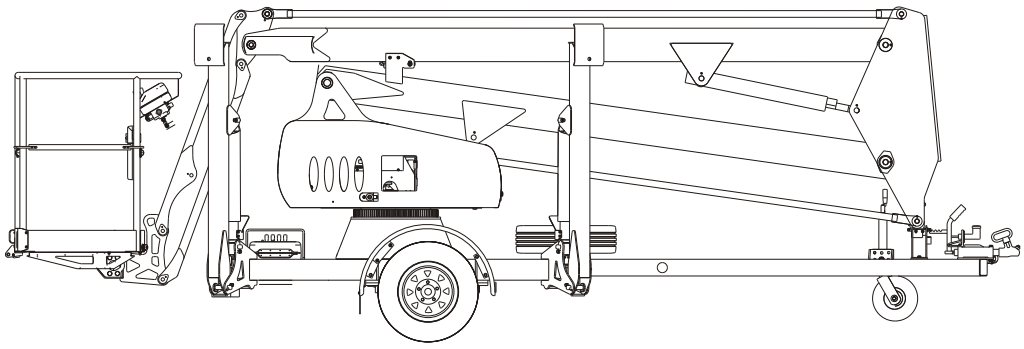
snorkel

MHP1335
MHP1544



Diesel
Gasoline
Battery Electric
Bi-Energy Options

REPAIR PARTS
MANUAL

Part Number 13619-2
November 2012 (Rev B)
Version 3

Serial Number MHP1335-07-000003 and after

Table of Contents

General Specifications

10.9m Height Restriction Kit

Maintenance Information

Stability Testing

Table of Contents

Section 1. - Repair Parts

Section 2. - Hydraulics

Section 3. - Electrical

Section 4. - Options

The Snorkel MHP13/35 & MHP15/44 Mark II are boom supported elevating work platforms built to conform to these standards, American Standard ANSI A92.2

Australian Standard AS1418-10(Int) Elevating Work Platforms.

■ General Specifications MHP13/35 Mark II

SPECIFICATIONS	MHP13/35 Mark II	
Working height	12.6m	41'
Platform height	10.6m	35'
Rated load	250kg (227kg ANSI)	550lb (500lb ANSI)
Rated load (with rotator)	227kg (200kg ANSI)	500lb (440lb ANSI)
Platform size	1250 x 780 x 1070mm	4.1' x 2.6' x 3.5'
Platform construction	Steel	
Platform levelling	Mechanical	
Boom type	Articulating	
Horizontal reach	5.6m at 6m	18.4' at 19.7'
Maximum wind speed 12.5m/s	45kph	28mph
Turntable rotation	540^{O} non-continuous or 360^{O} continuous	
Power source (std.)	Gasoline engine 5.5hp	
Hydraulic system	Proportional electro/hydraulic	
Stabilisation	4 independently operated hydraulic outriggers with safety interlocks	
Stabiliser footprint (max.)	3.7 x 3.6m	12.1' x 11.8'
Standard colour	Snorkel orange base and covers, white turret and booms	
Transport height	2.05m	6.7'
Overall length	5.99m	19.7'
Overall width - outriggers extended	3.95m	12.1
Overall width - outriggers stowed	1.58m	5.2'
Tyre size (standard)	185 R14	
Brakes	Hydraulic disc	
Maximum towing speed	80kph	50mph
Maximum rated axle capacity	1750kg	3858lb
Weight (standard model)	1260kg (approx)	2777lb (approx)
Insulation rating	Nil	
Trailer tongue weight (approx)	65kg	143lb
Maximum chassis inclination	$1^{O}/1^{O}$	
Maximum outrigger load	920kg	2028lb
Maximum allowable force	400N	

■ General Specifications MHP15/44 Mark II

SPECIFICATIONS	MHP15/44 Mark II	
Working height	15.2m	50'
Platform height	13.4m	44'
Rated load	227kg	500lb
Rated load (with rotator)	200kg	440lb
Platform size	1250 x 780 x 1070mm	4.1' x 2.6' x 3.5'
Platform construction	Steel	
Platform levelling	Mechanical	
Boom type	Articulating	
Horizontal reach	6.45m at 8m	21' 1" at 26' 4"
Maximum wind speed 12.5m/s	45kph	28mph
Turntable rotation	540^{O} non-continuous or 360^{O} continuous	
Power source (std.)	Gasoline engine 5.5hp	
Hydraulic system	Proportional electro/hydraulic	
Stabilisation	4 independently operated hydraulic outriggers with safety interlocks	
Stabiliser footprint (max.)	3.7 x 3.6m	12' 1" x 13' 9"
Standard colour	Snorkel orange base and covers, white turret and booms	
Transport height	2.1m	6' 10"
Overall length	7.45m	24' 5"
Overall width - outriggers extended	3.95m	13'
Overall width - outriggers stowed	1.77m	5' 9"
Tyre size	185 R14	
Brakes	Hydraulic disc	
Maximum towing speed	80kph	50mph
Maximum rated axle capacity	1750kg	3858lb
Weight (standard model)	1500kg (approx)	3306lb (approx)
Insulation rating	Nil	
Trailer tongue weight	90kg	198lb
Max chassis inclination	1^{O}/1^{O}	
Maximum outrigger load	1040kg	2292lb
Maximum allowable force	400N	

■ 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

■ Classification

Group B Type 1

■ AS1418.1 Group Classification

C3

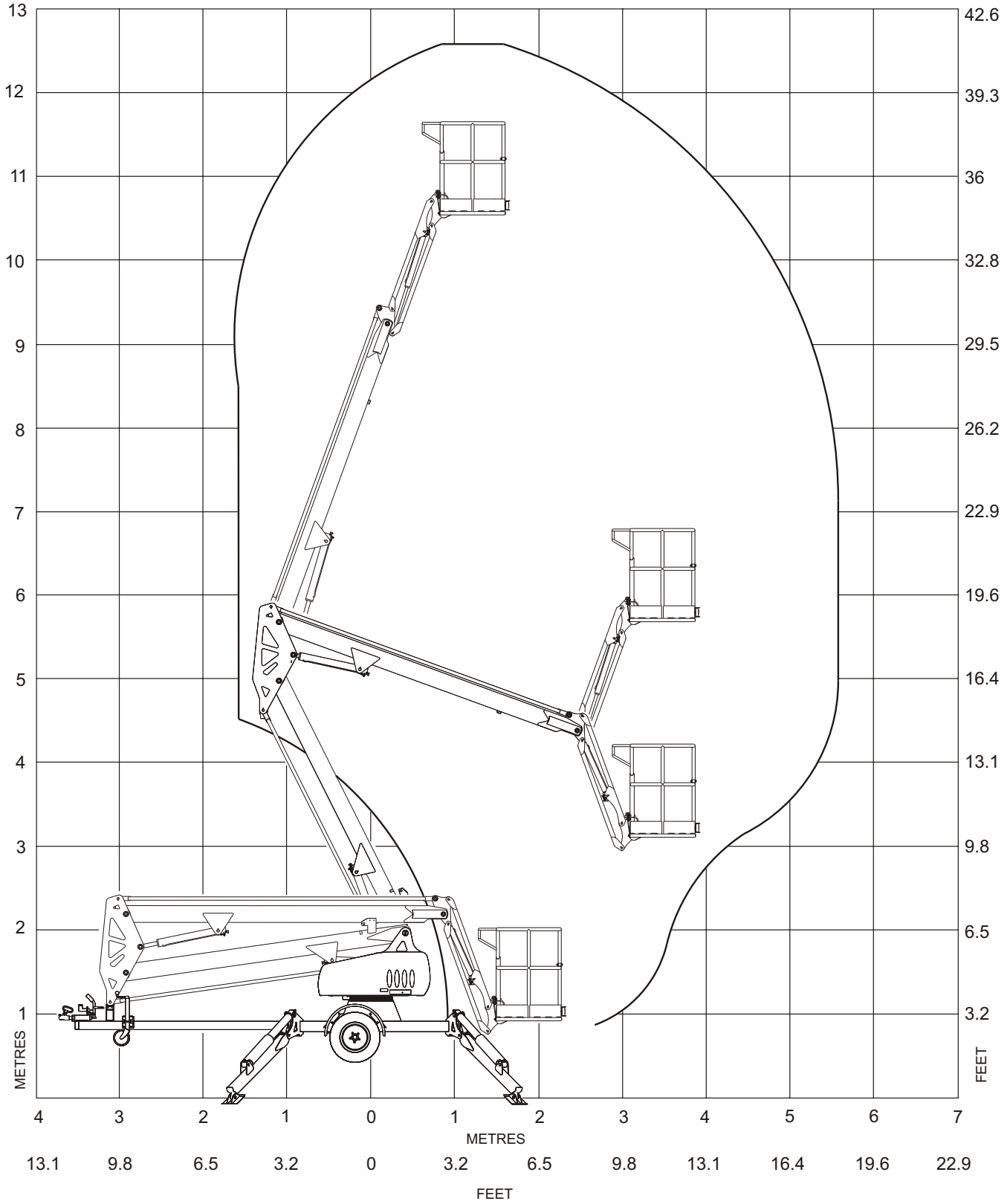
■ Commissioning Information

Commissioning of the machine consists of performing the Pre Delivery and Inspection Report (PDIR) satisfactorily.

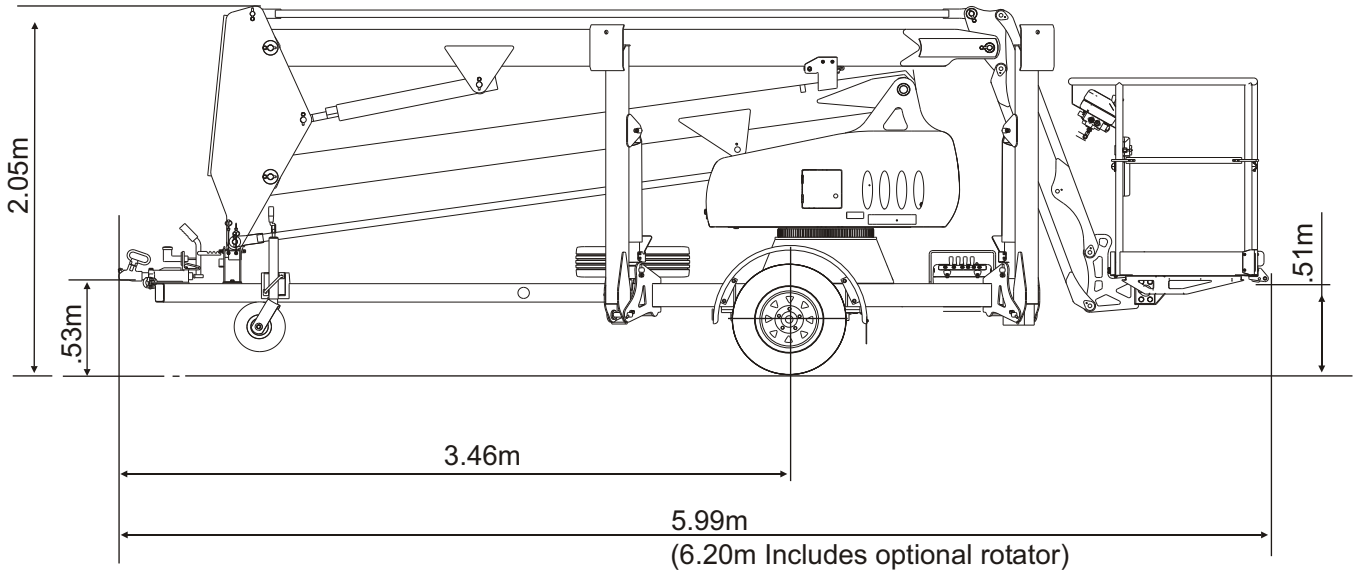
This PDIR is performed by Snorkel or it's agent before the machine is delivered.

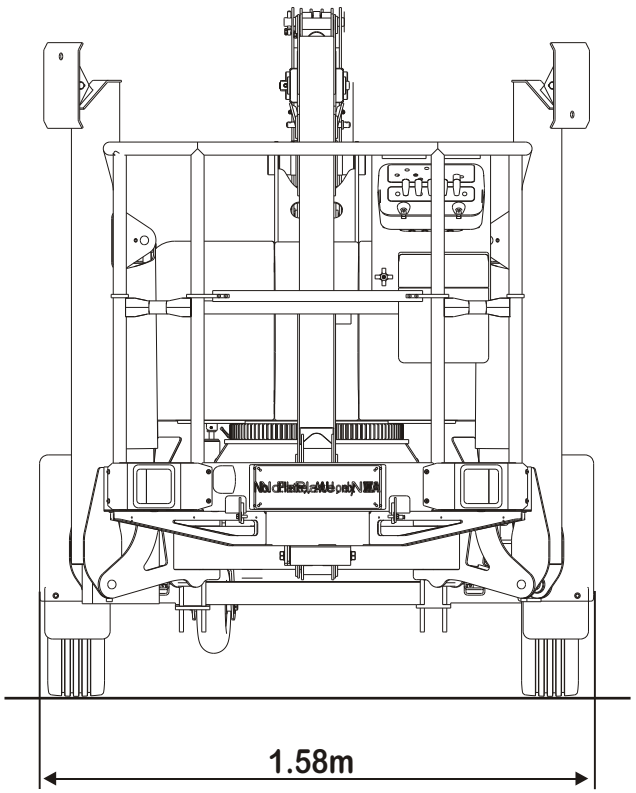
A completed PDIR can be obtained, by request, from the salesagent.

■ Working Envelope MHP13/35 Mark II

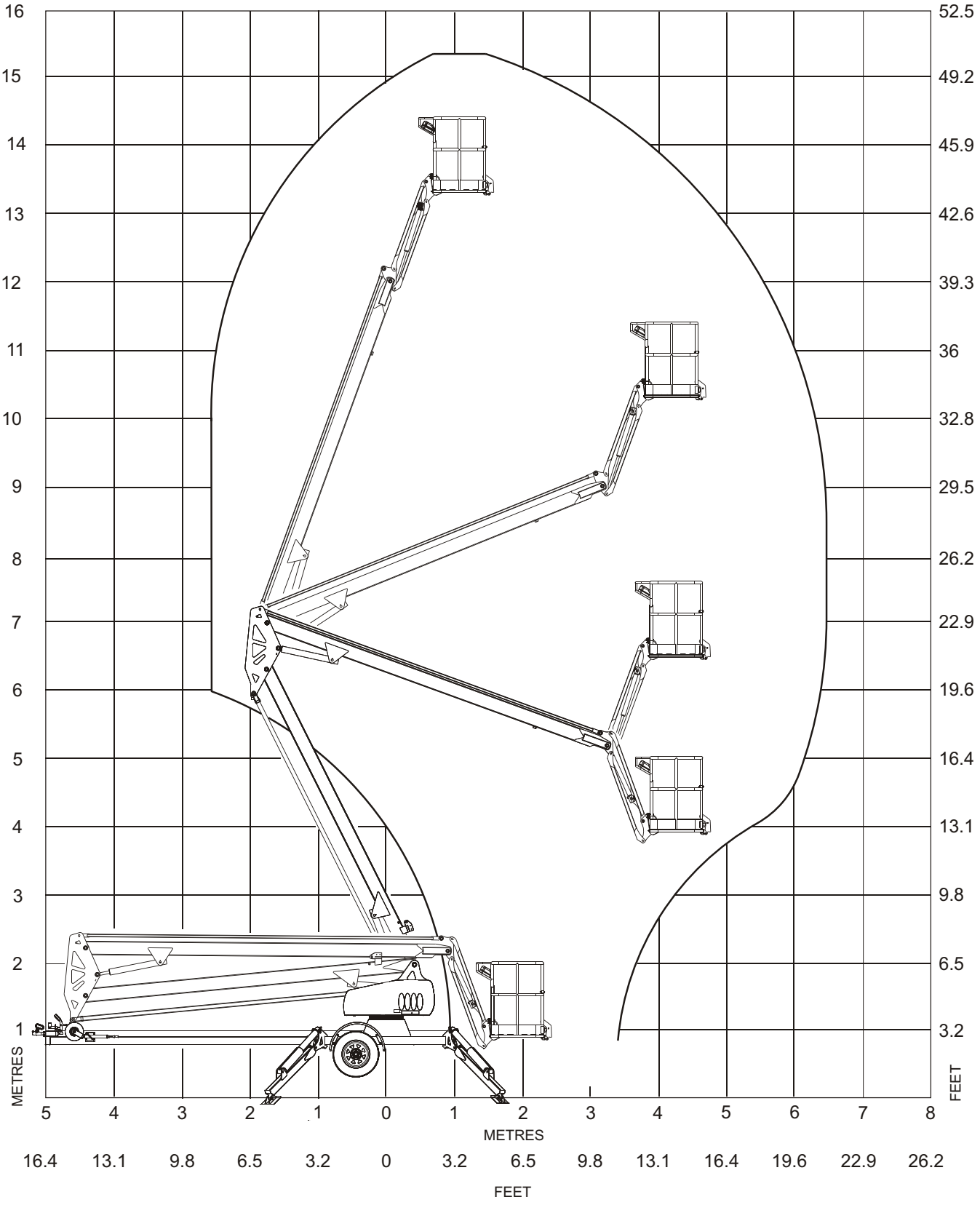


■ Stowed Unit Dimensions MHP13/35 MKII

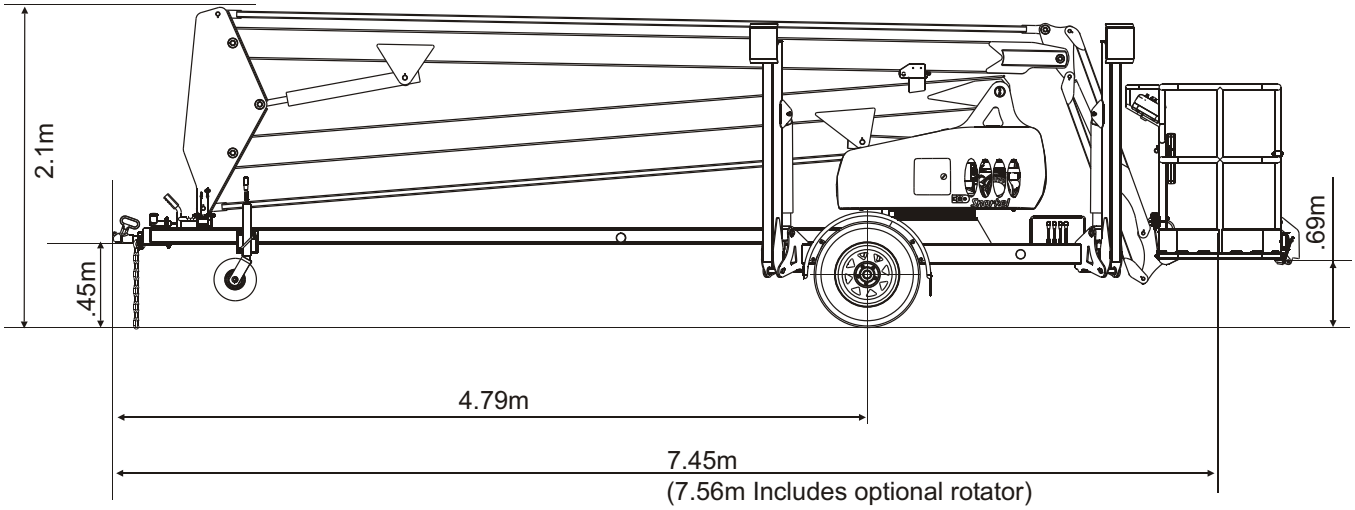


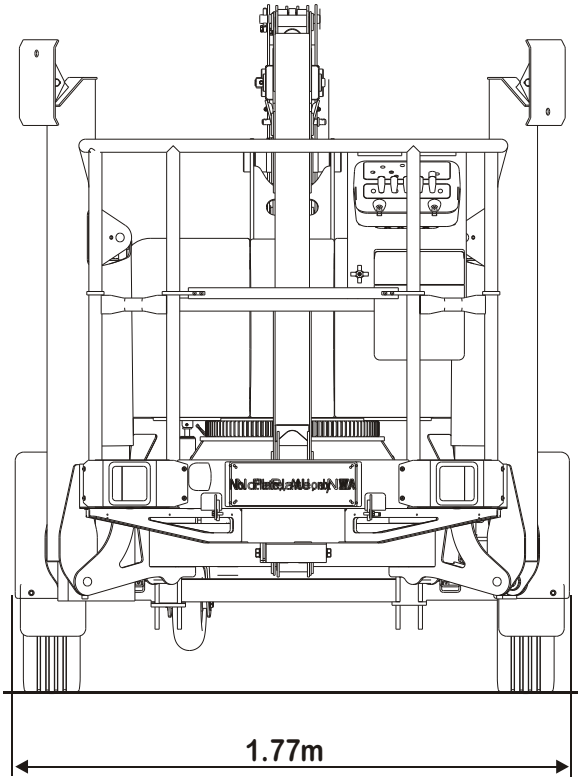


■ Working Envelope MHP15/44 Mark II



■ Stowed Unit Dimensions MHP15/44 MKII





■ Introduction

MHP1544 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.

■ 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 15 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 drawings 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 MHP13/35 & MHP15/44 Mark II.

❑ Maintenance

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

❑ Repair parts and drawings

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

❑ Hydraulics

(Section 2), contains parts listings and drawings 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 drawings of electrical components installations including wiring schematics.

❑ Options

Options (Section 4), contains parts listings and drawings 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 drawing.

⚠CAUTION

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

Components	Service Required
Engine fuel level	Check fuel tank level (full)
Fuel tank cap	Visually inspect (installation, tightness)
Engine oil level	Check oil level (between dipstick lines)
Fuel leaks	Visually inspect (hoses, connections, etc.)
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	Check fluid level (between lines on tank)
Hydraulic oil leaks	Visually inspect (hoses, tubes)
Tires and wheels	Visually inspect (condition)
Bolts and fasteners	Visually inspect (looseness)
Structural damage and welds	Visually inspect (weld cracks, dents)
Lanyard anchor points	Visually inspect (condition)
Platform gate	Visually inspect (operation)
Platform guardrails	Visually inspect (condition)
Air filter	Check condition
Control switches	Actuate and inspect (operation)
Emergency lower	Check operation (causes correct motion)
Placards and decals	Visually inspect (installation, condition)
Optional items	Check operation
Pins and pin keepers	Visually inspect (installation, condition)

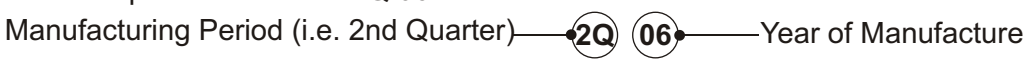
■ Hydraulic Hose Age

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**

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

Eaton Sample Hose Code **2Q 06**

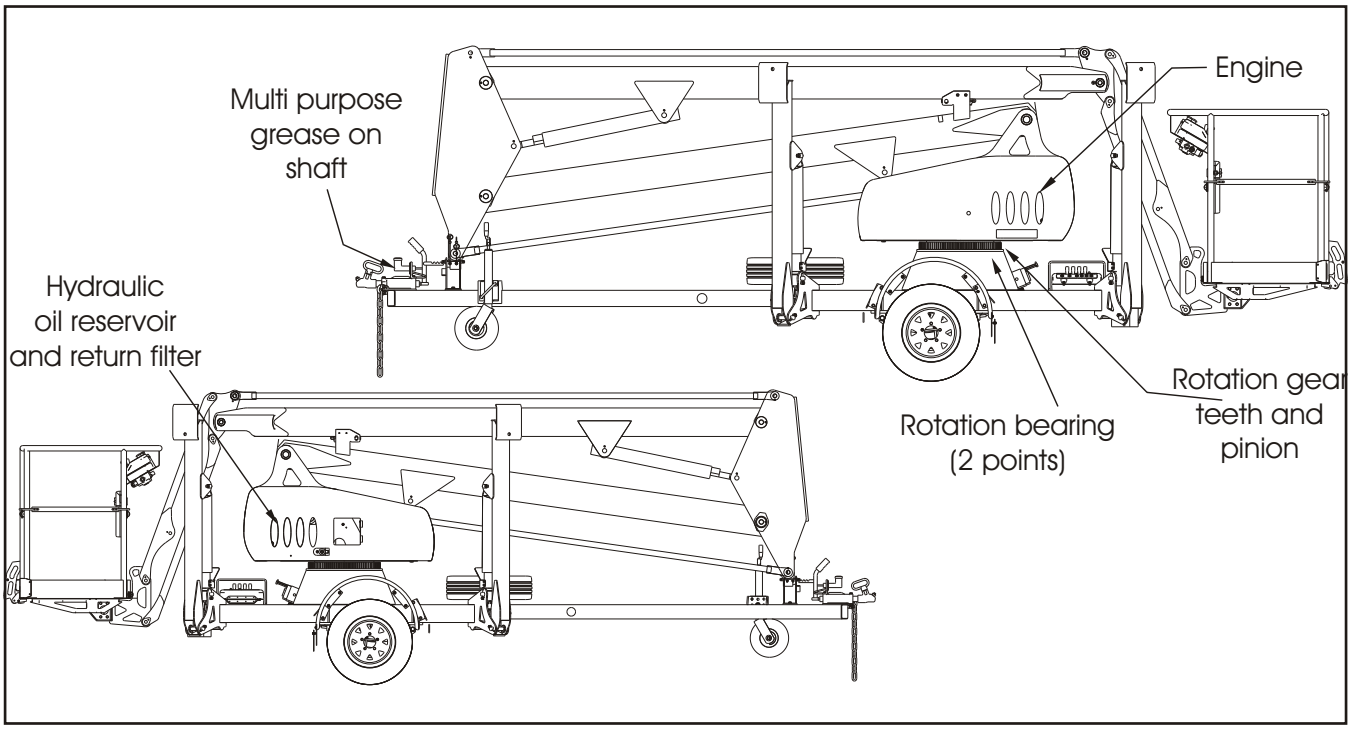


■ 90 Day or 150 Hour Maintenance (Trained Service Technician)

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 controller	Check smooth operation & speeds	
Battery	Check specific gravity	1.260/1.275 at 27° C.
Hydraulic return filter	Check condition	Replace if dirty
Engine RPM	Check for proper engine RPM (2500)	See engine manufactures owner's manual
Engine oil	Replace per engine owners manual	

■ 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 return filter	Replace	After 1st. 50 hours, thereafter at recommended interval
Hydraulic pressures	Check pressures	



This drawing locates the lubrication points of the MHP13/35 and MHP15/44 Mark II.

■ 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 drawing. 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. Lubrication fitting is located on the font plate of the turntable.

❑ Rotation gear teeth and pinion

Rotation gear teeth and pinion. Gear teeth and gear box pinion should be lubricated with a multi purpose 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 sight gauge indicator 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.

❑ Return filter

Return filter. On MHP13/35 & MHP15/44 Mark II models, the hydraulic oil return filter is mounted in hydraulic oil reservoir.

The filter element is a throw-away type filter and should be changed after the initial break-in period (approximately 50 hours operation time).

The filter condition should be checked at the 90 day or 150 hour Preventive Inspection Maintenance interval or more frequently under extreme working conditions.

When changing the filter element, the oil inside of the filter element, should be examined for deposits of metal cuttings, which if present, could indicate excessive wear in some of the system components.

❑ 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.

■ 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 checklist

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 95.5 lbft 130 Nm			
Battery disconnect switch (4)			
Lubrication points			
Pins, pin keepers (2)			
Slew ring bolts (2,6)			
Turntable			
Structural (1)			
Swivel mount assembly (2,3)			
Hydraulic tubes and hoses (3,5)			
Cowling (5,6)			
Wire harness (2,5)			
System pressure (Max 2500 psi)			
Lubrication points			
Emergency bleed down valve (4,3)			
Engine (2,4)			
Engine charging system (4)			
Engine air filter (5)			
Engine oil level (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 return filter (3,4)			
Pins, pin keepers (2)			
Lower Booms			
Structural (1)			
Boom lift cylinder pin caps (2,6)			
Boom lift cylinder and holding valve (3,4)			
Jib cylinder pin (3,4)			
Hydraulic tubes and hoses (3,5)			
Electrical Wires (5,2)			
Upper Booms			
Structural (1)			
Electrical wires (5)			
Jib cylinder pin caps (2,6)			
Jib cylinder and holding valve (3,4)			

Check	OK	✔	X
Hydraulic hoses and tubes (3,5)			
Decals and placards (2,8)			
Platform rotator (Optional) (3,4)			
Platform rotation holding valve (3,4)			
Rotator mounting bolts (2,6)			
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)			
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)			
Turntable rotation (4)			
Upper boom lift UP - DOWN (4)			
Lower boom lift UP - DOWN (4)			
Jib boom lift UP - DOWN (4)			
Emergency stop (4)			
Platform Control Station			
Foot switch (4)			
Foot switch, functions operate when engaged (4)			
Start switch (4)			
Cold start (4) Choke			
Boom speed rheostat switch (4)			
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)			

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 MHP13/35 & MHP15/44 Mark II are as follows:

- ✓ Operator’s Manual
  Snorkel part number - 13619-1
- ✓ Repair Parts Manual
  Snorkel part number - 13619-2

■ Product Warranty

For full terms of your warranty policy refer to the rear of this manual after the Index section, or check with your Snorkel distributor, or check the Snorkel website.

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 MHP13/35

❑ Introduction

The purpose of this test is to assess if the MHP 1335 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 13/35
- 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 239kg and the test load for a machine with an optional basket rotator is 217kg.

The manual force is 400N with an additional multiplication factor of 1.1 giving 440N or 44.8kg. 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 25.3kg

The load simulating the wind and manual force is therefore 70.1kg.

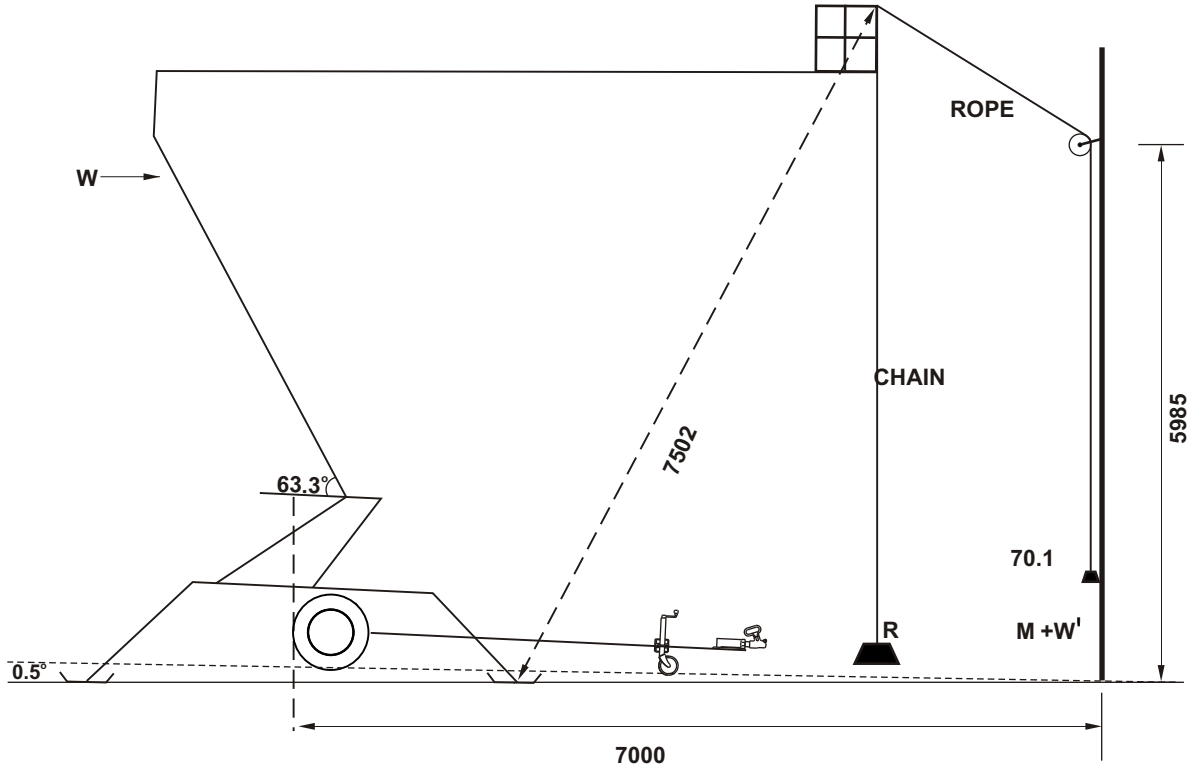
The test procedure is as follows (Refer Figure 1).

1. Set a pulley with rope, 5.985m 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 7m 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 boomhorizontal). 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 1**



RATED LOAD R = 239kg
STANDARD MACHINE
= 217kg
WITH ROTATOR

MANUAL FORCE M = 44.8kg

WIND FORCE W = 25.3kg

LOAD ON PULLEY = 70.1kg

■ Stability Testing MHP15/44

❑ Introduction

The purpose of this test is to assess if the MHP 1544 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 15/44
- 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 220kg and the test load for a machine with an optional basket rotator 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.

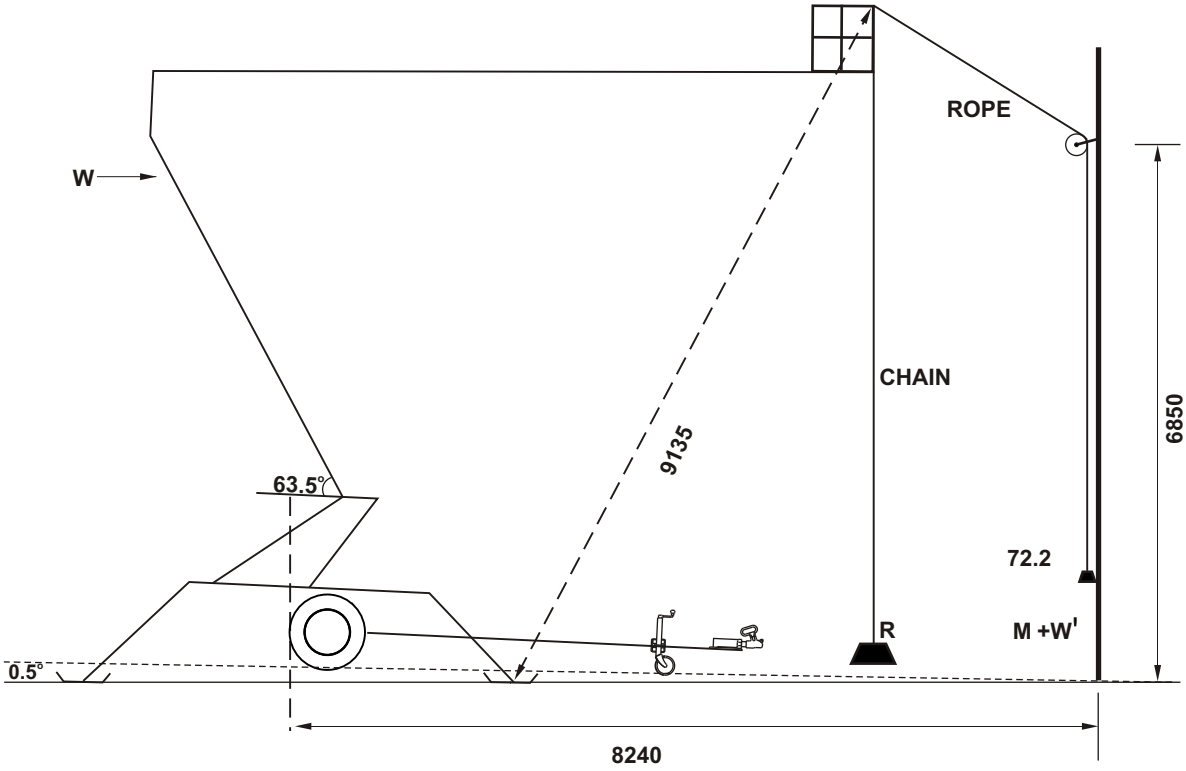
The test procedure is as follows (Refer Figure 2).

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 boomhorizontal). 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 1**



RATED LOAD R = 220kg
STANDARD MACHINE
= 194kg
WITH ROTATOR

MANUAL FORCE M = 45kg

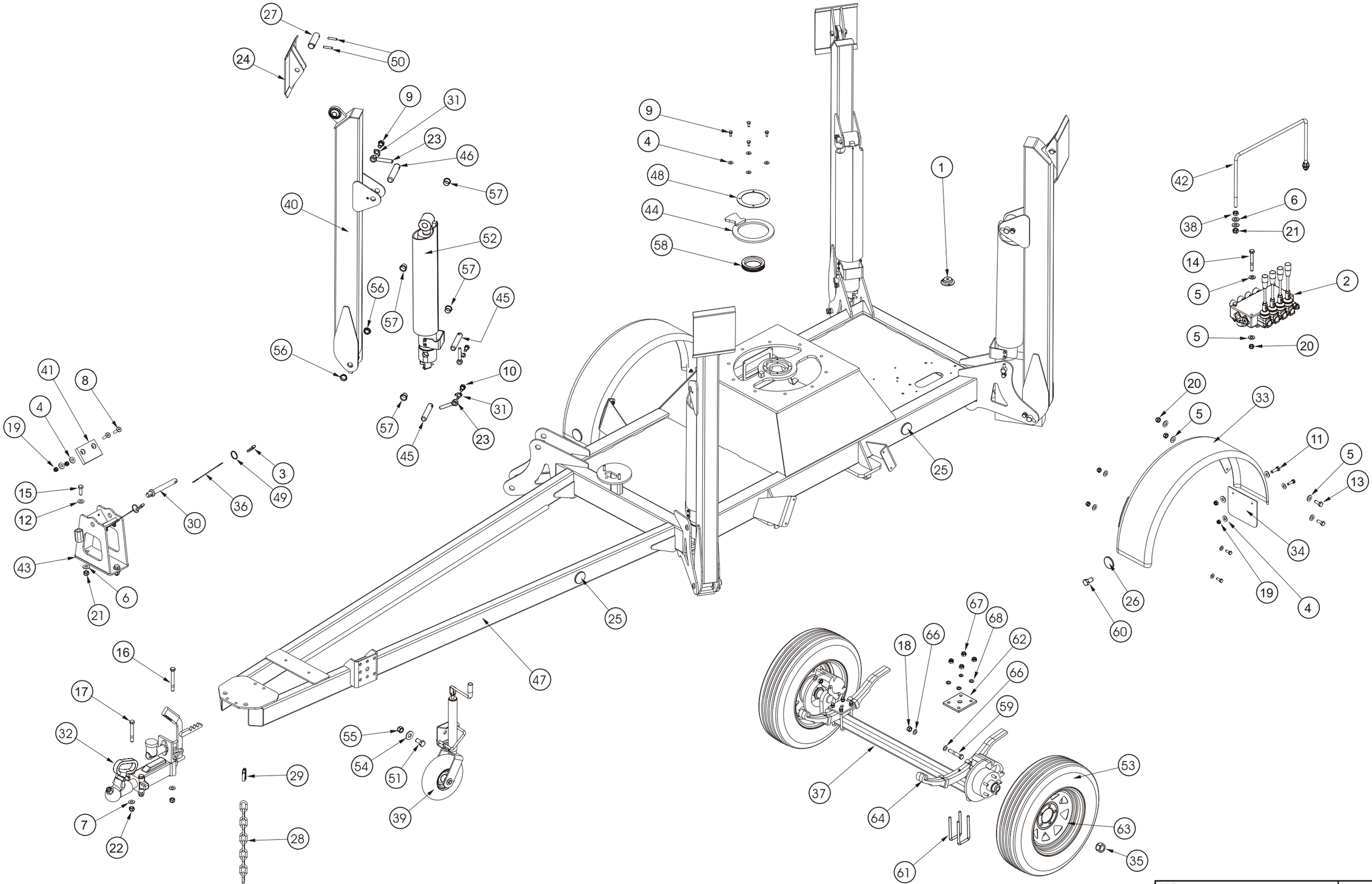
WIND FORCE W = 27.2kg

LOAD ON PULLEY = 72.2kg

Item	Part No	Qty	Description
	12775		Trailer assembly
1.	1273	1	Level bubble
2.	1651	1	4 bank Casappa valve - (Not used when auto stabiliser option fitted)
3.	1771-1	1	Lynch pin
4.	3603-06	18	Plain washer
5.	3603-08	22	Plain washer
6.	3603-10	6	Plain washer
7.	3603-12	8	Plain washer
8.	3606-06025	4	Metric countersunk screw
9.	3610-10016	12	Metric bolt
10.	3610-06016	4	Metric bolt
11.	3610-06020	4	Metric bolt
12.	60030-061	2	Plain washer
13.	3610-08025	8	Metric bolt
14.	3610-08065	3	Metric bolt
15.	3610-10030	2	Metric bolt
16.	3610-12090	2	Metric bolt
17.	3610-12110	2	Metric bolt
18.	3611-16	4	Nyloc nut
19.	3611-06	10	Metric nylock nut
20.	3611-08	11	Metric nylock nut
21.	3611-10	4	Metric nylock nut
22.	3611-12	8	Metric nylock nut
23.	8626	12	Pin keeper
24.	12790	4	Foot plate weldment
25.	9875-1	4	Reflector lens, orange
26.	9875-2	2	Reflector lens, white
27.	11369	4	Foot pin
28.	9973-1	1	Safety chain
29.	10993-1	1	Hammer lock
30.	11112-3	1	Boom lock pin
31.	11492-3	12	Tab washer
32.	12780	1	Tow coupling, 50mm
	11571	1	Tow coupling (New Zealand option), $1\frac{7}{8}$"
33.	12475	2	Mudguard, plastic
	12469	2	Optional mudguard (heavy duty steel)
34.	11585-3	2	Mud-flap
35.	1649-041	10	Wheel nut
36.	12062	2	Pin lock retainer
37.	12701	1	Axle assembly
38.	3602-10	2	Nut
39.	12405	1	Jockey wheel, standard
	12771	1	Jockey wheel, heavy duty, option
40.	12412 REV F	4	Stabiliser leg weldment
	13223	4	Stabiliser leg weldment (From Serial Number NZ090801)
41.	12419-4	2	Wear pad
42.	12418-1	1	Control guard
43.	12419	1	Boom rest weldment
44.	12420	1	Slew stop traveler - (Not used when continuous rotation option fitted)
45.	12741	8	Pin
46.	12742	4	Pin
47.	12426 REV L	1	Trailer chassis
48.	12444	1	Slew traveler hold down - (Not used when continuous rotation option fitted)
49.	45500-6	2	Key ring
50.	3633-3	8	Roll pin

Trailer assembly MHP13/35

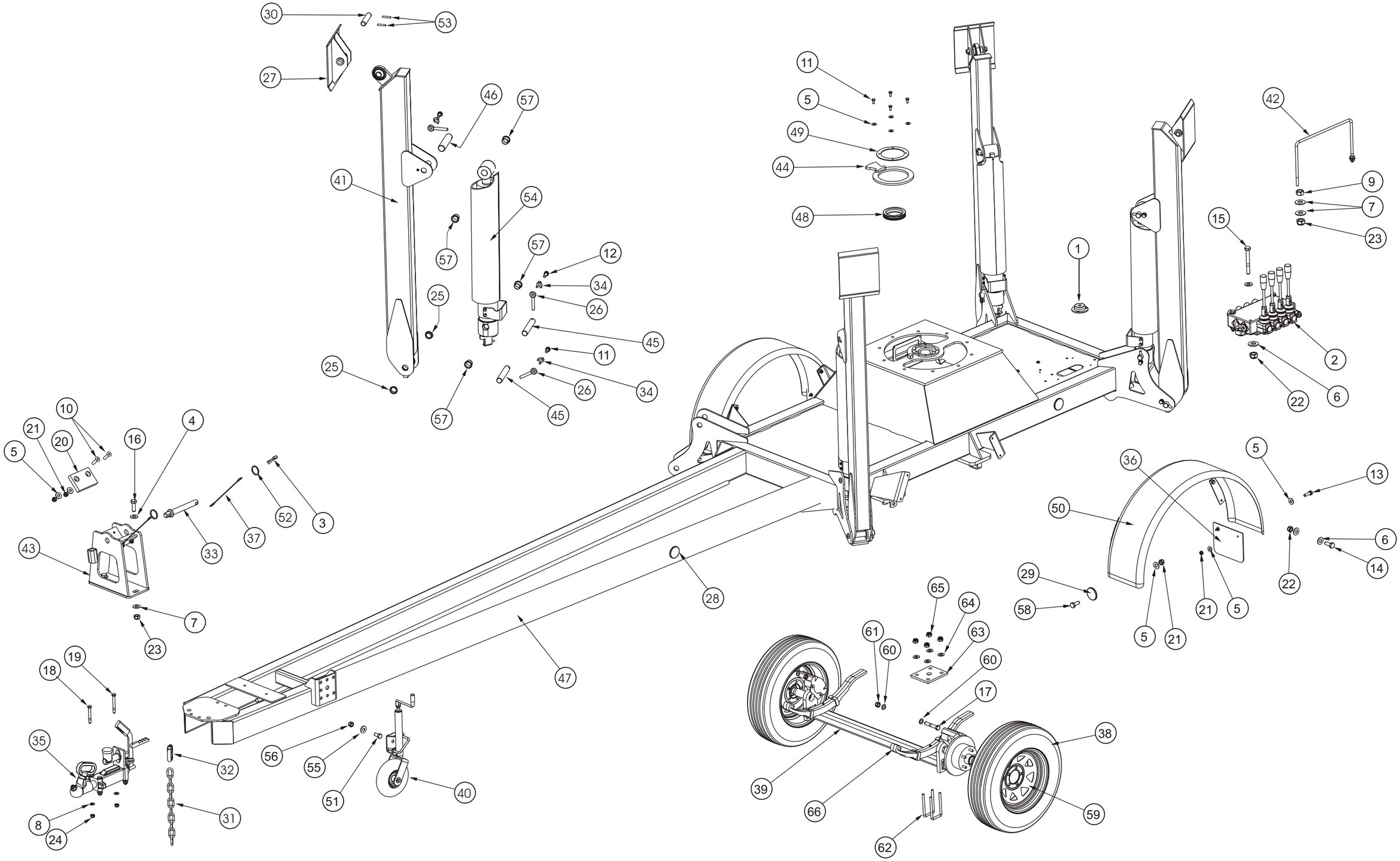
Item	Part No	Qty	Description
51.	3610-20040	1	Bolt
52.	12336A	4	Leg cylinder assembly
53.	12772-2	2	Tyre
54.	3603-20	1	Plain washer
55.	3611-20	1	Nylock nut
56.	3626-5	8	Flanged bush
57.	3626-1	16	Flanged bush
58.	12439	1	Hose protector
59.	3610-16100	2	Bolt (check thread length)
60.	3604-06020	2	Screw
61.	12703-3	2	U-bolt
62.	12826	2	U-bolt attachment plate
63.	12772-1	2	Wheel rim
64.	12702	PR	Spring assembly
66.	3603-16	4	Plain washer
67.	3602-12	8	Nut
68.	3605-012	8	Washer



TITLE Trailer Assembly

Snorkel Model MHP13/35 V3

snorkel



snorkel	TITLE Trailer Assembly		
Page 1-6	Snorkel Model MHP1544 V3		

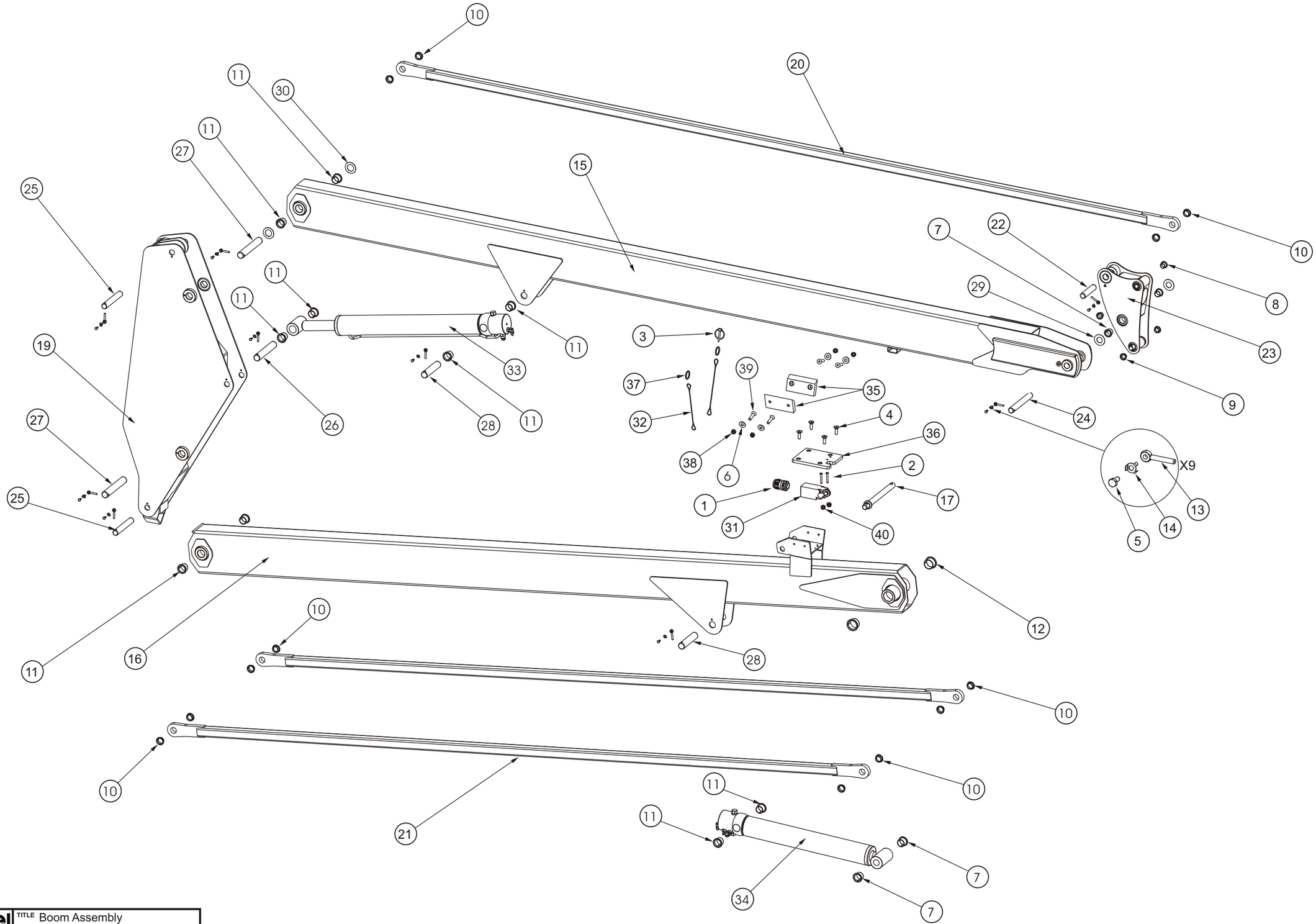
Item	Part No	Qty	Description
	12777		Trailer assembly
1.	1273	1	Level bubble
2.	1651	1	4 bank Casappa valve - (Not used when auto stabiliser option fitted)
3.	1771-1	1	Lynch pin
4.	60030-061	2	Plain washer
5.	3603-06	16	Plain washer
6.	3603-08	22	Plain washer
7.	3603-10	4	Plain washer
8.	3603-12	4	Plain washer
9.	3602-10	2	Nut
10.	3606-06025	4	Countersunk screw
11.	3610-10016	12	Metric bolt
12.	3610-06016	4	Metric bolt
13.	3610-06020	4	Metric bolt
14.	3610-08020	8	Metric bolt
15.	3610-08065	3	Metric bolt
16.	3610-10030	2	Metric bolt
17.	3610-16100	2	Metric bolt, (check thread length)
18.	3610-12090	2	Metric bolt
19.	3610-12100	2	Metric bolt
20.	12419-4	2	Wear pad
21.	3611-06	8	Nylock nut
22.	3611-08	11	Nylock nut
23.	3611-10	2	Nylock nut
24.	3611-12	4	Nylock nut
25.	3626-5	2	Flanged bush
26.	8628	12	Pin keeper
27.	12790	4	Foot plate weldment
28.	9875-1	4	Reflector lens, orange
29.	9875-2	2	Reflector lens, white
30.	11369	4	Foot pin
31.	9973-1	1	Chain
32.	10993-1	1	Hammer lock
33.	11112-3	1	Boom lock pin
34.	11492-1	12	Tab washer
35.	11571	1	Tow coupling, (NZ option), $1\frac{7}{8}$"
	12780	1	Tow coupling, 50mm
36.	11585-3	2	Mudflap
37.	12062	2	Pin lock retainer
38.	12772-2	2	Tyre
39.	12701	1	Axle assembly
40.	12405	1	Jockey wheel
41.	12412 REV F	4	Stabiliser leg weldment
	13223	4	Stabiliser leg weldment (From Serial Number NZ090801)
42.	12418	1	Control guard
43.	12419	1	Boom rest weldment
44.	12420	1	Slew stop traveller - (Not used when continuous rotation option fitted)
45.	12741	8	Pin
46.	12742	4	Pin
47.	12427 REV M	1	Trailer weldment
48.	12439	1	Trim panel
49.	12444	1	Slew traveller hold down - (Not used when continuous rotation option fitted)
50.	12475	2	Plastic mudguard
	12469	2	Optional mudguard (heavy duty steel)
51.	3610-20040	1	Bolt

Trailer assembly MHP15/44

Item	Part No	Qty	Description
52.	45500-6	2	Key ring
53.	60000-036	8	Roll pin
54.	12336A	4	Leg cylinder assembly
55.	3603-20	1	Plain washer
56.	3611-20	1	Nylock nut
57.	3626-1	8	Flanged bush
58.	3604-06020	2	Screw
59.	12772-1	2	Wheel rim
60.	3603-16	4	Plain washer
61.	3611-16	4	Nylock nut
62.	12703-3	2	U bolt
63.	12826	2	U bolt attachment plate
64.	3605-012	8	Washer
65.	3602-12	8	Nut
66.	12703	PR	Spring assembly

Boom assembly MHP13/35

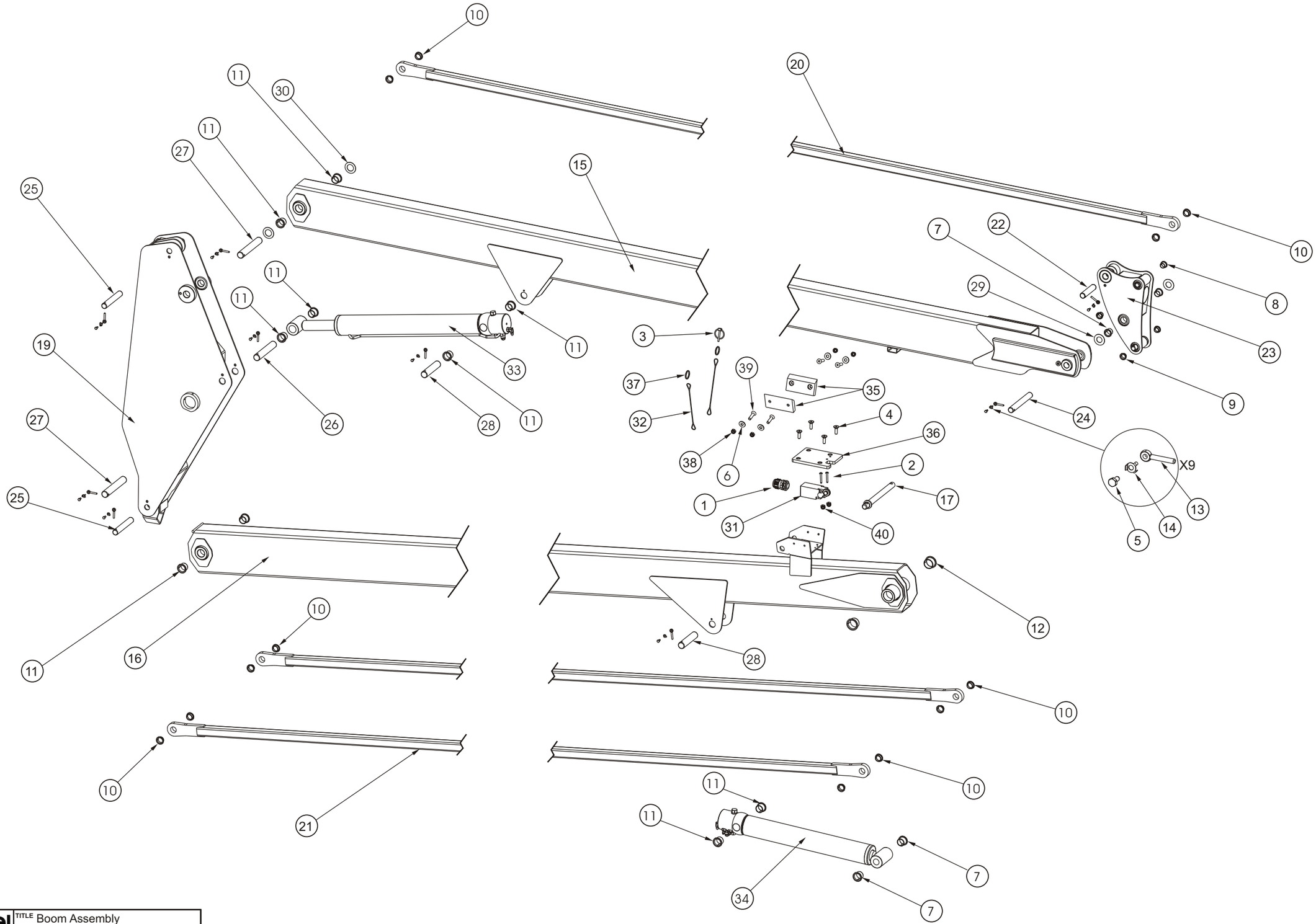
Item	Part No	Qty	Description
	12774		Boom assembly
1.	1814	1	Nylon cable gland
2.	3604-04040	2	Metric head pan screw
3.	1771-1	1	Lynch pin
4.	3606-06020	4	Countersunk screw
5.	3610-10020	4	Metric bolt
6.	3603-06	4	Plain washer
7.	3626-1	2	Flanged bush
8.	3626-10	2	Flanged bush
9.	3626-13	2	Flanged bush
10.	3626-5	12	Flanged bush
11.	3626-6	4	Flanged bush
12.	3626-9	2	Flanged bush
13.	8626	14	Pin keeper
14.	11492-3	9	Tab washer
15.	12371 REV J	1	Upper boom weldment
16.	12372 REV I	1	Lower boom weldment
17.	11112-10	1	Boom lock pin
18.	12372-17	1	Wear pad, boom rest
19.	12373	1	Floating turret weldment
20.	12374	1	Upper level rod
21.	12375	2	Lower level rod
22.	12740	1	Pin
23.	12383 REV H	1	Quadrant, jib/upper boom weldment
24.	12739	1	Pin
25.	12735	2	Pin
26.	12737	1	Pin
27.	12396	2	Pin
28.	12738	2	Pin
29.	12432-2510	2	Nylon spacer washer
30.	12432-3010	4	Nylon spacer washer
31.	12445	1	Micro switch
32.	12062	2	Pin lock retainer
33.	12333A REV B	1	Upper lift cylinder
34.	12334A	1	Lower lift cylinder
35.	11143-2	2	Wear pad, boom rest
36.	12372-17	1	Wear pad, boom rest
37.	45500-6	2	Ring
38.	3611-06	4	Metric nylock nut
39.	3606-06025	4	Metric countersunk screw
40.	3611-04	2	Metric nylock nut
41.	1816	17m	5 core cable (not shown)
42.	1812	12.5m	3 core cable (not shown)
43.	12437	1	Loom control (not shown)



snorkel	TITLE Boom Assembly	
Page 1-11	Snorkel Model MHP13/35 V3	

F E D C B A

1 2 3 4 5 6 7 8 9



snorkel

TITLE Boom Assembly

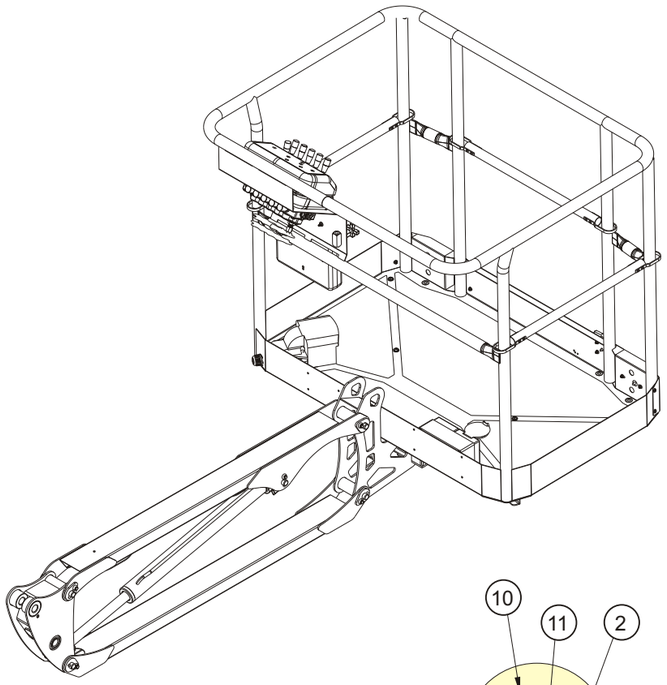
Page 1-12

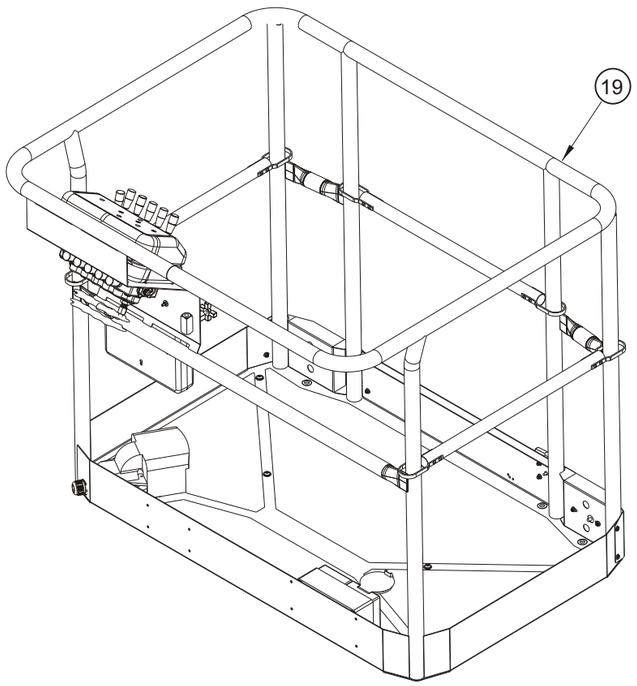
Snorkel Model MHP15/44 V3

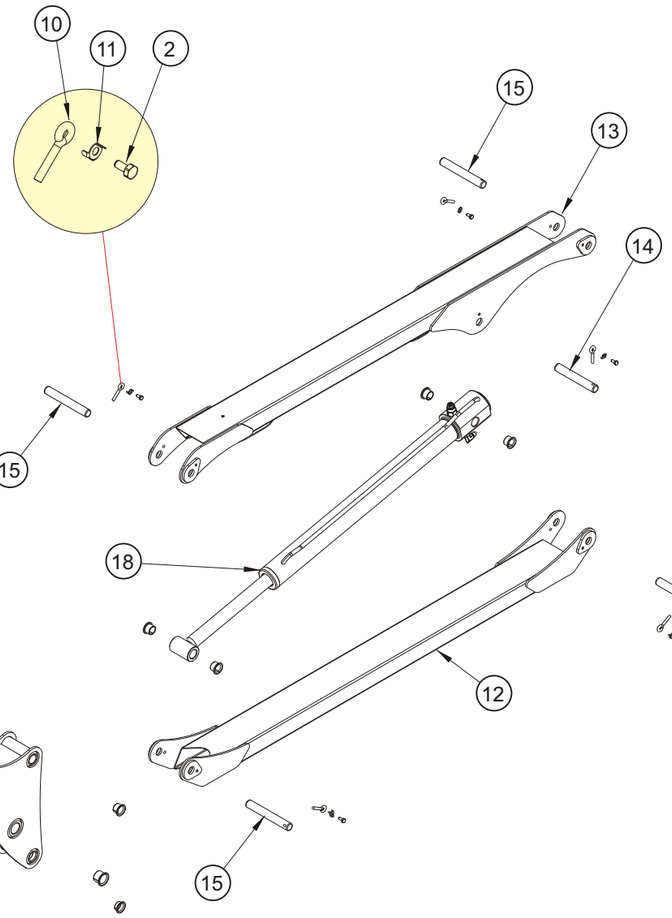
Item	Part No	Qty	Description
	12776		Boom assembly
1.	1814	1	Nylon cable gland
2.	3604-04040	2	Metric head pan screw
3.	1771-1	1	Lynch pin
4.	3606-06020	4	Countersunk screw
5.	3610-10020	10	Metric bolt
6.	3603-06	4	Plain washer
7.	3626-1	2	Flanged bush
8.	3626-10	2	Flanged bush
9.	3626-13	2	Flanged bush
10.	3626-5	12	Flanged bush
11.	3626-6	4	Flanged bush
12.	3626-9	2	Flanged bush
13.	8626	9	Pin keeper
14.	11492-3	9	Tab washer
15.	12455 REV I	1	Upper boom weldment
16.	12456 REV J	1	Lower boom weldment
17.	11112	1	Boom lock pin
18.	12372-17	1	Wear pad, boom rest
19.	12373 REV C	1	Floating turret weldment
20.	12457	1	Upper level rod
21.	12458	2	Lower level rod
22.	12740	1	Pin
23.	12383 REV H	1	Quadrant, jib/upper boom weldment
24.	12735	1	Pin
25.	12737	2	Pin
26.	12395	1	Pin
27.	12736	2	Pin
28.	12738	2	Pin
29.	12432-2510	2	Nylon spacer washer
30.	12432-3010	4	Nylon spacer washer
31.	12445	1	Micro switch
32.	12062	2	Pin lock retainer
33.	12333A REV B	1	Upper lift cylinder
34.	12334A	1	Lower lift cylinder
35.	11143-2	2	Wear pad, boom rest
36.	12372-17	1	Wear pad, boom rest
37.	45500-6	2	Ring
38.	3611-06	4	Metric nylock nut
39.	3606-06025	4	Metric countersunk screw
40.	3611-04	2	Metric nylock nut
41.	1816		5 core cable (not shown)
42.	1812		3 core cable (not shown)
43.	12437	1	Loom control (not shown)

Jib boom assembly

Item	Part No	Qty	Description
	12774		Jib boom assembly, MHP13/35
	12776		Jib boom assembly, MHP15/44
1.	3603-08	12	Washer, plain, M8
2.	3610-06012	5	Bolt, metric, M6 x 12
3.	3611-08	6	Nut, nyloc, M8
4.	3617-16035	8	Bolt, metric
5.	3626-1	2	Bush, flanged permaglide
6.	3626-10	6	Bush, flanged permaglide
7.	3626-13	2	Bush, flanged permaglide
8.	3631-16	8	Washer, disc lock
9.	3668-08020	6	Screw, button head socket
10.	8628	5	Pin keeper, rolled eye, 6mm
11.	11492-1	5	Washer, tab
12.	12288-110	1	Lower flyboom weldment
13.	12288-120	1	Upper flyboom weldment
14.	12347	1	Pin, 20 x 134mm
15.	12349	4	Pin, 20 x 144mm
16.	12383	1	Quadrant jib, upper boom weld
17.	12935	1	Cable clamp, flyboom
18.	12332	1	Flyboom cylinder
19.	13484A	1	Basket assembly



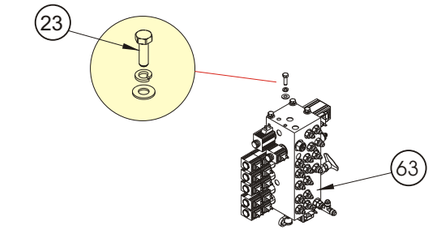


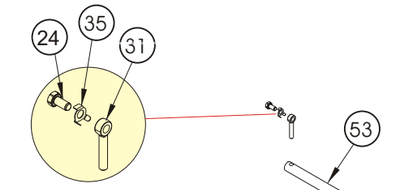


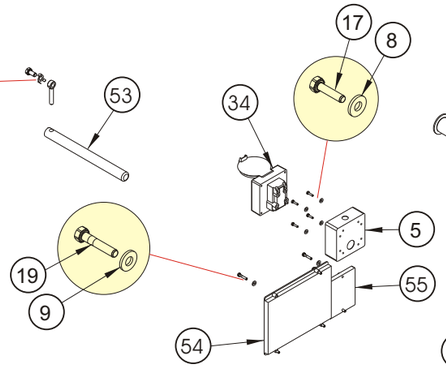
1	2	3	4	5	6	7	8	9

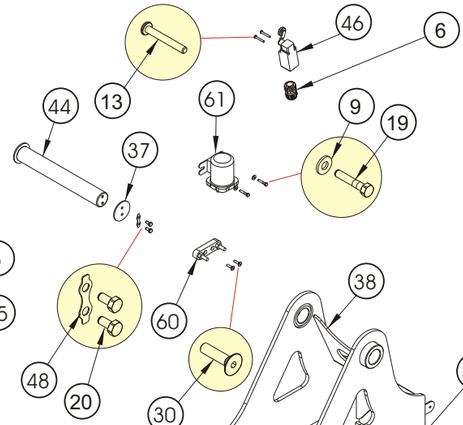
TITLE Jib Boom Assembly
Snorkel Models
MHP13/35 & MHP15/44 V3

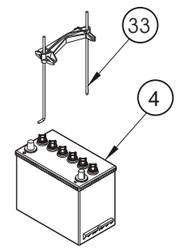
snorkel

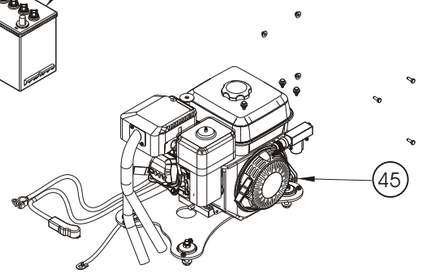


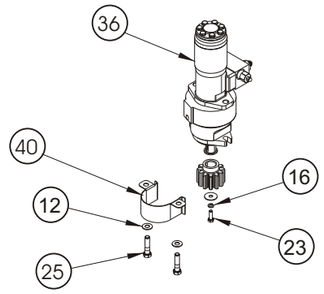


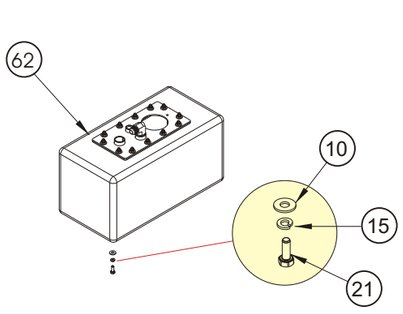


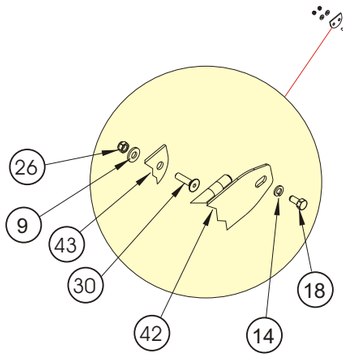


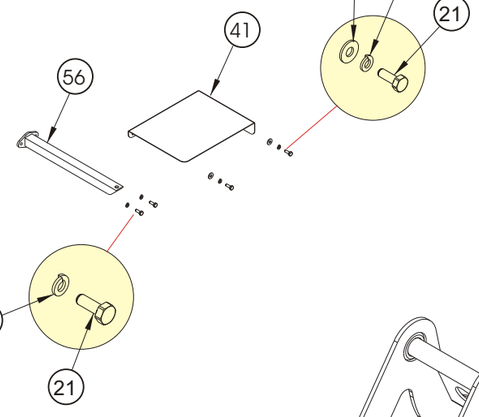


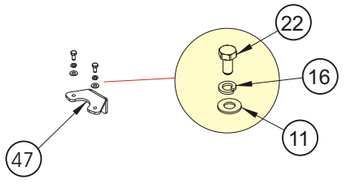


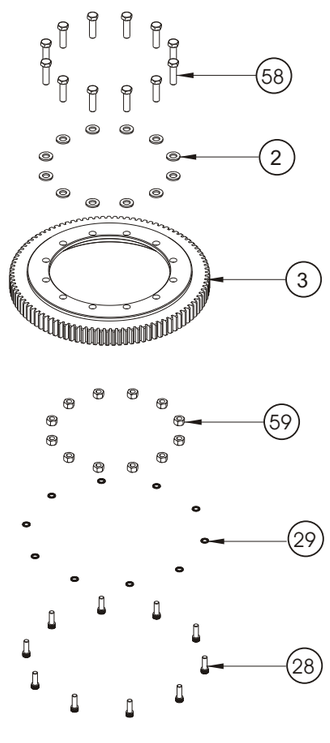


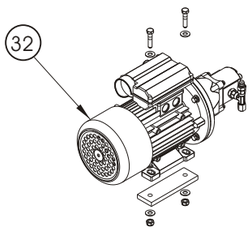


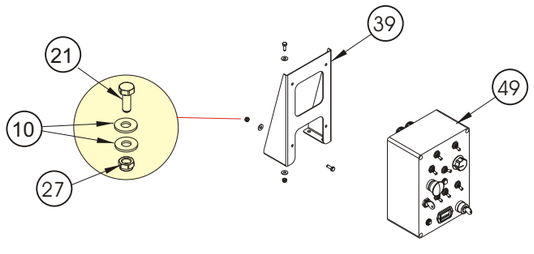


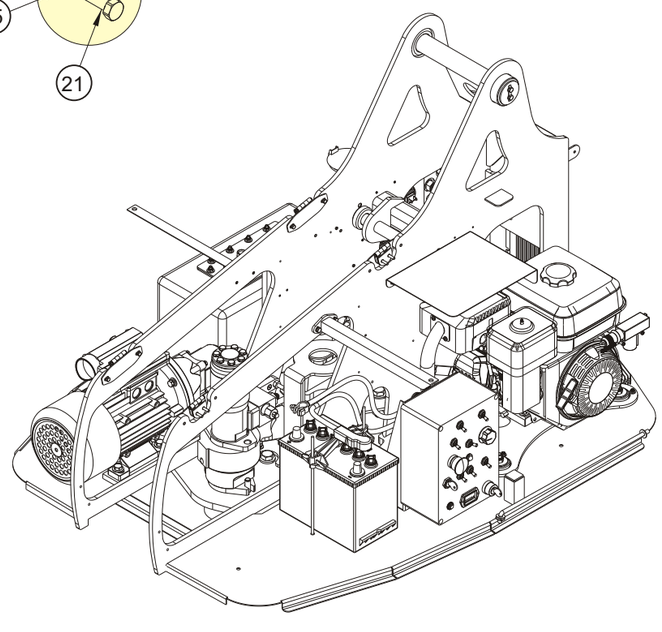












snorkel

Page 1-16

TITLE Column assembly
Snorkel Models
MHP13/35 & MHP15/44 V3

F E D C B A

1 2 3 4 5 6 7 8 9

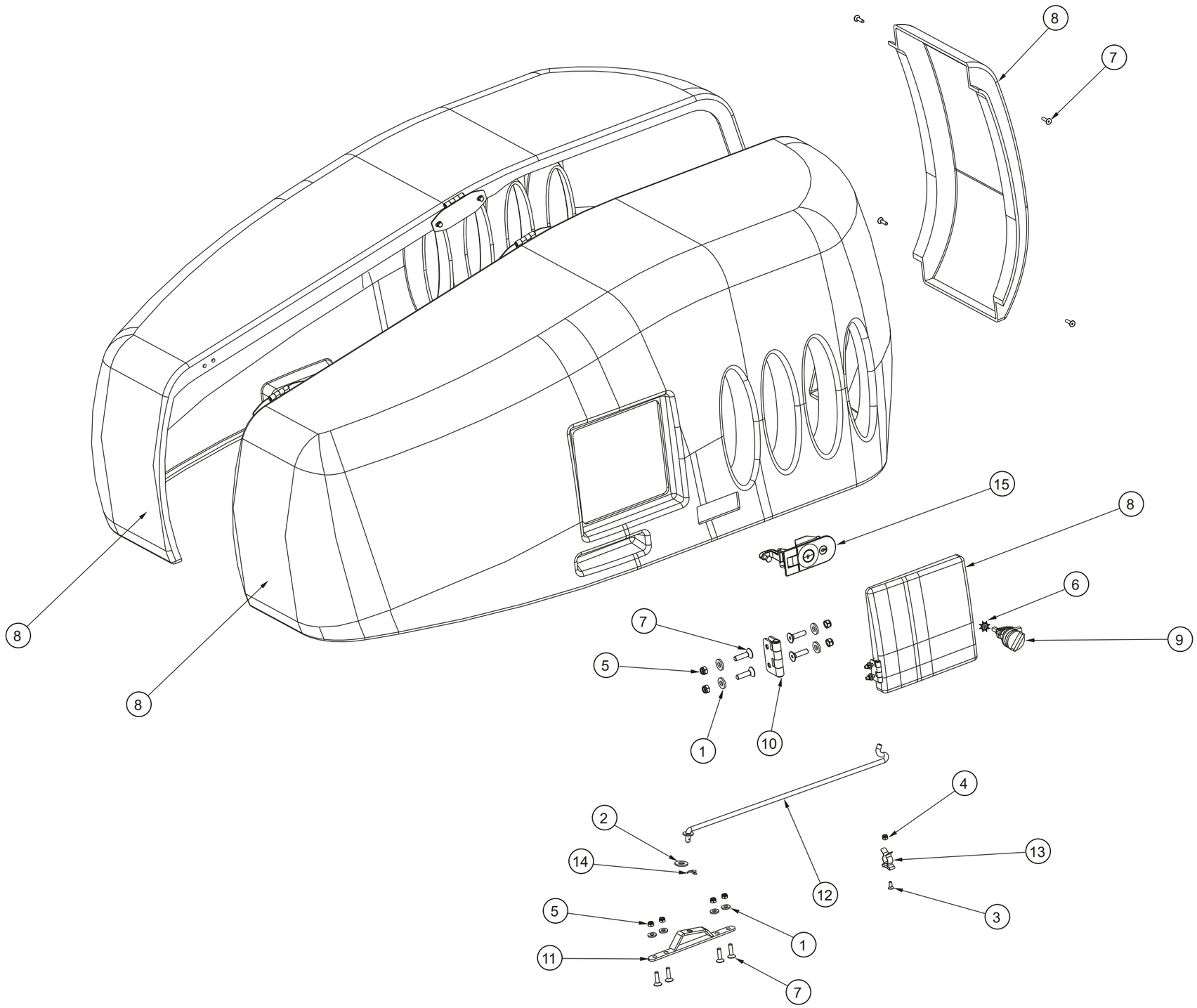
Item	Part No	Qty	Description
	12381A		Column assembly
1.	302-0049	1	Switch, battery disconnect, (24VDC option only)
2.	1034-120	12	Washer, M16, galvanised, hardened
3.	1067	1	Slew ring
4.	1288	1	Battery
5.	1808	1	PDL enclosure
6.	1814	1	Cable gland
7.	3566-1	1	Check valve, (24VDC & 230V option only)
8.	3603-04	4	Washer, plain, M4
9.	3603-05	12	Washer, plain, M5
10.	3603-06	19	Washer, plain, M6
11.	3603-08	7	Washer, plain, M8
12.	3603-12	2	Washer, plain, M12
13.	3604-04030	2	Screw, metric, pan head
14.	3605-05	8	Washer, spring, M5
15.	3605-06	10	Washer, spring, M6
16.	3605-08	6	Washer, spring, M8
17.	3610-04016	4	Bolt, metric, M4 x 16
18.	3610-05010	8	Bolt, metric, M5 x 10
19.	3610-05025	8	Bolt, metric, M5 x 25
20.	3610-06012	4	Bolt, metric, M6 x 12
21.	3610-06016	19	Bolt, metric, M6 x 16
22.	3610-08016	2	Bolt, metric, M8 x 16
23.	3610-08025	4	Bolt, metric, M8 x 25
24.	3610-10020	1	Bolt, metric, M10 x 20
25.	3610-12050	2	Bolt, metric, M12 x 50
26.	3611-05	4	Nut, nyloc, M5
27.	3611-06	8	Nut, nyloc, M6
28.	3613-12035	10	Cap screw
29.	3631-12	10	Washer, disc lock
30.	3660-05020	10	Screw, countersunk
31.	8626	1	Pin keeper
32.	9018-5	1	Pump and motor, 230V (230V option only)
33.	10268-2	1	Battery bracket
34.	10967-2	1	Appliance inlet (230V option only)
35.	11492-3	1	Washer, tab
36.	11943	1	Slew drive brake assembly
37.	12239-3	2	Pin end cap
38.	12381	1	Column weldment (Rev O)
39.	12381-18	1	Lower control box mount
40.	12381-25	1	Pinion gear guard
41.	12381-40	1	Heat deflector
42.	12392	4	Hinge weldment
43.	12392-2	4	Cover hinge spacer
44.	12399	1	Pin, 40 x 287
45.	12413	1	Engine assembly
46.	12445	1	Micro switch
47.	12452	1	Distributor drive lug
48.	12453	1	Lock tab, 40mm
49.	12521	1	lower control box
50.	12679-40	1	Bracket, (Continuous slew option only)
51.	12706	1	Battery clamp, (24VDC option only)
52.	12707	1	Voltage converter, (24VDC option only)
53.	12734	1	Pin, 25 x 280
54.	13485-01	1	Trionics, GP400C
55.	13485-03	1	Trionics, TBM

Column assembly

Item	Part No.	Qty	Description
56.	13632-10	2	Stay mount weld
57.	13632-20	2	Cover stay weldment, (not shown)
58.	60020-028N	12	UNF hex bolt
59.	60021-016	12	UNF nut
60.	446086	1	Fuse block, (24VDC option only)
61.	3087787	1	Contactor, 24V, sealed, (24VDC option only)
62.	11430A	1	Hydraulic oil tank assembly
63.	12377A	1	Main control manifold
65.	12483A	1	Remote control grease nipple

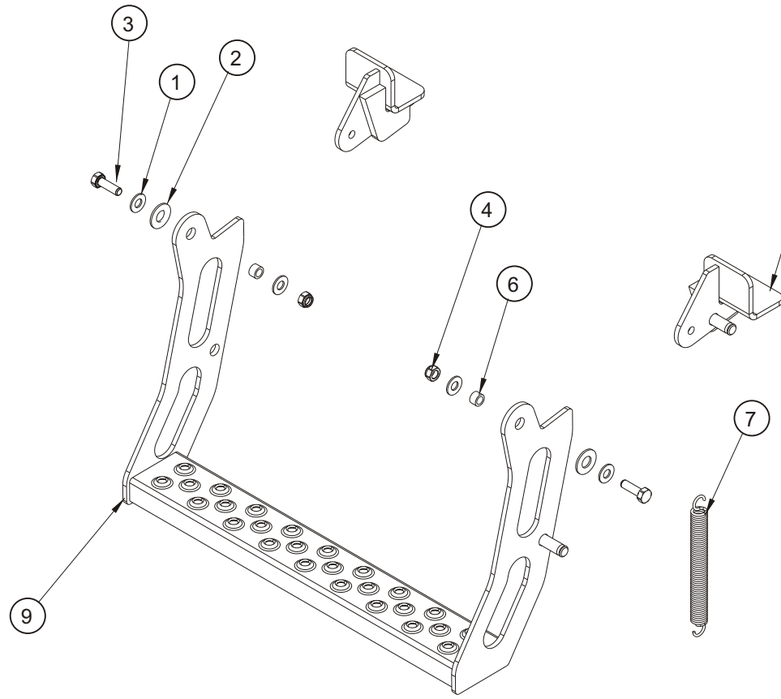
Column covers

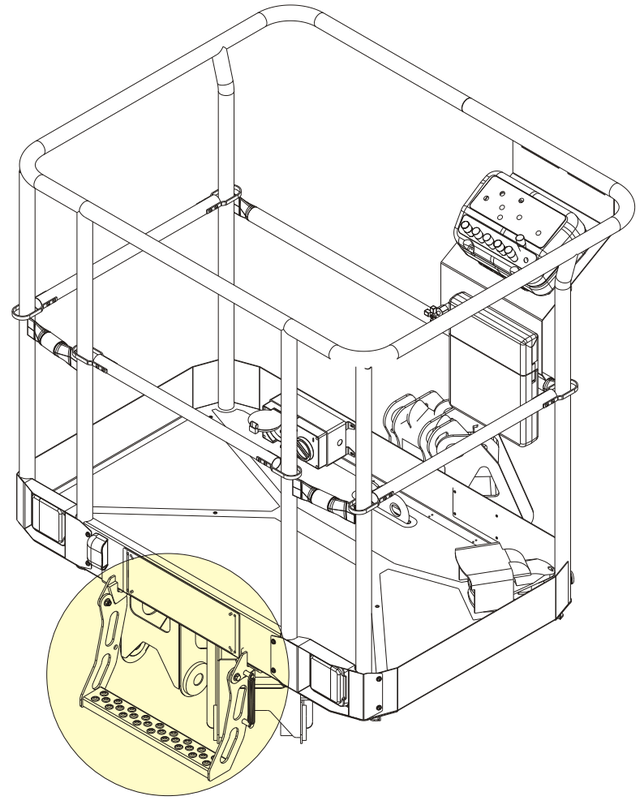
Item	Part No	Qty	Description
1.	3603-05	16	Plain washer
2.	3603-08	2	Plain washer
3.	3606-03008	2	Countersunk screw
4.	3611-03	2	Metric nylock nut
5.	3611-05	16	Metric nylock nut
6.	12406	1	Spur washer
7.	3660-05020	20	Countersunk screw
8.	12388	1	Cover kit
			Note: Covers can not be purchased individually, only as a complete kit
9.	12401	1	Latch, compression
10.	12403	2	Butt hinge
11.	12414-20	2	Stay pivot mount
12.	12414-5	2	Cover stay weldment
	13632-20	2	Cover stay weldment from MHP1335-07-000005 onwards
13.	12440	2	Tool clip
14.	60038-006	2	Split pin
15.	5510014	2	Latch, side cover



TITLE Covers
Snorkel Models
MHP13/35 & MHP15/44 V3

snorkel





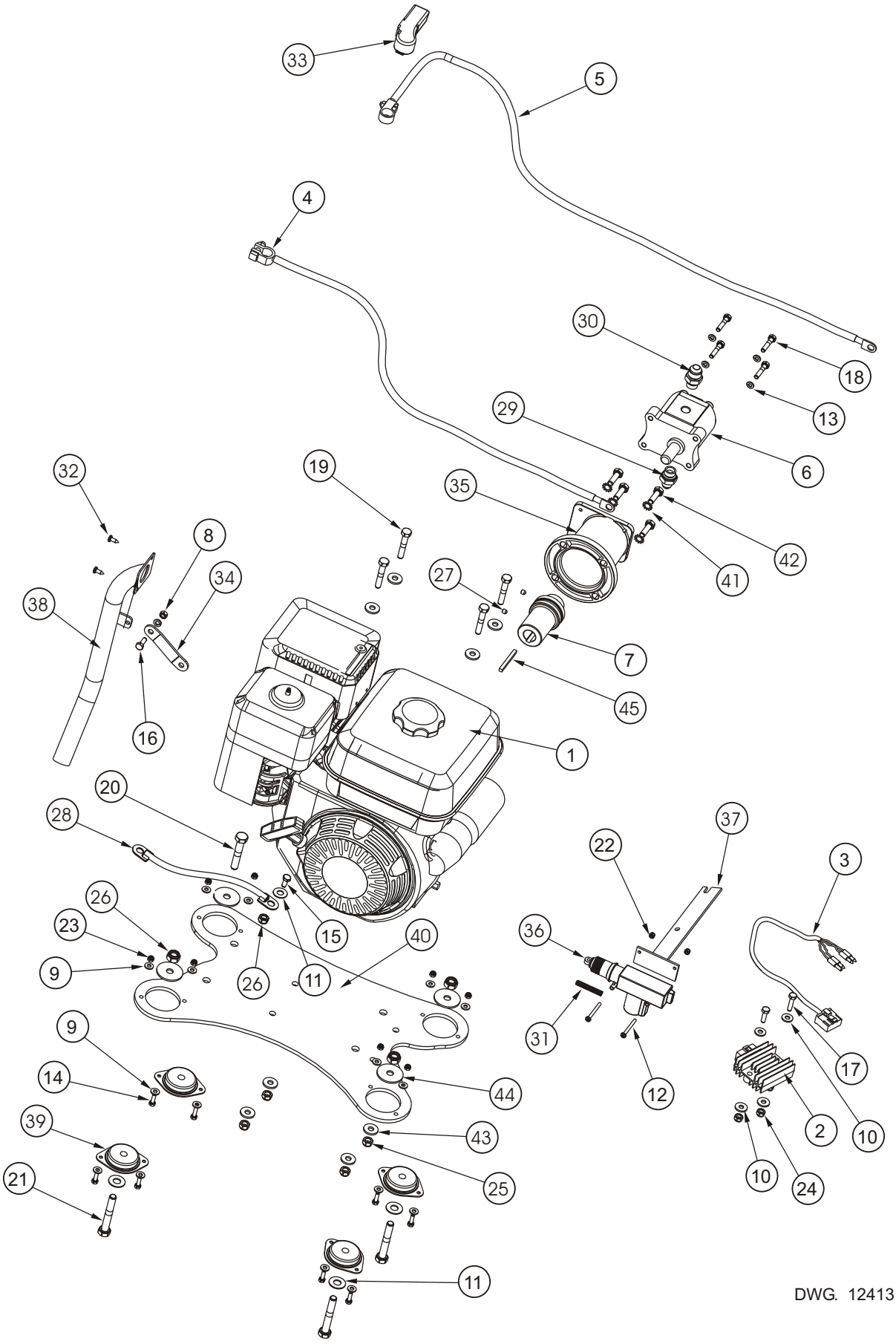
snorkel

TITLE Fold Down Step Assembly
Snorkel Models
MHP13/35 & MHP15/44 V3

Item	Part No	Qty	Description
	12480A		Fold down step assembly
1.	3603-08	4	Washer, plain, M8
2.	3603-12	2	Washer, plain, M12
3.	3610-08025	2	Bolt, metric, M6 x 25
4.	3611-08	2	Nut, nyloc
5.	3631-16	8	Washer, disc lock
6.	11429-32	2	Bush
7.	11429-34	1	Spring
8.	13484	1	Basket weld
9.	13514	1	Folding step weld
10.	13563	1	

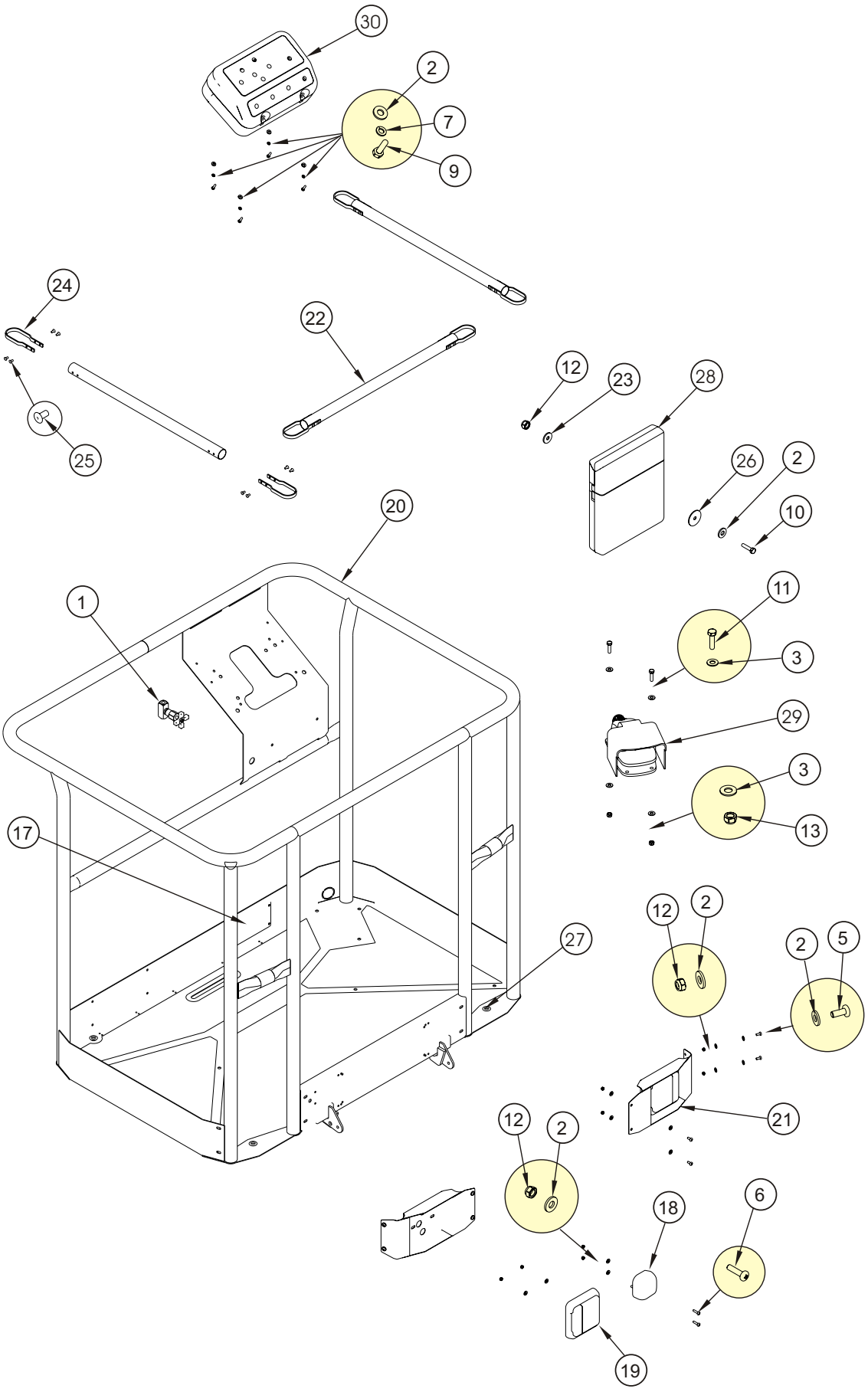
Engine assembly

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


33
5
4
30
18
13
29
6
32
19
35
42
41
8
34
27
38
7
45
16
1
20
28
37
22
3
26
23
15
40
36
9
26
11
31
12
9
17
14
44
2
10
39
43
10
24
21
25
11
DWG. 12413

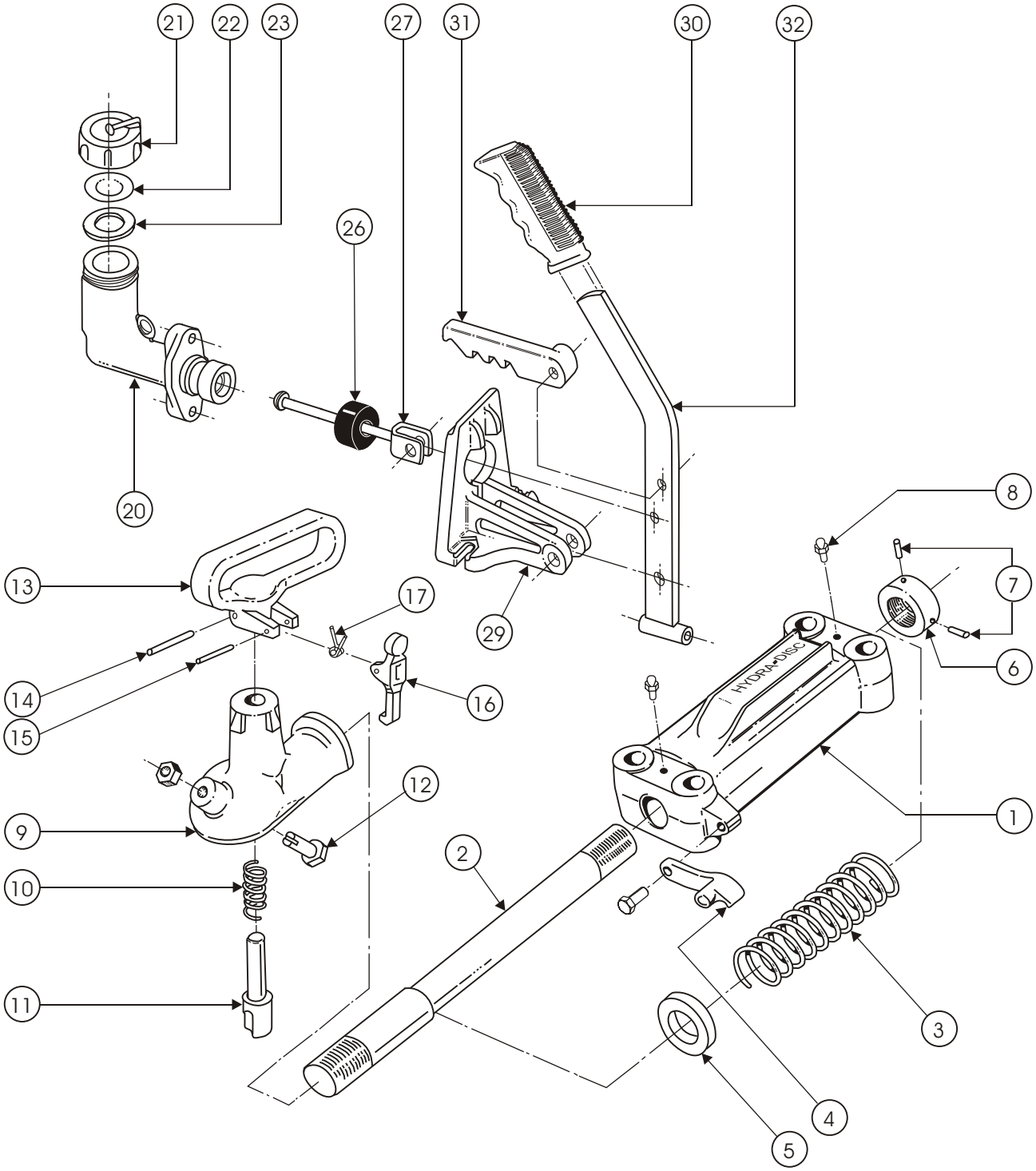
Basket assembly

Item	Part No	Qty	Description
			Basket assembly
1.	3027	1	Flow control valve
2.	3603-05	28	Washer, plain
3.	3603-08	4	Washer, plain
4.	3603-16	2	Washer, plain
5.	3604-05012	8	Screw, Pan head, M5 x 12
6.	3604-05020	2	Screw, machine
7.	3605-05	4	Washer, spring
8.	3608-16C	2	Cone lok nut, M16
9.	3610-05016	4	Bolt, metric
10.	3610-05020	2	Bolt, metric
11.	3610-08030	2	Bolt, metric
12.	3611-05	16	Nut, metric, nyloc
13.	3611-08	2	Nut, metric, nyloc
14.	3617-16035	8	Bolt, metric
15.	3626-10	4	Permaglide bush, flanged
16.	3631-16	8	Washer, disc lock
17.	9727	1	Certificate holder
18.	12386-2	1	Licence plate lamp, LED
19.	13056-4	2	Trailer light, combination
20.	13484	1	Basket weld
21.	13484-18	2	Recessed light guard
22.	13484-22	3	Drop bar, 610mm long
23.	13525-05	2	Washer, fender
24.	058523-000	6	U bracket
25.	60027-066N	24	Rivet, 1/8" x 5/32"
26.	60030-198	2	Washer, fender, 1/4"
27.	65004-008	4	Rubber grommet
28.	562386	1	Literature compartment
29.	3020021	1	Foot switch
30.	12385A	1	Upper control box assembly


30
2
7
9
24
22
25
12
23
28
26
2
10
20
1
11
3
29
3
13
17
27
12
2
2
5
21
12
2
18
6
19

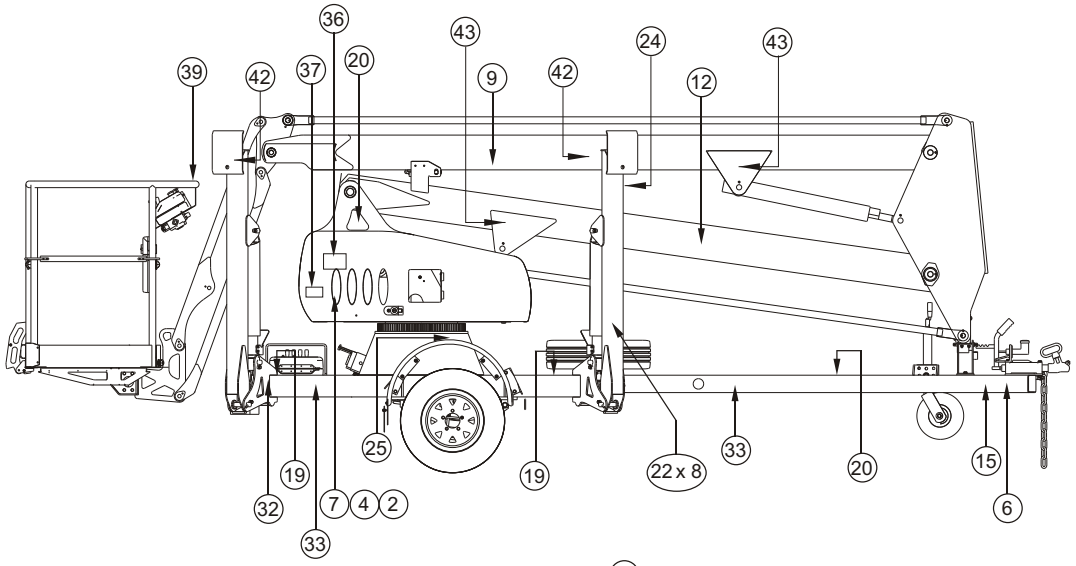
Tow coupling hydraulic

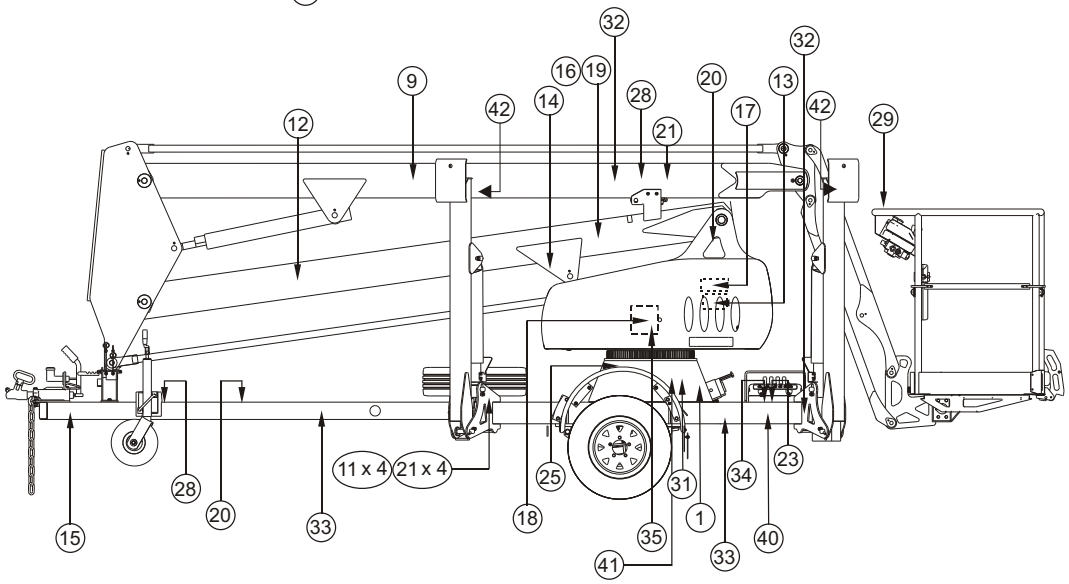
Item	Part No	Qty	Description
	11572	1	Coupling assembly, TC40HM/50mm
	12780	1	Coupling assembly, (NZ only, $1\frac{7}{8}$")
1.	11572-1	1	Body
2.	11572-2	1	Main shaft and head assembly
3.	9946-15	1	Main shaft spring
4.	9946-13	1	Reverse lock
5.	9946-14	1	Thrust ring
6.	9946-17	1	Collar
7.	60015-017	2	Grub screw 1 ¼" x ¼" BSW
8.	2030-001	2	Grease nipple
9.		Ref	Refer item 2
10.	9946-11	1	Lock pin spring (Includes 11)
11.		1	Lock pin
12.	9946-10	1	Adjusting screw M16
13.	9946-8	1	Handle assembly (Including 14, 15, 16, 17)
14.		1	Tension pin
15.		1	Tension pin
16.	9946-9	1	Trigger assembly (Including 15, 16, 17)
17.		1	Trigger spring
20.	10053-4	1	Master cylinder
21.	10053-1	1	Plastic cap (Includes 22, 23)
22.		1	Deflector
23.		1	Gasket
26.	10053-7	1	Rubber boot
27.	11572-3	1	Pushrod
29.	11572-4	1	Bracket, handle mounting
30.		Ref	Handgrip
31.	11572-5	1	Latch, handle
32.	11572-6	1	Handle (Includes item 30)

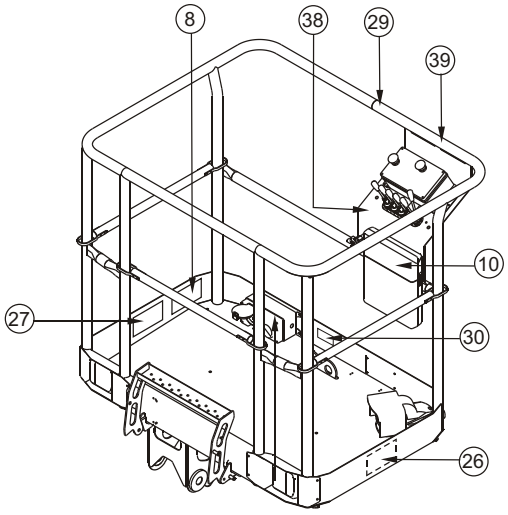

21
22
23
27
31
30
32
26
20
8
13
17
7
29
6
14
16
15
12
1
9
2
10
3
11
4
5

Placards and decals installation

Item	Part No	Qty	Description
1.	12833-2	1	Serial number plate
2.	12814	1	Decal, hydraulic fluid
3.	9751	1	Decal, NZ made
4.	302950	1	Decal, hydraulic oil level
6.	12424	1	Decal, towing speed
7.	9207	1	Decal, hydraulic oil
8.	9428	1	Decal, danger (Australia only)
	1843	1	Decal, warning (New Zealand only)
9.	511067-000	2	Decal, Snorkellift.com
10.	562426	1	Decal, operation manual
11.	0083426	4	Decal, tie down
12.	13471-01	2	Decal, MHP13/35
		2	Decal, MHP15/44
13.	9213	1	Decal, petrol
14.	300699	1	Decal, operator checklist
15.	302559	2	Decal, pinch point
16.	0323897	1	Decal, danger must not operate
17.	476706	1	Decal, danger explosive gas
18.	11420	1	Decal, lower control box
19.	0323896	2	Decal, electrocution hazard
20.	0150602	4	Decal, descending boom
21.	451986	6	Decal, limit switches
22.	9223-3	8	Decal, chevron
23.	12448	1	Decal, outrigger control
24.	501453-000	4	Decal, foot crush hazard
25.	7856-45	2	Decal, tyre pressure, MHP13/35 only
	7856	2	Decal, tyre pressure, MHP15/44 only
26.	12423-250	1	Decal, safe working load (NZ/Aust machines without rotator)
	12423-227	1	Decal, safe working load (NZ/Aust machines with rotator MHP13/35)
	12423-227	1	Decal, safe working load (US/CE machines without rotator)
	12423-200	1	Decal, safe working load (US/CE machines with rotator)
27.	99228-1	1	Decal, caution safety harness
28.	1772-002K	2	Decal, boom lock pin
29.	0072531	1	Decal, electrocution hazard (prior to serial number NZ070801)
30.	0150448	1	Decal, lanyard
31.	12545	1	Decal, auto stabiliser operation
32.	12617	4	Decal, forklift
33.	621486	1	Decal, stabiliser enable/disable switch (Option only)
34.	12830	1	Decal, overhead lift method (Option only)
35.	12523-1	1	Decal, fuel/electric switch (Option only)
36.	11948	1	Decal, battery service instructions (Option only)
37.	11944	1	Decal, DC motor isolate switch (Option only)
38.	13030	1	Decal, electrocution hazard (after serial number NZ070801)
39.	45198-7	1	Decal, danger maximum allowable wind speed
40.	13183	1	Decal, remove from towing vehicle before operating (from serial number NZ080616)
41.	12617	1	Decal, 10.9m height restriction, MHP1544 only, from serial number NZ081101
42.	0080650	4	Decal, shackle hook points
43.	13708-01	4	Decal, emergency descent

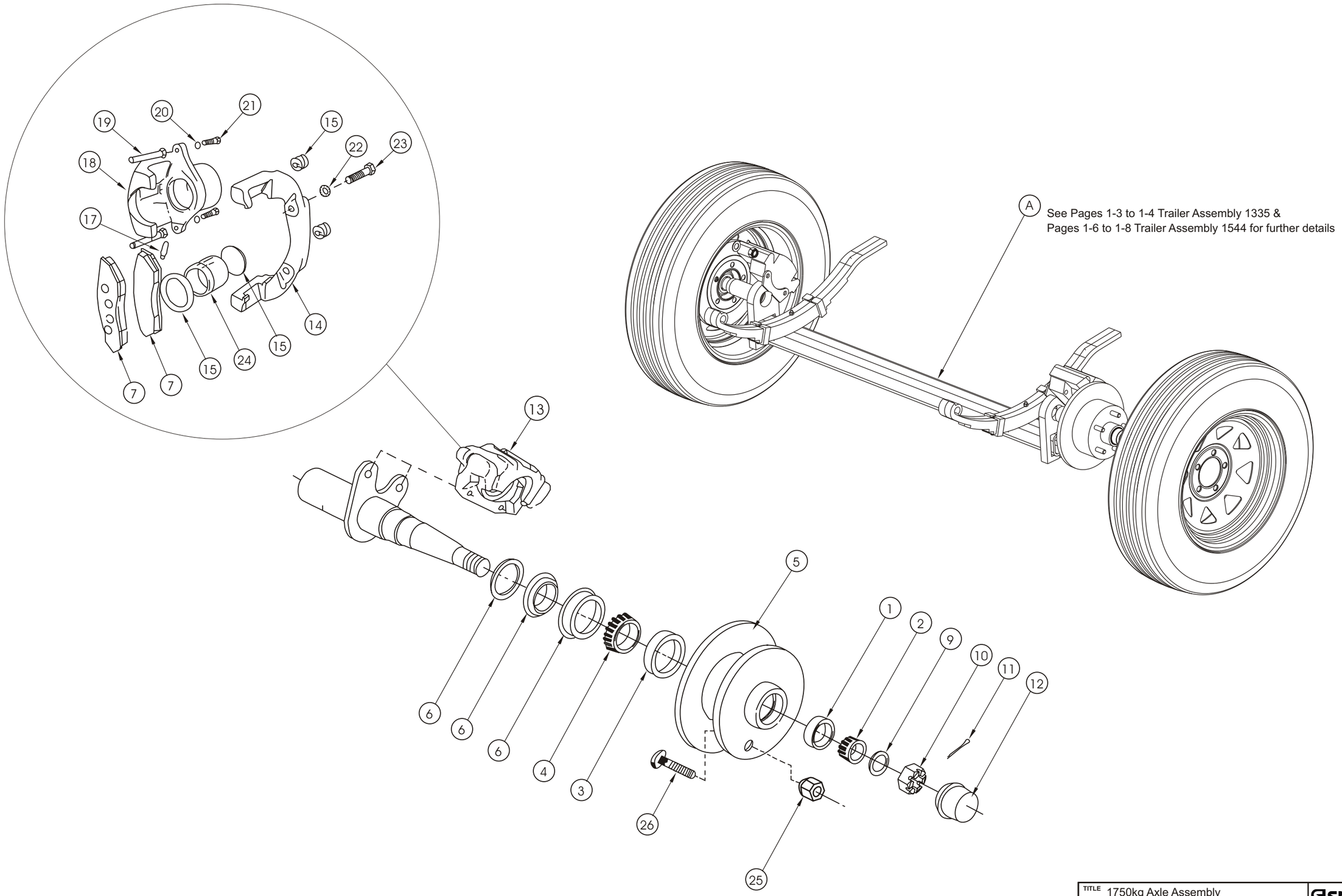

36
43
24
43
39
42
37
20
9
42
12
25
19
22 x 8
33
20
15
6
32
7
4
2
33


32
32
16
19
9
42
14
28
20
13
42
29
12
21
17
11 x 4
21 x 4
25
31
34
23
15
28
20
33
18
35
1
33
40
41


8
38
29
39
10
27
30
26

1750kg axle

Item	Part No	Qty	Description
A.	12701	Ref	Axle assembly
1.	11570-10	2	Wheel bearing kit (Includes 1,2,3,4)
2.		Ref	Wheel bearing
3.		Ref	Wheel bearing
4.		Ref	Wheel bearing
5.	12362-1	1	Wheel hub
6.	9297-7	2	Seal kit, hub
7.	12362-2	1 Pair	Brake pads
9.	1033-008	2	Nut kit (Includes 10,11)
10.		Ref	Washer
11.		Ref	Split pin
12.	9922-7	2	Grease cap
13.	2045-001	Ref	Caliper assembly, (Includes items -14 to 24)
14.	9945-9	2	Anchor plate
15.	2045K	Ref	Seal kit, caliper
17.	2045-003	2	Bleed screw
18.	2045-13	2	Housing
19.	2045-5	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.	2045-010	2	Piston
25.	1649-042	10	Wheel nut, UNF 7/16”
26.	1649-034	10	Wheel stud, UNF 7/16”



TITLE 1750kg Axle Assembly
Hydraulic, Disc Brakes
Snorkel models MHP13/35 & 15/44 V3

snorkel

Section 2. - Hydraulics

SLEW MOTOR WITH BRAKE

JIB CYL

LOWER CYL

UPPER CYL

ROTATOR OPTION

PILOT OPER. CHECK VALVE

PROPORTIONAL FLOW CONTROL VALVE

HONDA

PUMP

2500 p.s.i.

S.S ORIFICE

RELIEF VALVE

FLOW CONTROL VALVE

12377 MAIN VALVE

CONTROL VALVE

T/P

EMERGENCY LOWER PORT

STABILISER PORT

TANK PORT

ACCUM

TANK PORT

AUX. MOTOR

PUMP

AUX. MOTOR OPTION

2500 psi

LEG 1

LEG 2

LEG 3

LEG 4

LEG CYL

LEG VALVE BANK

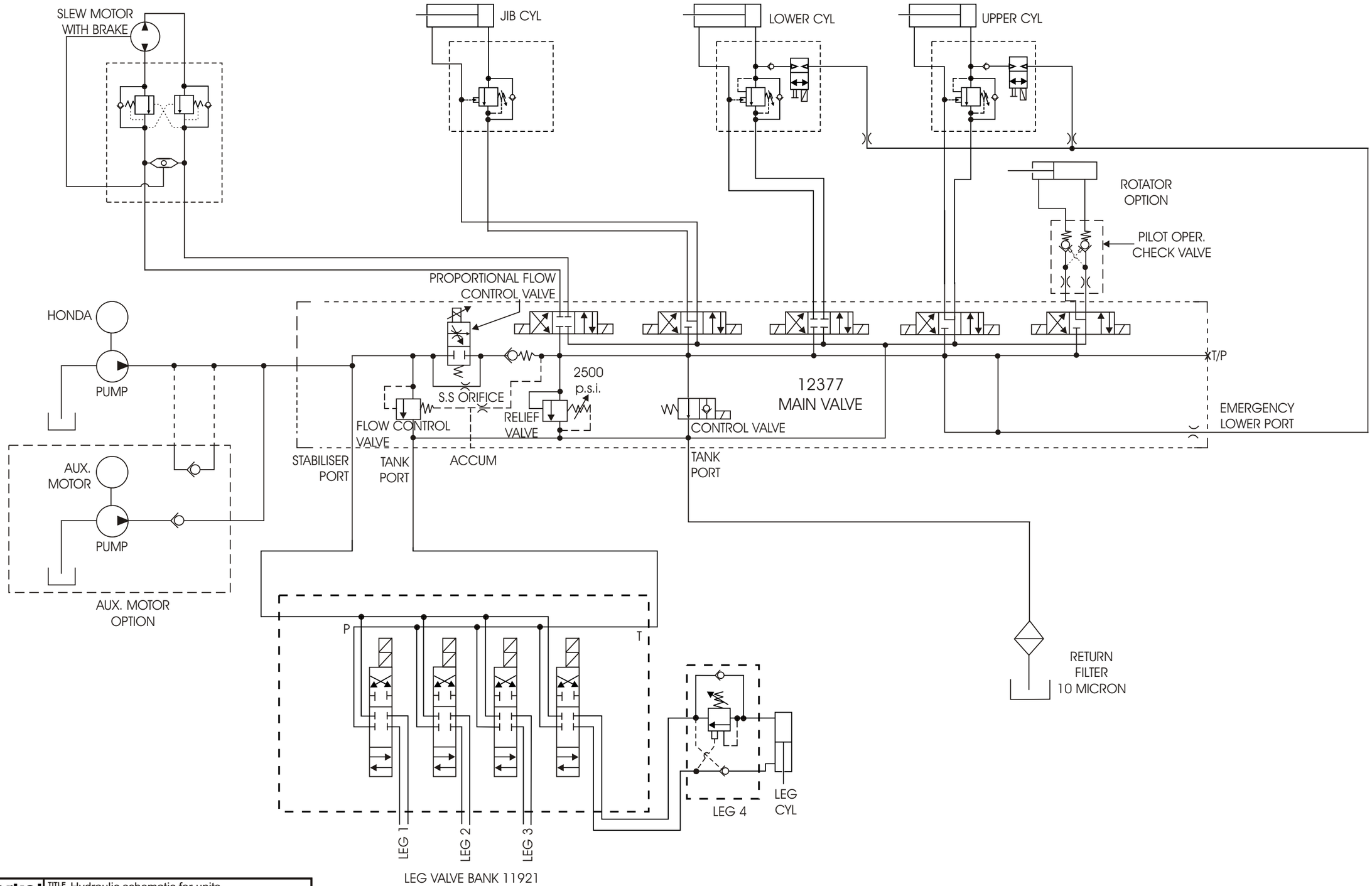
RETURN FILTER 10 MICRON

1	2	3	4	5	6	7	8	9

SEPT 2007

TITLE Hydraulic schematic for standard machines
Snorkel Models MHP13/35 & MHP15/44 V3

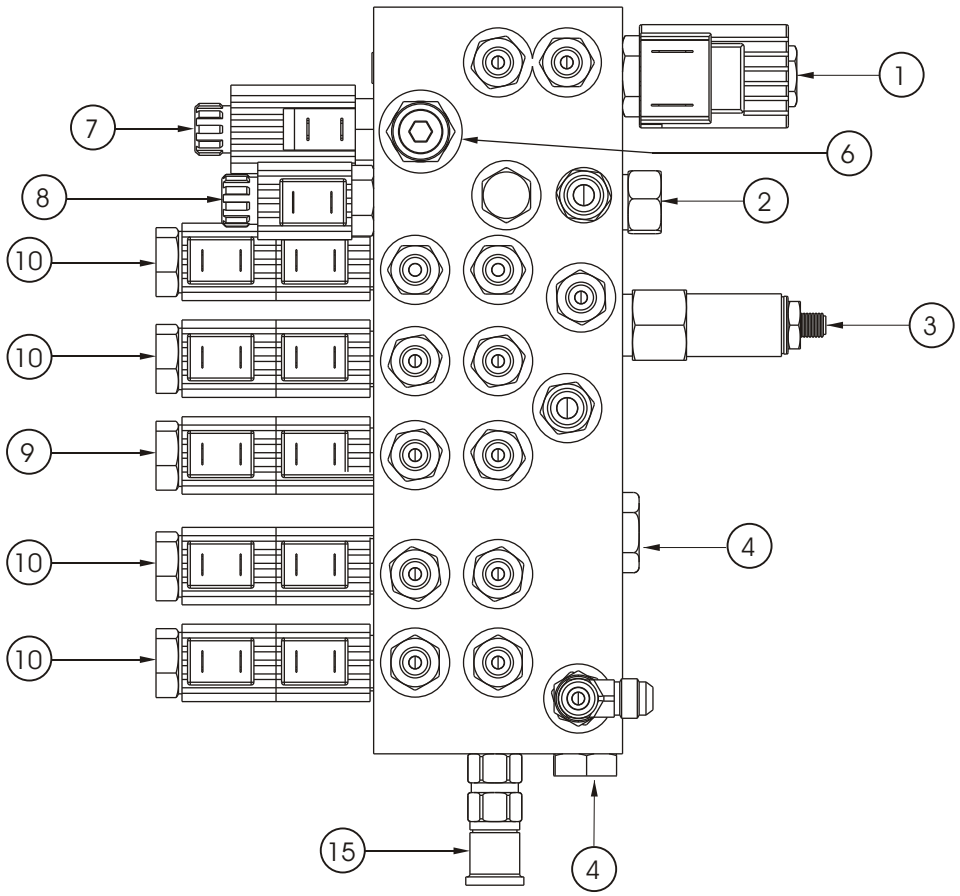
snorkel



snorkel

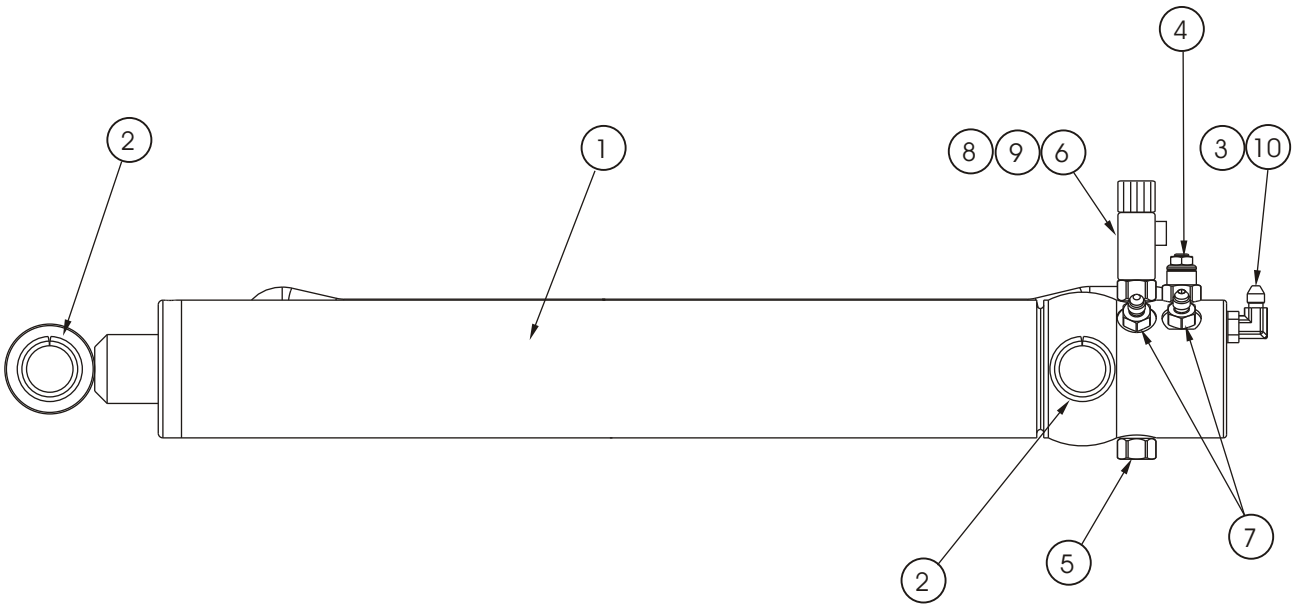
TITLE Hydraulic schematic for units fitted with self level stabilisers Snorkel Models MHP13/35 & MHP15/44 V3

Item	Part No	Qty	Description
	13712A		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.	7035-003	2	Plug, 7/8" uno
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

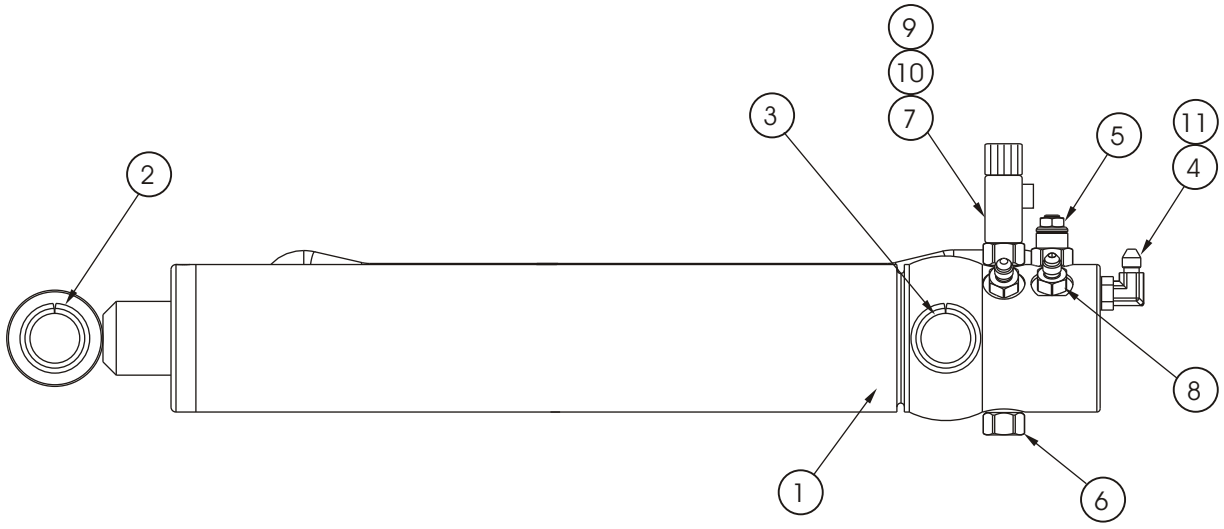


Upper lift cylinder assembly

Item	Part No	Qty	Description
	13710		Upper lift cylinder assembly
1.	12333	1	Upper Lift cylinder
	12333K	1	Seal kit
2.	3626-6	4	Flanged permaglide bush
3.	7031-002	1	JICM x UN O-Ring M elbow
4.	10856-1	1	Counterballance cartridge
5.	13713	1	Plug
6.	13705	1	Cartridge
7.	7025-013	2	JICM x UN O-Ring M nipple
8.	13706	1	Coil
9.	13707	1	Manual overide knob
10.	7804-001	1	Restrictor

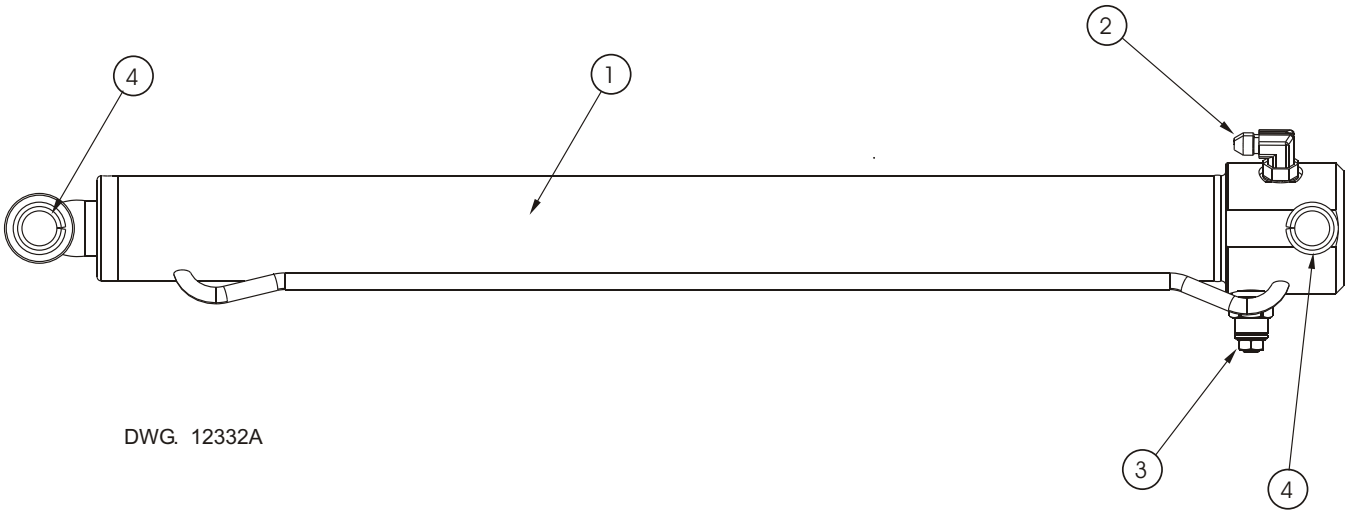


Item	Part No	Qty	Description
	13710		Lower lift cylinder assembly, MHP1335
	12507A		Lower lift cylinder assembly, MHP1544
1.	12334	1	Cylinder, lower lift, MHP1335
	12507	1	Cylinder, lower lift, MHP1544
	12334K	1	Seal kit, both models
2.	3626-1	2	Flanged permaglide bush
3.	3626-6	2	Flanged permaglide bush
4.	7031-002	1	JICM x UN O-Ring M Elbow
5.	10856-1	1	Counterbalance cartridge
6.	13713	1	Plug
7.	13705	1	Cartridge
8.	7025-013	2	JICM x UN O-Ring M Nipple
9.	13706	1	Coil
10.	13707	1	Manual overide knob
11.	7804-001	1	Restrictor



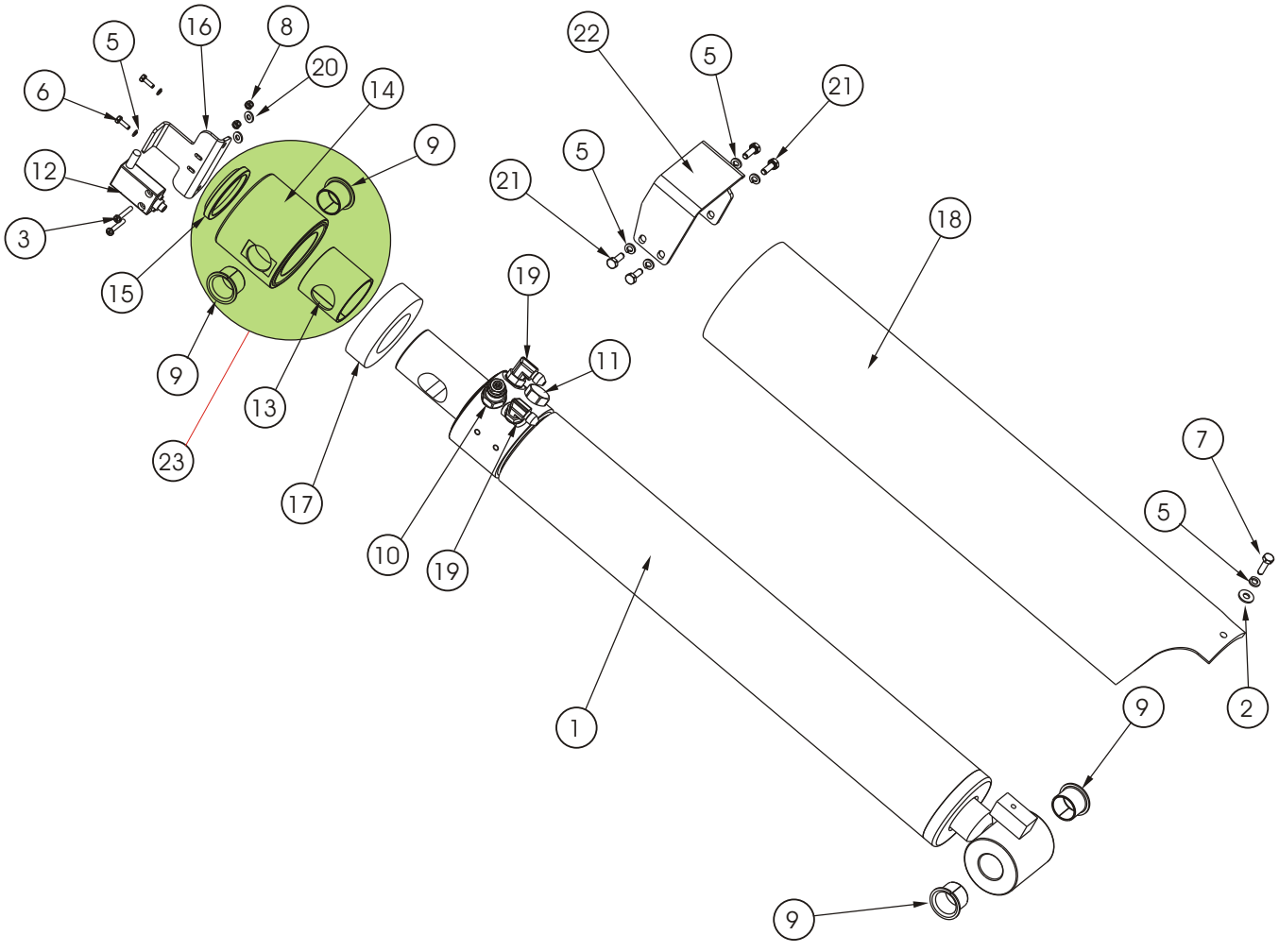
Flyboom cylinder assembly

Item	Part No	Qty	Description
	12332A		Flyboom cylinder assembly
1.	12332	1	Flyboom cylinder
	12332K	1	Seal kit
2.	7031-002	2	JICM x UN O-Ring M elbow
3.	10856-1	1	Counterbalance cartridge
4.	10976-1	1	Cavity plug
5.	3626-10	4	Flanged permaglide bush



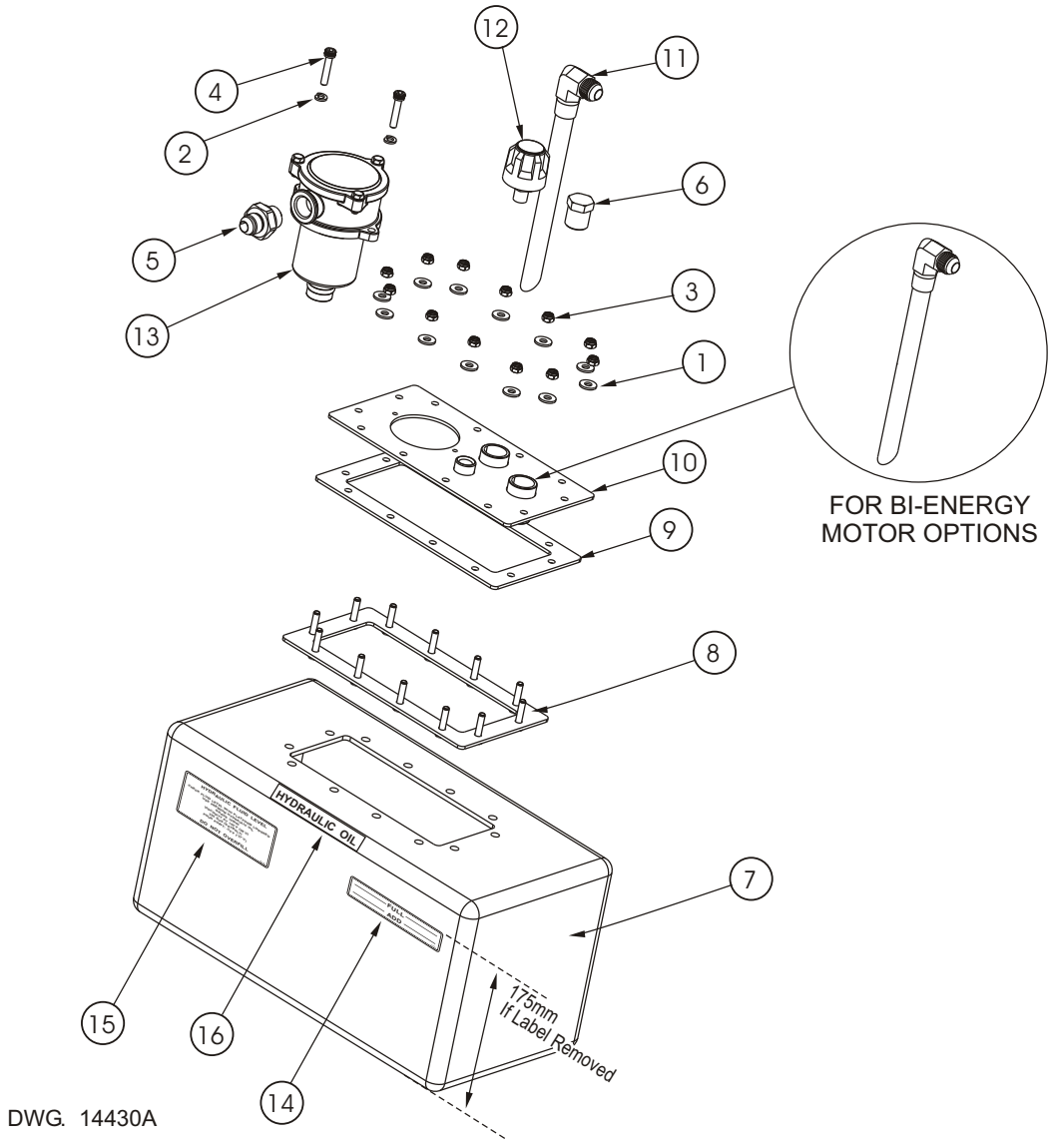
DWG. 12332A

Item	Part No	Qty	Description
	12336A		Stabiliser leg cylinder assembly
1.	12336	1	Stabiliser leg cylinder
	12336K	1	Seal kit
2.	3603-06	1	Plain washer
3.	3663-04025	2	Hex head socket cap screw
5.	3605-06	7	Spring washer
6.	3610-06012	2	Metric bolt
7.	3610-06020	1	Metric bolt
8.	3611-04	2	Metric Nylock nut
9.	3626-1	4	Flanged permaglide bush
10.	10286-3	1	Counterbalance cartridge
11.	10286-4	1	Check cartridge
12.	12336-10	1	Limit switch
13.	12336-11	1	Sliding bush
14.	12336-2	1	Cylinder base
15.	12336-3	1	Wiper seal
16.	12336-4	1	Switch mount
17.	12336-7	1	Rubber spring
18.	12425	1	Leg cylinder guard
19.	7031-002	2	JICM x UN O-Ring M elbow
20.	3603-04	2	Plain washer
21.	3610-06016	4	Metric bolt
22.	12336-20	1	Valve guard
23.	12336-50	1	Cylinder base assembly, includes items 9, 14, 13, 15



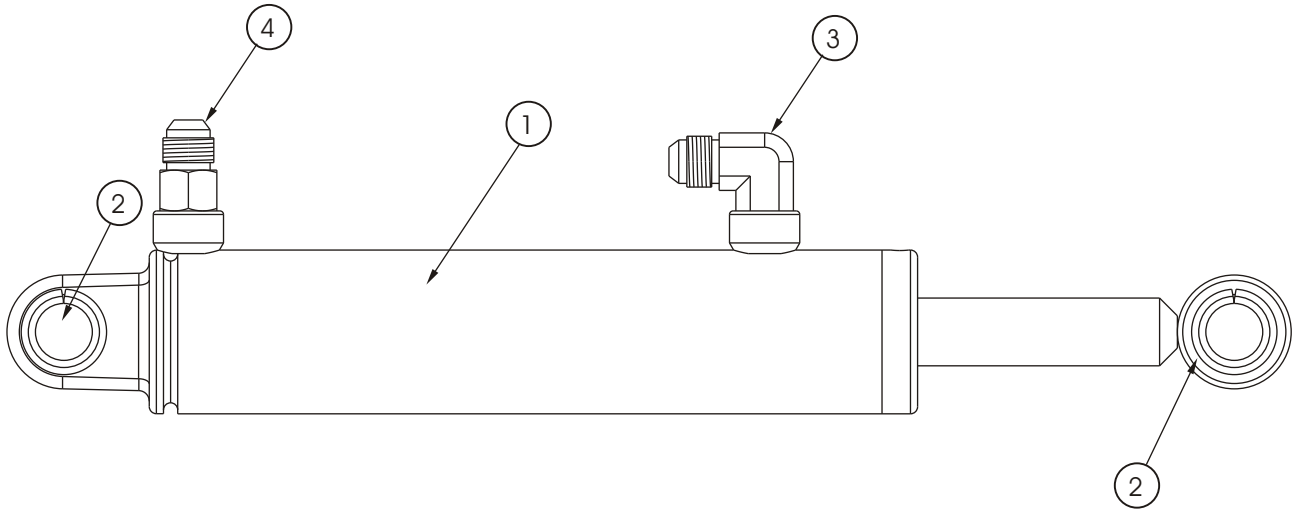
Hydraulic oil tank assembly

Item	Part No	Qty	Description
	14430A		Hydraulic oil tank assembly
1.	3603-06	12	Plain washer
2.	3605-06	2	Spring washer
3.	3611-06	12	Metric Nylock nut
4.	3613-06030	2	Metric cap screw
5.	7013-002	1	BSPP (Dowty) x JICM nipple
6.	7034-004	1	0.5" BSPTM plug
	11430-7	1	Suction pipe weldment (Replaces plug for electric motor option)
7.	11430-10	1	Oil tank, molded
8.	11430-11	1	Base plate weldment
9.	11430-15	1	Gasket
10.	11430-23	1	Top tank plate weldment
11.	11430-7	1	Suction pipe weldment
12.	11487	1	Filter breather
13.	11488-10	1	Tank top filter
14.	302950	1	Decal, hydraulic oil level, min/max
15.	12814	1	Decal, hydraulic fluid
16.	9207	1	Decal, hydraulic oil



DWG. 14430A

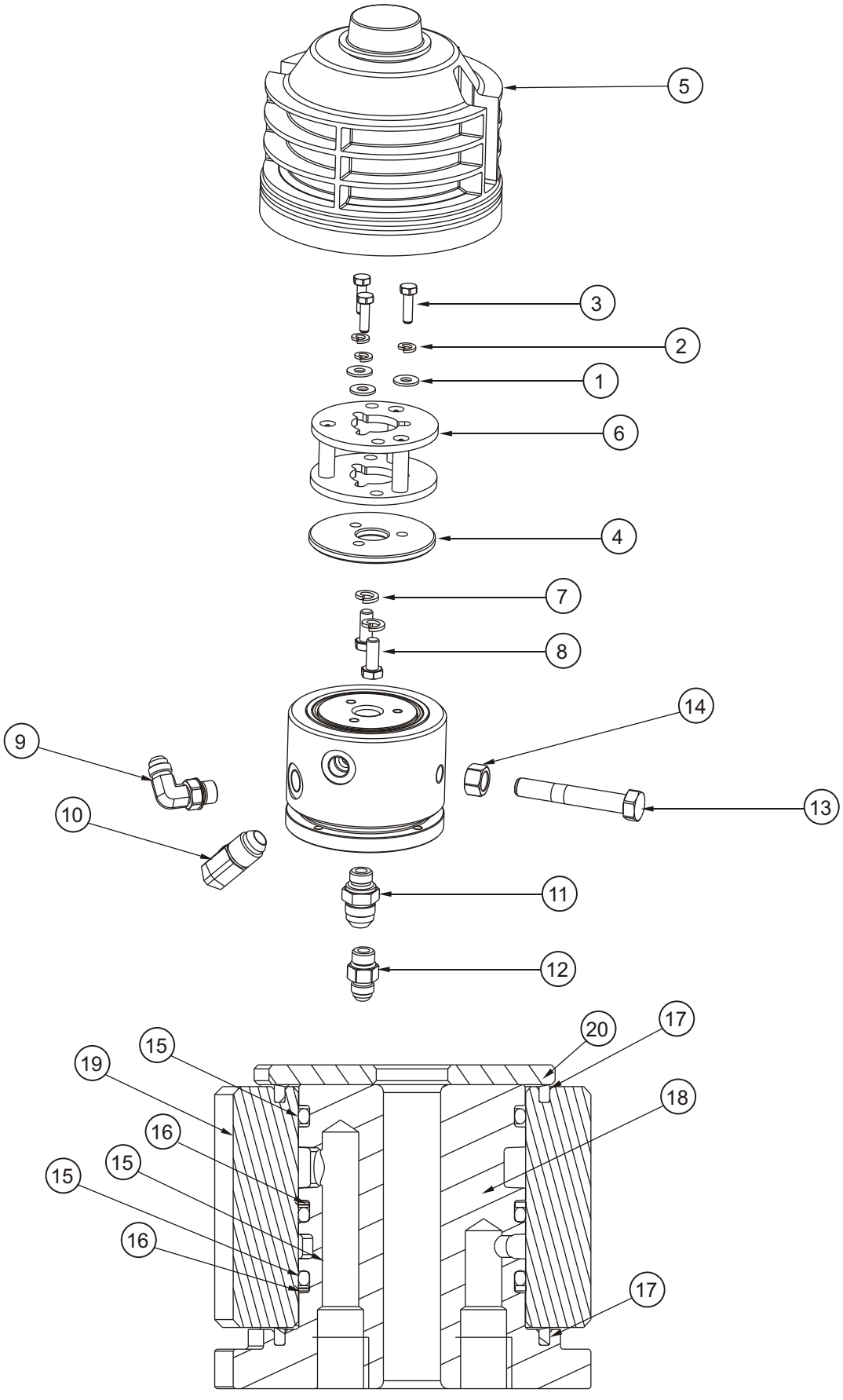
Item	Part No	Qty	Description
	12330A		Rotator cylinder assembly
1.	12330	1	Rotator cylinder
	12330K	1	Seal kit
2.	3626-3	2	Flanged permaglide bush
3.	7046-012	1	Elbow, BSPTM x JICM
4.	7019-018	1	Nipple, BSPTM x JICM



DWG. 12330A

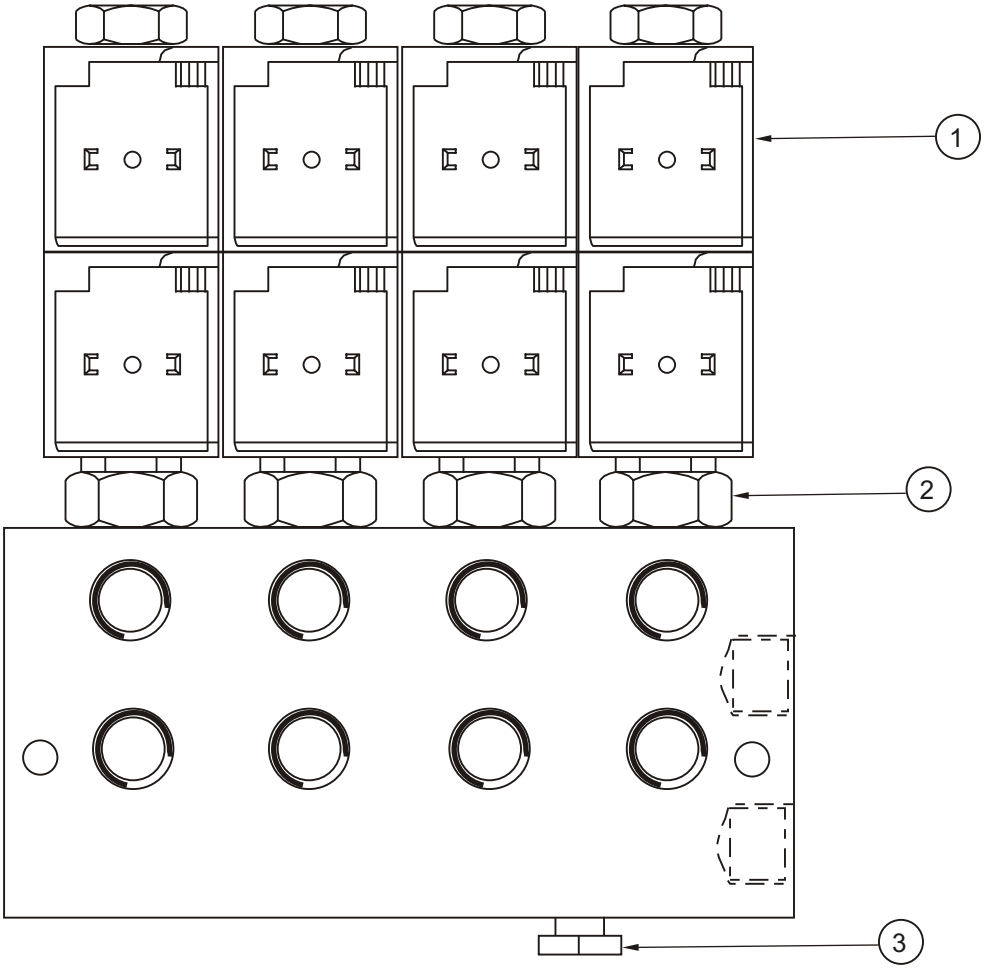
Optional Oil distributor assembly - 2 port

Item	Part No	Qty	Description
	12679A		Oil distributor assembly, 2 port
1.	3603-06	3	Plain washer
2.	3605-06	3	Spring washer
3.	3610-06020	3	Metric bolt
4.	11957-3	1	Distributor cap
5.	12679	1	Power plate rotator
6.	12679-20	1	Spacer plate
7.	60005-008	2	Spring washer
8.	60016-003	2	Bolt
9.	7031-001	1	JICM UN O-Ring elbow
10.	7031-007	1	JICM UN O-Ring elbow
11.	7025-002	1	JICM UN O-Ring straight
12.	506-7707	1	JICM UN O-Ring straight
13.	3615-12075	1	Metric set screw
14.	3602-12	1	Metric nut
15.	13-228	3	O-Ring
16.	11768-228	2	PTFE backup washer
17.	11956-5	2	Wiper seal
18.	11957-1	1	Distributor 2 port pillar
19.	11957-2	1	Distributor 2 port barrel
20.	11957-3	1	Distributor cap


5
3
2
1
6
4
7
8
14
9
13
10
11
12
20
17
15
19
18
16
15
15
16
17

Optional Automatic stabiliser

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

Electrical Circuit Diagram
MHPxxxx

September 3rd 2012

F

E

D

C

B

A

1 2 3 4 5 6 7 8 9

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

TBM LCB
1 2 3 4
B+ B+ B- B-

E-Stop UCB, C1 NC
Foot Switch
Enable UCB
E-Lower UCB
Choke UCB
Start UCB
Speed Ctrl UCB
Alarm UCB
Overload UCB
Lift Enable UCB
Power Select UCB
Fuel Elec
E-Stop UCB, C2 NC
Optional: Bi-energy units only
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
Slew UCB
Lower Boom UCB
Upper Boom UCB
Tele Boom UCB
Basket Rotate UCB

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

CONTACTOR
Motor 24V
24V Isolate 250A 5A 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
12V 10A E-Stop LCB, C1 NC
R1 86 85 87 30 87a
Key Switch LCB, C1 Closed=Platform
Key Switch LCB, C4 Closed=Base
Power Select LCB Diac Fuel Diac Fuel

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
Optional: Height Lockout

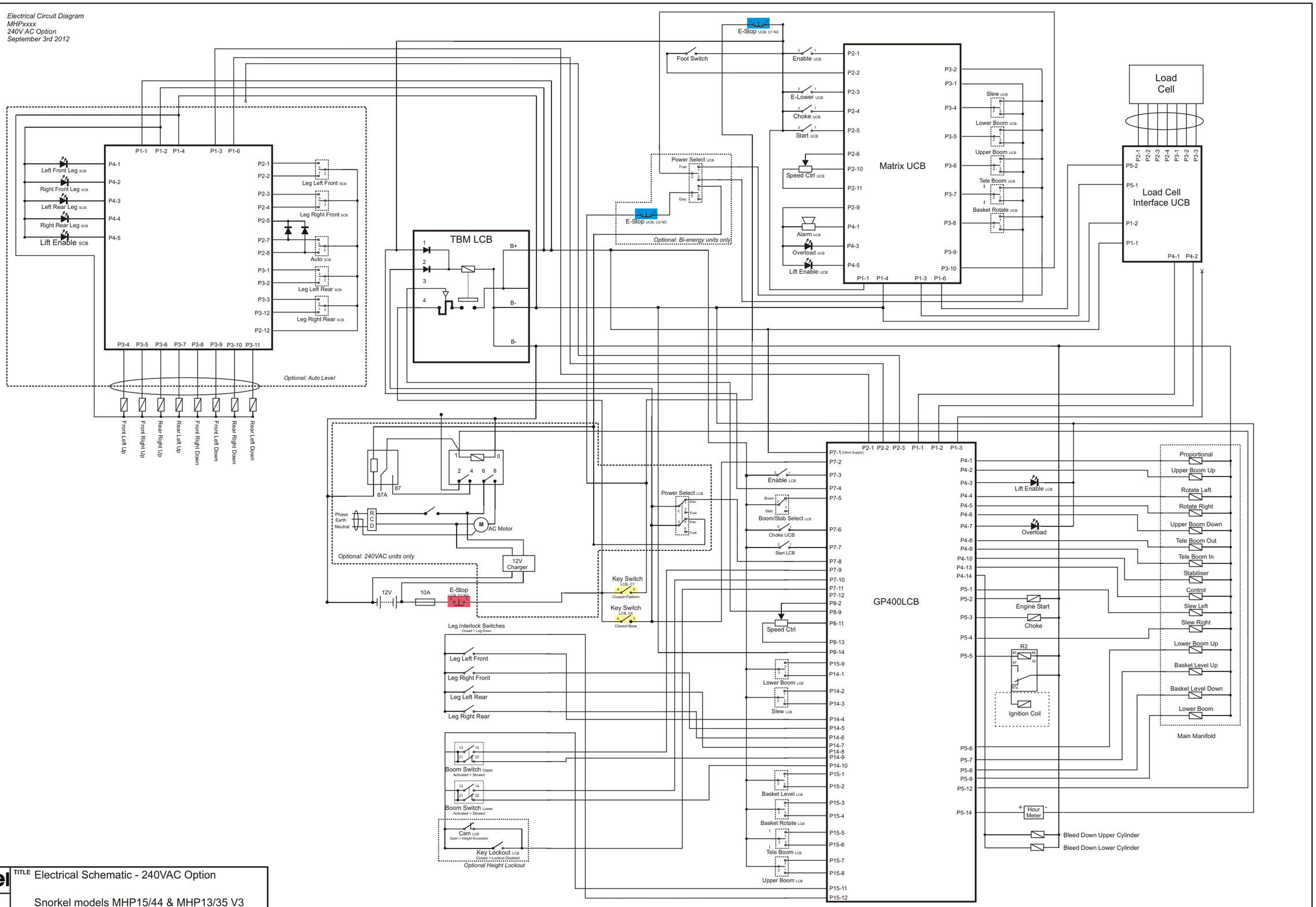
P7-1 (Valve Supply) P7-2 P7-3 P7-4 P7-5 P7-6 P7-7 P7-8 P7-9 P7-10 P7-11 P7-12 P8-2 P8-9 P8-11 P8-13 P8-14 P15-9 P14-1 P14-2 P14-3 P14-4 P14-5 P14-6 P14-7 P14-8 P14-9 P14-10 P15-1 P15-2 P15-3 P15-4 P15-5 P15-6 P15-7 P15-8 P15-11 P15-12
P2-1 P2-2 P2-3 P1-1 P1-2 P1-3
GP400LCB
Enable LCB
Boom Stab Boom/Stab Select LCB
Choke UCB
Start LCB
Speed Ctrl LCB
Lower Boom LCB
Slew LCB
Basket Level LCB
Basket Rotate LCB
Tele Boom LCB
Upper Boom LCB
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 LCB
Engine Start
Choke
R2 85 86 87 30 87a
Ignition Coil Honda
Hour Meter
Bleed Down Upper Cylinder
Bleed Down Lower Cylinder
Proportional
Upper Boom Up
Rotate Left
Rotate Right
Upper Boom Down
Tele Boom Out
Tele Boom In
Stabiliser
Control
Slew Left
Slew Right
Lower Boom Up
Basket Level Up
Basket Level Down
Lower Boom
Main Manifold

TITLE Electrical Schematic

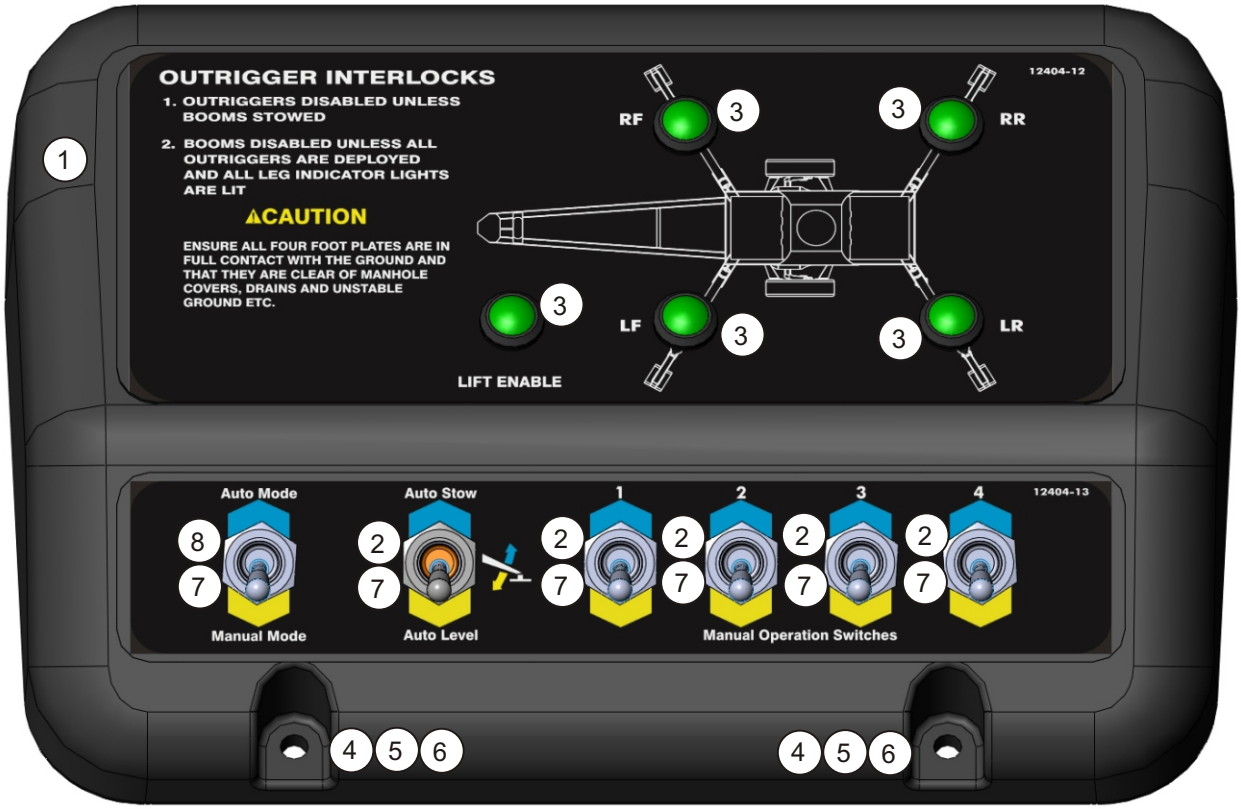
Snorkel models MHP15/44 & MHP13/35 V3

snorkel

Electrical Circuit Diagram
MHPxxxx
240V AC Option
September 3rd 2012

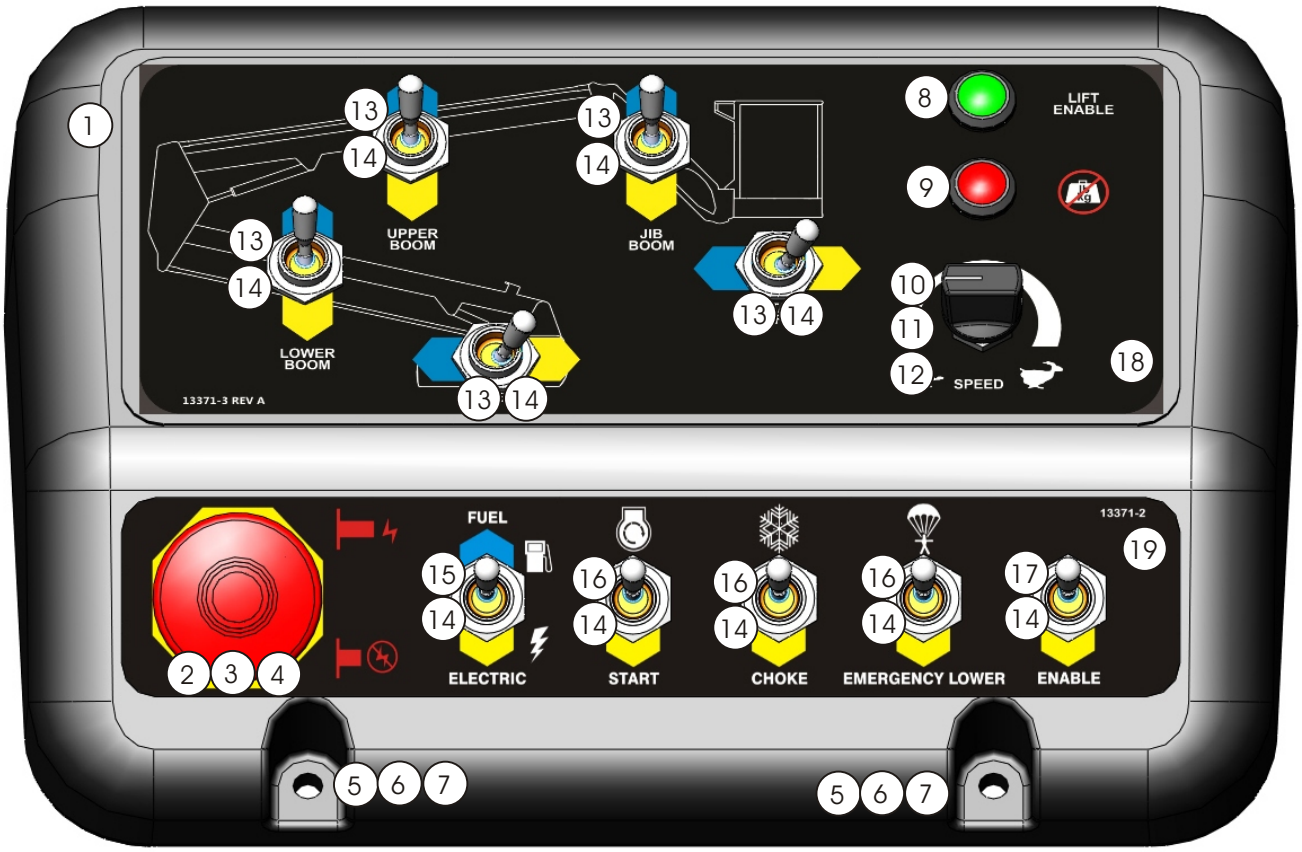


Item	Part No	Qty	Description
	13581	1	Control box assembly, auto stabiliser
1.	12404	1	Control box
2.	302-0018	5	Switch, toggle, DPDT (M/OFF/M)
3.	12536-3	5	LED, 12V green
4.	3604-05020	2	Screw, pan head M5 x 20 ZP
5.	3605-05	2	Washer, spring, M5, ZP
6.	3603-06	2	Washer, flat, M6 x 16 ZP
7.	12515	6	Washer, M12, rubber
8.	302-0097	1	Switch, toggle, DPDT, (ON/ON)
9.	1815-1	1	Cable gland, M32, nylon, (not shown)
10.	12416	1	Hinge, (not shown)
11.	12408	1	Rubber seal, (not shown)

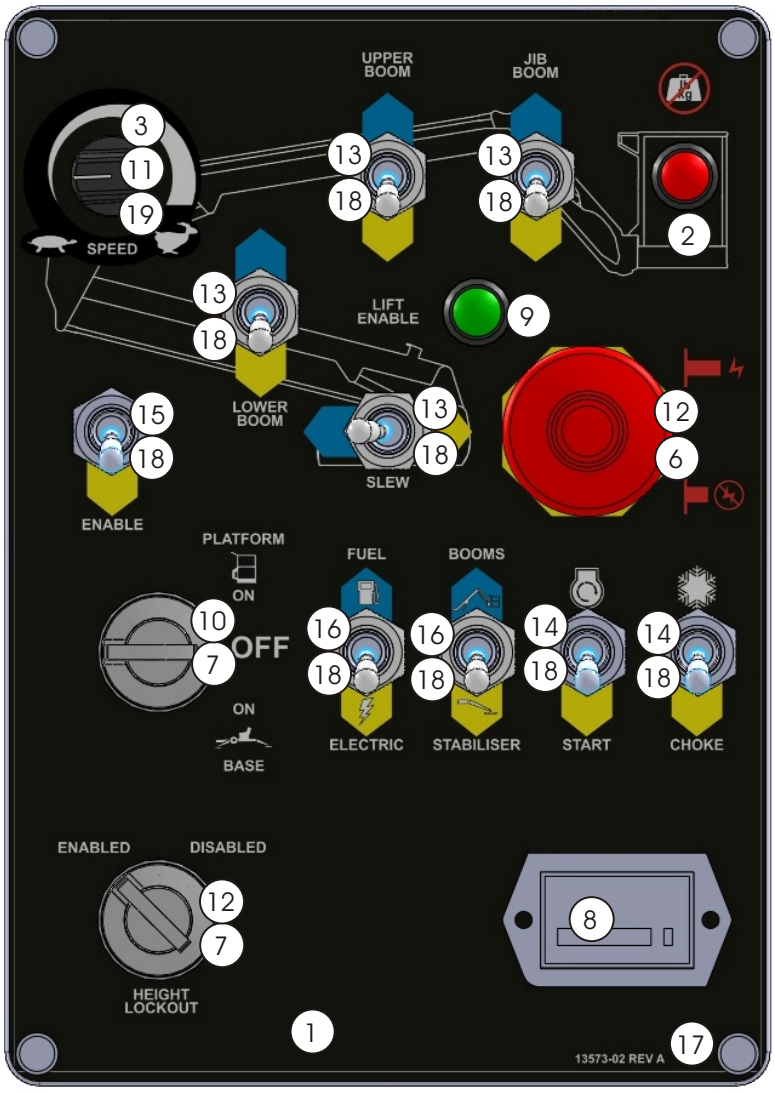


Upper control box assembly

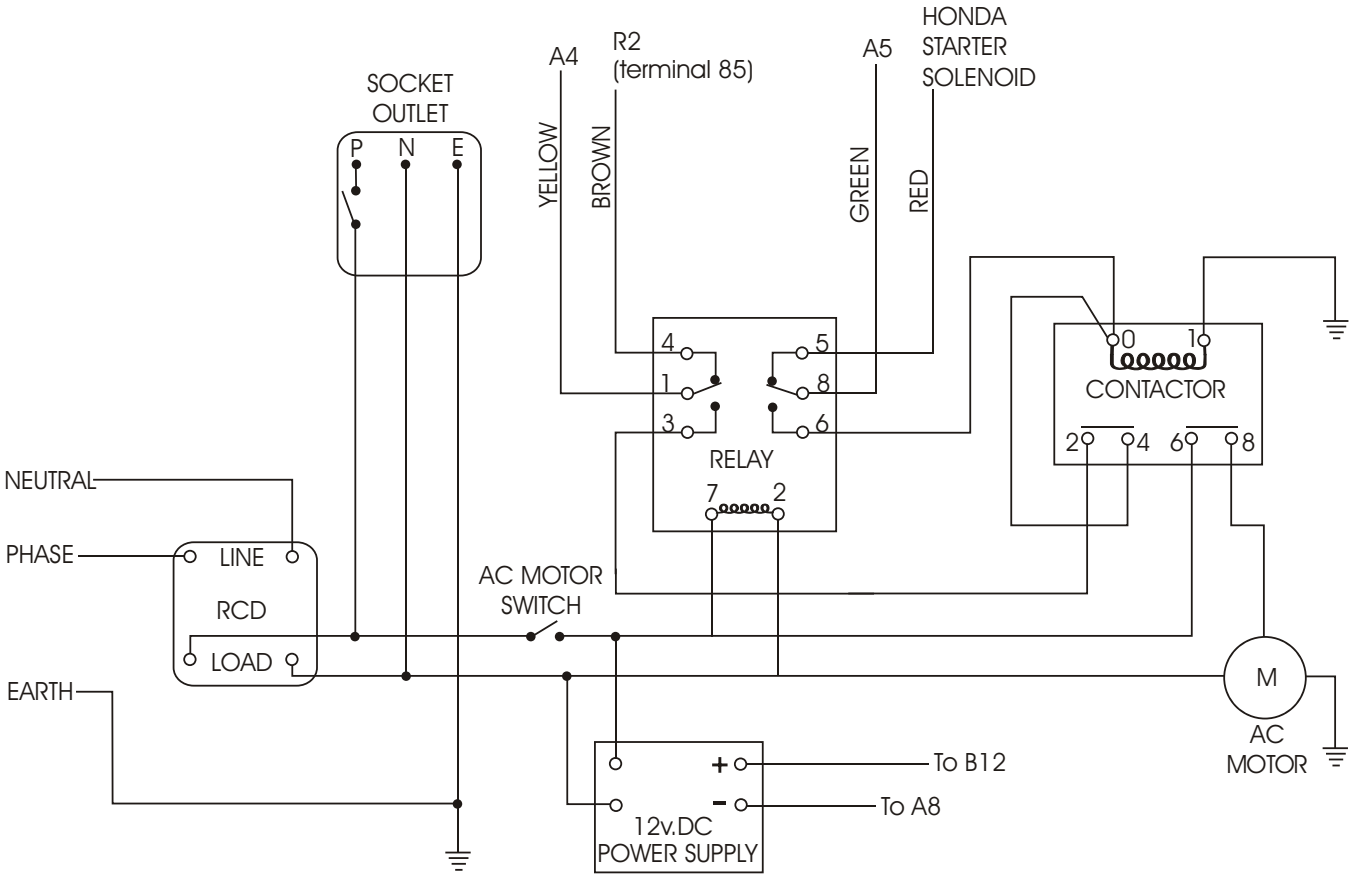
Item	Part No	Qty	Description
	13488A		Upper control box assembly
1.	13251-1	1	Control box
2.	9775	1	Emergency stop switch, pull release
3.	13380	1	Collar
4.	10118	1	Contact, normally closed
5.	3604-05020	2	Screw, pan head, M5 x 20
6.	3605-05	2	Washer, spring, M5
7.	3603-06	2	Washer, flat, M6 x 16
8.	12536-3	1	LED, 12V, green,10mm lens
9.	12536-4	1	LED, 12V, red, 10mm lens
10.	13489-1	1	Knob, speed control
11.	13489	1	Rheostat
12.	12516	1	Washer, M10, rubber
13.	302-0018	5	Switch, toggle, DPDT (M/OFF/M)
14.	12515	10	Washer, M12, rubber
15.	302-0097	1	Switch, toggle, DPDT (ON/ON)
16.	302-0015	3	Switch, toggle, SPST (MON/OFF)
17.	3020081	1	Switch, toggle, SPST (MON)
18.	1815-1	1	Cable gland, M32, nylon, (not shown)
19.	12416	1	Hinge, (not shown)
20.	12408	1	Rubber seal, (not shown)

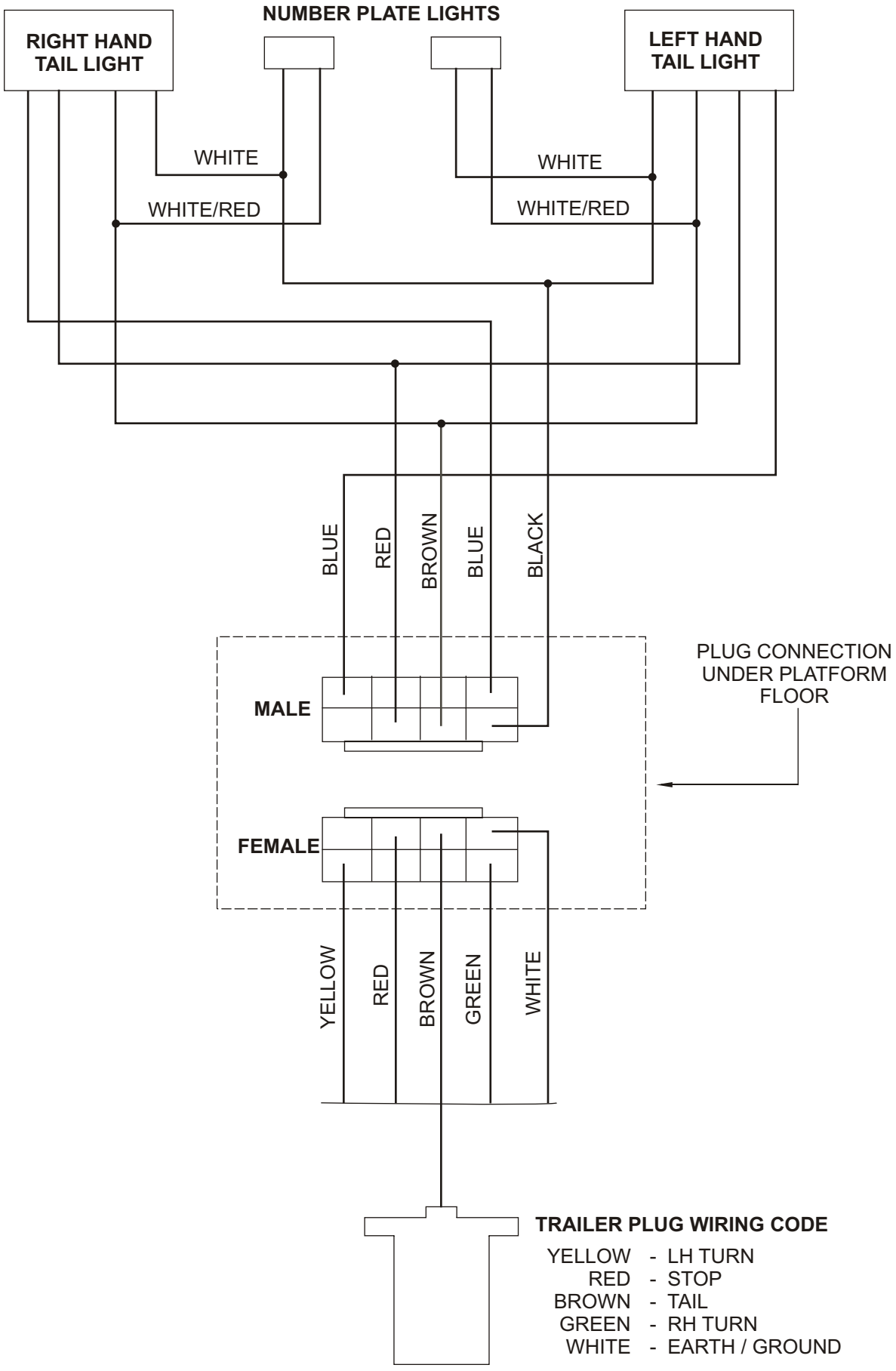


Item	Part No	Qty	Description
	13573A	1	Lower control box assembly
1.	12521-1	1	Control box, lower
2.	12536-4	1	LED, 12V, red
3.	13489-1	1	Knob, speed control
4.	1814	3	Cable gland (not shown)
5.	1815	1	Cable gland (not shown)
6.	9775	1	Stop switch head
7.	10744	1	Key switch
8.	455186	1	Hourmeter
9.	12536-3	1	LED, 12V, green
10.	13456	1	Key switch
11.	13489	1	Rheostat
12.	9776	2	Collar and contact block
13.	302-0018	4	Switch,toggle, DPDT (M/OFF/M)
14.	302-0015	2	Switch, toggle, SPST (MOM/OFF)
15.	302-0018	1	Switch, toggle, SPST (MON)
16.	302-0097	2	Switch, toggle, DPDT (ON/ON)
17.	13573-02	1	Decal, lower control box
18.	12515	9	Washer, M12, rubber
19.	12516	1	Washer, M10, rubber



AC motor option with 240VAC outlet drawing

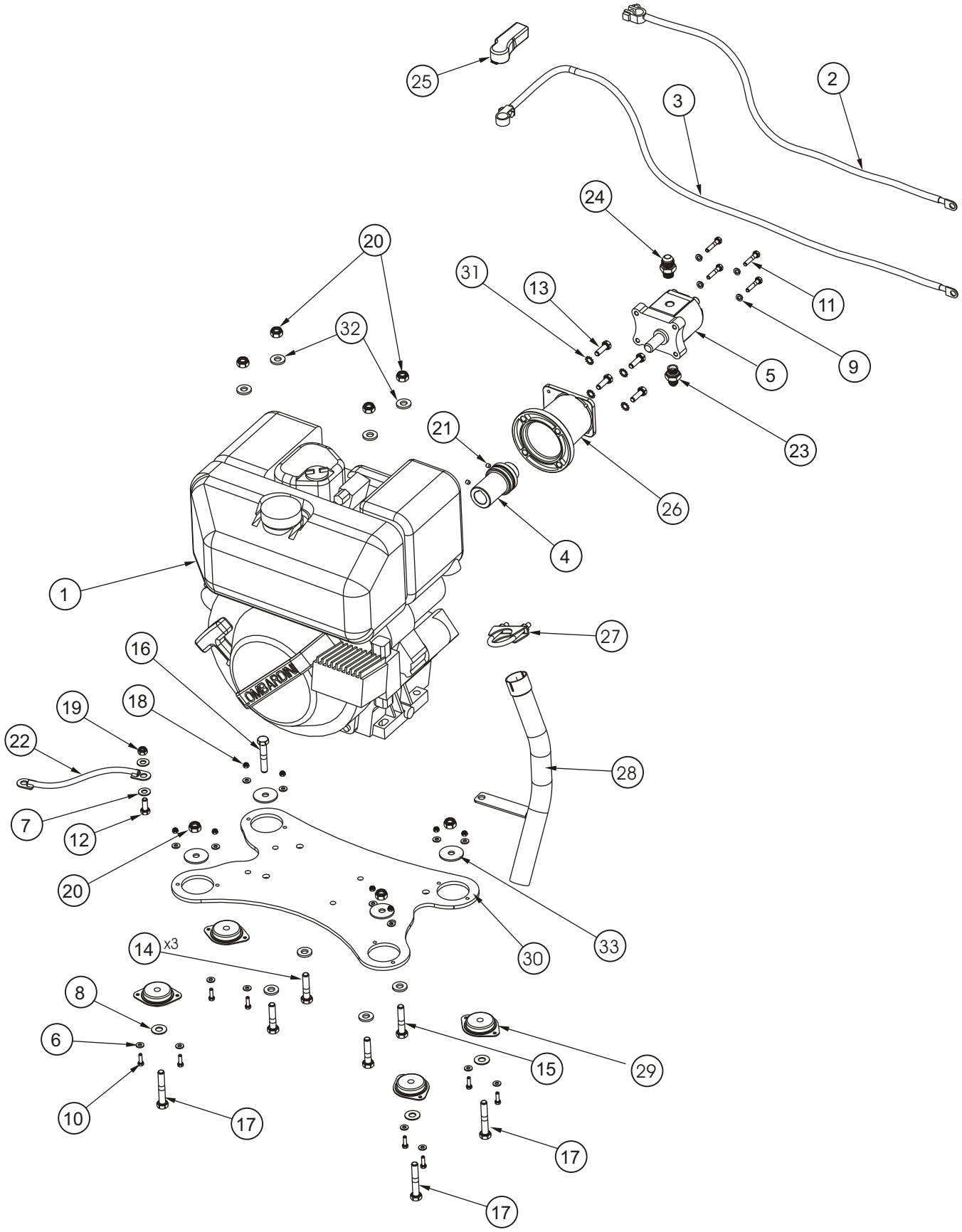



NUMBER PLATE LIGHTS
RIGHT HAND TAIL LIGHT
LEFT HAND TAIL LIGHT
WHITE
WHITE
WHITE/RED
WHITE/RED
BLUE
RED
BROWN
BLUE
BLACK
PLUG CONNECTION UNDER PLATFORM FLOOR
MALE
FEMALE
YELLOW
RED
BROWN
GREEN
WHITE
TRAILER PLUG WIRING CODE
YELLOW - LH TURN
RED - STOP
BROWN - TAIL
GREEN - RH TURN
WHITE - EARTH / GROUND

Section 4. - Options

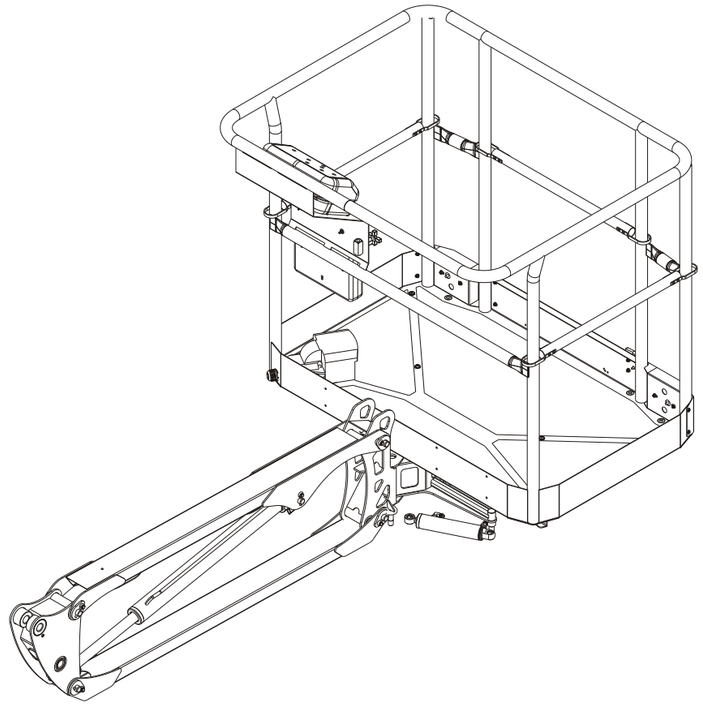
Engine assembly, Lombardini (Sheet 1)

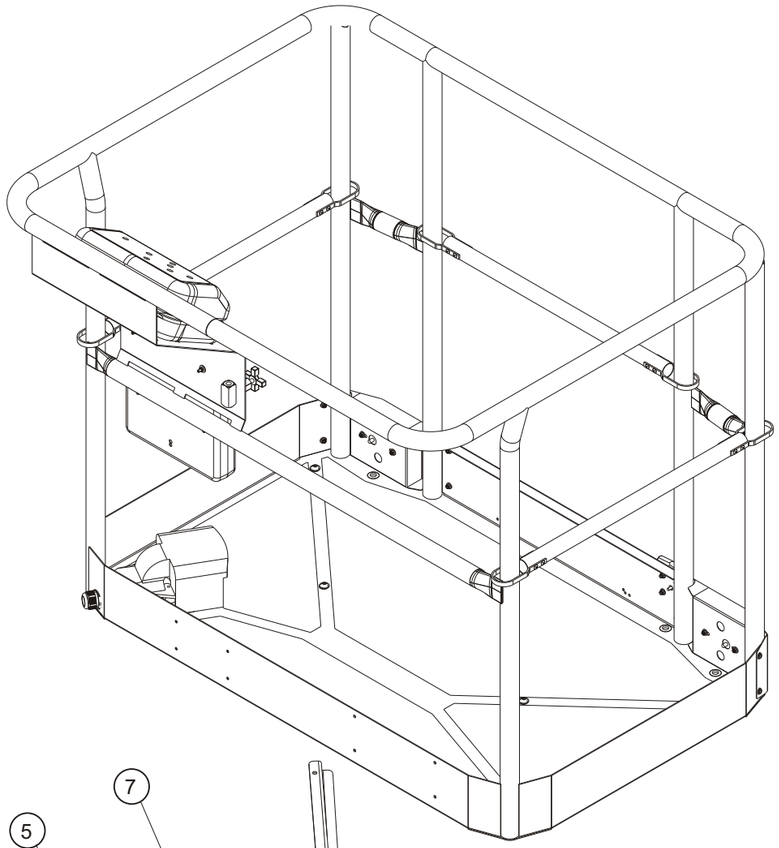
Item	Part No	Qty	Description
0.	12449		Engine assembly
1.	1171-8	1	Lombardini 15LD315 diesel engine
2.	1650-030	1	Battery cable
3.	1650-031	1	Battery cable
4.	1657-11	1	Drive coupling
5.	1659	1	Gear pump
6.	3603-05	16	Plain washer
7.	3603-08	2	Plain washer
8.	3603-10	3	Plain washer
9.	3605-06	4	Spring 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

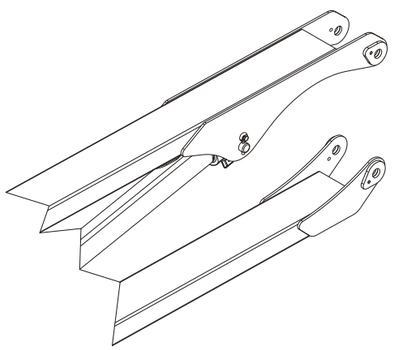

25
2
3
24
20
31
13
11
32
5
9
21
23
26
4
1
27
16
19
18
22
28
7
12
20
33
30
14 x3
8
6
15
29
10
17
17
17

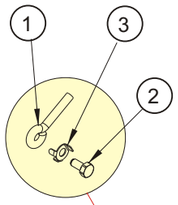
Basket rotator (Sheet 1)

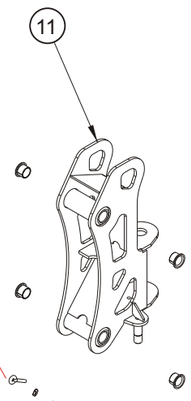
Item	Part No	Qty	Description
0.	12441		Basket rotator assembly
1.	8628	2	Pin keeper, rolled eye, 6mm
2.	3610-06012	2	Bolt, M6 x 12
3.	11492-1	2	Washer, tab
4.	3617-16035	8	Bolt, metric
5.	3631-16	8	Washer, disc lock
6.	13468	1	Load cell
7.	13497	1	Steel basket bottom mount
8.	12330	1	Rotate cylinder
9.	3626-5	2	Bush
10.	3626-3	2	Bush
11.	13563-2	1	Rotator half, basket
12.	13564-1	1	Rotator half, jib

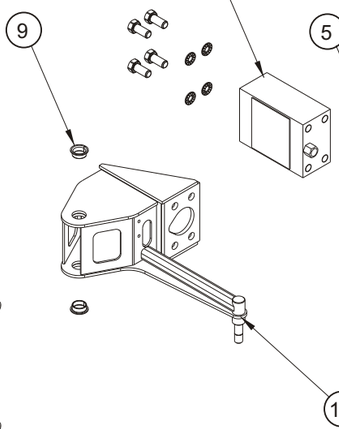


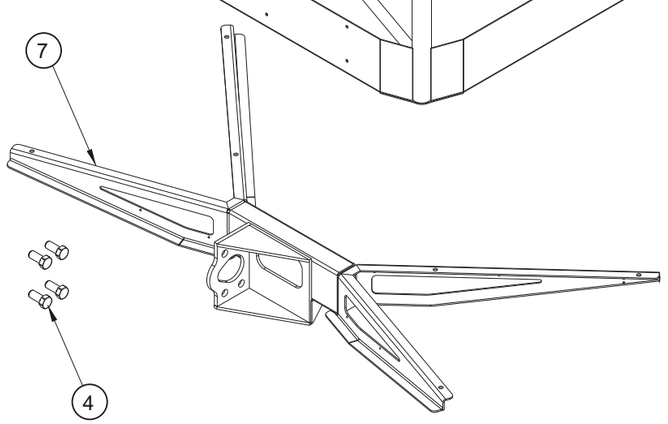


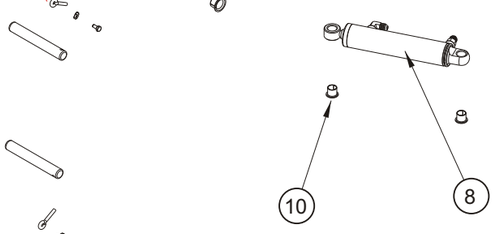




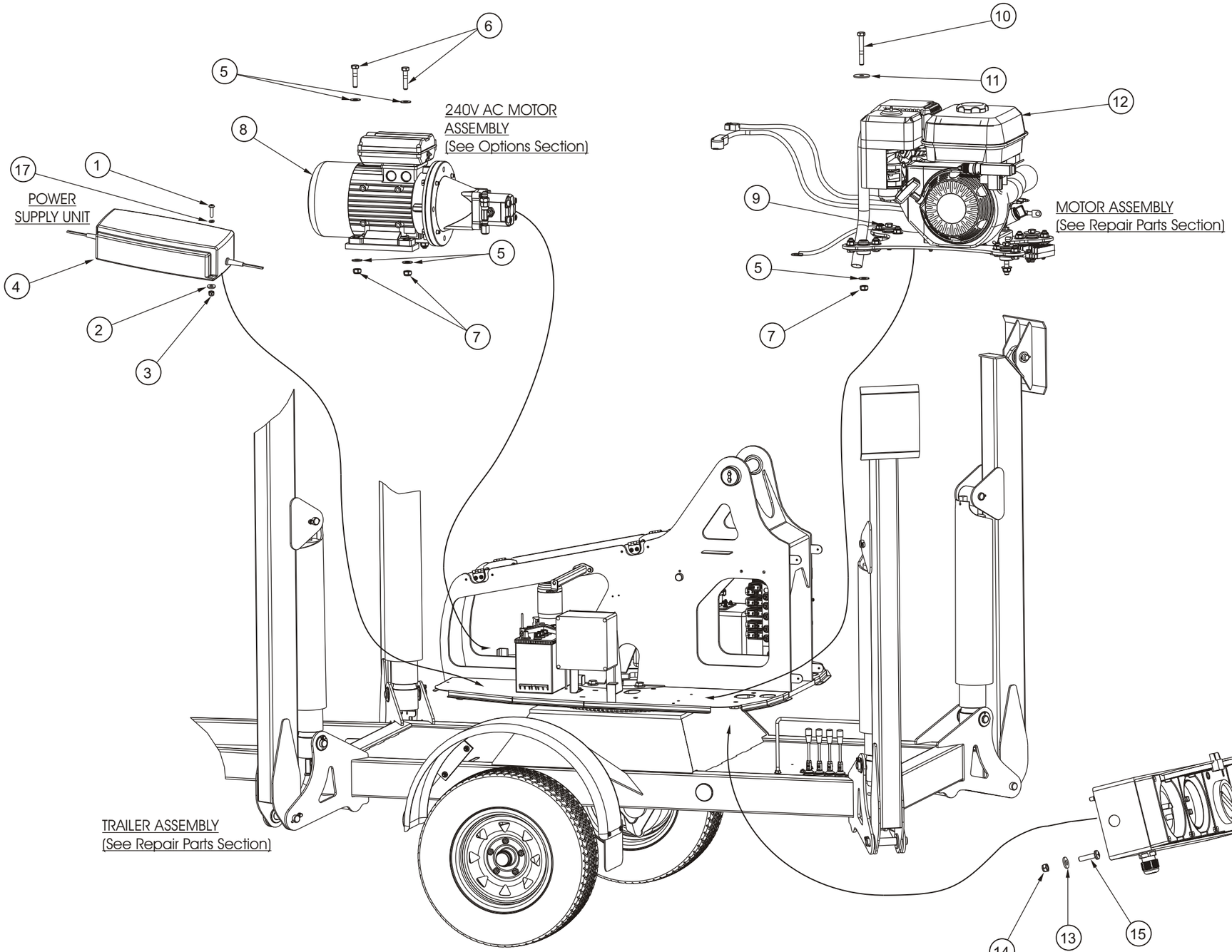








TITLE	Basket Rotator Assembly Sheet 2 Snorkel Models MHP13/35 & MHP15/44 V3
	snorkel
	Page 4-5


6
5
240V AC MOTOR
ASSEMBLY
(See Options Section)
8
17
1
POWER
SUPPLY UNIT
4
2
3
5
7
TRAILER ASSEMBLY
(See Repair Parts Section)

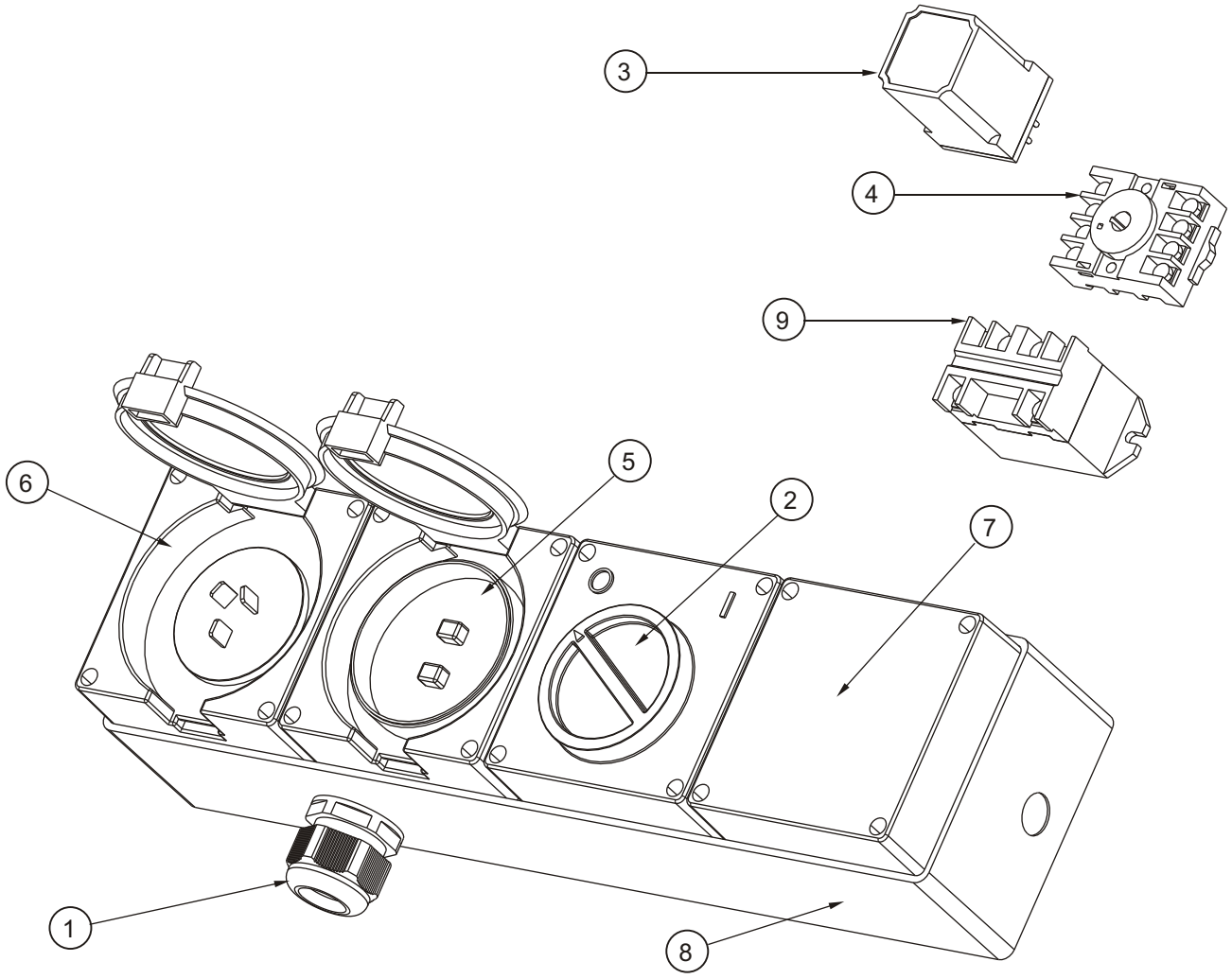
10
11
12
MOTOR ASSEMBLY
(See Repair Parts Section)
9
5
7

16
ELECTRIC MOTOR SUPPLY BOX
(See Options Section)
14
13
15

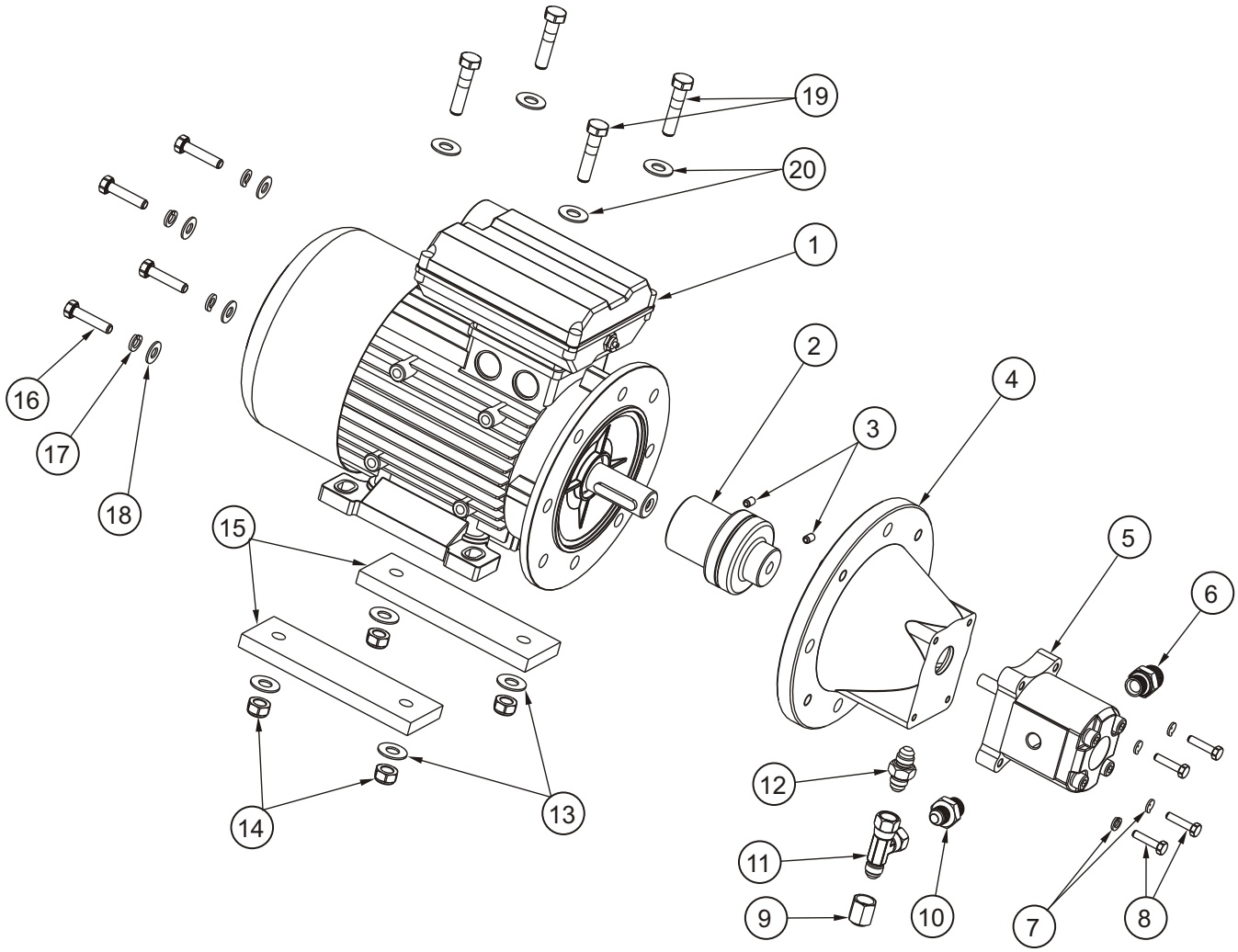
Item	Part no	Qty	Description
0.	12436		Honda 240V Gas/AC option
1.	3668-04016	2	Screw
2.	3603-04	2	Plain washer
3.	3611-04	2	Nylock nut
4.	12779	1	Power supply unit
5.	3603-10	12	Plain washer
6.	3610-10045	4	Bolt
7.	3611-10	8	Nylock nut
8.	9018-5	1	240V AC motor assembly
9.	3610-10055	1	Bolt
10.	3610-10065	3	Bolt
11.	5560179	4	Plain washer
12.	12413A	1	Honda engine assembly
13.	3603-05	4	Plain washer
14.	3611-05	4	Nylock nut
15.	3604-05020	4	Bolt
16.	12486A	1	Electric motor supply box
17.	3605-04	2	Spring washer

Honda 240V Gas/AC option (Sheet 3)

Item	Part No	Qty	Description
0.	12486		Electric motor supply box
1.	1815	1	Compression gland
2.	1865-001	1	Switch
3.	2500-5	1	Relay
4.	2500-6	1	Relay mounting base
5.	10967-1	1	RCD
6.	10967-2	1	Appliance inlet
7.	10967-4	1	Enclosure lid
8.	10967-6	1	Enclosure
9.	11588	1	Relay

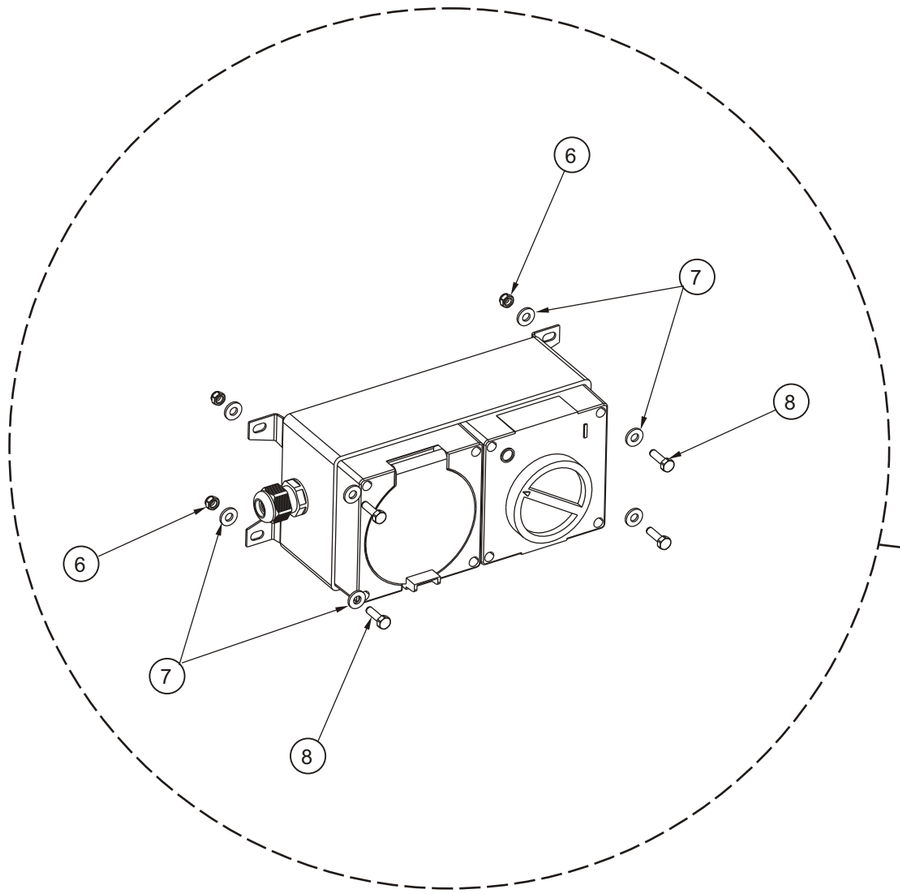


Item	Part No	Qty	Description
0.	12436-1		Pump and motor assembly
1.	1867-001	1	240V AC electric motor
2.	1657-007	1	Coupling taper shaft
3.	3612-06010	2	Grub screw
4.	1658-006	1	Bell housing
5.	11432	1	Pump
6.	7013-004	1	BSPP x JICM nipple
7.	3605-06	4	Spring washer
8.	3610-06025	4	Bolt
9.	6983-001	1	JIC F tapped hole plug
10.	7013-003	1	BSPP x JICM nipple
11.	9501-2	1	Hydraulic fitting
12.	11058-1	1	Check fitting
13.	3605-10	4	Plain washer
14.	3611-10	4	Nylock nut
15.	1867-005	2	Motor foot plate
16.	3610-08035	4	Bolt
17.	3605-08	4	Spring washer
18.	3603-08	4	Plain washer
19.	361070045	4	Bolt
20.	3603-10	4	Plain washer

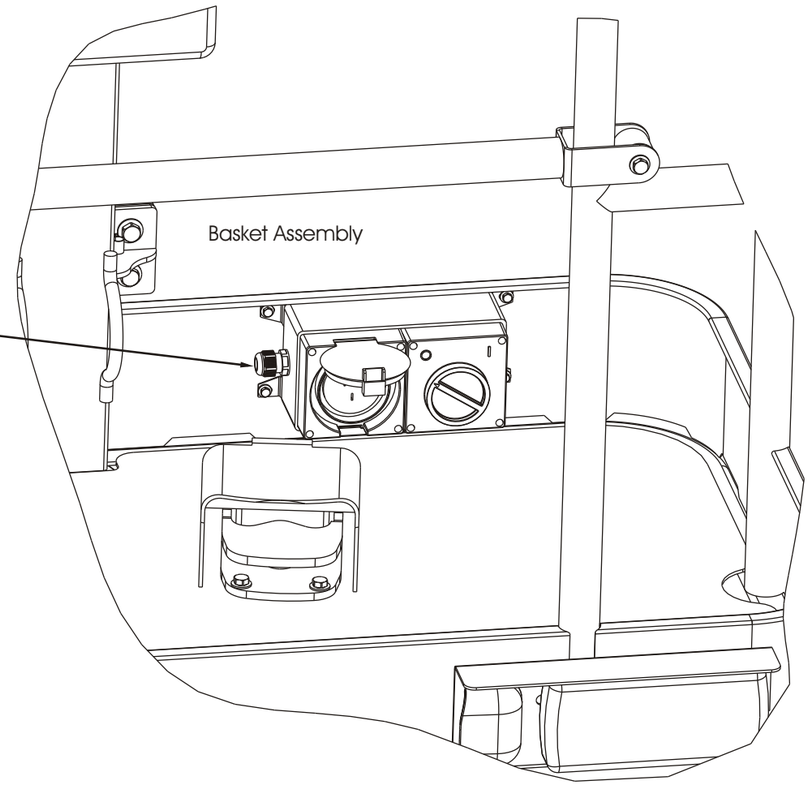


240V AC basket outlet (Sheet 1)

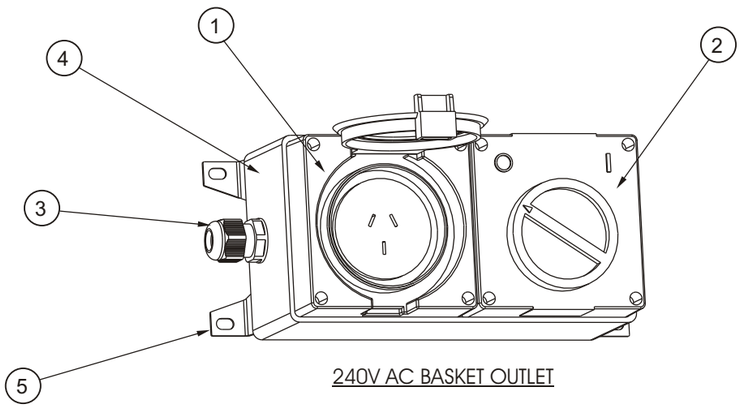
Item	Part No	Qty	Description
0.	12485-2		240V AC basket outlet assembly
1.	1807	1	Appliance outlet
2.	1865-001	1	Switch
3.	10263	1	Compression gland
4.	10967-3	1	Switch enclosure
5.	10967-5	4	Mounting feet
6.	3611-05	4	Nylock nut
7.	3603-05	8	Plain washer
8.	3610-05010	4	Bolt



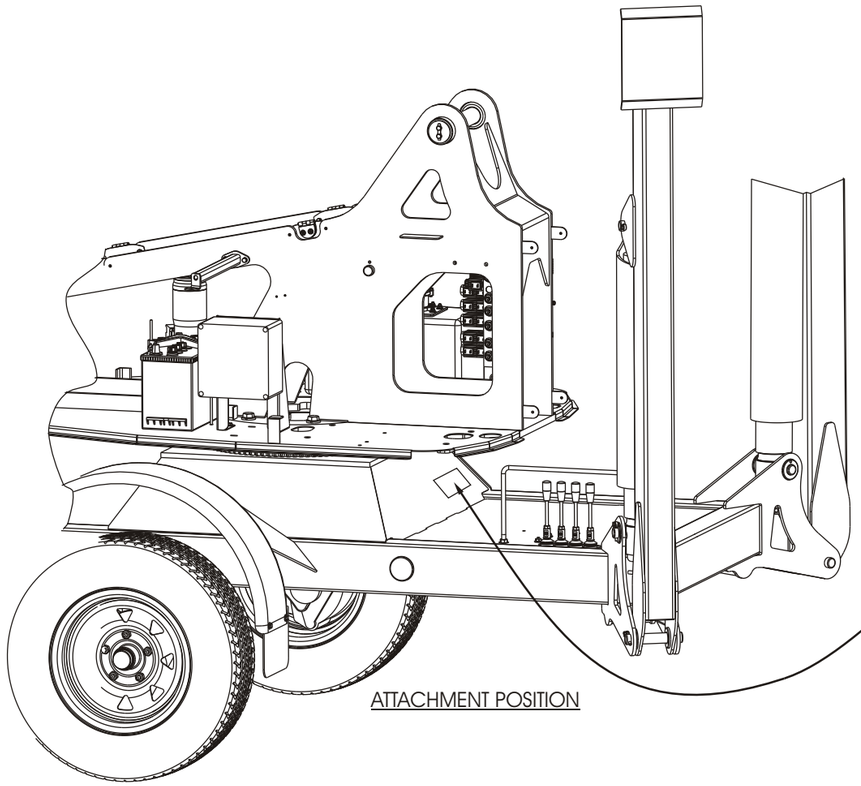
ATTACHMENT DETAIL



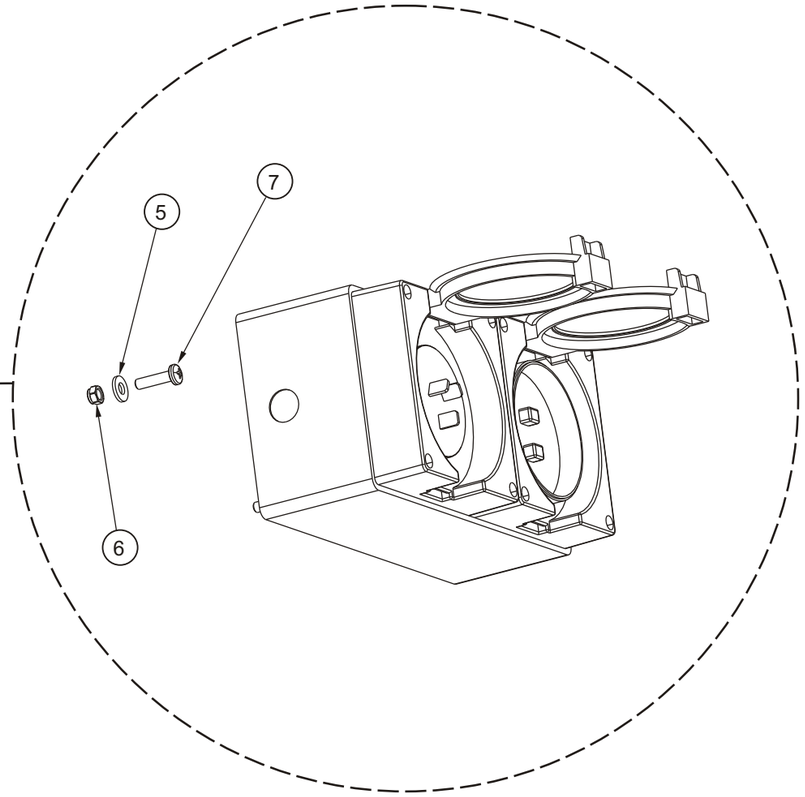
ATTACHMENT POSITION



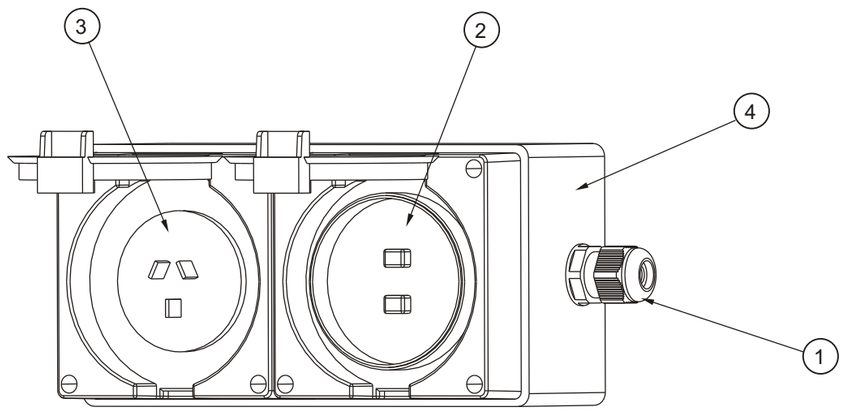
240V AC BASKET OUTLET



ATTACHMENT POSITION



ATTACHMENT DETAIL

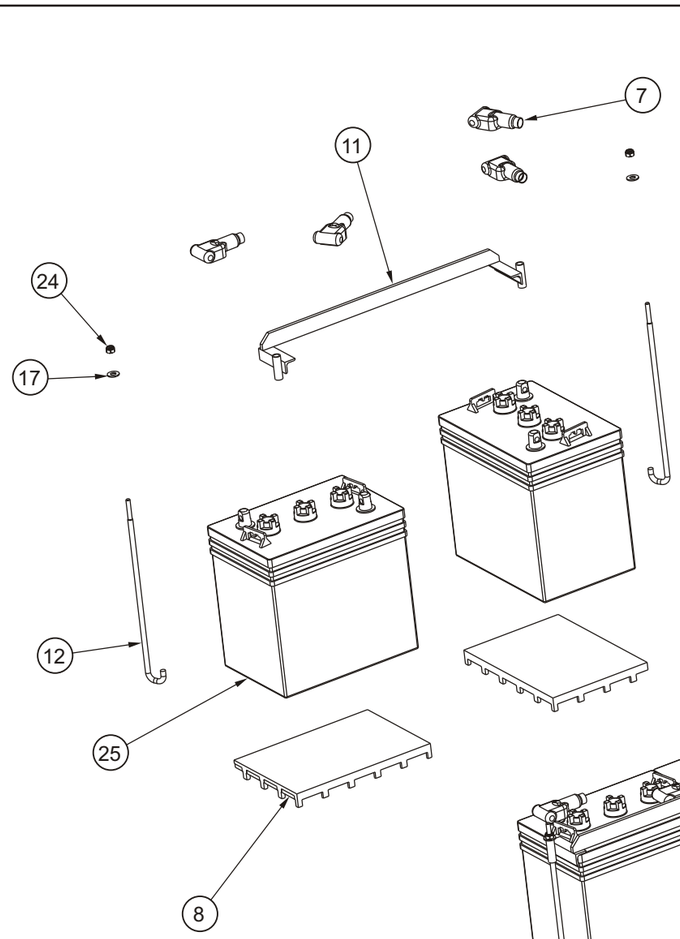


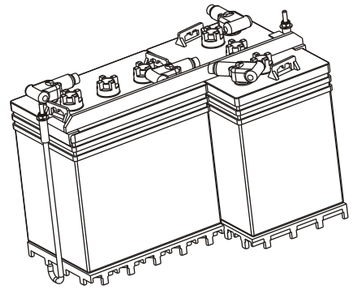
GROUND POWER SUPPLY

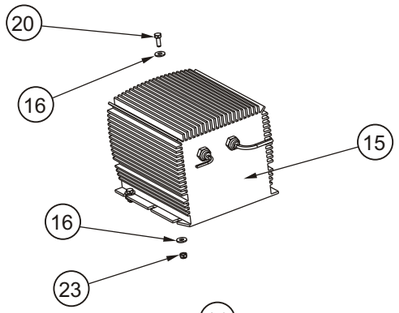
Item	Part No	Qty	Description
0.	12485-1		Ground power supply inlet assembly
1.	10263	1	Compression gland
2.	10967-1	1	RCD
3.	10967-2	1	Appliance inlet
4.	10967-3	1	Enclosure
5.	3603-05	4	Plain washer
6.	3611-05	4	Nylock nut
7.	3604-05020	4	Bolt

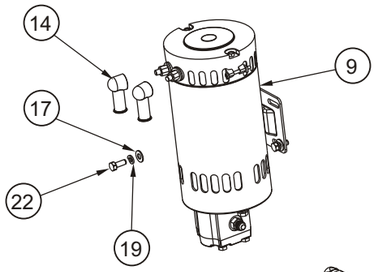
Bi-Energy power option (Sheet 1)

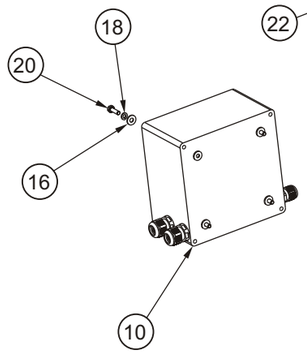
Item	Part No.	Qty	Description
1.	12413A	1	Honda engine assembly
2.	3566-1	1	Check valve
3.	3603-10	4	Plain washer
4.	3610-10065	4	Bolt
5.	3611-10	4	Nylock nut
6.	5560179	4	Washer, special
7.	11946	8	Rubber boot
8.	12434-10	4	Battery pad
9.	12434A	1	Pump assembly 24V DC
10.	12705	1	24Volt master switch assembly
11.	12706	2	Battery clamp
12.	12706-11	4	Battery "J" bolt
13.	12707	1	24V - 12V converter
14.	3040269	2	Cable boot
15.	3059907	1	Battery charger
16.	3603-06	16	Plain washer
17.	3603-08	8	Plain washer
18.	3605-06	8	Spring washer
19.	3605-08	4	Spring washer
20.	3610-06012	8	Bolt
22.	3610-08020	4	Bolt
23.	3611-06	4	Nylock nut
24.	3611-08	4	Nylock nut
25.	92222-1	4	6V battery

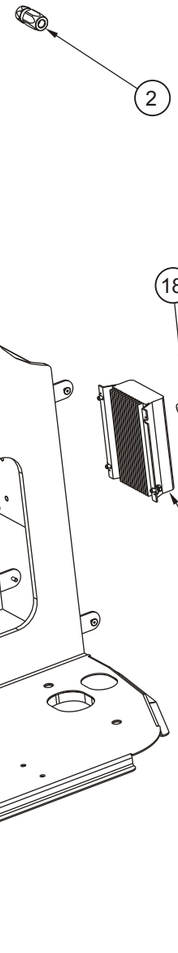


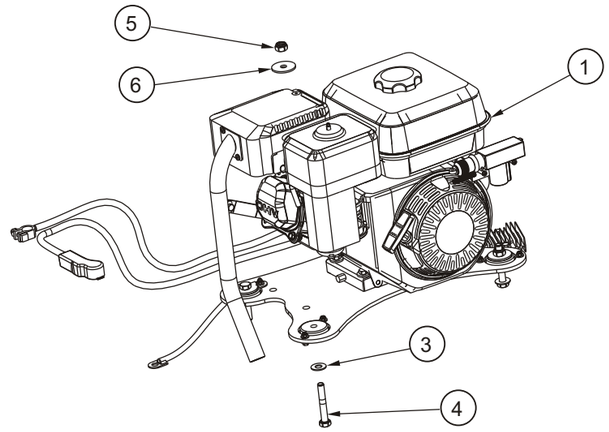






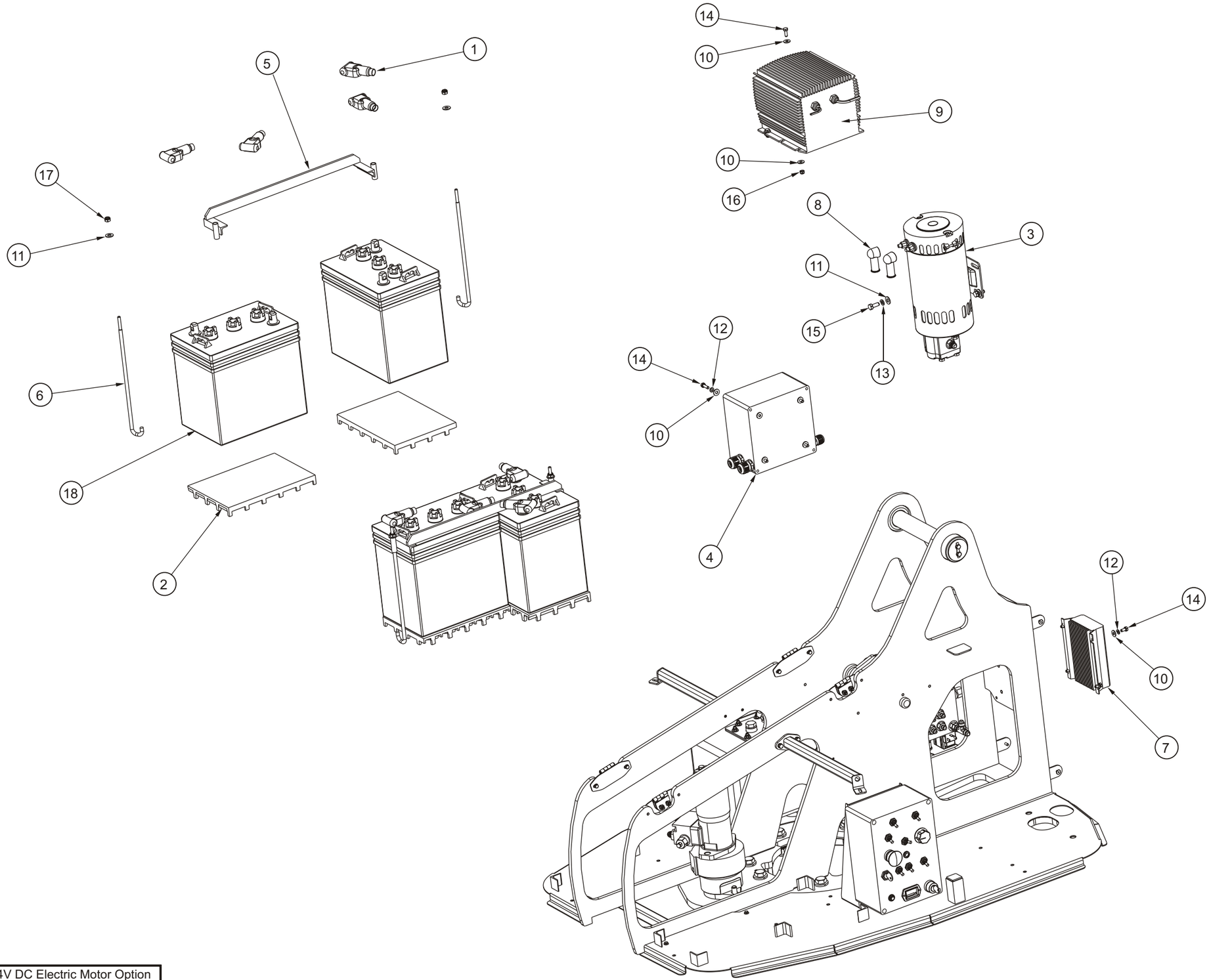






TITLE Bi-Energy power option
Sheet 2
Snorkel Models MHP13/35 & MHP15/44 V3

snorkel

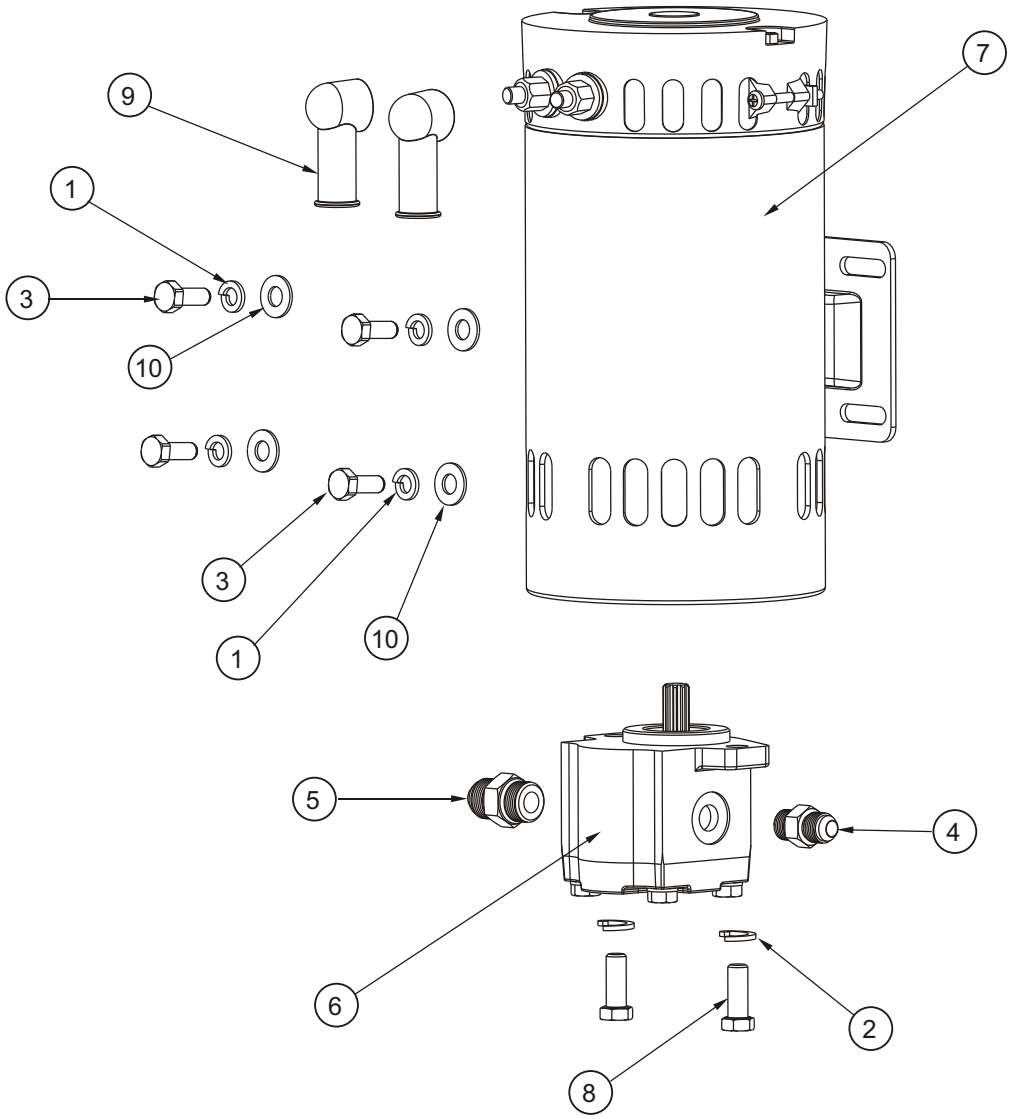

1
5
17
11
6
18
2
14
10
9
10
16
8
3
11
15
12
13
14
10
4
12
14
10
7

24V DC electric motor option (Sheet 2)

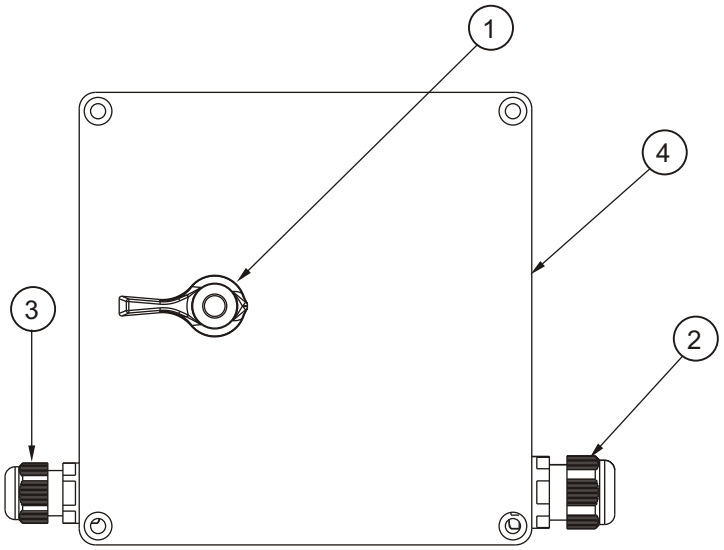
Item	Part No.	Qty	Description
0.	12434		24V DC Electric motor option
1.	11946	8	Rubber boot
2.	12434-10	4	Battery pad
3.	12434A	1	Pump assembly 24V DC
4.	12705	1	24Volt master switch assembly
5.	12706	2	Battery clamp
6.	12706-11	4	Battery "J" bolt
7.	12707	1	24V - 12V converter
8.	3040269	2	Cable boot
9.	3059907	1	Battery charger
10.	3603-06	16	Plain washer
11.	3603-08	8	Plain washer
12.	3605-06	8	Spring washer
13.	3605-08	4	Spring washer
14.	3610-06012	8	Bolt
15.	3610-08020	4	Bolt
16.	3611-06	4	Nylock nut
17.	3611-08	4	Nylock nut
18.	92222-1	4	6V battery

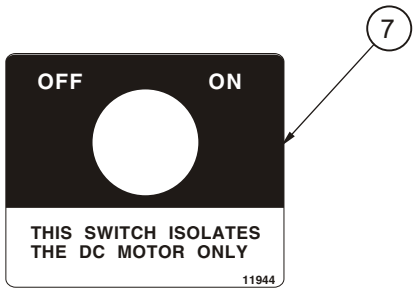
24V DC electric motor option (Sheet 3)

Item	Part No.	Qty	Description
0.	12188		Emergency pump assembly
1.	3605-08	4	Spring washer
2.	3605-10	2	Spring washer
3.	3610-08020	4	Metric bolt
4.	7025-001	1	Adaptor JICM - UNO
5.	7025-003	1	Adaptor JICM - UNO
6.	11930	1	Pump
7.	3080046	1	24V DC motor
8.	60017-007	2	Bolt
9.	3040269	2	Cable boot
10.	3603-08	4	Flat washer



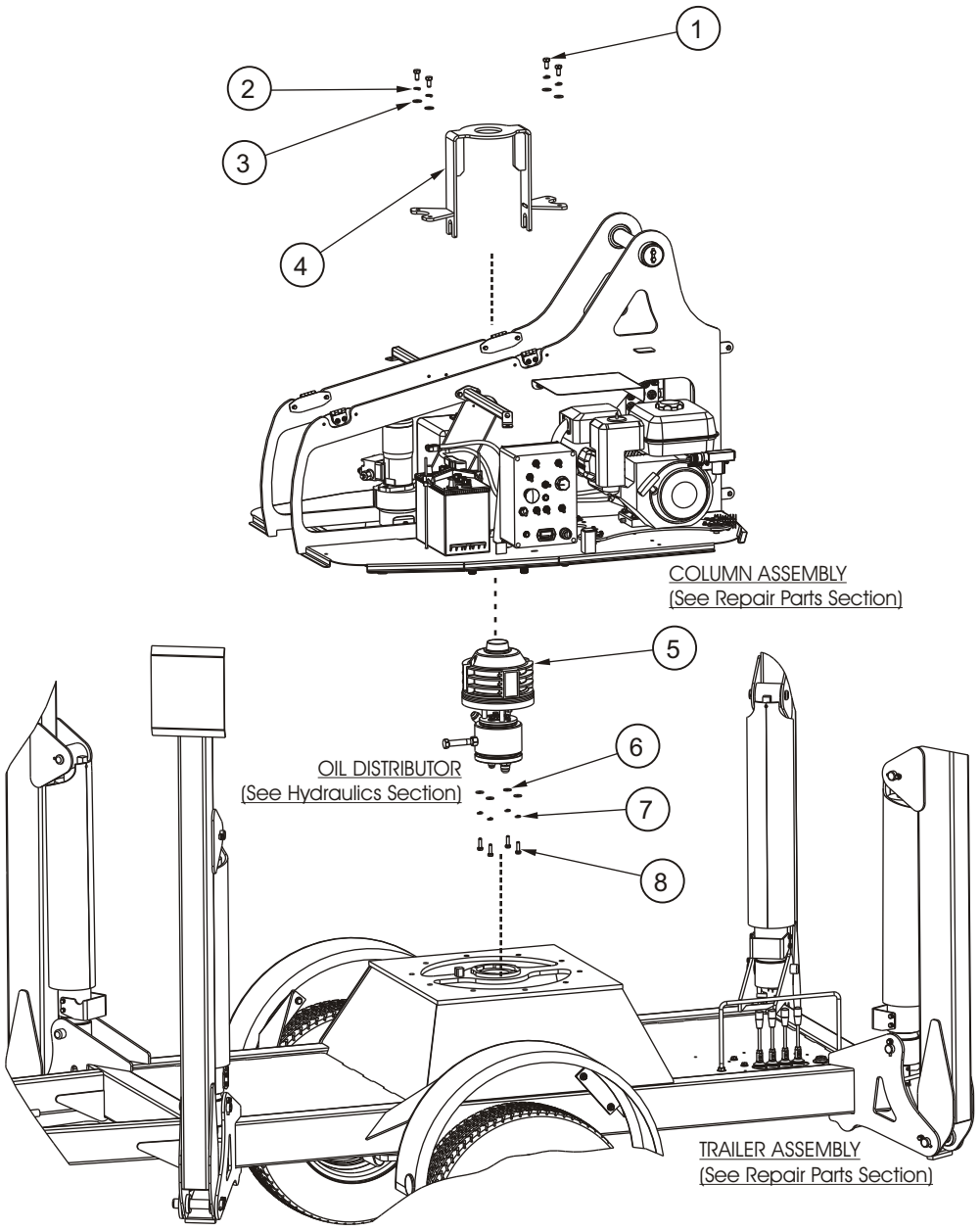
Item	Part No.	Qty	Description
0.	12705		Master switch assembly
1.	302-0049	1	Battery disconnect switch
2.	1814	2	Cable gland
3.	10263	1	Compression gland
4.	11408	1	Enclosure
5.	3040671	1	Contator, 12 volt (not shown)
6.	44607-6	1	Fuse (not shown)
7.	11944	1	Decal, DC motor isolator
8.	3611-04	4	Nylock nut (not shown)
9.	3604-04020	4	Screw (not shown)
10.	3603-04	4	Flat washer (not shown)



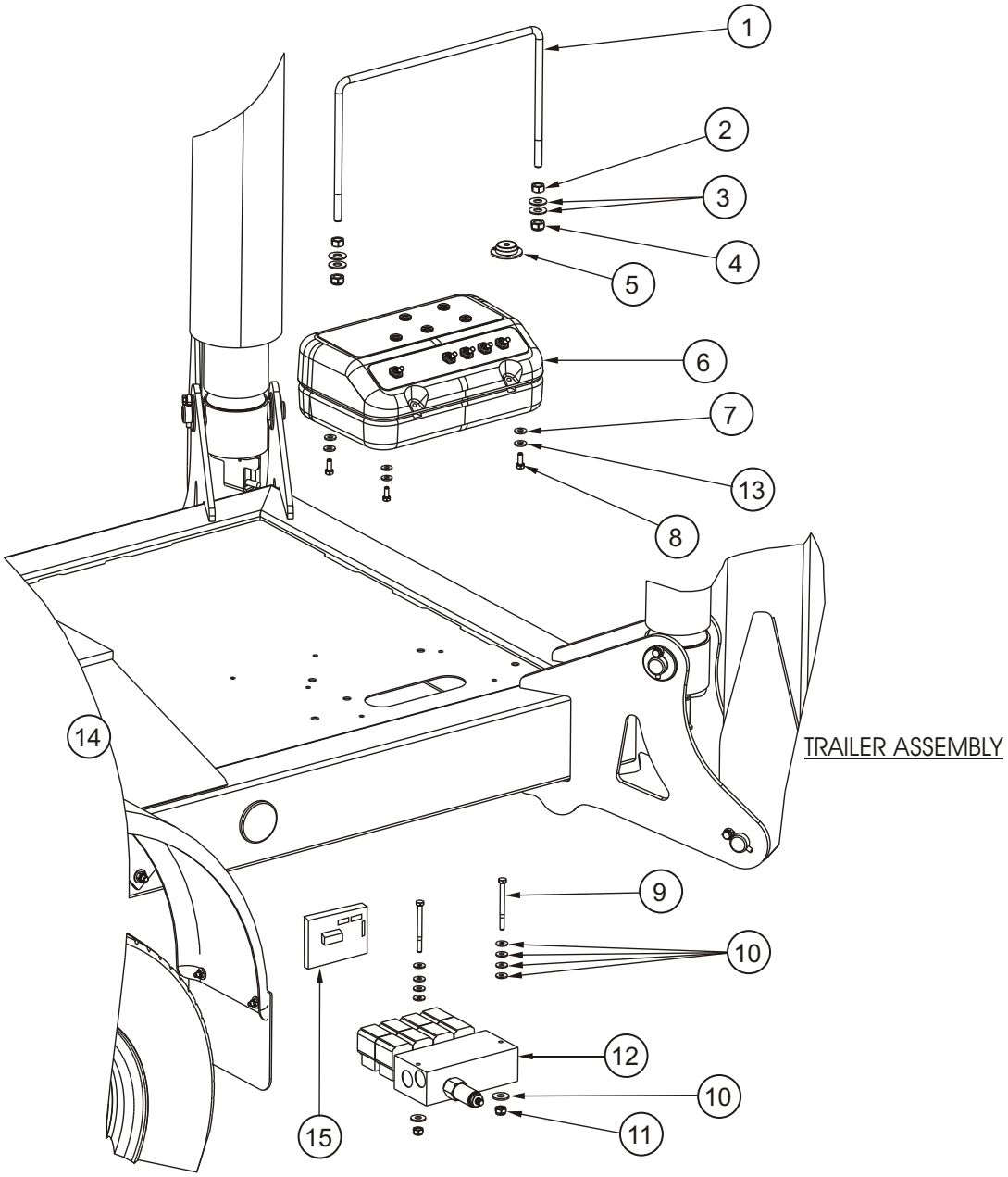


Continuous rotation option

Item	Part No	Qty	Description
0.	12443		Continuous rotation option
1.	3610-08016	4	Bolt
2.	3605-08	4	Spring washer
3.	3603-08	4	Flat washer
4.	12679-40	1	Moving bracket
5.	12679A	1	Oil distributor
6.	3603-06	4	Flat washer
7.	3605-06	4	Spring washer
8.	3610-06020	4	Bolt

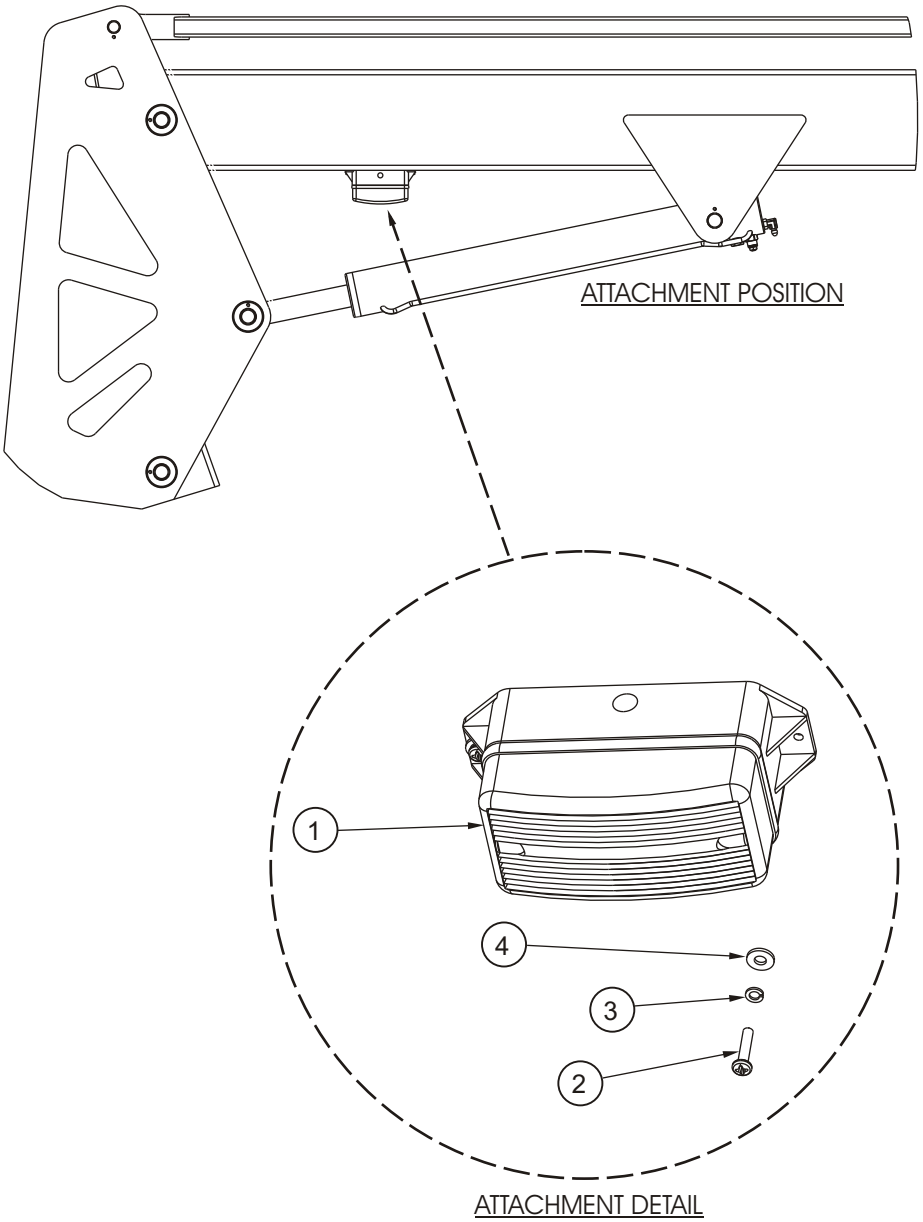


Item	Part No	Qty	Description
0.	12433		Auto stabiliser option, Trionics
1.	12418	1	Control lever guard
2.	3602-10	2	Nut
3.	3603-10	4	Plain washer
4.	3611-10	2	Nylock nut
5.	1273	1	Level bubble
6.	12433-1	1	Control box, auto stabiliser
7.	3603-05	8	Plain washer
8.	3610-05012	4	Bolt
9.	3610-06070	2	Bolt
10.	3603-06	10	Plain washer
11.	3611-06	2	Nylock nut
12.	11921A	1	Manifold block - auto stabiliser
13.	3605-05	4	Spring washer
14.	12545	1	Decal, auto stabiliser operation (not shown)
15.	12546	1	Printed circuit board

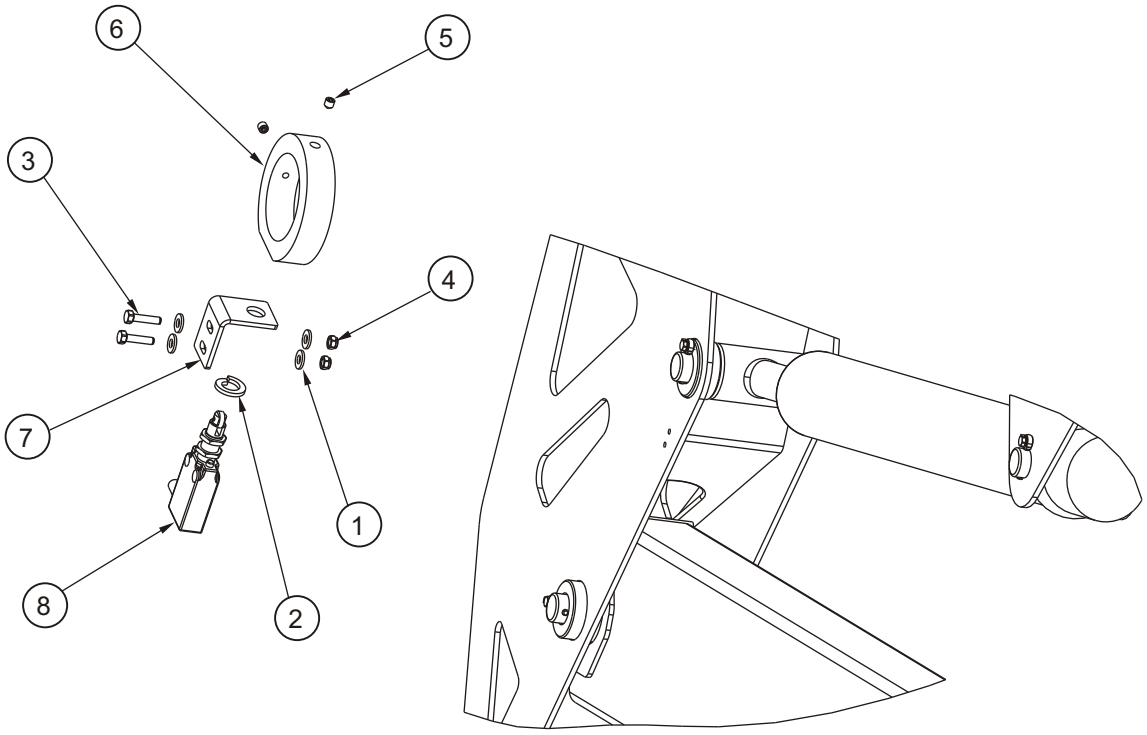


Flashing light option

Item	Part No	Qty	Description
0.	12488A		Flashing light assembly
1.	12488	1	Flashing light
2.	3604-04020	2	Bolt
3.	3605-04	2	Spring washer
4.	3603-04	2	Plain washer



Item	Part No	Qty	Description
0.	12462		10.9 metre kit
1.	3603-05	4	Plain washer
2.	3605-12	1	Spring washer
3.	3610-05020	2	Metric bolt
4.	3611-05	2	Nyloc nut
5.	3612-06006	2	Grub screw
6.	12518	1	Cam, 10.9 metre option
7.	12518-2	1	Bracket, 10.9 cam switch
8.	12525	1	Limit switch
			Not shown is key switch - Refer to lower control box on page



Parts index - Page locator

Printed in New Zealand

Product Warranty

1) 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. The warranty will apply subject to the machine being operated in accordance with the rules, precautions, instructions and maintenance requirements outlined in the Snorkel Operator and Parts/Service manual.

2) Snorkel further warrants the structural components, specifically the mainframe chassis, turntable, booms and/or 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 Warranty department, are found to be defective will be replaced or repaired by Snorkel through its local Authorised Dealer. The structural warranty specifically excludes adverse affects on the machine structure arising from damage, abuse or misuse of the equipment.

3) Machines may be held in an authorised Distributor stock for a maximum of six (6) months from the date of shipment from Snorkel, before the warranty period is automatically initiated.

4) It is the responsibility of the Distributor to complete and return a Pre delivery /Warranty registration, before the act of rental / loan / demonstration of the machine or delivery to an end user.

5) The Customer and Dealer shall not be entitled to the benefits of this warranty and Snorkel shall have no obligations here under unless the "Pre-Delivery and Inspection Report" has been properly completed and returned to the Snorkel Warranty department within ten (10) days after delivery of the Snorkel product to the Customer or Dealer's demonstration / 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.

6) Any part or parts which upon examination by the Snorkel Product Support Department are found to be defective within the specified warranty period, will be replaced or repaired at the sole discretion of Snorkel, through its local Authorised Distributor, at no charge.
Any parts replaced under warranty must be original Snorkel parts obtained through an authorised Snorkel Distributor unless expressly agreed otherwise in writing and in advance by Snorkel's warranty department.

7**)** All parts being claimed under warranty must be held available for return and inspection upon request for a period of 90 days from date of claim submission, it is necessary that all parts are individually tagged or marked with their part number and the warranty claim number. After 90 days all parts replaced under warranty which have not been returned to Snorkel should be destroyed. Failure to produce parts requested by the Warranty Administrator for inspection within a period of 14 days will result in the claim being automatically rejected in full. Materials returned for warranty inspection must have the following procedure :

- Carefully packaged to prevent additional damage during shipping
- Drained of all contents and all open ports capped or plugged
- Shipped in a container tagged or marked with the RMA number
- Shipped PREPAID. Any item(s) returned for warranty by any other means maybe refused and returned, unless prior approval is agreed with Snorkel.

Product Warranty

8**)** At the direction of the Snorkel Warranty department, any component part (s) of Snorkel products to be replaced or repaired under this warranty programme must be returned freight prepaid for inspection.
An RMA (Returns material authorisation) must be requested from Snorkel Warranty department, a copy to be placed with the returning component part(s)

9) All warranty replacement part will be shipped freight prepaid (standard charge) from the Snorkel Parts Service Department or from the Vendor to Dealer or Customer.

10) All warranty claims are subject to approval by Snorkel Service department. Snorkel reserves the right to limit or adjust claims with regard to defective parts, labour or travel time based on usual and customary guidelines.

REPLACEMENT PARTS WARRANTY

Any part replaced under this limited warranty is not subject to further warranty cover beyond the normal warranty period of the machine upon which the part was installed.

Any replacement parts sold (not delivered under a warranty claim) will be subject to a warranty period of (6) six months from the date of invoice.

Parts held by a Distributor are covered under warranty for a period of (12) twelve months from the date of invoice, provided that those parts have been subject to appropriate storage to prevent damage and deterioration.

CLAIM PROCEDURE

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

When a Distributor / Customer perceive a warranty issue to exist the following steps must be adhered to:

All warranty claims must be submitted within 30 days of the date of the machine repair

All correspondence in respect of the claim to be on an official Snorkel warranty claim form as supplied by Snorkel's warranty department

Allocate a warranty claim number to the repair

Place a purchase order for genuine Snorkel replacement parts

Snorkel to dispatch parts via the requested method (in line with the required response time)

Confirmation that a qualified technician is available to replace the part and that this person has been accepted by Snorkel to carry out such work under the warranty of the machine. Failure to do this may nullify the warranty.

FREIGHT DAMAGE

If a machine is received in a damaged condition, then the damage must be noted on the bill of lading and /or delivery documents and if possible photographs taken, prior to signing acceptance of the consignment.
The freight company must be contacted by the Distributor and a damage claim registered immediately.

Product Warranty

THIS WARRANTY EXCLUDES AND SNORKEL DOES NOT WARRANT:

1. Engines, motors, tyres and batteries 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 Distributor / Customer.
2. Any Snorkel product which has been modified or altered outside Snorkel factory without Snorkel written approval, if such modification or alteration, in the sole judgment of Snorkel 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 and abuse, 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, and repair Parts Manuals.
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. Routine maintenance, routine maintenance items and minor adjustments are not covered by this warranty, including but not limited to hydraulic fluid, filters and lubrication, paint and decals.
6. Any Snorkel product that has come into direct contact with any chemical or abrasive material.
7. 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, expenses 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
8. Snorkel Warranty policy does not cover any duties, taxes, environmental fees including without limitation, disposal or handling of tyres, batteries and petrochemical items.
9. Item specifically excluded are, fuel injectors, motor brushes, glow plugs, contactor tips and springs, oil filters, lamp bulbs, lamp lenses, o rings, coolants, lubricants and cleaning material.
10. Failure of replacement parts due to fault misdiagnosis or incorrect fitting by the Distributor / Customer

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 Authorised 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

Product Warranty

APPEAL

The buyer may appeal in writing against a rejected or adjusted claim to Snorkel warranty department within a period of 21 days of receiving the rejection or adjustment notice. The appeal should be grounded on express reasons and supported by relevant evidence. Appeals received outside of this time limit will not be considered.

WARRANTY SCHEDULE

Limited Warranty Periods

Item	Warranty Period
New machine materials and workmanship	**I year parts replacement**
Structural components (Chassis, Turntable, Booms, Scissors)	**5 years parts replacement or repair**
Parts held in a Distributor's stock	**12 months from date of invoice**
Parts sold (non warranty)	**6 months from date of invoice**
Batteries	**6 months from warranty registration date**
Other specifically excluded parts: **Fuel injectors** **Motor brushes** **Glow plugs** **Contactor tips and springs** **Oils** **Filters** **Lamp bulbs** **Lamp lenses** **'O' rings** **Coolants** **Lubricants** **Cleaning materials**	**Not covered by Warranty**

Local Distributor / Lokaler Vertiebshändler / Distributeur local
El Distribuidor local / Il Distributore locale

EUROPE, MIDDLE EAST AFRICA & ASIA

PHONE: +44 (0) 845 1550 O57
FAX: +44 (0) 845 1557 756

NORTH & SOUTH AMERICA

PHONE: +1 785 989 3000
TOLL FREE: +1 800 255 0317
FAX: +1 785 989 3070

AUSTRALIA

PHONE: +64 2 9725 4000
FAX: +64 2 9609 3057

NEW ZEALAND

PHONE: +64 6 3689 168
FAX: +64 6 3689 164

snorkel
www.snorkellifts.com