



ASSEMBLY OF OIL PUMP

Insert the outer rotor into the oil pump housing, the marks on the rotor facing inwards (Fig. 6M-1). Position the inner rotor onto the oil pump shaft with the lock pin (Fig. 6L-8), the marks on the inner rotor (Fig. 6M-2) and the lock ring spline on the shaft (Fig. 6M-3) facing outwards.

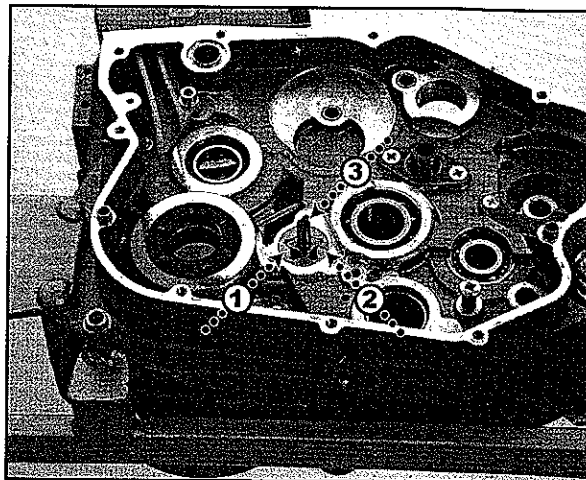


Fig.
6M

Thoroughly clean the inner surface of the oil pump cover and the sealing surface around the oil pump rotors.

Add a thin layer of silicone onto the sealing surface around the rotors.

Put on the oil pump cover onto the shaft, the mark on the cover and the crankcase half should align (Fig. 6N-1).

Screw on the three screws, using a threadlock liquid. torque 5 Nm.

Put one washer (Fig. 6N-2) onto the shaft and then insert the lock pin (Fig. 6N-3) into the shaft.

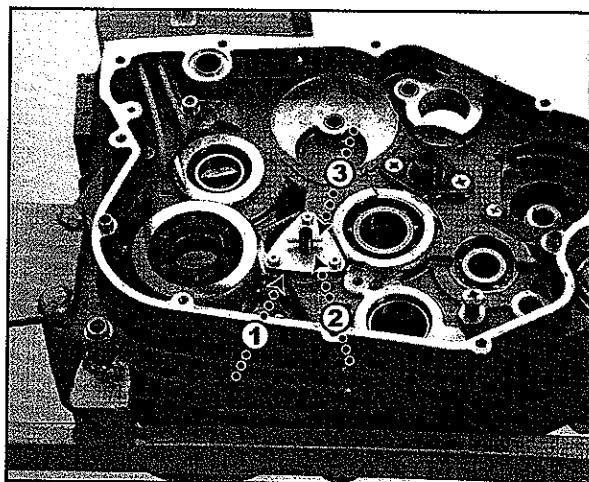


Fig.
6N

Put the drive gear (Fig. 6O-1) onto the shaft, be careful to align the spline on the backside of the drive gear with the lock pin on the shaft.

Place one washer (Fig. 6O-2) onto the shaft and then lock the whole device with a new circlip (Fig. 6O-3). Install the clutch, the transmission cover, the kick-start and the gearshift lever (see Section 7A). Fill the engine with the adequate quantity of oil.

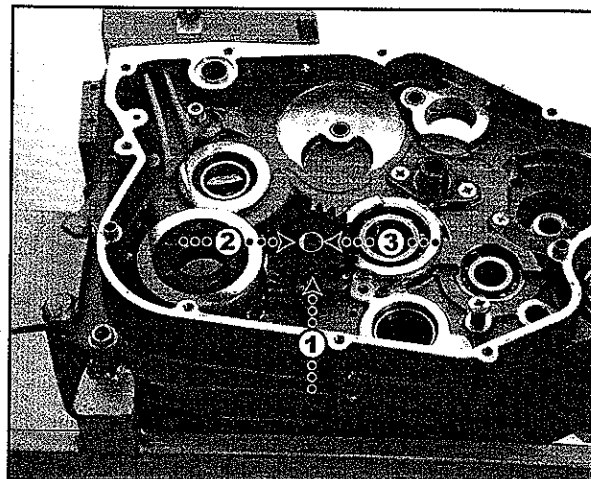


Fig.
6O

DISASSEMBLY OF WATER PUMP

Drain the coolant liquid from the cooling system by removing the hose connected to the water pump cover.

Unscrew the three screws (Fig. 7A-1) of the water pump cover (Fig. 7A-2) and remove the cover.

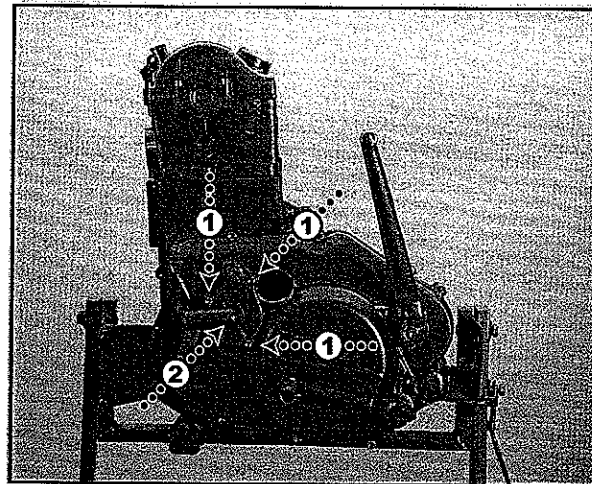


Fig.
7A

Remove the circlip (Fig. 7B-1) holding the water pump impeller (Fig. 7B-2) and gently remove the impeller. Soft mouthed pliers might be needed (Fig. 7C). Be careful not to lose the impeller pin (Fig. 7D-1). Inspect the surfaces of the driveshaft end and the inner of the water pump housing.

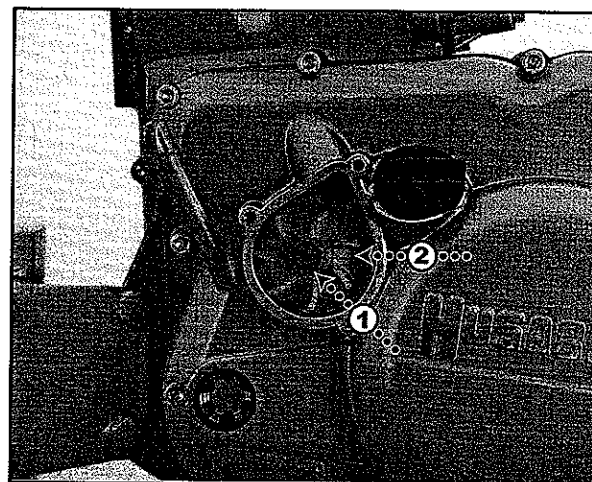


Fig.
7B

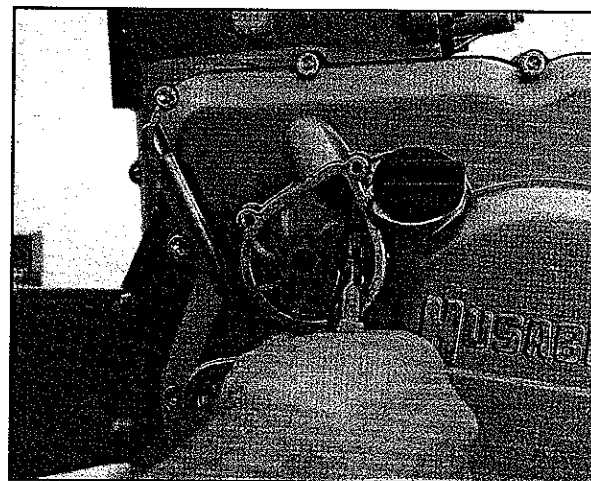


Fig.
7C

7

ASSEMBLY OF WATER PUMP

Install the impeller pin (Fig. 7D-1).

Align the spline on the backside of the impeller with the pin and gently push the impeller onto the shaft and the pin.

Secure the impeller with a new circlip.

Put on a new gasket and the cover and screw on the three screws, torque 5 Nm.

Refit the hose and fill the cooling system with the adequate level of coolant liquid.

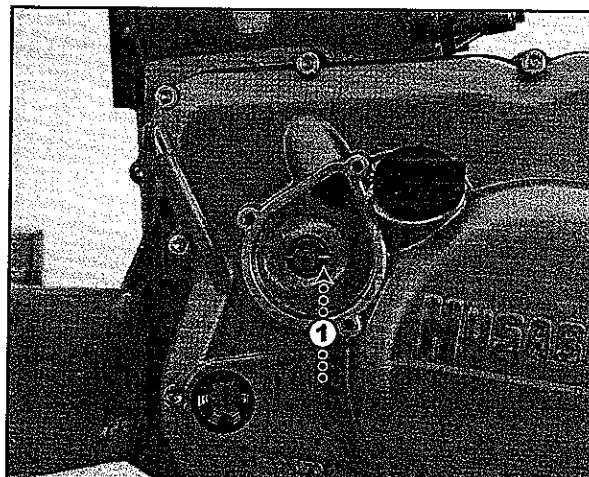


Fig.
7D



DISASSEMBLY OF CLUTCH

Drain the engine oil and the coolant from the cooling system.

Remove the water pump impeller.

Remove the kickstart lever and the gearshift lever.

Unscrew the ten screws of the transmission cover.

Please note that the two screws in the front and the rear (Fig. 7E-1) are slightly longer than the other ones.

Gently remove the cover without making any damages to the sealing surfaces of the cover and the crankcase half.

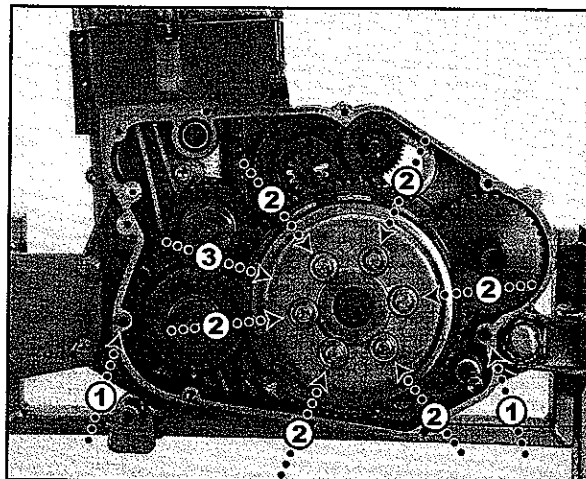


Fig.
7E

Unscrew the six screws (Fig. 7E-2) holding the clutch pressure plate crosswise in order to prevent the friction- and mating plates to either jam or warp. Remove these six screws including retainers and springs.

Remove the pressure plate (Fig. E-3) and the push rod (Fig. 7F-1).

Remove the clutch discs and the push rod.

Remove the circlip (Fig. 7F-2) on the main gear shaft, holding the clutch hub (Fig. 7F-3) and the clutch outer (Fig. 7F-4).

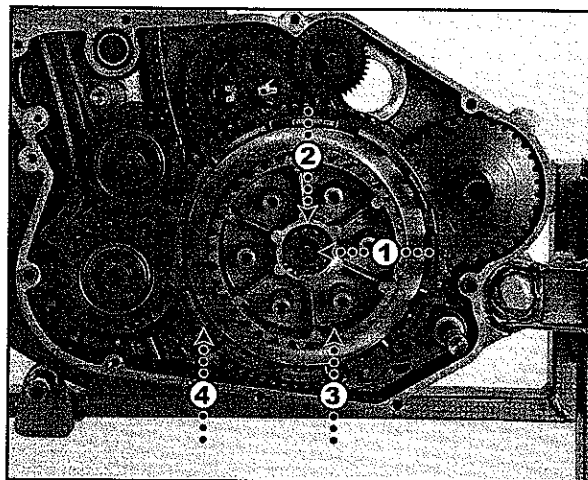


Fig.
7F

Place a suitable bolt (M10x20 mm for instance) in the pushrod channel of the main gear shaft. Attach the universal puller (Fig. 7G-1, Art.No. 270011-02) to the clutch hub with three of the previously removed screws. Screw on the center bolt of the puller towards the bolt-head of the previously placed bolt.

Remove the washer in between the clutch hub and the clutch outer. Remove the clutch center including the bushing (2001) or needle bearings (2002-2003) and the washer underneath the clutch center.

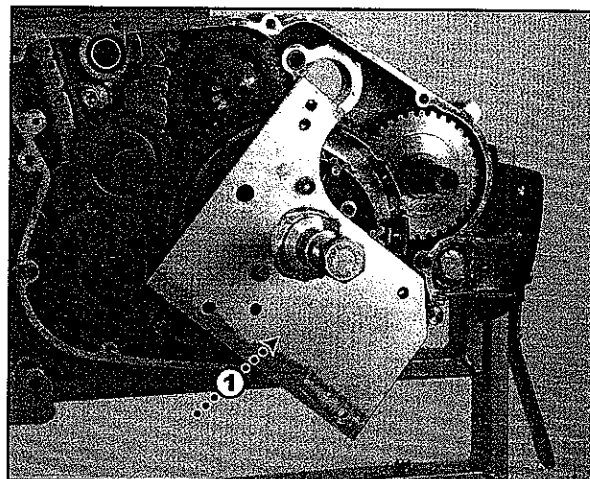


Fig.
7G

Check the bushing (2001) or needle bearings (2002-2003) (Fig. 7H-3) and the two washers (Fig. 7H-1,2) for any damages or deterioration.

Check the splines on the main gear shaft.

Check the main shaft bearing for any deterioration or damages.

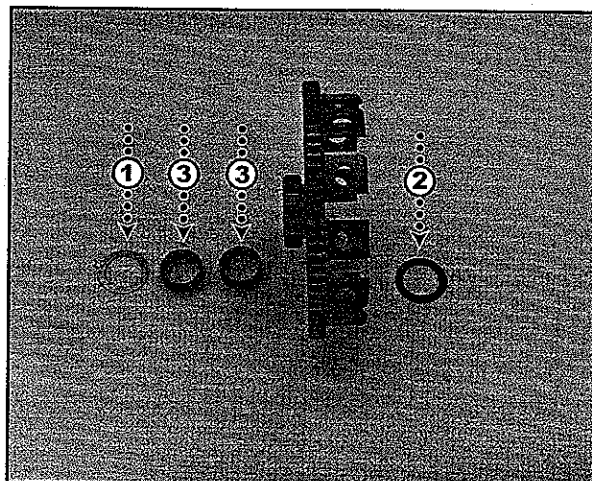


Fig.
7H



TRANSMISSION

Pressure plate 2001-2002.

Check the pressure plate (Fig. 7I-1) with its bearing (Fig. 7I-2) and pressure sleeve (Fig. 7I-3) in regards to any damages.

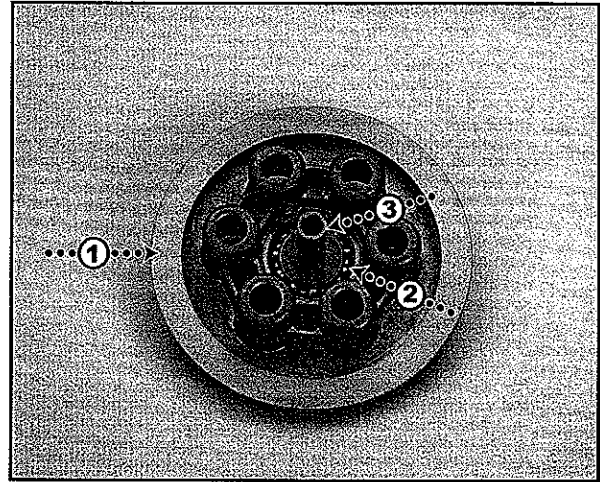


Fig.
7I

Pressure plate 2003.

Check the pressure plate (Fig. 7J-1) in regards to any damages. Also inspect the pressure bearing unit with its sleeve (Fig. 7J-2), bearing (Fig. 7 J-3), support washer (Fig. 7J-4) and locating clip (Fig. 7J-5).

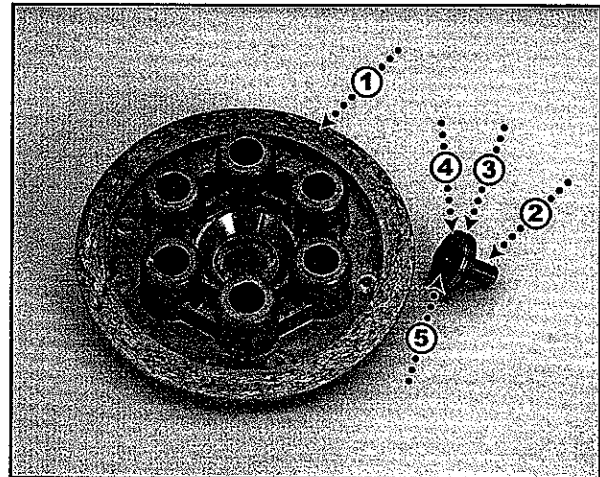


Fig.
7J

Clutch discs 2001-2002.

Check the friction discs (Fig. 7K-1) and mating plates (Fig. 7K-2) in regards to any damages or skewness. The friction discs have to be replaced if the whole package of friction- and mating plates measures below 19,6 mm provided that the mating plates show no signs of skewness.

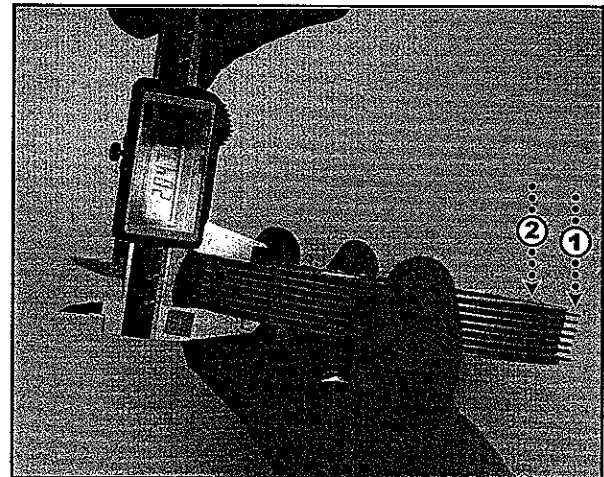


Fig.
7K

Clutch discs 2003.

Check the discs for any damage or skewness and measure the thickness as stated above. The min thickness is 20,8 mm for the 2003 plates.

Mind that the mating plates has different dimensions on the 2003 clutch. The four thick ones (1.4 mm) shall be placed in the middle (Fig. 7L-1) and two thin ones (1.0 mm) shall be placed to the inner and outer sides (Fig. 7L-2).

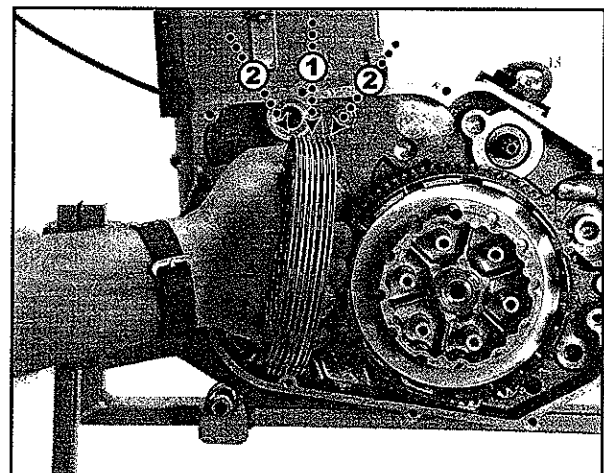


Fig.
7L



ASSEMBLY OF CLUTCH (Models with grooves in clutch centre)

Place one of the two washers and the bushing (2001 models) or the two needle bearings (2002 models) on the main shaft.

Put the clutch outer basket (Fig. 7M-1) onto the main shaft and the second washer (Fig. 7M-2) onto the main shaft towards the basket.

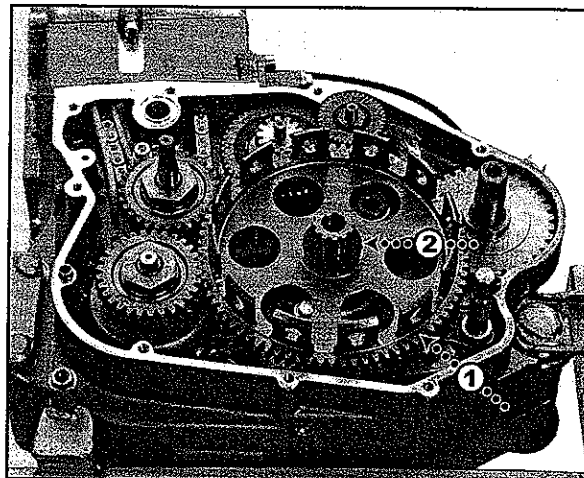


Fig.
7M

Slide the clutch hub (Fig. 7N-1) onto the main shaft. The 2001-2002 clutch should normally not need heating.

Using a suitable sleeve/socket on top of the center of the hub and a mallet, drive the hub to its bottom position. Secure the kickstart mechanism before tapping onto the clutch hub in order to prevent damages or dislocation of the kickstart mechanism.

Lock the clutch hub onto the main shaft with a new circlip (Fig. 7N-2).

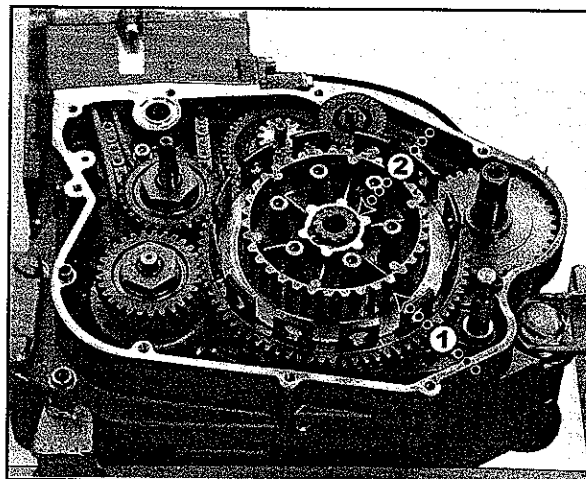


Fig.
7N

Place the friction discs and the mating plates into the clutch, starting with one mating plate, followed by one friction disc, then a mating plate and so on. The 8th mating plate (Fig. 7O-1) being the last one. Slide the push rod (Fig. 7O-2) through the main shaft and fit the pressure plate (Fig. 7P-1).

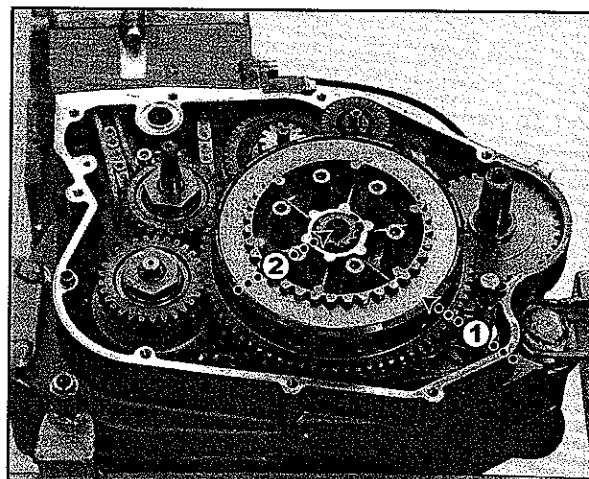


Fig.
7O

Put the springs, the spring retainers (Fig. 7P-2) and the screws (Fig. 7P-3) into the slots of the pressure plate. Tighten the pressure plate crosswise (Fig. 7P-A,B,C), torque 10 Nm.

Make sure that both of the guide bushings (Fig. 7P-4) are in straight and fixed positions. Put a new gasket onto the crankcase half. Check the sealings in the transmission cover; kickstart shaft and gearshift shaft, for any damages or weariness.

Slide the cover over the shafts and the guide bushings towards the crankcase half. Screw on the six screws, torque 10 Nm.

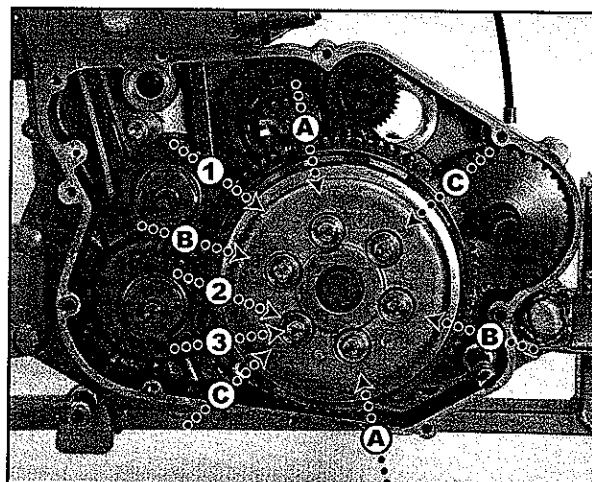


Fig.
7P

TRANSMISSION

ASSEMBLY OF CLUTCH (Models with traction sleeves)

Fit the inner, flat, washer (Fig 7H-1) towards the primary shaft bearing and slide the two needle bearings (Fig. 7H-2) and clutch outer basket (Fig 7Q-1) on to the shaft.

Then fit the two locating clips (Fig. 7Q-2) in the groove on the primary shaft (A dot of grease in the groove will help holding the clips) and fit the securing washer on the clips with the flange facing inwards.

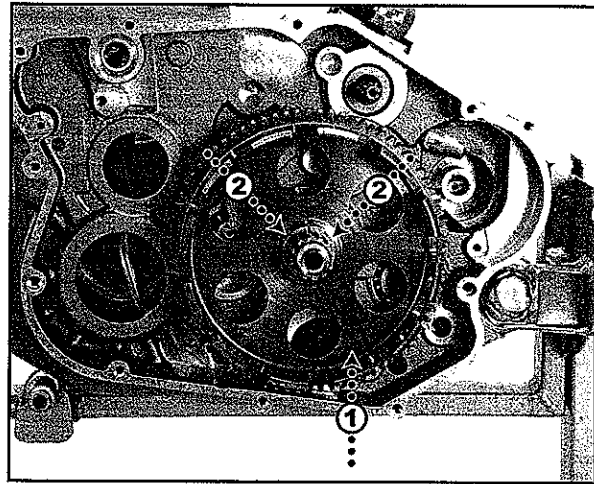


Fig.
7Q

Warm the clutch centre (Fig. 7R-1) to approximately 100 deg in an oven or likewise. Slide it on to the primary shaft until it bottoms on the securing washer.

Fit the lock washer (Fig. 7R-2) with its pre-bent lug facing the machined flat surface on the hub of the clutch centre. Screw on the nut (Fig. 7R-3) and tighten it to 30 Nm. Bend the two straight lugs (Fig. 7R-4) to flat surfaces on the nut to prevent rotation.

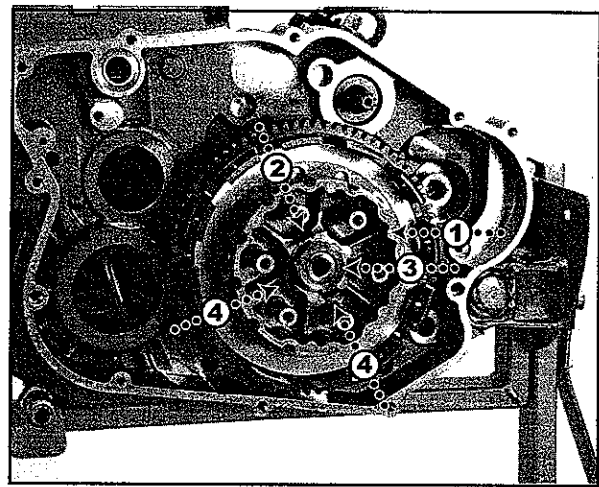


Fig.
7R

The easiest way to assemble the pack of friction and mating plates is to use only one traction sleeve (Fig. 7S-1) to locate the mating plates (Fig. 7S-2). Begin with one mating plate, friction plate, mating plate and so on until you end with a mating plate. Mind that the mating plates are of two different thicknesses. The four thick ones (1.4 mm) shall be placed in the middle, with two thin (1.0 mm) on inside and outside.

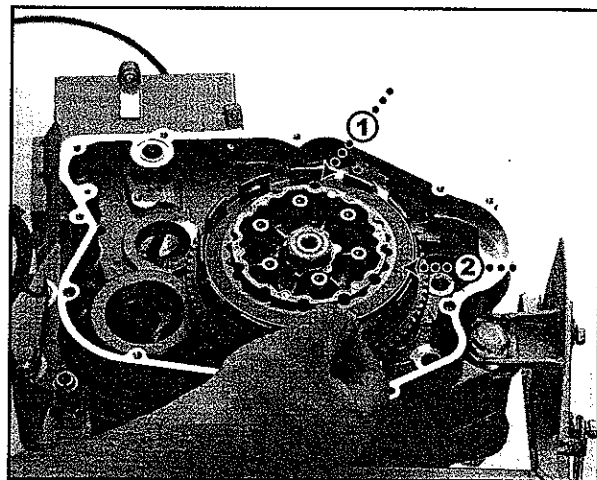


Fig.
7S

Finally slide in the remaining eleven traction sleeves (Fig. 7T-1), the push rod and the pressure plate with its bearing. Put the springs, spring retainers and screws as on the other clutch (Fig. 7P). Tighten the screws crosswise to 10 Nm.

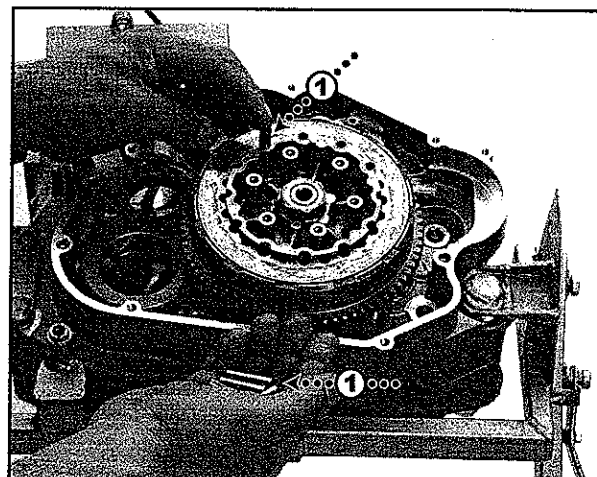


Fig.
7T



DISASSEMBLY OF GEARSHIFT MECHANISM

Drain the engine oil.

Dismantle the kickstart lever, the gearshift lever, the transmission cover and the clutch according to Section 7A.

Unscrew the bolt holding the gearshift location lever (Fig. 7U-1) and remove the bolt, the washer (Fig. X-1), the lever (Fig. 7X-2), the spring (7X-3) and the sleeve (Fig. 7X-4) attached to the lever.

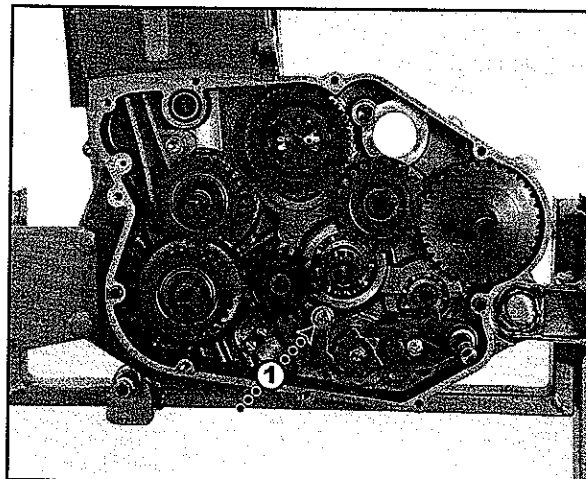


Fig.
7U

Unscrew the bolt holding the gear position star (Fig. 7V-1). Remove the bolt, the washer (Fig. 7X-5) and the position star (Fig. 7X-3).

Detach and remove the hair pin spring (Fig. 7V-2) including the sleeve (Fig. 7V-3).

Lift off the gearshift shaft including the gear selection plates from the crankcase half.

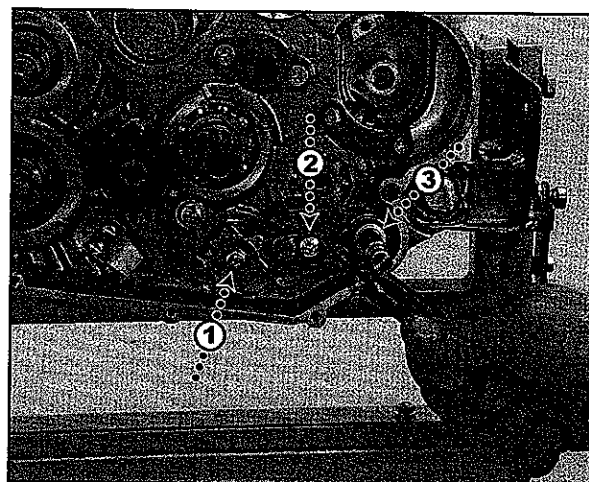


Fig.
7V

Check the gearshift location lever (Fig. 7X-2), position star (Fig. 7X-3) and the pins for any damages or deterioration.

Carefully check the surfaces of the both the upper gearshift selection plate (Fig. 7X-6) and the lower one (Fig. 7X-7). Grind off any sharp edges and check that both plates are totally even and in alignment with each other. The upper selection plate should, without any friction, easily slide across the lower selection plate (Fig. 7X-8).

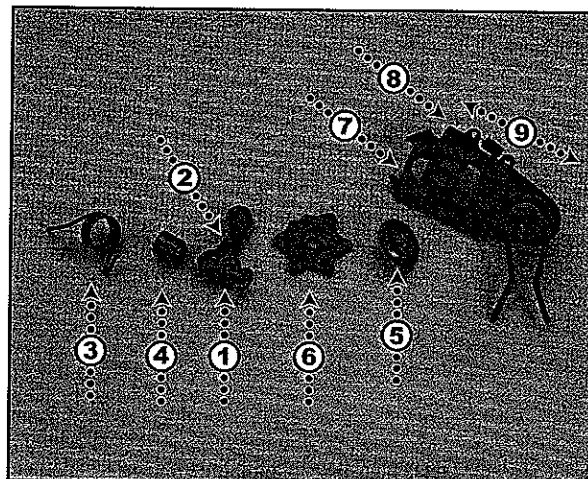


Fig.
7X

Each gear position as shown in Figure 7Y, 0-6. The figure 0 representing the position of the neutral, the figure 1 = 1st gear and so on. Please notice that the pin with a flat surface (Fig. 7Y-0) is the position of the neutral position in the position star (Fig. 7X-6).

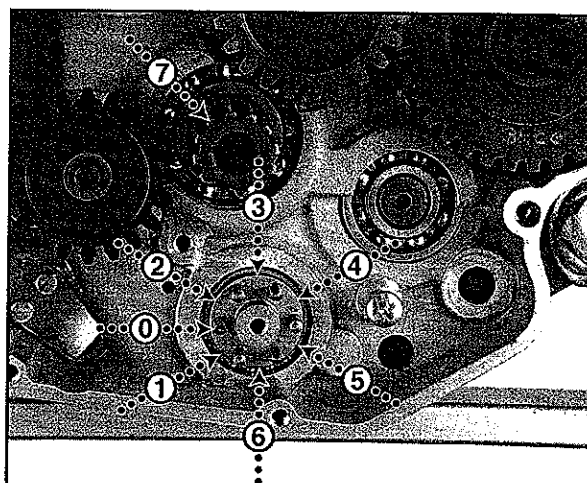


Fig.
7Y



ASSEMBLY OF GEARSHIFT MECHANISM

Install the gearshift shaft including the selection plates and the attachment spring.

Slide the sleeve and the spring onto the shaft and install the hair pin spring into its position. Please note that the bent part of this spring should be in the position as shown (Fig. 7Z-1).

Make sure that the flat-ended pin on the selector drum (Fig. 7B-2) is placed in its frontmost position. This puts the gearbox in neutral. Install the gear position star (Fig. 7AA-1) with the seat for neutral by the flat-ended pin.

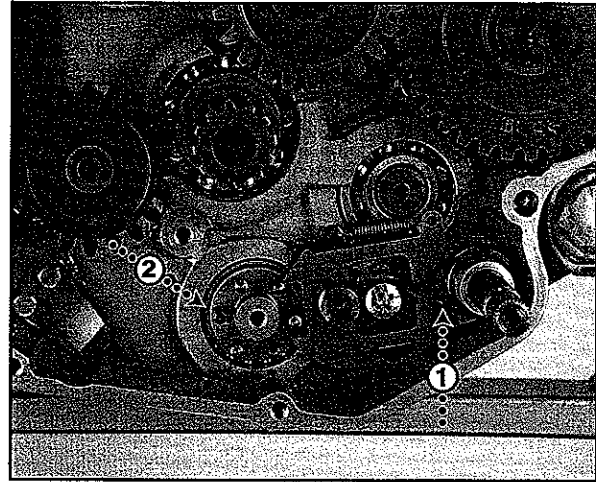


Fig.
7Z

Install the gearshift location lever including sleeve and spring (Fig. 7AA-2) by positioning the straight part of the spring into its position in the crankcase half, screw the bolt in a few turns, slide the lever, clockwise, over the position star and place the wheel of the lever into its final position in the star. Please observe that the chamfered edge of the sleeve should be facing outwards and towards the lever.

Check that the play; equal to none, and the resistance of the hair pin spring (Fig. 7AA-3) is exactly the same in both directions. If an adjustment is needed, turn the gearshift shaft as shown (Fig. 7AA-A), use a plier, gripping both ends of the spring, adjust the part of the spring needing an adjustment towards the other.

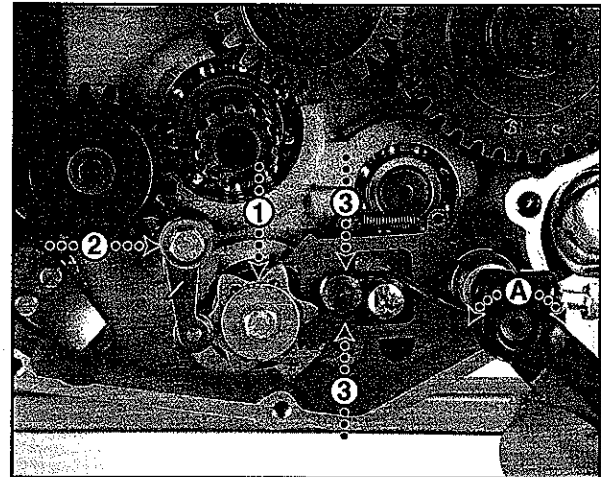


Fig.
7AA

Install the clutch according to section 7A, transmission cover, kickstart and gearshift lever according to section 7CD. Fill the engine with the adequate quantity of oil.

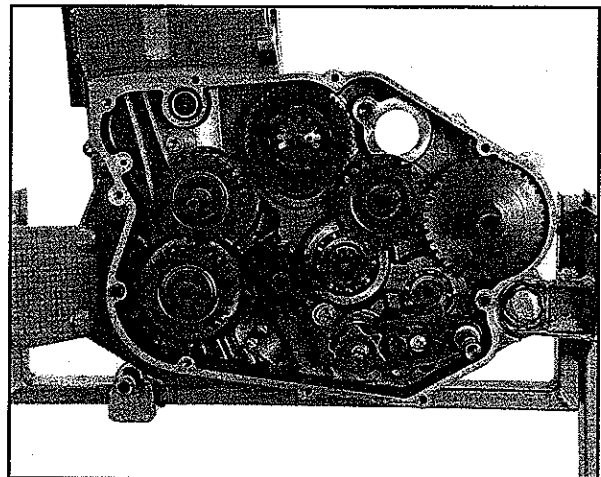


Fig.
7AB



DISASSEMBLY OF KICKSTART MECHANISM

Drain the engine oil.

Dismantle the kickstart lever, the gearshift lever, the transmission cover and the clutch according to Section 7A.

Remove the kickstart shaft (Fig. 7P-1) including the attached kickstart gear wheel (Fig. 7P-2) by just pulling the shaft straight out from the crankcase half. Most likely is also the spring on the inside of the gear wheel accompanying the shaft and the gear wheel when pulled out.

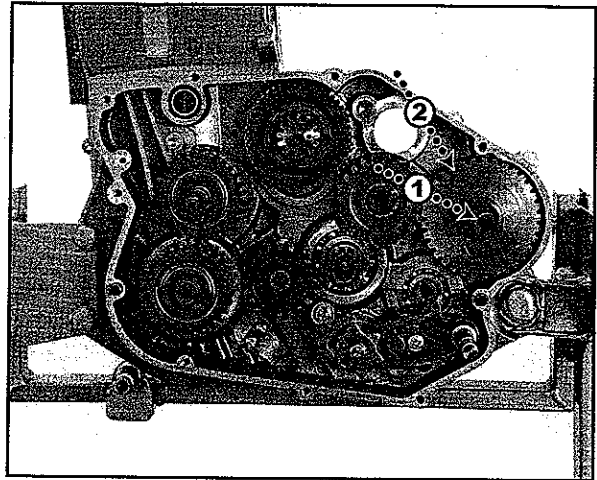


Fig.
7AC

The function of the kickstart mechanism:

When the kickstart lever is activated the kickstart engagement key (Fig. 7Q-1) is engaged into the gear ring of the kickstart gear wheel (Fig. 7Q-2) and thus the gear wheel turning the intermediate gear wheel (Fig. 7Q-3). The kickstart mechanism is brought back to its home position, when released, by the spring (Fig. 7Q-6). The engagement key is when resting towards the engagement sledge (Fig. 7Q-8) which is acting as both a stop and a device de-activating the engagement key from the gear ring of the kickstart gear wheel.

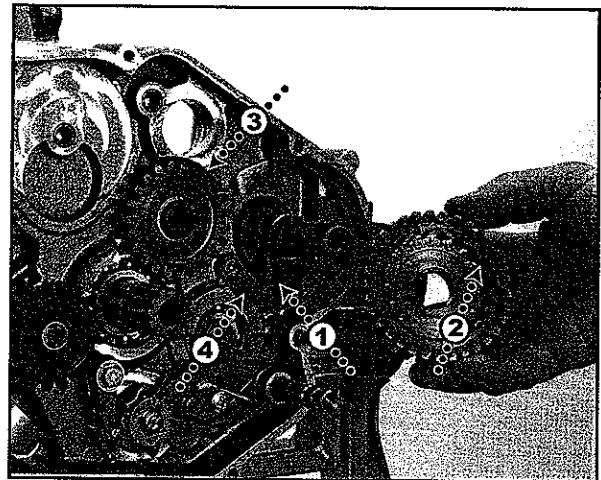


Fig.
7AD

Check the bushing in the transmission cover (Fig. 7S-1), the kickstart gear wheel (Fig. 7S-2), the bearing (Fig. 7S-3) and the kickstart shaft (Fig. 7S-4) for any damages or deterioration. Especially the surface and edge on the decompression device (Fig. 7R-4, 7) and the surface of the decompression lever (Fig. 7R-5). Grind off any rough scratches on the lever's front edge and the surface on the bottom of the lever.

The engagement key (Fig. 7S-6) should be replaced if it shows significant wear on the surface facing towards the gear ring on the kick start gear wheel. Check the engagement sledge (Fig. 7S-8) for any deterioration or damages.

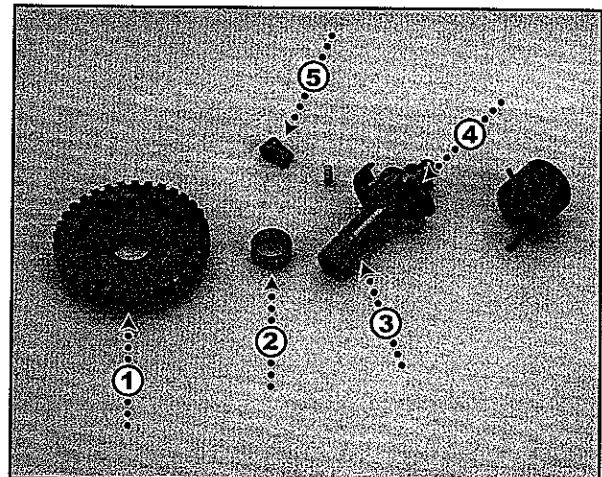


Fig.
7AE

Function of the decompression device:

When the kickstart lever is activated from the very top of the orbital path (Fig. 7AF-1) the decompression device (Fig. 7AF-2) lifts the decompression lever (Fig. 7AF-3). When the kickstart mechanism is brought back the chamfered edge of the decompression device (Fig. 7AF-4) pushes the decompression lever back towards the crankcase half thus letting the kickstart mechanism return to its home position.

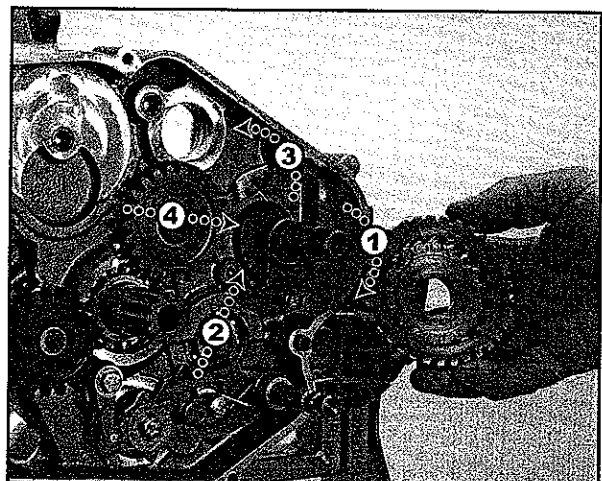


Fig.
7AF



ASSEMBLY OF KICKSTART MECHANISM

Install the spring as shown. The bent part of the spring (Fig. 7AG-1) gripping into the slot of the crankcase (Fig. 7AG-2) and the straight part of the spring (Fig. 7AG-3) facing outwards from the crankcase half.

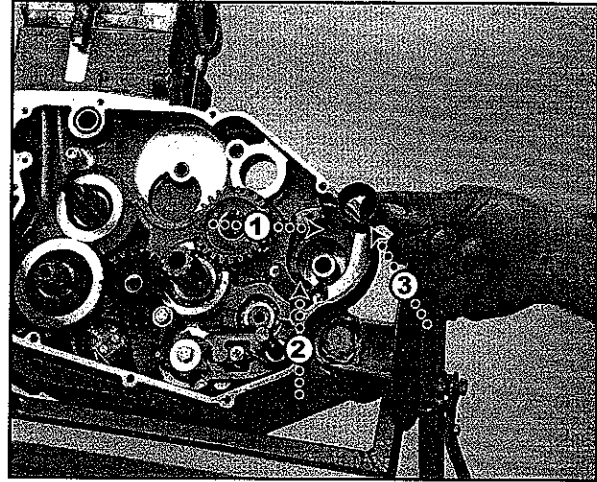


Fig.
7AG

Install the kickstart shaft into the machined hole of the crankcase with the spring fitted in the hole as shown (Fig. 7AH-1).

Turn the kickstart shaft, with the help of the kickstart lever or other suitable tool (Fig. 7AH-2), clockwise and by pushing the shaft into its seat, until the engagement key (Fig. 7AH-3) hooks up on the the engagement sledge (Fig. 7AH-4) and the shaft bottoms in its seat.

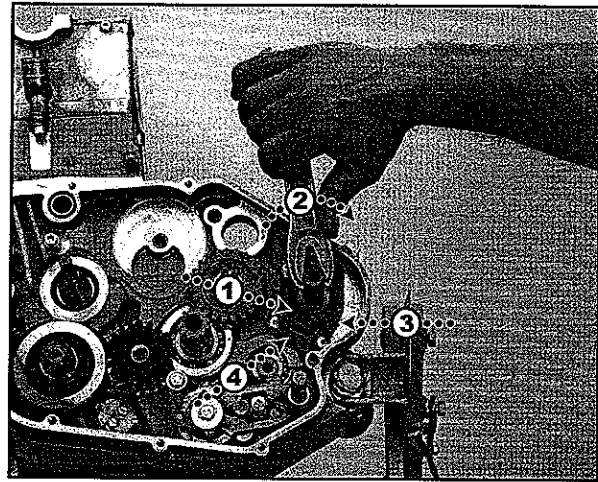


Fig.
7AH

Install the needle bearing (Fig. 7AI-1) and the kickstart gear wheel (Fig. 7AI-2) onto the shaft and within the cogs of the intermediate gear wheel (Fig. 7AI-3). Install the clutch according to section 7A.

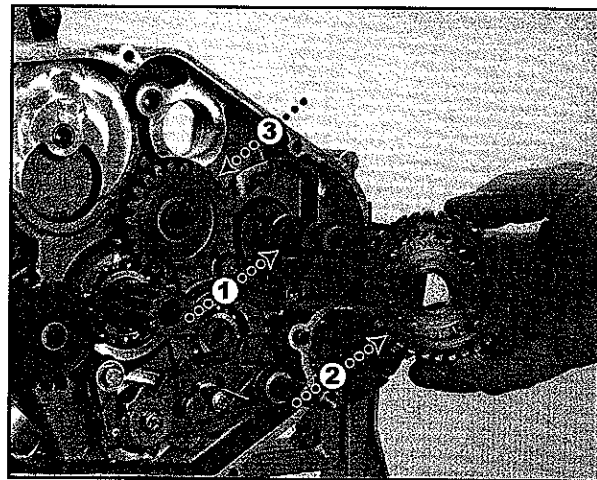


Fig.
7AI

Before fitting the transmission cover a thin layer of silicone or other gasket paste must be applied to the mating surfaces on both crankcase and transmission cover. This is needed on the rear end between point A and B.

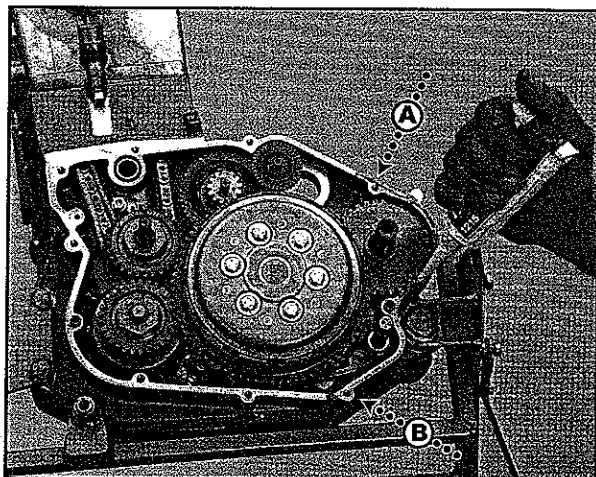


Fig.
7AJ

ELECTRIC STARTER

Attach the gearshift lever in preferred position. Slide the kickstart lever onto the shaft in a position, the lever facing outwards, just slightly touching the kickstarter stop knob (Fig. 7AK-1). You should have to bend the lever slightly backwards to be able to fold it in, otherwise necessary rotary angle is lost and the bike might be difficult to start.

Add some threadlock liquid to the screws of the levers and tighten the screws using a torque of 10 Nm. Fill the engine with the adequate quantity of oil.

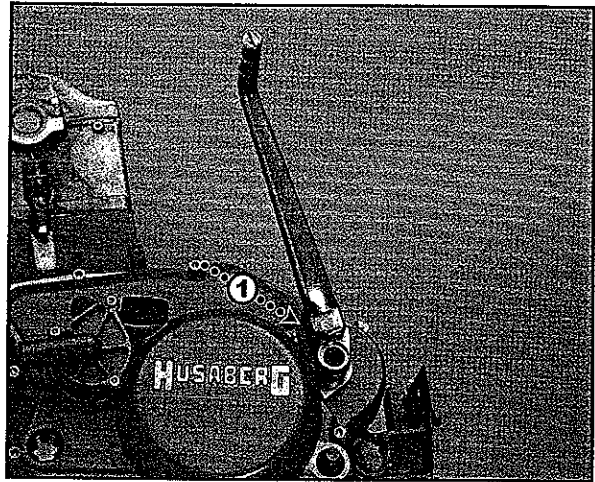


Fig.
7AK

DISASSEMBLY OF ELECTRIC STARTER

Remove the ground cable from the battery. Then remove the feeder cables from the starter relay (Fig. 8A-1) and the socket (Fig. 8A-2) from the cable harness. Pull the relay and rubber sleeve (Fig. 8A-3) from its plate. Remove the two M6 screws (Fig. 8A-4) and lift off the relay plate.

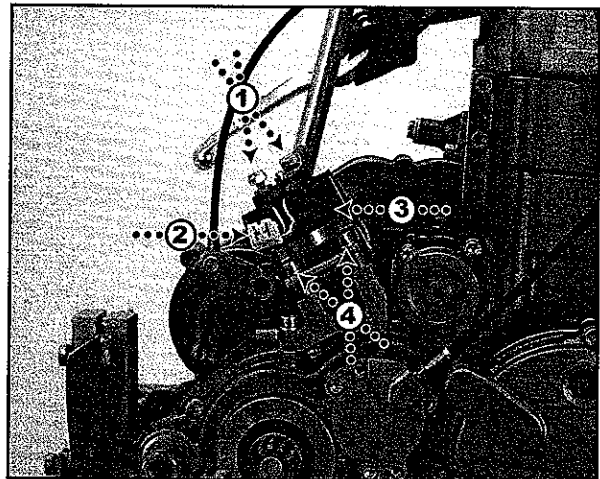


Fig.
8A

By slightly turning the starter motor back and forth (Fig 8B-A), pull it out of its seat in the left crankcase half. Be careful not to damage the o-ring placed around the motor's nose. When the motor back plate meets the motor support (Fig. 8B-1) it can be lifted out.

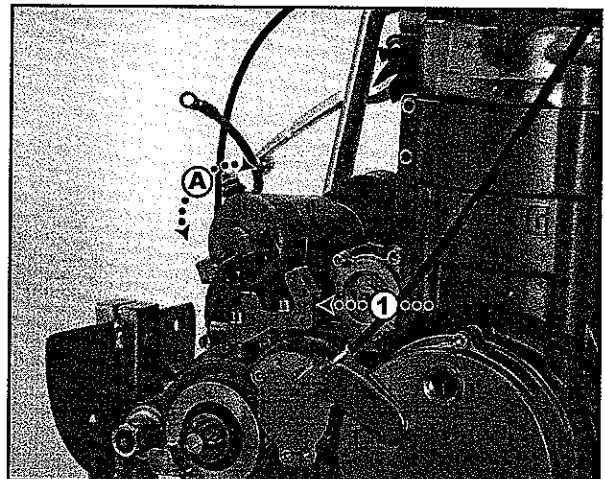


Fig.
8B

ELECTRIC STARTER

The rotation of the starter motor is transmitted over a reduction gear (Fig. 8C-1) and a free wheel gear (Fig. 8C-2) to the clutch. The reduction gear can be pulled straight out of the crankcase. To gain access to the free wheel the clutch has to be removed according to section 7A. Then pull the free wheel unit out holding the outer gear.

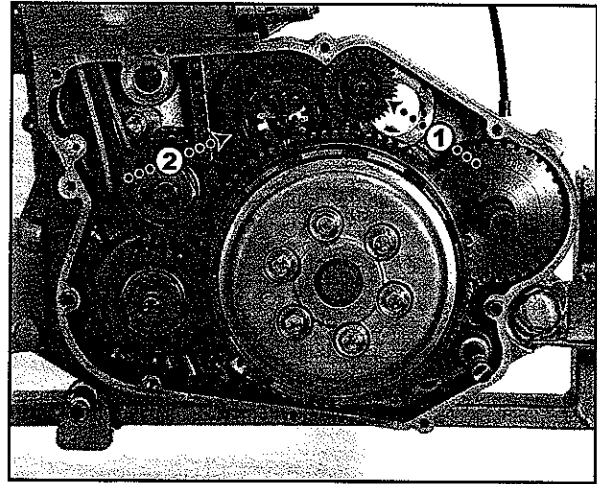


Fig.
8C

Early reduction gears are from a solid design. Check the teeth (Fig. 8D-1) and shaft ends (Fig. 8D-2) for damages and deterioration. Also check the needle bushings in both crankcase and transmission cover. Later engines (Mid 2002 and on) has a friction slip-clutch built in, to avoid damage to the starter motor at backfire. It is recommended to fit a friction gear if replacement is required.

The friction gear can not be dismantled so if it has lost its torque (9-15 Nm is acceptable), the whole unit must be replaced.

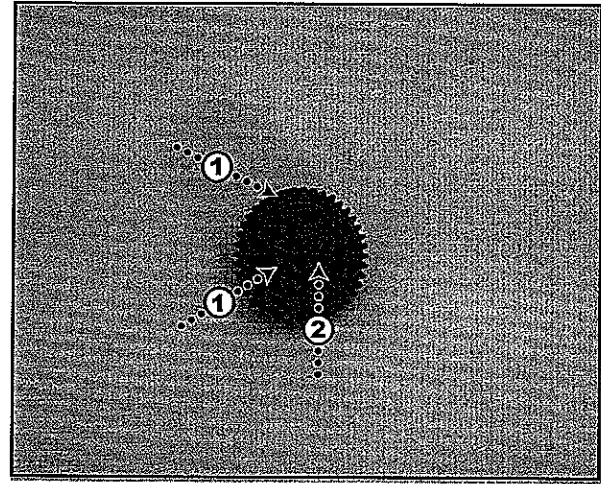


Fig.
8D

The freewheel consists of inner and outer gear, clutch unit and needle bearing. Check the surface of the outer gear (Fig. 8E-1) and the surface of the inner gear (Fig. 8A-2) for damage or deterioration. On the clutch unit special care must be taken on the mating surfaces (Fig. 8E-3) between "roller" and the surfaces of the gears. If flat surfaces occur in the "rollers", the clutch might slip and the freewheel will just spin.

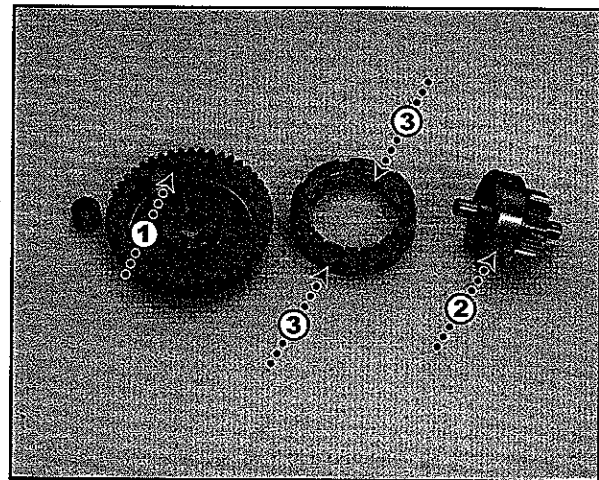


Fig.
8E