

snorkel

A38E



PARTS & SERVICE MANUAL

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Serial Number 006001 +

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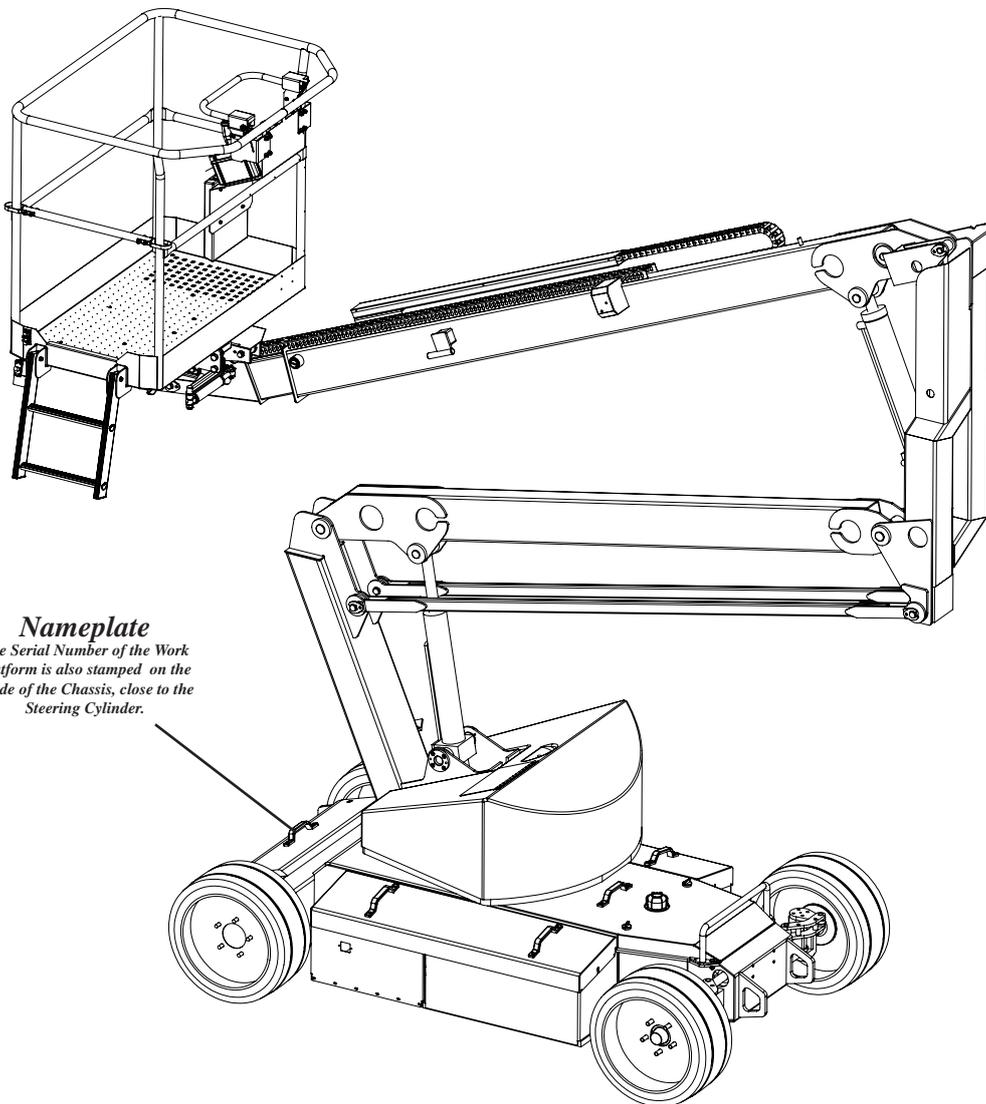
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SERVICE & PARTS MANUAL

A38E

Aerial Work Platform



Nameplate
The Serial Number of the Work
Platform is also stamped on the
inside of the Chassis, close to the
Steering Cylinder.

When contacting Snorkel for service or parts information, sure to include the MODEL and SERIAL NUMBERS from the equipment nameplate.

The A38E work platform meets and exceeds the requirements of both:
En280:2013 and ANSI A92.5 (1992)

WARNING

All personnel shall carefully read, understand and follow all safety rules and operating instructions before operating or performing maintenance on any Snorkel aerial work platform.

Safety Rules

Electrocution Hazard



THIS MACHINE IS NOT INSULATED!

Tip Over Hazard



NEVER elevate the platform or drive the machine while elevated unless the machine is on a firm, level surface.

Collision Hazard



NEVER position the platform without first checking for overhead obstructions or other hazards.

Fall Hazard



NEVER climb, stand, or sit on platform guardrails or midrail.

USE OF THE AERIAL WORK PLATFORM: This aerial work platform is intended to lift persons and his tools as well as the material used for the job. It is designed for repair and assembly jobs and assignments at overhead workplaces (ceilings, cranes, roof structures, buildings etc.). All other uses of the aerial work platform are prohibited!

THIS AERIAL WORK PLATFORM IS NOT INSULATED! For this reason it is imperative to keep a safe distance from live parts of electrical equipment!

NEVER get closer than the minimum distance recommended by your National Regulations.

Exceeding the specified permissible maximum load **is prohibited!** See "Platform Capacity" for details.

The use and operation of the aerial work platform as a lifting tool or a crane **is prohibited!**

NEVER exceed the manual force allowed for this machine. See "Manual Force" for details.

DISTRIBUTE all platform loads evenly on the platform.

NEVER operate the machine without first surveying the work area for surface hazards such as holes, drop-offs, bumps, curbs, or debris; and avoiding them.

OPERATE machine only on surfaces capable of supporting wheel loads.

NEVER operate the machine when wind speeds exceed this machine's wind rating. "Beaufort Scale" for details.

IN CASE OF EMERGENCY push EMERGENCY STOP switch to deactivate all powered functions.

IF ALARM SOUNDS while platform is elevated, STOP, carefully lower platform. Move machine to a firm, level surface.

Climbing up the railing of the platform, standing on or stepping from the platform onto buildings, steel or prefab concrete structures, etc., **is prohibited!**

Dismantling the entry gate or other railing components **is prohibited!** Always make certain that the entry gate is closed and securely locked!

It is prohibited to keep the entry gate in an open position when the platform is raised!

To extend the height or the range by placing of ladders, scaffolds or similar devices on the platform **is prohibited!**

NEVER perform service on machine while platform is elevated without blocking elevating assembly.

INSPECT the machine thoroughly for cracked welds, loose or missing hardware, hydraulic leaks, loose wire connections, and damaged cables or hoses before using.

VERIFY that all labels are in place and legible before using.

NEVER use a machine that is damaged, not functioning properly, or has damaged or missing labels.

To bypass any safety equipment **is prohibited** and presents a danger for the persons on the aerial work platform and in its working range.

NEVER charge batteries near sparks or open flame. Charging batteries emit explosive hydrogen gas.

Modifications to the aerial work platform **are prohibited** or permissible only at the approval by **Snorkel**.

AFTER USE, secure the work platform from unauthorized use by turning the keyswitch off and removing key.

The driving of **MEWP's** on the public highway is subject to regulations made under the Road Traffic Acts.

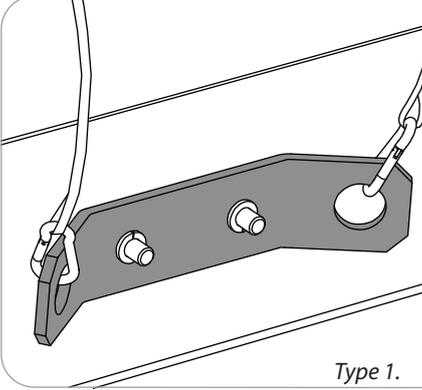
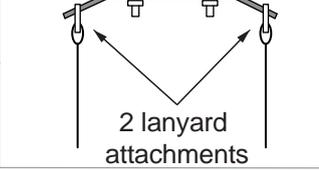
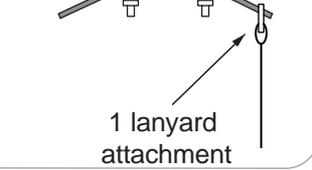
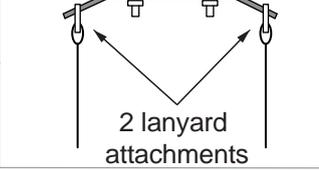
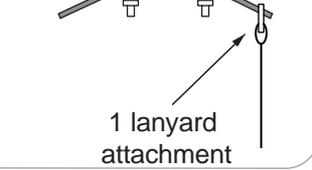
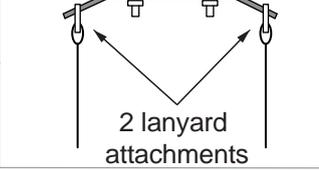
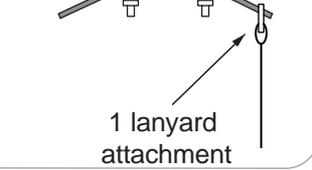
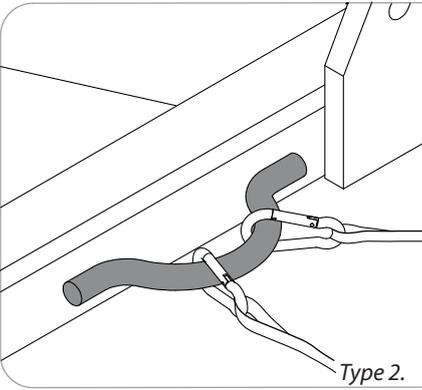
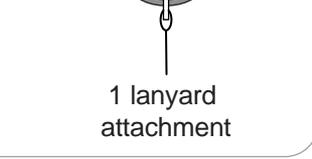
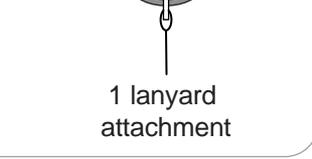
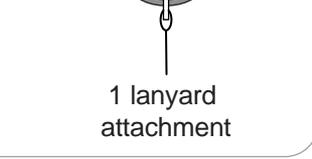
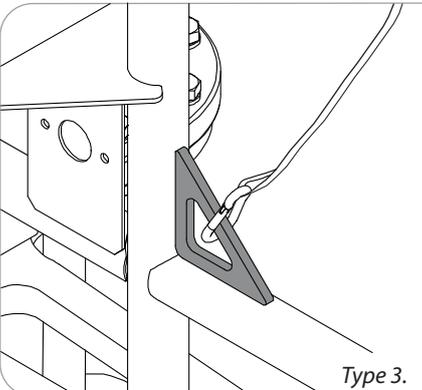
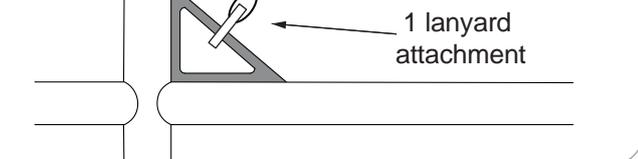
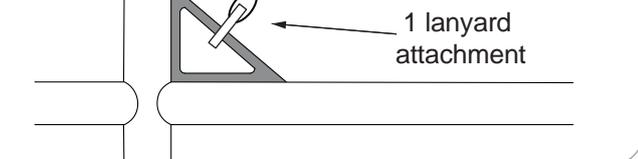
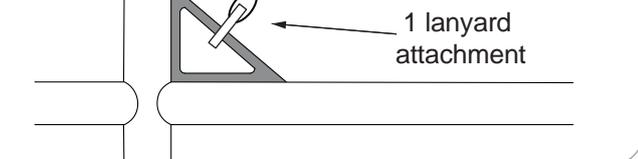
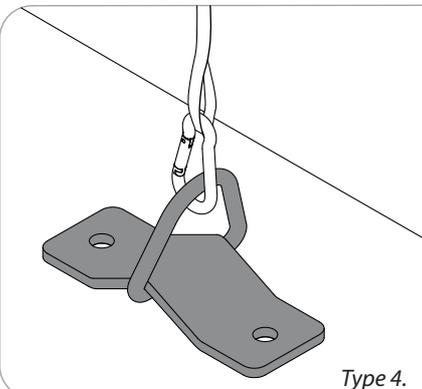
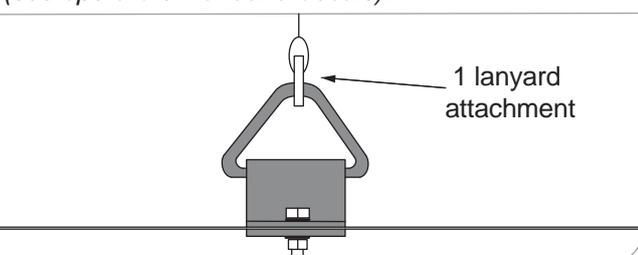
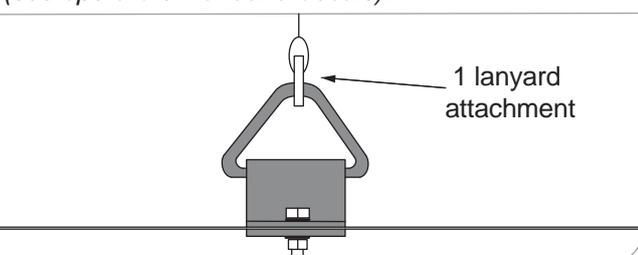
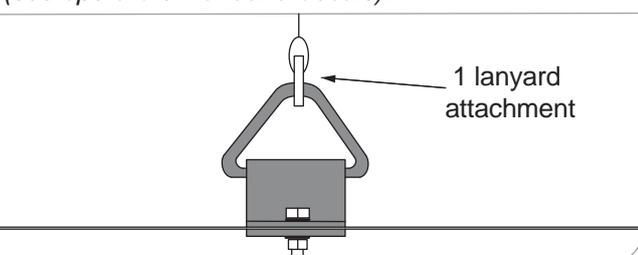
ALWAYS use a full body harness, **prior to raising the platform**, as recommended by the Health and Safety Executive (H1/05/05)

Safety Rules

Harness attachment points are provided in the platform and the manufacturer recommends the usage of a fall restraint harness, especially where required by national safety regulations.

All harness attachment points on SNORKEL vehicles have been tested with a force of 3,650 lbs (16.3 KN) per person.

See below examples of harness attachment points used on SNORKEL vehicles with their corresponding rating;

 <p>Type 1.</p>	<p>Harness attachment point Type 1. is rated for one lanyard attachment per loop as shown in the illustrations depending upon platform occupancy rating (see operators manual & decals).</p> <table border="1"><thead><tr><th data-bbox="705 443 1024 517">Top View</th><th data-bbox="1031 443 1343 517">Top View</th></tr></thead><tbody><tr><td data-bbox="705 526 1024 696"><p>2 lanyard attachments</p></td><td data-bbox="1031 526 1343 696"><p>1 lanyard attachment</p></td></tr></tbody></table>	Top View	Top View	 <p>2 lanyard attachments</p>	 <p>1 lanyard attachment</p>
Top View	Top View				
 <p>2 lanyard attachments</p>	 <p>1 lanyard attachment</p>				
 <p>Type 2.</p>	<p>Harness attachment point Type 2. is rated for two lanyard attachments per loop as shown in the illustrations depending upon platform occupancy rating (see operators manual & decals).</p> <table border="1"><thead><tr><th data-bbox="705 853 1024 927">Top View</th><th data-bbox="1031 853 1343 927">Top View</th></tr></thead><tbody><tr><td data-bbox="705 936 1024 1095"><p>2 lanyard attachments</p></td><td data-bbox="1031 936 1343 1095"><p>1 lanyard attachment</p></td></tr></tbody></table>	Top View	Top View	 <p>2 lanyard attachments</p>	 <p>1 lanyard attachment</p>
Top View	Top View				
 <p>2 lanyard attachments</p>	 <p>1 lanyard attachment</p>				
 <p>Type 3.</p>	<p>Harness attachment point Type 3. is rated for one lanyard attachment per loop as shown in the illustrations depending upon platform occupancy rating (see operators manual & decals).</p> <table border="1"><thead><tr><th data-bbox="705 1252 1024 1326">Front View</th></tr></thead><tbody><tr><td data-bbox="705 1335 1343 1494"><p>1 lanyard attachment</p></td></tr></tbody></table>	Front View	 <p>1 lanyard attachment</p>		
Front View					
 <p>1 lanyard attachment</p>					
 <p>Type 4.</p>	<p>Harness attachment point Type 4. is rated for one lanyard attachment per loop as shown in the illustrations depending upon platform occupancy rating (see operators manual & decals).</p> <table border="1"><tbody><tr><td data-bbox="705 1637 1343 1892"><p>1 lanyard attachment</p></td></tr></tbody></table>	 <p>1 lanyard attachment</p>			
 <p>1 lanyard attachment</p>					

NOTE: There can be more harness attachment points per machine than the maximum number of occupants allowed in a platform. Refer to the platform decal & specifications table listed in the operators manual for the correct occupancy rating before use.

NOTES:

Foreword

Introduction

HOW TO USE THIS MANUAL

This manual is divided into 7 Sections, The right hand pages of each Section is marked with a black section number printed at the top corner of each page which can be used as a quick guide.

SPECIAL INFORMATION



DANGER



Indicates an imminently hazardous situation which, if not avoided, will result in severe injury or death.



WARNING



Indicates a potentially hazardous situation which, if not avoided, could result in severe injury or death.



CAUTION



Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.



CAUTION



Detailed descriptions of standard workshop procedures, safety principles and service operations are not included. Please note that this manual does contain warnings and cautions against some specific service methods which could cause personal injury, or could damage a machine and make it unsafe. Please understand that these warnings cannot cover all conceivable ways in which service, whether or not recommended by Snorkel, can be done, or the possible hazardous consequences of each conceivable way, nor could Snorkel investigate all ways. Anyone using service procedures or tools, whether or not recommended by Snorkel, must satisfy themselves thoroughly that neither personal safety nor machine safety will be jeopardised.

Notes: Give helpful information.

All information contained in this manual is based on the latest product information available at the time of printing. We reserve the right to make changes at any time without notice. No part of this publication may be reproduced, stored in retrieval system, or transmitted, in any form by any means, electronic, mechanical, photocopying, recording, or otherwise, without prior written permission of the publisher. This includes text, figures and tables.

Introduction & Specifications

1.0

General Description & Machine Specifications.

Machine Preparation

2.0

Information on the preparation for use, shipment, forklifting, transporting and storage.

Operation

3.0

Operating Instructions & Safety Rules.

Maintenance

4.0

Preventative Maintenance & Service Intervals.

Troubleshooting

5.0

Causes of and Solutions to typical problems.

Schematics

6.0

Schematics and Valve Block Diagram with description and location of components.

Illustrated Parts Breakdown

7.0

Complete parts lists with illustrations.

1.0 Introduction

PURPOSE

The purpose of this Service & Parts Manual is to provide instructions and illustrations for the operation and maintenance of the A38E Work Platform manufactured by Snorkel (See Figure 1-1).

SCOPE

The manual includes the procedures and responsibilities which must be strictly adhered to for proper operation, maintenance, adjustment, and repair of this product. The Maintenance Section further covers preventative maintenance and trouble shooting.

1.1 General Information

The A38E is a quickly deployable self propelled aerial work platform, designed to raise two operators with hand tools to a work height of up to 13.45 m (44.12 ft.) i.e. a platform floor height of 11.45 m (37.56 ft.). It is designed to provide mobility with the Platform in the raised or lowered position, although travel with the Platform raised is limited to a low speed. The boom assembly and telescope functions are operated by a hydraulic pump driven by a DC electric motor. Two DC electric traction motors coupled to two braked gearboxes regulate the drive function.

PLATFORM

The platform is large enough for two operators and has a free-draining perforated floor with 150 mm (5.9 inches) toeboards. Hand rails are constructed from steel tubing and a safety drop-bar is provided at the entrance. Safety harness anchor points are also fitted in the floor of the platform. The primary Control Box is fitted permanently within this platform.

▲ WARNING ▲

DO NOT begin using the machine until the platform entrance drop bar is in the fully lowered position.

CONTROL BOX

The control box is permanently fitted at the front centre of the platform. It features a Joystick which will provide proportional control for raising or lowering either of the two booms, extending or retracting the Telescopic Boom, rotating (slewing) the entire Booms, Platform (if Platform Rotate fitted) & Posts Assembly or driving. A safety feature which is incorporated into the Joystick's operation is the Interlock Switch. This must be activated at all times while operation is required. This allows for one-handed operation. A complete explanation of control functions can be found in Section 3.

ELEVATING ASSEMBLY

The platform is raised and lowered by a combination of two steel lift booms and one telescopic boom, each of which is operated by a hydraulic cylinder which in turn is actuated by hydraulic power from the motor driven pump. Solenoid operated valves control to which cylinder the hydraulic oil is directed. Each cylinder features an integral holding valve to prevent uncontrolled descent in the case of a hose burst.

ROTATION GEAR

The Booms & Posts Assembly can be rotated to provide up to 5.6 m (18.4 ft.) of side outreach, measured from the centreline of rotation to the front of the Platform. This is done by means of an integral hydraulic motor driving a Worm Drive Unit, around a large diameter Slew Gear.

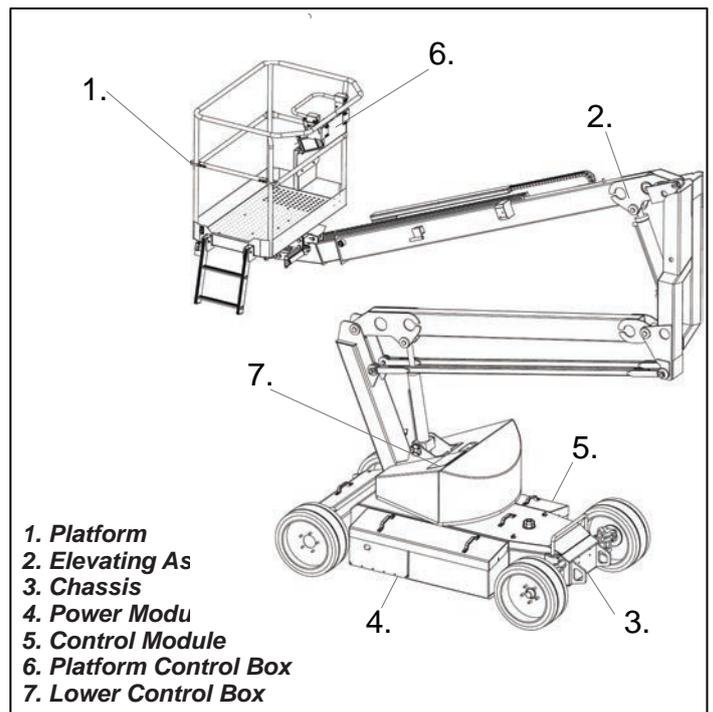


Figure 1-1: A38E Work Platform

DRIVE & STEER SYSTEMS

The A38E Work Platform is restricted to low speed drive when the Platform is raised above the Boom Rest Limit Switch. The Traction controller controls the application of drive from the Joystick by means of two Traction Motors, which are assembled to the drive wheels via a Drive Reduction Gearbox.

Steering of the A38E Work Platform is controlled by the P600, which controls the signals activating a double acting cylinder. An Operator can Steer left or right by depressing the Rocker Switches on top of the Joystick, while activating the Interlock Switch.

POWER SYSTEM

The power system incorporates eight 6V batteries driving the drive traction motors, or the 4kW (5.4HP) electric motor which in turn drives the hydraulic pump. The application of this hydraulic pressure is performed by the Control System.

CONTROL SYSTEM

The machine is provided with fully proportional controls by means of the interaction between a P600, electronic motor controller and a proportional joystick. The P600 and motor controller regulate the drive motor/pump speed and hence the flow of oil reaching the cylinders, the Worm Drive Unit or the Drive Reduction Gearbox. It regulates the direction of flow of the hydraulic oil via the solenoid valves located on the manifold block, and it also monitors the operation of all switches on the machine via the machine harness system.

The motor control units are located, in the left hand chassis module. The manifold block is located on the hydraulic tank. This is accessible by removing the main cover.

CHASSIS

The chassis is a structural frame designed to support all the components of the A38E Work Platform.

A38E PURPOSE & LIMITATIONS

The purpose of the A38E work platform is to provide a quickly deployable variable height work platform. It is capable of lifting two people with work tools up to an upper limit of 215 kg (ANSI 475 lbs) in total. The unit will provide the ability to reach over obstacles but must be used on firm level ground. See Specification table on page 1-3.

The platform must only be used on firm level or slightly uneven ground capable of supporting the maximum load generated under the four wheels. **Do not use on soft or severely sloping ground.**

⚠ DANGER ⚠

NOTE: It should be recognised that if the tilt switch senses a degree of slope greater than 3° the elevating circuits will lockout and sound a warning alarm. The Emergency Override should then be used, to lower the Elevating Assembly.

SNORKEL GUARD OVERRIDE

SWITCH

When the Snorkel Guard system is activated, the Snorkel Guard override switch is used to override the system to operate Upper and Lower Boom down functions. The switch is spring returned to the normal operation position.

- Hold the switch upward to override the Snorkel Guard System.
- Release the switch to the downward position to resume normal machine operation.

1.2 Specifications

Table 1-1: Specifications

ITEM	METRIC	IMPERIAL (ANSI)
Duty Cycle	45% of 8 hour shift	45% of 8 hour shift
Platform Size	0.58 m x 1.3 m (inside gaurdrails)	1.77 ft x 4.3 ft (inside gaurdrails)
Max. Platform Capacity	215 kg	475 lbs
Indoors	2 People	2 People
Outdoors	1 People	2 People
Min. Platform Floor Height	13.45 m	44.12 ft
	11.45 m	37.56 ft
	0.65 m	2.13ft
	6.10 m	20.00 ft
Platform Height At Maximum Outreach	5.40 m	17.72 ft
Stowed Dimensions		
Length	4.04 m	13.25 ft
Width	1.50 m	4.92 ft
Height	2.00 m	6.56 ft
Ground Clearance	0.12 m	0.39 ft
Wheel Base x Gauge	2.00 m x 1.27 m	6.56 ft x 4.16 ft
Rotation	362 degrees non-continuous	362 degrees non-continuous
Unloaded Weight	3,795 kg	9,140 lbs
With Load/ Max Weight	4,010 kg	9,615 lbs
Drive Speed Stowed	0 - 4 km/h	0 - 2.49 mph
Drive Speed Elevated	0 - 0.4 km/h	0 - 0.25 mph
Maximum Gradeability	36%	36%
Inside Turning Radius	1.12 m	3.6 ft
Outside Turning Radius	2.40 m	7.87 ft
Power Source	48V DC 4kW, 8 X 6V 210Ah Batteries	48V DC 5.4HP, 8 X 6V 210Ah Batteries
System Voltage Control	12V	12V
Battery Charger	Auto Dual AC input 100-240V ~ 50/60Hz 18A Output 48V, 25A	(Auto Dual AC input 100-240V ~ 50/60Hz 18A) Output 48V, 25A
Hydraulic Oil Tank Capacity	25 Litres	6.5 Gallons US
Max. Hydraulic Pressure	145 bar	2105 psi
Hydraulic Oil Grade	ISO #46	ISO #46
Cylinder Types	2 Double Acting Lift Cylinders With Lock Valves And Manual Emergency Lowering Facility. 1 Double Acting Telescopic Cylinder 1 Double Acting Plat. Rotate Cylinder	2 Double Acting Lift Cylinders With Lock Valves And Manual Emergency Lowering Facility. 1 Double Acting Telescopic Cylinder 1 Double Acting Plat. Rotate Cylinder
	Refer to Section 5 of the Service & Parts Manual	Refer to Section 5 of the Service & Parts Manual
Control System	One handed Proportional Joystick Operating Energy Efficient Motor Control System	One handed Proportional Joystick Operating Energy Efficient Motor Control System
Wheels/Tyres	400 mm Diameter Steel Disc Wheel With Solid All Surface Tyres	15.75 inch Diameter Steel Disc Wheel With Solid All Surface Tyres
Braking	Automatic Spring Applied Hydraulic Release	Automatic Spring Applied Hydraulic Release
Max Noise Level	69.5 dB(A)	69.5 dB(A)

2.1 Preparation for use

⚠ CAUTION ⚠

Read, understand and follow all operating instructions before attempting to operate the machine.

2.2 Preparation for Shipment

1. Lubricate machine per lubrication instructions in Section 4.4, Maintenance.
2. Fully lower the platform and make sure the machine is stowed securely.
3. Check that the hydraulic oil level is adequate and that it is not over filled.

Check that the batteries are charged and disconnect the batteries using the Battery Disconnect Plug. This prevents excessive power drain prior to next using the machine.

2.3 Forklifting the Work Platform

⚠ CAUTION ⚠

The A38E is not designed to be consistently forklifted. This operation can be used for very short distances only.

Forklift from the side by lifting under the chassis modules as per Figure 2-1. When lifting the A38E with a forklift, great care should be taken not to damage the right or left hand modules as these contain sensitive equipment.

2.4 Lifting the Work Platform

⚠ CAUTION ⚠

See specifications (Section 1.2) for the weight of the work platform and be certain that lifting apparatus is of adequate capacity to lift the platform.

The A38E may be lifted by an overhead hoist/crane in the following manner:

Four lifting straps capable of safely supporting the total weight of the A38E (3,795 Kg CE Version & 9,140 lbs ANSI Version) and at

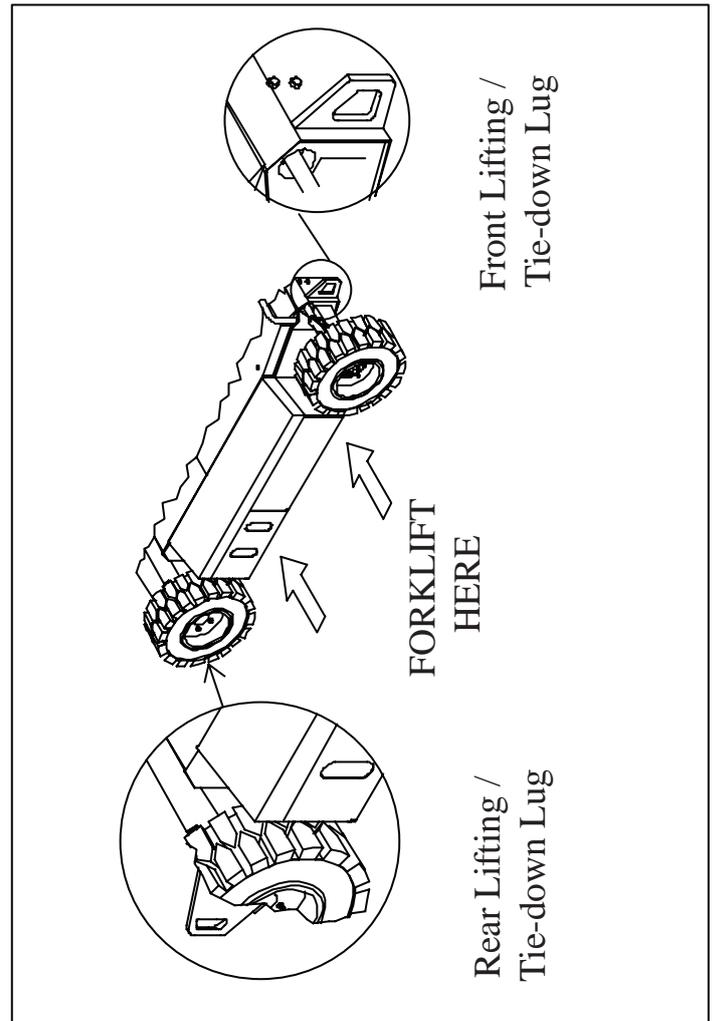


Figure 2-1: Forklifting & Lifting the A38E

least 250 cm (8 ft.) long are required. This minimum length is important to ensure the correct lifting angle. The straps should be positioned at the Lifting/Tie Down Lugs as shown in Figure 2-1. Great care must be taken to avoid damage to any of the components of the machine.

2.5 Transport by Truck

The A38E is normally carried upon a suitably rated transportation vehicle. Because of the high gradeability of the A38E it will be capable of driving directly on to most vehicles. If however the loading slope is greater than the gradeability or the batteries have been depleted sufficiently a winch should be used. The procedure when using a winch is to disengage the gearbox from the drive wheels using the Allen key release, and then winch the machine on to the vehicle in its freewheel state.

Refer to Section 2.6 which follows.

When the A38E is on the Truck it should then be made secure.

1. Chock the wheels of the A38E.
2. Secure the work platform to the transport vehicle with chains or straps of adequate load capacity attached to the lifting lugs on the chassis.

⚠ CAUTION ⚠

Overtightening of the chains or straps through tie down lugs may result in damage to the Work Platform.

2.6 Manual Brake Release

⚠ CAUTION ⚠

Perform this operation only when the machine will not operate under its own power and it is necessary to move the machine, or for winching onto a trailer for transportation. Ensure the machine is on level ground before commencing this operation and use wheel chocks as appropriate to prevent the machine from rolling inadvertently.

Do not exceed 3 mph. Faster speeds will damage drive components and void warranty.

1. Ensure that the Platform is fully lowered and that the Elevating Assembly is slewed (rotated) such that the platform is stowed above the drive wheels. Turn the Upper Control Box to the OFF position and remove the key.
2. Attach a chain/cable of sufficient capacity for towing the machine to the front or rear lifting/tie down lugs. Take up the slack in the chain/cable.
3. Locate the Allen head socket screws located in the centre of the two drive (rear) wheels and using a 6 mm Allen key, turn each one clockwise to its full extent. The machine is now in freewheel mode.

⚠ WARNING ⚠

DO NOT leave the machine unattended or attempt to operate the A38E Work Platform until the Brake Release Screws have been re-engaged.

4. When towing is completed, turn both Allen head socket screws in a counter clockwise direction until they rest firmly against the locking circlip.



Figure 2-2 : Manual Brake Release

2.7 Storage

No preparation is required for storage when the Work Platform is in regular use. Regular maintenance per *Table 4-1* should be performed.

If the work platform is to be placed in long term storage (dead storage) use the following preservation procedure.

PRESERVATION

1. Clean painted surfaces. If the painted surface is damaged, repaint.
2. Fill the hydraulic tank to operating level with the platform fully lowered. Fluid should be visible on the Dip Stick. It is not recommended that the hydraulic fluid be drained.
3. Coat exposed portions of cylinder rods with a preservative such as multipurpose grease and wrap with barrier material.
4. Coat all exposed unpainted metal surfaces with preservative.

BATTERIES

1. Disconnect the batteries.
2. Disconnect the battery leads and secure to the chassis.

⚠ WARNING ⚠

Care should be taken, while disconnecting the battery leads, that a short circuit does not occur. i.e. grounding to the chassis with a spanner.

3. Remove the batteries and place in alternate service. Battery efficiencies are best realised when used consistently.

2.8 Charging

The aerial platform is equipped with a 25 amp battery charger. The battery charger is located in the electrical compartment on the right side of the chassis.

⚠ WARNING ⚠

Batteries give off hydrogen and oxygen that can combine explosively. Death or serious injury can result from a chemical explosion. Charge the batteries only in a well ventilated area away from sparks or flame. Batteries give off hydrogen and oxygen that can combine explosively. Death or serious injury can result from a chemical explosion. Charge the batteries only in a well ventilated area away from sparks or flame.

⚠ CAUTION ⚠

The batteries may be overcharged and/or damaged if the charger is plugged in after the charge cycle is complete. Do not leave the battery charger on for more than 48 hours.

It may take from 1½ to 16 hours to recharge the batteries depending on the amount of discharge. If the charging cycle exceeds 16 hours without the batteries being fully recharged, unplug the charger and have the batteries checked.

- Fully recharge the batteries, immediately after use.
- One charging cycle per day is preferred.
- Fully charged batteries perform best.
- The deeper the discharge, the fewer number of cycles a battery will deliver. Deep discharges deteriorate the battery quicker than light shallow cycles.

An overly discharged battery may need to be cycled a few times before it can fully recover.

If a battery begins to heat before becoming fully charged, it may be necessary to recharge and discharge the battery a few times.

Use the following procedure to charge the batteries.

1. Make sure the battery disconnect inside the electrical compartment is plugged in (refer to Figure 2.3).

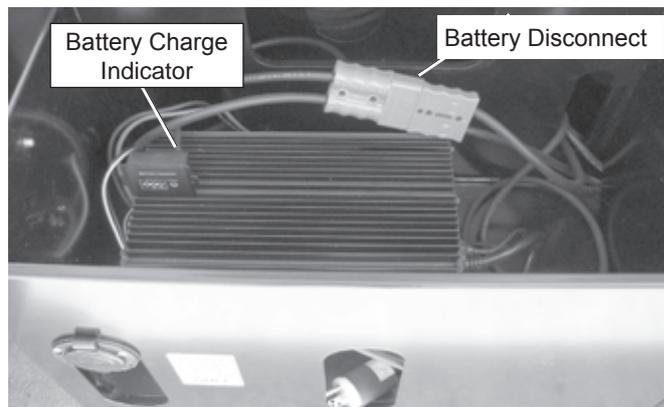


Figure 2.3 – Electrical Compartment

2. Remove the cover on each side of the chassis to access the batteries. Remove the caps from each battery.

Note

Machines can also be supplied with maintenance free batteries, fluid check will not be necessary on this type of battery.

3. Visually check the battery fluid level making sure the level is 3/8" (10 mm) above the plates. If needed, add distilled water.
4. Tightly replace the caps on each battery and replace and latch the battery tray covers.
5. Plug the battery charger into a properly grounded outlet (110 -240 volt AC, 50/60 Hz) using a 3 conductor, 12 gauge (1.5 mm) or larger extension cord. The outlet must be equipped with GFCI protection. The extension cord must be as short as possible and in good electrical condition.

Note

Do not operate any of the aerial platform functions while the battery charger is plugged in.

6. Visually inspect the battery charge indicator (refer to Figure 2.3).
- The charger will turn on three to five seconds after a complete electrical connection is made.
 - The LED charge indicators will be lit while the batteries are charging.

- When the batteries are fully charged, the charge indicator will blink.

⚠ CAUTION ⚠

The batteries may be overcharged and/or damaged if the charger is plugged in after the charge cycle is complete. Do not leave the battery charger on for more than 48 hours.

7. After the charge cycle is complete, unplug the extension cord from the battery charger and allow the batteries to cool.
8. Remove the cover on each side of the chassis to access the batteries. Remove the caps from each battery.

Note

Machines can also be supplied with maintenance free batteries, fluid check will not be necessary on this type of battery.

9. Visually check the battery fluid level making sure the level is 3/8" (10 mm) above the plates. If needed, add distilled water.
10. Tightly replace the caps on each battery

REPAIR PARTS

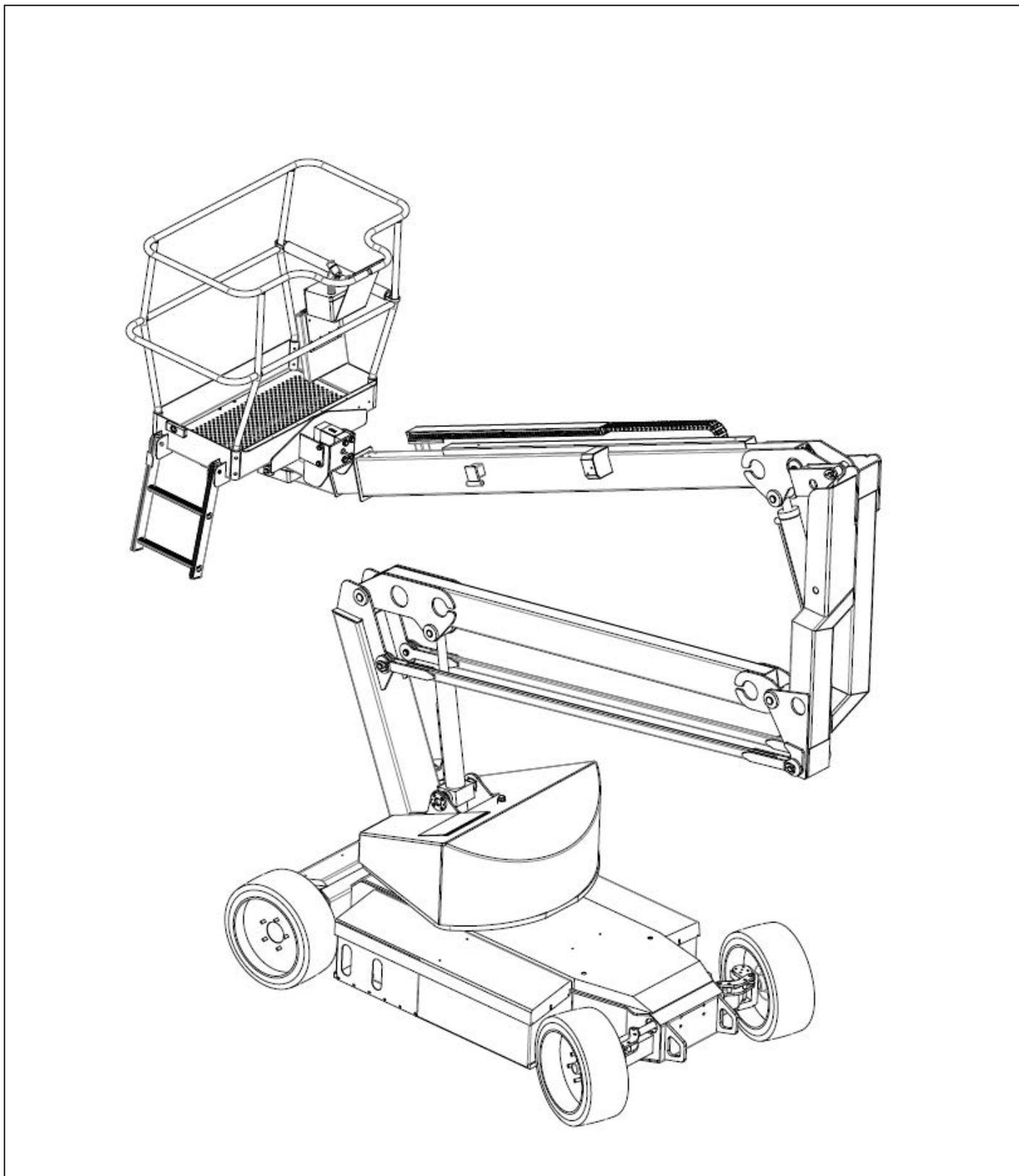
ITEM	PART NO.	DESCRIPTION	PAGE
1	514782-850	OPTION - SNORKELGUARD	7-68
2	514783-850	OPTION -HORN SOUND ON E/STOP	7-69
3	514784-850	OPTION -EMERGENCY POWER DESCEND	7-69
4	514785-850	OPTION -DRIVE LIGHT KIT	7-69
5	514786-850	OPTION -DRIVE DE-ACTIVATED ABOVE 8M	7-69
6	058191-000	OPTION, POWER TO PLATFORM 110V	---
7	058191-001	OPTION, POWER TO PLATFORM 220V	---
8	058275-000	OPTION, FLASHING BEACON	---
9	058284-000	OPTION, SPOTLIGHT IN PLATFORM	---

The options outlined opposite are available from Snorkel when ordering a new machine or as a spare part to be retrofitted to an existing machine. However, because the Options are not considered a normal spare part, the standard parts delivery policy may not always apply.

When required as a Spare Part please contact Snorkel Product Support for more information.

When required with new machine please contact Snorkel Sales & Marketing prior to placing machine order.

REPAIR PARTS

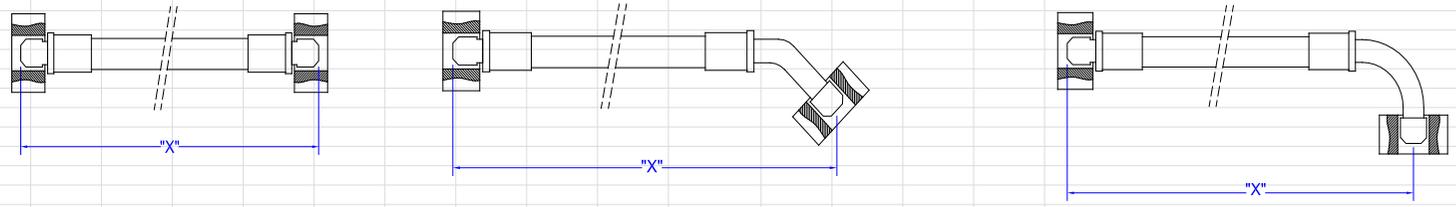


アイテム	部品番号	名前	数量	UOM
Not Shown	500200 001	FINAL ASSEMBLY (ANSI VERSION)		EA
Not Shown	500200 000	FINAL ASSEMBLY (CE VERSION)		EA
Not Shown	500202 000	Chassis Assembly	1	EA
Not Shown	500201 000	BOOMS & POSTS ASSEMBLY	1	EA
Not Shown	057603 000	CAGE & CRADLE ASSEMBLY (STANDARD)	1	EA
Not Shown	057580 000	DRIVE GEARBOX	2	EA
Not Shown	057530 000	MOTOR/PUMP ASSEMBLY	1	EA
Not Shown	512944 000	DRIVE MOTOR (SN:006001 006281 / 006523 #####)	1	EA
Not Shown	514274 000	DRIVE MOTOR	1	EA
Not Shown	057530 000	MOTOR/PUMP ASSEMBLY	1	EA
Not Shown	REF	Rear/Front Wheel Assembly	1	EA
Not Shown	500284 000	SLEW DRIVE	1	EA
Not Shown	500261 000	A38E MANIFOLD BLOCK (Manual/No Platform rotate)	1	EA
Not Shown	504504 000	Lower Cylinder Assembly	1	EA
Not Shown	504505 000	Upper Cylinder Assembly	1	EA
Not Shown	058461 000	Tele Cylinder Assembly	1	EA
Not Shown	058463 000	STEERING CYLINDER ASSEMBLY	1	EA
Not Shown	058734 000	Master Level Cylinder Assembly	1	EA
Not Shown	058735 000	Slave Cylinder	1	EA

アイテム	部品番号	名前	数量	UOM
Not Shown	12330	CYLINDER	1	EA
Not Shown	513434 000	A38E LOWER CONTROL BOX ASSEMBLY (CE) (Harnesses are not part of this assembly)	1	EA
Not Shown	513433 002	UPPER CONTROL BOX CE	1	EA
Not Shown	513433 003	UPPER CONTROL BOX ANSI	1	EA
Not Shown	500360 000	Hose Kit	1	EA

MACHINE DESCRIPTION :	
AB 38	
TOTAL HOSE LENGTH (incl. fittings)	ANG. DISP.
520mm	270°
1770 mm	IN-LINE
7270 mm	N/A
9200 mm	IN-LINE
1810 mm	IN-LINE
6710 mm	IN-LINE
6690mm	IN-LINE
1340 mm	IN-LINE
560 mm	N/A
1320 mm	N/A
342 mm	IN-LINE
260 mm	270°

HYDRAULIC KIT				UpRight POWERED ACCESS, VIGO CENTRE, BIRTLEY ROAD, WASHINGTON, TYNE & WEAR, NE38 9DA	THIS DRAWING IS COPYRIGHT AND THE PROPERTY OF UpRight LTD. IT MUST NOT BE COPIED OR RE-ISSUED WITHOUT THEIR WRITTEN CONSENT						
ITEM	PART NUMBER	QUANTITY OFF	ITEM DESCRIPTION	WORKING PRESSURE	HOSE SIZE	END FITTINGS		TOTAL HOSE LENGTH (incl. fittings)	ANG. DISP.		
						END 'A'	END 'B'				
HOSE KIT ONLY 513069-000											
HOSE & LOCATION ON MACHINE											
1	500225-000	1	HYDRAULIC MANIFOLD TO TANK	150 Bar	3/8"	3/8" BOF SWEPT 90	3/8" BOF SWEPT 90	<i>Dimension "X"</i>			
2	500226-000	2	MANIFOLD TO SLEW MOTOR	150 Bar	3/8"	3/8" BOF SWEPT 90	3/8" BOF SWEPT 90	520mm	270°		
3	500227-000	2	MANIFOLD TO TELE CYLINDER	150 Bar	3/8"	3/8" BOF SWEPT 90	3/8" BOF STRAIGHT	1770 mm	IN-LINE		
4	500228-000	2	MASTER TO SLAVE CYLINDER ARMOURGARD 1000mm ONE	150 Bar	1/4"	1/4" BOF SWEPT 90	1/4" BOF SWEPT 90	7270 mm	N/A		
5	500351-000	2	MANIFOLD TO LOWER LIFT CYLINDER	150 Bar	1/4"	1/4" BOF SWEPT 90	1/4" BOF SWEPT 90	9200 mm	IN-LINE		
6	500352-000	2	MANIFOLD TO UPPER LIFT	150 Bar	1/4"	1/4" BOF SWEPT 90	1/4" BOF SWEPT 90	1810 mm	IN-LINE		
7	500353-000	2	MANIFOLD TO MASTER CYLINDER	150 Bar	1/4"	1/4" BOF SWEPT 90	1/4" BOF SWEPT 90	6710 mm	IN-LINE		
8	500354-000	2	MANIFOLD TO STEERING CYLINDER	150 Bar	1/4"	1/4" BOF SWEPT 90	1/4" BOF SWEPT 90	6690mm	IN-LINE		
9	500355-000	2	BRAKES TEE PIECE TO BRAKES	150 Bar	1/4"	1/4" BOF STRAIGHT	1/4" BOF SWEPT 90	1340 mm	IN-LINE		
10	500356-000	1	MANIFOLD TO BRAKES TEE PIECE	150 Bar	1/4"	1/4" BOF STRAIGHT	1/4" BOF SWEPT 90	560 mm	N/A		
11	500357-000	1	HYDRAULIC TANK TO PUMP	150 Bar	1/2"	1/2" BOF SWEPT 90	1/2" BOF SWEPT 90	1320 mm	N/A		
12	500358-000	1	HYDRAULIC PUMP TO MANIFOLD	150 Bar	3/8"	3/8" BOF SWEPT 90	3/8" BOF SWEPT 90	342 mm	IN-LINE		
FITTINGS KIT ONLY 513070-000											
BONDED SEAL											
	057376-000	1	1/2" BONDED SEAL			SELF CENTERING DOWTY					
	057124-000	14	1/4" BONDED SEAL			SELF CENTERING DOWTY					
	510214-000	2	M10 BONDED SEAL			SELF CENTERING DOWTY					
	057352-000	1	3/4" BONDED SEAL			SELF CENTERING DOWTY					
	509439-000	2	3/8" BONDED SEAL			SELF CENTERING DOWTY					
FITTINGS											
	057121-000	2	ADAPTER MALE - MALE			1/4" BSP MALE	3/8" BSP MALE				
	057123-000	1	ADAPTER MALE - MALE			3/8" BSP MALE	1/2" BSP MALE				
	057358-000	12	ADAPTER MALE - MALE			1/4" BSP MALE	1/4" BSP MALE				
	12-1006	1	ADAPTER MALE - MALE			3/4" BSP MALE	1/2" BSP MALE				
	058805-000	2	ADAPTER MALE - MALE			M10x1 MALE	1/4" BSP MALE				
	057211-000	1	ADAPTER MALE - MALE			3/8" BSP MALE	3/8" BSP MALE				
						END 'A'	END 'B'	END 'C'			
13	058352-000	1	EQUAL TEE			1/4" BSP MALE	1/4" BSP MALE	1/4" BSP MALE			
14*	13-3549	1	IN- LINE CHECK VALVE			3/8" BSP MALE	3/8" BSP MALE				
ISSUE	1	2	2A	3	4	5	6	7	DRAWN BY : AW LISTER	DATE : 8 NOVEMBER 2007	DRAWING N°
ECR No.	25332	25538 (30/09/2008)	AWL 29-01-2009	25576 (3/4/2009)	25588 15/6/09	25905 (28/11/2011)	25928 (29/02/12)	26133*	APPROVED BY : S DOWNES	SHEET 1 of 1	500360-000



NOTES

ALL HOSES TO BE R17 OR EQUIVALENT TO ALLOW TIGHT BEND RADII
 ALL HOSES TO BE TESTED TO 1.5 TIMES THE WORKING PRESSURE
 ALL HOSES TO BE CLEANED TO 'NAS 10' SPECIFICATIONS, AND ENDS PLUGGED OR CAPPED
 ALL HOSES TO BE CLEARLY MARKED WITH THE UpRight PART NUMBER
 ANGULAR DISPLACEMENT CONVENTION - END A IS ALWAYS PLACED FURTHEST AWAY AND VERTICALLY UP.
 END B IS THEN TURNED CLOCKWISE FROM THE VERTICAL DATUM

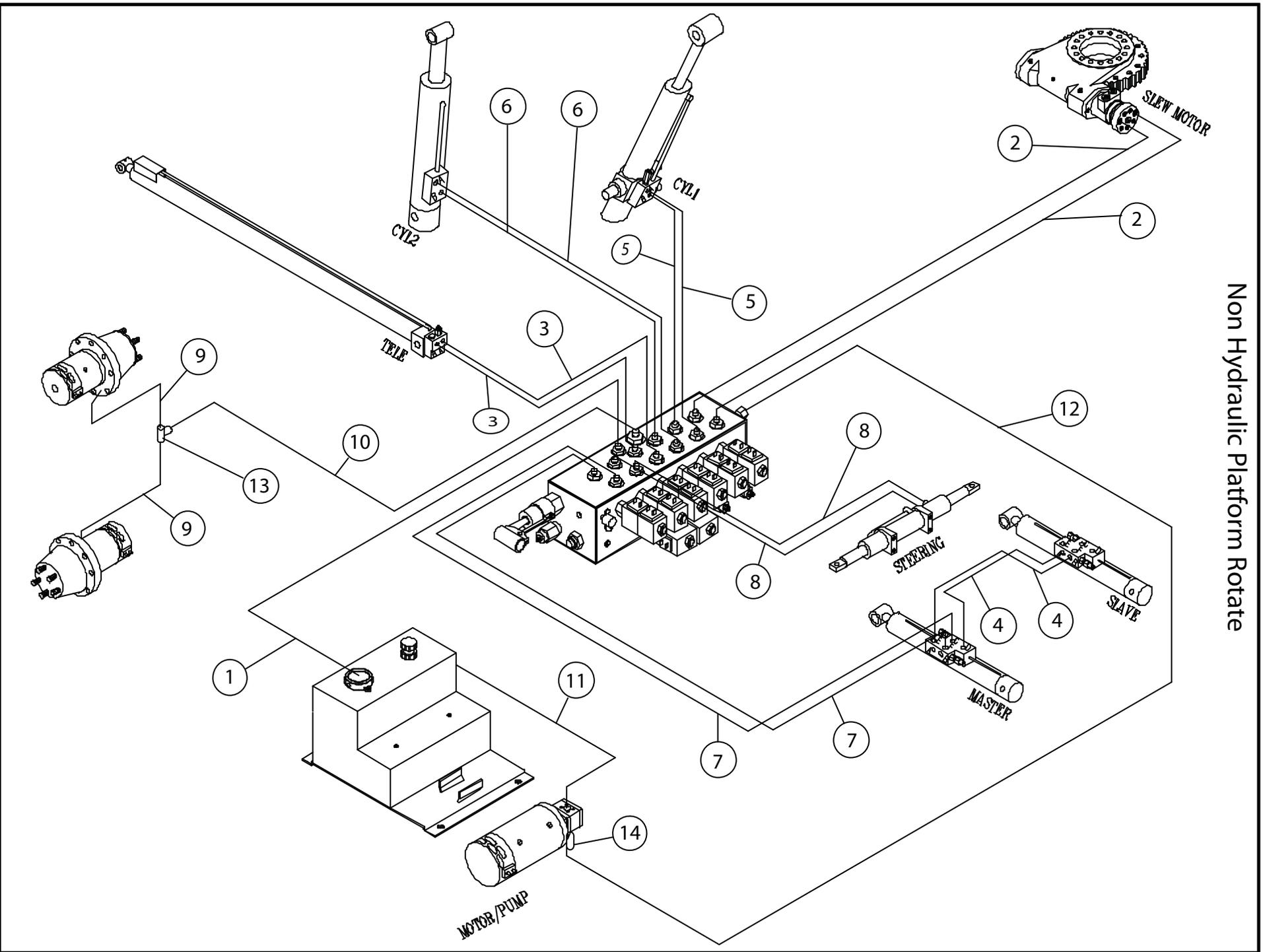
TIGHTENING TORQUES FOR HOSES AND FITTINGS

	ADAPTER	HOSE NJT STD	HOSE NJT O RING
1/4" BSP	34 Nm	41 Nm	24 Nm
3/8" BSP	47 Nm	68 Nm	33 Nm
1/2" BSP	102 Nm	109 Nm	48 Nm
3/4" BSP	149 Nm	149 Nm	84 Nm

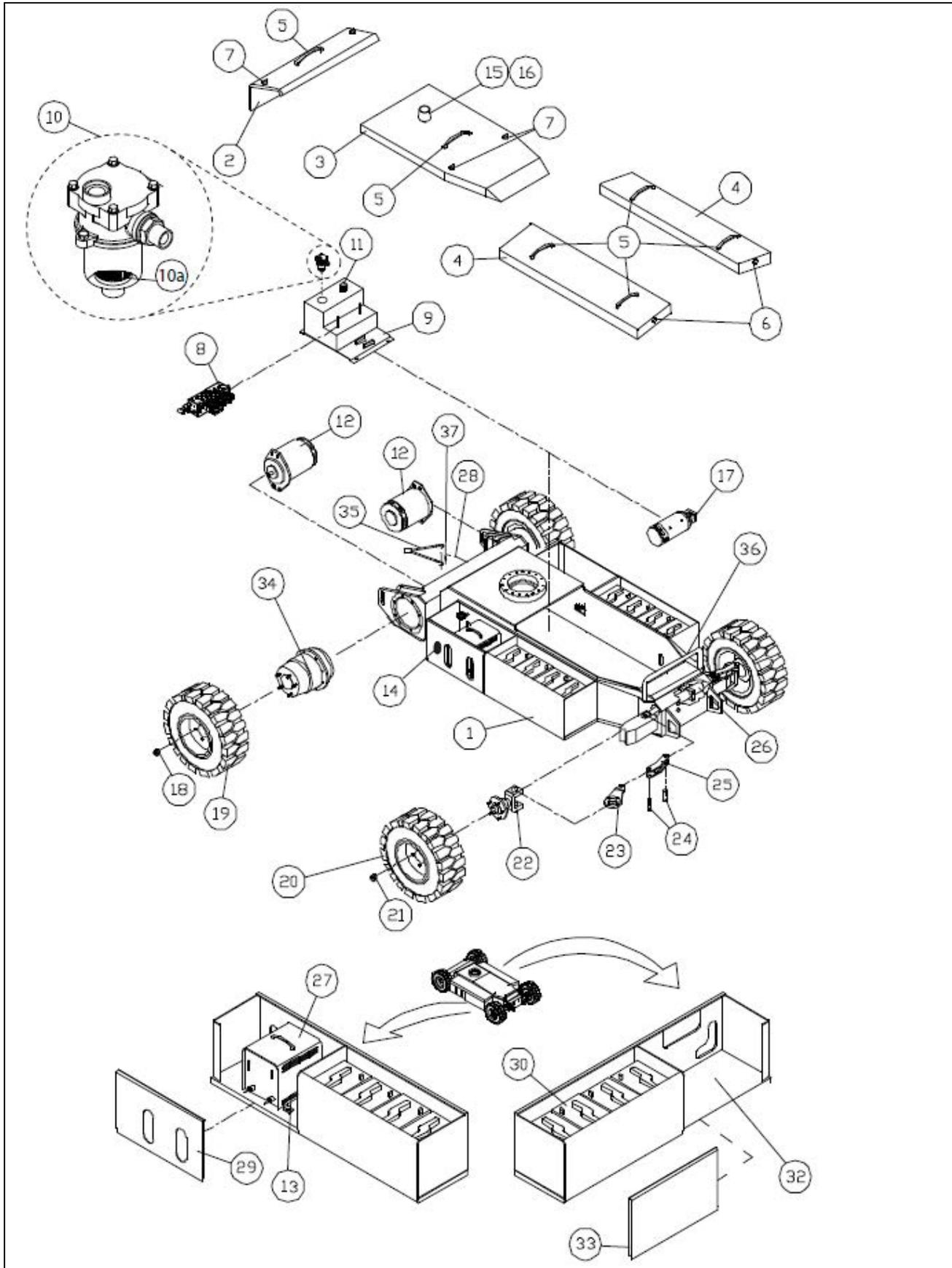
*NOTE:
 ITEM 14 IS NOT INCLUDED IN THE HOSE KIT
 AND SHOULD BE ORDERED SEPARATELY

Illustrated Parts Breakdown

Non Hydraulic Platform Rotate



REPAIR PARTS

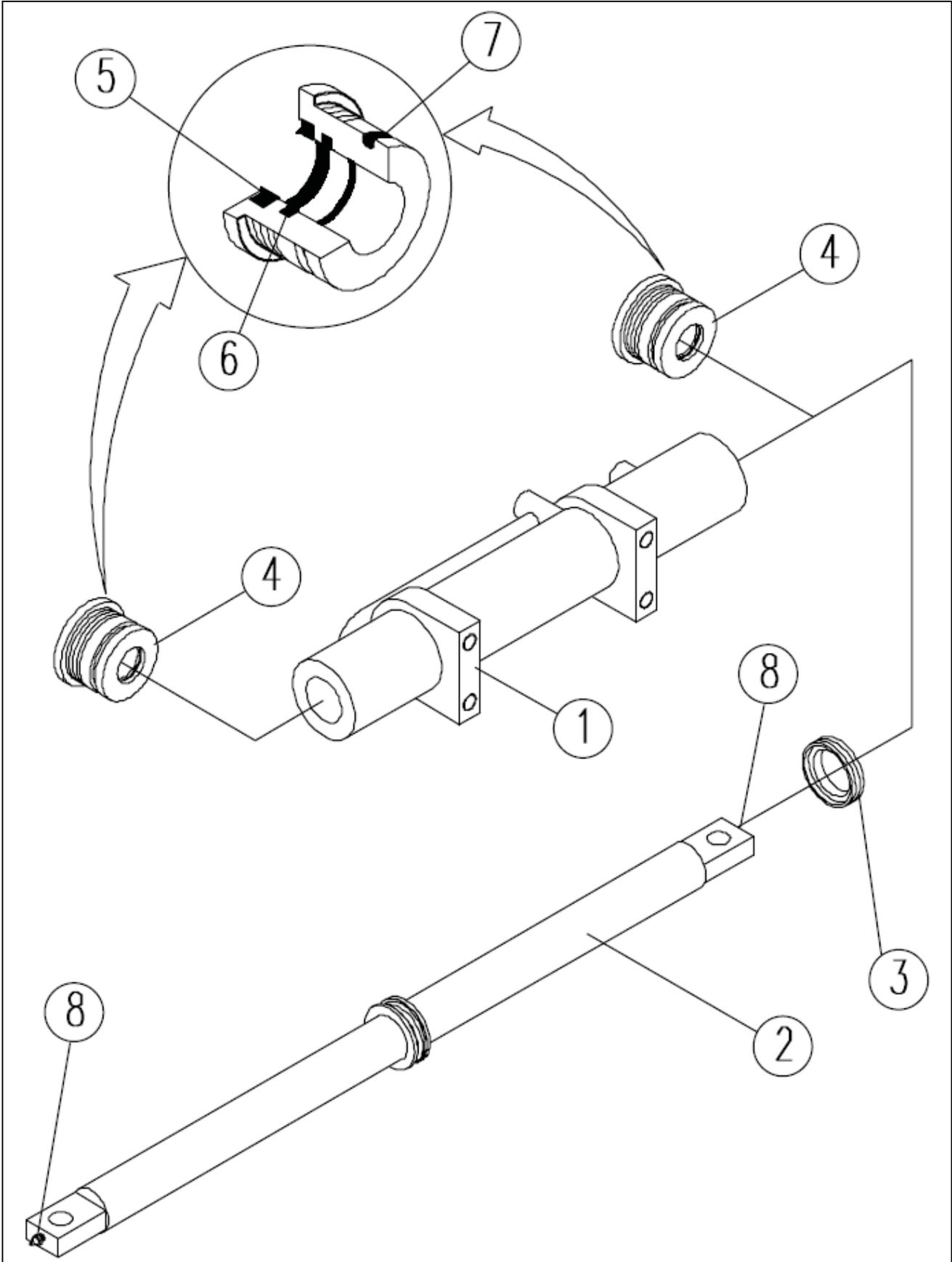


アイテム	部品番号	名前	数量	UOM
1	514031 000	A38E CHASSIS WELDMENT SN: A38E 01 0066807	1	EA
1	514347 000	A38E CHASSIS WELDMENT	1	EA
2	500232 000	A38E DRIVE MOTOR COVER	1	EA
3	500233 000	A38E CHASSIS BODY COVER SN: A38E 01 0066807	1	EA
3	514348 000	A38E CHASSIS BODY COVER	1	EA
4	500231 000	A38E MODULE COVER	2	EA
5	500052 000	GRAB HANDLE	6	EA
6	057727 000	TWIST SCREW FASTNER	4	EA
7	500259 000	A38 COVER GRIP LATCH	4	EA
8	500261 000	A38E MANIFOLD BLOCK (Manual/No Platform rotate)	1	EA
8	514351 000	A38E MANIFOLD BLOCK (Hydraulic Platform Rotate)	1	EA
9	500260 000	A38E HYDRAULIC RESERVOIR ASSEMBLY	1	EA
10	057532 000	RESERVOIR RETURN LINE FILTER ASSEMBLY(Inc Filter)	1	EA
10A	058074 000	FILTER / WASHER / SPRING ASSEMBLY (Part of item 10)	1	EA
11	057534 000	FILLER / BREATHER CAP	1	EA
12	512944 000	DRIVE MOTOR (SN:006001 006281 / 006523 #####)	2	EA
12	514274 000	DRIVE MOTOR	2	EA
13	238396	PLUGMALE STR 15AMP 125V NYLON	1	EA
14	3069521	INLET FLANGE	1	EA
Not Shown	3069542	FRONT COVER FOR 3069521	1	EA
15	510039 000	BEACON/FLASHING LIGHT,MULTI VOLTAGE (ANSI ONLY)	1	EA
16	510040 000	CAGE FOR BEACON (ANSI ONLY)	1	EA
17	057530 000	MOTOR/PUMP ASSEMBLY	1	EA

アイテム	部品番号	名前	数量	UOM
18	057578 000	REAR WHEEL NUT M14	10	EA
19	057668 001	REAR WHEEL TYRE & RIM ASSEMBLY (sn: 1297 004938)	2	EA
19	513430 000	REAR WHEEL TYRE & RIM ASSEMBLY (sn: 004939 current)	2	EA
20	057667 003	FRONT WHEEL TYRE & RIM ASSEMBLY (sn: 1297 004938)	2	EA
20	513429 000	FRONT WHEEL TYRE & RIM ASSEMBLY (sn: 004939 current)	2	EA
21	056066 016	Nut, NylockNut DIN985 M16 8.0	10	EA
22	057669 000	STEERING STUB AXLE ASSEMBLY (use 4 x 505087 012 Hardened Washer, M12 x 24mm, when securing)	2	EA
23	058427 000	A38E TORQUE ARMS	2	EA
24	500253 001	A38E STEERING LINKAGE PIN	4	EA
Not Shown	500252 000	CIRCLIP 16mm	4	EA
Not Shown	500408 000	BUSHINGS	2	EA
25	500250 000	A38E STEERING LINK ARM	2	EA
26	058463 000	STEERING CYLINDER ASSEMBLY	1	EA
Not Shown	058494 035	BOLT HEXSETSCREW DIN933 M12 X 35MM 8.8 ZP	4	EA
Not Shown	056021 012	Washer, SpringWasher DIN127B M	4	EA
27	0260021	CHARGER 48V, GLOBAL INPUT	1	EA
28	501868 001	HORN	1	EA
29	500234 002	A38E CHASSIS SIDE DROP PANEL WITH SLOTS (CE), BEFORE sn01 00975	1	EA
30	501074 000	BATTERY 6V 210AH	8	EA
32	010154 000	COVER BATTERY	18	EA
33	500234 001	A38E CHASSIS SIDE DROP PANEL WITHOUT SLOTS	1	EA

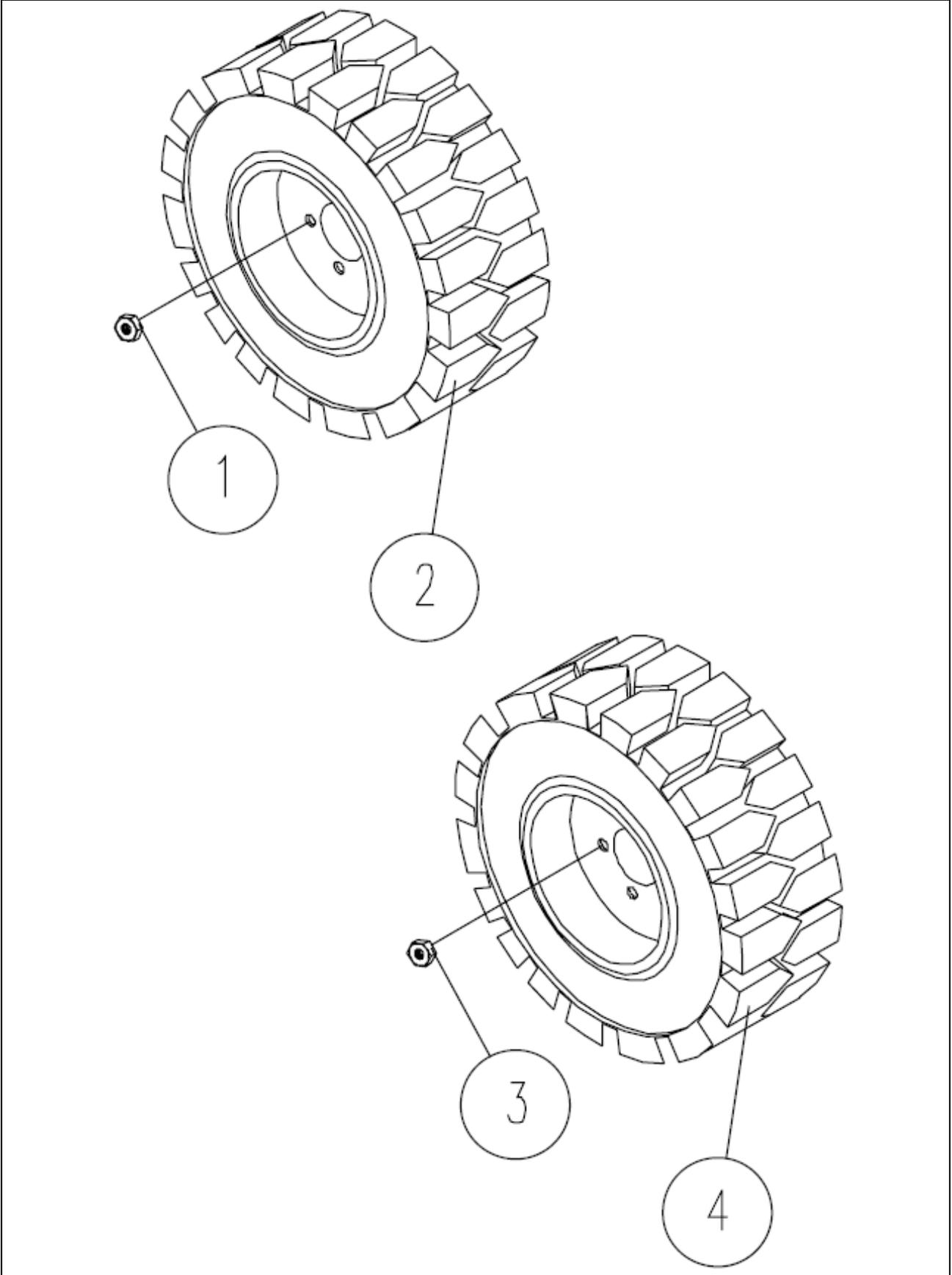
アイテム	部品番号	名前	数量	UOM
34	057580 000	DRIVE GEARBOX	2	EA
35	514331 000	CAPACITOR ASSEMBLY	1	EA
36	501841 000	CRASHBAR	1	EA
	501841 000 FLD	CRASHBAR RETRO KIT	1	EA
37	514450 000	DIODE ASSY	1	EA

REPAIR PARTS



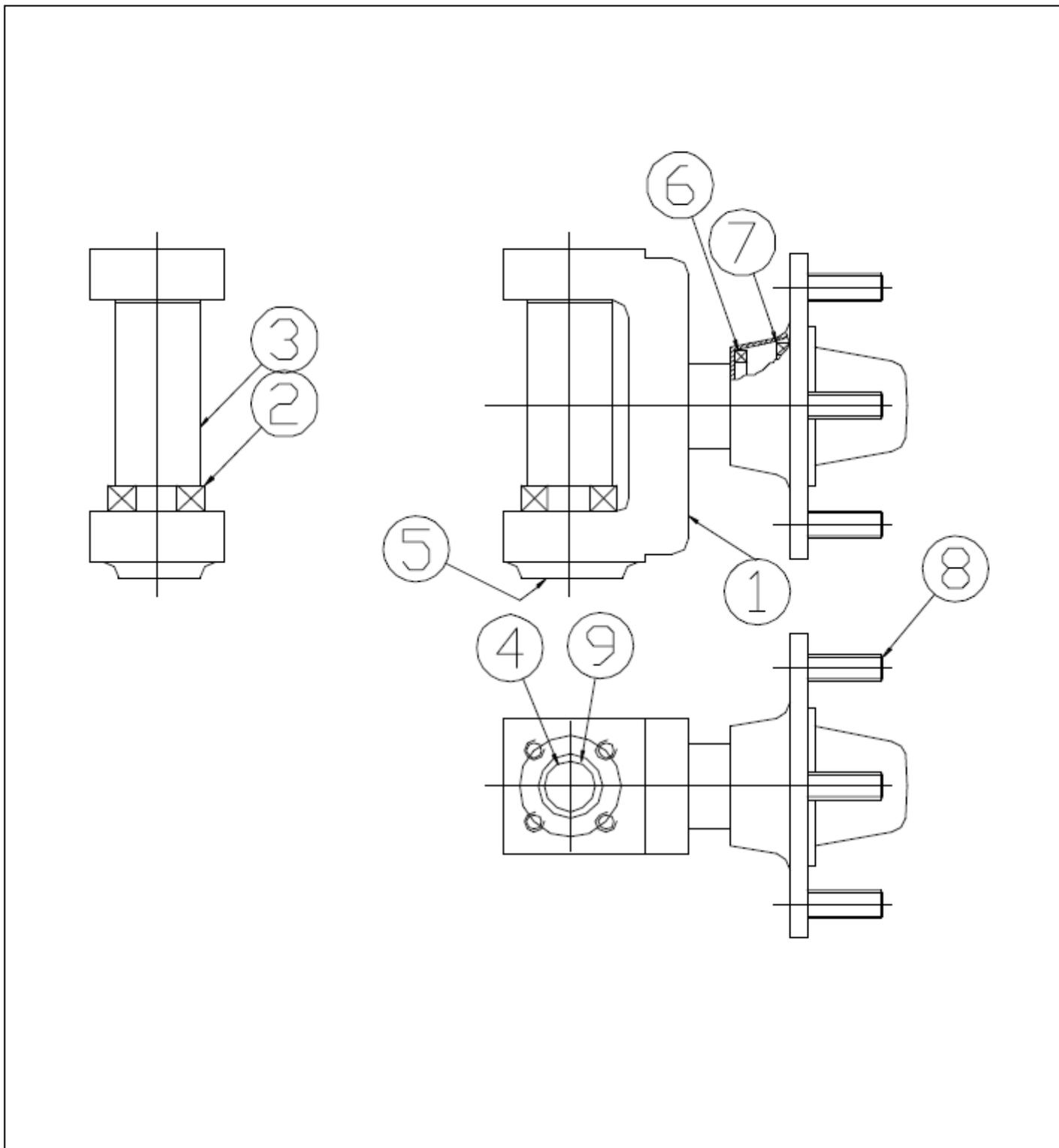
アイテム	部品番号	名前	数量	UOM
Not Shown	058463 000	STEERING CYLINDER ASSEMBLY		EA
1	REF	CYLINDER BODY	1	EA
2	REF	CYLINDER ROD	1	EA
	500460 000	SEAL KIT (CONTAINS 3, 5, 6 AND 7)	1	EA
3	KIT ITEM	WEARBAND	1	EA
4	REF	END CAP	1	EA
5	KIT ITEM	O RING	1	EA
6	KIT ITEM	O RING	1	EA
7	KIT ITEM	O RING	1	EA
8	057048 000	GREASE NIPPLE	3	EA

REPAIR PARTS



アイテム	部品番号	名前	数量	UOM
Not Shown	500494 000	REAR & FRONT WHEEL KIT (NON MARKING) SERIAL 004939 TO CURRENT		EA
1	057578 000	REAR WHEEL NUT M14	10	EA
2	057668 001	REAR WHEEL TYRE & RIM ASSEMBLY (sn: 1297 004938)	2	EA
3	057666 000	WHEEL NUT M16	10	EA
4	057667 003	FRONT WHEEL TYRE & RIM ASSEMBLY (sn: 1297 004938)	2	EA
Not Shown	500494 000	REAR & FRONT WHEEL KIT (NON MARKING) SERIAL 004939 TO CURRENT		EA
1	057578 000	REAR WHEEL NUT M14	10	EA
2	513429 000	FRONT WHEEL TYRE & RIM ASSEMBLY (sn: 004939 current)	2	EA
3	057666 000	WHEEL NUT M16	10	EA
4	513430 000	REAR WHEEL TYRE & RIM ASSEMBLY (sn: 004939 current)	2	EA

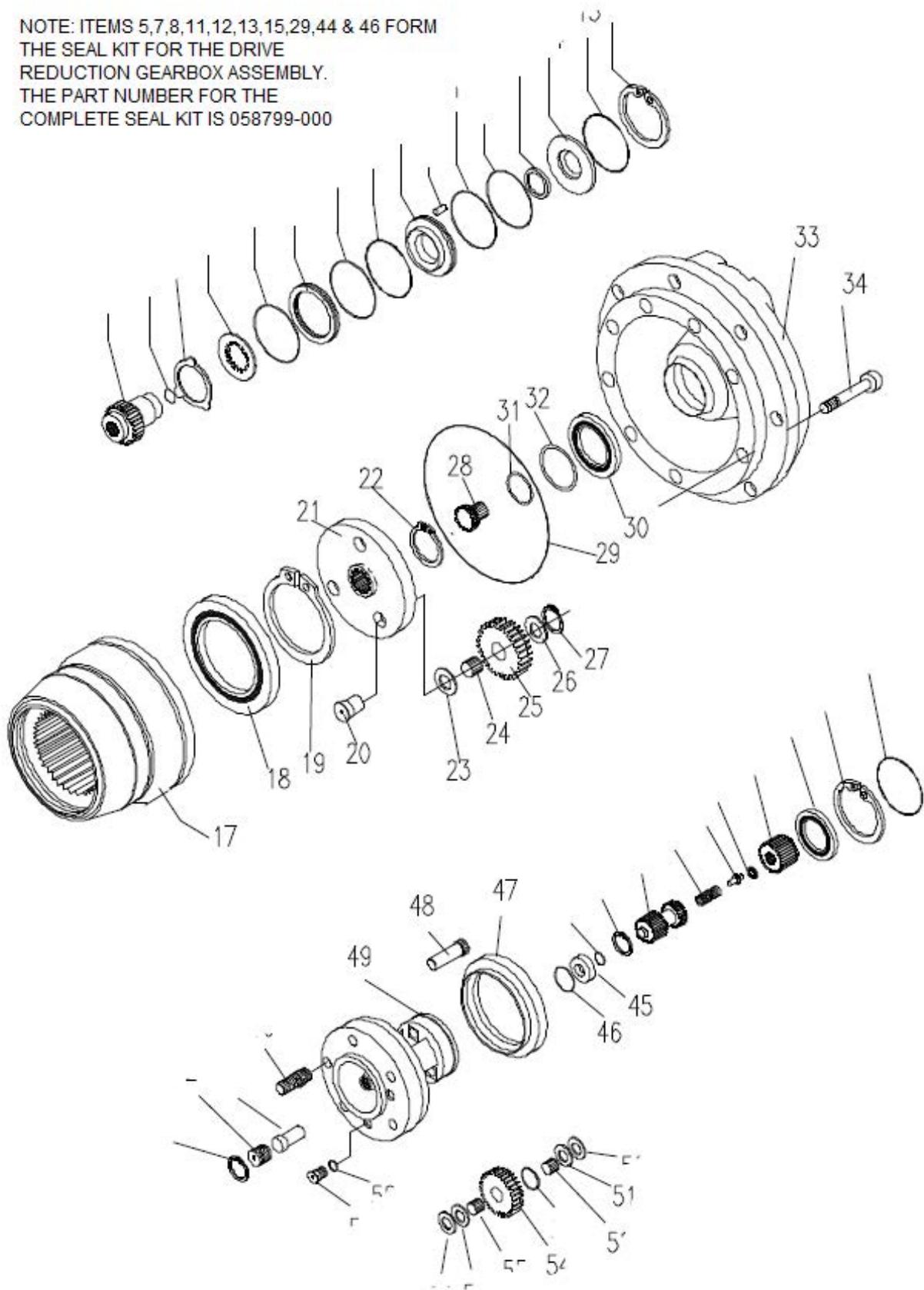
REPAIR PARTS



アイテム	部品番号	名前	数量	UOM
Not Shown	057669 000	STEERING STUB AXLE ASSEMBLY (use 4 x 505087 012 Hardened Washer, M12 x 24mm, when securing)		EA
1	057665 000	WHEEL HUB	1	EA
2	057664 000	THRUST BEARING	1	EA
3	057662 000	PIVOT BOSS	1	EA
4	057663 000	PIVOT PIN	1	EA
5	057585 000	COVER PLATE	1	EA
6	057584 000	OUTER HUB BEARING	1	EA
7	057583 000	INNER HUB BEARING	1	EA
8	057582 000	STUD	5	EA
9	057661 000	PIVOT BUSHING 30/38 x 30 long	2	EA

REPAIR PARTS

NOTE: ITEMS 5,7,8,11,12,13,15,29,44 & 46 FORM THE SEAL KIT FOR THE DRIVE REDUCTION GEARBOX ASSEMBLY. THE PART NUMBER FOR THE COMPLETE SEAL KIT IS 058799-000

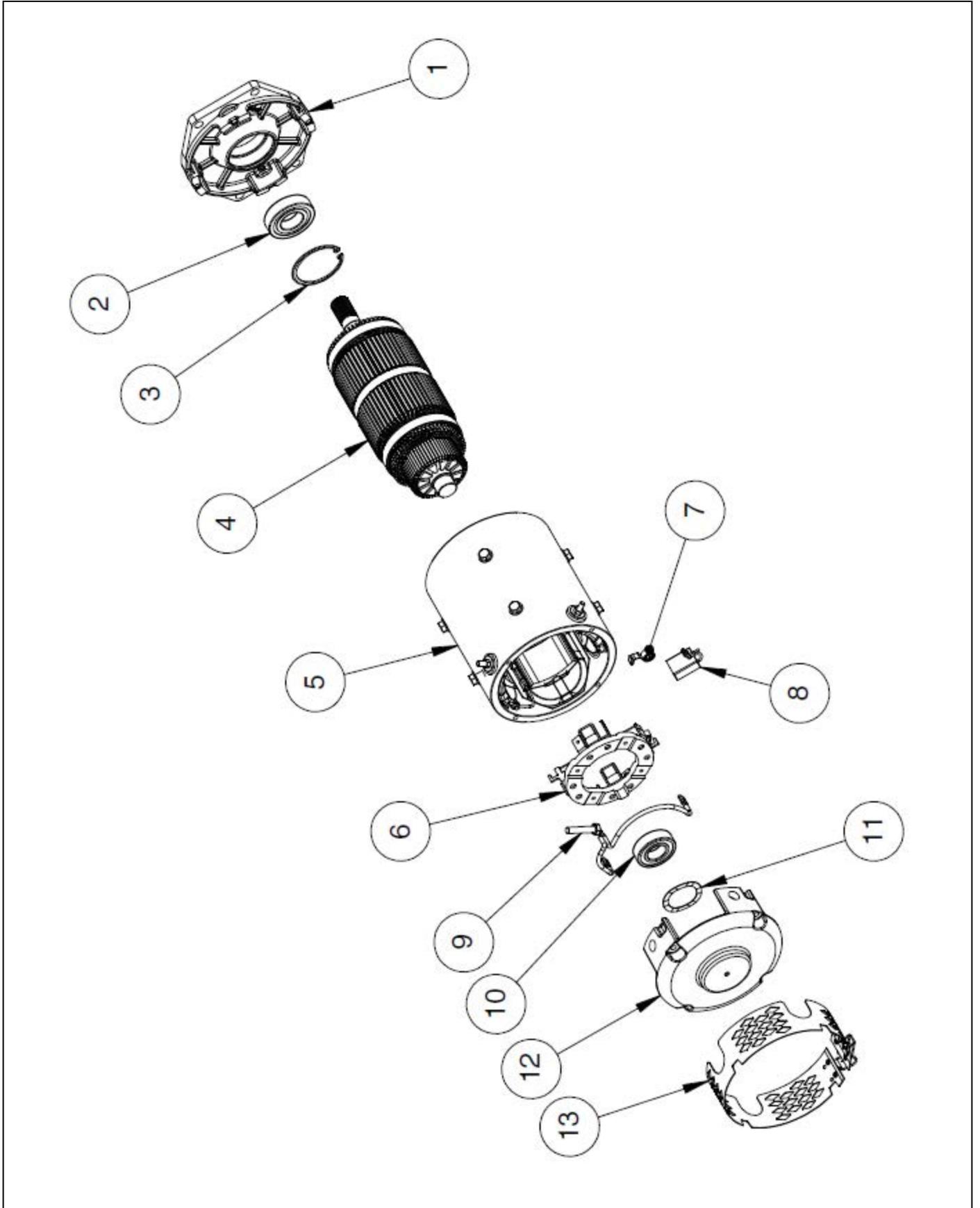


アイテム	部品番号	名前	数量	UOM
1	REF	COUPLING	1	EA
2	REF	EXPANSION PLUG	1	EA
3	REF	STEEL DISC	1	EA
4	REF	BRONZE DISC	1	EA
5	REF	O RING	1	EA
6	REF	SPACER	1	EA
7	REF	O RING	1	EA
8	REF	ANTI EXTRUS. RING	1	EA
9	REF	PISTON	1	EA
10	REF	SPRING	12	EA
11	REF	O RING	1	EA
12	REF	ANTI EXTRUS. RING	1	EA
13	REF	OIL SEAL	1	EA
14	REF	END PLATE	1	EA
15	REF	O RING	1	EA
16	REF	CIRCLIP	1	EA
17	REF	HUB	1	EA
18	REF	BEARING	1	EA
19	REF	CIRCLIP	1	EA
20	REF	PLANET SHAFT	1	EA
21	REF	PLANET CARRIER	1	EA
22	REF	CIRCLIP	1	EA
23	REF	THRUST WASHER	3	EA
24	REF	NEEDLE ROLLER	84	EA
25	REF	PLANET GEAR	3	EA
26	REF	THRUST WASHER	3	EA
27	REF	CIRCLIP	3	EA
28	REF	SUN PINION	1	EA
29	REF	O RING	1	EA

アイテム	部品番号	名前	数量	UOM
30	REF	BEARING	1	EA
31	REF	RETAINING RING	1	EA
32	REF	RETAINING RING	1	EA
33	REF	INPUT FLANGE	1	EA
34	REF	SCREW	8	EA
35	REF	SPACER	1	EA
36	REF	CIRCLIP	1	EA
37	REF	BEARING	1	EA
38	REF	COUPLING	1	EA
39	REF	BEARING	1	EA
40	REF	PIN	1	EA
41	REF	SPRING	1	EA
42	REF	SUN PINION	1	EA
43	REF	CIRCLIP	1	EA
44	REF	O RING	1	EA
45	REF	THRUST WASHER	1	EA
46	REF	O RING	1	EA
47	REF	RING + BEARING	1	EA
48	REF	PLANET SHAFT	3	EA
49	REF	SPINDLE	1	EA
50	REF	THRUST WASHER	3	EA
51	REF	THRUST WASHER	3	EA
52	REF	NEEDLE ROLLER	75	EA
53	REF	SPACER	3	EA
54	REF	PLANET GEAR	3	EA
55	REF	NEEDLE ROLLER	75	EA
56	REF	THRUST WASHER	3	EA
57	REF	THRUST WASHER	3	EA
58	REF	WASHER	2	EA

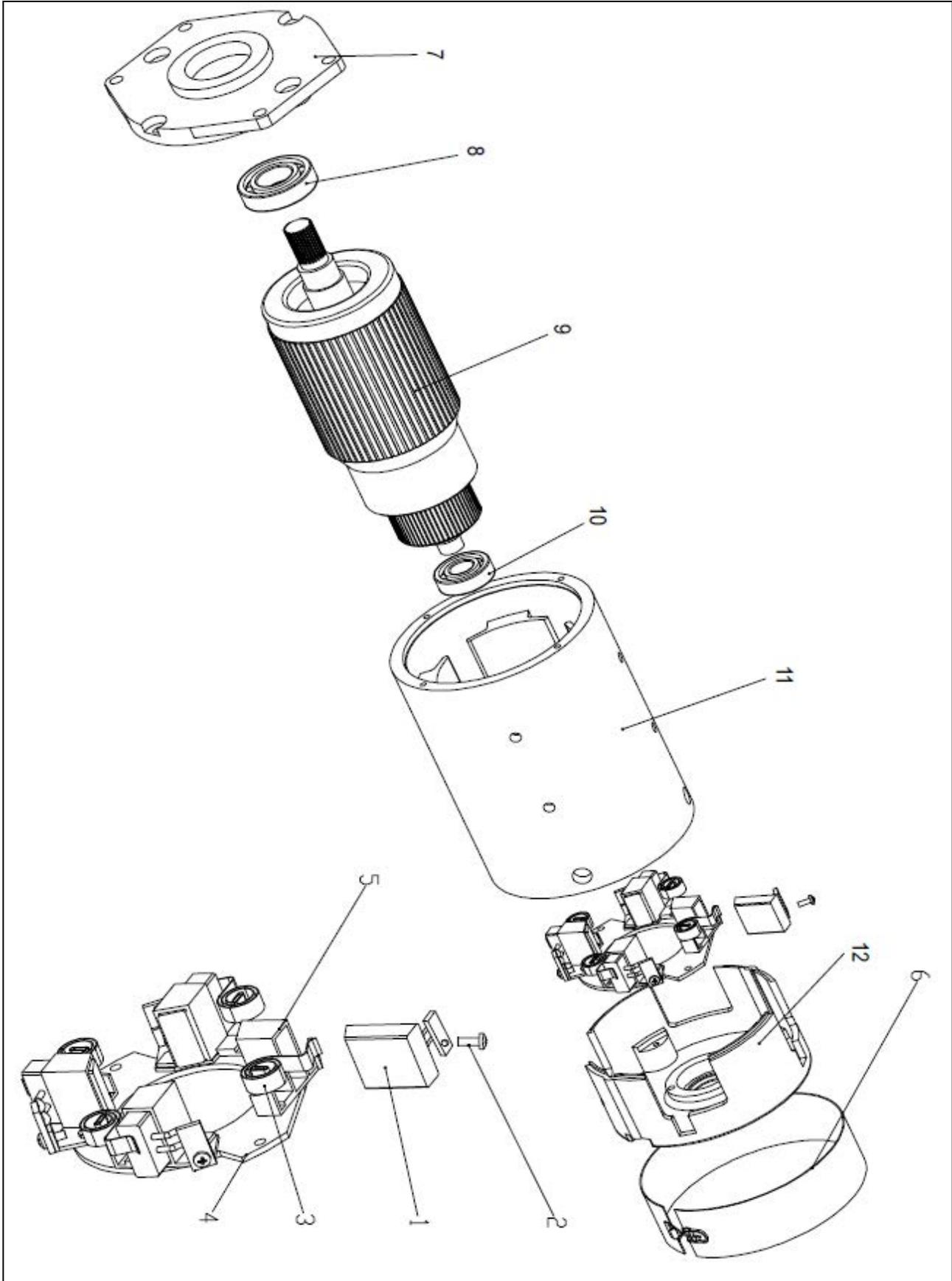
アイテム	部品番号	名前	数量	UOM
59	REF	PLUG	2	EA
60	REF	STUD M15 X 1.5	5	EA
61	REF	PIN	1	EA
62	REF	SCREW	1	EA
63	REF	CIRCLIP	1	EA

REPAIR PARTS



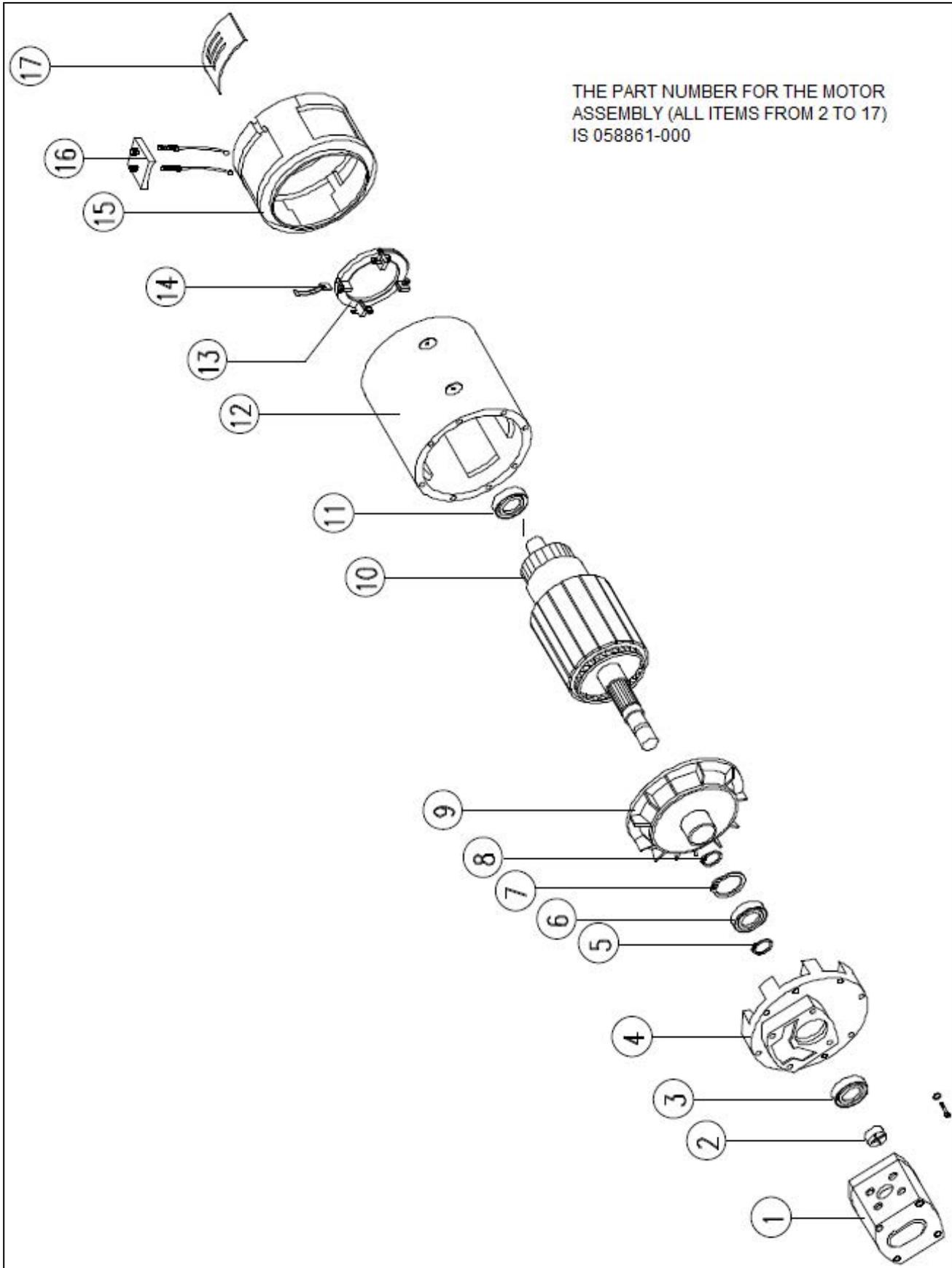
アイテム	部品番号	名前	数量	UOM
Not Shown	512944 000	DRIVE MOTOR (SN:006001 006281 / 006523 #####)		EA
1	512944 002	DRIVE END HEAD		EA
2	512944 004	BEARING		EA
3	512944 015	RETAINING RING		EA
4	512944 006	ARMATURE ASSEMBLY		EA
5	512944 009	FRAME & FIELD ASSEMBLY		EA
6	512944 014	BRUSH BOX ASSEMBLY (WITH SPRINGS)		EA
7	512944 012	SPRING		EA
8	512944 013	BRUSH (A 120)		EA
9	512944 011	BRUSH LEAD & TERMINAL SERVICE KIT		EA
10	512944 016	BEARING		EA
11	512944 003	WAVY WASHER		EA
12	512944 017	COMMUTATOR END HEAD		EA
13	512944 010	HEADBAND ASSEMBLY		EA
8	512944 005	OPTIONAL: BRUSH (H 100)		EA

REPAIR PARTS



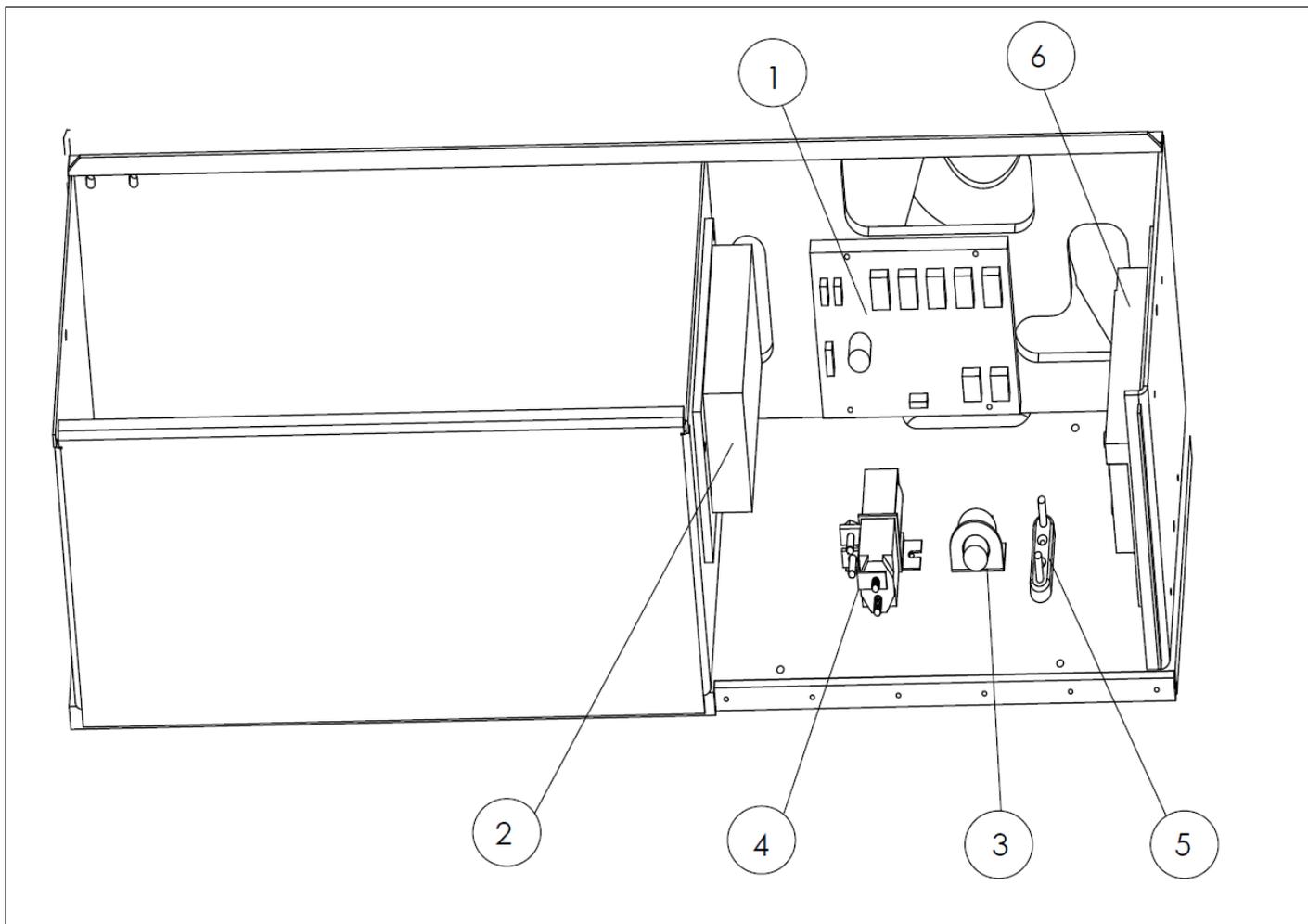
アイテム	部品番号	名前	数量	UOM
Not Shown	514274 000	DRIVE MOTOR		EA
1	514274 001	BRUSH	1	EA
2	514274 002	BOLT	1	EA
3	514274 003	SPRING	1	EA
4	514274 004	BRUSH BOX SUPPORT	1	EA
5	514274 005	BRUSH BOX	1	EA
6	514274 006	SHEATHING	1	EA
7	514274 007	FRONT ENDSHIELD	1	EA
8	514274 008	FRONT BEARING	1	EA
9	514274 009	ARMATURE	1	EA
10	514274 010	REAR BEARING	1	EA
11	514274 011	HOUSING	1	EA
12	514274 012	REAR ENDSHIELD	1	EA

REPAIR PARTS



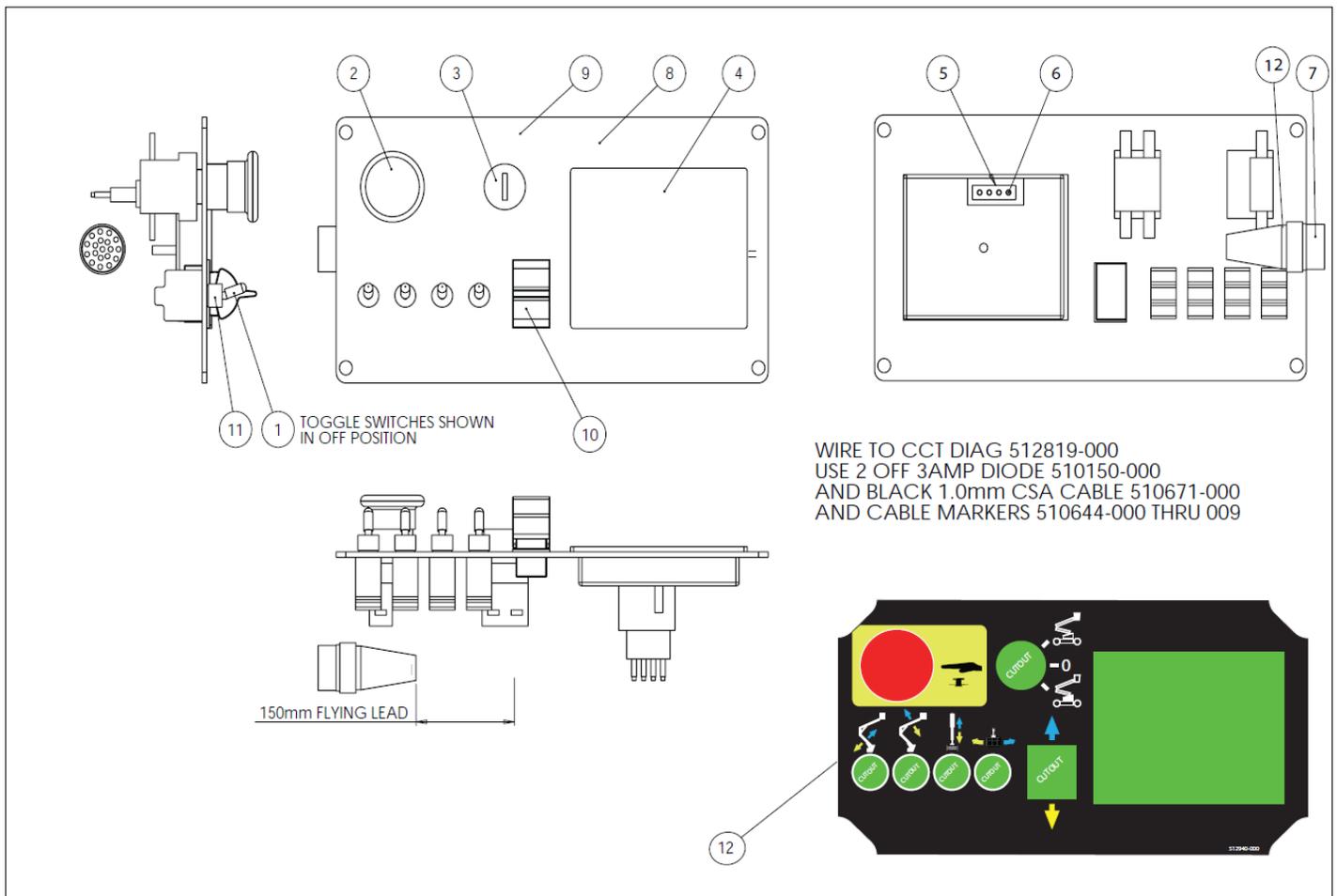
アイテム	部品番号	名前	数量	UOM
Not Shown	057530 000	MOTOR/PUMP ASSEMBLY		EA
1	058862 000	HYDRAULIC PUMP	1	EA
Not Shown	058862 001	OIL SEAL	1	EA
2	058847 000	COUPLING	1	EA
3	058862 001	OIL SEAL	1	EA
4	REF	PUMP MOUNTING FACE	1	EA
5	REF	CIRCLIP	1	EA
6	REF	BEARING	1	EA
7	REF	CIRCLIP	1	EA
8	REF	CIRCLIP	1	EA
9	REF	COOLING FAN	1	EA
10	REF	COMMUTATOR	1	EA
11	REF	BEARING	1	EA
12	REF	COMMUTATOR COVER	1	EA
13	REF	BRUSH HOUSING SUPPORT	1	EA
14	058863 000	BRUSH	4	EA
15	REF	END HOUSING	1	EA
16	REF	TERMINAL BLOCK	1	EA
17	REF	VENT/ INSPECTION CAP	4	EA

REPAIR PARTS



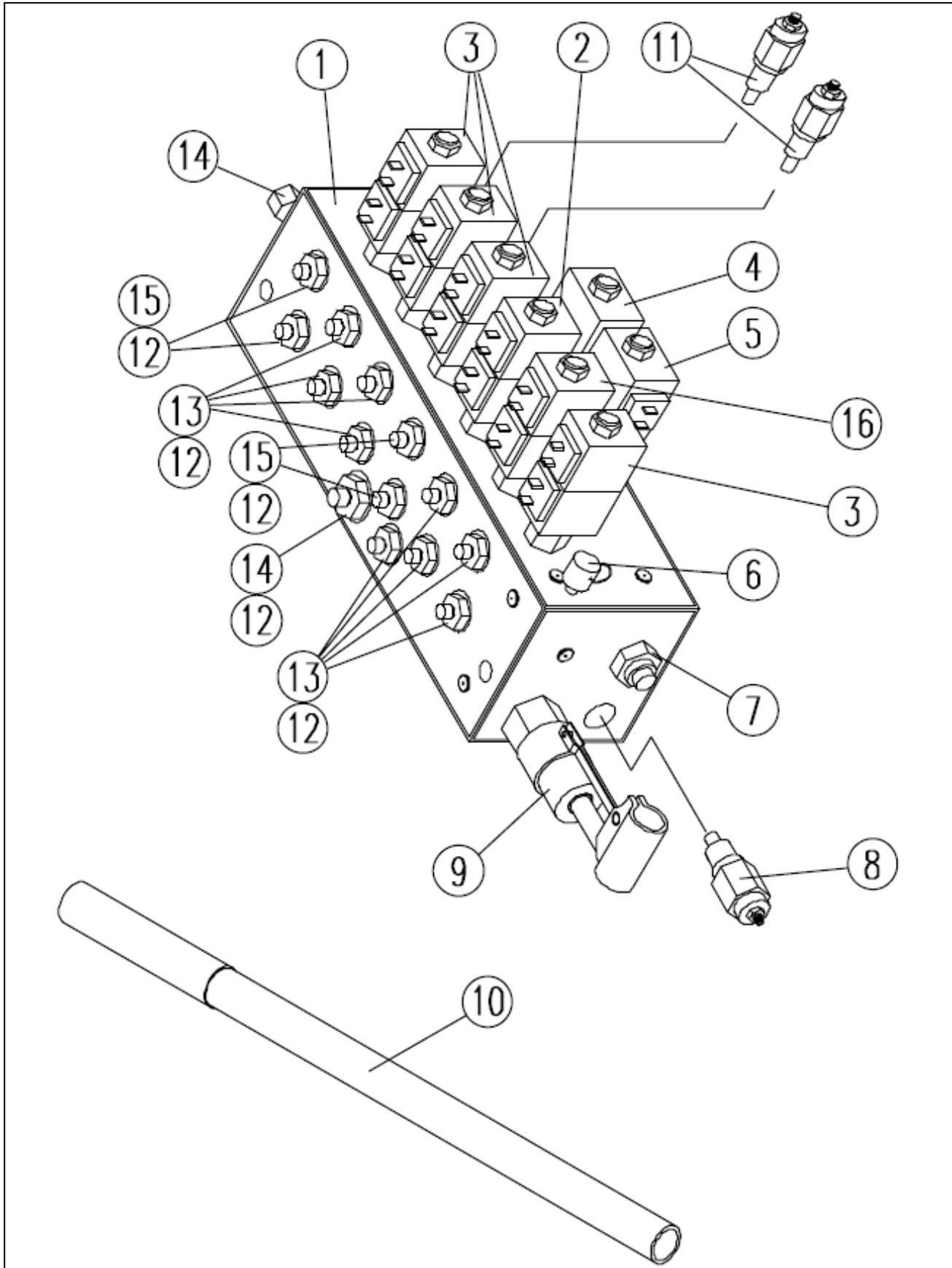
アイテム	部品番号	名前	数量	UOM
1	512941 000	GP400C	1	EA
2	512943 000	P600 PUMP MOTOR CONTROLLER	1	EA
3	512684 000	ALARM BRACKET	1	EA
4	513550 000	CONTACTOR SPDT 200A 12VDC	1	EA
5	501877 022	Fuse	1	EA
6	512942 000	SEM 600 PGT 21 510 611	1	EA
7	502588 000	ALARM, ECCO BEEPING 6 28VDC	1	EA
8	446086	Fuse Block	1	EA

REPAIR PARTS



アイテム	部品番号	名前	数量	UOM
Not Shown	513434 000	A38E LOWER CONTROL BOX ASSEMBLY (CE) (Harnesses are not part of this assembly)		EA
1	510521 000	GROUND OP SWITCH (ENABLE)	4	EA
2	510524 000	PUSH/PULL SW ASSY W/NC CONTACT	1	EA
3	512543 000	3 POS'N KEY SWITCH STAYPUT	1	EA
4	3087803	EZCal Panel Trionics	1	EA
5	512366 000	4 WAY PANEL PLUG	1	EA
6	510145 000	Mate N Lock PIN CONTACT	4	EA
7	513951 000	19 WAY CABLE CLAMP SOCKET	1	EA
8	512940 000	OVERLAY	1	EA
9	512939 001	A38 LOWER CNTRL PANEL	1	EA
10	514131 000	THUMB CONTROL UNIT	1	EA
11	514132 000	BOOT	4	EA
12	513583 000	LOWER CONTROL BRKT	1	EA

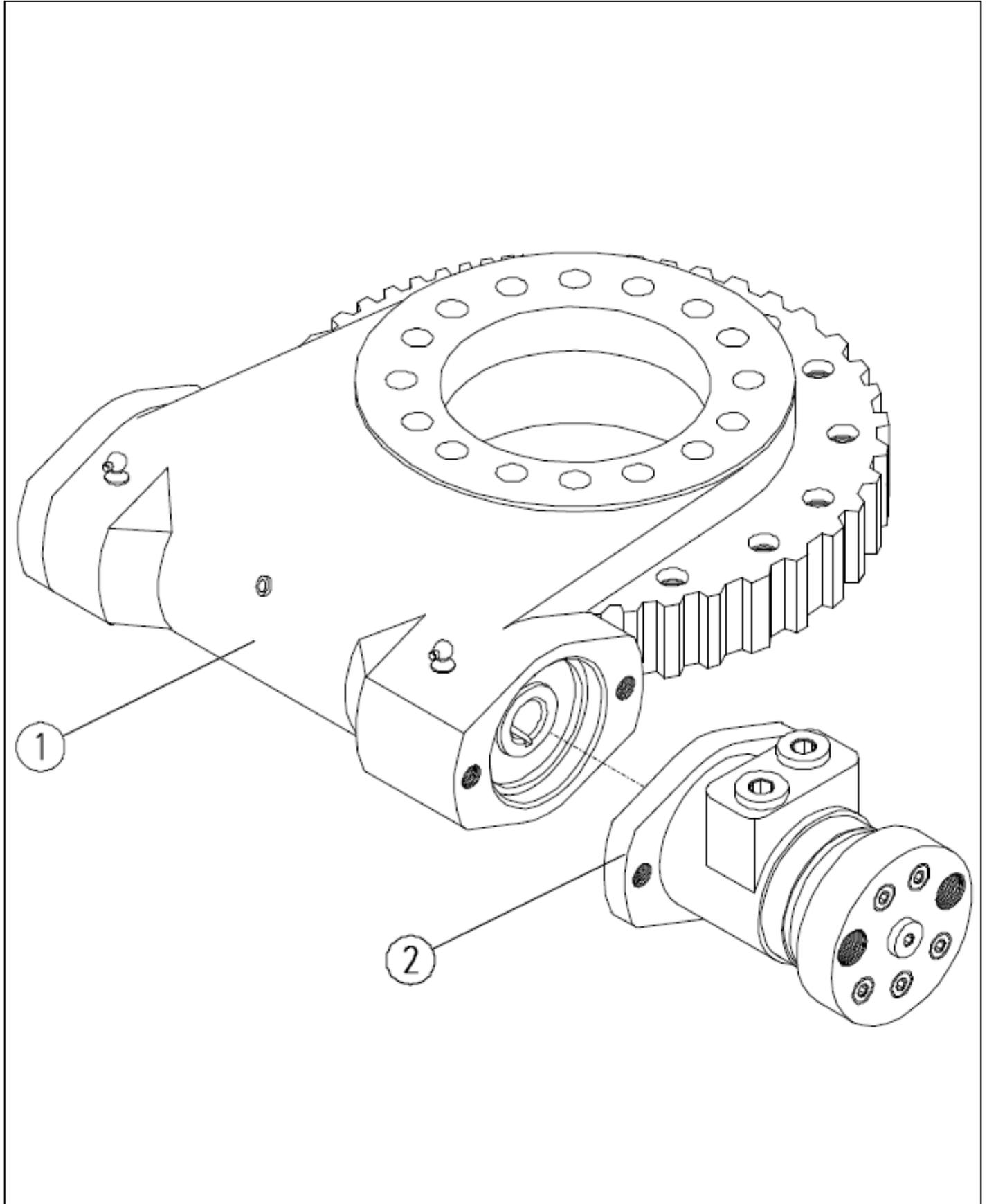
REPAIR PARTS



アイテム	部品番号	名前	数量	UOM
Not Shown	500261 001	MANIFOLD BLOCK ASSEMBLY (Non Hydraulic Platform Rotate)		EA
1	REF	MAIN MANIFOLD BLOCK ONLY	1	EA
2	501960 001	VALVE	1	EA
2	09 2088	Solenoid coil 12 V/22 W	2	EA
3	512815 000	VALVE	5	EA
3	09 2088	Solenoid coil 12 V/22 W	2	EA
4	510534 000	VALVE	1	EA
4	09 2088	Solenoid coil 12 V/22 W	2	EA
5	513923 000	VALVE	1	EA
5	09 2088	Solenoid coil 12 V/22 W	2	EA
6	057106 000	PRESSURE TEST POINT FITTING	1	EA
7	057540 000	PRESSURE REDUCING VALVE	1	EA
8	057536 000	MAINRELIEF VALVE	1	EA
9	500261 002	MANUAL TELE RETRACTIONVALVE	1	EA
10	0163373	HANDLE BLEED DOWN VALVE	1	EA
11	057539 000	CROSS LINE RELIEF VALVE	2	EA
12	REF	BONDED SEAL VARIOUS	12	EA
13	057358 000	ADAPTOR 1/4" x 1/4"	9	EA
14	057122 000	PISTON SEAL	2	EA
15	057121 000	PISTON LOCKNUT	4	EA
16	505555 009	VALVE	1	EA
16	09 2088	Solenoid coil 12 V/22 W	2	EA

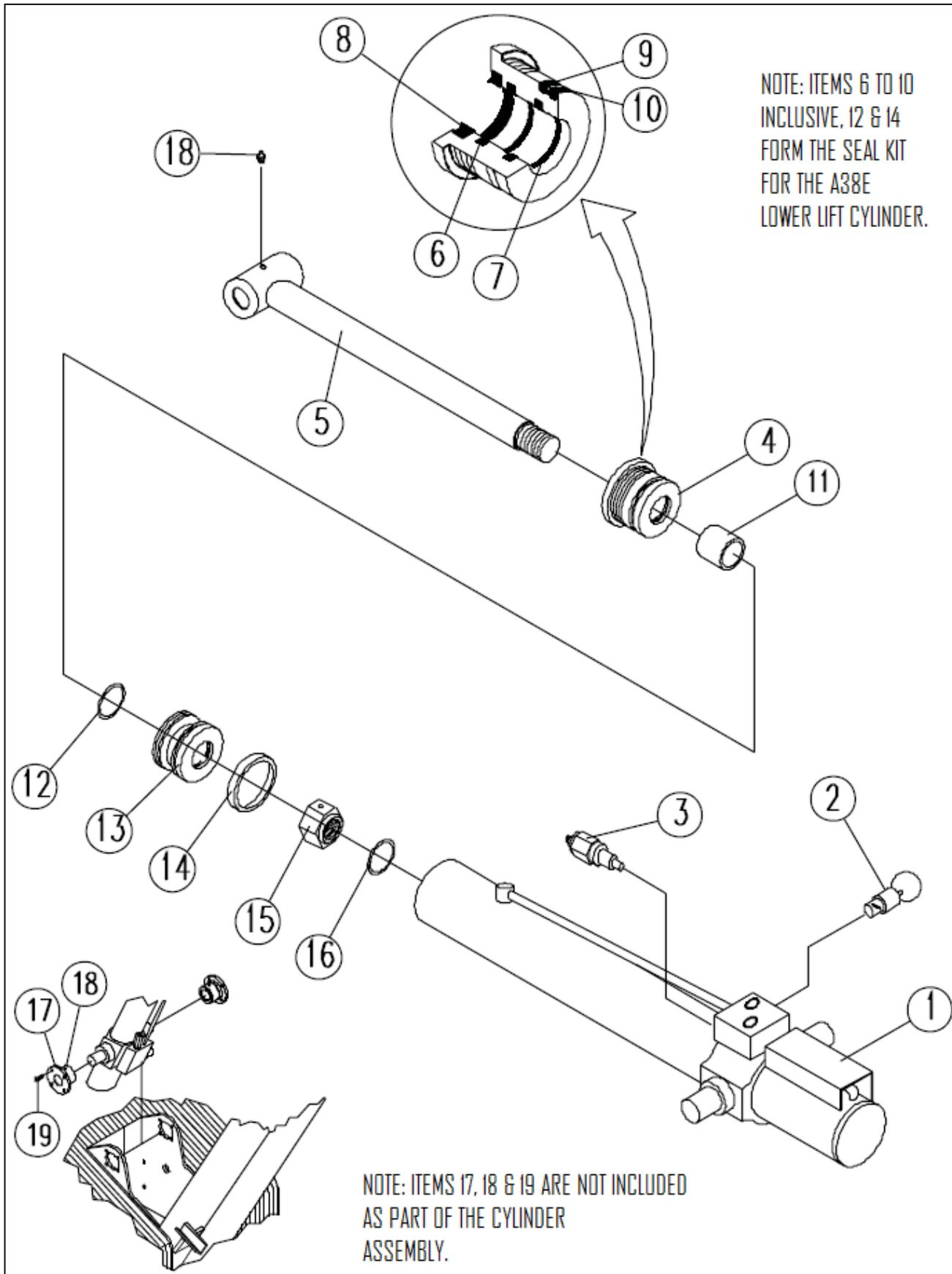
アイテム	部品番号	名前	数量	UOM
Not Shown	514351 000	A38E MANIFOLD BLOCK (Hydraulic Platform Rotate)		EA
1	REF	MAIN MANIFOLD BLOCK ONLY	1	EA
2	6010472	VALVECART 3 WAY VALVE	1	EA
2	514526 000	COIL	2	EA
3	12567 4	Cartridge, Solenoid Spool, 4 Way, 3 Posn, Motor Spool	4	EA
3	514526 000	COIL	2	EA
4	6018952	SOLENOID VALVE	2	EA
4	514526 000	COIL	2	EA
5	514523 000	VALVE	1	EA
5	514526 000	COIL	2	EA
6	12 3149	PRESSURE TEST POINT FITTING	1	EA
7	514525 000	PRESSURE REDUCING VALVE	1	EA
8	514524 000	MAINRELIEF VALVE	1	EA
9	500261 002	MANUAL TELE RETRACTIONVALVE	1	EA
10	0163373	HANDLE BLEED DOWN VALVE	1	EA
11	514527 000	CROSS LINE RELIEF VALVE	2	EA
13	514353 000	ADAPTER, 6ORB 3/8 BSP M M STR	2	EA
14	512251 000	ADAPTER, 4ORB 1/4 BSP M M STR	11	EA
15	514354 000	ADAPTER, 4ORB 3/8 BSP M M STR	4	EA

REPAIR PARTS



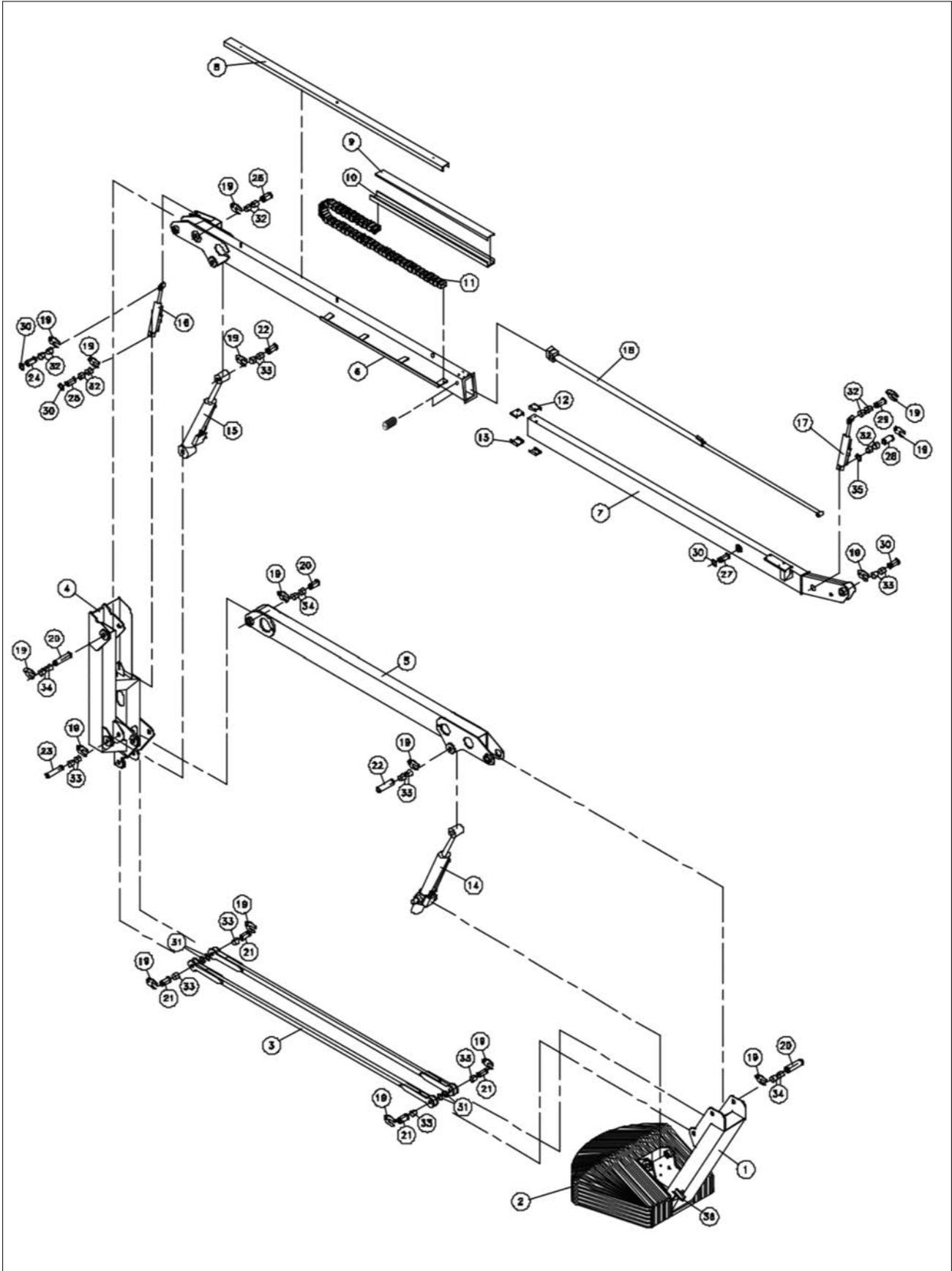
アイテム	部品番号	名前	数量	UOM
Not Shown	500284 001	SLEW MOTOR, WORM DRIVE UNIT & SLEW BEARING ASSEMBLY		EA
1	500284 000	SLEW DRIVE	1	EA
Not Shown	500280 000	BOLT 5/8" 11 UNC X 3 1/2"	16	EA
Not Shown	500281 000	WSHR M16 HARDEND STL DIN 6016 PLTD	32	EA
2	500285 000	SLEW MOTOR	1	EA
Not Shown	500285 001	SEAL KIT	1	EA
Not Shown	500282 000	BOLT 1/2" 13 UNC X 1"	2	EA
Not Shown	056021 012	Washer, SpringWasher DIN127B M	2	EA

REPAIR PARTS



アイテム	部品番号	名前	数量	UOM
	504504 000	Lower Cylinder Assembly	1	EA
	504504 010	SEAL KIT	1	EA
1	REF	CYLINDER BODY	1	EA
2	500397 000	EMERGENCY LOWERING VALVE	1	EA
3	058728 000	SINGLE OVERCENTRE VALVE	1	EA
4	REF	END CAP	1	EA
5	REF	ROD AND END PIVOT	1	EA
6	SEE NOTE	PLATFORM WELDMENT	1	EA
7	SEE NOTE	PLATFORM WELDMENT	1	EA
8	SEE NOTE	PLATFORM WELDMENT	1	EA
9	SEE NOTE	PLATFORM WELDMENT	1	EA
10	SEE NOTE	PLATFORM WELDMENT	1	EA
11	REF	SPACER	1	EA
12	SEE NOTE	PLATFORM WELDMENT	1	EA
13	REF	PISTON HEAD	1	EA
14	057122 000	PISTON SEAL	1	EA
15	057121 000	PISTON LOCKNUT	1	EA
16	501964 000	WASHER	1	EA
17	057121 001	A38E BOSS CAPHEAD SCREW M8	2	EA
18	501964 001	GREASE NIPPLE	3	EA
19	057121 001	A38E BOSS CAPHEAD SCREW M8	8	EA

REPAIR PARTS

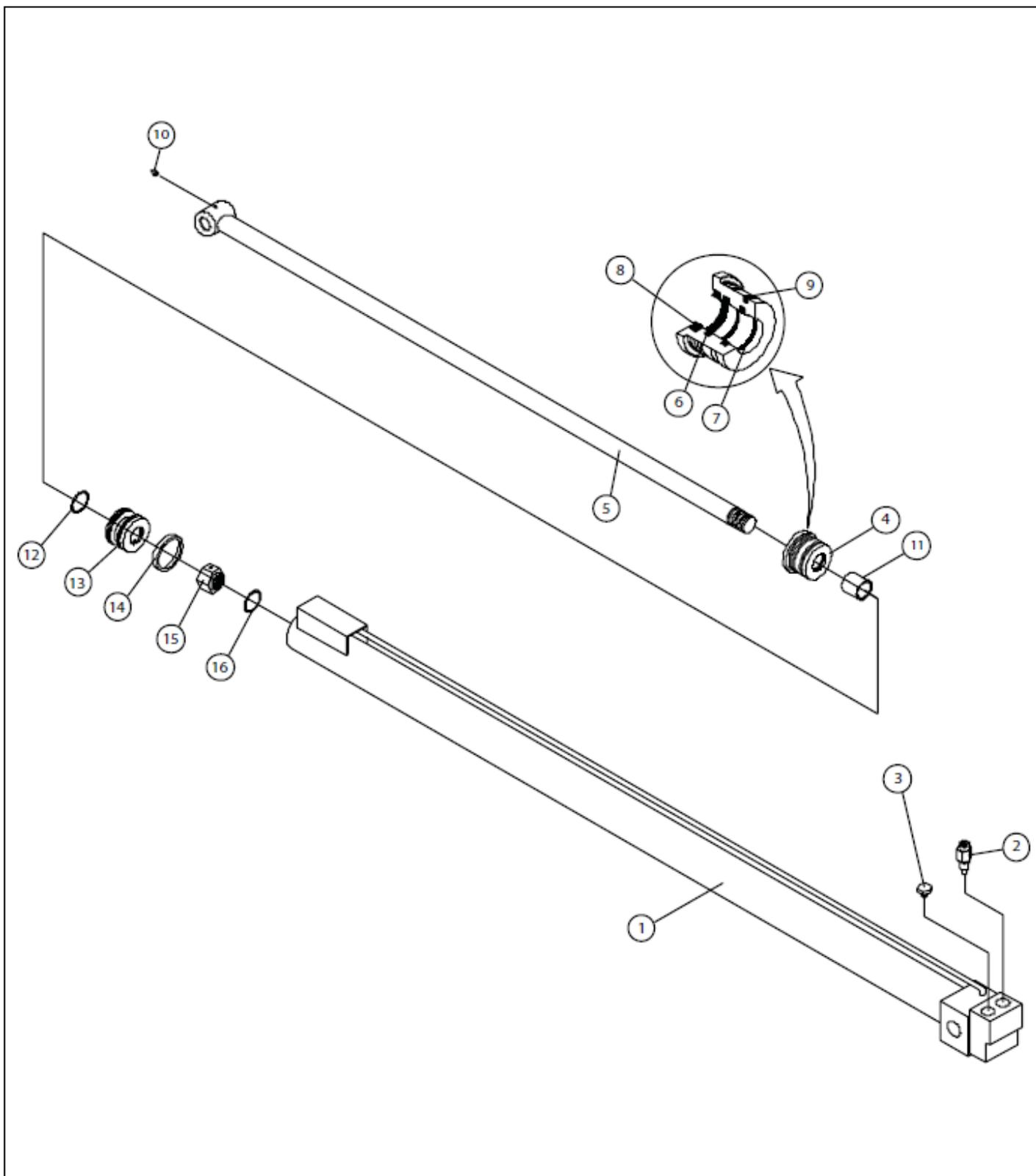


アイテム	部品番号	名前	数量	UOM
Not Shown	500201 000	BOOMS & POSTS ASSEMBLY		EA
1	058412 000	A38E 1st POST WELDMENT(sn:6000 6614)	1	EA
1	514346 000	A38E 1st POST WELDMENT	1	EA
2	512614 000	BALLAST ASSEMBLY CE	1	EA
Not Shown	512614 001	BALLAST ASSEMBLY ANSI	1	EA
3	058417 000	Lower Level Rod	2	EA
4	058416 000	Turret Weld	1	EA
5	058413 000	LOWER BOOM WELDMENT	1	EA
6	058414 001	OUTER BOOM	1	EA
Not Shown	260297	WEAR PAD 1 3/4" 4 ACME THREAD	2	EA
7	058415 001	INNER BOOM	1	EA
8	058457 002	A38E HOSE CABLE COVER	1	EA
9	500265 000	Cover For Energy Chain Support Channel	1	EA
Not Shown	057727 000	TWIST SCREW FASTNER	2	EA
10	500266 000	ENERGY CHAIN SUPPORT CHANNEL	1	EA
11	500468 000	ENERGY CHAIN, COMPLETE	1	EA
Not Shown	500468 002	ENERGY CHAIN (1 UNIT OF 24)	24	EA
Not Shown	500468 001	MOUNTING ELEMENTS	1	EA
12	057975 000	Wear Pad, Inner	2	EA
Not Shown	058510 016	M8 X 16 CSK	6	EA
Not Shown	058510 025	BLT FLSKTHD M8 1.25 25MM	2	EA
13	500275 001	OUTER TELESCOPIC BOOM WEAR PAD	2	EA

アイテム	部品番号	名前	数量	UOM
Not Shown	058491 010	M6 X 10 HEX	8	EA
Not Shown	500519 006	1/4" T4 WASHER	8	EA
Not Shown	057975 300	6mm INSERTS	8	EA
14	504504 000	Lower Cylinder Assembly	1	EA
15	504505 000	Upper Cylinder Assembly	1	EA
16	058734 000	Master Level Cylinder Assembly	1	EA
17	058735 000	Slave Cylinder	1	EA
18	058461 000	Tele Cylinder Assembly	1	EA
19	058056 000	Pin Keeper, Square	16	EA
Not Shown	056060 016	BOLT M10 X 16 mm	16	EA
Not Shown	056021 010	Washer, SpringWasher DIN127B M	16	EA
20	058055 006	Pin	3	EA
21	058054 001	Pin	4	EA
22	058066 001	Pin 80 x 230mm	1	EA
23	058066 007	Pin	1	EA
24	058053 004	Pin	1	EA
25	058053 005	Pin	1	EA
26	058065 006	PIN	1	EA
27	500254 000	Pin	1	EA
28	058053 001	Pin 25x93mm	1	EA
29	058065 005	Pin, 25 x 93mm	1	EA
30	058066 001	Pin 80 x 230mm	1	EA
31	057033 000	CIRCLIP 30mm	4	EA
32	057047 000	BUSH	8	EA
33	057054 000	BUSH	12	EA
34	057046 000	BUSH	8	EA
35	057034 000	CIRCLIP 25mm	4	EA

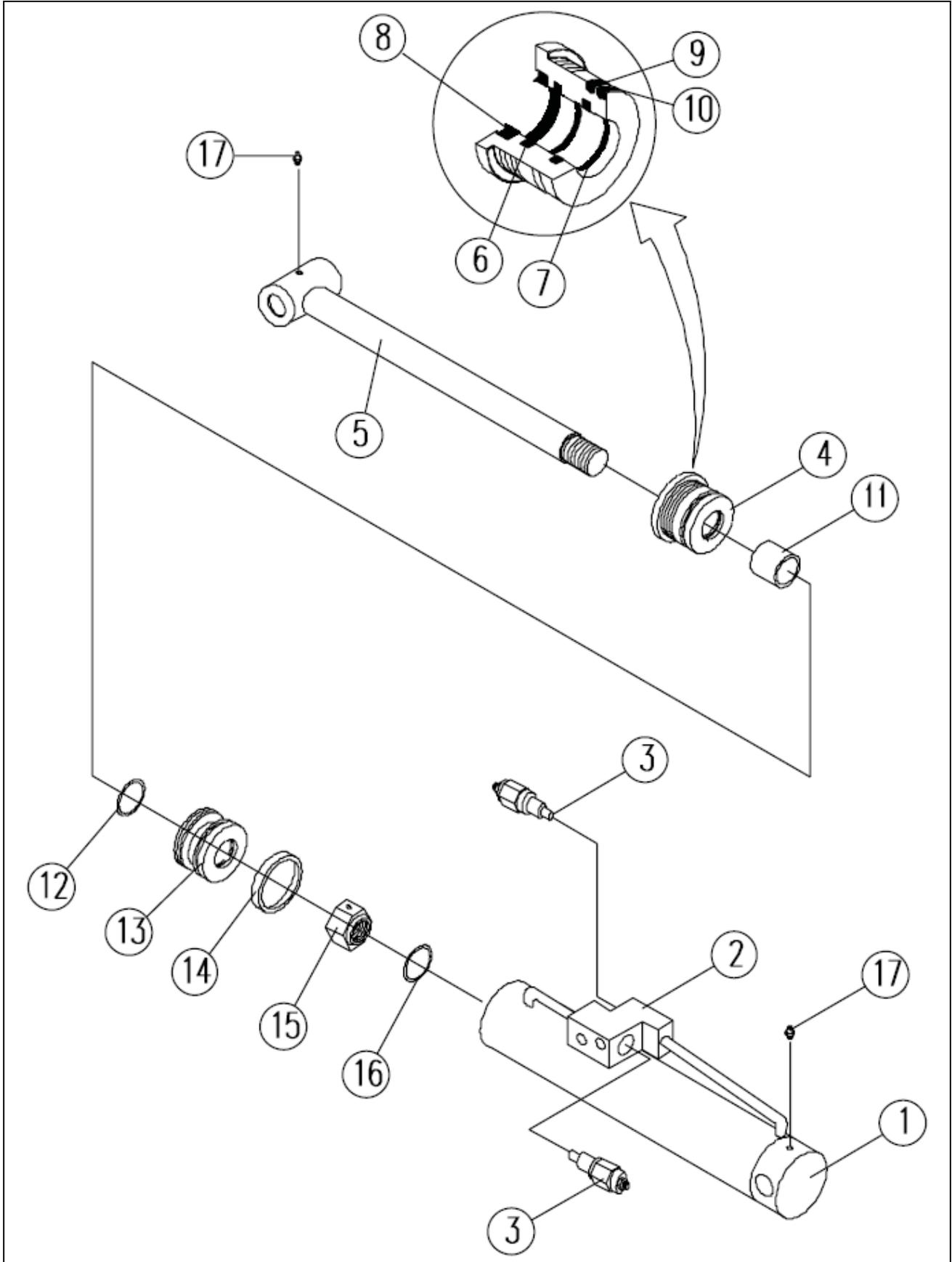
アイテム	部品番号	名前	数量	UOM
36	501085 000	BOOM REST (BOLT ON)	1	EA

REPAIR PARTS



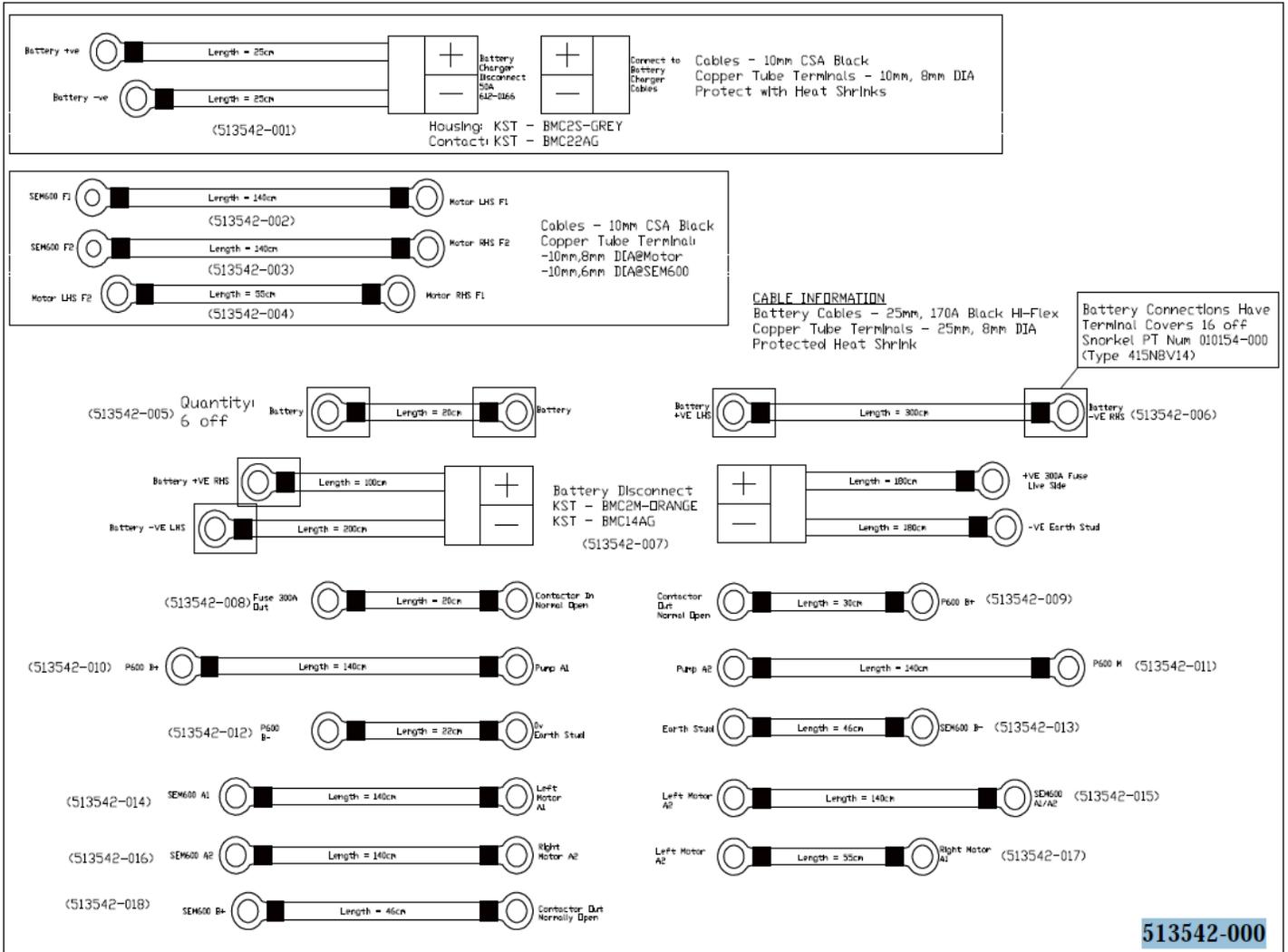
アイテム	部品番号	名前	数量	UOM
Not Shown	058461 000	Tele Cylinder Assembly		EA
1	REF	CYLINDER BODY	1	EA
2	058728 000	SINGLE OVERCENTRE VALVE	1	EA
3	058714 000	SINGLE P.O. CHECK VALVE	1	EA
4	REF	END CAP	1	EA
5	REF	ROD AND END PIVOT	1	EA
	500459 000	SEAL KIT (6 THRU 9, INCLUDING 12 AND 14)	1	EA
6	KIT ITEM	O RING	1	EA
7	KIT ITEM	O RING	1	EA
8	KIT ITEM	O RING	1	EA
9	KIT ITEM	O RING	1	EA
10	057048 000	GREASE NIPPLE		EA
11	REF	SPACER	1	EA
12	KIT ITEM	O RING	1	EA
13	REF	PISTON HEAD	1	EA
14	KIT ITEM	WEARBAND	1	EA
15	057121 000	PISTON LOCKNUT	1	EA
16	501964 000	WASHER	1	EA

REPAIR PARTS



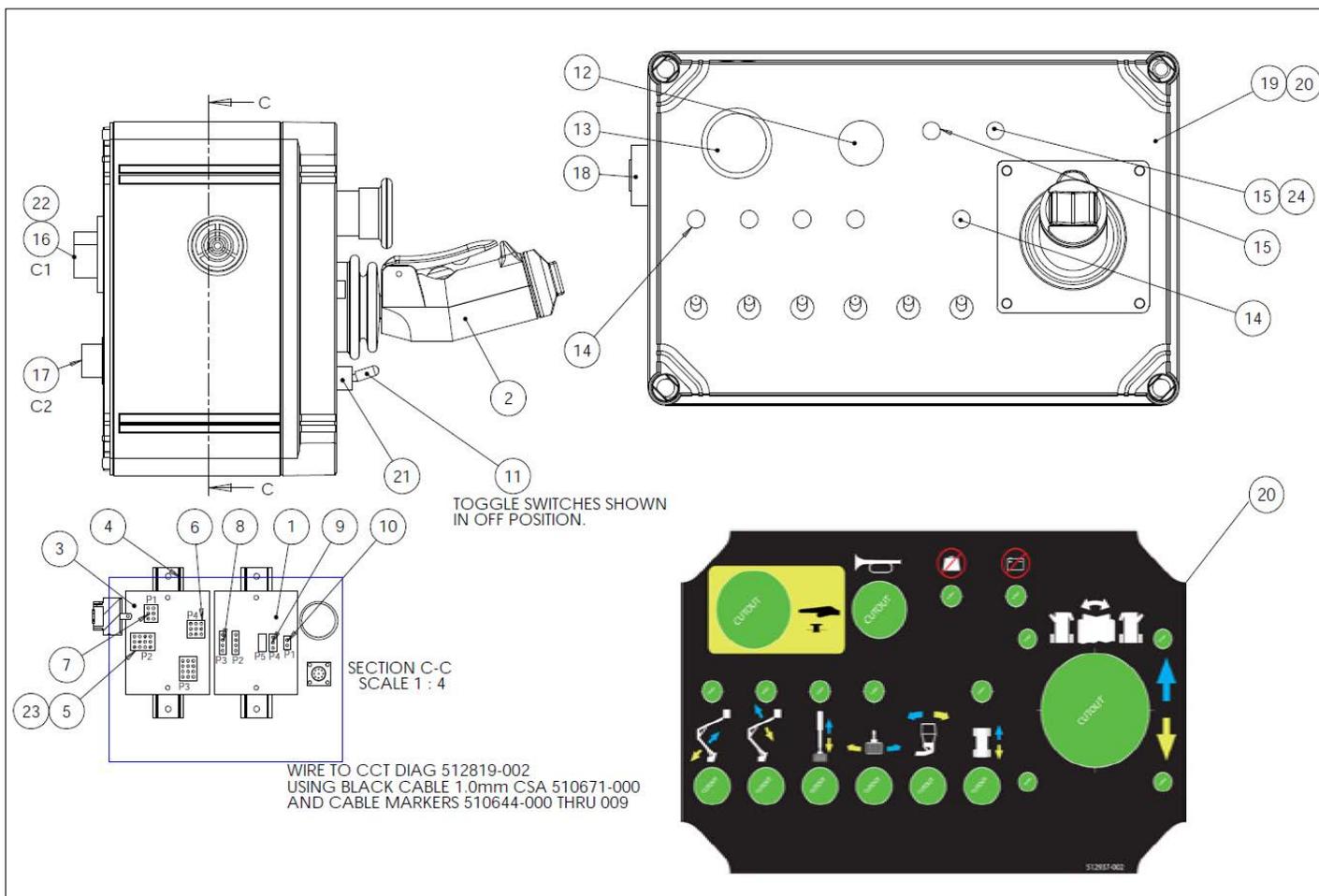
アイテム	部品番号	名前	数量	UOM
Not Shown	058734 000	Master Level Cylinder Assembly		EA
Not Shown	058735 000	Slave Cylinder		EA
1	REF	CYLINDER BODY	1	EA
2	REF	VALVE BLOCK BODY	1	EA
3	058728 000	SINGLE OVERCENTRE VALVE	1	EA
4	REF	END CAP	1	EA
5	REF	ROD AND END PIVOT	1	EA
	058750 000	SEAL KIT	1	EA
6	KIT ITEM	O RING	1	EA
7	KIT ITEM	O RING	1	EA
8	KIT ITEM	O RING	1	EA
9	KIT ITEM	O RING	1	EA
10	KIT ITEM	O RING	1	EA
11	REF	SPACER	1	EA
12	KIT ITEM	O RING	1	EA
13	REF	PISTON HEAD	1	EA
14	KIT ITEM	WEARBAND	1	EA
15	REF	PISTON LOCKOUT	1	EA
16	REF	WASHER	1	EA
17	057048 000	GREASE NIPPLE	2	EA

REPAIR PARTS



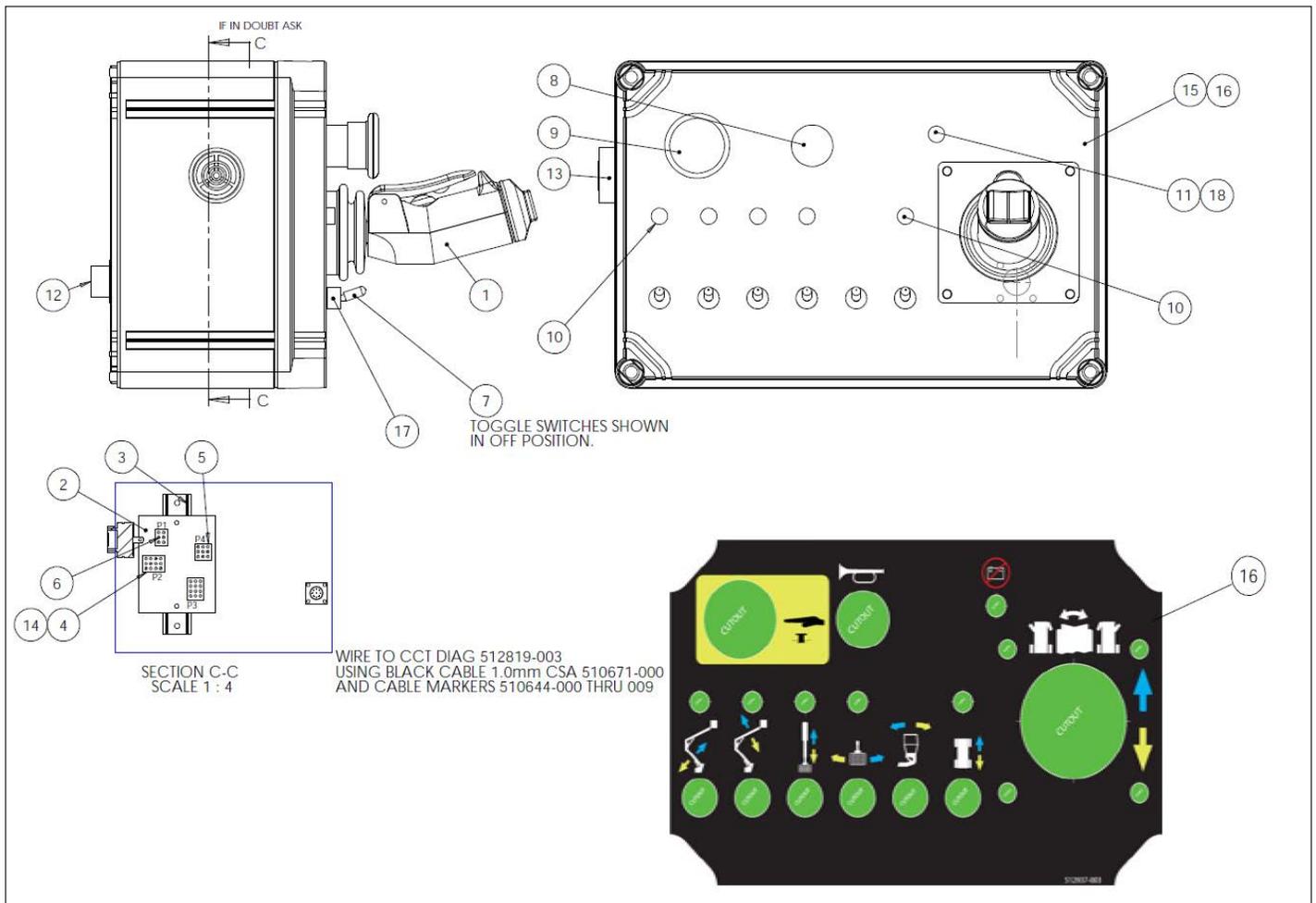
アイテム	部品番号	名前	数量	UOM
Not Shown	513542 000	A38E POWER CABLE KIT		EA
1	513539 000	A38E WIRE HARNESS TO PLATFORM AND GROUND CONTROL PANELS KIT	1	EA
Not Shown	513539 001	PLATFORM CABLE HARNESS	1	EA
	513950 000	9 WAY CABLE PLUG,PART OF 513539 001(WAS PN 512365 000)		EA
Not Shown	513539 002	GROUND PANEL CABLES	1	EA
2	513540 001	A38E VALVE CABLE	1	EA
3	513541 000	A38E CAN LINK CABLE KIT	1	EA
4	513542 000	A38E POWER CABLE KIT	1	EA

REPAIR PARTS



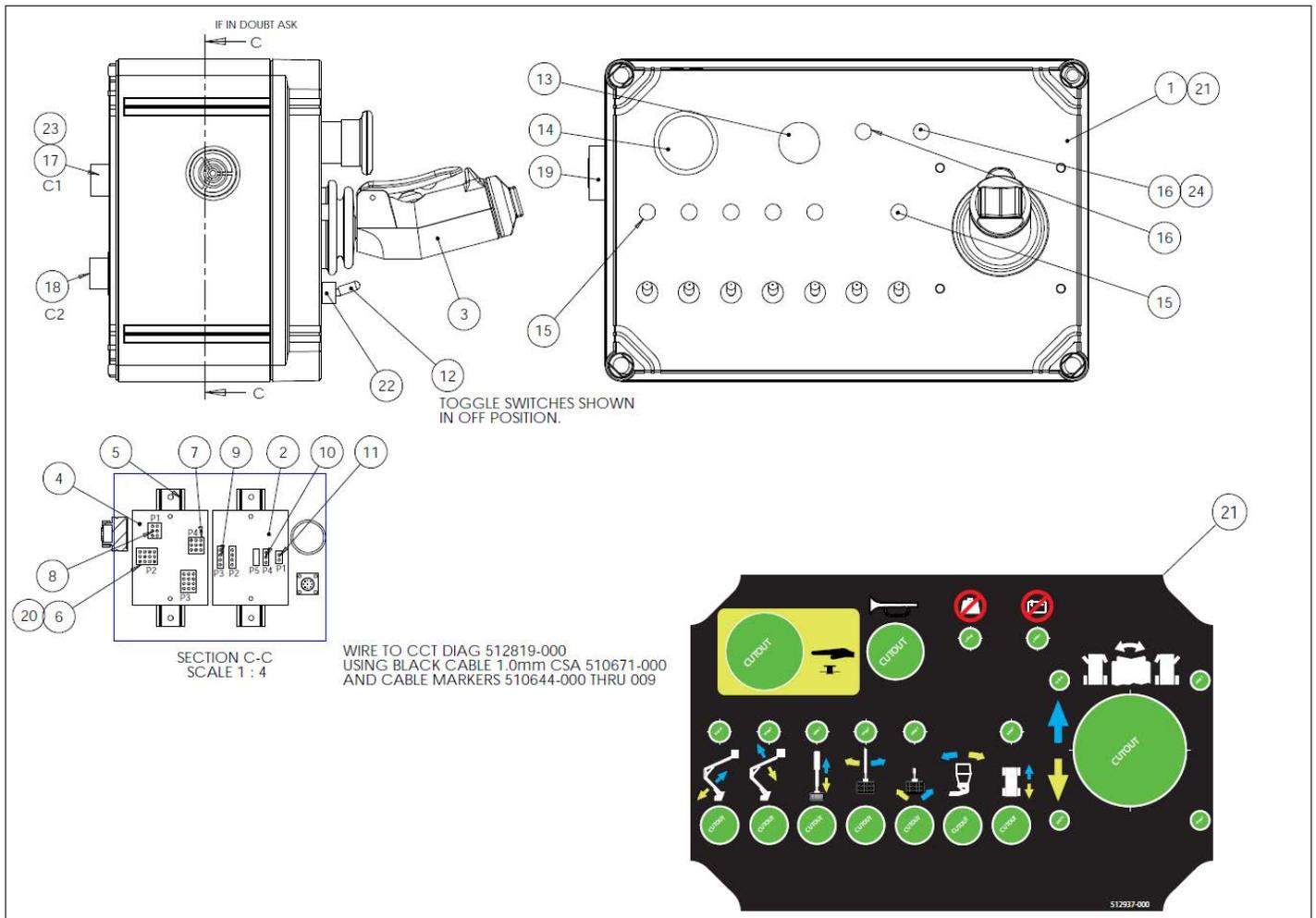
アイテム	部品番号	名前	数量	UOM
Not Shown	513433 002	UPPER CONTROL BOX CE		EA
1	13468 01	Trionics Load Cell Interface	1	EA
2	3087801	JOYSTICK, OEM MARCH 2016 AND AFTER	1	EA
3	510472 000	Matrix board (Before SN SL30 01 XXXX00061 / SL26 01 XXXX000017)	1	EA
4	512368 00a	DIN RAIL (170mm)	2	EA
5	510157 000	12 way panel plug	2	EA
6	510156 000	9WAY PANEL PLUG	1	EA
7	510154 000	6WAY PANEL PLUG	1	EA
8	512366 000	4 WAY PANEL PLUG	2	EA
9	510155 000	3WAY PANEL PLUG SW TWIST RELEASE E/STOP; SCHNEIDER	1	EA
10	512816 000	2WAY PANEL PLUG	1	EA
11	510521 000	GROUND OP SWITCH (ENABLE)	6	EA
12	510542 000	PUSHBUTTON BLACK C/W 1 N/O CON	1	EA
13	510524 000	PUSH/PULL SW ASSY W/NC CONTACT	1	EA
14	512935 000	LED GREEN 12V	5	EA
15	512934 000	LED RED 12V	2	EA
16	512938 000	9WAY BULKHEAD CONNECTOR	1	EA
17	513949 000	9 way chassis socket	1	EA
18	502588 000	ALARM, ECCO BEEPING 6 28VDC	1	EA
19	512936 002	A38E UCB ENCLOSURE (non power rotate)	1	EA
20	512937 002	OVERLAY	1	EA
21	514132 000	BOOT	6	EA
22	510145 000	Mate N Lock PIN CONTACT	7	EA
23	509755 000	Mate N lock socket contact	31	EA
24	514327 000	Resistor 1 K 0.5 W 5%	1	EA

REPAIR PARTS



アイテム	部品番号	名前	数量	UOM
Not Shown	513433 003	UPPER CONTROL BOX ANSI		EA
1	3087801	JOYSTICK, OEM MARCH 2016 AND AFTER	1	EA
2	510472 000	Matrix board (Before SN SL30 01 XXXX00061 / SL26 01 XXXX000017)	1	EA
3	512368 00a	DIN RAIL (170mm)	1	EA
4	510157 000	12 way panel plug	2	EA
5	510156 000	9WAY PANEL PLUG	1	EA
6	510154 000	6WAY PANEL PLUG	1	EA
7	510521 000	GROUND OP SWITCH (ENABLE)	6	EA
8	510542 000	PUSHBUTTON BLACK C/W 1 N/O CON	1	EA
9	510524 000	PUSH/PULL SW ASSY W/NC CONTACT	1	EA
10	512935 000	LED GREEN 12V	5	EA
11	512934 000	LED RED 12V	1	EA
12	513949 000	9 way chassis socket	1	EA
13	502588 000	ALARM, ECCO BEEPING 6 28VDC	1	EA
14	509755 000	Mate N lock socket contact	26	EA
15	512936 003	A38E UCB ENCLOSURE ANSI (NON POWER ROTATE)	1	EA
16	512937 003	OVERLAY	6	EA
17	514132 000	BOOT	1	EA
18	514327 000	Resistor 1 K 0.5 W 5%	1	EA

REPAIR PARTS



アイテム	部品番号	名前	数量	UOM
Not Shown	513433 000	A38 UPPER CONTROL BOX ASSY		EA
1	512936 000	A38 UCB ENCLOSURE	1	EA
2	13468 01	Trionics Load Cell Interface	1	EA
3	3087801	JOYSTICK, OEM MARCH 2016 AND AFTER	1	EA
4	510472 000	Matrix board (Before SN SL30 01 XXXX00061 / SL26 01 XXXX000017)	1	EA
5	512368 00a	DIN RAIL (170mm)	2	EA
6	510157 000	12 way panel plug	2	EA
7	510156 000	9WAY PANEL PLUG	1	EA
8	510154 000	6WAY PANEL PLUG	1	EA
9	512366 000	4 WAY PANEL PLUG	2	EA
10	510155 000	3WAY PANEL PLUG SW TWIST RELEASE E/STOP; SCHNEIDER	1	EA
11	512816 000	2WAY PANEL PLUG	1	EA
12	510521 000	GROUND OP SWITCH (ENABLE)	7	EA
13	510542 000	PUSHBUTTON BLACK C/W 1 N/O CON	1	EA
14	510524 000	PUSH/PULL SW ASSY W/NC CONTACT	1	EA
15	512935 000	LED GREEN 12V	6	EA
16	512934 000	LED RED 12V	2	EA
17	512938 000	9WAY BULKHEAD CONNECTOR	1	EA
18	513949 000	9 way chassis socket	1	EA
19	502588 000	ALARM, ECCO BEEPING 6 28VDC	1	EA
20	509755 000	Mate N lock socket contact	35	EA
21	512937 000	DECAL UPPER CONTROL BOX	1	EA
22	514132 000	BOOT	7	EA
23	510145 000	Mate N Lock PIN CONTACT	7	EA
24	514327 000	Resistor 1 K 0.5 W 5%	1	EA

アイテム	部品番号	名前	数量	UOM
Not Shown	513433 001	UPPER CONTROL BOX ASSEMBLY ANSI (Hydraulic Platform Rotate)		EA
1	3087801	JOYSTICK, OEM MARCH 2016 AND AFTER	1	EA
2	510472 000	Matrix board (Before SN SL30 01 XXXX00061 / SL26 01 XXXX000017)	1	EA
3	512368 00a	DIN RAIL (170mm)	1	EA
4	510157 000	12 way panel plug	2	EA
5	510156 000	9WAY PANEL PLUG	1	EA
6	510154 000	6WAY PANEL PLUG	1	EA
7	510521 000	GROUND OP SWITCH (ENABLE)	7	EA
8	510542 000	PUSHBUTTON BLACK C/W 1 N/O CON	1	EA
9	510524 000	PUSH/PULL SW ASSY W/NC CONTACT	1	EA
10	512935 000	LED GREEN 12V	6	EA
11	512934 000	LED RED 12V	1	EA
12	513949 000	9 way chassis socket	1	EA
13	502588 000	ALARM, ECCO BEEPING 6 28VDC	1	EA
14	509755 000	Mate N lock socket contact	30	EA
15	512936 001	A38E UCB ENCLOSURE ANSI	1	EA
16	512937 001	OVERLAY	1	EA
17	514132 000	BOOT	7	EA
18	514327 000	Resistor 1 K 0.5 W 5%	1	EA

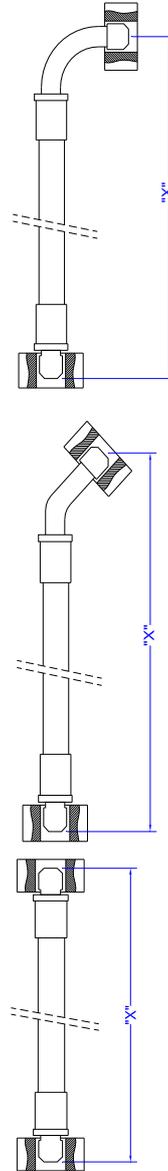
PLATFORM HYDRAULIC ROTATE HOSE/FITTING ASSY (ADDITIONAL)

514349-000

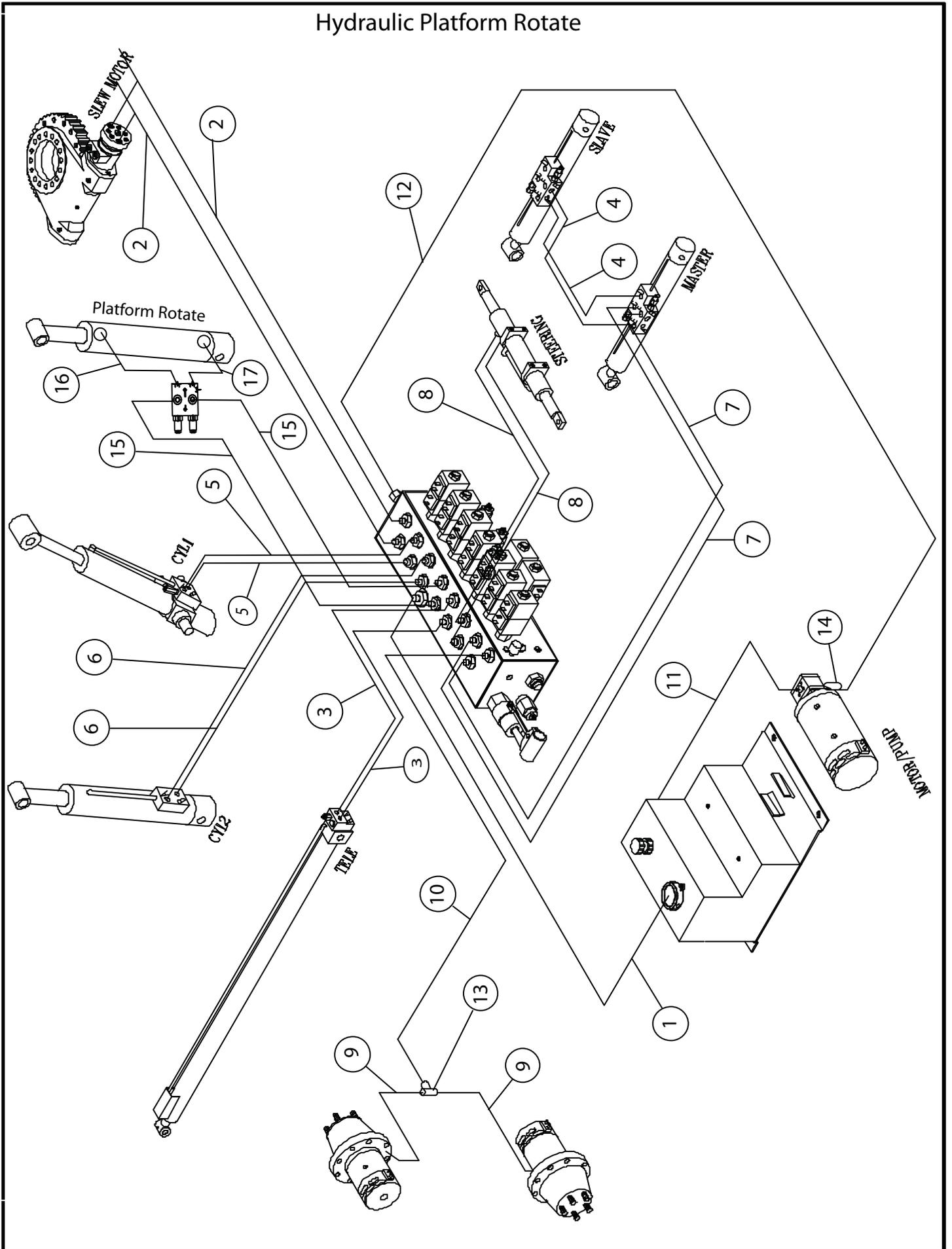
HYDRAULIC KIT				UPRIGHT POWERED ACCESS, YIGI CENTRE, BIRTLEY ROAD, WASHINGTON, TYNE & WEAR, NE38				THIS DRAWING IS COPYRIGHT AND THE PROPERTY OF UPRIGHT LTD, IT MUST NOT BE COPIED OR RE-ISSUED WITHOUT THEIR WRITTEN CONSENT				MACHINE DESCRIPTION :		
ITEM	PART NUMBER	QUANTITY OFF	LOCATION ON MACHINE	WORKING PRESSURE	HOSE SIZE	END 'A'	END 'B'	END FITTINGS	END 'B'	TOTAL HOSE LENGTH (incl. fittings) Dimension 'X'	ANG. DISP.	A38E HYD ROT		
HOSES														
15	514356-000	2	MANIFOLD - DOUBLE OVERCENTRE VALVE	210BAR	1/4" R17	1/4" BSP FEMALE SWEEP 90DEG	1/4" BSP FEMALE STRAIGHT	1/4" BSP FEMALE STRAIGHT		15.300	-			
16	514357-000	1	DOUBLE OVERCENTRE VALVE - CYLINDER	210BAR	1/4" R17	1/4" BSP FEMALE SWEEP 90DEG	1/4" BSP FEMALE STRAIGHT	1/4" BSP FEMALE STRAIGHT		600	-			
17	514358-000	1	DOUBLE OVERCENTRE VALVE - CYLINDER	210BAR	1/4" R17	1/4" BSP FEMALE SWEEP 90DEG	1/4" BSP FEMALE STRAIGHT	1/4" BSP FEMALE STRAIGHT		500	-			
FITTINGS														
DOUBLE OVERCENTRE VALVE:-														
	12-1887	2	1/4" BSP MALE-MALE POSITIONAL 90DEG											
	12-0901	2	1/4" BSP MALE-MALE STRAIGHT ADAPTOR											
	12-1507	2	1/4" SELF CENTREING BONDED SEAL											
ROTATE CYLINDER:-														
	514352-000	2	ADAPTER - 6CORB - 1/4" BSP MALE - MALE STRAIGHT											
MANIFOLD BLOCK:-														
	514353-000	2	ADAPTER - 6CORB - 3/8" BSP MALE - MALE STRAIGHT											
	512251-000	11	ADAPTER - 4CORB - 1/4" BSP MALE - MALE STRAIGHT											
	514354-000	4	ADAPTER - 4CORB - 3/8" BSP MALE - MALE STRAIGHT											
	12-3149	1	1/4" BSP MINIMESS TEST POINT											
ALL HOSES TO BE TAGGED AT BOTH ENDS.														
ISSUE	1	2	4	5	6	DRAWN BY : SDC		DATE : 21/08/14		DRAWING N°		514349-000		
C.N.	FIRST RELEASE	26507				APPROVED BY :		SHEET		1 of 1				

TIGHTENING TORQUES FOR HOSES AND FITTINGS

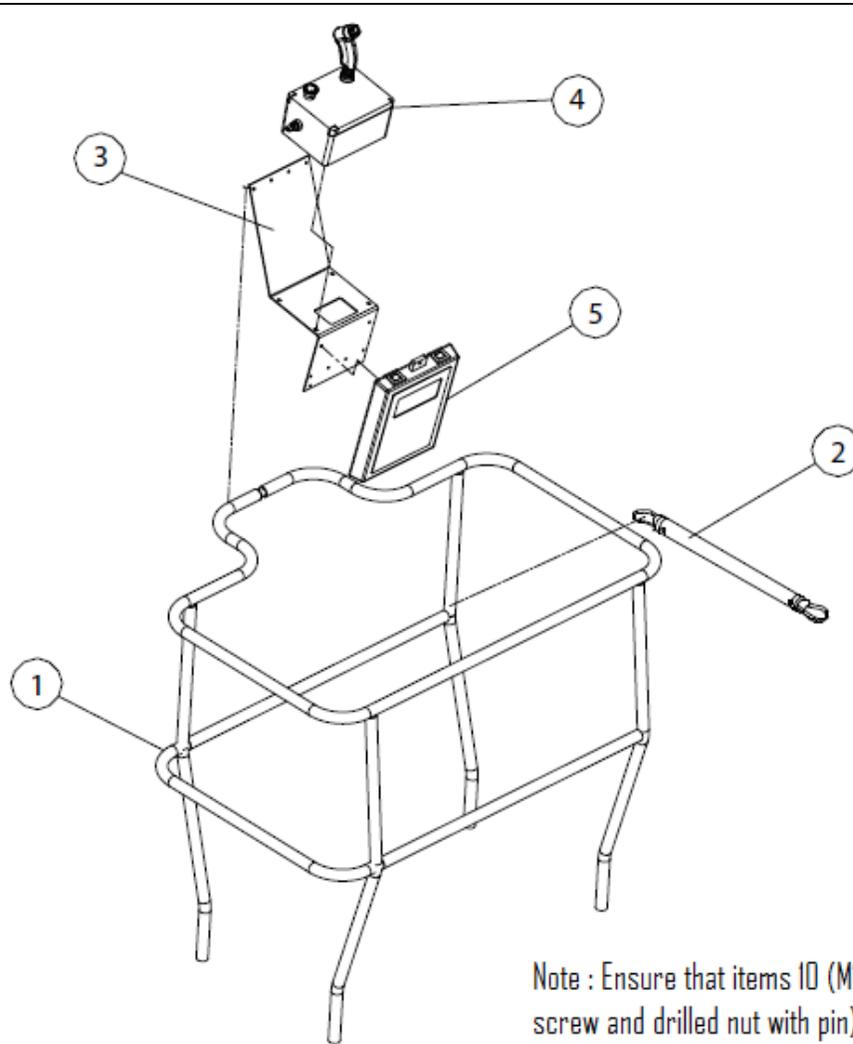
ADAPTER	HOSE NUT	HOSE NUT
	STD	O RING
1/4" BSP	34 Nm	41 Nm
3/8" BSP	47 Nm	68 Nm
1/2" BSP	102 Nm	133 Nm
3/4" BSP	149 Nm	192 Nm
		248 Nm



Illustrated Parts Breakdown

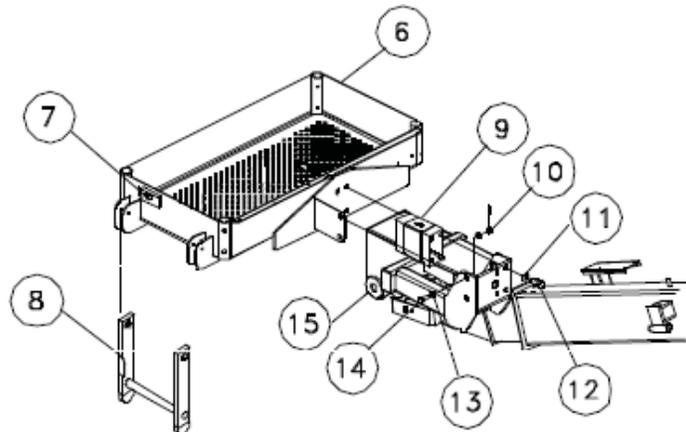


REPAIR PARTS



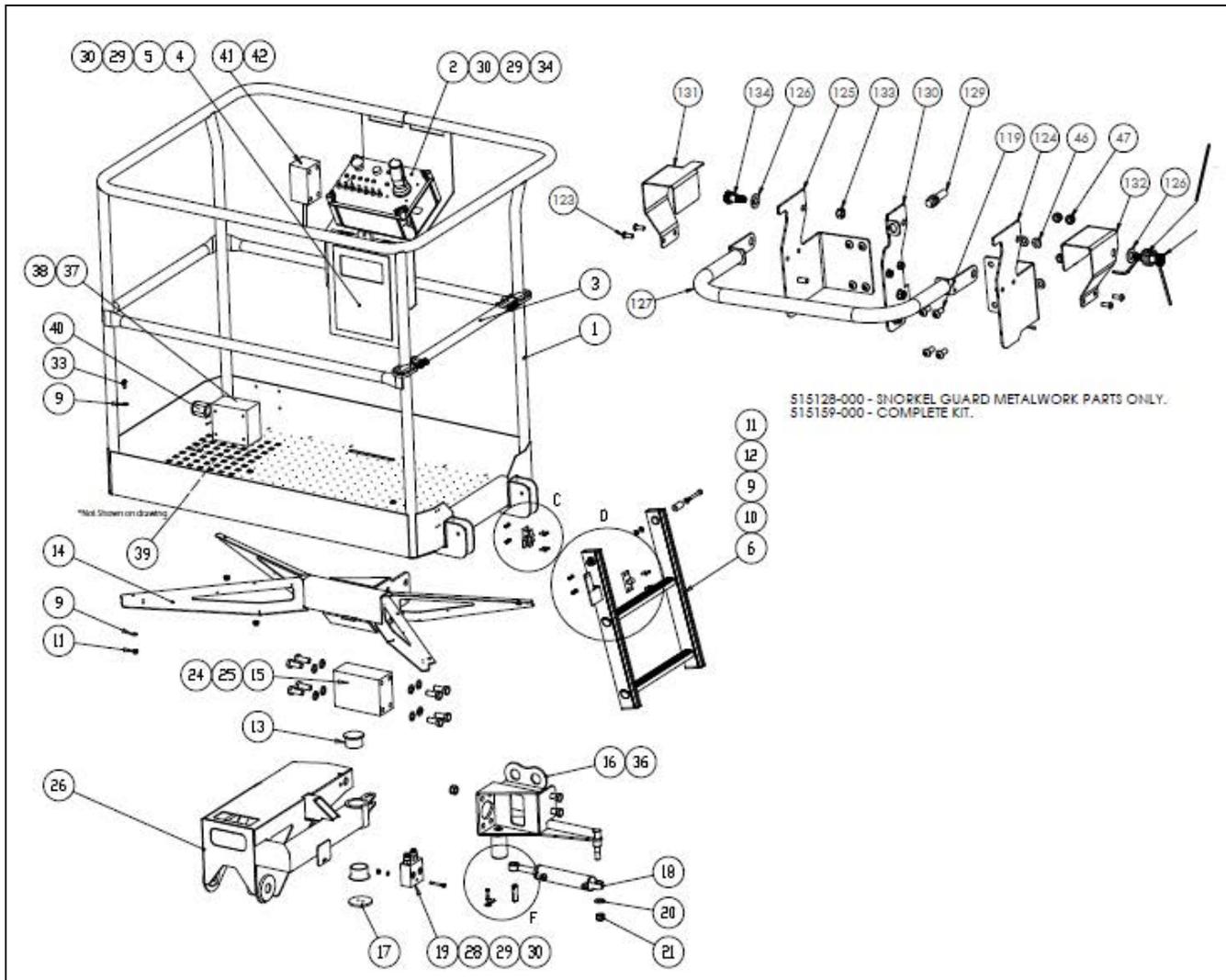
Note : Ensure that items 10 (M16 screw and drilled nut with pin) remain loose, these are safety bolts.

000(501864-000 is not included as part of this assembly)
(ANSI is Without Overload)



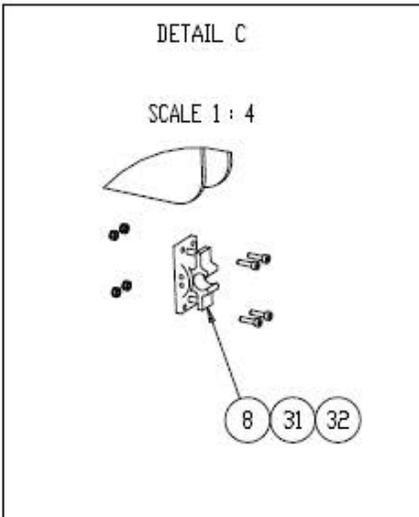
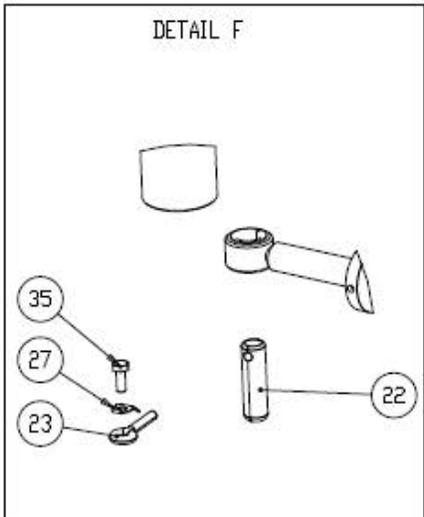
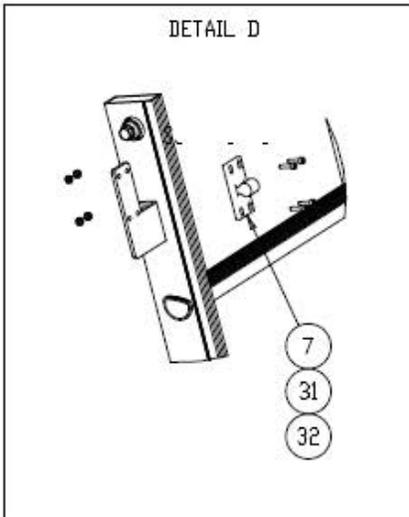
アイテム	部品番号	名前	数量	UOM
Not Shown	057603 000	CAGE & CRADLE ASSEMBLY (STANDARD)		EA
1	057521 003	CAGE RAIL ASSY	1	EA
2	508931 000	DROP BAR ASSY	1	EA
3	513563 000	CONTROL BOX MOUNTING PLATE	1	EA
4	513433 002	UPPER CONTROL BOX CE	1	EA
Not Shown	513433 003	UPPER CONTROL BOX ANSI	1	EA
5	010076 000	Manual Enclosure	1	EA
6	501970 000	ROTATOR FLOOR WELDMENT	1	EA
7	058251 000	LOCKING CATCH	1	EA
8	057347 001	LADDER	1	EA
9	513160 000	Load Cell	1	EA
Not Shown	513161 000	LOAD CELL HARNESS	1	EA
Not Shown	509791 000	OVERLOAD REPLACEMENT BLOCK(ANSI) 1	1	EA
10	509595 000	M16 BOLT + NUT CROSS DRILLED	2	EA
11	056069 016	WASHER STEELFLATWASHER M16 DIN	8	EA
12	503101 045	M16 X 45 HEX HEAD SCREW	8	EA
13	056069 016	WASHER STEELFLATWASHER M16 DIN	4	EA
15	501971 000	CAGE CRADLE WELDMENT	1	EA

REPAIR PARTS



515128-000 - SNORKEL GUARD METALWORK PARTS ONLY.
 515159-000 - COMPLETE KIT.

Note : Ensure that item 3 6 (M16 x55mm Bolt) remain loose, these are safety bolts.

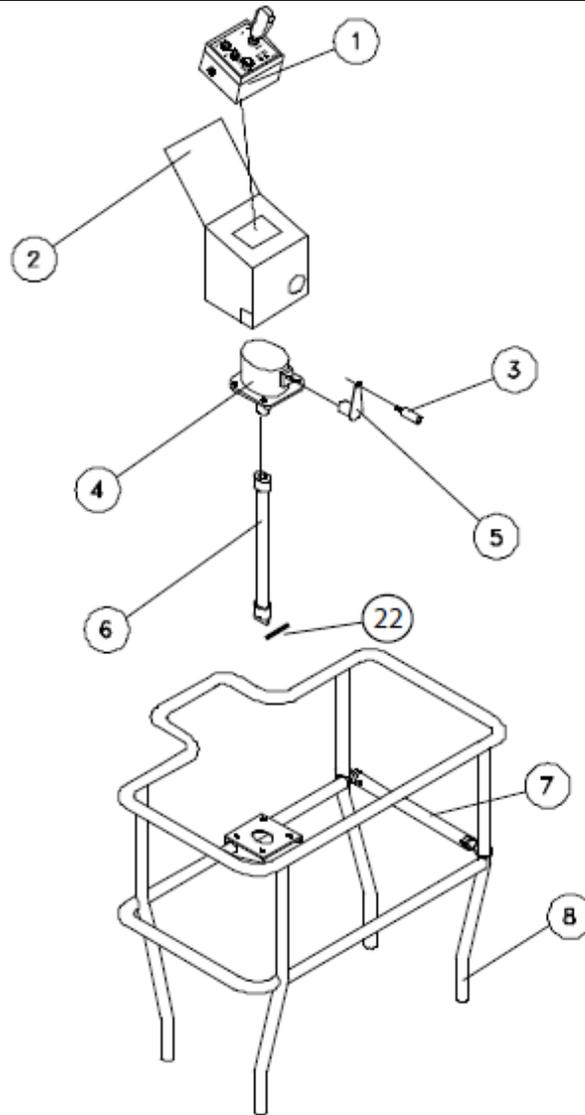


アイテム	部品番号	名前	数量	UOM
1	513767 001	A38E & TL39 BASKET WELDMENT	1	EA
2	513433 000	A38 UPPER CONTROL BOX ASSY	1	EA
3	513767 006	Drop Bar Assy	1	EA
4	010076 000	Manual Enclosure	1	EA
5	058491 016	BOLT HEXSETSCREW DIN933 M6 X 16MM 8.8 ZP	4	EA
6	513767 007	LADDER WELDMENT	1	EA
7	501352 001	LATCH MALE	1	EA
8	501352 002	LATCH FEMALE	1	EA
9	056069 008	WASHER, STEELFLATWASHER DIN12M8 FLAT WASHER DIN 125	16	EA
10	056059 060	Bolt, HexBolt DIN931 M8 x 60mm	2	EA
11	056066 008	NUT NYLOCKNUT DIN985 M8 8.0 ZP	8	EA
12	057405 000	LADDER PIVOT SHAFT	2	EA
13	504120 000	50 DIAMETER FLANGED BUSHING 2	2	EA
14	514392 000	BASKET BOTTOM MOUNT 1	1	EA
15	513160 000	Load Cell		EA
15	509791 000	OVERLOAD REPLACEMENT BLOCK(ANSI) 1	1	EA
16	514394 000	ROTATOR MOUNT BASKET 1	1	EA
17	13520 13	PIVOT CAP 1	1	EA
18	12330	CYLINDER	1	EA
19	13 0176	DOUBLE OVER CENTRE VALVE 1	1	EA
20	056069 016	WASHER STEELFLATWASHER M16 DIN	1	EA
21	056064 016	NUT NYLOCKNUT DIN985 M16 10.0	3	EA
22	12468 22	Pin, 16 x 55mm	1	EA
23	8628	Pin Keeper	1	EA

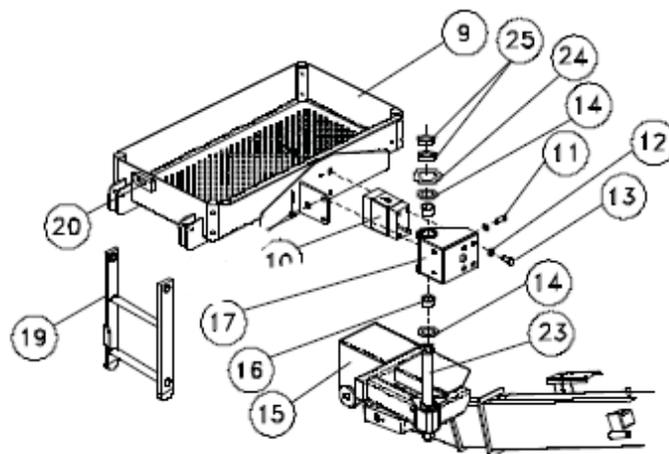
アイテム	部品番号	名前	数量	UOM
24	056021 016	WSHR LOCK M16 DIN 127	8	EA
25	503101 040	M16 x 40 HEX. HD. SCREW x1.5 P	8	EA
26	514393 000	TILT QUADRANT ASSY ROTATE	1	EA
27	11492 1	Tab Washer	1	EA
28	058491 050	M6 x 50 HEX. HD. BOLT 8.8	1	EA
29	056069 006	WSHR STEELFLATWSHE M6 DIN125A	13	EA
30	056066 006	Nut NylockNut DIN985 M6 8.0 Zi	9	EA
31	058500 016	M4 x 16 SOCKET HD CAP SCREW 12.9	8	EA
32	056066 004	NUT NYLOCK DIN985 M4 8.0 ZP	8	EA
33	500595 020	Bolt, SktButCapScrew DIN9427 M	6	EA
34	501253 040	M6 x 40 BUTTON HD. SCREW 12.9	4	EA
35	056058 016	HHD BLT M6 1.0 X 16 MM 8.8	1	EA
36	056687 055	M16 x 55 HEX. HD. BOLT 8.8	2	EA
37	3040624	Recepticle Outlet 20AMP	1	EA
38	3040625	Enclosure Face	1	EA
39	3040252	Circuit Breaker 15AMP	1	EA
40	505053 000	CABLE GLAND M25 x 1.5 (ANSI ONLY)	1	EA
41	0074979	Enclosure	1	EA
Not Shown	0074979	Enclosure	1	EA
42	056069 006	WSHR STEELFLATWSHE M6 DIN125A	20	EA
43	056066 006	Nut NylockNut DIN985 M6 8.0 Zi	19	EA
45	058491 016	BOLT HEXSETSCREW DIN933 M6 X 16MM 8.8 ZP	6	EA
46	056069 008	WASHER, STEELFLATWASHER DIN12M8 FLAT WASHER DIN 125	8	EA

アイテム	部品番号	名前	数量	UOM
47	056066 008	NUT NYLOCKNUT DIN985 M8 8.0 ZP	8	EA
119	500595 020	Bolt, SktButCapScrew DIN9427 M	18	EA
123	501253 016	M6 x 16 BUTTON HD. SCREW 12.9	11	EA
124	514764 003	PLT, SNORKEL GUARD RH	1	EA
125	514764 004	CLAMP PLATE LH	1	EA
126	056069 012	WASHER DIN125A M12 ZP	2	EA
127	515128 001	ACTUATOR BAR	1	EA
129	3028844	IFS241 (IFM PROXY)	1	EA
130	514764 008	PLATE SWITCH CLAMP HALF	1	EA
131	0260838	HINGE COVER, LH	1	EA
132	0260839	HINGE COVER, RH	1	EA
133	5560033	.375 16UNC HEX LOCK NUT	2	EA
134	301403	BOLT SHOULDER .375 .500 GR5	1	EA
135	0260857	PIN	1	EA
136	0260852	SPRING, GUARD ACTUATOR	1	EA

REPAIR PARTS



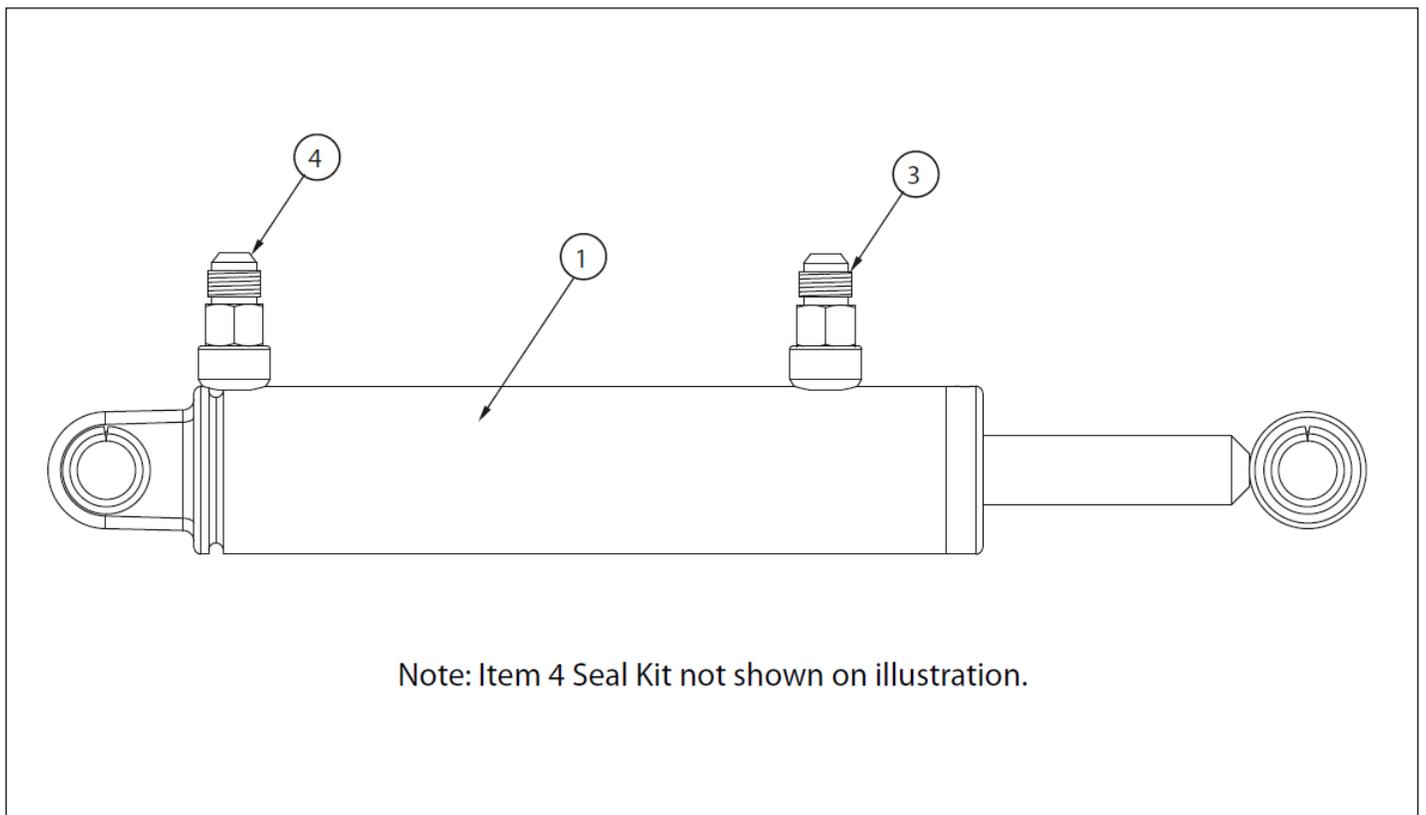
Note : Ensure that items 11 (M16 screw and drilled nut with pin) rema in loose, these are safety bolts.



アイテム	部品番号	名前	数量	UOM
Not Shown	500905 000	CAGE ROTATOR ASSEMBLY(OPTION) (501864 000 is not included as part of this assembly)(ANSI is Without Overload)		EA
1	513433 002	UPPER CONTROL BOX CE	1	EA
Not Shown	513433 003	UPPER CONTROL BOX ANSI	1	EA
2	500973 001	MOUNTING PLATE	1	EA
3	500985 000	ROTATING HANDLE	1	EA
4	500922 000	GEARBOX	1	EA
5	500905 034	HANDLE	1	EA
6	500905 030	DRIVE SHAFT	1	EA
7	508931 001	DROP BAR ASSY	1	EA
8	057521 001	BASKET RAIL	1	EA
9	501970 000	ROTATOR FLOOR WELDMENT	1	EA
10	513160 000	Load Cell	1	EA
Not Shown	513161 000	LOAD CELL HARNESS	1	EA
Not Shown	509791 000	OVERLOAD REPLACEMENT BLOCK(ANSI) 1	1	EA
11	509595 000	M16 BOL T + NUT CROSS DRILLED	2	EA
12	056069 016	WASHER STEELFLATWASHER M16 DIN	8	EA
13	503101 040	M16 x 40 HEX. HD. SCREW x1.5 P	8	EA
14	512321 000	DISC, FRICTION	2	EA
15	501971 001	CAGE CRADLE WELDMENT	1	EA
16	500993 000	45MM BRUSHING X 30mm LONG	2	EA
17	501972 000	WELDMENT, CAGE LINK	1	EA
19	057347 001	LADDER	1	EA
20	058251 000	LOCKING CATCH	1	EA

アイテム	部品番号	名前	数量	UOM
21	057405 000	LADDER PIVOT SHAFT	2	EA
22	512782 000	POLL PIN ROTATE LINK	1	EA
23	500905 018	CAGE PIVOT PIN	1	EA
24	504189 001	STEEL FLAT WASHER, M48 X 4mm	1	EA
25	056067 545	HEX JAM NUT, M45	2	EA

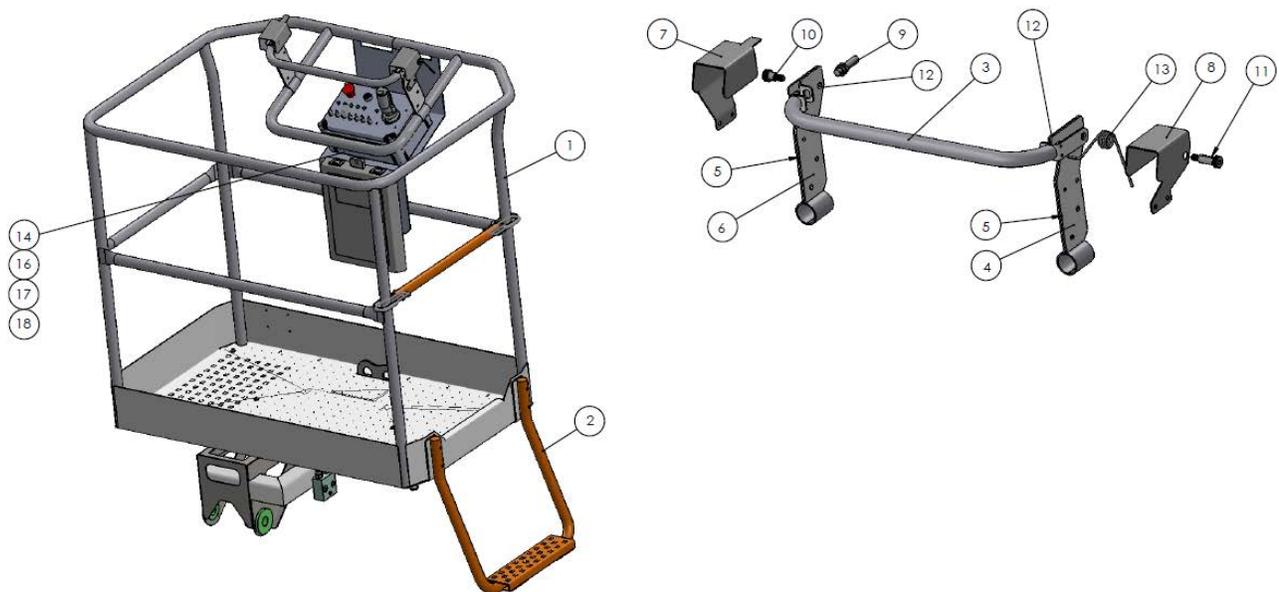
REPAIR PARTS



アイテム	部品番号	名前	数量	UOM
Not Shown	CYLINDER 12330	PLATFORM ROTATE CYLINDER ASSEMBLY		EA
1	12330	CYLINDER	1	EA
2	12330K	SEAL KIT	1	EA
3	514352 000	ADAPTER, 6ORB 1/4 BSP MALE MALE STRAIGHT	1	EA
4	514352 000	ADAPTER, 6ORB 1/4 BSP MALE MALE STRAIGHT	1	EA

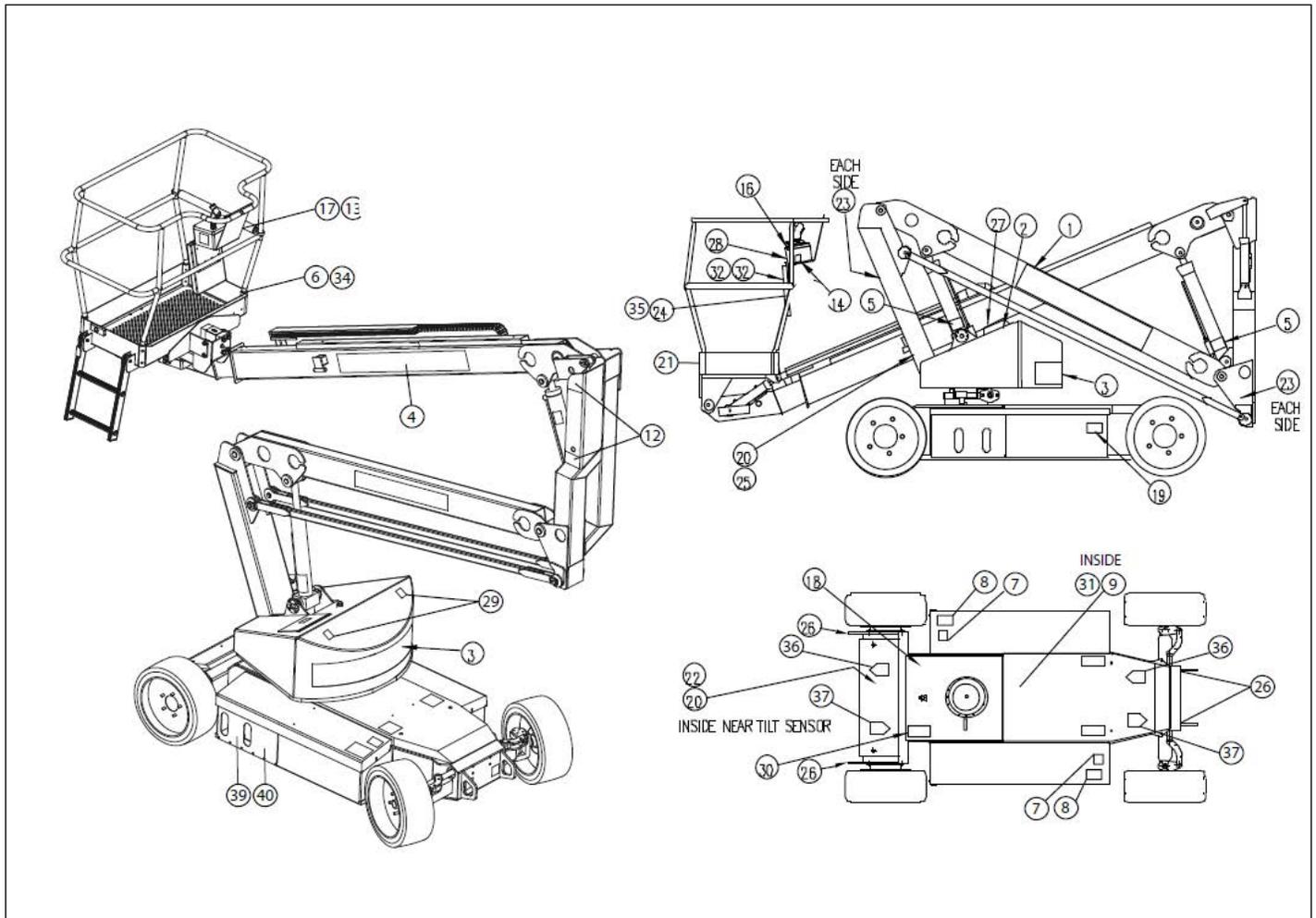
REPAIR PARTS

Note: part numbers shown with * should end with language code (EN=English, DE=German, ES=Spanish, IT=Italian, NL=Dutch) to ensure correct language selection.



アイテム	部品番号	名前	数量	UOM
1	514675 001	Basket Weldment	1	EA
2	514557 000	Platform Step Weldment	1	EA
3	514677 000	Actuator Bar Weldment	1	EA
4	514684 000	Clamp Mount Weldment LH	1	EA
5	514685 000	Clamp Mount Weldment RH	2	EA
6	514686 000	Switch Clamp Weldment	1	EA
7	514688 000	Hinge Cover LH	1	EA
8	514689 000	Hinge Cover RH	1	EA
9	3028844	IFS241 (IFM PROXY)	1	EA
10	301403	BOLT SHOULDER .375 .500 GR5	1	EA
11	0260857	PIN	1	EA
12	5560123	.375 16UNC THIN HEX LOCK NUT	2	EA
13	0260852	SPRING, GUARD ACTUATOR	1	EA
14	510521 000	GROUND OP SWITCH (ENABLE)	1	EA
15	514404 001	FLASHING BEACON BLUE	1	EA
16	7030161 *	Decal Snorkel Guard Override	1	EA
17	7030162 *	Decal Warning Snorkel Guard	1	EA
18	514698 000 *	Decal Snorkel Guard Override Oper	1	EA

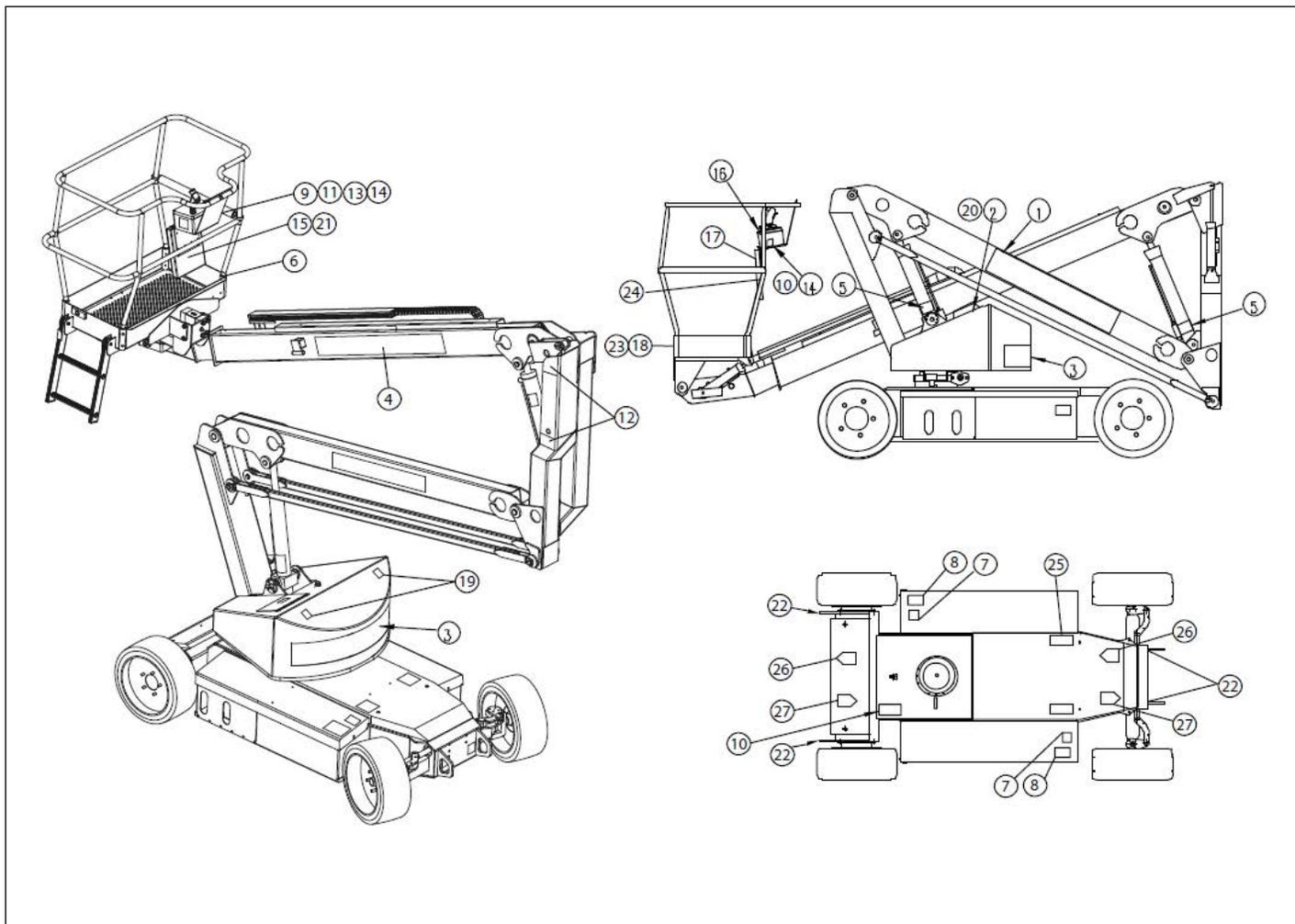
REPAIR PARTS



アイテム	部品番号	名前	数量	UOM
Not Shown	500206 001	DECAL KIT ENGLISH		EA
1	511069 000	DECAL SNORKEL A38E BOOM	2	EA
2	512940 000	OVERLAY	1	EA
3	512224 000	DECAL SNORKEL LOGO 75mm	1	EA
4	511067 000	Decal, www.snorkellifts.com	1	EA
5	510280 000	DECAL, IPAf EMERG LWR	2	EA
6	511099 000	Decal, Snorkel	1	EA
7	057429 000	DECAL BATTERY FLUID LEVEL	2	EA
8	057430 000	DECAL EXPLOSION HAZARD	2	EA
9	500467 000	DECAL HANDPUMP	1	EA
11	508771 000	DECAL, DO NOT REMOVE COMPONENTS	1	EA
12	058881 001	DECAL HAZARD TAPE	2	EA
13	058080 000	DECAL CAGE LEVELLING	1	EA
15	508772 000	DECAL, WARNING RESPONSIBILITIES	1	EA
16	512937 000	DECAL UPPER CONTROL BOX	1	EA
17	058538 000	DECAL DANGER/HAZARDS/INSTR	1	EA
18	0181562	Decal, Amchine Complies With ANSI (USA Only)	1	EA
19	058534 000	DECAL, BATTERIES	2	EA
20	058533 000	DECAL DO NOT AJUST SWITCHES	2	EA
21	058761 000	DECAL S.W.L. LARGE ANSI	1	EA
22	057434 001	DECAL GENUINE REPLACEMENTS	2	EA
23	057424 001	DECAL CRUSH HAZARD	4	EA
24	300699	Decal, Operators Checklist	1	EA
25	058181 003	DECAL 3 POINTS	1	EA
26	058531 000	Lift/tie down point	4	EA

アイテム	部品番号	名前	数量	UOM
27	500438 000	DECAL AB38 LWR CTRL	1	EA
28	057382 000	DECAL EMER. LOWERING	2	EA
29	058537 000	DECAL PINCH POINT	2	EA
30	066555 000	DECAL, RELIEF VALVE	1	EA
30	060197 001	DECAL, HYDRAULIC FLUID	1	EA
31	514252 000	MANUAL, OPERATORS A38E PG CE/A	1	EA
32	068635 001	Harness anchor point	1	EA
33	010076 001	DECAL, ATTENTION	1	EA
34	0070540	DECAL, YELLOW ARROW	1	EA
35	513792 000	DECAL YELLOW ARROW	2	EA
36	514252 200	SERVICE AND PARTS MANUAL	2	EA
37	511028 001	NAMEPLATE (ANSI)	1	EA
38	0070921	Decal, 125 Volts (USA Only)	1	EA
39	0150606	Decal, 125 Volts Power To Platform (USA Only)	1	EA
40	416836	DECAL BATTERY CHARGER PLUG	1	EA

REPAIR PARTS



ITEM	DUTCH CE 510207-000	ITALIAN CE 512231-000	SPANISH CE 510016-000	FRENCH CE 509722-000	GERMAN CE 500206-002	ENGLISH CE 500206-000	DESCRIPTION	QTY.
1	511069-000	511069-000	511069-000	511069-000	511069-000	511069-000	DECAL - SNORKEL A38E' BOOM	2
2	512940-000	512940-000	512940-000	512940-000	512940-000	512940-000	DECAL - LOWER CONTROL BOX	1
3	512224-000	512224-000	512224-000	512224-000	512224-000	512224-000	DECAL - 75mm SNORKEL LOGO	1
4	511067-000	511067-000	511067-000	511067-000	511067-000	511067-000	DECAL - WEB ADDRESS	1
5	510280-000	510280-000	510280-000	510280-000	510280-000	510280-000	DECAL - EMERGENCY LOWERING	2
6	511099-000	511099-000	511099-000	511099-000	511099-000	511099-000	DECAL - '100mmSnorkel' LOGO	2
7	510215-000	510848-000	509944-000	508834-000	057507-024	057429-000	DECAL - BATTERY FLUID LEVEL	2
8	057430-002	057430-002	057430-002	057430-002	057430-002	057430-002	DECAL - EXPLOSION HAZARD	2
9	510220-001	512236-000	510014-001	508852-001	057507-025	057692-004	DECAL - IMPORTANT BEFORE USING	1
10	511027-001	511027-001	511027-001	511027-001	511027-001	511027-001	NAMEPLATE, CE	1
11	510218-000	512234-000	510012-000	508850-000	500467-002	500467-000	DECAL - HANDPUMP	1
12	058881-001	058881-001	058881-001	058881-001	058881-001	058881-001	DECAL - HAZARD TAPE	2
13	510216-000	512232-000	510011-000	508848-000	057507-030	058080-000	DECAL - CAGE LEVELLING	1
15	511114-000-NL	511114-000-IT	511114-000-ES	511114-000-FR	511114-000-DE	511114-000-EN	OPERATORS MANUAL CE	1
16	512937-000	512937-000	512937-000	512937-000	512937-000	512937-000	DECAL - UPPER CONTROL BOX	1
17	510221-000	512237-000	510015-000	508853-000	058181-002	058181-003	DECAL - 3 POINT	1
18	504199-005	504199-005	504199-005	504199-005	504199-005	504199-005	DECAL - S.W.L. LARGE	1
19	058860-000	058860-000	058860-000	058860-000	058860-000	058860-000	DECAL - PINCH POINT	2
20	510217-000	512233-000	510017-000	508849-000	500438-002	500438-000	DECAL - LOWER CONTROL COVER	1
21	511115-200	511115-200	511115-200	511115-200	511115-200	511115-200	SERVICE & PARTS MANUAL	1
22	058531-200	058531-200	058531-200	058531-200	058531-200	058531-200	DECAL - TIE DOWN/LIFT POINT	4
23	058531-200	058531-200	058531-200	058531-200	058531-200	058531-200	DECAL - HARNESS HARD PO	1
24	010076-901	010076-901	010076-901	010076-901	010076-901	010076-901	DECAL - DOCUMENT BOX	1
25	060197-001	060197-001	060197-001	060197-001	060197-001	060197-001	DECAL - HYDRAULIC FLUID	1
26	0070540	0070540	0070540	0070540	0070540	0070540	DECAL - YELLOW ARROW	2
27	513792-000	513792-000	513792-000	513792-000	513792-000	513792-000	DECAL - RED ARROW	2

REPAIR PARTS

(No Image Available)

アイテム	部品番号	名前	数量	UOM
	8210148F	LANGUAGE KIT SPANISH AB38N		EA
1	969249	DECAL STRIPE YEL /BLK 1000 INCH	2.000	EA
2	7030067	SPANISH SHIPPING INFO	1	EA
3	8210132	MANUAL DEL USUARIO	1	EA
4	0074908	Decal, Snorkel Brand Logo	1	EA
5	569295	DECAL, SNORKEL BRAND LOGO 3.00	1	EA
6	510016 000	DECAL KIT SPANISH AB38N	1	EA
7	058534 000P	DECAL DANGER TIP OVER SPANISH	2	EA
8	508771 000P	DECAL WARNING REPLACEMENT PART	1	EA
9	508772 000P	DECAL WARNING QUALIFIED PERSON	2	EA
10	300699P	DECAL OPERATORS CHECKLIST SPANISH	1	EA
11	066568 000P	DECAL CRUSHING HAZARD SPANISH	2	EA
12	0070921P	DECAL 125 VOLTS 15 AMPS PACKAG	1	EA
13	0150606P	DECAL 125V 15AMP PWR TO PLATF	1	EA
14	416836ES	DECAL 110V PLUG FOR CHARGER	1	EA
15	0181562ES	DECAL MACH COMPLIES WITH ANSI	1	EA

REPAIR PARTS

**NO IMAGE AVAILABLE
(BOM FOR REFERENCE ONLY)**

アイテム	部品番号	名前	数量	UOM
	8210280 B	A38 FRENCH LANGUAGE KIT ANSI		EA
1	0075234FR	CSA DECAL FRENCH	1	EA
2	8210281	A38 FRENCH DECAL KIT ANSI	1	EA
3	0070901FR	PLAC CAUTN SERIAL NUMBER	1	EA
4	514252 000	MANUAL, OPERATORS A38E PG CE/A	1	EA

REPAIR PARTS

OPTION HORN SOUND ON E/STOP - 514783-850

ITEM	DESCRIPTION	PART NUMBER	QTY (PER M/C)
1	N/O CONTACT BLOCK	510527-000	2

OPTION EMERGENCY POWER DESCEND - 514784-850

ITEM	DESCRIPTION	PART NUMBER	QTY (PER M/C)
1	POWER UNIT	6020058	1
2	BATTERY	062299-002	1
3	12VOLT CONTACTOR	3040506	1
4	12VOLT CHARGER	510870-000	1
5	TOGGLE SWITCH	510521-000	2
6	DIODE 8AMP	510067-000	2
7	Lower Control Panel	512939-002	1
8	Upper Control Enclosure	510546-001	1
9	LCB Overlay	512940-002	1
10	UCB OVERLAY	512937-004	1

OPTION DRIVE LIGHT KIT - 514785-850

ITEM	DESCRIPTION	PART NUMBER	QTY (PER M/C)
1	LED OVAL LIGHT ASSY	0260721	2
2	PLAC LIGHTS ON/OFF	0181376	1
3	BRACKET FRONT LIGHTS	514761-000	2
4	CONR 2 PIN DEUTSCH RECEP	3049804	6
5	PIN CONTACT	3040314	16
6	LOCK WEDGE	3049808	6
7	LED RED LIGHT STOP/TAIL	069533	2
8	RELAY SPDT	3040469	1
9	CONR 2 PIN DEUTSCH PLUG	3049803	6
10	SKT CONTACT	3040342	16
11	LOCK WEDGE	3049807	6
12	CONR 4 PIN DEUTSCH RECEP	3049889	1
13	LOCK WEDGE	3049891	1
14	CONR 4 PIN DEUTSCH PLUG	3049888	1
15	LOCK WEDGE	509750-000	1
16	AMBER LIGHT	512492-000	4
17	LED FLASHER RELAY	514780-000	1
18	RELAY BASE	514781-000	1
19	TOGLE SWITCH SPDT	509472-000	1
20	INDICATOR OVERLAY	514778-000	1
21	Upper Control Enclosure	510546-001	1
22	UCB OVERLAY	512937-004	1

OPTION DRIVE DE-ACTIVATED ABOVE 8M - 514786-850

ITEM	DESCRIPTION	PART NUMBER	QTY (PER M/C)
1	ELEVATION SWITCH	058864-000	2

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

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4.0 Introduction



Be sure to read, understand and follow all information in the *Operation Section* of this manual before attempting to operate or perform service on any A38E Work Platform.

This section contains instructions for the maintenance of the A38E Series Work Platform. Procedures for scheduled maintenance and repair/removal are included.

Referring to *Section 3.0 and Section 6.0* will aid in understanding the operation and function of the various components and systems of the A38E Work Platform and help in diagnosing and repair of the machine.

Refer to Table 4-1, the Preventative Maintenance Checklist for the recommended Maintenance intervals.

TOOLS REQUIRED

The following is a list of items which may be required to perform certain maintenance & repair procedures on the A38E Work Platform.

- 1 x Multi-meter capable of reading Voltage, Ohms and Amps.
- 1 x Hydraulic Pressure Gauge
- Range (0 - 3000 PSI)
- 1 x Calibrator EZcal (Snorkel Part No: 504560-001)

Note:

EZcal Display can be used in place of the above Calibrator, the calibrator may only be necessary when working in the Platform as the EZ Display is located within the ground Controls.

4.1 Preventative Maintenance (Table 4-1)

The complete inspection consists of periodic visual and operational checks, together with all necessary minor adjustments to assure proper performance. Daily inspection will prevent abnormal wear and prolong the life of all systems. The inspection and maintenance schedule is to be performed at regular intervals.

Inspection and maintenance shall be performed by personnel who are trained and familiar with mechanical and electrical procedures. Complete descriptions of the procedures are in the text following the table.



Before performing preventative maintenance familiarise yourself with the operation of the machine.
Ensure that the machine is fully secured and supported when carrying out maintenance procedures in the elevated position.

The Preventative Maintenance table has been designed primarily to be used for machine service and maintenance repair.

Please copy the following page and use this table as a checklist when inspecting a machine for service.

Preventative Maintenance Table Key

Interval

- Daily** = each shift or every day
10h/7d = every 10 hours or 7 days
50h/30d = every 50 hours or 30 days
250h/6m = every 250 hours or 6 months
500h/1y = every 500 hours or 1 year
1000h/2y = every 1000 hours or 2 years

- Y**=Yes/Acceptable
N=No/Not Acceptable
R=Repaired/Acceptable

Preventative Maintenance Report

Date :	_____
Owner :	_____
Model No :	_____
V.I.N No :	_____
Serial No :	_____
Serviced By :	_____
Service Interval :	_____

COMPONENT	INSPECTION OR SERVICES	INTERVAL	Y	N	R
Battery System	Check electrolyte level.	Daily			
	Check battery cable condition.	Daily			
	Charge batteries.	Daily			
	Check Charger condition & operation.	Daily			
	Check specific gravity.	50h/30d			
	Clean exterior.	250h/6m			
	Clean terminals.	250h/6m			
Hydraulic Oil	Check oil level.	Daily			
	Drain and replace oil. (ISO #46).	500h/1y			
Hydraulic Pump	Wipe clean	50h/30d			
	Check for hose fitting leaks.	50h/30d			
	Check for leaks at mating surfaces.	50h/30d			
Hydraulic System	Check mounting bolts for proper torque.	50h/30d			
	Check for leaks.	Daily			
	Check hose connections.	50h/30d			
	Check for exterior wear.	50h/30d			
Emer. Hydraulic System	Change filter.	250h/6m			
	Open the emergency lowering valves and check for proper operation.	Daily			
Control Cable	Check switch operation.	Daily			
	Check the exterior of cable for pinching, binding or cable wear.	Daily			
Tyres / Wheels	Check for damage.	Daily			
	Check/torque nuts - Front: 200 Nm (150 ft. lbs) Rear: 130 Nm (95 ft. lbs)	50h/30d			
Overload System	Check/torque nuts - 220 Nm (162 ft. lbs)	50h/30d			
	Calibrate system	500h/1y			

COMPONENT	INSPECTION OR SERVICES	INTERVAL	Y	N	R
Steering Assembly	Check Steering Cylinder for leaks.	50h/30d			
	Lubricate all pivot pins.	250h/6m			
	Check Links and Hubs.	250h/6m			
Drive Motors	Check for operation.	Daily			
	Check for any foreign bodies.	Daily			
	Check for wear of brushes.	500h/1y			
	Check that commutator or springs are undamaged.	500h/1y			
	Check bearings for operation.	1000h/2y			
	Change oil in drive reduction gearbox. (ref: sec 4.12)	500h/1y			
Platform Deck and Guardrails	Check welds for cracks.	Daily			
	Check condition of floor.	Daily			
	Check that securing bolts are tightened.	Daily			
Slew System	Check drop bar on cage entrance.	Daily			
	Grease slew gear.	10h/7d			
	Check slew motor for leaks and mounting bolts for proper torque.	50h/30d			
Slew System/ First Post	Check hardware and fittings for proper torque.	250h/6m			
	Check torque on all bolts, 15 outer ring and 20 inner ring. Retorque to 220 Nm (160 ft. lbs).	50h/30d			
Elevating Assembly	Inspect for structural cracks.	Daily			
	Check hoses for pinch or rubbing points.	Daily			
	Check pivot pins for damage.	50h/30d			
	Check pivot pin retaining rings.	50h/30d			
	Check elevating assembly for bending.	250h/6m			
	Check component mounting for proper torque.	250h/6m			
Lift Cylinders	Check fasteners for proper torque.	250h/6m			
	Check cylinder rod for wear.	50h/30d			
	Check pivot pin retaining rings.	50h/30d			
Chassis Assembly	Grease all fittings as section 4.4.	50h/30d			
	Check hoses for pinch or rubbing points.	Daily			
Entire Unit	Function check Emergency stop switches at control boxes.	Daily			
	Inspect for structural cracks	Daily			
	Perform pre-operation inspection.	Daily			
	Check for and repair collision damage.	Daily			
	Check for peeling, missing or unreadable decals. Replace.	Daily			
	Lubricate.	50h/30d			
	Grease all fittings.	50h/30d			
	Check for corrosion - Remove and repaint.	250h/6m			

NOTE:
 Recommend Bolt Torques are shown in Table 4-3, **Section 4.13.**

Signature of Service Engineer

4.2 Battery Maintenance

Electrical energy for the motor is supplied by eight 6 volt batteries wired in series to give a 48 volts DC supply. Each of these batteries consist of three cells which can supply a maximum voltage of 2.1V ea =>6.3V per battery =>50.4V per battery pack. Proper care and maintenance of the batteries and motor will ensure maximum performance from the work platform.



Hazard of explosive gas mixture. Keep sparks, flames and smoking materials away from batteries
Always wear safety glasses when working with batteries.
Battery fluid is highly corrosive. Rinse away any spilled fluid thoroughly with clean water.

BATTERY INSPECTION AND CLEANING

Check battery fluid level daily, especially if work platform is being used in a warm, dry climate. If required, add distilled water; use of tap water with a high mineral content will shorten battery life.



If battery water level is not maintained, batteries will not fully charge, creating a low discharge rate which will damage Motor/Pump unit and void warranty.

Batteries should be inspected periodically for signs of cracks in the cases, electrolyte leakage and corrosion of the terminals. Inspect cables for worn spots or breaks in the insulation and for broken cable terminals.

Clean batteries that show signs of corrosion at the terminals or onto which electrolyte has overflowed during charging. Use a baking soda solution to clean the batteries, taking care not to get the solution inside the cells. Rinse thoroughly with clean, warm water. Clean battery and cable contact surfaces to a bright metal finish whenever a cable is removed.

Basic Rule for maximum duty cycle of deep cycle traction batteries

- Always recharge Battery as soon as possible after the low Battery L.E.D illuminates.
- Allow the charger to charge the batteries until it automatically shuts off.

BATTERY CHARGING

Batteries do not reach **full** potential until they have been through 50 charge/discharge cycles (however the rate at which the potential increases is exponential, and the batteries will normally have 95% potential after 15 charge/discharge cycles). Hence do not use a new battery in a battery pack that already has more than 15 cycles Charge batteries at the end of each work shift or sooner if batteries have been discharged. A battery is considered to have a faulty cell if it has less than 80% of the potential of the other batteries in the pack while measured under load.



DO charge batteries in a well-ventilated area.
DO NOT charge batteries in the vicinity of sparks or flames.
NEVER leave charger operating unattended for more than two days.
NEVER disconnect cables from batteries when charger is operating.
Permanent damage to batteries will result if they are not immediately recharged after discharging.
Keep charger dry.

To ensure a proper charge several items must first be checked.

1. Correct voltage and current are available to the charger.
2. Extension cord in good condition, is no longer than 8 m (26 ft.) and is 1.5 mm (12g a) or larger.
3. Charger will have an adequate time to allow a full charge i.e. ensure that power supply will not be switched off overnight.

All **Snorkel** battery operated Work Platforms, including the A38E can operate at ambient temperatures to a value of -20°C (-4°F). However for this there are two provisions which must be met.

- The ISO#46 grade of hydraulic oil normally used in Snorkel Work Platforms must be replaced with a grade suitable for these low temperature conditions.
- When ambient temperatures fall below 18°C (65°F) batteries cannot deliver 210 Ampere hours and so should be placed on charge as soon after use as possible. Under such conditions a 4 hour equalize charge once a week in the early afternoon will improve state of charge and battery life.

Charging

1. Check battery fluid level. If electrolyte level is lower than 10 mm (3/8 in) above plates add distilled water only.
2. Connect battery charger lead to properly earthed outlet of correct voltage and frequency.
3. The Charger will turn on automatically after going through a self test sequence. LED's will indicate the status of charging.
4. The Charger indicates that the charge is complete when the batteries are fully charged.

BATTERY CELL EQUALIZATION

Specific Gravity is a measurement of the strength of the electrolyte in a battery and is measured using a hydrometer. For a fully charged battery the temperature corrected reading should be about 1.28. The specific gravity of the electrolyte in the battery cells should be equalized monthly, or weekly when used in low temperature conditions. To do this, charge batteries as described above. After this initial charge, check the electrolyte level in all cells and add distilled water as necessary, and turn the charger on until a full charge is again indicated. During this time, the charging current will be low (four Amps) as cells are equalizing.

After equalization, the specific gravity of each cell should be checked with a hydrometer. The **temperature corrected** specific gravity in this state should be **1.28**. If any corrected readings are below **1.23**, the batteries contain bad cells and therefore the battery should be replaced.

Do not check the specific gravity in a cell to which water has just been added. If there is not enough electrolyte in a fully charged cell to obtain a sample for the hydrometer, add water and continue charging for one to two hours before checking again.

4.3 Temperature correction for Electrolyte readings

SPECIFIC GRAVITY CONVERSION CHART

Electrolyte Temperature		Temperature Corrected Specific Gravity, Fully Charged	
Fahrenheit	Celsius	USA	Euro
120	48.9	1291	1.29
110	43.3	1287	1.29
100	37.8	1283	1.28
90	32.2	1275	1.28
80	26.7	1275	1.28
70	21.1	1275	1.28
60	15.6	1267	1.27
50	10.0	1263	1.26
40	4.4	1259	1.26
30	-1.1	1255	1.26
20	-6.7	1251	1.25
10	-12.2	1247	1.25
5	-15.0	1245	1.25
0	-17.8	1243	1.24
-5	-20.6	1241	1.24
-10	-23.3	1239	1.24
-15	-26.1	1237	1.24
-20	-28.9	1235	1.24
-25	-31.7	1233	1.23
-30	-34.4	1231	1.23

Table 4-2: Specific Gravity Conversion Chart

4.4 Lubrication

Refer to Table 4-1 and Figure 4-1 for location and lubrication intervals required for the items that necessitate lubrication service. Refer to the appropriate sections for lubrication information on the Hydraulic Oil Tank and Filter.

PIVOT PINS

Apply grease liberally to the Pivot Pin and Pin Lock Plate locations using a brush or cloth. Force as much grease as possible between the Pins & Pin Lock Plates and the Weldments. Wipe away all excess grease.

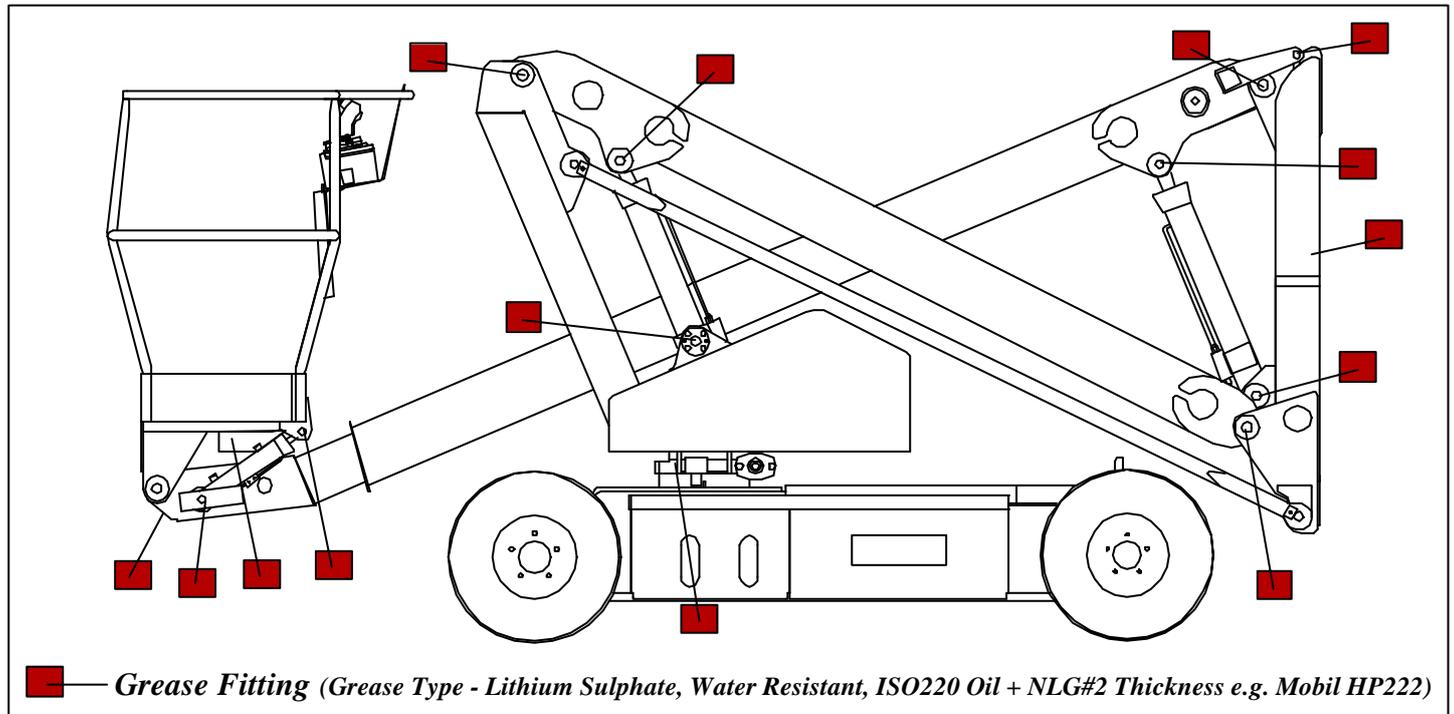


Figure 4-1: Lubrication Points

GREASE FITTINGS

Wipe each grease fitting before and after greasing. Using multipurpose grease in a grease gun, pump the grease into the fitting until grease just begins to appear at the edges of the pivot, then wipe of any excess grease.

Grease Fitting Locations

Lower Boom	2
Upper Boom	1
Telescopic Boom	1
Lower Cylinder (including Trunnions)	3
Upper Cylinder	2
Telescopic Cylinder	1
Master Cylinder	2
Slave Cylinder	2
Steering Cylinder	2
Torque Arms	4
Pinion Gearbox & Slew Bearing Assembly	3
Total	23

SLEW RING

Grease Slew Ring evenly and sparingly every 10 hours or 7 days as per the intervals in Table 4-1. **DO NOT** subject this area to powerwashing.

HYDRAULIC OIL TANK AND FILTER (Figure 4-2)

Fluid Level

With platform fully lowered i.e. stowed, oil should be visible on the dipstick. If the oil is NOT visible, fill the tank until oil (ISO#46) is then visible on the dipstick.

DO NOT fill above the upper line on the dipstick or when the platform is elevated.

Note: oil grades may vary depending on machine specification. Contact Snorkel Product Support for further advice.

Oil and Filter Replacement

1. Operate the platform for 10-15 minutes to bring the hydraulic oil up to normal operating temperature.



CAUTION



Wear safety gloves and safety glasses when handling hot oil (hydraulic oil can be a skin irritant). The hydraulic oil may be of sufficient temperature to cause burns.

2. Provide a suitable container to catch the drained oil. Hydraulic tank has a capacity of 25 Litres (6.5 Gallons US).
3. Remove the drain plug on the lower side and allow all oil to drain.
4. Clean the magnetic drain plug and reinstall.
5. Disconnect the return hose and hose fitting from inlet port of the hydraulic return filter. Loosen and remove the filter cover retaining bolts. Remove filter (10 micron) assembly. Replace with a new filter.
6. Fill the hydraulic reservoir with hydraulic oil (see Section 1-2) checking level with dipstick.
7. Recycle used oil as per local environmental regulations.

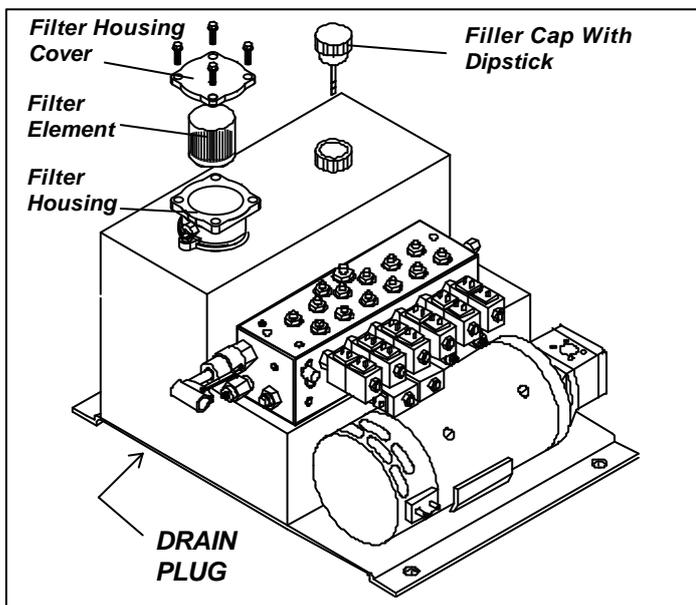


Figure 4-2: Oil and Filter Replacement

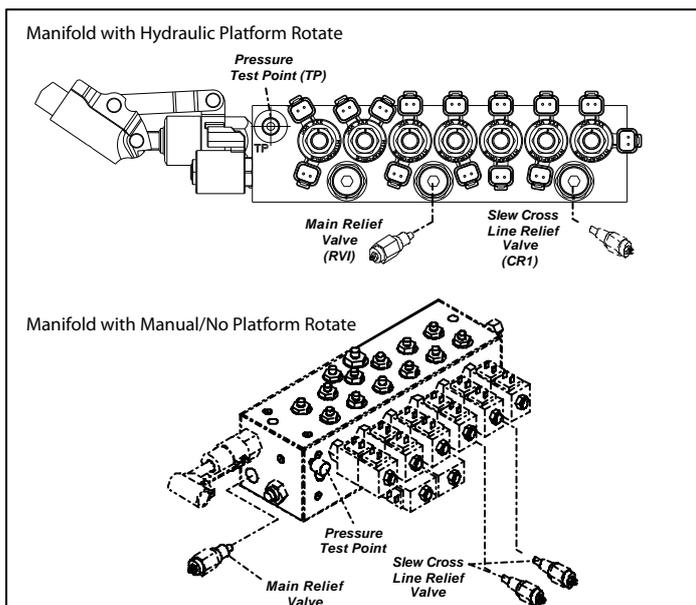


Figure 4-3: Manifold Block

4.5 Setting Hydraulic Pressures (Figure 4-3)

Check the hydraulic pressures whenever the pump, manifold or relief valve have been serviced or replaced.

! WARNING !

The hydraulic oil may be of sufficient temperature to cause burns. Wear safety gloves and safety glasses when handling hot oil. The oil in the hydraulic system is under very high pressure which can easily cause severe cuts. Obtain medical assistance immediately if cut by hydraulic oil.

MAIN RELIEF VALVE (Figure 4-3,4)

1. Operate the hydraulic system for 10-15 minutes to warm the oil.
2. Remove the cover from the Chassis body.
3. Insert pressure gauge into the high pressure gauge port (TP) on the Manifold Block.
4. Loosen locknut on main relief valve and turn adjusting screw anticlockwise two full turns using a 4 mm Allen key.
5. Operate the Telescope RETRACT function switch from lower controls and keep it activated.
6. Slowly turn the main relief valve adjusting screw clockwise until the pressure gauge reads 175 Bar (2538 p.s.i.) pressure.
7. Release the Telescope RETRACT switch.
8. Tighten locknut on main relief valve while holding the adjusting screw in position.

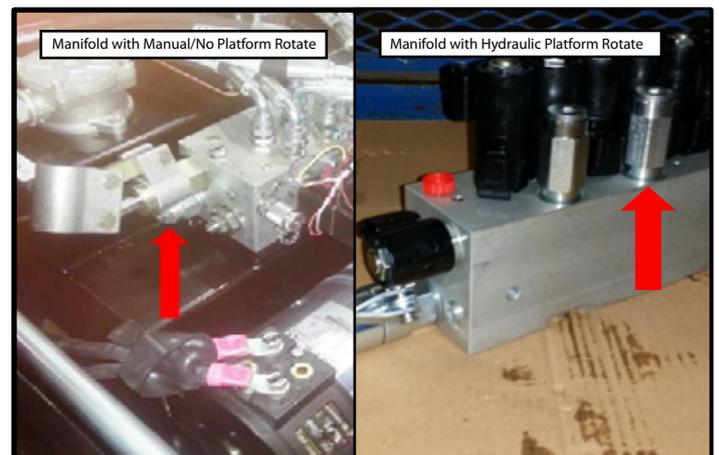


Figure 4-4: Setting Main Relief Pressures

SLEW CROSS-LINE RELIEF VALVES

1. Repeat steps 1-3 as outlined above
2. Loosen Locknuts on both cross-line relief valves and turn adjusting screws anticlockwise two full turns.
3. Operate slew function from lower controls and rotate the Elevating Assembly until the slew stop prevents further rotation.
4. Slowly turn the cross-line relief valve adjusting screw clockwise using a 4 mm Allen key until the pressure gauge reads 50 Bar (725 p.s.i.) pressure.
5. Now operate the slew function in the opposite direction through approximately 360° until the Slew Stop prevents further rotation.
6. Slowly turn the remaining cross-line relief valve adjusting screw clockwise until the pressure gauge reads 50 Bar (725 p.s.i.) pressure (Only applicable to Non Hydraulic Rotate manifold).
7. Tighten the locknuts on both cross-line relief valves while holding the adjusting screws in position (single valve on Hydraulic Rotate).

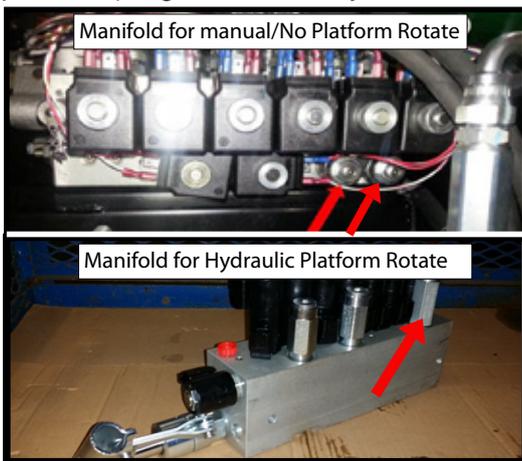


Figure 4-5: Setting Cross-Line Relief Pressures

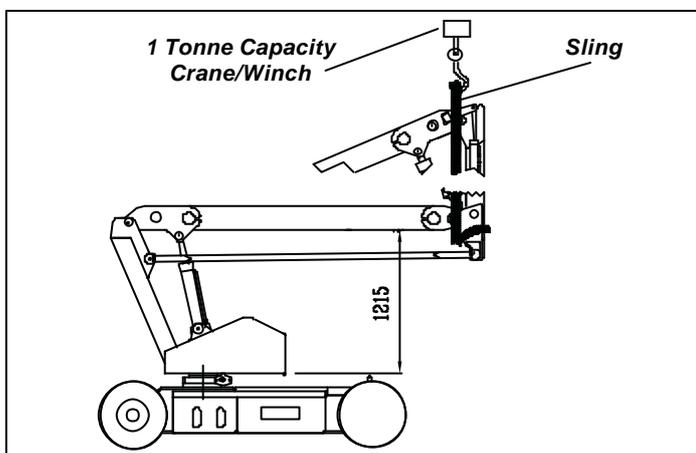


Figure 4-6: Supporting Elevating Assy.

4.6 Maintenance on Elevating Assembly (Figure 4-6)

The only time the Elevating Assembly needs to be elevated is to allow service work to be carried out on the lower parts of the Elevating Assembly, the Lower Lift Cylinder or the Slewing mechanisms. All other work (Bearings, Cylinders, Booms & Tension Bars) can and must be performed with the Elevating Assembly in the stowed position.

! WARNING !

BEFORE entering Elevating Assembly, to perform maintenance on the Work Platform while elevated, ensure that Elevating Assembly is properly supported by suitable crange of adequate capacity. (Recommended 1 tonne capacity crane and sling.)

INSTALLATION OF ELEVATING ASSEMBLY SUPPORT

1. Park the work platform on firm level ground.
2. Verify Platform Emergency Stop Switch is ON.
3. Hold the Chassis/Platform Selector Switch on the Lower Control Box to the 'Chassis' position.
4. Select Lower Control Boom 1 Switch and elevate until the lower boom is slightly above horizontal.
5. Place a sling of 1 Tonne load capacity at the end of the lower boom and second post. Ensure sling is secured so that it will not slip up along the boom.
6. Gradually lower the platform until Lower Boom is supported by the sling.

REMOVAL OF ELEVATING ASSEMBLY SUPPORT

1. Select Lower Control Boom 1 Switch and gradually raise the platform until the sling can be removed.
2. Remove the sling.
3. Completely lower platform.
4. Turn Key Switch to "OFF"

4.7 Switch Adjustments (Figure 4-7 & 4-8)

TILT SENSOR

The Tilt Sensor is incorporated in the GP400 control module.

Function: This limit switch is activated when the internal sensor in the 'Tilt Sensor' is tilted 3° or more (factory set at this value). When the Tilt Sensor activates the elevating and telescope extend functions will be locked out and an audible warning alarm will sound. It will activate if the Chassis tilts 3° in any direction.

SETTING THE TILT SENSOR TO ZERO



WARNING



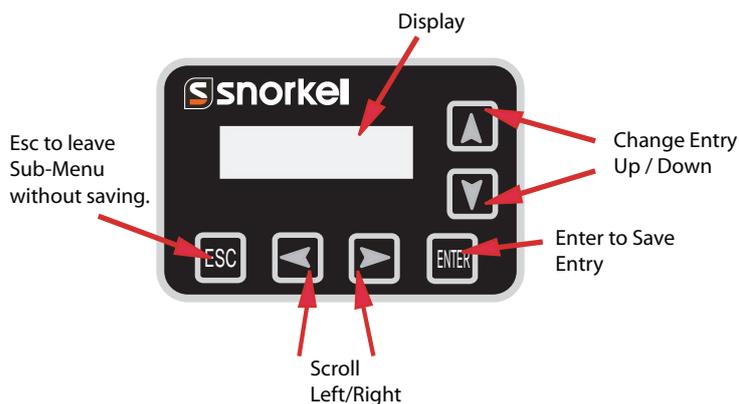
If the EZ230 control module is replaced and/of moved within the machine for any reason the tilt sensor must be reset for zero° using the following procedure. Failure to do so could result in serious injury or death.

To follow this procedure you need to switch the Ezcal display in the Upper Control Box into "Calibration mode".

1. Place the machine on a firm level surface , $\leq 0.25^\circ$
2. Use a Gauge to confirm that the front and rear of the chassis are level to within $\pm 0.25^\circ$ in both directions
3. Switch the machine on, press and hold Esc for 5 seconds until "Ezlift Menu" Appears.
4. Scroll to access level.(Enter)
5. Enter code 2222 for access level 2 .(Enter)
6. Scroll to setups.(Enter)
7. Scroll to tilt setups . (Enter)
8. Calibrate level. (Enter)
9. Enter for yes.

To confirm calibration has worked switch the machine of then back on again.

10. Scroll to Diagnostics. (Enter)
11. System. (Enter)
12. Scroll to tilt, both readings should be below 0.2° if not repeat from 3.



BOOM REST LIMIT SWITCH

Function: This limit switch is activated when the Elevating Assembly is fully stowed and the upper boom is sitting in the boom rest. The Boom Rest is located on the side of the First Post on the A38E Work Platform. The high speed drive can only be operated when this switch is activated. When the boom leaves the boom rest the Normally Open contacts of the limit switch open and power is cut to the high speed drive function.

Location: The switch is located on the side of the First Post on the Boom Rest Weldment. (see fig 4-8)

Adjustment: The switch should be activated when the boom sits in the boom rest. The lever is adjustable and should be adjusted so that the switch's activation/deactivation point occurs just as Boom 2 leaves the Boom Rest. To adjust the switch loosen the lever clamping nut and rotate the lever. Tighten the lever clamping nut. The switch should periodically be checked for freedom of movement and be kept clean from dirt and other contaminants that might affect its free movement.

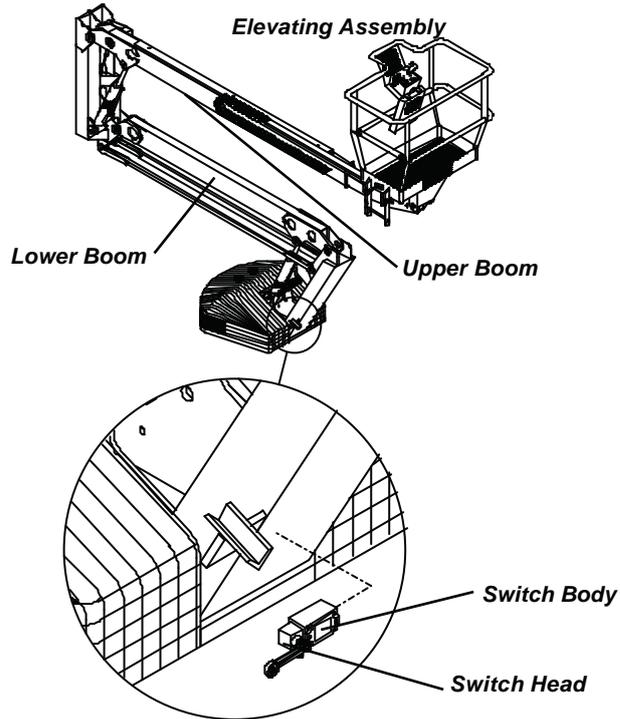


Figure 4-8: Boom Rest Limit Switch

4.8 Hydraulic Manifold (Figure 4-9)

Though it is not necessary to remove the manifold to perform all maintenance procedures, a determination should be made as to whether or not the manifold should be removed before maintenance procedures begin.

REMOVAL

1. Disconnect the Battery Disconnect Plug.
2. Remove the cover from the Chassis body.
3. Tag and disconnect the solenoid valve leads from the solenoids.
4. Tag, disconnect and plug hydraulic hoses.
5. Remove securing bolts that hold manifold block to hydraulic reservoir.
6. Remove the manifold block.

DISASSEMBLY



CAUTION

NOTE: Mark all components as they are removed so as not to confuse their location during assembly. Refer to Figure 4-9 often to aid in disassembly and assembly.

1. Remove coils from solenoid valves.
2. Remove solenoid valves and the relief valves.
3. Remove fittings and bonded washers.

CLEANING AND INSPECTION

1. Wash the manifold in cleaning solvent to remove built up contaminants and then blow out all passages with **clean** compressed air.
2. Inspect the manifold for cracks, thread damage and scoring where O-rings seal against internal and external surfaces.
3. Wash and dry each component and check for thread damage, torn or cracked O-rings and proper operation.
4. Replace parts and O-rings found unserviceable.

ASSEMBLY



CAUTION



Note: Lubricate all O-rings before installation to prevent damage to O-rings.

1. Install fittings, plugs and bonded seals.
2. Install the solenoid valves and tighten the coils on to the valves.
3. Install the Main Relief Valve and the Slew Cross- Line Relief Valves .

Note: Torque relief valves to 45 Nm (33 ft. lbs).
Torque solenoid spool cartridges to 20 Nm (14.75 ft. lbs)
Torque coil retaining nuts to 1.5 Nm (1.01 ft. lbs)

INSTALLATION

1. Attach manifold assembly to the Hydraulic Tank with bolts and washers.
2. Connect hydraulic hoses to their destinations on the manifold block.
3. Connect solenoid leads to their correct coils.
4. Operate each hydraulic function and check for proper function and leaks.
5. Re-secure cover to Chassis body.

1. **Valve Block**
2. **Solenoid Valve**
3. **Coil**
4. **Locking Nut**
5. **Fitting, straight**
6. **Bonded Washer**
7. **Pressure Reduction Valve**
8. **Main Relief Valve** (for Hydraulic Platform Rotate manifold for see page 4-6)
9. **Pressure Test Point**
10. **Telescopic Retraction Valve**
11. **Cross Line Relief Valves** (Only one valve on Hydraulic Platform Rotate manifold)

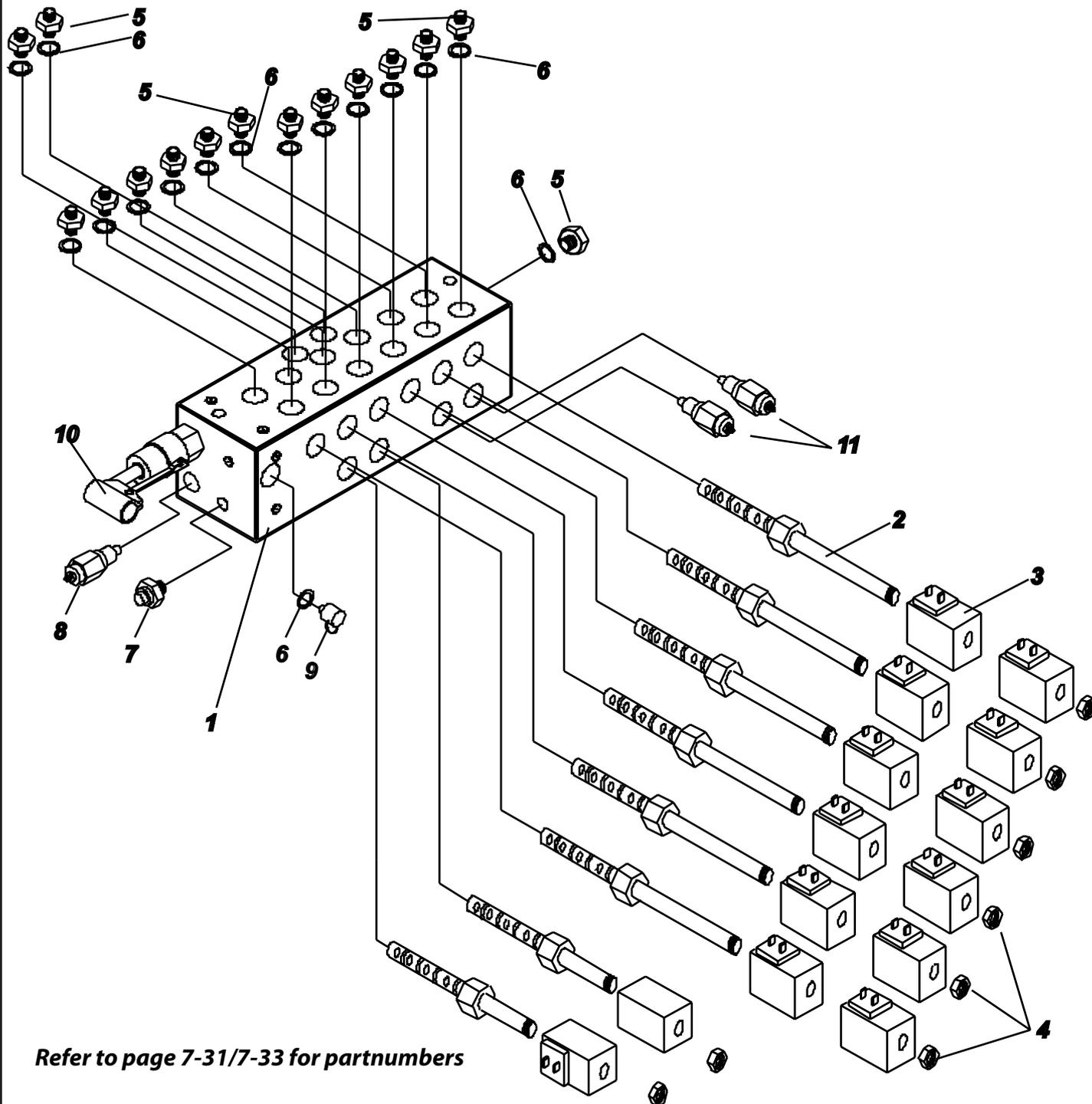


Figure 4-9: Manifold Block Components

4.9 Hydraulic Pump (Figure 4-10)



CAUTION



If the hydraulic reservoir has not been drained, suitable means for plugging the hoses should be provided to prevent excessive fluid loss.

REMOVAL

1. Mark, disconnect and plug hose assemblies.
2. Loosen the capscrews and remove the pump assembly from the motor.

INSTALLATION

1. Lubricate the pump shaft with general purpose grease and attach the pump to the motor with the capscrews.
2. Using a crisscross pattern torque each capscrew a little at a time until all the capscrews are torqued to 27 Nm (20 ft. lbs).
3. Unplug and reconnect the hydraulic hoses.
4. Check the oil level in the hydraulic tank before operating the work platform.

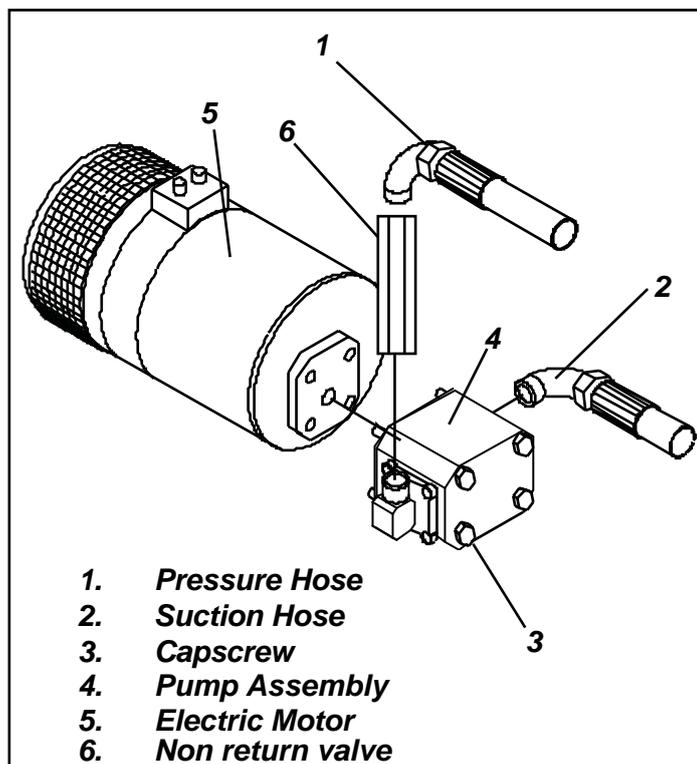


Figure 4-10: Hydraulic Pump

4.10 Traction Motor Maintenance - 514274-000 (See 7-19)



CAUTION



Before carrying out any maintenance procedures on the Drive Motors ensure that the electric circuit is disconnected i.e. disconnect the batteries and unplug the charger. It is also important that when dealing with batteries the proper safety precautions are adhered to. There is always a hazard of sparks or explosive gas.

INSPECTING THE DRIVE MOTORS

Remove the Seathing (Item 6) from the rear section of the motor and examine the brushes for excessive wear.

If required the brushes may need to be changed as follows:

1. Lift the spring (Item 3)
2. Release the brushes and unscrew the bolts (Item 2) from the brush box (Item 5)
3. Remove the brushes by pulling the electric leads.



WARNING



During these operations take care that screws, washers or other materials do not fall inside the motor.

4. After thoroughly cleaning the brush boxes, insert the new brushes and check that they slide correctly inside the seat (Item 5).
5. Tighten and lock the bolts (Item 2).
6. Push the springs back in place. Check the constant pressure on all the brushes, and the correct contact with the commutator.
7. Replace the inspection/ventilation covers.

4.10 Traction Motor Maintenance -512944-000 (See 7-21)

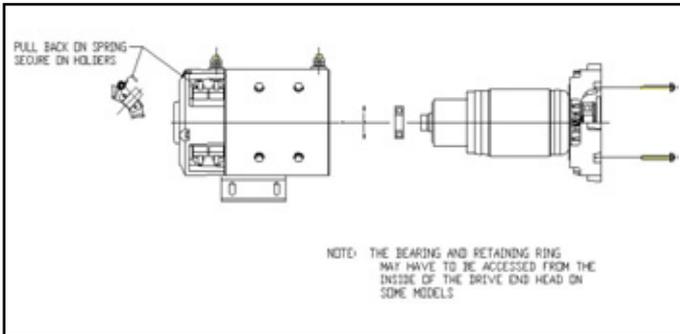


Figure 1. Exploded view of Drive End Locked Motor

- b. Hook spring scale as shown.
- c. Pull spring scale on a line directly opposite the line of force exerted. When the paper strip begins to move freely read the spring tension on the scale.

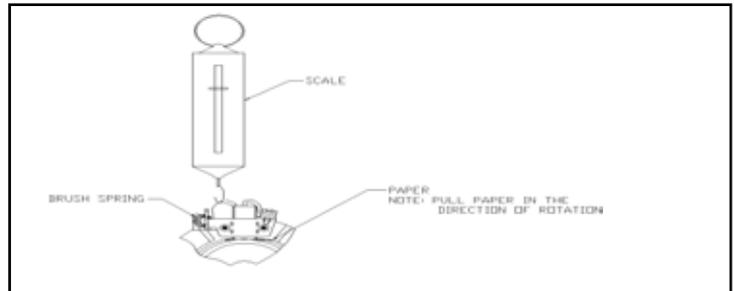


Figure 8. Brush Tension Testing

1. Pull back the brush springs and latch them on the holders in the open position (or if the brush box assembly has no holders, pull the springs out, pull the brush back and rest the springs on the side of the brush). See Figure 1. The brushes should move freely within the holders.
2. Check the brush springs for correct alignment on the back of the brush. A brush spring that does not apply equal pressure on the center of the brush will cause the brush to wear unevenly. Check for correct clearance and freedom of brush movement in the holder.
3. Replace brushes that are worn below their usable length, show signs of uneven wear or signs of over heating, such as discoloured brush shunts and brush springs.
4. Make sure the brush box assembly is tight on the commutator end head. Replace brush box assemblies in the commutator end head if they are physically damaged or brush holders are loose on the brush plate.
5. Brushes should always be replaced in complete sets of four or eight. Use identical replacement parts; do not substitute brush grades as they are matched to the motor type and application to provide the best service. Substituting brushes of the wrong grade can cause premature commutator failure and excessive brush wear.
6. Carefully release the brush springs allowing the brushes to contact the commutator. Brushes should be checked for proper tension using the following procedure:
 - a. Place paper strip between brush face and commutators. See Figure 8.

Motor Diameter		Ounce	Gram
5.5 inch	New Brush	55	1540
	Worn Brush	35	980
6.7 Inch	New Brush	65	1820
8.0 inch	Worn Brush	40	1120
9.0 Inch			

Table 2. Brush Tension Values

Every **500** working hours, or annually

- Brushes - Check the wear, the correct seating, and the regularity of the working surface.
- Springs - They should not be burned or damaged, and they must apply a constant and equal pressure on the brushes.
- Commutator - The surface must be clean and regular without grooving or burning.
- General - Check that foreign bodies or dirt have not entered the motor. Check that the ventilation holes are clean and not obstructed.

Every **1000** working hours, or every two years

- Bearings- All the bearings are fitted with a double shield and lubricated with high temperature grease. Check for leaks, vibration and noise. If necessary replace with bearings of identical type.
- Screws - Check that all nuts, particularly the cable nuts and screws are tight.

4.11 Electric Pump Motor (Figure 4-13)



WARNING



Before carrying out any maintenance procedures on the electric motor ensure that the electric circuit is disconnected i.e. disconnect the batteries and unplug the charger. It is also important that when dealing with batteries the proper safety precautions are adhered to. There is always a hazard of sparks or explosive gas.

TROUBLESHOOTING

1. Read the nameplate to become familiar with the motor, especially the rated voltage.
2. Try to turn the shaft by hand. Keep motor leads separated while doing this. **If the shaft turns freely go to step 3. If the shaft won't turn, proceed to step 2A.**
- 2A. The shaft could be tight for a number of reasons, this check is to determine if the tightness is of a temporary nature only. Obtain power to produce the nameplate voltage. Do not make a permanent connection. First touch the motor leads quickly to the power supply just long enough to observe if the shaft runs. If it does turn, then hold the motor leads on the power supply for a longer time. If the motor sounds normal, go to step 3. If the motor is noisy it should be taken apart as described in the **DISASSEMBLY** section.
3. If the motor turned freely, connect an ammeter in the circuit as shown in Figure 4-12. With rated voltage applied and the shaft running free, the ammeter should read less than 20% of the nameplate full load current. If the motor meets the above conditions then it can be assumed that the original problem is external to the motor.

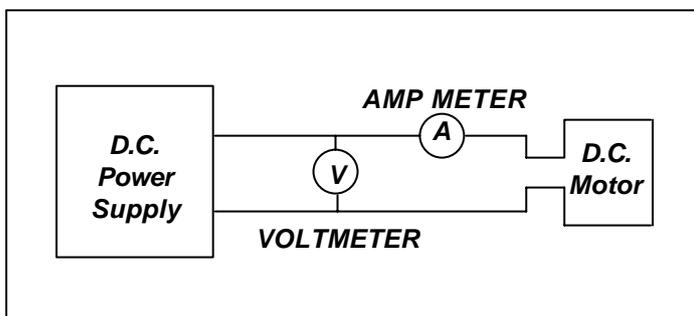


Figure 4-12: Electrical Test Circuit

DISASSEMBLY

1. Remove through bolts.
2. Remove pulley end cover
3. Pull the armature out of the assembly in one swift motion.
4. Remove commutator end cover.



CAUTION



NOTE: Do not place the stator ring in any mechanical holding device during the disassembly or assembly operation. Permanent distortion or other damage will result.

INSPECTION

Once the motor has been disassembled, go through the following check list steps to determine where the problem lies.

1. Bearings should spin smoothly and easily and have ample lubrication and be free of corrosion.
2. Armature should be checked for grounds and shorted Windings. Refinish commutator surface if pitted or excessively worn.
3. Brushes should be checked for wear and to ensure that they are free in the brush holders.

NOTE: Observe how the brushes are assembled in brush holders and position of brush lead. New brushes must be installed in same manner. Brushes should be removed as follows:

 - Remove brush spring clip from its mounting on brush assembly.
 - Lift brush assembly from the brush holder
 - Disconnect brush assembly lead.
 - New brush assembly to be installed by reversing the above procedure.
4. Inspect wire harness and all connections for signs of damage due to overheating.
5. Check stator to see if it is securely mounted.

REASSEMBLY

1. Install new brushes and be sure they are free in the holder. Install brush with the lead wires positioned as when received.
2. Place commutator cover on a work bench with brush assembly facing upward.

3. Place the bearing spring into the bearing bore.
4. Take a complete armature assembly, including bearings, and insert commutator end bearing into the bearing bore.
Note: Do not reuse bearings which have been removed from armature shaft. Keep assembly in a vertical position. Use extreme care not to damage armature with bearing pullers. New bearings should be installed by pressing inner race of bearing onto proper position on armature shaft.
5. Set the brushes to final position and lock with springs.
6. Place the complete stator down over the vertical armature, and into position on the commutator cover.
7. The stator assembly must be placed in a definite relationship with the commutator covers in order to obtain a neutral brush setting. There is a match-mark on both items. These two marks must line up exactly. Rotate until they do.
8. Assemble the pulley end cover in the proper relationship. Insert mounting bolts and tighten alternately to ensure a good mechanical alignment.
9. Spin the shaft by hand to see if it is free. Be sure motor leads (if used) are not touching together. If the leads are touching, a generator action will give the effect of friction in the motor. A no-load test can now be performed. At rated voltage, observe the no-load current. It should be less than 20% of the nameplate full load current. Anything higher will indicate:
 - Brushes are not on neutral setting (check matchmarks for exact alignment)
 - Faulty armature.

NOTE: Following assembly, the electric motor may turn in the wrong direction. The cause of this will be that the brush holder assembly has been connected the wrong way. To solve this disassemble and reconnect in the proper way. Reversing the polarity will not solve this problem as this is a series wound motor.

MAINTENANCE INTERVALS & PROCEDURES

Every **500** working hours, or annually

- | | |
|--------------|--|
| Brushes - | Check the wear, the correct seating, and the regularity of the working surface. |
| Springs - | They should not be burned or damaged, and they must apply a constant and equal pressure on the brushes. |
| Commutator - | The surface must be clean and regular without grooving or burning. |
| General - | Check that foreign bodies or dirt have not entered the motor. Check that the ventilation holes are clean and not obstructed. |

Every **1000** working hours, every two years

- | | |
|-----------|---|
| Bearings- | All the bearings are fitted with a double shield and lubricated with high temperature grease. Check for leaks, vibration and noise. If necessary replace with bearings of identical type. |
| Seals - | Check that hydraulic seals are in perfect condition. |
| Screws - | Check that all nuts, particularly the cable nuts and screws are tight. |

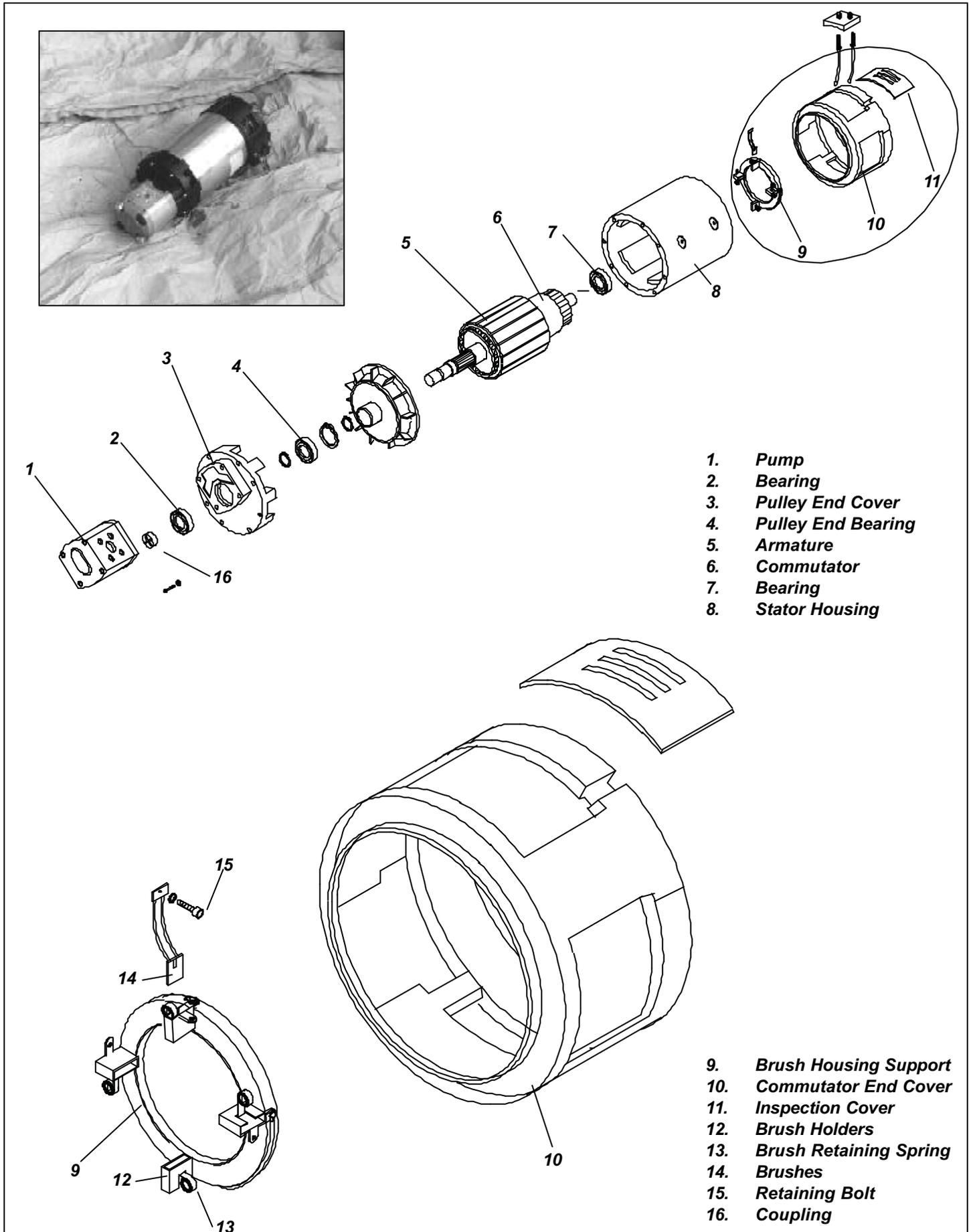


Figure 4-13: Electric Motor Assembly

4.12 Drive Reduction Gearbox (Figure 4-14)

As with most gearboxes oil changes must be carried out at regular intervals. Initially this should be done after the first 50/100 working hours and then subsequently every 500 working hours or at least every 12 months.

For this gearbox the **minimum** recommended viscosity index is 95. Depending on the ambient temperature of the work place the viscosity index should vary as follows:

Ambient Temperature	Viscosity Index (ISO 3448)
-20°C (-4°F) / 5°C (41°F)	VG 100
5°C (41°F) / 30°C (86°F)	VG 150
30°C (86°F) / 50°C (122°F)	VG 320

During oil change, we recommend that the inside of the Gearcase is flushed out with flushing fluid recommended by the lubricant manufacturer. Oil should be changed when hot to prevent a build up of sludge deposit. It is advisable to check the oil level at least once per month. If more than 10% of total oil capacity has to be added, check for oil leaks. Do not mix oils of different types even of the same make. Never mix mineral and synthetic oils.



CAUTION



Service Engineers must be aware of the dangers during an oil change involving hot oil i.e. scalding. The Service Engineer must also be responsible when disposing of the discarded oil. This should be done in accordance with local environmental regulations.

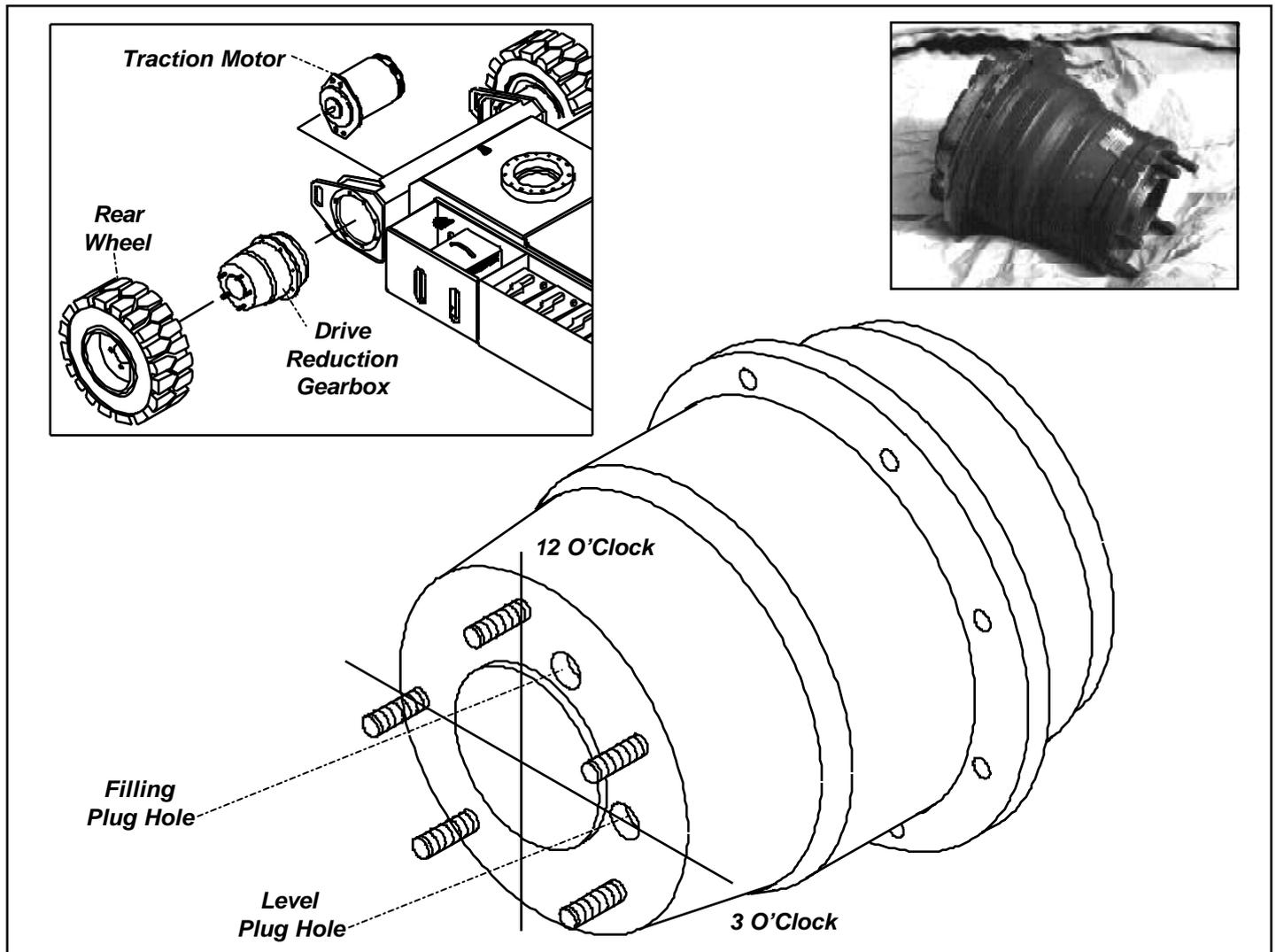


Figure 4-14: Drive Reduction Gearbox

CHANGING THE OIL

Unless an oil suction system can be used, it is necessary to remove the gearbox to fully drain the oil.

1. The A38E should be driven for five minutes in order to bring the oil up to working temperature.
2. The Electric Traction Motor must be disconnected from the Gearbox.



WARNING



Disconnect the batteries when working near the traction motors.

3. Unscrew the four bolts that hold the traction motor to the Gearbox and pull the Motor away from the rear face of the Gearbox.
4. Disconnect the brake hose from the brake port on the Gearbox and plug to avoid excessive oil spillage and contamination.
5. Loosen the five wheel nuts securing the Wheel Assembly to the Gearbox studs.
6. Jack up the rear of the A38E and chock the front wheels to prevent the machine from moving during the service.
7. Remove the Wheel Assembly by unscrewing the five wheel nuts
8. Unscrew the eight securing bolts that hold the Gearbox to the Chassis, and remove the Gearbox, noting its orientation on the chassis before removal.
9. Remove the oil filler and drain plugs from the front (stud) face of the Gearbox.
10. Stand the Gearbox vertically (studs facing down) in a suitable oil disposal container and allow the oil to drain fully.
11. The Gearbox needs to be half filled which requires approximately 0.9 Litres (0.23 Gallons US) of oil. To check this level, rotate the Gearbox into the horizontal position with one of the filler/drain plug holes in the 3 O' Clock position and the other plug hole above it (See fig 4-14). When the Gearbox is half full oil will just start to trickle out the plug hole in the 3 O'Clock position.
12. Insert and tighten both plugs and clean the surfaces of the gearbox.
13. Reattach the Gearbox to the Chassis in its original position with the eight securing bolts.



CAUTION



The Gearbox Securing Bolts must be torqued to 130 Nm (96 ft. lbs).

14. Reattach the brake hose to the brake port.
15. Reattach the Wheel Assembly to the Gearbox using the five M14 nuts.



CAUTION



The Wheel Assembly Nuts must be torqued as per values given in Table 4-1.

16. Reattach the Electric Traction Motor to the Gearbox.



CAUTION



The Electric Traction Motor Bolts must be torqued to 74 Nm (55 ft. lbs).

Repeat this procedure for the other Drive Gearbox.

4.13 Torque Specifications

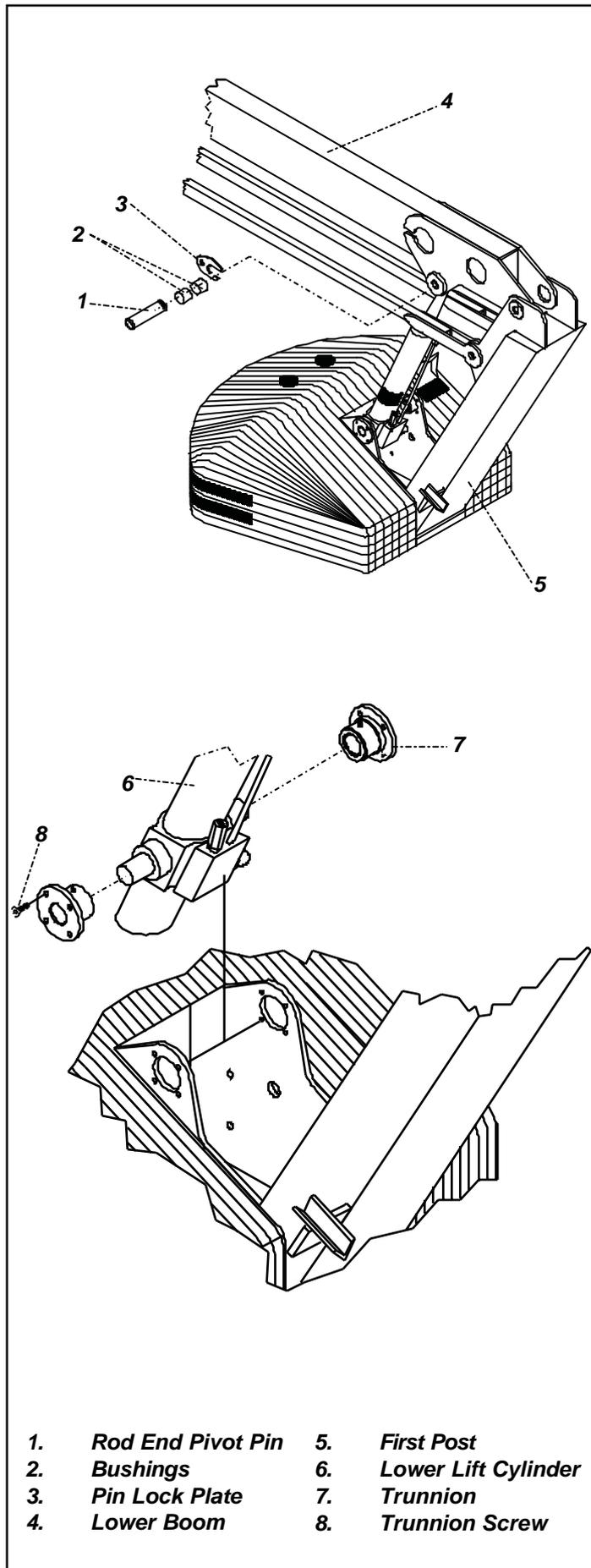
RETAINING BOLTS

Use the following values to torque bolts used on **Snorkel** A38E Work Platform unless a specific torque value is called out for the part being installed.

Thread Size	Location	Torque	
		Metric	Imperial
M4	SPIRIT LEVEL	3 Nm	2 Ft/Lbs
M6	VARIOUS	10 Nm	7 Ft/Lbs
M8	TRUNNION	25 Nm	18 Ft/Lbs
M10	PIN LOCK PLATES	45 Nm	33 Ft/Lbs
M12	TORQUE ARMS	90 Nm	67 Ft/Lbs
5/8" -11 UNC x 3 1/2" (ISO 10.9) (US Grade 8)	SLEW BEARING	220 Nm	165 Ft/Lbs

Table 4-3: Bolt Torques

NOTE: All Bolts are ISO Grade 8.8 unless otherwise stated



4.14 Lower Lift Cylinder (Figure 4-15)

REMOVAL



CAUTION



The Lower Lift Cylinder is heavy, so utilise appropriate lifting equipment to support the unit before removing pins.

1. Ensure that the A38E is on firm level ground, the Elevating Assembly is completely stowed, the Keyswitch is to the 'OFF' position and the Emergency Stop Button is pressed.
2. Provide a suitable container to collect the hydraulic fluid, then disconnect the hydraulic hoses. Immediately plug hoses to prevent foreign material from entering.
3. Remove securing bolts and pin lock plates from the cylinder pins.
4. Support rod end of cylinder and remove rod end pivot pin. Move cylinder backwards to rest against the first post.
5. Support the cylinder so that the Trunnion Pivot bushings can be removed. This is done by releasing the eight M8 Allen head bolts. Remove the cylinder from the machine.
6. Move the cylinder to a prepared work area. It is important that clean assembly practices are observed, as seals and other hydraulic cylinder components are sensitive to contamination.

DISASSEMBLY

1. Unscrew the headcap and withdraw the rod and piston assembly from the barrel tube.
2. Unscrew the piston nut and remove piston and headcap from the cylinder rod.
3. Remove the piston static O-ring from the cylinder rod.
4. Remove the piston seal from the piston.
5. Remove the rod seal, rod wiper and static seal from the headcap.
6. Care should be taken to save the O-ring and all other seals for reassembly, if they have been deemed serviceable following the cleaning and inspection phase of maintenance.

CLEANING AND INSPECTION

1. Clean all metal parts in solvent and blow dry

Figure 4-15: Lower Lift Cylinder

- with filtered compressed air.
2. Check all threaded parts for stripped or damaged threads.
3. Check the bearing surfaces inside of the headcap, outer edge surface of the piston, inside of the cylinder barrel and the shaft for signs of scoring, pits, excessive wear or polishing. Scratches or pits deep enough to catch a fingernail are unacceptable. Polishing is a sign of uneven loading and if sufficiently polished the affected parts should be replaced.
4. Replace any parts or seals found to be unserviceable.

REASSEMBLY/SEAL REPLACEMENT

Note: During seal replacement do not use sharp edged tools to avoid cutting the seals, and allow at least one hour for the seals to elastically restore to their original shape before assembly.

1. Lubricate and install new rod seal, rod wiper and static seal on the headcap.
NOTE: Multi-purpose lubricant should be used.
2. Install a new piston seal on the piston.
3. Install the headcap on the cylinder from the piston end.
4. Install the piston, piston nut and a new piston static O-ring on the cylinder rod. Screw nut to end of thread and secure with circlip.

5. Lubricate the piston seal and install the piston and rod assembly in the barrel tube.
6. Thread headcap onto barrel tube and hand tighten, then turn 1/4 turn further.
7. Install the lower cylinder Overcentre Valve.

INSTALLATION

NOTE: Before installing Lift Cylinder check cylinder pins, bearings and Trunnion Pivot for wear and replace if necessary.

1. Locate the Trunnion Pivot on the cylinder and place the lift cylinder against the first post.
2. Maintaining the Trunnion Pivot in place put the first Allen Bolt in one turn. Repeat for all of the bolts. When all bolts are in place tighten fully.

NOTE: Take care in aligning the holes so that the bolts can be made turn by hand. If holes are not properly aligned the Trunnion Pivot will be positioned incorrectly.

3. Install rod end bearings (if removed).
4. Lift rod end of cylinder into place and insert pin. Install pin lock plate. Fix pin lock plate with bolt.
5. Test with weight at rated platform load to check system operation.

Note: Diagram below shows a sample cylinder breakdown for the Upper Lift Cylinder. Component Breakdowns of the other cylinders are shown in the Illustrated Parts Breakdown.

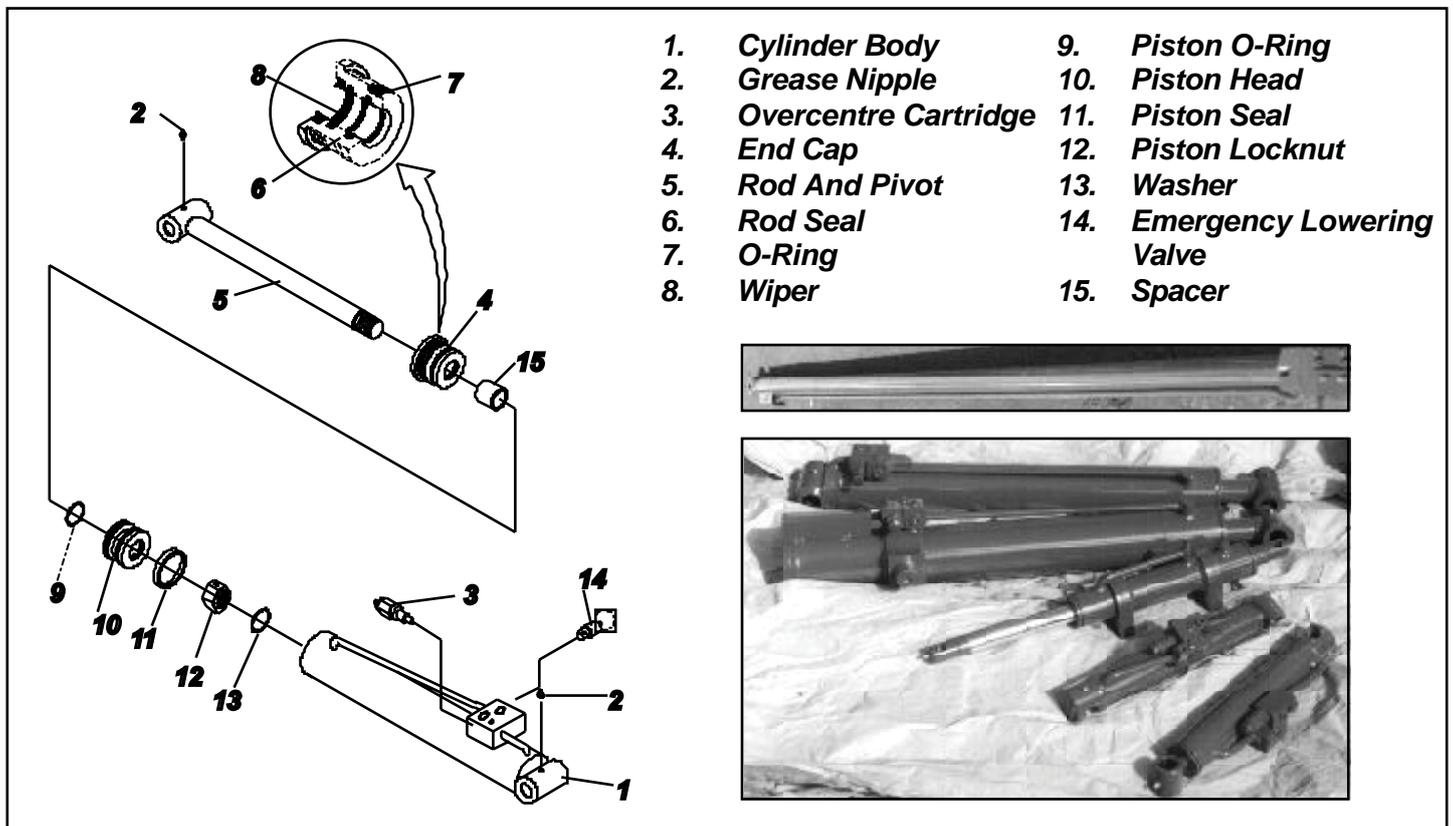


Figure 4-16: Hydraulic Cylinder Component Breakdown

4.15 Upper Lift Cylinder (Figure 4-17)

REMOVAL



CAUTION



The Upper Lift Cylinder is heavy, so utilise appropriate lifting equipment to support the unit before removing pins.

1. Ensure that the A38E is on firm level ground, the Elevating Assembly is completely stowed, the Keyswitch is to the 'OFF' position and the Emergency Stop Button is pressed.
2. Provide a suitable container to collect the hydraulic fluid, then disconnect the hydraulic hoses. Immediately plug hoses to prevent foreign material from entering.
3. Remove securing bolts and the pin lock plates from the cylinder pins.
4. Support rod end of cylinder and remove rod end pivot pin. Let cylinder down to hang freely.
5. Support the cylinder so that the barrel end cylinder pin can be removed, then remove the cylinder from the machine.
6. Move the cylinder to a prepared work area. It is important that clean assembly practices are observed as seals and other hydraulic cylinder components are highly sensitive to contamination.

DISASSEMBLY (Refer to Figure 4-16)

1. Unscrew the headcap and withdraw the rod and piston assembly from the barrel tube.
2. Unscrew the piston nut and remove piston and headcap from the cylinder rod.
3. Remove the piston static O-ring from the cylinder rod.
4. Remove the piston seal from the piston.
5. Remove the rod seal, rod wiper and static seal from the headcap.
6. Care should be taken to save the O-ring and all other seals for reassembly, if they have been deemed serviceable following the cleaning and inspection phase of maintenance.

CLEANING AND INSPECTION

1. Clean all metal parts in solvent and blow dry

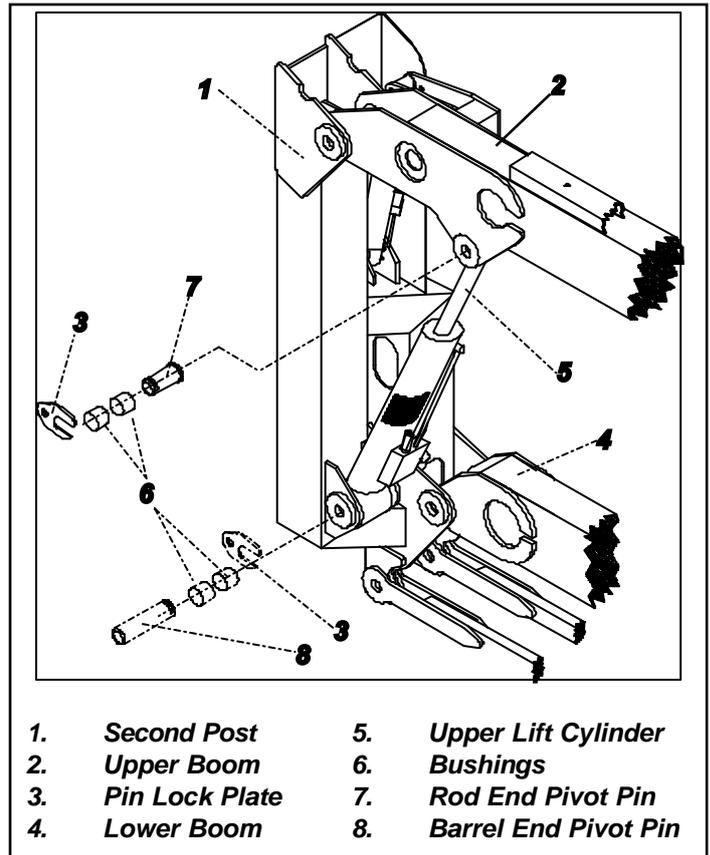


Figure 4-17: Upper Lift Cylinder

- with filtered compressed air.
2. Check all threaded parts for stripped or damaged threads.
3. Check the bearing surfaces inside of the headcap, outer edge surface of the piston, inside of the cylinder barrel and the shaft for signs of scoring, pits, excessive wear or polishing. Scratches or pits deep enough to catch a fingernail are unacceptable. Polishing is a sign of uneven loading and if sufficiently polished the affected parts should be replaced.
4. Replace any parts or seals found to be unserviceable.

REASSEMBLY/SEAL REPLACEMENT

Note: During seal replacement do not use sharp edged tools to avoid cutting the seals, and allow at least one hour for the seals to elastically restore to their original shape before assembly.

1. Lubricate and install new rod seal, rod wiper and static seal on the headcap.
NOTE: Multi-purpose lubricant should be used.
2. Install a new piston seal on the piston.
3. Install the headcap on the cylinder from the piston end.
4. Install the piston, piston nut and a new piston static O-ring on the cylinder rod. Screw nut to

5. Lubricate the piston seal and install the piston and rod assembly in the barrel tube.
6. Thread headcap onto barrel tube and hand tighten, then turn 1/4 turn further.
7. Install the upper cylinder Overcentre valve.

INSTALLATION

NOTE: Before installing Lift Cylinder check cylinder pins and bearings for wear and replace if necessary.

1. Install barrel end bearing (if removed)
2. Lift the barrel end of the cylinder into place and push the cylinder pin in.

NOTE: Take care in aligning the holes so that the pin can be pushed in by hand. Bearings will be damaged if holes are not properly aligned and the pin is forced.

3. Align pin lock plate on cylinder pin with hole in the mast and push the cylinder pin completely in. Fix pin lock plate with bolt.
4. Install rod end bearings (if removed).
5. Lift rod end of cylinder into place and insert pin. Install pin lock plate. Fix pin lock plate with bolt.
6. Test with weight at rated platform load to check system operation.

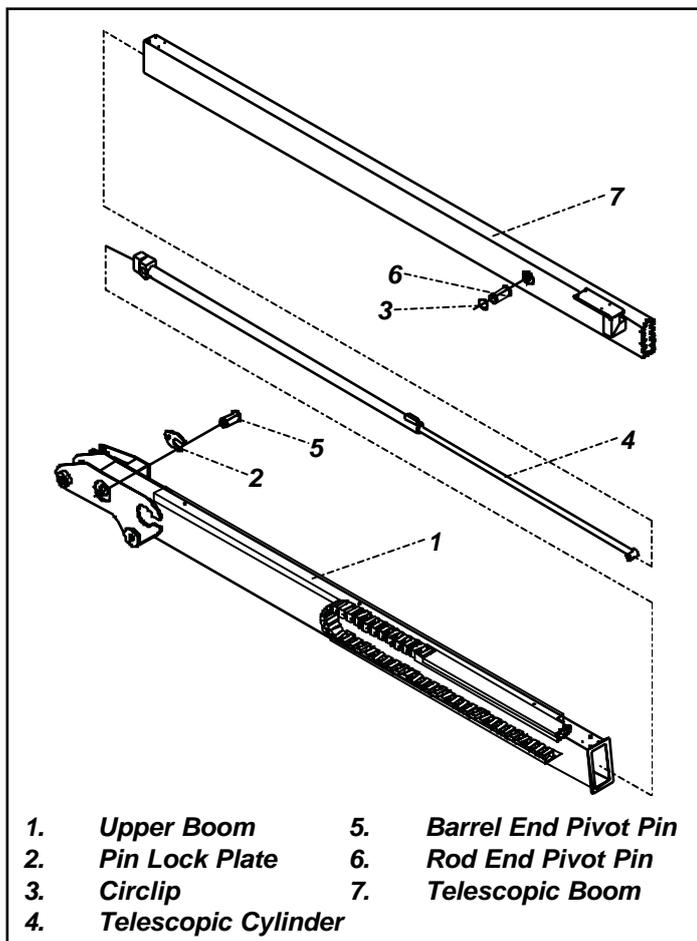


Figure 4-18: Telescopic Cylinder

4.16 Telescopic Cylinder (Figure 4-18)

REMOVAL

1. Ensure that the A38E is on firm level ground, the Elevating Assembly is completely stowed, the Keyswitch is to the 'OFF' position and the Emergency Stop Button is pressed.
2. From Chassis Controls extend the Telescope until the Rod End Pin is just visible. This will leave a small amount of clearance between the ground and the Telescopic Boom.
3. Support the Telescopic Boom & Platform Assembly to avoid any damage while removing the Telescopic Cylinder.
4. Provide a suitable container to collect the hydraulic fluid, then disconnect the hydraulic hoses. Immediately plug hoses to prevent foreign material from entering.
5. Remove securing bolts and pin lock plates from the barrel end cylinder pin.
6. Remove the Telescopic Cylinder rod end circlip and then push the rod end pin out.
7. Support the cylinder so that the barrel end cylinder pin can be removed, then remove the cylinder from the machine. This is done by pulling the cylinder forward through the gap provided in Boom 2 at the 2nd post end.
8. Move the cylinder to a prepared work area. It is important that clean assembly practices are observed. Seals and other cylinder components are highly sensitive to contamination.

DISASSEMBLY (Refer to Figure 4-16)

1. Unscrew the headcap and withdraw the rod and piston assembly from the barrel tube.
2. Unscrew the piston nut and remove piston and headcap from the cylinder rod.
3. Remove the piston static O-ring from the cylinder rod.
4. Remove the piston seal from the piston.
5. Remove the rod seal, rod wiper and static seal from the headcap.
6. Care should be taken to save the O-ring and all other seals for reassembly, if they have been deemed serviceable following the cleaning and inspection phase of maintenance.

CLEANING AND INSPECTION

1. Clean all metal parts in solvent and blow dry with filtered compressed air.
2. Check all threaded parts for stripped or damaged threads.
3. Check the bearing surfaces inside of the headcap, outer edge surface of the piston, inside of the cylinder barrel and the shaft for signs of scoring, pits, excessive wear or polishing. Scratches or pits deep enough to catch a fingernail are unacceptable. Polishing is a sign of uneven loading and if sufficiently polished the affected parts should be replaced.
4. Replace any parts or seals found to be unserviceable.

REASSEMBLY/SEAL REPLACEMENT

Note: During seal replacement do not use sharp edged tools to avoid cutting the seals, and allow at least one hour for the seals to elastically restore to their original shape before assembly.

1. Lubricate and install new rod seal, rod wiper and static seal on the headcap.
NOTE: Multi-purpose lubricant should be used.
2. Install a new piston seal on the piston.
3. Install the headcap on the cylinder from the piston end.
4. Install the piston, piston nut and a new piston static O-ring on the cylinder rod. Screw nut to end of thread and secure with circlip.
5. Lubricate the piston seal and install the piston and rod assembly in the barrel tube.
6. Thread headcap onto barrel tube and hand tighten, then turn 1/4 turn further.
7. Install the telescopic cylinder's Overcentre and Check Valves.

INSTALLATION

NOTE: Before installing Telescopic Cylinder check cylinder pins and bearings for wear and replace if necessary.

1. Lift the Telescopic Cylinder so that it will be able to slide down Boom 2.
2. While maintaining a positive hold on the cylinder position the barrel end of the cylinder into place. Push the cylinder pin in.
NOTE: Take care in aligning the holes so that the pin can be pushed in by hand. If holes are not properly aligned and the pin is forced in, the bearings will be damaged.
3. Align pin lock plate on cylinder pin with hole in

Boom 2 and push the cylinder pin completely in and fix pin lock plate with bolt.

4. Position the rod end of cylinder into place and insert the pin until the circlip groove is exposed. Replace the circlip.
5. From the Chassis Controls retract the Telescopic Cylinder fully.
7. Test with weight at rated platform load to check system operation.

4.17 Steering Cylinder (Figure 4-19)

REMOVAL

1. Ensure that the A38E is on firm level ground, the Elevating Assembly is completely stowed but slewed away from centre, the Keyswitch is to the 'OFF' position and the Emergency Stop Button is pressed.
2. Straighten the drive wheels.
3. Provide a suitable container to collect the hydraulic fluid, then disconnect the hydraulic hoses. Immediately plug hoses to prevent foreign material from entering.
4. Remove the circlips from each steering pivot pin. Push the steering pivot pins out and rotate the steering link arm away from the rod.
5. While supporting the cylinder remove the four bolts from the front panel of the A38E's chassis.
6. Move the cylinder to a prepared work area. It is important that clean assembly practices are observed as seals and other hydraulic cylinder components are highly sensitive to contamination.

DISASSEMBLY (Refer to Figure 4-16)

1. Unscrew both of the headcaps and withdraw the rod piston assembly (this is one unit) from the barrel tube.
2. Remove the piston static O-ring from the cylinder rod.
3. Remove the piston seal from the piston.
4. Remove the rod seal, rod wiper and static seal from the headcap.
5. Care should be taken to save the O-ring and all other seals for reassembly, if they have been deemed serviceable following the cleaning and inspection phase of maintenance.

CLEANING AND INSPECTION

1. Clean all metal parts in solvent and blow dry with filtered compressed air.
2. Check all threaded parts for stripped or damaged threads.
3. Check the bearing surfaces inside of the headcap, outer edge surface of the rod & piston assembly or inside of the cylinder barrel and the shaft for signs of scoring, pits, excessive wear or polishing. Scratches or pits deep enough to catch a fingernail are unacceptable. Polishing is a sign of uneven loading and if sufficiently polished the affected parts should be replaced.
4. Replace any parts or seals found to be unserviceable.

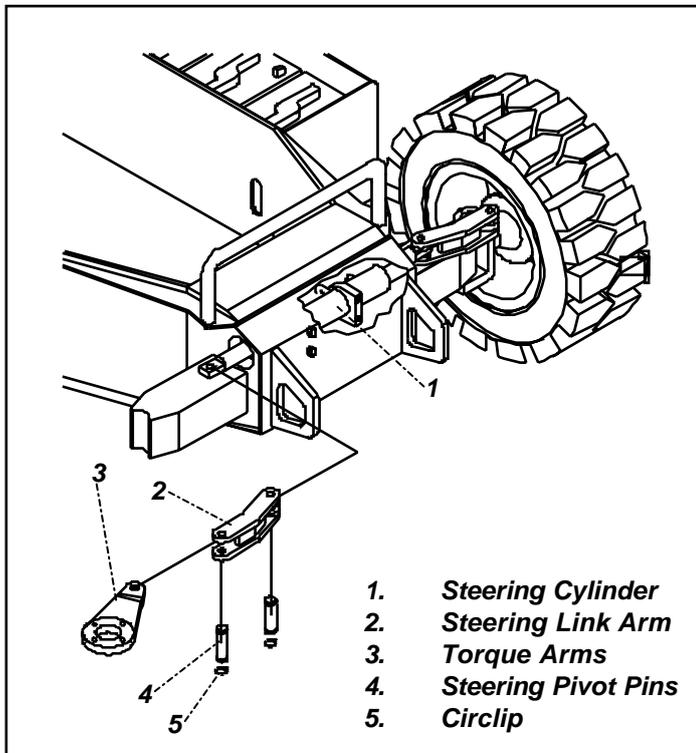


Figure 4-19: Steer Cylinder

REASSEMBLY/SEAL REPLACEMENT

Note: During seal replacement do not use sharp edged tools to avoid cutting the seals, and allow at least one hour for the seals to elastically restore to their original shape before assembly.

1. Lubricate and install new rod seal, rod wiper and static seal on the headcap.
NOTE: Multi-purpose lubricant should be used.
2. Install a new piston seal on the piston.
3. Install the headcap on one end of the cylinder barrel.
4. Lubricate the piston seal and install the rod &

piston assembly in the barrel tube.

6. Thread the headcap onto the free end of the barrel tube and hand tighten, then turn 1/4 turn further.

INSTALLATION

NOTE: Before installing the Steering Cylinder check cylinder pins and bearings for wear and replace if necessary.

1. While supporting the cylinder replace the four washers and bolts at the front panel of the A38E's chassis.
2. Move the steering arm so that the holes for positioning the pins are correct. Install each of the steering pivot pins and ensure that the circlips are attached properly.

NOTE: Take care in aligning the holes so that the pin can be pushed in by hand. If holes are not properly aligned and the pin is forced in, the bearings will be damaged.

Torque these four bolts to 90 Nm (66 ft. lbs).

3. Reconnect the hydraulic hoses.
4. Test system operation by carrying out a 'figure of eight' driving pattern for 5 cycles. This should be sufficient to prove proper function.

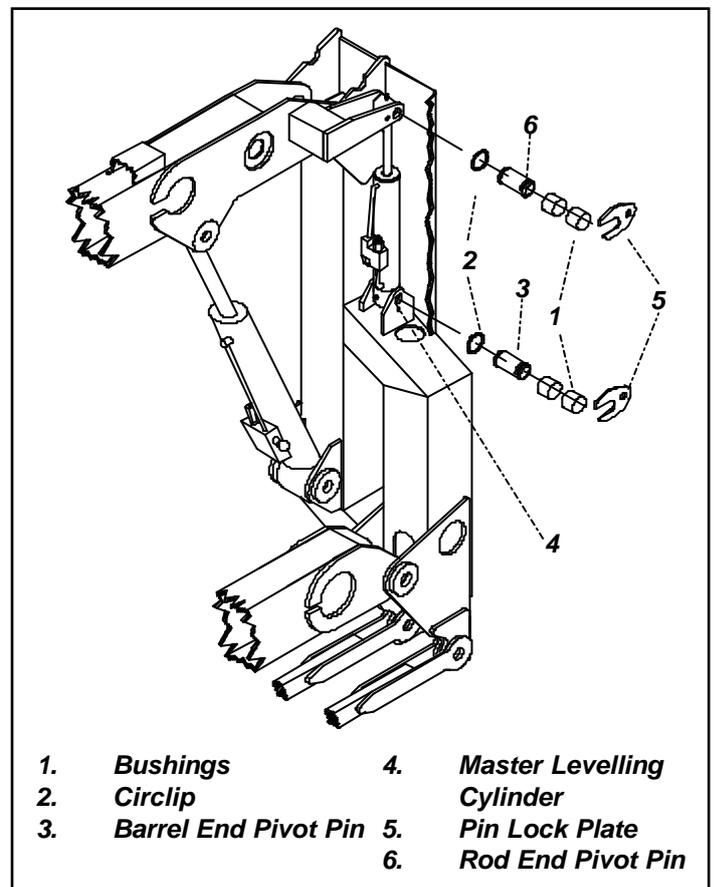


Figure 4-20: Master Levelling Cylinder

4.18 Master Levelling Cylinder (Figure 4-20)

REMOVAL

1. Ensure that the A38E is on firm level ground, the Elevating Assembly is completely stowed, the Keyswitch is to the 'OFF' position and the Emergency Stop Button is pressed.
2. Provide a suitable container to collect the hydraulic fluid, then disconnect the hydraulic hoses. Immediately plug hoses to prevent foreign material from entering.
3. Remove securing bolts and pin lock plates from the rod end cylinder pin. Remove the circlip from the barrel end of the cylinder
4. Support barrel end of cylinder and remove rod end pivot pin. Move cylinder backwards and allow to hang freely.
5. Support the cylinder so that the barrel end cylinder pin can be removed, then remove the cylinder from the machine.
6. Move the cylinder to a prepared work area. It is important that clean assembly practices are observed as seals and other hydraulic cylinder components are highly sensitive to contamination.

DISASSEMBLY (Refer to Figure 4-16)

1. Unscrew the headcap and withdraw the rod and piston assembly from the barrel tube.
2. Unscrew the piston nut and remove piston and headcap from the cylinder rod.
3. Remove the piston static O-ring from the cylinder rod.
4. Remove the piston seal from the piston.
5. Remove the rod seal, rod wiper and static seal from the headcap.
6. Care should be taken to save the O-ring and all other seals for reassembly, if they have been deemed serviceable following the cleaning and inspection phase of maintenance.

CLEANING AND INSPECTION

1. Clean all metal parts in solvent and blow dry with filtered compressed air.
2. Check all threaded parts for stripped or damaged threads.
3. Check the bearing surfaces inside of the headcap, outer edge surface of the piston,

inside of the cylinder barrel and the shaft for signs of scoring, pits, excessive wear or polishing. Scratches or pits deep enough to catch a fingernail are unacceptable. Polishing is a sign of uneven loading and if sufficiently polished the affected parts should be replaced.

4. Replace any parts or seals found to be unserviceable.

REASSEMBLY/SEAL REPLACEMENT

Note: During seal replacement do not use sharp edged tools to avoid cutting the seals, and allow at least one hour for the seals to elastically restore to their original shape before assembly.

1. Lubricate and install new rod seal, rod wiper and static seal on the headcap.
NOTE: Multi-purpose lubricant should be used.
2. Install a new piston seal on the piston.
3. Install the headcap on the cylinder from the piston end.
4. Install the piston, piston nut and a new piston static O-ring on the cylinder rod. Screw nut to end of thread and secure with circlip.
5. Lubricate the piston seal and install the piston and rod assembly in the barrel tube.
6. Thread headcap onto barrel tube and hand tighten, then turn 1/4 turn further.
7. Install the Master Cylinders Overcentre Valves.

INSTALLATION

NOTE: Before installing the Master Cylinder check cylinder pins and bearings for wear and replace if necessary.

1. Install barrel end bearing (if removed).
2. Lift the barrel end of the cylinder into place and push the barrel end pivot pin in until the circlip grooves are exposed, then attach the circlip.
NOTE: Take care in aligning the holes so that the pin can be pushed in by hand. If holes are not properly aligned and the pin is forced in, the bearings will be damaged.
3. Align pin lock plate on cylinder pin with hole in the 2nd Post and push the cylinder pin completely in and fix pin lock plate with bolt.
4. Install rod end bearings (if removed).
5. Lift rod end of cylinder into place and insert the rod end pivot pin until the circlip grooves are exposed, then attach the circlip. Install the pin lock plate.
6. Fix pin lock plate with bolt.
7. Test with weight at rated platform load to check system operation.

4.19 Slave Levelling Cylinder (Figure 4-21)

REMOVAL

1. Ensure that the A38E is on firm level ground, the Elevating Assembly is completely stowed, the Keyswitch is to the 'OFF' position and the Emergency Stop Button is pressed.
2. Provide a suitable container to collect the hydraulic fluid, then disconnect the hydraulic hoses. Immediately plug hoses to prevent foreign material from entering. Support the Platform
3. Remove securing bolts and pin lock plates from the cylinder pins.
4. Support barrel end of cylinder and remove rod end pivot pin. Move cylinder backwards allowing it to hang freely. Rotate the cylinder backwards.
5. Support the cylinder so that the barrel end cylinder pin can be removed, then remove the cylinder from the machine.
6. Move the cylinder to a prepared work area. It is important that clean assembly practices are observed as seals and other hydraulic cylinder components are highly sensitive to contamination.

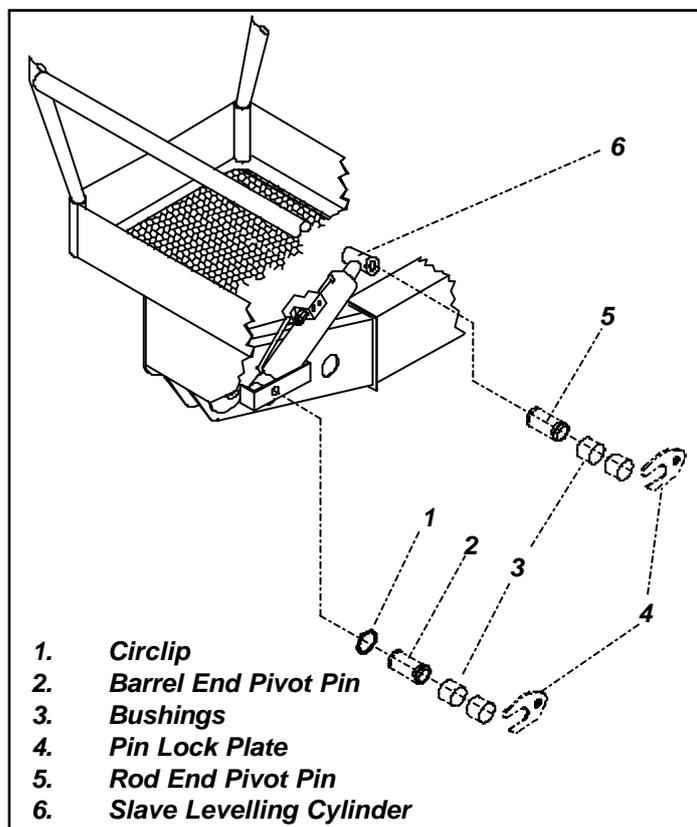


Figure 4-21: Slave Levelling Cylinder

DISASSEMBLY (Refer to Figure 4-16)

1. Unscrew the headcap and withdraw the rod and piston assembly from the barrel tube.
2. Unscrew the piston nut and remove piston and headcap from the cylinder rod.
3. Remove the piston static O-ring from the cylinder rod.
4. Remove the piston seal from the piston.
5. Remove the rod seal, rod wiper and static seal from the headcap.
6. Care should be taken to save the O-ring and all other seals for reassembly, if they have been deemed serviceable following the cleaning and inspection phase of maintenance.

CLEANING AND INSPECTION

1. Clean all metal parts in solvent and blow dry with filtered compressed air.
2. Check all threaded parts for stripped or damaged threads.
3. Check the bearing surfaces inside of the headcap, outer edge surface of the piston, inside of the cylinder barrel and the shaft for signs of scoring, pits, excessive wear or polishing. Scratches or pits deep enough to catch a fingernail are unacceptable. Polishing is a sign of uneven loading and if sufficiently polished the affected parts should be replaced.
4. Replace any parts or seals found to be unserviceable.

REASSEMBLY/SEAL REPLACEMENT

Note: During seal replacement do not use sharp edged tools to avoid cutting the seals, and allow at least one hour for the seals to elastically restore to their original shape before assembly.

1. Lubricate and install new rod seal, rod wiper and static seal on the headcap.
NOTE: Multi-purpose lubricant should be used.
2. Install a new piston seal on the piston.
3. Install the headcap on the cylinder from the piston end.
4. Install the piston, piston nut and a new piston static O-ring on the cylinder rod. Screw nut to end of thread and secure with circlip.
5. Lubricate the piston seal and install the piston and rod assembly in the barrel tube.
6. Thread headcap onto barrel tube and hand tighten, then turn 1/4 turn further.
7. Install the upper cylinder valve block. Check O-rings.

INSTALLATION

NOTE: Before installing the Slave Cylinder check cylinder pins and bearings for wear and replace if necessary.

1. Install barrel end bearing (if removed)
2. Lift the barrel end of the cylinder into place.
NOTE: Take care in aligning the holes so that the barrel end pivot pin can be pushed in by hand. If holes are not properly aligned and the pin is forced in, the bearings will be damaged.
3. Align pin lock plate on cylinder pin with hole in the bracket, push the cylinder pin completely in and fix pin lock plate with bolt. Attach the circlip inside the Telescopic Boom.
4. Install rod end bearings (if removed).
5. Lift rod end of cylinder into place and insert rod end pivot pin. Install pin lock plate.
6. Fix pin lock plate with bolt.
7. Test with weight at rated platform load to check system operation.

BLEEDING THE MASTER/SLAVE LEVELLING CIRCUIT

When air enters the Master/Slave Levelling circuit the Slave Levelling Cylinder is prevented from following the master cylinder precisely. If it seems there may be air in the system the following procedures should be followed.

1. While outside the Platform activate the Levelling Switch function and level the cage in the forward direction. Continue this until, and for 30 seconds after, the Platform comes to a stop.
2. Activate the Levelling function in the backward direction. Continue this until, and for 30 seconds after, the Platform comes to a stop. Care must be taken that the Platform Cage does not impact on the ground. Repeat this procedure until the cage becomes level when elevated.

The above two procedures have the effect of 'Priming' the Levelling Circuit. Test to see if the Slave Cylinder is operating correctly. If not follow the procedures below.

3. Ensure the Elevating Assembly is fully stowed and the booms are in their rest position.
4. Remove securing bolts and pin lock plates from the rod end cylinder pin of the Master Cylinder.
5. Remove the rod end pivot pin. Move cylinder backwards and allow to hang freely.
6. Loosen, but do not fully disconnect, the hose fitting at 'B'. Prepare to activate the Levelling

- Switch while a colleague holds a cloth at the fitting 'B'. Air will be expelled through this fitting.
7. Activate the Switch slowly in both directions until all air is expelled and hydraulic fluid begins to appear.
8. Repeat the above procedure for fitting 'A'. Lift the rod end of the cylinder into place and insert the pin until the circlip grooves are exposed, then attach the circlip. Install the pin lock plate.
9. Fix the pin lock plate with the bolt.
10. Support the Platform before removing the securing bolts and pin lock plates from the Slave Cylinders rod end pivot pin.
11. Remove the rod end pivot pin. Move the cylinder backwards allowing it to hang freely. Rotate the cylinder backwards.
12. Repeat the procedures outlined in Items 6, 7 & 8 for the Slave Cylinder.
13. Lift rod end of cylinder into place and insert pin. Install pin lock plate.
14. Fix pin lock plate with bolt.

4.20 Adjustment of Overcentre Valves on A38E Lift Cylinders (Figure 4-22)

The valve supplier delivers the Overcentre valve preset to specification and **SHOULD NOT** be adjusted by the user.

In the event of the valve having been tampered with the advisable course of action is to fit a replacement cartridge.

A **short term** solution is to temporarily adjust the valve as follows :-

- a) Place the max. SWL (Safe Working Load), evenly distributed, in the cage.
- b) Raise the boom to 50 mm stroke on the cylinder.
- c) First loosen the Locknut, then using an Allen Key adjust the spring setting screw on the valve cartridge. Turning the screw clockwise increases the pressure setting. Turning the screw anticlockwise reduces the setting and allows the boom to creep downwards. Adjust the spring setting until the boom just begins to creep downwards.
- d) Screw the adjuster **1 (one)** further turn **clockwise** and secure Locknut.

This operation should only be carried out by suitably qualified and/or experienced personnel.



The Overcentre Valves are located towards the Rod End of the Lower Lift and Upper Lift Cylinders.

Figure 4-22: Overcentre Valve



CAUTION



An incorrectly adjusted valve may cause one of the following:-

- Cylinder drifts down under load less than the SWL (Safe Working Load).
- Jerky motion in cylinder & boom when lowering.
- Pump under high load when lowering.
- Valve does not hold load if hose connections are loosened or broken.
- Damaged seals in cylinders due to high ambient temperature rise.
- High pitched sound from hydraulic system when lowering.

4.21 REPLACING THE GP400 CONTROL MODULE

If for any reason you have to replace the GP400 control module it is important that you complete the following procedures:



WARNING

If the GP400 control module is replaced and /or moved with the machine for any reason the tilt sensor must be result for zero ° and the loadcell re-calibrated using the following procedure.

Failure to do so could result in serious injury or death.

To follow this procedure you need to switch the Ezcal display in the lower control box into "Calibration mode".

To zero the tilt sensor :-

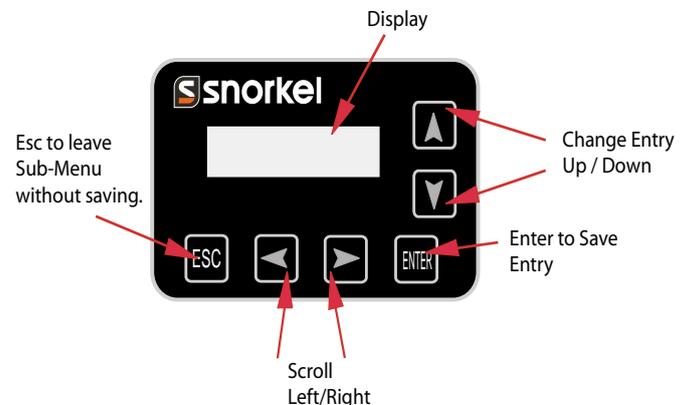
1. Place the machine on firm level surface, $\leq 0.25^\circ$
2. Use a Gauge to Confirm that the front and rear of the chassis are level to within $\pm 0.25^\circ$ in both directions.
3. Switch the machine on and press and hold Esc for 5 Seconds until "Ezlift Menu" is displayed.
4. Scroll to access level.(Enter)
5. Enter code 2222 for access level 2. (Enter)
6. Scroll to setups. (Enter)
7. Change defaults. (Enter)
8. Select Part number 1 (Enter)
9. Scroll to model
10. 1 = code(Enter followed by ESC)
11. Scroll to tilt setups. (Enter)
12. Calibrate level. (Enter)
13. Enter for yes.

To confirm calibration has worked switch the machine off then back on again.

14. Scroll to Diagnostics. (Enter)
15. System. (Enter)
16. Scroll to tilt, both reading should be below 0.2° if not repeat from 5.

Now Re-Calibrate the loadcell:-

17. Scroll to setups. (Enter)
18. Scroll to load setups. (Enter)
19. Scroll to Calibrate load (Enter)
20. Redo loaded? Press up arrow for yes, place SWL in basket and press enter twice.
21. Redo empty? Press up arrow for yes, remove load from platform and press enter twice.
22. Use arrow to enter calibration date and press Enter.
23. Place 120% of SWL in the platform and verify that the lift function cuts out automatically when raised off the boom switch.



4.22 CALLIBRATION OF THE LOAD CELL

If for any reason you have to replace the LOAD CELL it is important that you complete the following procedures:



WARNING

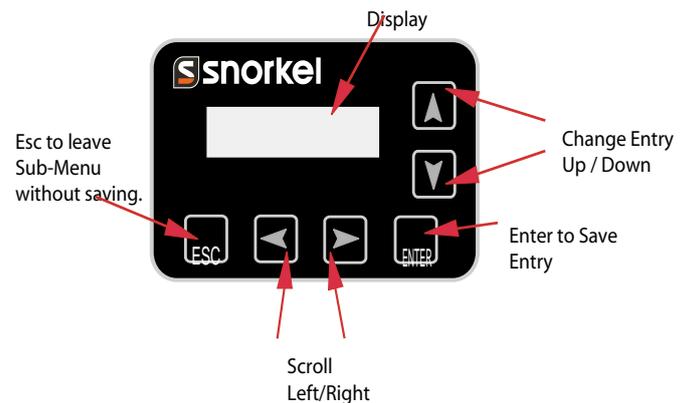


If the LOAD CELL is replaced and /or tampered with for any reason the loadcell must be re-calibrated using the following procedure.

Failure to do so could result in serious injury or death.

To follow this procedure you need to switch the Ezcal display in the lower control box into "Calibration mode".

1. Switch the machine on and press and hold Esc for 5 seconds until "Ezlift Menu" is displayed.
2. Scroll to access level. (Enter)
3. Enter code 2222 for access level 2. (Enter)
4. Scroll to setups. (Enter)
5. Scroll to load setups. (Enter)
6. Scroll to Calibrate load. (Enter)
7. Redo loaded? Press up arrow for yes, Place SWL in basket and press enter twice.
8. Redo empty? Press up arrow for yes, remove load from platform and press enter twice.
9. Use arrow to enter calibration date and press Enter.
10. Place 120% of SWL in the platform and verify the lift function cuts out automatically when raised off the boom switch.



3.0 Introduction

GENERAL FUNCTIONING

⚠ WARNING ⚠

To understand the properties of the A38E Work Platform it is recommended that you refer to the Hydraulic and Electrical Schematics in Section 6. All the information within this Service & Parts Manual should be read thoroughly and fully understood. Before beginning to operate the machine it is also a mandatory requirement to read, fully understand and follow the Operators Manual.

The A38E Lift and Steer functions are operated by utilising a battery powered electric motor which drives a hydraulic pump. The pump supplies oil under pressure to the various platform functions. The oil flow is directed to the different functions by electrically activated solenoid valves. The control of which solenoid valves activate and the rate at which the hydraulic fluid flows is carried by the application of the electrical circuit, and its components, to an ECU.

The Drive function is operated by utilising two drive motors which are controlled by a Electronic Traction Motor Controller.

NOTE:

An Interlock Trigger Switch is an integral part of the Joystick. This must be depressed for the functions to operate. This will energise the Line Contactor and enable electrical control. (This safety feature prevents inadvertent activation of all powered functions, in the case of accidental movement of the Joystick.)

DRIVING

Platform controls provide variable speeds for the drive function through the use of a Joystick. This is achieved using a motor control unit which varies the speed of the two DC electric traction motors. To drive the A38E there are a number of steps which need be taken. First the operator should ensure that neither of the Emergency Stop Buttons are pressed, then the Keyswitch on the ground control panel should be turned to the 'PLATFORM CONTROL' position. Momentarily operate the drive function switch and the A38E will be able to drive.

The machine will then drive at a speed proportional to the angle of the Joy- stick from the neutral

(centre) position, while the Joystick Interlock Switch is depressed. The speed range within which the machine will drive is determined by whether or not the booms are raised. If a boom is raised off the Boom Rest Limit Switch the current to the drive motors will be reduced leading to a significantly slower drive speed. This is a safety feature.

The drive wheels are driven by two DC electric traction motors coupled to two braked gearboxes. When the Joystick is in the neutral position the brake chamber is free of oil and the internal spring within the gearbox maintains the braking pressure. Upon moving the Joystick the brake chambers will receive a flow of pressurised oil which will release the brakes.

STEERING

Platform controls also provide a steering function through the use of 'Rocker' activated Steering Switches in the Joystick. This is achieved by using the P600 which varies the hydraulic flow by altering the voltage to the pump. To steer the A38E there are a number of steps which need be taken.

First the operator should ensure that neither of the Emergency Stop Buttons are pressed, then the Keyswitch ground control Panel should be turned to 'PLATFORM CONTROL' position.

Momentarily operate the drive function switch to drive and the A38E will also be able to steer. To steer the machine the Rocker should be pushed to the left or the right, while the Joystick Interlock Switch is depressed. Steering left or right will energise the steering coils and allow oil to enter the full bore side or annular side of the steering cylinder, thereby turning the wheels in the chosen direction.

NOTE:

Steering is not self-centring. The wheels must be returned to the straight ahead position by operating the Steering Switch.

OPERATING THE BOOMS

Boom functions, including the telescopic and slewing functions, can be operated either from the Platform Controls or the Chassis Controls.

The Platform controls provide variable speeds for the boom functions through the use of a Joystick. This is achieved using an P600 which varies the speed of the motor/pump unit and increases or decreases the flow of oil to the different functions. This control unit receives a control signal from the Joystick on the upper controls, the speed of the motor will increase as the Joystick is pushed further away from the

neutral (centre) position.

It will be noticed that on the Upper Control Box a set of switches are used to alternate functions. Each function will have its corresponding graphic and lamp. This selector switch indicates to the Controller which function is required and by using the Joystick the speed of this selected function can be adjusted.

Note: Machines supplied to Australia require that the operation of the Function Selector switch must be 'held' on until after the Joystick Interlock Switch is depressed. Every time the Joystick Interlock Switch is released, the Function Select and 'hold' sequence must be repeated.

The boom functions on the chassis controls provide proportional control for each function by way of an analog rocker switch, the desired function can be activated by holding on one of four switches on the controls and operating the analog rocker, the the four switches act as both selector & enable switches.

The use of these functions is further explained throughout this Section.

DESIGN FEATURES

The A38E Series Work Platform has the following features:

- The drive speed is limited to a 'creep speed' when operating the Work Platform while the machine is elevated.
- The energy-efficient motor control units provides long battery life and smooth proportional control of the boom and drive functions.
- All cylinders are fitted with hydraulic hose-burst protection interlocks.
- The on-board charger is fully automatic and charges the batteries efficiently and economically. If the work platform starts to become unstable and the Tilt Sensor is activated an alarm will sound in the upper control box. In this situation power is partially cut to the upper controls to prevent any boom movements (i.e. UP, TELE OUT) that might increase instability. An emergency override switch is fitted to allow the booms to be lowered at a controlled speed to bring the machine back to a stable position.
- In the event of a power loss the two Boom Lift Cylinders are fitted with emergency lowering valves which allow the booms to be lowered at a controlled speed by an operator on the ground.
- A Master Cylinder/Slave Cylinder levelling

system ensures that the Platform remains level throughout the entire working cycle of the machine.

- A manual rotation facility is fitted to allow rotation of the Elevating Assembly in the event of power loss.

HOUR METER & BATTERY CHARGE INDICATOR.

The A38E Series Work Platform is equipped with a display in the chassis control panel which displays total hours run & an Indication of remaining battery charge.

LOAD SENSING

The A38E is fitted with a load sensing system designed to comply with the requirements of :
BS EN 280 : 2013

If a load equivalent to 90% of safe working load is lifted an overload lamp will illuminate on the platform control box.

If a load which is greater than the safe working load is present in the basket all machine functions will cease to operate and an acoustic warning will sound. In order to return to normal operation a load equal to or less than the safe working load must be present in the basket and the power must be re-cycled, power can be re-cycled by pushing the emergency stop button and releasing it again.

3.1 Safety Rules and Precautions

⚠ WARNING ⚠

Before using the A38E Work Platform it is imperative to read, understand and follow the following Safety Rules and Precautions.

NEVER operate the machine unless you have been fully trained in its safe use, are medically fit and have read and fully understood these instructions.

NEVER leave the A38E unattended with the Platform in the raised position.

ALWAYS position the machine on firm level ground with a minimum bearing capacity of 550 kN/m² (80 psi).

CHECK that no overhead obstructions exist within the machines range of movement.

DO NOT work within 3 metres (10 feet) of live overhead cables. Set up warning tape barrier at the safe distance.

(THIS MACHINE IS NOT INSULATED).

DO NOT exceed the safe working load of 215 kg, (ANSI 475 lbs)

CE=max. 1 persons Outdoor + Tools 135Kg
2 person Indoor + Tools 55Kg

(ANSI=max. 2 person Indoor/Outdoor)

See specification table on page 1-3 .

NEVER sit, stand or climb on guard rail or midrail of the platform.

NEVER use ladders or scaffolding on the platform.

DO NOT use the machine as a crane or for any other application involving additional loads or forces. The maximum side force must not exceed 200N Outdoors / 400N Indoors, (ANSI = 90 ft. lbs).

DO NOT increase wind loadings by fitting items such as sign boards, flags etc. to the cage or boom.

DISTRIBUTE all loads evenly on the platform. See Table 1-1 for maximum platform load.

NEVER use damaged equipment. (Contact Snorkel Ltd. for instructions).

NEVER attach overhanging loads or increase the size of the working platform.

DO NOT use in winds exceeding 12.5 m/s (28 mph - Beaufort Force 6)

NEVER change or modify operating or safety systems.

INSPECT the machine thoroughly for cracked welds, loose hardware, hydraulic leaks, damaged control cable, loose wire connections and wheel bolts.

NEVER climb down an elevating assembly with platform elevated.

NEVER perform service on or in the elevating assembly while the platform is elevated without first blocking the elevating assembly.

NEVER recharge batteries near sparks or open flame; batteries under charge emit highly explosive hydrogen gas.

SECURE the work platform against unauthorised use by turning Keyswitch off and removing key from switch.

NEVER replace any component or part with anything other than original Snorkel replacement parts without Snorkel's consent.

NEVER leave the machine unattended while the Gearbox Drive is disengaged.

3.2 Controls and Indicators

The controls and indicators for operation of the A38E Work Platform are shown in Figures 3-1 & 3-2. The name and function of each control and indicator are listed in Tables 3-1. The index numbers in the figure correspond to the index numbers in the table. The operator should know the location of each control and indicator and have a thorough knowledge of the function and operation of each before attempting to operate the unit.

Table 3-1: Controls and Indicators***Platform Controller****

INDEX NO.	NAME	FUNCTION
1	Emergency Stop	Cuts all Platform control functions when pushed, twist to release.
2	Platform Level	Operate switch and hold while using joystick to level the platform.
3	Upper Boom	Operate switch to engage Upper Boom lift functions (Up & Down)
4	Low Boom	Operate switch to engage Lower Boom lift functions (Up & Down)
5	Drive	Operate switch to engage Drive functions (Forward & Reverse)
6	Horn	Operate switch and hold to sound the horn.
7	Slew (Rotate)	Operate switch to engage Slew functions (Clockwise & Counter Clockwise)
8	Warning Lamp	Low battery warning lamp
9	Telescope	Operate switch to engage Telescope functions (Extend & Retract)
10	Joystick	Depress deadman switch and select joystick forward or reverse to enable a selected function.
11	Warning Lamp	Overload warning lamp (CE Machines only)
12	Platform Rotate	Operate switch to engage platform rotate function (Clockwise & Counter Clockwise)

Chassis Control

INDEX NO.	NAME	FUNCTION
1	Emergency Stop	Cuts all machine functions
2	Upper Boom	Operate switch and hold to engage and enable Upper Boom lift functions (up & down)
3	Lower Boom	Operate switch and hold to engage and enable Lower Boom lift functions (up & down)
4	Slew (Rotate)	Operate switch and hold to engage and enable Slew functions (clockwise & counter Clockwise).
5	Telescope	Operate switch and hold to engage and enable Telescope functions (extend & retract)
6	Key Switch	Turns the machine OFF/ON and selects Platform or Chassis controls
7	Rocker Switch	Use with "enable" switches to activate the selected function
8	Display	In normal operation displays battery life and hour run. Can also be used to display diagnostics.

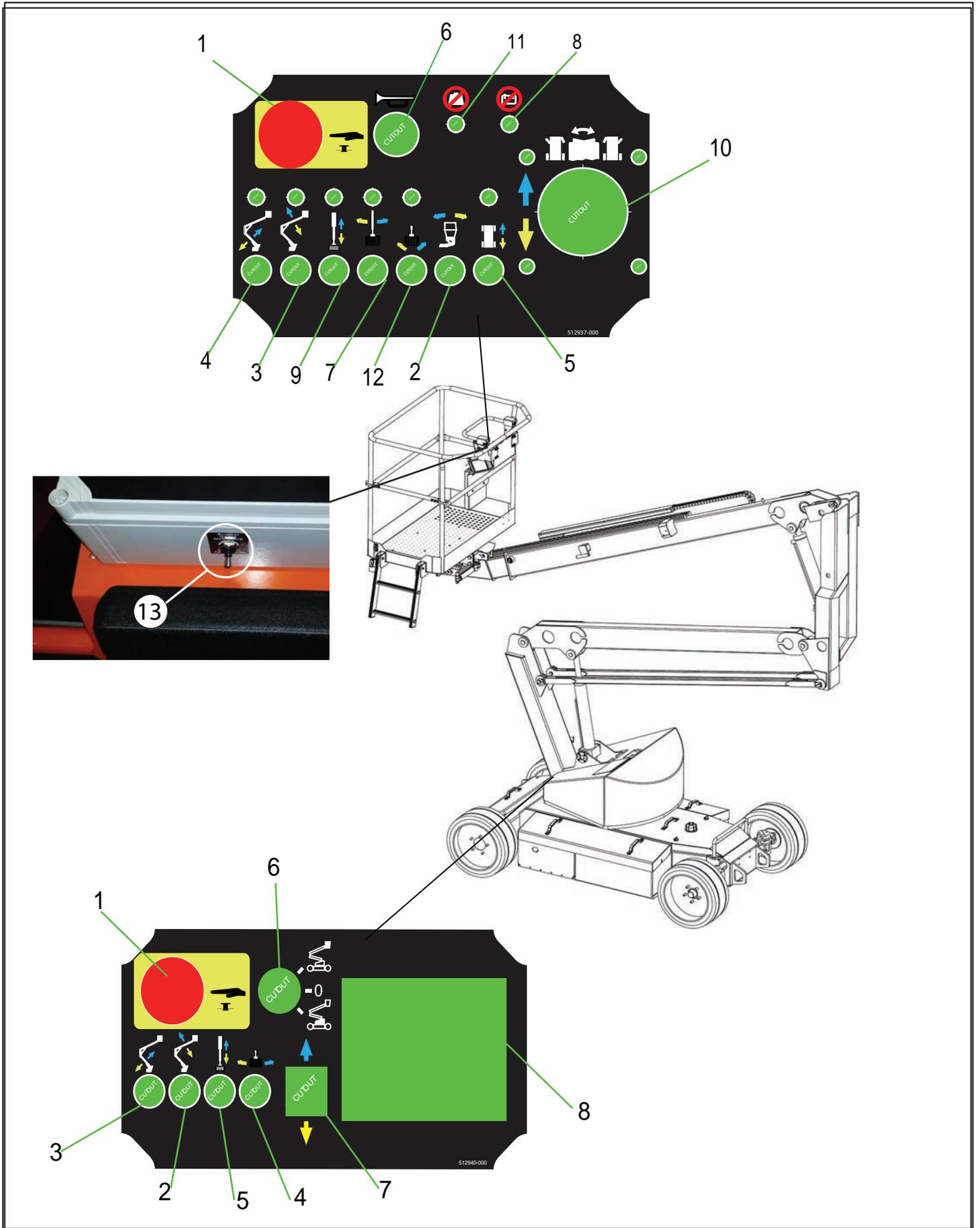


Table 3-1: Controls and Indicators

3.3 Pre-Operation Inspection

⚠ WARNING ⚠

Carefully read, understand and follow all safety rules and operating instructions. Perform the following steps each day before use. **DO NOT** perform service on Work Platform with the platform elevated unless the elevating assembly is properly supported.

1. Remove module covers and inspect for damage, oil leaks or missing parts.
2. Check the level of the hydraulic oil with the platform fully lowered and the Telescopic Boom fully retracted. Oil should be visible on the filler cap dip stick. If necessary top-up using ISO No. 46 hydraulic oil.
3. Check that the electrolyte level in the batteries is correct. (Battery Maintenance, Section 4.3)
4. Verify batteries are charged.
5. Check that the A.C. extension cord has been disconnected from charger.
6. Carefully inspect the entire machine for damage such as cracked welds or structural members, loose or missing parts, oil leaks, damaged cables or hoses, loose connections and tyre damage.
7. Move machine, if necessary, to unobstructed area where machine can be fully elevated.
8. Visually inspect the cylinders, hoses and cables for damage. Check for missing or loose parts.

SYSTEM FUNCTION INSPECTION

9. Turn both Chassis and Platform Emergency Stop switches **ON** (rotate clockwise).
10. Turn Keyswitch on the Lower Control box to the '**LOWER CONTROL SELECTION**'.
11. Using the chassis control switches, fully **ELEVATE** Booms no. 1 & 2 and **EXTEND** the Telescope.
12. **SLEW** the Elevating Assembly through 180 degrees in both directions.
13. Visually inspect the elevating assembly and cage mounting/structure, lift cylinders, cables and hoses for leaks, damage or erratic operation. Check for missing or loose parts such as nuts, bolts and circlips.
14. Test that the Emergency Lowering Valves on each of the Lift Cylinders is operating correctly as detailed in *Section 3.4*. **PUSH** the Emergency Stop Button to identify that functions will indeed cease when depressed.
15. Operate the manual telescopic retraction

system using the Handpump to test that it will work.

16. **LOWER** each boom until the Elevating Assembly is fully stowed. Turn Keyswitch on the Lower Control box to the '**LOWER CONTROL SELECTION**'. Climb into the Platform and check that the Platform is level. If not adjust as shown in the Platform Levelling Section of this manual. Repeat all the above tests from the Platform Controls. Push the Emergency Stop Button to identify that functions will indeed cease when depressed. Bring the machine back to the stowed position and retract the Telescopic Cylinder.
17. **PRESS** the Service Horn to see that it is operational. Select the **DRIVE** function. While pressing the Joystick Interlock Switch slowly **PUSH** the Joystick to **DRIVE FORWARD**, and then **PULL** to **DRIVE REVERSE**, to check for speed and proportional control. The farther you push or pull the Joystick the faster the machine will travel.
18. **PUSH** the Steering Switch **RIGHT** and then **LEFT** to check for steering control.
19. **RAISE** the Elevating Assembly until the Boom Rest Limit Switch is no longer activated and then repeat the Drive Function test. Only low speed ('**CREEP SPEED**') should be available.

The System Function Inspection is then complete.

⚠ WARNING ⚠

If there are any concerns about the safe use or operation of the A38E following this Pre-Operation Inspection **DO NOT USE THE A38E WORK PLATFORM**. Contact your supplier or Snorkel's Product Support Department.

Note: Machines supplied to Australia require that the operation of the Function Selector switch must be 'held' on until after the Joystick Interlock Switch is depressed. Every time the Joystick Interlock Switch is released, the Function Select and 'hold' sequence must be repeated.

3.4 Operation

NOTE: Before operating the A38E Work Platform it is imperative that the Pre-Operation Inspection (Section 3.3) has been completed and any deficiencies have been corrected. The operator must also understand the functions of all the controls before operating the machine.

ELEVATING & LOWERING THE A38E WORK PLATFORM

Before beginning any operation involving the Elevating Assembly the following checks should be carried out. When the A38E has been thoroughly inspected the elevating assembly can then be used.

⚠ WARNING ⚠

LOOK up and around for obstructions before performing the lift function.

ENSURE that the Elevating Assembly is clear of the Chassis before engaging the Slew operation.

DO NOT overload the platform DO NOT operate within 3 metres (10 feet) of any electrical power cables. THIS WORK PLATFORM IS NOT INSULATED.

Cordon off the area within the platform's working area to keep passers-by clear of the booms.

NOTE: Chassis controls are for service use only.

1. Ensure the 'CONTROL SELECTION KEYSWITCH' is selected to 'UPPER CONTROL' and both emergency stop buttons are released (twisted clockwise).
2. Enter Platform through the entrance at the side of the A38E and ensure that the drop bar is in the lowered position. Lock the Entry Step in the raised position.

⚠ WARNING ⚠

Damage to the machine is possible if the Entry Step is not locked in the raised position before operating the machine functions.

3. Before using the machine all local Safety Regulations involving helmets and restraining devices should be observed. Safety harness lanyards, not exceeding 1 m (3 ft.) in length, should be attached to anchor points in cage floor.
4. Select " LOWER BOOM " on function selector switch. Check for overhead obstructions and

when when satisfied squeeze the Joystick Interlock control on.

Slowly move the Joystick forward to **ELEVATE** the lower boom.

The further the joystick is moved, the faster the boom will move. Pressure must be applied to the Interlock at all times while operation is required.

5. Select "UPPER BOOM", "TELESCOPE", "PLATFORM ROTATE" or "SLEW ROTATE" as required using the 'Function Selector Switches' and operate as described above. For boom functions the controls will again be forward for **UP** and backward for **DOWN**.
6. To rotate (**SLEW**) **RIGHT** the Controller Joystick should be moved forward. Conversely to rotate (**SLEW**) **LEFT** move the Controller Joystick backward.
7. To "TELESCOPE" **IN** the Controller Joystick should be moved forward. Conversely to "TELESCOPE" **OUT** move the Controller Joystick backward.
8. Before lowering, check beneath the cage floor for obstructions, operate as described above, moving the Joystick back to lower the Booms.

Note: Machines supplied to Australia require that the operation of the Function Selector switch must be 'held' on until after the Joystick Interlock Switch is depressed. Every time the Joystick Interlock Switch is released, the Function Select and 'hold' sequence must be repeated.

TRAVEL WITH WORK PLATFORM LOWERED

1. Verify that the chassis Emergency Stop Button is in the 'ON' position (turn clockwise) and that the Keyswitch is turned to the 'UPPER CONTROL' position.
2. Climb into the Platform and check that the Platform Emergency Stop Button is in the 'ON' position, and that the Drive function button is depressed. Ensure that the drop bar is in the lowered position and the Entry Step is raised.
3. Check that the route is clear of persons, obstructions, pot holes or ledges and is capable of supporting the wheel loads. Also, check that the clearances above, below and to the side of the Work Platform are sufficient.
4. Grasp the Joystick so that the Interlock Switch is depressed (releasing this Interlock Switch will cut power to the Joystick). Slowly push or

pull the Joystick to **FORWARD** or **REVERSE** to travel in the desired direction. The farther you push or pull the Joystick from the centre the faster the machine will travel.

- To “**STEER**” the A38E activate the Interlock Switch while pushing the Steering Switch **LEFT** or **RIGHT** to turn the wheels. Observe the tyres while manoeuvring to ensure proper direction.

NOTE:

Steering is not self-centring. The wheels must be returned to the straight ahead position by operating the Steering Switch.

TRAVEL WITH WORK PLATFORM ELEVATED

⚠ WARNING ⚠

Travel with platform elevated **ONLY** on firm and level surfaces. Platform motion is exaggerated while travelling on uneven surfaces.

NOTE:

The Work Platform will travel at reduced speed when in the elevated position.

- Check that the route is clear of persons, obstructions, pot holes or ledges and is capable of supporting the wheel loads. Also, check that the clearances above, below and to the side of the Work Platform are sufficient.
- Operate the Drive function switch.
- Grasp the Joystick so that the Interlock Switch is depressed (releasing this Interlock Switch will cut power to the Joystick). Slowly push or pull the Joystick to **FORWARD** or **REVERSE** to travel in the desired direction. The farther you push or pull the Joystick from the center the faster the machine will travel.

⚠ CAUTION ⚠

If the machine comes to a halt and the Tilt Alarm sounds, immediately lower the Platform and move the machine to a level location before re-elevating the Platform.

PLATFORM LEVELLING

NOTE:

The Levelling function will only work when the Boom Rest Limit Switch has been activated i.e. when the

Booms are stowed.

The platform can be levelled from the Upper controls using the levelling function, operate and hold the levelling switch on the upper control box (see fig3-1) while moving the joystick forward or back to level the platform. The switch should be operated in short bursts to level the platform **slowly**.

PLATFORM ROTATE

Some machines are equipped with a platform rotate function. The platform can be rotated 150 degrees, 75 degrees either side of the boom using the following methods depending on machine platform type.

NOTE: Hydraulic platform rotate and manual platform rotate function is an option, machines without these options are fitted with fixed Platforms.

HYDRAULIC PLATFORM ROTATE

- Ensure the ‘**CONTROL SELECTION KEYSWITCH**’ is selected to ‘**UPPER CONTROL**’ and both emergency stop buttons are released (twisted clockwise).
- Enter Platform through the entrance at the side of the A38E and ensure that the drop bar is in the lowered position. Lock the Entry Step in the raised position.

⚠ WARNING ⚠

LOOK up and around for obstructions before performing the platform rotate function. ENSURE that the platform is clear of the Chassis and the Step is in the raised position before engaging the rotate operation.

- Operate the Platform Rotate switch, ensuring the selection light illuminates (refer to figure 3-1).
- Grasp the Joystick so that the Interlock Switch is depressed (releasing this Interlock Switch will cut power to the Joystick).

Note: Machines supplied to Australia require that the operation of the Function Selector switch must be ‘held’ on until after the Joystick Interlock Switch is depressed. Every time the Joystick Interlock Switch is released, the Function Select and ‘hold’ sequence must be repeated.

5. To rotate the “**PLATFORM**” **RIGHT**, the Controller Joystick should be moved forward. Conversely to rotate “**PLATFORM**” **LEFT** move the Controller Joystick backward.
6. Position the Platform perpendicular to the booms when driving or stowing the aerial platform.

MANUAL PLATFORM ROTATE

Turn the hand crank (refer to Figure 3-2) counterclockwise to rotate the platform to the left and clockwise to rotate the platform to the right.

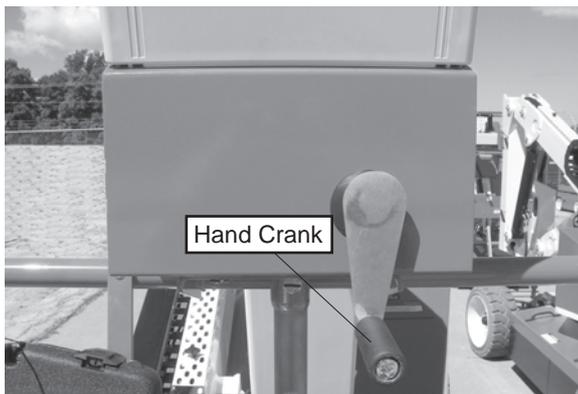


Figure 3-2: Manual Platform Rotator

Position the platform perpendicular to the booms when driving or stowing the aerial platform.

EMERGENCY SITUATIONS & EMERGENCY OVERRIDE

In any emergency situation, the first action to be taken should be to hit the red “Emergency Stop” button for instant cutout of all functions. It will then be required to twist the button clockwise, this releases the cutout and the machine can be operated again.

If the audible Tilt warning alarm sounds, normal control functions will cease to operate. This will be due to the following problem ;

- the machine is out of level i.e. Tilt Sensor has been activated.

In this situation the only machine functions that will operate are descent functions, descend to the ground in a controlled manner and cycle the power (push and release the emergency stop) to restore all functions, move the machine to a level surface and continue with normal operation.

Note that during emergency operation, controls will operate at a fixed, slow speed and will not allow the raising or extending of the Booms.

The Booms can be lowered or retracted.

Emergency Lowering

⚠ CAUTION ⚠

When operating this function, extreme care must be taken to ensure that the person carrying out the task does not become trapped by the structure. **DO NOT** climb down the Elevating Assembly to operate these valves.

Should the machine become inoperable when elevated, request a person on the ground to lower the platform using the emergency lowering valves. These are red knobs (push type) mounted at the base of the 2 Main Hydraulic Lift Cylinders (See Figure 3-3).

Operate the lower boom first by pushing slowly.

The boom will descend slowly. The speed of descent is controlled by retaining pressure on the valve - ensure a slow controlled rate of descent at all times. Descent can be halted at any time by removing pressure from the red knob.

Repeat the operation if necessary for the upper boom when cylinder is in reach of the ground.

With both main booms lowered fully it should then be possible to leave the platform safely.



Before operating the Emergency Lowering Valves the surrounding area should first be cleared of any potential obstructions. It is also important that when the valve is pushed, it is initially done slowly. This is so that sudden movement will not occur in the Elevating Assembly, leading to a potentially unstable machine.

Figure 3-3: Emergency Lowering

CONTROL FROM GROUND LEVEL

1. Chassis Controls are fitted at the base of the Elevating Assembly. These should be used when no operator is in the platform (for maintenance/ service or inspection purposes), or if the operator has become incapacitated. For further information see Table 3-1.
2. Use the appropriate switch to raise or lower Boom 1, Boom 2, Telescope or rotate as required.

AFTER USE EACH DAY

1. Ensure that the platform is fully lowered.
2. Park the machine on level ground, preferably undercover, secure against vandals, children or unauthorised operation.
3. Turn key switch to **OFF** and remove key to prevent unauthorised operation.
4. Recharge batteries in accordance with the instructions in section 4.2.

MANUAL ROTATION

1. Ensure booms are lowered as far as possible using the emergency lowering valves, and that the Emergency Stop Button is pressed to prevent any accidental powered operation.
2. Apply a 7/8" socket wrench to shaft and turn to rotate elevating assembly.
3. Remove wrench.

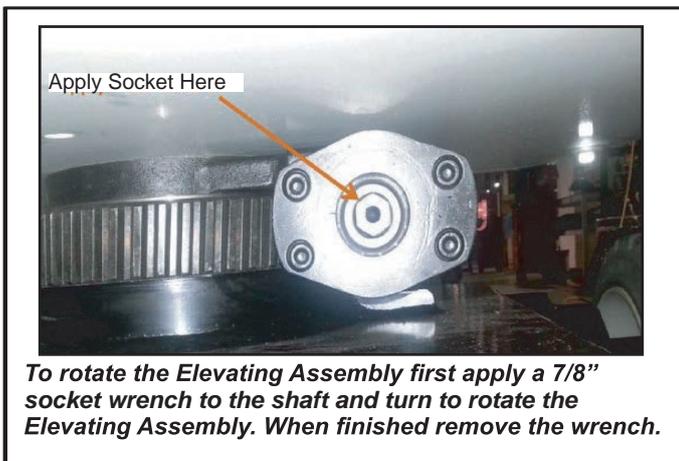


Figure 3-4: Manual Rotation

MANUAL TELESCOPIC RETRACTION (SEE FIGURE 3-7)

In the event of loss of electrical power the Telescopic Cylinder can be retracted as follows:

1. Remove the cover from the chassis body.
2. The Handpump is attached to the Main Manifold Block. Remove the Handpump Handle from the clips on the side of the Chassis and insert into the Handpump Valve as shown in Figure 3-7.
3. Operate handpump to retract the tele cylinder.
4. After use replace the Handpump Handle in the clips provided.
5. Reposition the cover on Chassis.

SNORKEL GUARD / OVERRIDE SWITCH

▲ WARNING ▲

The potential for an accident increases when safety devices do not function properly. Death or serious injury could result from such accidents. The Snorkel Guard override switch must only be used when all controls are released and in the neutral position. If a zero or neutral state cannot be achieved, depress the emergency stop and obtain assistance at the lower controls.

SNORKEL GUARD

The Snorkel Guard™ is a mechanically activated guarding system which offers an additional level of protection to the operator at the upper controls.

If an operator is involuntarily pushed against the spring-loaded Snorkel Guard™ rail that is mounted above the upper control panel, the machine functions are disabled.

When the Snorkel Guard is activated:

- the horn sounds.
- the blue light located on the machine chassis flashes (refer to Figure 3.6).
- all functions are interrupted.

OVERRIDE SWITCH OPERATION

When the Snorkel Guard™ system is activated, the Snorkel Guard™ override switch (located on the front face of the upper control box, refer to Figure 3.5) is used to override the system and allow operation of the descent functions only. The switch is spring returned to the normal operation position when released.

Additionally, when the Snorkel Guard™ is activated, the machine can be operated from the lower control panel.

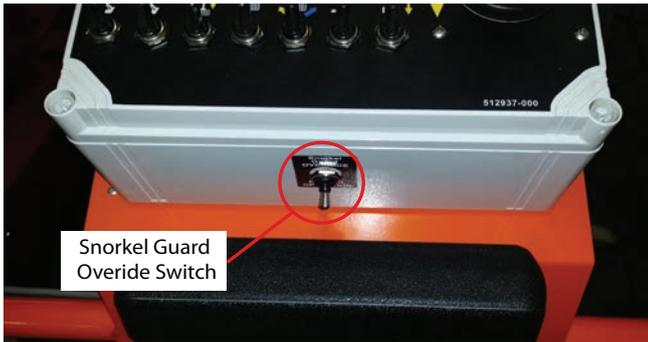


Figure 3-5: Snorkel Guard Override switch

1. When machine is stopped due to activation of the Snorkel Guard system, immediately depress the emergency stop, release all controls. Perform an assessment of the situation which caused the system to activate.
2. If it is determined that all controls are released and operation can proceed, return the emergency stop to the on position, and activate the Snorkel Guard override switch.
3. Activate the lowering functions to move the platform away from the obstacle that caused the Snorkel Guard activation.

Note: Only lowering functions are available when Override Switch is enabled.

4. Release switch to the downward position to resume normal Machine operation.
5. Assess the machine for any damage. If damage occurred, return to stowed position, exit the unit and perform a thorough inspection before returning to service.



Figure 3-6: Snorkel Guard Blue Beacon

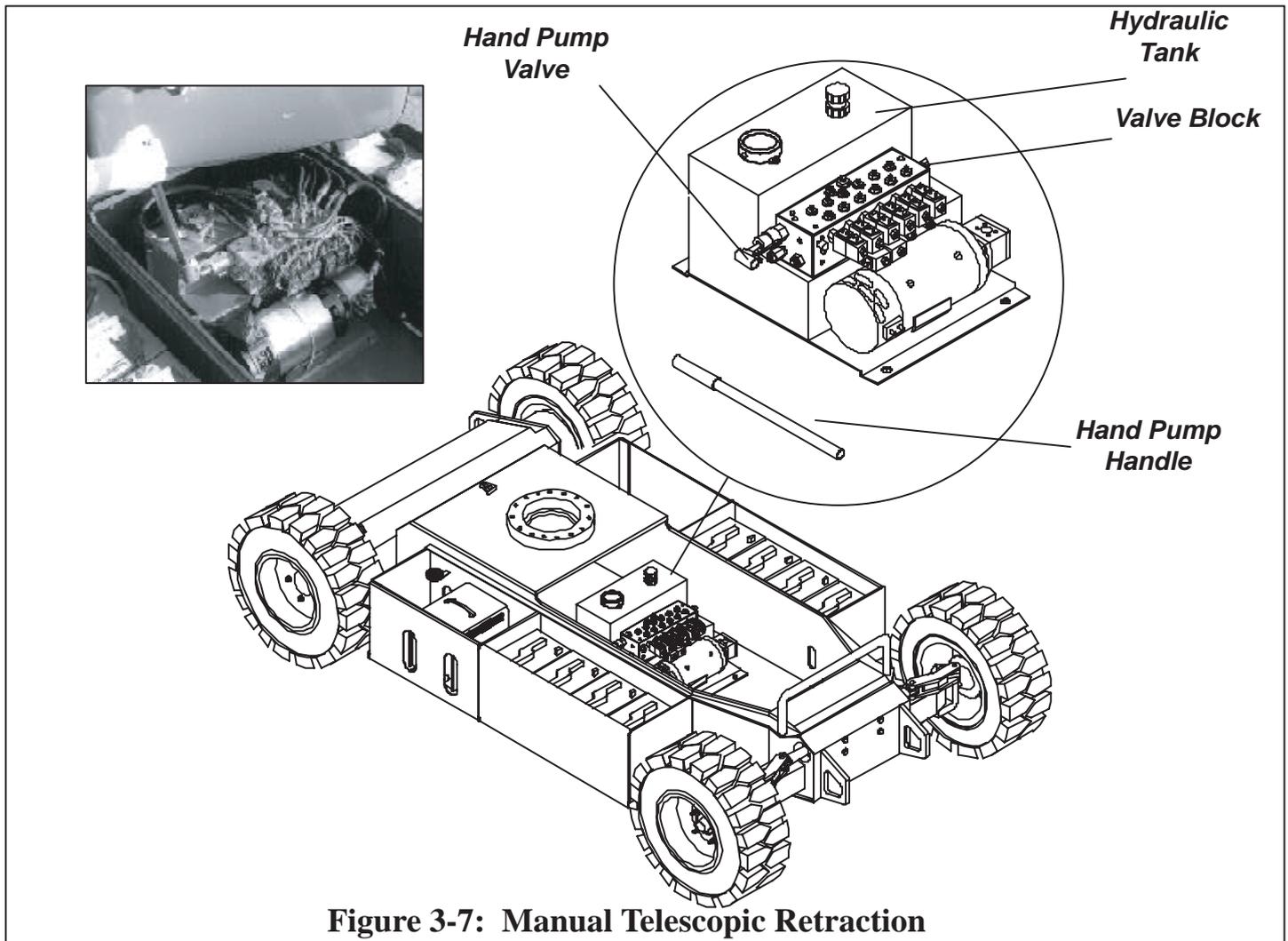


Figure 3-7: Manual Telescopic Retraction

5.0 Introduction

The following section provides troubleshooting guidelines to be used to locate and correct most of the operational problems which may occur. Problems which arise and which are not solved by following corrective actions should be referred to a technically qualified person, as there is no substitute for a thorough knowledge of and practical experience in the servicing and repair of related equipment and machines.

For further assistance contact the local distributor and if warranted the Snorkel product support at:

EUROPE, MIDDLE EAST
AFRICA & ASIA
PHONE: +44 (0) 845 1550 058
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: +61 1300 700 450
FAX: +61 2 9609 3057

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

Referring to Operators Manual and to Section 3.0 and Section 6.0 will aid in understanding the operation and function of the various components and systems of the A38E Work Platform and help diagnosing and repair of the machine.



WARNING



When troubleshooting, ensure that the work platform is resting on a firm, level surface. Disconnect the batteries when replacing or testing the continuity of any electrical component.

When performing any service on or in the elevating assembly area, which requires the platform to be raised, the elevating assembly must be securely supported by overhead cranes, or equivalent, of suitable capacity.

GENERAL PROCEDURE

Each malfunction is followed by a list of probable causes which will enable determination of the remedial action.

The Probable causes and remedial action should be followed in the order in which they are listed in the following tables.

Note that the majority of problems will be related to the electrical and hydraulic systems.

For this reason much attention has been paid to these areas in the troubleshooting charts.

The lists are not guaranteed to include all possible causes and remedies. The immediately obvious causes and remedies are not necessarily listed.

1. Verify your problem.

- Do a full function test from both the platform and chassis controls, and note all functions that are not operating correctly.

2. Narrow the possible causes of the malfunction.

- Use the troubleshooting guide to determine which components are common to all circuits that are not functioning correctly.

3. Identify the problem component.

- Test components that are common to all circuits that are not functioning correctly. Remember to check wires and terminals between suspect components, be sure to check connections to battery negative.

4. Repair or replace any component found to be faulty.

5. Verify that repair is complete.

- Do a full function test from both the platform and the chassis controls to verify that all functions are operating correctly and that the machine is performing to specified values.

SPECIAL TOOLS

The following is a list of tools which may be required to perform certain maintenance procedures on the AB38.

- Flow Meter with Pressure Gauge (**Snorkel** P/N: 067040-000).
- 0-69 bar (0-1000 psi) Hydraulic Pressure Gauge with Adapter Fittings (**Snorkel** P/N: 014124-010).
- 0-207 bar (0-3000 psi) Hydraulic Pressure Gauge with Adapter Fittings (**Snorkel** P/N: 014124-030).
- Adapter Fitting (**Snorkel** P/N: 063965-002).
- Inclinator (**Snorkel** P/N: 010119-000)
- Crimping Tool (**Snorkel** P/N: 028800-009)
- Terminal Removal Tool (**Snorkel** P/N: 028800-006)
- Calibrator EZcal (**Snorkel** P/N: 504560-001)

ADJUSTMENT PROCEDURES

Hydraulic settings must be checked whenever a component is repaired or replaced. Remove counterbalance valves and “bench test” them if they are suspect. Connect a pressure gauge of appropriate range to the test port located on the hydraulic manifold. Correct pressure settings are listed in the hydraulic schematic.

CHECKING PUMP PRESSURES

Remove hose from pump port and connect pressure gauge.

DIAGNOSTICS USING EZCAL DISPLAY

The EZcal Display can be switched into calibration mode to become an invaluable tool when troubleshooting on this machine.

Switch the machine on, press and hold Esc for 5 seconds until “SNORKEL EBOOM” is displayed then select diagnostics, the following menu’s are available:

1.	SYSTEM -	ENABLED	Display status of joystick trigger or enable switches.
		B+ SUPPLY	Displays Battery Voltage
		TRACTION	Demand ON or OFF, Armature & Field Current and SEM600 controller Temperature.
		PUMP	Pump Motor Voltage and Current and P600 Controller Temperature
		TILT	Displays tilt angle of the machine in X and Y, both should be less than 3 degrees
		HEIGHT	N/A
		LOAD	Displays load as a percentage of SWL
		OVERLOADED	Yes or No
		ELEVATED	Yes or No
2.	FUNCTIONS-	DRIVE	These display the percentage demand for each function.
		STEER	
		LL (LOWER LIFT)	
		UL (UPPER LIFT)	
		JIB (N/A)	
		BASKET	
		TELE	
		SLEW	
		INTERLOCK	
3.	DIGITALS	VERIOUS	Displays the condition of all digital inputs to the relevant controller & matrix, refer to the following table and the circuit diagram on page 6.1 for full list of I/O's.
4.	ANALOG	VERIOUS	Displays the condition of all analogue inputs to relevant controller & matrix.
5.	OUTPUT	VERIOUS	Displays the condition of all outputs from the relevant controller & matrix.

Troubleshooting

Section
5.0

MATRIX I/O		Sch. 15 500 410	AB 38	Rev 1
MP1-1	B+ supply		B+ supply	
P1-2	B+ supply			
P1-3	CANH		CANH	
P1-4	GND		GND	
P1-5	GND			
P1-6	CANL		CANL	
P2-1	B+ Digital Input			
P2-2	B+ Digital Input			
P2-3	B+ Digital Input		Steer Left Sw.	
P2-4	B+ Digital Input		Steer Right Sw.	
P2-5	B+ Digital Input		Trigger Sw.	
P2-6	Analog Input		Joystick Hall effect output	Direction & proportional control of selected function
P2-7	Analog Input			
P2-8	B- protected Supply	P2-8 & P2-11 share the same PTC		
P2-9	B+ protected Supply	P2-10 & P2-12 share the same PTC		
P2-10	5V protected Supply	(PTC 140mA)	Joystick Hall effect supply	
P2-11	B- protected Supply	P2-8 & P2-11 share the same PTC	Joystick Hall effect gnd	
P2-12	B+ protected Supply	P2-10 & P2-12 share the same PTC	Joystick Sw's supply	
P3-1	Mux digital input			Connect to common of all function Sw's
P3-2	Mux digital input		Moba Alarm output	High when Overload
P3-3	Mux digital input		Overload Sw.	0V when overload
P3-4	Mux High side output		Lower Boom function select Sw.	momentary SW's, latching function, & turning ON selected functions lamps
P3-5	Mux High side output		Upper Boom function select Sw.	
P3-6	Mux High side output		Tel Boom function select Sw.	
P3-7	Mux High side output		Slew Boom function select Sw.	
P3-8	Mux High side output		Basket Boom function select Sw.	momentary SW's, function not latching, function activated if Sw. closed and elevation Sw. closed
P3-9	Mux High side output		Drive function select Sw.	
P3-10	Mux High side output			
P3-11	Mux High side output			
P3-12	Mux digital input		Moba lamp output	pulse 1s ON, 1s OFF when 80% overload
P4-1	Low side 1A output		Buzzer	ON when overloaded (P3-3 @ 0V)
P4-2	Low side 1A output			
P4-3	Low side 1A output		Overload lamp	mimic P3-12 + flash quicker when overloaded (P3-3 @ 0V)
P4-4	Low side 1A output		Lower boom selected	ON when function latched
P4-5	Low side 1A output		Upper boom selected	ON when function latched
P4-6	Low side 1A output		Tele boom selected	ON when function latched
P4-7	Low side 1A output		Slew boom selected	ON when function latched
P4-8	Low side 1A output		Drive boom selected	ON when function latched
P4-9	N/C			

TROUBLESHOOTING TABLES

The next step is to refer to the Troubleshooting charts in tables.

Refer to Hydraulics section for detailed troubleshooting information on the pump/motor controller.

Read and understand the principles of operation before commencing any troubleshooting.



WARNING



RISK OF SERIOUS INJURY.

Ensure that the work platform is resting on firm, level surface.
The elevating assembly must be supported by an overhead hoist when troubleshooting and servicing the electrical/hydraulic system.

5.1 GENERAL TROUBLESHOOTING

PROBLEM	CAUSE	ACTION
All functions inoperable. Electric motor does not start.	1. Blown main fuse	Check the 300A fuse and replace if necessary
	2. Faulty Battery Charger	Connect charger to batteries and check the output voltage. If less than 48v, repair or replace. Check input voltage to charger. Check the internal charger protection fuse.
	3. Faulty Battery	Charge batteries overnight. Check individual cell voltage. Replace as necessary.
	4. Loose or broken battery leads	Check resistance and continuity of each individual lead. Replace as required.
	5. Emergency Stop buttons contacts failed	Check resistance and continuity of each individual lead. Replace as required.
	7. Loose Upper Control Box Terminal	Unscrew connector, align locating tabs and reconnect
	8. Battery Disconnect plug loose	Check and reconnect. Check the internal steel points for pitting or damage
	Electric motor starts but all functions are inoperable	1. Low hydraulic oil
2. Faulty hydraulic pump		Insert a pressure gauge in the G1 port of the valve block. Operate a function to the limit of stroke. Check that relief valve pressure develops. Repair or replace.
3. Faulty controller		Check the 10mm cable terminals for tightness.
Electric motor continues to run when action has ceased	1. Line contactor malfunction	Check the contact faces. Fusing or arcing due to contamination destroys the contacts. Replace the unit.
Pl.atform elevates very slowly or not at all	1. Leaking emergency lowering valves	Check the operating levers and cables. Check closure of the control knob at the base of the control valve block. Remove and replace the cylinder-mounted valves as necessary.
	2. Faulty lift valve solenoids	Test the voltage to the mast and jib solenoids. Swap around solenoids to isolate the problem. Solenoids are not serviceable.
	3. Platform overloaded	Remove excessive load. Check the pressure setting of the hydraulic 'lift limit' relief valve (CT11) on the block. This may only be reset at 215 kg payload in the platform.
	4. Low Battery level	Check the battery cell voltages after recharging. Total battery pack voltage should exceed 18v. Charge the batteries or replace faulty battery unit.
Platform drifts down uncontrollably	1. Leaking emergency lowering / hose burst valves	Check the operating levers and cables. Check contamination within the valve. Check closure of the control knob (CT14) at the base of the control valve block. Remove and replace the cylinder-mounted valves as necessary.
	2. Cylinder piston seal internal leakage	Switch off all power functions. Disconnect the hose from the annular side of the cylinder and check for small oil flow. Oil flow indicates a faulty cylinder piston seal. Remove and repair the cylinder.
	3. Platform is overloaded	Remove excessive weight. The Safe Working Load is 215kg for A38

Troubleshooting

Section
5.1

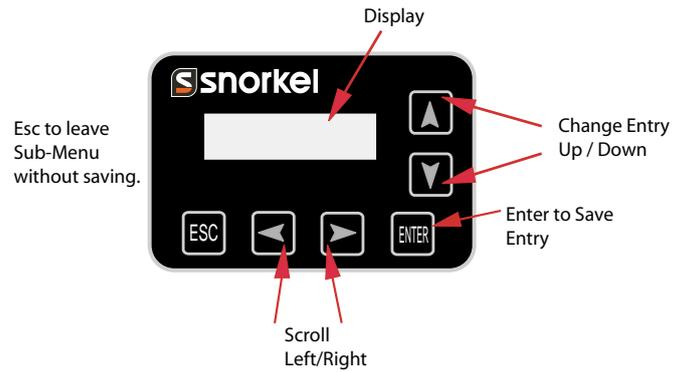
PROBLEM	CAUSE	ACTION
Platform assembly will not slew	1. Faulty controller	Check the I/O's Using EZcal diagnostics
	2. Faulty slew solenoid	Check voltage at the solenoid electrical connections. Use a screw driver or similar component to check the magnetic effect of solenoid.
	3. Incorrect cross-line relief setting	Insert a pressure gauge in the TP port of the valve block. Operate a slew function and measure the pressure. Provided the main relief pressure has been preset properly, the gauge should register 20-50 bar. Reset or replace CLRV valves thus preventing bypassing of oil.
	4. Faulty slew select switch	Replace the complete switch assembly.
Platform assembly will not descend	1. Faulty controller	Check the I/O's using EZcal diagnostics. Check the programmed mast speed settings. Check the continuity of mast speed enabling cables to the controller. Repair as necessary.
	2. Faulty mast or jib solenoids	Check the voltage to the solenoids V7 & V8 for the mast functions. Swap solenoids to confirm fault and replace if necessary.
Machine will not steer	1. Malfunction of joystick toggle switch	Check I/O's using EZcal diagnostics. Remove and service the switch &/or joystick.
	2. Faulty steering solenoid & valve	Check that the solenoids at V5 are energised while the steering Check the cables feeding these solenoids. Replace the solenoids if necessary. Check the valve cartridges for contamination.
	3. Faulty controller	Check I/O's using EZcal diagnostics. Check the continuity of the steer speed enabling cable to the controller. Repair or replace as necessary.
	4. Steer cylinder malfunction	Check the hose connections to the cylinder. Check the cylinder rod-end pins and the cylinder mounting bolts.
	5. Seized wheel mounting frame pivot(s)	Refer to the maintenance section for assembly and repair of the pivot and associated parts.
	6. Damaged steering link plates	Replace the steering link plates, associated pins and lock plates.
Machine will not drive	1. Temp	Reset system and allow the system to cool down.
	2. Towing valve open	Locate the towing valve CT 21 on the valve block. Ensure that it is fully closed by turning clockwise.
	3. Incorrect hose connections	Refer to the hydraulic diagram for correct connections of valve ports to the motor ports. Incorrect connection may result in locking of wheels.
	4. Fail-safe brake-circuit malfunction	Blocked brake line to either motor. Clear blockage and/or replace hoses and fittings. Check the correct function of the check valves V1 and V2 on the valve block. These valve should open to allow brake chamber evacuation.

REPLACING THE GP400 CONTROL MODULE

If for any reason you have to replace the GP400 control module it is important that you complete the following procedures:

WARNING

If the GP400 control module is replaced and/or moved within the machine for any reason the tilt sensor must be reset for zero° using the following procedure.
Failure to do so could result in serious injury or death.



To follow this procedure you need to switch the Ezcal display in the upper Control box into "calibration mode".

1.	Place the machine on a firm level surface , $\leq 0.25^\circ$
2.	Use a Gauge to confirm that the front and rear of the chassis are level to within $\pm 0.25^\circ$ in both directions.
3.	Switch the machine on and press and hold Esc for 5 Seconds until "Ezlift Menu" is displayed.
4.	Scroll to access level.(Enter)
5.	Enter code 2222 for access level 2 .(Enter)
6.	Scroll to setups.(Enter)
7.	Scroll to tilt setups.(Enter)
8.	Calibrate level. (Enter)
9.	Enter for yes.

To confirm calibration has worked switch the machine of then back on again.

10.	Scroll to Diagnostics. (Enter)
11.	System. (Enter)
12.	Scroll to tilt, both readings should be below 0.2° if not repe at from 5.

Now re-calibrate the load cell:-

17.	Scroll to setups. (Enter)
18.	Scroll to load setups. (Enter)
19.	Scroll to Calibrate load (Enter)
20.	Redo Loaded? Press up arrow for yes, place SWL in basket and press enter twice.
21.	Redo empty? Press up arrow for yes, remove load from platform and press enter twice.
22.	Use arrow to enter calabration date and press Enter.
23.	Place 120% of SWL in the platform and verify that the lift function cuts out automatically when raised off the boom switch.

Troubleshooting

GP400 I/O allocations			Sch. 15 500 430	AB 38	Rev 1
		U#	PCB 59 100 026		
			same hardware as 21 510 436		
P4-12	J6-12	23	Safe High side output	48V protected See Note 1	Line contactor
P4-13	J6-13	23	Safe High side output		Brake unlock
P4-14	J6-14	23	Safe High side output		Brake unlock
P4-15	J6-15	23	Safe High side output	48V protected	
P5-1	J5-1	17	High side PWM output		
P5-2	J5-2	16	High side 2A output		
P5-3	J5-3	16	High side 2A output		
P5-4	J5-4	17	High side PWM output		
P5-5	J5-5	17	High side 2A output		
P5-6	J5-6	16	High side 2A output		
P5-7	J5-7	18	High side PWM output		
P5-8	J5-8	18	High side PWM output		
P5-9	J5-9	16	High side 2A output		
P5-10	J5-10	18	High side PWM output		
P5-11	J5-11	18	High side PWM output		
P5-12	J5-12	15	High side 2A output		
P5-13	J5-13		B+ protected Supply (PTC 140mA)		
P5-14	J5-14	19	High side 2A output		
P5-15	J5-15	17	High side PWM output		
P6-1	J4-1	14	High side 2A output	Lower Boom up	V8
P6-2	J4-2	13	High side 2A output	Lower Boom down	
P6-3	J4-3	13	High side 2A output	Upper boom up	V7
P6-4	J4-4	14	High side 2A output	Upper boom down	
P6-5	J4-5	13	High side 2A output	Tele out	V6
P6-6	J4-6	13	High side 2A output	Tele in	
P6-7	J4-7	14	High side 2A output	Steer left	V5
P6-8	J4-8	12	High side 2A output	Steer right	
P6-9	J4-9	12	High side 2A output	Turntable CW	V4
P6-10	J4-10	14	High side 2A output	Turntable CCW	
P6-11	J4-11	12	High side 2A output	Basket level up	V9; basket leveling only operates when the booms are fully stowed, elevation sw. closed (B+)
P6-12	J4-12	12	High side 2A output	Basket level down	
P6-13	J4-13	15	High side 2A output		
P6-14	J4-14	15	High side 2A output		
P6-15	J4-15	15	High side 2A output	Buzzer	
P7-1	J3-1		B+ Digital Input	Valve supply	from P600
P7-2	J3-2		B+ Digital Input	Valve & Logic supply (ground mode)	Key sw grnd mode also to P600
P7-3	J3-3		B+ Digital Input		Elevation sw.
P7-4	J3-4		B+ Digital Input	Logic supply (platform mode)	Key sw platform mode also to P600
P7-5	J3-5		B+ Digital Input		Lower boom sw.
P7-6	J3-6		B+ Digital Input		Upper boom sw.
P7-7	J3-7		B+ Digital Input		Tele sw.
P7-8	J3-8		B+ Digital Input		Turntable sw.
P7-9	J3-9		B+ Digital Input		
P7-10	J3-10		B+ Digital Input		
P7-11	J3-11		B+ Digital Input		
P7-12	J3-12		B+ Digital Input		
P7-13	J3-13		B- Digital Input		
P7-14	J3-14		B- Digital Input		
P7-15	J3-15		B- Digital Input		
P8-1	J2-1		Analog Input	gnd finger joystick	Ground control; direction and proportional control of gnd control selected function Std 0.5V/2.5V/4.5V
P8-2	J2-2		Safe Analog Input		
P8-3	J2-3		Analog Input		
P8-4	J2-4		Analog Input		
P8-5	J2-5		Analog Input		
P8-6	J2-6		Safe Analog Input		
P8-7	J2-7		Analog Input		
P8-8	J2-8		Analog Input		
P8-9	J2-9		Analog Input		
P8-10	J2-10		No connect		
P8-11	J2-11		+5V protected Supply		
P8-12	J2-12		+5V protected Supply		
P8-13	J2-13		GND	gnd finger joystick	
P8-14	J2-14		GND		
P8-15	J2-15		GND		
P15-1	J10-1		B+ Digital Input		
P15-2	J10-2		B+ Digital Input		
P15-3	J10-3		B+ Digital Input		
P15-4	J10-4		B+ Digital Input		
P15-5	J10-5		B+ Digital Input		
P15-6	J10-6		B+ Digital Input		
P15-7	J10-7		B+ Digital Input		
P15-8	J10-8		B+ Digital Input		
P15-9	J10-9		B+ Digital Input		
P15-10	J10-10		B+ protected Supply	140mA PTC shared with 11, 12	
P15-11	J10-11		B+ protected Supply	140mA PTC shared with 10, 12	
P15-12	J10-12		B+ protected Supply	140mA PTC shared with 10, 11	

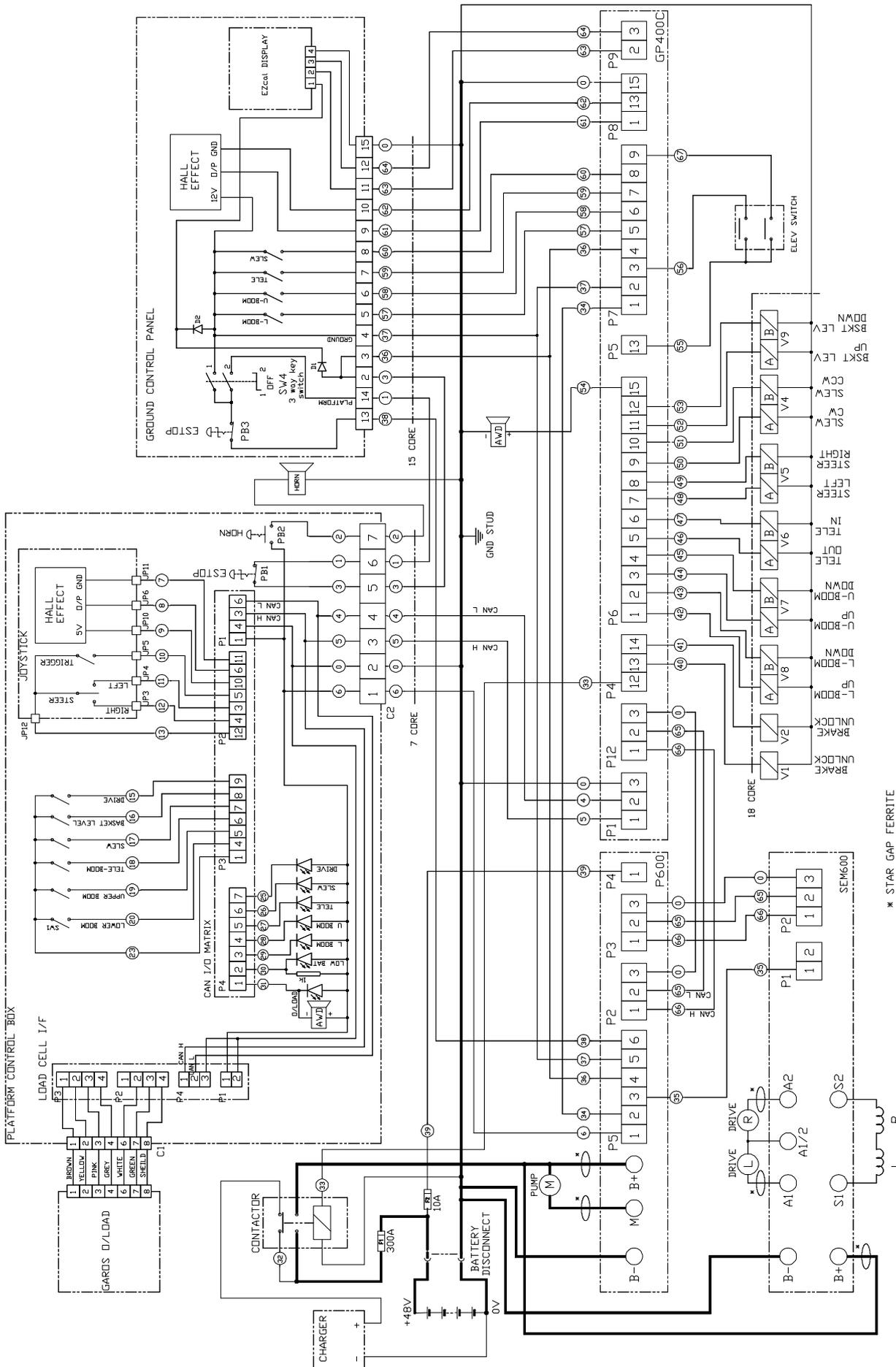
A38E CE Electric Kit Parts (Non Hydraulic Platform Rotate)

Circuit Diagram: 512819-002

DESCRIPTION	PART No.	QTY.
PLATFORM CONTROL BOX	513433-002	
Enclosure(cut-out)	512936-002	-
Joystick	510471-000	1
Matrix Board	510472-000	1
Overload I/F Board	13468-01	1
Alarm	502588-000	1
Twist& Release E/stop c/w 1 N/C contact block	510524-000	1
Black Flush Push Button c/w 1 N/O contact block	510542-000	2
Toggle Switch, on-(on) IP65	510521-000	6
Boot	514132-000	6
Red LED	512934-000	2
Green LED	512935-000	5
Platform Control Box Overlay	512937-002	1
9-way Chassis Socket	513949-000	1
6-way Panel Plug	510154-000	1
9-way Panel Plug	510156-000	1
12-way Panel Plug	510157-000	2
4-way Panel Plug	512366-000	2
3-way Panel Plug	510155-000	1
2-way Panel Plug	512816-000	1
Mate-N-Lock Socket Contact	510145-000	42
9-way Bulkhead Connector	512938-000	1
DIN Rail	512368-000	0.4
Resistor 1K 0.5W	514327-000	1
GROUND CONTROL PANEL	513434-000	
Ground Control Panel	512939-001	1
Ground Control Panel Overlay	512940-000	1
Ezcal Display	3087803	1
Twist& Release E/stop c/w 1 N/C contact block	510524-000	1
3 posn. Stayput Key Switch (key removeable only in off posi ^{ti} on) c/w/2 N/O contact blocks	512543-000	1
Analogue Rocker	514131-000	1
Deadman Toggle Switch, on-(on) IP65	510521-000	4
Boot	514132-000	4
19-Way Cable Clamp Socket	513951-000	1
4-way Panel Plug	512366-000	1
Mate-N-Lock Socket Contact	510145-000	4
3 amp diode.	510150-000	2
External Components		
12v Solenoid coil	505555-016	14
Alarm	502588-000	1
Alarm bracket	512684-000	1
Fuse 300Amp	067387-022	1
Fuse holder	501877-000	1
Contacto ^r	513550-000	1
GP400 (See Note)	512941-000	1
SEM600	512942-000	1
P600	512943-000	1
Load Cell	513160-000	1
Load Cell Cable Harness	513161-000	1
Trac ^{ti} on motors	512944-000	2
Eleva ^{ti} on Switch	058864-000	1
Horn	501868-001	1
Ferrite	510437-000	5
Capacitor Assy	514331-000	1
Cable Assemblies		
A38E Wire Harness PG Trionics	513539-000	1
A38E Valve Cable	513540-001	1
A38E Additional Cable Kit	513541-000	1
A38E Power Cable Kit	513542-000	1

Note: Machine serial numbers before SN: 006622 will require GP400c with software 3.2 installed

6.1. Electrical Schematics



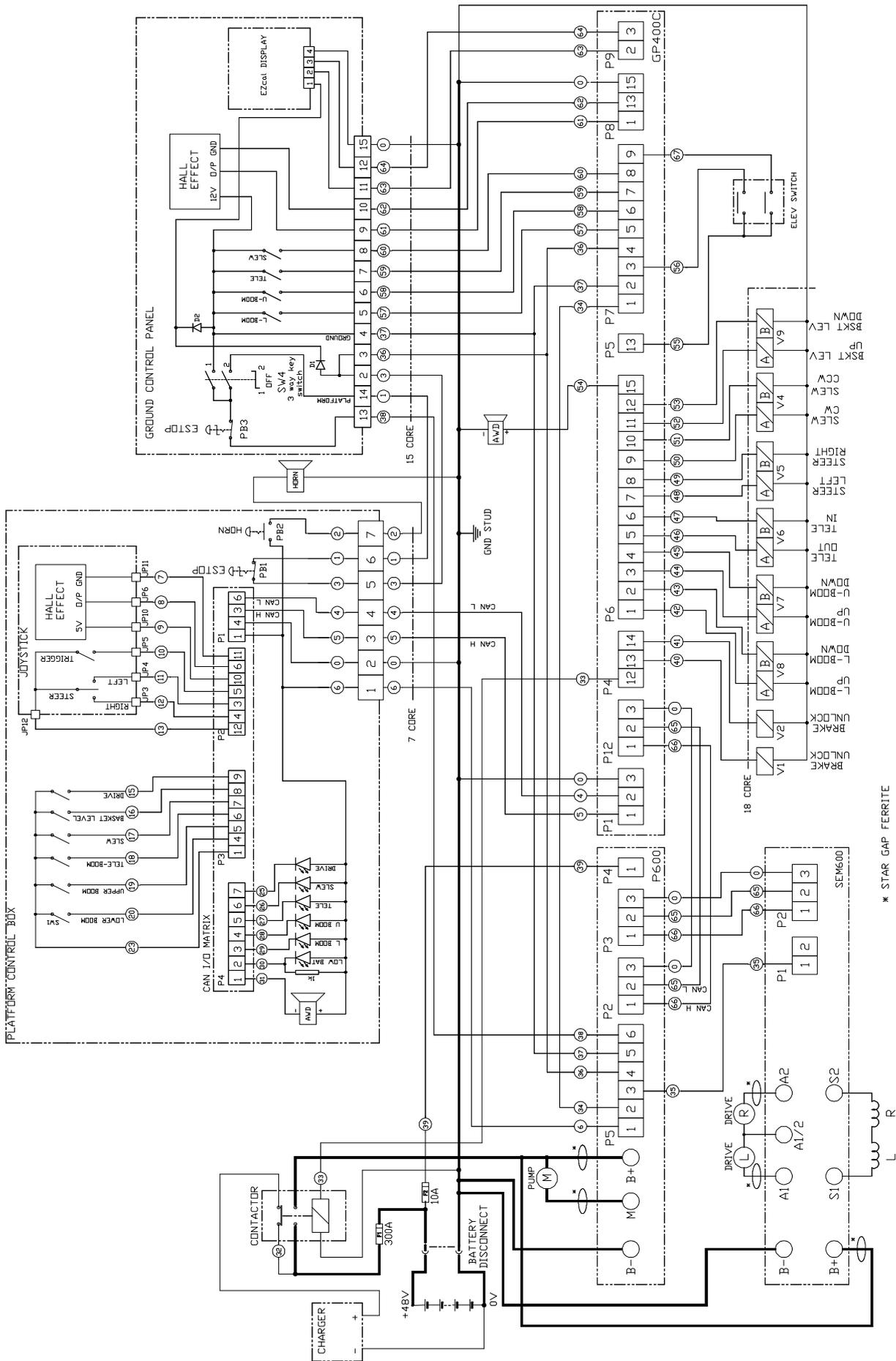
A 38E ANSI Electric Kit Parts (Non Hydraulic Platform Rotate)

Circuit Diagram: 512819-003

DESCRIPTION	PART No.	QTY
PLATFORM CONTROL BOX	513433-003	
Enclosure(cut-out)	512936-003	-
Joystick	510471-000	1
Matrix Board	510472-000	1
Alarm	502588-000	1
Twist& Release E/stop c/w 1 N/C contact block	510524-000	1
Black Flush Push Button c/w 1 N/O contact block	510542-000	2
Toggle Switch, on-(on) IP65	510521-000	7
Boot	514132-000	6
Red LED	512934-000	1
Green LED	512935-000	6
Platform Control Box Overlay	512937-003	1
9-way Chassis Socket	513949-000	1
6-way Panel Plug	510154-000	1
9-way Panel Plug	510156-000	1
12-way Panel Plug	510157-000	2
Mate-N-Lock Socket Contact	510145-000	30
DIN Rail	512368-000	0.4
Resistor 1K 0.5W	514327-000	1
GROUND CONTROL PANEL	513434-001	
Ground Control Panel	512939-001	1
Ground Control Panel Overlay	512940-000	1
Ezcal Display	3087803	1
Twist& Release E/stop c/w 1 N/C contact block	510524-000	1
3 posn. Stayput Key Switch (key removeable in any position) c/w/2 N/O contact blocks	510526-000	1
Analogue Rocker	514131-000	1
Deadman Toggle Switch, on-(on) IP65	510521-000	4
Boot	514132-000	6
19-Way Cable Clamp Socket	513951-000	1
4-way Panel Plug	512366-000	1
Mate-N-Lock Socket Contact	510145-000	4
3 amp diode.	510150-000	2
External Components		
12v Solenoid coil	505555-016	14
Alarm	502588-000	1
Alarm bracket	512684-000	1
Fuse 300Amp	067387-022	1
Fuse holder	501877-000	1
Contactor, 200Amp 12vdc SPDT	513550-000	1
GP400 (See note)	512941-000	1
SEM600	512942-000	1
P600	512943-000	1
Traction motors	512944-000	2
Elevation Switch	058864-000	1
Horn	501868-001	1
Ferrite	510437-000	5
Capacitor Assy	514331-000	1
Cable Assemblies		
A38E Wire Harness PG Trionics	513539-000	1
A38E Valve Cable	513540-001	1
A38E Additional Cable Kit	513541-000	1
A38E Power Cable Kit	513542-000	1

Note: Machine serial numbers before SN 006622 will require GP400c with software 3.2 installed

6.1. Electrical Schematics



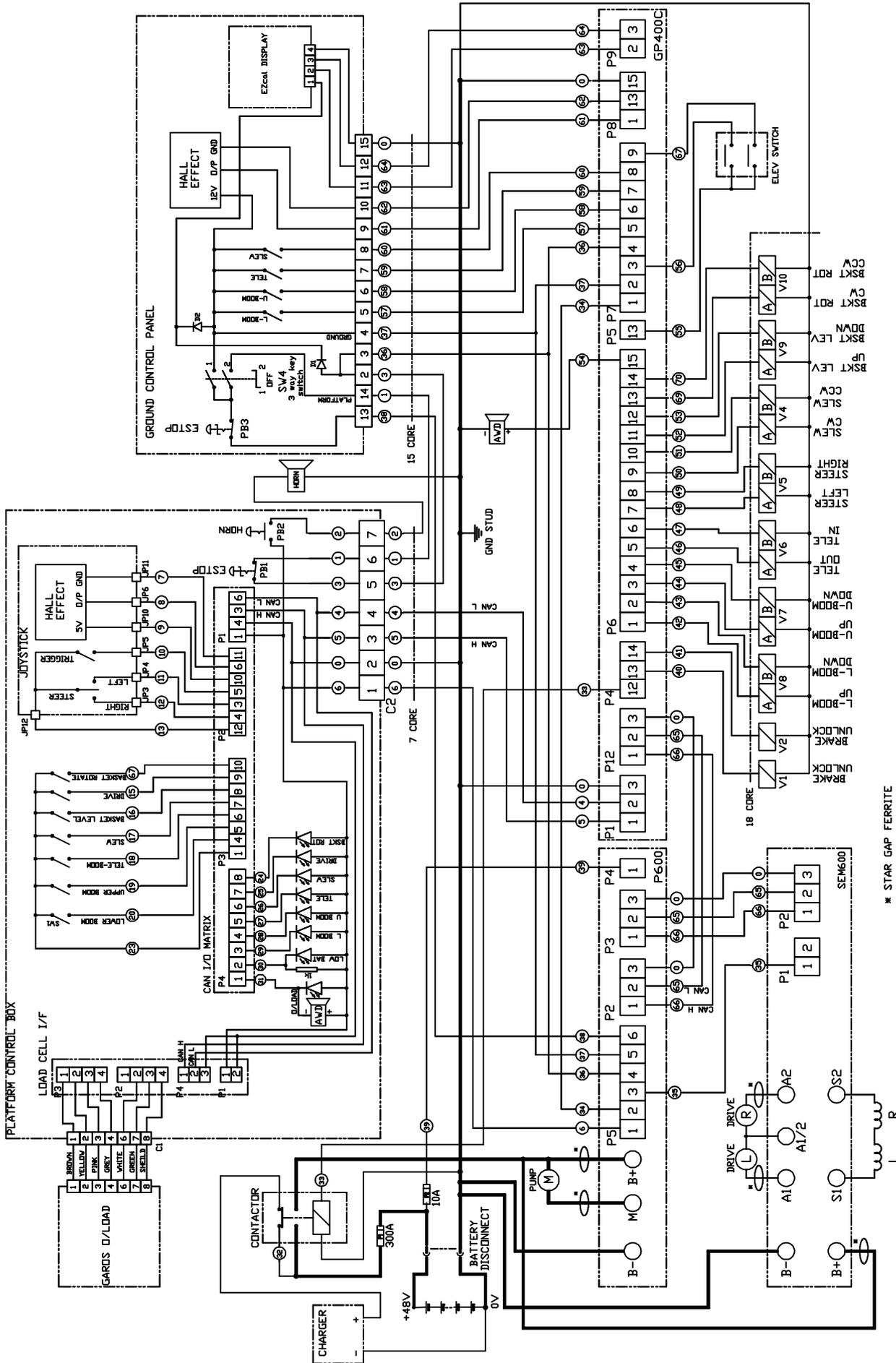
A38E CE Electric Kit Parts (Hydraulic Platform Rotate)

Circuit Diagram: 512819-000

DESCRIPTION	PART No.	QTY
PLATFORM CONTROL BOX	513433-000	
Enclosure(cut-out)	512936-000	-
Joystick	510471-000	1
Matrix Board	510472-000	1
Overload I/F Board	13468-01	1
Alarm	502588-000	1
Twist& Release E/stop c/w 1 N/C contact block	510524-000	1
Black Flush Push Button c/w 1 N/O contact block	510542-000	2
Toggle Switch, on-(on) IP65	510521-000	7
Boot	514132-000	7
Red LED	512934-000	2
Green LED	512935-000	6
Platform Control Box Overlay	512937-000	1
9-way Chassis Socket	513949-000	1
6-way Panel Plug	510154-000	1
9-way Panel Plug	510156-000	1
12-way Panel Plug	510157-000	2
4-way Panel Plug	512366-000	2
3-way Panel Plug	510155-000	1
2-way Panel Plug	512816-000	1
Mate-N-Lock Socket Contact	510145-000	42
9-way Bulkhead Connector	512938-000	1
DIN Rail	512368-000	0.4
GROUND CONTROL PANEL	513434-000	
Ground Control Panel	512939-001	1
Ground Control Panel Overlay	512940-000	1
Ezcal Display	3087803	1
Twist& Release E/stop c/w 1 N/C contact block	510524-000	1
3 posn. Stayput Key Switch (key removeable only in off position) c/w/2 N/O contact blocks	512543-000	1
Analogue Rocker	514131-000	1
Deadman Toggle Switch, on-(on) IP65	510521-000	4
Boot	514132-000	7
19-Way Cable Clamp Socket	513951-000	1
4-way Panel Plug	512366-000	1
Mate-N-Lock Socket Contact	510145-000	4
3 amp diode.	510150-000	2
External Components		
Alarm	502588-000	1
Alarm bracket	512684-000	1
Fuse 300Amp	067387-022	1
Fuse holder	501877-000	1
Contactor, 200Amp 12vdc SPDT	513550-000	1
GP400C (See Note)	512941-000	1
SEM600	512942-000	1
P600	512943-000	1
Load Cell	513160-000	1
Load Cell Cable Harness	513161-000	1
Traction motors	512944-000	2
Elevation Switch	058864-000	1
Horn	501868-001	1
Ferrite	510437-000	5
Cable Assemblies		
A38E Wire Harness PG Trionics	513539-000	1
A38E Valve Cable	513540-000	1
A38E Additional Cable Kit	513541-000	1
A38E Power Cable Kit	513542-000	1

Note: Machine serial numbers before SN: 006622 will require GP400c with software 3.2 installed

6.1. Electrical Schematics



* STAR GAP FERRITE

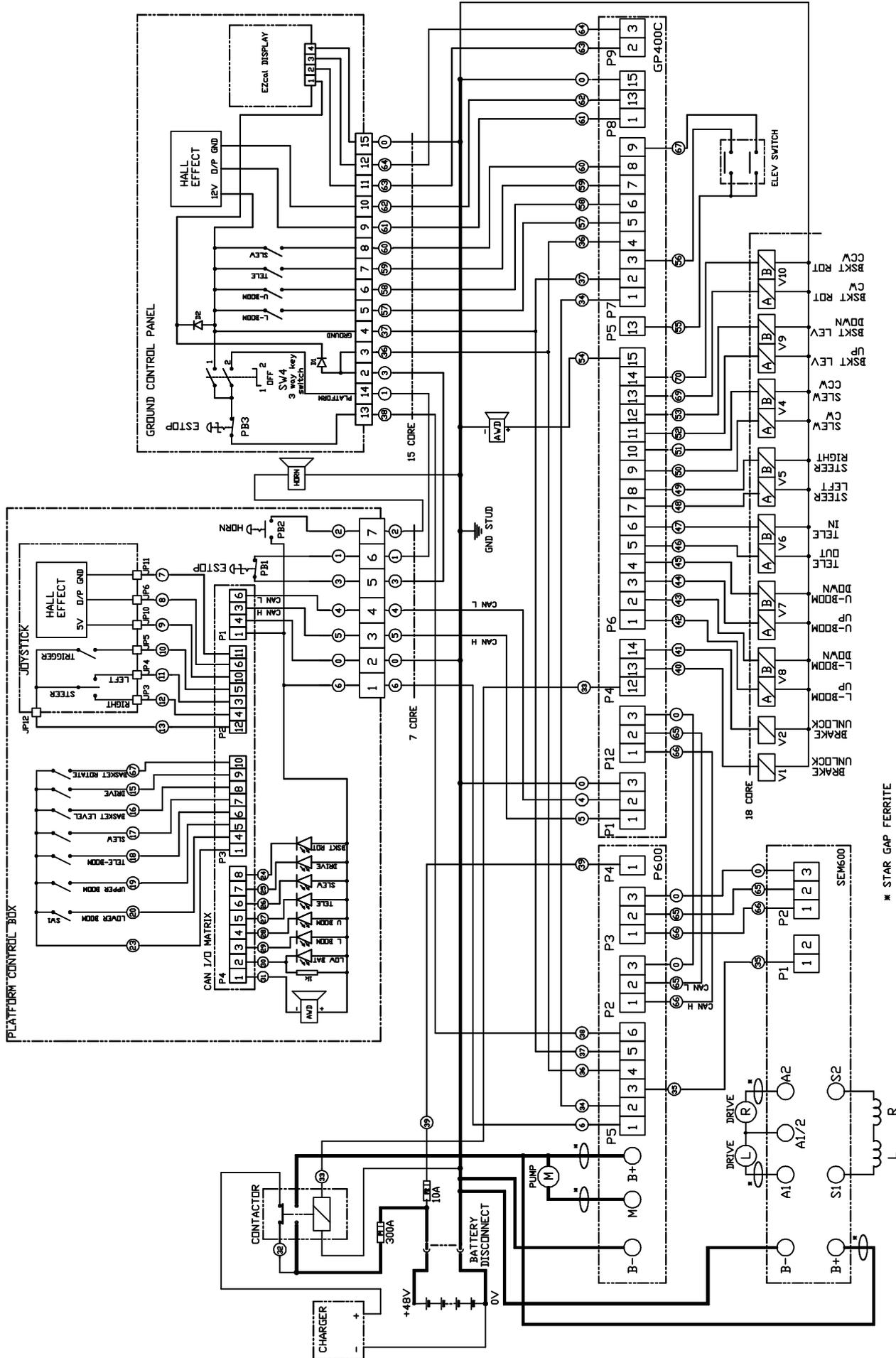
A 38E ANSI Electric Kit Parts (Hydraulic Platform Rotate)

Circuit Diagram: 512819-001

DESCRIPTION	PART No.	QTY
PLATFORM CONTROL BOX	513433-001	
Enclosure(cut-out)	512936-001	-
Joystick	510471-000	1
Matrix Board	510472-000	1
Alarm	502588-000	1
Twist& Release E/stop c/w 1 N/C contact block	510524-000	1
Black Flush Push Button c/w 1 N/O contact block	510542-000	2
Toggle Switch, on-(on) IP65	510521-000	7
Boot	514132-000	7
Red LED	512934-000	1
Green LED	512935-000	6
Platform Control Box Overlay	512937-001	1
9-way Chassis Socket	513949-000	1
6-way Panel Plug	510154-000	1
9-way Panel Plug	510156-000	1
12-way Panel Plug	510157-000	2
Mate-N-Lock Socket Contact	510145-000	30
DIN Rail	512368-000	0.4
GROUND CONTROL PANEL	513434-001	
Ground Control Panel	512939-001	1
Ground Control Panel Overlay	512940-000	1
Ezcal Display	3087803	1
Twist& Release E/stop c/w 1 N/C contact block	510524-000	1
3 posn. Stayput Key Switch (key removeable in any position) c/w/2 N/O contact blocks	510526-000	1
Analogue Rocker	514131-000	1
Deadman Toggle Switch, on-(on) IP65	510521-000	4
Boot	514132-000	4
19-Way Cable Clamp Socket	513951-000	1
4-way Panel Plug	512366-000	1
Mate-N-Lock Socket Contact	510145-000	4
3 amp diode.	510150-000	2
External Components		
Alarm	502588-000	1
Alarm bracket	512684-000	1
Fuse 300Amp	067387-022	1
Fuse holder	501877-000	1
Contactora, 200Amp 12vdc SPDT	513550-000	1
GP400(See note)	512941-000	1
SEM600	512942-000	1
P600	512943-000	1
Traction motors	512944-000	2
Elevation Switch	058864-000	1
Horn	501868-001	1
Ferrite	510437-000	5
Cable Assemblies		
A38E Wire Harness PG Trionics	513539-000	1
A38E Valve Cable	513540-000	1
A38E Additional Cable Kit	513541-000	1
A38E Power Cable Kit	513542-000	1

Note: Machine serial numbers before SN 006622 will require GP400c with software 3.2 installed

6.1. Electrical Schematics



* STAR GAP FERRITE

A38E CE Electric (Hydraulic Platform Rotate) Options:

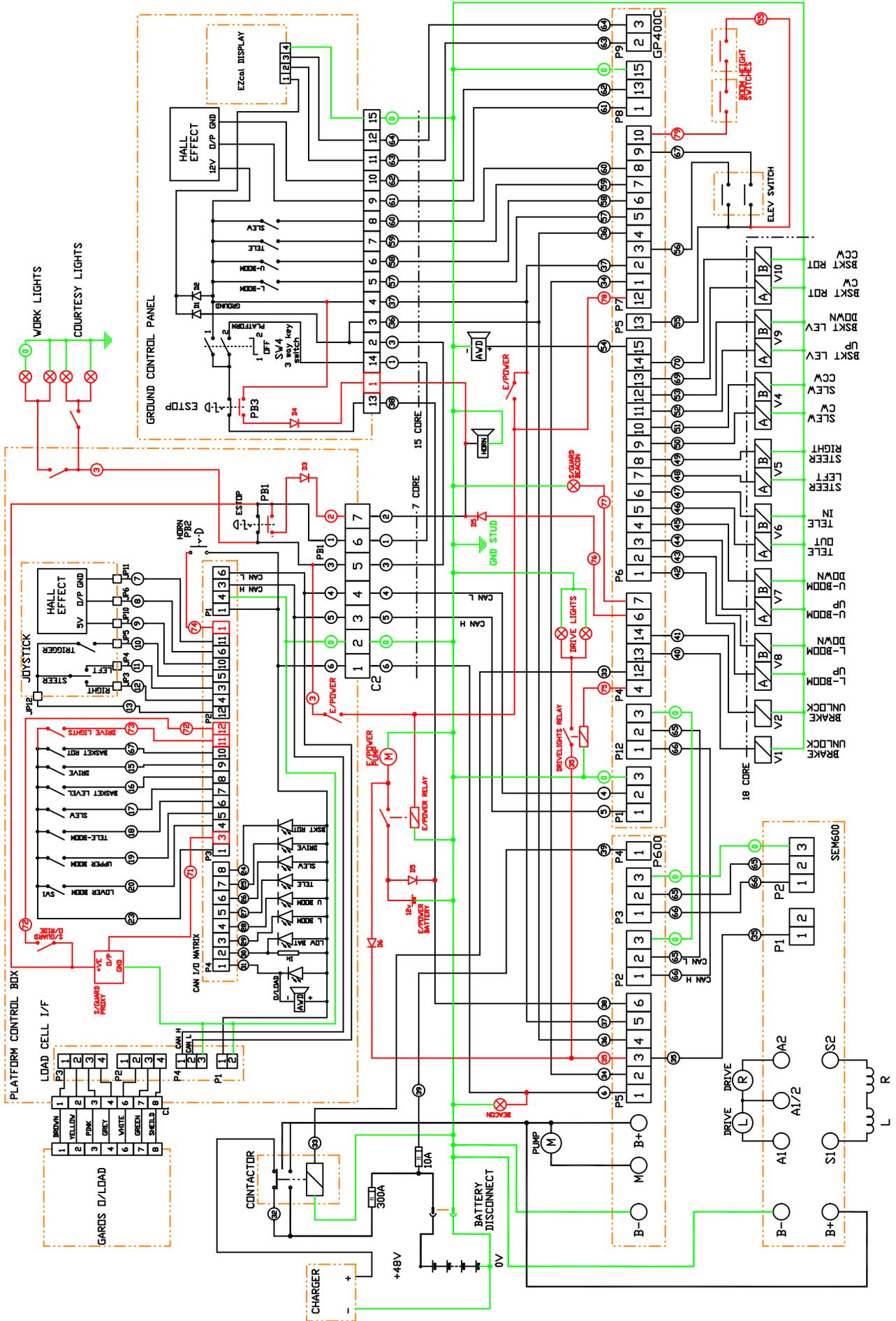
Snorkel Guard, Horn Sound on E/Stop, Emergency Power Desend, Drive Light and Drive Deactivated above 8 meters.

Circuit Diagram: 512819-004

OPTIONS	DESCRIPTION	PART NUMBER	QTY (PER M/C)
SNORKELGUARD	Proximity Sensor - 12mm	3028844	1
	TOGGLE SWITCH	510521-000	1
	Blue Beacon	514404-001	1
HORN SOUND ON E/STOP	N/O CONTACT BLOCK	510527-000	2
EMERGENCY POWER DESCEND	POWER UNIT	6020058	1
	BATTERY	062299-002	1
	12VOLT CONTACTOR	3040506	1
	12VOLT CHARGER	510870-000	1
	TOGGLE SWITCH	510521-000	2
	DIODE 8AMP	510067-000	2
DRIVE LIGHT KIT	LED OVAL LIGHT ASSY	0260721	2
	PLAC LIGHTS ON/OFF	0181376	1
	CONR 2 PIN DEUTSCH RECEP	3049804	6
	PIN CONTACT	3040314	16
	LED RED LIGHT STOP/TAIL	3069533	2
	RELAY SPDT	3040469	1
	CONR 2 PIN DEUTSCH PLUG	3049803	6
	SKT CONTACT	3040342	16
	LOCK WEDGE	3049807	6
	CONR 4 PIN DEUTSCH RECEP	3049889	1
	LOCK WEDGE	3049891	1
	CONR 4 PIN DEUTSCH PLUG	3049888	1
	LOCK WEDGE	509750-000	1
	AMBER LIGHT	512492-000	4
	LED FLASHER RELAY	514780-000	1
	RELAY BASE	514781-000	1
TOGLE SWITCH SPDT	509472-000	1	
INDICATOR OVERLAY	514778-000	1	
DRIVE DE-ACTIVATED ABOVE 8M	ELEVATION SWITCH	058864-000	2

Note : Options displayed in Schematic Diagram as Red or Green.

6.1. Electrical Schematics



6.2. Hydraulic Schematics (Non Hydraulic Platform Rotate)

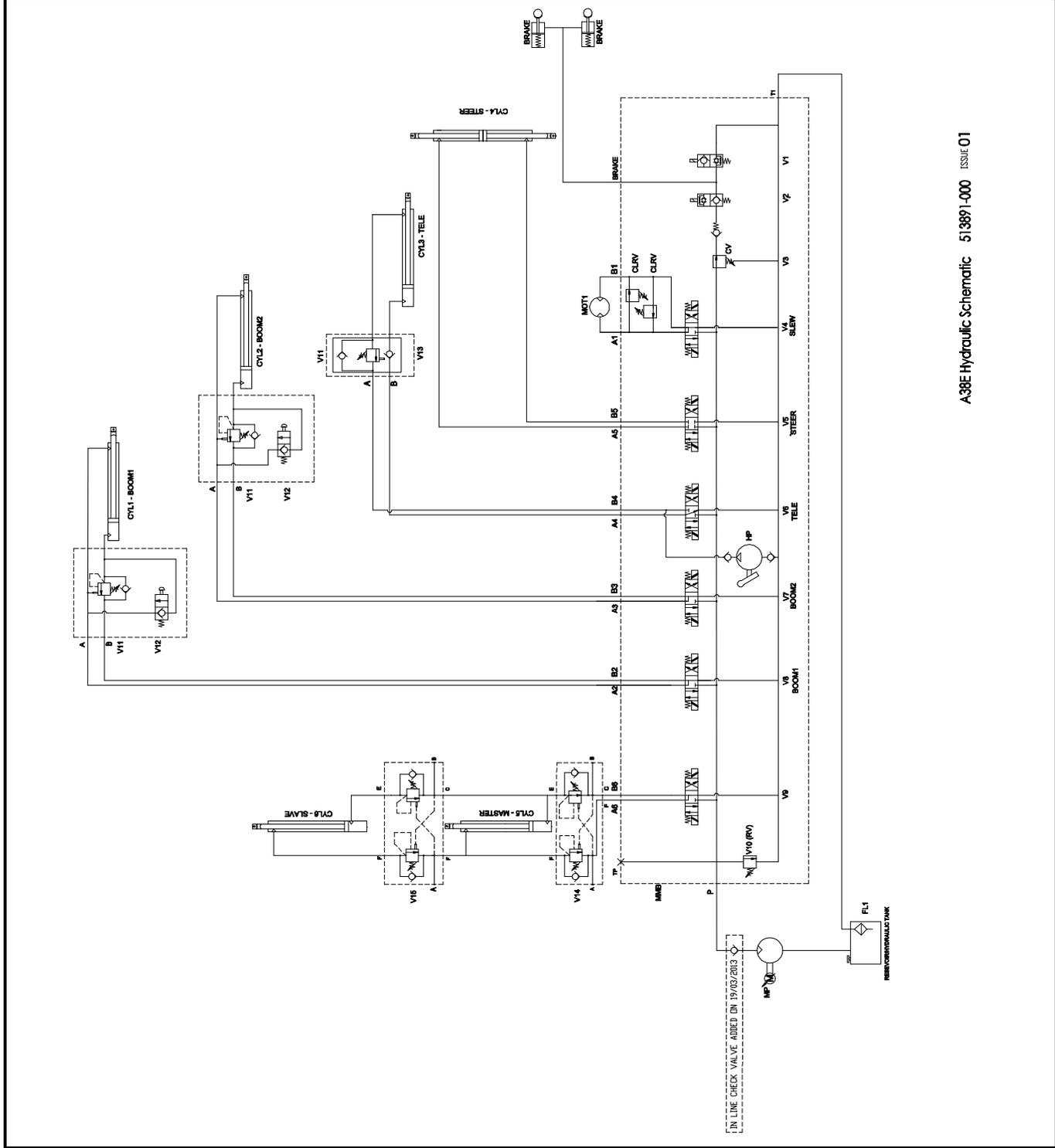
Table 6-2: Hydraulic Schematic Legend

REFERENCE	NAME	FUNCTION	LOCATION
BRK	Brake.	Spring applied - hydraulically released brakes to stop rotation of drive wheels. (Set at 100 Bar).	On front end of wheel drive motors on chassis.
CLR V	Cross-line relief valve.	To limit the max. operating pressure of the slew motor. (Set at 50 Bar).	On main manifold block.
CV	Check Valve.	To prevent oil pressure in the brake line from being lost through the main pressure line.	On main manifold block.
CYL1	Lower boom lift cylinder.	Provides the force to lift the lower boom - Boom1.	Foward of first post
CYL2	Upper boom lift cylinder.	Provide the force to lift the upper boom - Boom2.	Behind second post
CYL3	Telescopic cylinder.	Provides the force to push/pull the tele-boom - Boom3.	Inside Boom2 & Tele boom.
CYL4	Steering cylinder.	Provides the force to push/pull the steering torque arms.	Inside front of chassis.
CYL5	Master levelling cylinder.	Provides the pressure to the slave cylinder for cage levelling.	Behind the second post
CYL6	Slave levelling cylinder.	Provides the force to level the cage up/down.	Close to cage pivot at inner Tele boom.
FL1	Return line filter. (10 Micron)	Continuously filters hydraulic return oil.	On top of the hydraulic reservoir.
HP	Handpump.	Used for retraction of tele boom in the case of power failure. Delivers 15cc/stroke.	On side of manifold block.
MMB	Main manifold block.	Contains the directional control valves and relief valves that distribute oil to the various functions and control the operating pressures.	On hydraulic reservoir in chassis.
MOT1	Slew Motor.	Drives slew bearings drive pinion.	Connected to drive pinion.
MP	Motor/Pump set.	Gear pump close coupled to D.C electric motor. Provides pressurised oil flow for all hydraulic functions.	On chassis.
V1	Brake oil supply valve.	This valve is energised to allow oil into the brake release chamber.	On main manifold block
V2	Brake valve.	When energised this valve prevents the pressurised brake oil from venting back to tank. When the machine is stationary this valve de-energises and the brake oil vents to tank and the brake springs apply themselves and keep the machine stationary.	On main manifold block.
V3	Pressure reduction valve.	Prevents pressures in excess of 100 Bar entering the brake chambers.	On main manifold block.
V4	Slew Directional Control Valve.	Send oil to the left or right side of the slew motor.	On main manifold block.

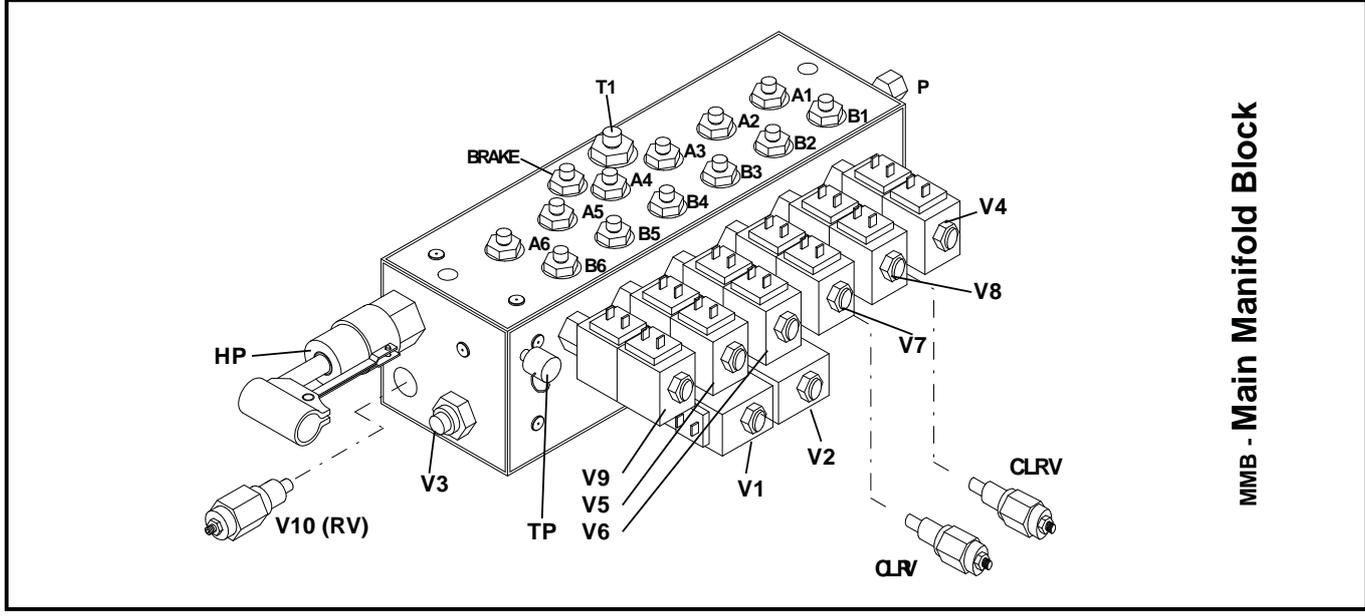
REFERENCE	NAME	FUNCTION	LOCATION
V5	Steer Directional Control Valve.	Send oil to the annular or full-bore side of the steering cylinder.	On main manifold block.
V6	Tele Directional Control Valve.	Send oil to the annular or full-bore side of the telescopic cylinder.	On main manifold block.
V7	Boom2 Directional Control Valve.	Send oil to the annular or full-bore side of the Boom2 cylinder.	On main manifold block.
V8	Boom1 Directional Control Valve.	Send oil to the annular or full-bore side of the Boom1 cylinder.	On main manifold block.
V9	Levelling Directional Control Valve.	Send oil to the annular or full-bore side of the levelling cylinders.	On main manifold block.
V10 (RV)	Main relief valve.	Sets max system pressure to 175 Bar	On main manifold block.
V11	Single Overcentre valve.	Prevents back flow and provides a hydraulic lock on the cylinder.	On base of upper, lower & tele cylinders.
V12	Emergency lowering valve.	Allows upper and lower boom to be manually lowered.	On base of upper and lower cylinders.
V13	Pilot operated check valve.	Holds tele cylinder in position after controls are released	On base of tele cylinder.
V14	Dual Overcentre valve.	Holds pressure in master/slave closed circuit and provides hose burst protection. (Set 160 Bar).	On base of master cylinder.
V15	Dual Overcentre valve.	Holds pressure in slave cylinder and provides host burst protection. (Set 120 Bar).	On base of slave cylinder.

Notes:

- All of the Overcentre Valves represented within this schematic have a 5:1 Pilot Ratio.
- The P/O Check Valve represented has a 3:1 Pilot Ratio.
- The maximum flow rate of the Pump/Motor Unit is limited to 15 L/min @ 100% speed. Although it should be noted that the actual flow rate will depend on the applied load and the D.C. Motor speed.
- The maximum 'Return' flow rates for each of the functions are restricted to the following values;
 - Slew... 4 L/min
 - Boom1... 8 L/min
 - Boom2... 5 L/min
 - Tele... 5 L/min
 - Steering... 6 L/min.



A38E Hydraulic Schematic 513891-000 ISSUE 01



MMB - Main Manifold Block

Figure 6-2 : Hydraulic Schematic (Non Hydraulic Platform Rotate)

6.2. Hydraulic Schematics (Hydraulic Platform Rotate)

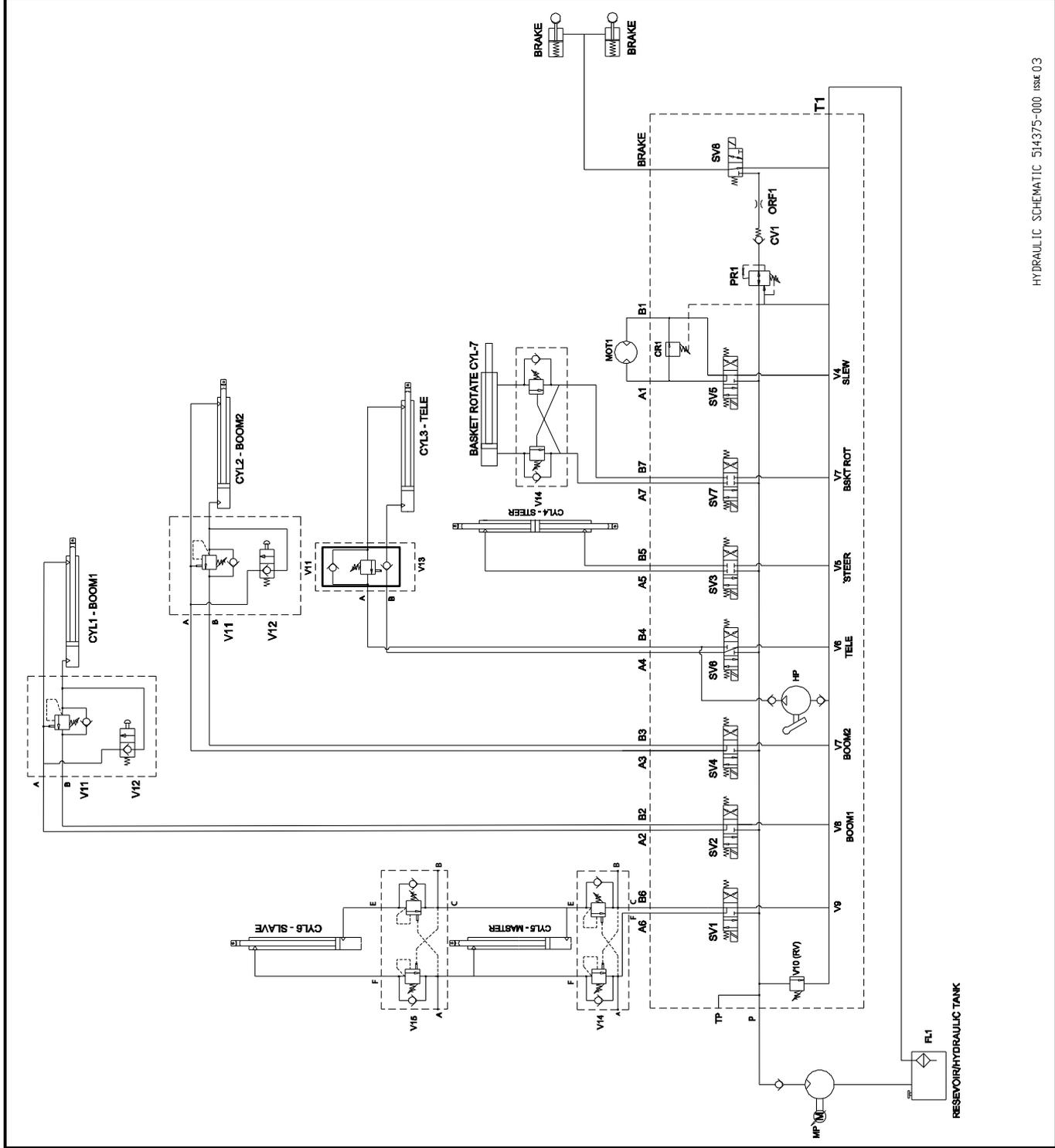
Table 6-3: Hydraulic Schematic Legend

REFERENCE	NAME	FUNCTION	LOCATION
BRAKE	Brake.	Spring applied - hydraulically released brakes to stop rotation of drive wheels. (Set at 100 Bar).	On front end of wheel drive motors on chassis.
CLRV	Cross-line relief valve.	To limit the max. operating pressure of the slew motor. (Set at 50 Bar).	On main manifold block.
CV	Check Valve.	To prevent oil pressure in the brake line from being lost through the main pressure line.	On main manifold block.
CYL1	Lower boom lift cylinder.	Provides the force to lift the lower boom - Boom1.	Forward of first post
CYL2	Upper boom lift cylinder.	Provide the force to lift the upper boom - Boom2.	Behind second post
CYL3	Telescopic cylinder.	Provides the force to push/pull the tele-boom - Boom3.	Inside Boom2 & Tele boom.
CYL4	Steering cylinder.	Provides the force to push/pull the steering torque arms.	Inside front of chassis.
CYL5	Master levelling cylinder.	Provides the pressure to the slave cylinder for cage levelling.	Behind the second post
CYL6	Slave levelling cylinder.	Provides the force to level the cage up/down.	Close to cage pivot at inner Tele boom.
CYL7	Hydraulic Platform Rotate Cylinder.	Provides the force to rotate the platform clockwise/anticlockwise.	Under Platform Assy.
FL1	Return line filter. (10 Micron)	Continuously filters hydraulic return oil.	On top of the hydraulic reservoir.
HP	Handpump.	Used for retraction of tele boom in the case of power failure. Delivers 15cc/stroke.	On side of manifold block.
MMB	Main manifold block.	Contains the directional control valves and relief valves that distribute oil to the various functions and control the operating pressures.	On hydraulic reservoir in chassis.
MOT1	Slew Motor.	Drives slew bearings drive pinion.	Connected to drive pinion.
MP	Motor/Pump set.	Gear pump close coupled to D.C electric motor. Provides pressurised oil flow for all hydraulic functions.	On chassis.
V1	Brake oil supply valve.	This valve is energised to allow oil into the brake release chamber.	On main manifold block
V2	Brake valve.	When energised this valve prevents the pressurised brake oil from venting back to tank. When the machine is stationary this valve de-energises and the brake oil vents to tank and the brake springs apply themselves and keep the machine stationary.	On main manifold block.
V3	Pressure reduction valve.	Prevents pressures in excess of 100 Bar entering the brake chambers.	On main manifold block.
V4	Slew Directional Control Valve.	Send oil to the left or right side of the slew motor.	On main manifold block.

REFERENCE	NAME	FUNCTION	LOCATION
V5	Steer Directional Control Valve.	Send oil to the annular or full-bore side of the steering cylinder.	On main manifold block.
V6	Tele Directional Control Valve.	Send oil to the annular or full-bore side of the telescopic cylinder.	On main manifold block.
V7	Boom2 Directional Control Valve.	Send oil to the annular or full-bore side of the Boom2 cylinder.	On main manifold block.
V8	Boom1 Directional Control Valve.	Send oil to the annular or full-bore side of the Boom1 cylinder.	On main manifold block.
V9	Levelling Directional Control Valve.	Send oil to the annular or full-bore side of the levelling cylinders.	On main manifold block.
V10 (RV)	Main relief valve.	Sets max system pressure to 175 Bar	On main manifold block.
V11	Single Overcentre valve.	Prevents back flow and provides a hydraulic lock on the cylinder.	On base of upper, lower & tele cylinders.
V12	Emergency lowering valve.	Allows upper and lower boom to be manually lowered.	On base of upper and lower cylinders.
V13	Pilot operated check valve.	Holds tele cylinder in position after controls are released	On base of tele cylinder.
V14	Dual Overcentre valve.	Holds pressure in master/slave closed circuit and provides hose burst protection. (Set 160 Bar).	On base of master cylinder.
V15	Dual Overcentre valve.	Holds pressure in slave cylinder and provides hose burst protection. (Set 120 Bar).	On base of slave cylinder.
V16	Directional Control Valve.	Send oil to the annular or full-bore side of the platform rotate cylinder.	On main manifold block.

Notes:

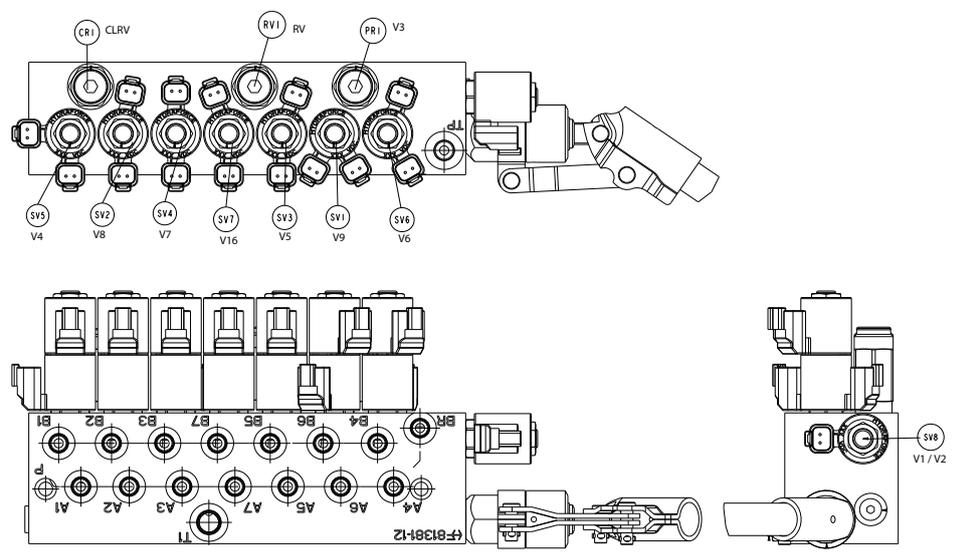
- All of the Overcentre Valves represented within this schematic have a 5:1 Pilot Ratio.
- The P/O Check Valve represented has a 3:1 Pilot Ratio.
- The maximum flow rate of the Pump/Motor Unit is limited to 15 L/min @ 100% speed. Although it should be noted that the actual flow rate will depend on the applied load and the D.C. Motor speed.
- The maximum 'Return' flow rates for each of the functions are restricted to the following values;
 - Slew... 4 L/min
 - Boom1... 8 L/min
 - Boom2... 5 L/min
 - Tele... 5 L/min
 - Steering... 6 L/min.



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Figure 6-3, : Hydraulic Schematic (Hydraulic Platform Rotate)

MMB- Main Manifold Block



<p>A</p> <p>A38 FRENCH LANGUAGE KIT ANSI 2-35</p> <p>A38E LOWER CONTROL BOX ASSEMBLY (CE) (Harnesses are not part of this assembly) . 2-13</p> <p>ADDITIONAL OPTIONS, A38E 2-36</p> <p>BOOMS & POSTS ASSEMBLY 2-18</p> <p>CABLES & ELECTRICAL COMPONENT LEGEND 2-21</p> <p>CAGE & CRADLE ASSEMBLY (STANDARD) 2-27</p> <p>CAGE HYDRAULIC ROTATOR ASSEMBLY 2-28</p> <p>CAGE ROTATOR ASSEMBLY (OPTION) . 2-29</p> <p>CHASSIS ASSEMBLY A38E 2-4</p> <p>CONTACT SNORKEL 2-37</p> <p>DECAL KIT ENGLISH (ANSI) 2-32</p> <p>DECAL KIT INTERNATIONAL (CE) 2-33</p> <p>DRIVE REDUCTION GEARBOX ASSEMBLY 2-8</p> <p>FINAL ASSEMBLY 2-2</p> <p>GENERAL INFORMATION 1-1</p> <p>HOSE ASSEMBLY 2-3</p> <p>INTRODUCTION & SPECIFICATIONS 1-2</p> <p>LANGUAGE KIT - SPANISH AB38N 2-34</p> <p>LOWER LIFT CYLINDER ASSEMBLY . . 2-17</p> <p>MACHINE PREPARATION 1-3</p> <p>MAINTENANCE 3-1</p> <p>MANIFOLD BLOCK ASSEMBLY (Hydraulic Platform Rotate) 2-15</p> <p>MANIFOLD BLOCK ASSEMBLY (Non Hydraulic Platform Rotate) 2-14</p> <p>MASTER/SLAVE CYLINDER ASSEMBLY . 2-</p>	<p>20</p> <p>MOTOR/PUMP ASSEMBLY 2-11</p> <p>OPERATION 3-2</p> <p>OPTION LIST 2-1</p> <p>OPTION SNORKEL GUARD 2-31</p> <p>PG PART ASSEMBLY, A38E 2-12</p> <p>PLATFORM HYDRAULIC ROTATE HOSE/FITTING ASSY (ADDITIONAL) 2-26</p> <p>PLATFORM ROTATE CYLINDER ASSEMBLY . 2-30</p> <p>REAR & FRONT WHEEL KIT (NON MARKING) . 2-6</p> <p>SCHEMATICS 4-1</p> <p>SLEW MOTOR, WORM DRIVE UNIT & SLEW BEARING ASSEMBLY 2-16</p> <p>STEERING CYLINDER ASSEMBLY 2-5</p> <p>TELESCOPIC CYLINDER ASSEMBLY 2-19</p> <p>TRACTION MOTOR ASSEMBLY -- SERIAL BREAK: (SN:006001 - 006204 / 006800 - Current) 2-10</p> <p>TRACTION MOTOR ASSEMBLY -- SERIAL BREAK: (SN:006407 - 006646) 2-9</p> <p>TROUBLESHOOTING 3-3</p> <p>UPPER CONTROL BOX ASSEMBLY ANSI (Hydraulic Platform Rotate) 2-25</p> <p>UPPER CONTROL BOX ASSEMBLY ANSI (Non Hydraulic Platform Rotate) 2-23</p> <p>UPPER CONTROL BOX ASSEMBLY CE (Hydraulic Platform Rotate) 2-24</p> <p>UPPER CONTROL BOX ASSEMBLY CE (Non Hydraulic Platform Rotate) 2-22</p> <p>WHEEL HUB ASSEMBLY 2-7</p>
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