



X30 125cc RL - TaG

MAIN BEARINGS REPLACEMENT:

FROM BALL BEARINGS TO NEW ROLLER BEARINGS

INSTRUCTION MANUAL

MAN - 096 - EN

MAIN BEARINGS

REPLACEMENT OF THE BALL BEARINGS WITH NEW ROLLER BEARINGS

It is now possible to replace the current 6206 ball bearings with the special roller bearings BC1-3342B (p.n. X30125397).

Due to its characteristics this type of bearing has an extremely long lifetime, also extending the lifetime of the crankcase as it dramatically reduces the number of main bearing replacements.

It also eliminates wear of the crankshaft journals and helps to preserve the crankshaft alignment during engine operation.

As shown on the pictures, the inner ring and the washer are not retained, and have to be installed onto the crankshaft as described by the following guidelines. On the contrary, the rollers and the plastic cage are installed firmly into the outer ring, and must not be disassembled.



For engine disassembling remove in sequence:

- The clutch-cover
- The Bendix plastic cover
- The clutch drum, then the clutch hub together with the starter ring
- The Bendix
- The ignition rotor and stator
- The starter motor's supplementary support on the left side
- The starter-motor
- The gears cover
- The spacer and the balancer shaft driving gear on the crankshaft
- The Seeger ring and the driven gear on the balancer shaft
- The reed block cover, the reed block and the gaskets
- The cylinder head, the cylinder, and the base gasket
- The circlips, piston pin and piston
- Open the crankcase and remove the crankshaft
- Remove the balancer shaft
- Remove the oil seals
- Remove the main bearings carefully with a punch through the oil seal hole, heat the bearing seat area on the crankcase with a heat gun.
- Remove the eventual shims between crankcase and bearings
- Check the status of the bearing seats in the crankcase

- Clean the crankcase accurately
- Prepare a clean horizontal plane as a base.
- Take the 2 bearings from the boxes, separate the outer rings with rollers from the inner rings and spacers, don't mix the parts between the two bearings.

ASSEMBLE THE NEW ROLLER BEARINGS

ASSEMBLING PROCEDURE

Assemble the new roller bearings by heating the crankcase (recommended).

- Degrease the outer rings' external diameter and lay them on the base having the marking "SKF" visible.
- Don't install the shims previously removed, normally they are not necessary.
- Protect your hands with heat-resistant gloves.
- With a hot air gun heat one half-crankcase by directing the air flow inside the bearing seat area, with circular movement, until you get a temperature of approximately 100°C, so that the bearing seat expands to allow the manual insertion of the outer ring.
- Put the crankcase half horizontally on the work area, take the bearing with your fingers by the interior, on the rollers, using a heat resistant glove. Put it straight into the seat until the end.
- Be sure the bearing reaches the bottom of the seat without bouncing back.
- Double check that the marking on the outer ring is visible.
- Don't move the half crankcase until it has cooled sufficiently.
- Repeat the operation with the other half.
- It's best to provide air cooling of the two crankcases by a fan, while they lay horizontally on the work area to accelerate the cooling. Don't cool them by fresh water.

CRANKSHAFT

The inner rings have to be assembled onto the crankshaft journals and retained by an interference fit.

It is extremely important to detect IF the used crankshaft is suitable to host the bearing's inner rings.

If the result of the checking is negative, or in case of any doubts, a brand new crankshaft must be considered. An insufficient interference will cause the release of the inner rings during engine operation with a complete crankshaft failure as a consequence.

Take the used crankshaft, clean and degrease.

Disassembling the crankshaft itself is not strictly necessary, to perform the following operations, although it is suggestable for handling ease.

Now we proceed measuring the journals' diameter, as the tolerance on journals is really strict, the measurement has to be carried out only with a fresh and good quality micrometer for shafts:

- measuring range 25-50mm;
- resolution 0.01mm or less;
- micrometer tips d.5-6mm;
- The micrometer must be provided with its own zero-gauge.



Without the appropriate instrument, please don't perform the checking and proceed only with a brand-new crankshaft



The crankshaft and the micrometer have to be at the same ambient temperature.

Very Important: proceed to correctly set the zero on the micrometer, using its own zero-gauge.

Check the journals diameter at approximately the center of journal length.

Verify that the measured diameter is between $\text{Ø}29.99\text{mm}$ and $\text{Ø}29.98\text{mm}$.

If the diameter is bigger than $\text{Ø}29.99\text{mm}$ or smaller than $\text{Ø}29.98\text{mm}$ proceed with a brand-new crankshaft.

Place the crankshaft onto the press plane.

If you are proceeding with an individual crankshaft half, please place the spacer p.n.10106 under the crankpin side to have a proper support on the base.

If you are proceeding with the complete crankshaft, please insert the plate for crankshaft disassembling (p.n.10104) between the two halves, and place everything on the support (p.n.10100). Again, use the spacer (p.n.10106) for proper support.

Installing the parts, we recommend matching the components of each single bearing.



Install the bearing spacer. The side with the marking must face down toward the crankshaft body.



Place the inner ring onto the crankshaft, the marking and the bigger chamfer must face upwards and remain visible.



Press the inner ring using a tubular punch with the following dimensions:
 $\text{Øint.} 30.5\text{mm}$
 $\text{Øext.} 37\text{mm}$ or higher
 $L = 100\text{mm}$ or higher.
Please note that the load needed for this operation is reasonably low and even a manual rack press is sufficient.

The tube-punch helps to press the inner hole parallel to the crankshaft axis.

The inner ring is fully in seat when the spacer is pinched by the inner ring itself, and it can't be rotated by hands.

Repeat the operation on the other side of the crankshaft.

Before installing the new oil seals onto the crankcase, install the crankshaft, then close the crankcase and tighten properly all the screws with cross-path at 8-10Nm.

Check the axial end-play, using the appropriate support provided with a dial gauge having resolution of 0.01mm.

The end-play must be 0.35-0.5mm.

If the reading is higher, open again the crankcase, extract the bearings and install shims to achieve the correct clearance. The shims should be equally divided between right and left, especially if the total thickness to be added is more than 0.1mm.

While checking the end play, just verify the presence of an even small radial clearance, which is normally 0.01mm or higher.

Once the end-play is correct, open again the crankcase and remove the crankshaft, install the oil seals and add grease between the main and secondary lips of each seal.

Clean the sealing faces of both crankcase halves with diluent and apply sealing paste ("Motorsil" or equivalent) on one half-crankcase.

Don't contaminate the sealing faces or the sealing paste with lubricant.

Install the balancer shaft.

Install the crankshaft, close the crankcase and tighten properly all the screws with cross-path at 10Nm.

Placing the crankcase in the normal working position, with an oilcan lubricate the main bearings by adding adequate oil quantity to the relevant lubrication holes in the transfers.

In the same way lubricate the conrod big end, on both left and right sides.

Make some crankshaft revolutions in order to spread the oil adequately.

REASSEMBLE THE COMPONENTS

ENGINE RE-ASSEMBLING - INSTALL IN SEQUENCE

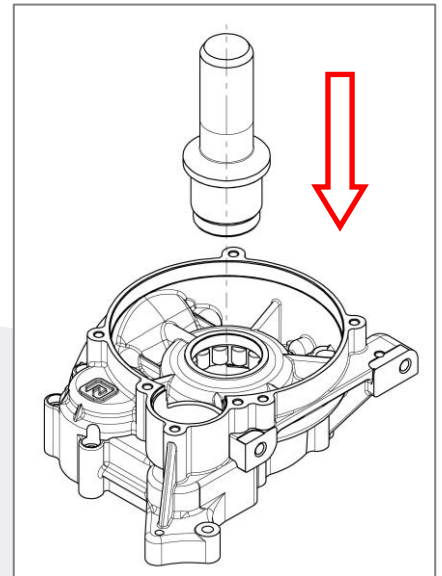
- The piston and piston pin, using brand new circlips preferably.
- The base gasket, the cylinder, the cylinder head.
- The reed block gasket, the reed block and the cover.
- The driven gear and its Seeger ring onto the balancer shaft (markings for timing).
- The driving gear and the spacer onto the crankshaft (markings for correct timing).
- The gears cover
- The starter motor and its supplementary support on the left side of the engine
- The ignition rotor, having verified the presence of the key in the groove.
- The ignition stator.
- The Bendix, lubricating the two pins with viscous grease.
- The clutch hub together with the starter ring, then the clutch drum lubricating slightly the roller cage spreading a small quantity of viscous grease.
- The Bendix plastic cover.
- The clutch cover.

SPECIFIC INFORMATION ON ROLLER BEARINGS REPLACEMENT

In order to allow the bearings to work with the appropriate clearance and with the correct coupling between rollers and rings, please replace the bearings complete: outer rings with rollers together with inner rings and spacers.

To push out the bearings from the crankcase, an appropriate punch (IAME ATT-075/2) is recommended as the load is applied to the rollers.

The punch must be $\varnothing 39.9\text{mm}$, with a pin $\varnothing 37.3\text{mm}$ to keep the rollers in seat during the operation. See in figure.



To remove the inner ring from the crankshaft, use the specific puller (IAME ATT-048X).

The lip grabbing the spacer is necessarily thin, be careful to fit it exactly on the crankshaft.

Tighten the 2 Allen screws M8x30, then tighten the M12 screw (Hex.19) until the complete extraction of the inner ring, blocking the puller body.

