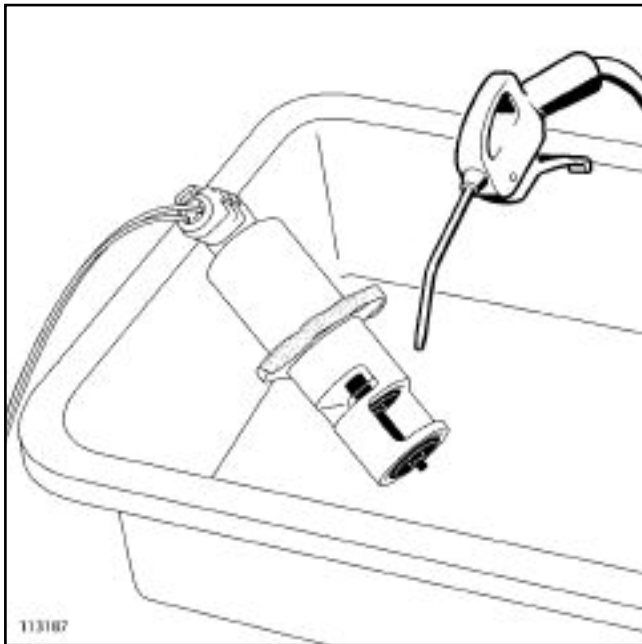




113187

Blow the solenoid valve dry using a compressed air gun.

Briefly press the button **(6)** to close the solenoid valve valves.

Remove the adhesive tape from the vent holes of the solenoid valve.

Special tooling required	
Mot. 588	Cylinder block liner clamps.
Mot. 251-01	Dial gauge support.
Mot. 252-01	Dial gauge support thrust plate.

I - RECOMMENDATIONS FOR REPAIR

WARNING

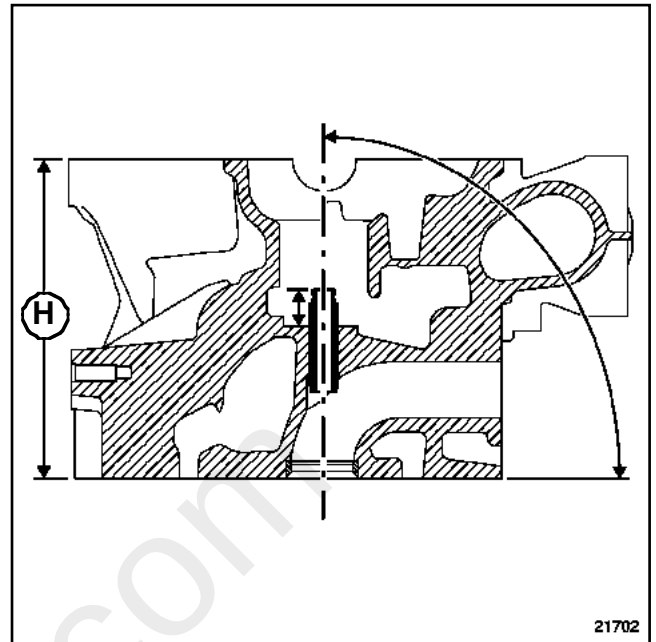
Parts should be clean before examining and testing them.

II - EQUIPMENT REQUIRED

- Torque wrench and cylinder head bolt tightening gauge (angular measuring type),
- Torque/angle wrench,
- Radial play measuring tape.
- Tool for checking the valve spring loading
- Pressure/vacuum pump
- Sliding calliper,
- Depth gauge
- Mortice gauge,
- Micrometer,
- Dial gauge,
- Body jig bench and a pair of v-blocks.
- Magnetic holder,
- Multimeter,
- The valve stem seal fitting kit,
- The cylinder head test tools,
- Set of shims,
- Cylinder head rule.

III - CHECKING THE UPPER ENGINE

1 - Check height of cylinder head



21702

Measure the height of the cylinder head (**H**) which should be **127 mm** using a mortice gauge.

2 - Checking the cylinder head gasket face

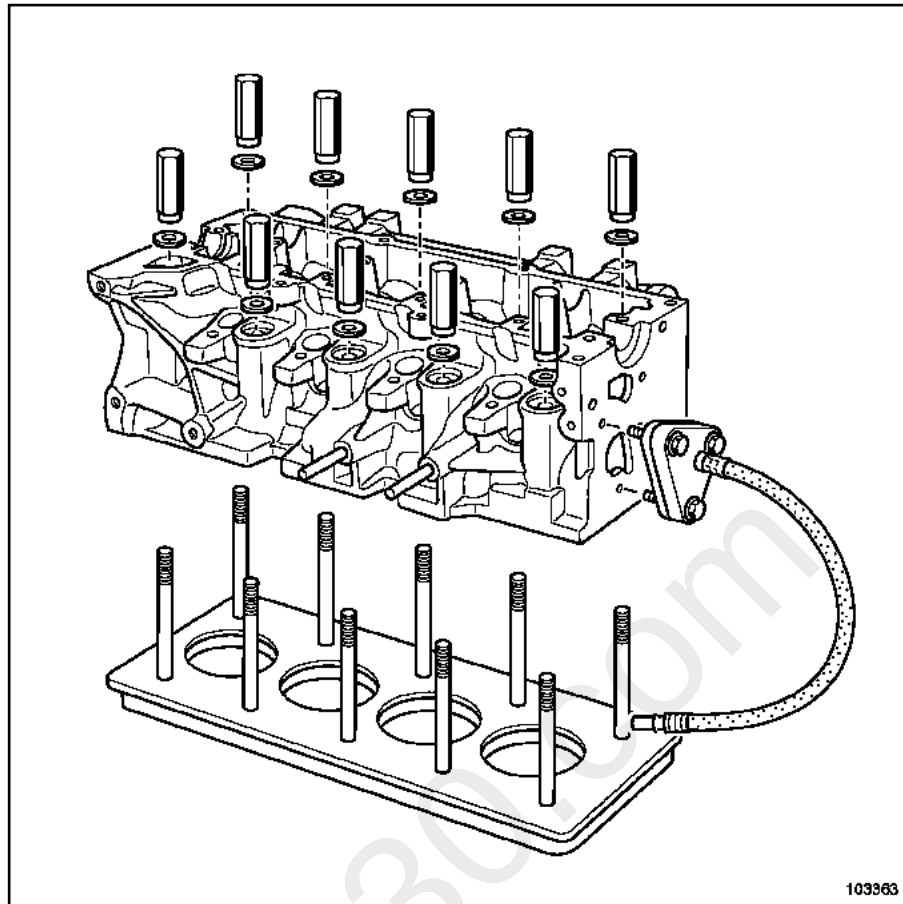
Use a cylinder head adjuster and set of feeler gauges to check the gasket face bow.

Maximum distortion: **0.05 mm**

The cylinder head cannot be adjusted.

Upper engine: Checking

3 - Checking the cylinder head seal



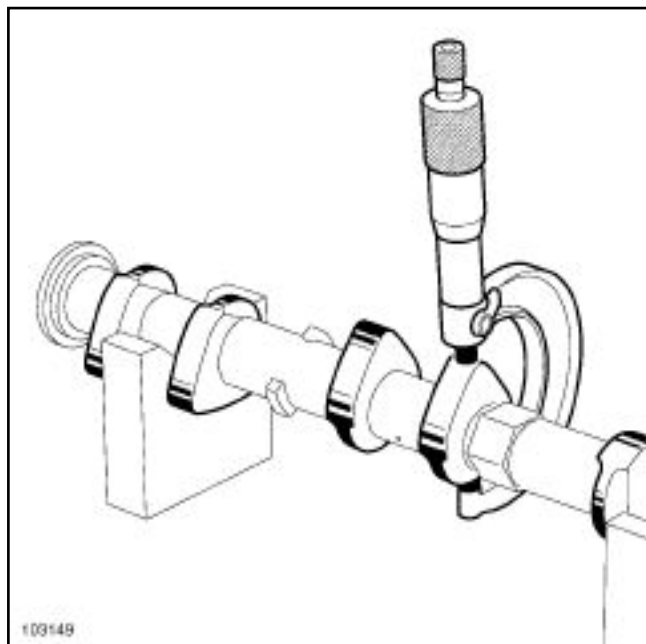
103363

103363

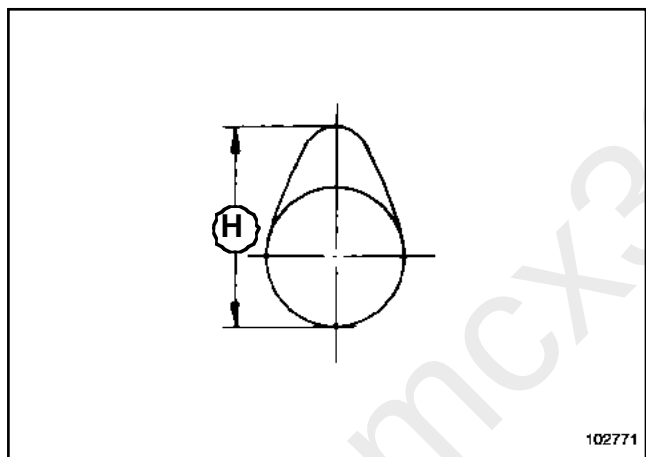
Test the cylinder head for possible cracks with the cylinder head test kit.

For the use of the cylinder head test unit (see **Technical Note 2781E**).

4 - Cam height checks



103149



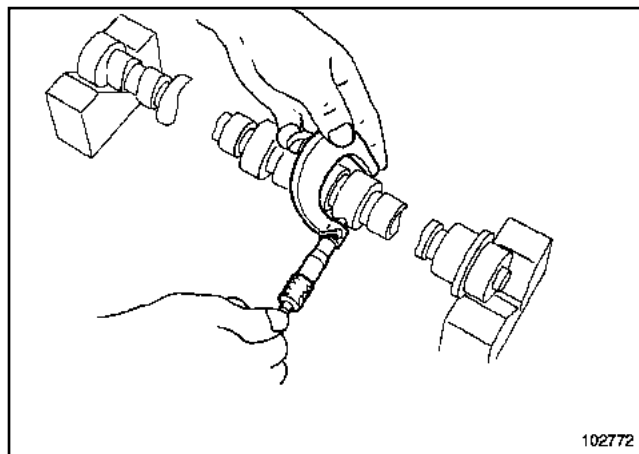
102771

Position camshaft bearings 2 and 4 on the v-blocks.

Using a micrometer, measure the height of the cams (**H**) which should be:

- Inlet: 44.015 ± 0.03 mm ,
- Exhaust: 44.595 ± 0.03 mm .

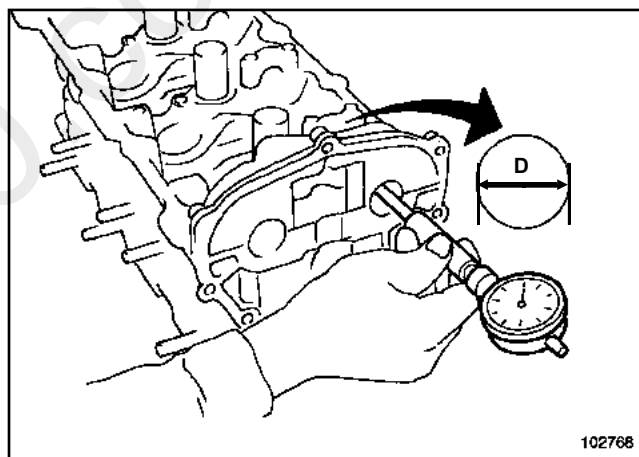
5 - Check the camshaft bearing diameters



102772

Using a micrometer, measure the external diameter of each camshaft bearing:

- bearing nos. 1,2,3,4,5: 24.9895 ± 0.0105 mm ,
- bearing no. 6: 27.9895 ± 0.0105 mm .



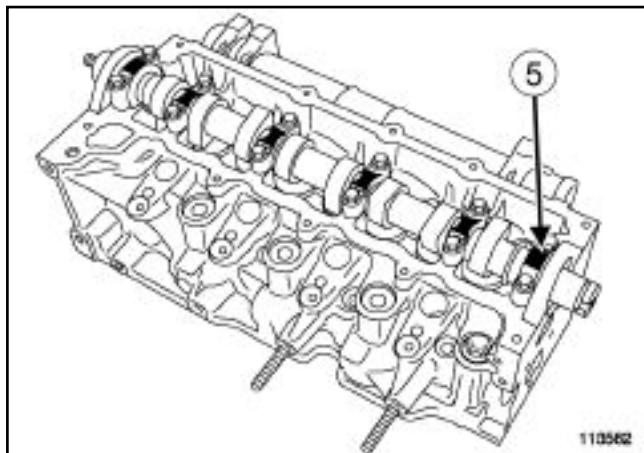
102768

Using a micrometer, measure the internal diameter of each cylinder head bearing:

- bearings No.1, 2, 3, 4, 5: 25.05 ± 0.01 mm ,
- bearing No.6: 28.05 ± 0.01 mm .

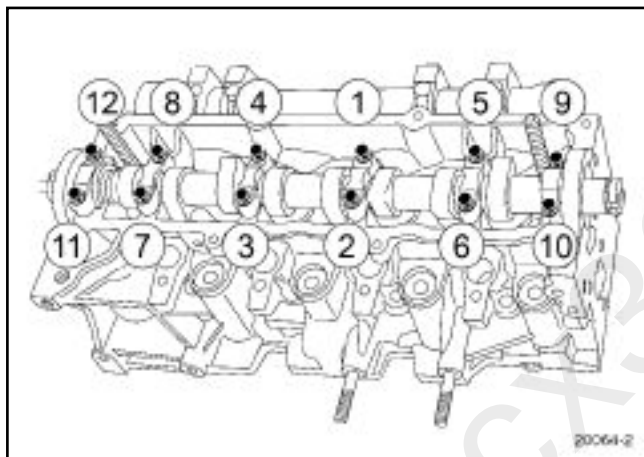
6 - Checking camshaft end play

Refit the camshaft.



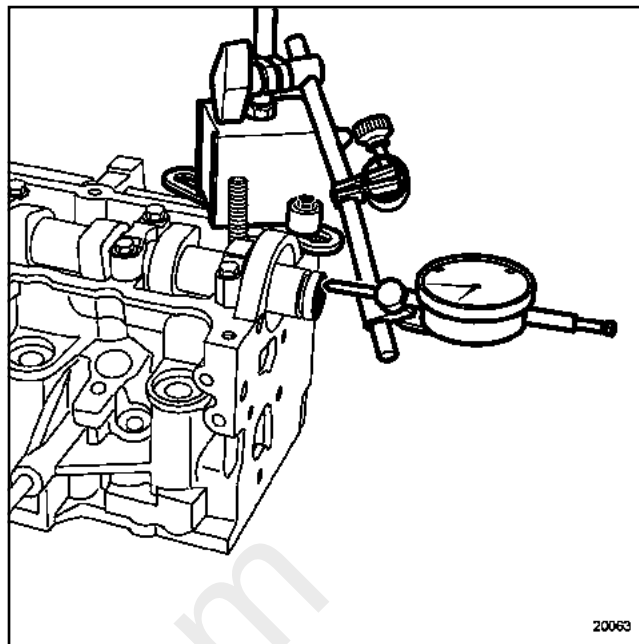
113562

Refit the camshaft bearing caps (observing their original positions, bearing No. 1 (5) engine flywheel end).



20064-2

Tighten to torque and in order **the crankshaft bearing cap mounting bolts (11 Nm)**.



20063

20063

Place the **(Mot. 588)** on the cylinder head, fixing it using the rocker cover bolt and a cross piece with dimensions as follows:

- external diameter **18 mm**,
- internal diameter **9 mm**,
- height **15 mm**.

Fix the magnetic holder to the cylinder head.

Using a dial gauge, measure the longitudinal gap which should be between **0.08 and 0.178 mm**.

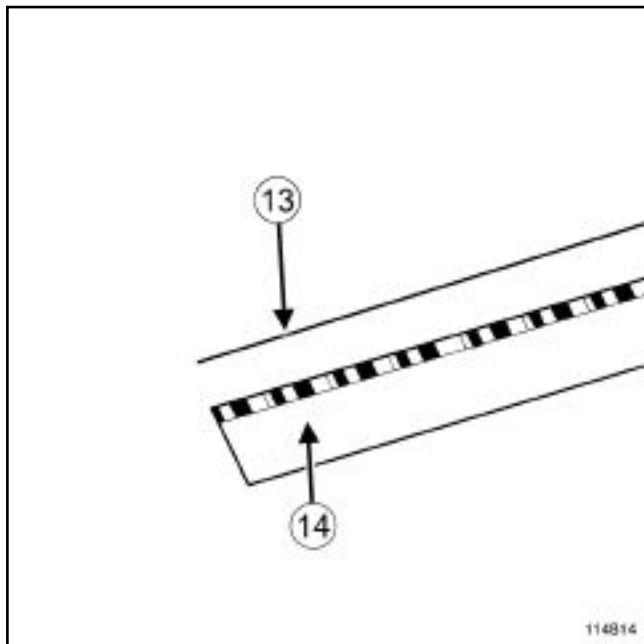
Remove:

- the camshaft bearing caps,
- the camshaft.

7 - Checking the camshaft diametric clearance

Remove any oil that may be on the camshaft bearings and the camshaft bearing caps.

Refit the camshaft.

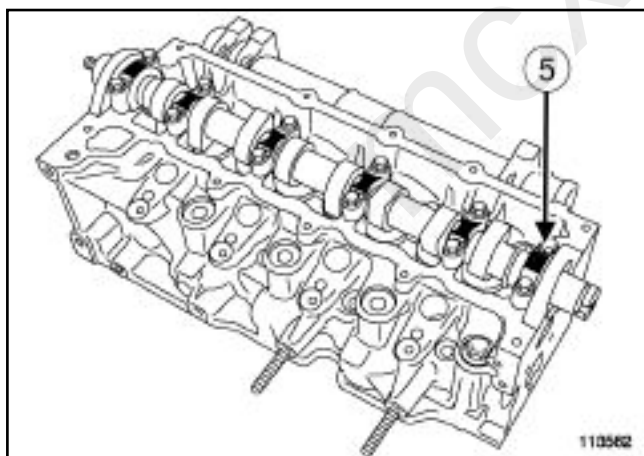


Cut pieces of measuring wire (13) .

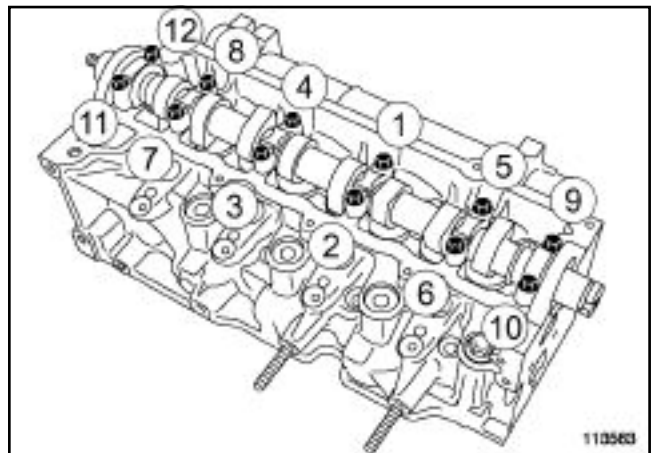
Place the wire in the camshaft shaft.

Note:

Do not allow the camshaft to turn during the operation in order to avoid distorting the measurement.



Refit the camshaft bearing caps (observing their original positions, bearing No. 1 (5) engine flywheel end).



Tighten to torque and in order the crankshaft bearing cap mounting bolts (11 Nm) .

Remove:

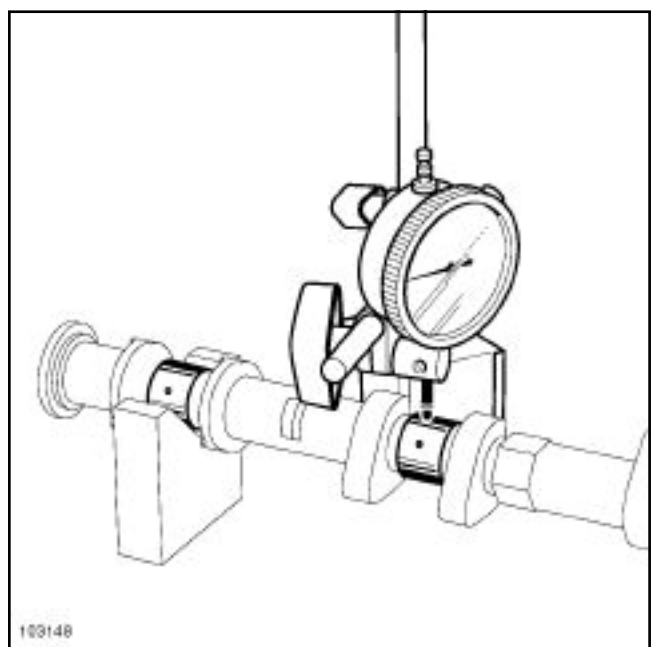
- the camshaft bearing caps,
- the camshaft.

Measure the flattening of the clearance measuring wire using the packaging paper (14) .

Check the value of the diametric clearance which should be between **0.04 and 0.081 mm** .

Clean any traces of measuring wire off the camshaft and the camshaft bearing caps.

8 - Checking the radial deviation of the camshaft



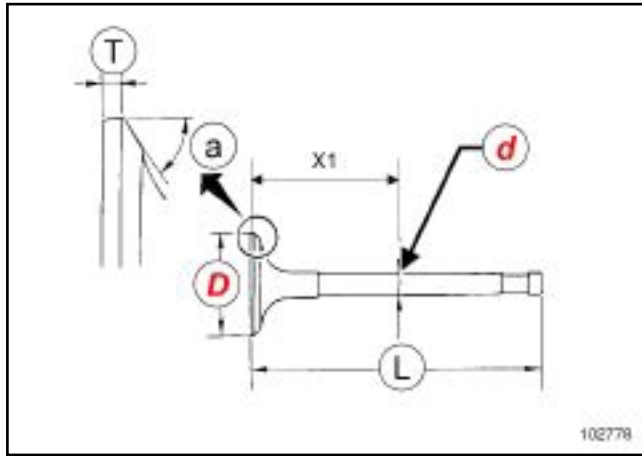
Position camshaft bearings 2 and 4 on the v-blocks.

Position a dial gauge vertically on camshaft bearing 3.

Turn the camshaft by hand.

Measure the radial deviation which should not be in excess of **0.05 mm**.

9 - Checking the valves



102778

Measure the valve stem diameter (**D**) at (**X1**):

- Inlet: **5.977 ± 0.008 mm** at (**X1**) = **41 mm**,
- Exhaust: **5.963 ± 0.008 mm** at (**X1**) = **41 mm**,

Measure the valve head diameter (**D**):

- Inlet: **33.5 ± 0.12 mm**,
- Exhaust: **29 ± 0.12 mm**.

Measure the valve length (**L**):

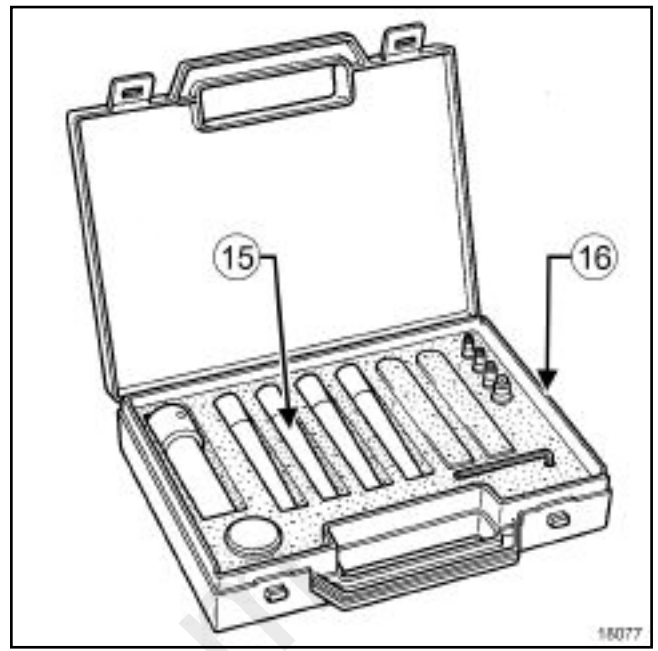
- Inlet: **100.95 ± 0.22 mm**,
- Exhaust: **100.75 ± 0.22 mm**.

Measure the seat angle (**A**):

- Inlet: **90°**,
- Exhaust: **90°**.

Thickness (**T**) of the valve head:

- Inlet: **1 mm**,
- Exhaust: **1 mm**.



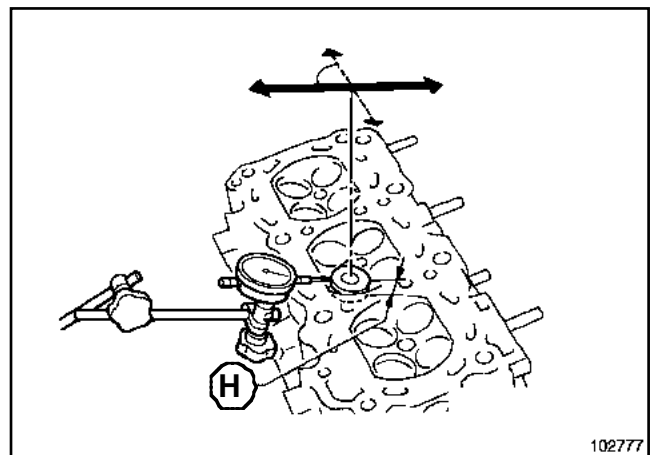
18077

Insert (**without forcing**) the valve in the guide tube (**15**) (with the same diameter as the valve) of the valve stem seal fitting set (**16**) to check:

- that the valve is not twisted,
- that the end of the valve (wedge end) is not strained.

10 - Checking the clearance between the valve and the guide

The clearance between the valve and the guide can be checked in two different ways.

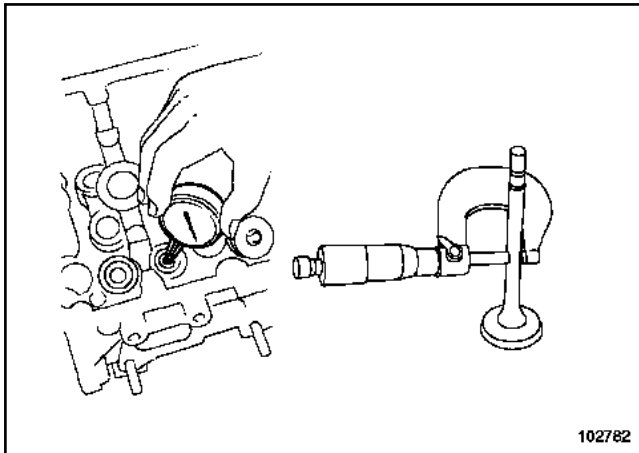


102777

102777

Press the head of the valve to a height (**H**) of **25mm**, then, using a dial gauge, take the measurement in the direction of the arrows, keeping to an angle of

90° to the camshaft shaft. The clearance between the valve and the guide is equal to half the measured value.



102782

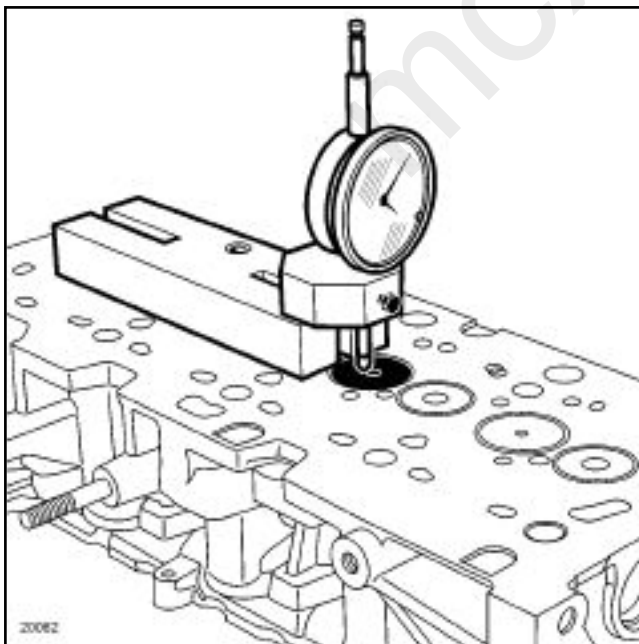
102782

Or using a micrometer measure the external diameter of the valve stem and interior diameter of the valve guide.

Clearance between the valve and the valve guide should be:

- Inlet: **0.02 to 0.05 mm** ,
- Exhaust: **0.03 to 0.063 mm** .

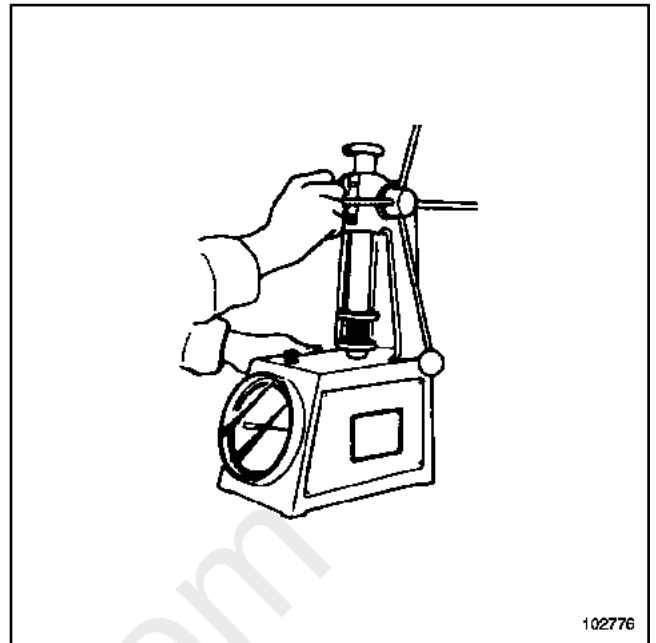
11 - Valve recess



20062

Check the valve recess using **(Mot. 251-01)** , **(Mot. 252-01)** and a dial gauge, which should be **0 ± 0.07 mm** .

12 - Checking the valve springs



102776

102776

Checking the calibration of the springs.

Length under load:

- **230 ± 12 N : 33.80 mm** ,
- **500 ± 23 N : 24.80 mm** .

Length of coiled seals: **23.40 mm** .

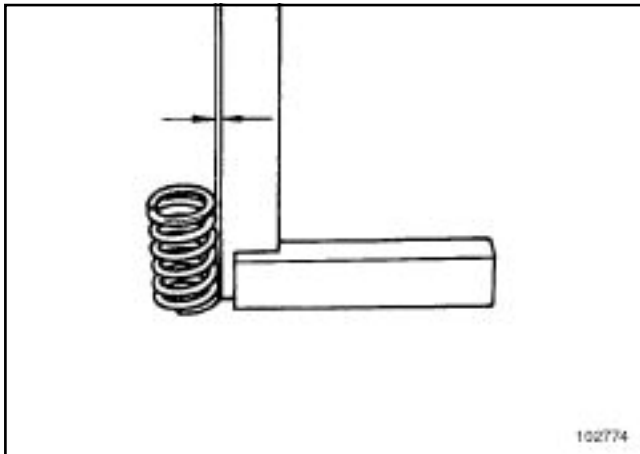
Wire diameter: **3.45 mm** .

Internal diameter:

- at the base of the spring **18.80 ± 0.2 mm** ,
- at the top of the spring **14.10 ± 0.2 mm** ,

External diameter:

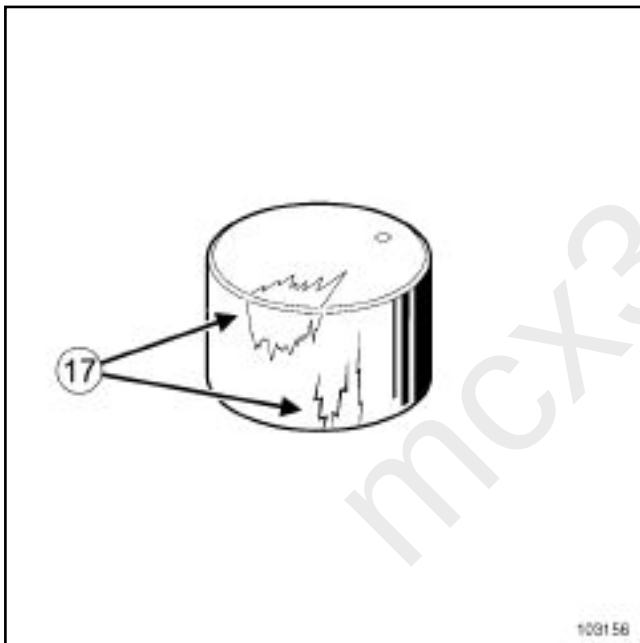
- at the base of the spring **25.70 ± 0.2 mm** ,
- at the top of the spring **21 ± 0.2 mm** ,



102774

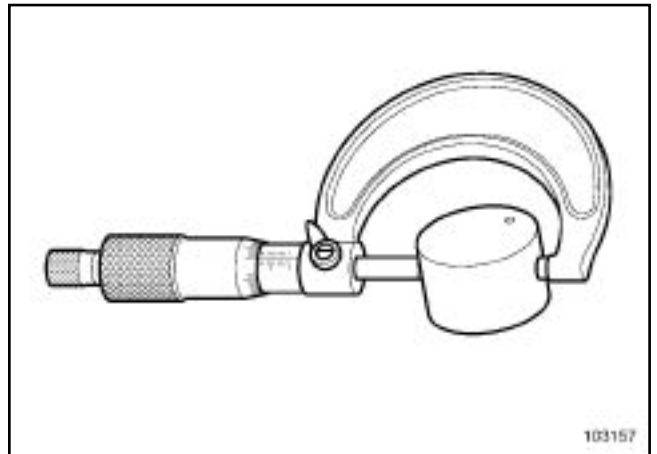
Check that the perpendicularity of the spring is not in excess of **1.2 mm** .

13 - Valve pushrod



103156

Check the condition of the tappet (worn or coating cracked (**17**)).



103157

Measure the external diameter of the tappet using a micrometer **34.975 ± 0.01 mm** .