

FUNCTION OF THE BEARINGS IN THE WATER PUMPS.



The water pump bearing has the function of holding the loads transmitted by the timing and the accessories belt or the gears and to connect the engine movement with the water pump impeller turning.

Normally, the water pumps are equipped with integrated shaft as appear in the below Picture.

✓ In this picture we can see a typical water pump bearing, composed by the outer ring, the bearing shaft, a row of rollers and a row of balls, all of them manufactured in stainless steel.

ROLLERS

BALLS

BEARING SHAFT

OUTER RING

TYPES OF BEARINGS USED IN THE AUTOMOTIVE WATER PUMPS.

It exist two basic types of bearings used in the automotive water pumps:



ROLLER-BALL BEARING

1- Roller-ball bearing, used when it is required to hold high radial loads.



BALL-BALL BEARING

2- Ball-ball bearing, used when there are required high speeds, radial load not very high and even a low component of axial load.

"These two basic types of bearings could have different design changes depending of the engine load requirements. There are different bearings that could be used in these cases, ball-ball angular contact bearing, roller-ball four points contact bearing, symmetric or asymmetric, depending the quantity of axial and radial loads required. Industrias Dolz select the bearing more appropriate to each engine application to cover the high levels of quality and durability that we offer to the customer.

TYPICAL BEARING DAMAGES THAT ARE PRODUCED IN WATER PUMPS.

1

EXCESSIVE TIMING BELT TENSION.

There are vehicles that require a manual tensioning of the timing or the accessories belt.



Manual tensor roller

The timing belt flat side letters use to have marked the belt trademark and belt technical characteristics. If the tensioning of the belt is very high, these letters disappear totally due to the excessive contact with the rollers or the blocking of one roller.



Letters can be read



Letters have been deleted

Appears red colouring in roller and balls. They are worn. Roller and balls race ways are also worn.

Bearing damages produce excessive noise. It is an indicator to stop immediately the engine to avoid engine breakdown.



Red colouring rollers and balls



Balls worn



TYPICAL BEARING DAMAGES THAT ARE PRODUCED IN WATER PUMPS.

2

TENSOR ROLLER INCORRECTLY TIGHTENED VIBRATIONS

If the screw that fix the tensor roller to the engine become loose (it was not tightened at correct torque), then it will be produced belt vibrations and whips. Consequence of that, it will be produced an irregular wear of the belt flat side letters very similar to that appears in the bellow picture.



Manual tensor roller



Letters can be read



Typical wear produced by abnormal tensor movements due to incorrect tightening of screw that fix it.



Bearing shaft race ways wear due to irregular loads applied to the water pump bearing



TYPICAL BEARING DAMAGES THAT ARE PRODUCED IN WATER PUMPS.

3

ENTRY OF REFRIGERANT LIQUID TO BEARING

If the water pump leaks between two dynamic seal contact faces, it will be produced an infiltration of coolant inside the bearing that will be removing the bearing internal protective grease. Without this grease, the bearing life will be reduced considerably because there will be produced a contact metal-metal of the bearing elements.



↕ Coolant has infiltrated inside the bearing removing it internal protective grease.



If you detect coolant loses by the water pump exhaust hole, you have to stop the engine and go to the mechanic.

"The water pump is connected to other engine parts by the timing belt, the accessories belt or gears. If any of these elements don't work properly, it should generate whips and vibrations that will be transmitted to the bearing, reducing considerably its life.

4

IRREGULAR FUNCTION OF OTHER ENGINE COMPONENTS.



CONCLUSIONS

The water pumps manufactured by Industrias Dolz use bearings that have same quality and life than original equipment.

For long bearing life should be followed this requirements:

- Tensioning the timing or accessories belt according OE specifications.
- To check that the screw that fix the tensor rollers to the engine is tightened to the correct torque.

- Repair the engine parts that are damaged (specially if they are connected to the water pump by the timing or the accessories belt).

And have the following precautions:

- Stop the engine if excessive noise is detected (bearing damage).
- Do not refill the expansion vessel with coolant in a systematic way if it is observed that the pump leaks, go to the workshop to verify the damage