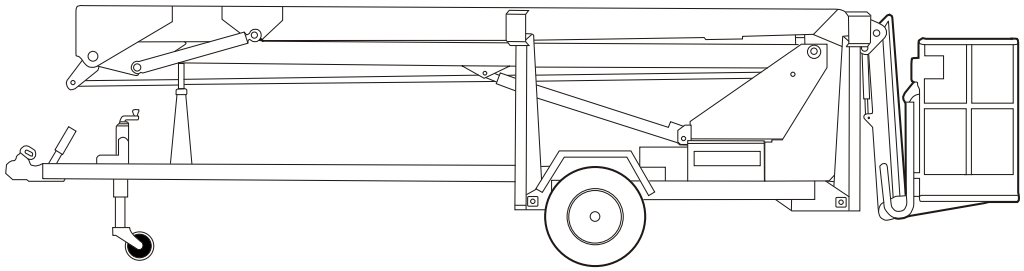
snorkel

MHP1544HD
With ELECTRIC CONTROLS

MHP1544HD
With HYDRAULIC CONTROLS



Gasoline
Battery Electric
Bi-Energy Options

REPAIR PARTS MANUAL

Part Number 13579-2
October 2011 (Rev A)
Version II

Serial Number NZxxxxxx and after

LIMITED WARRANTY

Snorkel warrants each new machine manufactured and sold by it to be free from defects in material and workmanship for a period of one (1) year from date of delivery to a Customer or for one year after the machine has been placed in first service in a Dealer rental fleet, whichever comes first. Any part or parts which, upon examination by the Snorkel Service Department, are found to be defective, will be replaced or repaired, at the sole discretion of Snorkel, through its local Authorized Dealer at no charge.

Snorkel further warrants the structural components; specifically, the mainframe chassis, turntable, booms and scissor arms, of each new machine manufactured by it to be free from defects in material and workmanship for an additional period of four (4) years. Any such part or parts which, upon examination by the Snorkel Service Department, are found to be defective will be replaced or repaired by Snorkel through its local Authorized Dealer at no charge; however, any labor charges incurred as a result of such replacement or repair will be the responsibility of the Customer or Dealer.

The Snorkel Service Department must be notified within forty-eight (48) hours of any possible warranty situation during the applicable warranty period. Personnel performing warranty repair or replacement must obtain specific approval by Snorkel Service Department prior to performing any warranty repair or replacement.

Customer and Dealer shall not be entitled to the benefits of this warranty and Snorkel shall have no obligations hereunder unless the "Pre-Delivery and Inspection Report" has been properly completed and returned to the Snorkel Service Department within ten (10) days after delivery of the Snorkel product to Customer or Dealer's rental fleet. Snorkel must be notified, in writing, within ten (10) days, of any machine sold to a Customer from a Dealer's rental fleet during the warranty period.

At the direction of the Snorkel Service Department, any component part(s) of Snorkel products to be replaced or repaired under this warranty program must be returned freight prepaid to the Snorkel Service Department for inspection. All warranty replacement parts will be shipped freight prepaid (standard ground) from the Snorkel Service Department or from Snorkel's Vendor to Dealer or Customer.

REPLACEMENT PARTS WARRANTY

Any replacement or service part made or sold by Snorkel is not subject to the preceding **Limited Warranty** beyond the normal warranty period of the machine upon which the part was installed.

THIS WARRANTY EXCLUDES AND SNORKEL DOES NOT WARRANT:

1. Engines, motors, tires and batteries which are manufactured by suppliers to Snorkel, who furnish their own warranty. Snorkel will, however, to the extent permitted, pass through any such warranty protection to the Customer or Dealer.
2. Any Snorkel product which has been modified or altered outside Snorkel's factory without Snorkel's written approval, if such modification or alteration, in the sole judgment of Snorkel's Engineering and/or Service Departments, adversely affects the stability, reliability or service life of the Snorkel product or any component thereof.
3. Any Snorkel product which has been subject to misuse, improper maintenance or accident. "Misuse" includes but is not limited to operation beyond the factory-rated load capacity and speeds. "Improper maintenance" includes but is not limited to failure to follow the recommendations contained in the Snorkel Operation, Maintenance, Repair Parts Manuals. Snorkel is not responsible for normal maintenance, service adjustments and replacements, including but not limited to hydraulic fluid, filters and lubrication.
4. Normal wear of any Snorkel component part(s). Normal wear of component parts may vary with the type application or type of environment in which the machine may be used; such as, but not limited to sandblasting applications.
5. Any Snorkel product that has come in direct contact with any chemical or abrasive material.
6. Incidental or consequential expenses, losses, or damages related to any part or equipment failure, including but not limited to freight cost to transport the machine to a repair facility, downtime of the machine, lost time for workers, lost orders, lost rental revenue, lost profits or increased cost.

This warranty is expressly in lieu of all other warranties, representations or liabilities of Snorkel, either expressed or implied, unless otherwise amended in writing by Snorkel's President, Vice President-Engineering, Vice President-Sales or Vice President-Marketing.

SNORKEL MAKES NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION OF THIS LIMITED WARRANTY. SNORKEL MAKES NO IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND DISCLAIMS ALL LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO INJURY TO PERSONS OR PROPERTY.

The Customer shall make all warranty claims through its local Authorized Dealer and should contact the Dealer from whom the Snorkel product was purchased for warranty service. Or, if unable to contact the Dealer, contact the Snorkel Service Department for further assistance.

Effective July 1995

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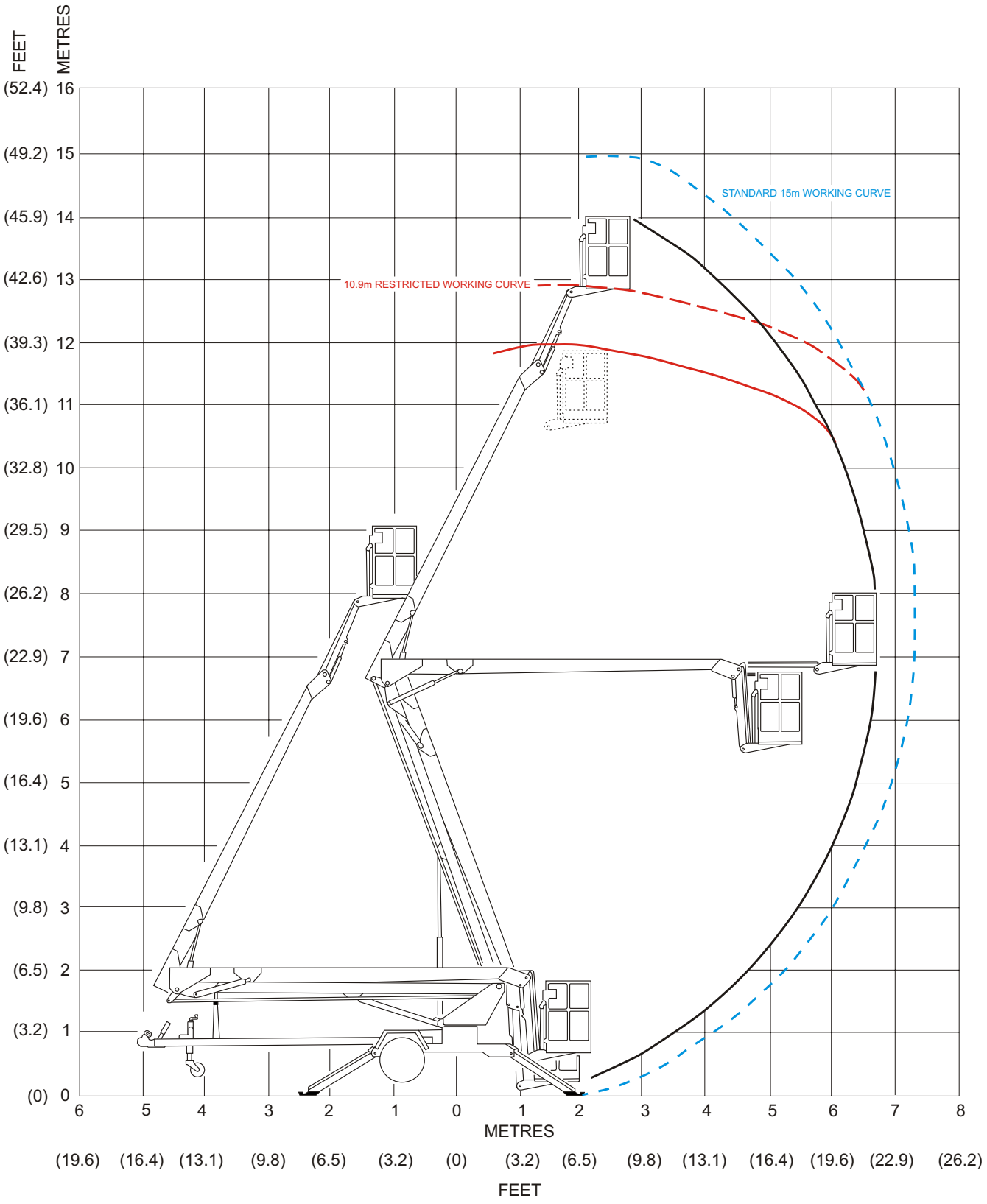
■ General Specifications

SPECIFICATIONS	MHP15/44HD-EC	
Nominal working height	14.8m	48'6"
Maximum height to basket floor	12.8m	42'
Maximum outreach	6.6m	21' 6"
Maximum width of base Stabilisers retracted Stabilisers extended	 1.8m 3.5m	 5' 11" 11' 6"
Safe working load (unrestricted)	200kg	440lbs
Platform size	1.7 x 0.70 x 1.14m	3' 10" x 2' 4" x 3' 7"
Platform construction	Steel	Steel
Travelling height	1.9m	6' 2"
Overall length	7.3m	24'
Maximum towing speed	80km/h	50m/h
Turntable rotation	540° Non continuous or 360° continuous	
Trailer tongue weight (approximately)	100kg	220lb
Maximum rated axle capacity	2000kg	4408lb
Insulation rating	Nil (on standard models)	
Weight	1760kg	3880lb

■ Engine Specifications

Engine Make	Honda (gasoline)
Model	GX 160
Engine type	4-stroke, over head valve, 1 cylinder
Displacement	163 cm^3 (9.9 cu-in)
Bore x Stroke	68 x 45 mm (2.7 x 1.8 in)
Max. output	4 kW/4,000 rpm
Max. torque	1.1 kg-m (8.0 ft-lb)/ 2500 rpm
Fuel	gasoline
Fuel Grade	automotive gasoline (unleaded or lowleaded preferred)
Fuel consumption	230 g/PSh
Cooling system	Forced air
Ignition system	Transistor magneto
PTO shaft rotation	Counterclockwise
Oil Capacity	0.60 litres (0.60 US qt, 0.53 Imp qt)
Oil Grade	SAE 10W-30

■ Working Envelope



■ Introduction

Units built for the Australian market may be fitted with a 10.9m height restriction kit.

This kit is fitted to allow the maximum height to the platform floor to be restricted to10.9m from the ground.

This is to allow the unit to be operated by unlicensed operators in accordance with Australian legislation.

⚠IMPORTANT

If this machine is fitted with a 10.9m kit you must ENSURE that you read and understand the information in this section.

■ Signage

If the machine is fitted with a 10.9m kit the decal below will be attached to the base/column adjacent to the height lockout switch.

Figure 1 - Decal

■ Operation

When the 10.9m function is selected, via the key switch mounted at the base, the unit operates normally until a micro switch at the knuckle is activated by a cam.

This then powers a solenoid valve that shuts off oil to the upper lift cylinders and prevents the upper boom raising any further.

The key switch ❶ allows the unit to operate normally so the platform floor height is 12.8m (15m working height) when the **DISABLED** position ❸ on the key switch is selected (see on Figure 2).

When the key switch is placed in the **ENABLED** position ❷ the unit is restricted to a platform floor height of 10.9m (see Figure 2). The key can only be removed in the disabled position thus effectively 'locking' the machine into the restricted mode.

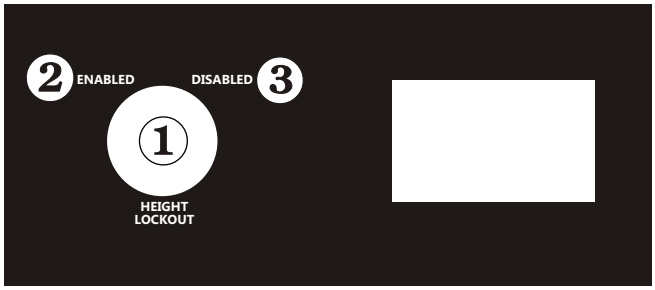


Figure 2 - Key Switch

⚠IMPORTANT

In order to operate this machine in the unrestricted mode (DISABLED) the operator is required to hold a WP Certificate of Competency.

⚠WARNING

The use of a machine fitted with a 10.9m height restriction kit, in the unrestricted (DISABLED) mode by an uncertified operator is a breach of Australian law.

⚠IMPORTANT

If a machine is fitted with a 10.9m height restriction kit, and the machine is to be made available for hire,
IT IS THE RESPONSIBILITY OF THE HIRE COMPANY OR OWNER
to establish that the person hiring the machine, or the person who will be operating the machine, has a WP class Certificate of Competency.

If they do not have such a qualification the machine must be restricted to 10.9m operation and the key must be removed thus locking the unit in that mode prior to the hiree removing the machine.

■ Operation In Unrestricted Mode

If the machine is being operated in the unrestricted (DISABLED) mode, by a suitably qualified operator, the key MUST be switched to restricted (ENABLED) mode and the key removed from the switch any time that the qualified operator leaves the machine.

As previously stated this effectively 'locks' the machine into the 10.9m mode thus preventing any unqualified person from operating the machine in the unrestricted mode.

10.9 Height Restriction

■ Tamper Protection

In order to reduce the likelihood of the machine being tampered with to gain the extra height by an unqualified operator, a tamper protection device is installed on the machine.

This consists of a lockwire and lead seal and the owner must check this on a regular basis to ENSURE that the protective device is in place.

⚠WARNING

If the seal is broken the owner of the machine must:

1. **ENSURE that the 10.9m lockout function still operates correctly.**
2. **Replace the seal.**
3. **ENSURE that the machine continues to meet the requirements of the relevant Australian legislation.**

■ About this Manual:

This Maintenance and Repair Parts manual covers current production machines only.

While Snorkel has attempted in every way to confirm that all information in this manual is correct, improvements are being constantly made to the machine that may not be reflected in this manual.

NOTE:

It is recommended that you record the serial and model number of your machine (see page 11 of this chapter). This information is found on the serial number placard.

■ Manual Organization

The Repair Parts Manual consists of five sections with an individual table of contents preceding sections 1 through 4.

Subassemblies and detailed parts are identified by index numbers on the illustrations that correspond to the item numbers on the parts listing. When requesting any part, always specify complete part number, description, model and serial number of your unit.

The following is a general description of each section and its contents.

❑ General Specifications

The section immediately preceding, contains information relating to the general specifications of the MHP15J.

❑ Maintenance

The pages immediately following, contain information as to the maintenance schedules - lubricants and procedures for proper lubrication of the unit.

❑ Repair parts and illustrations

Repair Parts (Section 1), contains parts listings and illustrations for general mechanical repair parts of all major installations and subassemblies of the unit.Hydraulics

❑ Hydraulics

(Section 2), contains parts listings and illustrations of hydraulic components installations including hydraulic schematics and individual components such as cylinders, controls valves and solenoid operated valves.

❑ Electrical

Electrical (Section 3), contains listings and illustrations of electrical components installations including wiring schematics.

❑ Options

Options (Section 4), contains parts listings and illustrations of optional installations that may be installed on your unit.

❑ Parts index - Page locator

The parts index - page locator, identifies the component by name and directs you to the section and page number where you may find information for that part such as its part order number, etc.

■ Maintenance and Schematics

❑ Maintenance information

The parts drawings located in the repair parts sections, are designed for use as a guide for proper disassembly of the machine and components as well as for parts replacement. Always refer to the hydraulic system installation drawings and the electrical wiring diagram before removing or disassembling associated parts.

⚠CAUTION

Do not attempt to disconnect or remove any hydraulic line before reading and understanding all text concerning the system hydraulics. In most cases, disassembly of the machine will be obvious from the illustration.

⚠IMPORTANT

DO NOT modify this ariel platform without prior written consent of Snorkel Engineering Department.

Modification may void the warranty, adversely affect stability, or affect the operational characteristics of the ariel platform.

When disassembling or reassembling components, complete the procedural steps in sequence. Do not partially disassemble or assemble one part, then start on another. Always check your work to assure that nothing has been overlooked.

The following list is a gentle reminder when disassembling or assembling the machine.

- ✓ Always be conscious of weight.
- ✓ Never attempt to lift heavy objects without the aid of a mechanical device.
- ✓ Do not allow heavy objects to rest in an unstable condition.
- ✓ Always make sure work platform is in stowed position - blocked or the weight removed by a suitable lifting device before disconnecting the hydraulic hose from the motor/pump unit to the lift cylinder.
- ✓ When raising a portion of the machine, be sure that adequate blocking is properly positioned - Do not depend on lifting device to hold and secure weight.
- ✓ If a part resists removal, check to see if all fasteners, electrical wiring, hydraulic lines, etc., have been removed or that other parts are not interfering.

Parts should be thoroughly inspected before restoring to service at the time of reassembly. Burrs, nicks or scratches may be removed from machined surfaces by honing or polishing with #600 crocus cloth, followed by a thorough cleaning in an approved cleaning solvent, and blown dry with compressed air. Do not alter the contour of any part. If this operation does not restore the part to a serviceable condition, replace the part.

Replace all O-rings, seals, and gaskets at reassembly. Use new roll pins or cotter pins. Dip all packing rings and seals in hydraulic oil before reassembling in cylinder and manifold installations. Replace any part having imperfect threads. In general, units that have been disassembled can be reassembled by reversing the order of disassembly.

Remember that the service life of a machine can be increased by keeping dirt and foreign materials out of the vital components. Precautions have been taken to safeguard against this; shields, covers, seals and filters are provided to keep air and oil supplies clean; however, these items must be maintained on a scheduled basis in order to function properly.

At any time air or oil lines are disconnected, clean surrounding areas as well as the opening and fittings themselves. As soon as a line or component is disconnected, cap or cover all openings to prevent the entry of dirt or foreign materials.

New parts should remain in their container until they are ready to be used.

Clearly mark or tag hydraulic lines and electrical wiring connections when disconnecting or removing them from unit. This will assure that they are correctly reinstalled.

Proper assembly is critical to the successful rebuilding of any unit. Carefully inspect any parts which are to be reused. If in doubt, replace.

"SAFETY FIRST" is a good slogan.

Replace any guards and protective devices that have been removed to carry out maintenance and repair work.

■ Maintenance schedules

Snorkel has established a Preventive Maintenance Schedule that includes:

- ✓ Daily Maintenance (Operator's Inspection)
- ✓ 90 Day or 150 Hour (frequent) Maintenance
- ✓ Yearly or 500 Hour (annual) Maintenance,

These schedules should ensure the detection of any defective, damaged or improperly secured parts and provide information regarding lubrication and other minor maintenance items.

The Maintenance Schedule following, outlines the requirements of these maintenance checks for each time interval. The Operator's Pre-operational inspection must be performed by a trained operator. All other maintenance and inspections must be performed by a trained service technician only.

Note that the 90 Day or 150 hour (frequent) and yearly or 500 hour (annual) Maintenance, require use of the Preventive Inspection Maintenance Checklist to pinpoint all inspection items. Retain a copy of these forms for your records.

They also require that all placards and decals on the unit are to be inspected.

All placards and decals must be in place and legible. Use the placards installation drawing and parts listing in the repair parts section 1 of this manual to check these placards and decals.

Snorkel recommends that you make additional copies of the Preventive Inspection Maintenance Checklist forms for your use in performing these

⚠ DANGER

Failure to perform the Preventive Maintenance at the intervals outlined in the Maintenance Schedule may result in a unit being operated with a defect that could result in INJURY or DEATH of the unit operator. DO NOT allow a unit to be operated that has been found to be defective.

Repair all defects before returning the unit to service.

■ Daily Maintenance

❑ Pre-operational Inspection

Item	Service Required
Engine fuel level	Look to see that the fuel tank is full
Fuel tank cap	Check to see that the cap is tight
Engine oil level	Check oil level (between dipstick lines)
Fuel leaks	Visually inspect (hoses and connections)
Engine cooling	Check that grills are not blocked
Wiring harnesses	Visually inspect (installation, condition)
Battery terminals	Visually inspect (no corrosion)
Battery fluid level	Check fluid level (1/4" or 6 mm below filler neck)
Hydraulic oil level	Visually inspect level (between lines on gauge)
Hydraulic oil leaks	Visually inspect (hoses, tubes)
Tyres and wheels	Visually inspect (condition)
Bolts and fasteners	Visually inspect (condition)
Structural damage and welds	Visually inspect (weld cracks, dents)
Lanyard anchor points	Visually inspect (condition)
Platform gravity gate	Check condition and operation
Platform guardrails	Visually inspect (condition)
Flashing light (option)	Visually inspect (operation)
Ground control switches	Actuate and inspect for proper operation
Ground control valve levers	Check operation (causes correct motion)
Emergency lower	Check operation (causes correct motion)
Platform control box switches	Actuate and inspect for proper operation
Platform control valve levers	Check operation (causes correct motion)
RCD/ELCB AC outlet (option)	Check operation
Platform work lights (option)	Check operation
Placards and decals	Visually inspect (installation, condition)

■ Hydraulic Hose Age

Hoses used in Snorkel production units are manufactured by Hydraulink, Parker and Eaton and have a code stamped on them that offers the following information.

Hydraulink Sample Hose Code **2-2005 lot 050519/10**

Month of Manufacture — **2** – **2005** **lot 050519/10** — Lot number

Year of Manufacture

Parker Sample Hose Code **11- 4Q 99**

Manufacturing Plant Number — **11** - **4Q** **99** — Year of Manufacture

Manufacturing Period (i.e. 4th Quarter)

Eaton Sample Hose Code **2Q 06**

Manufacturing Period (i.e. 2nd Quarter) — **2Q** **06** — Year of Manufacture

■ 90 Day or 150 Hour Maintenance (Trained Service Technician)

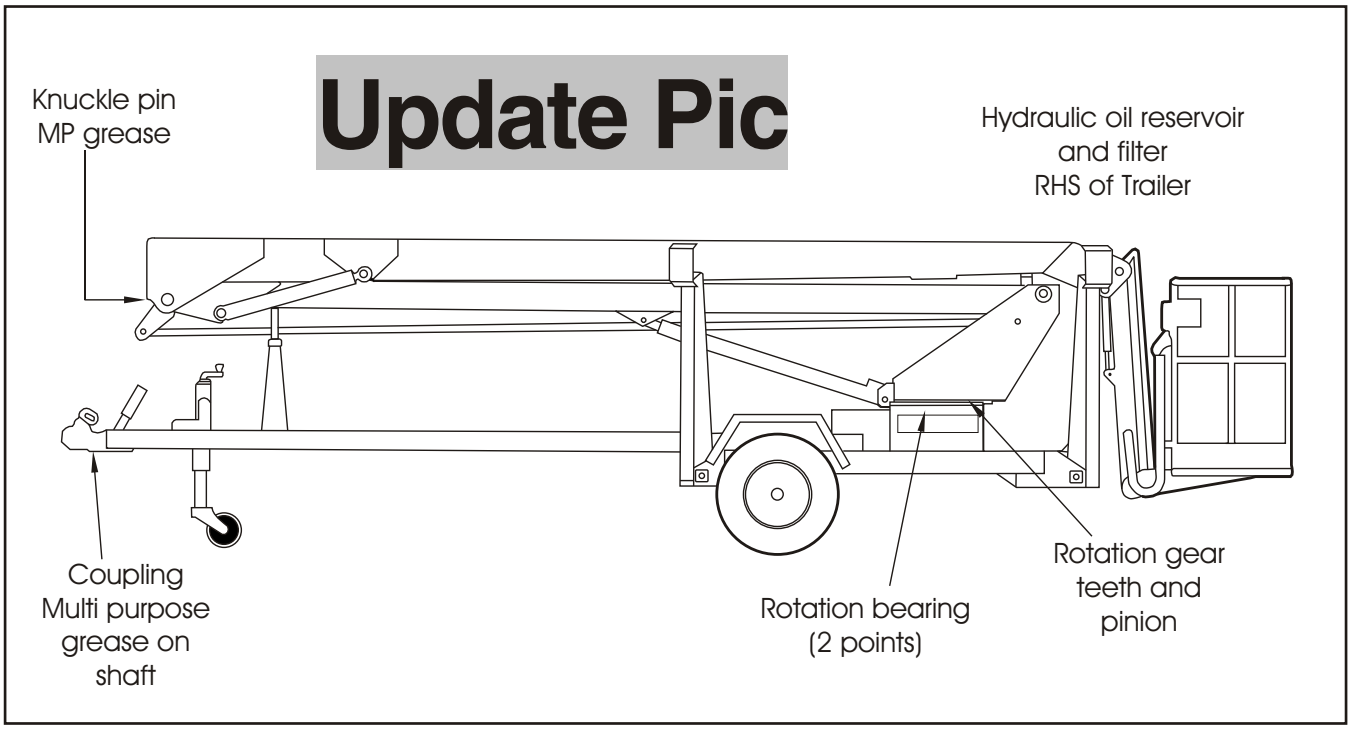
Components	Service Required	Recommended Lubricant or Further Instructions
Daily maintenance	Perform maintenance as per schedule	
Preventive inspection maintenance checklist	Perform inspection, complete form	Retain copy of checklist
Placards and decals inspection	Inspect using drawing and parts listing in section 1 (repair parts)	Replace any missing or unreadable decals/placards
Rotation bearing	Lubricate	Conoco Super Sta #2 Above 32° Mobilgrease CM-P Below 32° Mobilgrease CM-L
Rotation bearing teeth & pinion	Lubricate	Conoco Super Sta #2 Above 32° Mobilgrease CM-P Below 32° Mobilgrease CM-L
Platform rotator	Check smooth operation	Repair or replace if not working properly
Platform controls	Check smooth operation & speeds	
Battery	Check specific gravity	1.260/1.275 at 27° C.
Hydraulic filter	Check condition	Replace if dirty
Engine RPM	Check for proper engine RPM (3000)	See engine manufactures owner's manual
Engine oil	Replace per engine owners manual	

■ Six Monthly (Trained Service Technician)

Components	Service Required	Recommended Lubricant or Further Instructions
Over-centre valve	Inspect and service	
	Lubricate Plunger and bore	General purpose greaser

■ Yearly or 500 Hour Maintenance (Trained Service Technician)

Components	Service Required	Recommended Lubricant or Further Instructions
90 day or 150 hour maintenance	Perform maintenance per schedule	
Hydraulic oil reservoir	Clean and replace fluid	Shell Tellus 32 or similar
Hydraulic filter	Replace	After 1st. 50 hours, thereafter at recommended interval
Hydraulic pressures	Check pressures	
Wheel bearings	Clean and re-pack	EP Grease



The illustration locates the lubrication points of the MHP15/44HD.

■ Lubricants

To obtain maximum life of any industrial equipment, a well planned maintenance programme should be followed. The information provided on these and preceeding pages is intended to provide guidelines for proper lubrication, however, some operating conditions will require more frequent checks and lubrication than listed - for example applications with much dust or moisture will require modification of the schedule to fit that particular application.

The use of high grade lubricants and fluids should be encouraged. Sources of these lubricants may be from almost any of the oil companies. Those listed are typical and any lubricant with equal specifications may be used. However if in doubt regarding the use of lubricants other than those listed, contact Snorkel.

❑ Pressure gun application

Service all fittings as indicated in the Maintenance Schedule and lubrication illustration. Wipe away all excess lubricant from exposed surfaces. Over lubrication can collect dirt and foreign matter which acts as an abrasive. Lubrication of accessory equipment should be in accordance with the manufacturer's recommendations.

❑ Rotation bearing

Rotation bearing. Pressure gun lubricate bearing at recommended interval using lubricant as outlined in the maintenance schedule. Rotate while lubricating.

❑ Rotation gear teeth and pinion

Rotation gear teeth and pinion. Gear teeth and gear box pinion should be lubricated with a open gear grease.

❑ Engines

Engine. Refer to the engine manufacturer's instruction manual or consult your local engine service representative if engine adjustments or repairs are needed. The engine MUST be operated in accordance with manufacturer's instructions and serviced at recommended intervals.

❑ Hydraulic oil reservoir

Hydraulic oil reservoir. The fluid level should be kept between the low and full marks on the dipstick and should be checked with all cylinders fully retracted and the platform in stowed position.

The interior of the reservoir should be wiped out and cleaned each time the hydraulic oil is changed.

It is absolutely necessary that only new, clean hydraulic oil is added.

⚠CAUTION

If it becomes necessary to add or use an oil other than the recommended fluid, it is important that it be compatible and equivalent to the factory fill. Local oil suppliers can generally furnish this information.

If questions still remain, contact Snorkel for further information.

❑ Filling hydraulic system

This procedure must be followed when starting up a new machine or after any major service affecting the hydraulic system when a considerable volume of oil may have been drained from the system.

⚠IMPORTANT

It is most important that the machine is not operated unless the lower boom cylinder is completely filled with oil.

It is also advisable to follow this procedure if there is any doubt about the condition of the machine, i.e. if it has been standing idle for more than a week, or as a safeguard, when a new operator is taking charge of the machine.

NOTE - Air in Oil

If a cylinder is empty, filling it will cause the level in the reservoir to fall and may result in air being discharged from the cylinder into the tank.
In this event, when the cylinder is fully extended the engine should be stopped to allow the air to separate from the oil (about five minutes is sufficient) and the oil topped up again before restarting the engine.

1. Fill the reservoir with the recommended hydraulic oil. Leave the filler cap off so that any drop in the oil can be seen.
2. Lower the stabiliser legs to the operating position.
3. Raise the lower boom halfway.
4. Lower the lower boom and raise the hydraulic legs.
5. Check the oil level as in ❶.
6. Lower stabiliser legs to operating position.
7. Raise the lower boom fully then raise the upper boom fully.
8. Rotate the turntable through 360 .
9. Lower all booms and raise the hydraulic legs.
10. Check the oil level as in ❶.

The machines hydraulic system is now correctly filled.

NOTE - Oil Seals:

It is best to leave oil seals undisturbed if the machine is operating satisfactorily. If replacement of seals is necessary, extreme care must be taken not to damage the surface of the seals, cylinder bore or the chrome plated piston shaft.

- Absolute cleanliness is essential.

⚠CAUTION

At all times when a cylinder is stripped down make sure that the cylinder bore and the piston rod are not damaged in any way. Particular care is necessary that the cylinder head nut is not allowed to drop off the head and damage the chromium plated shaft.

If questions still remain, contact Snorkel for further information.

■ Over-Centre Valve

The over-centre valve is factory set and should not need adjusting unless it is knocked or the booms or levelling system is dismantled.

The over-centre valve should be checked six monthly. This can be done by levelling the trailer to the level bubble, and levelling the lower boom.

Observe the over-centre valve operation while raising the upper boom only. As the roller on the over-centre valve reaches the flat of the cam on which it travels, ensure that the roller extends, to actually roll on to the flat of the cam, and is not seized within the over-centre valve.

At this point the upper boom should not raise any higher, and the angle of the upper boom must not exceed 65°.

In this position the lower boom should not be able to be lowered until the upper boom is lowered.

The over-centre valve does not require regular maintenance apart from checking as detailed above.

⚠WARNING

It is important that if either the levelling system or engine speed is adjusted, the over-centre valve setting must be checked afterwards.

■ Battery

Battery. The battery will have longer life if the water level is maintained and it is kept charged. The unit

will have better starting characteristics with a fully charged battery.

In cold weather the battery should be maintained at full charge to keep from freezing. An extremely low or dead battery can freeze in cold weather. Make sure connections are clean and tight.

Make sure charging equipment is operating properly.

⚠DANGER

Lead-acid batteries contain sulfuric acid which will damage eyes or skin on contact. When working around batteries, ALWAYS wear a face shield to avoid acid in eyes.

If acid contacts eyes, flush immediately with clear water and get medical attention.

Wear rubber gloves and protective clothing to keep acid off skin, if acid contacts skin, wash off immediately with clear water.

Lead-acid batteries produce flammable and explosive gases. NEVER allow smoking, flames or sparks around batteries.

■ Preventive inspection maintenance 90 day or 150 hour checklistl

OK	OK - No Service Required
✔	Corrective Action Required
X	Corrected, (Record description of corrective action).

Serial Number _____

Inspection Procedures Codes
(1) Weld cracks, dents and/or rust
(2) Installation
(3) Leaks
(4) Operation
(5) Condition
(6) Tightness
(7) Residue buildup
(8) See placards and decals inspection chart

Check	OK	✔	X
Chassis			
Structural (1)			
Tires (5)			
Tire pressure (5)			
Hydraulic tubes and hoses (3,5)			
Decals and placards (2,8)			
Wheel nuts (6) Torque 80lbft 108.5Nm			
Battery disconnect switch (4)			
Lubrication points			
Pins, pin keepers (2)			
Turntable			
Structural (1)			
Swivel mount assembly (2,3)			
Hydraulic tubes and hoses (3,5)			
Wire harness (2,5)			
System pressure (Max 2800 psi)			
Lubrication points			
Emergency bleed down valve (4,3)			
Engine (2,4)			
Engine charging system (4)			
Engine air filter (5)			
Hydraulic pump (4)			
Engine oil (5)			
Electric choke (4)			
Hydraulic oil reservoir (2,3,5)			
Hydraulic oil reservoir filler/breather cap (2,6)			
Hydraulic oil reservoir fluid level (5)			
Hydraulic oil filter (3,4)			
Pins, pin keepers (2)			
Slew ring bolts (2,6)			
Lower Booms			
Structural (1)			
Boom lift cylinder pin (2,6)			
Boom lift cylinder and holding valve (3,4)			
Hydraulic tubes and hoses (3,5)			
Electrical Wires (5,2)			
Upper Booms			
Structural (1)			
Electrical wires (5)			
Jib cylinder pins (2,6)			
Jib cylinder and holding valve (3,4)			
Hydraulic hoses and tubes (3,5)			
Decals and Placards (2,8)			
Boom lift cylinder pins			

Check	OK	✔	X
Boom lift holding valve) (3,4)			
Platform			
Structural (1)			
Decals and placards (2,8)			
Platform gate (4)			
Hydraulic tubes and hoses (3,5)			
Platform mounting bolts (2,6)			
Correct operator's manual in document holder (2)			
Correct operation of tail lights, indicators (4)			
Battery			
Battery terminals (6,7)			
Battery electrolyte level (5)			
Fuel Tank			
Fuel tank (3,5)			
Fuel tank cap (2,3,4,5)			
Ground Control Station			
Station selector switch @ ground controls platform controls DO NOT work (4)			
Station selector switch @ platform controls ground controls DO NOT work (4)			
Cold start (4) Choke			
Keyed master switch (4)			
Boom speed rheostat switch (4) *Electric Controls Only*			
Turntable rotation (4)			
Upper boom lift UP - DOWN (4)			
Lower boom lift UP - DOWN (4)			
Jib boom lift UP - DOWN (4) *Electric Controls Only*			
Emergency stop (4)			
Over-centre valve (4,2)			
Interlocks			
Booms will not raise with legs stowed (4)			
Legs will not raise with booms up (4)			
Platform Control Station			
Foot switch (4) *Electric Controls / Hydraulic Controls Option*			
Foot switch, functions operate when engaged (4)			
Start switch (4)			
Cold start (4) Choke			
Boom speed rheostat switch (4) *Electric Controls Only*			
Turntable rotation (4)			
Upper boom lift UP - DOWN (4)			
Lower boom lift UP - DOWN (4)			
Jib boom lift UP - DOWN (4)			
Emergency stop (4)			
Optional Equipment			
Air line to platform (2,4)			
Dual fuel system (2,4)			
Platform work lights (2,4)			
Platform rotation (4)			
Platform Rotator			
Platform rotation holding valve (3,4)			
Rotator mounting bolts (2,6)			

Corrective Action Required

Note: If correction action is required on any item, attach sheet indicating problem and action taken.

All items have been properly checked and tested and found to be operating satisfactory or necessary corrective action has been completed.

Inspected By: _____ Date _____

■ Torque chart

NOM SIZE X PITCH	TENSILE STRESS AREA A_s (mm^2)	PROPERTY CLASS 8.8			PROPERTY CLASS 10.9		
		CLAMP LOAD W (N)	TORQUE (N.m)		CLAMP LOAD W (N)	TORQUE (N.m)	
			DRY k=0.20	LUBED k=0.15		DRY k=0.20	LUBED k=0.15
M3 x 0.5	5.03	2 200	1.32	0.99	2 990	1.79	1.34
M3.5 x 0.6	6.78	2 960	2.07	1.55	4 030	2.82	2.11
M4 x 0.7	8.78	3 830	3.07	2.30	5 220	4.17	3.13
M5 x 0.8	14.2	6 200	6.20	4.65	8 430	8.43	6.33
M6 x 1	20.1	8 770	10.5	7.90	11 950	14.3	10.8
M8 x 1.25	36.6	15 975	25.6	19.2	21 750	34.8	26.1
M8 x 1	39.2	17 100	27.4	20.5	23 275	37.3	27.9
M10 x 1.5	58.0	25 325	51	38.0	34 450	69	52
M10 x 1.25	61.2	26 725	53	40.1	36 350	73	55
M12 x 1.75	84.3	36 800	88	66	50 075	120	90
M12 x 1.25	92.1	40 200	96	72	54 700	130	98
M14 x 2	115	50 200	140	105	68 300	190	145
M14 x 1.5	125	54 550	155	115	74 250	210	155
M16 x 2	157	68 525	220	165	93 250	300	225
M16 x 1.5	167	72 900	235	175	99 200	320	240
M20 x 2.5	245	106 950	430	320	145 550	580	435
M20 x 1.5	272	118 750	475	355	161 550	650	485
M24 x 3	353	154 100	740	555	209 700	1 010	755
M24 x 2	384	167 600	805	605	228 100	1 100	820
M27 x 3	459	200 350	1 080	810	272 650	1 470	1 100
M27 x 2	496	216 500	1 170	875	294 600	1 590	1 150
M30 x 3.5	561	244 900	1 470	1 100	333 250	2 000	1 500
M30 x 3	580	253 150	1 520	1 140	344 500	2 070	1 550
M30 x 2	621	271 050	1 630	1 220	368 850	2 210	1 660
M33 x 3.5	694	302 950	2 000	1 500	412 250	2 720	2 040
M33 x 2	761	332 200	2 200	1 640	452 050	2 980	2 240
M36 x 4	817	356 600	2 570	1 930	485 300	3 490	2 620
M36 x 3	865	377 600	2 720	2 040	513 800	3 700	2 780
M39 x 4	976	426 000	3 320	2 490	579 750	4 520	3 390
M39 x 3	1 028	448 700	3 500	2 630	610 650	4 760	3 570
M42 x 4.5	1 121	489 300	4 110	3 080	665 850	5 590	4 200
M42 x 3	1 206	526 400	4 420	3 320	716 350	6 020	4 510
M45 x 4.5	1 306	570 050	5 130	3 850	775 750	6 980	5 240
M45 x 3	1 398	610 250	5 490	4 120	830 400	7 470	5 610
M48 x 5	1 473	642 950	6 170	4 630	874 950	8 400	6 300
M48 x 3	1 604	700 150	6 720	5 040	952 800	9 150	6 860

Grade marking 

■ To order service or repair parts

When placing an order for service or repair parts, please have the following information available for your machine.

- ✓ Machine model number
- ✓ Machine serial number
- ✓ Snorkel part number
- ✓ Description of part
- ✓ Quantity of parts required
- ✓ Your purchase order number
- ✓ Address for order to “Ship To”
- ✓ Your desired shipment method

All correspondence relative to this unit, such as field reports, discrepancy reports, requests for service information, etc., should be directed to:

Snorkel New Zealand
36 Bruce Road
P.O. Box 1041
Levin 5510
New Zealand

Phone: +64 06 368-9168
Fax: +64 06 368-9164

Attention: Parts Department

❑ ANSI and OSHA compliance

All owners and users of the aerial platform must read, understand, and comply with all applicable regulations. Ultimate compliance to OSHA regulations is the responsibility of the user and their employer.

ANSI publications clearly identify the responsibilities of all personnel who may be involved with the aerial platform. A reprint of the “Manual of Responsibilities for Dealers, Owners, Users, Operators, Lessors and Lessees of ANSI/SIA A92.5-1992 Boom-Supported Elevating Work Platforms” is available from Snorkel dealers or from the factory upon request.

Copies are also available from:

Scaffold Industry Association
20335 Ventura Blvd. Suite 310
Woodland Hills, CA 91364-2471 USA

❑ Manuals

Manuals are available from Snorkel to support any of the machines that we produce.

The specific manuals for MHP15/44HD are as follows:

- ✓ Operator’s Manual
  Snorkel part number - 13620-1

- ✓ Repair Parts Manual
  Snorkel part number - 13620-2

Record machine information here:

Model number*

_____

Serial number*

_____

Date of purchase

_____

Purchased from

_____

Snorkel dealer or distributor

_____

* This information is found on the serial number placard attached to your machine.

■ Stability Testing MHP15/44HD

❑ Introduction

The purpose of this test is to assess if the MHP 1544HD meets the requirements of AS 1418-10 2004 Appendix G Stability Calculations. The situation for minimum stability is with the booms at maximum outreach over the drawbar, with the maximum rated load in the platform, a manual force pulling toward the drawbar and maximum wind load acting on the back of the machine.

Since this testing involves taking the machine to the edge of its stability envelope care must be taken to ensure the test is failsafe i.e. the machine can not tip over if it fails the test. To this end the rated load is to be hung from the Test Weight Harness and the test weight is suspended 200mm above the ground during the test. If the machine starts to tip over the test weight will contact the ground, reducing the overturning moment, so that the machine can not continue to tip over.

❑ Equipment

- MHP 15/44HD
- Spirit level
- Rope
- Pulley
- Test weights & harness
- Ratchet tie down

❑ Setup and Procedure

The Test Weight harness location is at the rear edge of the platform. The test load for a standard machine is 194kg.

The manual force is 400N with an additional multiplication factor of 1.1 giving 440N or 45kg. The line of action of this force is such that it produces the greatest overturning moment. That is the line of action of the force is perpendicular to a line joining the top rail of the platform to the tipping line (see Figure 1).

The wind load is assumed to act at the centre of area of the elevated components. The Wind Load is 336N at 5.54m above ground. The overturning moment from the wind is used to find an equivalent force along the line of action of the manual force. The calculated force due to wind is 248N or 27.2kg

The load simulating the wind and manual force is therefore 72.2kg.

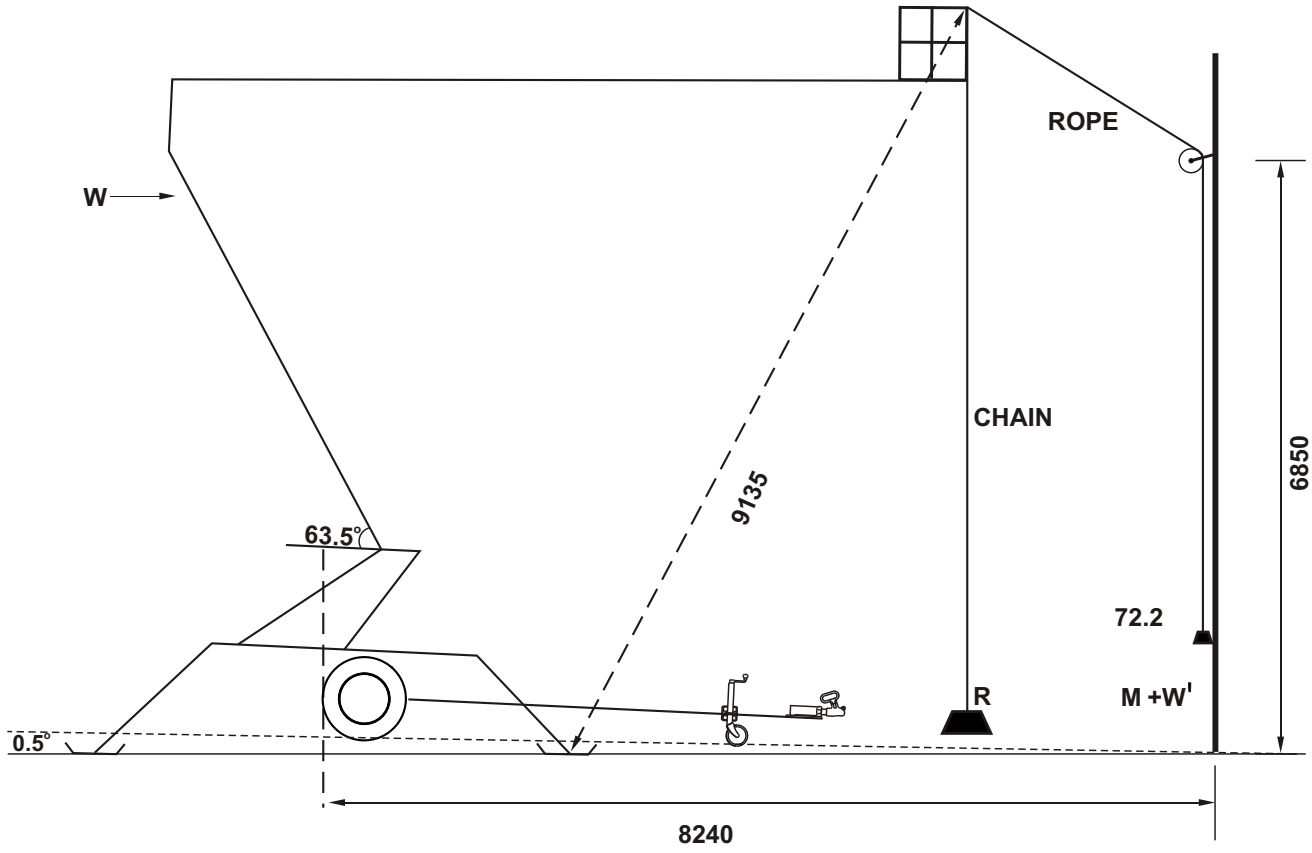
The test procedure is as follows (Refer Figure 2).

1. Set a pulley with rope, 6.85m above the ground on a fixed pole.
2. Place the machine so that the drawbar is pointing towards the fixed pole. The centre of the slew bearing must be 8.2m from a point directly beneath the pulley.
3. Raise the machine on the stabilisers to maximum height.
4. Level the machine laterally using the spirit level.
5. Level the machine fore and aft such that it is 0.5 deg drawbar down from level. (This simulates a poor setup by the end user).
6. Slew the booms until the rear of the basket is pointing towards the pole.
7. Tie the rope from the pulley around the top rail of the platform on the basket centre line.
8. Attach the Test Weight Harness and the Test Weight to the platform.
9. Raise the booms to maximum outreach (lower boom fully up and top boom and jib boom horizontal). The Test load must be between 100 and 200mm above ground.
10. Attach a ratchet tie down to the rope coming from pulley. Attach the other end to the Load simulating the wind and manual force.
11. Raise the Load simulating the wind and manual force with the ratchet tie down until the load is between 100 and 200mm above the ground. Ensure that the loads are not swinging i.e. the loads are static. (If both ‘rear’ legs lift clear of the ground STOP the test and release the ratchet).

❑ Pass Criteria

The machine can be assessed as meeting the requirements of AS 1418-10 2004 Appendix G Stability Calculations if the Test Load and the Load simulating the wind and manual force can be raised clear of the ground simultaneously while maintaining at least 3 point contact i.e. not more than 1 stabiliser foot off the ground.

❑ **Figure 2**



RATED LOAD R = 194kg
STANDARD MACHINE

MANUAL FORCE M = 45kg

WIND FORCE W = 27.2kg

LOAD ON PULLEY = 72.2kg

Trailer assembly 1-2
Trailer assembly drawing. 1-3
Boom assembly drawing 1-4
Boom assembly 1-5
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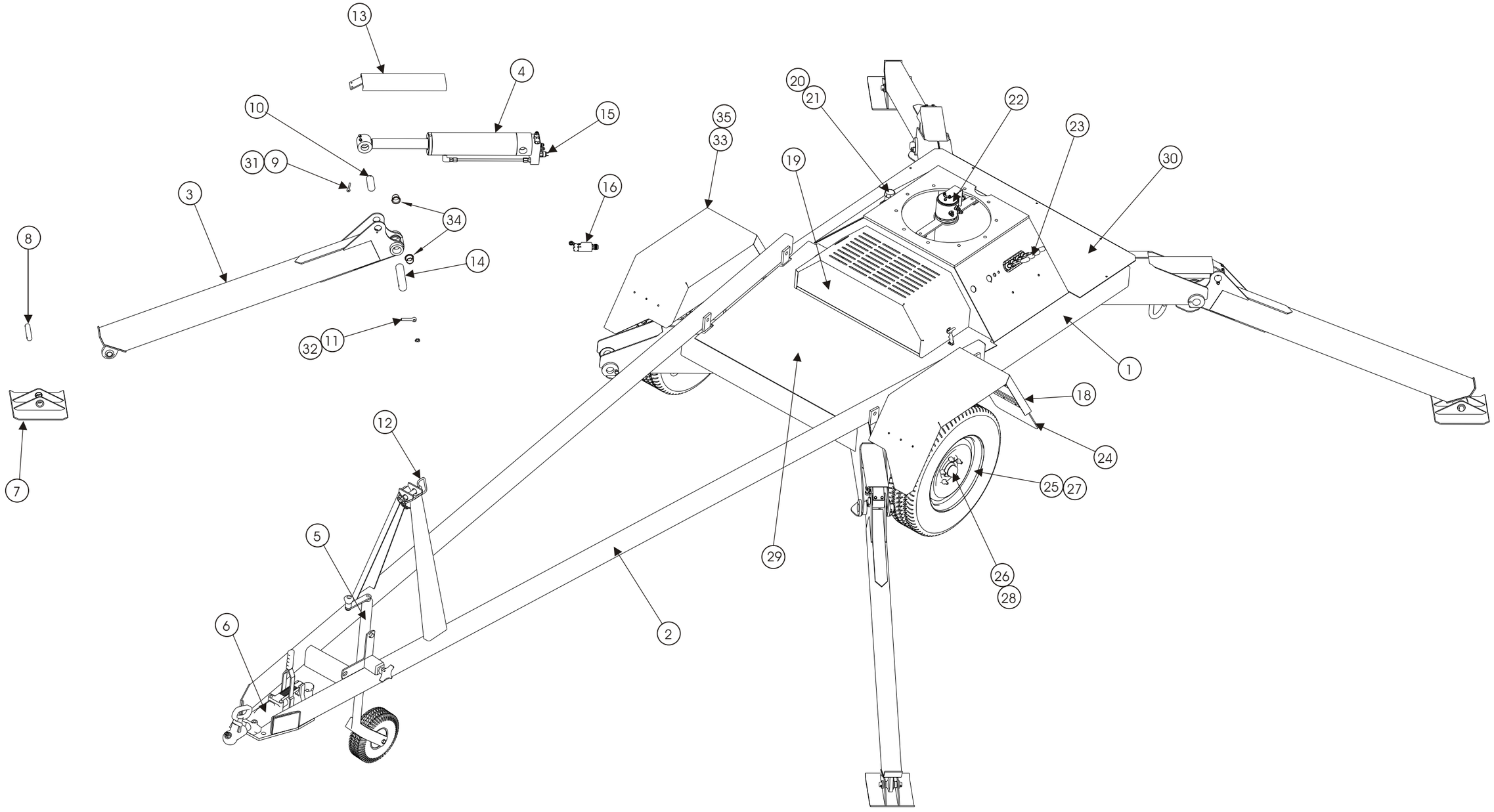
Engine assembly drawing 1-25

Trailer assembly

Item	Part No	Qty	Description
1.	12884	1	Trailer weld
2.	12883-1	1	Drawbar weld
3.	12900	4	Stabiliser weld
4.	10275A	4	Stabiliser cylinder
5.	1045	1	Jockey wheel
6.	12780	1	Tow coupling
7.	12790	4	Foot plate
8.	11369	4	Pin, foot plate
9.	8628	4	Pin keeper, 6mm
10.	10293	4	Pin, cylinder to stabiliser
11.	8626	8	Pin keeper, 10mm
12.	1771	1	Boom lock pin
13.	10277-2	4	Cylinder cover
14.	10291	4	Pin, stabiliser to housing
15.	9981	4	Pressure switch
16.	10142	4	Microswitch
17.	13143-1	2	Bracket, mudguard, left
18.	13046-1	1	Mudguard, left hand, (Replaces part number 12224L)
	12475	2	Plastic mudguard, (Prior to serial number NZ070806)
19.	13041	1	Engine cover
20.	8773	1	Oil tank
21.	7886	1	Dipstick
22.	11956A	1	Oil distributor, (Option only)
23.	9887	1	Leg control valve
24.	9869	2	Mudflap
25.	12772-1	2	Wheel rim, 14" (Prior to serial number NZ070806)
	13017-1	2	Wheel rim, 15" (From serial number NZ070806)
26.	12788	1	Drop axle assembly, (Prior to serial number NZ070806)
	12773	1	Drop axle assembly, (From serial number NZ070806)
27.	1704-005	2	Tyre, 14", (Prior to serial number NZ070806)
	13017-2	2	Tyre, 15", (From serial number NZ070806)
28.	12703	1	Springs, 2000kg
29.	9851-2	1	Floor plate, rear
30.	9851-5	1	Floor plate, front
31.	11492-1	8	Locktab, 6mm
32.	11492-3	8	Locktab, 10mm
33.	13046-2	1	Mudguard, right hand, (Replaces part number 12224R)
34.	3624-17	8	Bush, leg pivot
35.	13143-2	2	Bracket, mudguard, right



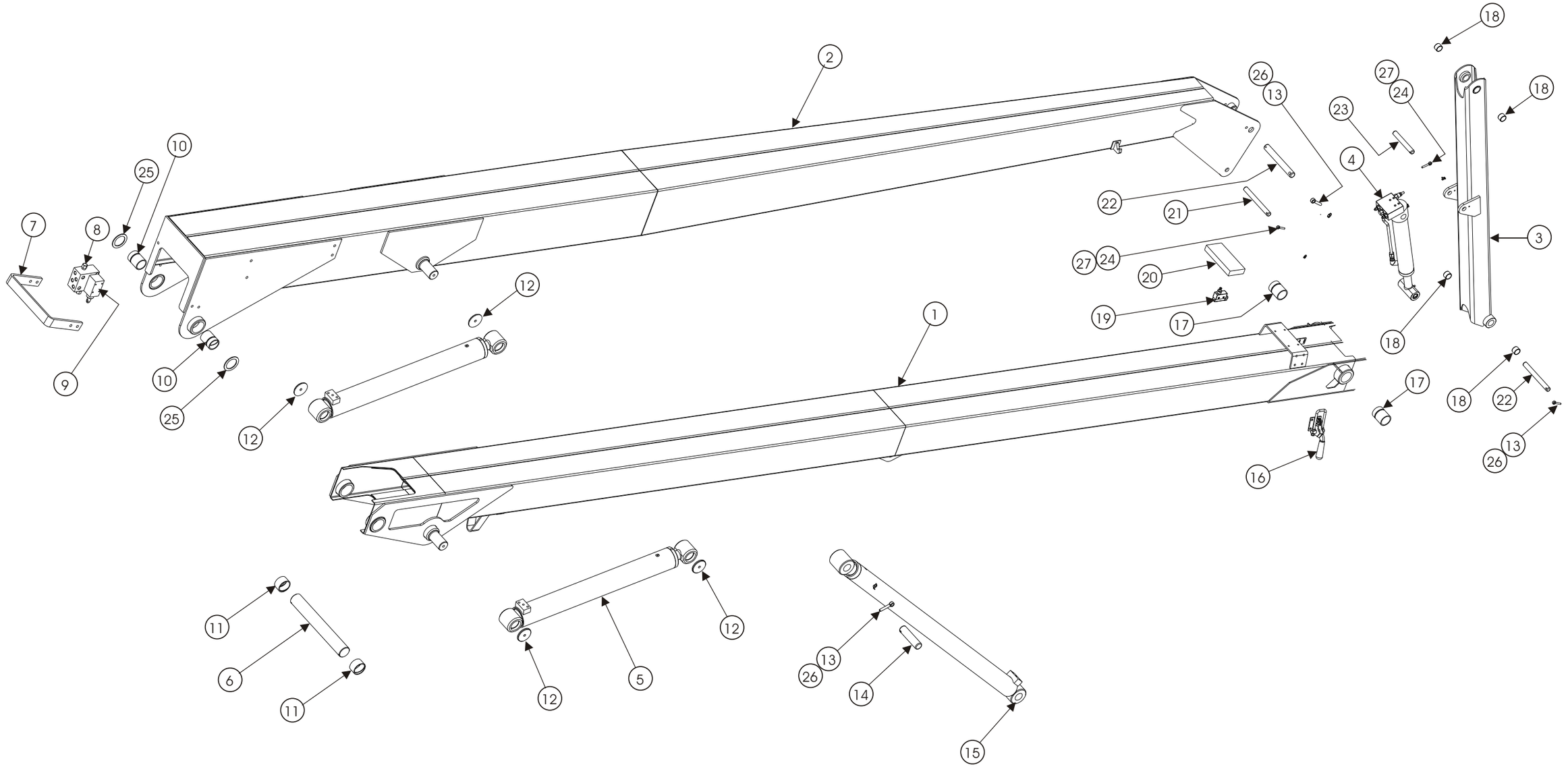
F E D C B A

1 2 3 4 5 6 7 8 9

TITLE Trailer Assembly

Snorkel model MHP15/44HD

snorkel



snorkel

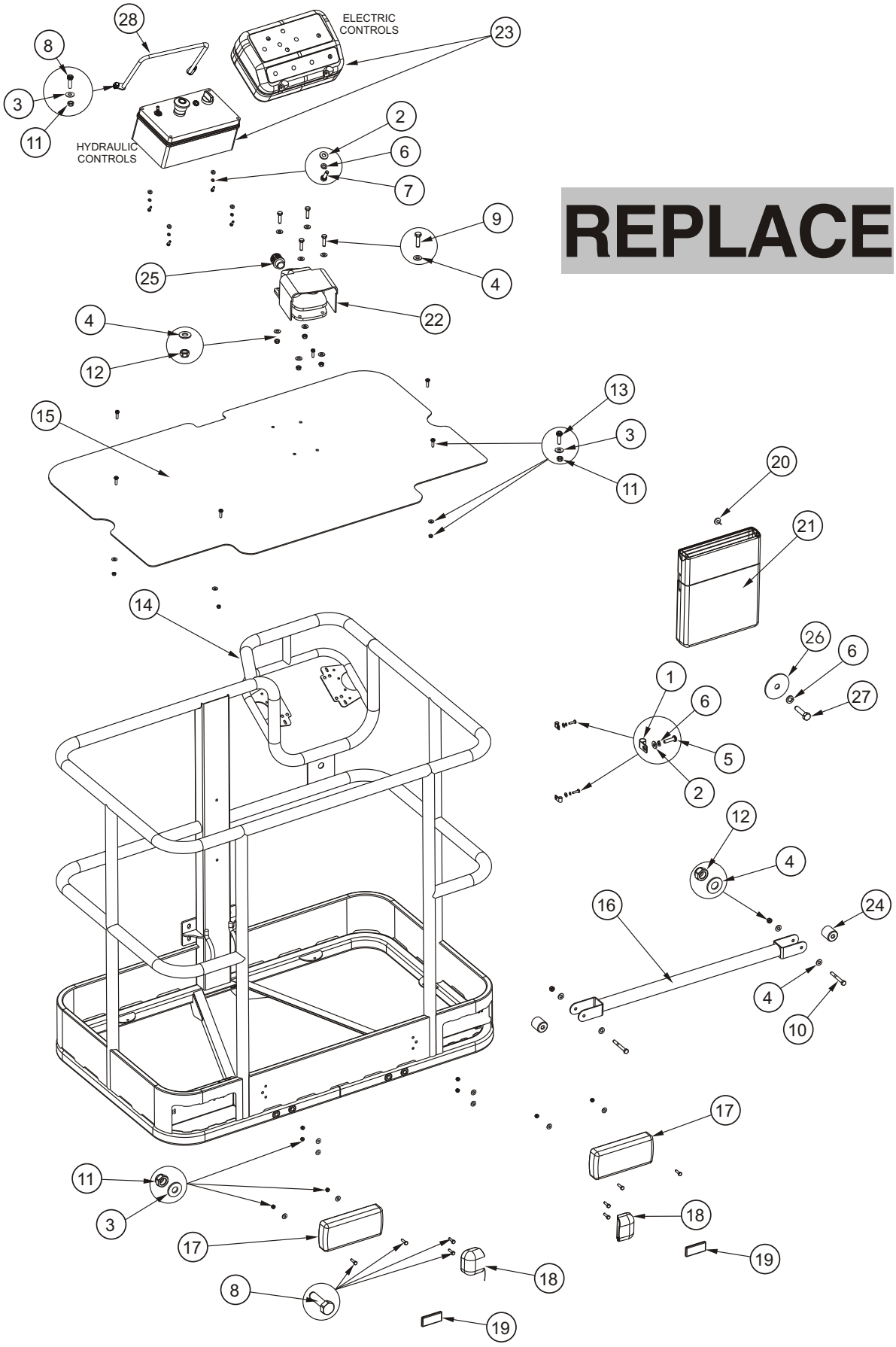
TITLE Boom Assembly

Snorkel model MHP15/44HD

Item	Part No	Qty	Description
1.	9927	1	Lower boom
2.	1578	1	Upper boom
3.	9885	1	Jib boom
4.	7177A	1	Jib cylinder
5.	1589A	2	Uper cylinder
6.	1578-021	1	Knuckle pin
7.	10999	1	Guard, overcentre valve
8.	11545	1	Overcentre manifold
9.	7851	1	Overcentre valve
10.	1549-024	2	Bush, upper boom
11.	1572-004	2	Bush, lower boom
12.	1578-015	4	Cap, cylinder
13.	8626	3	Pin keeper, 10mm
14.	9962	1	Pin, lower cylinder
15.	9928A	1	Lower cylinder
16.	10029	1	Boom latch
17.	1549-005	2	Bush, lower cylinder
18.	3624-3	4	Bush, jib boom
19.	11597	1	Microswitch
20.	1297M	1	Rubber block
21.	9794	1	Pin, jib cylinder
22.	9790	1	Pin, jib boom
23.	9793	1	Pin, jib cylinder
24.	8628	2	Pin keeper, 6mm
25.	8102	2	Washer, knuckle pin
26.	11492-3	3	Locktab, 10mm
27.	11492-1	2	Locktab, 6mm
29.	9792	1	Pin, basket frame

Platform assembly

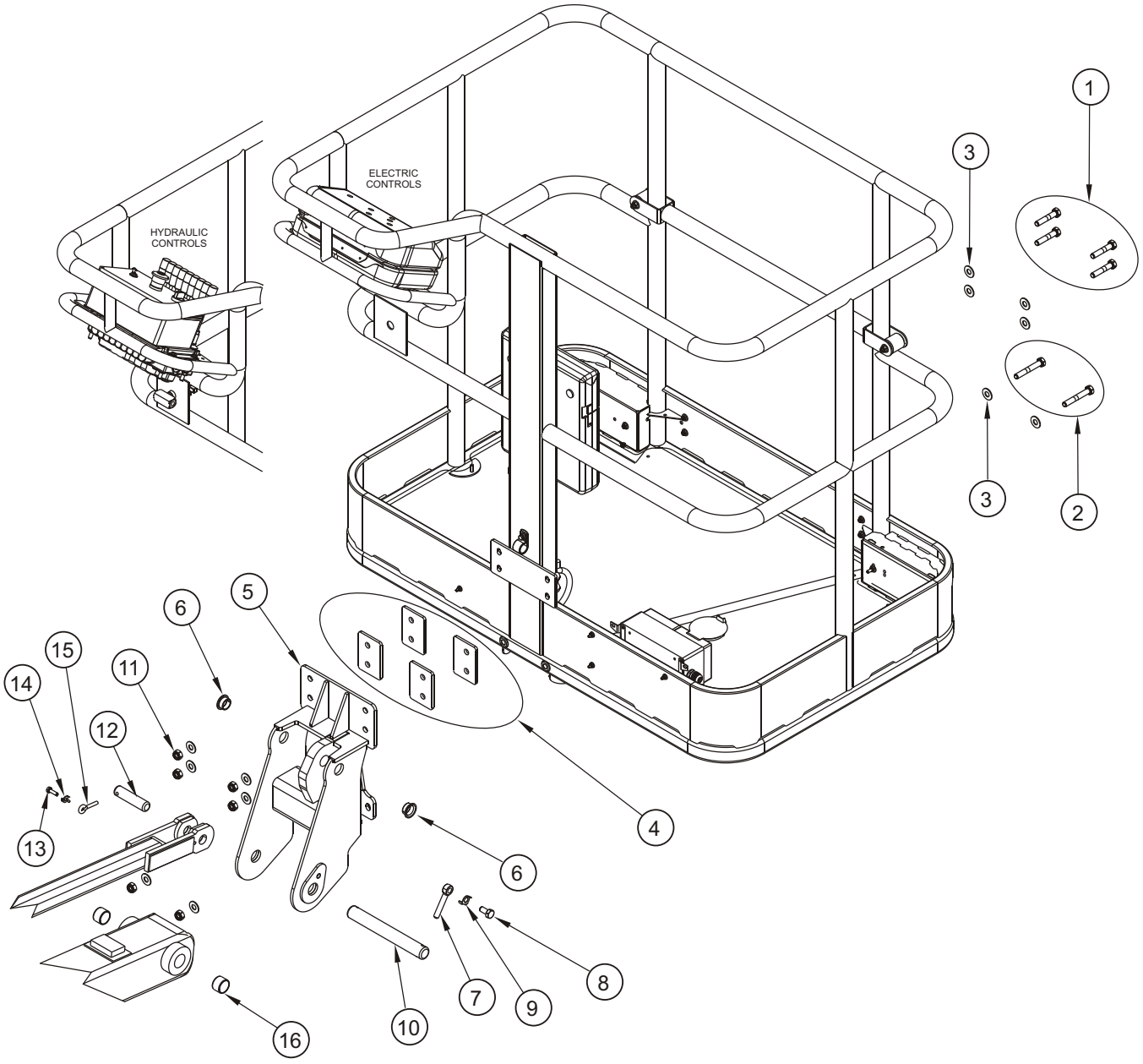
Item	Part No	Qty	Description
	12859A		Basket assembly
1.	2022-002	2	Clamp
2.	3603-05	6	Plain washer
3.	3603-06	18	Plain washer
4.	3603-08	12	Plain washer
5.	3604-05020	2	Machine screw
6.	3605-05	8	Spring washer
7.	3610-05016	4	Metric bolt
8.	3610-06020	10	Metric bolt
9.	3610-08030	4	Metric bolt
10.	3610-08065	2	Metric bolt
11.	3611-06	16	Nylock nut
12.	3611-08	6	Nylock nut
13.	3663-06020	6	Cap screw
14.	12327	1	Basket weld
15.	12327-1	1	Floor plate
16.	12327-50	1	Drop down bar
17.	12386-1	2	Rear direction indicator lamp LED
18.	12386-2	2	licence plate lamp LED
19.	12386-3	2	Retro reflector
20.	7895	4	Anti-rattle button
21.	562386	1	Literature compartment
22.	3020021	1	Foot switch
23.	12385A	1	Upper control box assembly
24.	12327-53	2	Roller
25.	1815	1	Nylon cable gland
26.	60030-198	2	Fender washer
27.	3610-05020	2	Bolt
28.	13363	1	Protector bar, hydraulic controls


ELECTRIC CONTROLS
HYDRAULIC CONTROLS
REPLACE

Basket mount assembly

Item	Part No.	Qty	Description
1.	3610-10050	4	Bolt, M10 x 70
2.	3610-10065	2	Bolt, M10 x 50
3.	3603-10	12	Washer, M10, flat
4.	12451-3	As Req	Spacer
5.	12849-1	1	Basket mount, fixed, steel basket
6.	3626-13	2	Bush, flanged 020 x 11.5
7.	8626	1	Pin keeper, 10mm
8.	3610-10020	1	Bolt, M10 x 20
9.	11492-3	1	Lock washer, M10
10.	9790	1	Pin
11.	3611-10	6	Nyloc nut, M10
12.	9859	1	Pin
13.	3610-06020	1	Bolt, M6 x 20
14.	11492-1	1	Lock washer, M6
15.	8628	1	Pin keeper, 6mm
16.	3624-3	2	Bush, 1" x 19.1

REPLACE


HYDRAULIC CONTROLS
ELECTRIC CONTROLS
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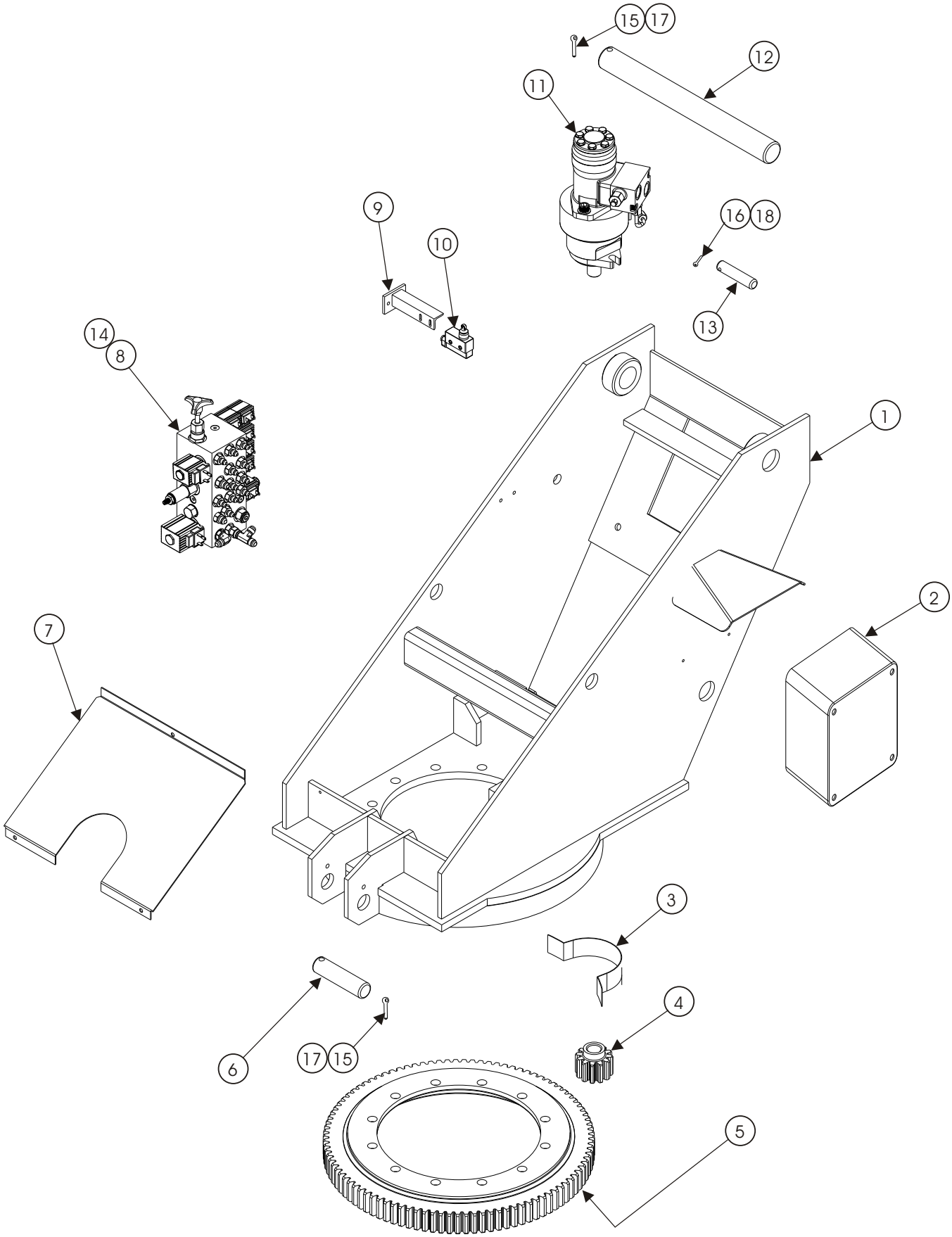
Column assembly - electric controls

Item	Part No	Qty	Description
1.	12875	1	Column weld
2.	12521A	1	Lower control box assembly
3.	11390-6	1	Slew pinion cover
4.	11942	1	Slew pinion gear
5.	1067	1	Slew ring
6.	9962	1	Pin, lower cylinder
7.	17679-10	1	Cover, oil distributor
8.	11415A	1	Control valve assembly
9.	11597-1	1	Bracket, microswitch
10.	11597	1	Microswitch
11.	11943	1	Slew motor and brake
12.	9786	1	Pin, boom to column
13.	9963	1	Pin, level rod
14.	11505		Wiring harness, control valve
15.	8626	2	Pin keeper, 10mm
16.	8628	1	Pin keeper, 6mm
17.	11492-3	2	Locktab, 10mm
18.	11492-1	1	Locktab, 6mm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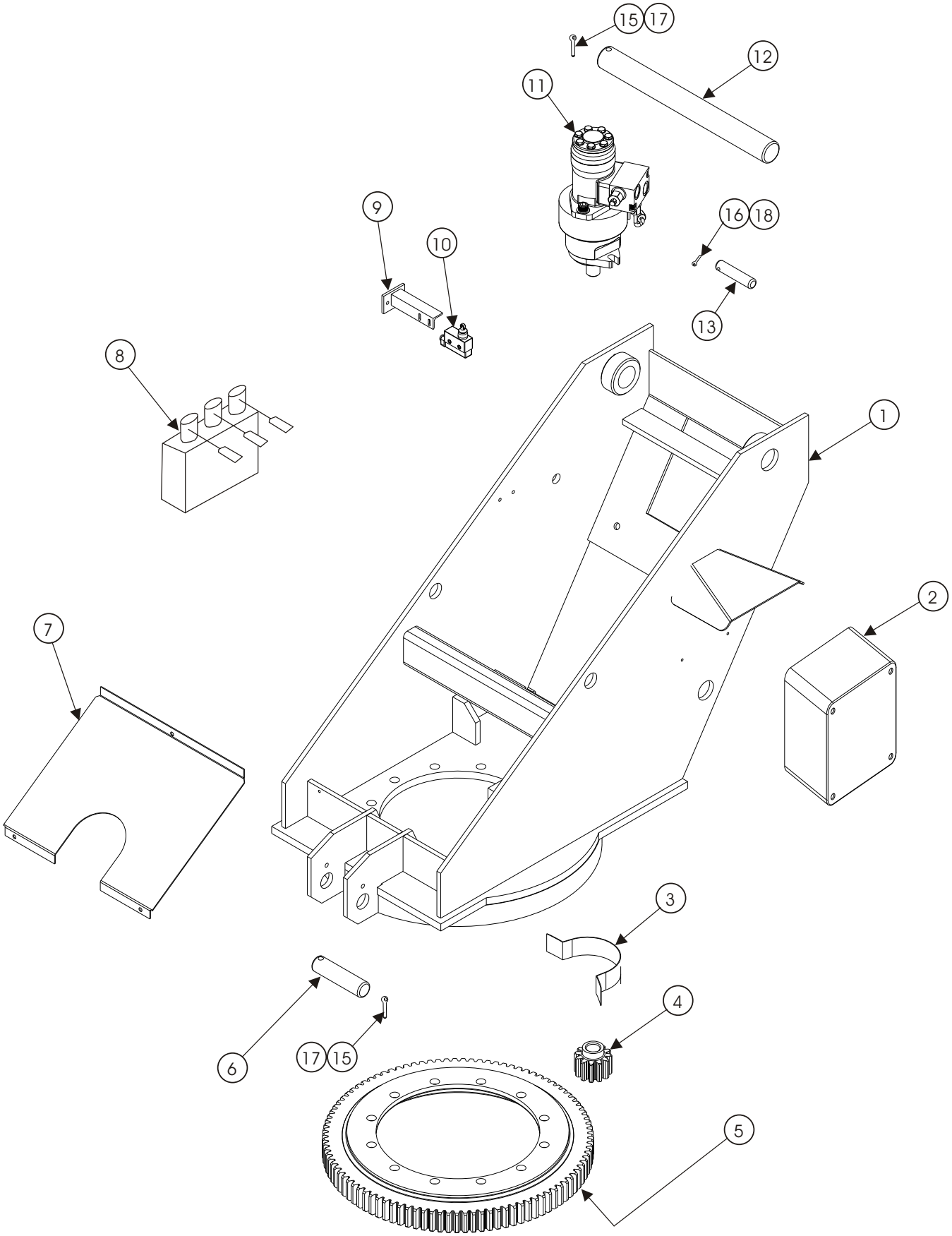
Column assembly - hydraulic controls

Item	Part No	Qty	Description
1.	12875	1	Column weld
2.	12521A	1	Lower control box assembly
3.	11390-6	1	Slew pinion cover
4.	11942	1	Slew pinion gear
5.	1067	1	Slew ring
6.	9962	1	Pin, lower cylinder
7.	17679-10	1	Cover, oil distributor
8.	11415A	1	Control valve assembly
9.	11597-1	1	Bracket, microswitch
10.	11597	1	Microswitch
11.	11943	1	Slew motor and brake
12.	9786	1	Pin, boom to column
13.	9963	1	Pin, level rod
15.	8626	2	Pin keeper, 10mm
16.	8628	1	Pin keeper, 6mm
17.	11492-3	2	Locktab, 10mm
18.	11492-1	1	Locktab, 6mm

Column assembly drawing, hydraulic controls



Placards and decals - electric controls

Item	Part No	Qty	Description
1.	0112471	2	Decal, Snorkel 4 logo
2.	0150448	1	Decal, lanyard attachment
3.	032-3899	1	Decal, Electrocution hazard
4.	12814	1	Decal, Hydraulic fluid
5.	12833-2	1	Serial number plate
6.	12947	2	Decal, MHP15/44HD logo
7.	1843	1	Decal, Warning, New Zealand only
	9428	1	Decal, Electric hazard, Australia only
8.	300699	1	Decal, Operators checklist
9.	45198-6	3	Decal, Do not disable limit switch
10.	45198-7	2	Decal, Wind speed rating
11.	569295	2	Decal, Snorkel 3 logo
12.	12424	1	Decal, Towing speed
13.	7856	2	Decal, Tyre pressure
14.	8945	1	Vehicle identification plate
15.	9223-3	10	Chevron, Warning stripes (pieces)
16.	013-0025	1	Decal, Warning with stabilisers
17.	9751	1	Decal, New Zealand made logo
18.	12545	1	Decal, Auto stabiliser operation
19.	10036	1	Decal, Cradle latch
20.	1772-002-K	1	Decal, Fit boom cradle lock pin
21.	12753	1	Decal, Emergency bleed down valve
22.	0072531	1	Decal, Electrocution hazard (prior to serial number NZ070806)
23.	0323897	1	Decal, Danger must not operate
24.	12423-200	1	Decal, Rated load
25.	99228-1	1	Decal, Caution safety harness
26.	007-1925	1	Decal, Gasoline
27.	56242-6	1	Decal, Operator manual enclosed
28.	13030	1	Decal, Electrocution hazard (after serial number NZ070806)
29.	13183	1	Decal, Remove from towing vehicle before operating (after serial number NZ080622)
30.	13205	1	Decal, 10.9m height restriction, Australia only (from serial number NZ080821)
31.	12617	1	Decal, Approved lift method
32.	0080650	4	Decal, Shackle hook points

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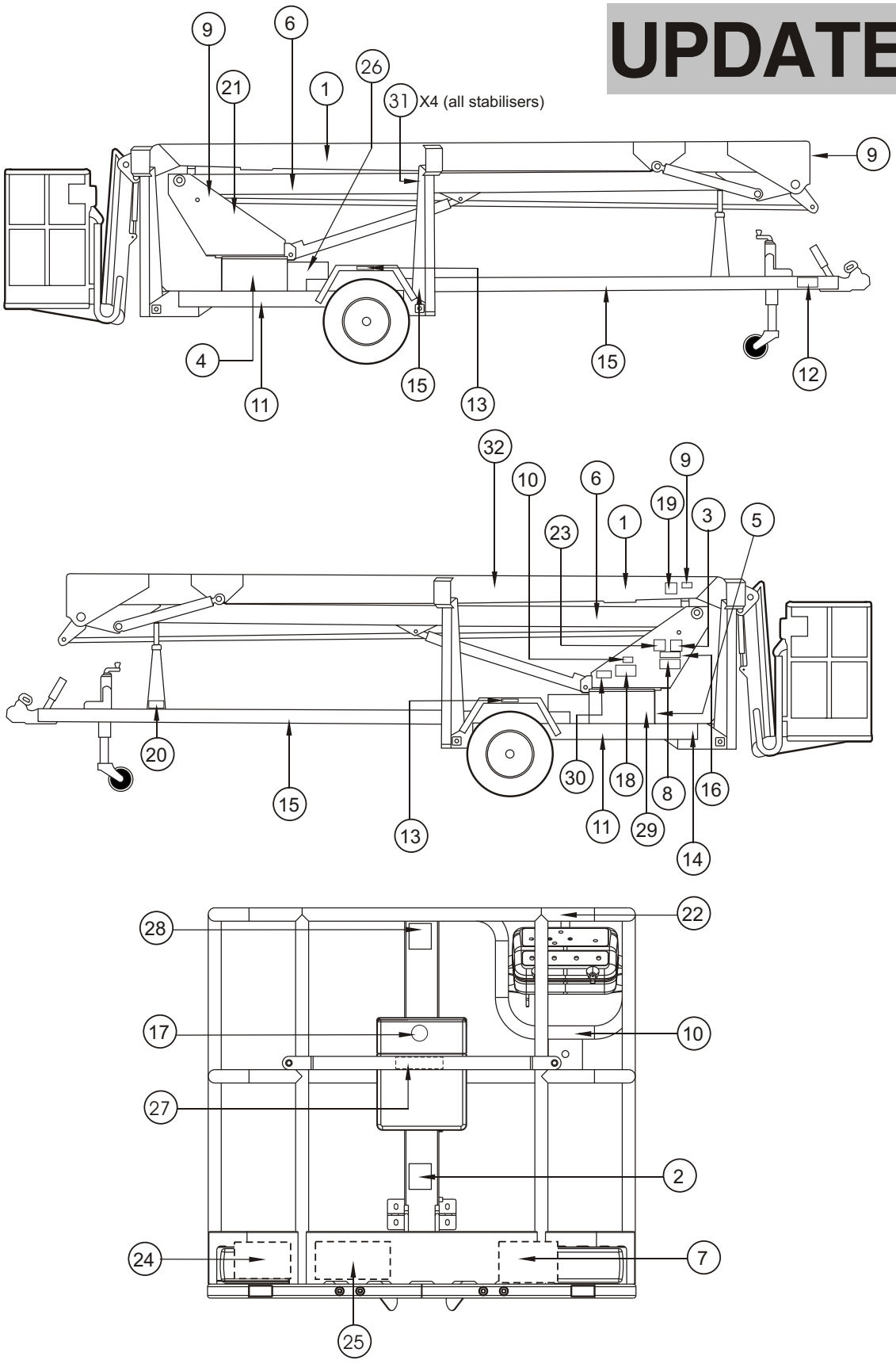
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Placards and decals - hydraulic controls

Item	Part No	Qty	Description
1.	0112471	2	Decal, Snorkel 4 logo
2.	0150448	1	Decal, lanyard attachment
3.	032-3899	1	Decal, Electrocution hazard
4.	12814	1	Decal, Hydraulic fluid
5.	12833-2	1	Serial number plate
6.	12947	2	Decal, MHP15/44HD logo
7.	1843	1	Decal, Warning, New Zealand only
	9428	1	Decal, Electric hazard, Australia only
8.	300699	1	Decal, Operators checklist
9.	45198-6	3	Decal, Do not disable limit switch
10.	45198-7	2	Decal, Wind speed rating
11.	569295	2	Decal, Snorkel 3 logo
12.	12424	1	Decal, Towing speed
13.	7856	2	Decal, Tyre pressure
14.	8945	1	Vehicle identification plate
15.	9223-3	10	Chevron, Warning stripes (pieces)
16.	9953	1	Decal, Lower control valve operation
17.	9751	1	Decal, New Zealand made logo
18.	12545	1	Decal, Auto stabiliser operation (when fitted)
19.	013-0025	1	Decal, Warning with stabilisers
20.	1772-002-K	2	Decal, Fit boom cradle lock pin
21.	12753	1	Decal, Emergency bleed down valve
22.	11843	1	Decal, Manual stabilisers
23.	0323897	1	Decal, Danger must not operate
24.	12423-200	1	Decal, Rated load
25.	99228-1	1	Decal, Caution safety harness
26.	007-1925	1	Decal, Gasoline
27.	56242-6	1	Decal, Operator manual enclosed
28.	13030	1	Decal, Electrocution hazard
29.	1697-006	1	Decal, In case of function failure
30.	12877-1	1	Decal, Lower control box
31.	0070420	1	Decal, Emergency bleed down
32.	12861-1	1	Decal, Upper control box, non-rotate
	12861-2	1	Decal, Upper control box, rotate
33.	13029	1	Decal, Emergency lowering
34.	13183	1	Decal, Remove from towing vehicle before operating (after serial number NZ080622)
35.	13205	1	Decal, 10.9m height restriction, Australia only (from serial number NZ080821)
36.	12617	1	Decal, Approved lift method
37.	0080650	4	Decal, Shackle hook points

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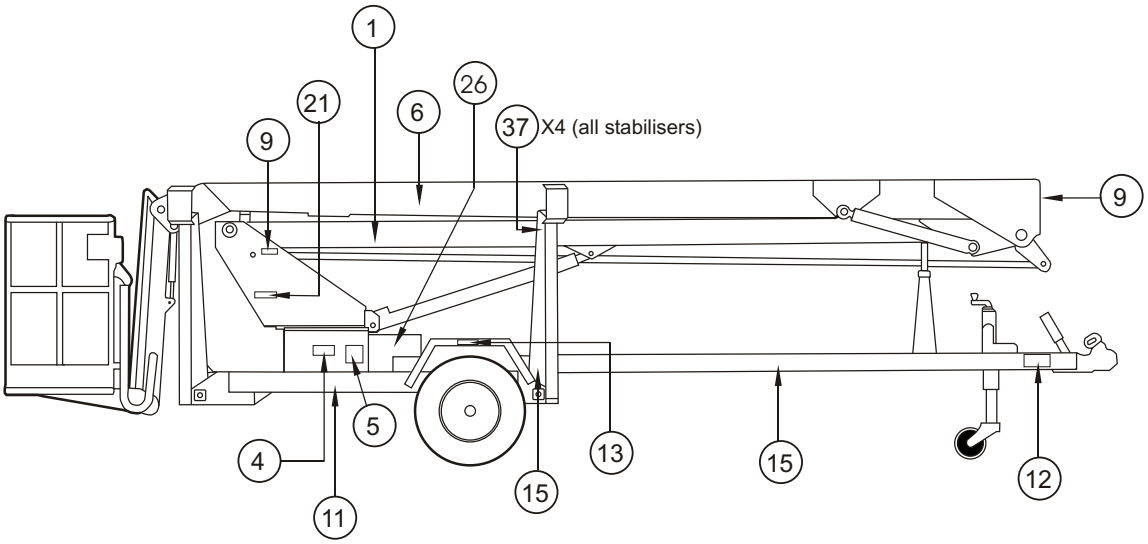
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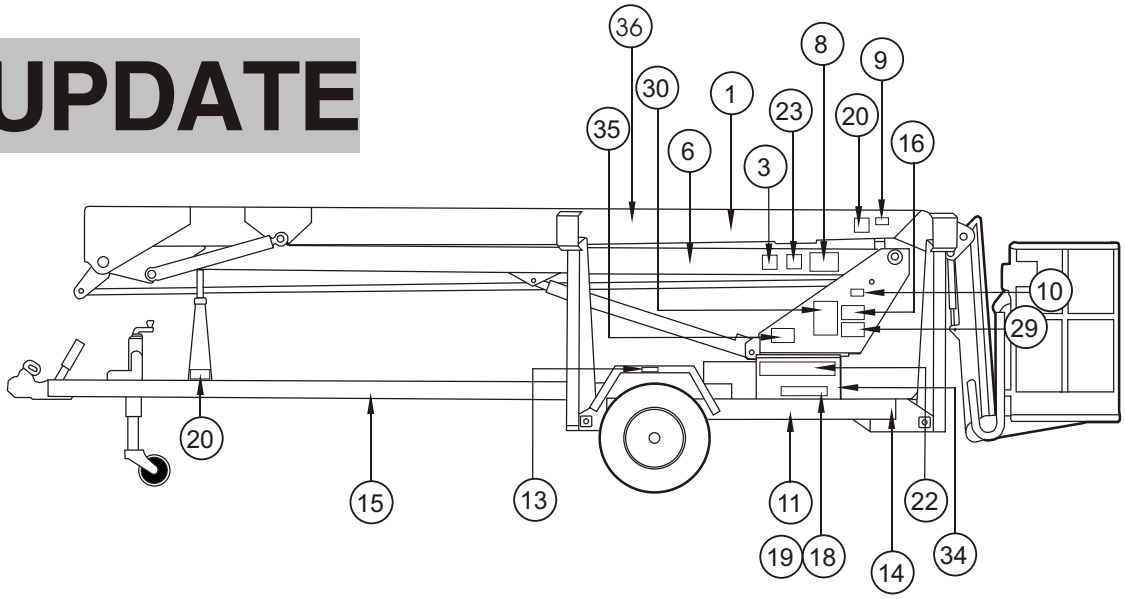
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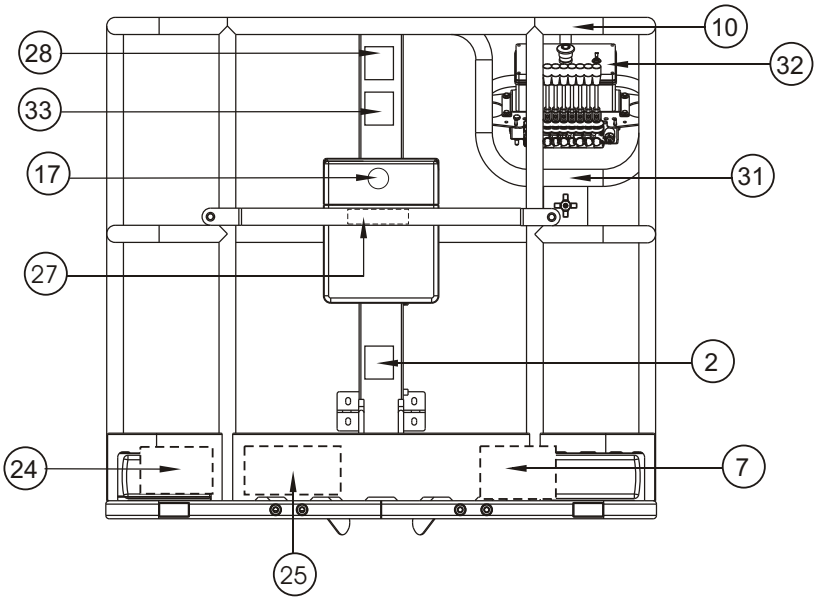
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Placards and decals - LV insulated machines

Item	Part No	Qty	Description
1.	0112471	2	Decal, Snorkel 4 logo
2.	0150448	1	Decal, lanyard attachment
3.	2829-1	6	Decal, LV cover
4.	12814	1	Decal, Hydraulic fluid
5.	12833-2	1	Serial number plate
6.	12947	2	Decal, MHP15/44HD logo
7.	12829	2	Decal, Uninsulated
8.	300699	1	Decal, Operators checklist
9.	45198-6	3	Decal, Do not disable limit switch
10.	45198-7	2	Decal, Wind speed rating
11.	569295	2	Decal, Snorkel 3 logo
12.	12424	1	Decal, Towing speed
13.	7856	2	Decal, Tyre pressure
14.	8945	1	Vehicle identification plate
15.	9223-3	10	Chevron, Warning stripes (pieces)
16.	9953	1	Decal, Lower control valve operation
17.	9751	1	Decal, New Zealand made logo
18.	12545	1	Decal, Auto stabiliser operation (when fitted)
19.	013-0025	1	Decal, Warning with stabilisers
20.	1772-002-K	2	Decal, Fit boom cradle lock pin
21.	12829-2	2	Decal, Condition
22.	11843	1	Decal, Manual stabilisers
23.	0323897	1	Decal, Danger must not operate
24.	12423-200	1	Decal, Rated load
25.	99228-1	1	Decal, Caution safety harness
26.	007-1925	1	Decal, Gasoline
27.	56242-6	1	Decal, Operator manual enclosed
28.	12829-3		Decal, Warning stripe insulated/uninsulated (yellow/red)
29.	12877-1	1	Decal, Lower control box
30.	12861-1	1	Decal, Upper control box, non-rotate
	12861-2	1	Decal, Upper control box, rotate
31.	13029	1	Decal, Emergency lowering
32.	13183	1	Decal, Remove from towing vehicle before operating (after serial number NZ080622)
33.	13205	1	Decal, 10.9m height restriction, Australia only (from serial number NZ080821)
34.	12617	1	Decal, Approved lift method
35.	0080650	4	Decal, Shackle hook points

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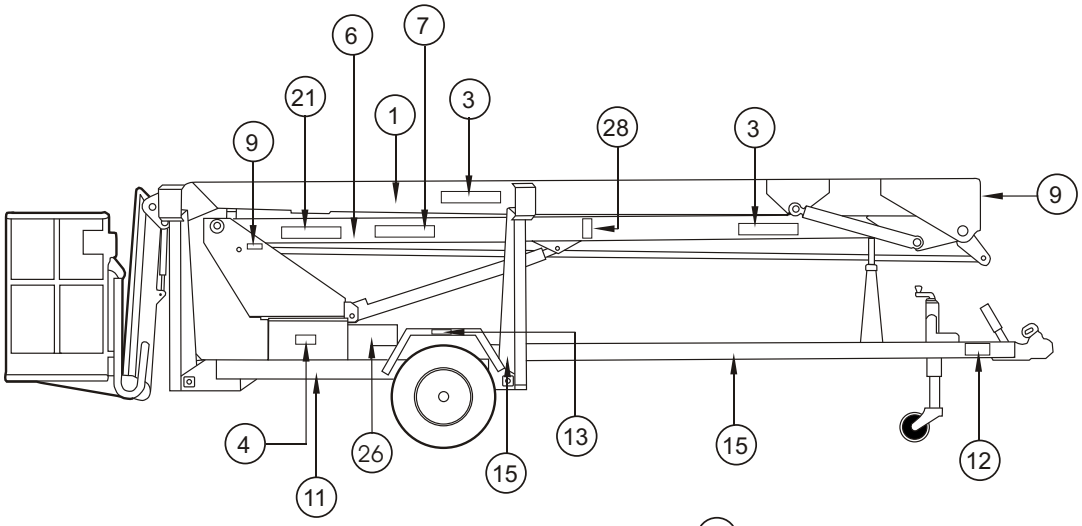
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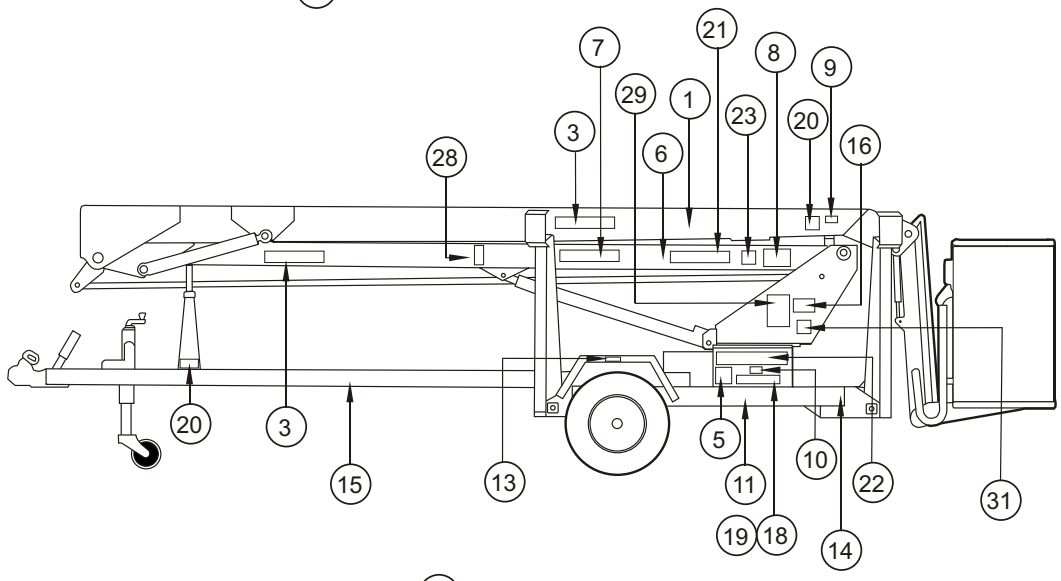
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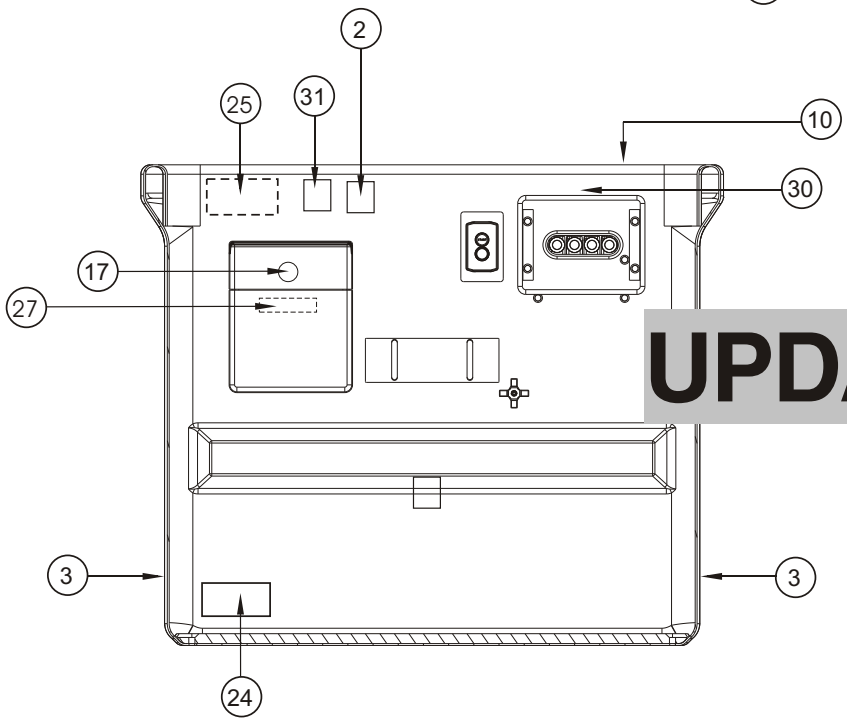
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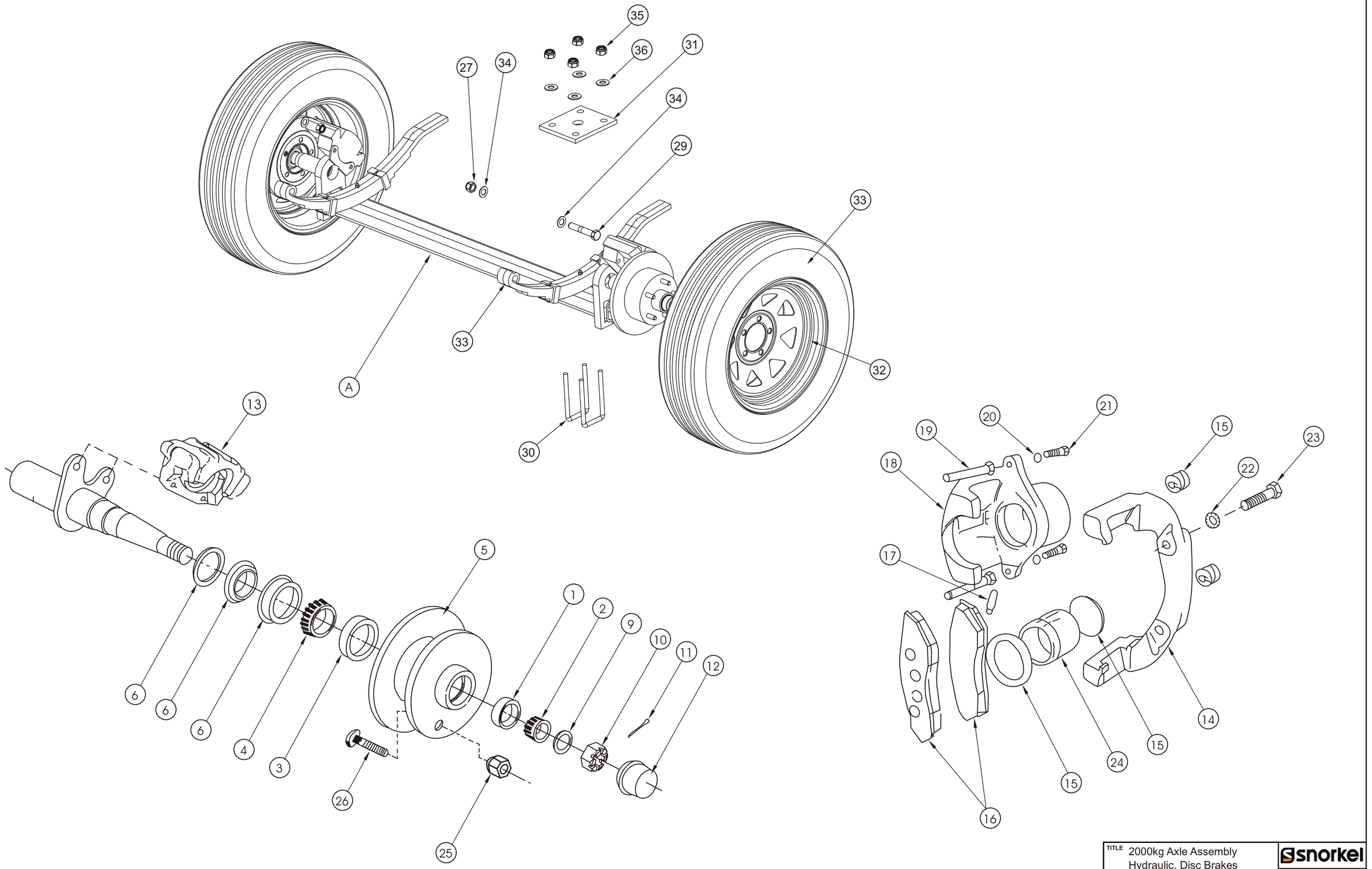
UPDATE

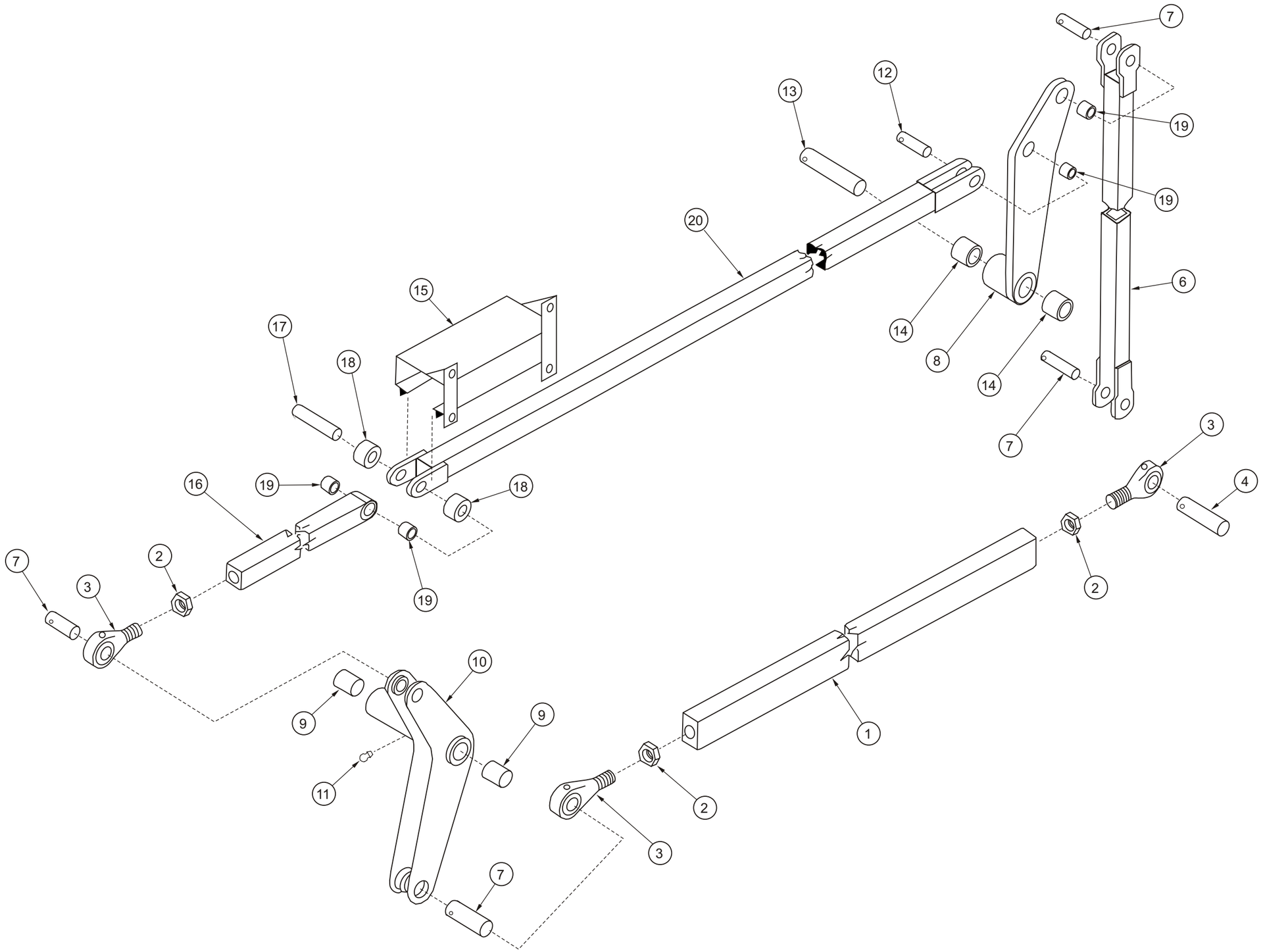
2000kg axle

Item	Part No	Qty	Description
A.	12773	Ref	Axle assembly, Prior to serial number NZ070806, 5 stud
	12788	Ref	Axle assembly, From serial number NZ070806, 6 stud
1.	12301-10	2	Bearing kit, includes 1, 2, 3, 4
2.		2	Bearing cone
3.		2	Bearing cup
4.		2	Bearing cone
5.	12301-3	2	Hub assembly, Pre NZ070806, (Includes 1, 5, 3, 25, 26)
	12534-2	2	Hub assembly, Post NZ070806, (Includes 1, 5, 3, 25, 26)
6.	11027-4	Ref	Seal kit, hub
9.	60030-075	2	Flat washer ¾" I.D.
10.	60021-092N	2	Castle nut ¾" U.N.F.
11.	60038-043N	2	Split pin
12.	12301-3	2	Grease cap
13.	2045-001	2	Caliper assembly, plated, no pads
14.	9945-9	2	Anchor plate
15.	2045K	Ref	Seal kit, caliper
16.	11027-5	4	Brake pads
17.	2045-003	2	Bleed screw
18.	2045-13	2	Housing
19.	11027-6	4	Guide pin
20.	3605-08	4	Spring washer M8
21.	3610-08030	4	Set screw M8 x 30 HT
22.	60005-013	2	Lockwasher
23.	3610-12035	2	Set screw M12 x 35 HT
24.	11027-11	2	Piston
25.	1649-041	12	Wheel nut, UNF 1/2", Post NZ070806
26.	1649-040	12	Wheel stud, UNF 1/2", Post NZ070806
27.	3611-16	4	Nut, nyloc
28.	1704-005	2	Tyre, Pre NZ070806
	13017-2	2	Tyre, Post NZ070806
29.	3610-16100	2	Bolt
30.	12703-3	2	U-bolt
31.	12826	2	U-bolt attachment plate
32.	12772-1	2	Wheel rim, Pre NZ070806
	13017-2	2	Wheel rim, Post NZ070806
33.	12703	PR	Spring assembly
34.	3603-16	4	Plain washer
35.	3602-12	8	Nut
36.	3605-012	8	Washer



TITLE 2000kg Axle Assembly
Hydraulic, Disc Brakes
Snorkel model MHP15/44HD

snorkel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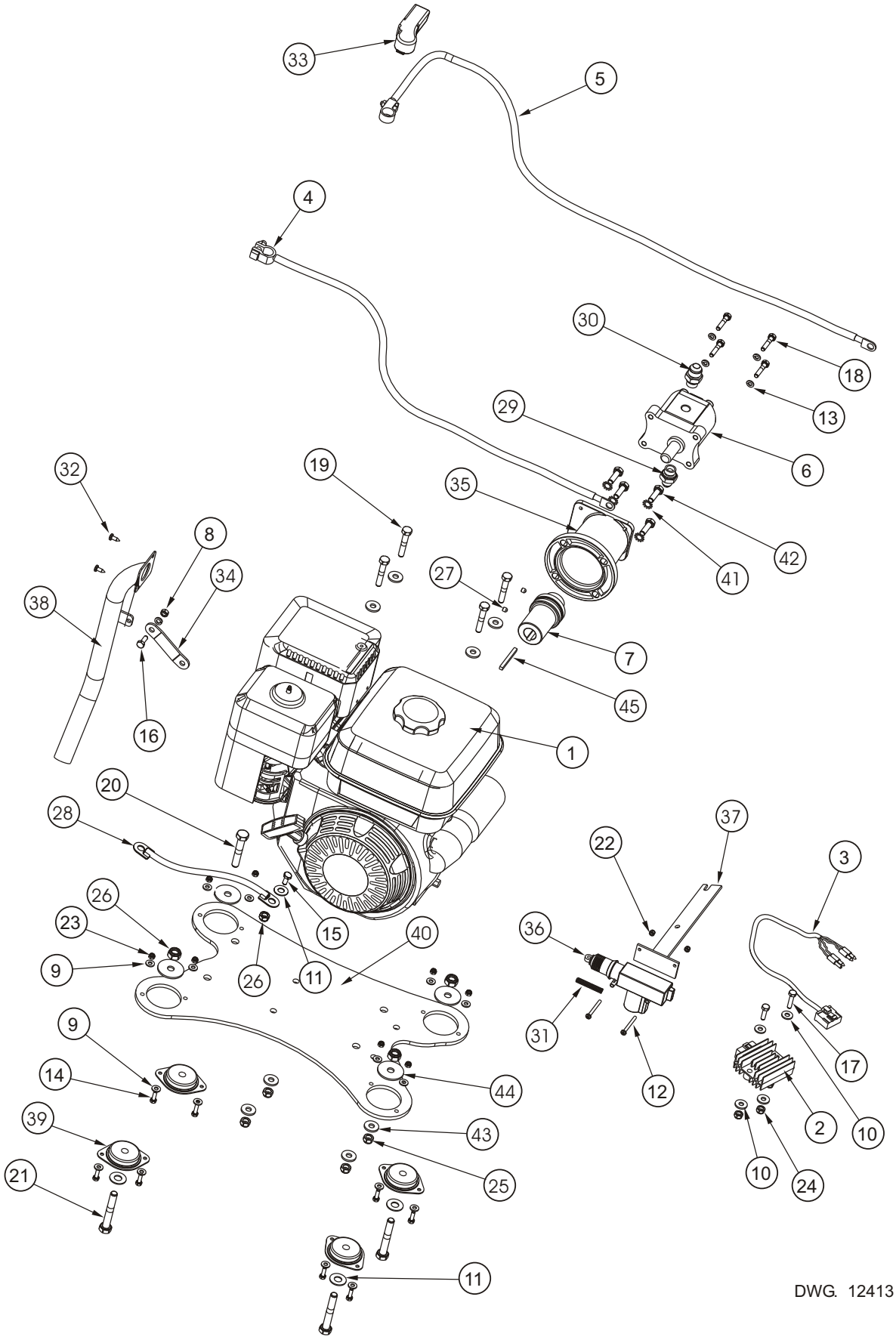
Item	Part No	Qty	Description
1.	9947-1	1	Lower level rod
2.	3608-20	3	Lock nut
3.	1750-120	3	Rod end
4.	9963	1	Pin
6.	9877	1	Extension level rod
7.	9859	4	Pin
8.	9884	1	Level quadrant
9.	1581-010	2	Bush
10.	9951	1	Level quadrant
11.	2030-001	1	Grease nipple
12.	9932	1	Pin
13.	9790	1	Pin
14.	3624-3	2	Bush
15.	9880	1	Level guide channel
16.	9879	1	Link level rod
17.	9882	1	Pin
18.	9881	2	Roller
19.	3624-8	4	Bush
20.	9878	1	Upper level rod

Engine assembly

Item	Part No	Qty	Description
	12413	1	Engine assembly
1.	1171-4	1	Honda GX160
2.	1171-4-022	1	Regulator / rectifier GX160
3.	1171-4-025	1	Loom, Honda rectifier
4.	1650-030	1	Battery cable
5.	1650-031	1	Battery cable
6.	1659	1	Gear pump
7.	1880	1	Drive coupling
8.	3602-06	1	Metric nut
9.	3603-05	16	Plain washer
10.	3603-06	4	Plain washer
11.	3603-10	4	Plain washer
12.	3604-04040	2	Metric screw pan head
13.	3605-06	5	Spring washer
14.	3610-05016	8	Metric bolt
15.	3610-10020	1	Metric bolt
16.	3610-06016	1	Metric bolt
17.	3610-06025	2	Metric bolt
18.	3610-06030	4	Metric bolt
19.	3610-08045	4	Metric bolt
20.	3610-10055	1	Metric bolt
21.	3610-10065	3	Metric bolt
22.	3611-04	2	Metric nylock nut
23.	3611-05	8	Metric nylock nut
24.	3611-06	2	Metric nylock nut
25.	3611-08	4	Metric nylock nut
26.	3611-10	4	Metric nylock nut
27.	3612-06006	2	Grub screw
28.	3649-10	1	Battery cable
29.	7013-003	1	BSPP (Dowty) x JICM nipple
30.	7013-004	1	BSPP (Dowty) x JICM nipple
31.	8398	1	Spring
32.	8978-1	2	Screw, self tapping
33.	10254	1	Cover, battery terminal
34.	10350-4	1	Exhaust bracket
35.	10417	1	Bell housing
36.	11444	1	Choke solenoid 12V
37.	11497	1	Choke solenoid bracket
38.	12407	1	Exhaust weldment
39.	12524	4	Engine mount
40.	12526	1	Engine mount plate
41.	60005-054	4	Lockwasher
42.	60016-090N	4	Bolt, plated
43.	60030-3N	8	Flat washer
44.	5560179	4	Flat washer, special
45.	1875KEY	1	Key steel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Section 2. - Hydraulics

Hydraulic schematic standard
Machines with electric controls 2-3
Hydraulic schematic auto level option
Machines with electric Controls 2-4
Hydraulic schematic standard
Machines with hydraulic controls 2-5
Hydraulic schematic auto level option
Machines with hydraulic Controls 2-6
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Lower boom lift cylinder assembly 2-6
Flyboom cylinder assembly 2-7
Stabiliser leg cylinder assembly 2-8
Continuous rotation (option) 2-9
Automatic stabiliser (option) 2-10

SLEW MOTOR/BRAKE

SLEW

PAD

LOWER

RAISE

JIB CYL

LOWER CYL

UPPER CYL 1

UPPER CYL 2

OVER CENTRE VALVE

PROPORTIONAL FLOW CONTROL VALVE

HONDA

PUMP

STABILISER SELECTOR VALVE

S.S ORIFICE

2500 p.s.i.

RELIEF VALVE

FLOW CONTROL VALVE

11415 MAIN VALVE

CONTROL VALVE

BLEED DOWN VALVE

PILOT OPER. CHECK VALVE

STABILISER PORT

TANK PORT

ACCUM

TANK PORT

EMERGENCY LOWER PORT

ROTATOR OPTION

AUX. MOTOR

PUMP

AUX. MOTOR OPTION

2500 psi

PRESS SW

400 p.s.i.

RETURN FILTER 10 MICRON

LEG 1

LEG 2

LEG 3

LEG 4

LEG CYL

LEG VALVE BANK

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TITLE Hydraulic schematic - standard
Machines with electric controls
Snorkel model MHP15/44HD

snorkel

SLEW MOTOR/BRAKE

SLEW

PAD

LOWER

RAISE

JIB CYL

LOWER CYL

UPPER CYL 1

UPPER CYL 2

OVER CENTRE VALVE

PROPORTIONAL FLOW CONTROL VALVE

HONDA

PUMP

S.S ORIFICE

2500 p.s.i.

RELIEF VALVE

FLOW CONTROL VALVE

CONTROL VALVE

11415 MAIN VALVE

BLEED DOWN VALVE

STABILISER PORT

TANK PORT

ACCUM

TANK PORT

EMERGENCY LOWER PORT

PILOT OPER. CHECK VALVE

ROTATOR OPTION

AUX. MOTOR

PUMP

AUX. MOTOR OPTION

P

T

PRESS SW 400 p.s.i.

LEG 1

LEG 2

LEG 3

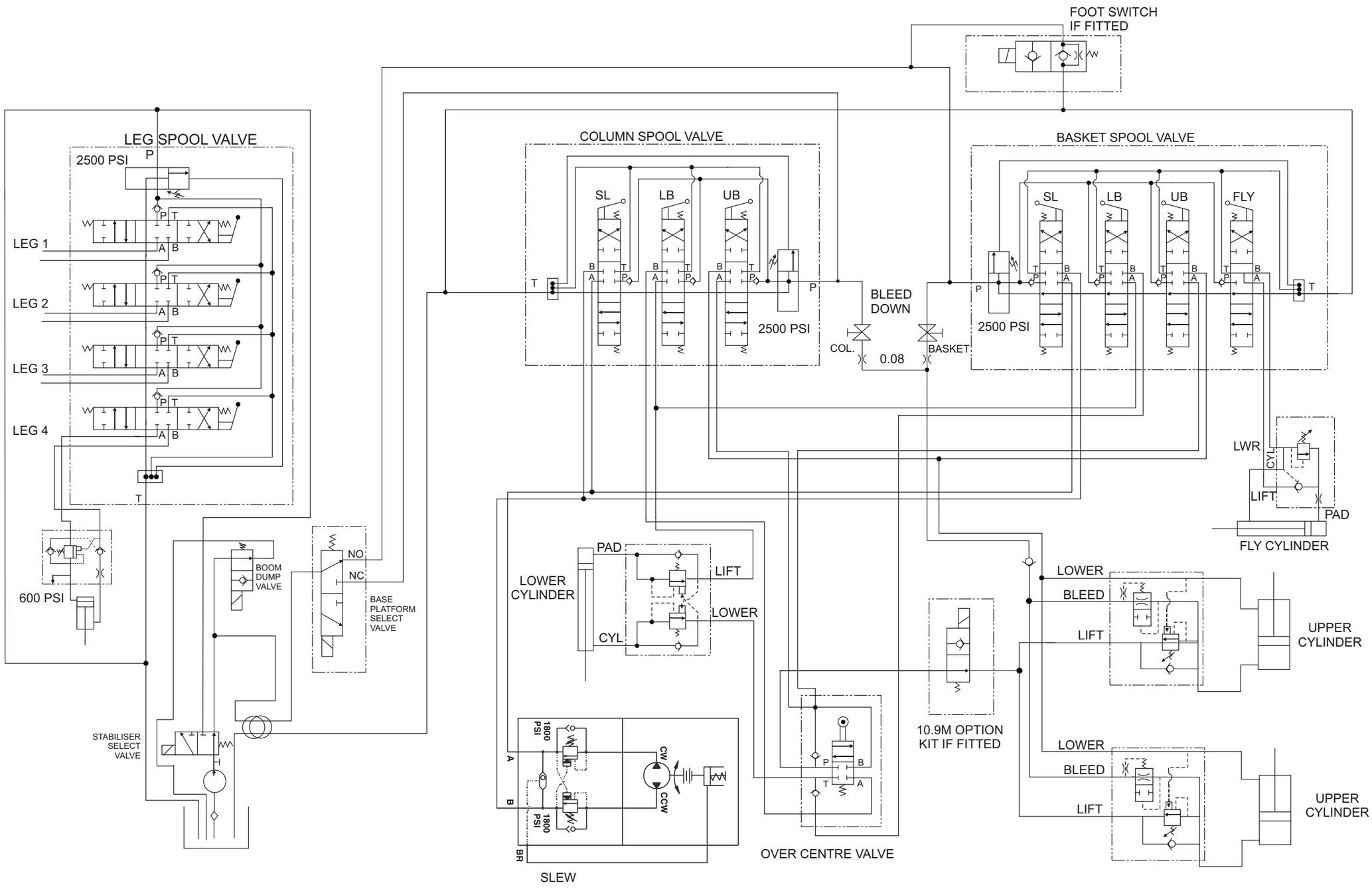
LEG 4

LEG CYL

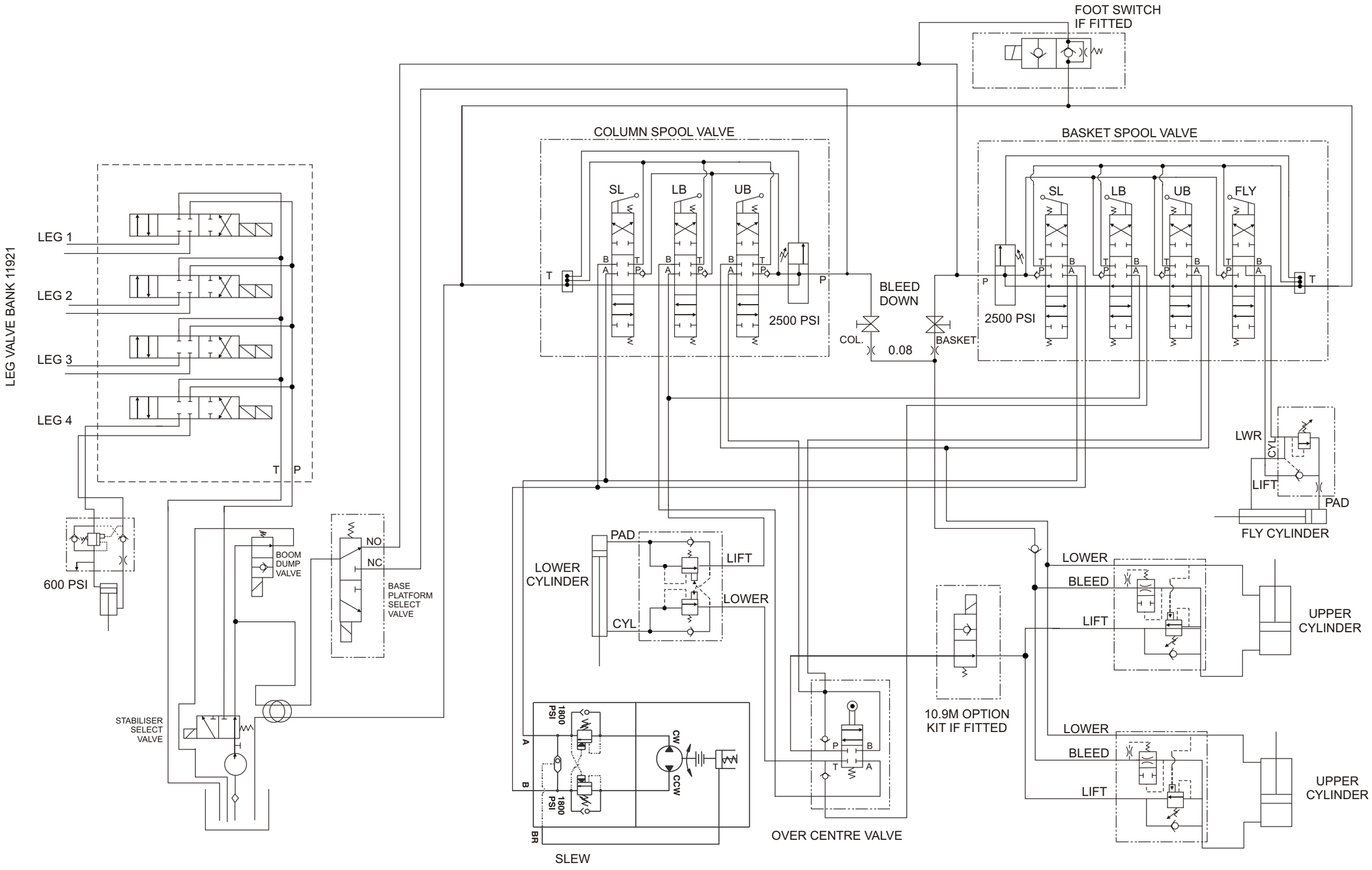
LEG VALVE BANK

snorkel

TITLE Hydraulic schematic - auto level
Machines with electric controls
Snorkel model MHP15/44HD



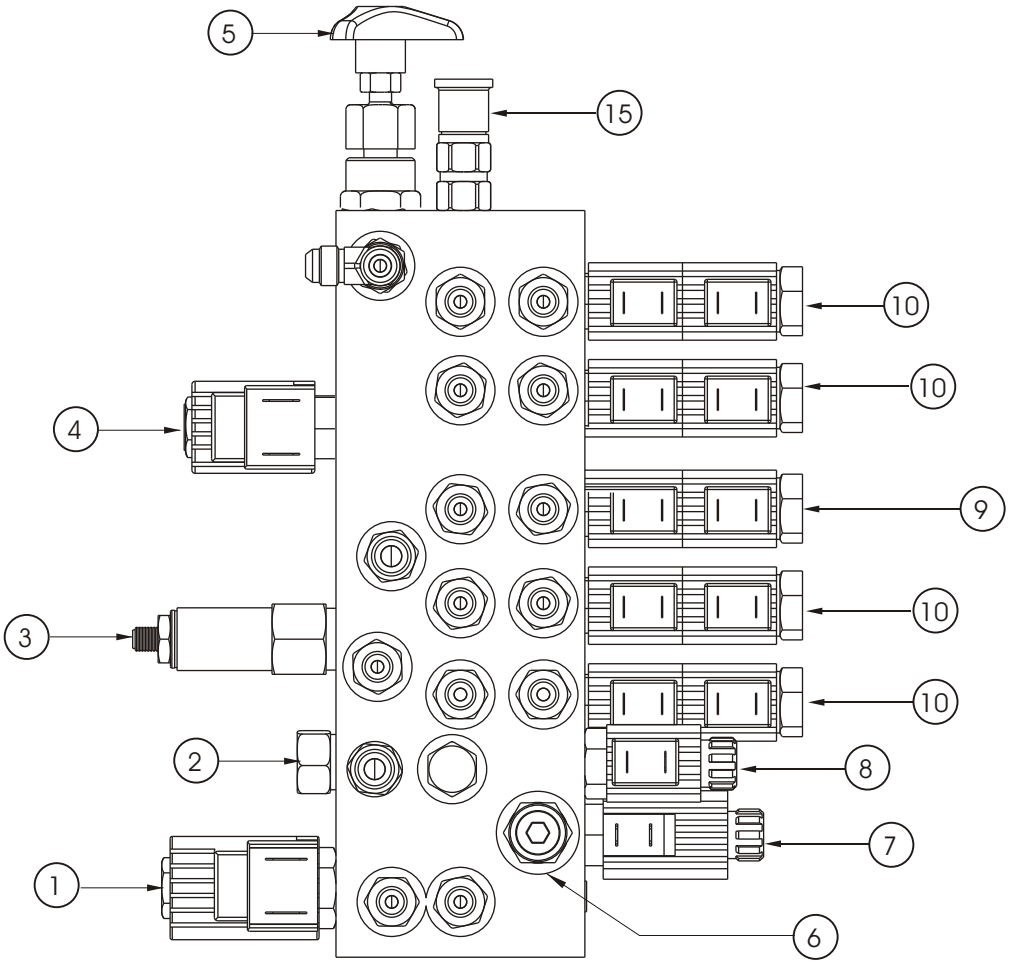
TITLE	Hydraulic schematic - standard Machines with hydraulic controls Snorkel model MHP15/44HDHC
	snorkel
	Page 2-5



snorkel

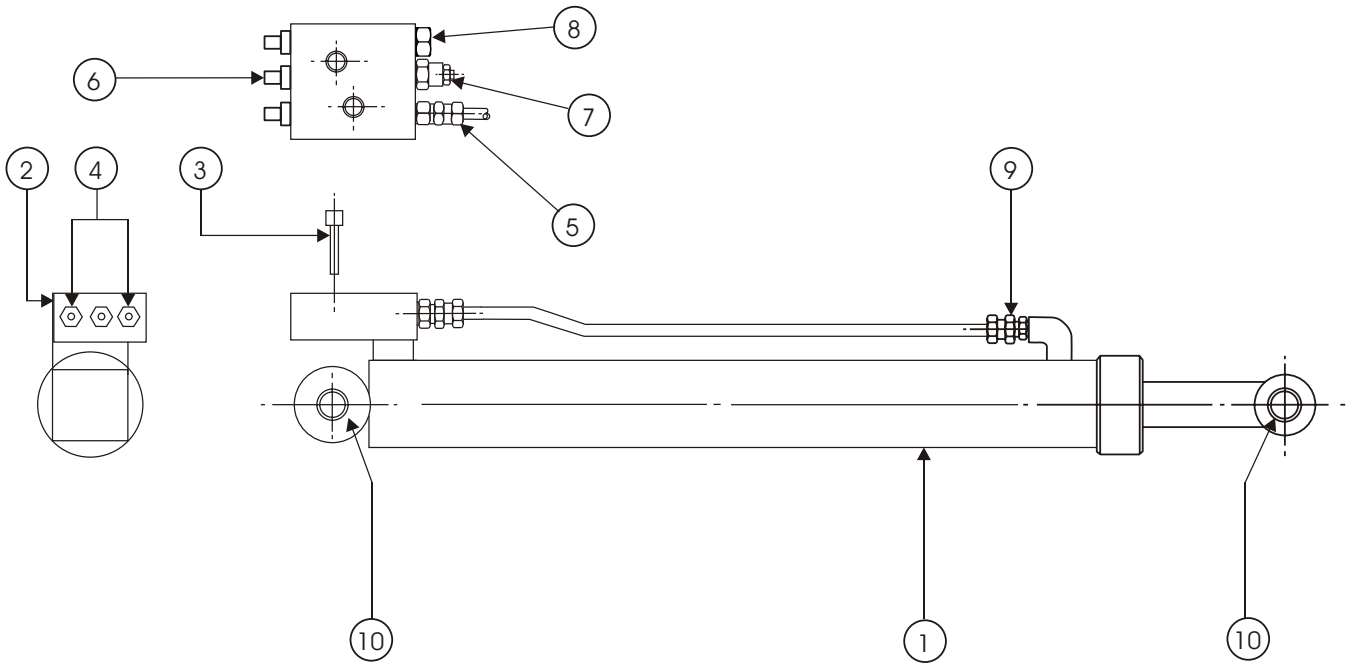
TITLE Hydraulic schematic - auto level
Machines with hydraulic controls
Snorkel model MHP15/44HDHC

Item	Part No	Qty	Description
	12377A		Main control valve assembly
1.	11415-1P	1	Stabiliser solenoid
2.	11415-2	1	Flow compensator
3.	11415-3P	1	Main relief valve 2500 psi
4.	11415-4P	1	Solenoid emergency lower
5.	11415-5P	1	Manual emergency lower
6.	11415-6P	1	Check valve 4 psi
7.	11415-77	1	Proportional flow control
8.	11415-8P	1	Control solenoid
9.	11415-9P	1	Solenoid valve, closed centre
10.	11415-10P	4	Solenoid valve, floating centre
11.	11415-6P	1	Check valve 4 psi
12.	11415-11PS	12	Solenoid coil, 12 volt
13.	11415-12	1	Minimum flow setting orifice
14.	11415-12	1	Emergency lowering orifice
15.	10996-1	1	Test point

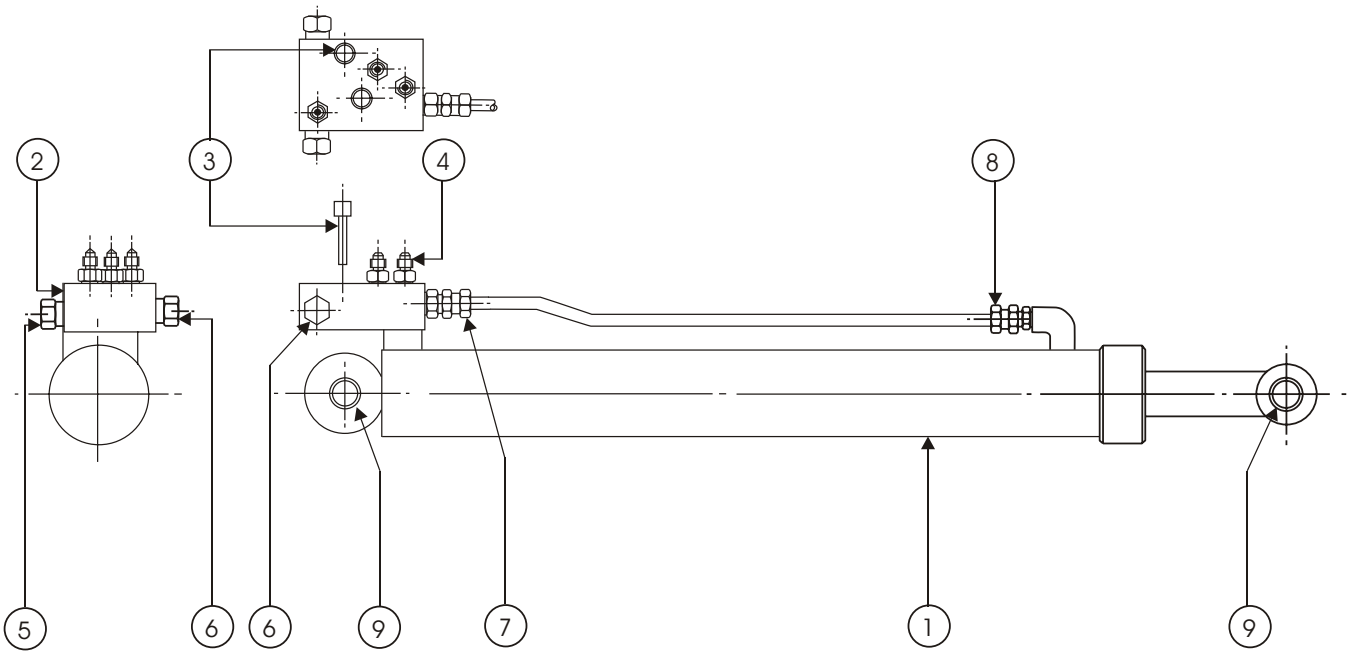


Upper boom lift cylinder assembly

Item	Part No	Qty	Description
1.	1589	1	Lift cylinder, upper
2.	9935	1	Valve, H&L D/A
3.	3613-0804050	2	Cap screw M8 x 50
4.	506-5705	2	Fitting, hydraulic 7/16” x 9/16”
5.	11611-6	1	Fitting, ferrulok
6.	11057-1	1	Check valve, fitting
7.	9935-1	1	Counterbalance cartridge
8.	9405	1	Velocity fuse
9.	11934-6	1	Fitting, ferrulok
10.	3624-11	2	Bush, permaglide
	1589K	1	Seal kit

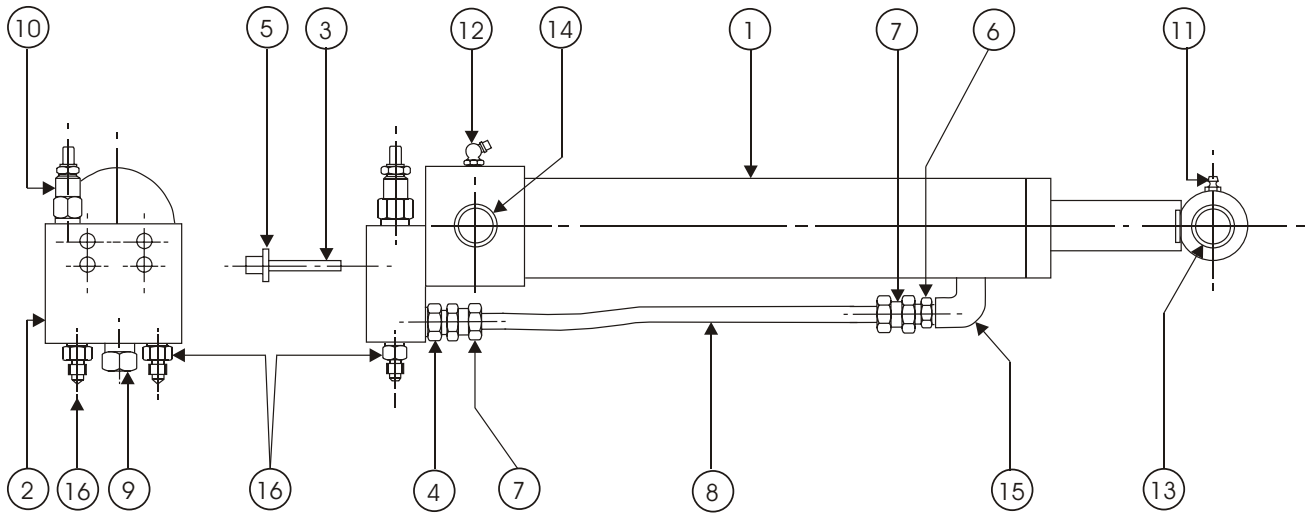


Item	Part No	Qty	Description
1.	9928	1	Lift cylinder, lower
2.	9931	1	Valve, H&L D/A
3.	3613-08040	2	Cap screw M8 x 40
4.	506-5705	2	Fitting, hydraulic 7/16” x 9/16”
5.	9401	1	Counterbalance cartridge
6.	7956	1	Counterbalance cartridge
7.	11611-6	1	Fitting, ferrulok
8.	11934-6	1	Fitting, ferrulok
9.	3624-4	4	Bush, permaglide
	9928K	1	Seal kit

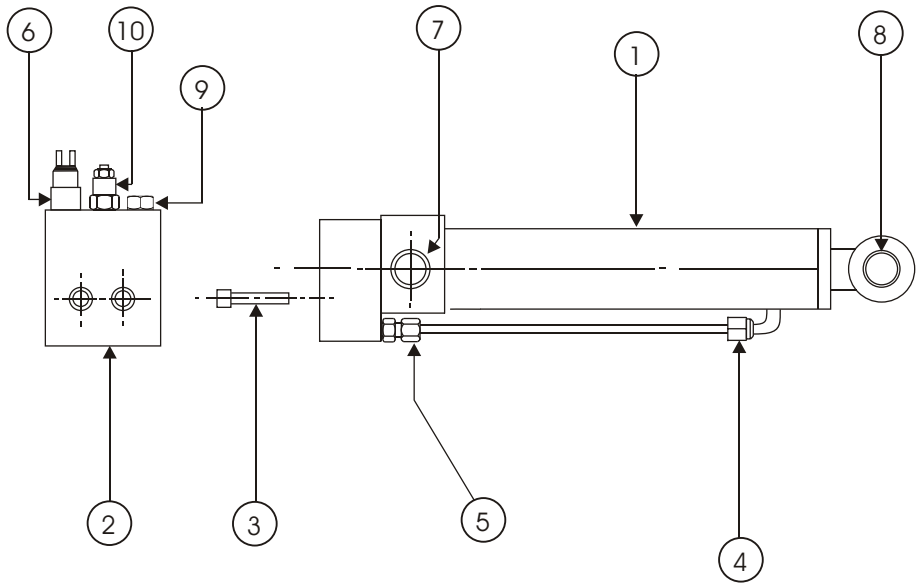


Flyboom cylinder assembly

Item	Part No	Qty	Description
1.	12177	1	Flyboom cylinder assembly
2.	11412-1	1	Relief valve
3.	11367-2	1	Pilot check valve
	12177K	1	Seal kit

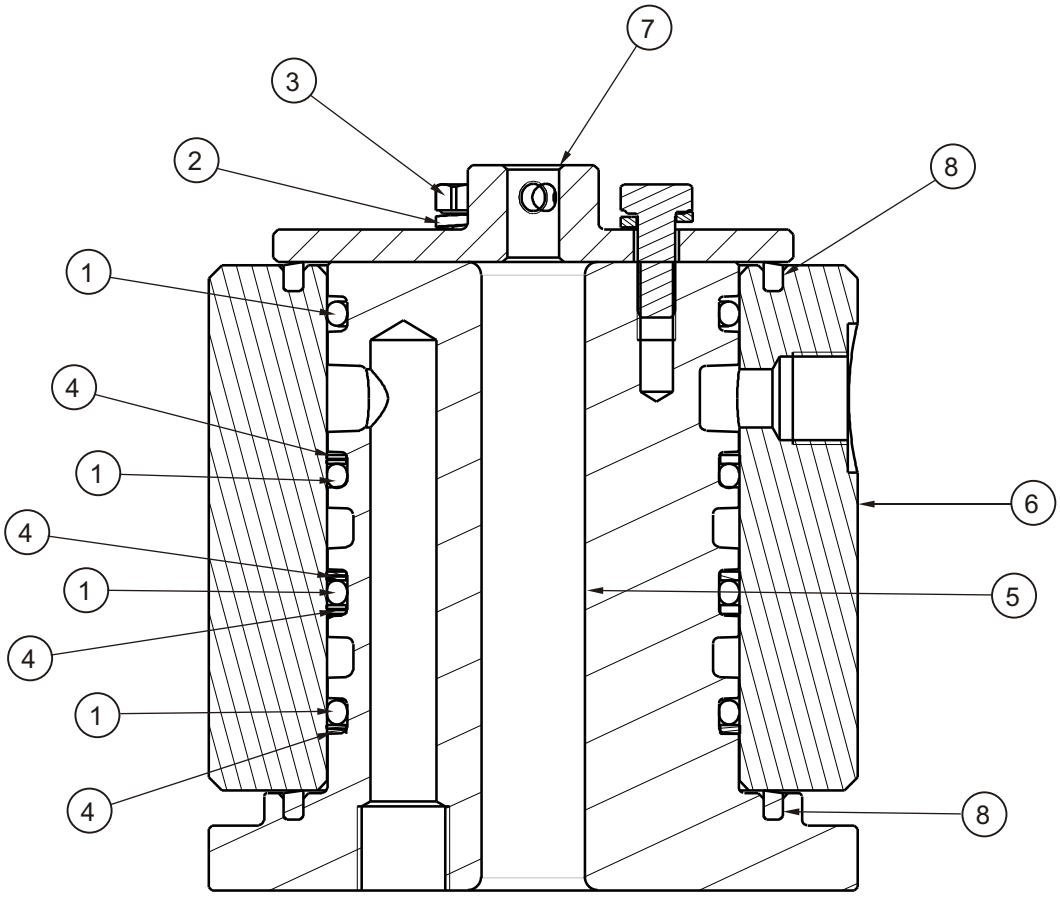


Item	Part No	Qty	Description
1.	10275	1	Cylinder, stabiliser
2.	10286	1	H and L valve, MHP15J Leg
3.	3613-08040	2	Cap screw M8 x 40
4.	11934-6	1	Fitting, ferrulok
5.	11611-6	1	Fitting, ferrulok
6.	9981	1	Pressure switch, set 400 psi
7.	3624-4	2	Bush, permaglide
8.	3624-18	2	Bush, permaglide
9.	10286-4	1	P.O. Check valve
10.	10286-3	1	Counterbalance valve
	10275K	1	Seal kit

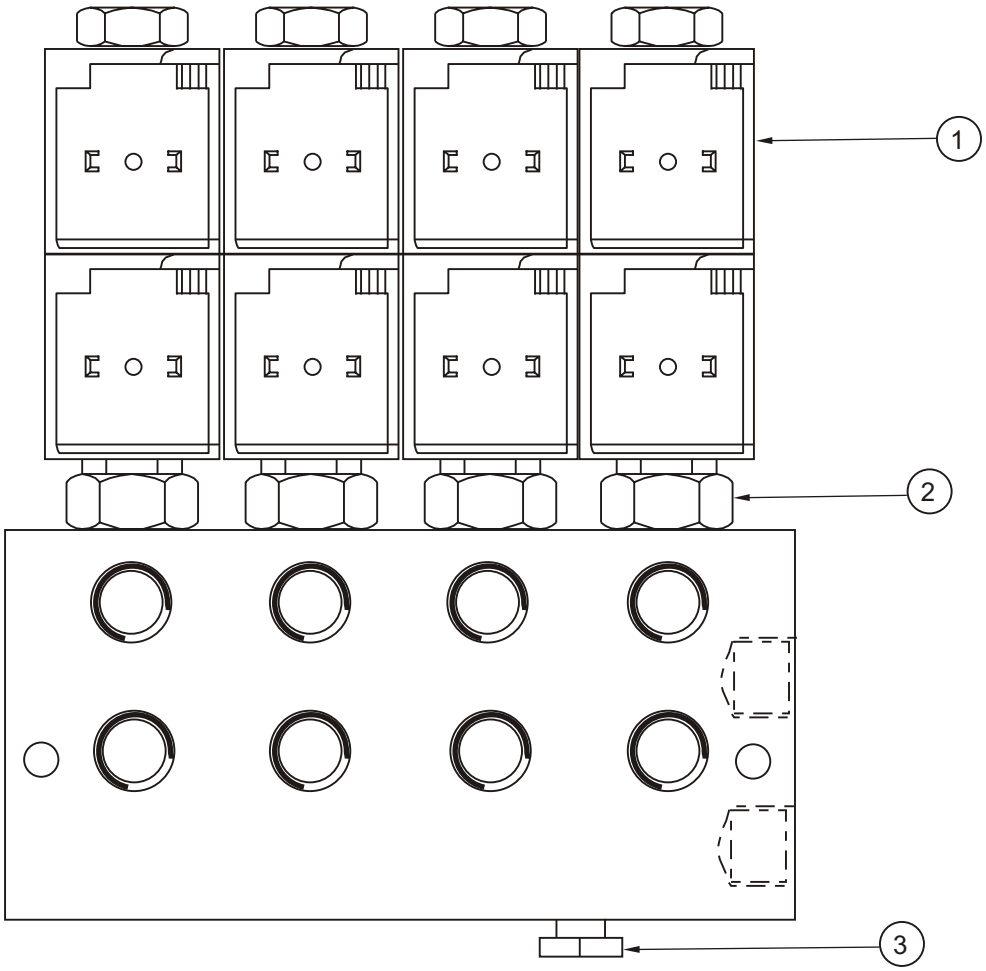


Continuous rotation (option)

Item	Part No	Qty	Description
1.	13-228	4	O-Ring Nitrile 90 DUR
2.	3605-06	3	Spring washer
3.	3610-06016	3	Metric bolt
4.	11768-228	4	PTFE backup washer
5.	11956-1	1	Distributor 3 part pillar
6.	11956-2	1	Distributor barrel
7.	11956-3	1	Distributor cap
8.	11956-5	2	Wiper seal
	11956K	1	Seal kit (includes items 1 & 4)



Item	Part No	Qty	Description
	11921A	Ref	Manifold block assembly
1.	11415-11	8	12V coil
2.	11415-9	4	Valve spool
3.	7034-001	1	Cavity Plug



Section 3. - Electrical

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Machines with electric controls 3-3
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Electrical Circuit Diagram
MHPxxxx

F
E
D
C
B
A

1 2 3 4 5 6 7 8 9

Left Front Leg
Right Front Leg
Left Rear Leg
Right Rear Leg
Lift Enable SCB

P1-1 P1-2 P1-4 P1-3 P1-6
P4-1 P4-2 P4-3 P4-4 P4-5
P2-1 P2-2 P2-3 P2-4 P2-5 P2-7 P2-8 P3-1 P3-2 P3-3 P3-12 P2-12
P3-4 P3-5 P3-6 P3-7 P3-8 P3-9 P3-10 P3-11

TBM LCB

E-Stop UCB, C1 NC
Foot
Enable UCB
E-Lower UCB
Choke UCB
Start UCB
Speed Ctrl UCB
Overload
Lift Enable

Matrix UCB
P2-1 P2-2 P2-3 P2-4 P2-5 P2-6 P2-10 P2-11 P2-9 P4-1 P4-3 P4-5
P1-1 P1-4 P1-3 P1-6
P3-2 P3-1 P3-4 P3-5 P3-6 P3-7 P3-8 P3-9 P3-10

Load Cell
Load Cell Interface UCB
P2-1 P2-2 P2-3 P2-4 P3-1 P3-2 P3-3
P5-2 P5-1 P1-2 P1-1 P4-1 P4-2

Fuel
Elec
E-Stop UCB, C2 NC
Optional: Bi-energy units

Motor 24V
E-Stop LCB, C2 NC
Key Switch LCB, C1 Closed=Platform
Key Switch LCB, C4 Closed=Base
Ign +24V in
Invertor 24V 12V +12V out
Optional: 24VDC units only
E-Stop LCB, C1 NC
Key Switch LCB, C1 Closed=Platform
Key Switch LCB, C4 Closed=Base

Leg Interlock Switches
Closed = Leg Down
Leg Left Front
Leg Right Front
Leg Left Rear
Leg Right Rear

Boom Switch Upper
Activated = Slowed
Boom Switch Lower
Activated = Slowed
Cam LCB
Open = Height Exceeded
Key Lockout LCB
Closed = Lockout Disabled

Boom Align Prox
Closed = Aligned with Boom Rest
Slew Interlock
Closed = Lower Boom < 500mm

P7-1 (Valve Supply) P7-2 P7-3 P7-4 P7-5 P7-6 P7-7 P7-8 P7-9 P7-10 P7-11 P7-12 P8-2 P8-9 P8-11 P8-13 P8-14 P15-9 P14-1 P14-2 P14-3 P14-4 P14-5 P14-6 P14-7 P14-8 P14-9 P14-10 P15-1 P15-2 P15-3 P15-4 P15-5 P15-6 P15-7 P15-8 P15-11 P15-12

Enable LCB
Boom
Stab
Choke UCB
Start LCB
Speed Ctrl

GP400LCB

P2-1 P2-2 P2-3 P1-1 P1-2 P1-3
P4-1 P4-2 P4-3 P4-4 P4-5 P4-6 P4-7 P4-8 P4-9 P4-10 P4-13 P4-14 P5-1 P5-2 P5-3 P5-4 P5-5 P5-6 P5-7 P5-8 P5-9 P5-12 P5-14

Lift Enable LCB
Overload
Bleed Down
Engine Start
Choke
Ignition Coil
Hour

Proportional
Control
Stabiliser
Slew Left
Slew Right
Lower Boom Up
Lower Boom
Upper Boom Up
Upper Boom
Tele Boom
Tele Boom In
Basket Level Up
Basket Level
Rotate Left
Rotate Right

TITLE Electrical Schematic
Machines with electric controls
Snorkel model MHP15/44HD

snorkel

Electrical Circuit Diagram
MHPxxxx
240V AC Option

F
E
D
C
B
A

1 2 3 4 5 6 7 8 9

Left Front Leg
Right Front Leg
Left Rear Leg
Right Rear Leg
Lift Enable SCB
P1-1 P1-2 P1-4 P1-3 P1-6
P4-1 P4-2 P4-3 P4-4 P4-5
P2-1 P2-2 P2-3 P2-4 P2-5 P2-7 P2-8 P3-1 P3-2 P3-3 P3-12 P2-12
P3-4 P3-5 P3-6 P3-7 P3-8 P3-9 P3-10 P3-11

TBM LCB

E-Stop UCB, C1 NC
Foot
Enable UCB
E-Lower UCB
Choke UCB
Start UCB
Speed Ctrl UCB
Overload
Lift Enable UCB
P2-1 P2-2 P2-3 P2-4 P2-5 P2-6 P2-10 P2-11 P2-9 P4-1 P4-3 P4-5
P1-1 P1-4 P1-3 P1-6
Matrix UCB
P3-2 P3-1 P3-4 P3-5 P3-6 P3-7 P3-8 P3-9 P3-10

Load Cell
Load Cell Interface UCB
P2-1 P2-2 P2-3 P2-4 P3-1 P3-2 P3-3
P5-2 P5-1 P1-2 P1-1 P4-1 P4-2

Fuel
Elec
E-Stop UCB, C2 NC
Optional: Bi-energy units

Optional: 240VAC units only
87 87A
1 0 2 4 6 8
Phase
Earth
Neutral
RCD
AC Motor
12V Charger
E-Stop LCB, C1 NC
Key Switch LCB_C1 Closed=Platform
Key Switch LCB_C4 Closed=Base

Leg Interlock Switches
Closed = Leg Down
Leg Left Front
Leg Right Front
Leg Left Rear
Leg Right Rear

Boom Switch Upper
Activated = Stowed
Boom Switch Lower
Activated = Stowed
Cam LCB
Open = Height Exceeded
Key Lockout LCB
Closed = Lockout Disabled

Boom Align Prox
Closed = Aligned with Boom Rest
Slew Interlock
Closed = Lower Boom < 500mm

P2-1 P2-2 P2-3 P1-1 P1-2 P1-3
P7-1 (Valve Supply) P7-2 P7-3 P7-4 P7-5 P7-6 P7-7 P7-8 P7-9 P7-10 P7-11 P7-12 P8-2 P8-9 P8-11 P8-13 P8-14 P15-9 P14-1 P14-2 P14-3 P14-4 P14-5 P14-6 P14-7 P14-8 P14-9 P14-10 P15-1 P15-2 P15-3 P15-4 P15-5 P15-6 P15-7 P15-8 P15-11 P15-12
GP400LCB
P4-1 P4-2 P4-3 P4-4 P4-5 P4-6 P4-7 P4-8 P4-9 P4-10 P4-13 P4-14 P5-1 P5-2 P5-3 P5-4 P5-5 P5-6 P5-7 P5-8 P5-9 P5-12 P5-14

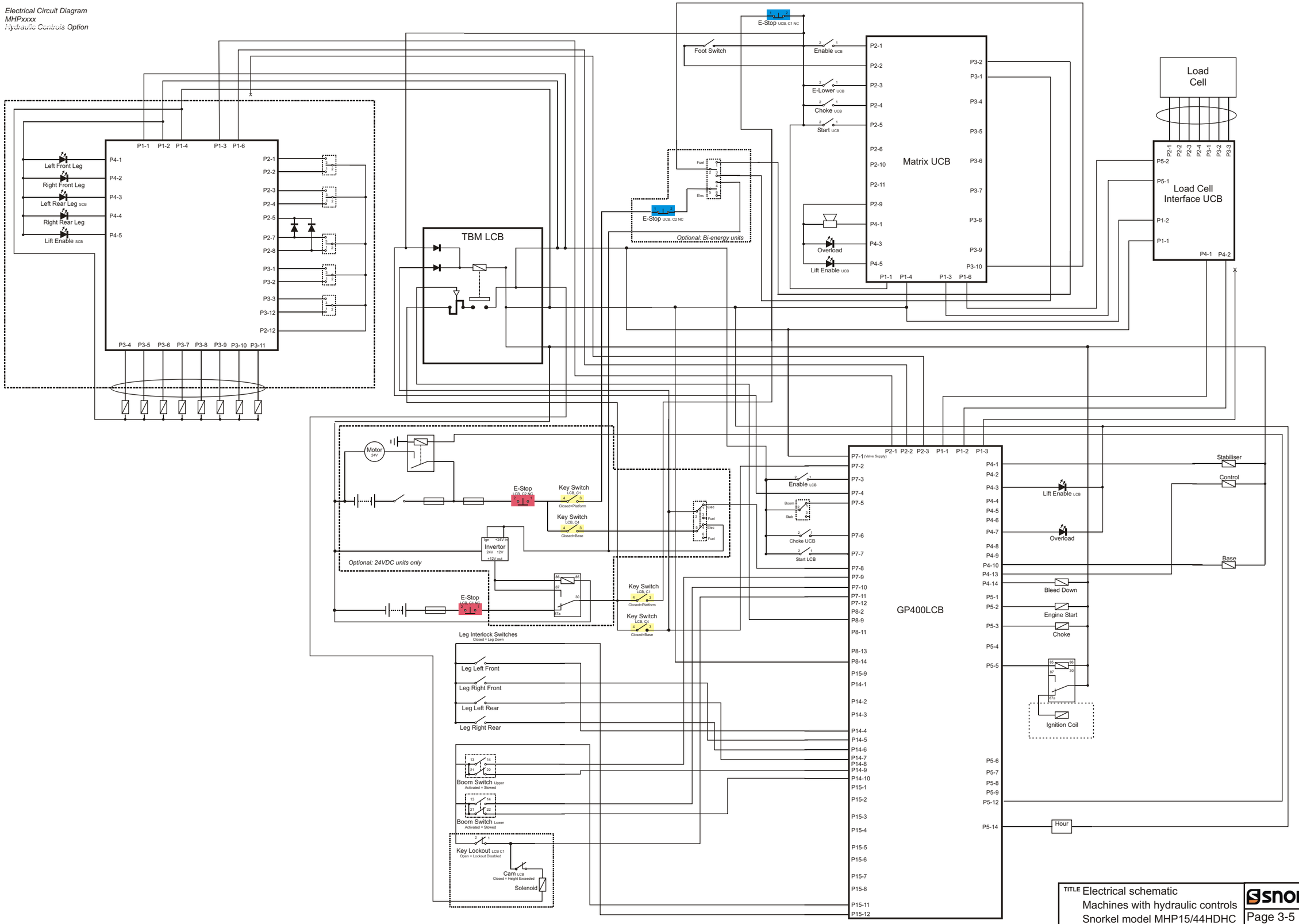
Enable LCB
Boom
Stab
Choke UCB
Start LCB
Speed Ctrl
Lift Enable LCB
Overload
Bleed Down
Engine Start
Choke
Ignition Coil
Hour

Proportional
Control
Stabiliser
Slew Left
Slew Right
Lower Boom Up
Lower Boom
Upper Boom Up
Upper Boom
Tele Boom
Tele Boom In
Basket Level Up
Basket Level
Rotate Left
Rotate Right

snorkel

TITLE Electrical Schematic - 240VAC Option
Machines with electric controls
Snorkel model MHP15/44HD

Electrical Circuit Diagram
MHPxxxx
Hydraulic Controls Option



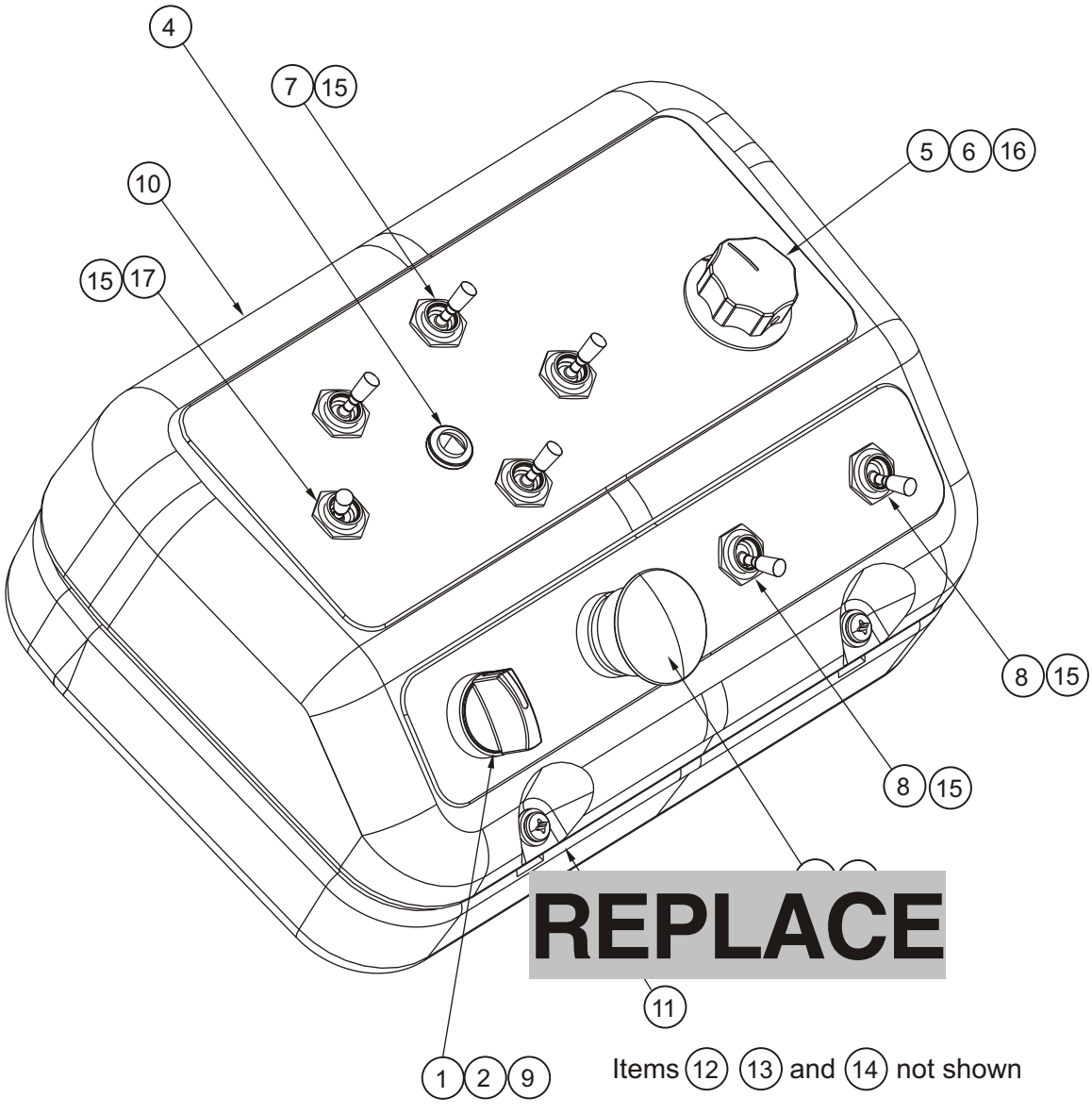
9	8	7	6	5	4	3	2

F E D C B A

TITLE Electrical schematic
Machines with hydraulic controls
Snorkel model MHP15/44HDHC

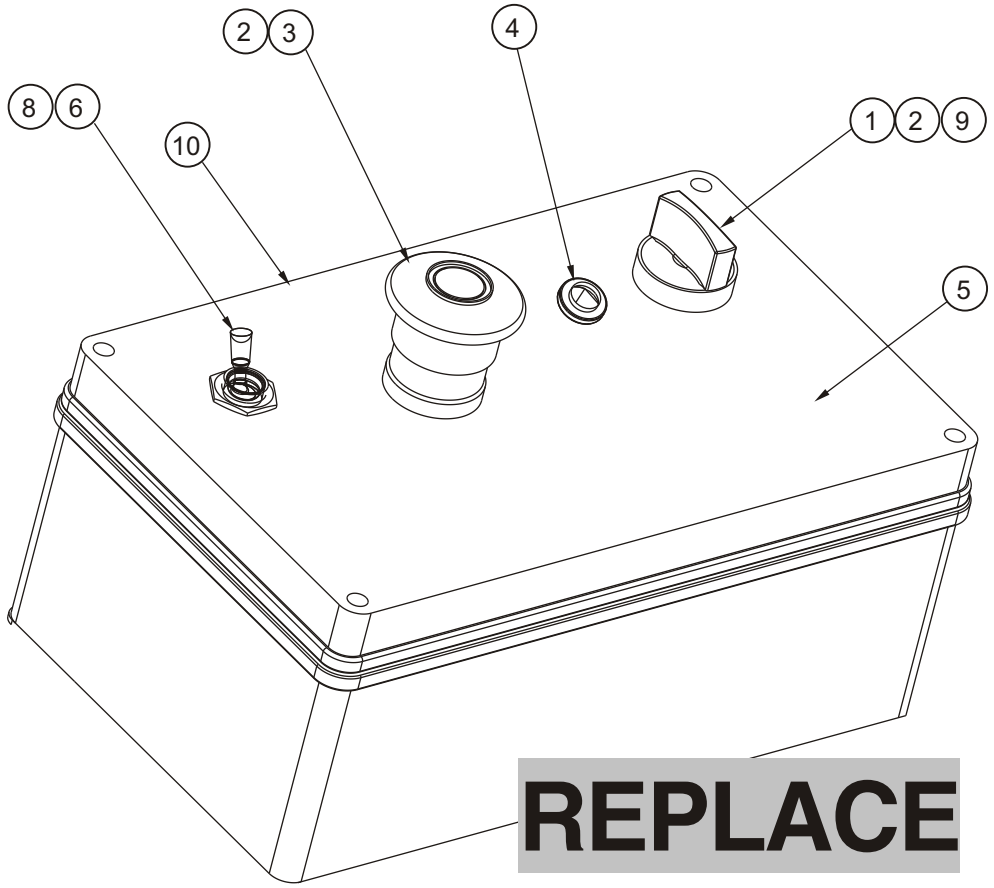
snorkel

Item	Part No.	Qty	Description
	12385A		Upper control box assembly
1.	8808-1	1	Start switch 3 position
2.	9776	1	Collar and contact block
3.	9775	1	Stop switch head
4.	125363	1	LED, 12V, green
5.	304-0412	1	Rheostat
6.	304-0348	1	Knob, speed control switch
7.	302-0018	4	Switch, toggle DPDT (M/OFF/M)
8.	302-0015	2	Switch, toggle SPST (MOM/OFF)
9.	10114	1	Contact set, additional
10.	12385	1	Control box, upper
11.	3604-05020	2	Pan head screw, plated
12.	12408	1	Rubber seal (not shown)
13.	12416	1	Hinge (not shown)
14.	304-0338	1	Plug assembly (not shown)
15.	7084-005	6	Seal
16	7084-007	1	Seal
17.	302-0018	1	Used with rotate option only

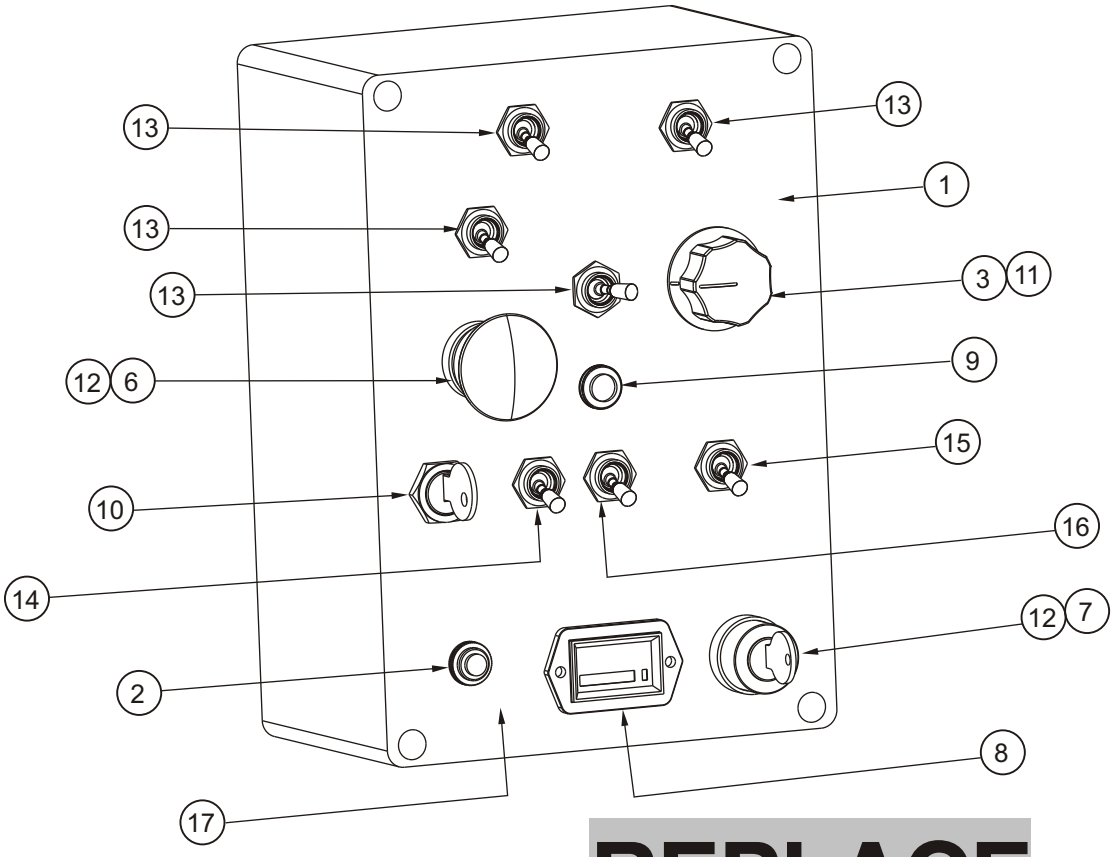


Upper control box assembly - hydraulic controls

Item	Part No.	Qty	Description
	12861A		Upper control box assembly
1.	8808-1	1	Start switch 3 position
2.	9776	2	Collar and contact block
3.	9775	1	Stop switch head
4.	12536-3	1	LED, 12V, green
5.	12861-1	1	Decal, Upper control box, no rotator
	12861-2	1	Decal, Upper control box, rotator
6.	12515	1	Washer, M12, rubber
7.	304-0338	1	Plug assembly, (not shown)
8.	302-0015	1	Switch, toggle SPST (MOM/OFF)
9.	10114	1	Contact set, additional
10.	12031-3	1	Control box, upper



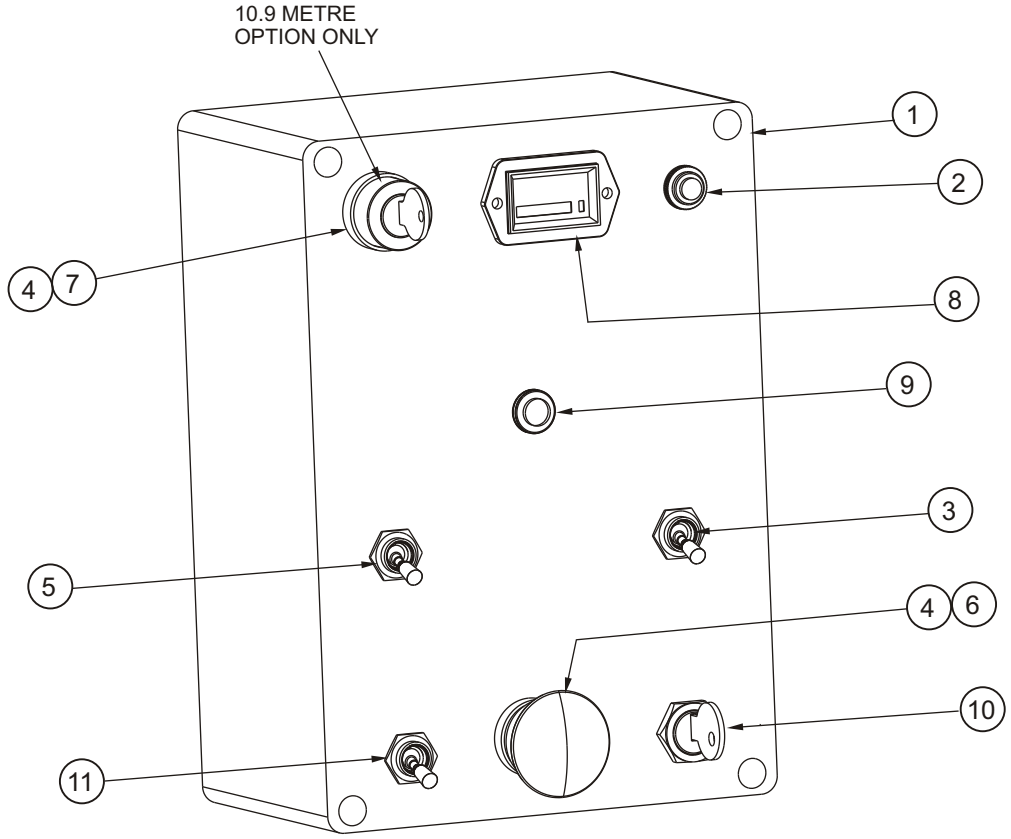
Item	Part No.	Qty	Description
	12521A	1	Lower control box assembly
1.	12521	1	Control box, lower
2.	56368-6	1	Circuit breaker, 15 amp
3.	304-0438	1	Knob, speed control switch
4.	1814	3	Cable gland (not shown)
5.	1815	1	Cable gland (not shown)
6.	9775	1	Stop switch head
7.	10744	1	Key switch
8.	455186	1	Hourmeter
9.	12536-3	1	LED, 12V, green
10.	3020087	1	Key switch
11.	304-0412	1	Rheostat
12.	9776	2	Collar and contact block
13.	302-0018	4	Switch,toggle, DPDT (M/OFF/M)
14.	302-0015	1	Switch, toggle, SPST (MOM/OFF)
15.	302-0048	1	Switch, toggle, 4PDT (ON/ON)
16.	302-0097	1	Switch, toggle, DPDT (ON/ON)
17.	12523	1	Decal, lower control box



REPLACE

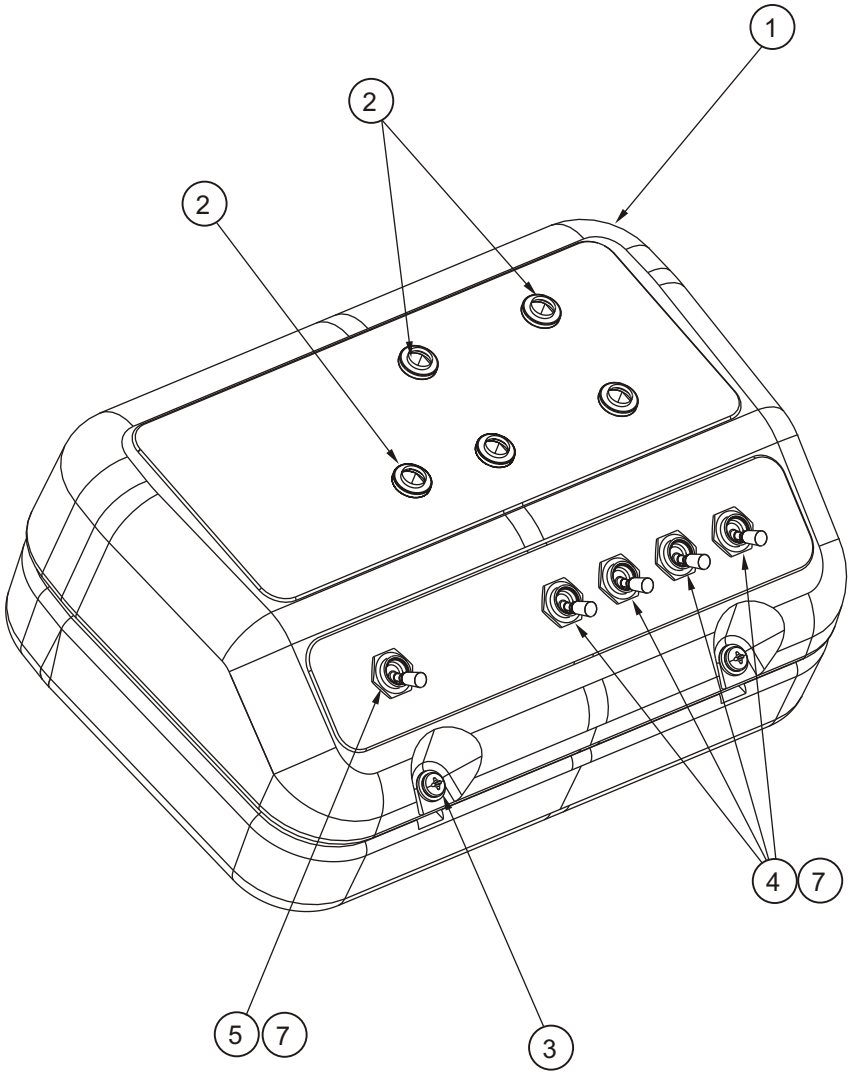
Lower control box assembly - hydraulic controls

Item	Part No.	Qty	Description
	12877	1	Lower control box assembly
1.	12521	1	Control box, lower
2.	56368-6	1	Circuit breaker, 15 amp
3.	302-0048	1	Switch, toggle, 4PDT (ON/ON)
4.	9776	2	Collar and contact block
5.	302-0097	1	Switch, toggle, DPDT (ON/ON)
6.	9775	1	Stop switch head
7.	10744	1	Key switch
8.	455186	1	Hourmeter
9.	12536-3	1	LED, 12V, green
10.	3020087	1	Key switch
11.	302-0015	1	Switch, toggle, SPST (MON/OFF)

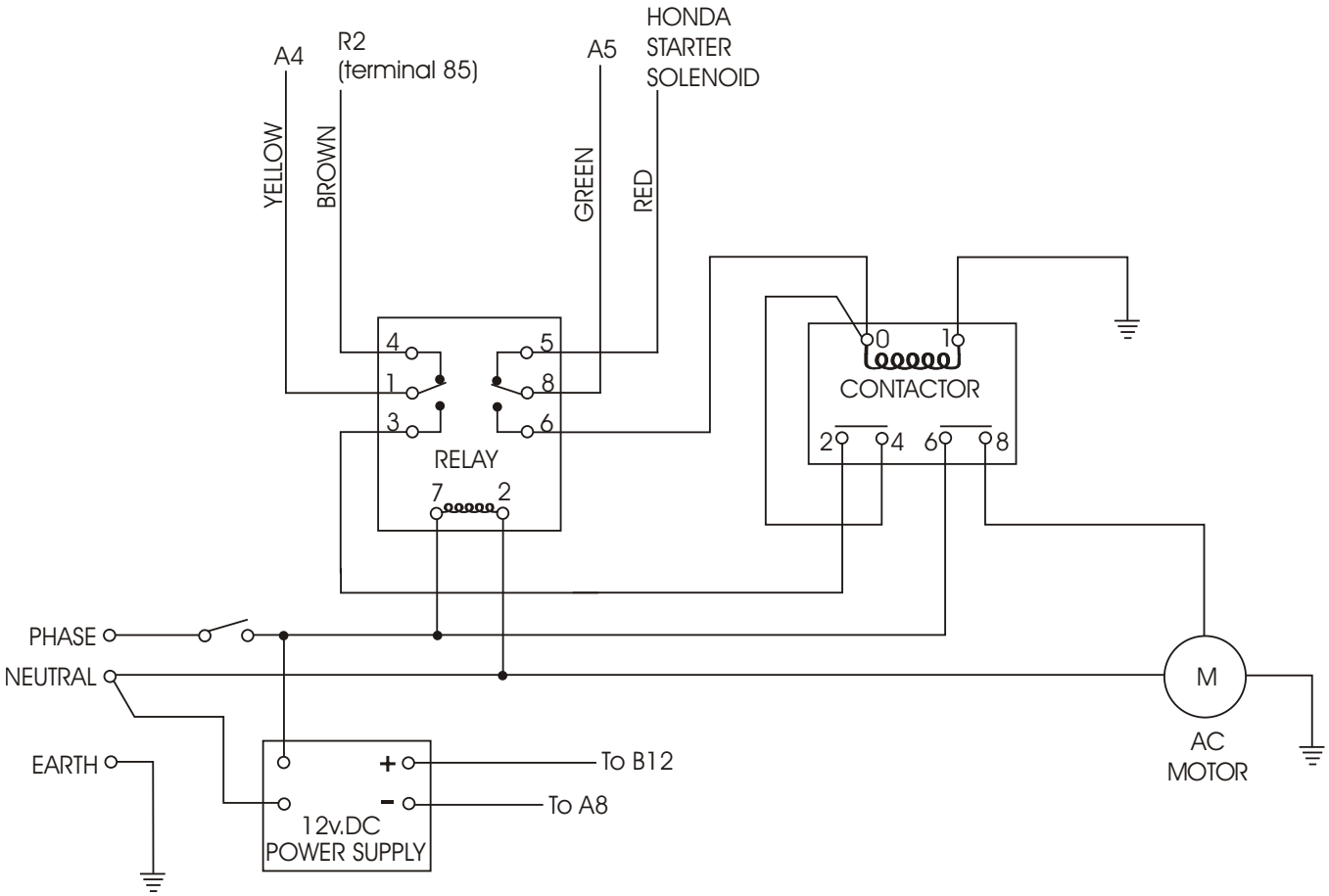


REPLACE

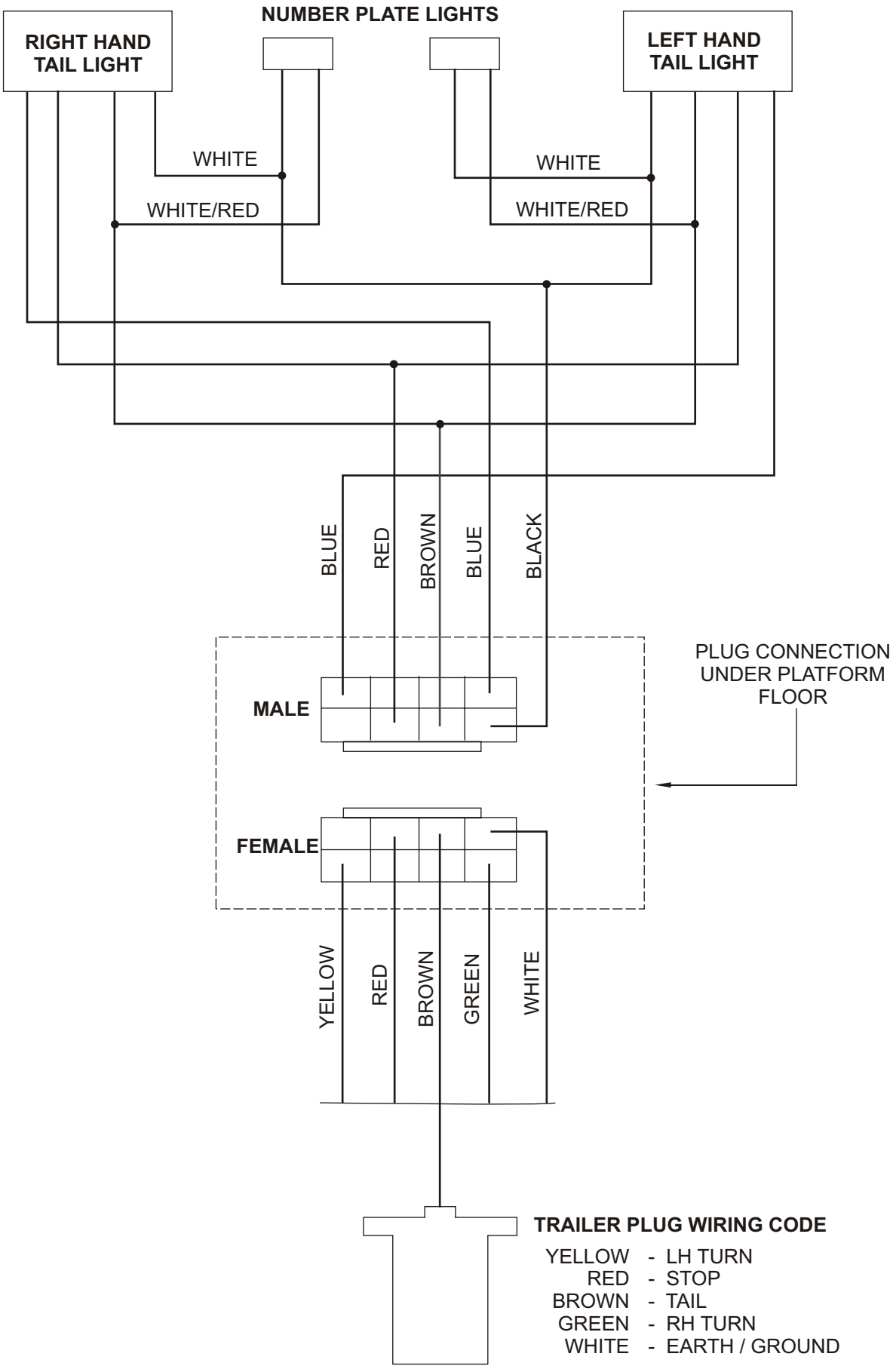
Item	Part No.	Qty	Description
	12404A		Control box assembly, auto stabiliser
1.	12404	1	Control box
2.	12536-3	5	LED, 12V green
3.	3604-05020	2	Pan head screw
4.	302-0016	5	Switch, toggle, SPDT (M/OFF/M)
5.	12416	1	Hinge (not shown)
6.	12408	1	Seal (not shown)
7.	12515	5	Washer
8.	1815	2	Cable gland (not shown)



AC motor option wiring schematic



KEEP??

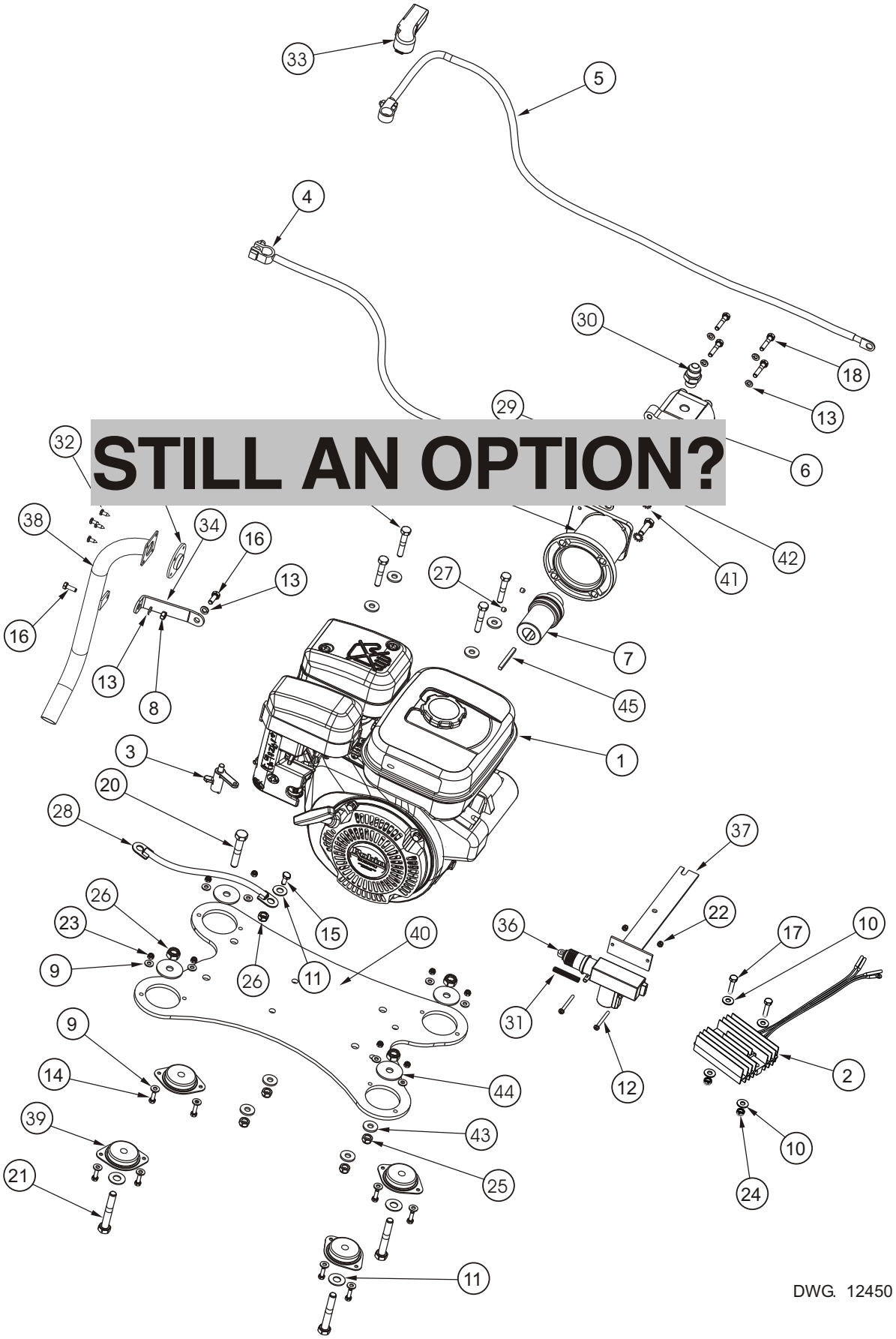

NUMBER PLATE LIGHTS
RIGHT HAND TAIL LIGHT
LEFT HAND TAIL LIGHT
WHITE
WHITE
WHITE/RED
WHITE/RED
BLUE
RED
BROWN
BLUE
BLACK
MALE
PLUG CONNECTION UNDER PLATFORM FLOOR
FEMALE
YELLOW
RED
BROWN
GREEN
WHITE
TRAILER PLUG WIRING CODE
YELLOW - LH TURN
RED - STOP
BROWN - TAIL
GREEN - RH TURN
WHITE - EARTH / GROUND

Section 4. - Options

Engine assembly, Robin (sheet 1) 4-2
Engine assembly, Robin (Sheet 2) 4-3
Engine assembly, Lombardini (Sheet 1) 4-4
Engine assembly, Lombardini (Sheet 2) 4-5
Basket rotator (Sheet 1) 4-6
Basket rotator (Sheet 2) 4-7
Continuous rotation option (sheet 1) 4-8
Continuous rotation option (sheet 2) 4-9
Spare wheel mount 4-10

Engine assembly, Robin (sheet 1)

Item	Part No.	Qty	description
0.	12450		Engine assembly EX17DS
	12542		Engine assembly EX21DS
1.	1171-11	1	Robin EX17 6.0HP
	1171-12	1	Robin EX21 7.0HP
2.	1171-11-022	1	Regulator / rectifier Robin
3.	1171-11-031	1	Choke actuator lever
4.	1650-030	1	Battery cable
5.	1650-031	1	Battery cable
6.	1659	1	Gear pump
7.	1880-003	1	Drive coupling
8.	3602-06	1	Metric nut
9.	3603-05	16	Plain washer
10.	3603-06	4	Plain washer
11.	3603-10	4	Plain washer
12.	3604-04040	2	Metric screw pan head
13.	3605-06	5	Spring washer
14.	3610-05016	8	Metric bolt
15.	3610-10020	1	Metric bolt
16.	3610-06016	1	Metric bolt
17.	3610-06025	2	Metric bolt
18.	3610-06030	4	Metric bolt
19.	3610-08045	4	Metric bolt
20.	3610-10055	1	Metric bolt
21.	3610-10065	3	Metric bolt
22.	3611-04	2	Metric nylock nut
23.	3611-05	8	Metric nylock nut
24.	3611-06	2	Metric nylock nut
25.	3611-08	4	Metric nylock nut
26.	3611-10	4	Metric nylock nut
27.	3612-06006	2	Grub screw
28.	3649-10	1	Battery cable
29.	7013-003	1	BSPP (Dowty) x JICM nipple
30.	7013-004	1	BSPP (Dowty) x JICM nipple
31.	8398	1	Spring
32.	8978-1	2	Screw, self tapping
33.	10254	1	Cover, battery terminal
34.	12539-4	1	Exhaust bracket
35.	10417	1	Bell housing
36.	11444	1	Choke solenoid 12V
37.	12541	1	Choke solenoid bracket
38.	12539	1	Exhaust weldment, EX17DS
	12543	1	Exhaust weldment, EX21DS
39.	12524	4	Engine mount
40.	12526	1	Engine mount plate
41.	60005-054	4	Lockwasher
42.	60016-090N	4	Bolt, plated
43.	60030-3N	8	Flat washer
44.	5560179	4	Flat washer, special
45.	5KEY	1	Key steel
46.	12539-50	1	Exhaust shroud


33
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4
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18
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32
STILL AN OPTION?
38
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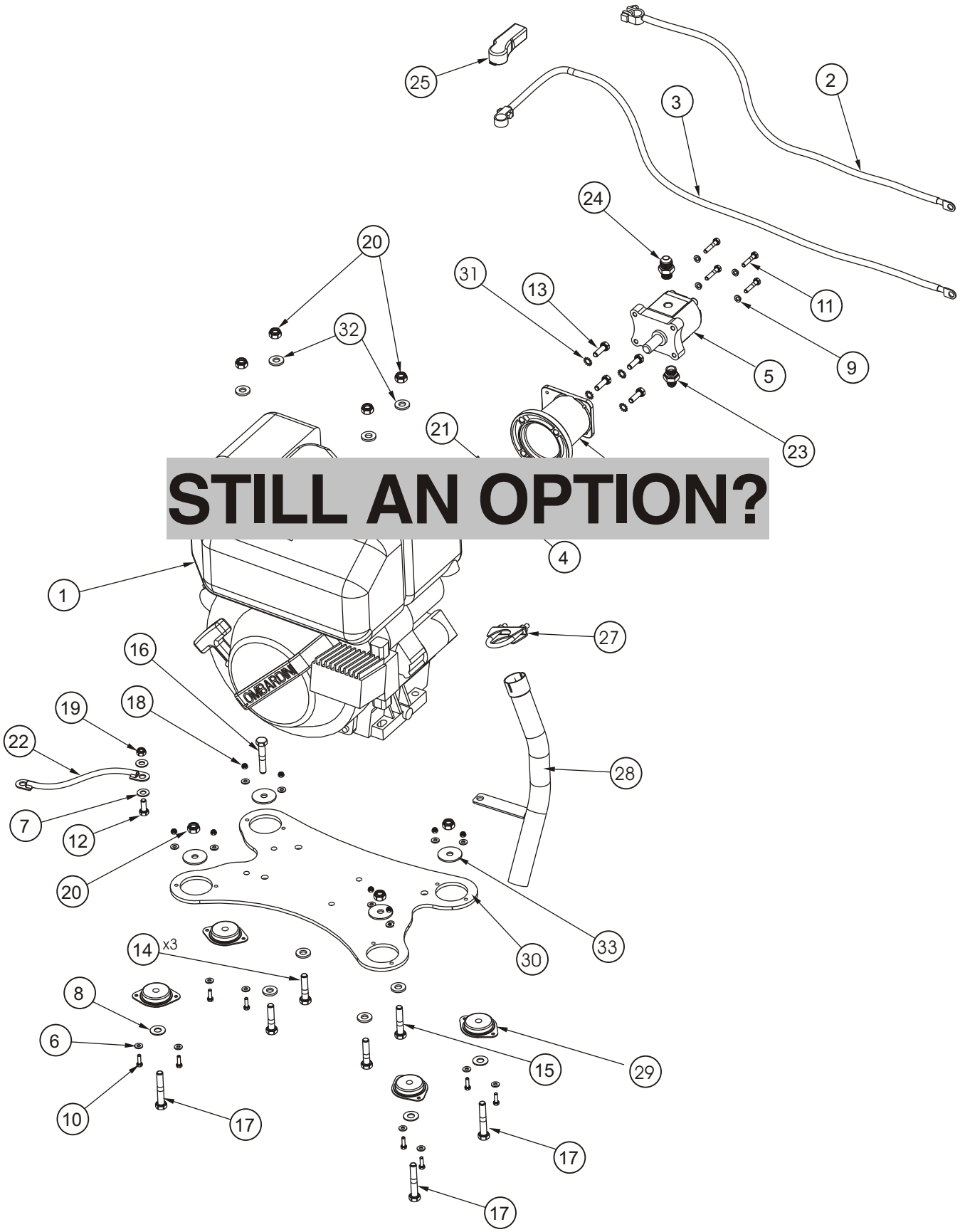
11
DWG. 12450

Engine assembly, Lombardini (Sheet 1)

Item	Part No	Qty	Description
0.	12449		Engine assembly
1.	1171-8	1	Lombardini 15LD315 diesel engine
2.	1650-030	1	Battery cable
3.	1650-031	1	Battery cable
4.	1657-11	1	Drive coupling
5.	1659	1	Gear pump
6.	3603-05	16	Plain washer
7.	3603-08	2	Plain washer
8.	3603-10	3	Plain washer
9.	3605-06	4	Spring washer
10.	3610-05016	8	Metric bolt
11.	3610-06030	4	Metric bolt
12.	3610-08020	1	Metric bolt
13.	3610-08025	4	Metric bolt
14.	3610-10045	3	Metric bolt
15.	3610-10050	1	Metric bolt
16.	3610-10055	1	Metric bolt
17.	3610-10060	3	Metric bolt
18.	3611-05	8	Nyloc nut
19.	3611-08	1	Nyloc nut
20.	3611-10	7	Nyloc nut
21.	3612-06006	2	Grub screw
22.	3649-10	1	Battery cable
23.	7013-003	1	BSPP (Dowty) x JICM nipple
24.	7013-004	1	BSPP (Dowty) x JICM nipple
25.	10254	1	Cover, battery terminal
26.	10417	1	Bell housing
27.	12409	1	Exaust clamp
28.	12450	1	Exhaust weld, Lombardini
29.	12524	4	Engine mount
30.	12526	1	Engine mount plate
31.	60005-054	4	Lockwasher
32.	60030-061	8	Washer, heavy duty
33.	5560179	4	Flat washer, special


25
2
3
24
20
31
13
11
32
5
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23
STILL AN OPTION?
4
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16
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18
22
28
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12
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33
30
14 x3
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15
29
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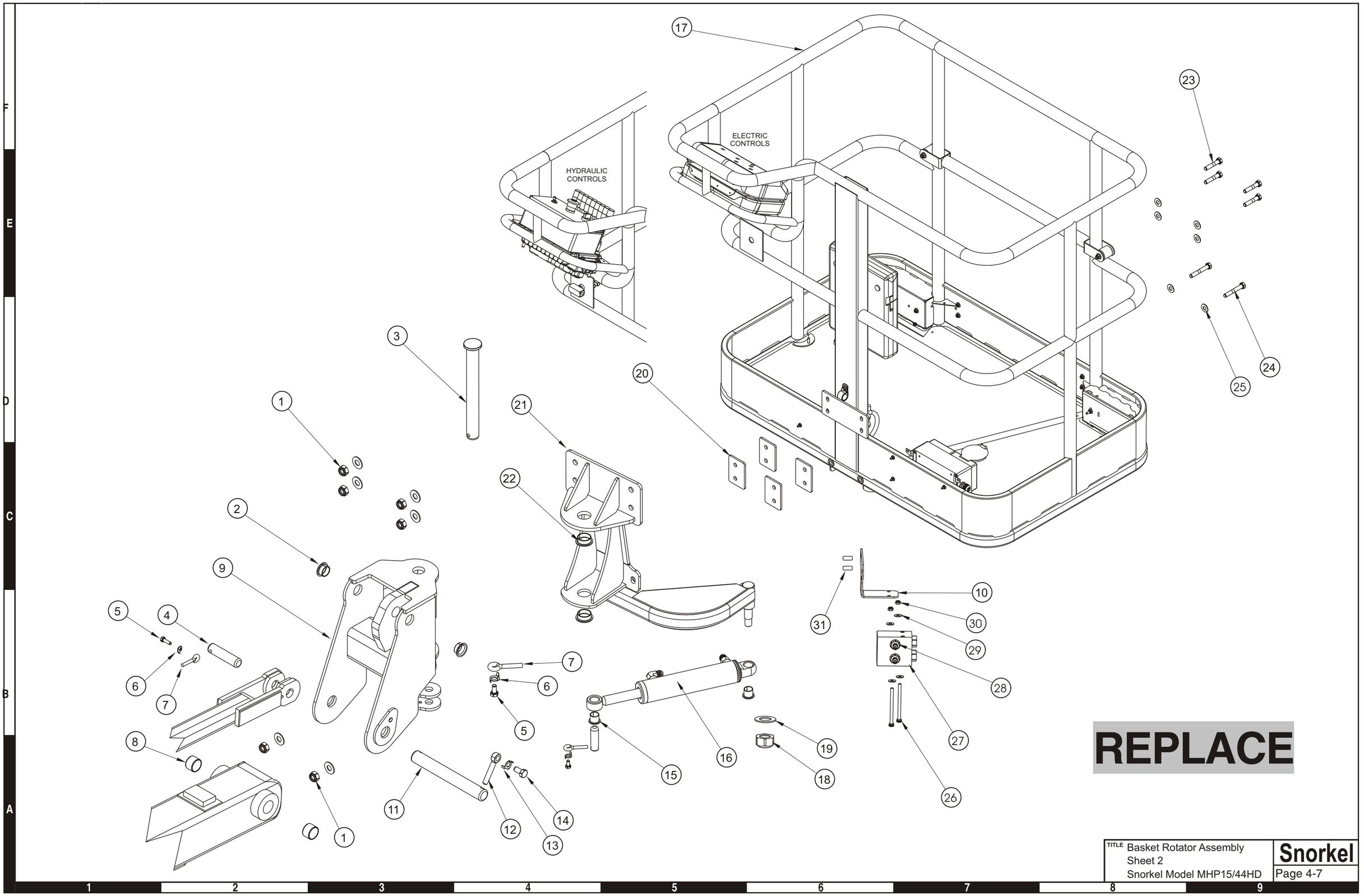
17
17

Basket rotator (Sheet 1)

Item	Part No	Qty	Description
0.			Basket rotator assembly
1.	3611-10	6	Nyloc nut
2.	3626-13	2	Bush, flanged
3.	12470	1	Stepped pin
4.	9859	1	Pin
5.	3610-06020	2	Bolt
6.	11492-1	2	Lock washer
7.	8628	2	Pin keeper
8.	3624-3	2	Bush
9.	12848-1	1	Rotator, jib side
10.	12468-16	1	Valve mount
11.	9790	1	Pin
12.	8626	1	Pin keeper
13.	11492-3	1	Lock washer
14.	3610-10020	1	Bolt
15.	3626-3	2	Flanged bush
16.	12330A	1	Rotator cylinder
17.	12859A	1	Basket assembly
18.	3608-16C	1	Conelock nut
19.	3603-16	3	Plain washer
20.	12451-3	As Req	Spacer
21.	12468-1	1	Rotator, basket side
22.	3626-5	2	Flanged bush
23.	3610-10050	4	Bolt
24.	3610-10090	2	Bolt, M10 x 90, C8.8
25.	3603-10	12	Flat washer
26.	3613-06080	2	Cap screw
27.	11586	1	Double pilot check valve
28.	506-5705	4	JICM x UNO O-Ring
29.	3603-06	4	Plain washer
30.	3611-06	2	Nyloc nut
31.	12036-5	2	Spacer



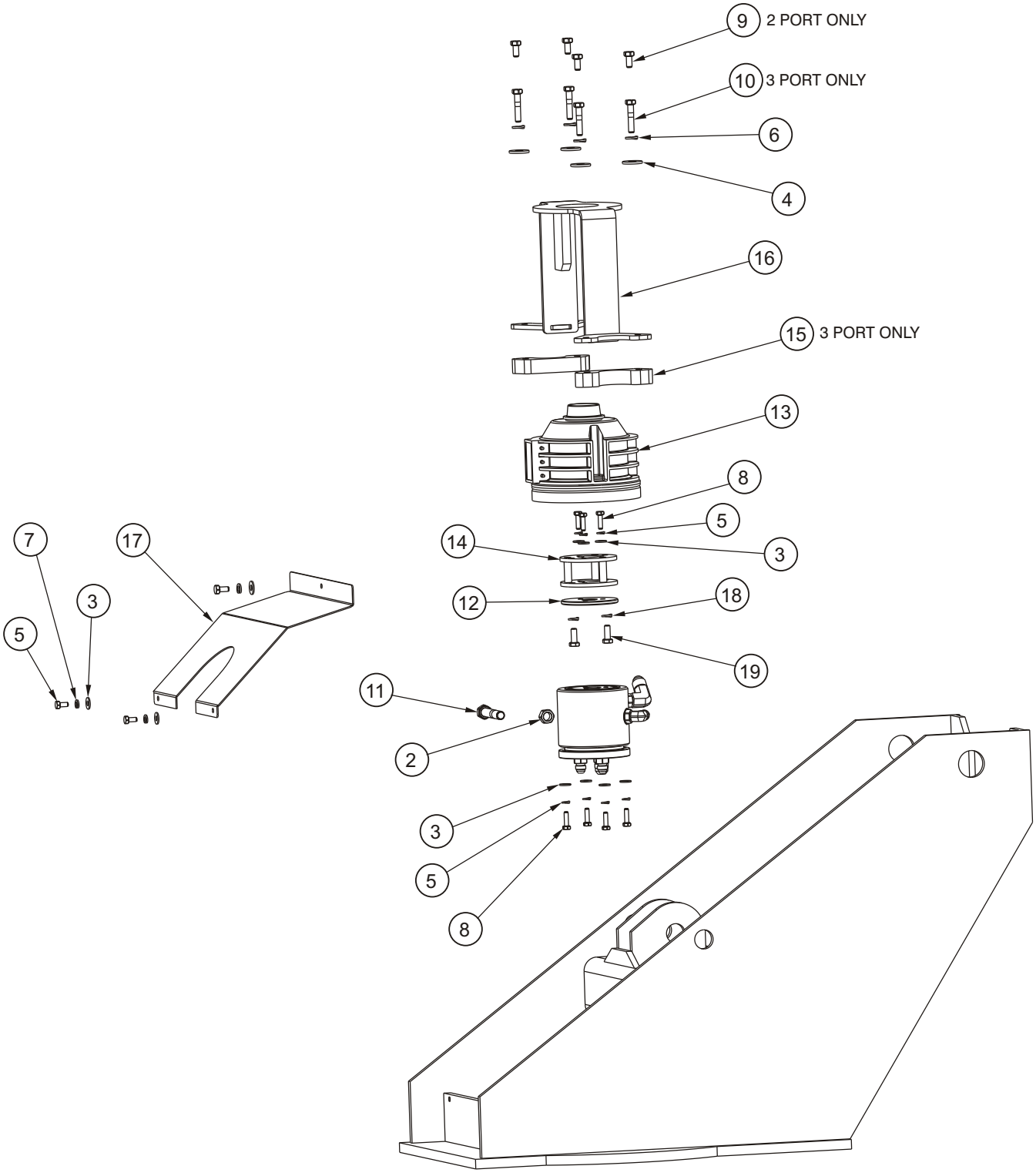
REPLACE

TITLE Basket Rotator Assembly
Sheet 2
Snorkel Model MHP15/44HD

Snorkel

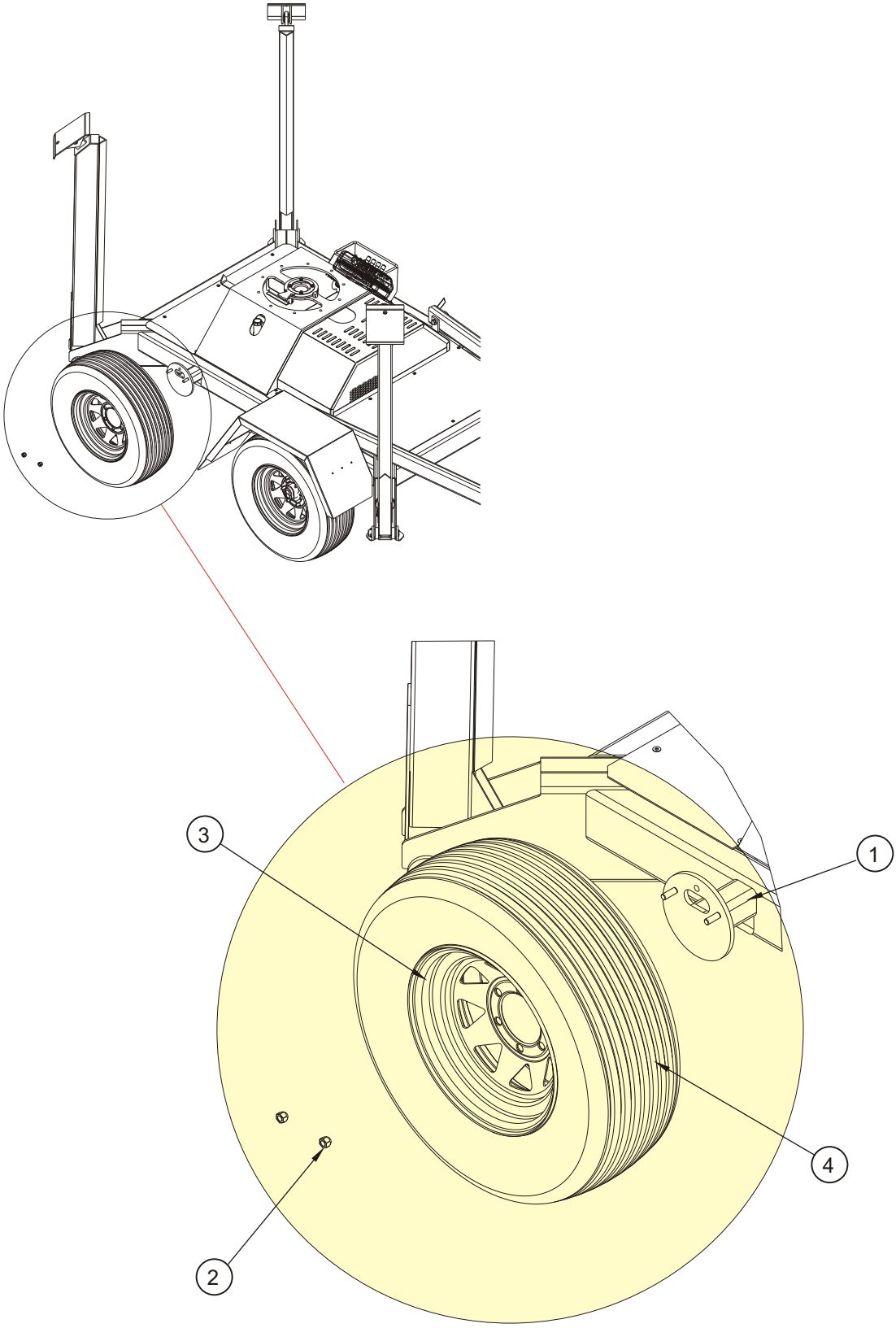
Continuous rotation option (sheet 1)

Item	Part No	Qty	Description
1.	506-5707	5	Fitting, hydraulic (not shown)
2.	3602-12	1	Metric hex nut
3.	3603-06	10	Plain washer
4.	3603-08	4	Plain washer
5.	3605-06	10	Spring washer
6.	3605-08	4	Spring washer
7.	3610-06012	3	Metric bolt
8.	3610-06020	7	Metric bolt
9.	3610-08016	4	Metric bolt
10.	3610-08040	4	Metric bolt
11.	3610-12075	1	Metric bolt
12.	11957-3	1	Distributor cap
13.	12679	1	Hydromotion 12 way slip ring
14.	12679-20	1	Spacer plate
15.	12679-50	2	Three port spacer plate
16.	12679-55	1	Moving bracket
17.	12679-60	1	Column cover
18.	60005-008	2	Spring washer
19.	60016-003	2	Bolt, 5/16" x 3/4"


9
2 PORT ONLY
10
3 PORT ONLY
6
4
16
15
3 PORT ONLY
13
8
5
14
3
12
18
19
11
2
3
5
8
7
17
3
5

Spare wheel mount

Item	Part No.	Qty	Description
1.	13050-1	1	Spare wheel mount, sub weld
2.	1649-041	2	Wheel nut
3.	13017-2	1	Wheel rim
4.	13017-1	1	Tyre



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El Distribuidor local / Il Distributore locale

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