

MANN+HUMMEL FM600 Oil Cleaning Centrifuge Maintenance Procedure

Applicable for the FM600-21/22/23/24/25/26/39 series Centrifuge Range

For efficient and safe operation of the MANN+HUMMEL centrifuge it is essential that high standards of cleaning and maintenance are observed. Detailed below is the procedure for cleaning the MANN+HUMMEL FM600 centrifuge. This should be done after the first 100 hours of operation and then at regular intervals ensuring the thickness of the dirt deposit inside the rotor does not exceed 45mm.

Maintenance Procedure

1. Stop the flow of oil to the centrifuge by either stopping the engine or closing the centrifuge isolating valve (if fitted). Ensure the centrifuge has come to a complete stop before proceeding. *If the centrifuge is mounted on a remote mounting base (p.n. 6899911101), the compressed air supply needs to be isolated. The safety drain cock must then be opened to release air pressure from inside the assembly. This safety drain cock must be closed before the centrifuge is restarted.*
2. Remove the band clamp, unscrew the cover nut and remove the centrifuge cover assembly.
3. Allow the oil to drain out of the rotor assembly. This may be assisted by raising the rotor on the spindle. Withdraw the rotor assembly vertically upwards from the spindle. The rotor should be removed and replaced on the spindle with care in order to ensure that the rotor bearings are not damaged.
4. Unscrew the rotor cover nut on the rotor assembly, for this two 60mm sockets (3/4" drive) are required. A service tool is available (p.n. 6890691201) to aid disassembly. This is to be used in conjunction with the two 60mm (3/4" drive) sockets.
5. Carefully remove the rotor cover.
6. Carefully remove the rotor tube. This should ensure the majority of sludge remains within the rotor tube.
7. Remove the paper insert from the rotor tube and clean any remaining sludge by using a wooden spatula or other non-damaging tool.
8. Carefully remove the separation cone from the rotor.
9. Clean the rotor tube, separation cone, rotor body and other parts using a suitable cleaning liquid.
10. Check the rotor nozzles to ensure free passage of oil.
11. Examine the top and bottom bearings of the rotor for excessive wear.
12. Replace the separation cone, making sure that it is properly located on the rotor base. If the separation cone does not fit properly, ensure the location area is free from dirt and refit the separation cone. If the separation cone shows any sign of damage then it should be replaced.
13. Examine the rotor body o-rings for damage and renew if necessary (Kit No. 6899719601). A new seal should be fitted every 3000 hours or if the old seal is damaged.
14. Replace the rotor tube onto the rotor base ensuring the seal is positioned correctly.
15. Fit a new paper insert (6890302801) into the rotor body.
16. Replace the rotor top onto the rotor tube ensuring the seal is positioned correctly. Tighten the rotor nut to a torque of 40Nm (29.5 lbt). Incorrect torque may result in rotor imbalance.
17. Examine the spindle journals for damage or excessive wear.
18. *If a remote mounting base (p.n. 6899911101) is being used the control mechanism should be checked. This can be done by using a thin wire with a hook formed on one end to raise the float within the remote mounting base. If the air supply to the unit is turned on air should flow into the control mechanism. Airflow should stop when the float is lowered.*
19. Replace the rotor assembly onto the spindle, avoiding damage to the bearings as before. Make sure the rotor assembly rotates freely.
20. Clean and inspect the cover, paying special attention to the cover nut assembly. The seal should be replaced if it shows signs of leaking (Kit No. 6899719601).
21. Examine the centrifuge body seal and renew if damaged (Kit No. 6899719601).
22. Replace the cover assembly and tighten the cover nut securely by hand only. Make sure that the cover is properly located so that the seal is properly compressed. Refit the band clamp and tighten hand tight. The band clamp must be securely fitted during operation of the centrifuge.
23. With the engine running, check all connections and joints for leaks. If excessive vibration occurs disassemble and inspect.

Important Notes

All rotors are precision balanced before leaving the factory. An out of balance condition can occur as a result of an uneven build up of sludge on the rotor wall or if the internal components of the rotor are damaged, incorrectly assembled, or excessively worn. The centrifuge should not be used if excessive vibration continues to occur during normal operation. The maximum bearing clearances when new are 0.10mm in the top bearing and 0.13mm in the bottom bearing. If the top or bottom bearing clearance exceeds 0.3mm then either the bearing tube or preferably the whole rotor assembly should be replaced. Oil leaks should be cured as soon as they occur by replacing seals and other parts as necessary.

Maintenance Action

Every Oil Drain Interval:

- Clean Rotor Assembly / Replace Paper Insert (6890302801)
- Inspect Centrifuge Body O-Ring & Rotor Body O-Rings. Replace if damaged (Kit No. 6899719601)
- Check Cover Nut O-Ring for leaks and replace if necessary (Kit No. 6899719601).
- Inspect Rotor Bearings for wear and replace Bearing Tube Assembly if necessary.
- Inspect Spindle for wear and replace Centrifuge Body Assembly if necessary.

Engine Overhaul:

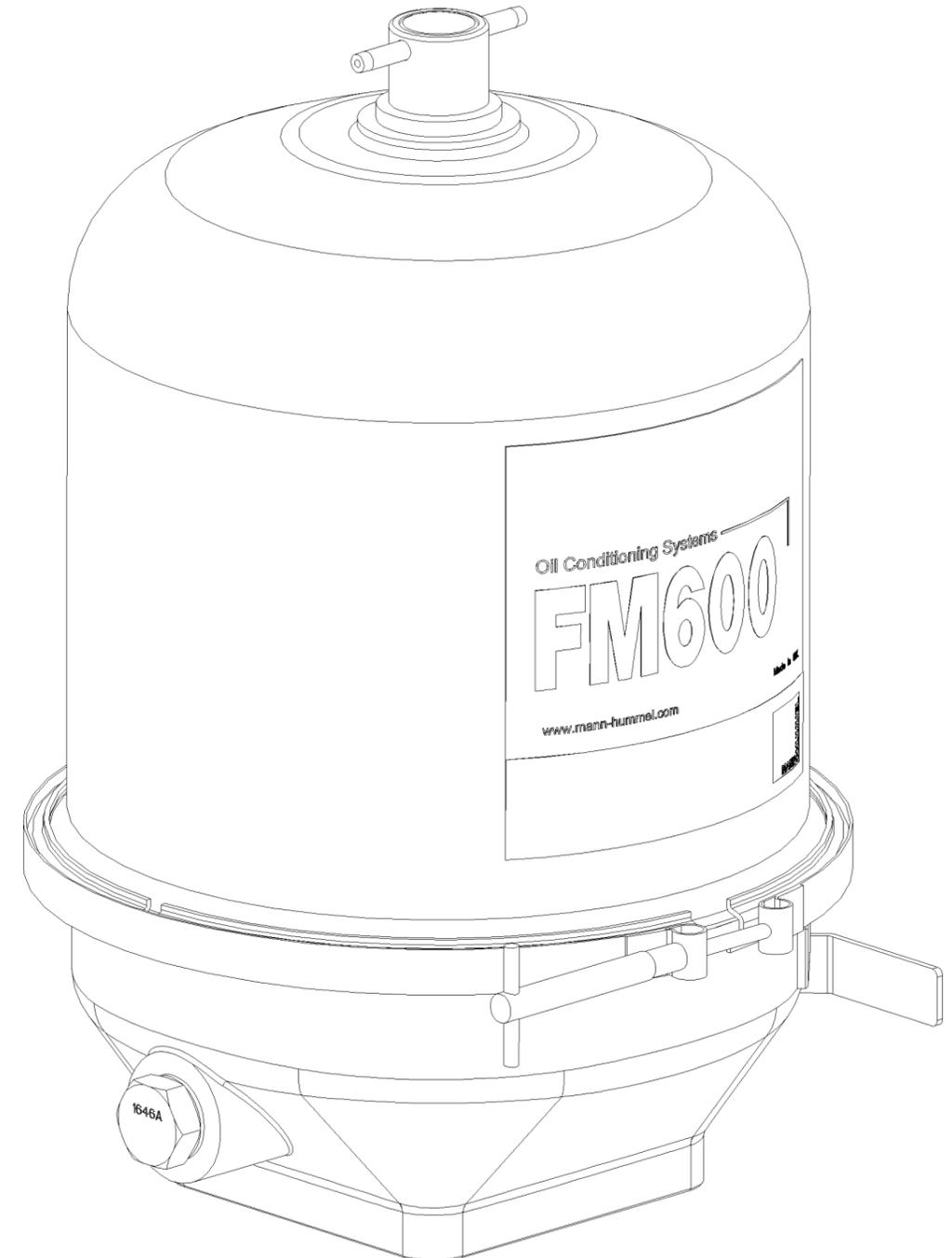
Replace Centrifuge

Please note that this should be used as a guide only. Maintenance intervals for the centrifuge are dependent on a number of factors and differ with engine type and operational environment.

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OIL CONDITIONING SYSTEMS SPARE PARTS LIST

MANN+HUMMEL



FM600 - 21/22/23/24/25/26/39 SERIES

Spare Parts List

| FM600 | PART No. | QTY | FM600-21 (6899118701) | FM600-22 (6899118801) | FM600-23 (6899118901) | FM600-24 (6899119001) | FM600-25 (6899119201) | FM600-26 (6899119301) | FM600-39 (6899123501) |
|----------------------------|----------|-----|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| CUT OFF VALVE RATING (BAR) | | | - | 3.5 | 2.5 | 2.5 | 2.5 | 2.5 | 3.5 |
| OIL INLET THREAD SPEC. | | | 3/4" BSP | 3/4" BSP | 3/4" BSP | 1 5/16" UNF | 3/4" NPT | M27x1.5 | 3/4" BSP |

| BODY ASSEMBLY | PART No. | QTY | FM600-21 (6899118701) | FM600-22 (6899118801) | FM600-23 (6899118901) | FM600-24 (6899119001) | FM600-25 (6899119201) | FM600-26 (6899119301) | FM600-39 (6899123501) |
|----------------------|------------|-----|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | 6899211001 | 1 | • | | | | | | |
| | 6899211101 | 1 | | • | | | | | • |
| | 6899211201 | 1 | | | • | | | | |
| | 6899211301 | 1 | | | | • | | | |
| | 6899211401 | 1 | | | | | • | | |
| | 6899211501 | 1 | | | | | | • | |

| ROTOR ASSEMBLY | PART No. | QTY | FM600-21 (6899118701) | FM600-22 (6899118801) | FM600-23 (6899118901) | FM600-24 (6899119001) | FM600-25 (6899119201) | FM600-26 (6899119301) | FM600-39 (6899123501) |
|--------------------------------|------------|-----|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | 6899415501 | 1 | • | • | • | • | • | • | |
| | 6899418901 | 1 | | | | | | | • |
| NOZZLE | 6890490301 | 2 | • | • | • | • | • | • | • |
| BEARING TUBE ASSEMBLY | 6899515301 | 1 | • | • | • | • | • | • | |
| BEARING TUBE ASSEMBLY | 6899516901 | 1 | | | | | | | • |
| SEPARATION CONE | 6893319301 | 1 | • | • | • | • | • | • | • |
| CIRCLIP | 6890120516 | 1 | • | • | • | • | • | • | • |
| PAPER INSERT (NOT ILLUSTRATED) | 6890302801 | 1 | • | • | • | • | • | • | • |
| ROTOR TOP | 6890464701 | 1 | • | • | • | • | • | • | • |
| ROTOR BASE | 6890445801 | 1 | • | • | • | • | • | • | • |
| ROTOR TUBE | 6890445101 | 1 | • | • | • | • | • | • | • |

| COVER ASSEMBLY | PART No. | QTY | FM600-21 (6899118701) | FM600-22 (6899118801) | FM600-23 (6899118901) | FM600-24 (6899119001) | FM600-25 (6899119201) | FM600-26 (6899119301) | FM600-39 (6899123501) |
|-----------------------|------------|-----|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | 6899036401 | 1 | • | • | • | • | • | • | • |
| COVER SUB-ASSEMBLY | 6899061901 | 1 | • | • | • | • | • | • | • |

| BAND CLAMP | PART No. | QTY | FM600-21 (6899118701) | FM600-22 (6899118801) | FM600-23 (6899118901) | FM600-24 (6899119001) | FM600-25 (6899119201) | FM600-26 (6899119301) | FM600-39 (6899123501) |
|-------------------|------------|-----|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | 6890335201 | 1 | • | • | • | • | • | • | • |

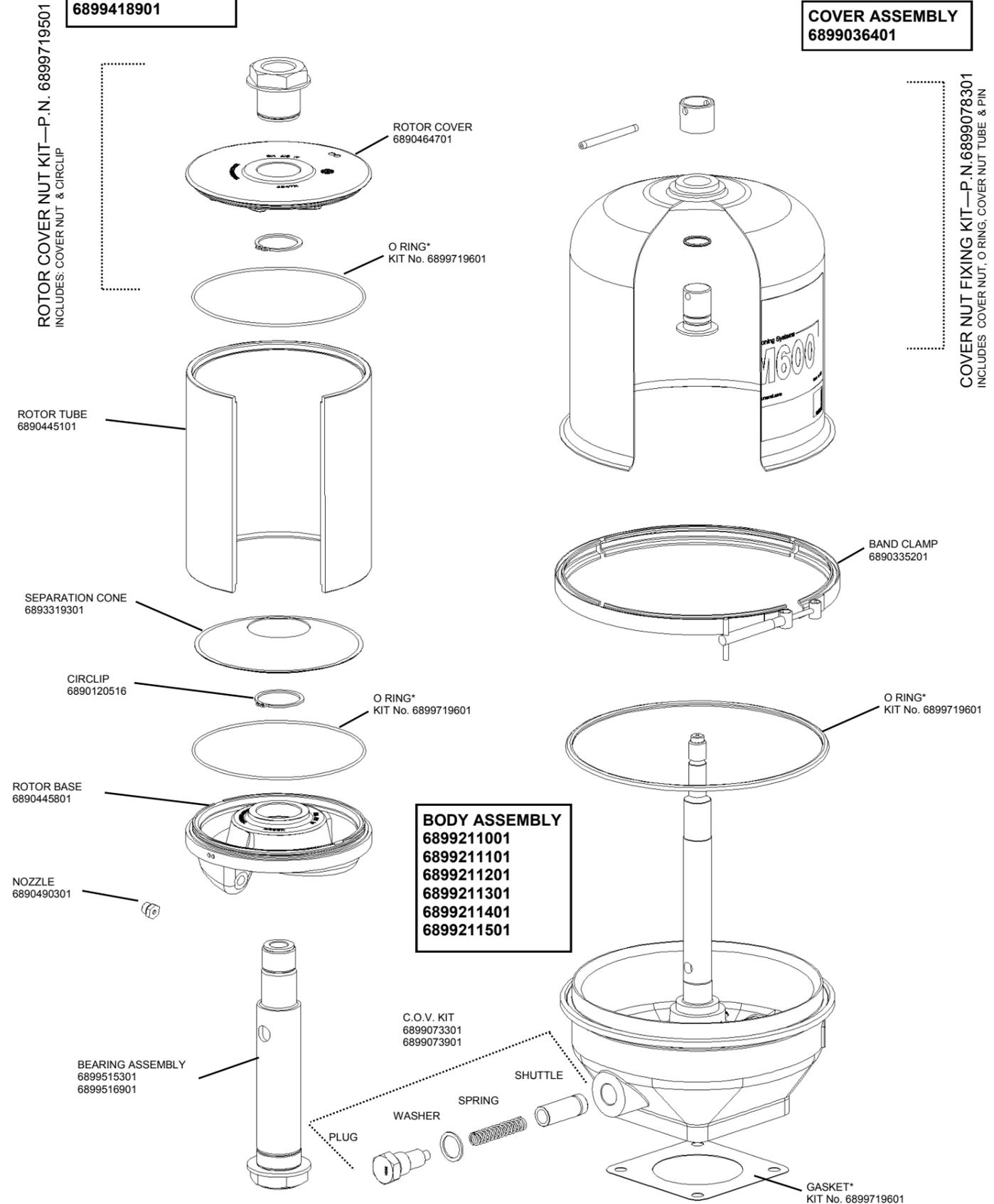
| FM600 KITS | PART No. | QTY | FM600-21 (6899118701) | FM600-22 (6899118801) | FM600-23 (6899118901) | FM600-24 (6899119001) | FM600-25 (6899119201) | FM600-26 (6899119301) | FM600-39 (6899123501) |
|----------------------|------------|-----|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| CUT OFF VALVE KIT | 6899073301 | 1 | | • | | | | | • |
| CUT OFF VALVE KIT | 6899073901 | 1 | | | • | • | • | • | |
| COVER NUT FIXING KIT | 6899078301 | 1 | • | • | • | • | • | • | • |
| ROTOR COVER NUT KIT | 6899719501 | 1 | • | • | • | • | • | • | • |
| SEALS KIT | 6899719601 | 1 | • | • | • | • | • | • | • |

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ROTOR ASSEMBLY
 6899415501
 6899418901

COVER ASSEMBLY
 6899036401



*SEALS KIT P.N. 6899719601 COMPRISES OF: C.O.V. WASHER, FILTER BODY O RING, CVR NUT O RING, 2 x RTR BODY O RINGS & BASE GASKET

Patent Pending Worldwide
 European Patent: EP 1009 537