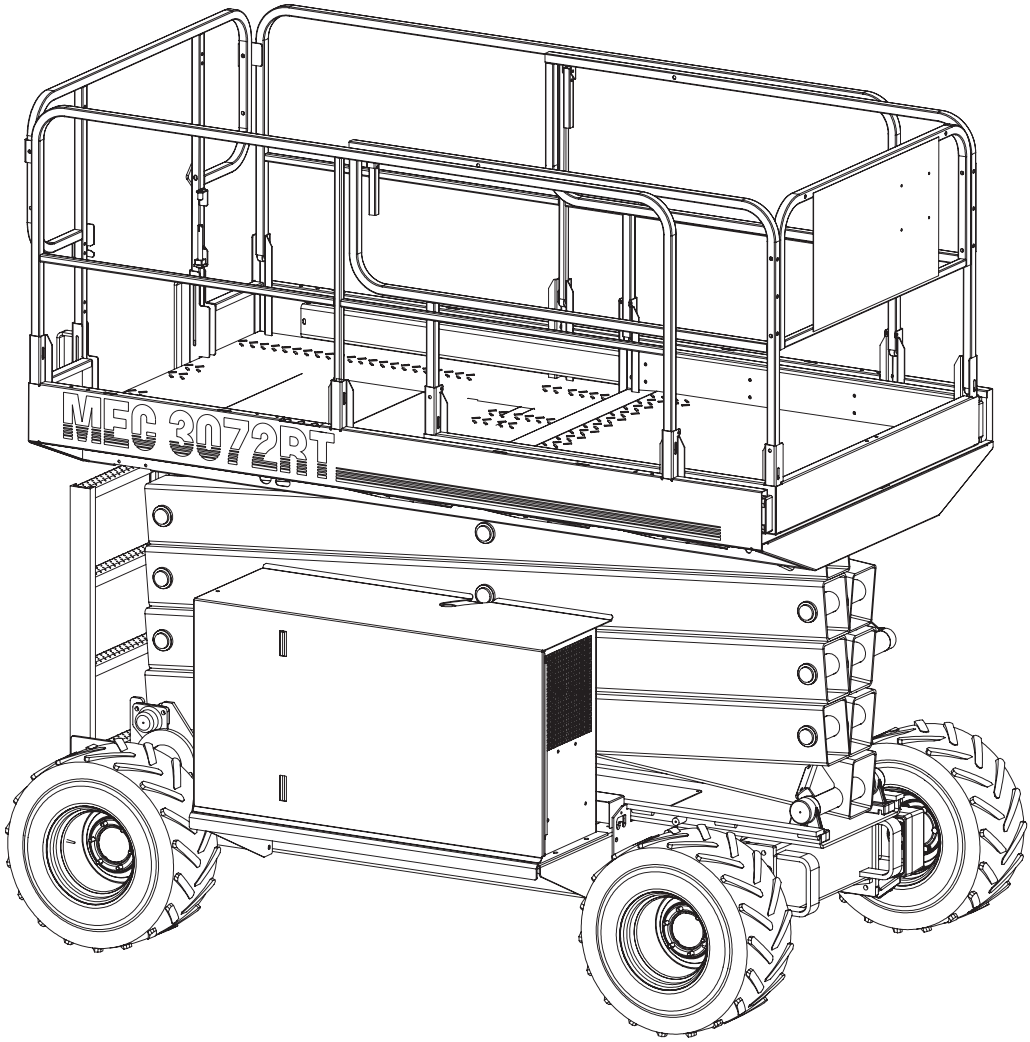
3072RT
3772RT

SERVICE AND PARTS MANUAL – CE



Part # 91471
Issued January 2007

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Parts Manual

INTRODUCTION

This manual consists of Service and Parts illustrations 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 scissors 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 scissors 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, Service and Parts Manuals 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 body of the machine, at the ground controls, and platform control console.

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 oneself that they are "proper and safe."

Your MEC Scissors 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:

Aerial Platform Sales Corp.
1775 Park Street, Suite 77 • Selma, CA 93662 USA
Ph: 1-800-387-4575 • 559-891-2488 • Fax: 559-891-2448
www.mecawp.com

GENERAL SAFETY TIPS

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

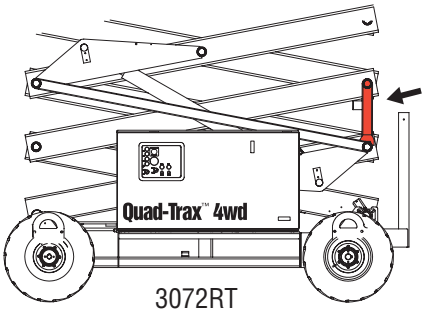
The actual operating environment of the machine governs the inspection schedule. Correct lubrication is an essential part of the preventative maintenance to minimize wear on working parts and ensure against premature failure. By maintaining correct lubrication, the possibility of mechanical failure and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

! DANGER !

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

- Block scissors 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.

Maintenance Lock In Position



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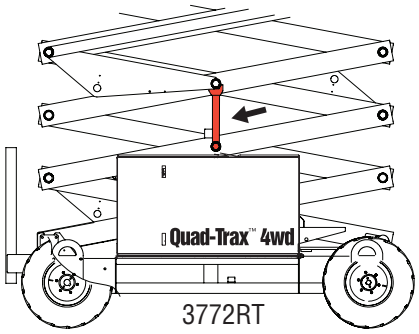


3772RT

Hydraulic System

WARNING !!!

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

CAUTION

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

Electrical System

CAUTION

Prevent damage to battery and/or electrical system;

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

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

Total System

CAUTION

Engine coolant level must be checked only after engine has cooled. If radiator cap is removed while the coolant is at normal operating temperature, pressure within the coolant system will force hot liquid out through the filler opening and possibly cause severe scalding.

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 scissors lift.

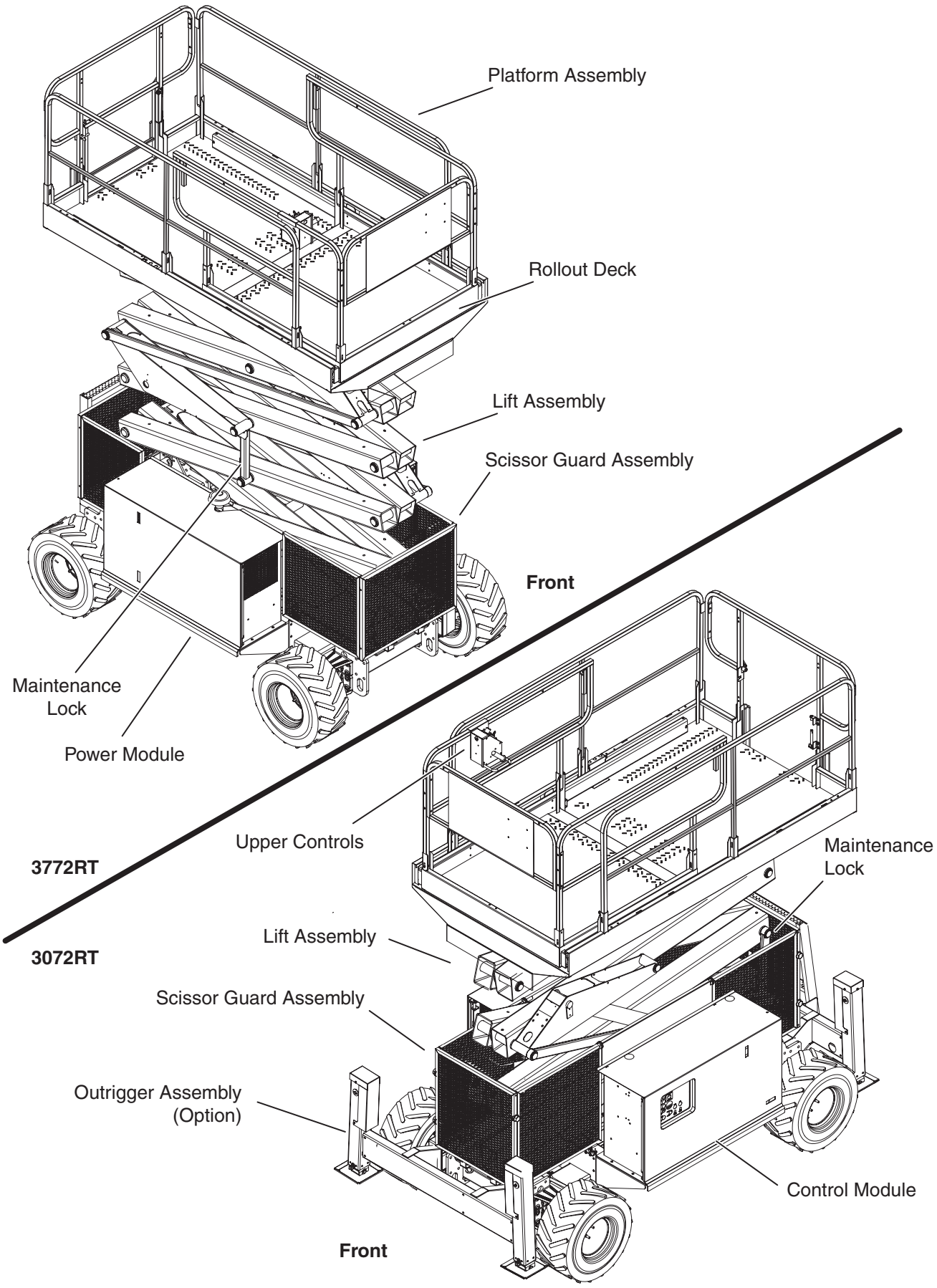
Inspection and maintenance should be performed by qualified personnel familiar with the equipment.

MACHINE SPECIFICATIONS

	3072RT	3772RT
Working Height*	11.0 m	13.0 m
Platform Height	9.0 m	11.0 m
Stowed Height: Folded Down Rails	2.75 m 2.00 m	2.62 m 1.85
Maximum Number 0 m/s wind (indoors) of Occupants 12.5 m/s wind (outdoors)	3 2	2 2
Lift Capacity (Evenly Distributed): Rollout Deck Capacity	454 kg 181 kg	340 kg 181 kg
Maximum Operating Inclination:	3 °	3 ° up to 9.1 m 1.5 ° up to 11.0 m
Platform Dimensions: With Roll-Out Deck extended With Roll-Out Deck Retracted Guard Rail Height Toe Board Height Rollout Deck Length	 1.52 m x 2.79 m 1.10 m 15.0 cm 1.22 m	 1.52 m x 2.79 m 1.10 m 15.0 cm 1.22 m
Overall Length	3.05 m	3.05 m
Overall Width	1.83 m	1.83 m
Wheel Base	2.18 m	2.18 m
Wheel Track	1.54 m	1.54 m
Turning Radius: Inside Outside	 1.86 m 4.43 m	 1.86 m 4.43 m
Ground Clearance	24 cm	24 cm
Machine Weight** (Unloaded) (Approx.)	3202 kg	3352 kg
Drive System (Proportional): Drive Speed (Platform Elevated) Drive Speed (Platform Lowered)	 0 – 0.6 km/hr 0 – 6.4 km/hr	 0 – 0.6 km/hr 0 – 6.4 km/hr
Lift/Lower Speed (Approx.)	26 sec / 28 sec	28 sec / 31 sec
Gradeability	45% / 24.2°	40% / 21.5°
Ground Pressure/Wheel (Maximum)	2.3 bar	2.3 bar
Wind Speed (Maximum)	12.5 m / sec	12.5 m / sec
Noise Level	86 dB	86 dB
Tire Size-Standard	26.0 x 12.0 - 380	26.0 x 12.0 - 380
Tire Pressure (Foam Filled Tires)	Foam Filled	Foam Filled
Wheel Load	1135 kg	1158 kg
Wheel Lug Nut Torque	102–115 Nm	102–115 Nm
Hydraulic Pressure: Main System Lift System Steer	 193 bar 172 bar 103 bar	 193 bar 172 bar 103 bar
Hydraulic Fluid Capacity	87 liters	87 liters
Fuel Capacity	57 liters	57 liters
Power System – Voltage	12 Volts DC	12 Volts DC
Alternator (Lighting Coil)	40 Amp	40 Amp
Engine Availability	Kubota D905E, 20 HP (14.9 kW), Diesel, Liquid Cooled	

*Working height adds 2m to platform height.

**Weight may increase with certain options or country standards.


Platform Assembly
Rollout Deck
Lift Assembly
Scissor Guard Assembly
Front
Maintenance Lock
Power Module
3772RT
Upper Controls
Maintenance Lock
3072RT
Lift Assembly
Scissor Guard Assembly
Outrigger Assembly (Option)
Control Module
Front

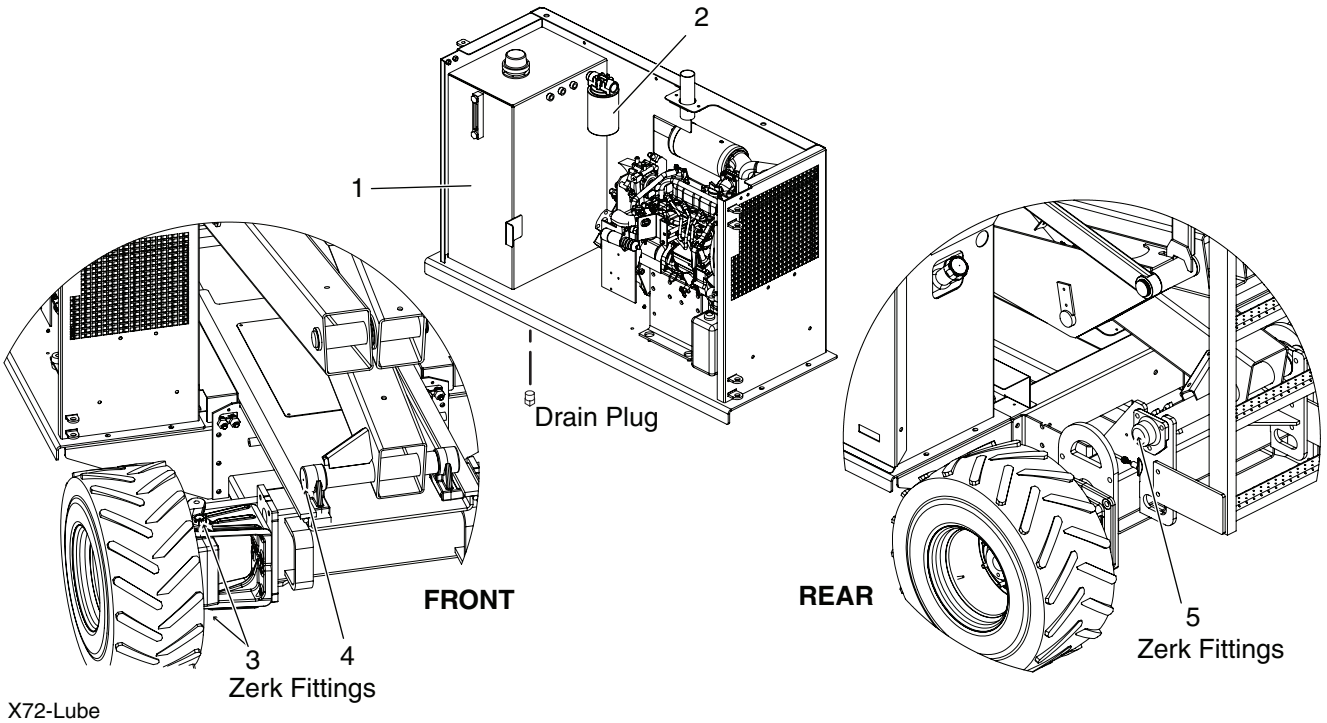
PRIMARY MACHINE COMPONENTS

Component	Service Section	Parts Section
Platform Assembly		
Upper Controls	2 | 5 | 6	1 | 2
Deck and Rails	3	2
Gate		2
Rollout Deck		2
Control Terminal Strip		1
Horn	2	1
Lift Assembly		
Beams	intro	3
Maintenance Lock	intro	3
Lift Cylinders	1 | 4 | 5 | 6	3 | 5
Limit Switch	2 | 3 | 5	3
Height Sensor	3 | 4 | 5	3
Base Assembly		
Front Drive Motors	intro | 1 | 4 | 5 | 6	4 | 5 | 6
R Drive Motors w/Brakes	intro | 1 | 4 | 5 | 6	4 | 5 | 6
Steering Components	1 | 4	3 | 5 | 6
Steering Components	1 | 4 | 5 | 6	3 | 5 | 6
Wheels & Tires	intro | 4	6
Hubs	intro	6
Slide Block	intro	6
Emergency Lowering	1	
Hoses & Cables	1 | 2 | 4	5 | 6
Outrigger (Option)	1 | 4 | 5 | 6	5 | 6
Power Module		
Engine	4 | 5 | 6	6
Hydraulic Pump	1 | 4 | 5 | 6	6
Hydraulic reservoir	intro | 1	6
Hydraulic Filter	intro | 1	6

Component	Service Section	Parts Section
Control Module		
Lower Controls	2 | 4 | 5 | 6	1 | 6
Hydraulic Manifold	1 | 4 | 5 | 6	5 | 6
Parking Brake Release	1	
Emergency Lowering	1	
Fuel Tank		6
Fuel Shutoff		6
Battery & Disconnect	2 | 4 | 5 | 6	6
Load Sense Module	3	6
Outrigger Manifold	1 | 4 | 5 | 6	5 | 6
Outrigger Control Module (Outrigger Option)	2 | 6	6
AC Generator (Option)	6	5 | 6
Relays		
Platform Power	2 | 4 | 5	1
Torque Speed	2 | 4 | 5	6
Throttle	2 | 4 | 5	6
Preheat (Glow Plugs)	2 | 4 | 5	6
Load Sense (Overload)	3 | 6	6
Outrigger (Option)	3 | 4 | 5	6
AC Generator (Option)	5	6

LUBRICATION

NO.	ITEM	SPECIFICATION	FREQUENCY
1	Hydraulic Reservoir	Fill To The Middle Of The Sight Gauge With Platform In The Stowed Position. Mobile 424. ***Do not substitute with lower grade oils as pump damage may result.***	Check Daily. 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. Change Every Three Months Or 300 Hours, Whichever Occurs First For Severe Usage.
3	Front Hubs Steering Pivots	Lithium N.L.G. #2 EP Purge Old Grease	Monthly or Every 25 Hours, Whichever Occurs First
4	Slide Block	Lithium N.L.G. #2 EP Purge Old Grease	Monthly or Every 25 Hours, Whichever Occurs First
5	Fixed	Lithium N.L.G. #2 EP Purge Old Grease	Monthly or Every 25 Hours, Whichever Occurs First



X72-Lube

SECTION 1: HYDRAULIC SYSTEM

HYDRAULIC SYSTEM - GENERAL

The hydraulic system is an open center, open- loop type. Generally in this type of system, hydraulic fluid is provided by a variable displacement, pressure compensated, piston type pump which is directly coupled to the engine. As the engine turns, the hydraulic pump drains oil from the reservoir and pumps this fluid to the valve packages.

If no function is selected to perform, the pump remains on standby and no fluid is pumped through the manifold. Each function has a maximum pressure control limit set by pressure relief valve.

Hydraulic integrated circuit, generally known as the manifold system (valve type) is designed to control all or part of machine functions by integrating various hydraulic cartridge valves into a manifold to provide directional, pressure, flow, and load control.

HYDRAULIC FLUID

Handling Precautions

! WARNING !!!

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.

! WARNING !!!

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 **Mobil 424** hydraulic fluid. Do not substitute with lower grade oils as pump damage may result.

Hydraulic Fluid Analysis

Use the following as a guide to determine when analysis of the hydraulic fluid is necessary:

- Anytime the hydraulic pump is replaced.
- If fluid discoloration is noticed in the hydraulic reservoir sight gauge tube.
- If after the first 50 hours of operation, the hydraulic filter element is plugged.
- Anytime the hydraulic filter element shows signs of metal contamination.
- Once every six (6) months, under normal operating conditions.
- Every three (3) months, in extremely dusty or dirty operating conditions.

The hydraulic fluid analysis must be done by a qualified laboratory. Always provide the following information with the test sample.

- Type of hydraulic fluid (see lubrication chart for recommended hydraulic fluid and/or your records).
- Model and Serial number of machine from which sample was taken.
- Purpose of analysis: pump failure, discoloration, etc.
- Type of analysis: complete to show additive breakdown, acid buildup, viscosity, type and percent of contaminants; also, comparison to new fluid and recommendations.

Following the above guidelines will prevent premature failure of pumps, cylinder seals, drive motors, and unnecessary downtime.

If system flushing and replacement of fluid is recommended, refer to the flushing procedure.

System Flushing Procedure

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

NOTE: AVOID MIXING PETROLEUM AND SYNTHETIC BASE OILS. IT IS NOT ADVISABLE TO MIX OILS OF DIFFERENT BRANDS OR TYPES, EXCEPT AS RECOMMENDED.

HYDRAULIC FLUID RESERVOIR

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

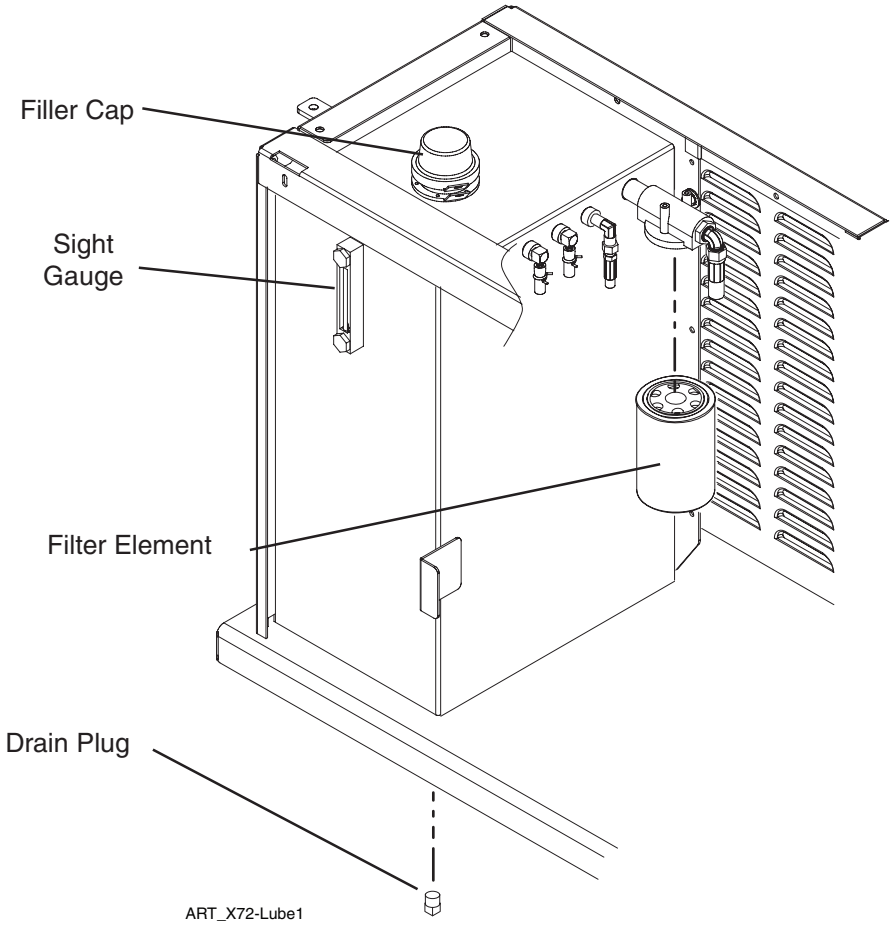
- Check tank for signs of leakage, every week.

Hydraulic Reservoir Assembly

All machines are produced 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 six (6) months or 500 hours. Extremely dirty conditions may require that the filter be replaced more often.

CAUTION

BEWARE OF HOT OIL. CONTACT WITH HOT OIL MAY CAUSE SEVERE BURNS.



HYDRAULIC PUMP

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

An internal combustion engine drives a variable displacement axial piston pump. Flow is proportional to drive speed and displacement. The pump is not serviceable. A faulty pump must be replaced.

WHEEL DRIVE

Note: Refer to *Section 3* for Remove and Replace instructions.

There are four (4) hydraulic, fixed-displacement gear wheel motors to provide power to all four wheels [two (2) front and two (2) rear].

Dynamic Braking Circuit

The two rear wheel motors have integral brakes that are spring held. Hydraulic pressure developed in the drive circuit, during drive mode, releases the brakes. A fixed orifice in the brake circuit controls the deceleration rate and initiates a smooth stop.

Front Wheel Motors (DT-701)

Housing and Shaft Disassembly

1. Remove all shaft related components from the shaft. Secure the motor housing in a vise.
   - Remove the retaining ring from the grove in the pilot of the housing.
   - Remove the spacer from the housing.
   - Remove the shaft from the housing.
   - Remove the bearing, thrust bearing, and two (2) thrust washers from the shaft.
2. Being careful not to drop bearing rollers,
   - pry out the shaft seal, backup seal, and dust seal from the bearing assembly.

NOTE: It is not necessary to remove the metal backup ring from the bearing to service the motor.

   - remove the high pressure seal from the groove in the pilot of the housing.
   - discard shaft seal, backup seal and high pressure seal.

3. Clean all parts in an oil-based solvent and dry using compressed air.

Housing and Shaft Assembly

1. Apply a light coating of oil to all new seals prior to installation.
   - Install the high pressure seal into the groove in the pilot of the housing.
2. Place the shaft on a clean, flat surface with the output end facing up.
   - Place the first thrust washer, thrust bearing and second thrust washer over the shaft.
   - Using plastic installation sleeve, place the shaft seal over the shaft with the lip facing down.
   - Repeat for the backup seal, making sure the lip faces down.
   - If the metal backup ring came out in *Step 2* above, place it over the shaft with the large O.D. facing down.
   - Lightly grease the bearing and place it over the shaft with the large O.D. facing down.
   - Use an arbor press to carefully press the bearing down to press the seal assembly into the bearing.
3. Place the shaft assembly into the housing.
   - Place the dust seal over the shaft with the lip facing up.
   - Place the bearing spacer and retaining snap ring over the shaft.

NOTE: It may be necessary to lightly tap the snap ring and bearing spacer to allow the retaining ring to seat properly.

   - Replace all shaft related components (i.e. keys, wire rings, nuts).

Motor Section Disassembly

1. Make a “V” shaped set of alignment marks on the endcover and housing to aid in the reassembly process.
   - Clamp the motor housing in a vise with the shaft facing down.
2. Remove the seven (7) bolts that hold the motor assembly together.
   - Carefully remove the endcover - *be aware that the piston and spring may fall out*.

- Carefully remove the piston from the endcover and set it aside.
- Remove and discard the O-ring seal and backup seal.
- Remove the spring and set it aside.

3. Lift commutator container and commutator from the motor and set aside.
   - Place commutator on a flat, clean surface with the seal facing up.
   - Gently tap on the seal with a small screwdriver until the opposite side of the seal lifts from the groove. Remove the seal and discard.
4. Remove the manifold, rotor set, and divider plate. Remove all seals and discard.

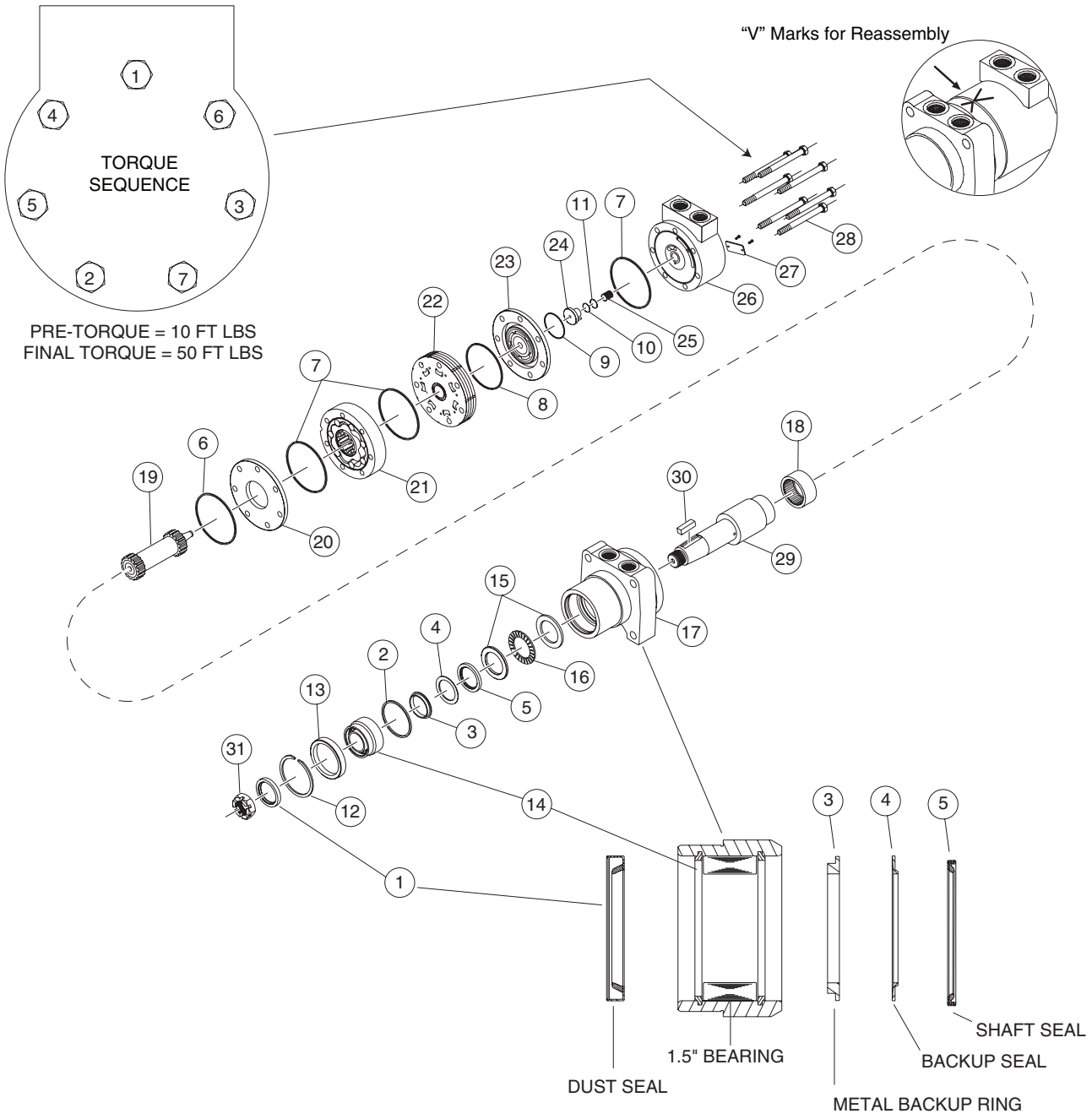
CAUTION: Do not allow rollers to drop from the rotor assembly when removing the rotor from the motor.

- Remove the drive link from the motor and set aside.

5. Clean all parts in an oil-based solvent and dry using compressed air. Apply a light coating of oil to all new seals prior to installation.

Motor Section Assembly

1. Install the drive link into the end of the shaft with the tapered end facing up.
   - Place the rear housing seal in the groove in the housing.
   - Place the divider plate onto the housing.
   - Place body seals in grooves in both sides of the rotor.
   - Place the rotor onto the housing with the side of the rotor with chamfer in splines facing the housing.
   - Place the manifold over the rotor with the seal-groove side up.
   - Install the manifold seal
2. Install the commutator seal into the commutator with the metal side facing up.
   - Use finger pressure to press the seal down flush with the surface of the commutator.
   - Place the commutator onto the manifold and then place the commutator onto the protruding end of the drive link. Make sure that the seal side is facing up.
3. Install the remaining body seal in the groove on the endcover.
   - Install the piston spring into the endcover, then the white backup seal followed by the O-Ring seal.
   - Line up the alignment pin with the hole in the endcover and press the piston into the endcover.
   - While holding the piston in place, lower the endcover assembly onto the motor. Align the “V” shaped marks that were made on the housing and endcover before disassembly.
4. Install the seven (7) assembly bolts.
   - Tighten bolts in sequence (see illustration)
   - Pre-torque to 10 ft. lbs (13,6 Nm).
   - Final torque to 50 ft. lbs (67,8 Nm).



DT701 Series Motor Components

1. * Dust Seal
2. * High Pressure Seal
3. * Metal Backup Shim
4. * Backup Seal
5. * Shaft Seal
6. * Housing Seal
7. * Body Seals (3)
8. * Manifold Seal
9. * Commutator Seal
10. * O-Ring Seal
11. * Backup Seal
12. Retaining Snap Ring
13. Bearing Spacer
14. 1.5" Bearing
15. Thrust Washers (2)
16. Thrust Bearing
17. Housing
18. Rear Housing Bearing
19. Drive Link
20. Divider Plate
21. Rotor Assembly
22. Manifold
23. Commutator Assembly
24. Endcover Piston
25. Piston Spring
26. Endcover
27. I.D. Tag Assembly
28. Assembly Bolts (7)
29. Shaft
30. Shaft Key
31. Shaft Nut

* Contained in seal kit

Rear Wheel Motors with Brakes (DT-710)

Disassembly

1. Make a “V” shaped set of alignment marks on the endcover and housing to aid in the reassembly process.
   - Clamp the motor housing in a vise with the shaft facing down.
2. Remove the seven (7) bolts that hold the motor assembly together.
   - Carefully remove the endcover - *be aware that the piston and spring may fall out*.

•Carefully remove the piston from the endcover and set it aside.

- Remove and discard the O-ring seal and backup seal.
- Remove the spring and set it aside.

3. Lift commutator container and commutator from the motor and set aside.
   - Place commutator on a flat, clean surface with the seal facing up.
   - Gently tap on the seal with a small screwdriver until the opposite side of the seal lifts from the groove. Remove the seal and discard.
4. Remove the manifold, rotor set, and divider plate. Remove all seals and discard.

CAUTION: Do not allow rollers to drop from the rotor assembly when removing the rotor from the motor.

- Remove the drive link from the motor and set aside.

5. Clean all parts in an oil-based solvent and dry using compressed air.

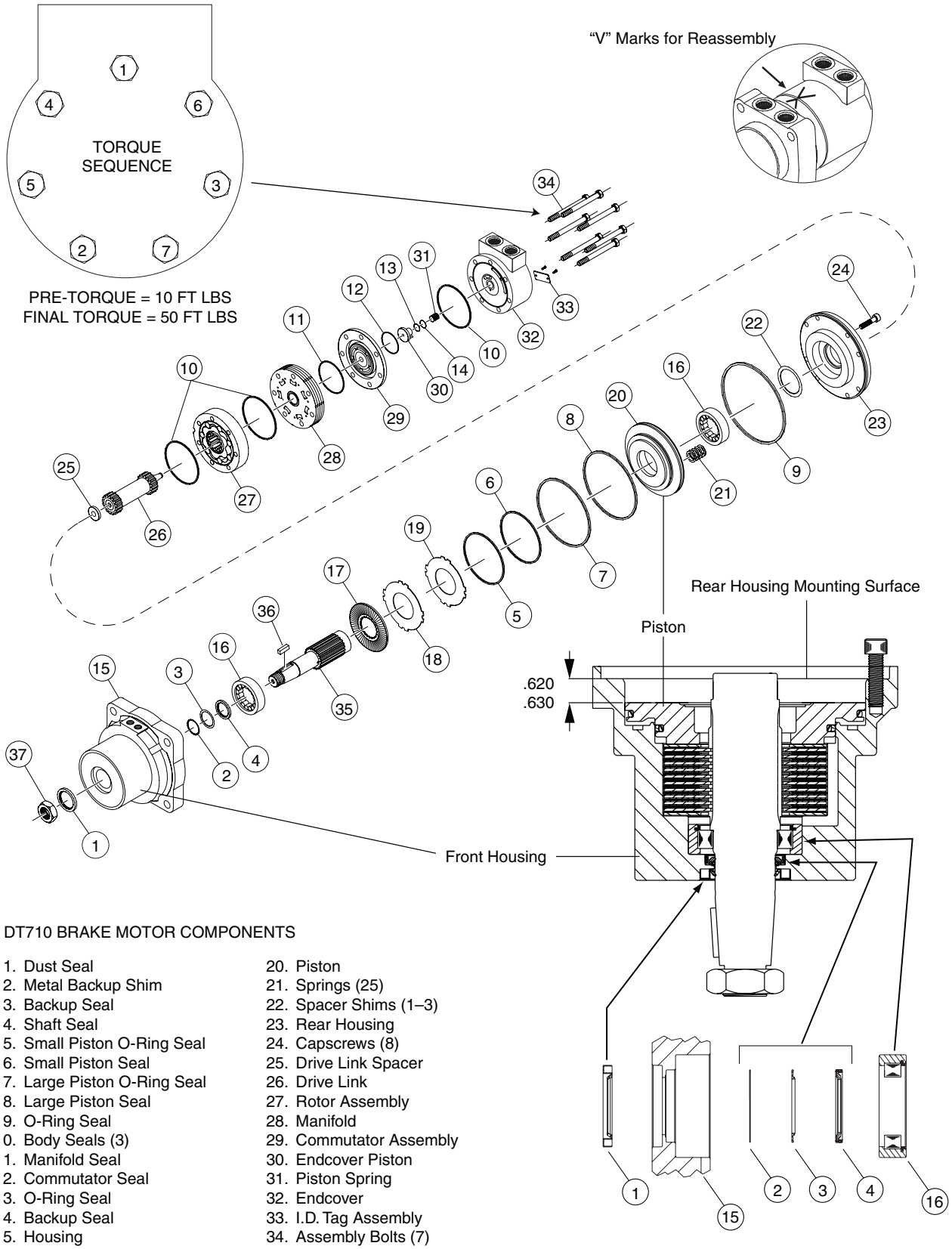
Assembly

1. Apply a light coating of oil to all new seals prior to installation.
2. Place the housing on a clean, flat surface with the output end facing up.
   - Install the dust seal with the lip on the seal facing up.
   - Clamp the housing in a vise with the pilot on the housing facing down.
   - Install the metal backup shim into the bore.
   - Install the backup seal into the housing bore with the lip on the seal facing up.
   - Install the shaft seal into the housing bore with the lip on the seal facing up.
   - Refer to illustration for seal orientation.
3. Install the bearing shims (not shown in illustration) in housing.
   - Install housing bearing.
   - Install the shaft being careful not to cut seal lip with the shaft keyway.
4. Locate the thick disk stamping and set it aside.
   - Install one (1) disk stamping into the housing. Make sure that lugs or splines engage those in the housing.
   - Install one (1) friction disk engaging splines on the disk with those on the shaft.
   - Alternate disk stampings and friction disks until all disks except the thick disk stamping are installed.
   - Install the thick disk stamping on top of the disk assembly.

5. Install the small O-Ring seal and large O-Ring seal into corresponding groves in the piston.
   - Install small seal and large seal in corresponding groves over the O-Ring seals.
   - Thoroughly coat the seals and sealing surfaces of the housing with clean oil.
   - Install the piston into the housing with the large O.D. side facing up.
   - Evenly press the piston down. Be careful not to pinch the seals.

IMPORTANT: If the disks and disk stampings are going to be replaced, the stack up on the new disks must be between .620 and .630 (15,7mm and 16mm) (see illustration).

6. Install spring on top of the piston.
   - Install O-Ring seal in groove in the rear surface of the housing.
   - Install the rear shaft bearing. Make sure that the snap ring that retains the bearing rolls faces out.
   - Place the rear housing onto the front housing and line up bolt holes.
   - Hold the motor assembly together, remove from the vise and place in an arbor press.
   - Press down on the rear housing until it contacts the front housing and lock the press
   - Install eight (8) capscrews and torque to 45 ft. lbs. (61 Nm).
7. Install the drive link into the end of the shaft with the tapered end facing up.
   - Place the body seals in the grooves in both sides of the rotor.
   - Place the rotor onto the housing with the side of the rotor with the chamfer in the splines facing the housing.
   - Place the manifold over the rotor with the seal groove side up.
   - install the manifold seal.
8. Install the commutator seal into the commutator with the metal side facing out.
   - Use finger pressure to press the seal down flush with the surface of the commutator.
   - Place the commutator onto the manifold and then place the commutator onto the protruding end of the drive link. Make sure that the seal side is facing up.
9. Install the remaining body seal in the groove on the endcover.
   - Install the piston spring into the endcover, then the white backup seal followed by the O-Ring seal.
   - Line up the alignment pin with the hole in the endcover and press the piston into the endcover.
   - While holding the piston in place, lower the endcover assembly onto the motor. Align the “V” shaped marks that were made on the housing and endcover before disassembly.
10. Install the seven (7) assembly bolts.
   - Tighten bolts in sequence (see illustration)
   - Pre-torque to 10 ft. lbs (13,6 Nm).
   - Final torque to 50 ft. lbs (67,8 Nm).



DT710 BRAKE MOTOR COMPONENTS

1. Dust Seal
2. Metal Backup Shim
3. Backup Seal
4. Shaft Seal
5. Small Piston O-Ring Seal
6. Small Piston Seal
7. Large Piston O-Ring Seal
8. Large Piston Seal
9. O-Ring Seal
10. Body Seals (3)
11. Manifold Seal
12. Commutator Seal
13. O-Ring Seal
14. Backup Seal
15. Housing
16. Shaft Bearing
17. Friction Disks (10)
18. Disk Stampings (9)
19. Thick Disk Stampings (2)
20. Piston
21. Springs (25)
22. Spacer Shims (1–3)
23. Rear Housing
24. Capscrews (8)
25. Drive Link Spacer
26. Drive Link
27. Rotor Assembly
28. Manifold
29. Commutator Assembly
30. Endcover Piston
31. Piston Spring
32. Endcover
33. I.D. Tag Assembly
34. Assembly Bolts (7)
35. Shaft
36. Shaft Key
37. Shaft Nut

PARKING BRAKE AND TOWING CIRCUIT

Note: Refer to *Parts Section 5* for hose routing.

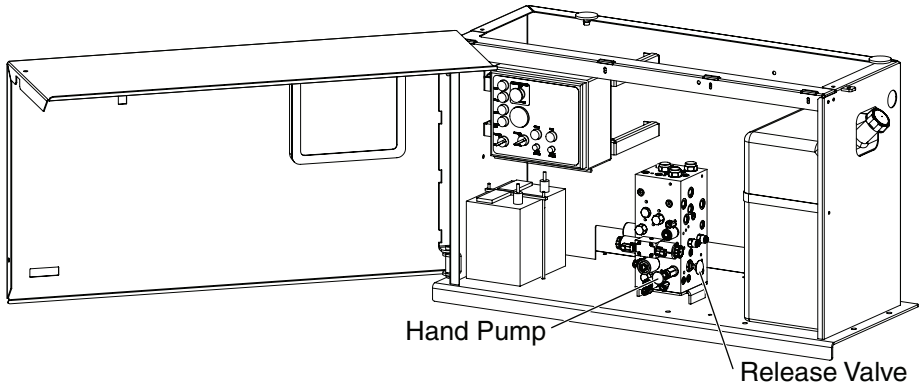
Machine can be winched or moved short distances in case of power failure at speeds not to exceed 5 MPH (8.05 kph).

CAUTION

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

Release Brakes Before Towing:

- 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.



DANGER

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:

- Brakes will reset when drive function is activated, or reset manually by pulling out the manual brake release valve.

EMERGENCY SYSTEMS AND PROCEDURES

! WARNING !!!

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

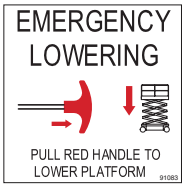
DO NOT ATTEMPT TO CLIMB DOWN BEAMS (SCISSORS) ASSEMBLY.

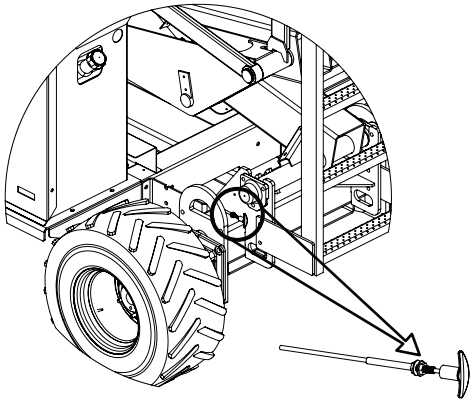
! WARNING !!!

BEFORE LOWERING PLATFORM, RETRACT THE DECK EXTENSION.

Emergency Lowering - 3072RT

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.

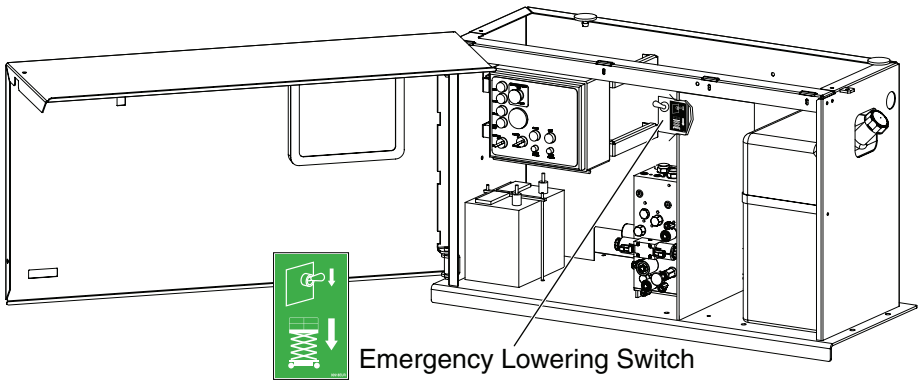




Emergency Lowering - 3772RT

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. Push down on the toggle switch and hold it to lower the platform to the desired height.
2. Once the platform is fully lowered, release the toggle switch to close the valve

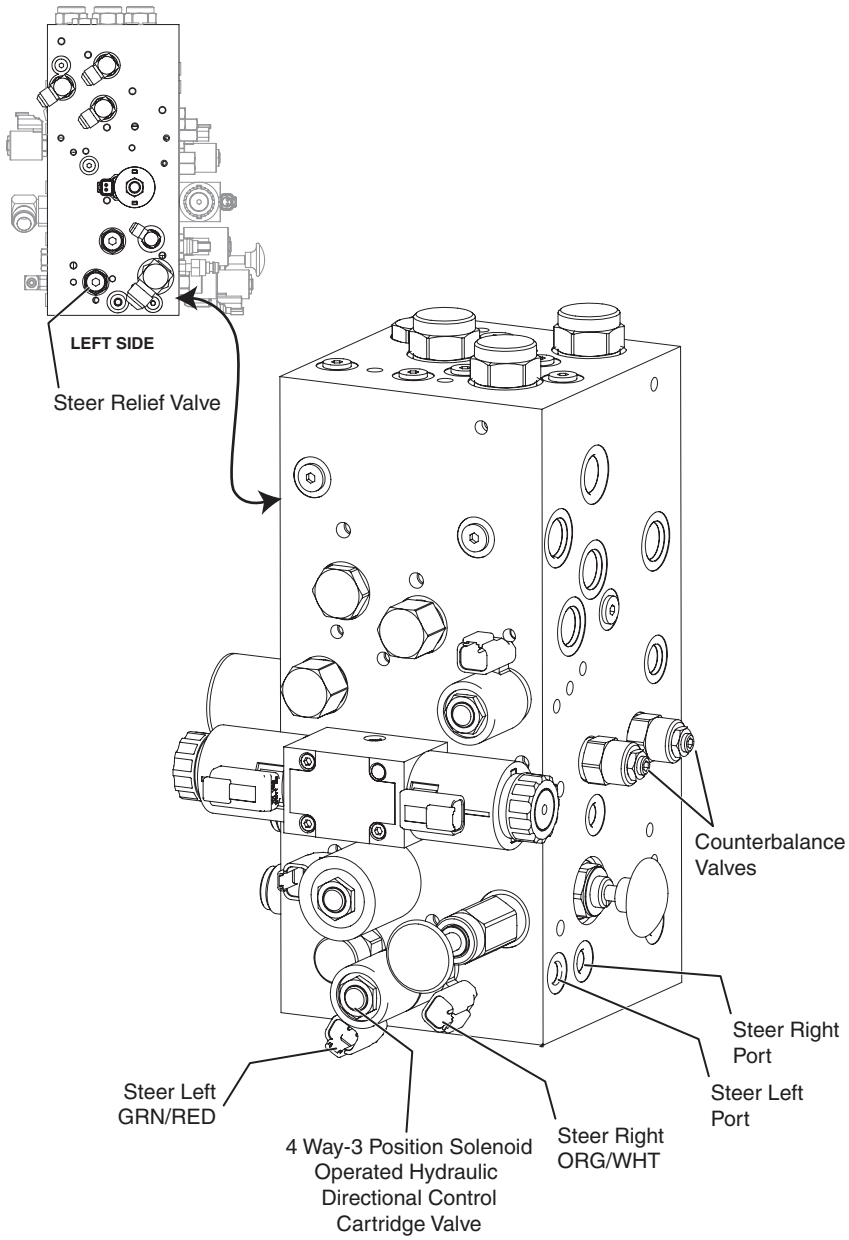


STEERING CIRCUIT

Note: Refer to *Hydraulic Manifold* and *Relief Pressure Adjustment Procedure*.
Refer to *Section 3* for Remove and Replace instructions.
Refer to *Parts Section 5* for hose routing.

The steering system consists of the following components:

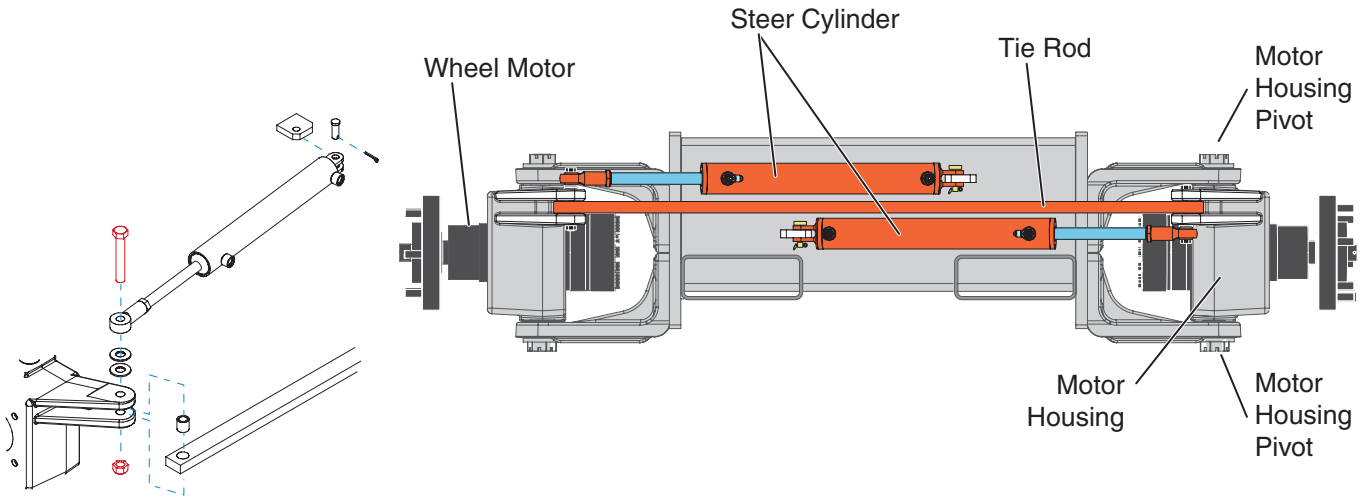
- The wheel motor housings have pivots on the top and bottom, and are mechanically linked together via a tie-rod.
- Steering is accomplished hydraulically by using two (2) double-acting cylinders, and a 4-way 3-position solenoid-operated, hydraulic directional control cartridge valve.
- Maximum steering pressure is limited by the relief valve (refer to *Relief Pressure Adjustment Procedure*).



Steer Cylinder

Note: Refer to *Cylinder Repair*.
Refer to *Section 3* for Remove and Replace instructions.
Refer to the *Parts Manual, Section 5* for parts list.

There are two (2) cylinders utilized in the steering system. These cylinders are a double acting type which requires oil flow to operate the cylinder rod in both directions. Directing oil forces the piston to travel towards the rod end of the barrel, extending the cylinder rod. By directing oil to the rod side of the cylinder the piston will be forced in the opposite direction and the cylinder rod will retract.



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 proportional valve.
  - 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*.

3072RT

One (1) single acting type hydraulic cylinder.

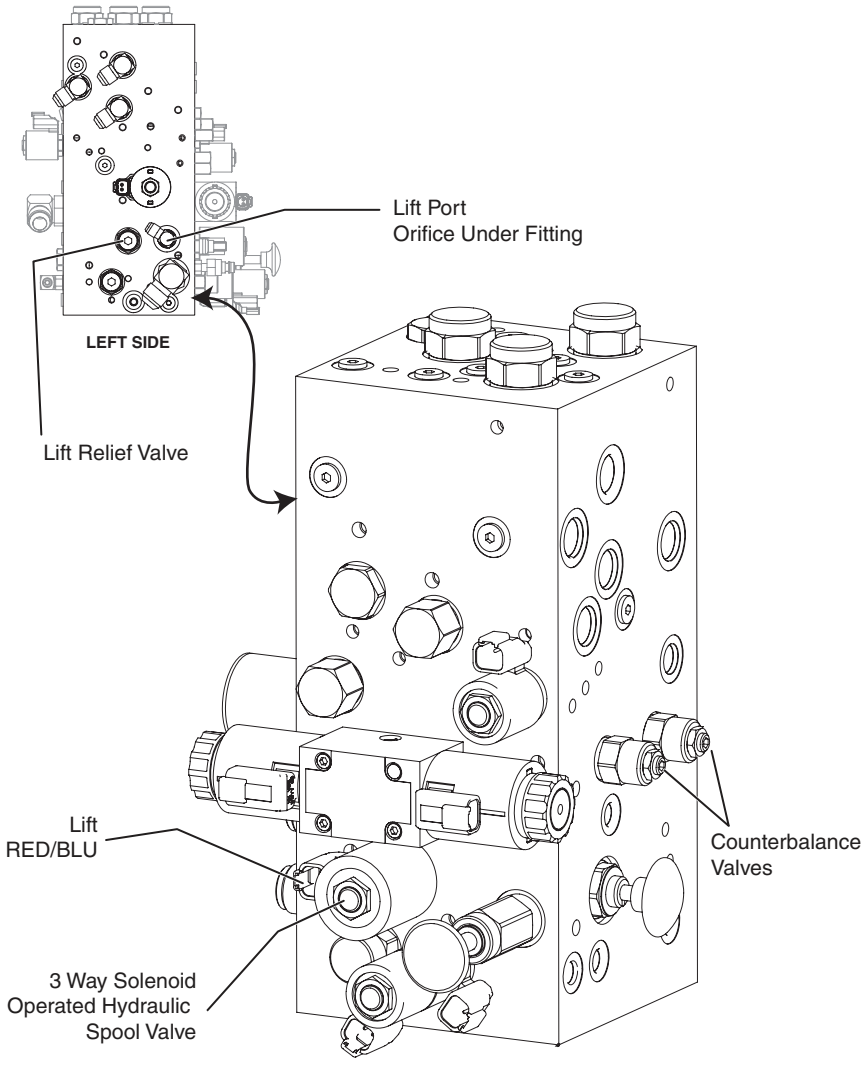
The cylinder has an integrated 2-position, 2-way solenoid operated platform lower valve for holding the platform in position. The valve is also externally actuated via a cable for manually lowering the platform.

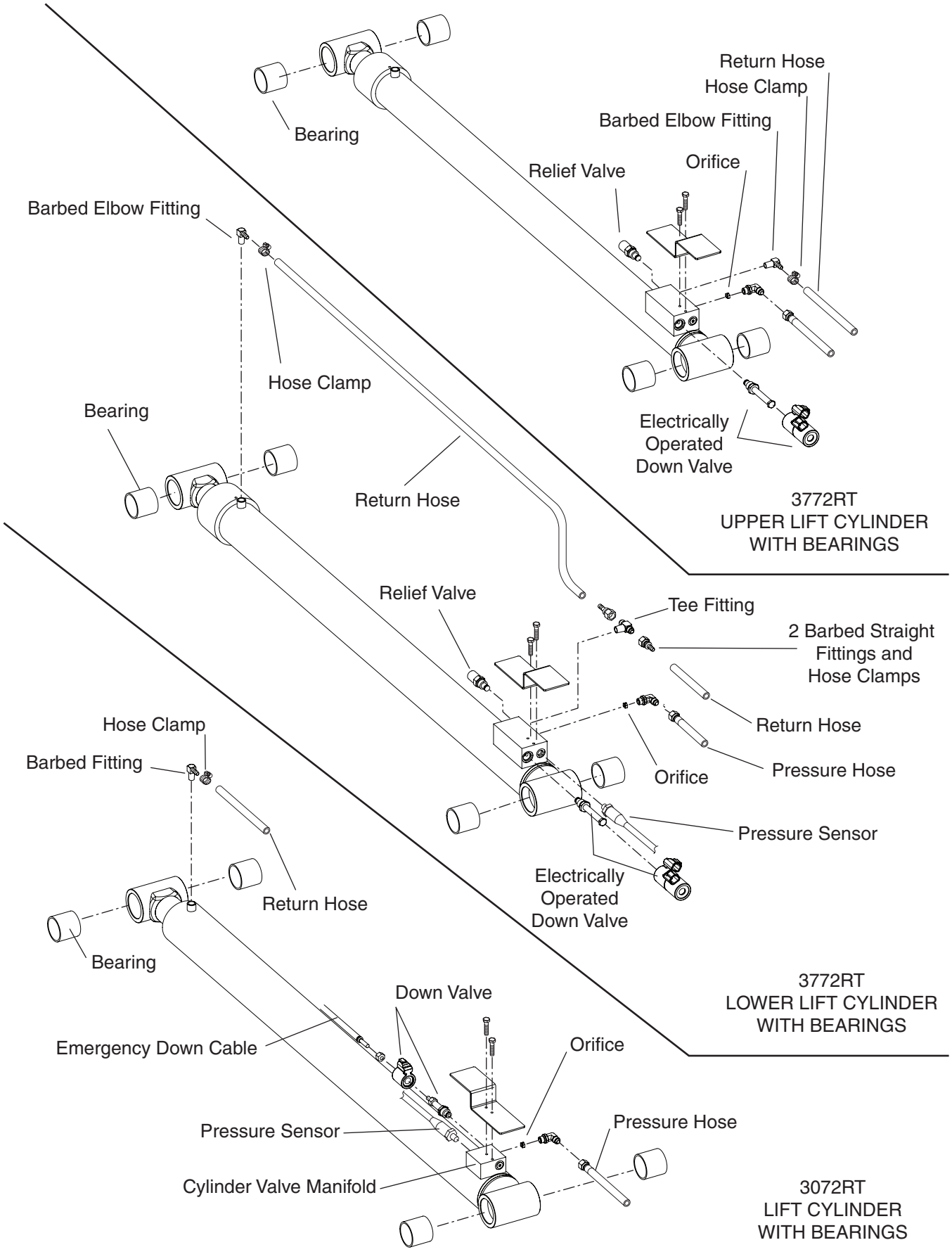
3772RT

Two (2) single acting type hydraulic cylinders.

Each cylinder has an integrated 2-position, 2-way solenoid operated platform lower valve for holding the platform in position. The valves are also externally actuated via a toggle switch for manually lowering the platform.

The normally closed holding valve prevents retraction of the cylinder rod should a hydraulic line rupture or a leak develop between the cylinder and its related control valve.




Bearing
Return Hose
Hose Clamp
Barbed Elbow Fitting
Relief Valve
Orifice
Barbed Elbow Fitting
Hose Clamp
Bearing
Return Hose
Electrically
Operated
Down Valve
3772RT
UPPER LIFT CYLINDER
WITH BEARINGS
Relief Valve
Tee Fitting
2 Barbed Straight
Fittings and
Hose Clamps
Return Hose
Hose Clamp
Barbed Fitting
Orifice
Pressure Hose
Pressure Sensor
Electrically
Operated
Down Valve
Return Hose
Bearing
3772RT
LOWER LIFT CYLINDER
WITH BEARINGS
Down Valve
Emergency Down Cable
Orifice
Pressure Sensor
Pressure Hose
Cylinder Valve Manifold
3072RT
LIFT CYLINDER
WITH BEARINGS

OPTIONAL OUTRIGGER

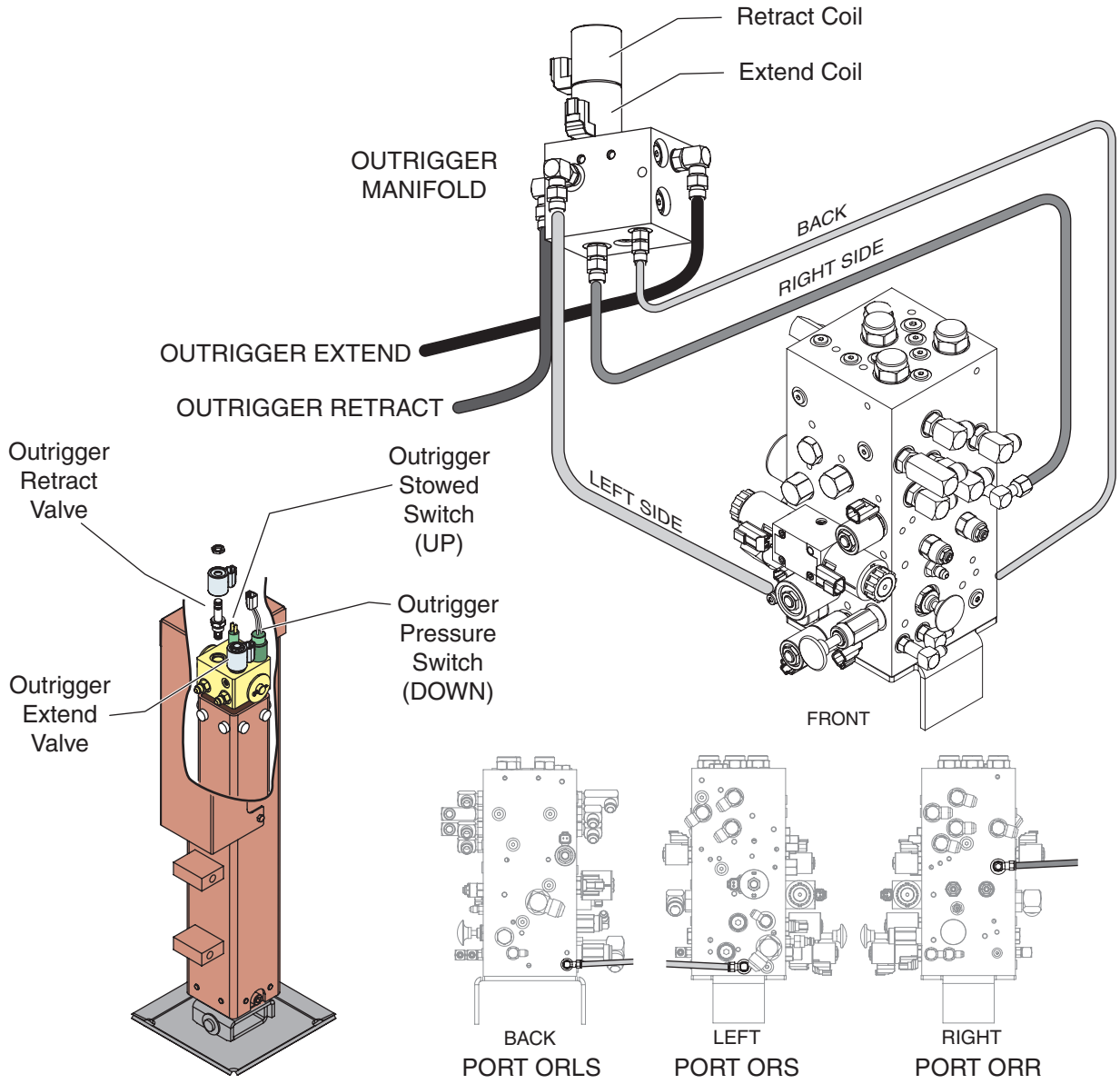
Note: Refer to *Section 3* for detailed description and troubleshooting.
Refer to *Cylinder Repair*.

Outrigger Hydraulic Manifold

The Optional outrigger manifold is located in the Control Module behind the Lower Control Box.

Cylinders

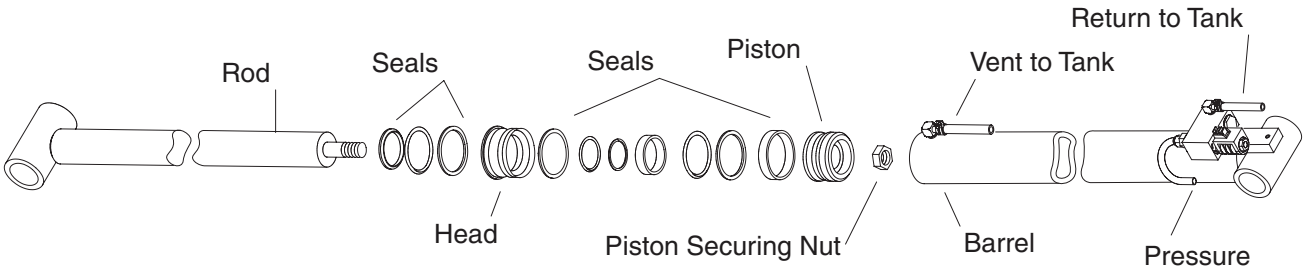
Four (4) double acting type hydraulic cylinders.



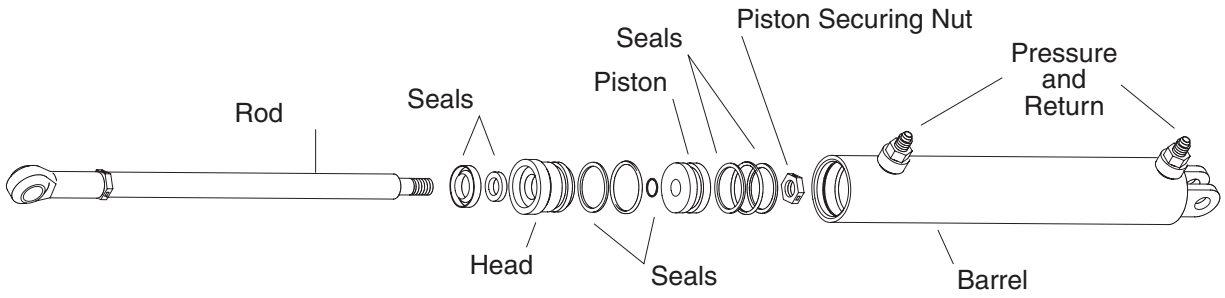
CYLINDER REPAIR

WARNING !!!

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



Typical Single Acting Cylinder



Typical Dual Acting Cylinder

Removal

Note: Refer to *Section 3* for Remove and Replace instructions, and the *Parts Manual* 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

CAUTION

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

1. Drain all oil 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 oil 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 oil 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 oil 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 1½" 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. Installation is reverse of removal.
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.

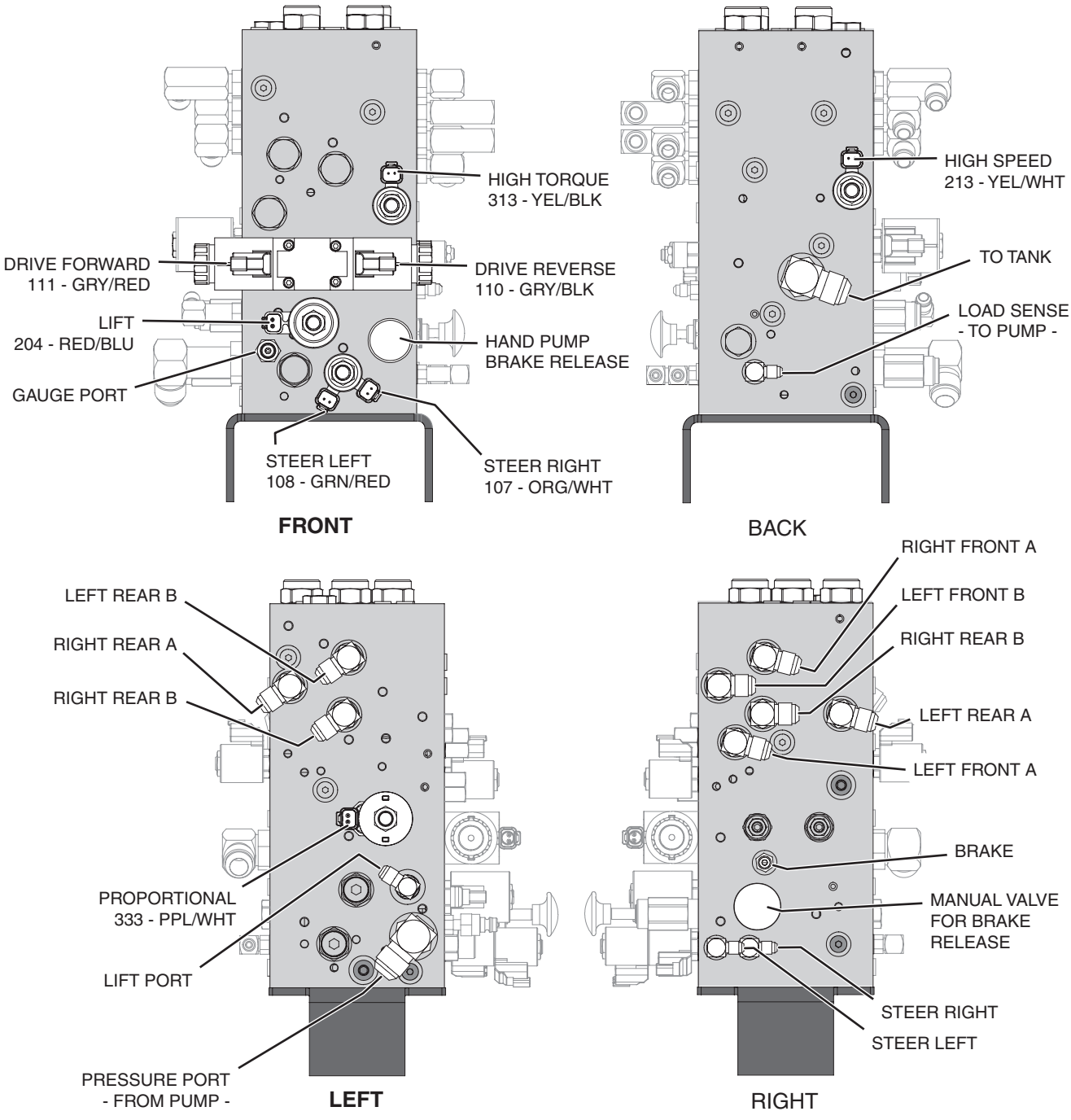
Assembly

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 Locktite #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.


HIGH TORQUE
313 - YEL/BLK
DRIVE FORWARD
111 - GRY/RED
DRIVE REVERSE
110 - GRY/BLK
LIFT
204 - RED/BLU
HAND PUMP
BRAKE RELEASE
GAUGE PORT
STEER LEFT
108 - GRN/RED
STEER RIGHT
107 - ORG/WHT
FRONT
HIGH SPEED
213 - YEL/WHT
TO TANK
LOAD SENSE
- TO PUMP -
BACK
LEFT REAR B
RIGHT REAR A
RIGHT REAR B
PROPORTIONAL
333 - PPL/WHT
LIFT PORT
PRESSURE PORT
- FROM PUMP -
LEFT
RIGHT FRONT A
LEFT FRONT B
RIGHT REAR B
LEFT REAR A
LEFT FRONT A
BRAKE
MANUAL VALVE
FOR BRAKE
RELEASE
STEER RIGHT
STEER LEFT
RIGHT

SECTION 2:
ELECTRICAL SYSTEM

ELECTRICAL SYSTEM - GENERAL

The electrical control system consists of a base control station and a platform control station.

Base Control Station

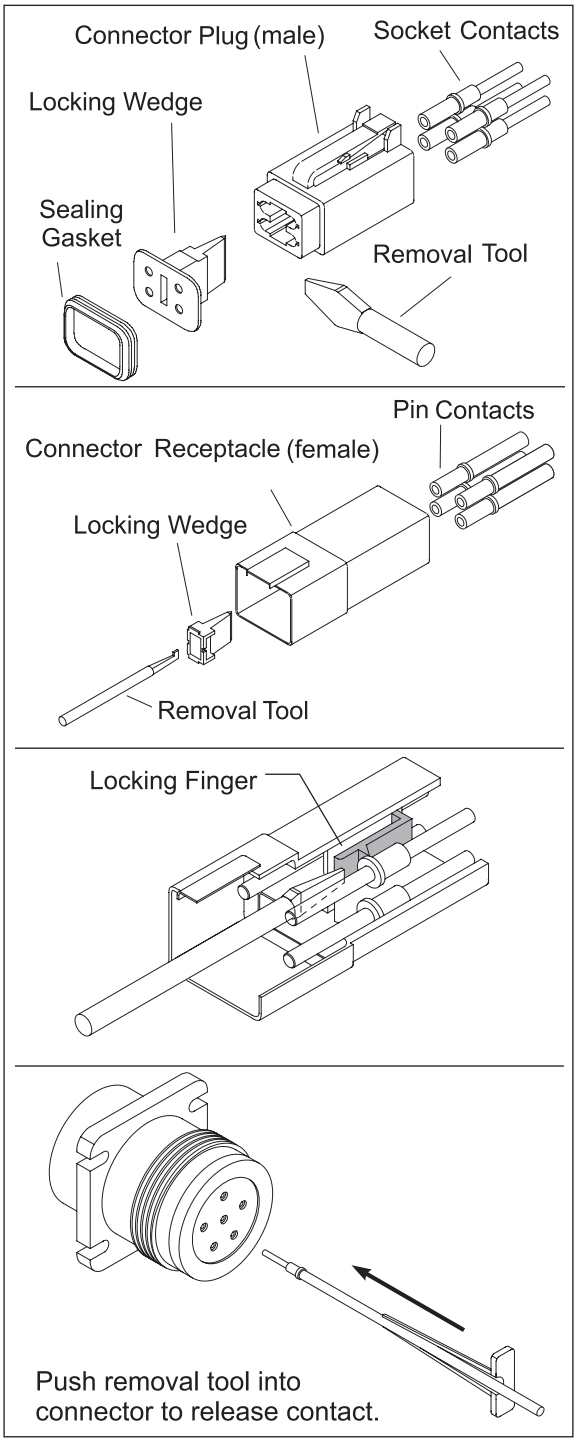
The base control station will operate all functions except steering and drive.

Platform Control Station

The platform control station will operate all functions including drive/steer and lift/lower. Momentary bidirectional rocker switch on the drive controller handle (joystick) provides the steering function. The control system for operation of drive/steer and lift/lower are electric-over-hydraulic type. The drive system is a proportional system controlled by position and direction of the upper control box controller handle (joystick).

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.



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. (6mm) 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.

BATTERY

! WARNING !!!

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.

A 12 volt battery supplies the 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 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 the oldest batteries are used first.
- Batteries should be kept fully charged. A battery, while in storage, should be recharged to full charge at recommended intervals.

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:	**Recharge:**
Below 40°F (4°C)	None required
Above 60°F (15°C)	Every month
40°-60°F (4°-15°C)	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 ½ 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 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	12V BATTERY
Fully Charged	1.280	2.10	12.60
Fully Discharged	1.130	1.75	10.50

Battery Replacement

To remove battery, follow these procedures.

! WARNING !!!

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

Battery is located in the Control Module 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.

! CAUTION

Prevent damage to battery and/or electrical system;

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

To install battery, reverse the process by positioning the battery in the compartment securely with hold down bolts. Connect battery cables. Always connect the positive cable first.

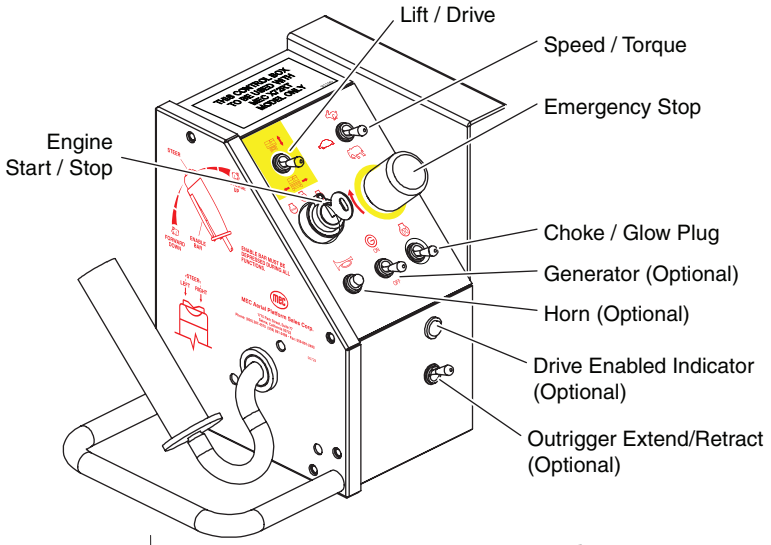
ALARMS AND SWITCHES

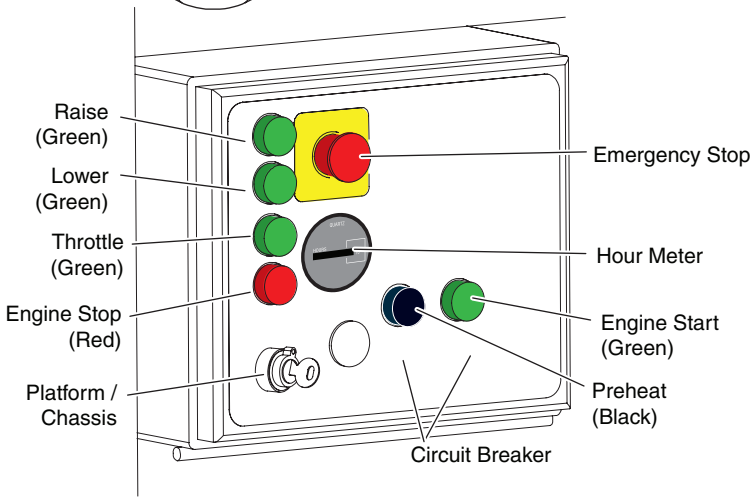
Emergency Stop Button

There are two red emergency stop buttons: one located on the platform control console and the other on the base control panel. This stop button, when in the “OUT” (ON) position, provides power to the desired control station. Also, the stop button, in the event of an emergency can be used to turn off the power by pushing “IN” (OFF). All functions stop immediately when depressed.

Turn the button clockwise to reset.

NOTE: As a safety feature, selecting and operating the base controls will override the platform controls, except the platform emergency stop button.
The base control emergency stop button will stop all machine operations, even if the selector switch is switched to platform controls.





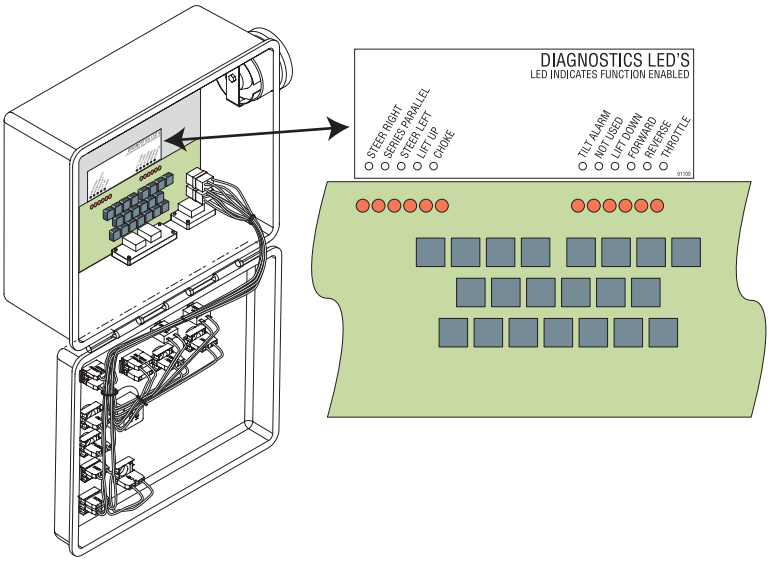
Selector Switch

Machine can be operated from the base/ground or platform controls. Activation of one or the other is achieved with this switch.

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

Diagnostic LED’s

There are Diagnostic LED’s located on the Printed Circuit Board inside the Base Control box. Each LED represents a function. When the LED is ON the function is ENERGIZED. Refer to the *DIAGNOSTIC LED’S* label to identify the LED function.



Master Disconnect Switch

Battery disconnect is provided in the Control Module to facilitate servicing and also to prevent unauthorized use of vehicle by using a padlock (to provide security).

Movement Alarm - Light (optional)

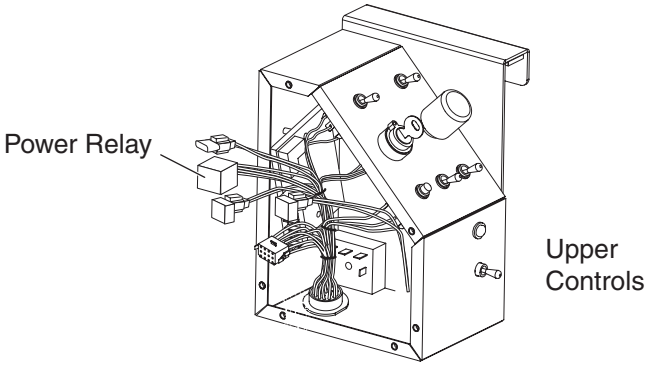
This light is activated as soon as the platform control console joystick (controller) lever is moved off the center “Neutral” position.

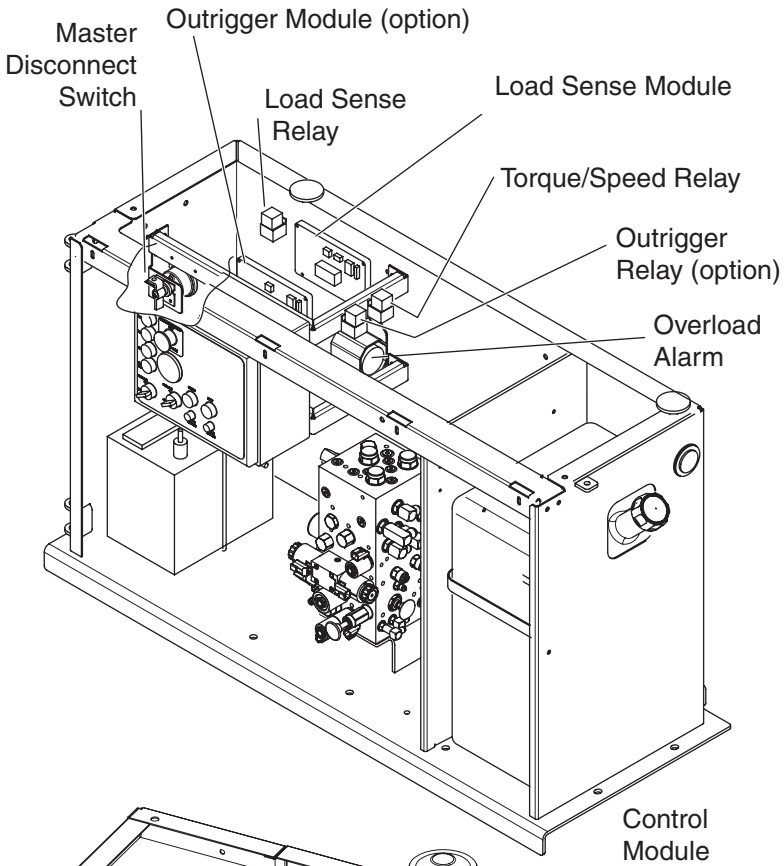
! WARNING !!!

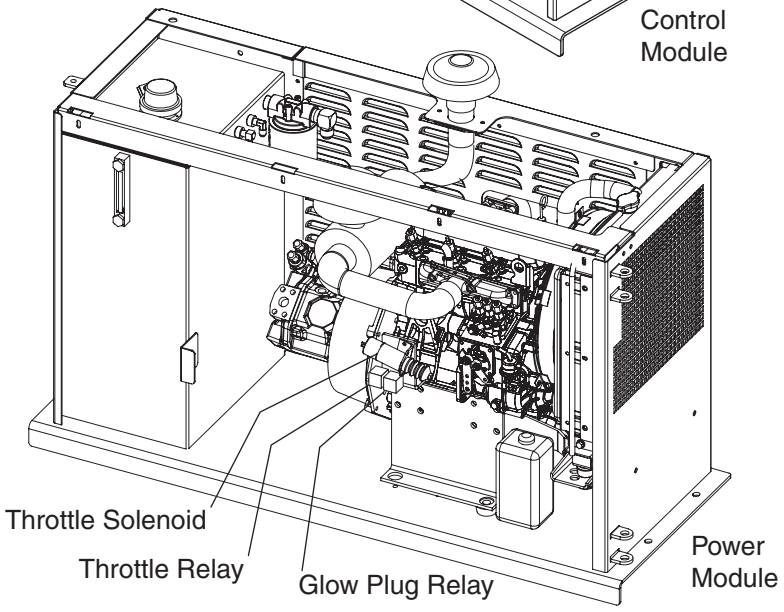
THE MOVEMENT ALARM IS PROVIDED FOR YOUR PROTECTION, AND PROTECTION OF PERSONS WORKING IN THE IMMEDIATE AREA. DISABLING THIS IMPORTANT SAFETY DEVICE MAY RESULT IN SERIOUS INJURY OR DEATH.

Relays

There are relays located inside the control module and inside the Upper Controls. (Refer to the Section 5 for relay functions and interconnect).







Upper Control Power Relay

Purpose: Cuts power to Upper Controls when Lower Controls are selected.

Torque/Speed Relay

Purpose: Disperses power to Torque Solenoid Valve when high speed or low speed is selected.

Load Sense Relay

Purpose: Cuts all functions when platform is overloaded.

Outrigger Relay (option)

Purpose: Cuts power to Lift circuits until Outriggers are fully deployed and in firm contact with the ground.

Throttle Relay

Purpose: The electric throttle solenoid receives its power through the Throttle Relay.

Glow Plug Relay

Purpose: The diesel engine glow plug receives its power through the Glow Plug Relay.

Limit Switch

The Limit Switch indicates Platform Height above 10 feet (3m). The switch operates in conjunction with the circuit board located in the lower control box and the proportional circuit board located in the upper control box.

Lower Controls Circuit Board

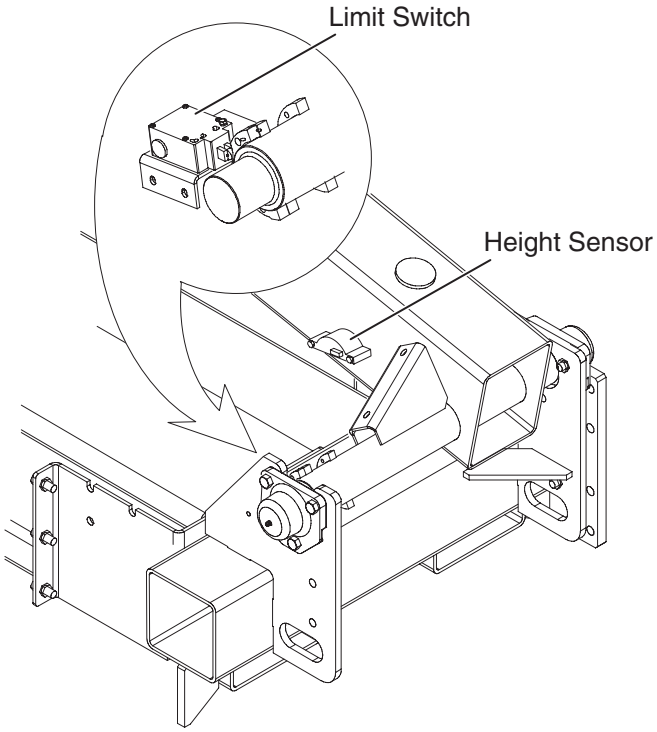
When the platform is elevated above 10 feet (3m) the limit switch is activated, causing the circuit board to;

- enable tilt sensor cutout operation
- lockout outriggers operation.

Upper Controls Proportional Circuit Board

When the platform is elevated above 10 feet (3m) the limit switch is activated, causing the proportional circuit board to;

- enable elevated drive speed.



Height Sensor

The Height Sensor works in conjunction with the Load Sense Control Module to prevent operation when the platform is overloaded.

OPTIONAL OUTRIGGERS SWITCHES

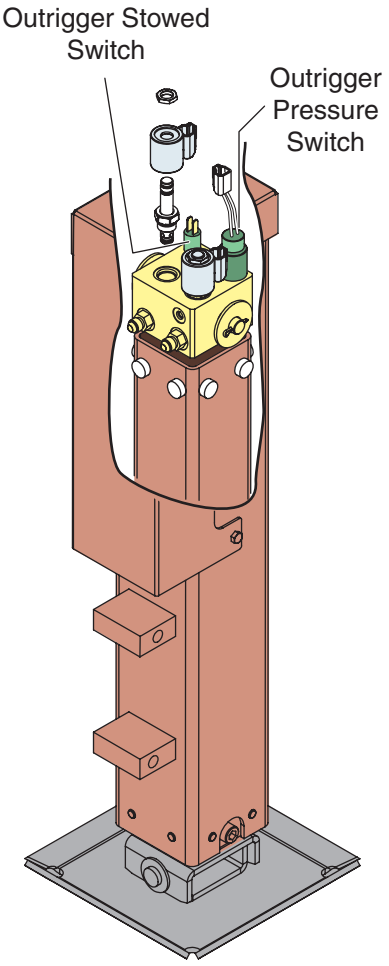
If the machine is equipped with outriggers, each of the four (4) outriggers has a Stowed Switch and a Pressure Switch.

Outrigger Stowed Switch

- Indicates full retraction of the outrigger cylinder.
- **Drive Function:** The machine will drive when the Outrigger Stowed Switch on all four (4) outriggers is engaged. If one (1) or more Outrigger Stowed Switch is open (not engaged) the machine *will not drive*.
- **Lift Function:** If one (1) or more Outrigger Stowed Switch is open (not engaged) the machine *will not lift* unless all four (4) outriggers are fully deployed.

Outrigger Pressure Switch

- Indicates full deployment of the outrigger.
- **Drive Function:** The machine *will not drive* if one (1) or more Outrigger Pressure Switch is engaged.
- **Lift Function:** The machine will elevate when all four (4) outriggers are fully retracted and the Outrigger Stowed Switches are engaged. When deployment begins the Outrigger Stowed Switches open and lift function is disabled. When all four (4) outriggers reach full deployment the Outrigger Pressure Switches close (engage) and lift function is restored.



CONTINUITY CHECKS

Check Toggle Switch:

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

Check Selector Switch

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

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 Relay Operation

- With one connection grounded, apply voltage to other relay connection.
- Confirm normally closed contacts are opening.
- Confirm normally open contacts are closing.

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 no resistance should be seen.

SECTION 3:
PLATFORM OVERLOAD SENSING SYSTEM

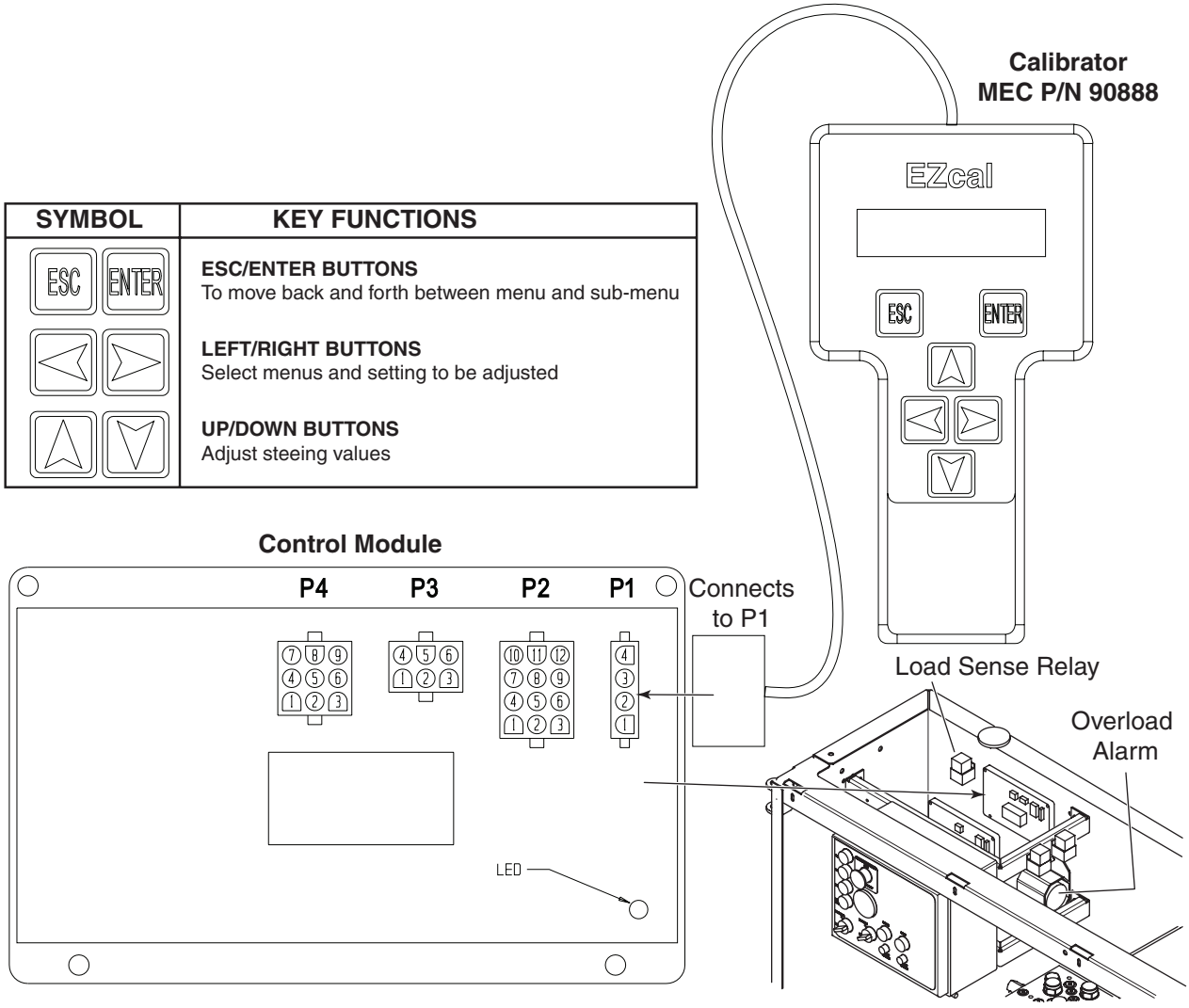
GENERAL DESCRIPTION

In combination with a height sensor to measure platform height and a pressure sensor to measure lift cylinder load, the GP102 control module calculates an estimate of load and prevents scissor vehicle operation when its platform is overloaded. The system also includes an integrated tilt sensor provides a warning alarm for tilted condition. In addition the automatic armguard cutout and descent alarm are controlled by this system. To access the control module for troubleshooting and calibration, the **EZcal** hand held device is required. These are available from MEC Aerial Platform Sales Corp.

! WARNING !!!

ONLY TRAINED AND AUTHORIZED PERSONNEL SHALL BE PERMITTED TO CALIBRATE THE PLATFORM OVERLOAD SENSING SYSTEM.

READ ALL INSTRUCTIONS CLOSELY BEFORE ATTEMPTING EACH STEP OF THE CALIBRATION PROCEDURE.



ELECTRICAL CONNECTIONS

P1 Connects to EZcal hand-held device for diagnostics and calibration.

P2 (J17) Connects to power supply & function switches:

	(J) P2-1	no connect
	(J) P2-2	no connect
RED/BLU 304	(J) P2-3	“UP” valve (B+ when UP requested)
YEL/BLU 105	(J) P2-4	“DOWN” valve (B+ when DOWN requested)
	(J) P2-5	no connect
	(J) P2-6	no connect
GRY/RED 111	(J) P2-7	“FWD” Valve (B+ when Forward commanded)
GRY/BLK 110	(J) P2-8	“REV” Valve (B+ when Reverse commanded)
	(J) P2-9	no connect
TAN/ORG 2	(J) P2-10	“PLATFORM ELEVATED” indication (B+ when platform stowed)
BLK 15	(J) P2-11	SUPPLY NEGATIVE (connected to B-)
RED/WHT 201	(J) P2-12	SUPPLY POSITIVE (connected to B+)

P3 (J16) Provides outputs for cutout Alarms, lamp, and relay

TAN 12	(J) P3-1	Tilt Sensor to Lower Control Box (B+ when not tilted)
BLU/WHT 72	(J) P3-2	Platform and Base Alarm
BLK/RED 74	(J) P3-3	OVERLOAD LAMP output (off normally, turns on to indicate overload)
RED/BLK 44	(J) P3-4	Cutout Relay output (B+ when not overloaded)
BLK 15	(J) P3-5	Cutout Relay B- (internally linked to P2-11)
	(J) P3-6	no connect

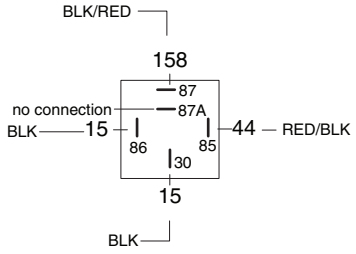
P4 Connects to lift cylinder pressure sensor and height sensor:

	(J) P4-1	no connect
ORG/GRN 42	(J) P4-2	pressure sensor (0.5V...4.5V analog)
ORG/RED 43	(J) P4-3	height sensor (1V...4V analog)
	(J) P4-4	no connect
	(J) P4-5	no connect
GRY 46	(J) P4-6	B+ protected supplies for pressure sensor
BLK 15	(J) P4-7	B– for pressure sensor
BLK 15	(J) P4-8	B– protected supplies for height sensor
BRN/YEL 49	(J) P4-9	B+ for height sensor

(J)- plug identification as it corresponds to the electrical schematic diagram.

(J18) Cutout Relay Connections:

BLK 15	30
RED/BLK 44	85
BLK 15	86
BLK/BLU 158	87



TROUBLESHOOTING

GP102 - EZcal Help Messages

When the **EZcal** hand-held device is connected to the **GP102** control module, the first menu available is “HELP” - just press the **ENTER** button to see a message describing the current status of the **GP102**; this This will provide the best information when troubleshooting the load sense system.

When an **EZcal** is unavailable, an LED on the **GP102** flashes to provide limited diagnostics. Refer to ***GP102*** *LED Flash Codes* in this section.

The following messages may be displayed on the Ezcal display.

EVERYTHING OK

The **GP102** detects no problems.

If problems are being experienced with the system, use the DIAGNOSTICS menus to check for faulty sensors and/or switches. LED on steady.

ARMGUARD ACTIVE!

The **GP102** has stopped descent at the Armguard height, and is delaying for 5 seconds to “give the operator the opportunity to see whether persons ... could be injured” (per EN 280 5.4.4). Vehicle movement will continue to be stopped after the delay until all functions are released. LED flash code 4.

B+ SUPPLY TOO LOW

The **GP102** is designed for use on 12V and 24V battery powered vehicles; it cannot operate with a supply below about 9V. The “BATTERY” voltage can be checked in the “SENSORS” menu (available in the “DIAGNOSTICS” menu). LED flash code 7.

DRIVE/LIFT SELECT INPUTS FAULTY!

Neither the drive select (P2-7) nor the lift select (P2-8) input is active, or both are active - the **GP102** cannot determine the vehicle use.

All vehicle operation will be prevented until the problem is corrected. LED flash code 2.

ELEVATION SWITCH SHIFTED?

The **GP102** uses the elevation switch in combination with the height sensor to ensure correct functionality of both; any of the following faults may be detected:

- The elevation switch should change state near the point at which it did during load calibration All vehicle operation will be prevented until the problem is corrected. LED flash code 4.

ELEVATION SWITCH STUCK?

The **GP102** uses the elevation switch in combination with the height sensor to ensure correct functionality of both; any of the following faults may be detected:

- When the platform is elevated, the measured height should be above that stored during load calibration
- When the platform is not elevated, the measured height should be below that stored during load calibration

All vehicle operation will be prevented until the problem is corrected. LED flash code 4.

FACTORY OVERRIDE

To allow vehicle movement during manufacture, the **GP102** is delivered in a "FACTORY OVERRIDE" state which disables all functionality. The first load calibration (even if not completed) will terminate this state. LED flash code 15.

FAULT: BAD TILT SENSOR

The **GP102** has detected that its integral tilt sensor is faulty - the module may need to be replaced. IMPORTANT: If the **GP102** is installed incorrectly, this fault may occur erroneously. LED flash code 8.

HEIGHT NOT CALIBRATED

During the first phase of load calibration ("DYNAMIC"), the **GP102** calibrates the minimum and maximum output of the height sensor so that platform height can be determined. This calibration must be successfully completed! LED flash code 1.

IDLE TIMEOUT ACTIVE!

If configured, the **GP102** will turn off all its outputs after a set time with no vehicle functions operated; this saves battery power and silences any alarm still sounding when the vehicle was left. Any vehicle function will end the idle timeout and restore normal operation of the **GP102** outputs. LED stays off.

INVALID HEIGHT - CHECK SENSORS

There is a problem that prevents the vehicle height being determined; there may be a fault with the height sensor, or the vehicle may have been modified or damaged since the last calibration occurred. All vehicle operation will be prevented until the problem is corrected. LED flash code 9.

INVALID LOAD - CHECK SENSORS

There is a problem which prevents the estimated load being determined; there may be a fault with the height sensor or the load sensor, or the vehicle may have been modified or damaged since the last calibration occurred. All vehicle operation will be prevented until the problem is corrected. LED flash code 6.

LOAD NOT CALIBRATED

During the second and third phases of load calibration ("LOADED" and "EMPTY"), the **GP102** calibrates the lift cylinder pressure at various heights corresponding to a fully loaded and unloaded platform. This calibration must be successfully completed! LED flash code 1.

NO LAST CALDATE!

At the end of load calibration, the **GP102** prompts for entry of the current date to aid in vehicle maintenance. A non-zero date must be entered! When load (re)calibration is begun, the last CALDATE is erased and cannot be re-entered until calibration is completed; this ensures that a partly calibrated vehicle cannot be operated. LED flash code 1.

P3-4 SHORT TO 0V?

The **GP102** startup tests detected that something is overloading the output on P3-4. All vehicle operation will be prevented until the problem is corrected. LED flash code 5.

P3-4 SHORT TO SUPPLY?

The **GP102** startup tests (or the continuous monitoring during any prevention of vehicle movement) detected that something is providing a permanent supply on P3-4 (defeating the internal cutout). All vehicle operation will be prevented until the problem is corrected. LED flash code 3.

TESTING HWFS

When the **GP102** is powered up, it carries out various tests to ensure that it is functioning safely.

TOO HIGH - DRIVE PREVENTED

A drive function has been selected but the platform is raised above the “MAX DRIVE” setting. (if enabled) The drive function will be prevented until the platform is lowered. LED flash code 8.

TOO HIGH - LIFT UP PREVENTED

The lift/up function has been selected but the platform is raised above the “MAX LIFT” setting. (if enabled) The lift/up function will be prevented until the platform is lowered. LED flash code 8.

UP/DOWN SELECT INPUTS ACTIVE TOGETHER!

The up select (P2-3 and/or P2-5) and the down select (P2-4 and/or P2-6) are active together - the **GP102** cannot determine the vehicle use. All vehicle operation will be prevented until the problem is corrected. LED flash code 2.

VEHICLE OVERLOADED

The estimated load in the platform exceeds the “OVERLOAD AT” setting in the “ADJUSTMENTS” “LOAD” menu. The **GP102** will activate the cutout to prevent vehicle operation until the platform load is reduced. LED flash code 8.

VEHICLE TILTED

Either the “X” or “Y” tilt (measured by the **GP102** integral tilt sensor) exceeds the “X TRIP” or “Y TRIP” setting in the “ADJUSTMENTS” “TILT” menu. LED flash code 8.

WAITING FOR B+ ON P2-12

The supply on P2-12 provides power for the outputs P3-1/2/3/4. The **GP102** cannot function if the supply is not present. Since the supply on P2-12 is switched to P3-4, vehicle operation will be prevented. LED flash code 7.

WAITING FOR NEUTRAL

When the **GP102** is powered up, all controls must be in neutral to allow safe testing of the failsafe output; no functions are allowed until testing is complete. LED flash code 2.

GP102 LED Flash Codes

The **GP102** has a built-in LED to provide simple diagnostics when no **EZcal** is available. Please note that the use of an **EZcal** provides significantly better diagnostics through the HELP messages. An **EZcal** is also necessary to calibrate a **GP102**.

LED on steady

This indicates no fault with the **GP102**

LED off always

This indicates no power to the **GP102**, or idle timeout (if enabled - activate a lift or drive function to cancel the idle timeout)

LED flash code 1

This indicates the **GP102** has not been properly calibrated.

LED flash code 2

This indicates a fault with the switch inputs to the **GP102**. Check wiring to connector P2.

LED flash code 3

This indicates a fault with the shutdown outputs of the **GP102** - a short to the supply has been detected. Check wiring from pins P3-4.

LED flash code 4

This indicates that armguard is active, or that there is a fault with the elevation switch - the **GP102** verifies correct opening and closing of the elevation switch against the height sensor. Checking the elevation switch on P2-10. If the height sensor has been adjusted or replaced, repeat the CALIBRATE HEIGHT procedure.

LED flash code 5

This indicates a fault with the shutdown outputs of the **GP102** - a short to 0V (ground) has been detected. Check wiring from pins P3-4.

LED flash code 6

This indicates a fault with the load measurement - check the pressure sensor and wiring from it to connector P4.

LED flash code 7

This indicates a fault with the supply to the **GP102** - check battery supply at least 8V on pin P2-12; also check that there is not a short to 0V (ground) on pin P4-1.

LED flash code 8

This is not a fault - it indicates the **GP102** has prevented a function; functions can be prevented if the platform is overloaded, if the machine is tilted too far, or if the platform is too high.

LED flash code 9

This indicates a fault with the height measurement - check the height sensor and wiring from it to connector P4.

LED flash code 10

This indicates the **GP102** is carrying out startup tests.

LED flash code 15

This indicates the **GP102** is in “FACTORY OVERRIDE” and overload functions are disabled - this aids manufacture by allowing vehicle movement before the machine is built sufficiently to be calibrated. 15 flash will be present whenever a *new* circuit board is installed previous to calibration.

CALIBRATION

Before attempting the calibration procedure, the batteries must be fully charged and battery terminals clean and tight. Move machine to an area that is perfectly level as measured by a spirit level or other leveling device. An Ezcal hand-held device (MEC part # 90888) is required to carry out all calibration procedures on the **GP102** Load sense control module.

Tilt Sensor Calibration

The integral tilt sensor of the **GP102** control module must be leveled to compensate for variations due to installation and vehicle construction. This procedure must be done if the lower control box is ever removed or repositioned, or if the **GP102** module is ever repositioned or replaced.

a.] Drive machine to level ground.

b.] Plug **EZcal** into connector P1 on load sense control module.

- Display reads HELP: PRESS ENTER.

c.] Press right arrow to ACCESS LEVEL 3, Press Enter.

- Display reads CODE 0000.

d.] Press up and right arrow to enter code 1775, Press Enter.

- Display reads ACCESS LEVEL 2.

e.] Right arrow to SETUPS, Press Enter.

- Display reads CHANGE DEFAULTS.

f.] Right arrow to TILT SETUPS, Press Enter.

- Display reads CALIBRATE LEVEL.

g.] Press Enter.

- Display reads CALIBRATE LEVEL: YES:ENTER,NO:ESC.

h.] Press Enter.

- Display reads TILT 0.0',0.0' i. Press ESC, ESC, ESC j. Disconnect **EZcal** from the load sense module.

Platform Load Calibration

Platform load calibration must be done if there are ever any significant repairs to the scissor assembly or if the lift cylinder is removed and serviced or replaced. Also, if any of the components of the Platform Load Sense System are replaced, the system will need re-calibration. During the calibration procedure the vehicle platform is fully raised and lowered three times:

1. "DYNAMIC" calibration – fully loaded platform raised & lowered in one continuous movement. DYNAMIC measurements are taken.
2. "LOADED" calibration – fully loaded platform raised & lowered with stops to take measurements. STATIC measurements are taken.
3. "EMPTY" calibration – unloaded platform raised & lowered with stops to take measurements. STATIC measurements are taken.

The following procedure must be followed COMPLETELY to calibrate the **GP102**; throughout the procedure various checks are made – if any problem is detected the procedure stops and displays a FLASHING failure message. Explanations of each message and suggested corrections can be found in the section of this manual following the calibration procedure.

NOTE: If the calibration procedure is interrupted, completed phases do not need to be repeated. A "REDO" prompt will appear – answer "NO" if there is no reason to repeat the phase, or "YES" if the phase must be repeated (for example because the wrong platform load was used on the previous phase).

a.] Drive machine to level ground, in area where it can reach full elevation.

b.] Place rated load in platform.

c.] Turn selector switch to Base controls.

d.] Remove top cover off of lower control station box, and plug **EZcal** into connector P1 on load sense control module.

EZcal display reads HELP: PRESS ENTER

e.] Press right arrow to ACCESS LEVEL 3, Press Enter.

- Display reads CODE 0000

f.] Press up and right arrow to enter code 1775, Press Enter.

- Display reads ACCESS LEVEL 2.

g.] Press Right Arrow to SETUPS, Press Enter.

- Display reads CHANGE DEFAULTS

h.] Press Enter to verify machine type. Press up and down arrows to change if necessary.

- Display reads 1=1532, 2=1932, 3=2033 …etc. Select appropriate model.

i.] Press Enter. Press Esc. Press Right Arrow to LOAD SETUPS. Press Enter.

- Display reads CALIBRATE LOAD

j.] Press Enter.

- Display reads PLATFORM DOWN? Verify that platform is fully lowered.

k.] Press Enter.

- Display reads PLATFORM LOADED? Verify that rated load is in platform.

l.] Press Enter.

- Display reads PLEASE LIFT. Hold lower controls switch in the up position until machine is fully elevated, then release switch.
- Display reads PLEASE LOWER. Hold switch in down position until platform is in the fully lowered position. Release switch. Display reads PLATFORM LOADED?

m.] Press Enter.

- Display reads PLEASE LIFT. Hold lower controls switch in the up position until machine is fully elevated, then release switch.

NOTE: The platform will lift incrementally during this phase of the calibration. Every third lift cycle the platform will fail to lift even though the circuit is initiated. When this occurs, release the lift switch for 1 second (or more) then reapply. The platform should then rise normally for another two cycles.

- Display reads TOTAL DATA #XX, then PLEASE LOWER. Hold switch in down position until platform is in the fully lowered position. Note: The platform will lower incrementally during this phase on the calibration. Do not release the switch until fully lowered. Release switch.
- Display reads TOTAL DATA #XX, then PLATFORM EMPTY?

NOTE: At this time the load in the platform must be removed. It is best to remove it without moving the machine. If you must switch to platform controls to move the machine, steps a.] through g.] must be repeated. Steps j.] through m.] will generate the REDO prompt. Answer NO. If machine was not moved, proceed to step n.].

n.] Press Enter.

- Display reads PLEASE LIFT. Hold lower controls switch in the up position until machine is fully elevated, then release switch.

NOTE: The platform will lift incrementally during this phase of the calibration. Every third lift cycle the platform will fail to lift even though the circuit is initiated. When this occurs, release the lift switch for 1 second (or more) then reapply. The platform should then rise normally for two cycles.

- Display reads TOTAL DATA #XX, then PLEASE LOWER. Hold switch in down position until platform is in the fully lowered position.

NOTE: The platform will lower incrementally during this phase on the calibration. Do not release the switch until fully lowered. Once fully lowered, release switch.

- Display reads TOTAL DATA #XX, then BUILDING TABLES, then CALDATE mm/dd/yy.

o.] Enter current date using Up, Down and Right Arrows.

- Display reads FINISHED.

p.] Disconnect **EZcal** from the load sense control module. The Platform Overload Sensing System is now calibrated.

Height Calibration

The height sensor must be calibrated if the height limit switch (LS-1 on electrical schematic) is ever replaced or adjusted. It is not necessary to redo the load calibration if the limit switch is all that was serviced. For this procedure it is not necessary to place any load in the platform.

a.] Drive machine to level ground, in area where it can reach full elevation.

b.] Turn selector switch to Base controls.

c.] Remove top cover off of lower control station box, and plug **EZcal** into connector P1 on load sense control module. **EZcal** display reads HELP: PRESS ENTER

d.] Press right arrow to ACCESS LEVEL 3, Press Enter.

- Display reads CODE 0000

e.] Press Up and Right Arrow to enter code 1775, Press Enter.

- Display reads ACCESS LEVEL 2.

f.] Press Right Arrow to SETUPS, Press Enter.

- Display reads CHANGE DEFAULTS

g.] Press Right Arrow to HEIGHT SETUPS, Press Enter.

- Display reads CALIBRATE HEIGHT

h.] Press Enter.

- Display reads PLATFORM DOWN? Verify that platform is fully lowered.

i.] Press Enter.

- Display reads PLEASE LIFT. Hold lower controls switch in the up position until machine is fully elevated, then release switch. Display reads PLEASE LOWER. Hold switch in down position until platform is in the fully lowered position. Release switch. Display reads FINISHED.

CALIBRATION TROUBLESHOOTING; Failure Messages

During calibration, various problems can be detected by the that prevent successful calibration. These problems are reported with a flashing message including an “F” code. The following descriptions are helpful in solving the problem:

F01:CHECK HWFS

This message is given if the startup tests have not completed.

Check HELP message for more information.

F02:NOT GROUND MODE

This message is given if the machine is not in ground mode (P2-2 must be high). Calibration can only be carried out in ground mode.

F03:NOT STOPPED

This message is given if any function switch is closed. Check DIAGNOSTICS / SWITCHES to see which function switch is closed.

F04:TILTED

This message is given if the machine is tilted. Calibration must be carried out with the machine level. If the machine is level, perform the Tilt Calibration procedure above.

F05:BAD HEIGHT

This message is given if the height sensor output (P4-3) is out of range at the start of calibration. The height sensor output must be between 1.0V and 4.0V. Check DIAGNOSTICS / SENSORS to see the output. A reading of 0V or 5V is probably due to a wiring problem.

F06:CHECK ELEV

This message is given if the elevation switch (P2-10) is open at the start of calibration, when the operator has confirmed the “PLATFORM DOWN?” question.

If the platform is down, check the elevation switch wiring.

F08:CHECK ELEV

This message is given if the elevation switch (P2-10) is closed at the end of the DYNAMIC lift, when the platform should be fully raised.

This message would occur if the UP switch was accidentally opened near the start of the DYNAMIC lift.

If the platform is fully raised, check the elevation switch wiring.

F09:BAD HEIGHT

This message is given if the height sensor output (P4-3) is out of range at the start of the DYNAMIC lift. The height sensor output must be between 1.0V and 4.0V. Check DIAGNOSTICS / SENSORS to see the output. This is usually due to a wiring problem.

F10:BAD HEIGHT

This message is given if the height sensor output (P4-3) is out of range at the end of the DYNAMIC lift. The height sensor output must be between 1.0V and 4.0V. Check DIAGNOSTICS / SENSORS to see the output. A reading of 0V or 5V is probably due to a wiring problem.

F11:NOT UP

This message occurs at the start of the DYNAMIC lift if the operator selects a function other than UP.

F12:TOO MANY

This message occurs if the DYNAMIC lift takes too long.

This message could occur if the UP switch was not released at the end of the dynamic lift.

F13:LOW HEIGHT RANGE

This message occurs at the end of the DYNAMIC lift if the height sensor output did not change sufficiently to give a reasonably accurate platform height estimate. DIAGNOSTICS / SENSORS can be used to check the height sensor output (P4-3) when the platform is fully lowered and fully raised; a difference of at least 1V is to be expected.

This message could occur if the UP switch was accidentally opened too early (when the platform is not fully raised).

F14:BAD HEIGHT

This message occurs if the height sensor output (P4-3) is out of range during the DYNAMIC lift. The height sensor output must be between 1.0V and 4.0V. Check DIAGNOSTICS / SENSORS to see the output. A reading of 0V or 5V is probably due to a wiring problem.

F15:CHECK ELEV

This message is given if the elevation switch (P2-10) is open when the platform has been fully lowered after the DYNAMIC lift.

This message would occur if the DOWN switch was accidentally opened before the platform was fully lowered.

If the platform is fully lowered, check the elevation switch.

F16:LOW ELEV.OPEN

This message is given if the elevation switch (P2-10) opened during lift at a too low height (below 5%). Check CALIBRATIONS / HEIGHT CALS; the “ElevUp” value shows the recorded height where the switch opened.

F17:HIGH ELEV.OPEN

This message is given if the elevation switch (P2-10) opened during lift at a too high height (above 25%).

Check CALIBRATIONS / HEIGHT CALS; the “ElevUp” value shows the recorded height where the switch opened.

F18:LOW ELEV.CLOSE

This message is given if the elevation switch (P2-10) closed during lower at a too low height (below 5%).

Check CALIBRATIONS / HEIGHT CALS; the “ElevDown” value shows the recorded height where the switch opened.

F19:HIGH ELEV.CLOSE

This message is given if the elevation switch (P2-10) closed during lower at a too high height (above 25%).

Check CALIBRATIONS / HEIGHT CALS; the “ElevUp” value shows the recorded height where the switch opened.

F20:HEIGHT<>0%
F21:HEIGHT<>0%

This message occurs if the platform height is not 0% after the platform has been fully lowered at the end of a calibration step. The platform must return to the same height each time it is fully lowered.

Check DIAGOSTICS / SYSTEM to check the height.

F22:HEIGHT<>100%
F23:HEIGHT<>100%

This message occurs if the platform height is not 100% after the platform has been fully raised during a calibration step. The platform must return to the same height each time it is fully raised.Check DIAGNOSTICS / SYSTEM to check the height.

F24:TOO MANY

This message occurs if too many static measurements are taken during a calibration step. In the rare event that this occurs, please call MEC for assistance.

F25:CHECK ELEV
F26:CHECK ELEV

This message indicates a problem with the elevation switch (P2-10) during the STATIC phases.

The switch is either staying closed to a higher height, or staying open to a lower height, than that recorded during the DYNAMIC phase.

F27:BAD HEIGHT

This message indicates a problem with the height sensor output (P4-3) during the STATIC calibration phases.

The height sensor output must be between 1.0V and 4.0V at all times.

Check DIAGNOSTICS / SENSORS to see the output. A reading of 0V or 5V is probably due to a wiring problem.

F30:BAD HEIGHTS

This message indicates that the recorded heights are not increasing during either STATIC lift, or are not decreasing during either STATIC lower.

It may be possible to cause this problem by repeatedly opening and closing the UP or DOWN switch during the STATIC phases.

F31:REJECT CURVE

The DYNAMIC pressure curve is unacceptable.

An initial pressure peak when the platform lifted cannot be found between 0% and 15% height.

Check the pressure sensor and lift cylinder hydraulics.

F32:REJECT CURVE

The DYNAMIC pressure curve is unacceptable.

There should be a lowest pressure about halfway through the lift (ie: near 50% height); the lowest pressure measured is at too low a height.

Check the pressure sensor and lift cylinder hydraulics.

F33:REJECT CURVE

The DYNAMIC pressure curve is unacceptable.

There should be a lowest pressure about halfway through the lift (ie: near 50% height); the lowest pressure measured is at too high a height.

Check the pressure sensor and lift cylinder hydraulics.

F34:REJECT CURVE

The DYNAMIC pressure curve is unacceptable.

There is not enough difference between the initial pressure peak and the minimum pressure.

Check the pressure sensor and lift cylinder hydraulics.

F40:REJECT DELTA

This message indicates that there is not enough difference between the loaded & empty pressure.

This message could occur if the platform were not properly loaded during the STATIC LOADED phase, or if the platform were not properly empty during the STATIC EMPTY phase.

This message could also occur if the wrong pressure sensor was fitted (eg: a 5000psi sensor when a 2000psi one is needed).

Check CALIBRATIONS / HEIGHT CALS; the “Height” indicates the first height at which there was insufficient difference and the “Up” and “Down” values show the loaded pressure (first) and the difference between loaded and empty pressure (second).

F42:LOW PRESSURE

This message indicates that the pressure is too low (0.5V or less) when the elevation switch opens during the DYNAMIC lift.

This message would occur if the pressure sensor was disconnected, or if there were some other wiring error.

Check DIAGNOSTICS / SENSORS to check the pressure.

F43:HIGH PRESSURE

This message indicates that the pressure is too high (4.5V or more) when the elevation switch opens during the DYNAMIC lift.

This message would occur if the wrong pressure sensor was fitted, or if there were some other wiring error.

Check DIAGNOSTICS / SENSORS to check the pressure.

F44:LOW PRESSURE

This message indicates that the pressure is too low (0.5V or less) at a STATIC measurement point.

This message would occur if the pressure sensor was disconnected, or if there were some other wiring error.

Check DIAGNOSTICS / SENSORS to check the pressure.

F45:HIGH PRESSURE

This message indicates that the pressure is too high (4.5V or more) at a STATIC measurement point.

This message would occur if the wrong pressure sensor was fitted, or if there were some other wiring error.

Check DIAGNOSTICS / SENSORS to check the pressure.

F46:CHECK ELEV

This message indicates that the elevation switch opened more than once during the DYNAMIC lift.

F47:CHECK ELEV

This message indicates that the elevation switch closed more than once during the DYNAMIC lower.

F48:BAD PRESSURE

This message is given if the pressure sensor output (P4-2) is out of range at the start of calibration.

The height sensor output must be between 0.5V and 4.5V.

Check DIAGNOSTICS / SENSORS to see the output. A reading of 0V or 5V is probably due to a wiring problem.

CALIBRATION TROUBLESHOOTING; Information Messages

During calibration the following messages may be displayed:

BUILDING TABLES — This message indicates that the STATIC measurements are being used to build calibration data - the process should take no more than 5s.

CALDATE: — This message is prompting for the date to be entered; it is stored to identify when the machine was calibrated.

The last calibrate date can be viewed in DIAGNOSTICS / LOG.

Press LEFT & RIGHT to select the flashing digits.

Press UP & DOWN to change the flashing digits.

Press ENTER when the entry is complete.

IMPORTANT: The date 00/00/00 is not allowed!

FINISHED — This message confirms that calibration is complete and successful.

GO DOWN MORE! — This message occurs if the DOWN switch is released during either STATIC lowering phase, when more measurements are needed (before the platform is fully lowered).

GO UP MORE! — This message occurs if the UP switch is released during either STATIC lifting phase, when more measurements are needed (before the platform is fully raised).

LIFT EMPTY — This message is displayed during the STATIC empty phase while the platform is being raised to the next measurement height.

LIFT LOADED — This message is displayed during the STATIC loaded phase while the platform is being raised to the next measurement height.

LIFTING — This message is displayed during the DYNAMIC phase while the platform is being raised.

LOWER EMPTY — This message is displayed during the STATIC empty phase while the platform is being lowered to the next measurement height.

LOWER LOADED — This message is displayed during the STATIC loaded phase while the platform is being lowered to the next measurement height.

LOWERING — This message is displayed during the DYNAMIC phase while the platform is being lowered.

MEASURING #

This message is displayed when the platform is stopped during either STATIC phase, when the takes a measurement.

There will be a short delay while the machine is allowed to stabilize after movement is stopped.

MUST GO DOWN!

This message occurs if the wrong switch is closed when the is waiting for the platform to be lowered.

MUST GO UP!

This message occurs if the wrong switch is closed when the is waiting for the platform to be raised.

PLATFORM DOWN?

This message is prompting for confirmation that the platform is fully lowered. If necessary the DOWN switch can be activated to lower the platform.

Press ENTER to confirm when the platform is fully lowered.

PLATFORM EMPTY?

This message is prompting for confirmation that the platform is completely empty.

Press ENTER to confirm when the platform is empty.

PLATFORM LOADED?

This message is prompting for confirmation that the platform is loaded to rated load (this will be 100% for the).

Press ENTER to confirm when the platform is loaded.

PLEASE LIFT ...

This message is prompting for the platform to be raised.

The UP switch should be closed.

PLEASE LOWER ...

This message is prompting for the platform to be lowered.

The DOWN switch should be closed.

PLEASE WAIT

This message indicates that the is busy; the delay will be short (no more than 5s).

REDO DYNAMIC:

This message is displayed if the DYNAMIC phase of load calibration has previously been completed.

Press ENTER when “NO” is displayed if there is no need to redo the DYNAMIC phase.

Press UP or DOWN to display “YES” then press ENTER if it is necessary to redo the DYNAMIC phase.

If the previous DYNAMIC calibration was in error, or if the height or pressure sensor is replaced, it will be necessary to redo the DYNAMIC phase.

REDO EMPTY:

This message is displayed if the EMPTY phase of load calibration has previously been completed.

Press ENTER when “NO” is displayed if there is no need to redo the EMPTY phase.

Press UP or DOWN to display “YES” then press ENTER if it is necessary to redo the EMPTY phase.

If the previous EMPTY calibration was in error, or if the pressure sensor is replaced, it will be necessary to redo the EMPTY phase.

REDO LOADED:

This message is displayed if the LOADED phase of load calibration has previously been completed.

Press ENTER when “NO” is displayed if there is no need to redo the LOADED phase.

Press UP or DOWN to display “YES” then press ENTER if it is necessary to redo the LOADED phase.

If the previous LOADED calibration was in error, or if the pressure sensor is replaced, it will be necessary to redo the LOADED phase.

TOTAL DATA:

This message is displayed at the end of each phase, to confirm the number of measurements recorded by the .

SECTION 4:
MECHANICAL COMPONENTS

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								
SAE GRADE	5				8			
CAP SCREW SIZE - inches -	TORQUE				TORQUE			
	FT. LBS		Nm		FT. LBS		Nm	
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
1/4 - 20	6.25	7.25	8.5	10	8.25	9.5	11	13
1/4 - 28	8	9	11	12	10.5	12	14	16
5/16 - 18	14	15	19	20	18.5	20	25	27
5/16 - 24	17.5	19	23	26	23	25	31	34
3/8 - 16	26	28	35	38	35	37	47.5	50
3/8 - 24	31	34	42	46	41	45	55.5	61
7/16 - 14	41	45	55.5	61	55	60	74.5	81
7/16 - 20	51	55	69	74.5	68	75	92	102
1/2 - 13	65	72	88	97.5	86	96	116	130
1/2 - 20	76	84	103	114	102	112	138	152
9/16 - 12	95	105	129	142	127	140	172	190
9/16 - 18	111	123	150	167	148	164	200	222
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

METRIC CAP SCREWS								
METRIC GRADE	8.8				10.9			
CAP SCREW SIZE - millimeters-	TORQUE				TORQUE			
	FT. LBS		Nm		FT. LBS		Nm	
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
M6 X 1.00	6	8	8	11	9	11	12	15
M8 X 1.25	16	20	21.5	27	23	27	31	36.5
M10 X 1.50	29	35	39	47	42	52	57	70
M12 X 1.75	52	62	70	84	75	91	102	123
M14 X 2.00	85	103	115	139	120	146	163	198
M16 X 2.50	130	158	176	214	176	216	238	293
M18 X 2.50	172	210	233	284	240	294	325	398
M20 X 2.50	247	301	335	408	343	426	465	577
M22 X 2.50	332	404	450	547	472	576	639	780
M24 X 3.00	423	517	573	700	599	732	812	992
M27 X 3.00	637	779	863	1055	898	1098	1217	1488
M3 X 3.00	872	1066	1181	1444	1224	1496	1658	2027

Torque values apply to fasteneers 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

CAUTION

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

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

Raising the Machine

DANGER

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. If wheel is to be removed, loosen but ***do not remove*** lugs before raising the machine.
4. Position a jack at the end of the machine to be lifted, under a solid lifting point in the center of the frame.
5. Raise the machine and place two (2) suitable jack stands under solid support points at the outer ends of the frame.
6. Lower the machine to rest on the jack stands and inspect for stability.

To lower the machine

1. Tighten lugs to proper torque (refer to machine specifications).
2. Raise machine slightly and remove jack stands.
3. Lower the machine and remove the jack.
4. Remove chocks.

Tires

Inspect for cuts, chunking, side-wall damage, or abnormal wear. Any tire faults MUST BE CORRECTED before further machine operation. Refer to Parts Manual Section for replacement tires.

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

NOTE: Replace tires with the correct tires to maintain the rating of this equipment.

Changing Tires

FOAM FILLED TIRES ARE EXTREMELY HEAVY. CARE MUST BE TAKEN TO AVOID PERSONAL INJURY.

Always block the wheels before raising the machine.

When a tire change is necessary, follow these tips:

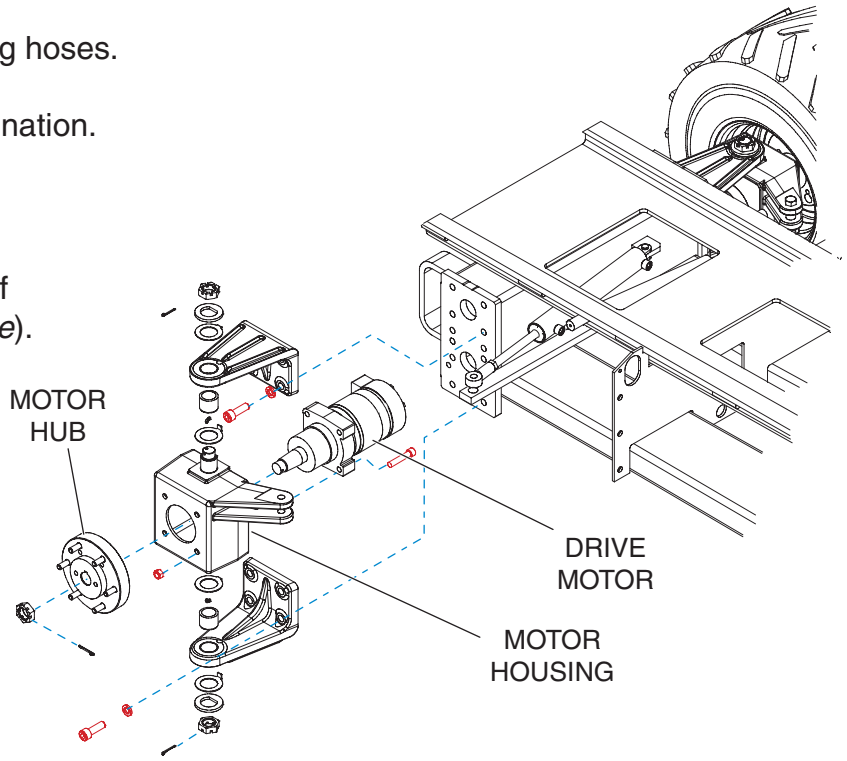
1. Chock tires on one end of machine and raise the other end of machine (see *Raising the Machine*).
2. Remove lug nuts and pull wheel off.
3. Install the replacement wheel.
4. Fasten lug nuts and tighten to proper torque. (Refer to machine specifications)
5. Lower the machine and remove the chocks.

Front Drive Motors

There are two (2) hydraulic motors on the front axle and two (2) drive motor brakes on the rear drive axle. These can be damaged or leaks may occur; repair or replace as necessary.

CAUTION:

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



Front Drive Motors

Remove

1. Raise and support the front end of machine (see *Raising the Machine*).
2. Remove the wheel and tire assembly to access drive motor.
3. Remove the hub from the drive motor shaft.
4. Disconnect the cylinder end and tie-rod from the motor housing.
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.

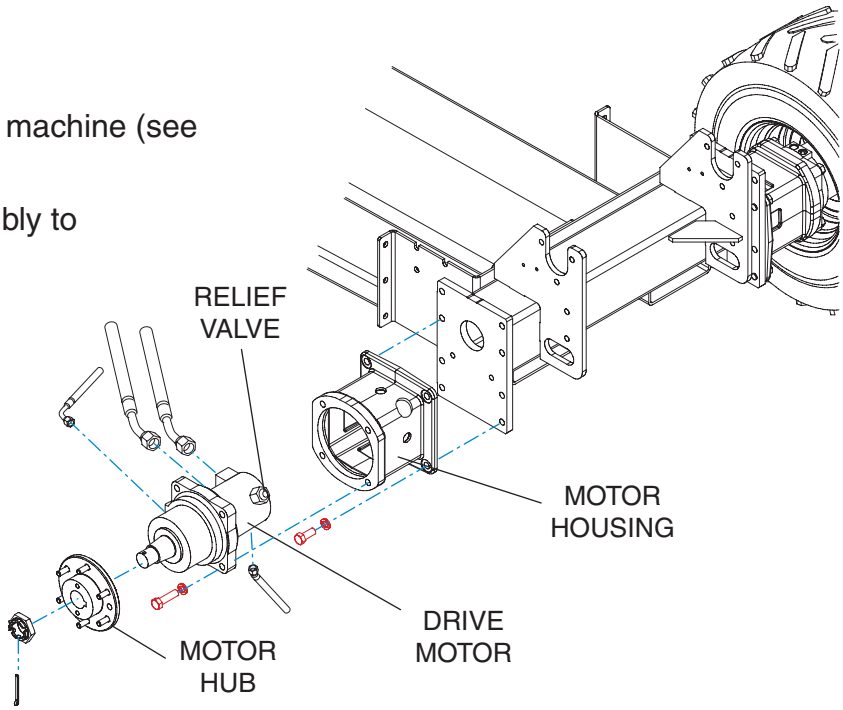
Replace

Installation is reverse of removal.

Rear Drive Motor with Brakes

Remove

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



Replace

Installation is reverse of removal.

Steer Cylinder

There are two (2) double acting type steer cylinders on this machine. During operation, cylinder(s) should not leak, but a slight damping at the rod seal is acceptable. The pins should be checked for wear.

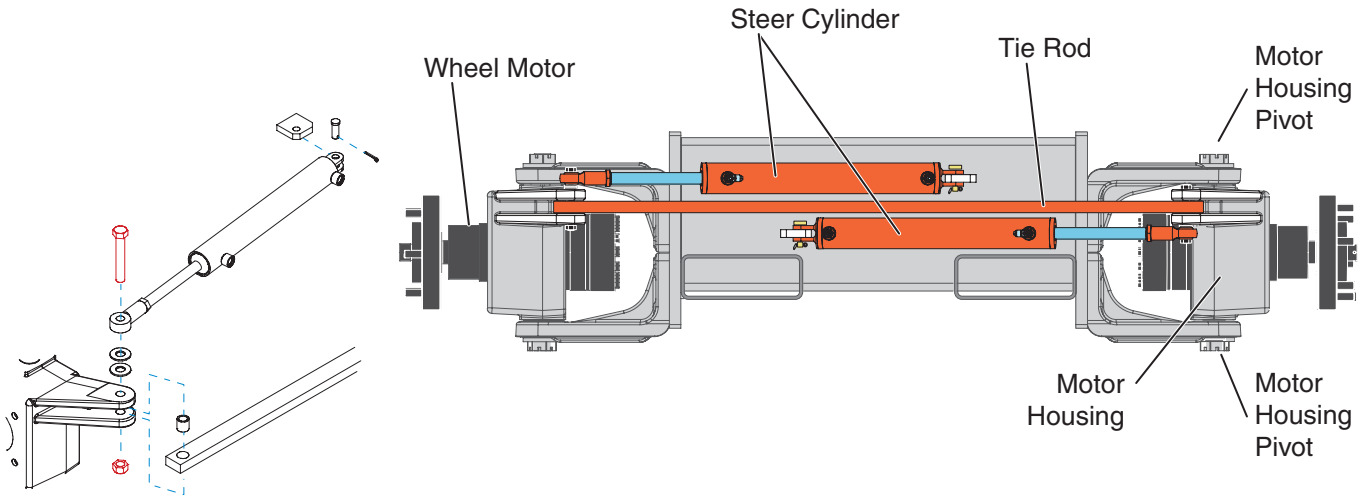
To replace steer cylinder:

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*).
1. Disconnect hydraulic hoses and cap them.
2. Remove the nut and bolt holding the steer cylinder to the motor mounting bracket.
3. Remove the pin and cotter pin holding the steer cylinder to the steer axle cross member (tie-rod).
4. Carefully lift off the steer cylinder.
5. Position the new steer cylinder and install pin and cotter pin to hold cylinder to the steer axle cross member.
6. Install nut and bolt to hold cylinder to motor mounting bracket.
7. Connect hydraulic hoses.
8. 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.



Hoses and Cables

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

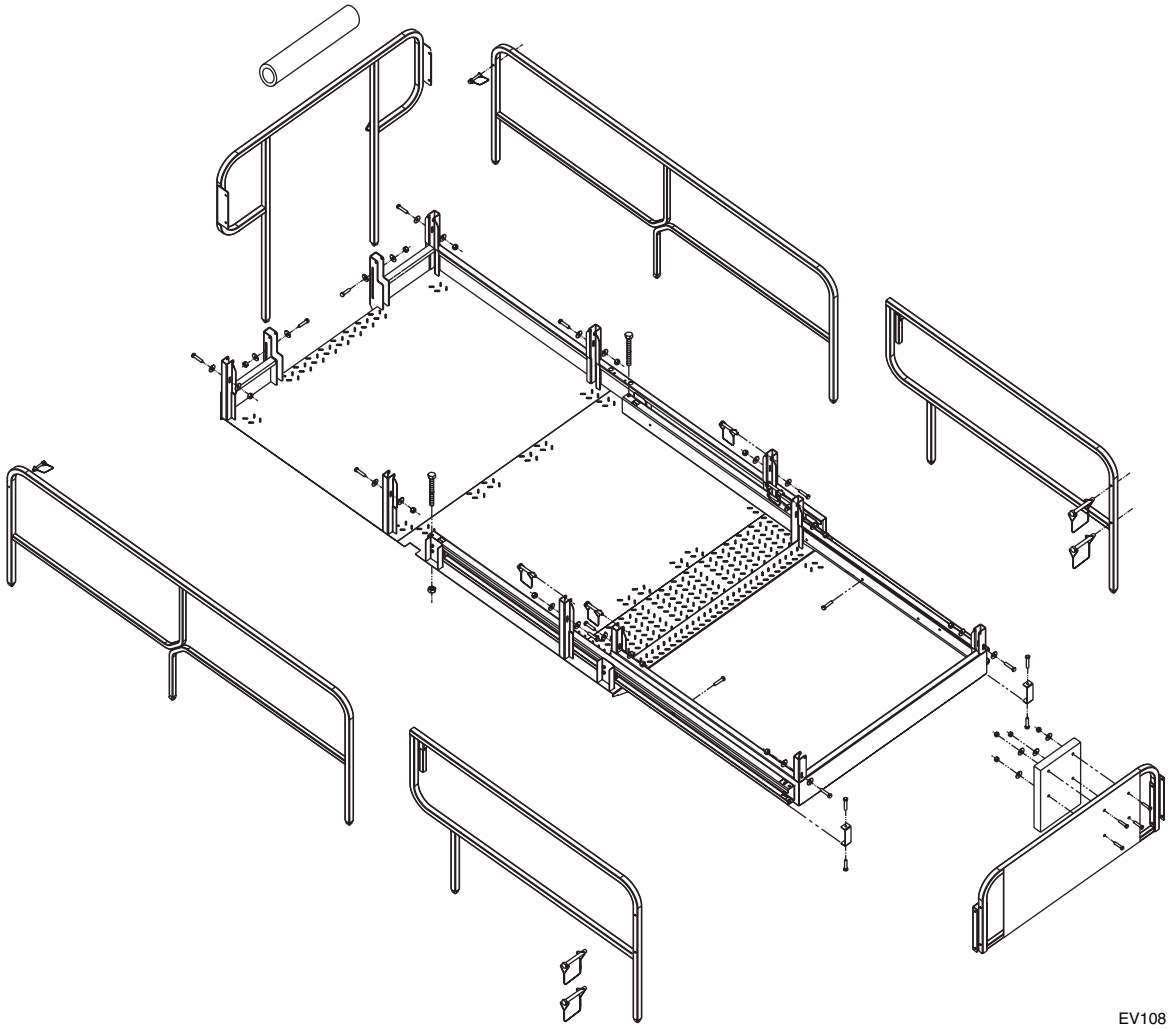
Inspect all hoses and electrical cables for security and damage. Hoses and cables should be examined for rubbing and chafing.

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.

Platform Removal

1. Raise platform about three (3) feet (1.0 m) and block the arms in the raised position. Also, connect overhead crane by appropriate lifting device to platform.
2. Disconnect all platform wires.
3. Remove the bolts from both platform brackets at the rear of the machine.
4. Slide platform and roll out deck off the machine.



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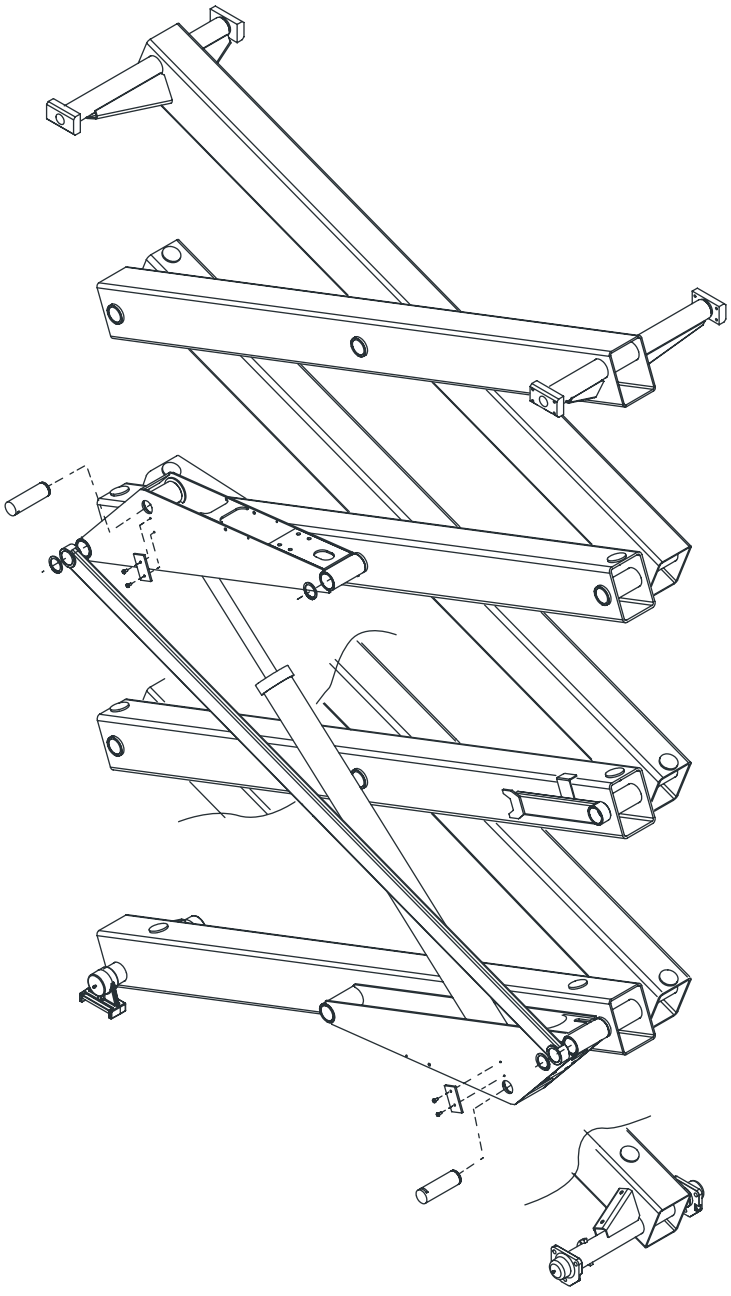
Lift Cylinder Removal and Installation

Note: Refer to *Section 1* for seal replacement instructions.
Refer to *Parts Section 3* 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 scissors arm assembly and support using the maintenance lock.
2. Disconnect hoses and wires and cables to the lift cylinder(s).
3. Use a suitable lifting device to support the lift cylinder.
4. Remove retaining pins and rod end pin.
5. Lift the cylinder from the scissors assembly using a suitable lifting device.

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



Scissors Beam Assembly

Note: Refer to *Parts Section 3* for detailed parts list and illustration.

Clean the beams once a year or as necessary and inspect along the beam's surface, especially weld and brackets.

Scissors Beam Removal

1. Remove the platform and lift cylinder(s).
2. Attach a suitable lifting device ti the scissors assembly.
3. Lift the scissors assembly

Installation is reverse of removal.

ENGINE MAINTENANCE

Diesel Engine

CAUTION

Always wear protective eye-wear when working with fuel and oil. Engine should be OFF when replacing filter elements.

For complete service information consult the engine manual that came with the machine.

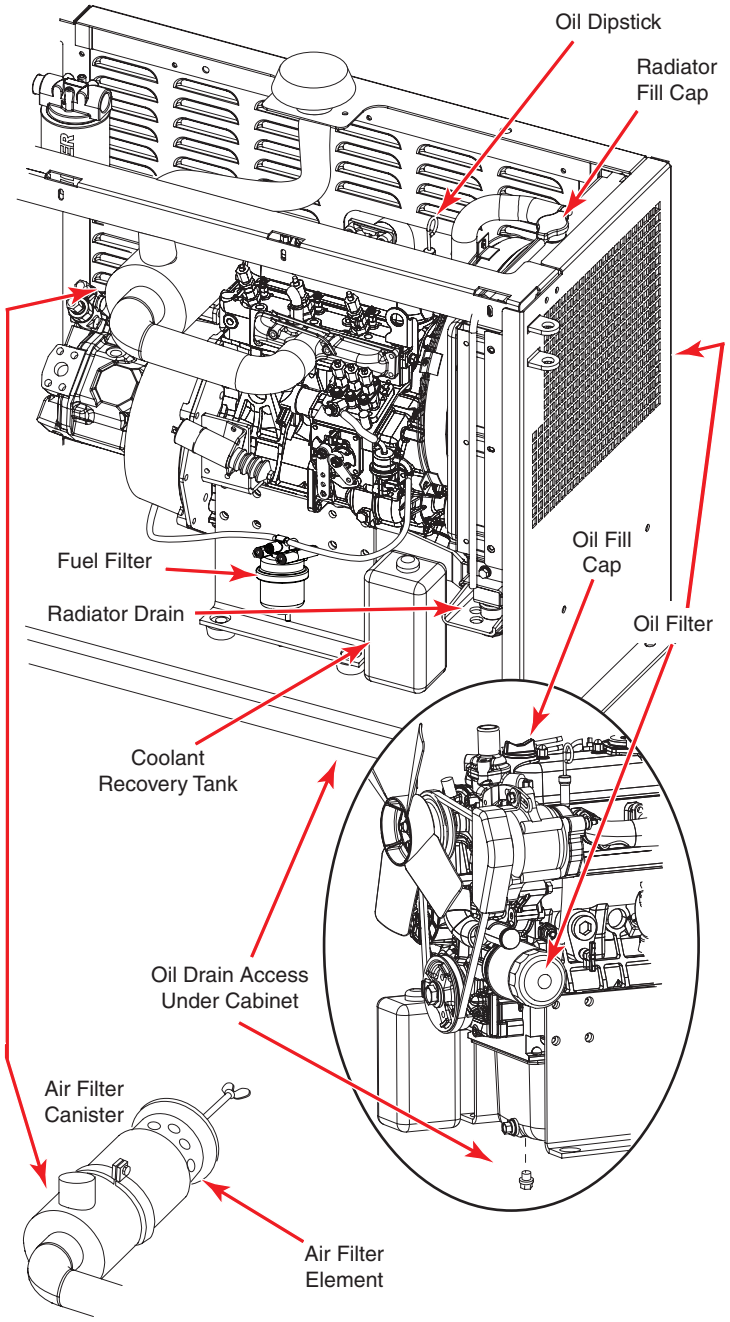
Oil and Oil Filter- Diesel

Dispose of used oil and filters properly.

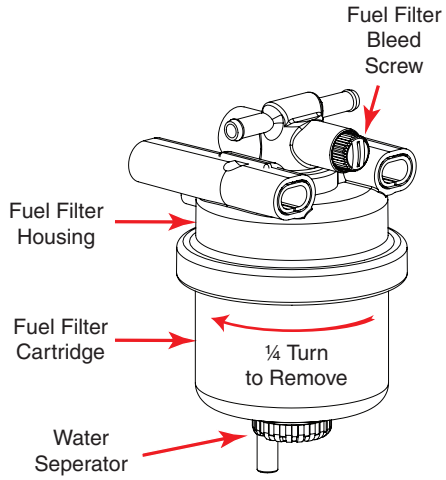
1. Use a suitable container to catch drained oil. Remove the drain plug. After oil has drained, replace the drain plug.
2. Remove the old filter and wipe the filter seal contact surface with a clean towel. Coat the seal on the new filter with clean oil, then install and tighten by hand.
3. Fill engine with 10w-30 motor oil until the dipstick indicates FULL. Capacity is 5.4 US quarts (5,1 l).
4. Recheck dipstick after running engine. Fill as necessary.

Air Filter Element- Diesel

1. Remove the hoses from the canister.
2. Loosen the bracket and remove the canister.
3. Remove the wing-bolt, remove old filter and replace with a new filter. Replace and tighten the wing-bolt. ***Do not run the engine with the air filter element removed.***
4. Replace the canister and attach the hoses. Tighten the canister bracket and hose clamps.

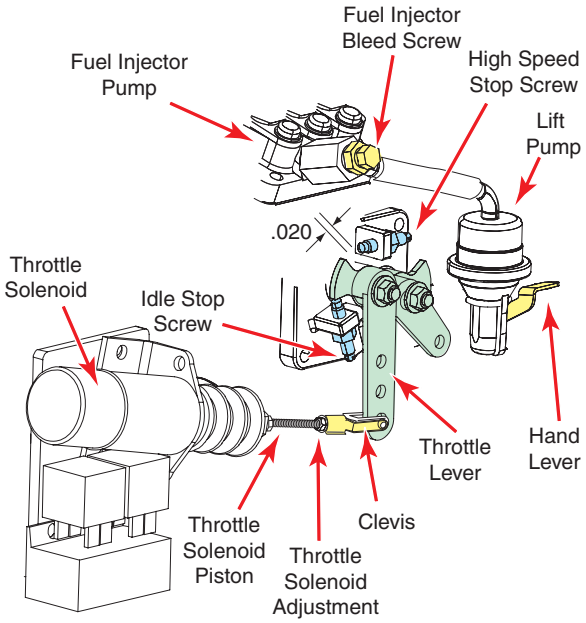


Fuel Filter- Diesel



1. Turn OFF valve at fuel filter.
2. Place a suitable container beneath the fuel filter assembly to catch spilled fuel. Clean the filter area.
3. Turn filter cartridge ¼ counterclockwise remove. Wipe the filter seal contact surface with a clean towel and install a new filter.
4. Open valve at fuel tank and check for leaks.
5. Purge the air from the fuel system as follows;
   - Fill fuel tank to the fullest extent. Open valve on bottom of fuel tank.
   - Loosen bleed screw on top of fuel filter housing a few turns.
   - Close the bleed screw when there are no more bubbles.
   - Open the bleed screw on the fuel injector pump. Use the lift pump hand lever to pump fuel to the injectors. Close the bleed screw when there are no more bubbles.

   Do not attempt to start the engine until Step 5 has been performed.
6. If fuel becomes contaminated with water, use the Water Seperator Valve at the bottom of the fuel cartridge to drain water.



Idle Speed Adjustment - Diesel

1. Bring engine to operating temperature.
2. Slow engine to complete idle.
3. Adjust the Idle Stop Screw until the RPM is 950. Adjust slightly up or down to avoid vibrations.
4. Hold the Idle Stop Screw while tightening the jam nut to prevent change in adjustment.

High Speed Adjustment - Diesel

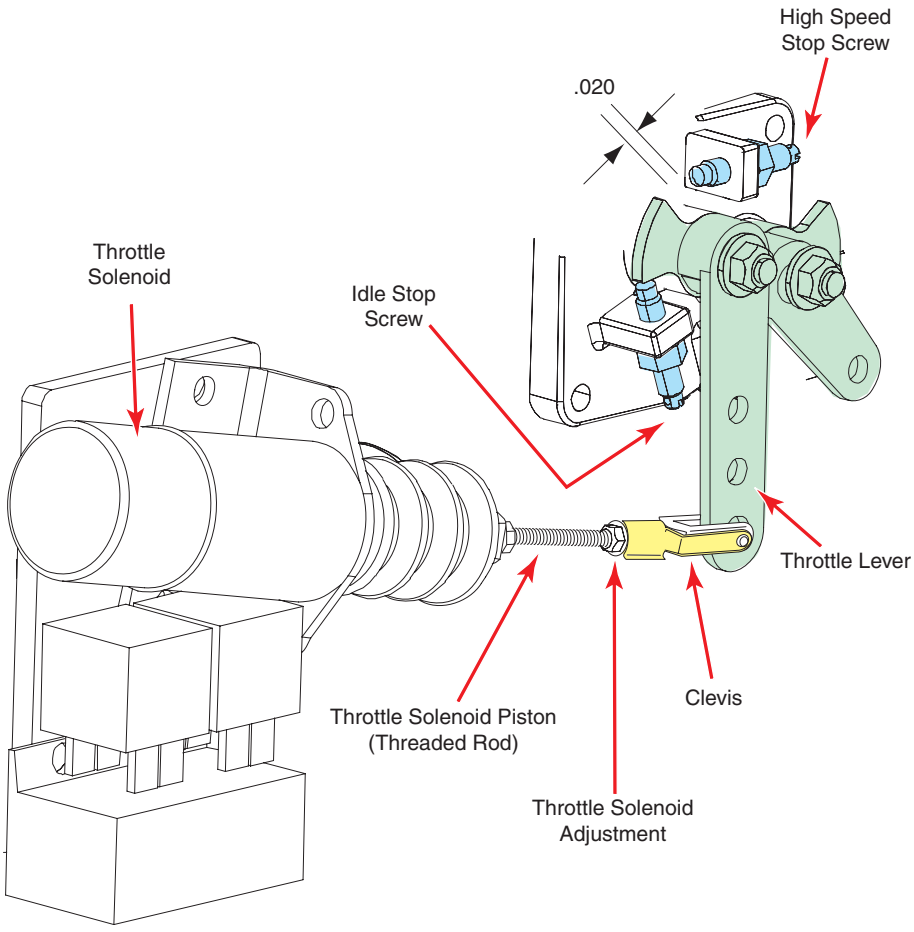
IMPORTANT: In order to prevent electrical system damage, check the Throttle Solenoid Adjustment after this procedure.

1. Bring engine to operating temperature.
2. Disconnect the Throttle Solenoid linkage at the clevis.
3. Manually pull the Throttle Lever until it contacts the High Speed Stop Screw.
4. Adjust the High Speed Stop Screw until the RPM is 3200 with the Throttle Lever against the High Speed Stop Screw.
5. Turn off the engine and reconnect the Throttle Solenoid linkage at the clevis.
6. Hold the High Speed Stop Screw while tightening the jam nut to prevent change in adjustment.

Throttle Solenoid Adjustment - Diesel

IMPORTANT: This final adjustment must be made after all other throttle speed adjustments. The solenoid must be free to retract fully in order to turn OFF the High Amperage Pull Circuit. Improper adjustment will result in solenoid failure and may damage the electrical system.

1. With the engine OFF, manually retract the solenoid by grasping the piston, just ahead of the boot, and pull to the fully retracted position.
2. With the solenoid piston fully retracted measure the distance between the High Speed Stop Screw and thethrottle linkage using a .020 feeler gauge.
3. Adjust clearance at the Throttle Solenoid linkage only. *Do not adjust the High Speed Stop Screw.*
   - Disconnect the linkage at the clevis and turn the clevis to lengthen or shorten as necessary.
   - Reconnect the clevis and measure again. Repeat until the measurement is correct.



OUTRIGGERS FUNCTION

The outriggers on the RT series MEC Scissor Lifts are a One-Touch Activation system. To deploy the outriggers, simply push the outrigger toggle switch down until the outriggers level the unit and the engine returns to idle. You are now ready to lift the platform. The outrigger control module is a “smart” unit, which will level the unit in all but extreme terrain so you don’t have to attempt to level it yourself.

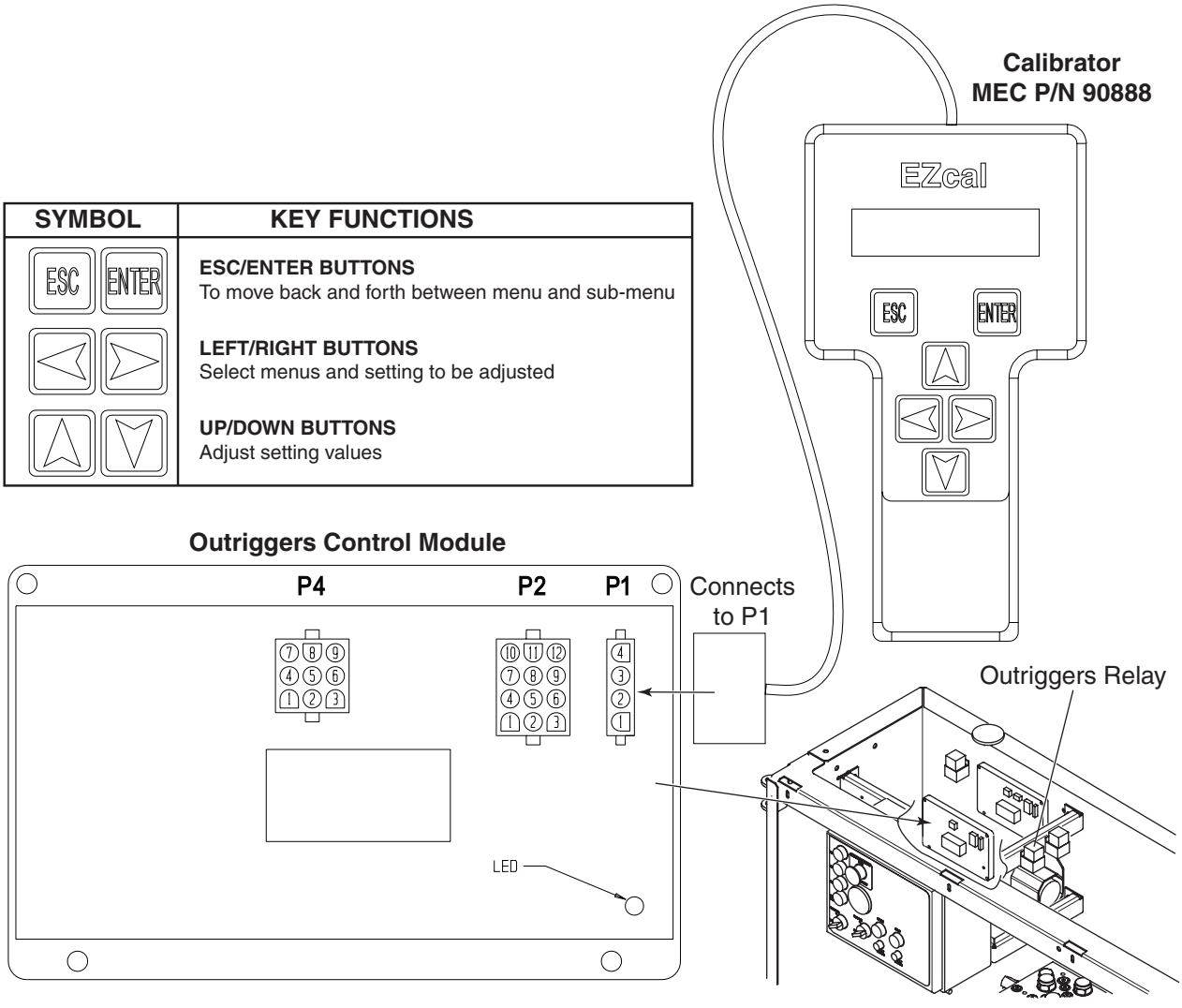
Operational Characteristics

- To deploy the outriggers, push the Outrigger Switch down and hold until the engine returns to idle. The unit will self-level.
- The outrigger legs can not be operated individually.
- The outriggers system will not operate when the platform is elevated above approximately 10 feet (3m)
- Travel is locked out when the outriggers are deployed. A Drive Indicator Light, above the outrigger switch, will illuminate when the outriggers are fully retracted.
- The engine will not return to idle when the outriggers are fully retracted. The drive indicator light is your signal that the outriggers are fully retracted.
- If the slope of the terrain is in excess of the outrigger’s leveling capabilities, the outrigger control system will continue to attempt to level and the engine will not return to idle. In this case, if the platform remains outside of the pre-described tilt sensor parameters, the unit will not elevate above 6 feet (2m) and the alarm will sound, indicating the out-of-level situation.
- The outrigger system uses a Top-out limit switch and a Pressure switch on each leg to monitor their respective positions.
- Each outrigger leg uses a Retract valve and an Extend valve to control cylinder stroke. These are located under the protective cover atop the outrigger leg.
- A 4-way, 3-position valve, on the outrigger hydraulic manifold controls the direction of oil flow to the outrigger legs.
- The GP106 Outrigger Control Module controls all outrigger valve and interlock duties as well as sensing unit level.
- Diagnosis of the GP106 Outrigger Control Module is possible by counting the number of flashes from the red LED and referring to *Outrigger Module GP106 LED Flash Codes* at the end of this section. Diagnosis and calibration of the outrigger module can also be done through the use of the EZ-Cal scan tool MEC part # 90888. (See GP106 troubleshooting in this section)
- If the GP106 Outrigger Control Module is ever replaced or removed or if you suspect that it requires calibration, you must use the EZ-Cal scan tool and the following directions to calibrate the outrigger module.

Outrigger Calibration

Before attempting the calibration procedure, move the machine to an area that is level as measured by a spirit level or other leveling device. An Ezcal hand-held device (MEC part # 90888) is required to carry out all calibration procedures on the GP106 Outriggers control module.

SYMBOL	KEY FUNCTIONS
ESC ENTER	**ESC/ENTER BUTTONS** To move back and forth between menu and sub-menu
◁ ▷	**LEFT/RIGHT BUTTONS** Select menus and setting to be adjusted
△ ▽	**UP/DOWN BUTTONS** Adjust setting values



Outriggers Tilt Sensor Calibration

The integral tilt sensor of the GP106 Outrigger Control Module must be calibrated to compensate for variations due to installation and vehicle construction. This procedure must be done if the control module is ever repositioned or replaced.

a. Drive machine to level ground.

b. Plug EZ-Cal into connector P1 on the control module.

Display reads HELP: PRESS ENTER.

c. Press right arrow to ACCESS LEVEL 3, Press Enter.

Display reads CODE 0000.

d. Press up and right arrows to enter code 1775, Press Enter.

Display reads ACCESS LEVEL 2.

e. Right arrow to MACHINE SETUP, Press Enter.

Display reads CHANGE DEFAULTS.

f. Right arrow to CALIBRATE LEVEL, Press Enter.

Display reads CALIBRATE LEVEL: YES:ENTER,NO:ESC.

g. Press Enter. Display reads TILT 0.0',0.0'

h. Press ESC, ESC

i. Disconnect EZ-Cal from the outrigger control module.

Outrigger calibration is now complete..

Outriggers Module GP106 Troubleshooting

When the **EZ-Cal** hand-held device is connected to the **GP106** control module, the first menu available is “HELP” – just press the **ENTER** button to see a message describing the current status of the **GP106**; this can be very helpful in diagnosing problems with the system.

When an **EZ-Cal** is unavailable, an LED on the **GP106** flashes to provide limited diagnostics

The following messages might be displayed:

EVERYTHING OK

The **GP106** detects no problems.

If problems are being experienced with the system, use the DIAGNOSTICS menus to check for wiring problems.

B+ SUPPLY TOO LOW

The **GP106** is designed for use on 12V and 24V battery powered vehicles; it cannot operate with a supply below about 9V.

The “BATTERY” voltage can be checked in the “SYSTEM” menu (available in the “DIAGNOSTICS” menu).

CANNOT LEVEL: BAD TILT SENSOR

Ensure that the **GP106** is correctly installed – if it is wrongly oriented, its integral tilt sensor will be unable to measure vehicle tilt correctly.

CHECK OUTRIGGERS SUPPLY (P4-9)

An auto-level or auto-retract signal has been detected by the **GP106** (on P2-5 or P2-6) but there is no supply on P4-9 to power the outrigger legs.

OUTRIGGERS MANUALLY CONTROLLED

The outrigger system cannot be manually controlled, but this message may appear. It indicates a wiring problem to terminal P2-2.

OUTRIGGERS CANNOT BE MOVED

The outrigger system will be unable to operate if the machine is on a steep slope greater than ten (10) degrees.

RELEASE OUTRIGGER DEMAND!

The **GP106** is waiting for an active signal on P2-5 or P2-6 to be released (due to activating a switch when power is applied, or in conjunction with manual use of the outriggers, or activating both switches together).

VEHICLE TILTED

Either the “X” or “Y” tilt (measured by the **GP106** integral tilt sensor) exceeds three degrees. This does not affect operation of outriggers.

OUTRIGGER WIRING FAULT

The system has detected voltage on P2-2 but voltage is not present on P2-5 or P2-6. Check wiring to P2-5/6.

Outriggers Module GP106 LED flash Codes

The **GP106** has a built-in LED to provide simple diagnostics when no **EZ-Cal** is available. Please note that the use of an EZ-Cal provides significantly better diagnostics through the HELP messages listed previously.

LED on steady

This indicates power to, and no fault with, the **GP106**

LED off always

This indicates no power to the **GP106**

LED flash code 1

Wiring Fault. Check connection to P2-2.

LED flash code 2

This indicates a fault with the switch inputs to the **GP106**. Check wiring to connector P2.

LED flash code 3

This indicates a fault with the “stable” output of the **GP106** – a short to the supply has been detected. Check wiring from pin P2-8

LED flash code 4

This indicates that the outriggers cannot be operated because the machine is on a slope greater than ten (10) degrees. Move machine to a different location.

LED flash code 5

This indicates a fault with the “stable” output of the **GP106** – a short to 0V (ground) has been detected. Check wiring from pin P2-8

LED flash code 6

This indicates a fault with the “auto” inputs of the **GP106** – check the wiring to pins P2-5 & P2-6

LED flash code 7

This indicates a fault with the supply to the **GP106** – check battery supply at least 8V on pins P2-12 & P4-9

LED flash code 8

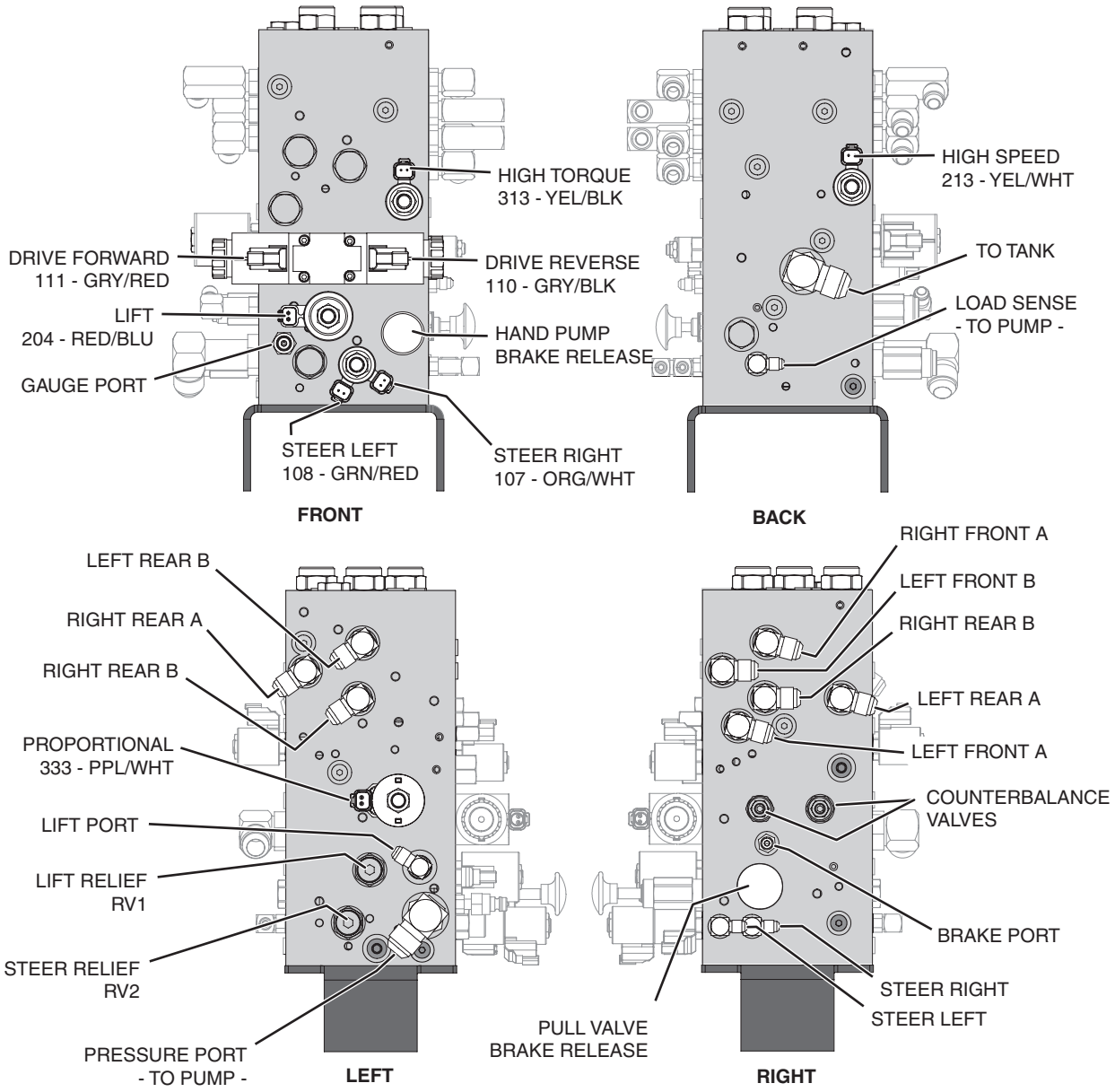
This indicates that the machine is not level. It is not a fault and will not affect operation of outriggers.

LED flash code 9

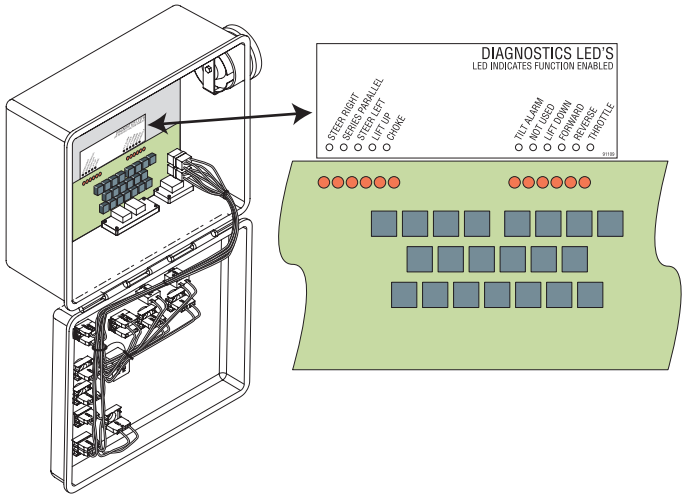
This indicates that the **GP106** is performing startup tests.

SECTION 5:
TROUBLESHOOTING

HYDRAULIC MANIFOLD



DIAGNOSTIC LEDs



TROUBLESHOOTING

The 3072RT and 3772RT are designed for ease of diagnostics. There is a terminal strip located under the work platform for checking signals to and from Upper Controls. There are also LED's located in the Lower Controls box to indicate outputs from the circuit board.

Diagnostic Example: if the lift LED does not illuminate when attempting to lift, either the main power is not on, or board is not receiving a signal for lift. If LED is illuminated but machine does not lift, there would be an electrical problem between the Circuit board and the valve, or a hydraulic problem. The main valve block is equipped with a quick disconnect gauge port to help diagnose the hydraulic system.

General Troubleshooting Tips

Before investigating a malfunction, check the following items:

- Check that battery switch is turned on.
- Check that battery connections are secure and battery if 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 circuit breaker is in the "ON" position (not tripped).

Common Causes of Hydraulic System Malfunctions:

- Incompatible hydraulic fluids mixed, destroying the additives and causing varnish build up, 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.
- Hydraulic oil contaminated with debris - filter change interval neglected.

NOTE: Mobil Fluid 424 Hydraulic Oil, is a multiple viscosity oil that is light enough for cold climates and resists thinning in warm climates. Only Mobil Fluid 424 or equivalent must be used. Substituting with a lower grade oil will result in pump failure.

Following is a step by step basic troubleshooting guide.

NOTE: Contamination always causes failure in any hydraulic system. It is very important to be careful not to introduce any contamination into hydraulic system during the assembly procedures. Please make sure all ports and cavities of the manifold and cylinders are properly covered/plugged during maintenance activities.

PROBLEM	PROBABLE CAUSE	REMEDY/SOLUTION
General Power Issue		
No operation from upper or Upper Control station	Main battery switch turned off	Located left of Lower Controls box
	Emergency switch pushed in or Ignition switch turned off	Upper or lower Emergency Stop switch will cut all power as will the Ignition switch in the Platform Controls box
	Dead Battery	Charge battery
	Blown fuse	Sealed unit just below Lower Controls box
	Circuit breaker tripped	Reset - Located in Lower Controls box panel
	Damaged Upper Controls box harness	Inspect from harness plug to terminal strip under platform
	Failed 25 AMP diode	Test/replace. Located inside Lower Controls box
	Failed Power Relay on Circuit board	Replace circuit board in Lower Controls box
Functions from Upper Controls but not from Upper Controls	Faulty relay, located in Upper Controls box	Check power on wire 101 from Key switch Check power on wire 101A from relay to Joystick plug
	Interlock switch (Joystick)	Check power to RED wire (power to switch) and power to PURPLE wire (power out of switch) at Joystick plug
Lift/Lower		
Platform will not Raise	Excessive weight on Platform	Reduce weight to within platform capacity
	Lift Relief valve out of adjustment	Adjust relief valve to rated capacity
	Lift Valve SV-1 not energized	Check lift circuit from Upper Controls box to SV-1 valve
	Lowering valve SV-5 stuck open (located at base of lift cylinder CYL-1)	Check and remove contamination, E-Down cable damaged or replace valve
	Level Sensor out of level (platform elevated above 6')	Reposition machine to firm level surface, Check Level Sensor function
	Main system pressure inadequate	Check pump output pressure (see *Hydraulic Pump Adjustment* in this section)
	Proportional control out of adjustment (High Range Adjustment)	See section on *Proportional Controller Adjustment* in this section
Platform will not lower or lowers slowly	Maintenance Lock in maintenance position	Return Maintenance Lock to the stowed position
	Lowering valve not energized	Check lowering circuit from Upper Controls box to Lowering valve SV-5
	Lowering valve not shifting	Clean debris, replace
	Lowering orifice (ORF-3) plugged	Clean orifice
Lowers but not completely (3772RT only)	Down valve on one cylinder inoperative	Check valve coils
Emergency lowering not working	E-Down cable broken or frayed (3072)	Replace E-Down cable
	Lowering valve not shifting	Clean debris, replace
	Lowering orifice (ORF-3) plugged	Clean orifice
3772RT ONLY	E-Down battery discharged	Charge, check charge diode & connections
	Valve coil failed on either cylinder	Test, replace
Lowers but not completely	Down valve on one cylinder inoperative	Check valve coils, wiring

continued...

PROBLEM	PROBABLE CAUSE	REMEDY/SOLUTION
Drive		
No drive function	Valve SVD1 not energizing	Check forward/reverse LEDs lighting up at circuit board inside Lower Controls box Check connections at valve Check voltage at valve Check ground to valve Check valve for proper functioning
	brakes not releasing	Check OD1 brake orifice for contamination
	Proportional Control out of adjustment (High Speed adjustment)	See *Proportional Controller Adjustment* in this section
(with outriggers option)	Outriggers lowered	Check Drive Enable light - raise outriggers
	Outrigger Retracted switch/s inoperative	Check enable light on Platform Controls box Check outrigger switches located on top of each outrigger jack for continuity
No drive elevated	Proportional Control out of adjustment (Low Range adjustment)	See *Proportional Controller Adjustment* in this section
	Jumper - axle float bypass missing from circuit board, Lower Controls box	Forward Reverse LEDs not lighting up at Lower Controls circuit board? Install jumper wire.
(with outriggers option)	Outriggers lowered	Check Drive Enable light - raise outriggers
	Unit out of level	Lower and reposition the machine. Check Level Sensor malfunction
Slow drive with Platform stowed	High torque enabled	Check Speed/Torque switch in Platform Controls Box
	Limit switch not functioning	Limit switch at left-rear of base Check continuity between wire 2 TAN/ORG and wire 20 RED/WHT. Continuity = platform stowed.
	Upper Controls circuit board running in slow speed mode	12 volts to “R” terminal on circuit board in Platform Controls box = High Range
	Proportional Control out of adjustment (Low Range adjustment)	See *Proportional Controller Adjustment* in this section
	Engine not running to full potential	Check engine operation as per engine manufacturer guidelines
	Wheel motor/s not functioning correctly	Inspect wheel motors for excessive bypass
	RV3 or RV4 not adjusted correctly	Check and adjust relief valves
Drive in one direction only	Rev-Up or FWD-Down micro-switch failure	Check micro-switches on Joystick controller for function or adjustment
	Drive valve SVD1 not energizing in one direction	Check 12 volts to appropriate coil, check coil, check valve function
	Counterbalance valve CBV1 or CBV2 not functioning correctly	Swap Counterbalance valves to see if functioning direction changes.
No low speed (high torque mode)	Speed/Torque selector switch inoperative	Check for 12 volts on terminals 2 & 3 of Speed/Torque switch in Platform Controls box with drive enabled
	Valve SV3 not functioning	Check for 12 volts and ground to valve Check for faulty valve spool
	EP1 poppet valve not functioning	Check or replace valve

continued...

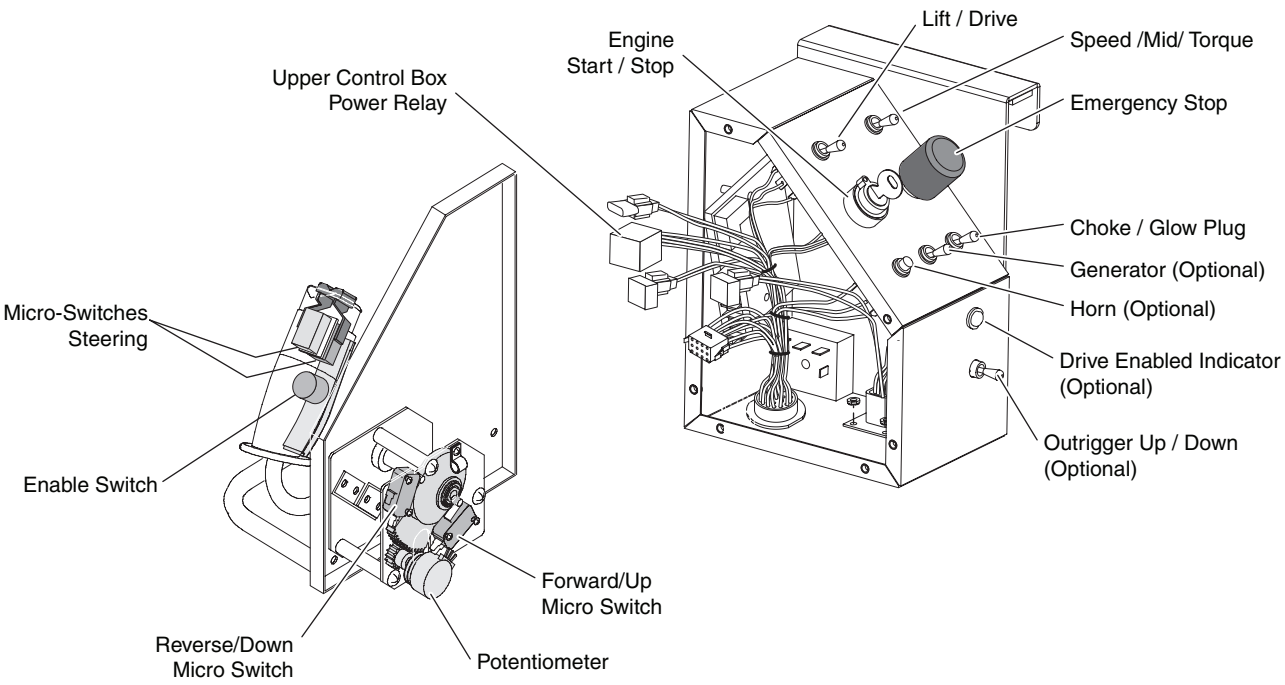
PROBLEM	PROBABLE CAUSE	REMEDY/SOLUTION
Drive		
No Mid Speed	SV3 or SV4 powered and/or shifted	These valves should not have 12 volts, in mid-speed, check valve function
	Speed/Torque selector switch malfunction	Should not have power at terminals 1 & 3 of Speed/Torque switch in Platform Controls box with drive enabled
No High Speed	Speed/Torque selector switch inoperative	Check for 12 volts on **all** terminals of Speed/Torque switch in Platform Controls box with drive enabled
	Faulty diode block DB1	Test DB-1 in Platform Controls box.
	Valve SV4 not functioning	Check voltage and ground to valve check for faulty valve spool
	EP2 poppet valve not functioning	Check or replace valve
Multi-Function		
No drive or Lift function from Upper Controls with steer operational	PWM circuit board in Platform Controls box not functioning correctly	Check battery + and - terminals at board. Check PWM output at A terminal. Check connections between A terminal and Proportional valve.
	Proportional valve malfunction	Check, for 1 AMP at valve during full Joystick stroke. Replace Proportional valve SP-1
	EC1 pressure compensation valve not functioning	Check, replace valve EC1
No steering With Drive operational	SV2 not functioning	Check voltage and ground to valve Check for faulty SV2 valve
	Faulty lift/drive selector switch	Check power on wire #25A on switch
	Faulty steer switch	Check switch in Joystick handle
	Steering Cylinder/s internal leakage	Check for internal leakage - repair
	RV1 steer relief valve not functioning	Check adjustment or replace

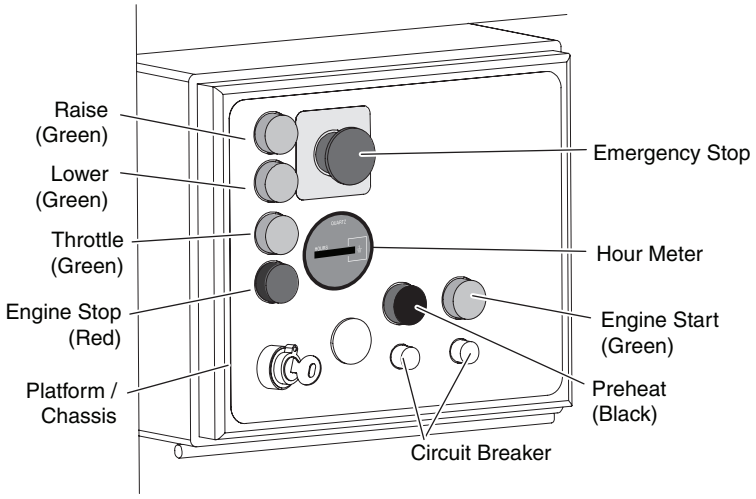
continued...

PROBLEM	PROBABLE CAUSE	REMEDY/SOLUTION
Diesel Engine		
Starter inoperative	Battery Cables loose or corroded	Clean, tighten cables
	Key switch not functioning	Check power to wire #20 at Key switch while cranking
	Starter not functioning	Check power to YEL/RED #220 wire at starter, Check ground cable to engine bell housing
	Circuit board relay failed	Check **input** on plug A pin-17, ORG/RED wire #20 on Lower Controls circuit board Check **output** on plug B pin-1, YEL/RED wire #220 on Lower Controls circuit board. *12 volts in - 0 volts out = replace circuit board*
No Engine start: Starter operates	Low diesel fuel level	Fill diesel tank, (see *Section 3* for Fuel Priming instructions)
	Fuel valve closed - located at fuel tank	Open valve
	Air in injector lines	See *Section 3* for Fuel Priming instructions
	Fuel filter clogged	Replace fuel filter
	Run solenoid not activating	Check power at WHT/BLK wire #320 from starter to run solenoid while cranking (WHT/BLK pull in, GRN/WHT hold wire)
	Glow plugs inoperative	See "*Glow Plugs Inoperative*" in this section
Engine starts but dies when starter disengaged	Faulty oil pressure switch	Check switch and wiring
	Faulty Fuel solenoid	Check 12 volts on GRN/WHT wire #116 - Replace Fuel Solenoid
Throttle & Glow Plugs		
Throttle does not operate	Misadjusted Throttle Solenoid (misadjusted throttle solenoid will result in the failure of the solenoid) maladjusted	Adjust throttle linkage NOTE: throttle linkage adjustment is critical on diesel engine)
	Throttle Solenoid failure	Check + and - to solenoid while operating Throttle
	Throttle Relay (located on side of engine)	Test for 12 volts on RED wire #00 and ORG wire # 225 while throttle is requested *Power on these wires should = 12 volts on ORG/BLK wire 325*
	Failed diode block (Large) located in Upper Controls box	Test and/or replace diode block Check for Throttle LED on Upper Control board
Throttle does not remain energized	Failed Throttle solenoid	Replace Throttle Solenoid
Glow Plugs inoperative	Failed Glow Plug Switch	Try Glow Plug switch on opposite control panel, Check for LED on Lower Controls circuit board.
	Failed Glow Plug Relay - located on side of engine	Test for 12 volts on RED #00 wire and on ORG/WHT wire #124 while operating glow plugs. *Power on these wires should = 12 volts on ORG/BLU wire 224*
	Failed glow plugs	Check for 12 volts at glow plugs while operating glow plugs.

end Trouble Table

CONTROLS AND SWITCHES



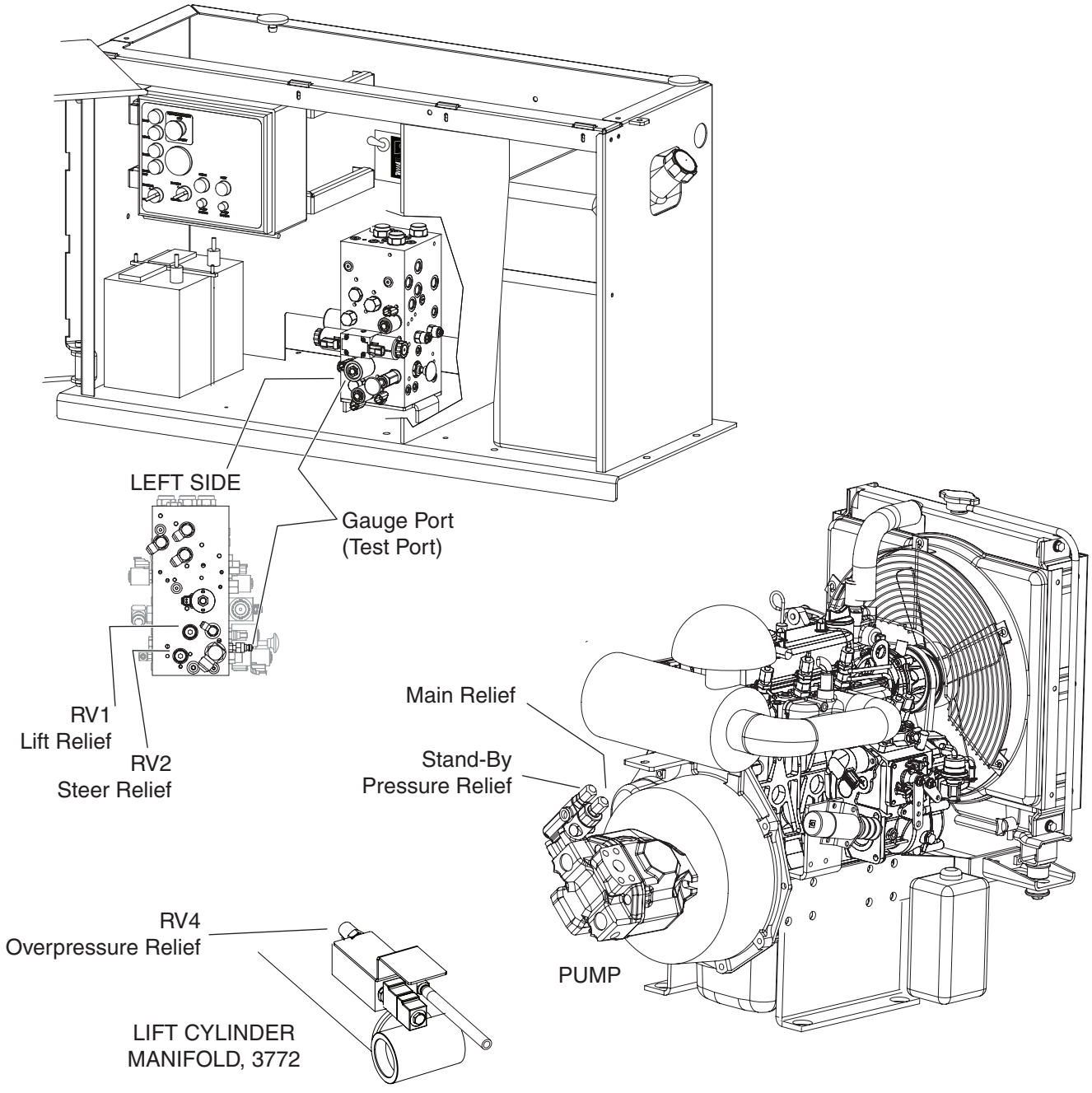


HYDRAULIC PRESSURE ADJUSTMENT PROCEDURES

- Before attempting to check and/or adjust pressure relief valves, operate the machine for 15 minutes or long enough to sufficiently warm the hydraulic oil.
- Insert a 0-5000 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	STAND-BY
3072RT	2800 PSI 193 bar	2500 PSI 172,4 bar	1500 PSI 103,4 bar	500-550 PSI 35-38 bar
3772RT	2800 PSI 193 bar	2500 PSI 172,4 bar	1500 PSI 103,4 bar	500-550 PSI 35-38 bar



Pump Adjustment

The Hydraulic Pump used in this model is a Variable Displacement, Pressure Compensated, Piston type pump. Proper adjustment is critical for normal operation of the machine. The following paragraphs will guide you through the various steps however, you must perform all steps, in their listed sequence, in order to achieve proper adjustment and machine performance.

Main Relief and Standby Adjustments

1. Start engine and operate the unit for 15 minutes or until the hydraulic oil is warm.
2. Insert a 0 – 5000 PSI (0-345BAR) gauge onto the manifold pressure gauge port.
3. Remove the acorn nut from the Main Relief adjustment screw. Loosen the jam nut and turn the screw counterclockwise 3 turns. Tighten the jam nut and install the acorn nut.
4. Remove the acorn nut from the Standby adjustment screw and loosen the jam nut. Turn the screw clockwise 3 turns or until the needle on the gauge stops climbing. At this point the gauge is reading full main relief pressure.
5. Access the Main Relief screw again and adjust it until the gauge settles at 2800 PSI (193.5bar). Tighten the jam nut and install the acorn nut.
6. Check the gauge reading again to ensure the setting did not change.
7. Turn the Standby adjustment screw counterclockwise until the gauge reads 550 PSI (38bar). Tighten the jamb nut and install the acorn nut.
8. Check the gauge reading again to ensure the setting did not change.

Pump Displacement Adjustment

This adjustment is set at the factory and should not be tampered with. The Displacement adjustment controls the maximum amount of oil flow that the pump will produce per revolution. Excessive flow will result in severe engine loading and stalling. Reduced flow will result in slower functions with no engine loading. If you suspect that the sitting is incorrect, please call MEC Product Support at (800) 387-4575 for assistance.

Main Relief

See Pump Adjustment Procedure.

Stand-By Pressure

See Pump Adjustment Procedure.

Lift Relief (RV1)

The Lift Relief valve is located on the left-side, center of the valve manifold. It will be necessary to remove the cap from the relief valve if adjustment is necessary. REMOVING THE CAP WHILE THE ENGINE IS RUNNING WILL RESULT IN OIL LEAKAGE.

To check Lift Relief valve setting, park the machine on a firm level surface free from overhead obstructions. Using the lift switch on the lower panel, elevate the platform to full elevation. While maintaining the lift command, record the reading on the gauge.

Steering Relief (RV2)

The steering Relief valve is located on the left side, lower of the valve manifold. It will be necessary to remove the cap from the relief valve if adjustment is necessary. REMOVING THE CAP WHILE THE ENGINE IS RUNNING WILL RESULT IN OIL LEAKAGE.

To check Steering Relief valve setting, operate steer in one direction. While maintaining the steer command, record the reading on the gauge.

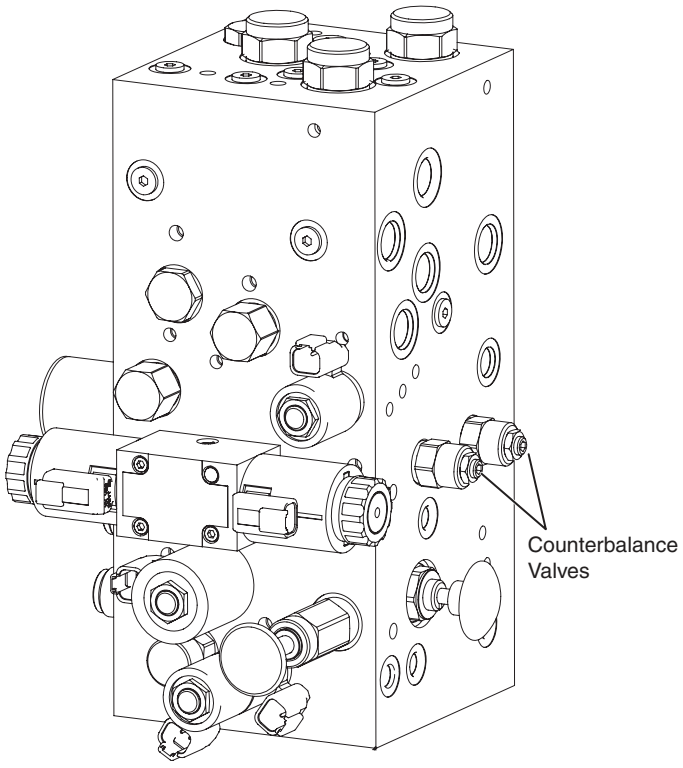
Lift Cylinder Overpressure Valves (RV4) 3772RT Only

The Lift Cylinder Overpressure valves are located on each of the lift cylinder valve blocks on the 3772RT model only.

Proper valve adjustment is not possible by the consumer. Considering their importance to the safe operation of the machine, they must not be tampered with. If the valve is suspected to be out of adjustment or tampered with, it must be replaced.

Setting Counterbalance Valves

1. Loosen the locknut on one of the valves.
2. Turn the adjustment screw counterclockwise (to the left) until it reaches the internal stop and the screw will turn no further.
3. Turn the adjustment screw clockwise (to the right) 1½ turns.
4. Tighten the locknut while holding the adjustment screw in position to prevent it from rotating.
5. Repeat steps 1 through 5 on the other Counterbalance valve.
6. Adjustment is complete.



PROPORTIONAL SPEED ADJUSTMENT

CAUTION

Proportional Circuit Board Adjustment should only be performed after all other components are deemed to be in proper working order.

There are many factors that may contribute to excessively fast or slow drive speeds. Proportional Circuit Board Adjustment should only be performed after all other components are deemed to be in proper working order and not contributing to abnormal driving speeds. Failure to do so may result in incorrect speeds once the offending component has been repaired.

Circuit Board Setting Test Procedure

Before you begin, ensure there are no overhead obstructions preventing lift to full height. Lay out a course measured at 20 feet (6 meters) long. Ensure there are no obstructions preventing a straight travel over the distance of the course including leading up to and away from the course. Try not to steer while driving the timed course.

High Speed Drive Test:

With the platform fully lowered, drive the machine over the course, crossing the start line at full speed. Record the time it takes for a (predetermined) point on the machine to cross both lines and compare with the chart below using the 'High Range' column figure.

Elevated Speed Drive Test:

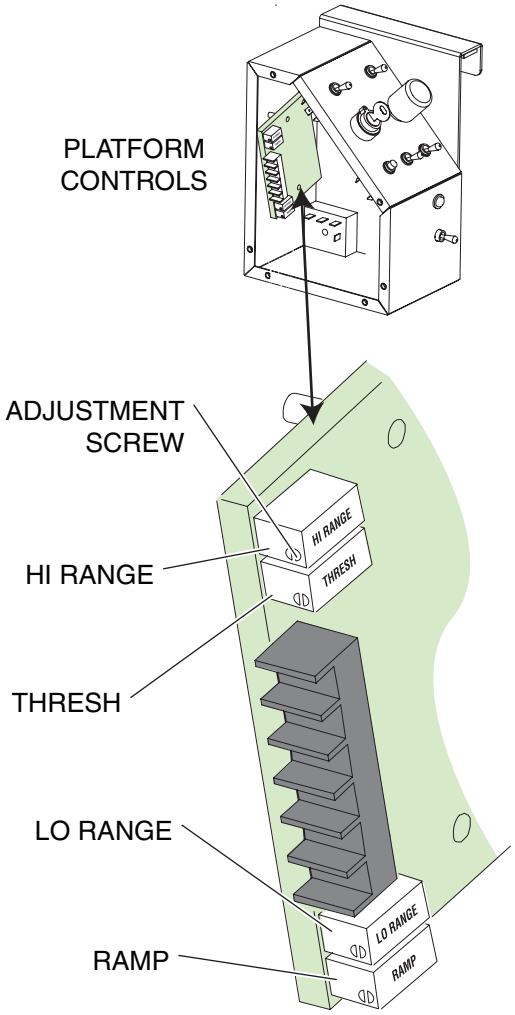
Elevate the platform above 12 feet (3.6 meters). Drive the machine over the course, crossing the start line at full speed. Record the time it takes for a (predetermined) point on the machine to cross both lines and compare with the chart below using the 'Low Range' column figure.

Speed Adjustment Table: 20 ft. (6 m) Course

TRIM POT	TRAVEL TIME IN SECONDS
High Range	3.5 to 4.0
Low Range	27 to 33

Adjustment Procedure

Note: Proportional Controller adjustments should only be made when the possibility of unauthorized tampering exists or after the Proportioning Valve or Proportional Circuit board was replaced. Though testing the proportional output should be part of routine maintenance, adjustments should not be necessary as a routine maintenance procedure.



The Trim Pots are located in the Platform Controls box (see illustration).

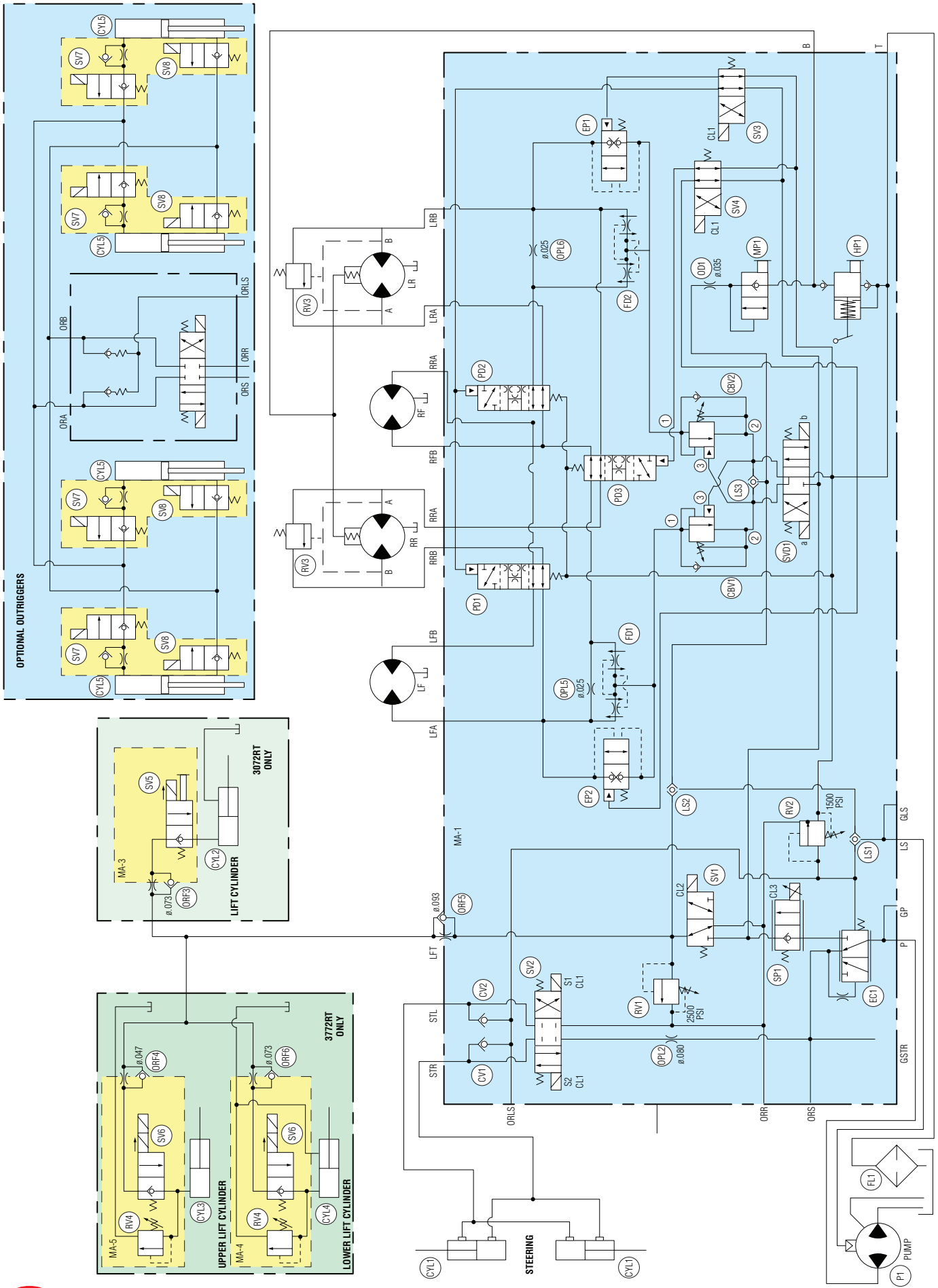
1. Turn the RAMP trim pot counterclockwise until a clicking noise is heard.
2. Ensure there are no overhead obstructions preventing lift to full height. Select LIFT mode, pull the enable and move the Joystick in reverse slowly to the point that the engine accelerates and hold it at that point. While holding the Joystick in that position, adjust the THRESH trim pot until the platform does NOT lift. Once adjusted, slight additional reverse motion of the Joystick should result in very slow and controlled lift action.
   - **Counterclockwise trim pot adjustment increases the amount of Joystick travel before platform movement.**
   - **Clockwise trim pot adjustment will allow platform movement sooner in the Joystick travel.**
3. If the machine was slow in the High Speed portion of the test, turn the HI RANGE trim pot clockwise until a clicking noise is heard.
4. If the Elevated Speed Drive Test resulted in speeds other then those listed, turn the LO RANGE trim pot clockwise to increase elevated drive speed or counterclockwise to decrease elevated drive speed to the proper speed. Repeat the Elevated Speed Drive Test.
5. The RAMP trim pot controls the smoothness of the motion start-up and linear ramp-up response. Turn the RAMP trim pot clockwise until the slowest machine start-up can be achieved while maintaining good proportional ramp-up through the travel of the Joystick.

SECTION 6:
SCHEMATICS

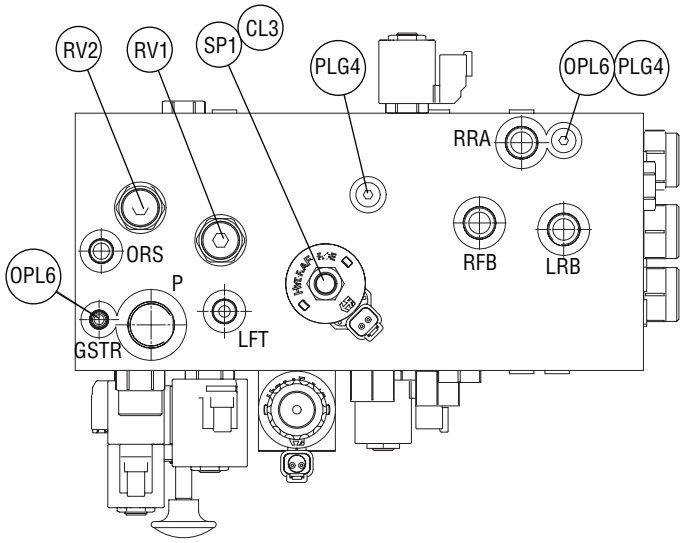
HYDRAULIC SCHEMATIC

Callout	Description
	Lift Cylinder Components (3072RT)
CYL2	Cylinder
MA3	Manifold, Lift Cylinder
SV5	Solenoid Valve - 12V Cable Attach
ORF3	Orifice - 0.073
	Lift Cylinder Components (3772RT)
CYL3	Cylinder, Upper
MA5	Manifold, Lift Cylinder, Upper
SV6	Solenoid Valve - 12V Dual Coil
RV4	Relief Valve - 3200 PSI
ORF4	Orifice - 0.073
CYL4	Cylinder, Lower
MA4	Manifold, Lift Cylinder, Lower
SV6	Solenoid Valve - 12V Dual Coil
RV4	Relief Valve - 3200 PSI
ORF6	Orifice - 0.047
	Wheel Motor Components
LF	Wheel Motor - Left Front
LR	Wheel Motor - Left Rear
RV3	Relief Valve - 3000 PSI - Cross Port Relief
RF	Wheel Motor - Right Front
RR	Wheel Motor - Right Rear
RV3	Relief Valve - 3000 PSI - Cross Port Relief
P1	Pump - Variable Displacement Pressure Compensated
FL1	Return Filter - 10 Micron
CYL1	Cylinder, Steering
	Optional Outriggers Components
CYL5	Outrigger Cylinder
SV7	Solenoid Valve, Poppet N.C.
SV8	Solenoid Valve, Poppet N.C.
SV9	Spool Valve, 4Way - 3 Position

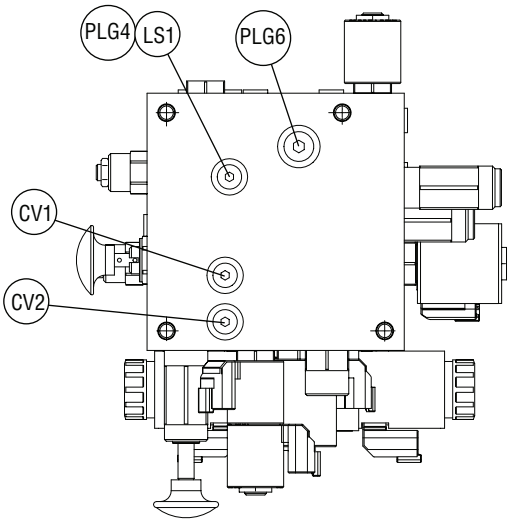
Callout	Description
	Manifold Components
MA1	Manifold, Main Valve Block
SVD1	Spool Valve, Drive, 4 Way - 3 Position
SV1	Spool Valve, Lift, 3 Way
SV2	Spool Valve, Steer, 4 Way - 3 Position
SV3 - SV4	Spool Valve, Series Parallel, 4 Way - 3 Position
SP1	Proportional Valve - 12V
RV1	Relief Valve, Lift - 2500 PSI
RV2	Relief Valve, Steer - 1500 PSI
PD1 - PD2 - PD3	Piloted Spool Valve, 4 Way - 3 Position
EP1 - EP2	Piloted Poppet Valve
MP1	Manual Pull Valve
LS1 - LS2 - LS3	Load Sense Shuttle Check Valve
CBV1 - CBV2	Counter Balance Valve
CL1	Coil, Series 8 - 12V
CL2	Coil, Series 10 - 12V
CL3	Coil, Series 10 E-Coil - 12V
HP1	Hand Pump, Brake Release
FD1 - FD2	Flow Divider / Combiner
EC1	Pressure Compensator
CV1 - CV2	Check Valve, Load Sense
OD1	Orifice Disc, Brake - 0.035
OPL2	Orifice Plug, Steer - 0.080
OPL5 - OPL6	Orifice Plug, Flow Divider Bleed - 0.025
ORF5	Orifice, Decent Control - 0.093


OPTIONAL OUTRIGGERS
3072RT ONLY
LIFT CYLINDER
3772RT ONLY
UPPER LIFT CYLINDER
LOWER LIFT CYLINDER
STEERING
PUMP
MA-1
MA-2
MA-3
MA-4
MA-5
LRB
LRA
RRA
RFB
RRB
LFB
LFA
LFT
STL
STR
ORLS
ORR
ORS
GLS
LS
GP
P
GSTR
1500 PSI
2500 PSI

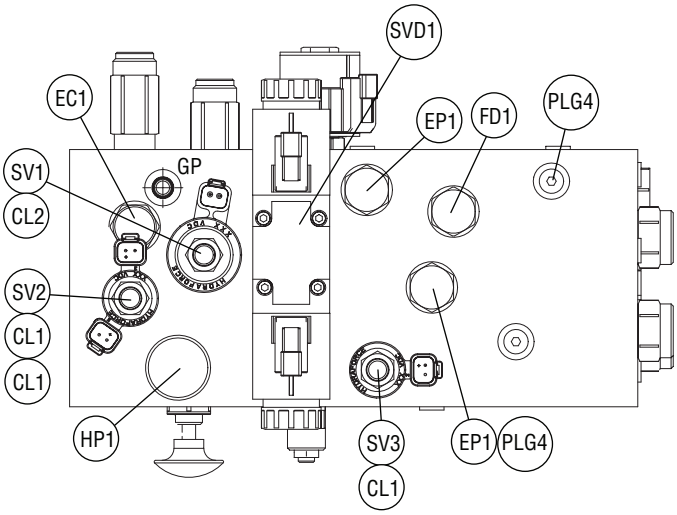
Main Hydraulic Manifold



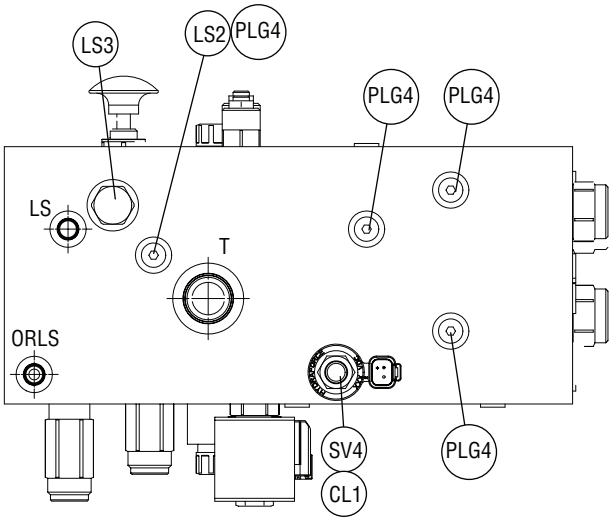
LEFT



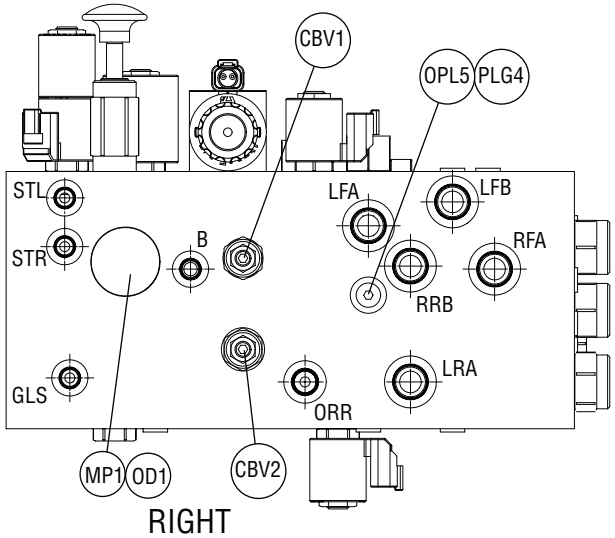
BOTTOM



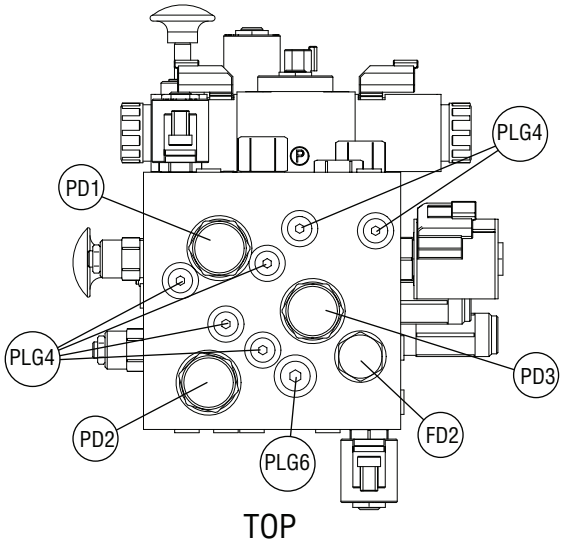
FRONT



BACK

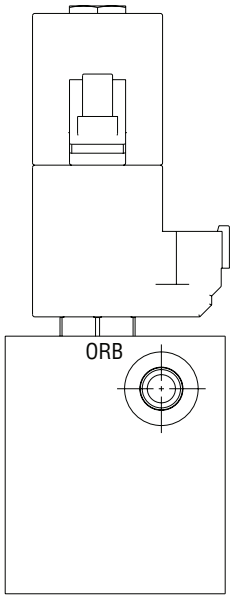


RIGHT

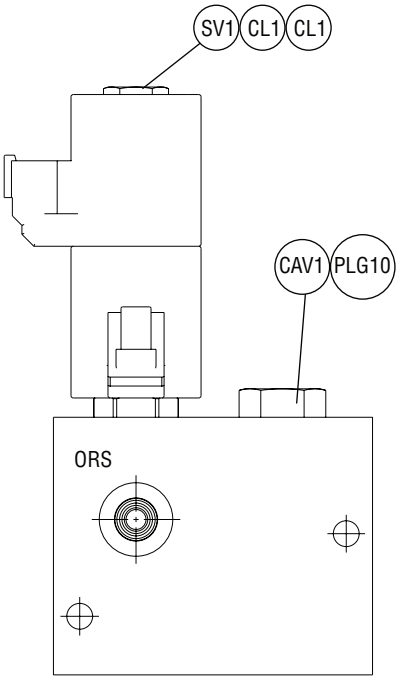


TOP

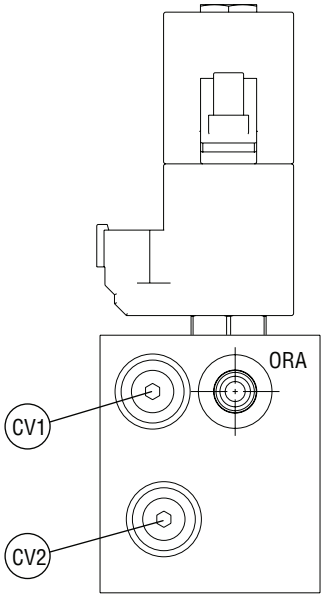
Optional Outriggers Hydraulic Manifold



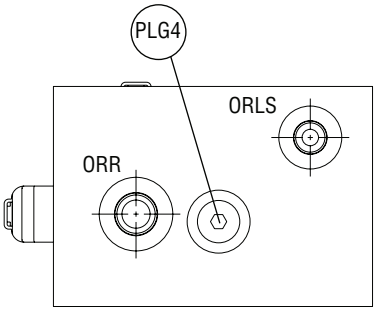
LEFT



FRONT

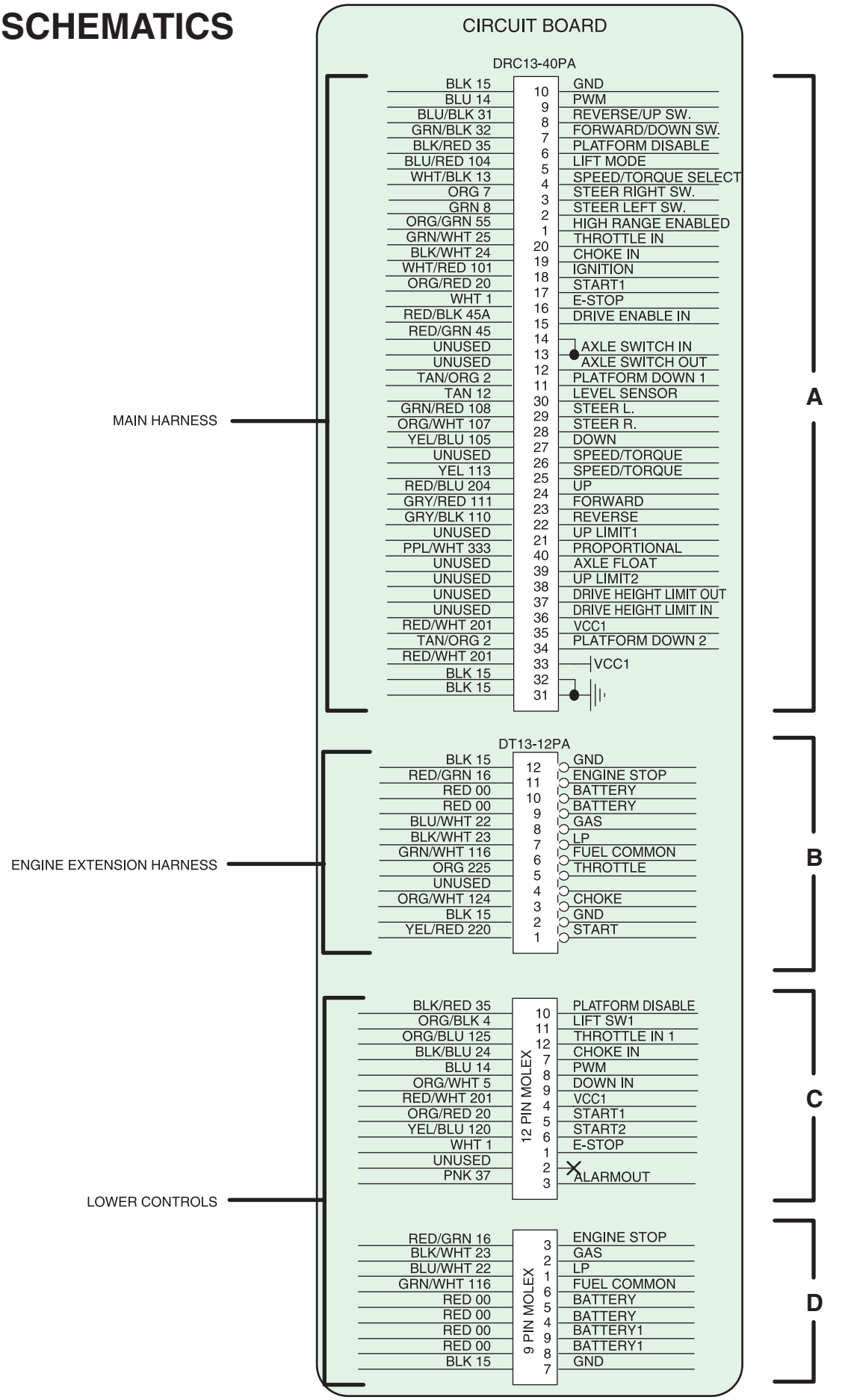


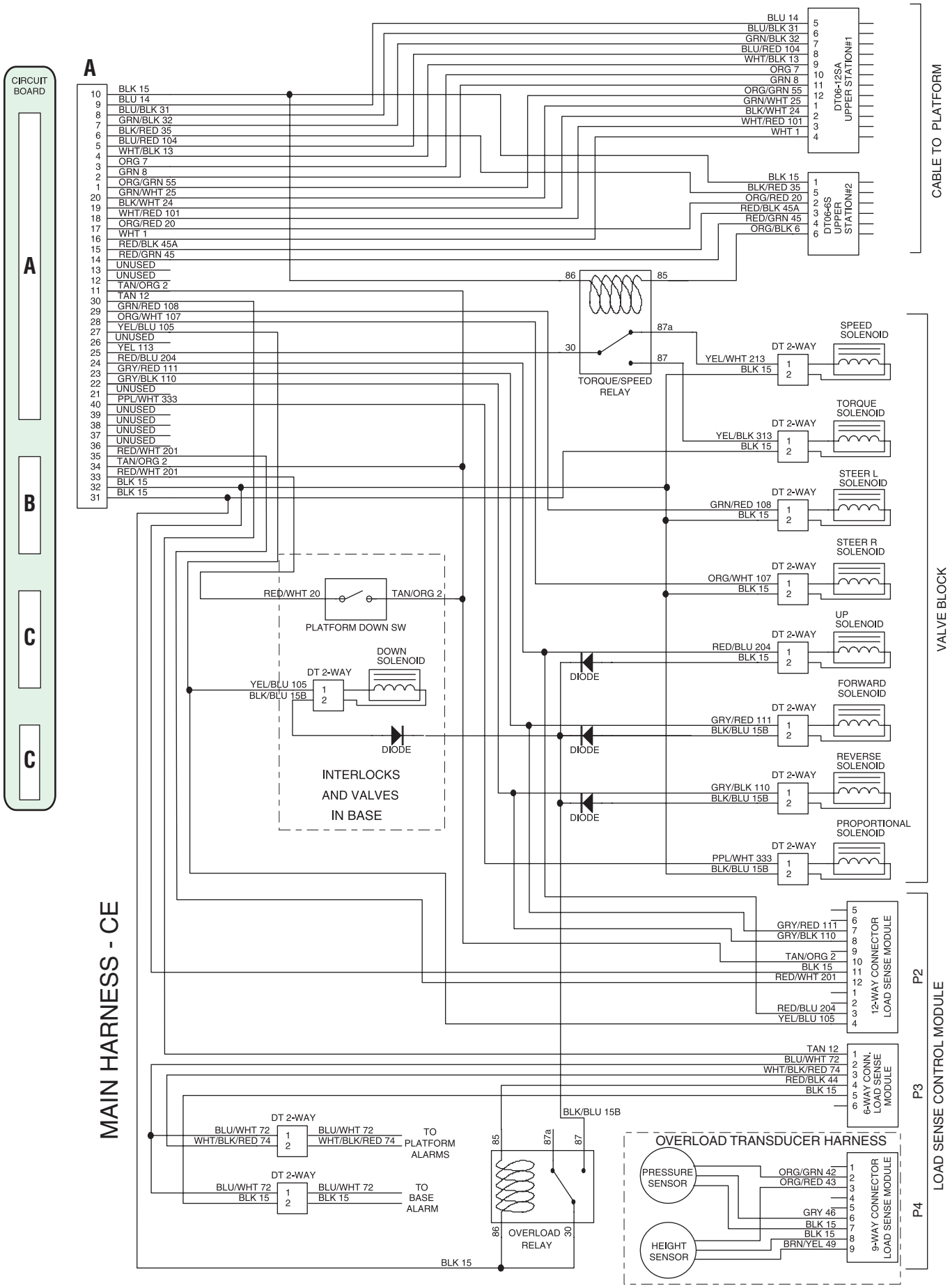
RIGHT



BOTTOM

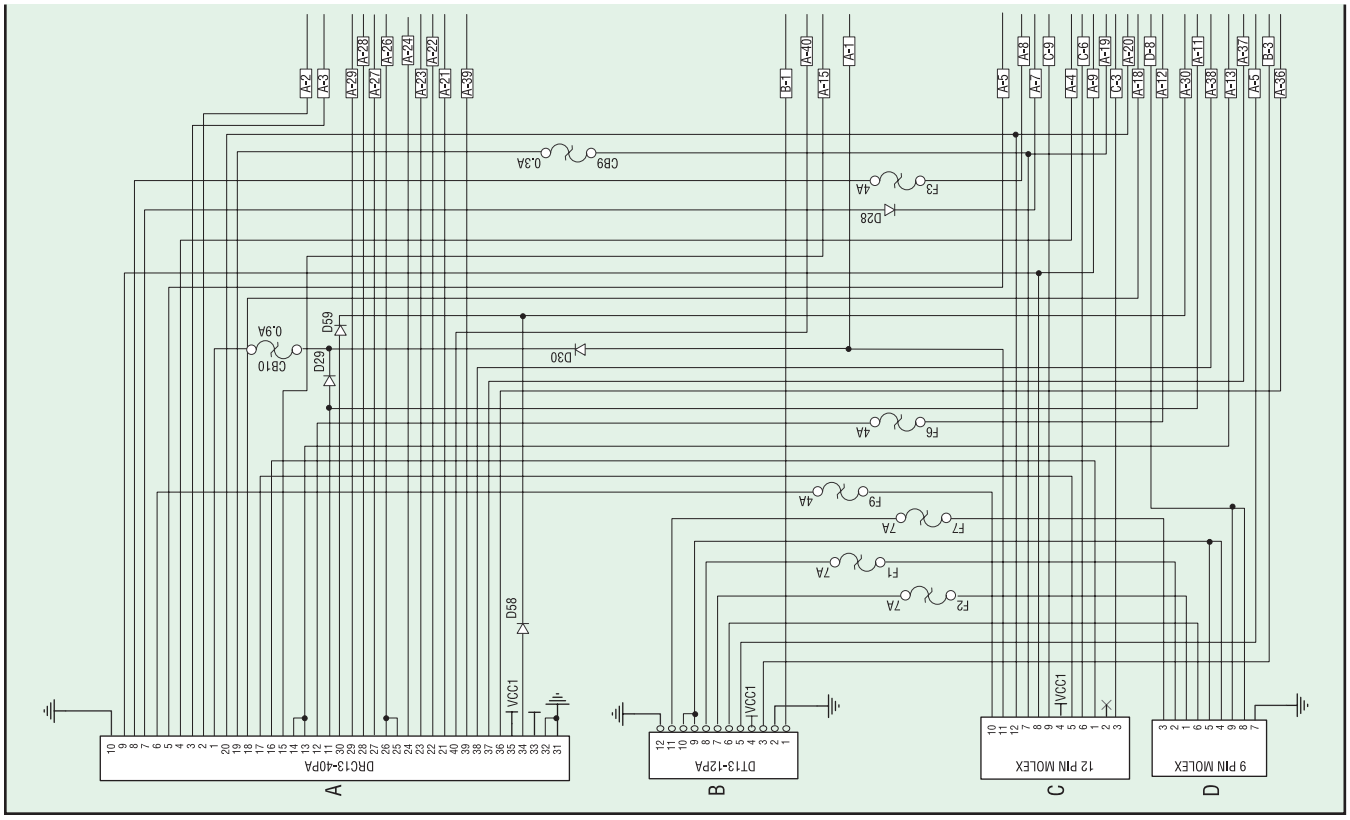
ELECTRIC SCHEMATICS

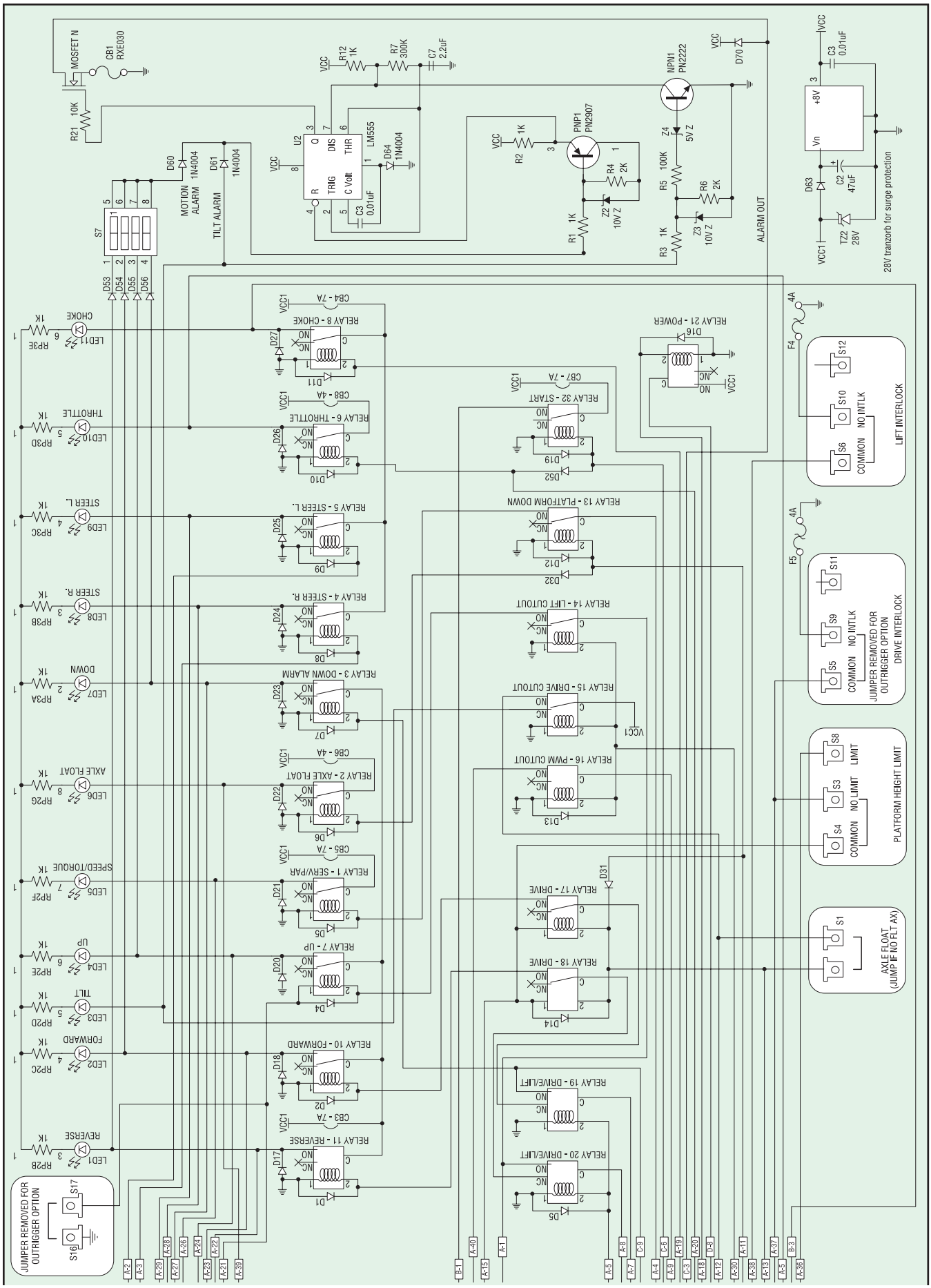



CIRCUIT BOARD
A
B
C
C
A
BLK 15
BLU 14
BLU/BLK 31
GRN/BLK 32
BLK/RED 35
BLU/RED 104
WHT/BLK 13
ORG 7
GRN 8
ORG/GRN 55
GRN/WHT 25
BLK/WHT 24
WHT/RED 101
ORG/RED 20
WHT 1
RED/BLK 45A
RED/GRN 45
UNUSED
UNUSED
TAN/ORG 2
TAN 12
GRN/RED 108
ORG/WHT 107
YEL/BLU 105
UNUSED
YEL 113
RED/BLU 204
GRY/RED 111
GRY/BLK 110
UNUSED
PPL/WHT 333
UNUSED
UNUSED
UNUSED
UNUSED
RED/WHT 201
TAN/ORG 2
RED/WHT 201
BLK 15
BLK 15
DT06-12SA UPPER STATION#1
DT06-6S UPPER STATION#2
CABLE TO PLATFORM
86
85
87a
30
87
TORQUE/SPEED RELAY
SPEED SOLENOID
TORQUE SOLENOID
STEER L SOLENOID
STEER R SOLENOID
UP SOLENOID
FORWARD SOLENOID
REVERSE SOLENOID
PROPORTIONAL SOLENOID
DT 2-WAY
YEL/WHT 213
YEL/BLK 313
GRN/RED 108
ORG/WHT 107
RED/BLU 204
GRY/RED 111
GRY/BLK 110
PPL/WHT 333
BLK 15
BLK/BLU 15B
DIODE
RED/WHT 20
TAN/ORG 2
PLATFORM DOWN SW
DOWN SOLENOID
YEL/BLU 105
INTERLOCKS AND VALVES IN BASE
VALVE BLOCK
MAIN HARNESS - CE
12-WAY CONNECTOR LOAD SENSE MODULE
6-WAY CONN. LOAD SENSE MODULE
9-WAY CONNECTOR LOAD SENSE MODULE
P2
P3
P4
LOAD SENSE CONTROL MODULE
TAN 12
BLU/WHT 72
WHT/BLK/RED 74
RED/BLK 44
BLU/WHT 72
WHT/BLK/RED 74
TO PLATFORM ALARMS
BLU/WHT 72
BLK 15
TO BASE ALARM
BLK/BLU 15B
OVERLOAD RELAY
OVERLOAD TRANSDUCER HARNESS
PRESSURE SENSOR
HEIGHT SENSOR
ORG/GRN 42
ORG/RED 43
GRY 46
BRN/YEL 49

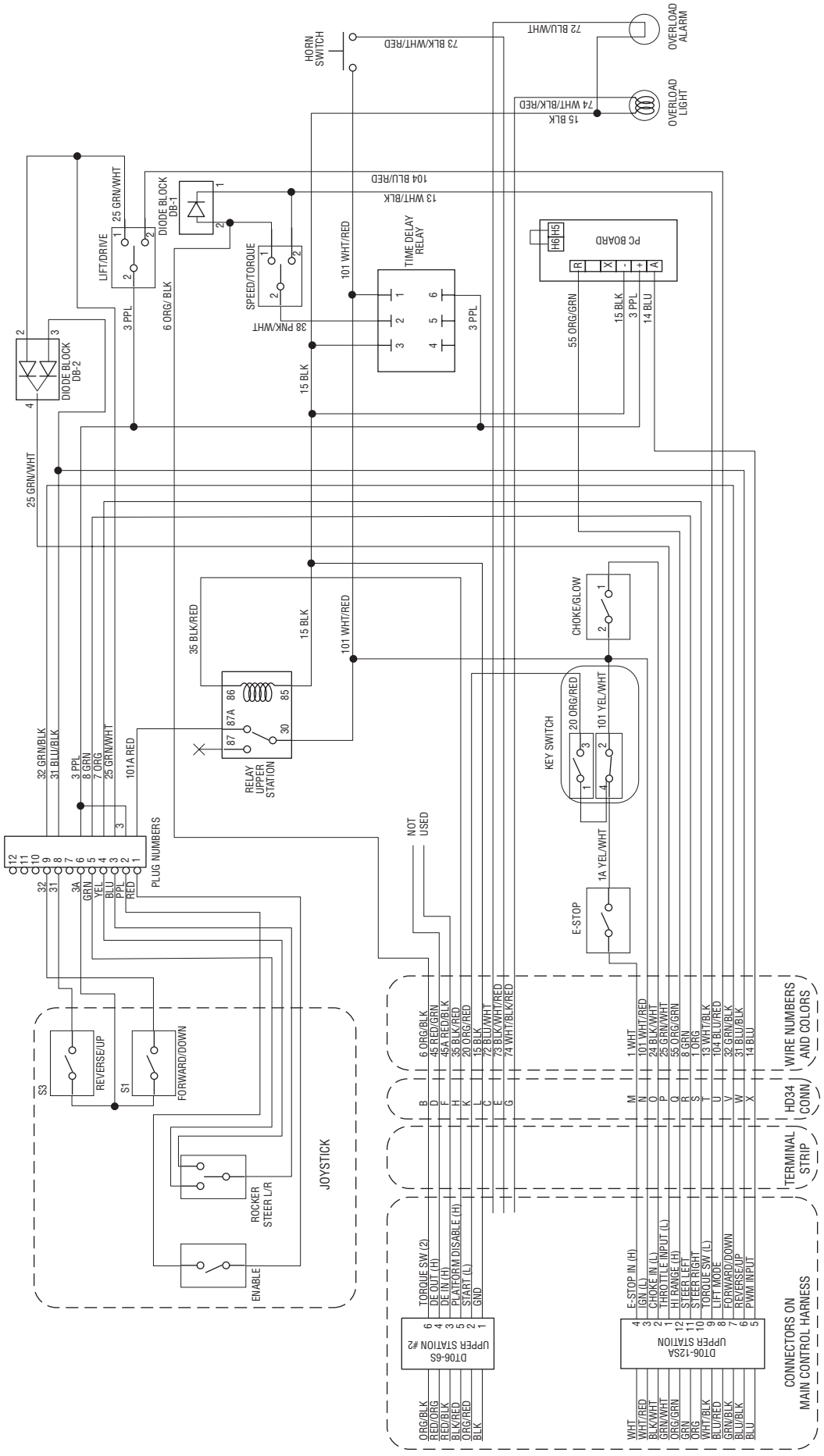
Circuit Board

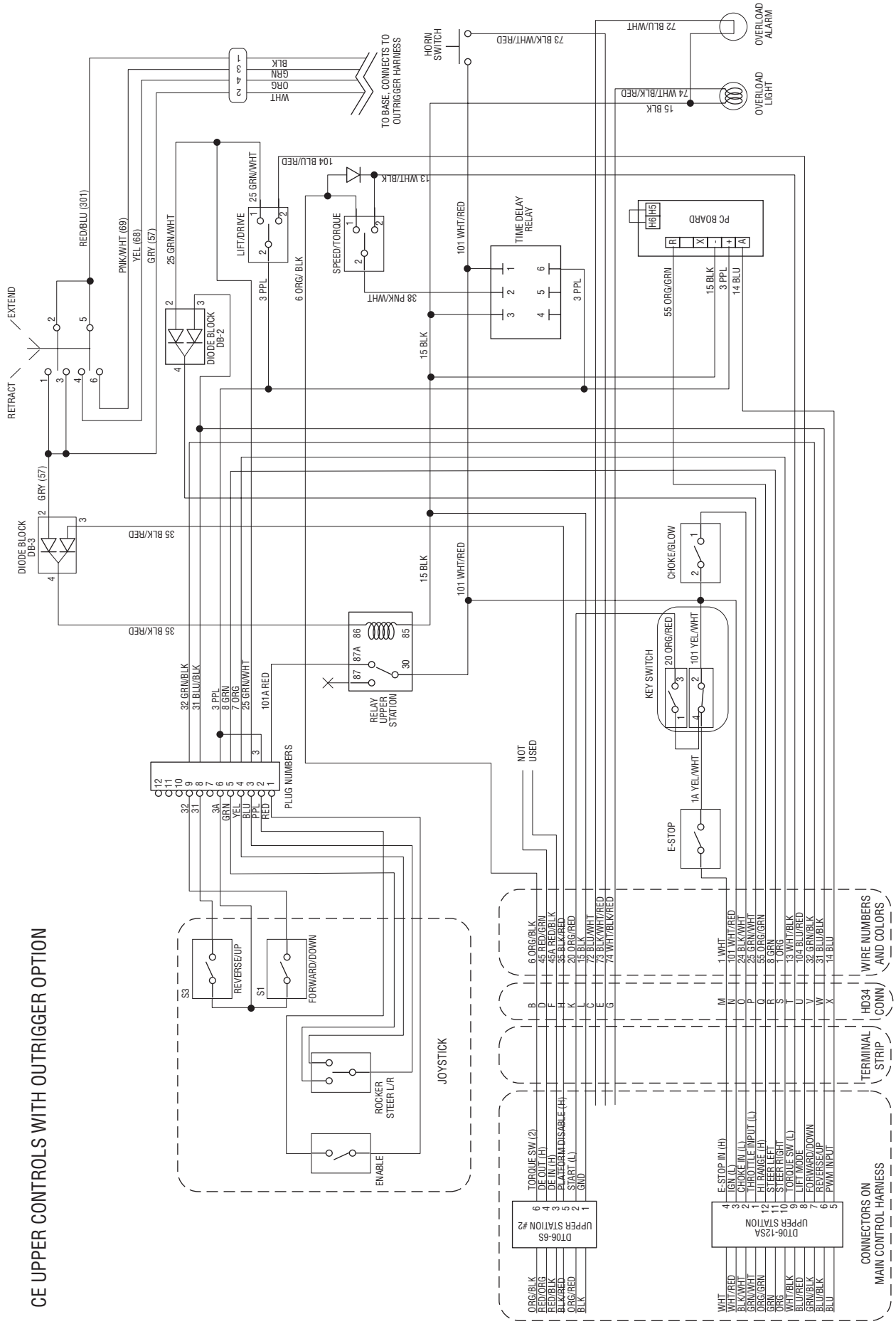
The Circuit Bard schematic is broken into two pages for clarity. The cable connections are shown on this page. Match the numbers to line-up the traces.

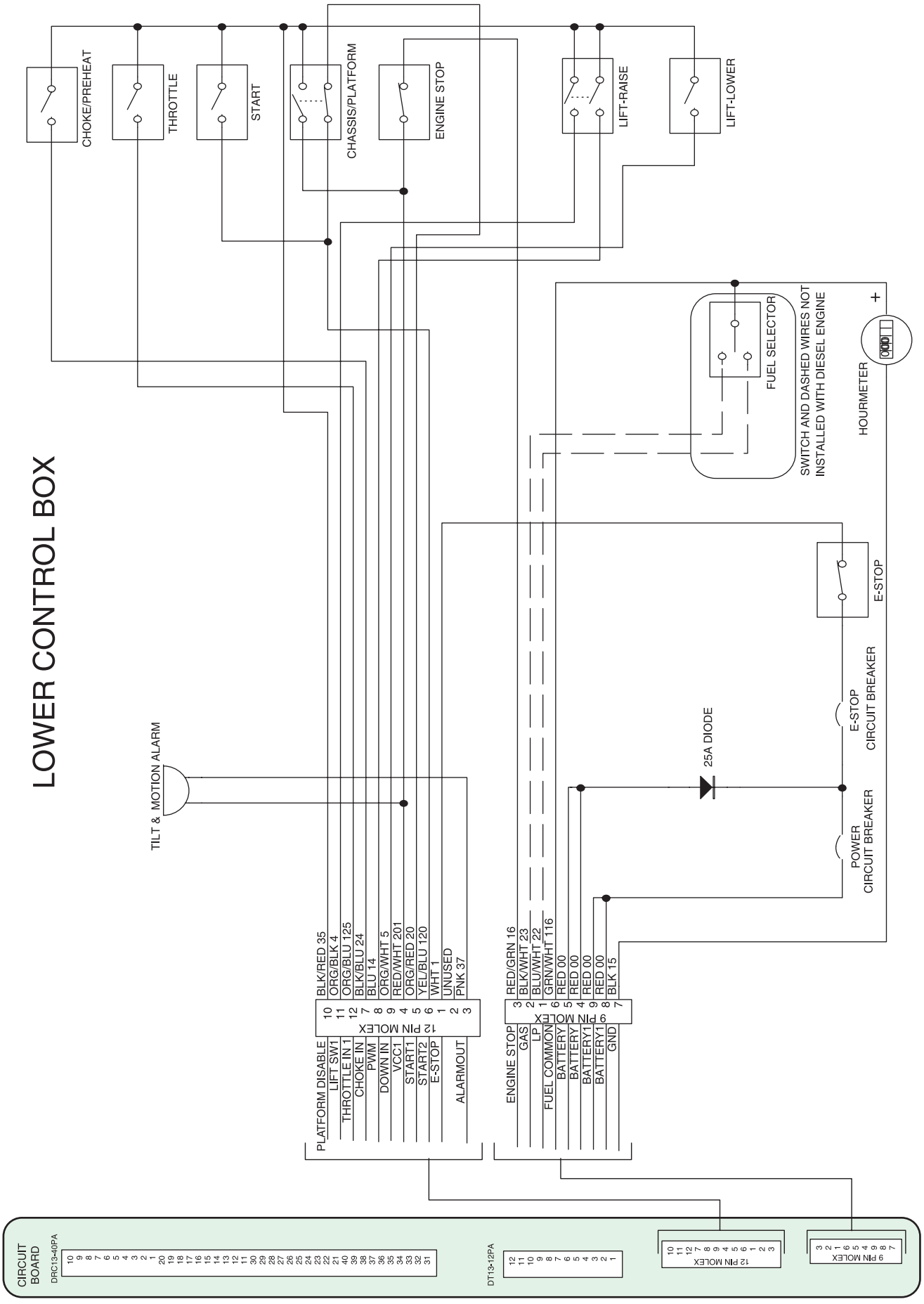


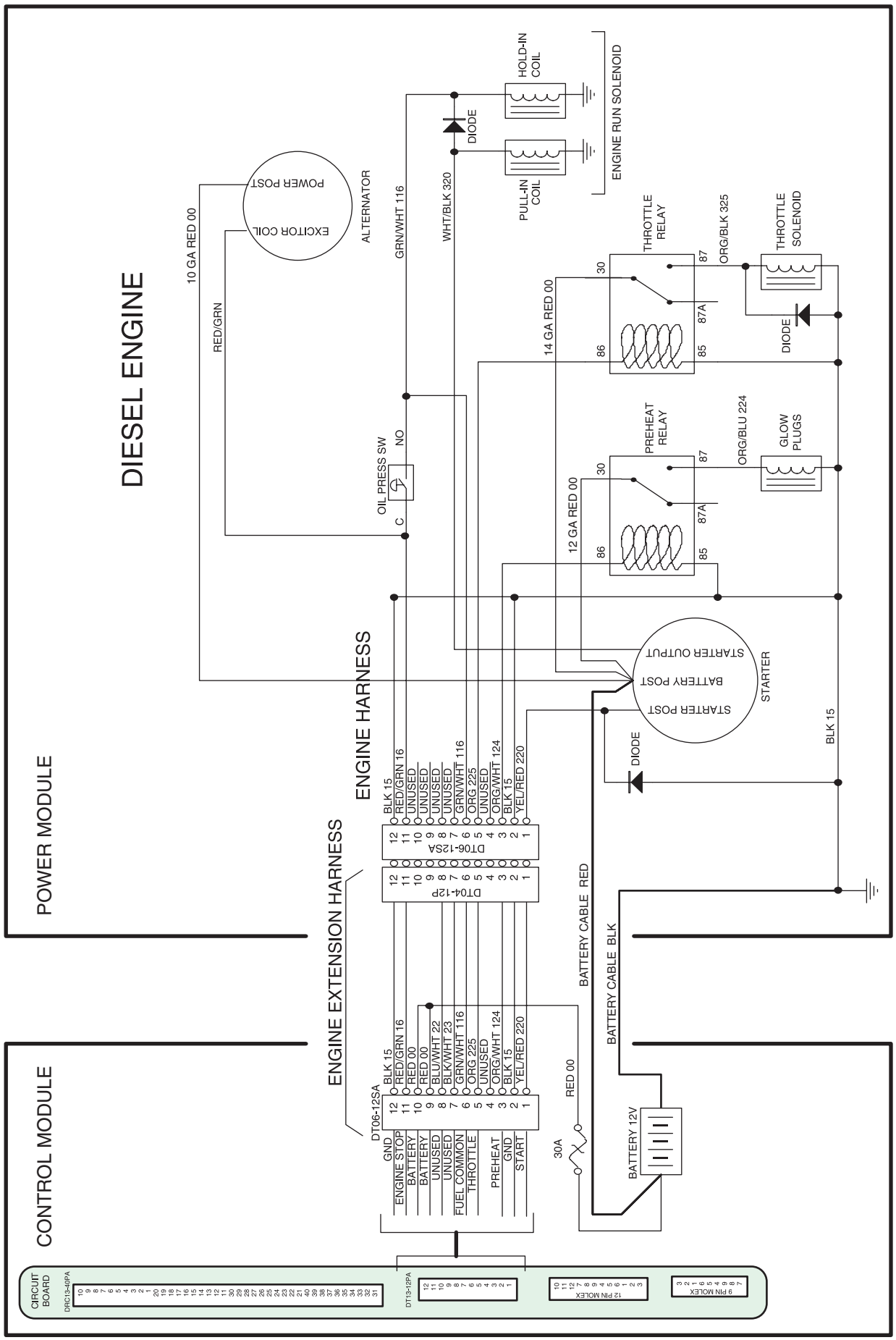

MOSFET N
CB1 RXE030
R21 10K
D60 1N4004
MOTION ALARM
D61 1N4004
TILT ALARM
S7
D53
D54
D55
D56
U2 LM555
R12 1K
R7 300K
C7 2.2uF
C3 0.01uF
D64 1N4004
R2 1K
PNP1 PN2907
R4 2K
Z2 10V Z
R1 1K
NPN1 PN2222
Z4 5V Z
R5 100K
R6 2K
Z3 10V Z
R3 1K
D70
ALARM OUT
C3 0.01uF
+8V
Vn
D63
C2 47uF
TZ2 28V
VCC1
28V tranzorb for surge protection
CHOKE
THROTTLE
STEER L.
STEER R.
DOWN
AXLE FLOAT
SPEED/TORQUE
UP
TILT
FORWARD
REVERSE
LED11
LED10
LED9
LED8
LED7
LED6
LED5
LED4
LED3
LED2
LED1
RP3E
RP3D
RP3C
RP3B
RP3A
RP2G
RP2F
RP2E
RP2D
RP2C
RP2B
RELAY 8 - CHOKE
RELAY 6 - THROTTLE
RELAY 5 - STEER L.
RELAY 4 - STEER R.
RELAY 3 - DOWN ALARM
RELAY 2 - AXLE FLOAT
RELAY 1 - SERV/PAR
RELAY 7 - UP
RELAY 10 - FORWARD
RELAY 11 - REVERSE
CB4 - 7A
CB8 - 4A
CB5 - 7A
CB6 - 4A
CB3 - 7A
RELAY 21 - POWER
RELAY 32 - START
RELAY 13 - PLATFORM DOWN
RELAY 14 - LIFT CUTOUT
RELAY 15 - DRIVE CUTOUT
RELAY 16 - PWM CUTOUT
RELAY 17 - DRIVE
RELAY 18 - DRIVE
RELAY 19 - DRIVE/LIFT
RELAY 20 - DRIVE/LIFT
CB7 - 7A
F4
F5
4A
S12
S10
S6
LIFT INTERLOCK
COMMON
NO INTLK
S11
S9
S5
JUMPER REMOVED FOR OUTRIGGER OPTION
DRIVE INTERLOCK
S8
S3
S4
PLATFORM HEIGHT LIMIT
LIMIT
NO LIMIT
S1
AXLE FLOAT (JUMP IF NO FLT AX)
S17
S16
JUMPER REMOVED FOR OUTRIGGER OPTION

CE UPPER CONTROLS WITHOUT OUTRIGGER OPTION

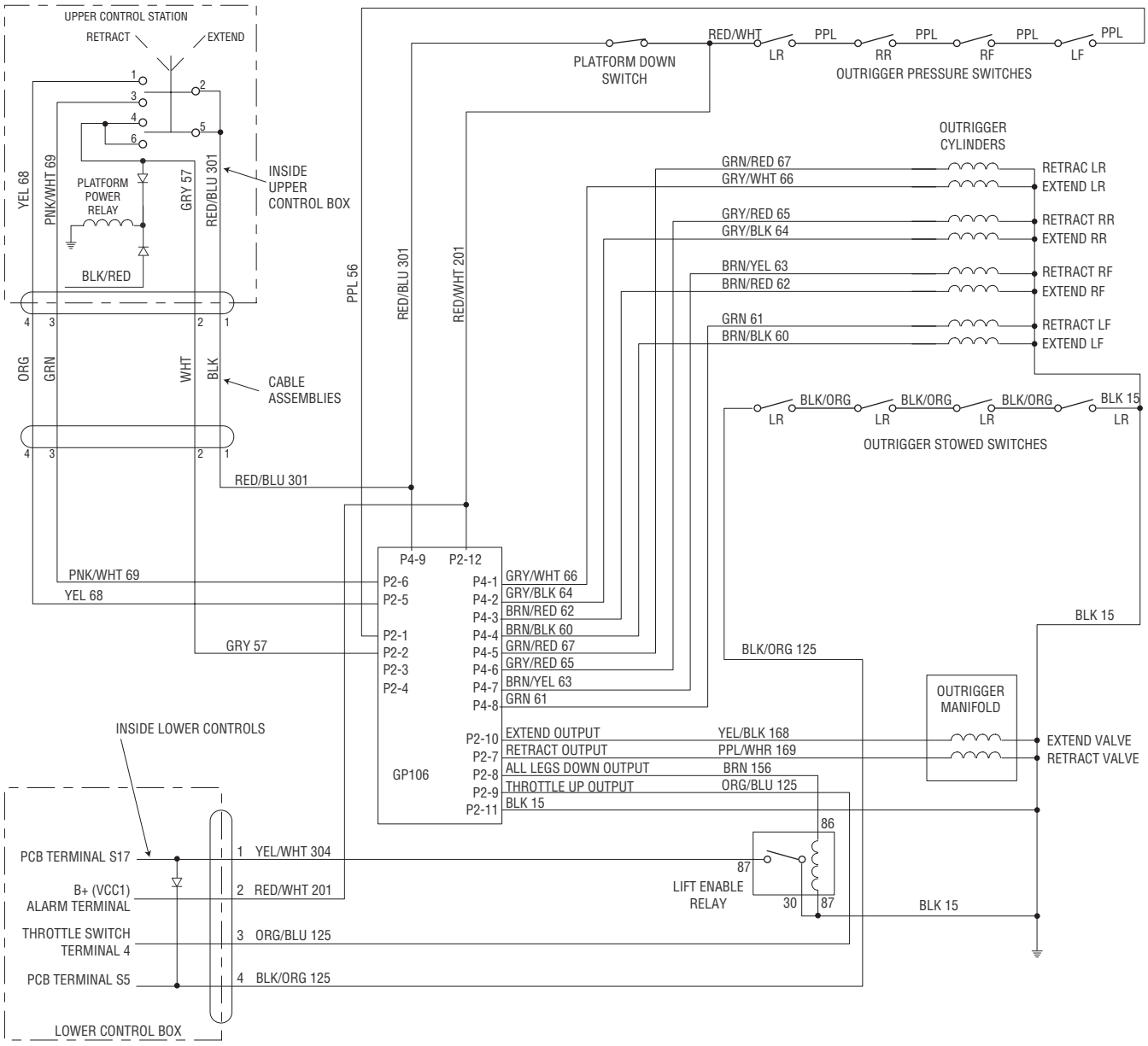



CE UPPER CONTROLS WITH OUTRIGGER OPTION
CONNECTORS ON MAIN CONTROL HARNESS
WIRE NUMBERS AND COLORS
HD34 CONN
TERMINAL STRIP
JOYSTICK
ENABLE
ROCKER STEER L/R
FORWARD/DOWN
REVERSE/UP
S1
S3
PLUG NUMBERS
RELAY UPPER STATION
KEY SWITCH
E-STOP
CHOKE/GLOW
NOT USED
DIODE BLOCK DB-3
DIODE BLOCK DB-2
EXTEND
RETRACT
LIFT/DRIVE
SPEED/TORQUE
TIME DELAY RELAY
PC BOARD
HORN SWITCH
OVERLOAD ALARM
OVERLOAD LIGHT
TO BASE, CONNECTS TO OUTRIGGER HARNESS
DT06-12SA UPPER STATION
DT06-6S UPPER STATION #2

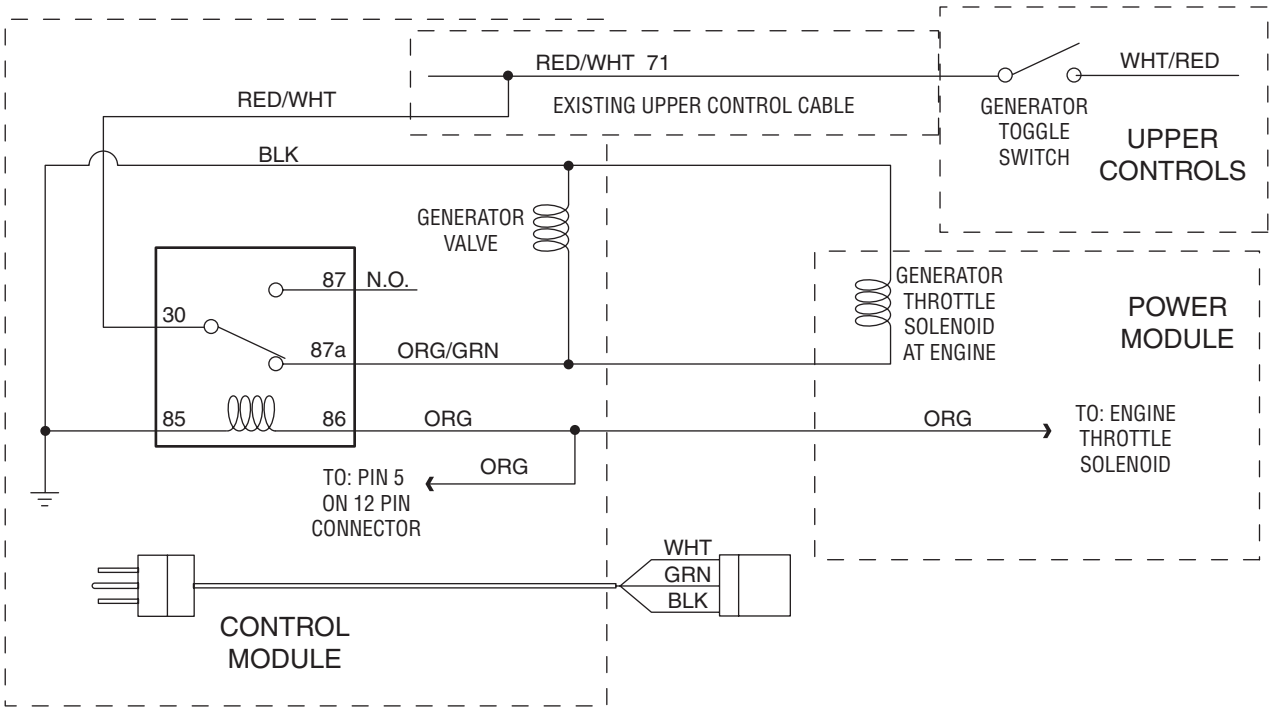

LOWER CONTROL BOX
CHOKE/PREHEAT
THROTTLE
START
CHASSIS/PLATFORM
ENGINE STOP
LIFT-RAISE
LIFT-LOWER
FUEL SELECTOR
SWITCH AND DASHED WIRES NOT INSTALLED WITH DIESEL ENGINE
HOURMETER
+
E-STOP
E-STOP CIRCUIT BREAKER
POWER CIRCUIT BREAKER
25A DIODE
TILT & MOTION ALARM
12 PIN MOLEX
PLATFORM DISABLE
LIFT SW1
THROTTLE IN 1
CHOKE IN
PWM
DOWN IN
VCC1
START1
START2
E-STOP
ALARMOUT
BLK/RED 35
ORG/BLK 4
ORG/BLU 125
BLK/BLU 24
BLU 14
ORG/WHT 5
RED/WHT 201
ORG/RED 20
YEL/BLU 120
WHT 1
UNUSED
PNK 37
9 PIN MOLEX
ENGINE STOP
GAS
LP
FUEL COMMON
BATTERY
BATTERY1
BATTERY1
GND
RED/GRN 16
BLK/WHT 23
BLU/WHT 22
GRN/WHT 116
RED 00
RED 00
RED 00
RED 00
BLK 15
CIRCUIT BOARD
DRC13-40PA
DT13-12PA
12 PIN MOLEX
9 PIN MOLEX


POWER MODULE
DIESEL ENGINE
ALTERNATOR
POWER POST
EXCITOR COIL
10 GA RED 00
RED/GRN
GRN/WHT 116
WHT/BLK 320
DIODE
HOLD-IN COIL
PULL-IN COIL
ENGINE RUN SOLENOID
THROTTLE RELAY
ORG/BLK 325
THROTTLE SOLENOID
14 GA RED 00
30
87
86
85
87A
OIL PRESS SW
NO
C
PREHEAT RELAY
ORG/BLU 224
GLOW PLUGS
12 GA RED 00
STARTER
STARTER POST
BATTERY POST
STARTER OUTPUT
BLK 15
ENGINE HARNESS
ENGINE EXTENSION HARNESS
DT06-12SA
DT04-12P
BLK 15
RED/GRN 16
UNUSED
GRN/WHT 116
ORG 225
ORG/WHT 124
YEL/RED 220
BLU/WHT 22
BLK/WHT 23
RED 00
30A
BATTERY CABLE RED
BATTERY CABLE BLK
BATTERY 12V
CONTROL MODULE
CIRCUIT BOARD
DRC12-40PA
DT13-12PA
12 PIN MOLEX
9 PIN MOLEX
GND
ENGINE STOP
BATTERY
UNUSED
FUEL COMMON
THROTTLE
PREHEAT
START

Optional Outriggers



Optional Generator



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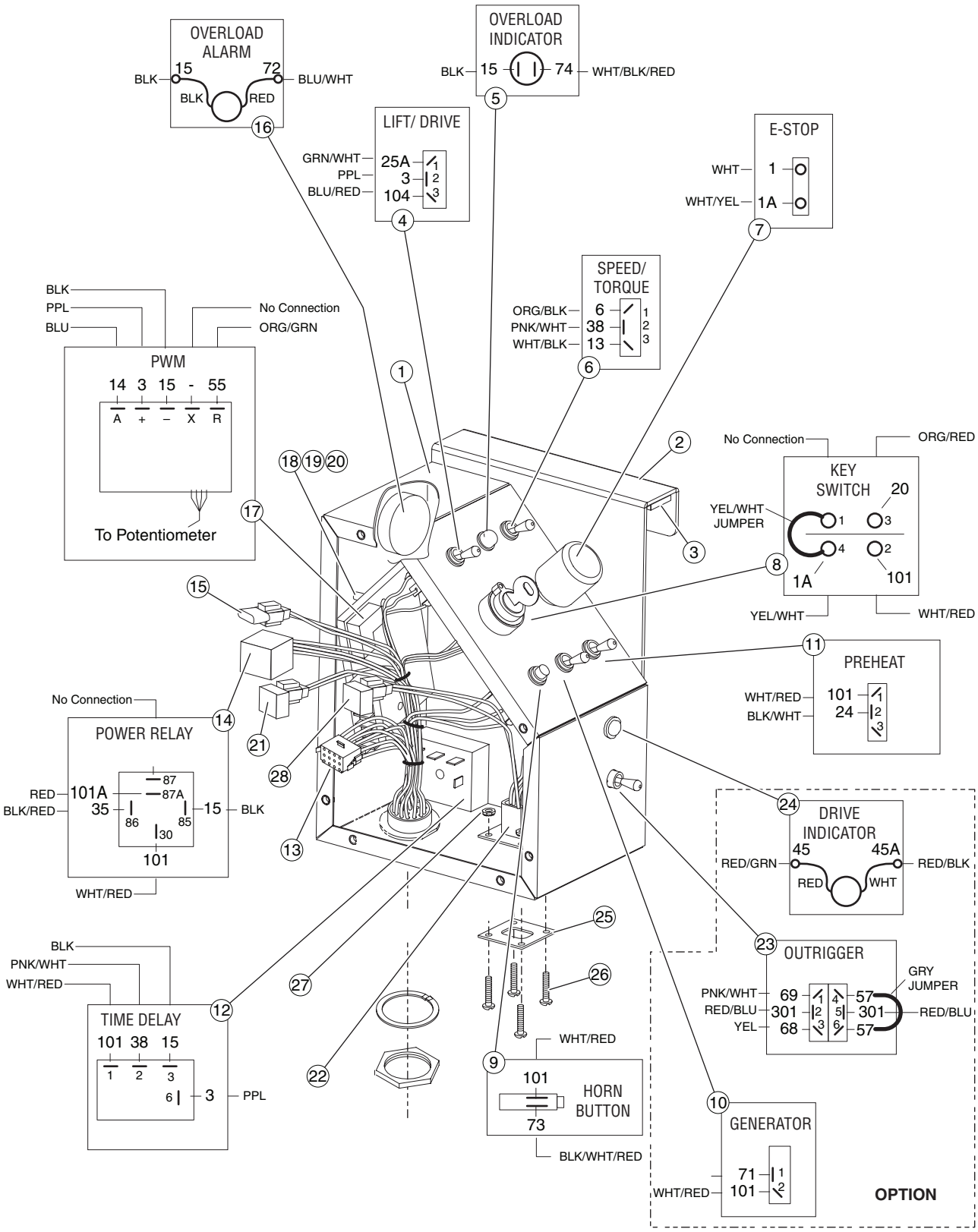
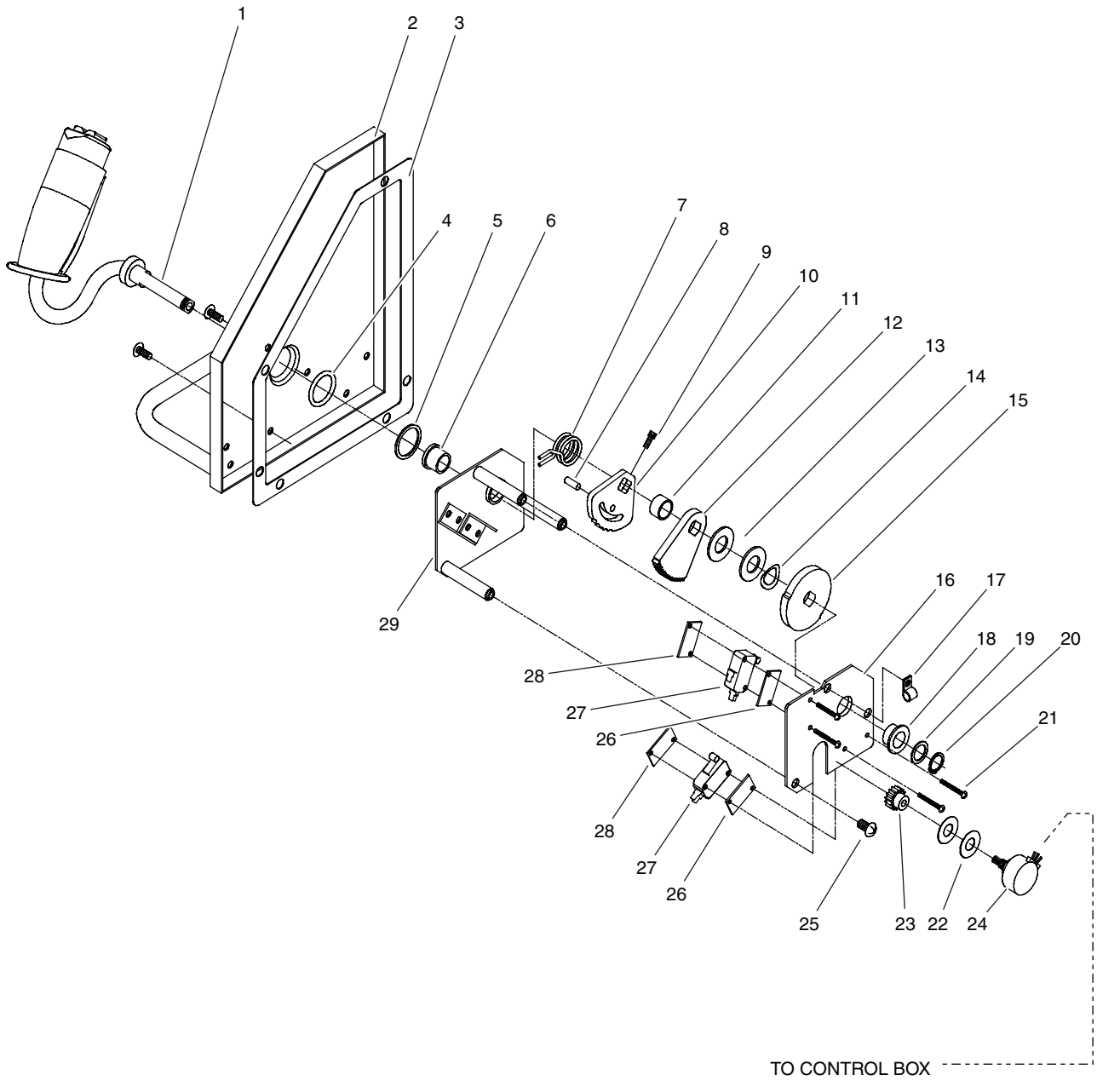
SECTION 1:
CONTROL BOXES



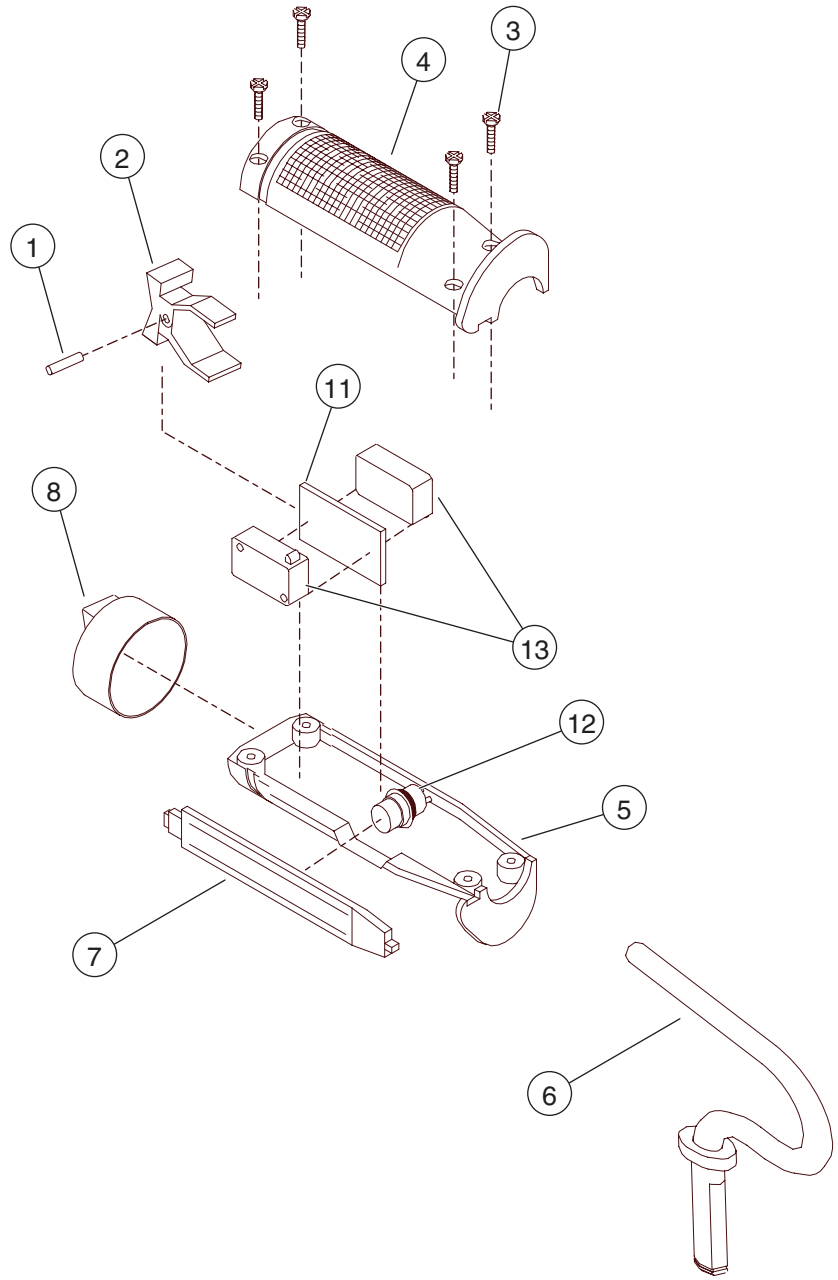
ART ControlBox-X72 CE

ITEM	PART NO.	QTY	DESCRIPTION
			UPPER CONTROLS, CE
	91139	-	CONTROL BOX ASSEMBLY, CE
1	16242	1	WELDMENT, CONTROL BOX
2	13865	1	BRACKET, CONTROL BOX HOLDER
3	6350	.5FT	TAPE, FOAM
4	6234	1	SWITCH, TOGGLE, LIFT/DRIVE
5	9183	1	LENS, RED, OVERLOAD INDICATOR
	9188	1	LIGHT, BAYONET, 14 VOLT
	9179	1	SOCKET, INDICATOR LIGHT
6	6905	1	SWITCH, TOGGLE, SPEED/TORQUE
7	7800	1	SWITCH, EMERGENCY STOP
8	91159	1	KEYSWITCH
	8082	1	CONTACT BLOCK, NO
	8083	1	CONTACT BLOCK, NC
9	8044	1	SWITCH, HORN BUTTON
10	5630	1	SWITCH, TOGGLE, GENERATOR (OPTION)
11	7423	1	SWITCH, TOGGLE, PREHEAT
12	91186	1	RELAY, TIME DELAY
13	91184	1	WIRE HARNESS, CONTROL BOX
14	91375	1	RELAY, POWER
15	91027	1	DIODE BLOCK, 2 POSITION
16	7553	1	ALARM, OVERLOAD WARNING
17	91107	1	PWM CARD
18	90814	2	SPACER
19	90833	2	SCREW, 6-32 X 3/4"
20	5364	2	NUT, 6-32
21	91028	1	DIODE BLOCK, 4 POSITION
			OUTRIGGER OPTION
22	91294	1	HARNESS, OUTRIGGER CONTROL
23	8638	1	SWITCH, TOGGLE
24	90789	1	LED, GREEN, DRIVE ENABLED
25	16312	1	PLATE, MOUNTING, OUTRIGGER PLUG
26	90833	2	SCREW, 6-32 X 3/4"
27	5364	2	NUT, 6-32
28	91028	1	DIODE BLOCK, 4 POSITION



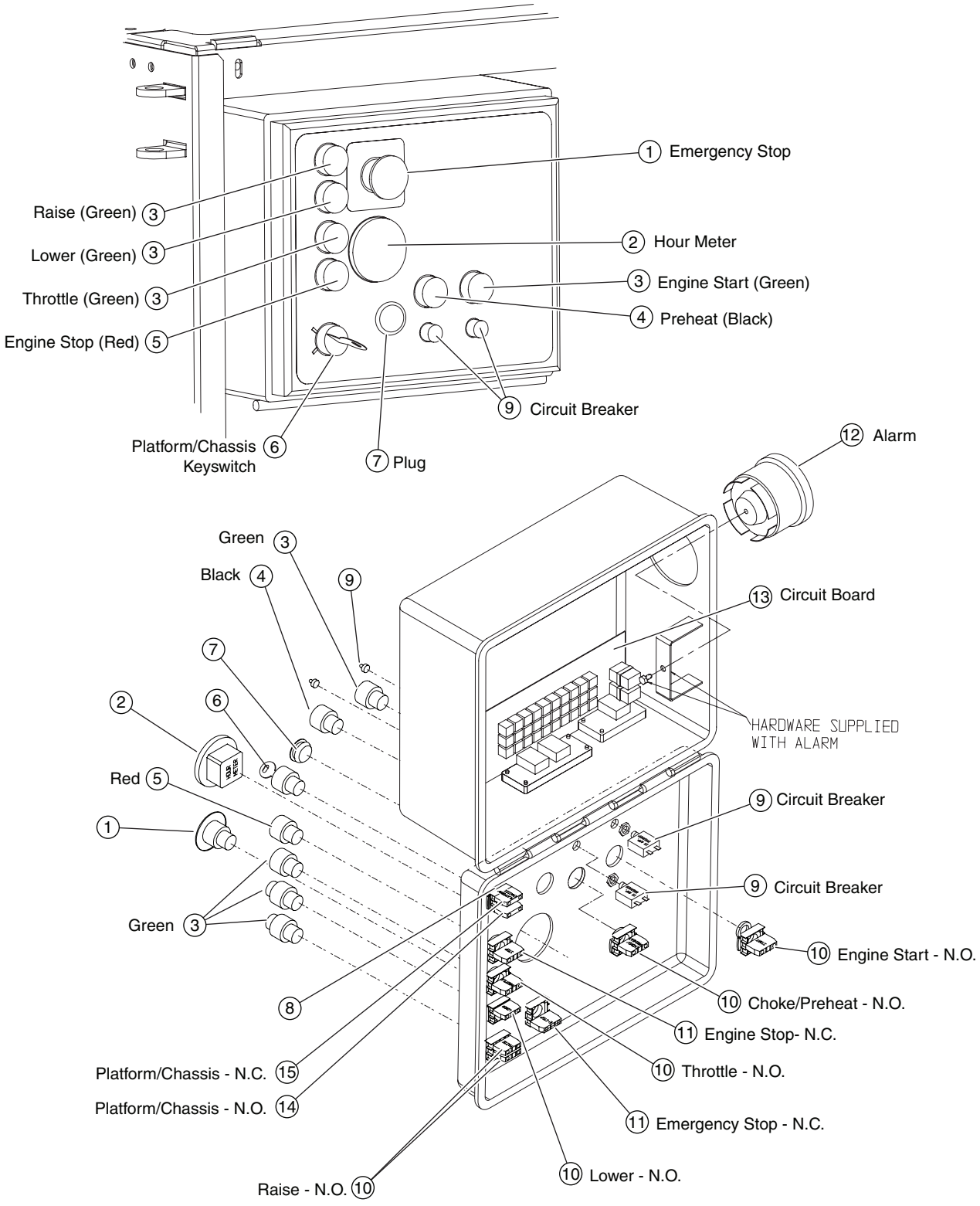
ART_ASSY13868

ITEM	PART NO.	QTY	DESCRIPTION
			Upper Control Box Cover Assembly
			CONTROL BOX COVER ASSEMBLY
1	13647	1	CONTROL ARM COVER
2	3772	1	COVER
3	7875	1	GASKET
4	7882	1	O-RING, 7/8" ID X 1 1/8" OD
5	HDW3768	1	WASHER, FLAT
6	7819	1	BEARING, BRONZE, FLANGED
7	8435	1	SPRING, JOYSTICK, CENTERING
8	100/8348	1	PIN, HOLD DOWN
9	HDW7887	1	SCREW, #6-32, 1/2" LG
10	13502	1	BRACKET, CENTERING
11	3763	1	SPACER, STEP
12	13402	1	GEAR, LARGE
13	HDW8531	2	WASHER, FLAT
14	HDW7881	1	WASHER, BEVEL
15	3782	1	CAM. DIRECTIONAL
16	13403	1	PLATE, BOTTOM
17	6917	1	CLAMP, CABLE 1/4"
18	7818	1	BEARING, BRONZE, FLANGED
19	HDW3771	1	WASHER, FLAT
20	5736	1	RING, RETAINING, 1/2"
21	HDW8399	4	SCREW, #4 - 40, 5/8" LG
22	HDW8567	2	WASHER, FLAT
23	8389	1	GEAR, SPUR
24	91522	1	POTENTIOMETER
25	HDW7888	12	SCREW, #10 - 32, 1/2" LG
26	3764	2	PLATE, SPACER
27	8696	2	SWITCH, LIMIT, MICRO V7
28	3765	2	PLATE, STRAP
29	3766	1	PLATE, TOP



ART_JoystickHandle

ITEM	PART NO.	QTY	DESCRIPTION
			UPPER CONTROL JOYSTICK
	13647		CONTROL ARM ASSEMBLY, JOYSTICK
1	8750	1	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)



ART_BaseControl-X72_CE

ITEM	PART NO.	QTY	DESCRIPTION
			Base Control Box, CE
	91169	-	BASE CONTROL PANEL - COMPONENTS
1	7800	1	SWITCH, EMERGENCY STOP
2	7909	1	HOUR METER
3	91533	4	SWITCH, BUTTON, GREEN
4	91534	1	SWITCH, BUTTON, BLACK
5	91535	1	SWITCH, BUTTON, RED
6	91369	1	KEYSWITCH, 2-POSITION
7	91329	1	PLUG
8	90714	1	MOUNTING PLATE, KEYSWITCH
9	7235	2	CIRCUIT BREAKER, 15 AMP
10	91537	6	BLOCK, CONTACT, N.O.
11	91538	2	BLOCK, CONTACT, N.C.
12	91539	1	ALARM, 107DB
13	91370	1	CIRCUIT BOARD
14	8082	1	CONTACT BLOCK, N.O.
15	8083	1	CONTACT BLOCK, N.C.

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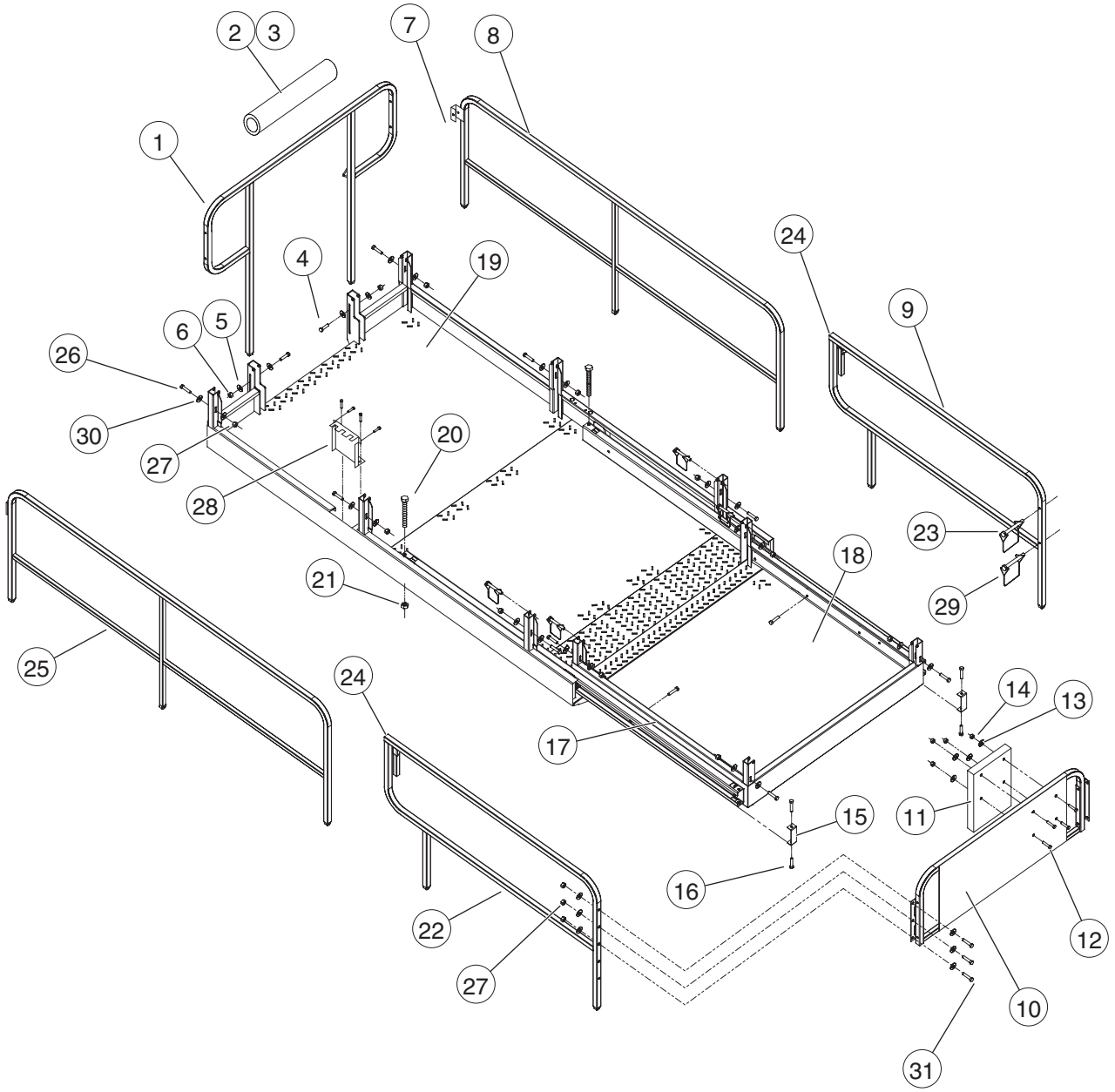
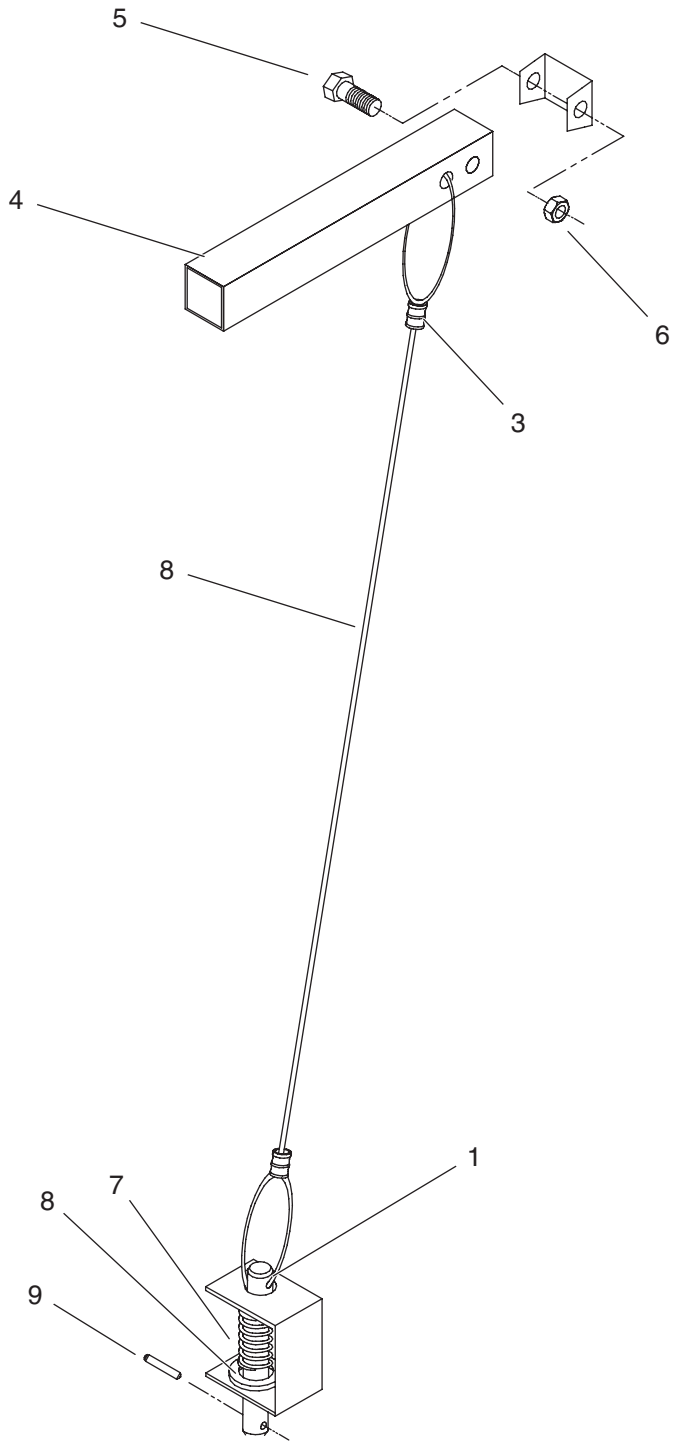
SECTION 2:
PLATFORM AND RAILS



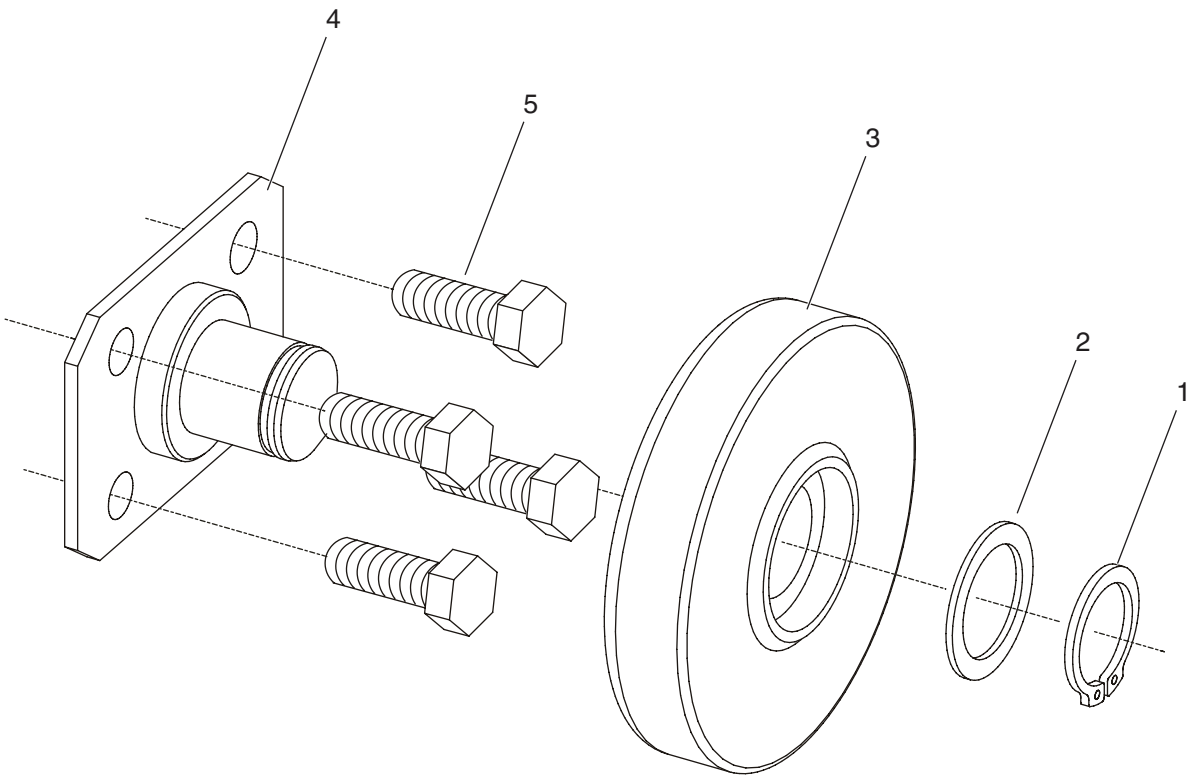
ART_PLATFORM

ITEM	PART NO.	QTY	DESCRIPTION
			PLATFORM ASSEMBLY
1	16222	1	REAR RAIL WELDMENT
2	7805	1	PADDING, RAIL (OPTIONAL)
3	7048	1	COVER, RAIL PADDING (OPTIONAL)
4	HDW7119	2	SCREW, 5/16” - 18, 2 ¼” LG, GR 5
5	HDW5217	4	FLAT WASHER, .343 ID × .688 OD × .063 THK
6	HDW8304	6	NUT, 5/16” - 18
7	HDW7593	6	PIN, WIRE LOCK, SQUARE, 3/8” × 2 ¼” LG
8	16176	1	SIDE RAIL WELDMENT, LH
9	14301	1	SIDE RAIL WELDMENT - EXTENSION
10	16177	1	FRONT RAIL WELDMENT
11	8909	1	MANUAL ENCLOSURE
12	HDW5723	8	SCREW, ¼” - 20, ½” LG
13	HDW8294	4	FLAT WASHER, .328 ID × 1.000 OD × .100 THK
14	HDW8267	4	NUT, ¼” - 20
15	14415	2	BRACKET, EXTENSION STOP
16	HDW5724	20	SCREW, 5/16” - 18, ¾” LG, GR 5
17	14152	2	CHANNEL, EXTENSION
18	16202	1	EXTENSION PLATFORM WELDMENT
19	16196	1	MAIN PLATFORM WELDMENT
20	HDW8856	2	SCREW, ½”-13, 5” LG
21	HDW8457	2	NUT, ½” - 13
22	14313	1	RIGHT SIDE RAIL WELDMENT - EXTENSION
23	HDW8974	1	PIN, WIRE LOCK, SQUARE, 3/8” × 3” LG
24	6823	2	CAP PLUG, 1 ¼"
25	16224	1	SIDE RAIL WELDMENT, RH
26	HDW8279	10	SCREW, 3/8-16, 2½" LG
27	HDW8268	10	NUT, 3/8-16
28	20552	1	COVER, PLATFORM CORD (NOT SHOWN)
29	91284	1	PIN HITCH 3/8" × 4
30	HDW5355	20	WASHER, FLAT, .438 ID×1.00 OD×.078 THK
31	HDW6434	3	SCREW, 3/8-16×2" LG



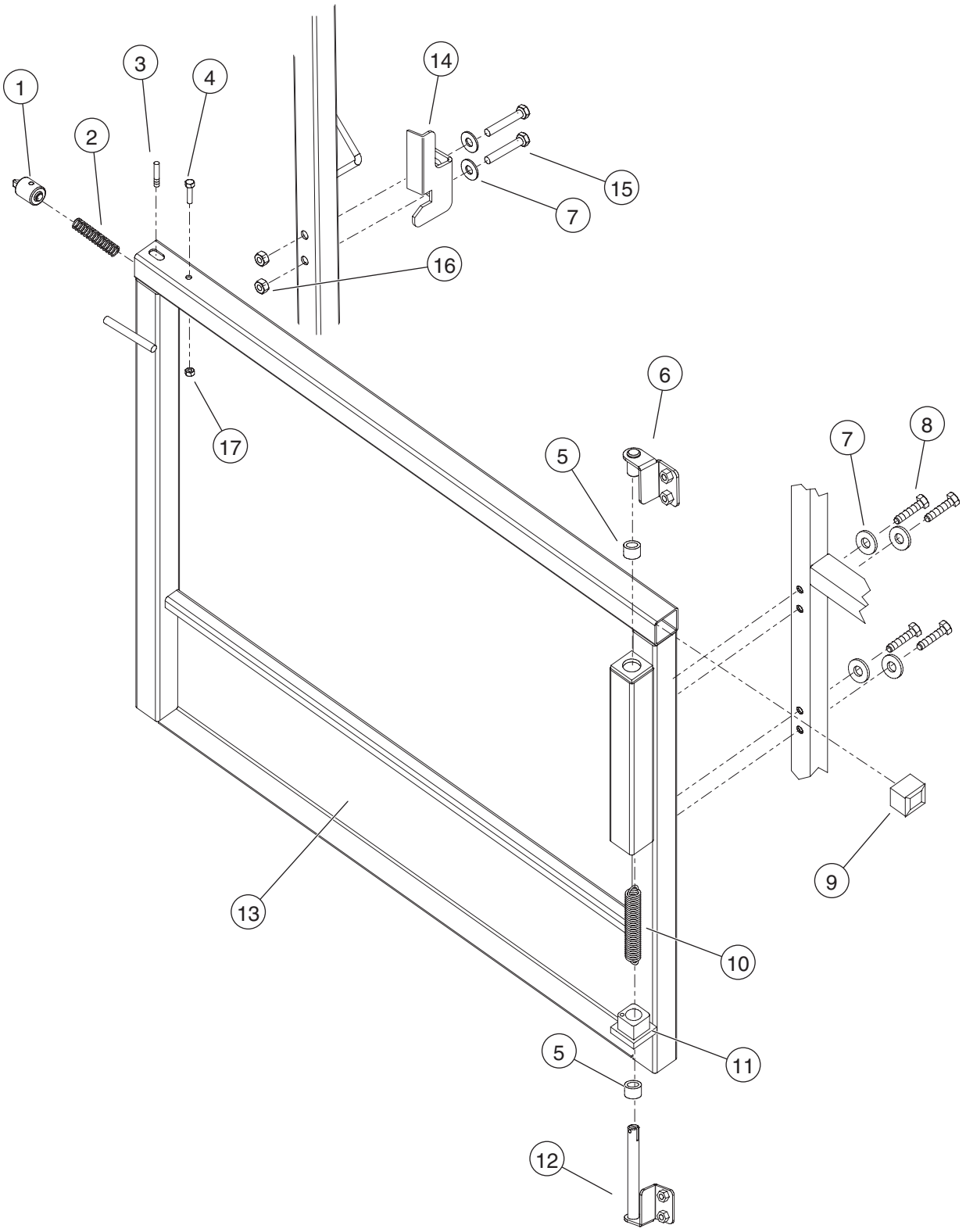
ART 769 R1

ITEM	PART NO.	QTY	DESCRIPTION
			Rollout Lock Pin Assembly
1	13737	1	PIN, EXTENSION LOCK
2	7184	3.7 FT	CABLE, COATED AND ROLLED
3	8814	2	SLEEVE, ALUMINUM OVAL
4	14344	1	HANDLE
5	HDW8303	1	SCREW, 5/16” - 18, 2” LG
6	HDW8304	1	LOCKNUT, 5/16” - 18
7	7408	1	SPRING, DECK LOCK
8	HDW7031	1	WASHER, FLAT, ½” ID 7/8” OD
9	HDW8513	1	PIN, SPRING, 1/8” DIA. ¾” LG



Art Number
Roller Assembly

ITEM	PART NO.	QTY	DESCRIPTION
			ROLLER ASSEMBLY
1	5918	1	RETAINING RING, HEAVY DUTY 1”
2	HDW8370	1	WASHER, FLAT, 1.015 ID × 1.375 OD × .062 THK
3	13230	1	ROLLER
4	14062	1	ROLLER PLATE WELDMENT
5	HDW5724	4	SCREW, 5/16” - 18, ¾” LG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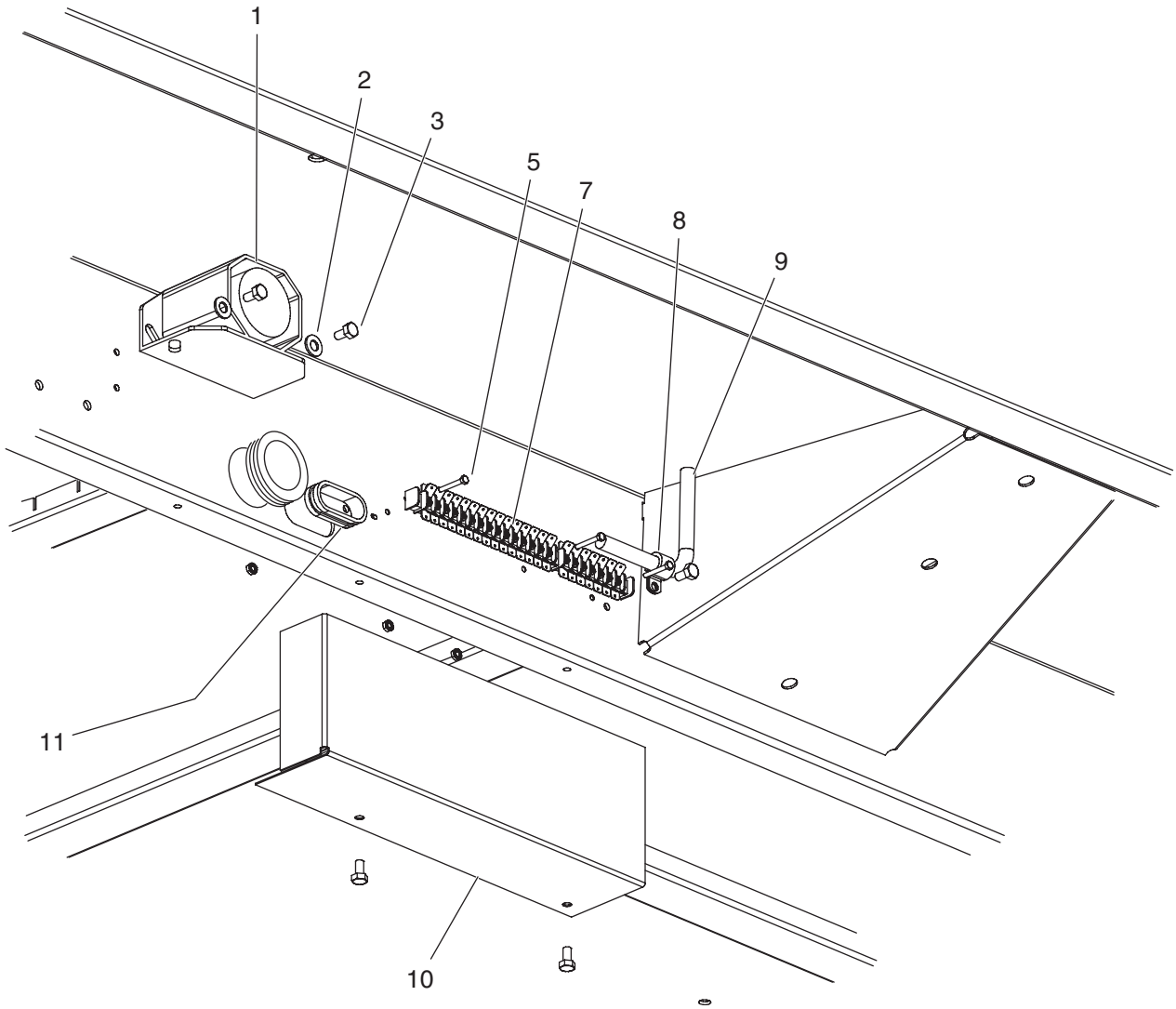
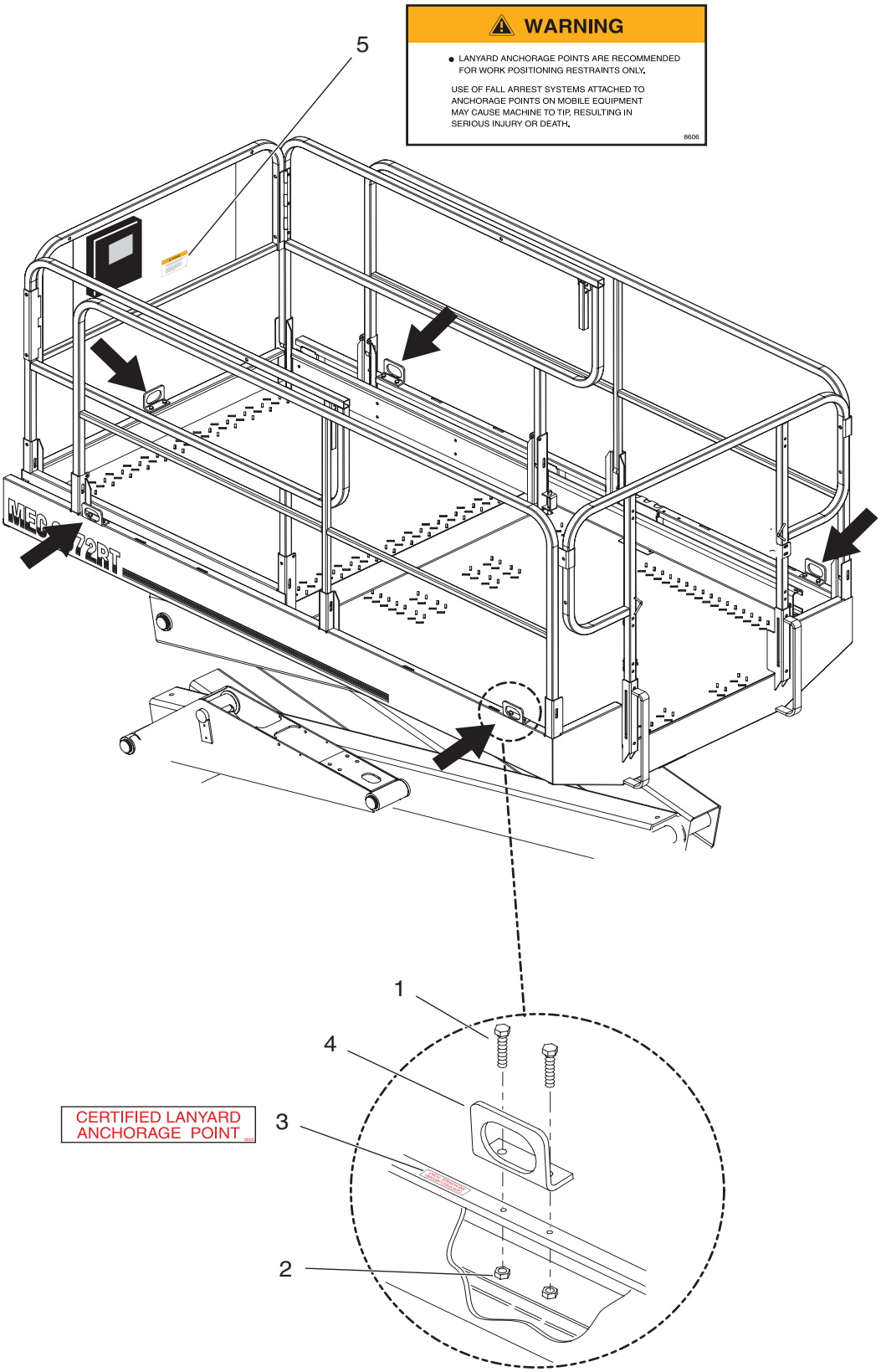
ITEM	PART NO.	QTY	DESCRIPTION
			SWING GATE
1	40003	1	LATCH PIN, REAR GATE
2	7055	1	SPRING, LATCH, .480 DIA. OD × 1.5" LG
3	40006	1	ROD, LATCH LEVER, REAR GATE
4	HDW6434	1	SCREW, 3/8-16 × 2" LG
5	8187	2	BEARING, NYLINER, 5/8" ID × 5/8" LG
6	40014	1	MOUNTING BRACKET, UPPER
7	HDW8294	6	WASHER, .328" ID × 1" OD × .100" THK
8	HDW8486	4	SCREW, 5/16" - 18, 1 7/8" LG, GR 5
9	6823	1	CAP PLUG, 1 ¼" SQUARE
10	8300	1	SPRING, TORSION, 1" DIA. OD × 4" LG
11	13272	1	BLOCK, PIVOT, REAR GATE
12	40015	1	MOUNTING BRACKET, LOWER
13	40017	1	SWING GATE WELDMENT
14	30814	1	STRIKE PLATE
15	HDW8303	2	SCREW, 5/6"-18, 2" LG, GR 5
16	HDW7120	2	NUT, 5/16"-18, GR 5
17	HDW8268	1	NUT, 3/8-16



Art CtnrlCCableInst

ITEM	PART NO.	QTY	DESCRIPTION
			CONTROL CABLE/HORN INSTALLATION
1	9716	1	HORN, 12-48V
2	HDW5217	2	WASHER, FLAT, .343 ID × .688 OD × .063 THK
3	HDW6455	5	SCREW, ¼"-20, ½" LG, GR 5
5	HDW5363	3	SCREW, #6-32, 1" LG, GR 5
6	HDW5364	3	NUT, KEPS, #6-32 , GR 5
7	6947	1	TERMINAL STRIP
8	6964	1	CLAMP, CABLE, 1" DIA.
9		REF	CABLE, UPPER CONTROL
10	14604	1	COVER, TERMINAL STRIP
11	5863	2	GROMMET, 1.5 ID × 1.75 OD × .187 THK


WARNING
● LANYARD ANCHORAGE POINTS ARE RECOMMENDED FOR WORK POSITIONING RESTRAINTS ONLY.
USE OF FALL ARREST SYSTEMS ATTACHED TO ANCHORAGE POINTS ON MOBILE EQUIPMENT MAY CAUSE MACHINE TO TIP, RESULTING IN SERIOUS INJURY OR DEATH.
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CERTIFIED LANYARD ANCHORAGE POINT

ITEM	PART NO.	QTY	DESCRIPTION
			LANYARD ATTACHMENT
	14583	-	LANYARD ATTACHMENT
1	HDW6433	10	SCREW, 3/8” - 16, 1” LG, GR 5
2	HDW8268	10	NUT, 3/8” - 16, GR 5
3	8605	5	DECAL, LANYARD ATTACH POINT
4	3923	5	BRACKET, ATTACH POINT
5	8606	1	DECAL, WARNING, POS RESTRAINTS

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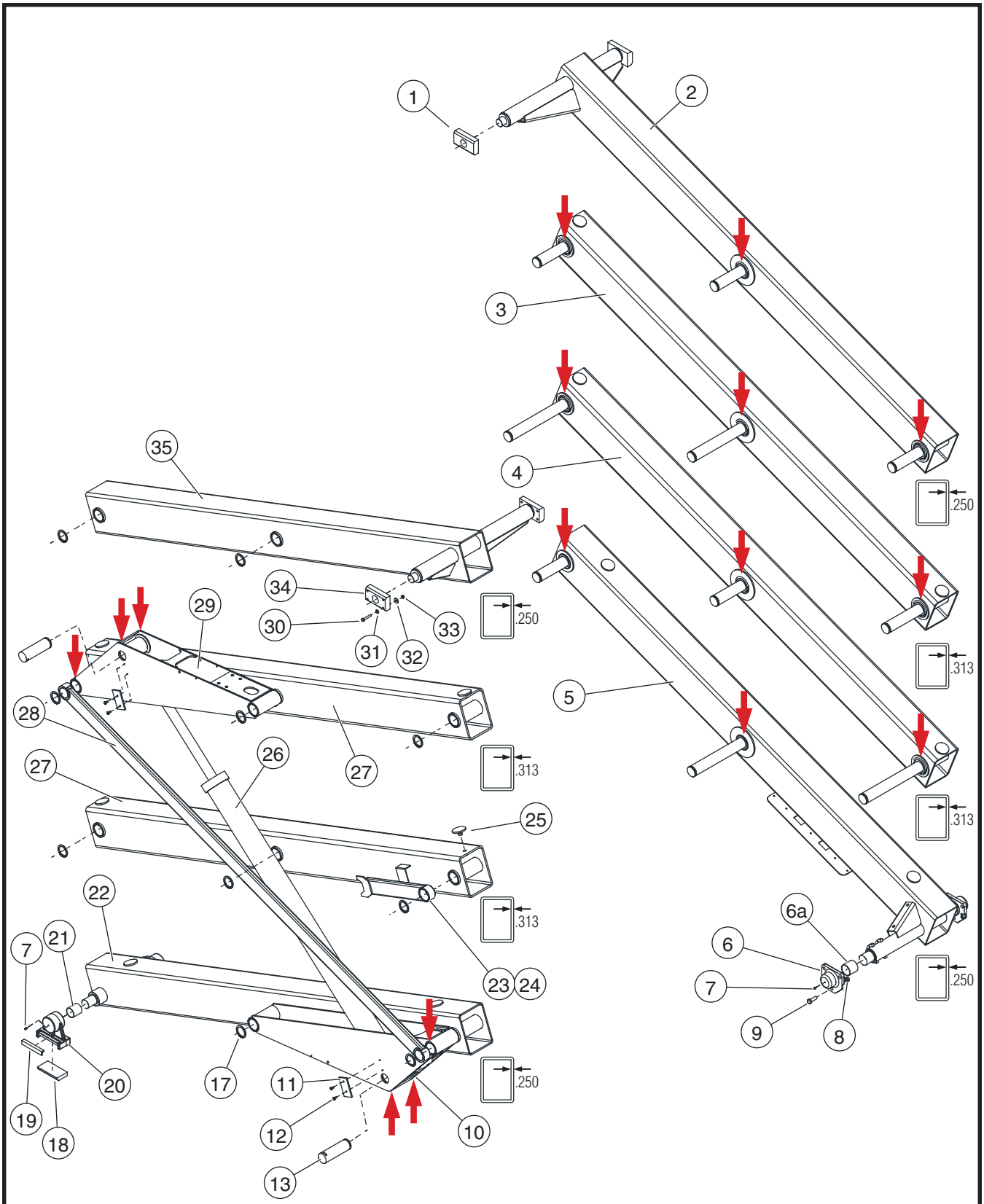
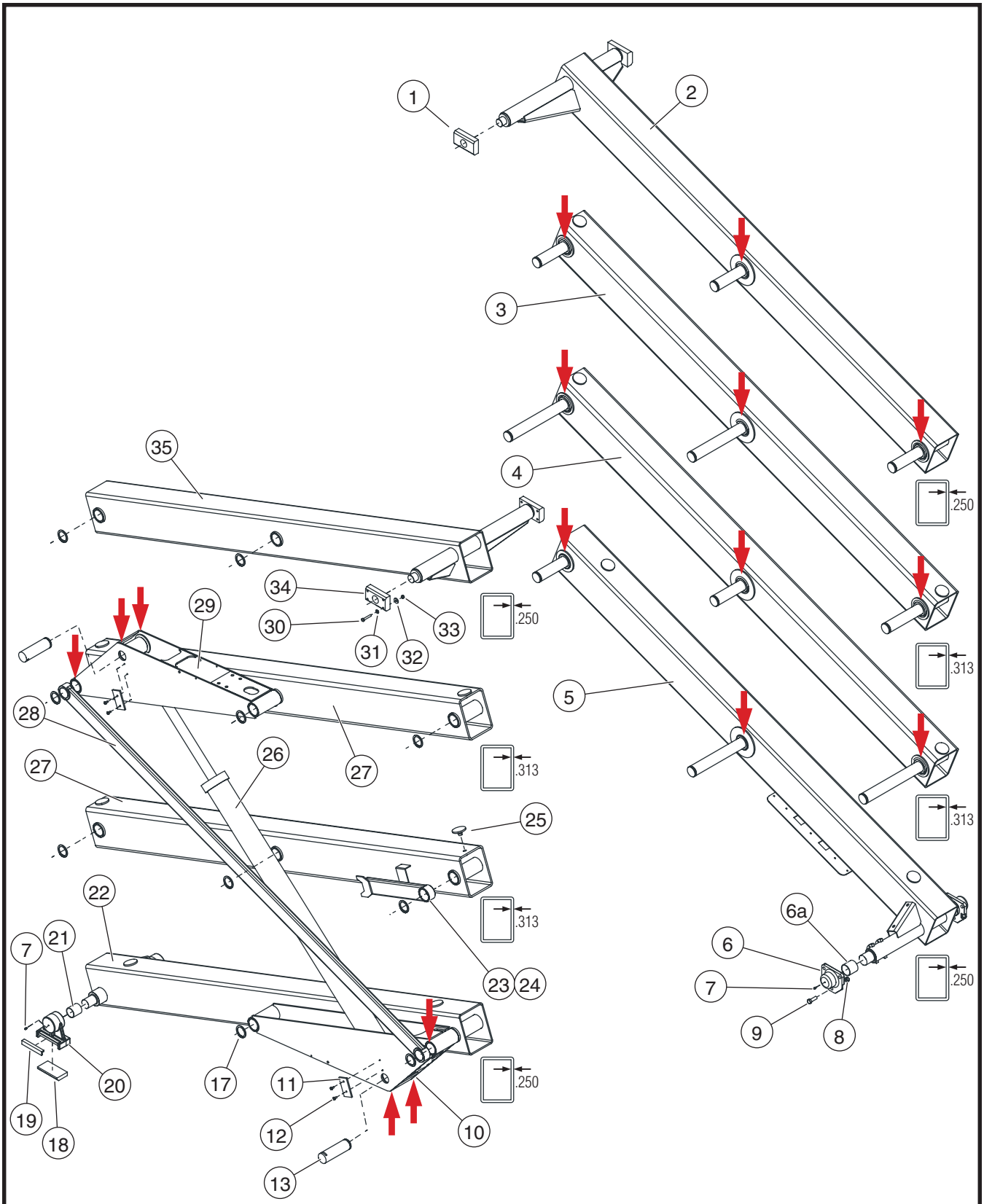
SECTION 3:
SCISSORS



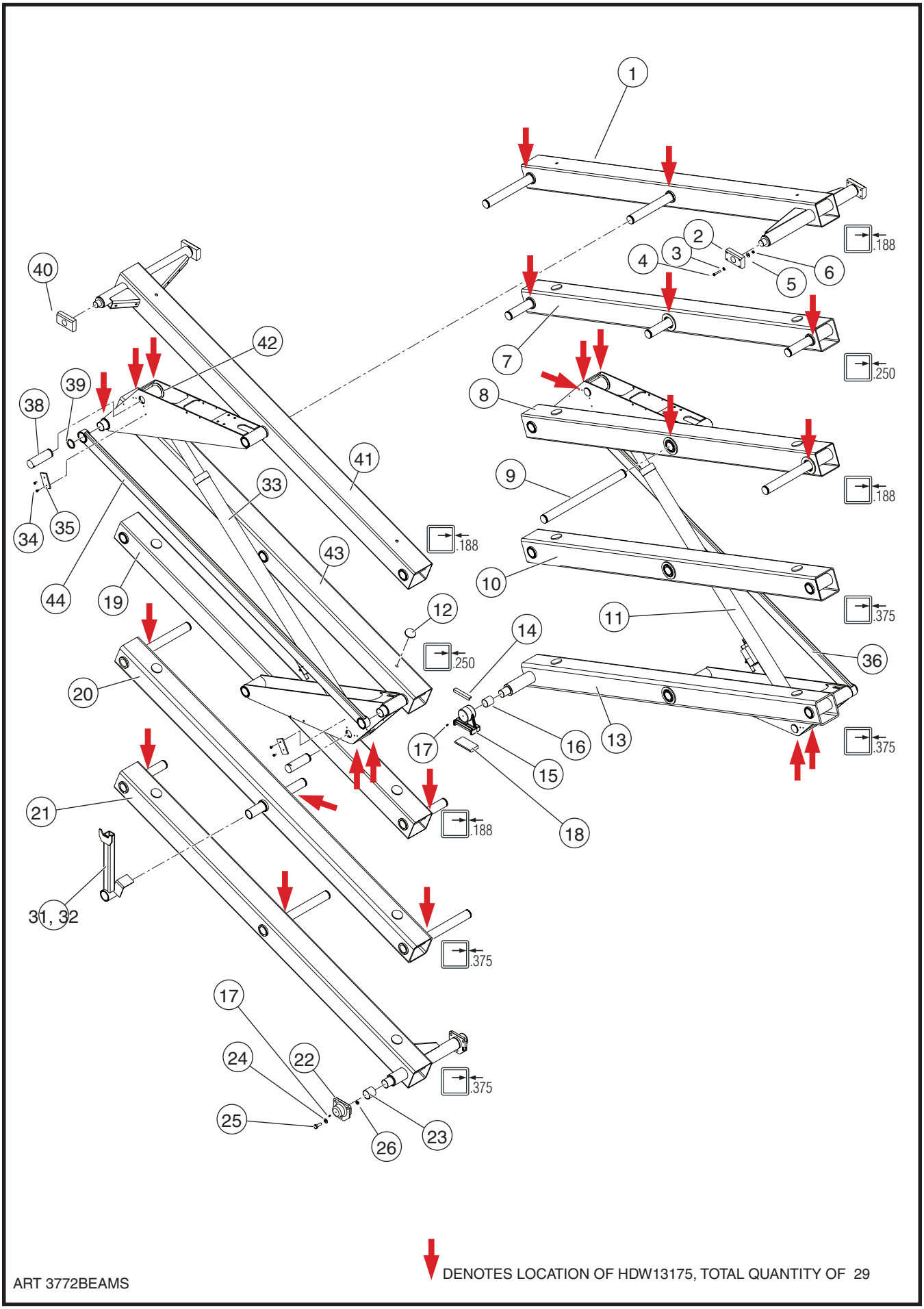
ART 3072BEAMS

ITEM	PART NO.	QTY	DESCRIPTION
			BEAM ASSEMBLY, 3072RT
1	14488	2	BLOCK, SLIDE, PLATFORM
2	40448	1	BEAM, 6 × 8 × .250, TOP SLIDE, W/PINS
3	40084	1	BEAM, 6 × 8 × .313 W/PINS
4	40081	1	BEAM, 6 × 8 × .313 W/PINS
5	40444	1	BEAM, 6 × 8 × .250, BOTTOM FIXED, W/PINS
6	40459	2	LOWER PIVOT, MACHINED CASTING
6A	6669	2	BEARING, 2” × 2”
7	5432	4	GREASE FITTING
8	HDW8457	6	LOCKNUT, ½” - 13, GR B
9	HDW8284	6	SCREW, ½” - 13, 2” LG, GR 8
10	HDW8899	2	RING, RETAINING (NOT SHOWN)
11	14538	2	BRACKET, CYLINDER RETAINING
12	HDW6455	4	SCREW, ¼” - 20, ½” LG
13	14537	2	PIN, CYLINDER MOUNT
17	6701	10	RING, RETAINING, 2”
18	9587	2	WEAR PAD, SLIDE BLOCK, BOTTOM
19	90235	2	WEAR PAD, ANGLE, SLIDE BLOCK TOP
20	40306	2	SLIDE PVT, LWR CAST, MACHINED
	8785	.67 FT	TAPE, DOUBLE COATED
21	7160	2	BEARING, 1 ¾” × 2”
22	40446	1	BEAM, 6 × 8 × .250, BOTTOM SLIDE, W/BEARINGS
23	14990	1	MAINTENANCE LOCK WELDMENT
24	8675	1	BEARING, 2 ¼” × 2” × 1 ½” LG (NOT SHOWN)
25	25429	12	SPACER BLOCK - BEAMS
26	91020	1	LIFT CYLINDER
27	40083	2	BEAM, 6 × 6 × .313
	6669	4	BEARING, 2” × 2” (NOT SHOWN)
28	14806	1	SUPPORT BEAM WELDMENT
29	16283	2	CYLINDER MOUNT
			CONTINUED . . .



ART 3072BEAMS

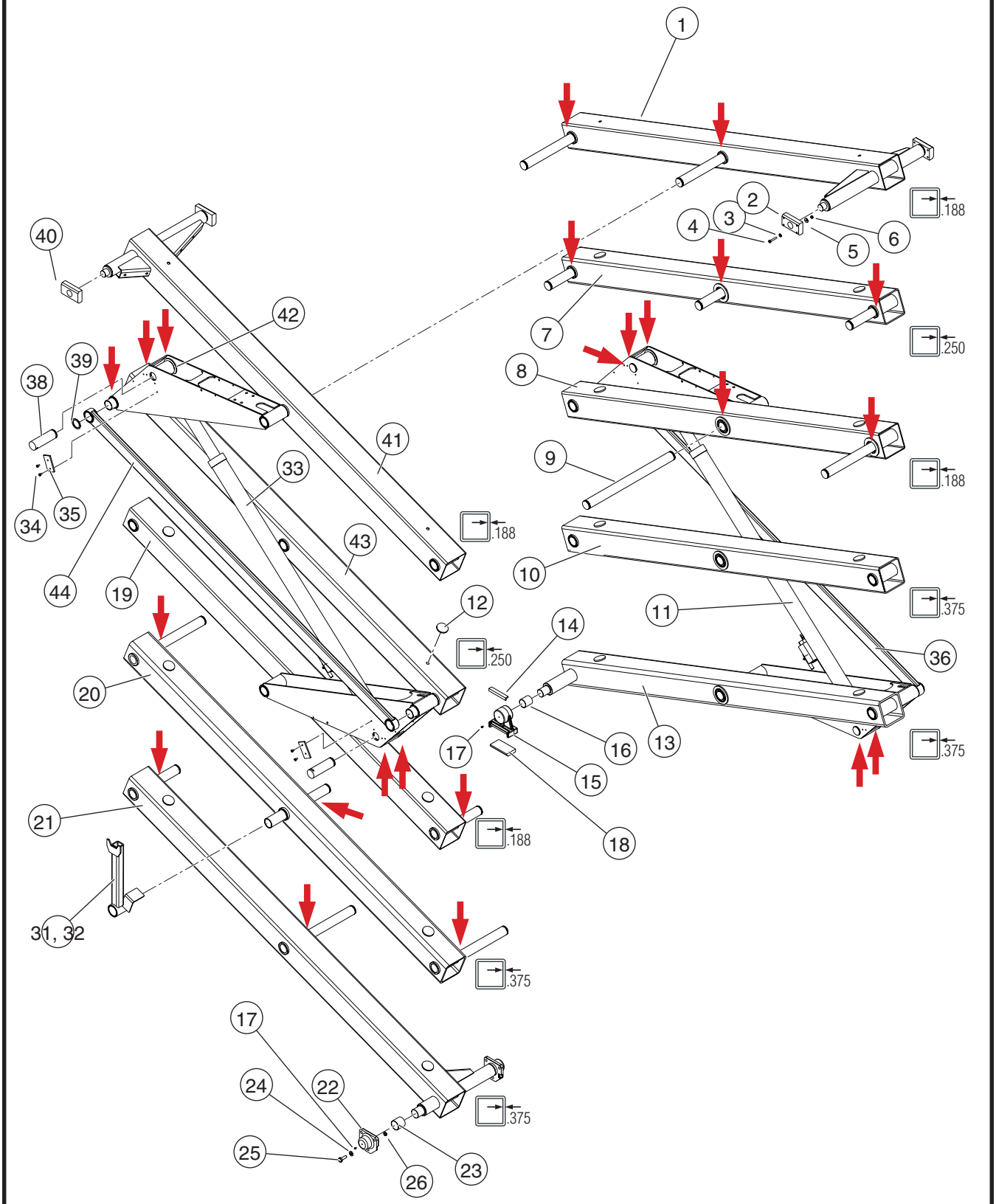
ITEM	PART NO.	QTY	DESCRIPTION
			BEAM ASSEMBLY, 3072RT (CONTINUED)
30	HDW8303	8	SCREW, 5/16” - 18, 2” LG
31	HDW5217	8	WASHER, FLAT, .343 ID × .688 OD × .063 THK
32	HDW8294	8	WASHER, FLAT, .328 ID × 1.000 OD × .100 THK
33	HDW8304	8	NUT, 5/6” - 18
34	14487	2	BLOCK, SLIDE, PLATFORM
35	40447	1	BEAM, 6 × 8 × .250, TOP FIXED, W/BEARINGS
	HDW13175	16	WASHER, 2.062 ID × 2.620 OD × .030 THK (NOT SHOWN)
	91185	1	CABLE, MAIN CONTROL (NOT SHOWN)



DENOTES LOCATION OF HDW13175, TOTAL QUANTITY OF 29

ART 3772BEAMS

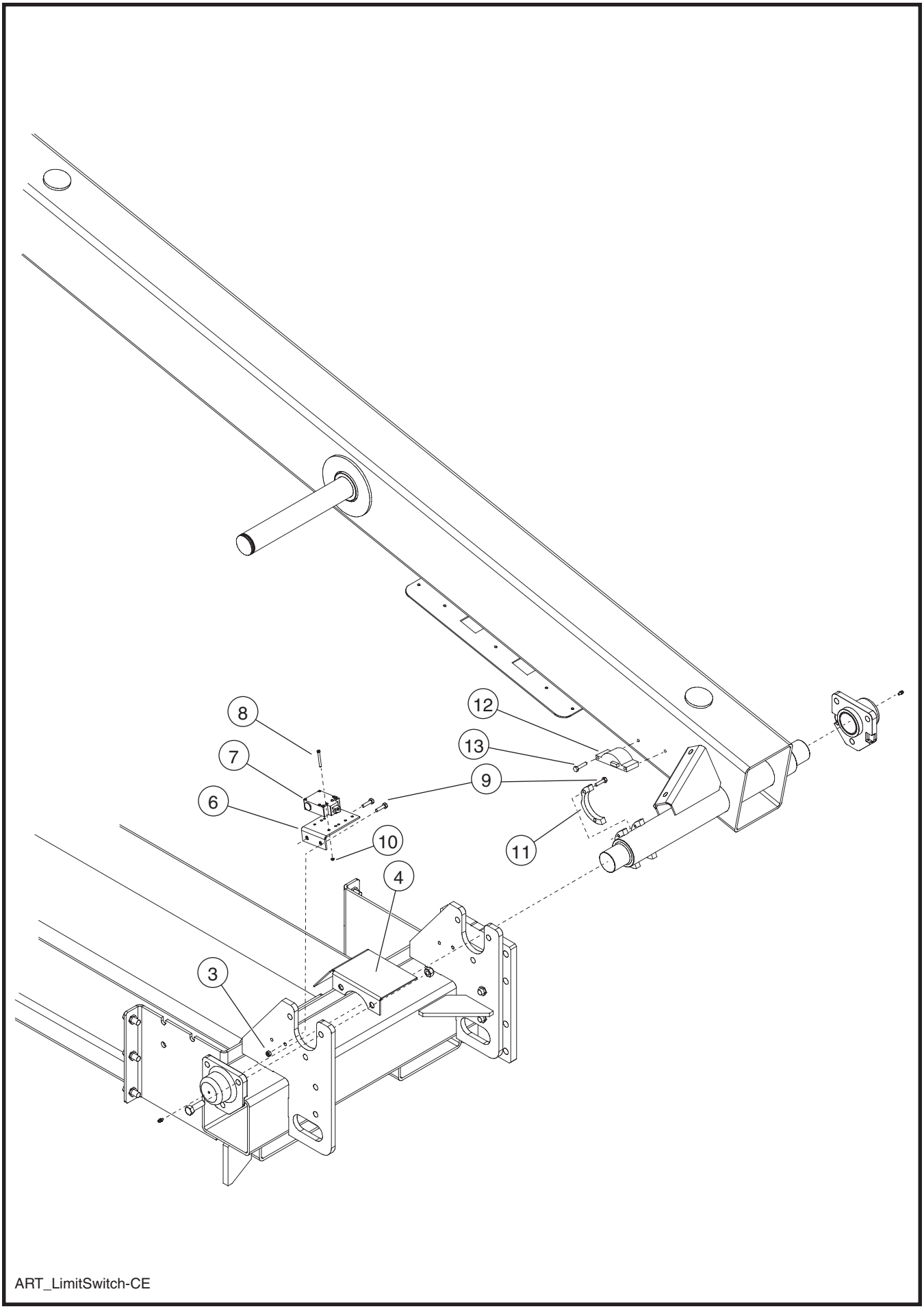
ITEM	PART NO.	QTY	DESCRIPTION
			BEAM ASSEMBLY, 3772RT
1	16290	1	BEAM 6 ×6 ×.188
2	14487	2	BLOCK, SLIDE, PLATFORM
3	HDW5217	8	WASHER, FLAT, .343 ID × .688 OD × .063THK
4	HDW8303	8	SCREW, 5/16" - 18, 2.00" LG
5	HDW8294	8	WASHER, FLAT, .328 ID × 1.000 OD × .100 THK
6	HDW8304	8	NUT, 5/16 - 18
7	40124	1	BEAM 6 × 6 × .250
8	16289	1	BEAM 6 ×6 ×.188
9	30407	1	PIN 2.00 DIA × 25.90" LG
10	16292	1	BEAM 6 ×6 ×.375 W/BEARINGS
11	91314	1	LIFT CYLINDER, LOWER
12	25429	16	SPACER BLOCK - BEAMS
13	16285	1	BEAM 6 ×6 ×.375, BOTTOM FITTED
14	90235	2	WEAR PAD, ANLE, SLIDE BLOCK, TOP
15	40306	2	SLIDE PIVOT LOWER CAST MACHINED
16	7160	2	BEARING, 1 ¾" × 2" - 28DU32
17	5432	4	GREASE FITTING
18	9587	2	WEAR PAD, SLIDE BLOCK, BOTTOM
19	16286	1	BEAM 6 ×6 ×.188
	6669	2	BEARING, 2.0 × 2.0 - 32DU32
20	40106	1	BEAM 6 ×6 ×.375
	6669	2	BEARING, 2.0 × 2.0 - 32DU32
21	16284	1	BEAM 6 ×6 ×.375
	6669	2	BEARING, 2.0 × 2.0 - 32DU32
22	40459	2	CASTING, MACHINED, LOWER PIVOT
23	6669	2	BEARING, 2.0 × 2.0 - 32DU32
24	HDW6491	6	WASHER, FLAT, .562 ID × 1.375 OD × .109 THK
25	HDW8284	6	BOLT, ½" - 13, 2.00" LG GR8
26	HDW8457	6	LOCKNUT, ½" - 13, GR8
31	30518	1	MAINTENANCE LOCK WELDMENT
32	8675	1	BEARING, 2 ¼" × 2" × 1 ½" LG (NOT SHOWN)
33	91315	1	LIFT CYLINDER, UPPER
			…CONTINUED



DENOTES LOCATION OF HDW13175, TOTAL QUANTITY OF 29

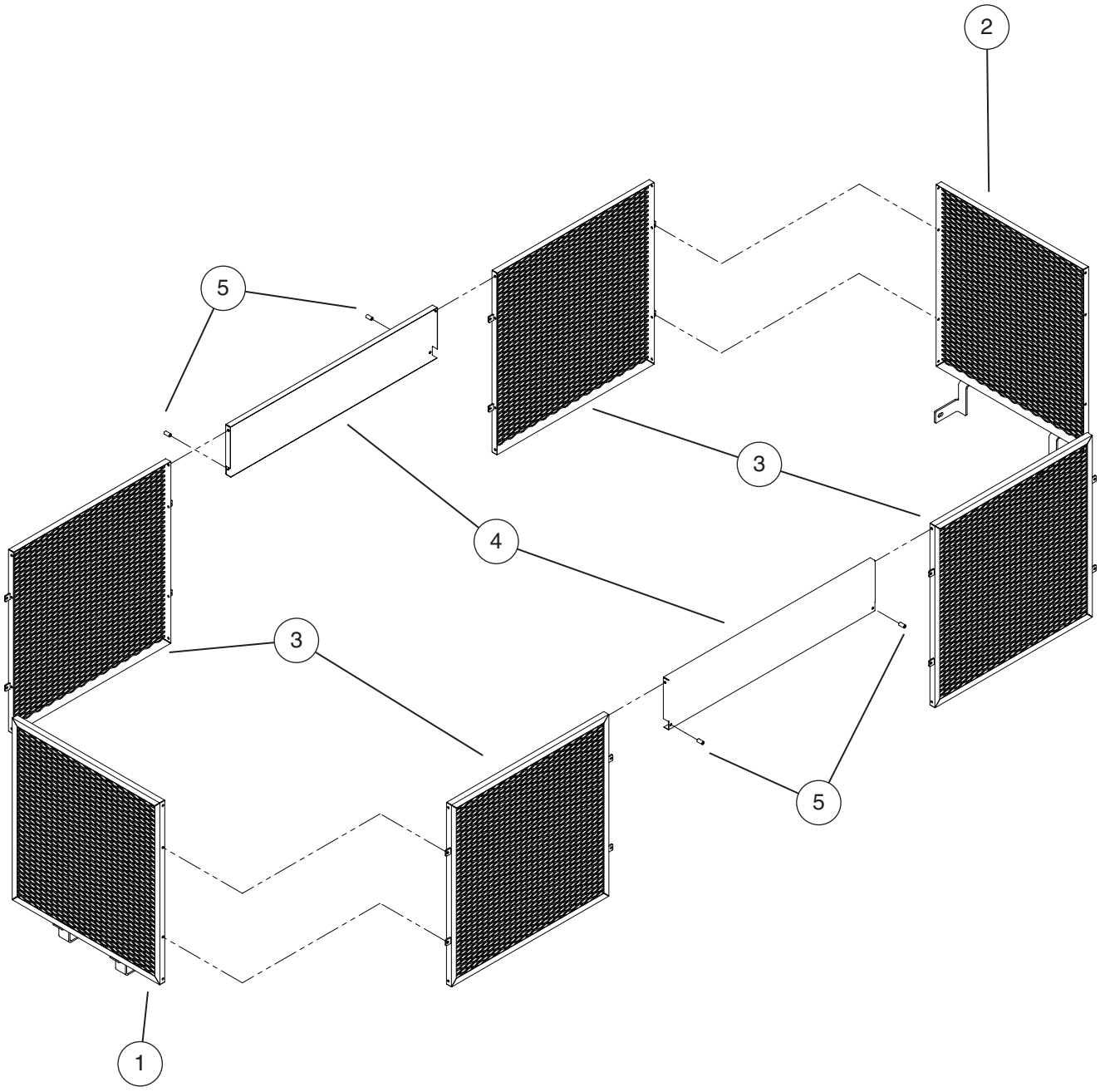
ART 3772BEAMS

ITEM	PART NO.	QTY	DESCRIPTION
			BEAM ASSEMBLY, 3772RT (CONTINUED)
34	HDW6455	8	SCREW, ¼" - 20, ½" LG
35	14538	4	BRACKET, CYLINDER RETAINING
36	14806	1	SUPPORT BEAM WELDMENT
37	16283	4	MOUNT CYLINDER W/CAP
38	14537	4	PIN, CYLINDER MOUNT, 1.998 × 6.408
39	6701	15	RING, RETAINING, 2" SHAFT
40	14488	2	BLOCK, SLIDE PLATFORM
41	16287	1	BEAM 6 ×6 ×.188 W/PINS
42	HDW8899	4	RING, RETAINING (NOT SHOWN)
43	16288	1	BEAM 6 ×6 ×.250 W/BEARINGS
44	16282	1	SUPPORT BEAM W/BEARINGS
	HDW13175	16	WASHER, 2.062 ID × 2.620 OD × .030 THK (NOT SHOWN)
	91321	1	CABLE, MAIN CONTROL (NOT SHOWN)



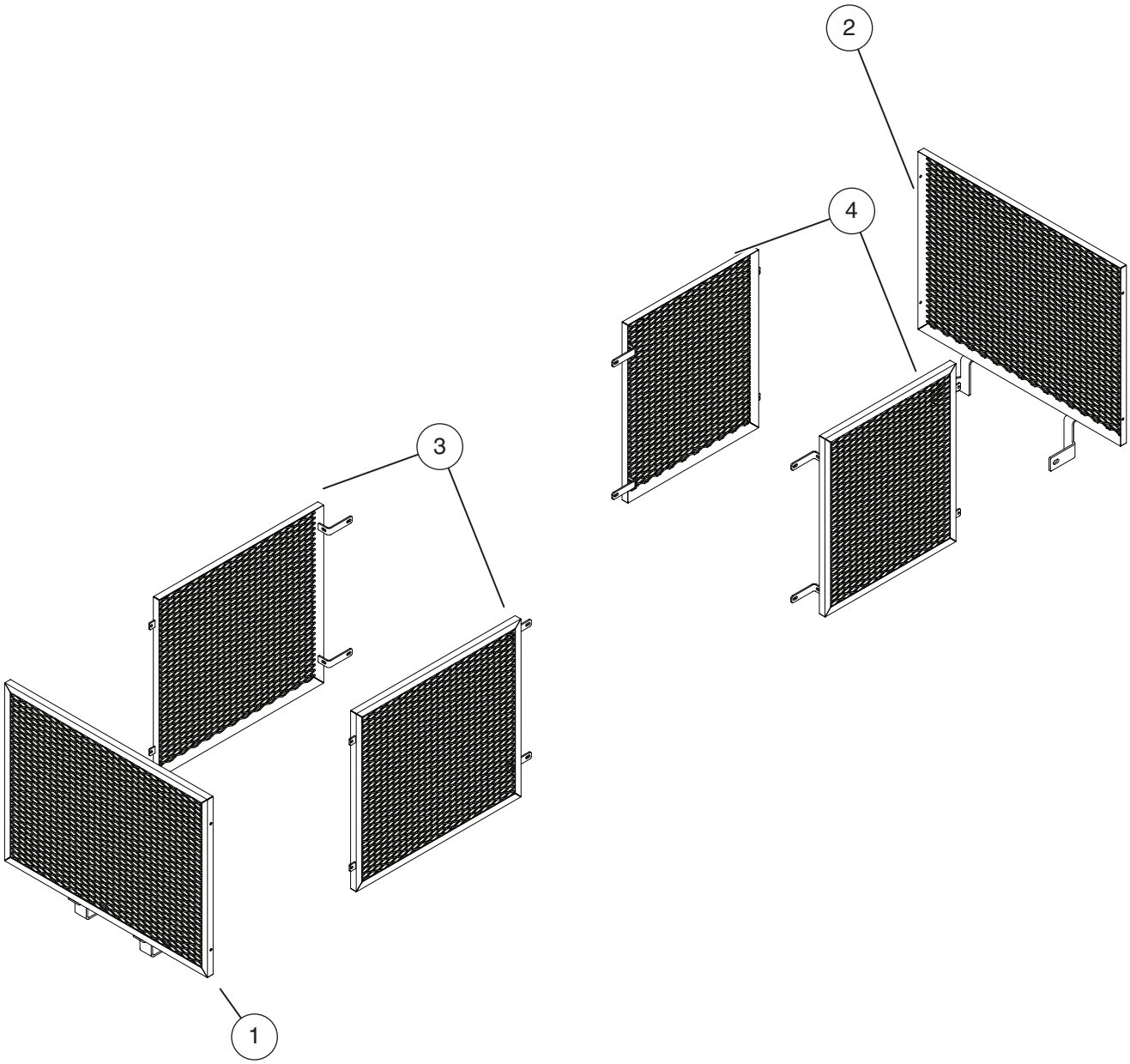
ART_LimitSwitch-CE

ITEM	PART NO.	QTY	DESCRIPTION
			LIMIT SWITCH INSTALLATION
3	HDW8267	2	NUT, ¼”-20
4	40604	1	COVER, LIMIT SWITCH
6	13838	1	BRKT, LIMIT SWITCH
7	90996	1	LIMIT SWITCH, SLOW SPEED
8	HDW8482	2	#8-32, 1 ½” LG, GR 2
9	HDW8273	4	¼”-20, 1” LG, GR 8
10	HDW5251	2	NUT, #8-32
11	40524	1	CAM, SLOW SPEED, 2.75 DIA.
			HEIGHT SENSOR INSTALLATION
12	90844	1	HEIGHT SENSOR
13	HDW6831	2	SCREW, ¼”-20, 2” LG



ART_3072Guards

ITEM	PART NO.	QTY	DESCRIPTION
			SCISSORS GUARD - 3072RT
1	16323	1	“FRONT PANEL, SCISSOR GUARD”
2	16324	1	“REAR PANEL, SCISSOR GUARD”
3	16325	4	“SIDE PANEL, SCISSOR GUARD”
4	16320	2	“MID PANEL, SCISSOR GUARD”
5	16332	4	SPACER



ART_3772Guard

ITEM	PART NO.	QTY	DESCRIPTION
			SCISSORS GUARD - 3772RT
1	16350	1	“FRONT PANEL, SCISSOR GUARD”
2	16353	2	“REAR PANEL, SCISSOR GUARD”
3	16355	2	“SIDE PANEL, SCISSOR GUARD”
4	16359	2	“SIDE PANEL, SCISSOR GUARD”

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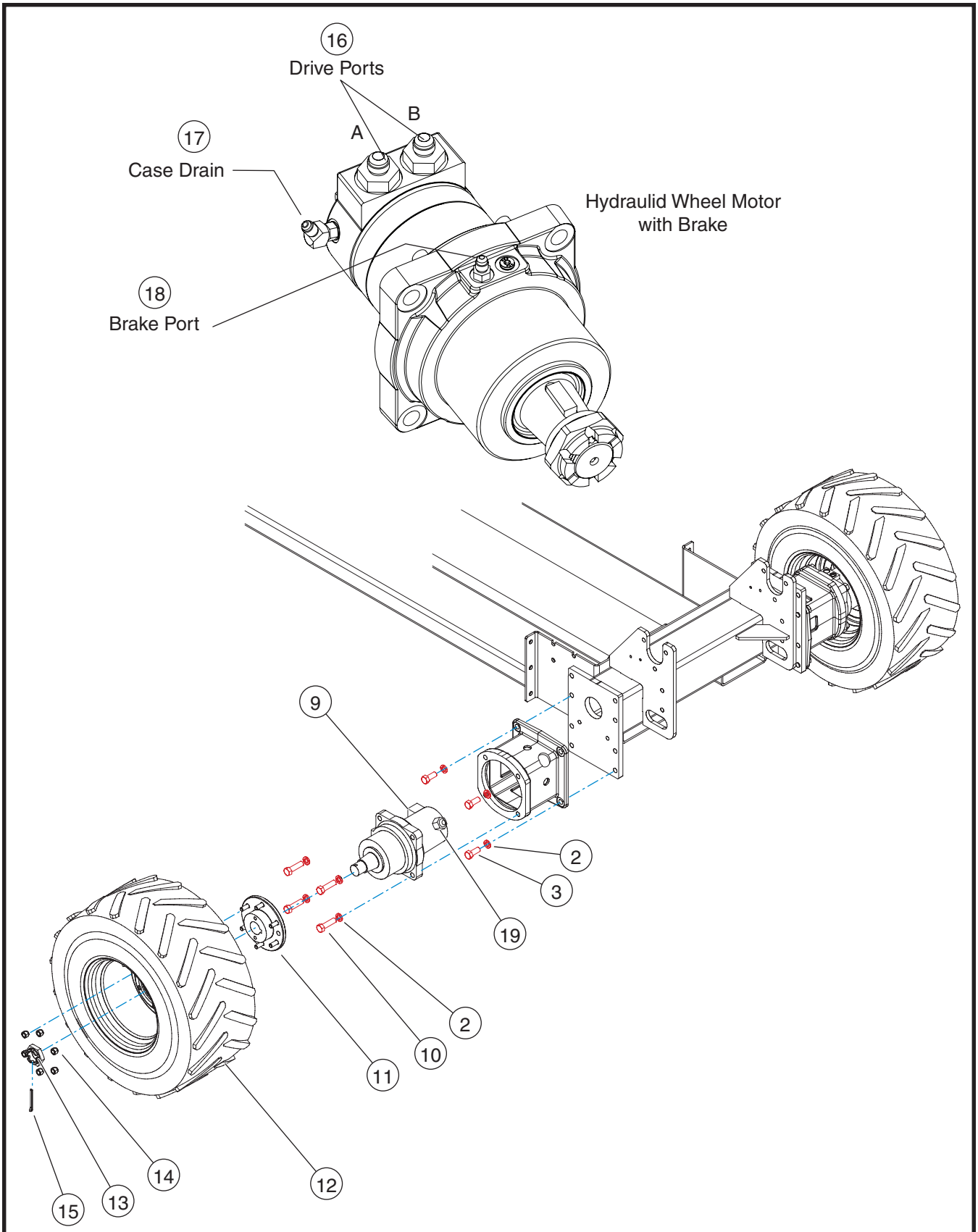
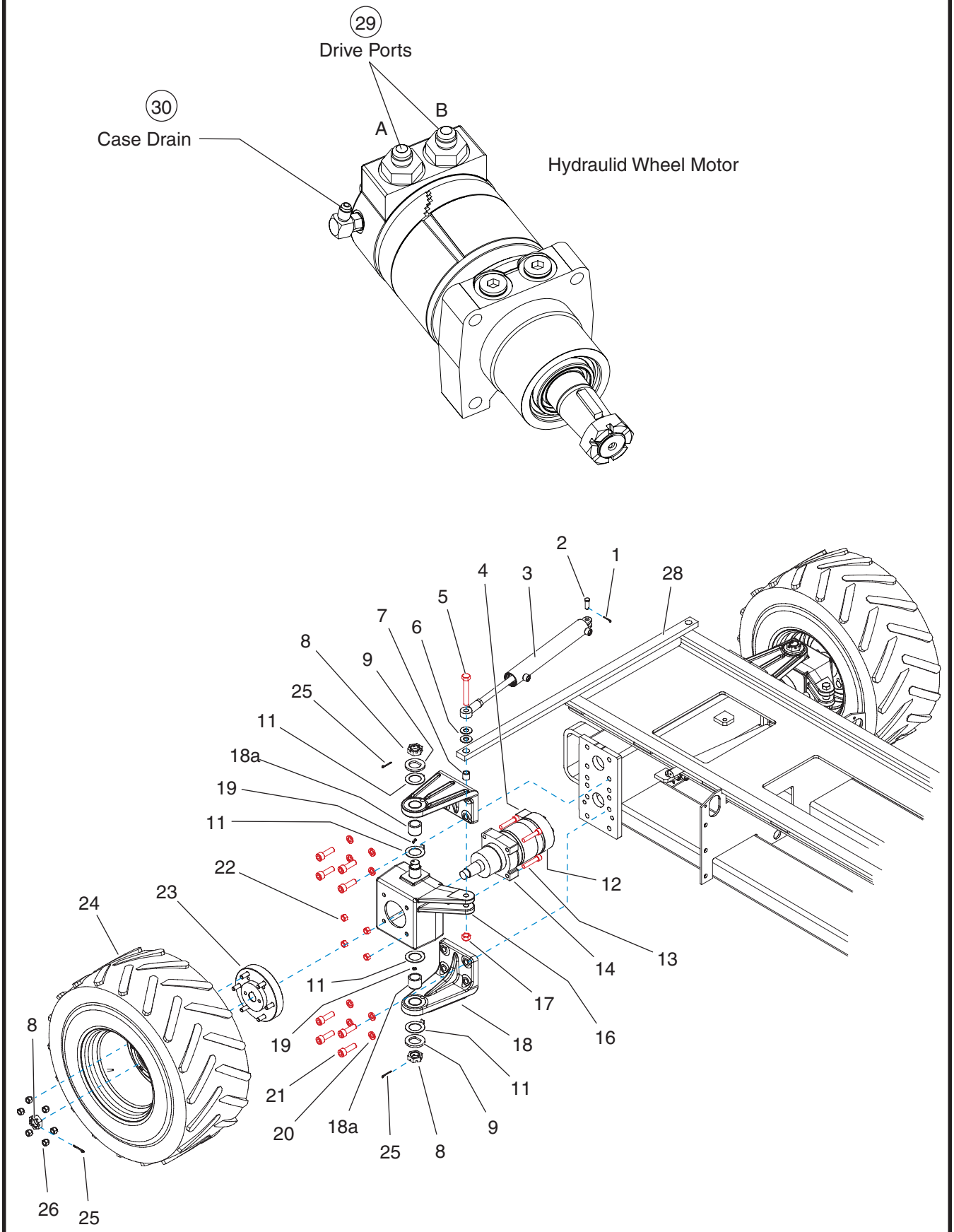
SECTION 4:
AXLES



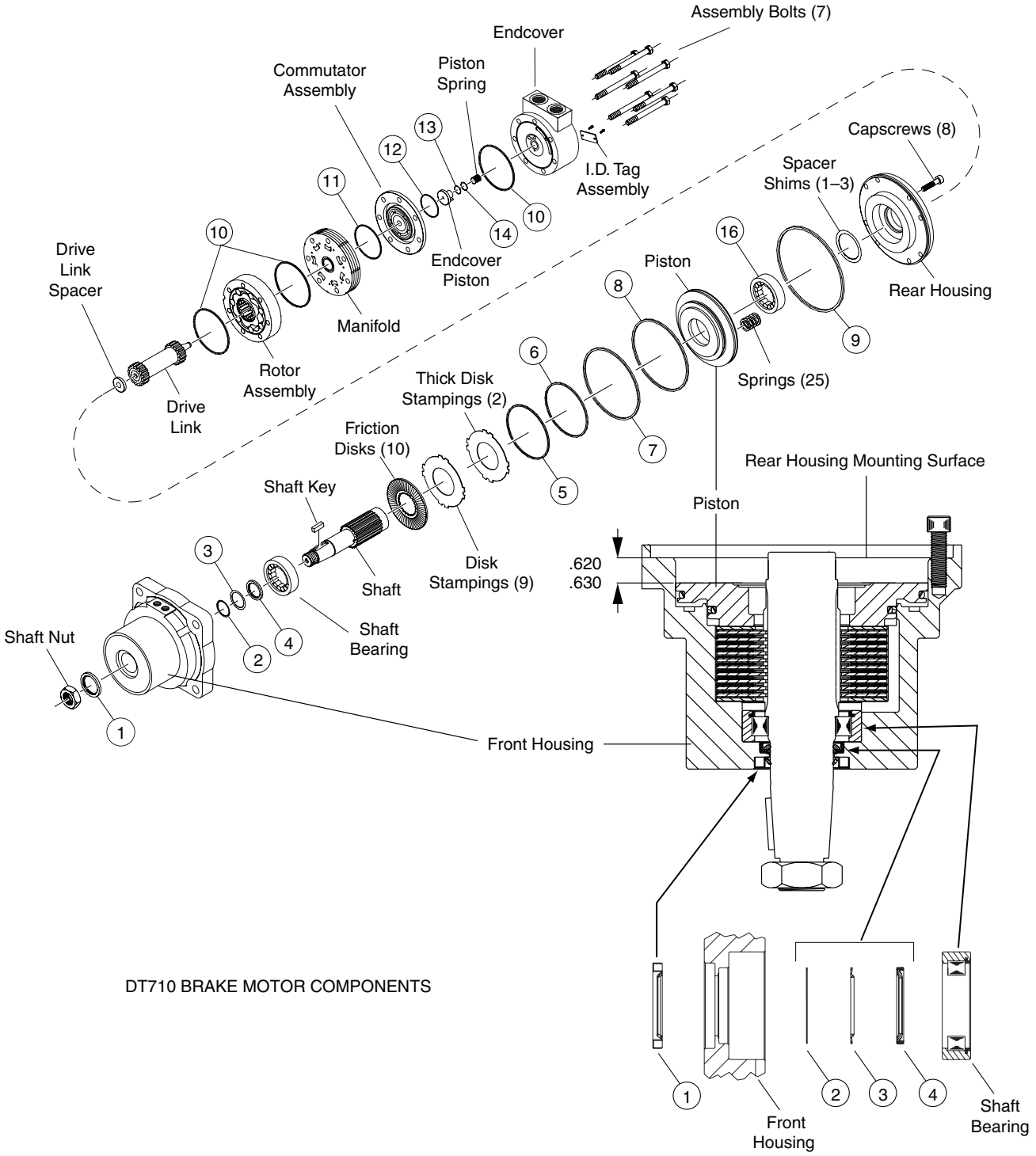
ART_RearAxle

ITEM	PART NO.	QTY	DESCRIPTION
			REAR AXLE ASSEMBLY
1	40258	2	MOUNT, MOTOR, REAR AXLE, MACHINED
2	HDW5994	16	WASHER, LOCK, .640 ID X 1.050 OD X .165 THK
3	HDW90409	8	BOLT, 5/8" - 11, 1 ½" LG
8	90765	4	HOSE PROTECTION (NOT SHOWN)
9	91319	2	WHEEL MOTOR, HYD W/BRAKE
10	HDW5989	8	SCREW, 5/8"-11, 2.25" LG, GR 5
11	14773	2	HUB
12	91167	1	WHEEL/TIRE ASSY, RH - 10 PLY - FOAM
	91168	1	WHEEL/TIRE ASSY, LH - 10 PLY - FOAM
	91180	-	WHEEL (SERVICE)
	91181	-	TIRE 26X12.00-380 (SERVICE)
13	HDW9037		NUT, CASTLE, M42 X 3 (SERVICE)
14	HDW6677	12	NUT, LUG, ½" - 20, GR 5
15	8925	2	PIN, COTTER, .250 DIA. X 3" LG
16	HDW8984	4	FITTING, MB-MJ-12-8
17	HDW91235	2	FITTING, MB-MJ45-4-5
18	HDW8881	2	FITTING, MB-MJ-4-4
19	91326	2	RELIEF VALVE



ART FrontAxle

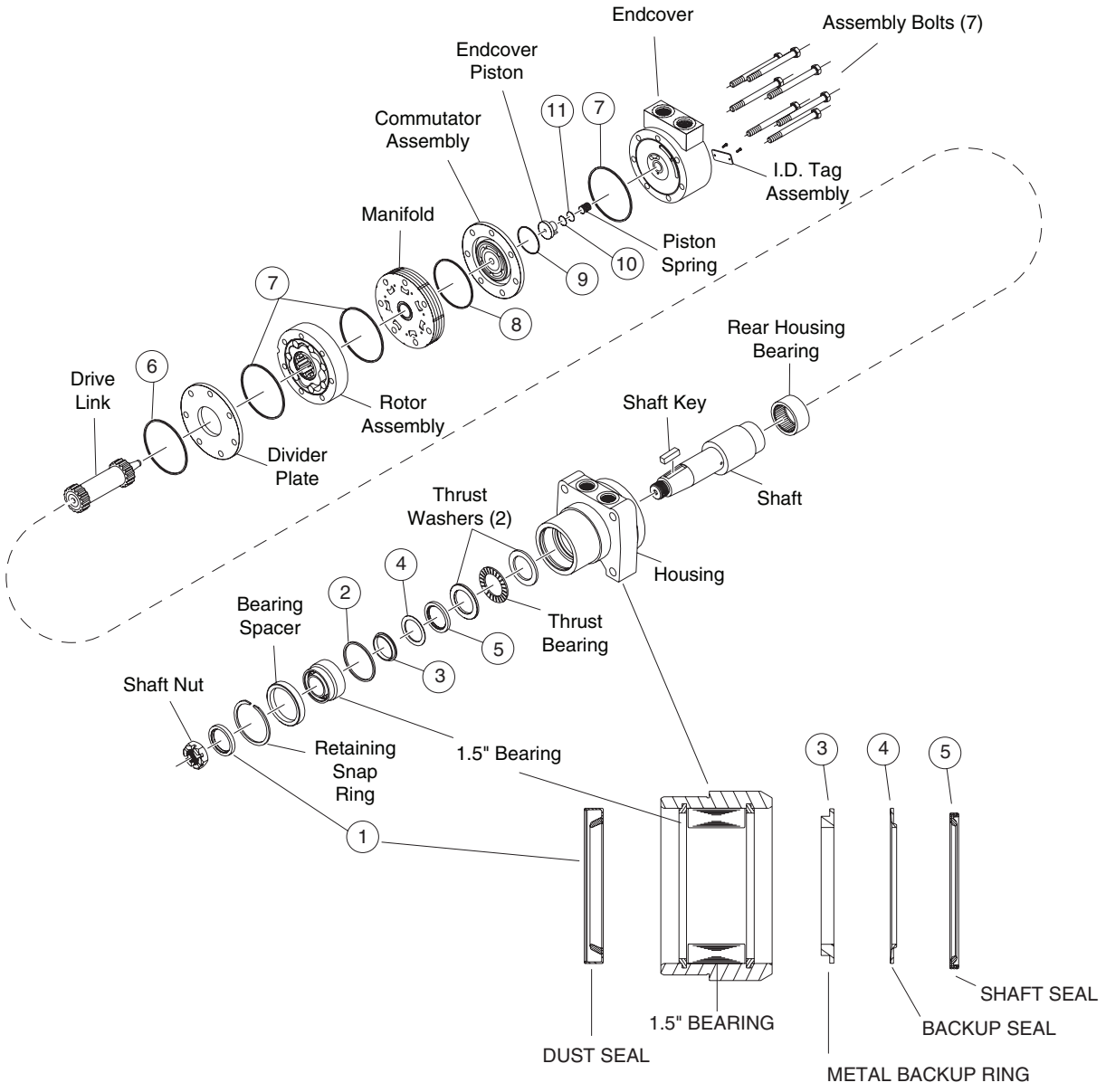
ITEM	PART NO.	QTY	DESCRIPTION
			FRONT AXLE ASSEMBLY
1	HDW5920	2	PIN, COTTER, .12 DIA. X 1" LG
2	HDW90770	2	PIN, CLEVIS, ½ DIA. X 1 3/8" LG
3	91019	2	CYLINDER, STEERING
	90990		SEAL KIT, STEER CYLINDER (NOT SHOWN)
4	91263	4	HOSE ASSEMBLY ½" (8M3K-8FJX-8FJX90S-37")
5	HDW7326	2	SCREW, 5/8" - 11. 4" LG, GR 5
6	HDW9219	4	WASHER, .656 ID X 1.312 OD X .093 THK
7	7292	2	BEARING, SLEEVE, BRONZE
8	HDW8568	6	NUT, 1 1/8" - 18
9	20311	4	WASHER, 1.375 ID X 2.75 OD X .250 THK
11	20312	8	WASHER, THRUST
12	90282	1	HOSE ASSEMBLY 5/16" (NOT SHOWN)
13	HDW7043	8	SCREW, ½"-13, 2.50" LG, GR 8, SOCKET HEAD
14	7300P	2	MOTOR, WHEEL, HYD.
15	90765	8	HOSE PROTECTION (NOT SHOWN)
16	40464	1	MOUNT, WHEEL MOTOR, LH, FRONT (CAST 40463)
	40308	1	MOUNT, WHEEL MOTOR, RH, FRONT (CAST 40367)
17	HDW6633	2	NUT, LOCK, 5/8" - 11, GR 5
18	40334	4	MOUNT, MOTOR W/BEARINGS
18A	9307	4	BEARING, 1.50 X 1.0 DIA
19	9607	2	FITTING, GREASE, 90°
20	HDW5994	16	WASHER, LOCK, .640 ID X 1.050 OD X .165 THK
21	HDW90410	16	SCREW, 5/8" - 11, 2" LG, GR 8, SOCKET HEAD
22	HDW8457	8	NUT, ½"-13, GR8
23	10709	2	HUB
24	91167	1	WHEEL/TIRE ASSY, RH - 10 PLY - FOAM
-	91168	1	WHEEL/TIRE ASSY, LH - 10 PLY - FOAM
25	HDW5290	6	PIN, COTTER, .156 DIA. X 1.75" LG
26	HDW6677	12	NUT, LUG, ½" - 20, GR 5
28	14331	1	ROD, TIE STEERING
29	HDW8984	4	FITTING, MB-MJ-12-8
30	HDW91236	2	FITTING, MB-MJ90-4-5



DT710 BRAKE MOTOR COMPONENTS

ART_DT710

ITEM	PART NO.	QTY	DESCRIPTION
			WHEEL MOTOR, REAR
	91319	-	WHEEL MOTOR W/BRAKE
	9781		SEAL KIT
1		1	DUST SEAL
2		1	METAL BACKUP SHIM
3		1	BACKUP SEAL
4		1	SHAFT SEAL
5		1	SMALL PISTON O-RING SEAL
6		1	SMALL PISTON SEAL
7		1	LARGE PISTON O-RING SEAL
8		1	LARGE PISTON SEAL
9		1	O-RING SEAL
10		3	BODY SEAL
11		1	MANIFOLD SEAL
12		1	COMMUTATOR SEAL
13		1	O-RING SEAL
14		1	BACKUP SEAL
	91138		DISK KIT
		10	FRICTION DISK
		9	DISK STAMPING
		2	THICK DISK STAMPING



DT701 Series Motor Components

ART_DT701

ITEM	PART NO.	QTY	DESCRIPTION
			WHEEL MOTOR, FRONT
	7300P	-	MOTOR WHEEL HYD PAINTED
-	90592	1	SEAL KIT
1	-	1	DUST SEAL
2	-	1	HIGH PRESSURE SEAL
3	-	1	METAL BACKUP SHIM
4	-	1	TEFLON BACK UP SEAL
5	-	1	SHAFT SEAL
6	-	1	HOUSING SEAL
7	-	3	BODY SEALS
8	-	1	MANIFOLD SEAL
9	-	1	COMMUTATOR SEAL
10	-	1	O-RING SEAL
11	-	1	TEFLON BACKUP SEAL

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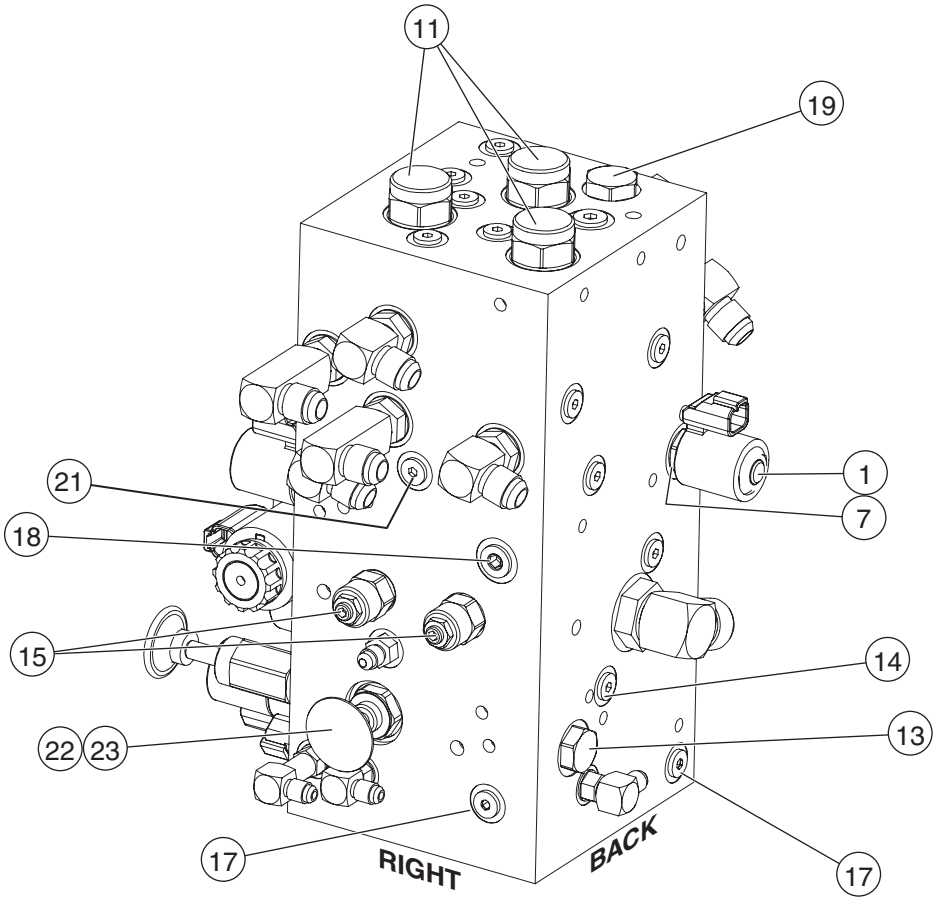
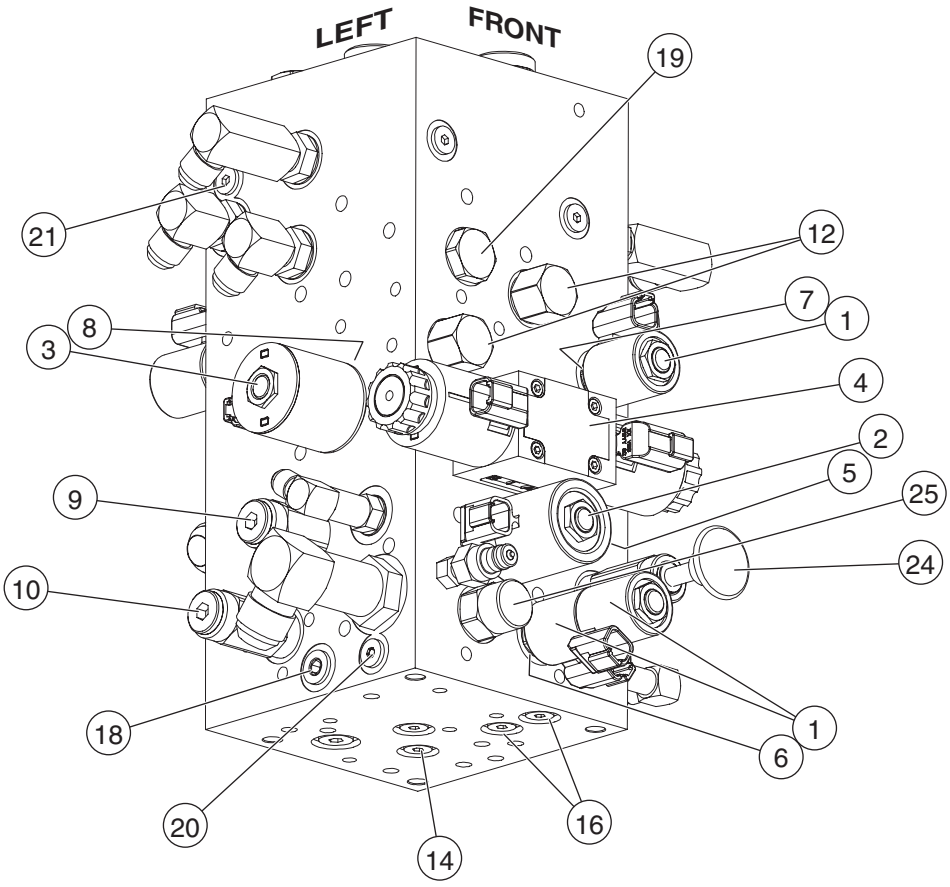
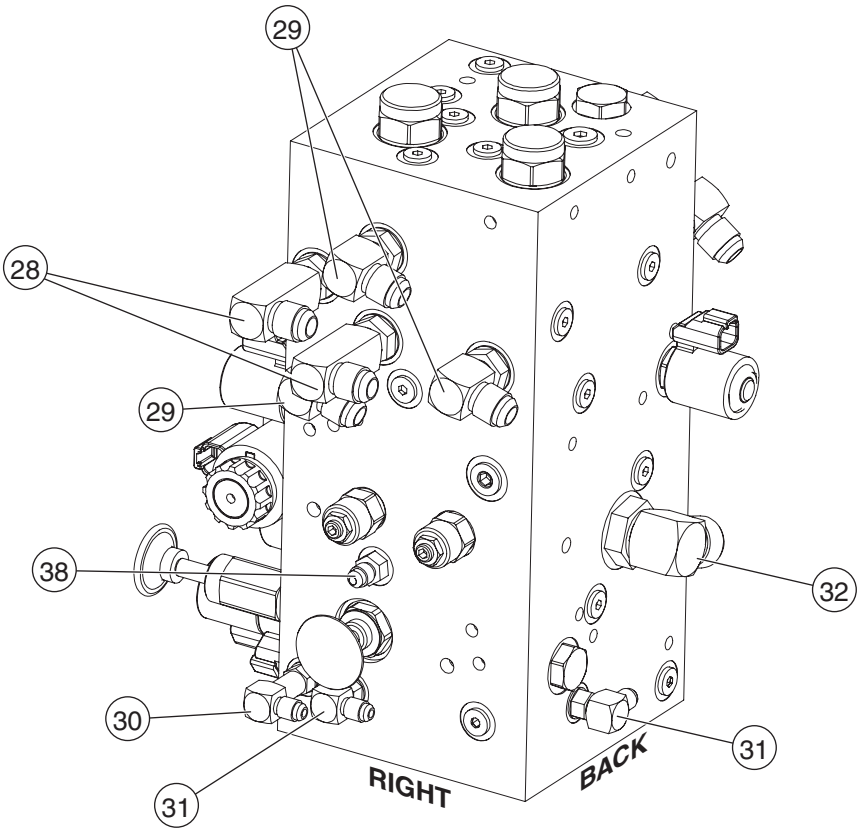
SECTION 5:
HYDRAULICS

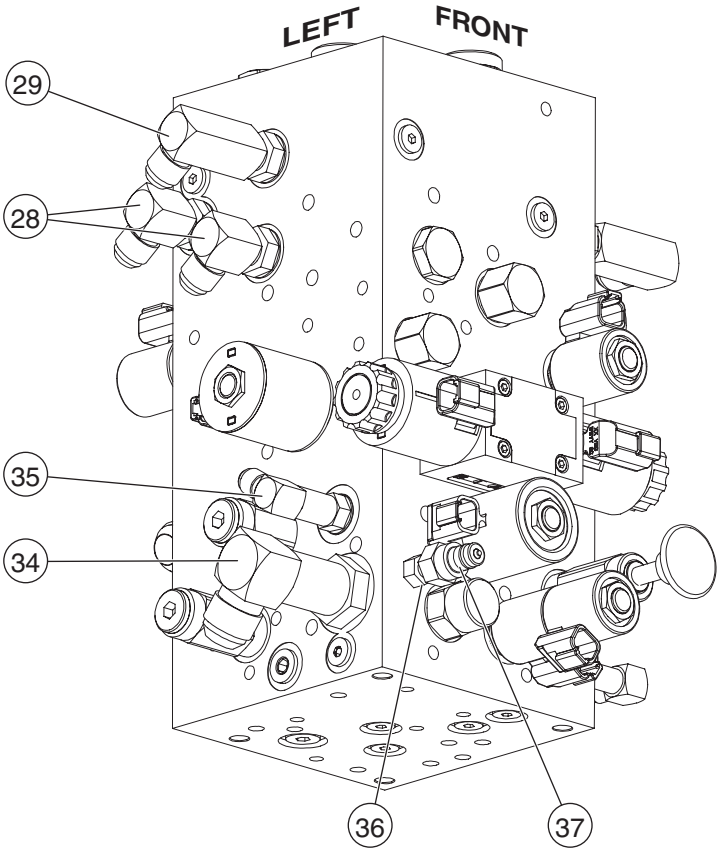




ART_91140-ASSY

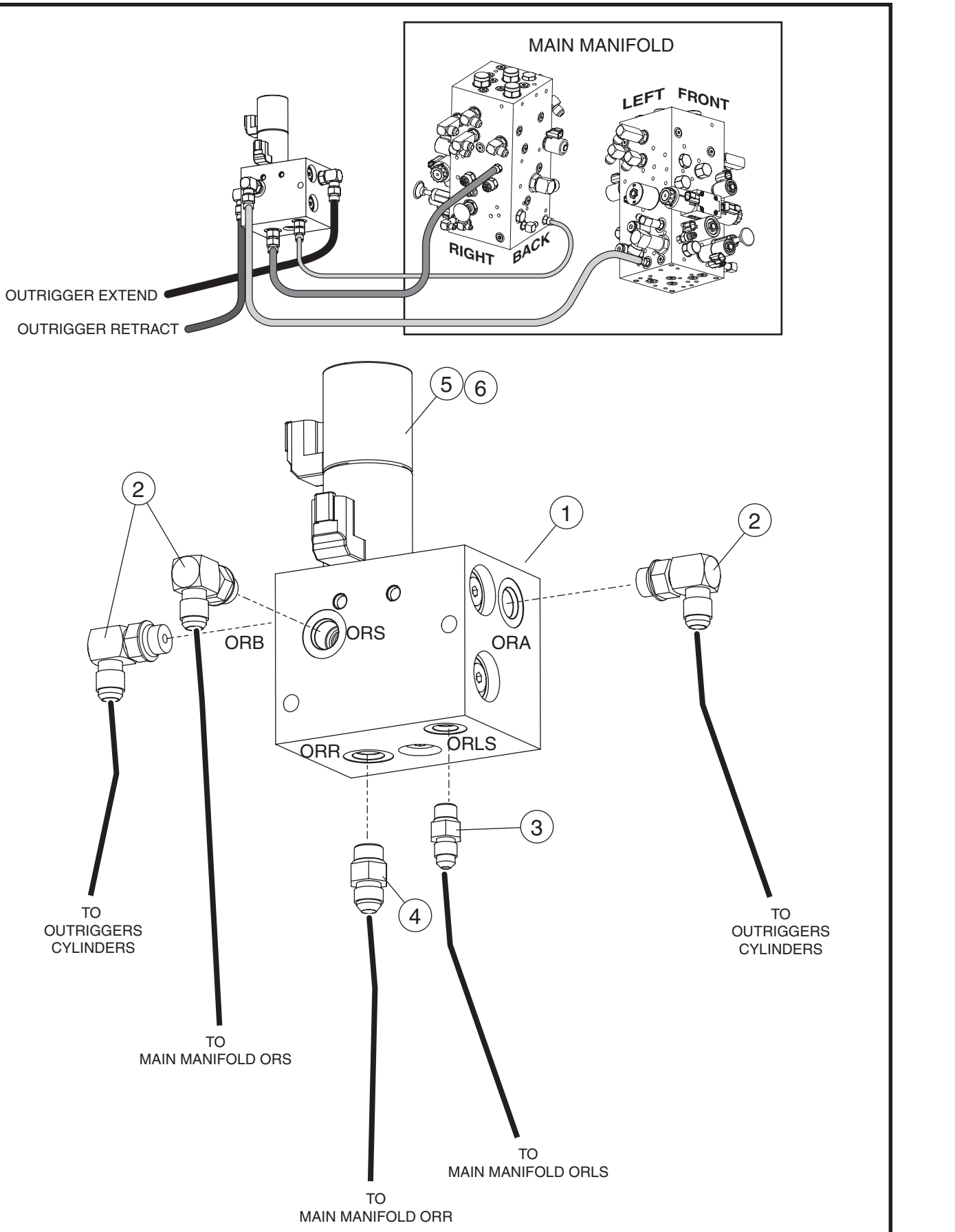
ITEM	PART NO.	QTY	DESCRIPTION
			MANIFOLD ASSEMBLY
	91140	-	MANIFOLD ASSEMBLY
1	91141	4	COIL, SERIES 8, 12V
2	91142	1	COIL, SERIES 10, 12V
3	91143	1	COIL, SERIES 10 E-COIL, 12V
4	91144	1	VALVE, DRIVE, 4 WAY 3 POSITION
5	91145	1	VALVE, LIFT SPOOL, 3 WAY
6	91146	1	VALVE, STEER, 4 WAY 3 POSITION
7	91147	2	VALVE, SERIES PARALLEL SPOOL, 4 WAY 3 POSITION
8	91148	1	VALVE, PROPORTIONAL, 12 V
9	91149	1	VALVE, RELIEF, LIFT
10	91150	1	VALVE, RELIEF, STEER
11	91151	3	VALVE, PILOTED SPOOL 4 WAY 3 POSITION
12	91152	2	VALVE, PILOTED POPPET
13	91153	1	VALVE, LOAD SHUTTLE CHECK
14	91154	2	VALVE, LOAD SHUTTLE CHECK
15	91350	2	VALVE, COUNTERBALANCE
16	91353	2	VALVE, CHECK
17	HDW7314	2	PORT PLUG M ¼", O-RING, RBG-4
	HDW7061	2	ADAPTER (W/ OUTRIGGER OPTION)
18	7484	2	PORT PLUG M 0.38" O-RING, RBG-6
	HDW7438	2	ADAPTER (W/ OUTRIGGER OPTION)
19	91351	2	FLOW DIVIDER / COMBINER
20	91355	1	ORIFICE PLUG, STEER
21	91356	2	ORIFICE PLUG, FLOW DIVIDER BLEED
22	91012	1	VALVE, MANUAL — PULL
23	91354	1	ORIFICE DISC
24	91015	1	HAND PUMP, BRAKE RELEASE
25	91352	1	PRESSURE COMPENSATOR





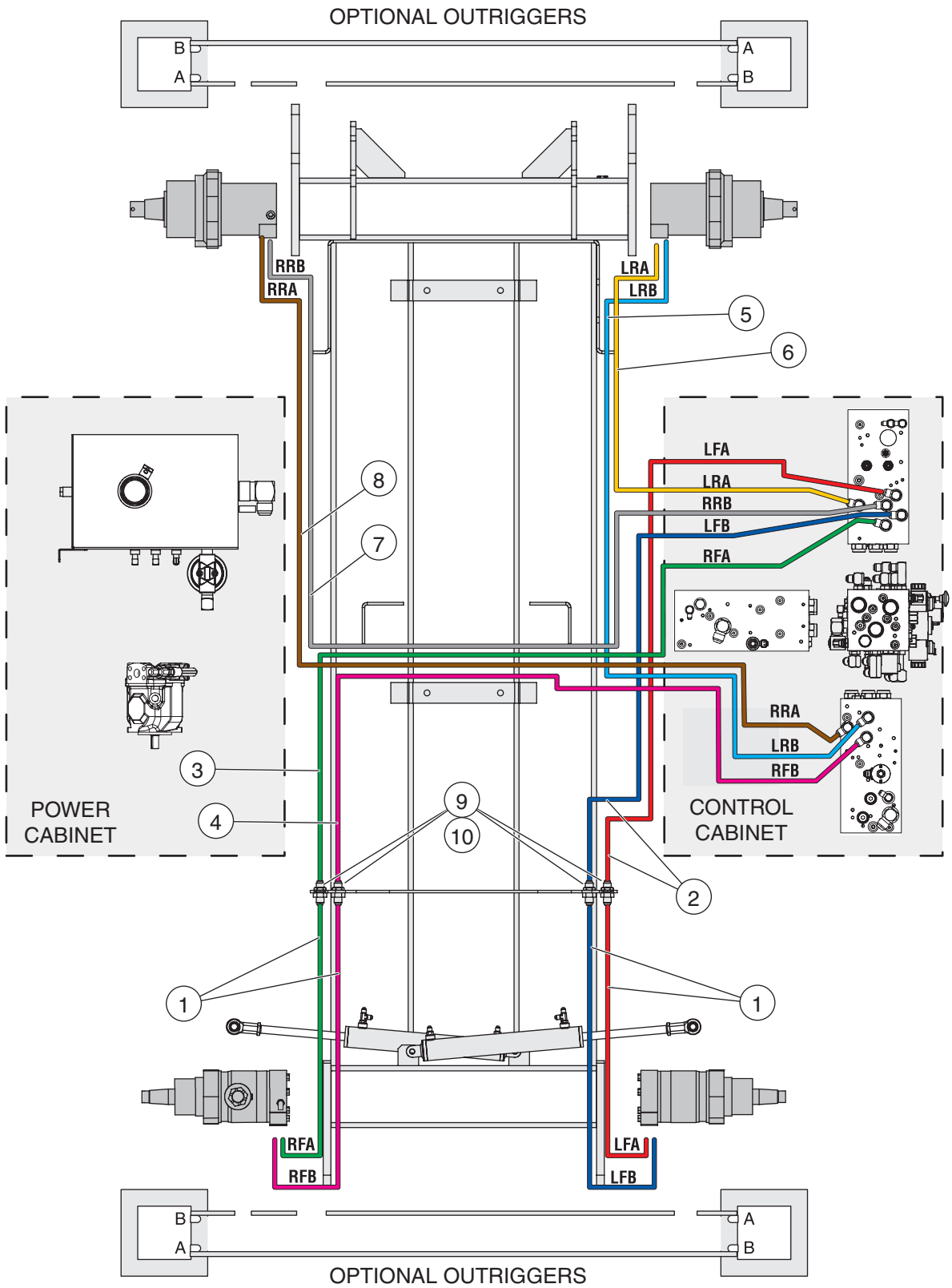
ART_91140-ASSY-HDW

ITEM	PART NO.	QTY	DESCRIPTION
			MANIFOLD ASSEMBLY – HARDWARE
28	HDW91248	3	ELBOW, 90°, MALE, ½", O-RING, MALE, ½", MB-MJ90LL-8-8
29	HDW90764	5	ELBOW, 90°, MALE, ½", O-RING, MALE, ½", MB-MJ90-8-8
30	HDW8877	2	ELBOW, 90°, MALE ¼" O-RING, MALE ¼", MB-MJ90-4-4
31	HDW91081	1	ELBOW, 90°, MALE ¼" O-RING, MALE ¼", MB-MJ90LL-4-4
32	HDW91244	1	ELBOW, 90°, MALE ¾" O-RING, MALE ¾", MB-MJ90-12-12
34	HDW91245	1	ELBOW, 90°, M ¾" O-RING, M ¾",MB-MJ90LL-12-12
35	HDW9157	1	ELBOW, 90°, M .37 JIC, M .37 O-RING, MB-MJ90LL-6-6
36	HDW7971	1	FITTING, MALE DISCONNECT, ¼" NPT
37	HDW91243	1	ADAPTER MALE ¼" ORNG M ¼" NTP, MP-MB-4-4
38	HDW8881	1	ADAPTER, MALE ¼", O-RING, MALE ¼" 37° MB-MJ-4-4



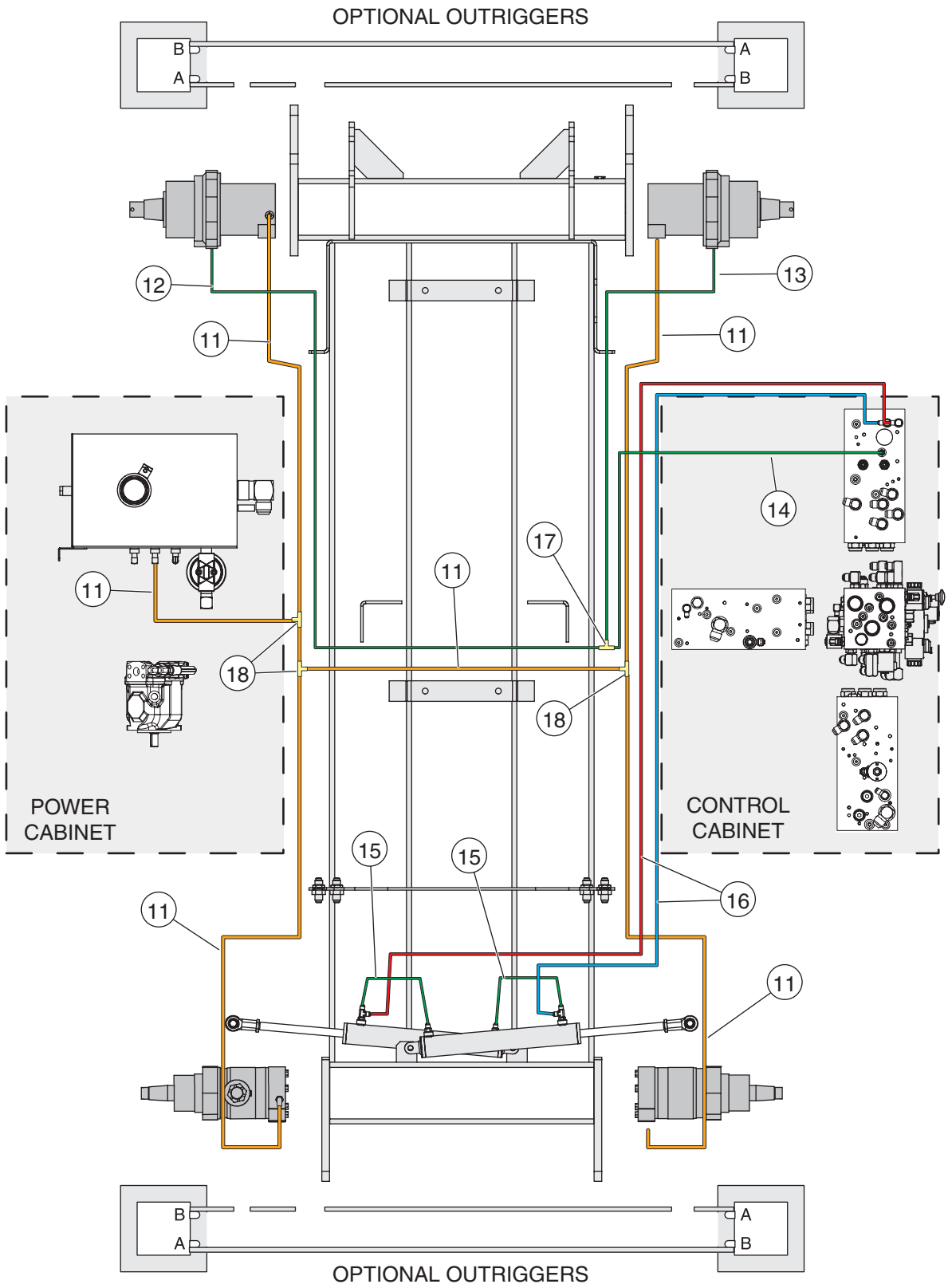
ART_91268ASSY

ITEM	PART NO.	QTY	DESCRIPTION
			MANIFOLD - OUTRIGGER (OPTION)
			SEE HOSE KIT FOR HOSES
1	91268	1	MANIFOLD ASSEMBLY
2	HDW7601	3	ELBOW 90° MALE 3/8" O-RING - MALE 3/8" JIC
3	HDW8881	1	ADAPTER MALE ¼" O-RING - MALE ¼" JIC
4	HDW7438	1	ADAPTER MALE 3/8" O-RING - MALE 3/8" JIC
5	91142	2	COIL
6	91008	1	VALVE SPOOL 4-WAY 3-POSITION



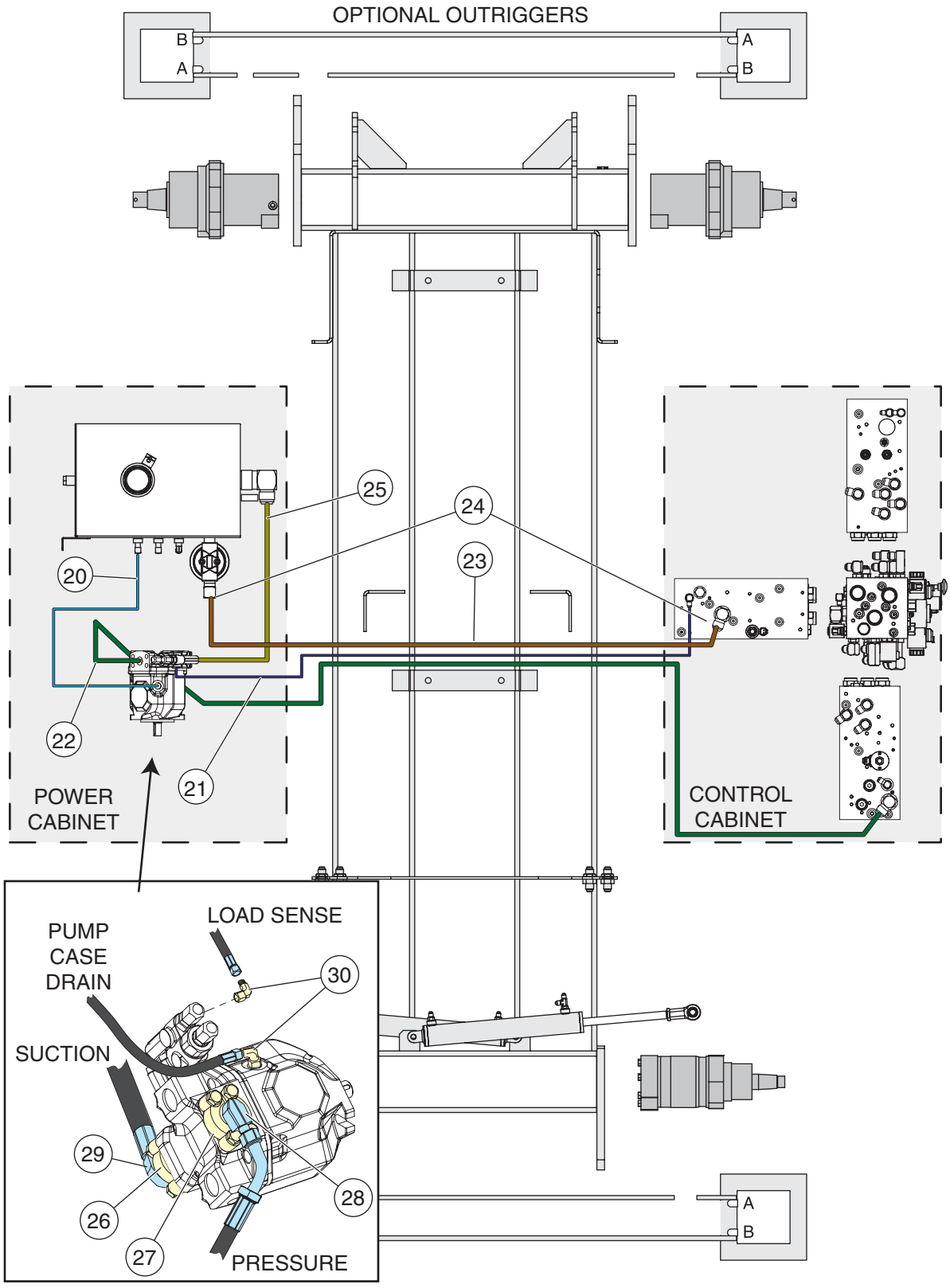
ART_X72Hoses- Axles

ITEM	PART NO.	QTY	DESCRIPTION
			Hose Kit - Axles
	90278	-	HOSE KIT
1	91263	4	HOSE ASSY, ½"×37", 8M3K-8FJX-8FJX90S-37"
2	9389	2	HOSE ASSY, ½" × 44", 8M3K-8FJX-8FJX
3	9386	1	HOSE ASSY, ½" × 68", 8M3K-8FJX-8FJX-68"
4	91261	1	HOSE ASSY, ½" × 61", 8M3K-8FJX-8FJX
5	91258	1	HOSE ASSY, ½" × 57", 8M3K-8FJX-8FJX45
6	91257	1	HOSE ASSY, ½" × 49", 8M3K-8FJX-8FJX45
7	91260	1	HOSE ASSY, ½" × 98", 8M3K-8FJX-8FJX45
8	91259	1	HOSE ASSY, ½" × 84", 8M3K-8FJX-8FJX45
9	91192	4	ADAPTER MALE ½" JIC - ½" JIC BULKHEAD
10	91193	4	JAMNUT ¾-16
			CONTINUED…



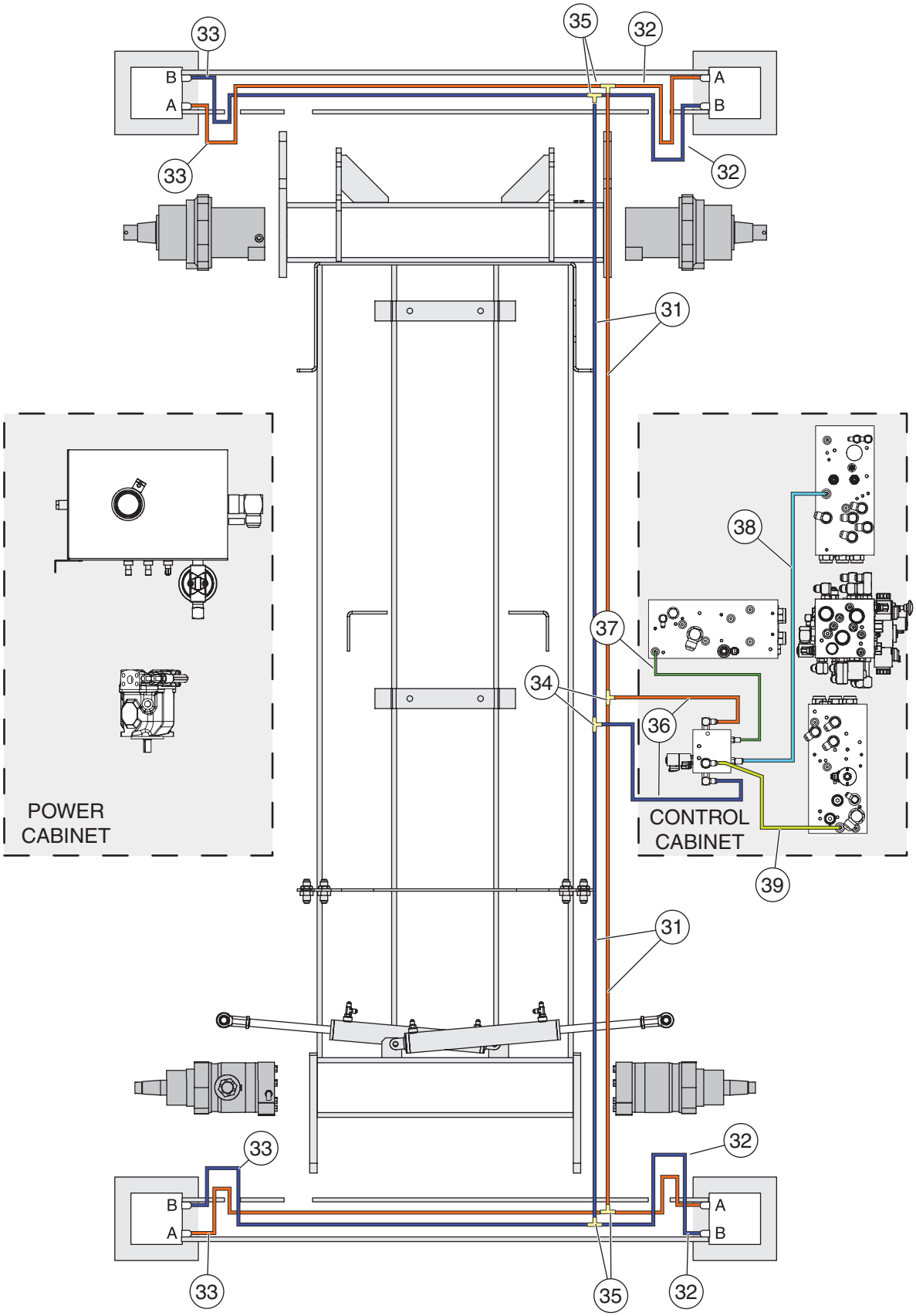
ART_X72Hoses- Steer

ITEM	PART NO.	QTY	DESCRIPTION
			HOSE KIT STEERING, BRAKE RELEASE AND AXLE RETURN
	90278	-	HOSE KIT CONTINUED
11	6458		HOSE, RETURN LINE, CUT TO LENGTH
12	9227	1	HOSE ASSY, ¼"×83", 4G1-4FJX-4FJX90S
13	91256	1	HOSE ASSY, ¼"×42", 4G1-4FJX-4FJX90S
14	91255	1	HOSE ASSY, ¼" × 15", 90°, 4G1-4FJX-4FJX90S
15	90275	2	HOSE ASSY, ¼" × 17", 4G1-4FJX-4FJX
16	91254	2	HOSE ASSY, ¼" × 68", 4G1-4FJX-4FJX
17	HDW9557	1	TEE M 0.25 JIC M 0.25 JIC
18	91249	3	TEE M 0.31 HS BR BNN
			CONTINUED…



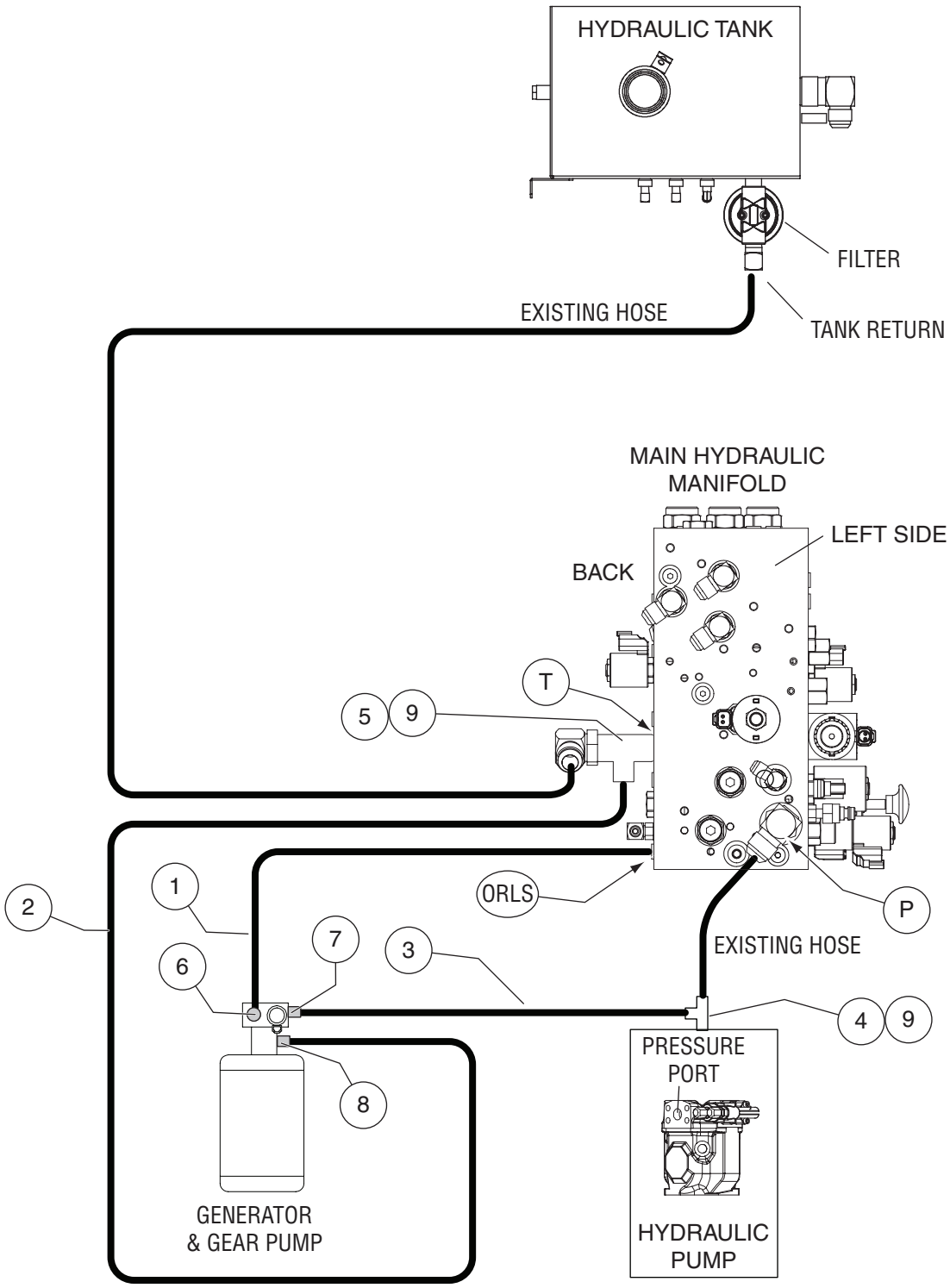
ART_X72Hoses- Pump

ITEM	PART NO.	QTY	DESCRIPTION
			HOSE KIT PUMP AND RETURN
	90278	-	HOSE KIT CONTINUED
20	90276		HOSE ASSY, ¼"×24",(4G1-4FJX-6FJX-24)
21	9847	1	HOSE ASSY, ¼" × 76", (4G1-4FJX-4FJX)
22	91264	1	HOSE ASSY, ¾" × 66", (12M3K-12FJX-12FJX45)
23	91247	6FT	HOSE ASSY, ¾", 12LOLA BULK
24	HDW91246	2	FITTING FEMALE ¾" JIC MALE ¾" HOSE BARB
25	91265	1	HOSE ASSY, 1" × 22", (16GMV-16FJX-16FJX-22")
26	91161	1	FLANGE KIT #16
27	91162	1	FLANGE KIT #12
28	91163	1	ADAPTER ¾" FLANGE, MALE ¾" JIC 90°
29	HDW91176	1	ADAPTER 1" FLANGE, MALE 1" JIC
30	HDW8877	2	ELBOW, 90°, MALE ¼" O-RING, MALE ¼" JIC
			LIFT HOSES SEE CYLINDER ART
			CONTINUED…



ART_X72Hoses-Outrig

ITEM	PART NO.	QTY	DESCRIPTION
			Hose Kit Outrigger (Option)
	90278	-	HOSE KIT
31	91047	4	HOSE ASSY, ¼"×63" (4G1-4FJX-6FJX)
32	91346	4	HOSE ASSY, ¼"×35" (4G1-4FJX-4FJX90 S)
33	91347	4	HOSE ASSY, ¼"×58" (4G1-4FJX-4FJX90 S)
34	HDW7391	2	TEE, MALE 3/8" JIC
35	HDW9557	4	TEE, MALE ¼" JIC
36	9038	2	HOSE ASSY, 3/8"×46" (6M3K-6FJX-6FJX)
37	90316	1	HOSE ASSY, ¼"×21" (4G1-7FJX-7FJX)
38	7598	1	HOSE ASSY, 3/8"×28" (6M3K-6FJX-6FJX)
39	8318	1	HOSE ASSY 3/8"×24" (6M3K-6FJX-6FJX90)


HYDRAULIC TANK
FILTER
EXISTING HOSE
TANK RETURN
MAIN HYDRAULIC
MANIFOLD
LEFT SIDE
BACK
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1
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ORLS
P
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6
EXISTING HOSE
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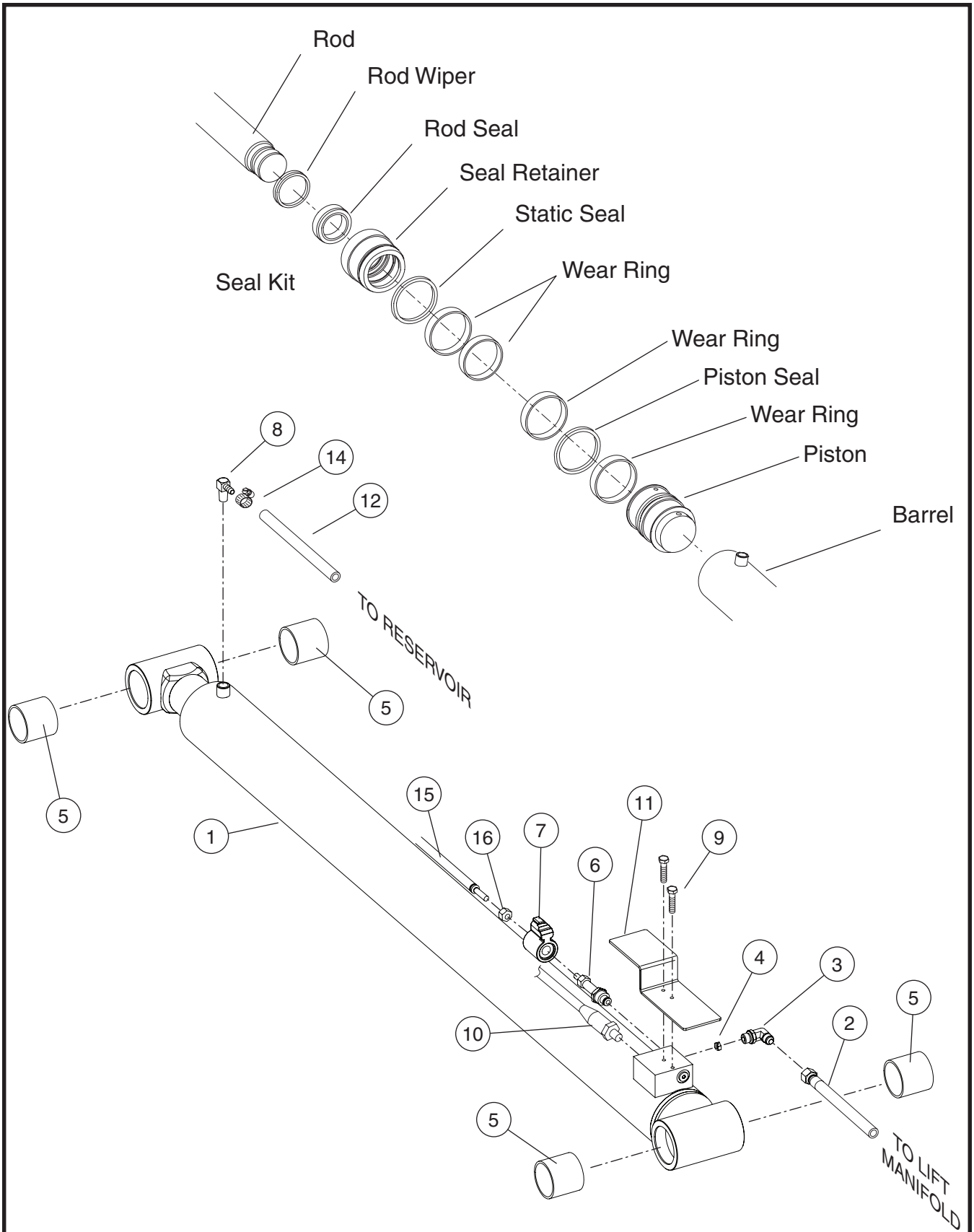
9
PRESSURE
PORT
8
GENERATOR
& GEAR PUMP
HYDRAULIC
PUMP

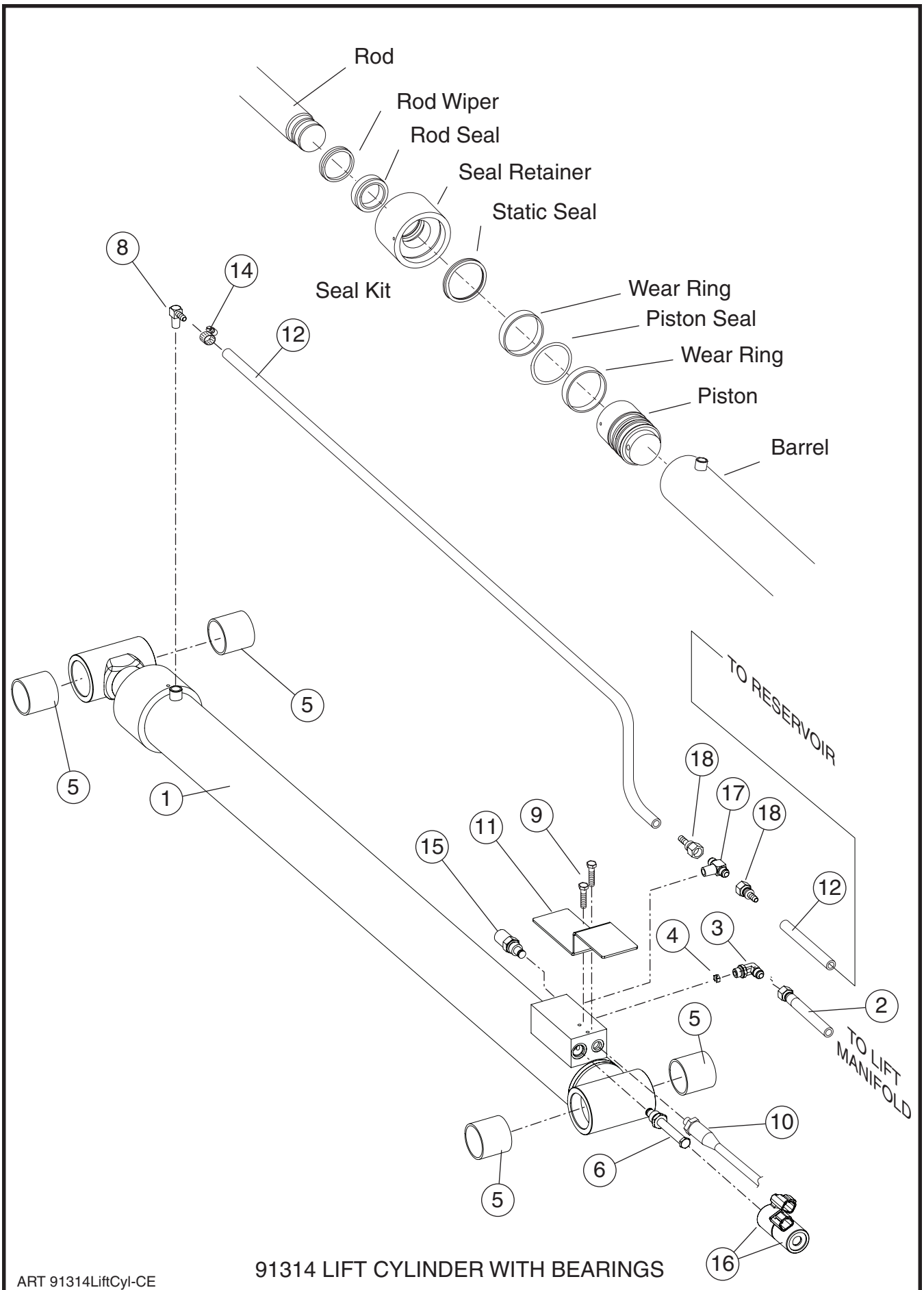
ITEM	PART NO.	QTY	DESCRIPTION
			HOSE KIT - GENERATOR (OPTION)
1	91346	1	HOSE ASSY, ¼" × 35" (4GI–4FJX–4FJX90S)
2	8317	1	HOSE ASSY, ½" × 19" (8M3K–8FJX–8FJX)
3	91259	1	HOSE ASSY, ½" × 84" (8M3K–8FJX–8FJX45)
4	HDW91467	1	ADAPTER, TEE, ¾" W/SWIVEL FEMALE
5	HDW91466	1	ADAPTER, TEE, ¾" MALE O-RING, ¾" MALE JIC
6	HDW8877	1	ADAPTER, MALE ¼" O-RING, MALE ¼" JIC 90°
7	HDW90764	1	ADAPTER, MALE ½" O-RING, MALE ½" JIC 90°
8	HDW90967	1	ADAPTER, MALE 5/8" O-RING, MALE ¼" JIC 90°
9	HDW91468	1	ADAPTER, FEMALE ¾" JIC, MALE ½" JIC 90°



91020 LIFT CYLINDER WITH BEARINGS

ART 91020-CE

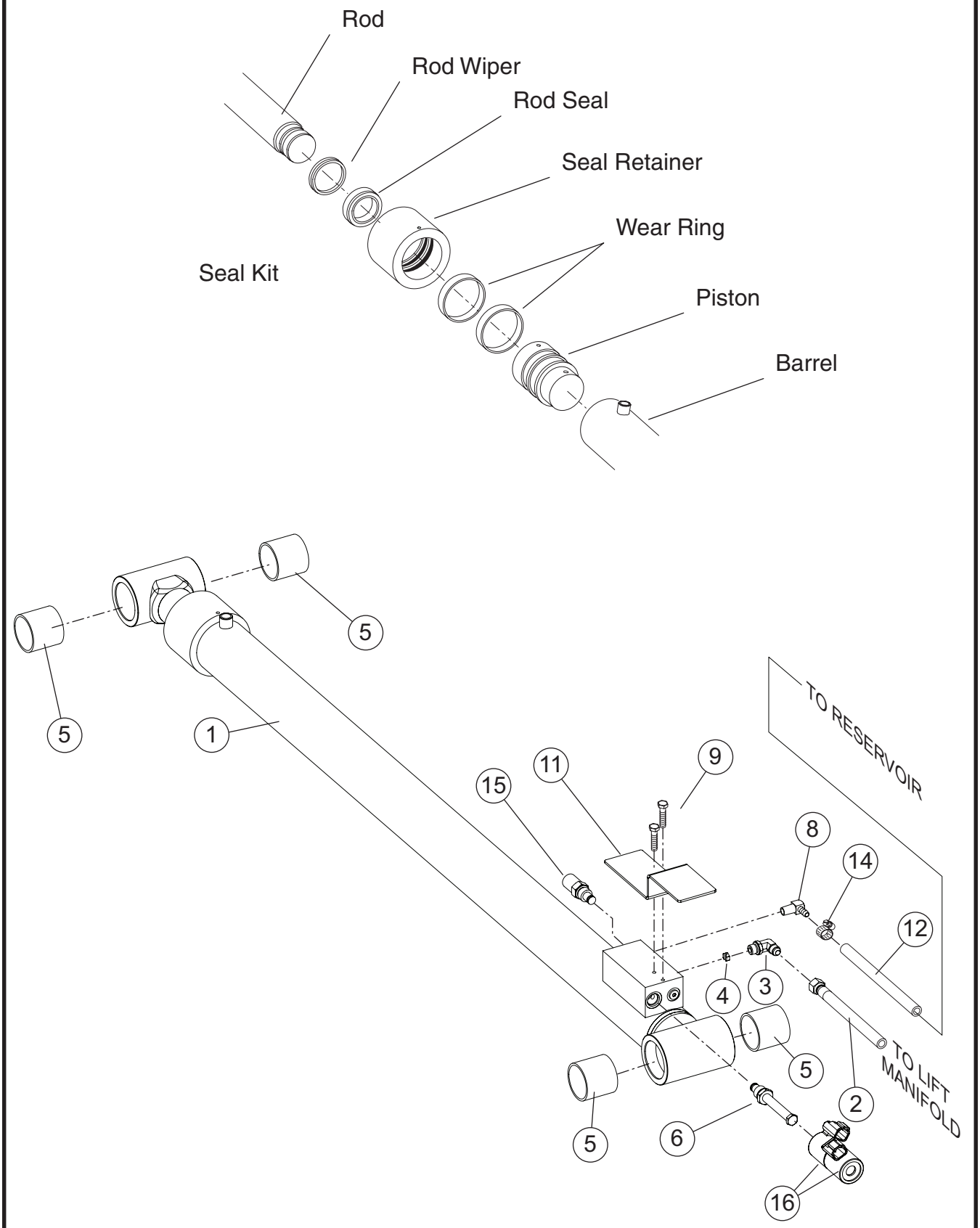
ITEM	PART NO.	QTY	DESCRIPTION
			LIFT CYLINDER, 3072RT, CE
1	91020	1	CYLINDER, LIFT 3072RT
2	90985	1	HOSE ASSEMBLY, 3/8"
3	HDW7601	1	FITTING, ELBOW ADAPTOR
4	90361	1	ORIFICE
5	6669	4	BEARING, 2" ID × 2" LG
6	91051	1	VALVE, 2 WAY, N.C. CABLE ATTACH
7	91141	1	COIL, 12 VOLT, DEUTSCH
8	HDW6727	1	FITTING, PIPE 90°, MALE BARB
9	HDW8152	2	SCREW, ¼" - 20 × ¾" LG
10	90845	1	PRESSURE SENSOR
11	16062	1	BRACKET, LIFT CYLINDER VALVE GUARD
12	6458	21 FT	HOSE, RETURN LINE
14	7788	1	CLAMP, HOSE
15	91182	1	CABLE, E-DOWN
16	HDW91240	1	NUT, COUPLING 10-32 × ¾"
	91460	REF	KIT, SEAL-LIFT CYLINDER (SERVICE)
N/A	91069	1	HARNESS, WIRE DOWN, VALVE (NOT SHOWN)



91314 LIFT CYLINDER WITH BEARINGS

ART 91314LiftCyl-CE

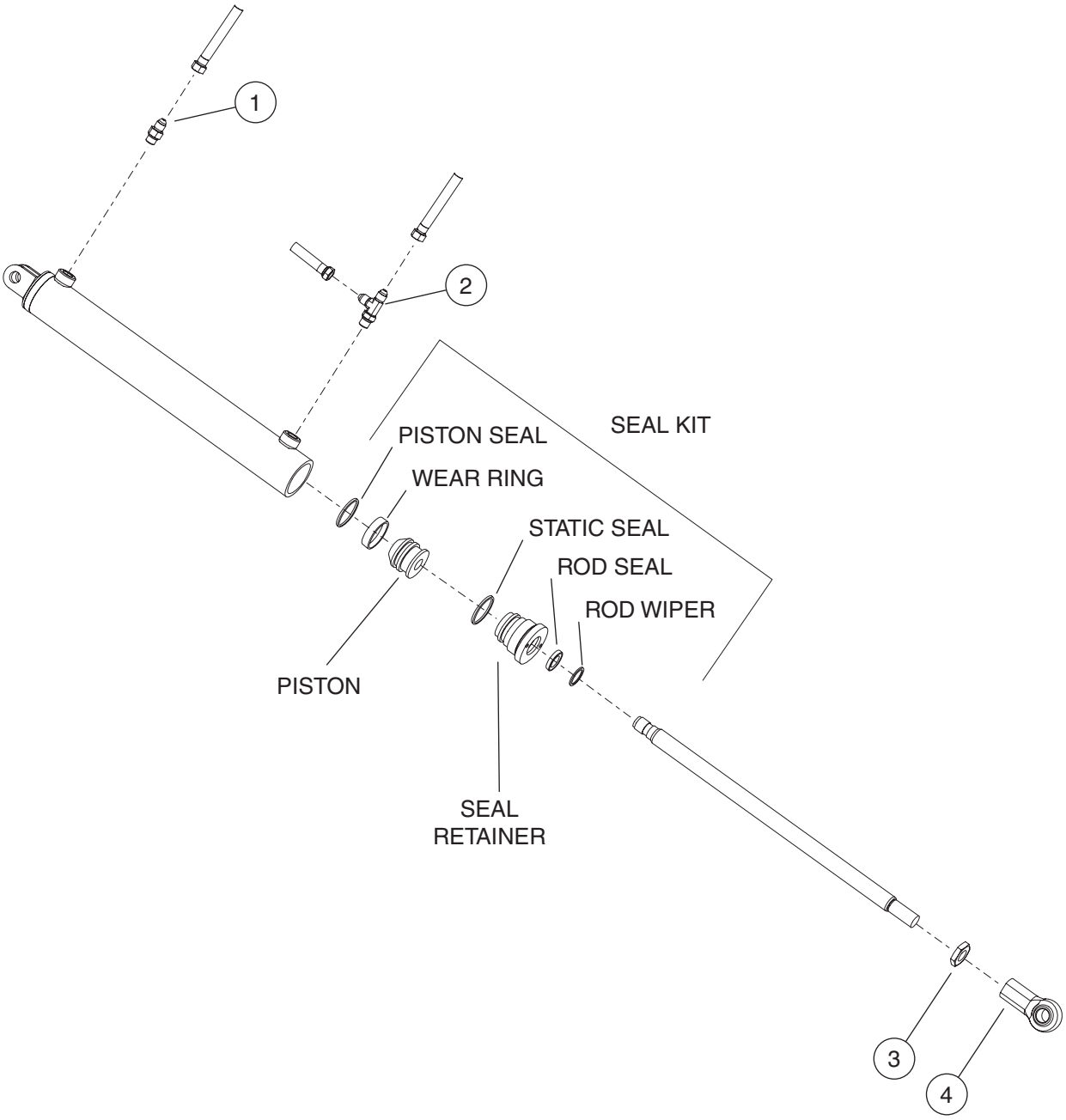
ITEM	PART NO.	QTY	DESCRIPTION
			LIFT CYLINDER, LOWER, 3772RT
1	91314	1	CYLINDER, LOWER LIFT, 3772RT
2	9039	1	HOSE ASSEMBLY, LIFT CYLINDER 3/8"
3	HDW7601	1	FITTING, ELBOW 90°, .37JIC × 37 ORING
4	90361	1	ORIFICE
5	90993	4	BEARING, BRONZE, 2" ID × 2" LG
6	91462	1	VALVE, 2 WAY, N.C. POPPET DUAL COIL
8	HDW6727	1	FITTING, PIPE 90°, MALE BARB
9	HDW8152	2	SCREW, ¼" - 20 × ¾" LG
10	90845	1	PRESSURE SENSOR
11	16062	1	BRACKET, LIFT CYLINDER VALVE GUARD
12	6458	21 FT	HOSE, RETURN LINE
14	7788	1	CLAMP, HOSE, 5/8 MAX
15	90969	1	RELIEF VALVE
16	91141	2	COIL, 12 VOLT, DEUTSCH CONNECTOR W/DIODE
17	HDW90943	1	FITTING, TEE ADAPTOR
18	HDW90945	2	FITTING, FEMALE SWIVEL
	90988	REF	KIT, SEAL-LIFT CYLINDER - LOWER (SERVICE)
N/A	91085	1	HARNESS, WIRE DOWN, VALVE (NOT SHOWN)



91315 LIFT CYLINDER WITH BEARINGS

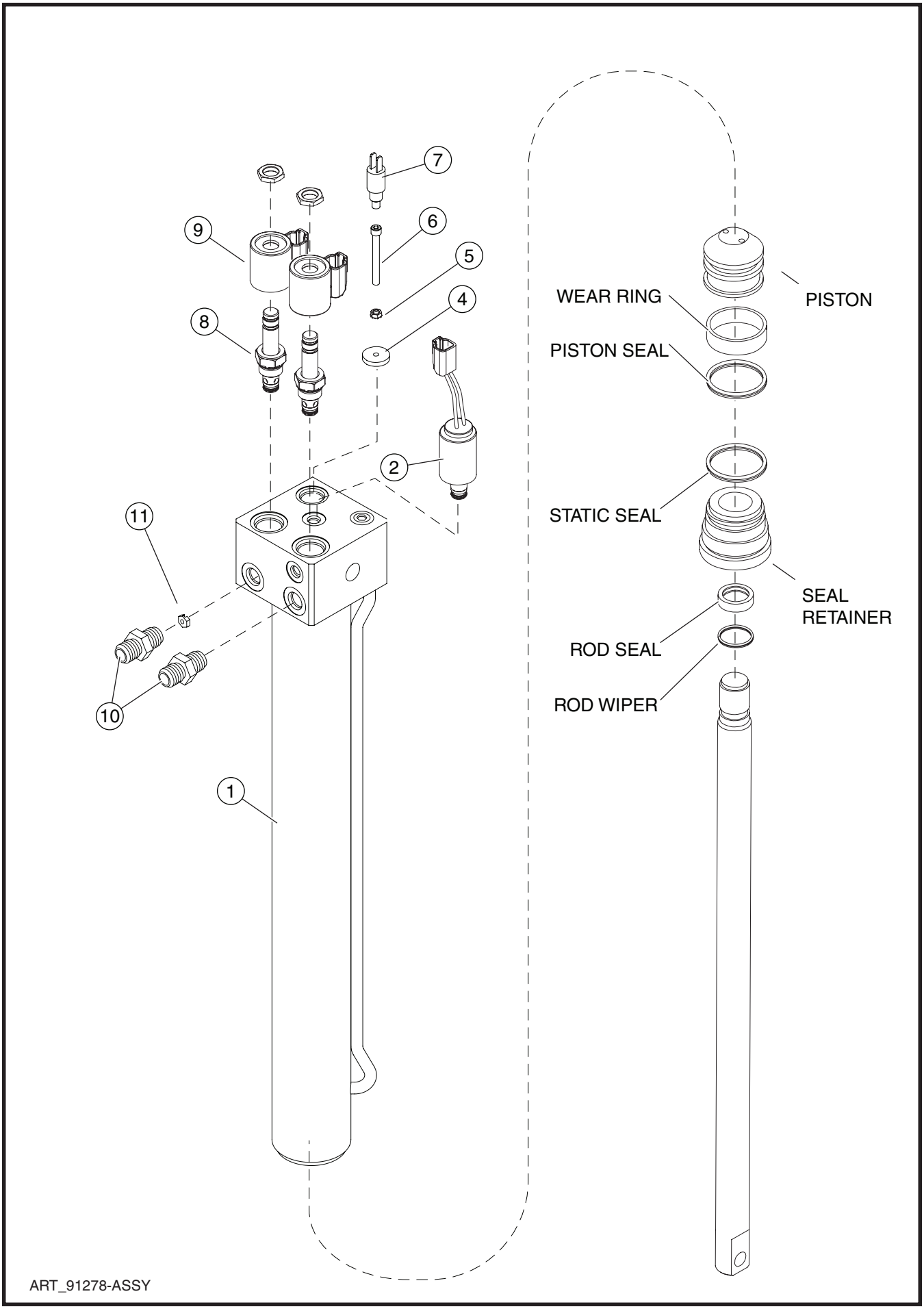
ART 91315 LiftCyl

ITEM	PART NO.	QTY	DESCRIPTION
			LIFT CYLINDER, UPPER, 3772RT
1	91315	1	CYLINDER, UPPER LIFT, 3772RT
2	91377	1	HOSE ASSEMBLY, LIFT CYLINDER 3/8" × 370"
3	HDW7601	1	FITTING, ELBOW ADAPTOR
4	90439	1	ORIFICE
5	90993	4	BEARING, BRONZE, 2" ID × 2" LG
6	91462	1	VALVE, 2 WAY, N.C. DUAL COIL
8	HDW6727	1	FITTING, PIPE 90°, MALE BARB
9	HDW8152	2	SCREW, ¼" - 20 × ¾" LG
11	16062	1	BRACKET, LIFT CYLINDER VALVE GUARD
12	6458	40 FT	HOSE, 5/16", RETURN LINE
14	7788	1	CLAMP, HOSE
15	90969	1	RELIEF VALVE
16	91141	2	COIL, 12 VOLT, DEUTSCH CONNECTOR W/DIODE
	90987	REF	KIT, SEAL-LIFT CYLINDER (SERVICE)
N/A	91086	1	HARNESS, WIRE DOWN, VALVE (NOT SHOWN)



ART_91019-EXP

ITEM	PART NO.	QTY	DESCRIPTION
			STEERING CYLINDER
	91019	-	STEERING CYLINDER
1	HDW8881	1	ADAPTER MALE ¼" O-RING-MALE ¼" JIC
2	HDW8876	1	ADAPTER MALE ¼ O-RING-MALE ¼" JIC TEE
3	HDW5925	1	JAMNUT 5/8-18
4	7293	1	ROD END
	90990	REF	SEAL KIT (SERVICE)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WEAR RING
PISTON
PISTON SEAL
STATIC SEAL
SEAL
RETAINER
ROD SEAL
ROD WIPER
ART_91278-ASSY

ITEM	PART NO.	QTY	DESCRIPTION
			OUTRIGGER CYLINDER (OPTION)
1	91278	4	CYLINDER, OUTTRIGGER
2	91281	1	SWITCH, OUTRIGGER PRESSURE N.O.
4	10907	1	WASHER ACTUATOR
5	HDW8476	1	NUT JAM ¼-20
6	HDW9761	1	SCREW, SOCKET HEAD ¼-20 × 2½
7	91277	1	SWITCH, OUTRIGGER RETRACT LIMIT N.O.
8	91464	2	VALVE N.C. POPPET
9	91141	2	COIL 12V DEUTSCH
10	HDW91465	2	ADAPTER 3/8 MALE O-RING, ¼ MALE JIC
11	90439	1	ORIFICE
	91463	REF	SEAL KIT

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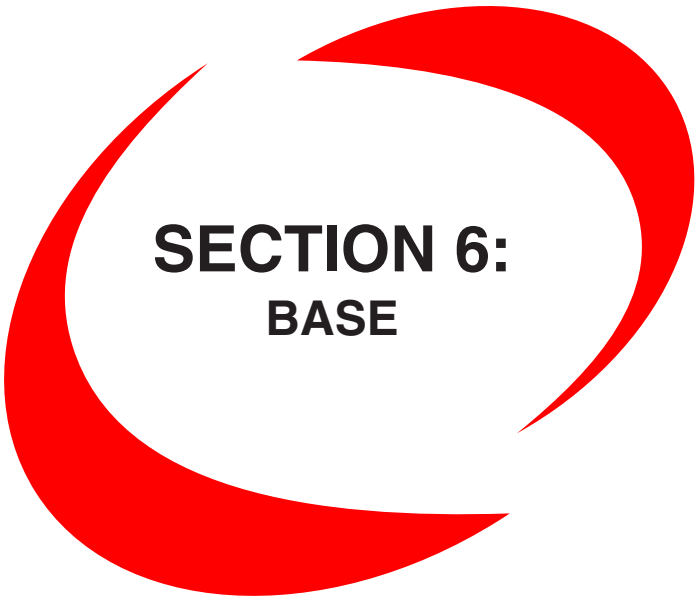
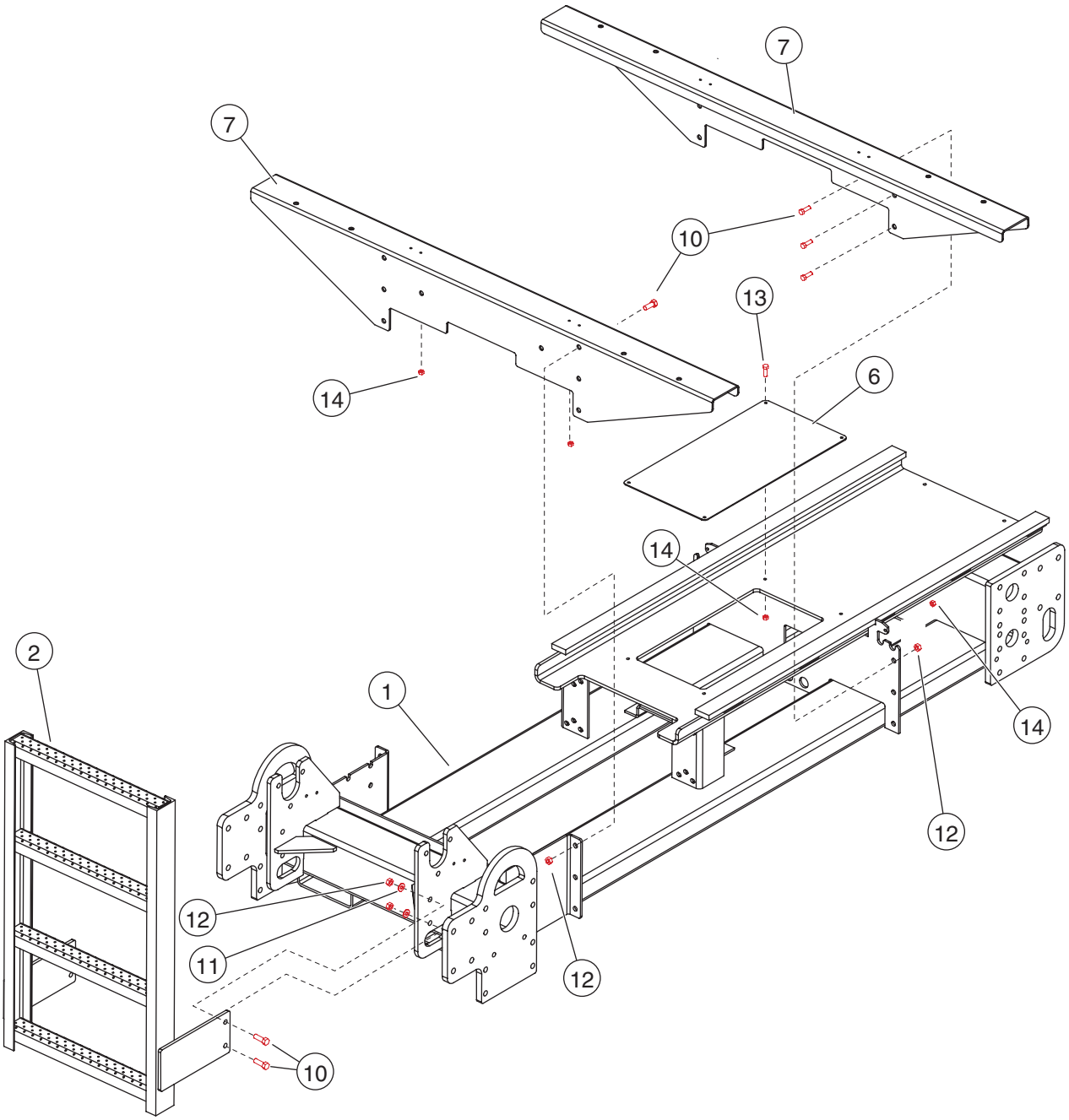
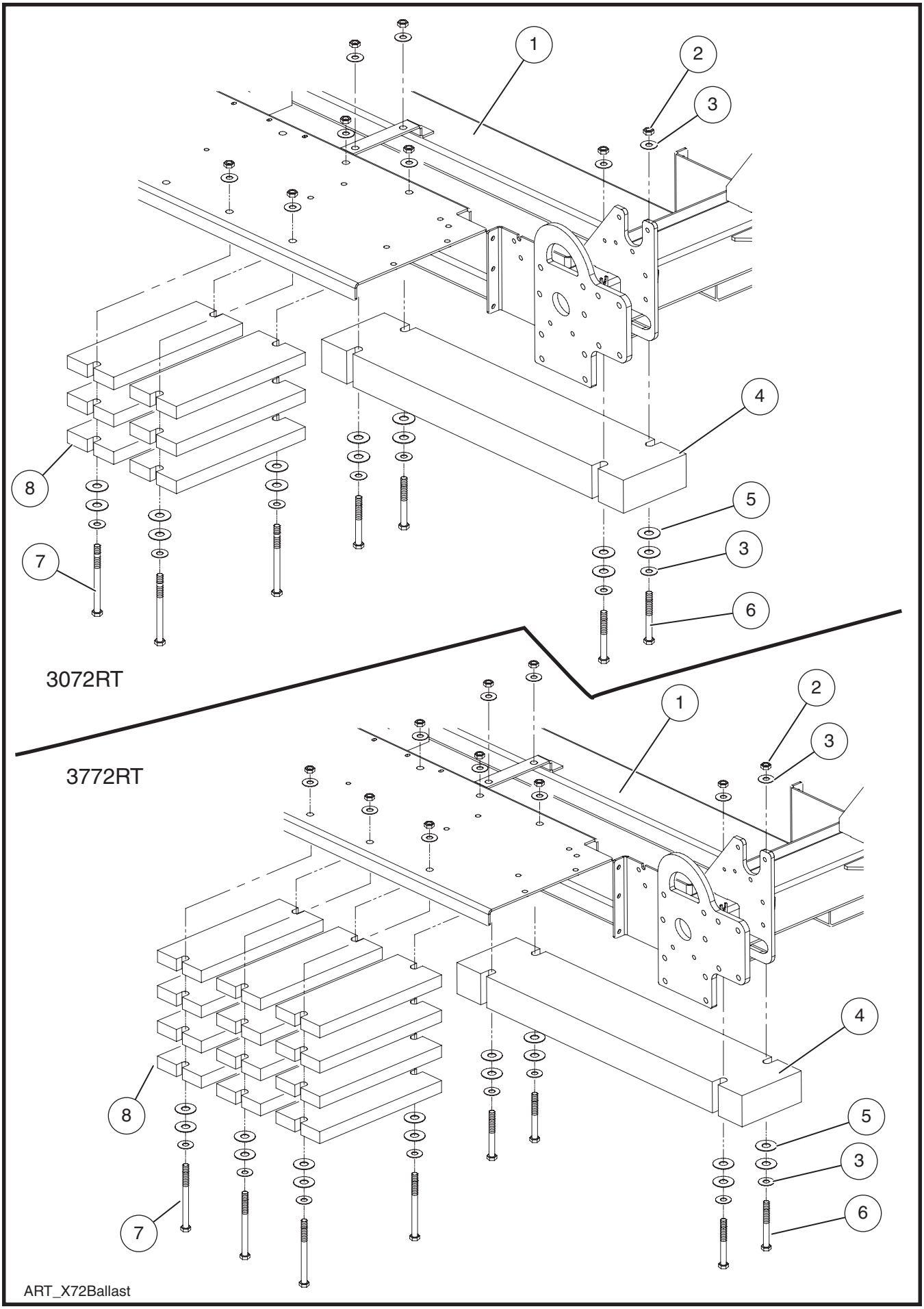


SECTION 6:
BASE



ART_X72 Base Assy

ITEM	PART NO.	QTY	DESCRIPTION
			BASE ASSEMBLY
1	40159	1	BASE WELDMENT
2	16160	1	LADDER WELDMENT, 3072RT STANDARD
	16293	1	LADDER WELDMENT, 3772RT STANDARD
6	16206	1	COVER, SLIDER PAN
7	14993	2	SUPPORT, MODULE
10	HDW8283	16	SCREW, ½" - 13, 1 ½" LG. GR8
11	HDW8531	4	WASHER, .531 ID × 1.0 OD × .063 THK
12	HDW8457	16	NUT, ½" - 13, GR 5
13	HDW5723	12	SCREW, ¼–12 × ¾"
14	HDW8267	12	NUT, ¼-20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3072RT
3772RT
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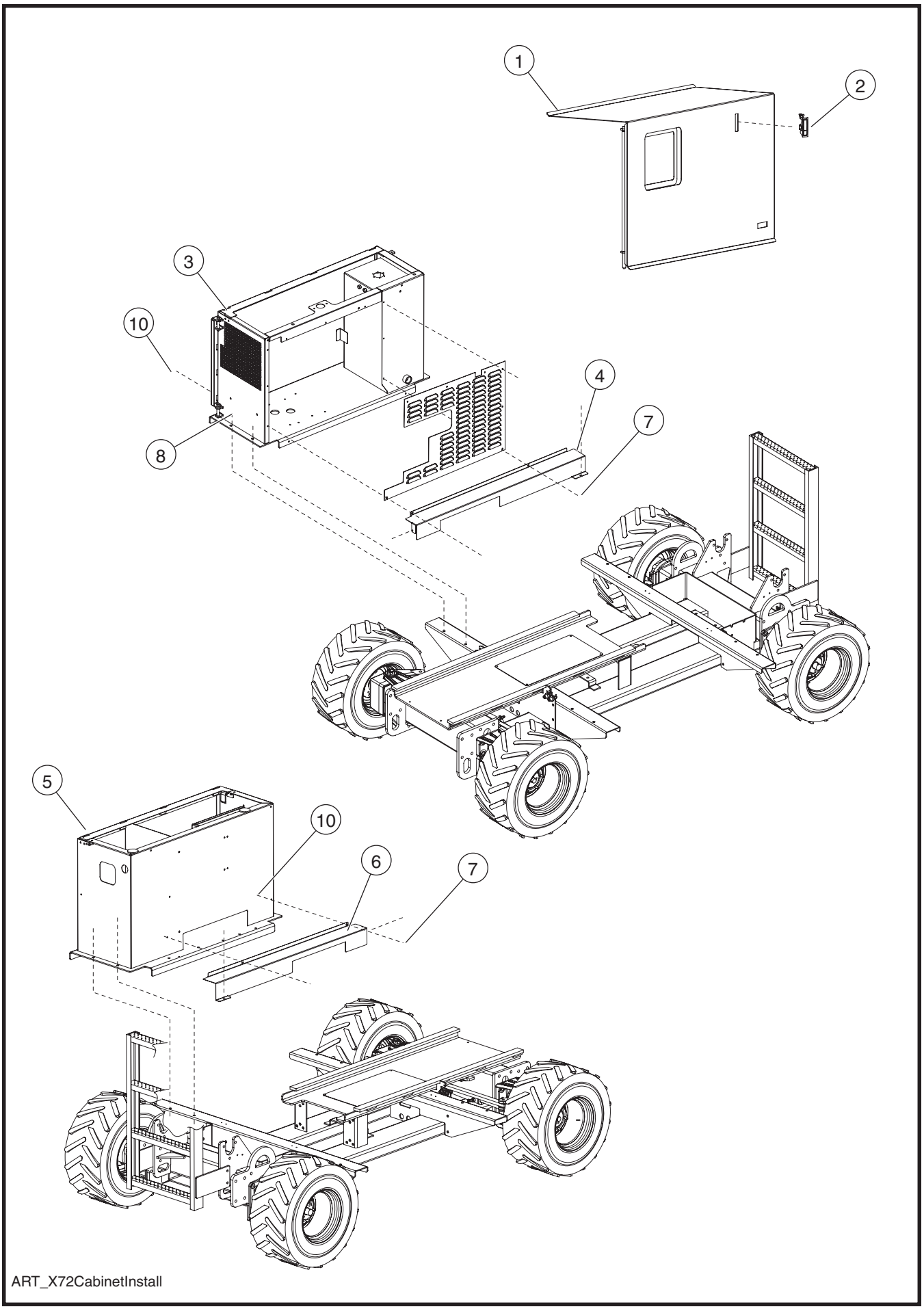
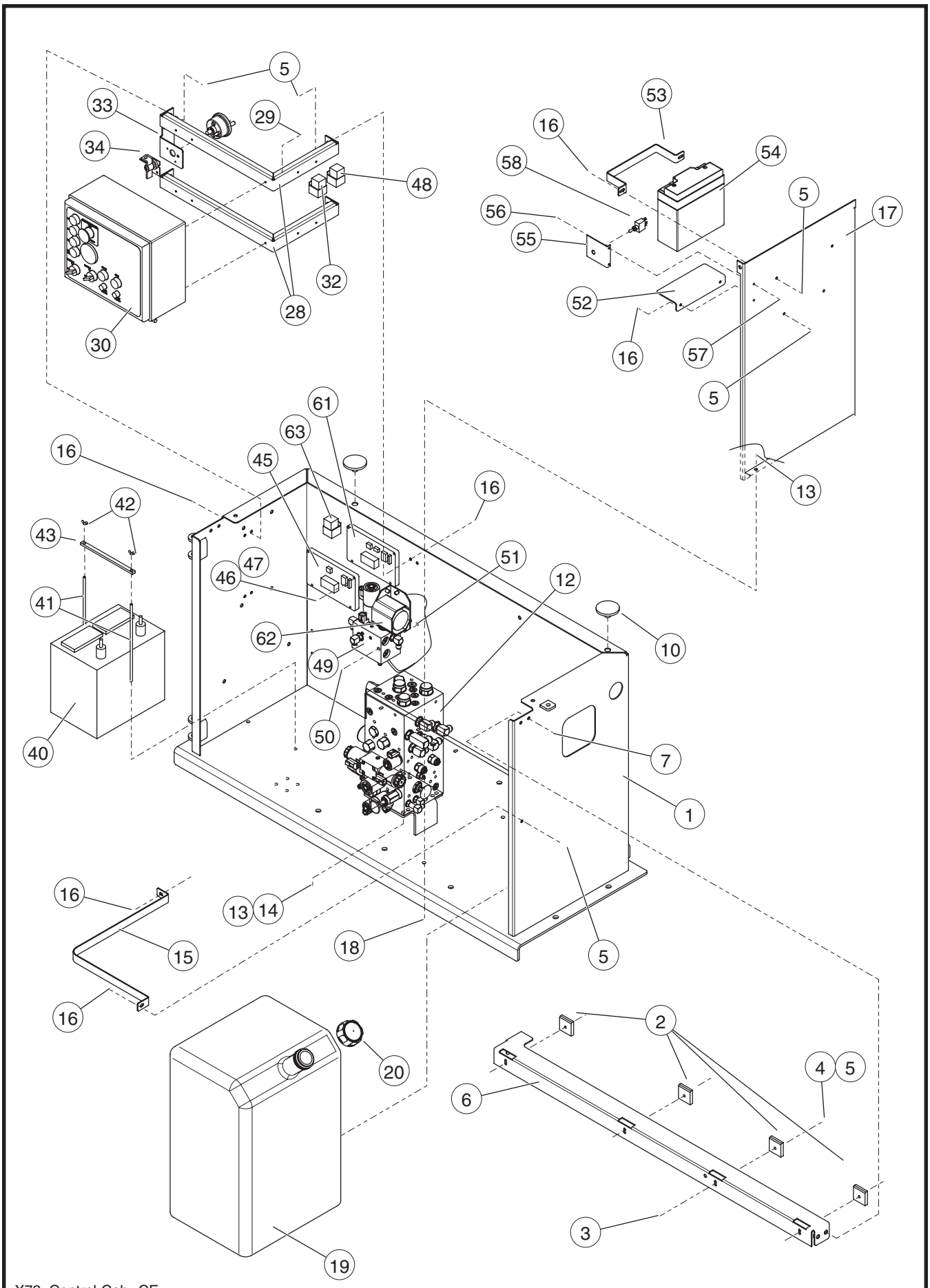
ART_X72Ballast

ITEM	PART NO.	QTY	DESCRIPTION
			BALLAST (COUNTERWEIGHT) INSTALLATION
1	40159	REF	BASE WELDMENT
2	HDW8457	8	NUT, LOCK, ½”-13, GR 5
3	HDW13195	16	WASHER, FLAT, .515 ID × 1.512 OD × .098 THK
4	40590	1	BAR, BALLAST WEIGHT
5	HDW90460	16	WASHER, FLAT, .531 ID × 2.000 OD × .062 THK
6	HDW90951	4	SCREW, ½”-13, 6” LG, GR 5
7	HDW7018	4	SCREW, ½”-13, 3” LG, GR 5
8	90406	6	PLATE, BALLAST WEIGHT 3072RT
	90406	12	PLATE, BALLAST WEIGHT 3772RT



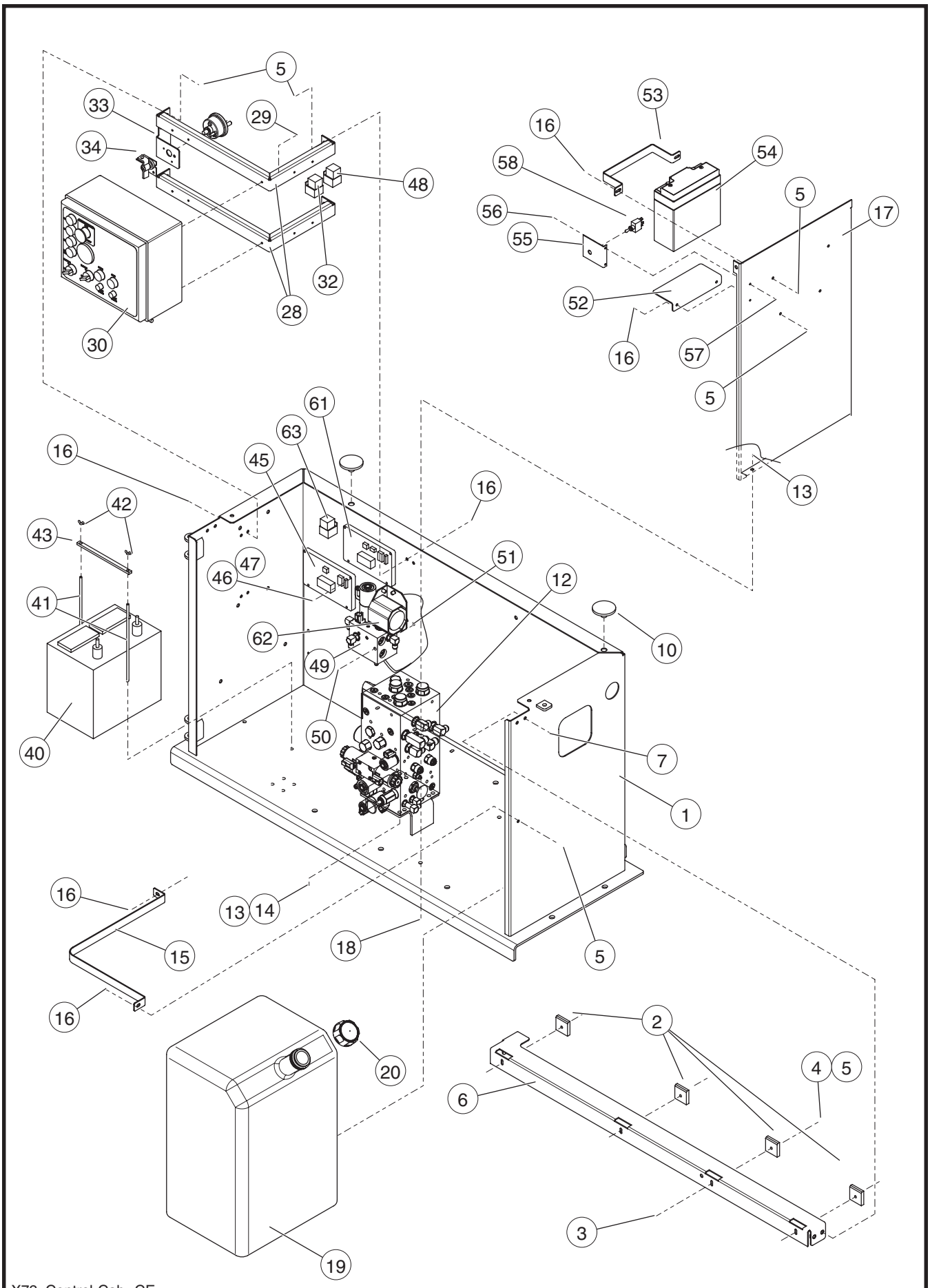
ART_X72CabinetInstall

ITEM	PART NO.	QTY	DESCRIPTION
			MODULES INSTALLATION
1	16156	1	DOOR WELDMENT, CONTROL MODULE
	16220	1	DOOR WELDMENT, POWER MODULE (NOT SHOWN)
2	8386	4	LATCH TRIGGER
3	16213	1	CABINET WELDMENT, ENGINE
4	16165	1	COVER, HOSE TRAY, LH 3072RT
4	16313	1	COVER, HOSE TRAY, LH 3772RT
5	16153	1	CABINET WELDMENT, CONTROL MODULE
6	16164	1	COVER, HOSE RH
7	HDW5723	8	BOLT, ¼”-20, ¾” LG, GR 5
8	HDW5417	8	SCREW, 3/8”-16, 1.25” LG, GR 8
9	HDW5355	8	WASHER, .438 ID × 1.000 OD × .078 THK
10	HDW8267	8	NUT, ¼-20



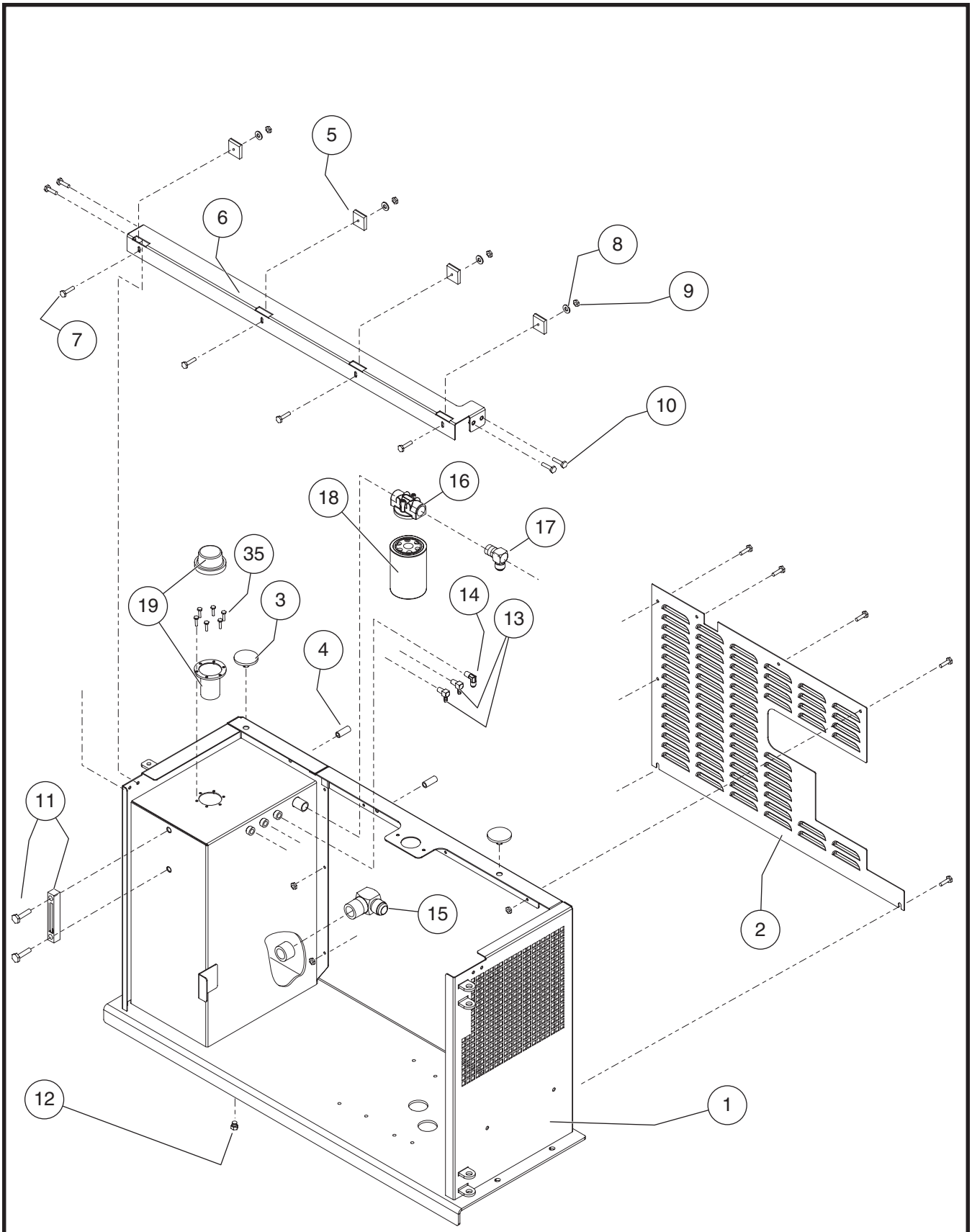
X72_Control-Cab- CE

ITEM	PART NO.	QTY	DESCRIPTION
			CONTROL MODULE - CE
1	16153	1	CONTROL MODULE WELDMENT
2	14896	4	BLOCK, SLIDE, DOOR
3	HDW8273	4	SCREW, ¼–20, 1" LG
4	HDW5217	4	WASHER, .343 ID × .680 OD × .063 THK
5	HDW8267	18	NUT, ¼–20, GR 5
6	16154	1	BRACKET, CROSS SUPPORT
7	HDW5724	4	SCREW, 5/16–18, ¾" LG, GR 5
	9441	50'	WIRE (NOT SHOWN)
10	25429	2	PAD
12	91140	1	HYDRAULIC MANIFOLD
13	HDW6433	4	SCREW, 3/8 × 1"
14	HDW7783	4	LOCK WASHER, 3/8
15	16225	1	BRACKET, FUEL TANK
16	HDW5723	18	SCREW, ¼-20 × ¾"
17	16152	1	BULKHEAD
18	HDW8268	5	NUT, 3/8
19	91023	1	FUEL TANK, PLASTIC
20	91091	1	FUEL TANK CAP
	6919	1	FUEL SHUTOFF (NOT SHOWN)
	HDW91279	1	ADAPTER, MALE 1/8 NPT, 5/16 HOSE BARB (NOT SHOWN)
	7788	1	CLAMP (NOT SHOWN)
	6458	72"	HOSE, FUEL LINE (NOT SHOWN)
	HDW91320	1	ADAPTER
28	16226	2	BRACKET, CONTROL BOX
29	HDW7888	4	SCREW, 10-32 × ½"
30	91169	1	LOWER CONTROL BOX
	91360	1	HARNESS, MAIN (NOT SHOWN)
32	91375	1	RELAY, SPEED/TORQUE, DRIVE
			CONTINUED …



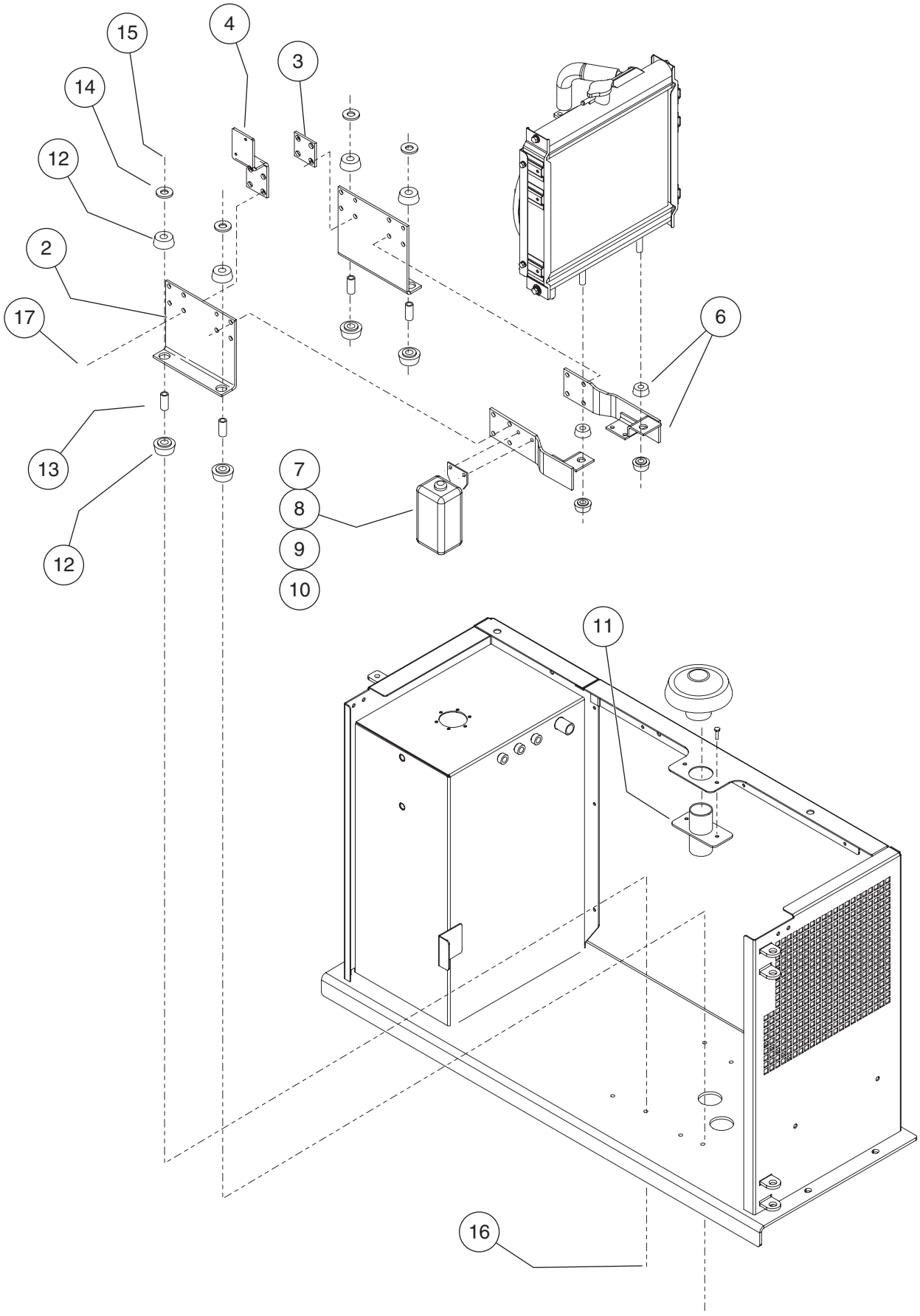
X72_Control-Cab- CE

ITEM	PART NO.	QTY	DESCRIPTION
			CONTROL MODULE - CE, CONTINUED
33	16229	1	BATTERY DISCONNECT BRACKET
34	8841	1	BATTERY DISCONNECT
	9438	1	BATTERY CABLE, RED, 15 INCH LONG (NOT SHOWN)
	9012	1	BATTERY CABLE, RED, 72 INCH LONG (NOT SHOWN)
	9013	1	BATTERY CABLE, BLACK, 72 INCH LONG (NOT SHOWN)
	7172	1	BOOT, BLACK (NOT SHOWN)
	7173	1	BOOT, RED (NOT SHOWN)
40	6854	1	BATTERY, 12VDC
41	2987	2	HOLD DOWN ROD
42	HDW6110	2	WING NUT
43	3436	1	HOLD DOWN BAR
			OUTRIGGER OPTION
45	91280	1	CONTROL MODULE (OUTRIGGER OPTION)
46	HDW90880	8	SCREW, 10-32 × 1"
47	HDW90803	8	NUT, 10-32 NYLOCK
48	91375	1	RELAY (OUTRIGGER OPTION)
49	91268	1	OUTRIGGER MANIFOLD, (OPTION)
50	HDW91332	2	SCREW, 5/16-18 × 3½"
51	HDW8304	2	NUT, 5/15-18
			3772RT EMERGENCY LOWERING
52	16620	1	BATTERY SHELF (3772RT)
53	16619	1	BATTERY BRACKET (3772RT)
54	90898	1	BATTERY, 12VDC (3772RT)
55	25480	1	BRACKET, EMERGENCY DOWN SWITCH (3772RT)
56	HDW90833	2	SCREW, 6–32 × ¾" LG
57	HDW5364	2	NUT, 6 –32
58	7423	1	SWITCH, TOGGLE, 1 POLE 2 POS (3772RT)
	91072	1	HARNESS, E-DOWN TO BATTERIES (NOT SHOWN)
	90905	1	HARNESS, E-DOWN W/DIODE (NOT SHOWN)
			OVERLOAD ALARM
61	90843	1	CONTROL MODULE, LOAD SENSE
62	9716	1	ALARM, OVERLOAD
63	91375	1	RELAY, OVERLOAD
	91359	1	HARNESS, OVERLOAD TRANSDUCER (NOT SHOWN)



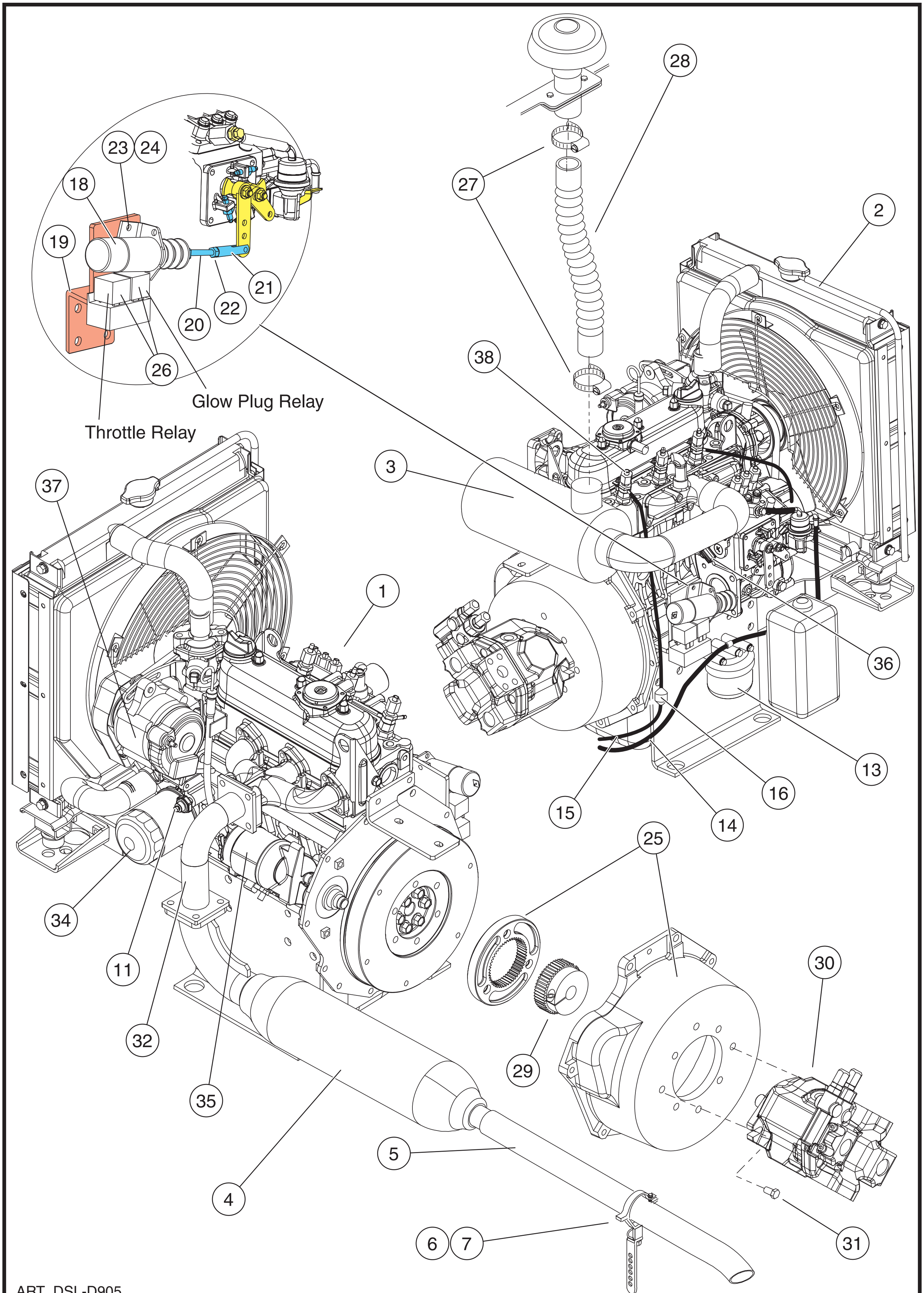
ART_CabinetPower-X72

ITEM	PART NO.	QTY	DESCRIPTION
			POWER MODULE, CE
1	16213	REF	WELDMENT, POWER MODULE
2	16247	1	GUARD, ENGINE MODULE
3	25429	2	PAD
4	40620	2	SPACER, INSULATOR, 1.59" LG
5	14896	4	BLOCK, SLIDE, DOOR
6	14826	1	BRACKET, CROSS SUPPORT
7	HDW8273	4	SCREW, ¼–20, 1" LG
8	HDW5217	4	WASHER, .343 ID × .680 OD × .063 THK
9	HDW8267	4	NUT, ¼–20, GR 5
10	HDW5724	4	SCREW, 5/16–18, ¾" LG, GR 5
			HYDRAULIC TANK INSTALLATION
11	9370	1	LEVEL GUAGE
12	HDW9200	1	PLUG, ¼ NPT
13	HDW6727	2	ELBOW, 90° ¼ NPT – 5/16 BARB
14	HDW7500	1	ELBOW, 90° ¼ NPT – 3/8 JIC
15	91164	1	ELBOW, 90° 1 1/8 NPT – 1 JIC
16	6714	1	FILTER HEAD
17	HDW9268	1	ELBOW, 90° ¾ NPT – ¾ JIC
18	6156	1	FILTER CARTRIDGE
19	9367	1	FILLER/STRAINER



ART_EngineMount DSL

ITEM	PART NO.	QTY	DESCRIPTION
			POWER MODULE: ENGINE MOUNT, CE
2	16209	2	ENGINE MOUNT, DIESEL
3	16210	1	SPACER
4	16207	1	BRACKET, SOLENOID MOUNT
7	91127	1	COOLANT OVERFLOW TANK
8	HDW5723	2	SCREW, ¼-20 × ¾
9	HDW8267	2	NUT, ¼-20
10	6458	3 FT	HOSE
11	16295	1	AIR INTAKE WELDMENT
	HDW5723	2	SCREW, ¼-20 × ¾"
	HDW8267	4	NUT, ¼–20, GR 5
12	7736	8	INSULATOR RUBBER
13	40620	4	SPACER ISOLATOR
14	HDW8567	4	WASHER, 3/8 FLAT
15	HDW8279	4	SCREW, 3/8-16 × 2 ½ GR8
16	HDW8268	4	NUT, 3/8-16
17	HDW91234	12	SCREW, M10-1.25 × 25 8.8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Glow Plug Relay
Throttle Relay
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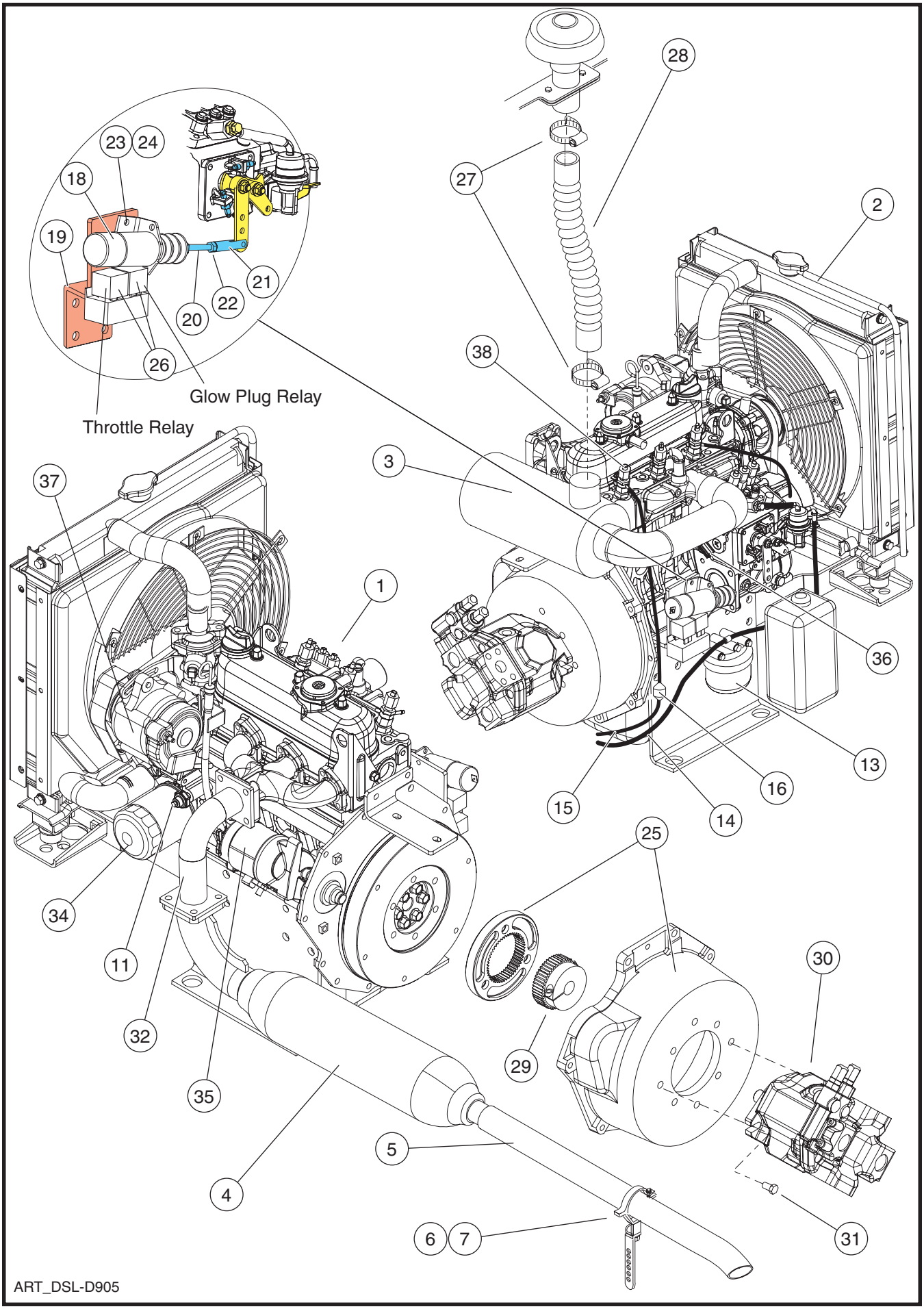
ART_DSL-D905

ITEM	PART NO.	QTY	DESCRIPTION
			ENGINE, DIESEL
	91036		ENGINE SUBASSEMBLY, DIESEL
1	91110	1	ENGINE KIT, D905
2	91113	1	RADIATOR KIT
	9831		RADIATOR
3	91111	1	AIR CLEANER KIT
	8667		AIR FILTER ELEMENT
4	91115	1	MUFFLER KIT
	9830		MUFFLER
5	91118	1	EXHAUST PIPE
6	9696	1	MUFFLER HANGER
7	9868	1	MUFFLER CLAMP
8	40620	1	SPACER
9	HDW8279	1	SCREW, 3/8–16 × 2 ½"
10	HDW8268	1	NUT, 3/8–16
11	91175	1	OIL PRESSURE SWITCH
12	HDW91187	1	FITTING, 1/8 NPT, M–F
13	91116	1	FUEL FILTER ASSEMBLY
	91123		FUEL FILTER ELEMENT
14	6458	8 FT	HOSE, FUEL, 5/16
15	91199	6 FT	HOSE, FUEL, 3/16
16	91114	1	VALVE, CHECK
17	7788	5	HOSE CLAMP
18	91119	1	SOLENOID, THROTTLE
19	16207	1	BRACKET, SOLENOID
20	10695	1	THROTTLE STUD
21	91117	1	CLEVIS
22	HDW91231	2	JAMNUT, ¼–28
23	HDW5723	2	SCREW, ¼–20 × ¾"
24	HDW8267	2	NUT, ¼–20
25	91112	1	KTR HOUSING KIT, D905
			CONTINUED…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Glow Plug Relay
Throttle Relay
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ART_DSL-D905

ITEM	PART NO.	QTY	DESCRIPTION
			ENGINE, DIESEL (CONTINUED)
26	91375	2	RELAY
27	7545	2	HOSE CLAMP
28	91340	1	HOSE, 2.00" I.D. FLEX
29	91130	1	HUB
30	91160	1	HYDRAULIC PUMP
31	HDW6433	2	SCREW, 3/8-16 × 1"
32	91376	1	MUFFLER EXTENSION (3772RT ONLY)
34	8665		OIL FLTER
35	8413		STARTER
36	8001		FUEL SOLENOID
37	90227		ALTERNATOR
38	9832		GLOW PLUGS

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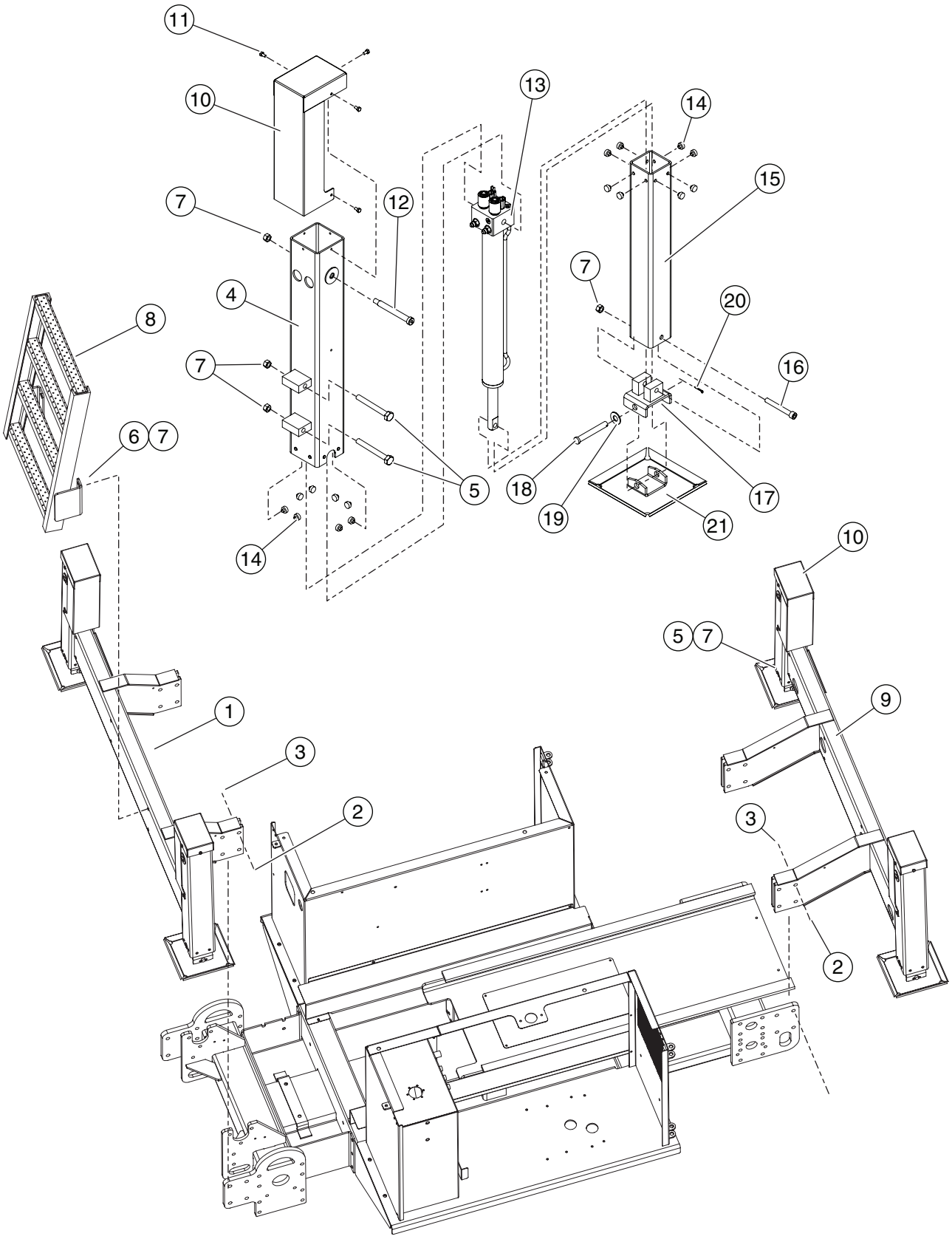
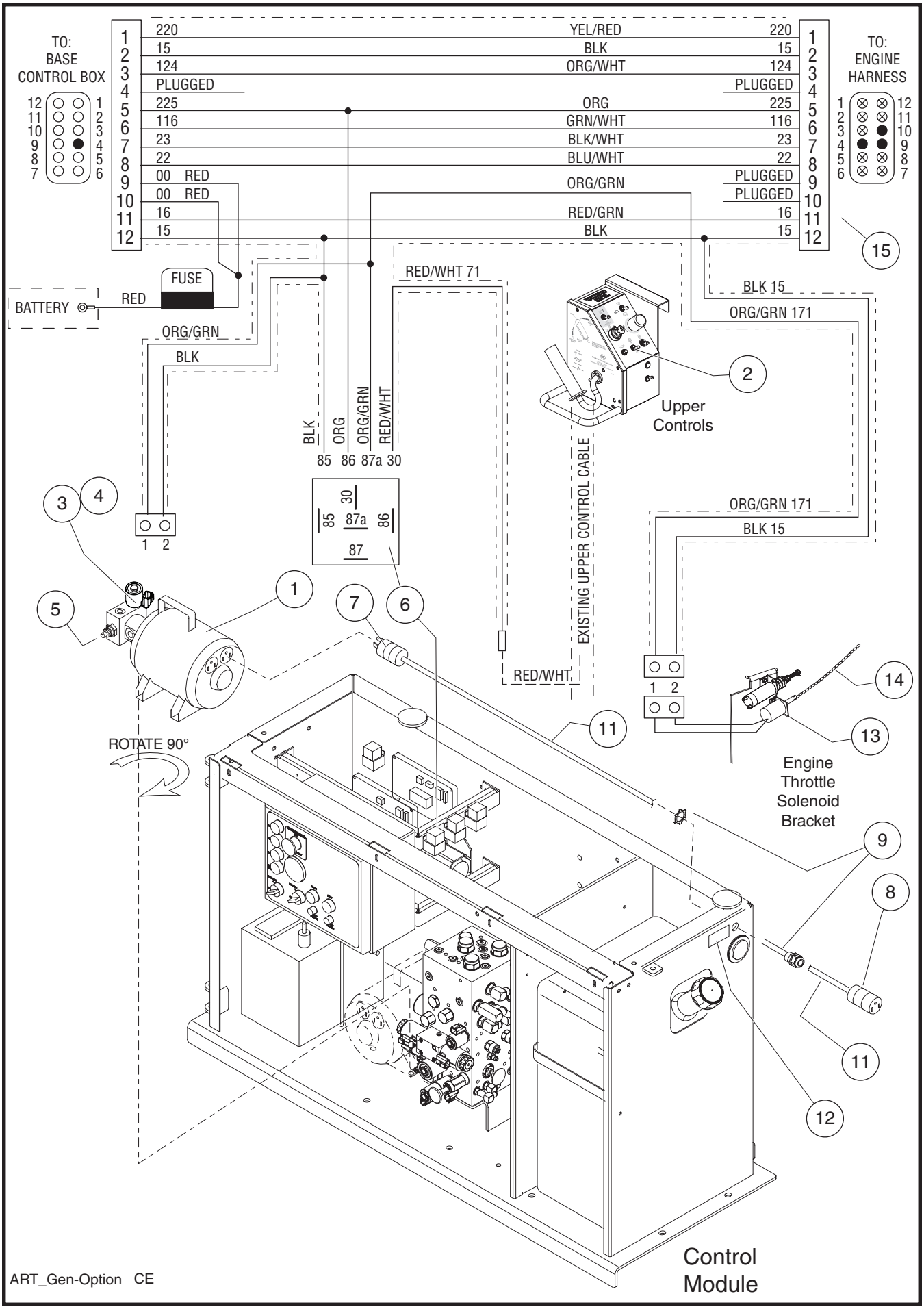
ITEM	PART NO.	QTY	DESCRIPTION
			WIRE HARNESS
	91360		HARNESS, MAIN (CE) [CONTROL MODULE - BASE & VALVES]
	91185		CONTROL CABLE, 3072RT [CONTROL MODULE TO DECK THROUGH SCISSOR BEAMS]
	91321		CONTROL CABLE, 3772RT [CONTROL MODULE TO DECK THROUGH SCISSOR BEAMS]
	91184		HARNESS, CONTROL BOX (UPPER) [INSIDE UPPER CONTROL BOX]
	91294		CABLE, OUTRIGGER OPTION, UPPER CONTROLS [INSIDE UPPER CONTROL BOX]
	91295		CABLE, OUTRIGGER OPTION, CONTROL, PLATFORM [DECK TO UPPER CONTROL BOX]
	91296		HARNESS, OUTRIGGER OPTION, CONTROL [CONTROL MODULE TO DECK THROUGH SCISSOR BEAMS]
	91276		HARNESS, OUTRIGGER OPTION [CONTROL MODULE TO OUTRIGGERS]
	91069		HARNESS, LIFT CYLINDER DOWN VALVE (3072RT) [CONTROL MODULE TO LIFT CYLINDER]
	91085		HARNESS, LOWER LIFT CYLINDER DOWN VALVE (3772RT) [CONTROL MODULE TO LIFT CYLINDER]
	91086		HARNESS, UPPER LIFT CYLINDER DOWN VALVE (3772RT) [CONTROL MODULE TO LIFT CYLINDER]
	90905 91378		HARNESS, E-DOWN WITH DIODE (3772RT) HARNESS, E-DOWN TO BATTERIES (3772RT)
	91171		HARNESS, ENGINE, INTERMEDIATE [CONTROL MODULE TO ENGINE MODULE]
	91543		HARNESS, ENGINE INTERMEDIATE, GENERATOR OPTION [CONTROL MODULE TO ENGINE MODULE]
	91173		HARNESS, ENGINE, DIESEL [ENGINE MODULE]
	91359		HARNESS, OVERLOAD TRANSDUCER [CONTROL MODULE]



ART_OutRigInst

ITEM	PART NO.	QTY	DESCRIPTION
			OUTRIGGER INSTALLATION (OPTION)
1	16279	1	WELDMENT, OUTRIGGER MOUNT, REAR
2	HDW7938	16	SCREW, 5/8–11 × 3" LG
3	HDW6633	16	LOCKNUT, 5/8–11
4	21168	4	WELDMENT, OUTER OUTRIGGER
5	HDW7052	8	SCREW, ½–13 × 3 ½" LG
6	HDW8498	4	SCREW, ½–13 × 4"
7	HDW8457	20	NUT, ½–13
8	16258	1	LADDER, 3072RT W/OUTRIGGERS
	16294	1	LADDER , 3772RT W/OUTRIGGERS
9	16278	1	WELDMENT, OUTRIGGER MOUNT, FRONT
10	21170	4	COVER, OUTRIGGER CYLINDER
11	HDW6455	20	SCREW, ¼–20 × ½"
12	HDW91328	4	SHOULDER SCREW, 5/8 × 4.75"
13	91278	4	CYLINDER, OUTRIGGER
14	90663	64	SPACER
15	10335	4	TUBE, INNER OUTRIGGER
16	HDW5916	4	SCREW, ½–13 × 4.0"
17	20998	4	BRACKET PIVOT
18	HDW91395	4	CLEVIS PIN, 5/8 × 5.0"
19	HDW9219	4	WASHER, FLAT
20	HDW5920	4	PIN, COTTER, 1/8 × 1"
21	21002	4	PAD WELDMENT


TO: BASE CONTROL BOX
TO: ENGINE HARNESS
220 YEL/RED 220
15 BLK 15
124 ORG/WHT 124
PLUGGED PLUGGED
225 ORG 225
116 GRN/WHT 116
23 BLK/WHT 23
22 BLU/WHT 22
00 RED ORG/GRN PLUGGED
00 RED PLUGGED
16 RED/GRN 16
15 BLK 15
BATTERY
RED
FUSE
ORG/GRN
BLK
RED/WHT 71
BLK 15
ORG/GRN 171
BLK ORG ORG/GRN RED/WHT
85 86 87a 30
Upper Controls
EXISTING UPPER CONTROL CABLE
ORG/GRN 171
BLK 15
RED/WHT
ROTATE 90°
Engine Throttle Solenoid Bracket
Control Module
ART_Gen-Option CE

ITEM	PART NO.	QTY	DESCRIPTION
			GENERATOR - OPTION
			REFER TO SECTION 5 FOR HOSE KIT
1	91550	1	GENERATOR, 2000 WATT
2	5630	1	SWITCH, TOGGLE
3	91551	1	VALVE, SOLENOID, 2-WAY, N.C.
4	91002	1	COIL, 12V 10 SERIES
5	91546	1	NEEDLE VALVE
6	91375	1	RELAY. SPDT
7	91544	1	PLUG,MALE, 3 PRONG
8	91545	2	RECEPTACLE, FEMALE
9	7594	1	STRAIN RELIEF
		1	LOCKNUT, ½" NPT
11	7617	6 FT	WIRE, 14GA, 3 CONDUCTOR
12	91556	1	LABEL, AC GENERATOR
13	9502	1	SOLENOID, GENERATOR-THROTTLE
14	91469	2 FT	CHAIN, SASH #8
15	91543	1	HARNESS, ENGINE INTERMEDIATE, GENERATOR OPTION

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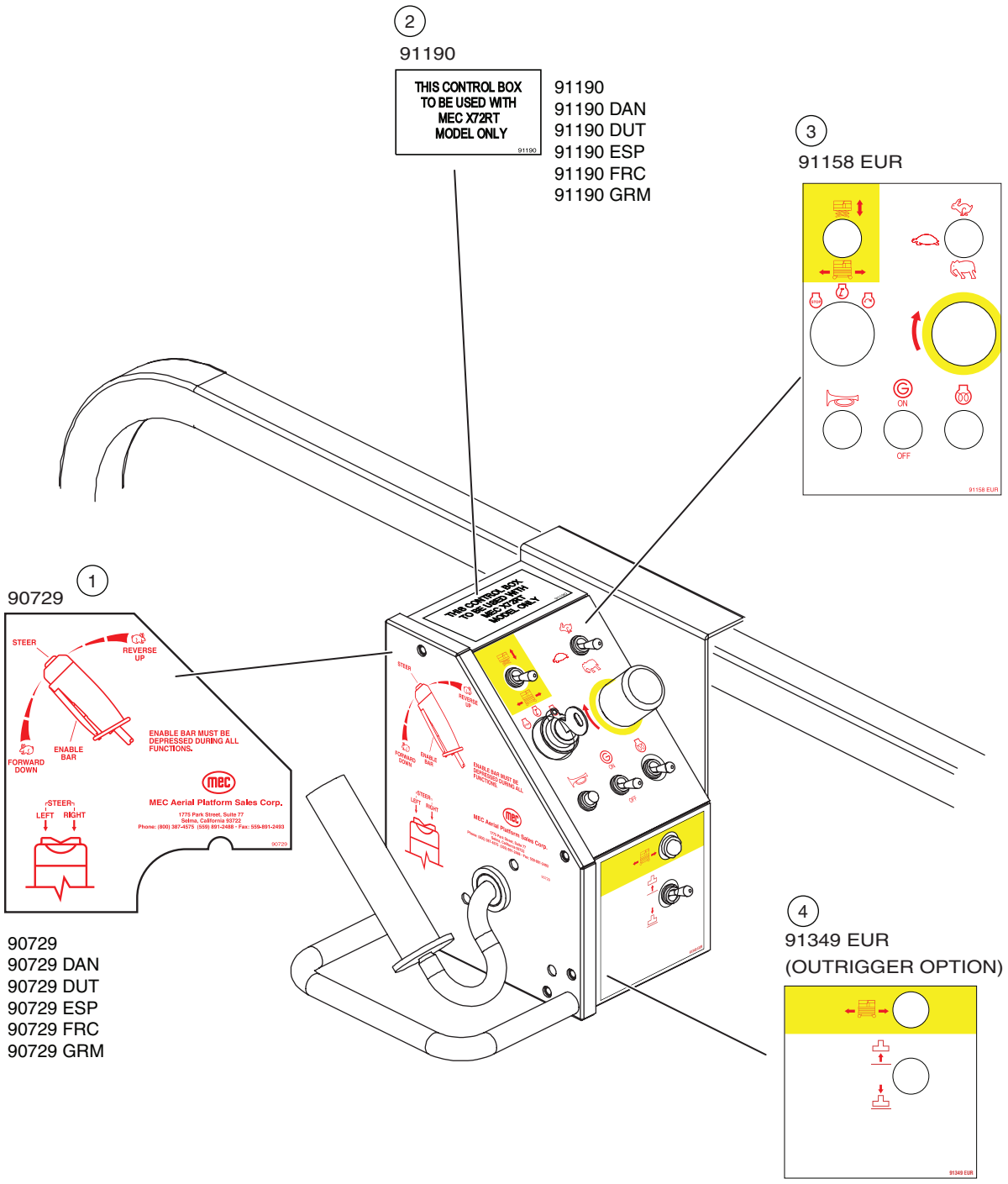
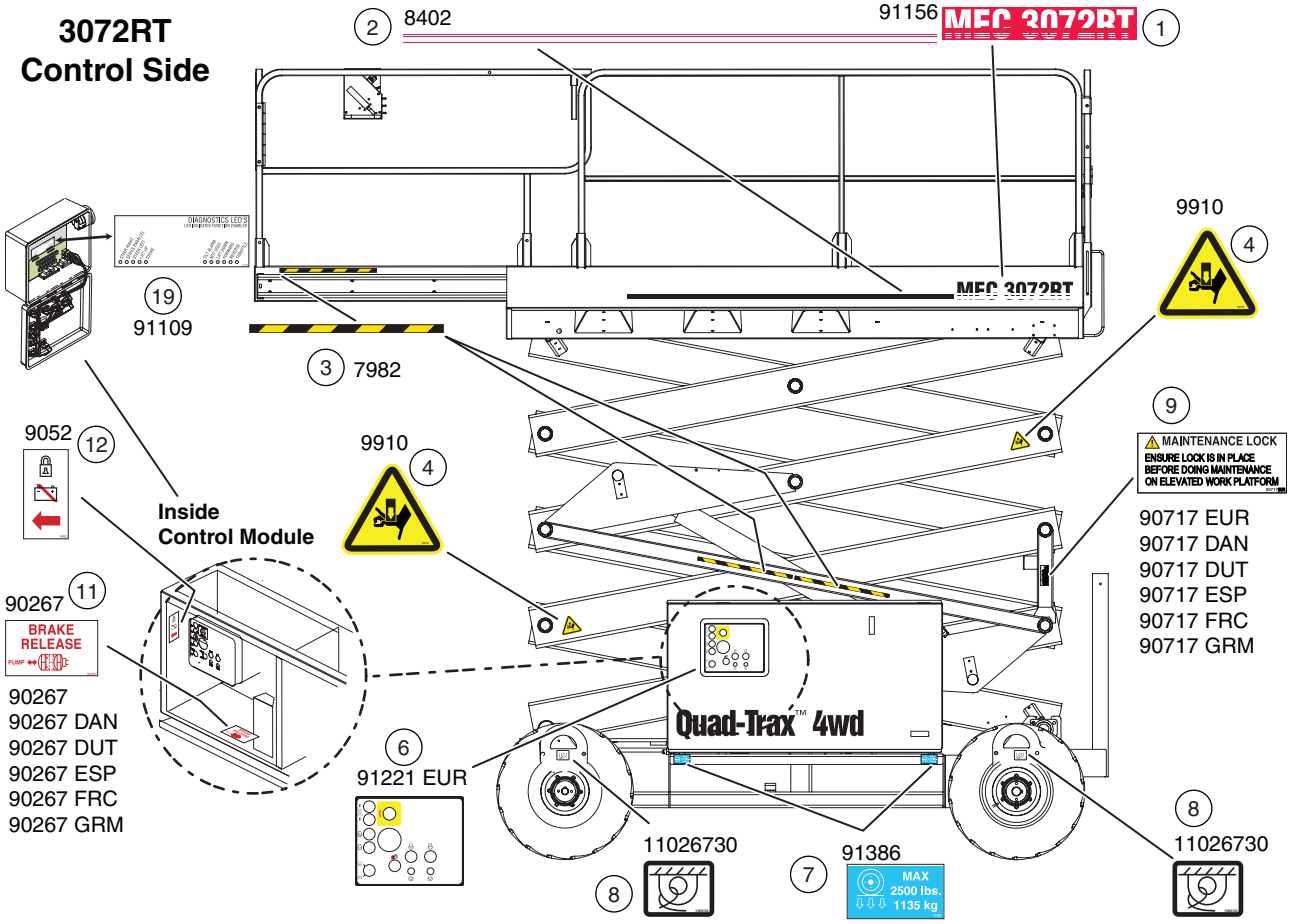
SECTION 7:
DECALS

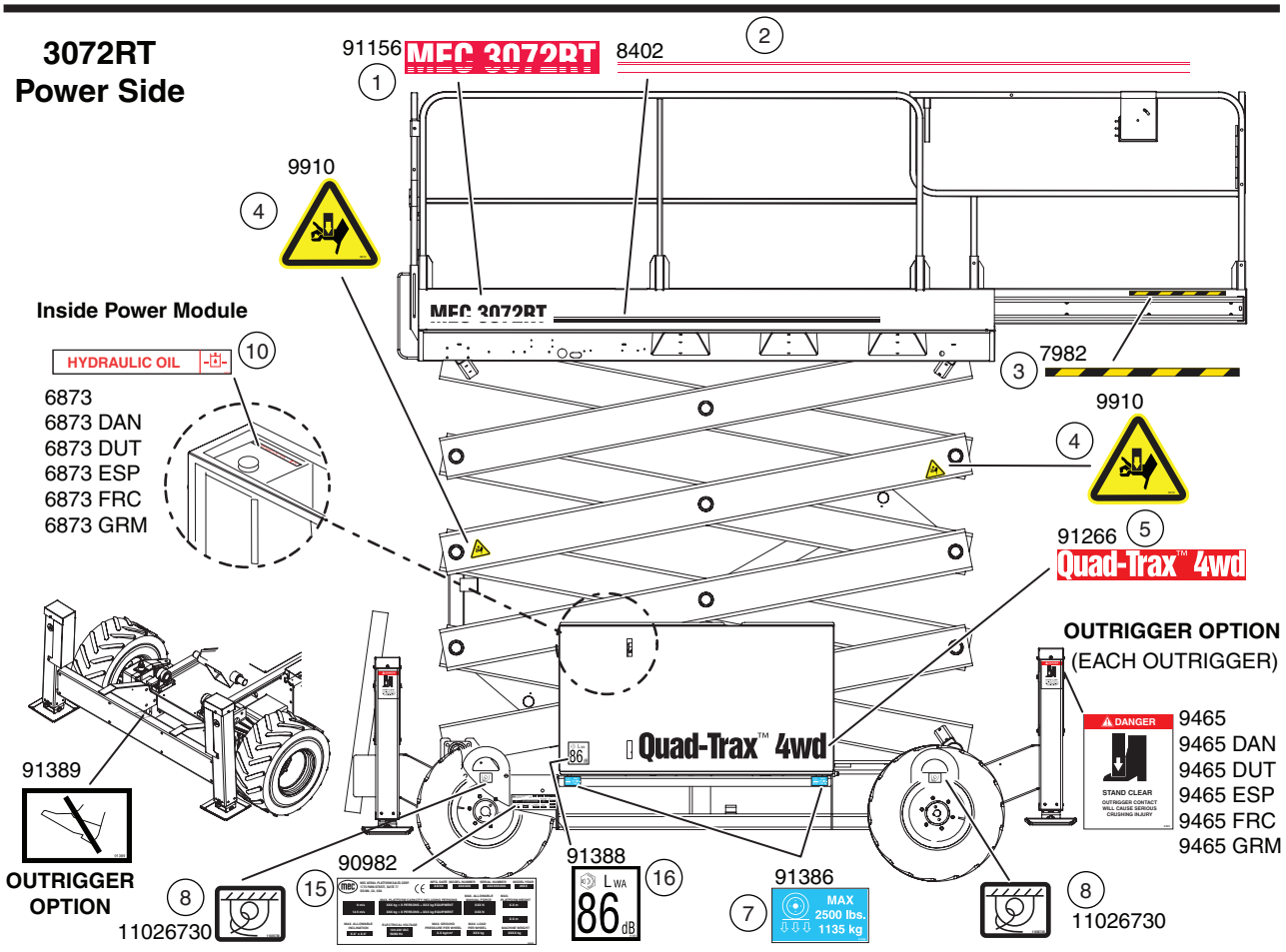

2
91190
THIS CONTROL BOX TO BE USED WITH MEC X72RT MODEL ONLY
91190
91190
91190 DAN
91190 DUT
91190 ESP
91190 FRC
91190 GRM
3
91158 EUR
ON
OFF
91158 EUR
1
90729
STEER
REVERSE UP
FORWARD DOWN
ENABLE BAR
ENABLE BAR MUST BE DEPRESSED DURING ALL FUNCTIONS.
STEER
LEFT
RIGHT
MEC Aerial Platform Sales Corp.
90729
90729
90729 DAN
90729 DUT
90729 ESP
90729 FRC
90729 GRM
4
91349 EUR
(OUTRIGGER OPTION)
91349 EUR

ITEM	PART NO.	QTY	DESCRIPTION
			DECAL KIT, UPPER CONTROL BOX, CE
1	90729	1	DECAL, UPPER CONTROL BOX, SIDE
			90729 DAN = DANISH 90729 DUT = DUTCH
			90729 ESP = SPANISH 90729 FRC = FRENCH
			90729 GRM = GERMAN
2	91190	1	DECAL, CONTROL BOX MODEL, X72RT
			91190 DAN = DANISH 91190 DUT = DUTCH
			91190 ESP = SPANISH 91190 FRC = FRENCH
			91190 GRM = GERMAN
3	91158 EUR	1	DECAL, UPPER CONTROLS, CE
4	91349 EUR	1	DECAL, OUTRIGGER CONTROLS, CE

3072RT Control Side

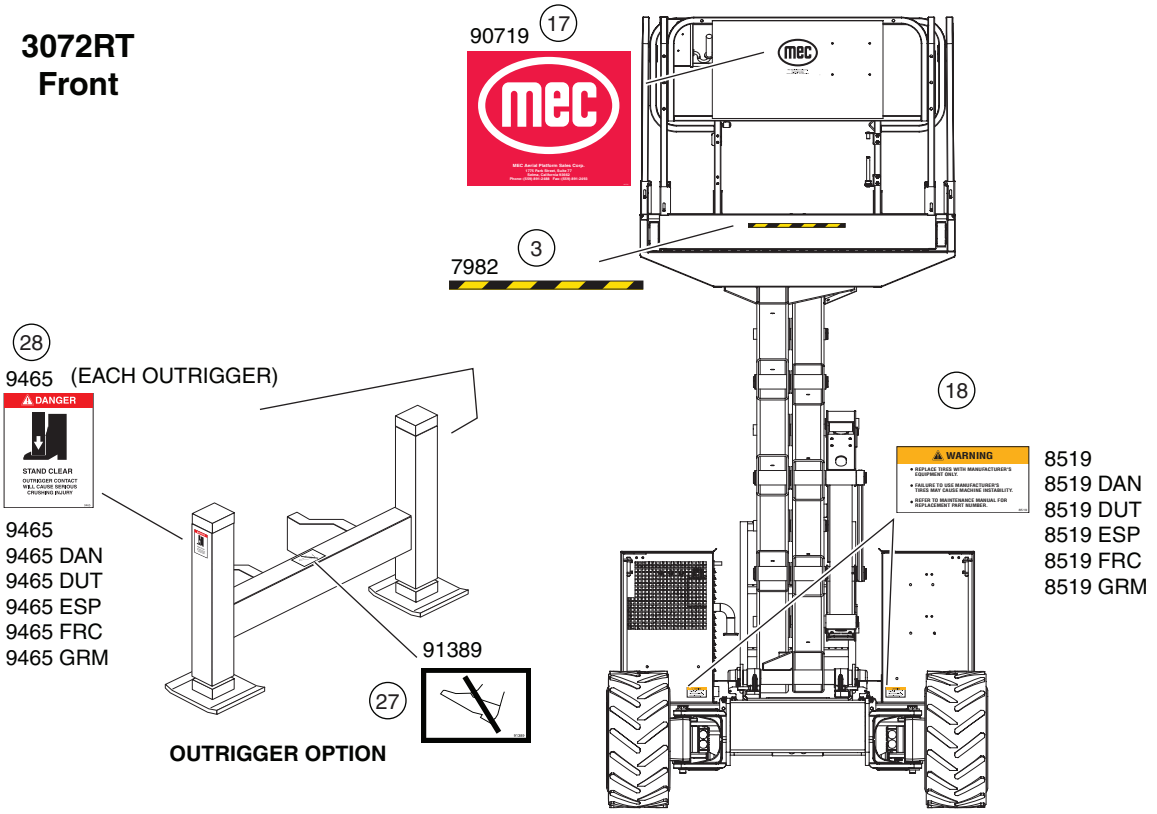


3072RT Power Side

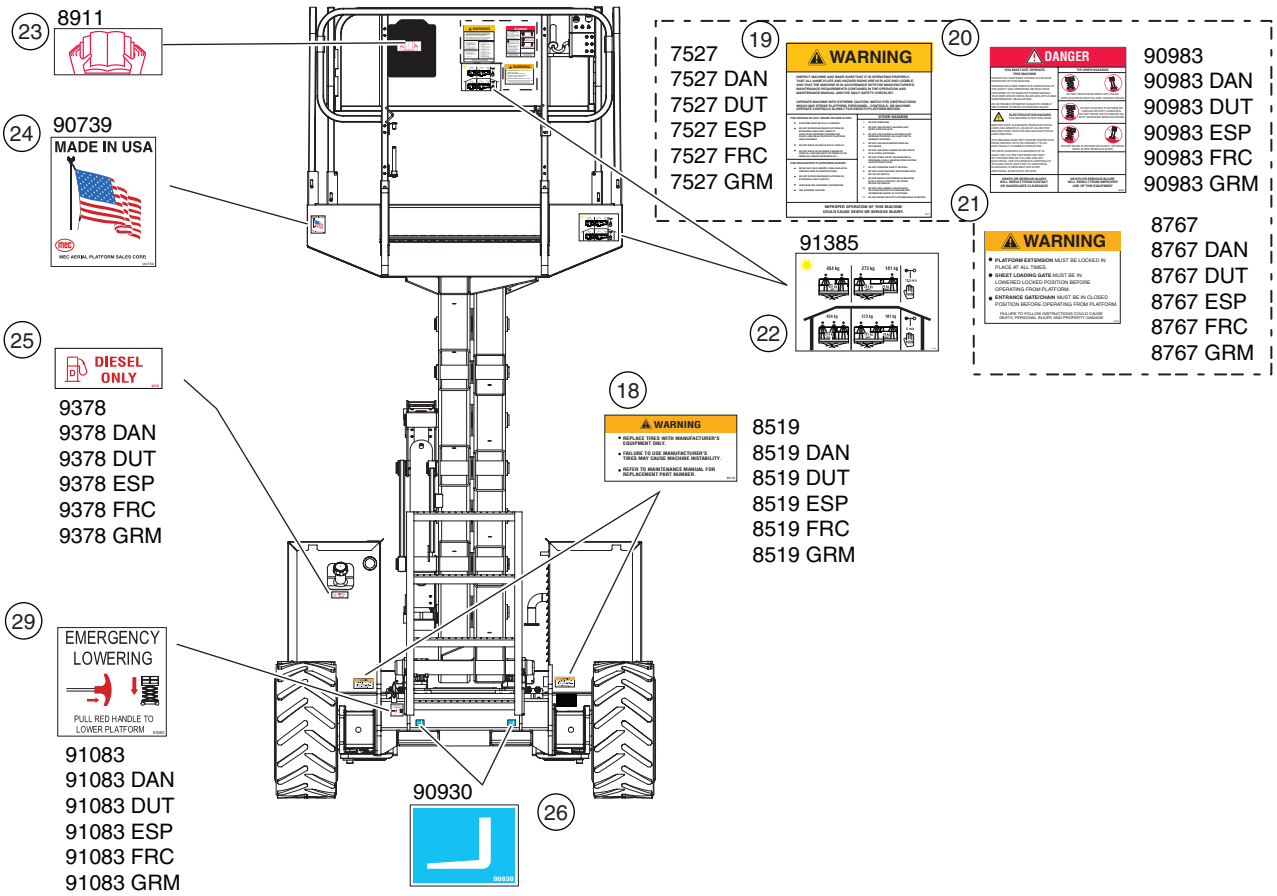


ITEM	PART NO.	QTY	DESCRIPTION
			DECAL KIT, SIDES, 3072RT, CE
1	91156	2	DECAL, MEC 3072RT
2	8402	2	DECAL, RAIL STRIPE
3	7982	7	DECAL, SAFETY STRIPE
4	9910	4	DECAL, HAND CRUSH HAZARD
5	91266	2	DECAL, QUAD TRAX 4WD
6	91221 EUR	1	DECAL, LOWER CONTROLS, DIESEL, CE
7	91387	4	DECAL, MAX WHEEL LOAD, 3772RT, CE
8	11026730	4	DECAL, TIE DOWN
9	90717 EUR	1	DECAL, MAINTENANCE LOCK, CE
			90717 DAN = DANISH 90717 DUT = DUTCH
			90717ESP = SPANISH 90717 FRC = FRENCH
			90717 GRM = GERMAN
10	6873	1	DECAL, HYDRAULIC OIL
			6873 DAN = DANISH 6873 DUT = DUTCH
			6873 ESP = SPANISH 6873 FRC = FRENCH
			6873 GRM = GERMAN
11	90267	1	DECAL, BRAKE RELEASE
			90267 DAN = DANISH 90267 DUT = DUTCH
			90267 ESP = SPANISH 90267 FRC = FRENCH
			90267 GRM = GERMAN
12	9052	1	DECAL, BATTERY DISCONNECT AND LOCK
			91374 GRM = GERMAN
15	90982	1	SERIAL PLATE
16	91388	1	DECAL, 86 DB
19	91109	1	DIAGNOSTIC LABEL

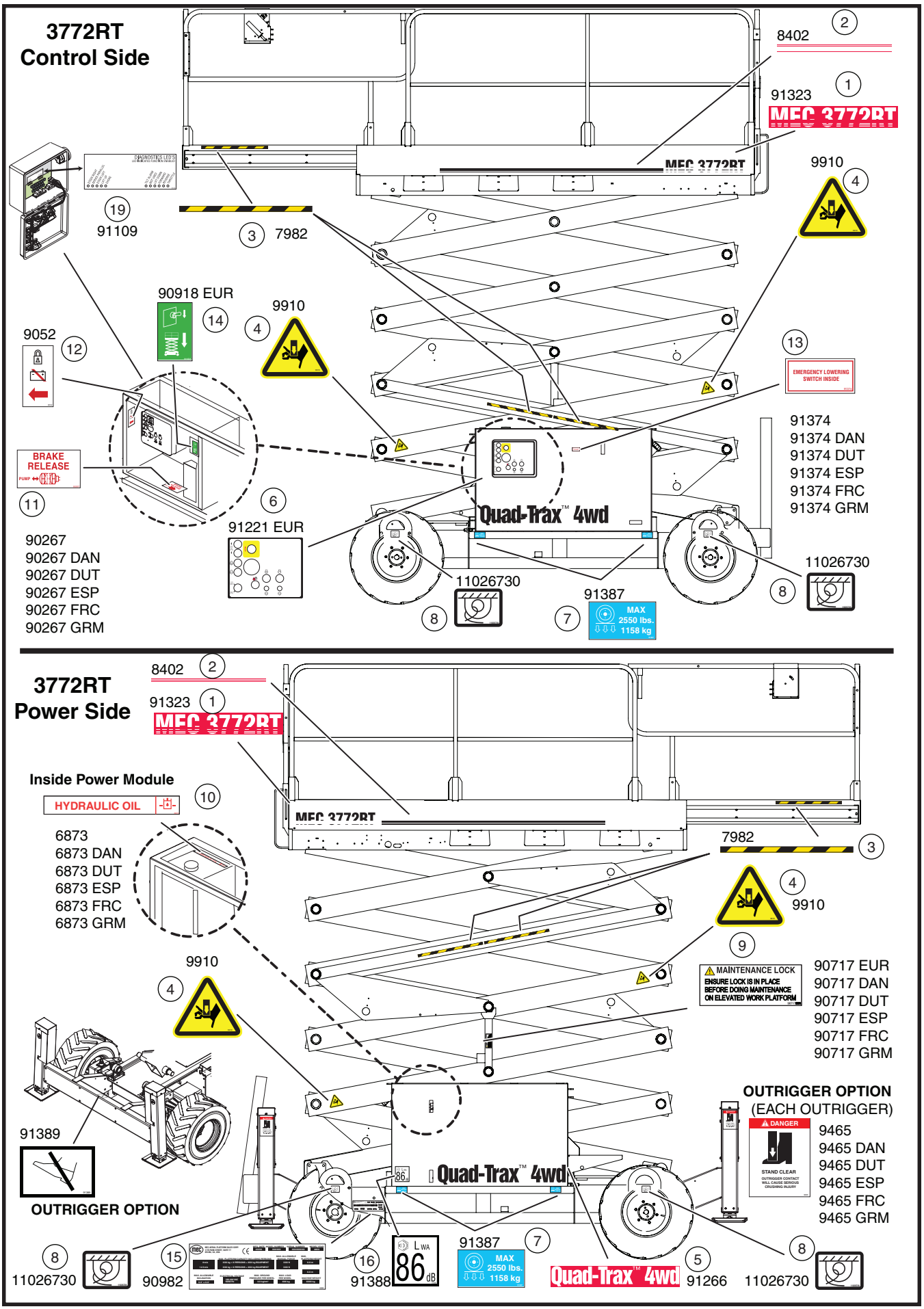
3072RT Front



3072RT Rear

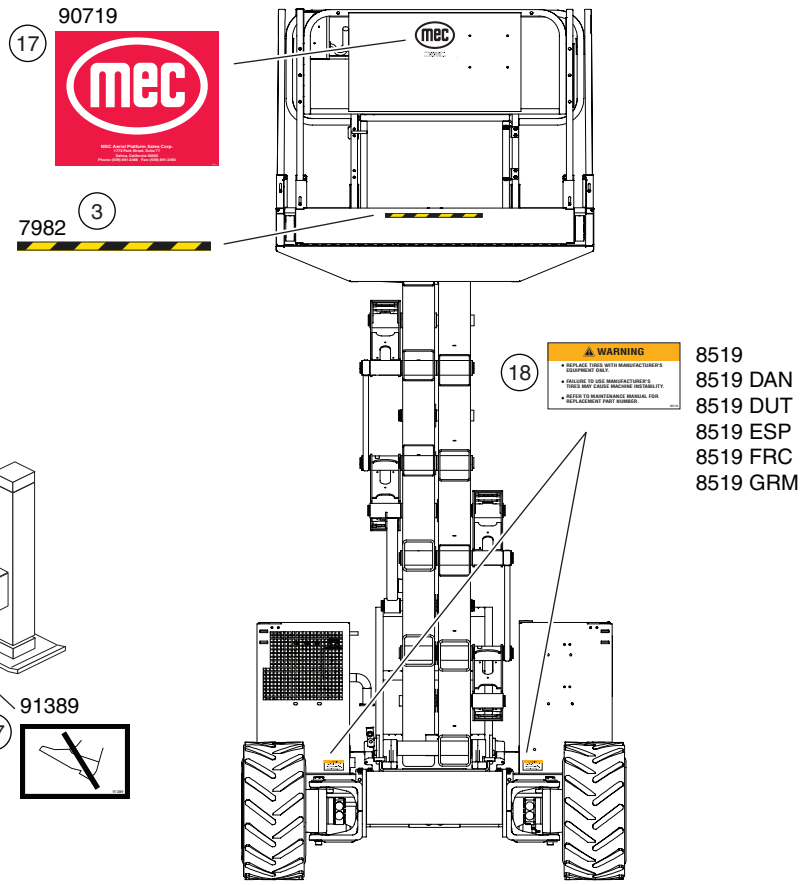


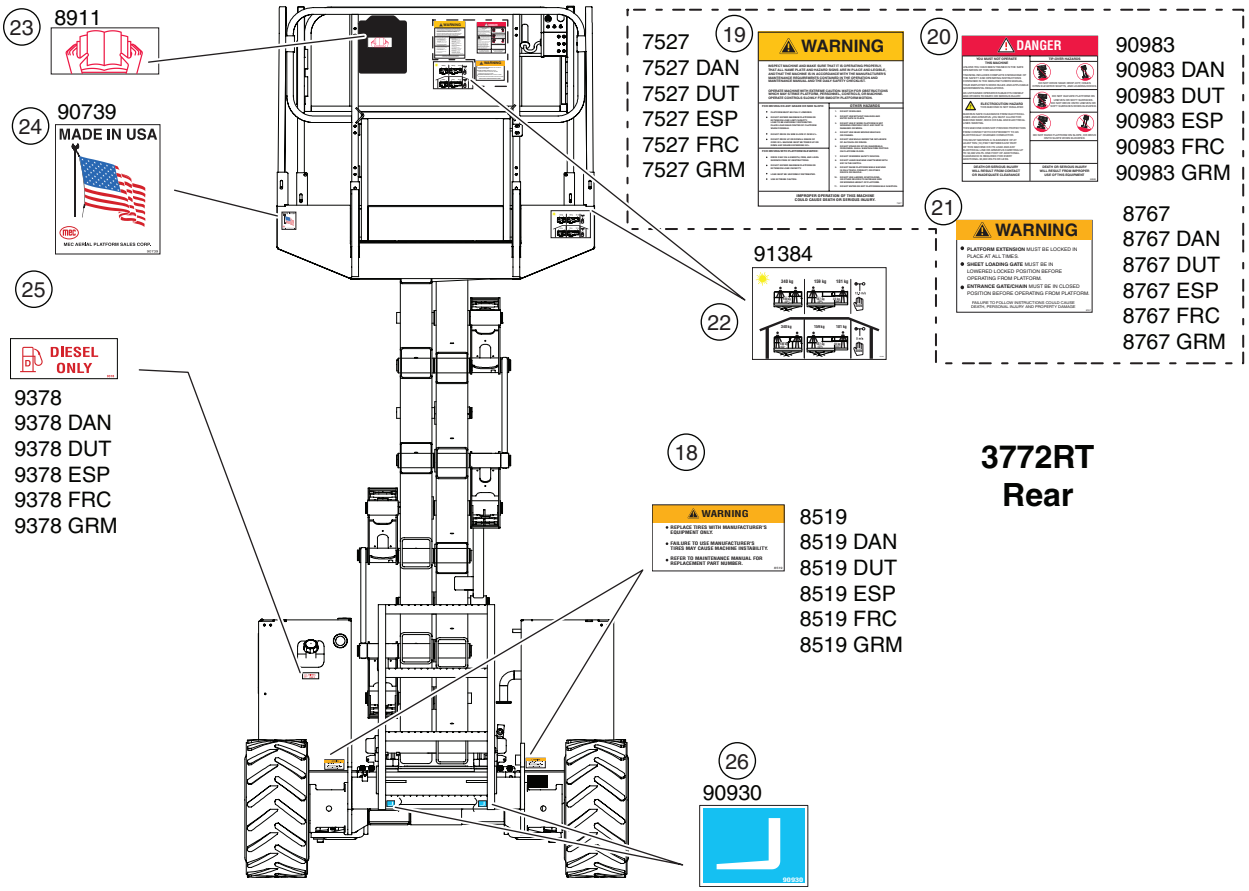
ITEM	PART NO.	QTY	DESCRIPTION
			DECAL KIT, ENDS, 3072RT, CE
17	90719	1	DECAL, MEC OVAL
18	8519	4	DECAL, WARNING, TIRE REPLACEMENT
			8519 DAN = DANISH 8519 DUT = DUTCH
			8519 ESP = SPANISH 8519 FRC = FRENCH
			8519 GRM = GERMAN
19	7527	1	DECAL, WARNING PANEL
			7527 DAN = DANISH 7527 DUT = DUTCH
			7527 ESP = SPANISH 7527 FRC = FRENCH
			7527 GRM = GERMAN
20	90983	1	DECAL, DANGER, ELECTRIC - TIPOVER - WIND RATING
			90983 DAN = DANISH 90983 DUT = DUTCH
			90983 ESP = SPANISH 90983 FRC = FRENCH
			90983 GRM = GERMAN
21	8767	1	DECAL, WARNING, SHEET LOADING
			8767 DAN = DANISH 8767 DUT = DUTCH
			8767 ESP = SPANISH 8767 FRC = FRENCH
			8767 GRM = GERMAN
22	91385	2	DECAL, 454KG CAPACITY, WIND RATING, CE
23	8911	1	DECAL, MANUAL CASE
24	90739	1	DECAL, MADE IN USA
25	9378	1	DECAL, DIESEL ONLY
			9378 DAN = DANISH 9378 DUT = DUTCH
			9378 ESP = SPANISH 9378 FRC = FRENCH
			9378 GRM = GERMAN
26	90930	2	DECAL, FORK LIFT POCKET, CE
27	91389	2	DECAL, NO STEP, CE
28	9465	4	DECAL, DANGER, KEEP CLEAR OUTRIGGERS
			9465 DAN = DANISH 9465 DUT = DUTCH
			9465 ESP = SPANISH 9465 FRC = FRENCH
			9465 GRM = GERMAN
29	91083	1	EMERGENCY LOWERING
			91083 DAN = DANISH 91083 DUT = DUTCH
			91083 ESP = SPANISH 91083 FRC = FRENCH
			91083 GRM = GERMAN


3772RT
Control Side
8402
2
91323
1
MEC 3772RT
19
91109
3
7982
9910
4
90918 EUR
14
9910
4
9052
12
13
EMERGENCY LOWERING SWITCH INSIDE
91374
91374 DAN
91374 DUT
91374 ESP
91374 FRC
91374 GRM
BRAKE RELEASE
11
6
91221 EUR
Quad-Trax™ 4wd
90267
90267 DAN
90267 DUT
90267 ESP
90267 FRC
90267 GRM
11026730
8
91387
7
MAX 2550 lbs. 1158 kg
11026730
8
3772RT
Power Side
8402
2
91323
1
MEC 3772RT
Inside Power Module
HYDRAULIC OIL
10
6873
6873 DAN
6873 DUT
6873 ESP
6873 FRC
6873 GRM
7982
3
4
9910
9
MAINTENANCE LOCK
ENSURE LOCK IS IN PLACE BEFORE DOING MAINTENANCE ON ELEVATED WORK PLATFORM
90717 EUR
90717 DAN
90717 DUT
90717 ESP
90717 FRC
90717 GRM
9910
4
OUTRIGGER OPTION
(EACH OUTRIGGER)
DANGER
STAND CLEAR
OUTRIGGER CONTACT WILL CAUSE SERIOUS CRUSHING INJURY
9465
9465 DAN
9465 DUT
9465 ESP
9465 FRC
9465 GRM
91389
OUTRIGGER OPTION
Quad-Trax™ 4wd
8
11026730
15
90982
16
91388
LWA 86 dB
91387
7
MAX 2550 lbs. 1158 kg
Quad-Trax™ 4wd
5
91266
8
11026730

ITEM	PART NO.	QTY	DESCRIPTION
			DECAL KIT, SIDES, 3772RT, CE
1	91323	2	DECAL, MEC 3772RT
2	8402	2	DECAL, RAIL STRIPE
3	7982	7	DECAL, SAFETY STRIPE
4	9910	4	DECAL, HAND CRUSH HAZARD
5	91266	2	DECAL, QUAD TRAX 4WD
6	91221 EUR	1	DECAL, LOWER CONTROLS, DIESEL, CE
7	91387	4	DECAL, MAX WHEEL LOAD, 3772RT, CE
8	11026730	4	DECAL, TIE DOWN
9	90717 EUR	1	DECAL, MAINTENANCE LOCK, CE
			90717 DAN = DANISH 90717 DUT = DUTCH
			90717ESP = SPANISH 90717 FRC = FRENCH
			90717 GRM = GERMAN
10	6873	1	DECAL, HYDRAULIC OIL
			6873 DAN = DANISH 6873 DUT = DUTCH
			6873 ESP = SPANISH 6873 FRC = FRENCH
			6873 GRM = GERMAN
11	90267	1	DECAL, BRAKE RELEASE
			90267 DAN = DANISH 90267 DUT = DUTCH
			90267 ESP = SPANISH 90267 FRC = FRENCH
			90267 GRM = GERMAN
12	9052	1	DECAL, BATTERY DISCONNECT AND LOCK
13	91374	1	DECAL, EMERGENCY LOWERING SWITCH INSIDE
			91374 DAN = DANISH 91374 DUT = DUTCH
			91374 ESP = SPANISH 91374 FRC = FRENCH
			91374 GRM = GERMAN
14	91918	1	DECAL, EMERGENCY LOWERING SWITCH
15	90982	1	SERIAL PLATE
16	91388	1	DECAL, 86 DB
19	91109	1	DIAGNOSTIC LABEL

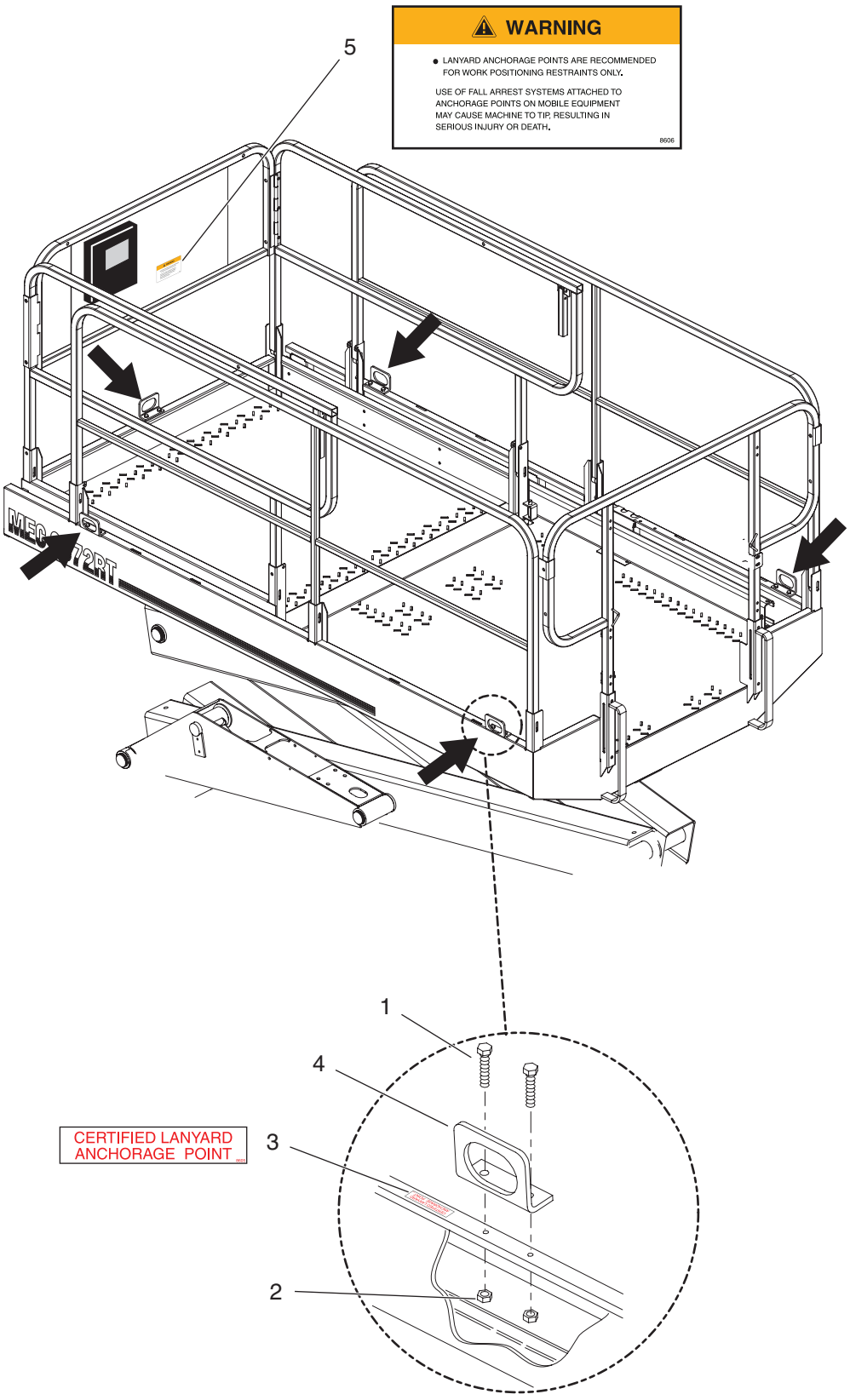
3772RT
Front





3772RT
Rear

ITEM	PART NO.	QTY	DESCRIPTION
			DECAL KIT, ENDS, 3772RT, CE
17	90719	1	DECAL, MEC OVAL
18	8519	4	DECAL, WARNING, TIRE REPLACEMENT
			8519 DAN = DANISH 8519 DUT = DUTCH
			8519 ESP = SPANISH 8519 FRC = FRENCH
			8519 GRM = GERMAN
19	7527	1	DECAL, WARNING PANEL
			7527 DAN = DANISH 7527 DUT = DUTCH
			7527 ESP = SPANISH 7527 FRC = FRENCH
			7527 GRM = GERMAN
20	90983	1	DECAL, DANGER, ELECTRIC - TIPOVER - WIND RATING
			90983 DAN = DANISH 90983 DUT = DUTCH
			90983 ESP = SPANISH 90983 FRC = FRENCH
			90983 GRM = GERMAN
21	8767	1	DECAL, WARNING, SHEET LOADING
			8767 DAN = DANISH 8767 DUT = DUTCH
			8767 ESP = SPANISH 8767 FRC = FRENCH
			8767 GRM = GERMAN
22	91384	2	DECAL, 340KG CAPACITY, WIND RATING, CE
23	8911	1	DECAL, MANUAL CASE
24	90739	1	DECAL, MADE IN USA
25	9378	1	DECAL, DIESEL ONLY
			9378 DAN = DANISH 9378 DUT = DUTCH
			9378 ESP = SPANISH 9378 FRC = FRENCH
			9378 GRM = GERMAN
26	90930	2	DECAL, FORK LIFT POCKET, CE
27	91389	2	DECAL, NO STEP, CE
28	9465	4	DECAL, DANGER, KEEP CLEAR OUTRIGGERS
			9465 DAN = DANISH 9465 DUT = DUTCH
			9465 ESP = SPANISH 9465 FRC = FRENCH
			9465 GRM = GERMAN


WARNING
LANYARD ANCHORAGE POINTS ARE RECOMMENDED FOR WORK POSITIONING RESTRAINTS ONLY.
USE OF FALL ARREST SYSTEMS ATTACHED TO ANCHORAGE POINTS ON MOBILE EQUIPMENT MAY CAUSE MACHINE TO TIP, RESULTING IN SERIOUS INJURY OR DEATH.
8606
5
1
4
3
2
CERTIFIED LANYARD ANCHORAGE POINT

ITEM	PART NO.	QTY	DESCRIPTION
			DECALS, ANCHORAGE POINTS
5	8606	1	DECAL, WARNING, POS RESTRAINTS 8606 DAN = DANISH 8606 DUT = DUTCH
			8606 ESP = SPANISH 8606 FRC = FRENCH 8606 GRM = GERMAN

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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.

Aerial Platforms Sales Corp.
1775 Park Street, Suite 77 • Selma, CA 93662 USA
Ph: 1-800-387-4575 • 559-891-2488 • Fax: 559-891-2448
E-mail:info@mecawp.com • Web:www.mecawp.com