SELWOOD D80

Operating and Service Manual

The products of Selwood Limited, are designed, developed and produced in the company's Chandler's Ford factory. Many features are covered by world-wide patents. Product names such as Spate, Simplite and Seltorque, are registered trade marks.

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.

Your attention is drawn to the following symbols used throughout this manual:-

CAUTION
This caution symbol draws attention to special instructions or procedures that, if not correctly followed, may result in damage to, or destruction of equipment.

WARNING
This warning symbol draws attention to special instructions or procedures that, if not strictly observed, may result in personal injury.

WARNING
A WARNING SYMBOL WITH THIS TYPE OF TEXT DRAWS ATTENTION TO SPECIAL INSTRUCTIONS OR PROCEDURES WHICH, IF NOT STRICTLY OBSERVED MAY RESULT IN SEVERE PERSONAL INJURY, OR LOSS OF LIFE.

Additional copies of this manual are available from Selwood Pt No 0808026000

Published by Selwood Limited

Instructions for Ordering Replacement Parts

1. Always quote the pump serial number located on the plate fastened to the bearing and air pump mechanism housing.
2. Always quote the part number(s) (ten digit) of the component(s), NOT the item number(s).
3. Always quote the description of the component(s).

Items usually supplied together as sub-assemblies will have the sub-assembly part number printed at the bottom of the relevant page.

Addi

HEALTH AND SAFETY AT WORK 1974

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 our products.

We take every care to ensure 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 operational and safety requirements leaflet P769 which accompanies each pump on despatch from our premises.

Our products also conform to the E.E.C. Machinery Safety Directive and carry the C.E. mark.

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**.

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SAFETY PRECAUTIONS

WARNING
ALL ITEMS IN THIS SECTION, IF NOT STRICTLY OBSERVED, COULD RESULT IN SEVERE PERSONAL INJURY OR LOSS OF LIFE.

1. Use only lifting equipment of suitable capacity for the size and weight of the equipment being lifted
2. The equipment must always be lifted using safe working practices and in accordance with any local and national guidelines or statutes. If in doubt, consult Selwood Pumps or a local lifting expert.
3. Whilst lifting the unit keep personnel well away and ***never*** allow people underneath.
4. Personnel working on the pump must always wear clean, correctly fitting clothing and safety footwear. Clothing impregnated with oil or fuel can constitute a health hazard through prolonged contact with the skin and may also constitute a fire hazard.
5. Check the type of liquid that the pump has been employed on before working on them. Residues could be hazardous to your health. If in doubt, flush thoroughly with clean water before commencing work.
6. Rotating equipment presents a hazard in itself. Alert surrounding personnel before starting and post notifications whilst in operation.
7. Moving parts are guarded to protect you. Guards removed for maintenance must be replaced before starting the pump.
8. Never insert anything into the pump body whilst the pump is running and the suction or delivery hoses are disconnected.
9. Use all flange bolt holes and ensure the correct bolt size and quality is utilised when connecting suction and delivery hoses.
10. Collapsible hoses must never be used on the suction side of the pump.
11. Keep the hose end suction area free from debris. Although the pump can handle solids up to the size indicated in the Technical Data section of this manual, larger or irregular solids may cause blockage with damage to pump components.
12. Always allow adequate ventilation for the pump driver. Diesel engines require air for both combustion and cooling. This air must never be allowed to re-circulate.
13. Be aware of burn and fire risks from items such as exhaust pipes and silencers. Never place flammable items around the unit.
14. Liquid pressure may still be present even after shutdown of the pump. Particular attention should be paid to delivery lines that are long, or rise through any height, as these can contain large volumes of liquid. These lines must be isolated and drained down before commencing work. Sudden release of this liquid can cause serious injury to an operator either directly or indirectly through the rotational motion it can induce.

WARNING! Delivery hose and any associated pipe work should be capable of withstanding the maximum system operating pressure. Selwood recommend the minimum pressure rating of 6 Bar hose. Suction hose should be of the non-collapsible variety.

WARNING! The pump should only be operated within the speed and pressure limits detailed in Section 1.8 of this manual.

1. If there is a danger of freezing, the fluid, normally retained within the pump between operating cycles, should be drained off through the drain taps provided.
2. **WARNING!** Never start or run the pump against a closed delivery valve. Failure to comply may result in damage to the unit or personal injury.
3. **WARNING!** Noise level at operator position (Start Panel) may exceed 80dB(A). Hearing protection must be worn at all times when the unit is running. Failure to comply may result in hearing damage or loss.

SELWOOD D80

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1 GENERAL INFORMATION

1.1 Installation

1. The pump unit and its associated baseplate or trolley mounting should be positioned on a firm horizontal platform, and in the case of portable units restrained from accidental movement.
2. If the pump is fitted with push-on type suction and delivery spigots the hoses must be firmly secured on these spigots with heavy duty clamps or clips capable of withstanding the system operating pressure.
3. The integrity of the hose clamping arrangements should be checked at regular daily intervals in the case of static installations or whenever the pump is repositioned in the case of portable units.
4. Similar precautions should be taken with clamps securing multiple lengths of hose on installation where long delivery and suction lines are involved.
5. Delivery hose and any associated pipework should be capable of withstanding the maximum system operating pressure. Suction hose should be of the non-collapsible variety.

1.2 Operation

1. The pump should only be operated within the speed and pressure limits detailed in the operating handbook for the model in question.
2. If there is a danger of freezing, the fluid normally retained within the pump between operating cycles should be drained off through the drain taps provided.
3. Where protective caps are used to prevent damage to the suction and delivery spigots during storage or in transit they must be removed before the pump is started up.

1.3 Maintenance

1. Inspection and maintenance procedures are detailed in the operating and servicing manual for the model in question.
2. Replacement parts. Only the manufacturers or factory approved components should be used as replacement parts and where necessary they should be fitted with the assistance of the special purpose tools indicated in the operating and servicing manual.
3. All maintenance work must be carried out with the pump and engine/motor stationary.

1.4 I.C. Engines

1. Where I.C. engines are used to power the pump they have been mounted in accordance with the engine manufacturers recommendations and adequate guarding provided between the pump and engine.
2. **Exhaust and Exhaust Pipes.** If there is a risk of accidental contact by operators. The exhaust system should be lagged or screened and the outlet directed away from operators or other persons likely to be nearby. Direct contact with flammable materials of all types must be avoided. The importance of adequate ventilation to ensure removal of exhaust fumes when engines are operated in enclosed or covered accommodation cannot be over-stressed. Engines should not be run in hazardous explosive atmospheres.
3. **Access and Operation.** Ensure that the operator can start, control and stop the engine easily by making all controls readily accessible. Fit remote controls if access is difficult. Follow the instructions laid down in the engine manufacturer's Operators Handbook for starting, operating and stopping procedures.
4. **Fuel.** In addition to the fire hazard associated with fuel and lubricating oils, preventative action is necessary with respect to leakage, contamination and bodily contact.
5. **Electrical Connections.** It is essential that earth terminals are connected with an absolutely sound earth point and care should be taken to ensure that the correct sized conductors are selected to suit the current and distance to be carried.

1.5 Fitting Instructions for Centaflex Couplings (Diesel Engines)

IMPORTANT NOTES – OBSERVE STRICTLY:

The Centaflex Coupling Assembly is supplied in a pre-assembled state and must be fitted to the pump drive shaft and engine flywheel in this state. On no account should any of the components that make up the coupling assembly be dismantled unless it has become necessary to service one of the component parts. Typically, the most likely component to require replacement will be the rubber element and servicing of this item is explained in Section 1.5.3 below.

The coupling assembly consists of a central steel hub whose outside diameter locates within a bore of a rubber element and is secured within the element using three cap screws that pass radially through its outer diameter. In turn, the rubber element locates onto three horizontal pins, equally disposed on a PCD and each secured to the face of a steel adaptor plate with cap screws. The cap screws securing both the central steel hub and the horizontal pins are torque tightened to the values shown in the table in Section 1.5.2 below.

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The rubber element itself is free to slide on the horizontal pins. It is therefore unnecessary to remove the cap screws that secure the pins unless the pins themselves have become damaged.

1.5.1 Preparation of the Centaflex Coupling for Pump Removal

NOTE: Before commencing, mark the position of the coupling assembly on the pump drive shaft. Pay particular attention to the size of the gap between the back of the rubber element and the face of the steel adaptor plate. This gap has been factory set and is maintained when the setscrew in the steel hub is locked in position.

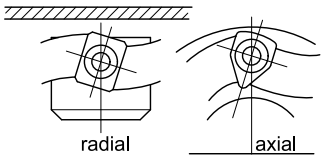
1. In order to allow the pump drive shaft to be withdrawn from the steel hub of the coupling, it will be necessary to loosen the setscrew located in the outside radius of the steel hub just in front of the rubber element. The setscrew clamps the coupling assembly onto the top of the pump drive shaft key and it is not necessary to completely remove this screw.
2. Once the setscrew is loose the pump drive shaft is free to be withdrawn from the hub of the coupling. Note too that when the setscrew is loose the coupling assembly is free to slide in either direction onto the pump drive shaft or onto the horizontal pins.

1.5.2 Centaflex Coupling Assembly Sequence

1. The radial and axial screws connecting the rubber element to the hubs must all be tightened to the torque given in the table below, using a torque wrench.

Centaflex Size	Screw Size	Tightening Torque	
		Nm	kgf.m
8	M10	50	5,13

2. Tightening with a torque wrench is particularly important. Tightening by feel will not do as experience has proved the tightening torques in such cases are far too low. Tightening torques which are too low will inevitably lead to slackening of the screws in service and consequently to the destruction of the coupling.
3. Ensure that on tightening the screws, the aluminium bushes in the rubber part are not twisted at the same time, but sit straight. In order to reduce friction between the screw head and the aluminium part, a small amount of grease should be applied under the head of the screw before fitting.
4. If necessary, use a suitable tool for applying counter pressure on the element to prevent twisting of the rubber part during tightening of the screws. This is particularly important with radial screws, otherwise the cylindrical faces between the aluminium insert and the hub will not engage on the full area, but only on two corners. This will inevitably lead to slackening of the screws and subsequent destruction of the coupling. If the coupling is supplied in a pre-assembled state do not dismantle it, but fit it in this condition.



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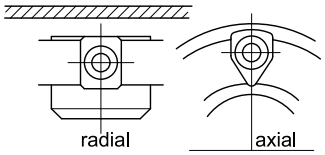

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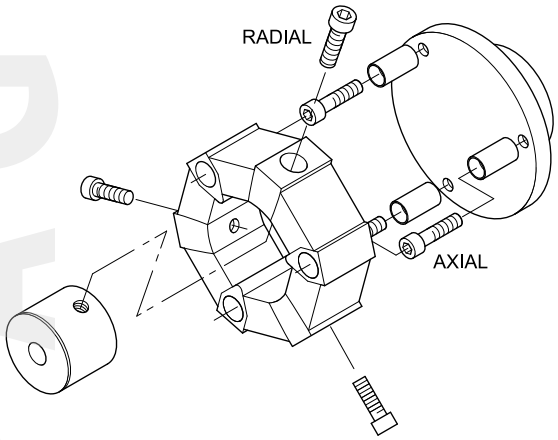
1.5.3 Replacement of the Steel Hub and Rubber Element

NOTE: Once the Centaflex coupling has been prepared in accordance with Section 1.5.1 above, it is free to be removed from the horizontal pins on the face of the adaptor plate.

1. If it becomes necessary to replace either the steel hub or rubber element, the three radial caps screws must be removed in order to separate the two components. When removing these cap screws it is recommended that the coupling assembly remain on the horizontal pins for ease of their removal.



2. Once the three radial screws are removed, the steel hub can be separated from the rubber element. Also at this stage the rubber element can be removed from the horizontal pins of the adaptor plate.
3. Replace the rubber element and/or steel hub as necessary to refurbish the assembly.
4. Fit the rubber element onto the horizontal pins of the adaptor plate.
5. Insert the steel hub into the centre of the rubber element and align the radial mounting holes with tapped holes in the hub.
6. Fit the three radial cap screws in accordance with the instructions at Section 1.5.2.

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7. The coupling assembly is now prepared for the replacement of the pump.
8. Once the pump drive shaft is engaged in the coupling hub bore, set the position of the coupling assembly to that previously marked when Section 1.5.1 was performed.
9. Tighten the setscrew that locks the steel hub of the coupling assembly to the pumps drive shaft key.

1.6 Electric Motors

1. All electrical connections should be made through adequately rated conductors and starters. Isolators and other associated switchgear should be of adequate capacity for the imposed power loadings. All work should be carried out by a competent person or electrician to BS7671 latest revision.
2. All electrical equipment should be adequately earthed.
3. Isolate the power supply before carrying out any commissioning, servicing or maintenance work on the pump or electric motor.
4. Where electric motors are to be operated in hazardous or explosive atmospheres they should be of the flameproof enclosure type appropriate to that atmosphere.

You are requested to take such steps as are necessary to ensure that this information is made available to all those involved with the use of our products. This information must be made available not only to your own employees at their workplace, but also to anyone who may purchase or otherwise acquire (hire) such products for use in his own workplace.

It is our intention constantly to review our obligations under the Health and Safety at Work Act and we will be issuing from time to time further information with regard to the safe application, use, inspections, and service associated with our products.

1.7 Fitting Instructions for Fenner Couplings (Electric Motors)

1. Adjust position of pump on chassis until the inside faces of the coupling flanges are parallel to each other. The distance between the faces should measure 33mm (1 1/4") max. Whilst adjusting the pump's position, it is also necessary to achieve alignment of the shaft centre-lines within 1.5mm (1/16") of each other by laying a straight edge cross the two flanges at several positions around their circumferences. Fully tighten the nuts immediately the coupling flanges are correctly aligned. Recheck alignment after tightening.
2. The flexible coupling assembly should now be completed. Open-out the tyre and fit over the coupling flanges ensuring the tyre beads seat properly on the flanges. To ensure proper seating, it may be necessary to strike the outside diameter of the tyre with a small mallet. When seated there should be a gap between the ends of the tyre of about 1/8" (3mm). Tighten clamping ring screws in flange alternately and evenly (approximately half a turn per screw) working round the flange until 15Nm (1. 5kgf m) torque is achieved.

1.8 Selwood D80 Standard Data

Capacity D80	90m^3/h
Delivery Head	23m
Self Priming Lift	9.1m
Solids Size	29m sphere
Air Handling Capacity	4.25 l/s
Pump Speed Max	2000rpm
Port Size BS EN 1092-2:2002 PN6	80mm

2 ROUTINE MAINTENANCE

Lack of routine maintenance is the most frequent reason for the break-down of pumps. We earnestly advise users to ensure that at least the following actions are taken.

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 the pump if significant quantities of water escape through the exhaust valve of the air pump. This pump is designed to handle 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, it must immediately be serviced if the level of oil in the flushing chamber varies daily, or if the oil becomes contaminated with the pumped fluid.
5. A hose strainer should always be fitted to the free end of the suction line if there is a possibility of over-sized solids entering the pump. The dimensions of rocks, pebbles, etc., must not exceed 29mm. Larger soft solids, however, of the type found in abattoir duties, for example, will pass freely through the pump. Refer to Selwood Pumps if in need of advice in this connection.

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6. As loss of prime and indeed loss of on-stream performance can easily arise as the result of leaking pipe-work joints, we recommend that all line fittings associated with the pump should be checked periodically for air-tightness.
7. It is most Important to use the correct fuel oil in the engine. Make sure that it is appropriate for the weather conditions (summer or winter) and that it is clean and free from water and foreign matter. Unsatisfactory running performance, excessive wear and damage can all result from the use of an Incorrect or contaminated fuel.
8. Periodically check the tension of all nuts and bolts, especially those securing the engine and pump to the chassis.
9. Pump servicing must always be carried-out in accordance with the instructions given in this manual. Only components supplied and approved by Selwood Pumps should be used. It is advisable to hold a small stock of spare parts to cover break-down circumstances. The Company will be pleased to give advice in this connection.
10. Engine servicing must always be carried-out in accordance with the instructions given in the manufacturer's manual. Do not hesitate to contact Selwood Pumps if the need for further advice arises.
11. Please contact Selwood Pumps in the event of experiencing difficulty when servicing. The company will also be very pleased to give advice in connection with the machine's installation, operation and maintenance.
12. All practical work must be carried-out in compliance with the Health and Safety at Work Act, 1975. Always start the engine in accordance with the manufacturer's instructions.

NOTE: If the above advice is followed, the likelihood of an expensive break-down will be greatly diminished. The pump should give a long and trouble-free life if these measures are put into effect.

3 LUBRICATION AND FASTENING TORQUES

3.1 Pump Lubrication

It is most important to maintain the correct levels of oil in the flushing chamber and bearing housing, and to ensure that the oil is of the recommended quality and is free from contamination. Selwood recommend the use of the following BP/Castrol or Shell products, which should be applied as per the following table. In some territories, the following grades may be known under differing trade names, please contact Selwood if problems occur in identifying the correct product.

COMPONENT	GRADE
ENGINES	BP C5 Global Shell Rimula X 15W-40
Bearing Housing	BP C5 Global Shell Rimula X 15W-40
Flushing Chamber	BP C5 Global Shell Rimula X 15W-40
Actuator Bore	Castrol Rustilo 431 Shell Ensis Compound
Impeller Bore	Castrol Rustilo 431 Shell Ensis Compound
Paper Gaskets	BP Energrease LS-EP2 Shell Alvania EP LF 2
Axle Shafts	BP Energrease LS-EP2 Shell Alvania EP LF 2
M10 Screws - Port Plate to Diffuser	Castrol Optimoly Paste HT

COMPARTMENT	SERVICE/DRAIN	
	CHANGE OIL & FILTERS	CHECK & TOP UP
Engine YANMAR 2TNE68	250 Hours	Daily
Bearing Housing Flushing Chamber	250 – 500 Hours	Daily
Actuator Bore Impeller Bore Shaft Sleeve Bore	ON ASSEMBLY	-
Paper Gaskets	ON ASSEMBLY	-
Axle Shafts Axle Pivot Assembly	6-12 Months	-
M10 Screws - Port Plate To Diffuser	ON ASSEMBLY	-

3.1.1 Commissioning Period

Drain both pump chambers and engine within 50-100 running-hours of commissioning either a new, or rebuilt pump, and refill with new oil to level plugs.

Flushing chamber capacity about 3.4 litres (6 pints).

Bearing housing capacity about 2.3 litres (4 pints).

Engine sump – Refer to Engine Instruction book.

3.1.2 After Commissioning Period

If the pump is driven by a diesel engine, the oil in both pump chambers should be drained and renewed simultaneously with the time schedule laid down by the engine manufacturer. This will usually require the pump oils to be drained and replaced every 250 running hours. Under no circumstances should the period for the pump exceed 500 running hours.

3.2 Fastening Torques

Failure to tighten threaded fasteners correctly can easily lead to assembly breakdown. It is very important, therefore, when carrying-out the instructions in this manual, to achieve the appropriate tensioning torques. In some cases, specific requirements are described in the instructions which must always be implemented. The following torques, in particular, must be applied.

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Item	Tightening Torques	
	lb ft	kgf m
M16 Lifting frame to Chassis Fixings	180	25
(D36) Actuator Cap Screw	42	5.5
(A22) Cap Screw M12 9005120552	60	8.3
M12 Engine & Pump to chassis fixings	72	10
Air Pump Pedestal Cap screws	25	5.8

4 CONDITIONS OF WARRANTY

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

For full terms and conditions please contact Selwood Ltd.

5 MAJOR SERVICING

5.1 Air Pump Maintenance

5.1.1 Delivery and Suction Valves

Failure of the pump set to prime quickly or to discharge the expected volume of air, may simply be due to faulty valve operation.

To inspect and service, proceed as follows:

1. Remove hoses from suction adaptor (A03) and exhaust adaptor (A03) spigots after loosening relevant hose clips.
2. Note orientation of both suction adaptor (A03) and exhaust adaptor (A03) before commencing. Remove both suction and exhaust adaptors by releasing nut (A05) and spring washers (A06). Remove gasket (A30) between suction adaptor and air pump outer body (A15), it is recommended that this item be replaced by new gasket on reassembly.
3. The exhaust valve (A07) can now be inspected. To replace the valve rubber if damaged, remove hex. Soc. C's'k. head screw (A04) which will relase valve clamp (A08) and valve rubber (A07). Check and clean if necessary, valve seat and clamp and reassemble by reversing procedure. Ensure valve rubber is fitted correctly i.e. flat face against valve seat.
4. The exhaust adaptor (A03) may now be refitted by reversing procedure in instructions 1 & 2. Ensure that hose spigot is clean and in correct orientation to refit hose and tighten clip.
5. The suction valve is situated inside the outer air pump body (A15) and may be inspected by releasing 8 hex. Hd. Screws (A14), nuts (A13), spring & plain washers (A11) & (A12). The outer body (A15) may now be lifted off to expose the suction valve. If the valve needs replacement follow procedure for exhaust valve as instruction 3.

NOTE: It is advisable to inspect both actuator seal and actuator valve (A07) while the outer body (A15) is removed. See Sections 5.1.2 & 5.1.3 for procedure.

6. To reassemble outer body (A15) together with suction adaptor (A03), reverse procedures in instructions 5,3 & 1. Ensure that 8 hex. Screws (A05) are tightened sequentially in small increments to give an even clamping force on actuator seal. Ensure also that suction adaptor hose spigot is clean and in correct orientation to fit hose.

NOTE: To give a vacuum tight seal it is recommended that gasket (A30) is renewed.

5.1.2 Actuator Valve

Malfunction of the actuator valve may also contribute to loss of priming efficiency, to inspect proceed as follows:

1. Remove outer air pump body (A15) as section 5.1.1 Instruction 5. This will expose the actuator (A20) and actuator seal (A18). To access the valve (A107) remove the actuator and seal in situ by following the procedure in section 5.1.3 Instructions 1 & 2. If actuator seal is suitable for continued use, handle with care th avoid cutting or damaging surfaces. On removal of actuator (A20), valve (A07) will be exposed for inspection. To replace valve follow procedure in Section 5.1.1 Instruction 3.

NOTE: It is advisable to check condition of actuator seal whilst it is exposed. See Section 5.1.3 for service and/or replacement.

2. To refit the actuator and seal follow procedure in Section 5.1.3 Instructions 4,6,8,9 & 10.

5.1.3 Actuator Seal (A18)

A further reason for the pump set failing to prime efficiently or to handle the expected volume of air, could be a faulty actuator seal (A18).

To inspect and service, proceed as follows:

1. Remove outer pump body (A15) complete with exhaust valve assembly. Remove actuator screw (D36).
2. Set actuator to top dead centre (maximum distance from inner pump body), by rotating engine shaft with starting handle. Using a tool that will not cut the rubber (such as a blunt screwdriver) and a lubricant (soap solution), remove actuator seal (A18) by prising it from the inner pump body (A19). Remove actuator (A20) complete with seal from drive rod (D37).

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3. To renew actuator seal (A18) remove failed component from actuator, insert firstly one side and then the other into the actuator groove, using a blunt tool that will not cut the rubber.

NOTE: The seal is handed and will not enter the inner pump body (A19) if fitted the wrong way round.

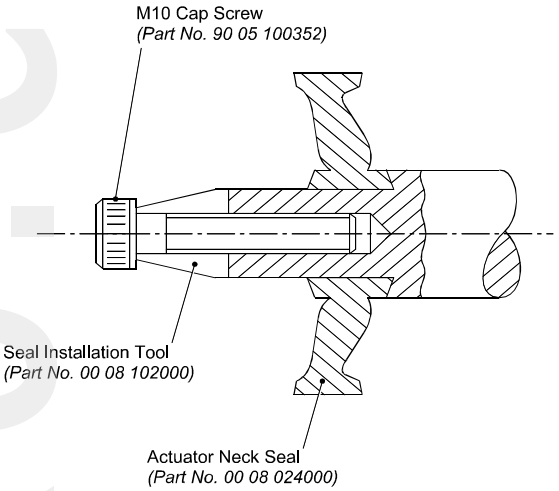
4. The correct assembly position for actuator seal (A18) is with the smaller diameter of its conical outer surface towards the inner pump body (A19). It will be seen that the housing in the body is tapered in the same direction as the external surface of the seal.
5. At this stage it is advisable to examine the condition of actuator neck seal (A21). This component should be replaced if any splits are evident on its visible surface. Refer to Section 5.1.4 Actuator Neck Seal (A21).
6. Smear soft soap on the outside section of new actuator seal (A18). Lightly grease actuator bore. Position actuator/seal assembly on drive rod (D37), locate actuator screw (D22) and washer (A23) and tighten to 42lb ft torque.
7. Before fitting outer pump body (A15) reciprocate the actuator by fitting and rotating the engine's starting handle about ten times to encourage centralisation of the connecting rod bearings. During this procedure, the actuator seal (A18) is likely to rotate slightly in the inner pump body (A19). Stop shaft rotation when actuator is at bottom dead centre (minimum distance from inner pump body).
8. Seat outside section of actuator seal in inner pump body recess by gently tapping with a non-metallic mallet.
9. Replace outer pump body assembly, and fit and evenly tighten screws (A14) washers (A13) spring washers (A12) and nuts (A11), by sequentially turning each screw a small amount until they are all fully tightened. It is important that the outside diameter of the actuator seal (A18) should be clamped evenly.

5.1.4 Actuator Neck Seal (A21)

Another reason for the pump set failing to prime efficiently or to handle the expected volume of air, could be failure of the actuator neck seal (A21).

To investigate and service, proceed as follows:

1. Remove outer pump body (A15) complete with delivery valve assembly, and actuator (A20) with actuator seal (A18) as directed in Section 5.1.3 Instructions 1 and 1.
2. Release hose clip (A02) allowing air hose to be disconnected from suction adaptor (A03). Screws (A22) should then be removed, leaving washers (A23) in inner pump body (A19).
3. The inner pump body can now be pulled by hand from the bearing housing, if necessary twisting to overcome any tendency of the seal (A21) to stick to drive rod (D37). Remove and discard failed seal.
4. Smear new actuator neck seal (A21) with soft soap to assist fitting, position in inner pump body (A19) and push both components over drive rod (D37) using assembly tool (Part No. 0008102000) smeared with soft soap. Check that washers (A23) are in place, and fit and fully tighten screws (A22). The heads of these screws should be fully contained within the recesses in the inner pump body.



5. Reassemble remaining components in accordance with Section 5.1.3 Actuator Seal (A18) Instructions 6 to 9, inclusively.

5.1.5 Drive Rod Seal Assembly and Bearing (A25 and A28)

If oil leaks from ports in housing (A24) it is probable that seal assembly (A25) is excessively worn. Such a condition may also indicate that drive rod bush (A28) should be replaced.

To inspect and service, proceed as follows:

1. Drain oil from bearing housing by removing filler cap (D08) and drain plug (D13). Ensure correct drain plug is removed.
2. Remove air pump components in accordance with Section 5.1.3 Actuator Seal (A18) Instructions 1 and 1, and Section 5.1.4 Actuator Neck Seal (A21) Instructions 2 and 3.
3. Remove 6 nuts (A11), spring washers (A12) & plain washers (A13) securing pedestal (A24) to pedestal (D06).
4. Being careful not to damage the flat sealing faces of housing (A24), carefully withdraw housing complete with its bearing and sealing components from pedestal (D06) and drive rod (D37).
5. Examine condition of wiper seals (A25) together with bearing. If either are worn or damaged, we recommend that a new housing (Part No. 0008905000) complete with seal assembly and bearing (A28) should be ordered and fitted. However, individual components can be renewed in accordance with the following instructions.

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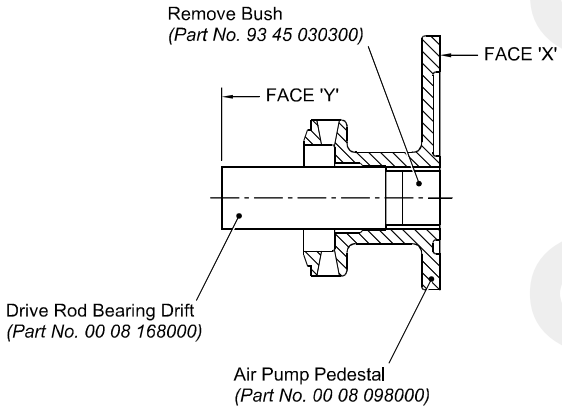
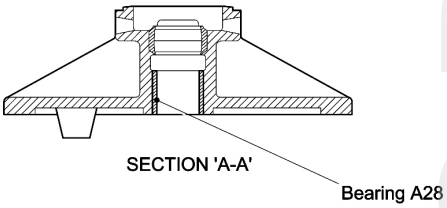
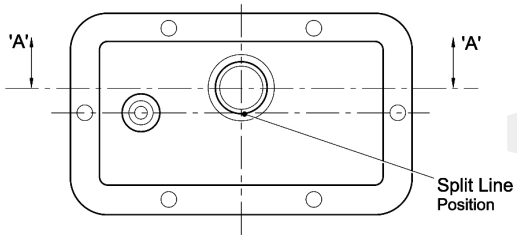
6. To replace drive rod bearing (A28) Use service tool PT. No 008168000 to remove old bearing from pedestal HSG (D06) being careful not to damage bores. Install new bearing using service tool PT No. 0008168000. Press bearing flush to HSG with split line as shown in diagrams.

   a) Insert shouldered end of drift into bush as shown. Support air pump pedestal evenly of face 'x' leaving sufficient clearance for bush to emerge freely. Push out bearing bush by pressing or striking on tool face 'Y'.

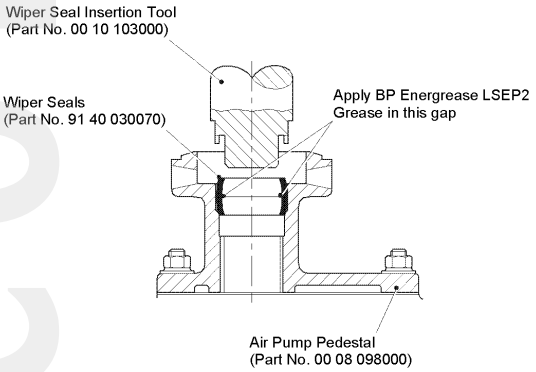






7. Ensure that seal components are assembled in accordance with the following instructions.

   a) The wiper seals (A25) should be pressed in position using insertion tool 0010103000. Ensure seal orientation is correct. See diagram below.



8. Before replacing bearing/seal housing assembly, check condition of drive rod, particularly if new bush (A28) has been fitted. If surface is significantly worn, the drive rod should be replaced in accordance with instructions given in Section 5.4.2.

9. Assembly tool (Part No. 0015101000) must be used when replacing bearing/ seal housing assembly to ensure that the wiping edges of the seal assembly (A25) are not damaged. The drive rod must be smeared with clean oil to assist this procedure. See Section 6.5. Gasket (A27) must be renewed, always use a component supplied by Selwood Pumps.

10. Reassemble remaining pump components in accordance with Section 5.1.4 Actuator Neck Seal (A21) Instruction 4 and Section 5.1.3 Actuator Seal (A18) Instructions 6 to 9, inclusively.

11. Replace drain plug (D13) and refill bearing housing (D06) with clean oil to level of plug (D08) and replace plug together with 'O' ring (D07). Refer to Section 3.1 Pump Lubrication for details of the oil required for the Bearing Housing.

5.2 Separator Maintenance

5.2.1 Float (B11)

If water in significant quantities continuously passes through the exhaust valve (A07) of the air pump, it is probable that the float (B11) is in need of replacement.

To inspect and service, proceed as follows:

1. Disconnect air hose (A41) by loosening hose clip (A42)
2. Remove nuts (A11) and washers (A12) and lift off separator cap (B01) complete with peel valve/upper diffuser assembly, (B01) to (B21) inclusively. Examine condition of float (B11) and replace with new component if punctured or significantly worn.
3. Check condition of peel valve rubber (B21) and bush (B07) replacing them, if necessary, in accordance with advice commencing at Section 5.2.2 Peel Valve (B21).
4. Also check for deposits of solids likely to interfere with the smooth working of the float system.

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5. When fitting a new float, ensure that it is securely tightened against nut (B12). During this procedure, the float should be positioned on the rod so that the operating plate (B15) with its associated peel valve fasteners is just clear of the central clamp-bar screws (B16), when the float is located in the upper-diffuser cone.
6. If all components are seen to be in satisfactory condition, replace separator cap assembly, washers (A12) and nuts (A11). Alternately tighten each nut a small amount to ensure that the cap is pulled down evenly. Do NOT over tighten. Replace air hose and re-tension hose clip (A42).

5.2.2 Peel Valve (B21)

If significant quantities of water are discharged from the exhaust valve (A07) of the air pump, and the float (B11) is in satisfactory condition, it is probable that a fault exists in the peel valve assembly.

To inspect and service, proceed as follows:

1. Remove separator cap sub-assembly (B01) to (B21) and unscrew float (B11) and nut (B12).
2. Release screws (B09) and spring washers (B10) to allow upper-diffuser/valve assembly to be withdrawn.
3. Remove screws (B04) and sealing washers (B05) to allow upper diffuser (B06) to be removed from the port plate sub-assembly.
4. Examine condition of peel valve rubber (B21) and air ports in plate (B03) which it should completely cover when the float is fully raised. If the rubber does not seat correctly, is distorted, or in any way damaged, it must be removed and discarded by releasing screws (B16).
5. To fit new peel valve rubber (B21), carefully clean existing parts thoroughly, especially surfaces of port plate (B03), and clamp bars (B19), and position new rubber on plate. Assemble screws (B16), clamp bar (B19), clamp bar seal (B20), washer (B18) and nuts (B17) in sequence shown on drawing. Alternately tighten each nut a small amount to ensure that even clamping pressure is produced. Correctly tightened nuts will not cause the clamp bar to distort the rubber.
6. Carefully attach the ends of the valve rubber (B21) to the operating plate (B15), noting that the components and method of assembly are identical to those described in Section 5.2.2 Peel Valve (B21) Instruction 5, except that clamp bar seal (B20) is omitted. Again, ensure that the nuts are not over-tightened.
7. After completing Section 5.2.2 Peel Valve (B21) Instructions 5 and 6, check that the peel valve rubber is capable of closing all of the air holes in port plate (B03) when operating rod (B13) is square to the plate and fully lifted.
8. Check condition of bush (B07) in upper diffuser B06) and replace, together with clip (B08) and Nitrile washer (B35) if significantly worn.

NOTE: The operating rod (B13) is normally a slack fit in the bush.

9. Position port plate sub-assembly on upper diffuser (B06), fit washers (B05) after checking that they will seal efficiently and fully tighten screws (B04). Reassemble nut (B12) and screw float (B11) on to operating rod and tighten securely in accordance with Section 5.2.1 Float (B11) Instruction 5.
10. Recheck operation of peel valve rubber (B21) to ensure that it fully covers air ports in plate (B03) when the float is located in the upper-diffuser cone. In this position there should be a gap of 3-5 mm between the heads of the centre clamp bar screws (B16) and the operating plate (B15). Adjust the position of the float on the operating rod to obtain the correct dimension.
11. Examine condition of gasket (B02) and renew, if necessary, before installing between port plate (B03) and separator cap (B01). Fit spring washers (A12) and screws (A11) each of which should be sequentially turned a small amount until fully tightened. Gasket (B02) must be evenly compressed.
12. Replace separator cap sub-assembly in accordance with Section 5.2.1 Float (B11) Instruction 6.

5.2.3 Deposits of Solids[†‡]

When handling liquids containing solids capable of adhering to product wetted surfaces, it is advisable periodically to check the valve system in the separator.

To inspect and service, proceed as follows:

1. Remove separator cap sub-assembly in accordance with Section 5.2.1 Float (B11) Instructions 1, 2 and 3, allowing separator body (B22) together with lower diffuser (B24), to be lifted off the suction tube (B27).
2. Remove any deposits of scale from lower diffuser (B24) and check condition of welds securing its circular bottom to the perforated cylinder. Remove any solids that may have accumulated in the suction tube (B27), renew gasket (B25) and reposition separator-body/lower-diffuser assembly on suction tube.
3. Remove deposited materials from surfaces of upper diffuser (B06) and note, in particular, the condition of welds securing cone and disc to perforated diffuser body. Also examine diffuser bush (B07) and operating rod (B13), and replace if significantly worn in accordance with Section 5.2.2 Peel Valve (B21) Instructions 3 to 11. Remove all deposited solids that would interfere with the free movement of the mechanism, obstruct the passage of air across the port plate holes, or inhibit the flow of water (through the holes in the upper diffuser, for example).
4. Once it is established that all components are in a satisfactory condition and are free from scale,

[†] Use lower Diffuser (Part No. 1594161000) for sludge handling duties. This is recognised by holes in the base as well as around the side.
[‡] Use lower Diffuser (Part No. 0015038000) for other applications where no solids are present which can adhere to the internal surfaces.

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replace separator cap sub-assembly in accordance with Section 5.2.1 Float (B11) Instruction 6. Any re-assembly work carried out on the peel valve assembly should be in accordance with Section 5.2.2 Peel Valve (B21) commencing at Instruction 1.

5.3 Impeller, Mechanical Seal and Delivery Valve Maintenance

5.3.1 Impeller (C04)

Generally speaking, it is only necessary to remove the impeller if the existing component has become severely abraded, or if access to other rotating parts is required.

To remove and replace, proceed as follows:

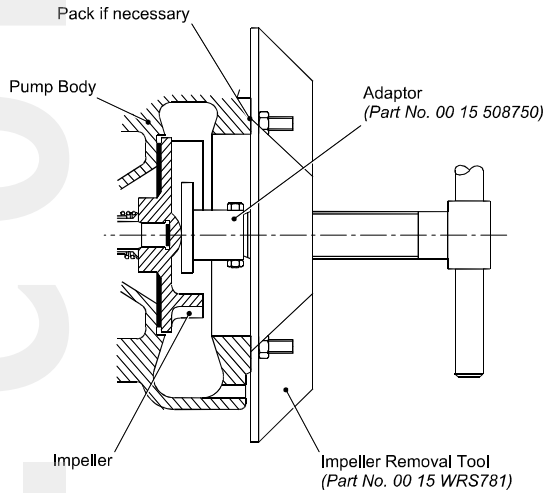
1. Remove air hose item (A41) from separator cap (B01), after loosening hose clip (A42).
2. Remove nuts (A11) and washers (A12), and lift off separator cap (B01) complete with peel valve/upper diffuser assembly, (B01) to (B21) inclusively.
3. Lift separator body (B22) complete with lower diffuser (B24) off suction tube (B27) allowing (dome) nuts (B29) and spring washers (B30) to be released.
4. Withdraw suction tube (B27) and gaskets (B28) after removing nuts (B29) and associated spring washers (B30).
5. Drain oil from flushing chamber by removing filler cap assembly (D08) and drain plug (D13). The condition of the oil will indicate whether or not the mechanical seal has been functioning correctly. If contamination is evident, the mechanical seal must be replaced in accordance with Section 5.3.2 Mechanical Seal (C08).
6. Remove impeller using service tool 0015WRS781. See diagram below for procedure.

   Offer up impeller removal tool across front face of pump volute as shown ensuring the correct nose adapter is fitted. Affix by using existing nuts and washers.

   Lock shaft if not connected to engine.

   Engage adapter in the recesses of the impeller and turn handle anti-clockwise to unscrew impeller.

NOTE: When reassembling impeller ensure threaded end of shaft is coated with **Castrol Rustilo 431 Grease or Approved Equivalent.**



7. Removal of the impeller will allow the mechanical seal spring to expand. Do NOT touch the shaft sleeve (C06) or spring if the mechanical seal has been functioning correctly and only the impeller is to be replaced. Premature failure of the mechanical seal assembly could result if the seal's faces are disturbed by moving the shaft sleeve.
8. Ensuring that the mechanical seal spring is in position, coat end of drive shaft with Castrol Rustilo 431 Grease Or Approved Equivalent, and refit impeller using service tool 0015WRS781. Screw impeller tightly by hand and give tool handle 2 or 3 sharp taps with copper mallet.
9. Use Rustilo 431 on the inside of the pump register. Fit new gasket (B28), position suction tube on studs, fit washers (B30) and fully tighten nuts (B29).
10. Renew gasket (B25), reposition separator body sub-assembly on suction tube, and fit separator cap assembly. Assemble washers (A12) and nuts (A11) and alternatively tighten each nut a small amount to ensure that the cap is pulled down evenly. Do NOT over-tighten.
11. Reposition air hose (A01) on spigot of separator cap (B01) and tighten hose clip (A02).
12. Replace drain plug (D13) using PTFE tape as a sealant, and fill flushing chamber with new oil to level of plug. Replace plug and 'O' ring (D08) and (D07). Refer to Section 3.1 Pump Lubrication for details of the oil required for the flushing chamber.

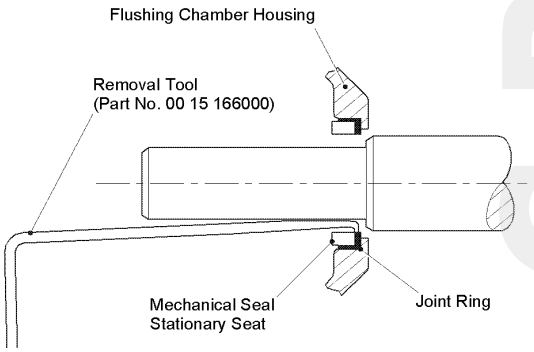
5.3.2 Mechanical Seal (C08)

The mechanical seal should be replaced if the flushing chamber oil continuously leaks into the pumped fluid, or if the oil becomes contaminated with the product. This latter condition is sometimes indicated by leakage of fluid out of a breather cap (D12). Under extreme conditions, pumped fluid may be seen escaping out of the vent at the bottom of bearing housing (D06).

In the event of abrasive materials being detected in the oil, it is likely that lip seal (D04) will have become worn and necessitate replacement in accordance with Section 5.4.3 Bearings and Lip Seal (D15, D18 and D04).

Daily checks on oil condition should ensure that seal failure is detected before damage occurs to related components. If the mechanical seal leaks, proceed as follows:

1. Drain oil from flushing chamber HSG section of bearing by removing its filler cap (D08) and drain plug (D06).
2. Remove impeller (C04) in accordance with Section 5.3.1 Impeller (C04) Instructions 1 to 7 inclusively, and remove impeller key (C05).
3. Withdraw shaft sleeve (C06) together with rotating mechanical seal parts and spring. It is likely that (C07) will be withdrawn with the sleeve remove it and check condition. Replace 'O' ring if unsuitable for further service.
4. Using seat removal tool (Part No. 0015166000), withdraw mechanical seal stationary seat from its housing in pump body (C09). Also remove the seat's rubber joint ring. (See Section 6.3).
5. Ensure oil is drained from flushing chamber. Remove impeller and shaft sleeve, complete with rotating mechanical seal components.
6. Engage tip of removal tool on inside face of seat. Remove seat by pulling evenly at several peripheral points.
7. Joint ring can then be collapsed and discarded.



8. The rotating parts of mechanical seal (C08) should now be removed from the shaft sleeve and discarded, taking care not to damage the sleeve's surfaces. This operation should be carried-out by hand using a tool that will not scratch the sleeve.
9. Once removed, examine condition of sleeve and replace with new component if unacceptably corroded or worn.

IMPORTANT ADVICE

New mechanical seal components must be handled with great care. In particular, the seal faces must not be touched by hand and must only come into contact with clean soft paper that is free from abrasive materials. Premature seal failure is likely to occur if this advice is not heeded.

10. Thoroughly clean recess in pump body (C09) and also the surrounding surfaces. Smear lubricant (soft soap or washing-up liquid, but not grease) in recess and also on outside diameter of rubber joint ring. Using several layers of clean soft paper to protect the seating face, press seat into recess by applying even finger-pressure. Make sure that the highly-polished sealing face is on the impeller side of the recess, that the new joint ring has been used, and that the seat is positioned directly against the shoulder at the bottom of the recess.
11. Smear lubricant on drive shaft diameters and 'O' ring (C07). Position 'O' ring on shaft. If a new shaft sleeve (C06) is being used, ensure that it is capable of sliding freely along the shaft and correctly trapping the 'O' ring in the recess provided.
12. Smear lubricant (soft soap) on outside diameter of shaft sleeve (C06) and inside diameter of rubber drive band. Protect the highly polished face of the seal with several layers of clean soft paper, and slide seal assembly onto sleeve using finger pressure only - USE NO TOOLS. The seal must be positioned so that the carbon face is about 3mm past the non-flanged end of the sleeve.
13. Within a few minutes, to ensure that the lubricant has not set, slide sleeve seal assembly onto shaft (seal face towards stationary seat) and press into working position using only the sleeve's flange. This procedure automatically causes the seal head to slide along the sleeve into its correct working position. Ensure that 'O' ring (C07) is correctly trapped in sleeve recess (C06) and that sleeve abuts against shoulder on shaft.
14. Push mechanical seal spring onto location diameter provided on seal head. Ensure that the spring's coils are correctly supported by the flange of sleeve (C06) and will not become trapped between the flange and the impeller (C04) Refit key (C05) and impeller in accordance with Section 5.3.1 Impeller (C04) Instructions 8 to 10
15. Replace remaining components in accordance with Section 5.3.1 Impeller (C04) Instructions 9 to 14, inclusively.

5.3.3 Delivery Valve, (C27)

Failure of the pump set to pump under suction lift conditions could be due to a fault in the delivery valve assembly.

To inspect and service, proceed as follows:

1. Ensure that pump has been shutdown and the delivery line has been drained.
2. Release T-bolt (C19), swing locking bar (C22) clear, and remove inspection panel (C24) and gasket (C25). It now becomes possible to lift the valve by hand to expose the valve seat (C16) so allowing foreign matter to be removed. Also undertake a preliminary check of the condition of the valve rubber.
3. If further disassembly is required, remove screws (C29), allowing clamping bar (C28) and delivery valve (C27) complete with valve plates (C26) and (C30) to be removed.
4. Separate upper and lower valve plates (C26) and (C30) by removing nut (C31) and bolt (C34), examine condition of rubber (C27), especially

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along the hinge line and seating surface. Discard if damaged or mis-shapen.

NOTE: If valve seat has been damaged delivery valve chamber (D18) will need replacement as seat is integral.

5. Reassemble components in reverse order, renewing gaskets (C17) and (C25) if necessary. Ensure that the radiused edge of clamping bar (C28) is adjacent to hinge line of valve rubber (C27) and that each screw is tightened a small amount so as to produce an even clamping pressure. Correctly tightened screws will not cause the clamp bar to distort the rubber. Seal screws with Loctite 572. Ensure roll pins (C30) are in position on inspection panel (C24).

NOTE: lock nut (C31) should be replaced with new item on reassembly.

5.4 Maintenance of Flushing Chamber, Air Pump Mechanism, Drive Coupling, Drive Shaft Bearings and Lip Seal

5.4.1 Flushing Chamber (D33)

Leakage of oil through the vent at the bottom of flushing chamber (D06) could be due to failure of either of the lip seals (D04). If the pumped liquid also leaks through the vent, the mechanical seal (C08) will require to be replaced in addition to its adjacent lip seal (D04).

In any of these events, proceed as follows:

1. Drain oil from flushing chamber and bearing housing by removing filler caps (D08) and drain plugs (D13) and (D34).
2. Remove separator assembly and suction tube (B27) or (B35) in accordance with Section 5.3.1 Impeller (C04) Instructions 1 to 4, inclusively.
3. Remove impeller (using service tool 0015WRS781 as described in section 5.3.1) mechanical seal spring, and shaft sleeve (C06) complete with mechanical seal parts (C08). Handle the sleeve and mechanical seal with great care and store in a safe place, particularly if these parts are to be reused.
4. Remove split guard fitted around flexible coupling, and release all of the coupling's fasteners allowing the rubber tyre to be removed.
5. Attach lifting equipment to bearing housing and pump body in compliance with requirements of Health and Safety at Work Act, 1975.
6. Remove nuts, bolts and washers securing pump to chassis and hoist clear, carefully noting the positions of any shims between pump feet and chassis.
7. Lower unit onto working surface and, in compliance with Health and Safety at Work Act, 1975, tip pump onto ends of studs (C10) ensuring that they are suitably protected from damage.
8. Remove nuts (A11) and spring washers (A12) and carefully separate bearing housing/flushing chamber assembly from pump body (C09). During this operation, be very careful not to damage the mechanical seal stationary seat by allowing it to contact the shaft.
9. The flushing chamber lip seal carrier will now be exposed inside bearing housing. To remove for replacement of lip seals and 'o' rings, release 4-M8 hex nuts, & spring washers.

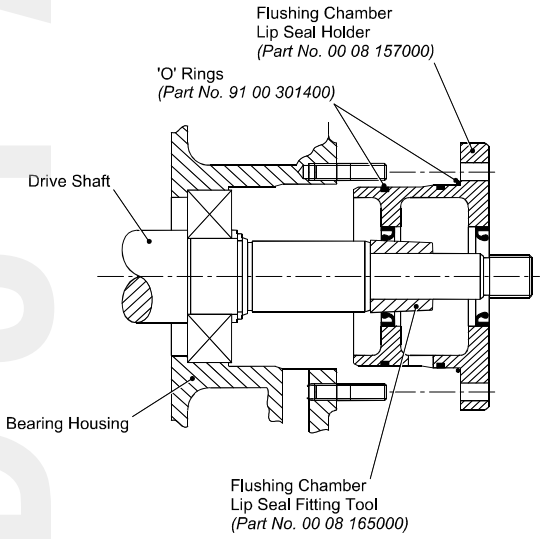
NOTE: 2-M8 tapped holes have been provided to aid removal of carrier. Use suitable length M8 screws to pull lip seal carrier free from bearing housing. Discard lip seals and 'o' rings being careful not to damage relevant surfaces. Thoroughly clean all surfaces and check that drain hole is clear. 'O' rings may now be replaced, follow procedure below for replacement of lip seals.

10. Check that circlip and spacer has been fitted adjacent to bearing, and thoughly clean exposed shaft surfaces and smear with oil. Check that lip seal fitting tool is internally and externally clean, smear with oil and slide over end of drive shaft as shown.
11. Check that flushing chamber lip seals are correctly orientated and generously lubricate their lips with oil. Check that the outer 'O' rings are fitted and smear the outer surface with oil.

NOTE: Lip seal chamber can only be fitted with drain hole in lower surface.

12. Slide chamber along fitting tool and outer drive shaft, ensuring the lip seals are not deformed or that the 'O' rings are not sheared when feeding the chamber into the bearing housing. Assembly may be aided by slightly tapping the assembly home.
13. Finally retain with washer and nuts M12 (torque to 40 lb ft – 54 Nm).

NOTE: When disassembling, the flushing chamber lip seal holder can be jacked free by the two screwed holes adjacent to the fixing.



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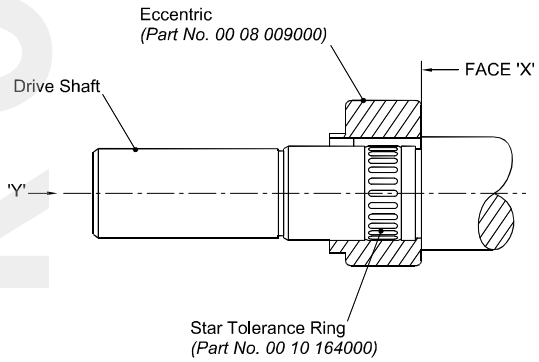
14. Position new gasket (C13) on studs (C14) and fit bearing housing assembly to pump body, taking great care to ensure that the shaft does not touch the mechanical seal stationary seat. Replace and tighten nuts (A11) and spring washers (A12).
15. Using lifting equipment in compliance with the Health and Safety at Work Act, 1975, position pump unit on chassis.
16. Refer to Section 1.5 when refitting the pump to a diesel engine. Refer to Section 1.7 when refitting the pump to an electric motor.
17. Replace split guards around flexible coupling and ensure that it is securely fastened, with nuts bolts and washers. Also fasten to flywheel guard where applicable with bolts and washers.
18. Read Section 5.3.2 Mechanical Seal (C08) Instructions 10 to 15, and carefully remove any foreign matter from the sleeve and mechanical seal components. Smear clean oil on both the 'O' ring (C07) and the drive shaft diameters. Position the 'O' ring on the shaft, and slide the sleeve/seal assembly onto shaft (carbon face towards stationary seat) and press into working position using only the sleeve's flange. Ensure that 'O' ring is correctly trapped in sleeve recess.
19. Replace impeller, suction tube and separator components in accordance with Section 5.3.1 Impeller (C04) Instructions 8 to 13, inclusively.
20. Replace bearing/seal housing assembly and actuator neck seal in accordance with Section 5.1.5 Drive Rod Seal Assembly and Bearing (A25 and A28) Instruction 9 and Section 5.1.4 Actuator Neck Seal (A21) Instruction 4.
21. Replace remaining air pump components in accordance with Section 5.1.3 Actuator Seal (A18) Instructions 6 and 9, inclusively.
22. Replace drain plug (D13) and fill flushing chamber with new oil to level of plug hole. Replace plug (D08) with 'O' ring (D07). Refer to Section 3.1 Pump Lubrication for details of the oil required for the flushing chamber.
23. Repeat this procedure for bearing housing ensuring that level plug (D08) with 'O' ring (D07) are replaced after the correct oil level is attained.

5.4.2 Air Pump Mechanism

Should actuator (A20) fail to reciprocate when the pump is running, or if other abnormal conditions are suspected, the air pump mechanism should be immediately inspected to minimise the risk of consequential damage.

Proceed as follows:

1. Drain oil from bearing housing and flushing chamber by removing filler caps (D08) with 'O' ring (D07) and drain plugs (D13).
2. Remove air pump components in accordance with Section 5.1.3 Actuator Seal (A18) Instructions 1 and 1, and Section 5.1.4 Actuator Neck Seal (A21) Instructions 2 and 3 (discard actuator neck seal if it has failed).
3. Being careful not to damage the flat sealing faces of housing (A24) carefully withdraw housing complete with bearing and sealing components from bearing housing (D06) and drive rod (D37).
4. Carry out Section 5.3.1 Impeller (C04) Instructions 2 to 4, inclusively.
5. Carry out Section 5.4.1 Bearing Housing/Flushing Chamber (D06) Instructions 3 to 9 inclusively.
6. Remove circlips (D24) to allow fulcrum pin (D28) to be removed. Drive rod (D37) and connecting rod (D26) may then be withdrawn.
7. The eccentric may now be removed as follows: Position face 'X' of eccentric on clean flat surface allowing for the shaft to emerge through. Press or strike end of shaft with soft faced mallet in direction of arrow 'Y' to push through eccentric. Be sure always to replace the star tolerance ring with a new part when reassembling, and check fit of key. Use identical tools as shown under Section 6.11 when assembling eccentric.



8. Examine condition of all components and renew failed or significantly worn items. A replacement connecting rod, complete with bushes, should be ordered against sub-assembly (Part No. 0008908000).
9. To rebuild mechanism, position new star tolerance ring (D) on drive shaft and push eccentric (D23) into position using service tools in Section 6.11
10. Position connecting rod (D26) on eccentric, thoroughly de-grease tapping in drive rod (D37) and assemble drive rod and fulcrum pin (D28) in connecting rod.
11. Refit circlips (D24) to secure fulcrum pin.
12. Replace flushing chamber and pump on chassis in accordance with Section 5.4.1 Flushing Chamber (D33) Instructions 11 to 17 inclusive.

NOTE: It will be necessary to start at 5.4.1 Flushing Chamber Instruction 10, if lip seals (D30) have to be replaced.

13. Read Section 5.3.2 Mechanical Seal (C08) Instruction 10 and carefully remove any foreign matter from the sleeve and mechanical seal components. Smear clean oil on both the 'O' ring (C07) and the drive shaft diameters. Position the 'O' ring on the shaft, and slide the sleeve/seal assembly onto shaft (carbon face towards stationary seat) and press into working position

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using only the sleeve's flange. Ensure that 'O' ring is correctly trapped in sleeve recess.

14. Replace impeller, suction tube and separator components in accordance with Section 5.3.1 Impeller (C04) Instructions 8 to 11, inclusively.
15. Replace bearing/seal housing assembly and actuator neck seal in accordance with Section 5.1.5 Drive Rod Seal Assembly and Bearing (A25 and A28) Instruction 9 and Section 5.1.4 Actuator Neck Seal (A21) Instruction 4.
16. Replace remaining air pump components in accordance with Section 5.1.3 Actuator Seal (A18) Instructions 6 to 9, inclusively.
17. Replace drain plug (D13) and fill flushing chamber with new oil to level of plug (D08). Replace plug and 'O' ring (D07). Refer to Section 3.1 Pump Lubrication for details of the oil required for the flushing chamber.
18. Repeat this procedure for bearing housing ensuring that level plug (D08) and 'O' ring (D07) are replaced after the correct oil level is attained.

5.4.3 Bearings and Lip Seal (D15, D18 and D04)

In the unlikely event of a bearing failure, or if the bearing housing oil escapes from the engine end of the bearing housing by passing across lip seal (D04), it becomes necessary to undertake work on the drive shaft assembly.

1. To replace drive end lip seal (D04) only proceed as follows:
   a) Remove oil from bearing housing by removing the filler cap (D08) and drain plug (D13).
   b) Remove lip seal carrier (D03) lip seal (D04) and gasket (D05) by removing cap screws (D01) and washers (A06 and A34).
   c) Prise out the old lip seal and press in a new seal. When fitting lightly lubricate the lips of the seal and if damaged replace gasket (D05). Ensure correct orientation of the lip seal. See Section 6.12
   d) Refit the components taking care not to damage the lip seal on the sharp edges of the keyway.
   e) Replace drain plug (D13) in bearing housing (D06). Fill with oil to correct level and replace level plug (D08) and O-ring (D07).
2. For bearing replacement proceed as follows:
   a) Carry out Section 5.4.2 Air Pump Mechanism Instructions 1 to 8, inclusively.
   b) Remove lipseal carrier (D03) lipseal (D04) and gasket (D05) by removing capscrews (D01) and washers (A06). If lipseal (D04) is to be utilised again ensure seal is not dragged over sharp edge of keyway. Refer to section 5.4.1 instruction 9.
   c) Moving to the impeller end of the bearing housing (D06) remove lip seal carrier (D20)
   d) Remove drive shaft (D17) complete with bearings (D18) and (D15) from bearing housing (D06) by applying pressure (preferably with a fly-press) to the protected coupling end of the drive shaft. Press outer face of (D15) bearing from bearing HSG (D06)
   e) Press bearings (D15) and (D18) from shaft (D17) and discard. Thoroughly clean all bearing housing surfaces and inspect shaft (D17) for damage.
   f) To fit new bearings, thoroughly clean all drive shaft surfaces and smear oil on bearing mounting diameters. Press new bearings onto shaft using workshop tools and method described Sections 6.10 and 6.11, taking care to ensure that:
      i) The bearings are kept in their as-received condition and do NOT come into contact with foreign matter.
      ii) Pressure during fitting is applied directly to the inner rings of the bearings and not to the outer rings.
      iii) The bearings are square to the shaft throughout the fitting procedure.
      iv) When fitted, the bearings register against the shaft shoulders.

NOTE: Use of the workshop tools will ensure the above criteria is fulfilled.

   g) Before replacing the drive shaft sub-assembly into the bearing housing, make sure that the bores that receive the bearings are clean and smeared with clean engine oil. Care must be exercised when passing the drive shaft with bearings into the bearing housing to ensure it is concentric and parallel to the mating surfaces. This is described in Section 6.10 and 6.11.
   h) The sub-assembly should be pressed into position by 'jacking' home the bearing carrier (D20) by means of the setscrews (D22) - do not apply shock loads such as hammer blows.

NOTE: 'Jack' home evenly - protect surface of bearing carrier (D20) with plain washers under setscrews (D22) finally remove setscrews (D22) and fit new washers (A13).

   i) The remaining components may now be reassembled in accordance with Section 5.4.2 Air Pump Mechanism Instructions 9 and 18, inclusively.

5.5 Chassis Maintenance (2 Wheel Site)

It is possible to work on individual components of the chassis without removing either the engine or the pump unit. In all cases work should be undertaken on level ground and care should be exercised to ensure that the pump set is fully immobilised. If the chassis is to be completely dismantled, both the engine and pump unit should be removed in compliance with the requirements of Health and Safety at Work Act, 1975.

1. To clean the fuel feed filter positioned towards drawbar end of chassis/fuel tank:

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a) Disconnect fuel line from filter by loosening hose clip and remove the three screws and washers around filter flange.

b) The filter can now be withdrawn from the tank taking care not to damage the mesh element or gasket. Inspect filter element and gasket and if necessary replace with new items.

2. Check and clean fuel tank filler by unscrewing fuel filler cap and lifting filter from filler neck.

3. Fuel tank(integral) may be drained and cleaned by removing tapered plugs: 1x1 1/2" BSP drawbar end, 2x1" BSP opposite end. Before proceeding ensure unit is immobilised and battery is safely disconnected. Also ensure adequate safety & handling provision is made for any fuel spillage and disposal of fuel waste.

NOTE: Before inspecting and/or servicing the following items ensure that integral tank/chassis is safely supported on underside of fuel tank side sections, leaving wheels and prop stands clear of ground.

4. Check both front and rear prop stands are undamaged & free to be raised, lowered and secured in their brackets, DO NOT apply grease to brackets. Check condition of retaining pin in drawbar prop stand i.e. pin should not be bent or excessively worn and tip should freely pivot. Replace any damaged or badly worn items.

5. Wheels may be slid off stub axles by removing split pins & retaining washers. Inspect wheels for damage, bearing & tyre condition and if necessary replace with new items.

6. To remove the lifting eye remove the four set bolts, nuts and spring washers.

7. Reassembly is a reverse of the above, ensuring that the wheel hubs, axles are thoroughly cleaned and liberally greased. Renew the fuel feed filter gasket if necessary.

5.6 Supersilent Canopy - Canopy Removal

To remove the canopy proceed as follows:

1. Disconnect the battery positive and negative and remove the battery assembly.

2. Disconnect exhaust pipework within canopy having first removed insulation blanket.

3. Disconnect emergency stop wiring plugs from stop buttons from within canopy. Tie up onto engine to prevent damage to wiring.

4. Remove suction and discharge aperture cover plates. Remove foam plugs and rubber blanking gasket.

5. Remove discharge fitting from discharge flange of pump.

6. In each corner of the skid, working up through the upper flange of the skid base are four M16 screws. Remove these in turn to release the canopy from the corners of the skid base.

7. With the corners released undo the M24 nyloc nuts from the centre lifting studs. The studs are locked internally and will not turn beyond a few degrees of movement. When these are both released the canopy is ready to be lifted clear.

8. In order to prevent damage to the engine radiator and to ensure a clean lift is achieved a pair of M12 eye bolts will be required to be fitted to the roof section on the radiator end of the canopy. The mounting positions are blanked off with normal hex head screws at present, remove these and replace with eye bolts.

9. Use a set of three or four leg chains. Attach two to the centre lifting eye and snag the other two to shorten them so that they pick up the radiator end of the canopy square. Lift the canopy up and away from the unit, place down on timber runners to protect the lower edge.

5.7 Supersilent Canopy -Fuel Tank Removal

To remove the fuel tank proceed as follows:

1. With the canopy removed it will now be necessary to remove the pump and engine from the tank structure. Begin by removing the coupling guards from the engine bell housing.

2. Disconnect the air pump silencer hose from the discharge elbow of the air pump. Remove the clamps holding silencer body. Remove the air pump silencer assembly complete.

3. Slacken and remove the four M12 fixings holding the pump body. Attach a suitable lifting device to the pump and manually draw the pump backwards off the coupling pins. When the pins are clear of the rubber element lift the pump unit clear of the chassis.

4. To remove the engine the following parts will need to be removed from the tank/skid structure and where necessary tied back to the engine to prevent damage. Disconnect and drain fuel lines. Undo and remove control panel from bracket. Working beneath the engine end of the skid slacken the bulkhead fitting lock nut on the oil drain hose and remove the hose end from the skid base. Tie the hose back to a suitable point on the engine.

5. The last fixings to be removed are engine mount securing screws. Slacken and remove each in turn.

6. The engine is now ready to be removed from the tank structure. Lift vertically up and away. Watch for any danger of collision between engine and tank. The engine will need to be placed in a suitable frame to prevent damage to the oil drain or sump.

7. To remove the tank, slacken and remove four tank to AV mount screws. With these removed use a set of four chains to lift the tank unit from the skid base using the four AV mount brackets.

5.8 Supersilent Canopy – Fuel Tank Refitting

To refit the fuel tank proceed as follows:

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1. Refit the tank as per removal taking note of the fuel drain plug position and its relationship to the access plug in the skid base. Orientate the tank so that the drain is behind the larger plug.
2. Insert the four screws to secure the tank to the AV mounts and check the alignment of the tank in the skid base before tightening these screws. During the tightening procedure a twisting moment can be applied to the rubber element of the mount which is undesirable. If this occurs, use or make a suitable tool to counteract this twist and tighten to 150 Nm. Recheck alignment and ensure no mounts are twisted. Correct if required.
3. Refit engine but do not fully tighten the mounting to the AV mount screws at this stage, finger tighten only. Reconnect all fuel lines, oil drain and refit the control panel.
4. Before refitting the pump unit slacken the grub screw (hex socket set screw) in the pump half coupling boss. Ensure that the hub and rubber element are free to slide on the pump shaft. This will be used as a guide for checking the alignment of the coupling at a later stage. Leave the coupling hub loose on the shaft.
5. Lift the pump end onto the chassis and push the unit onto the engine side coupling drive pins. With the coupling halves engaged drop in the four pump mounting fasteners and tighten nuts, finger tighten only.
6. The pump should now be visually aligned and tighten down to 70 Nm torque. Check that the coupling element and hub is free to move on the shaft to confirm correct alignment. A pry bar can be used, but it should not require any effort to move the assembly.
7. Move the engine on its mountings to make alignment adjustments. Any shimming to adjust vertical height should be added under the engine.
8. When alignment is satisfactory gradually tighten the four engine mount screws to 70 Nm, checking element /hub movement on the shaft each time.
9. When complete tighten grub screw in the coupling hub into position on the pump shaft. The element should not be fitted against the flywheel adaptor plate but clearance should be present to prevent end thrust transmission through the coupling element.

5.9 Supersilent Canopy – Canopy Refitting

To refit the canopy proceed as follows:

1. Re-sling the canopy as for removal and lift into position. Take care not to damage the radiator when positioning. Lower onto skid base checking for alignment of the lifting studs.
2. When down and before fitting any fixings check that the radiator overflow pipe is not trapped by the canopy bulkhead. Release if trapped.
3. Refit canopy lifting stud nuts and four corner fixing screws. Adjust alignment if necessary and tighten corner screws then stud nuts.
4. Remove eye bolts from canopy roof and replace with fasteners to prevent water ingress.
5. Refit the delivery and suction fittings and refit the suction and discharge covers as the reverse of removal.
6. Reconnect the exhaust extension and refit insulating cover.
7. Refit the fuel lines and control panel.
8. Refit the air pump exhaust silencer assembly.
9. Reconnect the emergency stop wiring and refit the battery assembly and coupling guards.
10. Fill with fuel and bleed the system as required. Test run. Inspect all fasteners after 50 hours of running.

6 WORKSHOP TOOLS

Major Servicing will always be carried-out more quickly by the use of the following special tools and procedure. More importantly, their use will help to ensure that new components are not damaged whilst being fitted.

The tools are simple to employ and have been designed for use in combination with standard fitter's tools. For some operations, a simple press, and a bench complete with a vice will be desirable.

We earnestly advise all pump users to purchase a complete set of tools.

6.1 Care of Servicing Tools

Always clean, oil and safely store tools after use.

Complete sets of tools are available by quoting:

Part No. 0008947100 – D80/ D100.

Comprising:

Bearing Assembly Stud	0015172100	1
Assembly Tool Stud	0018172000	1
Bearing and Eccentric Assembly Tool	0018169000	1
Air Pump Drive Rod Bearing	0008168000	1
Impeller Thread Adaptor	0008167100	1
Mechanical Seal Seat Removal Tool	0015166000	1
Flushing chamber Lip Seal Fitting Tool	0018165000	1
Air Pump Drive Rod Seal Assembly Tool	0010103000	1
Connecting Rod Seal Installation	0008102000	1
Drive Rod Installation Tool	0008101000	1

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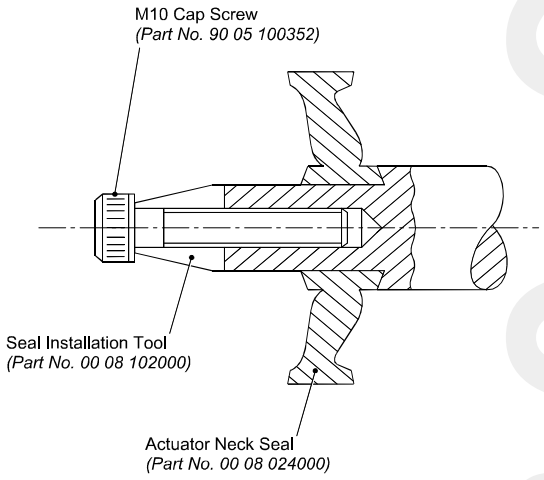
6.2 Fitting of Actuator Neck Seal

1. Lightly clamp seal installation tool against end of drive rod by means of capscrew, as shown.
2. Push seal into rear of inner pump body recess Part No. 0008014100.
3. Clean exposed shaft and tool surfaces, and smear with soft soap. Carefully slide the actuator neck seal onto shaft until it abuts against the conical shoulder.

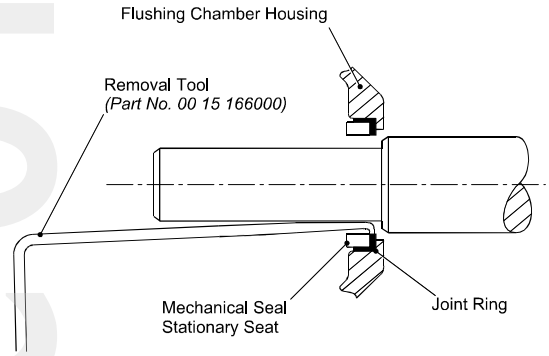


6.3 Removal of Mechanical Seal Stationary Seat and Joint Ring

1. Ensure oil is drained from flushing chamber. Remove impeller and shaft sleeve, complete with rotating mechanical seal components.
2. Engage tip of removal tool on inside face of seat. Remove seat by pulling evenly at several peripheral points.
3. Joint ring can then be collapsed and discarded.
4. To replace, the mechanical seal stationary seat and joint ring must be assembled together with the outer face of the joint ring smeared with soft soap, offered up to the flushing chamber housing and gently pressed home using a piece of wood.

IMPORTANT ADVICE

New Mechanical Seal Components must be handled with great care. In particular, the seal faces must not be touched by hand and must only come into contact with clean soft paper that is free form abrasive materials. Premature seal failure is likely to occur if this advice is not heeded.



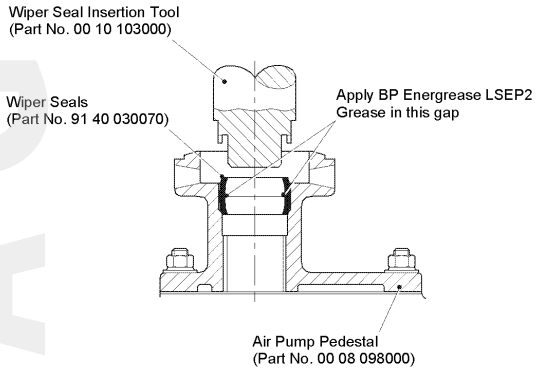
6.4 Removal of Drive Rod Seal Assembly

1. Gently tap out seals from rear with suitable punch ensuring bore is not damaged.
2. Replacement of seals may be aided by smearing adjacent surfaces with oil.
3. Gently press in wiper seals into the bore using the wiper seal insertion tool.

IMPORTANT ADVICE

Note correct orientation of lips.

4. Apply BP Energrease LSEP2 grease to the gap as shown.



6.5 To Fit Air Pump Pedestal to Pump

1. Thoroughly clean exposed drive rod surfaces and position installation tool as shown.
2. Ensure gasket is in place.
3. Thoroughly lubricate drive rod bearing, drive rod and installation tool together with the wiper seals with BP Energrease LSEP2 grease and push pedestal assembly along drive rod until it locates on the studs and registers with the corresponding face of the bearing housing.

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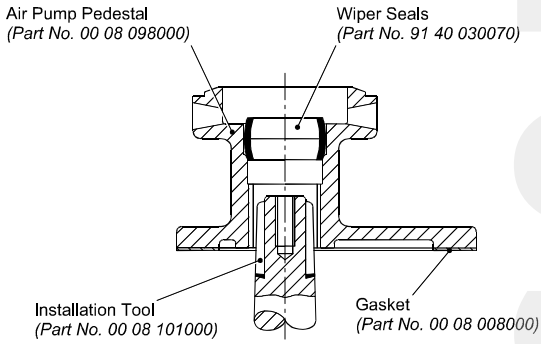
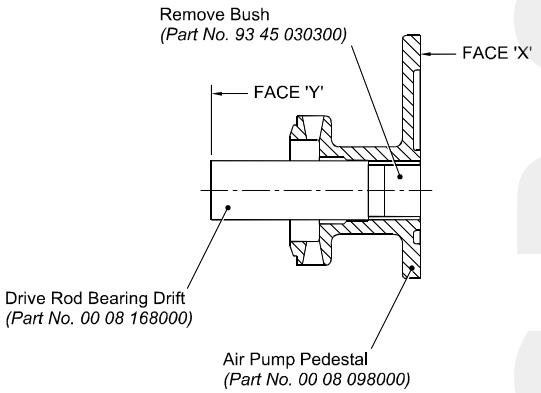


6.6 Remove Drive Rod Bearing Bush

1. Insert shouldered end of drift into bush as shown in upper sketch.Support air pump pedestal evenly on face 'X' leaving sufficient clearance for bush to emerge freely. Push out bearing bush by pressing or striking on tool face 'Y'.

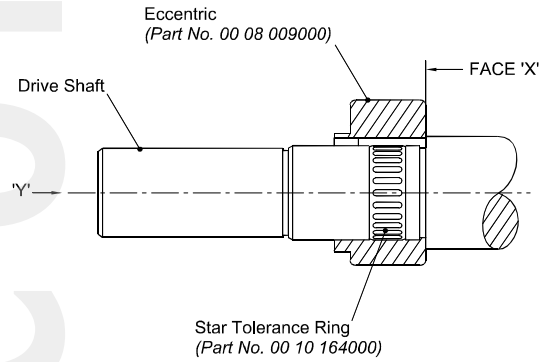


6.6.1 Fit New Bearing Bush

1. Position seal housing on clean flat surface and register new bush in bore. Lubricate bush and bore with oil to prevent pick up.
2. Insert shouldered end of drift into bush as shown. Insert bush by pressing or striking on tool face 'Y' until end of bearing is flush with face 'X'.

6.7 To Remove Eccentric

1. Position face ‘X’ of eccentric on clean flat surface allowing for the shaft to emerge through.
2. Press or strike end shaft with soft faced mallet in direction of arrow ‘Y’ to push through eccentric.
3. Be sure always to replace the star tolerance ring with a new part when reassembling, and check fit of key.
4. Use identical tools as shown under Section 6.11 when assembling eccentric.



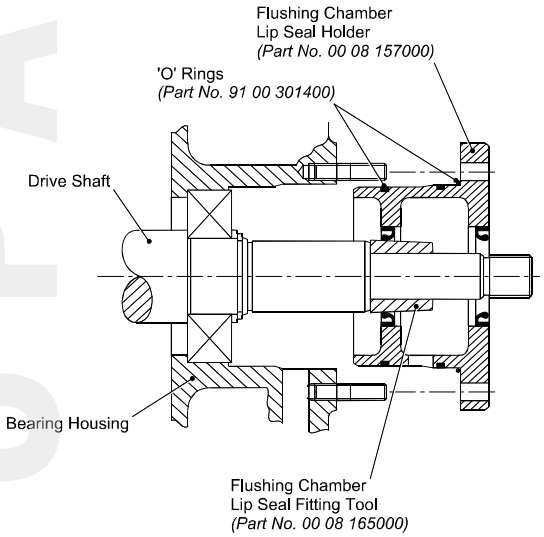
6.8 Assemble Flushing Chamber

1. Check that circlip and spacer has been fitted adjacent to bearing, and thoroughly clean exposed shaft surfaces and smear with oil. Check that lip seal fitting tool is internally and externally clean, smear with oil and slide over end of drive shaft as shown.
2. Check that flushing chamber lip seals are correctly orientated and generously lubricate their lips with oil. Check that’s the outer ‘O’ rings are fitted and smear the outer surface with oil.

NOTE: Check that flushing hole is at bottom.

3. Slide chamber along fitting tool and onto drive shaft, ensuring the lip seals are not deformed or that the ‘O’ rings are not sheared when feeding the chamber into the bearing housing. Assembly may be aided by slightly tapping the assembly home.
4. Finally retain with washer and nuts M12 (torgue to 40 lb ft – 54 Nm).

NOTE: When disassembling, the flushing chamber lip seal holder can be jacked free by the two screwed holes adjacent to the fixings.



6.9 Remove Impeller

1. Remove suction piping, suction tube, separator components, suction tube adapter plate together

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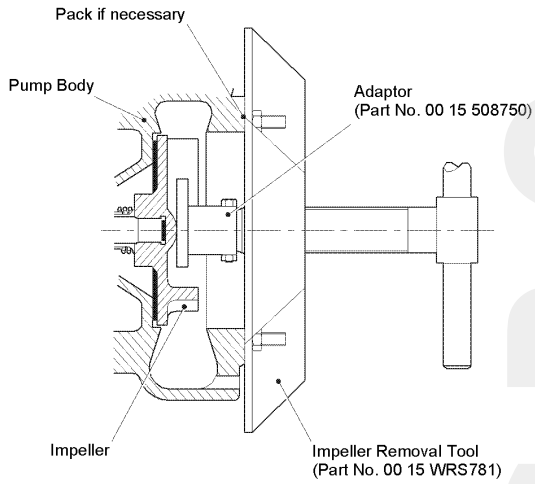
with front wear plate ensuring that the gasket between volute and tube adapter is also removed

2. Offer up impeller removal tool across front face of pump volute as shown ensuring the correct nose adapter is fitted. Affix by using existing nuts and washers.
3. Lock shaft if not connected to engine.
4. Engage adapter in the recesses of the impeller and turn handle anti-clockwise to unscrew impeller.

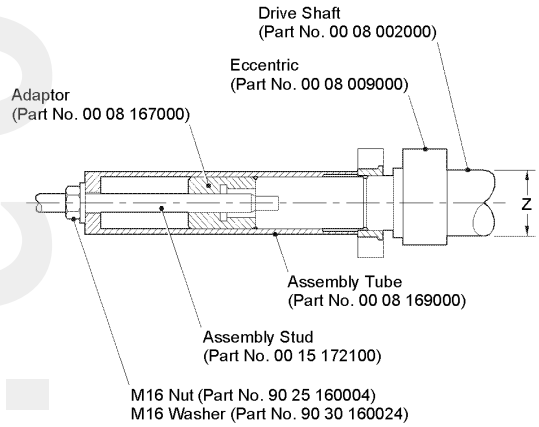
NOTE: When reassembling impeller ensure threaded end of shaft is coated with **Castrol Rustilo 431 Grease Or Approved Equivalent**.



6.10 Fit Replacement Drive End Bearing

1. Remove old bearing taking care not to damage the shaft in any way. This may be facilitated by removing together with the eccentric, see Section 6.7. Fit soft jaws to vice and clamp shaft horizontally on diameter 'Z' leaving the abutment shoulder overhanging.
2. Screw assembly stud Part No. 00 15172100 into shaft end until it bottoms. Thoroughly clean bearing mounting surfaces of shaft and smear with oil.
3. Carefully register inner ring of bearing on shaft ensuring it is not contaminated by foreign matter. Screw on adapter Part No. 0018167000. Position assembly tube Part No. 0015169200 plus adapter Part No. 0018181000 as shown.
4. Ensuring that the bearing is square to the shaft and that assembly tool is concentric to the shaft's centre line, push bearing onto shaft by applying steady and continuous screwing torque to the M16 nut and washer.
5. Check that inner ring of bearing is touching abutment shoulder of the distance sleeve of the eccentric.

NOTE: Bearings may be replace by using the assembly tools in conjunction with a press only, thus eliminating stud and nut.



6.11 Fit Replacement Impeller End Bearing

1. Remove old bearing taking care not to damage the shaft in any way. Fit soft jaws to vice and clamp shaft horizontally on diameter 'Z' leaving the abutment shoulder overhanging.
2. Screw adapter (Part No. 00 18167000) onto shaft end until it bottoms and into this screw the assembly stud (Part No. 0018172000) until that bottoms also. Thoroughly clean bearing mounting surfaces of shaft and smear with oil.
3. Carefully register bearings on shaft, ensuring that they are not contaminated by foreign matter and position assembly tube (Part No. 0015169200) as shown.
4. Ensuring that the bearing is square to the shaft and the assembly tool is concentric to the shaft centre line, push bearings onto shaft by applying steady and continuous screwing torque to the M16 nut and washer.
5. Check that the inner ring of bearing is touching abutment shoulder and ensure that the two bearings are tight together.
6. Finally replace the bearing spacer and circlip.

NOTE: Bearings may be replaced by using the assembly tools in conjunction with a press only, thus eliminating stud and nut.

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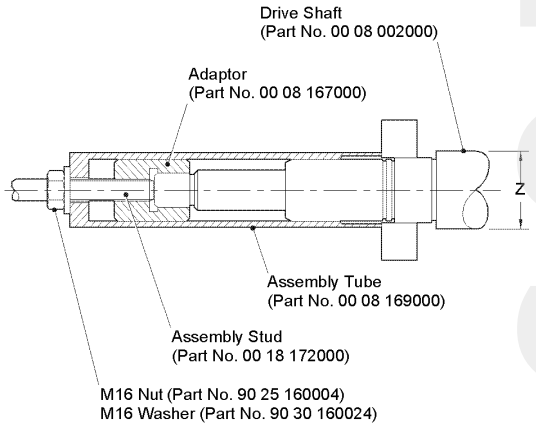
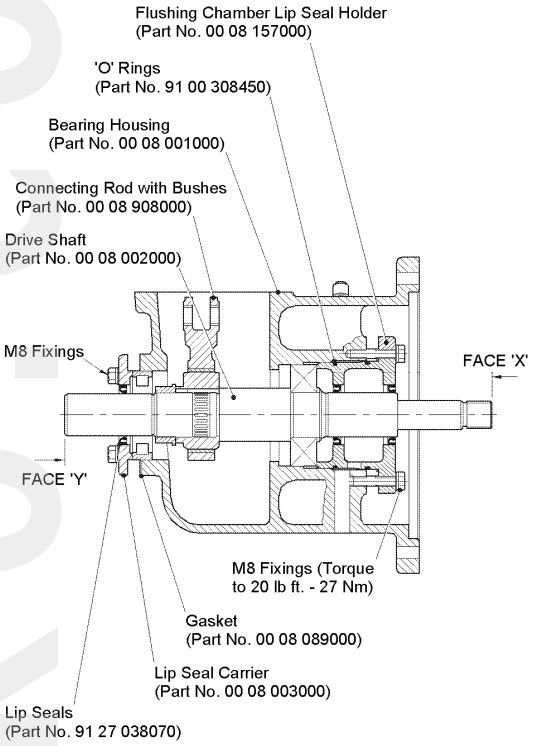


6.12 Assembly of Drive Shaft with Bearings into Housing

1. Remove assembly by releasing the 3 x M8 fixings holding the flushing chamber lip seal holder Part No. 0008157000. This can be 'jacked' free by the two screwed holes adjacent to the fixings. Remove the lip seal carrier at the other end Part No. 0008003000, taking care not to drag lip over keyway edge, and press on face 'Y' to withdraw bearings with drive shaft.
2. When assembling, all parts are to be scrupulously clean and bearing mounting surfaces smeared with oil.
3. The outer race of the drive and bearing is inserted by carefully drifting or pressing the race into the housing. Alternatively, the lip seal carrier, Part No. 0008003000 may be utilised, pressing the race into the housing by making use of longer bolts and jacking home evenly. If this latter method is employed be sure to use large washers beneath the bolt head to distribute pressure over a larger area as the lipseal carrier may be manufactured in light alloy.
4. Position bearing housing on its feet in the normal horizontal attitude.
5. Position drive shaft assembly tube Part No. 0018169000 at drive end of housing and retain with a single M8 fixing. Screw assembly stud Part No. 0018172000 into shaft end until it bottoms.
6. Be sure to thread shaft through connecting rod Part No. 0008908000 when assembling.
7. Ensure shaft with bearings is inserted into the bearing housing so that it is concentric and parallel to the mating surfaces, through the assembly tube and retained with M16 nut and washer. Pull assembly into housing by applying steady and continuous screwing torque to the M16 nut and washer.
8. Ensure assembly is fully 'home' by assembling the flushing chamber lip seal holder Part No. 0018157000, making sure the lip seals and 'O' rings are in good condition before bolting up.

NOTE: This operation will require temporary longer bolts or studs and the use of the lip seal fitting tool Part No. 0008165000 - see para 6.8.

9. Finally assemble lip seal carrier at the drive end ensuring seal is kept clear of keyway edge and making sure the 'O' ring is in good condition before bolting up.



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7 FAULT FINDING GUIDE

This table gives the most common symptoms arising in connection with water-handling duties. Please consult Selwood Pumps 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 contains contaminated oil. Very small volumes of oil may be lost from these chambers during a day's 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.

PUMP WILL NOT PRIME, OR LOSES PRIME HAVING PUMPED PRODUCT FOR A BRIEF PERIOD OF TIME

	ACTION	COMMENT
1	Check that drain taps fitted to volute and air pumps are closed.	Drain taps are sometimes left open overnight. If okay, try Action 2.
2	Remove inspection cover and check that delivery valve is seating efficiently.	The delivery line MUST BE DRAINED before the cover is removed. If okay, try Action 3.
3	Disconnect hose from air pump spigot and attach vacuum gauge to pump - should read 29' H_20 (25.6" Hg) or more, after the pump is stopped.	If vacuum is okay, check Action 4. If vacuum is low or fails quickly, check Action 8.
4	Reconnect air pump hose, and check vacuum at suction spigot of main pump. Correct reading is given above.	If vacuum is okay, check Actions 5 (a) and (b). If vacuum is slow to rise or low at terminal condition, check Actions 6 and 7.
5	(a) Check all suction-side hoses, fittings and joints for air leaks.	Priming problems are VERY often caused by faults in supply pipework. Air must not be allowed to pass into the system across couplings, etc.
	(b) Check strainer and suction hose for blockages.	Do not use non-reinforced hose. Always fit a strainer of correct size and type.
6	Examine separator assembly for air leaks or trapped solids. Check peel valve seat for ice in cold conditions.	Refer to Major Servicing: Section 5.2 for advice. The float must be able to rise and fall freely. The peel valve must completely shut-off the air pump when the float rises to its maximum position.
7	Check level of oil in flushing chamber.	If level is very low, mechanical seal may be admitting air. Top up, and re-check vacuum. Substantial oil loss indicates seal failure - refer to Major Servicing: Section 5.3.2 for advice.
8	Examine valves and flexing seals in air pump assembly and check that castings are not cracked.	Refer to Major Servicing: Section 5.1 for advice.

OUTPUT AND HEAD ARE LESS THAN PUBLISHED FIGURES

	ACTION	COMMENT
1	Check strainer and suction pipework for blockages. Also check that air is not being pulled through a vortex created in the supply reservoir.	Choking of the supply system by solids will increase the flow resistance, thus increasing the head against which the pump has to operate, and so reducing output, The entry of air through faulty pipe joints will have a similar effect. Reduction also occurs if air is entrained through a vortex to eliminate, increase strainer's submergence.
2	Check pump speed with tachometer.	Speed, off-load must not exceed: 2000rpm.
3	Check that delivery valve, discharge branch of casing, and pipework are free from blockages.	Obstructions down-stream of the pump will increase the flow resistance and thus reduce output.
4	Check condition of impeller.	Excessively worn vanes will reduce output. Also check outside diameter of vanes: Standard Selwood D80 – 192mm dia

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LIQUID IS BEING PUMPED OUT OF AIR PUMP, I.E. WATER CARRY-OVER IS OCCURRING

	ACTION	COMMENT
1	Cheek condition of separator assembly.	No significant amounts of water should normally pass across the air pump. The rubber peel valve may not be seating correctly, the float may be punctured, or not be able to rise and fall freely, etc. Also, check that bush is correctly positioned. Refer to Major Servicing: Section 5.2 for instructions.
2	Check condition of valves and flexing seals in air pump.	On rare occasions, malfunction of the air pump seals In air pump can cause the separator float to move erratically. Refer to major Servicing: Section 5.1 for instructions.

WATER LEAKING OUT OF FLUSHING CHAMBER VENT BEHIND VOLUTE, OR FROM BREATHER VALVE FITTED TO CHAMBER

	ACTION	COMMENT
1	Drain flushing chamber to check contents.	The chamber should only contain oil. If the mechanical seal has failed, water may be present in the chamber. If so, replace seal in accordance with instructions given in Major Servicing: Section 5.3.2.

OIL LEAKING OUT OF FLUSHING CHAMBER VENT BELOW VOLUTE

	ACTION	COMMENT
1	Top up both oil reservoirs, and run pump under supervision for say 30 min to determine from which reservoir leakage is occurring.	Replace faulty lip seal in accordance with instructions given in Major Servicing: Section 5.4.

OIL LEAKING FROM VENTS BELOW AIR PUMP

	ACTION	COMMENT
1	Check that mechanism reservoir has not been overfilled with oil.	It is extremely difficult to overfill pumps built to latest specifications. However, earlier machines were fitted with oil level plugs which did not automatically limit the oil volumes.
2	Check conditions of air pump drive rod and associated seal.	Refer to Major Servicing: Section 5.4 for instructions.

OIL LEAKING FROM ENGINE-END OF PUMP ASSEMBLY

	ACTION	COMMENT
1	Check that mechanism reservoir has not been overfilled with oil.	Although unlikely, incorrect filling may be responsible for the problem.
2	Replace lip seal in bearing housing lip seal carrier.	Refer to Major Servicing: Section 5.4 for instructions.

PUMP CANNOT BE ROTATED BY HAND BY MEANS OF STARTING HANDLE, FOR EXAMPLE

	ACTION	COMMENT
1	Check for ice in air pump or volute.	In cold weather, ice can form in these chambers if they have not been drained. Eliminate by means of hot water.
2	Check that air pump assembly is not faulty.	The actuator must be securely fastened to its drive rod, and must be able to reciprocate freely without touching any stationary surface. Refer to Major Servicing: Section 5.1 for instructions.
3	Check that impeller and drive shaft are free to rotate.	Although unlikely, it is possible for fibrous solids to restrict the impeller's movement. Also, failure of the drive shaft bearings may have resulted in the impeller striking the casing. Seizure of the bearings could also produce the problem. Refer to Major Servicing: Section 5.3 for instructions.

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PUMP PRODUCES UNEXPECTED NOISES WHEN RUNNING

	ACTION	COMMENT
1	Check quality and quantity of oil in mechanism chamber and flushing chamber.	Incorrect volume and quality may result in overheating as well as abnormal noise. Note that extensive running under such circumstances can significantly damage pump components.
2	Check that air pump assembly is not faulty.	The actuator must be securely fastened to its drive rod, and must be able to reciprocate freely without touching any stationary surface. Refer to Major Servicing: 5.1 for instructions.
3	Check that air pump mechanism is not faulty.	Excessively worn connecting rod bearings, or an under-sized eccentric or fulcrum pin, could cause this problem. Refer to Major Servicing: 5.4

Refer to Selwood Pumps if the above advice does not solve your problem.

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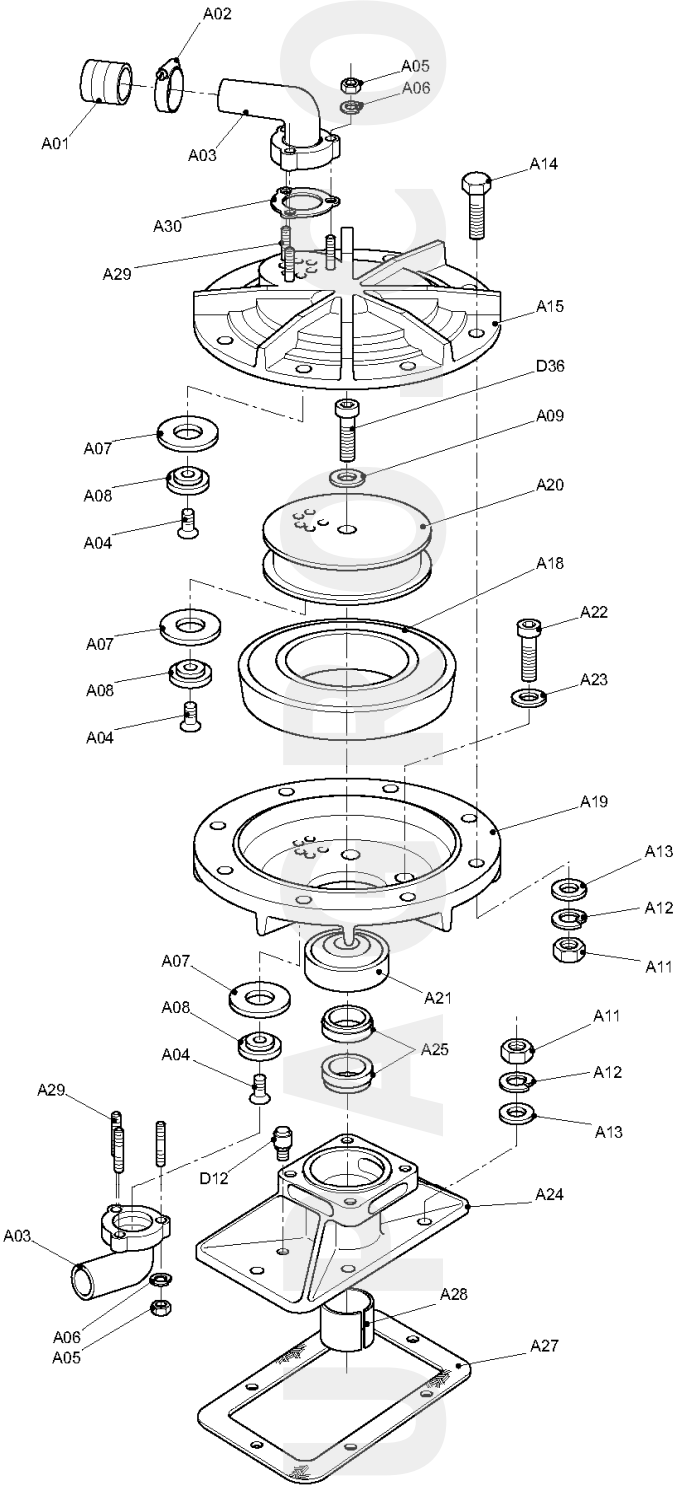

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8 PARTS LIST

8.1 Air Pump Parts

ITEM	DESCRIPTION	PART NUMBER	QTY
A03	Air Hose Adaptor	0891081000	2
A05	Hex. Nut M6	9025060004	6
A06	Spring Washer M6	9030060229	6
A29	Screwed Stud M6 X 20	9036060204	6
A14	Hex. Head Set Screw M8 x 30	9000080301	8
A15	Air Pump Outer Body	0008015100	1
A22	Hex. Socket Capscrew M10 x 35	9005100352	5
A09	Belville Washer	9030100359	1
A23	Capscrew Bearing Washer	0008100000	4
A19	Air Pump Inner Body	0008014100	1
A13	Plain Washer M8	9030080024	14
A12	Spring Washer M8	9030080229	14
A11	Hex. Full Nut M8	9025080004	14
A21	Actuator Neck Seal	0008024000	1
A25	Wiper Seal	9140030070	2
A24	Air Pump Pedestal	0008098000	1
A27	Gasket - Air Pump Pedestal	0008008000	1
A28	Bush - Air Pump Drive Rod	9345030300	1
D12	Breather Plug 1/8 in BSP	9522001000	1
A07	Air Pump Valve (Standard)	0008021000	3
A07	Air Pump Valve (Viton)	0008021100	3
A18	Actuator Seal	0008023000	1
A20	Actuator	0008016100	1
A30	Gasket - Hose Adaptor	0008022000	1
A08	Air Pump Valve Clamp	0008209000	3
A04	Hex. Soc, Csk Hd Screw M6 x 16	9009060160	3

When ordering spares, please state:
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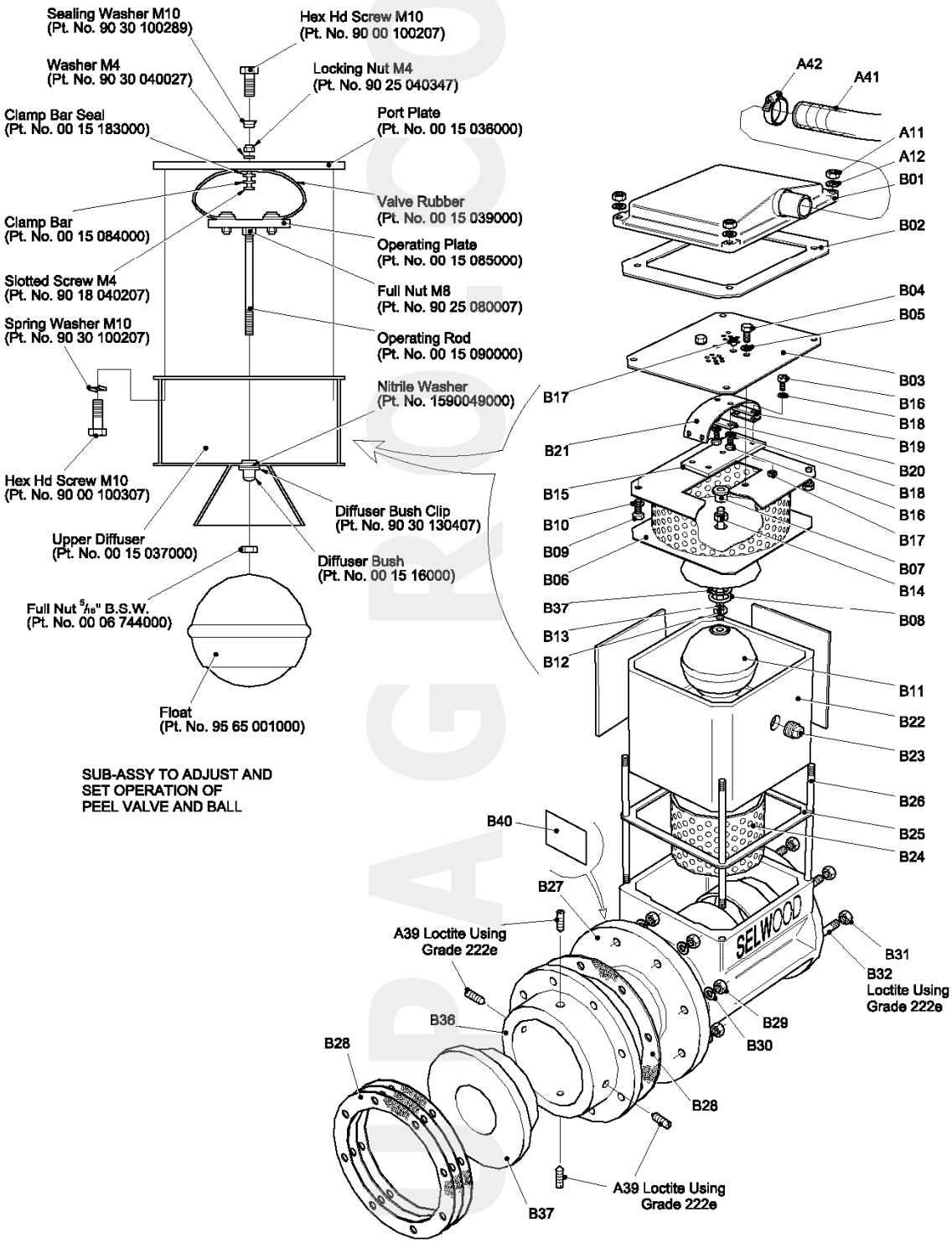

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8.2 Suction Tube & Separator

ITEM	DESCRIPTION	PART NUMBER	QTY
A11	Full Nut M10	9025100004	4
A12	Spring Washer M10	9030100229	4
B01	Separator Cap	0015034000	1
B02	Separator Cap Gasket	0015043000	1
B03	Port Plate	0015036000	1
B04	Hexagon Head Screw M10 x 20.S.S.	9000100207	2
B05	Sealing Washer M10	9030100289	2
B06	Upper Diffuser Sub-Assembly	0015037001	1
B07	Upper Diffuser Bush	0015160000	1
B08	Upper Diffuser Bush Clip	9030130407	1
B09	Hexagon Head Screw M10 x 30.S.S.	9000100307	4
B10	Spring Washer M10 S.S.	9030100207	4
B11	Float	9565001000	1
B12	Full Nut $^{5}/_{16}$" B.S.W. S.S.	0006741030	1
B13	Operating Rod	0015090000	1
B14	Full Nut M8 S.S.	9025080007	1
B15	Operating Plate	0015085000	1
B16	Slotted Head Screws M4 x 20. S.S.	9018040207	6
B17	Locking Nut M4 S.S.	9025040307	6
B18	Washer M4 S.S.	9030040027	6
B19	Clamp Bar	0015084000	3
B20	Clamp Bar Seal	0015183000	1
B21	Peel Valve Rubber	0015039000	1
B22	Separator Body	0015033000	1
B23	Plug ½" B.S.P.T.	9522004000	1
B24	Lower Diffuser	0015038000	1
B25	Separator Body Gasket	0015044000	1
B26	Tie Rod	0015045000	4
B27	Suction Tube	0892159000	1
B28	Suction Tube Gasket	0008048000	1
B29	Full Nut M10	9025120004	6
B30	Spring Washer M10	9030120229	6
B31	Full Nut M16	9025160004	8
B32	Stud M16	9035160551	8
B35	Washer - Nitrile	1590049000	1
B36	Adaptor Plate	0904023000	1
B37	Wear Plate	0904022000	1
B38	Spring Washer M16	9030160229	4
A39	Hex. Soc. Setscrew M10 St. Steel	9007100207	4
B40	"Impeller Thread Direction" Label	0018080000	1
A41	Suction Hose	9542000001	1
A42	Worm Drive Hose Clip - Size 1	9505030004	2

Sub-Assembly B06 includes B0, B08 and B35.

Items B05, B07, B08, B16, B17, B18, B20 and B21 are available as spares kit 0015996000

When ordering spares, please state:

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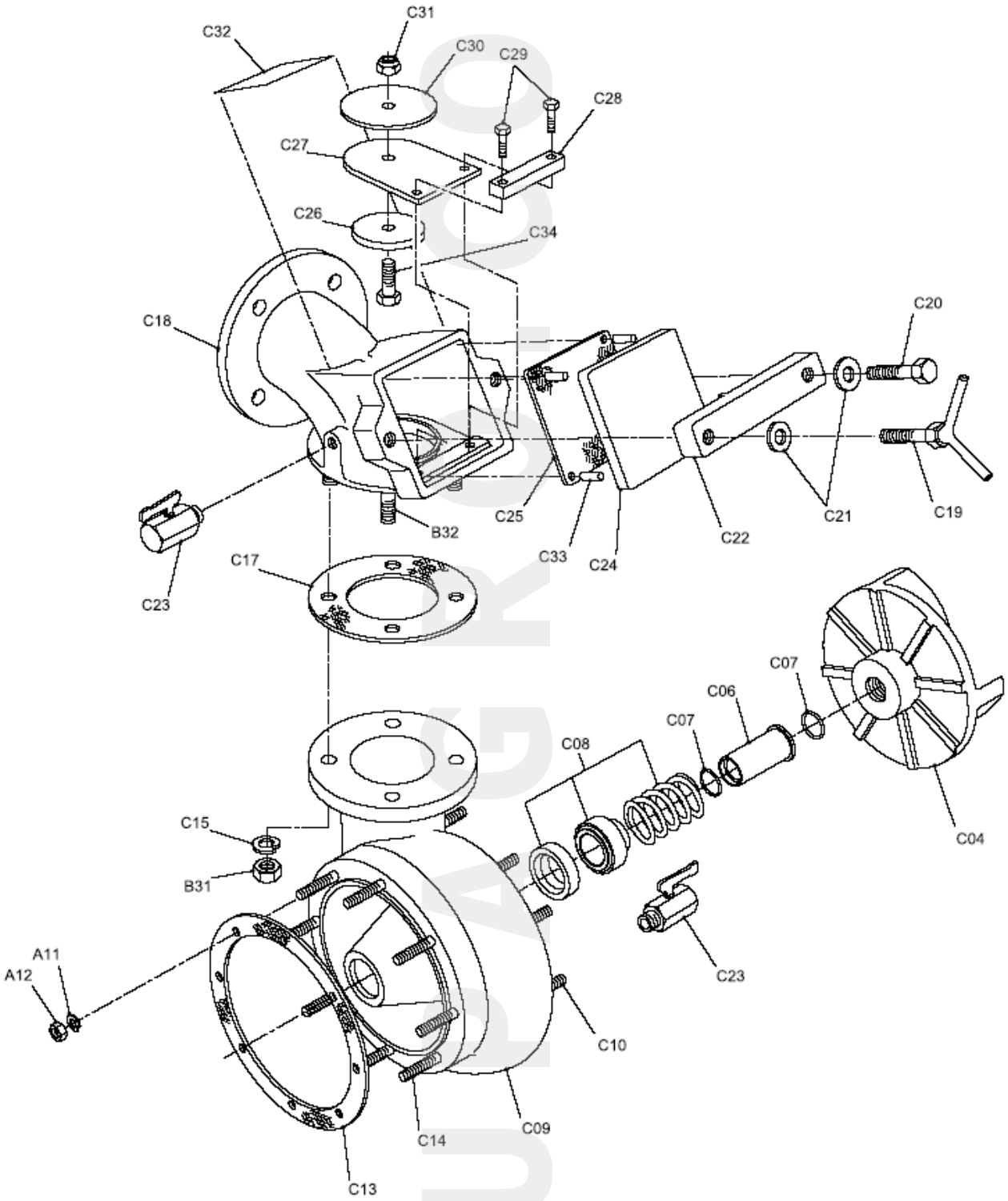

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8.3 Pump End and Delivery Valve

ITEM	DESCRIPTION	PART NUMBER	QTY
C20	Hex. Head Bolt M16 x 65	9001160651	1
C21	Plain Washer M16	9030160024	2
C23	Drain Tap 3/8" BSPT	9520003000	2
C33	Roll Pin	9042060180	4
C22	Valve Clamp Bar	0008027000	1
C29	Hex. Head Set Screw M8 x 25	9000080251	2
C30	Valve Plate - Upper	0008046000	1
C31	Hex. Self Locking Nut M10	9025100344	1
C32	Label - Check List	0008072000	1
C27	Delivery Valve Rubber	0008037000	1
C26	Valve Plate - Lower	0008032000	1
C34	Hex. Head Bolt M10 x 35	9001100351	1
C18	Delivery Valve Chamber D80	0008026000	1
C17	Gasket - Pump Casing/Delivery Valve Chamber	0008047000	1
C15	Spring Washer M16	9030160299	4
B31	Hex. Nut M16	9025160004	4
A11	Spring Washer M10	9030100229	8
A12	Hex. Nut M10	9025100004	8
C13	Gasket -Bearing Housing/Pump Body	0008011000	1
C14	Screwed Stud M10 x 35	9036100354	8
C09	Pump Casing	0008010100	1
C04	Impeller 192 mm Dia	0008012200	1
C07	'O' Ring	9100162510	2
C06	Shaft Sleeve	0008161000	1
C08	Mechanical Seal	9110032000	1
B32	Screwed Stud M16 x 40	9035160404	4
C25	Inspection Plate Gasket	0008028000	1
C24	Inspection Plate	0008029000	1
C22	Inspection Plate Locking Bar	0008030000	1
C19	'T' Handle Clamp Bar Bolt	0008031000	1
C10	Screwed Stud M10 x 45	9001051-02	8

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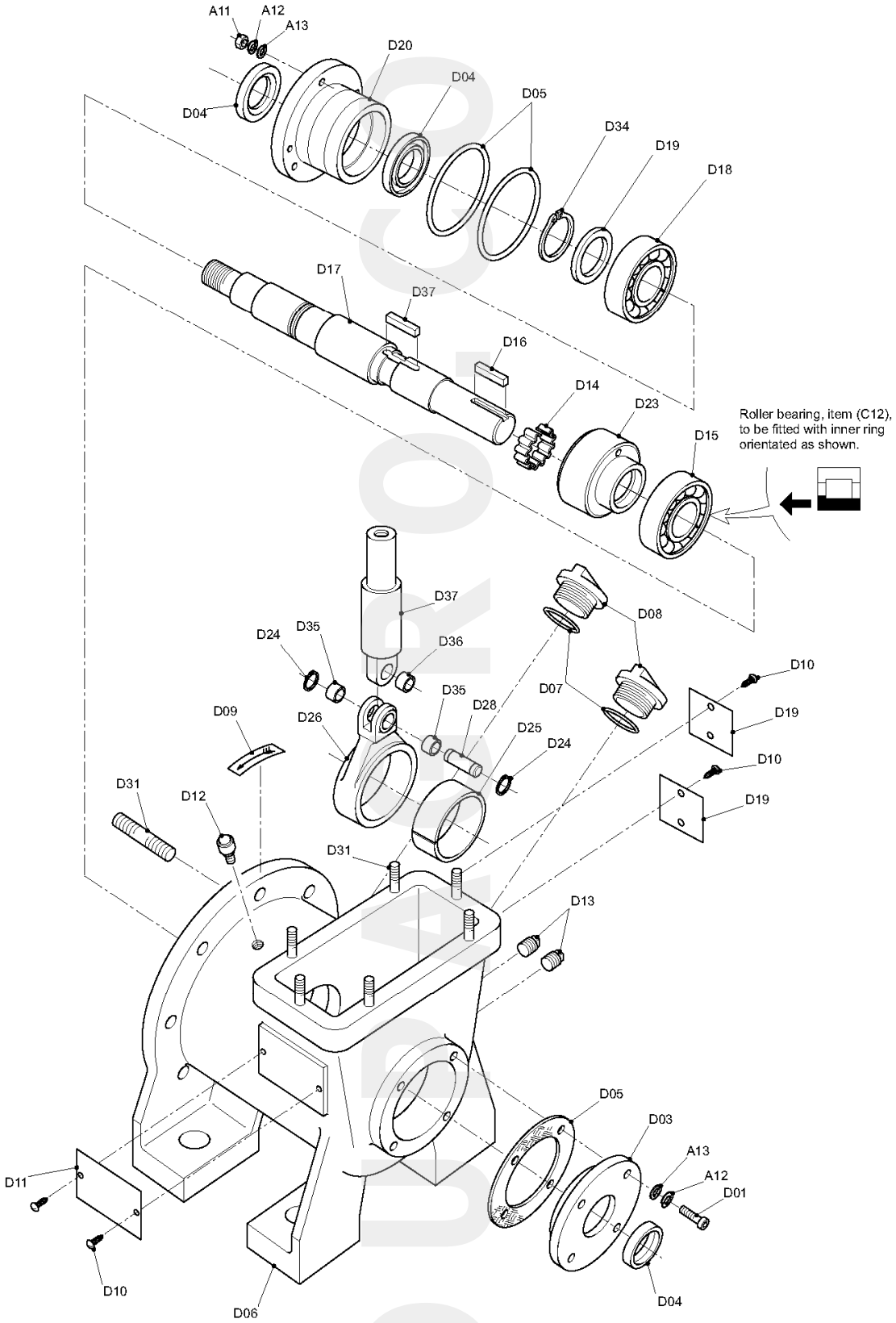

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8.4 Bearing and Air Pump Mechanism Housing

ITEM	DESCRIPTION	PART NUMBER	QTY
A11	Hex. Nut M8	9025080004	4
A12	Spring Washer M8	9030080229	8
A13	Plain Washer M8	9030080024	8
D20	Flushing Chamber Lip Seal Holder	0008157000	1
D04	Lip Seal	9127038070	3
D05	'0' Ring	9100308450	2
D34	Circlip External	9401000401	1
D19	Spacer Ball Bearing	0008005000	1
D18	Ball Bearing	9300630830	1
D37	Rect. Parallel Key (Eccentric)	9041102823	1
D16	Rect. Parallel Key (Pump Coupling)	9041104013	1
D15	Roller Bearing	9309120830	1
D23	Eccentric	0008009000	1
D14	Star Tolerance Ring	0010164000	1
D17	Drive Shaft	0008002100	1
D35	Air Pump Drive Rod Bush	9345015150	1
D07	'O' Ring	9100300250	2
D08	Oil Filter/Level Check Plug	0015186000	2
D19	Label - Oil Check	0015229000	2
D24	Circlip External	9401000151	2
D28	Fulcrum Pin	0008007000	1
D35	Connecting Rod Small End Bush	0008065000	2
D25	Connecting Rod Large End Bush	0008066000	1
D13	Drain Plug ¼" BSP	9522002000	2
D01	Hex. Head Setscrew M8 x 20	9000080201	4
D03	Lip Seal Carrier	0008003000	1
D05	Gasket - Lip Seal Carrier	0008089000	1
D06	Bearing Housing	0008001000	1
D10	Hammer Drive Screw No. 2 x 1/4 in	9045002259	6
D11	Label - Manufacturer	0015071000	1
D31	Screwed Stud M8 x 25	9036080254	10
D12	Breather Valve 1/8 in BSPT	9528001000	1
D09	Label - Direction of Rotation	0015078000	1
D26	Connecting Rod Assembly	0008908000	1
D37	Air Pump Drive Rod Assembly	0008910000	1

When ordering spares, please state:

PUMP NUMBER - PART NUMBER - DESCRIPTION OF PART

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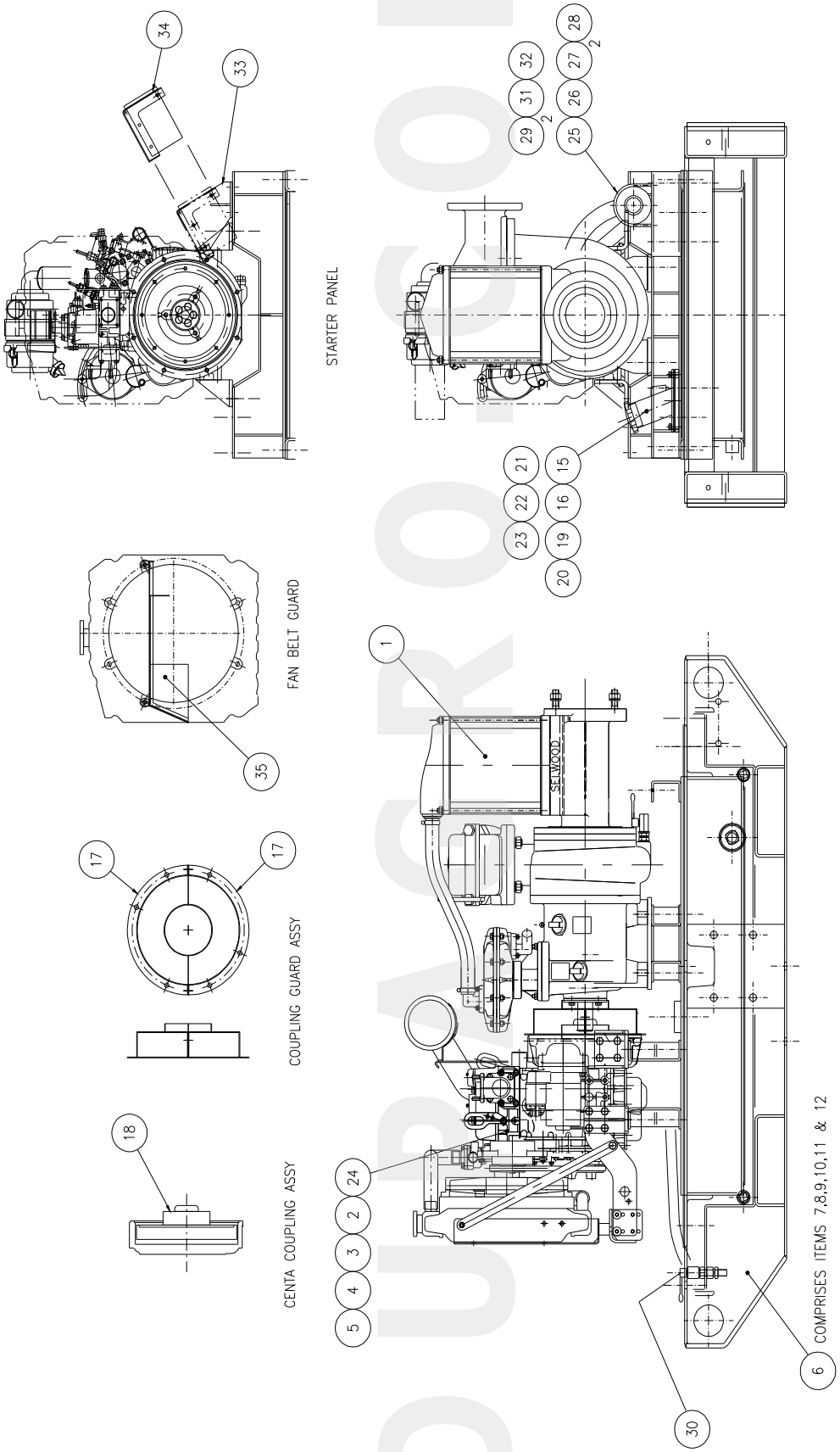

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8.5 D80/Yanmar 2TNE68 on Skid Chassis

ITEM	DESCRIPTION	PART NUMBER	QTY
1	Selwood D80 Pump Unit	0807053000	1
2/NI	Fuel Line, Feed	1001195000	1
3/NI	Fuel Line, Return	1001196000	1
4	Battery Lead, +ve	0804034000	1
5	Battery Lead, -ve	0804035000	1
6	Skid Chassis Assembly	0803203000	1
7	Skid Base Frame	0805053000	1
8	Chassis Fuel Tank	0805054000	1
9	Engine Front Crossmember	0805055000	1
10	Engine Rear Crossmember	0805056000	1
11	Pump Support Crossmember	0805057000	1
12	A/V Mount	0805058000	4
13	Plug ¾" BSP	9522P00601	3
14	Plug 2" BSP	9522P01601	1
15	Fuel Filler Plate with Bayonet	1501279000	1
16	Fuel Filler Plate Gasket	1501280000	1
17	Coupling Half Guard	0803077000	2
18	Centa Flywheel Coupling	9600M00015	1
19	Fuel Tank Filler Filter	0004463000	1
20	Fuel Filler Gasket	0015063000	1
21/NI	Fuel Tank Feed Filter	0803199000	1
22	Filler Cap	9550004000	1
23	Fuel Tank Contents Gauge	9590K04801	1
24	Yanmar 2TNE68 Engine	92005-0002	1
25	Air Pump Silencer 1" BSP Connections	9395000001	1
26	90^0 Equal Elbow 1" BSP Female	9517P01804	1
27	Worm Drive Hose Clip	9505007004	2
28	Suction Hose 25 I/D	9542000001	1
29	Clamp	0015509940	2
30	Remote Oil Drain Hose Assembly	92700-0226	1
31	Hex. Reducing Bush 1¾" BSP	9517P00803	1
32	Spigot ¾" BSP	1590109000	1
33/NI	Control Panel Bracket	0803385000	1
34/NI	Starter Panel Bracket	0803309000	1
35	Fan Belt Guard	7599236000	1

When ordering spares, please state:

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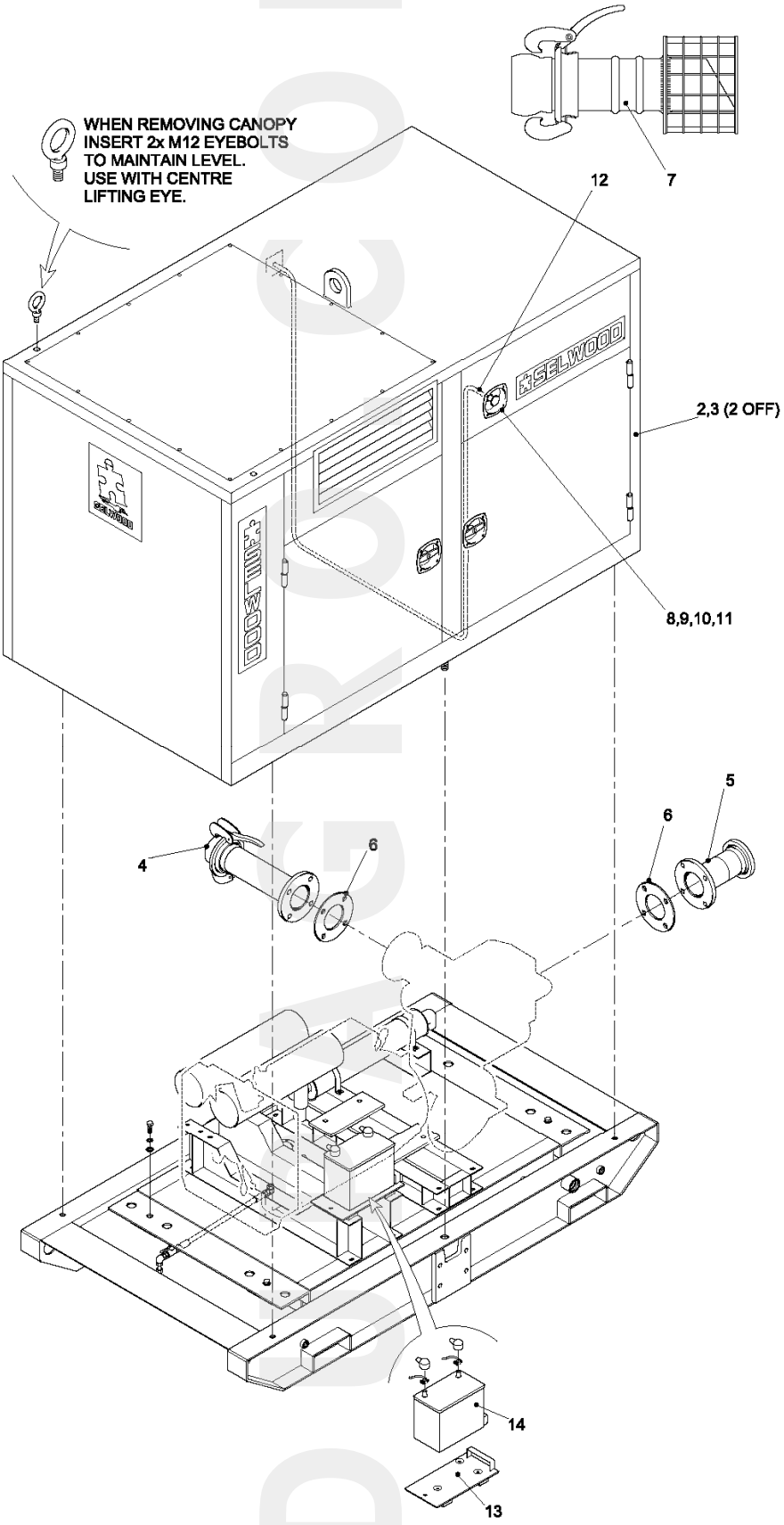

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8.6 D80/Yanmar 2TNE68 Supersilent on Skid Chassis

ITEM	DESCRIPTION	PART NUMBER	QTY
1	D80/Yanmar 2TNE68 Supersilent Skid	0803205S40	1
2	Noise Encapsulation Canopy Assembly	0803204000	1
3	Bauer Surround Gasket	0803208000	2
4	Flanged Bauer Connector, Delivery	0803206000	1
5	Flanged Bauer Connector, Suction	0805044000	1
6	Gasket, Suction/Delivery	0008047000	2
7	Bauer Strainer	0008156000	1
8	Black Coated Dishpan	9728-00045	2
9	Gasket	9728-00046	2
10	Mushroom Pushbutton	92800-0054	2
11	Contact Block	92800-0055	2
12	Emergency Stop Button Loom	0904134000	1
13	Battery Tray	0803214000	1
14	Battery, 40 AH	9296121900	1

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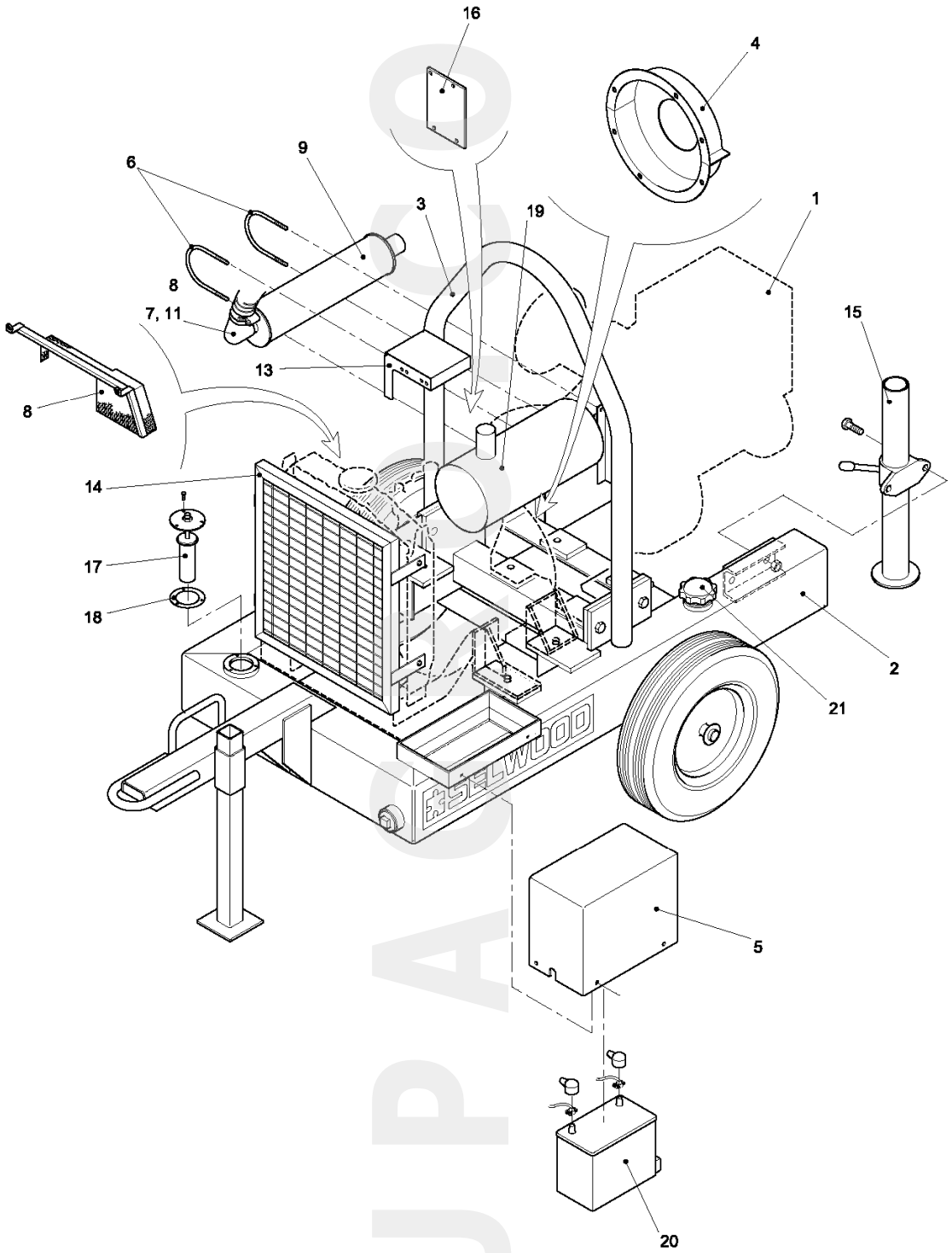

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8.7 D80 Yanmar 2TNE68 on 2 Wheel Site Chassis

ITEM	DESCRIPTION	PART NUMBER	QTY
1	Selwood D80 Pump Unit with 192 Ø Impeller	0804057000	1
2	D80 2 Wheel Site Chassis Assembly	0803200000	1
3	Lifting Eye	0803195000	1
4	Coupling Half Guard	0803077000	1
5	Battery Cover	0803079000	1
6	Exhaust U Bolt	0004509170	2
7	Spigot	1590109000	1
8	Hose Clip	9505030004	1
9	Air Pump Silencer	9395000001	1
10	Supavin Hose	9542000001	1
11	90º Elbow 1” BSB Equal	9517P00804	1
12	Fan Belt Guard	7599236000	1
13	Starter Panel Bracket	0803090000	1
14	Radiator Guard	0803078000	1
15	Propstand	0803220000	1
16	Air Filter Bracket	0803313000	1
17	Fuel Tank Feed Filter	0803199000	1
18	Fuel Tank Feed Filter Gasket	0015063000	1
19	Exhaust Heat Shield (Guard)	0803085000	1
20	Battery	9296121900	1
21	Fuel Filler Cap	9550004000	1
22	Centa Flywheel coupling (not illustrated)	9600M00015	1

When ordering spares, please state:

PUMP NUMBER - PART NUMBER - DESCRIPTION OF PART

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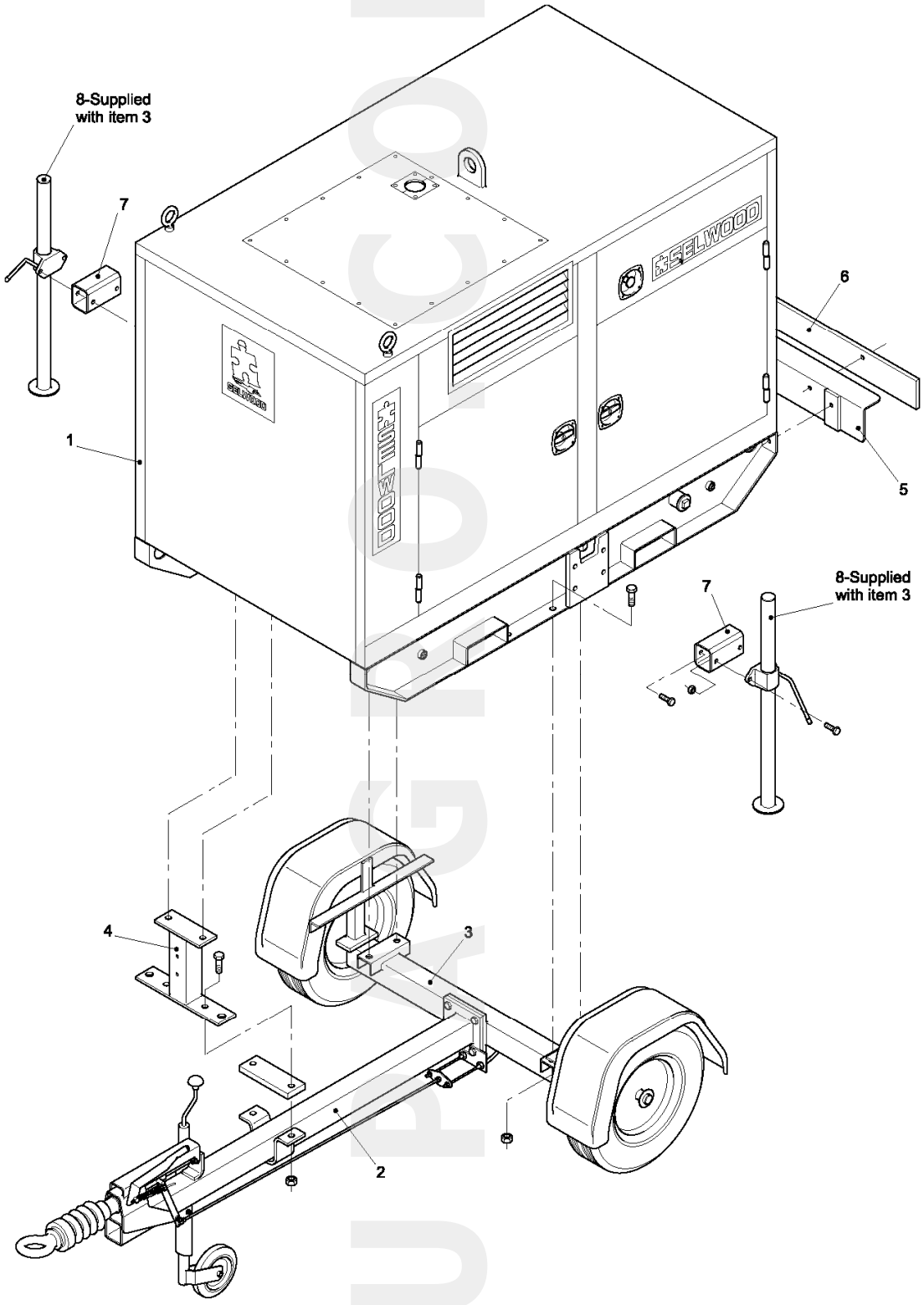

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8.8 D80/Yanmar 2TNE68 Supersilent on Fast Tow 2 Wheel Chassis

ITEM	DESCRIPTION	PART NUMBER	QTY
1	D80 Yanmar 2TNE68 Supersilent Skid	0803205S40	1
2	Canopy Fast Tow Kit	0803391000	1
3	Fast Tow Kit	9729-00016	1
4	Front Mounting Post	1503114000	1
5	Lighting Board Bracket	0803390000	1
6	Lighting Board	9730001000	1
7	Propstand Bracket	1503061000	2
8	Propstand	080391000	2

When ordering spares, please state:

PUMP NUMBER - PART NUMBER - DESCRIPTION OF PART

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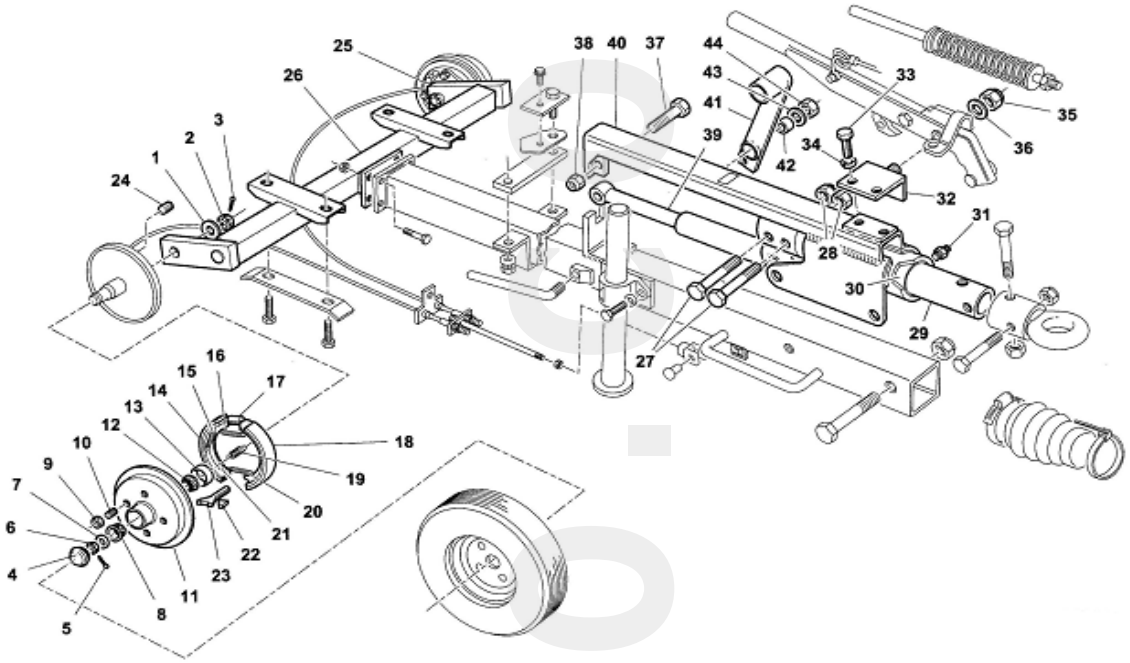

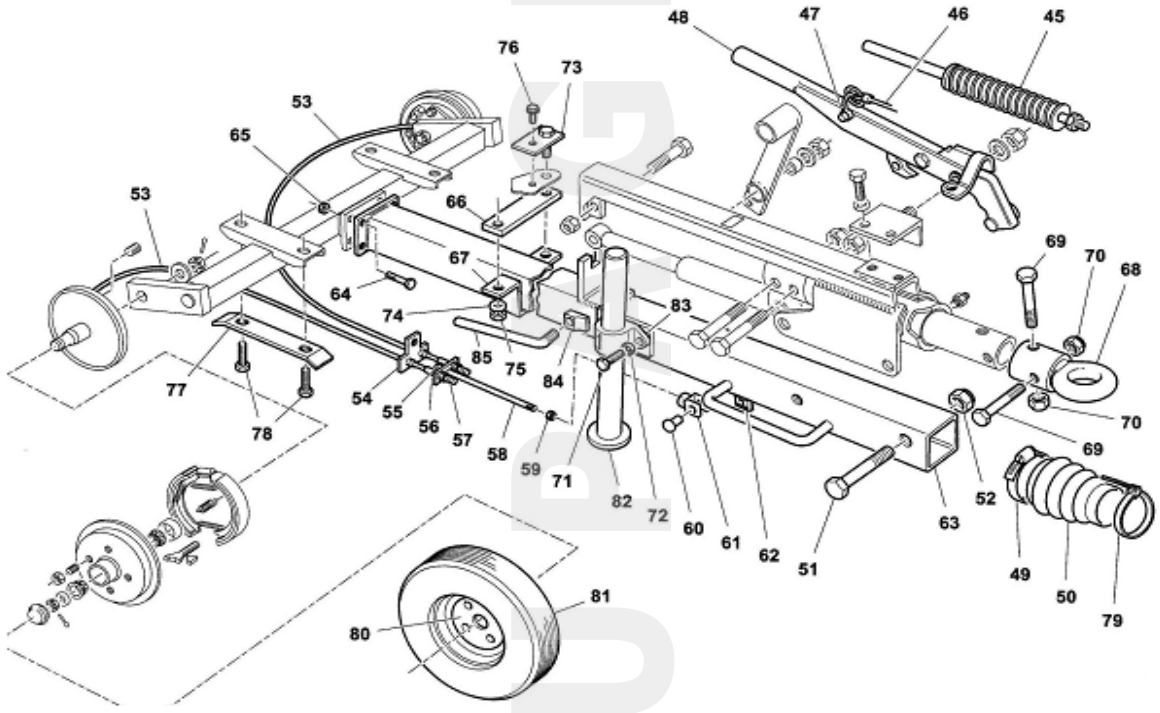

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8.8.1 2 - Wheel Trailer 9729-00016

ITEM	DESCRIPTION	PART NUMBER.	QTY
4	Hub Cap	1061 02	1
5	Split Pin	1/8" X 1.1/4"	1
6	Slotted Nut	¾ UNF	1
7	Washer	1053 05	1
8	Bearing (outer)	L44649/44610	1
9	Wheel Nut	1027 07	4
10	Stud	1026 15	4
11	Hub	1203 03	1
12	Bearing (inner)	LM48548/48510	1
13	Seal	162262	1
14	Shoe (reversing)	35259-21.02	1
15	Spring (carrier spring)	42904	2
16	Spring (top tension spring)	42903	1
17	Expander	45309	1
18	Shoe (fixed)	35261-21.02	1
19	Spring (shoe steady spring)	42861.01	1
20	Spring (bottom tension spring)	42126	1
21	Carrier	34648	1
22	Adjuster Wedges	45200	2
23	Bolt & Nut assembly	44826	1
24	Plug	V10.1	1
25	Holder, cable	45146	1
27	Bolt M10 x 75	M10 x 75	2
28	Self Locking Nut	M10	2
29	Shaft	1118 00	1
30	Bush	1208 00	2
31	Grease Nipple	5/16" UNF	2
32	Bracket	1195 14	1
33	Setscrew	M10 x 30	2
34	Spring Washer Square Section	M10	2
35	Self Locking Nut	M16	1
36	Washer	M16	1
37	Bolt	M10x50	1
38	Self Locking Nut	M10	1
39	Damper	043311	1
40	Frame	1123 00	1
41	Lever	1127 01	1
42	Bush	CT529	1
43	Washer	M12	1
44	Self Locking Nut	M12	1
45	Spring Store	1117 00	1
46	Cable	1050 00	1
47	D Shackle (1/4" Pin)	¼"	1
48	Lever, handbrake (complete)	1195 00	1
49	Clip, retaining (rear)	55/70	1
50	Cover	1075 04	1

When ordering spares, please state:

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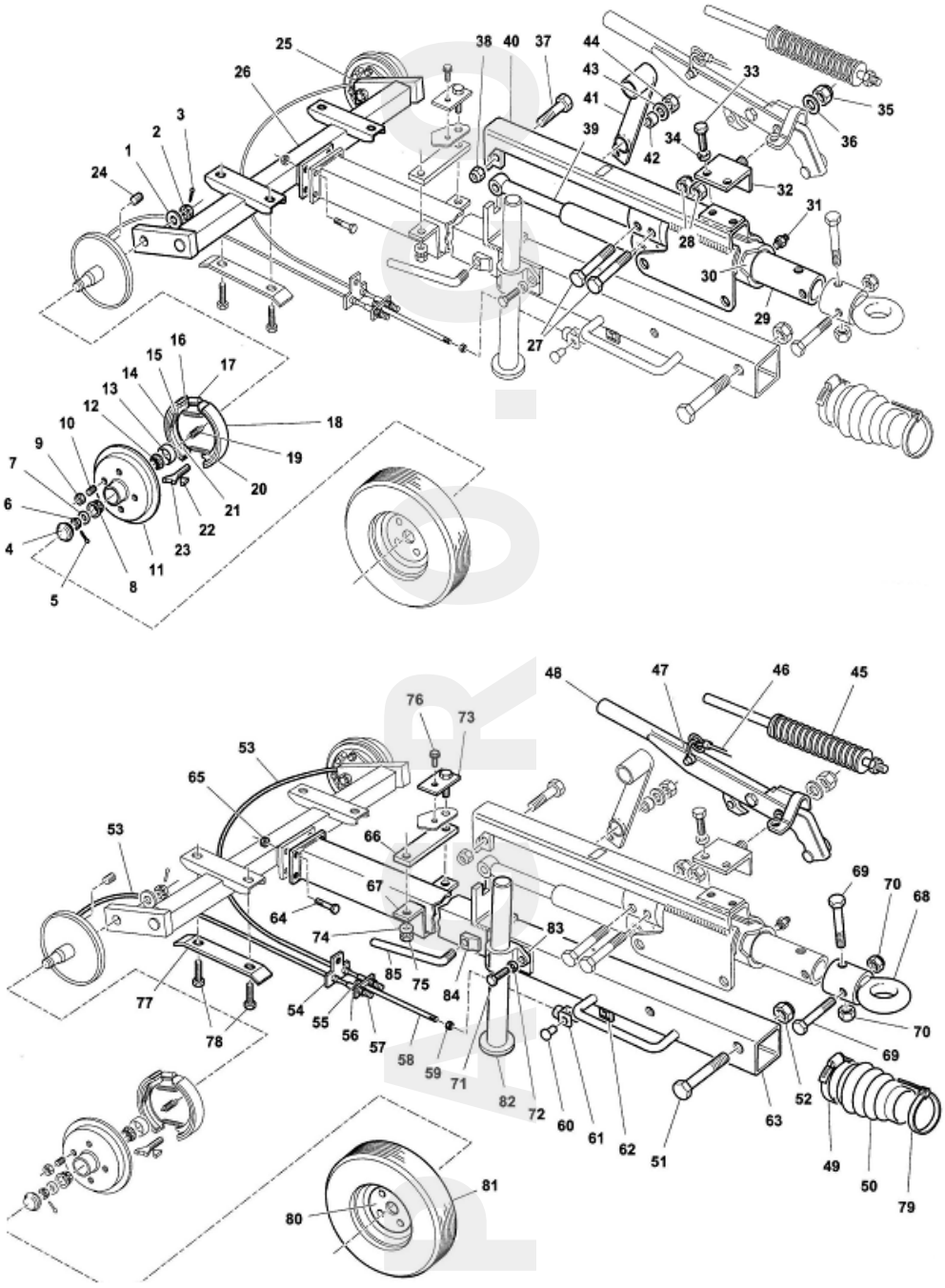

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51	Bolt	½" UNF x 4 ½"	2
52	Self Locking Nut	½" UNF	2
53	Cable	1165 04	2
54	Plate (cable anchor)	1192 01	1
55	Nut	5/16" UNF	2
56	Plate (compensator)	1017 03	1
57	Self Locking Nut	M12	1
58	48½" Rod	1080 61	1
59	Nut	5/16" UNF	1
60	Pin	NBI312	1
61	Fork (clevis)	GK1312	1
62	Clip, retaining	SLM8F2	1
63	Tube Towbar	1137 100	1
64	Setscrew	M10 x 35	4
65	Self Locking Nut	M10	4
66	Pad	1044 21	1
67	Clamp	1041 01	1
68	Towing Eye 2" BSAU	1102 01	1
68	Towing Hitch 50mm Ball	1205 00	1
69	Bolt	M10 x 75	2
70	Self Locking Nut	M10	2
71 – 78	Chassis to Body Fixings		
79	Tie Wrap 350mm	REL250	1
80	Wheel	REL250	1
81	Tyre	REL250	1
83 – 85	Cast Bracket Assembly	B42C3	1
OR			
82	Jockey Wheel	J348S	1
83 – 85	Cast Bracket Assembly	B48C6	1

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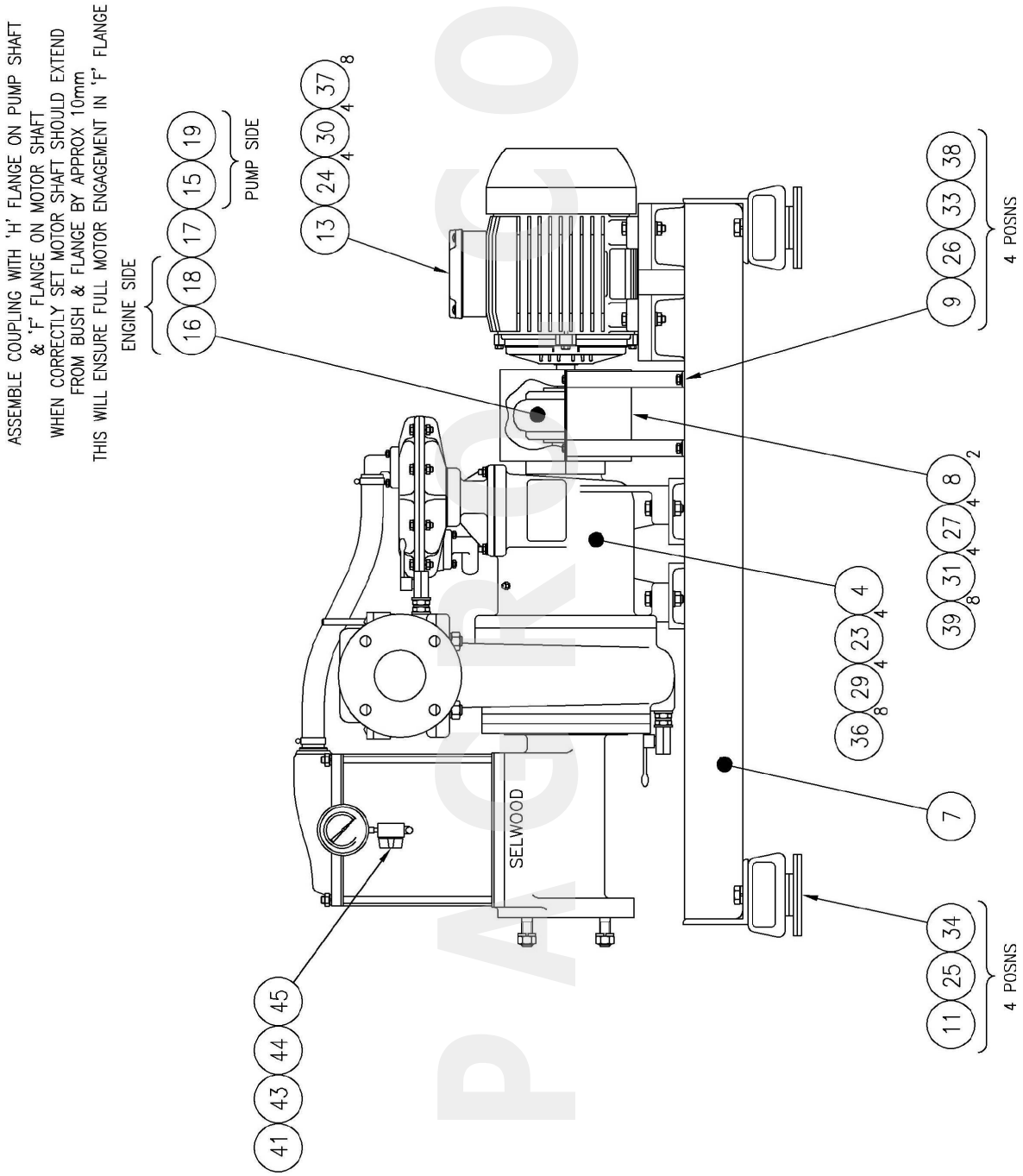

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8.9 D80 Electric Motor Static – 4kW 400V Build No. 0804290000
4kW 240V Build No. 089214200B

ITEM	DESCRIPTION	PART NUMBER	QTY
4	Selwood D80 Pump Unit with 192 Ø Impeller	0804057000	1
7	Static Chassis – 400V	0896170000	1
	Static Chassis – 240V	0892141000	1
8	Coupling Half Guard – 400V	0896171000	2
	Coupling Half Guard – 240V	0805336000	2
9	Coupling Half Guard Stay	0988057000	4
11	Anti-Vibration Mount	9680010000	4
13	Electric Motor 4 kW 400V / 3ph / 50Hz 4 Pole	92204-0003	1
	Electric Motor 3.7kW 240V / 1ph / 50Hz 4 Pole	92204-0001	1
15	Coupling Flange Type F	9601060002	1
16	Coupling Flange Type H	9601060003	1
17	Flexible Tyre	9601060048	1
18	Taper Lock Bush Ø38 Bore	9631161038	1
19	Taper Lock Bush Ø28 Bore	9631161028	1
23	Hex Head Bolt M12x50	9001120501	4
24	Hex Head Bolt M10x60 – 400V	9001020-01	4
	Hex Head Bolt M10x45 – 240V	900110451	4
25	Hex Head Screw M16x30	9000160301	4
26	Hex Head Screw M8x16	9000080161	4
27	Hex Head Screw M6x20	9000060201	4
29	Hex Self Locking Nut M12	9025120344	4
30	Hex Self Locking Nut M10	9025100344	4
31	Hex Self Locking Nut M6	9025060344	4
33	Spring Washer M8	9030080229	4
34	Spring Washer M16	9030160229	4
36	Plain Washer M12	9030120024	8
37	Plain Washer M10	9030100024	8
38	Plain Washer M8	9030080024	4
39	Plain Washer M6	9030060024	8
41	Drain Tap - Not used on 240V Unit	0003350000	1
43	Bush ½" BSP x ¼" BSP – Not Used on 240V Unit	9515P00407	1
44	Elbow Male x Female ¼" BSP – Not Used on 240V Unit	9515201000	1
45	Vacuum Gauge – Not Used on 240V Unit	9590P00202	1

When ordering spares, please state:

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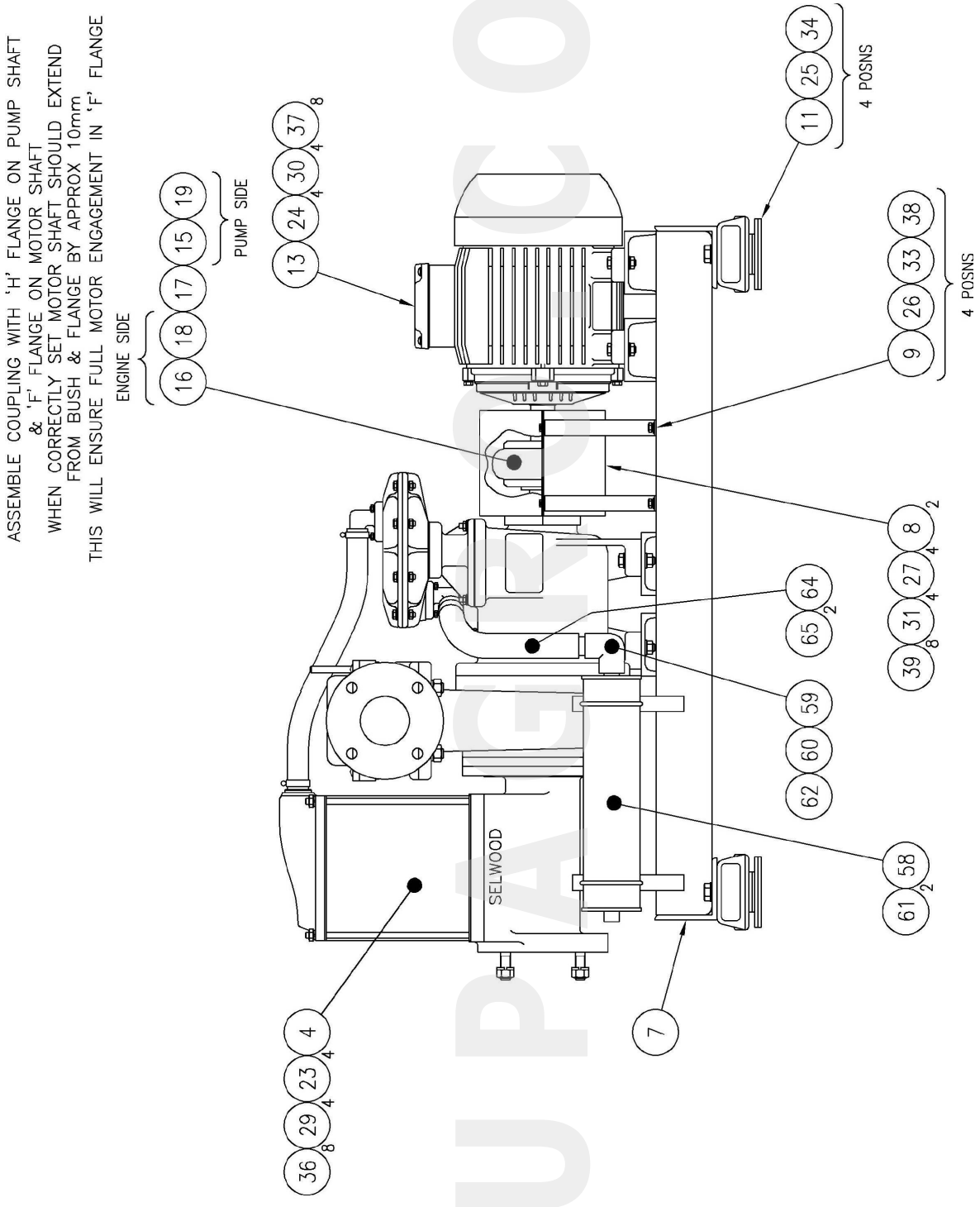

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8.10 D80 Electric Motor Static – 5.5kW 400V Build No. 0802081000

ITEM	DESCRIPTION	PART NUMBER	QTY
4	Selwood D80 Pump Unit with 192 Ø Impeller	0804057000	1
7	Static Chassis	0896170000	1
8	Coupling Half Guard	0008086100	2
9	Coupling Half Guard Stay	0988057000	4
11	Anti-Vibration Mount	9680010000	4
13	Electric Motor 5.5 kW 400V / 3ph / 50Hz 4 Pole	92205-0005	1
15	Coupling Flange Type F	9601060002	1
16	Coupling Flange Type H	9601060003	1
17	Flexible Tyre	9601060048	1
18	Taper Lock Bush Ø38 Bore	9631161038	2
23	Hex Head Bolt M12x50	9001120501	4
24	Hex Head Bolt M10x45	9001100451	4
25	Hex Head Screw M16x30	9000160301	4
26	Hex Head Screw M8x16	9000080161	4
27	Hex Head Screw M6x20	9000060201	4
29	Hex Self Locking Nut M12	9025120344	4
30	Hex Self Locking Nut M10	9025100344	4
31	Hex Self Locking Nut M6	9025060344	4
33	Spring Washer M8	9030080229	4
34	Spring Washer M16	9030160229	4
36	Plain Washer M12	9030120024	8
37	Plain Washer M10	9030100024	8
38	Plain Washer M8	9030080024	4
39	Plain Washer M6	9030060024	8
58	Air Pump Silencer 1” BSP	9395000001	1
59	Hexagon Bush 1” BSP Male x ¾” BSP Female	9517P00803	1
60	90º Equal Elbow 1” BSP Female	9517P00804	1
61	Clamp	0004509170	2
62	Spigot ¾” BSP	1590109000	1
64	Suction Hose 25mm ID	9542000001	1M
65	Worm Drive Hose Clip	9505030004	2

When ordering spares, please state:

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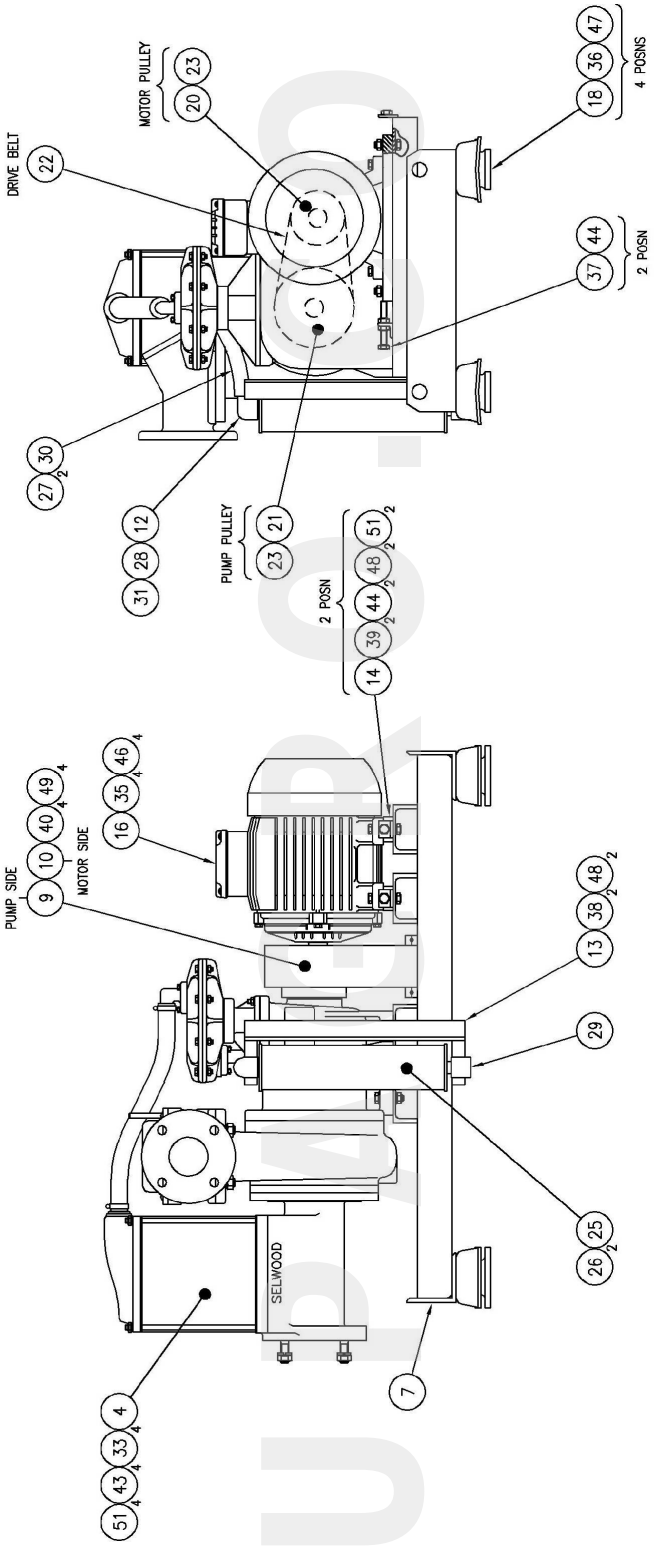

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8.11 D80 Belt Driven Electric Static – 7.5kW 400V Build No. 0897110000

ITEM	DESCRIPTION	PART NUMBER	QTY
4	Selwood D80 Pump Unit with 192 Ø Impeller	0804057000	1
7	Static Chassis	0897111000	1
9	Drive Belt Guard RH	0892315000	1
10	Drive Belt Guard LH	0892316000	1
12	Spigot ¾" BSP	1590109000	1
13	Support Bracket (Air Pump Silencer)	0892317000	1
14	Motor Spacer Pad	0892318000	2
16	Electric Motor 7.5 kW 400V / 3ph / 50Hz 2 Pole	9250132750	1
18	Anti-Vibration Mount	9680010000	4
20	HTD Pulley 44-8M-20	9633200044	1
21	HTD Pulley 64-8M-20	9633200064	1
22	HTD Belt 8M-800-20	9641208000	1
23	Taper Lock Bush 2012-38	9631029K38	2
25	Air Pump Silencer 1" BSP	9395000001	1
26	Clamp	9506M04101	2
27	Worm Drive Hose Clip	9505030004	2
28	90º Equal Elbow 1" BSP Female	9517P00804	1
29	Socket 1" BSP	9517P00801	1
30	Suction Hose 25mm ID	9542000001	1M
31	Hexagon Bush 1" BSP Male x ¾" BSP Female	9517P00803	1
33	Hex Head Bolt M12x50	9001120501	4
35	Hex Head Screw M10x35	9000100351	4
36	Hex Head Screw M16x40	9000160401	4
37	Hex Head Screw M12x90	9000120901	2
38	Hex Head Screw M12x20	9000120201	2
39	Hex Head Screw M12x45	9000120451	4
40	Hex Head Screw M6x12	9000060121	2
43	Hex Self Locking Nut M12	9025120344	4
44	Hex Full Nut M12	9025120004	6
46	Spring Washer M10	9030100229	4
47	Spring Washer M16	9030160229	4
48	Spring Washer M12	9030120229	6
49	Spring Washer M6	9030060229	9
51	Plain Washer M12	9030120024	8

When ordering spares, please state:

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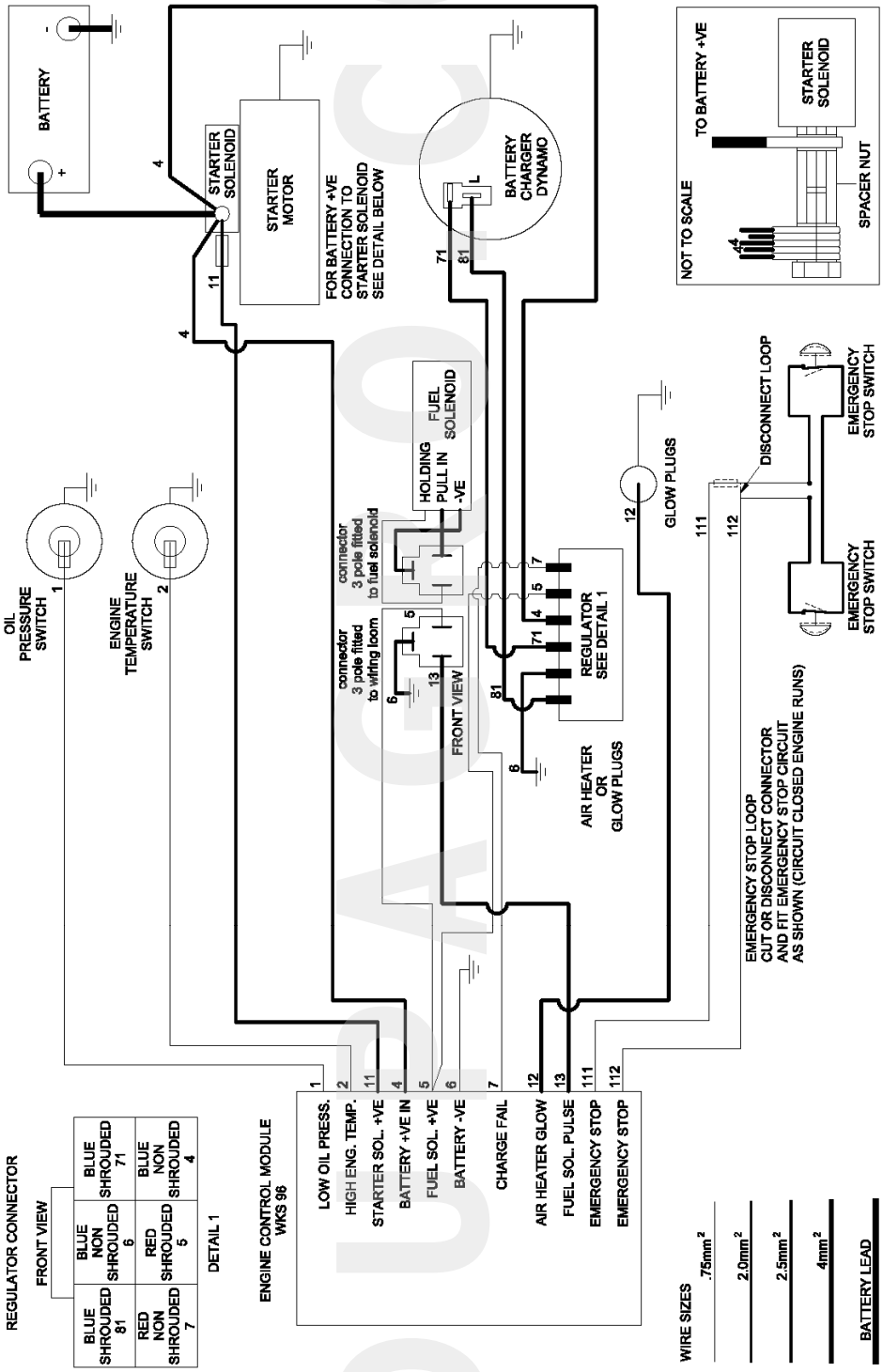
9 WIRING DIAGRAMS

9.1 Wiring Diagram for Yanmar 2TNE68 Engine in Supersilent Canopy



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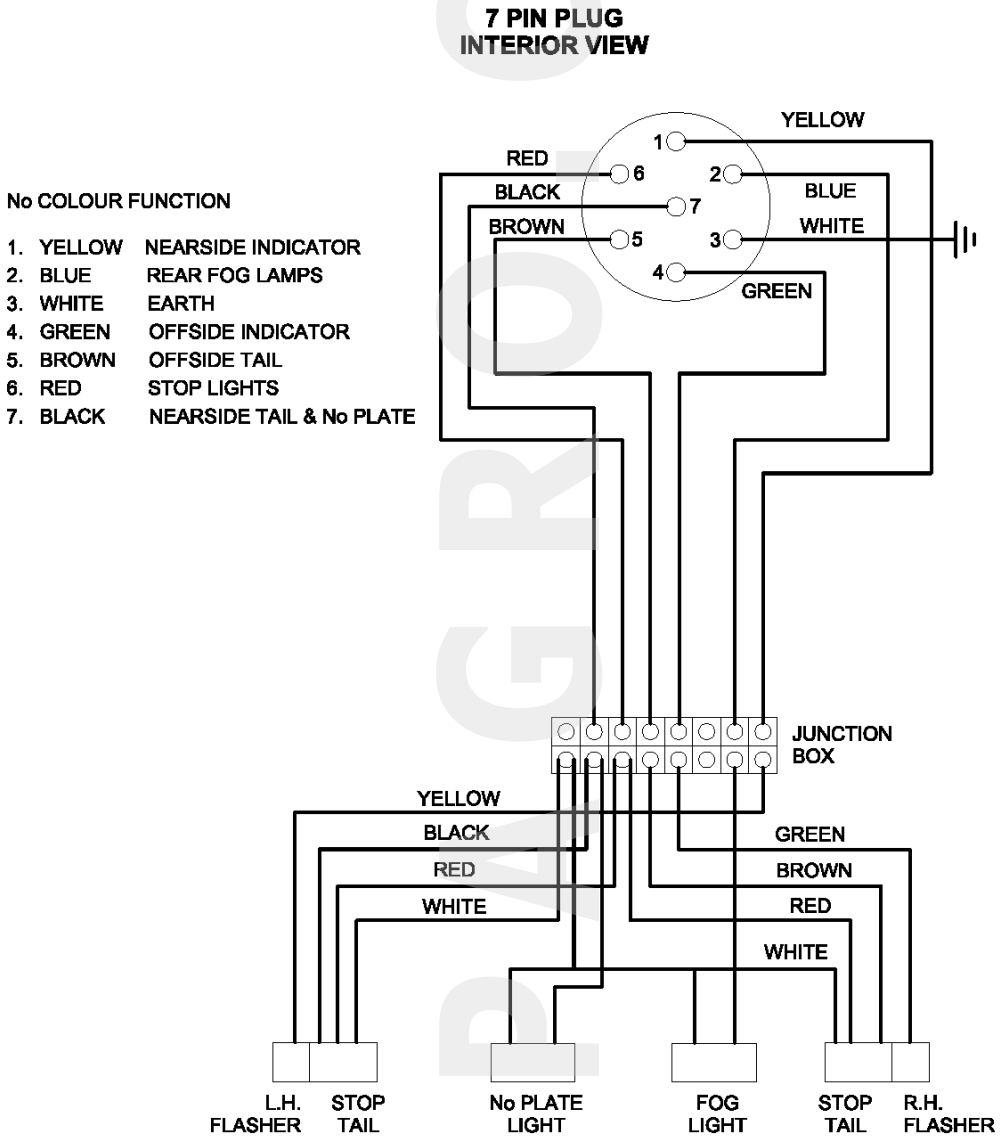
9.2 Fast Tow trailer Lighting Circuit



NOTE:

Front marker lights are for twin axle assemblies only

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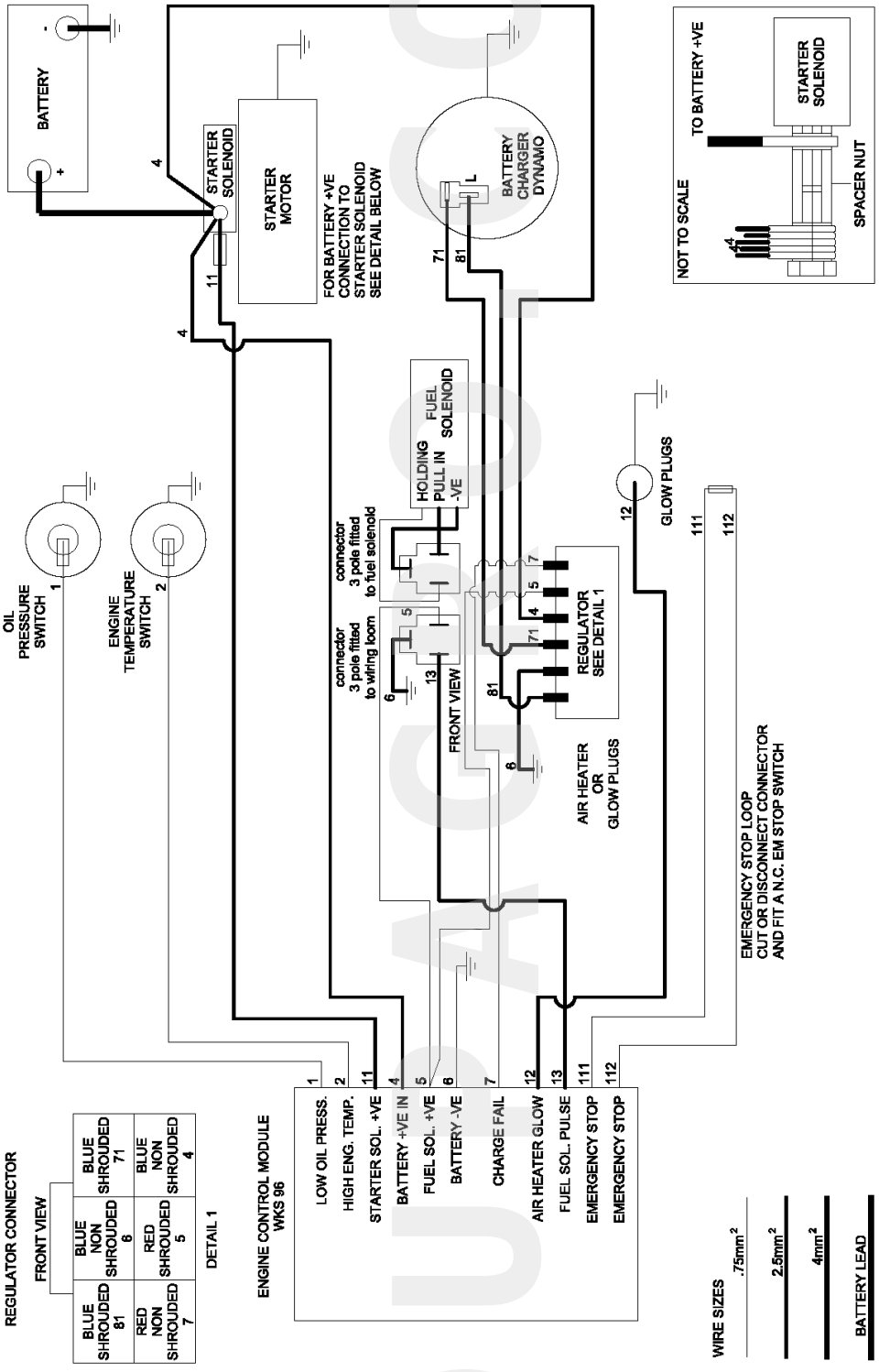
9.3 Wiring Diagram for Yanmar 2TNE68 Engine – Open Set



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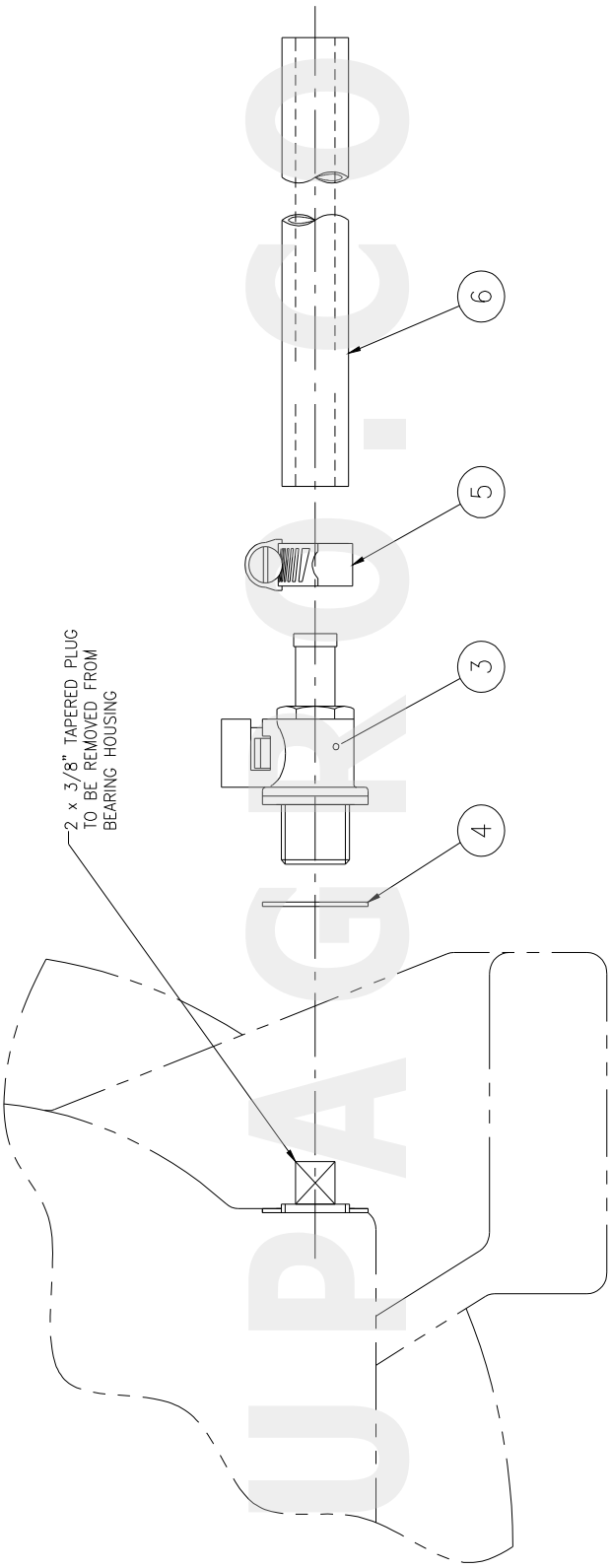

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10 OIL DRAIN EXTENSION KIT 0907051000

2 x Oil Drain Extension Kits Required for D80 SuperSilent Builds

ITEM	DESCRIPTION	PART NUMBER	QTY
1	Oil Drain Extension Kit	0907051000	
2			
3	Oil Drain Tap 3/8” BSP with Hose Spigot	9520P00301	1
4	Drain Tap Spacer/Sealing Washer	7599323000	1
5	Hose Clip	9505816907	1
6	Multi-Purpose Tube 10 I/D	9507K00301	1
7			

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