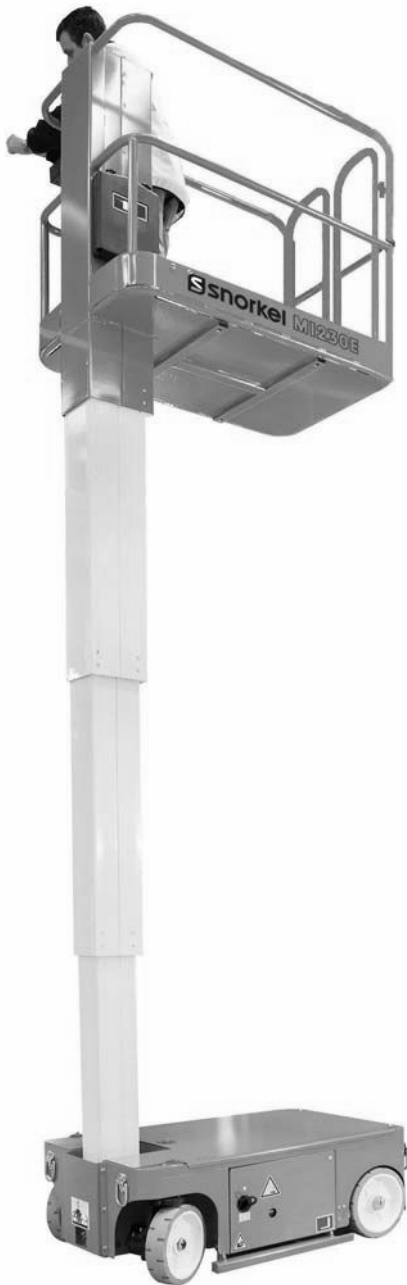


# snorkel

## M1230E



CE

## PARTS & SERVICE MANUAL

Part Number 512437-200  
January 2013

Serial Number 000001 and after

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## INTRODUCTION

This manual covers all models of the M1230E Aerial Work Platform. This manual must be stored on the machine at all times.

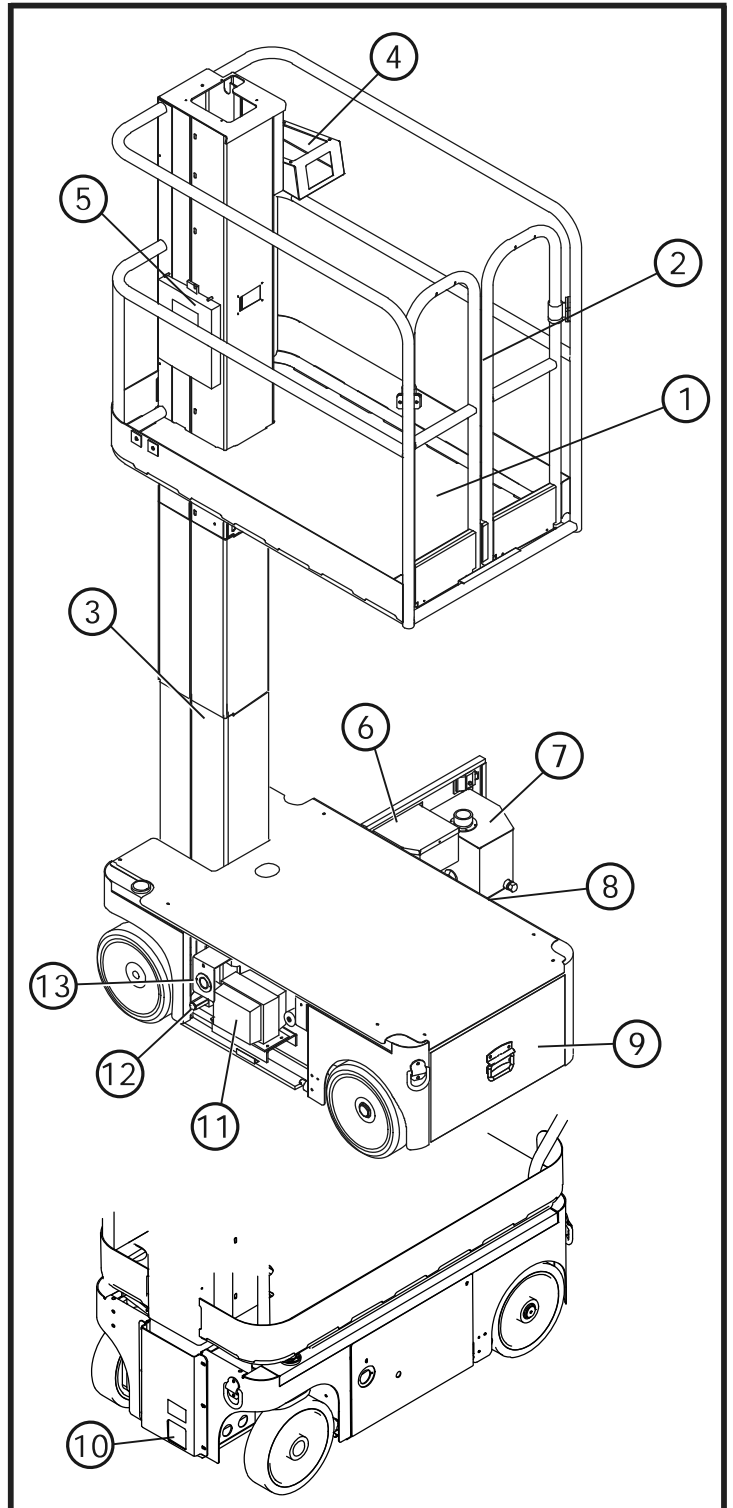
Read, understand and follow all safety rules and operating instructions before attempting to operate the machine.

## GENERAL DESCRIPTION

M1230E Series



- 
1. Platform
  2. Entry Gates
  3. Elevating Mast
  4. Platform Controls
  5. Manual Case
  6. Chassis Controls
  7. Hydraulic Reservoir
  8. Power / Control Module, Inc level sensor (EZ230)
  9. Battery Tray
  10. Emergency Lowering Valve
  11. Battery Charger
  12. Drive Relief Valve
  13. Charger Outlet Plug



# DAILY PREVENTATIVE MAINTENANCE CHECKLIST

## MAINTENANCE TABLE KEY

**Y** = Yes/Acceptable

**N** = No/Not Acceptable

**R** = Repaired/Acceptable

## PREVENTATIVE MAINTENANCE REPORT

Date: \_\_\_\_\_

Owner: \_\_\_\_\_

Model No: \_\_\_\_\_

Serial No: \_\_\_\_\_

Serviced By: \_\_\_\_\_

| COMPONENT                  | INSPECTION OR SERVICES   | Y | N | R |
|----------------------------|--|---|---|---|
| Battery                    | Check electrolyte level.   |   |   |   |
|                            | Check battery cable condition.                                     |   |   |   |
| Chassis                    | Check hoses for pinch or rubbing points.                           |   |   |   |
|                            | Check welds for cracks.  |   |   |   |
| Control Cable              | Check the exterior of the cable for pinching, binding or wear.     |   |   |   |
| Controller                 | Check switch operation.  |   |   |   |
| Drive Motors               | Check for operation and leaks.                                     |   |   |   |
| Elevating Assembly         | Inspect for structural cracks.                                     |   |   |   |
| Emergency Hydraulic System | Operate the emergency lowering valve and check for serviceability. |   |   |   |

| COMPONENT               | INSPECTION OR SERVICES                                      | Y | N | R |
|-------------------------|---|---|---|---|
| Entire Unit             | Check for and repair collision damage.                      |   |   |   |
| Hydraulic Fluid         | Check fluid level.  |   |   |   |
| Hydraulic Pump          | Check for hose fitting leaks.                               |   |   |   |
| Hydraulic System        | Check for leaks.  |   |   |   |
| Labels                  | Check for peeling, missing, or unreadable labels & replace. |   |   |   |
| Platform Deck and Rails | Check welds for cracks.                                     |   |   |   |
| Platform Deck and Rails | Check condition of deck.                                    |   |   |   |
| Tires                   | Check for damage.   |   |   |   |

## 3-7 HYDRAULICS

### HYDRAULIC OIL TANK AND FILTER

#### FLUID LEVEL

With Platform fully lowered, oil should be visible between Max /Min lines on the oil tank, if not, fill the tank.

**DO NOT** fill above the Max line when the platform is elevated.

#### OIL AND FILTER REPLACEMENT

1. Operate the work platform for 10-15 minutes to bring the hydraulic oil up to normal operating temperature.
2. Open module door.
3. Remove Hydraulic oil using a suitable pump. The Hydraulic tank has a 7,2 liter (1.9 US gal.) capacity.
4. Extract Filter module by removing the 3 screws shown in fig 2.
5. Remove Spring and replace Old filter
6. Ensure the filter is sitting correctly and refit Spring
7. Apply a thin film of clean hydraulic oil (ISO #46) to the 'O' Ring housed in the Filter Lid.
8. Refit the three screws shown in Fig 2.
9. Fill the hydraulic reservoir with hydraulic oil until the oil comes up just past the Min line .  
Hydraulic tank has a 7,2 liter ( 1.9 US gallon) capacity.

Figure 3-5: Hydraulic Oil Tank and Filter

1. Tank
2. Hose Fittings
3. Suction Screen
4. Filter Module
5. Filter Cap

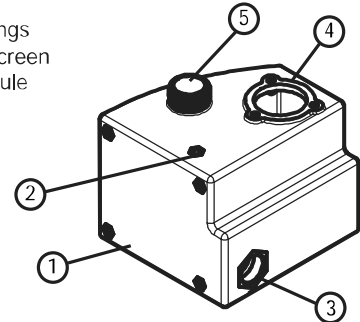


Fig 1

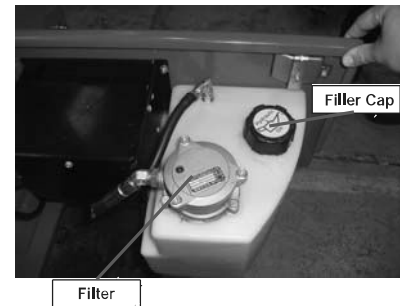
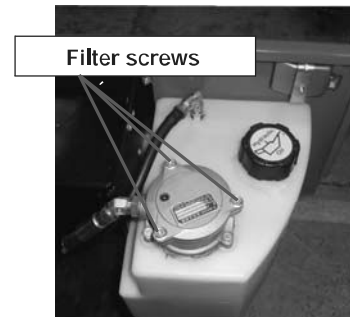


Fig 2



**! CAUTION !**

## 3-9 DRIVE MOTORS

### REMOVAL

1. Use a 1000Kg (**one ton**) capacity jack to raise the front of the machine. Position blocks under the machine to prevent the work platform from falling if the jack fails.
2. Block the rear wheels to prevent the machine from rolling.
3. Remove the cotter pin, nut, and washer.
4. Remove the wheel.

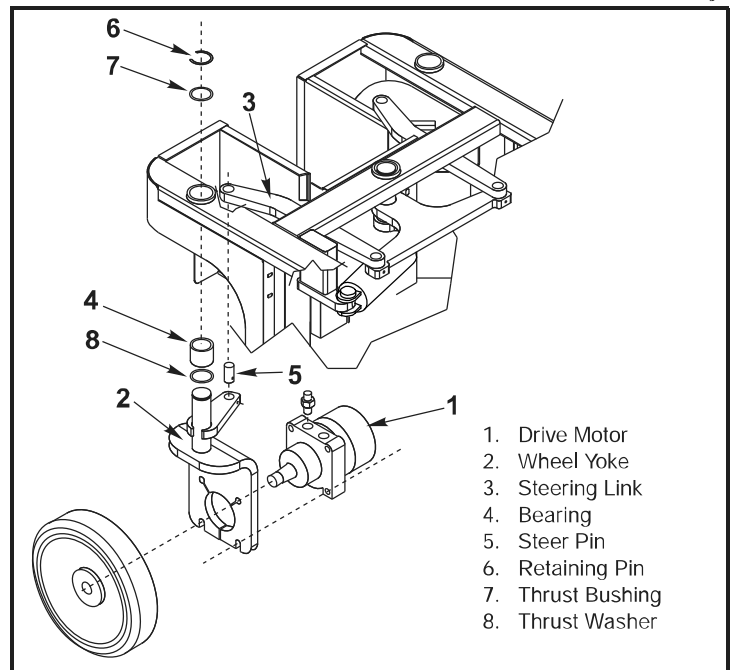
**NOTE:** Before disconnecting hoses, thoroughly clean off all outside dirt around fittings. (After disconnecting hoses and before removing from vehicle, IMMEDIATELY plug port holes.)

5. Tag, disconnect and plug the hose assemblies to prevent foreign material from entering.
6. Support the drive motor/wheel yoke assembly and remove the retaining ring at the top of the wheel yoke pivot. Remove the drive motor/wheel assembly from the machine.
7. Remove the locknuts, flat washers, capscrews and drive motor from the wheel yoke.

### INSTALLATION

1. Position the drive motor in the wheel yoke and secure with capscrews, flat washers and locknuts.
2. Install the drive motor/wheel yoke assembly into the pivot bearing along with the lower thrust washer, thrust bushing, and retaining ring.
3. Align the steer pin with the hole in the steering link.
4. Remove the plugs from the hose assemblies and connect to the drive motor.
5. Install the shaft key, wheel, washer and slotted nut. Torque the locknut to 102 N-m (75 ft-lbs). Install a new cotter pin. **DO NOT** back-off the nut to install cotter pin.
6. Remove blocks, lower the jack and remove. Operate the drive system and check for leaks.

Drive Motor Assembly



## DIAGNOSTICS USING EZCAL DISPLAY

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

Switch the machine on, press and hold Esc for 5 seconds until "Ezlift menu" is displayed then select diagnostics, the following menu's are available:

1. SYSTEM – MODE : Platform or Ground Controls selected.  
 SUPPLY : Displays battery voltage, should be above 18v when the machine is not running.  
 VALVE SUPPLY : ON or OFF  
 MOTOR V : Supply voltage to motor (0v when motor not running).  
 MOTOR I : Supply current to motor (0A when motor not running)  
 TEMPERATURE: Control temperature in °c, should be below 60.  
 TILT : Displays tilt angle of the machine in X and Y direction, both should be below 2°.  
 TILTED : YES or NO

The remaining submenu's in SYSTEM are not applicable to this machine.

2. PLATFORM - Checks the function of the switches and joystick functions in the platform controller.
3. GROUND - Checks the function of the switches in the ground controller.
4. INPUTS - Displays the condition of all inputs to the EZ230, see the following table and the circuit diagram on page 5.2 for a list of I/O's.
5. ANALOG - Displays the condition of all analog inputs from the EZ230.
6. OUTPUTS - Displays the condition of all outputs from the EZ230.

| I/O PORT | DESCRIPTION  |
|----------|--|
| P1-1     | 5V to Joystick (low current)   |
| P1-3     | 0V to Joystick (low current)   |
| P1-4     | Joystick analog input  |
| P2-7     | B+ feed (low current, for switches and sensors only)   |
| P2-8     | Lift down valve return (0V=active) CT13  |
| P3-1     | EMS Platform (B+ during platform mode)   |
| P3-2     | Valve supply (high current B+ during platform mode, supplies all valve outputs) P3-1 P3-2 are connected together |
| P3-6     | Drive select switch (B+=active)  |
| P3-7     | Lift select switch (B+=active)   |
| P3-8     | Steer right switch (B+=active)   |
| P3-9     | Steer left switch (B+=active)  |
| P3-12    | Trigger switch (B+=active)   |
| P4-1     | EMS Ground (B+ during ground mode)   |
| P4-4     | Lift down switch (B+=active in ground mode only)   |
| P4-5     | Lift up switch (B+=active in ground mode only)   |
| P4-6     | Stack Proximity Switch (B+=lowered, open=elevated)   |
| P4-7     | Not used - Connect to P2-7   |
| P5-1     | Line contactor output (B+ when active)   |
| P5-2     | Forward valve output (B+ when active) CT11A  |
| P5-3     | Reverse valve output (B+ when active) CT11B  |
| P5-4     | Pothole Retract valve output (B+ when active) CT12   |
| P5-6     | Steer left valve output (B+ when active) CT6A  |
| P5-8     | Steer right valve output (B+ when active) CT6B   |
| P5-10    | Ground Alarm output (B+ when active)   |
| P5-11    | Up valve output (B+ when active) CT7   |
| P5-12    | Down valve output (B+ when active) CT13  |

## ILLUSTRATED PARTS BREAKDOWN

### 6.1 INTRODUCTION

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

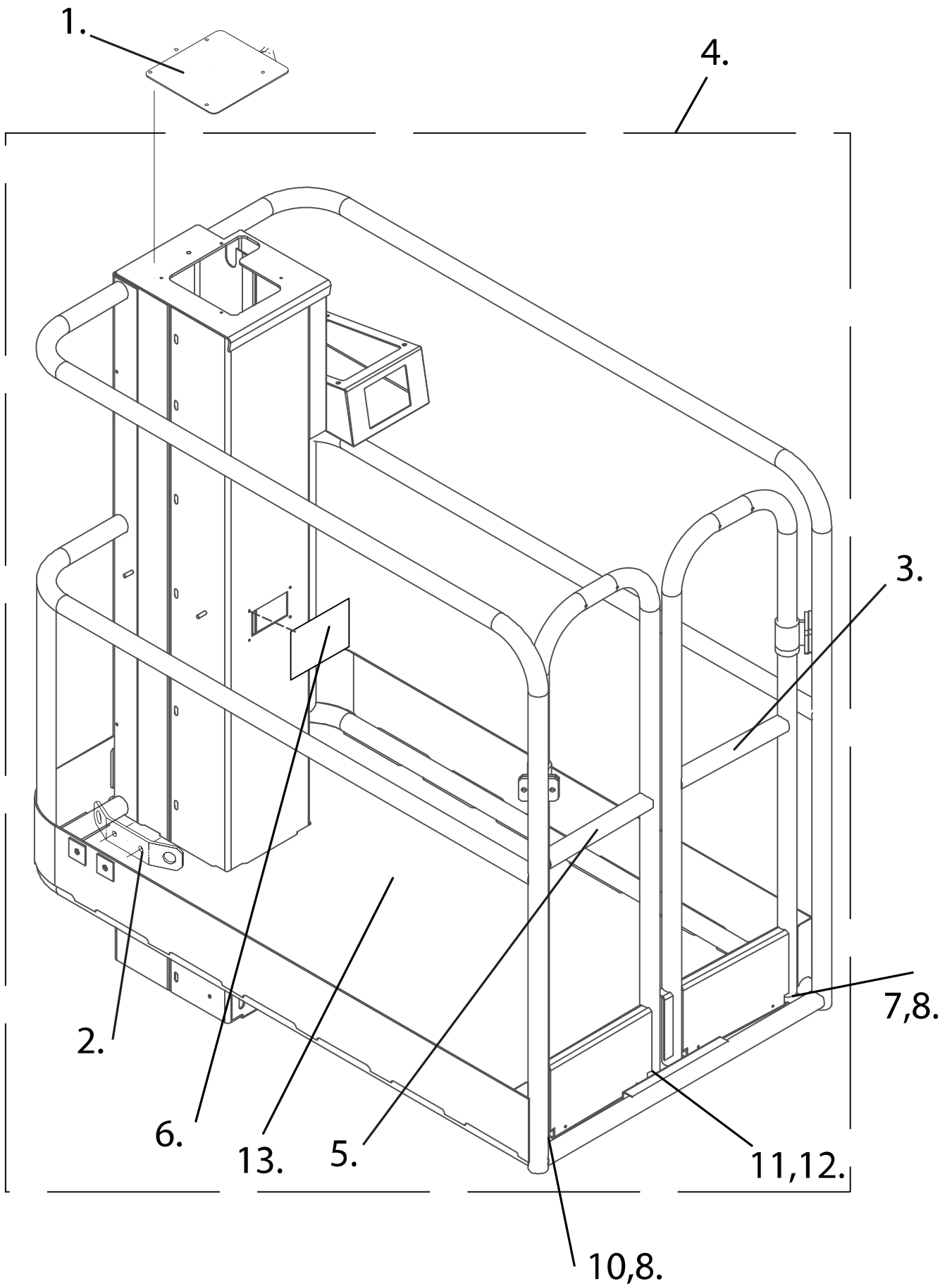
Each parts list contains the component parts for that assembly.

#### CONTENTS

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**NEVER** Replace any components or part with anything other than original Snorkel replacement parts without the Manufacturers consent.

Illustrated Parts Breakdown



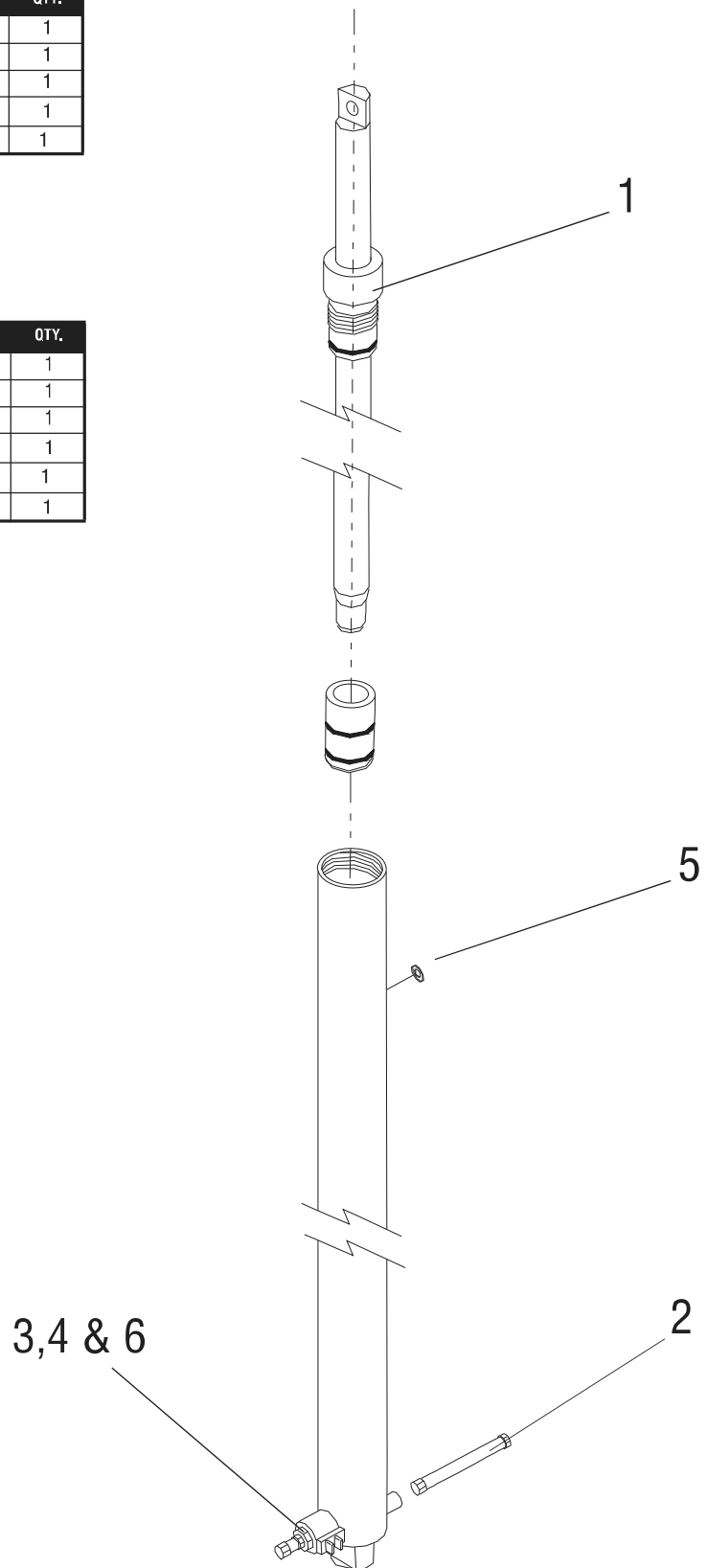
## Hydraulic Cylinder Assembly (Lift)

510894-000 Serial Range (000001 > 054179 )

| Item | Part       | Description                      | QTY. |
|------|------------|----------------------------------|------|
| 1    | 505037-010 | LIFT CYLINDER SEAL KIT           | 1    |
| 2    | 505073-000 | STANDPIPE ADAPTOR                | 1    |
| 3    | 501483-000 | EMERGENCY DOWN VALVE             | 1    |
| 4    | 501483-001 | ADAPTOR (EMERGENCY DOWN VALVE)   | 1    |
| 5    | 510892-000 | FITTING, - 4 ORB, -4 JICM POS 90 | 1    |

512636-000 Serial Range (054180 + )

| Item | Part       | Description                      | QTY. |
|------|------------|----------------------------------|------|
| 1    | 512793-000 | LIFT CYLINDER SEAL KIT           | 1    |
| 2    | 505073-000 | STANDPIPE ADAPTOR                | 1    |
| 3    | 512637-000 | EMERGENCY DOWN VALVE             | 1    |
| 4    | Not Used   |                                  | 1    |
| 5    | 510892-000 | FITTING, - 4 ORB, -4 JICM POS 90 | 1    |
| 6    | 513286-000 | T- HANDLE                        | 1    |



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