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## Notes

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General

The following repair instructions are intended to assist in inspections and repairs to be carried out. When ordering in going parts to your motor, please use the catalogue that was delivered with the roller. Also inform us of the machines S/N and the P/N and S/N for the motor. That will allow us to use our special knowledge and guarantee that the correct parts are delivered. Prerequisite is that this work is carried out only by qualified personnel.

These units are manufactured with great care and with adherence to defined tolerances to the highest manufacturing accuracy, and therefore the following points must be given particular attention:

Dismantling

1. When dismantling the unit from the machine, immediately close openings with plugs to prevent ingress of dirt.

2. Make note of the details on code plate, such as serial number, type number and running time of unit (for ordering spare parts).

3. Remove external dirt (cleaning spirit or trichlor solution).

4. Have a clean workplace ready, lay out tools ready.

5. Use only non-threading cleaning rags.

6. Before dismantling components, mark parts to ensure correct re-assembly.

7. Carry out step by step dismantling.

8. The appearance of the parts removed often gives an indication of the condition of the system. For example:

   Scored sliding surfaces, heavy abrasion - contaminated operating fluid

   Discoloration of components with heavy loading - overheating of operating fluid, incorrect choice of viscosity or inadequate specifications of operating fluid - insufficient oil
Reassembling

1. Use only genuine spare parts. We recommend the use of pre-assembled, coordinated and tested component groups. The required component groups and seal kits should be selected from the spare parts catalogue and ordered by quoting the code plate details.

2. Assembly should be carried out observing the maximum cleanliness.

3. Assembly is carried out in reverse order to dismantling unless otherwise stated, e.g. bearings in front housing to be pre-loaded.

4. Fundamentally do not reuse old seals.

5. Oil components before assembly (hydraulic mineral oil).

6. Tighten screws with torque wrench according to specifications. If there is any suspicion of stripping of threads, use new screws.

7. When carrying out dismantling/reassembly instructions refer to the appropriate drawings.

Important

On completion of repair, close all openings with plugs. Should difficulties arise, please contact our nearest service centre.
1. **Brake Dismantling**

1. Drain oil from the motor housing.

2. Remove (12 off) hex head screws, item 62.

3. The brake actuating mechanism assembly, items 50, 52 and 66, can now be removed.

4. Remove (8 off) cap screws item 63.

5. The brake housing, item 48, brake discs, items 54 and 55, brake pad, item 51, and brake shaft, item 49, can now be removed.

6. Check thrust washer, item 67, for wear. If required, remove washer by first removing bush, item 68, using the tip of a screwdriver. Items 67 and 68 should then be discarded.
DIMENSION 'S' TO BE MEASURED WITH A LOAD OF 2 kN ON ITEM 50

TORQUE TO 9-10.5 Nm

ENSURE CONTACT SURFACES ARE COATED WITH S1 GREASE

SHIM AS REQUIRED FOR DIMENSION 'S'
SHIM TO BE PLACED AGAINST REAR CASE AS SHOWN

0.8 MIN AFTER SETTING DIM 'S'

ASSEMBLE USING LOCTITE 221

ASSEMBLE USING LOCTITE 243
TORQUE TO 70-77 Nm

PRESS FIT ITEM 68 FLUSH INTO BORE AFTER FITTING ITEM 67 IN SHAFT AS SHOWN
2. **Motor Dismantling**

1. Drain oil from the motor housing.

2. Mark the relative positions of the front housing, rear housing and rotating group.

3. Remove (6 off) cap screws, item 33.

4. The rear casing assembly, items 21 - 28 and rotating group, items 15 - 17 and 20 can now be removed.
DIMENSION 'S' TO BE MEASURED WITH A LOAD OF 2 kN ON ITEM 50

TORQUE TO 9-10,5 Nm

ENSURE CONTACT SURFACES ARE COATED WITH S1 GREASE

0,8 MIN AFTER SETTING DIM 'S'

ASSEMBLE USING LOCTITE 221

LOCATE 13th OUTER PLATE HERE

ASSEMBLE USING LOCTITE 243
TORQUE TO 70-77 Nm

PRESS FIT ITEM 68 FLUSH INTO SHAFT BORE AFTER FITTING ITEM 67 IN SHAFT

ASSEMBLE USING LOCTITE 270
TORQUE TO 117-122 Nm

MEASURE GAP BETWEEN BEARING AND SPLIT RING UNDER PRELOAD

FILL SPACE BETWEEN LIPS WITH G3 GREASE

PACK BEARING WITH G3 GREASE

SMEAR SEAL LIP WITH G3 GREASE
3. **Front Housing Dismantling**

1. Remove split ring, item 4, using a soft steel drive to separate, and remove washer, item 3.

2. Support front housing on blocks and press shaft, item 1, out of bearings.

3. Remove face seal, item 10, from shaft. This seal should be discarded.

4. Complete the dismantling of the front housing by removing the bearing cups for items 6 and 7, and the seal, item 11, from the front housing, item 2.
MEASURE GAP BETWEEN BEARING AND SPLIT RING UNDER PRELOAD
FIT CORRECT SIZE WASHER

FILL SPACE BETWEEN LIPS WITH G3 GREASE
PACK BEARING WITH G3 GREASE
SMEAR SEAL LIP WITH G3 GREASE
4. Rear Housing Dismantling

1. Remove distributor block, item 22, from housing by softly tapping a suitable steel drift with a mallet, through the rear housing, on to the stop pin, item 23, being careful not to scratch or damage the valve face.

2. Remove and discard the seal rings, items 26, 27 and 28 and O-rings, item 32, (can be seen on page 9) using the tip of a small screwdriver.
5. **Rotating Group Dismantling**

1. Each piston assembly, items 16 and 17, can be removed under gravity or by low air pressure applied to the ports in the cylinder block, item 15.

2. Remove rollers, item 16, from piston assemblies and check for wear

3. Check timing face of cylinder block. If necessary lap timing face.
1. Front Housing Reassembling

See page 30 for Grease Specifications and page 33 for Tools.

1. Check all parts are clean and free from debris.

2. Place drive shaft, item 1, face seal, item 10, and front bearing inner ring, item 6, on bench.

3. Smear lip of face seal, item 10, with G3 grease.

4. Press face seal, item 10, on shaft, item 1, using bench press and assembly tool 1.

5. Press front bearing inner ring, item 6, on shaft, item 1, using bench press and assembly tool 2.

6. Pack bearing, item 6, with G3 grease.

7. Place front housing, item 2, shaft seal, item 11, rear bearing and front bearing outer rings, items 6 and 7, on bench.

8. Fill space between lips of shaft seal, item 11, with G3 grease.


11. Turn front casing over and fit front bearing outer ring, item 6, to front casing and press in using bench press and assembly tool 5.

12. Place front casing assembly, shaft assembly, rear bearing, item 7, washer, item 3, and split ring, item 4, on bench.
MEASURE GAP BETWEEN BEARING AND SPLIT RING UNDER PRELOAD FIT CORRECT SIZE WASHER

FILL SPACE BETWEEN LIPS WITH G3 GREASE

PACK BEARING WITH G3 GREASE

SMEAR SEAL LIP WITH G3 GREASE
13. Protect shaft splined diameter with marking tape.

14. Fit front housing assembly to shaft assembly, making sure face seal, item 10, locates in end of front housing assembly.

15. Remove masking tape from shaft.

16. Fit rear bearing, item 7, to shaft, item 1, and press on shaft using bench press and assembly tool 6.

17. Using bench press and assembly tool 7, apply a pre-load of 1.5 tonnes to rear bearing, item 7.

18. With pre-load still applied, fit split ring, item 4, on shaft, item 1, and using slip gauges, determine washer thickness required to maintain the bearing pre-load. Select correct washer thickness on ass'y to give 0 - 0.2 mm pre-load.

<table>
<thead>
<tr>
<th>Dynapac Part No</th>
<th>Thickness “T”</th>
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<tbody>
<tr>
<td>90 33 10</td>
<td>1.50</td>
</tr>
<tr>
<td>90 33 11</td>
<td>1.65</td>
</tr>
<tr>
<td>90 33 12</td>
<td>1.85</td>
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<tr>
<td>90 33 13</td>
<td>2.00</td>
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<tr>
<td>90 33 14</td>
<td>2.15</td>
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<tr>
<td>90 33 15</td>
<td>2.35</td>
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19. Remove split ring, item 4, and fit required washer, item 3, then refit split ring.

20. Remove load.

21. Check shaft, item 1, runs free in front housing assembly.

22. Place aside and cover to protect against ingress of dirt and damage.
MEASURE GAP BETWEEN BEARING AND SPLIT RING UNDER PRELOAD.
FIT CORRECT SIZE WASHER.

FILL SPACE BETWEEN LIPS WITH G3 GREASE.
PACK BEARING WITH G3 GREASE.
SMEAR SEAL LIP WITH G3 GREASE.
Rear Housing Reassembling

See page 30 for Grease Specifications and page 33 for Tools.

1. Check all parts are clean and free from debris.

2. Place distributor ring, item 22, and (6 off) springs, item 24, on bench.

3. Place springs, item 24, in recesses in distributor block, item 22, using mineral based grease to hold springs in position.

4. Place rear casing, item 21, stop pin, item 23, ring seals, items 26, 27 and 28 (and socket set screw, item 64, if it is not already in place), on bench.

5. Insert ring seals, items 26, 27 and 28, into correct grooves with minimum distortion of seals. Using alignment mandrel tool 8 stretch and align seals.

6. Insert stop pin, item 23, into distributor ring, item 22. Insert distributor ring assembly, items 22, 23 and 24, into rear housing, item 21. Align distributor so that the stop pin locates in the rear housing. Press home by hand checking that stop pin, item 23, engages with distributor and rear housing.

7. Using Loctite 542, assemble socket set screw, item 64, to rear casing, if it is not already present.
3  Rotating Group Reassembling

Take care not to damage timing face

1. Check all parts are clean and free from debris.

2. Place cylinder block, item 15, piston assemblies (8 off), item 17, and rollers, (8 off), item 16, on a bench.

3. Fit roller, item 16, to piston assembly, item 17. Dip piston assembly into oil.

4. Fit piston, item 17, and roller, item 16, to piston bore in cylinder block, item 15.

5. Repeat for each piston bore in cylinder block, item 15.

6. Place rotating group aside and cover to protect against ingress of dirt and damage.
Brake and Motor Reassembling

1. Check all parts are clean and free from debris.

2. Place front housing assembly, rotating group, cam, item 20, O-rings (2 off) item 32, rear housing assembly and socket headed cap screws (S.H.C.S.), (6 off), item 33, on bench.

3. Fit face O-ring, item 32, to front housing assembly, item 2, and position cam, item 20, on front housing assembly, aligning reference marks made before dismantling.

4. Assemble rotating group to front housing assembly, being careful not to damage splines on shaft, item 1, or cylinder block, item 15. Ensure that cylinder block is pushed up against rear bearing, item 7.

5. Fit face O-ring, item 32, to rear housing assembly and position on cam, aligning reference marks.

6. Fit (6 off) S.H.C.S’s, item 33, to assembly and locate and start all S.H.C.S’s before tightening.

7. First apply Loctite 270 on the treads. Torque Cap Screws to 117-122 Nm (tighten opposites to maintain squareness).

8. Check drive shaft to ensure motor rotates freely.

9. Place motor assembly, brake housing, item 48, brake shaft, item 49, brake piston, item 50, brake pad, item 51, end cover assembly, item 52, plug, item 53, brake discs, items 54 (12 off, 13th optional) and 55 (11 off), O-rings, items 31, 59 and 60, shims, items 56 and 57, gasket, item 58, hex head bolts, item 62, socket headed cap screws, item 63 (8 off), socket set screw, item 65, disc spring, item 66, thrust washer (if required), item 67, and bush, item 68, on bench.
13th PLATE OPTIONAL
SHIM AS REQUIRED
ASSEMBLE USING LOCTITE 542

DIMENSION 'S' TO BE MEASURED WITH A LOAD OF 2 kN ON ITEM 50
TORQUE TO 9-10.5 Nm
ENSURE CONTACT SURFACES ARE COATED WITH S1 GREASE

0.8 MIN AFTER SETTING DIM 'S'

MEASURE GAP BETWEEN BEARING AND SPLIT RING UNDER PRELOAD
FILL SPACE BETWEEN LIPS WITH G3 GREASE
PACK BEARING WITH G3 GREASE
SMEAR SEAL LIP WITH G3 GREASE

ASSEMBLE USING LOCTITE 221
LOCATE 13th OUTER PLATE HERE
ASSEMBLE USING LOCTITE 243
TORQUE TO 70-77 Nm
PRESS FIT ITEM 68 FLUSH INTO SHAFT BORE AFTER FITTING ITEM 67 IN SHAFT

ASSEMBLE USING LOCTITE 270
TORQUE TO 117-122 Nm
10. Fit O-ring, item 31, to rear housing, item 21.

11. If thrust washer, item 67, has been removed, fit to break shaft, item 49, (metal face to shaft).

12. Push bush, item 68, into break shaft, item 49.

13. Fit brake shaft, item 49, to motor assembly and press home by hand, taking care not to damage splines on brake shaft or cylinder block, item 15.

14. Fit brake housing, item 48, to motor assembly, such that brake port is aligned at 35° angle to the drain (see brake drawing page 9).

15. Fit (8 off) cap screws, item 63, to brake housing, item 48, having first applied Loctite Adhesive 243 to screw thread. Start all cap screws and centralize using a spare brake disc before tightening. Torque screws to 70-77 Nm (tighten opposites to maintain squareness).

16. Fit brake disc pack, items 54 and 55, to motor assembly.

17. Fit brake piston, item 50, to motor assembly.

18. Apply load of 2 kN to brake piston, item 50. With load applied, measure the distance between the brake piston face and the end of brake housing, item 48 (see brake drawing page 9). Select the correct amount of shims, item 56, required to adjust this distance to 6.6 ± 0.1 mm and 2 kN (an extra outer plate, item 54, may be used to reduce the number of shims required). Remove brake piston and fit shims to brake disc pack, items 54 and 55.

19. Fit O-ring, item 59, to brake pad, item 51.
13th PLATE OPTIONAL
SHIM AS REQUIRED

ASSEMBLE USING LOCTITE 542

DIMENSION 'S' TO BE MEASURED WITH A LOAD OF 2 kN ON ITEM 50
TORQUE TO 9-10.5 Nm
ENSURE CONTACT SURFACES ARE COATED WITH S1 GREASE

0.8 MIN AFTER SETTING DIM 'S'

LOCATE 13th OUTER PLATE HERE
ASSEMBLE USING LOCTITE 221
ASSEMBLE USING LOCTITE 243
TORQUE TO 70-77 Nm
PRESS FIT ITEM 68 FLUSH INTO SHAFT BORE AFTER FITTING ITEM 67 IN SHAFT
ASSEMBLE USING LOCTITE 270
TORQUE TO 117-122 Nm

MEASURE GAP BETWEEN BEARING AND SPLIT RING UNDER PRELOAD
FILL SPACE BETWEEN LIPS WITH G3 GREASE
PACK BEARING WITH G3 GREASE
SMEAR SEAL LIP WITH G3 GREASE
20. Fit socket set screw, item 65, gasket item 58, and brake pad, item 51, to brake piston, item 50.

21. Refit brake piston, item 50, to brake assembly.

22. Coat contact surfaces of disc spring, item 66, with S1 grease (see page 30 for Grease Specifications).

23. Fit disc spring, item 66, to brake assembly.

24. Fit O-ring, item 60, to plug, item 53.

25. Fit gasket, item 57, to brake housing.

26. Position end cover, item 52, insert all hex head screws, (12 off) item 62, and start by hand. Torque screws to 9-10.5 Nm (tighten opposites to maintain squareness).

27. Remove plastic plug, from rear casing, item 21, and fill motor with hydraulic system oil.

28. Refit plug and tighten.

29. Close all openings with plugs.
13th PLATE OPTIONAL
SHIM AS REQUIRED
ASSEMBLE USING LOCTITE 542

DIMENSION 'S' TO BE MEASURED WITH A LOAD OF 2 kN ON ITEM 50
TORQUE TO 9-10.5 Nm
ENSURE CONTACT SURFACES ARE COATED WITH S1 GREASE

0.8 MIN AFTER SETTING DIM 'S'

ASSEMBLE USING LOCTITE 221
LOCATE 13th OUTER PLATE HERE
ASSEMBLE USING LOCTITE 243
TORQUE TO 70-77 Nm
PRESS FIT ITEM 68 FLUSH INTO SHAFT BORE AFTER FITTING ITEM 67 IN SHAFT
ASSEMBLE USING LOCTITE 270
TORQUE TO 117-122 Nm

SMEAR SEAL LIP WITH G3 GREASE
MEASURE GAP BETWEEN BEARING AND SPLIT RING UNDER PRELOAD
FILL SPACE BETWEEN LIPS WITH G3 GREASE
PACK BEARING WITH G3 GREASE
CODE TYPE

S1  Lithium-base high temperature grease containing molybdenum disulphate (Mo S) for specific high load/temperature use. Only to be used where specifically called out on drawing.

e.g. B.P. Energrease L21-M Castrol LMM, Esso Multipurpose Grease Moly, Shell Retinax M.

G3  A high performance industrial grease of medium/hard consistency (NLG1 No. 3). Temperature range - 30°C to 150°C.

e.g. Shell Alvania G3.
Equipment (Dismantling and Reassembling)

General:

1. Allen key
   a. SW 2,5 DIN 911
   b. SW 8 DIN 911
   c. SW 10 DIN 911
   d. SW 12 DIN 911

2. Double ended ring spanner
   a. SW 10-11 DIN 838

3. Soft mallet
   a. Mallet size 40

4. Torque wrench(es) covering the ranges
   a. 9-10,5 Nm
   b. 70-77 Nm
   c. 117-122 Nm

5. Soft steel drift

6. Small screwdriver (no sharp edges)
   a. 1,5 mm

7. Bench press
   a. Max load at least 2 tonnes

8. Slip gauges
   a. 1,35-2,5 mm
Equipment (Dismantling and Reassembling)

Special:

1. Face seal assembly tool P/N 90 32 60
2. Front bearing (cone) assembly tool P/N 90 32 61
3. Shaft seal assembly tool P/N 90 32 62
4. Rear bearing (cup) assembly tool P/N 90 32 63
5. Front bearing (cup) assembly tool P/N 90 32 64
6. Rear bearing (cone) assembly tool P/N 90 32 65
7. Shaft spacer assembly tool P/N 90 32 66
8. Rear housing seal stretch and alignment mandrel P/N 90 32 67
Equipment (Dismantling and Reassembling)

Special, contd.

1. P/N 90 32 60
2. P/N 90 32 61
3. P/N 90 32 63
4. P/N 90 32 64
5. P/N 90 32 62
6. P/N 90 32 65
7. P/N 90 32 66
8. P/N 90 32 67