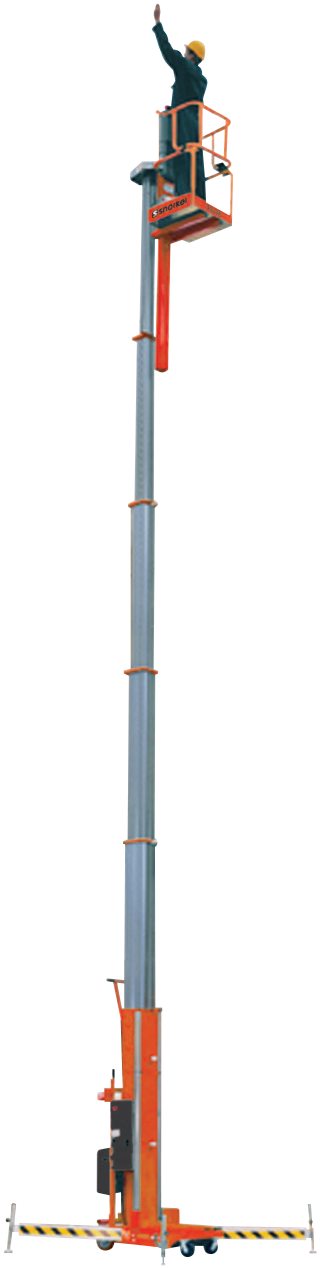
snorkel

UL40
UL32
UL25



PARTS & SERVICES

MANUAL

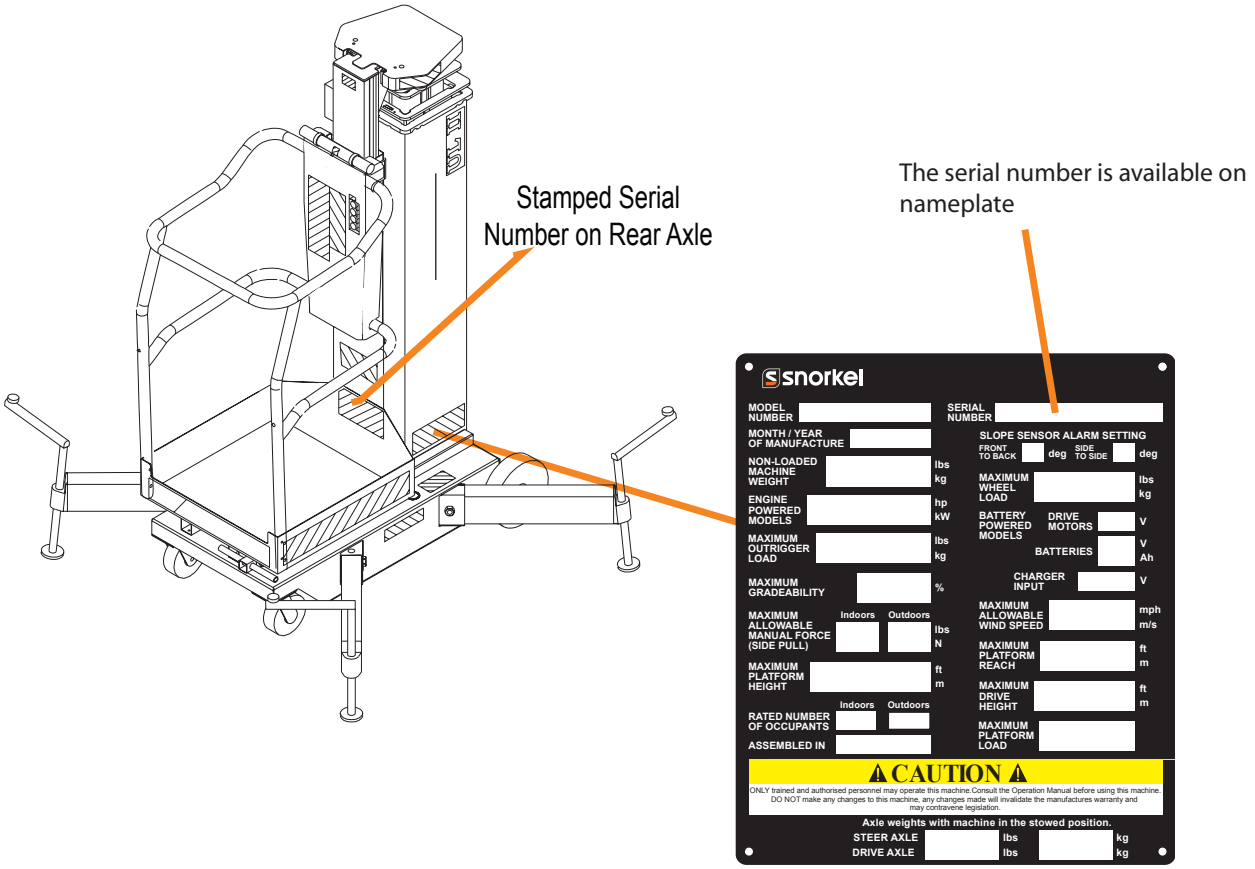
Serial Number UL25-01-060166 and after
Serial Number UL25-01-060167 and after
Serial Number UL32-01-060036 and after
Serial Number UL32-01-060037 and after
Serial Number UL40-01-060200 and after
Serial Number UL40-01-060201 and after

Part Number 515066-200
July 2017

UL25, UL32 & UL40

ENGLISH

When contacting Snorkel for service or parts information, be sure to include the model and serial numbers from the equipment name plate. Should the name plate be missing, the serial number is also stamped on top of the chassis above the front axle pivot.



USA

TEL: +1 (559)443 6600
FAX: +1 (559)268 2433

Europe

TEL: +44 (0) 1952 200
FAX: +44 (0) 1952 229

www.snorkellifts.com

UL25, UL32 & UL40 SERVICE AND PARTS MANUAL

FOREWORD

This manual is divided into six sections namely;

SECTION 1: INTRODUCTION
General description and machine specifications.

SECTION 2: OPERATION AND SPECIFICATION
Information on how to operate the work platform and how to prepare it for operation.

SECTION 3: SERVICE AND REPAIR
Preventative maintenance and service information.

SECTION 4: TROUBLESHOOTING
Causes and solutions to typical problems.

SECTION 5: SCHEMATICS
Schematics and valve block diagrams with description and location of components.

SECTION 6: ILLUSTRATED PARTS BREAKDOWN
Complete parts list with illustrations.

SPECIAL INFORMATION

NOTE: **Provides helpful information.**

WORKSHOP PROCEDURES

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.

CAUTION

Detailed prescriptions of standard workshop procedures, safety principles and service operations are not included.

Please note that this manual contains warnings and cautions against some specific service methods which could cause personal injury or could damage a machine or make it unsafe.

Please understand that these warnings cannot cover all conceivable ways in which service, whether or not recommended by Snorkel, might be carried out, or of the possible hazardous consequences of each conceivable way, nor could snorkel investigate all such ways.

Anyone using service procedures or tools whether or not recommended by Snorkel must satisfy themselves thoroughly that neither personal saftey nor machine safety will be jeopardized.

INTRODUCTION

PURPOSE

The purpose of this service and parts manual is to provide instructions and illustrations for the operation and maintenance of this work platform manufactured by Snorkel.

SCOPE

The manual includes procedures for proper operation, maintenance, adjustment and repair of this product as well as recommended maintenance schedules and troubleshooting.

GENERAL DESCRIPTION

The work platform consists of the platform, controller, elevating assembly, power module, control module and chassis.

WARNING

DO NOT *use the work platform without guardrails properly assembled and in place*

PLATFORM

The platform has a reinforced steel floor, 1.1 m (43.75 inches) high guardrails with a mid rail, 152 mm (6 inches) toe boards and an entry gate at the rear of the platform.

Features of the UL25/UL32/UL40 is shown in Figure 1-1.

1. Platform
2. Mast
3. Chassis
4. Outriggers
5. Drop bar
6. Lower Guardrail

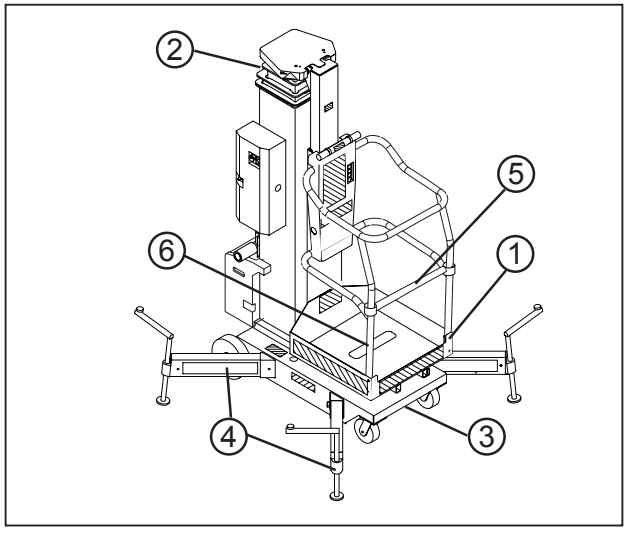


Figure 1-1: Work platform

INTRODUCTION

PLATFORM CONTROLLER

The platform controller contains the controls to operate the machine. It is located at the front of the platform. A complete explanation of control functions can be found in section 2.

ELEVATING ASSEMBLY

The platform is raised and lowered by the elevating assembly. The hydraulic pump driven by the engine, powers the cylinders. Solenoid operated valves control raising and lowering.

CHASSIS

The chassis is a structural frame that supports all the components of the SL26/30SL work platform.

PURPOSE OF EQUIPMENT

The objective of the work platform is to provide a quickly deployable, self propelled, variable height work platform to elevate personnel and materials to overhead work areas.

DANGER

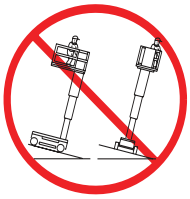
*The elevating function shall **ONLY** be used when the work platform is level and on a firm surface.*

OPERATION AND SPECIFICATION

SAFETY RULES

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.

ELECTROCUTION HAZARD	TIP OVER HAZARD	COLLISION HAZARD	FALL HAZARD	TRAPPING/CRUSHING HAZARD	STABILITY HAZARD	PUSH HAZARD
						
THIS MACHINE IS NOT INSULATED	NEVER ELEVATE THE PLATFORM OR DRIVE THE MACHINE WHILE ELEVATED UNLESS THE MACHINE IS ON A FIRM LEVEL SURFACE	NEVER POSITION THE PLATFORM WITHOUT FIRST CHECKING FOR OVERHEAD OBSTRUCTIONS OR OTHER HAZARDS	NEVER CLIMB, STAND OR SIT ON PLATFORM GUARDRAILS OR MIDRAIL	BEWARE OF CRUSHING HAZARD WHEN HOLDING HANDRAILS WHILE THE PLATFORM IS MOVING IN CLOSE PROXIMITY TO OTHER OBJECTS	NEVER ELEVATE THE PLATFORM UNLESS ALL 4 OUTRIGGERS HAVE BEEN PROPERLY INSTALLED	NEVER ATTEMPT TO PUSH THE SNORKEL LIFT WITH PEOPLE OR MATERIALS ON THE PLATFORM OR WITH THE PLATFORM ELEVATED.

- **USE OF THE AERIAL WORK PLATFORM**: This aerial work platform is intended to lift a person or persons and their tools including material needed for a job. The work platform is designed to be used for repair and assembly jobs **ONLY** at overhead work places (ceilings, cranes, roof structures, buildings, etc.).

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

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

  NEVER use the machine if damaged, not functioning properly, has damaged or missing decals.

  NEVER attach notice boards etc. to the platform as this will increase the wind loading.

- **INSULATION**: The aerial work platform is not insulated. It is imperative to keep a safe distance from live parts or electrical equipment. **DO NOT** get closer than the minimum distance recommended by the “National Regulations”.
- **PLATFORM CAPACITY**: Exceeding the specified permissible maximum load is **prohibited!** Refer to platform capacity on page 24 for details.
- **MANUAL FORCE**: **NEVER** exceed the manual force allowed for this machine. Refer to special limitations on page 9 for details.
- **LOAD DISTRIBUTION**: Ensure that all loads are distributed evenly on the platform.
- **SURVEILLANCE**: **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.
- **WHEEL LOAD: OPERATE** the machine only on surfaces capable of supporting wheel load.
- **WIND SPEED**: **NEVER** operate the machine when the wind speed exceeds the machine’s wind speed rating. Refer to the Beaufort scale for details.
- **EMERGENCY STOP**: In case of an emergency, push the **EMERGENCY STOP** switch to de-activate all powered functions.
- **ALARM**: If the alarm sounds while the platform is elevated, **STOP** operation immediately and carefully lower the platform. Move the machine to a firm, level surface.
- **SWING GATE**: 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.

  Extending the height of the platform by placing ladders, scaffolds or similar devices on the platform is **prohibited!**
- **SERVICING: NEVER** perform service on machine while platform is elevated without blocking the elevating assembly. Refer to “maintenance” for details.
- **INSPECT**: the machine thoroughly for cracked welds, loose or missing hardware, hydraulic leaks, loose wire connections and damaged cables or hoses before usage.
- **DECALS: VERIFY** that all labels are in place and legible before using the machine.
- **BATTERIES**: **NEVER** charge batteries near sparks or open flame. Charging batteries emit explosive hydrogen gas.
- **STORAGE**: **AFTER USE**, secure the work platform from unauthorised use by turning the key switch off and removing the key.
- **HARNESS**: Harness attachment points are provided on the platform and the manufacturer recommends the usage of a fall restraint harness especially where required by national safety regulations.

  Modifications to the aerial work platform are prohibited or permissible only at the approval of the manufacturer.
- **ENVIRONMENTAL TEMPERATURE LIMITATION**: The machine is primarily for use in normal ambient temperatures and conditions ranging between 50°C to -20°C
- **INDOOR USE:** This machine is for indoor use only. Do not use outdoors.

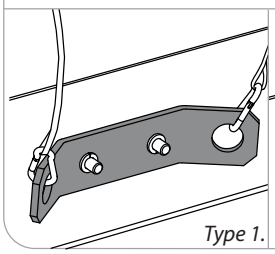
SAFETY NOTICE

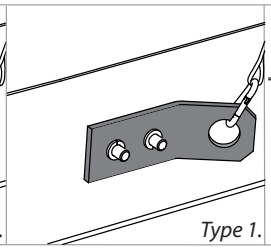
Harness attachment points are provided in the platform and the manufacturer recommends the usage of a fall restraint harness, especially where required by national safety regulations.

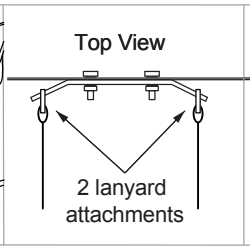
All harness attachment points on SNORKEL vehicles have been tested with a force of 3,650 lbs (16.3 KN) per person.

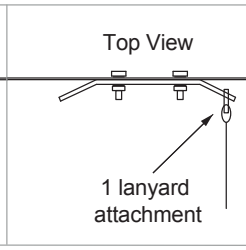
See below examples of harness attachment points used on SNORKEL vehicles with their corrosponding rating;

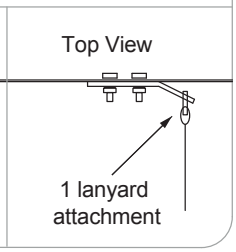
Harness attachment point ***Type 1.*** is rated for one lanyard attachment per loop as shown in the illustrations depending upon platform occupancy rating *(see operators manual & decals).*



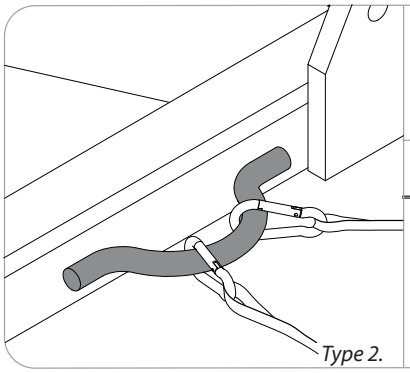


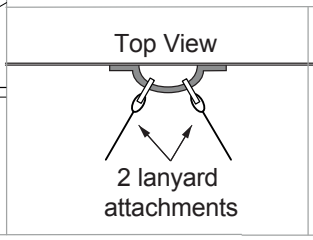


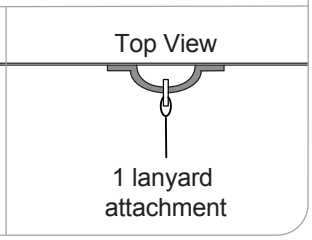




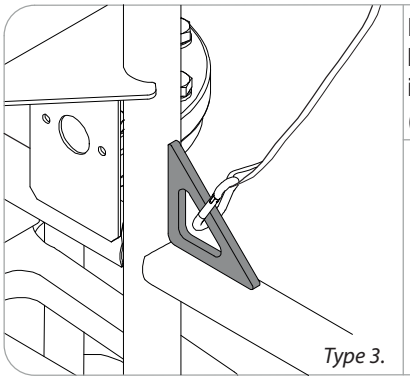
Harness attachment point ***Type 2.*** is rated for two lanyard attachments per loop as shown in the illustrations depending upon platform occupancy rating *(see operators manual & decals).*

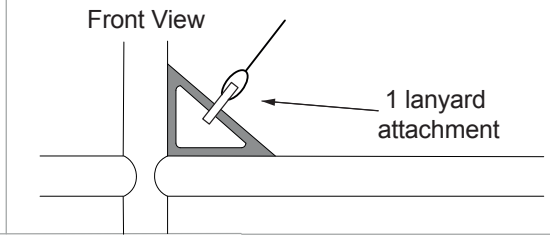




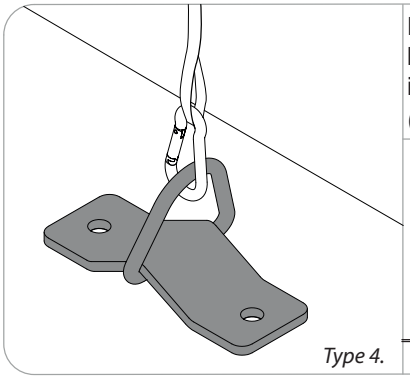


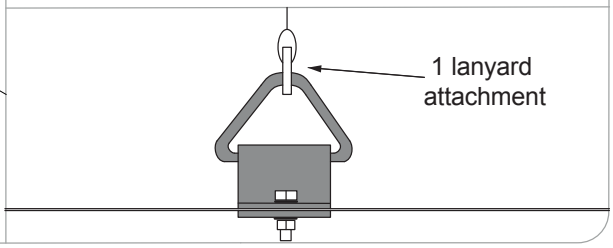
Harness attachment point ***Type 3.*** is rated for one lanyard attachment per loop as shown in the illustrations depending upon platform occupancy rating *(see operators manual & decals).*





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).*





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.

SAFETY NOTICE

NOTE:

1. To bypass any safety equipment is **prohibited** and presents a danger for the person/persons on the aerial work platform and in its working range.
2. Modification to the aerial work platform is **prohibited** or permissible only at the approval of Snorkel.
3. The driving of MEWP'S on the public highway is subject to national traffic regulations.
4. It is important to ensure that the machine meets the requirements of stability during use, transportation, assembly, dismantling when out of service, testing or foreseeable breakdowns.
5. Never use a machine that is damaged or not functioning properly. Verify that all labels are in place and legible before using.

Model Modell Modele Modelo	Modello Verticaal model Malli	**UL32DC**
Serial number Matricola ajanumero	Serienummer Numero de serie Matricola	**UL32-01-060004**

Holder of Technical File
Inhaber des technischen Dossiers
Titulaire du dossier technique
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Snorkel
Vigo centre
Washington
Tyne and Wear
NE38 9DA
England

Signed for Snorkel

Manufacturing Quality Manager

Jan-15

Date

Datum
Fecha
Data
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Paivamaara

EC Declaration of Conformity of Machinery 2006/42/EC
EC-Konformitätserklärung für Maschinen 2006/42/EC
Declaration De Conformite CE pour les Machines 2006/42/EC
Declaracion De Conformidad CE Para Maquinaria 2006/42/EC
Dichiarazione Di Conformità CE Per Le Macchine 2006/42/EC
CE Conformiteitsverklaring voor Machinerie 2006/42/EC
EU Deklaration Avseende Överensstammelse För Maskinutrustning 2006/42/EC
EF-Samsvarserklaering For Maskiner 2006/42/EC
EF-Overensstemmelseserklaering for Maskiner 2006/42/EC
EU Vaatimustenmukaisuusvakuutus 2006/42/EC

Manufacturer Hersteller Fabrikant Produsent Tillverkare Valmistaja Fabbricante Fabricante Fabricant	Snorkel Vigo Centre, Washington Tyne and Wear, England , NE38 9DA TEL:+44(0)845 1557 755 FAX:+44(0)845 1557 756

Authorized Representative Autorisierte Vertretung Representant autorise Representante autorizado Mandatario Erkend vertegenwoordiger Auktoriserad representant Autorisert representant Represenentant Valtuutettu edustaja	**Snorkel Europe** **Vigo Centre, Washington** **Tyne and Wear, England** **Tel: +44 (0) 845 1557 755** **FAX: +44 (0) 845 1557 756**

Description	Aerial Work Platform
Bezeichnung	Arbeitsbühne
Description	Plate-forme elevatrice de personnel Descripcion
	Platforma aerea de trabajo con motor
Descrizione	Piattaforma di sollevamento motorizzata
Beschrijving	Mechanisch aangedreven werkplatform
Beskrivning	Höj-och sänkbar arbetsplattform
Beskrivelse	Selvgående arbetsplattform
Beskrivelse	Motordrevet lofteplatform
Kuvaus	Konevoimalla toimiva nostolava Selvgående personarbetslift

CE

CONTENTS

INTRODUCTION

This manual covers the operation of the UL25, UL32 and UL40 work platforms. This manual must be stored on the machine at all times. Read, understand and follow all safety rules and operating instructions before attempting to operate the machine.

GENERAL DESCRIPTION

WARNING

DO NOT *use the maintenance platform without guardrails properly assembled and in place.*

1. Platform
2. Mast
3. Chassis
4. Outriggers
5. Guardrail
6. Entry drop bar
7. Chassis controls
8. Power unit
   - Motor
   - Hydraulic reservoir
9. Battery box (DC units)
   - Battery
   - Battery charger
10. Casters
11. Rear wheels
12. Screw jacks
13. Loader assembly
14. Emergency lowering valve

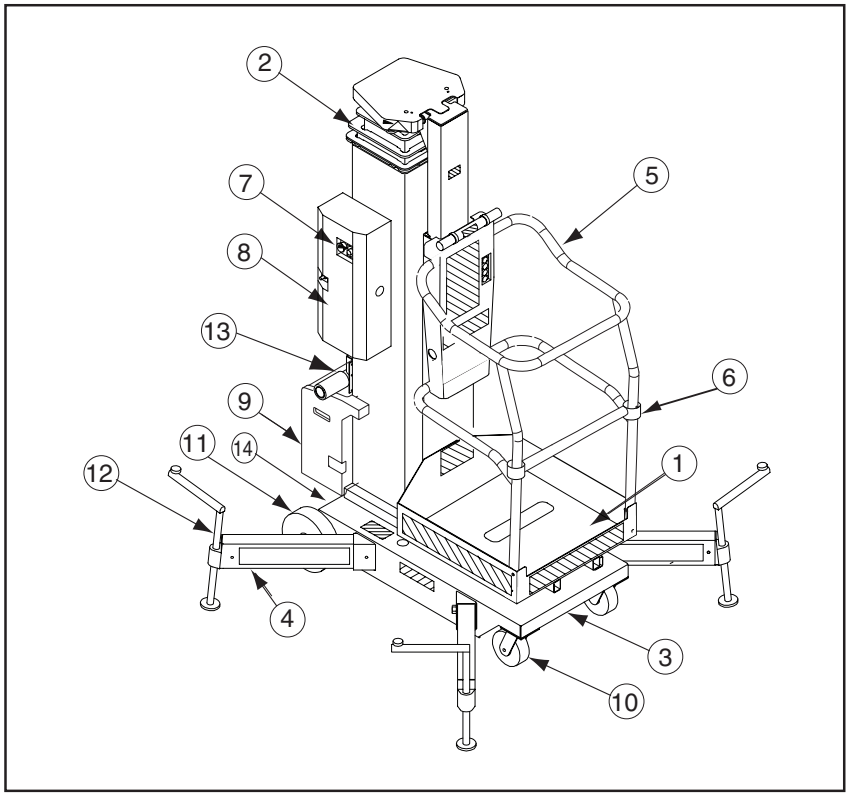


Figure 2-1: UL25/UL32/UL40 work platform.

SPECIAL LIMITATIONS

Elevating the work platform is limited to firm, level surfaces only. This machine is rated for indoor use only. All four outriggers must be properly installed before operating the machine.

DANGER

*The elevating function shall **ONLY** be used when the work platform is levelled and on a firm surface. **DO NOT** attempt to move this machine with the mast in an elevated position. The machine weighs in excess of 760 lb (345 kg) and must only be manoeuvered on firm, level ground.*

PLATFORM CAPACITY

The platform capacity for the machine including occupants is determined by model and options. This is listed under “specifications”.

DANGER

***DO NOT** exceed the maximum platform occupancy limits for this machine*

MANUAL FORCE

Manual force is the force applied by the occupants to objects such as walls or other structures outside the work platform. The maximum allowable manual force is limited to 200N (45 lbs.) of force.

DANGER

***DO NOT** exceed the maximum amount of manual force for this machine.*

LIFT LEVEL SENSOR INTERLOCK

The platform lift function is interlocked through a level sensor system. If the chassis is tilted more than 1.5 degrees in either direction, an alarm will sound when the power is turned on and the lift function will not operate. When the alarm sounds, only the platform lower function will operate.

PLATFORM CONTROLS AND INDICATORS DC MODELS

1. Emergency stop button
2. Platform raise button
3. Enable button
4. Platform lower button
5. Battery condition indicator

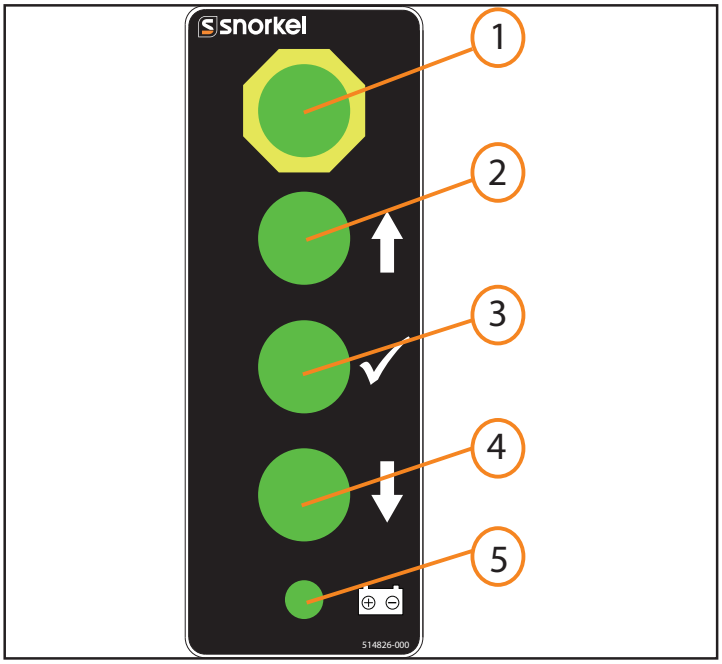


Figure 2-2: Platform controls and indicator locations

CHASSIS CONTROLS AND INDICATORS DC MODELS

1. Emergency stop button
2. Diagnostics port
3. Enable button
4. Platform raise button
5. Platform lower button
6. Power indicator
7. Control selector switch

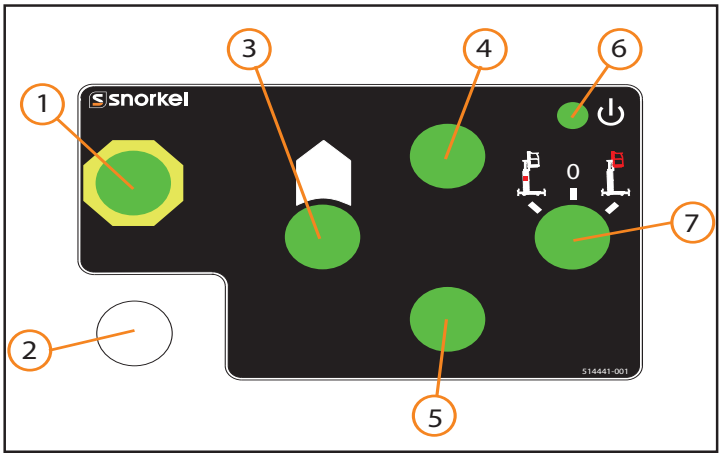


Figure 2-3: Chassis controls and indicator locations

PLATFORM CONTROLS AND INDICATORS AC MODELS

1. Emergency stop button
2. Platform raise button
3. Enable button
4. Platform lower button
5. Emergency lower switch
   NB: Use emergency lower switch in conjunction with the enable button (3) and the platform lower button (4) to lower the platform in the event of a mains power failure only.

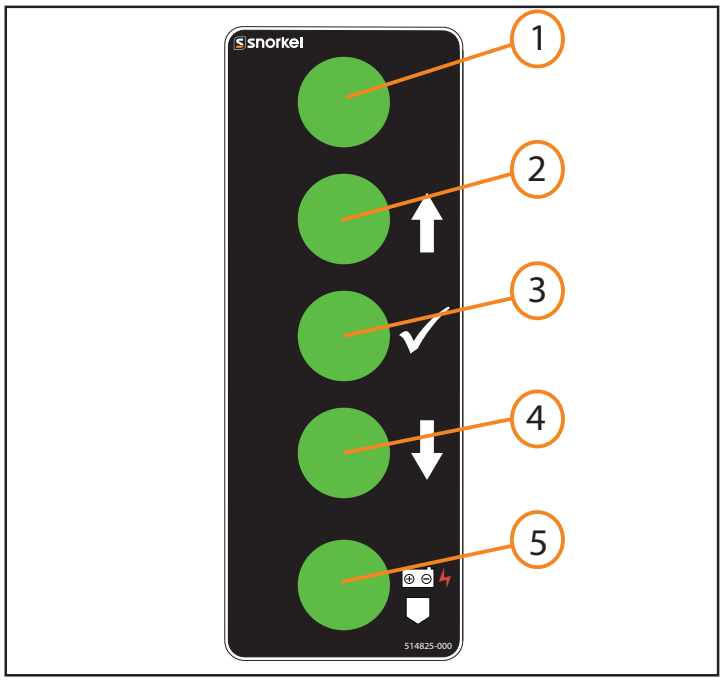


Figure 2-4: Platform controls and indicator locations

CHASSIS CONTROLS AND INDICATORS AC MODELS

1. Emergency stop button
2. Diagnostic port
3. Circuit breaker (MCB)
4. Enable button
5. Platform raise button
6. Platform lower button
7. Control selector switch

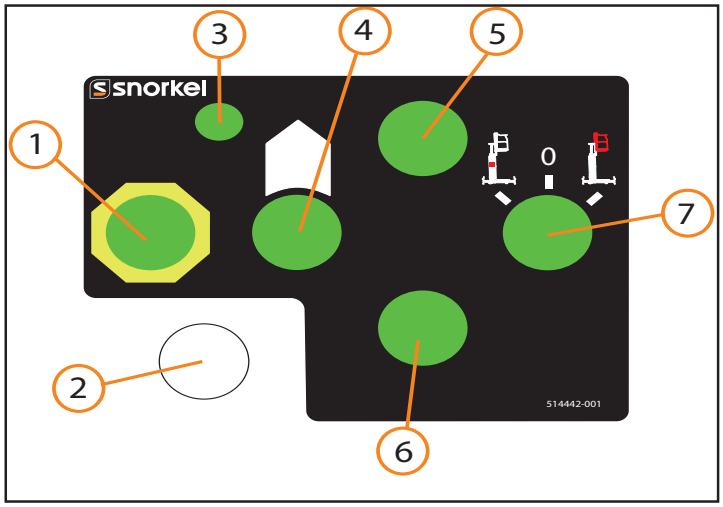


Figure 2-5: Chassis controls and indicator locations

PRE-OPERATION SAFETY INSPECTION

NOTE: Carefully read, understand and follow all safety rules, operating instructions, labels and National Safety Instructions/Requirements. Perform the following steps each day before use.

1. Check that all 4 outriggers are properly installed.
2. Check that the base is level.
3. AC units: Connect the power unit plug to an approved extension cord.
4. DC units: Verify that the batteries are charged.
5. Perform the safety interlock tests.
6. Check for external damage to the mast.
7. Check the level of the hydraulic fluid with the platform fully lowered using the following procedures;
   - Remove the reservoir cap and check the fluid level on the dipstick.
   - Add hydraulic fluid if necessary. Oil should be visible on the end of the dipstick.
8. Check that the fluid level in the batteries is correct. Refer to “Battery maintenance”.
9. Check that all guardrails are in place and all fasteners are properly tightened.
10. Inspect the machine thoroughly for cracked welds and structural damage, loose or missing hardware, hydraulic leaks, damaged control cable and loose wire connections.

OUTRIGGERS INTERLOCK TEST

DANGER

***Never** perform this test from the platform.*

1. Properly install all 4 outriggers and level the base.
2. Release the tension on 1 outrigger by turning the screw jack counter clockwise until the indicator light is no longer lit.
3. While standing on the ground, activate the control panel to elevate the platform. The platform should not elevate.
4. Re-level the base.
5. Repeat steps 2, 3 and 4 until all 4 outriggers have been tested.
6. Repeat steps 1 to 5 using the platform controls.

DANGER

***DO NOT** use a machine that elevates when the tension has been released on an outrigger. The machine must be repaired before using.*

DANGER

***DO NOT** use a machine if any outrigger indicator light remains illuminated when the related outrigger screw jack foot is clear of the ground. The machine must be repaired before use.*

LEVEL SENSOR INTERLOCK TEST

1. Properly install all 4 outriggers and ensure they all have tension applied. All 4 outrigger lights should be on.
2. Adjust the outriggers so that the platform is tilted by more than 1.5 degrees.
3. Verify that the tilt alarm sounds and using the ground control panel, the platform should not elevate.
4. Repeat steps 1 to 3 using the platform controls.

Refer to “Controls and indicators” for the locations of various controls and indicators.

WARNING

Stand Clear of the work platform while performing the following checks. Check above the work platforms for obstructions and electrical conductors.

NOTE: The platform will not elevate unless all four outriggers are properly installed with screw jack pads firmly in contact with the floor and each outrigger indicator lamp lit. The chassis is level to 1.0 degree or less in all directions.

Perform all tests prior to operating the machine.

1. Pull the chassis emergency stop switch to the ON position.
2. Turn the key to “ground controls”.
3. Pull the platform emergency stop switch to the ON position.
4. Push both the middle and the top buttons (enable and up) on the ground control box at the same time to elevate the platform. Release the buttons to stop.
5. Push both the middle and the bottom buttons (enable and down) at the same time to lower the platform. Release the buttons to stop.
6. Open the emergency lowering valve to verify proper operation.
7. Push the chassis emergency stop switch to verify proper operation. All machine functions should be disabled. Pull out the chassis emergency stop switch to resume.
8. Turn the key to platform controls and enter the platform ensuring the drop bar gate is correctly closed.
9. Repeat tests 4 & 5 from the platform controls.
10. Push the platform emergency stop switch to verify proper operation. All machine functions should be disabled. Pull out the platform emergency stop switch to resume.

OPERATION

Before operating the work platform, ensure that the pre-operation safety inspection has been completed and that any deficiencies have been corrected. Never operate a damaged or malfunctioning machine. The operator must be thoroughly trained on this machine.

NOTE: The platform will not elevate unless all 4 outriggers are properly installed with screw jack pads firmly in contact with the floor and each outrigger indicator lamp lit. The chassis is level to 1.0 degrees or less in all directions.

1. AC units: Connect the power unit plug to an approved extension cord.
2. DC units: Verify that the battery charger is turned off and that the extension cord is removed.
3. Pull the chassis emergency stop switch to the ON position.
4. Turn the key to platform.
5. Enter the platform by raising the drop bar.
6. Ensure the drop bar falls freely to its lowered position.

OUTRIGGER INSTALLATION

1. Remove the outriggers from the storage locations on the sides of the mast.
2. Insert the outriggers into the outrigger socket at the base.
3. Ensure the locking pin engages with the hole at the end of the outrigger. Pull the outrigger outwards to ensure it is engaged.
4. Repeat step 3 for the rest of the outriggers. Make sure all 4 locking pins are engaged.
5. Level the base, centring the bubble in the orbit level on the base by adjusting the screw jacks (turn clockwise) at the end of each outrigger. Do not release the tension (turn counterclockwise) on an outrigger to level the base.
6. All 4 screw jack pads must be in solid contact with a firm surface and each outrigger indicator light must be lit before the platform is elevated.

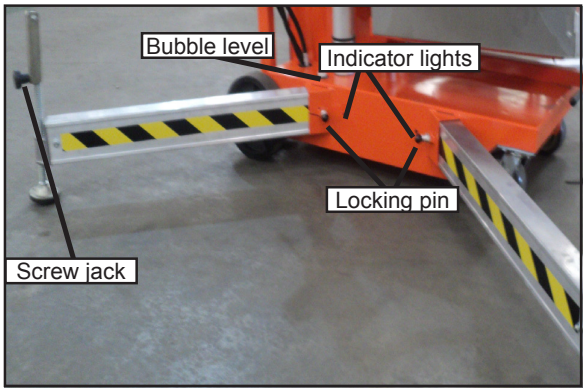


Figure 2-6: Outrigger installation components

PLATFORM ELEVATION

1. Check that the area above the platform is clear before elevating the platform.
2. Pull the platform emergency stop switch to the ON position.
3. Push both the middle and the top buttons (enable and up) on the control box at the same time to elevate the platform. Release the buttons to stop.
   - In the event of an emergency, push the emergency stop button.
4. Visually inspect the mast assembly for cracked welds and structural damage, loose hardware, hydraulic leaks, loose wire connections and erratic operation. Check for missing or loose parts

PLATFORM LOWER

1. Check that the area below the platform is clear before lowering the platform.
2. Push both the middle and bottom buttons (enable and down) at the same time to lower the platform. Release the buttons to stop.

BATTERY CONDITION LED

The battery condition LED illuminates to give an approximate indication of the amount of charge left to be used as follows:

Not illuminated	100% to 40%
Slow flash	40% to 20%
Fast flash	20% to 10%
Steady on less than	10%

Table 2-1: Battery condition indicators.

NOTE: To maximise battery life, always re-charge the battery after use and never store the machine for extended periods without first fully re-charging the battery.

EMERGENCY LOWERING

WARNING

If the platform should fail to lower, never climb down the elevating assembly.
Stand clear of the elevating assembly while operating the emergency lowering valve knob.

The emergency lowering valve can be reached only from the ground. When needed to be open to lower the platform, ask for assistance from the ground. The valve is located at the rear of the machine as shown in Figure 9.

1. Pull the knob to open the valve.
2. To close the valve, release the knob.

NOTE: The platform will not elevate if the emergency lowering valve is open.

AC UNITS ONLY

In the event of a mains power failure, the platform can be lowered from the platform controls by operating the emergency lower switch, the enable button and the platform lower button at the same time.

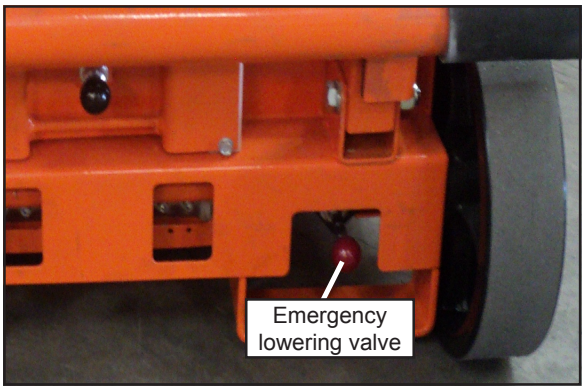


Figure 2-7: Emergency lowering valve location

NOTE: This procedure should only be used in the event of an emergency.

AFTER USE EACH DAY

1. Ensure that the platform is fully lowered.
2. Park the machine on a firm level surface, preferably under cover. Secure against vandals, children and unauthorized operation.
3. Turn the chassis key switch to OFF and remove the key to prevent unauthorized operation.

TRANSPORTING THE WORK PLATFORM

FORKLIFT

CAUTION

Forklifting is for transportation only. Refer to specifications for weight of the machine and be certain that the forklift is of adequate capacity to lift the machine.

Forklift the aerial platform from the rear by lifting from the fork pockets shown in Figure 2-10

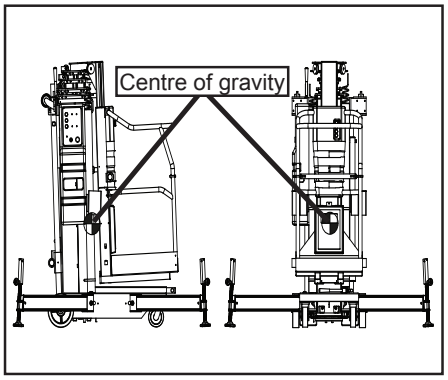


Figure 2-8: Centre of gravity.

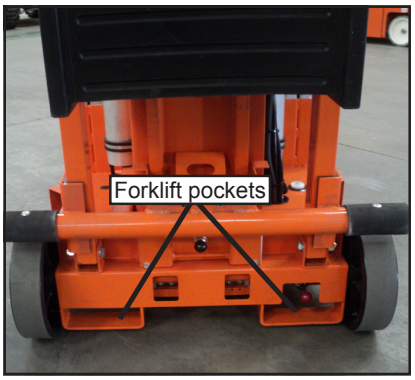


Figure 2-9: Fork pockets location.

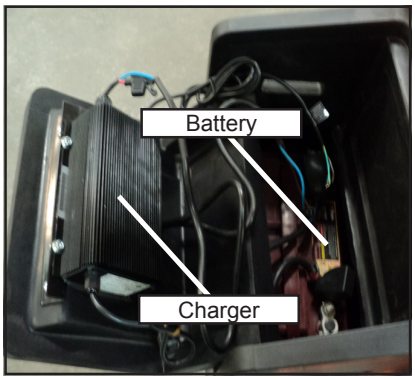


Figure 2-10: Battery box (DC model).

TRUCK

1. Manoeuvre the machine into the transport position and chock the wheels.
2. Secure the machine to the transport vehicle with chains or straps of adequate load capacity attached to the chassis lifting/tie down points.

DC MODELS

For DC models, prior to transportation, disconnect the plug from the battery box and remove the battery box from the rear of the machine.

CAUTION

The battery box is heavy (23.6kg/52 lbs). Lift properly to avoid back injury.

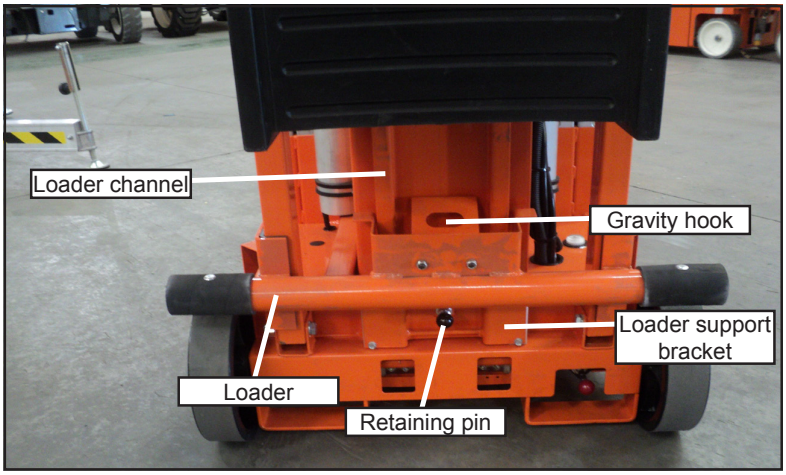


Figure 2-11: Loader in load position.

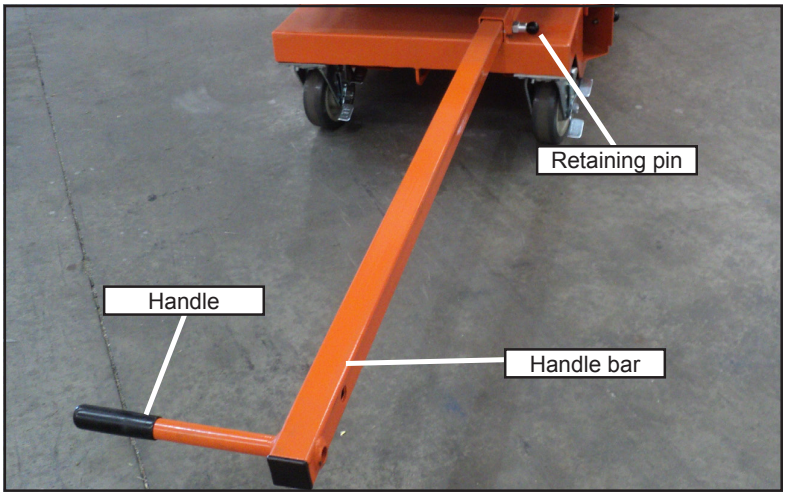


Figure 2-12: handle positioning.

TRANSPORTATION

LOADING

WARNING

Ensure that the loader fully engages the tailgate or vehicle bed.

1. Raise the loader support brackets and engage the retaining pin in the top hole of the loader channel.
2. Secure the loader to the loader support bracket with the gravity hook.
3. Position the unit so that the back of the machine comes into contact with the tailgate or vehicle bed.
4. Release the gravity hook and slide the loader down until it comes into contact with the tailgate or vehicle bed. Then, re-position the loader support bracket so that the retaining pin is in the first available hole above the loader.
5. Release the locking pin and pull the T-handle out until the locking pin engages the hole in the end of the T-handle.
6. Lift up on the T-handle using the loader as a pivot until the unit rotates to a horizontal position in the vehicle bed.
7. Push the base of the unit towards the front of the vehicle bed. The machine will slide on the loader until the rear wheels are on the bed. The unit may then be rolled on the rear wheels and upper casters.
8. Re-turn the T-handle to the stored position making sure that the locking pin engages the T-handle.
9. Secure the unit with suitable tie straps using the forklift pockets located under the base of the tilt back frame.

CAUTION

To prevent damage to the mast assembly, do not place rope or tie straps across the mast assembly when securing the unit for transportation.
***DO NOT** overtighten the rope or tie straps otherwise damage to the machine will result.*

UNLOADING

1. Unsecure the unit.
2. Release the locking pin and pull the T-handle out until the locking pin engages the hole at the end of the T-handle.
3. Roll the unit back until the rear wheels are off the edge of the tailgate or vehicle bed.
4. Pull downward on the T-handle allowing the unit to slide on the loader.
   - As the unit stops sliding on the loader, it will pivot on the loader to an upright position.
   - Gradually counterbalance the unit's weight by applying an upward force on the T-handle. This allows the unit to settle gently on the wheels avoiding undue impact on the unit.
5. Return the T-handle to the stored position making sure that the locking pin engages the T-handle.

PASSAGE THROUGH A DOORWAY

The UL machine is equipped with a castered rear tilt back assembly. When the unit is tilted back onto this support frame, the overall height is reduced to allow the unit to pass through a standard doorway.

LOWERING

CAUTION

Before tilting the machine unto the rear tilt back assembly, be sure that the retaining pin is fully inserted with the hair pin retainer and the cylinder assembly is fully extended.

***DO NOT** drop the tilt back frame. Keep out from under the tilt back frame and machine when tilting.*

1. Ensure that the area is clear of personnel and obstructions.
2. While holding the tilt back frame, remove the hair pin retainer and the retaining pin.
3. Lower the tilt back frame until the hole in the cylinder assembly align with the upper mounting bracket pin hole. Secure the cylinder assembly to the upper mounting bracket using the retaining pin and hair pin retainer.
4. Extend the tilt back handle to the tilt/lift position by releasing the locking pin and pulling the handle out of the tilt back assembly until the locking pin engages.
5. Push down on the tilt back handle until the unit comes to rest on the tilt back frame.
   - As the mast tilts back, counterbalance the machine's weight by increasing upward force on the end of the tilt back handle. This allows the machine to gently come to rest on the tilt back casters.
6. Pull down on the handle on the back of the mast to compress the cylinder assembly.
7. Return the tilt back handle to the storage position, making sure that the locking pin engages the handle.

RAISING

1. Lift up on the mast handle to extend the cylinder assembly.
2. Fully engage the tilt back handle until the locking pin engages.
3. Lift up on the tilt back handle.
   - As the mast approaches vertical, counterbalance the machine's weight by increasing downward force on the end of the tilt back handle. This allows the machine to settle gently on the front casters.
4. Return the tilt back handle to the storage position, making sure that the locking pin engages the handle.
5. While holding the tilt back frame, remove the retaining pin and raise the tilt back assembly to the stowed position.
6. Secure with the retaining pin, making sure that the retaining pin is fully inserted and that the hair pin retainer is installed.

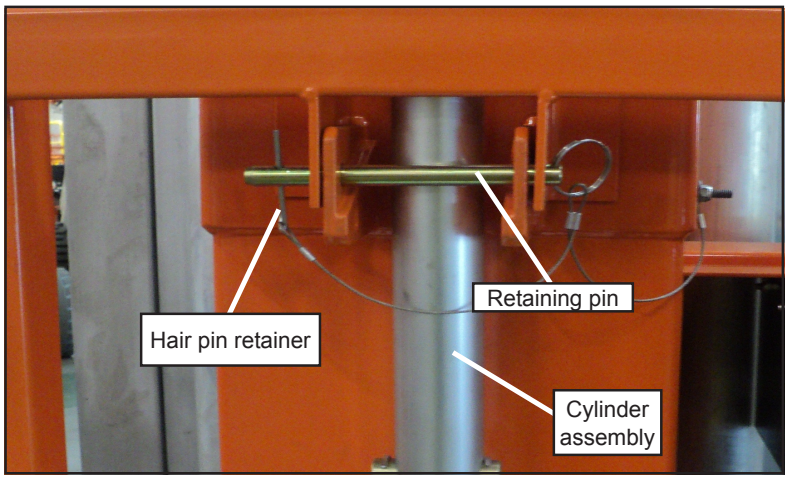


Figure 2-13: Cylinder secured with retaining pin.

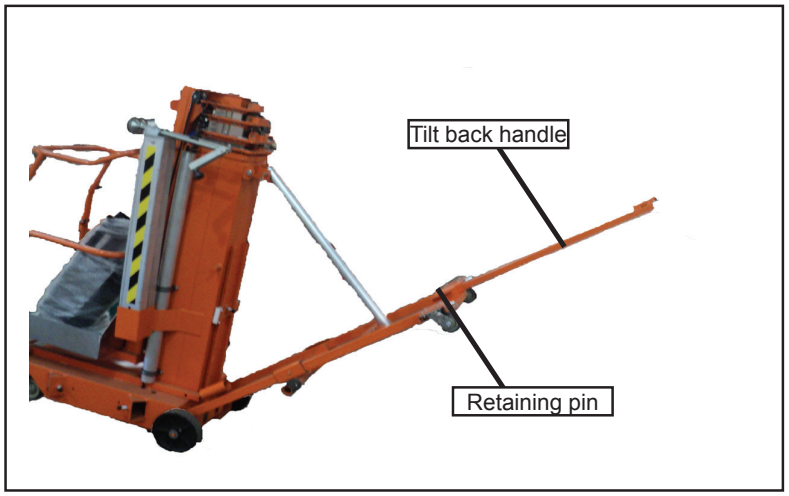


Figure 2-14: Lowering and raising with the tilt back handle.

BATTERY MAINTENANCE

WARNING

Hazard of explosive gas mixture. Keep sparks, flame and smoking material away from batteries.
Always wear safety glasses when working near batteries.
Battery fluid is highly corrosive. Thoroughly rinse away any spilled fluid with clean water.

Always replace the batteries with Snorkel batteries or manufacturer approved replacements weighing 22 kg (48 lbs.) each.

Use the following procedure to ensure battery maintenance.

1. Check the battery fluid level daily especially if the work platform is being used in a warm, dry climate.
2. If the electrolyte level is lower than 10 mm (3/8") above the plates, add distilled water only. Do not use tap water due to its high mineral content since it will shorten battery life.
3. Keep the terminals and tops of the batteries clean.
4. Refer to the service manual to extend battery life and for complete service instructions.

BATTERY CHARGING

WARNING

Charge the batteries in a well ventilated area. Do not charge the batteries when the work platform is near a source of spark or flames.
Permanent damage to the batteries will result if the batteries are not immediately recharged after discharging. Never disconnect the cables from the batteries when the charger is operating. Keep the charger dry.

Use the following procedure to charge the batteries after use.

1. Check the battery fluid level. If the battery fluid level is lower than 10 mm (3/8") above the plates, add distilled water only.
2. Verify the charger voltage switch is set to 12 volts.
3. Connect an appropriate extension cord to the charger plug. Plug the extension cord into a properly grounded outlet of proper voltage and frequency.

NOTE: The battery charger circuit must be used with a GFI (Ground fault interrupt) outlet.

NOTE: Do not operate the machine while the charger is plugged in.

HYDRAULIC FLUID

The hydraulic fluid reservoir is located under the power unit cover.

NOTE: Never add fluid if the platform is elevated.

HYDRAULIC FLUID CHECK

1. Make sure that the platform is fully lowered.
2. Open the chassis door.
3. Check the fluid level using the gauge on the dipstick.
4. To add hydraulic fluid, remove the filler cap.
5. Add the appropriate hydraulic fluid to raise the level to the end of the dipstick.

The complete inspection consists of periodic visual and operational checks along with periodic minor adjustments that assure proper performance. Daily inspection will prevent abnormal wear and prolong the life of all systems. The inspection and maintenance schedule should be performed by personnel who are trained and familiar with mechanical and electrical procedures.

WARNING

Before performing preventative maintenance, familiarize yourself with the operation of the machine. Always block the elevating assembly whenever it is necessary to perform maintenance while the platform is elevated.

The daily preventative maintenance checklist has been designed for machine service and maintenance. Photocopy the checklist page and use the checklist when inspecting the machine.

DAILY PREVENTATIVE MAINTENANCE SCHEDULE

MAINTENANCE TABLE KEY

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

PREVENTATIVE MAINTENANCE REPORT

Date: _____
Owner: _____
Model #: _____
Serial #: _____
Serviced by: _____

COMPONENT	INSPECTION OR SERVICES	Y	N	R
Operator's Manual	Check that the operators manual is in the manual holder and all pages are intact and readable			
Labels & Decals	Check that labels and decals are in place, intact and readable			
Control Cable	Check the exterior of the cable for pinching, binding or wear.			
Mast Assembly	Inspect for bends, cracks or loose rivets.			
Battery System	Check electrolyte level			
	Check battery cable condition			
	Check terminals are clean and connectors are tight			
	Check charger condition and operation			
	Charge batteries			
Hydraulic fluid	Check oil level			
Hydraulic system	Check all fittings are tight and there are no leaks			
Drive motors	Check for operation and leaks			
Hydraulic pump	Check fittings are secure and there are no leaks			
Emergency lowering	Operate the emergency lowering valve and check for serviceability.			
Controller	Check switch operation			
Platform deck and rails	Check fasteners are in place, correctly tightened and not damaged			
	Check the structure and welds for damage, deformation, corrosion and cracks			
	Check condition of deck (no damage, deformation, corrosion or cracks			
	Check entry gate closure functions correcly			

COMPONENT	INSPECTION OR SERVICES	Y	N	R
Elevating assembly	Inspect for external damage, dents, loose rivets or cracks.			
	Check the structure and welds for damage, deformation, corrosion and cracks			
Chassis	Check operation of outrigger interlocks			
	Check castors for damage			
	Check hoses for pinch or rubbing points			
	Check welds for cracks			
Lift Cylinders	Check for leaks			
Harness anchor point	Check fasteners are secure			
	Check for damage, deformation, corrosion and cracks			
System function inspection	Conduct system function inspection (see system function inspection pocedure)			
Emergency stops	Check that the emergency stop button on the basket panels opertates correctly			
	Check that the emergency stop button on the ground control panel operates correctly			
Alarm	Check that the alarm sounds when activated			

*** NOTE: Use ISO #46 during summer and ISO #32 during winter**

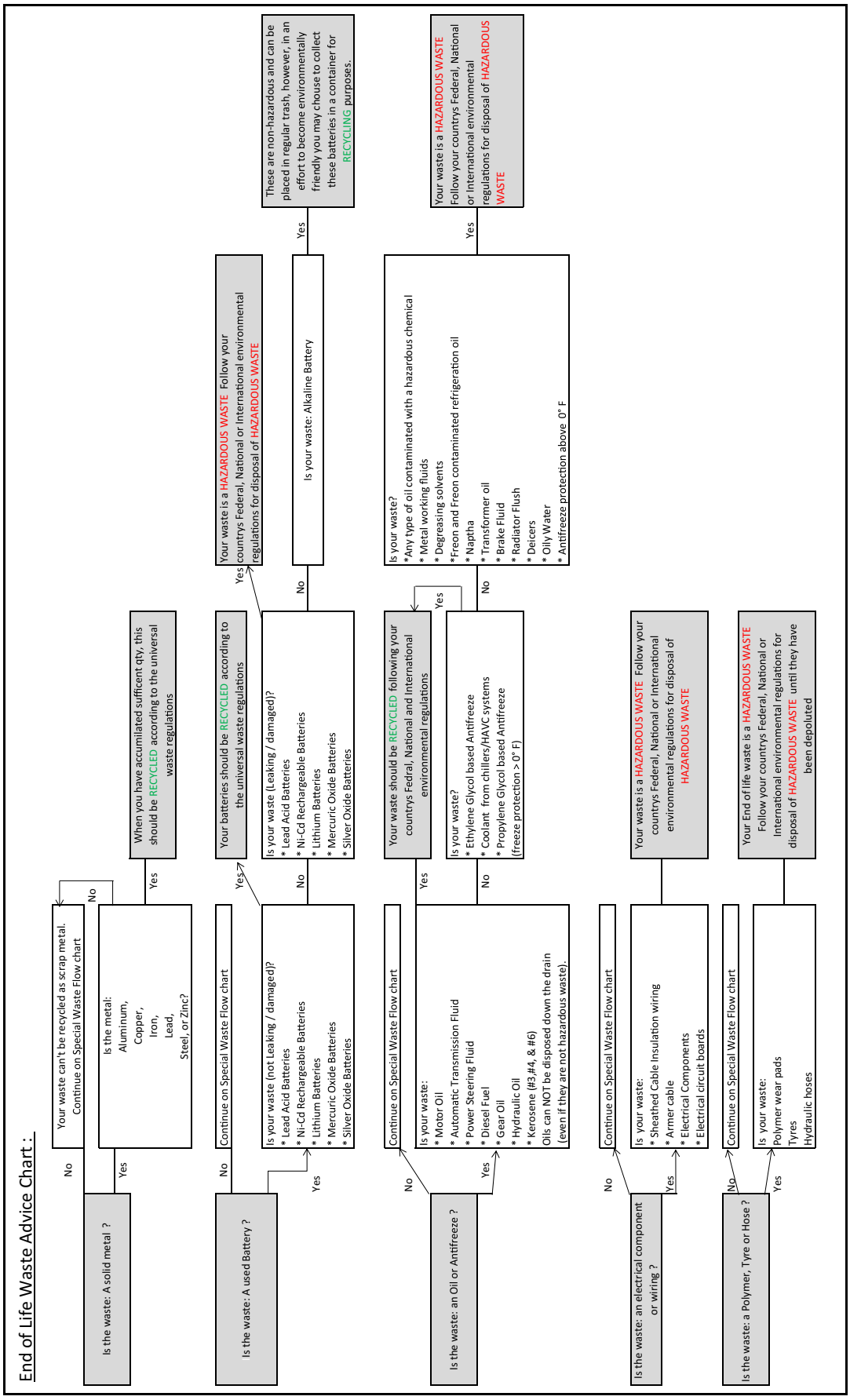
Table 2-2: Daily preventative maintenance checklist

ITEM	UL25	UL32	UL40
Platform capacity	159 kg (350 lbs.)	136 kg (300 lbs.)	136 kg (300 lbs.)
Occupants	1 PERSON	1 PERSON	1 PERSON
Height			
Working height	9.62 m (31.6 ft.)	11.75 m (38.5 ft.)	14.19 m (46.6 ft.)
Maximum platform height	7.62 m (25 ft.)	9.75 m (32 ft.)	12.19 m (40 ft.)
Minimum platform height	38 cm (15")	38 cm (15")	38 cm (15")
Dimensions			
Overall weight	390 kg (860 lbs)	435 kg (960 lbs)	470 kg (1040 lbs)
DC option weight	29 kg (64 lbs.)	29 kg (64 lbs.)	29 kg (64 lbs.)
Overall width (outriggers extended)	2.06 m (81")	2.06 m (81")	2.95 m (116")
Overall length (outriggers extended)	1.98 m (78")	1.98 m (78")	2.84 m (112")
Stowed dimensions			
Vertical height	1.98 m (78")	2.53 m (100")	2.90 m (114")
Width	74 cm (29")	74 cm (29")	74 cm (29")
Depth	1.24 m (49")	1.32 m (52")	1.32 m (52")
Diagonal storage height	1.94 m (76")	1.94 m (76")	2 m (79")
Diagonal storage length	2.59 m (102")	2.72 m (107")	3.05 m (120")
System voltage			
AC electric motor	120 VAC 60 Hz or 220 VAC 50/60 Hz		
DC electric power source	1-12 volt battery, group 27 105 Amp/hrs. minimum weight 22 kg (48 lbs.)		
Battery charger	Automatic, 120 VAC 60 Hz or 220 VAC 50 Hz Output: 10 Amp, 12 volts DC		
Hydraulic tank capacity	5.7 litres (1.5 gal)		
Maximum hydraulic pressure	165 bar (2400 PSI)		
Hydraulic Fluid			
Normal temperature: above 0° C [32 F]	ISO #46		
Low temperature: below 0° C [32 F]	ISO #32		
Extreme temperature: below -17° C [0 F]	ISO #15		
Control system	Push button lift and lower, red mushroom emergency stop switch		
Guardrails	1.1 m (43.5") high		
Toeboard	152 mm (6") high		
Maximum chassis inclination	1.0 degrees in all directions		
Outrigger loading	170 kg (374 lbs.)		
Vibration	Whole body vibration < 0.5 m/s^2, Handarm vibration < 2.5 m/s^2		
Sound pressure	68 dB (A) at control station		
Operating temperature range	-20° C to +50° C		

Table 3: UL25/32/40 Specification

NOTE: Specifications are subject to change without notice. Hot weather or heavy use may affect performance. Refer to the service manual for complete parts and service information. This machine meets or exceeds all applicable OSHA and ANSI A92.6 - 1999.

WASTE DISPOSAL AND REMOVAL



SERVICE AND REPAIR

CONTENTS

SERVICE AND REPAIR

INTRODUCTION

This section contains instructions for the maintenance of the work platform. Refer to the general information section for information relevant to all Snorkel work platform and help in diagnosing and repair of the machine.

The preventative maintenance table should be used at intervals specified by Snorkel or that of Local/National regulations to ensure the aerial platform is in good condition for use.

WARNING

Be sure to read, understand and follow all information stated in the operation section of this manual before attempting to operate or perform service on any work platform.

DANGER

*Never perform service on the work platform in the elevating assembly area while the platform is elevated without first blocking the elevating assembly. **DO NOT** stand in the elevating assembly area while deploying or storing the brace.*

SPECIAL TOOLS

The following is a list of special tools that are required to perform certain maintenance procedures. These tools may be purchased from local dealers.

Description	Part Number
Spanner Wrench for UL 25/32/40	062521-010
Strap Wrench	062482-000
Tie Rod Tensioner (2 required)	062738-000
Tensioner Bracket (2 required)	062739-000
EZCal Caliberation & Diagnostic Tool	3072123

Table 3-1: List of special maintenance tools.

PREVENTATIVE MAINTENANCE

The complete inspection consists of periodic visual and operational checks together with all necessary adjustments to assure proper performance. Daily inspection will prevent abnormal wear and pro-long 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 stated in the table 3-2.

WARNING

Before performing preventative maintenance, it is important to get familiar with the operation of the machine.
Never enter the area below the platform when the platform is elevated.

The preventative maintenance table has been designed to be used for machine service and maintenance repair.

PREVENTATIVE MAINTENANCE TABLE

INTERVAL

Daily = each shift or everyday
30 d = every 30 days
3 m = every 3 months
1 y = every 1 year
Y = Yes/Acceptable
N = No/Not Acceptable
R = Repaired/Acceptable

PREVENTATIVE MAINTENANCE REPORT

Date:
Owner:
Model #:
Serial #:
Serviced By:
Service Interval:

DO NOT fit replacement parts other than genuine components without express written approval from the manufacturer.

COMPONENT	INSPECTION OR SERVICES	INTERVAL	Y	N	R
Battery System (DC units only)	Check electrolyte level	Daily			
	Check specific gravity	30d			
	Charge batteries	Daily			
	Check charger condition & operation	Daily			
	Clean exterior	3m			
	Check battery cable condition	Daily			
	Clean terminals	3m			
Hydraulic Oil	Check oil level	Daily			
	Drain and replace oil (ISO #46)	1y			
Hydraulic system	Check for leaks	Daily			
	Check line connections	30d			
	Check hoses for exterior wear	30d			
Emergency hydraulic System	Open the emergency lowering valve and check for serviceability	3m			
Emergency Down	Check procedure for emergency down batteries	3m			
	A.C. Only: Replace emergency down batteries in upper control box	1y			
Controls	Check condition and operation	Daily			
Control Cable	Check the exterior of the cable for pinching, binding or wear	Daily			
Platform deck and rails	Check fasteners for proper torque	Daily			
	Check welds for cracks	Daily			
	Check condition of deck	Daily			
	Check entry way closure	Daily			
Hydraulic Pump	Check for fitting leaks	Daily			
	Wipe clean	30d			
	Check for leaks at mating surfaces	30d			
	Check mounting bolts for proper torque	30d			

COMPONENT	INSPECTION OR SERVICES	INTERVAL	Y	N	R
Elevating Assembly	Inspect for external damage, dents loose rivets or cracks	Daily			
	Check chains and sheaves for wear	3m			
	Inspect and adjust sequence straps	30d			
Chassis	Check cables for pinch or rubbing points	Daily			
	Check component mounting for proper torque	6m			
	Check welds for cracks	Daily			
	Check casters for damage	Daily			
Lift Cylinder	Check for leaks	Daily			
	Check for proper torque	30d			
Entire Unit	Perform pre-operation inspection	Daily			
	Check for and repair collision damage	Daily			
	Lubricate	3m			
	Check fasteners for proper torque	3m			
	Check for corrosion; remove and repaint	3m			
Labels	Check for peeling, missing or unreadable labels & replace	Daily			
Entire unit	Check for and repair collision damage	Daily			
	Check fasteners for proper torque	3m			
	Check for corrosion-remove and paint	6m			
	Lubricate	30d			

Table 3-2: Preventative maintenance checklist

A thorough investigation should be carried out every 6 months.

NOTE: Frequency and extent of periodic examinations may depend on national regulations.

LUBRICATION

Refer to figure 3-1 for the location of items that require lubrication service. Use an aerosol chain lubricant for all components to be lubricated.

CASTERS

Using a grease gun, apply 1 or 2 shots of multi-purpose bearing grease to each zerk fitting. Swivel casters have two zerk fittings, one at the wheel bearing and one at the swivel.

CHAINS

1. Ensure that the platform is fully lowered.
2. Apply enough aerosol chain lubricant to exposed section of chain to allow lubricant to run down chain.

SCREW JACKS

Apply a moderate amount of aerosol chain lubricant to each screw jack assembly.

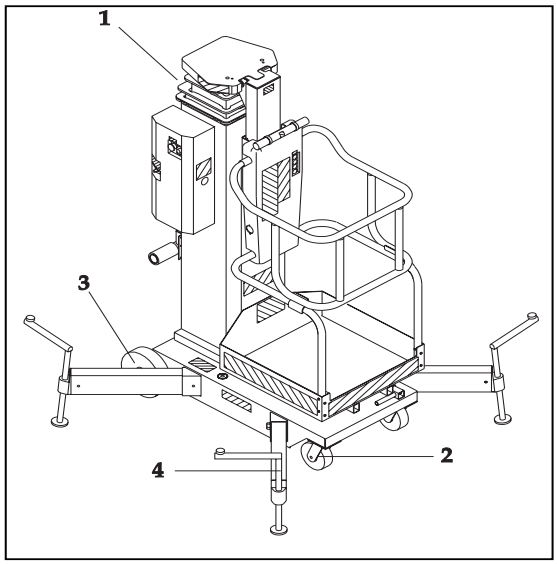


Figure 3-1: Locations for lubrication.

1	Chains
2	Casters
3	Rear Wheels
4	Screw Jacks

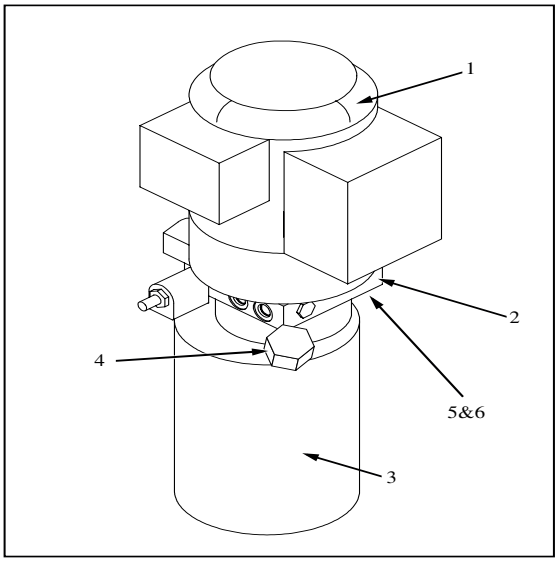


Figure 3-2: Hydraulic Power Unit.

1	Motor
2	Pump
3	Reservoir
4	Breather/Dipstick
5	Capscrew (under pump)
6	Grip Plate (under pump)

HYDRAULIC OIL RESERVOIR

To change oil in the reservoir, firstly verify that the platform is fully lowered.

1. Remove the hydraulic reservoir from the pump by removing four screws and four grip plates.
2. Provide a suitable container as an ideal reservoir for a 5.7 litres (1.5 U.S. gallon) capacity and dispose of hydraulic fluid properly. Contact local oil recyclers for more information.

NOTE: Ensure the o-ring is in place on the pump when installing the hydraulic reservoir.

3. Reinstall hydraulic reservoir to pump assembly with grip plates and screws.

4. Fill hydraulic reservoir through the dipstick hole with ISO #46 hydraulic fluid. The hydraulic reservoir has a 5.7 litres (1.5 U.S. gallon capacity. Ensure that the oil is visible on the end of the dipstick.

BATTERY MAINTENANCE - DC UNITS ONLY

Electrical energy for the motor is supplied by a 12 volt battery. Proper care and maintenance of the battery and motor will ensure maximum performance from the lift.

WARNING

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 clear water.

BATTERY INSPECTION AND CLEANING

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

WARNING

If the battery water level is not maintained, a full charge cannot be achieved. This will create a low discharge rate which will damage the motor/pump unit and void the warranty.

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

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

BATTERY CHARGING

Charge the battery at the end of each work shift or when the battery has been discharged; whichever occurs first.

CAUTION

*Charge the battery in a well ventilated area. **DO NOT** charge the battery when the lift is in an area containing sparks or flames.*
Permanent damage to the battery will result if not immediately recharged after discharging.
***NEVER** leave the charger operating unattended for more than two days.*
***NEVER** disconnect cables from the battery when the charger is operating.*
Keep the charger dry.

When night air temperatures fall below 18°C (65°F), a battery charged in an unheated area should be placed on charge as soon as possible after use. Under such conditions, a 4 hour charge once a week in the early afternoon will improve the battery life. Use the following procedure to charge the battery.

1. Check battery fluid level. If the electrolyte level is lower than 10mm (3/8 inches) above the plates, add distilled water only.
2. Verify charger voltage switch is set to 12 volts.
3. The battery charger is located at the rear of the mast. Connect an extension cord (a minimum of 1.5mm^2 [12 gauge] conductor and a maximum length of 15m [50 feet]) to the charger plug. Connect the other end of the extension plug to a properly grounded outlet of proper voltage and frequency.
4. Set charger control to “conventional” setting. Charger ammeter should indicate charger rate.
5. When battery is fully charged, charger automatically turns itself off. Disconnect the extension cord.

BATTERY CELL EQUALIZATION

The specific gravity of the electrolyte in the battery cells should be equalized monthly. To do this;

- Charge batteries as outlined in battery charging.
- After the initial charge, check the electrolyte level in all cells and add distilled water as necessary.
- Turn the charger on for an additional 8 hours. During this charge, the charging current will be low (four amps) as cells are equalizing.
- After equalization, the specific gravity of all cells should be checked with a hydrometer. The temperature corrected specific gravity in this state should be 1.260. If any corrected readings are below 1.230, 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 1 to 2 hours to adequately mix the water with the electrolyte.

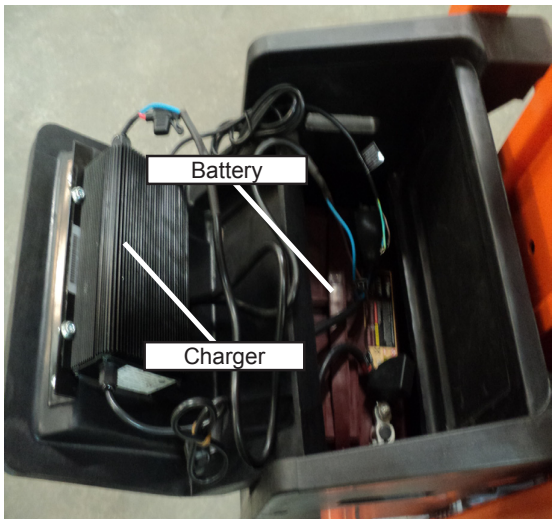


Figure 3-3: Battery Charger.

SETTING SYSTEM RELIEF VALVE

Check the hydraulic system pressure whenever the pump or relief valve has 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.

1. Install the outriggers and level the unit as normal (refer to the operators manual for operating instructions). Operate the hydraulic system for 5-10 minutes to warm up the hydraulic oil.
2. Remove the cover from the power unit assembly.
3. Place the rated safe working load for the machine (as stated under specifications in the operation section) on the platform. Do not use personnel as safe working load for this procedure.
4. Install a pressure gauge on the gauge port.
5. Remove the cap from the system relief valve (refer to figure 3-4) and turn the adjustment screw counterclockwise, 2 full turns.
6. Operate controls to elevate the machine. Note that the machine will not raise until the relief valve is properly adjusted.
7. Turn the system relief valve clockwise (refer to figure 3-4) until the machine begins to rise.
8. Elevate the platform fully and verify that the pressure does not exceed 165 bar (2400 PSI) at any time during the lift cycle.
9. Replace cap on the system relief valve and reassemble cover.

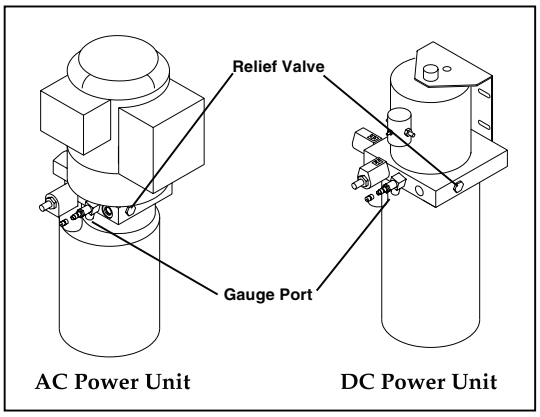


Figure 3-4: System Relief Valve.

MAST ASSEMBLY/DISASSEMBLY

Using a suitable lifting device, lower the work platform into a horizontal position (refer to figure 3-5). If possible, place the machine unto a sturdy work table using a forklift.

WARNING

Never attempt to lower the lift into a horizontal position without the use of a suitable lifting device; bodily injury or damage to the machine may result.

NOTE: Mark all components as they are removed to ease with re-installation in the correct location and sequence.

PLATFORM ASSEMBLY REMOVAL

1. Extend elevating assembly far enough to expose the eight screws attaching the cage support assembly to stage 6 by opening the emergency lowering valve and pulling on the cage guardrail.
2. Remove cover from the front of the platform assembly.

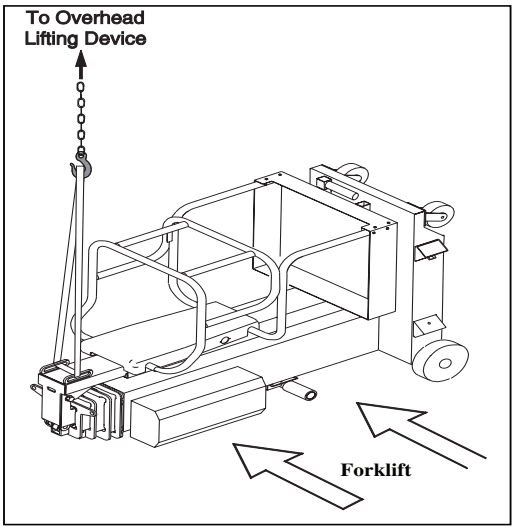


Figure 3-5: Lifting/Lowering Procedure.

3. Remove the cotter pins and chain retaining pins from the top front of stage 5.
4. Loosen screws from the strap retainer on the top casting of stage 5. Pull the strap free of the retainer.
5. Remove the cage support screws, slide the cage support out of the sixth stage mast and set aside. It should not be necessary to remove the pinch shield. Be careful not to damage the control cable.

NOTE: To remove the platform assembly from the cage support assembly, follow the steps 6-10 below.

6. Remove cable sheaves from the cage support weldment and strain reliefs from the top casting of stage 5.
7. Loosen screws from the strap retainer on the platform assembly weldment and free strap from the retainer.
8. Remove the 2 screws and washers holding the stop bracket located on the top of platform assembly weldment. Remove the stop bracket.
9. Slide the cage support weldment out of the top of the platform assembly weldment.
10. The slide bearings in platform assembly may now be inspected or replaced if necessary.

Use the following procedure in the sequence provided to disassemble the masts.

#6 MAST

1. Remove sequence strap retainer on the top of #4 mast.
2. Remove the allen head screws holding the top mast bearings between the #5 and #6 mast. Remove the top mast bearings.
3. Slide #6 mast out of #5 mast. As mast is removed, the bottom four mast bearings will fall out. Its important to note their orientation for re-assembly.
4. Disconnect the chain from the top of #4 mast.

#5 MAST

1. Remove the sequence strap retainer on the top of #3 mast.
2. Remove the allen head screws holding the top mast bearings between the #4 and #5 mast. Remove the top mast bearings.
3. Slide #5 mast out of #4 mast. As the mast is removed, the bottom four mast bearings will fall out. Its important to note their orientation for re-assembly.
4. Disconnect the chain from the top of #3 mast.

#4 MAST

1. Remove sequence strap retainer on the top of #2 mast.
2. Remove the Allen head screws holding the top mast bearings between the #3 and #4 mast. Remove the top mast bearings.

3. Slide #4 mast out of #3 mast. As mast is removed, the bottom four mast bearings will fall out; note their orientation for re-assembly.
4. Disconnect the chain from the top of the #2 mast.
5. Remove the cylinder by following instructions provided under the section named “CYLINDER ASSEMBLY”.

#3 MAST

1. Remove the sequence strap retainer on the top of #1 mast.
2. Remove the Allen head screws holding the top mast bearings between the #2 and #3 mast. Remove the top mast bearings.
3. Slide #3 mast out of #2 mast. As mast is removed, the bottom four mast bearings will fall out. Its important to note their orientation for re-assembly.

#2 MAST

1. Remove the Allen head screws holding the top mast bearings between the #1 and #2 mast. Remove the top mast bearings.
2. Slide the #2 mast out of the #1 mast. As mast is removed, the bottom four mast bearings will fall out. Its important to note their orientation for re-assembly.

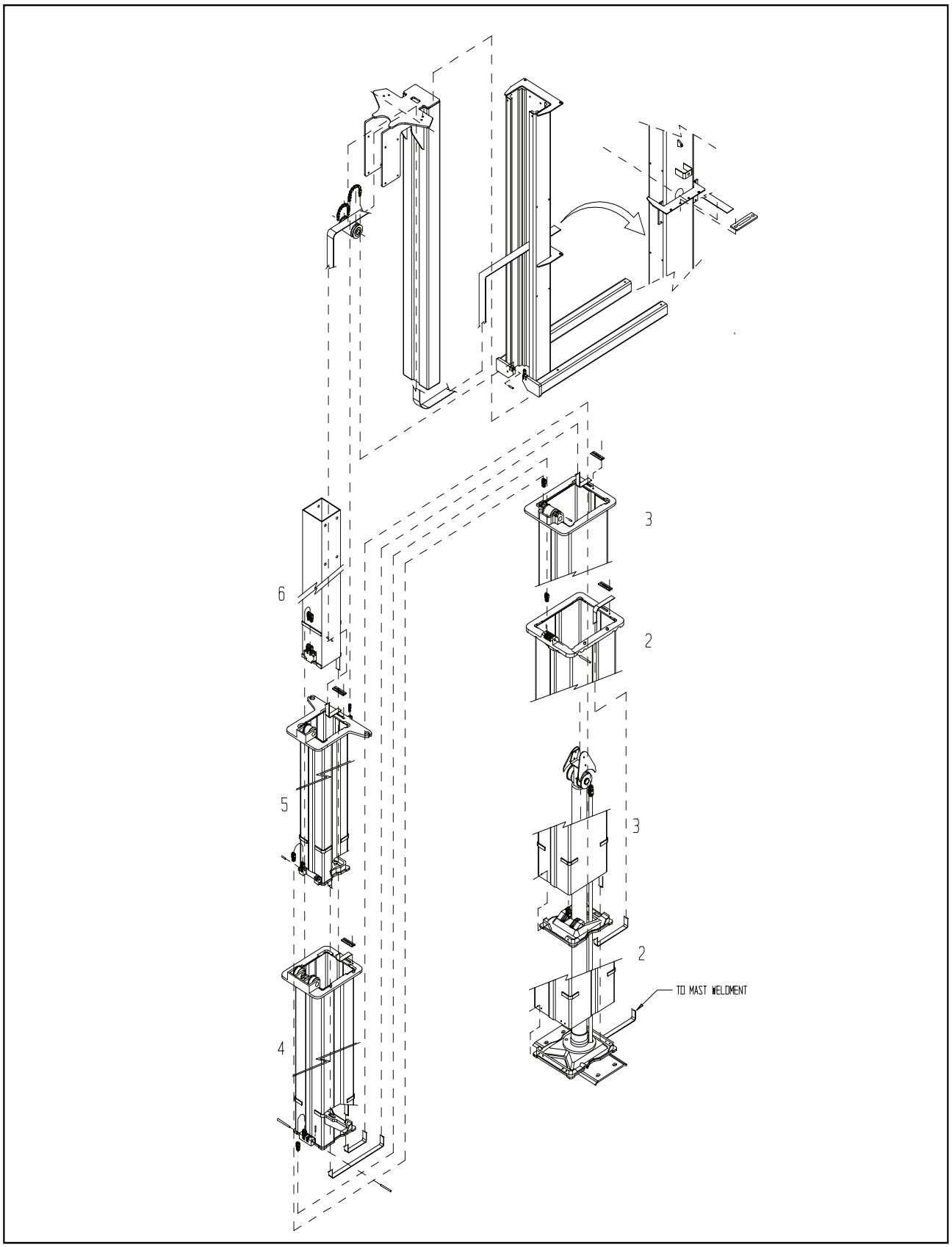


Figure 3-6: Mast Assembly, Strap and Chain Detail.

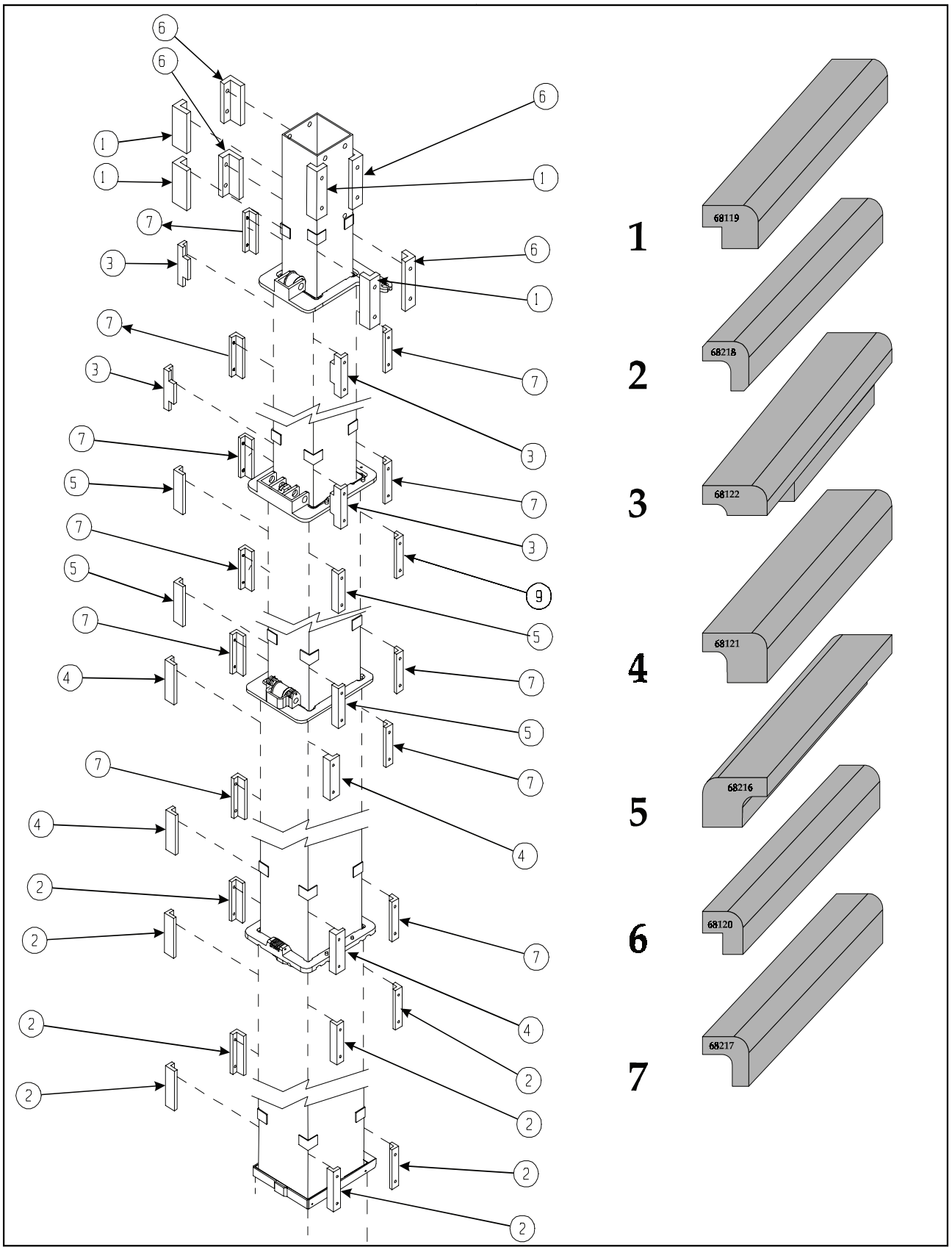


Figure 3-7: Mast Assembly, Bearing Detail.

PLATFORM ASSEMBLY

NOTE: Use WD-40 lubricant as necessary to aid with re-assembly.

#2 MAST

1. Set #2 mast in place.
2. Install bottom lower bearings.
3. Install bottom upper bearings.
4. Slide #2 mast in all the way except 30-38 cm (12-15 inches).
5. Install top bearings and secure with retaining screws using loctite 242 or equivalent on the threads.
6. Slide #2 mast in completely.

#3 MAST

1. Set #3 mast in place with the sequencing strap inside.
2. Install bottom lower bearings.
3. Install bottom upper bearings.
4. Slide #3 mast in all the way except 30-38 cm (12-15 inches).
5. Install top bearings and secure with retaining screws using loctite 242 or equivalent on the threads.
6. Place a 25 cm (10 inches) long wood block between #3 and #2 masts, slide #3 mast down tight against block. Pull sequencing strap completely out of the bottom assembly.
7. Install cylinder assembly by following instructions under “CYLINDER ASSEMBLY” section.

#4 MAST

1. Set #4 mast in place with the sequencing strap inside and the chains on the bottom.
2. Install bottom lower bearings.
3. Install bottom upper bearings.
4. Slide mast #4 in, making sure chains are not twisted.
5. Install top bearings and secure with retaining screws using loctite 242 or equivalent on the threads.
6. Install chains around #3 sheave and down through #3 casting. Secure to #2 casting with new roll pins.
7. Use a centre punch to dimple pin hole after roll pins are installed.

#5 MAST

1. Set #5 mast in place with the sequencing strap inside.
2. Install bottom lower bearings.
3. Install bottom upper bearings.
4. Slide #5 mast in, making sure chains are not twisted.
5. Install top bearings and secure with retaining screw using loctite 242 or equivalent on the threads.
6. Install chains around #4 sheaves and down through the casting. Secure to #3 casting with new roll pins.
7. Use a center punch to dimple pin holes after all roll pins are installed.
8. Slide mast in, leaving 25 cm (10 inches) exposed.

#6 MAST

1. Set #6 mast in place with the sequencing strap inside.
2. Run the remaining sequencing strap from the platform to the assembly through the slot in the bottom of stage #6 and up through the inside. Leave just enough slack on the outside to reach the attachment point at the top of stage #5.
3. Install the bottom lower bearings.
4. Install the bottom upper bearings.
5. Slide #6 mast in, making sure the chains are not twisted.
6. Install the top bearings and secure with retaining screws using loctite 242 or equivalent on the threads.
7. Install the #6 chain around the #5 sheave and through the casting secured to the #4 casting with

new roll pins.
8. Use a centre punch to dimple pin holes after all roll pins are installed.
9. Pull the sequencing strap attached to the bottom of mast #6 out through the bottom of the mast assembly. Be sure not to pull the strap that is attached to the top of mast #5.

PLATFORM SUPPORT ASSEMBLY

1. Slide the cage support weldment into the top of the platform assembly weldment.
2. Install the stop bracket and retaining screws/washers.
3. Feed chains over sheave.
4. Install cable sheaves with cables to the top of the cage support weldment.
5. Feed sequencing strap from inside mast #6 over sheave and out through the slot in the top of the cage support weldment.
6. Install cage support weldment to mast #6 using 8 screws and tighten.
7. Attach chains to #5 casting front using new cotter pins.

SEQUENCING STRAP INSTALLATION

NOTE: When installing straps, make sure they are not twisted.

1. Feed fish tape up through the bottom slot in the cage support weldment and out through the top slot.
2. Attach strap to the fish tape and pull out through bottom slot.
3. Feed fish tape down through the opening in the front of the platform support weldment and out through the bottom of the platform support weldment.
4. Attach strap to the fish tape and pull out through the opening. Attach the strap to the platform support weldment, pull tightly and secure with strap clamp and screws using loctite 242 or equivalent on the threads.
5. Feed #6 strap up through the mast between fourth and fifth stages with a fish tape.
6. Feed #5 strap up through the mast between third and fourth stages with a fish tape.
7. Feed #4 strap up through the mast between third and second stages with a fish tape.
8. Feed #3 strap up through the mast between first and second stages with a fish tape.
9. Install strap #6 to #4 top casting.
10. Install strap #5 to #3 top casting.
11. Install strap #4 to #2 top casting.
12. Install strap #3 to the top of #1 mast weldment.
13. Install the strap clamps and retaining screws using loctite 242 or equivalent on the threads. Pull straps tight while tightening retaining screws.

CYLINDER ASSEMBLY

SEAL REPLACEMENT

NOTE: The lift cylinder seal can be accessed from the bottom of the lift without removing the cylinder assembly.

Using a suitable lifting device, lower the work platform into a horizontal position (refer to Figure 3-5). If possible, place the machine on a sturdy work table using a forklift.

WARNING

Never attempt to lower lift into a horizontal position without the use of a suitable lifting device as this can lead to bodily injury or damage to the machine .

1. Remove cylinder mounting plate fasteners and retaining ring.
2. Remove tie rod nuts and count the number of turns required to bring the nut flush with the tie rod end and record for reference during installation. The tension on the tie rods maintain the left/right positioning of the cylinder within the mast assembly. Re-installing the nuts with the proper tension will speed up adjustment later.
3. Remove the cylinder mounting plate. Be careful not to allow the tie rods to suck back inside the

mast assembly. Replace the nuts on the tie rod ends temporarily to prevent this.
4. Remove the hydraulic line from the cylinder fitting and cap the cylinder fitting to prevent contaminants from entering the cylinder.

CAUTION

Marring the surface of the cylinder rod will damage cylinder seals and cause leakages. Use a strap wrench to prevent rod damage.

5. Extend the cylinder rod at least 12 inches by hand. Apply heat to rod near end cap to loosen loctite.

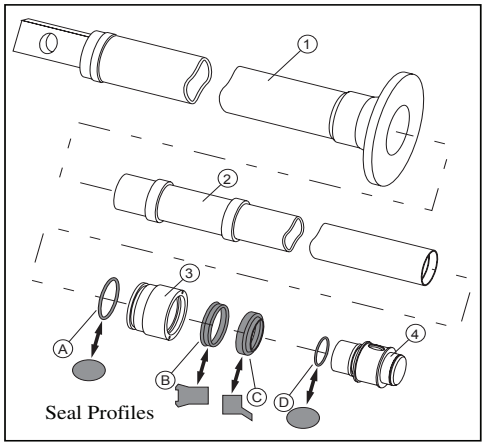
WARNING

Wear safety glasses and heat resistant gloves when operating torch. Do not touch hot surfaces without proper protection.

6. Using a strap wrench - 062482-000 to secure the cylinder rod, unscrew the cylinder rod end. If necessary, thread a 9/16 x 18 bolt into end cap port to use as a lever. Remove rod end cap and orifice/bleeder tube assembly.
7. Remove the seal retainer, using the spanner wrench - 062521-010.
8. Clean all sealing surfaces with a solvent. Inspect the cylinder rod for excessive wear. Replace if necessary.
9. Remove all seals from seal retainer, rod end cap and discard.

NOTE: Apply clean hydraulic fluid to new cylinder seal, threads and all sliding surfaces prior to assembly. If necessary, soften new seals with warm water 82°C (180° F) to aid in installation.

10. Twist the pressure seal into a 'C' shape and snap into a seal groove in seal retainer making sure the lip of the seal is facing inward.
11. Using the same method, install the rod wiper into the seal retainer outer groove, making sure that the blade of the seal is facing outward from the seal retainer.
12. Replace static seals in rod end cap and seal retainer by stretching them into place. Be careful not to cut the seal during installation.
13. Install the seal retainer unto the rod using a sharp blow from a hard rubber mallet to overcome seal squeeze. Slide the seal retainer into place and tighten using the spanner wrench.



Seal Kit			
1	Rod end cap	A	Static seal #1
2	Seal retainer	B	Rod wiper
3	Cylinder rod	C	Pressure seal
4	Cylinder body	D	Static seal #2

Figure 3-8: Lift Cylinder.

14. The rod and rod end threads must be absolutely clean. Spray threads with loctite primer #7471 and allow to dry for 5 minutes. Coat threads liberally with loctite #242. Thread rod end cap unto rod and tighten using strap wrench to hold rod.
15. Push rod back into cylinder for re-assembly.
16. Reconnect hydraulic line.
17. Remove nuts from tie rod ends and set the cylinder mounting plate in place. Secure the mounting plate with fasteners.
18. Install tie rod nuts flush with tie rod ends and torque each nut the exact number of turns used to remove it.
19. Re-install the retaining ring.
20. Using a suitable lifting device, raise the lift to its normal vertical position.
21. Bleed air from the cylinder by cycling the mast to full extension several times. The cylinder is self bleeding; air will be forced out of the cylinder during the lowering cycle.
22. If necessary, remove pinch shield and check the alignment of the cylinder within the mast assembly by looking down the mast with a flashlight. The cylinder may be moved left or right by tightening one or the other of the tie rod nuts.

CAUTION

If the cylinder is not centred, the mast may "hang" when lowering.

WARNING

Keep hands clear of the mast assembly when the pinch shield is removed for inspection purposes; pinching injury to hands may result. Never operate a machine with the pinch shield removed except for inspection.

ORIFICE VALVE CLEANING

Using a suitable lifting device, lower the work platform into a horizontal position (refer to Figure 3-5). If possible, place the machine on a sturdy work table using a forklift.

WARNING

Never attempt to lower lift into a horizontal position without the use of a suitable lifting device as this can lead to bodily injury or damage to the machine .

1. Remove the cylinder mounting plate fasteners and retaining ring.
2. Remove tie rod nuts and count the number of turns required to bring the nut flush with the tie rod end and record for reference during installation. The tension on the tie rods maintain the left/right positioning of the cylinder within the mast assembly. Re-installing the nuts with the proper tension will speed up adjustment later.
3. Remove the cylinder mounting plate. Be careful not to allow the tie rods to suck back into the mast assembly. Replace the nuts on the tie rod ends temporarily to prevent this.
4. Remove the hydraulic line from the cylinder fitting and cap the cylinder fitting to prevent contaminants from entering the cylinder.

CAUTION

Marring the surface of the cylinder rod will damage cylinder seals and cause leakages. Use a strap wrench to prevent rod damage.

5. Extend cylinder rod at least twelve inches by hand. Apply heat to the rod near the end cap to loosen Loc-tite.

WARNING

Wear safety glasses and heat resistant gloves when operating torch. Do not touch hot surfaces without proper protection.

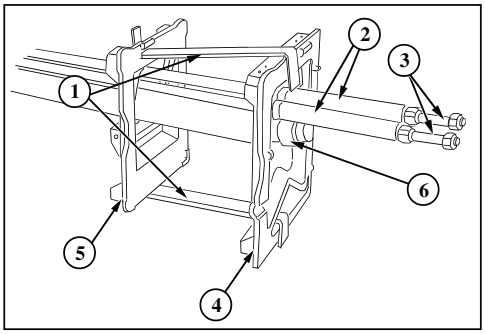
6. Using a strap wrench 062482-000 to secure the cylinder rod, unscrew the cylinder rod end. If necessary, thread a 9/16 x 18 bolt into an end cap port to use as a lever. Remove the rod end cap and orifice/bleeder tube assembly.
7. Remove snap ring to release orifice/bleeder tube from the rod end cap.
8. Clean the orifice valve hole with a straight pin. Flush with solvent to remove any contamination that may remain in the bleeder tube.
9. Re-install the orifice/bleeder tube into the rod end cap and secure with a snap ring.
10. Replace the static seal on the rod end. The existing seal may have been damaged by the heating rod end.
11. Rod and rod end threads must be absolutely clean. Spray threads with loctite primer #7471 and allow to dry for 5 minutes. Coat threads liberally with loctite #242. Thread the rod end cap unto the rod and tighten using a strap wrench to hold the rod.
12. Push the rod back into the assembly for re-assembly.
13. Re-connect the hydraulic line.
14. Remove nuts from the tie rod ends and set the cylinder mounting plate into place. Secure the mounting plates with fasteners.
15. Install the tie rod nuts flush with the tie rod ends and torque each nut the exact number of turns used to remove it.
16. Re-install the retaining ring.
17. Using a suitable lifting device, raise the lift to its normal vertical position.
18. Bleed air from the cylinder by cycling the mast to full extension several times. The cylinder is self bleeding; air will be forced out of the cylinder during the lowering cycle.
19. If necessary, remove the pinch shield and check alignment of the cylinder within the mast assembly by looking down the mast with a flashlight. The cylinder guide bearings must not be touching the inside surface of the #6 mast. The cylinder may be moved left or right by tightening the left or right tie rod nuts respectively.

CAUTION

If the cylinder is not centred, the mast may "hang" when lowering.

WARNING

Keep hands clear of the mast assembly when the pinch shield is removed for inspection purposes; pinching injury to hands may result. Never operate a machine with the pinch shield removed except for inspection.



Cylinder Assembly Installation			
1	Tension bracket (062739-000)	5	Bottom casting, Mast #3
2	Tie rod tensioners (062738-000)	6	Cylinder
3	Tie rods		
4	Bottom casting, Mast #2		

Figure 3-9: Cylinder Assembly Installation.

CYLINDER REMOVAL

Using a suitable lifting device, lower the work platform into a horizontal position (refer to Figure 3-5). If possible, place the machine on a sturdy work table using a forklift.

WARNING

Never attempt to lower lift into a horizontal position without the use of a suitable lifting device as this can lead to bodily injury or damage to the machine .

1. Remove the cylinder mounting plate fasteners and retaining ring.
2. Remove the tie rod nuts and count the number of turns required to bring the nut flush with the tie rod end and record for reference during installation. The tension on the tie rods maintains the left and right positioning of the cylinder within the mast assembly. Re-installing the nuts with the proper tension will speed up adjustment later.
3. Remove the cylinder mounting plate. Be careful not to allow the tie rods to suck back into the mast assembly. Replace the nuts on the tie rod ends temporarily to prevent this.
4. Remove the hydraulic line from the cylinder fitting and cap the cylinder fitting to prevent contaminants from entering the cylinder.
5. Remove sequence strap retainers on the top of the #3 and #2 masts.
6. Remove the front and rear mast access plates from the bottom of the #1 mast.
7. Remove the screws and washers, attaching the #2 and #3 bottom castings to the #2 and #3 mast assemblies.
8. While keeping tension on the tie rods, slide the cylinder, the #2 and #3 bottom castings out of the bottom of the UL lift far enough to expose both castings.
9. Install the cylinder tensioner brackets 062739-000 on #2 and #3 boom castings. Remove the tie rod nuts and install the tie rod tensioners, 062738-000. Remove all slack from the chains with the tie rod tensioners.
10. Remove the cylinder assembly from the mast assembly.

CYLINDER INSTALLATION

NOTE: The cylinder assembly must have tension brackets, a tension spacer and tie rod tensioners installed to remove slack from the chain.

1. Slide the cylinder assembly into the mast assembly until #3 bottom casting is at the bottom of the mast assembly.
2. Install the screws and washers attaching the #3 bottom casting to the #3 mast assembly.
3. Remove the cylinder tensioner brackets from the #2 and #3 bottom castings and tie rod tensioners from the tie rods. Install the tie rod nuts finger tight.
4. While maintaining tension on the tie rods to keep slack out of the chains, slide the cylinder assembly completely into the mast assembly.
5. Install the screws and washers attaching the #2 bottom casting to the #2 mast assembly.
6. Install the front and rear mast cover plates on the bottom of the #1 mast.
7. Feed the #4 strap between the #3 and the #2 mast with a fish tape.
8. Slide the #4 strap through the #2 casting.
9. Feed the #3 strap between the #2 and the #1 mast with a fish tape.

10. Install strap #4 to the #2 top casting.
11. Install strap #3 to the #1 top casting.
12. While maintaining tension on the sequencing straps, install strap retainers using loctite 242 or equivalent on the threads of the retainer screws.
13. Reconnect the hydraulic line.
14. Remove nuts from the tie rod ends and set the cylinder mounting plate into place. Secure the mounting plate with fasteners.
15. Install the tie rod nuts flush with the tie rod ends and torque each nut the exact number of turns used to remove it.
16. Re-install the retaining ring.
17. Using a suitable lifting device, raise the lift to its normal vertical position.
18. Bleed air from the cylinder by cycling the mast to full extension several times. The cylinder is self bleeding; air would be forced out of the cylinder during the lowering cycle.
19. If necessary, remove the pinch shield and check the alignment of the cylinder within the mast assembly by looking down the mast with a flashlight. The cylinder guide bearings must not be touching the inside surface of the #6 mast. The cylinder may be moved left or right by tightening the left or right tie rod nuts respectively.

WARNING

Keep hands clear of the mast assembly when the pinch shield is removed for inspection purposes; pinching injury to hands may result. Never operate a machine with the pinch shield removed except for inspection.

TORQUE SPECIFICATIONS

HYDRAULIC COMPONENTS

Use the following values to torque the hydraulic components used on Snorkel work platforms.

NOTE: Always lubricate threads with clean hydraulic oil prior to installation.

Coil nuts: 3 Nm (30 In/lbs)

Type: SAE part series	Cartridge poppet		Fittings		Hoses	
	Ft/Lbs	Nm	Ft/Lbs	Nm	In/Lbs	Nm
#4	N/A	N/A	N/A	N/A	135-145	15-16
#6	N/A	N/A	10-20	14-27	215-245	24-28
#8	25-30	34-41	25-30	34-41	430-470	49-53
#10	35-40	47-54	35-40	47-54	680-750	77-85
#12	85-90	115-122	85-90	115-122	950-1050	107-131
#16	130-140	176-190	130-140	176-190	1300-1368	147-155

Table 3-4: Hydraulic Component Torque.

FASTENERS

Use the following values to torque fasteners used on Snorkel work platforms unless a specific torque value is called out for the part being installed.

Thread size (American National Standard-UNF (fine))	Width across flats	Torque value			
		Imperial		Metric	
1/4	7/16	110	IN/Lbs	12	Nm
5/16	1/2	190	IN/Lbs	22	Nm
3/8	9/16	30	Ft/Lbs	41	Nm
7/16	5/8	50	Ft/Lbs	68	Nm
1/2	3/4	75	Ft/Lbs	102	Nm
5/8	15/16	150	Ft/Lbs	203	Nm
3/4	1(1/8)	250	Ft/Lbs	339	Nm
7/8	1(5/16)	400	Ft/Lbs	542	Nm
1	1(1/2)	600	Ft/Lbs	813	Nm

Table 3-5: Bolt Torque.

TROUBLESHOOTING

CONTENTS

TROUBLESHOOTING

INTRODUCTION

Table 4-1 provides a logical sequence of tests that are designed to isolate problems with the Snorkel lift. This table includes a list of probable causes and remedies.

WARNING

When troubleshooting, ensure that the work platform is resting on a firm, level surface.
When performing any service which requires the platform to be raised, ensure that all four outriggers are properly installed. Unplug the machine or disconnect the battery when replacing or testing the continuity of any electrical component.

GENERAL PROCEDURE

Troubleshooting should be carried out in two steps. First, thoroughly study both hydraulic and electrical schematics to determine possible causes. Loose terminal connections and short circuits are always a potential cause when troubleshooting. Secondly, check suspect components electrically, hydraulically and mechanically to determine if they are at fault. Refer to the section “SCHEMATICS” for further information to be used together with information from Table 4-1.

ISSUE	PROBABLE CAUSE	REMEDY
Lift function inoperable, electric motor does not start.	1. Extension cord too long or insufficient capacity.	Use minimum 1.5 mm^2 (12 ga.) cord of 16m (50 feet) or less in length.
	2. Not plugged in or faulty connection (AC only)	Check that all AC plugs and cords are used.
	3. No power at wall outlet (AC only)	Check power output at wall outlet.
	4. Faulty battery charger (DC only)	Check the voltage output of the battery charger. If less than 12 V DC, repair or replace
	5. Faulty battery (BAT)	After completely charging the battery, test the battery. Replace if faulty.
	6. Key switch (S2), Emergency stop switch (S1, S3) or push button switch (S4, S5) failed to open.	With the switch in the “on” position, check for continuity across the contacts. If none, replace.
	7. Outrigger interlock switch (S7, S8, S9 &S10)	Make sure all four outrigggers are in firm contact with the ground. Check continuity of interlock switches.
	8. Open circuit in cable to motor control box.	Test for continuity through cable assembly and repair or replace.
	9. Faulty electric motor (MI)	While operating the lift function, check the voltage to the electric motor. If voltage is present (12 V DC or 120/240 V AC), replace the motor. In case of low AC voltage, refer to #1.
Lift turns on and off repeatedly.	1. Low line voltage or battery charge.	Use minimum 11.5 mm^2 (12 ga.) cord of 16 m (50 feet) or less in length.

ISSUE	PROBABLE CAUSE	REMEDY
One or more, but not all indicator lights fail to operate.	1. Indicator light damaged or faulty	Replace indicator light.
	2. Outrigger limit switch damaged or faulty.	Replace switch.
	3. Chassis harness damaged or improperly connected.	Repair damage and ensure proper connection.
Lift function inoperable. Electric motor starts when control is activated.	1. Emergency lowering valve (V2) open.	Close valve.
	2. Hydraulic reservoir low.	Check hydraulic fluid level and top off as required.
	3. Down valve (V2) stuck	Check or replace down valve (V2).
	4. Relief valve (RV) out of adjustment or faulty.	Adjust the relief valve (RV). If not adjustable, replace.
	5. Lift valve (V1) faulty.	Check or replace lift valve (V1).
	6. Faulty hydraulic pump (P)	Check pressure and delivery of the hydraulic pump. Replace pump if required.
Platform does not lower using electrical switches. (Will lower using emergency lowering valve.)	1. Down valve solenoid (SOL1) faulty.	Test for continuity across solenoid. Repair or replace.
	2. Electrical malfunction.	Check all AC plugs and cords used (AC only). Check power output at wall outlet (AC only). With each switch (S1, S2, S3, S4 &S6) in the “on” position, check continuity across the contacts. If none, replace.
Platform does not lower or lowers very slowly.	1. Down orifice (ORF) plugged.	Remove and clean the down orifice check valve.
	2. Down valve (V2) blocked or stuck closed.	Check function/clear blockage of down valve.
	3. Mechanical interference	Inspect mast assembly, correct interference.
Platform continues to lower when controls are released.	1. Down valve (V1) stuck open.	Clean or replace down valve.

Table 4-1: Troubleshooting table.

TILT SENSOR

TILT SENSOR SWITCH

The tilt sensor is incorporated in the EZ120 control module. The switch is activated if the machine inclination is greater than 1.0° side to side or front to back. This results in a continuous audible alarm and lift disabled. The only way to stop the alarm from sounding is to return the machine to an inclination level below 1.0° side to side and front to back. The settings of this limit is preset at the factory and should on no account be adjusted.

SETTING THE TILT SENSOR TO ZERO

WARNING

If the EZ120 control module is replaced and/or moved within the machine for any reason, the tilt sensor must be reset for 0° using the procedure provided. Failure to do so could result in serious injury or death.

To follow the procedure, first connect an EZcal calibrator into the diagnostic port in the lower control box.

1. Place the machine on a firm level surface ≤ 0.25°.
2. Use a gauge to confirm that the front and rear of the chassis are level to within +/- 0.25° in both directions.
3. Switch the machine on and the EZcal menu should appear.
4. Scroll to access level and hit “Enter”.
5. Enter code 2222 for access level 2 and hit “Enter”.
6. Scroll to setups and hit “Enter”.
7. Scroll to tilt setups and hit “Enter”.
8. Choose calibrate level and hit “Enter”.
9. Hit “Enter” for yes for the machine tilt setup should be complete.

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

10. Scroll to diagnostics and hit “Enter”.
11. Search for system and hit “Enter”.
12. Scroll to tilt and both readings should be below 0.2°. If not, repeat from #3.

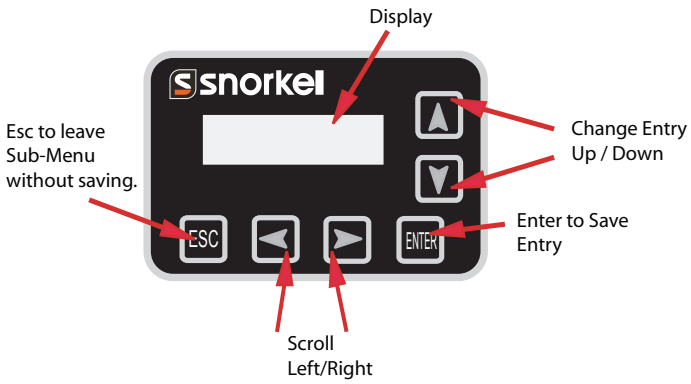


Figure 4-1: EZcal calibrator.

DIAGNOSTICS USING EZCAL CALIBRATOR

The EZcal calibrator can be used as a diagnostic tool. Plug it into the diagnostic port in the lower control box. Switch the machine on until the “EZlift menu” is displayed then select diagnostics. The following menu becomes available:

1. SYSTEM
   - SUPPLY: Displays battery voltage.
   - TILT: Displays tilt angle of the machine in X and Y direction. Both should be below 1.0°.
   - TILTED: YES or NO. (Should be yes when the machine is tilted.)
   - OUTRIGGERS: YES or NO. (Should be yes when the outriggers are correctly deployed.

The remaining submenu’s under “SYSTEM” are not applicable to this machine.

2. INPUTS
   - Displays the condition of all inputs to the EZ120. Refer to the I/O list for further information.

3. OUTPUTS
   - Displays the condition of all outputs from the EZ120.

4. LOG
   - SOFTWARE REV:
   - MAX BAT VOLTS:
   - Function time: Displays total machine run time.
   - Motor time: Displays total pump motor run time.

I/O PORT	DESCRIPTION
P1-1	Platform mode supply.
P1-2	Ground mode supply.
P1-3	Input from platform enable switch.
P1-4	Input from platform lower switch.
P1-5	Input from ground enable switch.
P1-6	Input from ground lower switch
P1-7	Spare.
P1-8	Input from outrigger limit switch #1
P1-9	Input from outrigger limit switch #2
P1-10	Input from outrigger limit switch #3
P1-11	Input from outrigger limit switch #4
P1-12	Input from outrigger limit switches #1,2,3,4 & platform raise switch in series.
P2-1	Output to alarm.
P2-2	Output to BDI lamp (DC only).
P2-3	Spare.
P2-4	Output to power on lamp (DC only)
P2-5	Output to platform raise valve.
P2-6	Output to platform lower valve.
P2-7	Output to line contactor.
P2-8	Spare.
P2-9	Output to outrigger switches & alarm supply.

Table 4-2: EZlift 120 I/O allocations.

REPLACING THE EZ120 CONTROL MODULE

If for any reason the EZ120 control module has to be replaced, it is important that the procedure listed below is followed.

WARNING

If the EZ120 control module is replaced and/or moved within the machine for any reason, the tilt sensor must be reset for 0° using the procedure provided. Failure to do so could result in serious injury or death.

To follow the procedure, first connect an EZcal calibrator into the diagnostic port in the lower control box.

1. Place the machine on a firm level surface ≤ 0.25°.
2. Use a gauge to confirm that the front and rear of the chassis are level to within +/- 0.25° in both directions.
3. Switch the machine on and the EZcal menu should appear.
4. Scroll to access level and hit “Enter”.
5. Enter code 2222 for access level 2 and hit “Enter”.
6. Scroll to setups and hit “Enter”.
7. Scroll to Change defaults and hit “Enter”.
8. Scroll to Vehicle and select (2) = UL D.C. or (11) = UL A.C. and then hit “Esc”.
9. Scroll to tilt setups and then hit “Enter”.
10. Choose calibrate level and hit “Enter”.
11. Choose “Enter” again for yes to enable the machine to be calibrated.

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

12. Scroll to diagnostics and hit “Enter”.
13. Search for system and hit “Enter”.
14. Scroll to tilt and both readings should be below 0.2°. If not, repeat from #5.

SCHEMATICS

INTRODUCTION

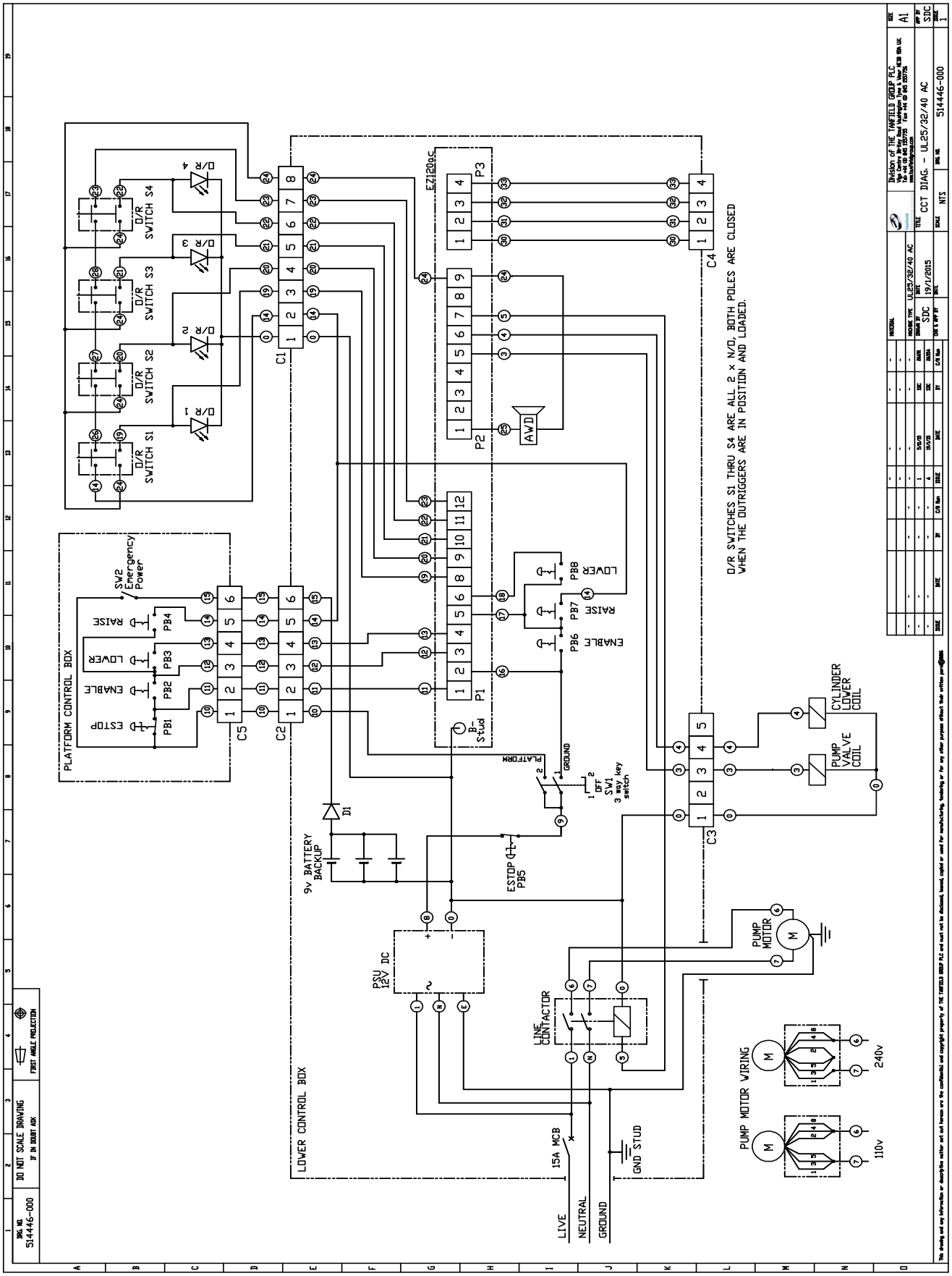
This section contains electrical and hydraulic power schematics and associated information for maintenance purposes.

The diagrams are to be used in conjunction with the information in section 4. The schematics provide an understanding to the makeup and functions of the systems for checking, tracing and fault-finding during troubleshooting analysis.

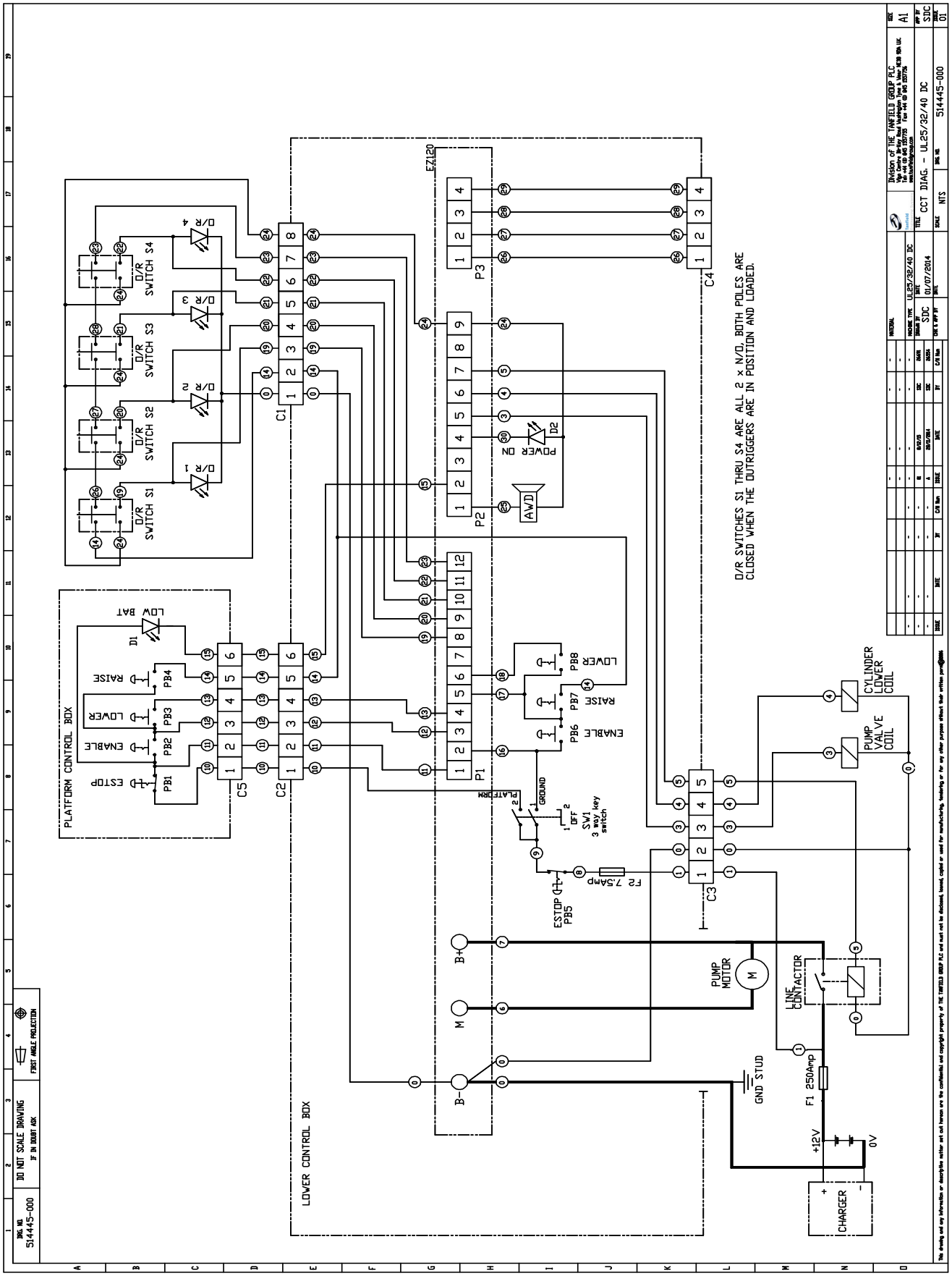
CONTENTS

SCHEMATICS

ELECTRICAL SCHEMATIC A.C. - 514446-000



ELECTRICAL SCHEMATIC D.C. - 514445-000



SCHEMATICS

HYDRAULIC SCHEMATIC

REFERENCE DESIGNATION	NAME	FUNCTION	LOCATION
CV	Check valve	Allows flow in one direction	Valve block assembly
CYL	Cylinder	Operates lift	On lift assembly
FLT	Filter	Separates matter held in suspension from fluid.	Inline with pump.
ORF	Orifice	Controls flow out of cylinder	Inline with cylinder
P	Pump	Supplies hydraulic pressure to system	Lower power module
RV	Relief valve	Limits maximum pressure by releasing oil	Valve assembly Lower power module
V1	Valve, 2-way norm. Open	Stops flow when energized.	Valve block assembly
V2	Valve, 2-way norm. Closed	Allows flow when energized.	Lift cylinder assembly.

Table 5-1: Hydraulic schematic legend.

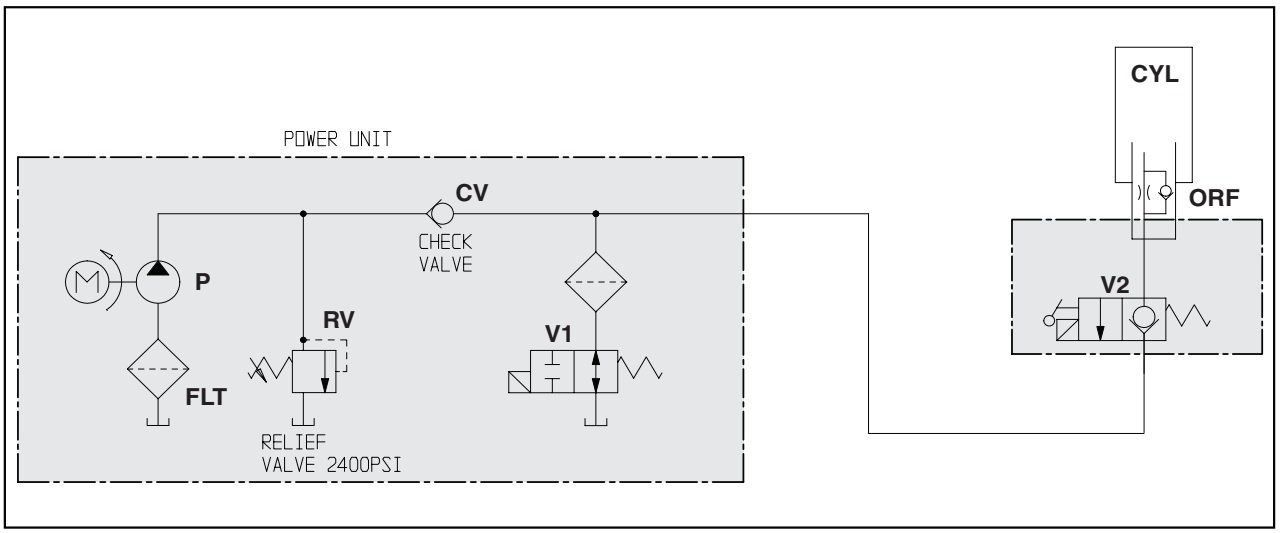


Figure 5-1: Hydraulic schematic.

ILLUSTRATED PARTS LIST

INTRODUCTION

This section lists and illustrates the replaceable assemblies and parts of this product as manufactured by Snorkel.

Each part list contains the component parts for that assembly.

CONTENTS

ILLUSTRATED PARTS LIST

GENERAL ASSEMBLY

ITEM	PART NUMBER	SUB ITEM	PART NUMBER	QTY
UL25 AC	514856-800	Power option AC	068008-011	1
		Decal kit	508783-002	1
		Operator's manual	515066-000	1
		Parts & services manual	515066-200	1
UL25 DC	514857-800	Power option DC	068009-011	1
		Decal kit	508783-000	1
		Operator's manual	515066-000	1
		Parts & services manual	515066-200	1
UL32 AC	514858-800	Power option AC	068008-011	1
		Decal kit	508783-003	1
		Operator's manual	515066-000	1
		Parts & services manual	515066-200	1
UL32 DC	514859-800	Power option DC	068009-011	1
		Decal kit	508783-001	1
		Operator's manual	515066-000	1
		Parts & services manual	515066-200	1
UL40 AC	514860-800	Power option AC	068008-011	1
		Decal kit	508783-003	1
		Operator's manual	515066-000	1
		Parts & services manual	515066-200	1
UL40 DC	514861-800	Power option DC	068009-011	1
		Decal kit	508783-001	1
		Operator's manual	515066-000	1
		Parts & services manual	515066-200	1

Table 6-1: Overall UL25/32/40 assembly and part numbers.

GENERAL ASSEMBLY BREAKDOWN

UL25 - 514856-800 (AC)
514857-800 (DC)

UL32 - 514858-800 (AC)
514860-800 (DC)

UL40 - 514860-800 (AC)
514861-800 (DC)

ITEM	PART NUMBER	DESCRIPTION	UL25	UL32	UL40
1	512805-100	Lift cylinder assembly	1		
	512789-100	Lift cylinder assembly		1	
	512806-100	Lift cylinder assembly			1
2	068050-001	2nd stage mast assembly	1		
	068050-002	2nd stage mast assembly		1	
	068050-003	2nd stage mast assembly			1
3	068056-001	3rd stage mast assembly	1		
	068056-002	3rd stage mast assembly		1	
	068056-003	3rd stage mast assembly			1
4	068061-001	4th stage mast assembly	1		
	068061-002	4th stage mast assembly		1	
	068061-003	4th stage mast assembly			1
5	068066-001	5th stage mast assembly	1		
	068066-002	5th stage mast assembly		1	
	068066-003	5th stage mast assembly			1
6	514600-001	6th stage mast assembly	1		
	514600-002	6th stage mast assembly		1	
	514600-003	6th stage mast assembly			1
7	068160-009	Cage support assembly	1		
	068160-010	Cage support assembly		1	
	068160-011	Cage support assembly			1
8	068218-000	Mast bearing	8	8	8
9	068217-000	Mast bearing	12	12	12
10	068216-000	Mast bearing	4	4	4
11	068122-000	Mast bearing	4	4	4
12	068121-000	Mast bearing	4	4	4
13	068120-000	Mast bearing	4	4	4
14	068119-000	Mast bearing	4	4	4
18	012553-005	Screw SOC HD 1/4 - 20 UNC x 5/8	21	21	21
19	012553-006	Screw SOC HD 1/4 - 20 UNC x 3/4	22	22	22
20	501258-020	Screw butt HD 3/8 - 16 x 5/8	8	8	8
21	062129-000	Strap retainer	5	5	5
22	011735-020	Roll pin	4	4	4
23	068143-000	Pin Leaf chain	2	2	2

ILLUSTRATED PARTS LIST

ITEM	PART NUMBER	DESCRIPTION	UL25	UL32	UL40
24	068141-000	Pin chain	2	2	2
25	510146-001	Cable connector gland	2	2	2
	510147-001	Cable connector nut	2	2	2
27	056065-045	Bolt hexhd .500-13 1.75 GR5	4	4	4
28	056069-012	Washer, SteelFlatWasher M12	4	4	4
29	984519	Nut hex LKG .500-13	4	4	4
30	063926-007	Plug	2	2	2
31	011735-020	Roll pin	2	2	2
32	068140-000	Pin	2	2	2
40	068187-000	Loader assembly	1		
41	068200-003	Tilt back assembly	1		
	068200-000	Tilt back assembly		1	
	068200-001	Tilt back assembly			1
42	062945-001	Retractile cord	1		
	062945-003	Retractile cord		1	
	062945-004	Retractile cord			1
43	062226-002	Cable storage tube	2		
	062226-003	Cable storage tube		2	
	062226-004	Cable storage tube			2
44	068157-001	Outrigger assembly	4		
	068157-001	Outrigger assembly		4	
	030838-007	Outrigger assembly			4
45	514735-000	Chassis weldment	1		
	514736-000	Chassis weldment		1	
	514737-000	Chassis weldment			1
46	514432-000	Motor cover	1	1	1
47	067995-000	Lifting alarm assembly	1	1	1
48	514817-000	Caster	2	2	2
49	068645-000	Axle shaft	1	1	1
50	514383-000	Wheel UL 10 x 2-1/2	2	2	2
51	068158-000	#1 Section slide	1	1	1
52	003570-000	Retaining pin	5	5	5
53	514471-000	Switch	4	4	4
54	514728-000	Stainless steel washer flat 3/4" x 2"	2	2	2
55	068646-000	Roll pin	2	2	2
56	020398-024	Clamp	4	4	4
57	011868-032	Grommet strain relief	1	1	1
58	011868-019	Grommet snap 7/8 DIA	2	2	2
59	011252-010	Screw HHC 1/4 - 20 UNC x 1(1/4)	4	4	4
60	056060-030	Screw HHC 3/8 - 16 x 3/4	8	8	8
61	056058-020	Screw MRH 1/4 - 20	3	3	3
62	011240-004	Washer 1/4 STD flat	20	20	20

63	056069-010	Washer 3/8 STD flat	16	16	16
64	505050-010	Nutzert 3/8 - 16 UNC	8	8	8
65	056058-040	Bolt, HexBolt DIN931 M6	2	2	2
66	011868-019	Grommet snap 7/8 DIA	1	1	1
68	514738-000	Chassis cover	2	2	2
69	005503-003	Screw, #6 self tapping	4	4	4
79	014066-004	Screw HWH SLFTP 1/4 x 1/2	4	4	4
90	514457-000	Wire harness	1	1	1
91	514454-000	Retractile Cord	1		
	514455-000	Retractile Cord		1	
	514456-000	Retractile Cord			1
92	515182-000	Fork Pocket	2	2	2

Table 6-2: UL25/32/40 general assembly components and part numbers.

ILLUSTRATED PARTS LIST

GENERAL ASSEMBLY BREAKDOWN

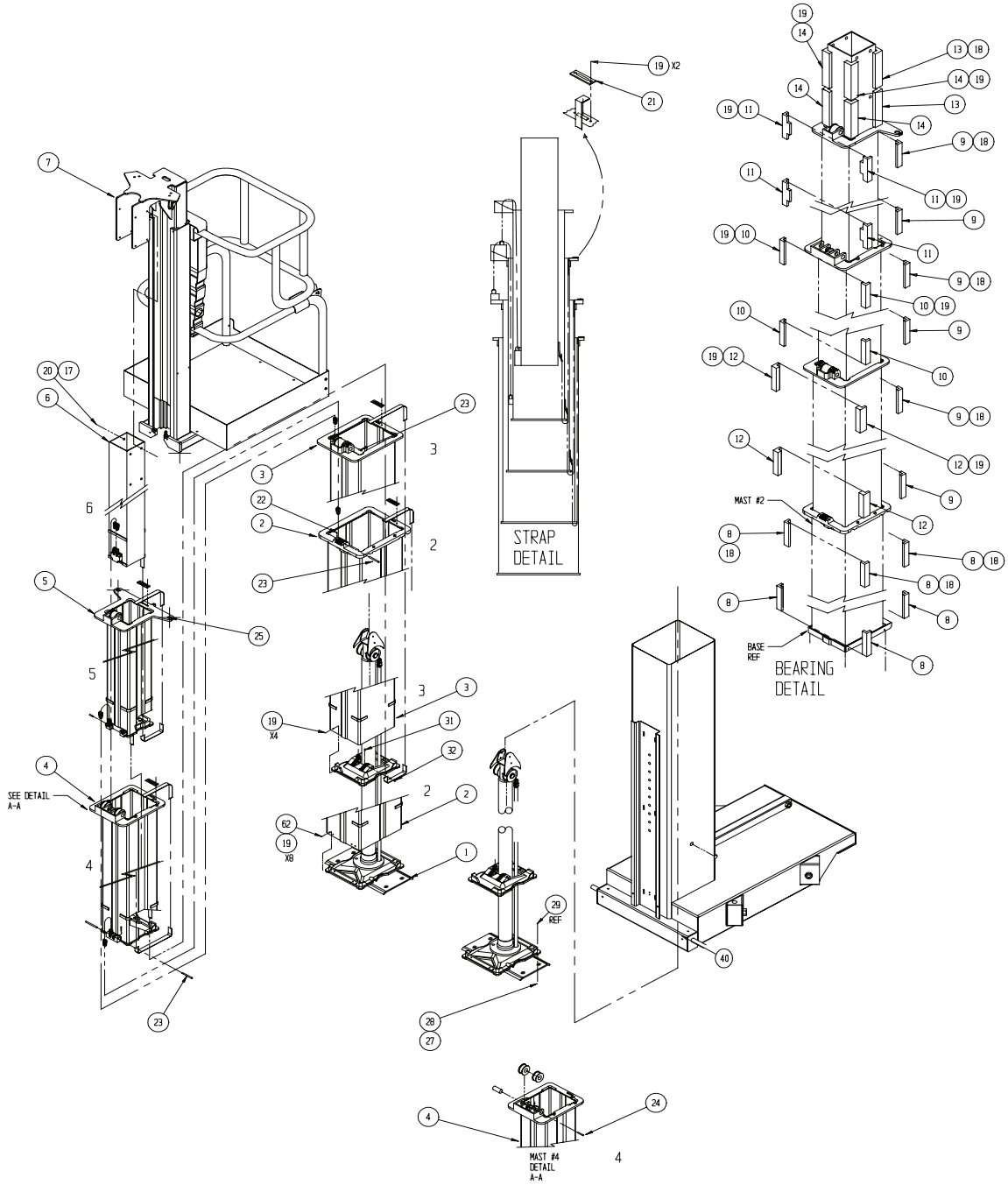


Figure 6-1: General assembly illustration, DWG 1.

GENERAL ASSEMBLY BREAKDOWN

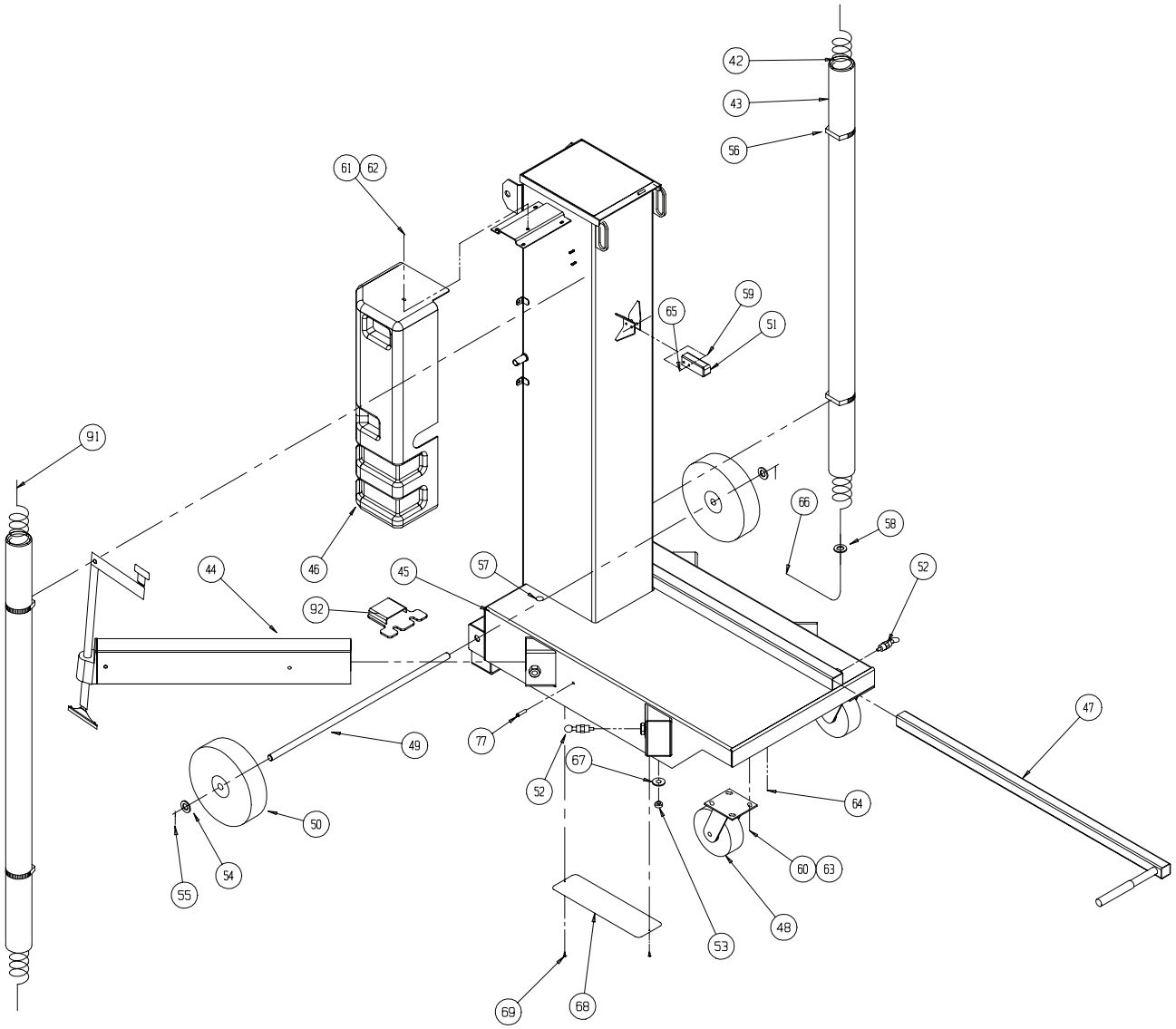


Figure 6-2: General assembly illustration, DWG 2.

ILLUSTRATED PARTS LIST

AC POWER OPTION - 068008-011

ITEM	PART NUMBER	DESCRIPTION	QTY
1	068115-001	Power unit	1
	068115-011	Valve, load	
	068115-012	Pump	
	068115-013	Seal kit	
	068115-015	Motor	
2	514458-000	Chassis harness, A.C.	1
3	514444-000	Control box	1
5	020809-001	Fitting, Tee 6MJ-6MB-6FJX	1
6	063965-003	Gage port	1
8	056069-008	Washer 8mm flat	4
9	011240-004	Washer 1/4 flat	4
10	011252-004	Screw HHC 1/4 - 20 (1/2)	4
11	056064-008	8 mm nut	4
13	013540-001	Wire nut 12-10	2
14	011868-019	Connection cable	1

Table 6-3: AC power option components and part numbers.

AC POWER OPTION - 068008-011

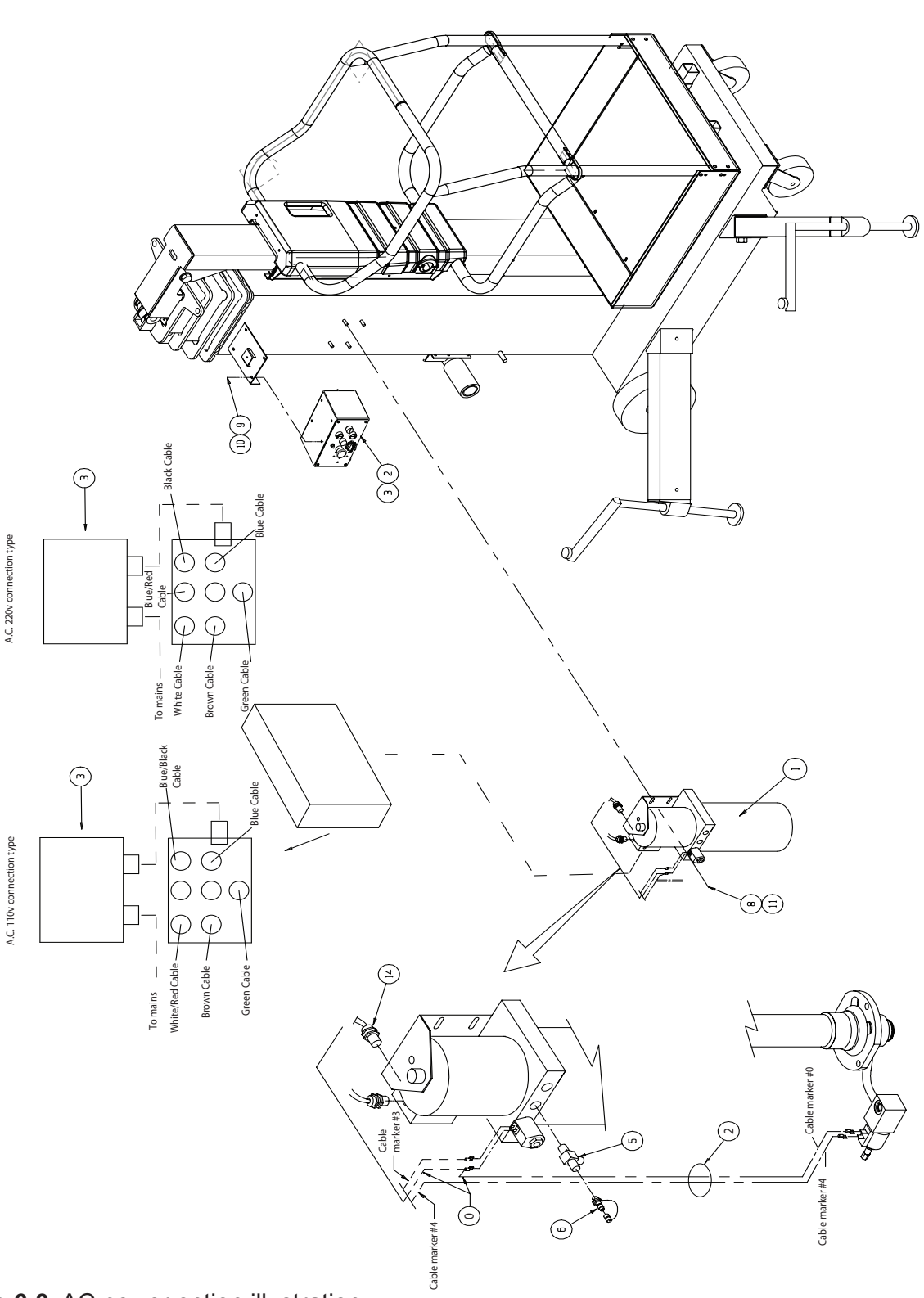


Figure 6-3: AC power option illustration.

DC POWER OPTION - 068009-011

ITEM	PART NUMBER	DESCRIPTION	QTY
1	068214-000	Battery box	1
2	3050002	Battery	1
3	514015-000	UL - China charger	1
4a	068116-001	Power unit (SN before 059999), See identification below	1
4b	515280-000	Power unit (SN after 060000), See identification below	1
6	513896-001	Black cable 25mm CSA - see note 1	2
7	513895-000	Ring crimp M10	2
9	029902-000	Conn 175 amp	2
12	011941-005	Fitting, straight 6MB - 6MJ	1
15	011252-008	Screw HHC 1/4 - 20 x 1	2
16	056058-040	M6 x 40 Hexhead UL	8
20	056069-006	M6 flat washer UL	8
26	068007-023	Control box w/electric down	1
27	011240-004	Washer 1/4 flat	4
28	011252-004	Screw HHC 1/4 - 20 x 1/2	4
29	010154-000	Terminal cover	2
30	514459-000	D.C. power harness	1

Table 6-4: DC power option components and part numbers.

DC power unit identification

DC POWER OPTION - 068009-011

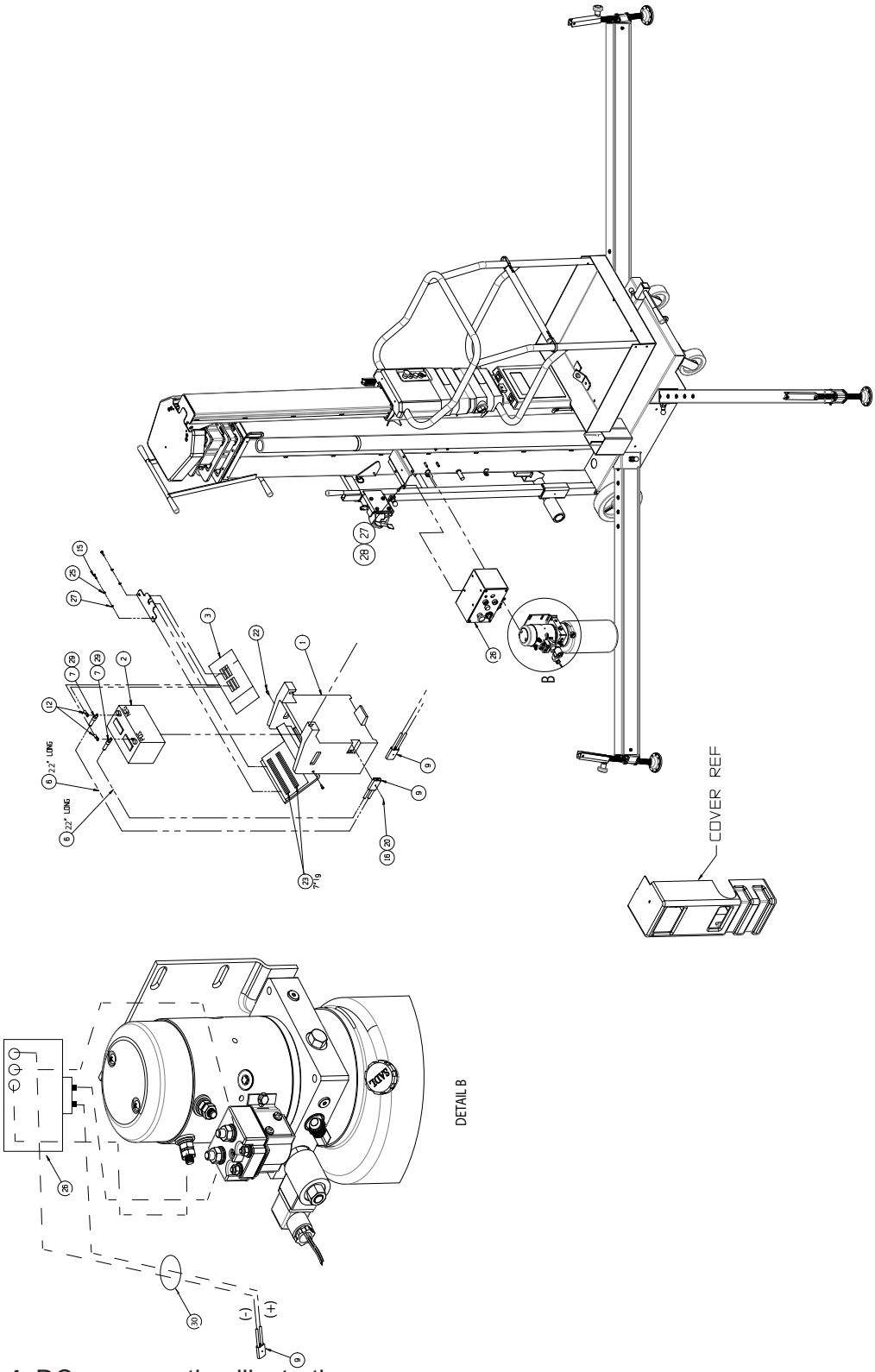


Figure 6-4: DC power option illustration.

AC LOWER CONTROL BOX - 514444-000

ITEM	PART NUMBER	DESCRIPTION	QTY
1	0120804	Push button; Schneider XB2BA3351C	1
2	0120803	Push button; Schneider XB2BA3341C	1
3	510542-000	Push button; Schneider XB2BA21C	1
4	510524-000	SW Twist release E/stop	1
5	512543-000	Keyswitch	1
6	513949-000	9 way chassis socket	1
7	514433-000	7 way chassis socket	1
8	514435-000	5 way chassis socket	1
9	502588-000	Alarm, ECCO beeping 6-28 VDC	1
10	510156-000	9 way panel plug	1
11	510157-000	12 way panel plug	1
12	505082-014	M5 x 14 skt button cap screw DIN9427	4
13	514442-001	Overlay	1
14	514439-000	UL AC lower control box weldment	1
15	514467-000	AC120 controller	1
16	514440-000	UL AC control box panel	1
17	514005-000	PSU 230 V AC to 12 V DC 7.5 A	1
18	029868-007	Circuit breaker 15 A	1
19	056064-006	M6 nylock nut	4
20	058502-025	M6 x 25 S.H.C.S.	2
21	501253-012	M6 x 12 Button HD. screw - 12.9	2
22	512368-000	Din rail (62mm)	1
23	514470-000	AC contactor	1
24	067155-001	Battery holder	3
25	026551-004	Pop-rivet 1/8”	6
26	510147-000	Cable gland M20	2
27	510146-000	Cable gland nut M20	2
28	056066-004	M4 nylock nut - 8	2
29	058500-012	M4 x 12 socket HD cap screw - 12.9	2
30	508077-000	3 - core cable 2.5mmCSA H07RN - F	2.5m
31	510167-000	8 A Diode	1
32	514642-000	Socket 4-way panel mount	1
33	512366-000	4-way panel plug	1
34	509755-000	Mate - n - lock SCKT contact	22
35	510145-000	Mate - n - lock pin contact	4

Table 6-5: AC Lower control box components.

AC LOWER CONTROL BOX - 514444-000

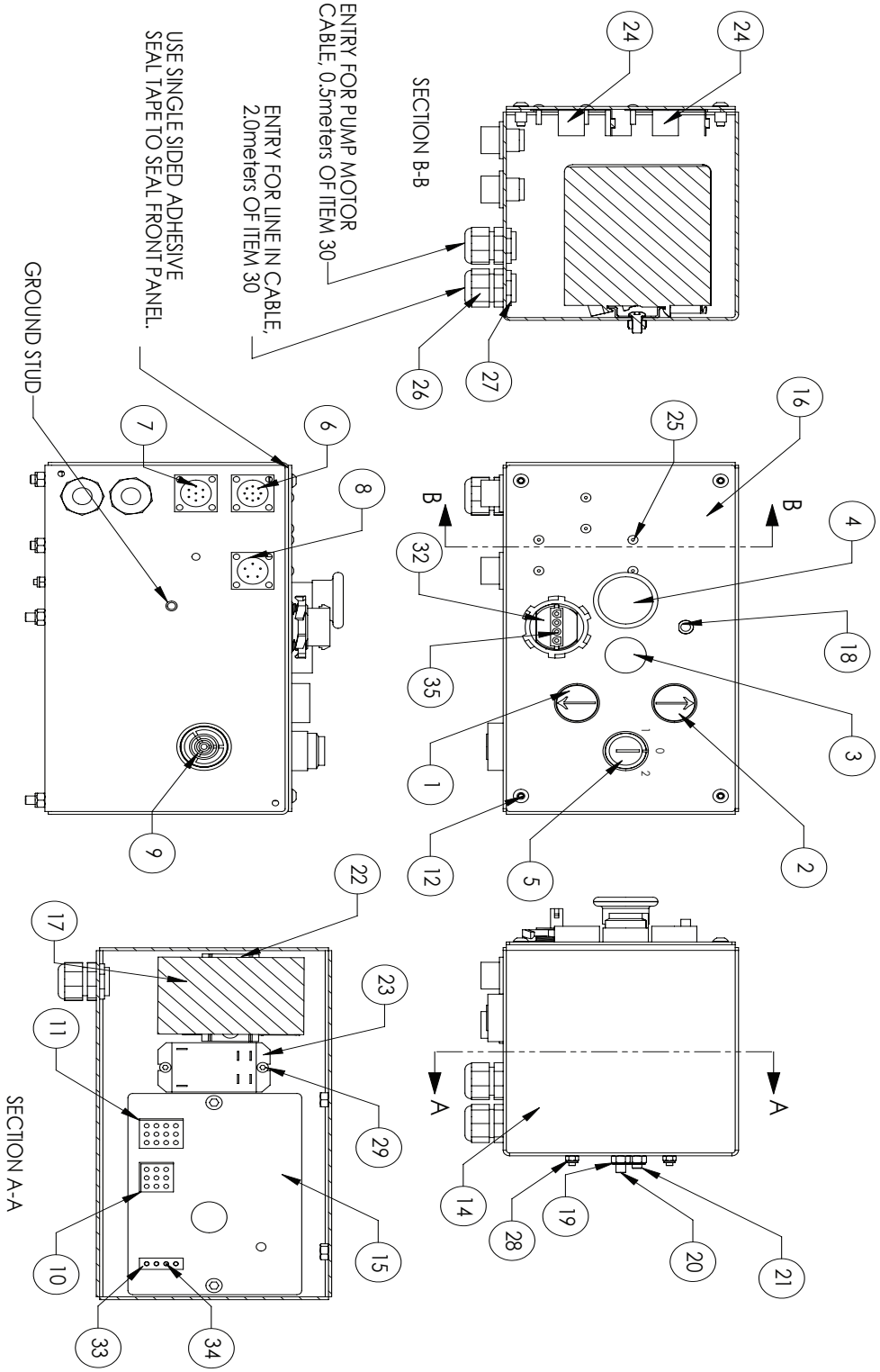


Figure 6-5: AC Lower control box illustration.

DC LOWER CONTROL BOX - 514443-000

ITEM	PART NUMBER	DESCRIPTION	QTY
1	514437-000	UL DC Lower control box weldment	1
2	514895-000	EZ120 controller	1
3	514438-000	UL DC lower control box panel	1
4	0120804	Push button; Schneider XB2BA3351C	1
5	0120803	Push button; Schneider XB2BA3341C	1
6	510542-000	Pushbutton; Schneider XB2BA21C	1
7	510524-000	SW twist release E/stop	1
8	512543-000	Keyswitch 3 position stayput	1
9	513949-000	9 way chassis socket	1
10	514433-000	7 way chassis socket	1
11	514435-000	5 way chassis socket	1
12	502588-000	Alarm, ECCO beeping 6-28 VDC	1
13	446086	Fuse holder	1
14	513876-000	FSHCS M5 x 0.8 x 25 class 8.8 DIN7991	2
15	056067-008	M8 nut - 8	4
16	510156-000	9 way panel plug	1
17	510157-000	12 way panel plug	1
18	505082-014	M5 x 14 skt button cap screw DIN9427	4
19	509755-000	Mate - n - lock SCKT contact	22
20	514441-001	Overlay	1
21	446076	Fuse 250 A	1
22	510561-008	M8 washer - ST/ST	2
23	056064-006	M6 nylock nut	2
24	058502-035	M6 x 35 S.H.C.S. - GR 8.8	2
25	509741-000	Blade fuse holder	1
26	509740-005	Blade fuse 7.5 A	1
27	514642-000	Socket 4-way panel mount	1
28	512935-000	LED green 12 V	1
29	510145-000	Mate - n - lock pin contact	4
30	512366-000	4 way panel plug	1

Table 6-6: DC Lower control box components.

DC LOWER CONTROL BOX - 514443-000

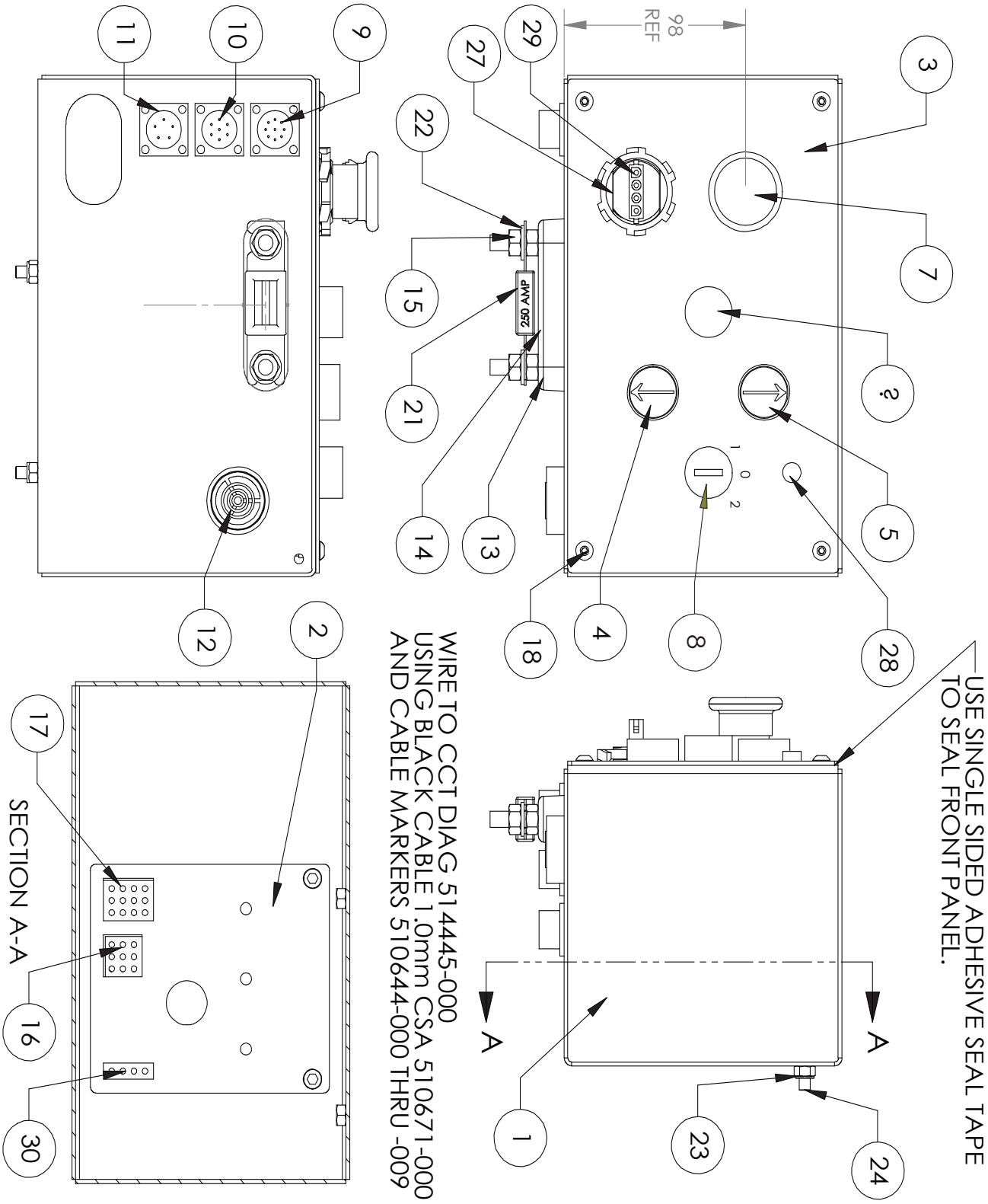


Figure 6-6: DC Lower control box illustration.

LIFT CYLINDER

UL25 - 068074-020
UL32 - 068074-021
UL40 - 068074-022

ITEM	PART NUMBER	DESCRIPTION	UL25	UL32	UL40
1	068129-000	3rd stage bottom casting	1	1	1
2	068128-000	2nd stage bottom casting	1	1	1
3	068113-006	Lift cylinder	1		
	068113-007	Lift cylinder		1	
	068113-008	Lift cylinder			1
	068113-010	Seal kit			
4	068076-000	Cylinder sheave	2	2	2
5	062164-000	Chain	2		
	062164-123	Chain		2	
	062164-149	Chain			2
6	068089-000	Cylinder mount	1	1	1
7	068080-001	Tie rods	2		
	068080-002	Tie rods		2	
	068080-003	Tie rods			2
8	011248-010	Locknut 5/8 -11 UNC	2	2	2
9	068079-000	Cylinder guide bearing	2	2	2
10	011737-010	Roll pin	1	1	1
11	068081-000	Pin cylinder	1	1	1
12	011764-023	Retaining ring	1	1	1
13	062642-022	Bearing 16DU16	2	2	2
14	062169-004	Master link	2	2	2
15	062655-001	Chain guard	2	2	2
16	011941-005	Fitting ST O-ring 6MB - 6MJ	1	1	1
17	011828-006	Screw Flat HD socket 1/4 - 20 x 3/4	2	2	2
18	068143-000	Chain pin	2	2	2
19	011240-002	Washer #8 flat	4	4	4
20	026553-008	Rivet 3/16	4	4	4
21	060861-115	Hydraulic hose	1		
	060861-011	Hydraulic hose		1	
	060861-011	Hydraulic hose			1
22	011737-010	Roll pin 1/4 x 1 - 1/4	1	1	1
23	063988-006	Shim		1	1
24	066179-001	Valve, Lowering	1	1	1
25	069040-000	Threaded stud 1/4 - 28 x 1	1	1	1
26	069041-000	Knob - Red	1	1	1

Table 6-7: Lift cylinder components.

LIFT CYLINDER

UL25 - 068074-020
UL32 - 068074-021
UL40 - 068074-022

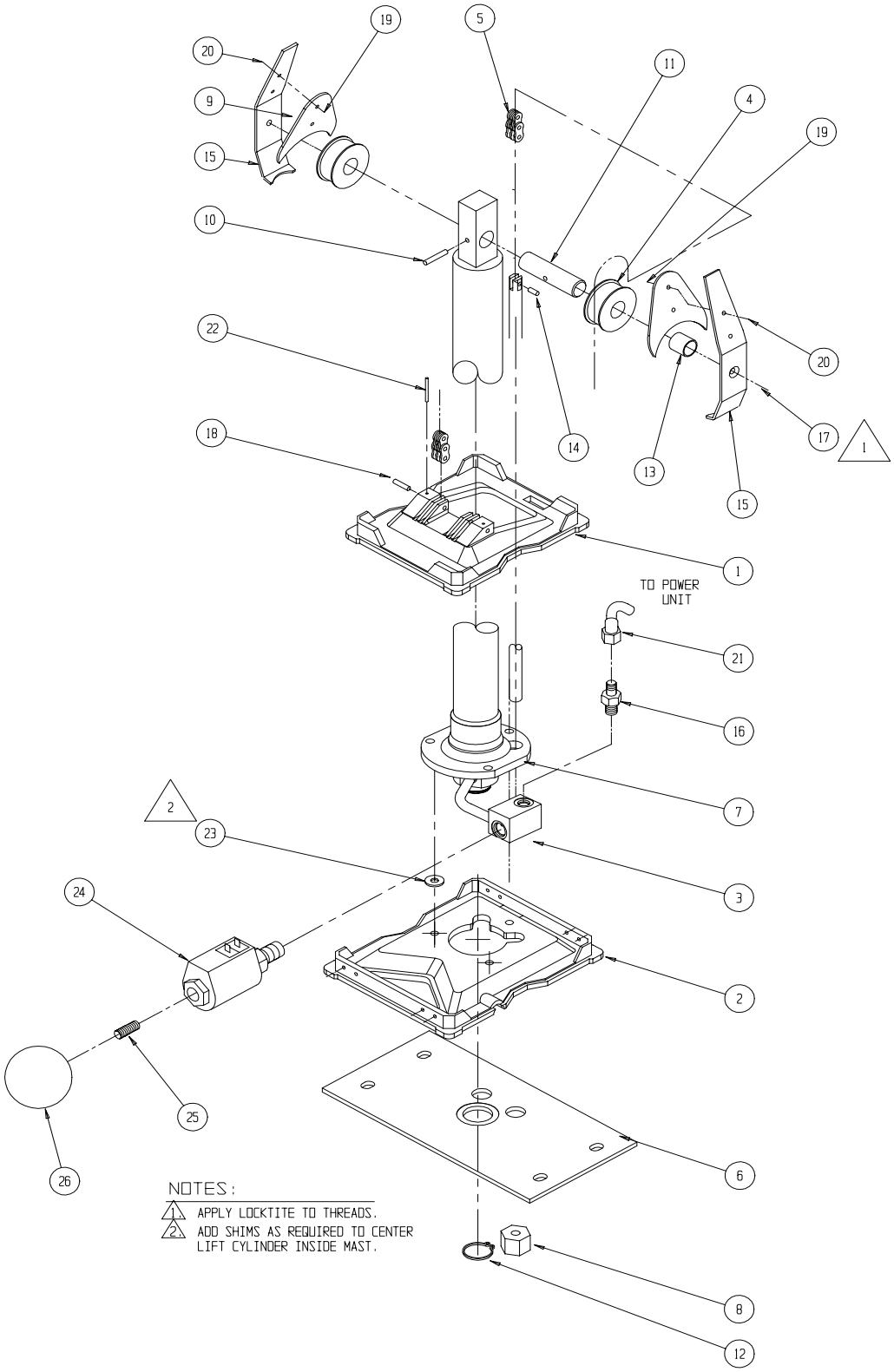


Figure 6-7: Lift cylinder illustration.

2nd STAGE MAST ASSEMBLY

UL25 - 068050-001
UL32 - 068050-002
UL40 - 068050-003

ITEM	PART NUMBER	DESCRIPTION	QTY
1	068055-001	2nd Stage mast assy UL25	1
	068055-002	2nd Stage mast assy UL32	1
	068055-003	2nd Stage mast assy UL40	1
2	068053-000	#2 Section slide	1
3	011703-016	Screw socket hex set 1/4 - 20 UNC x 1	2

Table 6-8: 2nd stage mast assembly components.

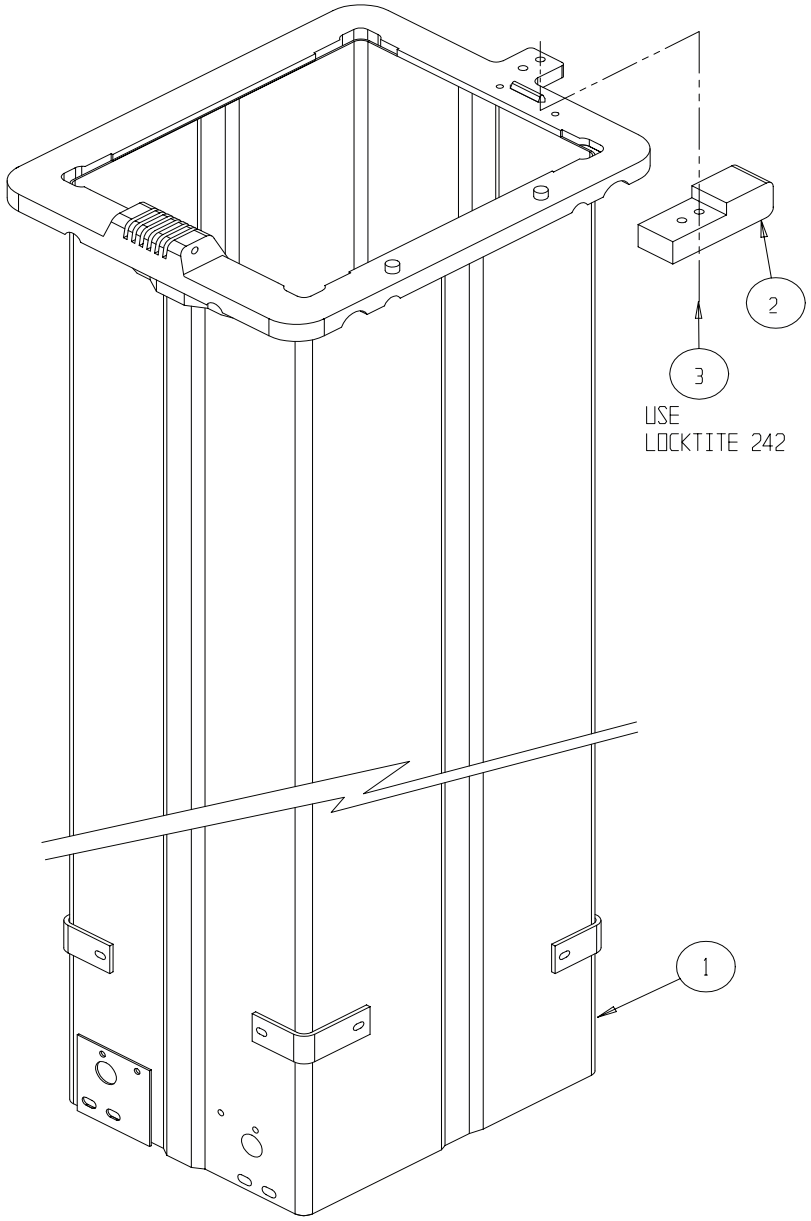


Figure 6-8: 2nd stage mast assembly illustration.

3rd STAGE MAST ASSEMBLY

UL25 - 068056-001
UL32 - 068056-002
UL40 - 068056-003

ITEM	PART NUMBER	DESCRIPTION	QTY
1	068060-001	3rd stage mast assy UL25	1
	068060-002	3rd stage mast assy UL32	1
	068060-003	3rd stage mast assy UL40	1
3	068139-000	Shaft	1
4	011735-012	Pin	1
6	062753-000	Strap assy	1
8	068137-000	Sheave	1
9	062642-010	Bearing	3
10	011786-005	MAC. Bushing	2

Table 6-9: 3rd stage mast assembly components.

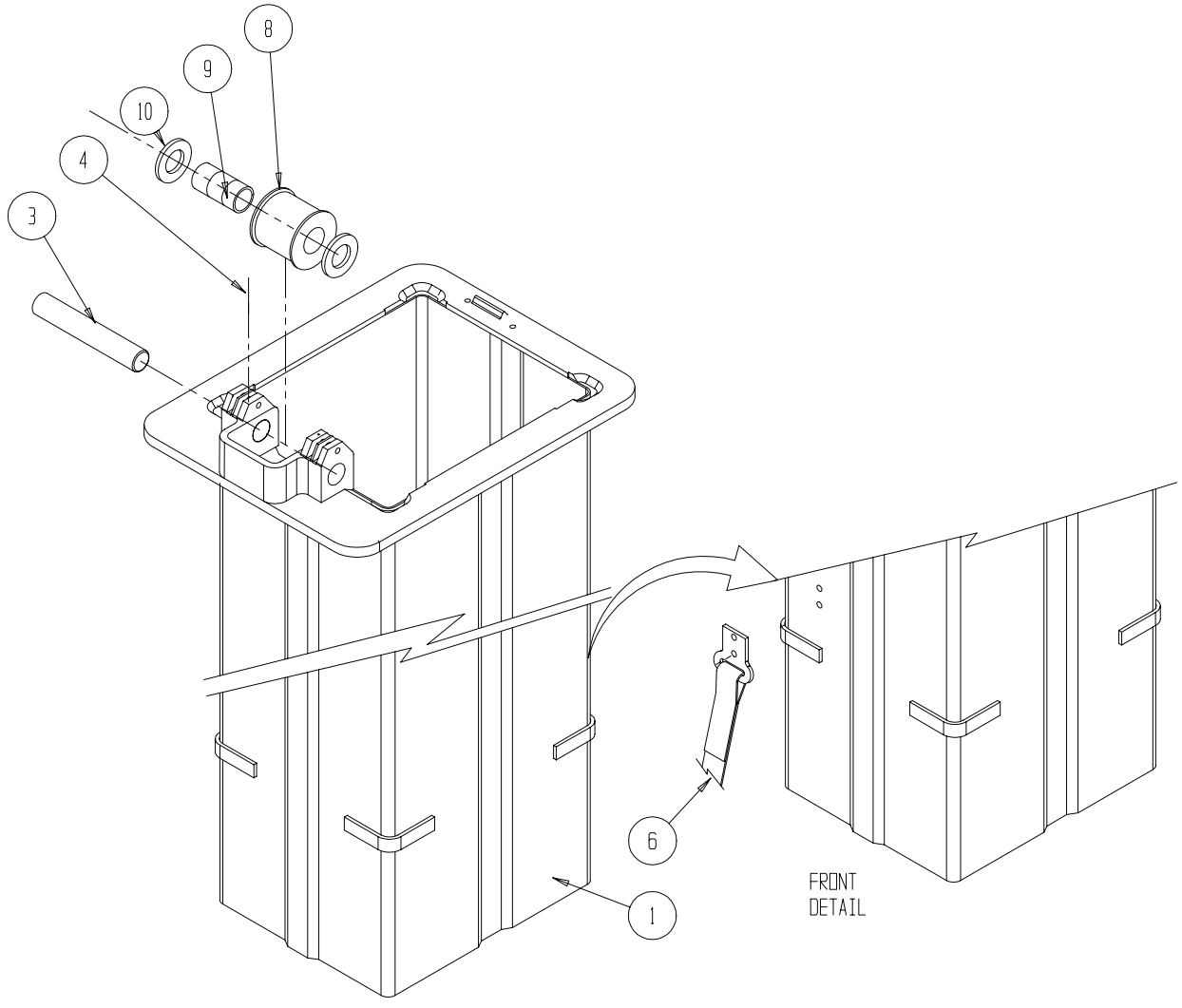


Figure 6-9: 3rd stage mast assembly illustration.

4th STAGE MAST ASSEMBLY

UL25 - 068061-001
UL32 - 068061-002
UL40 - 068061-003

ITEM	PART NUMBER	DESCRIPTION	QTY
1	068064-001	4th stage mast assy UL25	1
	068064-002	4th stage mast assy UL32	1
	068064-003	4th stage mast assy UL40	1
2	062168-111	Chain	2
	062168-137	Chain	2
	062168-163	Chain	2
3	068138-000	Shaft	2
4	011753-020	Shaft	2
5	068146-000	Pin	2
6	062753-000	Strap assy	1
8	068065-000	#4 section slide	1
9	012553-008	Screw socket HD cap 1/4 - 20 UNC x 1	2
10	062642-016	Bearing	2
11	068136-000	Sheave	2

Table 6-10: 4th stage mast assembly components.

4th STAGE MAST ASSEMBLY

UL25 - 068061-001
UL32 - 068061-002
UL40 - 068061-003

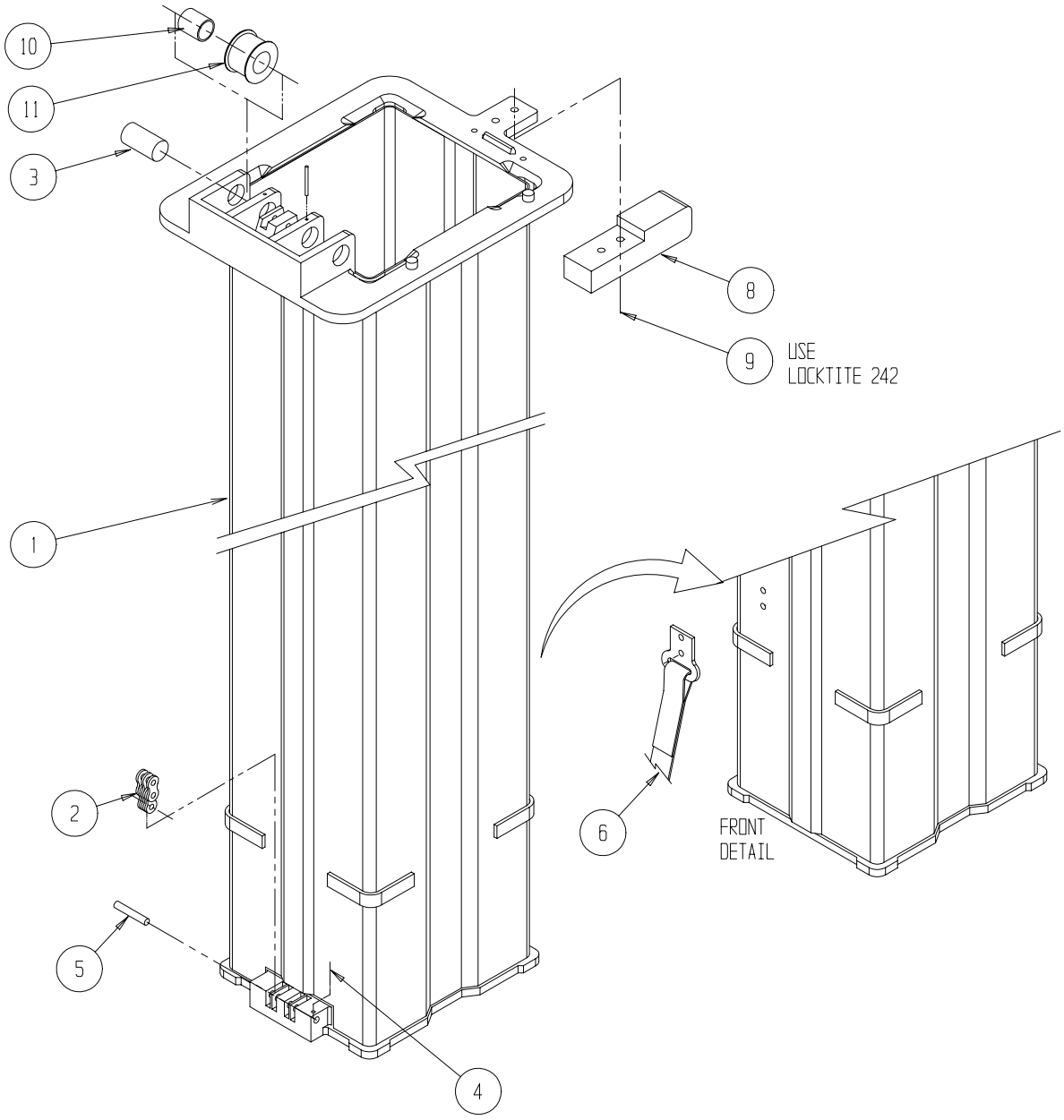


Figure 6-10: 4th stage mast assembly illustration.

5th STAGE MAST ASSEMBLY

UL25 - 068066-001
UL32 - 068066-002
UL40 - 068066-003

ITEM	PART NUMBER	DESCRIPTION	QTY
1	068069-001	5th stage mast assy UL25	1
	068069-002	5th stage mast assy UL32	1
	068069-003	5th stage mast assy UL40	1
2	062167-141	Chain	2
	062167-173	Chain	2
	062167-205	Chain	2
3	068138-001	Shaft	1
4	068135-000	Sheave, 5 stage top	1
5	068140-000	Pin	2
6	062753-000	Strap assy	1
8	011751-004	Pin, cotter 1/16 x 1/2	4
9	011252-016	Screw HHC 1/4 - 20 x 2	2
10	011240-004	Washer 1/4 STD flat	4
11	011248-004	Nut 1/4 - 20 UNC ESNA	2
12	068097-000	5th stage guide	1

Table 6-11: 5th stage mast assembly components.

5th STAGE MAST ASSEMBLY

UL25 - 068066-001
UL32 - 068066-002
UL40 - 068066-003

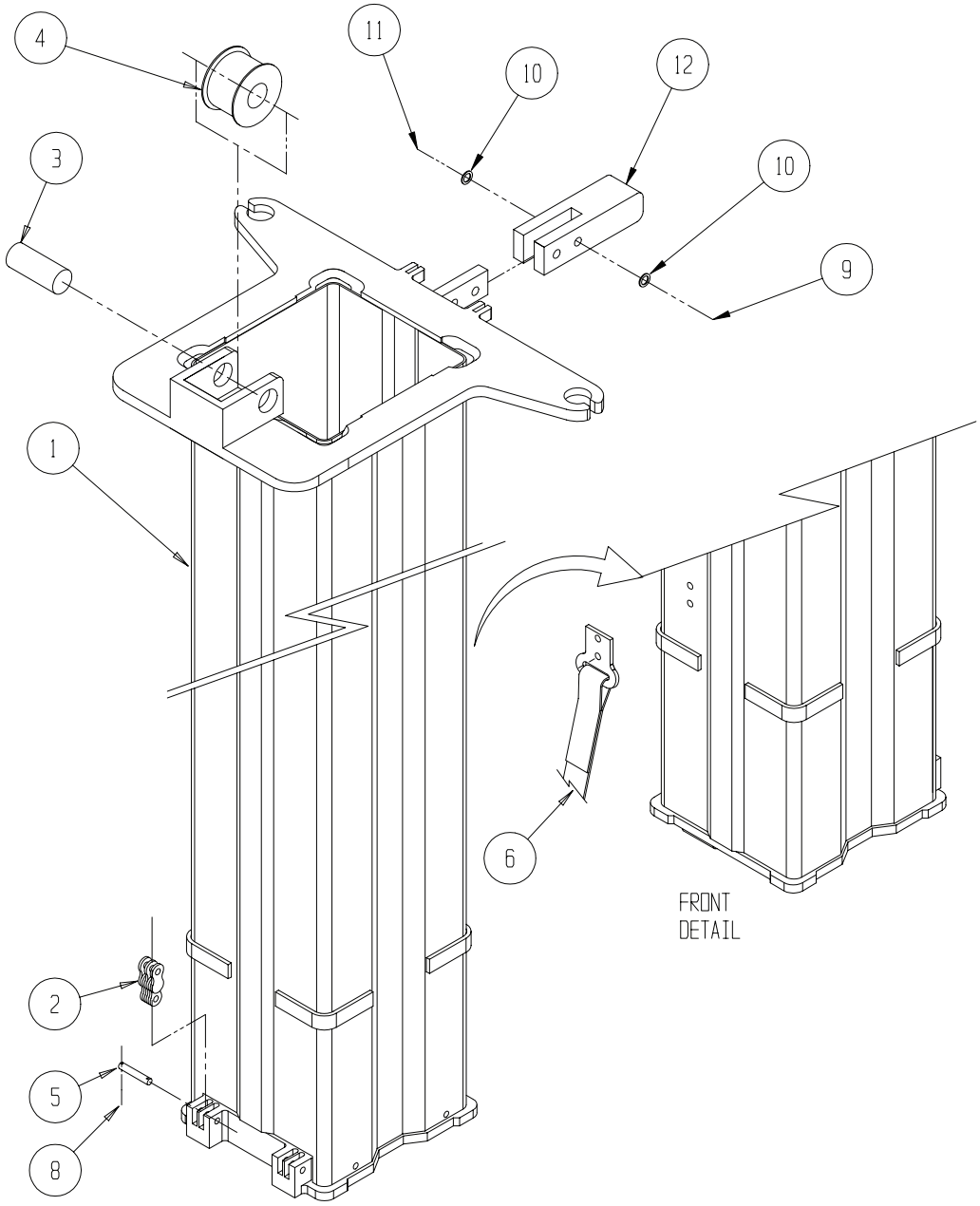


Figure 6-11: 5th stage mast assembly illustration.

6th STAGE MAST ASSEMBLY

UL25 - 514600-001
UL32 - 514600-002
UL40 - 514600-003

ITEM	PART NUMBER	DESCRIPTION	QTY
1	514601-001	6th stage weldment UL25	1
	514601-002	6th stage weldment UL32	1
	514601-003	6th stage weldment UL40	1
2	062166-139	Chain	2
	062166-171	Chain	2
	062166-203	Chain	2
3	062753-000	Strap assy	1
5	068073-000	Chain block	1
6	011821-005	Screw Butt HD 1/4 - 20 UNC	4
7	068144 - 000	Clevis pin 6B	2
8	011735-005	Roll pin 1/8 DIA x 5/8 LG	2
9	068219-099	UHMW wear strip x 1(1/2)	.25 ft

Table 6-12: 6th stage mast assembly components.

6th STAGE MAST ASSEMBLY

UL25 - 514600-001
UL32 - 514600-002
UL40 - 514600-003

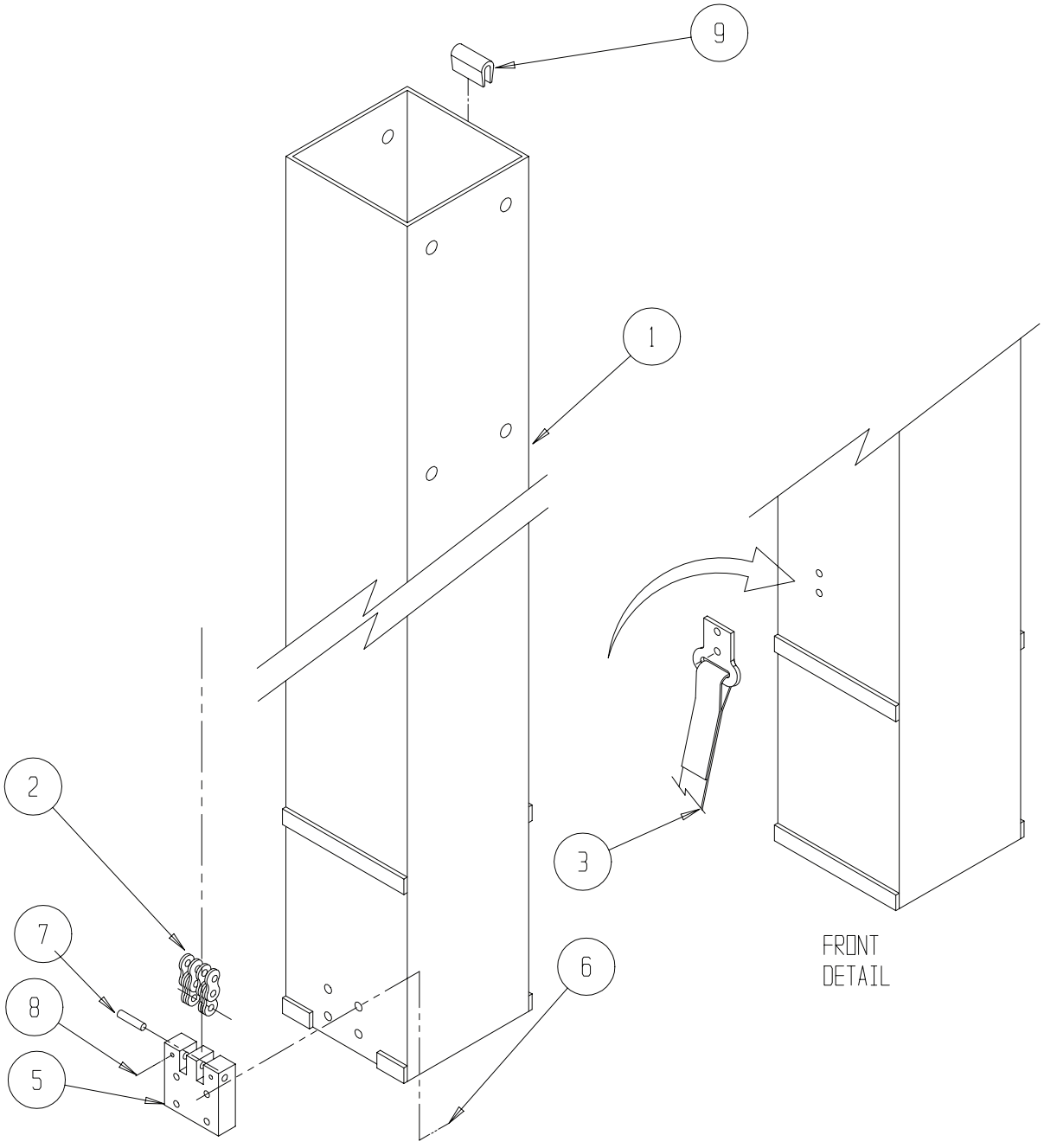


Figure 6-12: 6th stage mast assembly illustration.

PLATFORM SUPPORT ASSEMBLY

UL25 - 514599-000
UL32 - 514599-010
UL40 - 514599-011

ITEM	PART NUMBER	DESCRIPTION	UL25	UL32	UL40
1	514599-001	Platform support weldment	1		
	514599-002	Platform support weldment		1	
	514599-003	Platform support weldment			1
2	062165-133	Chain	2		
	062165-169	Chain		2	
	062165-201	Chain			2
4	017301-005	Tube 1/2 OD x 18 GA wall x 7/8	2	2	2
5	068092-000	Sleave spanner tube	1	1	1
6	068093-000	Roller chain	1	1	1
7	068094-0041	Control cable sheave	2	2	2
8	068162-000	Control cable sheave bracket	2	2	2
9	062753-001	Strap assy	1	1	1
10	068049-000	Control bracket	1	1	1
12	011254-010	Screw HHC 3/8 - 16 UNC x 1(1/4)	2	2	2
13	011240-006	Washer 3/8 STD flat	2	2	2
14	011250-006	Nut hex ESNA 3/8 - 16 UNC	2	2	2
16	068142-000	Chain pin	2	2	2
17	011253-006	Screw HHC 5/16 - 18 UNC x 3/4	2	2	2
18	011240-005	Washer 5/16 STD flat	2	2	2
19	011250-005	Nut hex ESNA 5/16 - 18 UNC	2	2	2
20	011252-008	Screw HHC 1/4 - 20 UNC x 1	4	4	4
21	011240-004	Washer 1/4 STD flat	11	11	11
22	011248-004	Nut hex ESNA 1/4 - 20 UNC	6	6	6
23	014099-044	Screw HHC 3/4 - 10 UNC x 5(1/2)	1	1	1
24	011248-012	Nut hex ESNA 3/4 - 10 UNC	1	1	1
25	068231-000	Top cover	1	1	1
26	011240-012	Washer STD flat 3/4	2	2	2
27	011252-003	Screw HHC 1/4 - 20 UNC x 3/8	3	3	3
28	062129-000	Strap retainer	1	1	1
29	012553-005	Screw SOC HD 1/4 - 20 UNC x 5/8	2	2	2
30	063926-007	50 x 50 insert	2	2	2

Table 6-13: Platform support assembly components.

PLATFORM SUPPORT ASSEMBLY

UL25 - 514599-000
UL32 - 514599-010
UL40 - 514599-011

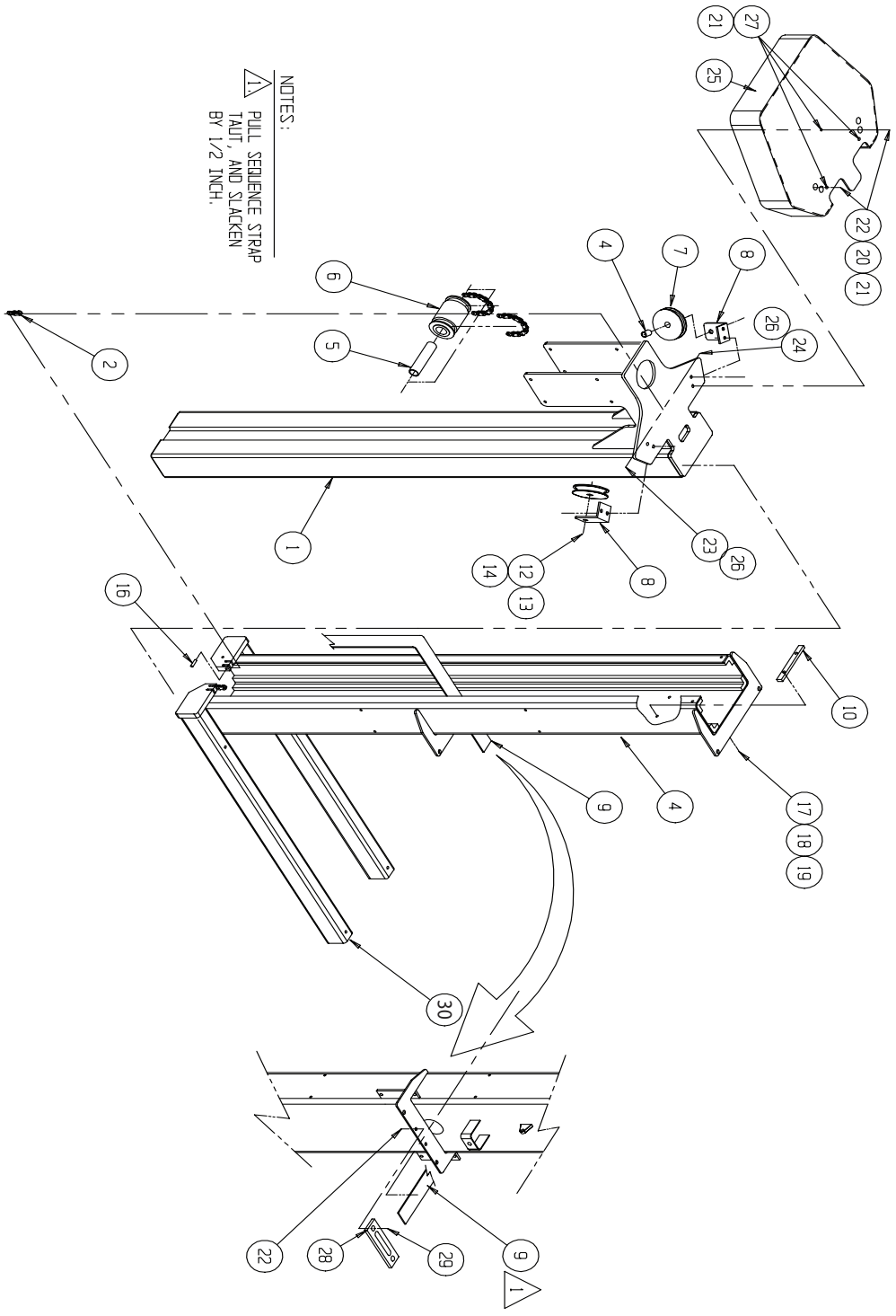


Figure 6-13: Platform support assembly illustration.

PLATFORM ASSEMBLY - UL25

068179-003

ITEM	PART NUMBER	DESCRIPTION	QTY
1	068082-001	Platform support weldment	1
2	068123-000	Slide angle	4
3	506275-001	Rail weldment (ANSI Lower rail 068150-002)	1
4	068149-002	Cage pan	1
5	068276-000	Shear guard	1
6	068096-000	Rail bearing top	4
7	068147-000	Front cover	1
8	057524-001	Drop bar assy	1
9	026525-003	Screw SLFTP #8 HWH x 3/8	16
10	970109	Screw HHC 1/4 - 20 UNC 2 x 3/4	2
11	011240-004	Washer 1/4 STD	15
12	011248-004	Nut hex ESNA 1/4 - 20 UNC	12
13	011264-022	Screw HHC 5/16 - 18 UNC x 2(3/4)	4
14	011240-005	Washer 5/16 STD	4
15	011246-010	Nut ESNA 5/16 - 18 UNC	4
16	510524-000	Switch, push pull	1
17	510525-000	Contact block	1
18	062799-011	Enclosure box & cover	1
19	0120803	Push button up	1
20	510527	Contact block N.O.	3
21	0120804	Push button down	1
22	510542	Push enable	1
23	029925-000	Connector	1
24	029939-002	Locknut 1/2 NPT	1
25	014252-004	Nut sert 1/4 - 20 UNC	3
26	011825-006	Screw RND HO 1/4 - 20 UNC x 3/4	5
27	011708-003	Screw RD HO mach #8-32 x 1/2	2
28	011252-014	Screw HHC 1/4 - 20 UN x 1 3/4	4
29	014924-008	U-bolt	2
30	068630-000	Extension spring Ø 0.055 wire	2
31	013919-009	Clamp, 5/8 DIA.	4
32	026551-007	Rivet 1/8 .251-.312 grip	4
33	057094-002	Harness hardpoint bracket	1
34	514696-000	Backing plate	1
35	514697-000	Backing plate	2
36	058508-030	Bolt - M10 x 30	1
37	056064-010	Nyloc nut - M10	1
38	505087-010	Flatwasher - M10	2
39	970129	Screw HHC 1/4 - 20 UNC x 3	2

Table 6-14: Platform assembly components UL25.

PLATFORM ASSEMBLY - UL25

068179-003

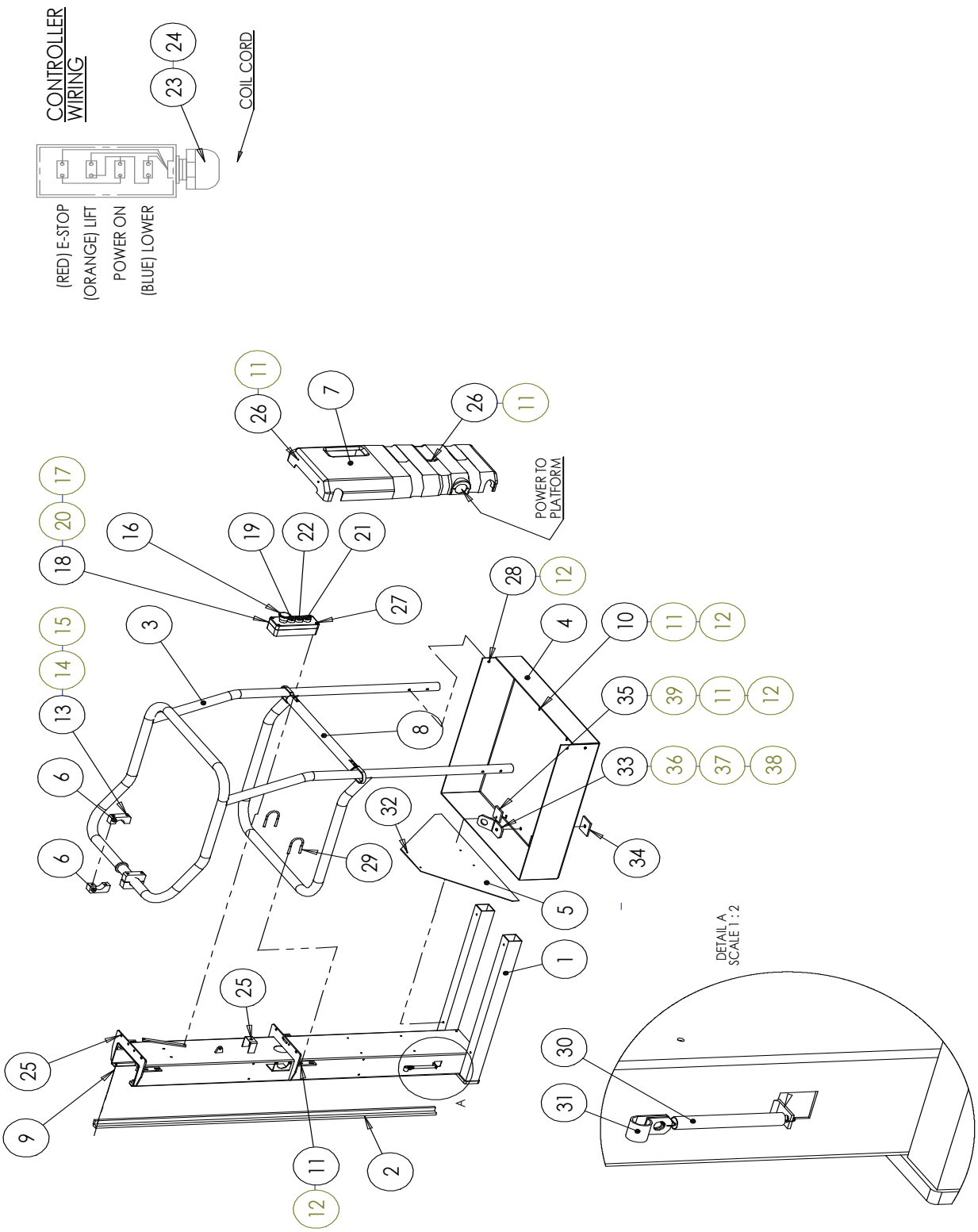


Figure 6-14: Platform assembly illustration UL25.

PLATFORM ASSEMBLY - UL32/UL40

068179-004

ITEM	PART NUMBER	DESCRIPTION	QTY
1	068082-001	Platform support weldment	1
2	068123-000	Slide angle	4
3	506275-001	Rail weldment (ANSI Lower rail 068150-002)	1
4	068149-002	Cage pan	1
5	068096-000	Rail bearing top	4
6	068147-000	Front cover	1
7	057524-001	Drop bar assy (ANSI upper rail 068171-002)	1
8	026525-003	Screw SLFTP #8 HWH x 3/8	16
9	970109	Screw HHC 1/4 - 20 UNC x 2(3/4)	2
10	011240-004	Washer 1/4 STD	15
11	011248-004	Nut Hex ESNA 1/4 - 20 UNC (ANSI rail only)	12
12	011264-022	Screw HHC 5/16 - 18 - UNC x 2 3/4	4
13	011240-005	Washer 5/16 STD	4
14	011246-010	Nut ESNA 5/16 - 18 UNC	4
15	510524-000	Switch, push pull	1
16	510525-000	Contact block	1
17	062799-011	Enclosure box & cover	1
18	0120803	Push button up	1
19	510527	Contact block N.O.	3
20	0120804	Push button down	1
21	510542	Push enable	1
22	029925-000	Connector	1
23	029939-002	Locknut 1/2 NPT	1
24	014252-004	Nut sert 1/4 - 20 UNC	3
25	011825-006	Screw RND HO 1/4 - 20 UNC x 3/4	5
26	011708-003	Screw RD HO mach #8 - 32 x 1/2	2
27	011252-014	Screw HHC 1 14 - 20 UNC x 1 3/4	4
28	014924-008	U - bolt	2
29	068630-000	Extension spring Ø 0.055 wire	2
30	013919-009	Clamp, 5/8 diameter	4
31	057094-002	Harness hardpoint bracket	1
32	514696-000	Backing plate	1
33	514697-000	Backing plate	2
34	058508-030	Bolt - M10 x 30	1
35	056064-010	Nyloc nut - M10	1
36	505087-010	Flat washer - M10	2
37	970129	Screw HHC 1/4 - 20 UNC x 3	2

Table 6-15: Platform assembly components UL32/UL40.

PLATFORM ASSEMBLY - UL32/UL40

068179-004

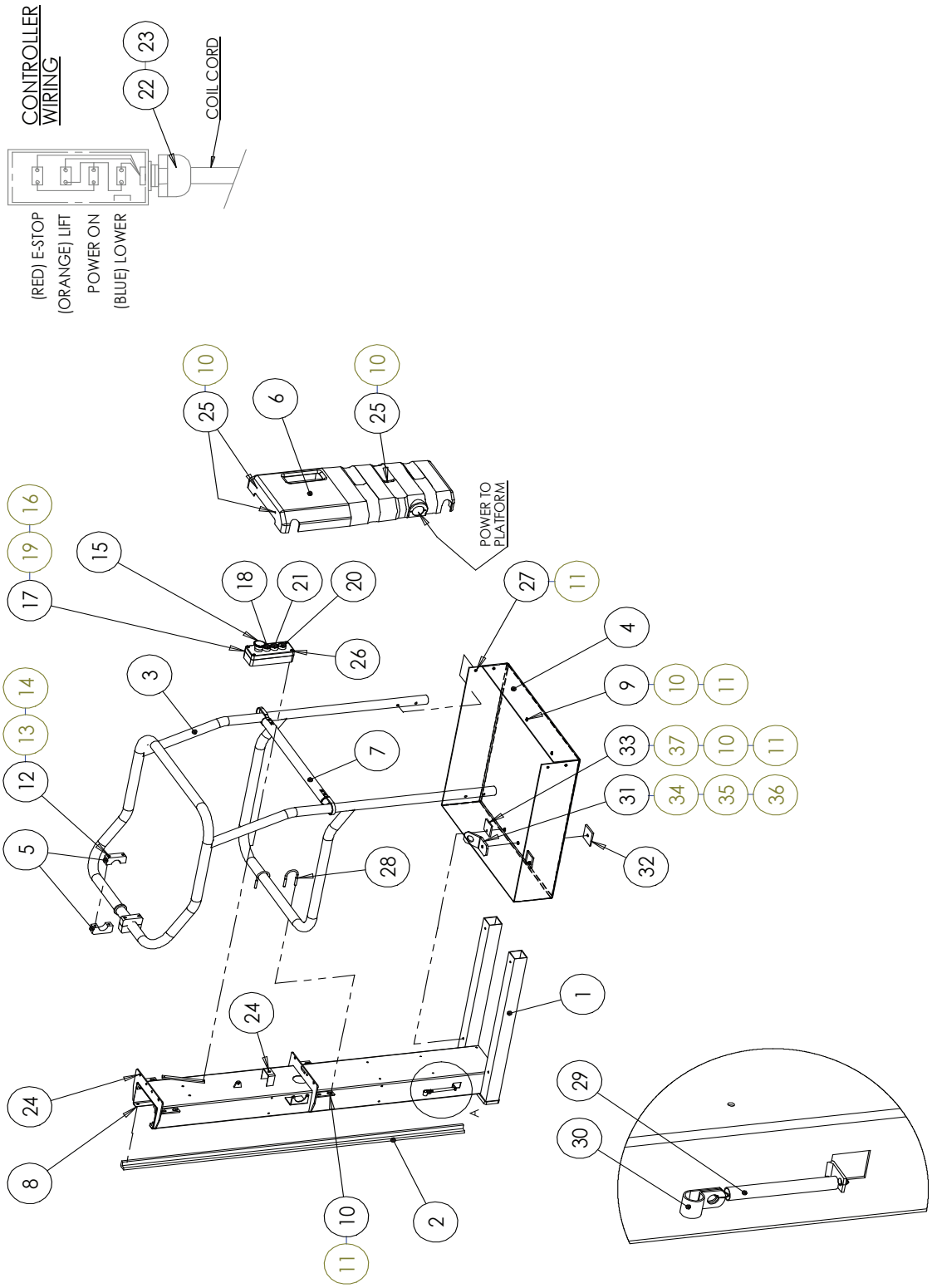


Figure 6-15: Platform assembly illustration UL32/UL40.

A.C. PLATFORM CONTROL BOX - 514795-000

ITEM	PART NUMBER	DESCRIPTION	QTY
1	514788-000	UL upper control box weldment	1
2	514789-000	UL A.C. upper control box panel	1
3	514433-000	7 way chassis socket	1
4	510524-000	SW twist release E/stop	1
5	0120803	Raise push button	1
6	510542-000	Pushbutton	1
7	0120804	Lower push button	1
8	514822-000	Switch 2-way spring to off	1
9	505082-010		4
10	514825-000	Overlay	1

Table 6-16: A.C. platform control box components.

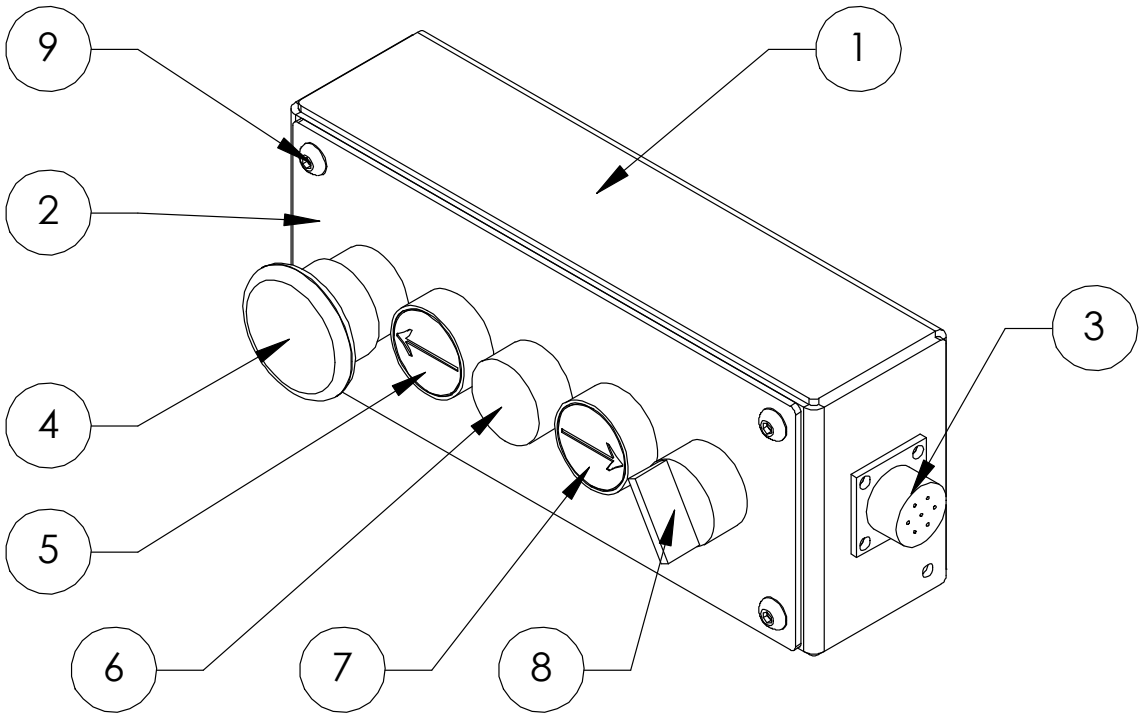


Figure 6-16: A.C. platform control box illustration.

D.C. PLATFORM CONTROL BOX - 514796-000

ITEM	PART NUMBER	DESCRIPTION	QTY
1	514788-000	UL upper control box weldment	1
2	514790-000	UL D.C. upper control box panel	1
3	514433-000	7 way chassis socket	1
4	510524-000	SW twist release E/stop	1
5	0120803	Raise push button	1
6	510542-000	Pushbutton	1
7	0120804	Lower push button	1
8	505082-010		4
9	514826-000	Overlay	1
10	512934-000	LED red 12V	1

Table 6-17: D.C. platform control box components.

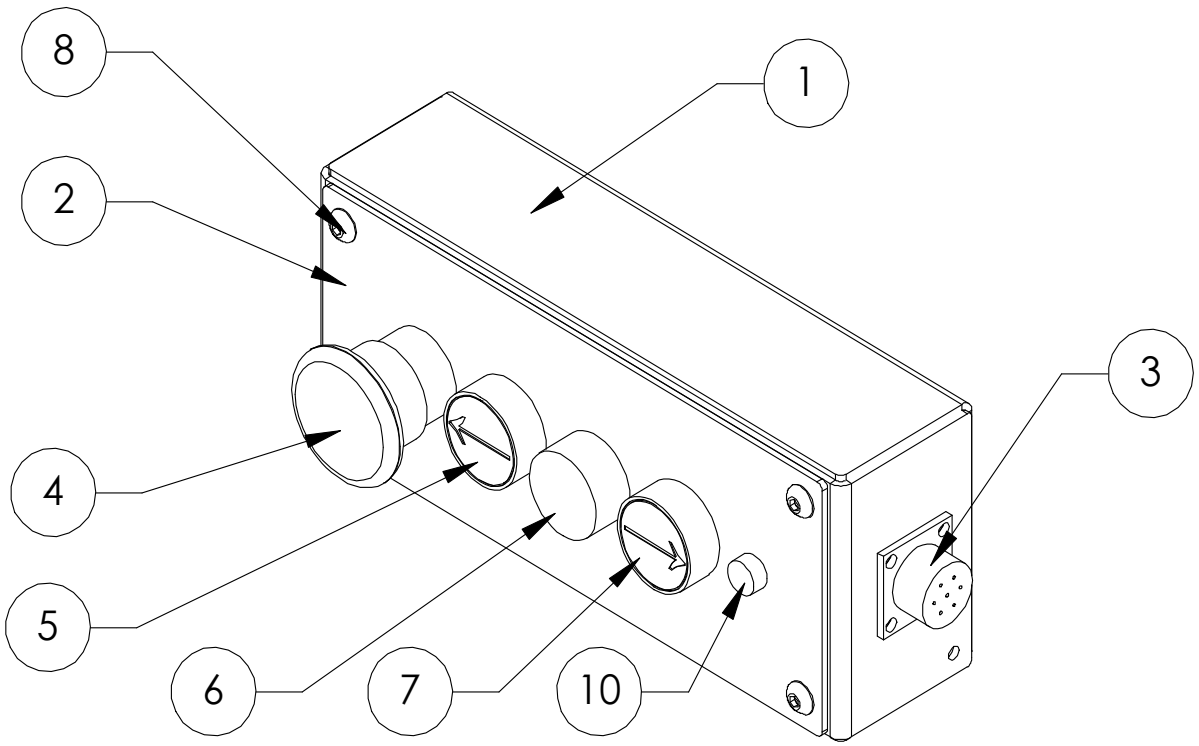


Figure 6-17: D.C. platform control box illustration.

TILT BACK ASSEMBLY

UL32 - 068200-000
UL40 - 068200-001

ITEM	PART NUMBER	DESCRIPTION	QTY
1	068180-000	Loader bar assembly	1
2	068190-000	Loader stop bracket assembly	1
3	068201-000	Tilt back weldment 32-40	1
4	062844-000	Tiltbar weldment	1
5	062846-001	Tube cylinder mount	1
6	068196-000	Inner tube 32	1
7	062884-002	Tube cylinder outer	1
8	062885-001	Fitting cylinder end	1
9	062886-000	Fitting cylinder end	1
10	062887-001	Pin cylinder mount	1
11	062891-001	Lanyard assembly	1
12	003570-000	Pin retaining	1
13	063650-003	Cylinder gas spring	1
14	062843-001	Grip	1
15	063926-004	Caplug	1
16	062888-003	Pin 3/4 x 2(1/2)	1
17	016590-001	Pipe .3/4 SCHD40ALUM 3/8 LG	2
18	514816-000	Caster	2
19	5592006	Ring retaining	2
21	504145-000	Split pin 3.2mm X 32 DIN 94 zinc plated	2
22	011256-008	1/2”- 13 UNC x 1” H.T. HEX Set	2
23	970269	Screw HHC 5/16 - 18 x 1	8
24	011256-022	Screw HHC 1/2 - 13 2(3/4)	2
25	986269	Flat washer .313	16
26	011248-008	Nut HEX ESNA 1/2-13 UNC	4
27	5560031	HEX lock nut .3125-18 UNC	8
28	016590-001	Pipe.3/4 SCHD40ALUMX3/8LG	2

Table 6-18a: UL32/40 tilt back assembly components.

TILT BACK ASSEMBLY -

UL32 - 068200-000
UL40 - 068200-001

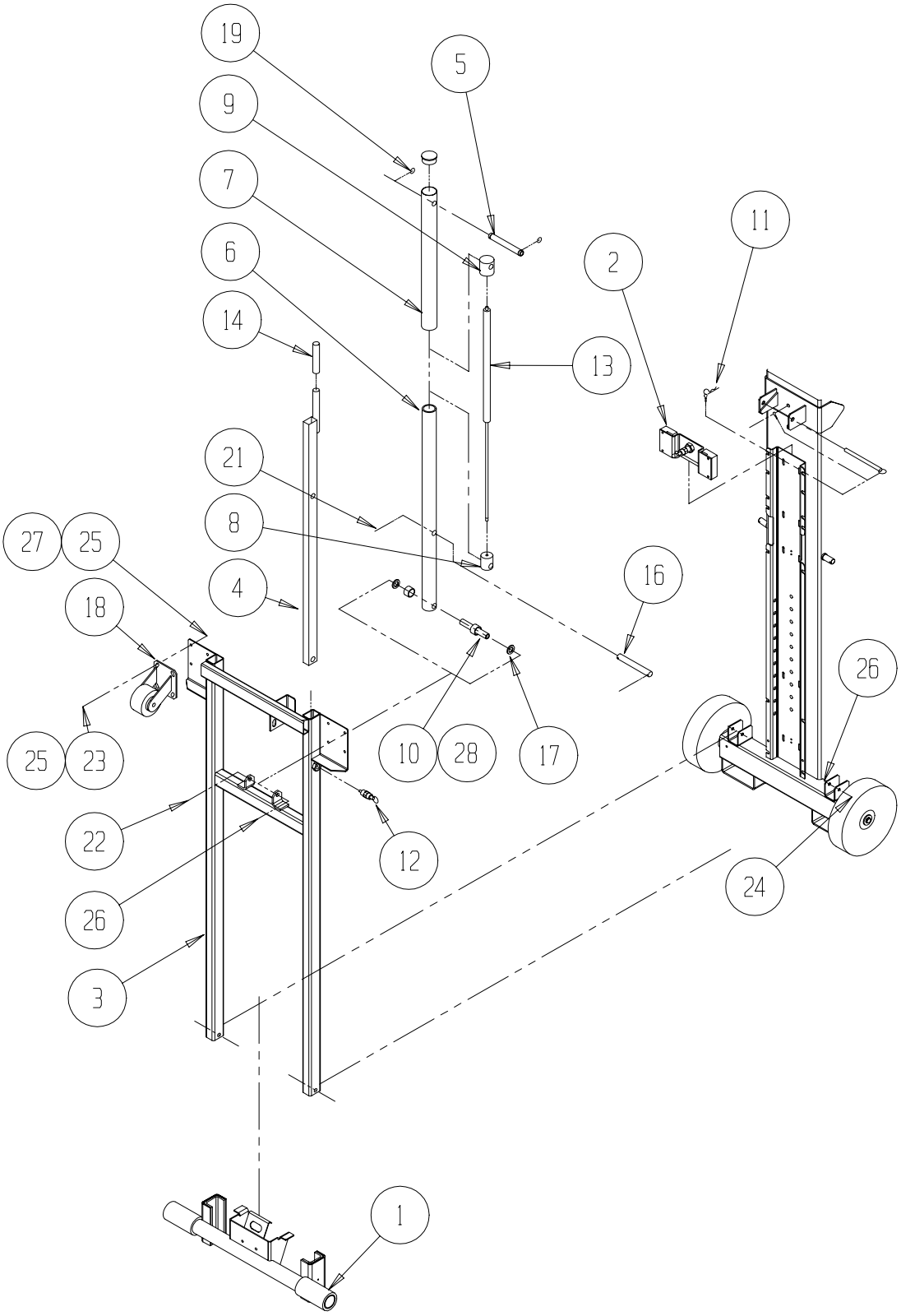


Figure 6-18a: UL32/40 tilt back assembly illustration.

TILT BACK ASSEMBLY -

UL25 - 068200-003

ITEM	PART NUMBER	DESCRIPTION	QTY
1	068201-002	TILTBACK WELDMENT(UL25)	1
2	068180-000	LOADER BAR ASSEMBLY	1
3	068190-000	LOADER STOP BRKT. ASSY.	1
4	514816-000	CASTOR, SWIVEL LOCK (4 x 2)	2
5	068265-000	LIFT TUBE	1
6	062846-001	TUBE - CYL. MOUNT	1
7	063926-004	CAP PLUG	1
8	062844-000	LIFTBAR WELDMENT	1
9	062843-001	GRIP SLEEVE	1
10	003570-005	RETAINING PIN ASSY.	1
11	011256-022	HEX HD BOLT - 1/2" UNC x 2.75	2
12	011248-008	NUT - 1/2-13 UNC	2
13	986269	FLAT WASHER - 5/16"	16
14	970269	HEX. HD. BOLT - 5/16"-18 x 1.25"	8
15	5560031	NYLOCK NUT - 5/16"-18	8
16	062891-001	LANYARD ASSEMBLY	1
17	5592006	EXTERNAL CIRCLIP - 19mm	2
18	068190-000	LOADER STOP BRACKET ASSY	1
19	062891-001	LANYARD ASSEMBLY	1
20	011248-008	Nut HEX ESNA 1/2-13 UNC	4
21	011256-022	SCREW HHC 1/2 - 13 2(3/4)	2

Table 6-18b: UL25 tilt back assembly components.

TILT BACK ASSEMBLY -

UL25 - 068200-003

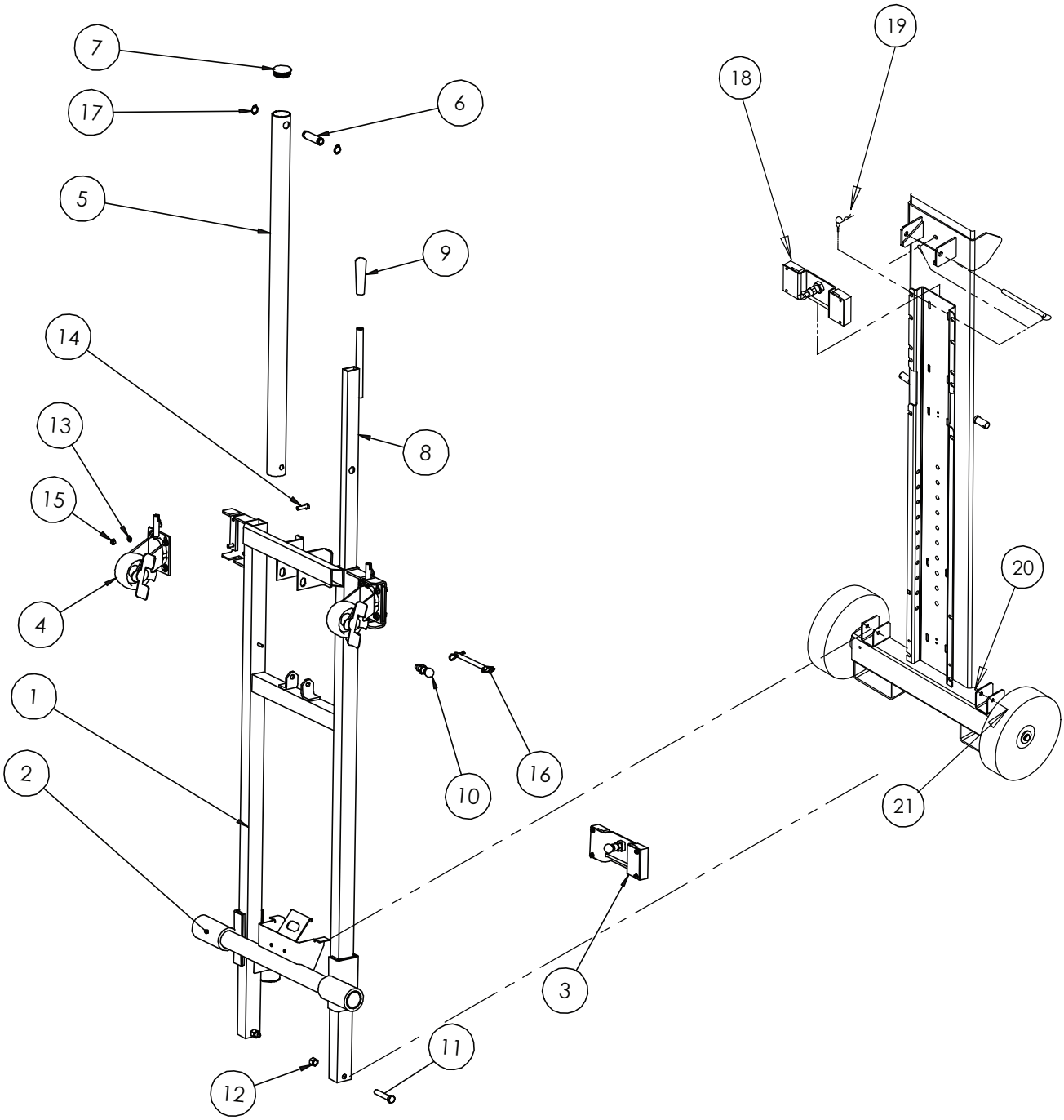


Table 6-18b: UL25 tilt back assembly components.

LOADER STOP BRACKET ASSEMBLY - 068190-000

ITEM	PART NUMBER	DESCRIPTION	QTY
1	068191-000	Loader stop bracket weldment	1
2	068193-000	Slide pad - loader stop	2
3	03570-000	Retaining pin assy	1
4	014066-006	Screw 1/4 self tapping x 3/4	4

Table 6-19: UL25/32/40 loader stop bracket assembly components

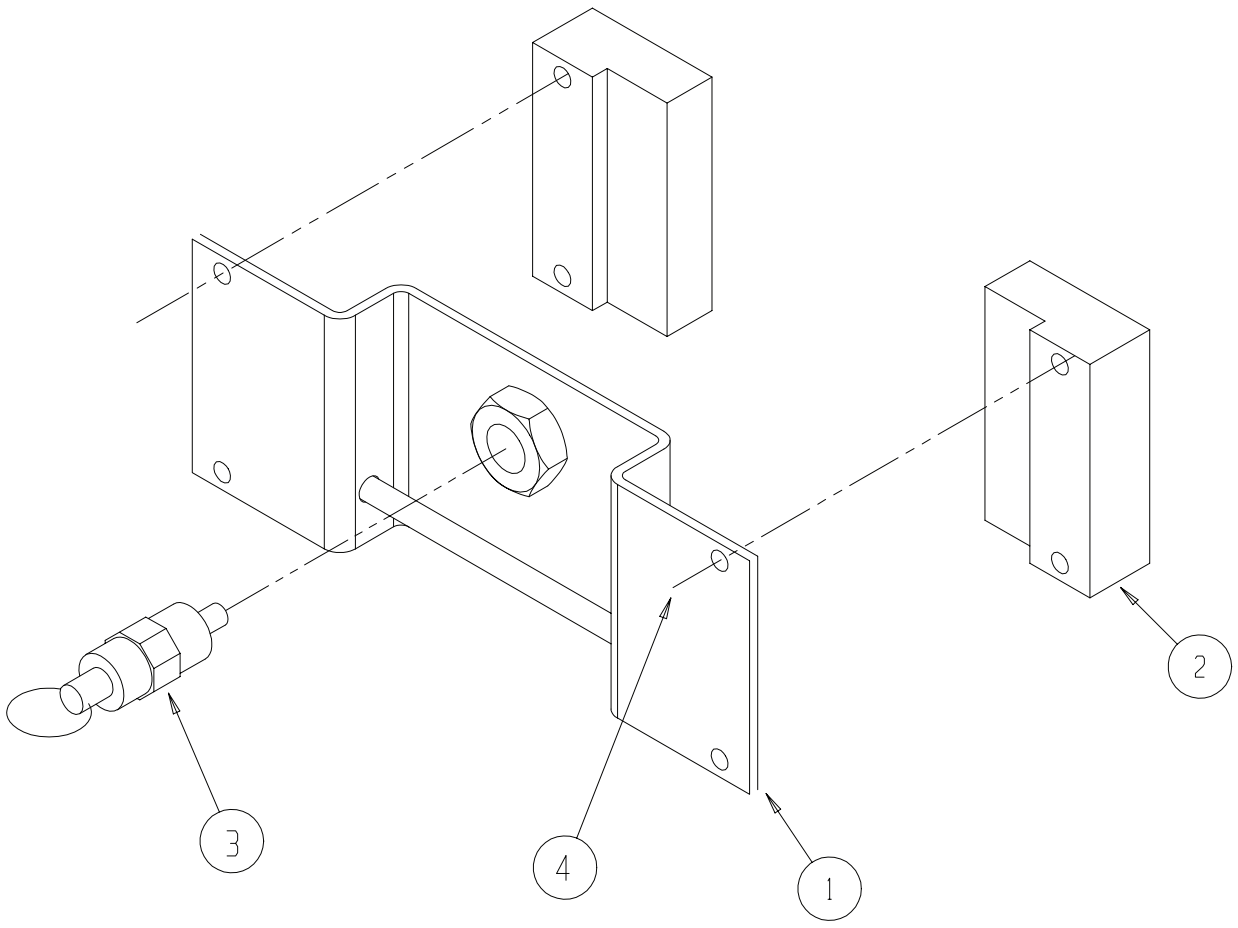


Figure 6-19: UL25/32/40 loader stop bracket assembly illustration.

LOADER BAR ASSEMBLY - 068168-000

ITEM	PART NUMBER	DESCRIPTION	QTY
1	068187-000	Loader bar weldment	1
2	068188-000	Slide pad	2
3	061694-005	Hose 2 5/8 OD x 2 ID x 5	2
4	062923-000	Loader hanger	1
5	015936-004	Bolt shoulder 3/8 x 1/2	2
6	011248-005	Nut hex ESNA 5/16 - 18 UNC	2
7	014066-006	Screw HWH SLFTP 1/4 - AB x 3/4	6

Table 6-20: UL25/32/40 loader bar assembly components

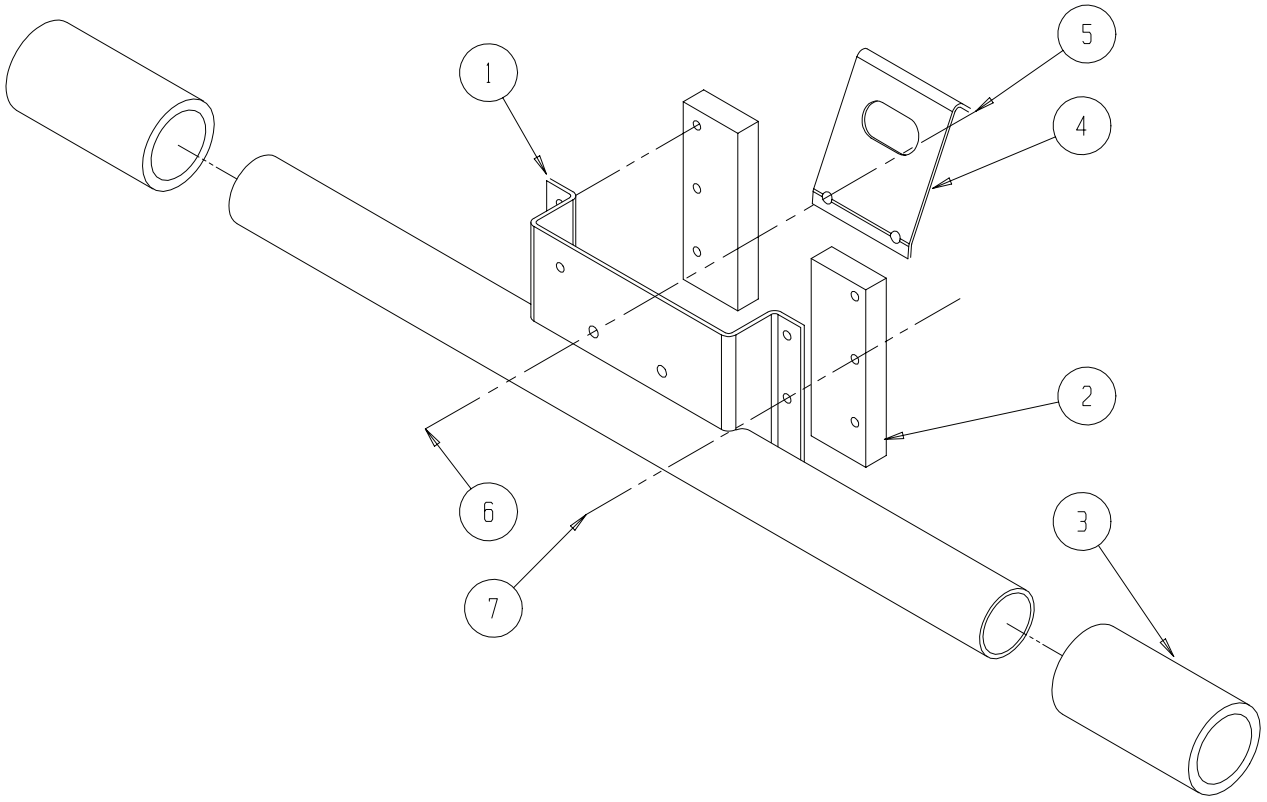


Figure 6-20: UL25/32/40 loader bar assembly illustration.

OUTRIGGER ASSEMBLY

UL25/UL32 - 068157-001

ITEM	PART NUMBER	DESCRIPTION	QTY
1	003471-000	Handle alarm	1
2	003508-000	Knob UL - Outrigger	1
3	003532-000	Pad assembly	1
4	026553-005	3/16” x 3/8” pop rivet	4
5	056059-045	Bolt, hexbolt DIN931 M8 x 45mm	4
6	056066-006	Nut nylock DIN985 M6 8.0 Zi	4
7	056066-008	Nut nylock DIN985 M8 8.0 Zi	4
9	056069-010	Washer, steelflat washer DIN125	8
10	056069-016	Washer, steelflat washer Din125A M16 Zinc	1
11	058491-050	Bolt, hexsetscrew DIN933 M6	4
12	062636-000	Jack screw	1
13	068102-001	Outrigger tube x 44	1
14	068148-000	Screw casting	1
15	508247-008	Washer, pennywasher, DIN9021, M8	8
16	056060-075	Bolt, hexbolt Din931 M10 x 75mm	4
17	970369	Bolt hexhead .313-18 1.00 GR5-5/1	4
18	056066-010	Nut, nylocknut Din985 M10 8.0	4
19	5569922	M8 spring washer	1

Table 6-21: UL25/32 outrigger assembly components

OUTRIGGER ASSEMBLY

UL40 - 030838-007

ITEM	PART NUMBER	DESCRIPTION	QTY
1	003471-000	Handle alarm	1
2	003508-000	Knob UL - Outrigger	1
3	003532-000	Pad assembly	1
4	026553-005	3/16” x 3/8” pop rivet	4
5	056059-045	Bolt, hexbolt DIN931 M8 x 45mm	4
6	056066-006	Nut nylock DIN985 M6 8.0 Zi	4
7	056066-008	Nut nylock DIN985 M8 8.0 Zi	4
8	030838-200	Outrigger tube strap	2
9	056069-010	Washer, steelflat washer DIN125	8
10	056069-016	Washer, steelflat washer Din125A M16 Zinc	1
11	058491-050	Bolt, hexsetscrew DIN933 M6	4
12	062636-000	Jack screw	1
13	030838-005	Outrigger tube UL40 CSA	1
14	068148-000	Screw casting	1
15	508247-008	Washer, pennywasher, DIN9021, M8	8
16	056060-075	Bolt, hexbolt Din931 M10 x 75mm	4
17	970369	Bolt hexhead .313-18 1.00 GR5-5/1	4
18	056066-010	Nut, nylocknut Din985 M10 8.0	4
19	5569922	M8 spring washer	1
20	011741-004	Screw flat HD SOC 3/8 - 16 UNC 1	18

Table 6-22: UL40 outrigger assembly components

OUTRIGGER ASSEMBLY

UL25/UL32 - 068157-001
UL40 - 030838-007

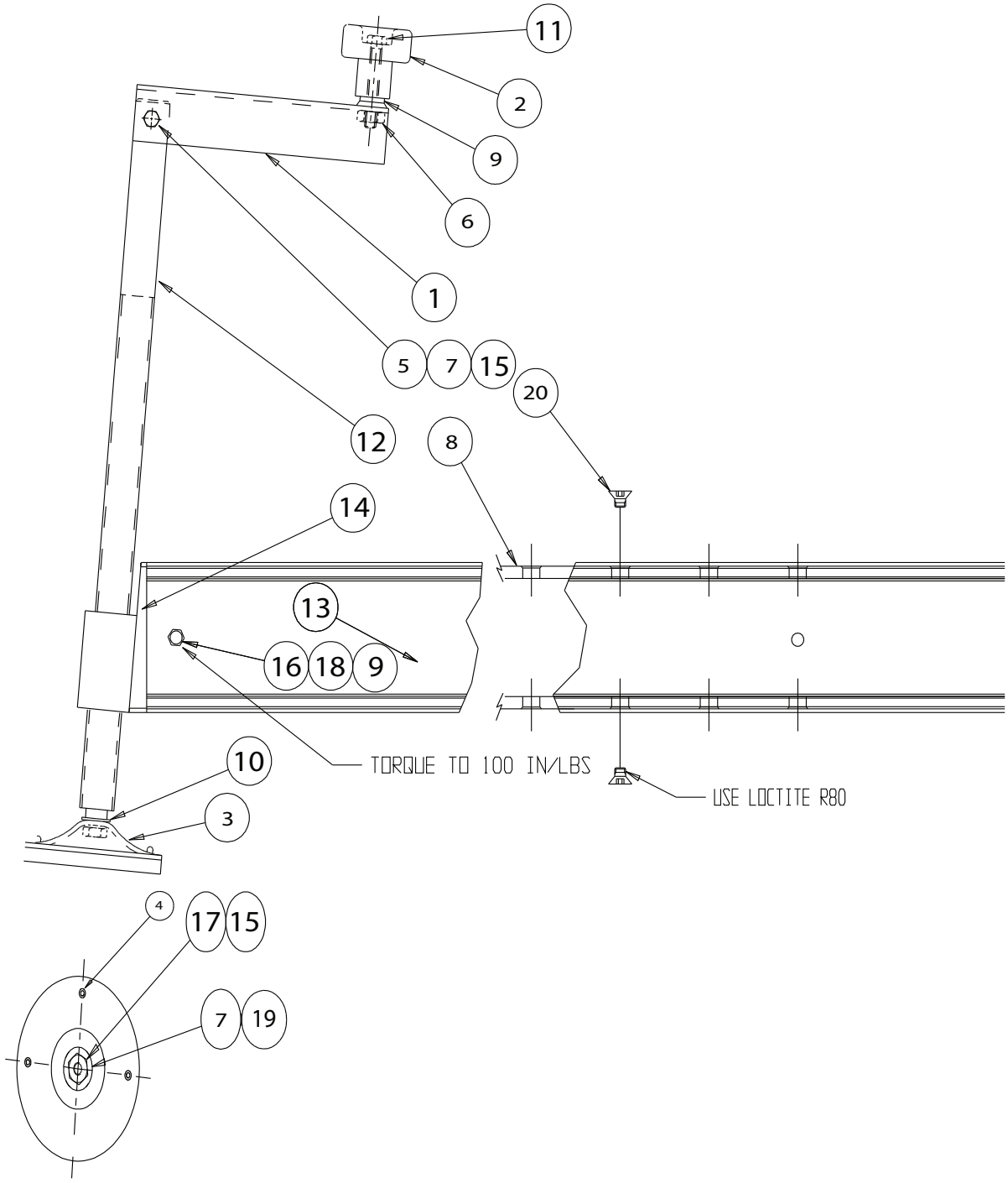


Figure 6-21: UL25/32/40 outrigger assembly illustration.

UL DC BATTERY BOX - 068214-000

ITEM	PART NUMBER	DESCRIPTION	QTY
1	068214-002	Battery box	1
2	068214-003	Battery box cover	1
3	011703-016	Socket HD cap 1/4” UNC x1”	2
4	514015-020	Battery charger mount	1

Table 6-23: UL DC battery box components

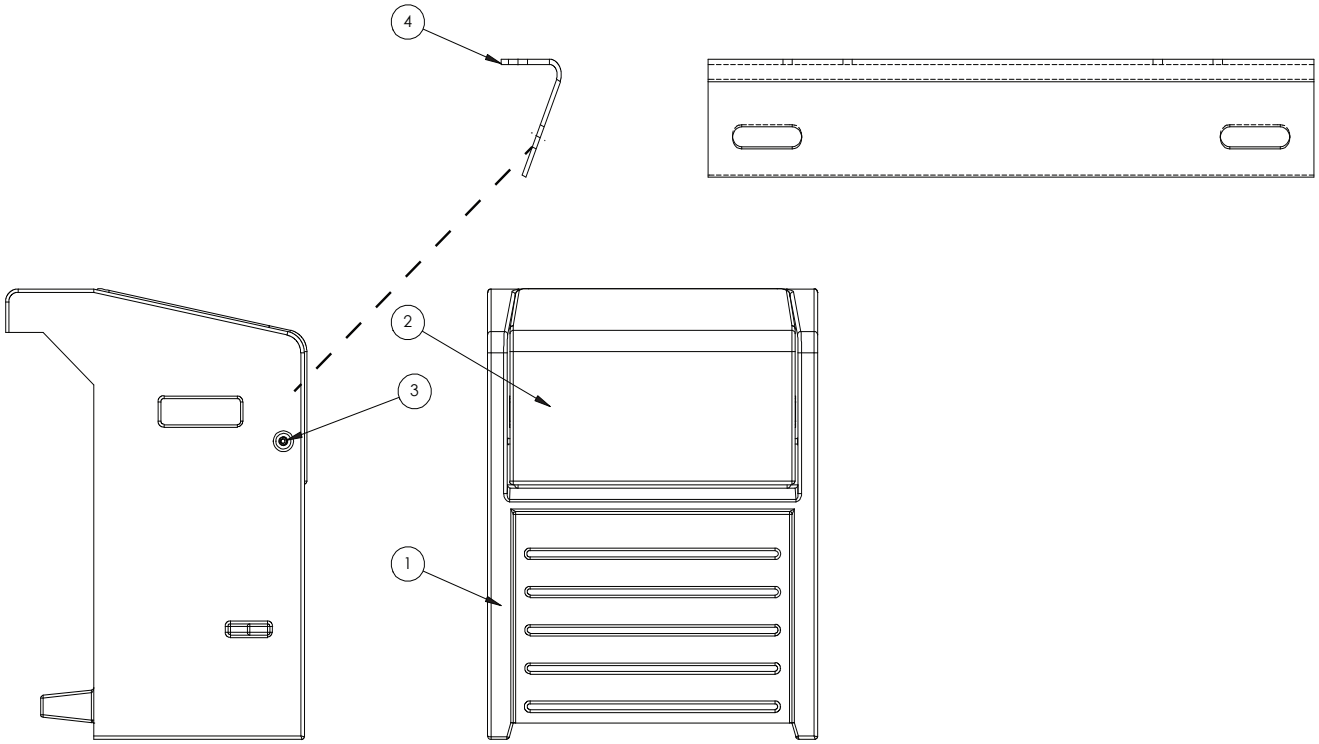


Figure 6-22: UL25/32/40 outrigger assembly illustration.

DECAL KIT - UL25

AC - 068013-012
DC - 068013-013

ITEM	PART NUMBER	DESCRIPTION	QTY
1	010076-901	Label, operating instructions	1
2	067195-003	Label, warning use	1
3	067195-203	Label, warning use	1
4	067195-303	Label, warning use	1
5	005223-903	Label, emergency down	1
6	101210-000	Label, warning hydrogen gas	1 DC only
8	064444-000	Label, USA	1
9	026551-004	Rivet, pop 1/8 .126 - .187 grip	18
10	062218-901	Label, insert outrigger	2
12	061683-008	Label, upright	2
13	068212-001	Label, UL25	1
14	061205-003	Nameplate	1
15	066550-015	Label, warning before using	1
16	066557-971	Label, warning max load 159 kg	1
18	101208-002	Label, warning pinch point	2
19	066551-905	Label, warning centre bubble	1
20	069338-900	Label, control switch	1
21	064936-009	Tape reflective	FT 12
23	062840-900	Label, controls	1
25	066550-215	Label, warning before using	1
26	066550-315	Label, Warning before using	1
27	062466-902	Label, Tiltback warning	1

Table 6-24: UL25 decal kit breakdown

DECAL KIT - UL25

AC - 068013-012
DC - 068013-013

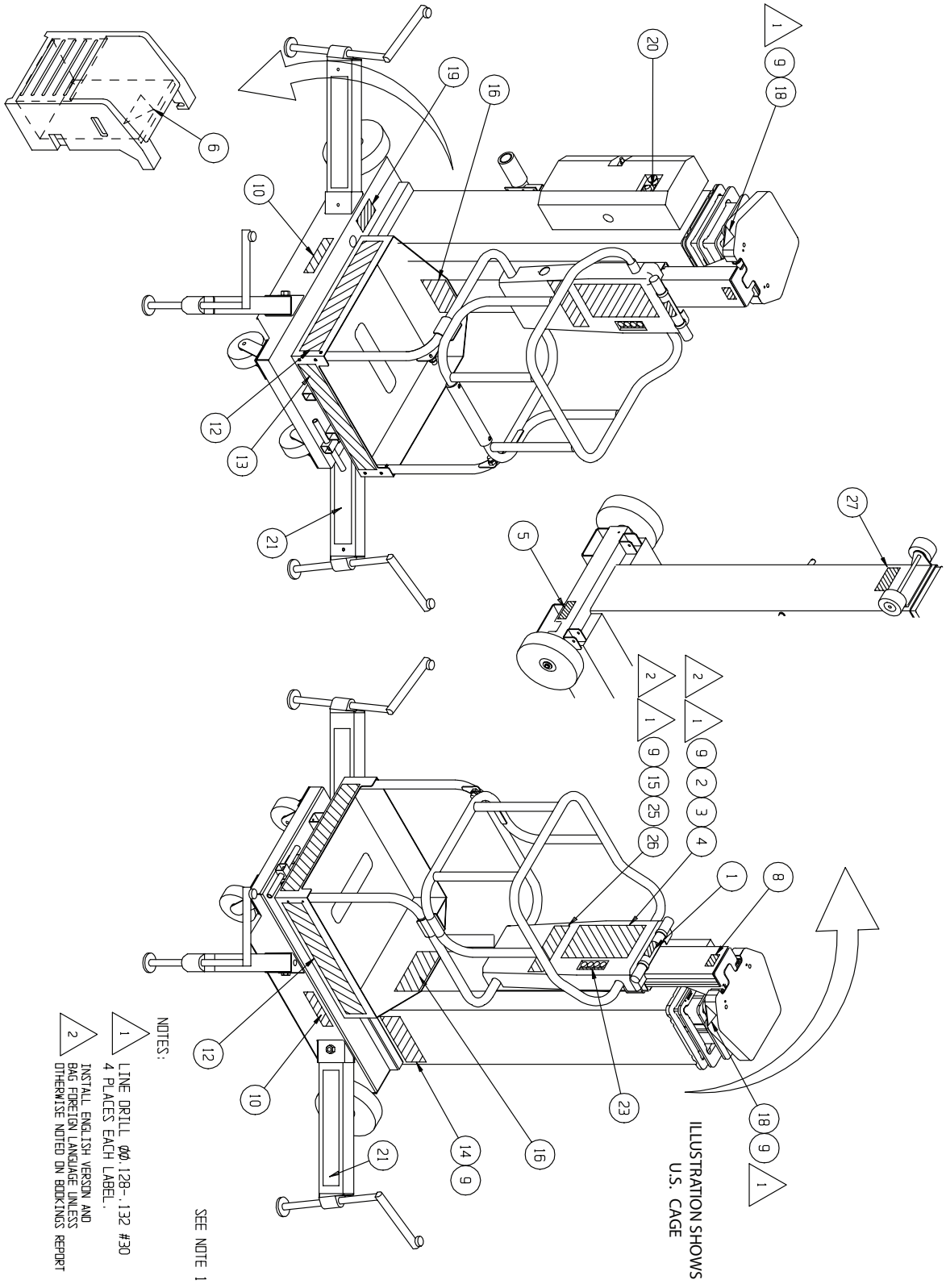


Figure 6-23: UL25 decal kit illustration.

DECAL KIT - UL32

AC - 068014-012
DC - 068014-013

ITEM	PART NUMBER	DESCRIPTION	QTY
1	010076-901	Label, operating instructions	1
2	067195-003	Label, warning use	1
3	067195-203	Label, warning use	1
4	067195-303	Label, warning use	1
5	005223-903	Label, emergency down	1
6	101210-000	Label, warning hydrogen gas	1 DC only
8	064444-000	Label, USA	1
9	026551-004	Rivet, pop 1/8 .126 - .187 grip	18
10	062218-901	Label, insert outrigger	2
12	061683-008	Label, upright	2
13	068212-002	Label, UL32	1
14	061205-003	Nameplate	1
15	066550-015	Label, warning before using	1
16	066557-959	Label, warning max load 135 kg	1
18	101208-002	Label, warning pinch point	2
19	066551-905	Label, warning centre bubble	1
20	069338-900	Label, control switch	1
21	064936-009	Tape reflective	FT 22
23	062840-900	Label, controls	1
25	066550-215	Label, warning before using	1
26	066550-315	Label, Warning before using	1
27	062466-902	Label, Tiltback warning	1

Table 6-25: UL32 decal kit breakdown

DECAL KIT - UL32

AC - 068014-012
DC - 068014-013

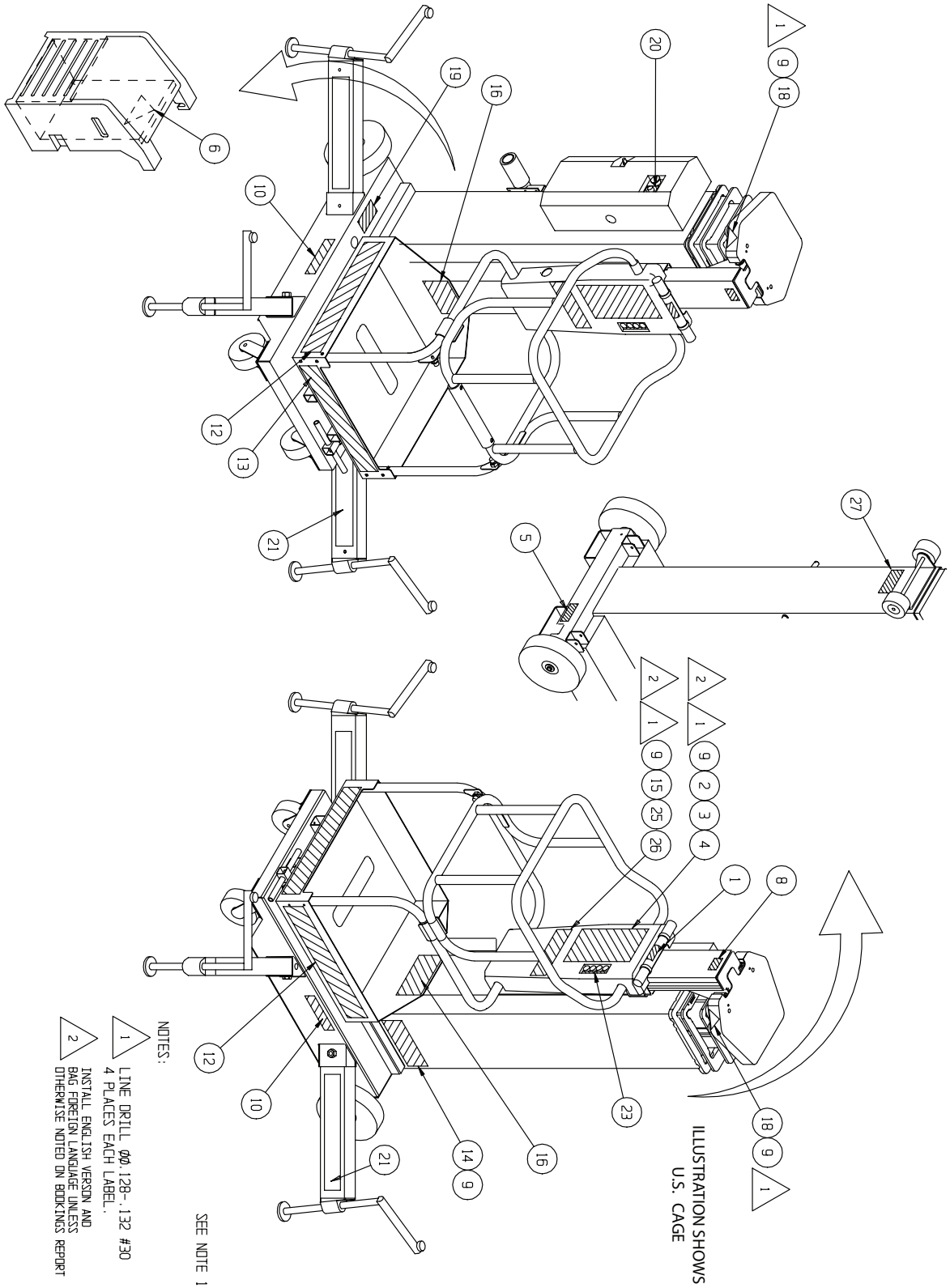


Figure 6-24: UL32 decal kit illustration.

DECAL KIT - UL40

AC - 068015-012
DC - 068015-013

ITEM	PART NUMBER	DESCRIPTION	QTY
1	010076-901	Label, operating instructions	1
2	067195-003	Label, warning use	1
3	067195-203	Label, warning use	1
4	067195-303	Label, warning use	1
5	005223-903	Label, emergency down	1
6	101210-000	Label, warning hydrogen gas	1 DC only
8	064444-000	Label, USA	1
9	026551-004	Rivet, pop 1/8 .126 - .187 grip	18
10	062218-901	Label, insert outrigger	2
12	061683-008	Label, upright	2
13	068212-003	Label, UL40	1
14	061205-003	Nameplate	1
15	066550-015	Label, warning before using	1
16	066557-959	Label, warning max load 135 kg	1
18	101208-002	Label, warning pinch point	2
19	066551-905	Label, warning centre bubble	1
20	069338-900	Label, control switch	1
21	064936-009	Tape reflective	FT 28.7
23	062840-900	Label, controls	1
25	066550-215	Label, warning before using	1
26	066550-315	Label, Warning before using	1
27	062466-902	Label, Tiltback warning	1

Table 6-26: UL40 decal kit breakdown

DECAL KIT - UL40

AC - 068015-012
DC - 068015-013

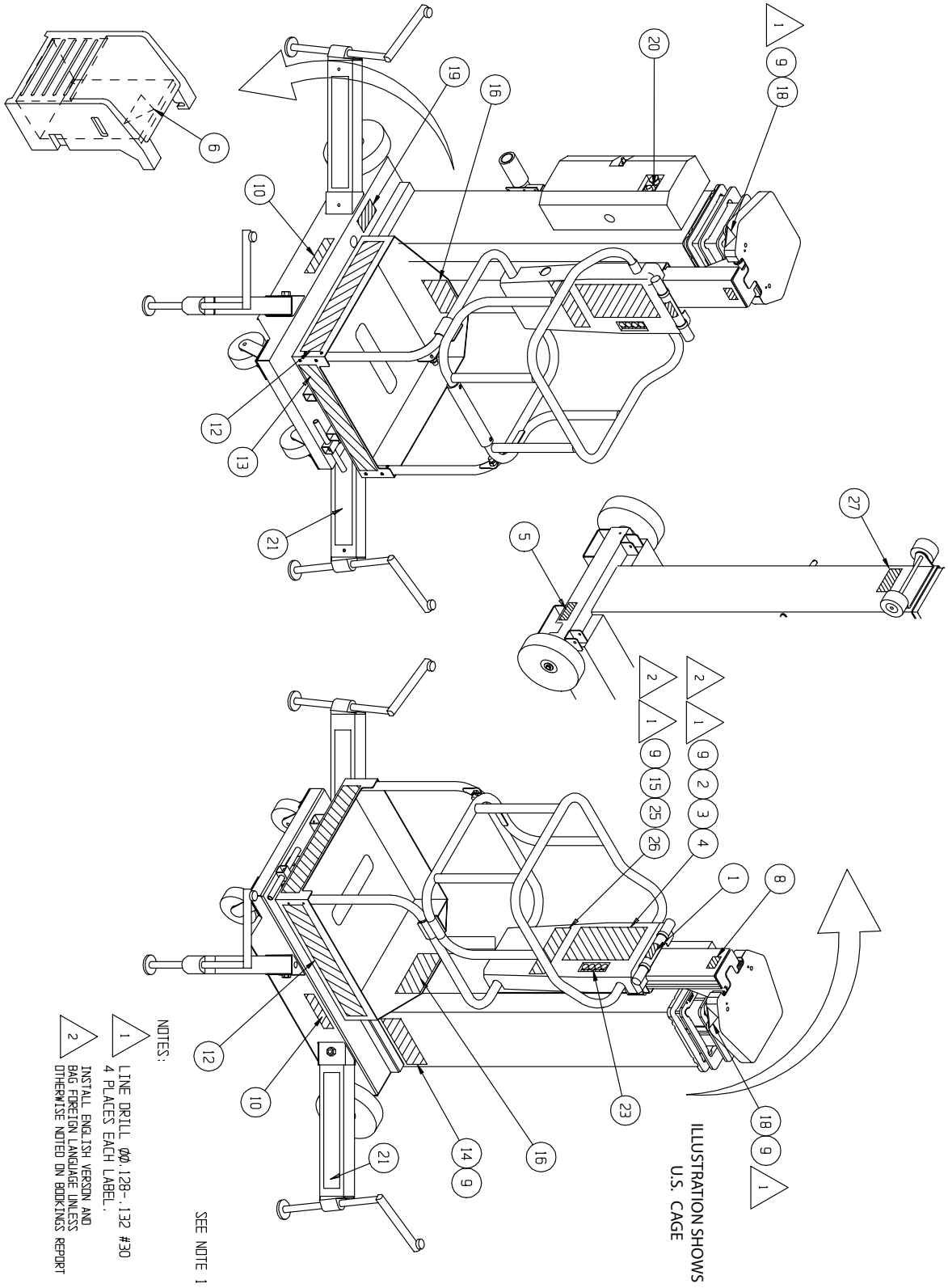


Figure 6-25: UL40 decal kit illustration.

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

EUROPE, MIDDLE EAST
AFRICA & ASIA
PHONE: +44 (0) 845 1550 057
FAX: +44 (0) 845 1557 756

NORTH & SOUTH AMERICA
PHONE: +1 785 989 3000
TOLL FREE: +1 800 225 0317
FAX: +1 785 989 3070

AUSTRALIA
PHONE: +61 2 9725 4000
FAX: +61 2 9609 3057

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

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