SELWOOD STORM

Operating & Service Manual

The products of Selwood Limited are designed, developed and produced in the company's Chandlers Ford factory.

World-wide patents cover many features. Product names such as Spate, Simplite and Seltorque, are registered trademarks.

As all products are subject to continuous development, the company reserves the right to alter the specifications and information given in this manual without prior notice.

Whilst every care has been taken in the preparation of this publication, the information it contains must not be regarded as binding.

Amendments to this publication will only be issued to cover those design changes, which fundamentally alter the build or operation and servicing procedures. They will be distributed through the company's dealers and agencies.

Published by Selwood Limited.

HEALTH & SAFETY AT WORK

As manufacturers of pumps and associated equipment we wish to inform you that, in compliance with Section 6 of the Act, safety precautions should be taken with certain of our products.

We take every care to ensure as far as is reasonably practicable that our products are safe and without risk to health when properly used. Nevertheless, appropriate health and safety precautions must be taken, and in particular you are requested to have special regard to the use of the products Installation and Operating Instructions.

CALIFORNIA USA PROPOSITION 65 WARNING

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

WARNING

Pumps and engines may be fitted with seals or 'O' rings manufactured from **VITON** or similar material.

When temperatures reach 400°C (720°F) a corrosive acid is produced, which cannot be removed from the skin.

If signs of material decomposition are evident, or if in doubt, **always wear disposable heavy-duty gloves**.

SELWOOD STORM

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1 PUMP SPECIFICATION

1.1 Performance

Maximum Speed	2000rpm
Maximum total generated head	23.75m of water
Maximum flowrate	62.5m³/hr
Maximum pumped solids size	29mm sphere
Self priming lift	8.8m of water
Air pump capacity	4.25l/s free air

1.2 Dimensions

Inlet port	2.1/2"BSP female and 4" hosetail
Outlet port	21/2"BSP female and 4" hosetail

Overall dimensions and weight of the complete pumpset will vary depending on specification ordered. Please refer to the Pump Division of Selwood Limited for detailed information.

2 INSTALLATION & OPERATING INSTRUCTIONS

2.1 Trailer Mounted Units

1. Set trailer on firm level ground and chock wheels.
2. Ensure that rigid hose is used on the suction, and that the discharge hose has a minimum working pressure of 75psi.
3. Ensure that hoses are correctly coupled and that the suction strainer is fully submerged.
4. If a water trap is fitted in the fuel line, it should be inspected periodically and drained if necessary.

2.2 Fixed Installation

1. Chassis to be set on anti-vibration mounts.

NOTE: With electric drives chassis must be earthed.

2. Join rigid pipework with flexible couplings.
3. Avoid short radius pipe bends close to pump suction.
4. Internal combustion engines must be aspirated and exhausted to atmosphere in accordance with engine manufacturer instructions.
5. When pumping fluids emitting noxious gases, the air pump must be exhausted to atmosphere outside of the pump house.

2.3 General

1. Do not exceed specified speed of 2000rpm.
2. Ensure that correct suction strainer is fitted.

Max. solids capacity	29mm
3" Hose spigot strainer	0008155000
3" Male Bauer strainer	0008156000
4" Hose spigot strainer	1092033000
4" Male Bauer strainer	1092034000

3. Before starting, ensure all drain valves are closed and that delivery valve cover is secure.

2.4 Precautions in Freezing Conditions

1. Ensure the volute and delivery valve are completely drained before leaving the pump stationary.
2. When the pump has been left stationary, it is possible for the separator float to freeze onto the casing thereby holding the valve open and allowing water into the air pump if the pump were started. To avoid this occurring, warm water should be poured into the separator through the separator hose.
3. When pumping in extremely cold conditions ice may form on the separator valve seat, preventing closure and allowing water into the air pump. Close observation must be maintained, and the pump shut down at the first sign of water coming from the air pump.

2.5 Clearing the Discharge Valve

1. Release nuts securing valve inspection cover, and remove cover.
2. Valve flap may be lifted back through opening, giving access to valve seat.
3. Remove obstruction.
4. Check cover seal and replace cover, ensuring nuts are fully tightened.

3 CONDITIONS OF WARRANTY

For a period of six months from delivery of any Selwood pump to the first user thereof, or twelve months from the despatch of any such pump by Selwood Limited, whichever period is the shorter, Selwood Limited will repair or, at its option, replace any component which in the opinion of Selwood Limited has failed due to defective workmanship or materials.

This warranty does not apply to:

a) the driver or any accessories or proprietary fittings whatsoever;

b) any pump which, in the opinion of Selwood Limited, has been altered, used, maintained, serviced or stored otherwise than in accordance with Selwood Limited instructions and professional practice;

c) any pump from which the serial numbers have been removed or altered;

d) fair wear and tear;

e) consequential loss or damage.

4 REPLACEMENT PARTS

4.1 Instructions for Ordering

1. Always quote the pump serial number located on the plate fastened to the pump.
2. Always quote the ten digit part number for the component, not the item reference number.
3. Always quote the description of the component.
4. Items usually supplied together as sub-assemblies, will have the sub-assembly part number printed at the bottom of the relevant page.

5 ROUTINE MAINTENANCE

Lack of routine maintenance is the most frequent cause of pump break-downs. We earnestly advise users to ensure that the following actions are taken as a minimum.

5.1 Daily Inspections

1. Check these three oil levels daily:
   a) Engine oil.
   b) Bearing housing oil.
   c) Flushing chamber oil.
2. Always drain water from the pump in cold weather, when it is not running. Drain:
   a) Pump body.
   b) Delivery valve chamber.
3. Do not run pump if significant quantities of water escape through the air pump. This pump is designed to tolerate moisture-laden air, but not to pump a high percentage of water. Refer to servicing instructions for further advice.
4. Do not run the pump if malfunction is suspected in any of its parts. In particular, the pump must be serviced immediately, if the oil level in the flushing chamber varies daily, or if the oil is contaminated with the pumped fluid.
5. A suction hose strainer should always be fitted if there is a possibility of oversized solids entering the pump. Larger soft solids, however, of the type found in abattoir duties etc will pass freely through the pump. Refer to Selwood Limited if further advice is required on this subject
6. All pipework joints, particularly on the suction side of the pump, should be checked regularly for air tightness. Any air leak could prevent the pump from priming, and can affect on-stream performance.
7. Where fitted, the correct type and grade of fuel must be used in the engine. Ensure that the grade used is suitable for the climatic conditions, and that it is free from contaminants. Unsatisfactory performance, in addition to damage and premature wear, can result from the use of contaminated fuel.
8. Check the tension of all nuts and bolts periodically, particularly those securing the engine and pump to the chassis.
9. Pump servicing must always be carried out in accordance with the servicing section of the manual. Only components supplied and approved by Selwood Limited should be used. It is advisable to maintain a small stock of spare parts to cover unplanned usage, and Selwood Limited will be pleased to give advice in this connection.
10. Engine servicing must always be carried out in accordance with the manufacturer's instructions. Contact Selwood Limited if the need for further advice arises.
11. Should any advice on servicing, installation, operating or maintenance of the pumpset be required, please contact Selwood Limited.
12. All work must be carried out in accordance with the Health and Safety at Work Act, 1974.

Remember: If the above advice is followed, the likelihood of an expensive breakdown will be greatly diminished, and the pump should give a long and trouble-free life.

5.2 Lubrication

It is most important to maintain the correct grade and levels of oil in the flushing chamber and bearing housing, and to ensure that the oil is free from contamination. Use 10W/30 in both chambers.

5.3 Commissioning Period

Drain both flushing and bearing housing chambers within 100 running hours of commissioning either a new, or rebuilt pump, and refill with new 10W/30 oil to the correct level.

5.4 After Commissioning Period

If the pump is driven by a diesel engine, the oil in both flushing and bearing housing chambers should be drained and renewed simultaneously with the engine oil, in accordance with the engine manufacturers specified time intervals. This will normally require oil changes every 250 hours, but under no circumstances should pump oil change intervals exceed 500 hours.

5.5 Fastening Torques

Failure to tighten threaded fasteners correctly can easily lead to assembly breakdowns. It is important therefore, when carrying out the instructions in this manual, to achieve the appropriate torque figures.

The most significant torque values are:

Air pump actuator capscrew	5.8kgf.m (42lb.ft)
Air pump pedestal capscrew	3.5kgf.m (25lb.ft)

6 GENERAL MAINTENANCE

NOTES:

1. Electric Start, Engine Driven Pumps: Disconnect the negative battery connection before starting work.
2. Electric Motor Driven Pumps: Ensure that the motor is isolated before starting work.

6.1 Main Pump Assembly

6.1.1 Volute Removal and Refitting

Removal

1. Drain oil from mechanical seal chamber by removing plug (C27).
2. Remove separator air hose (D30).
3. Position a suitable support under the bearing housing (C04), at a point close to its connection with the mechanical seal housing (B14).
4. Remove nuts (B31) and spring washers (B32), and slide the volute casing (A14) forward until the studs are dear of the mechanical seal housing, taking care not to damage the shims and 'O' rings. Note, the mechanical seal housing is not removable at this stage.
5. Retain spacers (B33) and support foot (B15).

Refitting

Refitting is the reverse of the removal procedure, with the following notes:

1. Inspect all shims, 'O' rings and gaskets, and replace as necessary.
2. Care should be taken when fitting volute casing, to ensure that 'O' ring is not pinched or rolled out of its groove.
3. Ensure that mounting foot spacers (B33) are correctly positioned.

6.1.2 Impeller Removal and Refitting

Removal

1. Remove volute as Section 7.1.1
2. Release the capscrew (B27), taking care as the mechanical seal spring may push the impeller (B12) off the shaft.
3. Remove the impeller complete with its capscrew, seal washer (B28), and rotating half of the mechanical seal (B13). The impeller/shaft key (C25) may also come away with the impeller.
4. The centre boss is bonded into the impeller and should not be removed.

Refitting

1. Inspect all components and replace if necessary. It is recommended that a new mechanical seal be fitted whenever the faces have been parted. See Section 7.1.4.
2. Lightly oil impeller bore.
3. Slide impeller onto shaft, taking care not to damage or contaminate face of mechanical seal.
4. Fit a new sealing washer (B28), and refit impeller capscrew using 'Loctite' 242. Tighten to a torque of 22 lbf-ft. (16Kgf-m)
5. Refit volute and check clearance between impeller and front wear plate. This clearance should be 0.5mm, and can be adjusted by altering the shim pack (B36, B37, B38) between the volute and mechanical seal housing.
6. Access can be gained by removing separator as Section 7.2.

6.1.3 Impeller Clearance

Clearance at the front of the impeller must be maintained at a maximum of 0.5mm. Increasing this clearance will result in a loss of hydraulic efficiency and reduced bearing life.

6.1.4 Mechanical Seal

IMPORTANT NOTE: It is essential that absolute cleanliness be maintained throughout any procedure involving a mechanical seal. Any debris, however small, remaining on the seal face will cause premature failure of the seal.

Removal

1. Remove volute as Section 7.1.1.
2. Remove impeller as Section 7.1.2.
3. Using service tool 0015166000, remove stationary seat of mechanical seal (B13) from its housing (B14).

Refitting

1. It is recommended that a new mechanical seal be fitted whenever the seal faces have been parted.
2. Thoroughly dean the impeller, shaft and housing recess.
3. Carefully unpack the new mechanical seal, ensuring that the faces are not damaged or contaminated.
4. Lubricate outside of stationary face joint ring and inside of housing bore with soft soap. (Do not oil or grease).
5. Carefully push seal into housing with face protected, ensuring that seal is fully home and square.
6. Lubricate outside diameter of impeller spigot and inner bore of seal rubber with soft soap (Do not oil or grease).
7. Push back rotating half of seal onto impeller spigot using a twisting action. Ensure rubber is fully home against rear face of impeller.
8. Lightly oil impeller bore.
9. Slide impeller onto shaft, taking extreme care not to damage or contaminate seal face.
10. Fit a new sealing washer (B28) and refit impeller capscrew (B27) using 'Loctite' 242. Tighten to a torque of 22 lbf-ft (16Kgf-m).

11. Refit volute and separator assemblies.

6.1.5 Front Wear Plate

Removal

1. Remove volute as Section 7.1.1.
2. Remove retaining screws (B24) and washers (B29).
3. Remove wear plate (B11). If necessary, access can be gained via suction tube to use a suitable drift to aid removal.

Refitting

1. Thoroughly clean wear plate and volute.
2. Lightly grease volute/wear plate interface.
3. Offer up wear plate to volute and align screw holes.
4. Examine retaining screws (B24) and replace as necessary.
5. Refit retaining screws and washers, using 'Loctite' 242.
6. Refit volute as Section 7.1.1.

6.1.6 Lip Seals - Impeller End

Removal

1. Remove volute as Section 7.1.1.
2. Remove impeller as Section 7.1.2.
3. Remove mechanical seal housing (B14).
4. Remove four capscrews (C32) and spring washers (C30), and withdraw bearing retainer (C07) complete with lip seals. Note, a dowel locates retainer.
5. Remove 'O' rings (C11 and C14) from bearing retainer (C11), and dowel pin (C13).
6. Shaft sleeve (C10) may come away with bearing retainer.
7. Inspect shaft sleeve sealing surface for damage, and replace if necessary.
8. Remove lip seals (C09 and C08), noting their positions and orientation.
9. Clean lip seal seating area thoroughly.

Refitting

1. Oil new seals and push into housing, ensuring correct orientation.
2. If removed, lightly smear surface of shaft sleeve (C10) with grease, and replace taking care not to pinch or dislodge 'O' ring (C21).
3. Lightly grease between lips of seal (C08) with Shell Alvania RA.
4. Fit new 'O' ring (C14) over dowel pin (C13) and smear with oil or grease.
5. Fit new 'O' ring (C11) to bearing retainer (C07) and smear with oil or grease.
6. Carefully replace bearing retainer, over shaft sleeve, ensuring that dowel enters locating hole in rear of retainer.
7. Refit capscrews and spring washers, and tighten to a torque of 8 lbf-ft.
8. Refit mechanical seal housing (B14), with 'O' ring (B17).
9. Refit mechanical seal as Section 7.1.4.
10. Refit impeller as Section 7.1.2.
11. Refit volute as Section 7.1.1.

6.1.7 Lip Seal - Coupling End

NOTE: This procedure assumes that suitable lifting gear is available. In the absence of lifting gear, remove volute as Section 7.1.1. Prior to removing pump from chassis, ensure stability of chassis by supporting as necessary.

Removal

1. Provided the faces of the mechanical seal are not allowed to part, flushing chamber oil does not require draining. Otherwise, drain oil from both chambers by removing drain plugs (C27).
2. Support pump, and remove capscrews joining pump to engine.
3. Remove fasteners from support foot (B15) to baseplate.
4. Slide pump away from engine to disengage coupling, then lift away to a suitable working area.
5. Ensure pump is suitably supported before carrying out further work.
6. Remove coupling half retaining bolt (C28), complete with spring washer and thrust washer (C29 and C22).

   NOTE: Shaft will move forward under action of the mechanical seal spring.
7. Remove coupling half and key.
8. Remove four capscrews (C32) and spring washers (C33).
9. Withdraw bearing retainer (C16), complete with lipseal (C17).
10. Shaft sleeve (C18) may come away with bearing retainer.
11. Inspect shaft sleeve sealing surface for damage and replace if necessary.
12. Remove 'O' ring (C19) from bearing retainer.
13. Remove lipseal, noting orientation of seal in housing.
14. Clean lipseal seating area thoroughly.

Refitting

1. Oil new seal and push into position ensuring correct orientation.
2. If removed, smear shaft sleeve (C18) with grease, and replace taking care not to pinch or dislodge 'O' ring (C19).
3. Fit new 'O' ring (C19) to bearing retainer and smear with oil or grease.
4. Carefully replace bearing retainer, over shaft sleeve.
5. Refit capscrews and spring washers.

6. Refit coupling half complete with key (C26) thrust washer (C22), spring washer (C29) and screw (C28). Use Loctite 242 Threadlock or similar, on screw thread.
7. Tighten screw (C28) to a torque of 40 lbf-ft (29.5Kgf-m).
8. Reassemble pump to engine and baseplate.
9. If removed, replace volute as Section 7.1.1.
10. Refit drain plugs, and refill chambers with 10W/30 oil.

6.1.8 Bearings

Removal

NOTE: Prior to removing pump from chassis, ensure stability of chassis by supporting as necessary.

1. Drain oil from both chambers by removing drain plugs (C27).
2. Remove volute as Section 7.1.1.
3. Remove impeller as Section 7.1.2.
4. Remove mechanical seal as Section 7.1.4.
5. Remove mechanical seal housing (B14).
6. Remove Air Pump as Section 7.4.
7. Remove capscrews joining pump to engine.
8. Remove screws joining mounting foot to base plate.
9. Slide pump away from engine to disengage coupling, and lift away to a suitable working area.
10. Remove bearing retainer (C07) and shaft sleeve (C10) as Section 7.1.6.
11. Remove capscrews (C32) and washers (C33) from bearing retainer (C16).
12. Mark air pump conn rod assembly (C02), to ensure it is refitted in the same orientation as original build.
13. Support air pump conn rod to prevent damage.
14. Remove shaft (C05), through bearing (C06), toward coupling end. Note, on clearing bearing, shaft will be free to fall through bearing housing, and so must be carefully supported.
15. Inner race of roller bearing (C06), and entire bearing (C15) will remain on shaft, and should be removed and discarded.
16. Remove air pump conn rod (C02) from bearing housing aperture.
17. Remove circlips (C12 and C20).
18. Remove coupling half, shaft sleeve and bearing retainer from shaft.
19. Remove bearing race from housing and discard.

Refitting

1. Thoroughly clean bearing housing.
2. Inspect shaft for damage, paying particular attention to sealing surfaces and bearing diameters, and renew if necessary.
3. Refit circlips (C12 and C20).
4. Fit ball bearing (C15) onto shaft (C05), ensuring inner race fully abuts to shoulder and is square.
5. Fit 2 new 'O' rings (C21) onto shaft and smear with oil or grease.
6. Inspect surface of shaft sleeve (C18) and replace if necessary. Smear shaft sleeve with grease and fit onto shaft, taking care not to pinch or dislodge 'O' ring.
7. Inspect lip seal (C17) and replace if necessary.
8. Fit new 'O' ring (C19) onto bearing retainer (C16) and smear with oil or grease.
9. Carefully slide bearing retainer, complete with lip seal, onto shaft sleeve.
10. Refit key (C26).
11. Refit coupling half and secure with screw (C28), spring washer (C29) and thrust washer (C22).
12. Fit inner race of roller bearing (C06) onto shaft and secure in place with an old shaft sleeve or a suitable length of tube.
13. Pass shaft assembly into bearing housing from the coupling end, taking care to avoid damaging machined surfaces.
14. When impeller end of shaft becomes visible through air pump aperture, carefully slide air pump conn rod (C02) over shaft, ensuring that conn rod is replaced in the same orientation as originally fitted.
15. Continue passing shaft into bearing housing until bearing and retainer locate in position. Secure with screws (C32) and spring washers (C33), hand tight only at this stage.
16. Fit remainder of roller bearing (C06) over shaft and into bearing housing.
17. Inspect surface of shaft sleeve (C10) and replace if necessary. Smear shaft sleeve with grease and fit onto shaft, taking care not to pinch or dislodge 'O' ring.
18. Inspect lip seals (CC08 and C09) and replace if necessary.
19. Fit new 'O' ring (C14) onto dowel (C13) and smear with oil or grease.
20. Fit new 'O' ring (C11) onto bearing retainer (C07) and smear with oil or grease.
21. Carefully slide bearing retainer, complete with lip seals, onto shaft sleeve, ensuring dowel locates in hole in rear of bearing retainer. Secure with screws (C32) and spring washers (C33), hand tight only.
22. Gradually tighten screws (C32) in both bearing retainers, rotating shaft periodically to ensure free movement.
23. Refit air pump assembly as Section 7.2.
24. Fit new 'O' ring (B17) to bearing housing and smear with oil or grease.
25. Refit mechanical seal housing (B14), taking care not to pinch or dislodge 'O' ring.
26. Refit shims.

27. Fit new 'O' ring (B16) to mechanical seal housing and smear with oil or grease.
28. Fit a new mechanical seal as Section 7.1.4.
29. Refit impeller as Section 7.1.2.
30. Refit volute as Section 7.1.1.
31. Check and adjust impeller front clearance as Section 7.1.3.
32. Refit separator as Section 7.2.

6.2 Separator Assembly

6.2.1 Float

Removal

1. Disconnect air pump hose (D30) by loosening hose clip (D31).
2. Remove fasteners from top cap (A01), and lift top cap away complete with float and peel valve assemblies.
3. Note orientation of float, relative to suction tube.
4. Release locknut (A23), and unscrew float (A10) from operating rod (A09). Note; do not allow operating rod to rotate as this may cause damage to the peel valve (A04).

Refitting

Refitting is the reverse of the removal procedure, with the following notes:

1. Float must be fitted in the correct orientation, i.e. with the flattened sides of the float aligned with the sides of the suction tube.
2. Inspect gasket (A02) and replace if necessary.

6.2.2 Peel Valve

Removal

1. Remove separator top cap as Section 7.2.1.
2. Remove float as Section 7.2.1.
3. Undo screws (A21) and separate top cap (A01) from peel valve assembly.
4. Slide upper diffuser (A08) off operating rod (A09).
5. Remove screws (A19) and clamp bar (A05), retaining peel valve (A04) to port plate (A03).
6. Remove screws (A19), nuts (A20) and clamp bars (A05), retaining peel valve to operating plate (A06).

Refitting

Refitting is the reverse of the removal procedure, with the following notes:

1. Do not overtighten fasteners securing peel valve, otherwise the rubber will distort and not seal correctly.
2. When fitting screws (A19) peel valve to port plate, and (A21) upper diffuser and port plate to top cap, seal threads with a suitable compound. Failure to do this will result in reduced priming performance.

6.2.3 Lower Diffuser

Removal

1. Remove separator top cap as Section 7.2.1.
2. Remove screws (A16) and spring washers (A18).
3. Lift off separator body (A11).
4. Lift out lower diffuser (A13).

Refitting

Refitting is the reverse of the removal procedure, with the following notes:

1. Inspect gaskets (A12) and replace if necessary.

6.3 Delivery Valve Assembly

6.3.1 Delivery Valve

Removal

1. Remove nuts (B21) and spring washers (B22), and lift off valve body (B03).
2. Remove gasket (B04).
3. Remove screws (B24) and spring washers (B25).
4. Remove clamp bar (B05).
5. Delivery valve assembly can now be lifted away, as can spacer bar (B09).
6. Valve assembly can be separated, if necessary, by removing nut (B23).

Refitting

Refitting is the reverse of the removal procedure, with the following notes:

1. Inspect valve rubber (B08) and replace if necessary.
2. Ensure clamp bar (B05) is correctly fitted, with curved edge towards valve rubber.
3. Inspect gasket (B04) and replace if necessary.

6.4 Air Pump Assembly

6.4.1 Air Pump Suction Valve

Removal

1. Remove hose to separator (D30).
2. Remove bolts, nuts and washers retaining pump body halves (D03 and D06).
3. Lift off outer pump body (D03) to reveal valve assembly on underside.
4. Remove screw (D26) together with valve clamp (D09) and valve rubber (D08).

Refitting

Refitting is the reverse of the removal procedure, with the following notes:

1. Inspect valve rubber (D08) and replace if necessary.
2. When refitting outer pump body (D03), pull down evenly ensuring actuator seal (D05) is correctly located.

6.4.2 Actuator Suction Valve

Removal

1. Remove outer pump body (D03) as Section 7.4.1.
2. Remove actuator retaining bolt (D24) with belleville washer (D25).
3. Prise actuator seal (D05) away from inner pump body (D06).
4. Remove actuator (D04) complete with seal (D05) from drive rod (C01), ensuring neck seal (D07) is not disturbed.
5. Invert actuator (D04) to reveal suction valve, which may be serviced as Section 7.4.1.

Refitting

Refitting is the reverse of the removal procedure, with the following notes:

1. Examine upper surface of neck seal (D07), and replace if necessary. See Section 7.4.5.
2. Lubricate outer surface of actuator seal (D05) with soft soap (do not oil or grease).
3. Position actuator assembly onto drive rod (C01).
4. Fit belleville washer (D25) with domed side uppermost, and retain with bolt (D24). Tighten to a torque of 42 lbf-ft (31 Kgf-m)
5. Ensure outside surface of actuator seal (D05) fully locates in inner pump body (D06).

6.4.3 Actuator Seal

Removal

1. Remove outer pump body as Section 7.4.1.
2. Remove actuator assembly as Section 7.4.2.
3. Prise actuator seal (D05) away from actuator (D04).

Refitting

Refitting is the reverse of the removal procedure, with the following notes:

1. Examine actuator seal (D05) and replace if necessary.
2. Lubricate inner surface of actuator seal with soft soap (do not oil or grease).

Fit actuator seal to actuator (D04), ensuring taper on outer surface matches taper on air pump inner body (D06).

6.4.4 Air Pump Discharge Valve

Removal

1. Remove outer pump body as Section 7.4.1.
2. Remove actuator assembly as Section 7.4.2.
3. Remove capscrews (D27) and washers (D28).
4. Note orientation of discharge elbow (D01) on inner pump body (D06).
5. Lift off inner pump body (D06).
6. Remove nuts (D18) and washers (D19), and remove discharge elbow (D01) to reveal discharge valve assembly.
7. Discharge valve assembly can be serviced as Section 7.3.1.

Refitting

Refitting is the reverse of the removal procedure, with the following notes:

1. Ensure inner pump body (D06) is replaced with discharge elbow (D01) in the correct orientation.

6.4.5 Actuator Neck Seal

Removal

1. Remove outer pump body as Section 7.4.1.
2. Remove actuator assembly as Section 7.4.2.
3. Remove inner pump body as Section 7.4.4.
4. Prise neck seal (D07) from housing (D14).

Refitting

Refitting is the reverse of the removal procedure, with the following notes:

1. Inspect neck seal and replace if necessary. It should be noted that over long periods of use, these seals may develop cracks around the inner neck diameter. When these have grown to half to three quarters of the original thickness, the seals should be replaced. Radial cracks in the seals can be ignored.
2. It is recommended that both actuator seal (D05) and neck seal (D07) are replaced at the same time.
3. Lubricate neckseal with soft soap (do not oil or grease), and push into inner pump body (D06).
4. The pump should not be operated for long periods with failed seals.

6.4.6 Air Pump Drive Rod and Seals

Removal

1. Remove outer pump body as Section 7.4.1.
2. Remove actuator assembly as Section 7.4.2.
3. Remove inner pump body as Section 7.4.4.
4. Remove actuator neck seal as Section 7.4.5.
5. Remove screws (D29) and washers (D22).
6. Lift off pedestal (D14), complete with seals and bush.
7. Remove circlip (C24), support drive rod (C01) and drive out fulcrum pin (C03).
8. Remove circlip (D13) from pedestal (D14).
9. Remove wiper seal (D10), seal carrier (D12) and distributor seal (D11), noting their position and orientation.
10. If necessary, push out linear bearing (D16).

Refitting

Refitting is the reverse of the removal procedure, with the following notes:

1. Inspect all seals and replace as necessary.
2. Inspect gasket (D15) and replace if necessary.
3. If removed, bearing (D16) should be replaced.

4. Lubricate bearing (D16) and push into pedestal until bottom edges of bearing and pedestal are level. Use service tool 0015168000.
5. Apply grease to seal housing and slide distributor seal (D11) sideways over circlip groove to avoid damage, and then turn lip of seal down towards bearing.
6. Press wiper seal (D10) into carrier (D12) with lip uppermost, using service tool 0010103000.
7. Push carrier and seal into housing, with lip uppermost, to contact distributor seal.
8. Fit circlip.
9. Prior to refitting, lubricate fulcrum pin (C03) and bearing (D16) with clean oil.
10. When refitting pedestal (D14) over drive rod (C01), care must be taken to avoid damage to seals.

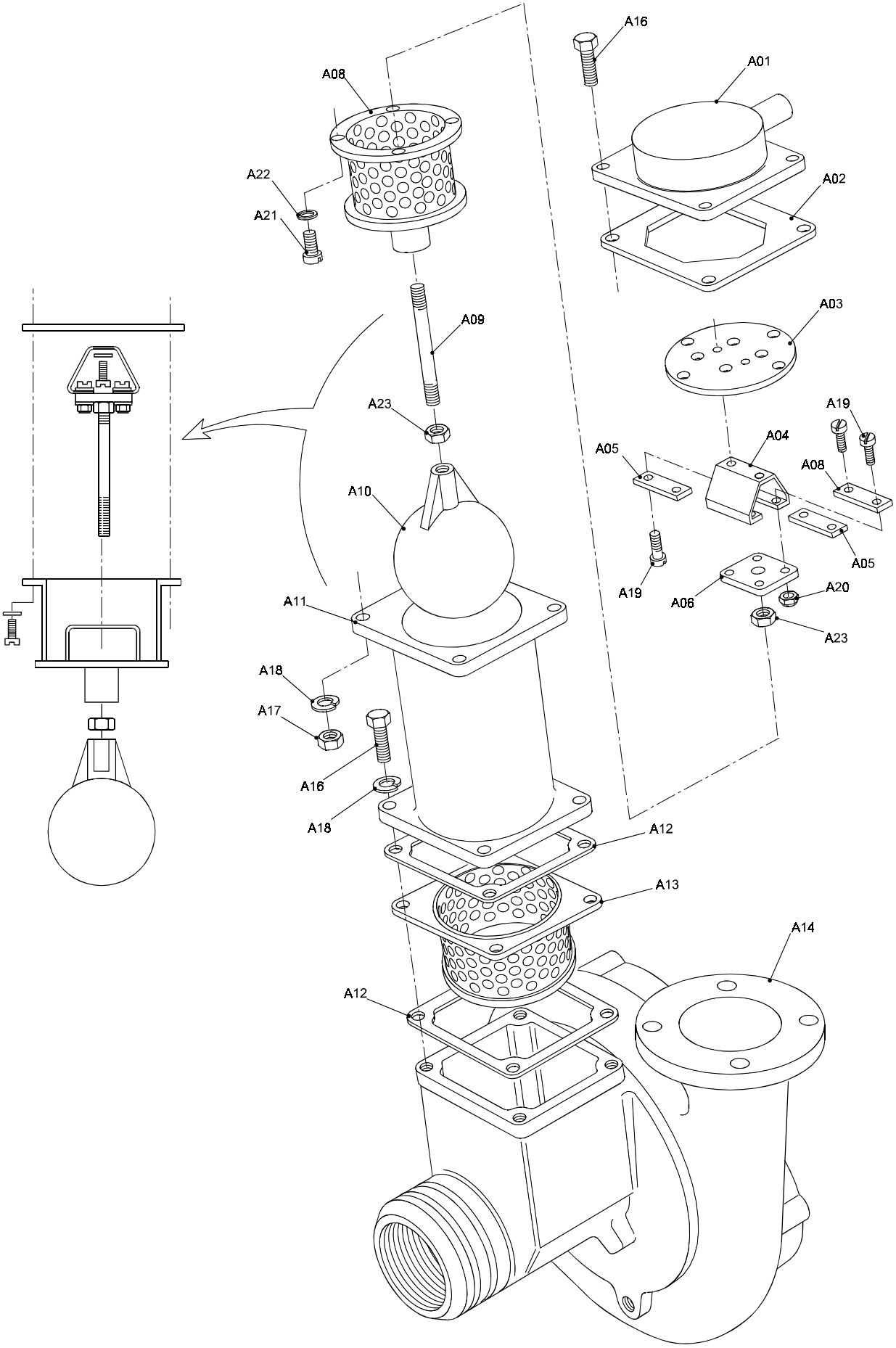
7 FAULT FINDING GUIDE

This table gives only the most common symptoms arising in connection with water handling duties. Please consult Selwood Ltd for further advice if the service fault is not described, and particularly if the duty has uncommon characteristics.

At no time should the pump be run if its bearing housing or flushing chamber contain contaminated oil. Very small volumes of oil may be lost from these chambers during a days normal running, but remedial action should immediately be taken if the loss becomes excessive.

The most likely causes of failure are given in the sequence in which they should be investigated. For example, if the pump will not prime, carry out the first service instruction that is listed and proceed to the second only if the first proves to be inappropriate.

	SYMPTOM	POSSIBLE CAUSE	ACTION
AIR HANDLING PERFORMANCE			
1.	Pump will not prime or primes slowly.	Leaking suction pipework joints	Tighten and if necessary remake all joints
2.	Pump will not prime or primes slowly.	Faulty delivery valve assembly	Inspect and renew if necessary
3.	Pump will not prime or primes slowly.	Faulty air pump valves	Inspect and renew if necessary
4.	Pump will not prime or primes slowly.	Faulty actuator valve	Inspect and renew if necessary
5.	Pump will not prime or primes slowly.	Faulty actuator seal	Inspect and renew if necessary
6.	Pump will not prime or primes slowly.	Faulty actuator neckseal	Inspect and renew if necessary
AIR PUMP DISCHARGING WATER			
7.	Significant amounts of water passing out of Air pump	Faulty separator float	Inspect and renew if necessary
8.	Significant amounts of water passing out of Air pump	Faulty separator (peel) valve	Inspect and renew if necessary
PUMPING CAPACITY			
9.	Drop on output	Worn impeller	Inspect and renew if necessary
10.	Drop on output	Obstructed flow passages	Check for solids in suction Tube, around suction Strainer, and in pipework generally
11.	Drop on output	Engine speed incorrectly set	Check that speed is 2000rpm off load
LEAKAGE AND CONDITION OF LUBRICATING OILS			
12.	Oil leaking from ports Behind air pump	Worn seal assembly	Inspect and renew if necessary
13.	Significant drop in flushing Chamber oil level	Mechanical or lip seal failure	Inspect and renew if necessary
14.	Significant drop in bearing Housing oil level	Lip seal failure, or cause 12	Inspect and renew if necessary
15.	Oil leaking from flushing Chamber vent	Lip seal failure	Inspect and renew if necessary
16.	Emulsified or contaminated Oil in flushing chamber	Mechanical seal failure	Inspect and renew if necessary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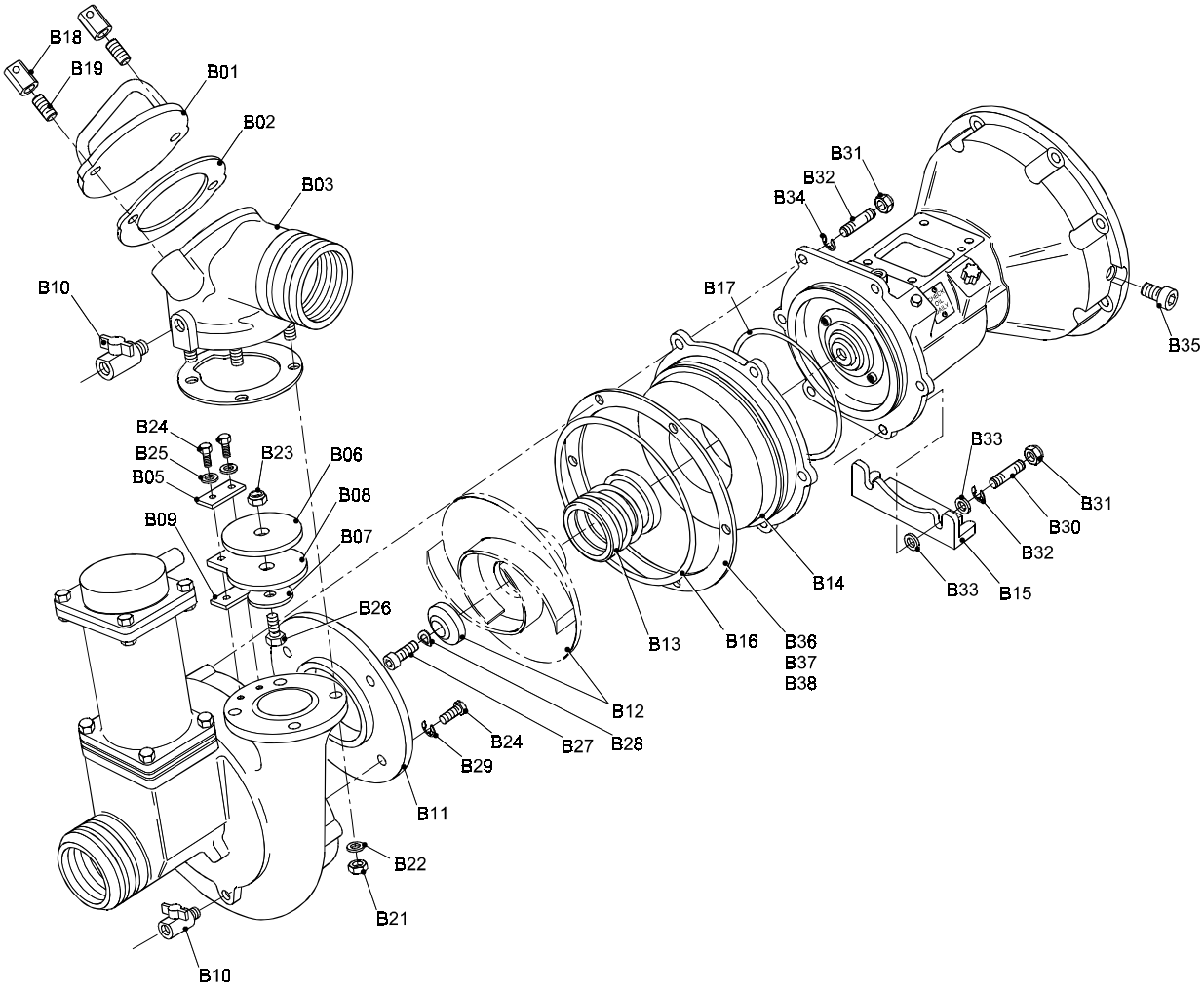
8 PART LIST

8.1 Volute and Separator

ITEM	DESCRIPTION	PART NUMBER	QTY
A01	Top Cap - Separator	7596053000	1
A02	Gasket - Top Cap	7596073000	1
A03	Port Plate - Peel Valve	7596067000	1
A04	Peel Valve	7596071000	1
A05	Clamp Bar - Peel Valve	7596070000	3
A06	Plate Operating	7596069000	1
A07			
A08	Diffuser - Upper	7596065000	1
A09	Rod - Operating	7596068000	1
A10	Float	9565k02401	1
A11	Body - Separator	7596090000	1
A12	Gasket - Body	7596072000	2
A13	Diffuser - Lower	7596064000	1
A14	Volute	7596063000	1
A15			
A16	Screw - Hex. Hd - M10x35	9000100351	8
A17	Nut - Hex - M10	9025100004	4
A18	Washer - Spring - M10	9030100229	8
A19	Screw - Pan. Hd - M4x12	9018040127	6
A20	Nut - Aerotite - M4	9025040307	4
A21	Screw - Pan.Hd - M4x16	9018040167	4
A22	Washer - Plain - M4	9030040027	4
A23	Nut - Hex - 1/4"BSW	9040407-01	2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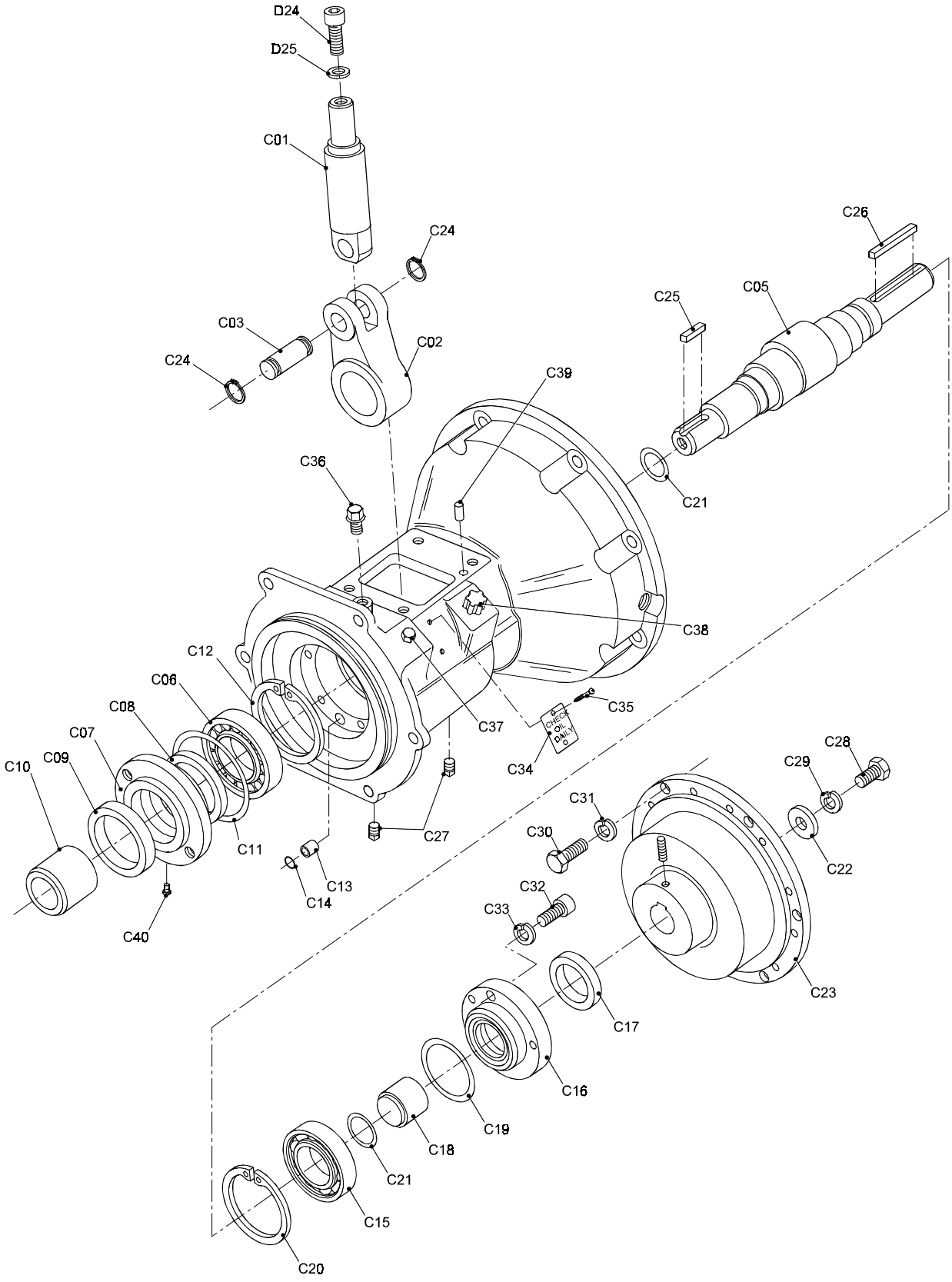
8.2 Pump End and Delivery Valve

ITEM	DESCRIPTION	PART NUMBER	QTY
B01	Cover - Delivery Valve	7596062000	1
B02	Gasket - Cover	7596091000	1
B03	Body - Delivery Valve	7596085000	1
B04	Gasket - Body	7597011000	1
B05	Clamp Bar - Delivery Valve	7596081000	1
B06	Plate - Upper	7596078000	1
B07	Plate - Lower	7596079000	1
B08	Valve - Rubber	7596082000	1
B09	Spacer Bar - Delivery Valve	7597216000	1
B10	Drain Tap	0003350000	2
B11	Wear Plate	7596055000	1
B12	Impeller Assembly	7596076000	1
B13	Mechanical Seal Assembly	7596093000	1
B14	Housing - Mechanical Seal	7596051000	1
B15	Foot - Bearing Housing	7596052000	1
B16	‘O’ Ring	910700-004	1
B17	‘O’ Ring	910600-002	1
B18	Nut - Hex - Long - M12	1589135000	2
B19	Stud - M12x30	9001250-09	2
B20	Stud - M12x35	9001250-06	4
B21	Nut - Hex - M12	9025120004	4
B22	Washer - Spring - M12	9030120229	4
B23	Nut - Hex - Self Locking - M8	9025080344	1
B24	Screw - Chs. Hd - M6x20	9000697-01	6
B25	Washer - Plain - M6	9030060027	2
*B26	Screw - Hex. Hd - M8x20	9000080201	1
B27	Capscrew - M10x25	9001047-01	1
B28	Seal Washer - M10	9001077-01	1
B29	Washer - Spring - M6	9000677-01	4
B30	Stud - M10x60	9001050-04	2
B31	Nut - Hex - M10	9025100004	6
B32	Washer - Spring - M10	9030100229	6
B33	Spacer - Foot	7597218000	4
B34	Stud - M10x40	9001050-05	4
B35	Plug - M16	9539M01601	1
B36	Shim - 0.15	7596083000	A/R
B37	Shim - 0.25	7596084000	A/R
B38	Shim - 0.5	7598303000	A/R

*B26 Part Number changed to 9000080251 M8 x 25 as of pump number 75SA234D.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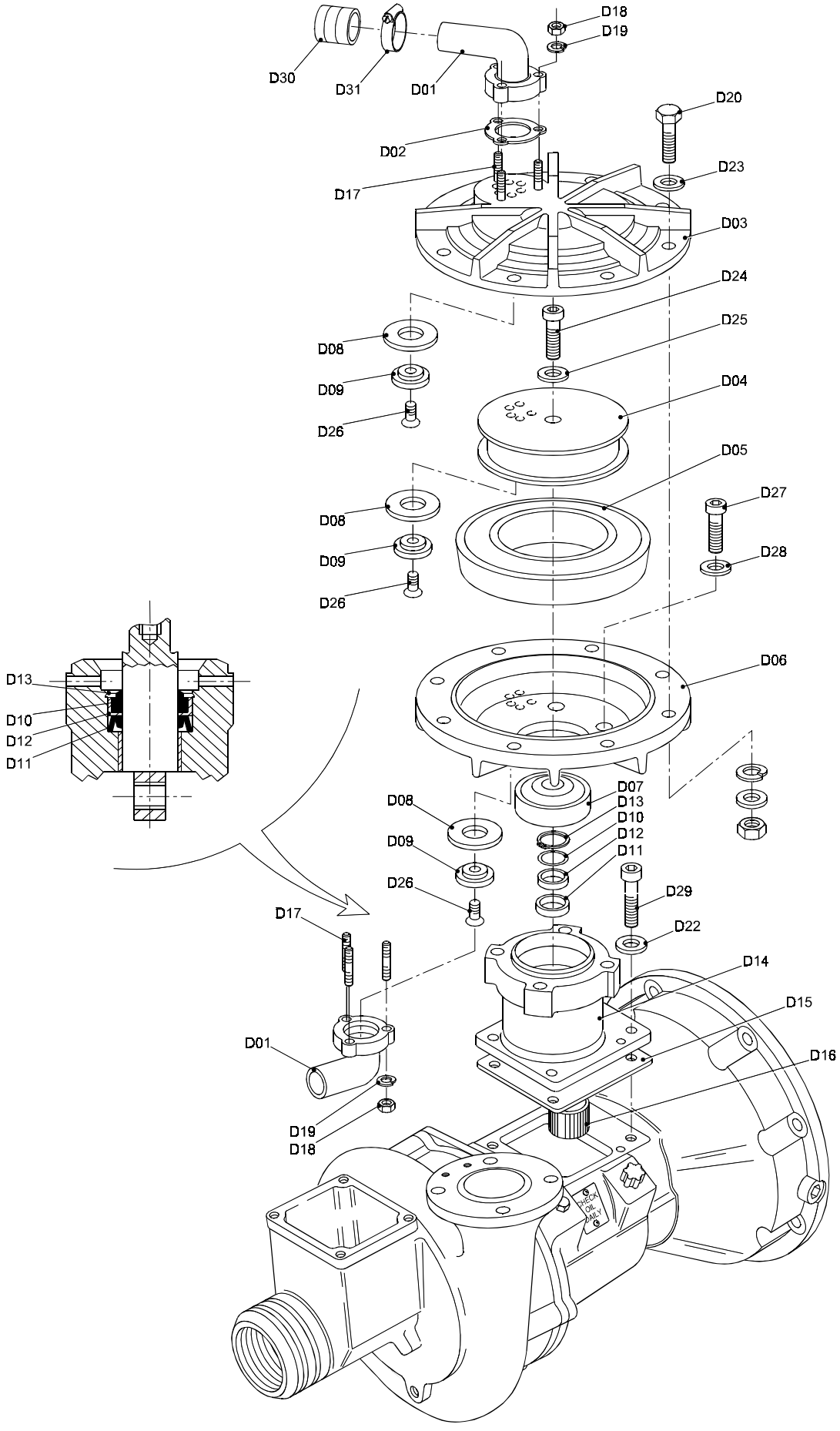
8.3 Bearing and Air Pump Mechanism Housing

ITEM	DESCRIPTION	PART NUMBER	QTY
C01	Drive Rod Assembly - Air Pump	1590104000	1
C02	Connecting Rod Assembly - Air Pump	1589102000	1
C03	Fulcrum Pin	1589094000	1
C04	Bearing Housing	7596080000	1
C05	Drive Shaft	7596060000	1
C06	Bearing - Roller	930110-003	1
C07	Retainer - Bearing	7596057000	1
C08	Seal - Oil	910110-004	1
C09	Seal - Oil	910110-003	1
C10	Sleeve - Shaft	7596059000	1
C11	'O' ring	910200-003	1
C12	Circlip	94D130072A	1
C13	Dowel - Hollow	7598256000	1
C14	'O' ring	910000-001	1
C15	Bearing - Ball	930100-001	1
C16	Retainer - Bearing	7596056000	1
C17	Seal - Oil	910110-002	1
C18	Sleeve - Shaft	7596058000	1
C19	'O' ring	910200-005	1
C20	Circlip	94D130080A	1
C21	'O' ring	910100-002	2
C22	Washer - Thrust - Coupling	7596061000	1
C23	Coupling Assembly	9600M02502	1
C24	Circlip	9401000151	2
C25	Key	9000099-05	1
C26	Key	9000099-04	1
C27	Plug - Drain	9522002000	2
C28	Screw - Hex. Hd - M10x25	9000100251	1
C29	Washer - Spring - M10	9030100229	1
C30	Screw - Hex. Hd - M8x20	9000080201	6
C31	Washer - Spring - M8	9030080229	6
C32	Screw - Cap - Hex Socket - M6x20	9005060200	8
C33	Washer - Spring - M6	9030060229	8
C34	Label - Oil Check	0015229000	1
C35	Screw - Hammer Drive	9045002259	2
C36	Breather	9528P00202	1
C37	Plug - Oil Filler - C/W Dipstick	7598304000	1
C38	Plug - Breather - C/W Dipstick	7598305000	1
C39	Dowel – 8x20	9000869-01	1
C40	Screw – Cheesehead – M5x6	9000594-01	1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8.4 Air Pump

ITEM	DESCRIPTION	PART NUMBER	QTY
D01	Adaptor - Air Hose	0891081000	2
D02	Gasket - Adaptor	0008022000	1
D03	Body - Outer - Air Pump	0008015100	1
D04	Actuator - Air Pump	0008016100	1
D05	Seal - Actuator	0008023000	1
D06	Body - Inner - Air Pump	0008014100	1
D07	Seal - Neck	0008024000	1
D08	Valve - Air Pump	0008211000	3
D09	Clamp - Valve	0008209000	3
D10	Seal - Wiper	9140035070	1
D11	Seal - Distributor	9171044100	1
D12	Carrier - Seal	1589100000	1
D13	Circlip	94D130050A	1
D14	Pedestal - Air Pump	7598257000	1
D15	Gasket - Pedestal	1589101000	1
D16	Bearing	930144-001	1
D17	Stud - M6x20	9036060204	6
D18	Nut - Hex - M6	9025060004	6
D19	Washer - Spring - M6	9030060229	6
D20	Screw - Hex. Hd - M8x30	9000080301	8
D21	Nut - Hex - M8	9025080004	8
D22	Washer - Spring - M8	9030080229	12
D23	Washer - Plain - M8	9030080024	8
D24	Screw - Cap - Hex. Skt - M10x35	9005100352	1
D25	Washer - Belleville - M10	9030100359	1
D26	Screw - Csk.Hd - Hex. Skt - M6x16	9009060160	3
D27	Screw - Cap - Hex.Skt - M10x25	9001040-01	4
D28	Washer - Bearing	0008100000	4
D29	Screw - Cap - Hex.Skt - M8x25	9005080250	4