

# PREVENTIVE MAINTENANCE AND TROUBLE SHOOTING

## PICKUP COIL TESTING

Testing the MAG and MCP (RF) coils consists of measuring the resistance with an ohmmeter.

1. Measure the resistance between pin A and pin B. The resistance should be approximately as listed in the following table.
2. The resistance from any pin to the case should be greater than 1 megohm.

**Table A** - DC Resistance of some common coils\*

<b>COIL</b>	<b>DC RESISTANCE</b> (Ohms)
MC2PAHT	15.0 ±10%
MCP	2.5 ±10%
MCP3A	11.5 ±10%
PC13-110G	1800 ±10%
PC13-70G	1800 ±10%
PC13-74G	1800 ±10%
PC13-74S	1850 ±15%
PC24-45G	1350 ±10%
PC24-45S	1850 ±15%
PC28-13G	120 ±20%
PC28-14G	180 ±20%

If either resistance measurement fails, replace the pickup coil. Firmly seat the new coil in the flowmeter.

## BEARING REPLACEMENT

The type of bearings installed in the flowmeter have been selected to operate in the type of service being metered.

It is recommended that the bearings be checked periodically for wear. The type of fluid being measured, as well as temperature and cleanliness of the service, have a direct relationship on the life expectancy of the bearings. Therefore, it is best to contact the engineering department or the HFC Customer Service department for the proper preventive maintenance interval.

It is recommended that the bearings be replaced if any signs of wear are apparent. An unexplained shift in the output accuracy could be a sign of worn bearings.

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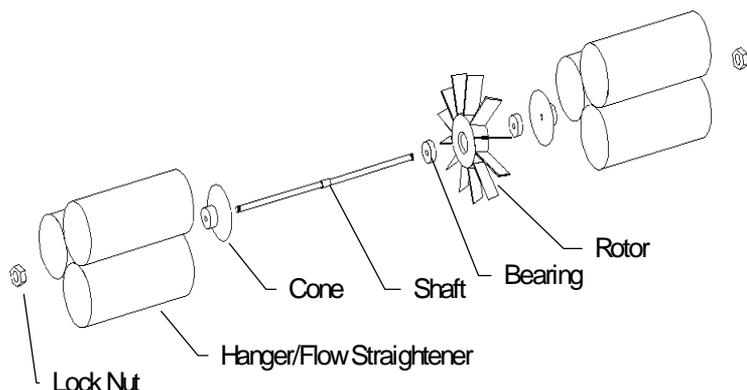
\* For specific coils not listed contact the HFC Customer Service Department for the approximate resistance readings.

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**CAUTION:** *If bearings are allowed to operate without replacement at the recommended interval, the accuracy of the device may drift from the original calibration and if left long enough severe damage to the rotor and/or internals may occur.*

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Ball bearings can be changed in the field. Sleeve type bearings can not be changed in the field. If no down time can be tolerated, a spare rotor with sleeve bearing or complete set of spare internals should be stocked.



**Figure 3** Exploded View - Flowmeter Internals

### **BEARING REPLACEMENT FOR THREADED SHAFTS**

1. Remove the meter to a clean stable work surface.
2. Using two “Spin-Tite” wrenches, remove one lock nut from the shaft.
3. Place a small head stove bolt in a vise. Guide the bolt head gently through one of the hanger/flow straightener tubes and in a smooth firm stroke remove the hanger from the housing.
4. With the shaft placed vertically downward, carefully remove a cone, two bearings, and the rotor.
5. Remove the other hanger in a similar manner.
6. Examine the shaft and cones for scoring. If scoring is present, replacement is necessary.
7. Obtain new bearings of the same type from stock or the manufacturer. Discard old bearings.
8. Reassemble one hanger in the housing with the shaft, a cone, and an end nut.
9. Place the bearings into the rotor. Guide the bearings and rotor onto the shaft making sure to reassemble with the “IN” side of rotor facing the “IN” side of the housing.
10. Place the remaining cone on the shaft. Gently “rattle” the flowmeter to seat the internals on the shaft.

11. When properly seated, gently push the hanger onto the shaft. Be sure to properly align the hanger on the shaft. The hangers seat against a shoulder machined into the housing.
12. Gently tighten the self-locking lock nuts until they make contact with the spring clip hanger. “Two Finger” tight on a “Spin-Tite” is more than adequate.
13. Holding the meter horizontally, gently blow into it (DO NOT use compressed air). The rotor should turn freely. With a magnetic coil the rotor should gradually slow down and then “quiver” to a stop with one of its blades aligning with the pickup coil. With a MCP (RF) coil the rotor should “coast” smoothly to a stop.
14. Clean the flowmeter assembly with ISOPROPYL ALCOHOL or an alternately approved cleaning solution.

The flowmeter is ready for service. When installing the flowmeter be sure to orientate the input and output correctly.

### **BEARING REPLACEMENT FOR NON-THREADED SHAFTS**

1. Remove meter to a clean stable work surface.
2. Insert the hanger tool (3P-Tool HFC Stock # 300-8113) into the hanger/flow straightener assembly.
3. Turn the P3-Tool until the hanger tubes are aligned with the scallops in the meter housing.
4. Holding the meter in the vertical direction slowly remove the tool. The hanger, shaft, cones, rotor, and bearings should come out with the tool. Should any of the components hang-up inside the meter housing care should be taken in their removal.
5. Remove the remaining hanger in a similar manner.
6. Examine the shaft and cones for scoring. If scoring is present, replacement is necessary.
7. Obtain new bearings of the same type from stock or the manufacturer. Discard old bearings.
8. Insert the shaft with cone into the hanger and assemble the remaining internal parts onto the shaft.
9. Place the hanger assembly with the internals on the P3-Tool.
10. Hold the housing in the vertical position and align the hanger assembly with the scallops in the meter housing.
11. Gently slide the hanger and rotor assembly into the housing with the “IN” on the rotor oriented in the same direction as the “IN” on the housing.
12. When the hanger assembly is fully inserted into the meter housing, twist the P3-Tool to secure the hanger in the ‘locked’ position.
13. Align the second hanger with the scallops on the housing and with the rotor shaft.

**Caution:** *It is very important that the shaft is properly inserted into the second hanger. Failure to do so will result in damage to the rotor, shaft, and/or bearings.*

14. With the hanger properly positioned in the housing, secure it in place by inserting the P3-Tool and twisting it to the 'locked' position.
15. Using the P3-Tool align the tubes of the two hangers.
16. Holding the meter horizontally, gently blow into it (DO NOT use compressed air). The rotor should turn freely. With a magnetic coil the rotor should gradually slow down and then "quiver" to a stop with one of its blades aligning with the pickup coil. With a MCP (RF) coil the rotor should "coast" smoothly to a stop.
17. Clean the flowmeter assembly with ISOPROPYL ALCOHOL or an alternately approved cleaning solution.

The flowmeter is ready for service. When installing the flowmeter be sure to orientate the input and output correctly.

## EXPLODED VIEW/TURBINE INTERNALS

