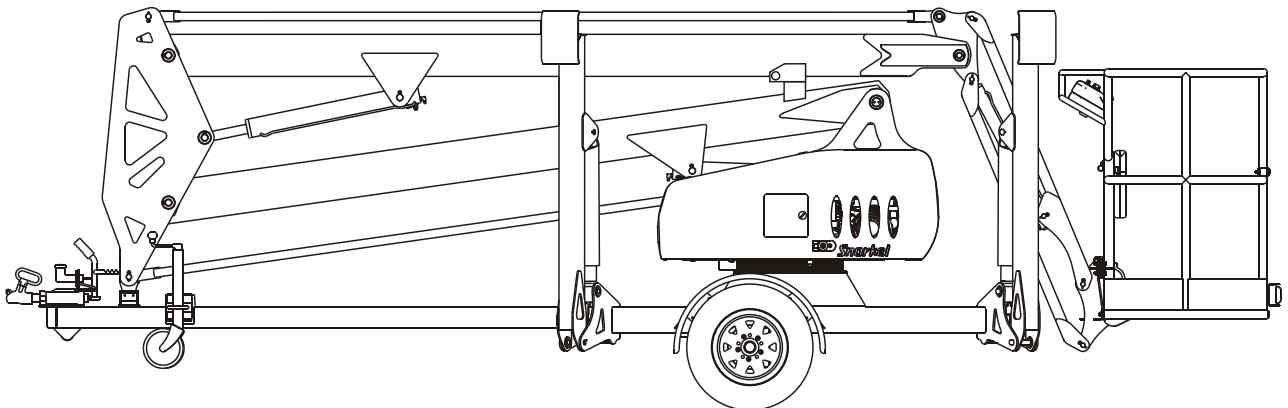


Snorkel

Maintenance and Repair Parts Manual

MHP 13/35

**Engine Powered
Gasoline/Diesel
Battery Electric**



LIMITED WARRANTY

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

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

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

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

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

REPLACEMENT PARTS WARRANTY

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

THIS WARRANTY EXCLUDES AND SNORKEL DOES NOT WARRANT:

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

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

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

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

Effective July 1995

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Section A. - General Specifications

The Snorkel MHP13/35 is a boom supported elevating work platform built to conform to these standards, American Standard ANSI A92.2-2001

Canadian Standard C225-00 2002

Australian Standard AS1418-10(Int) 2004 Elevating Work Platforms.

■ General Specifications

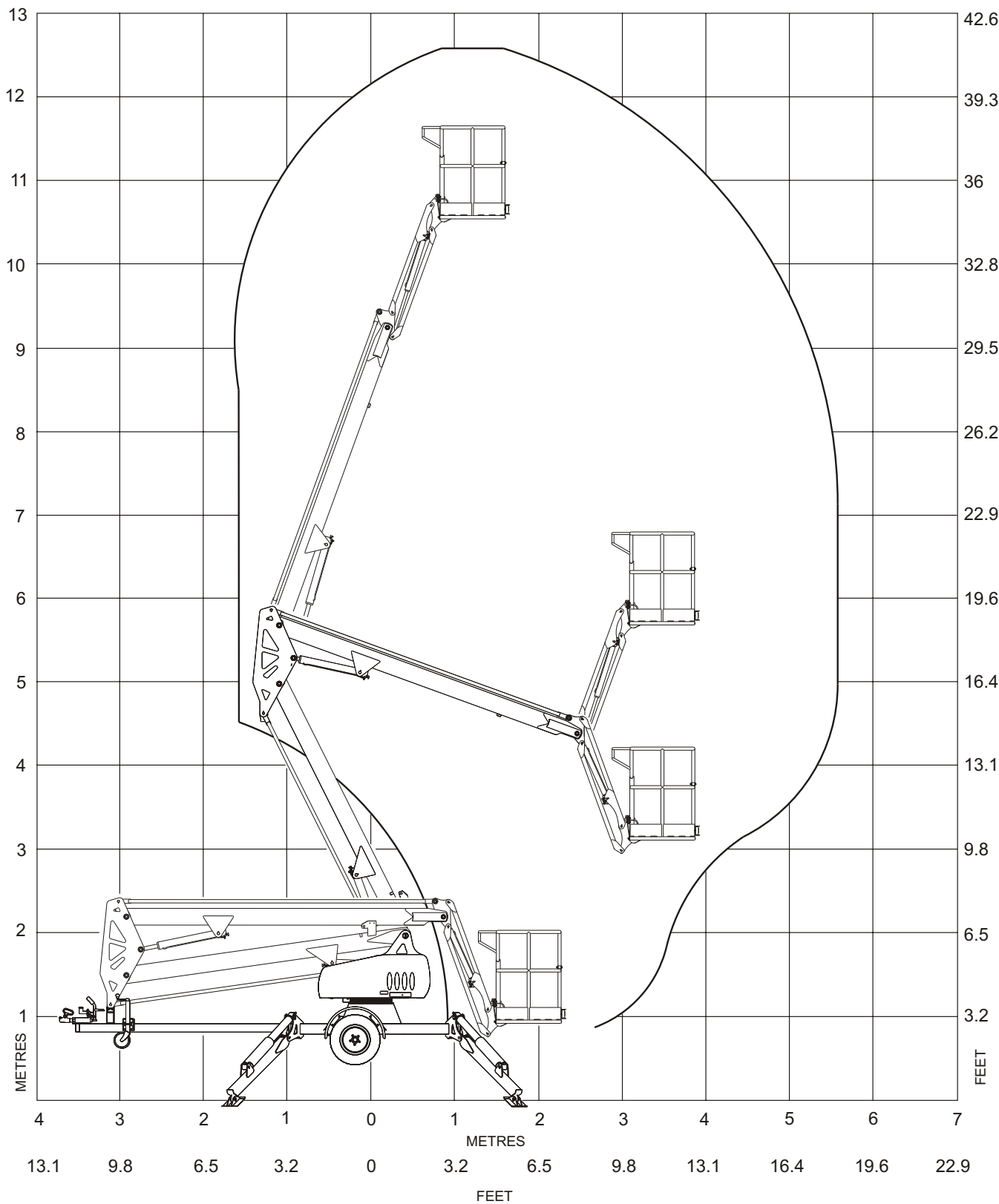
SPECIFICATIONS	MHP13/35	
Working height	12.6m	41'
Platform height	10.6m	35'
Rated load	250kg	550lb
Rated load (with rotator)	227kg	500lb
Platform size	1250 x 780 x 1070mm	4.1' x 2.6' x 3.5'
Platform construction	Steel	
Platform levelling	Mechanical	
Boom type	Articulating	
Horizontal reach	5.6m at 6m	19' 8" at 19' 8"
Maximum wind speed 12.5m/s	45kph	28mph
Turntable rotation	540° non-continuous or 360° 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	2.05m	6' 8"
Overall length	5.99m	20' 4"
Overall width - outriggers extended	3.7m	12' 1"
Overall width - outriggers stowed	1.58m	5' 2"
Tyre size	165 x 13LT	
Brakes	Hydraulic disc	
Maximum towing speed	80kph	50mph
Maximum rated axle capacity	1500kg	3306.9lb
Weight (standard model)	1200kg	2645lb
Insulation rating	Nil	
Trailer tongue weight	65kg	143lb

General Specifications

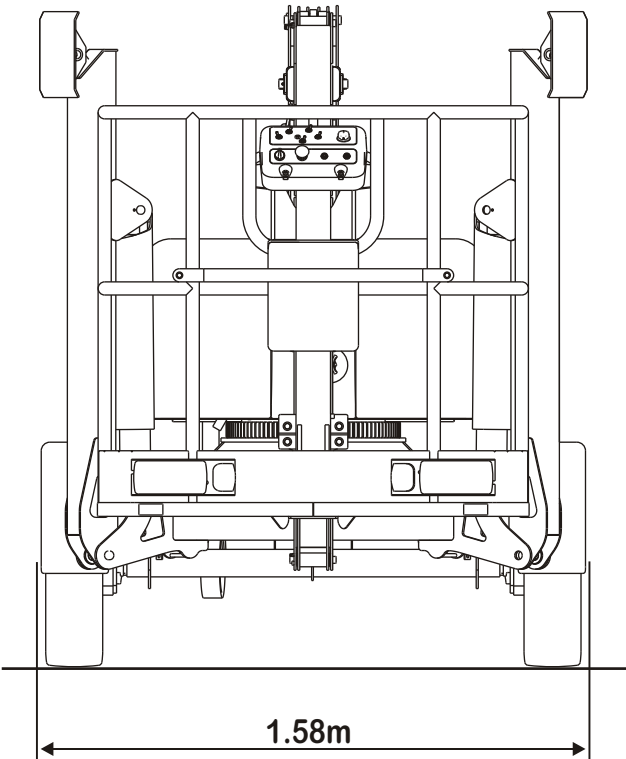
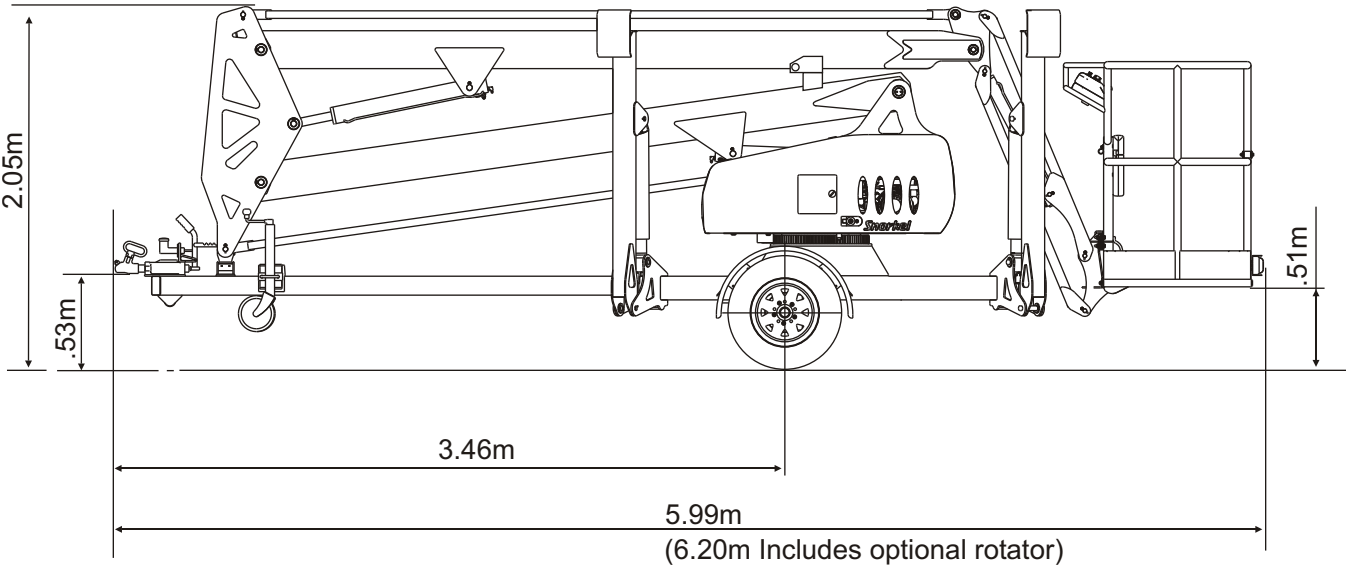
■ Engine Specifications

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

Working Envelope



General Specifications



■ 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 14 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.

□ 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.

Maintenance Information

- ✓ 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)

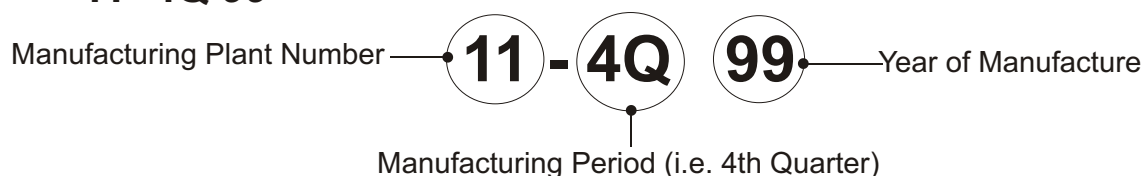
■ Hydraulic Hose Age

EN982 Clause 7.3.1 requires the manufacturing date of each hydraulic hose to be clearly visible on the hose.

Hoses used in production of this unit are manufactured by Parker and the manufacturing date is present in a coded format.

The key to decode the date is as follows:

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



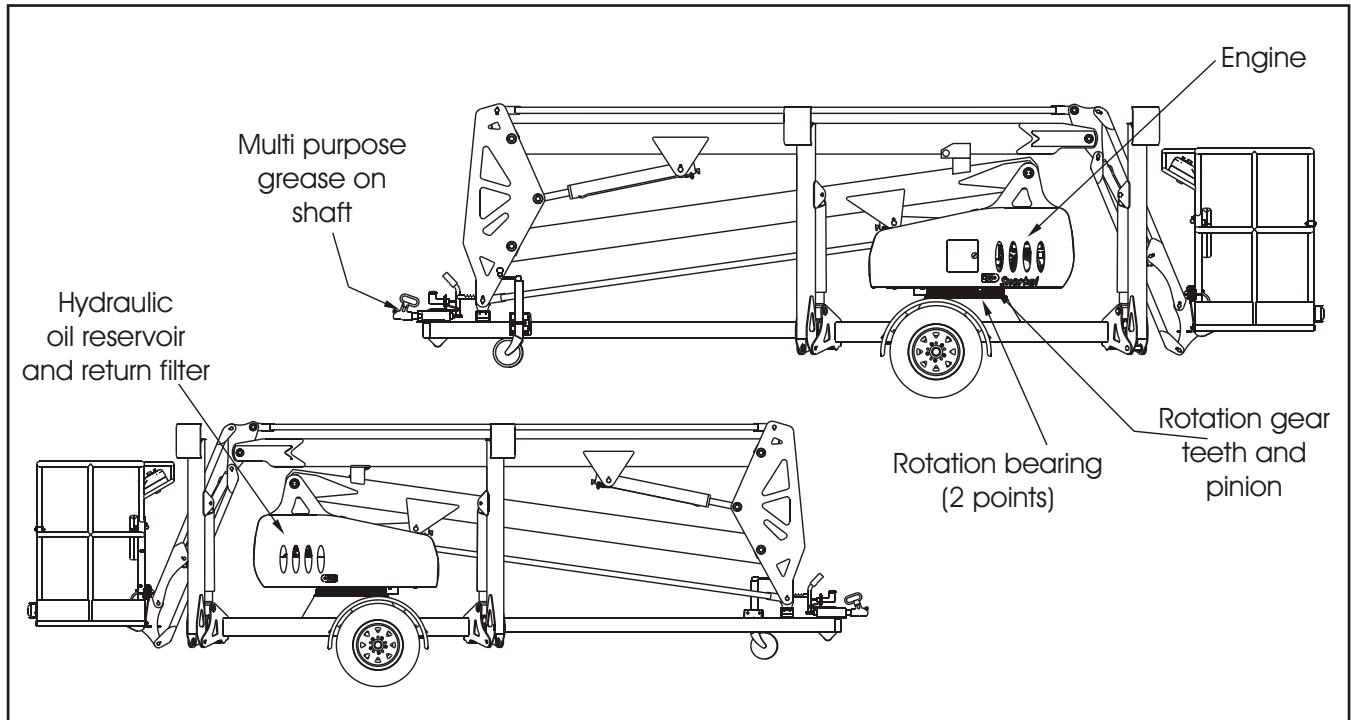
Maintenance Information

■ 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.

■ Lubricants

Specific lubricants as recommended by Snorkel, should be used in maintaining your unit. 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 front 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.

Maintenance Information

If questions still remain, contact Snorkel for further information.

❑ Return filter

Return filter. On MHP13/35 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 is equipped with an (optional) hydraulic pressure gauge to indicate the filter element condition. A by-pass relief within the filter base is provided and is set to by-pass at 25 PSI. If pressure readings are above 25 PSI, the filter should be changed.

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

The filter condition indicator is accurate only when the engine is running at maximum RPM and pump is discharging maximum flow, which occurs only during full speed. This requires that the indicator be observed while the unit is in motion. Oil temperature should be at least 70 degrees.

⚠ CAUTION

Use extreme caution while observing the condition indicator because of the motion of the boom. The condition indicator is best observed from outside of the tract of the vehicle wheels to avoid a possible unsafe condition.

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.

■ 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.

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

[illegible]MHP13/35 – 12431B

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.

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

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   							

Maintenance Information

■ 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
36 Bruce Road
P.O. Box 1041
Levin 5500
New Zealand

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

Attention: Parts Department

□ Manuals

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

The specific manuals for MHP13/35 are as follows:

- ✓ Operator's Manual
Snorkel part number - 12431A
- ✓ Repair Parts Manual
Snorkel part number - 12431B

□ 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

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

□ 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).

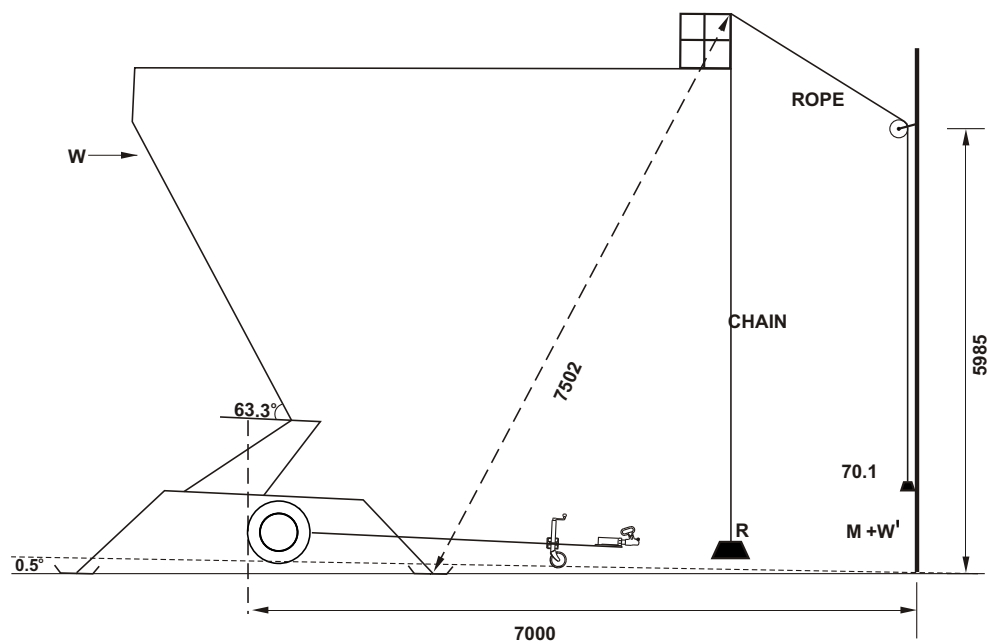
1. Set a pulley with rope, 5.985m above the ground on a fixed pole.
2. Place the machine so that the drawbar is pointing towards the fixed pole. The centre of the slew bearing must be 7m from a point directly beneath the pulley.
3. Raise the machine on the stabilisers to maximum height.
4. Level the 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 boom horizontal). The "Test load" must be between 100 and 200mm above ground.
10. Attach a ratchet tie down to the rope coming from pulley. Attach the other end to the "Load simulating the wind and manual force".
11. Raise the "Load simulating the wind and manual force" with the ratchet tie down until the load is between 100 and 200mm above the ground. Ensure that the loads are not swinging i.e. the loads are static. (If both 'rear' legs lift clear of the ground STOP the test and release the ratchet).

□ Pass Criteria

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

Maintenance Information

□ 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

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Trailer assembly

Item	Part No	Qty	Description
	12426A		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.	3610-06012	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.	3610-12040	4	Metric bolt
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.	8628	12	Pin keeper
24.	9846	4	Foot plate weldment
25.	9875-1	4	Reflector lens, orange
26.	9875-2	2	Reflector lens, white
27.	9948	4	Foot pin
28.	9973-1	1	Safety chain
29.	10993-1	1	Hammer lock
30.	11112-3	1	Boom lock pin
31.	11492-1	12	Tab washer
32.	11572	1	Tow coupling
33.	12467	2	Mudguard, plastic
	11585	2	Optional mudguard (heavy duty steel)
34.	11585-3	2	Mud-flap
	12467-1	2	Plastic mud-flap (goes with plastic mud-guard)
36.	12062	2	Pin lock retainer
37.	12362	1	Axle assembly
38.	3602-10	2	Nut
39.	12405	1	Jockey wheel
40.	12412	4	Stabiliser leg weldment
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.	12421	8	Pin
46.	12422	4	Pin
47.	12426	1	Trailer chassis
48.	12444	1	Slew traveler hold down - (Not used when continuous rotation option fitted)
49.	45500-6	2	Key ring
50.	60000-036	8	Roll pin
51.	3610-20040	1	Bolt
52.	12336A	4	Leg cylinder assembly

Trailer assembly

Item	Part No	Qty	Description
53.	12361A	2	Wheel and tyre assembly
	12361	2	Wheel rim only
54.	3603-20	1	Plain washer
55.	3611-20	1	Nylock nut
56.	3626-5	8	Flanged bush
57.	3626-1	4	Flanged bush
58.	12439	1	Hose protector
59.	3603-12HD	4	Hardened washer
60	3604-06020	2	Screw

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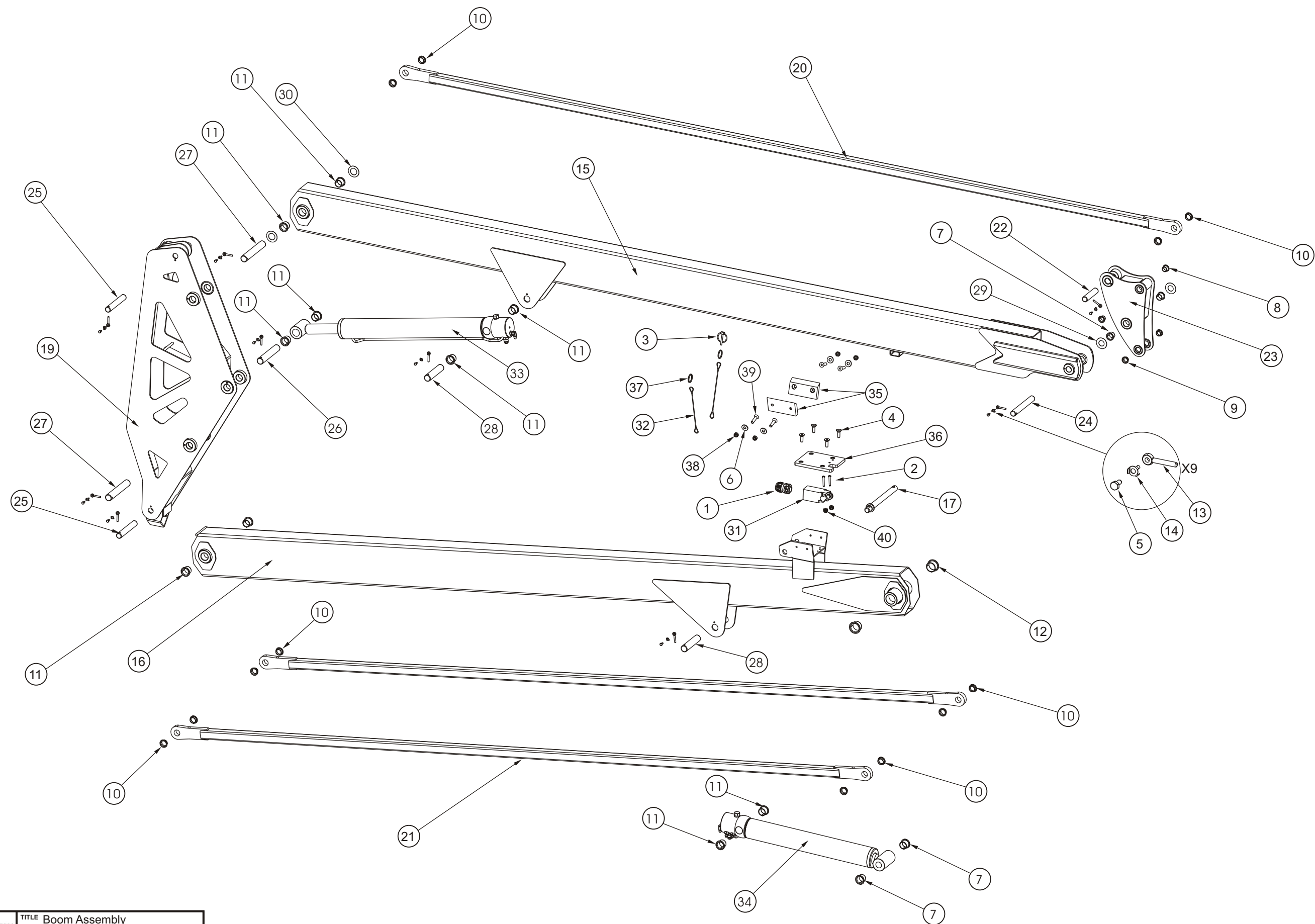
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**Snorkel**
INTERNATIONAL

TITLE Boom Assembly

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Snorkel Model MHP13/35

DWG. 12390

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Item	Part No	Qty	Description
	12390		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.	3610-06012	9	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.	8628	9	Pin keeper
14.	11492-1	9	Tab washer
15.	12371	1	Upper boom weldment
16.	12372	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.	12380	1	Pin
23.	12383	1	Quadrant, jib/upper boom weldment
24.	12393	1	Pin
25.	12394	2	Pin
26.	12395	1	Pin
27.	12396	2	Pin
28.	12397	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	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)

Jib boom assembly before SN NZ051005

Item	Part No	Qty	Description
	12390		Jib boom assembly
1.	3610-06012	6	Bolt
2.	3626-1	2	Flanged bush
3.	3626-10	10	Flanged bush
4.	3626-13	2	Flanged bush
5.	8628	6	Pin keeper
6.	11492-1	6	Tab washer
7.	12288-100	1	Upper flyboom weldment
8.	12288-110	1	Lower flyboom weldment
9.	12347	5	Pin 20 x 134mm
10.	12380	1	Pin 25 x 115
11.	12383	1	Quadrant jib/upper boom weldment
12.	12327A	1	Basket assembly
13.	12332A	1	Flyboom cylinder
14.	3611-10	6	Nylock nut
15.	12451-3	As Req	Basket spacer
16.	3610-10050	4	Bolt
17.	3610-10070	2	Bolt
18.	3603-10	12	Washer, plated
19.	12451	1	Fixed basket mounting

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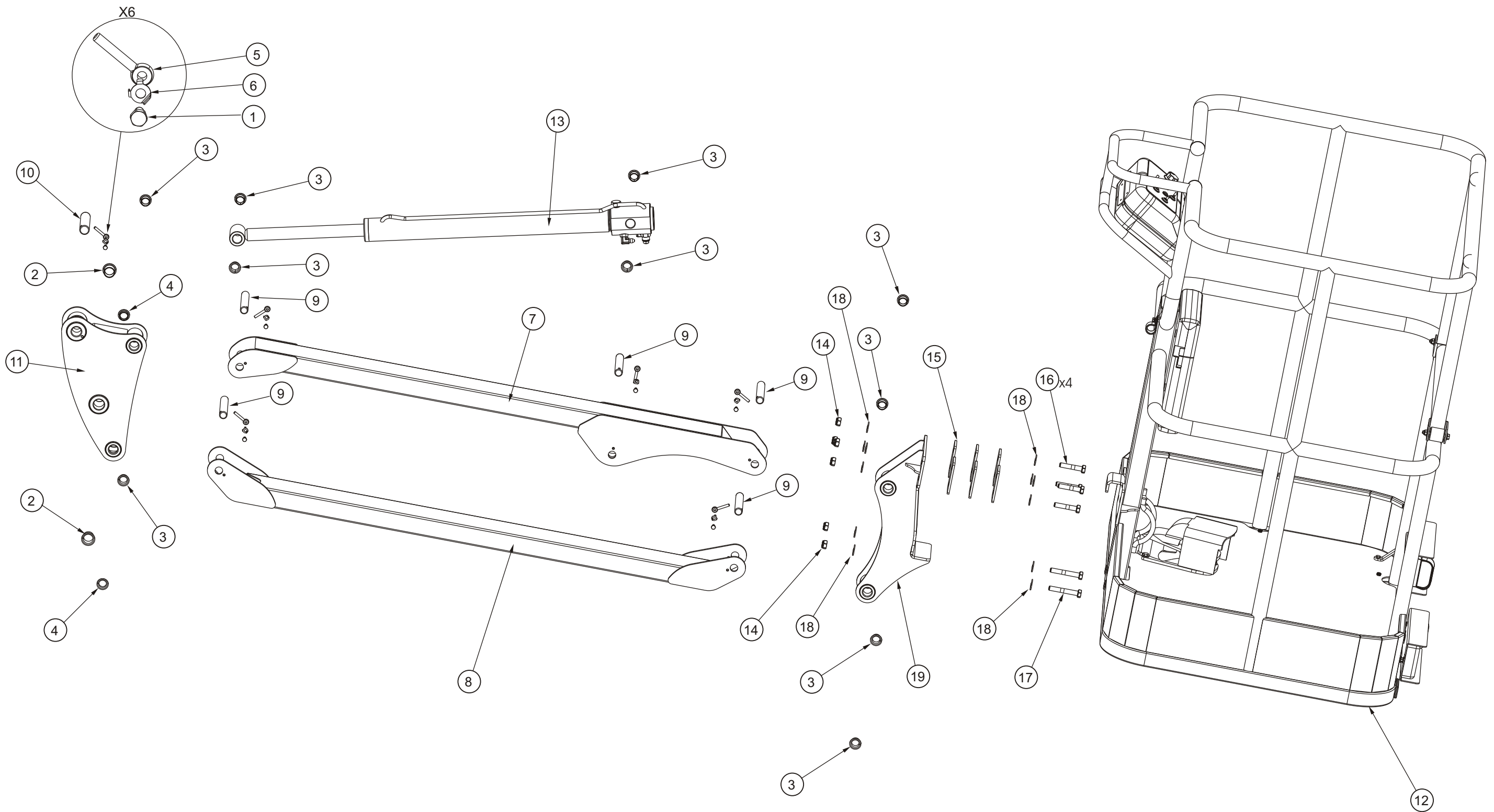
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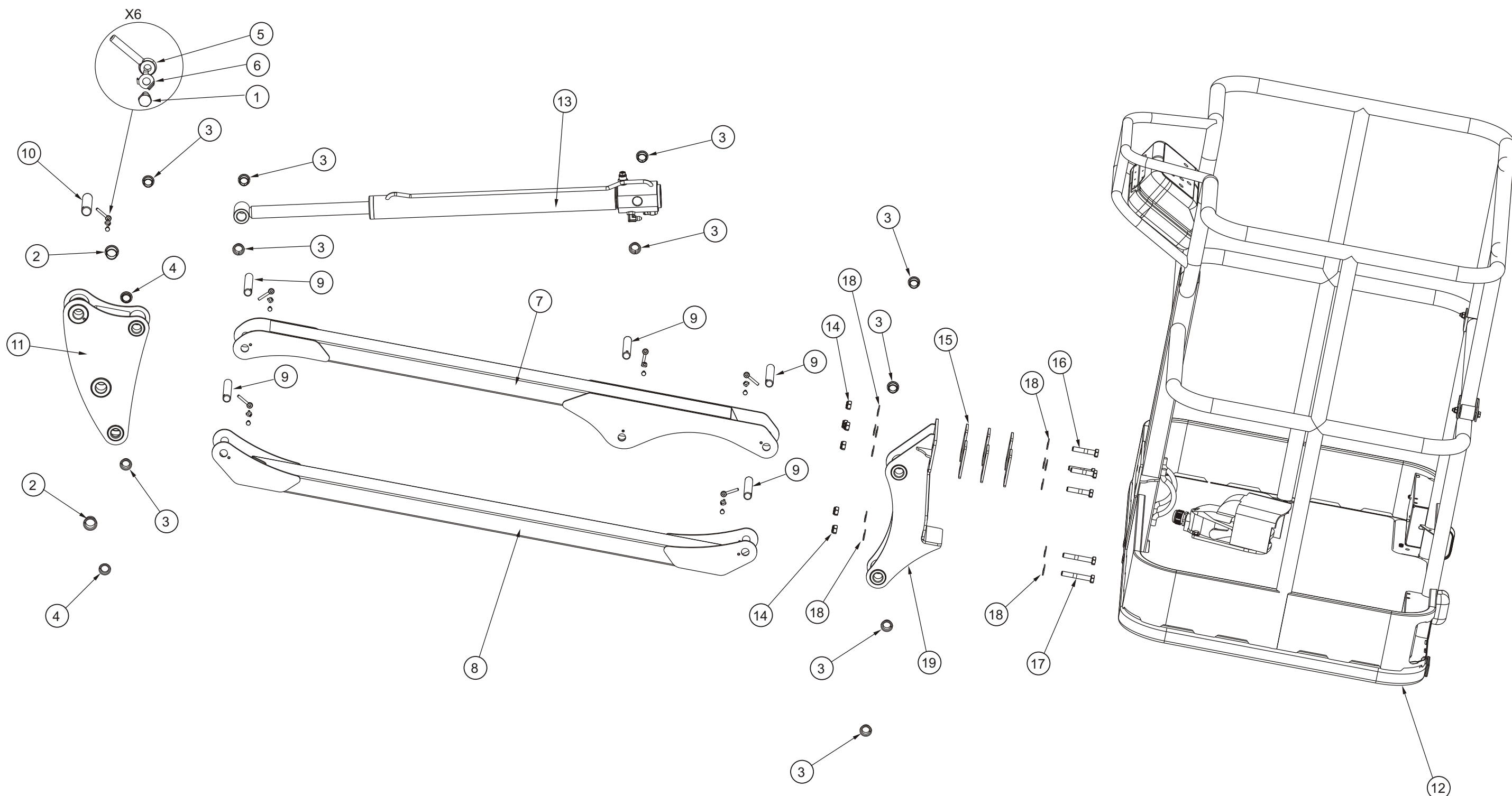
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Item	Part No	Qty	Description
	12390		Jib boom assembly
1.	3610-06012	6	Bolt
2.	3626-1	2	Flanged bush
3.	3626-10	10	Flanged bush
4.	3626-13	2	Flanged bush
5.	8628	6	Pin keeper
6.	11492-1	6	Tab washer
7.	12288-120	1	Upper flyboom weldment
8.	12288-110	1	Lower flyboom weldment
9.	12347	5	Pin 20 x 134mm
10.	12380	1	Pin 25 x 115
11.	12383	1	Quadrant jib/upper boom weldment
12.	12327A	1	Basket assembly
13.	12332A	1	Flyboom cylinder
14.	3611-10	6	Nylock nut
15.	12451-3	As Req	Basket spacer
16.	3610-10050	4	Bolt
17.	3610-10070	2	Bolt
18.	3603-10	12	Washer, plated
19.	12451	1	Fixed basket mounting

Item	Part No	Qty	Description
	12381A		Column assembly
1.	1034-120	12	Hardened washer
2.	1067	1	Slew ring
3.	1288	1	Battery
4.	1814	1	Cable gland
5.	11942	1	Slew pinionr
6.	3605-05	8	Plain washer
7.	3603-06	23	Plain washer
8.	60030-197	1	Plain washer
9.	12377A	1	Main control manifold
10.	3603-12	2	Plain washer
11.	3603-12HD	2	Plain washer
12.	3604-04030	2	Metric panhead screw
13.	3605-05	8	Spring washer
14.	3605-06	14	Spring washer
15.	3605-08	2	Spring washer
16.	11430A	1	Hydraulic oil tank assembly
17.	3610-05010	8	Metric bolt
18.	3610-06012	5	Metric bolt
19.	3610-06016	17	Metric bolt
20.	3610-08025	5	Metric bolt
21.	60021-028N	12	Nut
22.	3610-12050	2	Metric bolt
23.	60021-016	12	Bolt
24.	3611-05	8	Nyloc nut
25.	3611-06	8	Nyloc nut
26.	12483	1	Remote grease nipple mount
27.	3611-12	2	Nyloc nut
28.	3613-12035	10	Cap screw
29.	3631-12	10	Disc lock washer
30.	3631-16	12	Disc lock washer
31.	3660-05020	8	Counter sunk screw
32.	8628	1	Pin keeper
33.	12453	2	Lock tab
34.	10268-2	1	Battery bracket
35.	12445-90DEG	1	Micro switch
36.	11406	1	Lower control box
37.	11492-1	1	Tab washer
38.	11943	1	Slew drive and brake assembly
39.	12239-3	1	Pin end cap
40.	12381	1	Column weldment
41.	12381-18	1	Lower control box mount
42.	12381-25	1	Pinion gear guard
43.	12381-35	1	Valve mount
44.	12392	4	Hinge weldment
45.	12392-2	4	Cover, hinge spacer
46.	12398	1	Pin
47.	12399	1	Pin
48.	12413	1	Engine assembly
49.	12414-10	1	Stay mount weldment
50.	12414-11	1	Stay side mount, right hand
51.	12414-5	1	Cover stay weldment (not shown)
52.	3610-08020	2	Bolt
53.	11943-2	1	Plain washer
54.	5570003	1	Right angle grease nipple
55.	12483-3	1	Connector

Column assembly before SN NZ050901

Item	Part No	Qty	Description
56.	12483-4	1	Tube
57.	12483-3	1	Connector
58.	12483-2	1	Adaptor

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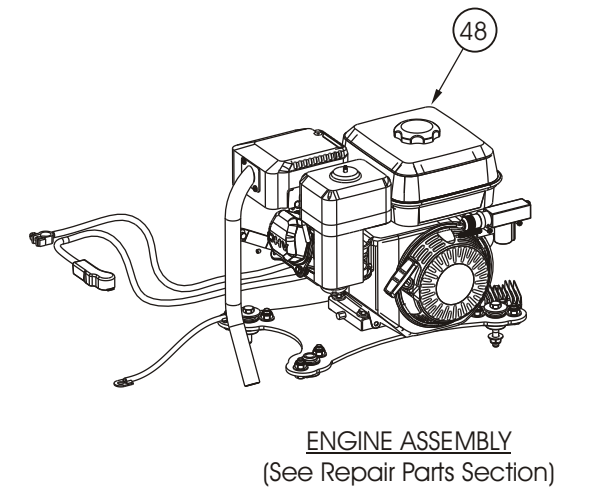
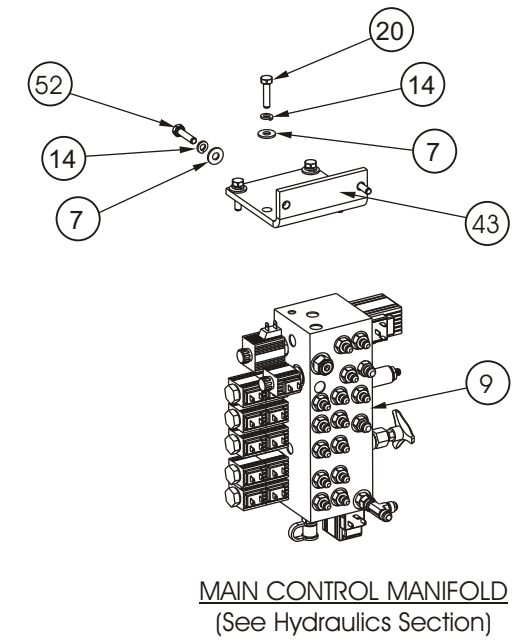
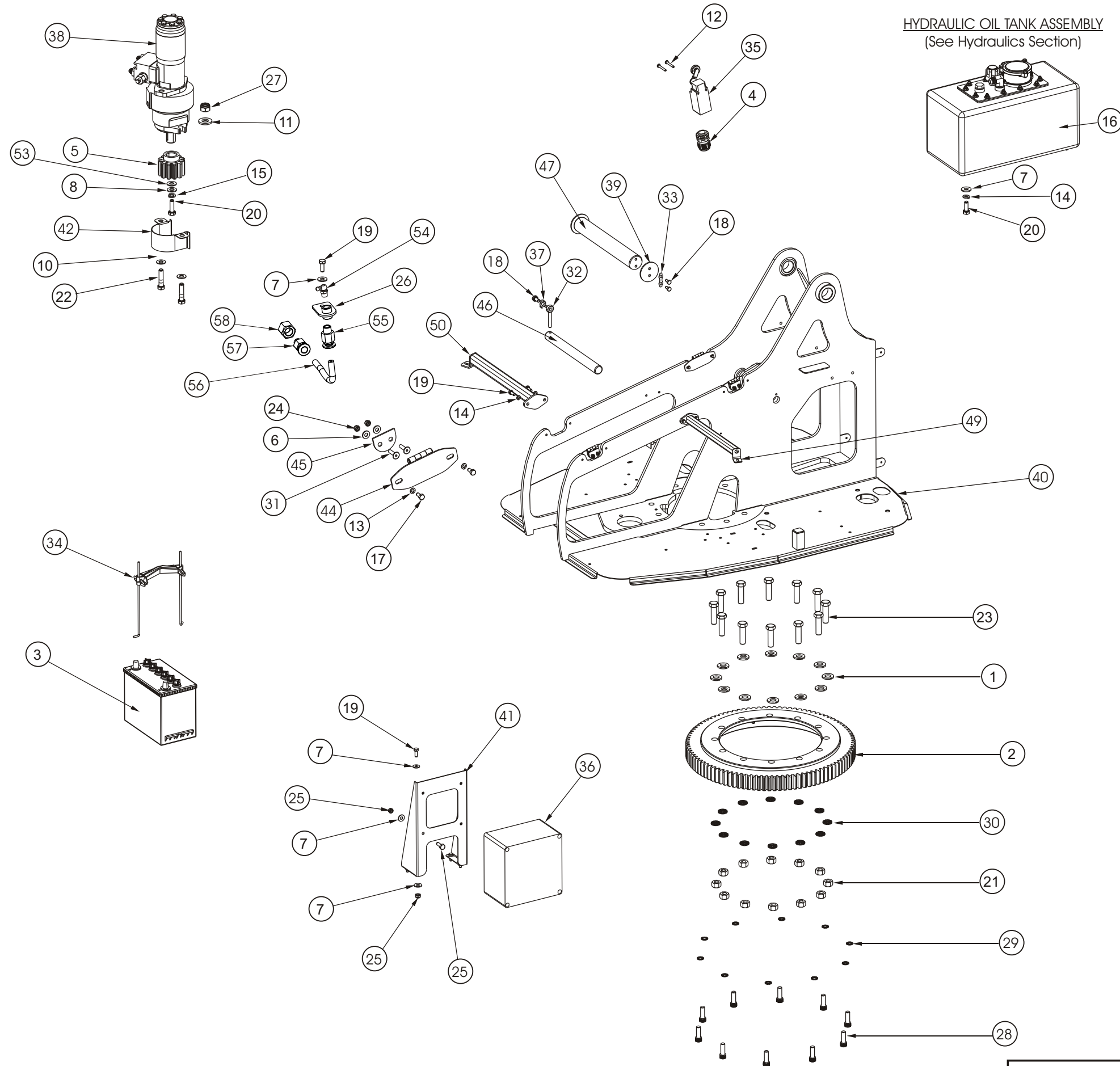
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Revision A June 15 2005

DWG. 12381A

TITLE Column assembly

Snorkel Model MHP13/35

Snorkel

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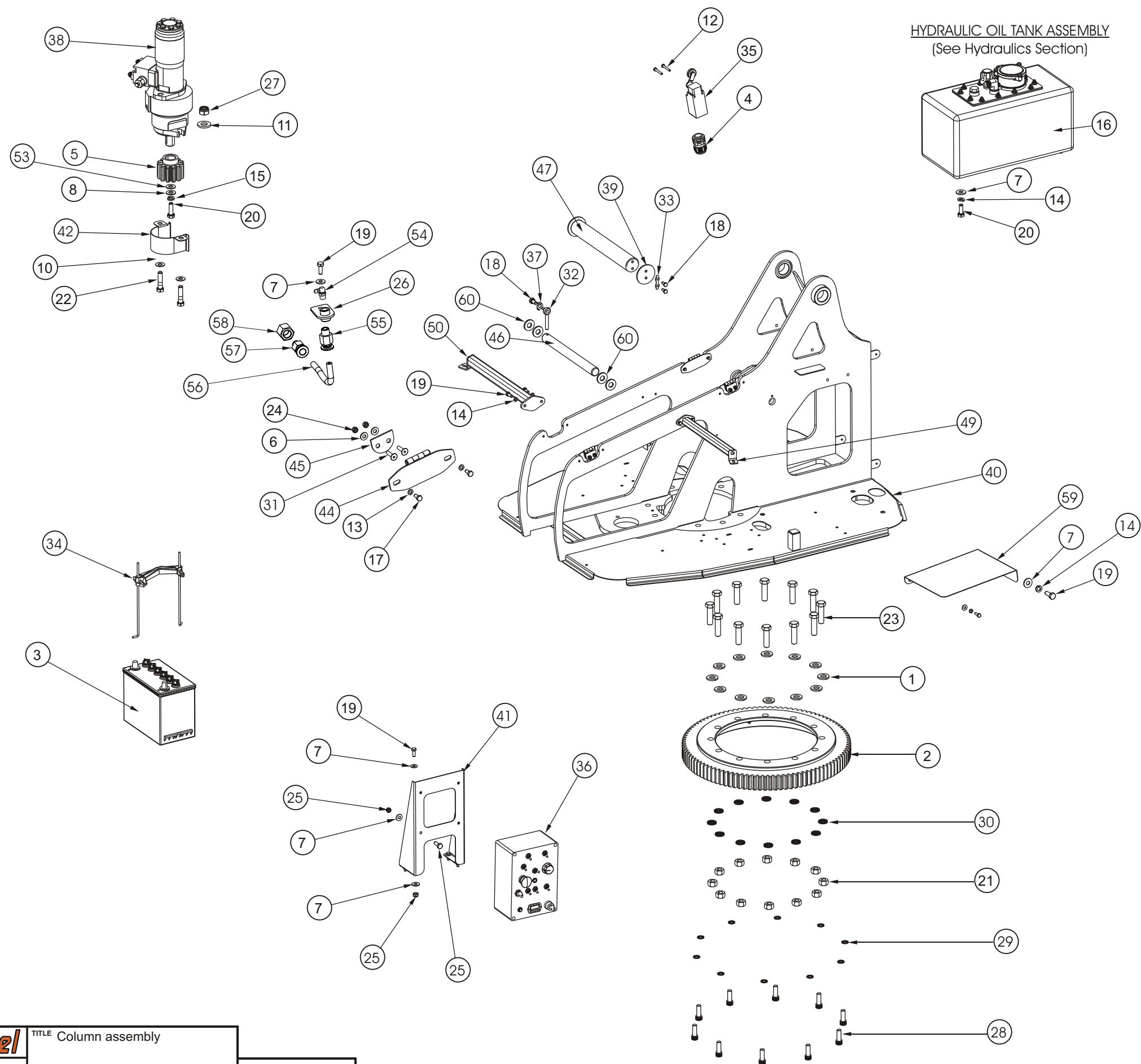
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**Snorkel**

TITLE Column assembly

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Snorkel Model MHP13/35

DWG. 12381A

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Item	Part No	Qty	Description
	12381A		Column assembly
1.	1034-120	12	Hardened washer
2.	1067	1	Slew ring
3.	1288	1	Battery
4.	1814	1	Cable gland
5.	11942	1	Slew pinionr
6.	3605-05	8	Plain washer
7.	3603-06	25	Plain washer
8.	60030-197	1	Plain washer
9.	12377A	1	Main control manifold
10.	3603-12	2	Plain washer
11.	3603-12HD	2	Plain washer
12.	3604-04030	2	Metric panhead screw
13.	3605-05	8	Spring washer
14.	3605-06	16	Spring washer
15.	3605-08	2	Spring washer
16.	11430A	1	Hydraulic oil tank assembly
17.	3610-05010	8	Metric bolt
18.	3610-06012	5	Metric bolt
19.	3610-06016	19	Metric bolt
20.	3610-08025	5	Metric bolt
21.	60021-028N	12	Nut
22.	3610-12050	2	Metric bolt
23.	60021-016	12	Bolt
24.	3611-05	8	Nyloc nut
25.	3611-06	8	Nyloc nut
26.	12483	1	Remote grease nipple mount
27.	3611-12	2	Nyloc nut
28.	3613-12035	10	Cap screw
29.	3631-12	10	Disc lock washer
30.	3631-16	12	Disc lock washer
31.	3660-05020	8	Counter sunk screw
32.	8628	1	Pin keeper
33.	12453	2	Lock tab
34.	10268-2	1	Battery bracket
35.	12445-90DEG	1	Micro switch
36.	12521	1	Lower control box
37.	11492-1	1	Tab washer
38.	11943	1	Slew drive and brake assembly
39.	12239-3	1	Pin end cap
40.	12381	1	Column weldment
41.	12381-18	1	Lower control box mount
42.	12381-25	1	Pinion gear guard
43.	12381-35	1	Valve mount
44.	12392	4	Hinge weldment
45.	12392-2	4	Cover, hinge spacer
46.	12398	1	Pin
47.	12399	1	Pin
48.	12413	1	Engine assembly
49.	12414-10	1	Stay mount weldment
50.	12414-11	1	Stay side mount, right hand
51.	12414-5	1	Cover stay weldment (not shown)
52.	3610-08020	2	Bolt
53.	11943-2	1	Plain washer
54.	5570003	1	Right angle grease nipple
55.	12483-3	1	Connector

Column assembly after SN NZ050901

Item	Part No	Qty	Description
56.	12483-4	1	Tube
57.	12483-3	1	Connector
58.	12483-2	1	Adaptor
59.	12381-40	1	Heat deflector
60.	9990	4	Thrust washer

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	1	Cover, engine side
9.	12388-2	1	Cover, hydraulic tank side
10.	12388-3	1	Cover, door
11.	12388-4	1	Cover, rear
12.	12401	1	Latch, compression
13.	12403	2	Butt hinge
14.	12414-20	2	Stay pivot mount
15.	12414-5	2	Cover stay weldment
16.	12440	2	Tool clip
17.	60038-006	2	Split pin
18.	5510014	2	Latch, side cover

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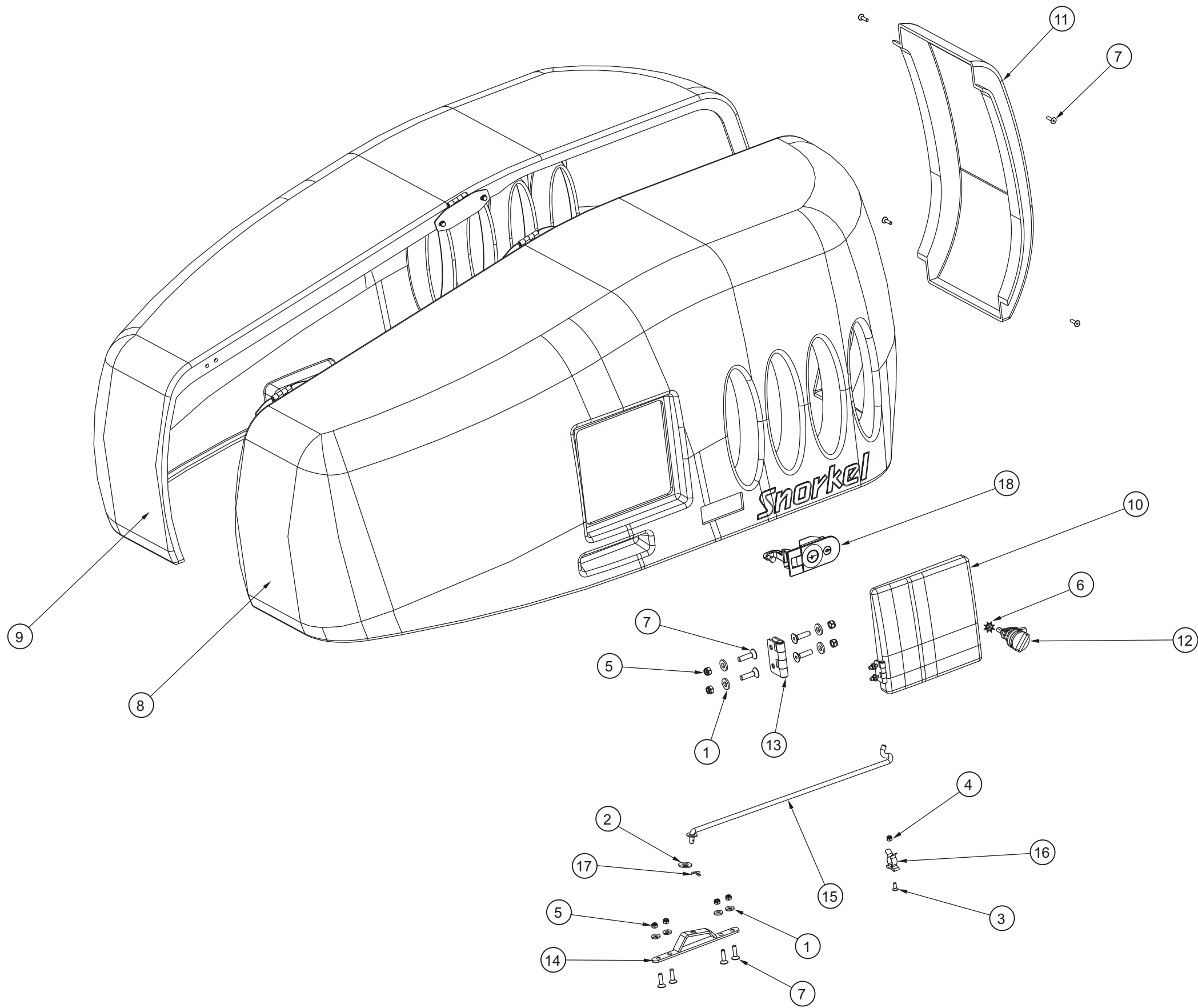
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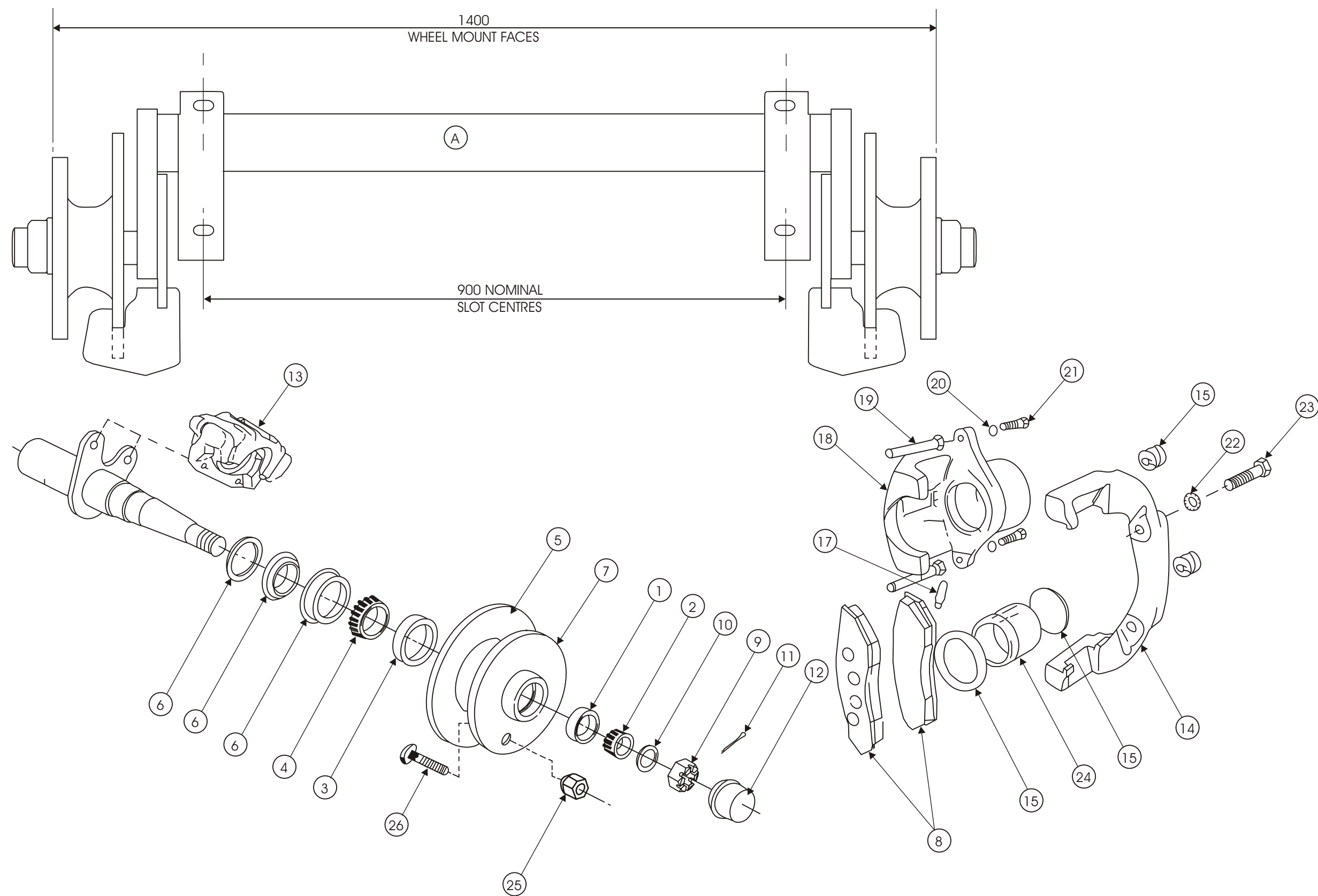
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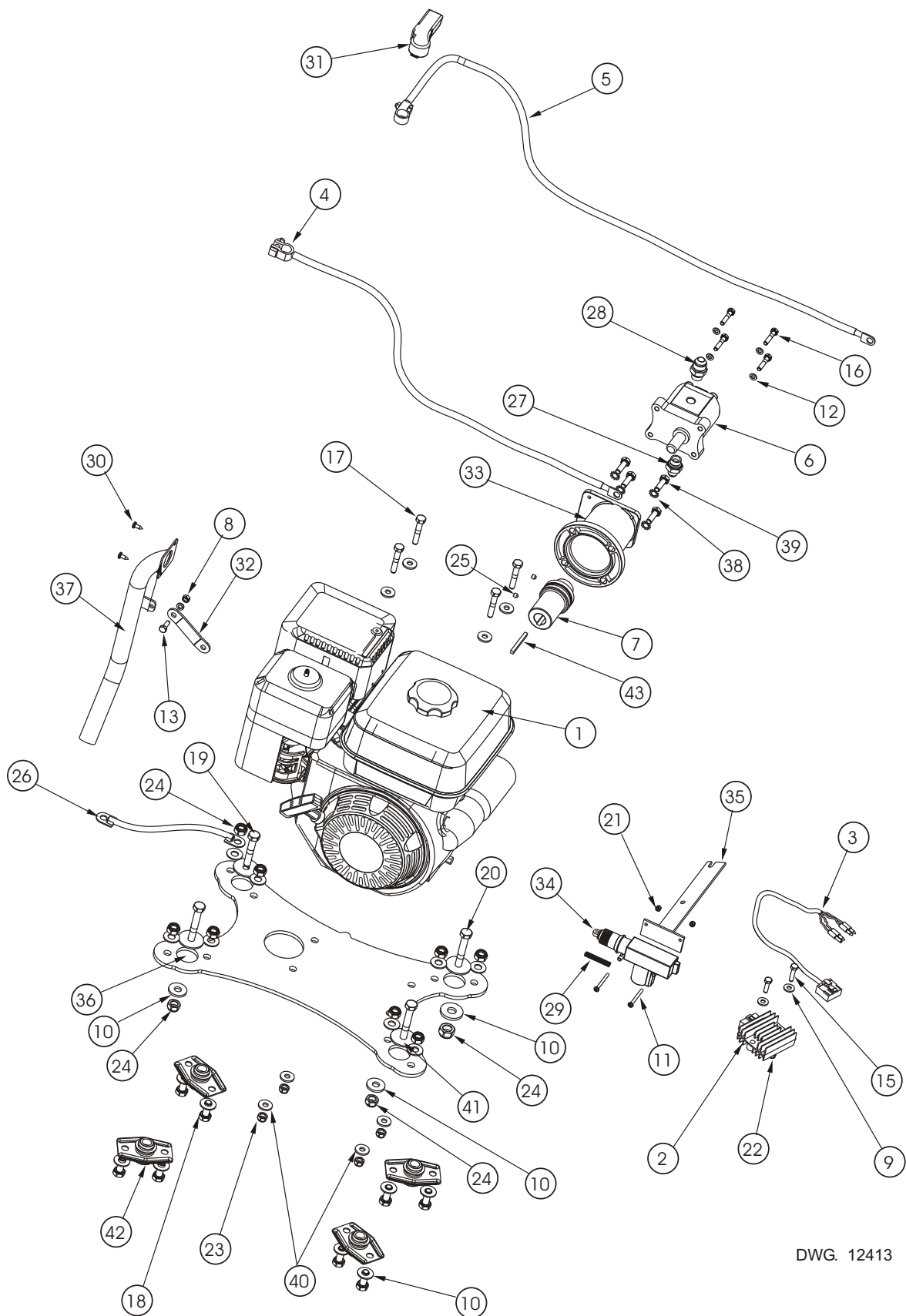
TITLE 1500kg Axle Assembly
Hydraulic disc brakes
Snorkel Model MHP13/35

DWG. A11570 Rev. A. 14-3-2005

Item	Part No	Qty	description
A.	12362	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 Pair	Brake rotor
6.	9297-7	2	Seal kit, hub
7.	12362-2	2	Wheel hub
8.	2045-004	4	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"

Engine assembly before SN NZ050801

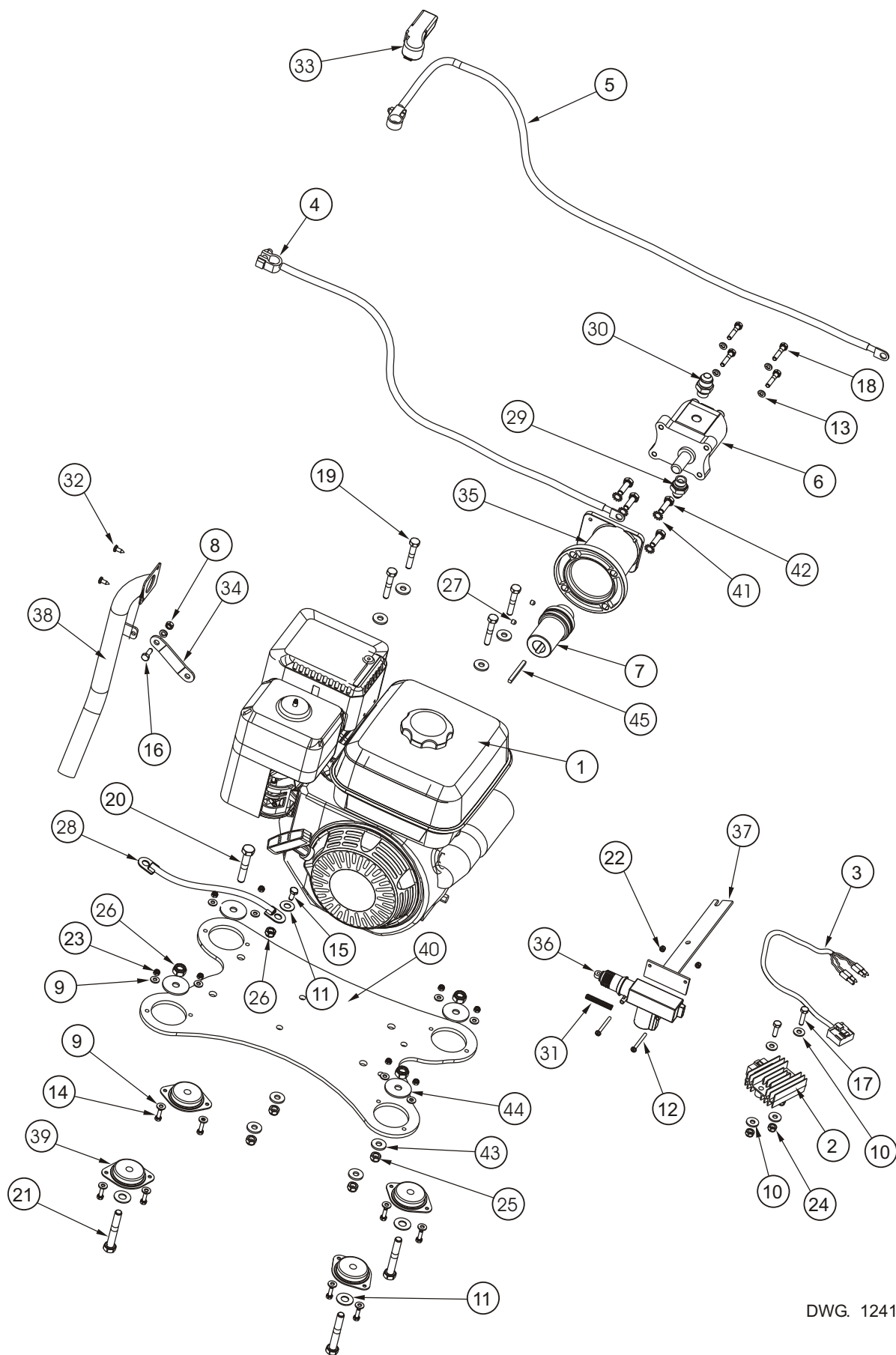
Item	Part No	Qty	Description
	12413		Engine assembly
1.	1171-4	1	Honda GX160
2.	1171-4-022	1	Regulator / rectifier GX160
3.	1171-4-025	1	Loom, Honda rectifier
4.	1650-030	1	Battery cable
5.	1650-031	1	Battery cable
6.	1659	1	Gear pump
7.	1880	1	Drive coupling
8.	3602-06	1	Metric hex nut
9.	3603-06	3	Plain washer
10.	3603-10	19	Plain washer
11.	3604-04040	2	Metric screw pan head
12.	3605-06	5	Spring washer
13.	3610-06016	1	Metric bolt
14.	3610-06020	1	Metric bolt
15.	3610-06025	1	Metric bolt
16.	3610-06030	4	Metric bolt
17.	3610-08045	4	Metric bolt
18.	3610-10025	8	Metric bolt
19.	3610-10055	1	Metric bolt
20.	3610-10065	3	Metric bolt
21.	3611-04	2	Metric nylock nut
22.	3611-06	1	Metric nylock nut
23.	3611-08	4	Metric nylock nut
24.	3611-10	11	Metric nylock nut
25.	3612-06006	2	Metric grub screw
26.	3649-10	1	Battery cable
27.	7013-003	1	BSPP (Dowty) x JICM nipple
28.	7013-004	1	BSPP (Dowty) x JICM nipple
29.	8398	1	Spring
30.	8978-1	2	Screw, self tapping
31.	10254	1	Cover, battery terminal
32.	10350-4	1	Exhaust bracket
33.	10417	1	Bellhousing
34.	11444	1	Choke solenoid 12V
35.	11497	1	Choke solenoid bracket
36.	12381-19	1	Engine mount plate
37.	12407	1	Exhaust weldment
38.	60005-054	4	5/16" ext. lockwasher
39.	60016-090N	4	3/4" x 1/4" NC bolt, plated
40.	60030-3N	8	5/16" flat washer
41.	5560179	4	Flat washer, special
42.	7630208	4	Engine mount
43.	1875KEY	1	3/16" key steel



DWG. 12413

Engine assembly from SN NZ050801

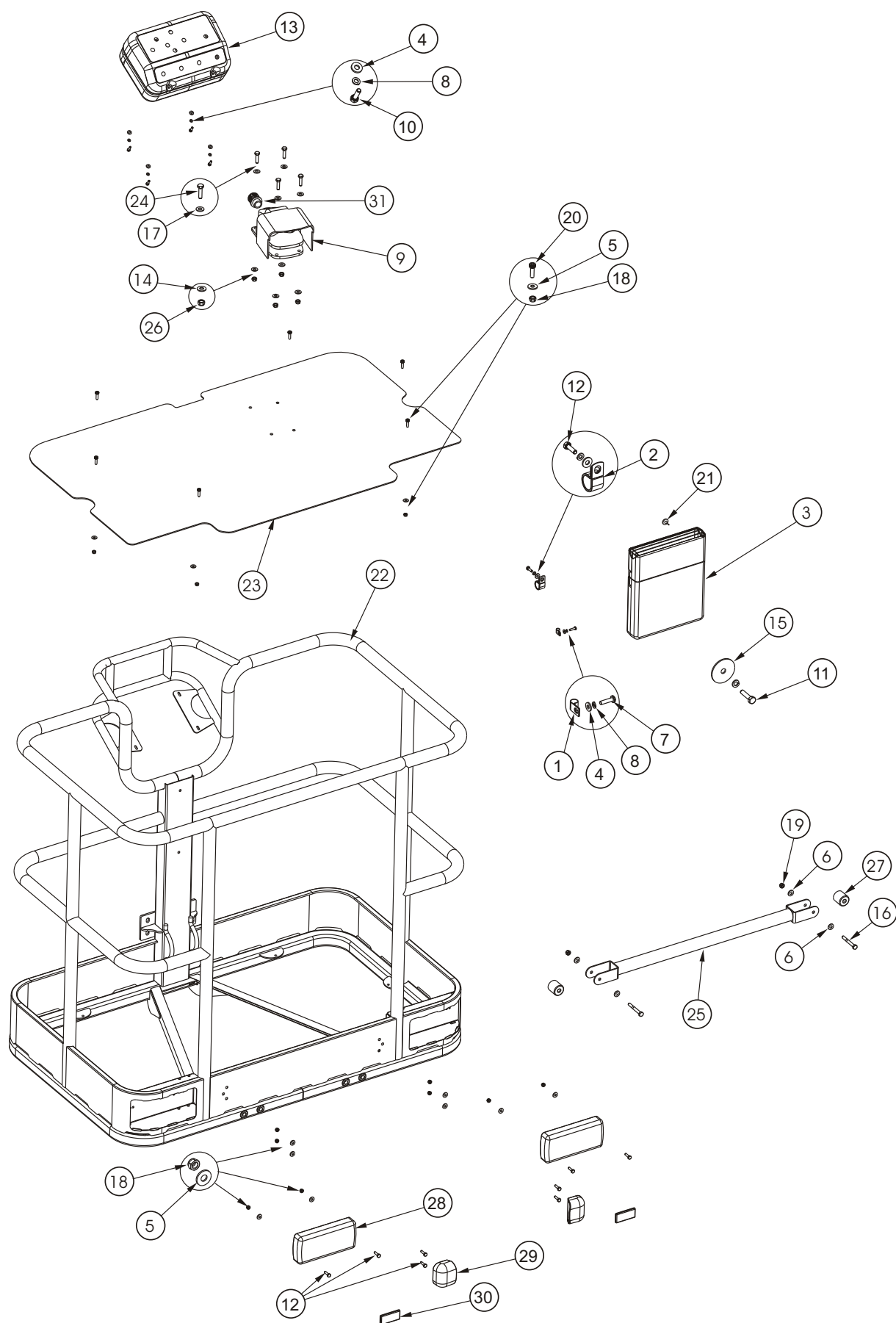
Item	Part No	Qty	Description
	12413	1	Engine assembly
1.	1171-4	1	Honda GX160
2.	1171-4-022	1	Regulator / rectifier GX160
3.	1171-4-025	1	Loom, Honda rectifier
4.	1650-030	1	Battery cable
5.	1650-031	1	Battery cable
6.	1659	1	Gear pump
7.	1880	1	Drive coupling
8.	3602-06	1	Metric nut
9.	3603-05	16	Plain 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



DWG. 12413

Basket assembly

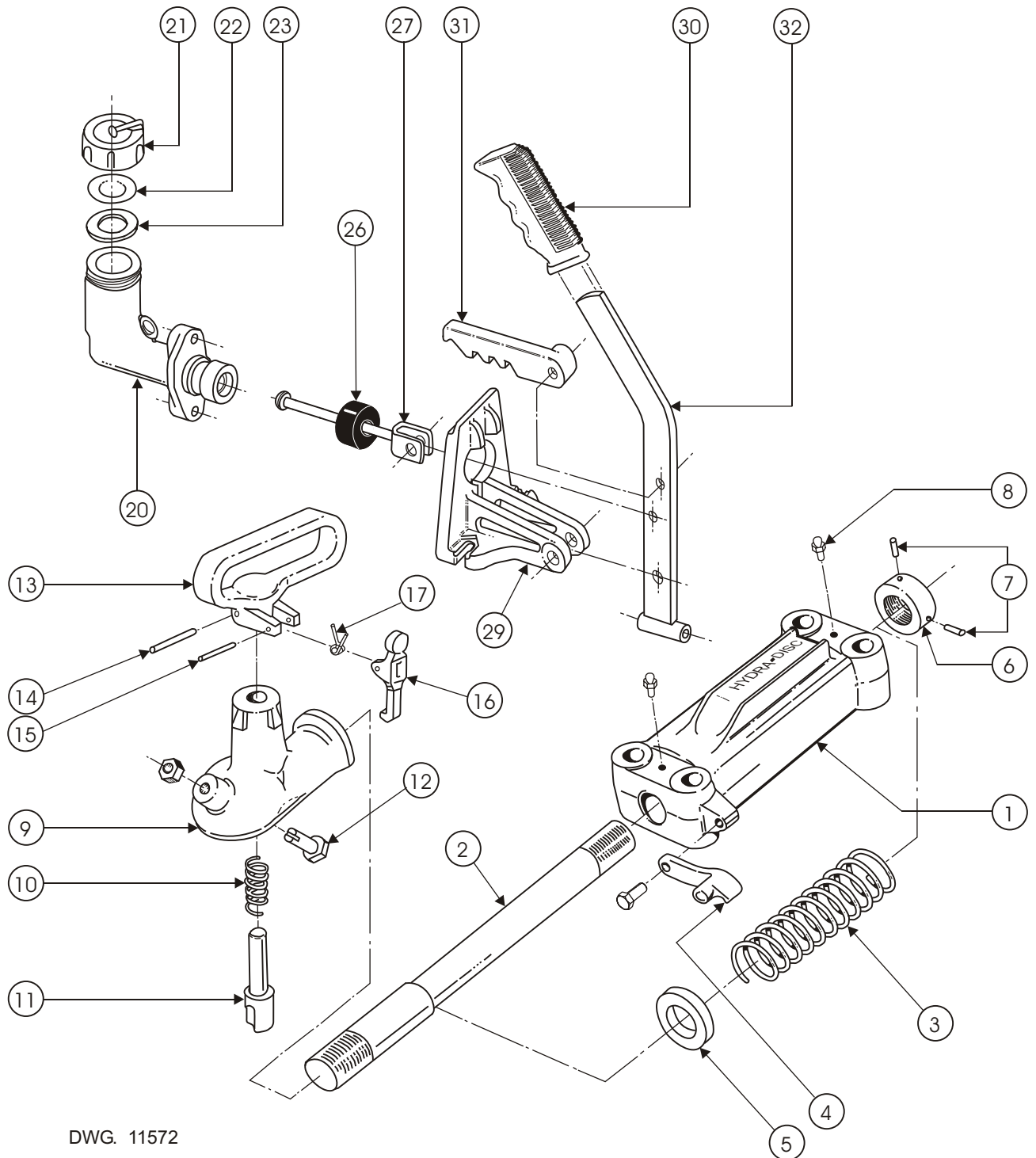
Item	Part No	Qty	Description
	12327A		Basket assembly
1.	2022-002	2	Clamp
2.	45248	1	Clamp
3.	3602-06	18	Metric nut
4.	3603-05	6	Plain washer
5.	3603-06	29	Plain washer
6.	3603-08	8	Plain washer
7.	3604-05020	2	Machine screw
8.	3605-05	8	Spring washer
9.	3605-06	11	Spring washer
10.	3610-05016	4	Bolt
11.	3610-05020	2	Bolt
12.	3610-06020	5	Bolt
13.	3610-06016	2	Bolt
14.	3610-06030	6	Bolt
16.	3610-08065	2	Bolt
17.	3603-08	4	Washer
18.	3611-06	10	Nylock nut
19.	3611-08	6	Nylock nut
20.	3668-06020	6	Cap screw
21.	7895	4	Anti-rattle button
22.	12327	1	Basket weld
23.	12327-1	1	Floor plate
24.	12327-32	2	Light guard
25.	12327-50	1	Gravity gate
26.	12327-55	2	Cable protector
27.	12327-53	2	Roller
28.	12386-1	2	Tail lamp, LED
	12473	2	Tail lamp, SAE LED combination (US approved)
29.	12386-2	2	Licence plate lamp, LED
30.	12386-3	2	Red reflector
31.	1815	1	Nylon cable gland
32.	60030-198	2	Fender washer
33.	562386	1	Literature compartment
34.	3020021	1	Foot switch
35.	12385A	1	Upper control box assembly
36.	3603-08	4	Washer
37.	3611-08	6	Nylock nut
38.	3610-08030	4	Bolt



DWG. 12327A

Tow coupling hydraulic

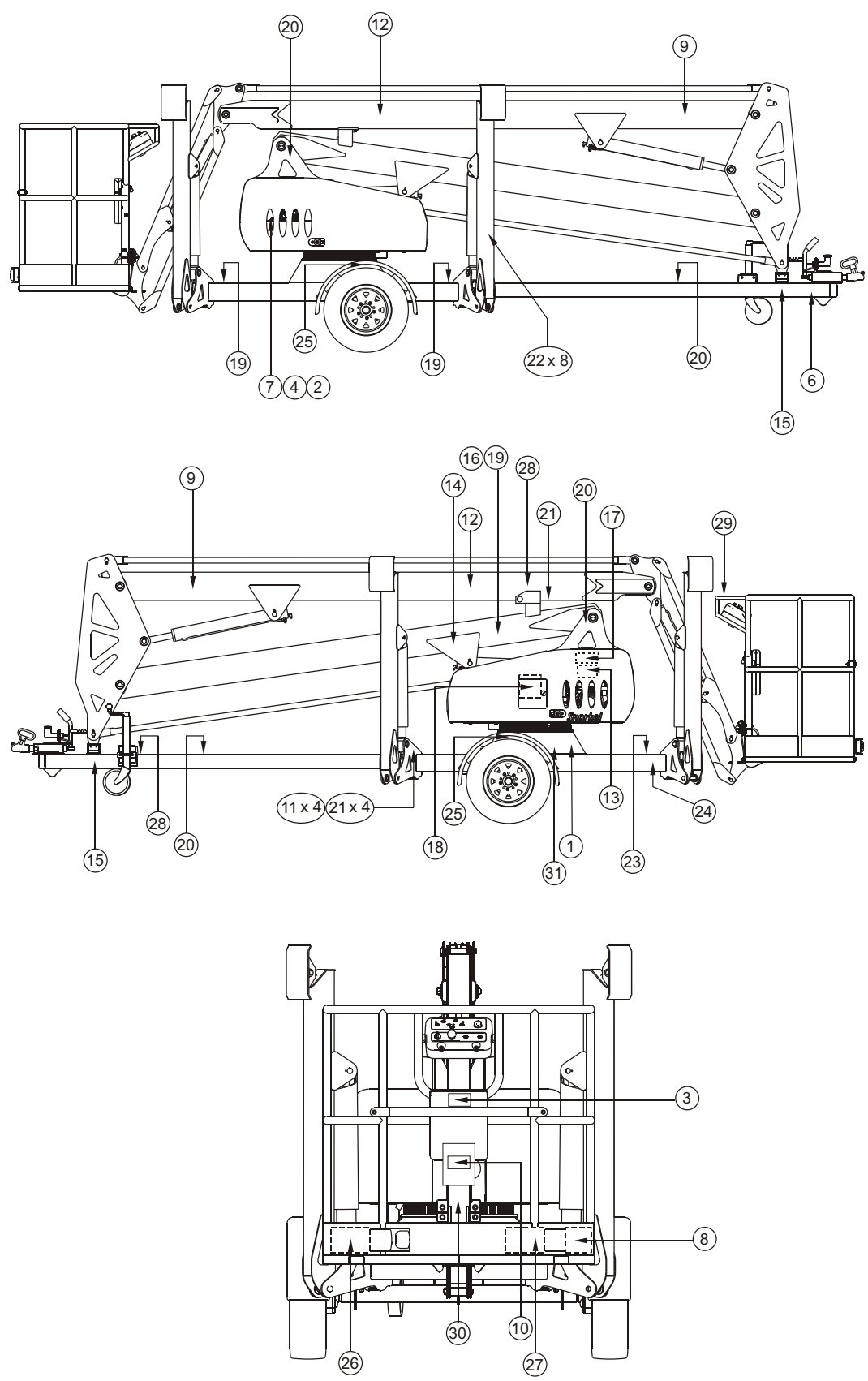
Item	Part No	Qty	Description
	11572	1	Coupling assembly, TC40HM/50mm
1.	11572-1	1	Body
2.	11572-2	1	Main shaft and head assembly
3.	9946-15	1	Main shaft spring
4.	9946-13	1	Reverse lock
5.	9946-14	1	Thrust ring
6.	9946-17	1	Collar
7.	60015-017	2	Grub screw 1 ¼" x ¼" BSW
8.	2030-001	2	Grease nipple
9.		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)



DWG. 11572

Placards and decals installation

Item	Part No	Qty	Description
1.	9972-MHP	1	Serial number plate
2.	451776	1	Decal, hydraulic fluid level
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.	569295	2	Decal, Snorkel
10.	562426	1	Decal, operation manual
11.	0083426	4	Decal, tie down
12.	12447	2	Decal, MHP13/35
13.	9213	1	Decal, petrol
14.	300699	1	Decal, operator checklist
15.	302559	2	Decal, pinch point
16.	0323897	1	Decal, danger
17.	476706	1	Decal, danger explosive gas
18.	11420	1	Decal, lower control box
19.	0323899	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.	8945	1	Decal, vin plate
25.	7856-45	2	Decal, tyre pressure
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)
	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
28.	1772-002K	2	Decal, boom lock pin
29.	0072531	1	Decal, electrocution hazard
30.	0150448	1	Decal, lanyard
31.	12517	1	Decal, auto stabiliser operation



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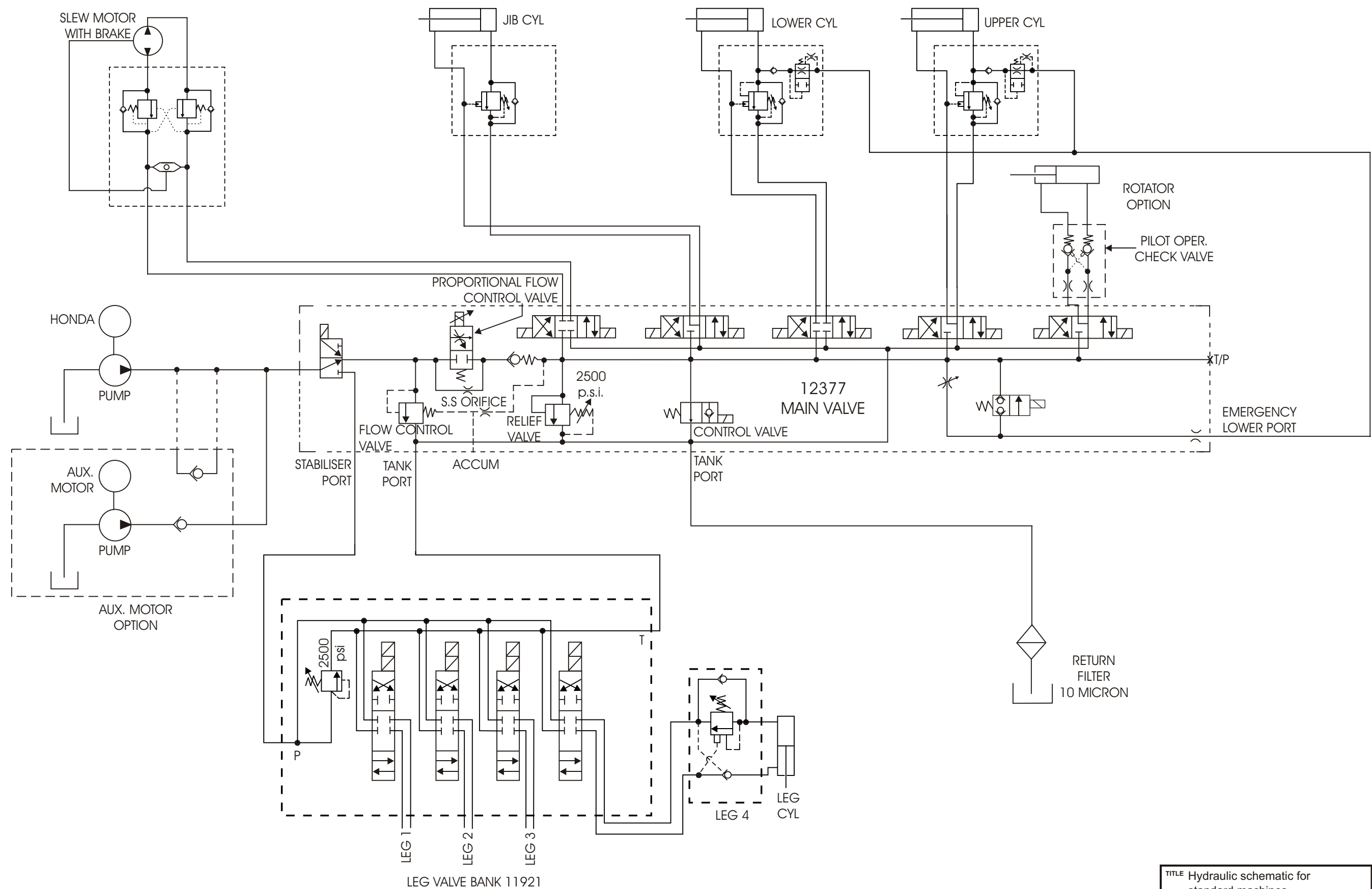
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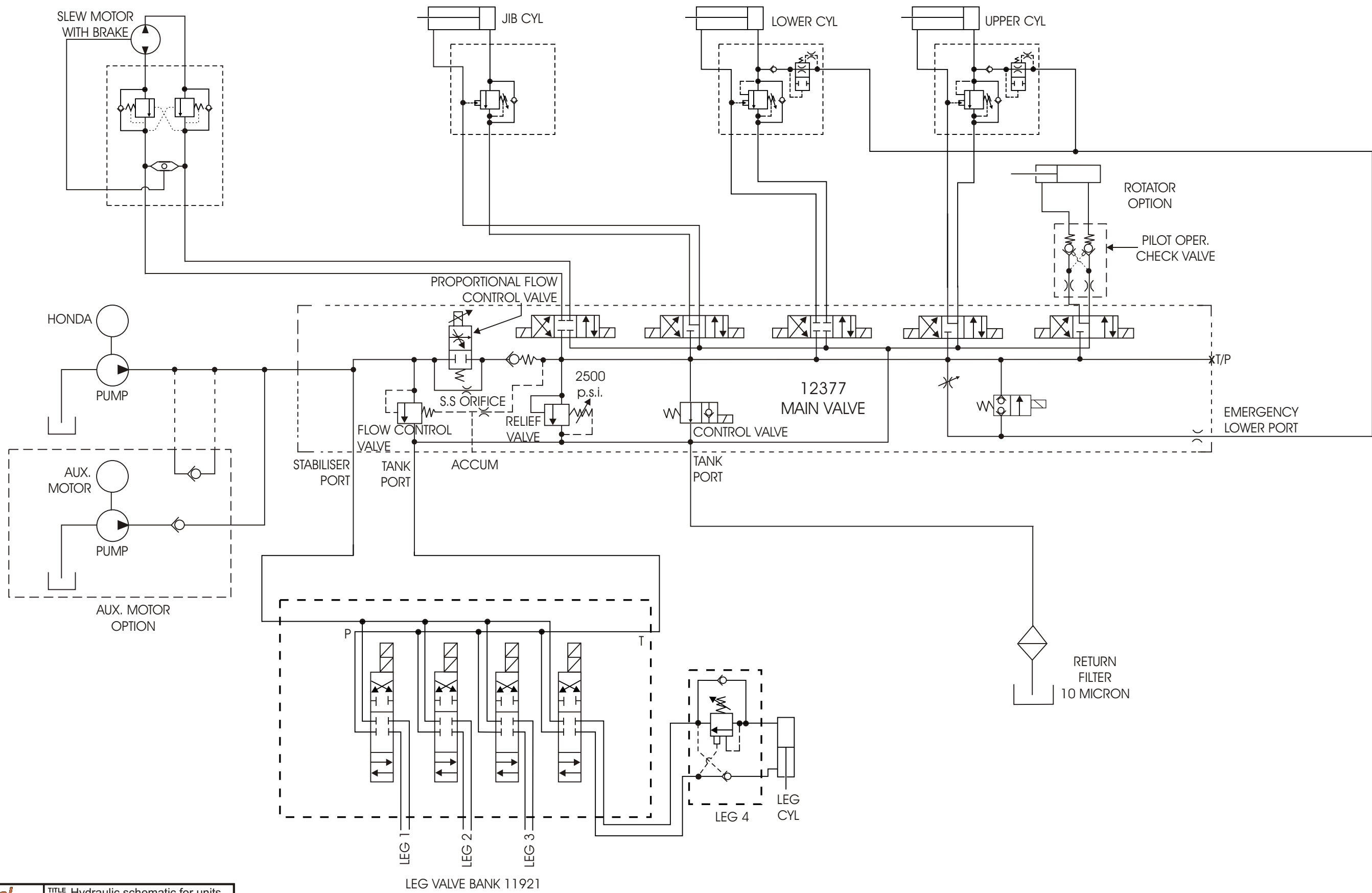
DWG. 0000000

TITLE Hydraulic schematic for
standard machines
Snorkel model MHP13/35

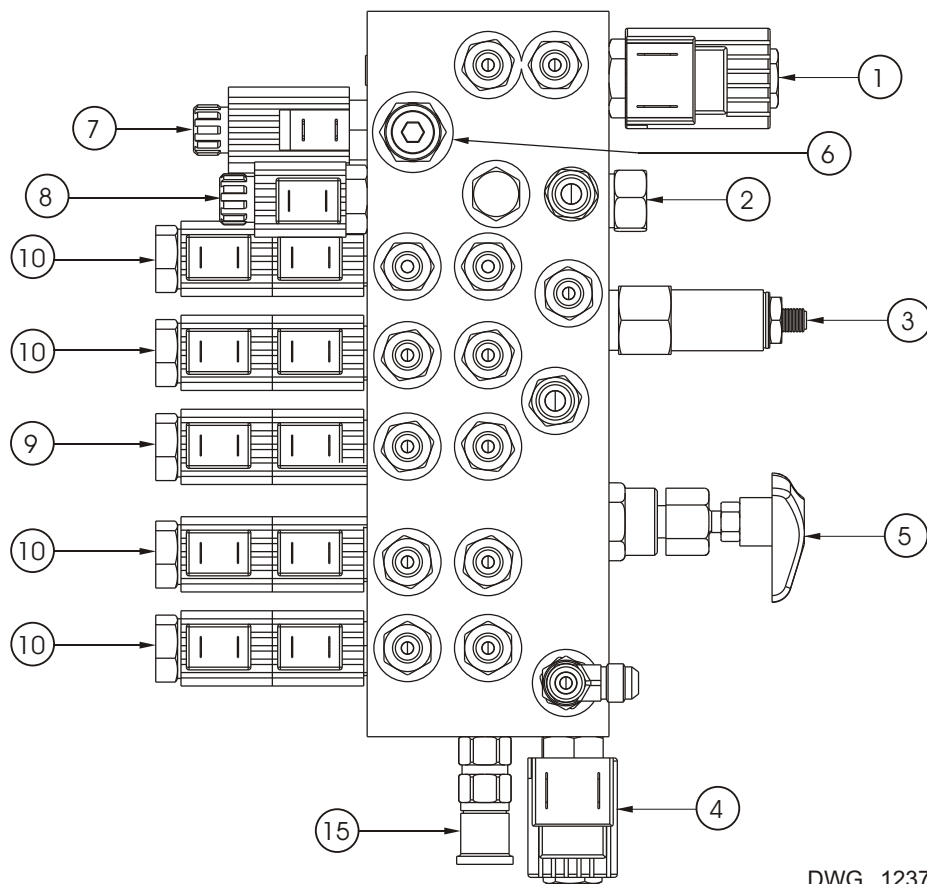
Snorkel
HYDRAULICS

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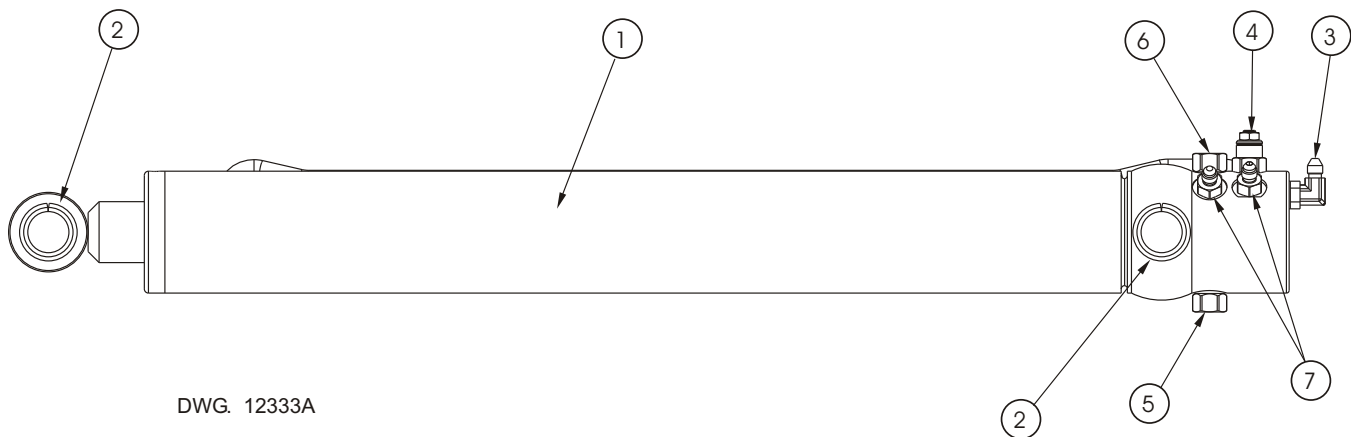
Item	Part No	Qty	Description
	12377A		Main control valve assembly
1.	11415-1	1	Stabiliser solenoid
2.	11415-2	1	Flow compensator
3.	11415-3	1	Main relief valve 2500 psi
4.	11415-4	1	Solenoid emergency lower
5.	11415-5	1	Manual emergency lower
6.	11415-6	1	Check valve 4 psi
7.	11415-7	1	Proportional flow control
8.	11415-8	1	Control solenoid
9.	11415-9	1	Solenoid valve, closed centre
10.	11415-10	4	Solenoid valve, floating centre
11.	11415-6	1	Check valve 4 psi
12.	11415-11	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



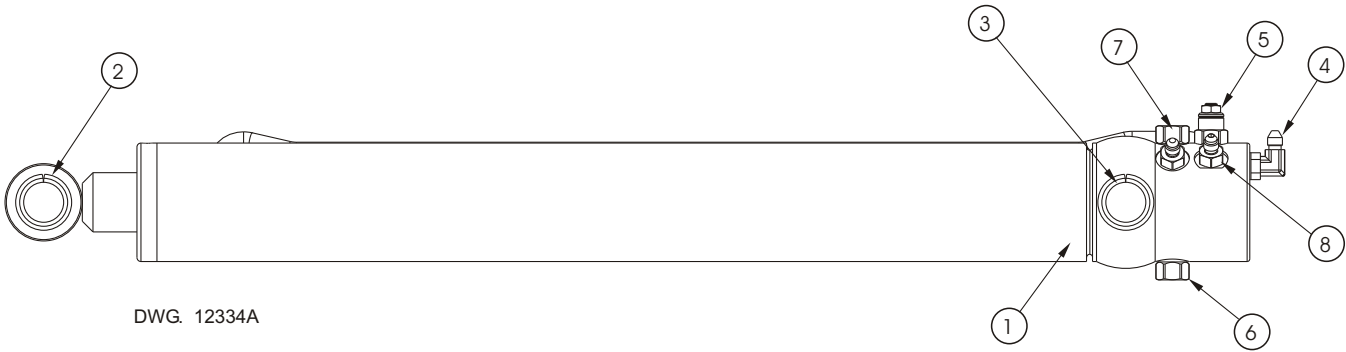
DWG. 12377A

Upper lift cylinder assembly

Item	Part No	Qty	Description
	12333A		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.	10856-2	1	Check cartridge
6.	10856-3	1	Velocity fuse
7.	506-5705	2	JICM x UN O-Ring M nipple

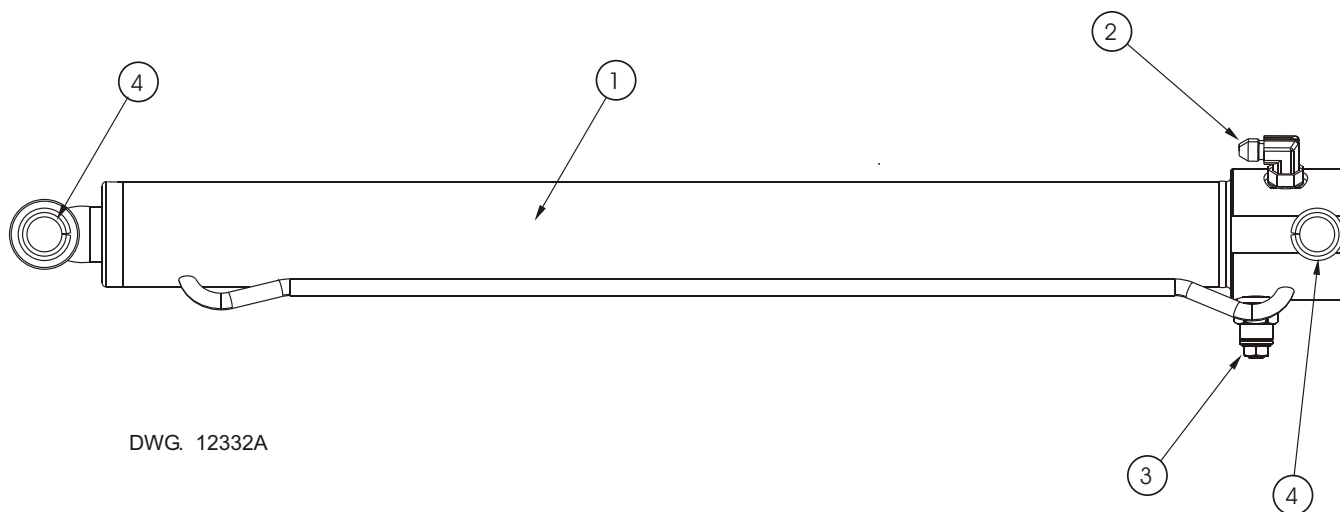


Item	Part No	Qty	Description
	12334A		Lower lift cylinder assembly
1.	12334	1	Lower lift cylinder
	12334K	1	Seal kit
2.	3626-1	2	Flanged permaglides bush
3.	3626-6	2	Flanged permaglides bush
4.	7031-002	1	JICM x UN O-Ring M Elbow
5.	10856-1	1	Counterbalance cartridge
6.	10586-2	1	Check cartridge
7.	10586-3	1	Velocity fuse
8.	506-5705	2	JICM x UN O-Ring M Nipple



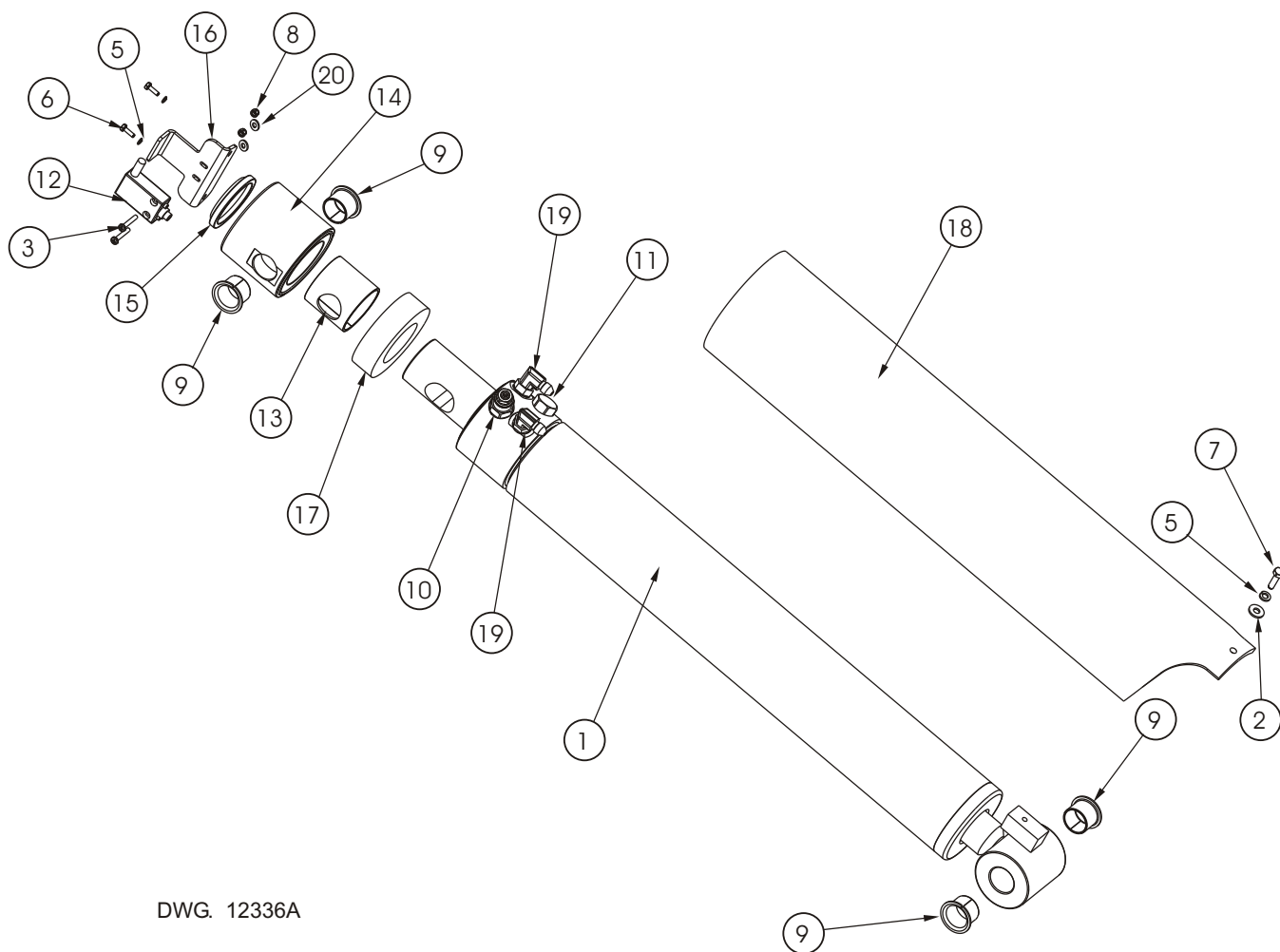
Flyboom cylinder assembly

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



Stabiliser leg cylinder assembly

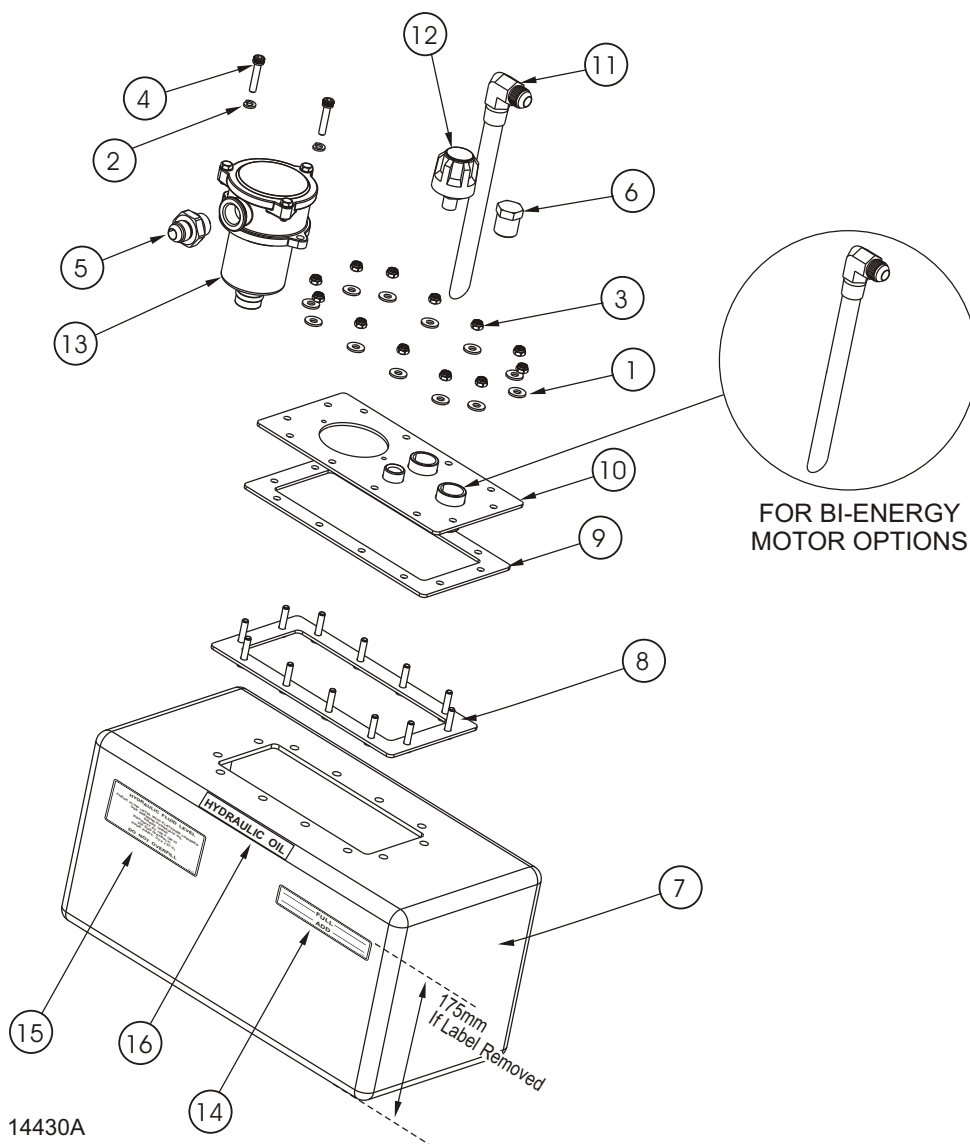
Item	Part No	Qty	Description
	12336A		Stabiliser leg cylinder assembly
1.	12336	1	Stabiliser leg cylinder
	12336K	1	Seal kit
2.	3603-06	1	Plain washer
3.	3663-04025	2	Hex head socket cap screw
5.	3605-06	3	Spring washer
6.	3610-06012	2	Metric bolt
7.	3610-06020	1	Metric bolt
8.	3611-04	2	Metric Nylock 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



DWG. 12336A

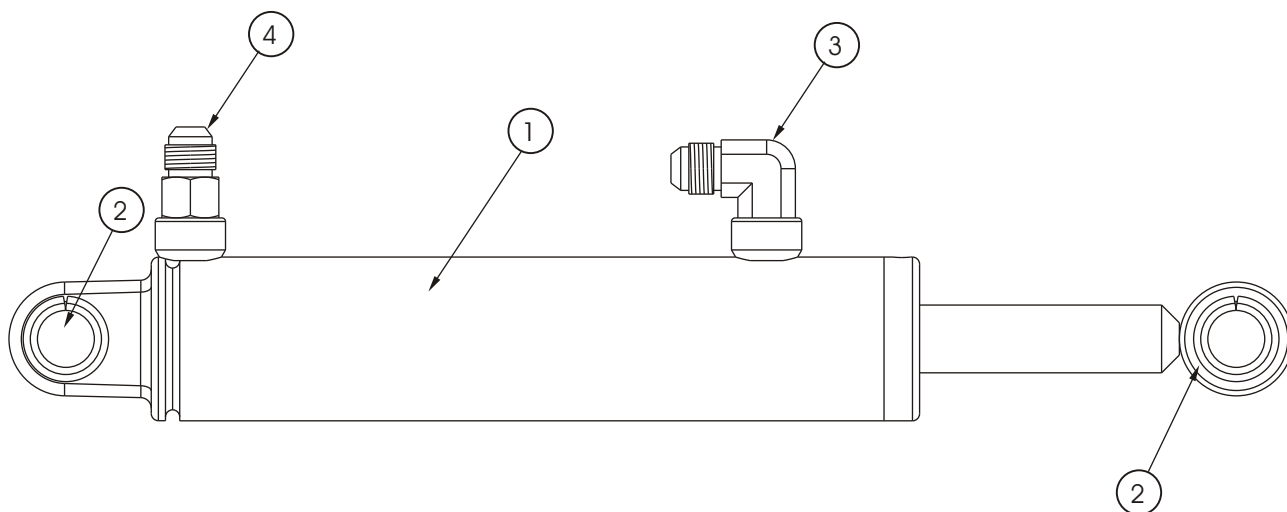
Hydraulic oil tank assembly

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.	451776	1	Decal, hydraulic fluid
16.	9207	1	Decal, hydraulic oil



Optional Rotator cylinder assembly

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

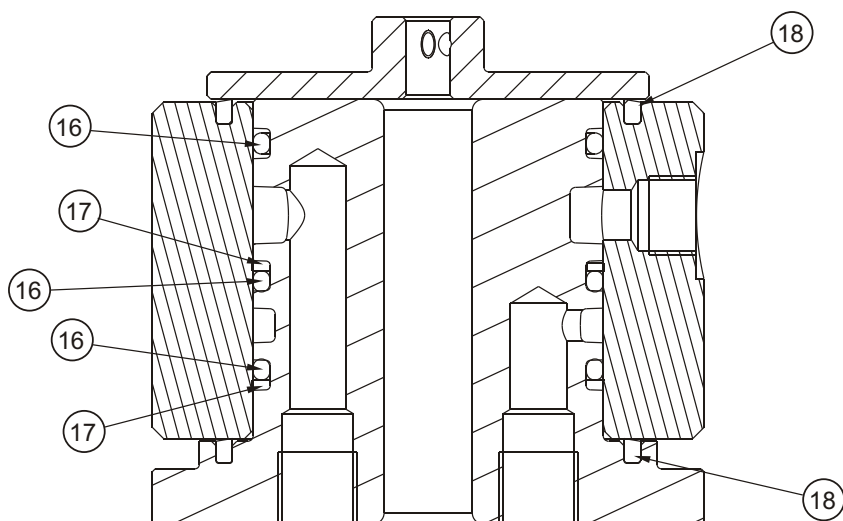
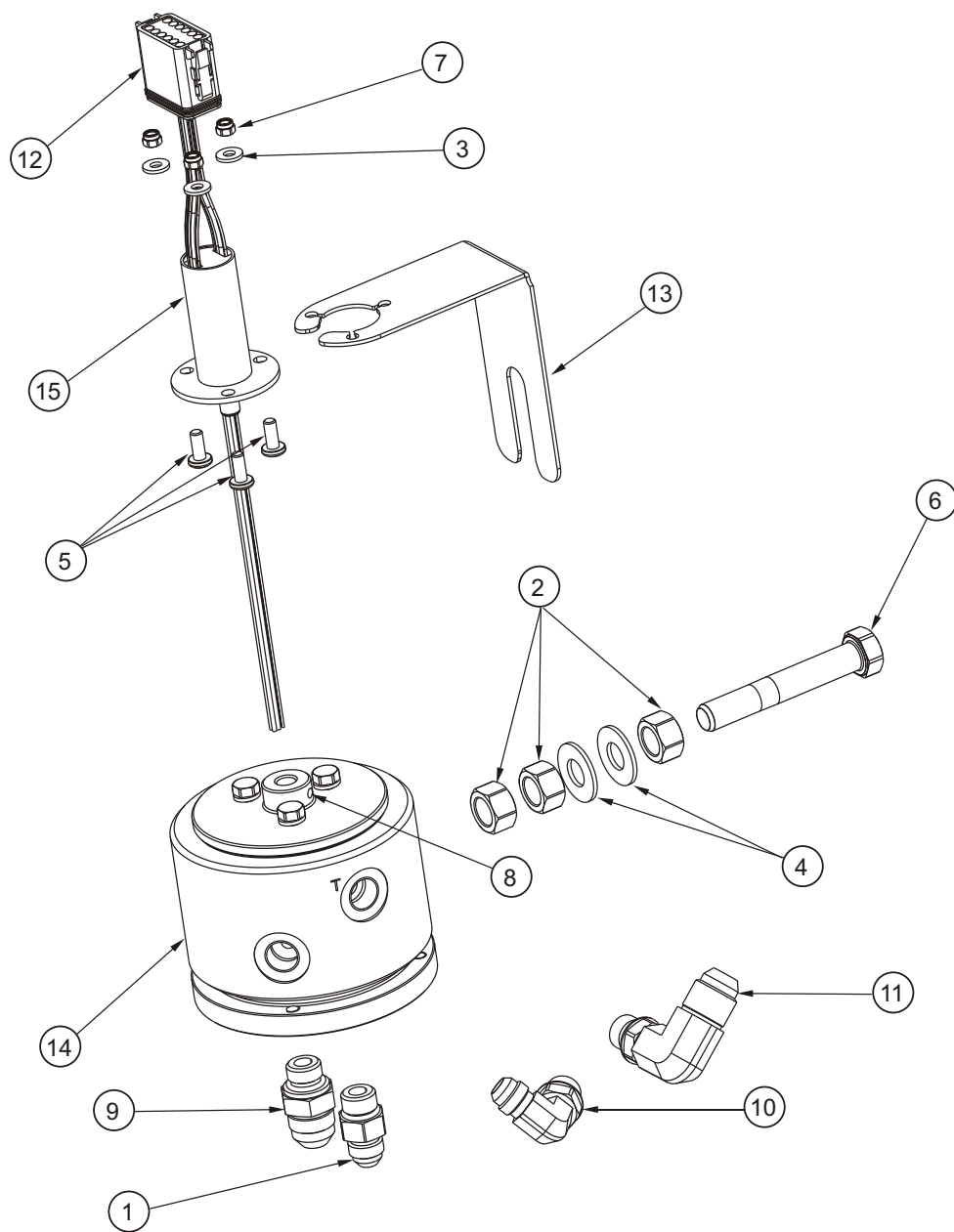


DWG. 12330A

Optional Oil distributor assembly - 2 port

Item	Part No	Qty	Description
	11957A		Oil distributor assembly
1.	506-5707	1	Hydraulic fitting
2.	3602-12	3	Metric nut
3.	3603-05	3	Plain washer
4.	3603-12	2	Plain washer
5.	3604-05012	3	Pan head screw
6.	3615-12075	1	Metric set screw
7.	3611-05	3	Metric nylock nut
8.	3612-05008	1	Metric grub screw
9.	7025-002	1	JIC M x UN O-Ring M elbow
10.	7031-001	1	JIC M UN O-Ring elbow
11.	7031-007	1	JIC M UN O-Ring nipple
12.	11413-6	1	Connector, male
13.	11956-4	1	Distributor rotation bracket
14.	11957	1	Distributor, 2 port
15.	12411-10	1	Slip ring assembly, includes item 12
16.	13-228	3	O-Ring
17.	11768-228	2	PTFE backup washer
18.	11956-5	2	Wiper seal
	11957K	1	Seal kit

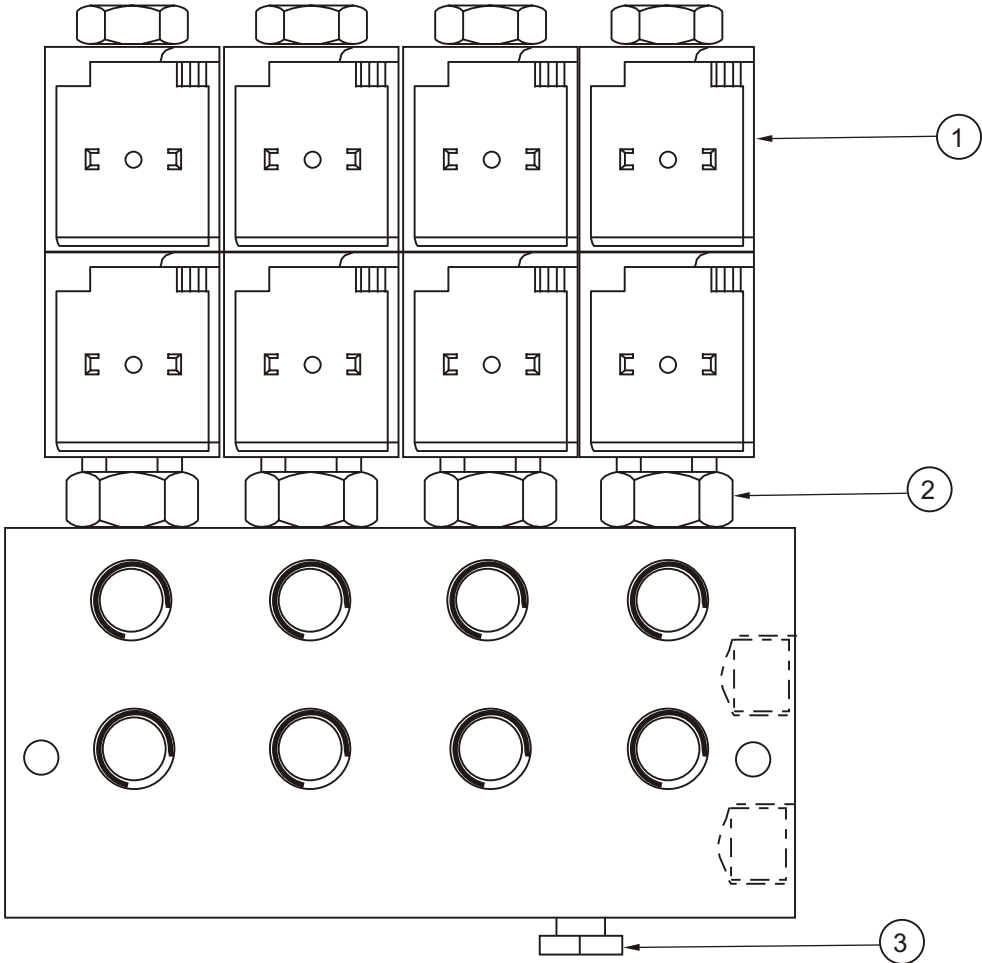
Optional Oil distributor assembly drawing



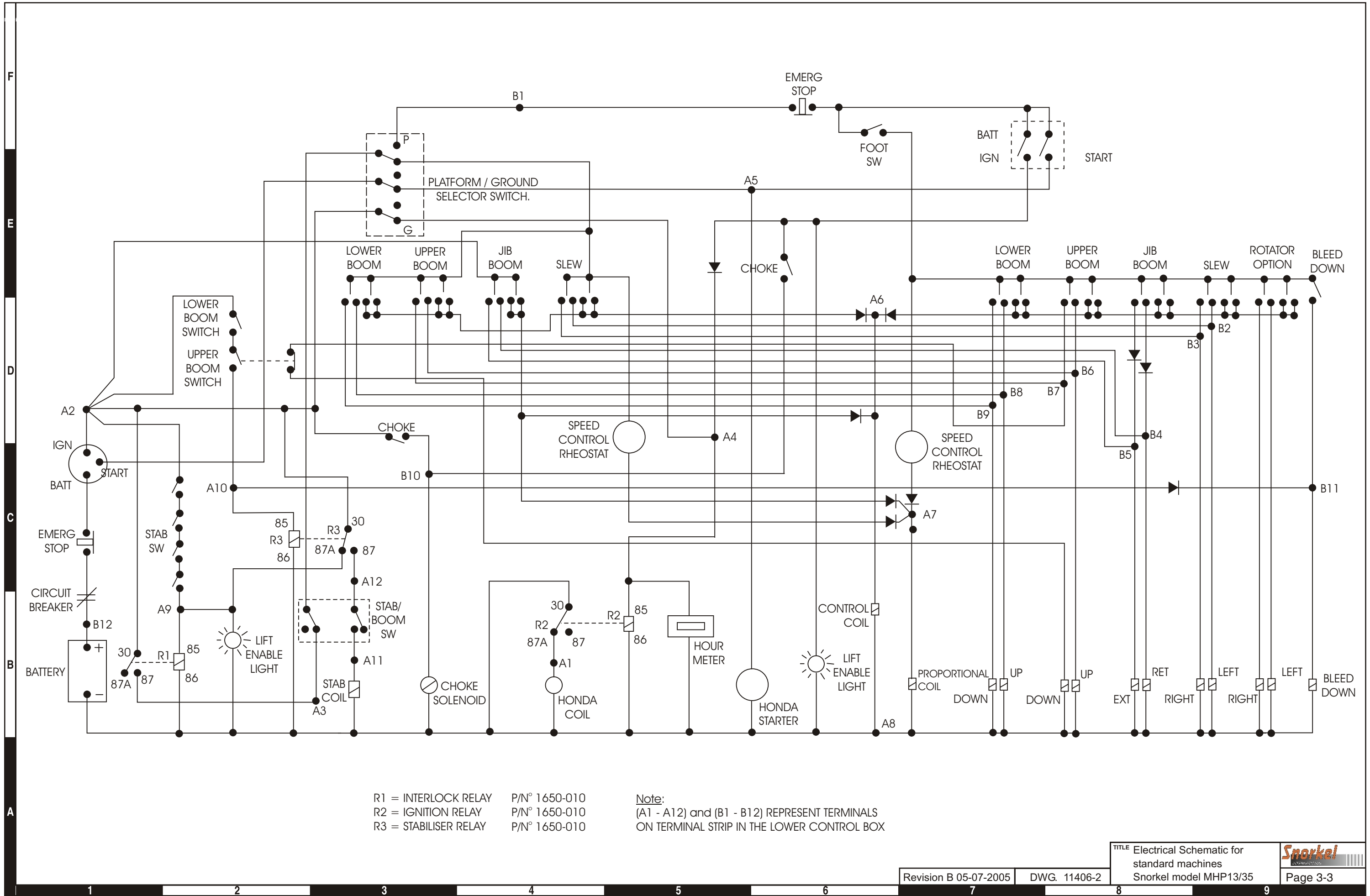
DWG. 12443

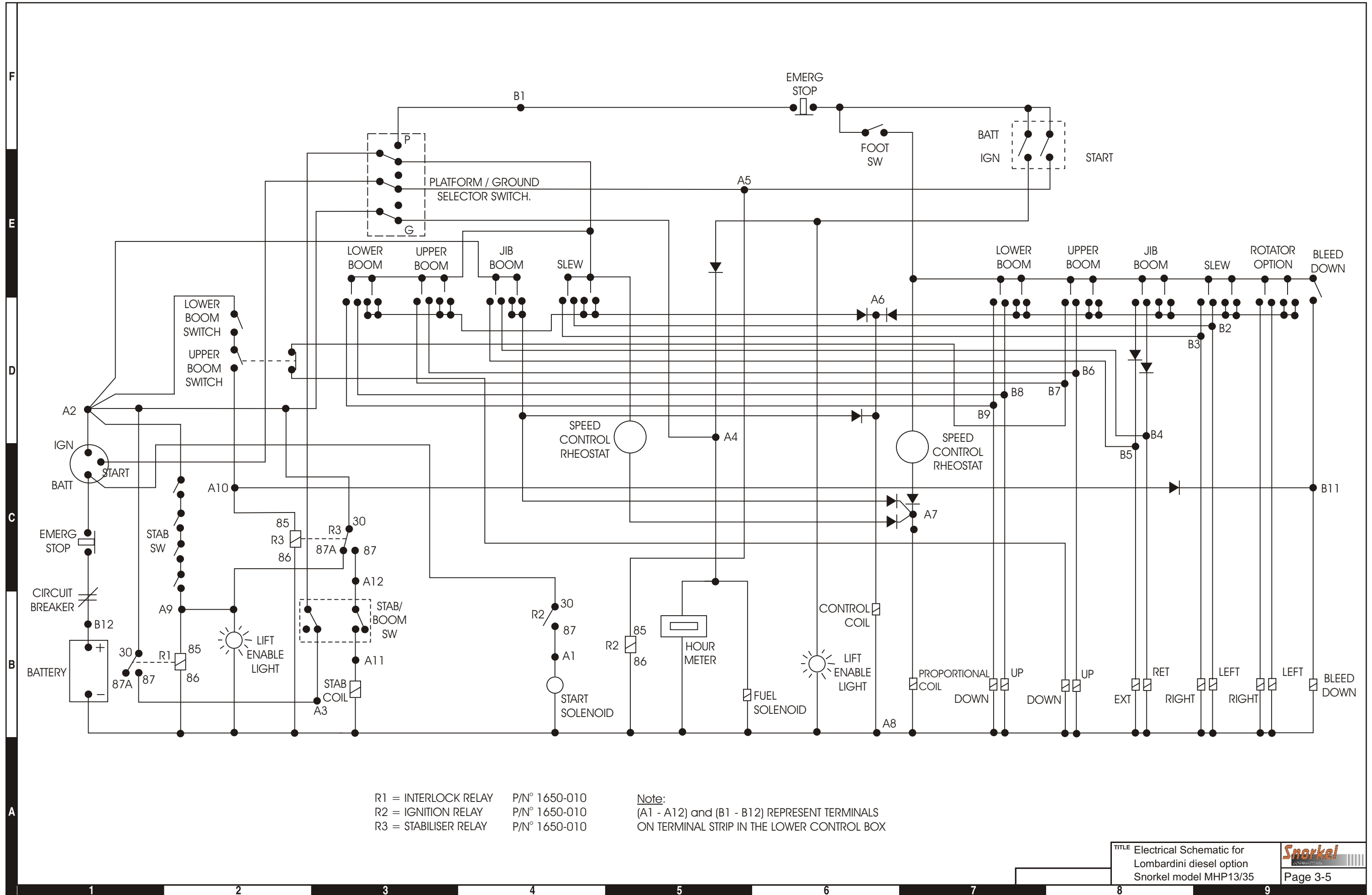
Optional Automatic stabiliser

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



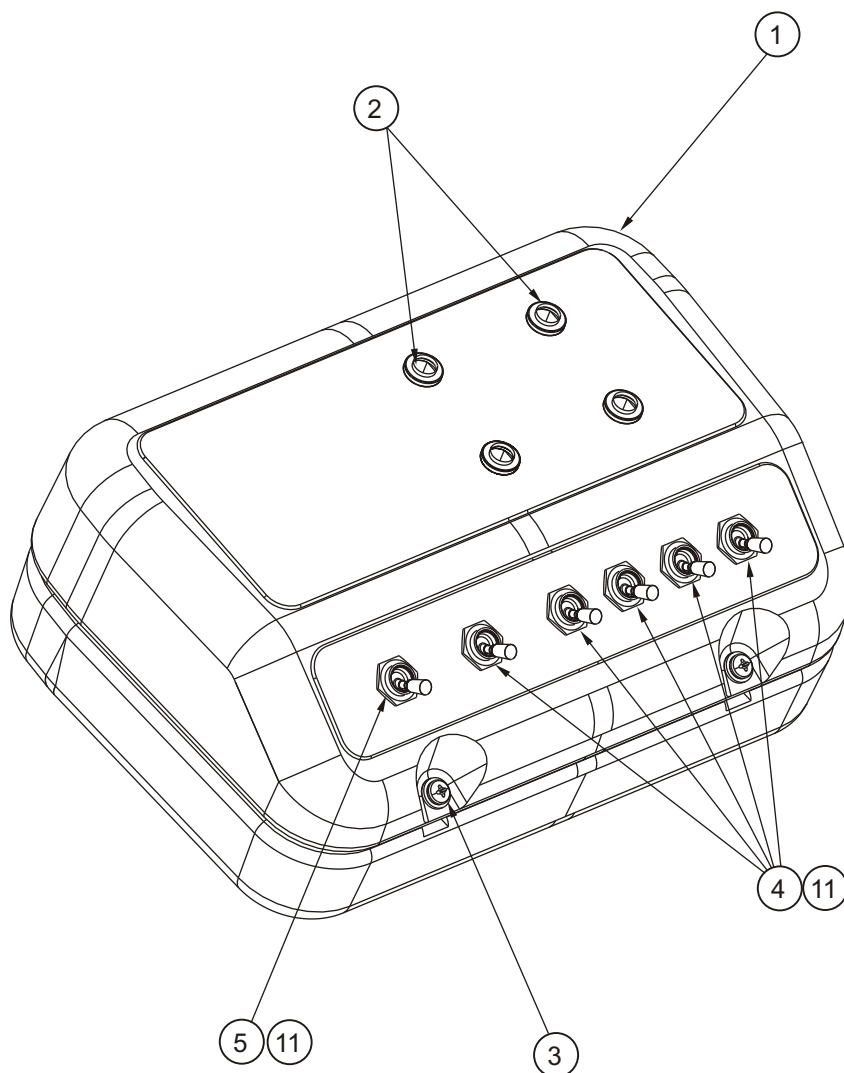
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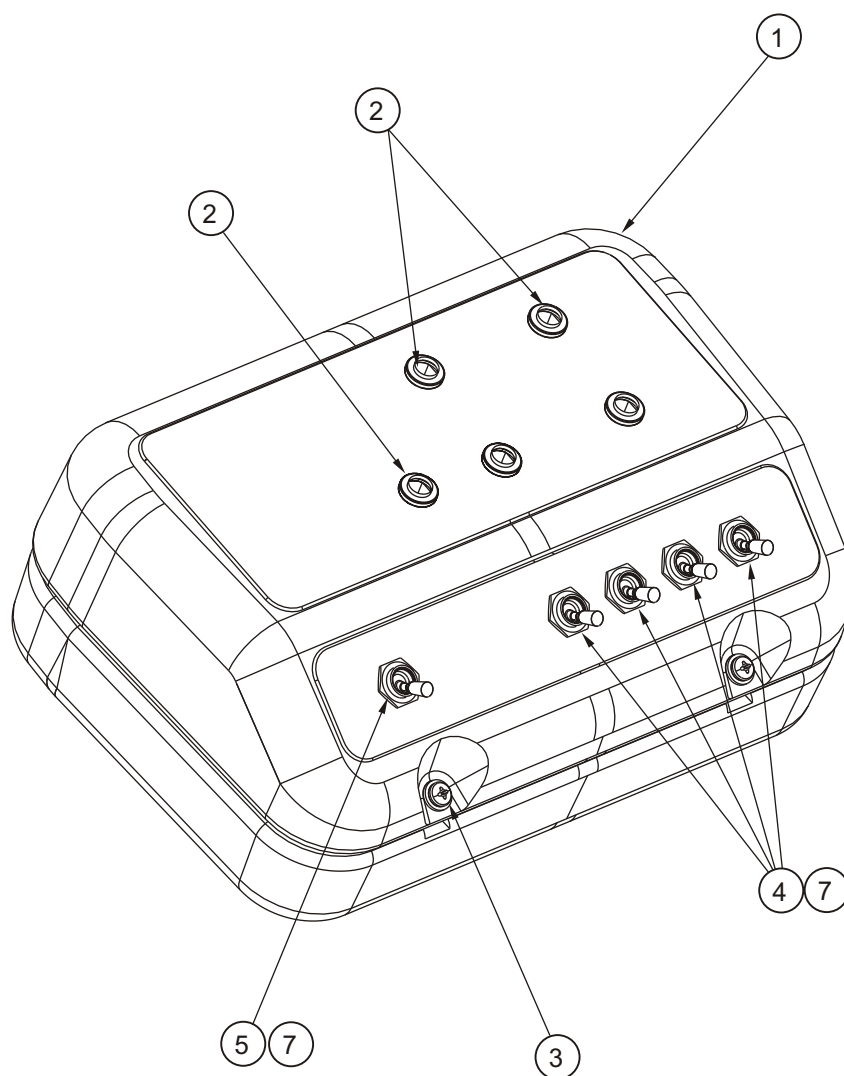
Automatic stabiliser control box assembly before SN NZ051001

Item	Part No	Qty	Description
	12404A		Control box assembly, auto stabiliser
1.	12404	1	Control box
2.	560377	4	Lamp, 12V green (before Serial number NZ050901)
	12536-3	4	LED, 12V green (from Serial number NZ050901)
3.	3604-05020	2	Pan head screw
4.	302-0016	5	Switch, toggle, SPDT (M/OFF/M)
5.	3020097	1	Switch, toggle, DPDT
6.	304-0411	1	Audible alarm (not shown)
7.	12416	1	Hinge (not shown)
8.	1650-010	1	Relay (not shown)
9.	304-0338	1	Plug assembly (not shown)
10.	12408	1	Seal (not shown)
11.	7084-005	6	Seal

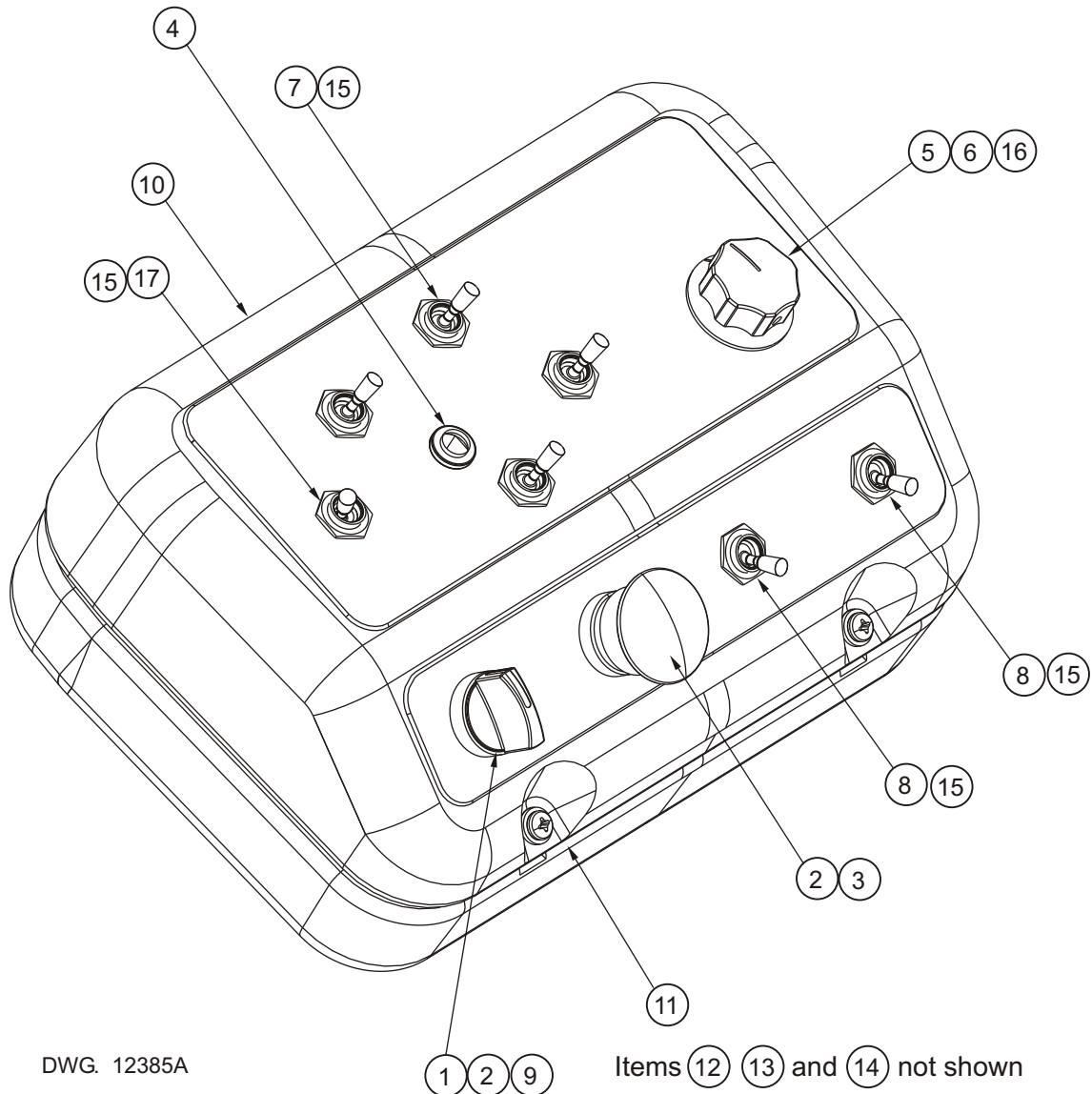


Automatic stabiliser control box assembly after SN NZ051001

Item	Part No	Qty	Description
	12404A		Control box assembly, auto stabiliser
1.	12404	1	Control box
2.	12536-3	5	LED, 12V green (from Serial number NZ050901)
3.	3604-05020	2	Pan head screw
4.	302-0016	5	Switch, toggle, SPDT (M/OFF/M)
5.	12416	1	Hinge (not shown)
6.	12408	1	Seal (not shown)
7.	12515	5	Washer
8.	1815	2	Cable gland (not shown)

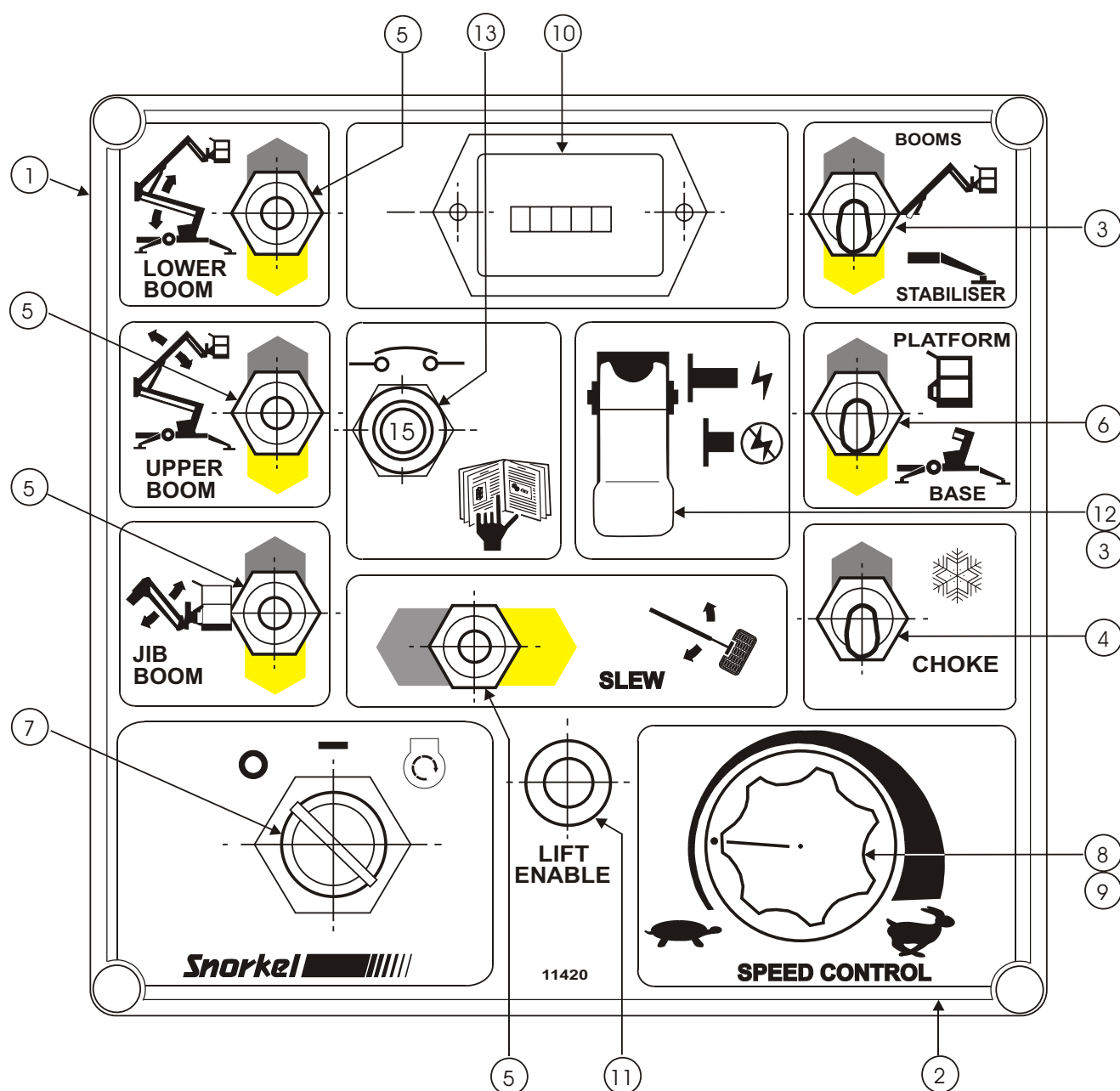


Item	Part No	Qty	Description
	12385A		Upper control box assembly
1.	8808-1	1	Start switch 3 position
2.	9776	1	Collar and contact block
3.	9775	1	Stop switch head
4.	560377	1	Lamp, 12V, green (before serial number NZ051001)
	12385A	1	LED, 12V, green (from serial number NZ051001)
5.	304-0412	1	Rheostat
6.	304-0348	1	Knob, speed control switch
7.	302-0018	4	Switch, toggle DPDT (M/OFF/M)
8.	302-0015	2	Switch, toggle SPST (MOM/OFF)
9.	10114	1	Contact set, additional
10.	12385	1	Control box, upper
11.	3604-05020	2	Pan head screw, plated
12.	12408	1	Rubber seal (not shown)
13.	12416	1	Hinge (not shown)
14.	304-0338	1	Plug assembly (not shown)
15.	7084-005	6	Seal
16.	7084-007	1	Seal
17.	302-0018	1	Used with rotate option only



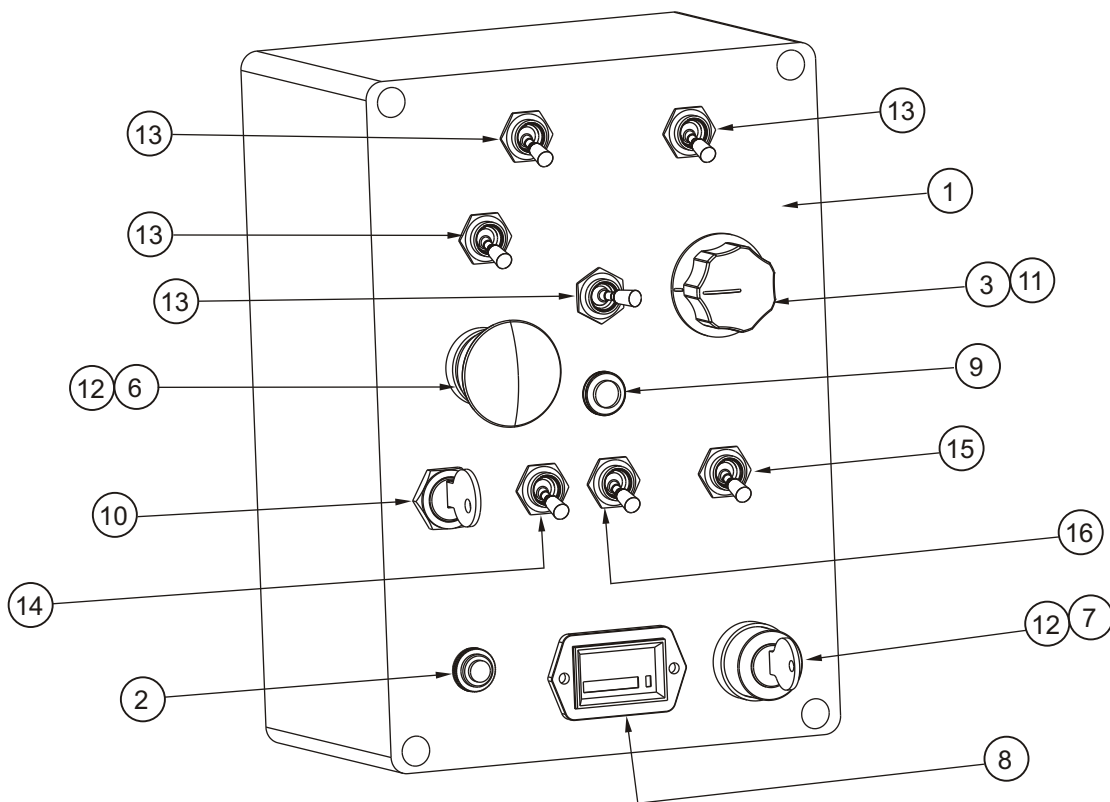
Lower control box assembly before SN NZ050901

Item	Part No	Qty	Description
1.	11406-1	1	Control box, lower, drilled
2.	11420	1	Decal, control box
3.	302-0013	1	Switch, toggle DPDT (ON/ON)
4.	302-0015	1	Switch, toggle SPST (MOM/OFF)
5.	302-0018	4	Switch, toggle DPDT (M/OFF/M)
6.	302-0048	1	Switch, toggle 4PDT (ON/ON)
7.	3020087	1	Key switch </td
8.	304-0348	1	Knob, speed control switch
9.	304-0412	1	Rheostat 25 ohm
10.	455186	1	Hourmeter 12-60VDC square
11.	560377	1	Lamp, 12V, green (before serial number NZ051001)
	12521A	1	LED, 12V, green (from serial number NZ051001)
12.	56223-6	1	Switch guard
13.	56368-6	1	Circuit breaker 15 amp

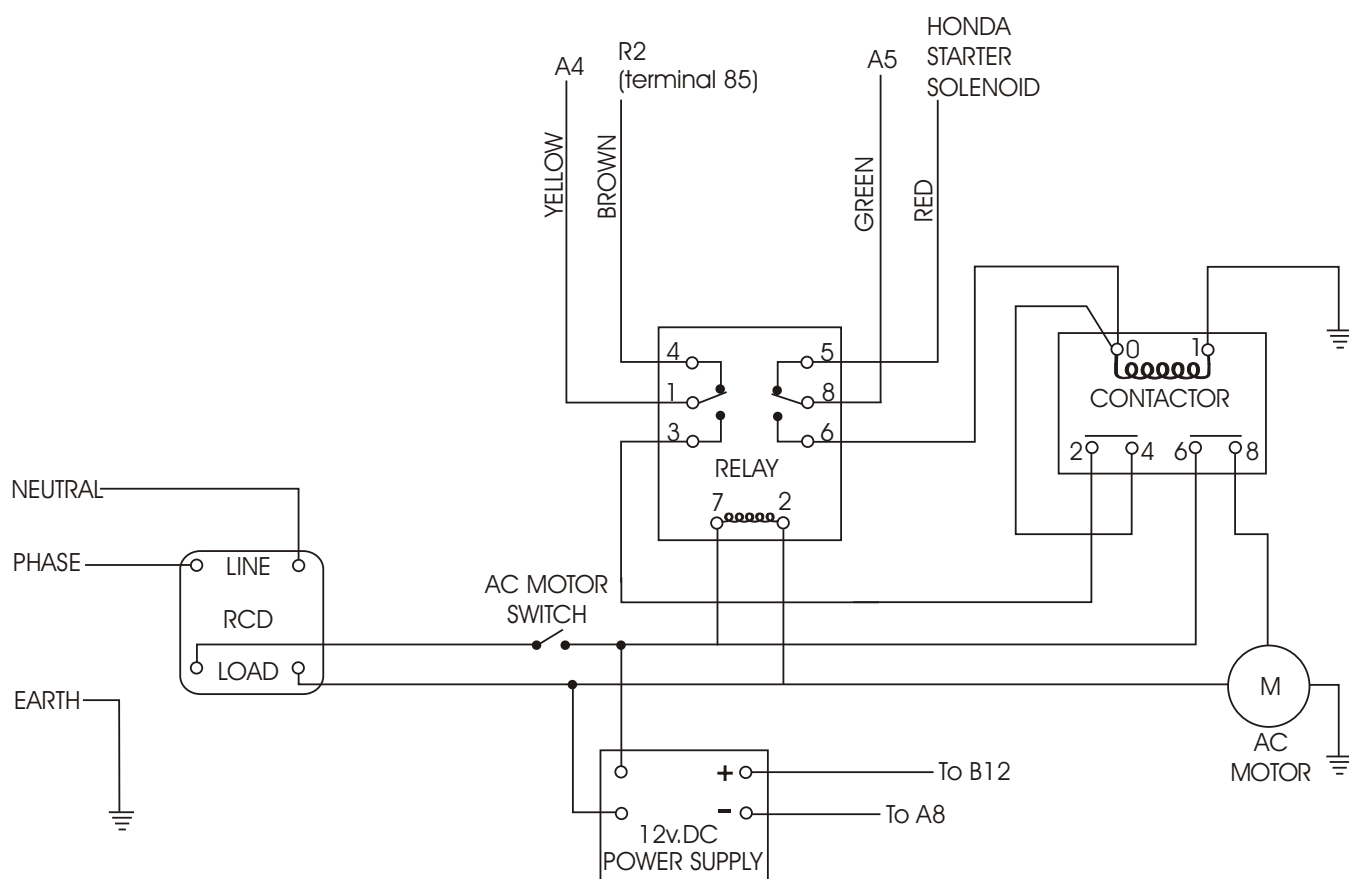


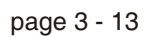
Lower control box assembly from SN NZ050901

Item	Part No	Qty	Description
1.	12521	1	Control box, lower
2.	56368-6	1	Circuit breaker, 15 amp
3.	304-0438	1	Knob, speed control switch
4.	1814	3	Cable gland (not shown)
5.	1815	1	Cable gland (not shown)
6.	9775	1	Stop switch head
7.	10744	1	Key switch
8.	455186	1	Hourmeter
9.	560377	1	Lamp, 12V, green (before serial number NZ051001)
	12521A	1	LED, 12V, green (after serial number NZ051001)
10.	3020087	1	Key switch
11.	304-0412	1	Rheostat
12.	9776	2	Collar and contact block
13.	302-0018	4	Switch,toggle, DPDT (M/OFF/M)
14.	302-0015	1	Switch, toggle, SPST (MOM/OFF)
15.	302-0048	1	Switch, toggle, 4PDT (ON/ON)
16.	302-0097	1	Switch, toggle, DPDT (ON/ON)



AC motor option drawing

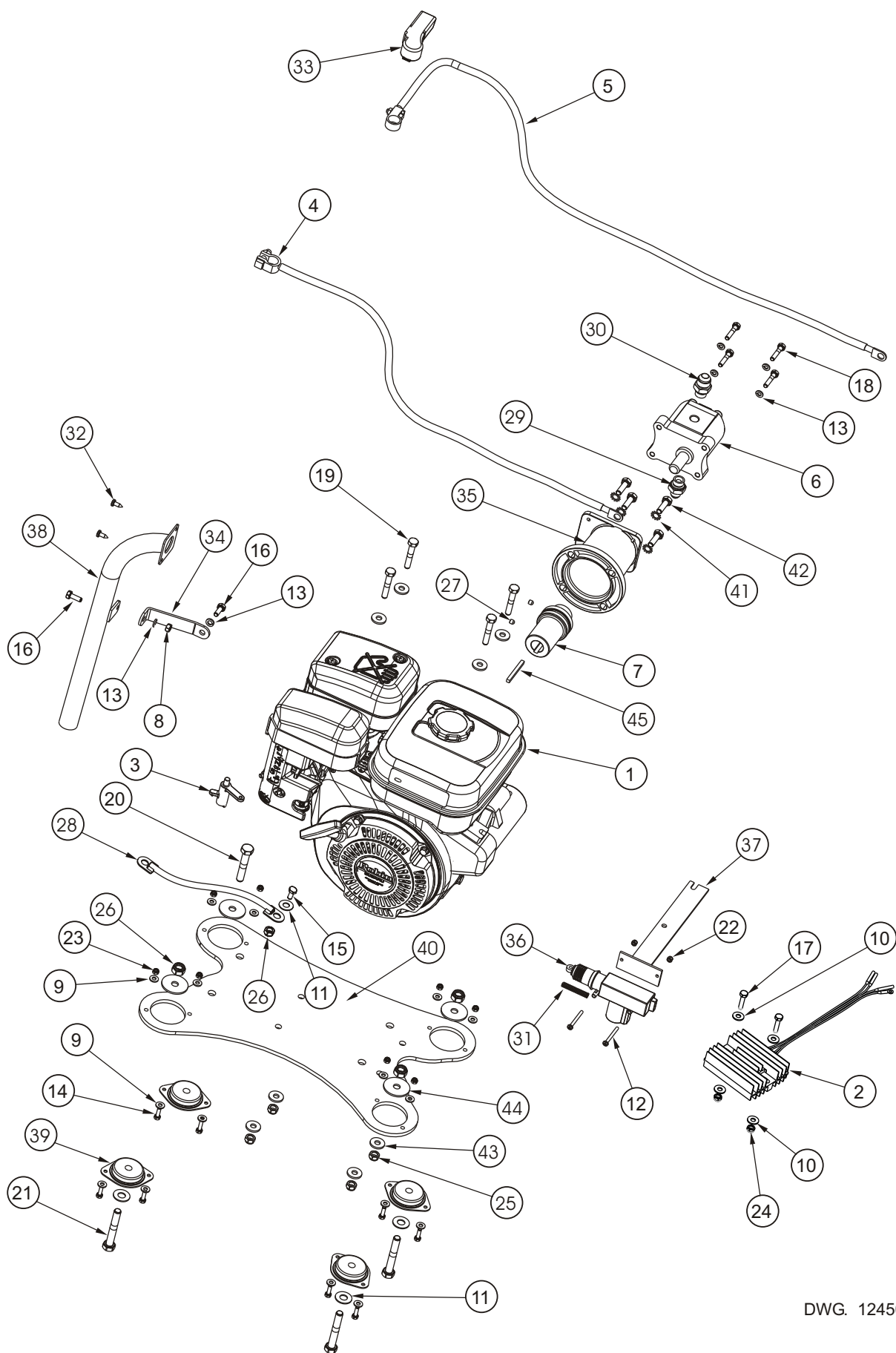




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Engine assembly, Robin

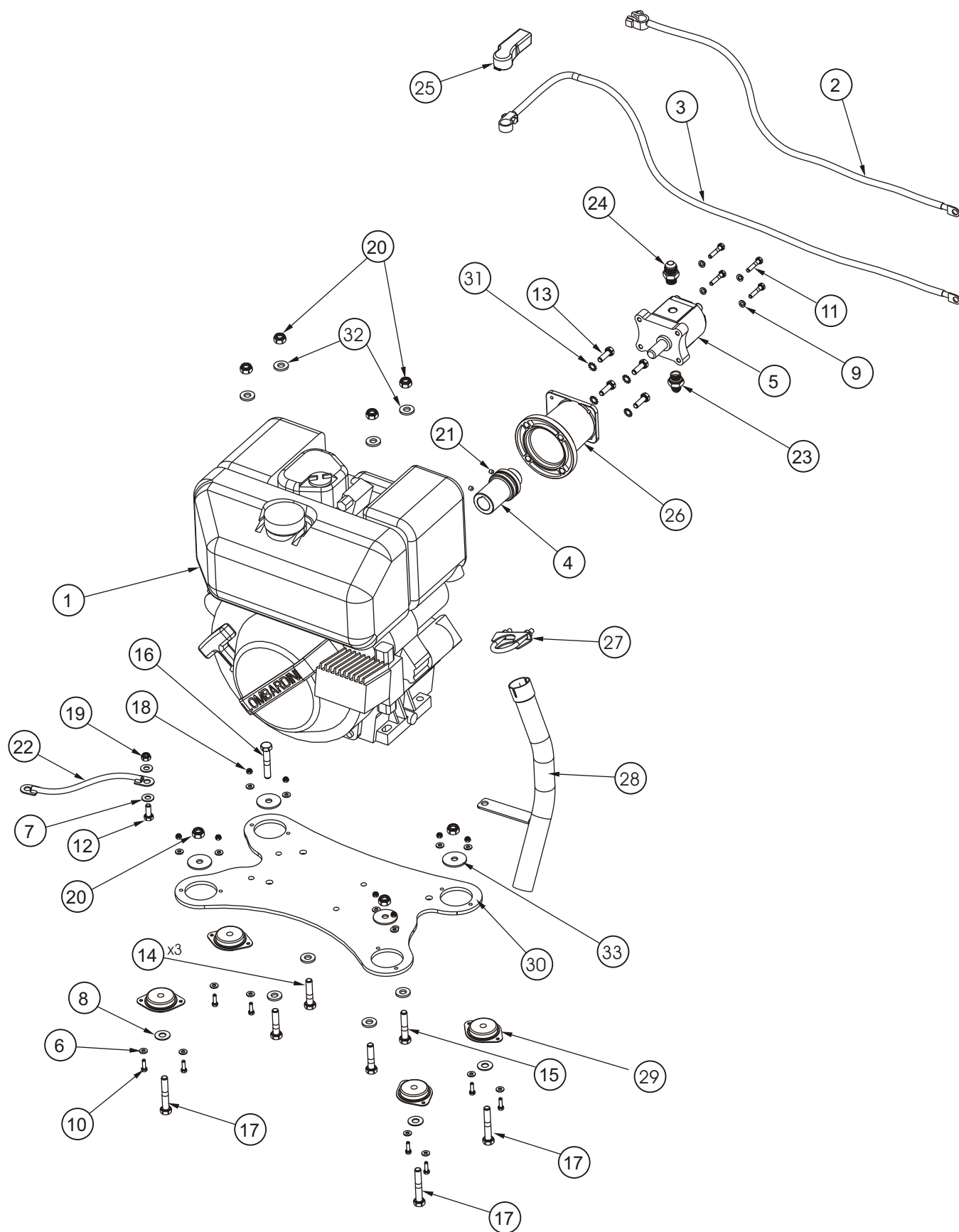
Item	Part No	Qty	Description
	12450	1	Engine assembly EX17DS
	12542	1	Engine assembly EX21DS
1.	1171-11	1	Robin EX17 6.0HP
	1171-12	1	Robin EX21 7.0HP
2.	1171-11-022	1	Regulator / rectifier Robin
3.	1171-11-031	1	Choke actuator lever
4.	1650-030	1	Battery cable
5.	1650-031	1	Battery cable
6.	1659	1	Gear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



DWG. 12450

Engine assembly, Lombardini

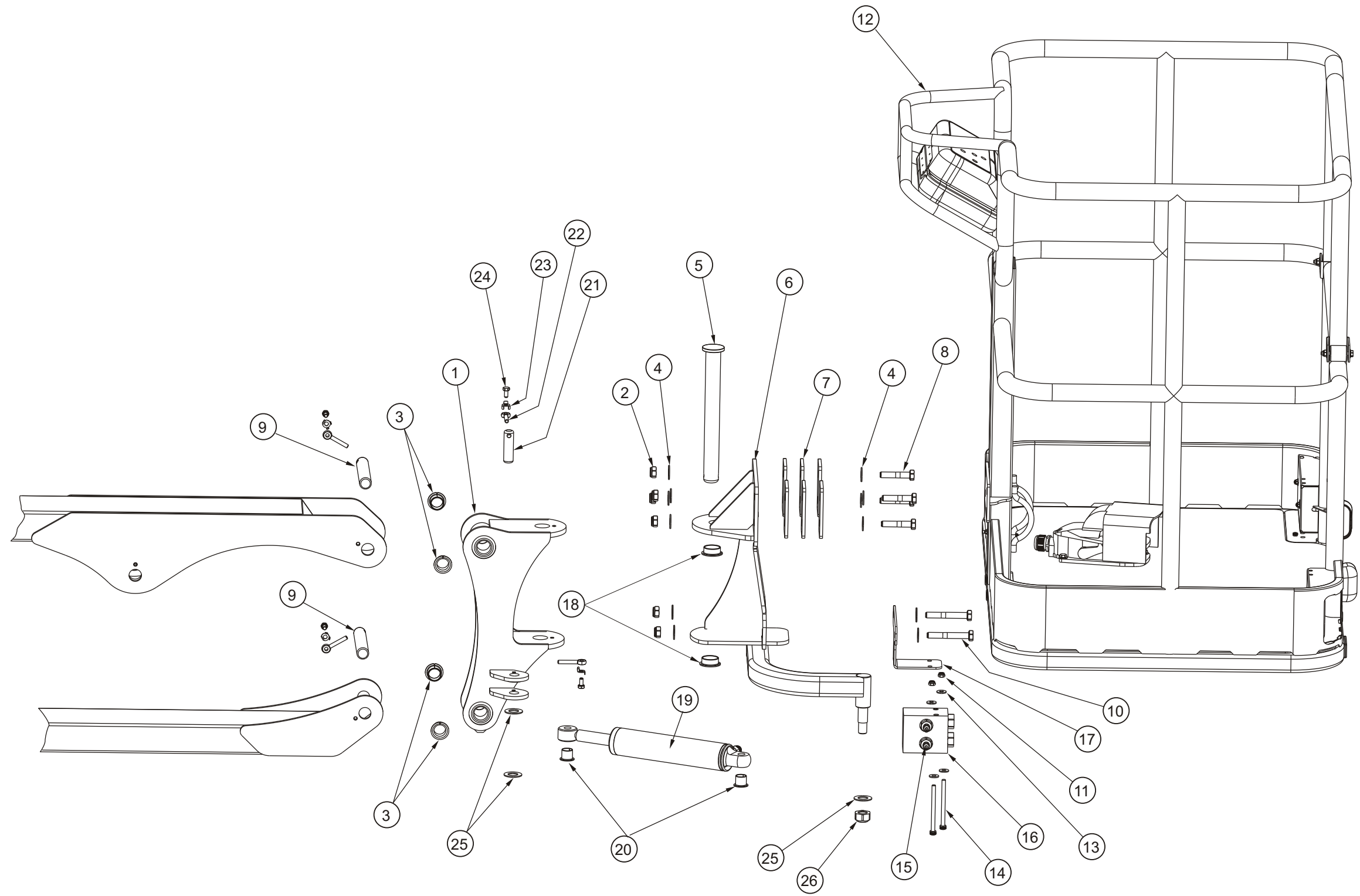
Item	Part No	Qty	Description
	12449	1	Engine assembly
1.	1171-8	1	Lombardini 15LD315 diesel engine
2.	1650-030	1	Battery cable
3.	1650-031	1	Battery cable
4.	1657-11	1	Drive coupling
5.	1659	1	Gear pump
6.	3603-05	16	Plain washer
7.	3603-08	2	Plain washer
8.	3603-10	3	Plain washer
9.	3605-06	4	Spring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



Basket rotator assembly

Item	Part No	Qty	Description
	12441		Basket rotator assembly
1.	12468-2	1	Rotator, jib side
2.	3611-10	6	Nylock nut
3.	3626-10	4	Flanged bush
4.	3603-10	12	Plain washer
5.	12470	1	Stepped pin 25 x 235
6.	12468-1	1	Rotator, basket side
7.	12451-3	As Req	Basket spacer
8.	3610-10050	4	Bolt
9.	12347	2	Pin 20 x 134mm
10.	3610-10070	2	Bolt
11.	3611-06	2	Nylock nut
12.	12327A	1	Basket assembly
13.	3603-06	4	Plain washer
14.	3613-06080	2	Cap screw
15.	506-5705	4	JIC M x UN O-Ring Nipple
16.	11586	1	Double pilot check valve
17.	12468-16	1	Valve mount
18.	3626-5	2	Flanged bush
19.	12330A	1	Rotator cylinder
20.	3626-3	2	Flanged bush
21.	12468-22	1	Pin
22.	8628	4	Pin keeper
23.	11492-1	4	Tab washer
24.	3610-06012	4	Bolt
25.	3603-16	3	Plain washer
26.	3608-16C	1	Conelock nut

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Revision A 3 May 2005

DWG. 12468

TITLE Basket Rotator Assembly
Snorkel Model MHP13/35

Snorkel
EXTRAPRO
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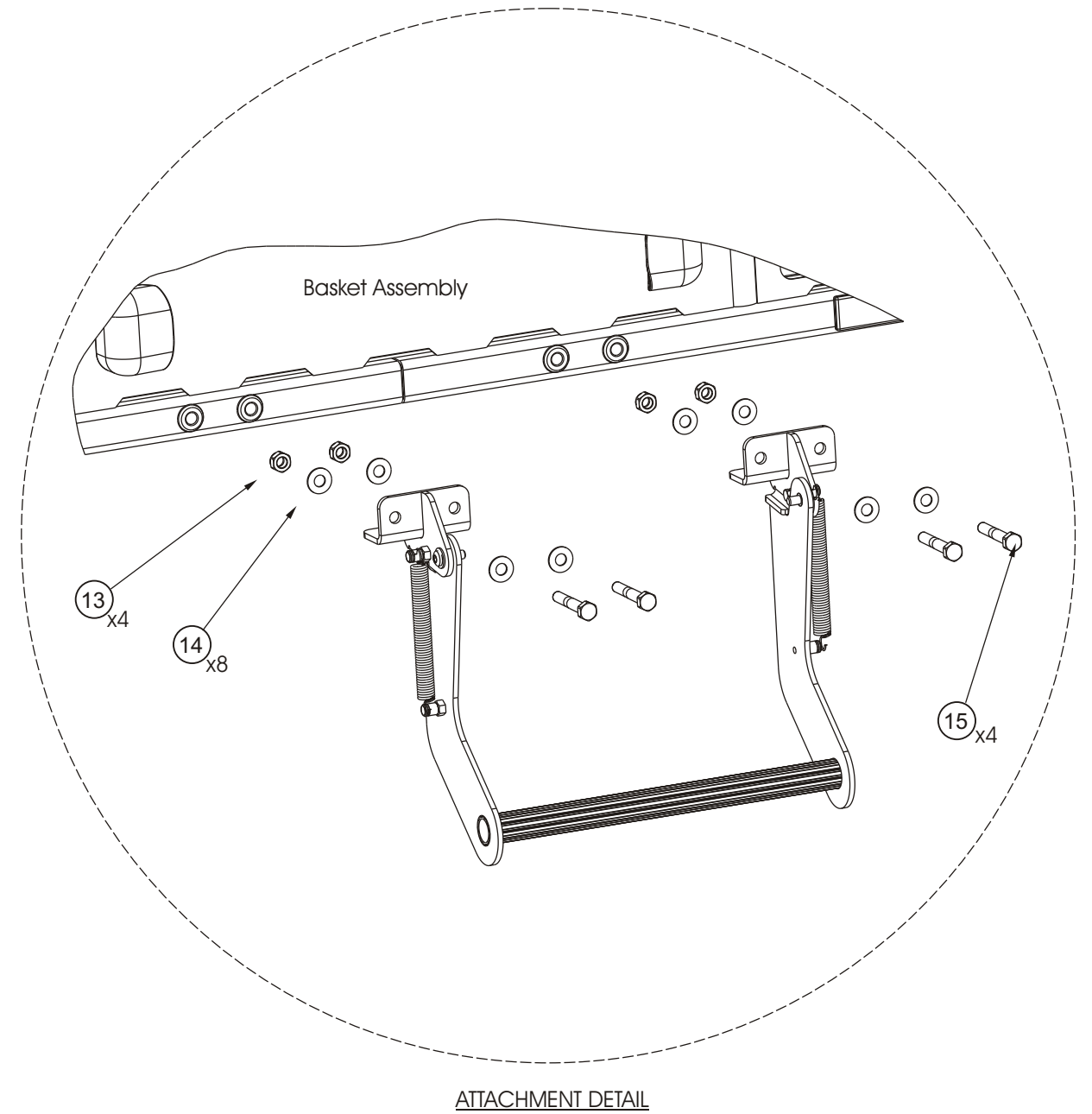
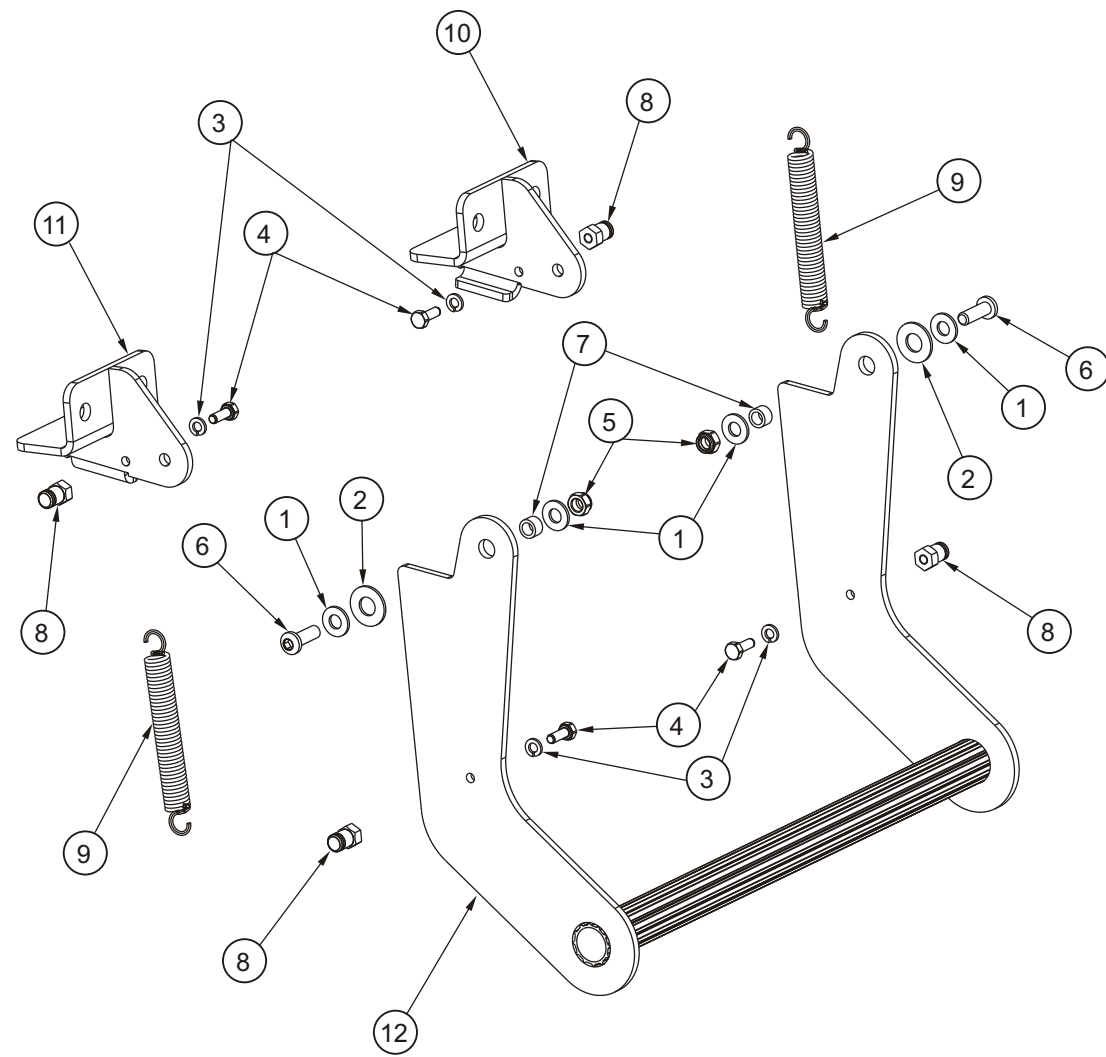
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Item	Part No	Qty	Description
	12480A		Fold down step assembly
1.	3603-08	4	Plain washer
2.	3603-12	2	Plain washer
3.	3605-06	4	Spring washer
4.	3610-06016	4	Metric bolt
5.	3611-08	2	Metric nylock nut
6.	3668-08025	2	Socket button head screw
7.	11429-32	2	Bush
8.	11429-33	4	Spring retainer
9.	11429-34	2	Spring
10.	12480-10	1	Step mount, left
11.	12480-20	1	Step mount, right
12.	12480-30	1	Rung weldment (all machines before Serial Number NZ050701)
	12480-300	1	Rung weldment (all machines from Serial Number NZ050701)
13.	3611-10	4	Nylock nut
14.	3603-10	8	Plain washer
15.	3610-10070	4	Bolt

Honda 240V gas/AC option

Item	Part no	Qty	Description
1.	3610-04016	4	Bolt
2.	3603-04	4	Plain washer
3.	3611-04	4	Nylock nut
4.	11115	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

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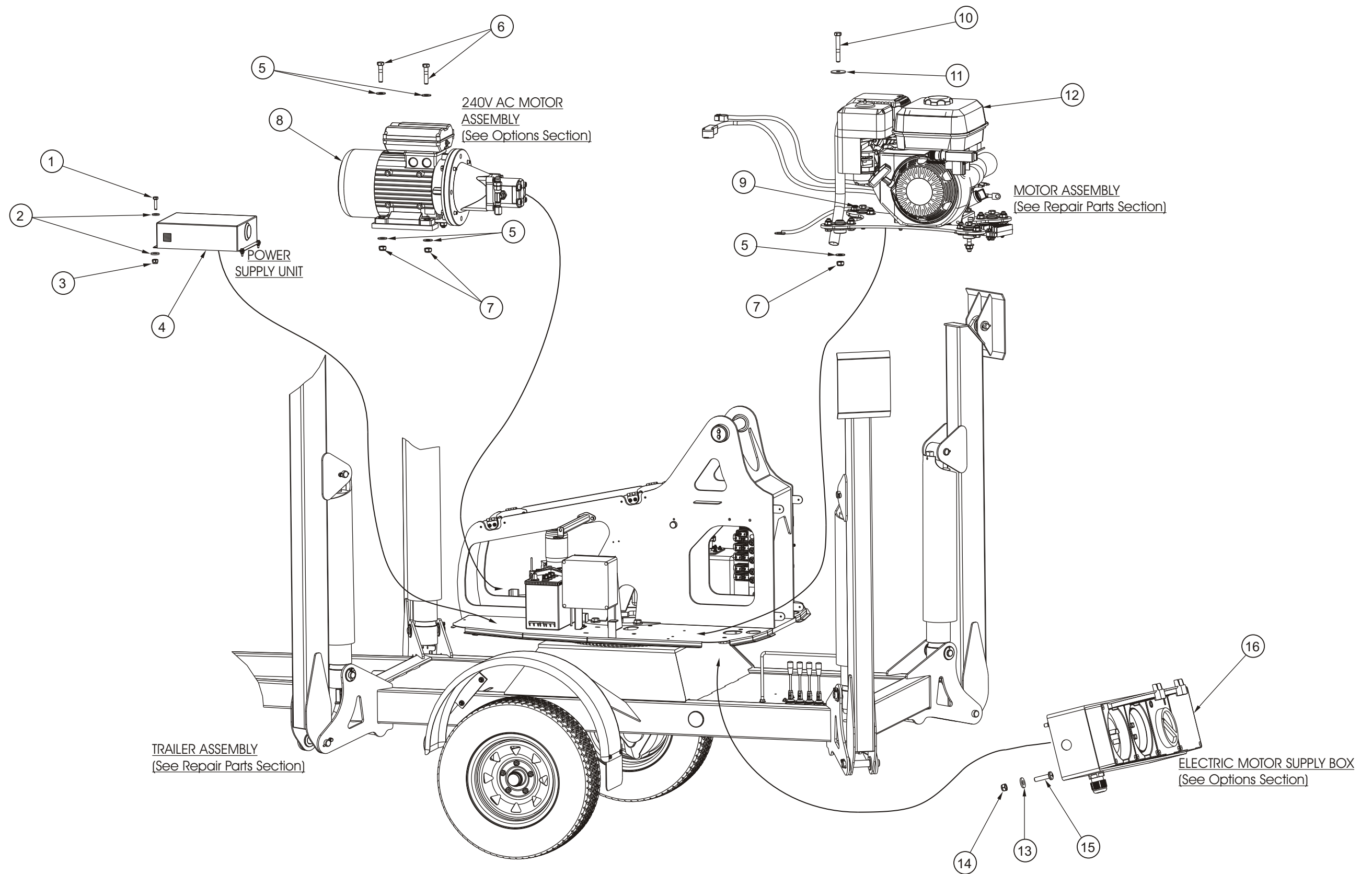
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TITLE Honda 240V Gas/AC Option

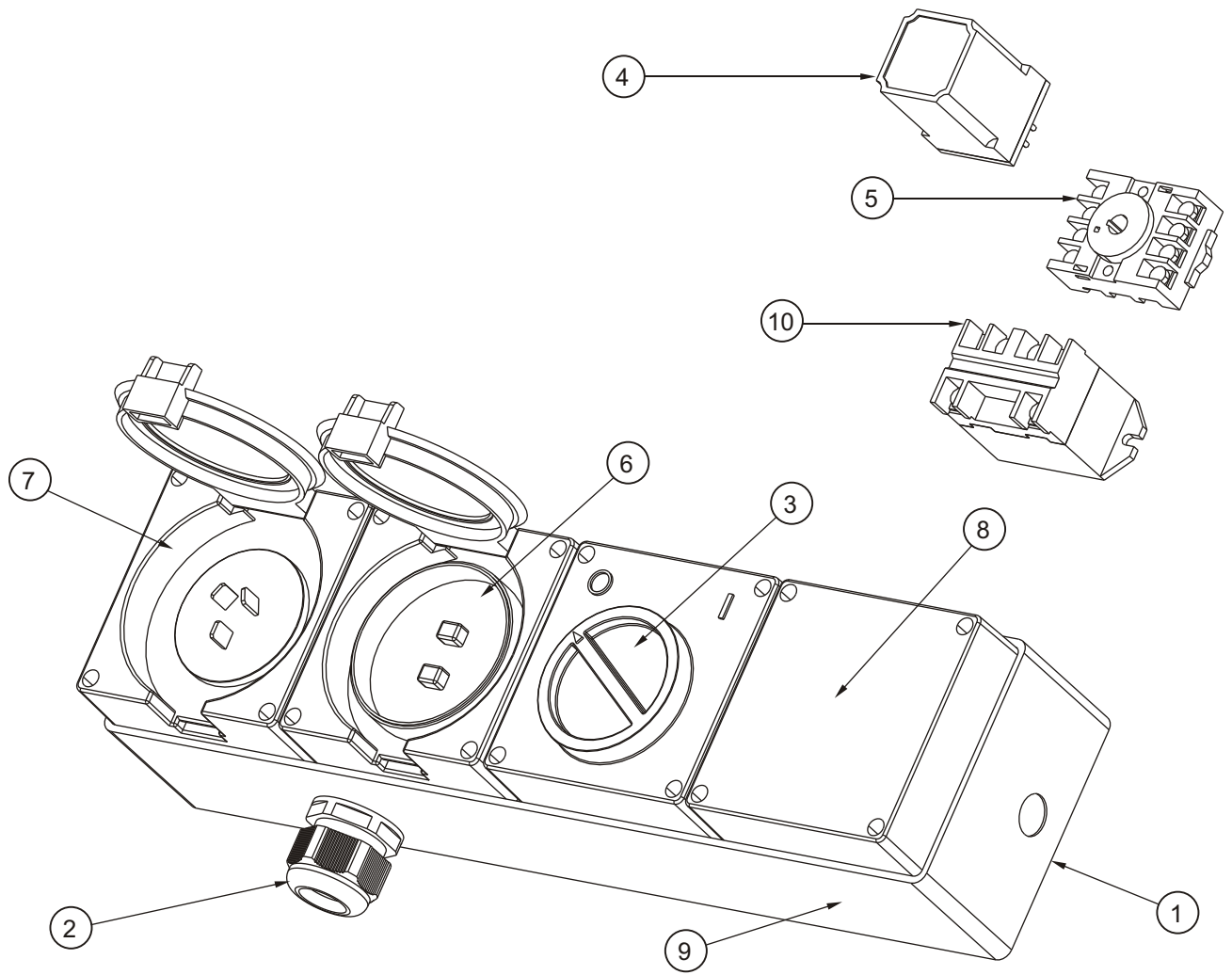
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Snorkel Model MHP13/35

Snorkel
 INTERNATIONAL

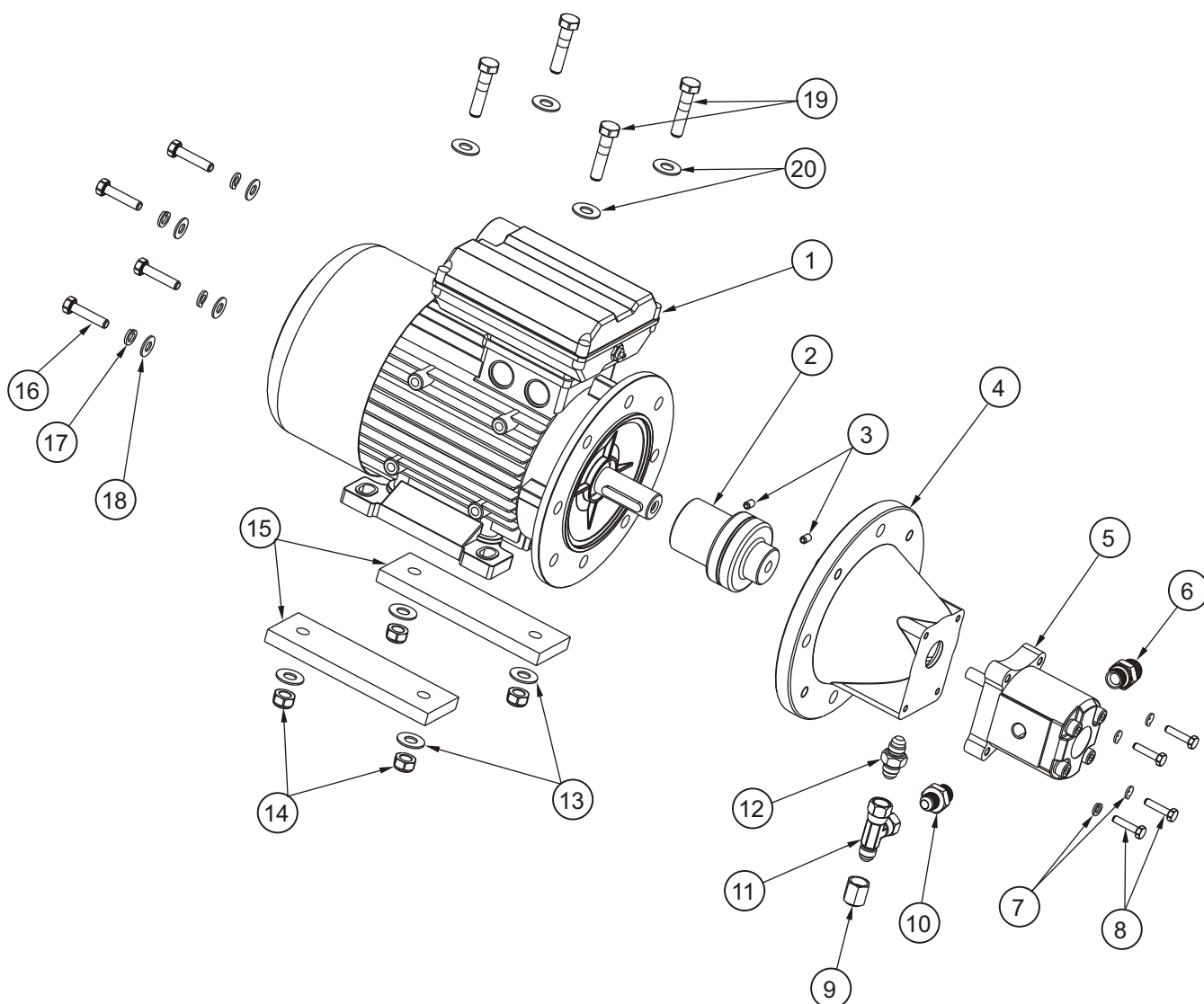
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Item	Part No	Qty	Description
1.	12486	1	Electric motor supply box
2.	1815	1	Compression gland
3.	1865-001	1	Switch
4.	2500-5	1	Relay
5.	2500-6	1	Relay mounting base
6.	10967-1	1	RCD
7.	10967-2	1	Appliance inlet
8.	10967-4	1	Enclosure lid
9.	10967-6	1	Enclosure
10.	11588	1	Relay

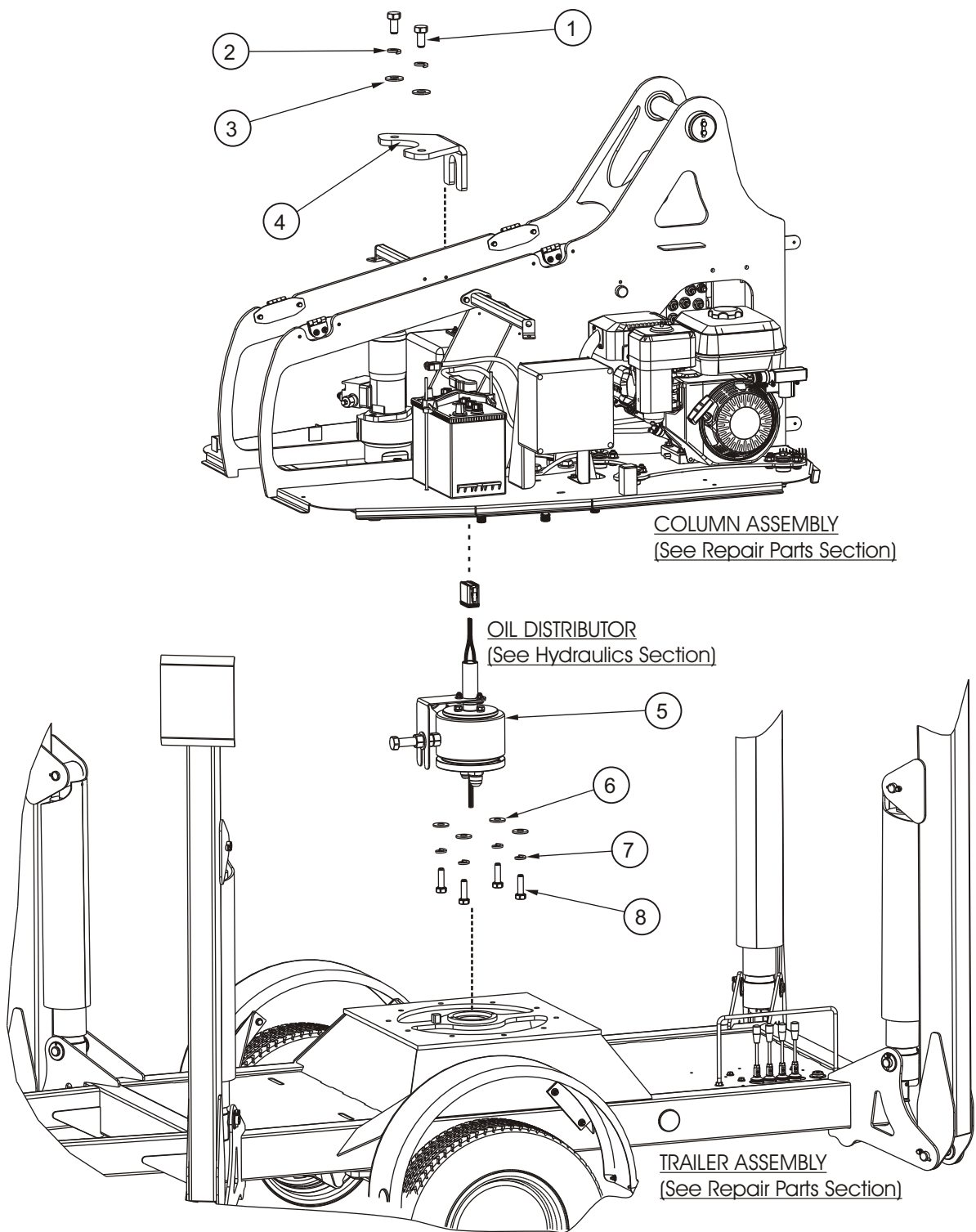


240 AC motor

Item	Part No	Qty	Description
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



Item	Part No	Qty	Description
1.	3610-08016	2	Bolt
2.	3605-08	2	Spring washer
3.	3603-08	2	Plain washer
4.	12452	1	Distributor drive
5.	11957A	1	Oil distributor
6.	3603-06	4	Plain washer
7.	3605-06	4	Spring washer
8.	3610-06020	4	Bolt



240V AC basket outlet

Item	Part No	Qty	Description
1.	12485-2	1	240V AC basket outlet
2.	1807	1	Appliance outlet
3.	1865-001	1	Switch
4.	10263	1	Compression gland
5.	10967-3	1	Switch enclosure
6.	10967-5	4	Mounting feet
7.	3611-05	4	Nylock nut
8.	3603-05	8	Plain washer
9.	3610-05010	4	Bolt

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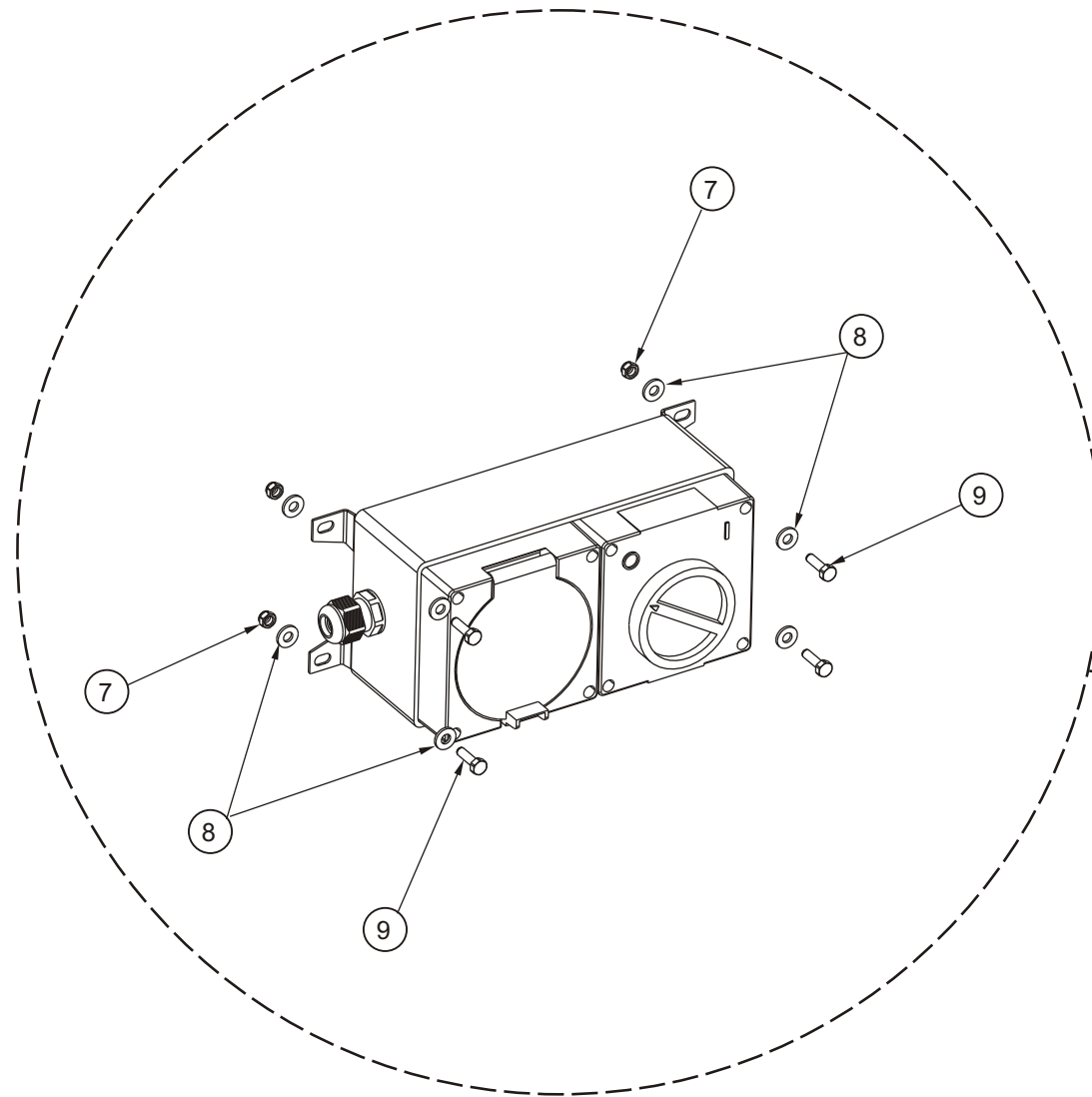
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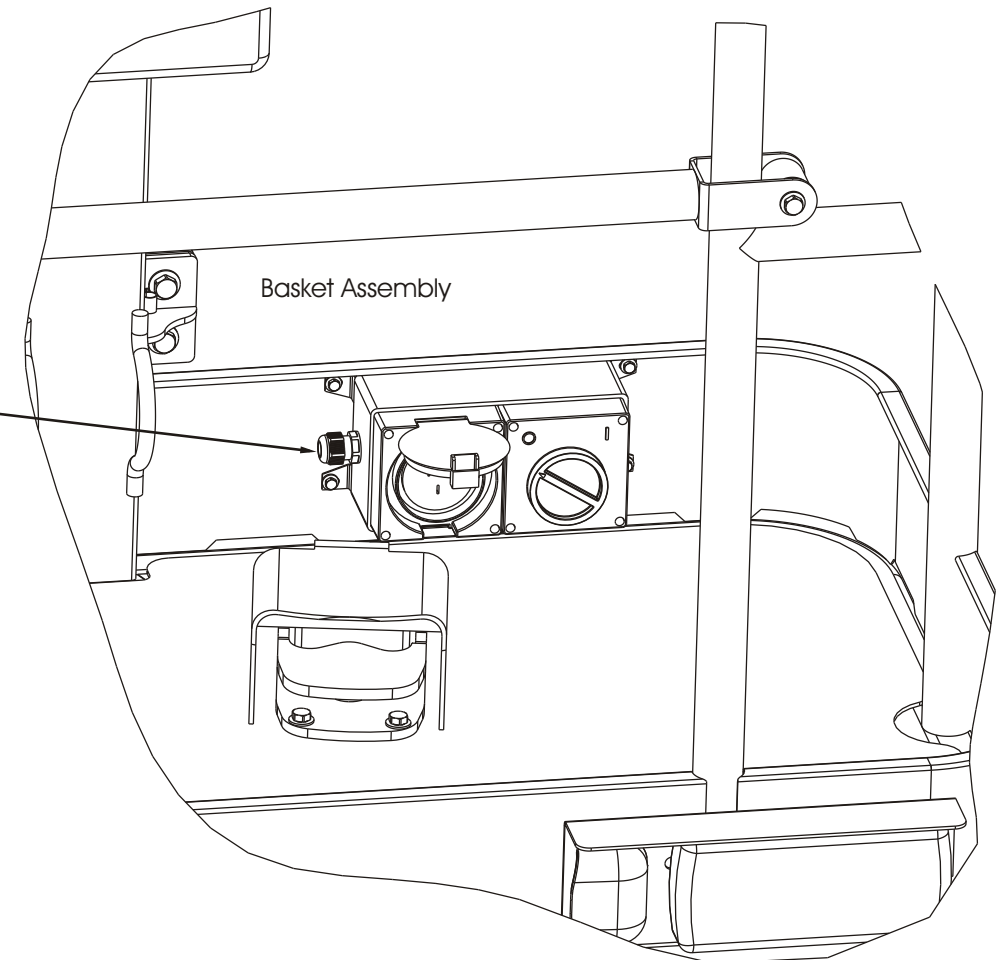
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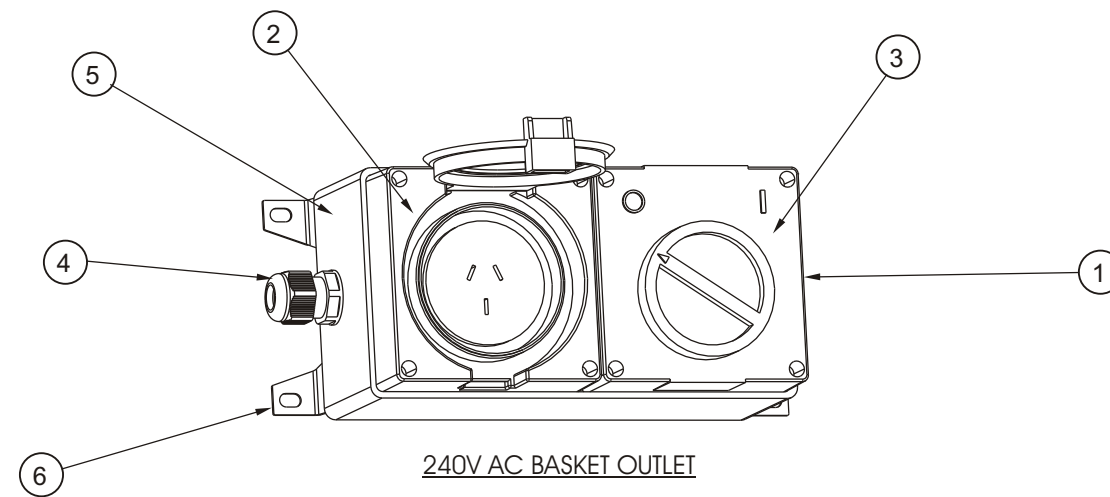
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ATTACHMENT DETAIL



ATTACHMENT POSITION



240V AC BASKET OUTLET

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TITLE 240V AC Basket Outlet

Snorkel Model MHP13/35

Snorkel
INTERNATIONAL

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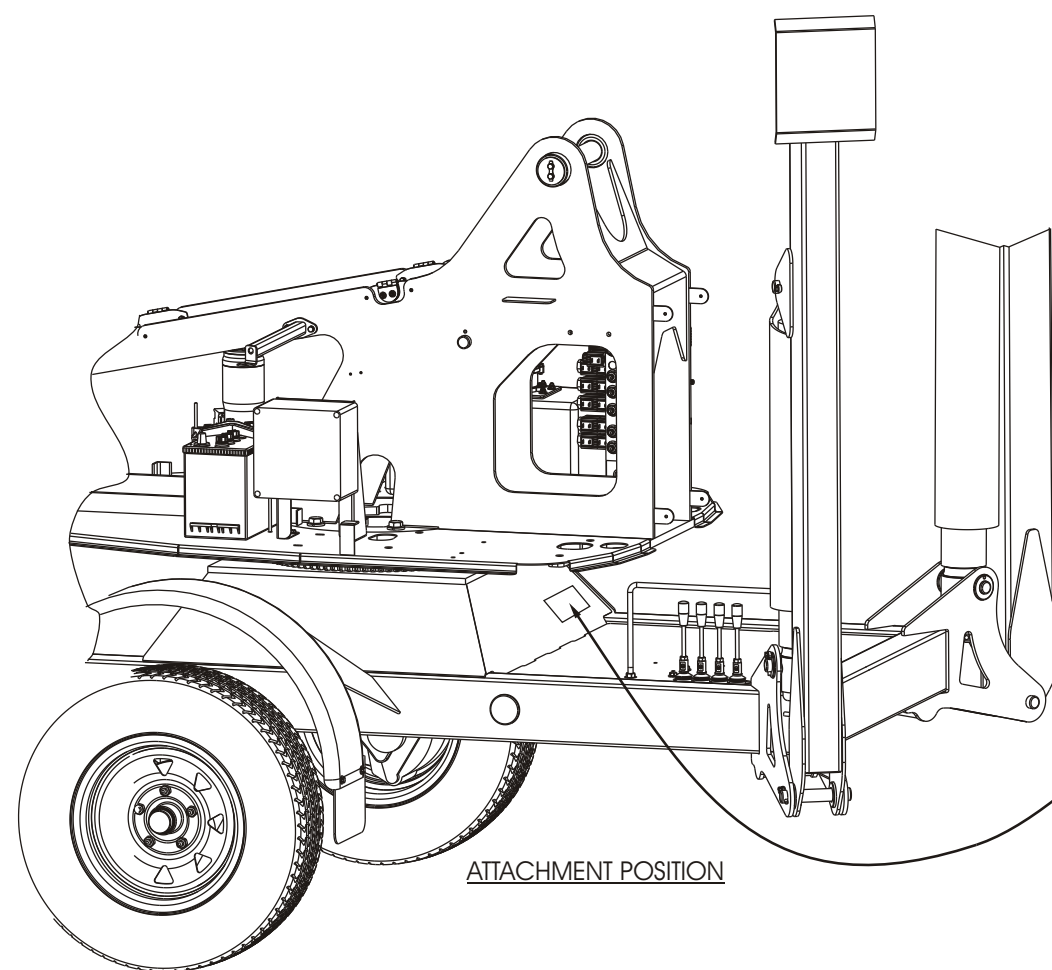
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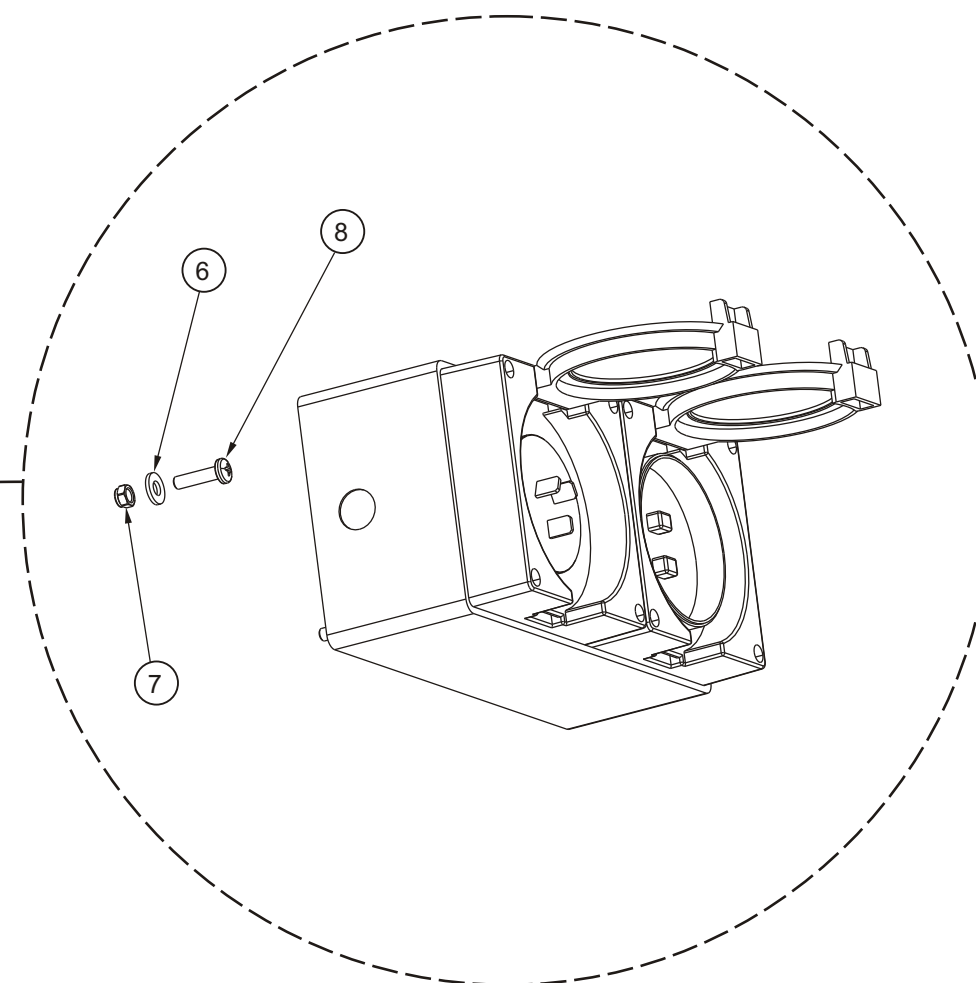
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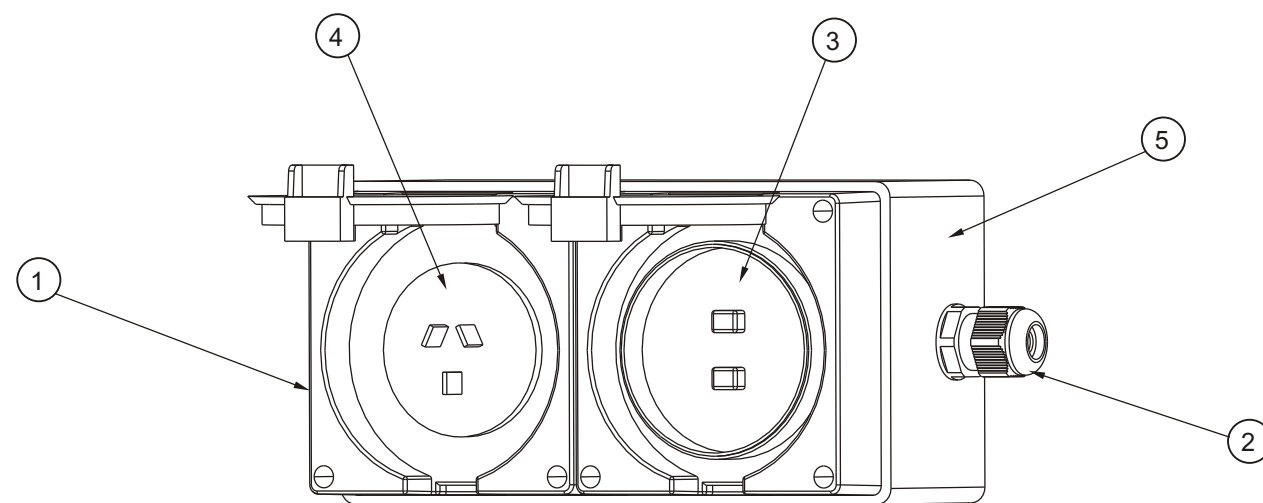
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ATTACHMENT POSITION



ATTACHMENT DETAIL



GROUND POWER SUPPLY

Snorkel
EQUIPMENT

TITLE Ground Power Supply

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Snorkel Model MHP13/35

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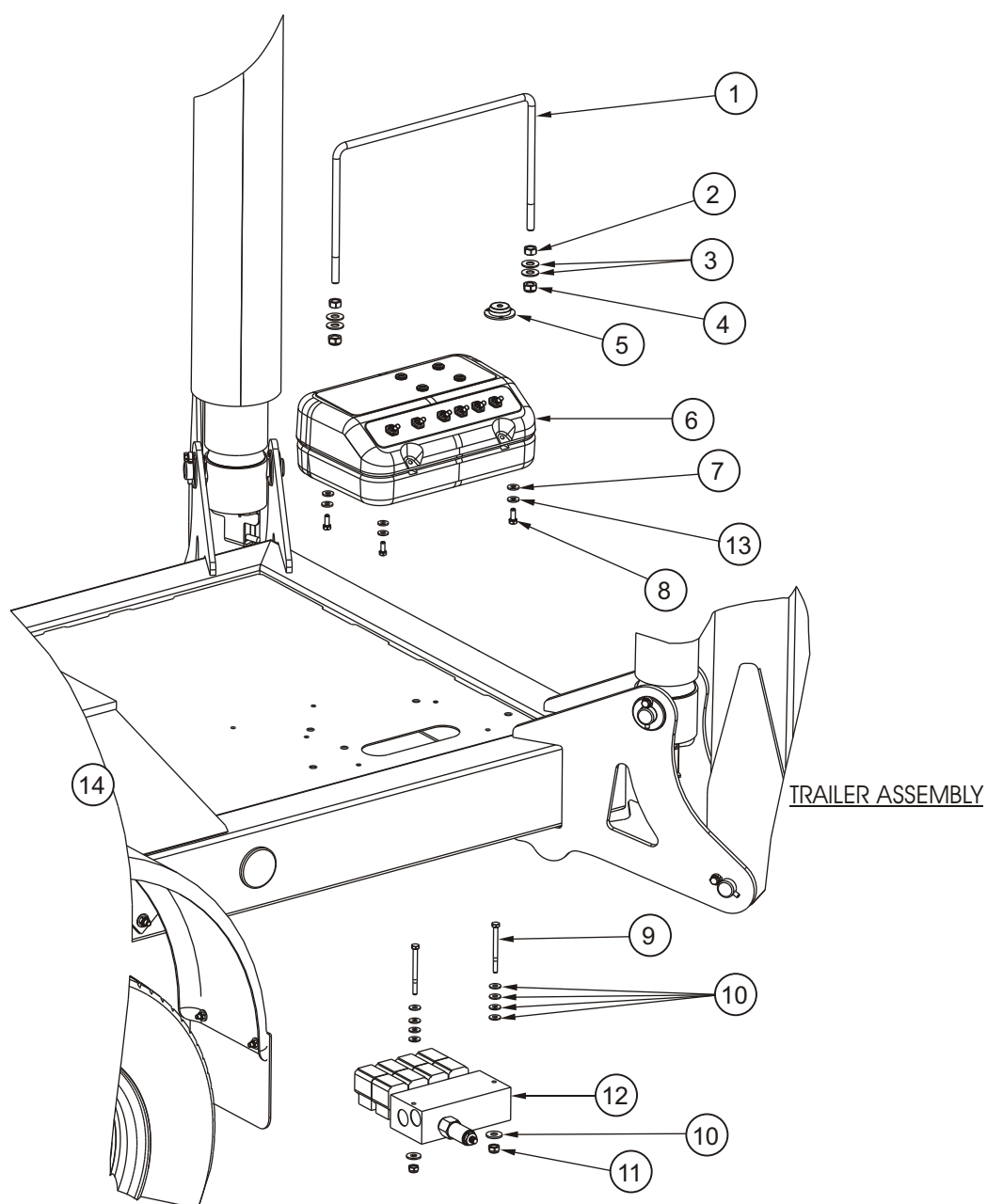
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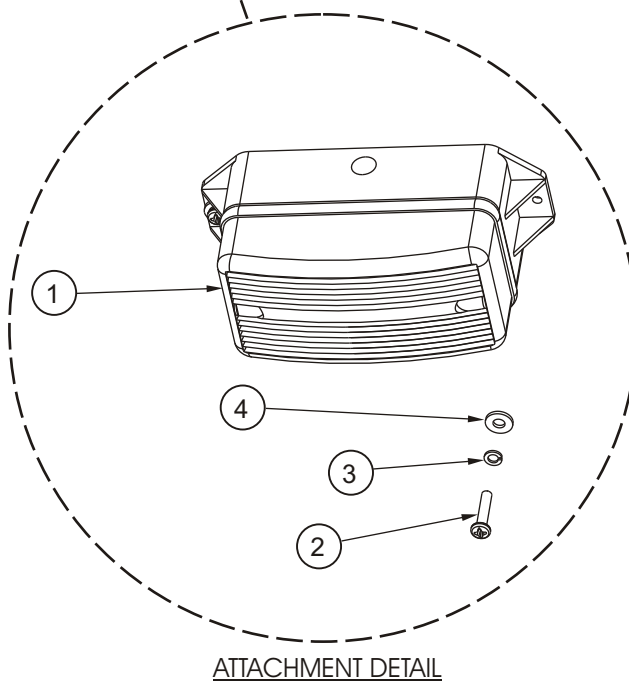
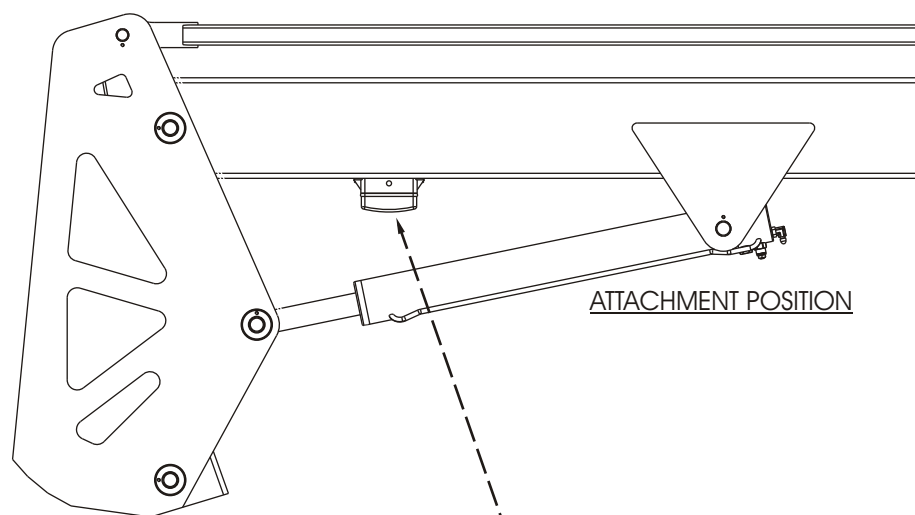
Item	Part No	Qty	Description
1.	12485-1	1	Ground power supply
2.	10263	1	Compression gland
3.	10967-1	1	RCD
4.	10967-2	1	Appliance inlet
5.	10967-3	1	Enclosure
6.	3603-05	4	Plain washer
7.	3611-05	4	Nylock nut
8.	3604-05020	4	Bolt

Auto stabiliser option

Item	Part No	Qty	Description
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.	12404A	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.	12517	1	Decal, auto stabiliser operation (not shown)



Item	Part No	Qty	Description
	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



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