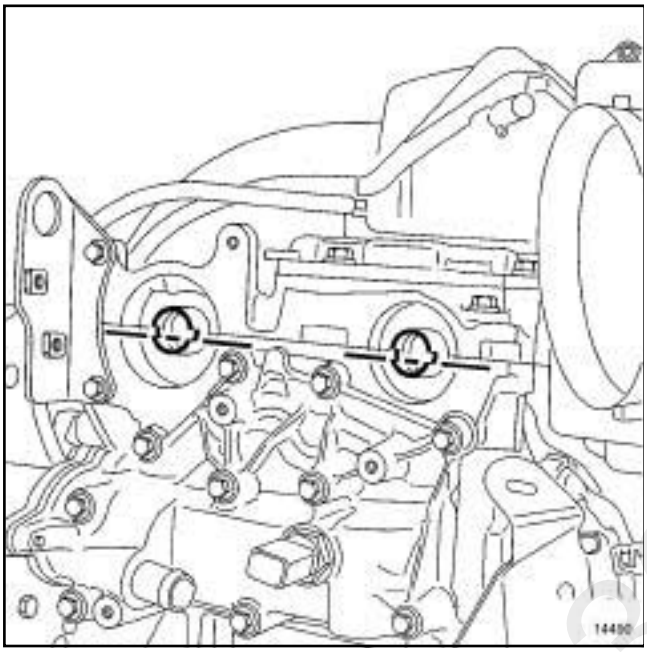
K4M

5 - Checking the timing

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

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

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


14490

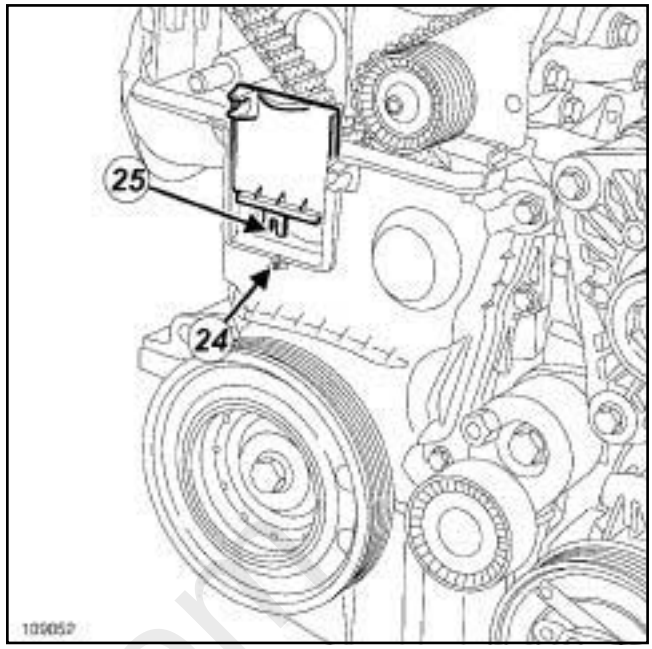
❑ Position (without forcing) the camshaft setting tool **(Mot. 1496)** fitted with the **(Mot. 1750)** (the camshaft end grooves must be horizontal and offset towards the bottom).

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 **(Mot. 1489)** from the cylinder block.



109052

❑ Refit the lower timing cover flap, checking that the locating pin (**24**) fits properly in the notch (**25**) .

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).

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.

K4M

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

1 - Adjusting the timing

❑

Note:

If the stud loosens with the nut (see **11A**, **Top and front of engine**, **Camshaft: Removal - Refitting**, page **11A-247**) (Technical Note 3887A,11A, Top and front of engine).

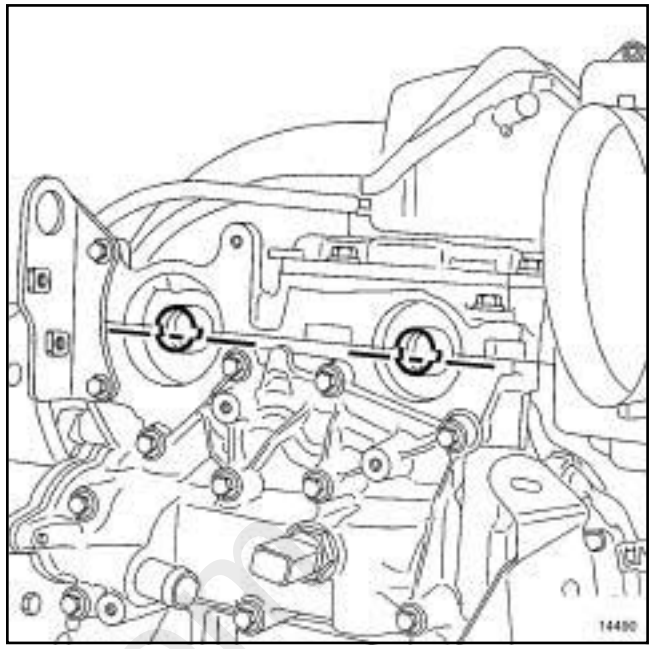
WARNING

Always degrease:

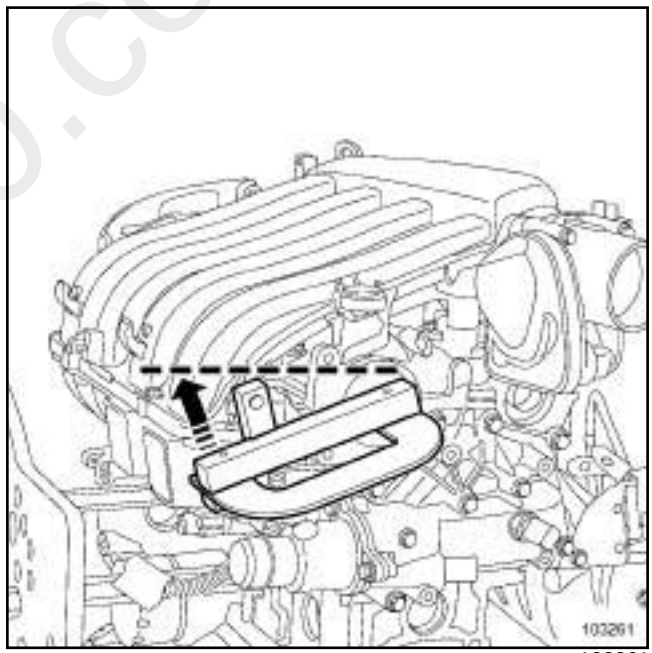
- the end of the crankshaft (timing end),
- the timing sprocket pressure faces and bore of the crankshaft,
- the crankshaft accessories pulley bearing faces,
- the camshaft ends (timing end),
- the camshaft sprocket bores and bearing faces.

This is to avoid timing slippage.

This slippage leads to engine damage.



14490



103261

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

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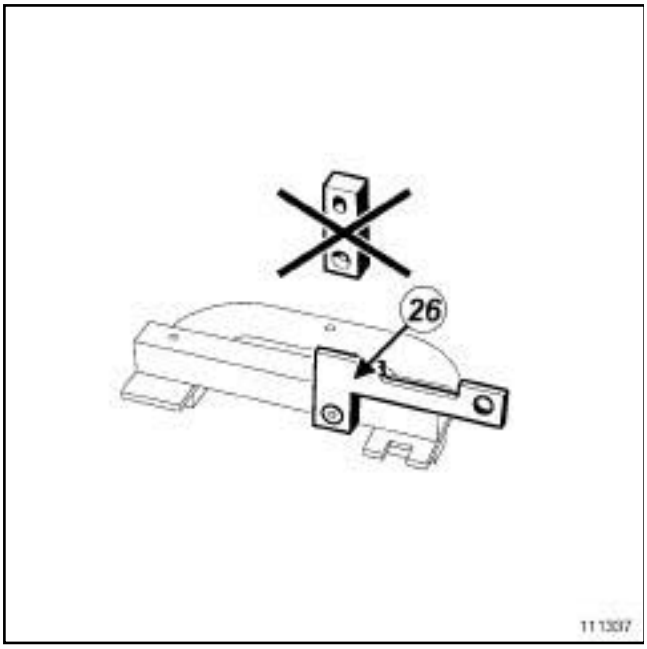
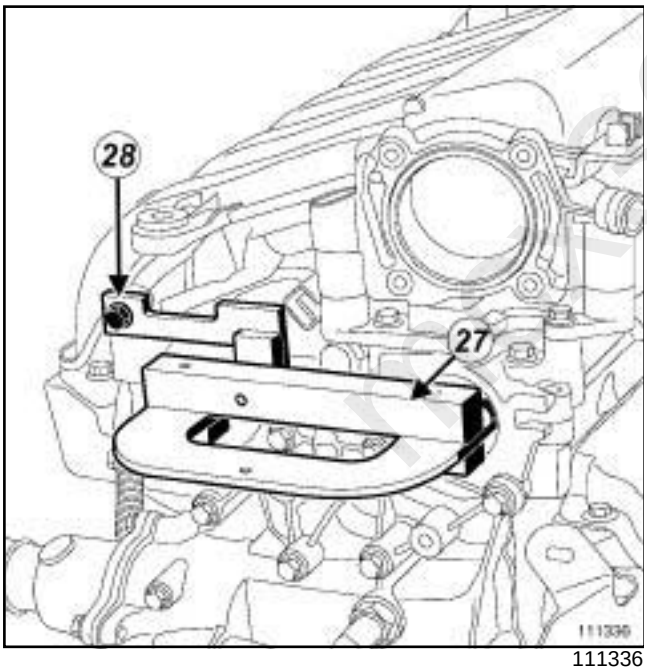
K4M



111337

❏ Fit the **(Mot. 1496)** with the **(Mot. 1750)** (**26**) .



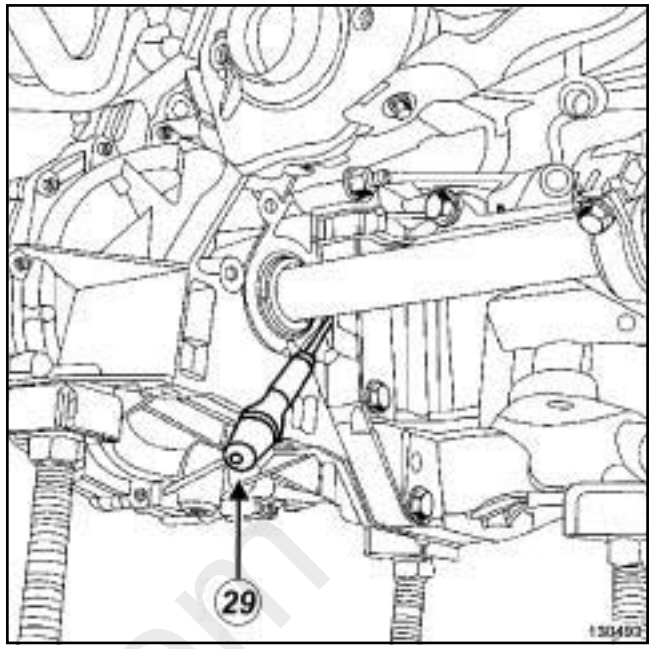
111336

❏ Fit:

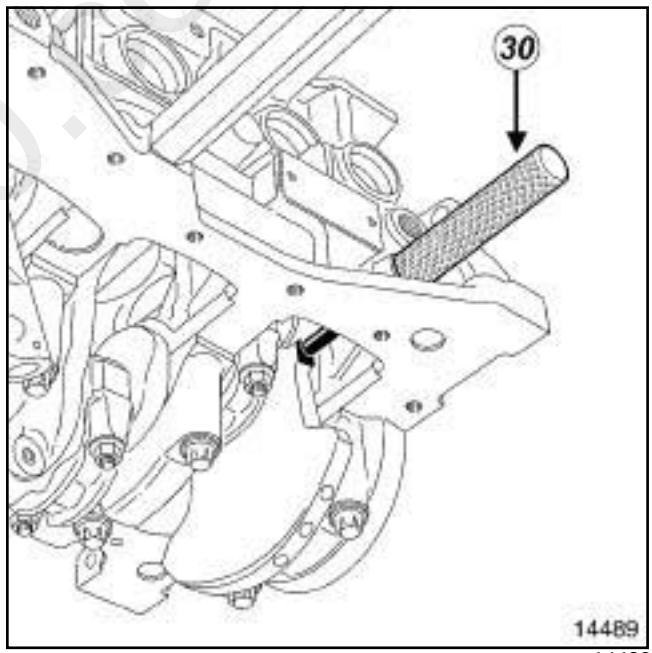
- the **(Mot. 1496)** (**27**) fitted with the **(Mot. 1750)** on the end of the camshaft,
- a lifting eye bolt (**28**) to secure the tool **(Mot. 1496)** equipped with the tool **(Mot. 1750)**.

❏ Refit:

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



130493

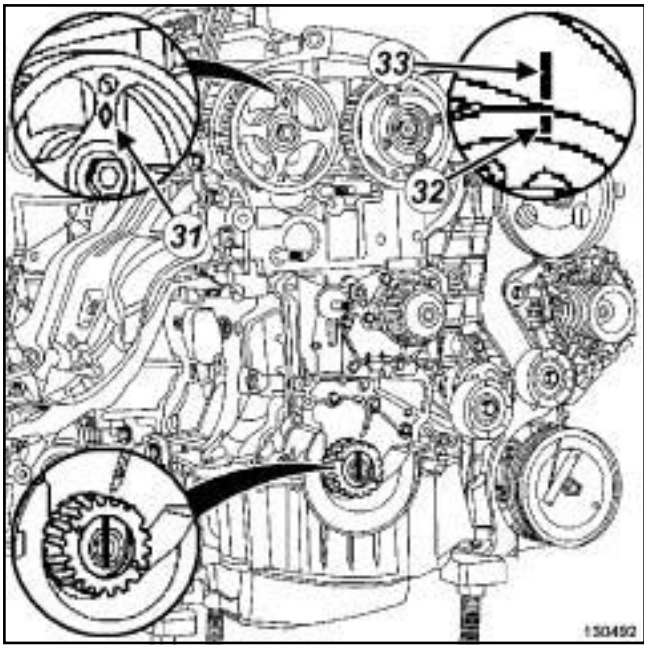


14489

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

❏ Use a screwdriver (**29**) 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)** (**30**) using the screwdriver; the crankshaft groove should be at the top.

K4M



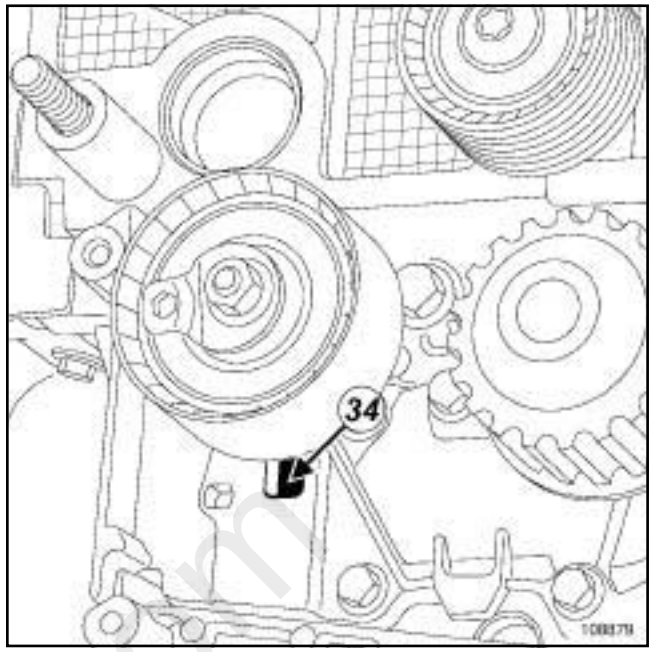
130492

❏ Position:

- the RENAULT badge (**31**) etched on the stem of the exhaust camshaft sprocket vertically and pointing upwards,
- the camshaft dephaser mark (**32**) vertically and pointing upwards.

❏ Make a mark (**33**) 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 (**34**) .

❏ Screw on the timing tensioning roller nut without tightening it.

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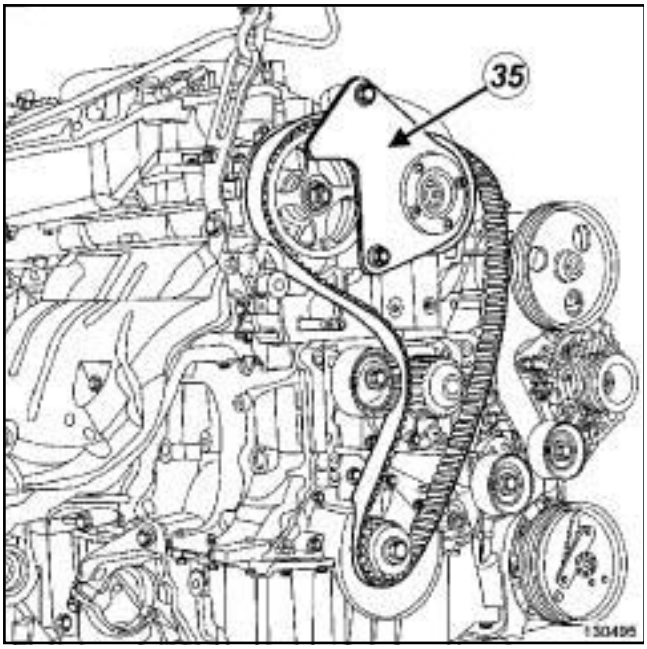


130495

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

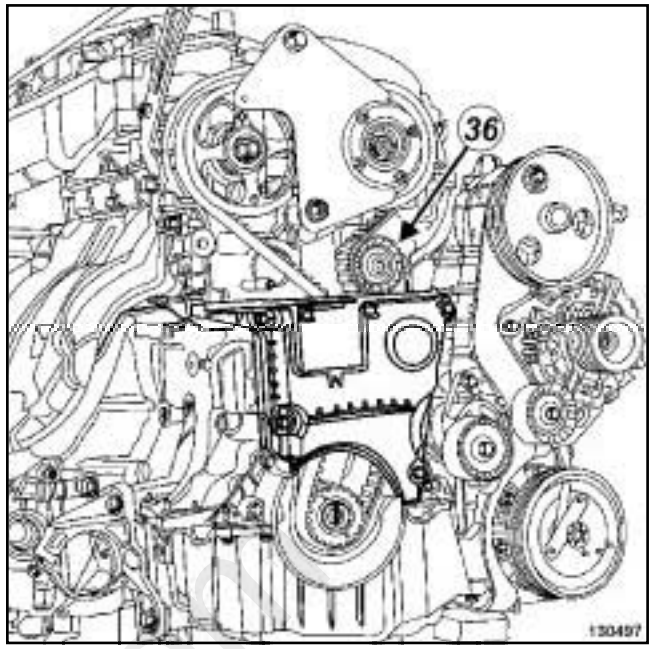
❏ Fit the tool **(Mot. 1490-01)** (**35**) on the camshaft sprockets (use the bolt and nut of the upper timing cover to fit the tool **(Mot. 1490-01)**).

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.

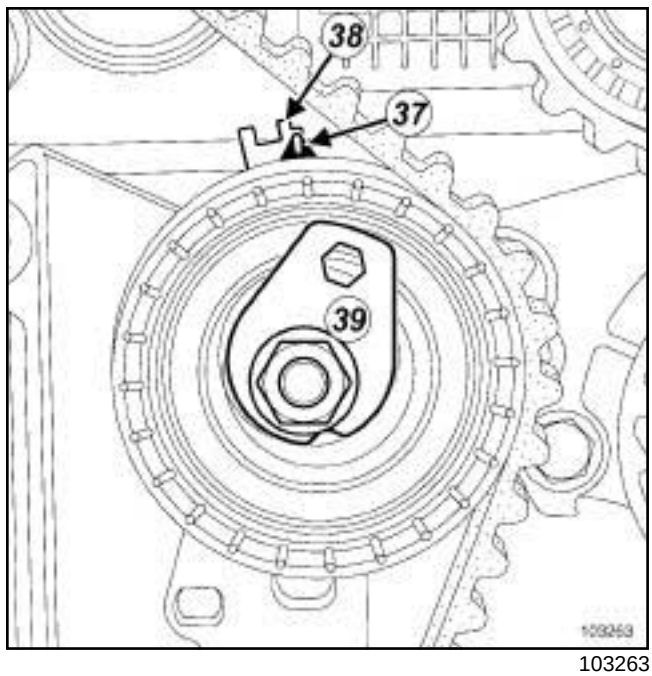


130497

❏ Refit a new timing fixed roller (**36**) .

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

3 - Timing belt tension

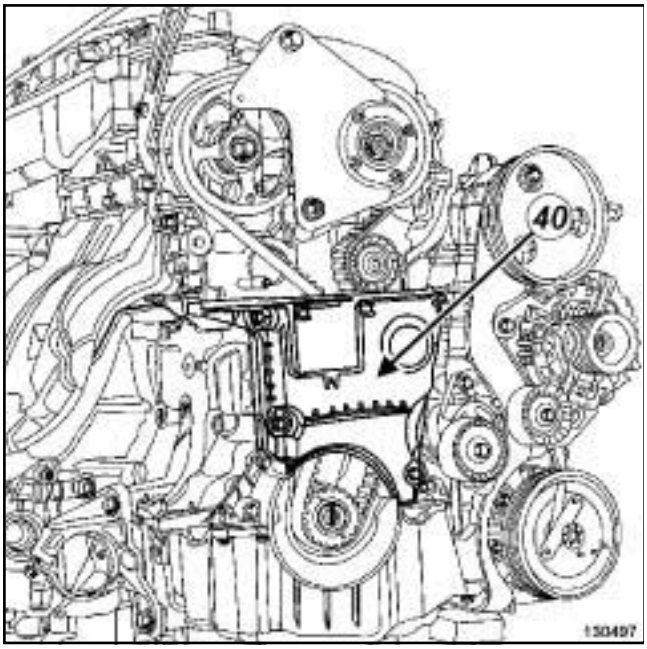


103263

❏ Position the adjustable index (**37**) opposite the mark (**38**) , by turning the eccentric (**39**) clockwise using an Allen key.

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

K4M



130497

❏ Refit the lower timing cover (**40**) .

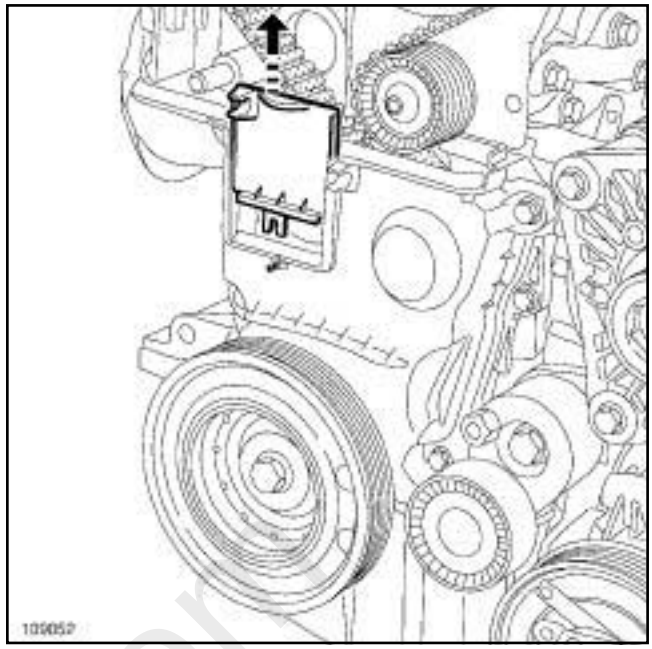
❏ Tighten to torque the **lower timing cover bolts (12 N.m)**.

❏ 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.



109052

❏ Remove:

- the timing flap from the lower timing cover.
- 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)**.

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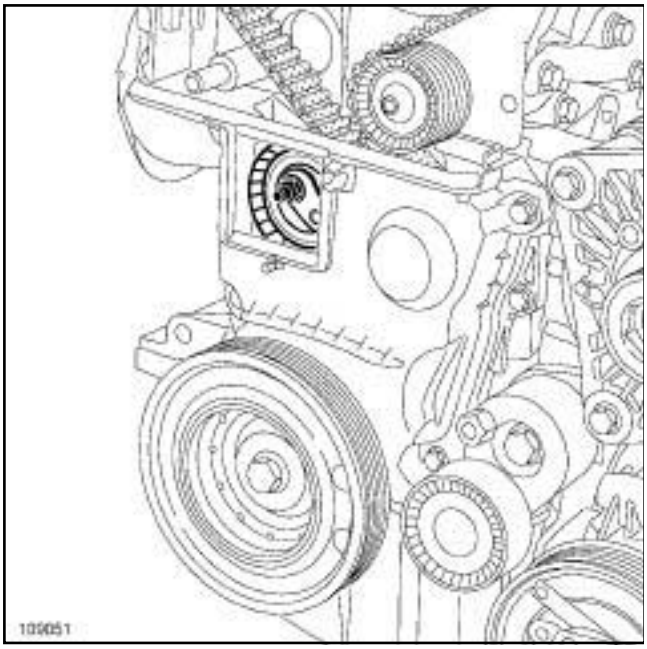
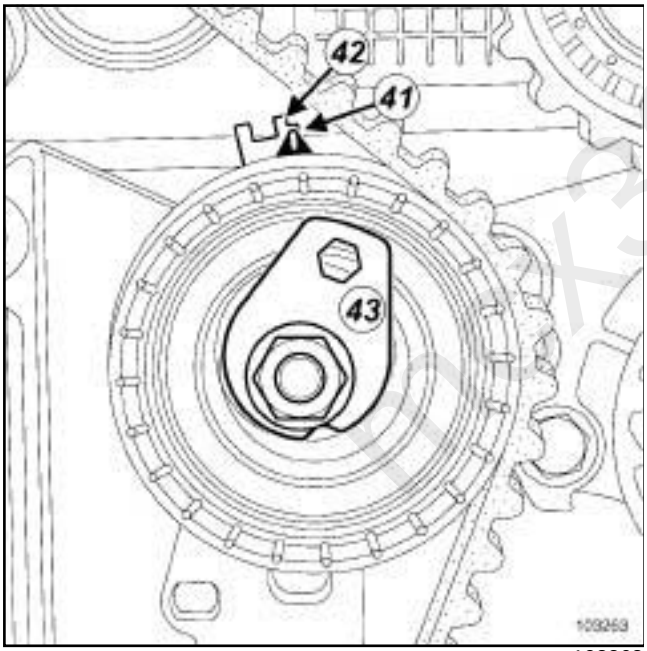
K4M



109051



103263

❏ Check through the lower timing cover window that the adjustable index (**41**) is opposite the notch (**42**) , 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 (**41**) opposite the mark (**42**) turning the eccentric cam (**43**) clockwise.

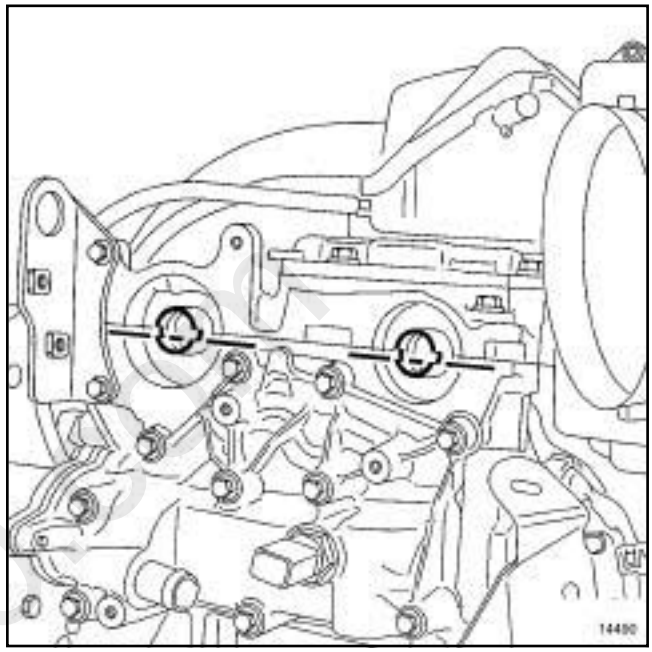
❏ Torque tighten the **timing tensioning roller nut (27 N.m)**.

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 tool **(Mot. 1496)** equipped with the tool **(Mot. 1750)** (the camshaft end grooves must be horizontal and offset downwards).

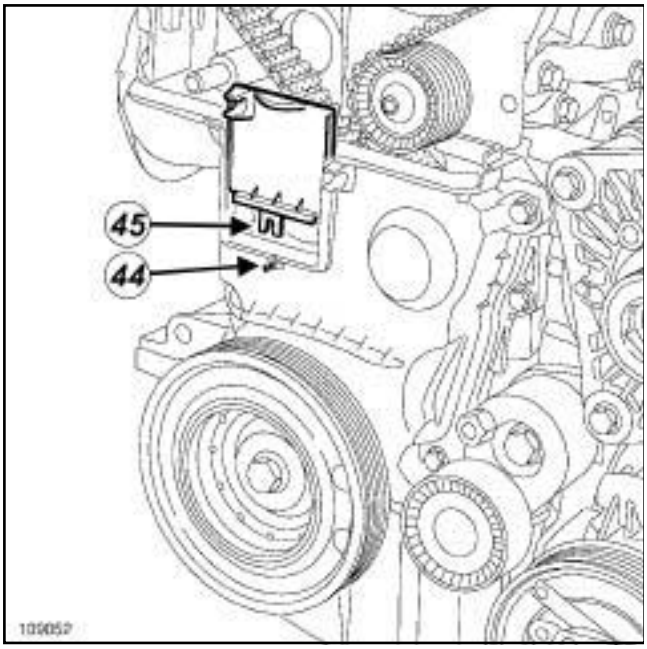
Note:

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 **(Mot. 1489)** from the cylinder block.

K4M



109052

❏ Refit the lower timing cover flap, checking that the locating pin (**44**) fits properly in the notch (**45**) .

III - FINAL OPERATION

❏ Refit:

- a new inlet camshaft plug using the **(Mot. 1487)**,
- a new exhaust camshaft plug using the tool **(Mot. 1488)**.

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

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

❏ Refit the upper timing cover.

❏ Torque tighten:

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

❏ Refit the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) .

❏ Refit:

- the engine wiring,
- the lifting eye on the flywheel end,
- the dipstick guide.

❏ Torque tighten:

- the **dipstick guide tube bolt (10 N.m)**,
- the **flywheel end lifting eye bolts (10 N.m)**.

❏ Clip on the lifting eye connector.

K4M, and 862

❏ Position the wiring of the upstream oxygen sensor.

❏ Clip the wiring to the oxygen sensor.

❏ Connect the oxygen sensor connector.

❏ Refit:

- the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) ,
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) ,
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the windscreen wiper arms (see **Windscreen wiper arm: Removal - Refitting**) (85A, Wiping - Washing),
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the battery tray (see **Battery: Removal - Refitting**) (80A, Battery),
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the engine undertray.

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K9K, and 766 or 768

Special tooling required	
Mot. 1453	Engine anchorage support with multiple adjustments and retaining straps.
Mot. 1489	TDC locating pin.
Mot. 1430	Set of 5 crankshaft and camshaft pulley timing pins.

Equipment required
safety strap(s)
protective gloves
1/2" female torx socket (12.7 mm square drive)
torque wrench
offset spanner
torque/angle wrench
cylinder head bolt tightening gauge (angular measuring type)

Tightening torques ▽	
tensioning roller bolt	**27 Nm**
camshaft timing sprocket crown bolts	**14 Nm**
crankshaft accessories pulley bolt M14	**120 Nm + 95° ± 15°**
TDC setting pin plug	**25 Nm**
cylinder head suspended mounting bolts	**25 Nm**
camshaft position sensor bolt	**8 Nm**

IMPORTANT
Wear protective gloves during the operation.

WARNING
Never rotate the engine anti-clockwise (timing end).

WARNING
Do not run the engine without the accessories belt so as not to damage the crankshaft accessories pulley.

I - PARTS TO BE SYSTEMATICALLY REPLACED

❑ - the timing belt,

- the timing belt tensioning roller,

- the crankshaft accessories pulley bolt.

II - CONSUMABLES FOR REPAIR

❑ - **SILICONE ADHESIVE SEAL** (see **Vehicle: Parts and consumables for the repair**) (MR 392, 04B, Consumables - Products).

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

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

❑ Remove:

- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),

- the front section of the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),

- the engine undertray,

- the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) .

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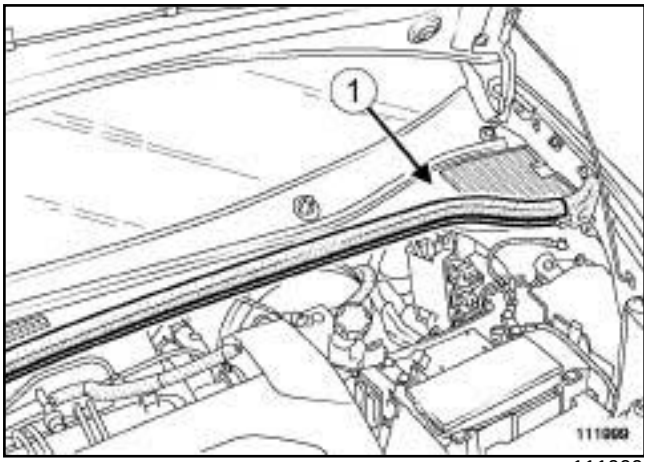
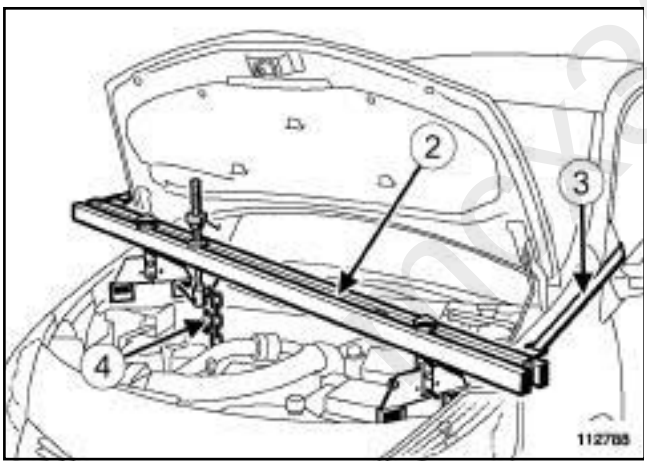
K9K, and 766 or 768



111999

❏ Remove:

- the engine cover,
- the scuttle panel grille (**1**) (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment).



112788

❏ Position the **(Mot. 1453)** (**2**) and hold it in place using a **safety strap(s)** (**3**) .

❏ Fit a chain (**4**) on the lifting eye of the crankshaft end to enable the engine to be lifted using the **(Mot. 1453)**.

❏ Remove:

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

Note:

Do not damage the air conditioning pipes.

II - OPERATION FOR REMOVAL OF PART CONCERNED

❏ Fit **protective gloves**.

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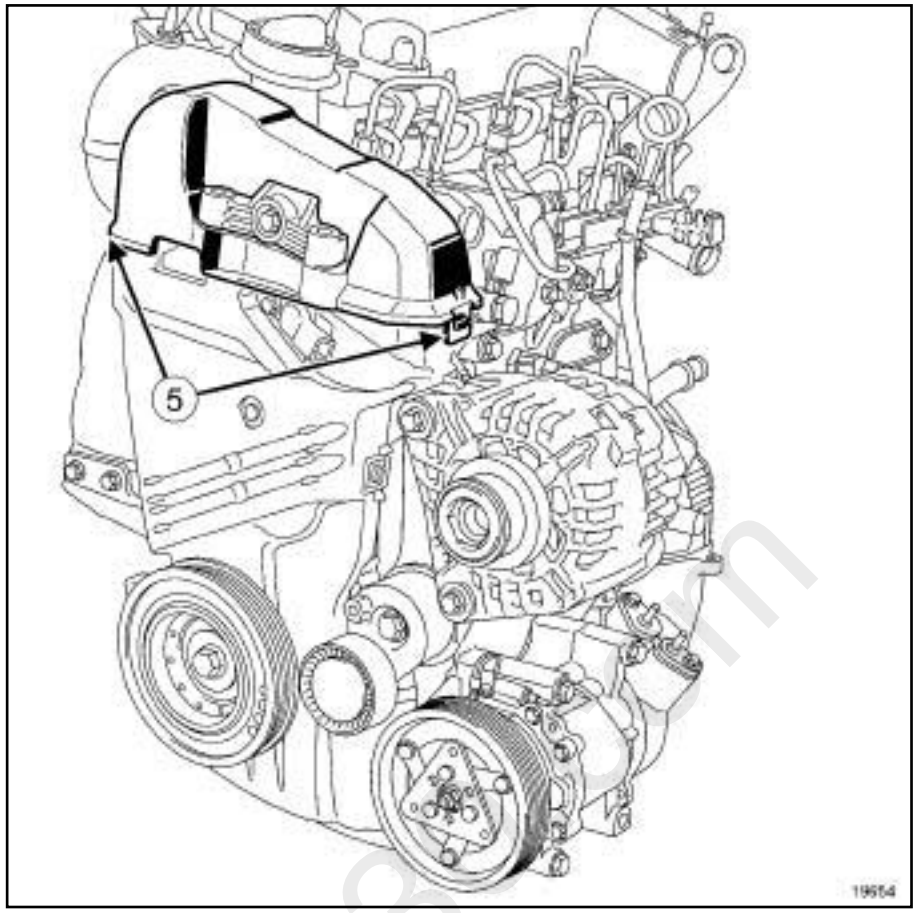
K9K, and 766 or 768

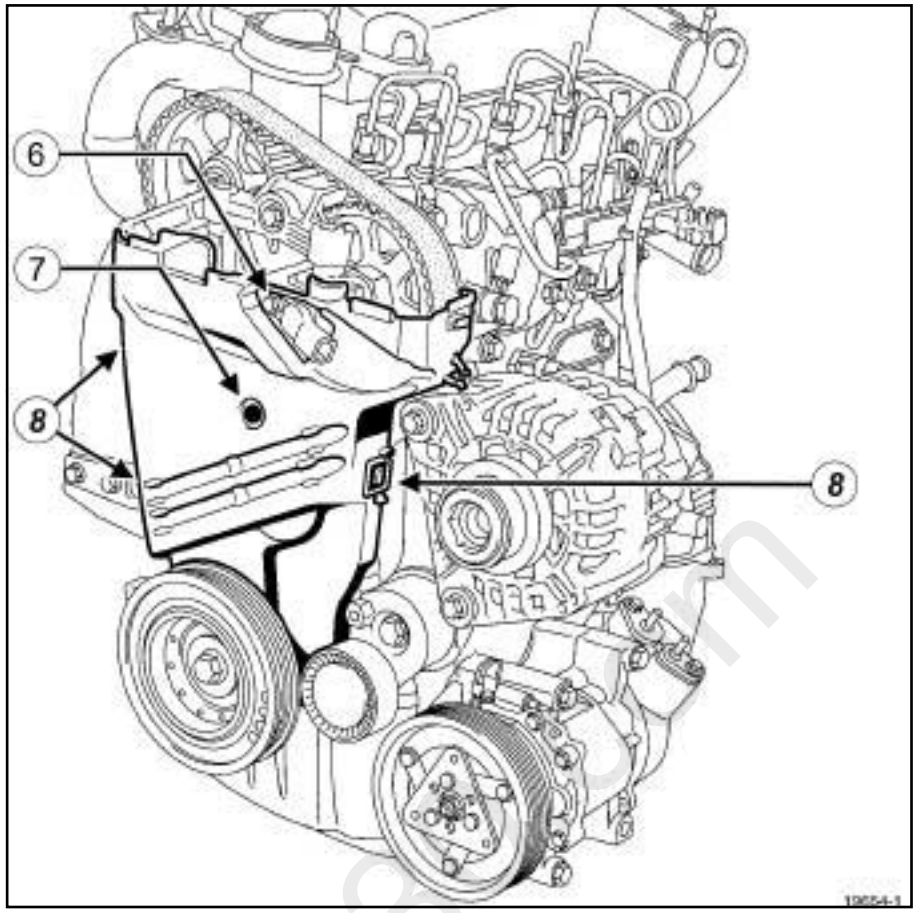


19654

❑ Remove the upper timing cover by unclipping both tabs (**5**) .

mcx33.com

K9K, and 766 or 768



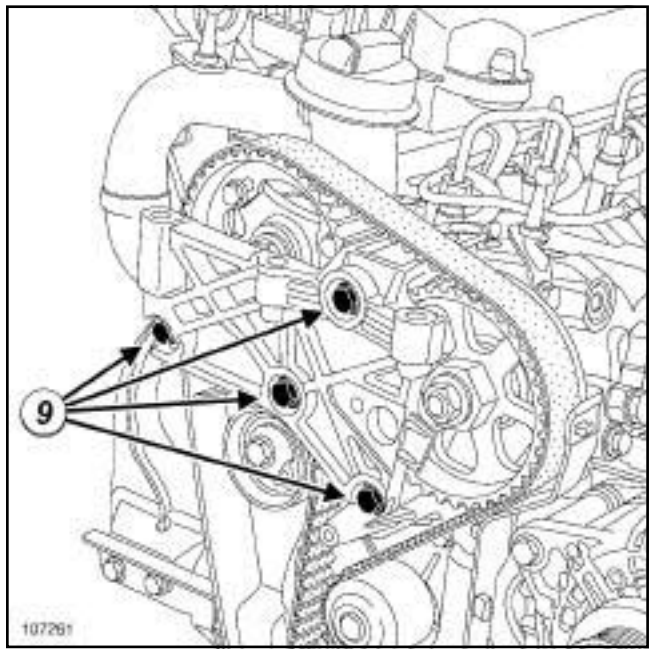
19654-1

❏ Remove:

- the camshaft position sensor (**6**) ,
- the plastic bolt (**7**) .

❏ Unclip the three tabs (**8**) .

❏ Remove the lower timing cover.

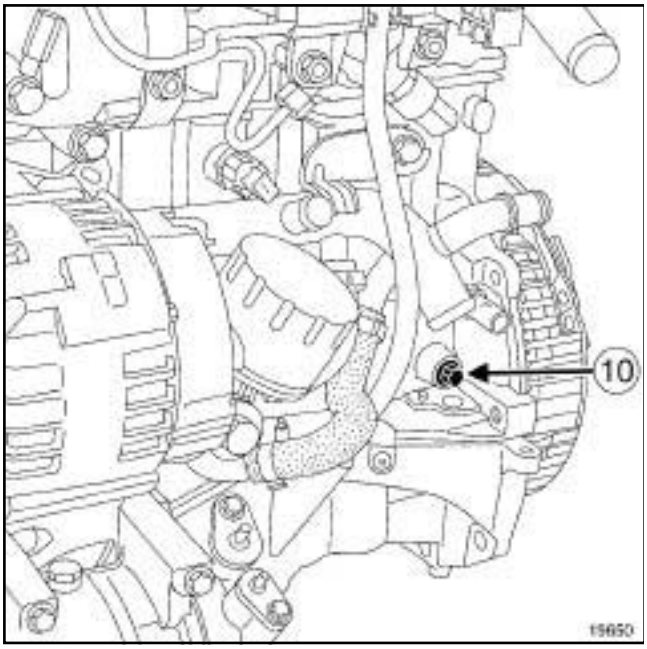


107261

❏ Remove:

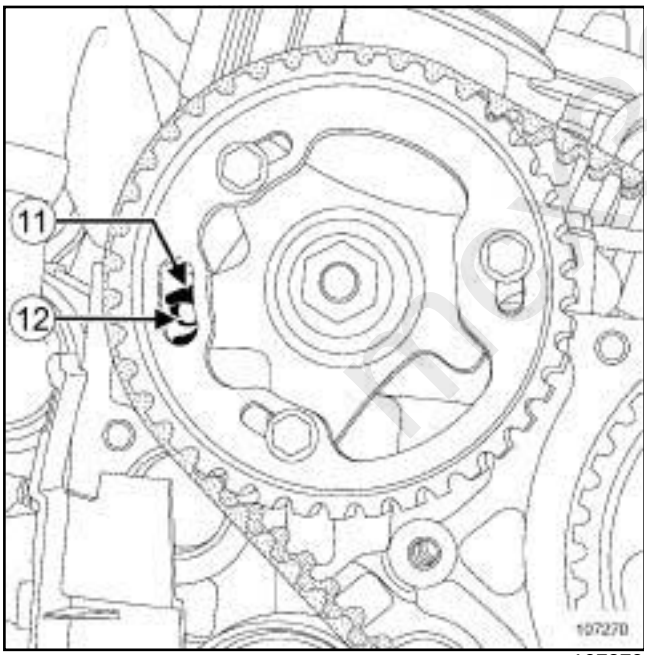
- the bolts (**9**) from the cylinder head suspended mounting,
- the cylinder head suspended mounting.

K9K, and 766 or 768



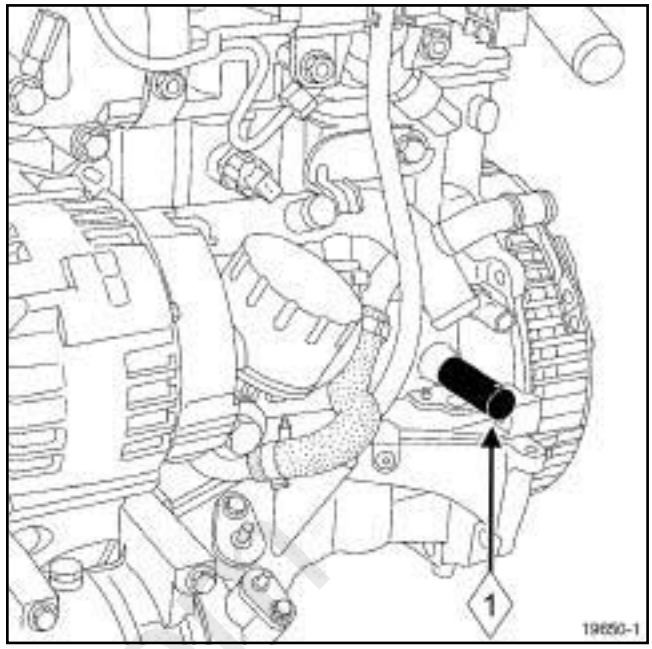
19650

❏ Remove the TDC pin plug (**10**) using a **1/2" female torx socket (12.7 mm square drive) (14)**.



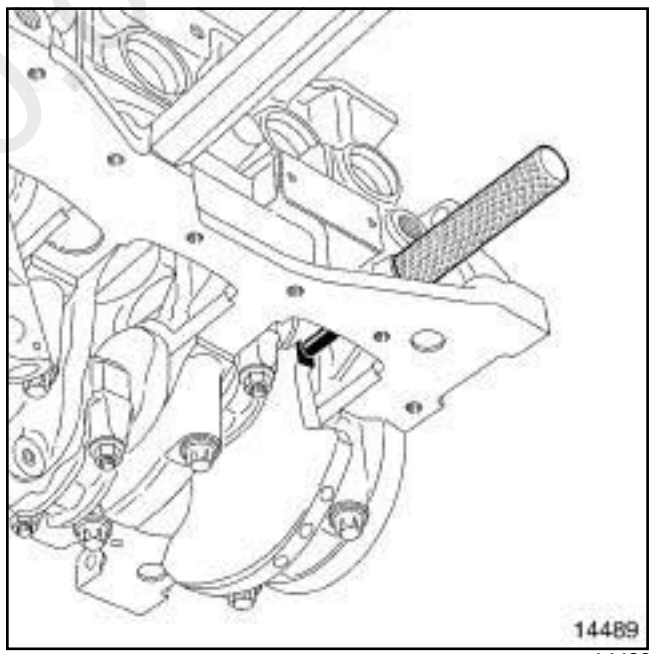
107270

❏ Rotate the crankshaft clockwise (timing end) to position the hole (**11**) in the camshaft timing sprocket almost opposite the hole (**12**) in the cylinder head.



19650-1

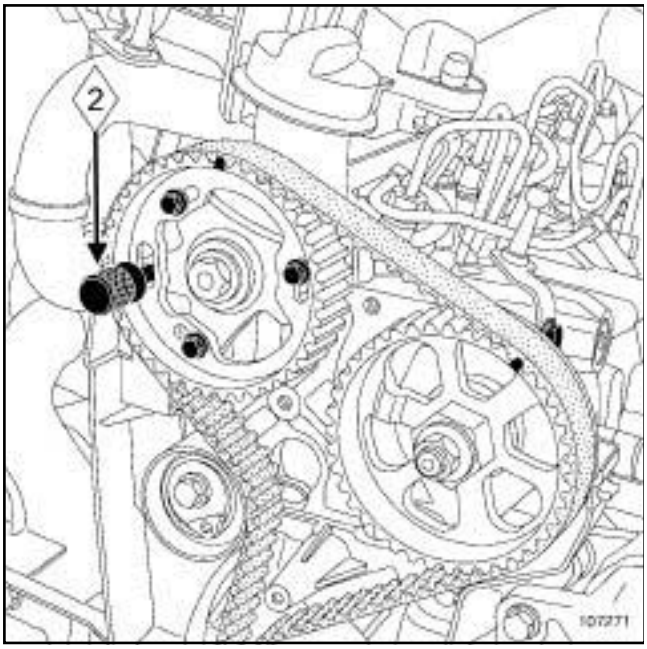
❏ Screw in the TDC setting pin (**1**) **(Mot. 1489)**.



14489

❏ Turn the crankshaft clockwise (timing end) smoothly until the crankshaft comes into contact with the TDC setting pin.

K9K, and 766 or 768

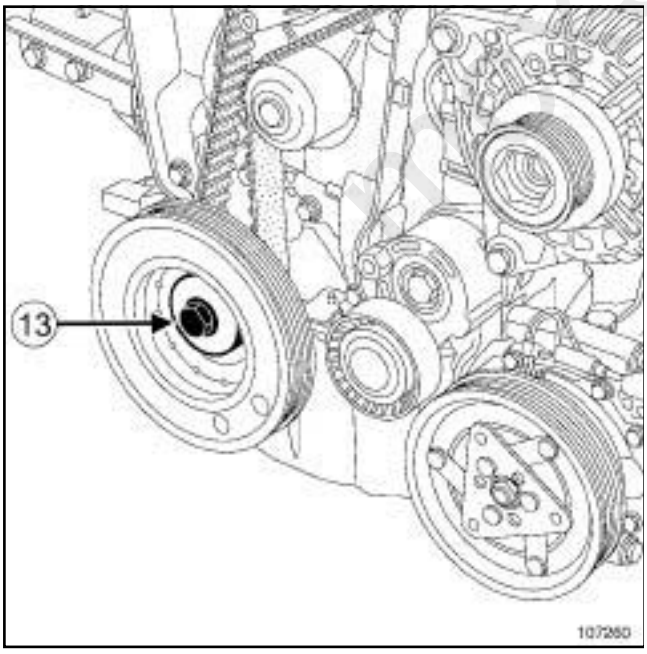


107271

❏ Engage the pin (**2**) **(Mot. 1430)** in the camshaft timing sprocket and cylinder head holes.

❏ Remove:

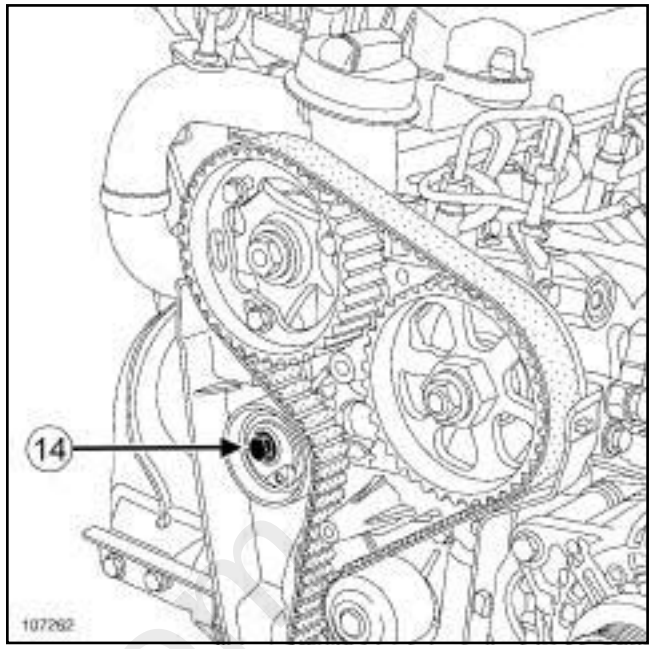
- the camshaft timing sprocket setting pin **(Mot. 1430)**,
- the TDC setting pin **(Mot. 1489)**.



107260

❏ Remove:

- the bolt (**13**) from the crankshaft accessories pulley, locking the engine flywheel with a large flat-blade screwdriver,
- the crankshaft accessories pulley.



107262

❏ Undo the tensioning roller bolt (**14**) .

❏ Loosen the timing tension wheel by turning the eccentric cam using a **6 mm** Allen key.

❏ Remove:

- the timing belt,
- the timing tensioning roller.

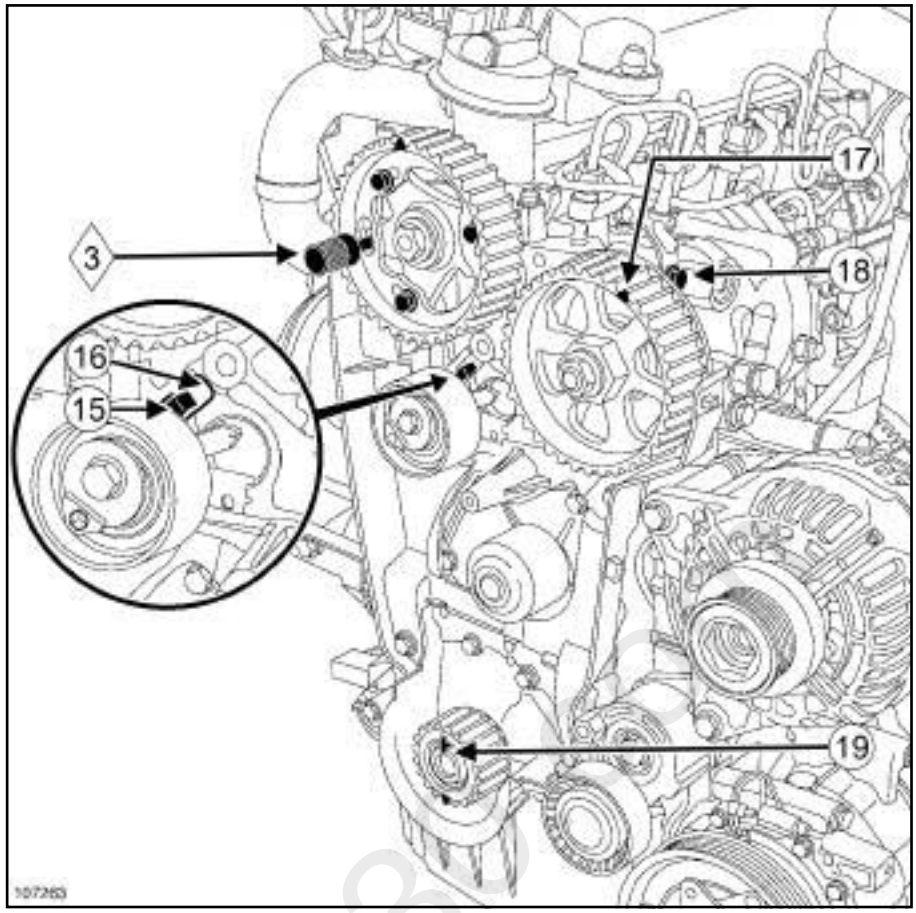
REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❏ Check:

- that there is no oil leak from the camshaft and crankshaft seals,
- the condition of the coolant pump (hard seal, play in the shaft, fluid leak, shaft rotation, (see **Technical Note 3175A, Cooling system fault finding, 19A, Cooling, Cooling system - Fault finding chart ALP 8**).

K9K, and 766 or 768



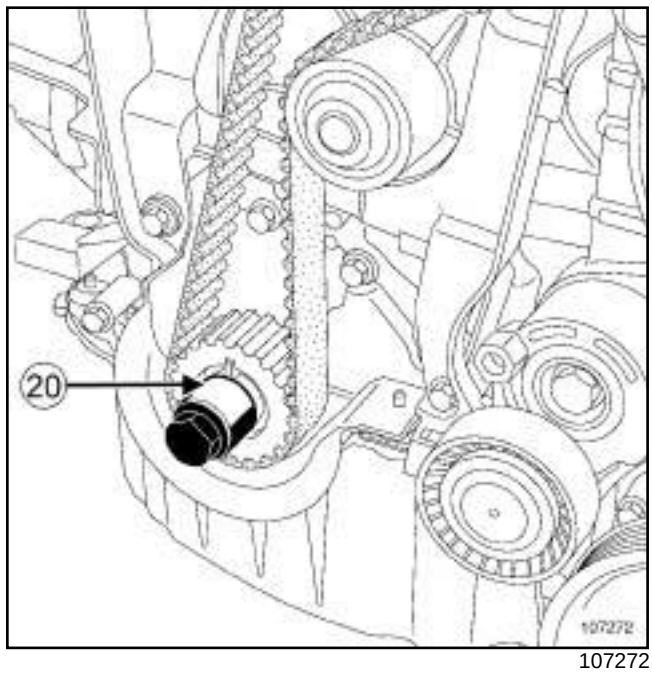
107263

❏ Refit the timing tension wheel.

❏ Put the tensioning roller lug (**15**) in the cylinder head groove (**16**) .

❏ Engage the pin (**3**) **(Mot. 1430)** in the camshaft timing sprocket and cylinder head holes, turning the camshaft using an **18 mm** offset spanner if necessary.

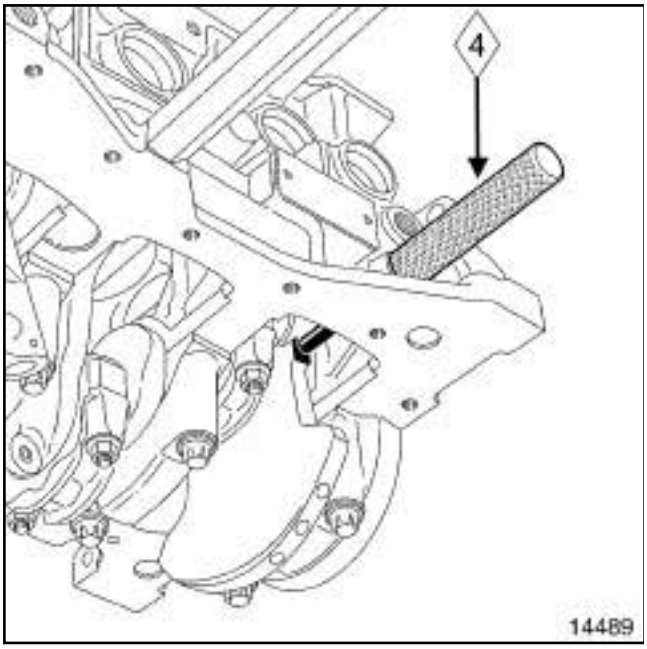
❏ Check that the mark on the high pressure pump (**17**) is opposite the bolt head (**18**) .



107272

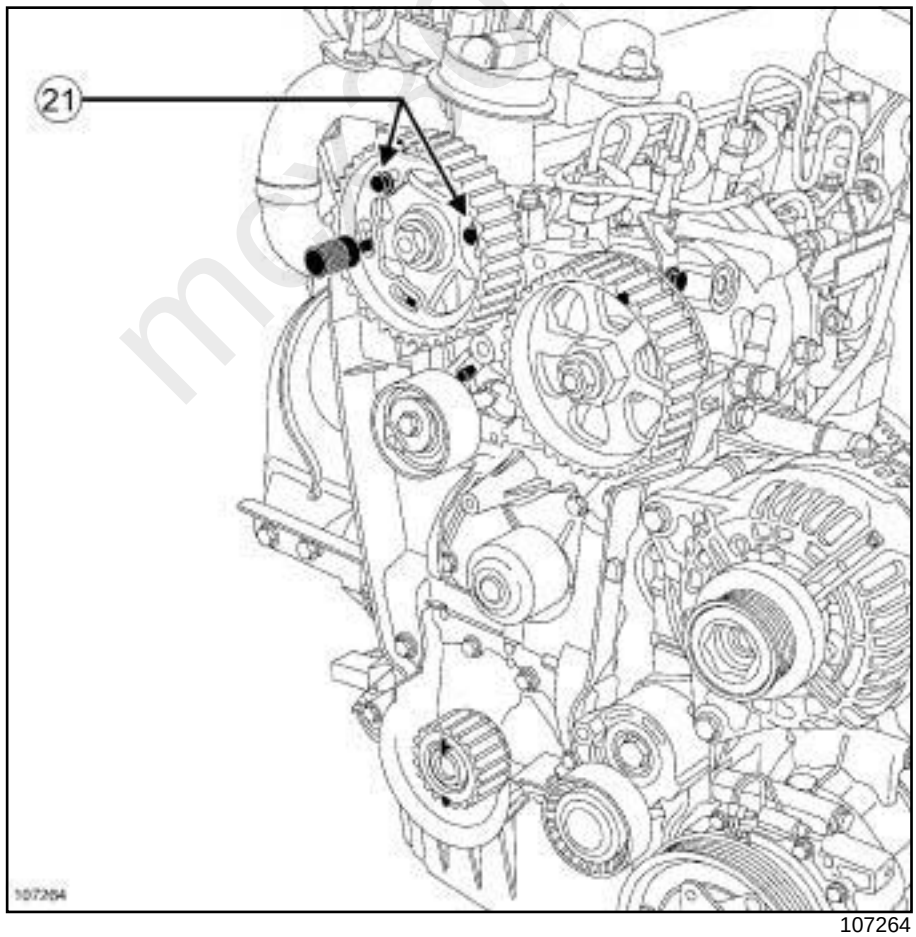
❏ Screw the old crankshaft accessories pulley bolt fitted with a spacer (**20**) (which does not cover the timing sprocket mark) into the crankshaft.

K9K, and 766 or 768



14489

❑ Position the crankshaft so that it presses against the TDC setting pin (**4**) **(Mot. 1489)** (the crankshaft sprocket collet ***(19)*** must face upwards).

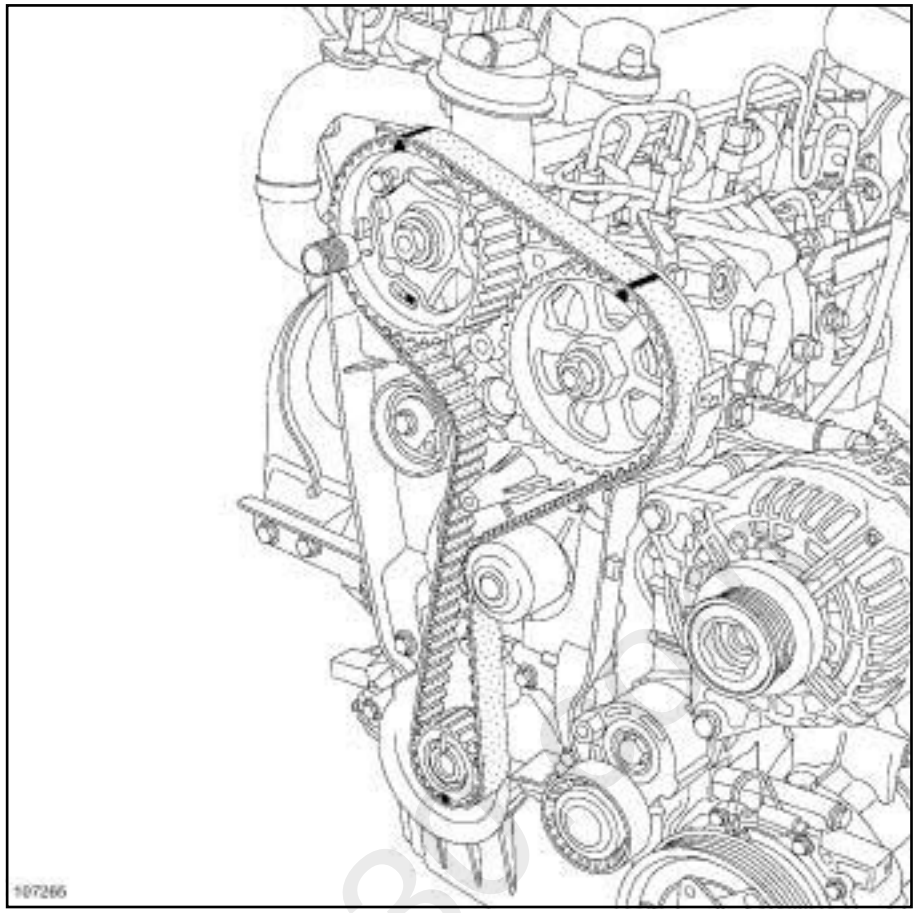


107264

❑ Remove one bolt from the camshaft timing sprocket crown.

❑ Loosen the other two camshaft timing sprocket crown bolts (**21**) by one turn.

K9K, and 766 or 768



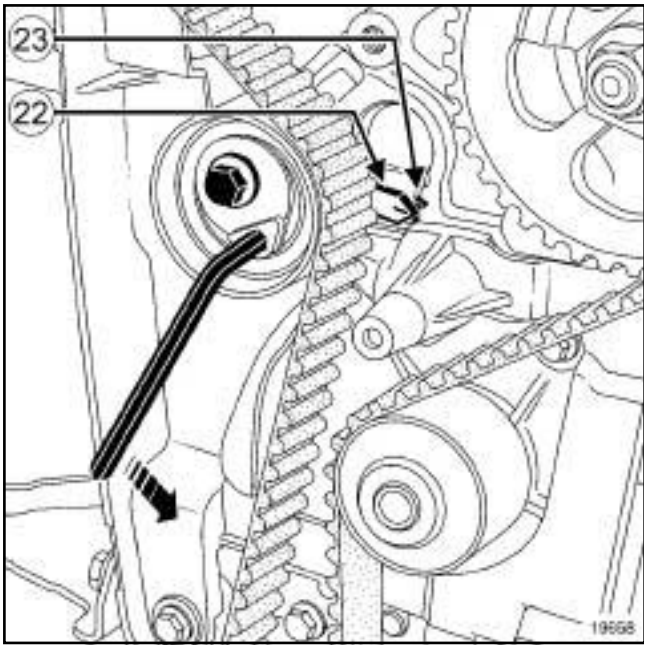
107265

❑ Fit the timing belt, starting with the crankshaft sprocket, by aligning the marks on the belt with those on the crankshaft and camshaft sprockets, and the high pressure pump pinion.

Note:

There should be 19 belt tooth grooves between the marks on the camshaft sprocket and the high pressure pump pinion, and 51 belt tooth grooves between the crankshaft sprocket and the high pressure pump pinion.

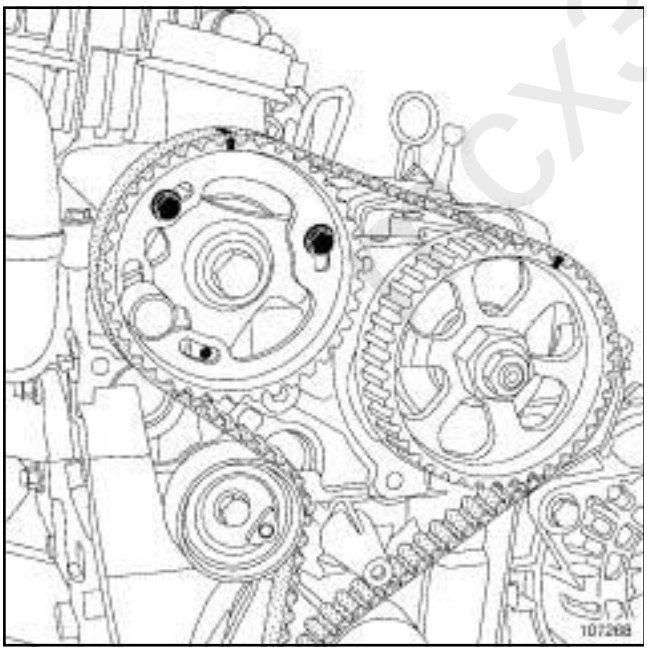
K9K, and 766 or 768



19658

❑ Position the tensioning roller adjustable index marker (**22**) opposite the lug (**23**) , turning the eccentric cam anti-clockwise using a **6 mm** Allen key.

❑ Torque tighten the **tensioning roller bolt (27 Nm)** using a **torque wrench**.



107268

❑ Check that the camshaft timing sprocket crown bolts are not fully locked against the camshaft timing sprocket crown. If they are, repeat the timing belt refitting procedure.

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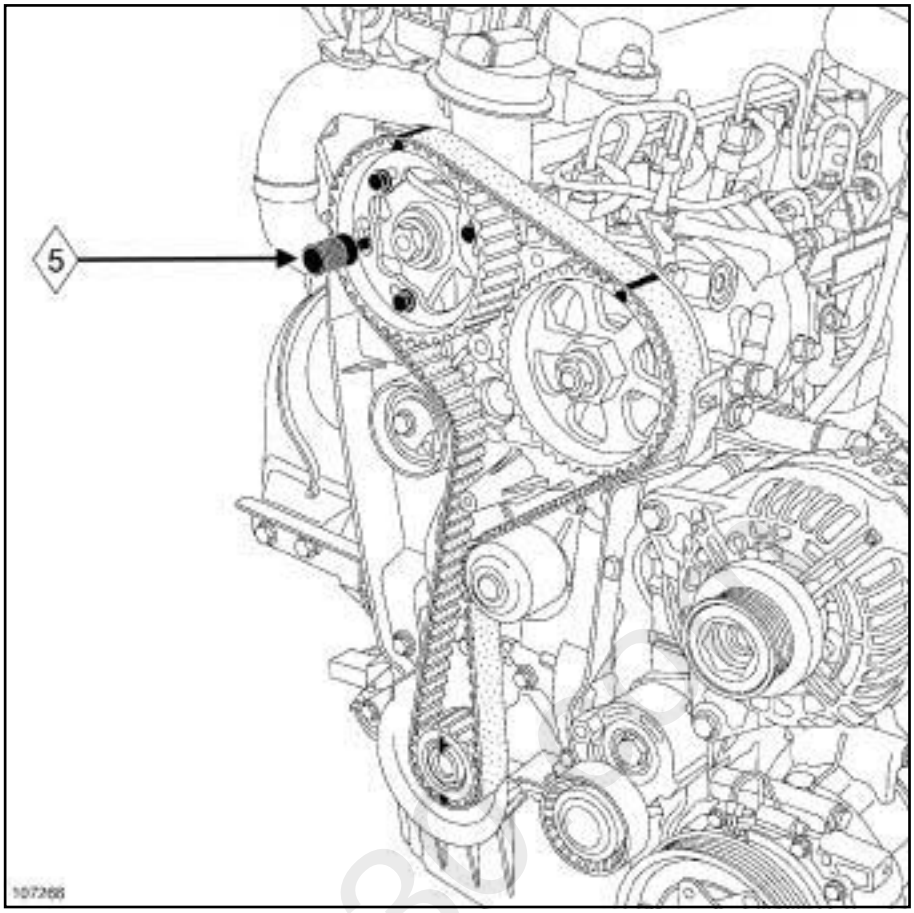
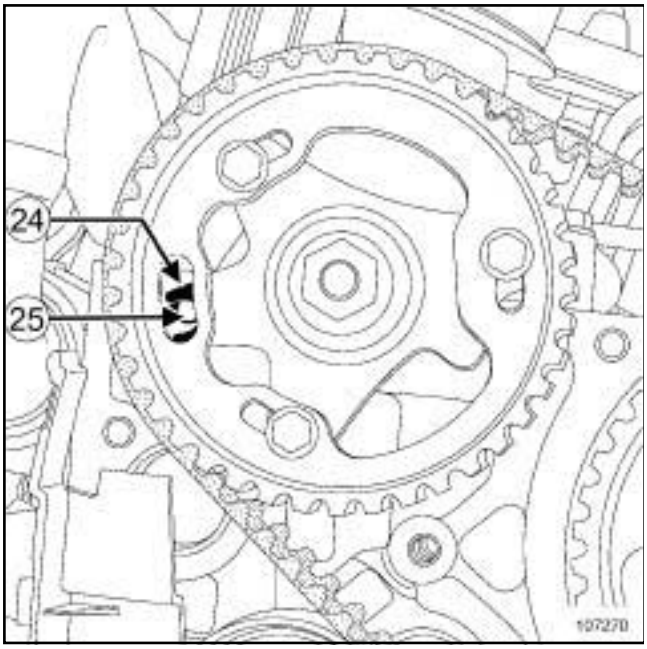
K9K, and 766 or 768



107266

- ❏ Refit the bolt from the camshaft timing sprocket crown.
- ❏ Torque tighten the **camshaft timing sprocket crown bolts (14 Nm)** using a **torque wrench**.
- ❏ Remove:
  - the TDC setting pin **(Mot. 1489)**,
  - the camshaft timing sprocket setting pin ***(5)*** **(Mot. 1430)**.

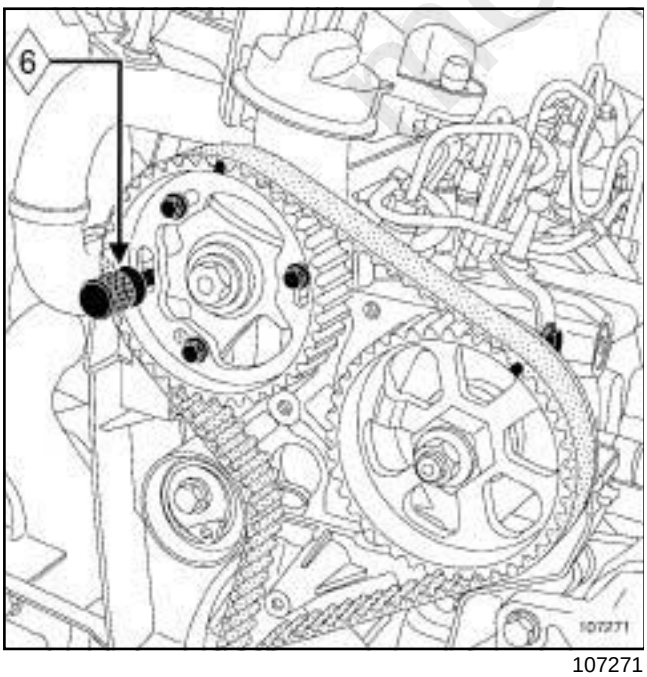
K9K, and 766 or 768



107270

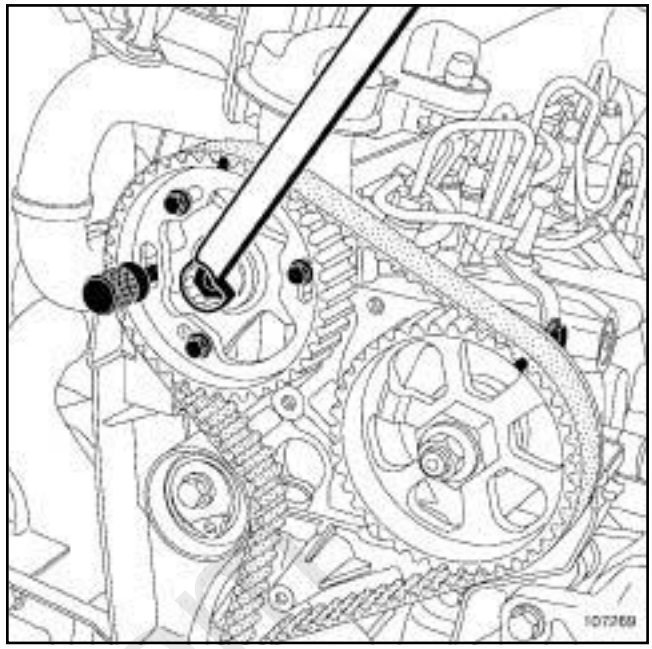
❏ Rotate the crankshaft clockwise through two revolutions (timing end). Before the hole (**24**) in the camshaft timing sprocket is opposite the hole (**25**) in the cylinder head:

- screw the TDC setting pin **(Mot. 1489)** into the cylinder block,
- bring the crankshaft slowly and smoothly against the TDC setting pin.



107271

❏ Lock the camshaft timing sprocket using the (**6**) **(Mot. 1430)**.



107269

❏ If the pin **(Mot. 1430)** does not engage:

- loosen the camshaft timing sprocket crown bolts by a maximum of one turn,
- turn the camshaft timing sprocket hub using a **offset spanner (18 mm)** to set the camshaft timing sprocket hub,
- do not retighten the camshaft timing sprocket crown bolts.

❏ Loosen the camshaft timing sprocket crown bolts by a maximum of one turn.

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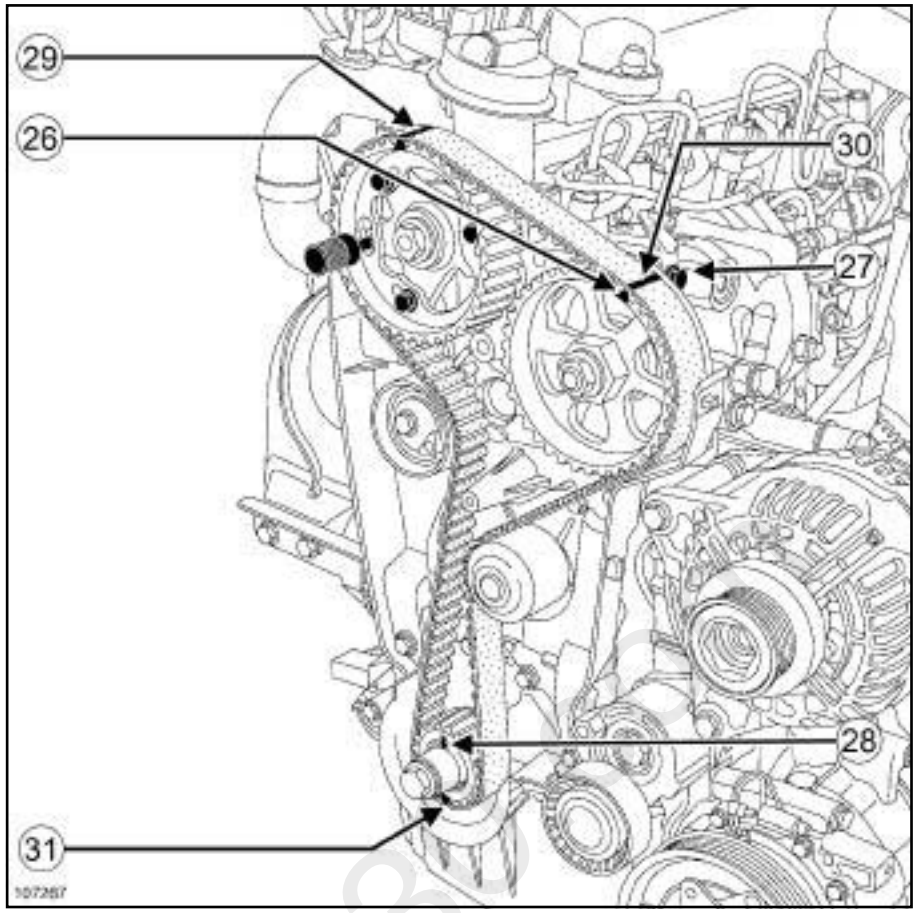
K9K, and 766 or 768



107267

❑ Check:

- that the high pressure pump pinion mark (**26**) is opposite the bolt head (**27**) ,
- that the crankshaft timing sprocket collet (**28**) is positioned vertically at the top,
- that there are 19 belt tooth grooves between the marks on the camshaft sprocket (**29**) and the high pressure pump pinion (**30**) ,
- that there are 51 belt tooth grooves between the crankshaft sprocket marks (**31**) and the high pressure pump pinion (**30**) .

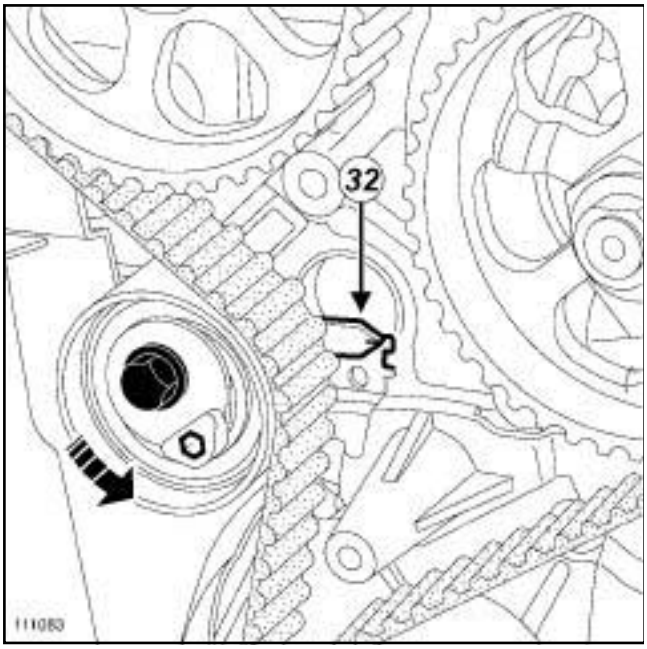
Note:

After two turns, the tensioning roller index markers may be in two different positions.

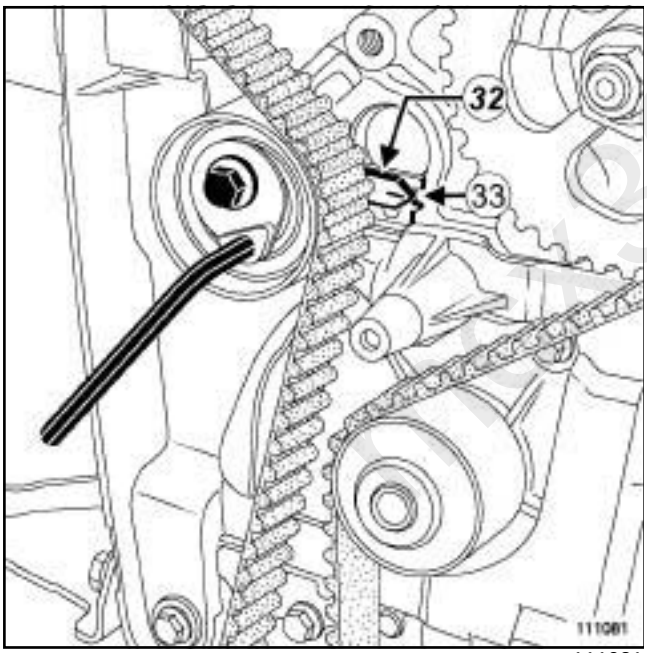
The rotation of the tensioning roller eccentric depends on the position.

K9K, and 766 or 768

First position



111083



111081

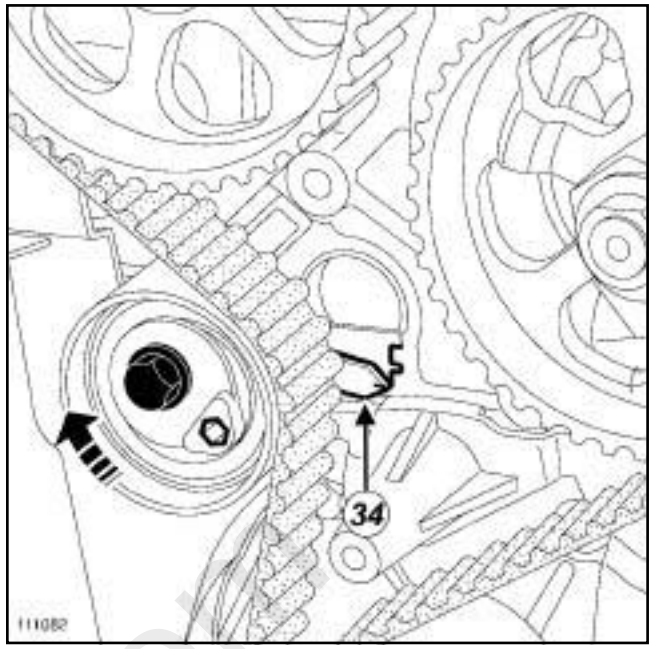
❏ Loosen the tensioning roller bolt by no more than one turn, holding it with a **6 mm** Allen key.

❏ Gradually align the adjustable index (**32**) in the middle of the timing window (**33**) , turning the key anti-clockwise.

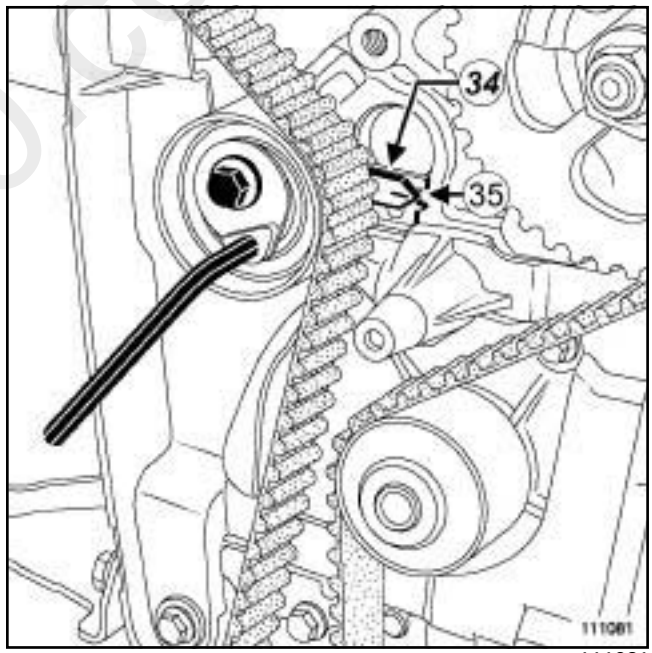
❏ Torque tighten:

- the **tensioning roller bolt (27 Nm)** using a **torque wrench**.
- the **camshaft timing sprocket crown bolts (14 Nm)** using a **torque wrench**.

Second position



111082



111081

❏ Loosen the tensioning roller bolt by no more than one turn, holding it with a **6 mm** Allen key.

❏ Gradually align the adjustable index (**34**) in the middle of the timing window (**35**) , turning the key clockwise.

❏ Torque tighten:

- the **tensioning roller bolt (27 Nm)** using a **torque wrench**,
- the **camshaft timing sprocket crown bolts (14 Nm)** using a **torque wrench**.

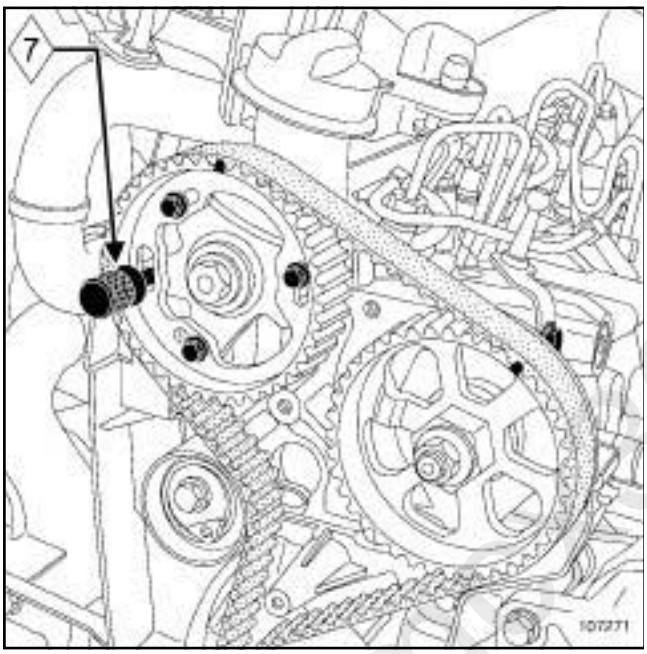
K9K, and 766 or 768

❏ Remove the following tools:

- the TDC setting pin **(Mot. 1489)**,
- the camshaft timing sprocket setting pin **(Mot. 1430)**.

❏ Rotate the crankshaft clockwise through two revolutions (timing end). Before the hole in the camshaft timing sprocket is opposite the hole in the cylinder head:

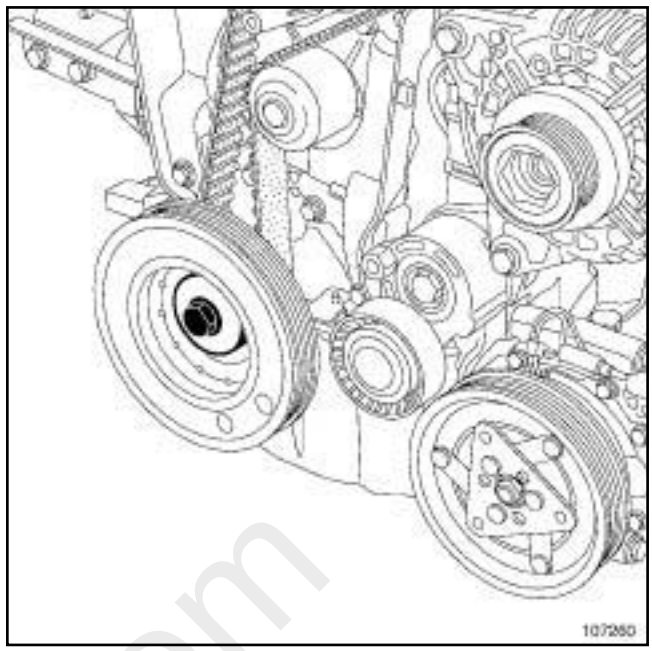
- screw the TDC setting pin **(Mot. 1489)** into the cylinder block,
- bring the crankshaft slowly and smoothly against the TDC setting pin.



107271

❏ Lock the camshaft timing sprocket using the (**7**) **(Mot. 1430)**.

❏ If the pin does not engage, repeat the timing belt refitting operation.



107260

❏ Refit the accessories crankshaft pulley with a new bolt.

❏ Tighten to torque and angle (crankshaft in contact with the TDC setting pin) the **crankshaft accessories pulley bolt M14 (120 Nm + 95° ± 15°)** using a **torque/angle wrench** or a **torque wrench** and a **cylinder head bolt tightening gauge (angular measuring type)**.

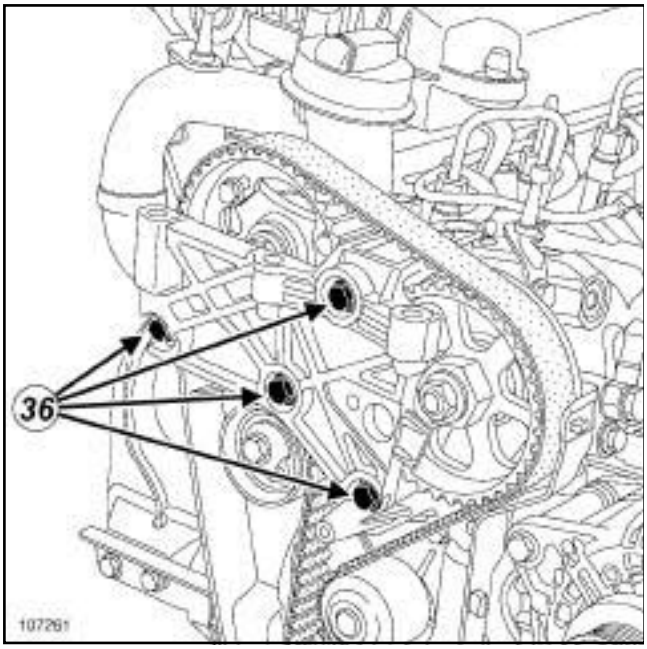
❏ Remove the following tools:

- the TDC setting pin **(Mot. 1489)**,
- the camshaft timing sprocket setting pin **(Mot. 1430)**.

❏ Refit the TDC pin plug, coating the threading with **SILICONE ADHESIVE SEALANT**.

❏ Torque tighten the **TDC setting pin plug (25 Nm)** using a **torque wrench**.

K9K, and 766 or 768



107261

❏ Refit:

- the cylinder head suspended mounting support,
- the cylinder head suspended mounting bolts (**36**) ,

❏ Torque tighten the **cylinder head suspended mounting bolts (25 Nm)** using a **torque wrench**.

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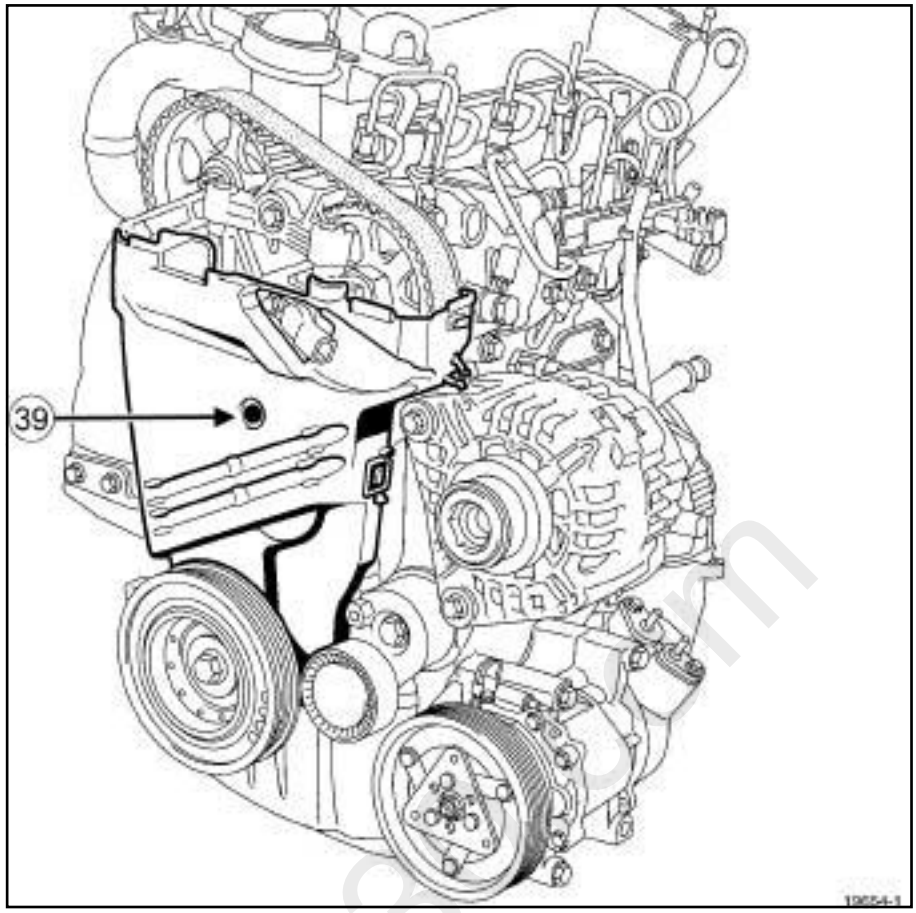
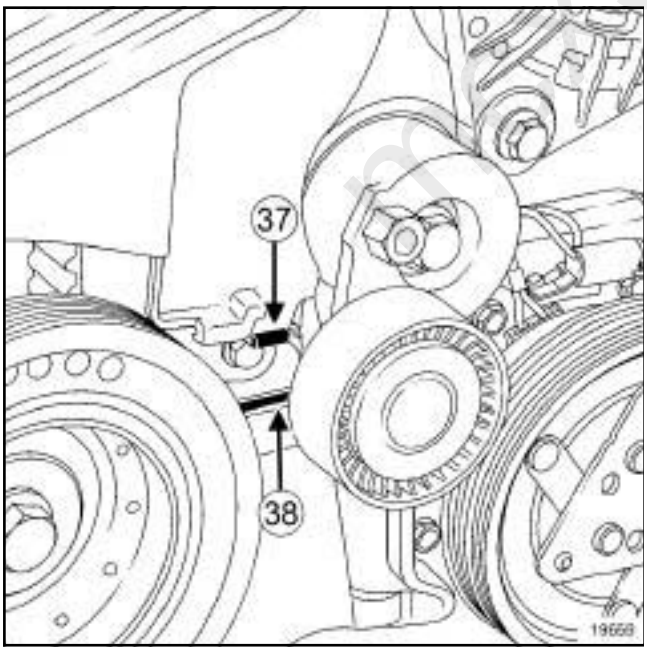
K9K, and 766 or 768



19654-1

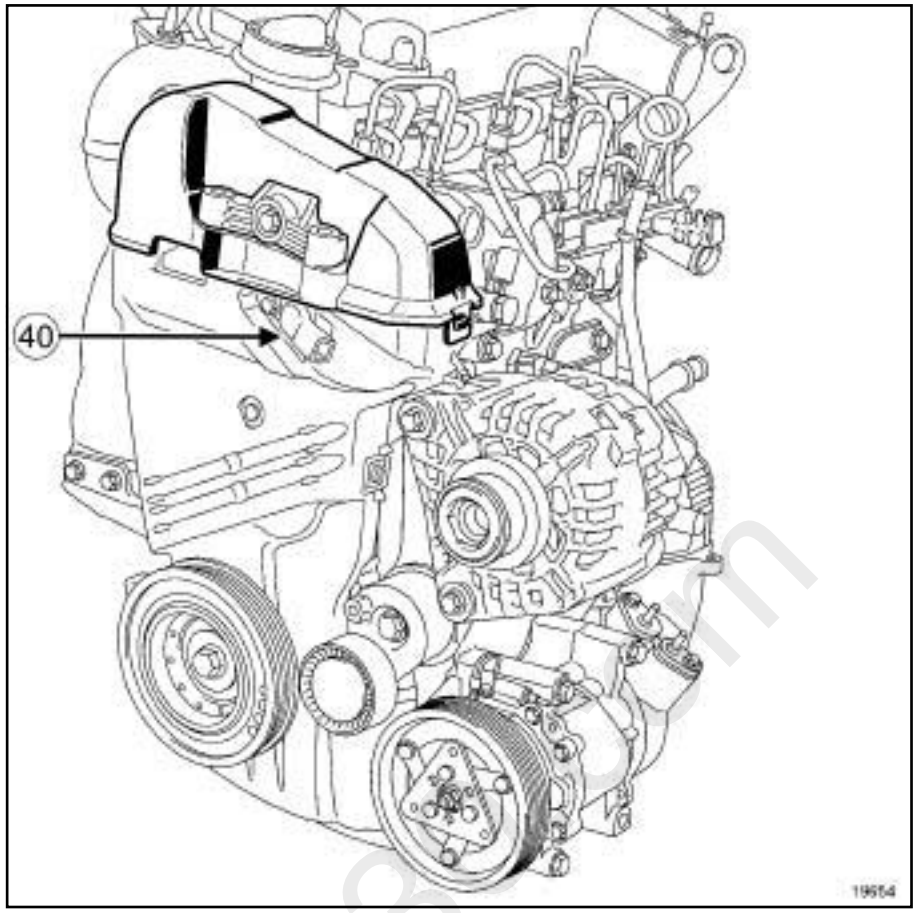


19659

❑ Refit:

- the lower timing cover, positioning the tab (**37**) in the inner timing cover hole (**38**) ,
- the timing cover plastic bolt (**39**) .

K9K, and 766 or 768



19654

❑ Refit the high pressure pump position sensor (**40**) .

❑ Torque tighten the **camshaft position sensor bolt (8 Nm)** using a **torque wrench**.

❑ Refit the upper timing cover.

II - FINAL OPERATION

❑ Refit:

- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,

Remove:

- the chain,
- the **safety strap(s)**,
- the **(Mot. 1453)**,

Refit:

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

K9K, and 766 or 768

- the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) ,
- the engine undertray,
- the front section of the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),

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

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K4J

Special tooling required	
Mot. 1368	Tool for tightening eccentric tensioning roller bolt. 8 mm Torx wrench and 12.7 mm square.
Mot. 799-01	Timing gear wheel immobiliser.
Mot. 1496	Camshaft timing tool.
Mot. 1750	Additional tool to support the camshaft adjusting tool, Mot. 1496.
Mot. 1489	TDC locating pin.
Mot. 1490-01	For locking and adjusting the camshaft pulleys.
Mot. 1487	Tool for refitting camshaft covers (57 mm diameter).
Mot. 1488	Tool for refitting 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 fixed 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**
dipstick guide tube bolt	**10 N.m**
flywheel end lifting eye bolts	**10 N.m**

REMOVAL

I - REMOVAL PREPARATION OPERATION

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

❑ Remove:

- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the battery tray (see **Battery: Removal - Refitting**) (80A, Battery),
- the air inlet duct clips,
- the air inlet duct,
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) ,
- 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 accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) .

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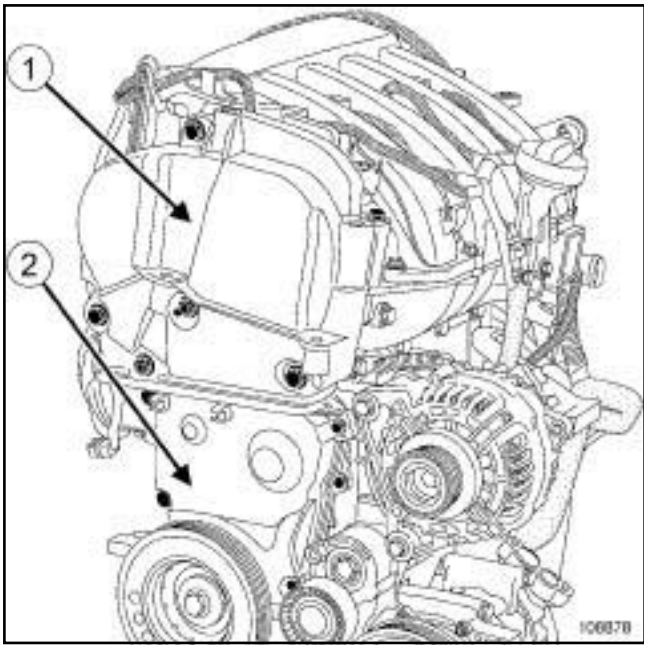
K4J

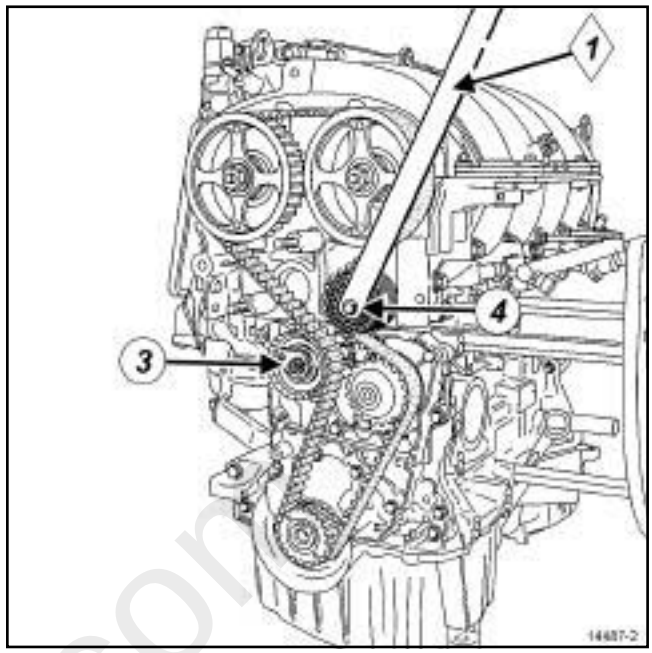


108878

❑ Remove:

- the crankshaft accessories pulley (see **11A**, **Top and front of engine**, **Crankshaft accessories pulley: Removal - Refitting**, page **11A-31**) ,
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the upper timing cover bolts,
- the upper timing cover nuts,
- the upper timing cover (**1**) ,
- the lower timing cover bolts,
- the lower timing cover (**2**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED



14487-2

❑ Loosen the nut (**3**) of the timing tensioning roller.

Note:

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

❑ Remove:

- the timing fixed roller bolt (**4**) using the tool **(Mot. 1368)** (**1**) ,
- the timing fixed roller,
- the timing belt,
- the timing tensioning roller nut,
- the timing tensioning roller,
- the crankshaft timing sprocket.

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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 (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).

II - REFITTING OPERATION FOR PART CONCERNED

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

1 - Adjusting the timing

❑

WARNING

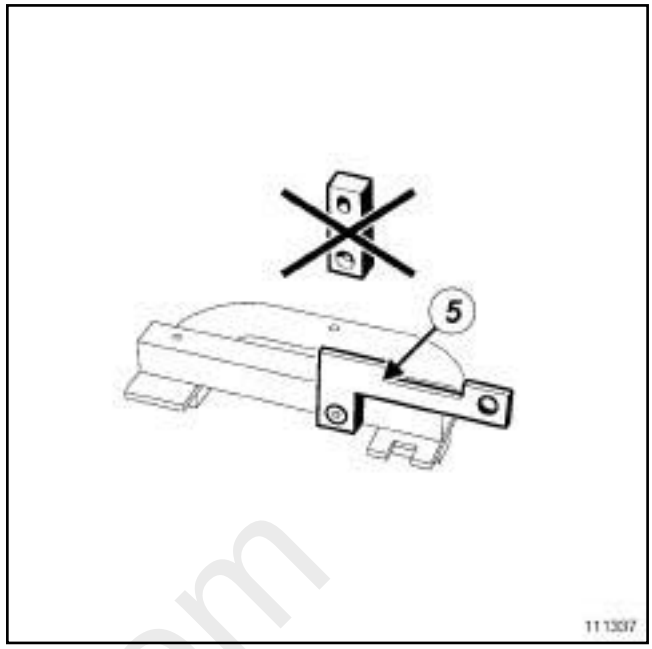
Be sure to degrease:

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

This is to avoid timing slippage.

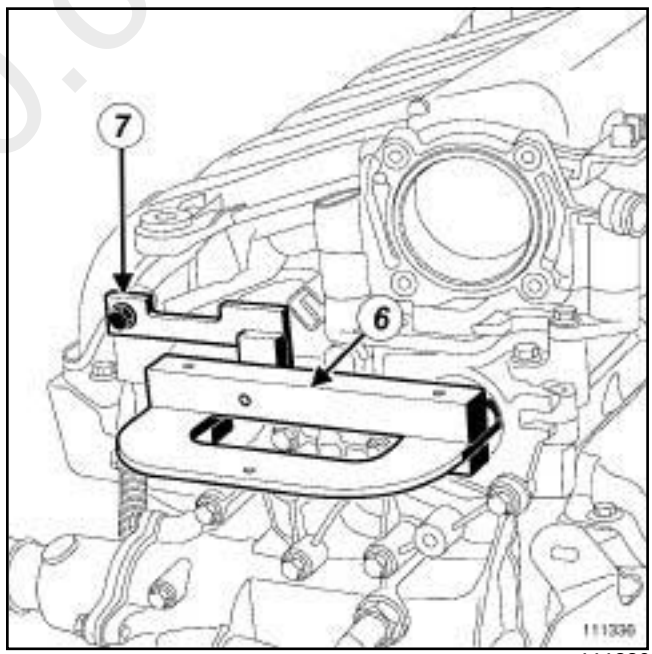
This slippage leads to engine damage.

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



111337

❑ Fit the **(Mot. 1496)** with the **(Mot. 1750)** (**5**) .



111336

❑ Fit:

- the **(Mot. 1496)** (**6**) fitted with the **(Mot. 1750)** on the end of the camshaft,
- a lifting eye bolt (**7**) to secure the tool **(Mot. 1496)** equipped with the tool **(Mot. 1750)**.

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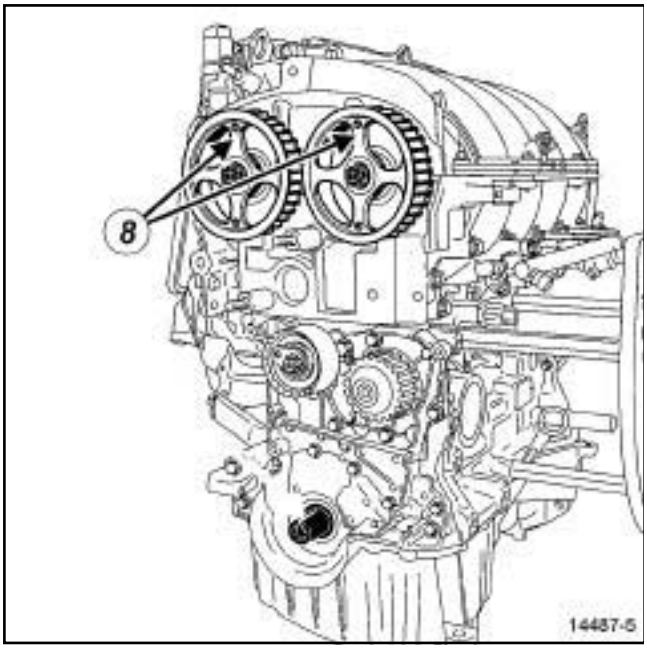
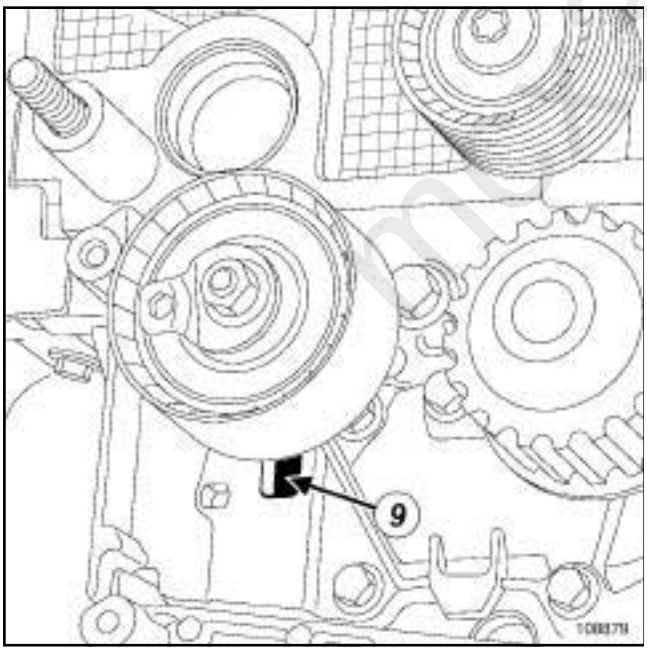


14487-5

❏ Position the RENAULT badge (**8**) engraved on the stem of each camshaft sprocket vertically and pointing upwards.

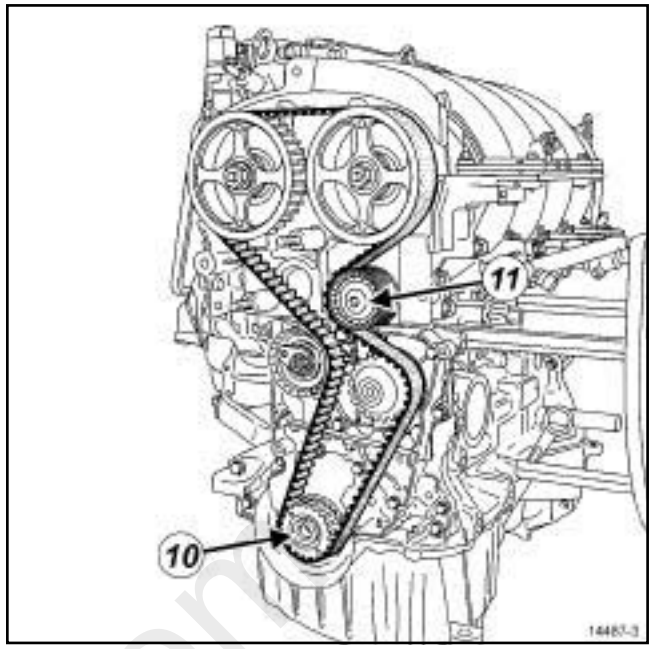
2 - Refitting



108879

❏ Refit a new timing tensioning roller by positioning the lug of the timing tensioning roller in the groove (**9**) .

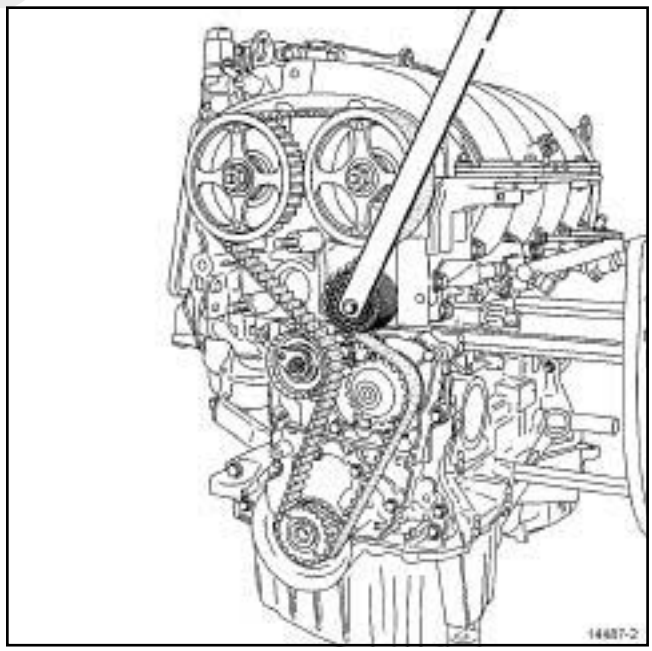
❏ Screw on the timing tensioning roller nut without tightening it.



14487-3

❏ Refit:

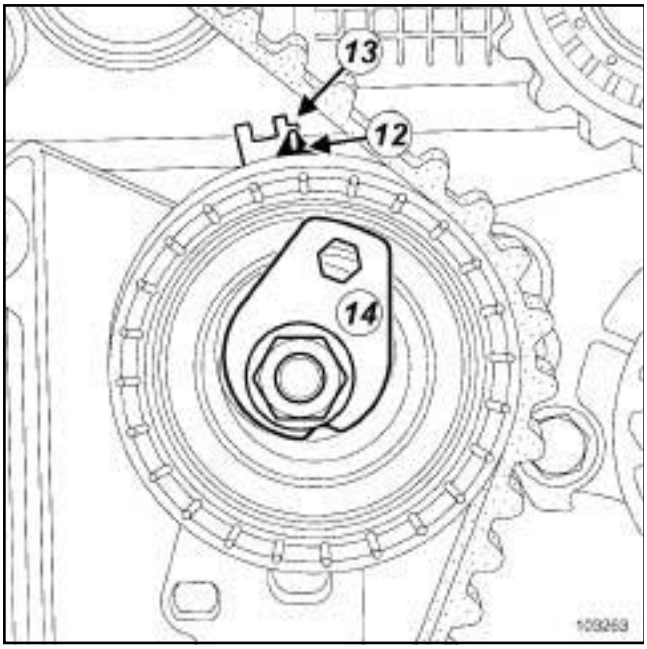
- the crankshaft timing sprocket (**10**) ,
- a new timing belt,
- a new timing fixed roller (**11**) .



14487-2

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

K4J

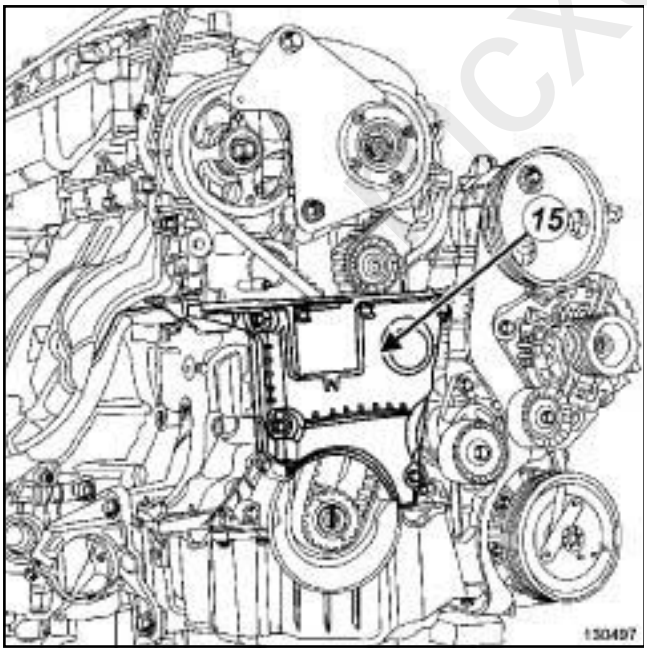


103263

❏ Position the adjustable index (**12**) opposite the mark (**13**) , by turning the eccentric (**14**) 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.

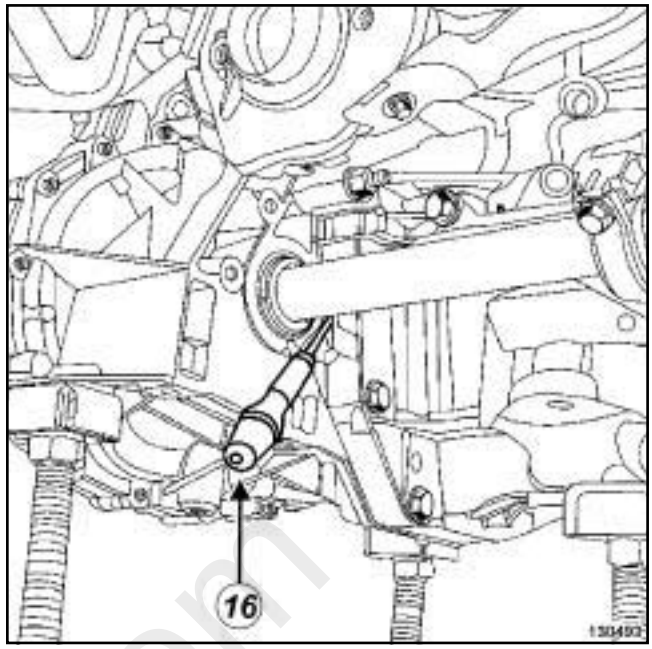


130497

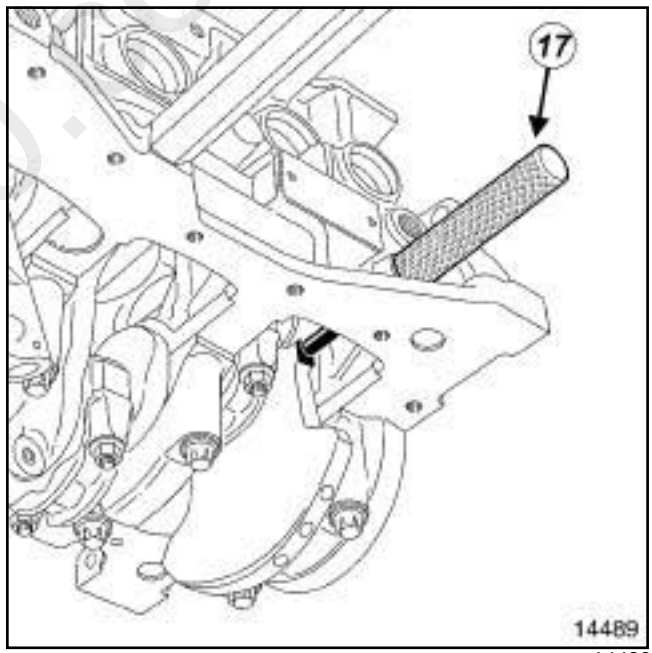
❏ Refit the lower timing cover (**15**) .

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

❏ Refit a new crankshaft accessories pulley.



130493

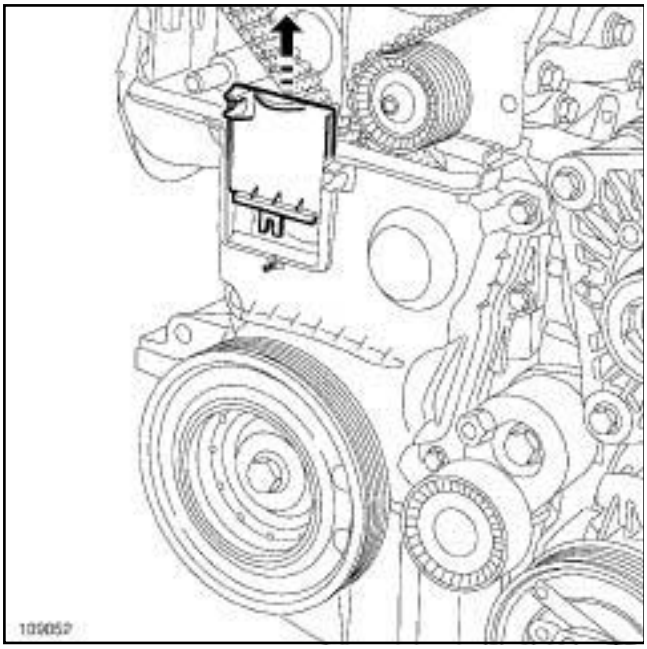


14489

❏ Use a screwdriver (**16**) 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)** (**17**) 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)**).

K4J



109052

❏ Remove:

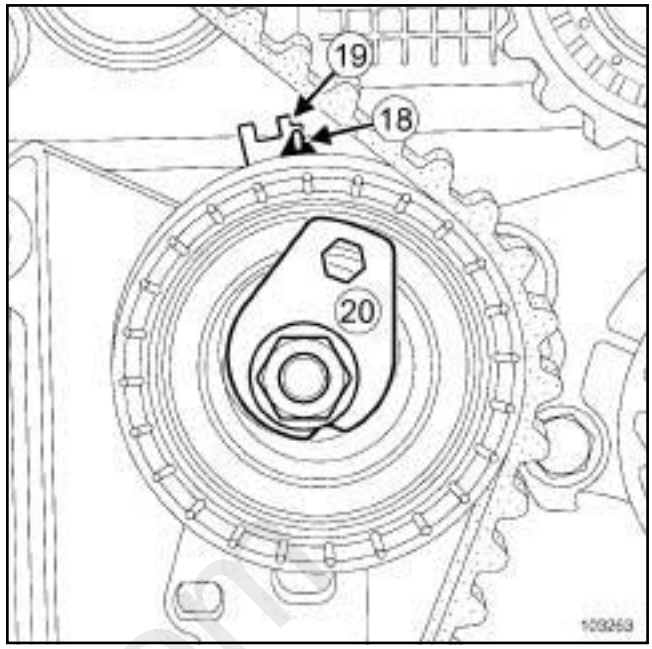
- the timing flap from the lower timing cover,
- the lifting eye bolt from the **(Mot. 1496)**,
- the timing tool **(Mot. 1496)** fitted with the **(Mot. 1750)**,
- the **(Mot. 1489)** from the cylinder block.

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.



103263

❏ Check that the adjustable index (**18**) is opposite the notch (**19**) , 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 (**18**) opposite the mark (**19**) turning the eccentric cam (**20**) 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.

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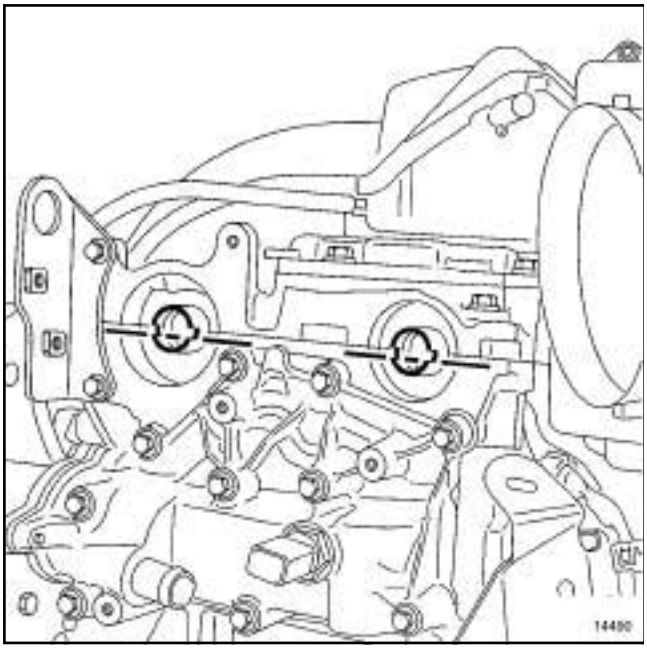


14490

❏ 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).

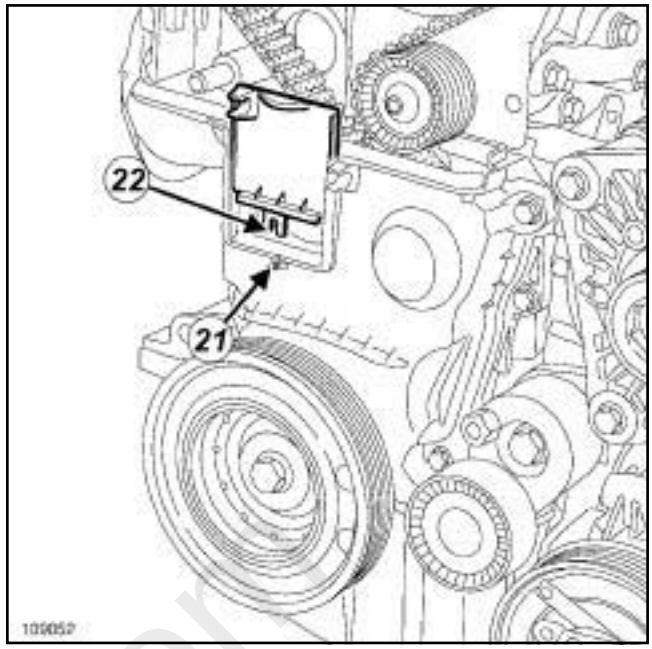
Note:

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 **(Mot. 1489)** from the cylinder block.

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



109052

❏ Refit the lower timing cover flap, checking that the locating pin (**21**) fits properly in the notch (**22**) .

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 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 of the camshaft sprockets to be loosened.

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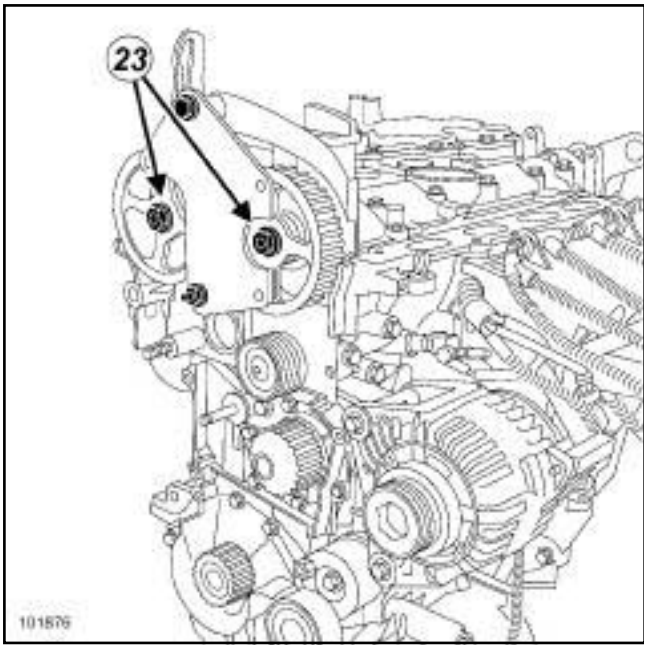
K4J



101876

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

❑ Loosen the nuts (**23**) of each camshaft sprocket.

❑ Remove:

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

1 - Adjusting the timing

❑

Note:

If the stud loosens with the nut (see **11A**, **Top and front of engine**, **Camshaft: Removal - Refitting**, page **11A-247**) (Technical Note 3887A,11A, Top and front of engine).

WARNING

Always degrease:

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

This is to avoid timing slippage.

This slippage leads to engine damage.

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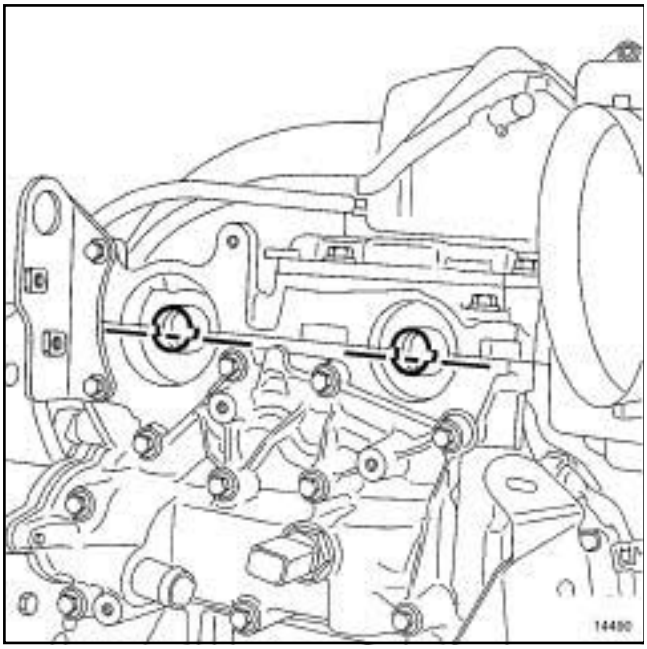
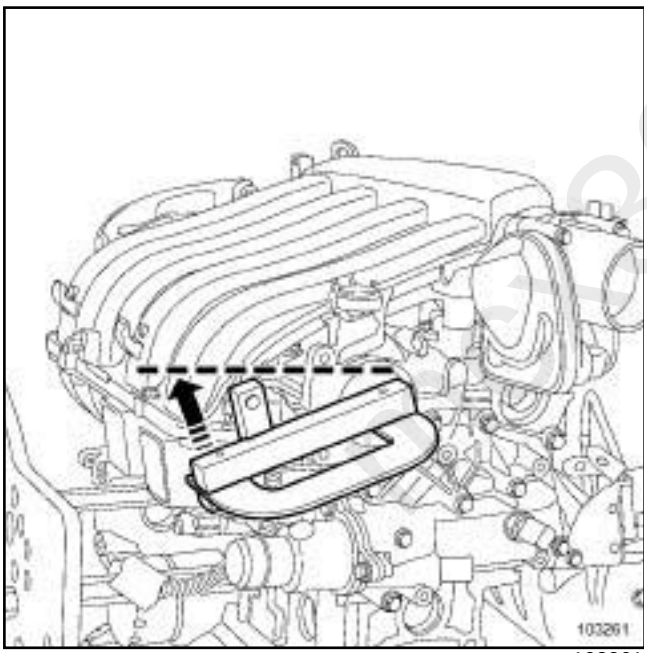
K4J

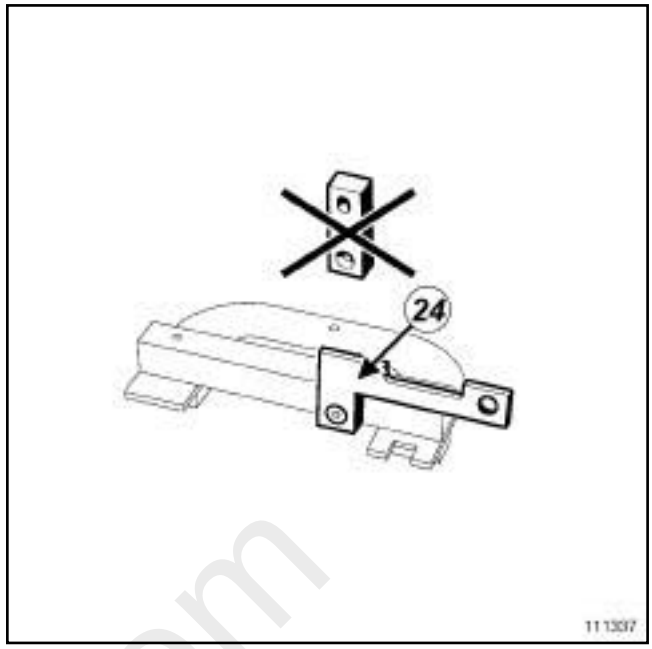


14490



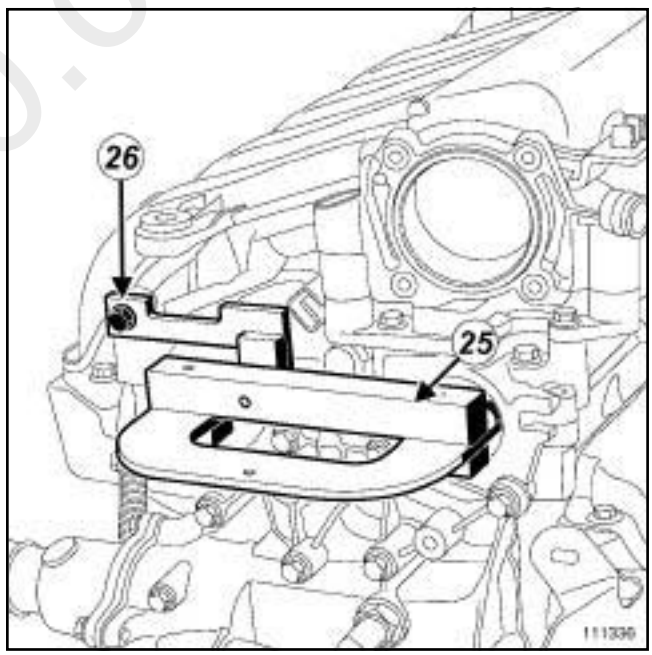
103261

❑ 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)** (**24**) .



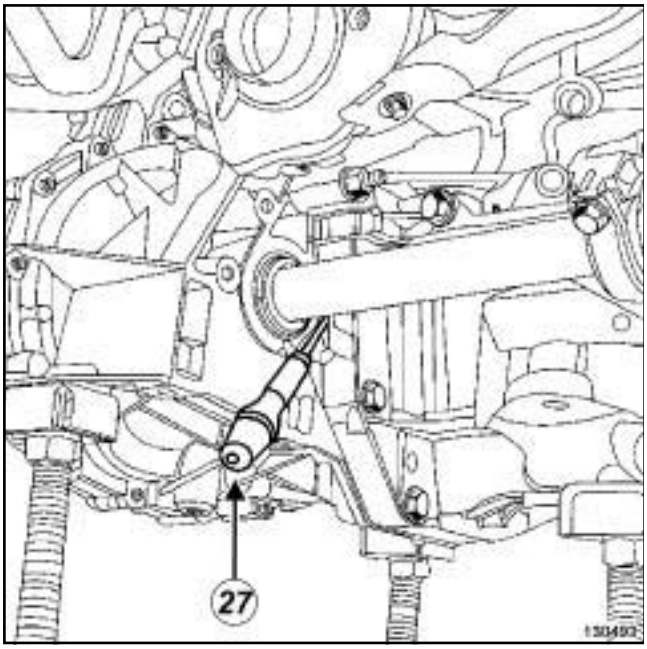
111336

❑ Fit:

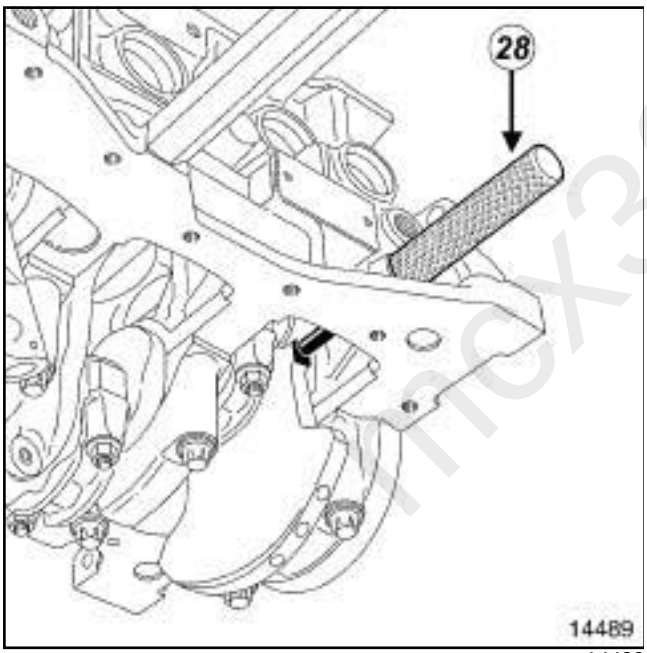
- the **(Mot. 1496)** (**25**) fitted with the **(Mot. 1750)** on the end of the camshaft,
- a lifting eye bolt (**26**) to secure the tool **(Mot. 1496)** equipped with the tool **(Mot. 1750)**.

❑ Refit:

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



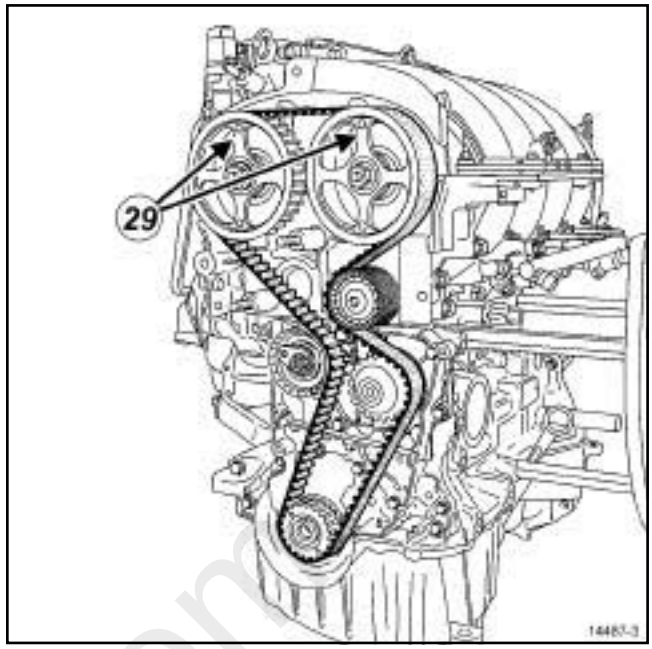
130493



14489

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

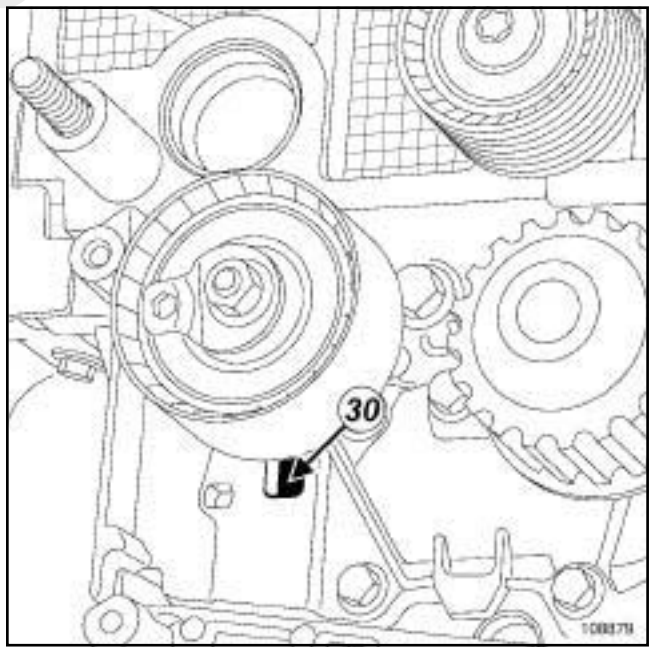
❑ Use a screwdriver (**27**) to check that the flywheel does not turn (clockwise at the timing end), otherwise bring the crankshaft back into contact with the tool **(Mot. 1489)** (**28**) using the screwdriver; the crankshaft groove should be at the top.



14487-3

❑ Position the RENAULT badge (**29**) 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 (**30**) .

❑ Screw on the timing tensioning roller nut without tightening it.

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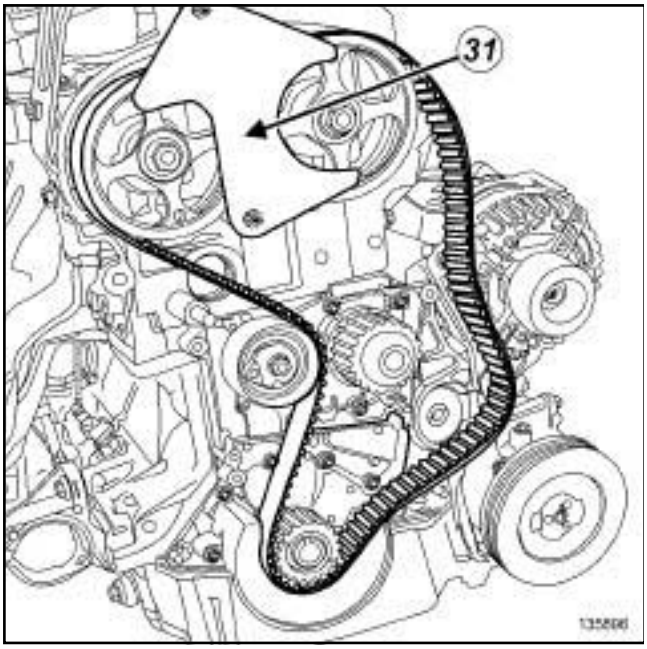


135896

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

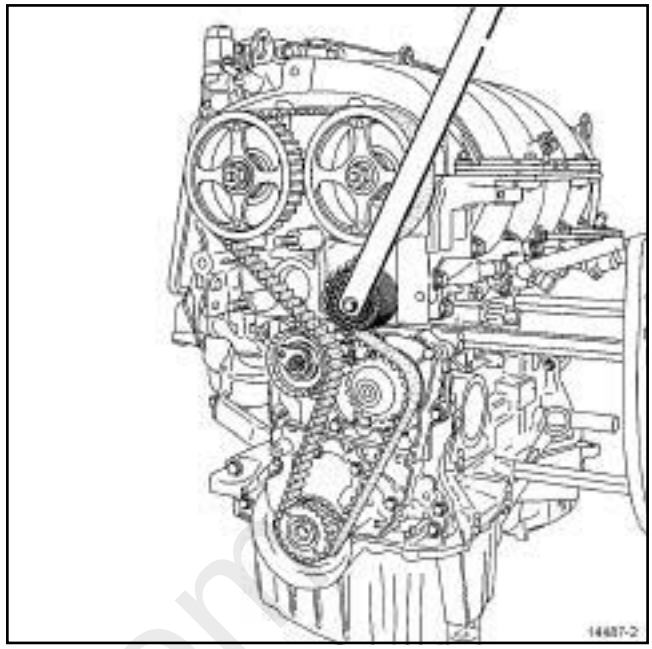
❑ Fit the tool **(Mot. 1490-01)** (**31**) on the camshaft sprockets (use the bolt and nut of the upper timing cover to fit the tool **(Mot. 1490-01)**).

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.

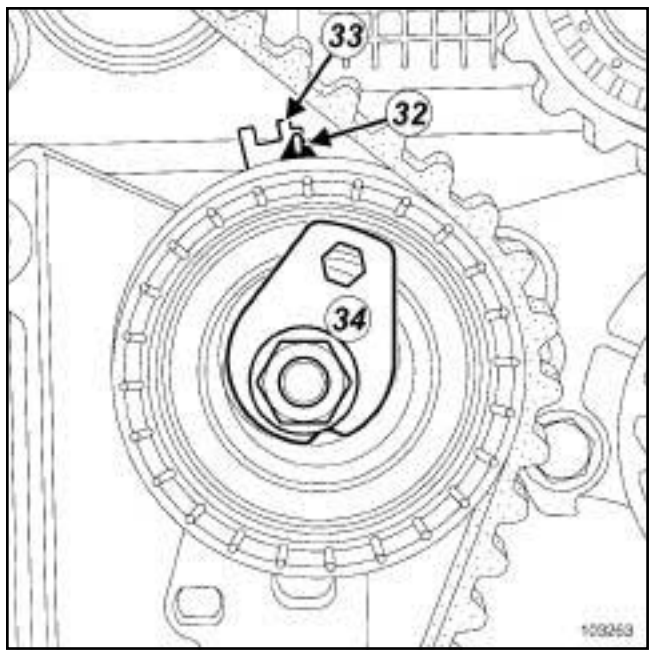


14487-2

❑ 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 (**32**) opposite the mark (**33**) , by turning the eccentric (**34**) clockwise using an Allen key.

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

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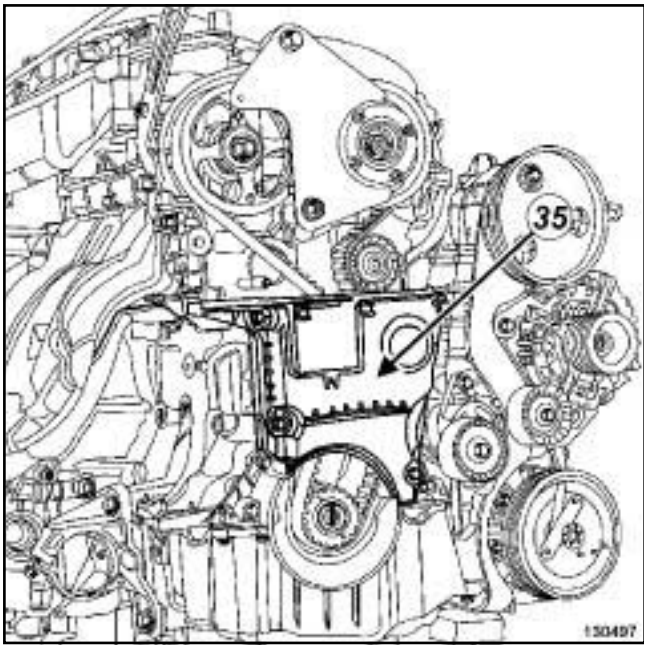
K4J



130497

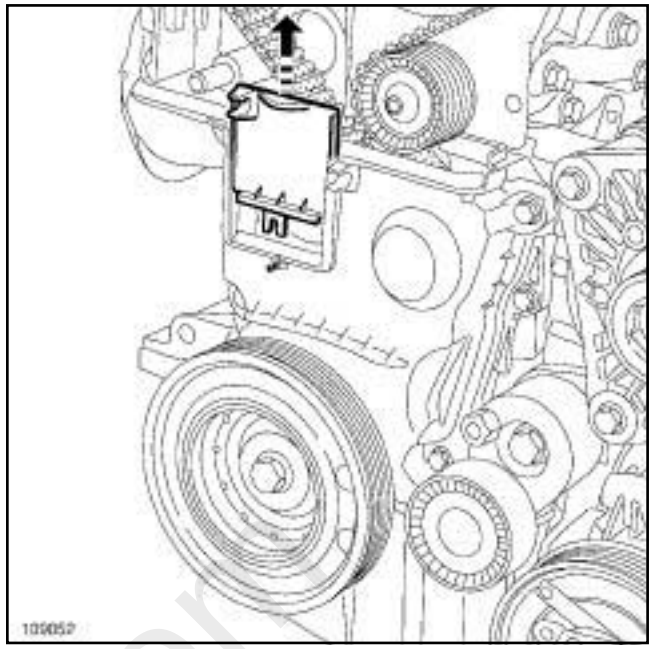
❏ Refit the lower timing cover (**35**) .

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

❏ Refit a new crankshaft accessories pulley.

❏ Torque and angle tighten:

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



109052

❏ Remove:

- the timing flap from the lower timing cover,
- 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.

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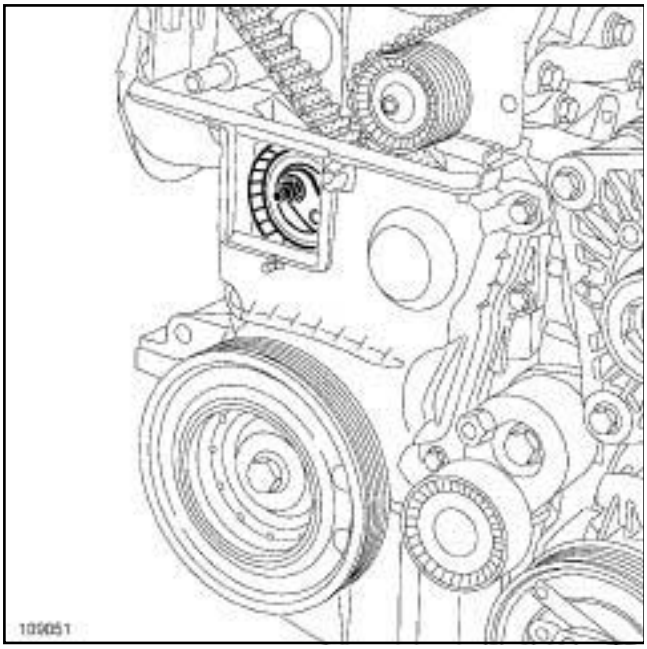
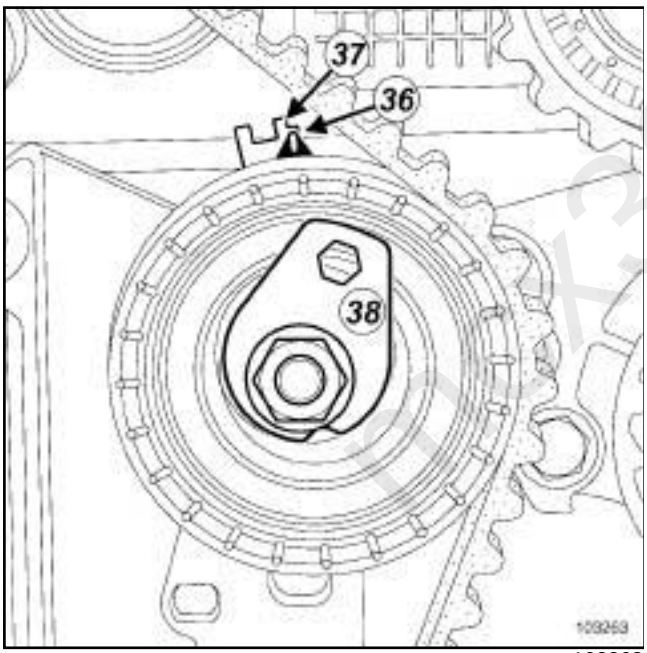
K4J



109051



103263

❏ Check that the adjustable index (**36**) is opposite the notch (**37**) , 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 (**36**) opposite the mark (**37**) turning the eccentric cam (**38**) clockwise.

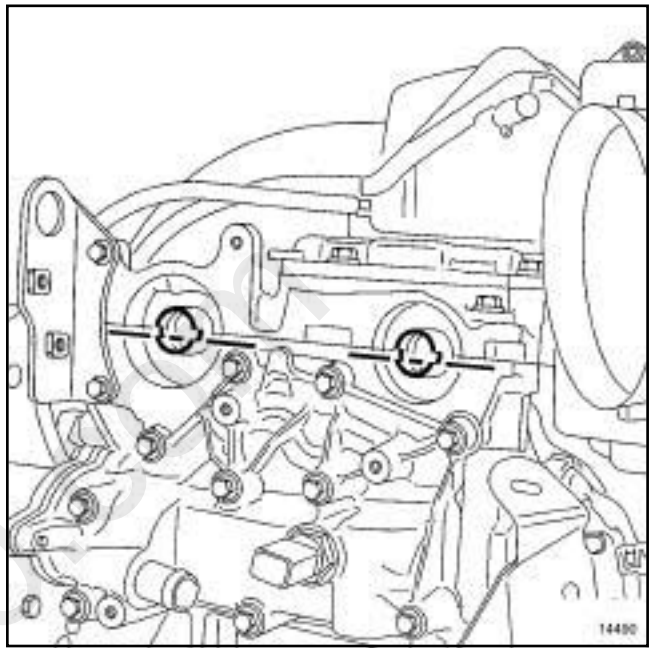
❏ Torque tighten the **timing tensioning roller nut (27 N.m)**.

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 tool **(Mot. 1496)** equipped with the tool **(Mot. 1750)** (the camshaft end grooves must be horizontal and offset downwards).

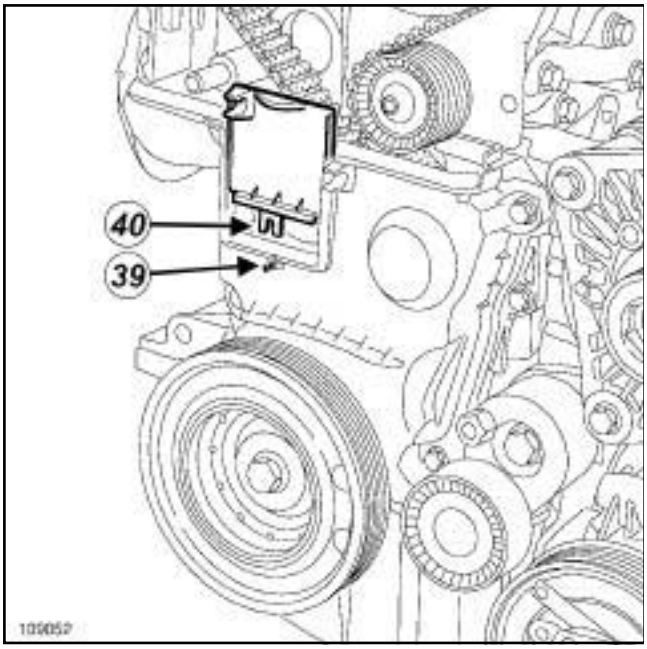
Note:

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 **(Mot. 1489)** from the cylinder block.

K4J



109052

❏ Refit the lower timing cover flap, checking that the locating pin (**39**) fits properly in the notch (**40**) .

III - FINAL OPERATION

❏ Refit:

- a new inlet camshaft plug using the **(Mot. 1487)**,
- a new exhaust camshaft plug using the tool **(Mot. 1488)**.

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

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

❏ Refit the upper timing cover.

❏ Torque tighten:

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

❏ Refit the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) .

❏ Refit:

- the engine wiring,
- the lifting eye on the flywheel end,
- the dipstick guide.

❏ Torque tighten:

- the **dipstick guide tube bolt (10 N.m)**,
- the **flywheel end lifting eye bolts (10 N.m)**.

❏ Clip on the lifting eye connector.

❏ Refit:

- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (35A, Wheels and tyres),
- the throttle valve (see **12A**, **Fuel mixture**, **Throttle valve: Removal - Refitting**, page **12A-33**) ,
- the air filter unit (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the air inlet duct,
- the air inlet duct clips,
- the battery tray (see **Battery: Removal - Refitting**) (80A, Battery),
- the battery (see **Battery: Removal - Refitting**) (80A, Battery),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (56A, Exterior equipment).

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F4R

Special tooling required	
Mot. 1453	Engine anchorage support with multiple adjustments and retaining straps.
Mot. 1453-01	Additional handle nut for engine lifting support tool Mot. 1453.
Mot. 1672	Lower engine support.
Mot. 1054	TDC setting pin.
Mot. 1496	Camshaft timing tool.
Mot. 1801	Camshaft sprocket locking tool F4 engines.
Mot. 1509-01	Adapter kit for tool Mot.1509 or Mot.1801
Mot. 1487	Tool for refitting camshaft covers (57 mm diameter).
Mot. 1488	Tool for refitting camshaft covers (43 mm diameter).

Tightening torques ▽	
toothed sprocket nuts	**80 N.m**
fixed roller bolt	**50 N.m**
tensioning roller nut	**7 N.m**
toothed sprocket nuts	**80 N.m**
old inlet camshaft dephaser bolt	**30 N.m**
old exhaust camshaft pulley nut	**30 N.m**
tensioning roller nut	**32 N.m**
toothed sprocket nuts	**80 N.m**
new inlet camshaft dephaser bolt	**30 N.m**
new exhaust camshaft pulley nut	**30 N.m**
new inlet camshaft dephaser bolt	**90 N.m**
inlet camshaft dephaser pulley blanking cover	**15 N.m**

Tightening torques ▽	
new exhaust camshaft pulley nut	**86° ± 6°**
lower timing cover bolts	**9 N.m**
upper timing cover bolts	**38 N.m**
new bolt on the crankshaft accessories pulley	**40 N.m + 110° ± 10°**

WARNING

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

Note:

Two different engine support tools can be used to remove the right-hand suspended engine mounting:

- the **(Mot. 1453)** fitted with the **(Mot. 1453-01)** used only for standard removal and refitting of the timing belt,
- the **(Mot. 1672)** used for removing and refitting the timing belt followed by removal and refitting of the cylinder head, which releases the lifting eyes for the cylinder head to be removed.

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

❑ Remove:

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

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

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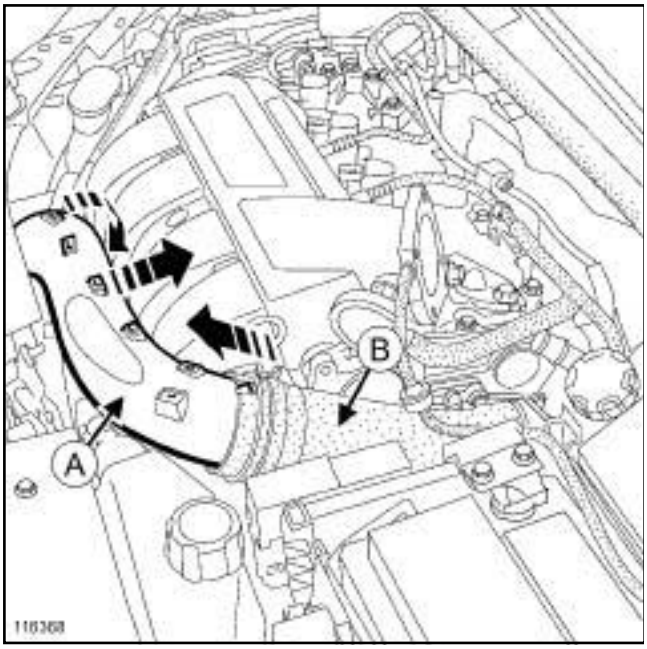
F4R



116368

❏ Remove the air inlet duct (**A**) :

- unclip it from the front end panel,
- turn it and disconnect it.

❏ Disconnect the duct (**B**) :

- from the air resonator,
- from the air filter unit.

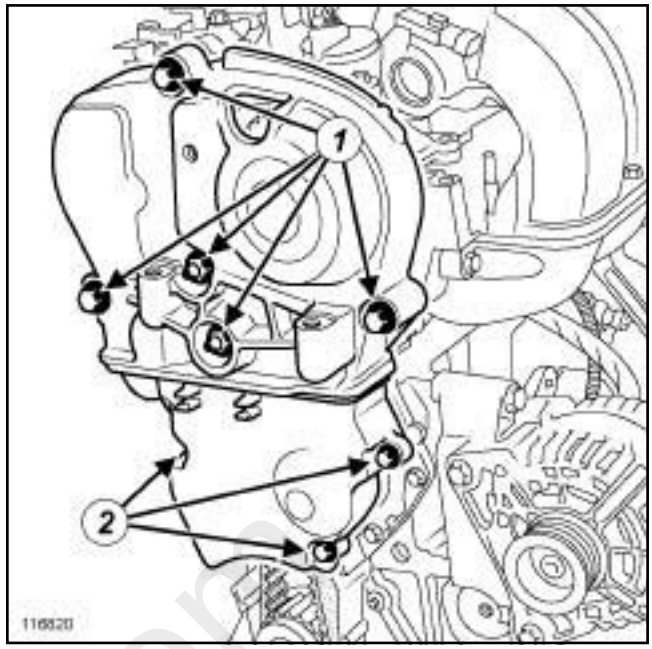
❏ Remove:

- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front right-hand wheel arch liner on the front bumper side (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the engine undertray.

❏ Remove the crankshaft accessories pulley, locking the flywheel with a screwdriver.

❏ Fit the timing end lifting eye (see **11A**, **Top and front of engine**, **Lifting eyes: Removal - Refitting**, page **11A-305**) .

❏ Fit the **(Mot. 1453)** with the **(Mot. 1453-01)** and with retaining belts.



116820

❏ Remove:

- the right-hand suspended mounting support (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,
- the nuts and bolts (**1**) on the upper timing cover,
- the upper timing cover,
- the bolts (**2**) on the lower timing cover,
- the lower timing cover.

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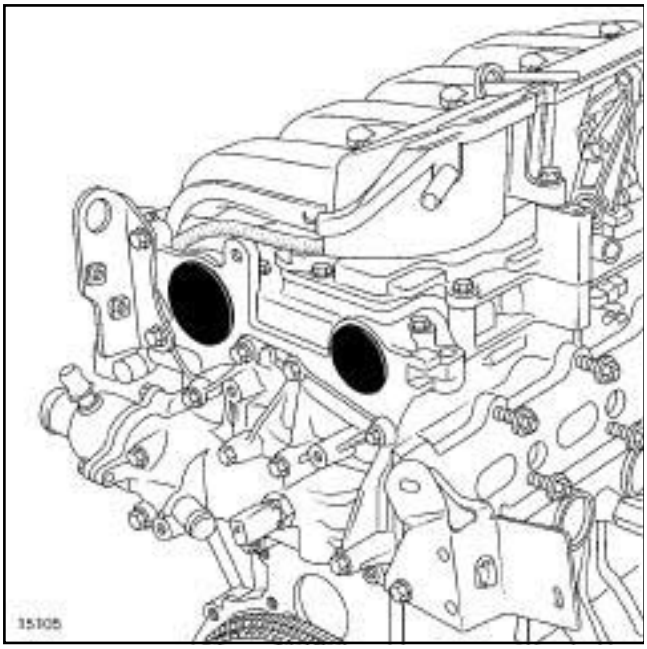
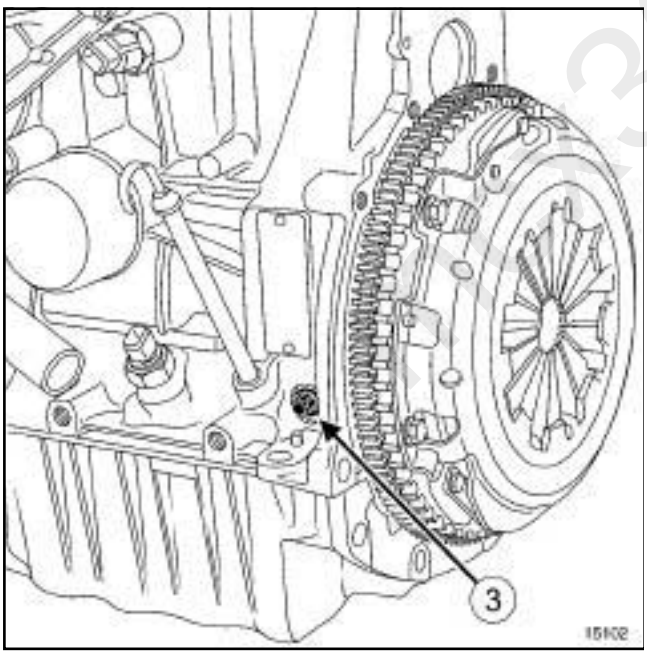


15105

❏ Use a screwdriver to make a hole in the middle of the camshaft sealing plugs.

❏ Remove the camshaft sealing plugs.



15102

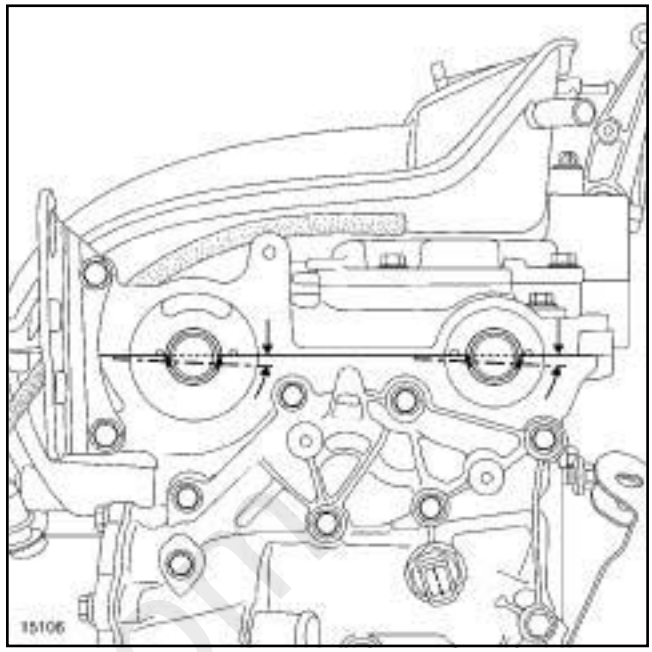
❏ Remove the TDC setting pin plug (**3**) .

II - OPERATION FOR REMOVAL OF PART CONCERNED

1 - ADJUSTING THE TIMING

❏ Refit:

- the crankshaft accessories pulley,
- the crankshaft accessories pulley bolt.

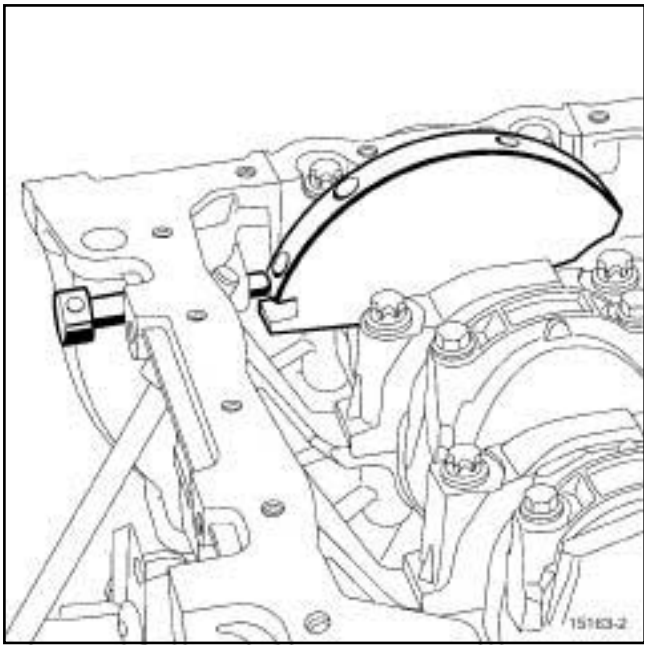


15106

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

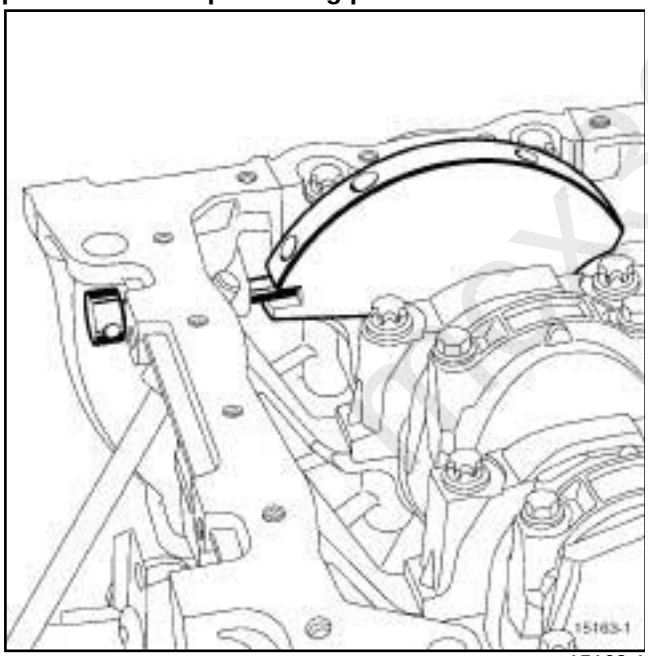
F4R

position of TDC pin before setting point



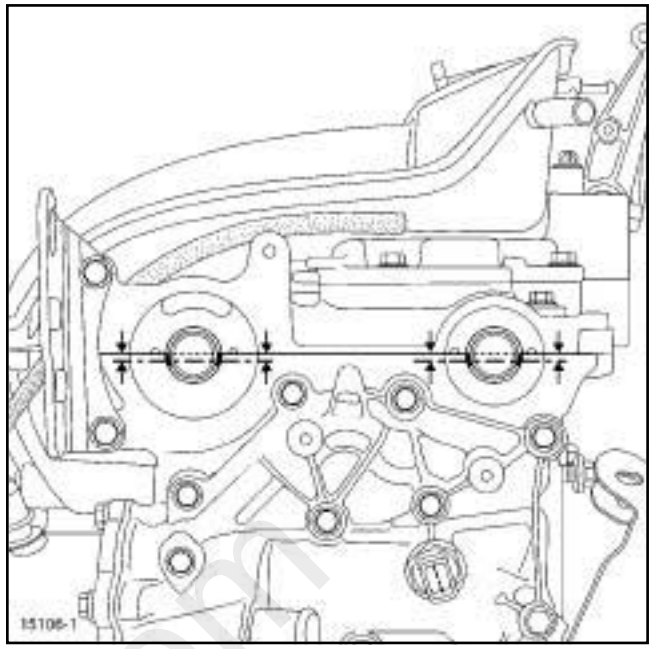
15163-2

position of TDC pin setting point



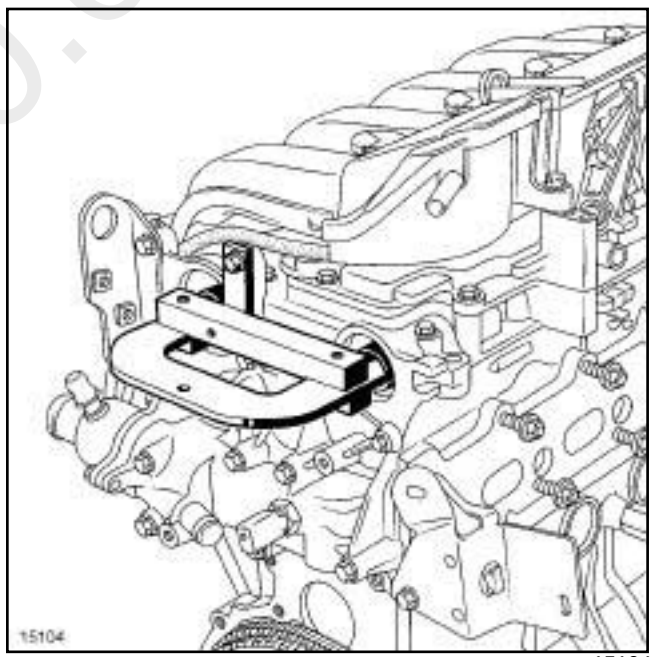
15163-1

❏ Insert the TDC setting pin **(Mot. 1054)** and rotate the engine slightly clockwise (timing end) until the setting point is reached.



15106-1

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



15104

❏ Fit the **(Mot. 1496)** onto the ends of the camshafts.

❏ Remove:

- the crankshaft accessories pulley bolt,
- the crankshaft accessories pulley.

F4R

2 - REMOVING THE TIMING BELT

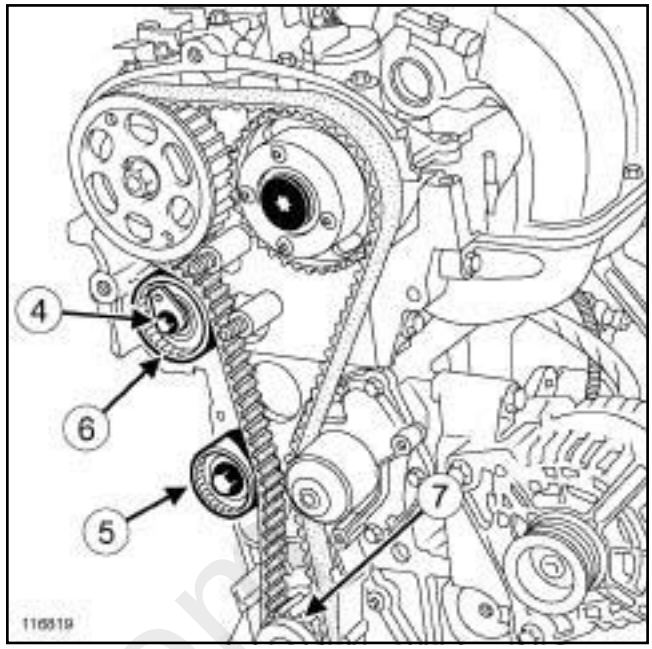
❑

WARNING
Never turn the engine against its operating direction.

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

WARNING
When replacing the belt, be sure to replace the tensioning rollers and fixed rollers.

Note:
Always replace the inlet camshaft dephaser bolt and the exhaust camshaft pulley nut after checking the tension of the timing belt.



116819

❑ Slacken the timing belt by undoing the tensioning roller nut (**4**) .

❑ Remove:

- the fixed roller (**5**) fitted with its bolt and spacer,
- the timing belt,
- the tensioning roller (**6**) fitted with its nut,
- the crankshaft sprocket (**7**) ,

❑ Check that the ring of the camshaft dephaser is correctly locked (no rotation of the ring to the left or to the right); if it is not, replace the inlet camshaft dephaser.

❑

Note:
If the inlet camshaft dephaser must be removed, follow the removal-refitting procedure for the camshaft dephaser (see **11A**, **Top and front of engine**, **Camshaft: Removal - Refitting**, page **11A-247**) . Always lock the inlet camshaft dephaser when replacing it.

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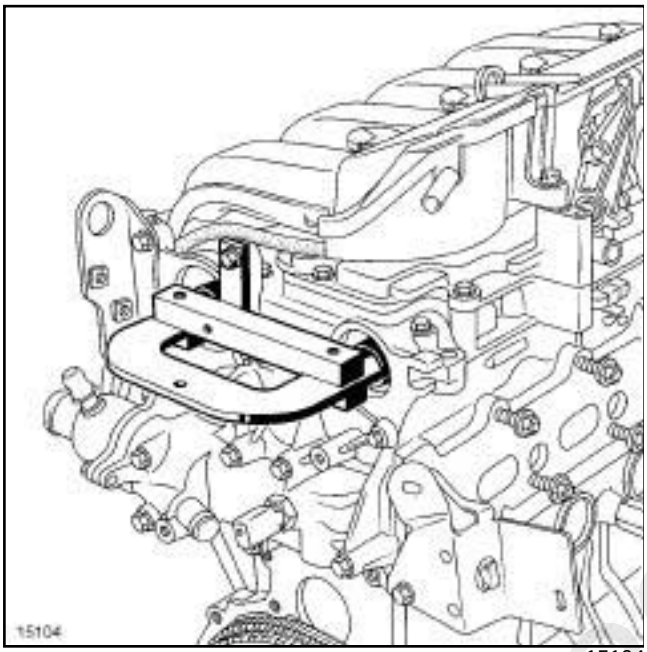
F4R

REFITTING

I - OPERATION FOR REFITTING THE TIMING BELT

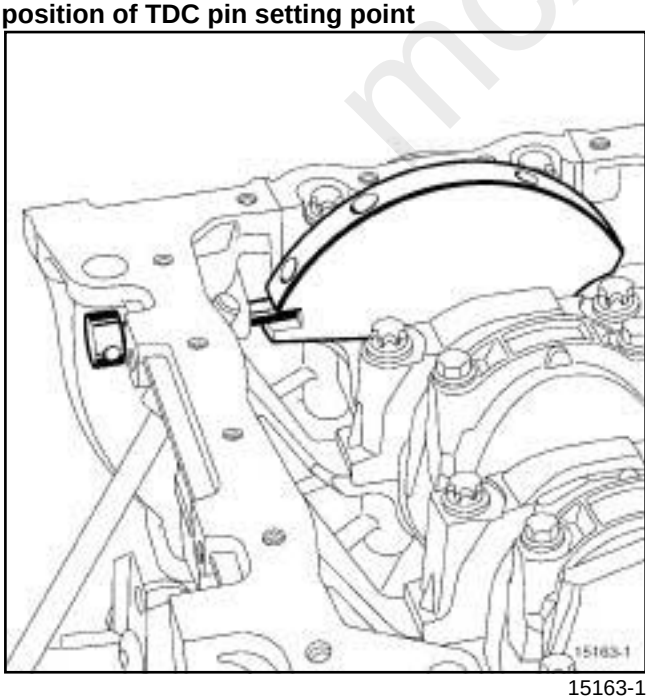
1 - ADJUSTING THE TIMING



15104

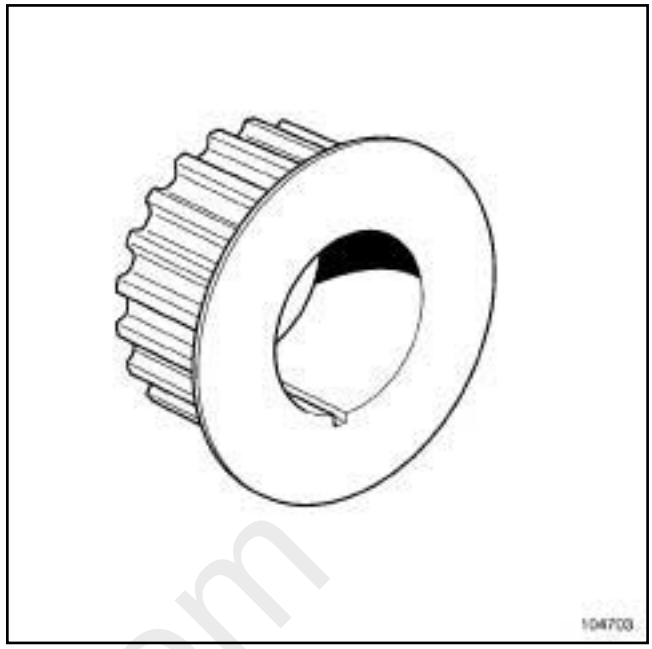
❑ Check that camshaft setting tool **(Mot. 1496)** is still in place.

position of TDC pin setting point



15163-1

❑ Check that the TDC pin **(Mot. 1054)** is still in place and that the crankshaft is set.



104703

❑

WARNING

Always degrease:

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

This is to avoid timing slippage.

This slippage causes engine damage.

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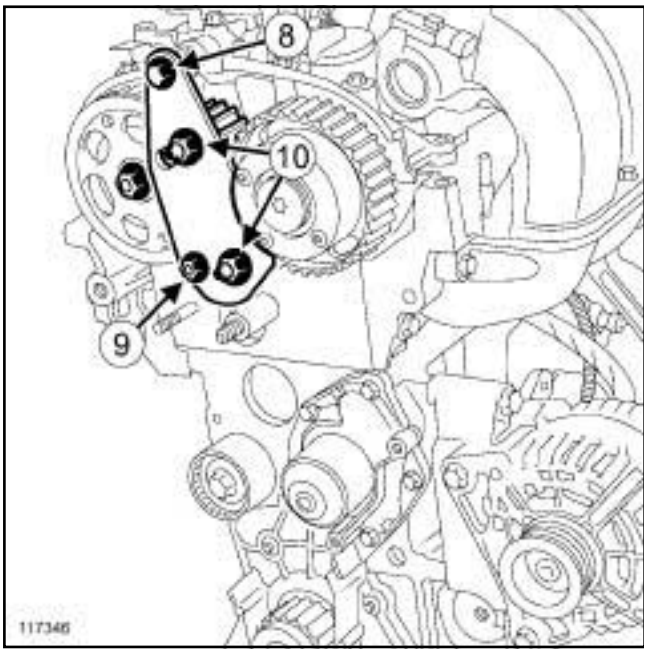
F4R

2 - TIMING BELT REFITTING PREPARATION OPERATION



117346

❏ Fit:

- the **(Mot. 1801)** fitted with the sprocket **(Mot. 1509-01)**,
- the upper bolt (**8**) on the upper timing cover and the collar nut (**9**) .

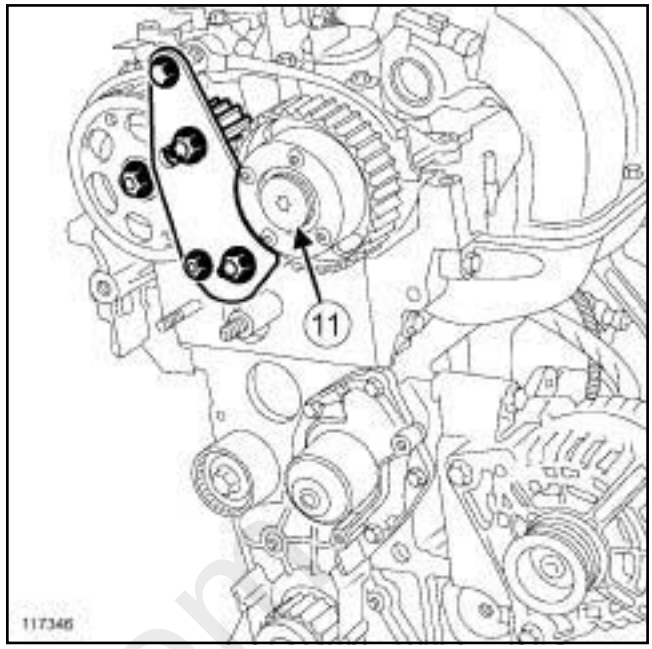
❏ Tighten the upper bolt on the upper timing cover and the collar nut.

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

❏ Torque tighten the **toothed sprocket nuts (80 N.m)** (**10**) .

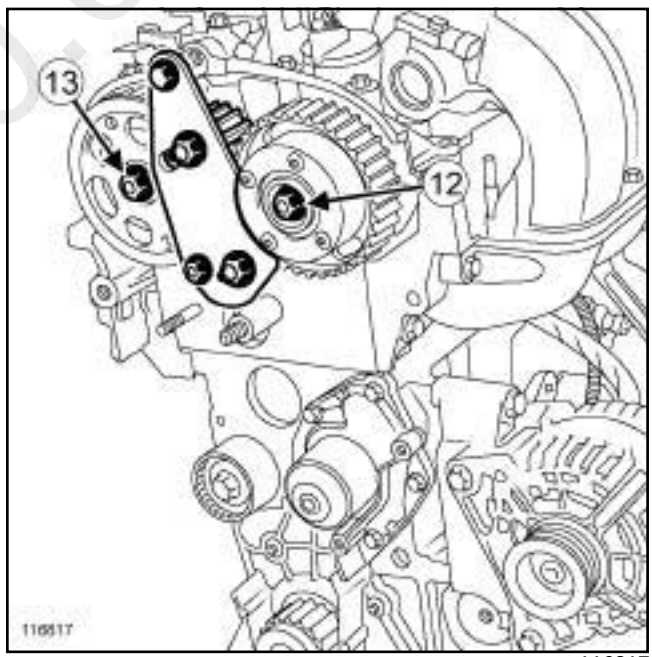
Note:

Beware of oil running out when removing the blanking cover from the camshaft dephaser and when removing the camshaft dephaser.



117346

❏ Remove the inlet camshaft dephaser blanking cover (**11**) .



116817

❏ Release by a single turn:

- the old inlet camshaft dephaser bolt (**12**) ,
- the old exhaust camshaft pulley nut (**13**) .

❏ Remove the **(Mot. 1801)** fitted with sprocket **(Mot. 1509-01)**.

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F4R

3 - REFITTING THE TIMING BELT

❑

WARNING
Never turn the engine against its operating direction.

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

WARNING
When replacing the belt, be sure to replace the tensioning rollers and fixed rollers.

Note:
Always replace the inlet camshaft dephaser bolt and the exhaust camshaft pulley nut after checking the tension of the timing belt.

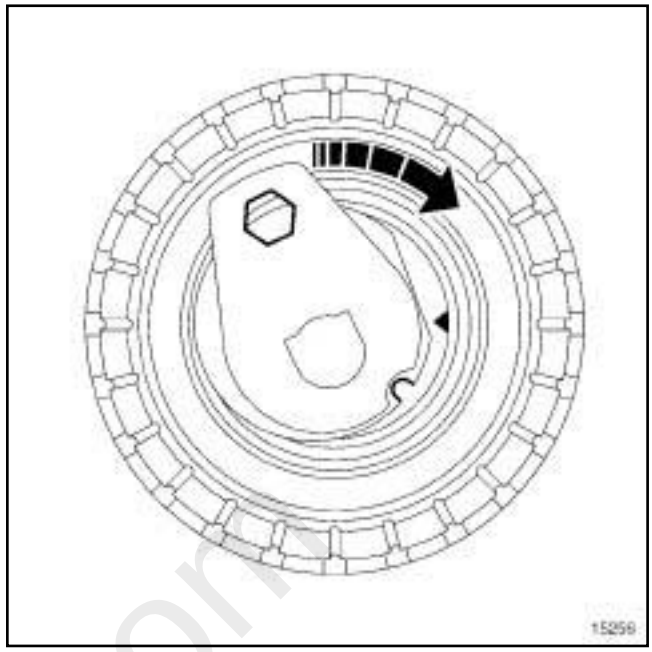
❑ Refit:
- the timing sprocket on the crankshaft,
- the new tensioning roller.

Note:
Ensure that the **(Mot. 1496)** is correctly fitted and that the inlet camshaft dephaser and the exhaust camshaft pulley can rotate freely so that the timing belt tension is correct.

❑ Refit:
- the new timing belt,
- the new fixed roller.

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

4 - BELT TENSION



15256

❑

Note:
When tightening the tensioning roller, use a 6mm Allen key to stop the roller moving during the operation.

❑ Align the marks on the tensioning roller using a **6mm** Allen key.

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

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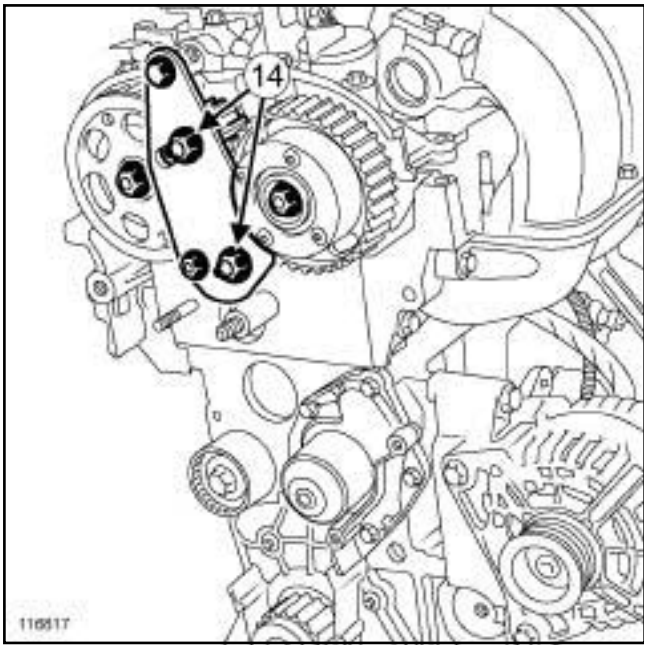


116817

❏ Fit the **(Mot. 1801)** fitted with the sprocket **(Mot. 1509-01)**.

❏ Bring the upper bolt on the upper timing cover into contact with the collar nut.

❏ Tighten the upper bolt on the upper timing cover and the collar nut.

❏ Bring the sprockets into contact with the camshaft pulleys.

❏ Tighten to torque:

- the **toothed sprocket nuts (80 N.m)** (**14**) ,
- the **old inlet camshaft dephaser bolt (30 N.m)**,
- the **old exhaust camshaft pulley nut (30 N.m)**.

❏ Remove the **(Mot. 1801)**.

❏ Remove:

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

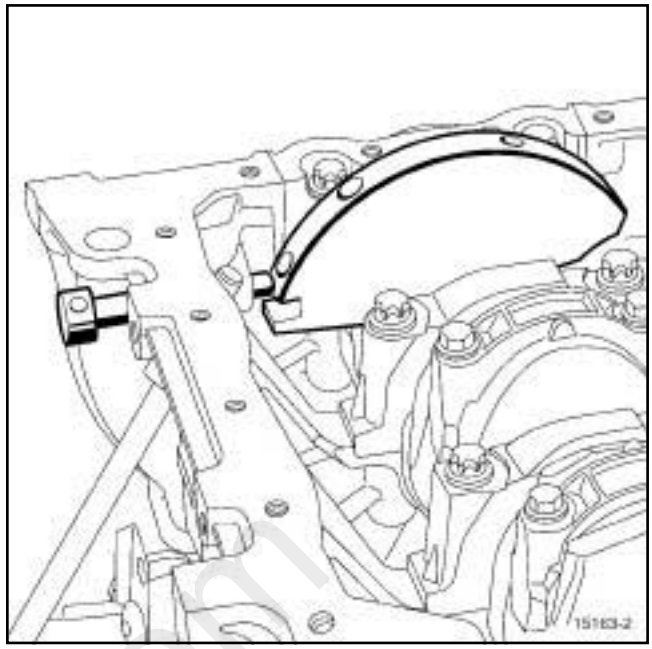
5 - CHECKING THE TIMING AND THE TENSION OF THE TIMING BELT

a - Checking the timing

❏ Refit:

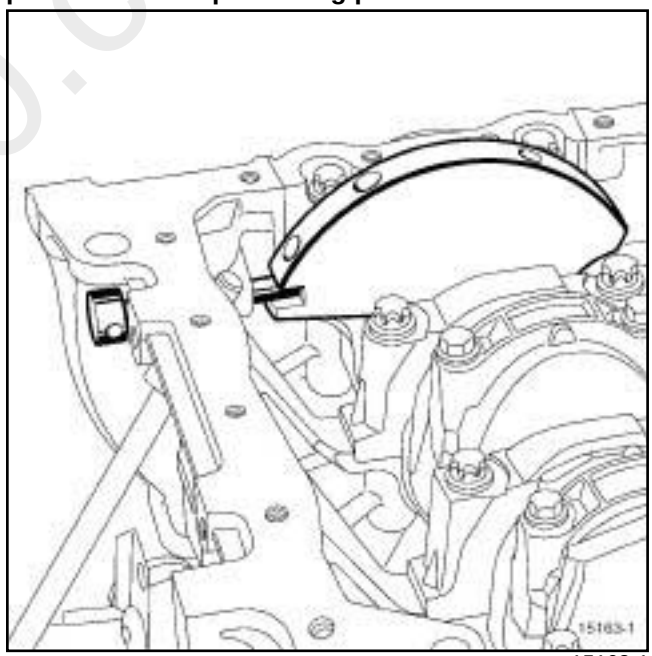
- the crankshaft accessories pulley,
- the new crankshaft accessories pulley bolt.

position of TDC pin before setting point



15163-2

position of TDC pin setting point



15163-1

❏ Rotate the crankshaft clockwise by two turns (timing end), and before the end of the two turns insert the TDC pin **(Mot. 1054)** then move the crankshaft to its setting point.

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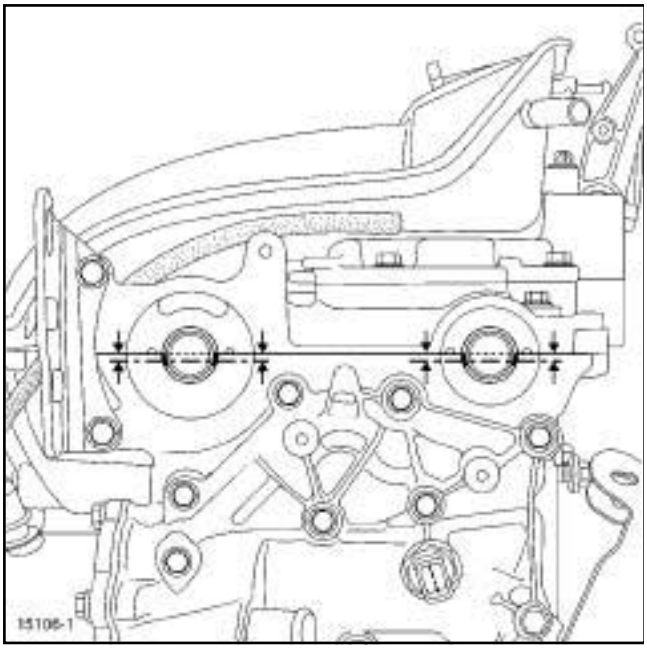
F4R

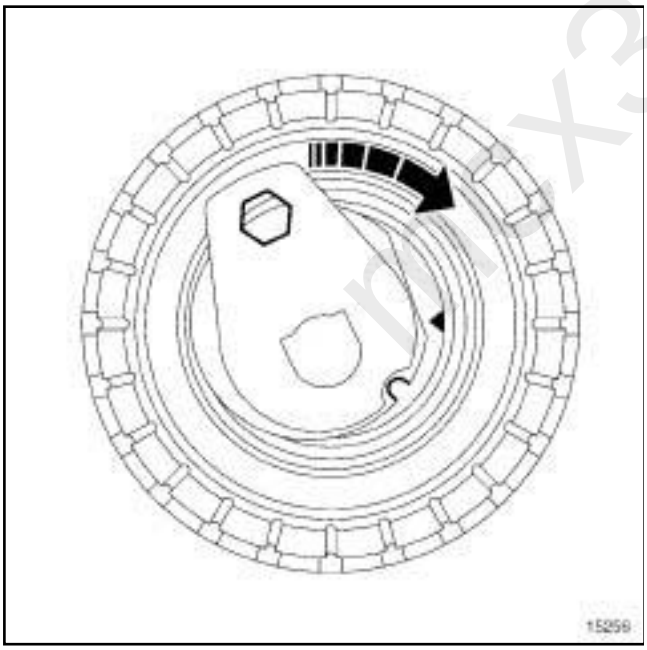
position of camshaft setting point



15106-1

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

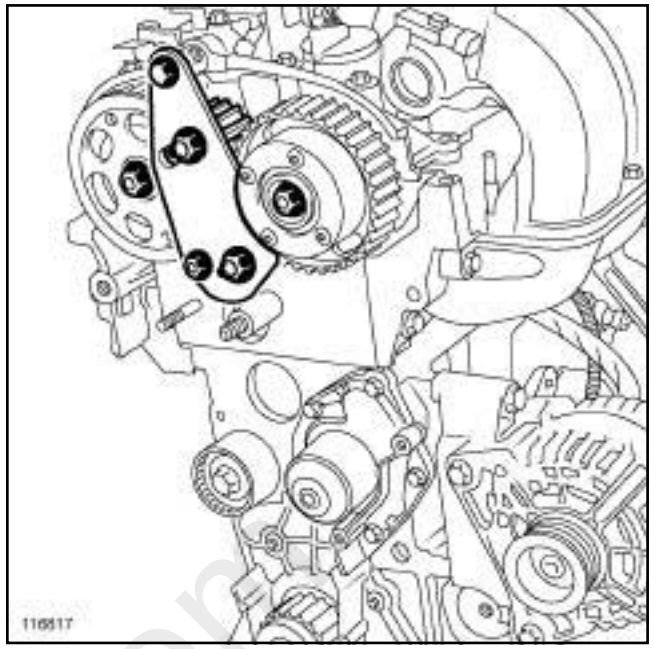
b - Checking the tension



15256

❑ After the engine has been rotated twice, check that the tensioning roller marks are correctly aligned; if they are not aligned return to the timing belt tension step.

❑ Torque tighten the **tensioning roller nut (32 N.m)**.



116817

❑ Position the **(Mot. 1801)**.

❑ Bring the upper bolt on the upper timing cover into contact with the collar nut.

❑ Tighten the upper bolt on the upper timing cover and the collar nut.

❑ Bring the sprockets into contact with the camshaft pulleys.

❑ Torque tighten the **toothed sprocket nuts (80 N.m)**.

❑ Undo:

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

❑ Fit without tightening:

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

❑ Tighten to torque:

- the **new inlet camshaft dephaser bolt (30 N.m)**,
- the **new exhaust camshaft pulley nut (30 N.m)**.

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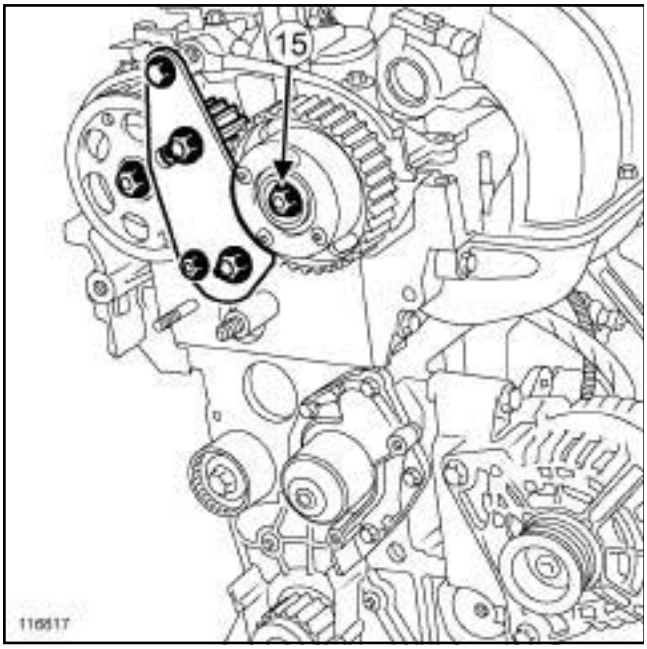
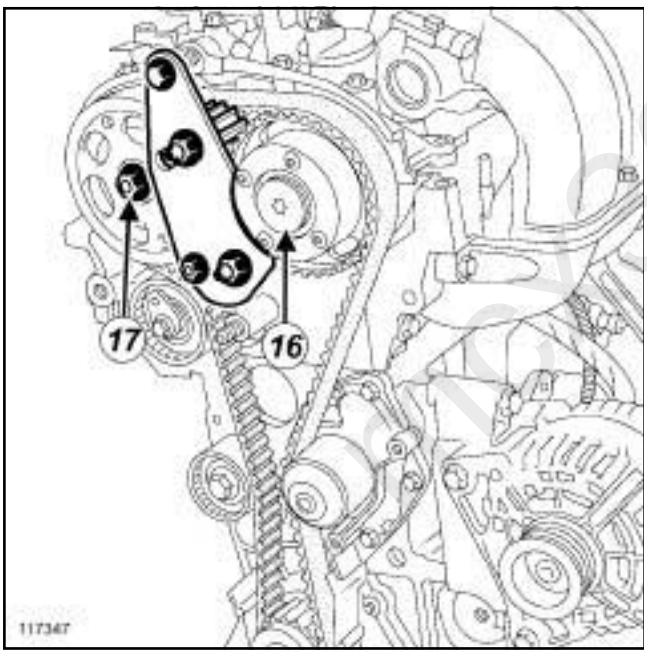


116817



117347

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

❏ Tighten to torque:

- the **new inlet camshaft dephaser bolt (90 N.m)** (**15**) ,
- the **inlet camshaft dephaser pulley blanking cover (15 N.m)** (**16**) .

❏ Tighten to angle the **new exhaust camshaft pulley nut (86° ± 6°)** (**17**) .

❏ Remove:

- the **(Mot. 1801)**,
- the TDC setting pin **(Mot. 1054)**.

❏ Refit the new sealing plugs:

- at the inlet camshaft end using the **(Mot. 1487)**,
- at the exhaust camshaft end using the **(Mot. 1488)**.

II - FINAL OPERATION.

❏ Refit:

- the crankshaft TDC pin plug applying a drop of **MASTIXO** to the threading,
- the lower timing cover,
- the lower timing cover bolts.

❏ Torque tighten the **lower timing cover bolts (9 N.m)**.

❏ Refit:

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

❏ Torque tighten the **upper timing cover bolts (38 N.m)**.

❏ Refit the right-hand suspended mounting support (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) .

❏ Remove the **(Mot. 1453)** fitted with the **(Mot. 1453-01)**.

❏ Remove the engine lifting eye at the timing end (see **11A**, **Top and front of engine**, **Lifting eyes: Removal - Refitting**, page **11A-305**) .

❏ Refit:

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

❏ Torque tighten the **new bolt on the crankshaft accessories pulley (40 N.m + 110° ± 10°)**.

❏ Refit:

- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front right-hand wheel arch liner on the front bumper side (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),

- the engine undertray,
- the air filter box (see **12A**, **Fuel mixture**, **Air filter unit: Removal - Refitting**, page **12A-17**) ,
- the battery (see **Battery: Removal - Refitting**) (MR 392, 80A, Battery),
- the air inlet duct on the air resonator and the air filter unit,
- the air inlet duct by clipping it onto the front end panel.

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

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K9K, and 750 or 752

Special tooling required	
Mot. 1453	Engine anchorage support with multiple adjustments and retaining straps.
Mot. 1489	TDC locating pin.
Mot. 1430	Set of 5 crankshaft and camshaft pulley timing pins.

Equipment required
safety strap(s)
protective gloves
1/2" female torx socket (12.7 mm square drive)
hexagonal socket
roll pin punch
offset spanner
torque wrench
torque/angle wrench
cylinder head bolt tightening gauge (angular measuring type)

Tightening torques ▽	
crankshaft accessories pulley M12 bolt	**60 N.m + 100° ± 10°**
tensioning roller bolt	**27 N.m**
camshaft timing sprocket crown bolts	**14 N.m**
crankshaft accessories pulley M 14 bolt	**120 N.m + 95° ± 15°**
TDC pin plug	**25 N.m**
cylinder head suspended mounting bolts	**25 N.m**
camshaft position sensor bolt	**8 N.m**

IMPORTANT
Wear protective gloves during the operation.

WARNING
Never rotate the engine anti-clockwise (timing end).

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

❑ **Parts always to be replaced**

- Timing belt,
- Timing belt tensioning roller,
- Crankshaft accessories pulley bolt.

❑ **Consumables**

- Silicone adhesive sealant (see **Vehicle: Parts and consumables for the repair**) (MR 392, 04B Consumables - Products)
- Surface cleaner (see **Vehicle: Parts and consumables for the repair**) (MR 392, 04B Consumables - Products).

REMOVAL

I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

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

❑ Remove the front engine cover.

❑ Remove:

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

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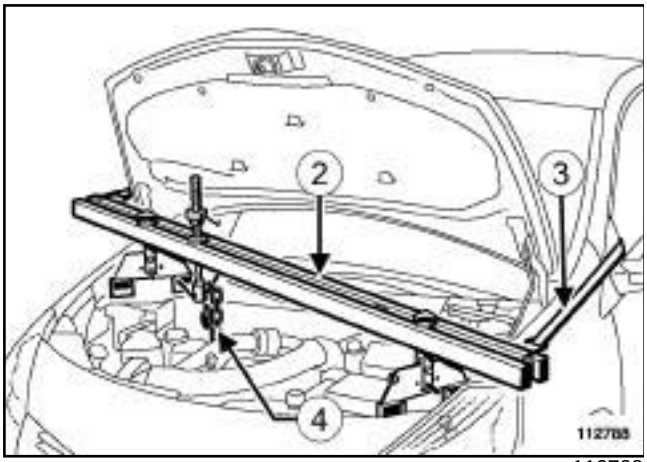
K9K, and 750 or 752



112788

❏ Position the **(Mot. 1453)** (**2**) and hold it in place using a **safety strap(s)** (**3**) .

❏ Fit a chain (**4**) on the lifting eye of the crankshaft end to enable the engine to be lifted using the **(Mot. 1453)**.

❏

Note:

Do not damage the air conditioning pipes.

Remove:

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

II - OPERATION FOR REMOVAL OF PART CONCERNED

❏

Note:

There are two types of timing belt assembly.

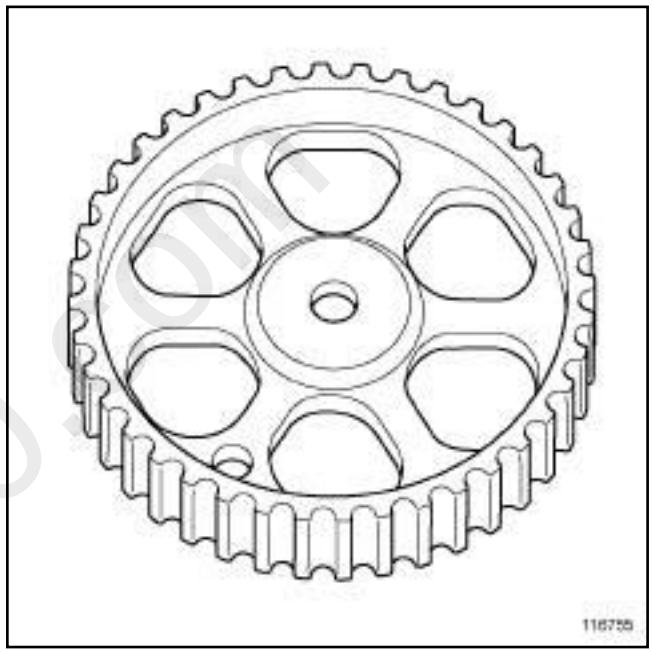
III - FIRST FITTING

Recommendations for repair

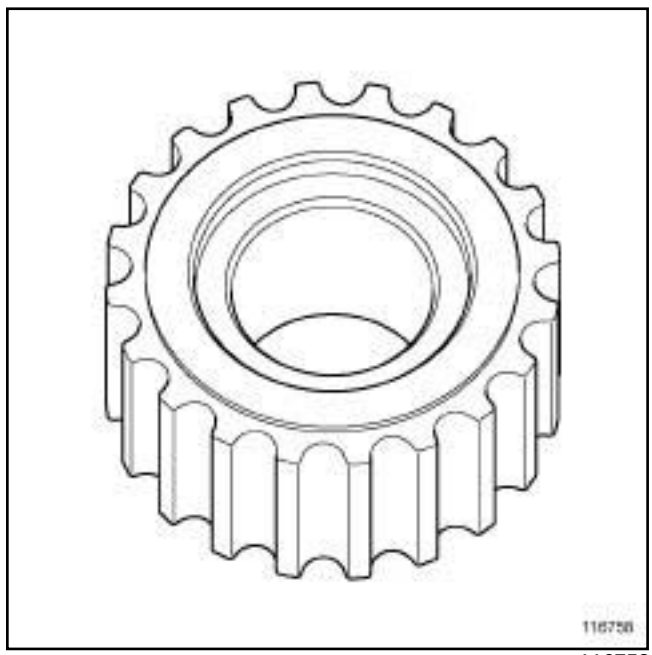
❏

Note:

This procedure is applicable to engines manufactured up to 02/12/2005 fitted with a single unit camshaft timing sprocket and a crankshaft timing sprocket without collet.



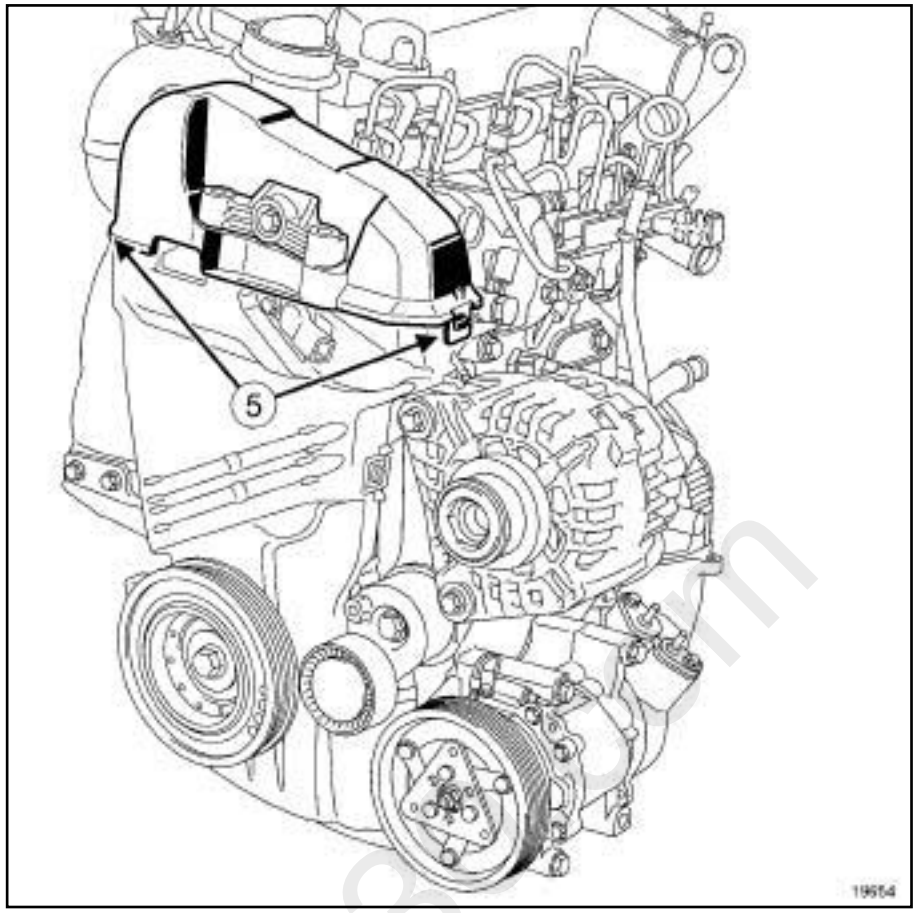
116755



116758

❏ Wear **protective gloves** during the operation.

K9K, and 750 or 752



19654

❑ Remove the upper timing cover by unclipping both tabs (**5**) .

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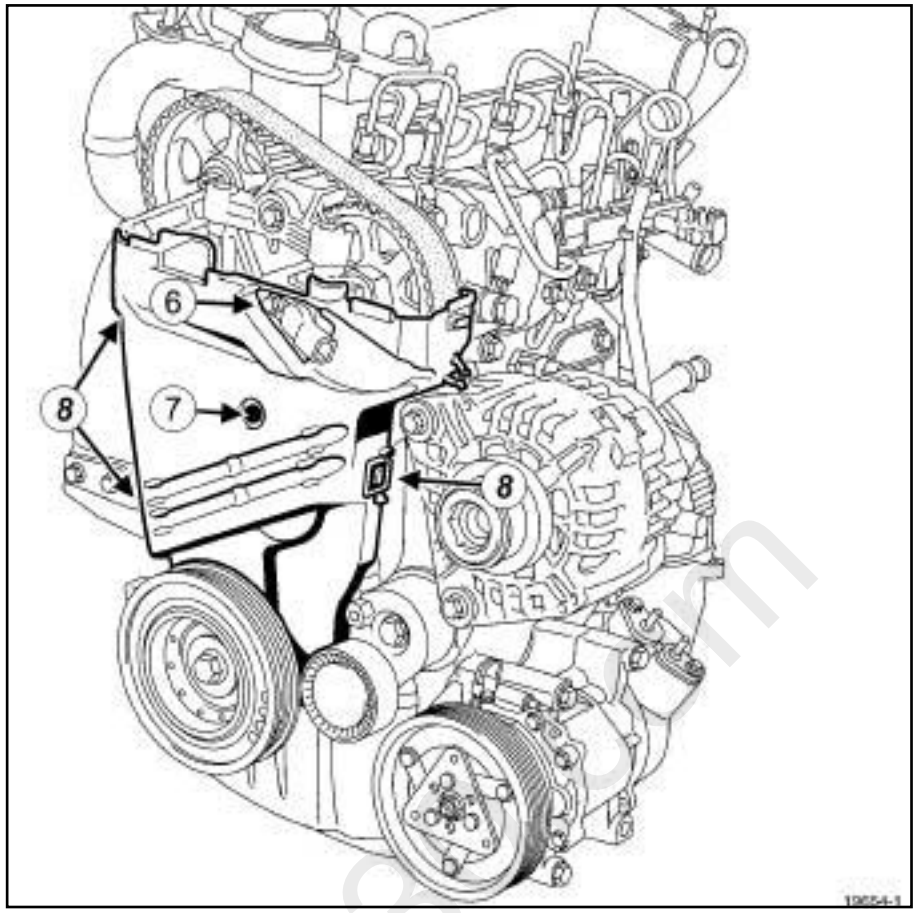
K9K, and 750 or 752



19654-1

❏ Remove:

- the camshaft position sensor (**6**) ,
- the plastic bolt (**7**) .

❏ Unclip the three tabs (**8**) .

❏ Remove the lower timing cover.

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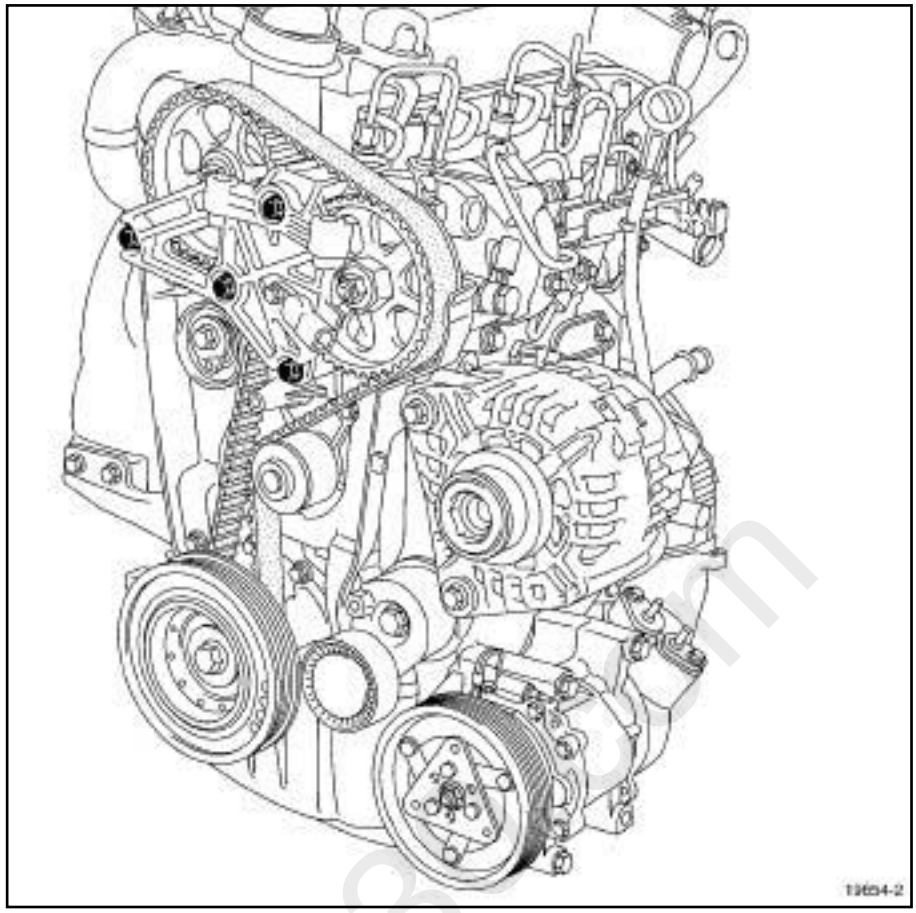
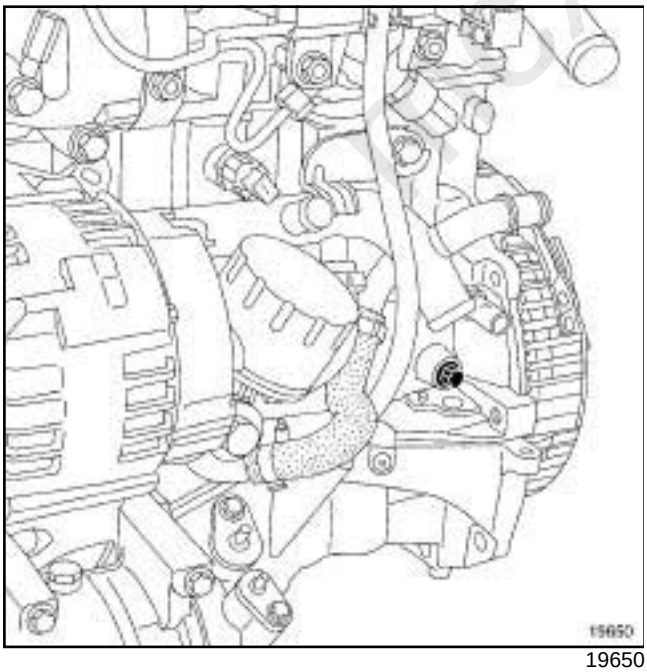
K9K, and 750 or 752



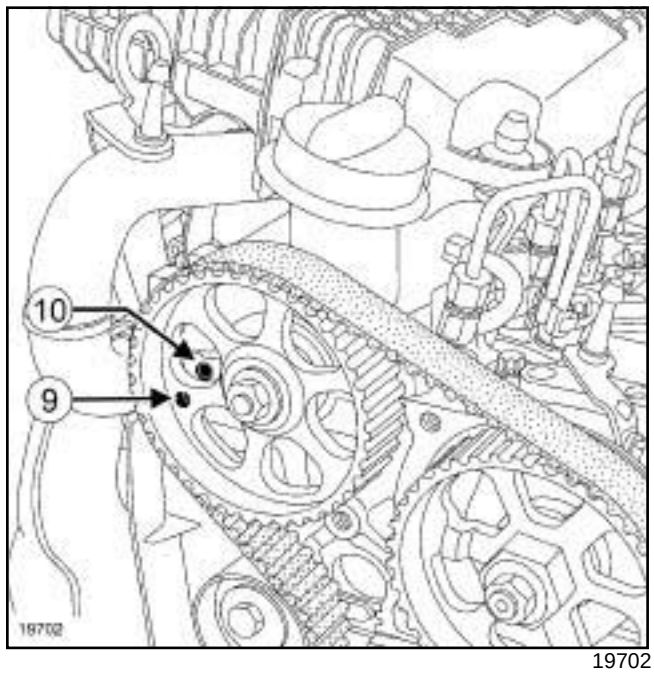
19654-2

❏ Remove the cylinder head suspended mounting .



19650

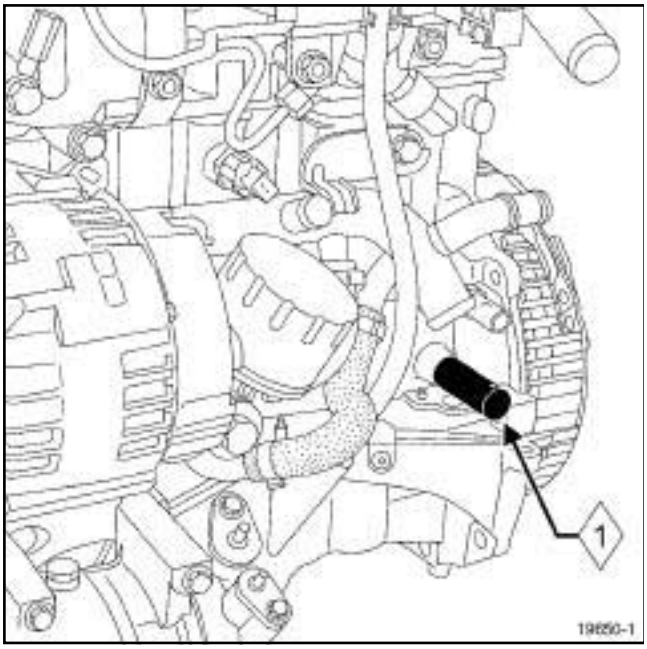
❏ Remove the TDC pin plug using a **1/2" female torx socket (12.7 mm square drive) (14)**.



19702

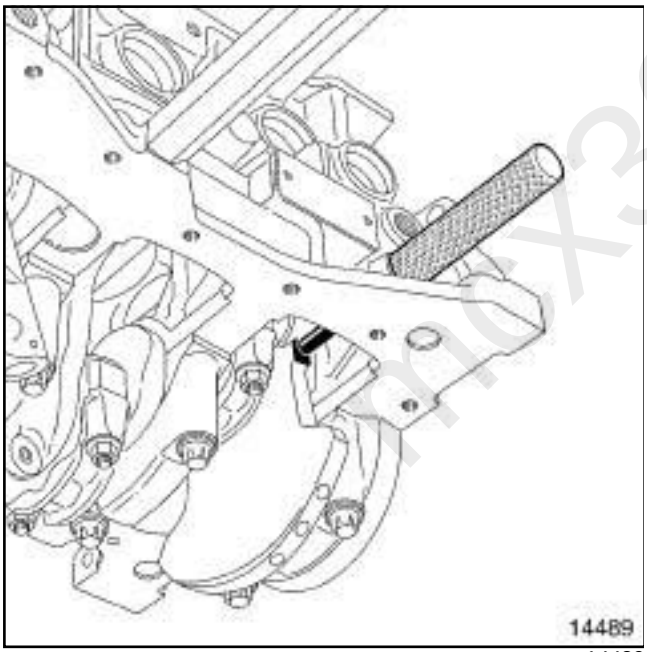
❏ Rotate the crankshaft clockwise (timing end) to position the hole (**9**) in the camshaft timing sprocket almost opposite the hole (**10**) in the cylinder head.

K9K, and 750 or 752



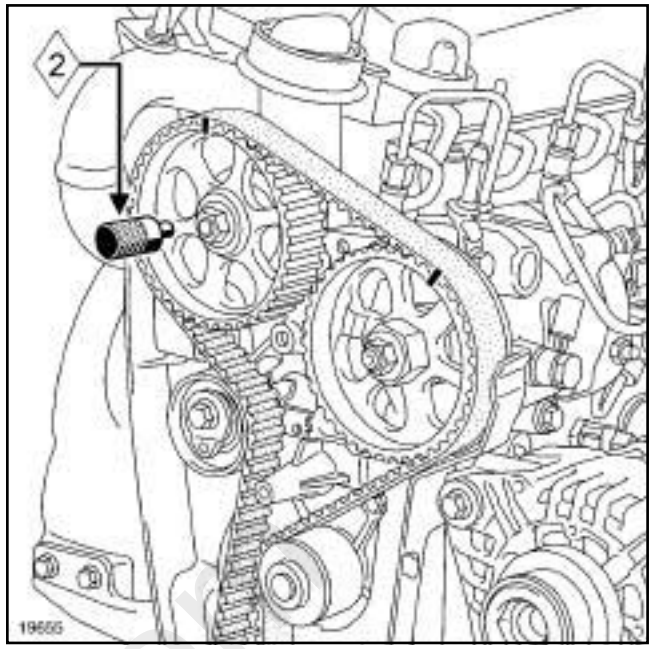
19650-1

❏ Screw in the TDC setting pin (**1**) **(Mot. 1489)**.



14489

❏ Turn the crankshaft clockwise (timing end) smoothly until the crankshaft comes in contact with the TDC setting pin.



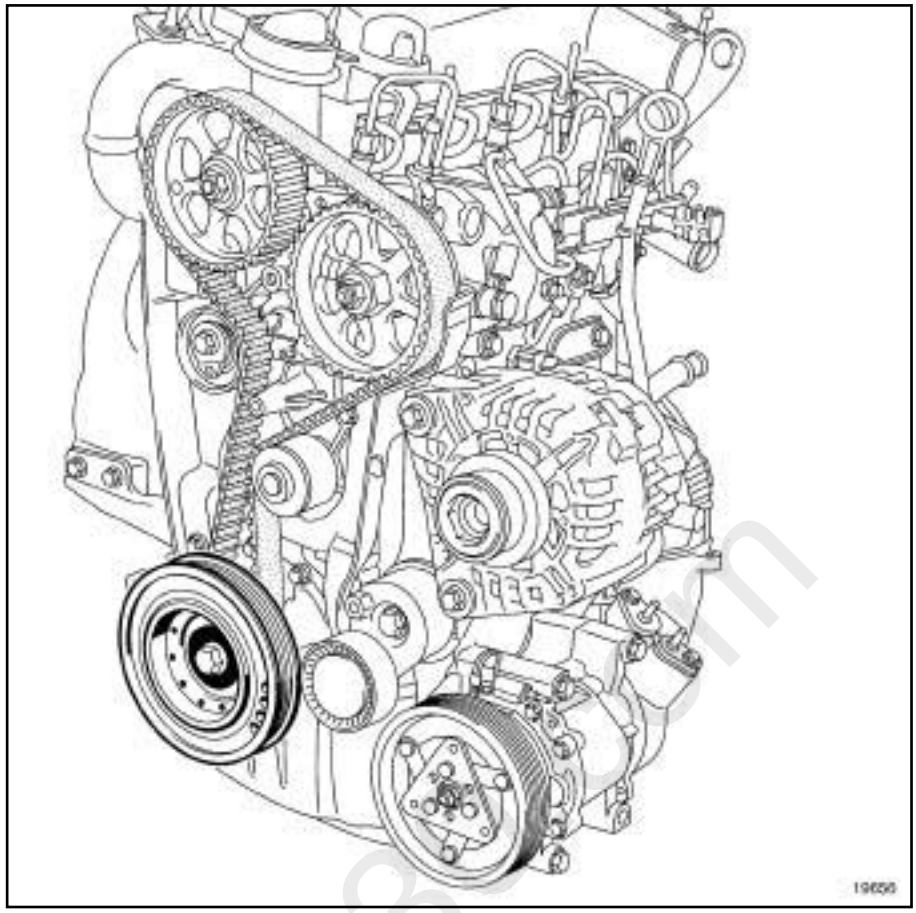
19655

❏ Engage the pin (**2**) **(Mot. 1430)** in the camshaft timing sprocket and cylinder head holes.

❏ Remove:

- the camshaft timing sprocket setting pin **(Mot. 1430)**,
- the TDC setting pin **(Mot. 1489)**.

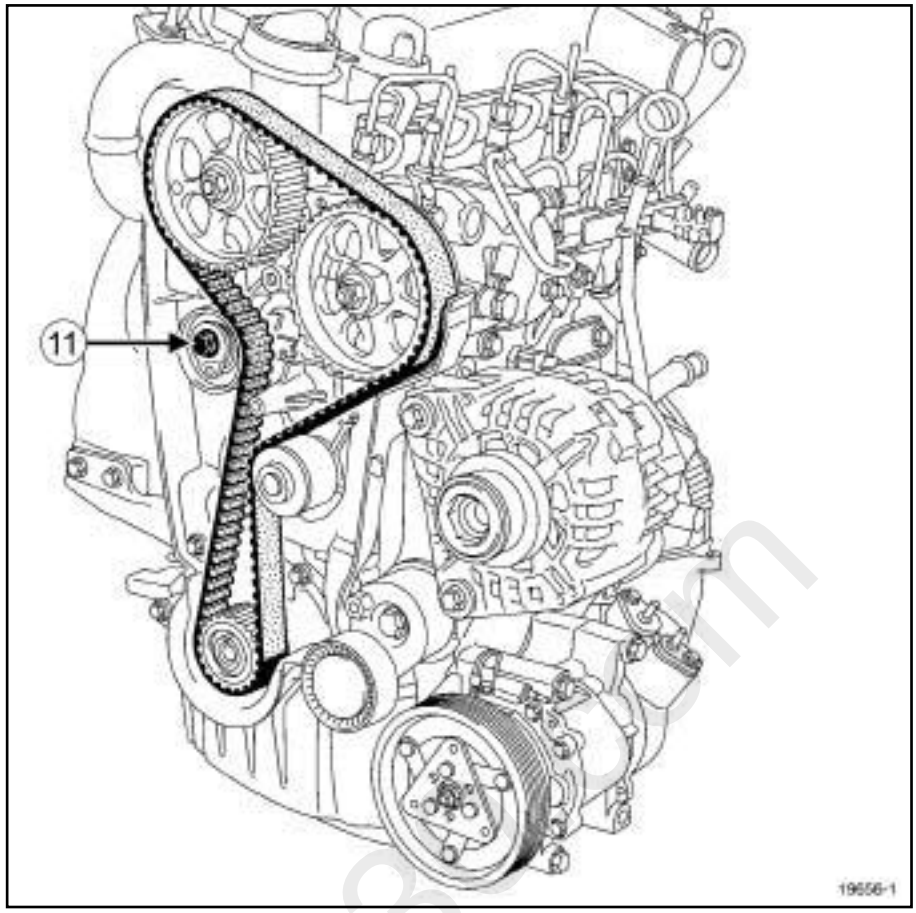
K9K, and 750 or 752



19656

❏ Remove the crankshaft accessories pulley by locking the flywheel with a large flat-blade screwdriver.

K9K, and 750 or 752



19656-1

❏ Slacken the tensioning roller bolt (**11**) .

❏ Loosen the timing tension wheel by turning the eccentric using a **6 mm hexagonal socket**.

❏ Remove:

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

IV - SECOND FITTING

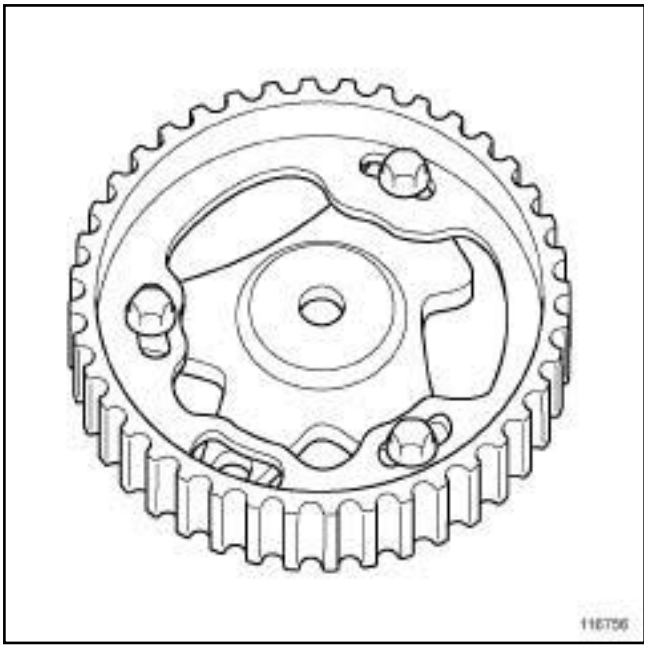
Recommendations for repair

❏

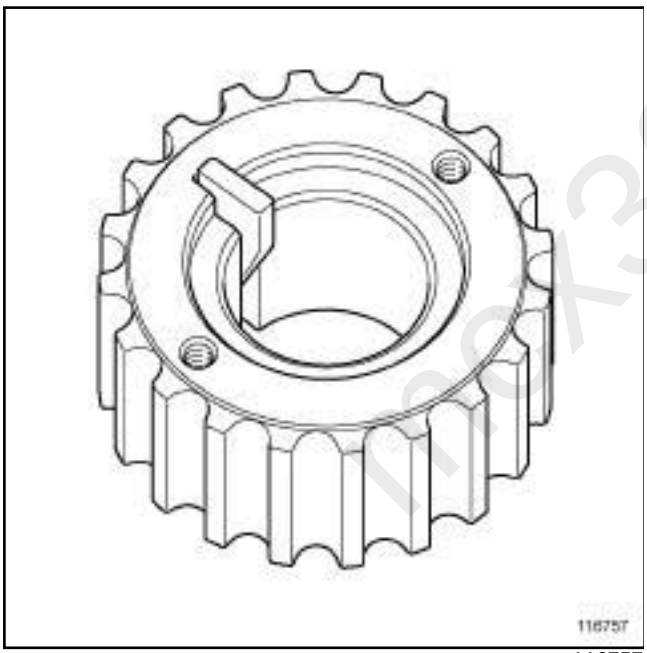
Note:

This procedure is applicable to engines manufactured from 02/12/2005 fitted with a two-part camshaft timing sprocket and a crankshaft timing sprocket with collet.

K9K, and 750 or 752



116756



116757

❑ Wear **protective gloves** during the operation.

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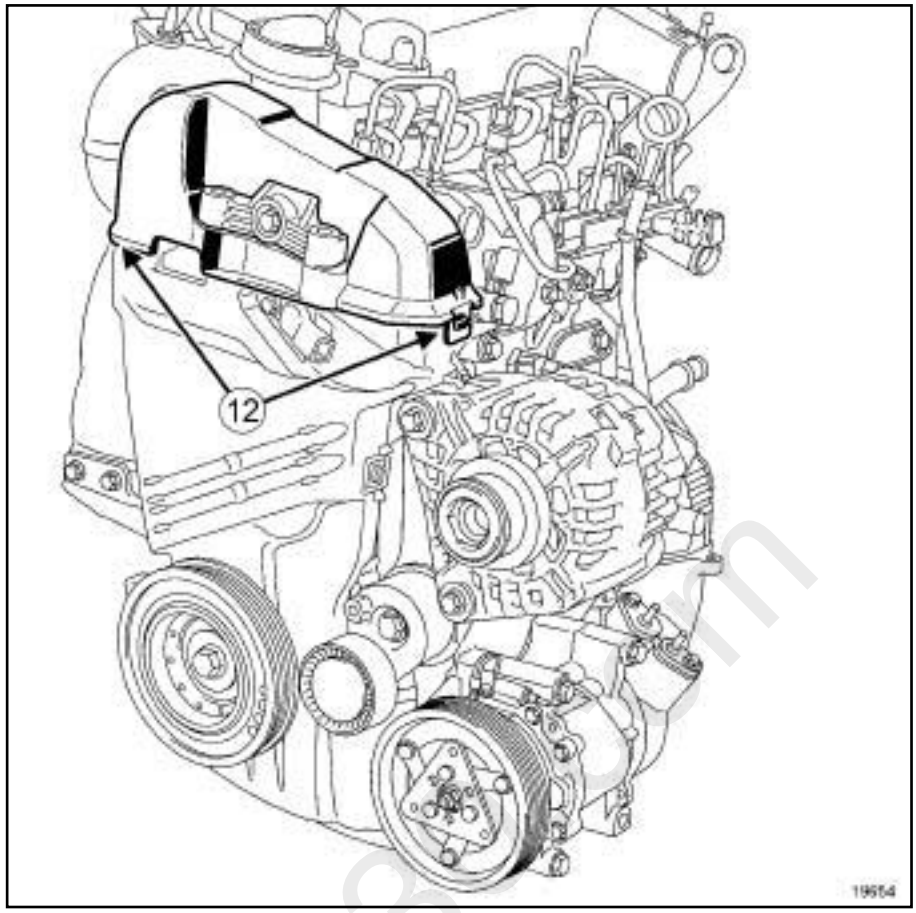
K9K, and 750 or 752



19654

❑ Remove the upper timing cover by unclipping both tabs (**12**) .

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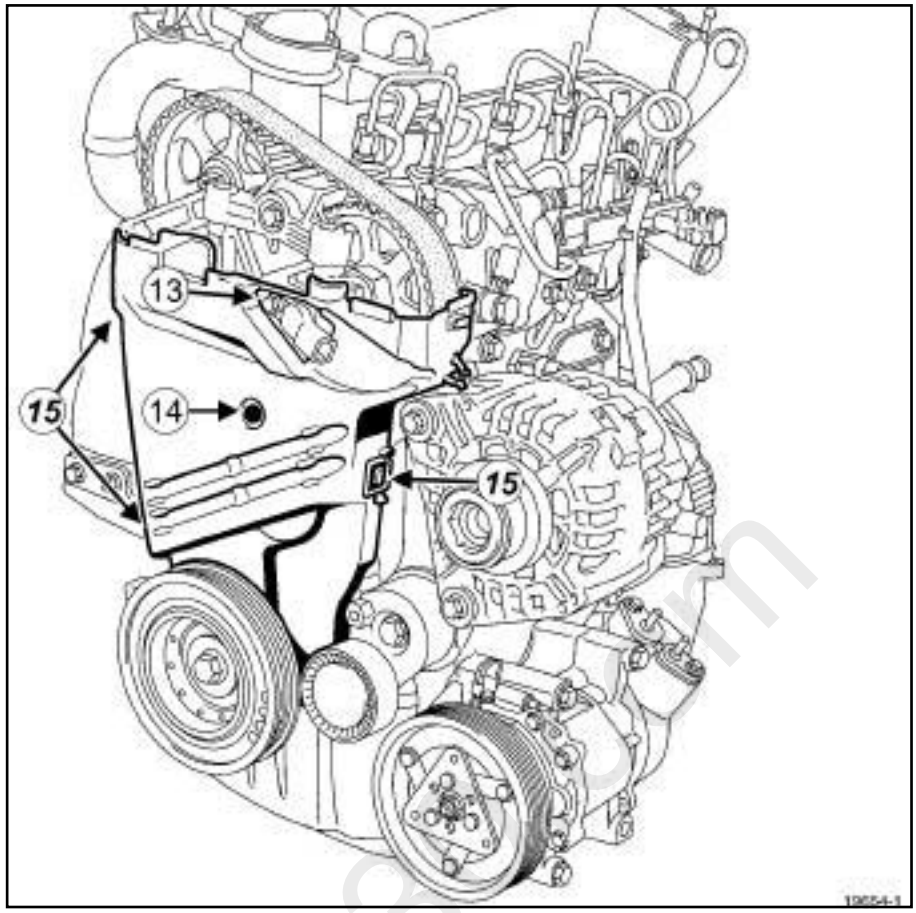
K9K, and 750 or 752



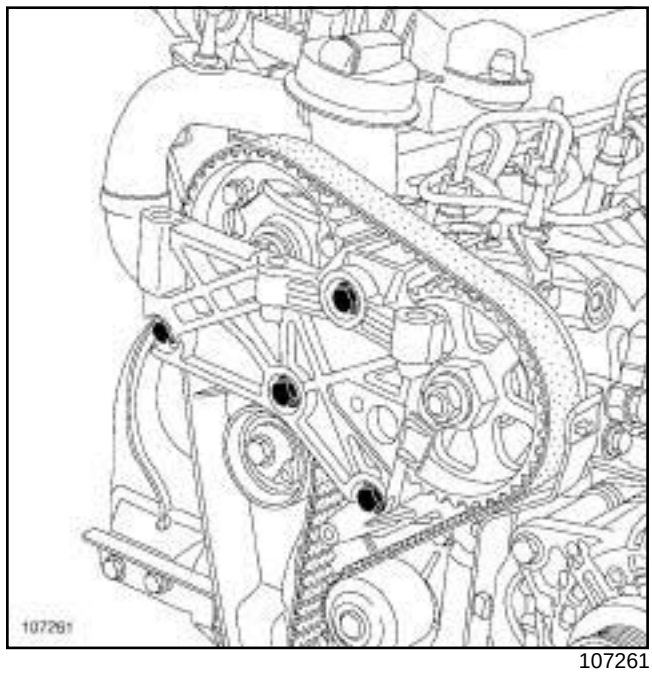
19654-1

❑ Remove:

- the camshaft position sensor (**13**) ,
- the plastic bolt (**14**) .

❑ Unclip the three tabs (**15**) .

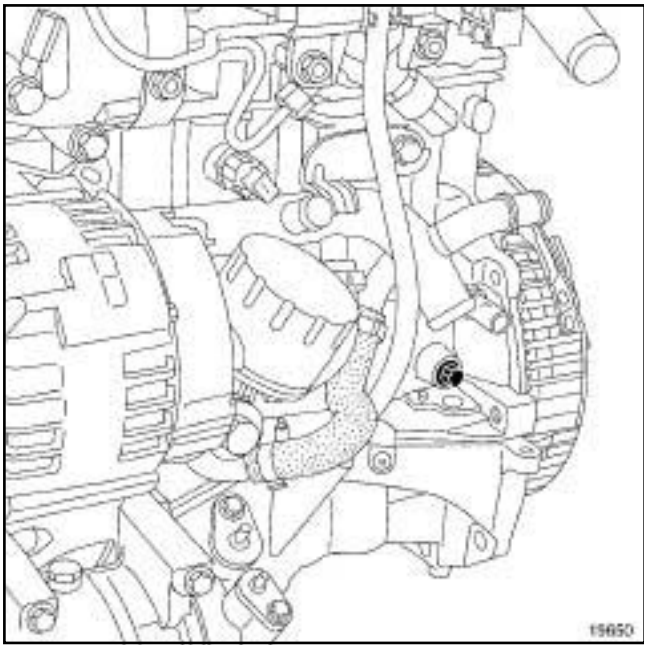
❑ Remove the lower timing cover.



107261

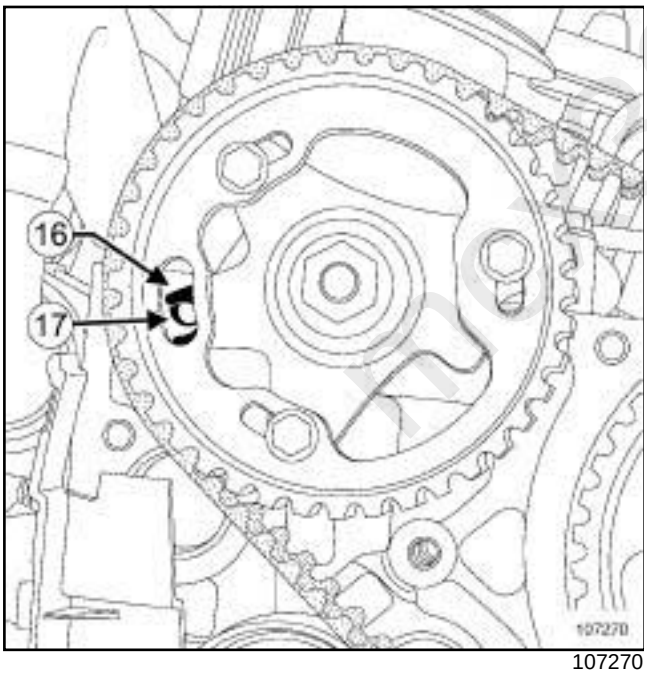
❑ Remove the cylinder head suspended mounting .

K9K, and 750 or 752



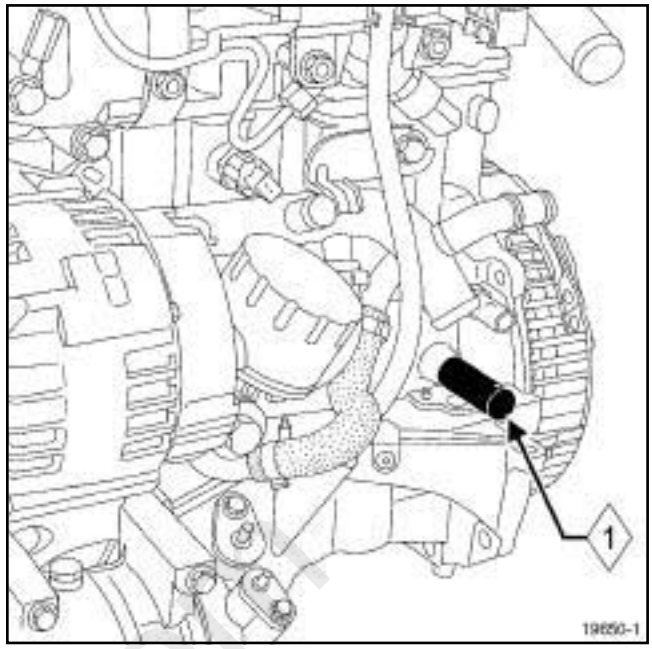
19650

❑ Remove the TDC pin plug using a **1/2" female torx socket (12.7 mm square drive) (14)**.



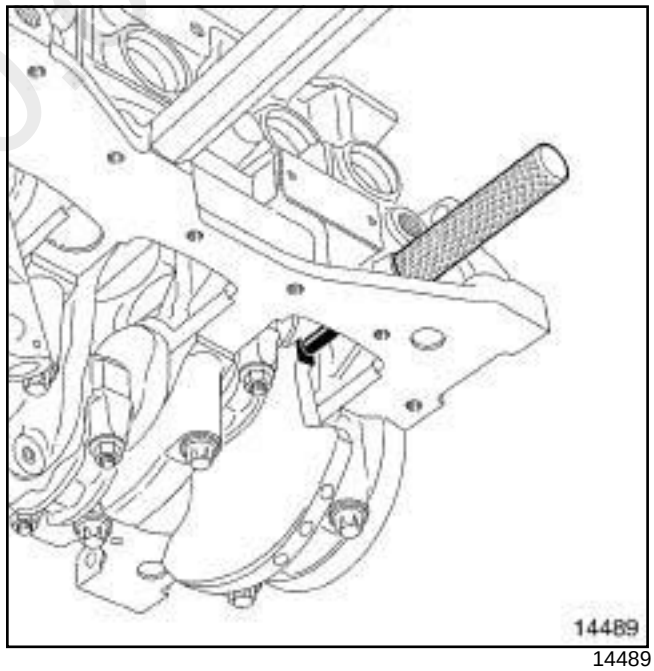
107270

❑ Rotate the crankshaft clockwise (timing end) to position the hole (**16**) in the camshaft timing sprocket almost opposite the hole (**17**) in the cylinder head.



19650-1

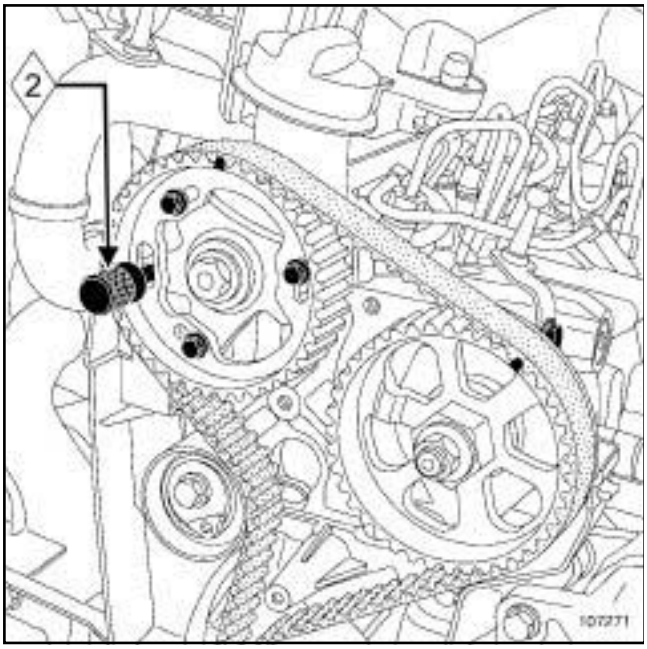
❑ Screw in the TDC setting pin (**1**) **(Mot. 1489)**.



14489

❑ Turn the crankshaft clockwise (timing end) smoothly until the crankshaft comes in contact with the TDC setting pin.

K9K, and 750 or 752

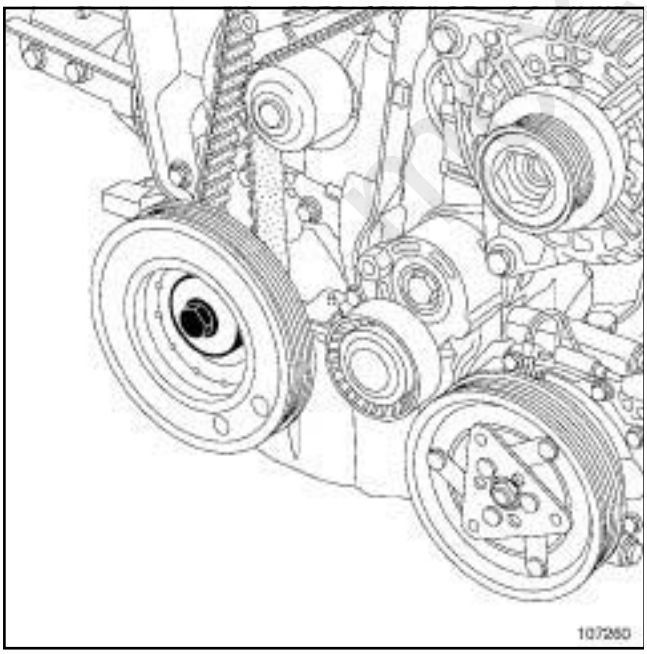


107271

❏ Engage the pin (**2**) **(Mot. 1430)** in the camshaft timing sprocket and cylinder head holes.

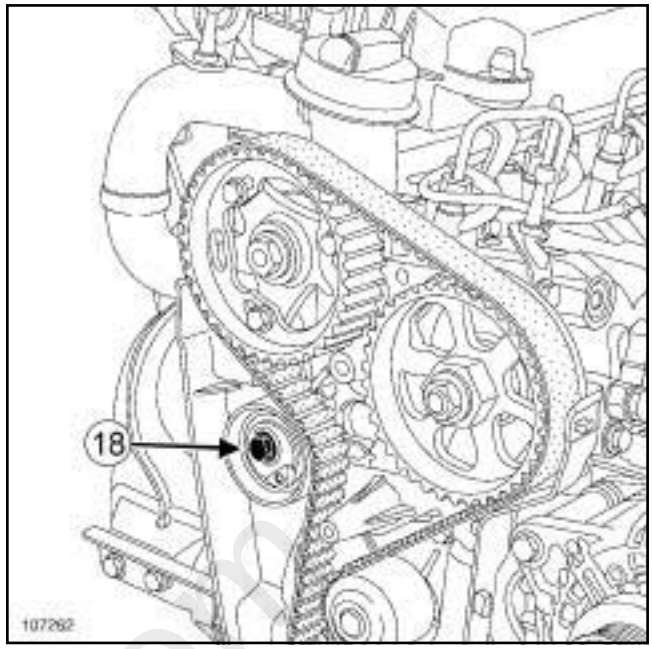
❏ Remove:

- the camshaft timing sprocket setting pin **(Mot. 1430)**,
- the TDC setting pin **(Mot. 1489)**.



107260

❏ Remove the crankshaft accessories pulley by locking the flywheel with a large flat-blade screwdriver.



107262

❏ Slacken the tensioning roller bolt (**18**) .

❏ Loosen the timing tension wheel by turning the eccentric using a **6 mm hexagonal socket**.

❏ Remove:

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

REFITTING

❏ Check:

- that there is no oil leak from the camshaft and crankshaft seals,
- the condition of the coolant pump (hard seal, play in the shaft, fluid leak, shaft rotation, (see **Technical Note 3175A, Cooling system fault finding, 19A, Cooling, Cooling system - Fault finding chart ALP 8**).

❏

WARNING

It is essential to remove the grease from the end of the crankshaft, the camshaft timing sprocket and the bearing face of the crankshaft accessories pulley. This is to avoid timing slippage.

K9K, and 750 or 752

I - REFITTING OPERATION FOR PART CONCERNED

❑

Note:

There are two types of timing belt assembly.

II - FIRST FITTING

1 - Recommendations for repair

❑

Note:

This procedure is applicable to engines manufactured up to 02/12/2005 fitted with a single unit or two-part camshaft timing sprocket and a crankshaft timing sprocket without collet.

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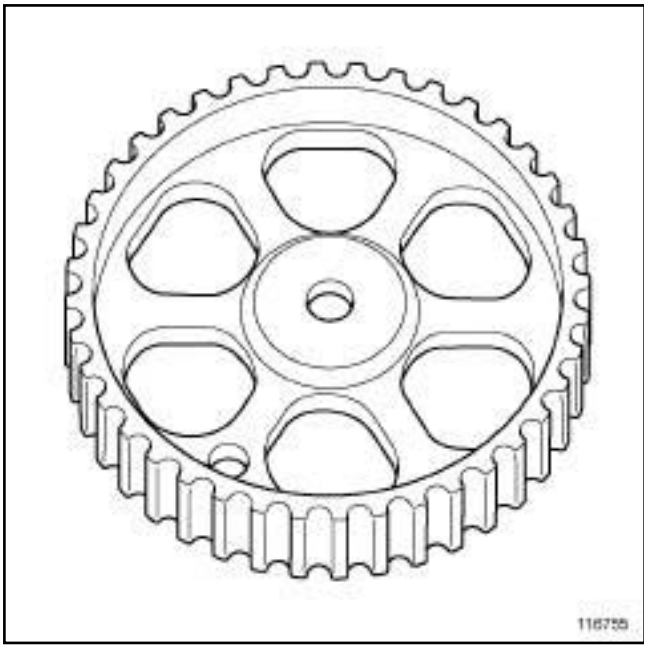
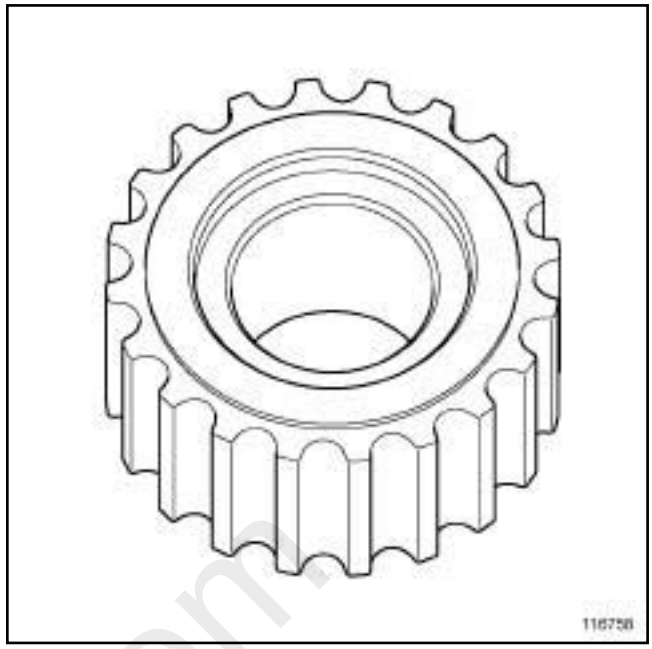
K9K, and 750 or 752

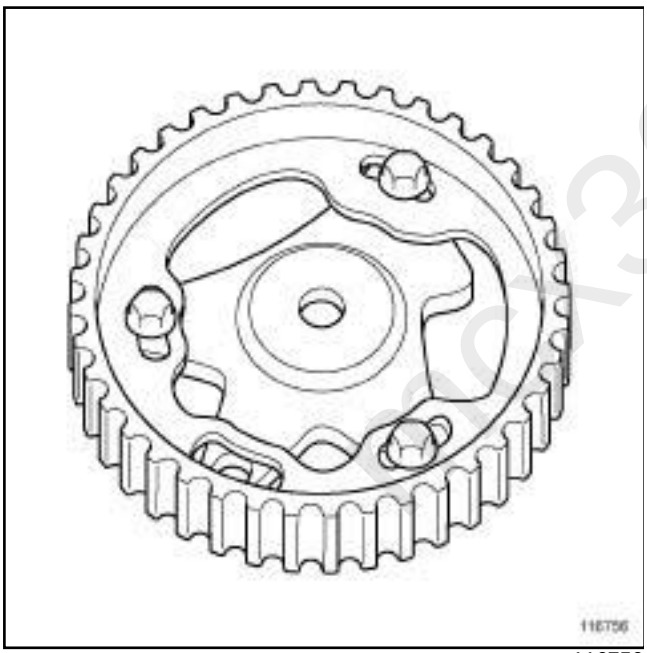


116755



116758

❑ Wear **protective gloves** during the operation.



116756

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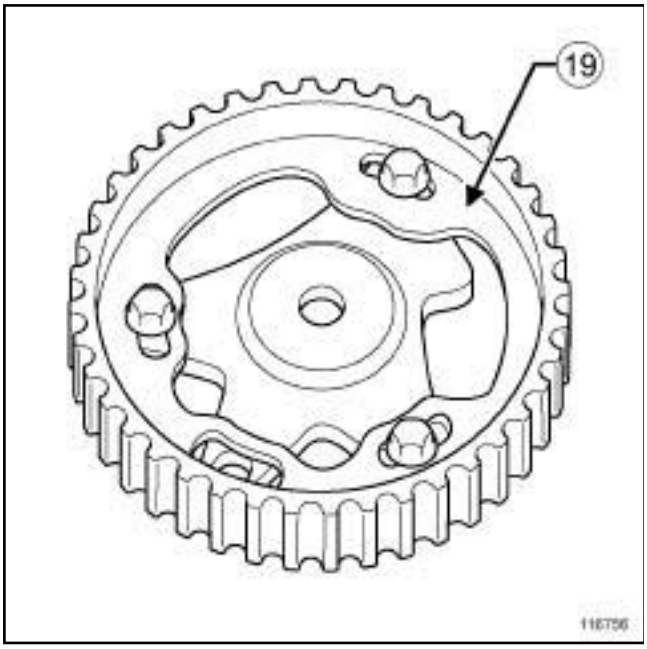
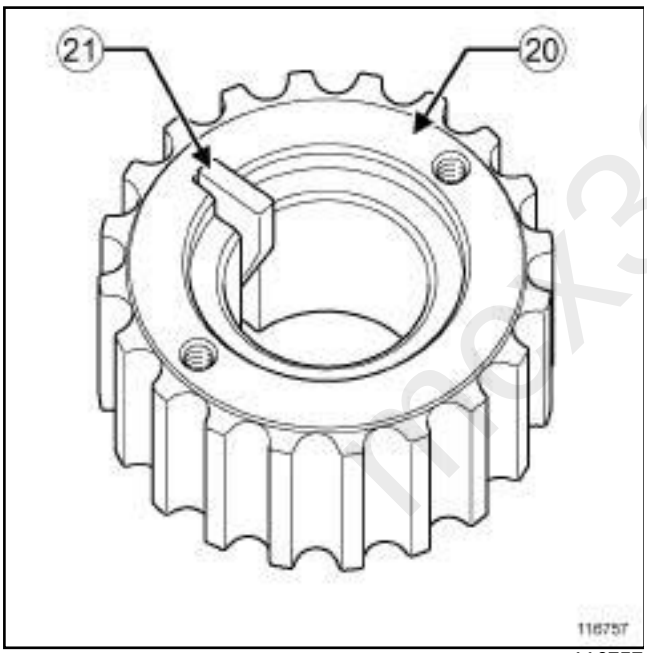
K9K, and 750 or 752



116756



116757

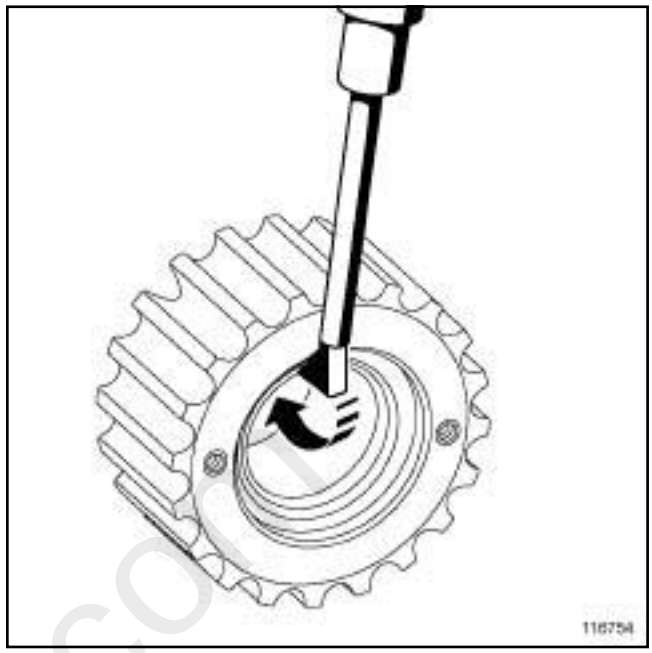
❏ In the event of replacement:

- of a camshaft timing sprocket, the Parts Department will only supply a two-part camshaft timing sprocket (**19**) ,
- of a crankshaft timing sprocket, the Parts Department will only supply a crankshaft timing sprocket with collet (**20**) .

❏ Before refitting the crankshaft timing sprocket; it is essential to remove the crankshaft timing sprocket collet (**21**) .

❏ Place the crankshaft timing sprocket on a wooden stand to avoid damaging its teeth.

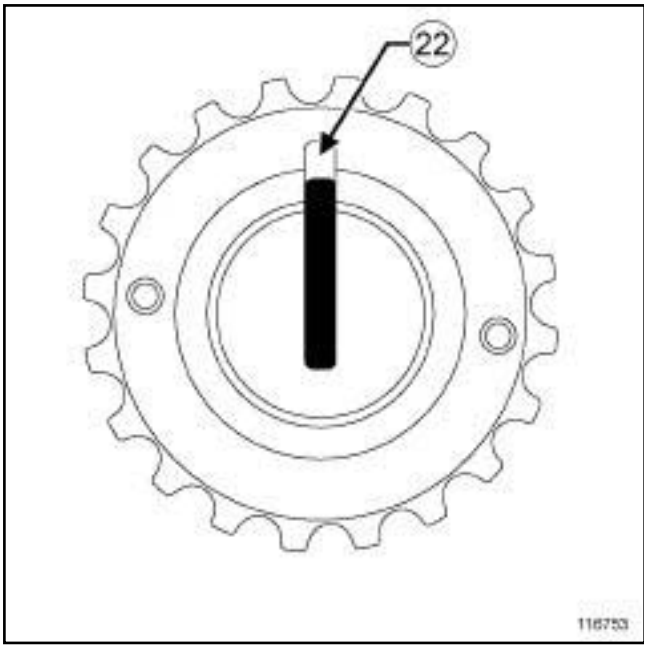
❏ When extracting the crankshaft timing sprocket collet, take care not to mark the crankshaft timing sprocket bore.



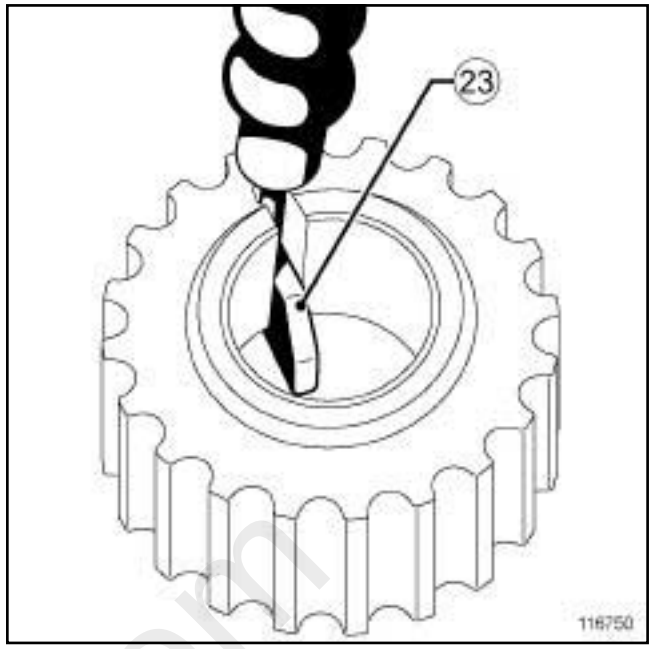
116754

❏ Pivot the collet towards the interior of the crankshaft timing sprocket using a **roll pin punch** with a diameter of **5 mm** and a mallet.

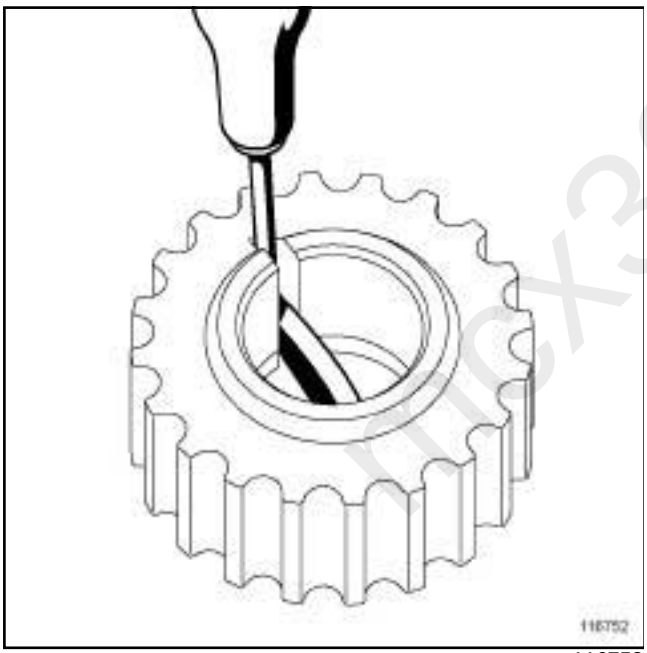
K9K, and 750 or 752



116753

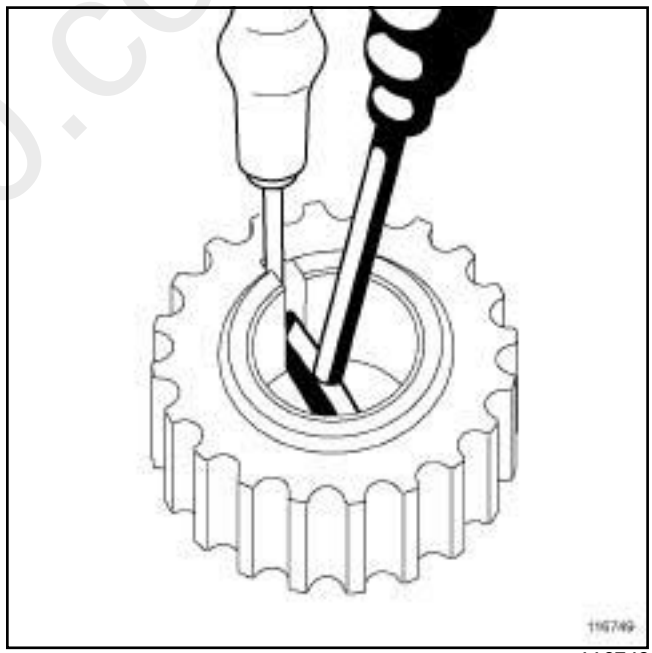


116750



116752

❑ Slide a **roll pin punch** with a diameter of **3 mm** into the crankshaft timing sprocket groove (**22**) .



116749

❑ Position the **roll pin punch** with a diameter of **5 mm** at (**23**) on the collet.

❑ Pivot the collet to position it vertically.

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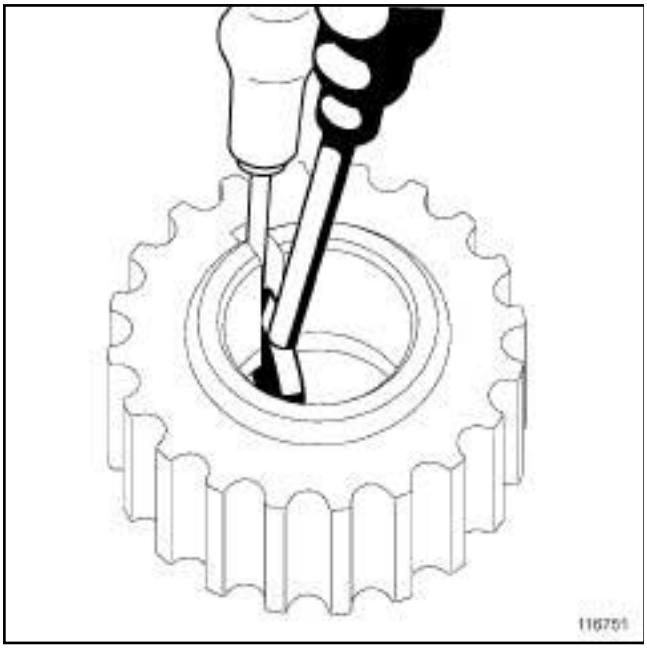
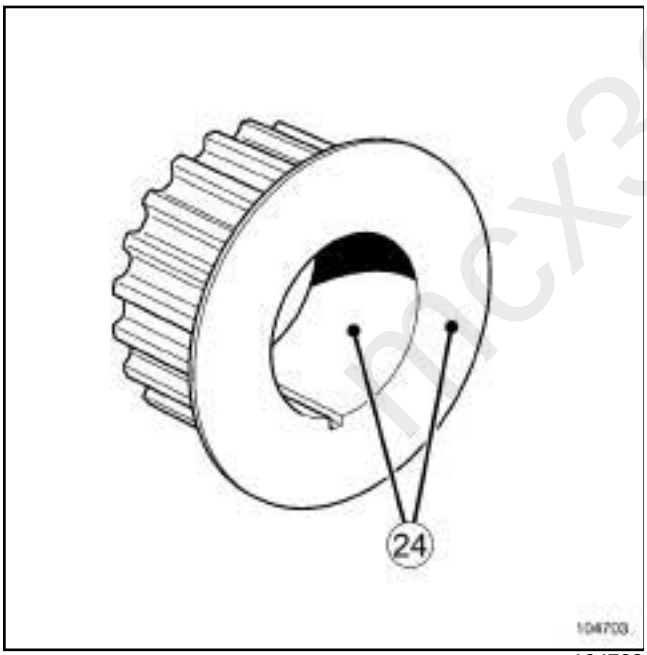
K9K, and 750 or 752



116751

❏ Extract the crankshaft timing sprocket collet using a **roll pin punch** and a mallet.



104703

❏ Use surface cleaner to degrease:

- the end of the crankshaft (timing end),
- the crankshaft timing sprocket bore and pressure faces at (**24**) ,
- the contact surfaces of the crankshaft accessories pulley.

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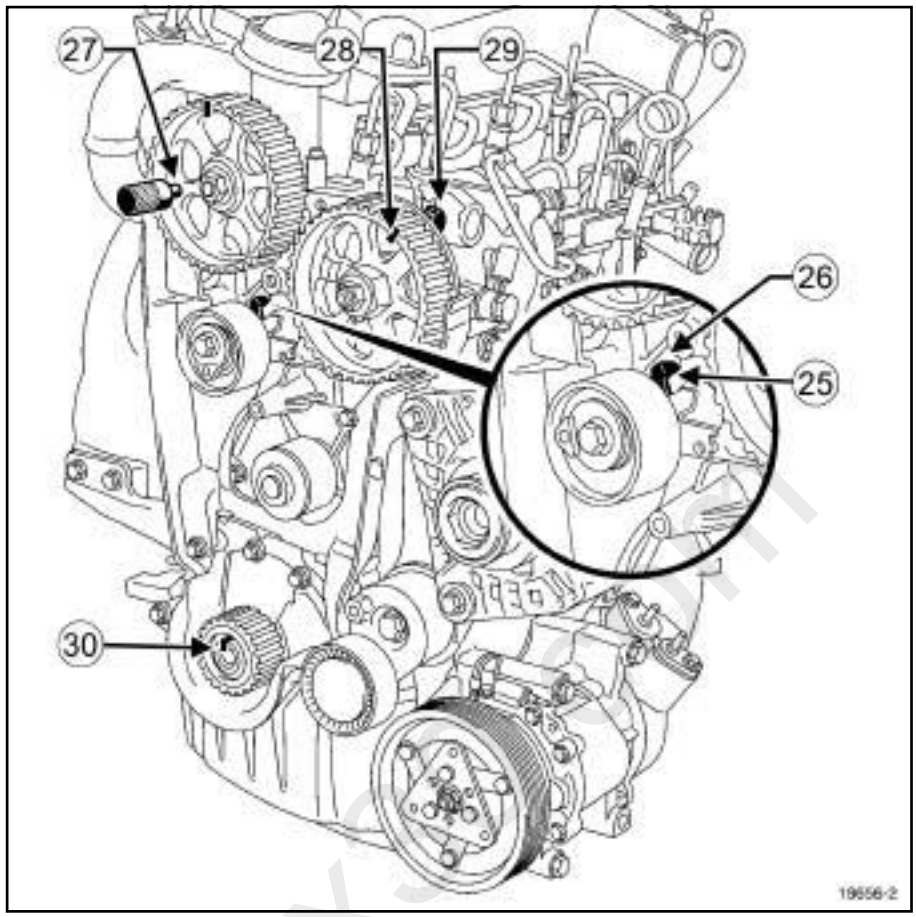
K9K, and 750 or 752

2 - Timing belt fitting procedure for engines fitted with a single unit camshaft timing sprocket



19656-2

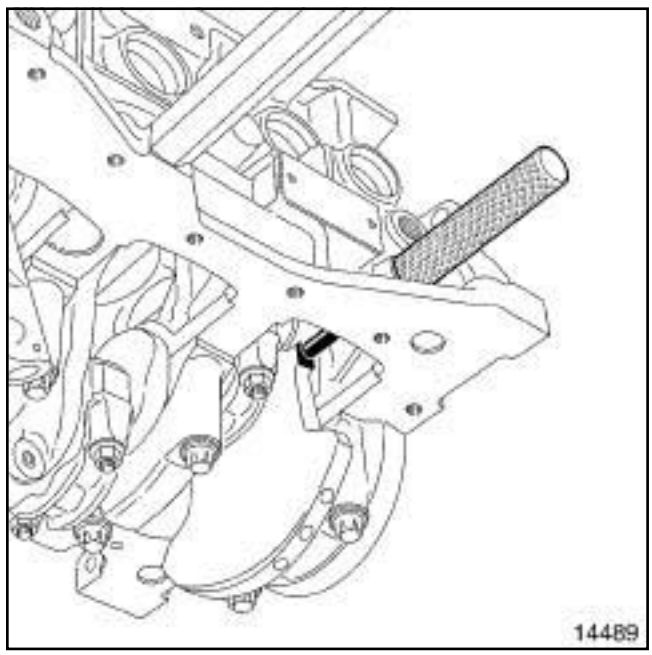
❏ Refit:

- the crankshaft timing sprocket,
- the timing tensioning roller.

❏ Put the tensioning roller lug (**25**) in the cylinder head groove (**26**) .

❏ Engage the pin **(Mot. 1430)** in the camshaft timing sprocket and cylinder head holes at (**27**) , turning the camshaft using a **offset spanner (18 mm)** if necessary.

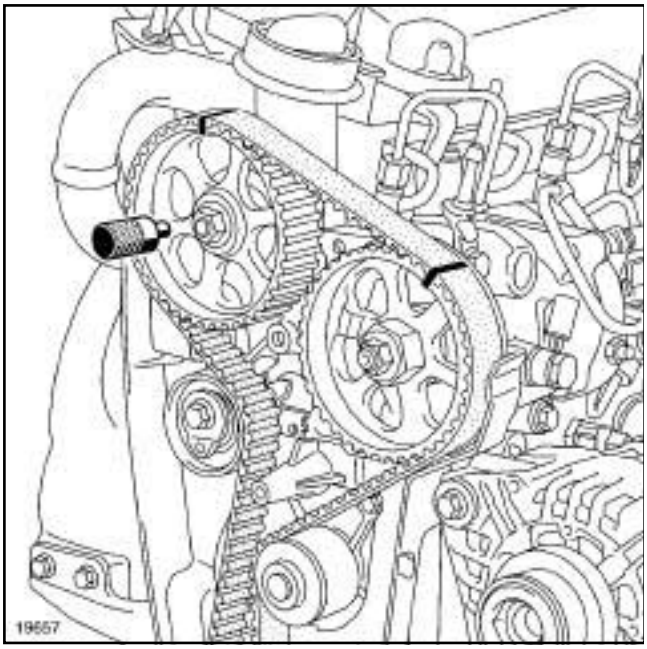
❏ Check that the mark on the high pressure pump pinion (**28**) is opposite the bolt head (**29**) .



14489

❏ Position the crankshaft so that it presses against the TDC setting pin **(Mot. 1489)** (the crankshaft groove ***(30)*** must face upwards).

K9K, and 750 or 752



19657

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

Note:

There should be 19 timing belt tooth spaces between the marks on the camshaft sprocket and the high pressure pump pinion.

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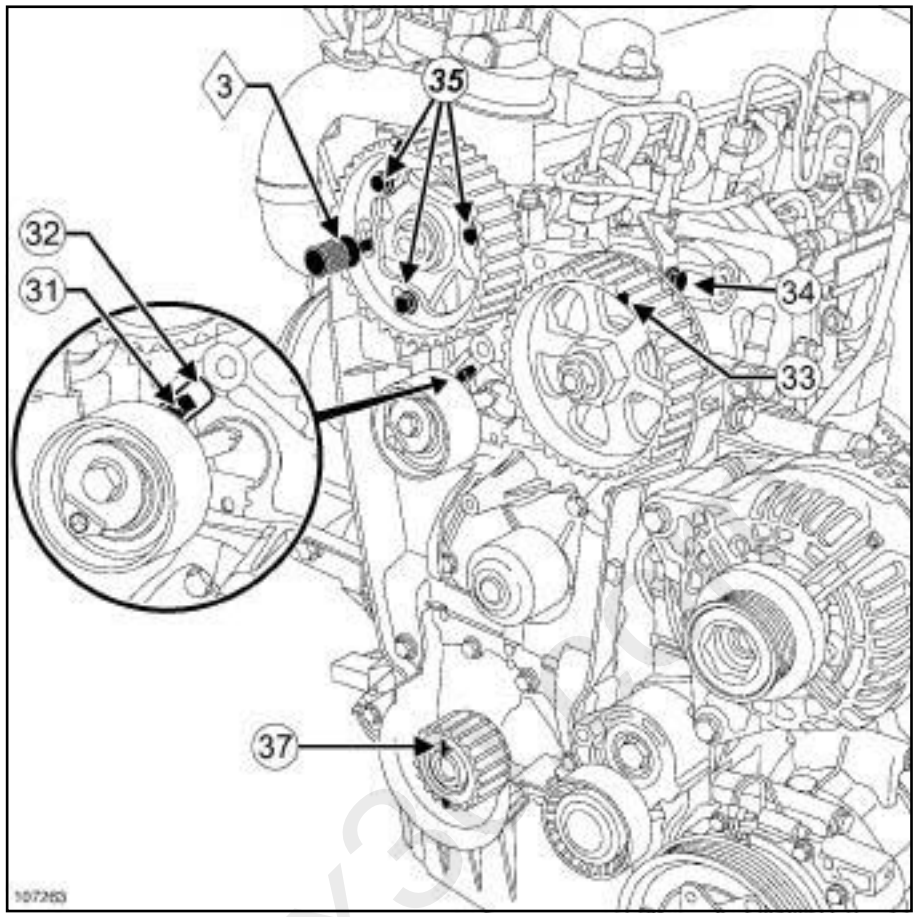
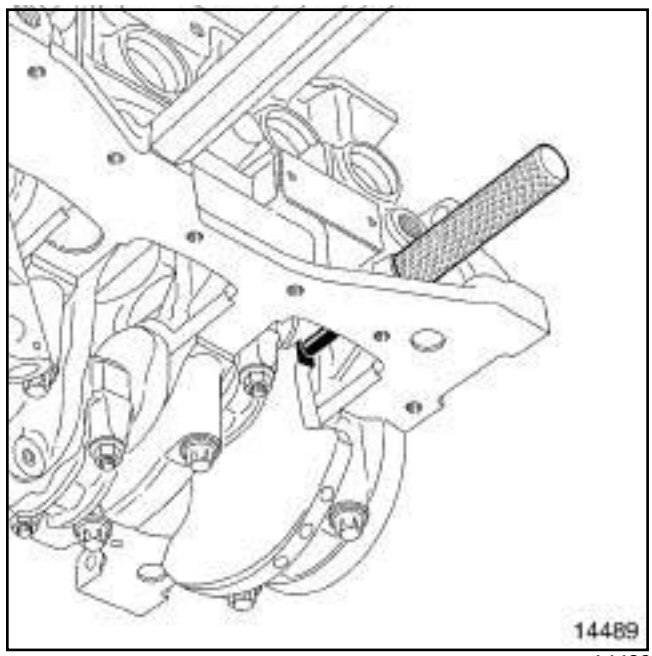
K9K, and 750 or 752

3 - Timing belt fitting procedure for engines fitted with a two-part camshaft timing sprocket



107263

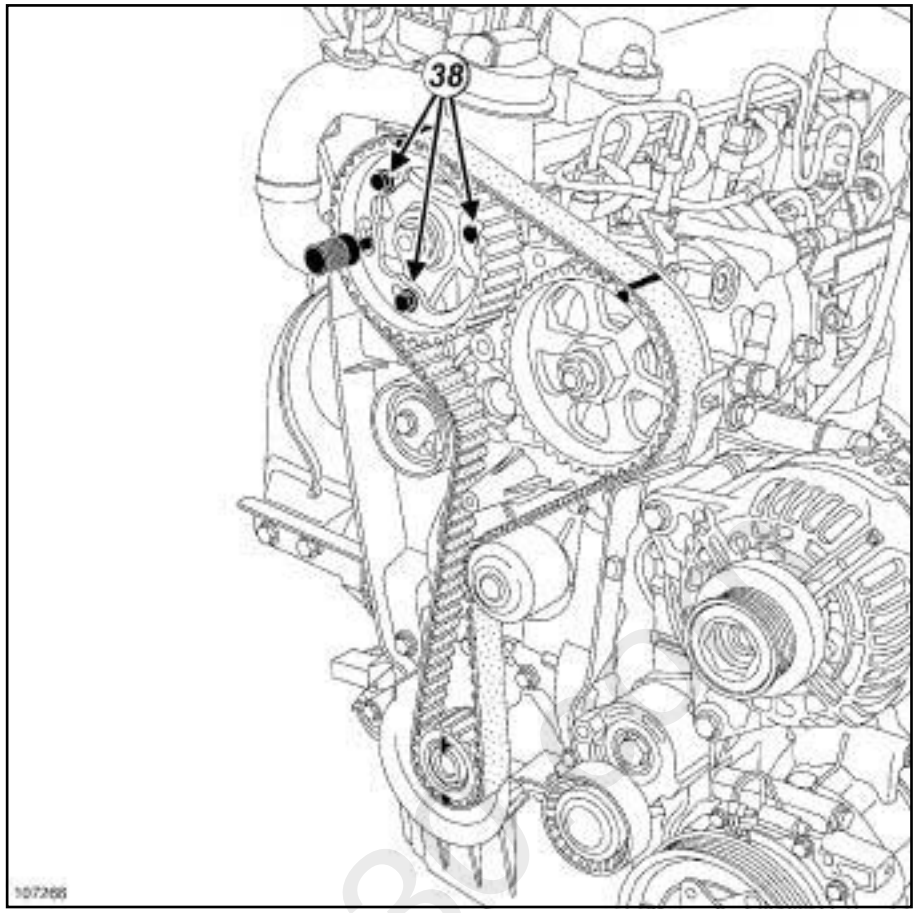
- ❏ Refit the timing tensioning roller.
- ❏ Put the tensioning roller lug (**31**) in the cylinder head groove (**32**) .
- ❏ Engage the pin (**3**) **(Mot. 1430)** in the camshaft timing sprocket and cylinder head holes, turning the camshaft using a **offset spanner (18 mm)** if necessary.
- ❏ Check that the mark on the high pressure pump pinion (**33**) is opposite the bolt head (**34**) .
- ❏ Loosen the three camshaft timing sprocket crown bolts (**35**) by one turn.



14489

- ❏ Position the crankshaft so that it presses against the TDC setting pin **(Mot. 1489)** (the crankshaft groove ***(37)*** must face upwards).

K9K, and 750 or 752



107266

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

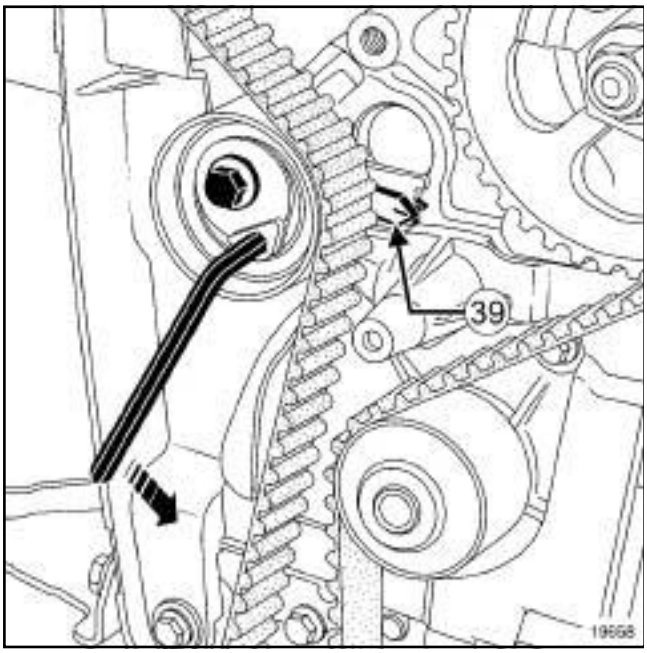
Note:

There should be 19 timing belt tooth spaces between the marks on the camshaft sprocket and the high pressure pump pinion.

❑ Use a **torque wrench** to torque tighten the **camshaft timing sprocket crown bolts (14 N.m)** (**38**) .

K9K, and 750 or 752

4 - Second part of the timing procedure for engines fitted with a single unit or two-part camshaft timing sprocket



19658

❏ Position the tensioning roller adjustable index marker (**39**) opposite the lug **, turning the eccentric cam anti-clockwise using a 6 mm** Allen key.

❏ Use a **torque wrench** to torque tighten the **tensioning roller bolt (27 N.m)**.

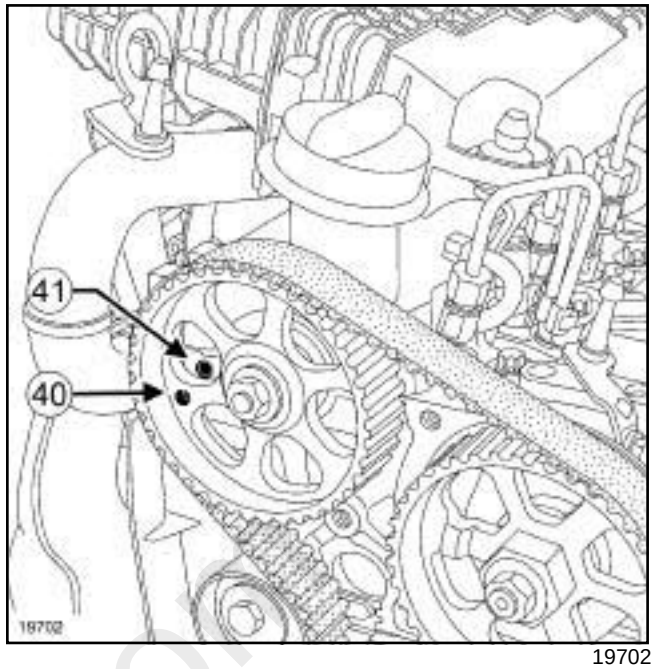
❏ Refit the accessories crankshaft pulley with a new bolt.

❏ Torque and angle tighten using a **torque/angle wrench** or a **torque wrench** and a **cylinder head bolt tightening gauge (angular measuring type)** (crankshaft against the TDC setting pin):

- the **crankshaft accessories pulley M12 bolt (60 N.m + 100° ± 10°)**,
- the **crankshaft accessories pulley M14 bolt (120 N.m + 95° ± 15°)**

❏ Remove the following tools:

- the camshaft timing sprocket setting pin **(Mot. 1430)**,
- the TDC setting pin **(Mot. 1489)**.

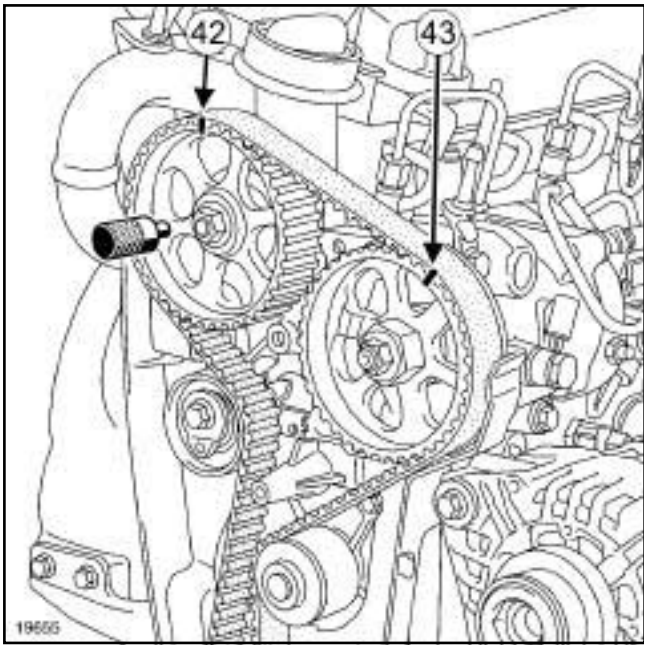


19702

❏ Rotate the crankshaft clockwise through two revolutions (timing end). Before the hole (**40**) in the camshaft timing sprocket is opposite the hole (**41**) in the cylinder head:

- screw the TDC setting pin **(Mot. 1489)** into the cylinder block,
- bring the crankshaft slowly and smoothly against the TDC setting pin.

K9K, and 750 or 752



19655

❏ Lock the camshaft timing sprocket using the **(Mot. 1430)**.

Note:

There should be 19 timing belt tooth grooves between the marks on the camshaft sprocket (**42**) and the high pressure pump pinion (**43**)

❏ Remove:

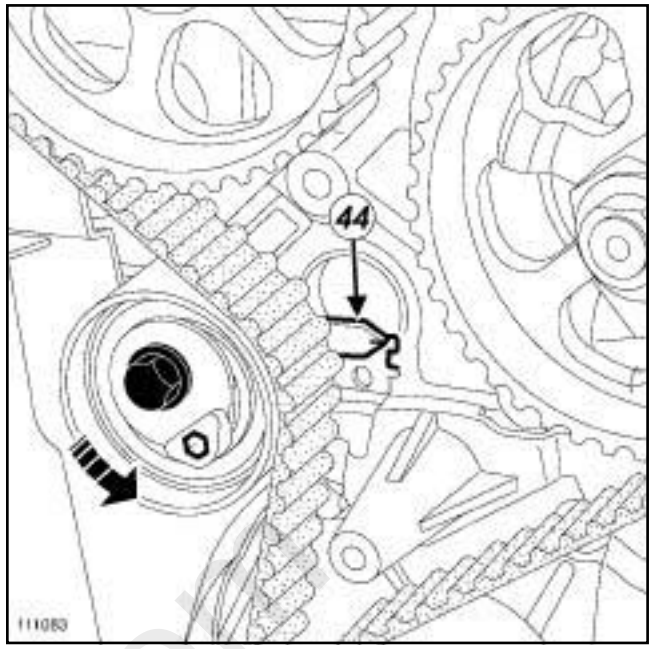
- the TDC setting pin **(Mot. 1489)**,
- the camshaft timing sprocket setting pin **(Mot. 1430)**.

Note:

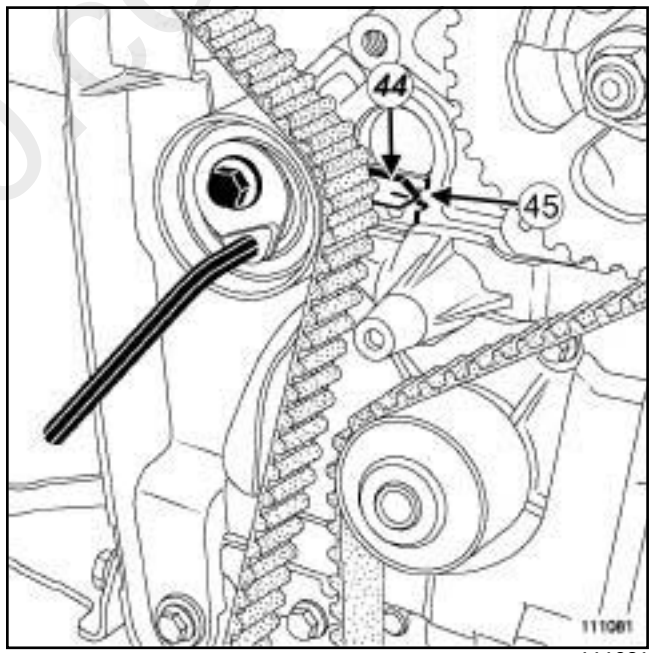
After two turns, the tension wheel index markers may be in two different positions.

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

First position



111083



111081

❏ Loosen the tensioning roller bolt by no more than one turn, holding it with a **6 mm** Allen key.

❏ Gradually align the adjustable index (**44**) in the middle of the timing window (**45**) , **turning the key anti-clockwise**.

❏ Use a **torque wrench** to torque tighten the **tensioning roller bolt (27 N.m)**.

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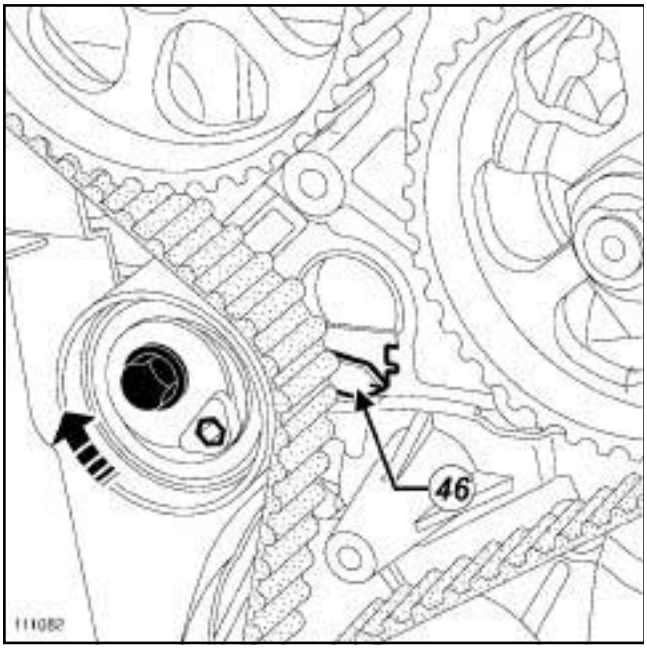
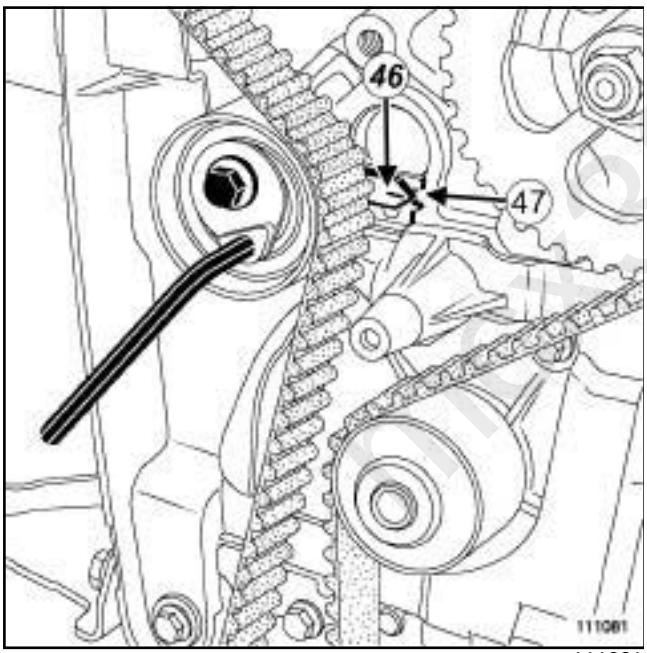
K9K, and 750 or 752

Second position



111082



111081

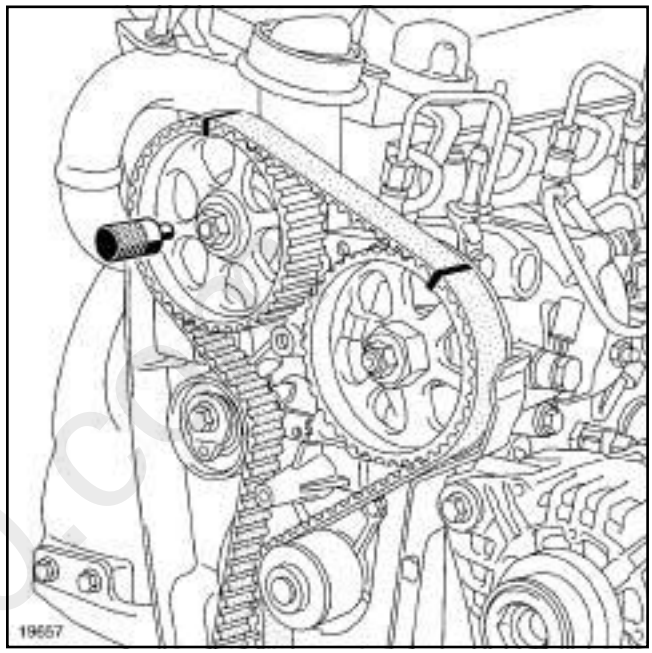
❏ Loosen the tensioning roller bolt by no more than one turn, holding it with a **6 mm** Allen key.

❏ Gradually align the adjustable index (**46**) in the middle of the timing window (**47**) , **turning the key clockwise**.

❏ Use a **torque wrench** to torque tighten the **tensioning roller bolt (27 N.m)**.

❏ Rotate the crankshaft clockwise through two revolutions (timing end). Before the hole in the camshaft timing sprocket is opposite the hole in the cylinder head:

- screw the TDC setting pin **(Mot. 1489)** into the cylinder block,
- bring the crankshaft slowly and smoothly against the TDC setting pin.



19657

❏ Lock the camshaft timing sprocket using the **(Mot. 1430)**.

❏ If the pin does not engage, repeat the timing belt refitting operation.

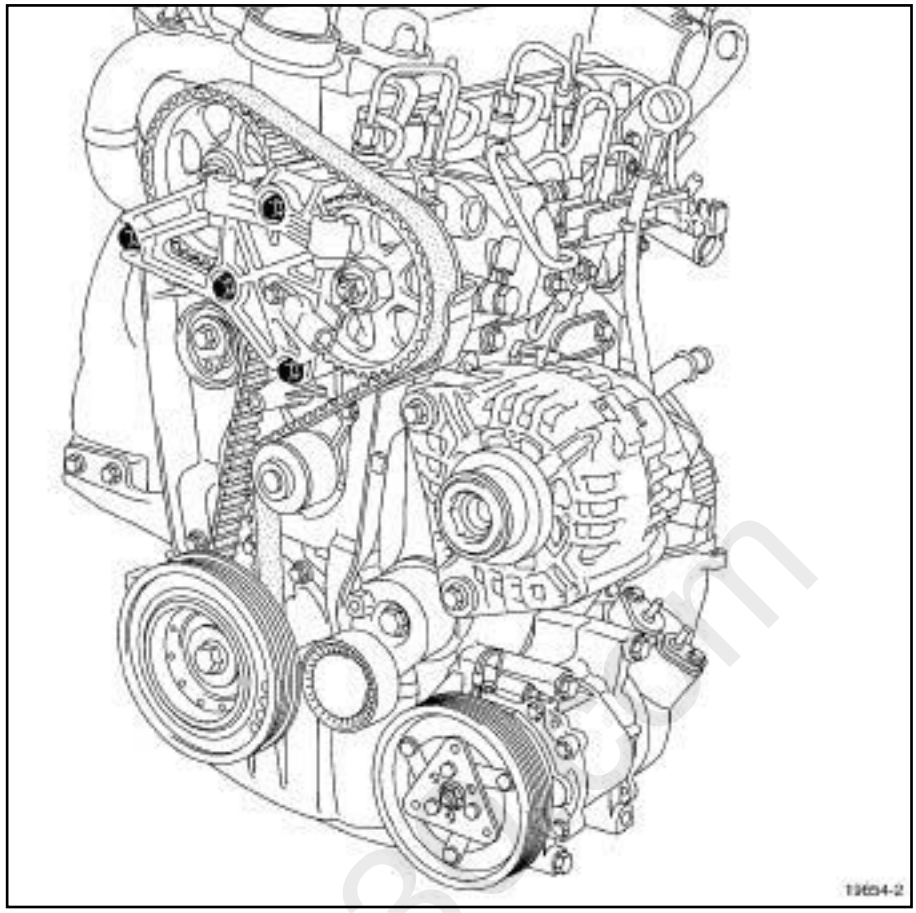
❏ Remove the following tools:

- the TDC setting pin **(Mot. 1489)**,
- the camshaft timing sprocket setting pin **(Mot. 1430)**

❏ Apply a drop of **SILICONE ADHESIVE SEALANT** to the threading of the TDC pin plug.

❏ Use a **torque wrench** to torque tighten the **TDC pin plug (25 N.m)**.

K9K, and 750 or 752

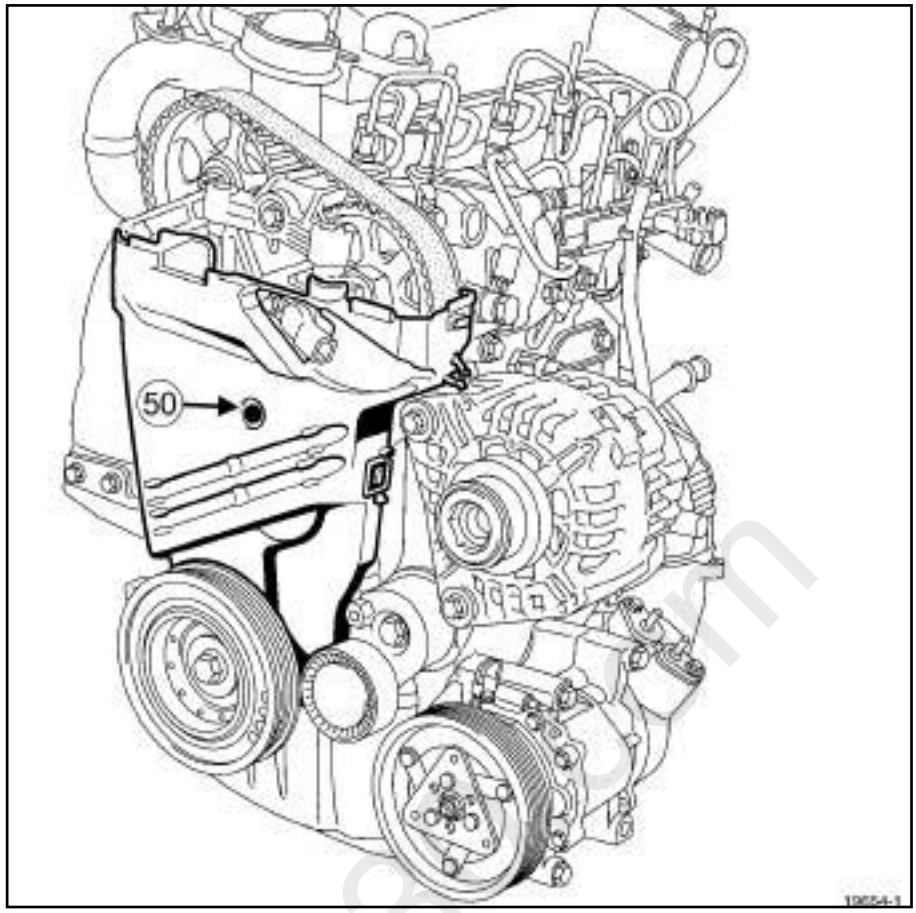


19654-2

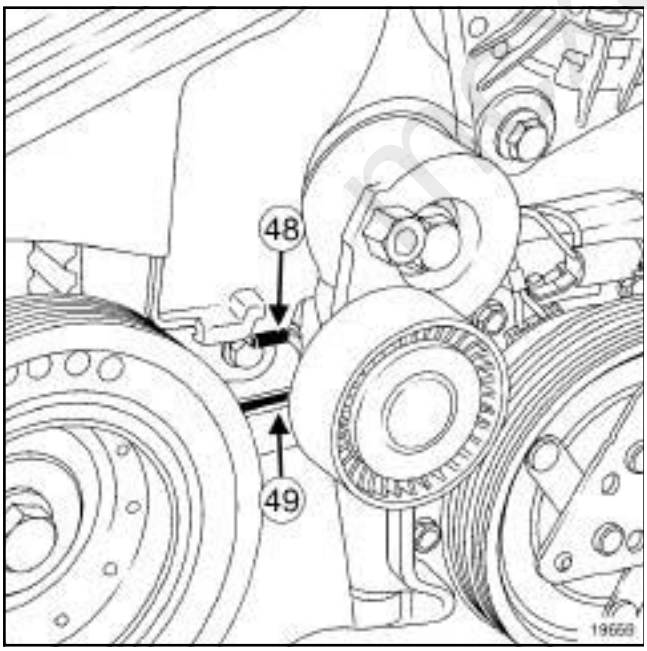
❏ Refit the cylinder head suspended mounting.

❏ Use a **torque wrench** to torque tighten the **cylinder head suspended mounting bolts (25 N.m)**.

K9K, and 750 or 752



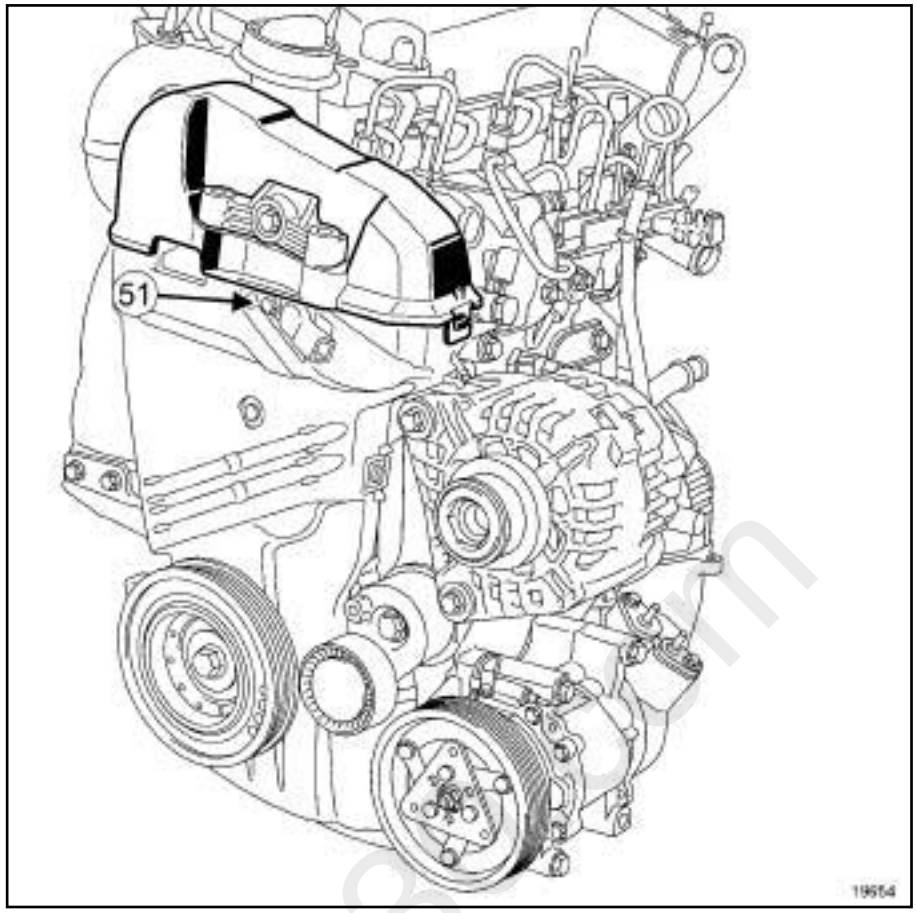
19654-1



19659

❑ Refit:

- the timing cover, positioning the tab (**48**) in the inner timing cover hole (**49**) ,
- the timing cover plastic bolt (**50**) .



19654

❑ Refit the camshaft position sensor (**51**) .

❑ Use a **torque wrench** to torque tighten the **camshaft position sensor bolt (8 N.m)**.

❑ Refit the upper timing cover.

III - SECOND FITTING

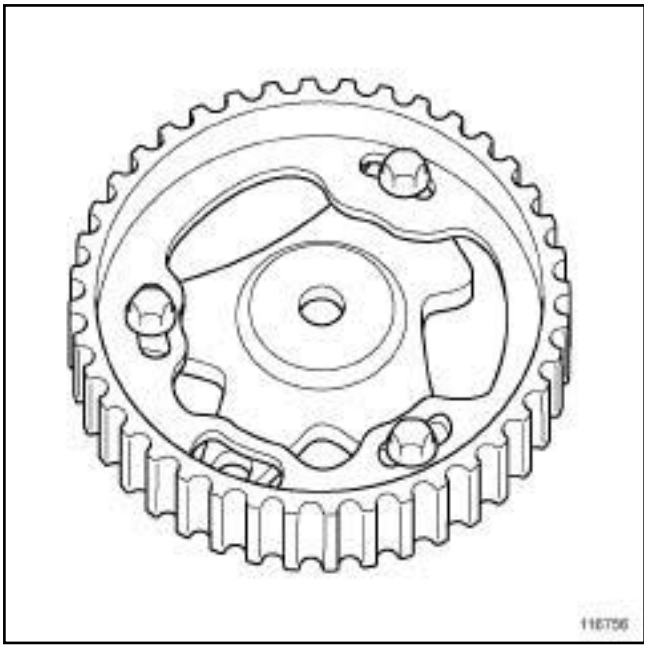
Recommendations for repair

❑

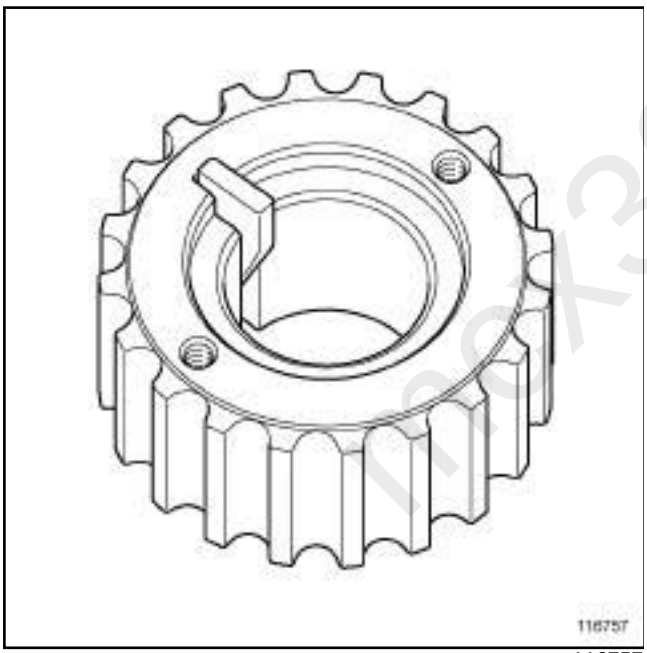
Note:

This procedure is applicable to engines manufactured from 02/12/2005 fitted with a two-part camshaft timing sprocket and a crankshaft timing sprocket with collet.

K9K, and 750 or 752



116756



116757

❑ Wear **protective gloves** during the operation.

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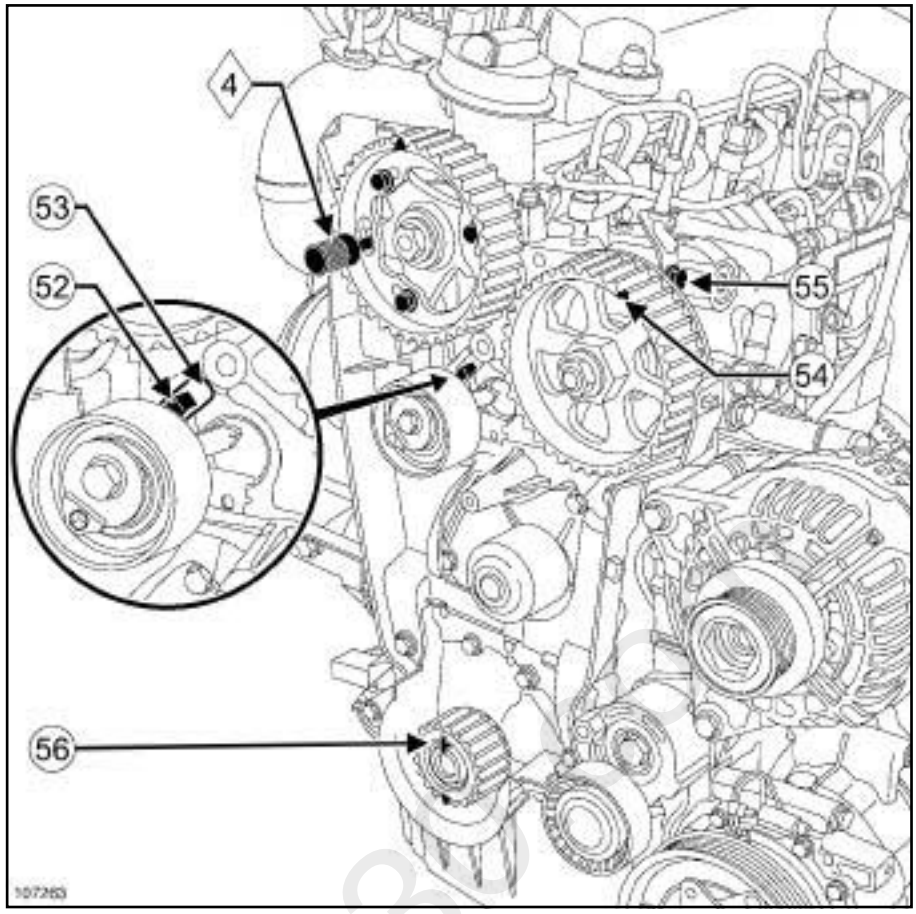
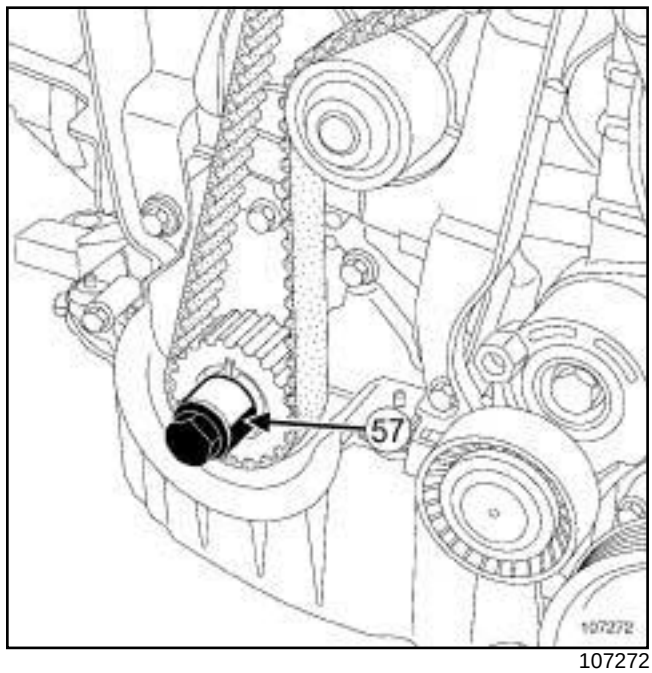
K9K, and 750 or 752



107263

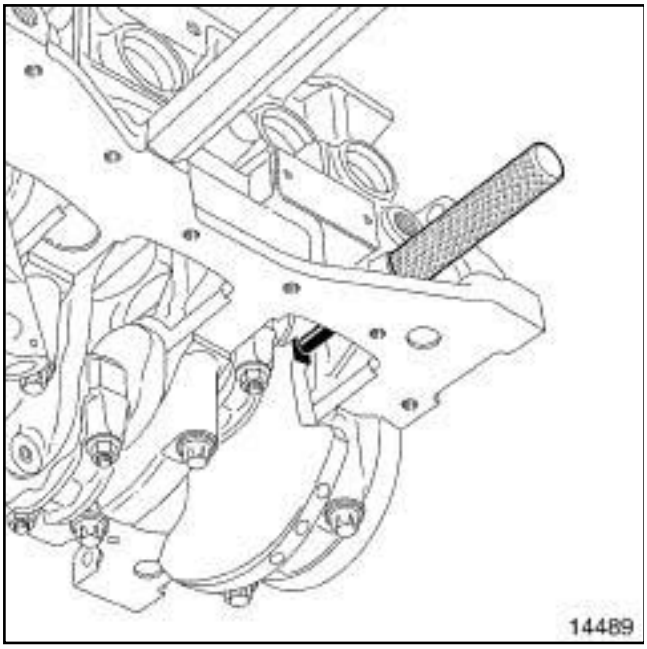
- ❏ Refit the timing tensioning roller.
- ❏ Put the tensioning roller lug (**52**) in the cylinder head groove (**53**) .
- ❏ Engage the pin (**4**) **(Mot. 1430)** in the camshaft timing sprocket and cylinder head holes, turning the camshaft using a **offset spanner (18 mm)** if necessary.
- ❏ Check that the mark on the high pressure pump (**54**) is opposite the bolt head (**55**) .



107272

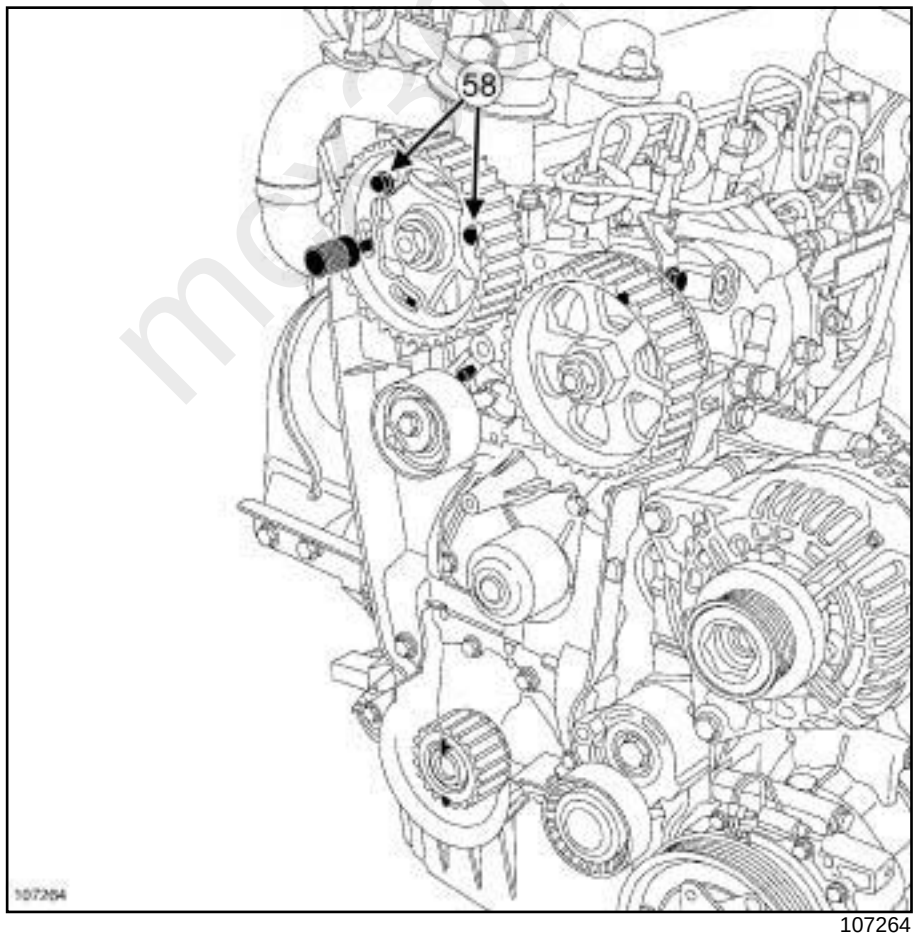
- ❏ Tighten the old crankshaft accessories pulley bolt fitted with a spacer (which does not cover the timing sprocket mark) (**57**) onto the crankshaft.

K9K, and 750 or 752



14489

❏ Position the crankshaft so that it presses against the TDC setting pin **(Mot. 1489)** (the crankshaft sprocket ***(56)*** collet must face upwards).

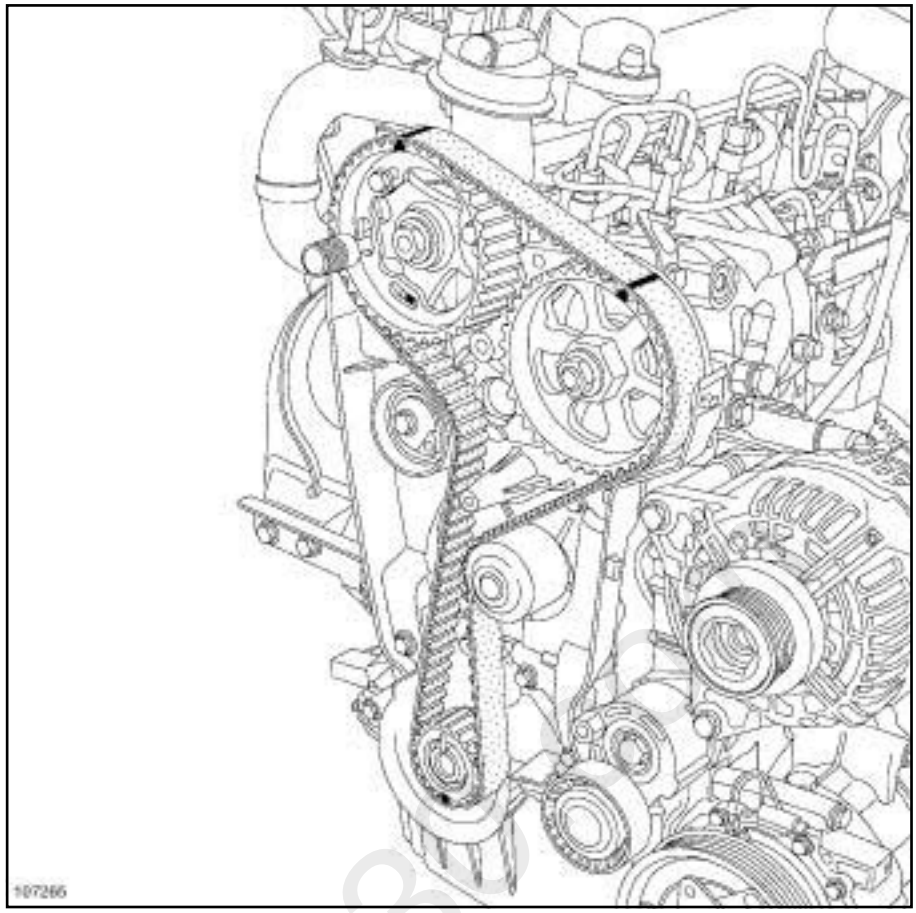


107264

❏ Remove one bolt from the camshaft timing sprocket crown.

❏ Loosen the other two camshaft timing sprocket crown bolts (**58**) by one turn.

K9K, and 750 or 752

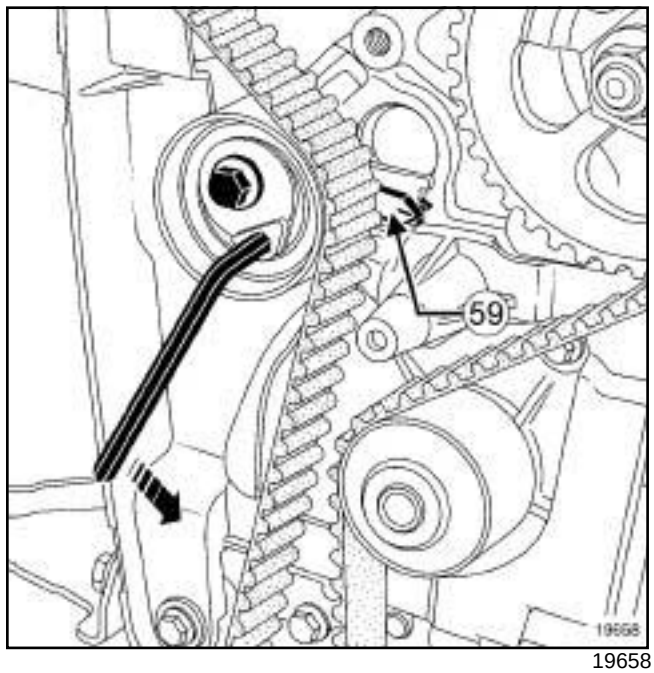


107265

❑ Fit the timing belt, starting with the crankshaft sprocket, by aligning the marks on the timing belt with those on the crankshaft sprockets and camshaft and high pressure pump pinions.

Note:

There should be 19 timing belt tooth grooves between the marks on the camshaft sprocket and the high pressure pump pinion, and 51 timing belt tooth grooves between the crankshaft sprocket and the high pressure pump pinion.

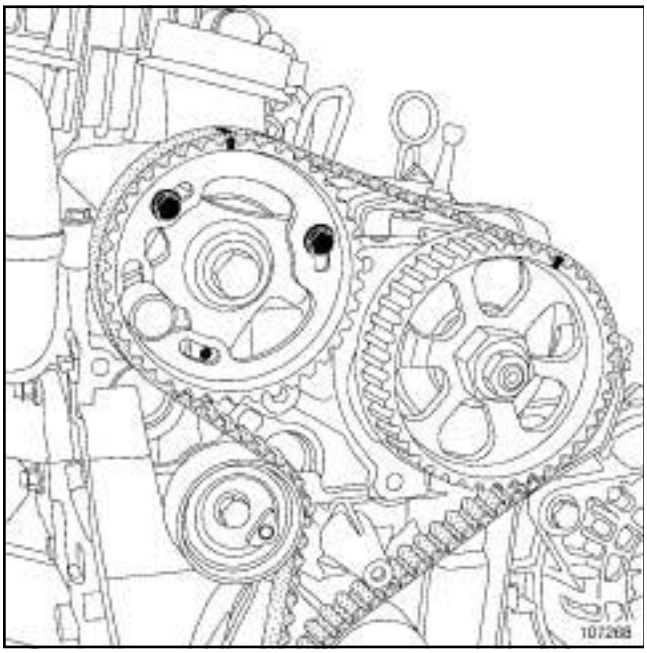


19658

❑ Position the tensioning roller adjustable index marker (**59**) opposite the lug **, turning the eccentric cam anti-clockwise using a 6 mm** Allen key.

K9K, and 750 or 752

❏ Use a **torque wrench** to torque tighten the **tensioning roller bolt (27 N.m)**.



107268

❏ Check that the camshaft timing sprocket crown bolts are not fully locked against the camshaft timing sprocket crown. If they are, repeat the timing belt refitting procedure.

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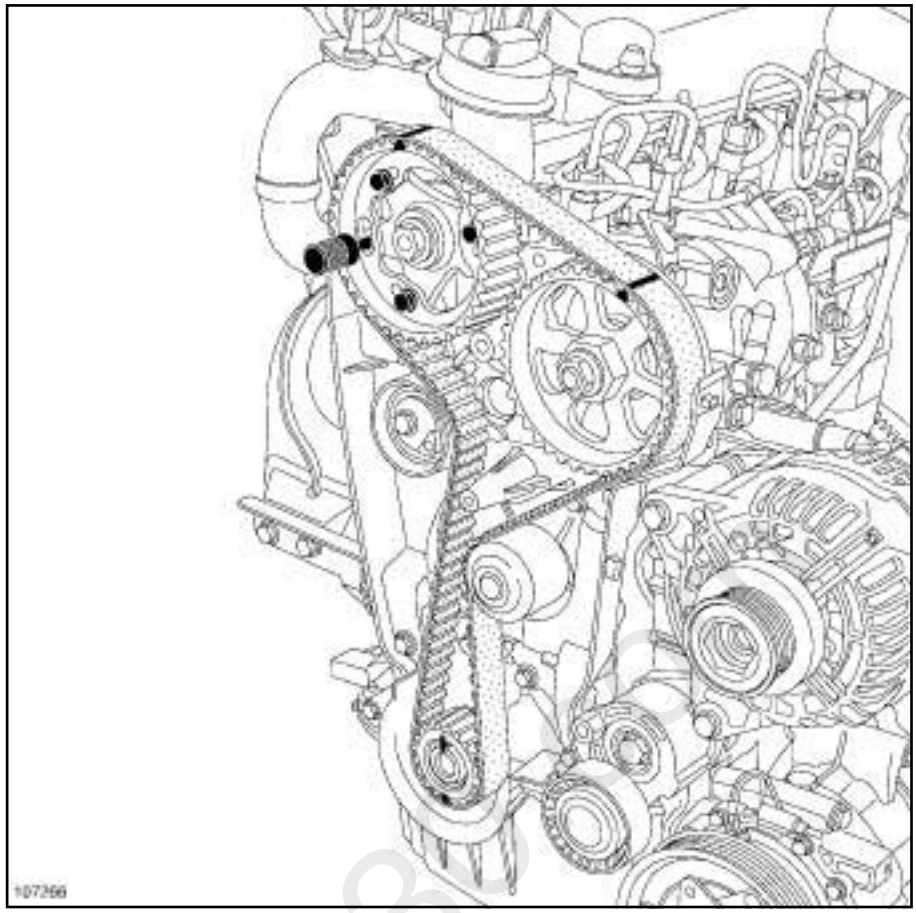
K9K, and 750 or 752



107266

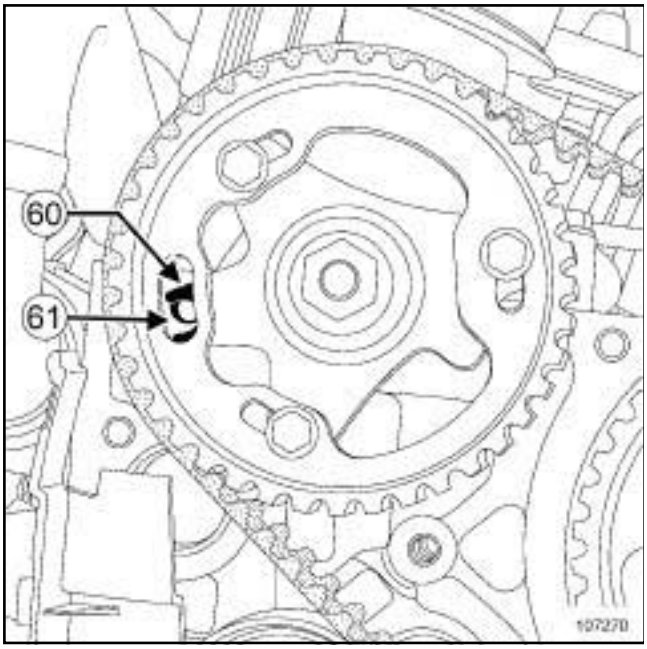
❑ Refit the bolt from the camshaft timing sprocket crown.

❑ Use a **torque wrench** to torque tighten the **camshaft timing sprocket crown bolts (14 N.m)**.

❑ Remove:

- the TDC setting pin **(Mot. 1489)**,
- the camshaft timing sprocket setting pin **(Mot. 1430)**.

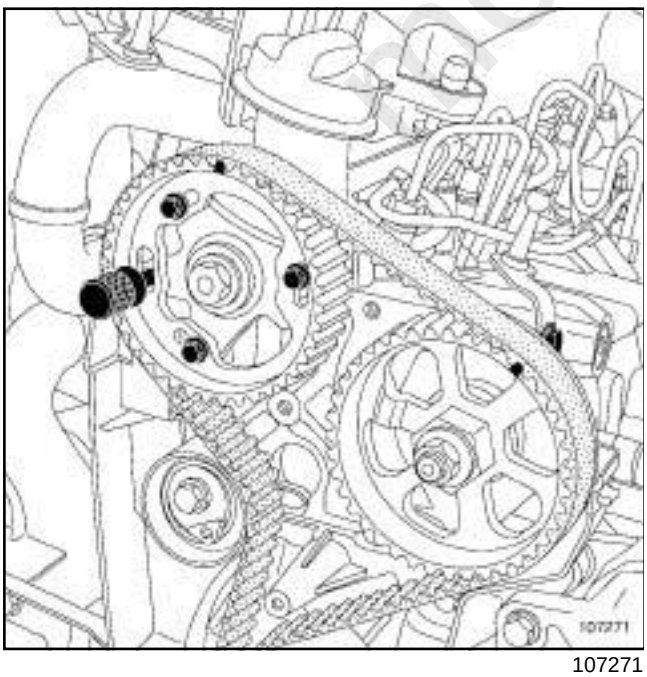
K9K, and 750 or 752



107270

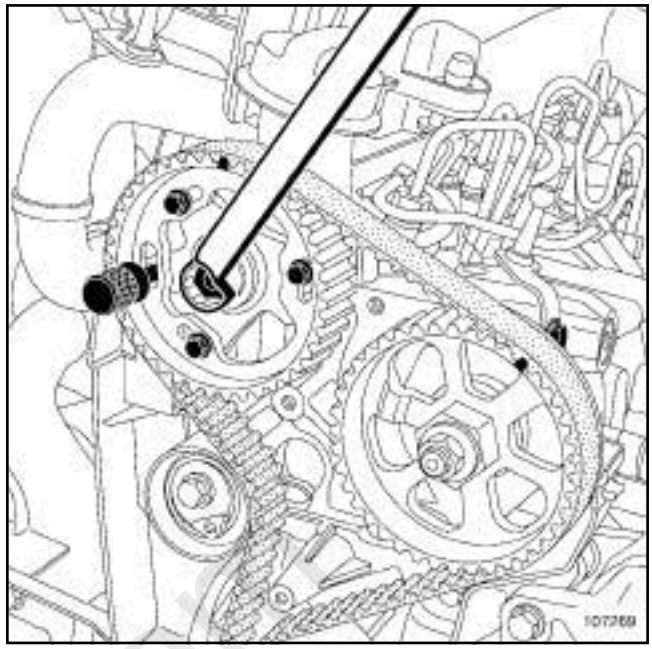
❏ Rotate the crankshaft clockwise through two revolutions (timing end). Before the hole (**60**) in the camshaft timing sprocket is opposite the hole (**61**) in the cylinder head:

- screw the TDC setting pin **(Mot. 1489)** into the cylinder block,
- bring the crankshaft slowly and smoothly against the TDC setting pin.



107271

❏ Lock the camshaft timing sprocket using the **(Mot. 1430)**.



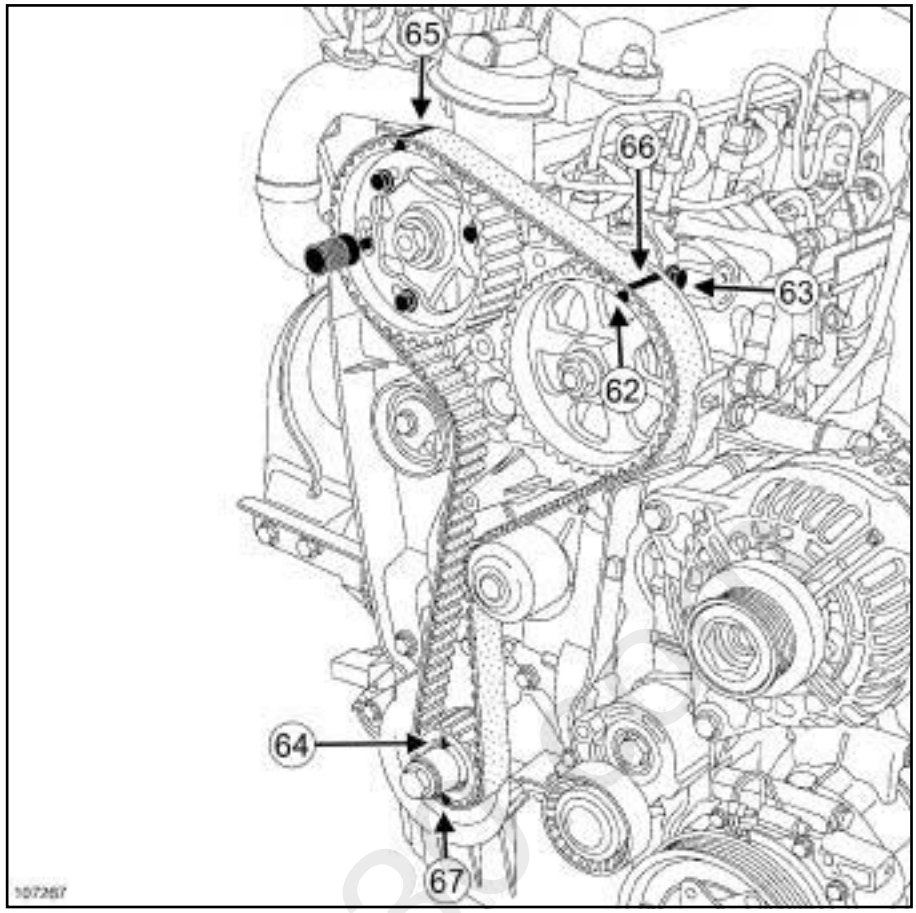
107269

❏ If the pin **(Mot. 1430)** does not engage:

- loosen the camshaft timing sprocket crown bolts by a maximum of one turn,
- turn the camshaft timing sprocket hub using a **offset spanner (18 mm)** to set the camshaft timing sprocket hub,
- do not retighten the camshaft timing sprocket crown bolts.

❏ Undo the camshaft timing sprocket crown bolts.

K9K, and 750 or 752



107267

❑ Check:

- that the high pressure pump pinion mark (**62**) is opposite the bolt head (**63**) ,
- that the crankshaft timing sprocket collet (**64**) is positioned vertically at the top,
- that there are 19 belt tooth grooves between the marks on the camshaft sprocket (**65**) and the high pressure pump pinion (**66**) ,
- that there are 51 belt tooth grooves between the marks on the crankshaft sprocket (**67**) and the high pressure pump pinion (**66**) .

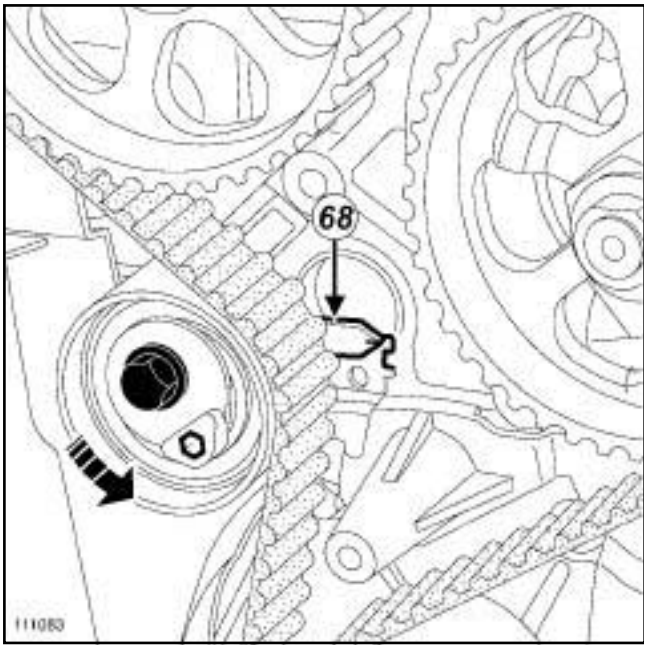
Note:

After two turns, the tension wheel index markers may be in two different positions.

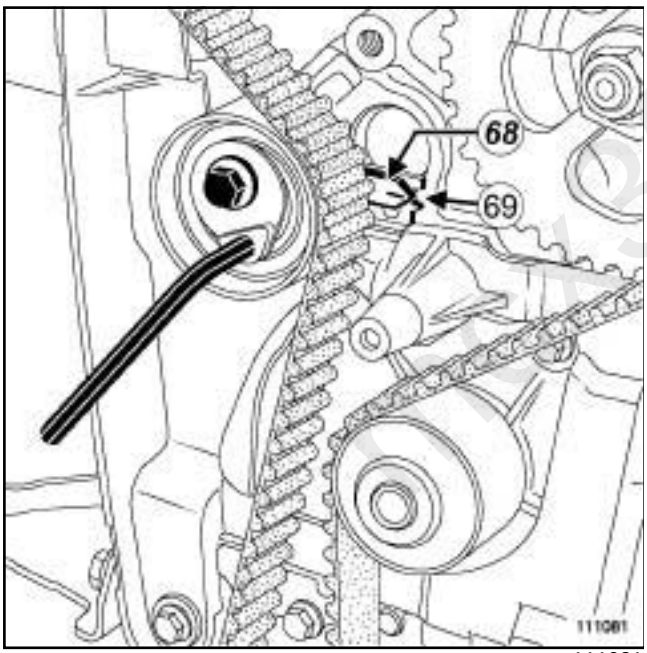
The rotation of the tension wheel eccentric depends on the position.

K9K, and 750 or 752

First position



111083



111081

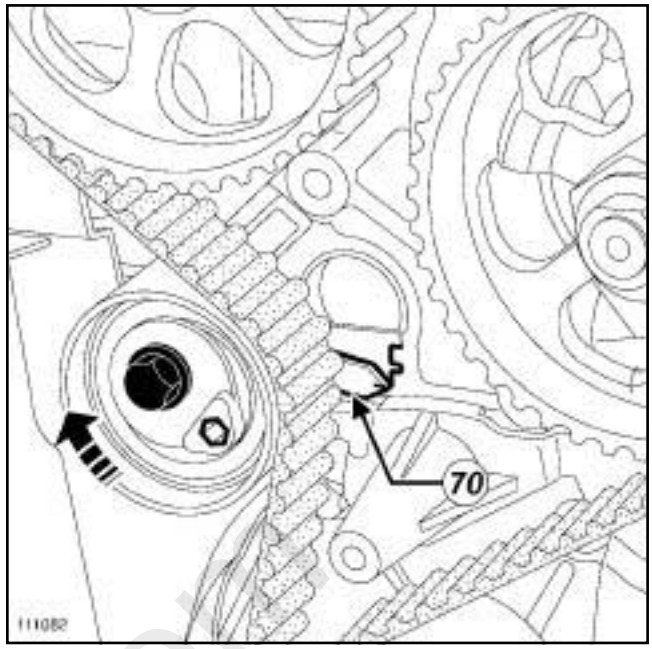
❏ Loosen the tensioning roller bolt by no more than one turn, holding it with a **6 mm** Allen key.

❏ Gradually align the adjustable index (**68**) in the middle of the timing window (**69**) , **turning the key anti-clockwise**.

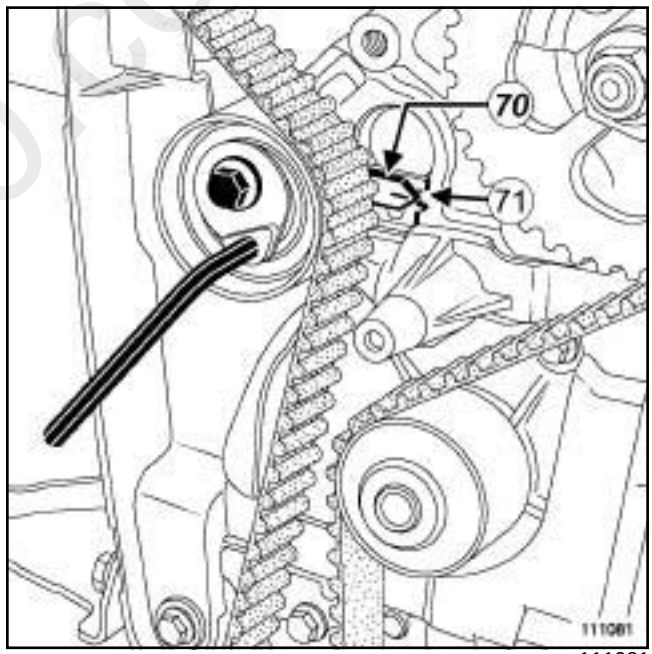
❏ Use a **torque wrench** to torque tighten:

- the **tensioning roller bolt (27 N.m)**,
- the **camshaft timing sprocket crown bolts (14 N.m)**.

Second position



111082



111081

❏ Loosen the tensioning roller bolt by no more than one turn, holding it with a **6 mm** Allen key.

❏ Gradually align the adjustable index (**70**) in the middle of the timing window (**71**) , **turning the key clockwise**.

❏ Use a **torque wrench** to torque tighten:

- the **tensioning roller bolt (27 N.m)**,
- the **camshaft timing sprocket crown bolts (14 N.m)**.

❏ Remove the following tools:

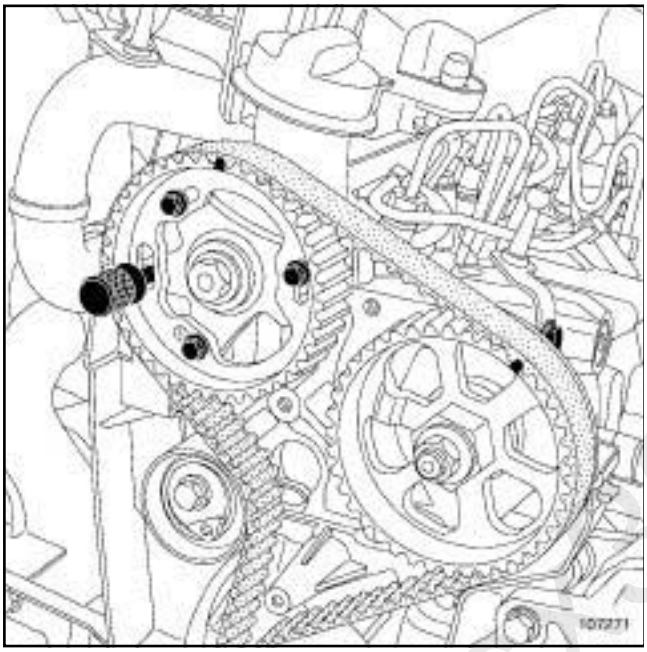
- the TDC setting pin **(Mot. 1489)**,

K9K, and 750 or 752

- the camshaft timing sprocket setting pin **(Mot. 1430)**.

❏ Rotate the crankshaft clockwise through two revolutions (timing end). Before the hole in the camshaft timing sprocket is opposite the hole in the cylinder head:

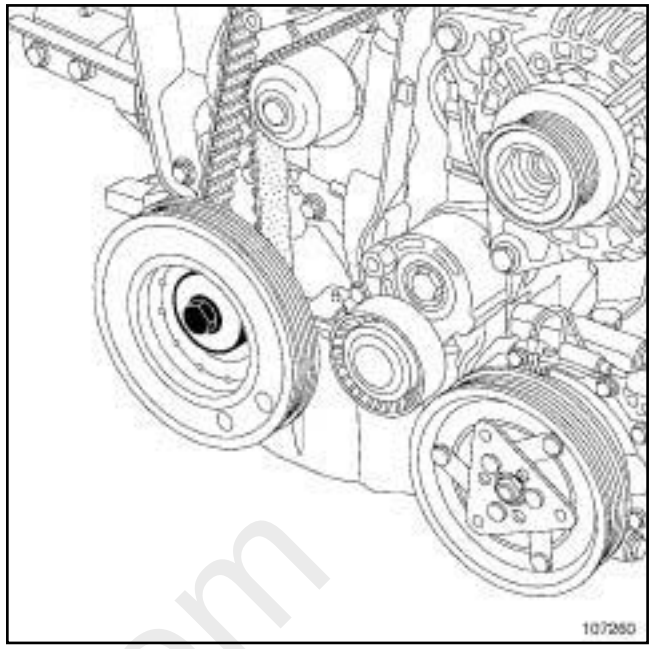
- screw the TDC setting pin **(Mot. 1489)** into the cylinder block,
- bring the crankshaft slowly and smoothly against the TDC setting pin.



107271

❏ Lock the camshaft timing sprocket using the **(Mot. 1430)**.

❏ If the pin does not engage, repeat the timing belt refitting operation.



107260

❏ Refit the accessories crankshaft pulley with a new bolt.

❏ Use a **torque/angle wrench** or a **torque wrench** and a **cylinder head bolt tightening gauge (angular measuring type)** (crankshaft against the TDC setting pin) to torque and angle tighten the **crankshaft accessories pulley M 14 bolt (120 N.m + 95° ± 15°)**.

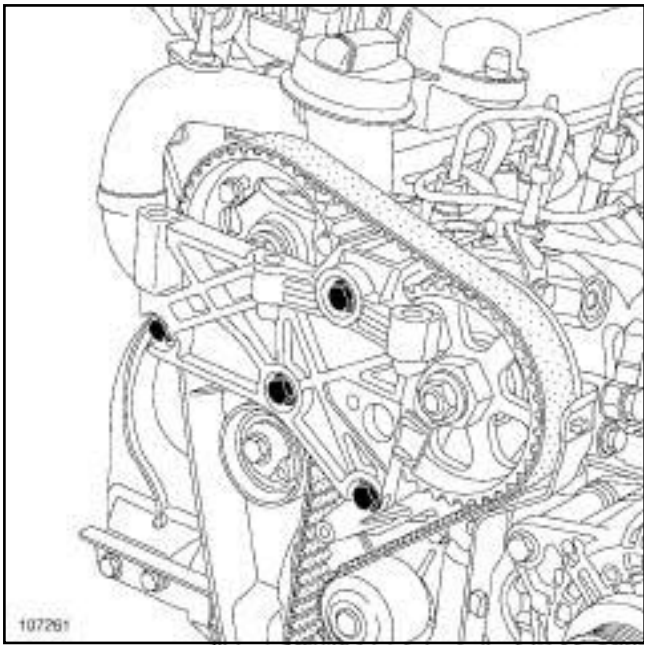
❏ Remove the following tools:

- the TDC setting pin **(Mot. 1489)**,
- the camshaft timing sprocket setting pin **(Mot. 1430)**.

❏ Refit the TDC pin plug, coating the threading with **SILICONE ADHESIVE SEALANT**.

❏ Use a **torque wrench** to torque tighten the **TDC pin plug (25 N.m)**.

K9K, and 750 or 752



107261

❏ Refit the cylinder head suspended mounting .

❏ Use a **torque wrench** to torque tighten the **cylinder head suspended mounting bolts (25 N.m)**.

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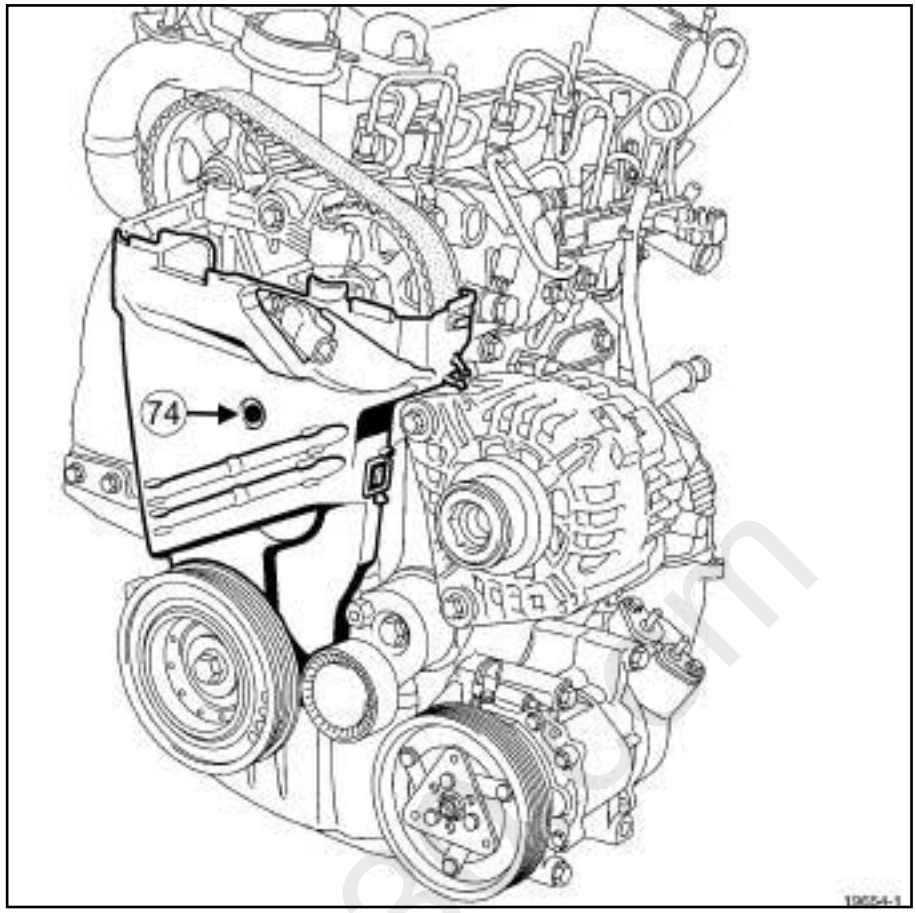
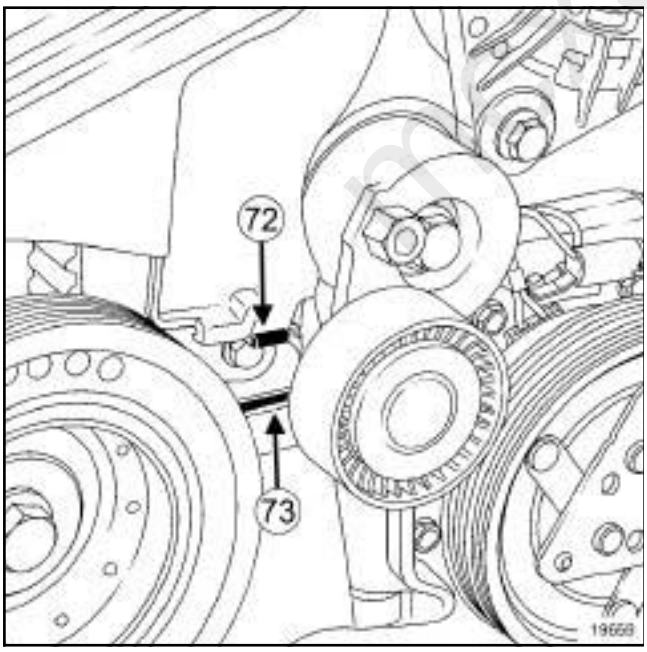
K9K, and 750 or 752



19654-1

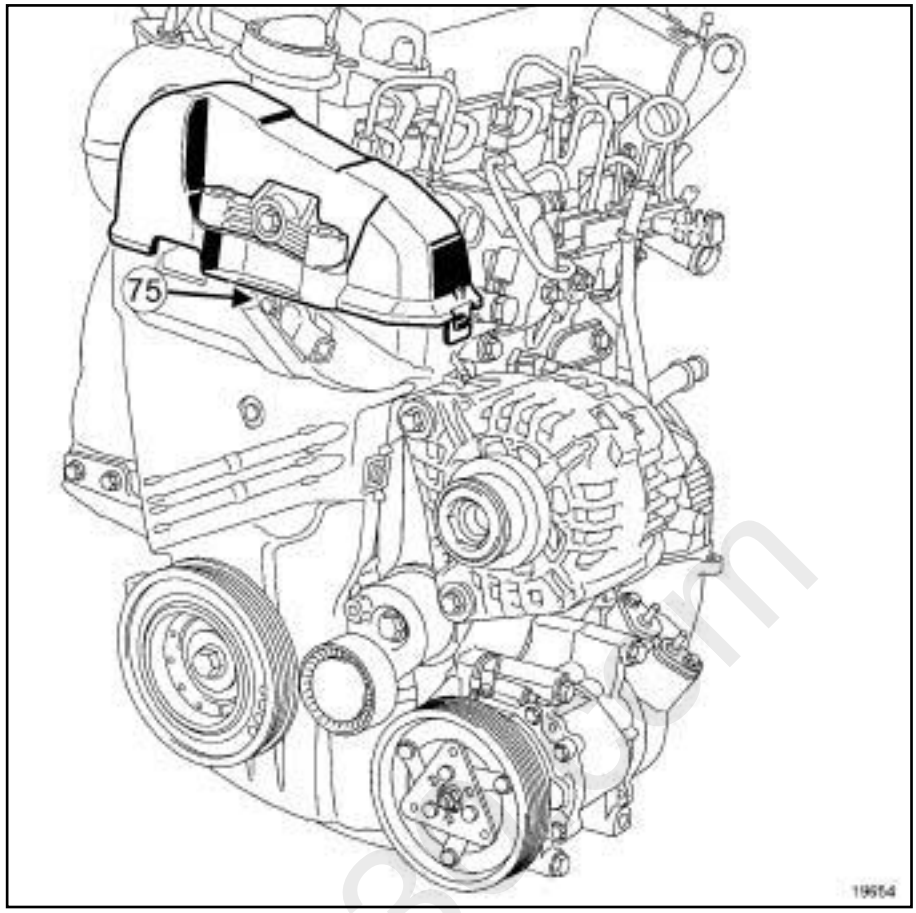


19659

❑ Refit:

- the lower timing cover, positioning the tab (**72**) in the inner timing cover hole (**73**) ,
- the timing cover plastic bolt (**74**) .

K9K, and 750 or 752



19654

❑ Refit the camshaft position sensor (**75**) .

❑ Use a **torque wrench** to torque tighten the **camshaft position sensor bolt (8 N.m)**.

❑ Refit the upper timing cover.

IV - FINAL OPERATION

❑ Refit:

- the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) ,
- the engine undertray.

❑ Refit:

- the accessories belt (see **11A**, **Top and front of engine**, **Accessories belt: Removal - Refitting**, page **11A-5**) ,
- the front section of the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,

❑ Remove:

- the chain,
- the **safety strap(s)**,
- the **(Mot. 1453)**.

❑ Refit:

- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scuttle panel grille (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the engine cover.

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

K9K, and 764 or 772

Special tooling required	
Mot. 1453	Engine anchorage support with multiple adjustments and retaining straps.
Mot. 1489	TDC locating pin.
Mot. 1430	Set of 5 crankshaft and camshaft pulley timing pins.

Equipment required
protective gloves
safety strap(s)
1/2" female torx socket (12.7 mm square drive)
offset spanner
torque/angle wrench
torque wrench
cylinder head bolt tightening gauge (angular measuring type)

Tightening torques ▽	
tensioning roller bolt	**27 N.m**
camshaft timing sprocket crown bolts	**14 N.m**
crankshaft accessories pulley M14 bolt	**120 N.m + 95°± 15°**
TDC setting pin plug	**25 N.m**
cylinder head suspended mounting bolts	**25 N.m**

IMPORTANT
Wear **protective gloves** during the operation.

WARNING
Never rotate the engine anti-clockwise (timing end).

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

PARTS AND CONSUMABLES FOR THE REPAIR WORK

❑ **Parts always to be replaced**

- Timing belt,
- Timing belt tensioning roller,
- Crankshaft accessories pulley bolt.

❑ **Consumables**

- Silicone adhesive sealant (see **Vehicle: Parts and consumables for the repair**) (MR392, 04B, Consumables - Products).

REMOVAL

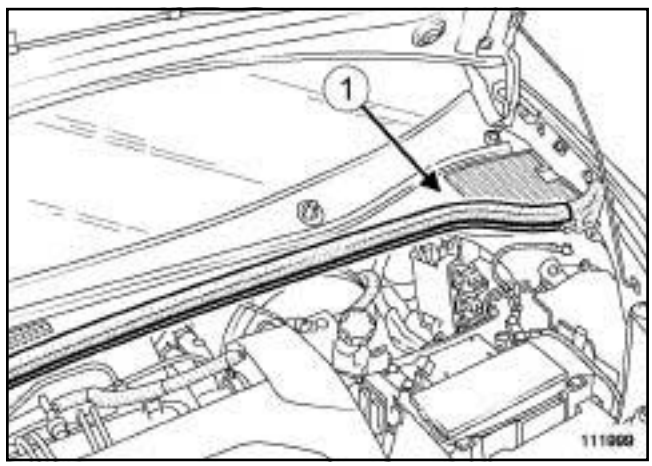
I - REMOVAL PREPARATION OPERATION

❑ Position the vehicle on a two-post lift (see **Vehicle: Towing and lifting**) (MR 392, 02A, Lifting equipment).

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

❑ Remove:

- the front right-hand wheel (see **Wheel: Removal - Refitting**) (MR 392, 35A, Wheels and tyres),
- the front section of the front right-hand wheel arch liner (see **Front wheel arch liner: Removal - Refitting**) (MR 393, 55A, Exterior protection),
- the engine undertray,
- the lower engine tie-bar (see **19D**, **Engine mounting**, **Lower engine tie-bar: Removal - Refitting**, page **19D-13**) .



111999

❑ Remove:

- the engine cover,

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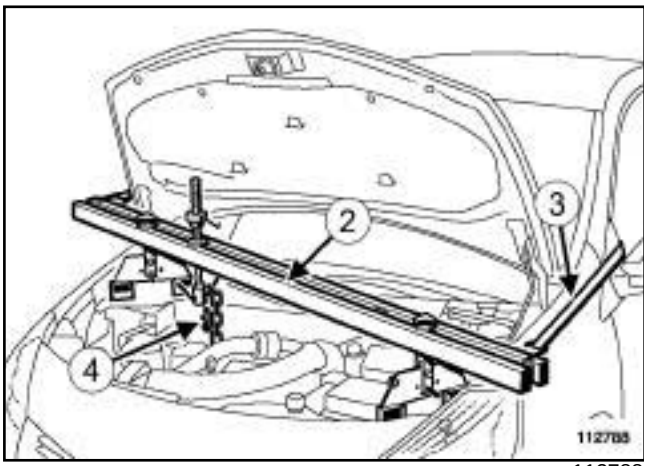
K9K, and 764 or 772

- the scuttle panel grille (**1**) (see **Scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment),
- the scoop under the scuttle panel grille (see **Scoop under the scuttle panel grille: Removal - Refitting**) (MR 393, 56A, Exterior equipment).



112788

❏ Position the **(Mot. 1453)** (**2**) and hold it in place using a **safety strap(s)** (**3**) .

❏ Fit a chain (**4**) on the lifting eye of the crankshaft end to enable the engine to be lifted using the **(Mot. 1453)**.

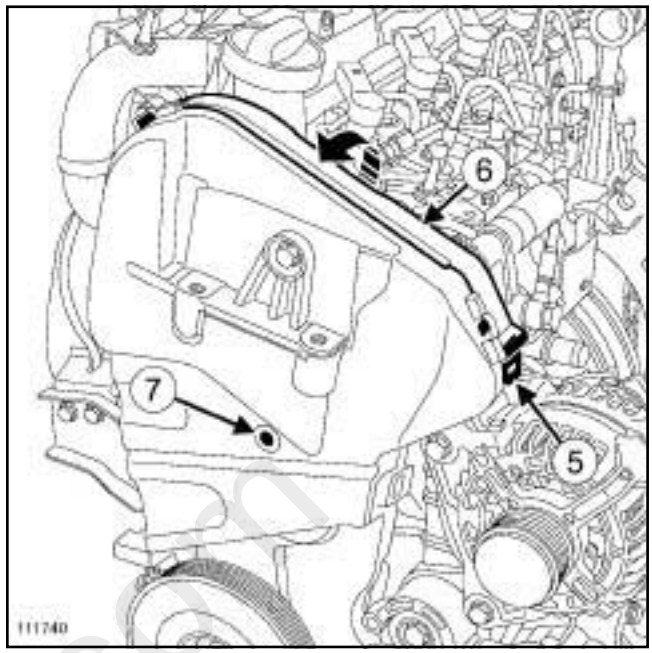
❏ Remove:

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

Note:

Do not damage the air conditioning pipes.

II - OPERATION FOR REMOVAL OF PART CONCERNED

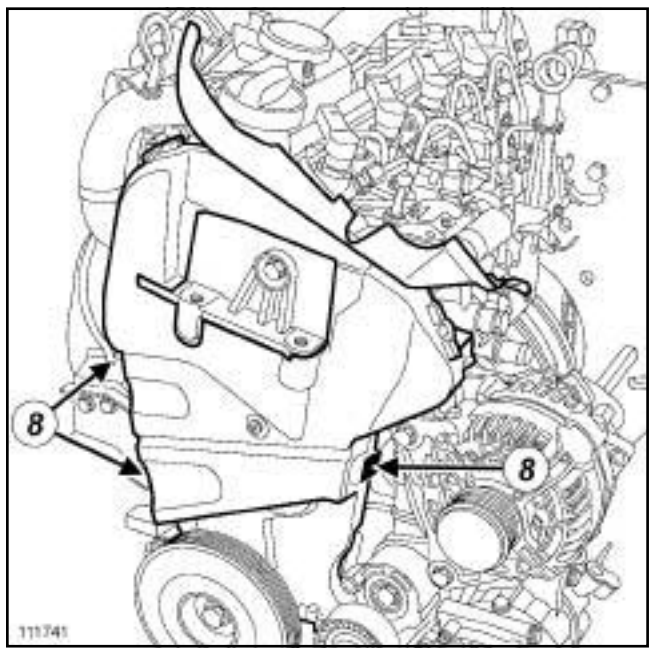


111740

❏ Unclip the tab (**5**) .

❏ Rotate the timing cover (**6**) in the direction of the arrow.

❏ Remove the plastic bolt (**7**) .

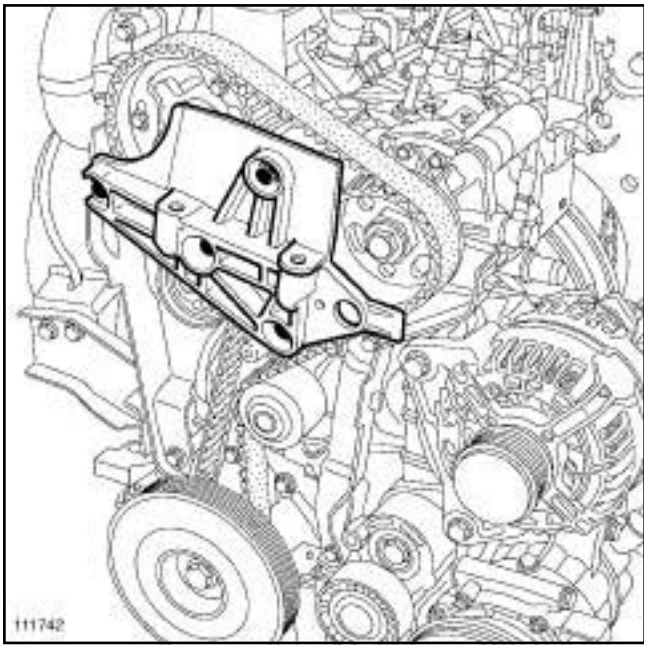


111741

❏ Unclip the three tabs (**8**) .

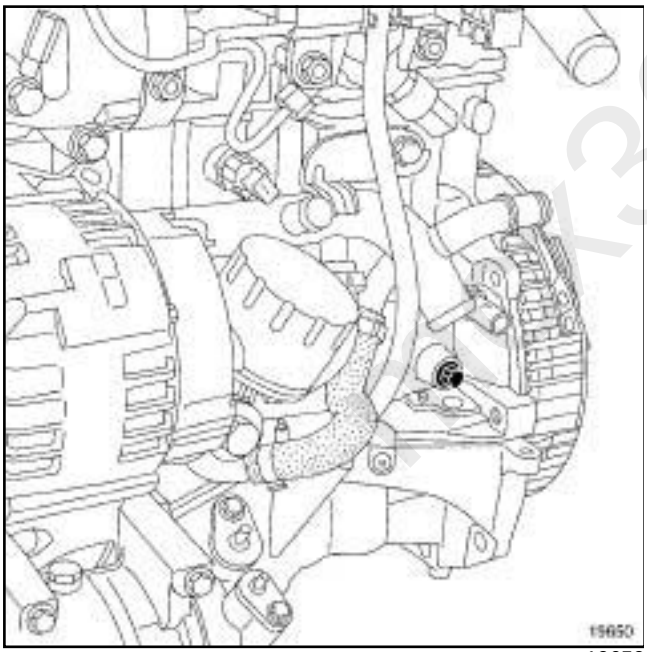
❏ Remove the timing cover.

K9K, and 764 or 772



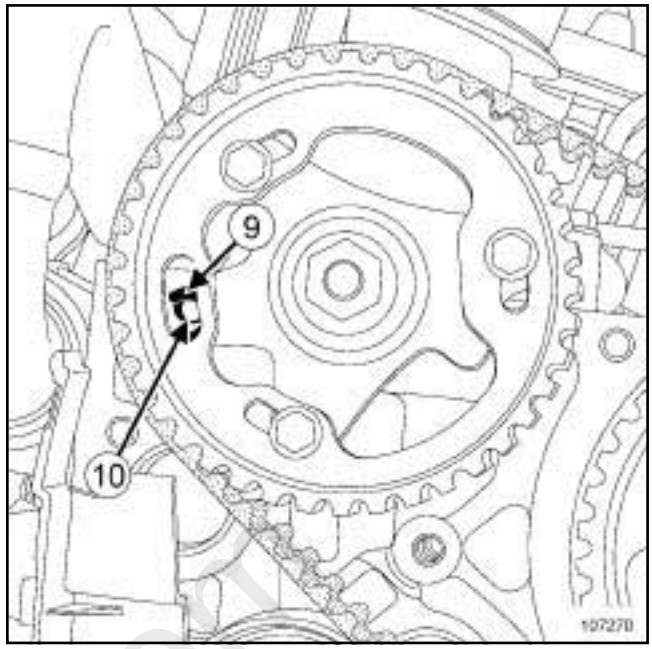
111742

❏ Remove the cylinder head suspended mounting .



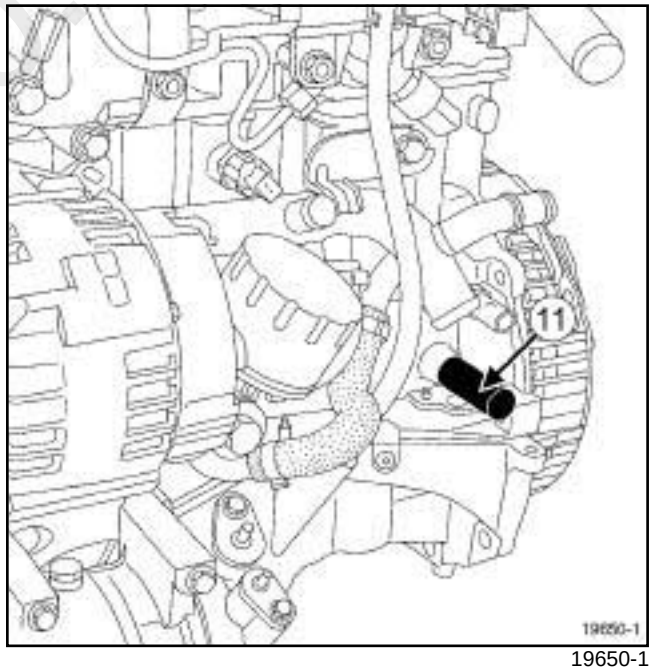
19650

❏ Remove the TDC pin plug using a **1/2" female torx socket (12.7 mm square drive) (14)**.



107270

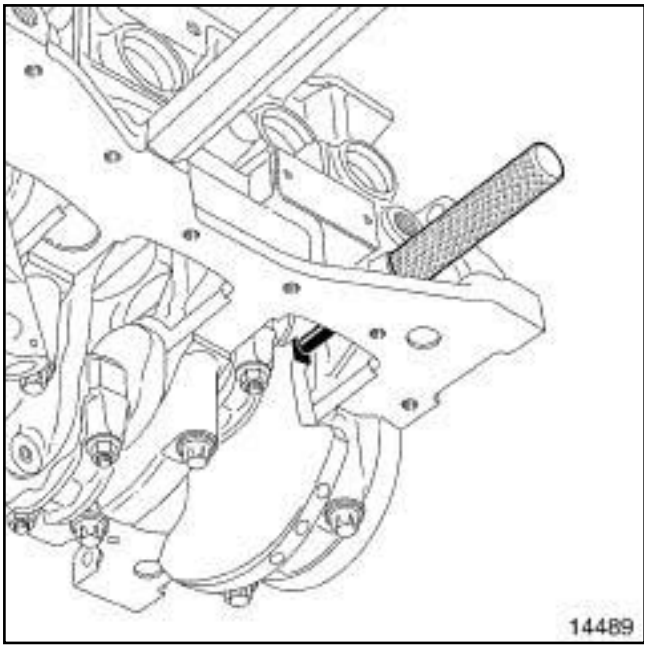
❏ Rotate the crankshaft clockwise (timing end) to position the hole (**9**) in the camshaft timing sprocket almost opposite the hole (**10**) in the cylinder head.



19650-1

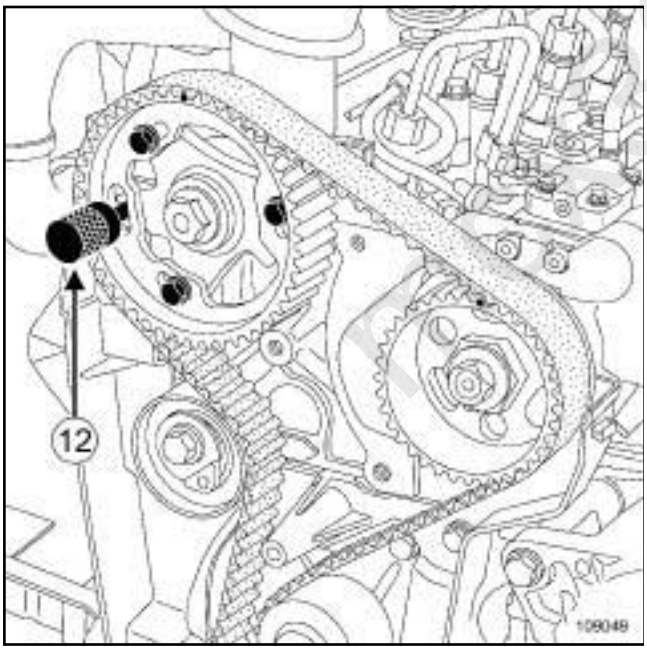
❏ Screw in the TDC setting pin (**11**) **(Mot. 1489)**.

K9K, and 764 or 772



14489

❏ Turn the crankshaft clockwise (timing end) smoothly until the crankshaft comes into contact with the TDC setting pin.



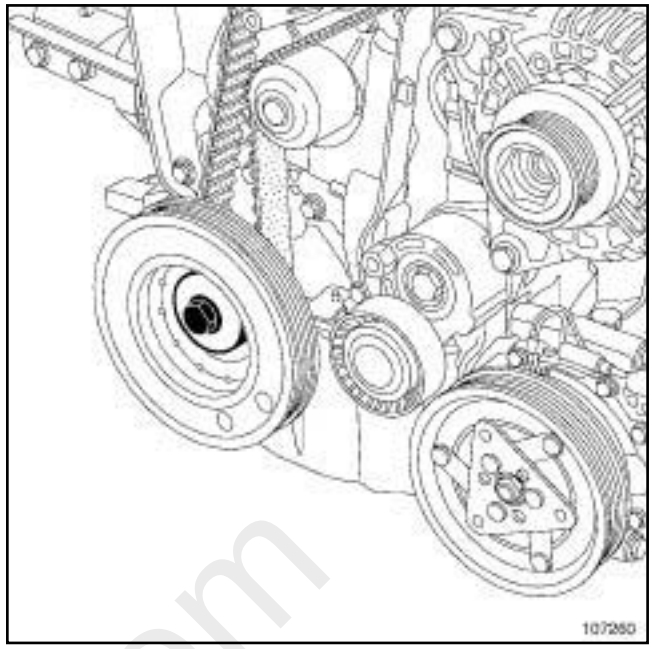
109049

❏ Engage the pin (**12**) **(Mot. 1430)** in the camshaft timing sprocket and cylinder head holes.

❏ Remove:

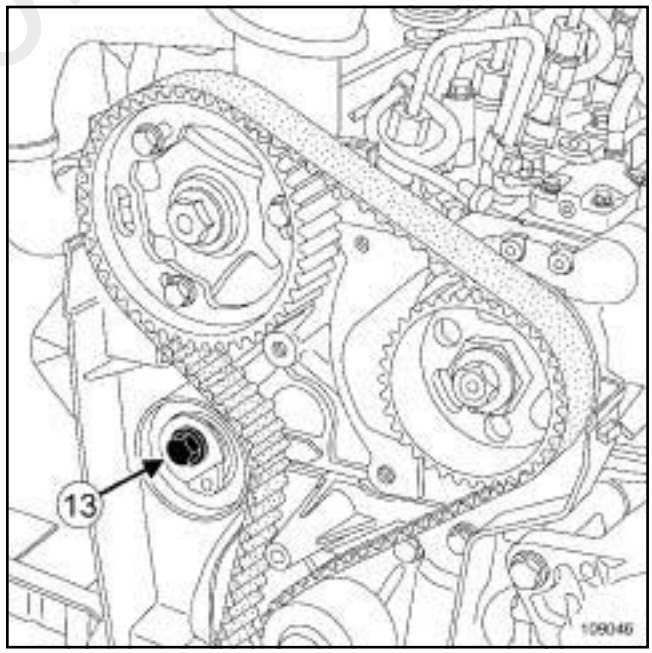
- the camshaft timing sprocket setting pin **(Mot. 1430)**,
- the TDC setting pin **(Mot. 1489)**.

❏ Remove the starter (see **16A**, **Starting - Charging**, **Starter: Removal - Refitting**, page **16A-23**) .



107260

❏ Remove the crankshaft accessories pulley by locking the flywheel with a large flat-blade screwdriver and passing via the starter location.



109046

❏ Slacken the tensioning roller bolt (**13**) .

❏ Slacken the timing tension wheel by turning the eccentric cam using a **6 mm** Allen key.

❏ Remove:

- the timing belt,
- the timing tensioning roller.

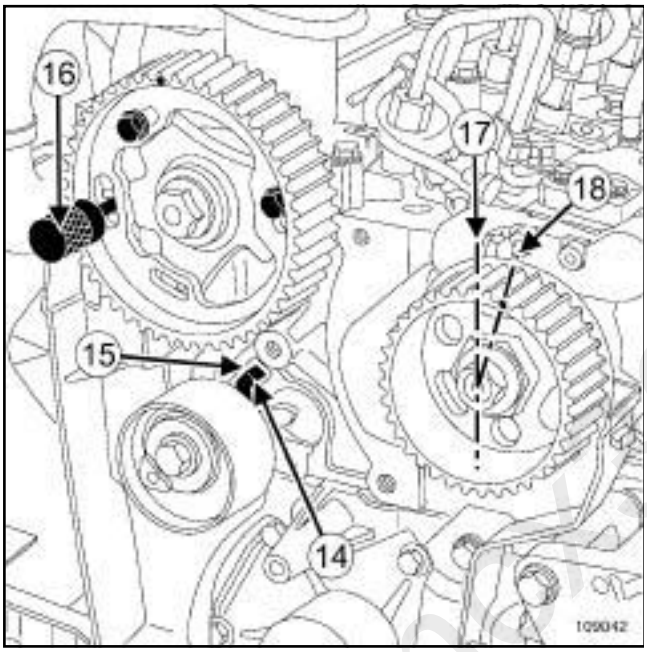
K9K, and 764 or 772

REFITTING

I - REFITTING OPERATION FOR PART CONCERNED

❑ Check:

- that there is no oil leak from the camshaft and crankshaft seals,
- the condition of the coolant pump (hard seal, play in the shaft, fluid leak, shaft rotation, (see **Technical Note 3175A, Cooling system fault finding, 19A, Cooling, Cooling system - Fault finding chart ALP 8**).



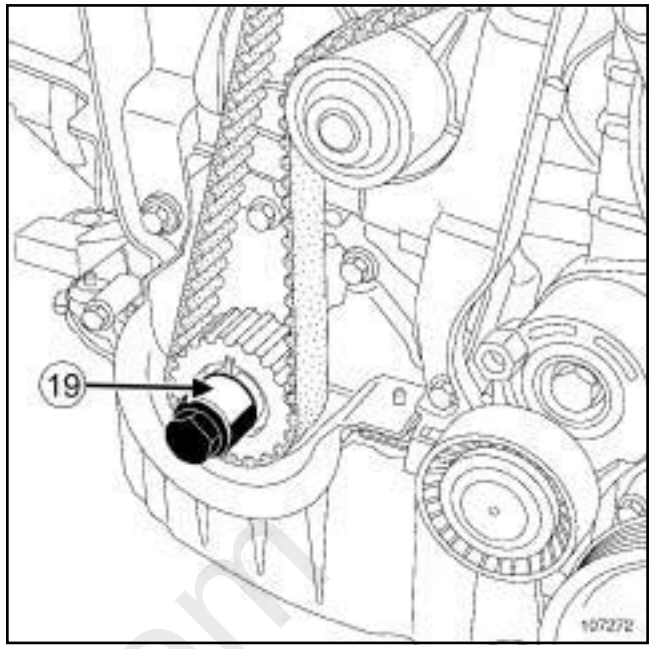
109042

❑ Refit the timing tensioning roller.

❑ Put the tensioning roller lug (**14**) in the cylinder head groove (**15**) .

❑ Engage the pin (**16**) **(Mot. 1430)** in the camshaft timing sprocket and cylinder head holes, turning the camshaft using a **offset spanner (18 mm)** if necessary.

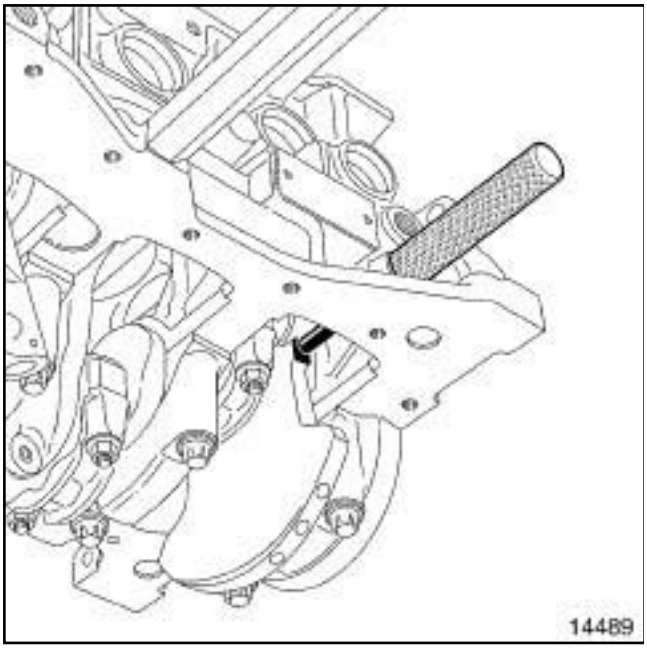
❑ Check that the high pressure pump mark (**18**) has shifted one tooth to the right of the vertical axle (**17**) .



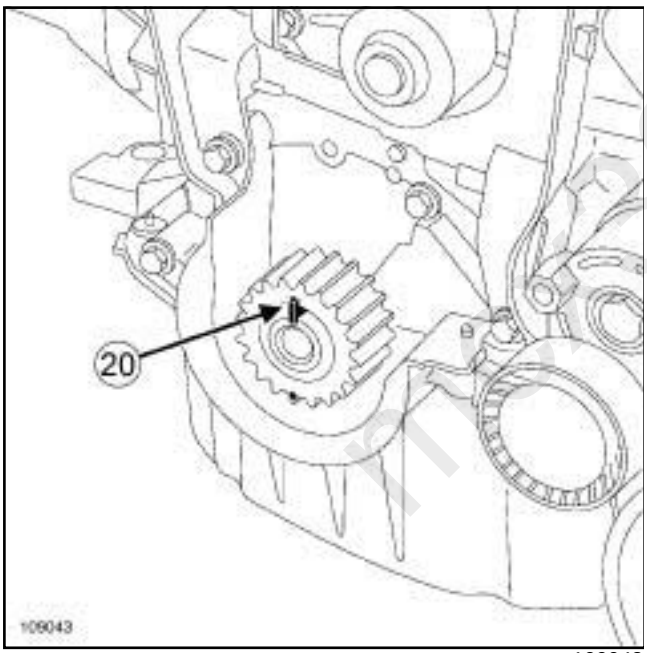
107272

❑ Tighten the old crankshaft accessories pulley bolt fitted with a spacer (which does not cover the timing sprocket mark) (**19**) onto the crankshaft.

K9K, and 764 or 772

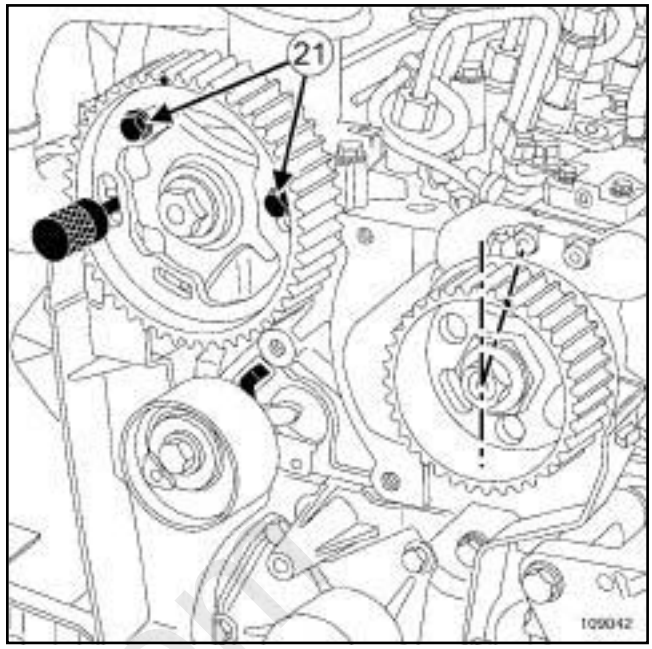


14489



109043

❑ Position the crankshaft so that it presses on the TDC setting pin **(Mot. 1489)** (the crankshaft timing sprocket collet (**20**) must face upwards).

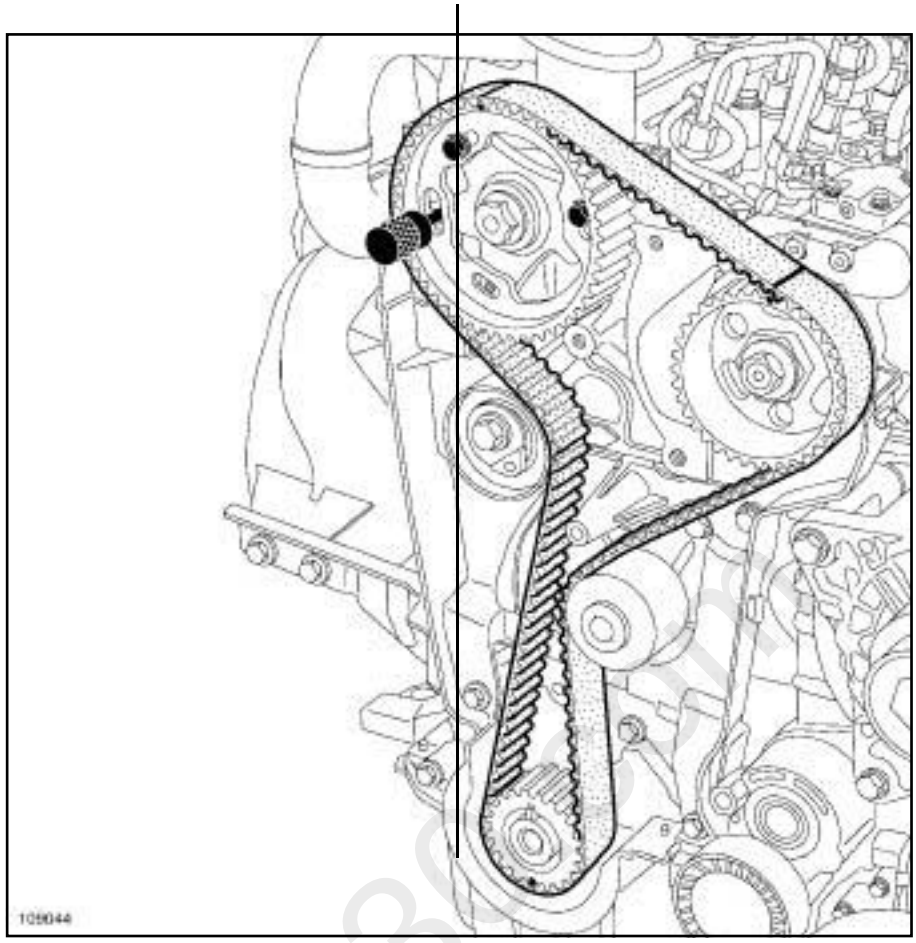


109042

❑ Remove one of the camshaft timing sprocket crown bolts to prevent full lock during the following actions.

❑ Loosen the other two camshaft timing sprocket crown bolts (**21**) by one turn.

K9K, and 764 or 772

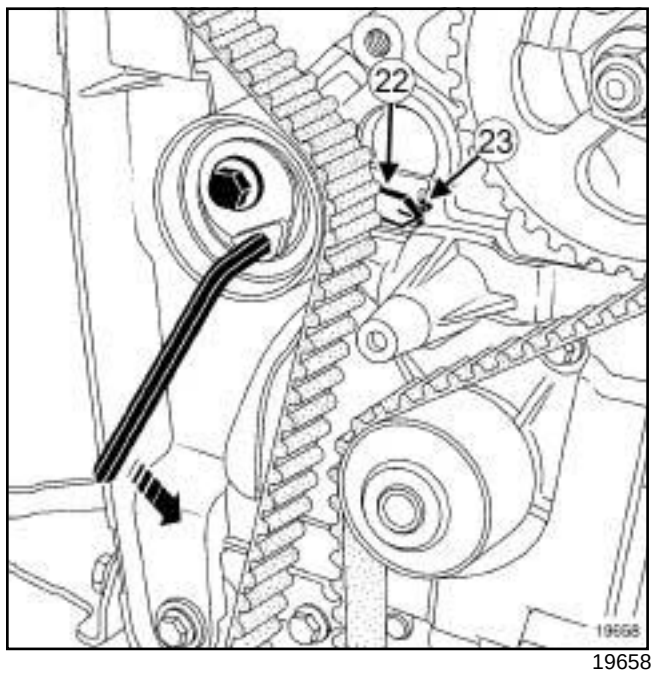


109044

❑ Fit the timing belt, starting with the crankshaft sprocket, by aligning the marks on the belt with those on the crankshaft and camshaft sprockets, and the high pressure pump pinion.

Note:

There should be 19 tooth valleys on the belt between the camshaft sprocket marks and the high-pressure pump, and 51 tooth valleys between the crankshaft sprockets and the high-pressure pump.

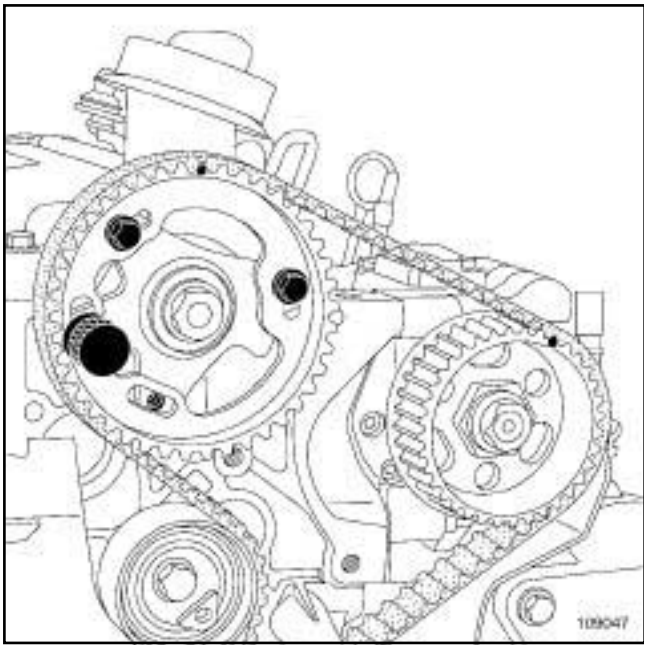


19658

❑ Position the tensioning roller adjustable index marker (**22**) opposite the lug (**23**) , turning the eccentric cam anti-clockwise using a **6 mm** Allen key.

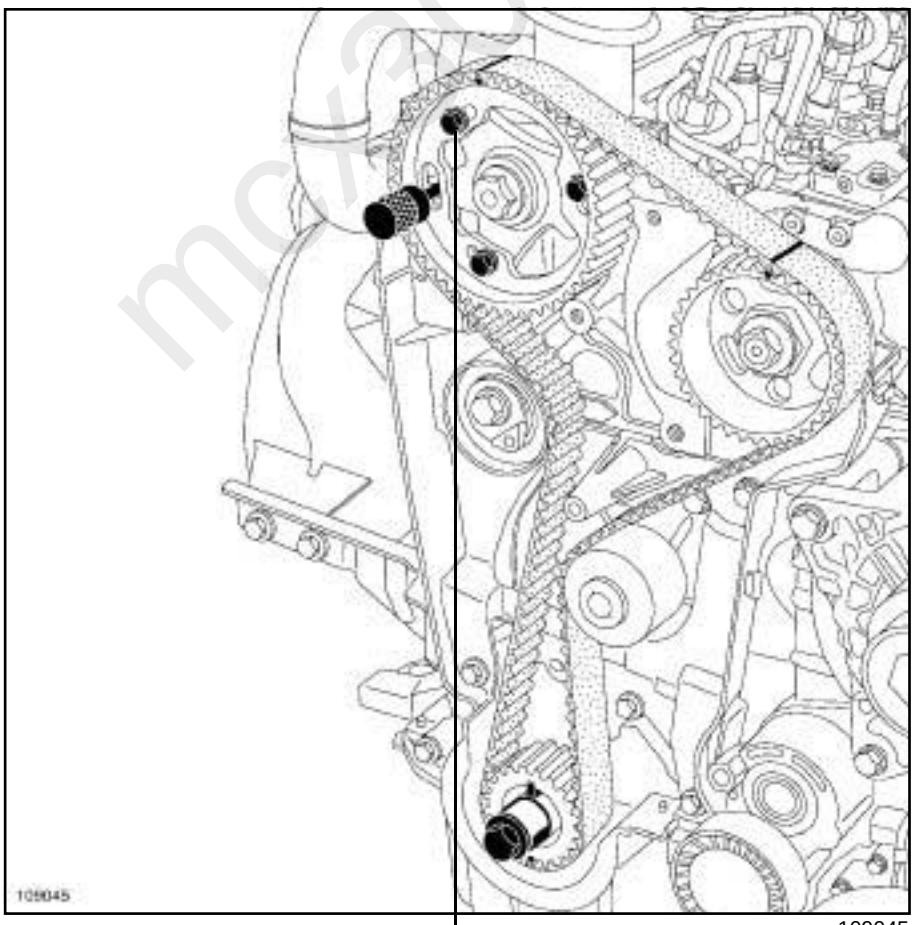
❑ Torque tighten the **tensioning roller bolt (27 N.m)**.

K9K, and 764 or 772



109047

❏ Check that the camshaft timing sprocket crown bolts are not fully locked against the camshaft timing sprocket crown. If they are, repeat the timing belt re-fitting procedure.



109045

❏ Refit the bolt from the camshaft timing sprocket crown.

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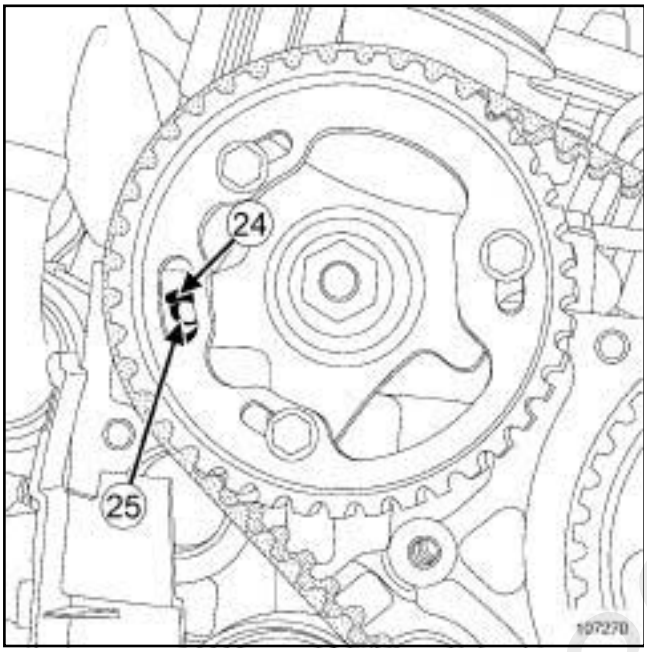
K9K, and 764 or 772

❏ Torque tighten the **camshaft timing sprocket crown bolts (14 N.m)**.

❏ Remove:

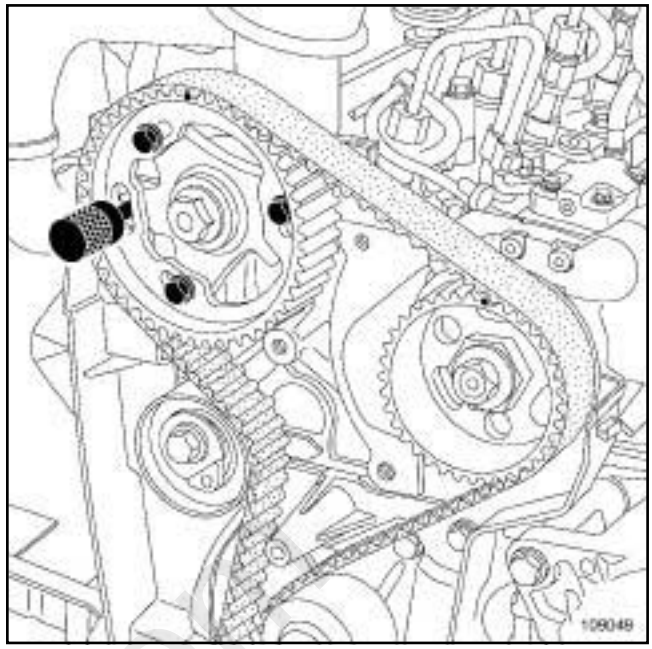
- the TDC setting pin **(Mot. 1489)**,
- the camshaft timing sprocket setting pin **(Mot. 1430)**.



107270

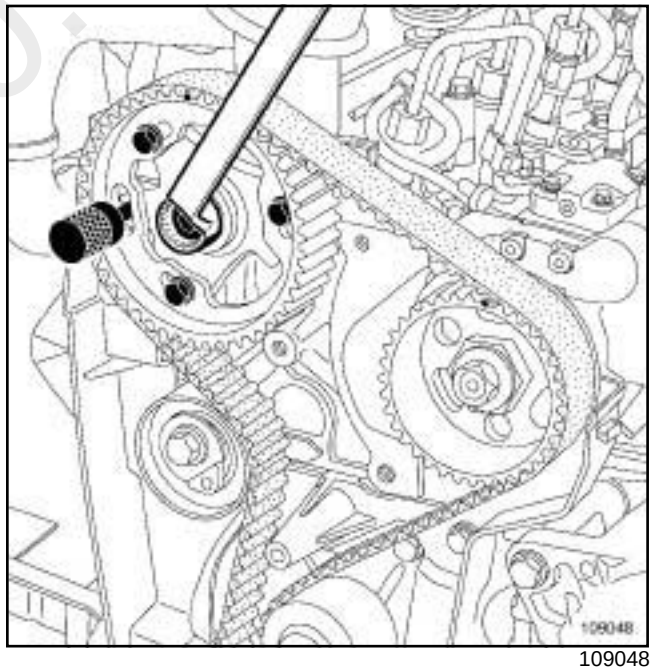
❏ Rotate the crankshaft clockwise through two revolutions (timing end). Before the hole (**24**) in the camshaft timing sprocket is opposite the hole (**25**) in the cylinder head:

- screw the TDC setting pin **(Mot. 1489)** into the cylinder block,
- bring the crankshaft slowly and smoothly against the TDC setting pin.



109049

❏ Lock the camshaft timing sprocket using the **(Mot. 1430)**.



109048

❏ If the pin **(Mot. 1430)** does not engage:

- loosen the camshaft timing sprocket crown bolts by a maximum of one turn,
- turn the camshaft timing sprocket hub using an **18 mm** offset spanner to facilitate setting of the camshaft timing sprocket hub,
- do not retighten the camshaft timing sprocket crown bolts.

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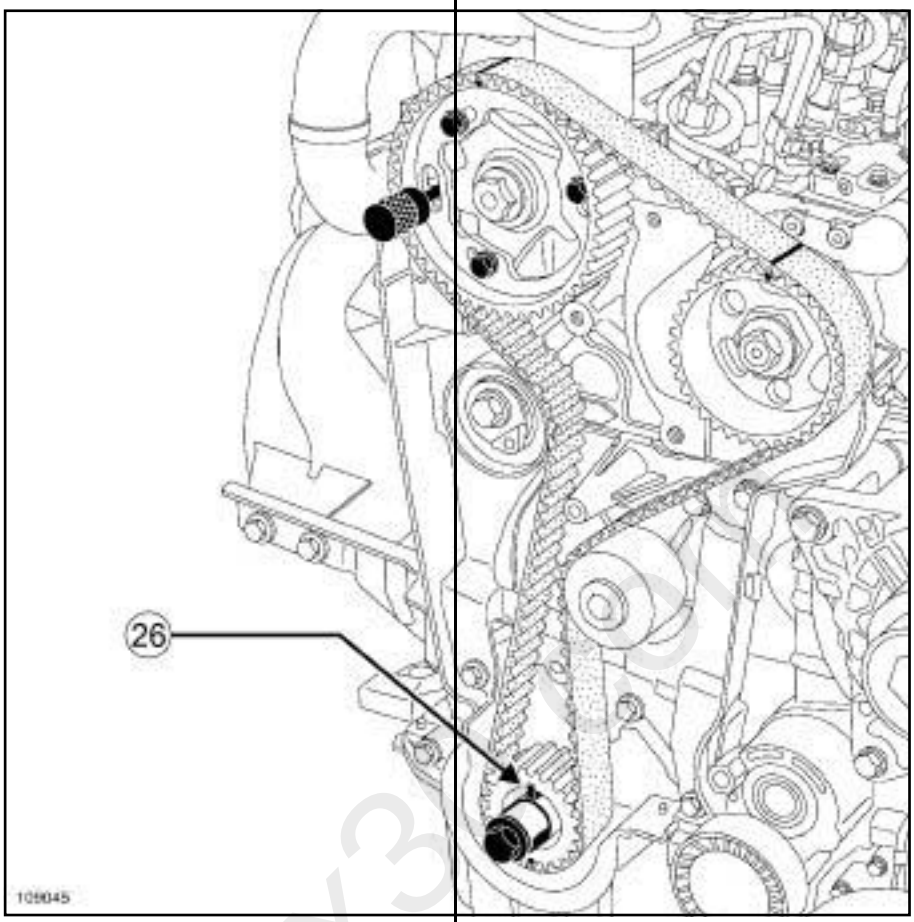
K9K, and 764 or 772

❏ Loosen the camshaft timing sprocket crown bolts by a maximum of one turn.



109045

❏ Check that the crankshaft timing sprocket collet (**26**) is positioned vertically at the top.

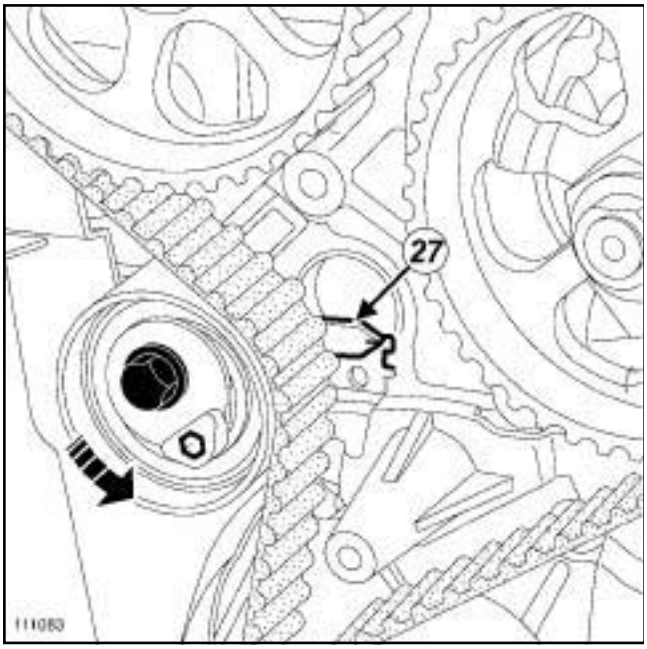
Note:

After two turns, the tension wheel index markers may be in two different positions.

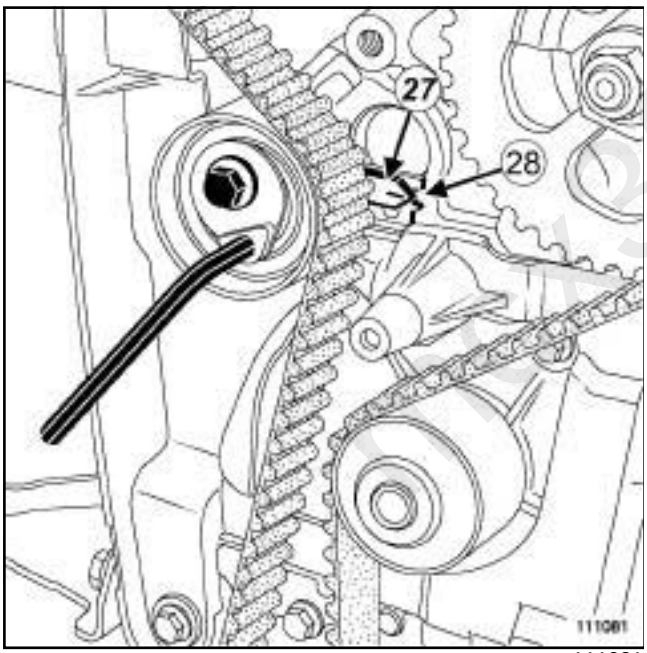
The rotation of the tension wheel eccentric depends on the position.

K9K, and 764 or 772

First position



111083



111081

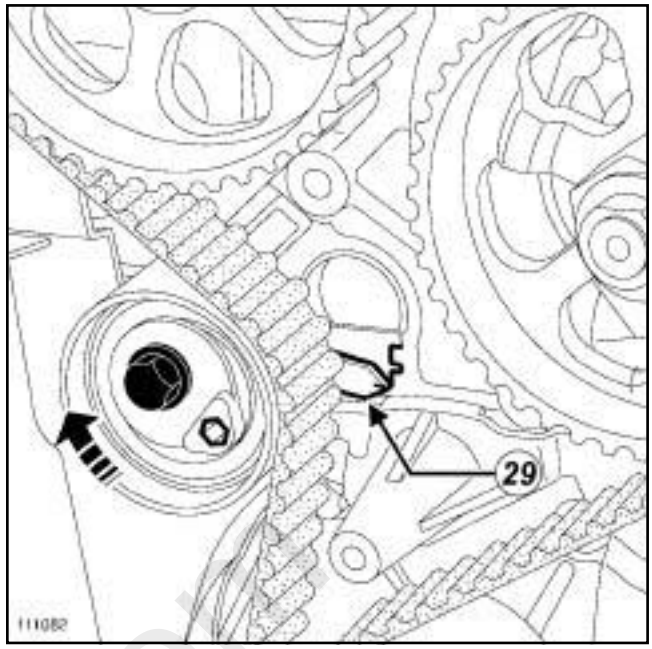
❏ Loosen the tensioning roller bolt by no more than one turn, holding it with a **6 mm** Allen key.

❏ Gradually align the adjustable index (**27**) in the middle of the timing window (**28**) , turning the key anti-clockwise.

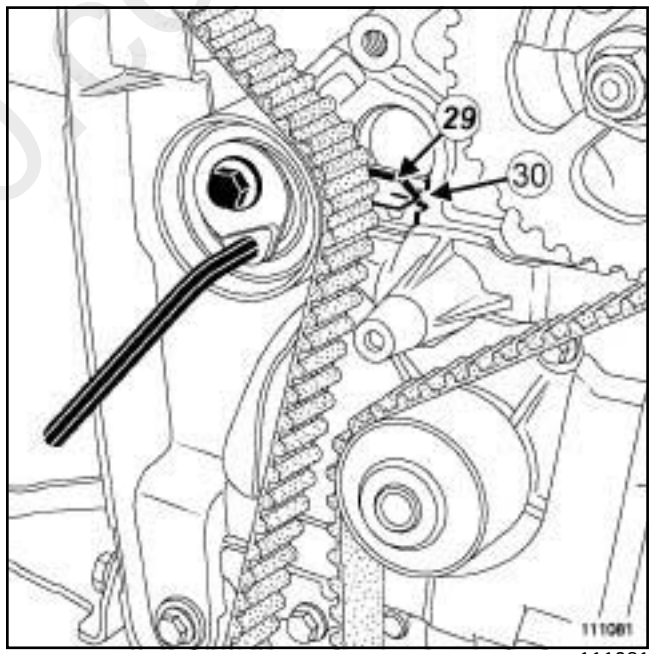
❏ Torque tighten:

- the **tensioning roller bolt (27 N.m)**,
- the **camshaft timing sprocket crown bolts (14 N.m)**.

Second position



111082



111081

❏ Loosen the tensioning roller bolt by no more than one turn, holding it with a **6 mm** Allen key.

❏ Gradually align the adjustable index (**29**) in the middle of the timing window (**30**) , turning the key clockwise.

❏ Torque tighten:

- the **tensioning roller bolt (27 N.m)**,
- the **camshaft timing sprocket crown bolts (14 N.m)**.

❏ Remove the following tools:

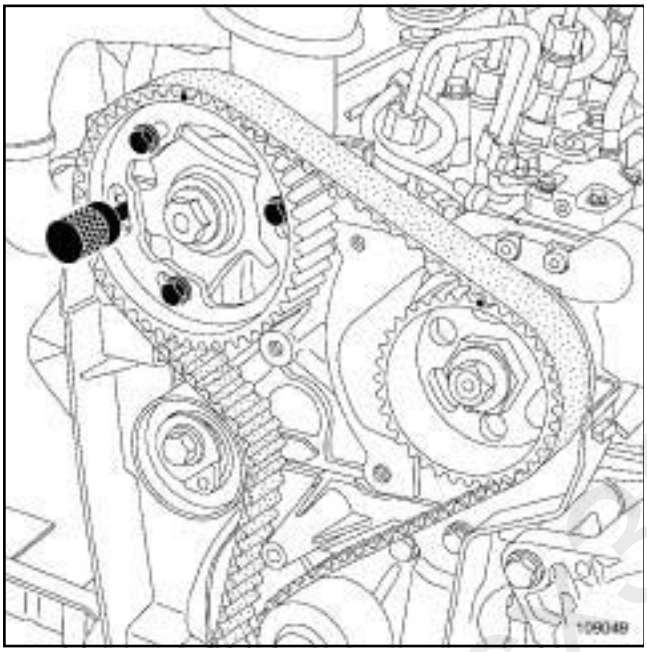
- the TDC setting pin **(Mot. 1489)**,

K9K, and 764 or 772

- the camshaft timing sprocket setting pin **(Mot. 1430)**.

❏ Rotate the crankshaft clockwise through two revolutions (timing end). Before the hole in the camshaft timing sprocket is opposite the hole in the cylinder head:

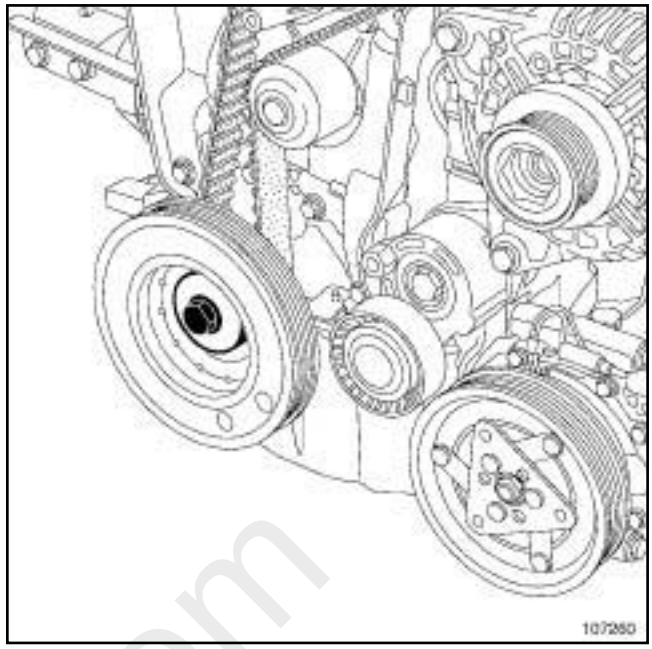
- screw the TDC setting pin **(Mot. 1489)** into the cylinder block,
- bring the crankshaft slowly and smoothly against the TDC setting pin.



109049

❏ Lock the camshaft timing sprocket using the **(Mot. 1430)**.

❏ If the pin does not engage, repeat the timing belt refitting operation.



107260

❏ Refit the accessories crankshaft pulley with a new bolt.

❏ Torque and angle tighten (crankshaft against the TDC setting pin) the **crankshaft accessories pulley M14 bolt (120 N.m + 95°± 15°)** using a **torque/angle wrench** or a **torque wrench** fitted with a **cylinder head bolt tightening gauge (angular measuring type)**.

❏ Remove the following tools:

- the TDC setting pin **(Mot. 1489)**,
- the camshaft timing sprocket setting pin **(Mot. 1430)**.

❏ Refit the TDC pin plug, coating the threading with **SILICONE ADHESIVE SEALANT**.

❏ Torque tighten the **TDC setting pin plug (25 N.m)**.

❏ Refit the starter (see **16A**, **Starting - Charging**, **Starter: Removal - Refitting**, page **16A-23**) .

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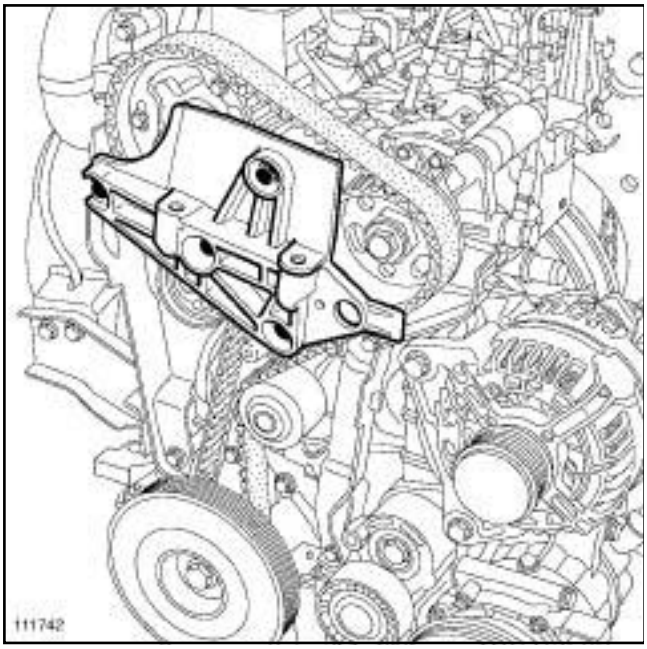
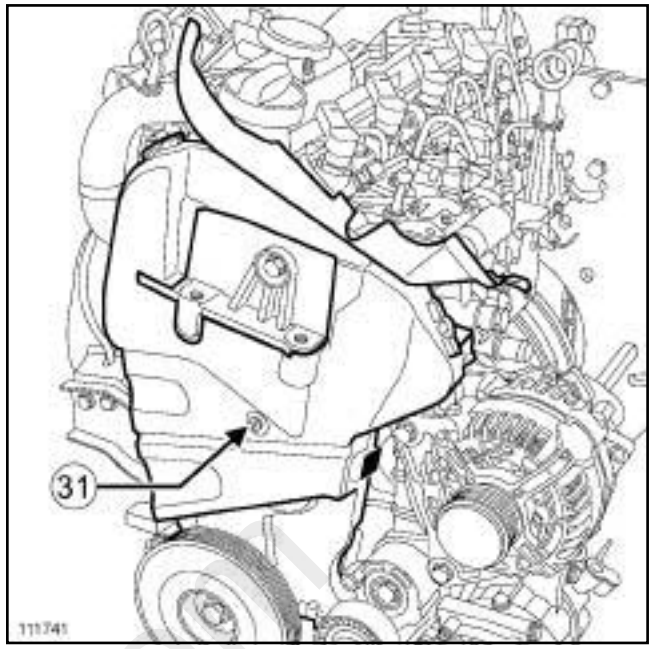


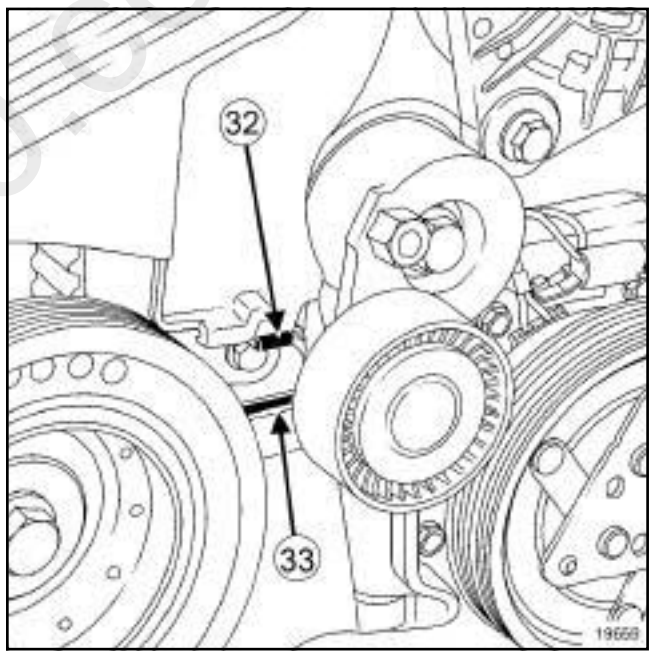
111742

❑ Refit the cylinder head suspended mounting .

❑ Torque tighten the **cylinder head suspended mounting bolts (25 N.m)**.



111741



19659

❑ Refit:

- the timing cover, positioning the tab (**32**) in the inner timing cover hole (**33**) ,
- the timing cover plastic bolt (**31**) .

II - FINAL OPERATION

❑ Refit:

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

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K9K, and 764 or 772

- the right-hand suspended engine mounting (see **19D**, **Engine mounting**, **Right-hand suspended engine mounting: Removal - Refitting**, page **19D-22**) ,

❑ Remove:

- the **safety strap(s)**,
- the chain,
- the **(Mot. 1453)**.

❑ Refit:

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

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

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