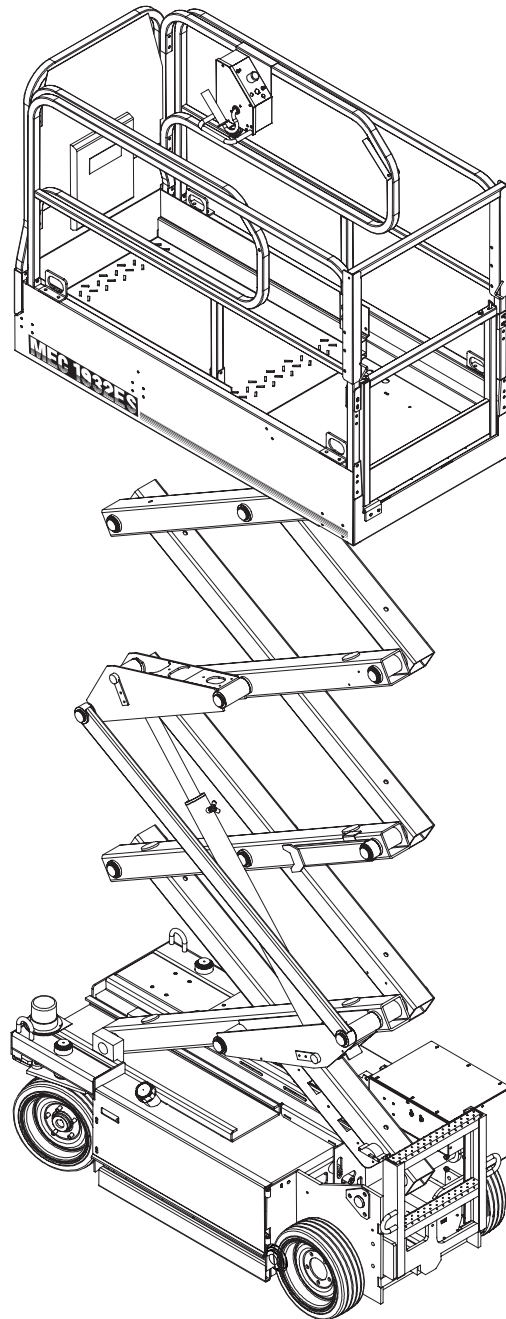




# SERVICE AND PARTS MANUAL

## 1532ES / 1932ES



### Serial Number Range

1532ES: 9001000 - Present

1932ES: 9104000 - Present

Part # 90753 R4  
October 2008

# Revision History:

## March 2008

| Pages | Reason for update                                       |
|-------|---|
| 5-13  | <b>Service Section 5</b><br>Update Electrical Schematic |

## October 2008

| Pages                               | Reason for update   |
|-------------------------------------|---|
| 5-1<br>5-14 – 15<br>5-16 – 20       | <b>Service Section 5</b><br>Update contents<br>Add Canadian electric schematic<br>Update page numbers   |
|                                     | <b>Parts Table of Contents</b><br>Update to include new pages in Section C  |
| A-1<br>A-17<br>A-19<br>A-20<br>A-21 | <b>Section A</b><br>Update contents<br>Update parts list: Wire Harness, Communication Cable (Early Model)<br>Update parts list: Wire Harness, Communication Cable (Current Model)<br>New illustration, Cutout Relays, Canadian<br>New parts list, Cutout Relays, Canadian |
| C-1 – 20                            | <b>Section C</b><br>Update illustrations: Scissor Assembly, all models<br>Update parts list: Scissor Assembly, all models<br>Update illustration: Lift Cylinder installation<br>Update parts list: Lift Cylinder without Emergency Lowering Cable<br>Update page numbers  |
| D-15<br>D-16<br>D-17                | <b>Section D</b><br>Update parts list: Hydraulic Hoses, X32ES early models<br>Update illustration: Hydraulic Hoses, X32ES late models<br>Update parts list: Hydraulic Hoses, X32ES late models  |
| E-3<br>E-9<br>E-10<br>E-11          | <b>Section E</b><br>Update parts list: Ladder and Control Brackets<br>Update parts list: Brake Assembly<br>Update Illustration: Steering Assembly<br>Update parts list: Steering Assembly   |



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# INTRODUCTION

This manual consists of Service and Parts sections.

The Service Section of this manual is designed to provide you, the customer, with the instructions needed to properly maintain the MEC self-propelled scissor lift. When used in conjunction with the illustrated *Parts Section* and the *Operators Manual* (provided separately), this manual will assist you in making necessary adjustments, repairs, identifying, and ordering the correct replacement parts.

All parts represented here are manufactured and supplied in accordance with MEC's quality standards.

We recommend that you use Genuine MEC parts to insure proper OPERATION and reliable PERFORMANCE.

To obtain maximum benefits from your MEC scissor lift, always follow the proper operating and maintenance procedures. Only trained authorized personnel should be allowed to operate or service this machine. Service personnel should read and study the *Operator's* and *Service and Parts Manual* in order to gain a thorough understanding of the unit prior to making any repairs.

To help you recognize important safety information, we have identified warnings and instructions that directly impact on safety with the following signals:



**“DANGER” INDICATES AN IMMINENTLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, WILL RESULT IN DEATH OR SERIOUS INJURY. THIS SIGNAL WORD IS LIMITED TO THE MOST EXTREME SITUATIONS.**



**“WARNING” INDICATES A POTENTIALLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN DEATH OR SERIOUS INJURY.**



**“CAUTION” INDICATES A POTENTIALLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, MAY RESULT IN MINOR OR MODERATE INJURY. IT MAY ALSO BE USED TO ALERT AGAINST UNSAFE PRACTICES. “CAUTION” IS USED FOR PROPERTY-DAMAGE ONLY ACCIDENTS.**

**NOTE:** The best method to protect yourself and others from injury or death is to use common sense. If you are unsure of any operation, don't start until you are satisfied that it is safe to proceed and have discussed the situation with your supervisor.

Service personnel and machine operators must understand and comply with all warnings and instructional decals on the machine.



**MODIFICATIONS OF THIS MACHINE FROM THE ORIGINAL DESIGN AND SPECIFICATIONS WITHOUT WRITTEN PERMISSION FROM MEC ARE STRICTLY FORBIDDEN. A MODIFICATION MAY COMPROMISE THE SAFETY OF THE MACHINE, SUBJECTING OPERATOR(S) TO SERIOUS INJURY OR DEATH.**

MEC's policies and procedures demonstrate our commitment to Quality and our relentless ongoing efforts towards Continuous Improvement, due to which product specifications are subject to change without notice.

Any procedures not found within this manual must be evaluated by the individual to assure one-self that they are "proper and safe."

Your MEC Scissor Lift has been designed, built, and tested to provide many years of safe, dependable service. Only trained, authorized personnel should be allowed to operate or service the machine.

*MEC, as manufacturer, has no direct control over machine application and operation. Proper safety practices are the responsibility of the user and all operating personnel.*

**If There Is A Question On Application And/Or Operation Contact:**



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# GENERAL SAFETY TIPS

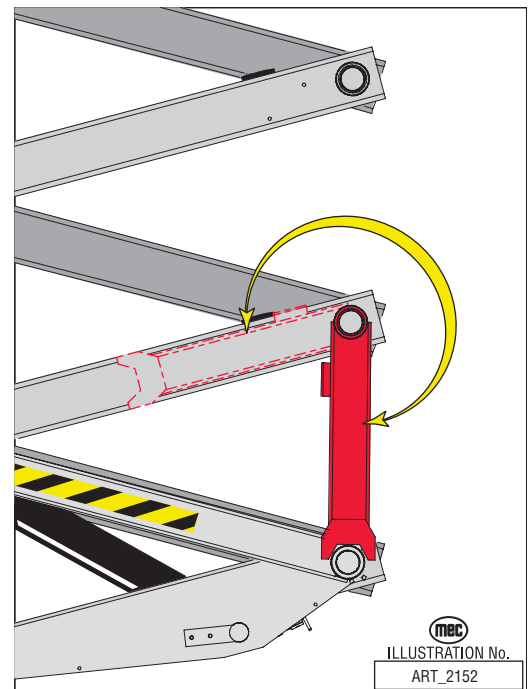
Regular inspection and conscientious maintenance is the key to efficient economical operation of your scissor lift. It will help to assure that your equipment will perform satisfactorily with a minimum of service and repair.

The actual operating environment of the machine governs the inspection schedule. Correct lubrication is an essential part of the preventative maintenance to minimize wear on working parts and ensure against premature failure. By maintaining correct lubrication, the possibility of mechanical failure and resulting downtime is reduced to a minimum.



**NEVER PERFORM SERVICE ON THE MACHINE (WITH THE PLATFORM ELEVATED) WITHOUT FIRST BLOCKING THE SCISSOR ASSEMBLY IN PLACE USING THE MAINTENANCE LOCK!**

- ◆ Block scissor assembly using Maintenance Lock if machine is in the elevated/extended position.
- ◆ Never leave hydraulic components or hoses open. They must be protected from contamination (including rain) at all times.
- ◆ Never open a hydraulic system when there are contaminants in the air.
- ◆ Always clean the surrounding area before opening hydraulic systems.
- ◆ Use only recommended lubricants. Improper lubricants or incompatible lubricants may be as harmful as no lubrication.
- ◆ Watch for makeshift “fixes” which can jeopardize safety as well as lead to more costly repair.



## Hydraulic System



**HYDRAULIC FLUID UNDER PRESSURE CAN PENETRATE AND BURN SKIN, DAMAGE EYES, AND MAY CAUSE SERIOUS INJURY, BLINDNESS, AND EVEN DEATH. CORRECT LEAKS IMMEDIATELY.**



**Hydraulic fluid leaks under pressure may not always be visible. Check for pin hole leaks with a piece of cardboard, not your hand.**

## Electrical System



**Prevent damage to battery and/or electrical system;**

- ◆ **Always disconnect the negative (-) battery cable first.**
- ◆ **Always connect the positive (+) battery cable first.**

When connecting battery cables, connect the positive terminal first. If the negative cable is installed first, and contact is made between the positive side of the battery and a metal surface on the machine while connecting the positive cable, a spark will occur. This can cause damage to the electrical system, battery explosion, and personal injury.

## Total System



**Failure to perform preventive maintenance at recommended intervals may result in the unit being operated with a defect that could result in injury or death of the operator.**

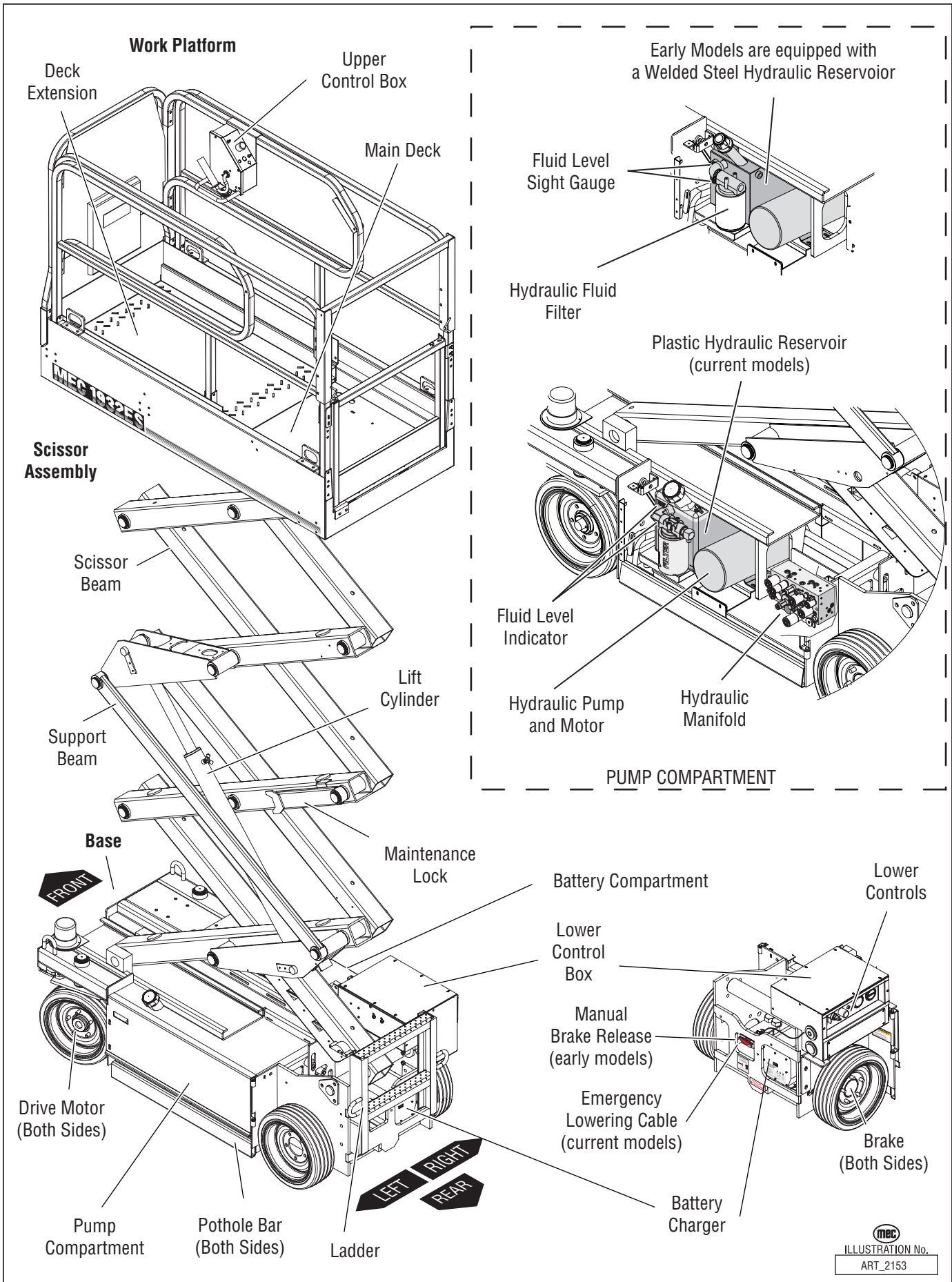
**Immediately report to your supervisor any Defect or malfunction. Any defect shall be repaired prior to continued use of the scissor lift.**

**Inspection and maintenance should be performed by qualified personnel familiar with the equipment.**

# MACHINE SPECIFICATIONS

|   | 1532ES                                    |   | 1932ES              |   |                 |
|---|---|---|---------------------|---|-----------------|
| Working Height*   | 21 ft                                     | 6.57 m                                      | 25 ft               | 7.79 m                                      |                 |
| Platform Height   | 15 ft                                     | 4.57 m                                      | 19 ft               | 5.79 m                                      |                 |
| Stowed Height   | Rails Up                                  | 75 in                                       | 1.90 m              | 79.5 in                                     | 2.02 m          |
|   | Rails Folded Down                         | NA  | NA                  | NA  | NA              |
| Maximum Number of Occupants   | 2   | 2   | 2                   | 2   |                 |
| Lift Capacity (Evenly Distributed)  | 600 lbs                                   | 272.2 kg                                    | 500 lbs             | 226.8 kg                                    |                 |
| Rollout Deck Capacity   | 250 lbs                                   | 113.4 kg                                    | 250 lbs             | 113.4 kg                                    |                 |
| Platform Dimensions   | With Deck extended                        | 102 in                                      | 2.59 m              | 102 in                                      | 2.59 m          |
|   | With Deck Retracted                       | 66 in                                       | 1.68 m              | 66 in                                       | 1.68 m          |
|   | Guardrail Height                          | 40.5 in                                     | 1.03 m              | 40.5 in                                     | 1.03 m          |
|   | Toeboard Height                           | 7 5/8 in                                    | 0.19 m              | 7 5/8 in                                    | 0.19 m          |
|   | Deck Extension Length                     | 36 in                                       | 0.91 m              | 36 in                                       | 0.91 m          |
|   | Overall Length                            | 74 in                                       | 1.88 m              | 74 in                                       | 1.88 m          |
| Overall Width   | 31.5 in                                   | 0.80 m                                      | 31.5 in             | 0.80 m                                      |                 |
| Wheelbase   | 50 in                                     | 1.27 m                                      | 50 in               | 1.27 m                                      |                 |
| Wheel Track   | 27.37 in                                  | 0.70 m                                      | 27.37 in            | 0.70 m                                      |                 |
| Turning Radius  | Inside                                    | 2 in  | 5 m                 | 2 in  | 5 m             |
|   | Outside                                   | 67 in                                       | 1.7 m               | 67 in                                       | 1.7 m           |
| Ground Clearance  | 3 in                                      | 7.62 m                                      | 3 in                | 7.62 m                                      |                 |
| Machine Weight** (Unloaded) (Approx.)   | 2,725 lbs                                 | 1236 kg                                     | 3,060 lbs           | 1388 kg                                     |                 |
| Drive System (Proportional)   | Drive Speed (Platform Elevated - Forward) | 0 - 0.5 mph                                 | 0 - 0.8 km/h        | 0 - 0.5 mph                                 | 0 - 0.8 km/h    |
|   | Drive Speed (Platform Lowered)            | 0 - 2.5 mph                                 | 0 - 4.02 km/h       | 0 - 2.5 mph                                 | 0 - 4.02 km/h   |
|   | Lift/Lower Speed (Approx.)                | 17 sec / 20 sec                             | 17 sec / 20 sec     | 17 sec / 20 sec                             | 17 sec / 20 sec |
| Gradeability  | 25% / 14°                                 | 25% / 14°                                   | 25% / 14°           | 25% / 14°                                   |                 |
| Ground Pressure/Wheel (Maximum)   | 105 psi                                   | 7.4kg/cm <sup>2</sup>                       | 113 psi             | 7.9 kg/cm <sup>2</sup>                      |                 |
| Wind Speed (Maximum)  | 25 m.p.h.                                 | 40 km/h                                     | 25 m.p.h.           | 40 km/h                                     |                 |
| Tire Size-Standard (Solid, non-marking rubber)  | 14 in dia. x 4.5 in                       | 35.56 cm x 11.43 cm                         | 14 in dia. x 4.5 in | 35.56 cm x 11.43 cm                         |                 |
| Wheel Lug Nut Torque  | 75 - 85 ft lbs                            | 102 - 115 Nm                                | 75 - 85 ft lbs      | 102 - 115 Nm                                |                 |
| Hydraulic Pressure  | Main System                               | 2750 psi                                    | 190 bar             | 2750 psi                                    | 190 bar         |
|   | Lift System                               | 1900 psi                                    | 131 bar             | 2600 psi                                    | 180 bar         |
|   | Steer                                     | 850 psi                                     | 59 bar              | 850 psi                                     | 59 bar          |
| Hydraulic Fluid Capacity  | 3 gal                                     | 11.36 liters                                | 3 gal               | 11.36 liters                                |                 |
| Power System – Voltage  | 24 Volts DC                               | 24 Volts DC                                 | 24 Volts DC         | 24 Volts DC                                 |                 |
| Battery Charger   | Input                                     | 100-220 Volt AC, 50/60 Hz, 5.6 Amp          |                     | 100-220 Volt AC, 50/60 Hz, 5.6 Amp          |                 |
|   | Output                                    | 24 Volt DC, 25 Amps Tapering, Timed Shutoff |                     | 24 Volt DC, 25 Amps Tapering, Timed Shutoff |                 |
| Batteries   | Four 6 Volt deep-cycle                    | 220 Amp hours @ 20 hour rating              |                     | 220 Amp hours @ 20 hour rating              |                 |
| Electric Motor  | Early Models                              | 2.0 h.p. (1.49 kW): 3000 r.p.m.             |                     | 2.0 h.p. (1.49 kW): 3000 r.p.m.             |                 |
|   | Current Models                            | 4.0 h.p. (2.98 kW): 3000 r.p.m.             |                     | 4.0 h.p. (2.98 kW): 3000 r.p.m.             |                 |
| Meets Requirements of ANSI A92.6-2006 Section 4<br>*Metric equivalent of working height adds 2m to platform height. U.S. adds 6 ft. to platform height.<br>**Weight may increase with certain options or country standards. |   |   |                     |   |                 |





# PRIMARY MACHINE COMPONENTS

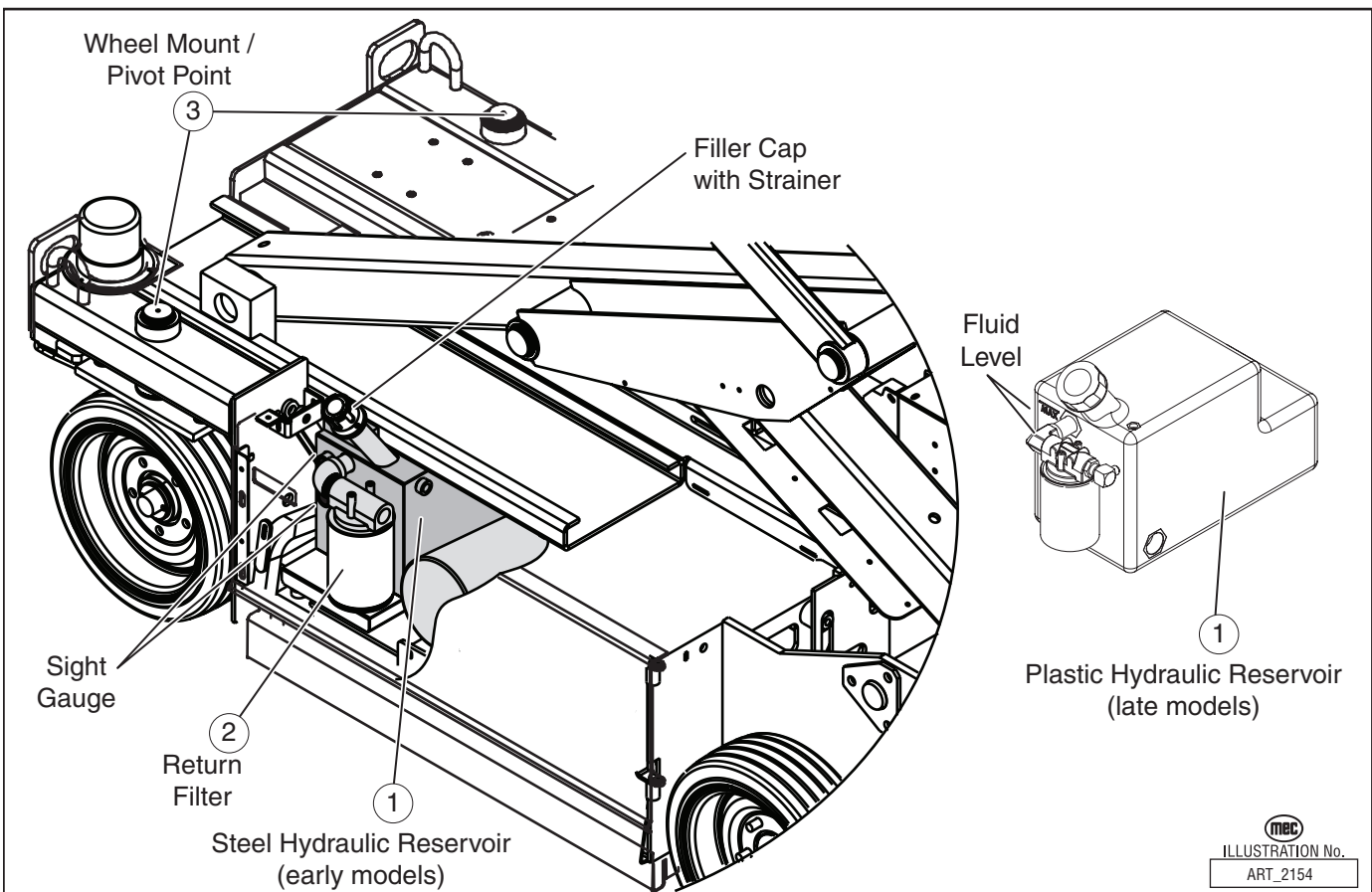
Use this chart to find information relating to a specific component.

| Component                | Service Section       | Parts Section | Component                  | Service Section   | Parts Section |
|--------------------------|-----------------------|---------------|----------------------------|-------------------|---------------|
| <b>Platform Assembly</b> |                       |               | <b>Pump Compartment</b>    |                   |               |
| Upper Controls           | 2   4   5             | A             | Hydraulic Pump & Motor     | intro   1   4   5 | E             |
| Deck and Rails           | 3                     | B             | Hydraulic Reservoir        | intro   1         | D             |
| Chain Closure            |                       | B             | Hydraulic Filter           | intro   1         | D             |
| Optional Gate            |                       | B             | Hydraulic Manifold         | 1   4   5         | D             |
| Deck Extension           |                       | B             |                            |                   |               |
| Control Terminal Strip   | 2   5                 | A   B         |                            |                   |               |
| Horn (optional)          | 2   4   5             | A   B         |                            |                   |               |
| Power to Platform        |                       | B             |                            |                   |               |
| <b>Lift Assembly</b>     |                       |               | <b>Battery Compartment</b> |                   |               |
| Scissor Assembly         | 3                     | C             | Battery Pack               | 2   4             | E             |
| Maintenance Lock         | intro                 | C             |                            |                   |               |
| Lift Cylinder            | 1   3   4   5         | C             |                            |                   |               |
|                          |                       |               |                            |                   |               |
| <b>Base Assembly</b>     |                       |               | <b>Lower Control Box</b>   |                   |               |
| Drive Motors             | intro   1   3   4   5 | E             | Lower Controls             | 2   4   5         | A             |
| Brakes                   | intro   1   3   4   5 | E             | Power to Platform          | 2                 | A             |
| Steering Components      | 1   3   4   5         | E             | Tilt Sensor                | 2   4   5         | A             |
| Wheels & Tires           | 3                     | E             | Diode Board                | 2   4   5         | A             |
| Emergency Lowering       | 1                     | E             | Motor Controller (PWM)     | 2   4   5         | A             |
| Hoses & Cables           | 1   3                 | A   B   D     | Battery Disconnect Switch  | 2                 | A             |
| Battery Charger          | 2   4   5             | E             | Motion Alarm               | 2   5             | E             |
| Pothole Components       | 3                     | E             |                            |                   |               |
| Pothole Switch           | 2   4   5             | E             |                            |                   |               |
| Limit Switch             | 2   4   5             | E             |                            |                   |               |
| Lubrication Points       | intro                 | C             |                            |                   |               |
| Brake Release Hand Pump  | 5                     | D             |                            |                   |               |
|                          |                       |               |                            |                   |               |



# LUBRICATION

| NO. | ITEM                | SPECIFICATION  | FREQUENCY OF LUBRICATION   |
|-----|---------------------|--|--|
| 1   | Hydraulic Reservoir | Fill to the middle of the sight gauge with platform in the stowed position.<br><br><b>Anti-Wear 150 SSU<br/>(ISO 32/mil spec 0-5606)</b> | Check daily.<br><br>Change yearly or every 1,000 hours, whichever occurs first.  |
| 2   | Hydraulic Filter    | Filter element   | Change every six months or 500 hours, whichever occurs first for normal usage.<br><br>Change every three months or 300 hours, whichever occurs first for severe usage. |
| 3   | Wheel Motor Mount   | Lithium N.L.G. #2 EP<br>purge old grease   | Weekly or every 25 hours, whichever occurs first   |





# SECTION 1: HYDRAULIC SYSTEM

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Hydraulic System Components ..... 1-4

Parking Brake and Towing Circuit ..... 1-6

Emergency Systems And Procedures ..... 1-7

Steering Circuit ..... 1-8

Platform Lift Circuit ..... 1-9

Cylinder Repair ..... 1-10

Hydraulic Manifold ..... 1-13



# HYDRAULIC FLUID

## Handling Precautions



**PERSONS IN REGULAR CONTACT WITH MINERAL-BASED HYDRAULIC FLUID NEED TO BE AWARE OF THE IMPORTANCE OF THOROUGH HYGIENE, AND THE PROPER METHODS FOR HANDLING MINERAL OILS IN ORDER TO AVOID POTENTIAL HAZARDS TO HEALTH.**

If mineral-based hydraulic fluid is **SPLASHED INTO THE EYES**, it must be **WASHED OUT THOROUGHLY** using abundant quantities of water. If irritation persists, medical advice should be sought.



**HYDRAULIC FLUID UNDER PRESSURE CAN PENETRATE AND BURN SKIN, DAMAGE EYES, AND MAY CAUSE SERIOUS INJURY OR BLINDNESS.**

**FLUID LEAKS UNDER PRESSURE MAY NOT ALWAYS BE VISIBLE.**

## Fluid Recommendations

MEC recommends the use of ISO Grade 32 hydraulic fluid. A 150SSU EQUIVALENT substitute can be used if absolutely necessary. Mineral-based hydraulic fluids produced by different companies will **USUALLY** mix with each other satisfactorily, but this **IS NOT RECOMMENDED**. When in doubt, consult with your supplier.

ISO Grade 32 has proven to be suitable for use in all climates. For continued operation in temperatures below 32 °F (0 °C), use of an ATF hydraulic fluid is satisfactory.

The only exception to the above is to drain and fill the system with ATF fluid or its equivalent. This will also start up at temperatures down to -20 °F (-29 °C). However, use of this fluid will give poor performance at temperatures above 120 °F (49 °C).



## System Flushing Procedure

1. With platform fully down, drain hydraulic fluid from hydraulic reservoir into an empty container.
2. When the hydraulic reservoir is empty, remove suction strainer and hoses.
3. Remove return line on the hydraulic reservoir.
4. Remove the bypass filter and hose.
5. Flush the hoses with clean hydraulic fluid.
6. Discard old bypass filter element and replace.
7. Flush out the tank with hoses removed from the hydraulic reservoir.
8. Reinstall all hoses in the previous steps.
9. Fill hydraulic reservoir with filtered, fresh hydraulic fluid (refer to Lubrication Chart).
10. Loosen output hose fittings at pump to flood with hydraulic fluid. Tighten fittings.
11. Briefly operate all functions. Two or three lift cycles may be necessary to purge all air from lift cylinder(s).
12. When the above procedures have been completed, fill hydraulic reservoir to full mark on sight gauge.
13. Check all leaks and correct as necessary. Machine is now ready to be placed back into operation.

**NOTE:** Avoid mixing petroleum and synthetic base fluids. It is not advisable to mix fluids of different brands or types, except as recommended.

# HYDRAULIC SYSTEM COMPONENTS

## Hydraulic Fluid Reservoir

This consists of the tank, a filler cap with breather, a drain plug, and a bypass filler with a 10 micron filter element.

Perform the following steps weekly:

- ◆ Check tank for signs of leakage.
- ◆ Inspect tank securing bolts for tightness.

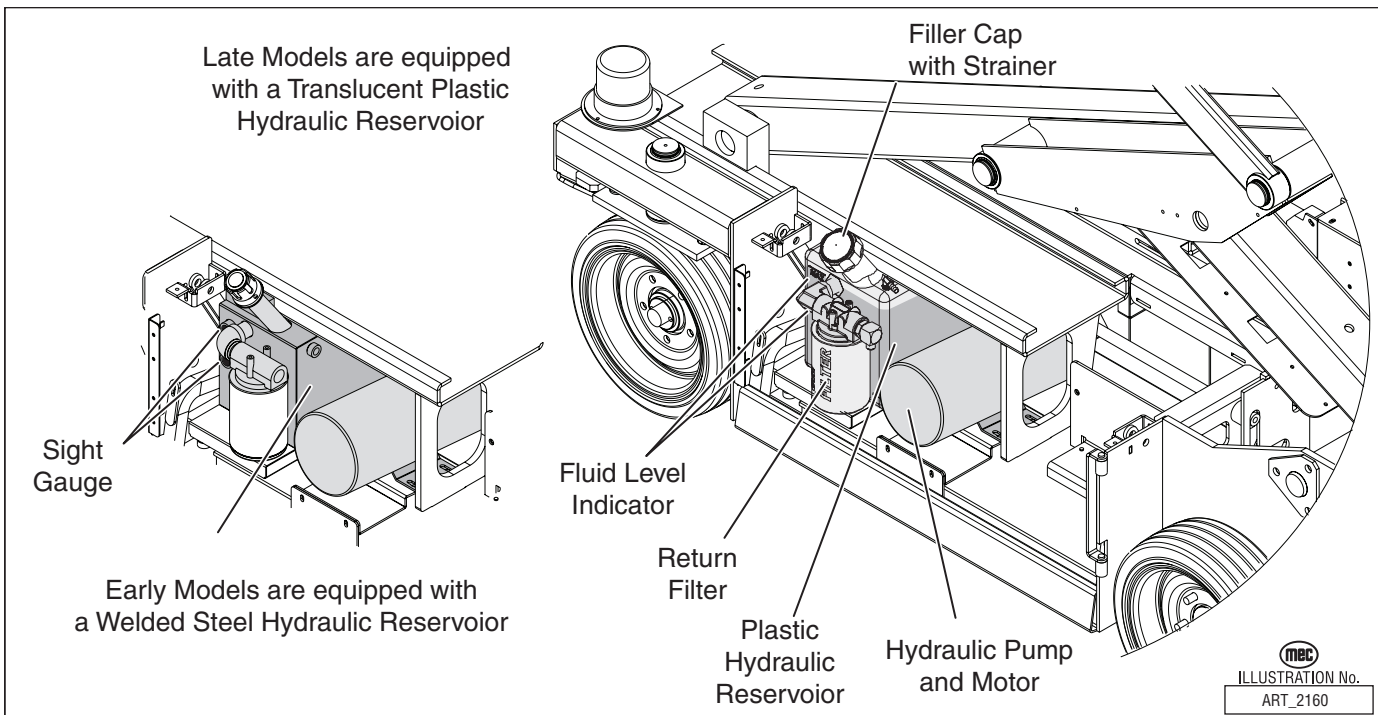
## Hydraulic Filter

All machines are equipped with a filter. It is a 10 micron spin-on, bypassing filter. When the filter is clogged, hydraulic flow bypasses the filter element. The filter element must be changed every 6 months or 500 hours. Extremely dirty conditions may require that the filter be replaced more often.

Beware of hot fluid. Contact with hot fluid may cause burns.

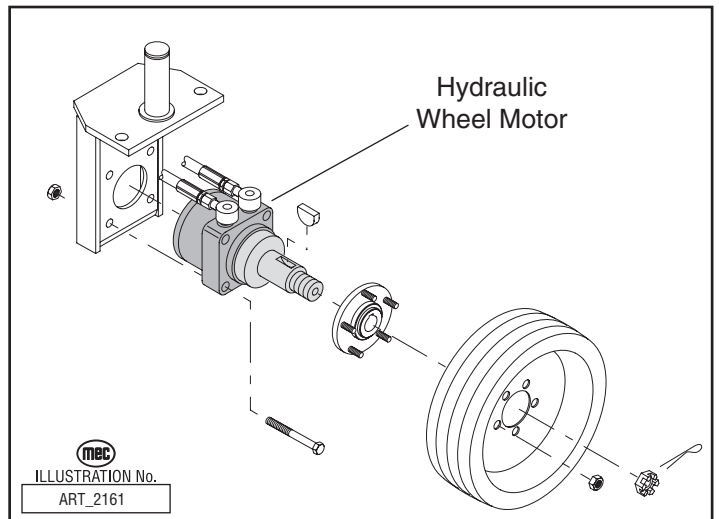
## Hydraulic Pump

An electric motor drives the fixed displacement, gear pump. The pump provides hydraulic fluid flow to operate the machine functions at 3 gpm. There are no adjustments on the pump. The pump provides power for the lift, drive, brake and steering functions.



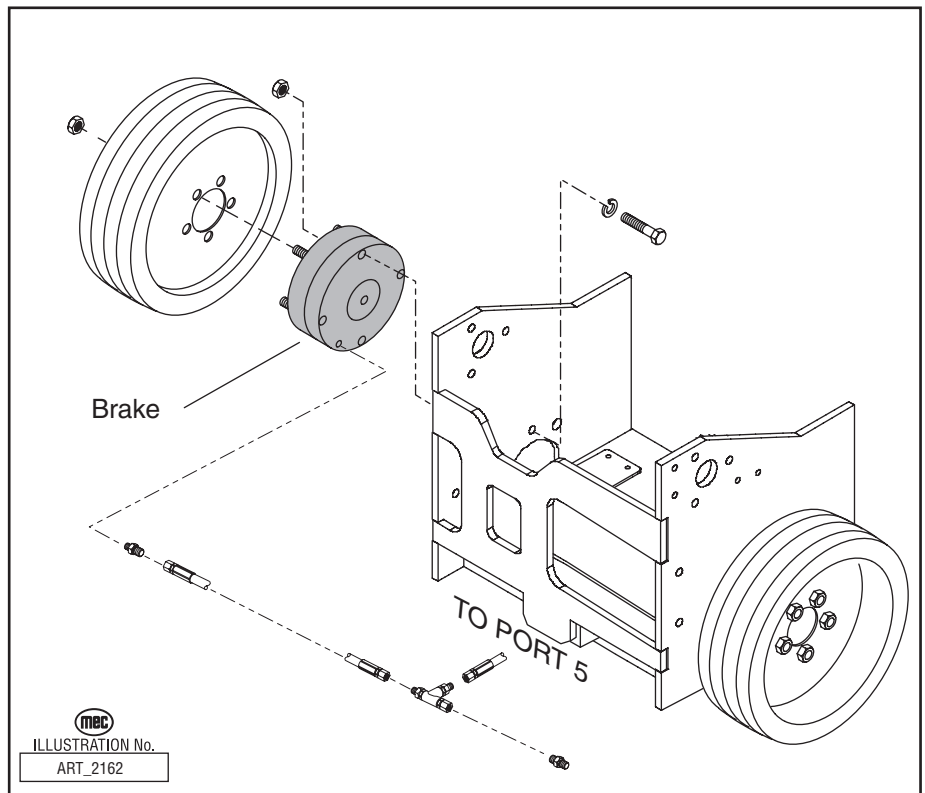
## Wheel Drive Circuit

There are two (2) hydraulic, fixed-displacement gear wheel motors to provide power to the two (2) front wheels.



## Braking Circuit

Rear brakes are released whenever the machine is commanded to drive.



# PARKING BRAKE AND TOWING CIRCUIT

**Note:** Refer to *Parts Section E* for hose routing.

Machine can be winched or moved short distances in case of power failure at speeds not to exceed 5 mph (8.05 km/h).



**PRIOR TO MANUALLY RELEASING BRAKES, INSURE WHEELS ARE CHOCKED TO PREVENT MACHINE FROM MOVING.**

Release Brakes Before Towing:

- ◆ Open the tow valve by turning counter-clockwise.
- ◆ Push in the manual brake release valve located on the main manifold.
- ◆ Using the hand pump on the manifold, pump valve until pressure is built.
- ◆ Machine is now ready for towing.



**AFTER RELEASING THE BRAKES, THERE IS NOTHING TO STOP THE MACHINE'S TRAVEL. MACHINE WILL ROLL FREELY ON SLOPES. BE ON GUARD AGAINST RUNAWAY.**

To Reset Brakes:

- ◆ Close the tow valve by turning it clockwise.
- ◆ Brakes will reset when drive function is activated or reset by pulling on manual brake release valve.

# EMERGENCY SYSTEMS AND PROCEDURES



**IF THE CONTROL SYSTEM FAILS WHILE THE PLATFORM IS ELEVATED, HAVE AN EXPERIENCED OPERATOR USE THE EMERGENCY LOWERING PROCEDURE TO SAFELY LOWER THE PLATFORM.**

**DO NOT ATTEMPT TO CLIMB DOWN SCISSOR ASSEMBLY.**

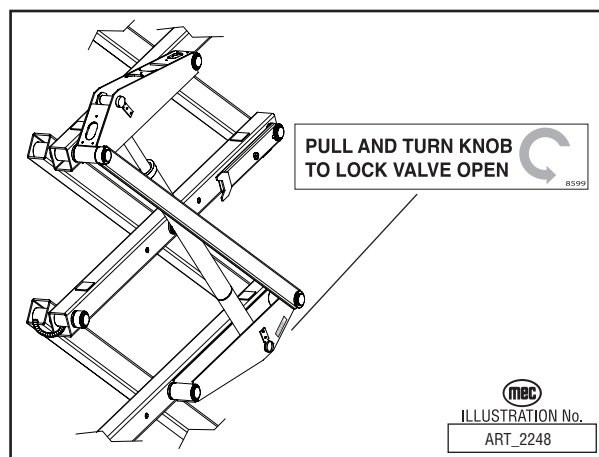


**BEFORE LOWERING PLATFORM, RETRACT THE DECK EXTENSION.**

## Emergency Lowering - Early Models

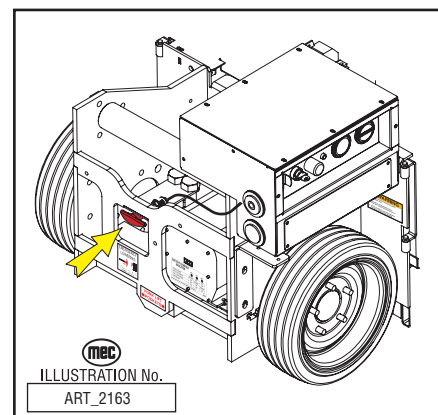
The Emergency Down System is used to lower the platform in case of power or valve failure. To lower the platform, perform the following steps:

1. Pull and turn knurled knob on lift cylinder counterclockwise to lock the valve in open position.
2. Pull manual activator (override valve) on main manifold to lower platform to desired height.
3. To return to normal operation, turn knurled knob on lift cylinder clockwise. Valve will automatically lock.



## Emergency Lowering - Current models

Emergency Down system is used to lower the platform in case of power or valve failure. To lower the platform, pull the red "T" handle located at the rear of the machine. Lowering stops when you release the "T" handle.



# STEERING CIRCUIT

**Note:** Refer to *Hydraulic Manifold and Relief Pressure Adjustment Procedure*.  
Refer to *Section 3* for Remove and Replace instructions.  
Refer to *Parts Section E* for hose routing.

## The steering system consists of the following components:

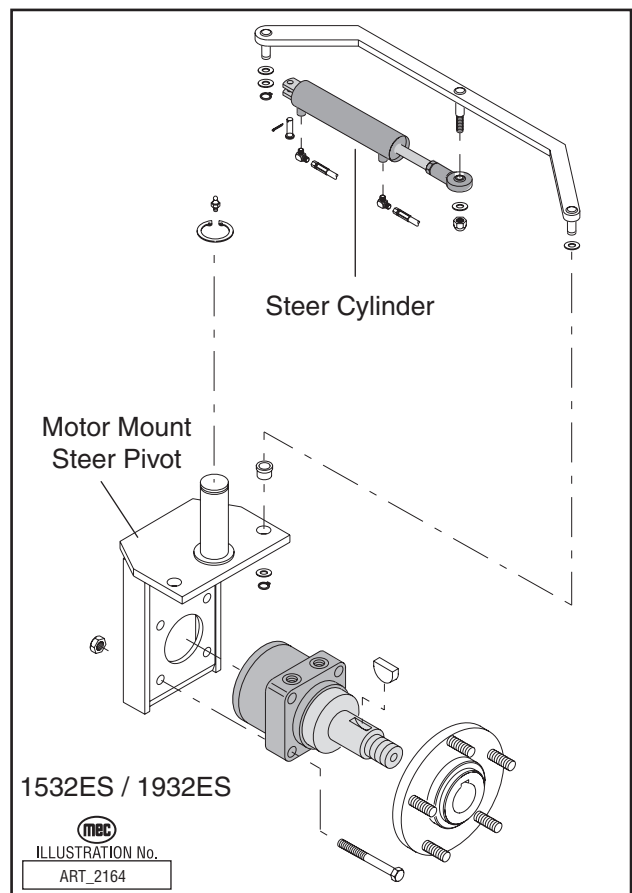
- ◆ The wheel motor housings have pivots on the top and bottom, and are mechanically linked together via a tie-rod.
- ◆ Steering is accomplished hydraulically by using one (1) double-acting cylinder, and a 4-way 3-position solenoid-operated, hydraulic directional control cartridge valve.
- ◆ Maximum steering pressure is limited by the relief valve (refer to *Relief Pressure Adjustment Procedure*).

## Steer Cylinder

There is one (1) cylinder utilized in the steering system. This cylinder is a double acting type which requires fluid flow to operate the cylinder rod in both directions. Directing fluid forces the piston to travel towards the rod end of the barrel, extending the cylinder rod.

By directing fluid to the rod side of the cylinder the piston will be forced in the opposite direction and the cylinder rod will retract.

Refer to the Mechanical Section of this manual for cylinder disassembly, or replacement.



# PLATFORM LIFT CIRCUIT

**Note:** Refer to *Hydraulic Manifold* and *Relief Pressure Adjustment Procedure*.  
Refer to *Section 3* for Remove and Replace instructions.

- ◆ The lift system uses the hydraulic pump to obtain proportional lifting function controlled by the lift valve and pump speed.
- ◆ Lowering is single speed controlled by the holding valves on the lift cylinder(s) and regulated by a fixed orifice located on the lift cylinder(s).
- ◆ Platform capacity is limited by a hydraulic relief valve in the lift circuit. (Refer to Machine Specifications or the Hydraulic Schematic for proper setting).

## Lift Cylinder

**Note:** Refer to *Cylinder Repair*.

### 1532ES / 1932ES

One (1) single acting type hydraulic cylinder.

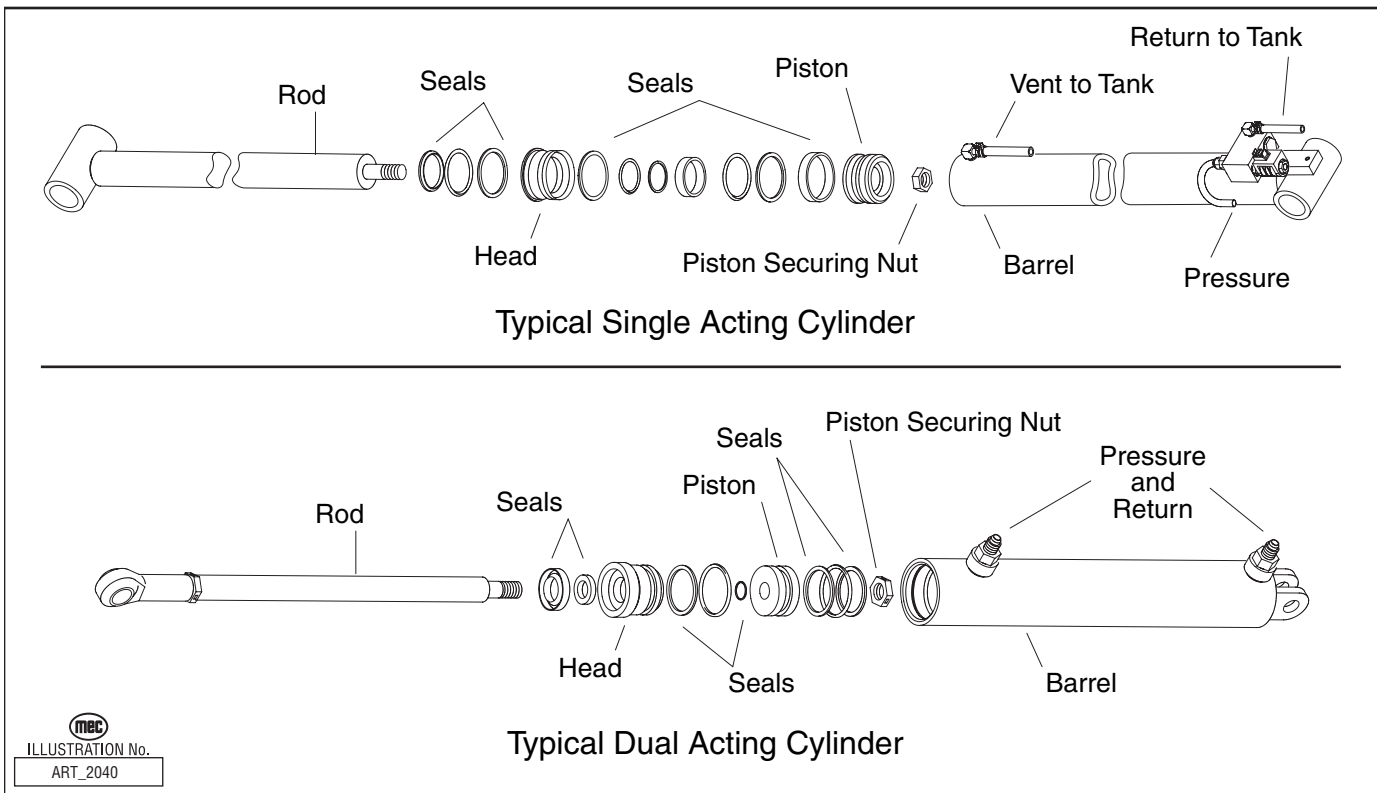
The cylinder has an integrated 2-position, 2-way solenoid operated platform lower valve for holding the platform in position.

The valve is also externally actuated for manually lowering the platform. Early models use a pull-to-release knob at the cylinder, while current models use a cable release with a pull handle located near the ladder (see *Emergency Systems and Procedures*).

# CYLINDER REPAIR



**CYLINDERS ARE HEAVY. SUPPORT CYLINDERS BEFORE REMOVING HARDWARE THAT SECURES THE CYLINDER TO THE MACHINE.**



## Removal

**Note:** Refer to *Section 3* for Remove and Replace instructions, and the *Parts Section* for a list of hardware specific to the cylinder being repaired.

1. Tag hoses for proper reassembly.
2. Disconnect hoses and IMMEDIATELY cap the openings to prevent contamination.
3. Remove cylinder from the machine as described in *Section 3*.



## Preparation



**Take care not to damage rod surface and guard against dirt or other foreign objects entering system.**

1. Drain all fluid from cylinder.
2. Clean all dirt and grit from outside of cylinder.
3. Insert cylinder into vise.

## Cylinder Disassembly

1. Remove the head from the cylinder body.
2. Remove the shaft assembly from the barrel, pulling in a straight line, so as not to scar the internal parts.
3. Insert shaft into a **soft jawed** vise so that the head and piston can be removed. Be sure the shaft and vise are both clean before using.
4. Remove nut at the end of the shaft and pull head and piston off of the rod.
5. Remove all seals from the head and piston using a non-sharp seal tool. These tools are available from various seal suppliers.
9. Clean all fluid and debris off of the head, piston, shaft, collar and barrel using solvent, rags, and an air hose.
10. Inspect parts for scratches, pits or polishing. Check seal groves and sealing surfaces.
  - a. Scratches or pits deep enough to catch the fingernail are unacceptable; replace the cylinder.
  - b. Polishing is a sign of uneven loading. Check for roundness. If a polished surface is not round within .007 in (0.18 mm) replace the cylinder.

## Cylinder Assembly

### CAUTION:

- ◆ To insure a quality repair, cylinder parts must be thoroughly cleaned, dry, and free of solvents, and assembly must be performed in a clean area free of dust and contamination.
- ◆ To avoid cutting the seals, do not use sharp edged tools during seal replacement. After installing seals allow at least one hour for the seals to restore to their original shape before assembling the cylinder.
- ◆ Torque all hardware according to the *Hydraulic Components Torque Table* unless otherwise specified.

1. Lubricate all components with clean hydraulic fluid.
2. Install new seal kit components. Install all seals on the head and piston using the non-sharp seal tool.
3. Place a small amount of fluid on the inside seals of the head and reinstall it on the shaft, by slipping head over the piston end of the shaft being very careful not to damage the inside seals.
4. Place a small amount of fluid on the inside seals of the piston and reinstall it on the shaft by slowly twisting the piston on over the threads of the shaft being very careful not to damage the inside seals.
5. Reinstall the shaft nut; torque 1 ½" nut to 160 ft-lbs.
6. Grease the outside seals of the head and piston.
7. Reinstall the shaft into the barrel of the cylinder and push in until groove of the head lines up with the slot in the barrel.
17. Reinstall the cylinder retainer.
18. Cycle the cylinder using air to check for proper operation.

**NOTE:** It is very important to keep all parts clean when working with hydraulic cylinders, even one small piece of dirt or grit can damage the cylinder.

# HYDRAULIC MANIFOLD

- Note:** Refer to *Section 3* for Remove and Replace instructions, and the *Parts Section* for a list of hardware.  
Tag all components as they are removed so as not to confuse their location during reassembly.

## Hydraulic Manifold Removal

1. Disconnect the negative battery terminal.
2. Tag and disconnect the solenoid valve leads.
3. Tag and disconnect hydraulic hoses, and IMMEDIATELY cap the openings to prevent contamination.
4. Remove the bolts that hold the manifold to the mounting bracket.
5. Remove the manifold block.

## Disassembly

1. Remove coils from solenoid valves.
2. Remove valves.
3. Remove fittings, plugs, springs, balls, and orifices.

## Cleaning and Inspection

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

## Assembly

- Note:** Lubricate all O-rings before installation to prevent damage to the O-ring. Seat balls in manifold block by lightly tapping on the ball with a brass drift punch.

1. Install fittings, plugs, springs, balls, and orifices. Use one drop of Loctite #424 or equivalent thread locker on each screw-in orifice.
2. Install valves.

## Installation

1. Attach manifold assembly to mounting plate with mounting bolts.
2. Connect solenoid leads (as previously tagged).
3. Connect hydraulic hoses (as previously tagged). Be certain to tighten hoses.
4. Connect the battery.
5. Operate each hydraulic function and check for proper operation and leaks.
6. Adjust valve pressures.







# SECTION 2: ELECTRICAL SYSTEM

**Electrical System - General ..... 2-2**

**Deutsch Connectors ..... 2-3**

**Batteries ..... 2-4**

**Alarms and Switches ..... 2-8**

**Continuity Checks ..... 2-12**

**Diode Board ..... 2-13**

**Sevcon Motor Speed Controller ..... 2-14**



# ELECTRICAL SYSTEM - GENERAL

The electrical control system consists of a lower control box and an upper control box.

## Lower Control box

The ground station, when enabled via the Base/Platform Selector Switch, disables the upper station and provides control for a fixed speed Lift UP/DOWN functionality.

## Upper Control box

The upper station consists of a joystick controller with enable switch trigger), Lift/Drive Mode (Forward/Down, Reverse/Up and accelerator demand), Steer (Right/Left). A torque mode switch causes both hydraulic motors to operate in parallel rather than in series for speed control mode (normal).

# DEUTSCH CONNECTORS

Deutsch connectors used on MEC equipment is designed so that individual parts may be replaced without replacing the entire component. Special tools and detailed instructions are provided in Deutsch Connector field kits, MEC part # 84091.

## Male Plug Connector

- ◆ Use the flat end of the Removal Tool or a flat blade screwdriver to pry the locking wedge from the connector, taking care not to damage the Sealing Gasket.
- ◆ Inspect and replace damaged parts.
- ◆ Replace or re-crimp wires and contacts.

## Female receptacle Connector

- ◆ Use the notched end of the removal tool or a wire hook to pull the locking wedge from the connector
- ◆ Replace worn or damaged parts
- ◆ Replace or re-crimp wires and contacts.

## Locking Fingers

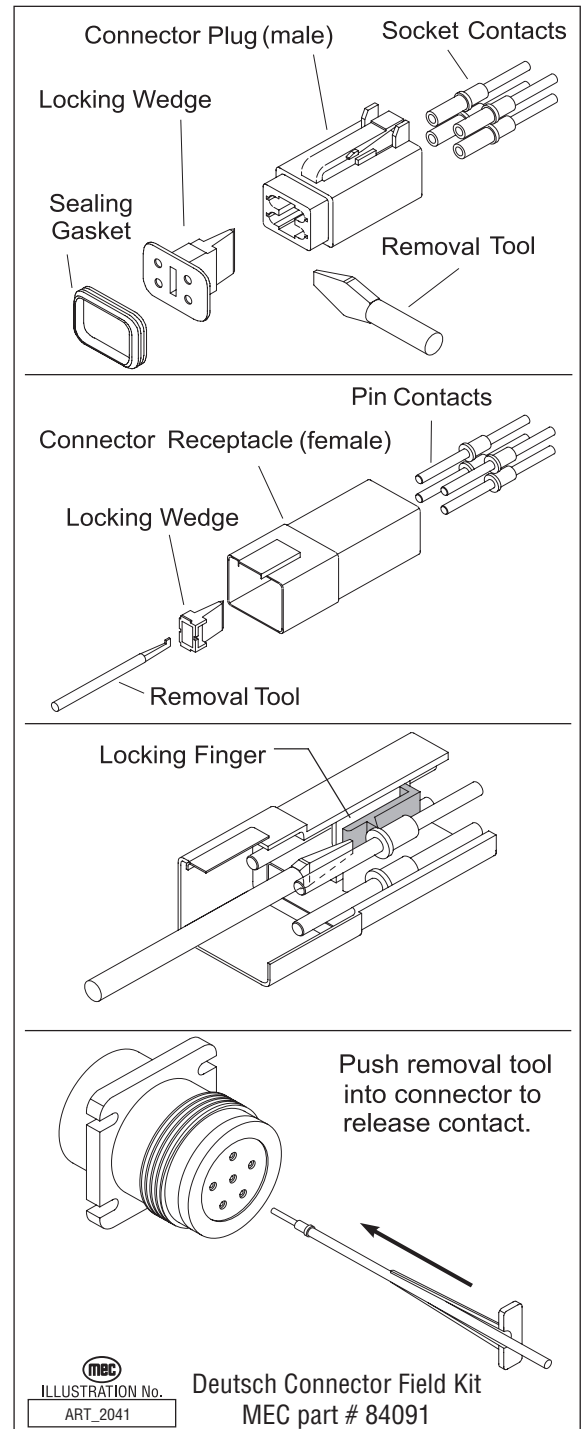
- ◆ Remove the locking wedge as outlined above.
- ◆ Using the removal tool or a flat blade screwdriver, push the Locking Fingers aside to release the contact.
- ◆ Pull the wire and contact out of the connector.

## Heavy Duty Plug

- ◆ Slide the removal tool along the wire to be replaced and push into the connector to release the contact.
- ◆ Pull the wire and contact out of the plug.

## Crimping

- ◆ Strip 1/4 in (6 mm) insulation from the wire.
- ◆ Insert the contact into the crimping tool and insert the stripped wire into the contact making sure no wires are outside the contact barrel.
- ◆ Close the handles of the crimping tool, then release the handles to remove the crimped contact.



# BATTERIES



**CHARGING BATTERIES CREATE EXPLOSIVE HYDROGEN GAS. KEEP SPARKS, FLAMES AND SMOKING MATERIALS AWAY FROM BATTERIES.**

**ALWAYS WEAR SAFETY GLASSES WHEN WORKING WITH BATTERIES.**

**BATTERY FLUID IS CORROSIVE. THOROUGHLY RINSE SPILLED FLUID WITH CLEAN WATER.**

**REPLACE WITH MANUFACTURER APPROVED BATTERIES.**

**BEFORE DISCONNECTING THE BATTERY NEGATIVE (-) LEAD, MAKE SURE THAT ALL SWITCHES ARE OFF. IF ON, A SPARK WILL OCCUR AT THE GROUND TERMINAL THAT COULD IGNITE HYDROGEN GAS OR FUEL VAPORS.**

Four (4), 6 volt batteries supply the 24 volt electrical power required to operate the electrical circuits.

## Battery Maintenance (in storage)

Follow these procedures for maintenance of battery on a machine not in use:

- ◆ Keep battery clean. Electrolyte of “wet” batteries should be checked regularly and kept at proper level.
- ◆ Never stack one battery directly on top of another because post or container damage can result. If batteries are stored individually, place supporting boards between layers. Rotate stock so that oldest batteries are used first.
- ◆ “Wet” batteries should be kept fully charged. A “wet” battery, while in storage, should be recharged to full charge at recommended intervals. Leaving the MEC charger connected during prolonged storage will maintain battery voltage automatically.

A battery fully (100 %) charged at 80 °F (26.6 °C)

- drops to 65 % at 32 °F (0 °C)

- drops to 40 % at 0 °F (-32 °C)

## Recommended Intervals

### If Stored At:

Below 40 °F (4 °C)

Above 60 °F (15 °C)

40 ° - 60 °F (4 ° - 15 °C)

### Recharge:

None required

Every month

Every 2 months



## Battery Maintenance (in use)

Check battery and surrounding area for signs of damage or corrosion.

Check battery terminals for:

- ◆ Corrosion: Regularly clean connections and apply a nonmetallic grease or protective spray to retard corrosion.
- ◆ Loose connections: Be sure all cable connections are tightly secured, and that good contact is made with terminals.
- ◆ Broken or Frayed cables: Be sure all connections are good and that no loose or broken wires are exposed. Replace as necessary.

Check battery electrolyte level. Replenish the electrolyte, if necessary. Remove vent caps before filling, and USE ONLY DISTILLED WATER. DO NOT OVERFILL. Fill to level indicator (or 1/2 inch over the top of separators, if there is no level indicator). Fill after charging to prevent overflow of acid due to expansion. Do not use a hose to add water to batteries.

Allowing the electrolyte level to drop below the top of the separators will lead to shortened battery life.

Excessive water usage can indicate that a battery has been overcharged, has been subjected to excessively high temperatures, or is nearing the end of its service life.

## Battery Preventative Maintenance:

Every 15 hours (after battery has been charged), spot-check the specific gravity of two or more cells. A fully charged battery should indicate 1.28 specific gravity. If low readings are noted, check the following:

- ◆ Check terminals for corrosion, loose connections and broken or frayed cables.
- ◆ Check all cells with a hydrometer for variance in specific gravity. A variation of 0.03 points or more between cells is a cause for concern. Mark the low cells.

Recheck specific gravity of all cells after recharging. Wash the top of the battery, making sure all vents are in place. Do not allow cleaning water or other foreign matter to enter the cells. Use a solution of bicarbonate of soda (5 tsp of baking soda per quart of warm water) and water to wash the battery if there is an accumulation of acid.

### Battery Specific Gravity and Voltage Table

| SPECIFIC GRAVITY |       | VOLTS DC |            |             |
|------------------|-------|----------|------------|-------------|
| EACH CELL        |       | PER CELL | 6V BATTERY | 12V BATTERY |
| Fully Charged    | 1.280 | 2.10     | 6.30       | 12.60       |
| Fully Discharged | 1.130 | 1.75     | 5.19       | 10.50       |



## Battery Charging

### Main Electrical Power



**The use of an improper extension cord could result in a risk of fire or electric shock.**

The use of long extension cords with the charger should be minimized. If an extension cord is used, ensure that it has three conductors with a ground and that the wire size and length meet your electrical code for the voltages and currents of the Electrical Specifications table. Locate all cords so that they will not be driven over, stepped on, tripped over, or otherwise subjected to damage or stress.

Connect the power supply cord to a properly grounded 100 v/50 or 60 Hz, 115 v/ 60 Hz, or 230 v/50 or 60 Hz socket. This charger automatically senses and adjusts to the AC input voltage range.

The charger will start automatically within four to six seconds. The charger will start even with severely discharged batteries (down to 1 volt terminal voltage). Once charging starts, the LEDs indicate the charging progress as described in the following Charging State table. If all 3 LEDs blink together there is a problem. Take proper action according to the trouble shooting guide found in *Section 4: Troubleshooting*. The charger goes into an equalizing charge mode after the batteries are charged and all 3 LEDs are ON. The charger will continue to charge at a low current then shut-off automatically when complete.

### Charging State & LED Display

|                       |     | 50 %     | 75 %     | 100 %    |
|-----------------------|-----|----------|----------|----------|
| Charging State        | LED |          |          |          |
| 0 to 50 % charged     |     | Blinking | OFF      | OFF      |
| 50 % to 75 % charged  |     | ON       | Blinking | OFF      |
| 75 % to 100 % charged |     | ON       | ON       | Blinking |
| 100 % charged         |     | ON       | ON       | ON       |
| Abnormal Cycle        |     | OFF      | OFF      | Blinking |

## Battery Replacement



**BEFORE REMOVING THE BATTERIES FROM THE MACHINE, TURN OFF THE SELECTOR/KEY SWITCH. THERE SHOULD BE NO POWER.**



**Prevent damage to battery and/or electrical system;**

- ◆ **Always disconnect the negative battery cable first.**
- ◆ **Always connect the positive battery cable first.**

### Main Electrical Power

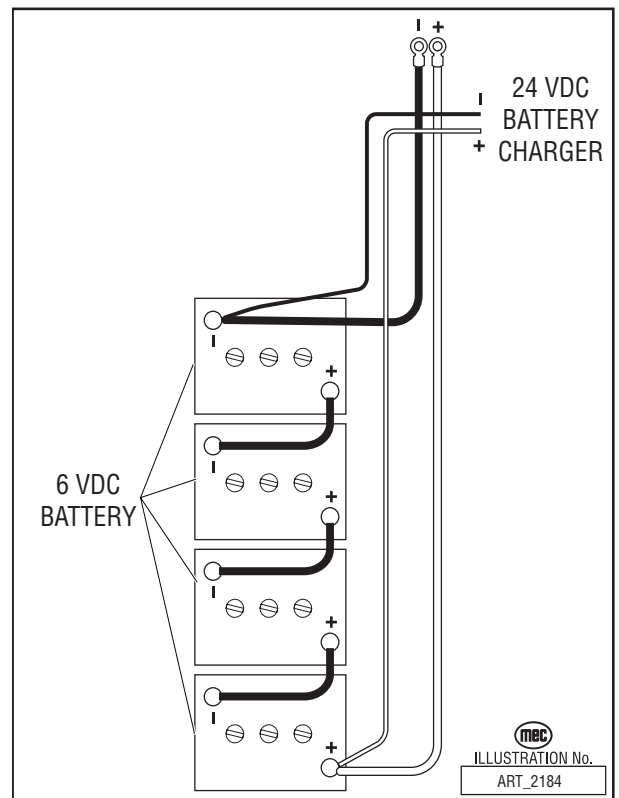
To remove batteries, follow these procedures.

Batteries are located in the side compartment of the machine.

**Always disconnect the negative battery cable first.**

Remove bolts holding battery. Lift the battery from the compartment. Put the battery to the side and dispose of properly.

To install the battery, reverse the process by positioning the battery in the compartment securely with hold down bolts. Connect battery cables.



# ALARMS AND SWITCHES

## Emergency Stop Button

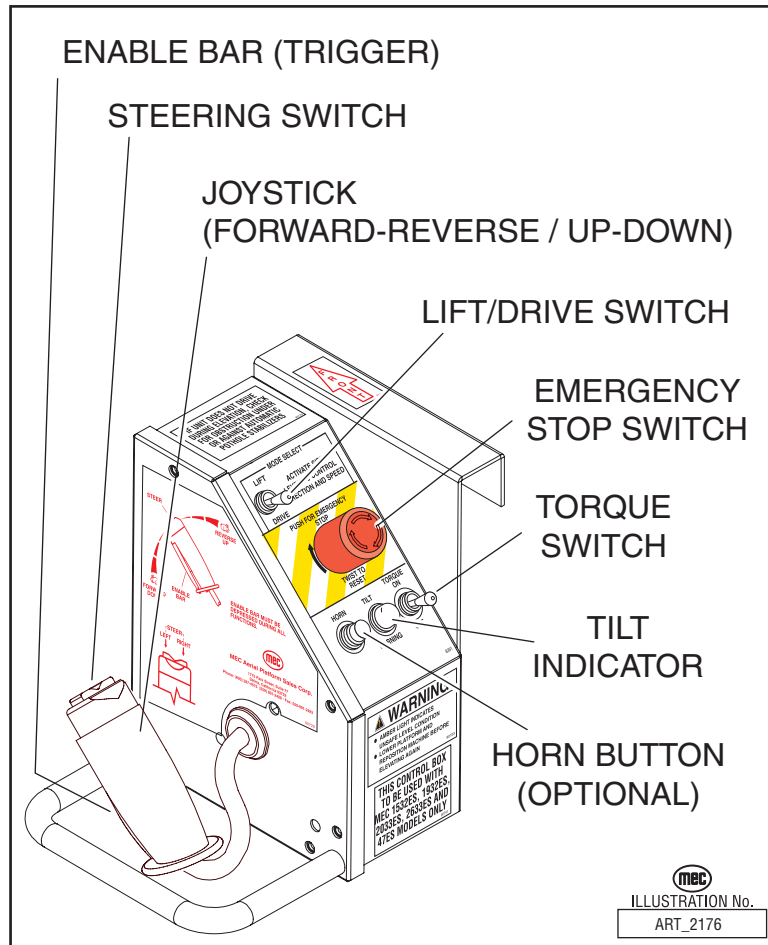
There are two red emergency stop buttons: one located on the upper controls and the other on the lower control panel.

This stop button, when in the ON (OUT) position, provides power to the desired control box. Also, the stop button, in the event of an emergency can be used to turn off the power by pushing IN. All functions stop immediately when depressed.

Turn button clockwise to reset.

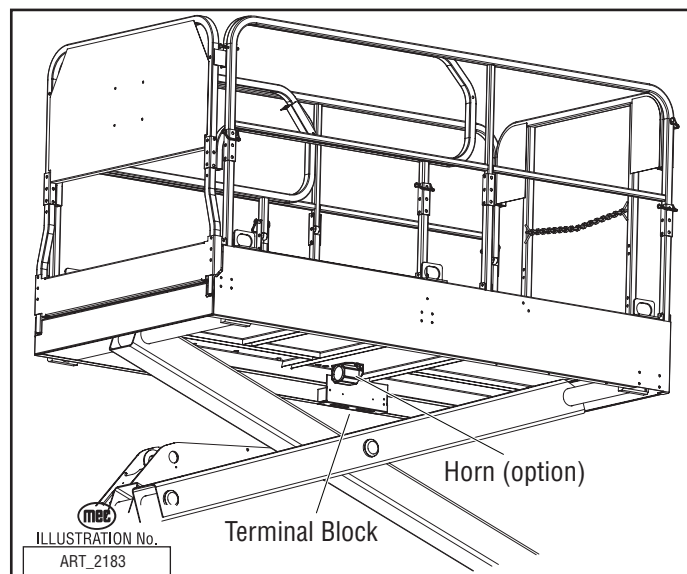
**NOTE:** As a safety feature, selecting and operating the lower controls will override the upper controls emergency stop button.

The lower control box emergency stop button will stop machine operations, even if the selector switch is switched to upper controls.



## Horn

It is activated at the upper controls and sounds at the ground alerting personnel to clear the machine's path to avoid hazards or unsafe conditions.



## Selector Switch

Machine can be operated from the lower or upper controls. Activation of one or the other is achieved with this switch.

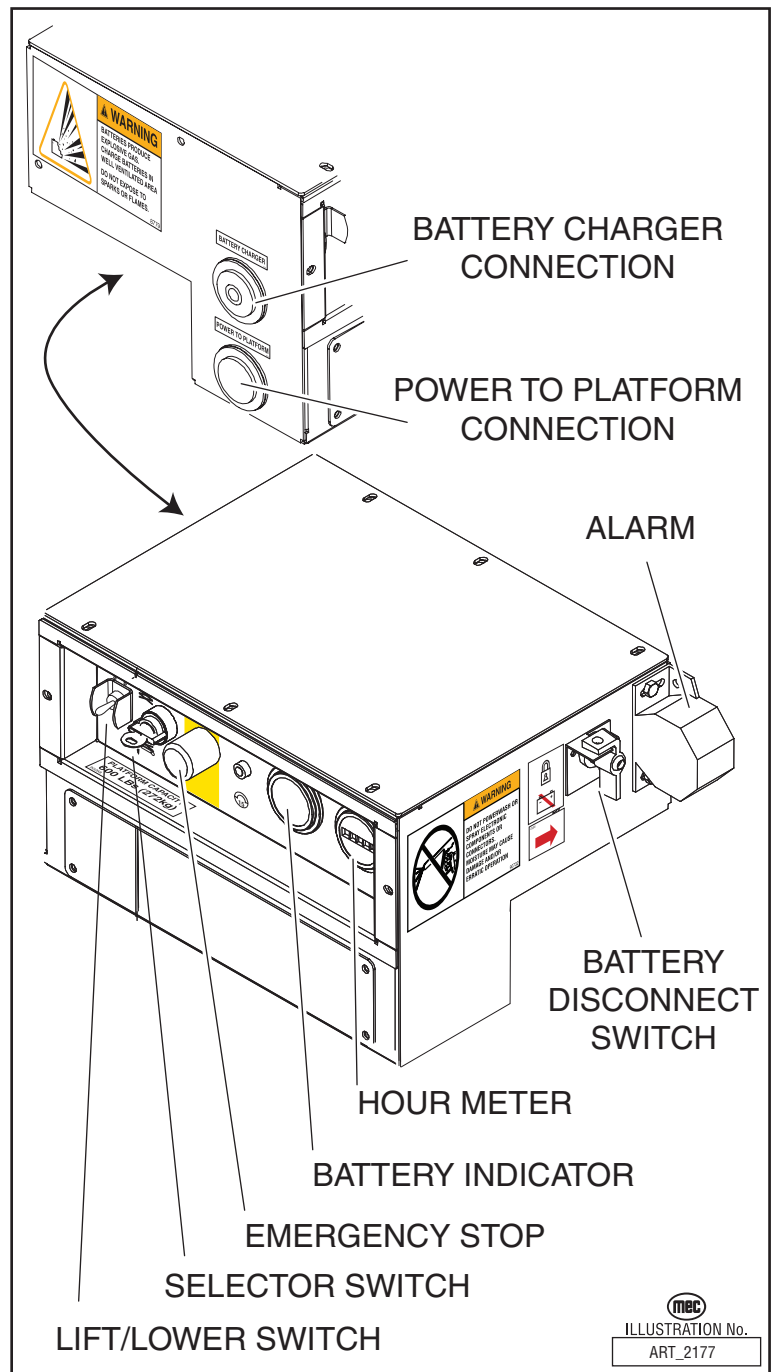
With the upper controls selected, from the lower control panel, if the platform up/ lower function is operated there should be NO movement. Similarly, with the lower controls selected, from the upper controls if any machine function is operated, there should be NO movement.

## Master Disconnect Switch

The switch is used primarily to shut off control circuit. The battery disconnect is provided to facilitate servicing and also to prevent unauthorized use of the vehicle by using a padlock (to provide security).

## Movement Alarm

This alarm is activated as soon as the upper control box joystick (controller) lever is moved off the center "Neutral" position.



**THE MOVEMENT ALARM IS PROVIDED FOR YOUR PROTECTION, AND PROTECTION OF PERSONS WORKING IN THE IMMEDIATE AREA. DISABLING THIS IMPORTANT SAFETY DEVICE MAY RESULT IN SERIOUS INJURY OR DEATH.**

## Tilt Alarm

The tilt sensor is located in the Lower Control Box

### Tilt Alarm Visual

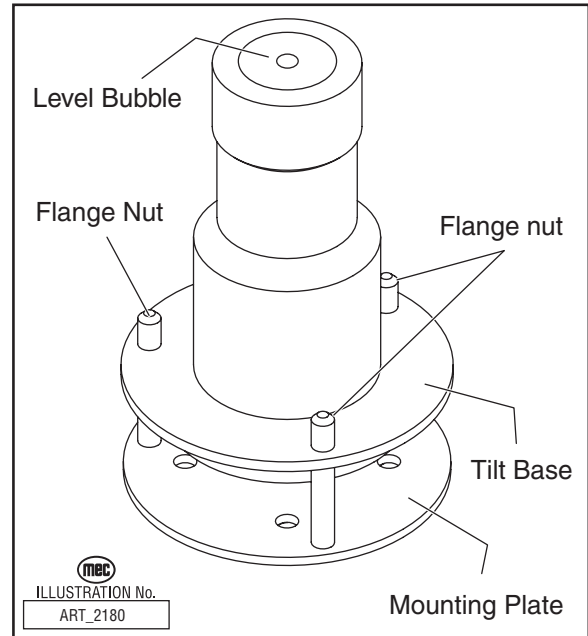
A warning light provided at the upper console will give a visual warning when the machine is at an unsafe angle; the platform should not be elevated when the warning indicator light is on.

### Tilt Alarm Test

This can be tested by tipping the sensor. This "Push-To-Test" feature enables the tilt alarm to be tested without losing its adjustment. Individually push down on each of the three fastened corners of the tilt alarm. There should be enough travel to cause the alarm to sound as each corner is pressed. (There is approximately a 1-3 second delay). If the alarm does not sound, the flange nuts have been tightened too far. Loosen the nut on the 90° corners and repeat this test procedure.

### Tilt Alarm Sensor Adjustment

- ◆ Before attempting to adjust the alarm, park the machine on a firm, flat, level surface. Use of an inclinometer is recommended to ensure front and rear of chassis is level.
- ◆ Open the lower control panel to access the sensor. Adjust the three flange nuts until the bubble on top of the sensor is centered.
- ◆ Check that the electrical connections are correct and secured tight.
- ◆ Close/shut the lower control panel.



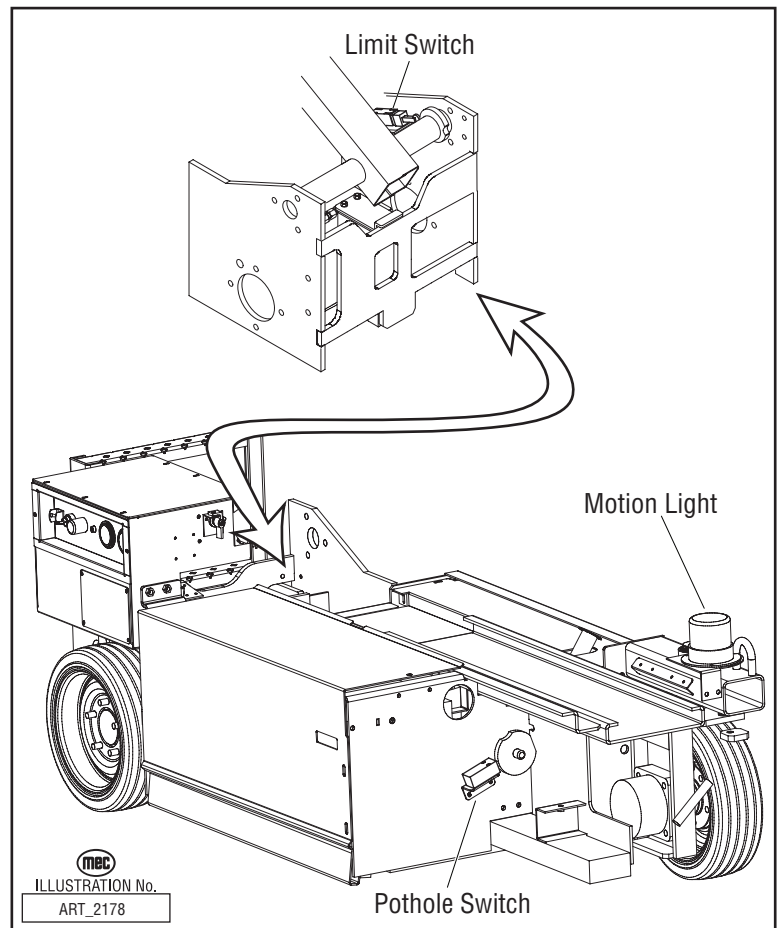
## Limit Switch

There is a limit switch to prevent driving in high speed. When the platform is raised above approximately 7 feet (2.13 meters), the machine will be in the slow speed mode.

## Pothole Switch

When the platform is elevated above 8 feet, the pothole switch cam rotates to activate the pothole switch causing the pothole bars to extend.

When the platform is lowered, the pothole switch cam rotates until the switch aligns with the cam low spot to deactivate the switch and cause the pothole bars to retract.



# CONTINUITY CHECKS

## Check Toggle Switch

- ◆ Disconnect wires and connect one probe of ohm meter to the connection on toggle switch and the other probe on the other connection.
- ◆ When toggle is open, there should be no reading, and when closed there should be a low resistance reading.

## Check Selector Switch

- ◆ Disconnect wires and connect one probe of ohm meter to common and the other to normally open terminal.
- ◆ With the switch flipped, there should be a low resistance reading.

## Check Emergency Stop Button

- ◆ Disconnect wires and connect one probe of ohm meter to connection on button and other probe on other connection.
- ◆ There should be no reading with the button pressed and a low resistance with it reset.

## Check Limit Switch Operation

- ◆ Disconnect wires.
- ◆ With one probe of ohm meter to common and other probe to open contact, move limit switch arm. Low resistance should be seen.
- ◆ With one probe of ohm meter to common and other probe to closed contact, low resistance should be seen. Move limit switch arm and zero-to-very-low resistance should be seen.



# DIODE BOARD

The diode board is located inside the lower control box.

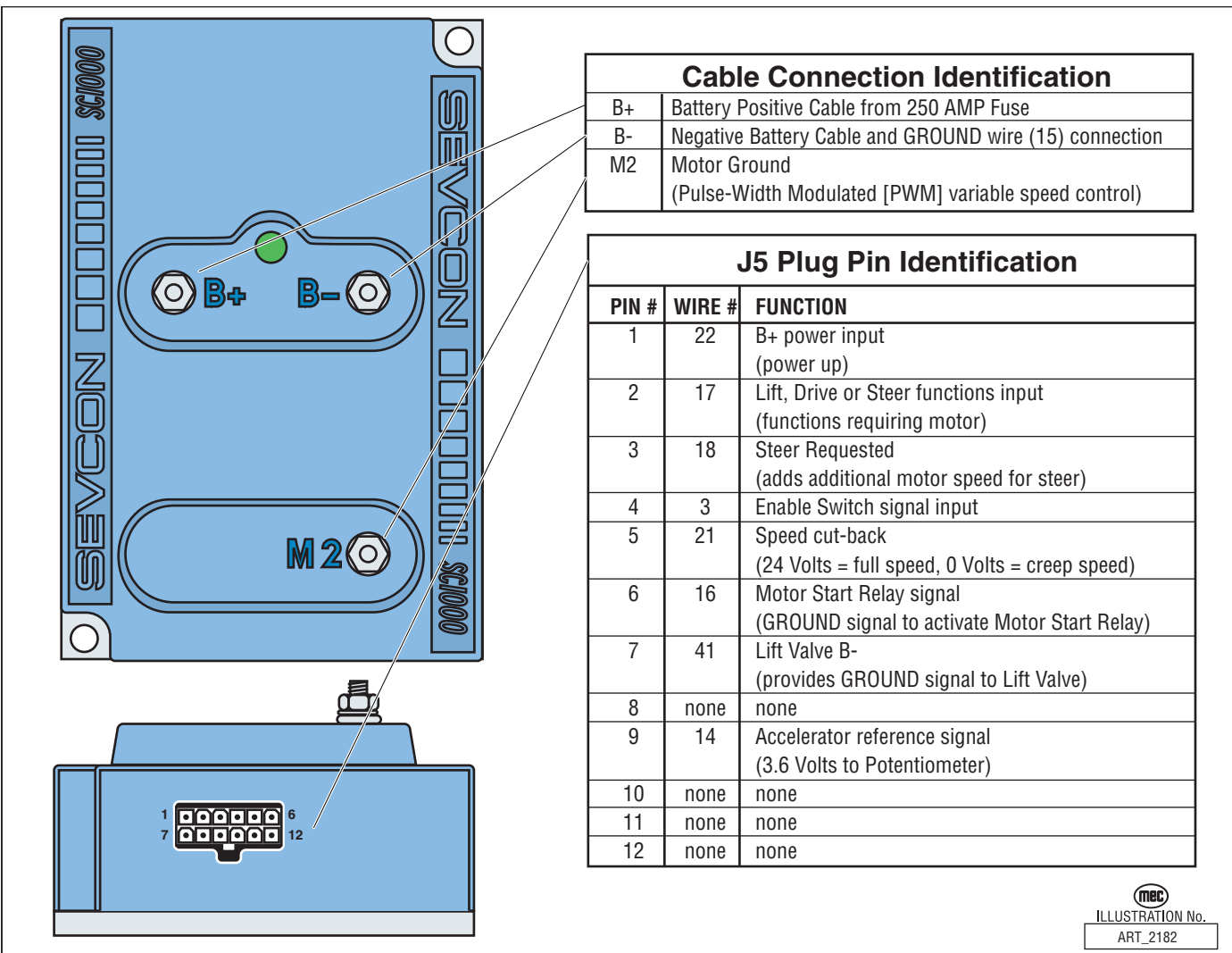
| J1 Plug Pin Identification |        |        |   |
|----------------------------|--------|--------|---|
| PIN #                      | WIRE # | SIGNAL | FUNCTION  |
| 1                          | 10     | INPUT  | Drive Reverse                                     |
| 2                          | 11     | INPUT  | Drive Forward                                     |
| 3                          | 19     | OUTPUT | Brake, Decel Valve signal                         |
| 4                          | 8      | INPUT  | Steer Left  |
| 5                          | 18     | OUTPUT | Steer signal to Sevcon                            |
| 6                          | 5      | INPUT  | Down signal                                       |
| 7                          | 20     | OUTPUT | Signal to Motion Alarm(s)<br>(optional)           |
| 8                          | 17     | OUTPUT | Sevcon & Hour Meter<br>(motor function requested) |
| 9                          | 15     | INPUT  | Battery Negative                                  |
| 10                         | 7      | INPUT  | Steer Right                                       |
| 11                         | 4      | INPUT  | Lift Up   |
| 12                         | 2      | INPUT  | Limit Switch<br>(24V = platform down)             |
| 13                         | 3      | OUTPUT | Enable, from lower Lift switch                    |
| 14                         | 21     | OUTPUT | To Sevcon (for speed cutback)                     |

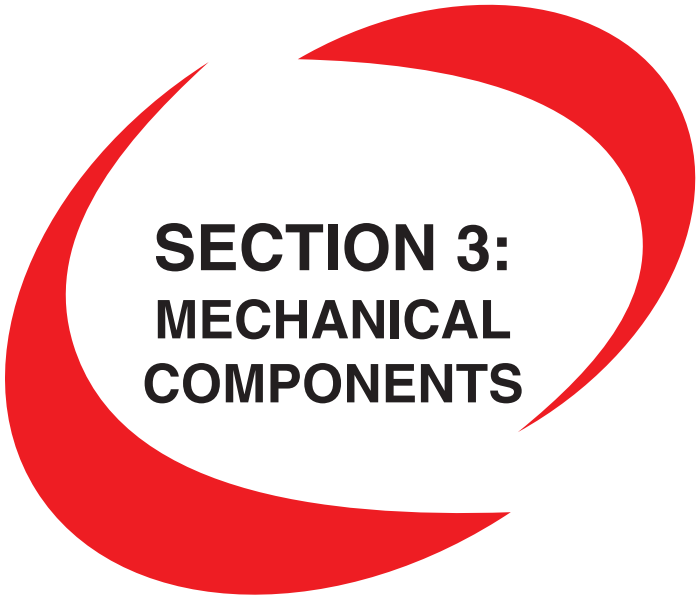
ILLUSTRATION No.  
ART\_2181

# SEVCON MOTOR SPEED CONTROLLER

The Sevcon Motor Speed Controller, located in the lower control box, is a microprocessor designed with the express purpose of operating the D/C electric motor at varying speeds. The controller uses Pulse-width Modulation (PWM) technology on the Ground side of the motor to control motor speed. Out of concern for operator safety and to prevent short-circuiting, the Controller monitors certain circuits for potential abnormalities. When the controller senses a problem it errs to the side of safety and stops all motor operation. The green LED will flash a code indicating the reason for the shutdown.

Refer to *Section 4: Troubleshooting* for diagnostic codes.





# SECTION 3: MECHANICAL COMPONENTS

**Torque Specifications ..... 3-2**

**Mechanical Components ..... 3-3**







- Base / Undercarriage ..... 3-3
- Hoses and Cables ..... 3-3
- Raising the Machine ..... 3-4
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- Pothole Circuit ..... 3-9
- Platform Removal ..... 3-10
- Lift Cylinder Removal and Installation ..... 3-11
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# TORQUE SPECIFICATIONS

## Fasteners

Use the following values to apply torque unless a specific torque value is called out for the part being used.

| AMERICAN STANDARD CAP SCREWS |   |      |      |      |   |     |      | METRIC CAP SCREWS |                                   |  |      |      |      |   |      |      |      |
|------------------------------|---|------|------|------|---|-----|------|-------------------|-----------------------------------|--|------|------|------|---|------|------|------|
| SAE GRADE                    | 5   |      |      |      | 8   |     |      |                   | METRIC GRADE                      | 8.8  |      |      |      | 10.9  |      |      |      |
| CAP SCREW SIZE<br>- inches - |  |      |      |      |  |     |      |                   | CAP SCREW SIZE<br>- millimeters - |   |      |      |      |   |      |      |      |
|                              | TORQUE  |      |      |      | TORQUE  |     |      |                   |                                   | TORQUE   |      |      |      | TORQUE  |      |      |      |
|                              | FT. LBS   |      | Nm   |      | FT. LBS   |     | Nm   |                   |                                   | FT. LBS  |      | Nm   |      | FT. LBS   |      | Nm   |      |
|                              | MIN   | MAX  | MIN  | MAX  | MIN   | MAX | MIN  | MAX               |                                   | MIN  | MAX  | MIN  | MAX  | MIN   | MAX  | MIN  | MAX  |
| 1/4 - 20                     | 6.25  | 7.25 | 8.5  | 10   | 8.25  | 9.5 | 11   | 13                | M6 X 1.00                         | 6  | 8    | 8    | 11   | 9   | 11   | 12   | 15   |
| 1/4 - 28                     | 8   | 9    | 11   | 12   | 10.5  | 12  | 14   | 16                | M8 X 1.25                         | 16   | 20   | 21.5 | 27   | 23  | 27   | 31   | 36.5 |
| 5/16 - 18                    | 14  | 15   | 19   | 20   | 18.5  | 20  | 25   | 27                | M10 X 1.50                        | 29   | 35   | 39   | 47   | 42  | 52   | 57   | 70   |
| 5/16 - 24                    | 17.5  | 19   | 23   | 26   | 23  | 25  | 31   | 34                | M12 X 1.75                        | 52   | 62   | 70   | 84   | 75  | 91   | 102  | 123  |
| 3/8 - 16                     | 26  | 28   | 35   | 38   | 35  | 37  | 47.5 | 50                | M14 X 2.00                        | 85   | 103  | 115  | 139  | 120   | 146  | 163  | 198  |
| 3/8 - 24                     | 31  | 34   | 42   | 46   | 41  | 45  | 55.5 | 61                | M16 X 2.50                        | 130  | 158  | 176  | 214  | 176   | 216  | 238  | 293  |
| 7/16 - 14                    | 41  | 45   | 55.5 | 61   | 55  | 60  | 74.5 | 81                | M18 X 2.50                        | 172  | 210  | 233  | 284  | 240   | 294  | 325  | 398  |
| 7/16 - 20                    | 51  | 55   | 69   | 74.5 | 68  | 75  | 92   | 102               | M20 X 2.50                        | 247  | 301  | 335  | 408  | 343   | 426  | 465  | 577  |
| 1/2 - 13                     | 65  | 72   | 88   | 97.5 | 86  | 96  | 116  | 130               | M22 X 2.50                        | 332  | 404  | 450  | 547  | 472   | 576  | 639  | 780  |
| 1/2 - 20                     | 76  | 84   | 103  | 114  | 102   | 112 | 138  | 152               | M24 X 3.00                        | 423  | 517  | 573  | 700  | 599   | 732  | 812  | 992  |
| 9/16 - 12                    | 95  | 105  | 129  | 142  | 127   | 140 | 172  | 190               | M27 X 3.00                        | 637  | 779  | 863  | 1055 | 898   | 1098 | 1217 | 1488 |
| 9/16 - 18                    | 111   | 123  | 150  | 167  | 148   | 164 | 200  | 222               | M3 X 3.00                         | 872  | 1066 | 1181 | 1444 | 1224  | 1496 | 1658 | 2027 |
| 5/8 - 11                     | 126   | 139  | 171  | 188  | 168   | 185 | 228  | 251               |                                   |  |      |      |      |   |      |      |      |
| 5/8 - 18                     | 152   | 168  | 206  | 228  | 203   | 224 | 275  | 304               |                                   |  |      |      |      |   |      |      |      |
| 3/4 - 10                     | 238   | 262  | 322  | 255  | 318   | 350 | 431  | 474               |                                   |  |      |      |      |   |      |      |      |
| 3/4 - 16                     | 274   | 302  | 371  | 409  | 365   | 402 | 495  | 544               |                                   |  |      |      |      |   |      |      |      |
| 7/8 - 9                      | 350   | 386  | 474  | 523  | 466   | 515 | 631  | 698               |                                   |  |      |      |      |   |      |      |      |
| 7/8 - 14                     | 407   | 448  | 551  | 607  | 543   | 597 | 736  | 809               |                                   |  |      |      |      |   |      |      |      |
| 1 - 8                        | 537   | 592  | 728  | 802  | 716   | 790 | 970  | 1070              |                                   |  |      |      |      |   |      |      |      |
| 1 - 14                       | 670   | 740  | 908  | 1003 | 894   | 987 | 1211 | 1137              |                                   |  |      |      |      |   |      |      |      |

Torque values apply to fasteners as received from the supplier, dry or when lubricated with normal engine oil.  
If special graphite grease, molydisulphide grease, or other extreme pressure lubricants are used, these torque values **do not apply**.

## Hydraulic Components

Use the following values to apply torque to hydraulic components. Always lubricate threads with clean hydraulic oil prior to installation.

| TYPE: SAE PORT SERIES | FITTINGS |           | HOSES     |           |
|-----------------------|----------|-----------|-----------|-----------|
|                       | FT. LBS. | Nm        | FT. LBS.  | Nm        |
| #4                    | 9 - 11   | 12 - 15   | 16 - 18   | 22 - 24   |
| #6                    | 19 - 24  | 25 - 32   | 28 - 32   | 38 - 43   |
| #8                    | 39 - 42  | 53 - 57   | 38 - 42   | 52 - 57   |
| #10                   | 58 - 62  | 78 - 84   | 58 - 62   | 79 - 84   |
| #12                   | 79 - 85  | 107 - 115 | 83 - 87   | 113 - 118 |
| #16                   | 136-144  | 184 - 195 | 100 - 110 | 136 - 149 |

# MECHANICAL COMPONENTS

Following is a description of the major mechanical components of the scissors lift.

## Base / Undercarriage



**When cleaning the base/undercarriage, cover electrical components to prevent water penetration.**

Steam clean the chassis as necessary, and inspect all welds and brackets. Check for cylinder pins that turn in their mounting, which will indicate sheared retaining pins.

## Hoses and Cables

**Note:** Refer to *Parts Section E* for detailed hydraulic hose diagrams.

Inspect all hoses and electrical cables for security and damage. Hoses and cables should be examined for rubbing and chafing.

Check for leaks at fittings. Replace any damaged hose or cable.

1. Tag hoses for proper reassembly.
2. Disconnect hoses and IMMEDIATELY cap the openings to prevent contamination.
3. Torque hose fittings according to the Hydraulic Torque Specification Table.

## Raising the Machine



**THE USE OF SUBSTANDARD LIFTING DEVICES AND/OR JACK STANDS MAY CAUSE THE MACHINE TO FALL RESULTING IN DEATH OR SERIOUS PERSONAL INJURY.**

The following are needed to safely raise and support the machine;

- ◆ a jack with a lifting capacity of two (2) tons or more.
- ◆ jack stands with a rating of one (1) ton or more.

### To raise the machine

1. Move machine to a firm level surface capable of supporting the weight of the machine.
2. Chock tires on one end of machine and raise the other end of machine.
3. Position a jack at the end of the machine to be lifted, under a solid lifting point in the center of the frame.
4. Raise the machine and place two (2) suitable jack stands under solid support points at the outer ends of the frame.
5. Lower the machine to rest on the jack stands and inspect for stability.

### To lower the machine

1. Raise machine slightly and remove jack stands.
2. Lower the machine remove the jack.
3. Remove chocks.

## Tires/Wheels

Tires are solid non marking rubber permanently mounted on a steel wheel. Inspect for cuts, chunking, side-wall damage, or abnormal wear. Any tire faults **MUST BE CORRECTED** before further machine operation. Refer to Parts Section for replacements.



**FAILURE TO USE APPROVED PARTS MAY CAUSE DEATH OR SERIOUS PERSONAL INJURY.**

**NOTE:** Replace tires/wheels with the correct parts to maintain the rating of this equipment.

### Changing Tires/Wheels



**ALWAYS BLOCK THE MACHINE BEFORE RAISING THE MACHINE.**

When a tire / wheel change is necessary, follow these tips:

1. While the machine is on the ground, loosen but **do not remove** lug nuts.

**NOTE:** Wheels may spin when attempting to loosen lug nuts without the weight of the machine on the wheels. Loosen lug nuts enough to break free, but leave them tight for safety.

2. Raise and support the machine (see *Raising the Machine*).
3. Remove lug nuts and pull the wheel off.
4. Install the replacement wheel and tighten the lug nuts.
5. Lower the machine to the ground.
6. Torque lug nuts to 75 to 85 ft-lbs (102 to 115 Nm).
7. Remove the chocks.

## Front Drive Motors

There are two (2) hydraulic motors on the front axle. These can be damaged or leaks may occur; repair or replace as necessary. Refer to *Section 1 - Hydraulics* for motor service and repair procedure.

### CAUTION:

- ◆ Clean all fittings before disconnecting hoses.
- ◆ Tag hoses for proper reassembly.
- ◆ Plug all openings to prevent contamination.

## Front Drive Motors

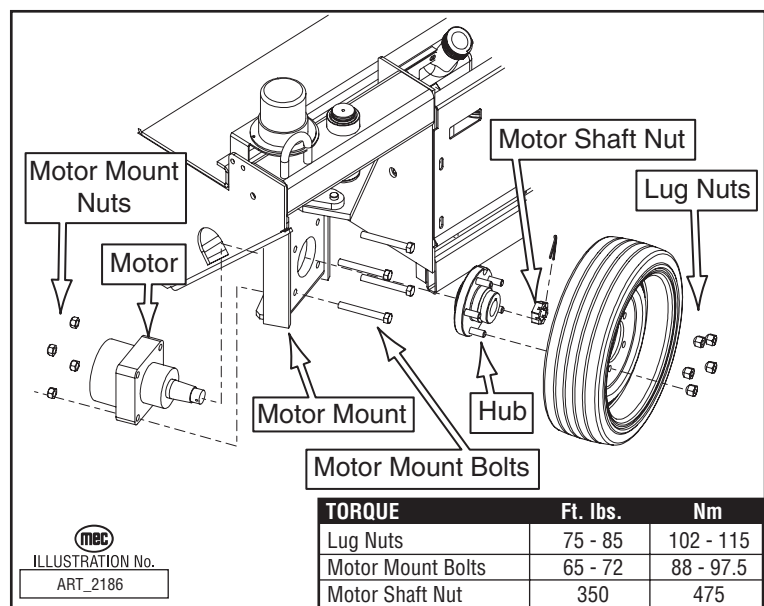
### Remove

**NOTE:** Removal of the motor does not require disconnection or removal of steering components.

1. Loosen the lug nuts.
2. Raise and support the front end of machine (see *Raising the Machine*).
3. Remove the wheel and tire assembly to access drive motor.
4. Remove the cotter pin, motor shaft nut, and hub from the drive motor shaft.
5. Turn the motor housing to gain access to the motor and hose assemblies.
6. Disconnect hose assemblies from drive motor.
7. Remove the cap screws and remove the drive motor.

### Replace

Installation is reverse of removal.





## Rear Wheel Brakes

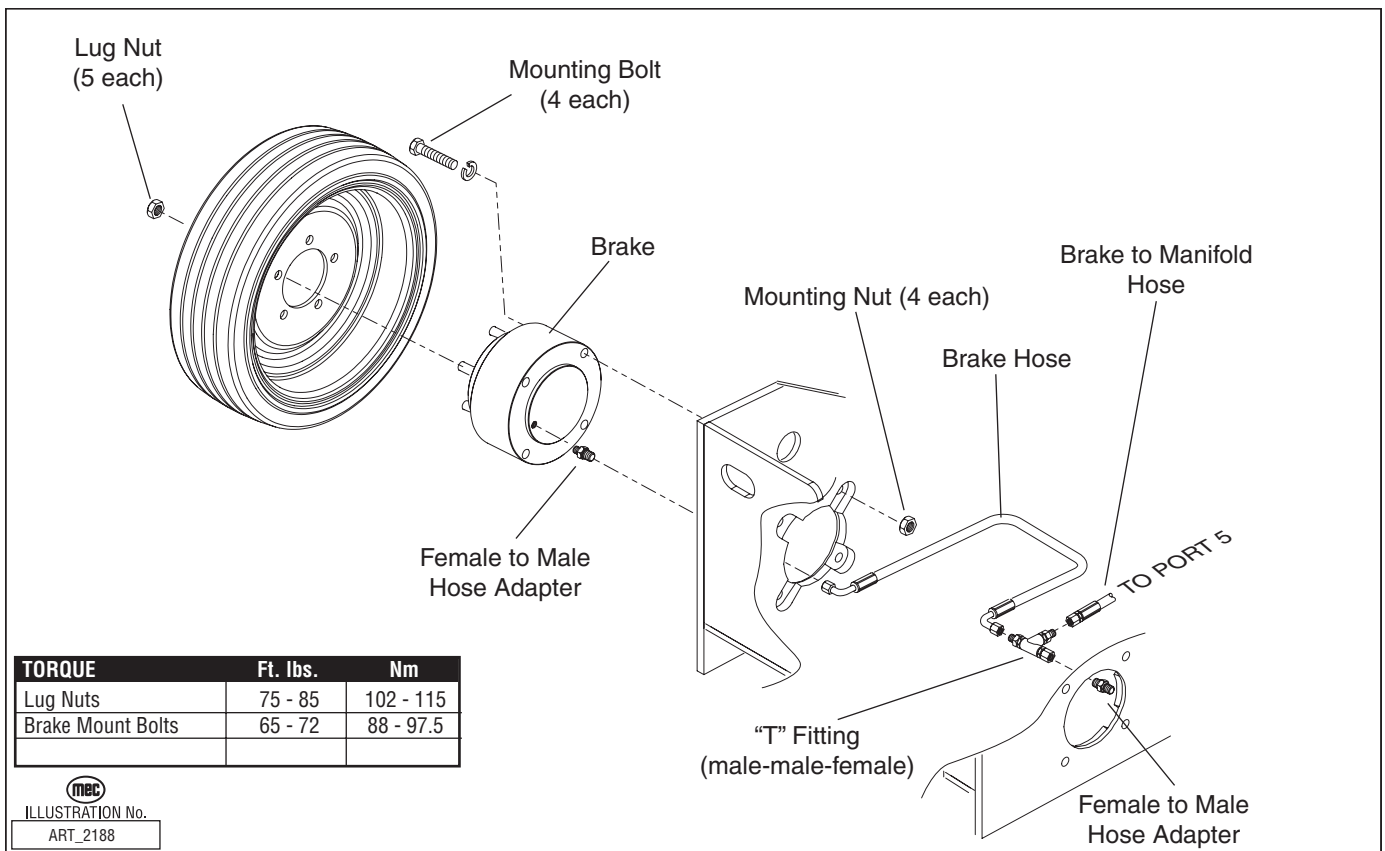
Refer to *Parts Section E* for brake kit.

### Remove

1. Raise and support the rear end of machine (see *Raising the Machine*).
2. Remove the wheel and tire assembly to access brake.
3. Disconnect hose assemblies from the brake.
4. Remove the cap screws and remove the brake from the housing.

### Replace

Installation is reverse of removal.



## Steer Cylinder

There is one (1) double acting type steer cylinder on this machine. During operation, cylinder should not leak, but a slight damping at the rod seal is acceptable. The pins should be checked for wear.

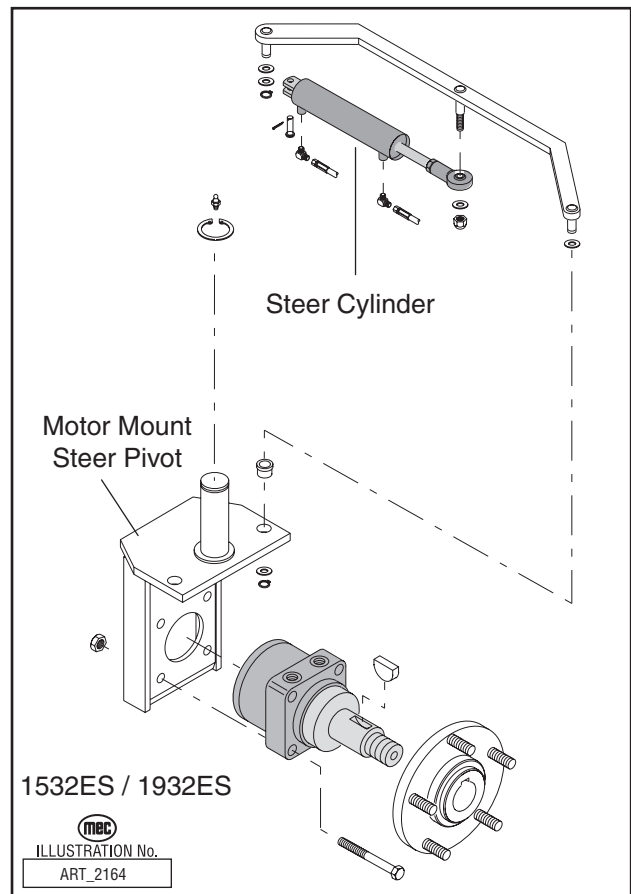
### To replace steer cylinder:

- CAUTION:**
- ◆ Clean all fittings before disconnecting hoses.
  - ◆ Tag hoses for proper reassembly.
  - ◆ Plug all openings to prevent contamination.

1. Raise and support the front end of machine (see *Raising the Machine*).
2. Disconnect hydraulic hoses and cap them.
3. Remove the pins and cotter pin holding the steer cylinder to the motor mounting bracket.
4. Remove the pin and cotter pin holding the steer cylinder to the steer axle cross member.
5. Carefully lift off the steer cylinder.
6. Position the new steer cylinder and install pin and cotter pin to hold cylinder to the steer axle cross member.
7. Install pin and cotter pin to hold cylinder to motor mounting bracket.
8. Connect hydraulic hoses.
9. To purge air from cylinder;
  - ◆ place a suitable container beneath the hose connections to catch spilled oil,
  - ◆ loosen hose fittings slightly,
  - ◆ actuate steer function,
  - ◆ when all air is purged, tighten hose connections.

### Steer Cylinder Seal Replacement

Refer to *Section 1* for seal replacement instructions.



## Pothole Circuit

The Pothole Depression Rails are raised and lowered mechanically. When the platform is elevated, the depression rails are pulled into position by spring tension. When the platform is lowered, the bottom fixed beam in the scissor stack presses downward on the pothole actuator and raises the depression rails.

### Repair:

1. Raise and support the scissor assembly using the maintenance lock.
2. Refer to the illustration and Section E of the Parts Manual.

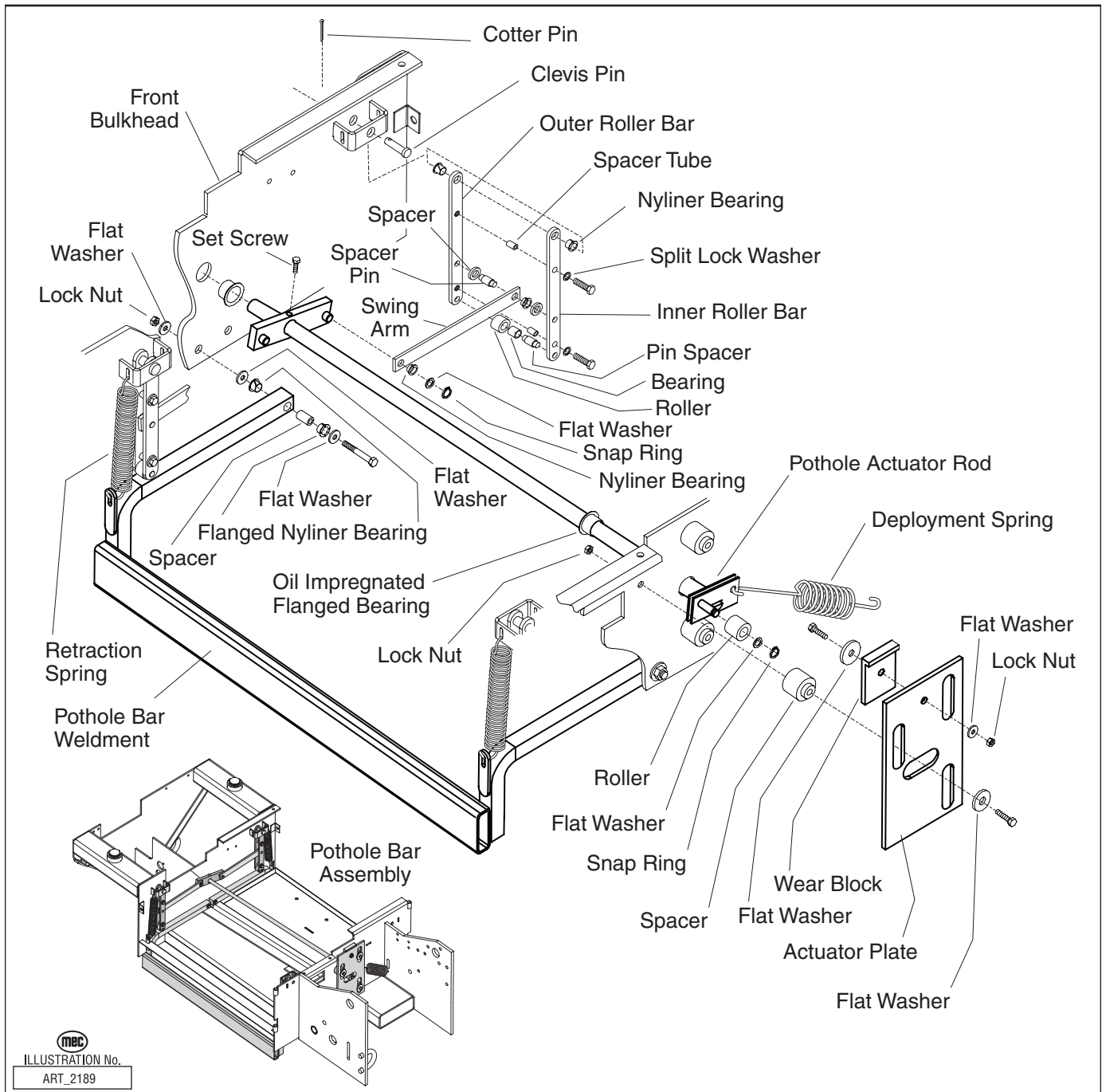
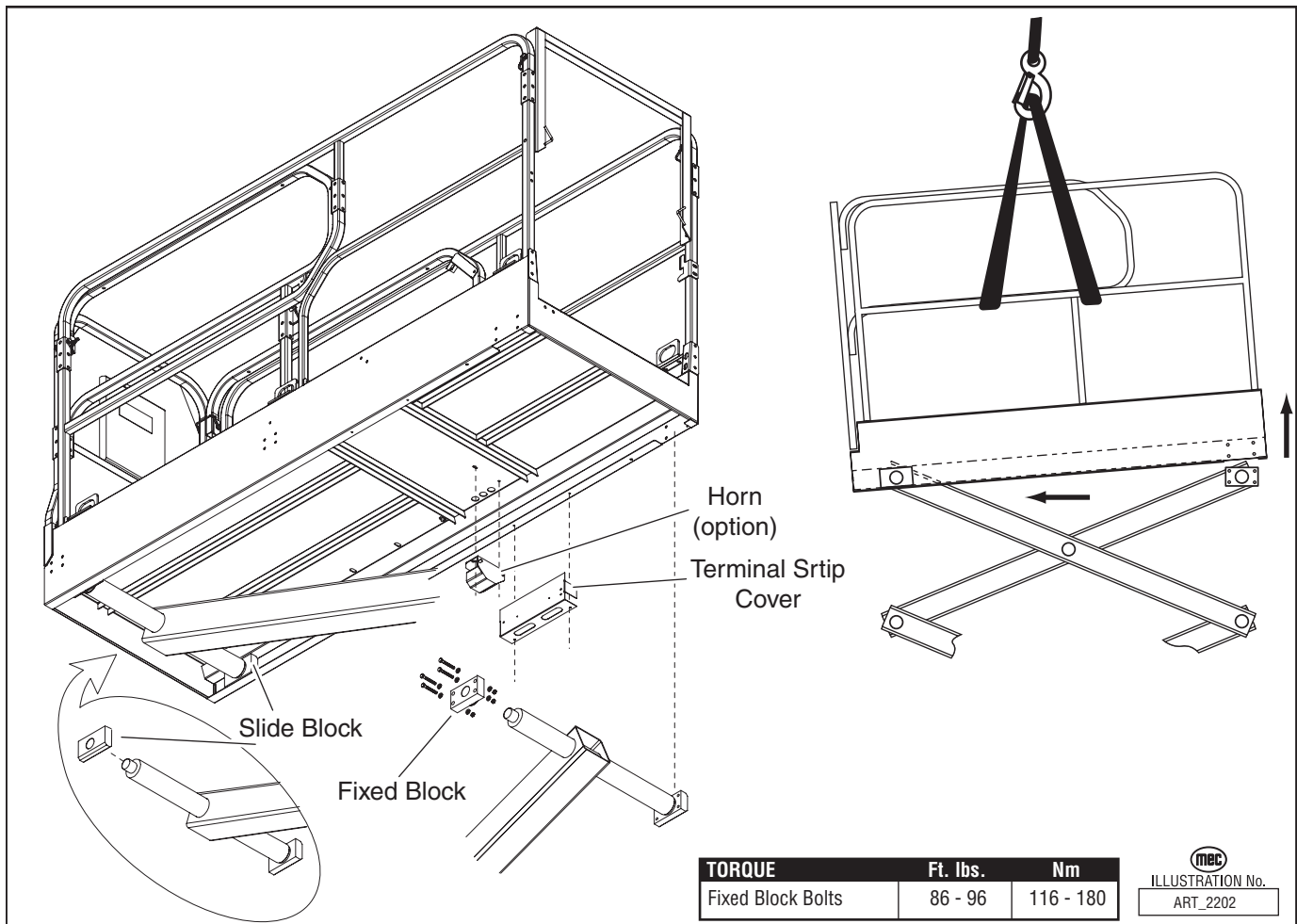


ILLUSTRATION No.  
ART\_2189



## Platform Removal

1. Raise platform and support with the maintenance lock (see *General Safety Tips*).
2. Connect overhead crane by appropriate lifting device to platform.
3. Remove the terminal strip cover and disconnect all platform wires. Remove any components that will obstruct the scissor slide path.
4. Remove the bolts from both fixed blocks at the rear of the platform.
5. Lift the rear of the platform until the fixed blocks are clear.
6. Slide the platform assembly forward until the slide blocks align with the slide track opening at the rear of the platform.
7. Remove the platform assembly.
8. Installation is reverse of removal.



## Lift Cylinder Removal and Installation

**Note:** Refer to *Section 1* for seal replacement instructions.  
Refer to *Parts Section C* for detailed parts list and illustration.

**CAUTION:**

- ◆ Clean all fittings before disconnecting hoses.
- ◆ Tag hoses for proper reassembly.
- ◆ Plug all openings to prevent contamination.

1. Raise the scissor arm assembly and support using the maintenance lock.
2. Remove the support beam.
  - ◆ Remove the upper and lower retaining rings.
  - ◆ Remove the upper and lower nylon washers.

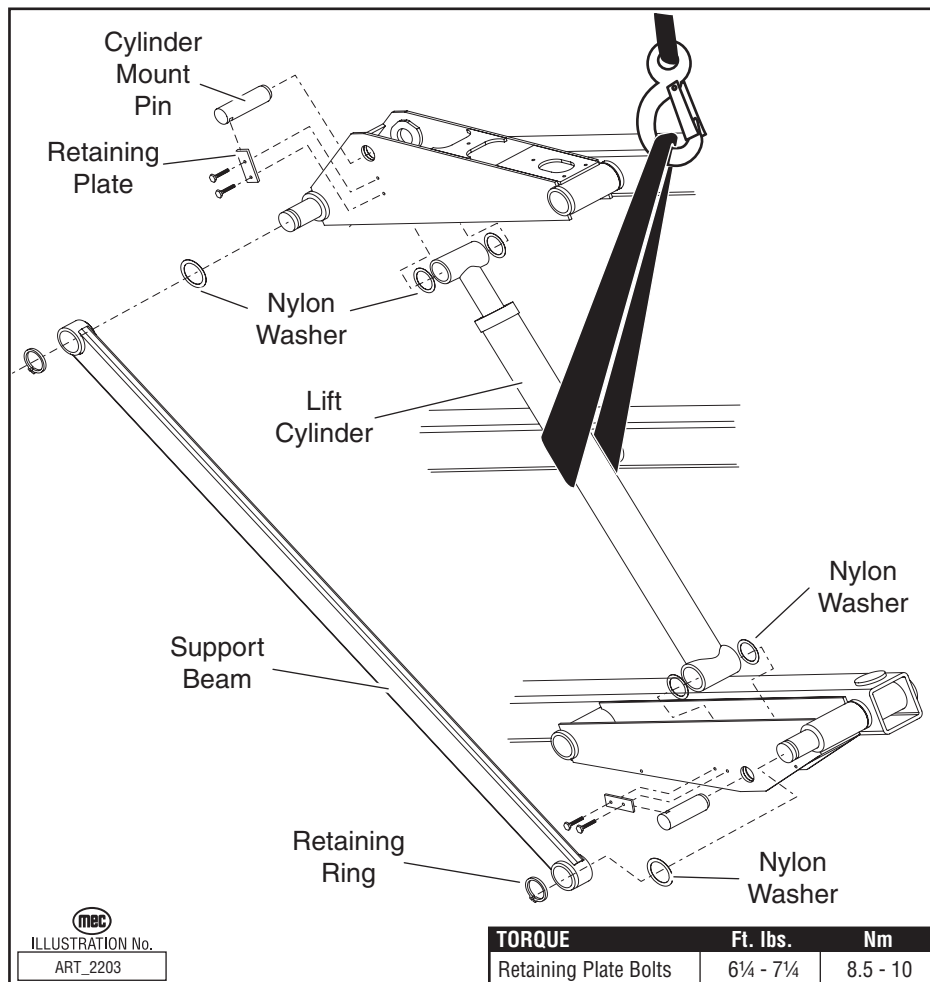
3. Disconnect hoses and wires and cables from the lift cylinder(s).
4. Use a suitable lifting device to support the lift cylinder.

**CAUTION:** **Attach the lifting device to the cylinder body.**  
Lifting by the rod end will cause the cylinder to extend.

5. Remove the upper retaining plate, cylinder mount pin, and two (2) nylon washers.
6. Remove the lower retaining plate.
7. While supporting the cylinder, carefully remove the cylinder mount pin and two (2) nylon washers.

**CAUTION:** The cylinder may shift suddenly when the pin is removed.

8. Lift the cylinder from the scissor assembly using a suitable lifting device.
9. Clean all parts before reassembly. Replace worn or damaged parts with new parts.
10. Installation is reverse of removal.



## Scissor Beam Assembly

**Note:** Refer to *Parts Section C* for detailed parts list and illustration.

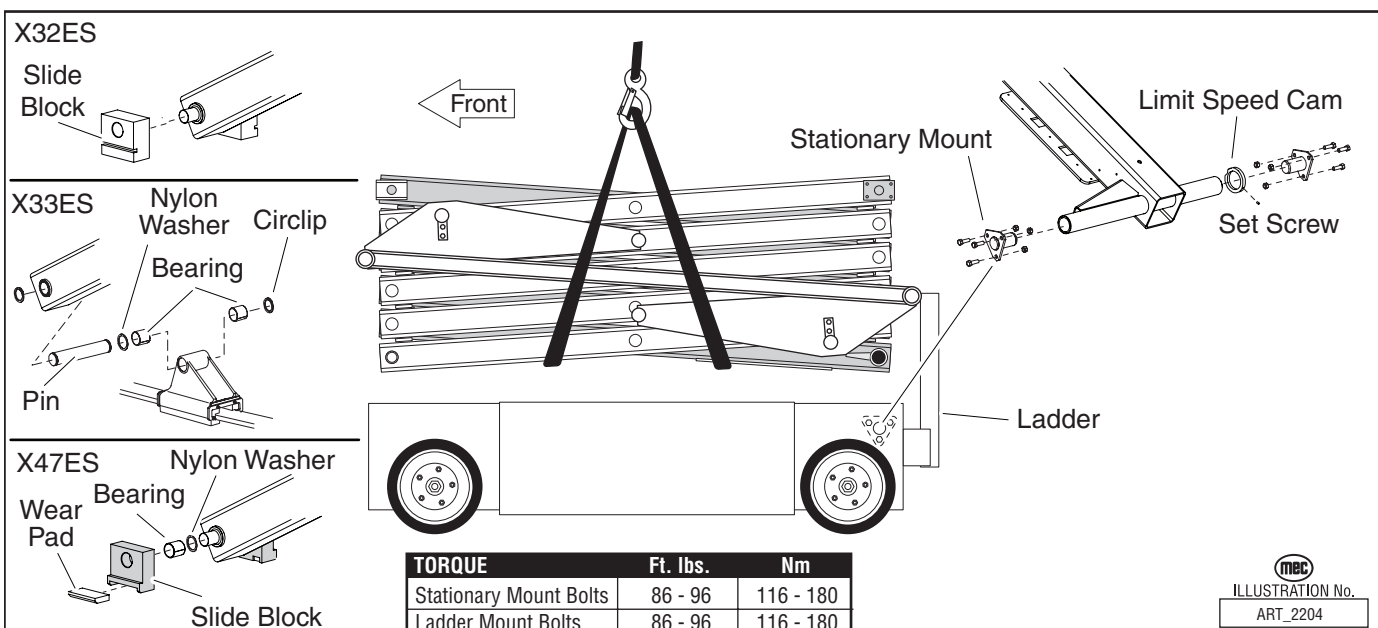
Clean the scissor assembly once a year or as necessary and inspect along the beam surfaces, especially the welds and brackets.

### Scissor Beam Removal

1. Remove the platform and ladder.
2. Attach a suitable lifting device to the scissor assembly.
3. Remove the stationary mounts.
4. Carefully lift until the rear of the scissor is clear and remove the limit speed cam.
5. Slide the scissor assembly to the rear until the slide block reaches the end of slide channel and lift the scissor assembly.

**CAUTION:** The scissor assembly may shift suddenly upon clearing the slide channel.

6. Remove slide blocks and wear pads.
7. Clean all parts before installation. Replace worn or damaged parts with new parts.
8. Installation is reverse of removal.





# SECTION 4: TROUBLESHOOTING

**General Troubleshooting Tips ..... 4-2**

**Hydraulic Pressure Adjustment Procedures ..... 4-4**

**Troubleshooting ..... 4-6**

**Sevcon Motor Speed Controller ..... 4-14**

    LED Diagnostics Definitions (Flash Codes) ..... 4-15

    Sevcon Motor Speed Controller - Connections ..... 4-17

**Troubleshooting Battery Charger ..... 4-19**



# GENERAL TROUBLESHOOTING TIPS

The ES series Aerial Work Platform operates on a "Motor Control" theory in which fluid flow volume is controlled by varying the speed of the DC electric motor. 100% of the fluid produced by the pump goes to the selected function.

The ES series is designed for easier troubleshooting. There is a terminal strip located under the platform for checking signals to and from upper controls. There is also an LED's located on the Motor Control Unit located inside the lower control box, that will help in the event the DC electric motor fails to operate (see Motor Controller Flash Codes in this section for troubleshooting with flash codes). It is important to note that not all failures will cause a flash code on the motor controller. Before you begin troubleshooting this model, check the battery state of charge and inspect the battery connections for looseness or corrosion. A fully charged battery set on a 24 V DC system will have a nominal voltage of 25.6 V DC.

Before investigating a malfunction, check the following items:

- ◆ Check that battery connections are secure and battery is fully charged.
- ◆ Check that the emergency stop button is released (UP/OUT position).
- ◆ Check that the hydraulic fluid is at the correct level.
- ◆ Check that the brake release valve is open.
- ◆ Check that the circuit breaker is in the ON position.

## Common Causes of Hydraulic System Malfunctions:

- ◆ Incompatible hydraulic fluids mixed, destroying the additives and causing varnish buildup, resulting in the valves sticking.
- ◆ Water in the hydraulic fluid due to a damp climate.
- ◆ Improper hydraulic fluid used. Viscosity too high in cold climates. Viscosity too low in warm climates.

**NOTES:** Contamination always causes failure in any hydraulic system. It is very important to be careful not to introduce any contamination into your hydraulic system during the assembly procedures. Make sure all ports and cavities of the manifold and cylinders are properly covered while other work is performed.

## Early Model vs. Current Model

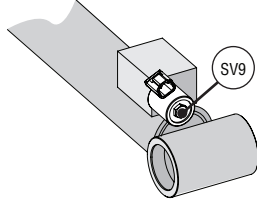
Current model hydraulics are modified in the following ways;

- ◆ Electrical components use Deutsch style connectors.
- ◆ The brake release hand pump is on the main manifold.
- ◆ Valve **CV1** is eliminated.
- ◆ Valve **SV7** is eliminated.
- ◆ Valve **SV8** is eliminated.
- ◆ Steering flow control valve **PFC1** and relief valve **RV3** are replaced by a single valve **FRR1**.

Refer to the accompanying illustrations when using the Troubleshooting Guide.

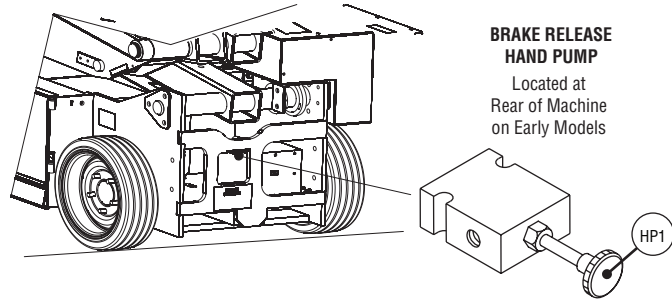


**LIFT CYLINDER**  
(All Models)

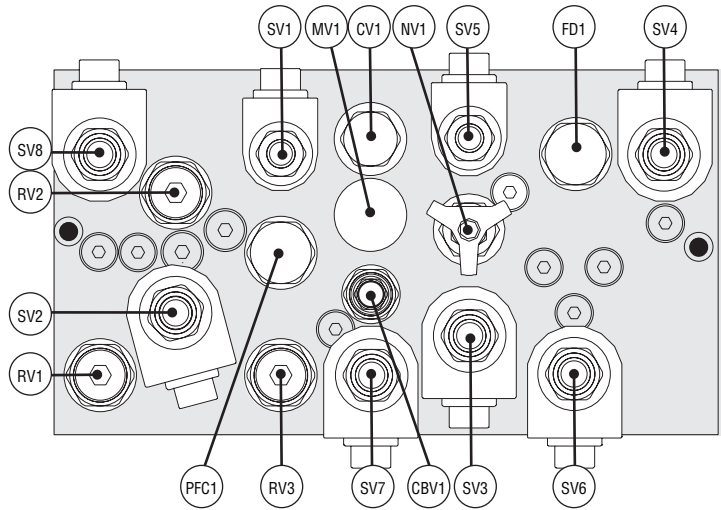
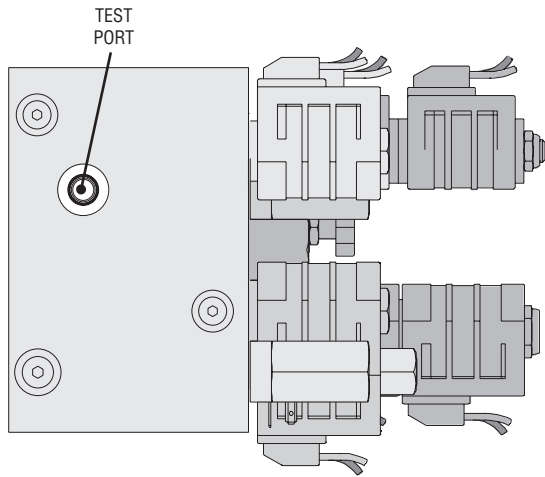


**BRAKE RELEASE  
HAND PUMP**

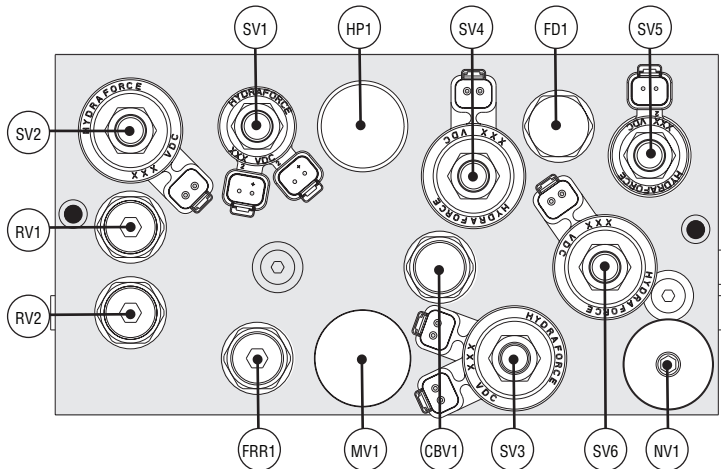
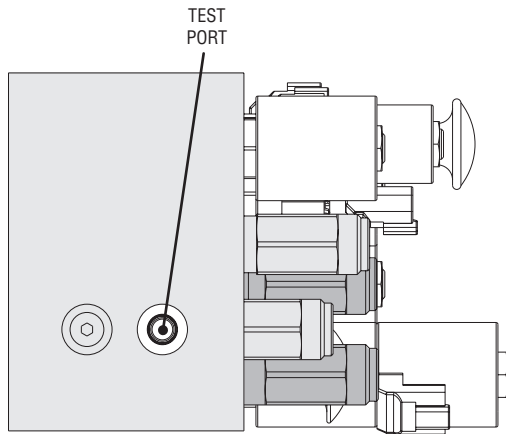
Located at  
Rear of Machine  
on Early Models



**MAIN MANIFOLD**  
(Early Models)



**MAIN MANIFOLD**  
(Current Models)



**mecc**  
ILLUSTRATION No.  
ART\_2245

Hydraulic Valve Locations, 1532ES - 1932ES



# HYDRAULIC PRESSURE ADJUSTMENT PROCEDURES

- ◆ Before attempting to check and/or adjust pressure relief valves, operate the machine for 15 minutes or long enough to sufficiently warm the hydraulic fluid.
- ◆ Insert a 0-3500 psi gauge onto the pressure test port on the valve manifold using gauge adapter fitting MEC part no. 8434.

## Pressure Adjustment Table

| MODEL  | MAIN             | LIFT             | STEER          | COUNTERBALANCE PRESSURE |
|--------|------------------|------------------|----------------|-------------------------|
| 1532ES | 2750PSI 190 bar  | 1900 PSI 131 bar | 850 PSI 59 bar | 550 PSI 38 bar          |
| 1932ES | 2750 PSI 190 bar | 2600 PSI 180 bar | 850 PSI 59 bar | 550 PSI 38 bar          |

## Check and Adjust Pressure (except counterbalance)

If adjustment is required, set pressure to the correct setting as follows:

- ◆ Connect pressure gauge (0-3500 psi) with a female quick disconnect to the main test port.

### Main/System

- ◆ Disconnect forward or reverse coil of drive valve.
- ◆ Energize drive function by moving joystick (lever) in the direction of the already disconnected coil.
- ◆ Hold the switch for 10 seconds to get an accurate reading on the pressure gauge.

### Lift

- ◆ Energize the platform to full extension with **no load on platform**.
- ◆ Hold the switch for 10 seconds to get an accurate reading on the pressure gauge.

### Steering

- ◆ Energize the steering to full left.
- ◆ Hold the switch for 10 seconds to get an accurate reading on the pressure gauge.

## Early Models

Early models do not have a tamper proof cap.

- ◆ Turn adjustment screw "IN" to increase the pressure.
- ◆ Turn adjustment screw "OUT" to decrease the pressure.

## Current Models

- ◆ Remove the tamper proof cap.
- ◆ Turn adjustment screw "IN" to increase the pressure.
- ◆ Turn adjustment screw "OUT" to decrease the pressure.
- ◆ When correct pressure is obtained replace tamper proof cap with a new one.

**CAUTION: Do not operate pump with tamper proof cap removed as fluid will emit under pressure.**

## Setting Counterbalance Valves

- ◆ Before attempting to check and/or adjust counterbalance valves, operate the machine for 15 minutes or long enough to sufficiently warm the hydraulic fluid.
- ◆ Insert a 0-1000 psi gauge onto the pressure test port on the valve manifold using gauge adapter fitting MEC part no. 8434.

## Check and Adjust Pressure (counterbalance)

If adjustment is required, set pressure to the correct setting as follows:

- ◆ Open the freewheel valve (NV1) completely.
- ◆ Operate drive in either direction.
- ◆ Hold the switch for 10 seconds to get an accurate reading on the pressure gauge.

### Early Models

- ◆ Loosen the jamnut.
- ◆ Turn “counterclockwise” to increase the pressure.
- ◆ Turn “clockwise” to decrease the pressure.

### Current Models

- ◆ Using pliers or other gripping tool, **carefully** remove the tamper proof cap.
- ◆ Turn adjustment screw “IN” to increase the pressure.
- ◆ Turn adjustment screw “OUT” to decrease the pressure.
- ◆ When correct pressure is obtained replace tamper proof cap with a new one.

# TROUBLESHOOTING

| PROBLEM  | POSSIBLE CAUSE   | REMEDY/SOLUTION   |
|--|--|---|
| <b>GENERAL LOSS OF POWER</b>                                     |  |   |
| <b>No operation from upper or lower control station</b>          | Main battery switch turned off   | Located on of lower control box   |
|  | Emergency switch pushed in or Base-Platform switch turned off                | Pull upper and lower emergency stop switches to initiate power  |
|  | Circuit breaker tripped  | Check for short circuits and Reset<br>Located in lower control box panel                                  |
|  | Damaged upper control box harness  | Inspect from harness plug to terminal strip under platform  |
|  | Batteries discharged   | Look for a 7 or 9 flash code while attempting function. Check battery voltage under load                  |
|  | Check for motor controller flash codes                                       | See "Sevcon Motor Speed Controller" in this section for troubleshooting flash codes                       |
| <b>Functions from lower controls but not from upper controls</b> | Upper Emergency Stop switch pushed in  | Pull upper emergency stop switch  |
|  | Interlock switch (joystick)  | check power to red wire (power to switch) and power to purple wire (power out of switch) at joystick plug |
|  | Damaged harnesses  | Check scissor and upper box harness for damage  |
| <b>LIFT</b>  |  |   |
| <b>Partial or intermittent lift from either control station</b>  | Low battery voltage, at 18 volts operating                                   | Lift will stop, a 9-flash code will be displayed on the motor controller while attempting to lift         |
|  | Platform overloaded  | Check platform load and compare with posted Maximum Weight labels, reduce load                            |
|  | Lift relief valve RV1 out of adjustment                                      | Adjust relief valve to rated capacity   |
|  | Lowering valve SV9 pulled out or emergency down cable (if equipped) sticking | Inspect lowering valve, located on lift cylinder<br>Check cable adjustment/operation (if equipped)        |
|  | 6- flash code at motor controller  | Test potentiometer POT1 for open circuit<br>Located in upper control box, replace                         |

Troubleshooting (continued)

| PROBLEM   | POSSIBLE CAUSE                           | REMEDY/SOLUTION  |
|---|--|--|
| <b>LIFT (CONTINUED)</b>   |  |  |
| <b>No lift from either control station - Pump motor runs</b>                                | Lift Valve SV2 not energized             | Check lift circuit on wire # 4 from control box to lift valve SV2  |
|   | Main system pressure inadequate          | Check main relief RV2 adjustmnt, Check pump output pressure using a flow meter   |
| <b>No lift from either control station - Pump motor NOT operating while attempting lift</b> | Micro-switch S7 inoperative              | Check operation of micro-switch located in upper control box on joystick   |
|   | Mode Selector Switch S6 faulty           | Check power through S6 on wire 10  |
|   | Damaged wiring or poor plug connection   | Check wire 10 through plug connections from upper control box to Diode Board   |
|   | Failed diode in diode board              | Test diodes on diode board, replace diode board  |
| <b>LOWER</b>  |  |  |
| <b>Platform will not lower</b>  | Maintenance lock in maintenance position | Elevate platform slightly and return maintenance lock to the stowed position   |
|   | Lowering valve/s not energized SV9 (SV8) | Check lowering circuit wire # 5 from control box to lowering valve, located on lift cylinder<br>On earlier units, check valve SV8 also |
|   | Lowering valve/s not shifting            | Clean debris, replace  |
|   | Lowering orifice ORF3 plugged            | Clean orifice - located under fitting at lift cylinder   |
| <b>Emergency lowering not working</b>   | E-down cable frayed (later models only)  | replace e-down cable   |
|   | Lowering valve not shifting              | Clean debris, replace  |



Troubleshooting (continued)

| PROBLEM   | POSSIBLE CAUSE   | REMEDY/SOLUTION   |
|---|--|---|
| <b>DRIVE</b>  |  |   |
| <p><b>No drive either direction</b><br/> <b>Pump motor runs while attempting to drive</b><br/> <b>LOW pressure indicated at Test Port TP-1</b></p>  | <p>Freewheel Valve NV1 open</p> <p>Brake valve SV5 not shifting</p><br><p>Brake valve SV5 not shifting -no power on wire 19</p>  | <p>Turn counter-clockwise to close</p> <p>Check power to SV5<br/> Remove SV5 and check for contamination<br/> Replace SV5</p> <p>Check power back to diode board term 3</p>   |
| <p><b>No drive either direction</b><br/> <b>Pump motor runs while attempting to drive</b><br/> <b>HIGH pressure indicated at Test Port TP-1</b></p> | <p>Drive valve SV3 not shifting</p><br><p>Drive valve SV3 not shifting - no ground to valve coils on wire # 151</p> <p>Counterbalance Valve CBV1 failure</p>   | <p>Check power to SV3<br/> Remove SV3 and check for contamination<br/> Replace SV3</p> <p>Check Limit Switch LS1 for sticking or failure<br/> Loosen up with lubricant<br/> Replace</p> <p>Replace CBV1</p>   |
| <p><b>Reduced, slow or sluggish drive either direction</b></p> <p><b>Torque switch OFF</b></p>  | <p>Freewheel Valve NV1 partially open</p> <p>Torque valve/s SV4 &amp; or SV6 sticking</p> <p>Decel valve SV7 inoperative - earlier units only</p><br><p>One or both Wheel motors WM1 &amp; WM2 internal bi-pass</p> <p>Limit Switch LS1 inoperative</p> <p>6- flash code at motor controller</p> | <p>Turn counter-clockwise to close</p><br><p>Inspect torque valves SV4 &amp; SV6, replace</p><br><p>Check for power to SV7 while driving<br/> Check valve for contamination<br/> Replace valve</p><br><p>Test wheel motors<br/> Replace wheel motors</p><br><p>Check power on wire 22 and 2 in limit switch with platform below 6 feet.</p><br><p>Test potentiometer POT1 for open circuit<br/> Located in upper control box<br/> Replace</p> |
| <p><b>Reduced, slow or sluggish drive either direction</b><br/> <b>Torque switch ON</b></p>   | <p>One Torque valve SV4 or SV6 not shifting</p><br><p>One or both Wheel motors WM1 &amp; WM2 internal bi-pass</p>  | <p>Check voltage on wire #13 while driving<br/> Check valves for contamination, replace SV4 or SV6</p><br><p>Test wheel motors<br/> Replace wheel motors</p>  |



Troubleshooting (continued)

| PROBLEM   | POSSIBLE CAUSE  | REMEDY/SOLUTION  |
|---|---|--|
| <b>DRIVE (CONTINUED)</b>  |   |  |
| <p><b>No Drive in REVERSE only Pump motor NOT operating while attempting to drive</b></p> | <p>Micro-switch S7 inoperative</p> <p>Mode Selector Switch S6 faulty</p> <p>Damaged wiring or poor plug connection</p> <p>Failed diode in diode board</p> | <p>Check operation of micro-switch<br/>Located in upper control box on joystick</p> <p>Check power through S6 on wire 10</p> <p>Check wire 10 through plug connections from upper control box to Diode Board</p> <p>Test diodes on diode board<br/>Replace diode board</p> |
| <p><b>No Drive in FORWARD only Pump motor NOT operating while attempting to drive</b></p> | <p>Micro-switch S8 inoperative</p> <p>Mode Selector Switch S6 faulty</p> <p>Damaged wiring or poor plug connection</p> <p>Failed diode in diode board</p> | <p>Check operation of micro-switch<br/>Located in upper control box on joystick</p> <p>Check power through S6 on wire 11</p> <p>Check wire 11 through plug connections from upper control box to Diode Board</p> <p>Test diodes on diode board<br/>Replace diode board</p> |
| <p><b>No Drive in REVERSE only Pump motor OPERATES while attempting to drive</b></p>      | <p>Drive valve SV3 not shifting</p>   | <p>Check power to SV3, remove SV3<br/>Check for contamination<br/>Replace SV3</p>  |
| <p><b>No Drive in FORWARD only Pump motor OPERATES while attempting to drive</b></p>      | <p>Drive valve SV3 not shifting</p>   | <p>Check power to SV3, remove SV3<br/>Check for contamination<br/>Replace SV3</p>  |
| <p><b>Drives in one direction regardless of direction operated</b></p>                    | <p>Drive valve SV3 sticking</p> <p>Drive valve SV3 powered in one direction</p>   | <p>Check SV3 for contamination<br/>Replace SV3</p> <p>Short in wiring, faulty diode board</p>  |



Troubleshooting (continued)

| PROBLEM   | POSSIBLE CAUSE  | REMEDY/SOLUTION   |
|---|---|---|
| <b>DRIVE (CONTINUED)</b>  |   |   |
| <b>No Drive above limit switch<br/>HIGH pressure indicated at Test Port TP-1</b>            | Pothole system not deployed<br><br>Pothole limit switch/s LS2 & LS3 inoperative   | Clear debris from under pothole bars<br>Check pothole linkage operation<br><br>Check switch/s for presence of Ground on wire 151 when pothole bars completely deployed  |
| <b>No Drive above limit switch<br/>LOW pressure indicated at Test Port TP-1</b>             | Decel valve SV7 inoperative - earlier units only<br><br>Pump output reduced due to wear                                       | Check for power to SV7 while driving<br>Check valve for contamination<br>Replace valve<br><br>Test pump with a flow meter<br>Replace  |
| <b>Speed uncontrollable while descending a hill</b>   | Counterbalance Valve CBV1 out of adjustment   | See " <i>Setting Counterbalance Valves</i> " in this section<br>Replace valve   |
| <b>STEER</b>  |   |   |
| <b>No Steer<br/>Either direction<br/>Pump motor OPERATES while attempting to steer</b>      | Steer valve SV1 not shifting<br><br>Steering linkage binding<br><br>No power to SV1<br><br>Steering Cylinder internal failure | Check power to SV1, remove SV1 and check for contamination<br>Replace SV1<br><br>Inspect - lube linkage, replace as necessary<br><br>Check for broken wires between lower control box and SV1 valve<br><br>Inspect, replace seals |
| <b>No Steer<br/>Either direction<br/>Pump motor NOT operating while attempting to steer</b> | Selector switch S6 inoperative<br><br>Broken wire in joystick   | Check for power on wire 3 and 3a when steer attempted<br><br>Check for broken Blue wire in joystick handle  |
| <b>No Steer<br/>Right only<br/>Pump motor NOT operating while attempting to steer</b>       | Micro-switch S4 inoperative<br><br>Damaged wiring or poor plug connection<br><br>Failed diode in diode board                  | Check operation of micro-switch located in upper control box in joystick handle<br><br>Check wire 7 through plug connections from upper control box to Diode Board<br><br>Test diodes on diode board<br>Replace diode board       |

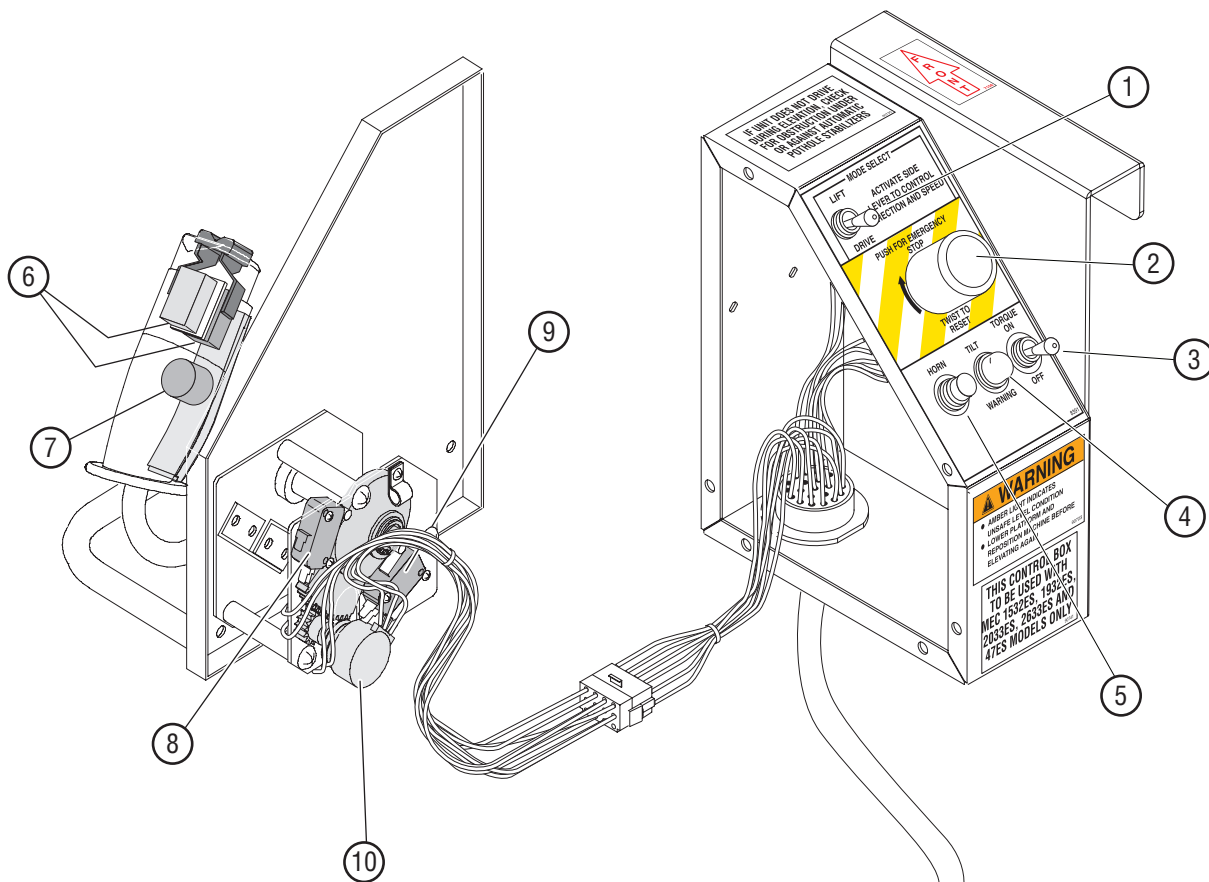




Troubleshooting (continued)

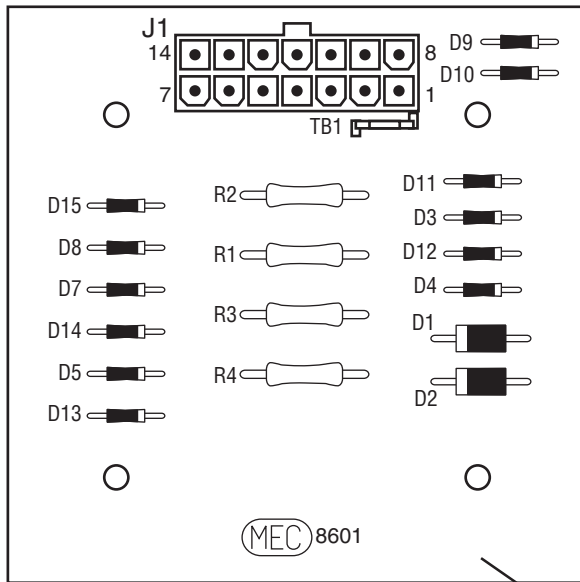
| PROBLEM   | POSSIBLE CAUSE  | REMEDY/SOLUTION   |
|---|---|---|
| <b>DRIVE (CONTINUED)</b>  |   |   |
| <p><b>No Steer<br/>Left only<br/>Pump motor<br/>NOT operating<br/>while<br/>attempting to<br/>steer</b></p> | <p>Micro-switch S5 inoperative</p> <p>Damaged wiring or poor plug connection</p> <p>Failed diode in diode board</p> | <p>Check operation of micro-switch located in uppercontrol box in joystick handle</p> <p>Check wire 8 through plug connections from upper control box to Diode Board</p> <p>Test diodes on diode board</p> <p>Replace diode board</p> |
| <p><b>No Steer<br/>Right only<br/>Pump motor<br/>OPERATES<br/>while<br/>attempting to<br/>steer</b></p>     | <p>Steer valve SV1 not shifting</p> <p>Steering linkage binding</p> <p>Steering Cylinder internal seal failure</p>  | <p>Check power to SV1</p> <p>Remove SV1 and check for contamination</p> <p>Replace SV1</p> <p>Inspect - lube linkage, replace as necessary</p> <p>Inspect, replace seals</p>  |
| <p><b>No Steer<br/>Left only<br/>Pump motor<br/>OPERATES<br/>while<br/>attempting to<br/>steer</b></p>      | <p>Steer valve SV1 not shifting</p> <p>Steering linkage binding</p> <p>Steering Cylinder internal seal failure</p>  | <p>Check power to SV1</p> <p>Remove SV1 and check for contamination</p> <p>Replace SV1</p> <p>Inspect - lube linkage, replace as necessary</p> <p>Inspect, replace seals</p>  |
| <p><b>Drives in one<br/>direction<br/>regardless of<br/>direction<br/>request</b></p>                       | <p>Steer valve SV1 sticking</p> <p>Drive valve SV1 powered in one direction</p>                                     | <p>Inspect SV1 valve for debris</p> <p>Replace SV1</p> <p>Short in wiring, faulty diode board.</p>  |





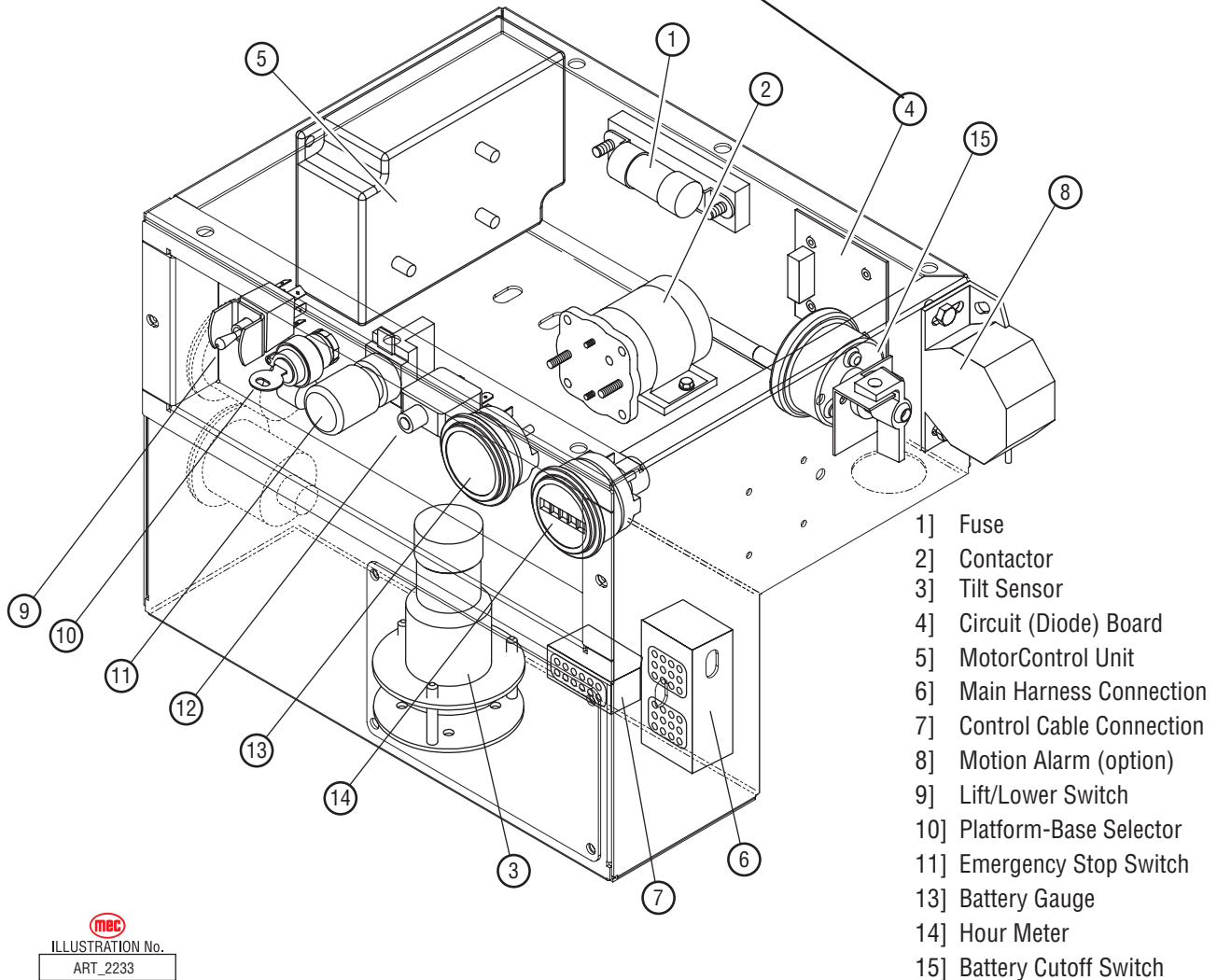
- 1] Lift/Drive Selector Switch
- 2] Emergency Stop Switch
- 3] Torque Switch
- 4] Tilt Warning Light
- 5] Horn Button (option)
- 6] Steering Micro-Switches
- 7] Drive Enable Switch
- 8] Reverse/Down Rocker Switch
- 9] Forward/Up Rocker Switch
- 10] Potentiometer
- 11] Terminal Strip

  
 ILLUSTRATION No.  
 ART\_2234



| J1 Plug Pin Identification |        |        |  |
|----------------------------|--------|--------|--|
| PIN #                      | WIRE # | SIGNAL | FUNCTION                                       |
| 1                          | 10     | INPUT  | Drive Reverse                                  |
| 2                          | 11     | INPUT  | Drive Forward                                  |
| 3                          | 19     | OUTPUT | Brake, Decel Valve signal                      |
| 4                          | 8      | INPUT  | Steer Left                                     |
| 5                          | 18     | OUTPUT | Steer signal to Sevcon                         |
| 6                          | 5      | INPUT  | Down signal                                    |
| 7                          | 20     | OUTPUT | Signal to Motion Alarm(s) (optional)           |
| 8                          | 17     | OUTPUT | Sevcon & Hour Meter (motor function requested) |
| 9                          | 15     | INPUT  | Battery Negative                               |
| 10                         | 7      | INPUT  | Steer Right                                    |
| 11                         | 4      | INPUT  | Lift Up  |
| 12                         | 2      | INPUT  | Limit Switch (24V = platform down)             |
| 13                         | 3      | OUTPUT | Enable, from lower Lift switch                 |
| 14                         | 21     | OUTPUT | To Sevcon (for speed cutback)                  |

MEC  
ILLUSTRATION No.  
ART\_2181



MEC  
ILLUSTRATION No.  
ART\_2233



# SEVCON MOTOR SPEED CONTROLLER


The Sevcon Motor Speed Controller (MC-1) is a microprocessor designed with the express purpose of operating the D/C electric motor at varying speeds. The controller uses Pulse-Width Modulation (PWM) technology on the Ground side of the motor to control motor speed. Out of concern for operator safety and to prevent short-circuiting, the Controller monitors certain circuits for potential abnormalities. When the controller senses a problem it errs to the side of safety and stops all motor operation. The green LED will flash a code indicating the reason for the shutdown.

Refer to the *LED Diagnostics Definitions* and *Sevcon Motor Speed Controller - Connections* on the following pages.

The diagram shows the Sevcon Motor Speed Controller (MC-1) with terminal connections for B+, B-, and M2. A green LED is located between the B+ and B- terminals. Below the main unit, a J5 plug is shown with pins 1, 6, 7, and 12 labeled. Lines connect the B+, B-, and M2 terminals to the 'Cable Connection Identification' table, and the J5 plug to the 'J5 Plug Pin Identification' table.

| Cable Connection Identification |  |
|---------------------------------|--|
| B+                              | Battery Positive Cable from 250 AMP Fuse                             |
| B-                              | Negative Battery Cable and GROUND wire (15) connection               |
| M2                              | Motor Ground<br>(Pulse-Width Modulated [PWM] variable speed control) |

| J5 Plug Pin Identification |        |   |
|----------------------------|--------|---|
| PIN #                      | WIRE # | FUNCTION  |
| 1                          | 22     | B+ power input<br>(power up)  |
| 2                          | 17     | Lift, Drive or Steer functions input<br>(functions requiring motor)       |
| 3                          | 18     | Steer Requested<br>(adds additional motor speed for steer)                |
| 4                          | 3      | Enable Switch signal input  |
| 5                          | 21     | Speed cut-back<br>(24 Volts = full speed, 0 Volts = creep speed)          |
| 6                          | 16     | Motor Start Relay signal<br>(GROUND signal to activate Motor Start Relay) |
| 7                          | 41     | Lift Valve B-<br>(provides GROUND signal to Lift Valve)                   |
| 8                          | none   | none  |
| 9                          | 14     | Accelerator reference signal<br>(3.6 Volts to Potentiometer)              |
| 10                         | none   | none  |
| 11                         | none   | none  |
| 12                         | none   | none  |

  
 ILLUSTRATION No.  
 ART\_2182

## LED Diagnostics Definitions (Flash Codes)

| LED READING          | DIAGNOSIS   |
|----------------------|---|
| <b>LED Steady On</b> | Controller is operational and detects no irregularities on monitored circuits.  |
| <b>LED Off</b>       | <p><b>No power-up</b></p> <ul style="list-style-type: none"> <li>• No power to pin # 1</li> <li>• No ground to B- post</li> <li>• LED failure or internal controller fault</li> </ul>   |
| <b>2 Flashes</b>     | <p><b>Procedure fault.</b></p> <ul style="list-style-type: none"> <li>• Enable depressed at power up</li> <li>• Enable depressed for more then 15 seconds without function request</li> <li>• No signal on wire 17 pin # 2 when function requested</li> <li>• No B- to diode board</li> <li>• Failed diode/s</li> <li>• Damaged wire harness</li> <li>• Internal controller fault</li> </ul>  |
| <b>3 Flashes</b>     | <p><b>Motor circuit low.</b></p> <p>Set with unit at rest and is the result of the voltage at M-2 dropping to approximately 4 volts or lower. Possible causes:</p> <ul style="list-style-type: none"> <li>• Short to ground in the motor circuit between the motor contactor and the M-2 terminal</li> </ul>  |
| <b>4 Flashes</b>     | <p><b>Motor circuit high.</b></p> <p>Set with the unit at rest and is the result of the voltage at M-2 terminal rising above 21 volts. Possible causes:</p> <ul style="list-style-type: none"> <li>• Motor contactor points are welded shut</li> </ul>  |
| <b>5 Flashes</b>     | <p><b>Motor contactor circuit open.</b></p> <p>Set when a function is requested but no current can flow through the motor circuit to the M-2 terminal. Possible causes:</p> <ul style="list-style-type: none"> <li>• Blown 200 amp fuse</li> <li>• Malfunctioning motor contactor</li> <li>• Worn motor brushes</li> <li>• Incomplete circuit to the Sevcon pin #6</li> </ul> <p>If the motor and contactor circuits are diagnosed as working properly:</p> <ul style="list-style-type: none"> <li>• Sevcon internal fault</li> </ul> |

continued...

## LED Diagnostics Definitions (continued)

| LED READING      | DIAGNOSIS  |
|------------------|--|
| <b>6 Flashes</b> | <p><b>Accelerator fault.</b><br/>Set with unit at rest, a 6 flash will result in an 80% cutback of motor speed. The Accelerator is the proportional control circuitry for the Sevcon. It works in conjunction with the potentiometer located in the upper control box, which is connected to the joystick handle through a gear arrangement.</p> <p><b>Measure voltage at terminals 14 and 15 on the platform terminal strip or at the potentiometer plug connection.</b></p> <ul style="list-style-type: none"><li>• With the joystick handle in neutral, 3.6 volts should be measured on the accelerator circuit (wire #14)</li><li>• Voltage proportionally decreases with the travel of the joystick, with 0 volts at full stroke</li><li>• With the joystick centered, voltages lower than 3.1 or higher than 3.9 will trigger a (6 flash) code</li></ul> |
| <b>7 Flashes</b> | <p><b>Battery voltage fault.</b></p> <ul style="list-style-type: none"><li>• This includes battery voltage below 12 volts or above 45 volts as measured on pin #1</li><li>• This code will disable all functions</li></ul>   |
| <b>8 Flashes</b> | <p><b>Thermal cutback.</b></p> <ul style="list-style-type: none"><li>• Sevcon internal temperatures above 176 degrees F</li><li>• Will limit motor speed in comparison with over temperature</li><li>• Resets when cooled</li></ul>  |
| <b>9 Flashes</b> | <p><b>Battery voltage at or below 18 volts</b></p> <ul style="list-style-type: none"><li>• As measured on pin #1</li><li>• This code will interrupt or prevent lift function but will allow drive and steer functions</li></ul> <p>When lift is interrupted due to a 9 flash, the electric motor will still run.</p>   |

## Sevcon Motor Speed Controller - Connections

The following two pages describe the connections to the Sevcon Motor Speed Controller with a brief description of their function and the voltage measurements under normal conditions.

**Important: Batteries must be fully charged before troubleshooting!**

**A fully charged battery set on a 24 V DC system will have a nominal voltage of 25.6 V DC**

| FUNCTION   | VOLTAGE READING   |
|--|---|
| <b>PIN 1 – WIRE 22</b> (WIRE 9 ON EARLY UNITS)                 |   |
| <b>Battery Positive Input</b>                                  | Switched<br><b>5% less than battery voltage</b> <ul style="list-style-type: none"> <li>• Controller power-up and reference point for battery state-of-charge</li> <li>• Green LED indicates controller power-up</li> <li>• Power travels through the upper emergency-stop switch with upper controls selected</li> <li>• 7-Flash code and 9-flash code indicate low voltage at this terminal</li> </ul> |
| <b>Pin 2 Wire 17</b>   |   |
| <b>Lift, Drive or Steer functions requested</b>                | Motorized function is requested<br><b>15%-18% less than battery voltage</b> <ul style="list-style-type: none"> <li>• Controller begins the motor run sequence with this signal but still requires a signal on pin 4 and a change on pin 9 before the motor will operate</li> </ul>  |
| <b>Pin 3 Wire 18</b>   |   |
| <b>Steer Function Requested</b>                                | When steering is operated<br><b>15%-18% less than battery voltage</b> <ul style="list-style-type: none"> <li>• Adds motor speed to compensate for addition of steer requirement during drive operation</li> <li>• Provides a minimum motor speed for steer requirement when only steer is operated</li> </ul>   |
| <b>Pin 4 Wire 3</b>  |   |
| <b>Enable signal input</b>                                     | When joystick trigger pulled<br><b>5% less than battery voltage.</b> <ul style="list-style-type: none"> <li>• Motor will not start without this input</li> <li>• A signal here longer then 15 seconds without a signal on pin-2 or pin-3 will result in a 2-flash code failure</li> </ul>   |
| <b>Pin 5 Wire 21</b>   |   |
| <b>Speed cut-back signal from limit switch or Lift circuit</b> | Full speed: <b>24 V DC</b><br>Creep speed: <b>0 V DC.</b> <ul style="list-style-type: none"> <li>• Speed cut-back is the elevated drive speed</li> </ul>  |



Sevcon Motor Speed Controller - Connections (continued)

| FUNCTION   | VOLTAGE READING  |
|--|--|
| <b>PIN 6 – WIRE 16</b>   |  |
| <b>Motor Start Relay ground signal</b>                                       | <p>Idle: <b>24 V DC</b></p> <p>When function requested: <b>0 V DC</b></p> <ul style="list-style-type: none"> <li>• This is how the Controller maintains control over the motor circuit</li> <li>• Sevcon controls the Motor Start Relay function ground signal</li> <li>• Will not operate the motor start relay when 2, 3, 4 &amp; 7 flash codes occur</li> </ul>   |
| <b>PIN 7 – WIRE 41</b>   |  |
| <b>Ground signal to Lift solenoid valve</b>                                  | <p><b>0 volts</b></p> <p>No ground presence until lift is requested</p> <ul style="list-style-type: none"> <li>• By providing the ground signal, lift function can be prevented anytime battery voltage falls below 18 volts. This will result in a 9 flash code</li> </ul>  |
| <b>PIN 9 – WIRE 14</b>   |  |
| <b>Accelerator reference signal to the potentiometer (upper control box)</b> | <p>From <b>3.5 V DC</b> with joystick in the neutral to <b>0 V DC</b> at full stroke</p> <ul style="list-style-type: none"> <li>• Controller uses this circuit to monitor joystick input after pins 2 &amp; 4 energize</li> <li>• Controls motor speed in reference to the voltage on this circuit</li> <li>• Voltages above 4.0 V DC or below 3.0 V DC will result in a 6 flash code</li> </ul>                                       |
| <b>POST B+</b>   |  |
| <b>Battery positive cable from 200 amp fuse</b>                              | <p>Full battery voltage</p> <ul style="list-style-type: none"> <li>• No real diagnostic value</li> </ul>   |
| <b>POST B–</b>   |  |
| <b>Battery positive cable from 200 amp fuse</b>                              | <p>Battery ground cable connection</p> <p>Ground path for motor operation</p> <ul style="list-style-type: none"> <li>• All system ground wires (wire #s 15 &amp; 15A) terminate here</li> <li>• Best place to connect ground lead from multi-meter while troubleshooting</li> </ul>  |
| <b>POST M-2</b>  |  |
| <b>PWM controlled motor ground</b>   | <p>Idle: <b>12 V DC – 13 V DC</b></p> <p>During operation, between <b>5 V DC &amp; 24 V DC</b></p> <ul style="list-style-type: none"> <li>• 12 – 13 volts is reference voltage used by the controller to monitor motor circuit irregularities at idle</li> <li>• 0 volts at idle = 3 flash code</li> <li>• Above 20 volts at idle = 4 flash code</li> <li>• No voltage change after Motor Start Relay signal = 5 flash code</li> </ul> |





# TROUBLESHOOTING BATTERY CHARGER

To be able to use the trouble shooting guide safely and effectively, it is important to read through this guide before beginning any tests.



**Do not disassemble charger. Return to MEC when service or repair is required.**



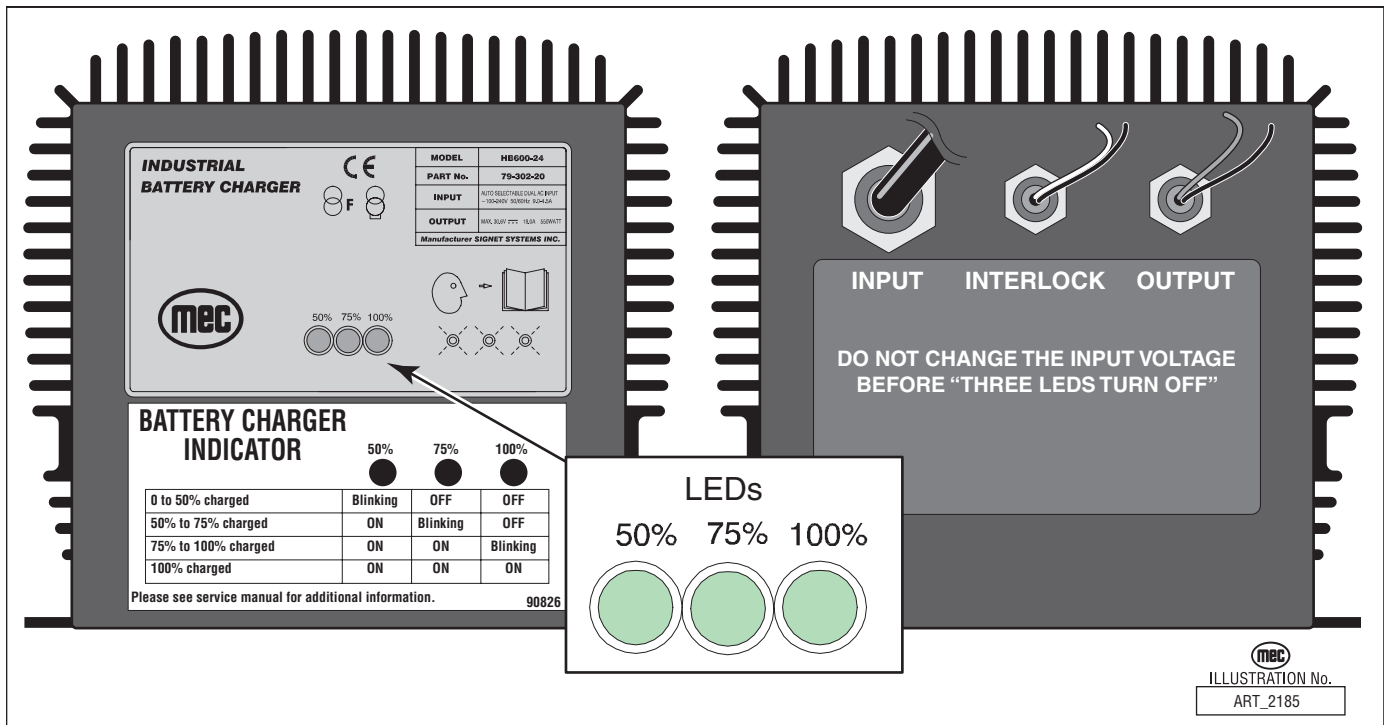
**TO REDUCE THE RISK OF ELECTRIC SHOCK, ALWAYS DISCONNECT BOTH THE POWER SUPPLY CORD AND THE OUTPUT WIRES BEFORE ATTEMPTING MAINTENANCE.**



**DO NOT OPERATE THE CHARGER IF IT IS MALFUNCTIONING. PERSONAL INJURY OR PROPERTY DAMAGE MAY RESULT.**

Incorrect assembly may result in a risk of electric shock or fire. The following procedures are intended only to determine if a malfunction may exist in the charger. Most returned chargers test good, it is very important that this procedure is followed and that other problems are corrected before assuming the charger has failed.

The MEC battery charger is a fully automatic type with a maintenance feature that will maintain battery voltage indefinitely when connected to an AC power source. The battery charger should be plugged into an unswitched AC source if stored for long periods of time.



|         | LED Status                                       | Description  |
|---------|--|--|
| Fault   | All 3 LED lamps blink once simultaneously        | Output is open or short, or output voltage is over a limit. Otherwise, output terminals are reversed |
|         | All 3 LED lamps blink twice simultaneously       | Input voltage is out of the range  |
|         | All 3 LED lamps blink three times simultaneously | The internal temperature of the charger exceeds a limit  |
|         | All 3 LED lamps blink four times simultaneously  | Output current exceeds a limit   |
| Warning | 100% LED lamp blinks                             | Battery pack has a bad cell  |

To determine if a charger is malfunctioning, identify the problem from the following list and refer to the appropriate section for detailed instructions.

- 1.) Charger does not turn on
- 2.) All 3 LEDs blink simultaneously
- 3.) 100% LED blinks while 50% and 75% LEDs are "OFF"
- 4.) Batteries do not fully charge
- 5.) The AC supply circuit breaker or fuse is blown

If the problem is not listed above, refer the problem to a qualified service agent for additional trouble shooting procedures.

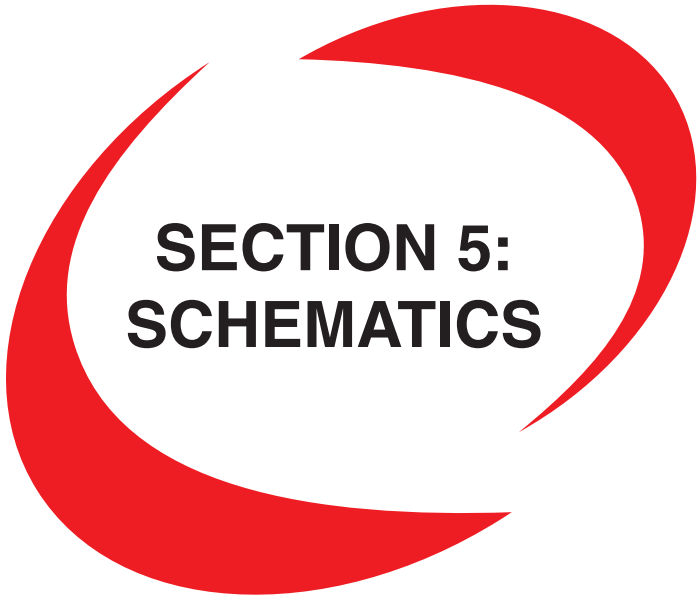
## Troubleshooting Battery Charger (continued)

| PROBLEM  | DIAGNOSIS   |
|--|---|
| <p><b>Charger does not turn ON</b></p>                           | <p><b>The AC plug must be disconnected and reconnected to start the charger once it has turned-off from a charge cycle.</b></p> <ul style="list-style-type: none"> <li>• Connect the AC supply cord securely to a live AC outlet</li> <li>• Double check the outlet to ensure it is working by connecting a known good piece of equipment with the outlet</li> <li>• Inspect the DC output wires and connections to be sure they are in good working condition</li> <li>• Refer to LED Flash Codes below if all 3 LEDs are flashing</li> <li>• Replace charger if everything else is correct</li> </ul> |
| <p><b>All 3 LEDs blink <i>ONCE</i> simultaneously</b></p>        | <p><b>Output connection error</b></p> <ul style="list-style-type: none"> <li>• Check the battery and charger connection and correct</li> <li>• The output may not be connected to the batteries</li> <li>• The connections to the batteries may have corroded or loosened</li> <li>• The output may be shorted due to improper connection to the batteries or pinched wires</li> <li>• The output may be connected in reverse polarity to the batteries</li> </ul> <p>The charger will not be damaged by any of these problems</p>  |
| <p><b>All 3 LEDs blink <i>TWICE</i> simultaneously</b></p>       | <p><b>AC input voltage tolerance beyond limit</b></p> <ul style="list-style-type: none"> <li>• Check the AC input voltage. The charger is indicating the AC voltage is too low or too high</li> </ul> <p>This is an unusual problem and would most likely occur with a very poorly regulated engine-generator set providing the AC voltage to the charger.</p>  |
| <p><b>All 3 LEDs blink <i>THREE TIMES</i> simultaneously</b></p> | <p><b>Charger is overheated</b></p> <ul style="list-style-type: none"> <li>• No action required. When the charger cools, charging will restart automatically</li> <li>• Check and correct for dirt or other debris on charger that may be reducing cooling</li> </ul>   |
| <p><b>All 3 LEDs blink <i>FOUR TIMES</i> simultaneously</b></p>  | <p><b>Input or output over current</b></p> <ul style="list-style-type: none"> <li>• No action required, charger will correct and restart automatically</li> </ul>   |
| <p><b>100% LED blinks while 50% and 75% LEDs are "OFF"</b></p>   | <p><b>The 18 hour timer has elapsed and stopped charging. Batteries are unable to complete constant current and constant voltage charge cycle.</b></p> <ul style="list-style-type: none"> <li>• Batteries are weak, old, or have one or more bad cells. Batteries will still charge but capacity will be reduced. Replace batteries</li> <li>• Battery pack too large for charger. Use higher output charger or unplug then plug-in charger to restart charge cycle to complete charging</li> </ul>   |

Troubleshooting Battery Charger (continued)

| PROBLEM   | DIAGNOSIS  |
|---|--|
| <b>Batteries do not fully charge</b>                | <p><b>If the batteries are charged overnight, make sure the AC supply is not being switched-off at night with other building items.</b></p> <ul style="list-style-type: none"><li>• Check battery condition following the battery supplier's instructions</li><li>• Check for dead cells or reduced capacity</li><li>• Replace charger only if other problems are not found</li></ul>  |
| <b>The AC line circuit breaker or fuse is blown</b> | <p><b>A defective circuit breaker or fuse, overloaded circuit, or a charger problem can cause this condition.</b></p> <ul style="list-style-type: none"><li>• Connect the charger to a different AC outlet (on a different circuit) in the building</li><li>• If the charger operates properly on other AC outlets, a qualified Person should correct the AC outlet problem</li><li>• If the AC supply checks good, the charger should be replaced</li></ul> |





# SECTION 5: SCHEMATICS

|   |            |
|---|------------|
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# HYDRAULIC SCHEMATICS

**1532ES - Serial # 9001000 - 9001099**

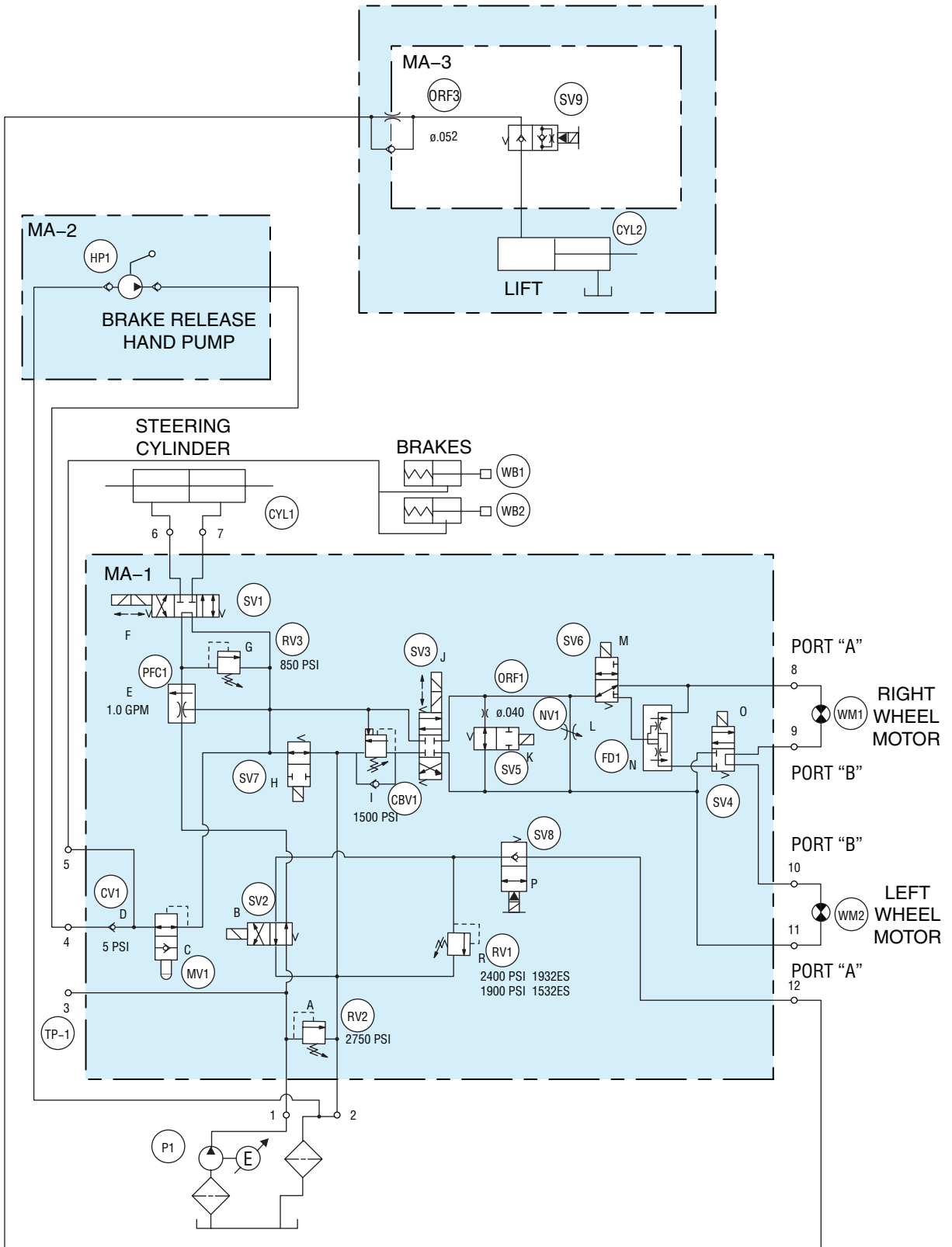
**1932ES - Serial # 9104000 - 9104999**

| ITEM | DESCRIPTION                  | Location                      |
|------|------------------------------|-------------------------------|
| CBV1 | Counterbalance Valve         | Main Manifold (MA-1)          |
| CV1  | Check Valve                  | Main Manifold (MA-1)          |
| CYL1 | Steering Cylinder            | Machine Base, Front           |
| CYL2 | Lift Cylinder, 2047, 2647    | Scissor Assembly              |
| FD1  | Flow Divider                 | Main Manifold (MA-1)          |
| HP1  | Hand Pump, Brakes            | Brake Release Manifold (MA-2) |
| MA-1 | Main Manifold Assembly       | Battery Compartment           |
| MA-2 | Brake Release Manifold       | Battery Compartment           |
| MA-3 | Manifold Assembly            | Lift Cylinder                 |
| MV1  | Manifold Valve               | Main Manifold (MA-1)          |
| NV1  | Needle Valve                 | Main Manifold (MA-1)          |
| ORF1 | Orifice Plug, Wheel Motors   | Main Manifold (MA-1)          |
| ORF3 | Orifice, Down Valve          | Lift Cylinder Manifold (MA-3) |
| P1   | Pump                         | Pump Compartment              |
| PCF1 | Steering Relief Flow Control | Main Manifold (MA-1)          |
| RV1  | Relief Valve, Lift Relief    | Main Manifold (MA-1)          |
| RV2  | Relief Valve, Main Relief    | Main Manifold (MA-1)          |
| RV3  | Relief Valve, Steering       | Main Manifold (MA-1)          |
| SV1  | Spool Valve, Steering        | Main Manifold (MA-1)          |
| SV2  | Spool Valve, Lift            | Main Manifold (MA-1)          |
| SV3  | Spool Valve, Drive           | Main Manifold (MA-1)          |
| SV4  | Spool Valve, Decel           | Main Manifold (MA-1)          |
| SV5  | Spool Valve, Torque          | Main Manifold (MA-1)          |
| SV6  | Spool Valve, Torque          | Main Manifold (MA-1)          |
| SV7  | Spool Valve, Brakes          | Main Manifold (MA-1)          |
| SV8  | Poppet Valve, Down           | Main Manifold (MA-1)          |
| SV9  | Spool Valve, Down            | Lift Cylinder Manifold (MA-3) |
| TP1  | Test Port                    | Main Manifold (MA-1)          |
| WB1  | Wheel Brake                  | Drive Wheel                   |
| WB2  | Wheel Brake                  | Drive Wheel                   |
| WM1  | Wheel Motor, Right Side      | Machine Base                  |
| WM2  | Wheel Motor, Left Side       | Machine Base                  |



**HYDRAULIC SCHEMATIC**

|                      |                             |
|----------------------|-----------------------------|
| Model: / Serial #    |                             |
| 1532ES               | 9001000 - 9001099           |
| 1932ES               | 9104000 - 9104999           |
| 2033ES               | 8804000 - 8804099           |
| 2633ES               | 11100000 - 11100599         |
| Reference Art #: 915 | Publication Art #: ART_2194 |



**1532ES - Serial # 9001100 - Current**

**1932ES - Serial # 9105000 - Current**

| ITEM | DESCRIPTION                  | Location                          |
|------|------------------------------|-----------------------------------|
| CBV1 | Counterbalance Valve         | Main manifold (MA-1)              |
| CYL1 | Steering Cylinder            | Machine Base, Front               |
| CYL2 | Lift Cylinder                | Scissor Assembly                  |
| FD1  | Flow Divider                 | Main manifold (MA-1)              |
| FRR1 | Steering Relief Flow Control | Main manifold (MA-1)              |
| HP1  | Hand Pump, Brakes            | Brake Release Manifold (MA-2)     |
| MA-1 | Main Manifold Assembly       | Machine Base, Battery Compartment |
| MA-2 | Manifold Assembly            | Lift Cylinder                     |
| MV1  | Manifold Valve               | Main manifold (MA-1)              |
| NV1  | Needle Valve                 | Main manifold (MA-1)              |
| ORF1 | Orifice Plug, Wheel Motors   | Main manifold (MA-1)              |
| ORF2 | Orifice Disc, Brake Release  | Main manifold (MA-1)              |
| ORF3 | Orifice, Down Valve          | Lift Cylinder Manifold (MA-3)     |
| P1   | Pump                         | Pump Compartment                  |
| RV1  | Relief Valve, Lift Relief    | Main manifold (MA-1)              |
| RV2  | Relief Valve, Main Relief    | Main manifold (MA-1)              |
| SV1  | Spool Valve, Steering        | Main manifold (MA-1)              |
| SV2  | Spool Valve, Lift            | Main manifold (MA-1)              |
| SV3  | Spool Valve, Drive           | Main manifold (MA-1)              |
| SV4  | Spool Valve, Brake/Decel     | Main manifold (MA-1)              |
| SV5  | Spool Valve, Torque          | Main manifold (MA-1)              |
| SV6  | Spool Valve, Torque          | Main manifold (MA-1)              |
| SV9  | Spool Valve, Down            | Lift Cylinder Manifold (MA-2)     |
| WB1  | Wheel Brake                  | Drive Wheel                       |
| WB2  | Wheel Brake                  | Drive Wheel                       |
| WM1  | Wheel Motor, Right Side      | Machine Base                      |
| WM2  | Wheel Motor, Left Side       | Machine Base                      |





**HYDRAULIC SCHEMATIC**

Model: / Serial #

1532ES | 9001100 -

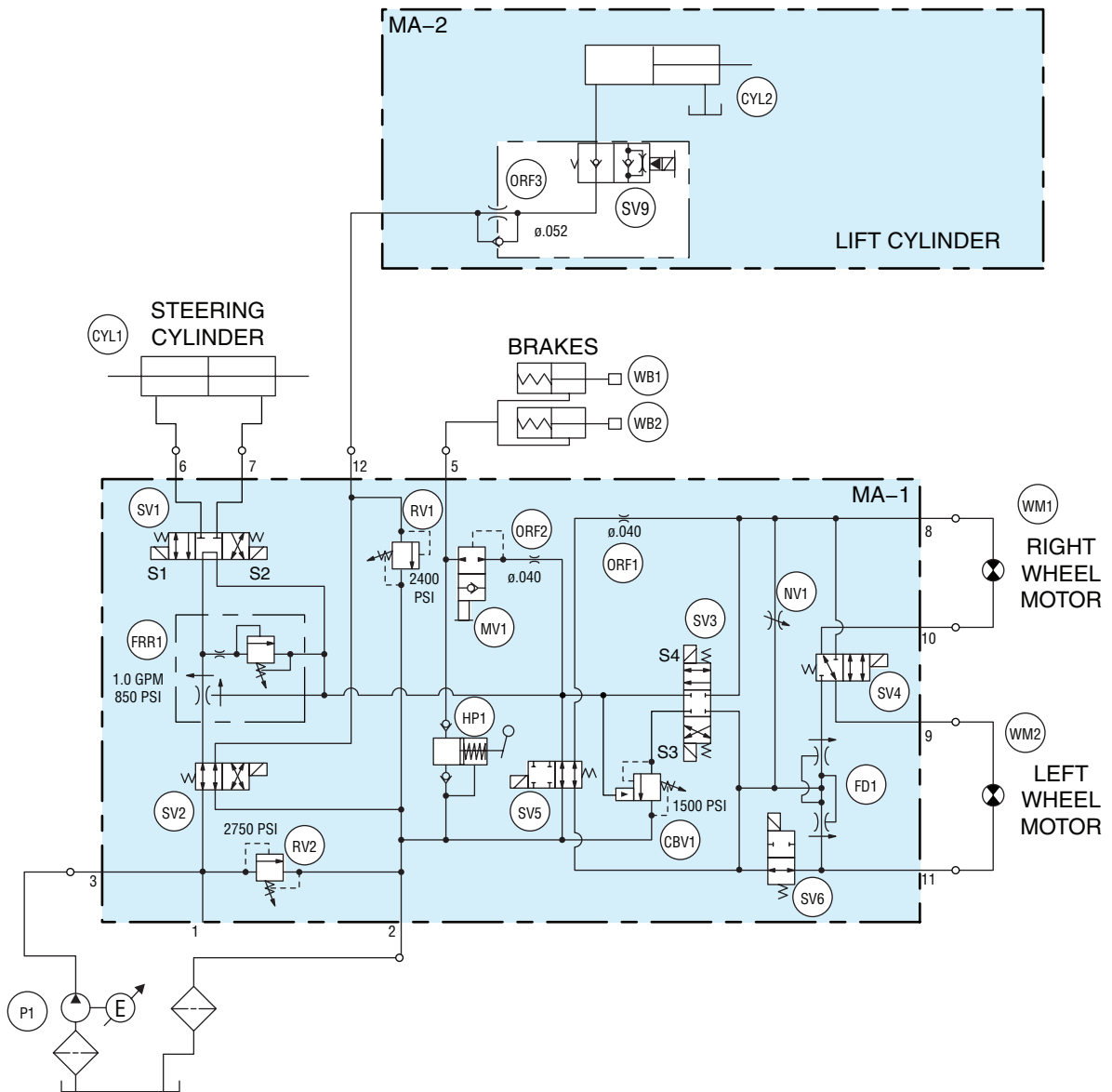
1932ES | 9105000 -

2033ES | 8804100 -

2633ES | 1101000 -

Reference Art #: 965

Publication Art #: ART\_2195



**mec** Hydraulic Manifold - early style

Model: / Serial #

1532ES | 1932ES

2033ES | 2633ES

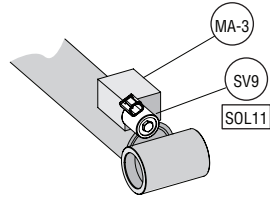
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Publication Art #: ART\_2196

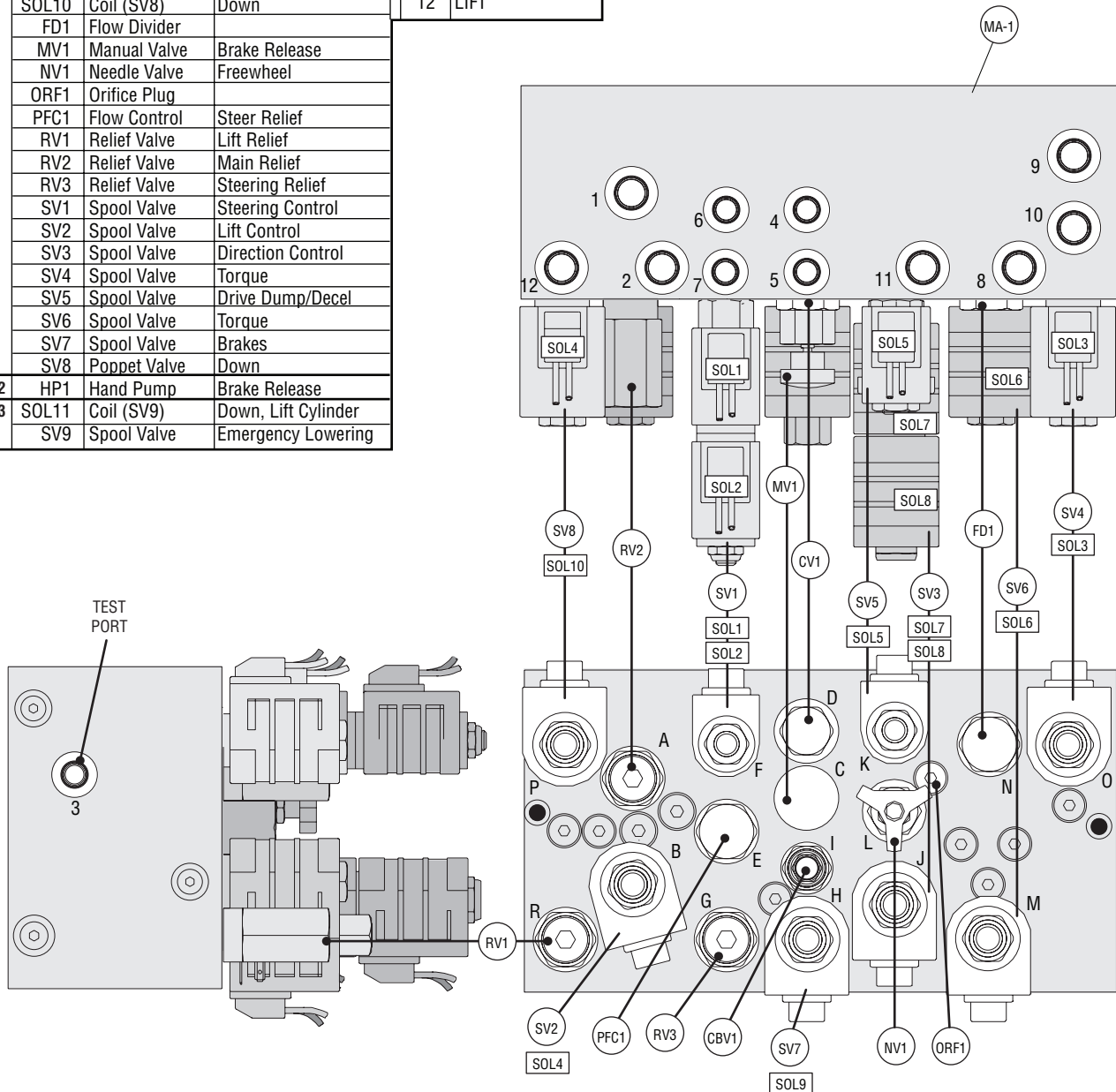
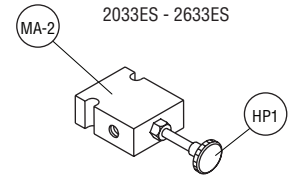
NOTE: Early style manifold. Refer to Hydraulic Schematic for serial # break

| COMPONENTS | FUNCTION     | PORTS                |                     |
|------------|--------------|----------------------|---------------------|
|            |              |                      |                     |
| CBV1       | Relief Valve | Counter Balance      | 1 PUMP              |
| CV1        | Check Valve  | Flow Control, Brakes | 2 TANK              |
| SOL1       | Coil (SV1)   | Steer Right          | 3 TEST PORT         |
| SOL2       | Coil (SV1)   | Steer Left           | 4 BRAKE RELEASE     |
| SOL3       | Coil (SV5)   | Drive/Decel          | 5 BRAKE             |
| SOL4       | Coil (SV2)   | Lift                 | 6 STEER             |
| SOL5       | Coil (SV4)   | Torque               | 7 STEER             |
| SOL6       | Coil (SV6)   | Torque               | 8 RIGHT A           |
| SOL7       | Coil (SV3)   | Drive Forward        | 9 RIGHT B           |
| SOL8       | Coil (SV3)   | Drive Reverse        | 10 LEFT B           |
| SOL9       | Coil (SV7)   | Brakes               | 11 LEFT A           |
| SOL10      | Coil (SV8)   | Down                 | 12 LIFT             |
| FD1        | Flow Divider |                      |                     |
| MV1        | Manual Valve | Brake Release        |                     |
| NV1        | Needle Valve | Freewheel            |                     |
| ORF1       | Orifice Plug |                      |                     |
| PFC1       | Flow Control | Steer Relief         |                     |
| RV1        | Relief Valve | Lift Relief          |                     |
| RV2        | Relief Valve | Main Relief          |                     |
| RV3        | Relief Valve | Steering Relief      |                     |
| SV1        | Spool Valve  | Steering Control     |                     |
| SV2        | Spool Valve  | Lift Control         |                     |
| SV3        | Spool Valve  | Direction Control    |                     |
| SV4        | Spool Valve  | Torque               |                     |
| SV5        | Spool Valve  | Drive Dump/Decel     |                     |
| SV6        | Spool Valve  | Torque               |                     |
| SV7        | Spool Valve  | Brakes               |                     |
| SV8        | Poppet Valve | Down                 |                     |
| MA2        | HP1          | Hand Pump            | Brake Release       |
| MA3        | SOL11        | Coil (SV9)           | Down, Lift Cylinder |
|            | SV9          | Spool Valve          | Emergency Lowering  |

**LIFT CYLINDER**  
1532ES - 1932ES  
2033ES - 2633ES



**BRAKE RELEASE HAND PUMP**  
1532ES - 1932ES  
2033ES - 2633ES



**mec** Hydraulic Manifold - current style

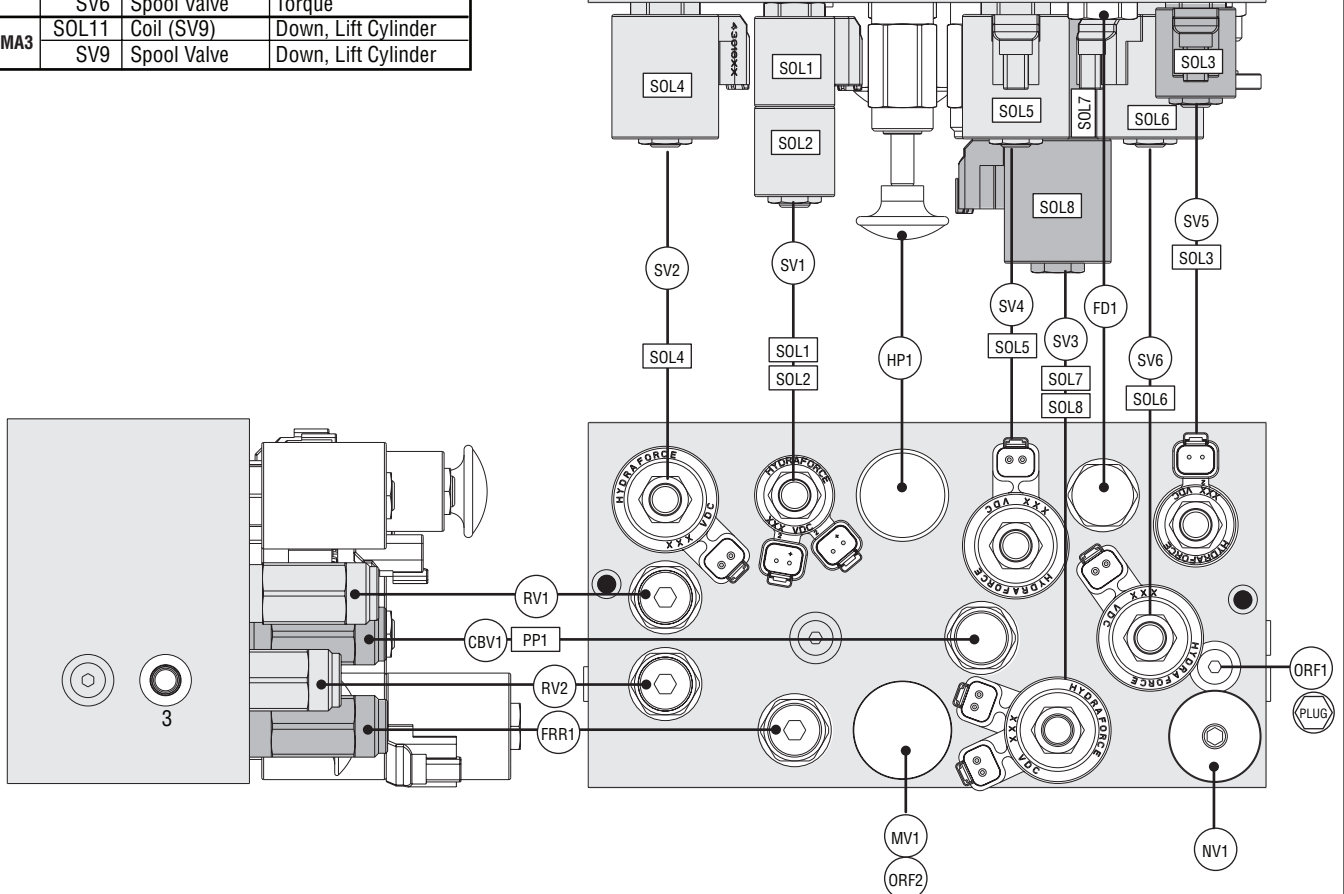
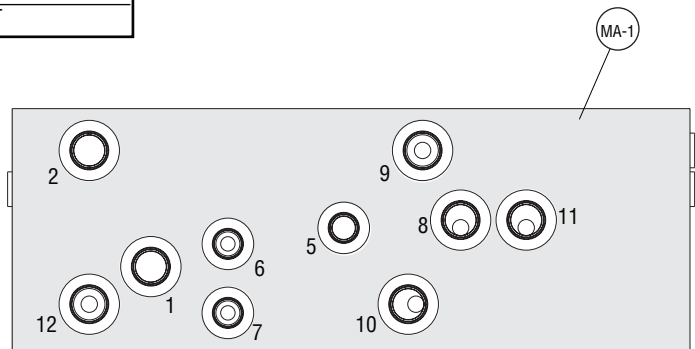
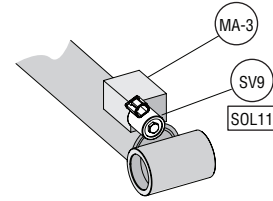
Model: / Serial #  
 1532ES | 1932ES  
 2033ES | 2633ES

Reference Art #: none      Publication Art #: ART\_2197

NOTE: Current style manifold. Refer to Hydraulic Schematic for serial # break

| COMPONENTS           | FUNCTION            | PORTS |           |
|----------------------|---------------------|-------|-----------|
|                      |                     |       |           |
| CBV1 Relief Valve    | Counter Balance     | 1     | PUMP      |
| SOL1 Coil (SV1)      | Steer Right         | 2     | TANK      |
| SOL2 Coil (SV1)      | Steer Left          | 3     | TEST PORT |
| SOL3 Coil (SV5)      | Brake/Decel         | 4     | N/A       |
| SOL4 Coil (SV2)      | Lift                | 5     | BRAKE     |
| SOL5 Coil (SV4)      | Torque              | 6     | STEER     |
| SOL6 Coil (SV6)      | Torque              | 7     | STEER     |
| SOL7 Coil (SV3)      | Drive Forward       | 8     | RIGHT B   |
| SOL8 Coil (SV3)      | Drive Reverse       | 9     | LEFT A    |
| FD1 Flow Divider     |                     | 10    | RIGHT A   |
| FRR1 Flow Control    | Steer Relief        | 11    | LEFT B    |
| HP1 Hand Pump        | Brake Pump          | 12    | LIFT      |
| MV1 Manual Valve     | Brake Release       |       |           |
| NV1 Needle Valve     | Freewheel           |       |           |
| ORF1 Orifice Plug    | Flow Restriction    |       |           |
| ORF2 Orifice Disc    | Flow Restriction    |       |           |
| PP1 Pilot Piston     | Counter Balance     |       |           |
| RV1 Relief Valve     | Lift Relief         |       |           |
| RV2 Relief Valve     | Main Relief         |       |           |
| SV1 Spool Valve      | Steering Control    |       |           |
| SV2 Spool Valve      | Lift Control        |       |           |
| SV3 Spool Valve      | Direction Control   |       |           |
| SV4 Spool Valve      | Torque              |       |           |
| SV5 Spool Valve      | Drive Dump/Decel    |       |           |
| SV6 Spool Valve      | Torque              |       |           |
| MA1 SOL11 Coil (SV9) | Down, Lift Cylinder |       |           |
| MA3 SV9              | Down, Lift Cylinder |       |           |

LIFT CYLINDER



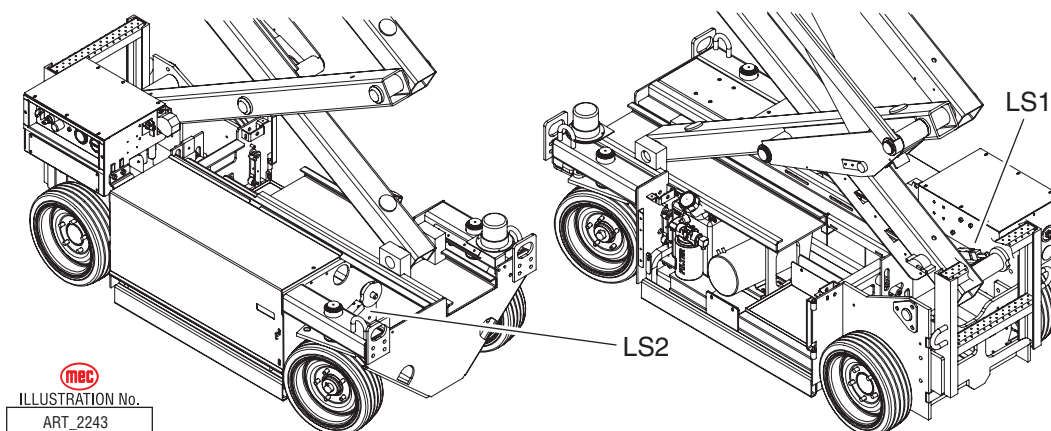
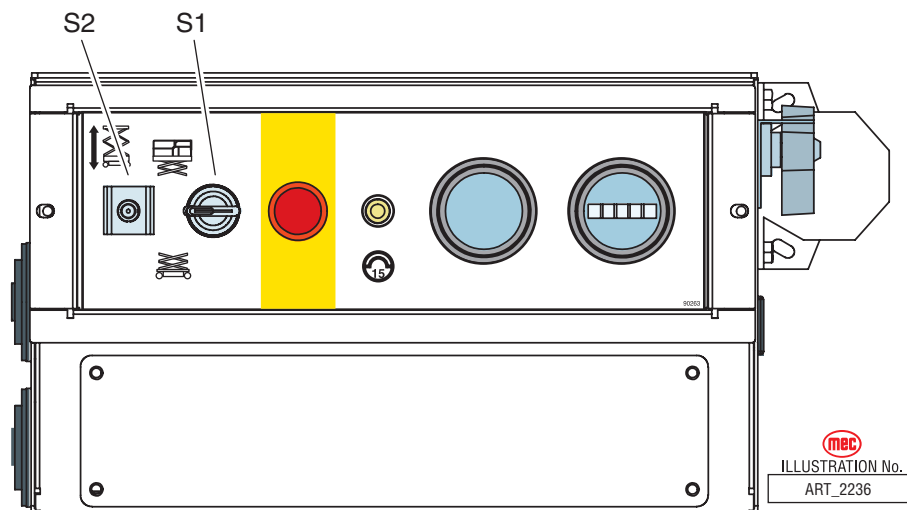
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# ELECTRIC SCHEMATICS

**NOTES:** (Unless otherwise specified)

1. Switch **S1 BASE/PLATFORM** makes contact from the CENTER to the LEFT position when placed in **BASE**.
2. Switch **S2 UP/DOWN** makes contact from the CENTER to the LEFT position when the switch is held in the CONTACT position and automatically returns to the CENTER position when released.
3. Switch **LS1** opens the N/C set of contacts and closes the N/O set of contacts when the platform reaches approximately 7 feet.
4. Switch **LS2** closes the N/C set of contacts when the Pothole Bars are down and locked in place.



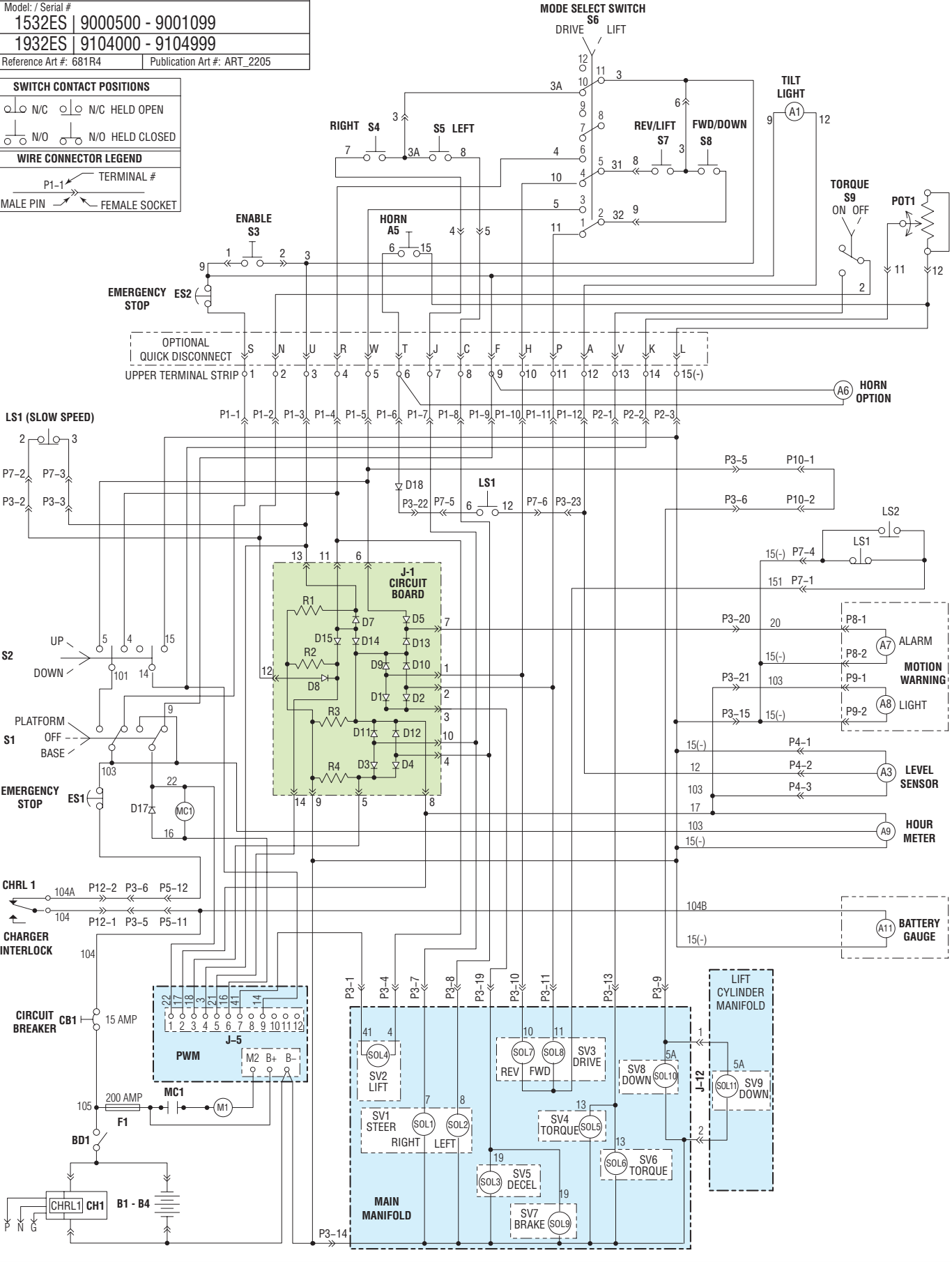
**1532ES, S/N 9000500 - 9001099****1932ES, S/N 9104000 - 9104999**

| ITEM     | DESCRIPTION                    | FUNCTION                            | LOCATION                     |
|----------|--------------------------------|-------------------------------------|------------------------------|
| A1       | Tilt Light, 28V                | Warn when Machine is Tilted         | Upper Control Box            |
| A3       | Level Sensor                   | Activates Tilt Light                | In Lower Control Box         |
| A5       | Push-Button Switch             | Activates Horn                      | On Upper Control Box         |
| A6       | Horn, 12V - 48V (option)       | Activated by Operator               | Under Platform               |
| A7       | Overload/Motion Alarm (option) | Warn of Movement                    | Outside Lower Control Box    |
| A8       | Motion Light (option)          | Warn of Movement                    | Front Left Corner of Machine |
| A9       | Hour Meter                     | Record Machine Usage Time           | Lower Control Panel          |
| A11      | Battery Indicator              | Show Battery Status                 | Lower Control Panel          |
| B1-4     | 6-V Deep Cycle Battery         | Power for Motor And Control Circuit | Inside Battery Compartment   |
| BD1      | Battery Disconnect Switch      | Disconnect All Electrical Power     | Lower Control Box            |
| CB1      | Circuit Breaker, 15AMP Manual  | Control Circuit Protection          | Lower Control Panel          |
| CH1      | Battery Charger                | Recharges 24-VDC Battery Pack       | Machine Base, Rear           |
| CHRL1    | Charger Relay                  | Disconnect Electric when Charger ON | Inside Charger               |
| D1 - D15 | Circuit Board Diodes           | Directs Signal to Proper Location   | Inside Lower Control Box     |
| D17      | Diode w/Ring Terminals         | Suppression Diode                   | Across Contactor Coil        |
| D18      | Diode                          | Optional "Out of Level" Alarm       | Main Harness                 |
| ES1      | Switch, Emergency Stop         | Shutdown All Moving Functions       | Lower Control Panel          |
| ES2      | Switch, Emergency Stop         | Shutdown All Platform Functions     | Upper Control Box            |
| F1       | Fuse, 200AMP                   | Main Line Fuse                      | Inside Lower Control Box     |
| LS1      | Limit Switch, Double Pole      | Enable Drive and High Speed         | Right Rear Corner of Machine |
| LS2      | Limit Switch, Single Pole      | Drive Enable if Pothole Deployed    | On pothole Linkage           |
| M1       | Motor, 24V, 2HP                | Turn the Hydraulic Pump             | Inside Pump Compartment      |
| MC1      | 24-V Contactor                 | Connects Battery (+) to Motor       | Inside Lower Control Box     |
| PWM      | Controller, DC 250AMP          | Changes the Motor Speed             | Inside Lower Control Box     |
| POT1     | Potentiometer, 20K Ohms        | Senses Operator Input               | Upper Control Box            |
| R1 - R4  | Circuit Board Resistors        |                                     | Inside Lower Control Box     |
| S1       | Key Switch, N/O Contact Block  | Select Base or Platform Controls    | Lower Control Panel          |
| S2       | Switch, Toggle                 | Lift/Lower at Lower Controls        | Lower Control Panel          |
| S3       | Switch, Push Button            | Enable Other Functions at Platform  | Upper Control Box Handle     |
| S4       | Switch, Micro                  | Right Turn Switch                   | Upper Control Box Handle     |
| S5       | Switch, Micro                  | Left Turn Switch                    | Upper Control Box Handle     |
| S6       | Switch, Toggle                 | Select LIFT or DRIVE                | Upper Control Box            |
| S7       | Switch, Micro                  | Reverse or Lift Switch              | Upper Control Box            |
| S8       | Switch, Micro                  | Forward or Down Switch              | Upper Control Box            |
| S9       | Switch, Toggle                 | TORQUE Switch                       | Upper Control Box            |
| SOL1     | Coil, Turn Right Solenoid      | Activate Turn Right Valve (SV1)     | Main Manifold                |
| SOL2     | Coil, Turn Left Solenoid       | Activate Turn Left Valve (SV1)      | Main Manifold                |
| SOL3     | Coil, Decel Solenoid           | Activate Decel Valve (SV5)          | Main Manifold                |
| SOL4     | Coil, Lift Solenoid            | Activate Lift Valve (SV2)           | Main Manifold                |
| SOL5-6   | Coil, Torque Solenoid          | Activate Torque Valves (SV4) (SV6)  | Main Manifold                |
| SOL7     | Coil, Reverse Solenoid         | Activate Reverse Valve (SV3)        | Main Manifold                |
| SOL8     | Coil, Forward Solenoid         | Activate Forward Valve (SV3)        | Main Manifold                |
| SOL9     | Coil, Brake Solenoid           | Activate Brake Valve (SV7)          | Main Manifold                |
| SOL10    | Coil, Down Solenoid            | Activate Down Valve (SV8)           | Main Manifold                |
| SOL11    | Coil, Down Solenoid            | Activate Down Valve (SV9)           | Lift Cylinder Manifold       |

**MEC** ELECTRIC SCHEMATIC

Model / Serial #  
 1532ES | 9000500 - 9001099  
 1932ES | 9104000 - 9104999  
 Reference Art #: 681R4 | Publication Art #: ART\_2205

| SWITCH CONTACT POSITIONS |                     |
|--------------------------|---------------------|
|                          | N/C N/C HELD OPEN   |
|                          | N/O N/O HELD CLOSED |
| WIRE CONNECTOR LEGEND    |                     |
|                          | TERMINAL #          |
|                          | MALE PIN            |
|                          | FEMALE SOCKET       |



**1532ES, S/N 9002000 - Current****1932ES, S/N 9105000 - Current**

| ITEM     | DESCRIPTION                    | FUNCTION                            | LOCATION                     |
|----------|--------------------------------|-------------------------------------|------------------------------|
| A1       | Tilt Light, 28V                | Warn when Machine is Tilted         | Upper Control Box            |
| A3       | Level Sensor                   | Activates Tilt Light                | Inside Lower Control Box     |
| A5       | Push-Button Switch             | Activates Horn                      | Upper Control Box            |
| A6       | Horn, 12V - 48V (option)       | Activated by Operator               | Under Platform               |
| A7       | Overload/Motion Alarm (option) | Warn of Movement                    | Outside Lower Control Box    |
| A8       | Motion Light (option)          | Warn of Movement                    | Front Left Corner of Machine |
| A9       | Hour Meter                     | Record Machine Usage Time           | Lower Control Panel          |
| A11      | Battery Indicator              | Show Battery Status                 | Lower Control Panel          |
| B1-4     | 6-V Deep Cycle Battery         | Power for Motor And Control Circuit | Inside Battery Compartment   |
| BD1      | Battery Disconnect Switch      | Disconnect All Electrical Power     | Lower Control Box            |
| CB1      | Circuit Breaker, 15AMP Manual  | Control Circuit Protection          | Lower Control Panel          |
| CH1      | Battery Charger                | Recharges 24-VDC Battery Pack       | Machine Base, Rear           |
| CHRL1    | Charger Relay                  | Disconnect Electric when Charger ON | Inside Charger               |
| MC1      | 24-V Contactor                 | Connects Battery (+) to Motor       | Inside Lower Control Box     |
| D1 - D15 | Circuit Board Diodes           | Directs Signal to Proper Location   | Inside Lower Control Box     |
| R1 - R4  | Circuit Board Resistors        |                                     | Inside Lower Control Box     |
| D17      | Diode w/Ring Terminals         | Suppression Diode                   | Across Contactor Coil        |
| ES1      | Switch, Emergency Stop         | Shutdown All Moving Functions       | Lower Control Panel          |
| ES2      | Switch, Emergency Stop         | Shutdown All Platform Functions     | Upper Control Box            |
| F1       | Fuse, 200AMP                   | Main Line Fuse                      | Inside Lower Control Box     |
| LS1      | Limit Switch, Double Pole      | Enable Drive and High Speed         | Right Rear Corner of Machine |
| LS2      | Limit Switch, Single Pole      | Drive Enable if Pothole Deployed    | On pothole Linkage           |
| M1       | Motor, 24V, 2HP                | Turn the Hydraulic Pump             | Pump Compartment             |
| PWM      | Controller, DC 250AMP          | Changes the Motor Speed             | Inside Lower Control Box     |
| POT1     | Potentiometer, 20K Ohms        | Senses Operator Input               | Upper Control Box            |
| S1       | Key Switch, N/O Contact Block  | Select Base or Platform Controls    | Lower Control Panel          |
| S2       | Switch, Toggle                 | Lift/Lower at Lower Controls        | Lower Control Panel          |
| S3       | Switch, Push Button            | Enable Other Functions at Platform  | Upper Control Box Handle     |
| S4       | Switch, Micro                  | Right Turn Switch                   | Upper Control Box Handle     |
| S5       | Switch, Micro                  | Left Turn Switch                    | Upper Control Box Handle     |
| S6       | Switch, Toggle                 | Select LIFT or DRIVE                | Upper Control Box            |
| S7       | Switch, Micro                  | Reverse or Lift Switch              | Upper Control Box            |
| S8       | Switch, Micro                  | Forward or Down Switch              | Upper Control Box            |
| S9       | Switch, Toggle                 | TORQUE Switch                       | Upper Control Box            |
| SOL1     | Coil, Turn Right Solenoid      | Activate Turn Right Valve (SV1)     | Main Manifold                |
| SOL2     | Coil, Turn Left Solenoid       | Activate Turn Left Valve (SV1)      | Main Manifold                |
| SOL3     | Coil, Decel/Brake Solenoid     | Activate Decel/Brake Valve (SV5)    | Main Manifold                |
| SOL4     | Coil, Lift Solenoid            | Activate Lift Valve (SV2)           | Main Manifold                |
| SOL5-6   | Coil, Torque Solenoid          | Activate Torque Valves (SV5)(SV6)   | Main Manifold                |
| SOL7     | Coil, Reverse Solenoid         | Activate Reverse Valve (SV3)        | Main Manifold                |
| SOL8     | Coil, Forward Solenoid         | Activate Forward Valve (SV3)        | Main Manifold                |
| SOL11    | Coil, Down Solenoid            | Activate Down Valve (SV9)           | Lift Cylinder                |





**MEC** ELECTRIC SCHEMATIC

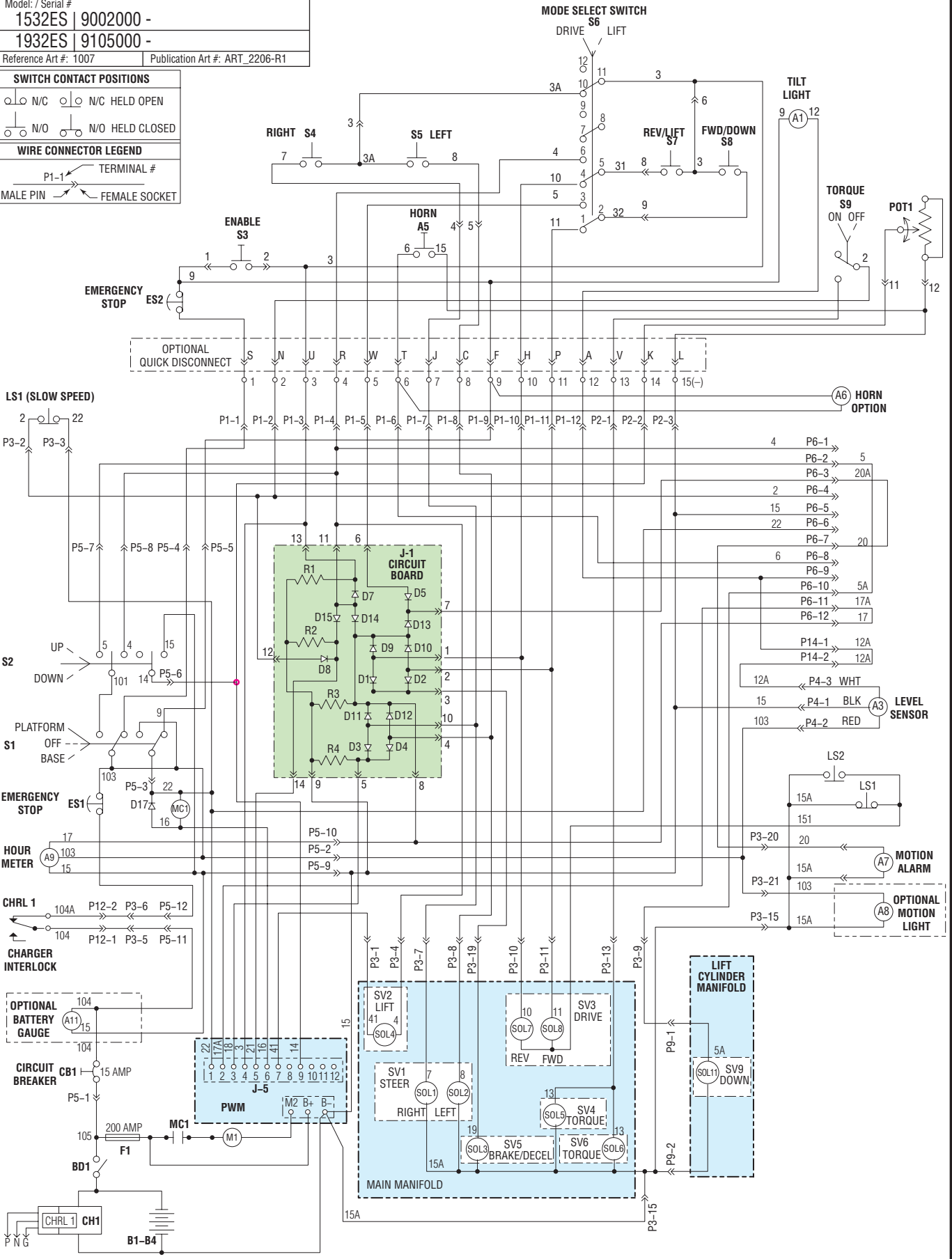
Model: / Serial #  
**1532ES** | **9002000 -**  
**1932ES** | **9105000 -**  
 Reference Art #: 1007 Publication Art #: ART\_2206-R1

**SWITCH CONTACT POSITIONS**

N/C N/O N/O HELD OPEN N/O HELD CLOSED

**WIRE CONNECTOR LEGEND**

TERMINAL #  
 P1-1  
 MALE PIN FEMALE SOCKET

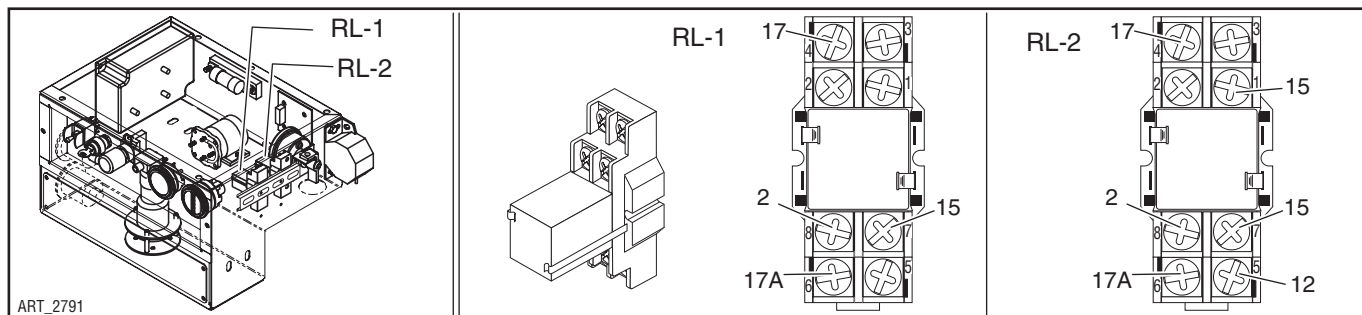


## Canadian Models

1532ES, S/N 9002000 - Current

1932ES, S/N 9105000 - Current

| ITEM        | DESCRIPTION                    | FUNCTION                            | LOCATION                     |
|-------------|--------------------------------|-------------------------------------|------------------------------|
| A1          | Tilt Light, 28V                | Warn when Machine is Tilted         | Upper Control Box            |
| A3          | Level Sensor                   | Activates Tilt Light                | Inside Lower Control Box     |
| A5          | Push-Button Switch             | Activates Horn                      | Upper Control Box            |
| A6          | Horn, 12V - 48V (option)       | Activated by Operator               | Under Platform               |
| A7          | Overload/Motion Alarm (option) | Warn of Movement                    | Outside Lower Control Box    |
| A8          | Motion Light (option)          | Warn of Movement                    | Front Left Corner of Machine |
| A9          | Hour Meter                     | Record Machine Usage Time           | Lower Control Panel          |
| A11         | Battery Indicator              | Show Battery Status                 | Lower Control Panel          |
| B1-4        | 6-V Deep Cycle Battery         | Power for Motor And Control Circuit | Inside Battery Compartment   |
| BD1         | Battery Disconnect Switch      | Disconnect All Electrical Power     | Lower Control Box            |
| CB1         | Circuit Breaker, 15AMP Manual  | Control Circuit Protection          | Lower Control Panel          |
| CH1         | Battery Charger                | Recharges 24-VDC Battery Pack       | Machine Base, Rear           |
| CHRL1       | Charger Relay                  | Disconnect Electric when Charger ON | Inside Charger               |
| MC1         | 24-V Contactor                 | Connects Battery (+) to Motor       | Inside Lower Control Box     |
| D1 - D15    | Circuit Board Diodes           | Directs Signal to Proper Location   | Inside Lower Control Box     |
| R1 - R4     | Circuit Board Resistors        |                                     | Inside Lower Control Box     |
| D17         | Diode w/Ring Terminals         | Suppression Diode                   | Across Contactor Coil        |
| ES1         | Switch, Emergency Stop         | Shutdown All Moving Functions       | Lower Control Panel          |
| ES2         | Switch, Emergency Stop         | Shutdown All Platform Functions     | Upper Control Box            |
| F1          | Fuse, 200AMP                   | Main Line Fuse                      | Inside Lower Control Box     |
| LS1         | Limit Switch, Double Pole      | Enable Drive and High Speed         | Right Rear Corner of Machine |
| LS2         | Limit Switch, Single Pole      | Drive Enable if Pothole Deployed    | On pothole Linkage           |
| M1          | Motor, 24V, 2HP                | Turn the Hydraulic Pump             | Pump Compartment             |
| PWM         | Controller, DC 250AMP          | Changes the Motor Speed             | Inside Lower Control Box     |
| POT1        | Potentiometer, 20K Ohms        | Senses Operator Input               | Upper Control Box            |
| RL-1 - RL-2 | Relay, SPDT 2-Pole             | Cutout Function when Tilted         | Inside Lower Control Box     |
| S1          | Key Switch, N/O Contact Block  | Select Base or Platform Controls    | Lower Control Panel          |
| S2          | Switch, Toggle                 | Lift/Lower at Lower Controls        | Lower Control Panel          |
| S3          | Switch, Push Button            | Enable Other Functions at Platform  | Upper Control Box Handle     |
| S4          | Switch, Micro                  | Right Turn Switch                   | Upper Control Box Handle     |
| S5          | Switch, Micro                  | Left Turn Switch                    | Upper Control Box Handle     |
| S6          | Switch, Toggle                 | Select LIFT or DRIVE                | Upper Control Box            |
| S7          | Switch, Micro                  | Reverse or Lift Switch              | Upper Control Box            |
| S8          | Switch, Micro                  | Forward or Down Switch              | Upper Control Box            |
| S9          | Switch, Toggle                 | TORQUE Switch                       | Upper Control Box            |
| SOL1        | Coil, Turn Right Solenoid      | Activate Turn Right Valve (SV1)     | Main Manifold                |
| SOL2        | Coil, Turn Left Solenoid       | Activate Turn Left Valve (SV1)      | Main Manifold                |
| SOL3        | Coil, Decel/Brake Solenoid     | Activate Decel/Brake Valve (SV5)    | Main Manifold                |
| SOL4        | Coil, Lift Solenoid            | Activate Lift Valve (SV2)           | Main Manifold                |
| SOL5-6      | Coil, Torque Solenoid          | Activate Torque Valves (SV5)(SV6)   | Main Manifold                |
| SOL7        | Coil, Reverse Solenoid         | Activate Reverse Valve (SV3)        | Main Manifold                |
| SOL8        | Coil, Forward Solenoid         | Activate Forward Valve (SV3)        | Main Manifold                |
| SOL11       | Coil, Down Solenoid            | Activate Down Valve (SV9)           | Lift Cylinder                |



**mecc ELECTRIC SCHEMATIC: CANADA**

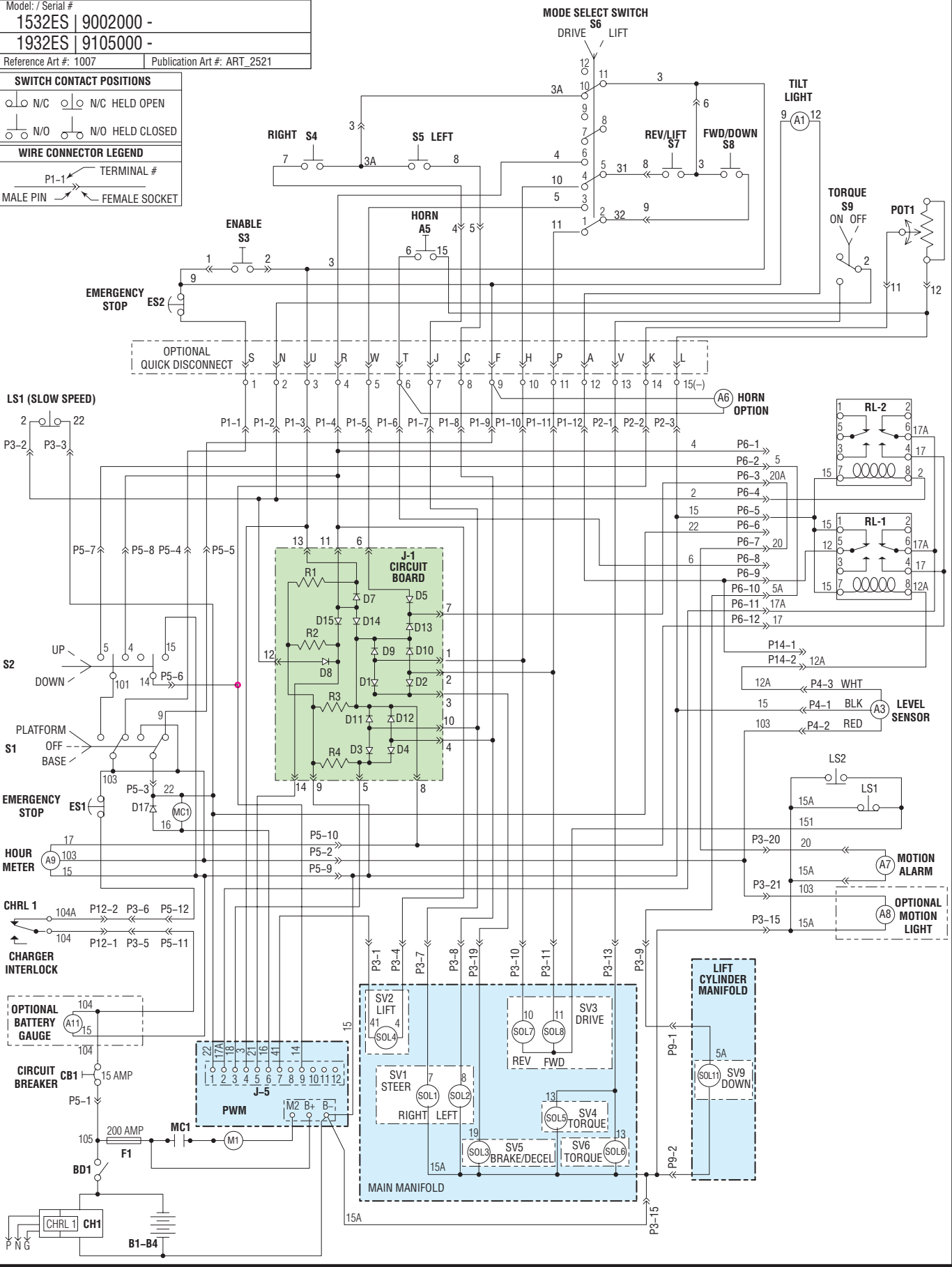
Model / Serial #  
**1532ES | 9002000 -**  
**1932ES | 9105000 -**  
 Reference Art #: 1007 | Publication Art #: ART\_2521

**SWITCH CONTACT POSITIONS**

N/C    N/C HELD OPEN  
 N/O    N/O HELD CLOSED

**WIRE CONNECTOR LEGEND**

TERMINAL #  
 MALE PIN    FEMALE SOCKET



**Component Locations**

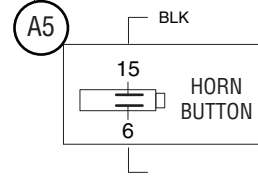
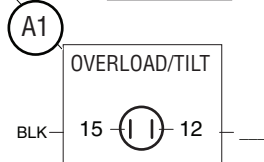
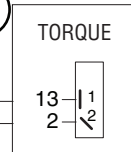
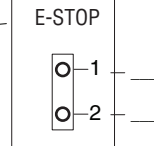
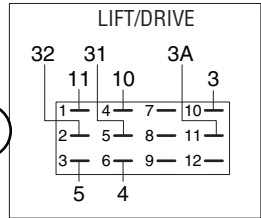
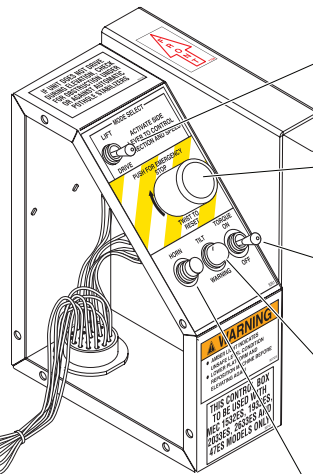
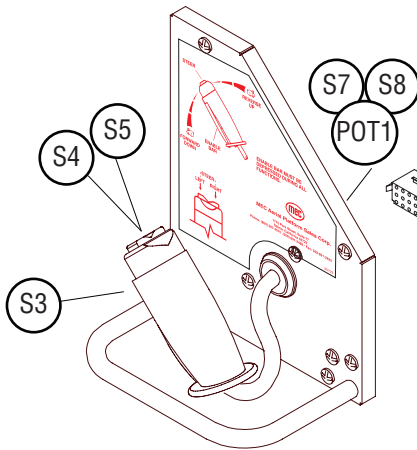
Model: / Serial #

ES Models: all ANSI

Reference Art #: none

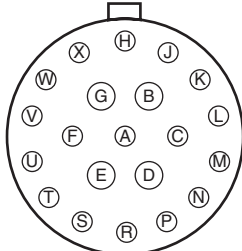
Publication Art #: 2211

**REFER TO  
ELECTRIC SCHEMATIC**

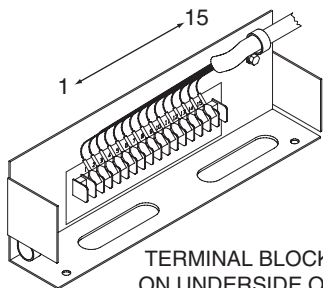


**REMOVABLE  
CONTROL  
HARNESS**

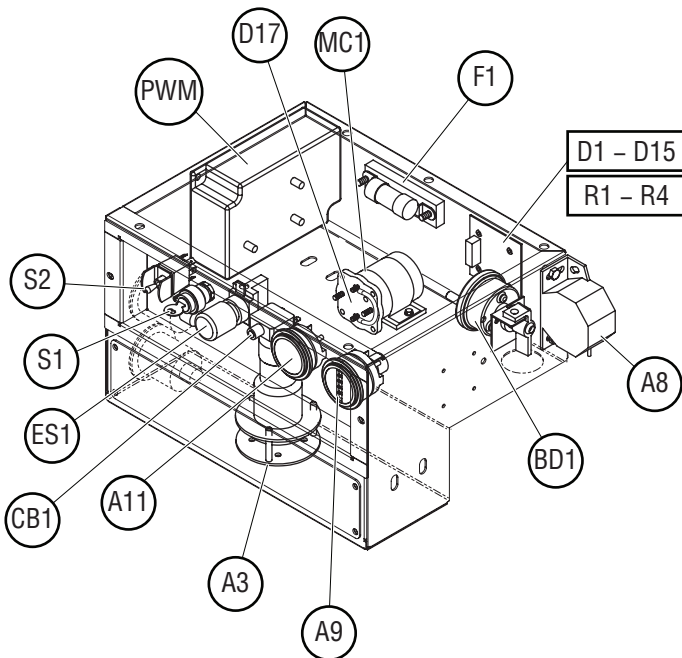
| PIN # | WIRE #   |
|-------|----------|
| S     | 1        |
| F     | 9        |
| W     | 5        |
| R     | 4        |
| V     | 13       |
| A     | 12       |
| H     | 10       |
| P     | 11       |
| U     | 3        |
| T     | 6        |
| J     | 7        |
| N     | 2        |
| C     | 8        |
| K     | 14       |
| M     | 16 (GND) |
| L     | 15       |



END VIEW OF  
REMOVABLE  
CONTROL HARNESS  
(OPTIONAL  
QUICK  
DISCONNECT)



TERMINAL BLOCK  
ON UNDERSIDE OF  
PLATFORM DECK

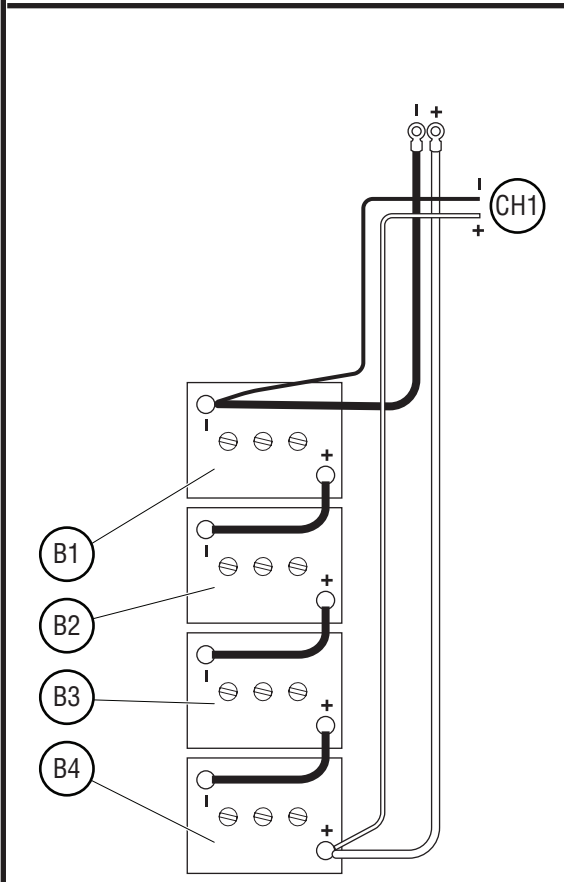
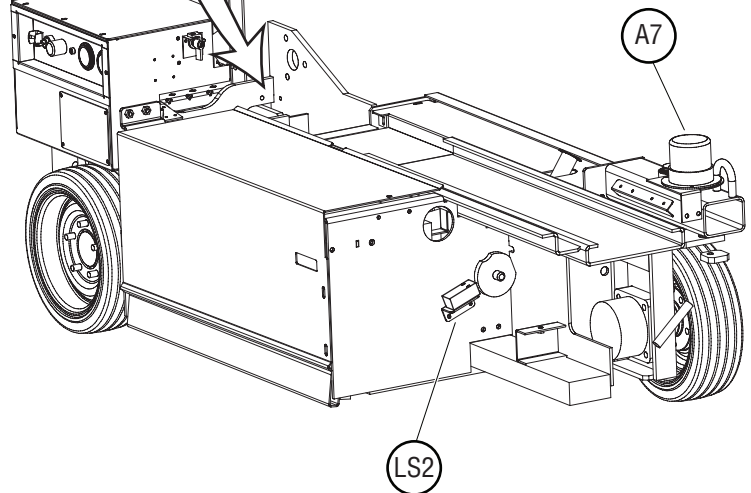
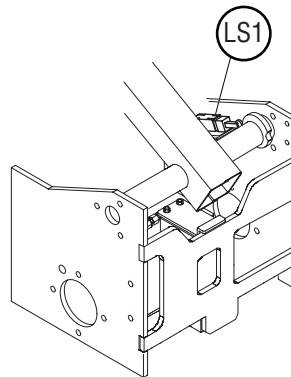
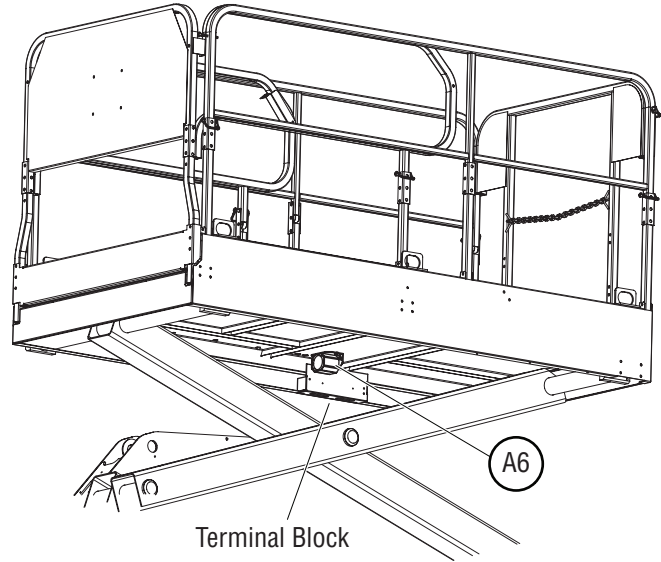


**Component Locations**

Model / Serial #  
1532ES - 1932ES: all

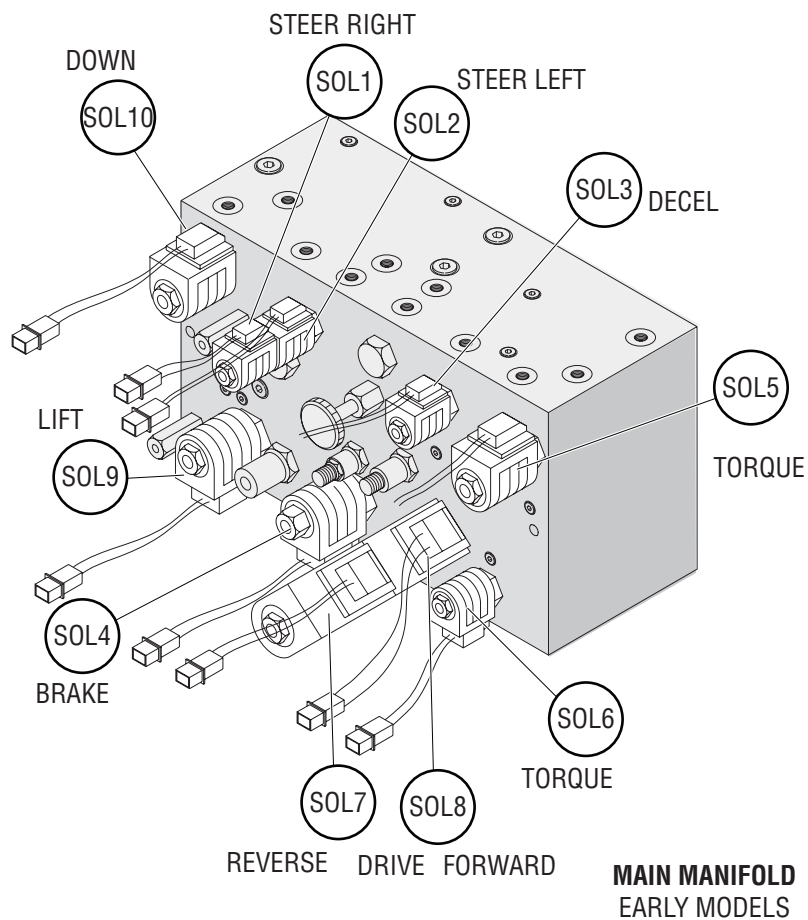
Reference Art #: none | Publication Art #: ART\_2212

**REFER TO  
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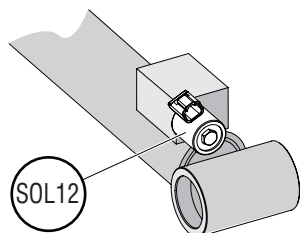


|                            |                             |
|----------------------------|-----------------------------|
| <b>Component Locations</b> |                             |
| Model: / Serial #          |                             |
| ES Models: all             |                             |
|                            |                             |
| Reference Art #: none      | Publication Art #: ART_2213 |

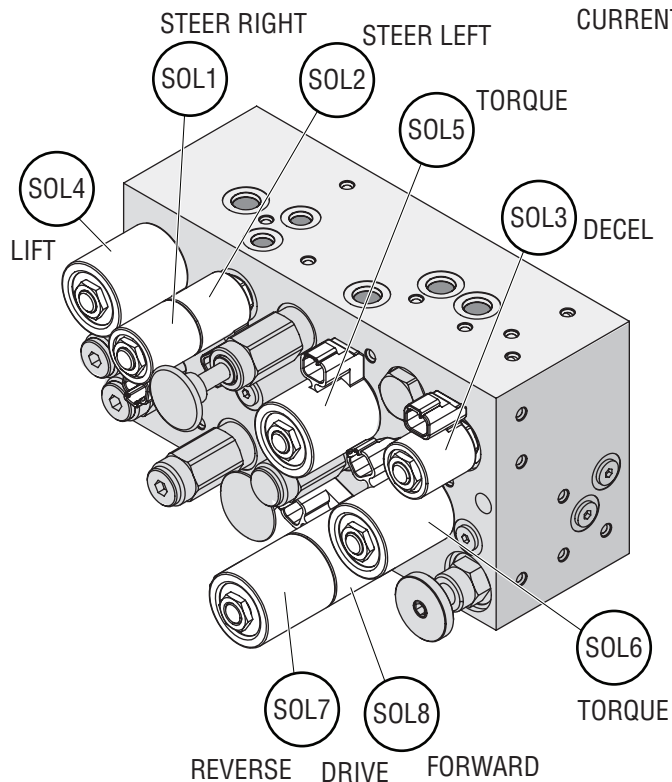
**REFER TO  
ELECTRIC SCHEMATIC**



**LIFT CYLINDER**

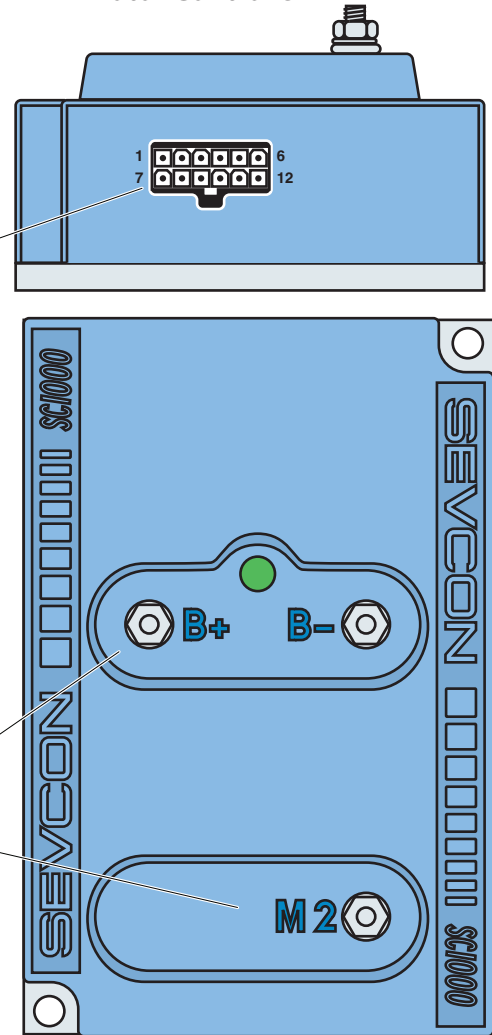


**MAIN MANIFOLD  
CURRENT MODELS**



**REFER TO  
ELECTRIC SCHEMATIC**

**PWM  
Motor Controller**

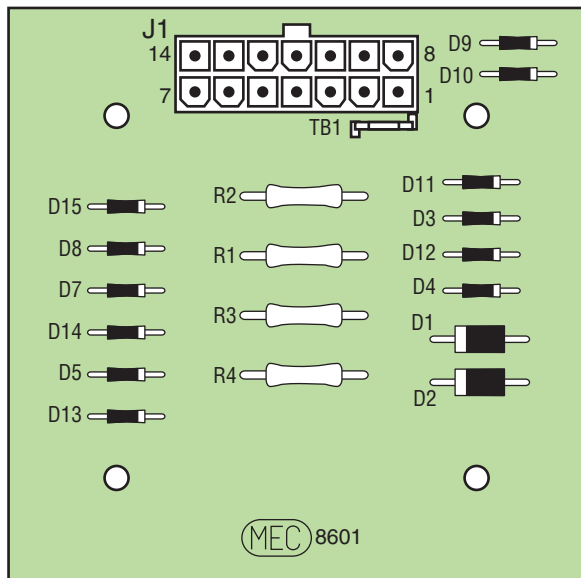


| J5 Pin Identification |        |  |
|-----------------------|--------|--|
| PIN #                 | WIRE # | FUNCTION   |
| 1                     | 22     | B+ power input (power up)  |
| 2                     | 17     | Lift, Drive or Steer functions requested (functions requiring motor)   |
| 3                     | 18     | Steer Requested (adds additional motor speed for steer)                |
| 4                     | 3      | Enable signal input  |
| 5                     | 21     | Speed cut-back (24 Volts = full speed, 0 Volts = creep speed)          |
| 6                     | 16     | Motor Start Relay signal (GROUND signal to activate Motor Start Relay) |
| 7                     | 41     | Lift Valve B- (provides GROUND signal to Lift Valve)                   |
| 8                     | none   | none   |
| 9                     | 14     | Accelerator reference signal (3.6 Volts to Potentiometer)              |
| 10                    | none   | none   |
| 11                    | none   | none   |
| 12                    | none   | none   |

| Terminal Identification |   |
|-------------------------|---|
| POST                    | FUNCTION  |
| B+                      | Battery Positive Cable from 200 AMP Fuse                          |
| B-                      | Negative Battery Cable and GROUND wire (15) connection            |
| M2                      | Motor Ground (Pulse-Width Modulated [PWM] variable speed control) |

**Circuit Board**



**J1 Plug Pin Identification**

| PIN # | WIRE # | SIGNAL | FUNCTION                                       |
|-------|--------|--------|--|
| 1     | 10     | INPUT  | Drive Reverse                                  |
| 2     | 11     | INPUT  | Drive Forward                                  |
| 3     | 19     | OUTPUT | Brake, Decel Valve signal                      |
| 4     | 8      | INPUT  | Steer Left                                     |
| 5     | 18     | OUTPUT | Steer signal to Sevcon                         |
| 6     | 5      | INPUT  | Down signal                                    |
| 7     | 20     | OUTPUT | Signal to Motion Alarm(s) (optional)           |
| 8     | 17     | OUTPUT | Sevcon & Hour Meter (motor function requested) |
| 9     | 15     | INPUT  | Battery Negative                               |
| 10    | 7      | INPUT  | Steer Right                                    |
| 11    | 4      | INPUT  | Lift Up  |
| 12    | 2      | INPUT  | Limit Switch (24V = platform down)             |
| 13    | 3      | OUTPUT | Enable, from lower Lift switch                 |
| 14    | 21     | OUTPUT | To Sevcon (for speed cutback)                  |





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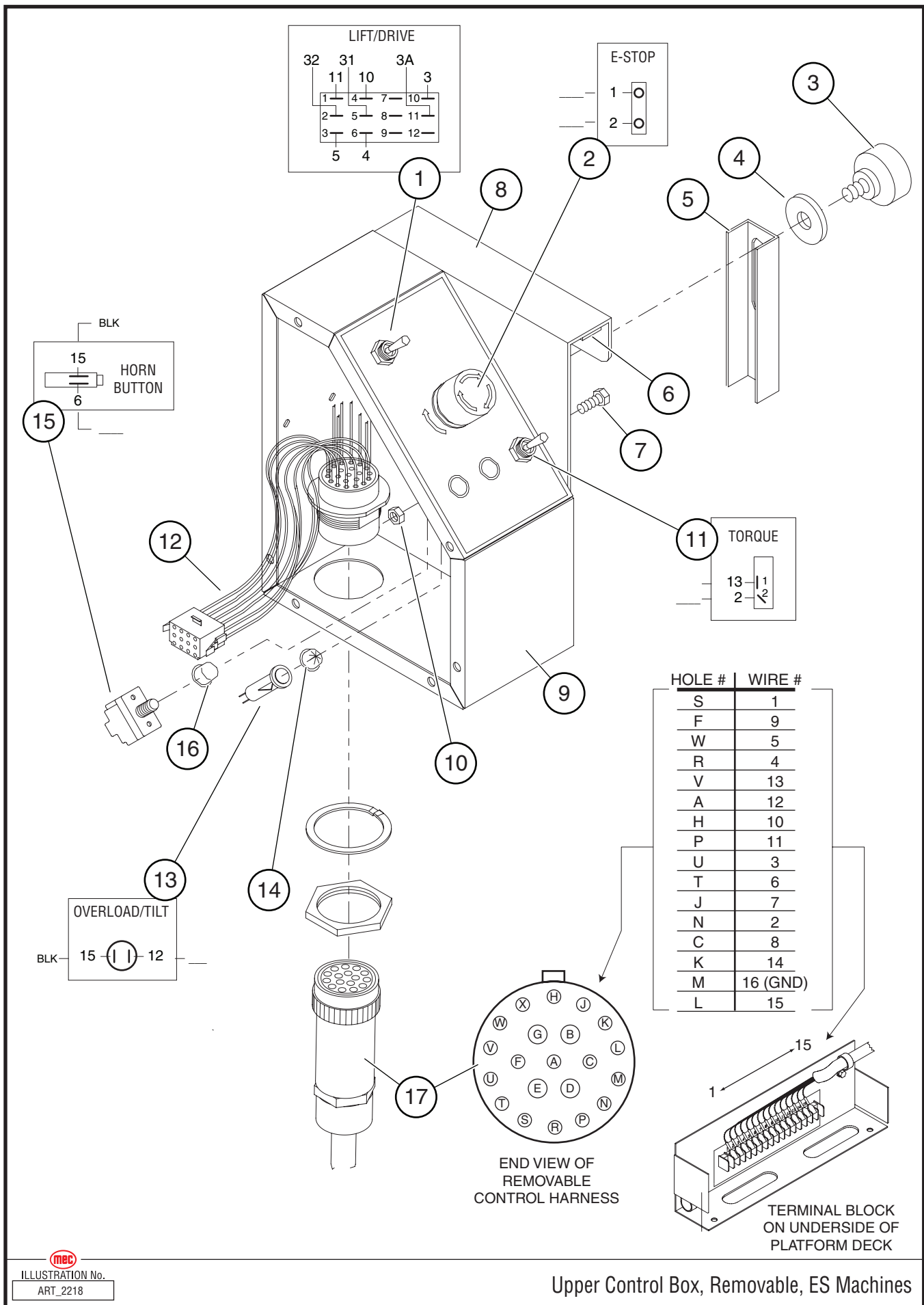
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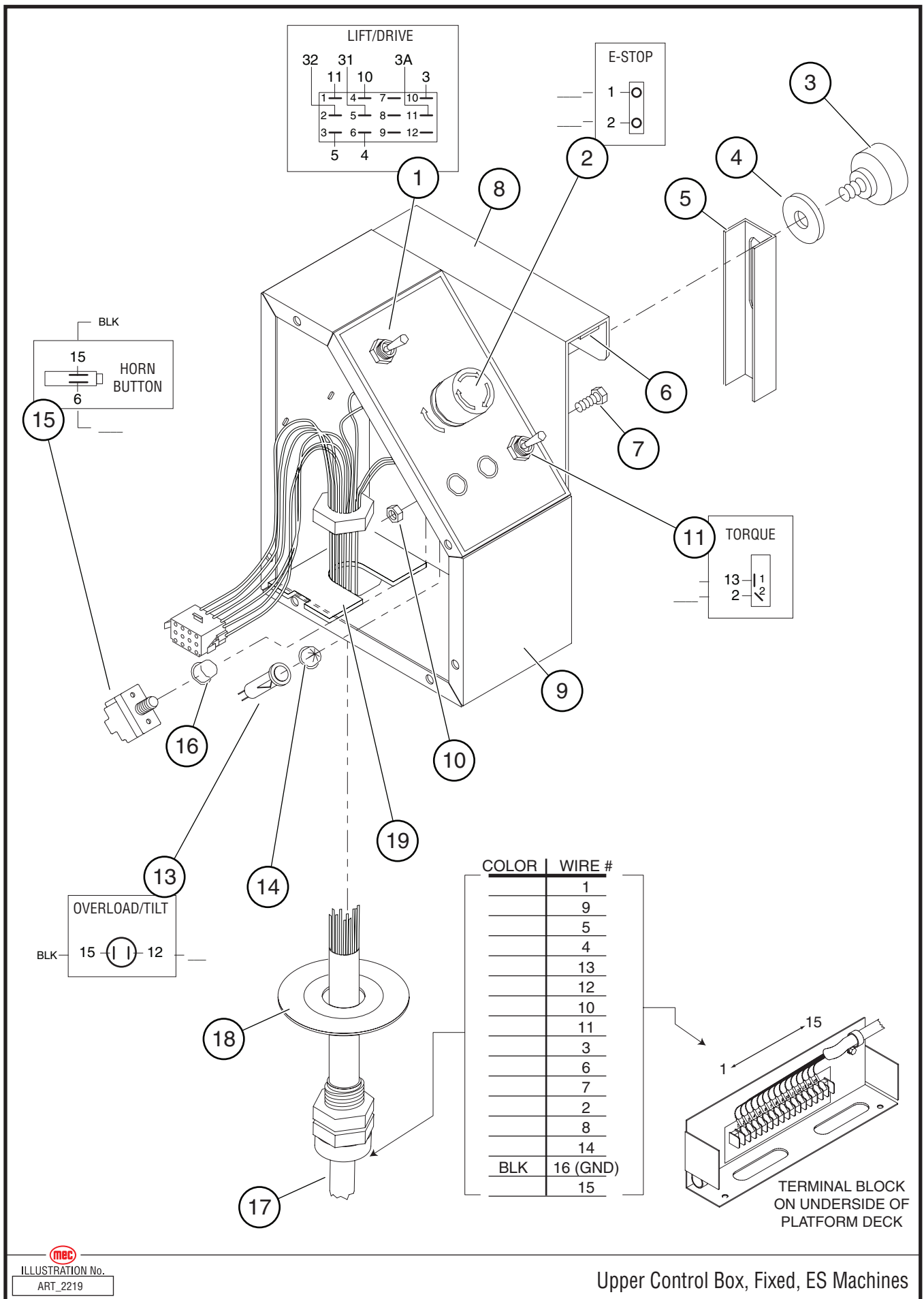
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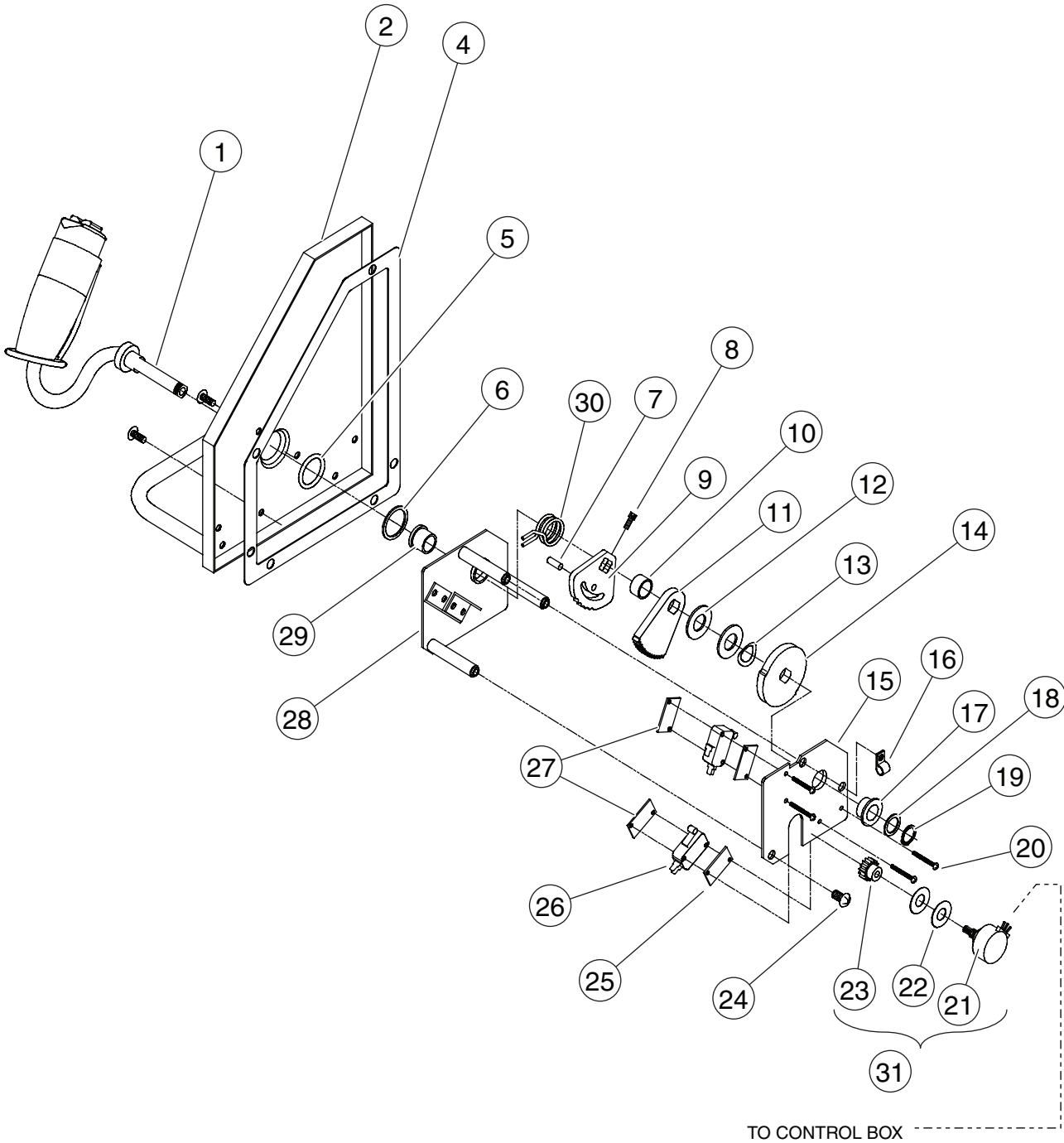
| ITEM | PART NO. | QTY | DESCRIPTION                             |
|------|----------|-----|---|
|      |          |     | <b>REMOVABLE CONTROL BOX ASSEMBLY</b>   |
|      | 25525    |     | REMOVABLE CONTROL BOX ASSEMBLY (OPTION) |
| 1    | 8638     | 1   | SWITCH, TOGGLE, 2 POSITION, 4 POLE      |
| 2    | 7800     | 1   | EMERGENCY STOP SWITCH ASSEMBLY          |
|      | 9345     | 1   | BLOCK-CONTACT N.C.                      |
| 3    | 8826     | 1   | THUMBSCREW, 5/16" - 18, FLOWER          |
| 4    | HDW8294  | 1   | WASHER, FLAT                            |
| 5    | 13864    | 1   | LOCK, CONTROL ARM BRACKET               |
| 6    | 6350     | .5  | TAPE, FOAM                              |
| 7    | HDW5724  | 1   | SCREW, 5/16" - 18, 3/4" LG              |
| 8    | 13865    | 1   | BRACKET, CONTROL BOX HOLDER             |
| 9    | 13867    | 1   | WRAPPER, CONTROL BOX                    |
| 10   | HDW7120  | 1   | NUT, 5/16" - 18                         |
| 11   | 5630     | 1   | SWITCH, TOGGLE, TORQUE                  |
| 12   | 90100    | 1   | WIRE HARNESS, W/CONNECTOR CONTROL BOX   |
| 13   | 9179     | 1   | SOCKET, LIGHT                           |
| 14   | 9184     | 1   | LENS, YELLOW                            |
| 14   | 9183     | 1   | LENS, RED                               |
|      | 9182     | 1   | LIGHT, BAYONET, 28 VOLT                 |
| 15   | 8044     | 1   | SWITCH, (MANUAL HORN) (OPTION)          |
| 16   | 8819     | 1   | BOOT (OPTION)                           |
| 17   | 7656     | 1   | CABLE, UPPER CONTROL (SEE WIRE HARNESS) |
|      | 6318     |     | PIN REPAIR KIT FOR CABLE                |
|      |          |     |   |
|      |          |     |   |
|      |          |     |   |
|      |          |     |   |





| ITEM | PART NO.      | QTY    | DESCRIPTION  |
|------|---------------|--------|--|
|      |               |        | <b>FIXED CONTROL Box ASSEMBLY</b>                          |
| 1    | 90824<br>8638 | 1      | CONTROL BOX ASSEMBLY<br>SWITCH, TOGGLE, 2 POSITION, 4 POLE |
| 2    | 7800<br>9345  | 1<br>1 | EMERGENCY STOP SWITCH ASSEMBLY<br>BLOCK-CONTACT N.C.       |
| 3    | 8826          | 1      | THUMBSCREW, 5/16" - 18, FLOWER                             |
| 4    | HDW8294       | 1      | WASHER, FLAT   |
| 5    | 13864         | 1      | LOCK, CONTROL ARM BRACKET                                  |
| 6    | 6350          | .5     | TAPE, FOAM   |
| 7    | HDW5724       | 1      | SCREW, 5/16" - 18, 3/4" LG                                 |
| 8    | 13865         | 1      | BRACKET, CONTROL BOX HOLDER                                |
| 9    | 13867         | 1      | WRAPPER, CONTROL BOX                                       |
| 10   | HDW7120       | 1      | NUT, 5/16" - 18  |
| 11   | 5630          | 1      | SWITCH, TOGGLE, TORQUE                                     |
| 12   | 90817         | 1      | WIRE HARNESS, UPPER CONTROL CABLE                          |
| 13   | 9179          | 1      | SOCKET, LIGHT  |
| 14   | 9184<br>9182  | 1<br>1 | LENS, YELLOW<br>LIGHT, BAYONET, 28 VOLT                    |
| 15   | 8044          | 1      | SWITCH, (MANUAL HORN) (OPTION)                             |
| 16   | 8819          | 1      | BOOT (OPTION)  |
| 17   | REF           | 1      | CONTROL CABLE (SEE WIRE HARNESS)                           |
| 18   | 16079         | 1      | STRAIN RELIEF WASHER                                       |
| 19   | 16120         | 1      | MOUNTING PLATE   |
|      |               |        |  |
|      |               |        |  |
|      |               |        |  |
|      |               |        |  |
|      |               |        |  |
|      |               |        |  |







| ITEM | PART NO. | QTY | DESCRIPTION                                    |
|------|----------|-----|--|
|      |          |     | <b>UPPER CONTROL BOX COVER ASSEMBLY</b>        |
|      | 13868    |     | CONTROL BOX COVER ASSEMBLY                     |
| 1    | 13647    | 1   | CONTROL ARM                                    |
| 2    | 3772     | 1   | COVER  |
| 4    | 7875     | 1   | GASKET   |
| 5    | 7882     | 1   | O-RING, 7/8" ID X 1 1/8" OD                    |
| 6    | HDW3768  | 1   | WASHER, FLAT                                   |
| 7    | 100/8348 | 1   | PIN, HOLD DOWN                                 |
| 8    | HDW7887  | 1   | SCREW, #6-32, 1/2" LG                          |
| 9    | 13502    | 1   | BRACKET, CENTERING                             |
| 10   | 3763     | 1   | SPACER, STEP                                   |
| 11   | 13402    | 1   | GEAR, LARGE                                    |
| 12   | HDW8531  | 2   | WASHER, FLAT                                   |
| 13   | HDW7881  | 1   | WASHER, BEVEL                                  |
| 14   | 3782     | 1   | CAM. DIRECTIONAL                               |
| 15   | 13403    | 1   | PLATE, BOTTOM                                  |
| 16   | 6917     | 1   | CLAMP, CABLE 1/4"                              |
| 17   | 7818     | 1   | BEARING, BRONZE, FLANGED                       |
| 18   | HDW3771  | 1   | WASHER, FLAT                                   |
| 19   | 5736     | 1   | RING, RETAINING, 1/2"                          |
| 20   | HDW8399  | 4   | SCREW, #4 - 40, 5/8" LG                        |
| 21   | 8383     | 1   | POTENTIOMETER                                  |
| 22   | HDW8567  | 2   | WASHER, FLAT                                   |
| 23   | 8389     | 1   | GEAR, SPUR                                     |
| 24   | HDW7888  | 12  | SCREW, #10 - 32, 1/2" LG                       |
| 25   | 3764     | 2   | PLATE, SPACER                                  |
| 26   | 8696     | 2   | SWITCH, LIMIT, MICRO V7                        |
| 27   | 3765     | 2   | PLATE, STRAP                                   |
| 28   | 3766     | 1   | PLATE, TOP                                     |
| 29   | 7819     | 1   | BEARING, BRONZE, FLANGED                       |
| 30   | 8435     | 1   | SPRING, JOYSTICK, CENTERING                    |
| 31   | 13527    | 1   | POTENTIOMETER ASSEMBLY (INCLUDES 21, 22, & 23) |
| 32   | 8346     | 1   | WIRE HARNESS (NOT SHOWN)                       |



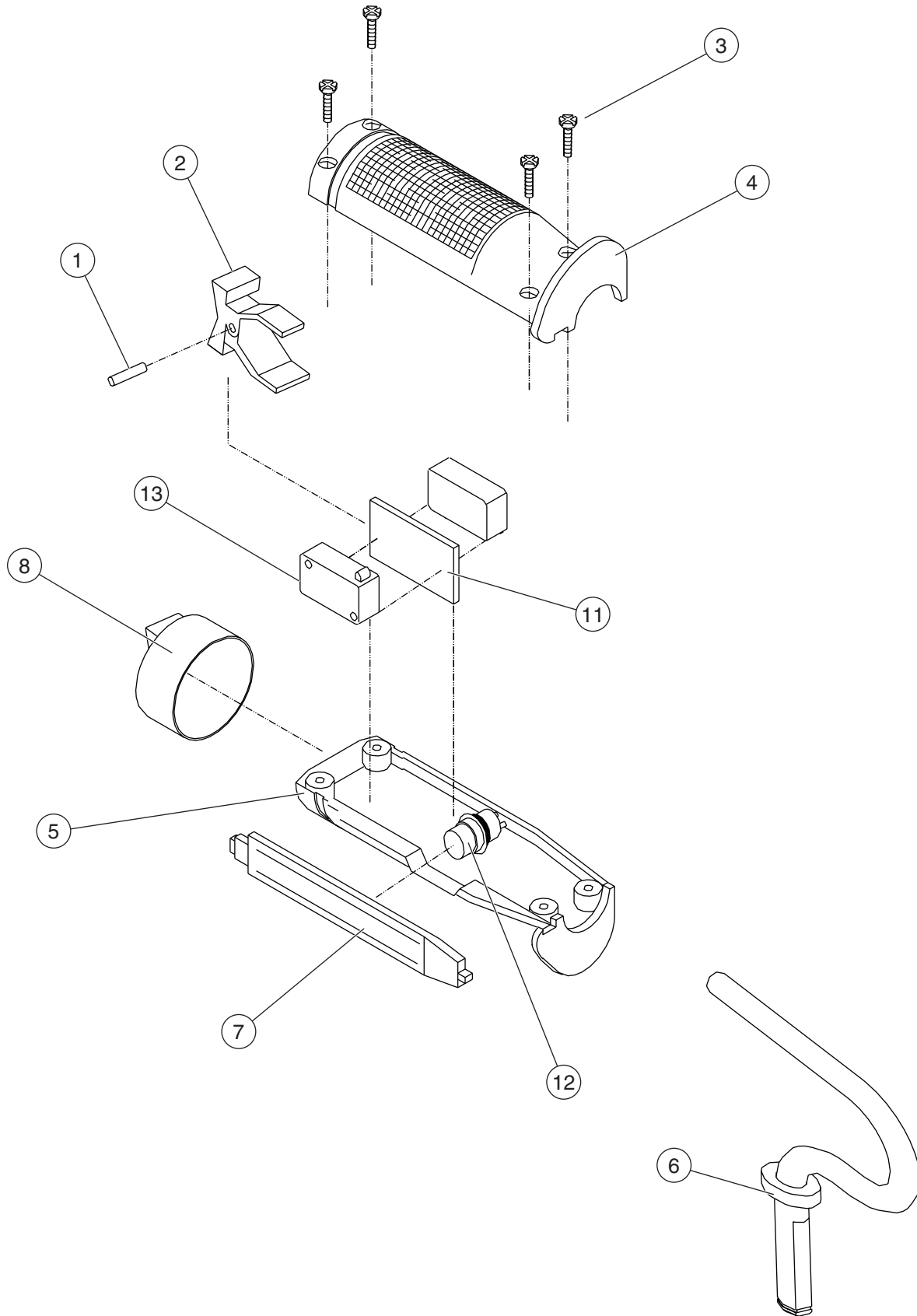


ILLUSTRATION No.  
ART\_2221

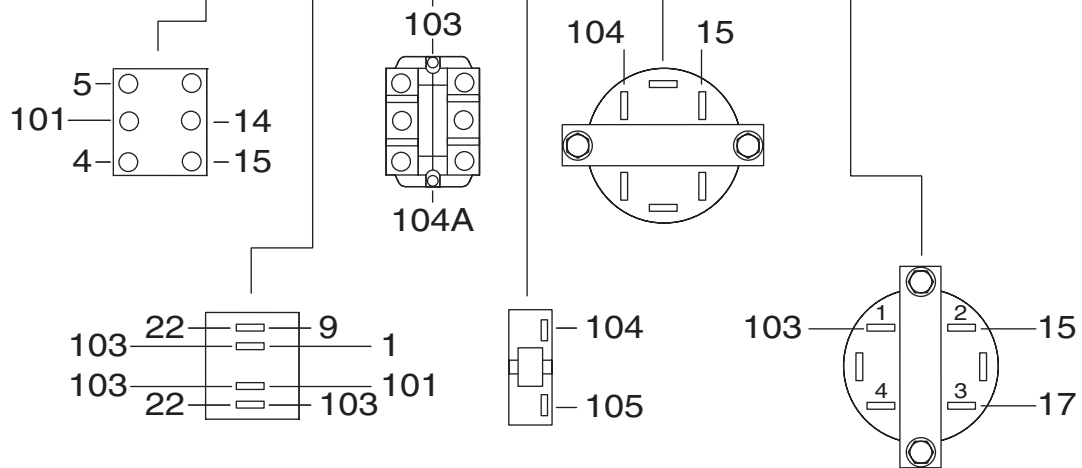
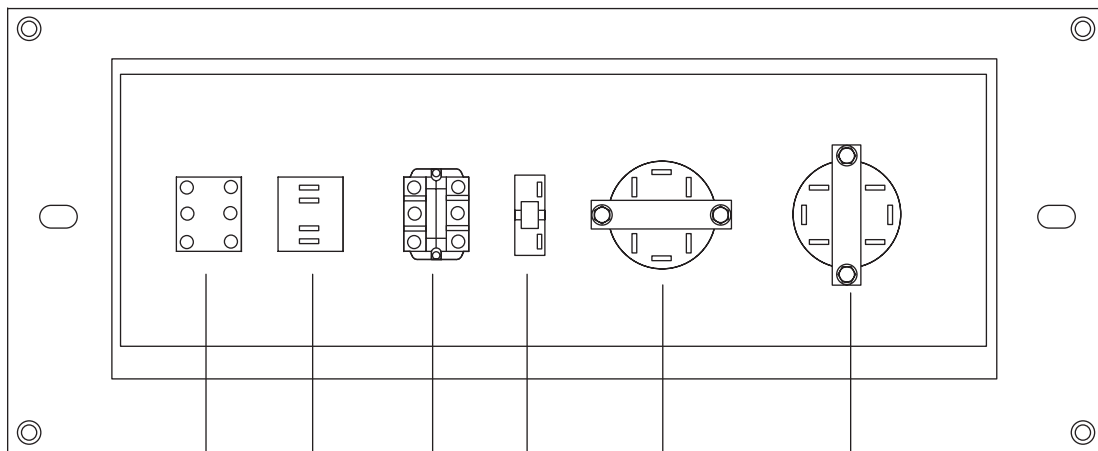
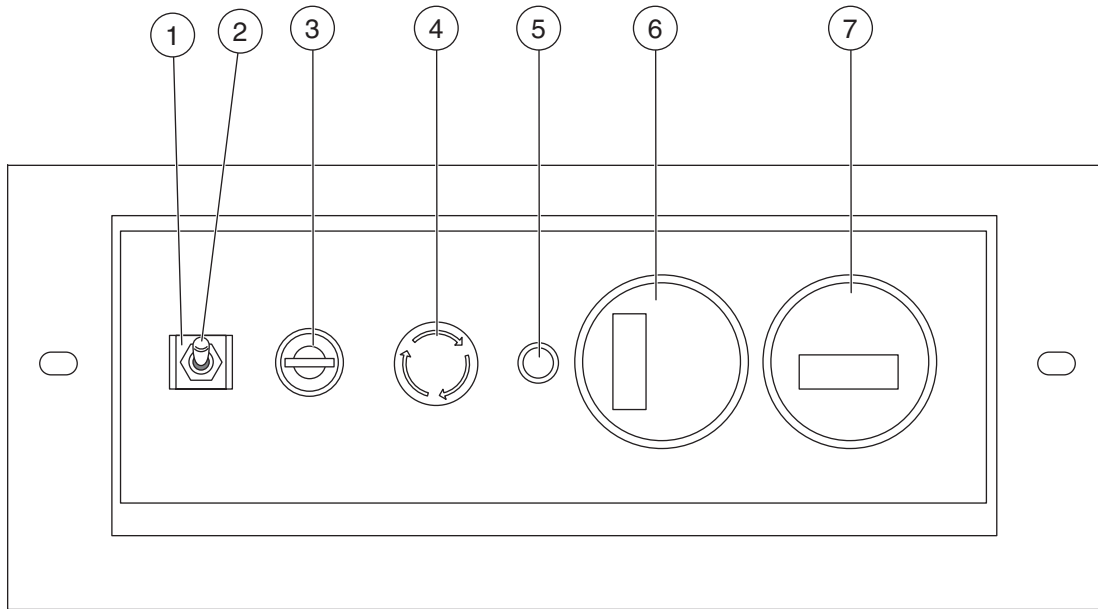
Reference: ART\_188

Control Arm (Joystick)



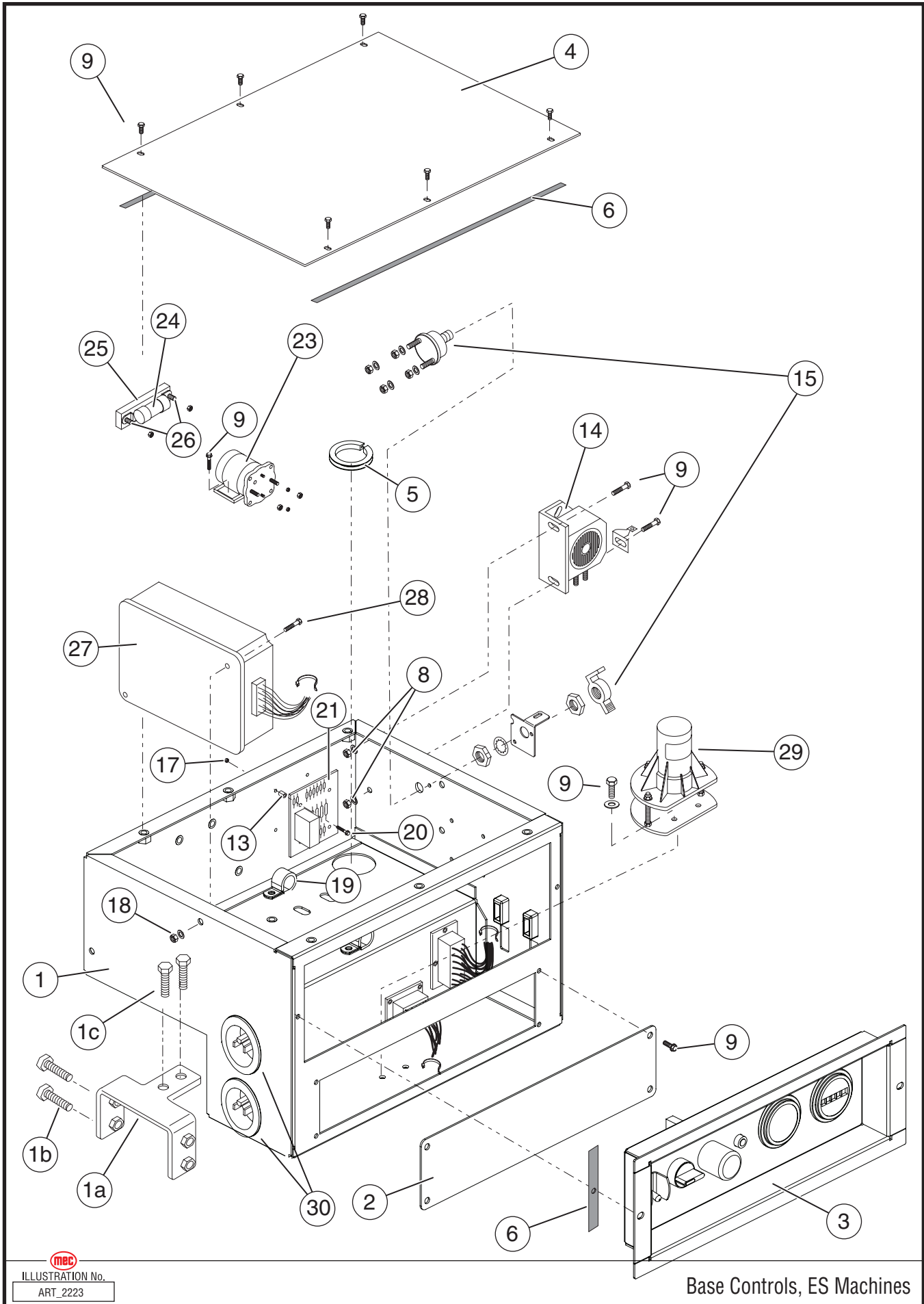
| ITEM | PART NO.      | QTY | DESCRIPTION                                |
|------|---------------|-----|--|
|      |               |     | <b>JOYSTICK</b>                            |
| 1    | 13647<br>8750 | 1   | CONTROL ARM ASSEMBLY<br>PIN (SERVICE ONLY) |
| 2    | 8453          | 1   | SWITCH ACTUATOR (SERVICE ONLY)             |
| 3    | HDW8455       | 4   | SCREW, 6-1/2" LG (SERVICE ONLY)            |
| 4    | 8752          | 1   | GRIP-TOP HALF (SERVICE ONLY)               |
| 5    | 8751          | 1   | GRIP-BOTTOM HALF (SERVICE ONLY)            |
| 6    | 13638         | 1   | CONTROL ARM WITHOUT WIRE                   |
| 7    | 8748          | 1   | TRIGGER (SERVICE ONLY)                     |
| 8    | 8456          | 1   | ROCKER BOOT (SERVICE ONLY)                 |
|      | 7476          | 5   | AMP PINS                                   |
|      | 8630          | 1   | HANDLE, GRIP                               |
|      | 8761          |     | SWITCH ASSEMBLY (NOT SHOWN)                |
|      | 8089          | 1'  | WIRE, BLK 18GA 300 V                       |
|      | 7777          | 2   | TERMINAL, PUSH ON, 3/16"                   |
| 11   | 8447          | 1   | SWITCH SEPARATOR (SERVICE ONLY)            |
| 12   | 8753          | 1   | MOTION SWITCH, ON-OFF (SERVICE ONLY)       |
| 13   | 8448          | 2   | SWITCH (SERVICE ONLY)                      |
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| ITEM | PART NO. | QTY | DESCRIPTION                            |
|------|----------|-----|--|
|      |          |     | <b>LOWER CONTROL PANEL</b>             |
| 1    | 1313     | 1   | SWITCH GUARD                           |
| 2    | 5694     | 1   | SWITCH, TOGGLE                         |
| 3    | 9549     | 1   | TUMBLER, KEY SWITCH                    |
|      | 90714    | 1   | BASE MOUNT WITH 2 N.O. CONTACTS        |
| 4    | 8082     | 4   | BLOCK, N.O. CONTACT                    |
|      | 7800     | 1   | SWITCH, EMERGENCY STOP                 |
| 5    | 9345     | 1   | BLOCK, CONTACT, N.C. (ABB)             |
|      | 7235     | 1   | CIRCUIT BREAKER, 15 AMP                |
| 6    | 7099     | 1   | BATTERY GAUGE, 24 VOLT (OPTIONAL)      |
|      | 7115     | 1   | PLUG (IF BATTERY GAUGE IS NOT PRESENT) |
| 7    | 7909     | 1   | METER, HOUR                            |
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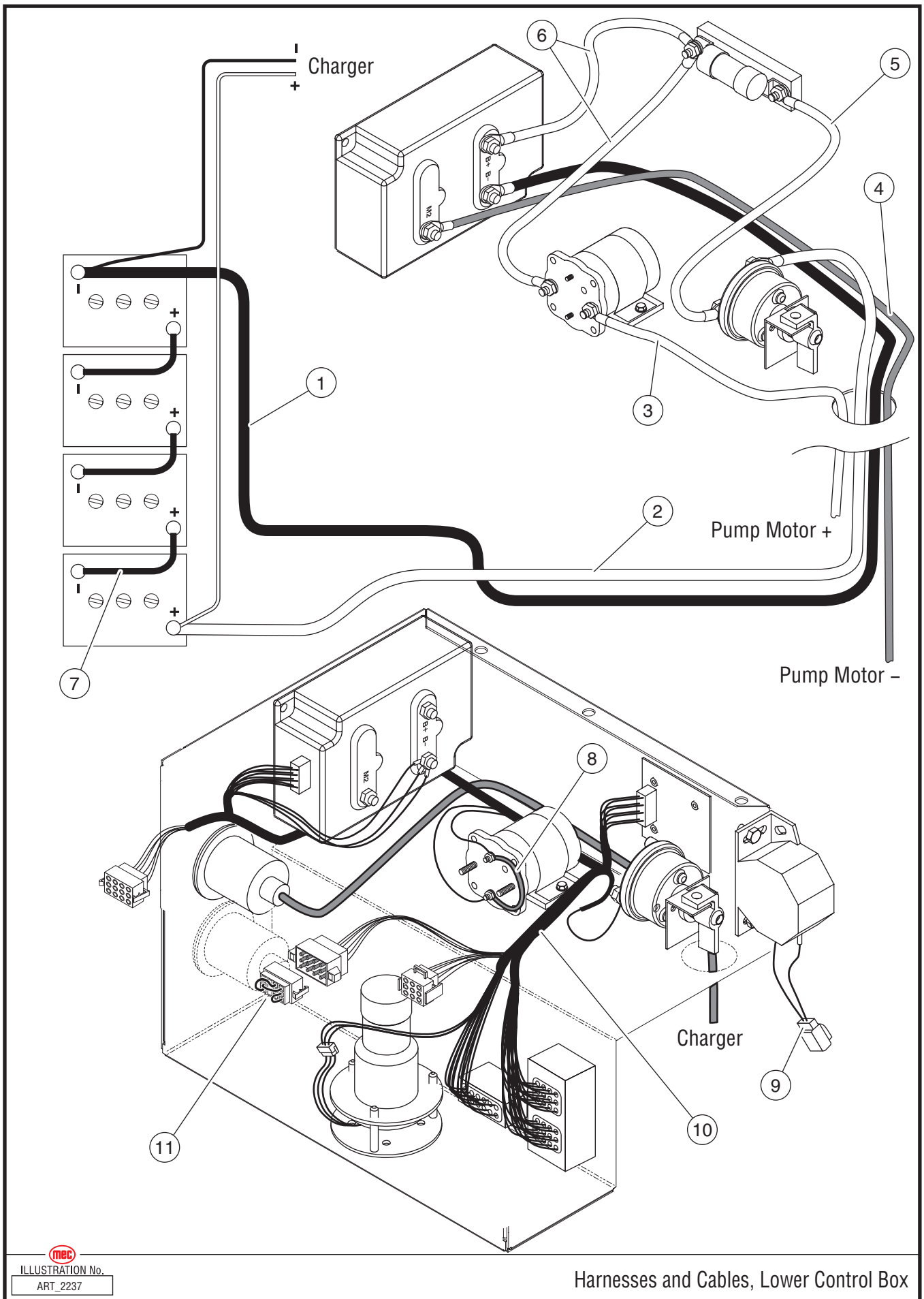


Base Controls, ES Machines

**mecc**  
 ILLUSTRATION No.  
 ART\_2223



| ITEM | PART NO. | QTY   | DESCRIPTION  |
|------|----------|-------|--|
|      |          |       | <b>LOWER CONTROL BOX</b><br><b>1532ES - SERIAL # 9001000 - 9001010</b> |
|      |          |       | <b>1932ES - SERIAL # 9104001 - 9104541</b>                             |
| 1    | 15111    | 1     | WELDMENT, BASE CONTROL BOX   |
| 1A   | 25477    | 1     | BRKT, CONTROL BOX MOUNT  |
| 1B   | HDW5417  | 2     | SCREW  |
| 1C   | HDW6432  | 2     | SCREW  |
|      |          |       | <b>1532ES - SERIAL # 9001011 - UP</b>                                  |
|      |          |       | <b>1932ES - SERIAL # 9104542 - UP</b>                                  |
| 1    | 16609    | 1     | WELDMENT, BASE CONTROL BOX   |
| 2    | 16608    | 1     | COVER, ACCESS PANEL  |
| 3    | 16053    | 1     | CONTROL PANEL  |
| 4    | 15118    | 1     | COVER, ACCESS PANEL TOP  |
| 5    | 5863     | 1     | GROMMET  |
| 6    | 9454     | 3 FT. | GASKET STRIP   |
| 8    | HDW5276  | 4     | NUT, 1/4" - 20   |
| 9    | HDW6455  | 14    | SCREW, 1/4 -20 X 1/2"  |
| 10   | HDW90879 | 2     | SCREW, #6 - 32 X 1 1/4"  |
| 11   | HDW90880 | 4     | SCREW, #10 - 32 X 1"   |
| 12   | HDW90803 | 4     | LOCKNUT, #10 - 32  |
| 13   | 90814    | 4     | SPACERS, NYLON   |
| 14   | 8698     | 1     | ALARM, MOTION (OPTION)   |
| 15   | 8841     | 1     | SWITCH, MASTER DISCONNECT  |
| 17   | HDW8364  | 12    | NUT #6 - 32  |
| 18   | HDW6461  | 2     | LOCKNUT, 1/4" - 20   |
| 19   |          |       | CLAMP  |
| 20   | HDW90833 | 10    | SCREW, #6 - 32 X 3/4" LG   |
| 21   | 8601     | 1     | CIRCUIT BOARD  |
| 23   | 5967     | 1     | CONTACTOR, 24 V  |
| 24   | 8344     | 1     | FUSE, 200A   |
| 25   | 8345     | 1     | FUSE HOLDER  |
| 26   | HDW90929 | 2     | SCREW, 1/4" - 20, 1" LG  |
| 27   | 90991    | 1     | MOTOR CONTROLLER   |
| 28   | HDW90288 | 2     | SCREW, 1/4" - 20, 3" LG  |
| 29   | 90217    | 1     | TILT SENSOR  |
| 30   | 90749    | 2     | RECEPTACLE   |



**mecc**  
 ILLUSTRATION No.  
 ART\_2237

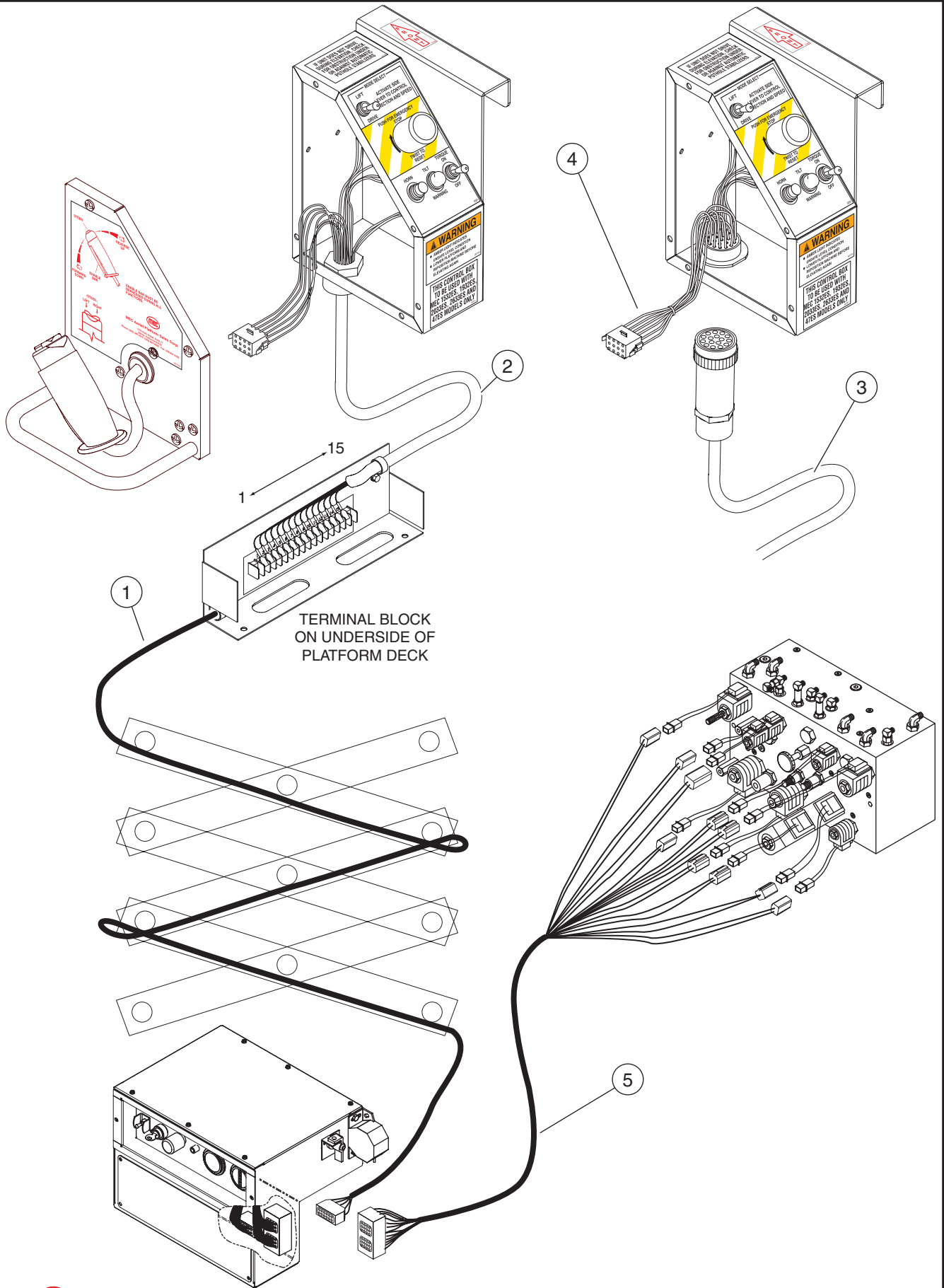
Harnesses and Cables, Lower Control Box





| ITEM | PART NO. | QTY    | DESCRIPTION  |
|------|----------|--------|--|
|      |          |        | <b>WIRE HARNESES, LOWER CONTROLS</b>   |
| 1    | 90962    | 1      | BATTERY CABLE, BLACK   |
| 2    | 9062     | 1      | BATTERY CABLE, RED   |
| 3    | 8836     | 1      | BATTERY CABLE, RED   |
| 4    | 9243     | 1      | BATTERY CABLE, BLACK   |
| 5    | 8837     | 1      | BATTERY CABLE, RED   |
| 6    | 8426     | 2      | BATTERY CABLE, RED   |
| 7    | 6208     | 3      | BATTERY CABLE, BLACK   |
| 8    | 8368     | 1      | DIODE  |
| 9    | 8782     | 1      | HARNESS, BASE ALARM (OPTION)   |
| -    | 9441     | 45'    | WIRE, 14 GA, CE COLORS   |
| NS   | 90156    | AS REQ | TERMINAL, PUSH ON, 1/4" MALE FI, 22-18   |
| NS   | 9356     | 2      | CLAMP, NYLON   |
| NS   | 90781    | 1      | FORK TERMINAL 12 GA  |
|      |          |        |  |
|      |          |        | <b>1532ES - SERIAL # 9001000 - 9001010</b><br><b>1932ES - SERIAL # 9104001 - 9104541</b> |
| 10   | 9977     | 1      | HARNESS, INSTRUMENT  |
|      |          |        | <b>1532ES - SERIAL # 9001011 - UP</b>  |
| 10   | 90800    | 1      | HARNESS, INSTRUMENT  |
| 11   | 90896    | 1      | JUMPER WIRE, ANSI  |
|      |          |        | <b>1932ES - SERIAL # 9104542 - UP</b>  |
| 10   | 90810    | 1      | HARNESS, INSTRUMENT  |
| 11   | 90896    | 1      | JUMPER WIRE, ANSI  |
|      |          |        |  |
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1  
 15  
 TERMINAL BLOCK  
 ON UNDERSIDE OF  
 PLATFORM DECK

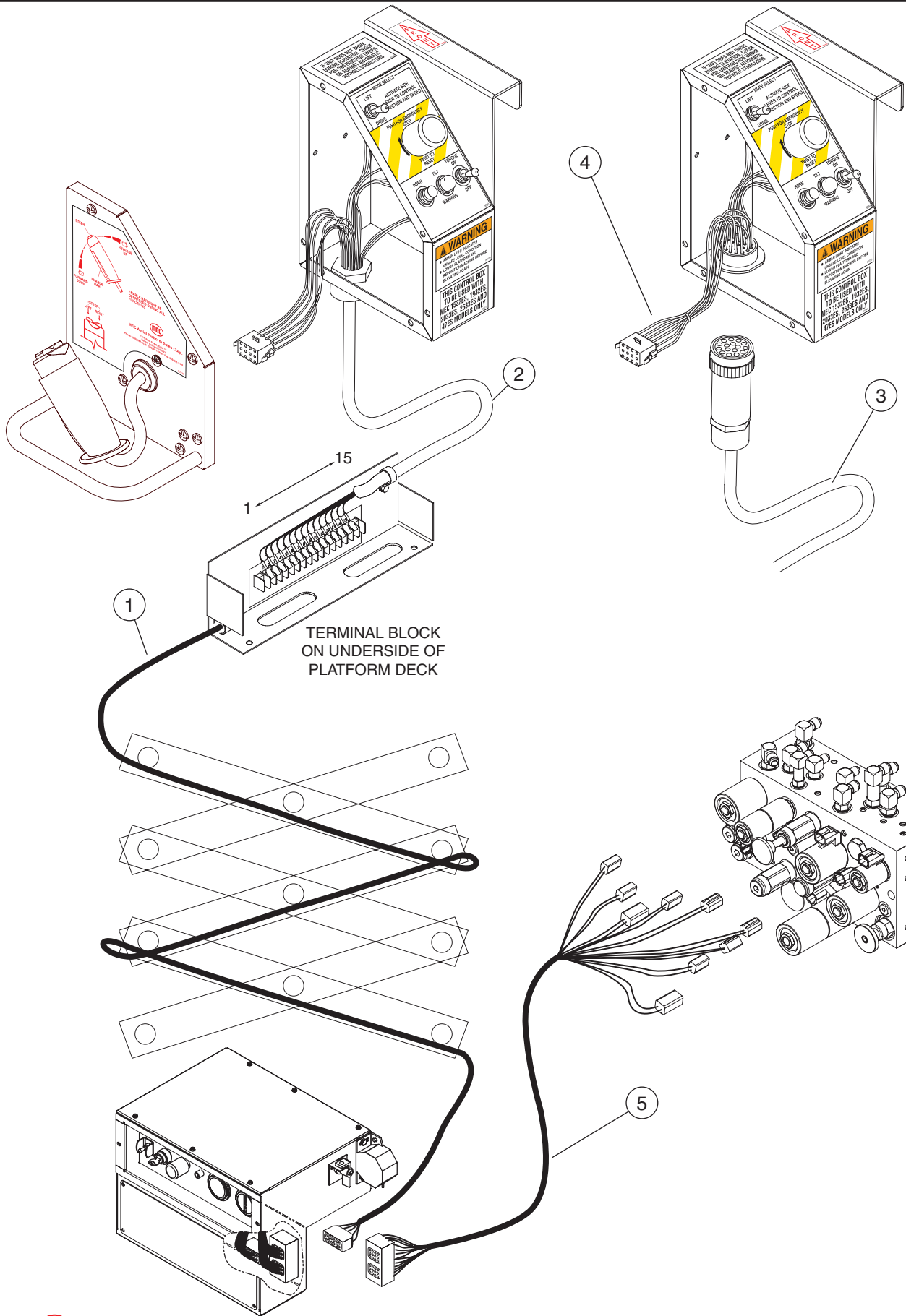
**mec**  
 ILLUSTRATION No.  
 ART\_2394

Control Cable and Manifold Harness



| ITEM | PART NO.     | QTY | DESCRIPTION   |
|------|--------------|-----|---|
|      |              |     | <b>WIRE HARNESES, COMMUNICATION CABLE (EARLY MODELS)</b>                        |
|      |              |     | <b>1532ES SERIAL # 9001000 TO 9001010</b>                                       |
|      |              |     | <b>1932ES SERIAL # 9104000 TO 9104541</b>                                       |
| 1    | 90129        | 1   | COMMUNICATION CABLE, 1532ES   |
| 1    | 90128        | 1   | COMMUNICATION CABLE, 1932ES   |
|      |              |     | <b>WIRE HARNESES, UPPER CONTROLS (EARLY MODELS)</b>                             |
|      |              |     | <b>1532ES SERIAL # 9001000 TO 9001099</b>                                       |
|      |              |     | <b>1932ES SERIAL # 9104000 TO 9105000</b>                                       |
| 2    | 90817        | 1   | CONTROLLER CABLE, FIXED   |
| 3    | 7656<br>6318 | 1   | CONTROLLER CABLE, REMOVABLE (OPTION)<br>PIN REPAIR KIT FOR CABLE (SEE PAGE A-2) |
| 4    | 90100        |     | CONTROL BOX HARNESS (USED WITH REMOVABLE CABLE)                                 |
|      |              |     | <b>WIRE HARNESES, OTHER (EARLY MODELS)</b>                                      |
|      |              |     | <b>1532ES SERIAL # 9001000 TO 9001099</b>                                       |
|      |              |     | <b>1932ES SERIAL # 9104000 TO 9105000</b>                                       |
| 5    | 9978         | 1   | BASE / MANIFOLD HARNESS   |
| NS   | 9054         | 1   | LIFT CYLINDER HARNESS, DOWN VALVE (NOT SHOWN)                                   |
| NS   | 90225        | 1   | SAFETY SWITCH HARNESS (NOT SHOWN)   |
| NS   | —            | 1   | HORN (OPTION) SEE SECTION B   |
| NS   | —            | 1   | POWER CONVERTER (OPTION) SEE SECTION E, OPTIONS                                 |
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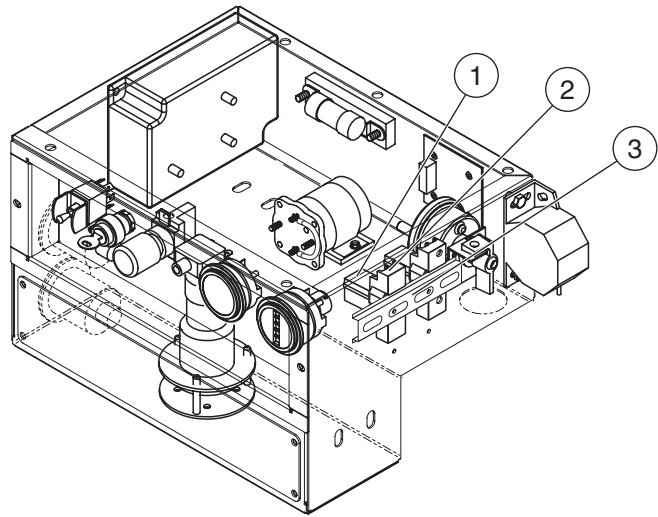
**mecc**  
 ILLUSTRATION No.  
 ART\_2235

Control Cable and Manifold Harness

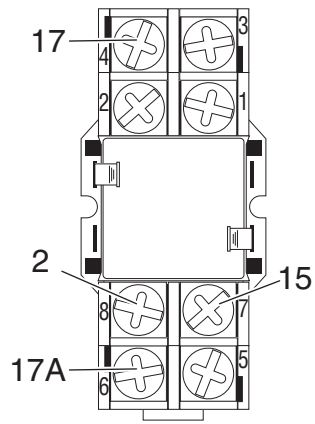
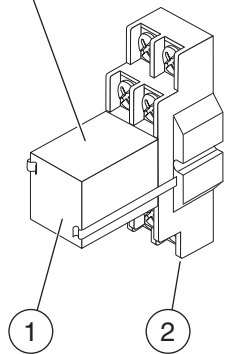


| ITEM | PART NO. | QTY | DESCRIPTION  |
|------|----------|-----|--|
|      |          |     | <b>WIRE HARNESES, COMMUNICATION CABLE (CURRENT MODELS)</b> |
|      |          |     | <b>1532ES SERIAL # 9001011 UP</b>                          |
|      |          |     | <b>1932ES SERIAL # 9104542 UP</b>                          |
| 1    | 90913    | 1   | COMMUNICATION CABLE, 1532ES                                |
| 1    | 90812    | 1   | COMMUNICATION CABLE, 1932ES                                |
|      |          |     | <b>WIRE HARNESES, UPPER CONTROLS (CURRENT MODELS)</b>      |
|      |          |     | <b>1532ES SERIAL # 9001100 UP</b>                          |
|      |          |     | <b>1932ES SERIAL # 9105001 UP</b>                          |
| 2    | 90817    | 1   | CONTROLLER CABLE, FIXED                                    |
| 3    | 7656     | 1   | CONTROLLER CABLE, REMOVABLE (OPTION)                       |
|      | 6318     |     | PIN REPAIR KIT FOR CABLE (SEE PAGE A-2)                    |
| 4    | 90100    |     | CONTROL BOX HARNESS (USED WITH REMOVABLE CABLE)            |
|      |          |     | <b>WIRE HARNESES, OTHER (CURRENT MODELS)</b>               |
|      |          |     | <b>1532ES SERIAL # 9001100 UP</b>                          |
|      |          |     | <b>1932ES SERIAL # 9105001 UP</b>                          |
| 5    | 91071    | 1   | BASE / MANIFOLD HARNESS                                    |
| NS   | 91070    | 1   | LIFT CYLINDER HARNESS, DOWN VALVE (NOT SHOWN)              |
| NS   | —        | 1   | HORN (OPTION) SEE SECTION B                                |
| NS   | —        | 1   | POWER CONVERTER (OPTION) SEE SECTION E, OPTIONS            |
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RL-1



RL-2

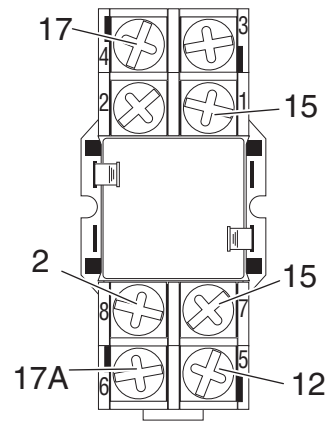
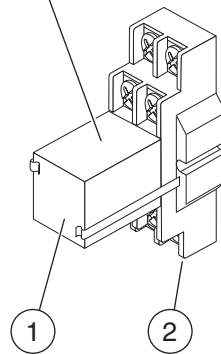


ILLUSTRATION No.  
ART\_2523

Cutout Relays, ES Series, Canadian Models



| <b>ITEM</b> | <b>PART NO.</b> | <b>QTY</b> | <b>DESCRIPTION</b>                    |
|-------------|-----------------|------------|---------------------------------------|
|             |                 |            | <b>CUTOUT RELAYS, CANADIAN MODELS</b> |
| 1           | 90927           | 2          | RELAY, SPDT 2-POLE                    |
| 2           | 90871           | 2          | BASE, RELAY                           |
| 3           | 16333           | 1          | BRACKET, RELAY                        |
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**SECTION B:  
PLATFORM  
AND RAILS**

PLATFORM AND RAILS ..... B-3  
ROLLOUT DECK AND RAILS ..... B-5  
LANYARD ATTACHMENT ..... B-7  
ENTRY GATE ..... B-9  
SWING GATE (OPTION) ..... B-11  
ROLLOUT DECK LOCK ..... B-13  
ROLLOUT DECK ROLLER ..... B-15  
TERMINAL BLOCK ..... B-17  
OPERATOR HORN (ANSI OPTION) ..... B-17  
AIRLINE TO PLATFORM (OPTION) ..... B-17  
POWER TO PLATFORM ..... B-19



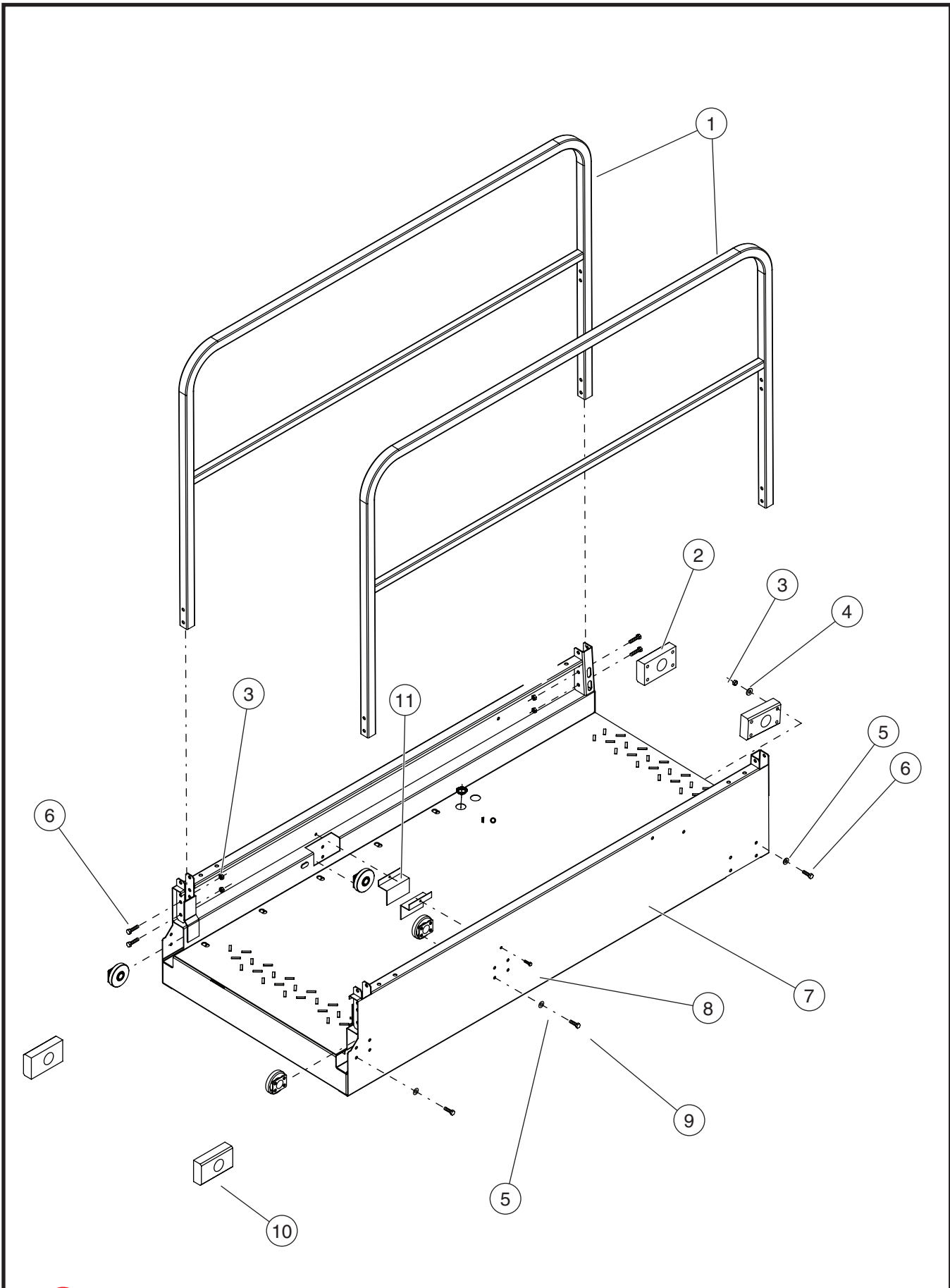


ILLUSTRATION No.  
ART\_2251

Reference: ART\_684

Work Platform, Main Deck, X32ES



| ITEM | PART NO. | QTY | DESCRIPTION                  |
|------|----------|-----|------------------------------|
|      |          |     | <b>PLATFORM AND RAILS</b>    |
| 1    | 16016    | 2   | RAIL, MAIN PLATFORM          |
| 2    | 12777    | 2   | PLATFORM FIXED END BLOCK     |
| 3    | HDW8304  | 16  | NUT, 5/16" - 18              |
| 4    | HDW8194  | 8   | WASHER, FLAT                 |
| 5    | HDW5217  | 24  | WASHER, FLAT                 |
| 6    | HDW8486  | 16  | SCREW, 5/16" - 18, 1 7/8" LG |
| 7    | 25502    | 1   | PLATFORM, MAIN               |
| 8    | HDW6455  | 2   | SCREW, 1/4" - 20, 1/2" LG    |
| 9    | HDW5724  | 16  | SCREW, 5/16" - 18, 3/4" LG   |
| 10   | 13778    | 2   | BLOCK, SLIDE, PLATFORM       |
| 11   | 13637    | 2   | BRACKET, ROLLER COVER        |
|      |          |     |                              |
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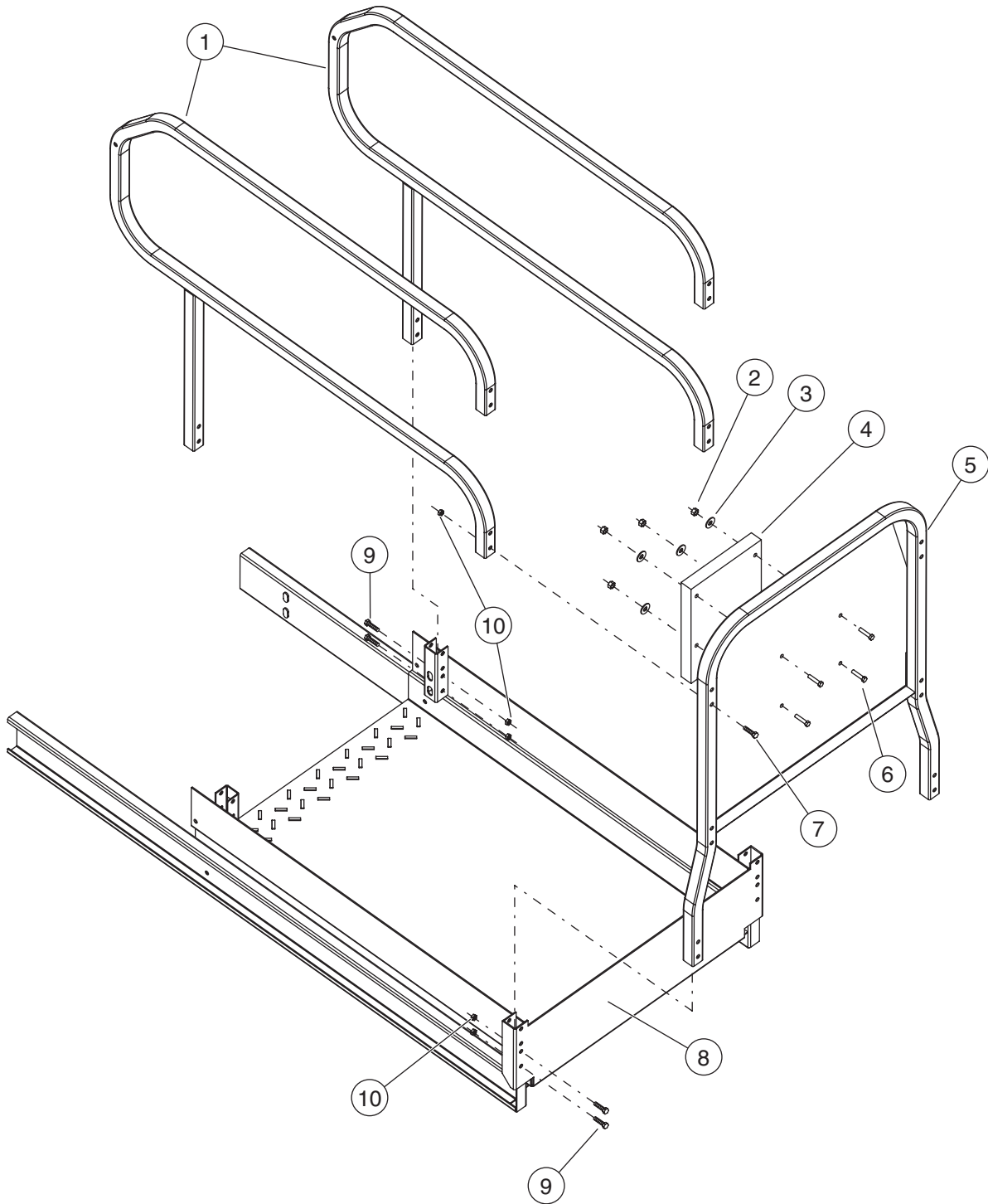


ILLUSTRATION No.  
ART\_2250

Reference: ART\_683

Extension Deck, X32 ES



| ITEM | PART NO. | QTY | DESCRIPTION                     |
|------|----------|-----|---------------------------------|
|      |          |     | <b>ROLLOUT DECK AND RAILS</b>   |
| 1    | 25057    | 2   | RAIL, MAIN EXTENSION PLATFORM   |
| 2    | HDW8267  | 4   | LOCK NUT, 1/4" - 20             |
| 3    | HDW8294  | 4   | WASHER, FLAT                    |
| 4    | 8909     | 1   | ENCLOSURE, MANUAL               |
| 5    | 16034    | 1   | RAIL, FRONT, EXTENSION PLATFORM |
| 6    | HDW5904  | 4   | SCREW, 1/4" - 20, 3/4" LG       |
| 7    | HDW7471  | 8   | SCREW, 5/16" - 18, 3" LG        |
| 8    | 25499    | 1   | PLATFORM EXTENSION WELDMENT     |
| 9    | HDW8486  | 8   | SCREW, 5/16" - 18, 1 7/8" LG    |
| 10   | HDW8304  | 16  | NUT, 5/16" - 18                 |
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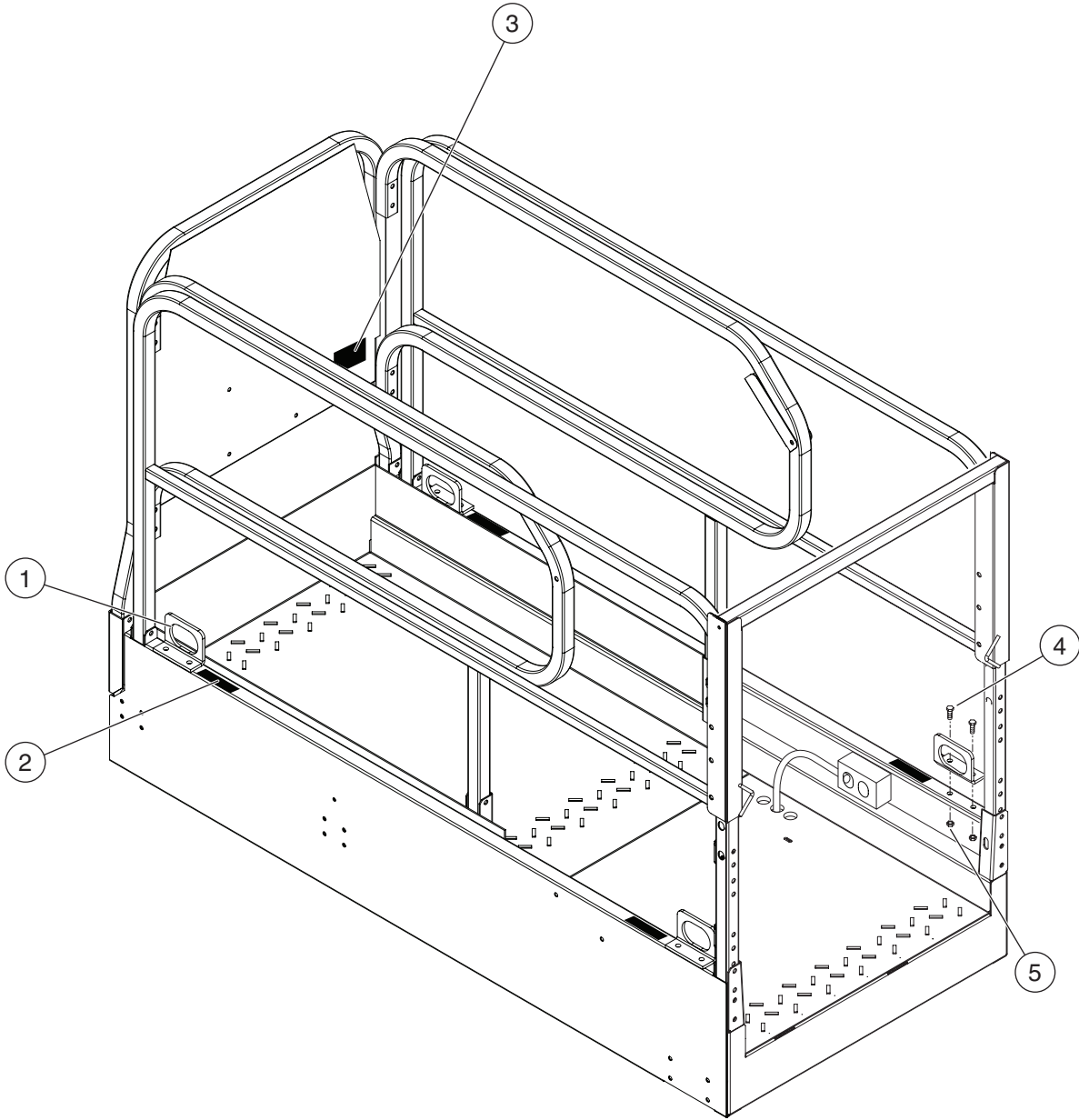


ILLUSTRATION No.  
ART\_2229

Lanyard Attachment Option, 1532ES - 1932ES



| ITEM | PART NO. | QTY | DESCRIPTION               |
|------|----------|-----|---------------------------|
|      |          |     | LANYARD ATTACHMENT        |
| 1    | 3923     | 4   | BRKT, ATTACHMENT POINT    |
| 2    | 8605     | 4   | DECAL, LANYARD ATTACHMENT |
| 3    | 8606     | 1   | DECAL, WARNING RESTRAINT  |
| 4    | HDW6432  | 8   | SCREW, 3/8" - 16, 3/4" LG |
| 5    | HDW5039  | 8   | LOCK NUT, 3/8" - 16       |
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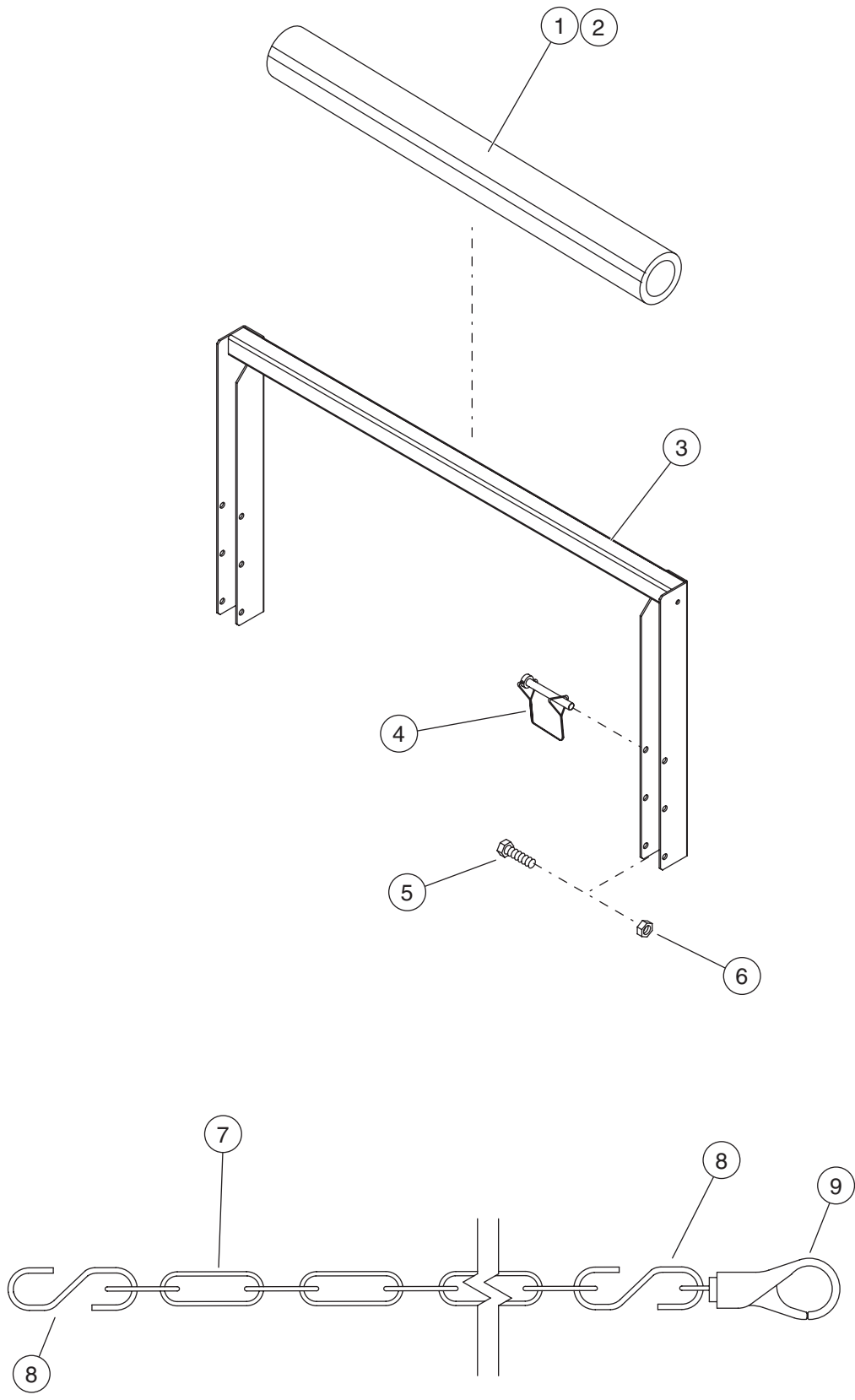


 ILLUSTRATION No.  
ART\_2252

Reference: ART\_685

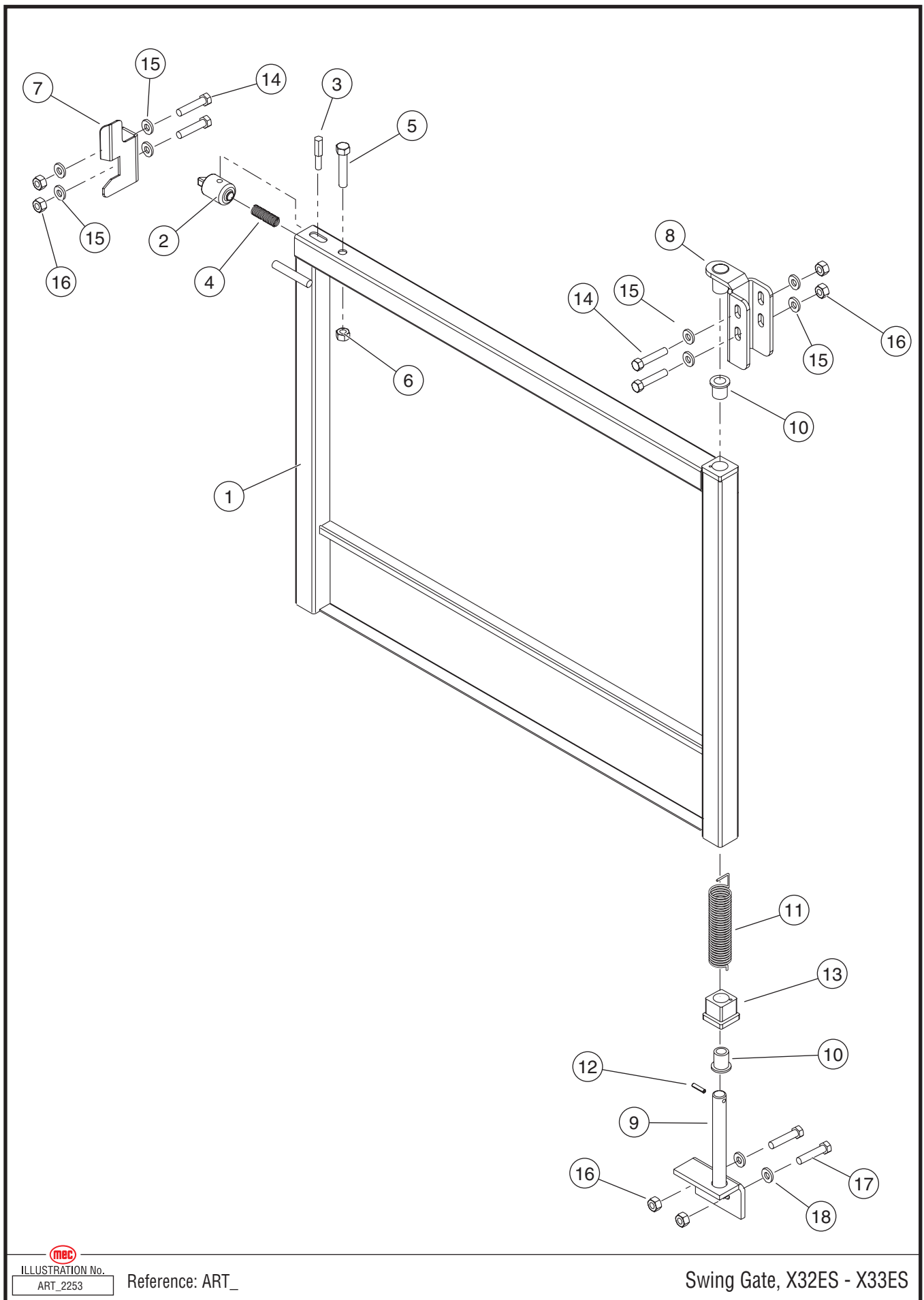
Entry Chain and Rail, X32ES






| ITEM | PART NO. | QTY   | DESCRIPTION                                |
|------|----------|-------|--|
|      |          |       | <b>ENTRY GATE</b>                          |
| 1    | 7048     | 1     | COVER, RAIL PAD (OPTION ONLY)              |
| 2    | 7805     | 3 FT. | PAD, RAIL (OPTION ONLY)                    |
| 3    | 25051    | 1     | GATE, SHEET LOAD                           |
| 4    | HDW90792 | 2     | PIN, LOCK, 5/16"                           |
| 5    | HDW7119  | 4     | SCREW, 5/16" - 18, 2 1/4" LG               |
| 6    | HDW8304  | 4     | NUT, 3/8" - 16                             |
| 7    | 1366     | 1     | GUARD CHAIN                                |
| 8    | 5239     | 2     | LINK, CONNECTING, S-HOOK                   |
| 9    | 8781     | 1     | CHAIN LINK SNAP                            |
|      | 2510     | 1     | CHAIN GUARD ASSY (INCLUDES ITEMS 7, 8 & 9) |
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 ILLUSTRATION No. ART\_2253 Reference: ART\_

Swing Gate, X32ES - X33ES

| ITEM | PART NO. | QTY | DESCRIPTION                              |
|------|----------|-----|--|
|      |          |     | <b>SWING GATE (OPTION)</b>               |
| 1    | 25605    | 1   | SWING GATE WELDMENT                      |
| 2    | 40003    | 1   | PIN, LATCH                               |
| 3    | 40006    | 1   | ROD, LATCH LEVER                         |
| 4    | 7055     | 1   | SPRING, LATCH                            |
| 5    | HDW8277  | 1   | SCREW, 3/8" - 16, 1 3/4" LG              |
| 6    | HDW6281  | 1   | NUT, 3/8" - 16                           |
| 7    | 25615    | 1   | BRKT STRIKER SWING GATE                  |
| 8    | 15046    | 1   | SWING GATE MOUNT WELD UPPER              |
| 9    | 15043    | 1   | SWING GATE MOUNT WELD LOWER              |
| 10   | 8187     | 2   | BEARING, NYLINER, FLANGED                |
| 11   | 8300     | 1   | SPRING, TORSION, 1" OD, 4" LG            |
| 12   | HDW7455  | 1   | PIN, SLOTTED SPRING, 3/16" DIA X 3/4" LG |
| 13   | 13272    | 1   | BLOCK, PIVOT                             |
| 14   | HDW7119  | 4   | HEX CAP SCREW 5/16"-18 X 2.25"           |
| 15   | HDW8294  | 8   | FLAT WASHER 0.328 ID                     |
| 16   | HDW8304  | 6   | LOCNUT 5/16"-18                          |
| 17   | HDW5724  | 2   | HEX CAP SCREW 5/16"-18 X 3/4"            |
| 18   | HDW5217  | 2   | FLAT WASHER 11/32" ID                    |
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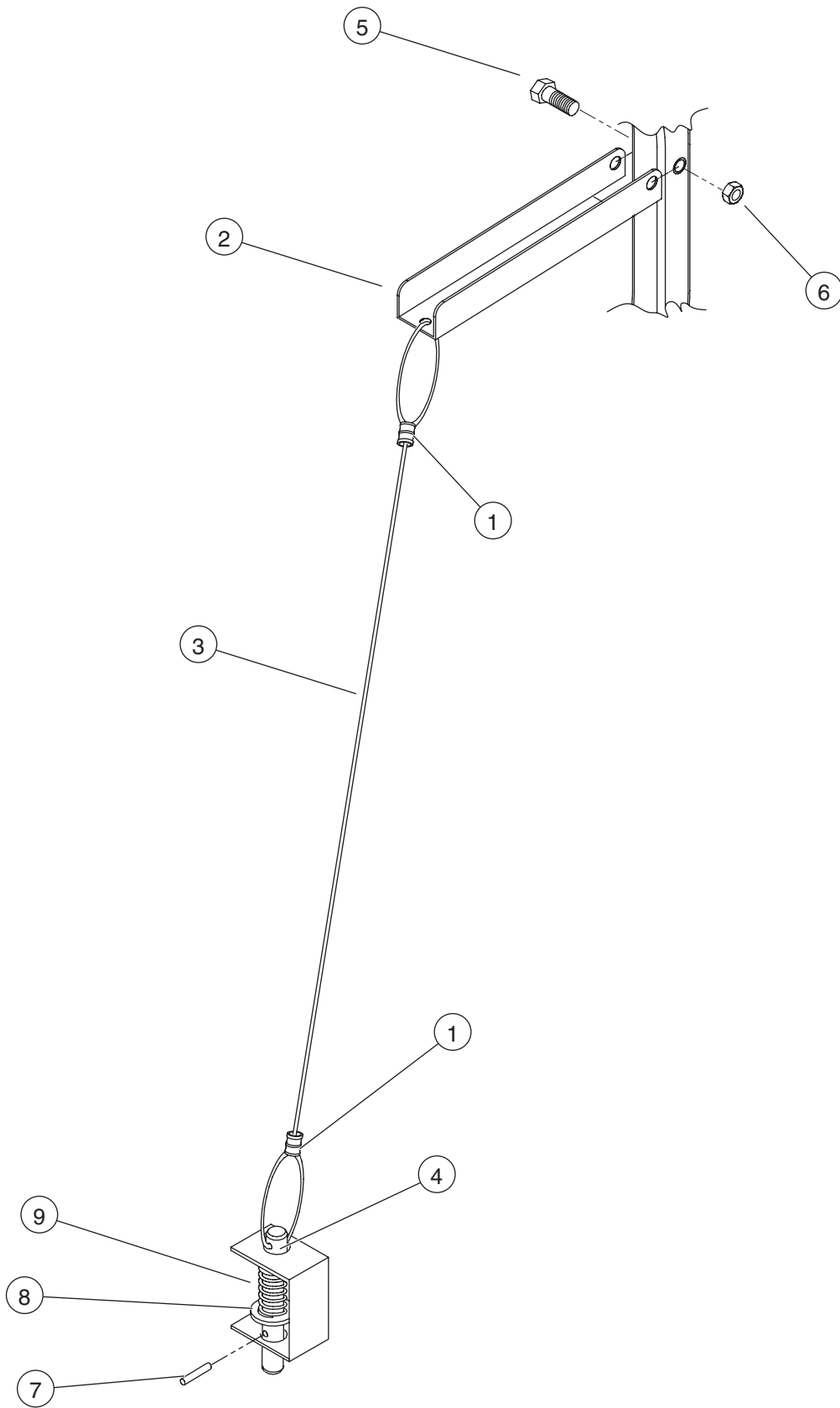


ILLUSTRATION No.  
ART\_2174

Reference ART\_686

Roll-out Deck Lock Pin Assembly



| ITEM | PART NO. | QTY   | DESCRIPTION                   |
|------|----------|-------|-------------------------------|
|      |          |       | <b>ROLLOUT DECK LOCK</b>      |
|      | 25297    | 1     | PLATFORM LOCK PIN ASSEMBLY    |
| 1    | 8814     | 2     | SLEEVES, OVAL ALUMINUM        |
| 2    | 13814    | 1     | HANDLE - ROLLOUT PLATFORM     |
| 3    | 7184     | 3.2FT | WIRE CABLE, COATED & ROLLED   |
| 4    | 13737    | 1     | PIN, EXTENSION LOCK           |
| 5    | HDW8303  | 1     | SCREW, 5/16" - 18, 2" LG      |
| 6    | HDW8304  | 1     | NUT, 5/16" - 18               |
| 7    | HDW8513  | 1     | SPRING PIN, 1/8" DIA, 3/4" LG |
| 8    | HDW7031  | 1     | WASHER, 1/2" ID, 7/8" OD      |
| 9    | 7408     | 1     | SPRING, DECK LOCK             |
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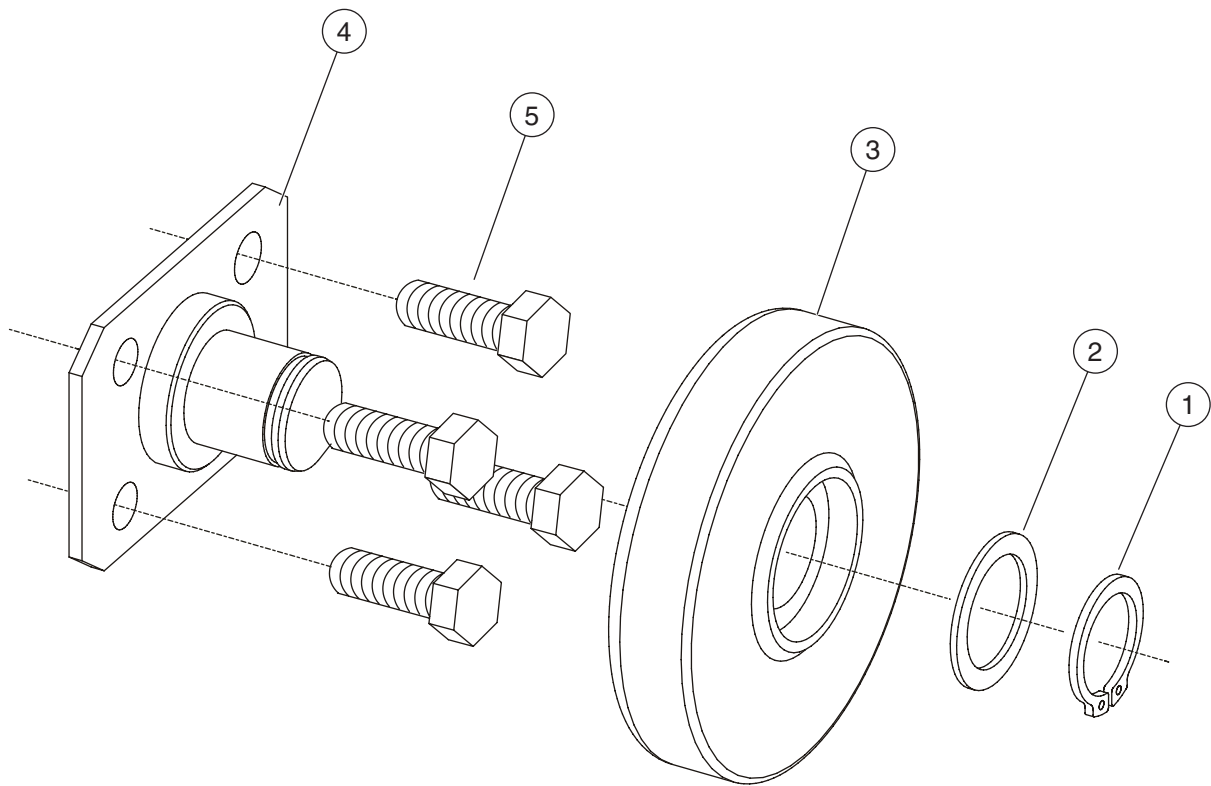


ILLUSTRATION No.  
ART\_2095

Reference: ART\_687

Roll-out Deck Roller



| ITEM | PART NO. | QTY | DESCRIPTION                    |
|------|----------|-----|--------------------------------|
|      |          |     | <b>ROLLOUT DECK ROLLER</b>     |
| 1    | 5918     | 1   | RING, RETAINING, HEAVY DUTY 1" |
| 2    | HDW8370  | 1   | WASHER                         |
| 3    | 13230    | 1   | ROLLER                         |
| 4    | 13267    | 1   | ROLLER PLATE WELDMENT          |
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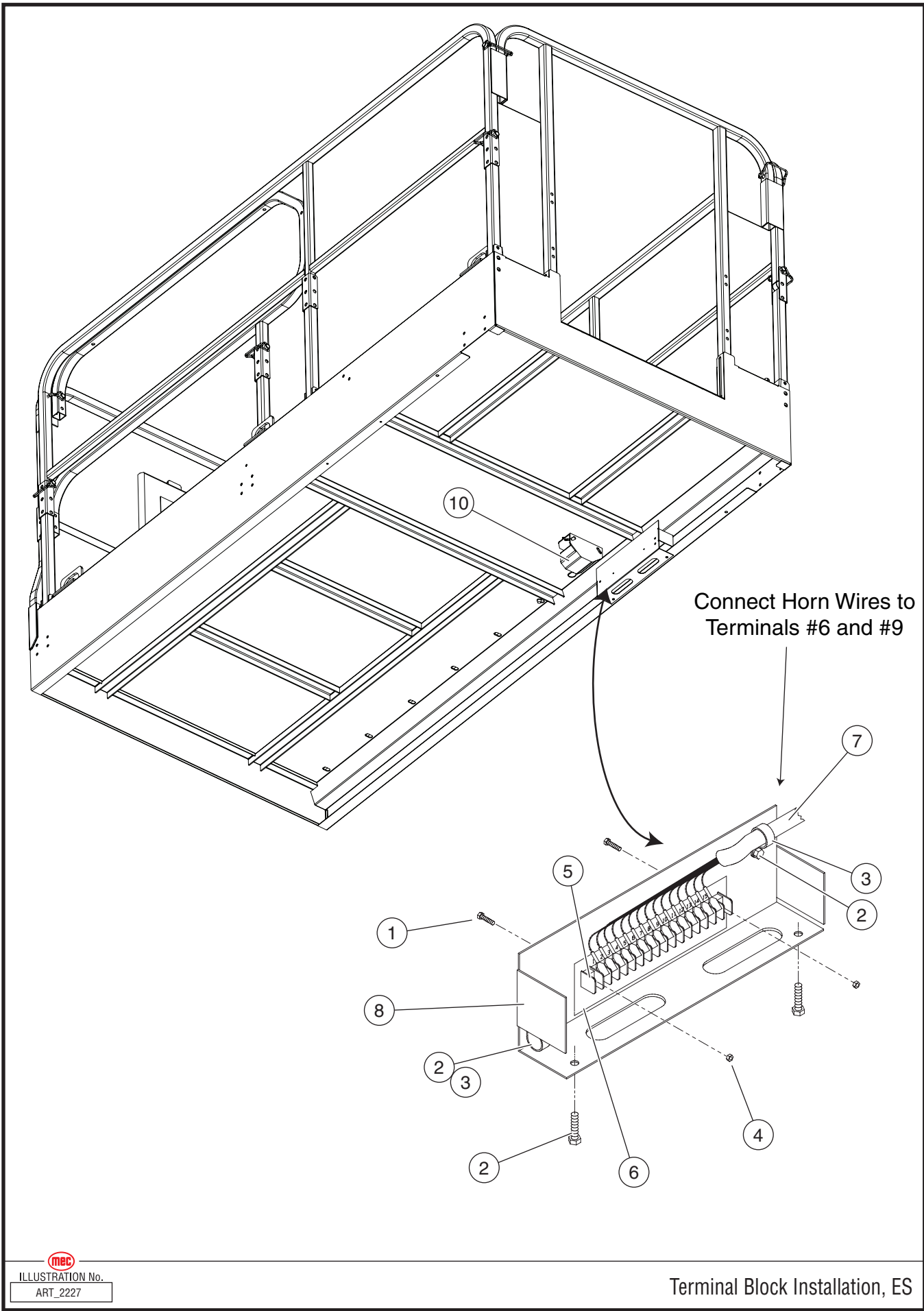


 ILLUSTRATION No.  
ART\_2227

Terminal Block Installation, ES



| ITEM | PART NO. | QTY | DESCRIPTION   |
|------|----------|-----|---|
|      |          |     | <b>TERMINAL BLOCK</b>   |
| 1    | HDW5363  | 2   | SCREW, 6-32, 1" LG  |
| 2    | HDW6455  | 4   | SCREW, 1/4" - 20, 1/2" LG   |
| 3    | 5882     | 2   | CABLE CLAMP   |
| 4    | HDW5364  | 2   | NUT, 6-32   |
| 5    | 5991     | 1   | TERMINAL BLOCK  |
| 6    | 7817     | 1   | STRIP, BACKING, 15 POSITION                                       |
| 7    | REF      | 1   | WIRE HARNESS, UPPER CONTROLS                                      |
| 8    | 25526    | 1   | TERMINAL STRIP COVER  |
|      |          |     |   |
| 10   | 9716     | 1   | <b>OPERATOR HORN (ANSI OPTION)</b><br>HORN, 12-48 VOLT ELECTRONIC |
|      | HDW5723  | 2   | SCREW, 1/4" - 20, 3/4" LG   |
|      | HDW5276  | 2   | NUT, 1/4" - 20  |
|      | HDW5217  | 2   | WASHER, FLAT  |
|      |          |     | <b>AIRLINE TO PLATFORM (OPTION)</b>                               |
|      |          |     | <b>(NOT SHOWN)</b>  |
|      | 5351     | 1   | CABLE TIE   |
|      | 8543     | *   | HOSE, 1/4" AIRLINE<br>* 1532ES = 27 FT.                           |
|      |          |     | * 1932ES = 33 FT.   |
|      | 8559     | 2   | CLAMP, HOSE   |
|      | HDW5052  | 2   | FITTING, 1/4" MALE, MALE HOSE BARB                                |
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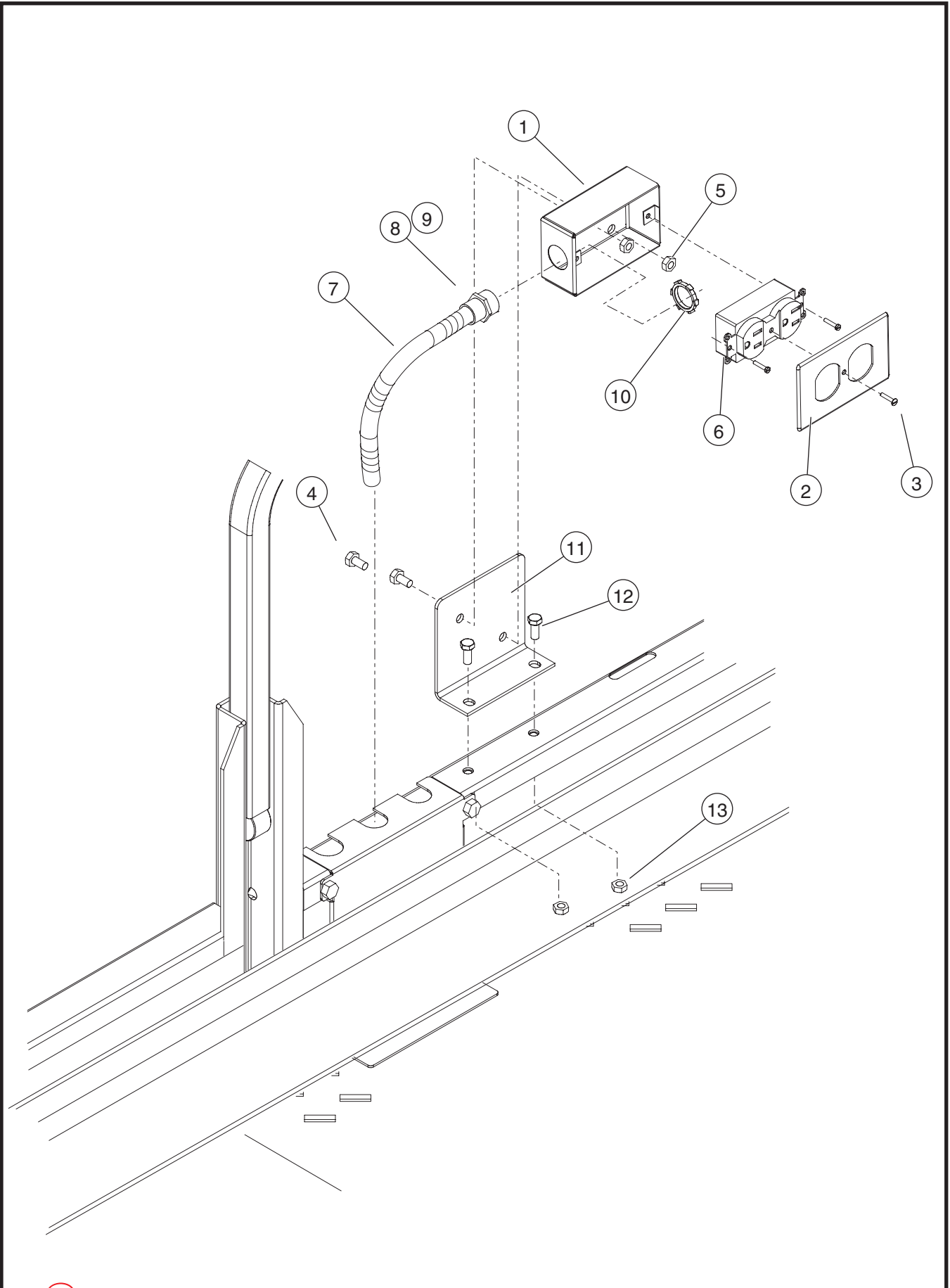


ILLUSTRATION No.  
ART\_2228

### Power to Platform Outlet Installation



| ITEM | PART NO. | QTY   | DESCRIPTION                        |
|------|----------|-------|------------------------------------|
|      |          |       | <b>POWER TO PLATFORM</b>           |
| 1    | 90827    | 1     | BOX, RECEPTACLE                    |
| 2    | 90828    | 1     | DUPLEX RECEPTACLE COVER            |
| 3    | HDW5636  | 1     | SCREW #6 - 32 x 0.25"              |
| 4    | HDW6455  | 2     | SCREW, 1/4" - 20, 1/2" LG          |
| 5    | HDW8267  | 2     | LOCKNUT 1/4" - 20                  |
| 6    | 5381     | 1     | RECEPTACLE, DUPLEX                 |
| 7    | 8208     | 1     | CONDUIT, 3/8" FLEXIBLE             |
| 8    | 8209     | 1     | FERRULE, 3/8"                      |
| 9    | 8479     | 1     | BUSHING, 3/4" ID                   |
| 10   | 8833     | 1     | CONNECTOR, OUTLET BOX 3/8" CONDUIT |
| 11   | 16221    | 1     | BRACKET                            |
| 12   | HDW5724  | 2     | SCREW, 5/16-18 x 3/4"              |
| 13   | HDW8304  | 2     | NUT, 5/16-18                       |
|      | HDW8501  | 2     | CLIP, SELF RETAINING               |
|      | 7617     | *     | WIRE, 14 GA                        |
|      |          | 28 FT | *1532ES                            |
|      |          | 35 FT | * 1932ES                           |
|      | HDW5217  | 2     | FLAT WASHER 11/32" ID              |
|      |          |       |                                    |
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# SECTION C: SCISSORS

SCISSOR ASSEMBLY - 1532ES, SERIAL # UP TO 9001099 ..... C-3  
SCISSOR ASSEMBLY - 1532ES, SERIAL # 9001100 - UP ..... C-5  
SCISSOR ASSEMBLY - 1932ES, SERIAL # UP TO 9105899 ..... C-7  
SCISSOR ASSEMBLY - 1932ES, SERIAL # 9105900 - UP ..... C-9  
SCISSOR ASSEMBLY MOUNT ..... C-11  
LIFT CYLINDER MOUNT ..... C-13  
LIFT CYLINDER, 25237 ..... C-15  
LIFT CYLINDER, 90801 WITHOUT EMERGENCY LOWERING CABLE ..... C-17  
LIFT CYLINDER, 90801 WITH EMERGENCY LOWERING CABLE ..... C-19  
LIFT CYLINDER, 91055 WITH EMERGENCY LOWERING CABLE ..... C-21



14

↓ DENOTES LOCATION OF  
HDW3802.

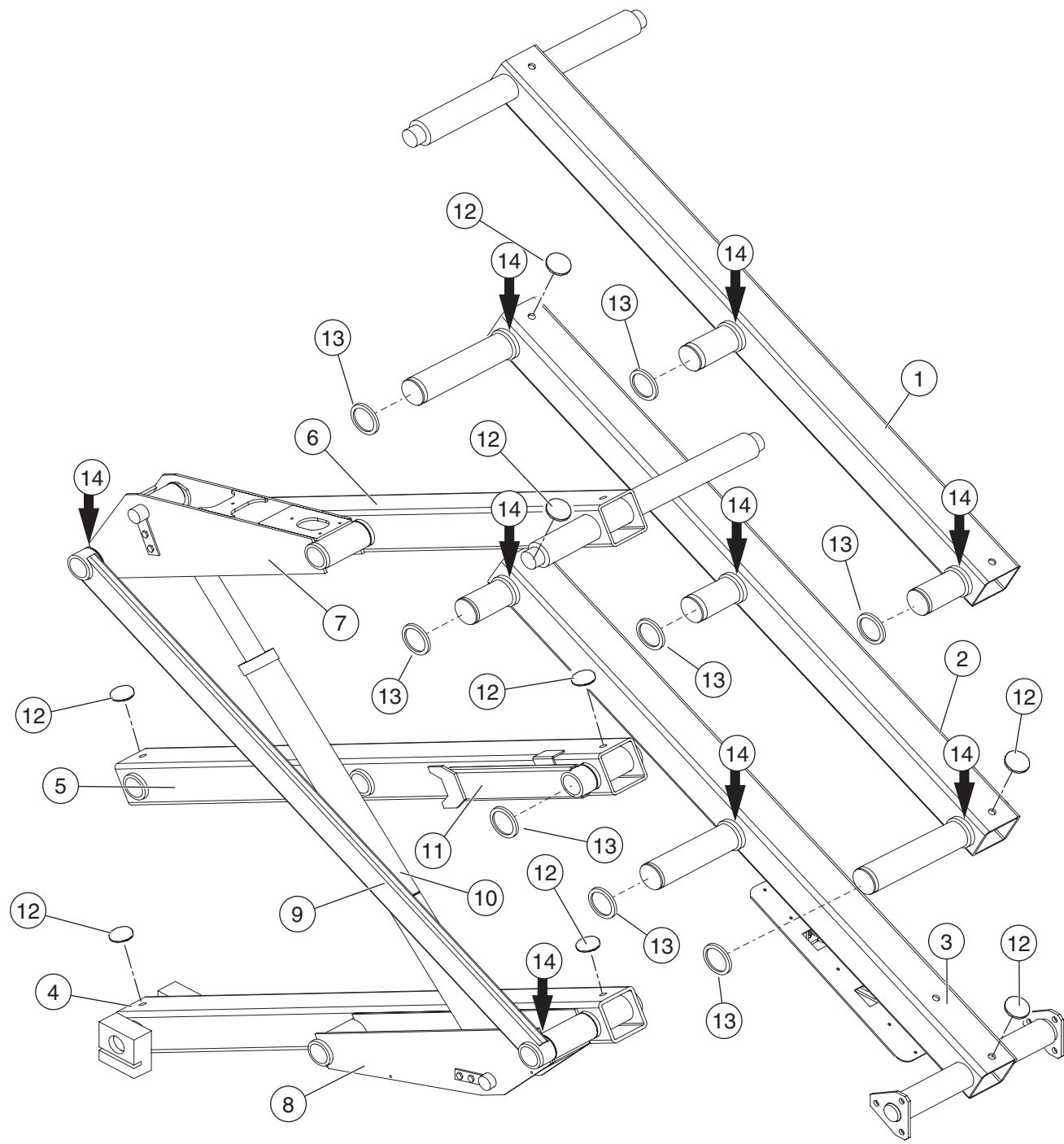


  
ILLUSTRATION No.  
ART\_2260 R1

Serial # Up to 9001099

Scissor Assembly, 1532ES



| ITEM | PART NO. | QTY   | DESCRIPTION  |
|------|----------|-------|--|
|      |          |       | <b>SCISSOR ASSEMBLY - 1532ES, SERIAL # UP TO 9001099</b> |
| 1    | 25406    | 1     | BEAM, WITH PINS  |
| 2    | 25411    | 1     | BEAM, WITH PINS  |
| 3    | 25558    | 1     | BEAM, WITH BEARINGS                                      |
|      | 7160     | 2     | BEARING, 28DU32  |
| 4    | 25413    | 1     | BEAM, WITH BEARINGS                                      |
|      | 7160     | 4     | BEARING, 28DU32  |
| 5    | 25409    | 1     | BEAM, WITH BEARINGS                                      |
|      | 7160     | 6     | BEARING, 28DU32  |
| 6    | 25405    | 1     | BEAM, WITH BEARINGS                                      |
|      | 7160     | 6     | BEARING, 28 DU32   |
| 7    | 25121    | 1     | CYLINDER MOUNT, UPPER                                    |
|      | 7160     | 4     | BEARING, 28DU32  |
| 8    | 25119    | 1     | CYLINDER MOUNT, LOWER                                    |
|      | 7160     | 4     | BEARING, 28DU32  |
| 9    | 25095    | 1     | SUPPORT, BEAM, 1 X 3                                     |
| 10   | REF      | 1     | LIFT CYLINDER (SEE END OF THIS SECTION)                  |
| 11   | 25454    | 1     | MAINTENANCE LOCK   |
|      | 8907     | 1     | BEARING, MSI2832-24                                      |
| 12   | 25429    | 8     | SPACER RUBBER  |
| 13   | 8919     | 10    | RETAINING RING   |
| 14   | HDW3802  | 9     | WASHER, FLAT NYLATRON                                    |
| —    | 7041     | 5     | HOSE CLAMP   |
| —    | 9146     | 1     | HOSE CLAMP   |
| —    | 90765    | 11.5' | CABLE WRAP   |
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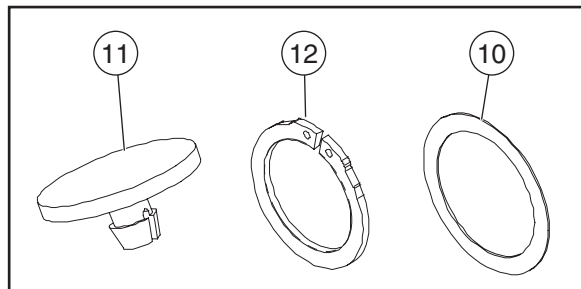
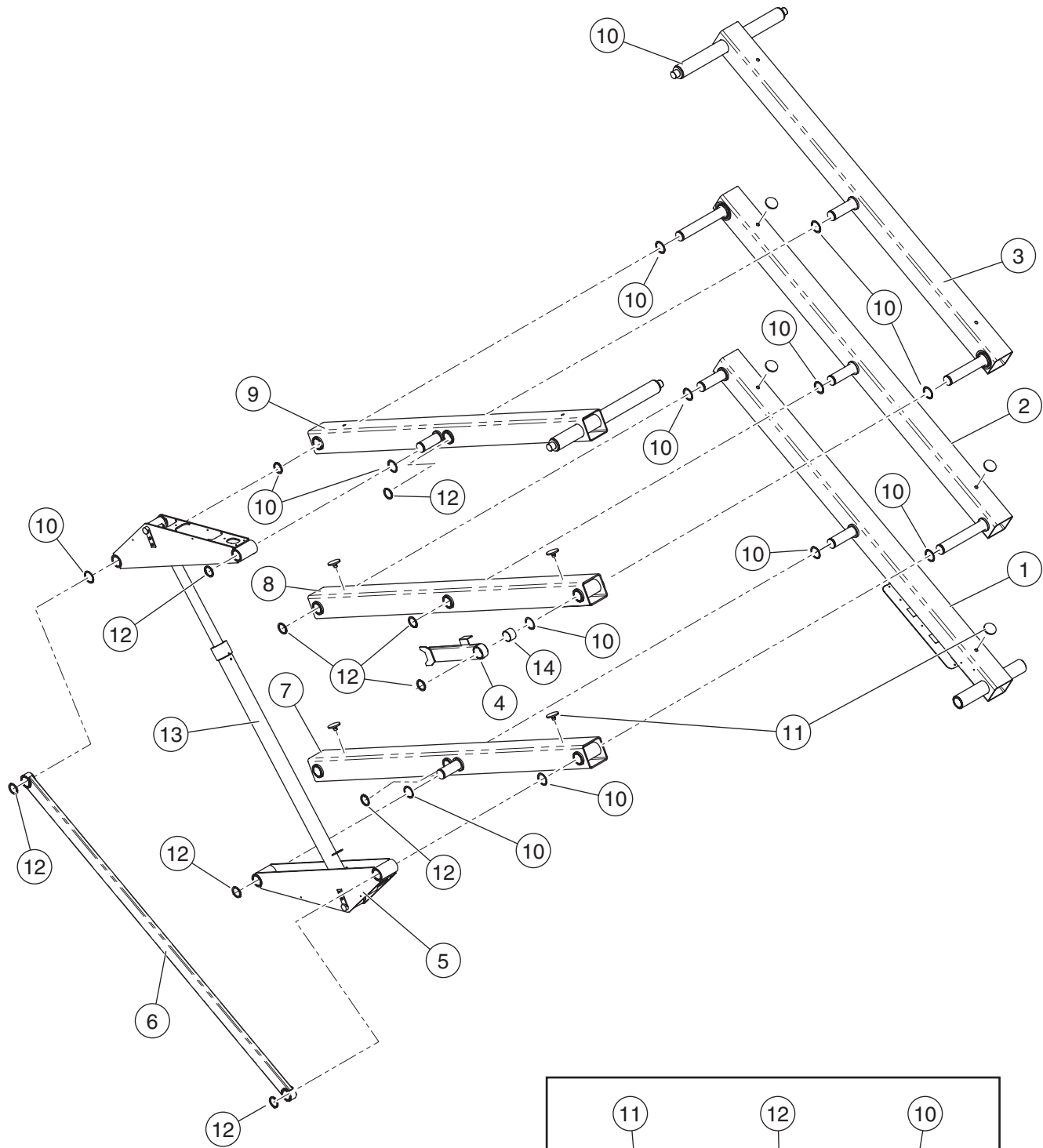


  
 ILLUSTRATION No.  
 ART\_2793

Serial # 9001100 - Up

Scissor Assembly, 1532ES



| ITEM | PART NO. | QTY | DESCRIPTION   |
|------|----------|-----|---|
|      |          |     | <b>SCISSOR ASSEMBLY - 1532ES, SERIAL # 9001100 - UP</b> |
| 1    | 17059    | 1   | BEAM WELDMENT   |
| 2    | 25411    | 1   | BEAM WELDMENT   |
| 3    | —        | 1   | BEAM WELDMENT   |
| 4    | 25454    | 1   | MAINTENANCE LOCK WELDMENT                               |
| 5    | 17058    | 2   | CYLINDER MOUNT WELDMENT                                 |
| 6    | 25095    | 1   | BEAM, SUPPORT WELDMENT                                  |
| 7    | 17056    | 1   | BEAM WELDMENT   |
| 8    | 25409    | 1   | BEAM WELDMENT   |
| 9    | 25407    | 1   | BEAM WELDMENT   |
| 10   | WDH3802  | 17  | WASHER, NYLON   |
| 11   | 25429    | 12  | SPACER, RUBBER  |
| 12   | 8919     | 12  | RETAINING RING, 2 INCH DIA                              |
| 13   | REF      | 1   | LIFT CYLINDER (SEE FOLLOWING PAGES)                     |
| 14   | 8907     | 1   | BEARING, 2.25 OD x 2 ID x 1.5 LG                        |
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15 DENOTES LOCATION OF  
HDW3802.

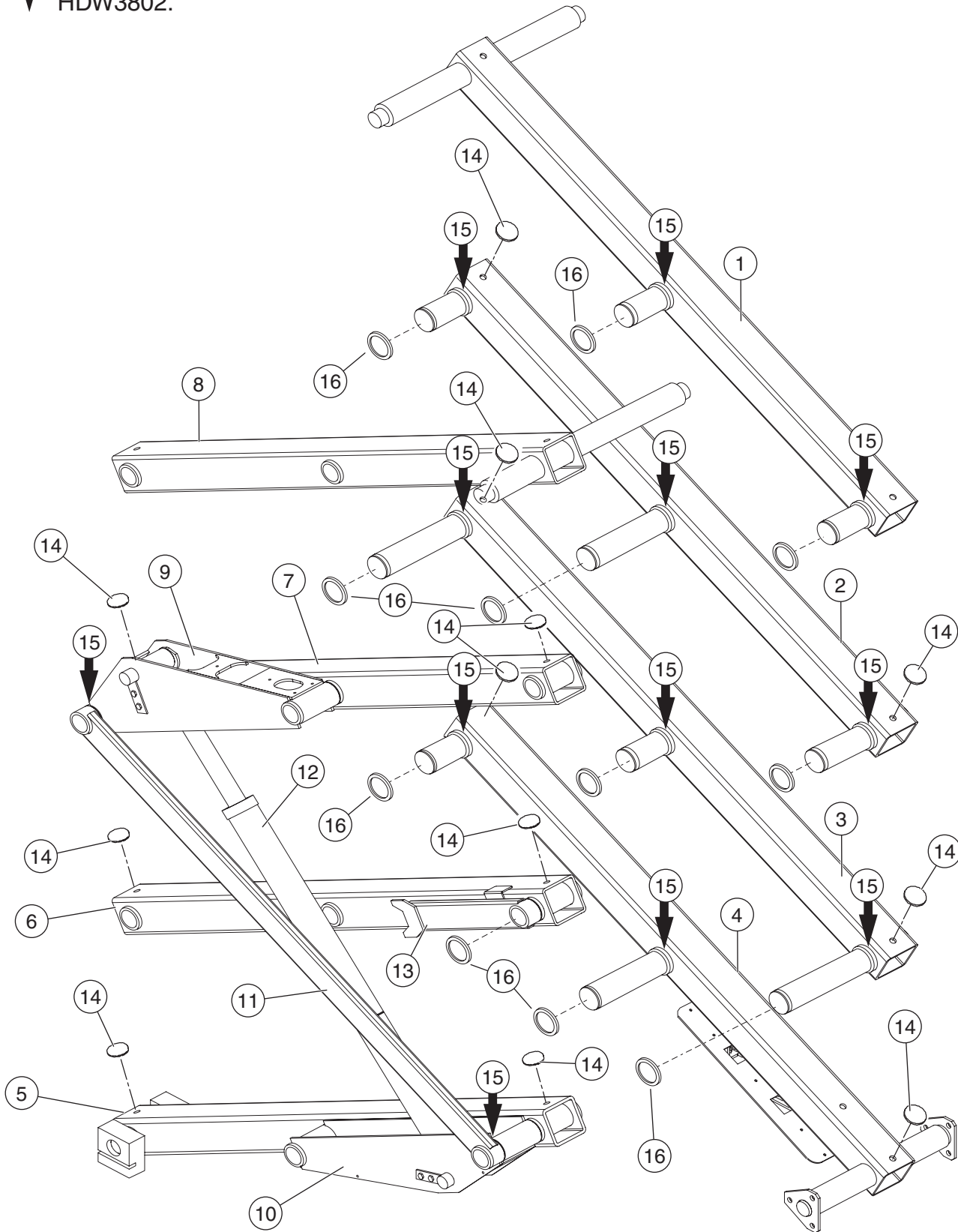


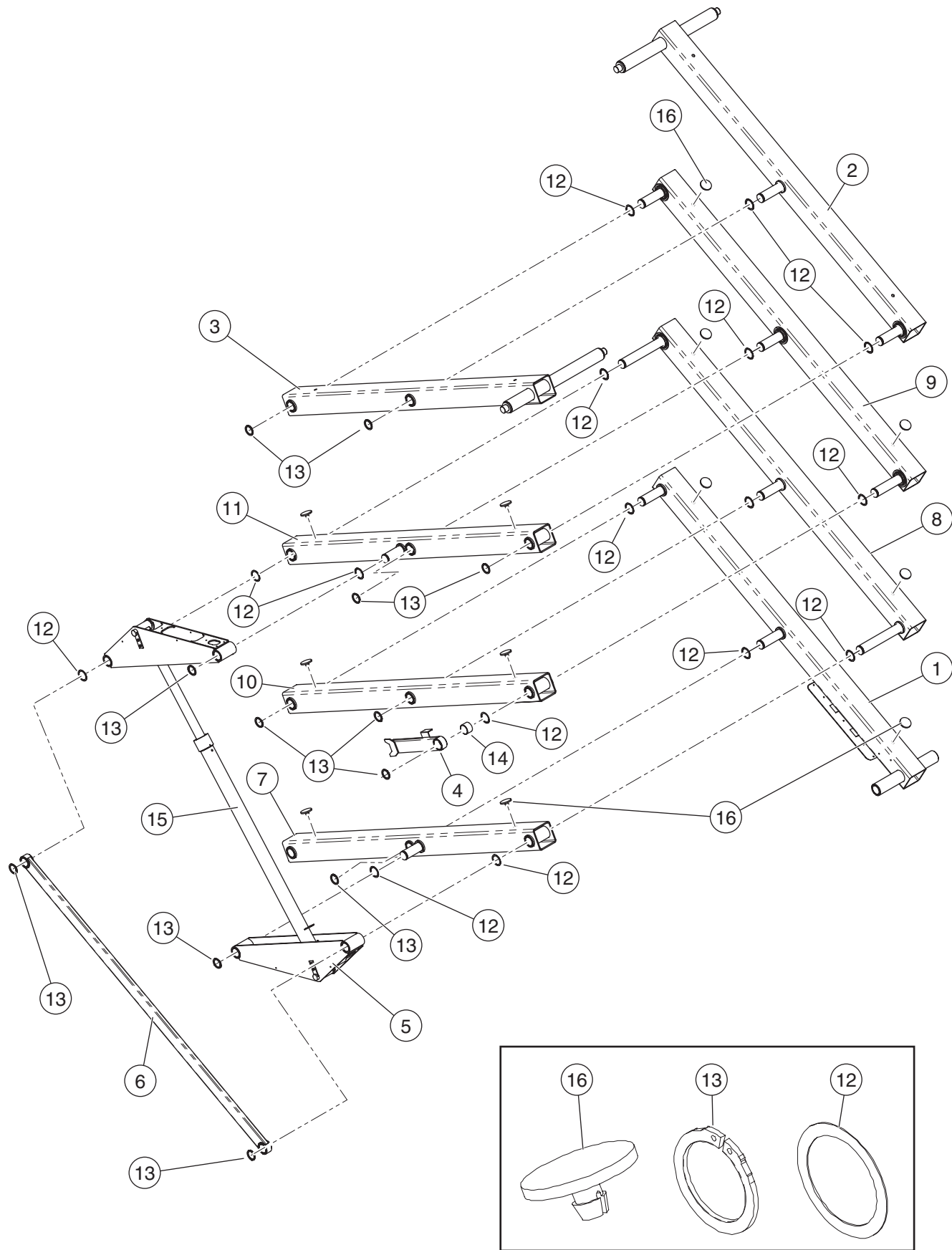
  
ILLUSTRATION No.  
ART\_2261 R1

Serial # Up to 9105899

Scissor Assembly, 1932ES

| ITEM | PART NO. | QTY   | DESCRIPTION  |
|------|----------|-------|--|
|      |          |       | <b>SCISSOR ASSEMBLY - 1932ES, SERIAL # UP TO 9105899</b> |
| 1    | 25408    | 1     | BEAM, WITH PINS  |
| 2    | 25410    | 1     | BEAM, WITH PINS  |
| 3    | 25411    | 1     | BEAM, WITH PINS  |
| 4    | 25558    | 1     | BEAM, WITH BEARINGS                                      |
|      | 7160     | 2     | BEARING, 28DU32  |
| 5    | 25413    | 1     | BEAM, WITH BEARINGS                                      |
|      | 7160     | 4     | BEARING, 28DU32  |
| 6    | 25409    | 1     | BEAM, WITH BEARINGS                                      |
|      | 7160     | 6     | BEARING, 28DU32  |
| 7    | 25409    | 1     | BEAM, WITH BEARINGS                                      |
|      | 7160     | 6     | BEARING, 28 DU32   |
| 8    | 25407    | 1     | BEAM, WITH BEARINGS                                      |
|      | 7160     | 6     | BEARING, 28DU32  |
| 9    | 25121    | 1     | CYLINDER MOUNT, UPPER                                    |
|      | 7160     | 4     | BEARING, 28DU32  |
| 10   | 25119    | 1     | CYLINDER MOUNT, LOWER                                    |
|      | 7160     | 4     | BEARING, 28DU32  |
| 11   | 25095    | 1     | SUPPORT, BEAM, 1 X 3                                     |
| 12   | REF      | 1     | LIFT CYLINDER (SEE END OF THIS SECTION)                  |
| 13   | 25454    | 1     | MAINTENANCE LOCK   |
|      | 8907     | 1     | BEARING, MSI2832-24                                      |
| 14   | 25429    | 12    | SPACER RUBBER  |
| 15   | HDW3802  | 18    | WASHER, FLAT NYLATRON                                    |
| 16   | 8919     | 10    | RETAINING RING   |
| —    | 7041     | 5     | HOSE CLAMP   |
| —    | 9146     | 1     | HOSE CLAMP   |
| —    | 90765    | 11.5' | CABLE WRAP   |
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 ILLUSTRATION No.  
 ART\_2794

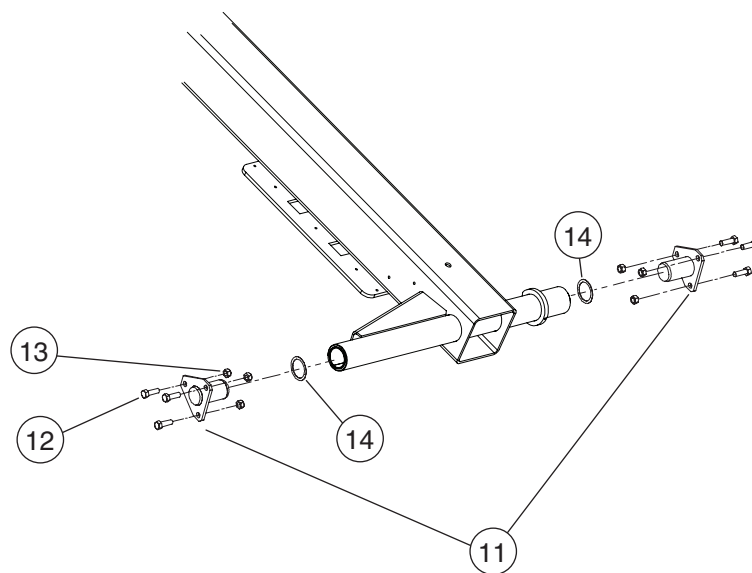
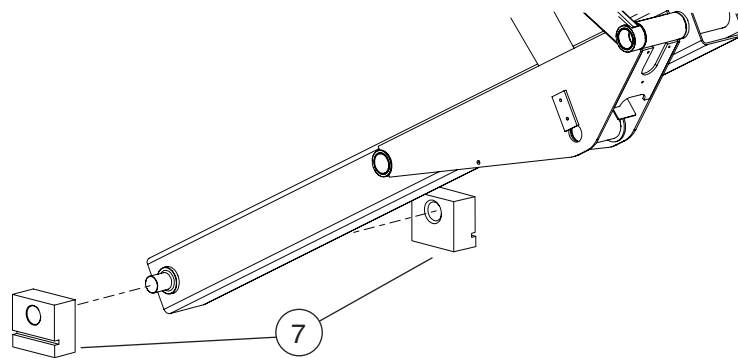
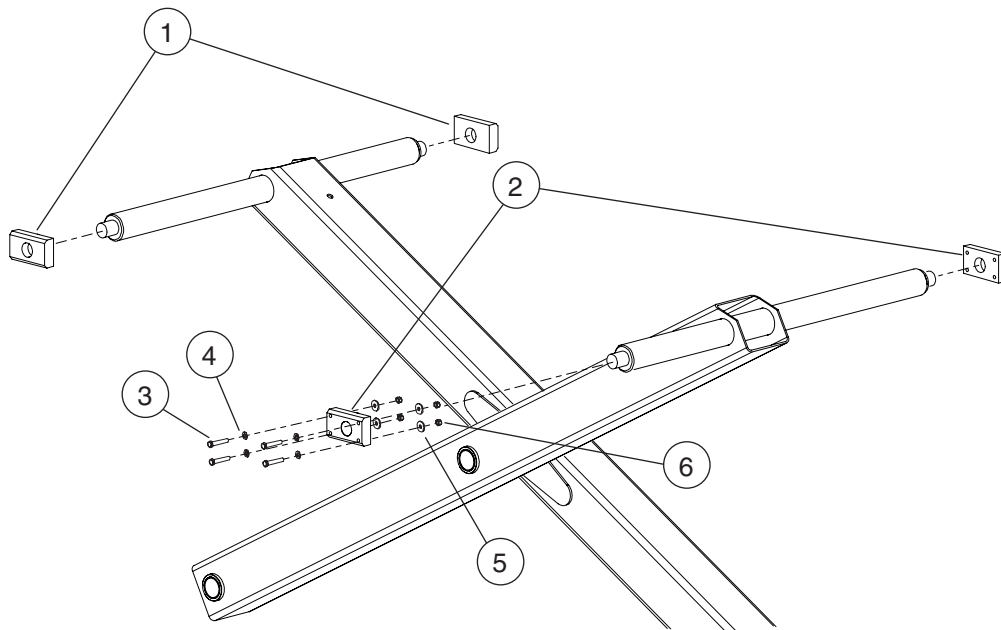
Serial # 9105900 - Up

Scissor Assembly, 1932ES



| ITEM | PART NO. | QTY | DESCRIPTION   |
|------|----------|-----|---|
|      |          |     | <b>SCISSOR ASSEMBLY - 1932ES, SERIAL # 9105900 - UP</b> |
| 1    | 17059    | 1   | BEAM, WELDMENT  |
| 2    | 25408    | 1   | BEAM, .18 WL (4X)                                       |
| 3    | 25407    | 1   | BEAM, 4 × 4 × .18                                       |
| 4    | 25454    | 1   | MAINTENANCE LOCK WELDMENT                               |
| 5    | 17058    | 2   | CYLINDER MOUNT WELDMENT                                 |
| 6    | 25095    | 1   | BEAM, SUPPORT WELDMENT W/BEARINGS                       |
| 7    | 17056    | 1   | BEAM WELDMENT W/PINS                                    |
| 8    | 25411    | 1   | BEAM, 4 × 4 × .25 W/PINS (2X)                           |
| 9    | 17054    | 1   | BEAM WELDMENT W/PINS                                    |
| 10   | 25409    | 1   | BEAM, 4 × 4 × .25 W/BEARINGS                            |
| 11   | 17053    | 1   | BEAM WELDMENT W/PINS                                    |
| 12   | HDW3802  | 17  | WASHER, NYLON, 2.06 ID, 2.62 OD, .030 THK               |
| 13   | 8919     | 12  | RETAINING RING  |
| 14   | 8907     | 1   | BEARING, 2.25 OD × 2 ID × 1.5 LG                        |
| 15   | REF      | 1   | LIFT CYLINDER (SEE FOLLOWING PAGES)                     |
| 16   | 25429    | 12  | SPACER, RUBBER  |
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| ITEM | PART NO. | QTY | DESCRIPTION                               |
|------|----------|-----|---|
|      |          |     | <b>SCISSOR ASSEMBLY MOUNT</b>             |
| 1    | 13778    | 2   | BLOCK, SLIDE PLATFORM                     |
| 2    | 13777    | 2   | BLOCK, FIXED PLATFORM                     |
| 3    | HDW8486  | 4   | SCREW, 5/16-18, 1.87 LG, GR 8             |
| 4    | HDW5217  | 4   | WASHER, .343 ID X .688 OD X .063 THK      |
| 5    | HDW8294  | 4   | WASHER, .328 ID X 1.000 OD X .100 THK     |
| 6    | HDW8304  | 4   | NUT, 5/16-18, GR 5                        |
| 7    | 25427    | 2   | BLOCK, SLIDE BASE                         |
| 11   | 25173    | 2   | PIN WELDMENT STATIONARY MOUNT             |
| 12   | HDW8283  | 6   | SCREW, 1/2-13, 1.5 LG, GR 8               |
| 13   | HDW8457  | 6   | NUT, LOCK, 1/2-13                         |
| 14   | HDW13175 | 16  | WASHER, NYLON, 2.06 ID, 2.62 OD, .030 THK |
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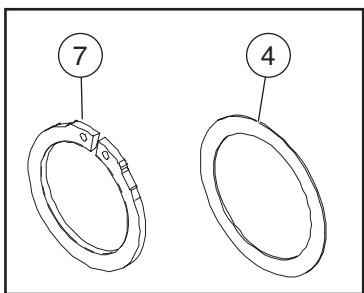
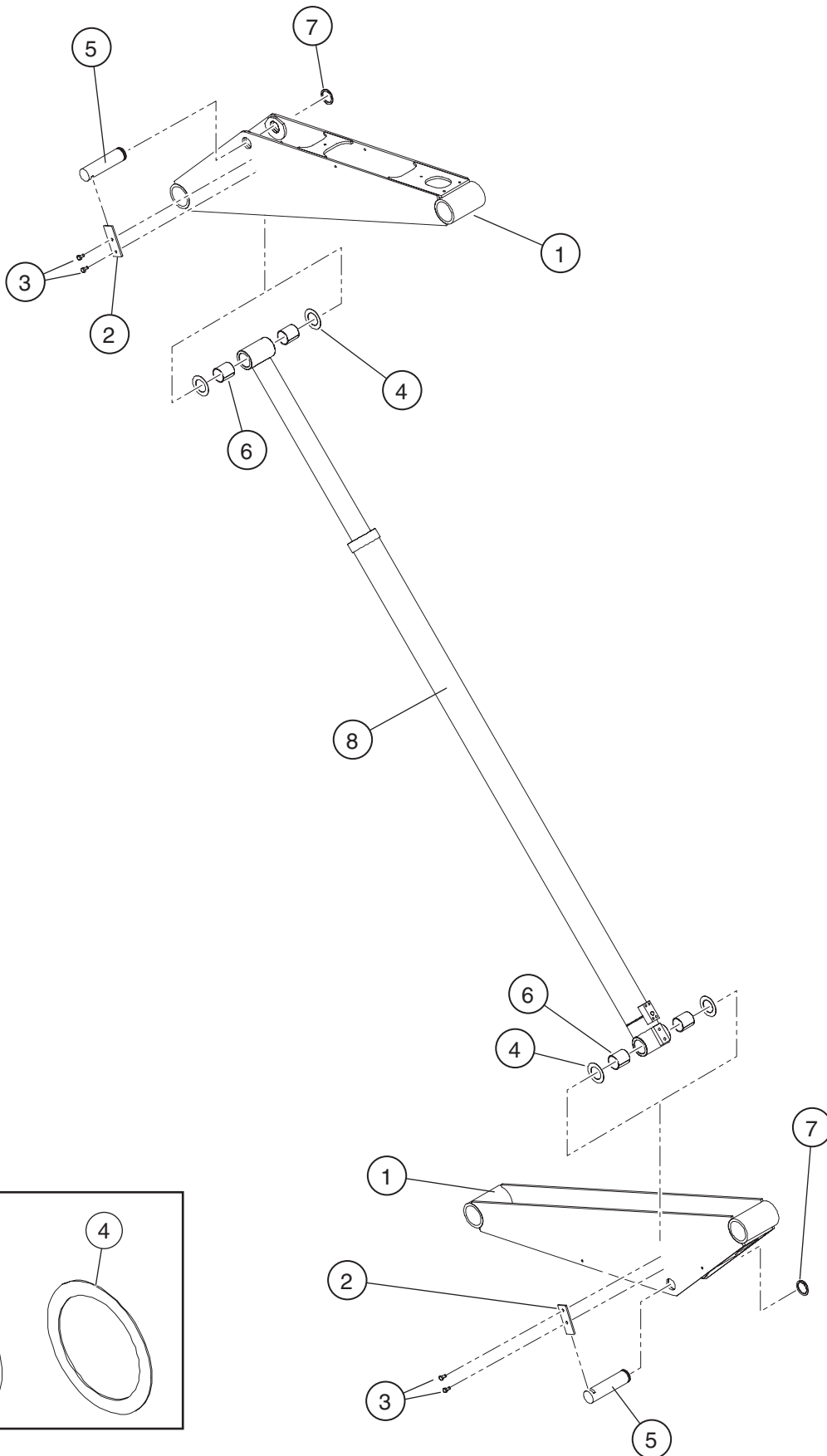


  
 ILLUSTRATION No.  
 ART\_2265 R1

Cylinder Mounting Detail



| ITEM | PART NO. | QTY | DESCRIPTION  |
|------|----------|-----|--|
|      |          |     | <b>LIFT CYLINDER MOUNT</b>                           |
| 1    | REF      | 2   | CYLINDER MOUNT WELDMENT<br>REFER TO SCISSOR ASSEMBLY |
| 2    | 25219    | 2   | PLATE RETAINER, CYL MOUNT 3.75 X 1.25 X 0.179        |
| 3    | HDW5723  | 4   | SCREW, 1/4-20, 1/2 LG, GR 5                          |
| 4    | HDW13339 | 4   | WASHER, NYLON, 1.385 ID X 2.255 OD X .030 THK        |
| 5    | 25142    | 2   | PIN, 1.373 X 5.382 CYL MOUNT                         |
| 6    | 6984     | 4   | BEARING, 1.375 X 1.625 LG                            |
| 7    | 6669     | 2   | BEARING, 2.0 X 2.0 LG                                |
|      |          |     |  |
| 8    | 6875     | 2   | RETAINING RING, 1.375 DIA.                           |
| 9    | REF      | 1   | LIFT CYLINDER  |
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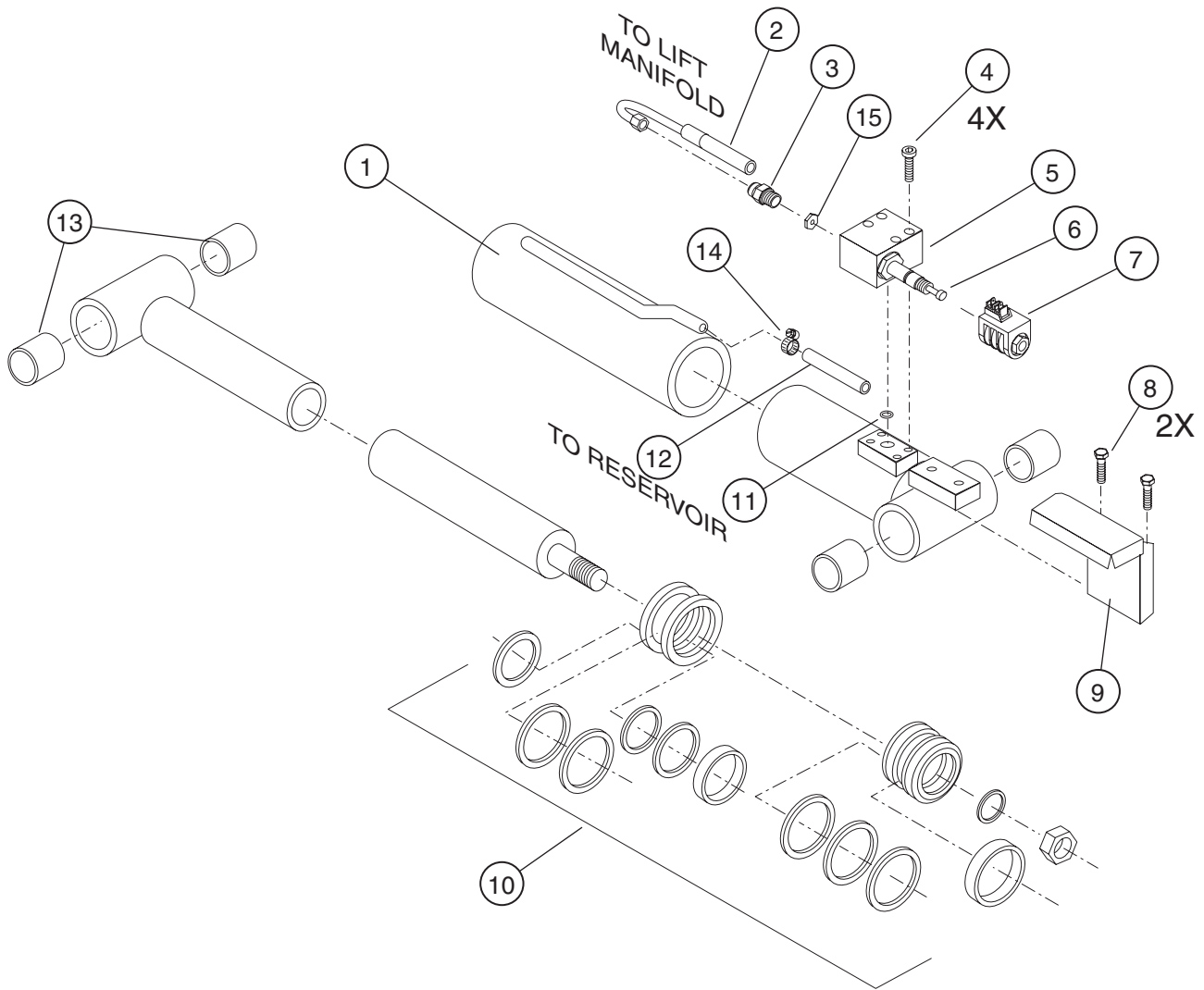


  
 ILLUSTRATION No. ART\_2266

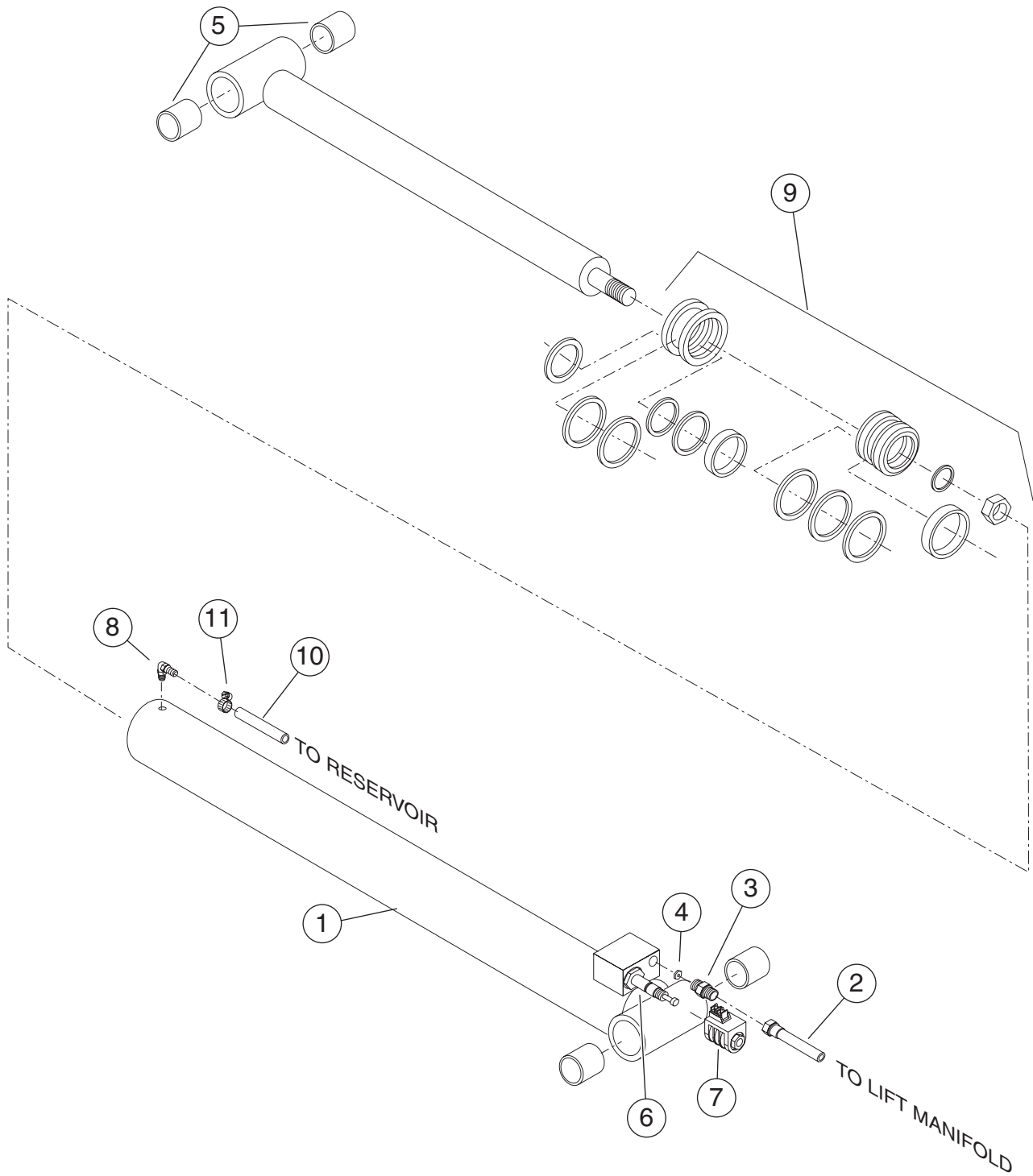
1532: Serial # 9001000 - 9001008  
 1932: Serial # 9100000 - 9104470

25237 Hydraulic Cylinder



| ITEM | PART NO. | QTY | DESCRIPTION                                     |
|------|----------|-----|---|
|      |          |     | <b>LIFT CYLINDER, 25237</b>                     |
|      |          |     | <b>1532ES - SERIAL # 9001000 TO # 9001008</b>   |
|      |          |     | <b>1932ES - SERIAL # 9100000 TO # 9104470</b>   |
| 1    | 25237    | 1   | CYLINDER, LIFT                                  |
| 2    | REF      | 1   | HOSE ASSEMBLY, LIFT CYLINDER (SEE SECTION D)    |
| 3    | HDW7438  | 1   | FITTING PIPE, ADAPTOR                           |
| 4    | HDW8592  | 4   | SCREW, CAP, SOCKET HD, 1/4"-20 X 1.50, GRADE 8  |
| 5    | 13551    | 1   | MANIFOLD, LIFT CYLINDER-STANDARD                |
| 6    | 8595     | 1   | VALVE, 2 WAY, N.C. W/MANUAL LOCK                |
| 7    | 8914     | 1   | COIL, 24 VOLT, DOUBLE SPADE W/DIODE             |
| 8    | HDW8663  | 2   | SCREW, CAP, HEX HD, 5/16"-18 X .50, GRADE 2     |
| 9    | 13728    | 1   | BRACKET, CYLINDER VALVE GUARD WELDMENT          |
| 10   | 7078     | 1   | KIT, SEAL-LIFT CYLINDER (SERVICE)               |
| 11   | 6426     | 1   | O-RING, MANIFOLD BLOCK                          |
| 12   | REF      | 13' | HOSE, RETURN LINE                               |
| 13   | 6984     | 4   | BEARING, DU, 1 3/8" ID X 1 5/8" LG              |
| 14   | 7788     | 1   | CLAMP, HOSE                                     |
| 15   | 90439    | 1   | ORIFICE 0.047 (1932ES)                          |
|      | 90889    | 1   | ORIFICE 0.055 (1532ES)                          |
| —    | REF      | 1   | HARNESS, WIRE DOWN, VALVE (SEE PARTS SECTION E) |
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| ITEM | PART NO. | QTY | DESCRIPTION  |
|------|----------|-----|--|
|      |          |     | <b>LIFT CYLINDER, 90801 WITHOUT EMERGENCY LOWERING CABLE</b>                                   |
|      |          |     | <b>1532ES - SERIAL # 9001009 TO # 9001031</b><br><b>1932ES - SERIAL # 9104471 TO # 9105000</b> |
| 1    | 90801    | 1   | CYLINDER, LIFT   |
| 2    | REF      | 1   | HOSE ASSEMBLY, LIFT CYLINDER (SEE SECTION D)   |
| 3    | HDW7438  | 1   | FITTING, PIPE, ADAPTOR   |
| 4    | 90439    | 1   | ORIFICE 0.047 (1932ES)   |
|      | 90889    | 1   | ORIFICE 0.055 (1532ES)   |
| 5    | 6984     | 4   | BEARING, DU, 1 3/8" ID X 1 5/8" LG   |
| 6    | 90815    | 1   | VALVE, 2 WAY, N.C. CABLE ATTACH  |
| 7    | 90816    | 1   | COIL, 24 VOLT  |
| 8    | HDW8879  | 1   | FITTING, PIPE 90°, MALE BARB   |
| 9    | 7078     | 1   | KIT, SEAL-LIFT CYLINDER (SERVICE)  |
| 10   | REF      | 14' | HOSE, RETURN LINE (SEE SECTION D)  |
| 11   | 7788     | 1   | CLAMP, HOSE  |
| —    | REF      | 1   | HARNES, WIRE, DOWN VALVE (SEE PARTS SECTION A)   |
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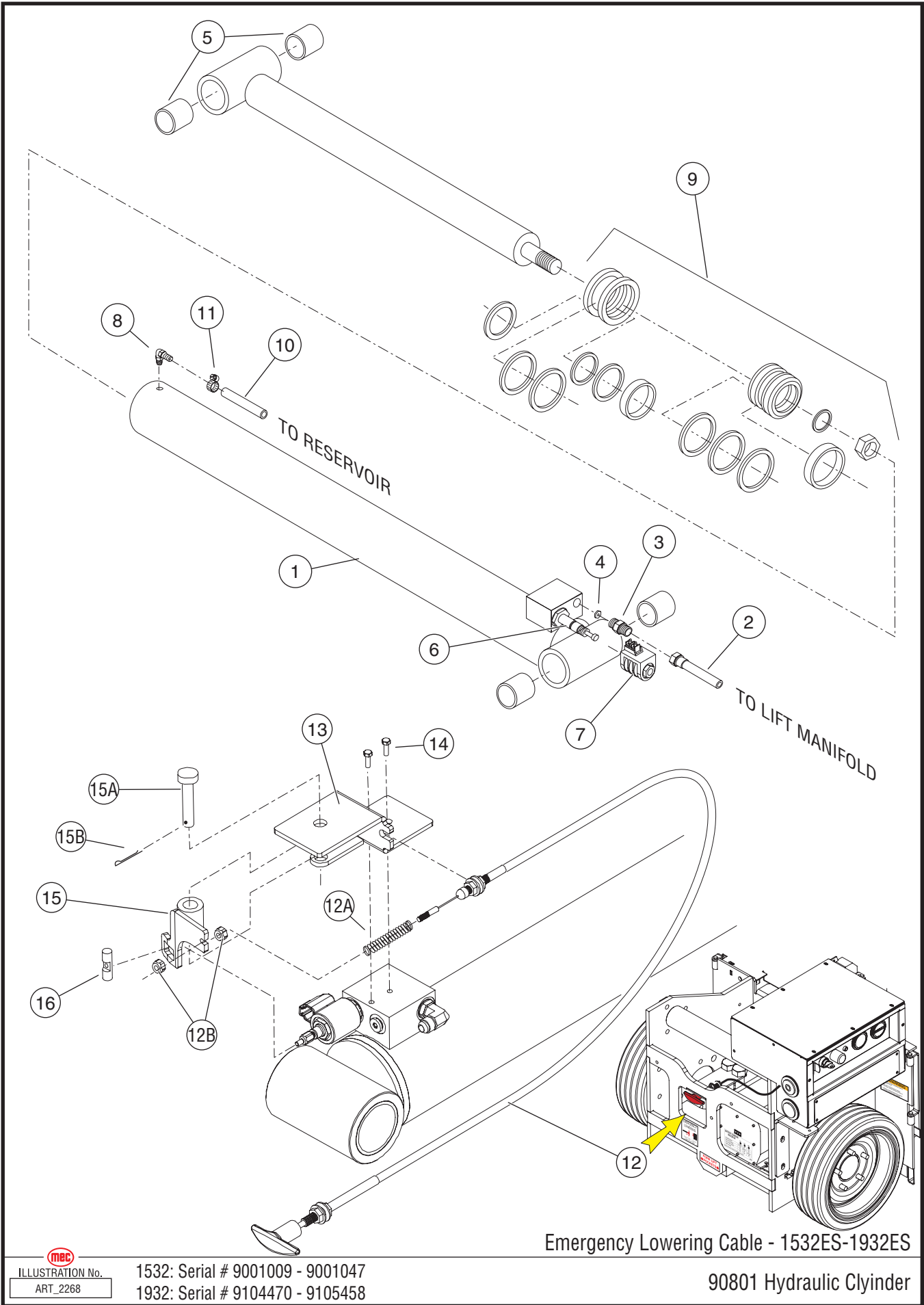
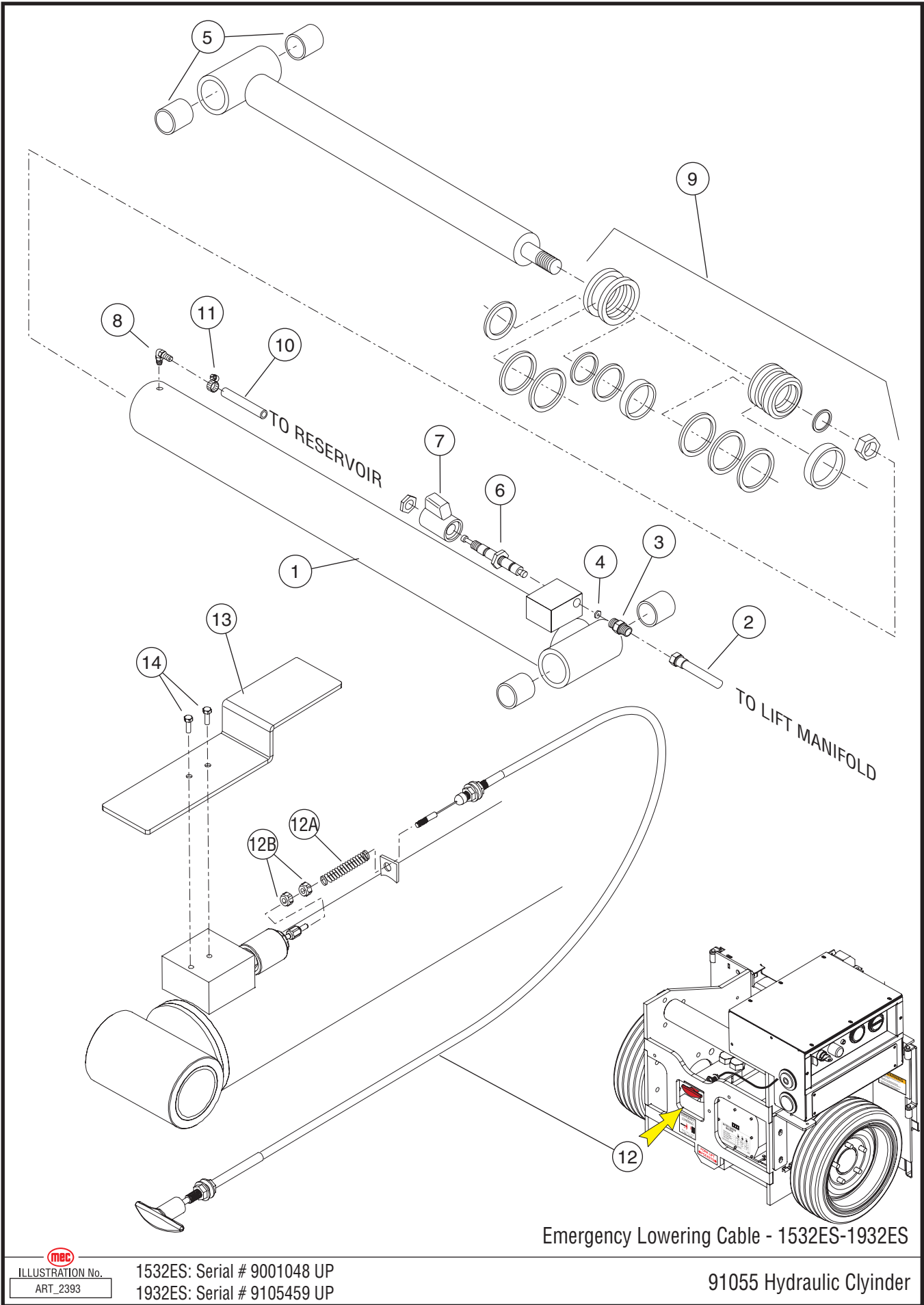


ILLUSTRATION No. ART\_2268

1532: Serial # 9001009 - 9001047  
 1932: Serial # 9104470 - 9105458



| ITEM | PART NO. | QTY | DESCRIPTION  |
|------|----------|-----|--|
|      |          |     | <b>LIFT CYLINDER, 90801 WITH EMERGENCY LOWERING CABLE</b>                                      |
|      |          |     | <b>1532ES - SERIAL # 9001032 TO # 9001047</b><br><b>1932ES - SERIAL # 9105001 TO # 9105458</b> |
| 1    | 90801    | 1   | CYLINDER, LIFT   |
| 2    | REF      | 1   | HOSE ASSEMBLY, LIFT CYLINDER (SEE SECTION D)   |
| 3    | HDW7438  | 1   | FITTING, PIPE, ADAPTOR   |
| 4    | 90439    | 1   | ORIFICE 0.047 (1932ES)   |
|      | 90889    | 1   | ORIFICE 0.055 (1532ES)   |
| 5    | 6984     | 4   | BEARING, DU, 1 3/8" ID X 1 5/8" LG   |
| 6    | 91051    | 1   | VALVE, 2 WAY, N.C. CABLE ATTACH  |
| 7    | 91001    | 1   | COIL, 24 VOLT  |
| 8    | HDW8879  | 1   | FITTING, PIPE 90°, MALE BARB   |
| 9    | 7078     | 1   | KIT, SEAL-LIFT CYLINDER (SERVICE)  |
| 10   | REF      | 14' | HOSE, RETURN LINE (SEE SECTION D)  |
| 11   | 7788     | 1   | CLAMP, HOSE  |
| —    | REF      | 1   | HARNESS, WIRE, DOWN VALVE (SEE PARTS SECTION A)  |
| 12   | 91104    | 1   | CABLE, 80 IN, 1532ES   |
| 12   | 91082    | 1   | CABLE, 100 IN, 1932ES  |
| 12A  | —        | 1   | SPRING   |
| 12B  | —        | 2   | CAP LUG  |
| 13   | 16117    | 1   | WELDMENT, CABLE MOUNT ATTACHMENT   |
| 14   | 8152     | 2   | BOLT   |
| 15   | 16121    | 1   | BELL CRANK   |
| 15A  | —        | 1   | CLEVIS PIN   |
| 15B  | —        | 1   | COTTER PIN   |
| 16   | 16134    | 1   | E-DOWN PIVOT NUT   |
|      |          |     |  |



**mecc**  
 ILLUSTRATION No. ART\_2393

1532ES: Serial # 9001048 UP  
 1932ES: Serial # 9105459 UP

91055 Hydraulic Cylinder





| ITEM | PART NO. | QTY | DESCRIPTION  |
|------|----------|-----|--|
|      |          |     | <b>LIFT CYLINDER, 91055 WITH EMERGENCY LOWERING CABLE</b>                  |
|      |          |     | <b>1532ES - SERIAL # 9001048 UP</b><br><b>1932ES - SERIAL # 9105459 UP</b> |
| 1    | 91055    | 1   | CYLINDER, LIFT   |
| 2    | REF      | 1   | HOSE ASSEMBLY, LIFT CYLINDER (SEE SECTION D)                               |
| 3    | HDW7438  | 1   | FITTING, PIPE, ADAPTOR   |
| 4    | 90439    | 1   | ORIFICE 0.047 (1932ES)   |
|      | 90889    | 1   | ORIFICE 0.055 (1532ES)   |
| 5    | 6984     | 4   | BEARING, DU, 1 3/8" ID X 1 5/8" LG   |
| 6    | 91051    | 1   | VALVE, 2 WAY, N.C. CABLE ATTACH  |
| 7    | 91001    | 1   | COIL, 24 VOLT  |
| 8    | HDW8879  | 1   | FITTING, PIPE 90°, MALE BARB   |
| 9    | 7078     | 1   | KIT, SEAL-LIFT CYLINDER (SERVICE)  |
| 10   | REF      | 14' | HOSE, RETURN LINE (SEE SECTION D)  |
| 11   | 7788     | 1   | CLAMP, HOSE  |
| —    | REF      | 1   | HARNESS, WIRE, DOWN VALVE (SEE PARTS SECTION A)                            |
| 12   | 91082    | 1   | CABLE, 100 IN  |
| 12   | 91104    | 1   | CABLE. 80 IN   |
| 12A  | —        | 1   | SPRING   |
| 12B  | —        | 2   | CAP LUG  |
| 13   | 16062    | 1   | BRACKET, LIFT CYLINDER VALVE GUARD   |
| 14   | 8152     | 2   | BOLT   |
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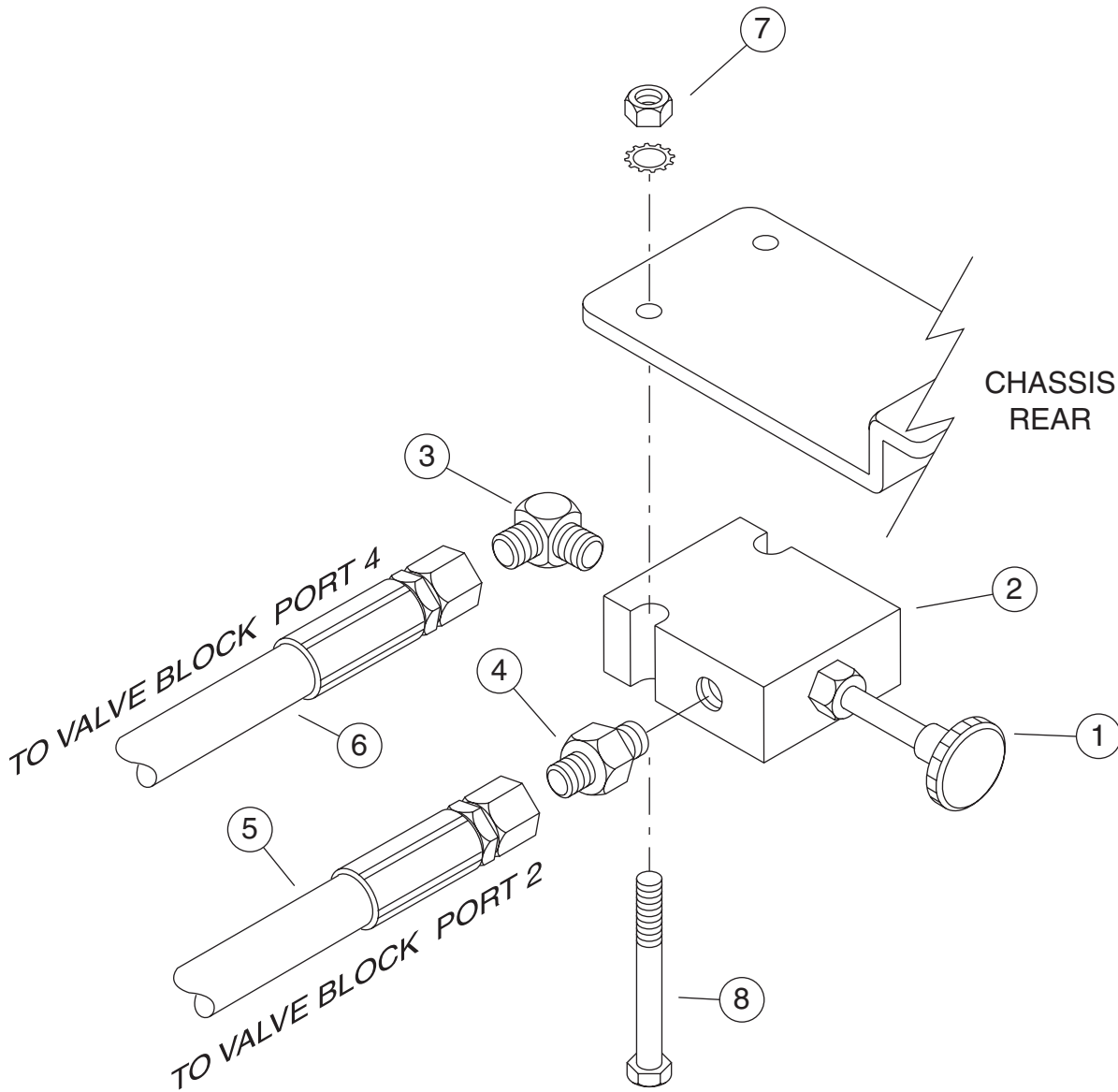


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# SECTION D: HYDRAULICS

|   |      |
|---|------|
| BRAKE RELEASE MANIFOLD, EARLY MODEL.....  | D-3  |
| MAIN MANIFOLD ASSEMBLY, EARLY MODEL ..... | D-5  |
| MAIN MANIFOLD ASSEMBLY, LATE MODELS.....  | D-9  |
| HYDRAULIC RESERVOIR, STEEL .....          | D-11 |
| HYDRAULIC RESERVOIR, PLASTIC.....         | D-13 |
| HYDRAULIC HOSES, EARLY MODELS .....       | D-15 |
| HYDRAULIC HOSES, LATE MODELS .....        | D-17 |





| ITEM | PART NO.       | QTY | DESCRIPTION  |
|------|----------------|-----|--|
|      |                |     | <b>BRAKE RELEASE MANIFOLD, EARLY MODEL</b>   |
|      |                |     | <b>1532ES - SERIAL #9001000 - # 9001099</b><br><b>1932ES - SERIAL #9104000 - # 9104999</b> |
|      |                |     |  |
| 1    | 90234<br>90326 | 1   | BRAKE RELEASE MANIFOLD<br>VALVE, HYDRAULIC HAND PUMP                                       |
| 2    | 90325          | 1   | BLOCK, MANIFOLD  |
| 3    | HDW90329       | 1   | FITTING, 90°, MALE 1/4", O-RING MALE 3/8"  |
| 4    | HDW7438        | 1   | FITTING, ADAPTOR, MALE 3/8" O-RING MALE 3/8"   |
| 5    | REF            | 1   | HOSE ASSY  |
| 6    | REF            | 1   | HOSE ASSY  |
| 7    | HDW5276        | 4   | NUT, 1/4" - 20   |
| 8    | HDW6831        | 2   | SCREW, 1/4" - 20, 2" LG  |
|      |                |     |  |
|      |                |     |  |
|      |                |     |  |
|      | REF            |     | SEE HYDRAULIC HOSES, THIS SECTION  |
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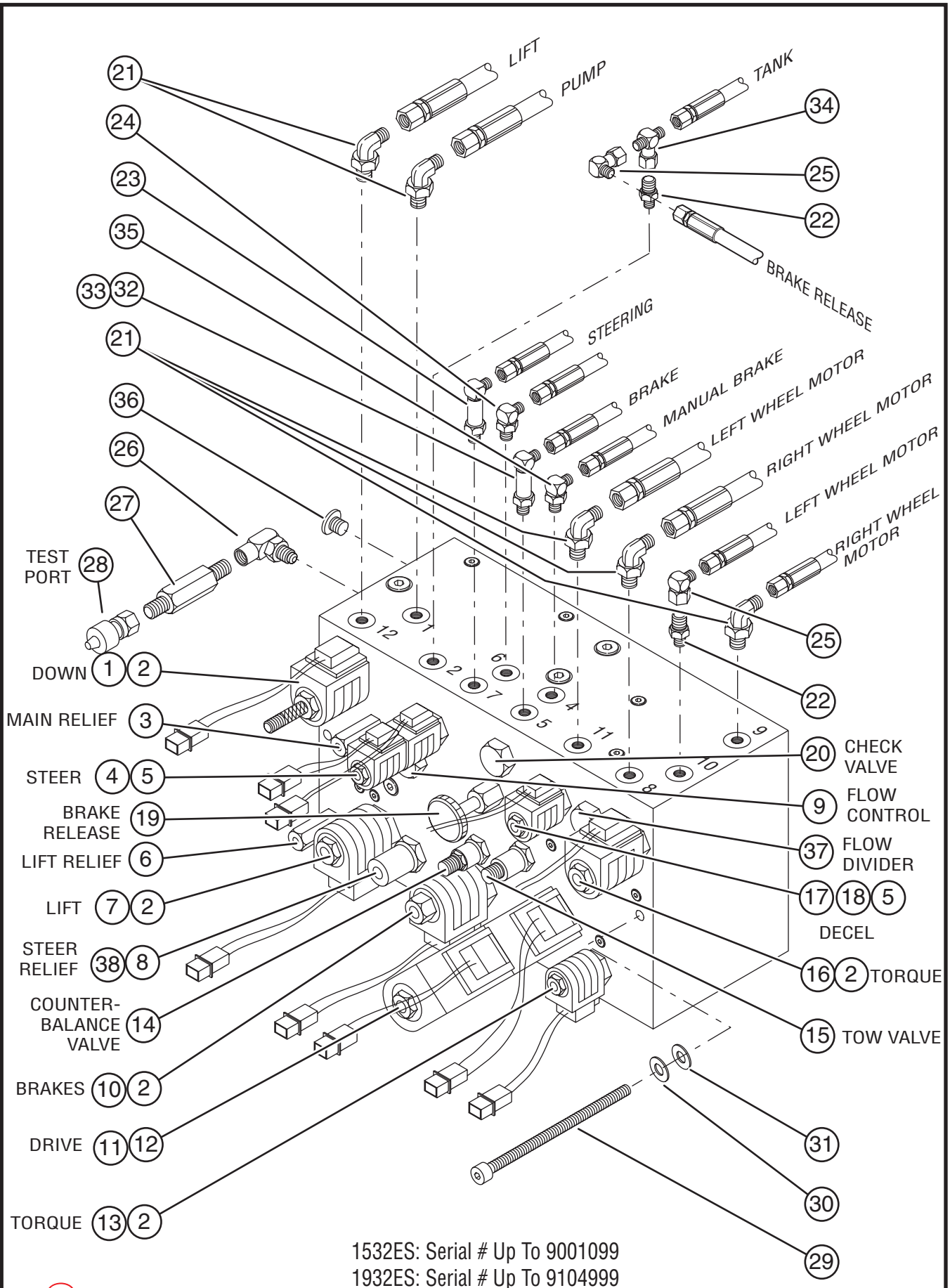


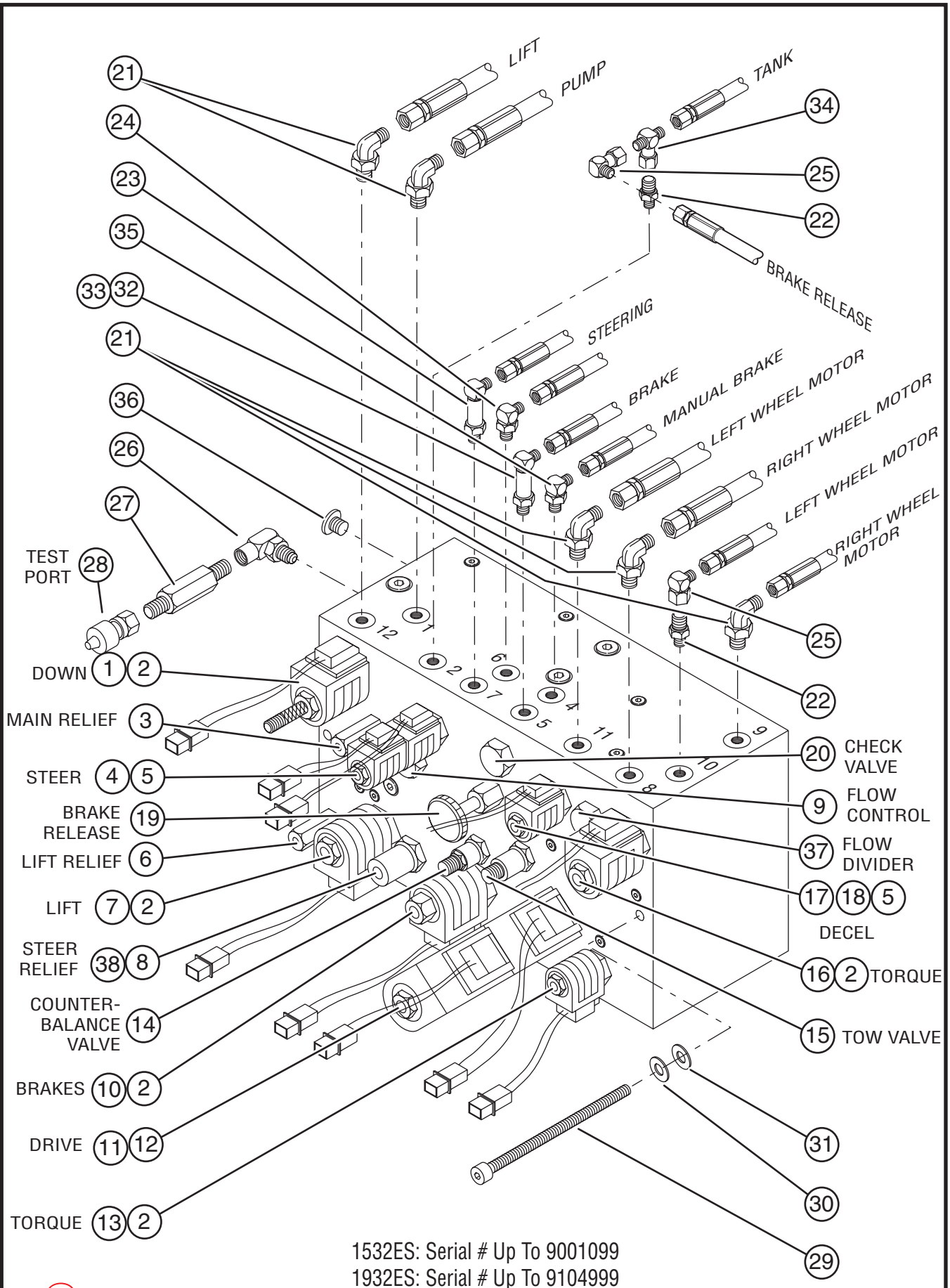
  
 ILLUSTRATION No.  
 ART\_2286

9999, Hydraulic Manifold Assembly, X32ES



| ITEM | PART NO. | QTY | DESCRIPTION   |
|------|----------|-----|---|
|      |          |     | <b>MAIN MANIFOLD ASSEMBLY, EARLY MODEL</b><br><b>1532ES - SERIAL #9001000 - # 9001099</b> |
|      | 9999     |     | <b>1932ES - SERIAL #9104000 # 9104999</b><br>MAIN MANIFOLD ASSEMBLY                       |
| 1    | 8343     | 1   | VALVE, SPOOL, POP, 2 WAY, N.C. W/MAN OVERRIDE   |
| 2    | 9996     | 5   | COIL, 24 VOLT   |
| 3    | 9992     | 1   | VALVE, RELIEF   |
| 4    | 9986     | 1   | VALVE, SPOOL, 4 WAY, 3 POSITION (STEERING)  |
| 5    | 9988     | 3   | COIL, 24 VOLT   |
| 6    | 9993     | 1   | VALVE, RELIEF   |
| 7    | 9982     | 1   | VALVE, SPOOL, 4 WAY   |
| 8    | 9984     | 1   | VALVE, RELIEF   |
| 9    | 5954     | 1   | VALVE, PRIORITY FLOW CONTROL  |
| 10   | 6975     | 1   | VALVE, SPOOL, N.O.  |
| 11   | 9995     | 1   | VALVE, SPOOL, 4 WAY, 3 POSITION (DRIVE)   |
| 12   | 9997     | 2   | COIL, 24 VOLT   |
| 13   | 6976     | 1   | VALVE, SPOOL, 3 WAY   |
| 14   | 9669     | 1   | VALVE, COUNTER BALANCE  |
| 15   | 90378    | 1   | VALVE NEEDLE (TOW VALVE)  |
| 16   | 8373     | 1   | VALVE, SPOOL, 4 WAY   |
| 17   | 9985     | 1   | VALVE, SPOOL, N.O.  |
| 18   | 9998     | 1   | ORIFICE 0.040 DIA.  |
| 19   | 9665     | 1   | VALVE, MANUAL (BRAKE RELEASE)   |
| 20   | 9990     | 1   | VALVE, CHECK  |
|      | 25575    | -   | HOSE KIT, SEE HYDRAULIC HOSES, THIS SECTION   |
|      |          |     | (CONTINUED ON NEXT PAGE)  |
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1532ES: Serial # Up To 9001099  
 1932ES: Serial # Up To 9104999

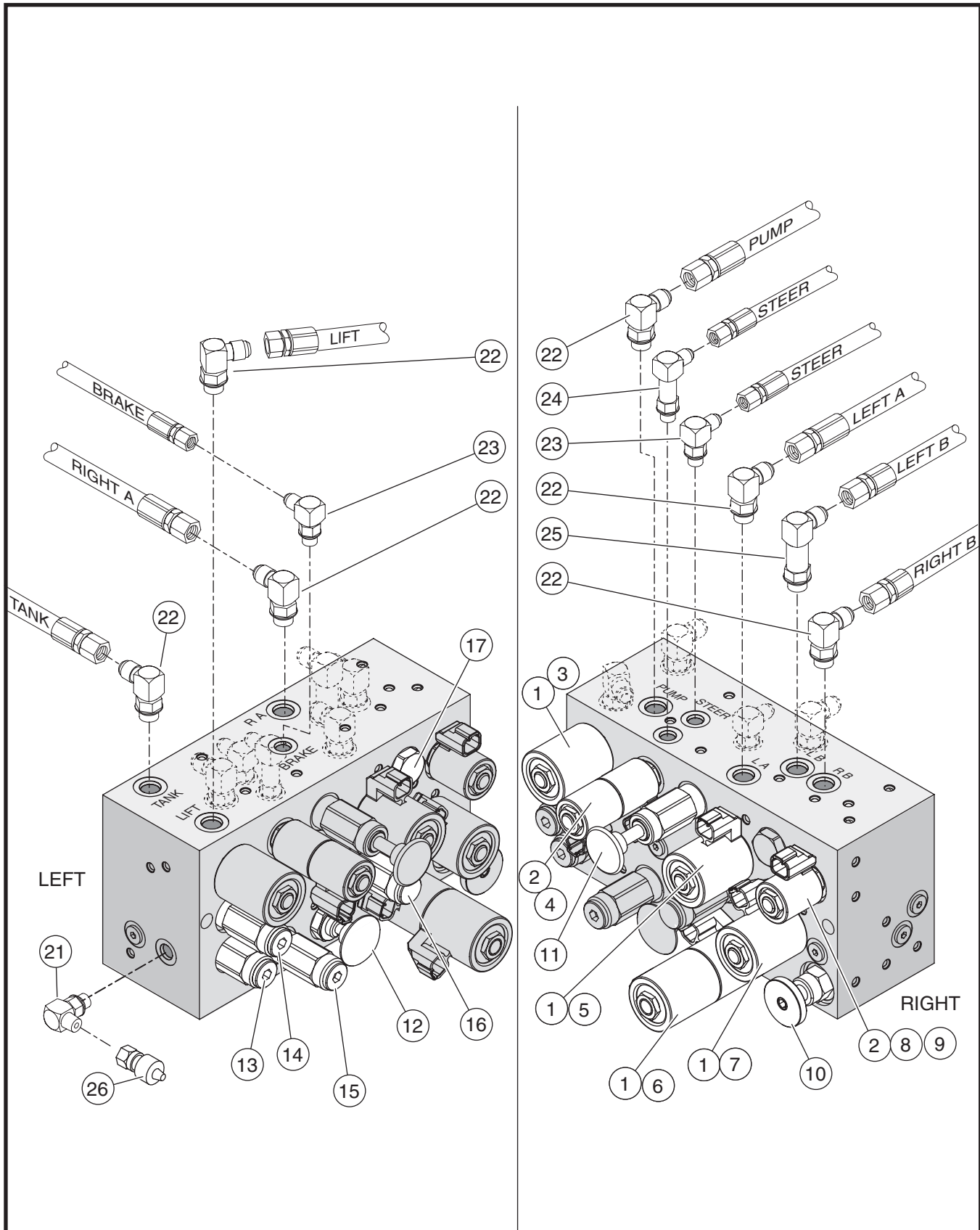
  
 ILLUSTRATION No.  
 ART\_2286

9999, Hydraulic Manifold Assembly, X32ES



| ITEM | PART NO. | QTY | DESCRIPTION   |
|------|----------|-----|---|
|      |          |     | <b>MAIN MANIFOLD ASSEMBLY, EARLY MODELS (CONTINUED)</b> |
|      |          |     | <b>1532ES - SERIAL #9001000 - # 9001099</b>             |
|      |          |     | <b>1932ES - SERIAL #9104000 - # 9104999</b>             |
| 21   | HDW8081  | 5   | FITTING, 90° ELBW, MALE 3/8", MALE 1/2" O-RING          |
| 22   | HDW7389  | 2   | ADAPTER, MALE 3/8", MALE 3/8" O-RING                    |
| 23   | HDW9157  | 1   | FITTING, 90° ELBW, MALE 3/8", MALE 3/8" O-RING          |
| 24   | HDW7601  | 1   | FITTING, 90° ELBW, MALE 3/8", MALE 3/8" O-RING          |
| 25   | HDW90299 | 2   | FITTING, 90° ELBW, MALE 3/8", FML 3/8", MALE 3/8"       |
| 26   | 9980     | 1   | FITTING, 90° ELBW, MALE 3/8" O-RING, FML 1/4" NPT       |
| 27   | HDW90301 | 1   | UNION, MALE 1/4" NPT, MALE 1/4" NPT,3" LG               |
| 28   | HDW7971  | 1   | DISCONNECT, MALE 1/4"                                   |
| 29   | HDW90287 | 2   | SCREW, 1/4" - 20, 4.5" LG                               |
| 30   | HDW5277  | 2   | WASHER, LOCK  |
| 31   | HDW5217  | 2   | WASHER, FLAT  |
| 32   | HDW90327 | 1   | FITTING, 90° ELBW, MALE 1/4", MALE 3/8" O-RING          |
| 33   | 2974     | 1   | PLUG, METERING  |
| 34   | HDW90285 | 1   | FITTING, MALE 3/8" TEE                                  |
| 35   | HDW90329 | 1   | FITTING, 90° ELBW, MALE 1/4", MALE 3/8" O-RING          |
| 36   | HDW9200  | 1   | FITTING, MALE PLUG 1/4" NPT                             |
| 37   | 91014    | 1   | FLOW DIVIDER  |
| 38   | 9971     | 3   | RELIEF VALVE TAMPER PROOF CAP                           |
|      | 25575    | -   | HOSE KIT, SEE HYDRAULIC HOSES, THIS SECTION             |
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 ILLUSTRATION No.  
 ART\_2287

1532ES: Serial # 9001100 - UP  
 1932ES: Serial # 9105000 - UP

91000, Hydraulic Manifold Assembly, X32ES



| ITEM | PART NO. | QTY | DESCRIPTION                                      |
|------|----------|-----|--|
|      |          |     | <b>MAIN MANIFOLD ASSEMBLY, LATE MODELS</b>       |
|      |          |     | <b>1532ES - SERIAL # 9001100 UP</b>              |
|      |          |     | <b>1932ES - SERIAL # 9105000 UP</b>              |
| 1    | 91002    | 5   | COIL   |
| 2    | 91001    | 3   | COIL   |
| 3    | 91003    | 1   | VALVE, SPOOL 4 WAY 2 POSITION (LIFT)             |
| 4    | 91004    | 1   | VALVE, SPOOL 4 WAY 3 POSITION (STEERING)         |
| 5    | 91005    | 1   | VALVE, SPOOL 4 WAY 2 POSITION (TORQUE)           |
| 6    | 91008    | 1   | VALVE, SPOOL 4 WAY 3 POSITION (DRIVE)            |
| 7    | 91007    | 1   | VALVE, SPOOL 2 WAY N.O. (TORQUE)                 |
| 8    | 91006    | 1   | VALVE, SPOOL 4 WAY 2 POSITION (DRIVE DUMP/DECEL) |
| 9    | 9998     | 1   | ORIFICE, 0.040                                   |
| 10   | 91016    | 1   | VALVE, NEEDLE (TOW/FREEWHEEL)                    |
| 11   | 91015    | 1   | PUMP, MANUAL (BRAKE)                             |
| 12   | 91012    | 1   | VALVE, MANUAL (BRAKE RELEASE)                    |
| 13   | 91010    | 1   | VALVE, RELIEF (MAIN)                             |
| 14   | 91009    | 1   | VALVE, RELIEF (LIFT)                             |
| 15   | 91011    | 1   | VALVE, RELIEF (STEER/PRIORITY FLOW CONTROL)      |
| 16   | 91013    | 1   | VALVE, RELIEF (COUNTERBALANCE WITH PISTON)       |
| 17   | 91014    | 1   | VALVE, CHECK (FLOW DIVIDER)                      |
| 21   | HDW91080 | 1   | FITTING, 90° ELBOW, MALE ¼" × FML ¼" NPT         |
| 22   | HDW7601  | 6   | FITTING, 90°, MALE 3/8", 3/8" O-RING MALE        |
| 23   | HDW8877  | 2   | FITTING, 90° ELBOW, MALE ¼" × MALE ¼"            |
| 24   | HDW91081 | 1   | FITTING, 90° ELBOW, MALE ¼" × MALE ¼" TALL       |
| 25   | HDW9157  | 1   | FITTING, 90° ELBW, MALE 3/8", MALE 3/8" O-RING   |
| 26   | HDW7971  | 1   | TEST PORT  |
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|      |          |     | SEE HYDRAULIC HOSES, THIS SECTION                |
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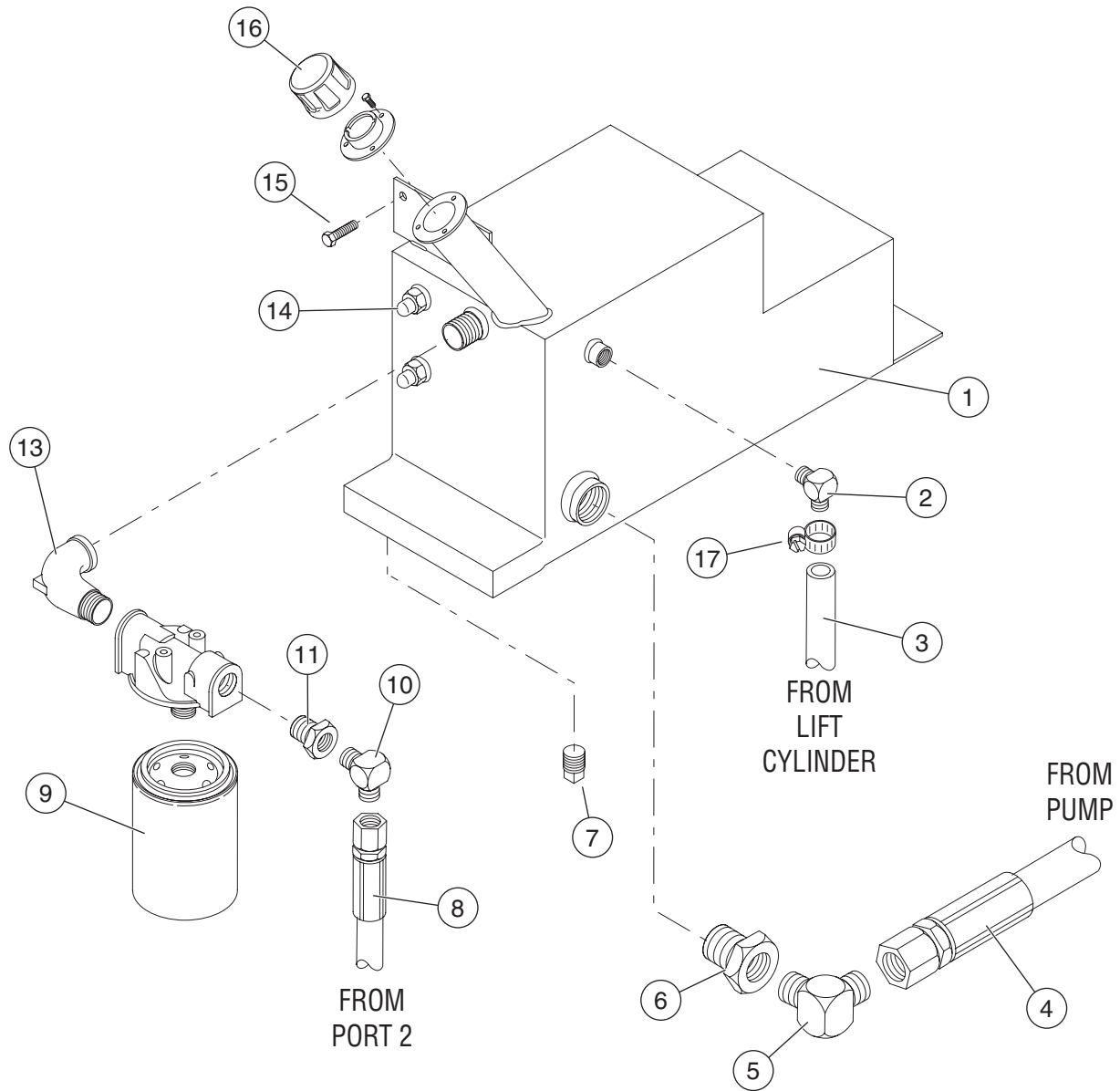


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ART\_2289

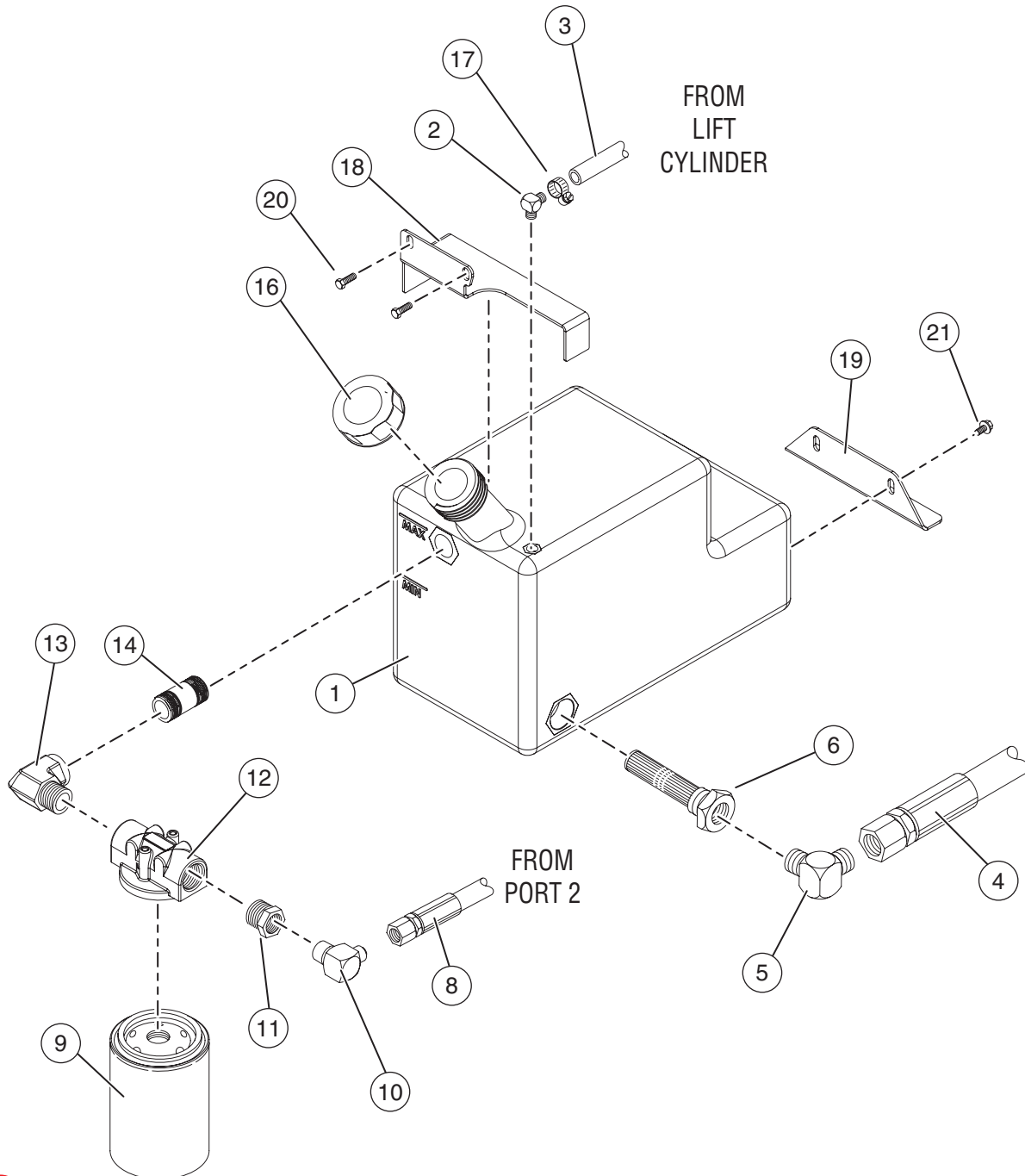
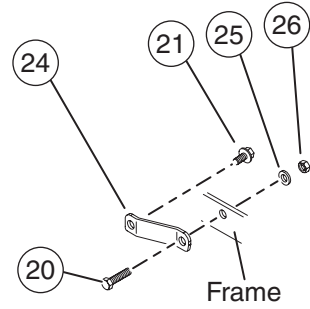
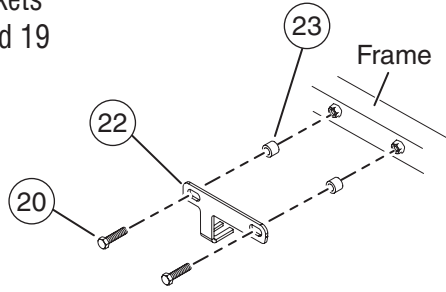
Hydraulic Reservoir Assembly, Steel, X32ES



| ITEM | PART NO. | QTY  | DESCRIPTION                                      |
|------|----------|------|--|
|      |          |      | <b>HYDRAULIC RESERVOIR, STEEL</b>                |
|      |          |      | <b>1532ES - SERIAL #9001000 - # 9001039</b>      |
|      |          |      | <b>1932ES - SERIAL #9104000 - # 9105477</b>      |
| 1    | 25468    | 1    | HYDRAULIC RESERVOIR WELDMENT                     |
| 2    | HDW6727  | 1    | FITTING, ELBOW 90°, MALE 1/4", MALE BARB 1/4"    |
| 3    | REF      | -    | HOSE, RETURN LINE                                |
| 4    | REF      | 1    | HOSE ASSY  |
| 5    | HDW6510  | 1    | FITTING, ELBOW 90°, MALE 1/2" SAE, MALE 1/2" NPT |
| 6    | 8412     | 1    | SUCTION STRAINER                                 |
| 7    | HDW9200  | 1    | FITTING, MALE 1/4"                               |
| 8    | REF      | 1    | HOSE ASSY  |
| 9    | 6156     | 1    | FILTER, OIL CARTRIDGE                            |
| 10   | HDW90300 | 1    | FITTING, ELBOW 90°, MALE 3/8", MALE 1/2"         |
| 11   | HDW6752  | 1    | ADAPTER, MALE 3/4", FML 1/2"                     |
| 12   | 6714     | 1    | FILTER, HEAD                                     |
| 13   | 90215    | 1    | FITTING, ELBOW 90°, FML 3/4", MALE 3/4"          |
| 14   | HDW5938  | 2    | FITTING, SIGHT GAUGE                             |
| 15   | HDW6455  | 2    | SCREW, 1/4" - 20, 1/2" - 66                      |
| 16   | 90127    | 1    | FILLER BREATHER                                  |
| 17   | 7788     | 1    | CLAMP, HOSE                                      |
| NS   | 5292     | 3.25 | US GAL HYDRAULIC OIL                             |
|      | REF      |      | SEE HYDRAULIC HOSES, THIS SECTION                |
|      |          |      |  |
|      |          |      |  |
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Early Style Mounting Brackets  
replaced by brackets 18 and 19



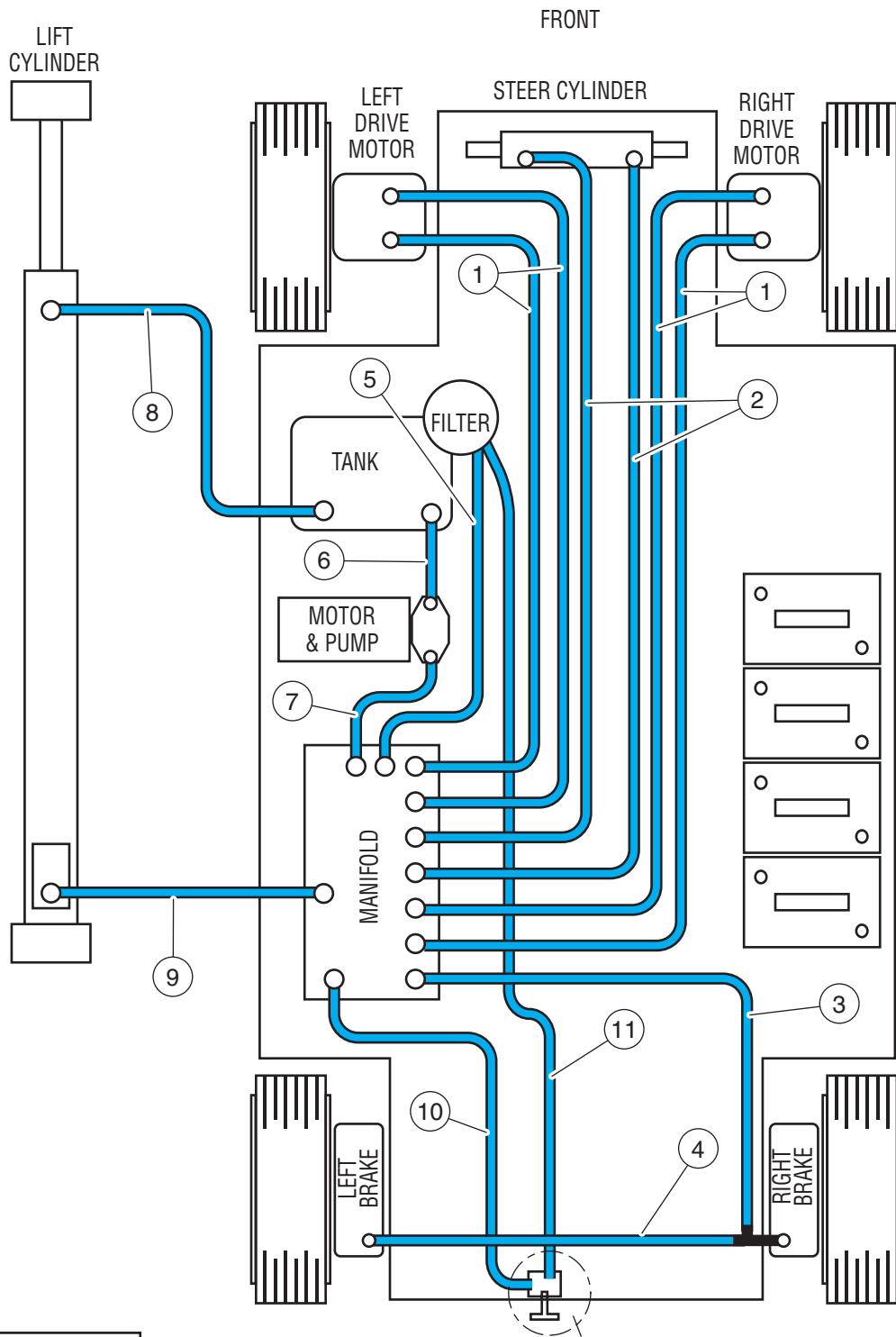
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ILLUSTRATION No.  
ART\_2288

Hydraulic Reservoir - 1532ES & 1932ES



| ITEM | PART NO. | QTY  | DESCRIPTION                                      |
|------|----------|------|--|
|      |          |      | <b>HYDRAULIC RESERVOIR, PLASTIC</b>              |
|      |          |      | <b>1532ES - SERIAL #9001040 UP</b>               |
|      |          |      | <b>1932ES - SERIAL #9105478 UP</b>               |
| 1    | 16119    | 1    | HYDRAULIC RESERVOIR PLASTIC                      |
| 2    | HDW6727  | 1    | FITTING, ELBOW 90°, MALE 1/4", MALE BARB 1/4"    |
| 3    | REF      | -    | HOSE, RETURN LINE                                |
| 4    | REF      | 1    | RETURN HOSE                                      |
| 5    | HDW6510  | 1    | FITTING, ELBOW 90°, MALE 1/2" SAE, MALE 1/2" NPT |
| 6    | 8412     | 1    | SUCTION STRAINER                                 |
| 8    | REF      | 1    | HOSE ASSY  |
| 9    | 6156     | 1    | FILTER, OIL CARTRIDGE                            |
| 10   | HDW90300 | 1    | FITTING, ELBOW 90°, MALE 3/8", MALE 1/2"         |
| 11   | HDW6752  | 1    | ADAPTER, MALE 3/4", FML 1/2"                     |
| 12   | 6714     | 1    | FILTER, HEAD                                     |
| 13   | 90215    | 1    | FITTING, ELBOW 90°, FML 3/4", MALE 3/4"          |
| 14   | 91601    | 2    | PIPE NIPPLE, 3/4" × 2"                           |
| 16   | 90127    | 1    | FILLER BREATHER                                  |
| 17   | 7788     | 1    | CLAMP, HOSE                                      |
| 18   | 16713    | 1    | BRACKET, RESERVOIR SADDLE                        |
| 19   | 19714    | 1    | BRACKET, RESERVOIR TAB ANCHOR                    |
| 20   | HDW6455  | 2    | SCREW, 1/4" - 20, 1/2" - 66                      |
| 21   | HDW6455  | 1    | SCREW  |
| 22   | 16125    | 1    | BRACKET, TOP, RESERVOIR                          |
| 23   | —        | 1    | SPACER, RESERVOIR BRACKET (NO LONGER USED)       |
| 24   | 16344    | 1    | BRACKET, REAR, RESERVOIR                         |
| 25   | —        | 1    | WASHER (NO LONGER USED)                          |
| 26   | —        | 1    | NUT (NO LONGER USED)                             |
| NS   | 5292     | 3.25 | US GAL HYDRAULIC FLUID, ISO32 OR EQUIVALENT      |
|      |          |      |  |
|      | REF      |      | SEE HYDRAULIC HOSES                              |





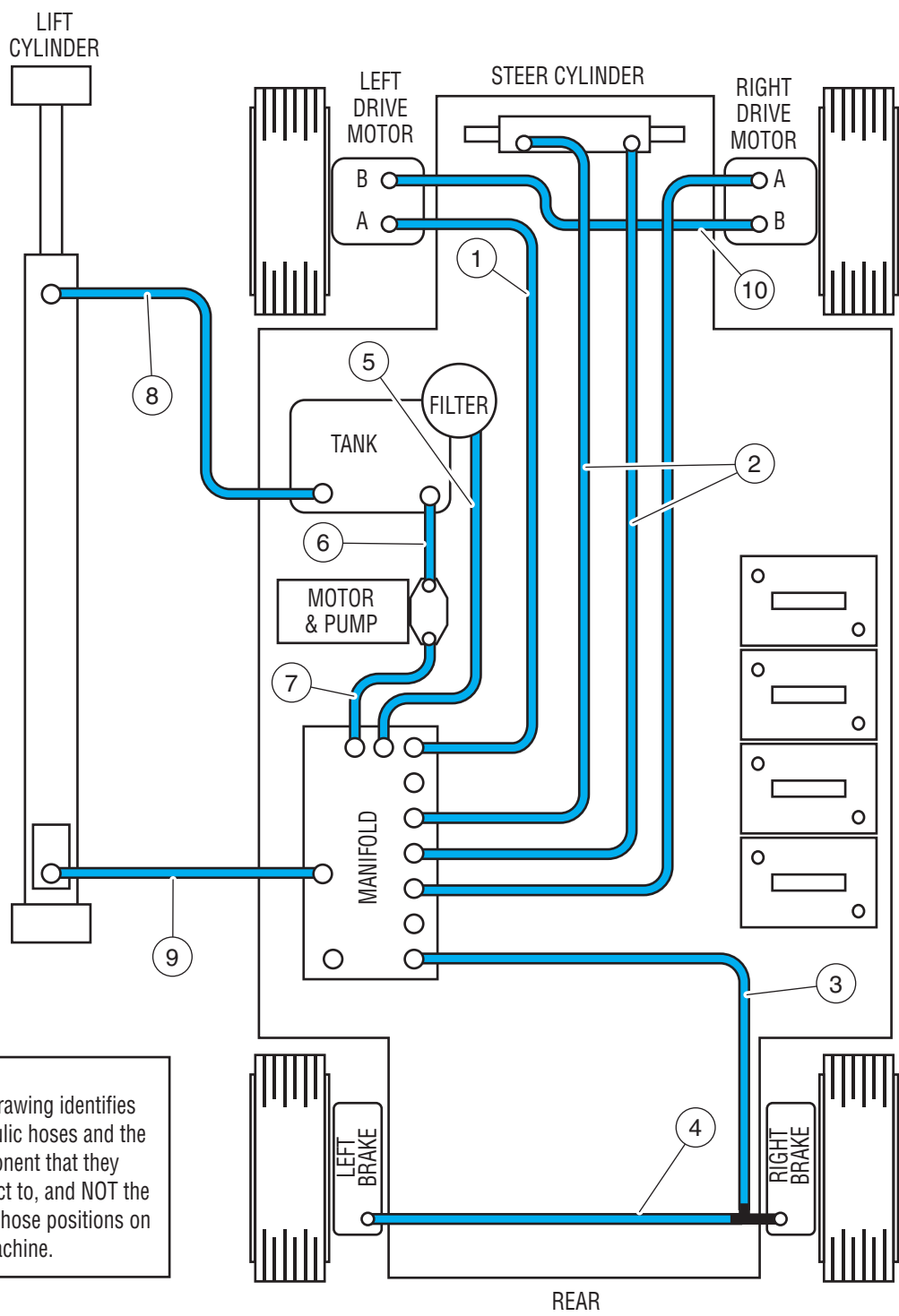
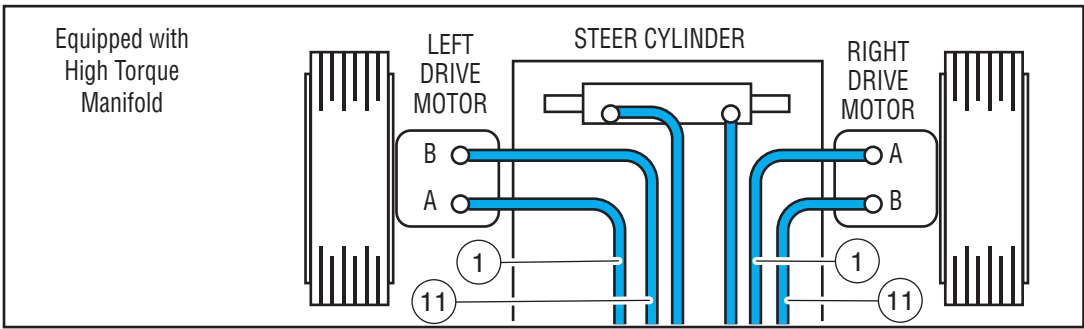
**NOTE:**  
 This drawing identifies hydraulic hoses and the component that they connect to, and NOT the actual hose positions on the machine.

**MANUAL BRAKE RELEASE HAND PUMP**  
 only used up to:  
 1532ES - serial #9001099  
 1932ES - serial #9104999



| ITEM | PART NO. | QTY    | DESCRIPTION                                       |
|------|----------|--------|---|
|      |          |        | <b>HYDRAULIC HOSES, EARLY MODELS</b>              |
|      |          |        | <b>11532ES - SERIAL # TO # 9001099</b>            |
|      |          |        | <b>1932ES - SERIAL # TO # 9104999</b>             |
| 1    | 90286    | 4      | HOSE ASSEMBLY, DRIVE MOTORS                       |
| —    | 6675     | AS REQ | SEAL KIT, DRIVE HOSE SWIVEL                       |
| 2    | 9404     | 2      | HOSE ASSEMBLY, STEER CYLINDER                     |
| 3    | 90276    | 1      | HOSE ASSEMBLY, BRAKE TO MANIFOLD                  |
| 4    | 90275    | 1      | HOSE ASSEMBLY, BRAKE TO BRAKE                     |
| 5    | 9038     | 1      | HOSE ASSEMBLY, MANIFOLD TO FILTER                 |
| 6    | 9959     | 1      | HOSE ASSEMBLY, SUCTION                            |
| 7    | 7598     | 1      | HOSE ASSEMBLY, PRESSURE                           |
| 8    | 6458     | 9 FT   | HOSE ASSEMBLY, LIFT CYLINDER TO RESERVOIR, 1532ES |
| 8    | 6458     | 13 FT  | HOSE ASSEMBLY, LIFT CYLINDER TO RESERVOIR, 1932ES |
|      |          |        | <b>1532ES - SERIAL # TO # 9001007</b>             |
|      |          |        | <b>1932ES - SERIAL # TO # 9104474</b>             |
| 9    | 9245     | 1      | HOSE ASSEMBLY, LIFT CYLINDER                      |
|      |          |        | <b>1532ES - SERIAL # 9001009 TO # 9001099</b>     |
|      |          |        | <b>1932ES - SERIAL # 9104475 TO # 9104999</b>     |
| 9    | 90819    | 1      | HOSE ASSEMBLY, LIFT CYLINDER                      |
| 10   | 90274    | 1      | HOSE ASSEMBLY, HAND PUMP                          |
| 11   | 7598     | 1      | HOSE ASSEMBLY, HAND PUMP RETURN                   |
|      |          |        |   |
|      |          |        |   |
|      |          |        |   |
|      |          |        |   |





**NOTE:**  
 This drawing identifies hydraulic hoses and the component that they connect to, and NOT the actual hose positions on the machine.

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 ILLUSTRATION No.  
 ART\_2290 R1

1532ES - Serial # 9001100 - UP  
 1932ES - Serial # 9105000 - UP

Hydraulic Hoses, X32ES



| ITEM    | PART NO.         | QTY         | DESCRIPTION   |
|---------|------------------|-------------|---|
|         |                  |             | <b>HYDRAULIC HOSES, LATE MODELS</b>   |
|         |                  |             | <b>1532ES - SERIAL # 9001100 UP</b>   |
|         |                  |             | <b>1932ES - SERIAL # 9105000 UP</b>   |
| 1<br>—  | 90286 *<br>6675  | 2<br>AS REQ | HOSE ASSEMBLY, DRIVE MOTORS<br>SEAL KIT, DRIVE HOSE SWIVEL  |
| 2<br>3  | 91047<br>90316   | 2<br>1      | HOSE ASSEMBLY, STEER CYLINDER<br>HOSE ASSEMBLY, BRAKE TO MANIFOLD                                   |
| 4<br>5  | 90275<br>9038    | 1<br>1      | HOSE ASSEMBLY, BRAKE TO BRAKE<br>HOSE ASSEMBLY, MANIFOLD TO FILTER                                  |
| 6<br>7  | 91396<br>7598    | 1<br>1      | HOSE ASSEMBLY, SUCTION<br>HOSE ASSEMBLY, PRESSURE   |
| 8       | 6458             | 9 FT        | HOSE ASSEMBLY, LIFT CYLINDER TO RESERVOIR, 1532ES   |
| 8       | 6458             | 13 FT       | HOSE ASSEMBLY, LIFT CYLINDER TO RESERVOIR, 1932ES   |
| 9<br>10 | 90819<br>5996 ** | 1<br>1      | HOSE ASSEMBLY, LIFT CYLINDER<br>JUMPER, DRIVE HOSE  |
| 11<br>— | 90286 *<br>6675  | 2<br>AS REQ | HOSE ASSEMBLY, DRIVE MOTORS<br>SEAL KIT, DRIVE HOSE SWIVEL  |
|         |                  |             |   |
|         |                  |             | * use when equipped with High Torque Manifold<br>** use when NOT equipped with High Torque Manifold |
|         |                  |             |   |
|         |                  |             |   |
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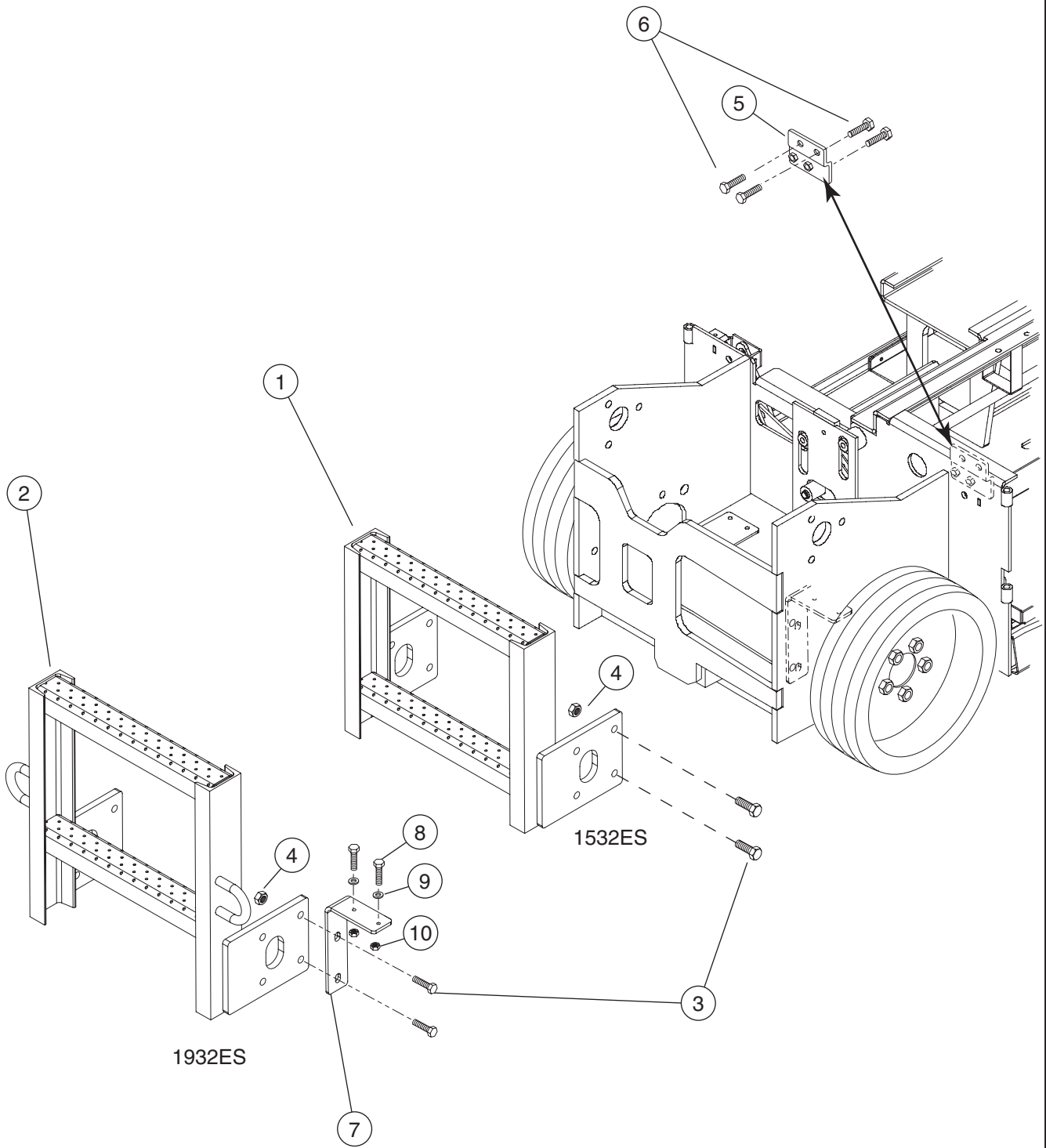


A large, stylized red graphic consisting of two overlapping, curved shapes that form a circular frame around the central text.

# SECTION E: BASE

LADDER AND CONTROL BOX BRACKETS ..... E-3  
BASE COVERS ..... E-5  
OPTIONS ..... E-7  
BRAKE ASSEMBLY ..... E-9  
STEERING ..... E-11  
HYDRAULIC PUMP ASSEMBLY ..... E-13  
POTHOLE ASSEMBLY ..... E-15  
WHEEL MOTOR ..... E-19  
BATTERY INSTALLATION ..... E-21  
POTHOLE LIMIT SWITCH - X32 SERIES ..... E-23  
DRIVE CUTOUT SWITCH - X32 SERIES ..... E-23  
BATTERY CHARGER ..... E-25





| ITEM | PART NO. | QTY | DESCRIPTION  |
|------|----------|-----|--|
|      |          |     | <b>LADDER AND CONTROL BOX BRACKETS</b>                                     |
| 1    | 16063    | 1   | LADDER (1532ES)  |
| 2    | 16040    | 1   | LADDER (1932ES)  |
| 3    | HDW8283  | 4   | SCREW, 1/2" - 13, 1 1/2" LG  |
| 4    | HDW8457  | 4   | NUT, 1/2" - 13   |
| 5    | 25476    | 1   | BRKT, CONTROL BOX MOUNT  |
| 6    | HDW6432  | 4   | SCREW 3/8" - 16, 3/4" LG   |
|      |          |     | <b>1532ES: SERIAL # TO 9001040</b><br><b>1932ES: SERIAL # TO 9105299</b>   |
| 7    | 16149    | 1   | LOWER CONTROL BOX SUPPORT  |
|      |          |     | <b>1532ES: SERIAL #9001041 - UP</b><br><b>1932ES: SERIAL #9105300 - UP</b> |
| 7    | 16334    | 1   | LOWER CONTROL BOX SUPPORT  |
| 8    | HDW5904  | 2   | SCREW  |
| 9    | HDW5470  | 2   | WASHER   |
| 10   | HDW8267  | 2   | NUT  |
|      |          |     |  |
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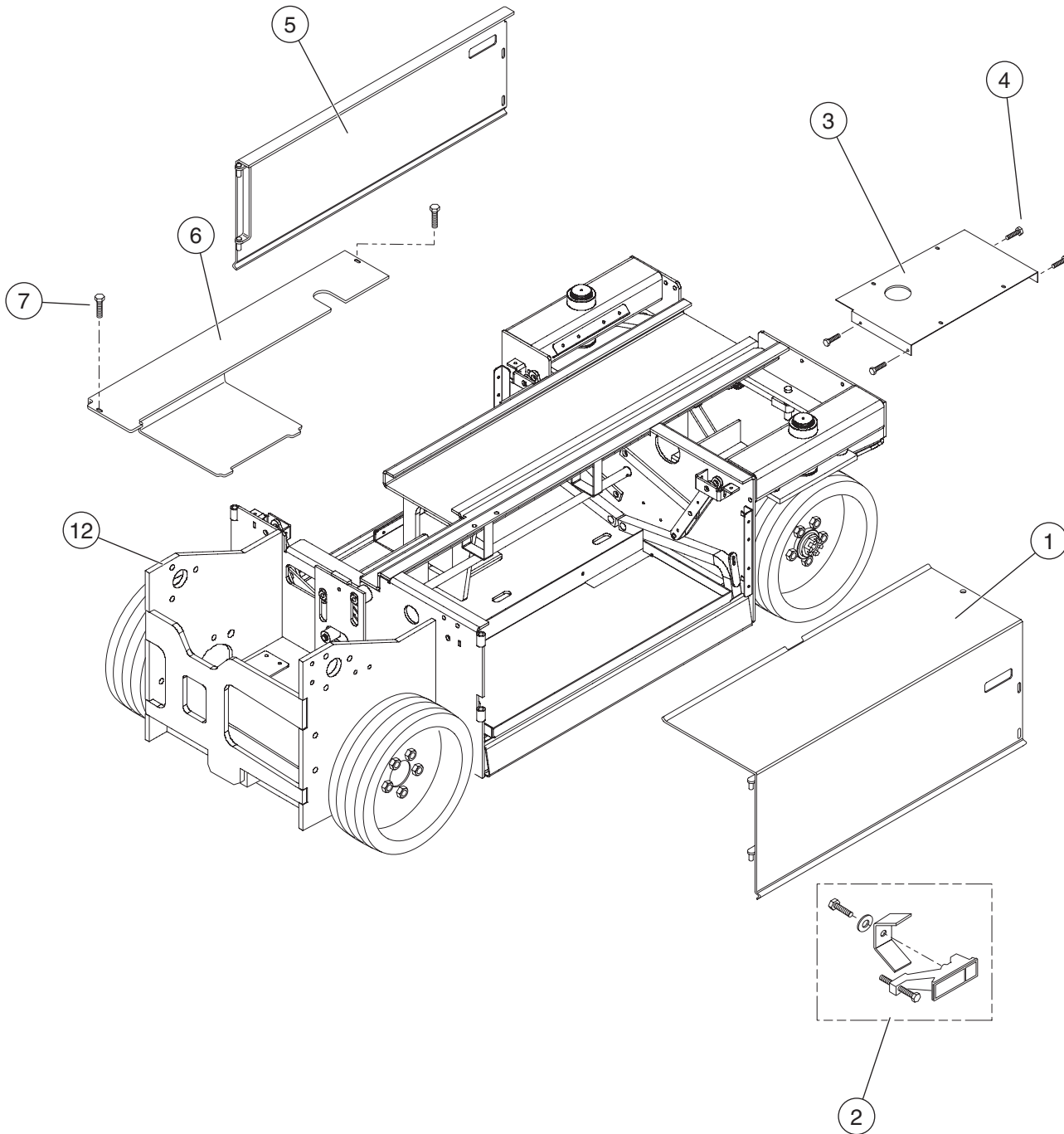
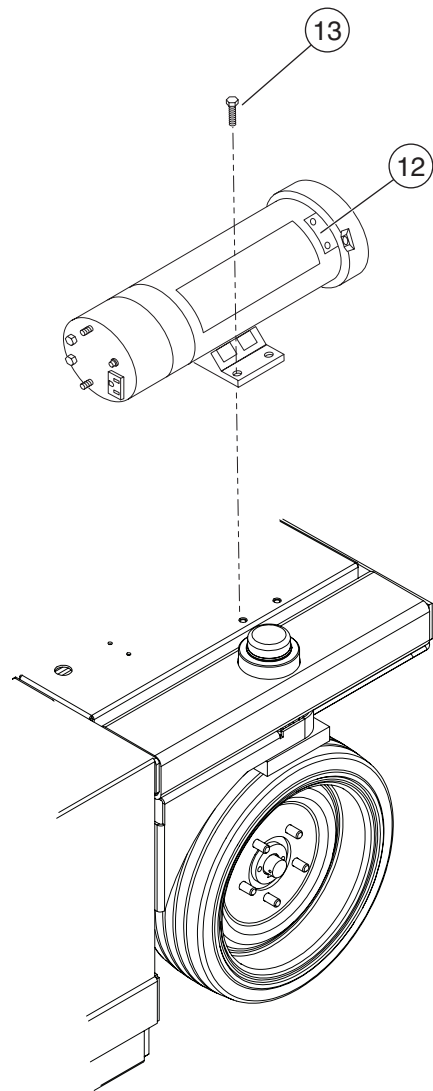
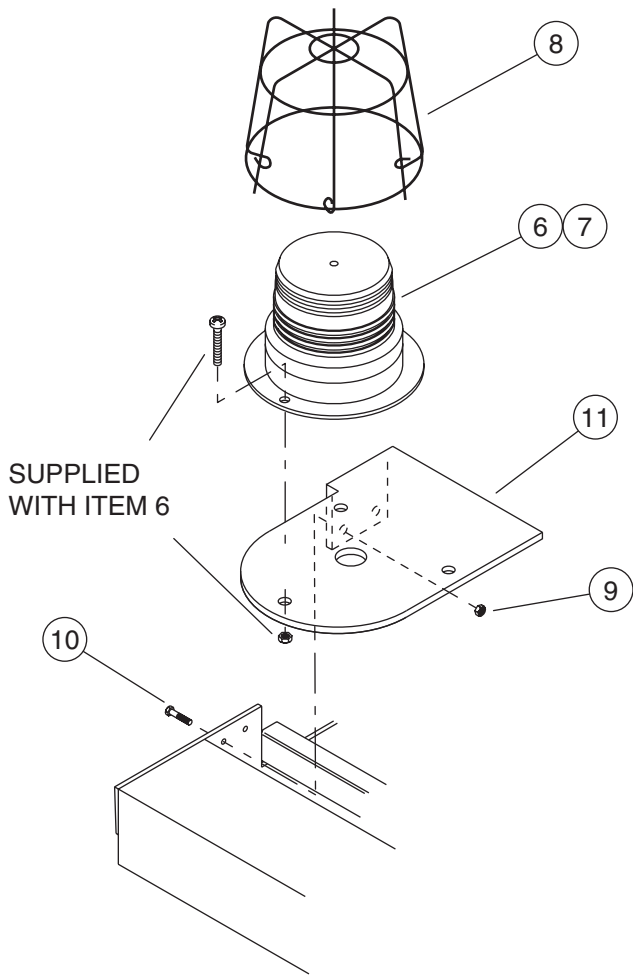
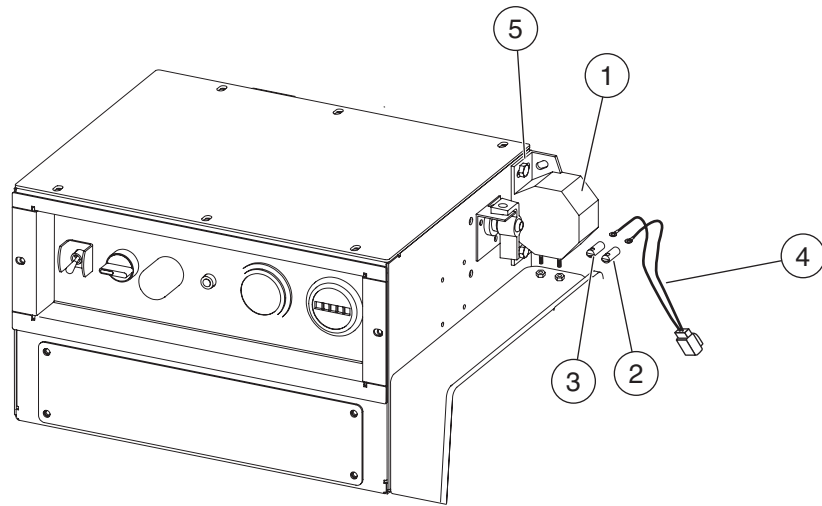


  
ILLUSTRATION No.  
ART\_2304

Base and Covers, 1532ES - 1932ES





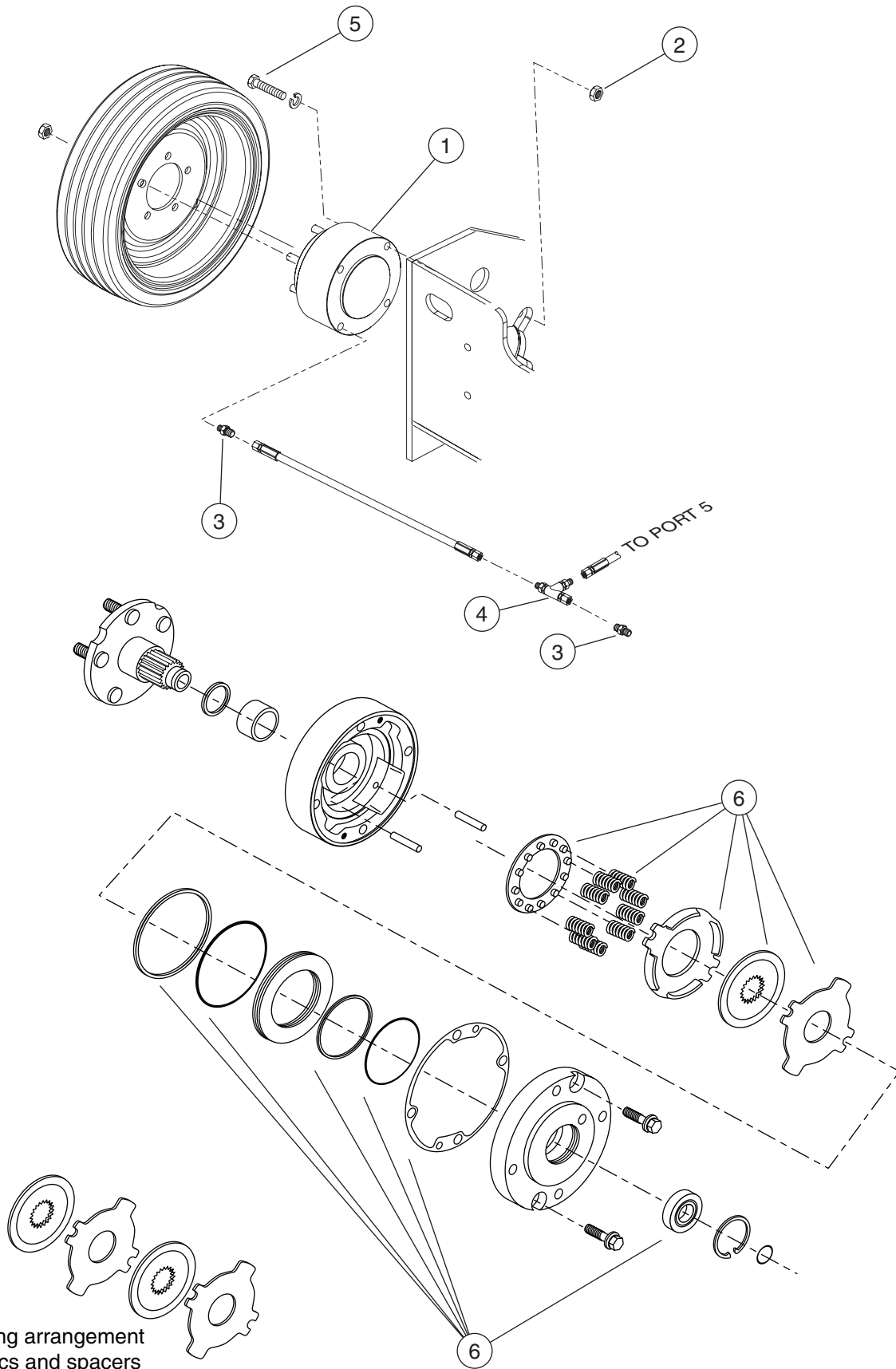


Base Options, 1532ES - 1932ES

 ILLUSTRATION No.  
ART\_2307

| ITEM | PART NO. | QTY | DESCRIPTION                  |
|------|----------|-----|------------------------------|
|      |          |     | <b>OPTIONS</b>               |
|      |          |     | <b>MOTION ALARM</b>          |
| 1    | 8698     | 1   | ALARM, MOTION 12-48 VOLTS    |
| 2    | 8709     | 1   | INSULATOR, TERMINAL, RED     |
| 3    | 8710     | 1   | INSULATOR, TERMINAL, BLACK   |
| 4    | 8782     | 1   | HARNESS, MOTION ALARM        |
| 5    | HDW6455  | 2   | SCREW, 1/4" - 20, 1/2" LG    |
|      |          |     | <b>MOTION LIGHT</b>          |
| 6    | 9770     | 1   | LIGHT, STROBE                |
| 7    | 9836     | 1   | TUBE REPLACEMENT             |
| 8    | 90213    | 1   | GUARD, LENS                  |
| 9    | HDW8304  | 2   | NUT, 5/16" - 18              |
| 10   | HDW8310  | 2   | SCREW, 5/16" - 18, 1 1/4" LG |
| 11   | 25492    | 1   | BRKT, LIGHT MOUNT            |
|      |          |     | <b>POWER CONVERTER</b>       |
| 12   | 7103     | 1   | CONVERTER                    |
| NS   | 7109     | 1   | BOOT INSULATOR, BLACK        |
| NS   | 7110     | 1   | BOOT INSULATOR, RED          |
| NS   | 7111     | 1   | CABLE, POWER SUPPLY          |
| NS   | 7112     | 1   | CABLE, POWER SUPPLY          |
| NS   | 7130     | 1   | CAPACITOR                    |
| 13   | HDW5204  | 4   | SCREW, 5/16" - 18, 1" LG     |
|      |          |     |                              |
|      |          |     |                              |
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Stacking arrangement  
for discs and spacers



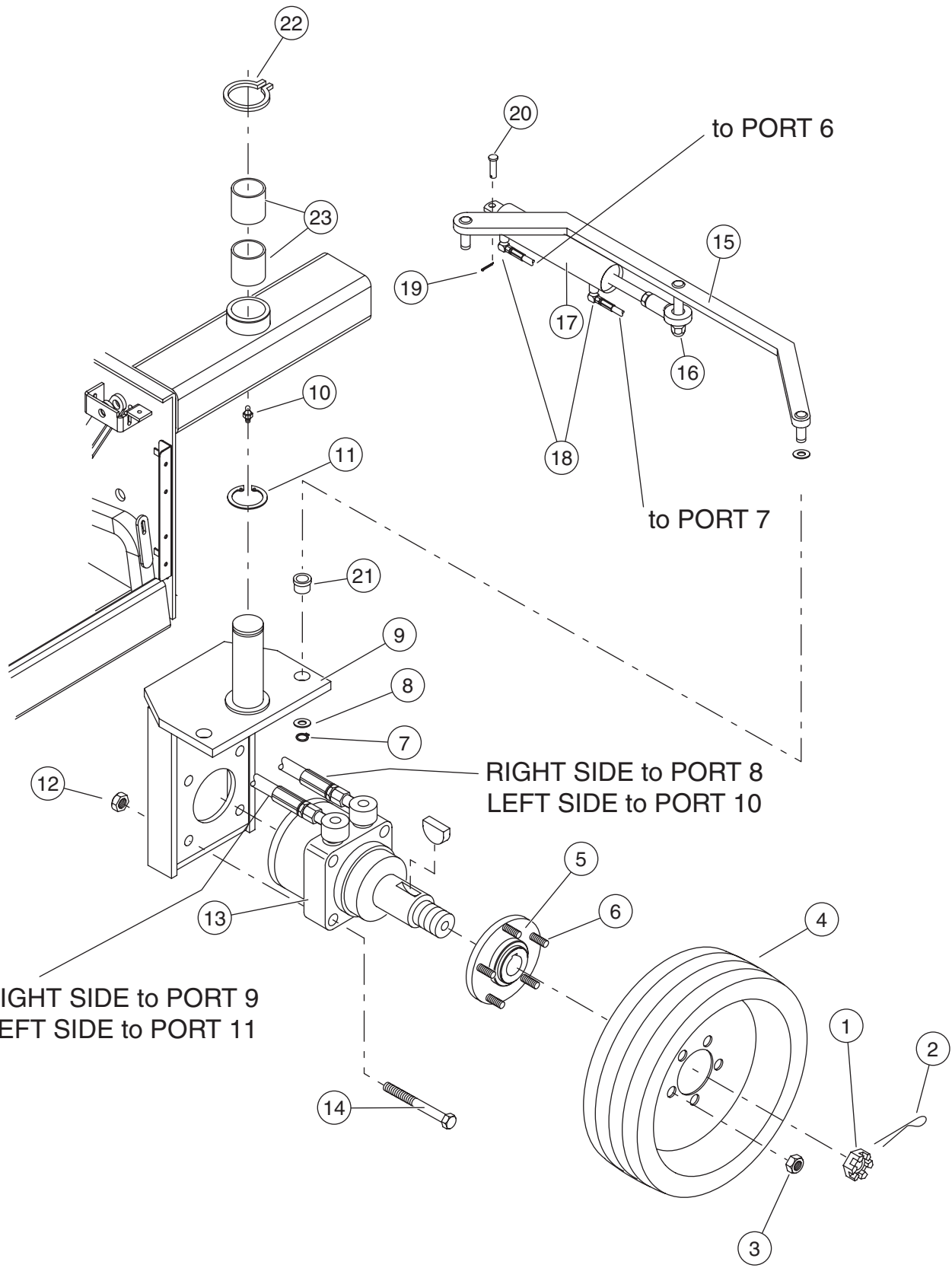
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Brake Installation, ES



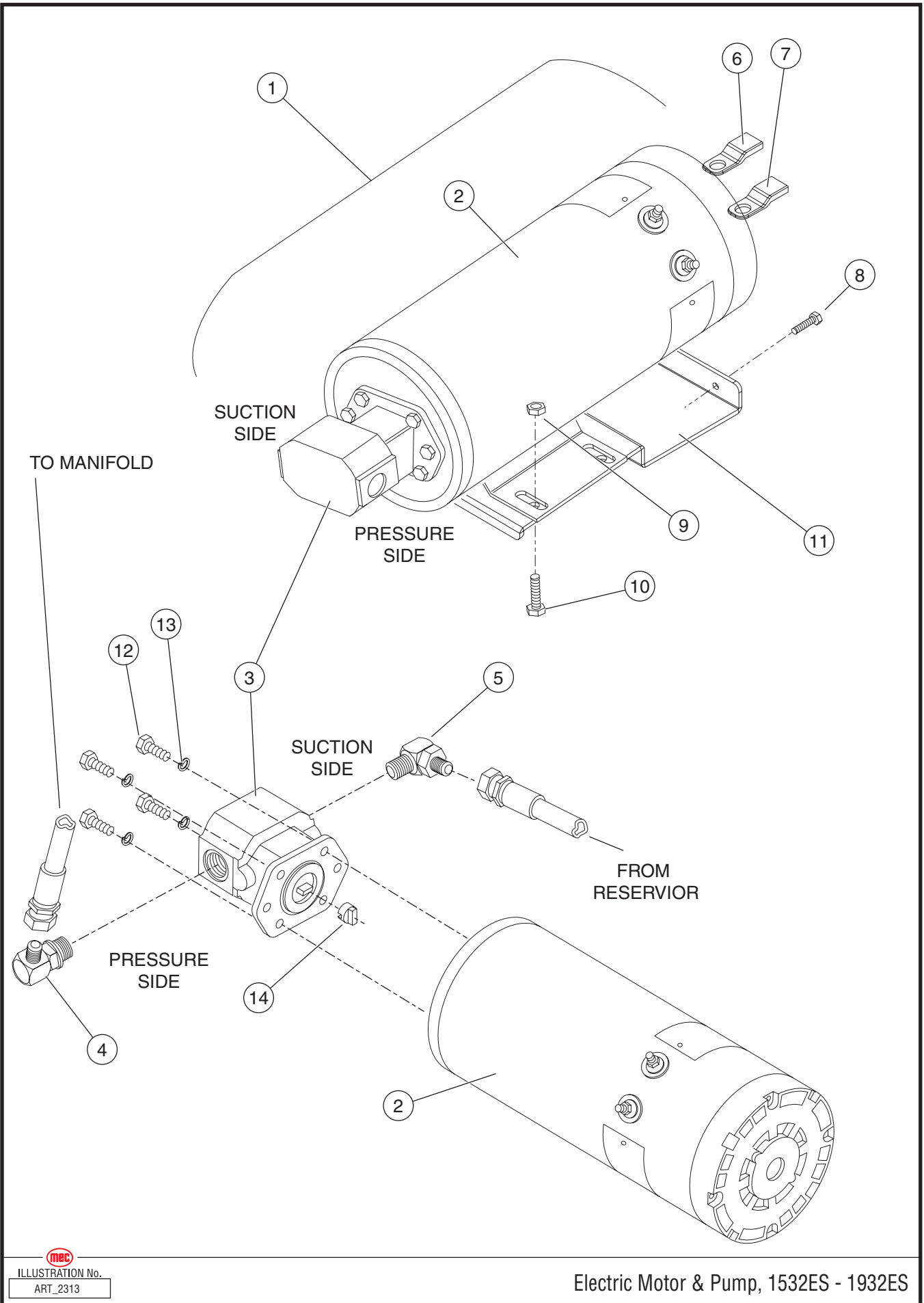
| ITEM | PART NO. | QTY | DESCRIPTION  |
|------|----------|-----|--|
| 1    | 9544     | 2   | <b>BRAKE ASSEMBLY</b><br><b>HYDRAULIC BRAKE ASSY - MICO BRAND</b>                  |
|      |          |     | <b>1532ES SERIAL #9001000 - 9001066</b><br><b>1932ES SERIAL #9104000 - 9105783</b> |
| 1    | 91599    | 2   | <b>HYDRAULIC BRAKE ASSY - AUSCO BRAND</b>  |
|      |          |     | <b>1532ES SERIAL #9001067 - UP</b><br><b>1932ES SERIAL #9105784 - UP</b>           |
| 2    | HDW8457  | 8   | NUT, 1/2" - 13   |
| 3    | HDW8881  | 2   | ADAPTER, MALE 1/4" O-RING, MALE 1/4"   |
| 4    | HDW90332 | 1   | FITTING, MALE 1/4", MALE 1/4", FEMALE 1/4" TEE                                     |
| 5    | HDW8498  | 8   | SCREW, 1/2" - 13, 4" LG  |
| 6    | 90413    | 1   | BRAKE REPAIR KIT   |
|      |          |     | SEE HYDRAULIC HOSES (PARTS SECTION D)  |
|      |          |     |  |
|      |          |     |  |
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| ITEM | PART NO. | QTY | DESCRIPTION                                   |
|------|----------|-----|---|
|      |          |     | <b>STEERING</b>                               |
| 1    | HDW8568  | 2   | NUT, SLOTTED, 1 1/8" - 18                     |
| 2    | HDW5290  | 2   | PIN, COTTER                                   |
| 3    | HDW6677  | 10  | NUT, LUG, 1/2" - 20                           |
| 4    | 8812     | 2   | WHEEL/TIRE NON MARKING                        |
| 5    | 25542    | 2   | HUB TAPERED DRIVE                             |
| 6    | HDW6676  | 10  | LUG BOLT 1/2"-20                              |
| 7    | 9066     | 2   | RING, RETAINING 5/8"                          |
| 8    | HDW9219  | 2   | WASHER, SPACER                                |
| 9    | 25548    | 2   | WELDMENT, WHEEL MOTOR MOUNT                   |
| 10   | 5432     | 2   | FITTING, GREASE INSERT                        |
| 11   | HDW3802  | 2   | WASHER, 2 1/2" NYLON                          |
| 12   | HDW8457  | 8   | NUT, 1/2" - 13                                |
| 13   |          | 2   | MOTOR, HYDRAULIC WHEEL                        |
|      | 90231    |     | 1532ES SERIAL # TO # 9001040                  |
|      |          |     | 1932ES SERIAL #TO # 9105299                   |
|      | 90809    |     | 1532ES SERIAL # 9001041 -UP                   |
|      |          |     | 1932ES SERIAL # 9105300 - UP                  |
| 14   | HDW6435  | 8   | SCREW, 1/2" - 13, 2 1/2" LG                   |
| 15   | 25324    | 1   | WELDMENT, TIE ROD                             |
| 16   | HDW6633  | 1   | NUT, 5/8" - 11                                |
| 17   | 90865    | 1   | CYLINDER, STEERING                            |
|      | 90990    |     | SEAL KIT, STEER CYLINDER                      |
| 18   | HDW90818 | 2   | FITTING, 90° ELBW, MALE #4 SAE, MALE 3/8" JIC |
| 19   | HDW5920  | 1   | PIN, COTTER                                   |
| 20   | HDW90770 | 1   | PIN, CLEVIS                                   |
| 21   | 9170     | 2   | BEARING, FLANGED 5/8"                         |
| 22   | 8919     | 2   | RING, RETAINING                               |
| 23   | 7160     | 4   | BEARING                                       |
|      |          |     | SEE HYDRAULIC HOSES (PARTS SECTION D)         |
|      |          |     |   |



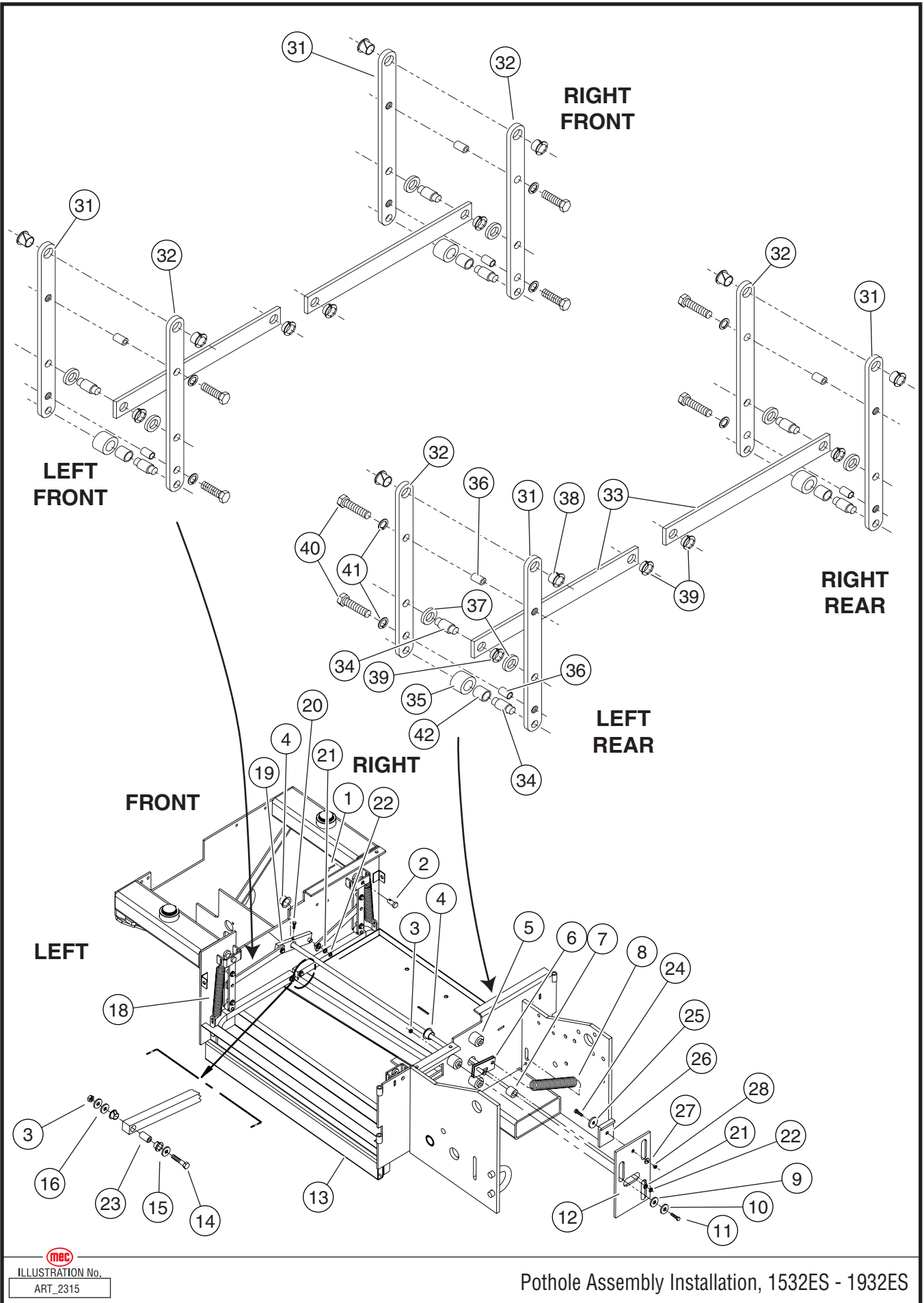


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 ART\_2313





| ITEM | PART NO.       | QTY | DESCRIPTION  |
|------|----------------|-----|--|
|      |                |     | <b>HYDRAULIC PUMP ASSEMBLY</b><br><b>1532ES: S/N# TO #9001040</b>    |
|      |                |     | <b>1932ES: S/N# TO # 9105299</b>                                     |
| 2    | 8544           | 1   | MOTOR, 24 VDC, 2 HP  |
| 3    | 8546           | 1   | PUMP   |
| 14   | 6314           | 1   | COUPLER  |
|      |                |     | <b>1532ES: S/N# 9001041 - UP</b><br><b>1932ES: S/N# 9105300 - UP</b> |
| 1    | 90970          | 1   | POWER UNIT ASSEMBLY, MONARCH   |
| 2    | 90997<br>91226 | 1   | MOTOR, 24 VDC, 2 HP<br>BRUSHES                                       |
| 3    | 90998          | 1   | PUMP   |
| 14   | 90999          | 1   | COUPLER  |
|      |                |     | <b>ALL MODELS</b>  |
| 4    | HDW8081        | 1   | FITTING, 90° ELBW, MALE 1/2" O-RING, MALE 3/8" SIZE: 37              |
| 5    | HDW90967       | 1   | FITTING, 90° ELBW, MALE 3/8" O-RING, MALE 1/2" SIZE: 50              |
| 6    | REF            | 1   | BATTERY CABLE, RED (SEE HARNESSSES, PARTS SEC 1)                     |
| -    | 7172           | 1   | BOOT TERMINAL INSULATOR RED (NOT SHOWN)                              |
| 7    | REF            | 1   | BATTERY CABLE, BLACK, (SEE HARNESSSES, PARTS SEC 1)                  |
| -    | 7172           | 1   | BOOT TERMINAL INSULATOR BLACK (NOT SHOWN)                            |
| 8    | HDW6455        | 2   | SCREW, 1/4" - 20, 1/2" LG  |
| 9    | HDW5005        | 4   | NUT, 5/16" - 18  |
| 10   | HDW5204        | 4   | SCREW, 5/16" - 18, 1" LG   |
| 11   | 25555          | 1   | BRKT ELECTRIC MOTOR MOUNT  |
| 12   | HDW5724        | 4   | SCREW, 5/16"-18, 3/4" LG   |
| 13   | HDW5006        | 4   | LOCKWASHER, 5/16"  |
|      |                |     | SEE HYDRAULIC HOSES (SECTION D)                                      |
|      |                |     |  |



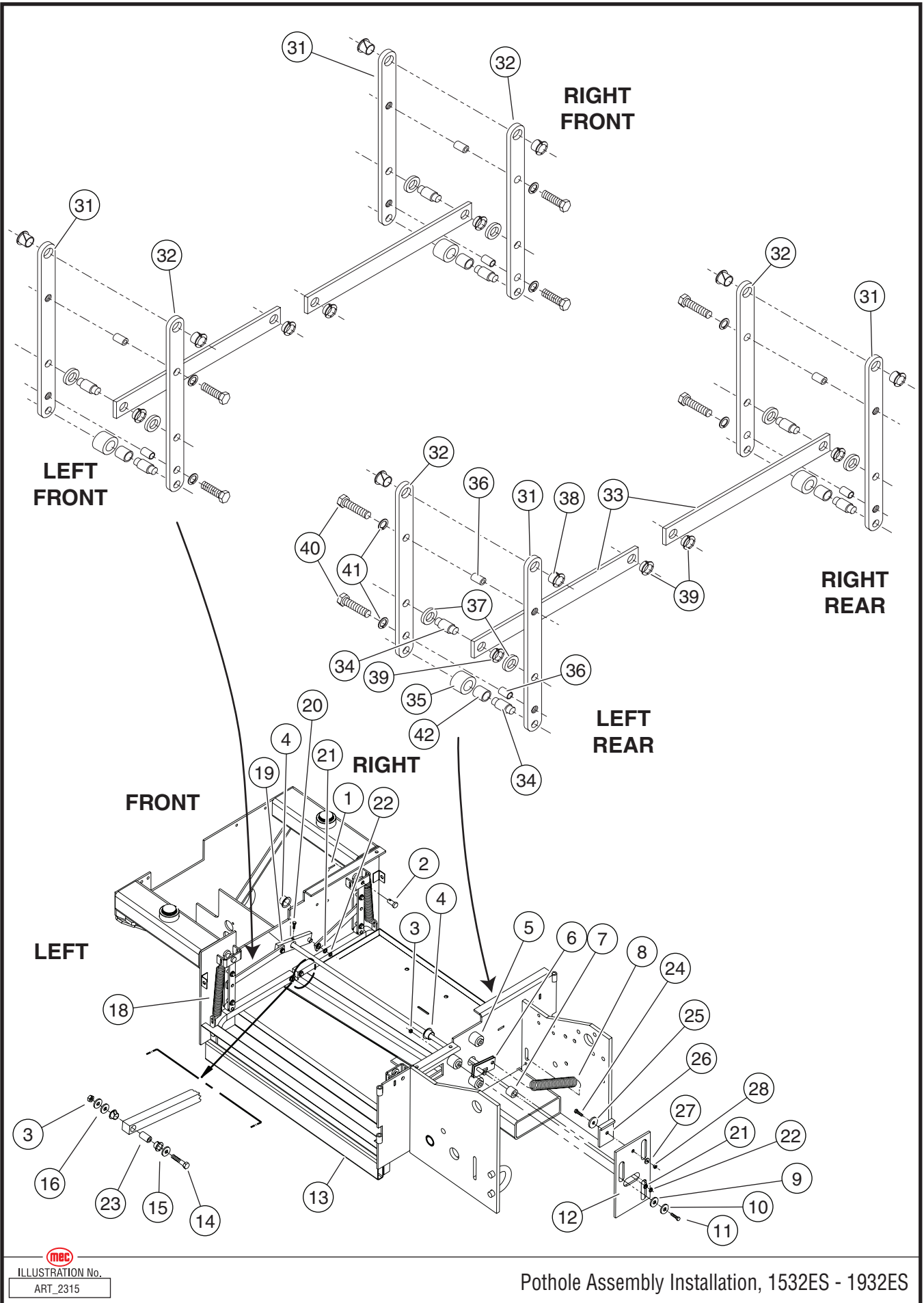
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 ILLUSTRATION No.  
 ART\_2315

Pothole Assembly Installation, 1532ES - 1932ES



| ITEM | PART NO. | QTY | DESCRIPTION  |
|------|----------|-----|--|
|      |          |     | <b>POTHOLE ASSEMBLY</b>                              |
| 1    | HDW5920  | 4   | PIN, COTTER, 1/8" X 1"                               |
| 2    | HDW7229  | 4   | PIN, CLEVIS, 1/2" X 2"                               |
| 3    | HDW5039  | 7   | LOCK NUT, 3/8" - 16                                  |
| 4    | 7260     | 2   | BEARING, OIL IMPREGNATED, 3/4" X 3/4", FLANGED       |
| 5    | 8602     | 3   | SPACER, STEPPED PVC                                  |
| 6    | 25378    | 1   | POTHOLE ACTUATOR ROD WELDMENT                        |
| 7    | 4541     | 1   | ROLLER   |
| 8    | 25307    | 1   | SPRING, TENSION - DEPLOYMENT                         |
| 9    | HDW13556 | 3   | WASHER, FLAT, 3/8" ID, 1 1/2" OD, 1/8" THICK-PLASTIC |
| 10   | HDW13338 | 3   | WASHER, FLAT, 3/8" ID, 1 1/2" OD, 1/8" THICK-STEEL   |
| 11   | HDW8279  | 3   | SCREW, 3/8" - 16, 2 1/2" LG, GRADE 5                 |
| 12   | 25246    | 1   | PLATE, POTHOLE ACTUATOR                              |
| 13   | 25151    | 2   | POTHOLE BAR WELDMENT                                 |
| 14   | HDW8278  | 4   | SCREW, 3/8" - 16, 1 1/4" LG, GRADE 8                 |
| 15   | 7202     | 8   | BEARING, 5/8" ID X 7/16" LG, FLANGED                 |
| 16   | HDW11467 | 12  | WASHER, FLAT   |
| 18   | 9027     | 4   | SPRING, TENSION, 1" OD X 5" LG, RETRACTION           |
| 19   | 11129    | 2   | STABILIZER, PIVOT BAR                                |
| 20   | HDW5724  | 2   | SCREW, 5/16" - 18, 3/4" LG, GRADE 5                  |
| 21   | HDW7031  | 5   | WASHER, FLAT, 1/2" ID, 7/8" OD, 1/16" THICK          |
| 22   | 5736     | 5   | RING, RETENTION, 1/2" SHAFT                          |
| 23   | 11181    | 4   | SPACER   |
| 24   | HDW8273  | 1   | SCREW, 1/4" - 20, 1" LG                              |
| 25   | HDW5470  | 1   | WASHER, FLAT, 1 1/2" OD, 9/32" ID X 1/8"             |
| 26   | 25306    | 1   | WEAR BLOCK, POTHOLE ACTUATOR                         |
| 27   | HDW5217  | 1   | WASHER, FLAT, 11/16" OD, 11/32" ID X 1/16"           |
| 28   | HDW6461  | 1   | LOCK NUT, 1/4" - 20                                  |
|      |          |     | (CONTINUED...)                                       |
|      |          |     |  |
|      |          |     |  |





**mecc**  
 ILLUSTRATION No.  
 ART\_2315

Pothole Assembly Installation, 1532ES - 1932ES





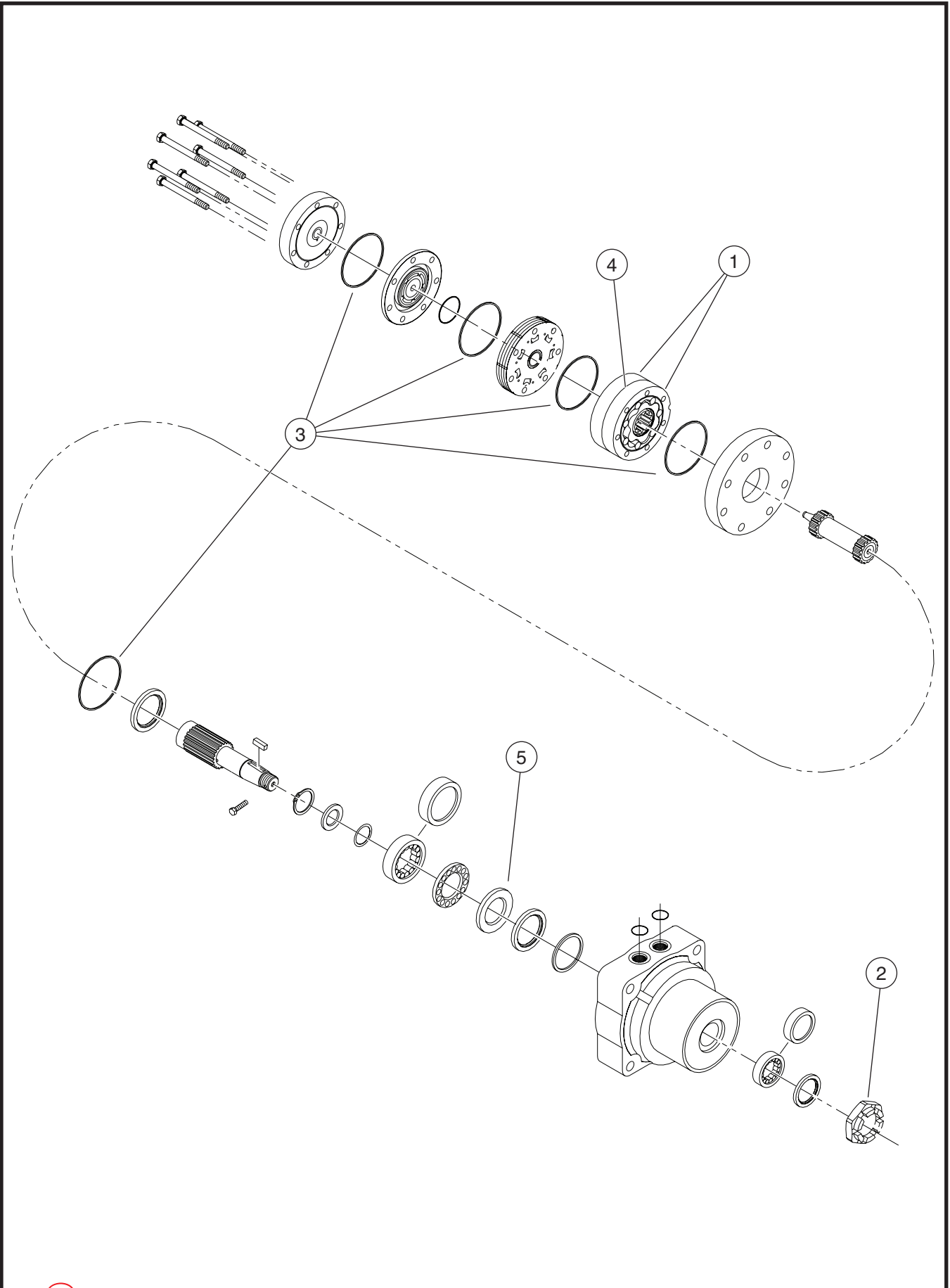


  
ILLUSTRATION No.  
ART\_2318

Wheel Motor Assembly, ES

| ITEM | PART NO.       | QTY | DESCRIPTION  |
|------|----------------|-----|--|
|      |                |     | <b>WHEEL MOTOR</b>   |
|      |                |     | <b>1532ES - SERIAL # 9001034</b><br><b>1932ES - SERIAL #TO 9105299</b> |
|      | 90231<br>90419 |     | WHEEL MOTOR<br>SEAL KIT FOR WHEEL MOTOR 90231                          |
|      |                |     | <b>1532ES - SERIAL # 9001035 UP</b>                                    |
|      | 90809          |     | <b>1932ES - SERIAL #9105300 UP</b><br>WHEEL MOTOR                      |
|      |                |     | SEAL KIT FOR WHEEL MOTOR   |
|      |                |     | <b>ALL MODELS</b>  |
| 1    | –              | 2   | STATER HALVES  |
| 2    | HDW8568        | 1   | NUT, 1 1/8" - 18   |
|      |                |     | SEAL KIT   |
| 3    | –              | 5   | SEAL RING  |
| 4    | –              | 1   | SEAL RING BETWEEN HALVES   |
| 5    | –              | 1   | SHAFT SEAL   |
|      |                |     |  |
|      |                |     |  |
|      |                |     |  |
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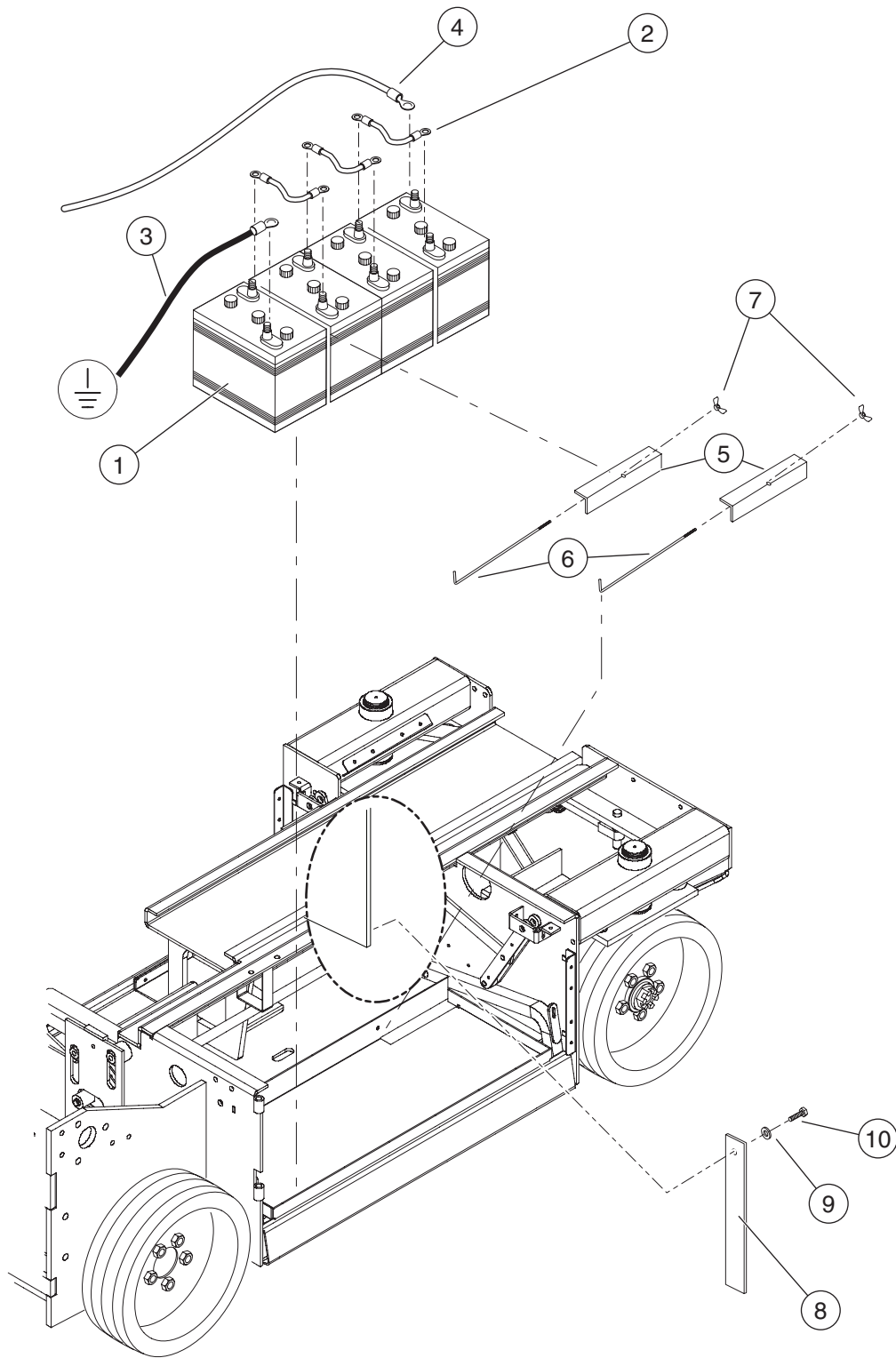


ILLUSTRATION No.  
ART\_2319

Battery Installation, 1532ES - 1932ES





| ITEM | PART NO. | QTY | DESCRIPTION                                |
|------|----------|-----|--|
|      |          |     | <b>BATTERY INSTALLATION</b>                |
| 1    | 5970     | 4   | BATTERY, 6 VOLT                            |
| 2    | REF      | 3   | CABLE, BLACK (SEE HARNESSSES, PARTS SEC 1) |
| 3    | REF      | 1   | CABLE, BLACK (SEE HARNESSSES, PARTS SEC 1) |
| 4    | 9243     | 1   | CABLE, RED (SEE HARNESSSES, PARTS SEC 1)   |
|      | 7172     | 4   | BOOT TERMINAL INSULATOR, BLACK (NOT SHOWN) |
|      | 7173     | 4   | BOOT TERMINAL INSULATOR, RED (NOT SHOWN)   |
|      |          |     |  |
| 5    | 16039    | 2   | HOLD DOWN, BATTERY                         |
| 6    | 13263    | 2   | ROD, HOLD DOWN                             |
| 7    | HDW6110  | 2   | NUT, WING, 1/4" - 20                       |
|      |          |     |  |
| 8    | 7638     | 1   | GROUNDING STRAP                            |
|      |          |     |  |
| 9    | HDW5355  | 1   | WASHER, FLAT 7/16"                         |
| 10   | HDW90825 | 1   | SCREW, 7/16" - 14 X 1" LG                  |
|      |          |     |  |
|      |          |     |  |
|      |          |     |  |
|      |          |     |  |
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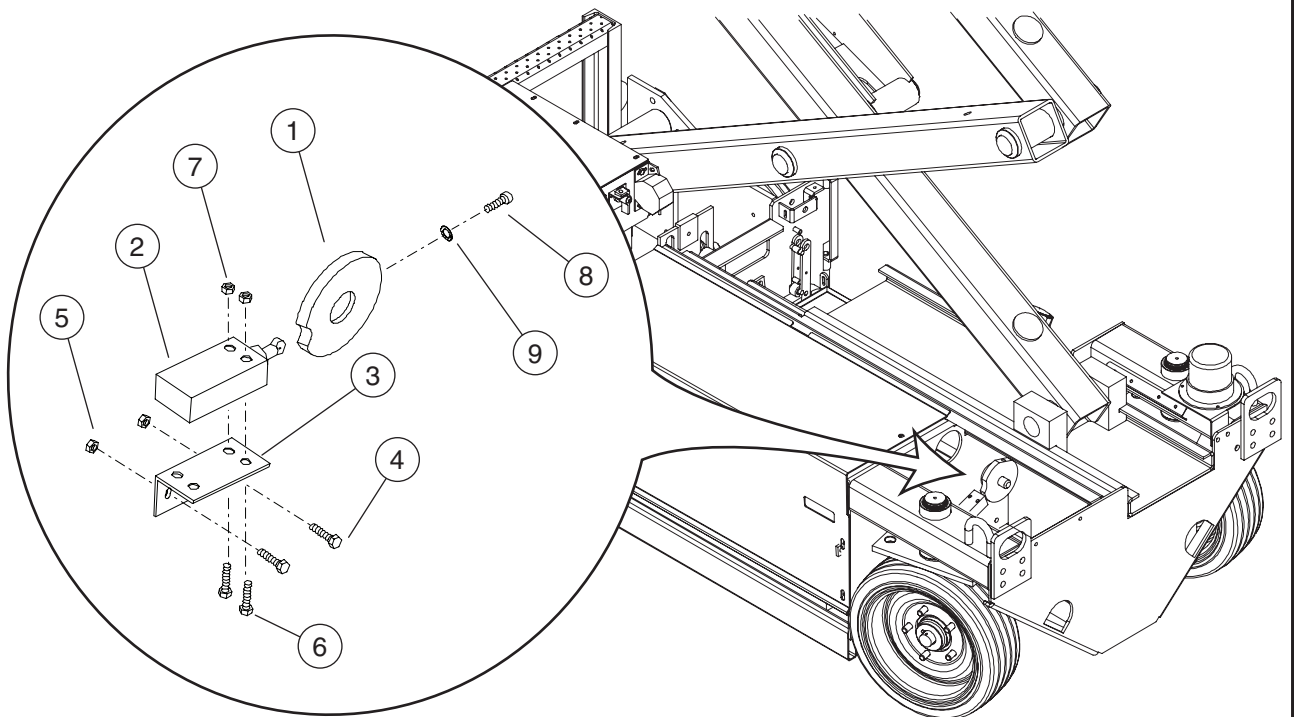
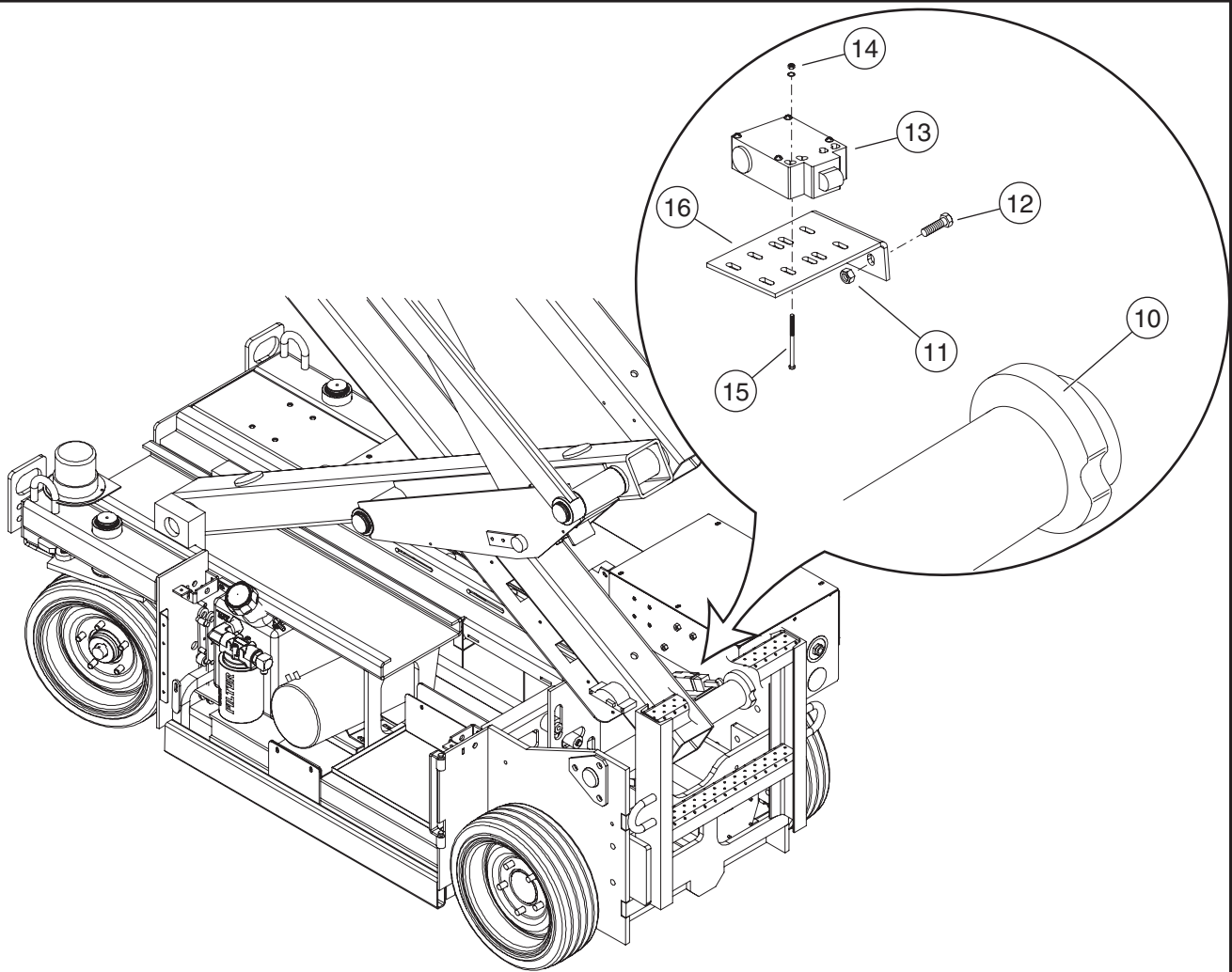


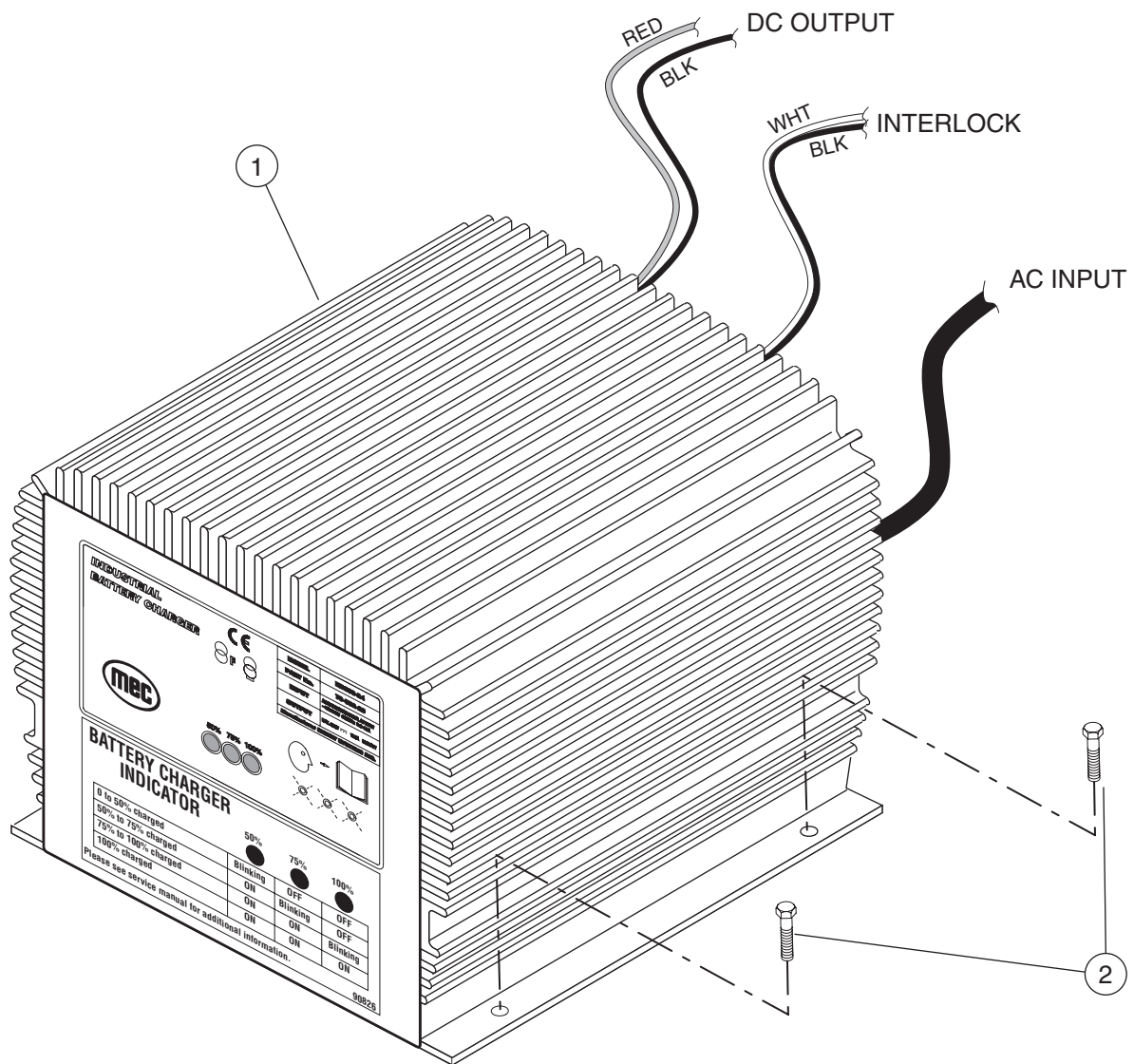
ILLUSTRATION No.  
ART\_2322

Limit Switches Installation, 1532ES - 1932ES



| ITEM | PART NO. | QTY | DESCRIPTION                              |
|------|----------|-----|--|
|      |          |     | <b>POTHOLE LIMIT SWITCH - X32 SERIES</b> |
| 1    | 25377    | 1   | CAM, DRIVE CUTOOUT                       |
| 2    | 90531    | 1   | SWITCH, LIMIT                            |
| 3    | 13840    | 1   | BRACKET, LIMIT SWITCH                    |
| 4    | HDW5723  | 2   | SCREW, 1/4" - 20, 3/4" LG                |
| 5    | HDW5276  | 2   | NUT 1/4" - 20                            |
| 6    | HDW8482  | 2   | SCREW #8 - 32, 1 1/2" LG                 |
| 7    | HDW5251  | 2   | NUT #8 - 32                              |
| 8    |          | 1   | SET SCREW                                |
| 9    | HDW5006  | 1   | WASHER FLAT                              |
|      |          |     |  |
|      |          |     | <b>DRIVE CUTOOUT SWITCH - X32 SERIES</b> |
| 10   | 25269    | 1   | CAM, LIMIT SPEED                         |
|      | HDW8870  | 1   | SET SCREW                                |
| 11   | HDW5276  | 2   | NUT 1/4" - 20                            |
| 12   | HDW8482  | 2   | #8 - 32, 1 1/2" LG                       |
|      |          |     |  |
| 13   | 8932     | 1   | SWITCH, LIMIT SPEED, HONEYWELL BRAND     |
| 13   | 90996    | 1   | SWITCH, LIMIT SPEED, TELEMECANIQUE BRAND |
|      |          |     |  |
| 14   | HDW5251  | 2   | NUT, #8 - 32                             |
| 15   | HDW8273  | 2   | SCREW, 1/4" - 20, 1" LG                  |
| 16   | 13838    | 1   | BRKT, LIMIT SWITCH MOUNT                 |
|      |          |     |  |
|      |          |     |  |
|      |          |     |  |
|      |          |     |  |









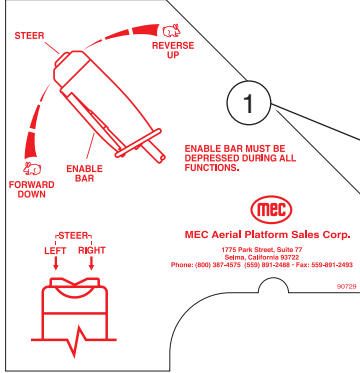
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# SECTION F: DECALS

DECALS, 1532ES - 1932ES CONTROLS ..... F-3  
DECALS, 1532ES - 1932ES BASE ..... F-5  
DECALS, 1532ES - 1932ES SCISSORS ..... F-7  
DECALS, 1532ES - 1932ES PLATFORM ..... F-9



90729



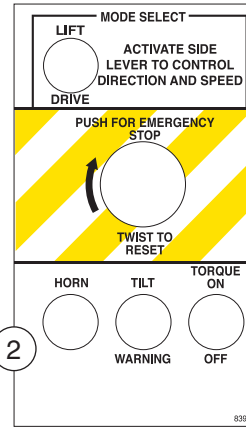
90735

IF UNIT DOES NOT DRIVE DURING ELEVATION, CHECK FOR OBSTRUCTION UNDER OR AGAINST AUTOMATIC POTHOLE STABILIZERS

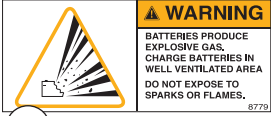
7156



8391



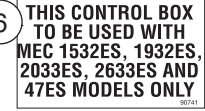
8779



90723



90741

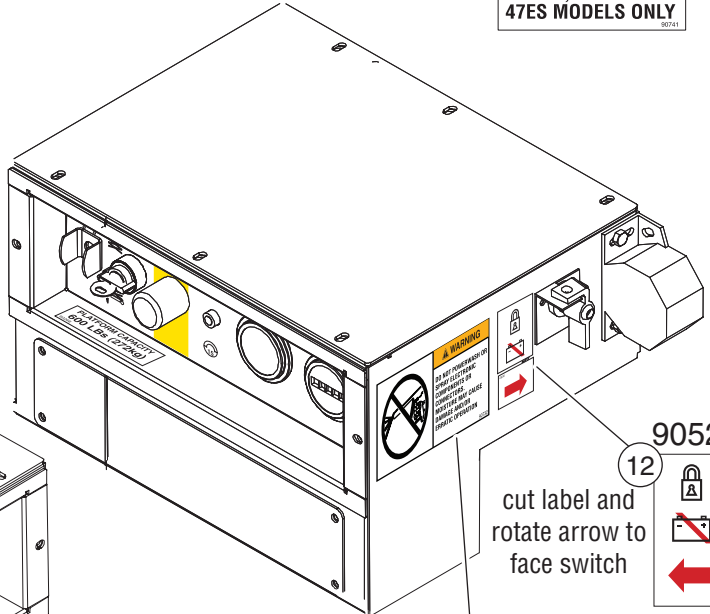
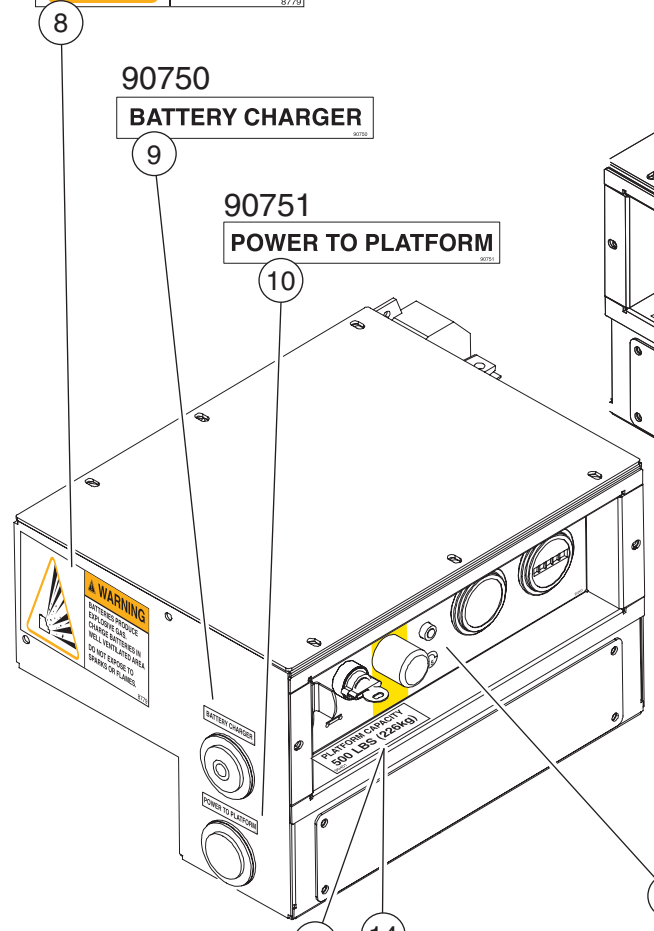


90750

BATTERY CHARGER

90751

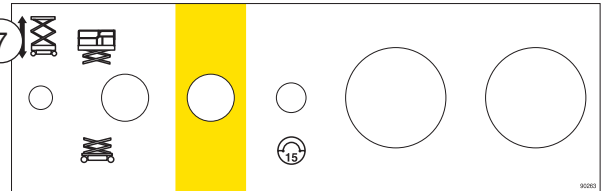
POWER TO PLATFORM



90732



90263



PLATFORM CAPACITY 600 LBS (272kg)

PLATFORM CAPACITY 500 LBS (226kg)

90268 (1532ES)

90401 (1932ES)

ILLUSTRATION No. ART\_2332

Control Labels | 1532ES - 1932ES







91553

|   |                |  |                                |                        |                             |                    |
|---|----------------|--|--------------------------------|------------------------|-----------------------------|--------------------|
| <b>MEC</b>                                      |                | MEC AERIAL PLATFORM SALES CORP.<br>1775 PARK STREET SUITE 77<br>SELMA, CA 95662, USA | MFG DATE<br>XXXXX              | MODEL NUMBER<br>XXXXXX | SERIAL NUMBER<br>XXXXXXXXXX | MODEL YEAR<br>20XX |
| <b>MAX. PLATFORM CAPACITY INCLUDING PERSONS</b> |                |  | <b>ELECTRICAL VOLTAGE</b>      |                        |                             |                    |
| XXX LBS = X PERSONS + EQUIPMENT                 |                |  | XXX VOLTS                      |                        |                             |                    |
| XXX KG = X PERSONS + EQUIPMENT                  |                |  | MAX. MANUAL FORCE              |                        |                             |                    |
| MAX. DRIVE HEIGHT                               |                |  | XXX LBS                        |                        |                             |                    |
| XX FT   | MACHINE WEIGHT |  | XXX LBS                        |                        |                             |                    |
| XX M  | XXXX LBS       |  | XXX KG                         |                        |                             |                    |
| MAX. PLATFORM HEIGHT                            |                |  | MAX. GROUND                    |                        |                             |                    |
| XX FT   | XX MPH         |  | PRESSURE PER WHEEL             |                        |                             |                    |
| XX M  | X MPH          |  | XX PSI                         |                        |                             |                    |
|   |                |  | MAX. LOAD PER WHEEL            |                        |                             |                    |
|   |                |  | XXX LBS                        |                        |                             |                    |
|   |                |  | XXX KG                         |                        |                             |                    |
|   |                |  | MAX. HYDRAULIC SYSTEM PRESSURE |                        |                             |                    |
|   |                |  | XXXX PSI                       |                        |                             |                    |
|   |                |  | XXX BAR                        |                        |                             |                    |

THIS MACHINE HAS BEEN CONSTRUCTED IN ACCORDANCE WITH SECTION 4 OF ANSI A94.1 COVERED BY U.S. PAT. #4,016,000 & CANADIAN PAT. # 2,116,870

6873

**HYDRAULIC OIL** 

90267

**3 BRAKE RELEASE**



90725

**WARNING**

- REPLACE TIRES WITH MANUFACTURER'S EQUIPMENT ONLY.
- FAILURE TO USE MANUFACTURER'S TIRES MAY CAUSE MACHINE INSTABILITY.
- REFER TO SERVICE AND PARTS MANUAL FOR REPLACEMENT PART NUMBER.

4

4

90826

**BATTERY CHARGER INDICATOR**

|                     | 50%      | 75%      | 100%     |
|---------------------|----------|----------|----------|
| 0 to 50% charged    | Blinking | OFF      | OFF      |
| 50% to 75% charged  | ON       | Blinking | OFF      |
| 75% to 100% charged | ON       | ON       | Blinking |
| 100% charged        | ON       | ON       | ON       |


Please see service manual for additional information.

7

90826

91083

**EMERGENCY LOWERING**



PULL RED HANDLE TO LOWER PLATFORM

6

90748

**8 FORK LIFT POCKETS**

8

90726

**WARNING**

- EACH REPLACEMENT BATTERY MUST WEIGH A MINIMUM OF 60 POUNDS / 27.3 kg
- FAILURE TO MEET MINIMUM WEIGHT REQUIREMENT MAY CAUSE MACHINE INSTABILITY.

5

**MEC**  
ILLUSTRATION No.  
ART\_2333

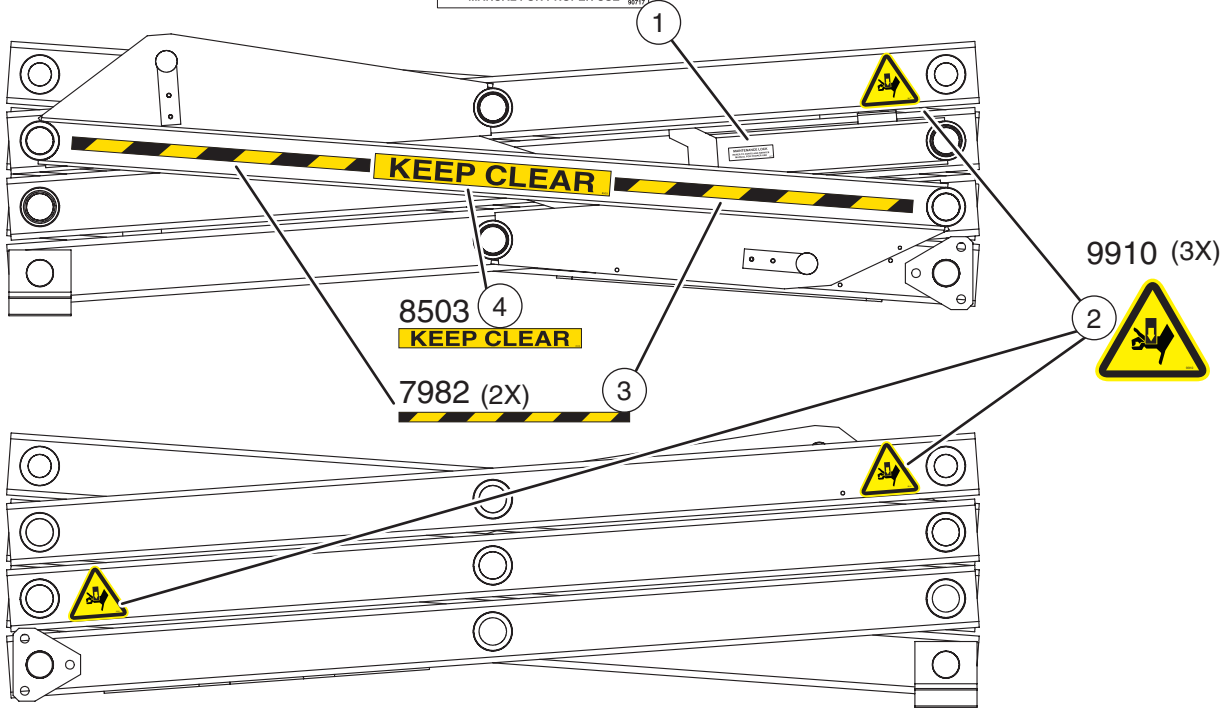
Base Labels | 1532ES - 1932ES





90717

MAINTENANCE LOCK  
REFER TO PARTS AND SERVICE  
MANUAL FOR PROPER USE



1532ES

1932ES

90717

MAINTENANCE LOCK  
REFER TO PARTS AND SERVICE  
MANUAL FOR PROPER USE

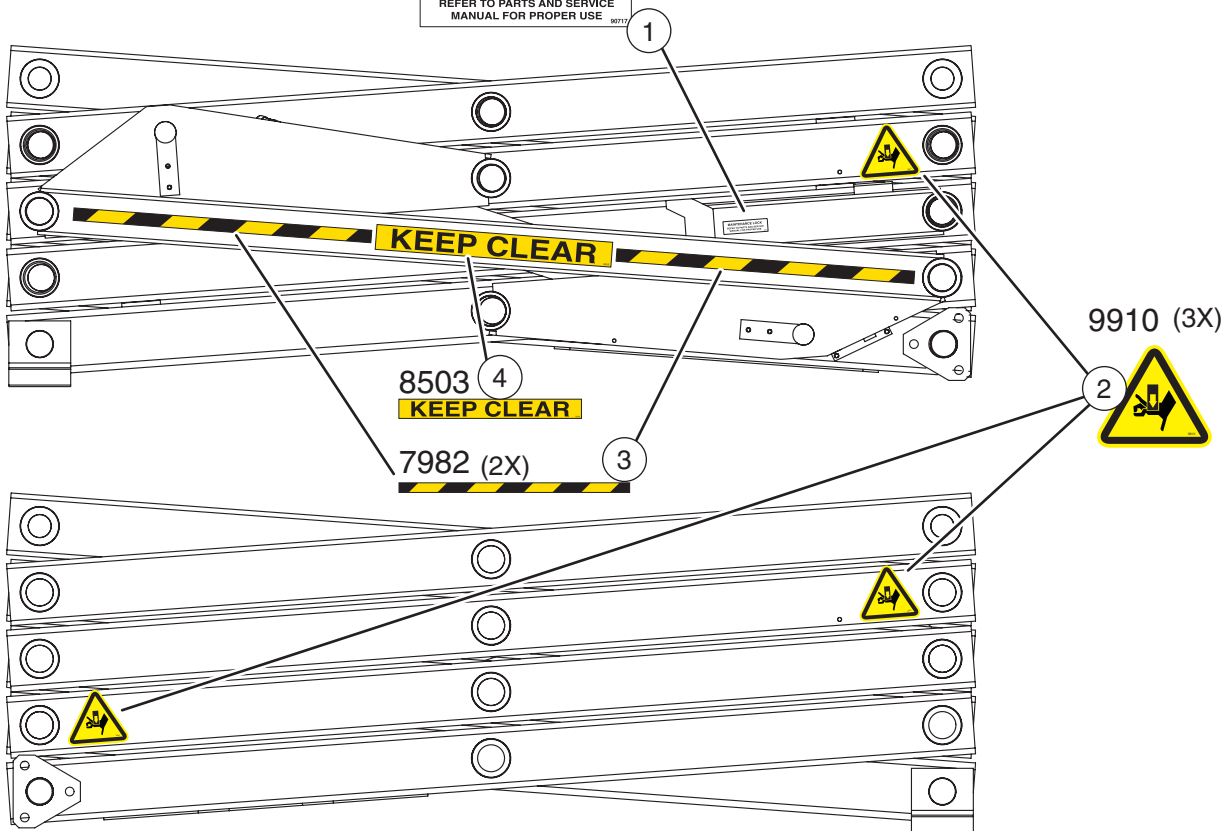


ILLUSTRATION No.  
ART\_2334

Scissors Labels | 1532ES - 1932ES







| ITEM | PART NO. | QTY | DESCRIPTION                                |
|------|----------|-----|--|
|      |          |     | <b>DECALS, 1532ES - 1932ES PLATFORM</b>    |
| 1    | 90721    | 1   | DECAL, DANGER, TIP OVER                    |
| 2    | 90722    | 1   | DECAL, WARNING, MAINTENANCE                |
| 3    | 90730    | 1   | DECAL, WARNING, PLATFORM LOCK              |
| 4    | 9137     | 2   | DECAL, WARNING, PLATFORM CAPACITY(1532ES)  |
| 5    | 90736    | 2   | DECAL, WARNING, PLATFORM CAPACITY (1932ES) |
| 7    | 90733    | 1   | DECAL, MANUALS INSIDE                      |
| 8    | 90739    | 1   | DECAL, MADE IN USA                         |
| 9    | 8806     | 1   | DECAL, WARNING, LANYARD (OPTION)           |
| 10   | 8805     | 4   | DECAL, ANCHORAGE POINTS (OPTION)           |
| 11   | 90718    | 1   | DECAL, WARNING, INSPECTION                 |
| 12   | 90719    | 1   | DECAL, MEC LOGO                            |
| 13   | 9138     | 2   | DECAL, MEC 1532ES                          |
| 14   | 8816     | 2   | DECAL, MEC 1932ES                          |
| 16   | 8402     | 2   | DECAL, RAIL STRIPE                         |
| 20   | 7155     | 1   | DECAL, LOCATE CONTROL BOX HERE             |
|      |          |     |  |
|      |          |     |  |
|      |          |     |  |
|      |          |     |  |
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## Limited Owner Warranty

MEC Aerial Platform Sales Corp. warrants its equipment to the original purchaser against defects in material and/or workmanship under normal use and service for one (1) year from date of registered sale or date the unit left the factory if not registered. MEC Aerial Platform Sales Corp. further warrants the structural weldments of the main frame and scissor arms to be free from defects in material or workmanship for five (5) years from date of registered sale or date unit left the factory if not registered. Excluded from such warranty is the battery(s) which carries a ninety (90) day warranty from described purchase date. Warranty claims within such warranty period shall be limited to repair or replacement, MEC Aerial Platform Sales Corp's option, of the defective part in question and labor to perform the necessary repair or replacement based on MEC Aerial Platform Sales Corp's then current flat rate, provided the defective part in question is shipped prepaid to MEC Aerial Platform Sales Corp. and is found upon inspection by MEC Aerial Platform Sales Corp. to be defective in material and/or workmanship. MEC Aerial Platform Sales Corp. shall not be liable for any consequential, incidental or contingent damages whatsoever. Use of other than factory authorized parts; misuse, improper maintenance, or modification of the equipment voids this warranty. The foregoing warranty is exclusive and in lieu of all other warranties, express or implied. All such other warranties, including implied warranties of merchantability and of fitness for a particular purpose, are hereby excluded. No Dealer, Sales Representative, or other person purporting to act on behalf of MEC Aerial Platform Sales Corp. is authorized to alter the terms of this warranty, or in any manner assume on behalf of MEC Aerial Platform Sales Corp. any liability or obligation which exceeds MEC Aerial Platform Sales Corp's obligations under this warranty.



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