

Espace

N.T. 3219A

JE0N

ESPACE FITTED WITH THE F4R ENGINE

**For parts not described in this technical note refer to Workshop Repair
Manual M.R. 315.**

77 11 205 204

MAY 1999

Edition Anglaise

"The repair methods given by the manufacturer in this document are based on the technical specifications current when it was prepared.

The methods may be modified as a result of changes by the manufacturer in the production of the various component units and accessories from which his vehicles are constructed".

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This note is a supplement to Technical Note 3107A (engine and cooling section) and covers the special features of Espace vehicles fitted with automatic transmission.

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ENGINE AND PERIPHERALS ASSEMBLY Specifications

10

Engine	Index	Cubic capacity (cm³)	Bore (mm)	Stroke (mm)	Compression ratio
F4R	700 701	1998	82.7	93	9.8/1

CYLINDER HEAD

Removal of the cylinder head requires the removal/refitting of the engine and transmission assembly (see Section 10-2 NT 3107A)

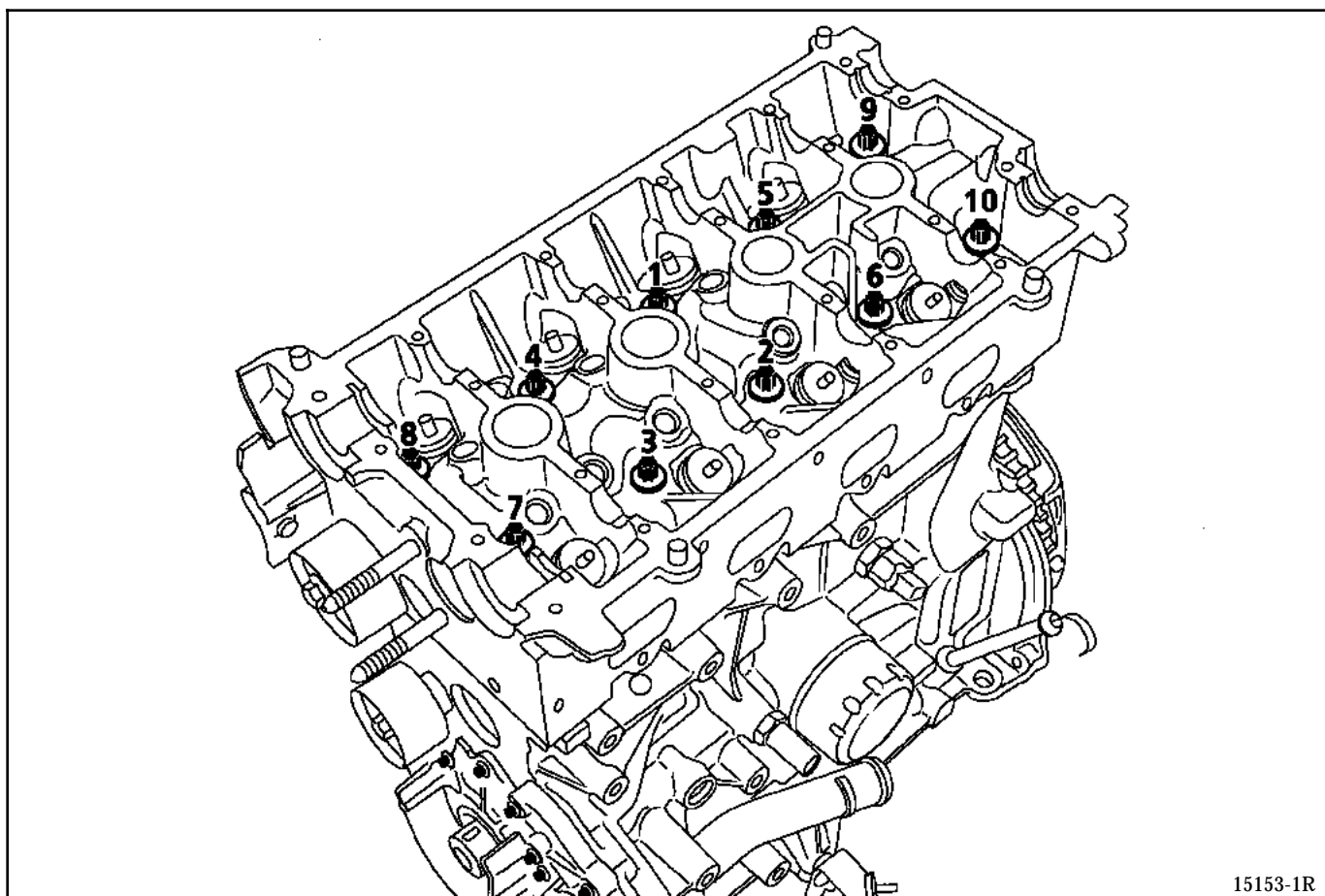
The bolts can be reused if the length under the head does not exceed 118.5 mm (otherwise change all the bolts).

Cylinder head tightening procedure

REMINDER: to achieve correct tightening of the bolts, remove any oil from the cylinder head securing holes using a syringe.

Do not coat new bolts with oil. However, if the bolts are reused, it is essential to coat them with engine oil.

Tighten all the bolts to **2 daN.m** in the order indicated below.



15153-1R

Check that all the bolts are correctly tightened to **2 daN.m**, then carry out angular tightening (bolt by bolt) of $165^\circ \pm 6^\circ$.

No retightening of the cylinder head bolts following application of this procedure.

VALVES

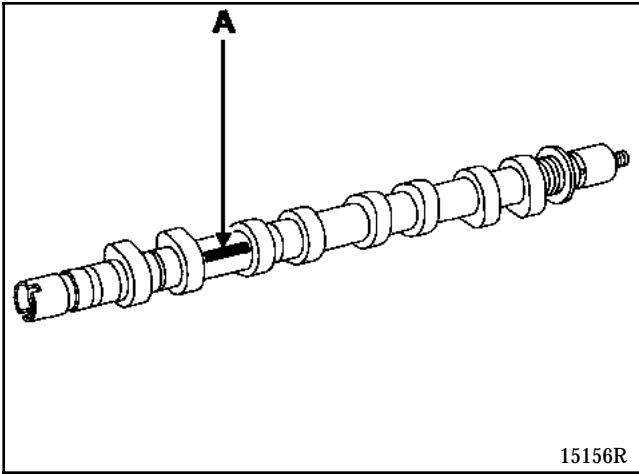
Valve lift (in mm)

Inlet:	10
Exhaust:	10

Camshafts

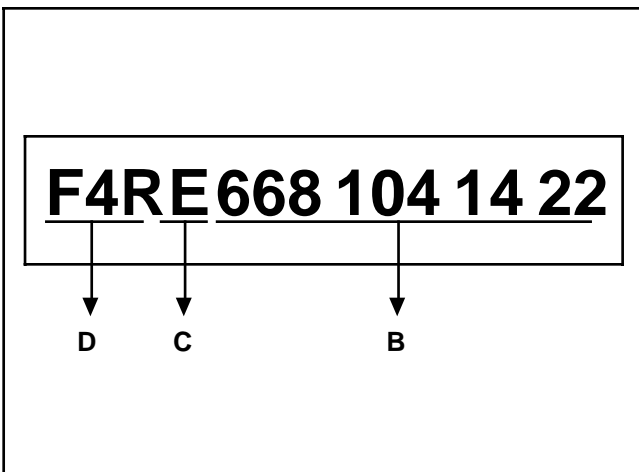
The camshafts are identified

- either by a mark (A).

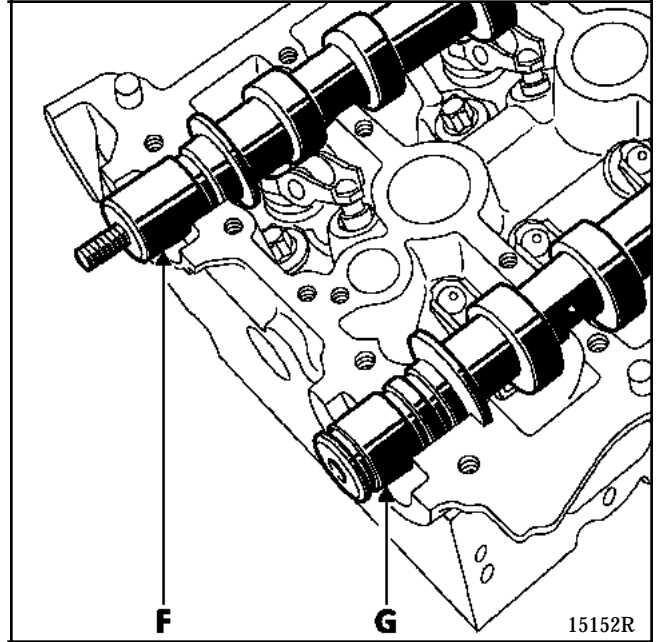


Details of mark (A) :

- mark (B) is only used by the supplier,
 - mark (C) identifies the camshafts:
 - A = Inlet
 - E = Exhaust
 - mark (D) indicates the engine type
- Example:



- or by the ends of the camshafts.



- **F exhaust** camshaft
- **G inlet** camshaft

Timing diagram (cannot be checked)

Diagram with the intake not dephased

	Inlet camshaft		Exhaust camshaft	
	Cam 1	Cam 2	Cam 1	Cam 2
Intake opening delay*	- 10	- 14	-	-
Intake closing delay	40	44	-	-
Exhaust opening advance	-	-	24	20
Exhaust closing advance**	-	-	- 4	0

Diagram with the intake dephased

	Inlet camshaft		Exhaust camshaft	
	Cam 1	Cam 2	Cam 1	Cam 2
Intake opening delay*	6	2	-	-
Intake closing delay*	24	28	-	-
Exhaust opening advance	-	-	24	20
Exhaust closing advance**	-	-	- 4	0

* As the Intake Opening Delay is negative, the valves open after **TDC**.

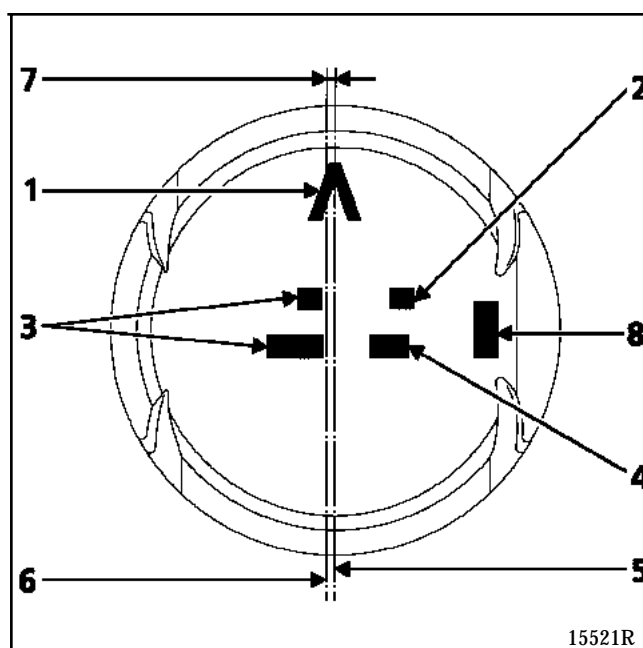
** As the Exhaust Closing Advance is negative, the valves close before **TDC**.

PISTONS

SMP piston

The pin is free in the connecting rod and in the piston.

Piston marking



- 1 The direction of the piston Δ engine flywheel side
- 2 The piston category (2-3)
- 3 Only used by the supplier
- 4 Only used by the supplier
- 5 Piston line of symmetry
- 6 Piston pin hole line
- 7 Offset between the hole of line (6) and the piston symmetry line (5) is **0.8 mm**
- 8 Identification of the piston in relation to the engine, marking of the cubic capacity of the engine (2) corresponds to the **F4R** engine.

CONNECTING RODS

Lateral clearance of the big end (**in mm**)
0.22 to 0.402

Centreline distance between the big end and the
little end (**in mm**)
144 ± 0.035

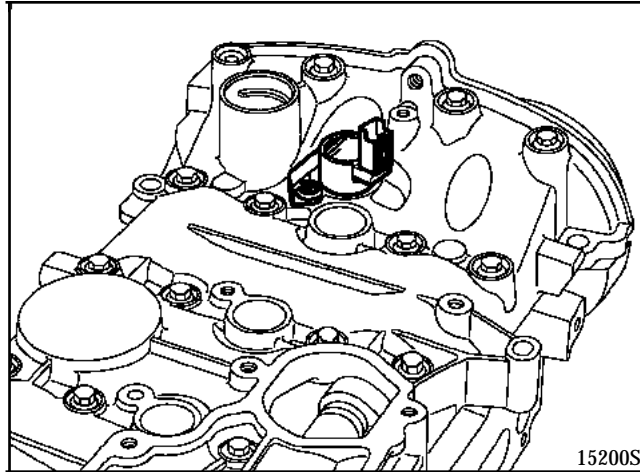
Big end diameter (**in mm**)
51.587 $\begin{matrix} 0 \\ -0.019 \end{matrix}$

Little end diameter (**in mm**)
23 (without ring)
21 (with ring)

Replacement of the control solenoid valve seal

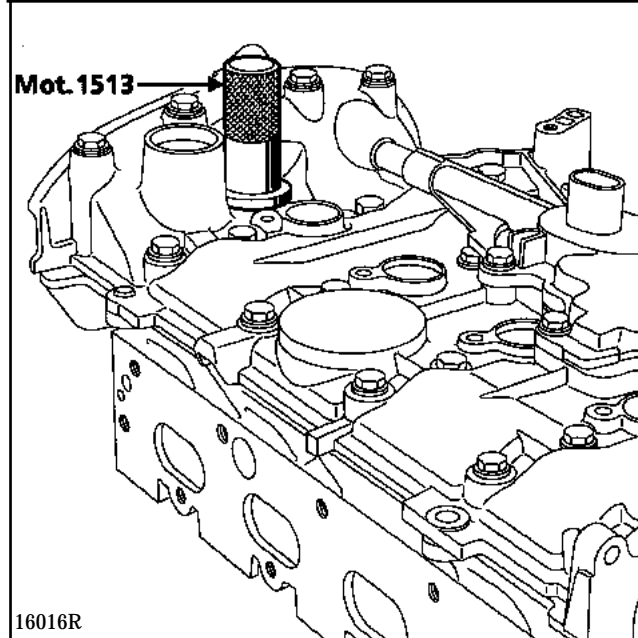
Remove:

- the coil,
- the solenoid valve,



- the seal.

The seal is refitted using tool **Mot. 1513**.



Refit in the reverse order to removal.

ESSENTIAL SPECIAL TOOLS	
Mot. 799-01	Tool for immobilising pinions for toothed timing belt
Mot. 1054	Top dead centre pin
Mot. 1509	Tool for immobilising camshaft pulleys
Mot. 1509-01	Accessory for Mot. 1509
Mot. 1512	Tool for fitting the exhaust camshaft seal
Mot. 1517	Tool for fitting the inlet camshaft seal
Mot. 1496	Tool for setting camshafts
ESSENTIAL EQUIPMENT	
Angular tightening wrench	
14 mm hexagonal wrench	

There are two very distinct procedures for setting the timing.

FIRST PROCEDURE

This is applied in the event of replacement of any components which require slackening of the exhaust camshaft pulley and of the timing inlet camshaft phase shifter.

During this operation, it is essential to change:

- the exhaust camshaft pulley nut,
- the inlet camshaft phase shifter bolt,
- the phase shifter camshaft seal,
- the phase shifter blanking piece seal.

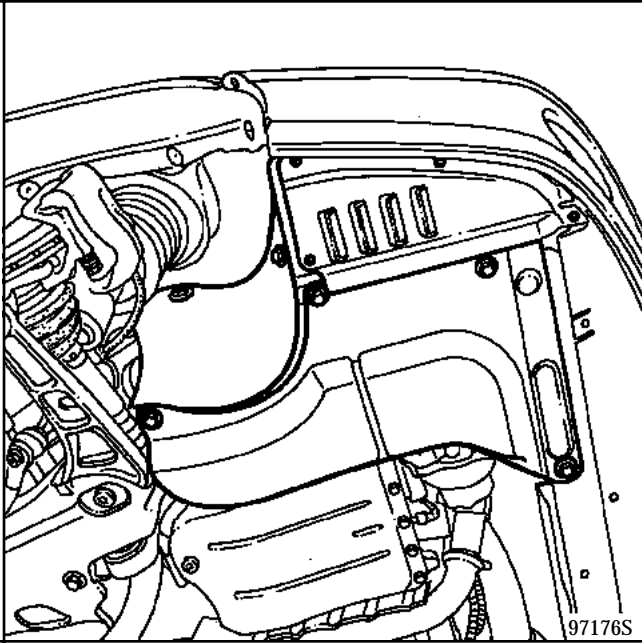
REMOVAL

Place the vehicle on a two post lift.

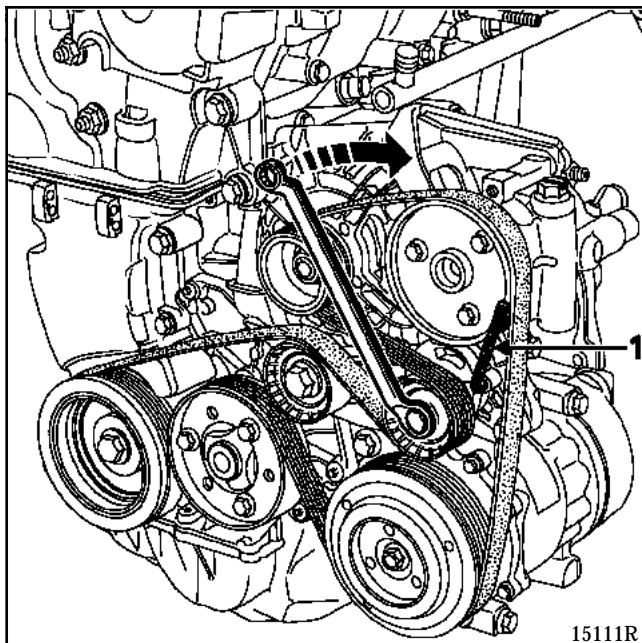
Disconnect the battery.

Remove:

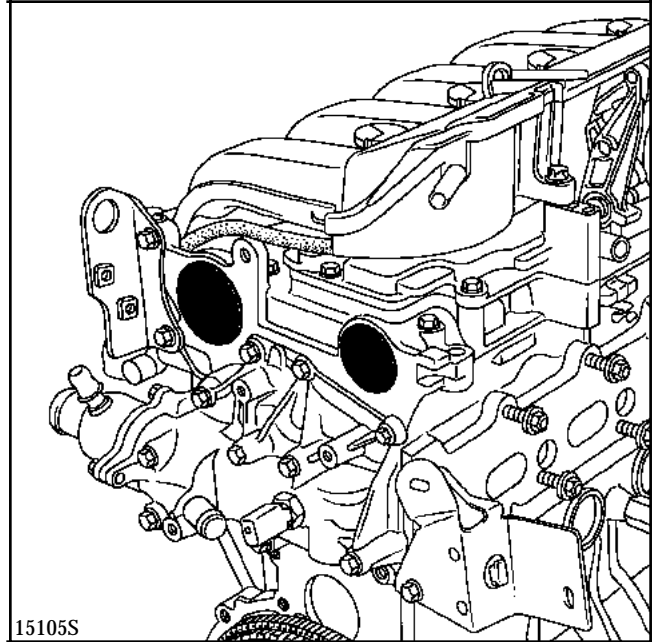
- the front right wheel,
- the front right wheel arch protector,



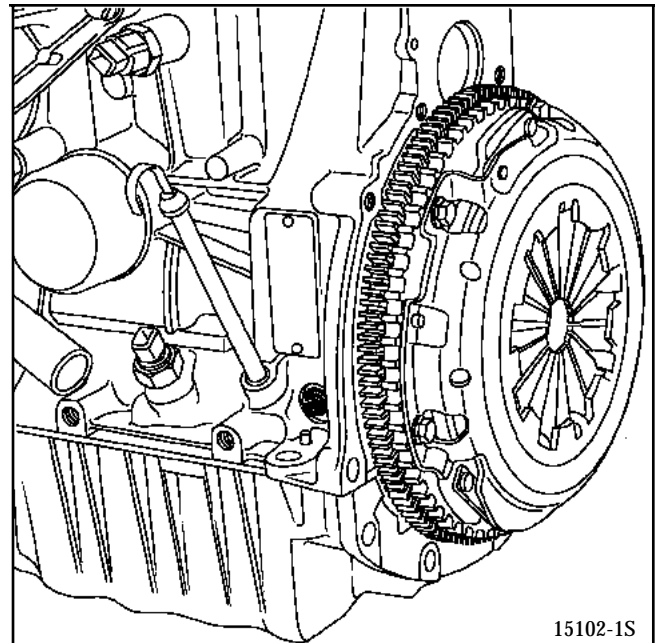
- the accessories belt; tilt the belt's automatic tensioner in the direction indicated below using a **13 mm offset ring ended spanner**. Clamp the tensioner using a **6 mm hexagonal wrench (1)**.



- the inserts at the end of the camshafts,



- the Top Dead Centre pin plug.



TOP AND FRONT OF ENGINE

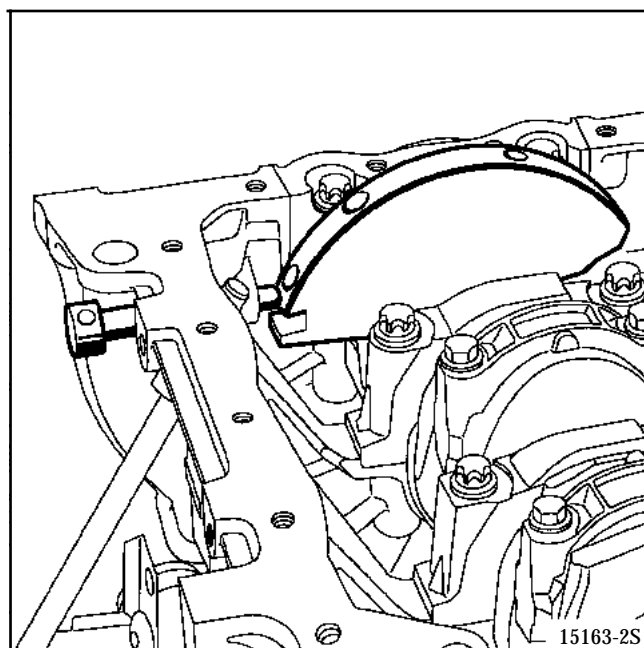
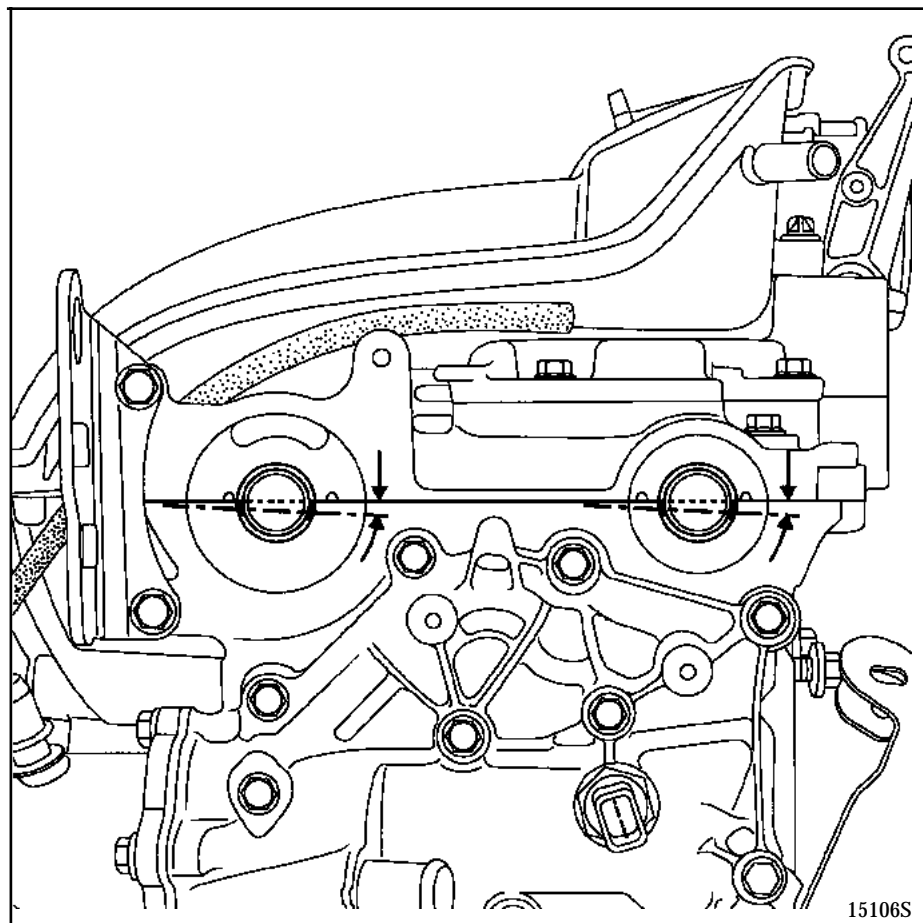
Timing belt

11

Positioning the timing at the setting point

Procedure

Position the camshaft grooves downwards and almost horizontal as indicated below, then insert the Top Dead Centre pin Mot. 1054 to be between the balancing hole and the crankshaft setting groove.

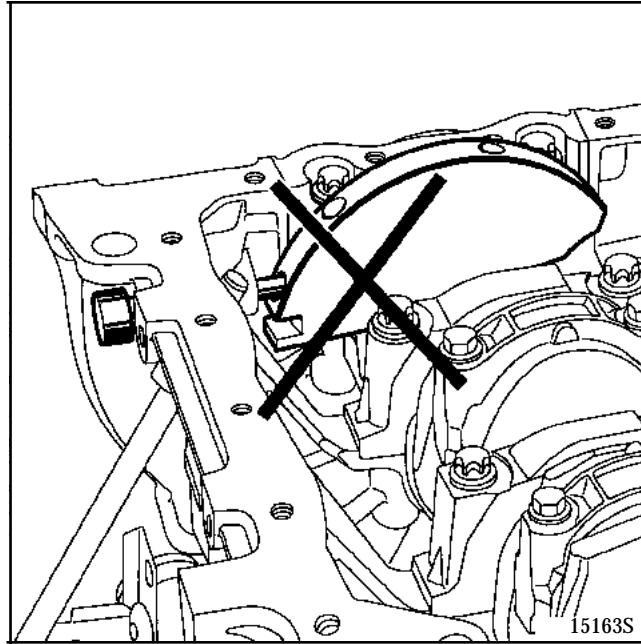


TOP AND FRONT OF ENGINE

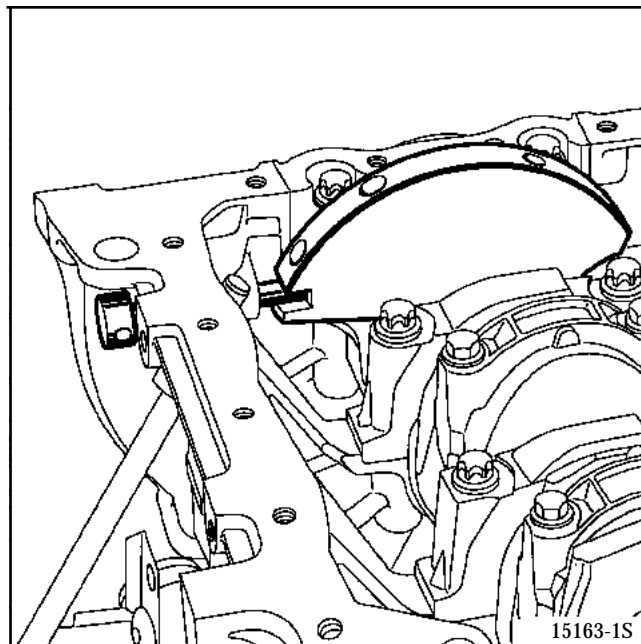
Timing belt

NOTE: this is to avoid pinning the crankshaft in a balancing hole.

Incorrect position



Correct position (pinned crankshaft)



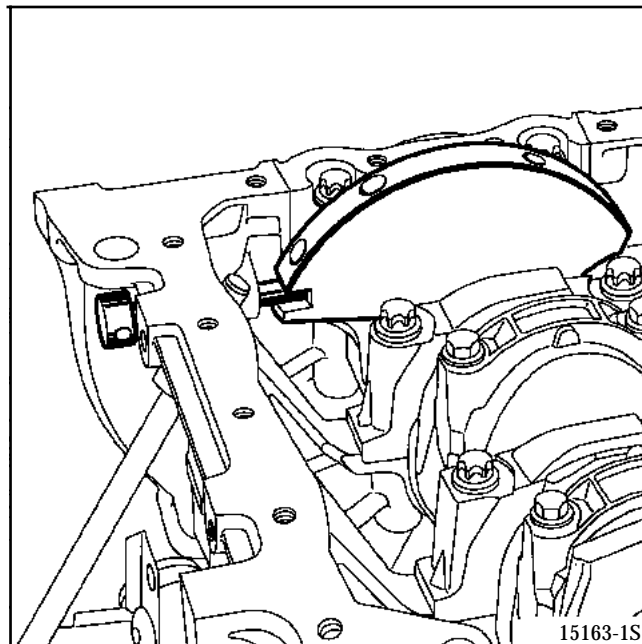
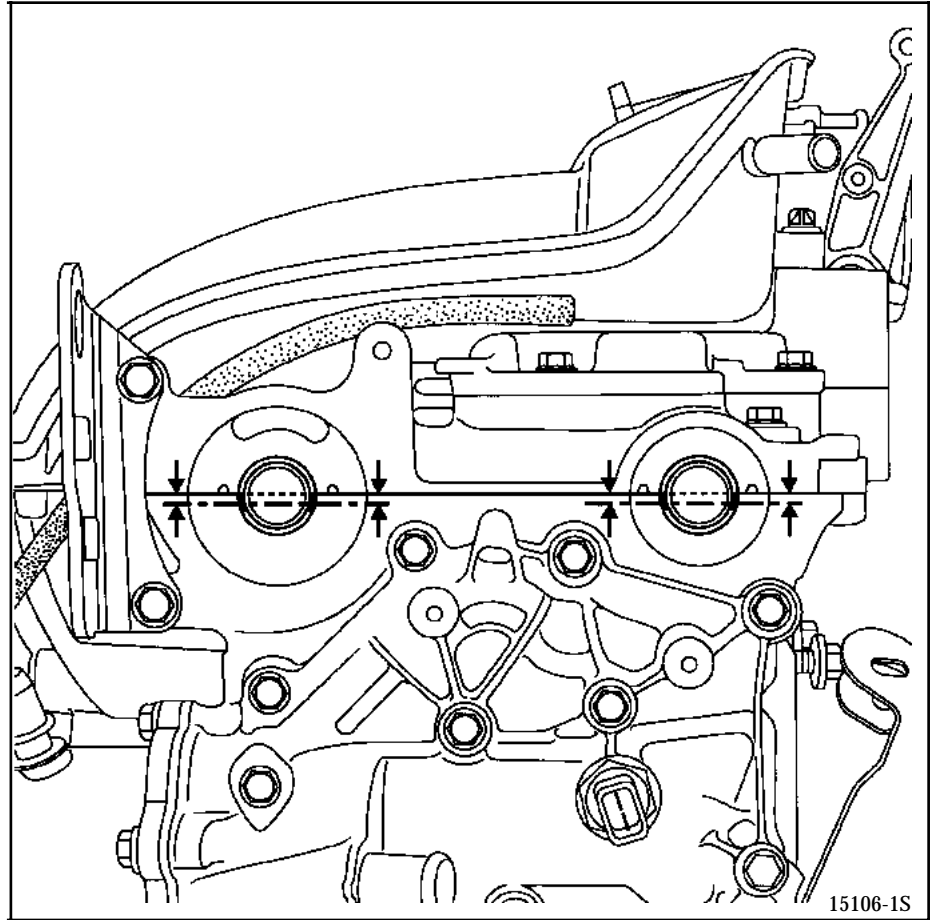
TOP AND FRONT OF ENGINE

Timing belt

11

Turn the engine clockwise (timing side), to the timing setting point.

The camshaft grooves should be horizontal and offset downwards as indicated on the diagram below.

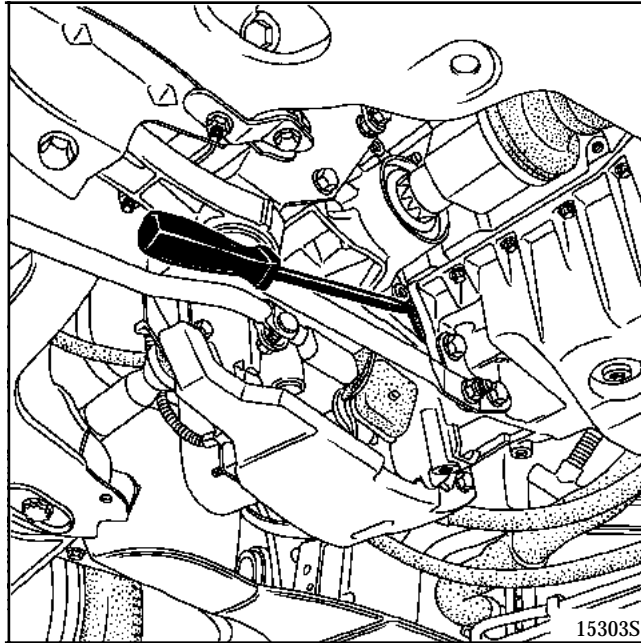


TOP AND FRONT OF ENGINE

Timing belt

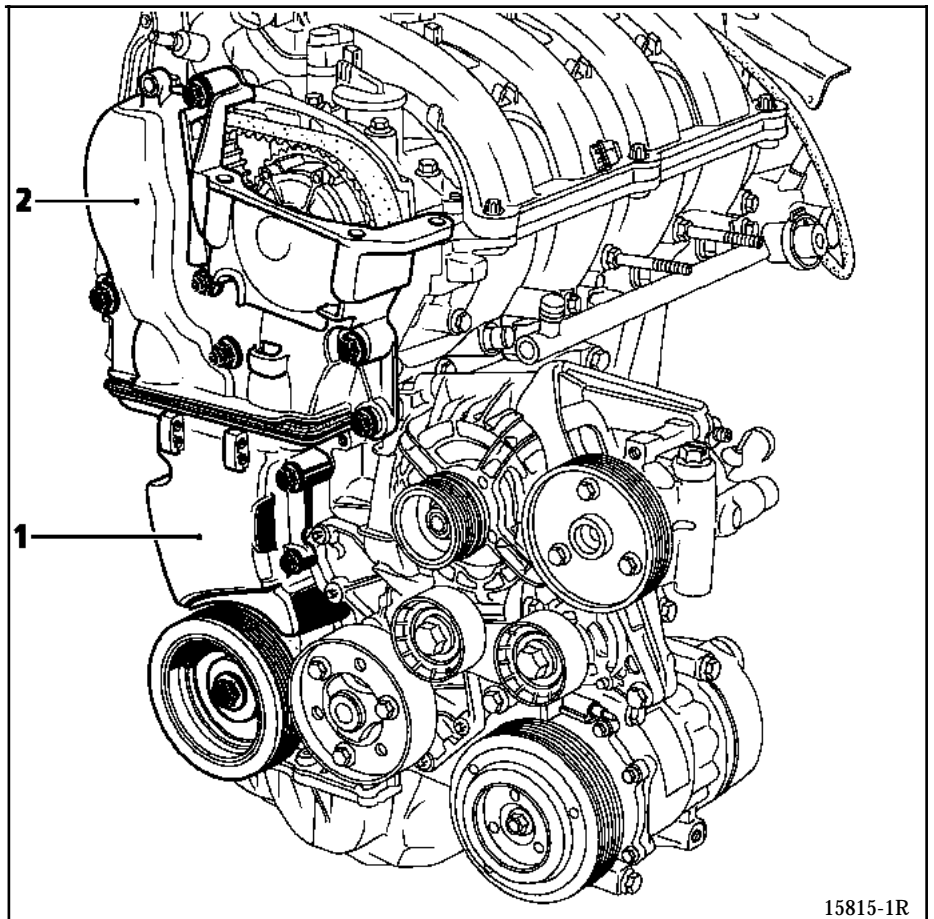
11

Immobilise the engine flywheel using tool **Mot. 582-01** or a large screwdriver.



Remove:

- the crankshaft pulley,
- the intermediate timing cover (1),
- the upper timing cover (2).

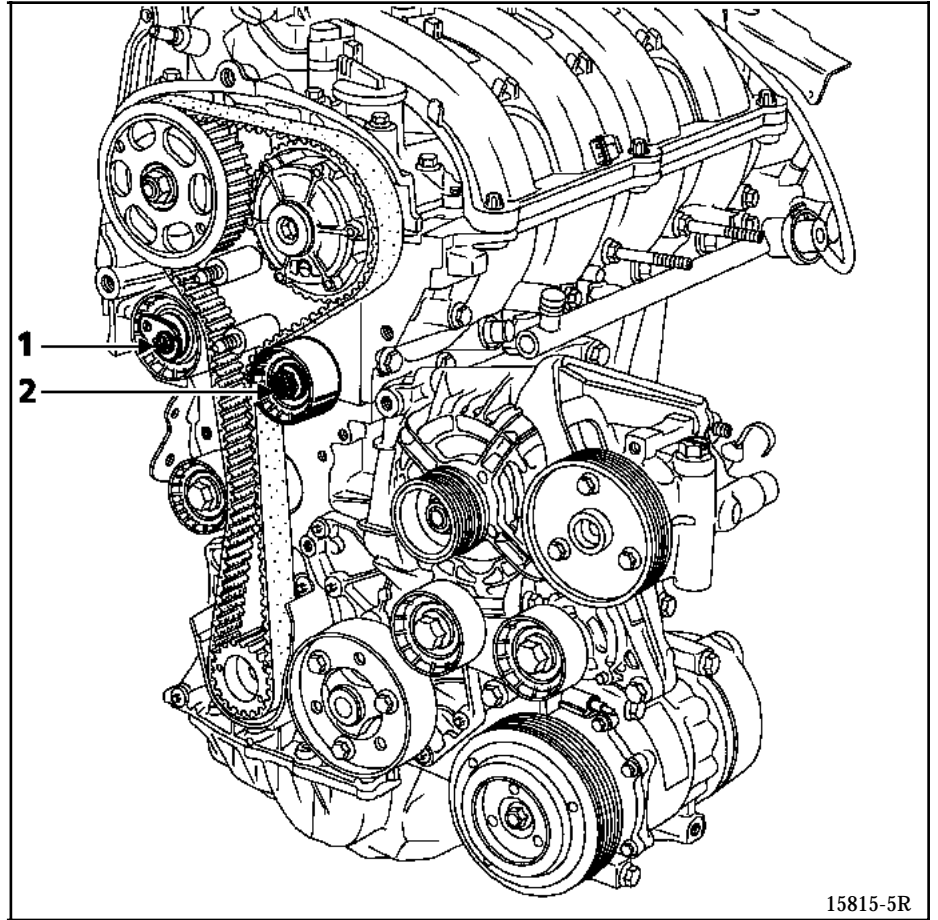


Timing belt

Slacken the tensioner nut (1).

Remove:

- the pulley (2),
- the timing belt **taking care not to let the crankshaft timing pinion fall.**
- the camshaft pulleys using tool **Mot. 1509.**



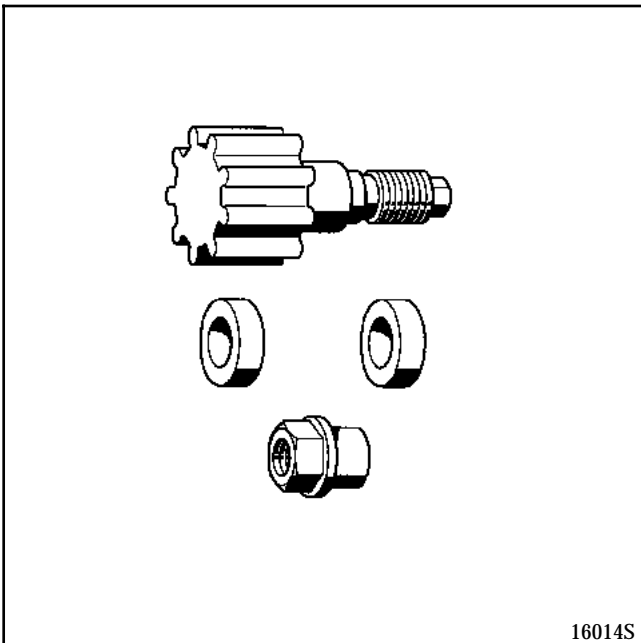
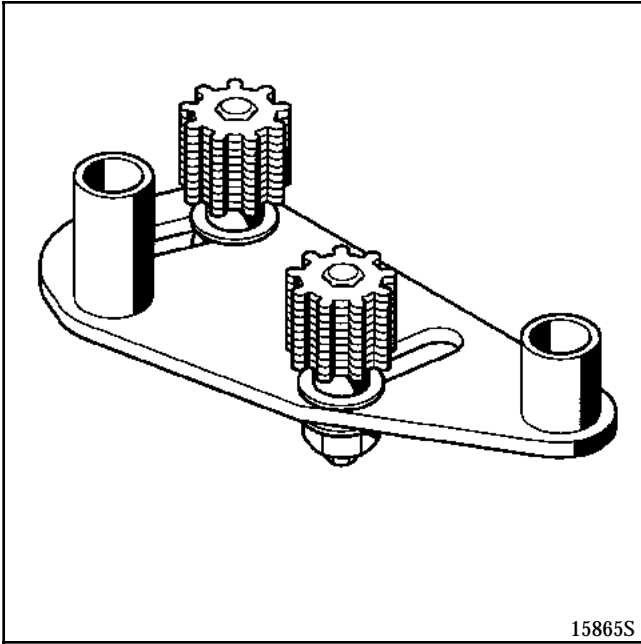
TOP AND FRONT OF ENGINE

Timing belt

11

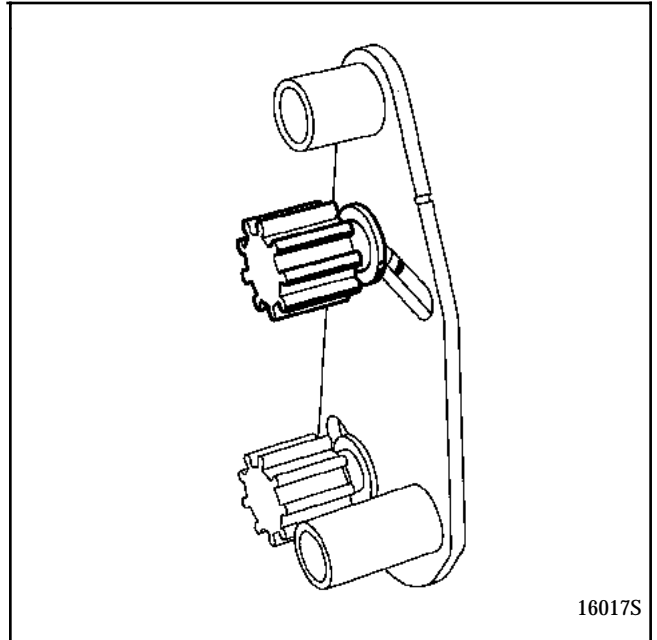
Procedure for slackening the exhaust camshaft pulley and the inlet camshaft phase shifter.

The operation is carried out using tools Mot. 1509 and Mot. 1509-01.

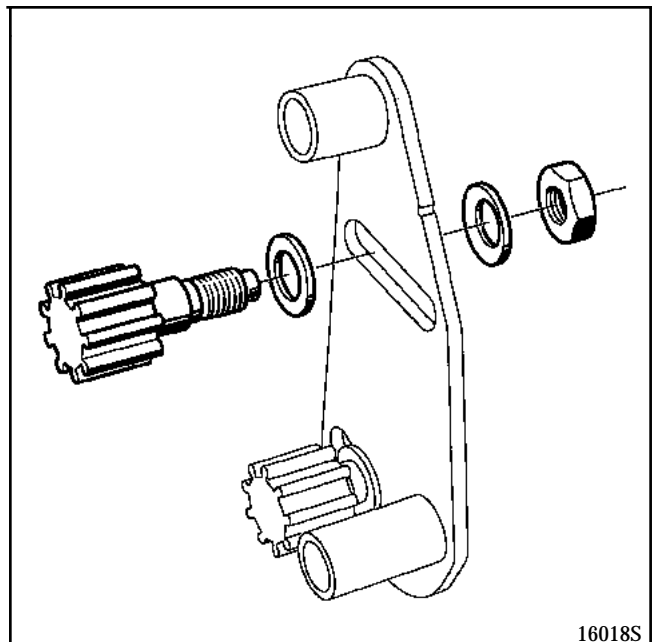


Preparation of tool Mot. 1509

Remove the upper toothed pinion from the bracket.

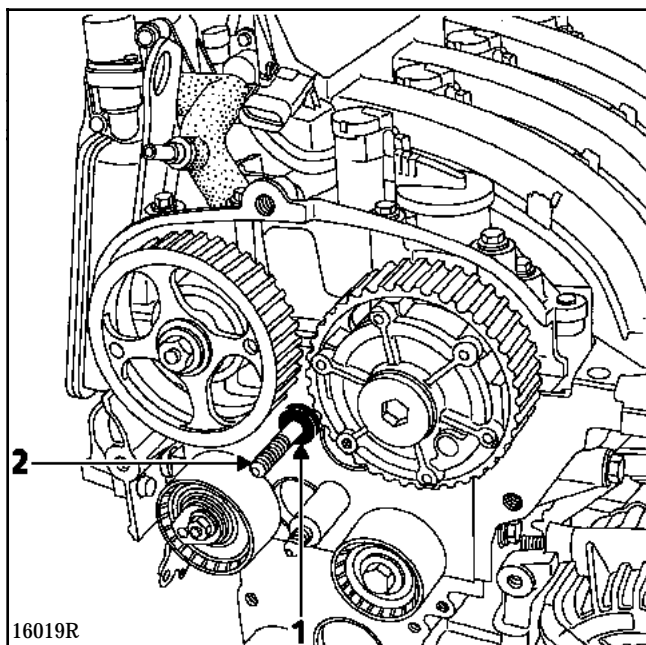


In its place fit the toothed pinion of tool Mot. 1509-01 (reusing the two washers and the nut of Mot. 1509).

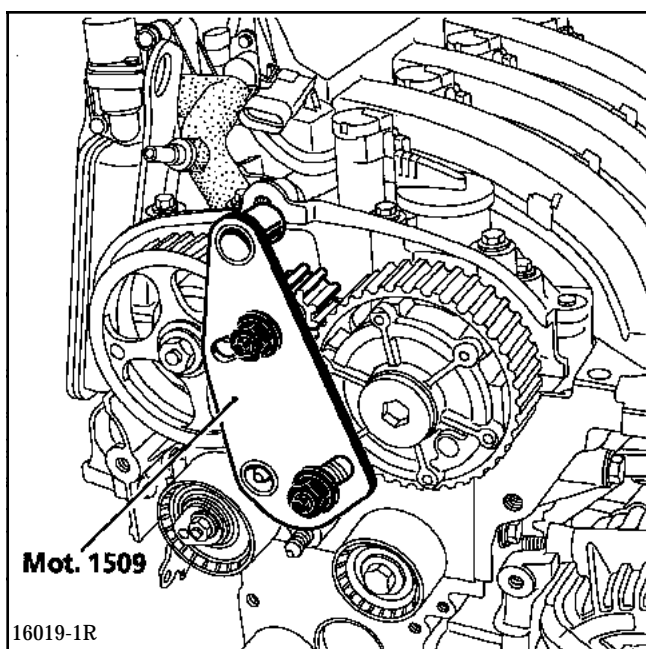


Fit:

- the spacer (1) of tool **Mot. 1509-09** on the stud (2).

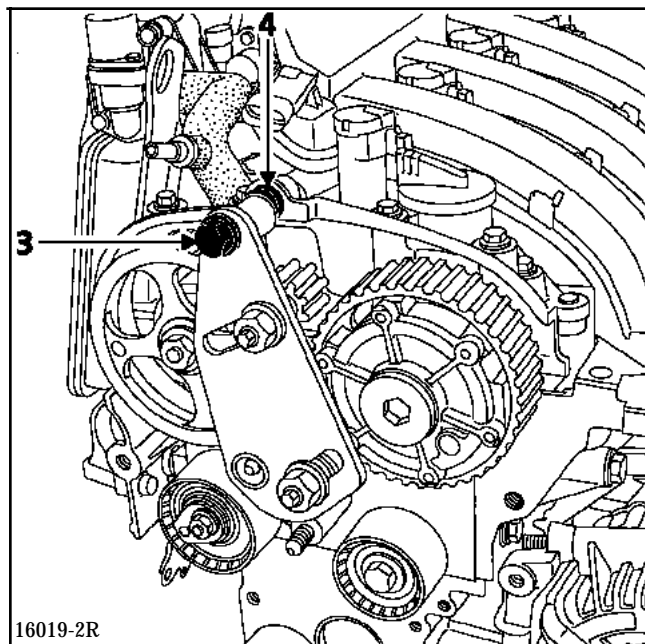


- tool **Mot. 1509** as indicated on the diagram below,

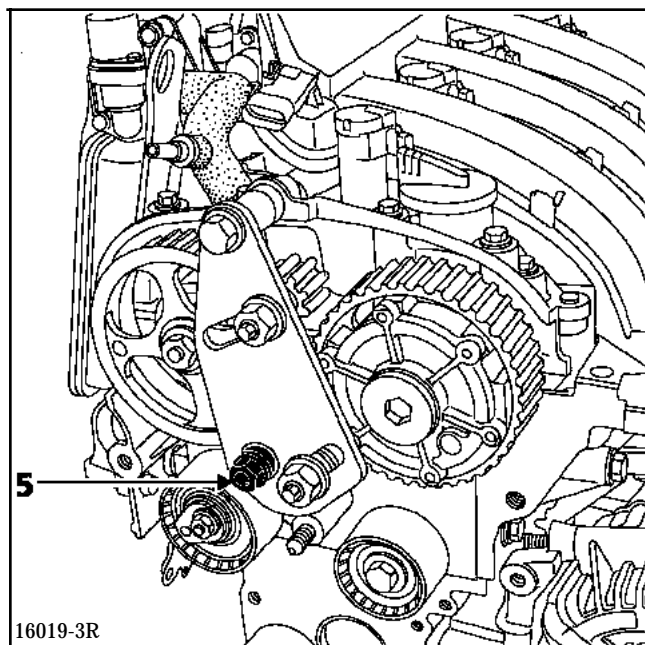


Tool **Mot. 1509** is fitted by offering it up from the front, between the pinions and the shock absorber turret and pivoting it around the lower pin.

- the upper bolt (3) while positioning the spacer (4) of tool **Mot. 1509-01** between the tool and the camshaft bearing cap housing (**do not tighten the bolt**).



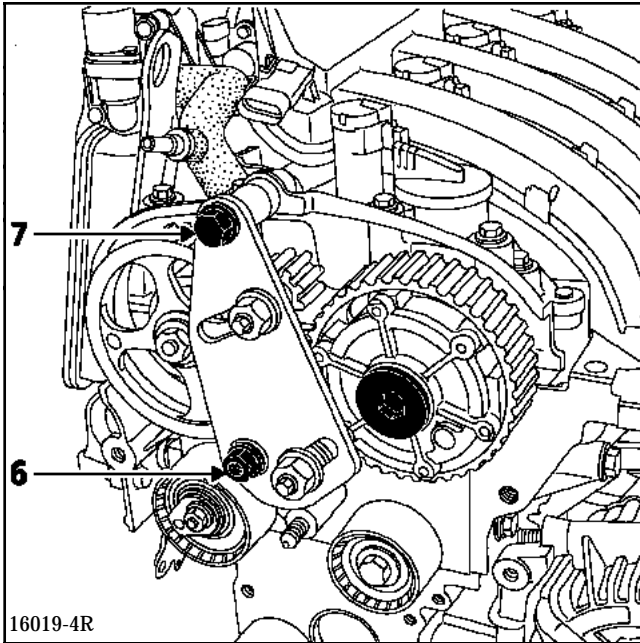
- the nut (5) of tool **Mot. 1509-01**.



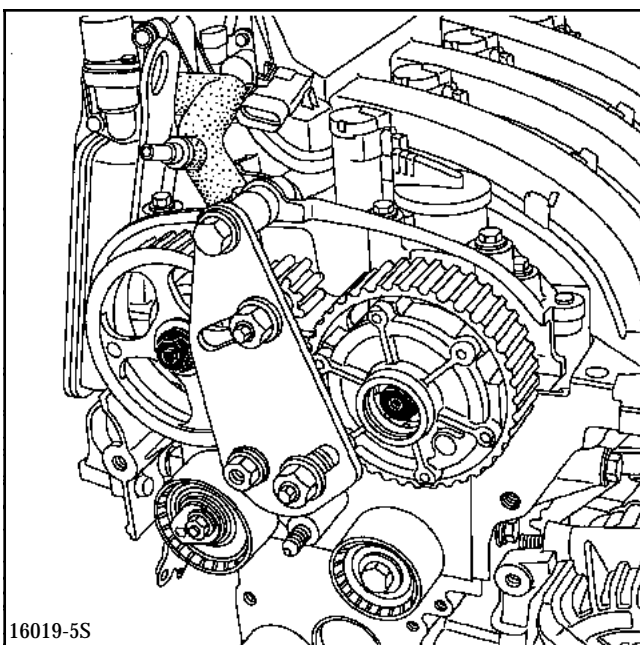
Tighten the lower nut (6) and the upper bolt (7), then immobilise the pulleys using the toothed pinions of tool **Mot. 1509**.

Remove:

- the inlet camshaft phase shifter blanking piece using a **14 mm** hexagonal wrench,

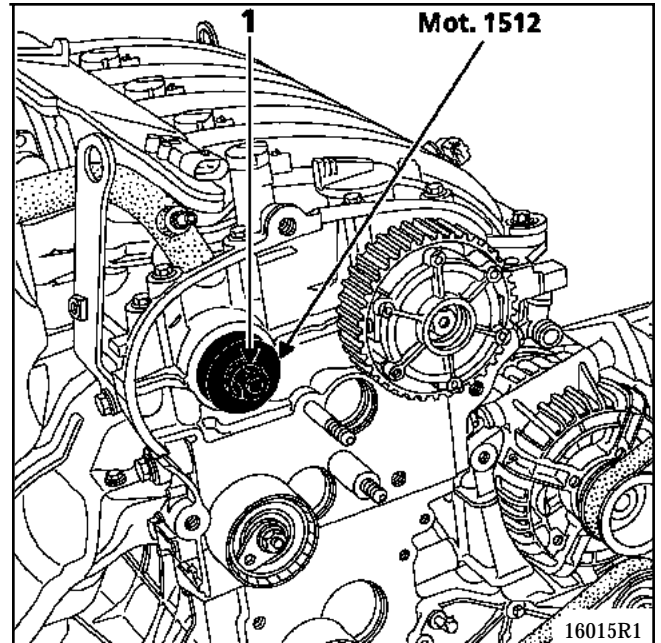


- the exhaust camshaft pulley nut,
- the inlet camshaft phase shifter bolt.

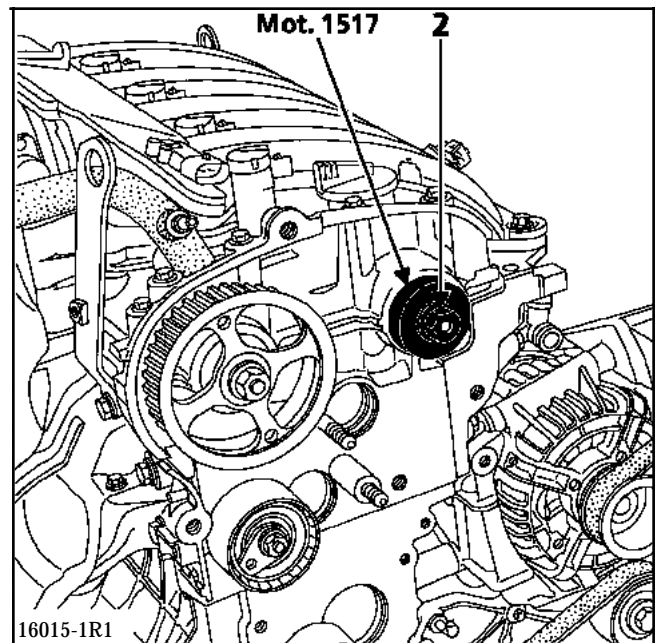


Replacement of the camshaft seals

Fitting of the **exhaust camshaft seal** using tool **Mot. 1512** using the old nut (1).



Fitting of the **inlet camshaft phase shifter seal** using tool **Mot. 1517** using the old bolt (2).



TOP AND FRONT OF ENGINE

Timing belt

11

Setting the timing

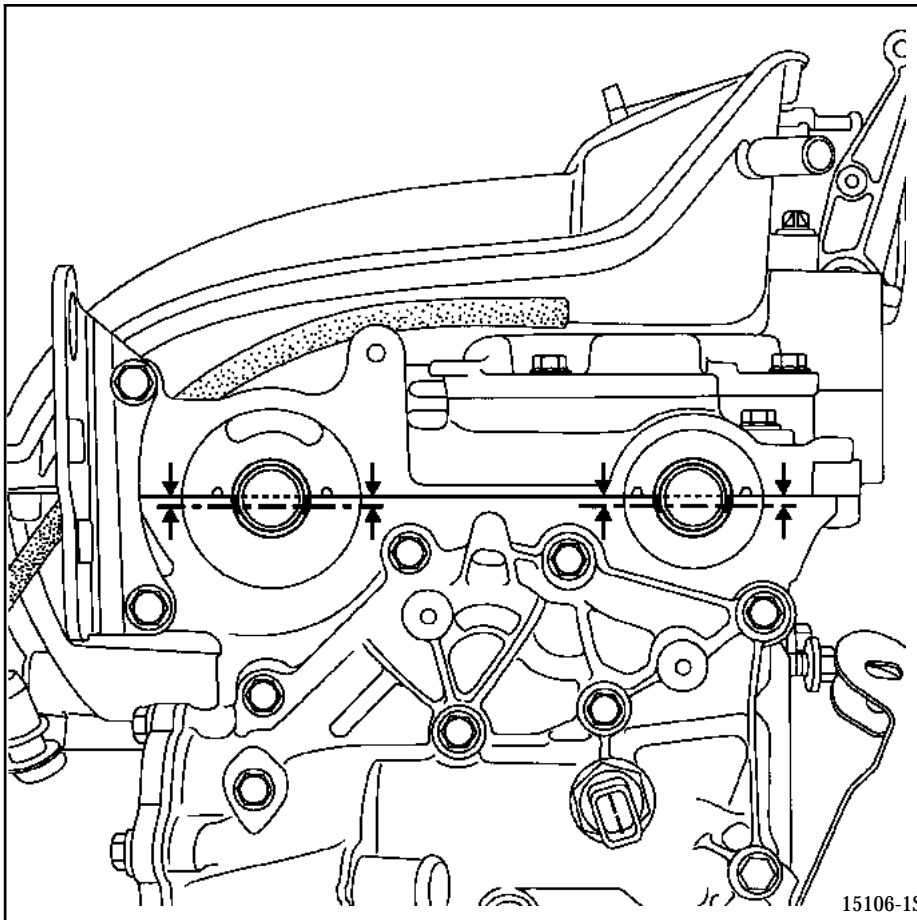
WARNING:

it is essential to degrease the end of the crankshaft (timing end), the bore and the contact surfaces of the timing pinion, the contact surfaces of the accessories pulley and the ends of the camshafts (timing end), the bores and contact surfaces of the exhaust camshaft pulley and the inlet camshaft phase shifter. This is to prevent sliding between the timing, the crankshaft and the exhaust camshaft pulleys and the inlet phase shifter which could destroy the engine.

NOTE:

to make it easier to place the grooves in a horizontal position, position the camshaft pulley and phase shifter, then screw in place the **old pulley nut** and the **old phase shifter bolt** tightening them to **1.5 daN.m MAXIMUM**, and position the pistons at mid-travel (to prevent any contact between the valves and the pistons).

Place the camshaft grooves in a horizontal position as **indicated on the diagram below** (turning the camshafts using tool Mot. 799-01 if necessary).

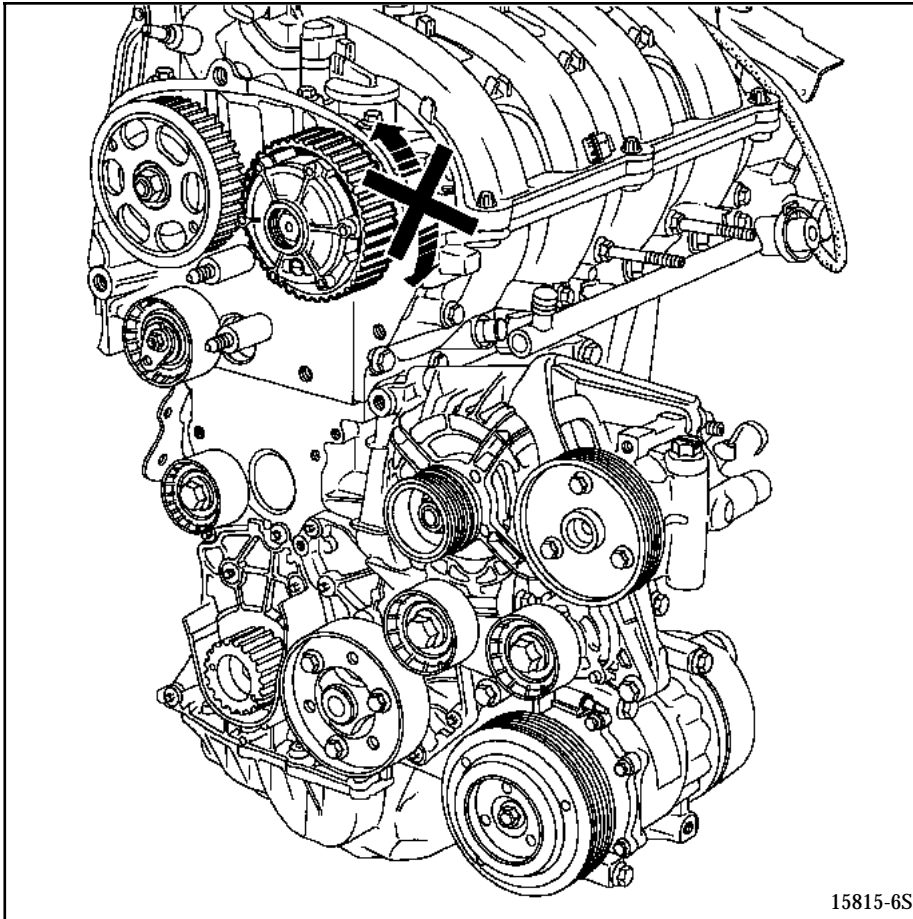


TOP AND FRONT OF ENGINE

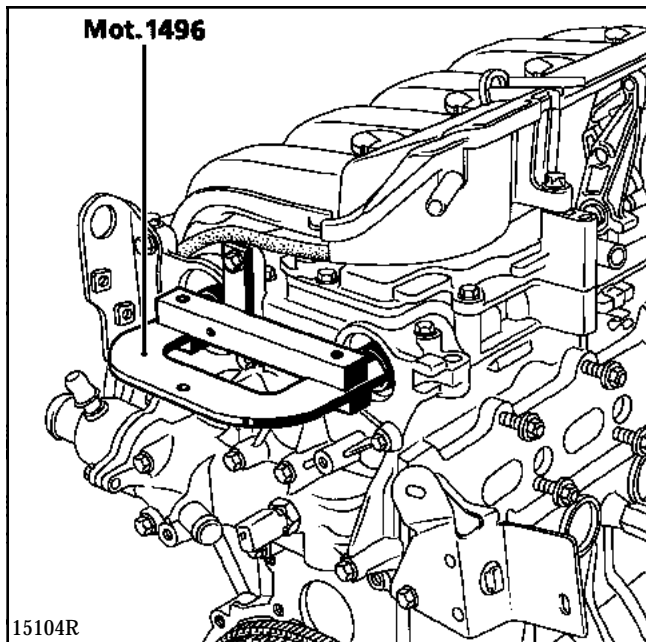
Timing belt

11

Check that the inlet camshaft phase shifter crown wheel is immobilised correctly (no rotation of the crown wheel to the left or the right).



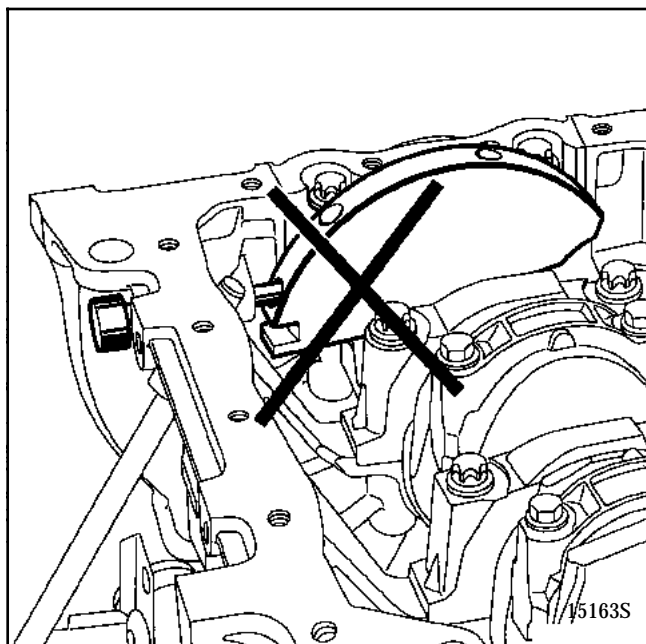
Fit tool **Mot. 1496** which is secured to the end of the camshafts.



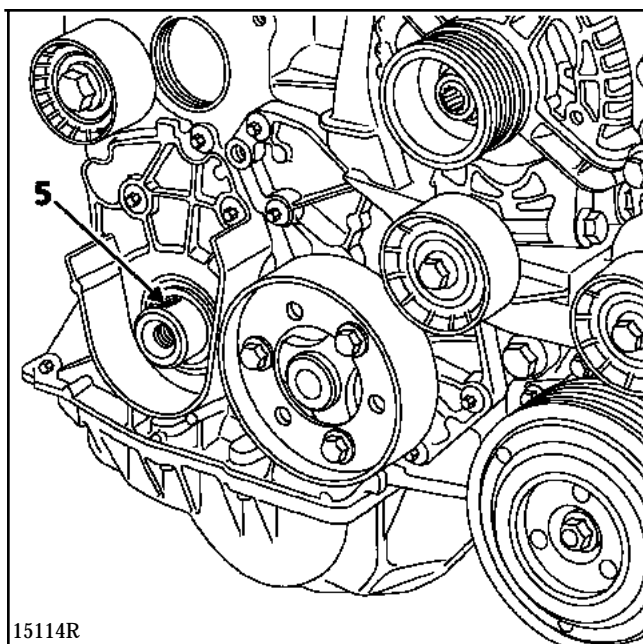
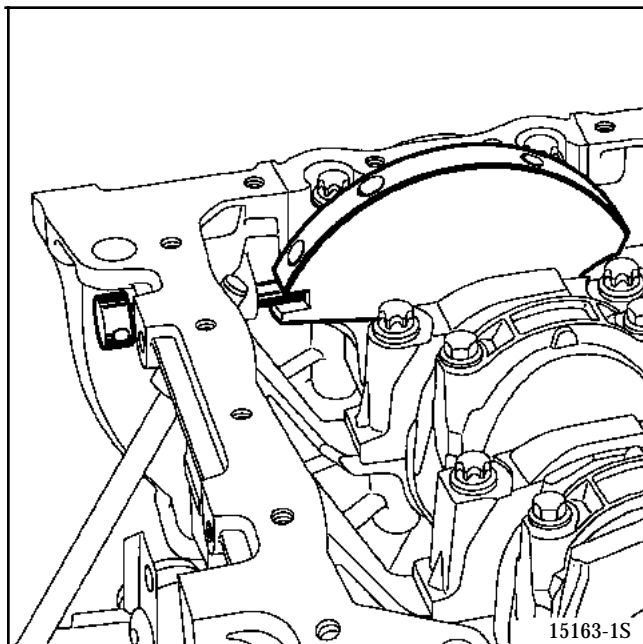
Remove the old pulley nuts and replace them with new nuts (without tightening the nuts, clearance of 0.5 to 1 mm between the nut and the pulley).

Check that the crankshaft is correctly pinned at Top Dead Centre and not in the balancing hole (the crankshaft groove (5) should be in the vertical centreline of the engine).

Incorrect position



Pinned crankshaft



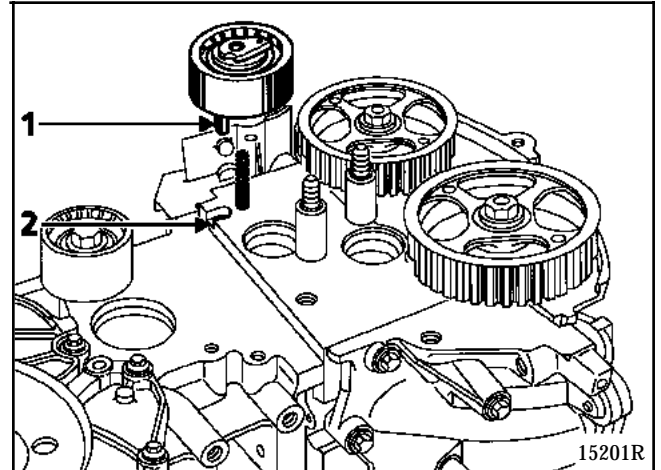
TOP AND FRONT OF ENGINE

Timing belt

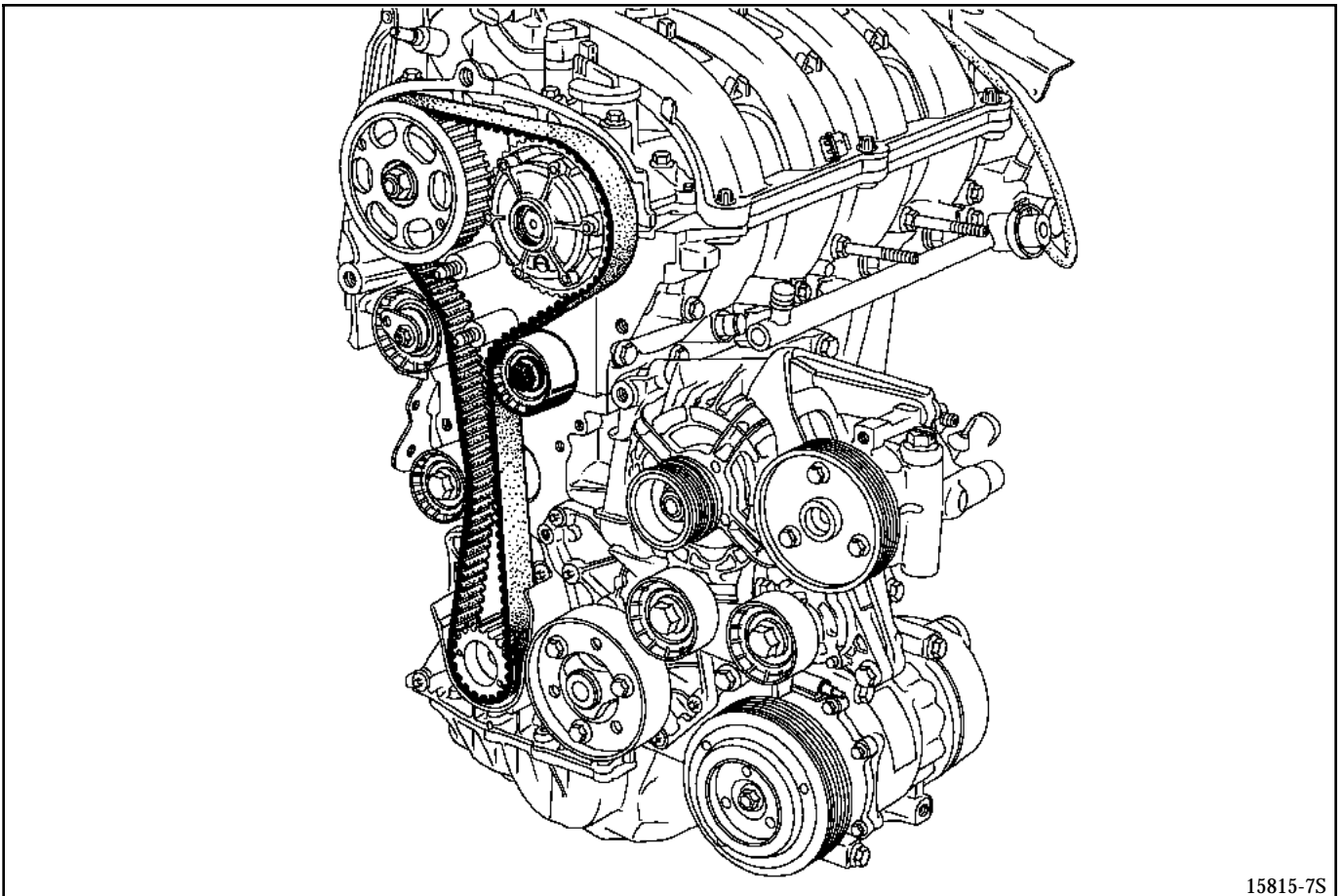
11

When a timing belt is changed, it is essential to change the timing tensioners and pulleys.

Check that the tensioner lug (1) is correctly positioned in the groove (2).



Refit:
- the timing belt,



- the crankshaft accessories pulley, pretightening the bolt (**without fully tightening the bolt, clearance of 2 to 3 mm between bolt/pulley**).

NOTE:

- the accessories crankshaft pulley bolt can be reused if the length under the head does not exceed **49.1 mm** (otherwise change it),
- do not oil a new bolt. However, if the old bolt is reused, it is essential to oil the threads and under the head.

TOP AND FRONT OF ENGINE

Timing belt

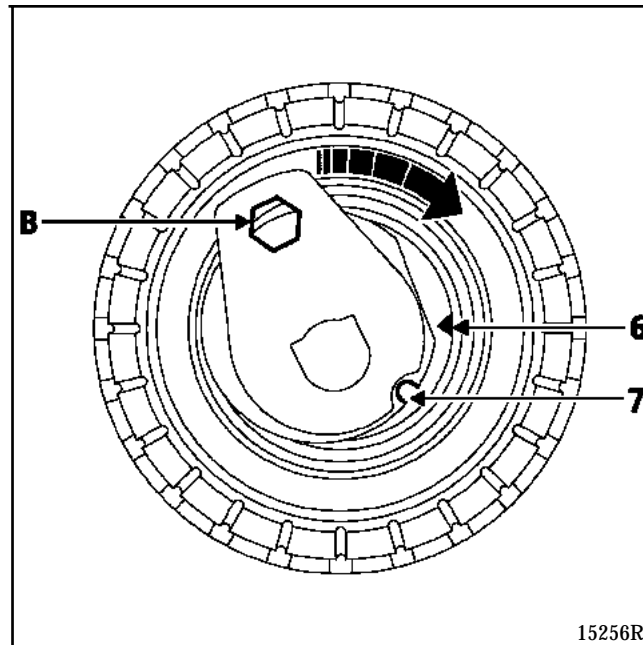
11

Belt tension

Check that there is still a clearance of **0.5 to 1 mm** between nuts and the camshaft pulleys.

NOTE: do not turn the tensioner anti-clockwise.

Align tensioner marks (6) and (7) using a **6 mm** hexagonal wrench at (B).



Pretighten the tensioner nut to a torque of **0.7 daN.m**.

NOTE: check carefully that the nut and the bolt of the camshaft pulleys do not come into contact with their respective pulleys. Also, place the camshaft pulleys flush against the camshaft from time to time.

Turn the timing **six revolutions** clockwise (timing end) via the **exhaust pulley** using tool **Mot. 799-01**.

Align marks (6) and (7) if necessary, slackening the tensioner nut by one revolution maximum while retaining it using a **6 mm** hexagonal wrench. Then fully tighten the nut to a torque of **2.8 daN.m**.

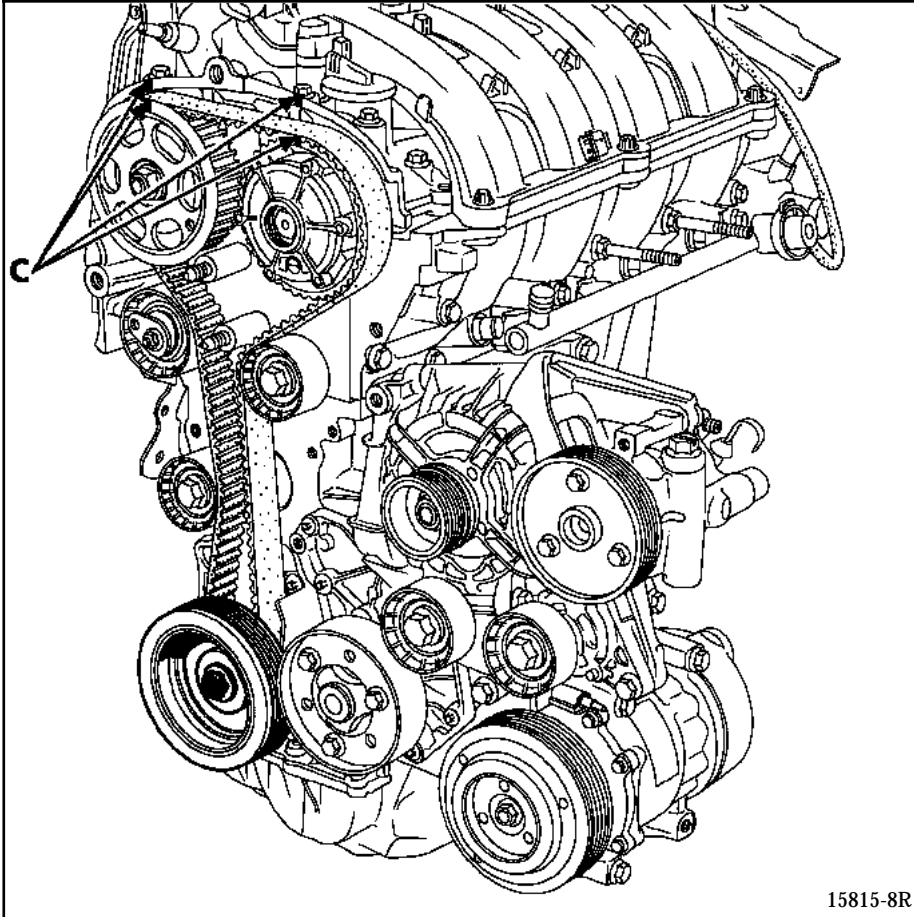
Tighten the accessories crankshaft pulley bolt to a torque of **2 daN.m (Top Dead Centre pin still in place in the crankshaft)**.

TOP AND FRONT OF ENGINE

Timing belt

11

Using a pencil, make a mark (C) between the camshaft pulleys and the camshaft bearing cap housing.



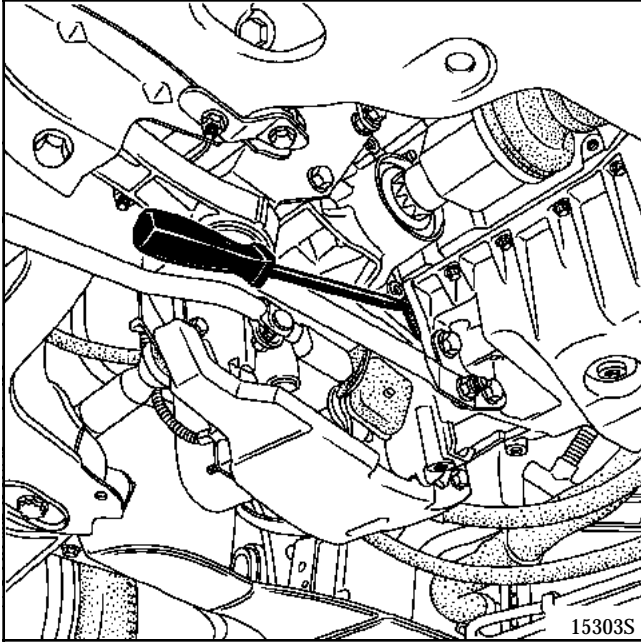
REMOVE THE TOP DEAD CENTRE PIN.

TOP AND FRONT OF ENGINE

Timing belt

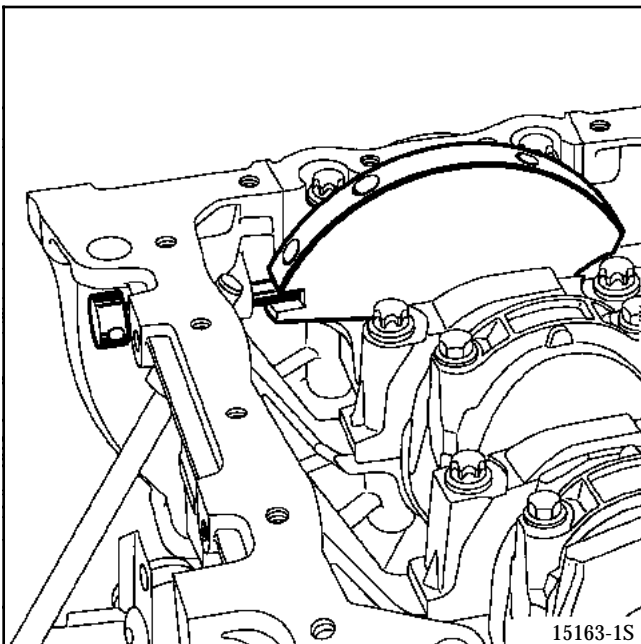
11

Immobilise the engine flywheel using tool **Mot. 582-01** or a **large screwdriver**, then turn the accessories crankshaft pulley bolt through an angle of $115^{\circ} \pm 15^{\circ}$.

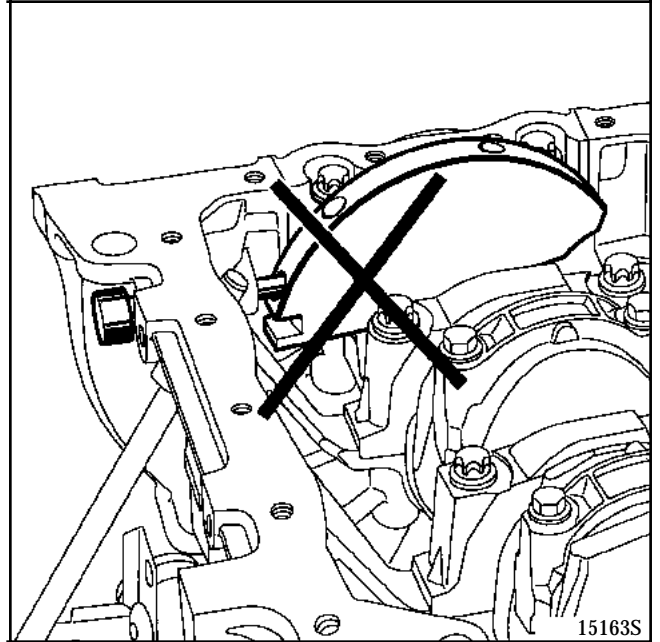


Pin the crankshaft using the marks made earlier between the camshaft pulleys and the camshaft bearing cap housing. The marks must be aligned as this ensures that the pin is in the pin hole and not in the crankshaft balancing hole.

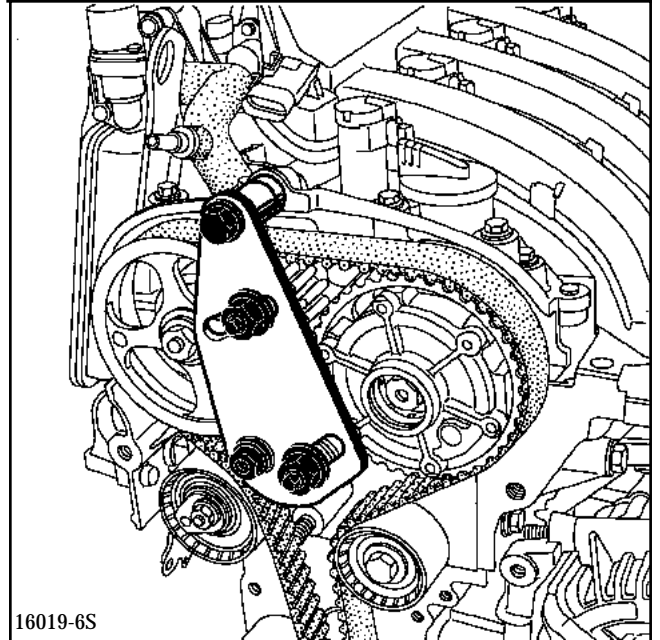
Correct position



Incorrect position



Fit the camshaft pulley immobilising tool **Mot. 1509** fitted with the accessory **Mot. 1509-01**.



Tighten the new **inlet** camshaft phase shifter bolt to a torque of **10 daN.m**.

Tighten the **exhaust** camshaft pulley nut to a torque of **3 daN.m**, then turn through an angle of **86° ± 6°**.

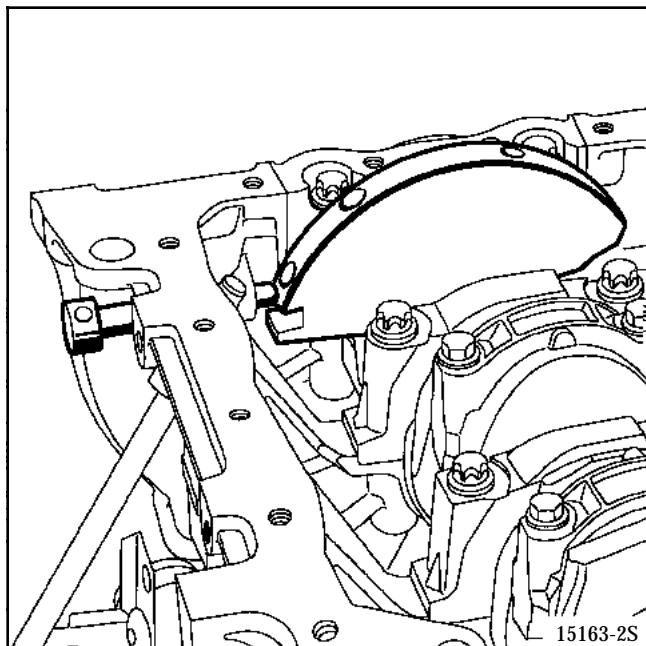
Remove camshaft setting tool **Mot. 1496**, camshaft pulley immobilising tool **Mot. 1509**, and Top Dead Centre pin **Mot. 1054**.

Checking the setting and tension

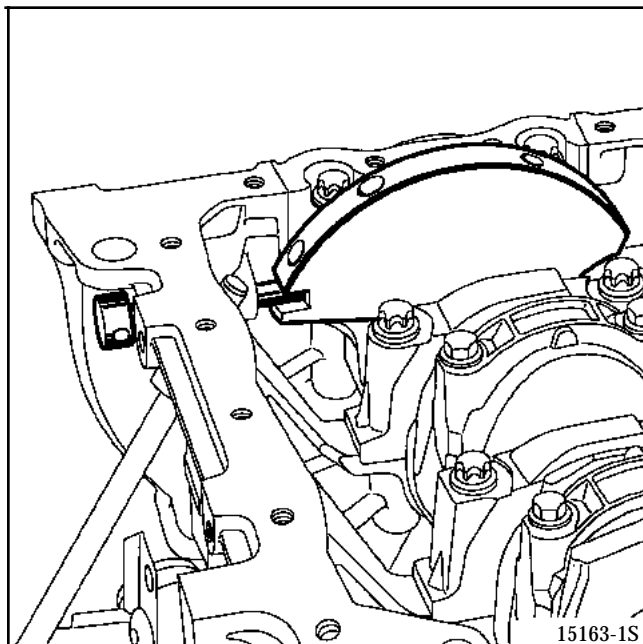
Checking the tension:

Turn the crankshaft two revolutions clockwise (timing end) and before the end of the two revolutions (**that is a half-tooth before alignment of the marks made previously by the operator**), insert the crankshaft Top Dead Centre pin (to be between the balancing hole and the pinning hole), then move the timing to its setting point.

Before pinning



Pinned crankshaft



Remove the Top Dead Centre pin.

Check that the tensioner marks are correctly aligned and repeat the tensioning procedure if they are not. Slacken the tensioner nut by one revolution maximum while retaining it using a **6 mm** hexagonal wrench.

Align the tensioner marks and fully tighten the nut to a torque of **2.8 daN.m**.

TOP AND FRONT OF ENGINE

Timing belt

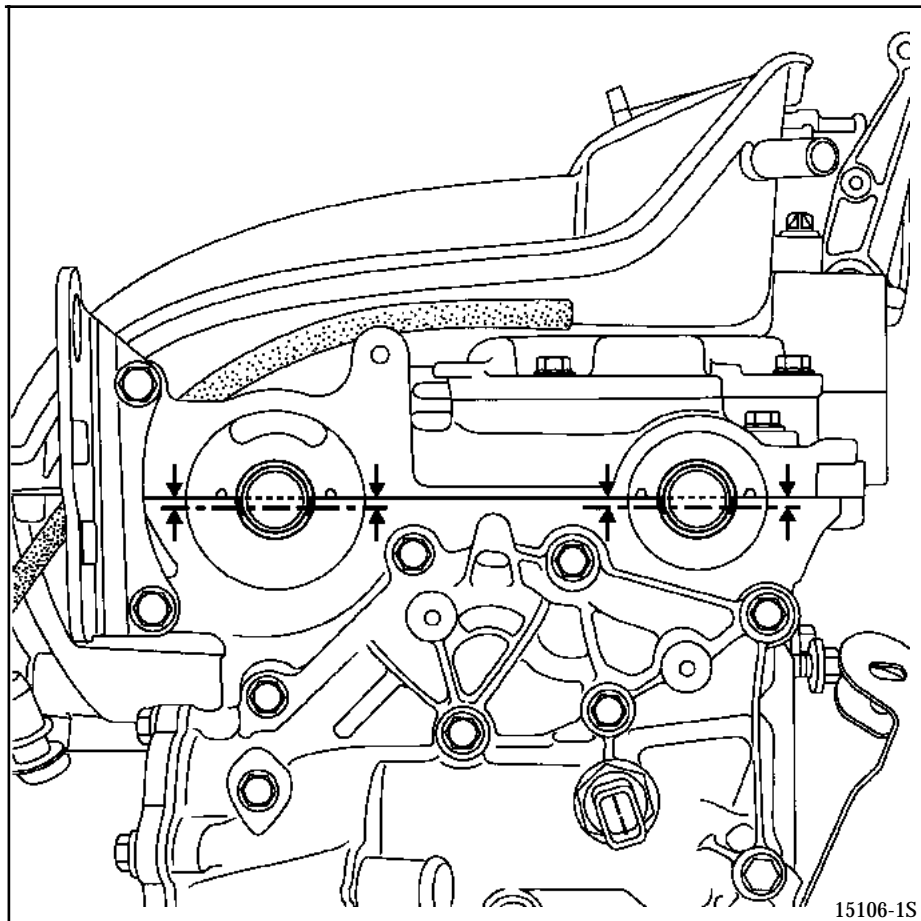
11

Checking the setting

Ensure that the tensioner marks are positioned correctly before checking the timing setting.

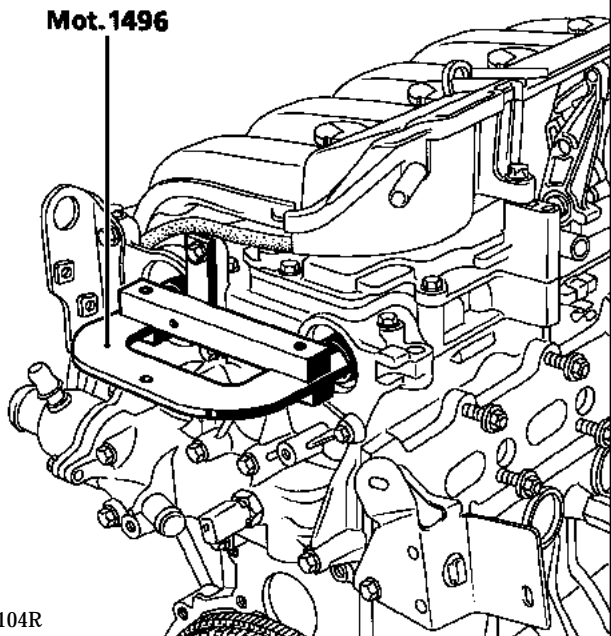
Fit the Top Dead Centre pin (check that the marks made on the camshaft pulleys by the operator are aligned).

Fit (without using force) camshaft setting tool **Mot. 1496** (the camshaft grooves should be horizontal and offset downwards). If the tool does not engage, the timing setting and tensioning procedure must be repeated.



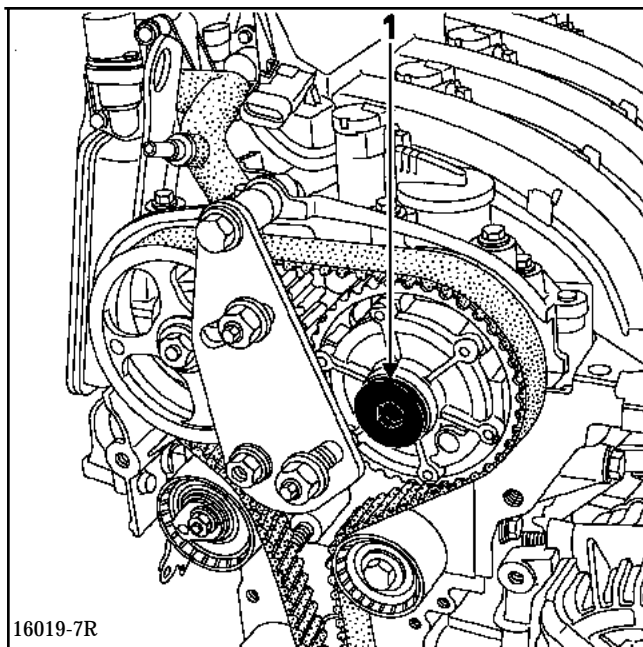
15106-1S

Mot. 1496



15104R

Refit the phase shifter blanking piece (1) (fitted with its new seal) tightening it to a torque of **2.5 daN.m.**



16019-7R

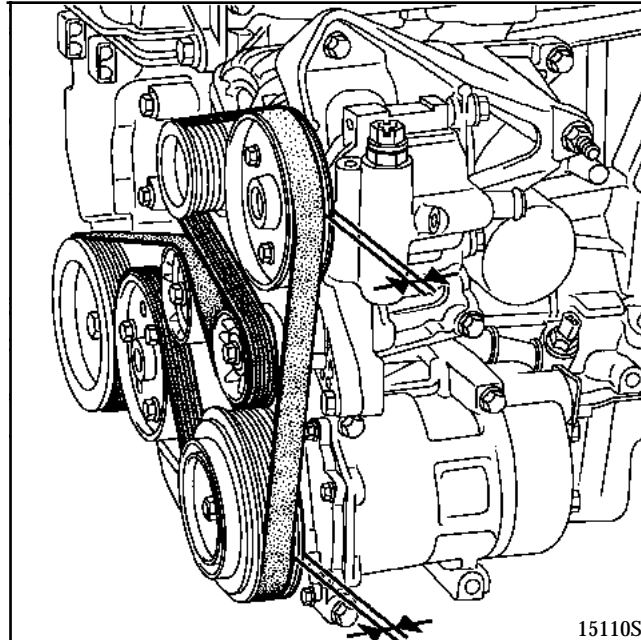
TOP AND FRONT OF ENGINE

Timing belt

11

Refit in the reverse order to removal.

When refitting the accessories belt, it is essential to check that the tooth "X" inside the pulleys (timing end) remains "free".



Second PROCEDURE

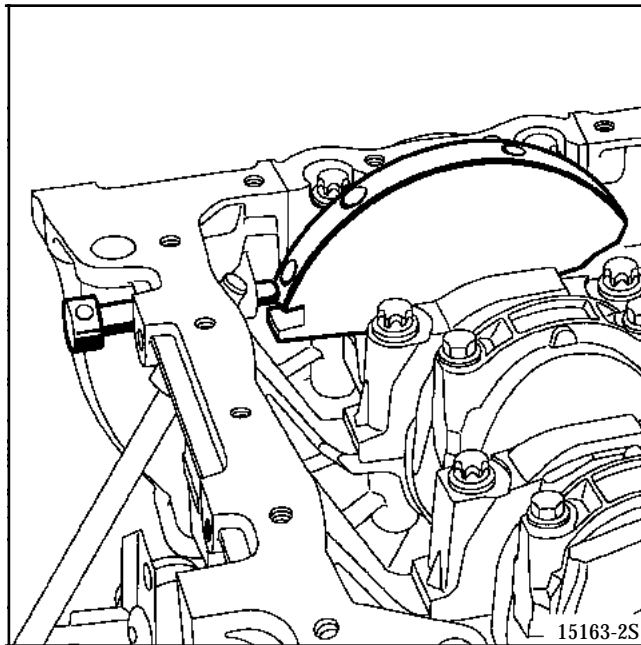
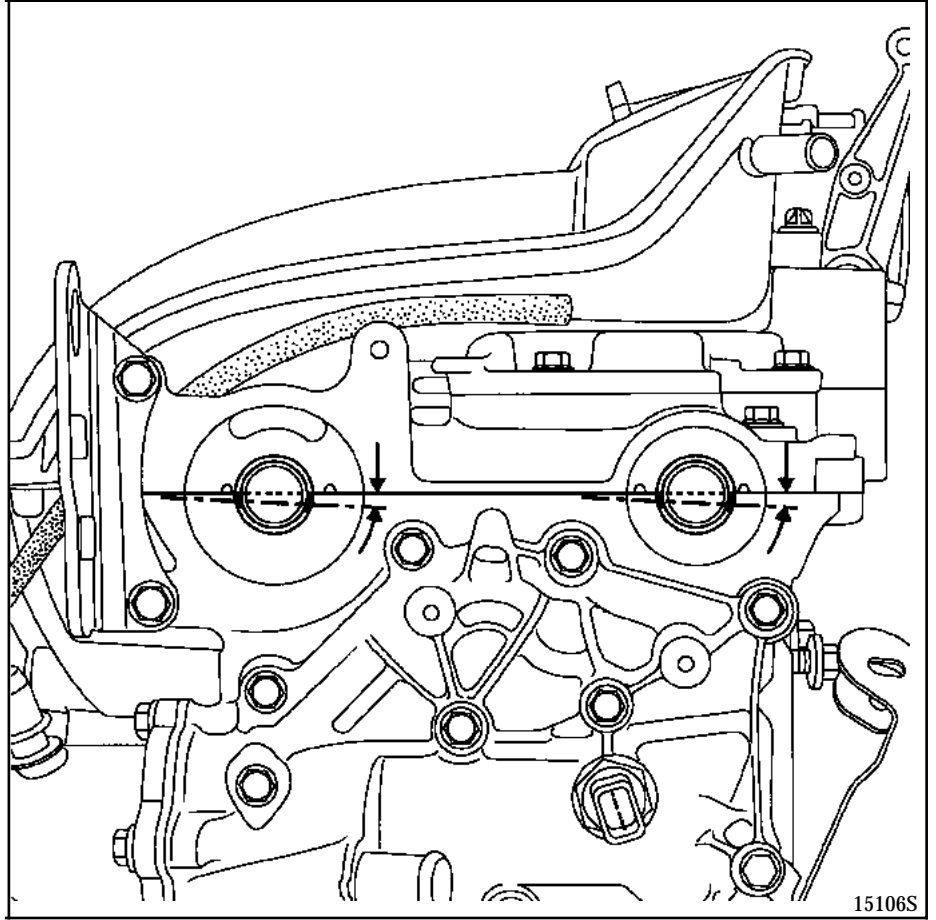
This is applied in the event of replacement of any components on the timing face which do not require slackening of the exhaust camshaft pulley and of the inlet camshaft phase shifter.

For removal of the accessories belt and the timing covers, refer to the beginning of the first procedure (Page 11-2).

Timing belt

Setting the timing

WARNING: it is essential to degrease the end of the crankshaft, the bore and the contact surfaces of the crankshaft pinion and the contact surfaces of the crankshaft pulley to prevent sliding between the timing and the crankshaft which could destroy the engine. Position the camshaft grooves downwards and almost horizontal as indicated in the diagram below, then insert the Top Dead Centre pin Mot. 1054 to be between the balancing hole and the crankshaft setting groove.

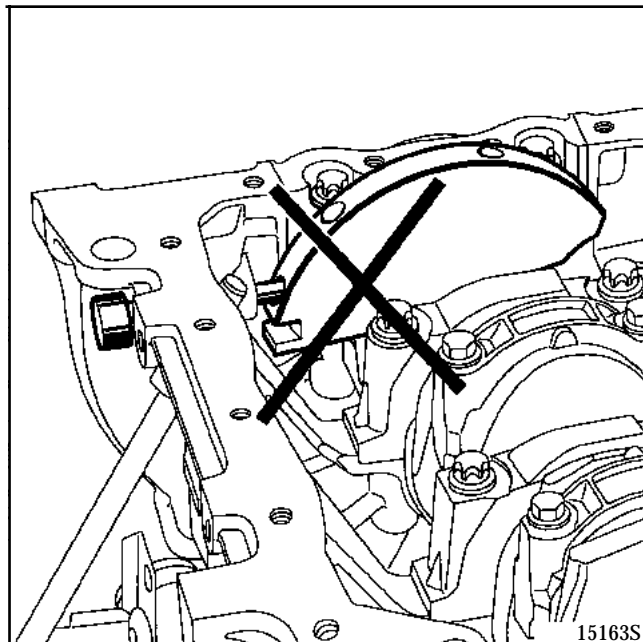


TOP AND FRONT OF ENGINE

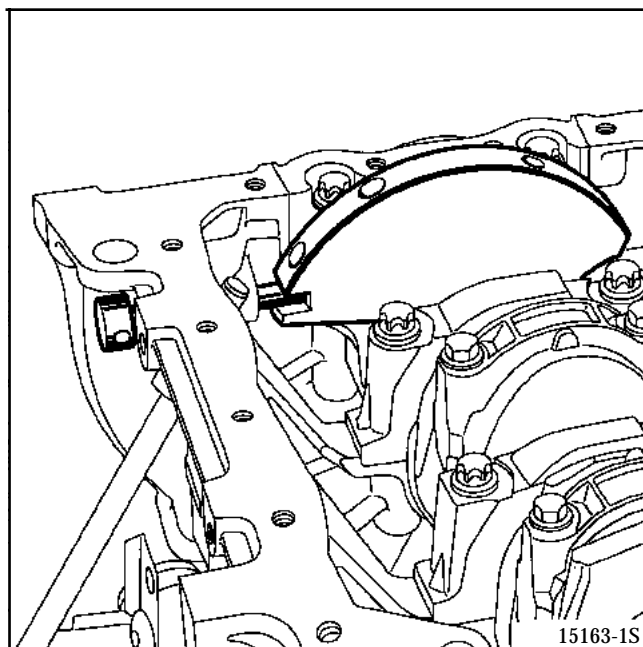
Timing belt

NOTE: this is to avoid pinning the crankshaft in the balancing hole.

Incorrect position

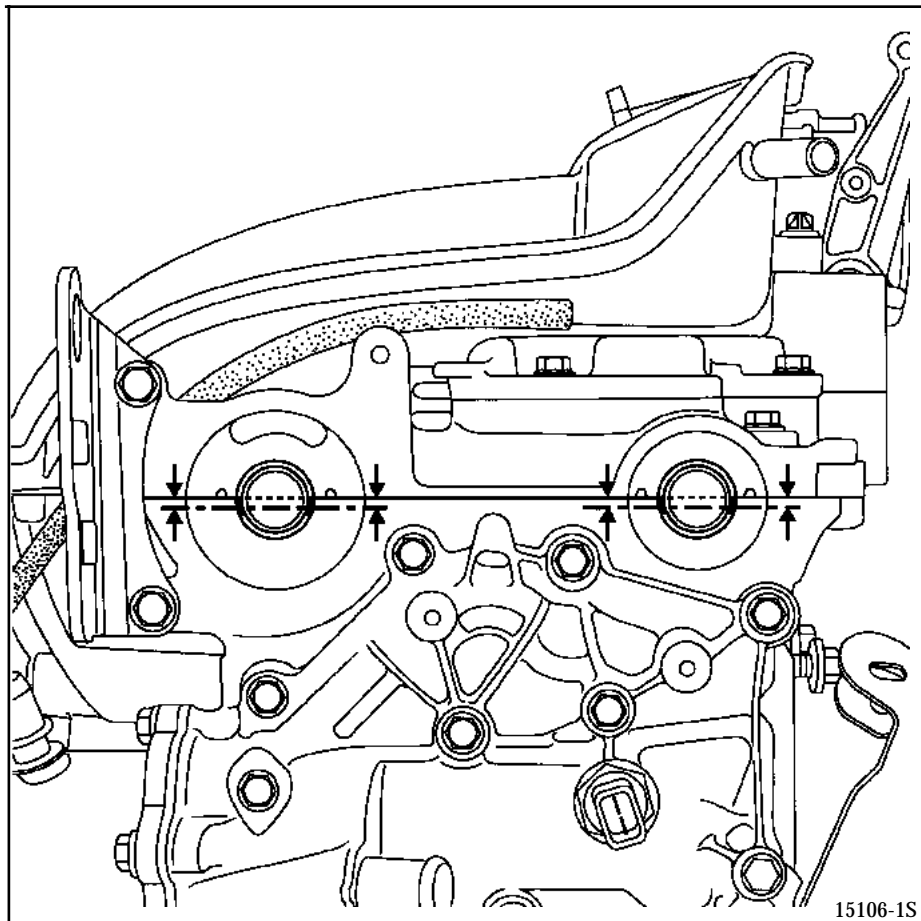


Correct position (pinned crankshaft)

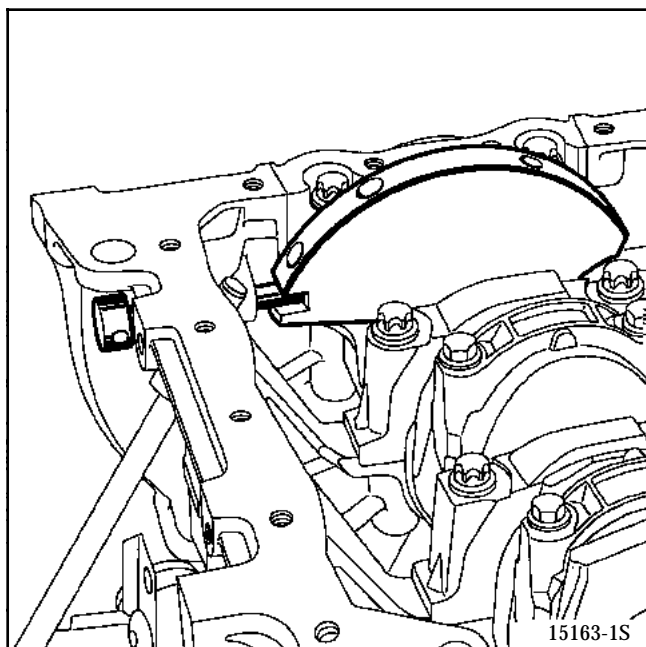


Turn the engine clockwise (timing end), to the timing setting point.

The camshaft grooves should be horizontal and offset downwards as indicated on the diagram below.

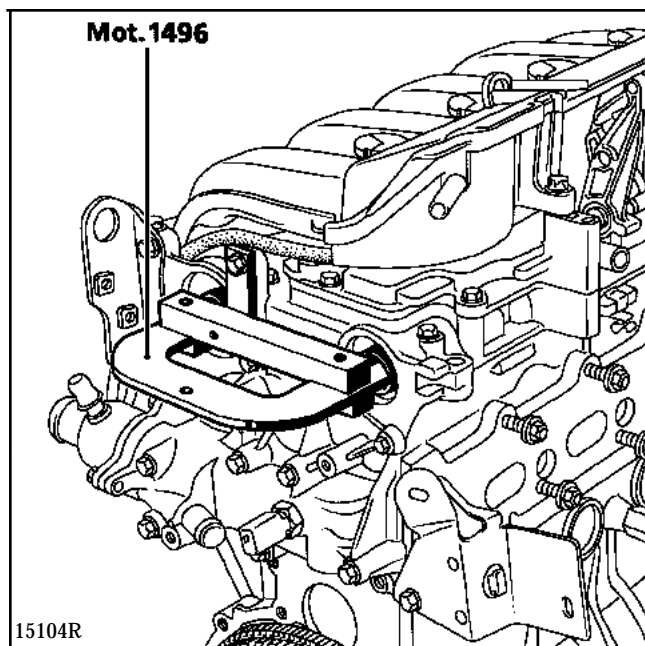


15106-1S



15163-1S

Fit tool **Mot. 1496** which is secured at the end of the camshafts.



15104R

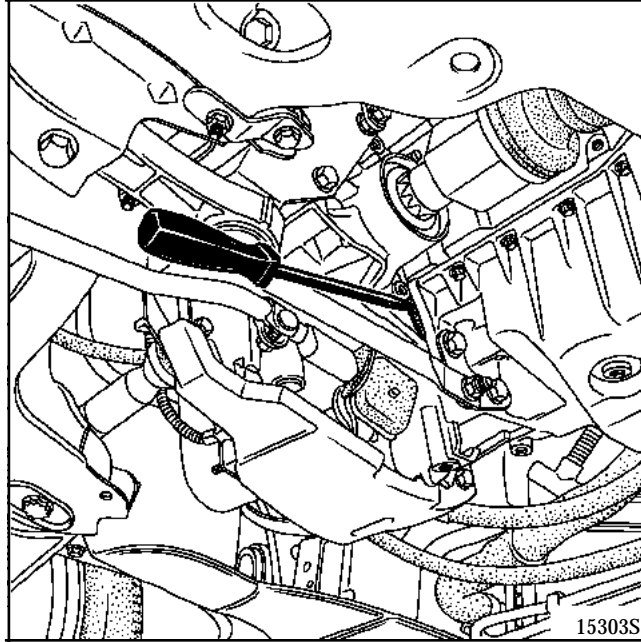
TOP AND FRONT OF ENGINE

Timing belt

11

Remove the Top Dead Centre pin.

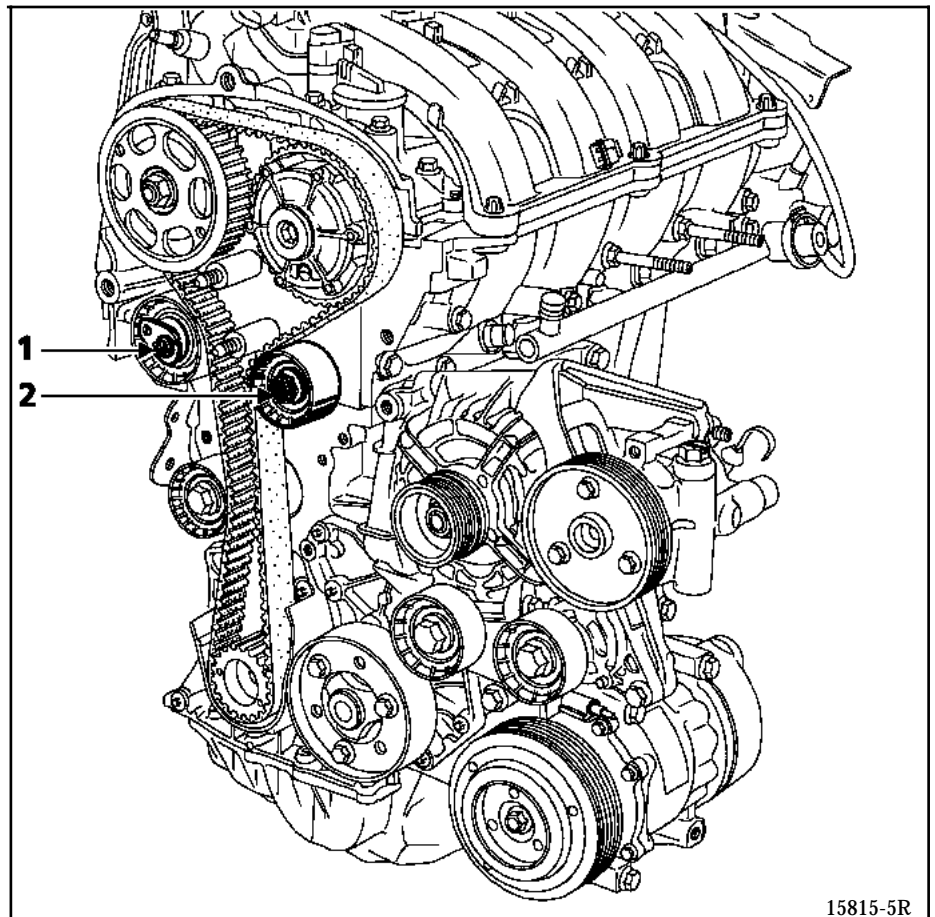
Immobilise the engine flywheel using tool **Mot. 582-01** or a large screwdriver.



Remove the accessories cranks-
haft pulley.

Slacken the timing tensioner
by unscrewing nut (1).

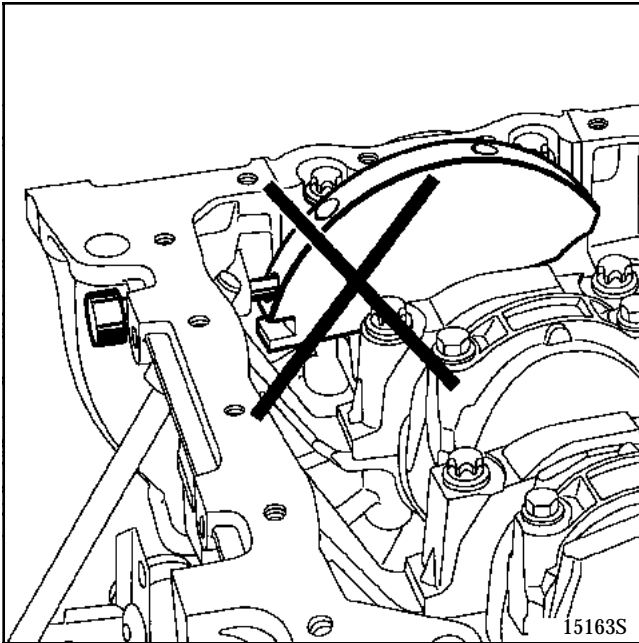
Remove the pulley (2).



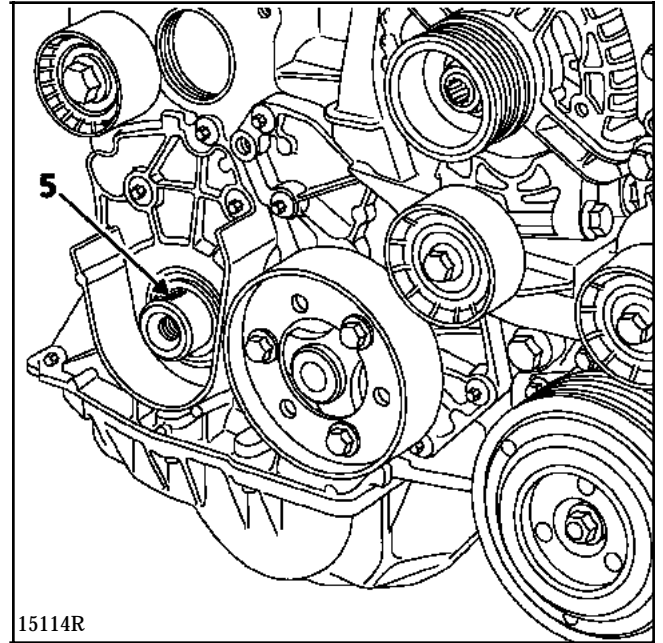
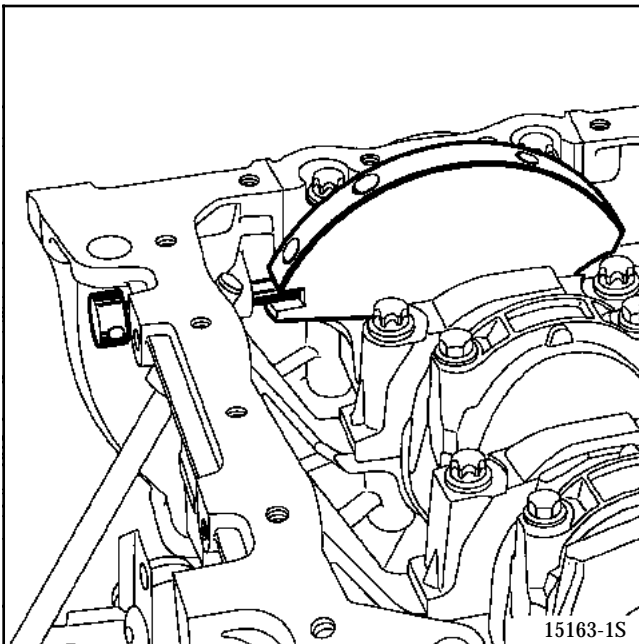
Remove the timing belt.

Check that the crankshaft is correctly pinned at Top Dead Centre and not in the balancing hole (1) (crankshaft groove (5) should be in the vertical centreline of the engine).

Incorrect position



Pinned crankshaft

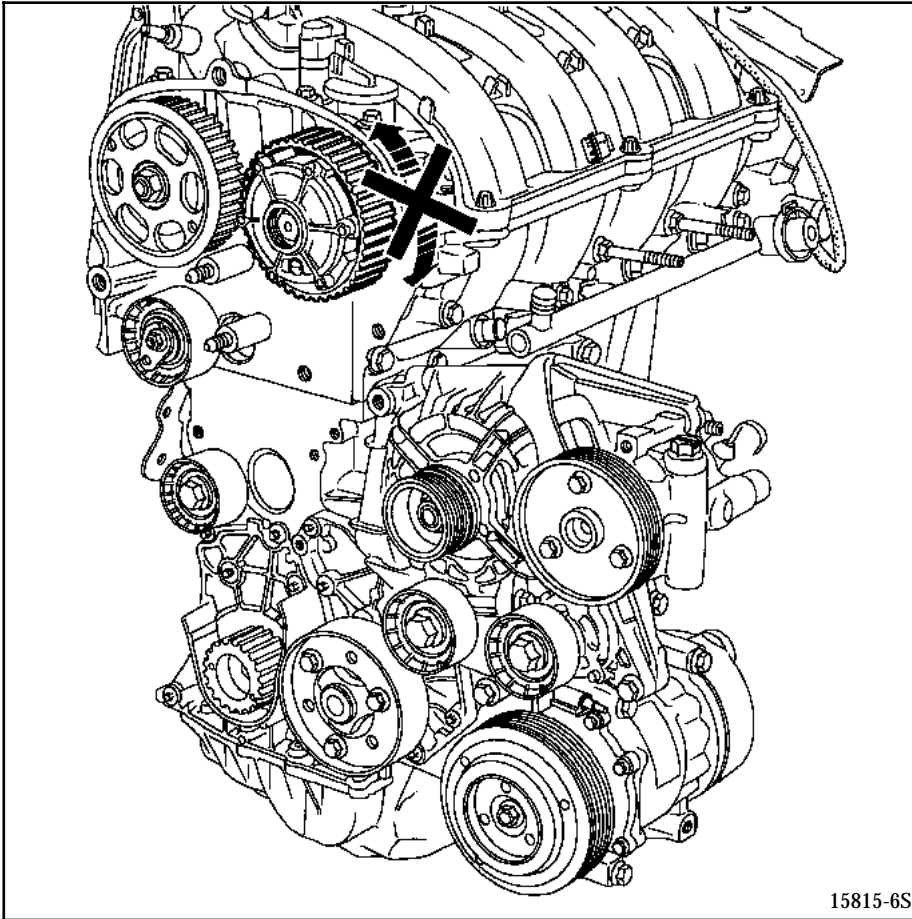


TOP AND FRONT OF ENGINE

Timing belt

11

Also check that the inlet camshaft phase shifter crown wheel is immobilised correctly (no rotation of the crown wheel to the left or to the right).



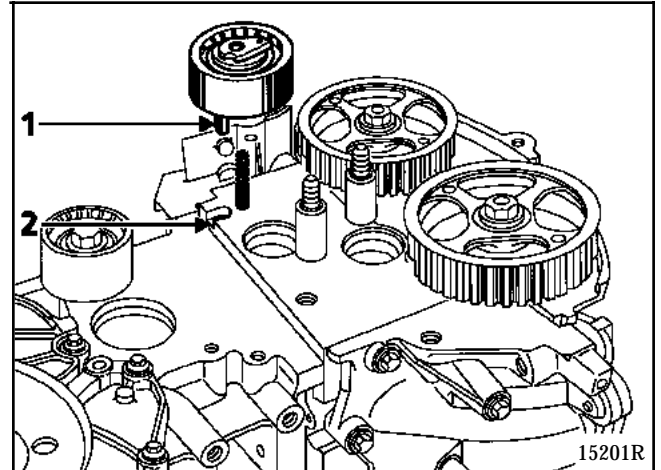
TOP AND FRONT OF ENGINE

Timing belt

11

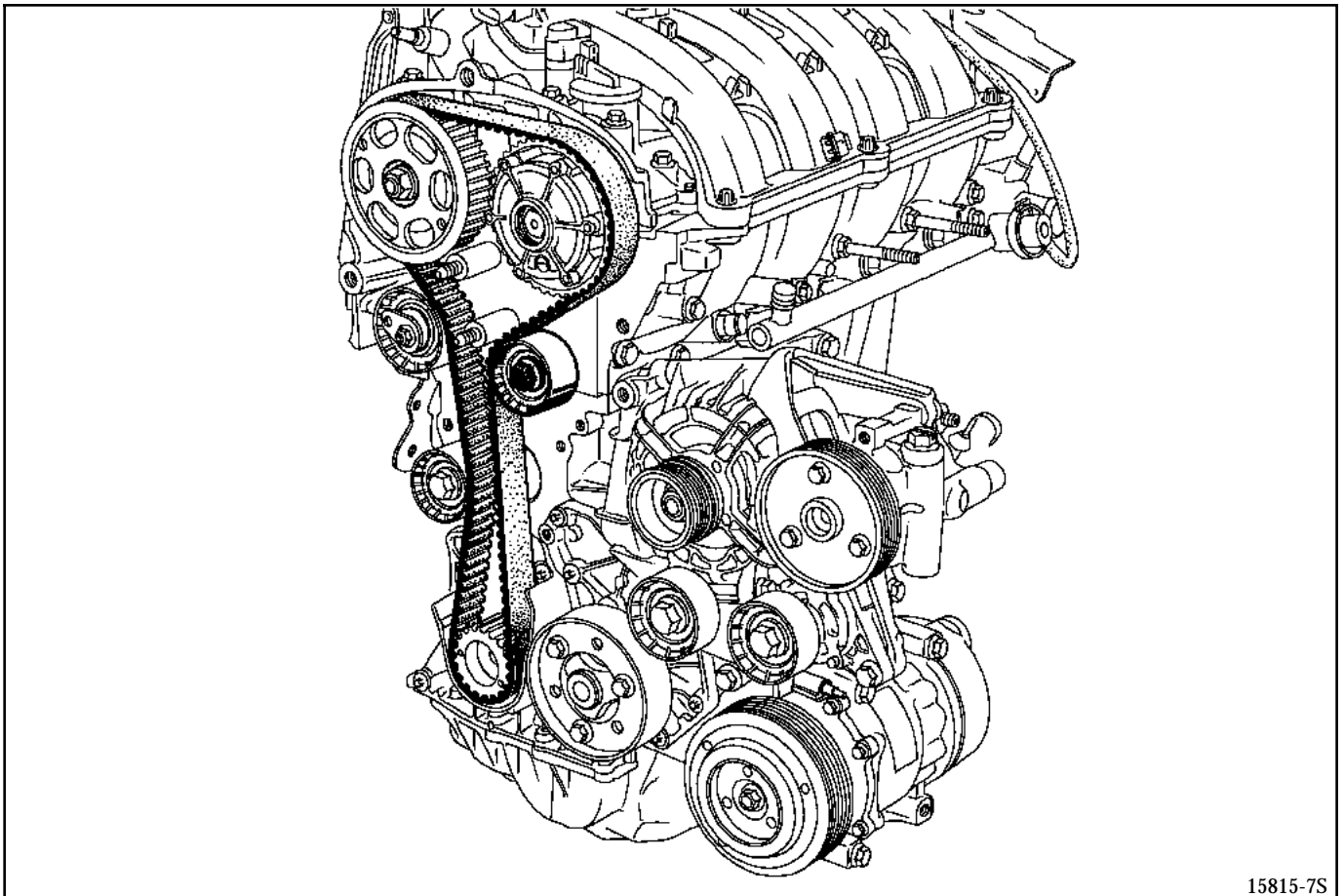
When a timing belt is changed, it is essential to change the timing tensioners and pulleys.

Check that the tensioner lug (1) is correctly positioned in the groove (2).



Refit:

- the timing belt,



- the crankshaft accessories pulley, pretightening the bolt (**without fully tightening the bolt, clearance of 2 to 3 mm between bolt/pulley**).

NOTE:

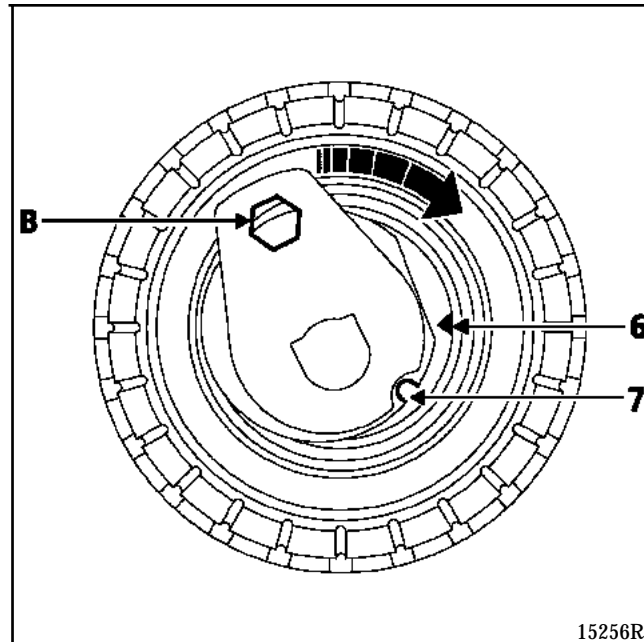
- the accessories crankshaft pulley bolt can be reused if the length under the head does not exceed **49.1 mm** (otherwise change it),
- do not oil a new bolt. However, if the old bolt is reused, it is essential to oil the threads and under the head.

TOP AND FRONT OF ENGINE

Timing belt

11

Align tensioner marks (6) and (7) using a **6 mm** hexagonal wrench at (B).



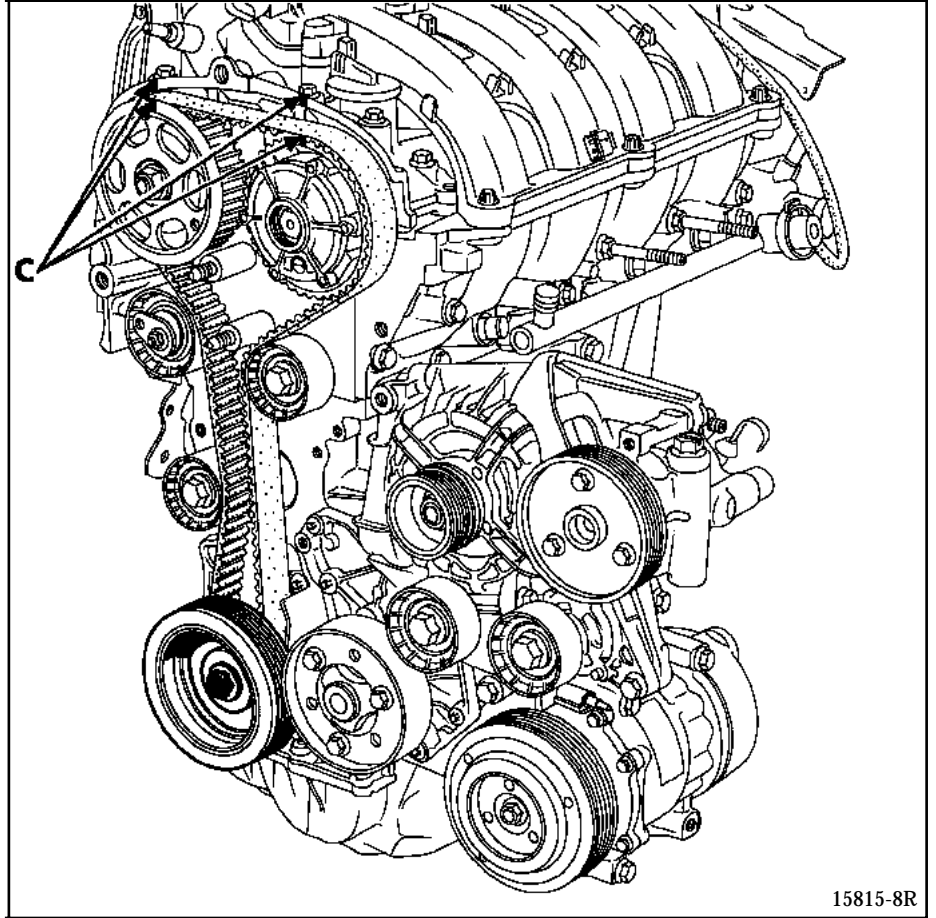
Pretighten the tensioner nut to a torque of **0.7 daN.m**.

Tighten the accessories crankshaft pulley bolt to a torque of **2 daN.m (Top Dead Centre pin still in place in the crankshaft)**.

NOTE: do not turn the tensioner anti-clockwise.

Timing belt

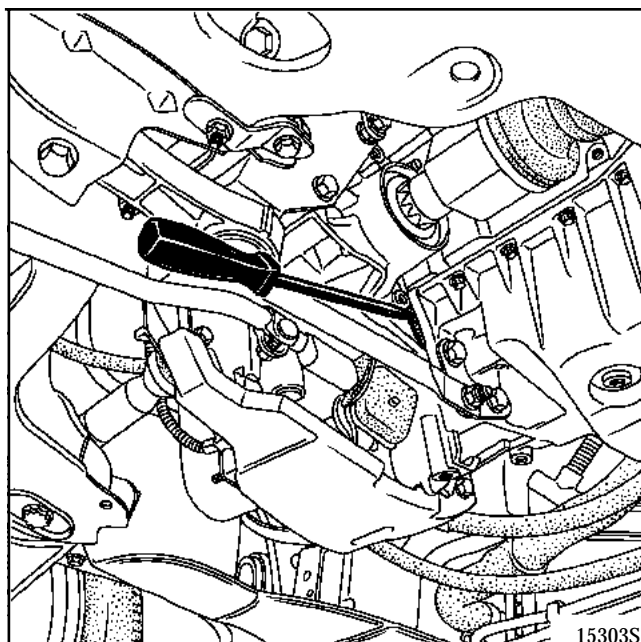
Make a mark (C) on the inlet camshaft phase shifter crown wheel and the exhaust pulley in relation to the camshaft bearing cap housing.



15815-8R

Remove camshaft setting tool **Mot. 1496** and Top Dead Centre pin **Mot. 1054**.

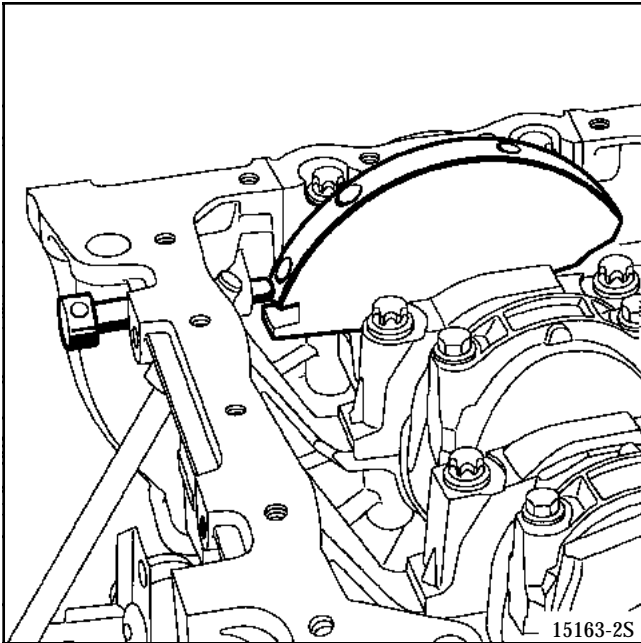
Carry out the angular tightening of the crankshaft pulley bolt to $115^{\circ} \pm 15^{\circ}$, while immobilising the engine flywheel using a large screwdriver.



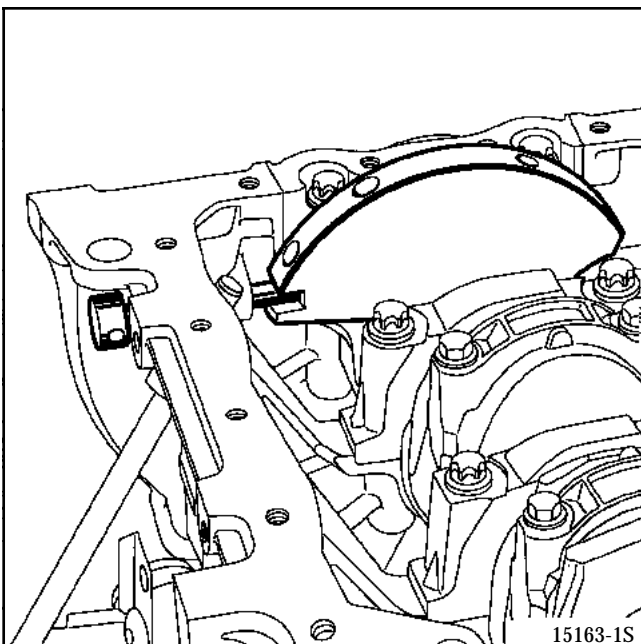
15303S

Timing belt

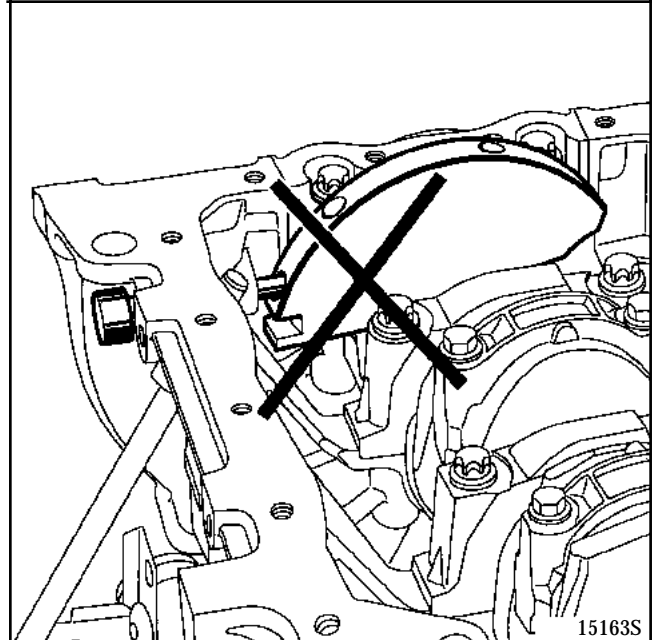
Turn the crankshaft two revolutions clockwise (timing end) and before the end of the two revolutions (**that is a half-tooth before alignment of the marks made previously by the operator**), insert the crankshaft Top Dead Centre pin (to be between the balancing hole and the pinning hole), then move the timing to its setting point.



Correct position



Incorrect position



Remove Top Dead Centre pin **Mot. 1054**.

Check that the tensioner marks are correctly aligned and repeat the tensioning procedure if they are not. Slacken the tensioner nut by one revolution maximum while retaining it using a **6 mm** hexagonal wrench.

Align the tensioner marks and fully tighten the nut to a torque of **2.8 daN.m**.

Checking the setting and the tension

Checking the tension:

Turn the crankshaft two revolutions clockwise (timing end) and before the end of the two revolutions (**that is a half-tooth before alignment of the marks made previously by the operator**), insert the crankshaft Top Dead Centre pin.

Remove Top Dead Centre pin **Mot. 1054**.

Check that the tensioner marks are correctly aligned and repeat the tensioning procedure if they are not. Slacken the tensioner nut by one revolution maximum while retaining it using a **6 mm** hexagonal wrench.

Align the tensioner marks and fully tighten the nut to a torque of **2.8 daN.m**.

TOP AND FRONT OF ENGINE

Timing belt

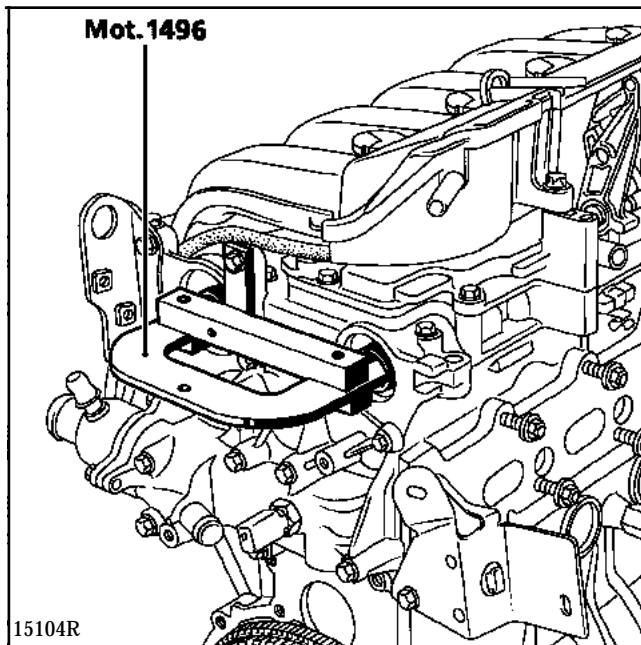
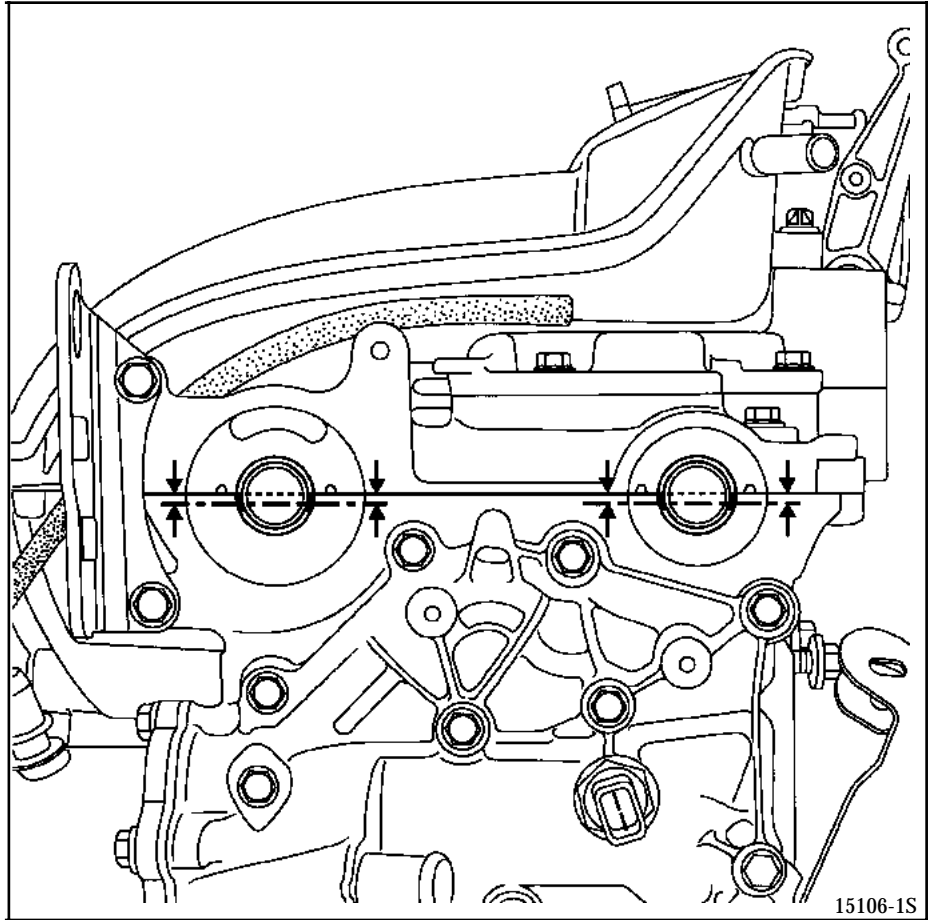
11

Checking the setting

Ensure that the tensioner marks are positioned correctly before checking the timing setting.

Fit the Top Dead Centre pin (check that the marks made on the camshaft pulleys by the operator are aligned).

Fit (without using force) camshaft setting tool **Mot. 1496** (the camshaft grooves should be horizontal and offset downwards). If the tool does not engage, the timing setting and tensioning procedure must be repeated.



Removal of the cooling system radiator requires removal of the cooling assembly.

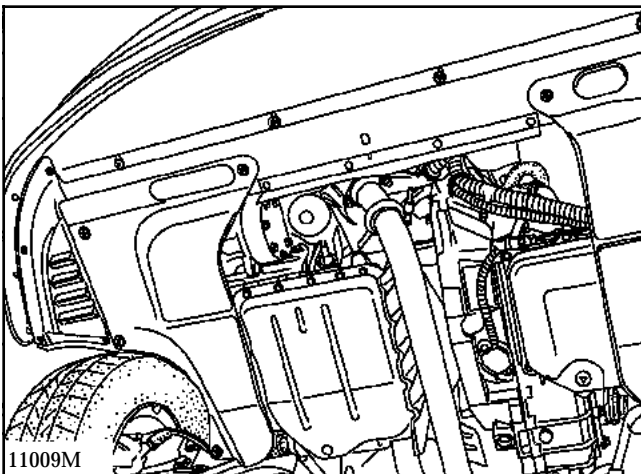
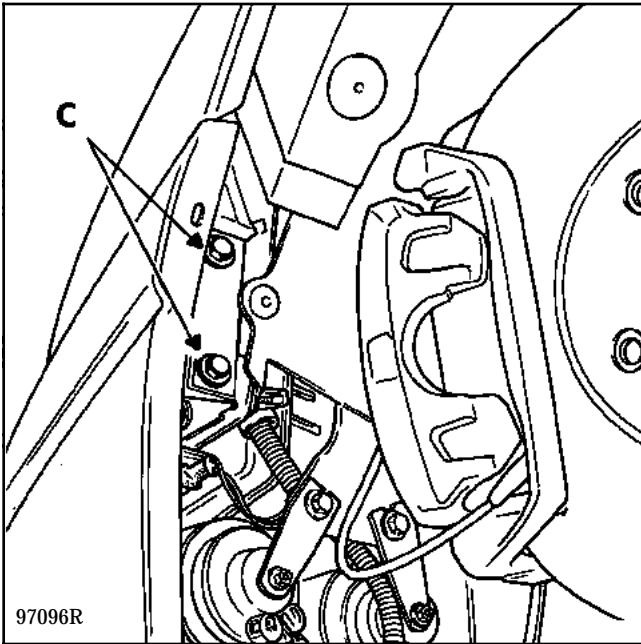
Place the vehicle on a two post lift.

Disconnect the battery.

Drain the refrigerant circuit using a charging station.

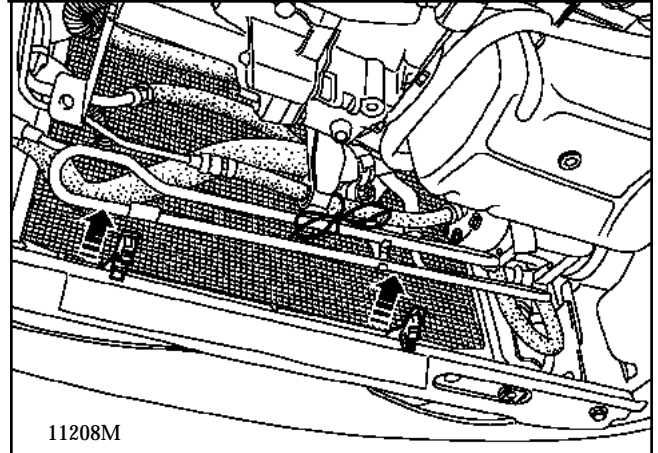
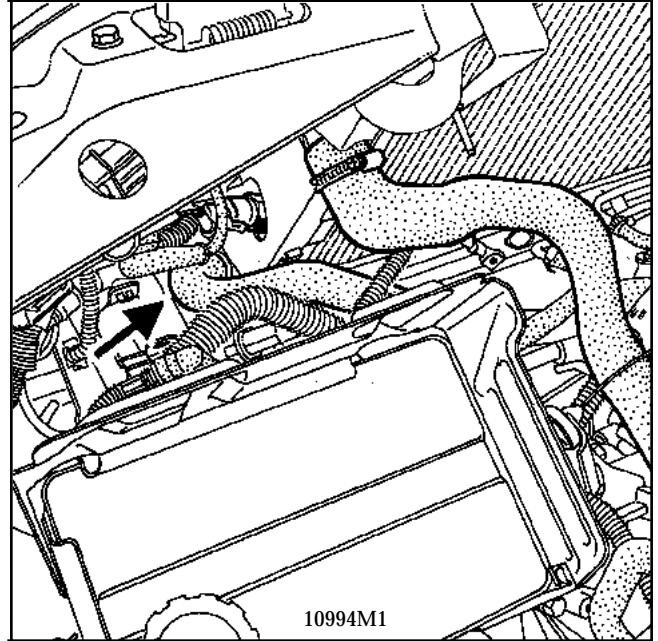
Remove the front bumper (move aside the front wheel arches to gain access to the bolts (C)).

Disconnect the fog lamps if necessary.

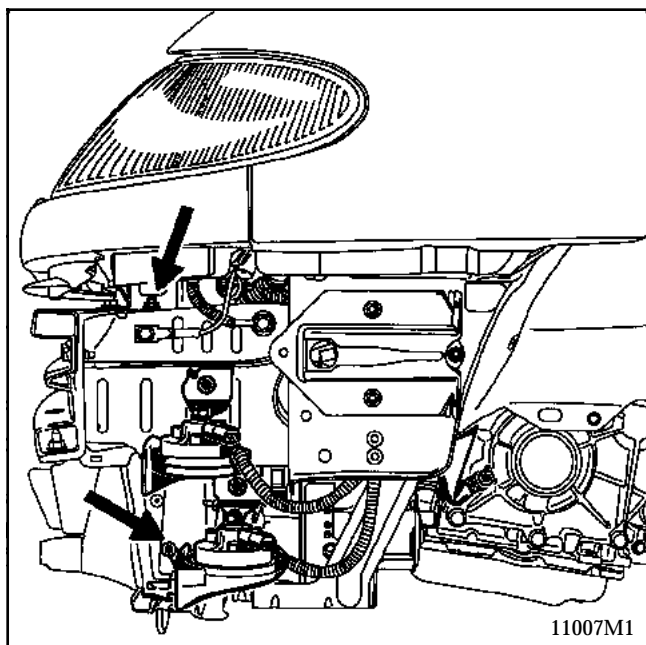


Drain the engine cooling circuit by disconnecting the lower radiator hose.

Unclip the power steering oil cooler and attach it to the engine.



Remove the mounting bolts securing the baffles on the side members.



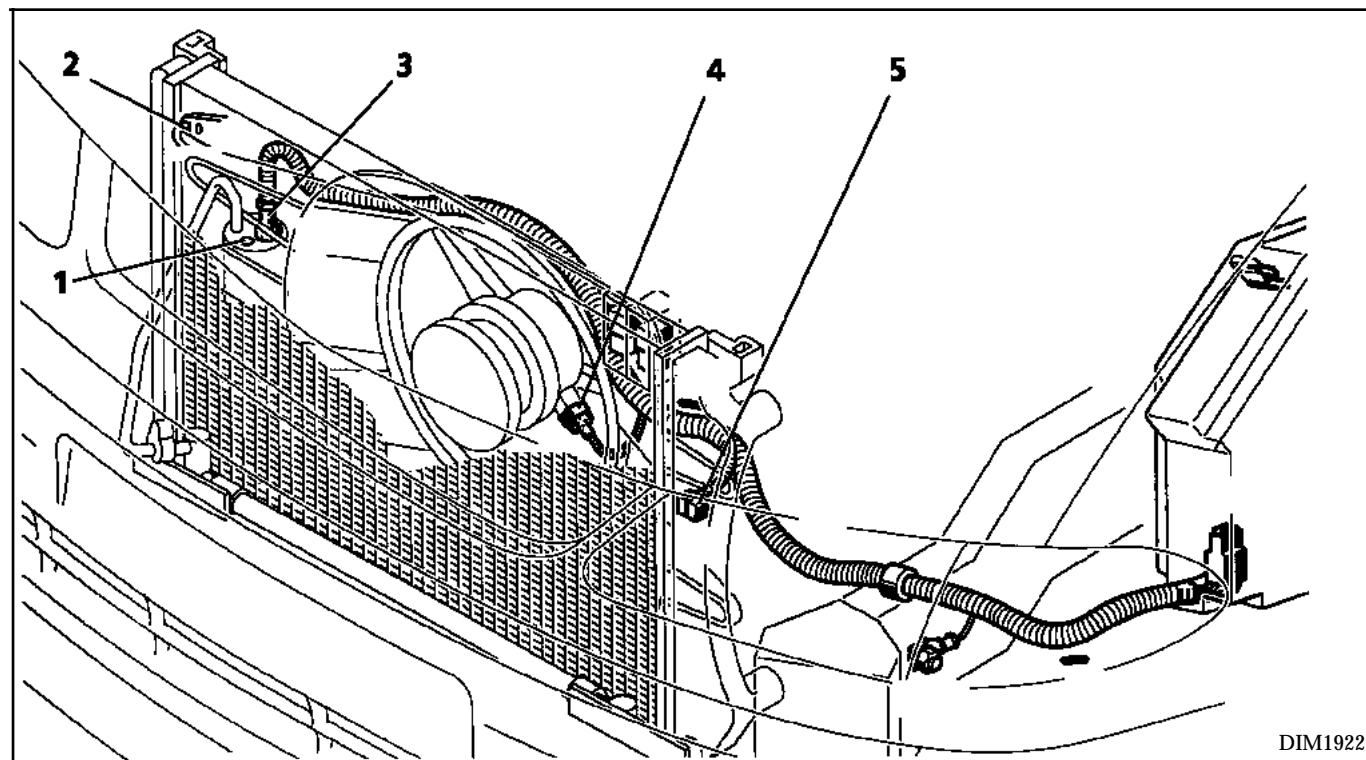
Fold back the baffles towards the cooling assembly.

Remove the mounting bolt securing the air conditioning circuit pipes clamp on the dehydration canister outlet (1) and condenser inlet (2). Close the holes immediately.

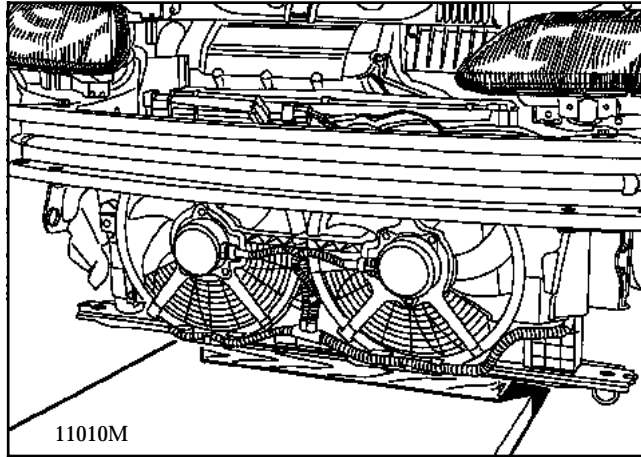
Disconnect:

- the trifunction pressure switch (3) above the bottle,
- the upper radiator hose,
- the radiator thermal switch,
- the fan (4),
- the relay housing (5).

Detach the electrical harness from its mountings on the cooling assembly and fold it back on the left-hand side.



Place the radiator lower crossmember on one or two shims so that it is supported and it is possible to gain access to the mounting bolt on the ends of the side members.



Remove the two mounting bolts securing the crossmember on the side members and lift the vehicle to remove the cooling assembly.

REFITTING

Work in a pair to refit the cooling assembly. If necessary, grease the upper mounting rubbers on the headlight-carrier crossmember.

If necessary, remove the radiator grille to make it possible to guide the upper radiator aligners in the headlight-carrier crossmember.

Proceed in the reverse order to removal.

Fill the refrigerant circuit (if fitted) and the coolant circuit.

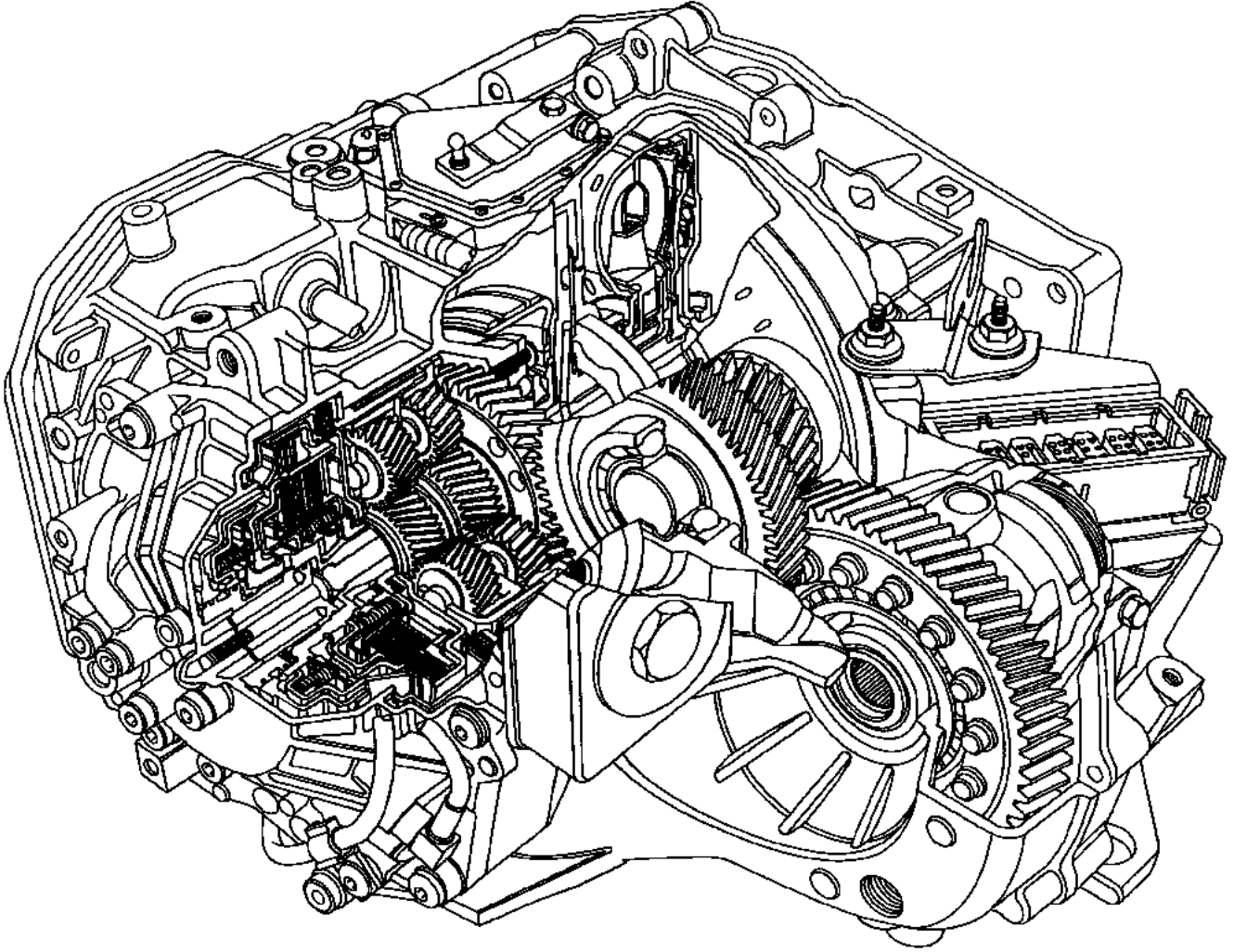
Reconnect the battery, put back into operation all the units which were disrupted by its disconnection.

Bleed the engine and check the sealing of the cooling and air conditioning circuits.

AUTOMATIC TRANSMISSION

Exploded view

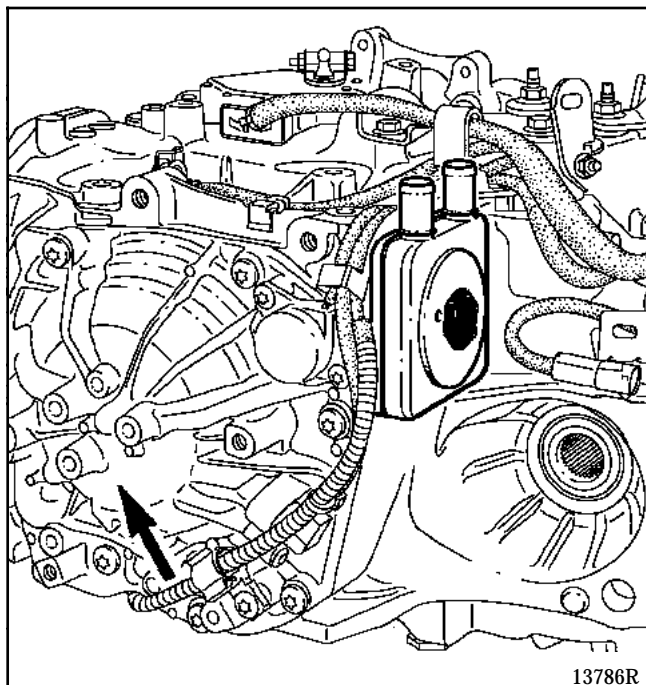
23



PRN2315

VEHICLE	A.T. TYPE	ENGINE	STEP DOWN RATIO	FINAL DRIVE RATIO
JE0 N	DP0 005	F4R 701	52 / 67	21 / 73

Automatic transmission identification engraving.



SPECIFICATIONS

Weight: 70 kg

Space vehicles fitted with the DP0 automatic transmission are equipped with systems called: "Shift Lock" and "Lock Up".

The purpose of the "Shift Lock" is to prevent movement of the selector lever without simultaneous pressing of the brake pedal. **For troubleshooting operations when the battery is faulty, refer to the vehicle handbook.**

The purpose of the "Lock Up" or converter coupling is to connect the automatic transmission directly to the engine. This function is carried out by a "mini clutch" placed in the converter. The "Lock Up" is controlled by the DP0 computer.

Gears (epicyclic trains output):

1st	2nd	3rd	4th	Reverse
2.724	1.499	1	0.71	2.455

TOWING

It is preferable, in all cases, to have the vehicle towed on a flat-bed trailer or with the front wheels lifted. However, if this is not possible, towing may be carried out in exceptional circumstances at a speed below 30 mph (50 km/h) and over a distance limited to 30 miles (50 km) maximum (lever in N).

TOWED LOAD

It is compulsory that the towed load is less than 1,300 kg with a trailer with brakes (for driver only).

AUTOMATIC TRANSMISSION

Consumables

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DESCRIPTION	COMPONENT CONCERNED
MOLYKOTE BR2 grease	Converter centring device
Loctite FRENBLOC	Brake caliper mounting bolt

Parts which must always be changed

Parts which must be changed if they have been removed:

- prevailing torque nuts,
- seals,
- rubber seals.

Oil

The DP0 automatic transmission is **lubricated for life**, it does not require any maintenance.


All that is required is for the level to be topped up in the event a slight leak.

Specified oil:

ELF RENAULTMATIC D3 SYN (to be ordered from ELF) Standard DEXRON III.

Capacity in litres

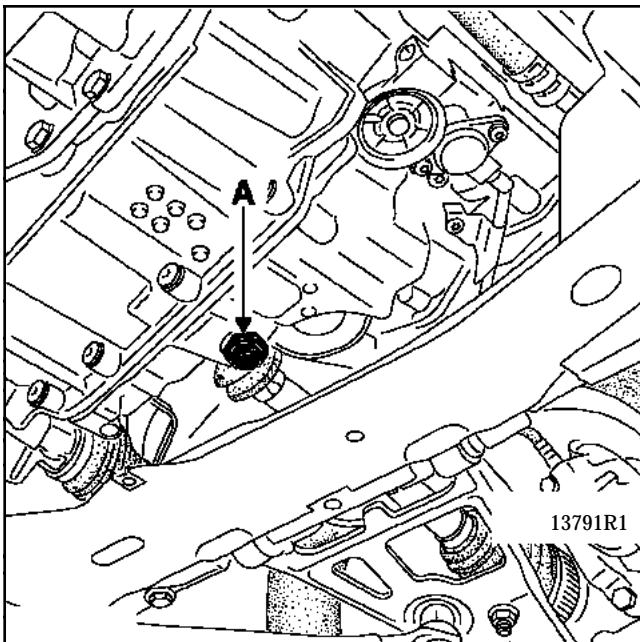
	Mechanical section
Total volume	6

TIGHTENING TORQUES (in daN.m)	
Drain plug	2.5
Top-up overflow	3.5

DRAINING

It is preferable to drain the automatic transmission with the oil warm (60°C maximum), to eliminate as many impurities as possible.

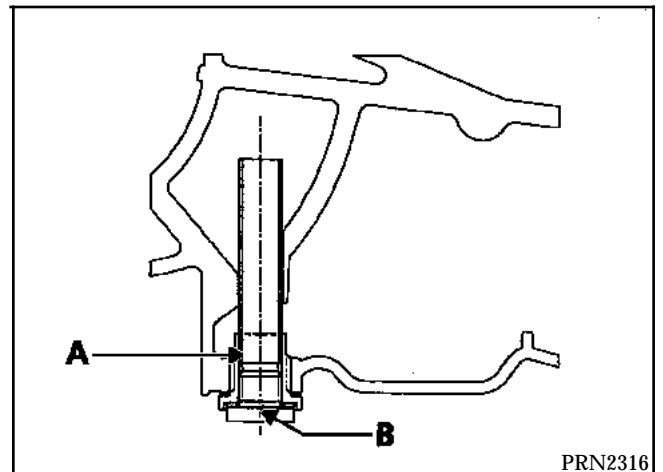
Draining is by removing plug (A).



Special features:

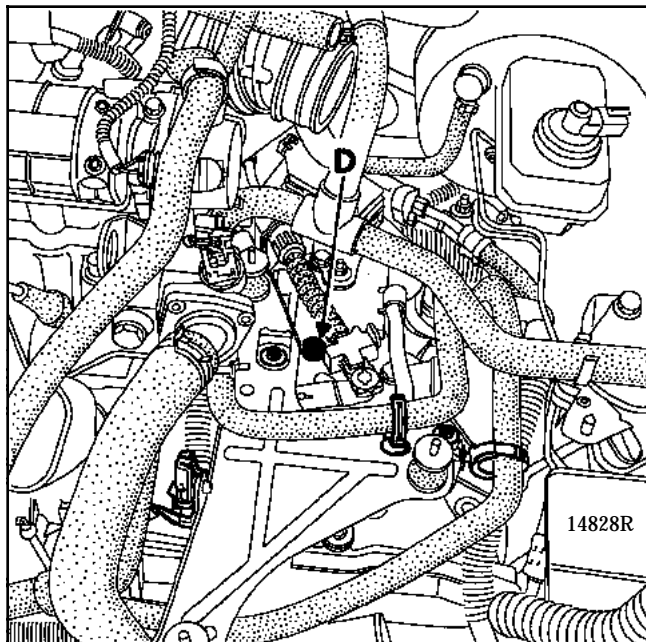
The plug has two functions:

- draining (by removing the overflow (A)),
- topping up (by removing the plug (B)).



FILLING

Filling is via hole (D).



Use a funnel with 15/100 filter to prevent the introduction of impurities.

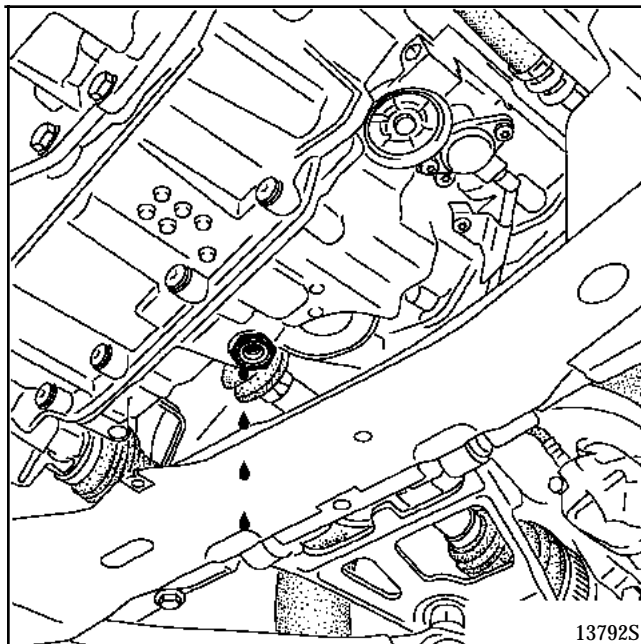
FILLING PROCEDURE

- 1 - Place the vehicle on level ground.
- 2 - Fill the automatic transmission with **3.5 litres** of new oil.
- 3 - Run the engine at idle.
- 4 - Connect the XR25, enter:

D	1	4
---	---	---

 then

#	0	4
---	---	---
- 5 - When a temperature of $60^{\circ}\text{C} \pm 1^{\circ}\text{C}$ is reached, open the top-up plug.
- 6 - Position a receptacle to recover at least 0.1 litres of excess oil and wait until the oil flows **drop by drop**.



- 7 - Close the top-up plug.

PROCEDURE FOR CHECKING THE LEVEL OTHER THAN DURING FILLING OPERATIONS

It is **ESSENTIAL** to check the level in accordance with the procedure described below;

- 1 - Place the vehicle on level ground.
- 2 - Fill the automatic transmission with **0.5 litres** of new oil.
- 3 - Run the engine at idle. Carry out operations 4, 5 and 6 described above.

If the oil does not flow or if the quantity which can be added is less than 0.1 litres, stop the engine, add 0.5 litres, allow the transmission to cool to 50°C then repeat operations 3-4-5-6.

IMPORTANT: In the case of an oil change, the **electronic oil age counter (inside the computer) must be reset to zero. Enter the date of draining using command G74***.

Place the vehicle on a two post lift.

Lift the vehicle until the wheels are a few centimetres off the ground.

Connect the XR25.

Place the ISO selector on S8.

Enter the DP0 transmission code

D **1** **4** then **#** **0** **4**

to display the oil temperature.

The check must be carried out at an oil temperature of between **60°C** and **80°C**.

Start the engine, place the lever at D.

Enter the code :

**0** **6**

to display the engine speed.

Accelerate fully keeping the brakes applied. The front wheels must not rotate.

ATTENTION: Full-load must not be maintained for more than **5 seconds**. After this, there is a **significant risk of destruction** of the converter or the automatic transmission.

IMPORTANT:

Once the measurement has been taken, release the accelerator and **keep the brakes applied until the engine speed has stabilised at idle** (there is a risk of damage to the automatic transmission if this condition is not observed).

The engine speed should stabilise at:
2600 ± 150 rpm.

If the setting point is outside the tolerance the converter must be changed.

COMMENT: If the setting point is too low this may be due to a lack of engine power.

AUTOMATIC TRANSMISSION

Hydraulic distributor

23

ESSENTIAL SPECIAL TOOLS

B.Vi. 1462 Plunger shaft adjusting screw

TIGHTENING TORQUES (in daN.m)



Cover mounting bolt	1
Distributor mounting bolt	0.75

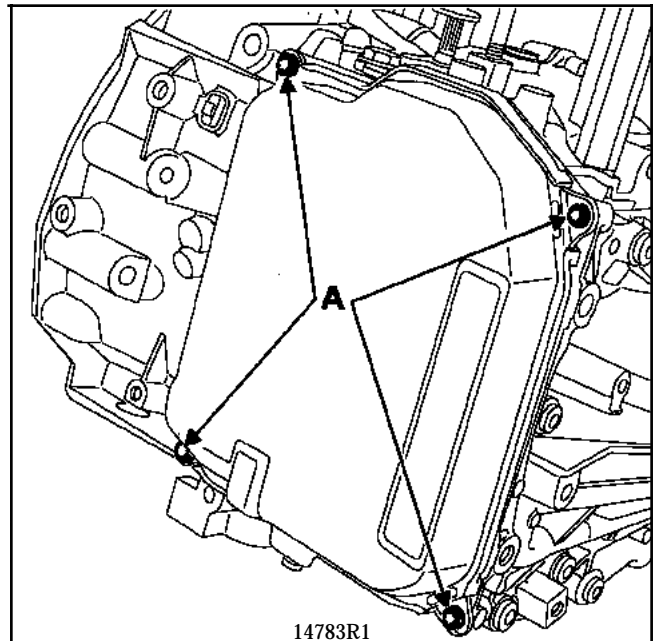
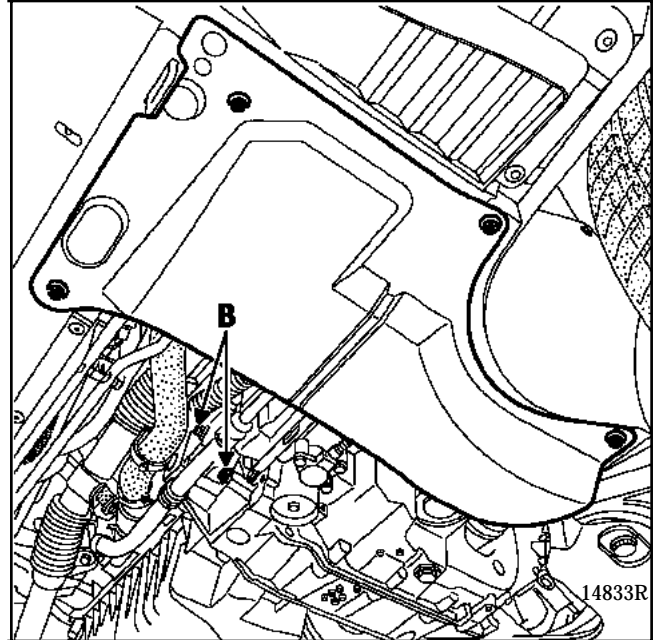
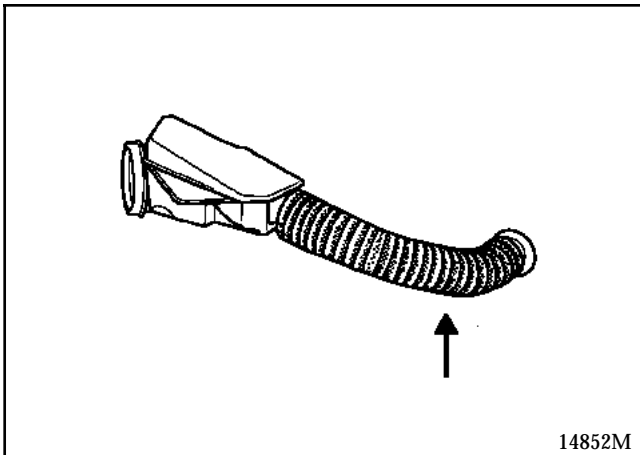
REMOVAL

Place the vehicle on a two post lift.
Disconnect the battery.

Drain the automatic transmission (refer to the relevant section).

Remove:

- the air filter air intake pipe,



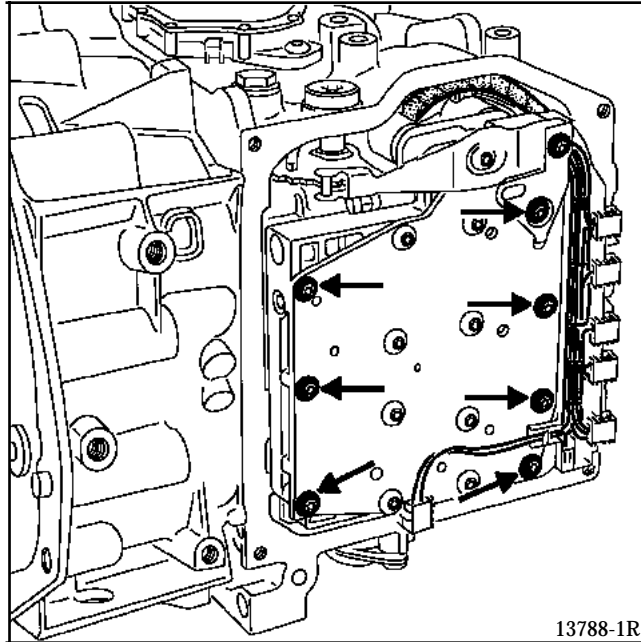
- the power steering pipe mounting bolts (B) ,
- the four hydraulic distributor cover retaining bolts (A) (warning, oil may flow out).

AUTOMATIC TRANSMISSION

Hydraulic distributor

23

Remove the seven hydraulic distributor mounting bolts.



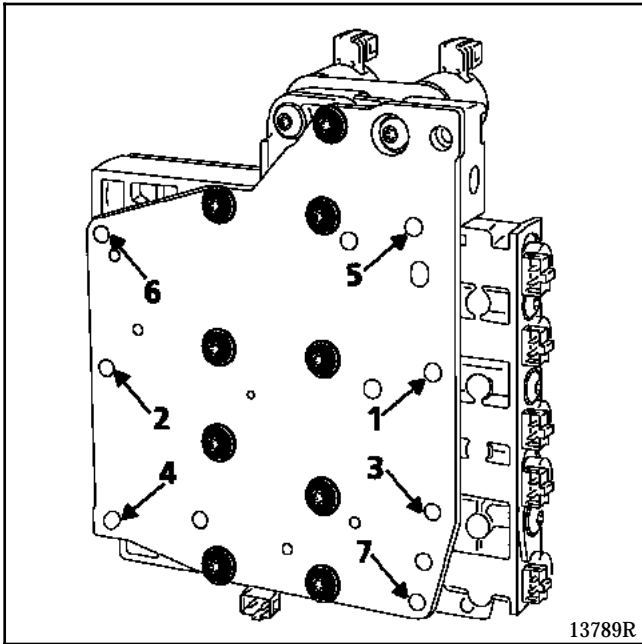
Disconnect the solenoid valve connectors and remove the hydraulic distributor.

REFITTING

Offer up the hydraulic distributor and reconnect the solenoid valve connectors.

Refit the hydraulic distributor mounting bolts as indicated below:

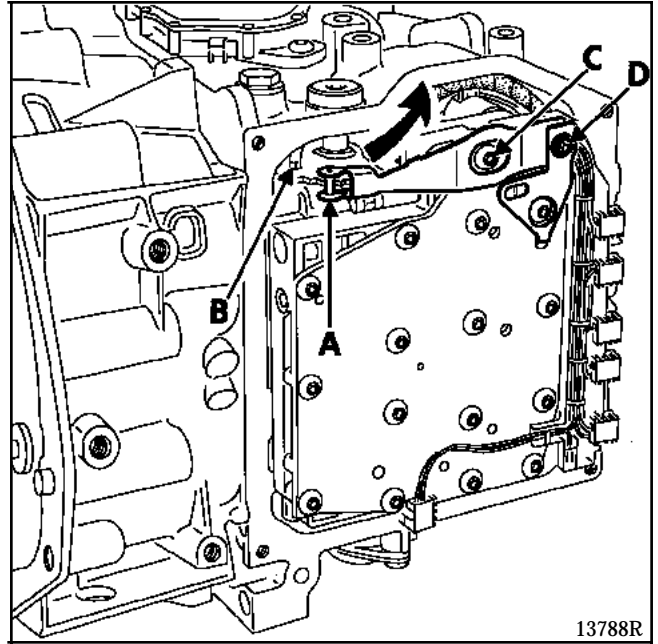
- Fit:
 - the distributor prealigning it using bolts (4) and (5),
 - the other bolts.
- Tighten the bolts to a torque of **0.75 daN.m** in the order 1 - 2 - 3 - 4 - 5 - 6 - 7.



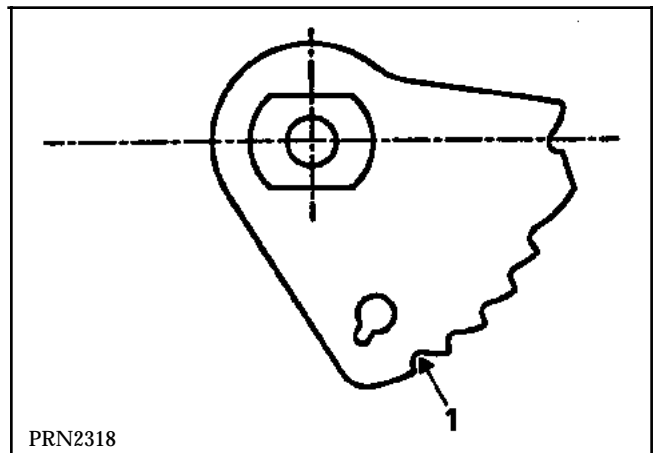
SETTING THE PLUNGER SHAFT

Retain the multifunction switch in the extreme position (1st imposed) using a plastic clip and a bolt in the mechanical section housing.

Remove bolt (C).



Position the plunger shaft by placing the roller (A) in the hollow of sector (B) corresponding to 1st imposed.



Fit tool **B.Vi. 1462** in place of bolt (C). Screw in the tool fully while retaining the plunger shaft.

Tighten bolt (D) to the specified torque.

Remove the tool, refit bolt (C) and tighten it to the specified torque.


Apply command G80** using the XR25 if the hydraulic distributor is changed to reset the auto-adaptive patterns to zero and command G74* to reset the oil age counter to zero (enter the date of draining day/month/year).

AUTOMATIC TRANSMISSION

Automatic transmission (Removal - Refitting)

23

ESSENTIAL SPECIAL TOOLS	
T. Av. 476	Tool for extracting ball joints
ESSENTIAL EQUIPMENT	
Engine support stand	
Component jack	

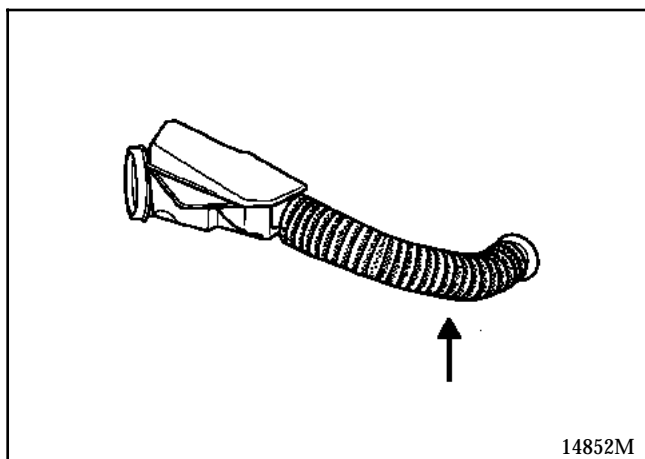
TIGHTENING TORQUES (in daN.m)	
Transmission nut	33
Brake caliper bolt	3.5
Lower ball joint nut	6.5
Shock absorber base bolt	20
Engine tie-bar bolt	5.5
Gearbox surround and starter bolt	4.4
Suspended support on gearbox nut	6
Wheel bolts	10
Steering ball joint nut	4
Converter to drive plate mounting nut	3
Exchanger mounting bolt	5
Modular connector support bolt	2

REMOVAL

Place the vehicle on a two post lift.

Disconnect the battery.

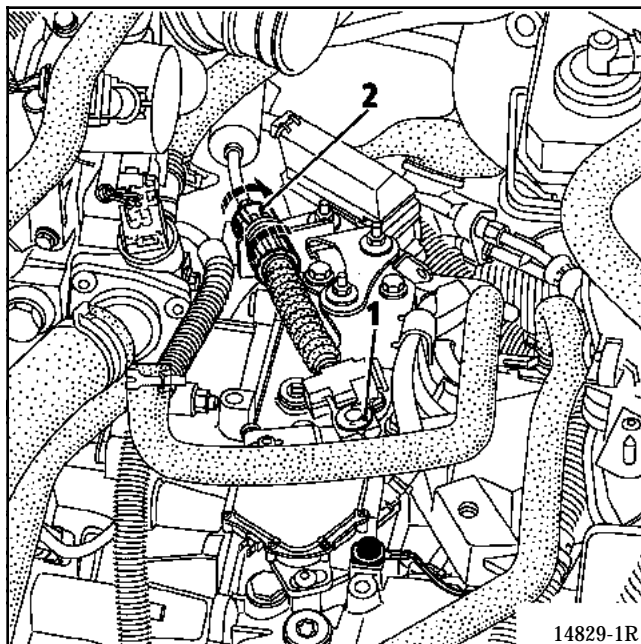
Remove the air intake pipe.



Disconnect:

- the ball joint (1) from the multifunction switch cable,
- the multifunction switch cable (2) releasing the cable sleeve stop.

NOTE: do not move the orange ring during this operation. It is possible that this may break on removal or refitting. If appropriate, do not replace the control cable as the absence of this part does not adversely affect the functionality of the system.



AUTOMATIC TRANSMISSION

Automatic transmission (Removal - Refitting)

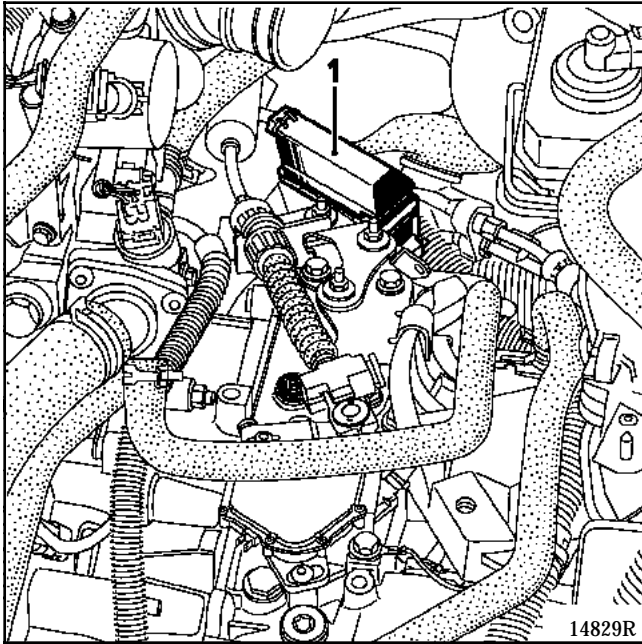
23

Disconnect:

- the modular connector (1) freeing the connector slide,
- the oxygen sensor,
- the speed sensor connector.

IMPORTANT:

Protect the connector by slipping it into a sealed plastic bag.

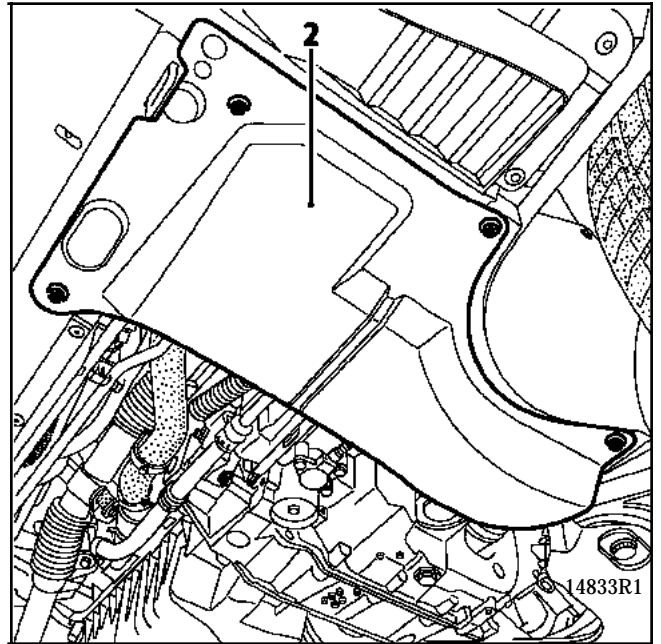


Remove the top dead centre connector.

Fit hose clamps and disconnect the exchanger.

Remove:

- the two half-casings under the engine (2),
- the driveshafts (see Workshop Repair Manual **MR 315 Section 29**)



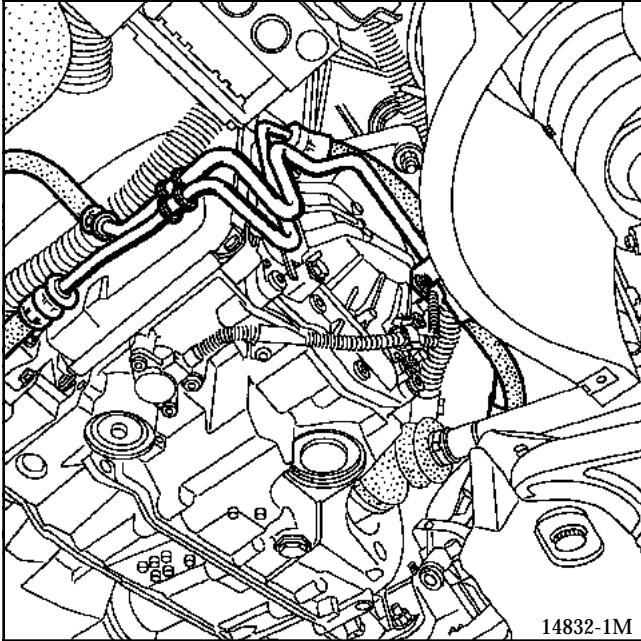
AUTOMATIC TRANSMISSION

Automatic transmission (Removal - Refitting)

23

Remove:

- the starter,
- the engine tie-bar,
- the earth strap,
- the power steering support mountings.



Fit the engine support stand.

Turn the crankshaft clockwise to gain access to the three nuts which secure the drive plate / converter and remove them.

Remove:

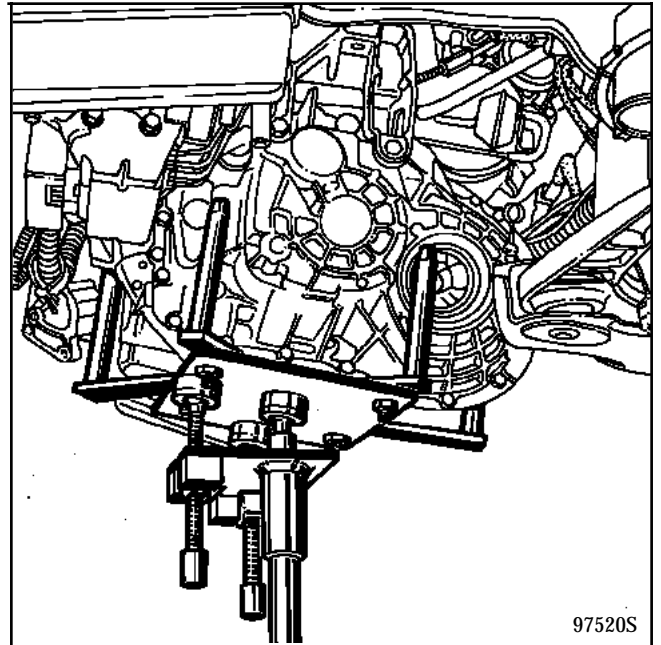
- the left-hand wheel arch,
- the gearbox mounting.

Tilt the engine / automatic transmission downwards as much as possible.

WARNING: take care not to damage the air conditioning compressor.

Remove the gearbox surround upper bolts and studs.

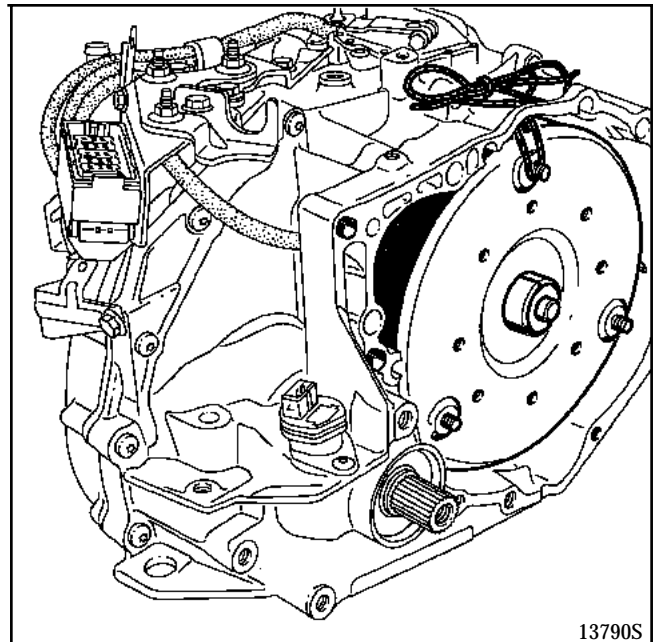
Fit the component jack.



Remove the gearbox surround lower bolts and studs.

Uncouple the automatic transmission from the engine taking care not to dislodge the converter.

Attach the converter using a strap to prevent it from becoming dislodged.



REFITTING

Refitting does not present any difficulties, proceed in the reverse order to removal.

CHECK THAT THE CENTRING PINS ARE PRESENT.

DO NOT REUSE THE CONVERTER MOUNTING NUTS. ALWAYS FIT NEW NUTS.


Top up the oil (refer to the relevant section).

If the oil is changed, use the XR25 to apply command **G80**** to reset the auto-adaptive patterns to zero and command **G74*** to rest the oil age counter in the automatic transmission computer to zero.

ESSENTIAL SPECIAL TOOLS

B. Vi. 1459 Tool for fitting the right-hand driveshaft seal

B. Vi. 1460 Tool for fitting the left-hand driveshaft seal

TIGHTENING TORQUE (in daN.m)	
Brake caliper bolt	3.5
Lower ball joint nut	6.5
Shock absorber base bolt	20
Wheel bolts	10
Steering ball joint nut	4
Drain plug	2.5

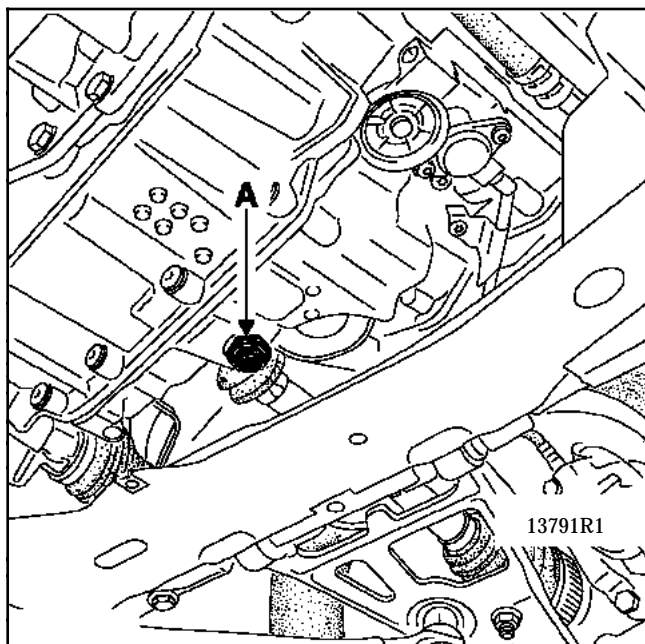
To change an differential outlet seal, the corresponding driveshaft must be removed.

REMOVAL

Place the vehicle on a two post lift.

Disconnect the battery.

Drain the automatic transmission via plug (A).



Remove the faulty differential outlet seal using a screwdriver or a hook taking care not to scratch the surfaces with which it is in contact.

Take care not to let the seal spring fall into the automatic transmission.

REFITTING

The seal is fitted using tool **B. Vi. 1459** or **B. Vi. 1460**.

Guide the assembly until the tool is in contact with the automatic transmission casing.

Refit in the reverse order to removal.

TIGHTEN THE SCREWS, NUTS, BOLTS TO THE SPECIFIED TORQUES.

Fill the automatic transmission and check the level (refer to the relevant section).

ESSENTIAL SPECIAL TOOLS	
B. Vi. 1457	Tool for fitting the converter seal
Mot. 587	Tool for extracting the seal

The converter seal can only be removed following removal of the automatic transmission and the converter (refer to the relevant section).

REMOVAL

Remove the converter as far as possible in the centreline.

Warning: the converter contains a significant quantity of oil which may flow out on removal.

Using tool **Mot. 587**, remove the seal taking care not to damage the surfaces with which it is in contact.

REFITTING

The operation must be carried out with great care. Coat all the surfaces in contact with oil.

Fit the new seal (coated with oil) fully using tool **B. Vi. 1457**.

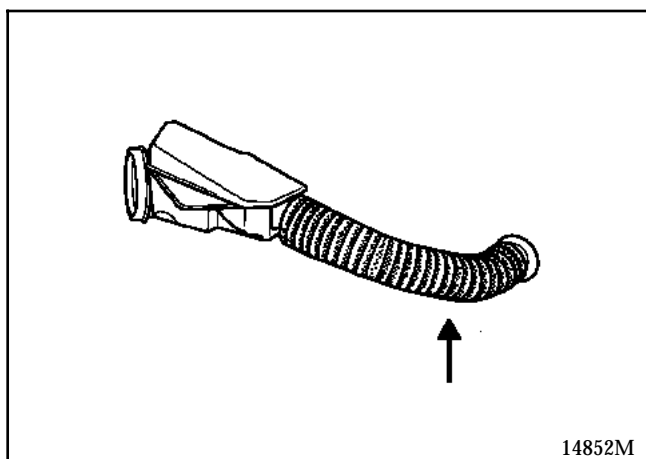
Check that the converter is fitted correctly.

TIGHTENING TORQUES (in daN.m)	
Multifunction switch mounting bolt	1
Lever mounting nut	1

REMOVAL

Place the switch in position **D**.

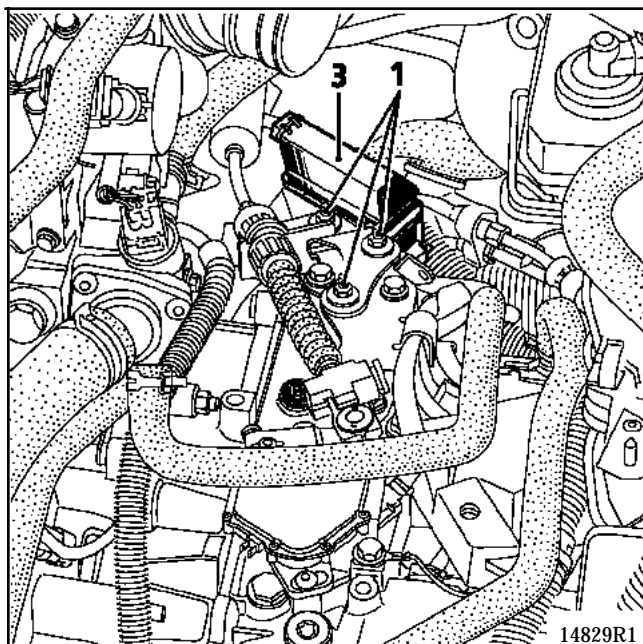
Remove the air intake pipe.



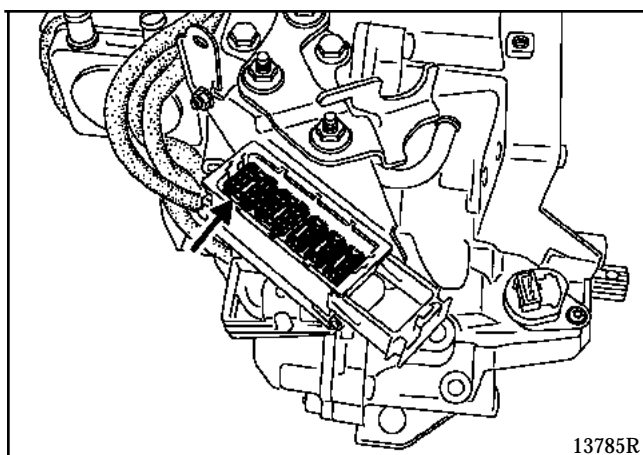
Disconnect the ball joint from the multifunction switch selection cable.

Remove:

- the lever and the two multifunction switch mounting bolts,
- the three modular connector (3) support plate mounting bolts (1).



- the modular connector plate mounting bolts then extract the connector from the multifunction switch (12-way)



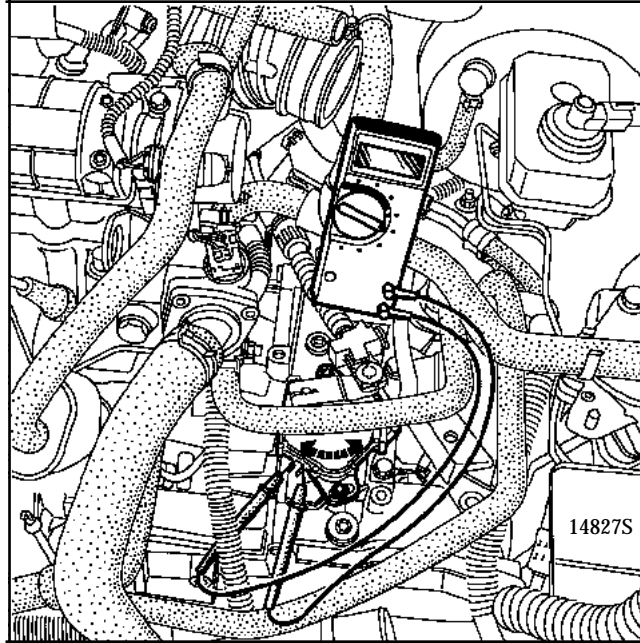
REFITTING

Place the multifunction switch in position **D**.

Reconnect the multifunction switch connector.

SETTING THE MULTIFUNCTION SWITCH

Control shaft in position **NEUTRAL**:
Place two electrical terminals on the position
checking tabs.




Turn the multifunction switch by hand until the
electrical setting contact closes (resistance at the
contact terminals= **0 Ω**).

Tighten the bolts to a torque of **1 daNm**.

**AFTER TIGHTENING, THE ELECTRICAL CONTACT
SHOULD REMAIN CLOSED.**

TIGHTEN THE SCREWS, NUTS, BOLTS TO THE
SPECIFIED TORQUES.

Check that the gears operate and change
correctly.

TIGHTENING TORQUES (in daN.m)	
Input speed sensor mounting bolt	1
Output speed sensor mounting bolt	1
Exchange flow control solenoid valve bolt	1
Line pressure sensor bolt	0.8

Special feature of REMOVAL:

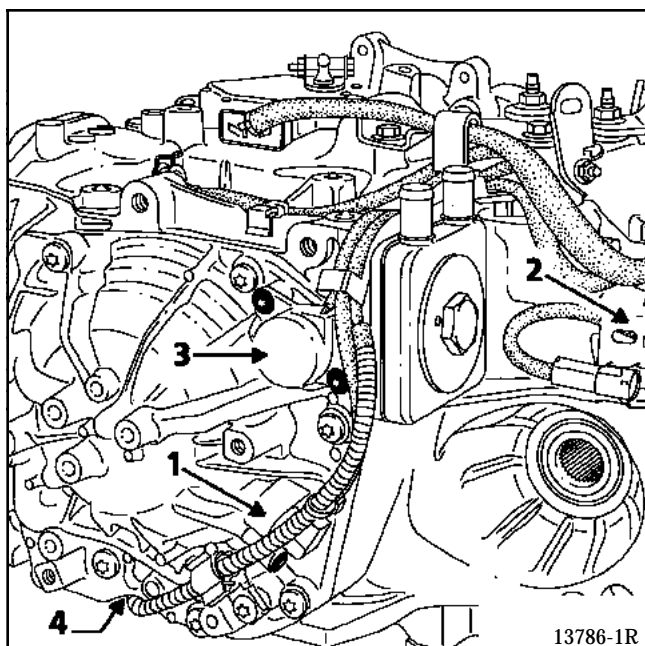
If a sensor is changed, always remove the modular connector (refer to the section "Removal/refitting of the automatic transmission").

IMPORTANT:

Protect the connector by slipping it into a sealed plastic bag.

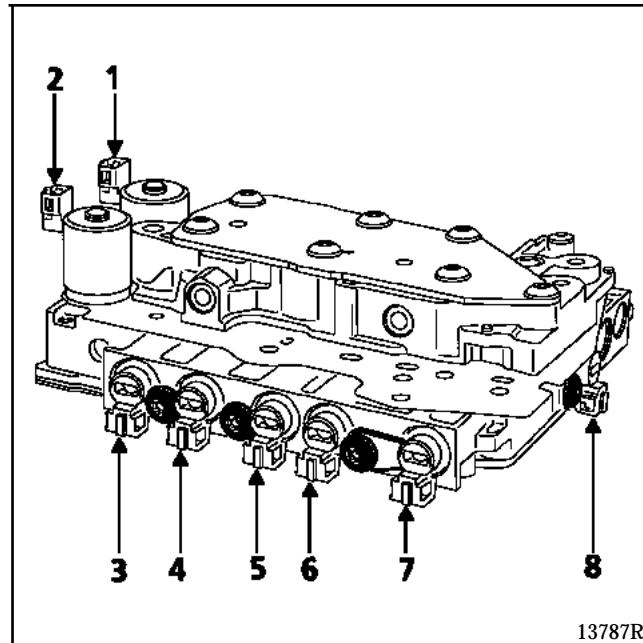
Removal:

- of the speed sensors,
 - of the line pressure sensor,
 - of the exchanger flow control solenoid valve,
- is carried out **without draining and without removal** of the automatic transmission.



- 1 Input speed sensor
- 2 Output speed sensor
- 3 Exchanger flow control solenoid valve
- 4 Line pressure sensor

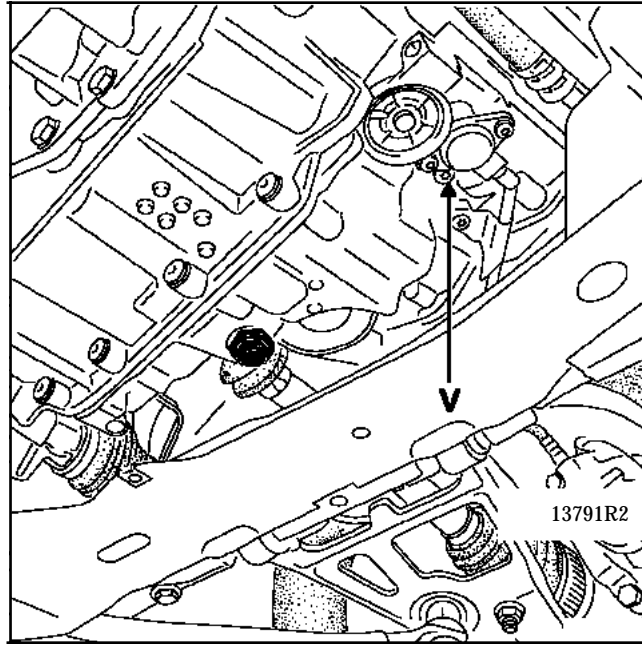
The solenoid valves are removed following removal of the hydraulic distributor (refer to the relevant section).



- 1 EVM Modulating solenoid valve
- 2 EVLU LOCK UP solenoid valve (converter coupling)
- 3 EVS4 Sequence solenoid valve
- 4 EVS3 Sequence solenoid valve
- 5 EVS1 Sequence solenoid valve
- 6 EVS2 Sequence solenoid valve
- 7 EVS6 Sequence solenoid valve
- 8 EVS5 Sequence solenoid valve

AUTOMATIC TRANSMISSION

Line pressure socket



The oil pressure socket is next to the pressure sensor.

Remove bolt (V) and fit tool **Bvi. 466.06.**