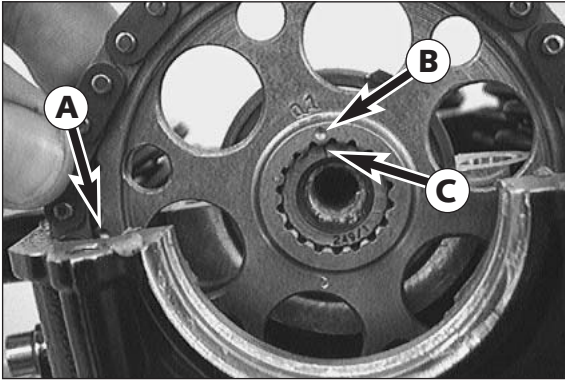
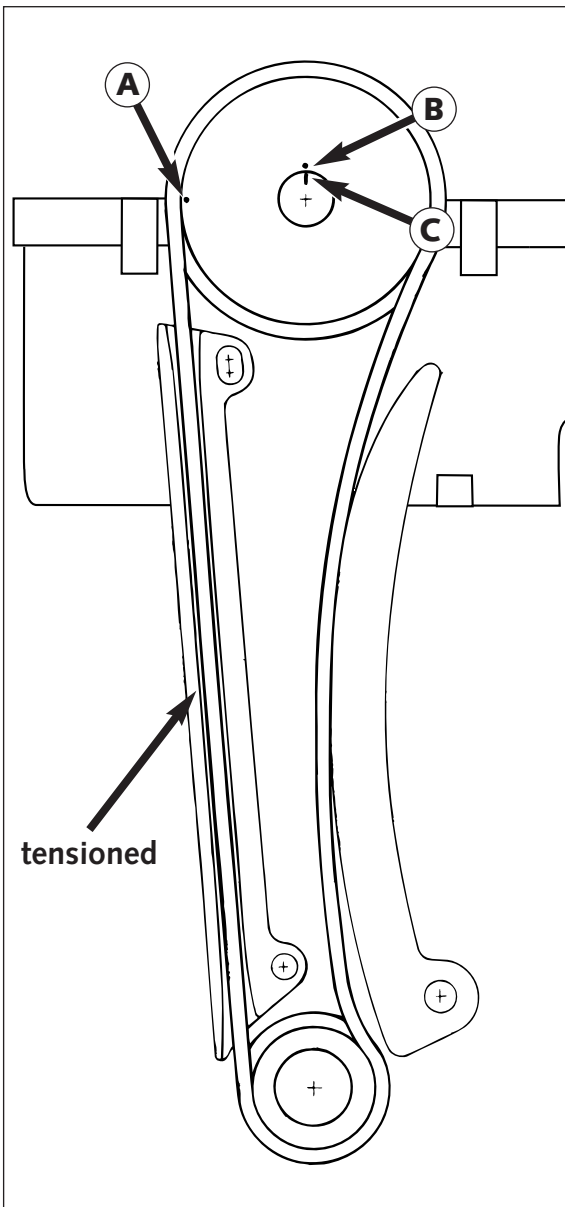


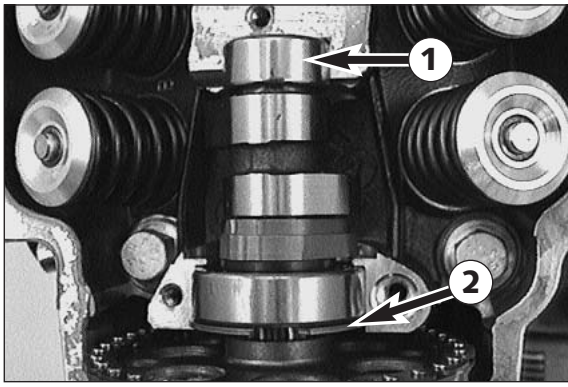
Mounting the camshaft, timing marks

- Fit the camshaft gear into the timing chain so that mark **A** (a point) is aligned with the top surface of the cylinder head when the timing chain strand tensioned.
- Tilt engine to one side and place circlip **1** on camshaft gear.

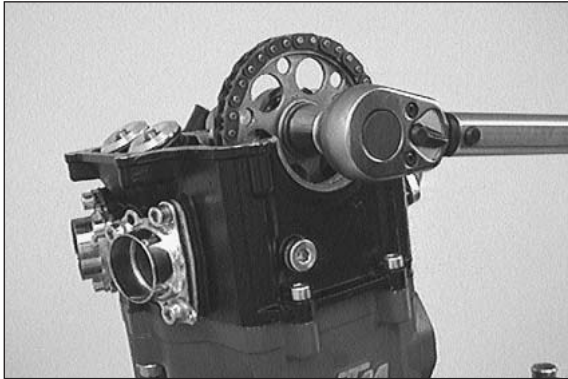


- Slide grooved ball bearing flush onto the preassembled camshaft and fit the camshaft into the camshaft gear so that the mark **B** and mark **C** are aligned.

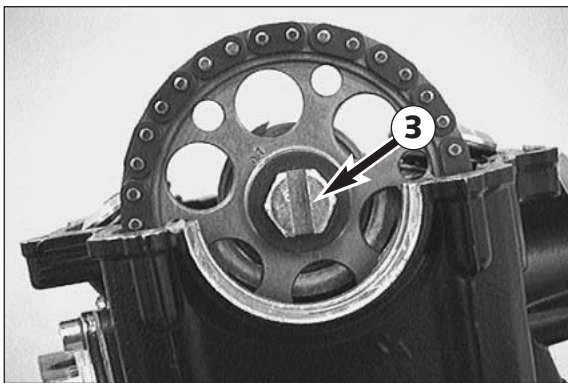




- Lubricate the needle bushing ❶ with oil and slide it onto the camshaft.
- Mount camshaft together with bearing and circlip ❷ into cylinder head.



- Degrease the threads in the camshaft and the driving bolt and apply Loctite 243.
- Mount the driving bolt together with the lock washer and the washer (10x28x3 mm) and tighten (35 Nm/25 ft.lb).



Mounting the water pump

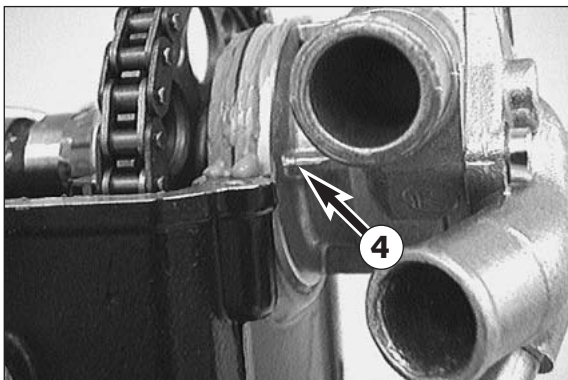
- Loosen crankshaft locking bolt and turn crankshaft until groove ❸ is at a position vertical to the sealing surface for the cylinder head top section.
- Coat O-ring of water pump with sealing compound (Three-Bond) and carefully mount the water pump. The flat part of the water pump shaft must be introduced into the groove of the HH bolt.

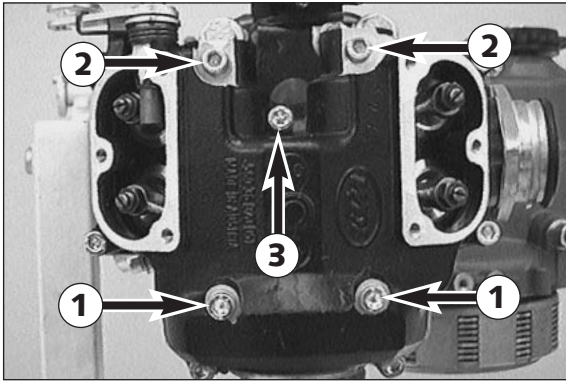
!

CAUTION

!

THE MARKING ❹ LOCATED ON THE HOUSING OF THE WATER PUMP MUST BE FLUSH TO THE SEAL SURFACE.





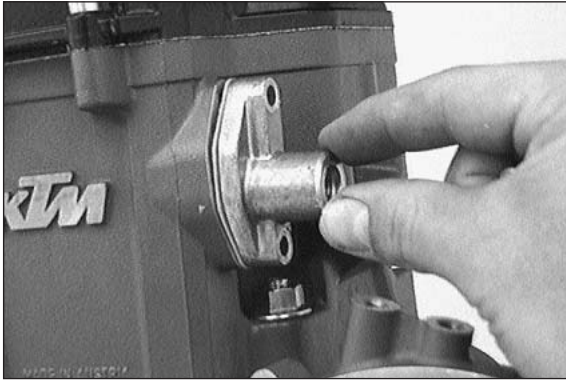
Mounting the cylinder head top section

- Clean the sealing area of the cylinder head top section and apply a thin layer of sealing compound.
- Fit dowel in the area of the spark plug.
- Carefully position cylinder head top section (do not jam with water pump) and mount bolts.

! CAUTION !

COPPER SEAL RINGS MUST BE FITTED TO THE 5 ALLEN HEAD BOLTS ①, ② AND ③.

- Tighten bolts ① and ② to 8 Nm diagonally.
- Tighten bolts ② to 15 Nm.
- Tighten all other bolts of the cylinder head top section with 8 Nm.

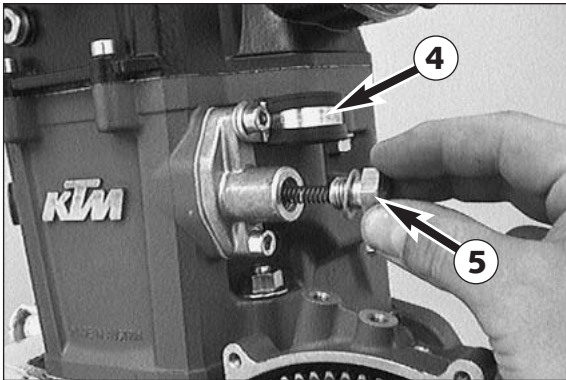


Mounting the automatic tensioner

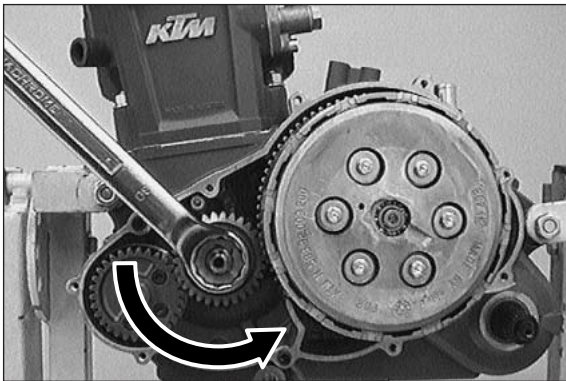
- Fit preassembled automatic tensioner with gasket into the cylinder.
- Mount the clamp ④ and two bolts with copper seal rings.

! CAUTION !

IF THE RATCHETING PAWL IS NOT ENGAGED INTO THE FIRST NOTCH THIS WILL CAUSE EXCESSIVE TENSION OF THE CHAIN.



- Fit pressure spring and plug ⑤ with gasket and tighten with 20 Nm.



Automatic decompression testing

- Rotate the crankshaft in the usual direction of rotation (i.e. forward). After every other rotation, the decompression cam must be clearly heard to click as it disengages.

NOTE: If turning of the engine does not produce a click of the decompression cam, first of all check the tightening torque of the driving bolt (camshaft gear).



Adjustment of valve clearance

- Adjust piston to ignition top dead center (check marks of flywheel) and screw crankshaft locking bolt back in.

!

CAUTION

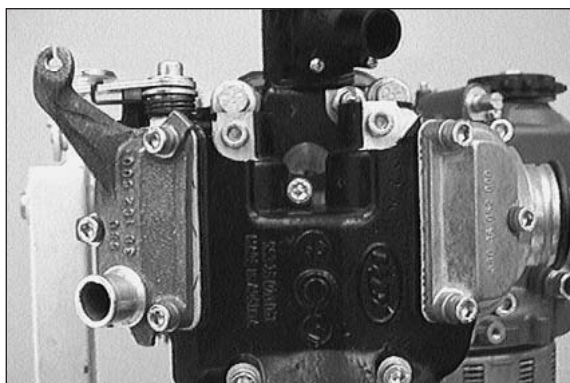
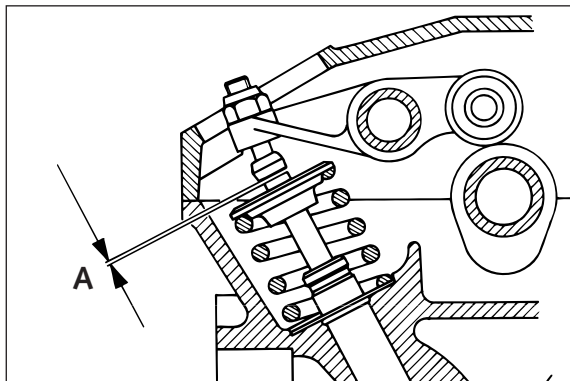
!

IF THE PISTON IS NOT IN IGNITION TDC, VALVES ARE OPENED AND A CORRECT ADJUSTMENT IS NOT POSSIBLE - IN THAT CASE CRANKSHAFT MUST BE MOVED A FULL TURN.

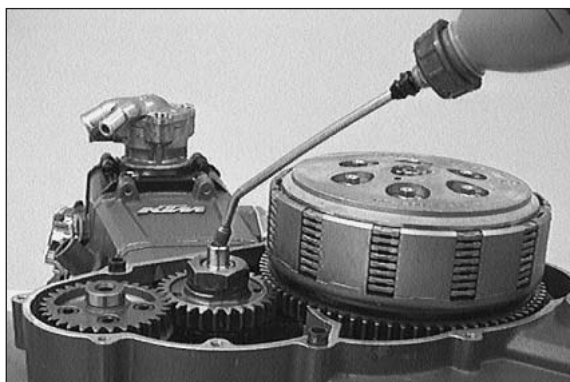
- Valve clearance **A** is measured at cold engine between valve stem and adjusting screw.

VALVE CLEARANCE 400 : INTAKE 0.20 mm / EXHAUST 0.20 mm
 VALVE CLEARANCE 540 : INTAKE 0.15 mm / EXHAUST 0.15 mm
 VALVE CLEARANCE 620 : INTAKE 0.15 mm / EXHAUST 0.15 mm
 VALVE CLEARANCE 625 : INTAKE 0.15 mm / EXHAUST 0.15 mm
 VALVE CLEARANCE 640 : INTAKE 0.15 mm / EXHAUST 0.15 mm
 VALVE CLEARANCE 660 : INTAKE 0.15 mm / EXHAUST 0.15 mm

- Tighten counternuts with 20 Nm.
- Remove the crankshaft locking bolt.

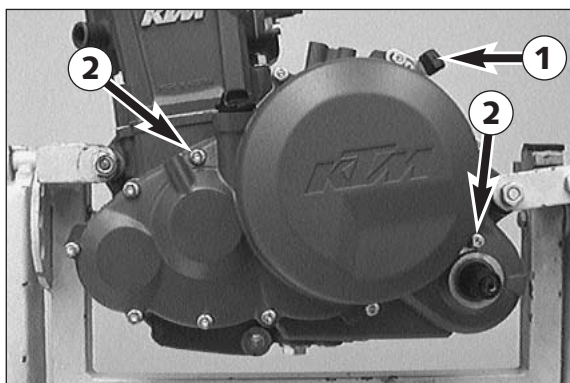


- Mount both valve covers with new gaskets and bolts with copper seal rings.
- Tighten bolts with 8 Nm.
- Insert and tighten spark plug with 20 Nm.



Mounting the clutch cover

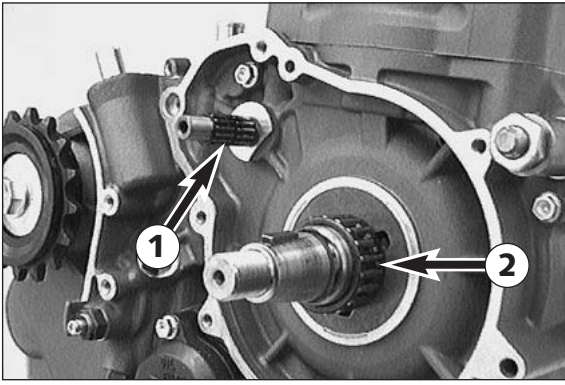
- Pour approx. 30 ml of oil into the crankshaft journal hole.



- Make sure that the two dowels are mounted.
- Fit new gasket and fix with dabs of grease.
- Apply grease to the shaft seal ring in the clutch cover and mount clutch cover.
- Fit bolts and bump rubber **1** for kickstarter.

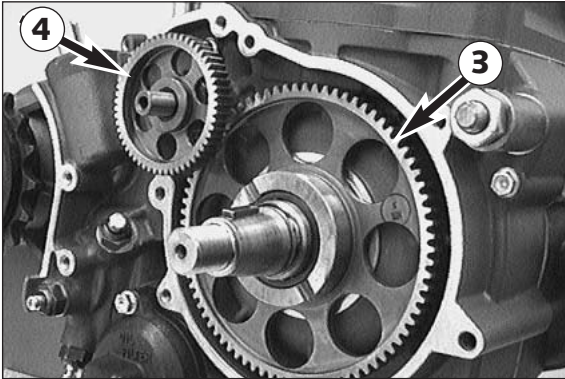
NOTE: Bolts **2** must each be provided with a copper seal ring.

- Tighten bolts with 8 Nm.

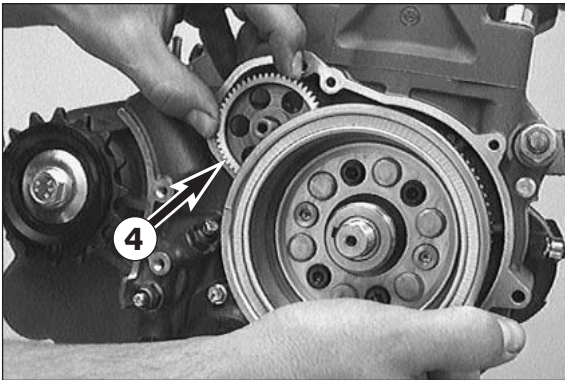


Mounting the electric starter drive

- Insert the woodruff key into the crankshaft.
- Slide 2 needle bearings ① onto the bearing pin of the reduction gear.
- Slide the needle bearing ② onto the crankshaft.
- Oil the needle bearings.



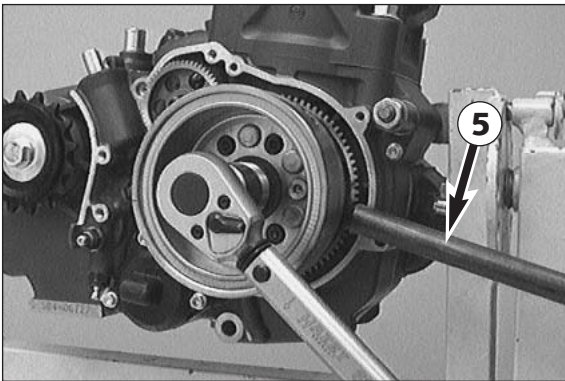
- Mount the freewheel gear ③ and the reduction gear ④.



Mounting the ignition (Kokusan 4K-2)

- Degrease the cones of flywheel and crankshaft.
- Thoroughly oil the freewheel and mount the flywheel.

NOTE: Turn the reduction gear for easier mounting of the flywheel.



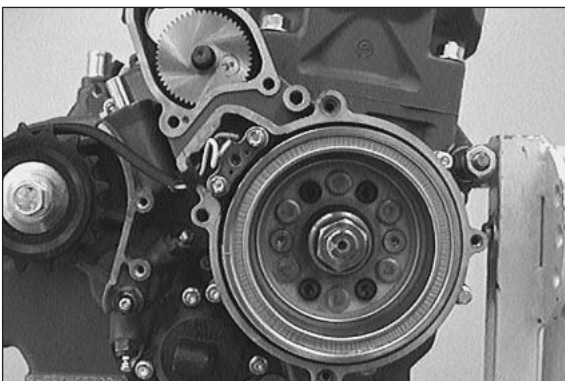
- Mount disk with the nut.
- Use the holding tool ⑤ to hold the flywheel and tighten the hexagon nut with 150 Nm.

!

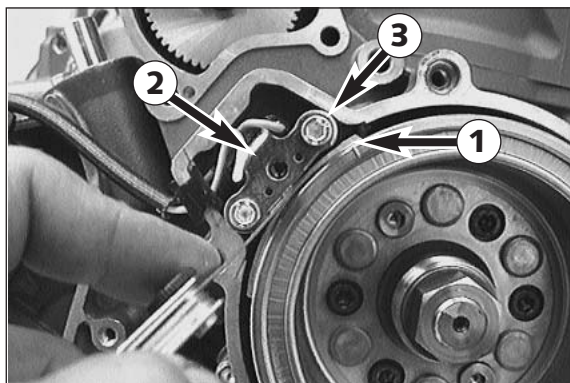
CAUTION

!

TO AVOID DISTORTION OF THE CRANK WEB, NEVER MOUNT THE CRANKSHAFT LOCKING BOLT TO TIGHTEN THE HEXAGON NUT OF THE FLYWHEEL.



- Insert 2 dowels into the housing.
- Apply silicone to both sealing surfaces and mount a new gasket.
- Mount the preassembled starter flange and use 4 bolts to fasten the starter flange.

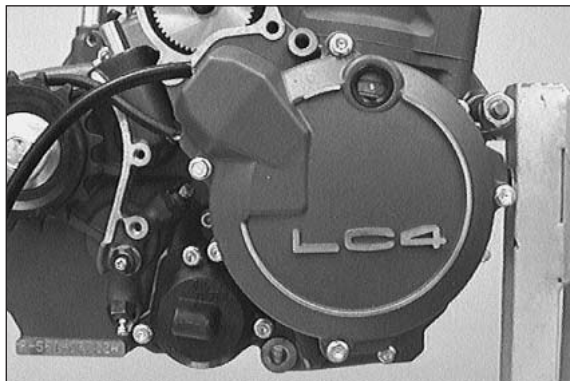


Adjusting the pulse generator

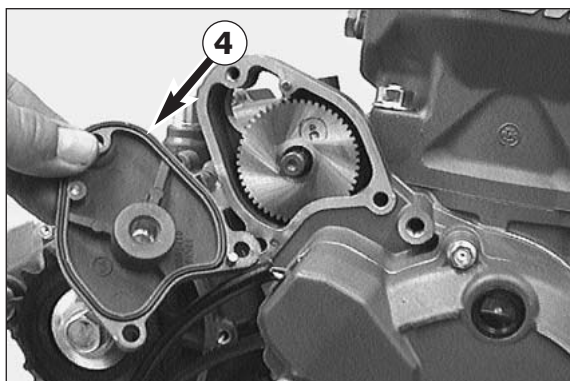
- Turn the flywheel until the elevated section of the flywheel ① coincides with the pulse generator ②.
- Use a feeler gauge to measure the distance between the pulse generator and the flywheel.

Setpoint value: 0.75 mm (0.03 in) +/- 0.2 mm (0.008 in)

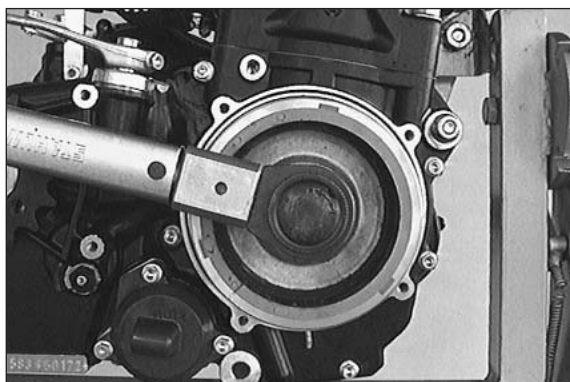
- If necessary undo the two bolts ③ and adjust the distance by moving the pulse generator. When mounting the two bolts secure them with Loctite 243.



- Insert 2 dowels.
- Apply silicone to both sealing surfaces and mount a new gasket.
- Mount ignition cover and tighten all bolts.

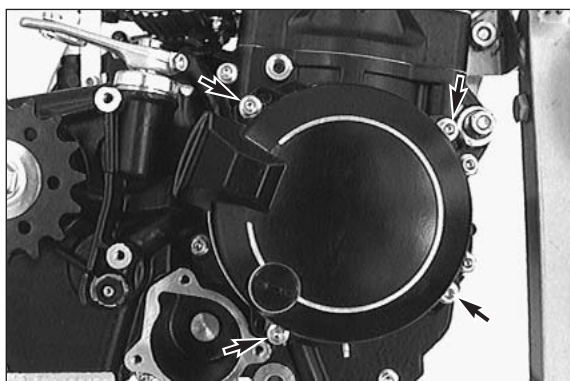


- Insert a new O-ring ④ into the groove of the starter cover and fasten the starter cover with 3 bolts.

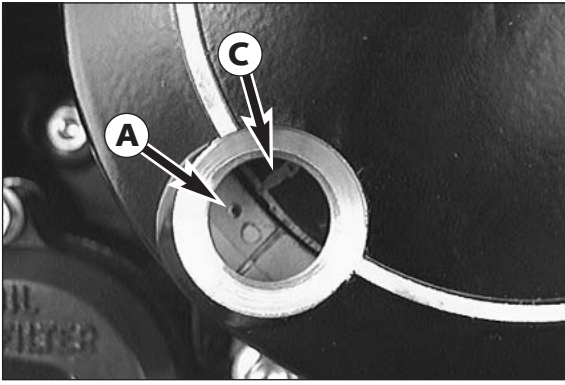


Mounting the ignition (SEM)

- Block crankshaft with crankshaft locking bolt.
- Place woodruff key in crankshaft.
- Clean cones of crankshaft and flywheel and mount flywheel.
- Fit spring washer and collar nut.
- Tighten collar nut to 60 Nm.
- Place the O-ring into the groove of the engine housing.



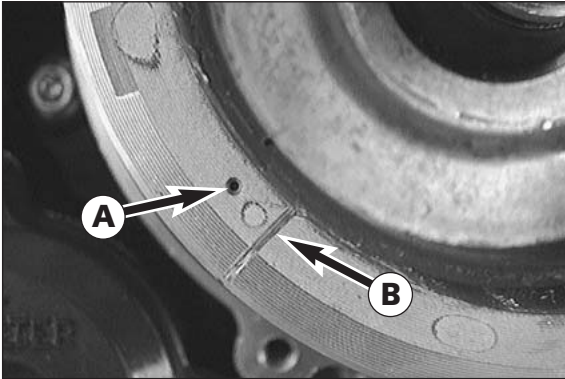
- Fit preassembled ignition cover and mount the 4 bolts but do not tighten.



Adjustment of ignition point (SEM)

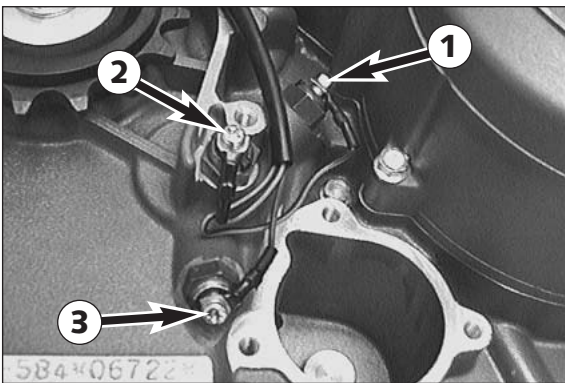
NOTE: The ignition point is adjusted after the crankshaft locking bolt has been mounted.

- Remove the plug at the ignition cover.
- Turn ignition cover so that the mark **C** on the stator and the mark **A** on the flywheel are aligned.
- Tighten the 4 bolts of the ignition cover.
- Finally, mount the ignition cover plug.



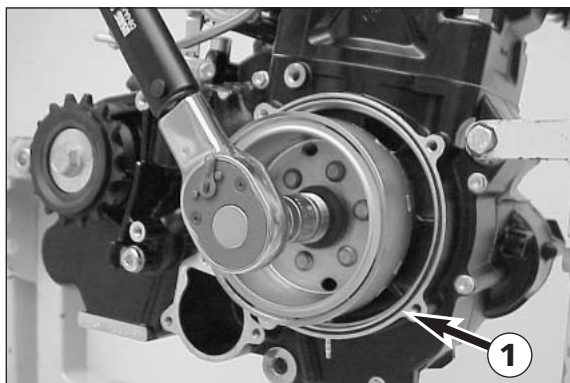
NOTE: The 400 LC4 engine needs more preignition than the other LC4 engines. As all LC4 engines are equipped with the same ignition system, the flywheel is provided with an additional mark (groove) for the 400 LC4 engine. The ignition adjustment procedure is exactly the same.

- In the 400 LC4 model the marking **B** (notch) must coincide with the marking on the stator.
- In the 540 LC4, 620 LC4 and 640 LC4 model the marking **A** (2 mm bore) must coincide with the marking on the stator.



Mounting the EPC wiring harness

- Put the wiring harness through the clip at the automatic tensioner and connect all 3 cable lugs to the contact screws, making sure to connect each cable to the corresponding screw:
- Connect the black/orange cable to contact screw **1**.
- Connect the black/green cable to contact screw **2**.
- Connect the black/blue cable to contact screw **3**.

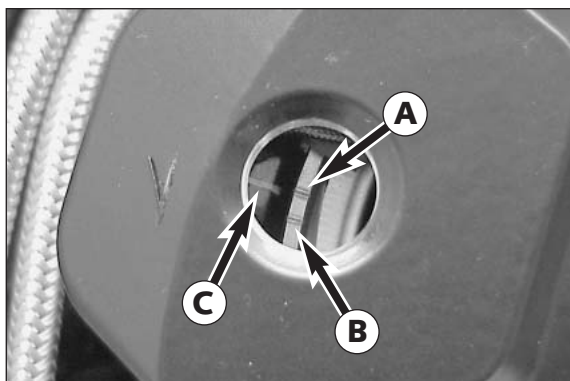


Installing the ignition (Kokusan 4K-3)

- Block the crankshaft with the crankshaft locking bolt.
- Insert the woodruff key into the crankshaft.
- Clean the cone of the flywheel and the crankshaft and mount the flywheel.
- Mount the spring washer and the collar nut (LH thread).
- Tighten the collar nut with 60 Nm.
- Insert the O-ring **1** into the groove in the engine housing.



- Mount the pre-assembled ignition cover. Insert the 4 bolts without tightening them yet.



Adjusting the ignition point (Kokusan 4K-3)

NOTE: The ignition point is adjusted while the crankshaft locking bolt is still twisted in.

- Remove the plug at the clutch cover.
- Turn the clutch cover until mark **C** on the pulse generator and mark **A** or **B**, respectively, on the flywheel coincide.

NOTE: In 400 LC4 engines mark **B** must coincide with the mark on the pulse generator.

In 620/660 LC4 engines mark **A** must coincide with the mark on the pulse generator.

- Tighten the 4 bolts of the ignition cover.
- Finally, mount the plug.

