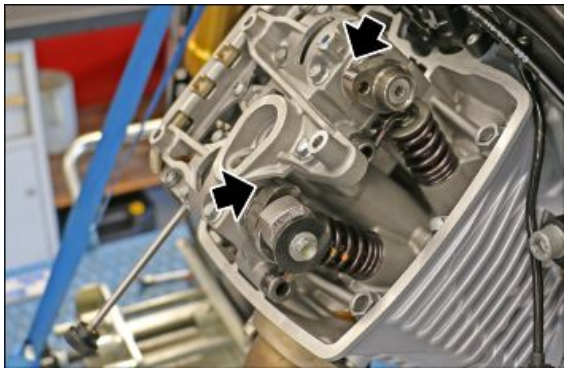
Checking the valve clearance

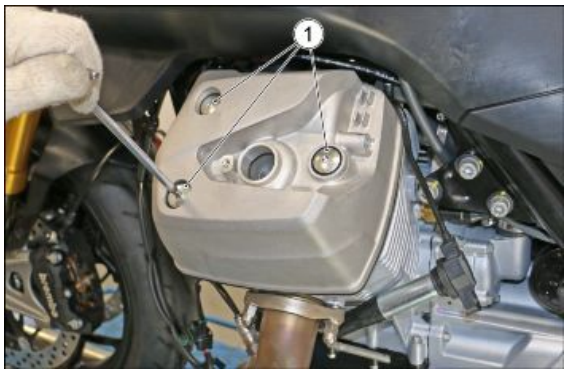
- Install a workshop stand to the rear wheel of the vehicle so as to lift it from the ground.
- Remove the spark plugs from both heads.
- Turn the rear wheel until the left-hand piston is at top dead centre (TDC) and in compression (all cams facing up and with the lobes converging).



NOTE

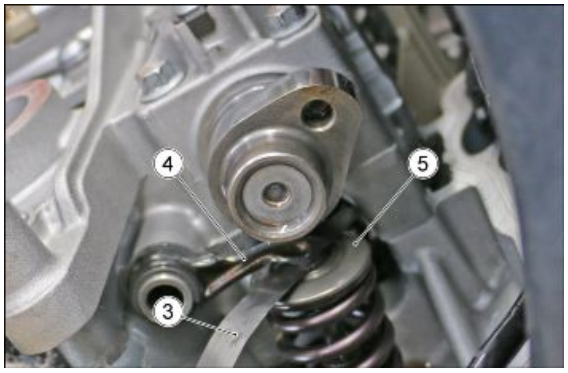
Checking the valve clearance should be performed first on the left head.

- Remove the three fixing screws (1).



- Remove the valve cover (2) from the head.

- Using a feeler gauge reed valve (3), measure the distance between the rocker (4) and the valve (5).



Characteristic

Intake valve clearance

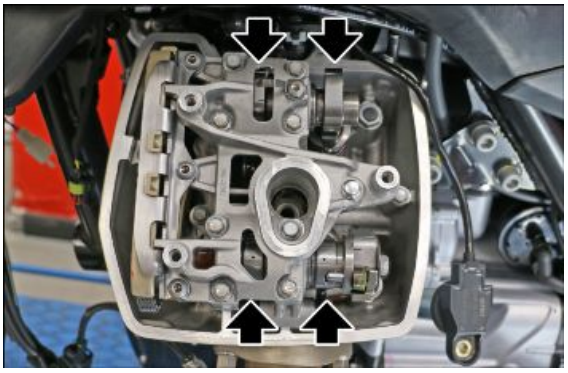
0.10 - 0.15 mm (0.0039 - 0.0059 in)

Exhaust valve clearance

0.30 - 0.35 mm (0.0118 - 0.0138 in)

- Repeat the operation for the remaining valves.

If the valve clearance is not within the tolerance range, adjust the valve clearance as shown below.



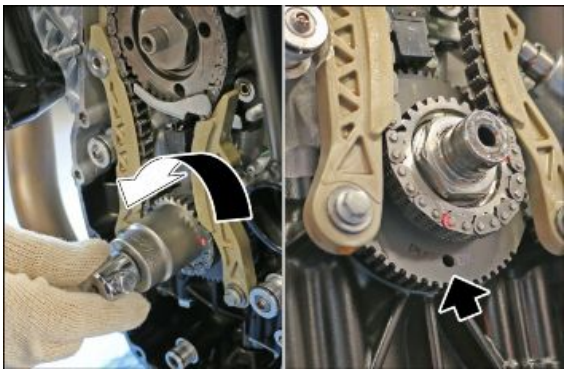
- Turn the rear wheel and bring the right-hand piston to TDC and in compression (the lobes of the camshafts must face upwards and diverge from each other, as shown in the figure).
- Repeat the valve clearance control operations on the right head.

If the valve clearance is not within the tolerance range, adjust the valve clearance as shown below.

VALVE CLEARANCE ADJUSTMENT

RIGHT HEAD

- Preventively remove: radiator, timing cover, spark plug valve covers.
- Turn the engine counter-clockwise and bring the RH piston to Top Dead Centre.



NOTE

THE HOLE ON THE PINION MARKED "PMS DX" MUST BE ALIGNED WITH THE HOLE ON THE CRANKCASE.

- Insert the centring pin in the crankshaft pinion, making sure to intercept the holes of the pinion and of the crankcase.

Specific tooling

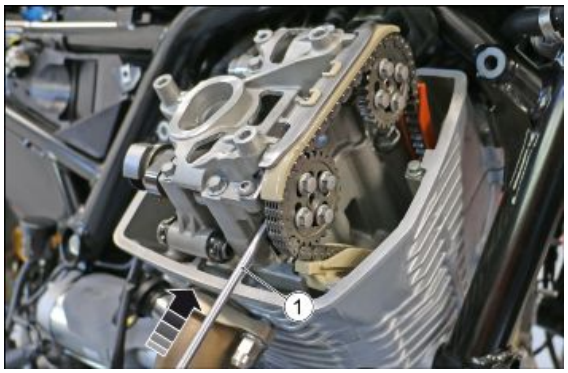
020851Y Camshaft timing pin

- Check that the cam lobes are divergent from each other.

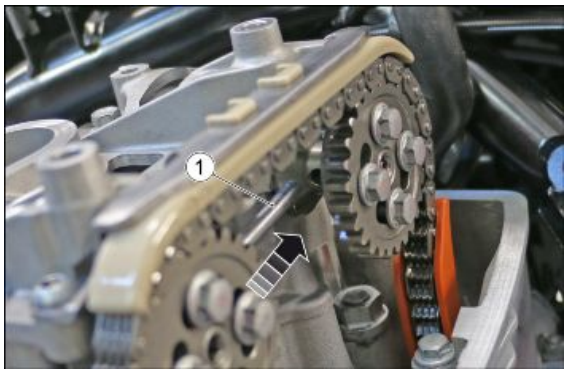
- Insert the special tool (1) into the hole on the exhaust camshaft.

Specific tooling

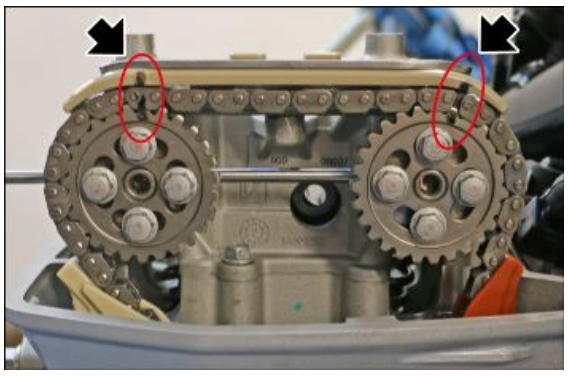
021064Y Large pin for engine timing



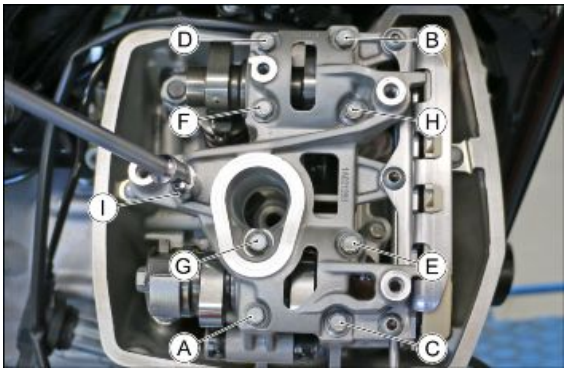
- Continue to insert the tool (1) to intercept the hole on the intake manifold.



- For safety, mark the position of the sprockets on the chain and of the chain in relation to the upper chain tensioner shoe.



- Remove the fixing screws of the upper mounting, following the sequence A-B-C-D-E-F-G-H- I.



- Remove the upper mounting (2) from the head.

- Remove the tool (1) from the camshafts, taking care that the chain tensioner, still loaded with oil, does not cause the shafts to drop from the head.

- Remove the intake camshaft (3).

CAUTION

MAKE SURE THAT THE CHAIN TENSIONER DOES NOT COME OUT OF ITS SEAT AND FALL INTO THE ENGINE.

- Remove the exhaust camshaft (4).

- Fasten the timing chain to the vehicle, taking care that it does not get out of the sprocket on the service shaft.

- Lift the rocker arm of the valve(s) to be adjusted.

- Using a magnet, remove the calibrated pads (5) from the valves to be adjusted and replace them with pads of a suitable thickness to achieve the specified valve clearance.

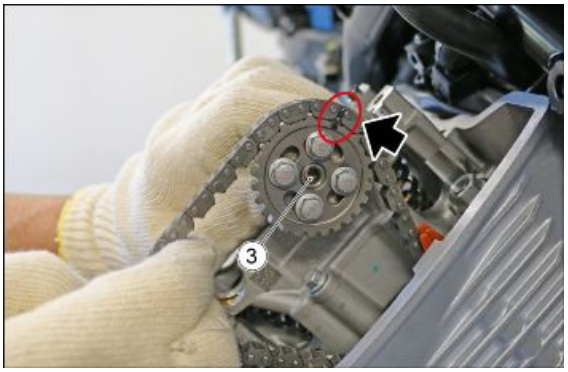
To find the thickness of the pads to be installed, use the following formula:

Installed pad thickness **+** measured clearance **-** specified clearance **=** new pad thickness

CAUTION

PAY CLOSE ATTENTION NOT TO DROP THE CALIBRATED PADS INTO THE ENGINE.

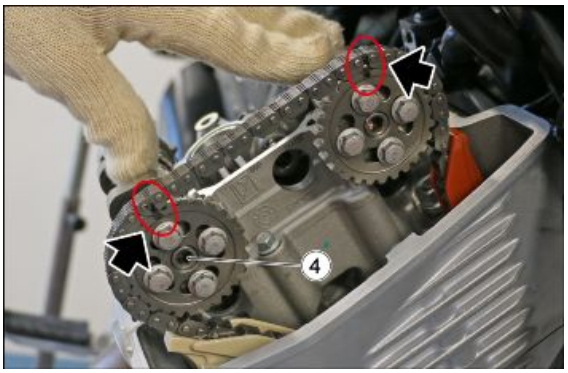
- After replacing the pad(s), install the intake shaft (3) on the timing chain, so that the sprocket and the chain marks coincide, then position it in its seat on the head.



- Install the exhaust shaft (4) on the timing chain, by aligning the references the sprocket and chain, then place it in its seating on the head.

CAUTION

WHEN INSTALLING THE EXHAUST SHAFT, TAKE CARE NOT TO DROP THE INTAKE SHAFT.



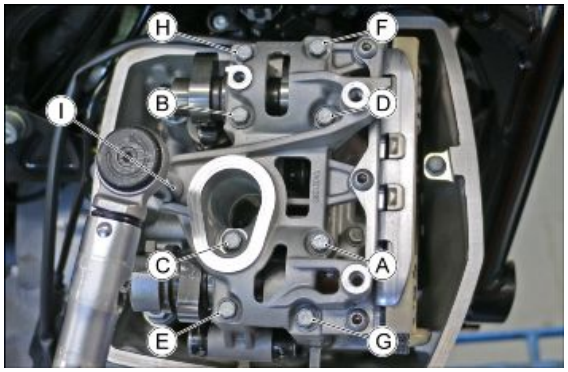
- Refit the special tool (1) back into the intake and exhaust camshafts.

- While holding the camshafts in position, install the upper mounting (2).

NOTE

WHEN REMOUNTING THE PUMP, REPLACE THE "O-RINGS"

- Tighten the fixing screws to the specified torque, following the sequence A-B-C-D-E-F-G-H- I.



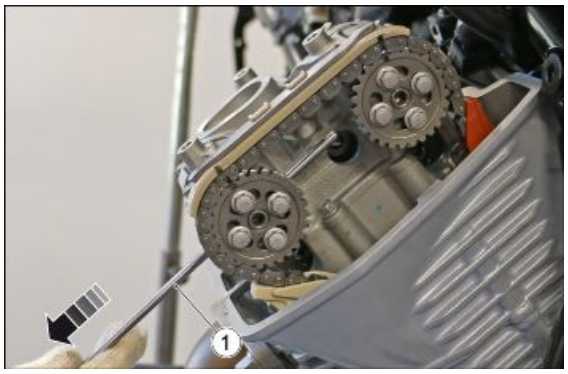
Locking torques (N*m)

Camshaft support screw **11-13 Nm (8.11 - 9.59 lbf ft)**

NOTE

The screw (6) in the hole of the spark plug has a washer, while the screw (7) is the single shorter screw compared to the others.

- Remove the special tool (1) from the camshafts.



- Remove the pin from the pinion of the crankshaft.
- Refit the cover valves, spark plug, timing system cover and the radiator.
- Restore the water level in the radiator and in the expansion tank.