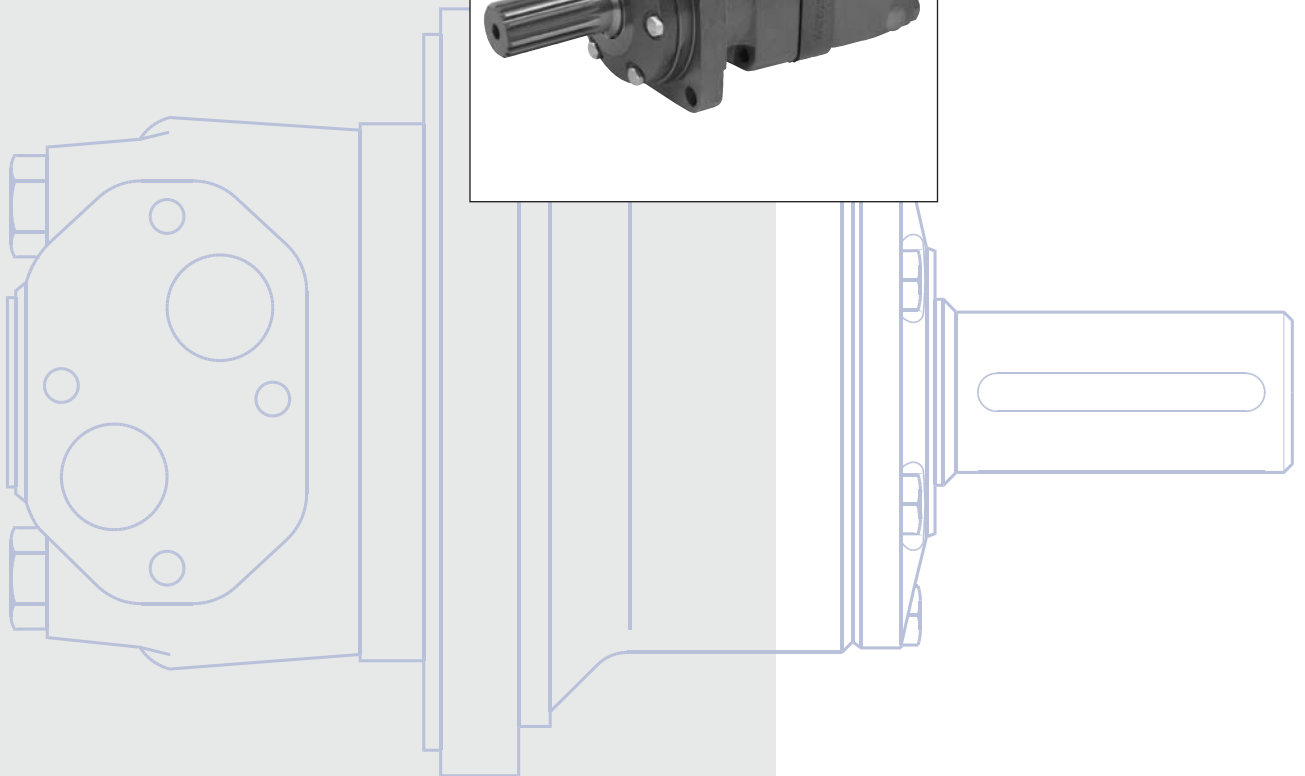
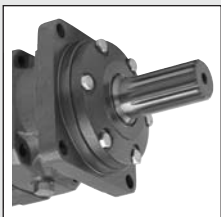




OMT Series 2

Orbital Motors

Service Manual



Revision History

Table of Revisions

| Date | Page | Changed | Rev |
|-----------|------|-------------------------------------|-----|
| Sept 2003 | | | CA |
| Feb 2010 | 4-5 | Drain plug updated, Layout adjusted | CB |
| Sep 2010 | 16 | New back cover | CC |

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Frontpage: F300 215. Drawing 151-1976.fa

Special Versions

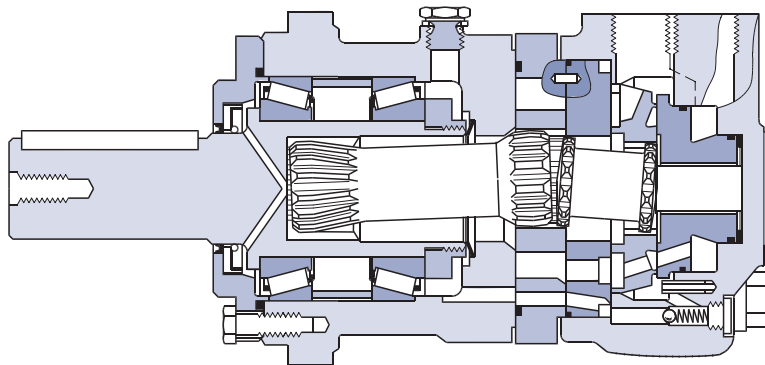
The list of spare parts cannot be used when ordering parts for special OMT versions. In this respect, please contact the sales organisation for Sauer-Danfoss.

Comments

- a) Only OMT series 2:
After week 41.97 the guide pin has a new location. When repairing motors manufacturing before week 41.97 it will therefore be necessary to replace end cover, balance plate, tightening pin and spring washer.

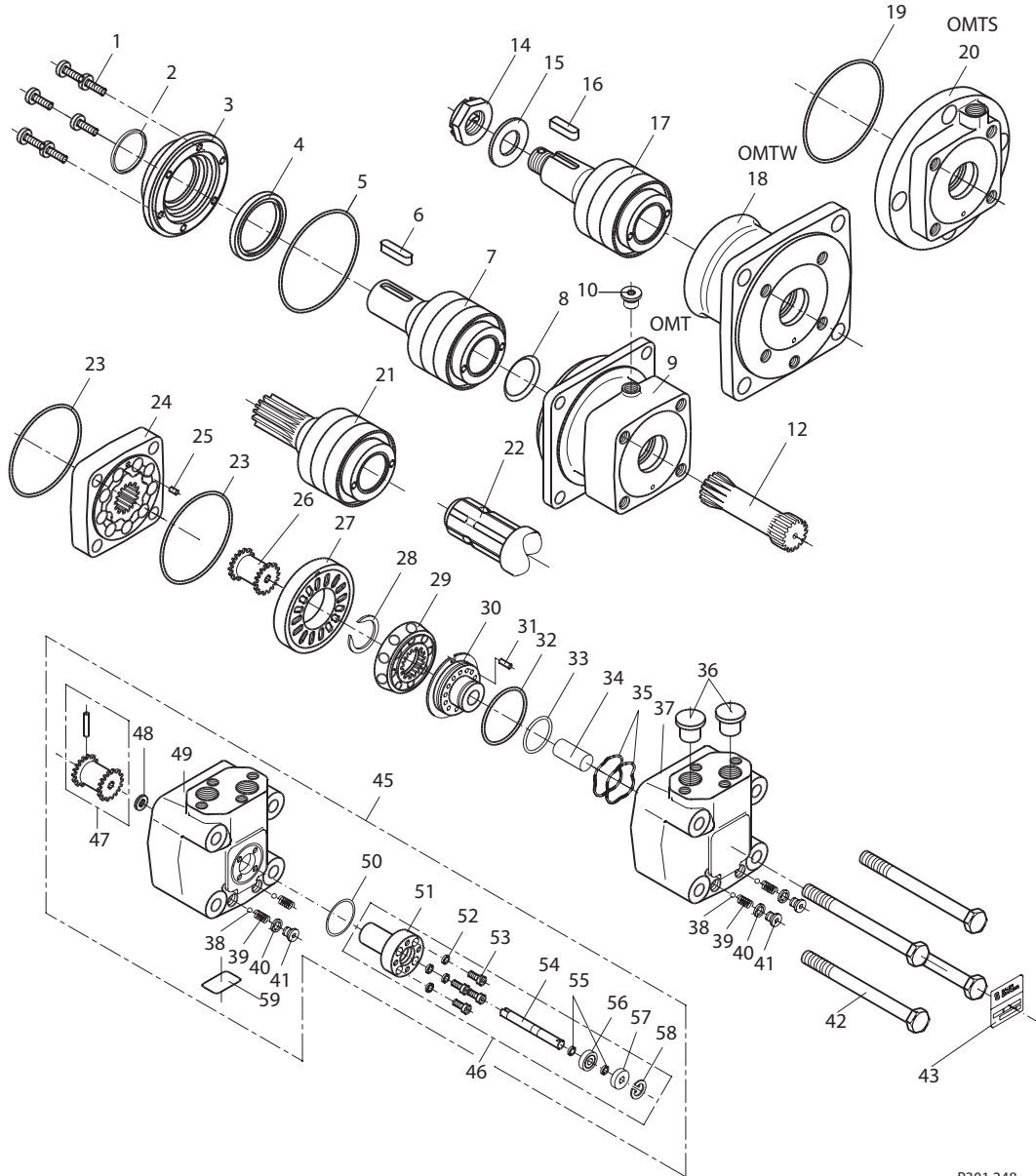
Modification by Change of Series

From OMT series 2 to series 2.1:
New shaft bearings introduced.
Shaft incl. bearings, bearing housing and front cover modified accordingly.


OMT Series 2

151-1776.10

**Exploded View OMT
Series 2**



P301 248

Tightening torque: 

- Item 1: 22 - 26 N·m [194 - 230 lbf·in]
- Item 10: 30 - 60 N·m [265 - 531 lbf·in]
- Item 41: 10 - 15 N·m [88 - 132 lbf·in]
- Item 42: 135 - 145 N·m [1195 - 1283 lbf·in]
- Item 53: 4 - 6 N·m [35 - 53 lbf·in]

Spare Parts List

| Item | Spare parts | Number per motor | |
|------|--|------------------|---|
| | | Code No. | |
| 1 | Screw M8; l = 25 mm [0.98 in] | 681X0287 | 6 |
| 2 | Dust seal ring 45 • 52 • 4 mm [1.77 • 2.05 • 0.16 in] | 633B3202 | 1 |
| 3 | Front cover OMT series 2.1 OMT series 2 | 151B1490 | 1 |
| | | 151B1506 | 1 |
| 4 | Shaft seal 45 • 65 • 7 mm [1.77 • 2.16 • 0.27 in] NBR 45 • 65 • 7 mm [1.77 • 2.16 • 0.27 in] FPM | 633B3201 | 1 |
| | | 633B3199 | 1 |
| 5 | O-ring 90 • 2 mm [3.54 • 0.08 in] | 633B1301 | 1 |
| 6 | Parallel key Metric: 12 • 8 • 70 mm SAE: 3/8 • 3/8 • 2 1/4 in, BS 46 | 682L8014 | 1 |
| | | 682L8045 | |
| 7 | Cylindrical shaft Metric: Ø40 mm OMT/OMTW incl. bearings and parallel key series 2.1 Ø40 mm OMT/OMTW incl. bearings and parallel key series 2 SAE: Ø1 1/2 in OMT/OMTW incl. bearings and parallel key series 2.1 Ø1 1/2 in OMT/OMTW incl. bearings and parallel key series 2 | 151B0177 | 1 |
| | | 151B0101 | 1 |
| | | 151B0182 | 1 |
| | | 151B0145 | 1 |
| 8 | Conical seal ring | 633B9022 | 1 |
| 9 | Bearing housing Metric: OMT series 2.1 OMT series 2 SAE: OMT series 2.1 OMT series 2 | 151B1960 | 1 |
| | | 151B1500 | 1 |
| | | 151B1961 | 1 |
| | | 151B1626 | 1 |
| 10 | Drain plug Metric: 1/4 BSPF steel, incl O-ring SAE: 9/16 - 18 UNF, incl O-ring | 631X9926 | 1 |
| | | 631X9925 | 1 |
| 12 | Cardan shaft OMT/OMTW/OMTS 160 l = 104 mm [4.09 in] OMT/OMTW/OMTS 200 l = 108 mm [4.25 in] OMT/OMTW/OMTS 250 l = 114 mm [4.48 in] OMT/OMTW/OMTS 315 l = 124 mm [4.88 in] OMT/OMTW/OMTS 400 l = 134.5 mm [5.30 in] OMT/OMTW/OMTS 500 l = 148.5 mm [5.85 in] | 151B1346 | 1 |
| | | 151B1347 | 1 |
| | | 151B1348 | 1 |
| | | 151B1655 | 1 |
| | | 151B1657 | 1 |
| | | 151B1537 | 1 |
| 14 | Castellated nut Metric: M 30 • 2 mm SAE: 1 1/4 - 18 UNEF | 681X8204 | 1 |
| | | 681X8290 | 1 |
| 15 | Washer, metric version only 31 • 56 • 4 mm [1.22 • 2.20 • 1.56 in] | 684X2532 | 1 |
| 16 | Parallel key Metric: 12 • 8 • 28 mm SAE: 7/16 • 7/16 • 11/4 in, BS 46 | 682L8017 | 1 |
| | | 682L8046 | 1 |
| 17 | Tapered shaft Metric: Ø45 mm OMT/OMTW series 2.1 incl. bearings and item 14, 15, 16 series 2 SAE: Ø1 3/4 in OMT/OMTW series 2.1 incl. bearings and items 14, 16 series 2 | 151B0178 | 1 |
| | | 151B0108 | |
| | | 151B0181 | 1 |
| | | 151B0140 | |
| 18 | Bearing housing Metric: OMTW series 2.1 OMTW series 2 SAE: OMTW series 2.1 OMTW series 2 | 151B1955 | 1 |
| | | 151B1502 | 1 |
| | | 151B1956 | 1 |
| | | 151B1628 | 1 |
| 19 | O-ring OMTS 125 • 3 mm [4.92 • 0.12 in] NBR | 633B1484 | 1 |
| 20 | Mounting flange OMTS Metric: SAE: | 151B1504 | 1 |
| | | 151B1629 | 1 |

Spare Parts List

| Item | Spare parts | | Number per motor | | |
|------|-------------------------------------|---|-------------------------------------|----------|---|
| | | | Code No. | | |
| 21 | Splined shaft | Metric: | Ø38.1 mm incl. bearings series 2.1 | 151B0179 | 1 |
| | | | Ø38.1 mm incl. bearings series 2 | 151B0110 | 1 |
| | | SAE: | Ø1 1/2 in incl. bearings series 2.1 | 151B0183 | 1 |
| | | | Ø1 1/2 in incl. bearings series 2 | 151B0149 | 1 |
| 22 | Pt.o. shaft | Metric: | incl. bearings series 2.1 | 151B0180 | 1 |
| | | SAE: | incl. bearings series 2 | 151B0128 | 1 |
| 23 | O-ring | 96 • 3 mm [3.77 • 0.12 in] NBR | | 633B1366 | 2 |
| 24 | Gearwheel set | OMT/OMTW/OMTS 160 | W = 20 mm [0.79 in] | 151B1033 | 1 |
| | | OMT/OMTW/OMTS 200 | W = 25 mm [0.10 in] | 151B1034 | 1 |
| | | OMT/OMTW/OMTS 250 | W = 31 mm [1.22 in] | 151B1035 | 1 |
| | | OMT/OMTW/OMTS 315 | W = 40 mm [1.57 in] | 151B1087 | 1 |
| | | OMT/OMTW/OMTS 400 | W = 51 mm [2.00 in] | 151B1088 | 1 |
| | | OMT/OMTW/OMTS 500 | W = 65 mm [2.56 in] | 151B1062 | 1 |
| 25 | Guide pin | Ø4, l = 10 mm [0.39 in] | | 682L2006 | 1 |
| 26 | Valve drive | | | 151B1309 | 1 |
| 27 | Channel plate | | | 151B1043 | 1 |
| 28 | Stop ring for OMTS 315, 400 and 500 | | | 151B1539 | 1 |
| 29 | Disc valve | | | 151B1072 | 1 |
| 30 | Balance plate | a) | | 151B1483 | 1 |
| 31 | Guide pin | Ø5, l = 14 mm [0.55 in] a) | | 682L9105 | 1 |
| 32 | O-ring | 63 • 2 mm, NBR [2.48 • 0.08 in] | | 633B1365 | 1 |
| | | 60 • 2 mm, FPM [2.36 • 0.08 in] | | 633B1394 | 1 |
| 33 | O-ring | 40 • 2 mm, NBR [1.57 • 0.08 in] | | 633B1378 | 1 |
| | | 40 • 2 mm, FPM [1.57 • 0.08 in] | | 633B1454 | 1 |
| 34 | Spacer | | | 151B1311 | 1 |
| 35 | Spring washer | 33 • 39.1 • 0.5 mm [1.30 • 1.54 • 0.02 in] a) | | 684X0087 | 2 |
| 36 | Seal plug (plastic) | Metric: | | 633X0071 | 2 |
| | | SAE: | | 633X7027 | 2 |
| 37 | Valve housing | Metric a) | | 151B1660 | 1 |
| | | SAE a) | | 151B1715 | 1 |
| 38 | Ball | Ø1/4 in | | 689X1015 | 2 |
| 39 | Spring | | | 013-0662 | 2 |
| 40 | Washer | 13.9 • 10.2 • 1 mm [0.54 • 0.40 • 0.04 in] | | 684X2564 | 2 |
| 41 | Plug | 1/8 BSPF | | 631X2053 | 2 |
| 42 | Screw M14 | OMT/OMTW/OMTS 160/200 | l = 120 mm [4.72 in] | 681X1118 | 4 |
| | | OMT/OMTW/OMTS 250 | l = 130 mm [5.12 in] | 681X1120 | 4 |
| | | OMT/OMTW/OMTS 315 | l = 140 mm [5.51 in] | 681X1123 | 4 |
| | | OMT/OMTW/OMTS 400 | l = 150 mm [5.90 in] | 681X1127 | 4 |
| | | OMT/OMTW/OMTS 500 | l = 160 mm [6.30 in] | 681X1411 | 4 |
| 43 | Name plate (aluminium) | OMT/OMTW/OMTS | | 151A0407 | 1 |
| | Name plate (brass) | | | 151A0408 | 1 |
| 45 | Valve housing | with tacho connection and valve drive, metric version only a) | | 151B0132 | 1 |

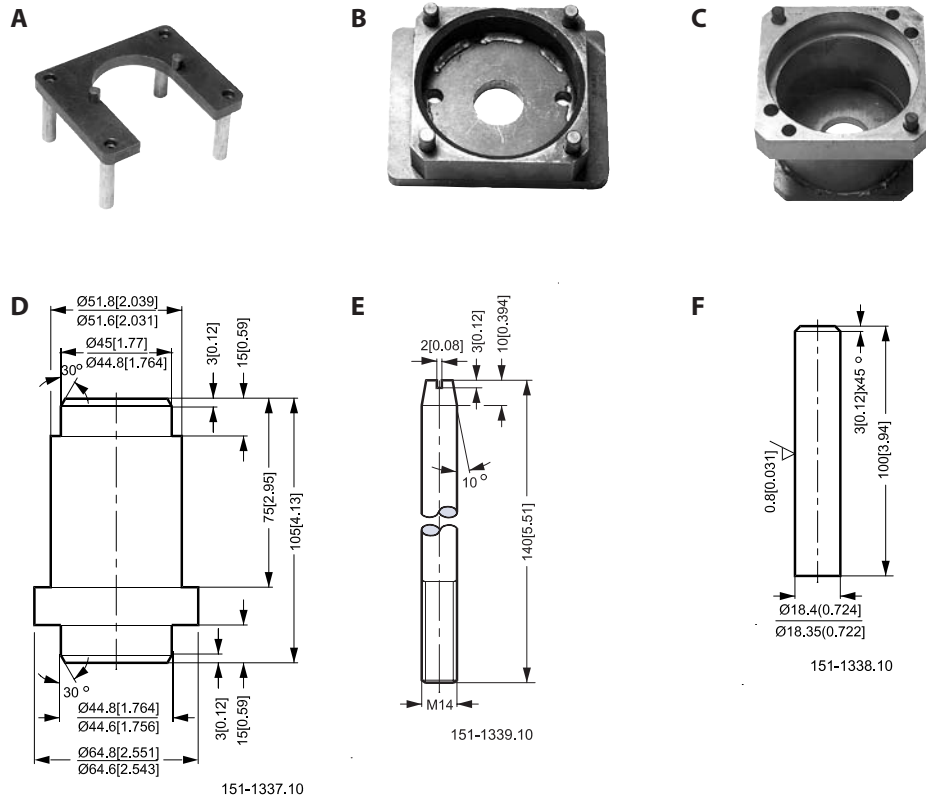
Spare Parts List

| Item | Spare parts | Number per motor | |
|------|--|------------------|---|
| | | Code No. | |
| 46 | Tacho connection | 151B1029 | 1 |
| 47 | Valve drive incl. guide pin | 151B1030 | 1 |
| 48 | Spacer ring | 151B1450 | 1 |
| 49 | Tacho valve housing a) | 151B1662 | 1 |
| 50 | O-ring 40 • 2 mm, NBR [1.57 • 0.08 in] | 633B1378 | 1 |
| 51 | Tacho bearing housing a) | 151B1442 | 1 |
| 52 | Washer 5.6 • 8.5 • 1 mm [0.22 • 0.33 • 0.04 in] | 684X2012 | 4 |
| 53 | Screw M5 l = 15 mm [0.59 in] | 681X1880 | 4 |
| 54 | Tacho drive shaft | 151B1443 | 1 |
| 55 | Retaining ring 6.0 • 0.7 DIN 6799 | 682L4922 | 2 |
| 56 | Bearing 8 • 22 • 7 mm [0.31 • 0.87 • 0.27 in] | 981X1020 | 1 |
| 57 | Shaft seal 8 • 22 • 6.5 mm [0.31 • 0.87 • 0.25 in] | 633B3175 | 1 |
| 58 | Retaining ring 22 • 1 DIN 472 | 682L4008 | 1 |
| 59 | Name plate (aluminium) for OMT/OMTW/OMTS with tacho connection | 151A0409 | 1 |
| A | Set of seals NBR OMT, OTMW item 2, 4, 5, 8, 23, 32 and 33 | 151B0113 | 1 |
| B | Set of seals FPM OMT, OTMW, OMTS item 4, 32 and 33 | 151B0115 | 1 |
| C | Set of seals NBR OMTS item 8, 19, 23, 32 and 33 | 151B0114 | 1 |
| D | Kit set NBR OMTS item 8 and 19 | 151B1040 | 1 |

NBR: (Buna N, Perbunan), FPM (Viton)

* Contained in spare parts bag A, B, C or D


Special Tools



- A: Main holding tool.
Code number: SJ 151-9000-1
- B: Holding tool for OMT and OMTS.
Code number: SJ 151B9000-1
- C: Holding tool for OMTW.
Code number: SJ 151B9000-2
- D: Mandrel and backstop for fitting shaft seal.
Code number: SJ 151B9000-13
- E: Two guide bolts
- F: Mandrel to remove balance plate

The tools cannot be bought from Sauer-Danfoss

Dismantling

| Item | Part to remove | Comments |
|---------------------|--|--|
| 6 or 16 | Parallel key | Cylindrical or tapered shafts |
| 8 * | Conical seal ring | |
| 10, 11 | Drain plug and washer | |
| 36 | Seal plugs (2 off) | Place the motor in holding tool |
| 41 | Plugs (2 off) Series 2 only | Use  5 mm Allan head spanner |
| 40 | Washer (2 off) | Tilt motor, springs and balls come out |
| 39 | Springs (2 off) | |
| 38 | Ball (2 off) | Use 22 mm socket spanner |
| 42 | Screw (4 off) | |
| 37 | Valve housing | Lift off carefully as a unit, holding your fingers under the channel plate (Item no. 27) |
| 23 | O-ring | |
| 27 | Channel plate | |
| 28 | Stop ring Only on OMTS 315, 400 an 500 | |
| 29 | Disc valve | |
| 34 | Spacer | |
| 30 | Balance plate | Fill in oil into the spacer hole and use the $\varnothing 18.4$ mm [0.72 in] mandrel as a piston to press up the balance plate |
| 31 | Guide pin | |
| 32 | O-ring | |
| 33 | O-ring | |
| 35 | Spring washer (2 off) | |
| 26 | Valve drive | |
| 25 | Guide pin | |
| 24 | Gearwheel set | Hold fingers under the gearwheel set to prevent the parts from dropping out |
| 23 | O-ring | |
| 12 | Cardan shaft | |
| 8 | Conical seal ring | Not on OMTS, is already removed |
| 1 **) | Screw (6 off) | Unscrew with 13 mm socket spanner |
| 3 **) | Front cover | |
| 5 **) | O-ring | |
| 2 **) | Dust seal ring | Item no. 2 and 4 to be knocked out by means of the special mandrel ("D" on page 8) |
| 4 **) | Shaft seal | |
| 7, 17 **) 21, 22 | Shaft incl. bearings | Press out the shaft/bearing assembly using a hydraulic press (pressing force max. 2500 N) <u>Shaft/bearing assembly should not be dismantled!</u> |

* OMTS only


**) OMTS except

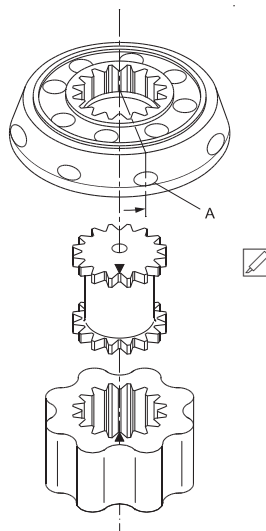
**Dismantling of
Tacho Connection**

| Item | Part to remove | Comments |
|------|------------------------|---|
| 53 | Screw (4 off) | |
| 46 | Tacho connection | Remove from tacho valve housing |
| 50 | O-ring | |
| 48 | Spacer ring | |
| 58 | Retaining ring | Loosen tacho shaft package (by tapping lightly a the end of the shaft) and extract the package from tacho housing |
| 57 | Shaft seal | |
| 55 | Retaining ring (2 off) | |
| 56 | Bearing | |

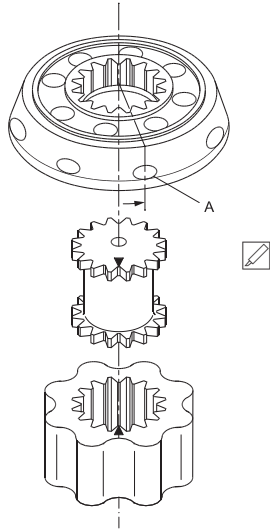



After dismantling, clean all parts in low aromatic kerosene.
Examine the parts and exchange them if necessary.
Immediately before assembly, lubricate each part with hydraulic oil and grease rubber parts with vaseline

Assembling

| Item | Part to remove | Comments |
|-----------------------|----------------------|---|
| 8 *) | Conical seal ring | Fit into recess in bearing housing, placed in the holding tool |
| 7, 17 **) 21 or 22 | Shaft incl. bearings | <p>Check the depth of the bore for the bearings at the bearing housing.</p> <p>OMT series 2.1: 59.5 mm [2.34 in] OMT series 2: 60.5 mm [2.38 in]</p> <p>Width of the bearing package outer rings.</p> <p>OMT series 2.1: 56 mm [2.20 in] OMT series 2: 58 mm [2.28 in]</p> <p>Use the hydraulic press. (max. 2500 N [550 lbf])</p> <hr/> <p>Always press on the bearing outer ring.</p> |
| 4 **) | Shaft seal | Knock into position in the front cover, using the assembly mandrel. Grease with vaseline |
| 2 **) | Dust seal ring | Use assembly mandrel, plastic hammer and support (to prevent the shaft seal from being knocked out). Grease with vaseline |
| 5 **) | O-ring | Grease with vaseline |
| 3 **) | Cover | Height of the bearing support: OMT series 2.1: 3.5 mm [1.14 in] OMT series 2: 2.5 mm [0.10 in] |
| 1 **) | Screw (6 off) | Use a 13 mm socket spanner. Tighten to  22 - 26 N.m [195 - 230 lbf.in]. Turn the motor upside down. Fill up splines area in the shaft with oil. Mount 2 off guide bolts |
| 12 | Cardan shaft | If visible difference in splines length: Longest splines to be mounted in the output shaft |
| 23 | O-ring | Grease with vaseline |
| 24 | Gearwheel set | <p>Hold fingers under the gearwheel set to prevent parts falling out. Hole 6 mm [0.24 in] to be aligned with hole in the bearing housing.</p> <p>Mark the wheel of the gearwheel set at the point where the tip of a spline tooth is opposite the bottom of a tooth in the external rotor teeth (see drawing).</p> |



Assembling

| Item | Part to remove | Comments |
|---------|--|--|
| 26 | Valve drive  | Mark the bottom of a spline tooth on the valve drive. Line up the mark on rotor and valve drive. Applies to motors with tacho connection: Pin on valve drive must point upwards |
| 23 | O-ring | Grease with vaseline. Mount in channel plate groove |
| 25 | Guide pin | |
| 27 | Channel plate | |
| 29 | Disc valve | Align mark on valve drive with a hole in the outer rim. (A on drawing). Turn disc valve counter clockwise until splines in the two parts engage |
| 35 | Spring washer (2 off) | Place into valve housing. |
| 32, 33 | O-ring | Fit the two O-rings (greased with vaseline) in the balance plate grooves |
| 31 | Guide pin | |
| 30 | Balance plate | Mount in valve housing. |
| 34 | Spacer | Grease with vaseline to prevent the spacer from dropping out |
| 37 | Valve housing | Mount unit on the rest of the motor. Ports should face in the same direction as the drain port |
| 42 | Screw (4 off) | Lubricate threads and cross tighten screws to  135 - 145 N·m [1195 - 1283 lbf·in] |
| 38 | Ball (2 off) | |
| 39 | Spring (2 off) | |
| 40 | Washer (2 off) | |
| 41 | Plug (2 off) | Tighten to  10 - 15 N·m [90 - 130 lbf·in] |
| 6 or 16 | Parallel key | Secure with plastic ring or tape |
| 10, 11 | Drain plug and washer | Fill motor with oil before plugging. Tighten to  30 - 60 N·m [270 - 530 lbf·in] |
| 8 *) | Conical seal ring | Grease with vaseline to keep in place |
| 36 | Seal plug (2 off) | |

*) OMTS only

**Assembling of Tacho
Connection**

The tacho connection must be reassembled in reverse order in relation to the procedure described under "disassembling the tache connection".
4 screws (pos. 53) to be tightened to 4 - 6 N·m [35.5 - 53 lbf·in].



OMT Series 2 Orbital Motor
Service Manual
Notes

Notes



OMT Series 2 Orbital Motor
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Notes

Notes



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