



**CONVERSION INSTRUCTIONS FOR
STANDARD SPINDLE
TO
ONE PIECE SEPARATOR/SPINDLE AND
THREADED REVERSE THRUST BEARING**

FEATURING:

- *ONE PIECE SEPARATOR/SPINDLE WITH CERAMIC SLEEVE BEARING
- *CERAMIC BEARING CARTRIDGE PROPELLER
- *THREADED REVERSE THRUST BEARING CARTRIDGE

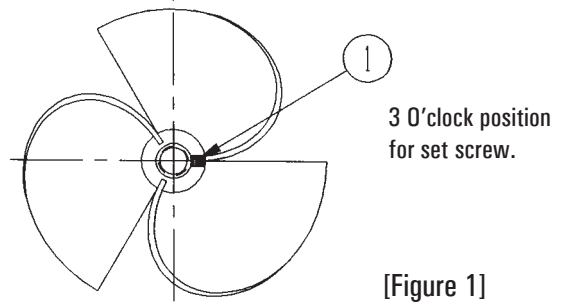


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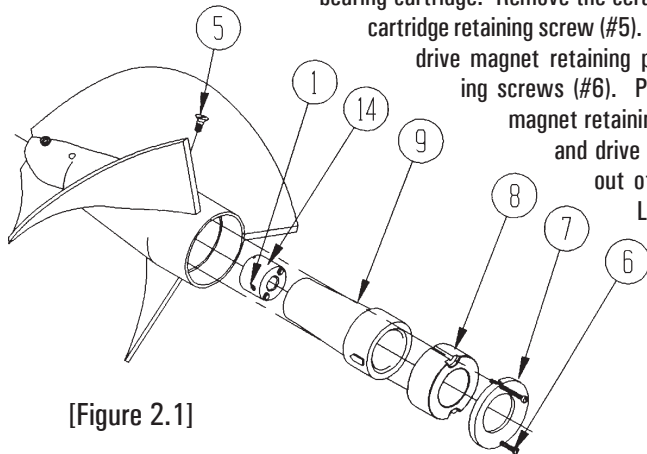
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The following instructions are intended to guide you through a change over from a standard spindle configuration to a one piece separator/spindle & threaded reverse thrust bearing cartridge. It is necessary to remove the standard propeller assembly, replace the standard reverse thrust bearing cartridge assembly with a threaded version, and remove and replace the separator/spindle with a one piece separator/spindle assembly.

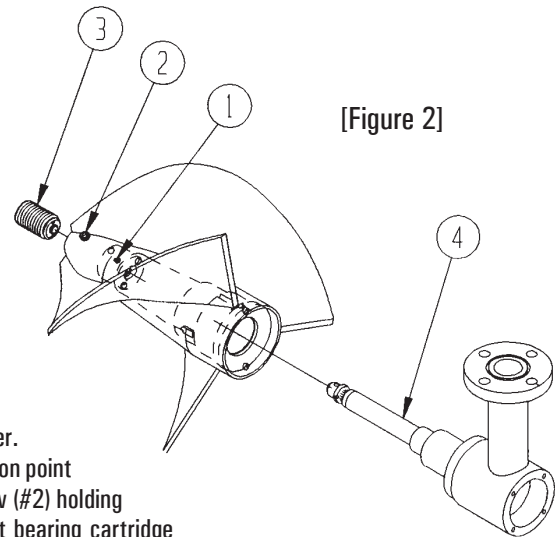
1. [fig. 1] **PROPELLER REMOVAL** can be accomplished by first turning the propeller so that the allen wrench clearance hole is at the 3 o'clock position (when facing the front of the propeller) to line up with the set screw (#1) in the side of the reverse thrust bearing cartridge (#14). If the set screw (#1) is not in the proper location (3 o'clock) then turn the propeller slowly until the set screw is accessible through the allen wrench clearance hole. Using a 5/64 inch allen wrench, loosen the set screw (#1) in the reverse thrust bearing cartridge (#14) until it is approximately one half the depth of the allen wrench clearance hole. **NOTE:** If the bearing area appears to be clogged with dirt or sediment, making it difficult to locate the set screw, then the thrust bearing cartridge (#3) (see fig. 2) should be removed for visible access to the reverse thrust bearing cartridge. Removal of the thrust bearing cartridge (#3) is accomplished by loosening the nylon point set screw (#2) and unscrewing the thrust bearing cartridge (#3). The bearing area should be flushed out with water. Pulling lightly, slide the propeller assembly off the support spindle (#4). If the propeller assembly does not come off with only minimal force, loosen the set screw (#1) another thread or two then try again.



2. [fig. 2 and 2.1] **CERAMIC BEARING CARTRIDGE (#9), drive magnet (#8), and drive magnet retaining plate (#7) must be removed in order to replace the standard reverse thrust bearing cartridge (#14) with the threaded reverse thrust bearing cartridge.** Remove the ceramic bearing cartridge retaining screw (#5). Remove the drive magnet retaining plate mounting screws (#6). Pull the drive magnet retaining plate (#7) and drive magnet (#8) out of the propeller.

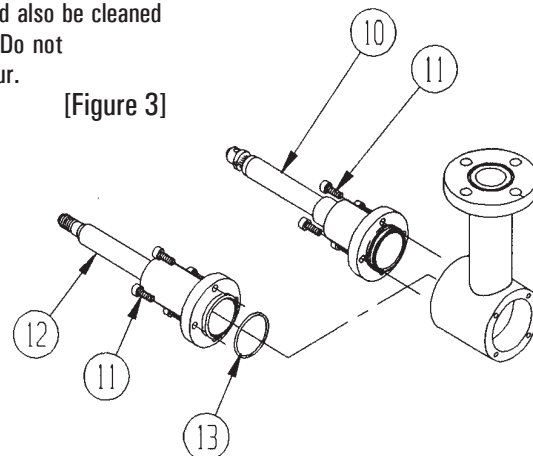


Loosen the nylon point set screw (#2) holding the thrust bearing cartridge (#3). If the thrust bearing cartridge was removed in the previous step, it must be reinstalled in the nose of the propeller at this time. Thread the thrust bearing cartridge (#3) into the propeller until it contacts the reverse thrust bearing cartridge (#14). Continue to thread the thrust bearing cartridge into the propeller until the ceramic thrust bearing cartridge and reverse thrust bearing cartridge are pushed out the back of the propeller.



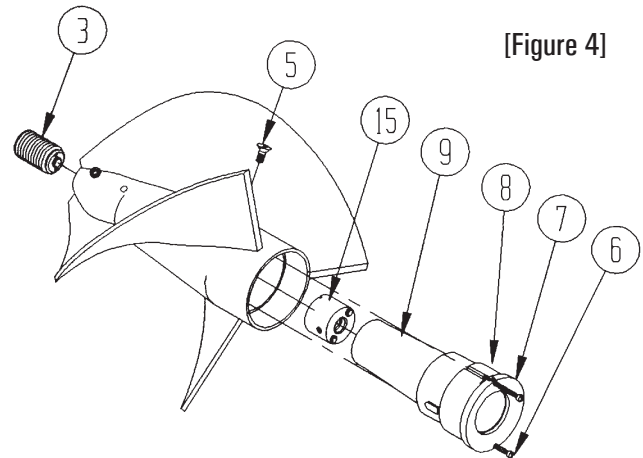
Ceramic bearing cartridge (#9) and drive magnet (#8) should be cleaned of any foreign material and inspected for damage. Using a bottle brush, thoroughly clean the inside of the ceramic bearing cartridge (#9) and the magnet inside diameter (#8). After cleaning the propeller, flush the inside out with water. The outside surfaces of the propeller should also be cleaned to assure a smooth, unrestricted flow across the surface of the propeller. Do not use an oil-based solvent in cleaning, as damage to the assembly could occur.

3. [fig. 3] **SEPARATOR & SPINDLE ASSEMBLY (#10) must be removed by removing the four mounting screws (#11) which thread into the gearbox/drop pipe. Separator o-ring (#13), included with the conversion kit, should be covered with a thin coat of silicone grease. The new one piece separator/support spindle assembly (#12) can then be installed in the front of the gearbox/drop pipe with a firm push, gently rotating the assembly at the same time. Replace and tighten the four separator mounting screws (#11).**



4. [fig. 4] **PROPELLER** must now be reassembled with the new threaded reverse thrust bearing cartridge. Remove the thrust bearing cartridge (#3)

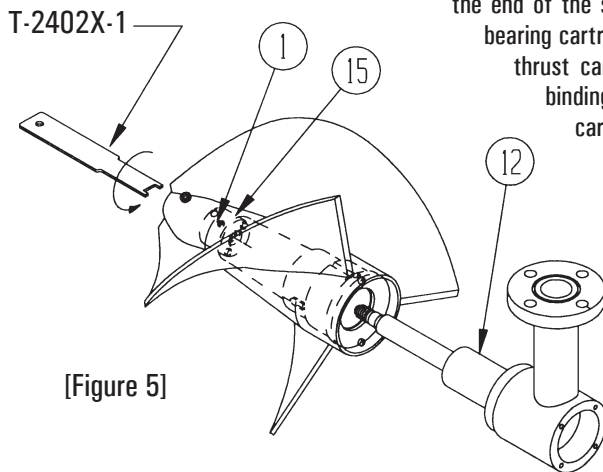
so that it does not interfere with assembly and installation of the propeller. Insert the threaded reverse thrust bearing cartridge (#15) into the propeller with the thrust bearings pointing toward the back of the propeller. Be sure the reverse thrust bearing cartridge slides all the way to the bottom of the propeller cavity. Insert the ceramic bearing cartridge into the propeller with the tab on the cartridge aligned with the slot inside the propeller cavity. The hole for the ceramic bearing cartridge retaining screw should line up with the hole in the side of the propeller. Press the cartridge into the propeller until it stops against the shoulder in the propeller. Now install the magnet and magnet retaining plate. Install and tighten the magnet retaining plate screws (#6) and the ceramic bearing cartridge retaining screw (#5) (do not overtighten).



[Figure 4]

PROPELLER ASSEMBLY installation is now required. This meter is now equipped with a one piece separator/ spindle and threaded reverse thrust bearing cartridge. The installation procedures are different than what you may have used in the past. Read these instructions on installation of propeller before proceeding. Note: A note should be made on your original service manual for this meter indicating that the meter is now equipped with a one piece separator/spindle and threaded reverse thrust bearing cartridge. You should have received a new service manual with the conversion kit. If you did not receive a new service manual, contact McCrometer for the proper manual.

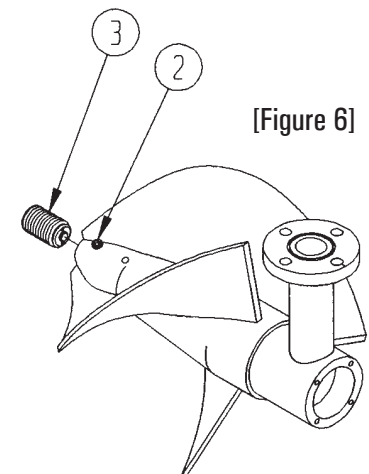
5. (fig. 5) **PROPELLER INSTALLATION** is accomplished by following these steps: a) The reverse thrust cartridge set screw (#1) should be protruding out of the reverse thrust bearing cartridge so it will not bind up on the spindle thread. **NOTE:** Look through the end of the propeller and hole in the reverse thrust cartridge to be sure the set screw is not showing. b) Slide the propeller assembly onto the support spindle (#12) until the reverse thrust bearing cartridge (#15) contacts the threads on the end of the spindle (#12). Using Tool T-2402X-1, thread the reverse thrust bearing cartridge onto the spindle. If you feel any resistance when threading the reverse thrust cartridge on, stop at once and check to be sure the set screw (#1) is not binding on the thread. Be careful not to cross-thread the reverse thrust bearing cartridge. Thread the reverse thrust bearing cartridge (#15) onto the spindle (#12) until the trailing edge of the propeller contacts the gearbox/drop pipe. Set the proper end play by inserting a 5/64" allen wrench into the reverse thrust bearing set screw (through the side of the propeller) and loosen the reverse thrust bearing cartridge (#15) one half turn counterclockwise. Tighten the set screw in reverse thrust bearing cartridge. There should be approximately .02" clearance between the gearbox/drop pipe and trailing edge of the propeller when the propeller is pulled forward (away from the gearbox/drop pipe). The propeller must not contact the gearbox/drop pipe.



[Figure 5]

6. (fig. 6) **THRUST BEARING CARTRIDGE ASSEMBLY (#3)** should be inspected for damage and replaced in the nose of the propeller. The thrust bearing cartridge (#3) is used to adjust the amount of longitudinal end play of the propeller assembly on its spindle (#12), which should be about 1/64 inch. End play can be adjusted by turning the thrust bearing cartridge assembly (#3) clockwise until it tightens against the end of the support spindle (#12), then turning thrust bearing cartridge (#3) counterclockwise 1/8 of a turn. Tighten set screw (#2). Check the longitudinal end play of the propeller to ensure it's not excessive and does not allow the propeller to contact the gearbox/drop pipe. Check the clearance between the propeller and gearbox/drop pipe. The clearance should be approximately .010" between the gearbox/drop pipe and trailing edge of the propeller when the propeller is pushed back (toward the gearbox/drop pipe). The propeller assembly must spin freely.

7. **PROPELLER BEARING** can be checked for excessive radial play by rocking the propeller gently from side to side on the spindle. Some play is required for proper operation of the water lubricated ceramic sleeve bearing.



[Figure 6]

ONE PIECE SEPARATOR/SPINDLE WITH THREADED REVERSE THRUST BEARING CARTRIDGE

PARTS LIST

NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	1-1101-8-5	SET SCREW, REVERSE THRUST BEARING CARTRIDGE
2	1	1-1125-6	SET SCREW, THRUST BEARING CARTRIDGE
3	1	3-2356	THRUST BEARING CARTRIDGE ASSEMBLY
4	1	-	SUPPORT SPINDLE
5	1	1-1116-8-6	SCREW, CERAMIC BEARING CARTRIDGE MOUNTING
6	2	1-1115-3-18	SCREW, DRIVE MAGNET RETAINING PLATE
7	1	1-2428-‡	DRIVE MAGNET RETAINING PLATE
8	1	1-1601-2	DRIVE MAGNET
9	1	4-2426-A	CERAMIC BEARING CARTRIDGE ASSEMBLY
10	1	-	SEPARATOR ASSEMBLY WITH SPINDLE (NON-THREADED)
11	4	1-1103-8-7	SCREW, SEPARATOR/SPINDLE MOUNTING
12	1	4-2455-2	SEPARATOR/SUPPORT SPINDLE ASSEMBLY (THREADED)
13	1	1-1551-24	O-RING, SEPARATOR
14	1	3-2402	REVERSE THRUST BEARING ASSEMBLY (NON-THREADED)
15	1	3-2402-2	REVERSE THRUST BEARING ASSEMBLY (THREADED)

‡ Consult factory for complete part number

NOTE: Please refer to your meter service manual for complete parts and price list information.

CONVERSION KIT SHOULD INCLUDE:

1. Service manual for meter with one piece separator/spindle
2. Conversion instructions
3. Separator and support spindle assembly, threaded (#4-2455-2), item 12
4. Reverse thrust bearing assembly, threaded (#3-2402-2), item 14
5. Bearing Tool #T-2402X-1
6. Separator o-ring (#1-1551-24), item 13