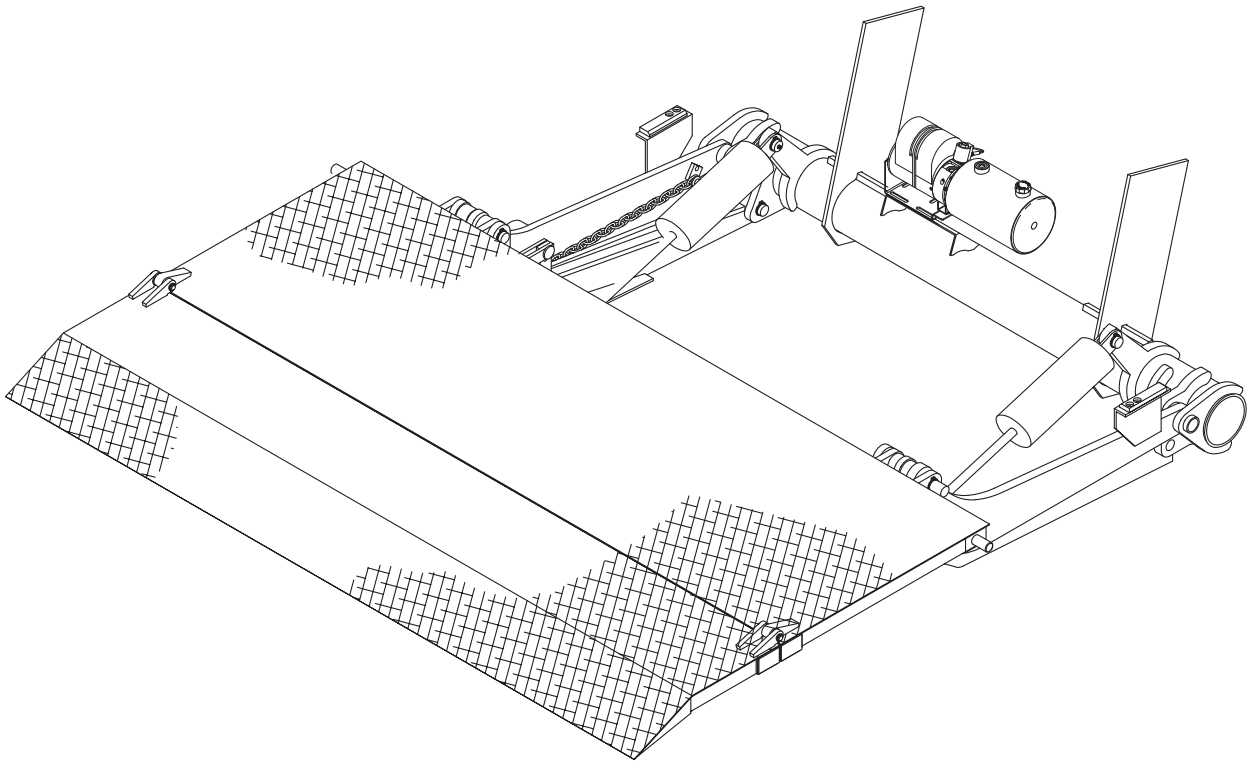
STOWAWAY

Tailgates By THIEMAN

ST 22 & ST 31
OWNERS MANUAL/PARTS LIST



ST 31 SHOWN

⚠ IMPORTANT! KEEP IN VEHICLE!

PLEASE READ AND UNDERSTAND THE CONTENTS OF THIS MANUAL BEFORE OPERATING THE EQUIPMENT.

NTEA THE ASSOCIATION FOR THE WORK TRUCK INDUSTRY MEMBER

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FOR YOUR RECORDS

Model No. _____ Date Purchased _____

Serial No._____

NOTE: When Ordering Parts Be Sure To Include This Information!

PARTS ORDERING PROCEDURE

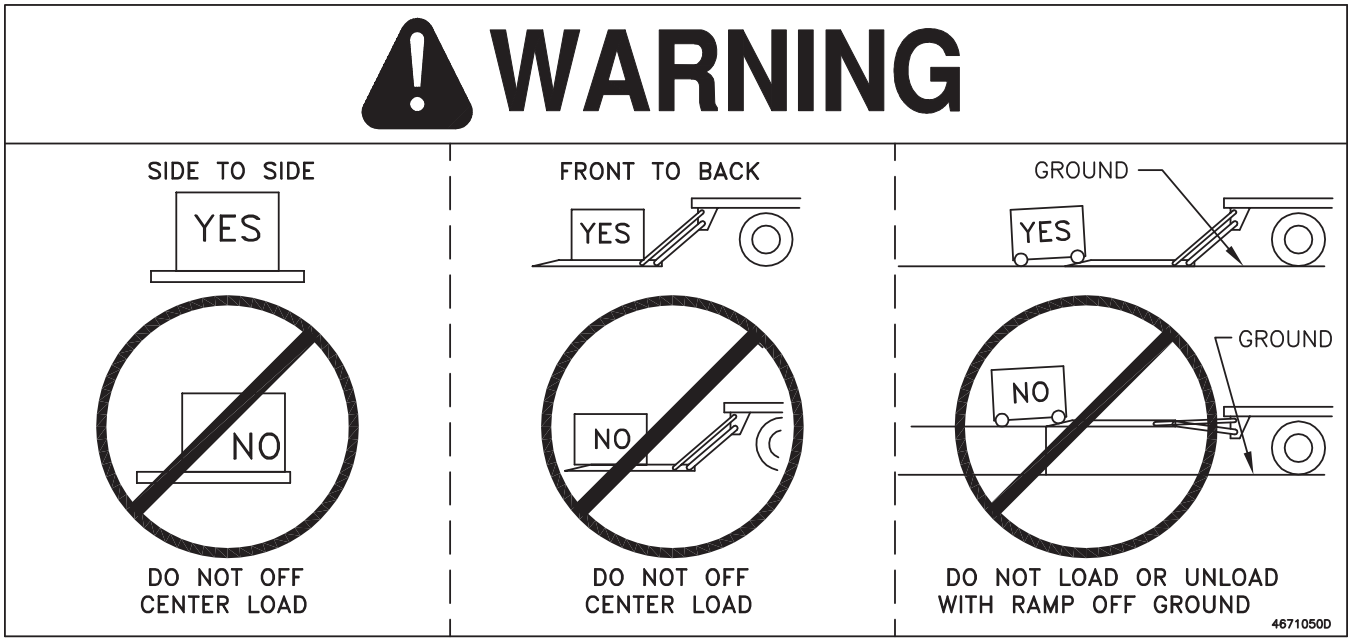
When ordering parts, please include all the information asked for below. If this information is not available, a complete written description or sketch of the required part will help Thieman identify and deliver the needed part to you.

THE FOLLOWING INFORMATION MUST BE INCLUDED:

1. Serial Number – Thieman liftgate serial numbers can be found on the tag located on the front side of the trunnion tube.
2. Model Number and Capacity.
3. Platform size and Material – Steel or Aluminum.
4. Part number.
5. Description.
6. Quantity required.

WATER LEVEL LOADING

When a load is to be raised or lowered, this load must be centered from side to side on the load bearing platform. The load should also be closest to the edge of the platform nearest the truck. If a load is not uniformly distributed, then the heaviest portion should be closest to the edge of the platform nearest the truck.



WARNING!

The following list of warnings are to be read before operating the ST series liftgate.

+ Read this Owners Manual and all of the decals on the liftgate BEFORE operating the liftgate.
+ All protective covers and guards must be in place before operating the liftgate.
+ DO NOT operate the liftgate if you do not have a thorough knowledge and understanding of the operation of the liftgate.
+ NEVER OVERLOAD THE LIFTGATE. The maximum rated capacity of the ST series liftgate differs with each model as follows:
  ST22 – 2200LBS
  ST31 – 3100LBS
+ Never use the liftgate if it makes any unusual noises, has vibrations, or fails to operate freely.
+ Make certain that the area below the platform is clear before and at all times during the operation of the liftgate.
+ Keep hands and feet clear of all pinch points.
+ The platform must in the closed position and the transit chains attached properly before transit.
+ Always load as close to the center of the platform and as close to the vehicle as possible. See figure 1.
+ Never operate lift trucks on or over any part of the platform.

+ Load and unload the platform from the rear and not from the side of the platform.
+ Only operate liftgate when vehicle is on level ground and the parking brake is set.
+ Follow the maintenance guide as outlined in this manual.
+ DO NOT attempt any repairs unless you are qualified to do so.
+ If any repairs, adjustments, or maintenance not covered in this manual are required, contact your nearest Thieman distributor or the factory.

OPERATING INSTRUCTIONS

Caution

Be sure to operate liftgate at a safe distance and never improperly load platform as this may cause personal injury or damage to the liftgate.

UNFOLDING OF PLATFORM

1. Lower platform to ground until lift arms contact the ground.
2. Grasp platform handle on bottom side and manually unfold the platform to the ground. The platform extension can now be unfolded to the ground.

RAISING OF PLATFORM

3. Push toggle switch up to raise platform to bed height.

LOWERING OF PLATFORM

4. Push toggle switch down to lower platform to the ground.

CLOSING OF PLATFORM

5. Manually fold platform extension and ramp.
6. Using platform handle, manually fold platform.
7. Raise gate into the stowed position until latches are engaged over pins.

THERMAL DATA: To avoid overheating the motor do not operate this unit for more than 8 cycles/10 minutes with the maximum load. The motor then must be allowed to completely cool down to ambient temperature before cycling the lift again. This unit also has a 15% duty cycle, which means the liftgate can be cycled no more than 3 cycles/10 minutes constantly with a maximum load.

MAINTENANCE GUIDE

The following inspection and maintenance operations should be performed at the recommended intervals or anytime the liftgate shows signs of abuse, and improper or abnormal operation.

MONTHLY INSPECTION AND MAINTENANCE

Operate the liftgate throughout its entire operational cycle and check the following:

1. Check that there are no unusual noises or vibrations.
2. Check platform height relative to bed height. If platform is lower, adjust cylinder with a 13/16 wrench to obtain the necessary height.
3. Check for apparent damage to the liftgate such as bent or distorted members, any cracked welds which may have resulted from overloading or abuse.
4. Check for excessive wear in the following areas:
    A. Platform hinge pins and lift arms
    B. All cylinder pins, bolts, and clevis
    C. Platform extension pivots
    D. Linkage pins and clevises
5. Check that the platform pivot pins are in place and retained by their proper retainers.
6. Check that all protective covers and guards are properly in place and secured.
7. Check for oil leaks in these areas:
    A. Lift cylinder
    B. Hydraulic hose-replace if it shows signs of wear or cracking.

C. Hydraulic fittings-tighten or replace as may be required to stop leakage.

8. Check the oil level in the pump reservoir. With the liftgate in the stowed position the oil should be within 1/2" from the top of the reservoir. See chart below for oil applications.
9. Check that all wiring and battery cable connections are tight and free of corrosion.
10. Lubrication of the ST series liftgate should be as follows:

Area of Tailgate	Type of Lubrication	Frequency
Pivot pins w/ zerk	Grease*	50 cycles
Pump oil change	see chart below	yearly
Control handle pivots	SAE 10 or 20 oil	50 cycles

*See the parts list for location of the grease zerks.
For -40 to 120 F use #0 Grade grease.
For -20 to 200 F use #1 Grade grease.

HYDRAULIC FLUID CHART	
Temperature Range	Acceptable Fluids
-75 to 165°F	Exxon Univis J-26
-20 to 130°F	Dexron III Exxon Superflo ATF Shell Donax TG
-50 to 80°F	Shell Aero Fluid 4 Mobil Aero HFA Exxon Univis J-13 MIL H-5606

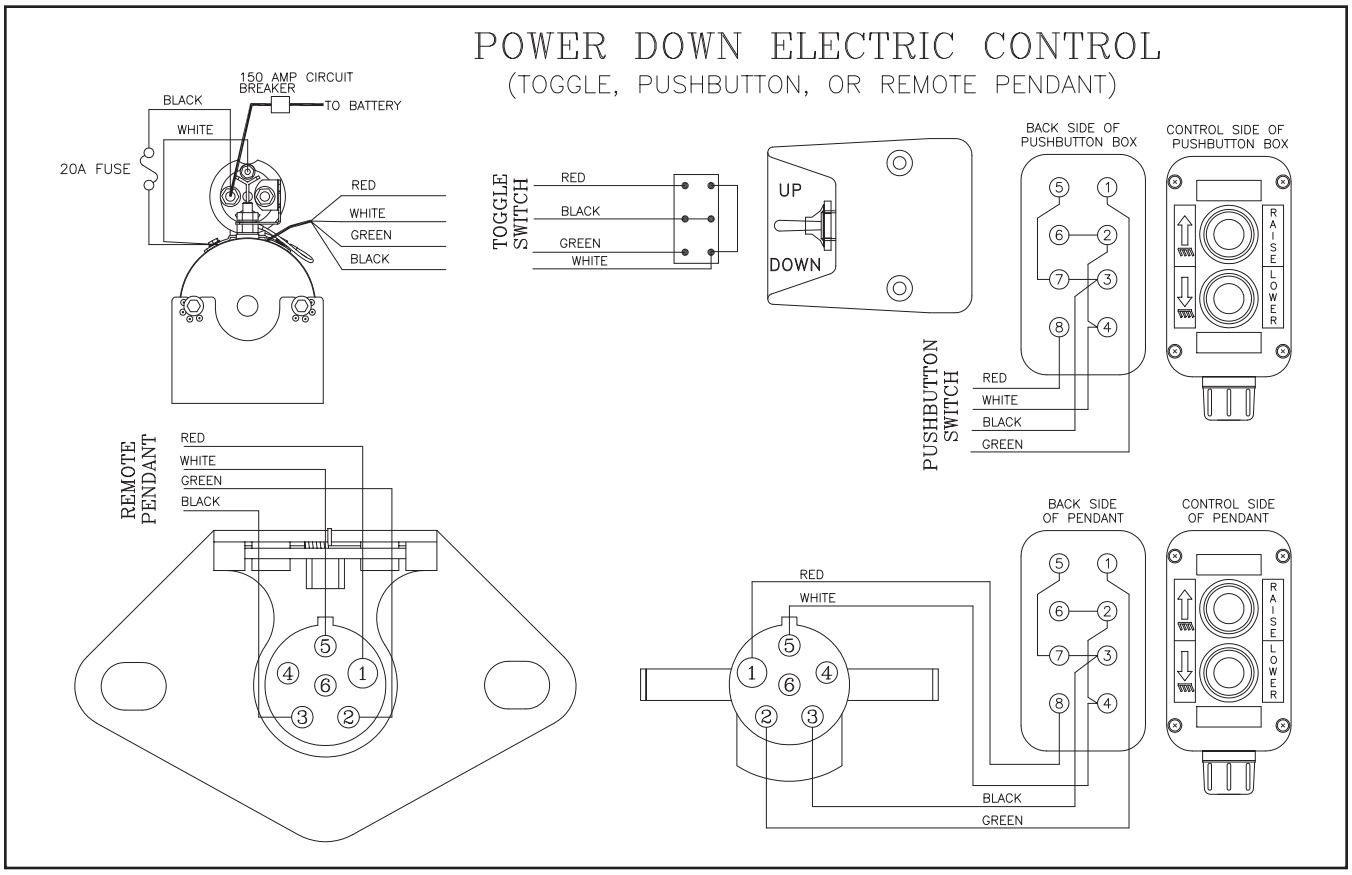
11. Check the pump relief pressure and also the motor amperage at this pressure. These values should be as follows:

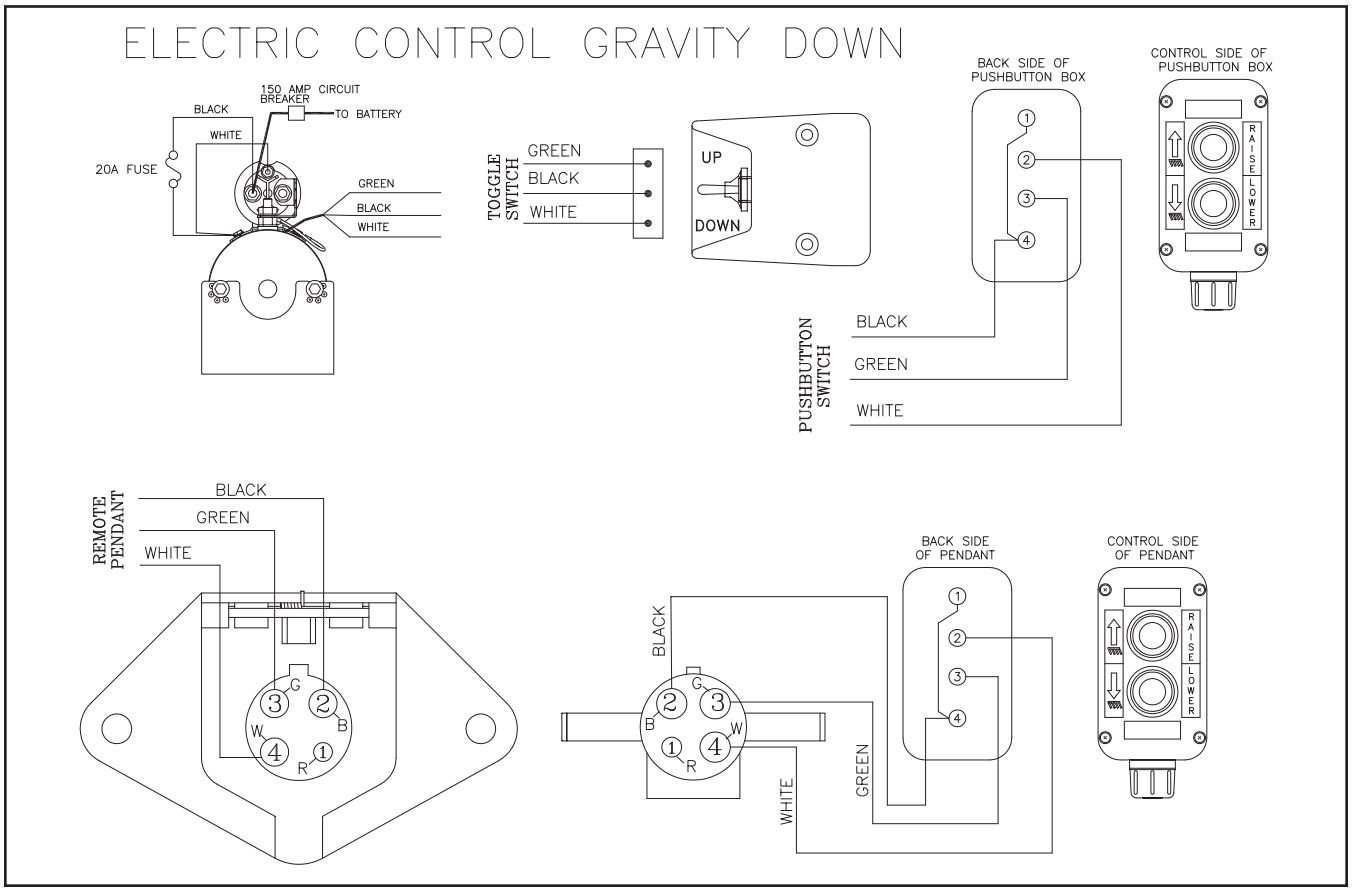
Model	Max Amp Draw	Relief Pressure (psi)
ST 22	175	2200
ST 31	175	2200

Semi-Annual Inspection

1. Perform the procedures outlined in the Monthly Inspection and Maintenance.
2. Inspect pump motor by:
   A. Disconnecting battery cable
   B. Remove motor end cover
   C. Examine the armature brushes for wear. (Brushes should be replaced if they are less than 1/8" long).
   D. Clean all residue out from inside of the motor housing.
   E. Apply several drops of light weight machine oil to the armature shaft bearing in the motor end cover and reassemble the motor end cover.
3. If the hydraulic oil in the reservoir is dirty:
   A. Unfold platform and lower platform to the ground. Raise platform to bed height so cylinders are fully retracted. Support the platform in this position with a lift truck or crane.
   B. Drain the oil from the hydraulic system and flush the entire system.
   C. Remove reservoir from pump and clean suction line filter. Also clean out any contaminants inside reservoir. Remount reservoir when completed.
   D. Replace the oil as outlined in Section 9 under Monthly Maintenance and Inspection.

ELECTRICAL PICTORIAL

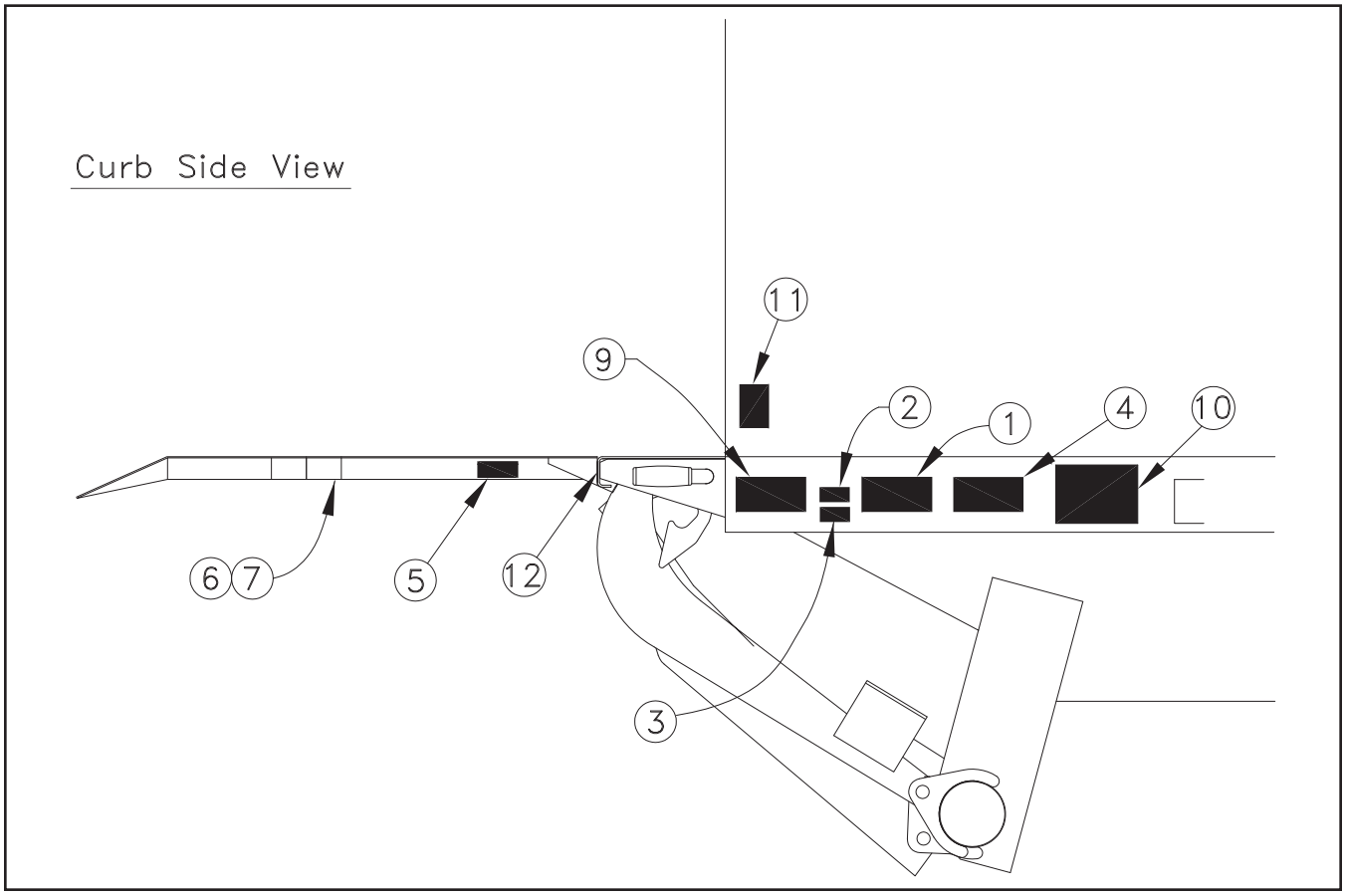




INSPECTION AND LOCATION OF DECALS

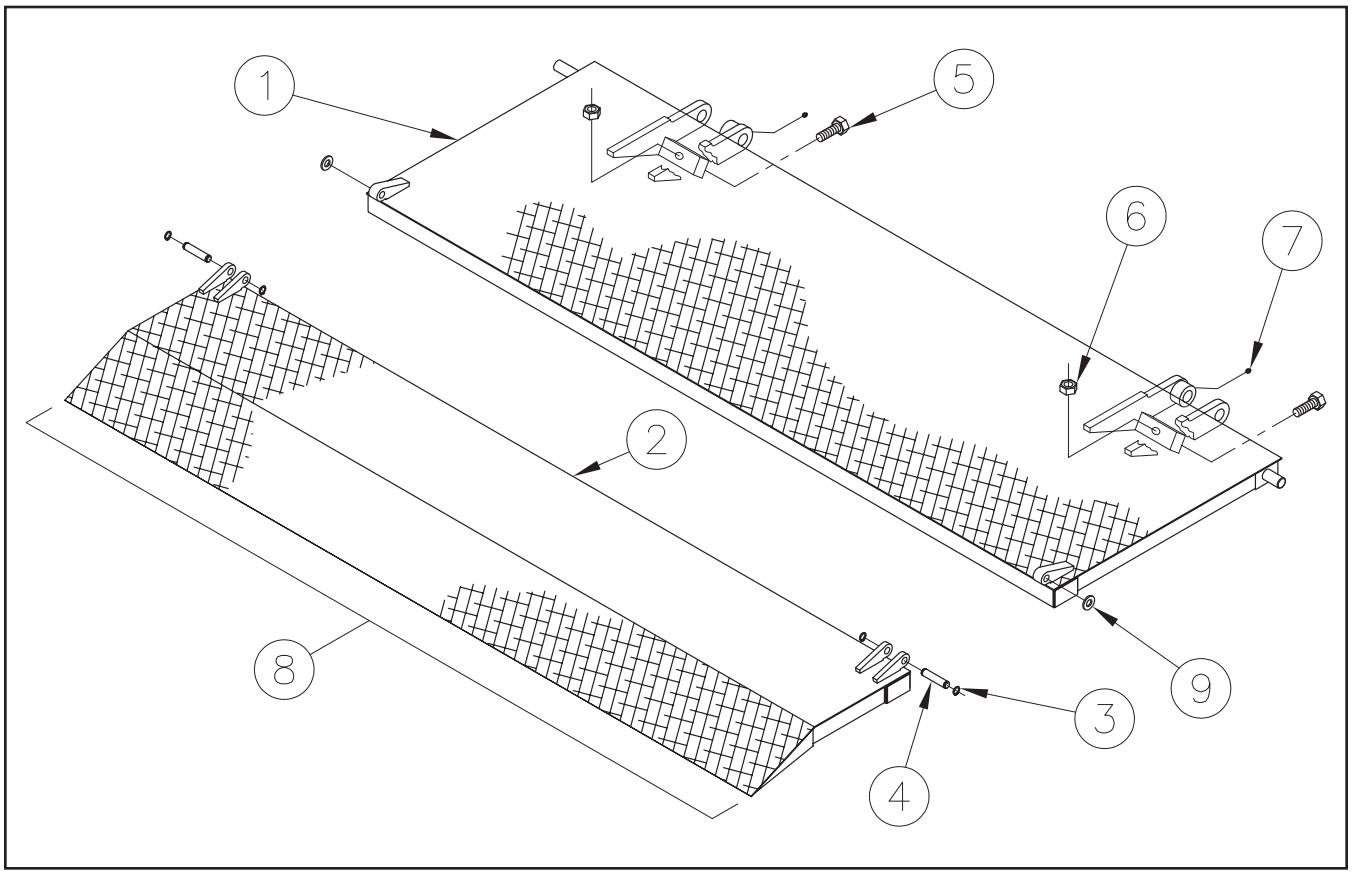
Inspect all of the decals listed below to be certain that they are in the proper location and they are legible. All decals must be in place and legible or all warranties are void!

Item	Part Name	Part Number
1	Warning Decal-off center	4671050
2	Fast Idle Decal	4650150
2	PTO Decal	4650140
3	Danger Decal-no riding	4609
4	Operating Decal-Toggle	4606
5	Capacity Decal-2200#	4650540
5	Capacity Decal-3100#	4650740
6	Warning Decal-pinch point	4604
7	Handle decal	4605
8	Thieman Nameplate	4650800
9	Urgent Warning Decal	4650530
10	Wiring Decal - Gravity Down	4612
10	Wiring Decal - Power Down	4614
11	Warning Decal	4620
12	Reflectors (3)	5705



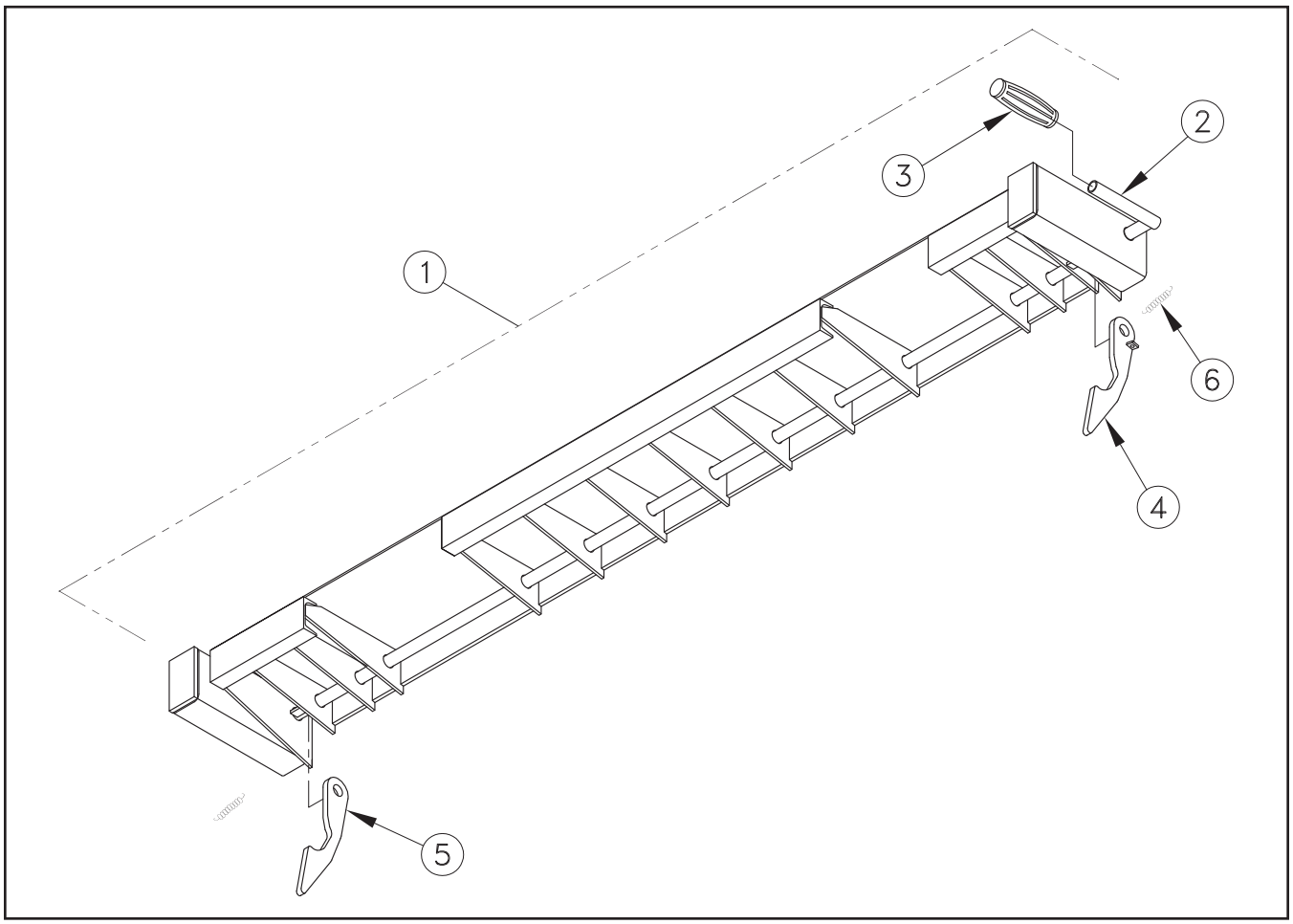
PLATFORM ASSEMBLY

Item	Part Number	Description	Qty.
1	31324	Platform Main Section	1
2	31124-001	Platform Extension	1
3	5781017	Retaining Ring	4
4	5056	Hinge Pin	2
5	8271856	Screw 1.00 x 2.25	2
6	8426899	Nut 1.00	2
7	8271291	Zerk	2
8	31325	Platform Asm 8440	1
9	8107-011	Washer .62	2



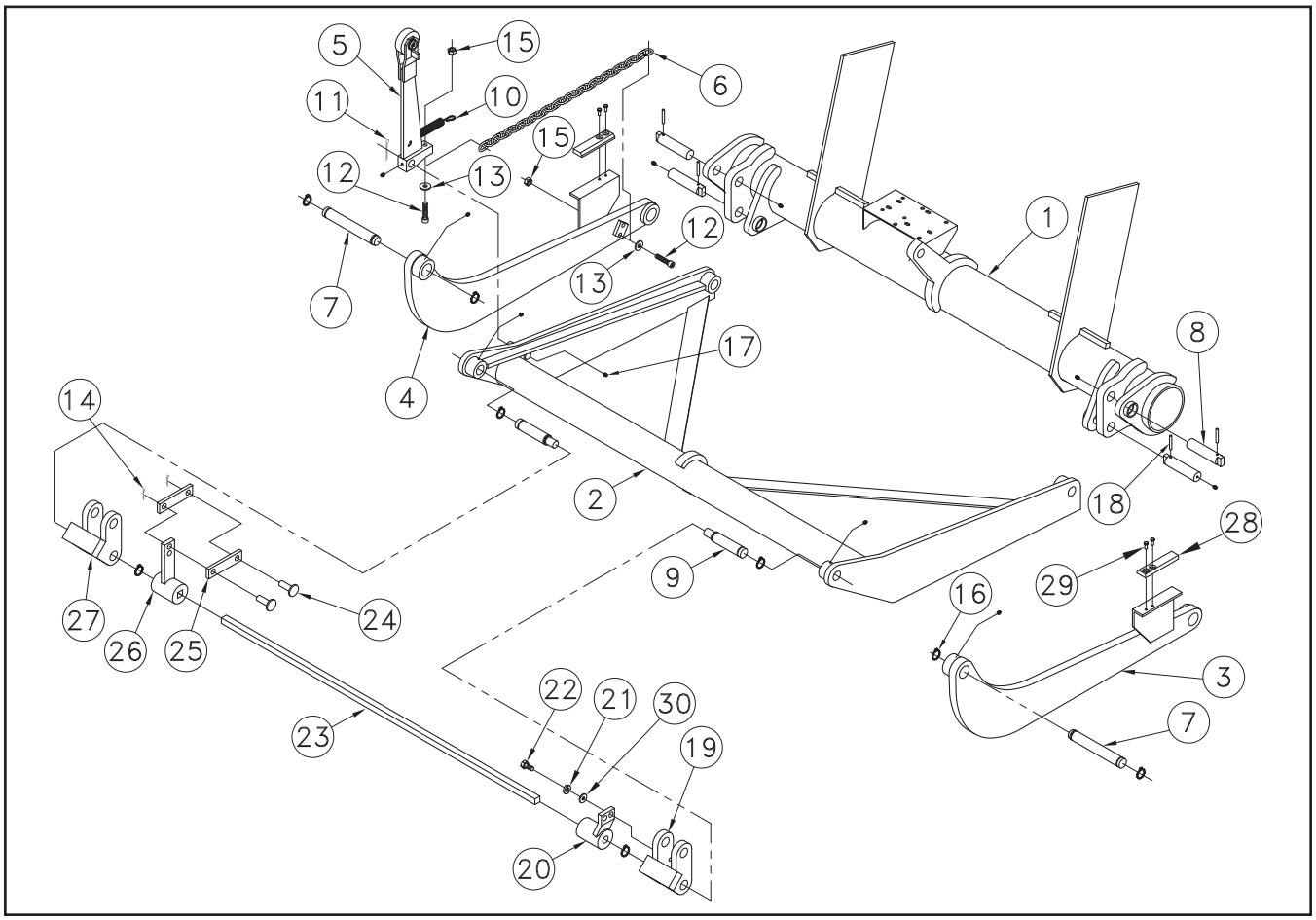
SPACER ASSEMBLY

Item	Part Number	Description	Qty
1	31556	Spacer Asm	1
2	31549-002	Control Shaft	1
3	5701043	Handle Grip	1
4	3192-002	Latch RH	1
5	3192-001	Latch LH	1
6	5101100	Spring	2



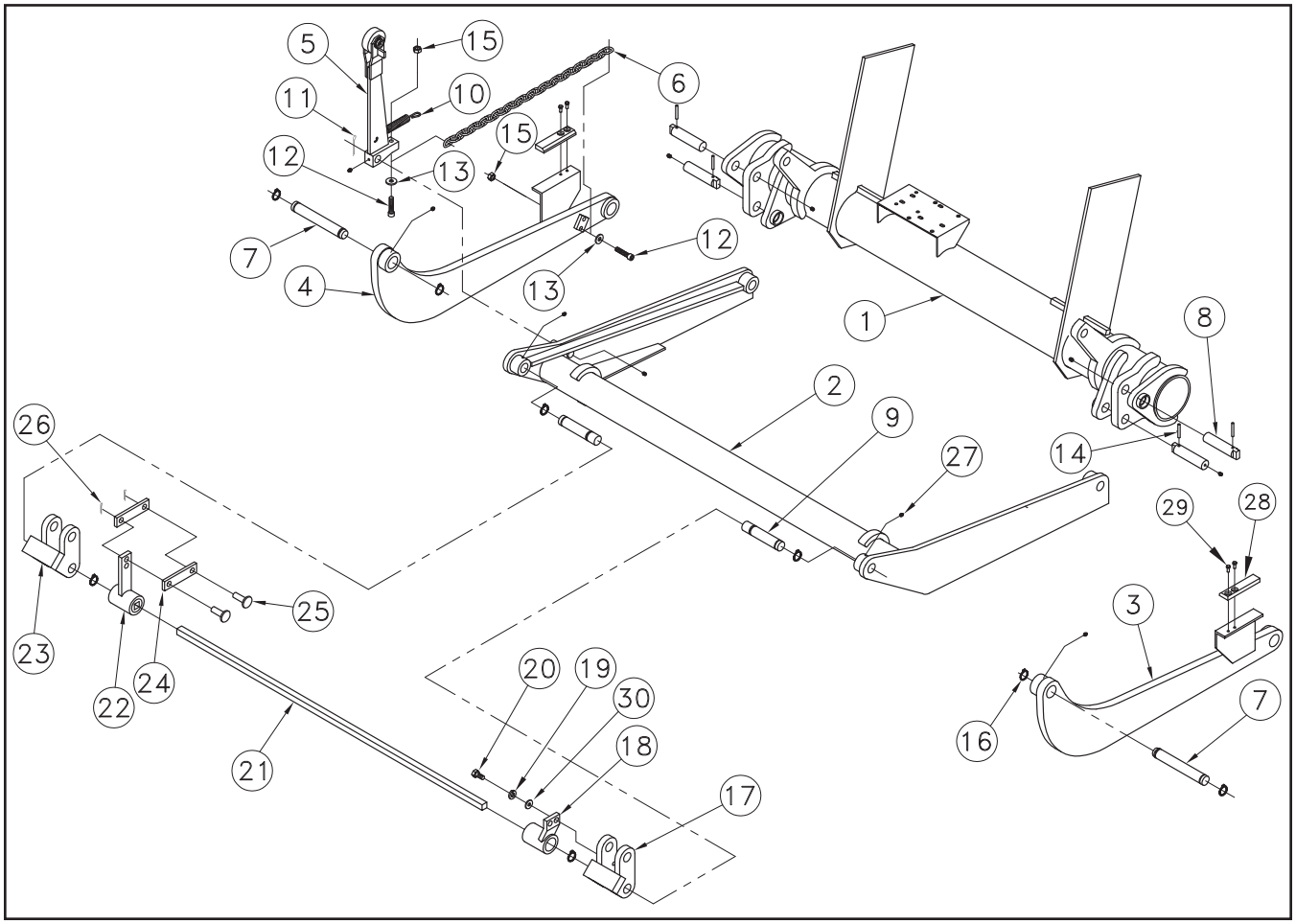
TRUNNION, LIFT ARMS, AND IDLER ARMS-ST22

Item	Part Number	Description	Qty
1	3103460	Trunnion Asm	1
2	3103590	Lift Arm Asm	1
3	31119-002	Idler Arm RH	1
4	31119-001	Idler Arm LH	1
5	3103480	Kicker Arm Asm	1
6	4101-013	Chain	1
7	5064	Pin Asm IA to pivot	2
8	5028	Pin IA, LA-trunnion	4
9	5000161	Pin Asm LA to pivot	2
10	5100180	Spring	1
11	8137243	Cotter Pin	1
12	8427570	Screw .44 x 2.50	2
13	8120396	Flatwasher .44	2
14	5708-005	Spring Pin	2
15	9414073	Lock Nut .44	2
16	5781009	Retaining Ring	10
17	8271291	Zerk	12
18	5708-001	Spring Pin	4
19	3103530	Hinge Asm CS	1
20	3103710	Spring Lever CS	1
21	8120384	Lockwasher .50	1
22	8100-014	Screw .50 x 1.00	1
23	5100050	Torsion Bar	1
24	5794001	Clevis Pin	2
25	2331150	Link	2
26	3103700	Spring Lever SS	1
27	3103540	Hinge Asm SS	1
28	5702242	Wear Pad	2
29	8449646	Screws	4
30	8120396	Flatwasher - .50	1



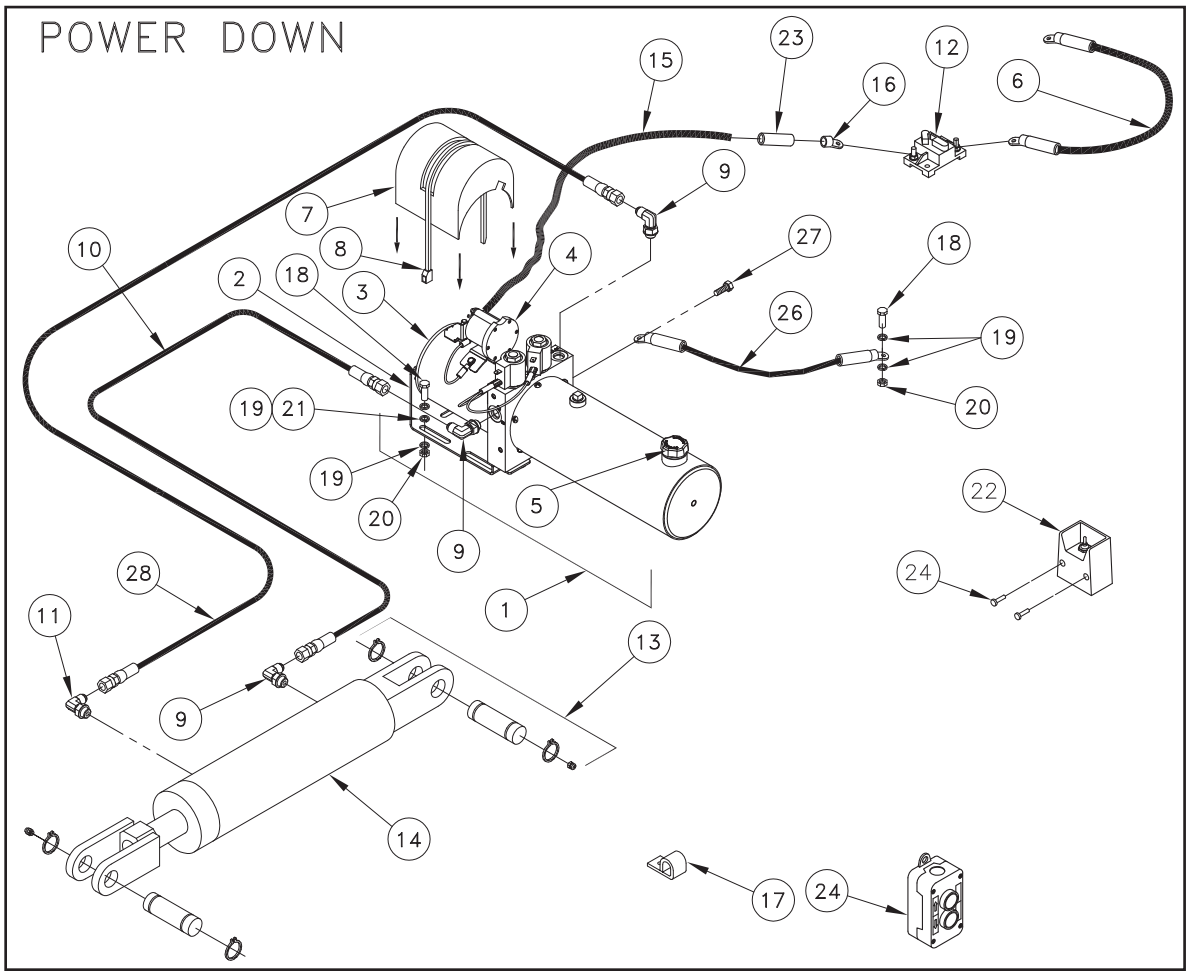
TRUNNION, LIFT ARMS, AND IDLER ARMS-ST31

Item	Part Number	Description	Qty
1	3109400	Trunnion Asm	1
2	3109410	Lift Arm Asm	1
3	31119-002	Idler Arm RH	1
4	31119-001	Idler Arm LH	1
5	3103480	Kicker Arm Asm	1
6	4101-013	Chain	1
7	5064	Pin Asm IA to pivot	2
8	5028	Pin IA, LA-trunnion	4
9	5000161	Pin Asm LA to pivot	2
10	5100180	Spring	1
11	8137243	Cotter Pin	1
12	8427570	Screw .44 x 2.50	2
13	8120396	Flatwasher .44	2
14	5708-001	Spring Pin	4
15	9414073	Lock Nut .44	2
16	5781009	Retaining Ring	8
17	3103530	Hinge Asm CS	1
18	3103710	Spring Lever CS	1
19	8120384	Lockwasher .50	1
20	8100-014	Screw .50 x 1.00	1
21	5100050	Torsion Bar	1
22	3103700	Spring Lever SS	1
23	3103540	Hinge Asm SS	1
24	2331150	Spring Link	2
25	5794001	Clevis Pin	2
26	5708-005	Spring Pin	2
27	8271291	Zerk	8
28	5702242	Wear Pad	2
29	8449646	Screw	4
30	8120396	Flatwasher .50	1



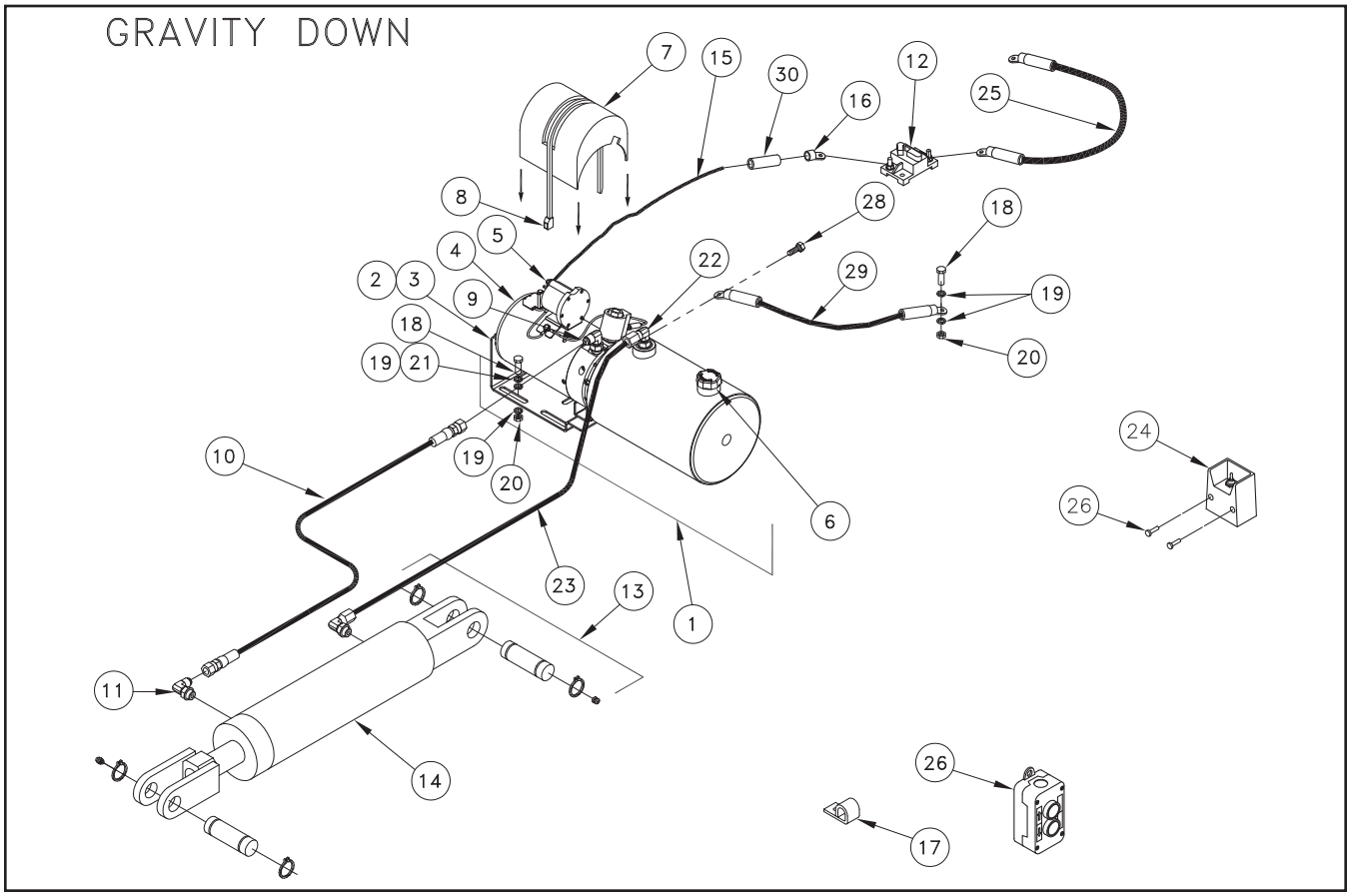
ELECTRIC CONTROL PUMP ASSEMBLY POWER DOWN-ST22

Item	Part Number	Description	Qty
1	4404	EST Pump Asm-incl 2 to 5	1
2	4421420	Pump bracket	1
3	4423520	Motor 8111	1
4	4468	Solenoid	1
5	4420410	Breather cap	1
6	4318-001	Battery Cable #2 x 2'	1
7	5704	Cover	1
8	5700100	Strap	1
9	4930-001	Elbow MJ-MAORB	3
10	4951-015	Hose 51.00	1
11	4931-001	Restrictor Elbow MJ-MAORB	1
12	4301770	Circuit Breaker	1
13	5001841	Pin Asm	2
14	42000	Cylinder 3.5 x 10	1
15	4300030	Battery Cable #2 x 25’	1
16	4350	Cable lug	1
17	5701260	Cable retainer	12
18	8180122	Screw .38-16 x 1.00	5
19	8106-010	Internal Tooth Lockwasher .38	10
20	8120377	Nut .38	5
21	8120388	Flatwasher .38	4
22	31445	Toggle Switch Asm	1
23	4319-002	Heat Shrink	1
24	4422860	Pushbutton Control	1
25	8111-005	Screw #10 x .75	2
26	4318-002	Ground Cable #2 x 2'	1
27	8104-006	Screw .31 x 1	1
28	4951-016	Hose 63.00	1



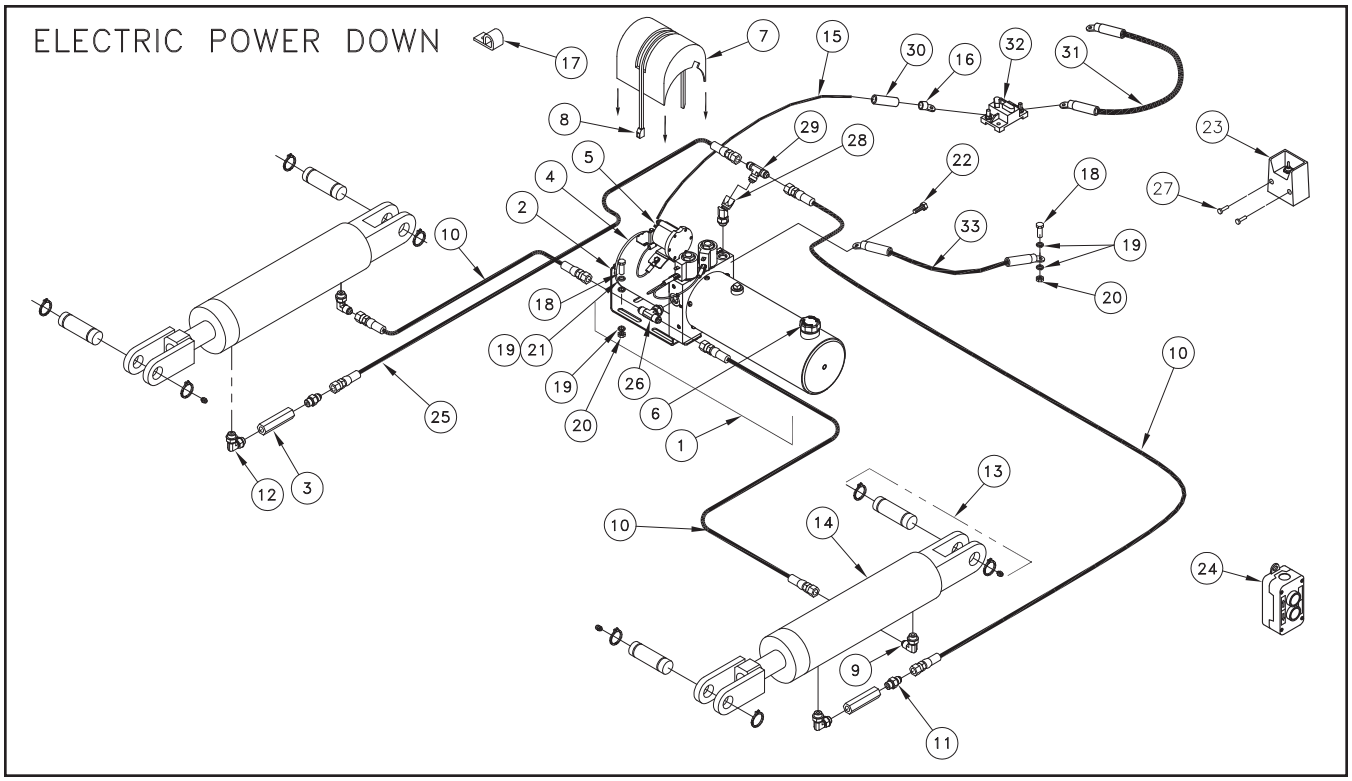
ELECTRIC CONTROL PUMP ASSEMBLY GRAVITY DOWN-ST22

Item	Part Number	Description	Qty
1	4400351	Pump Asm-incl 2 to 6	1
2	4421420	Pump bracket	1
3	4421350	Mounting bracket	1
4	4423520	Motor 8111	1
5	4468	Solenoid	1
6	4420410	Breather cap	1
7	5704	Cover	1
8	5700100	Strap	1
9	4930-001	Elbow MJ-MAORB	1
10	4951-004	Hose 48.00	1
11	4931-004	Restrictor Elbow MJ-MAORB	1
12	4301770	Circuit Breaker	1
13	5001841	Pin Asm	2
14	42000	Cylinder 3.5 x 10	1
15	4300030	Battery cable #2 x 25’	1
16	4350	Cable lug	1
17	5701260	Cable retainer	4
18	8180122	Screw .38-16 x 1.00	5
19	8106-010	Internal Tooth Lockwasher .38	10
20	8120377	Nut .38	5
21	8120388	Flatwasher .38	4
22	4933-001	Elbow BT-MAORB	2
23	4921-012	Tubing 42”	1
24	31446	Toggle Switch Asm	1
25	4318-001	Battery Cable #2 x 2'	1
26	4422850	Pushbutton Control	1
27	8111-005	Screw #10 x .75	2
28	8104-006	Screw .31 x 1	1
29	4318-002	Ground Cable #2 x 2'	1
30	4319-002	Heat Shrink	1



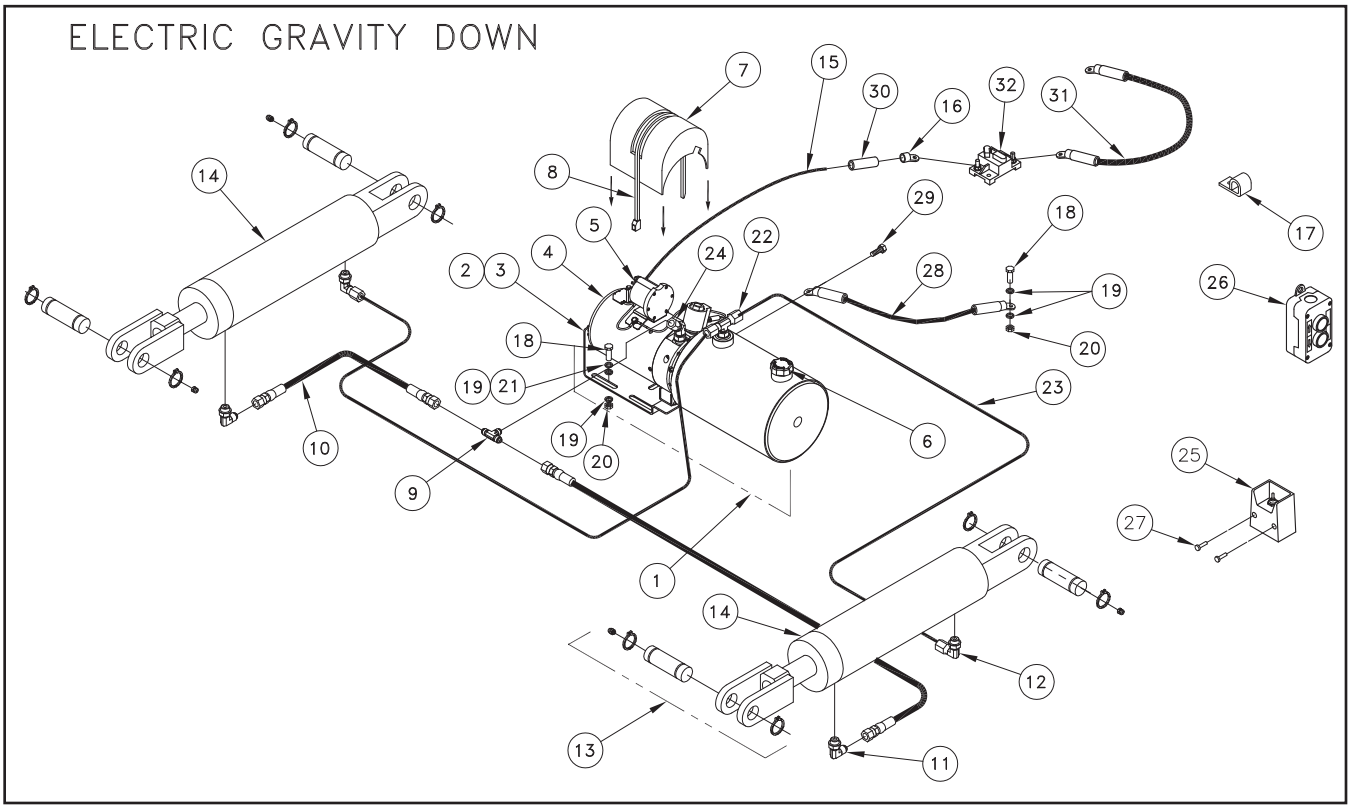
ELECTRIC CONTROL PUMP ASSEMBLY POWER DOWN-ST31

Item	Part Number	Description	Qty
1	4404	EST Pump Asm-incl 2 to 6	1
2	4421420	Pump bracket	1
3	4948-004	Flow Control	2
4	4423520	Motor 8111	1
5	4468	Solenoid	1
6	4420410	Breather cap	1
7	5704	Cover	1
8	5700100	Strap	1
9	4930-001	Elbow MJ-MAORB	2
10	4951-015	Hose 51.00	3
11	4941-001	Straight Adapter MJ-MORB	2
12	4936-001	Elbow MAORB-MAORB	2
13	5001841	Pin Asm	4
14	4295	Cylinder 3 x 10	2
15	4300030	Battery Cable #2 x 25’	1
16	4350	Cable lug	1
17	5701260	Cable retainer	4
18	8180126	Screw .38-16 x 1.50	5
19	8106-010	Internal Tooth Lockwasher .38	10
20	8120377	Nut .38	5
21	8120388	Flatwasher .38	4
22	8104-006	Screw .31 x 1	1
23	31445	Toggle Switch Asm	1
24	4422860	Pushbutton Control	1
25	4951-016	Hose 63.00	1
26	4932-001	Branch Tee MJ-MJ-MAORB	1
27	8111-005	Screw #10 x .75	2
28	4938-001	45° Elbow MAORB-FJS	1
29	4953-001	Branch Tee MJ-MJ-MJ	1
30	4319-002	Heat Shrink	1
31	4318-001	Battery Cable #2 x 2'	1
32	4301770	Circuit Breaker	1
33	4318-002	Ground Cable #2 x 2'	1



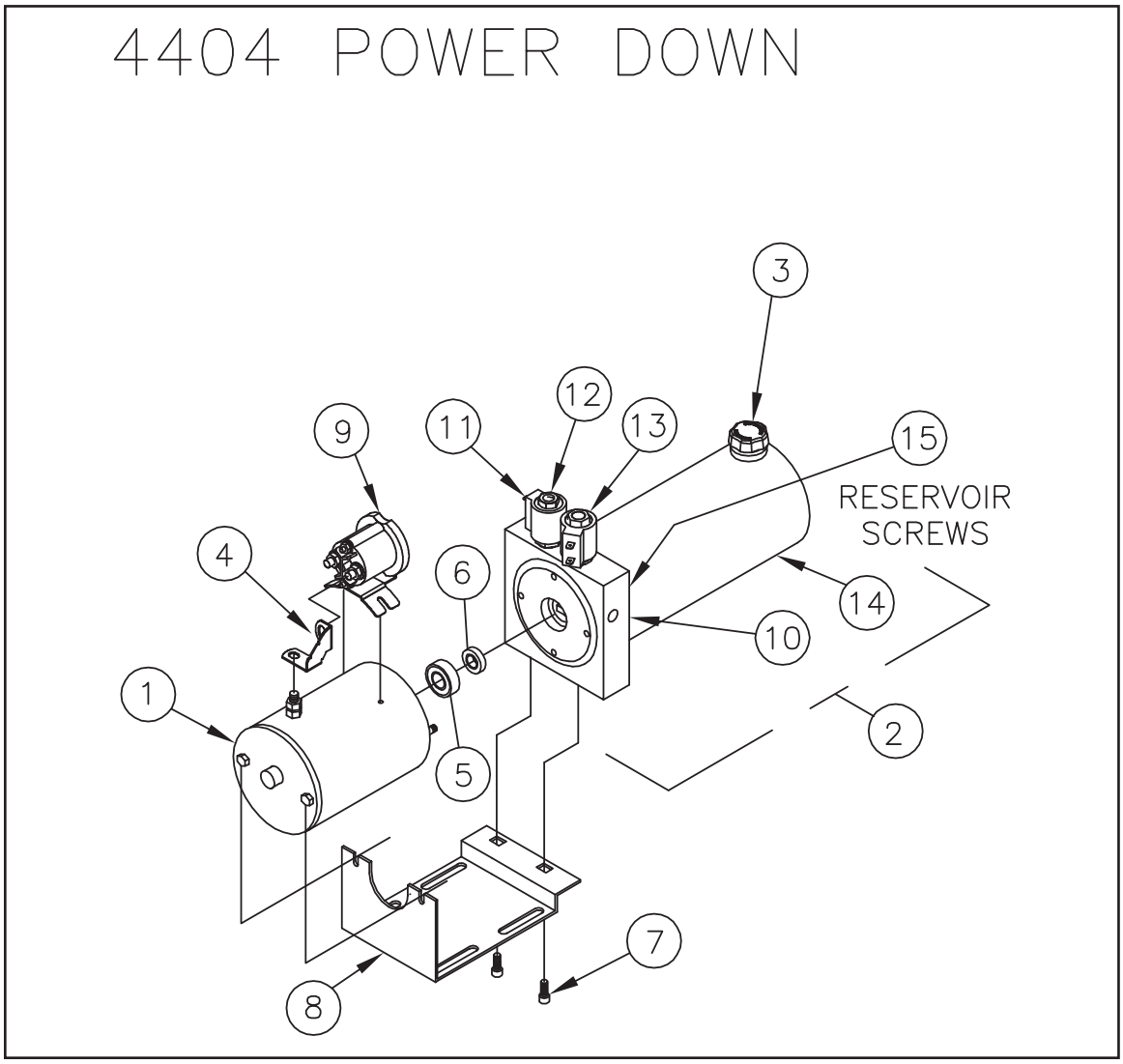
ELECTRIC CONTROL PUMP ASSEMBLY GRAVITY DOWN-ST31

Item	Part Number	Description	Qty
1	4400351	Pump Asm-incl 2 to 6	1
2	4421420	Pump bracket	1
3	4421350	Mounting bracket	1
4	4423520	Motor 8111	1
5	4468	Solenoid	1
6	4420410	Breather cap	1
7	5704	Cover	1
8	5700100	Strap	1
9	4953-001	Tee MJ-MJ-MJ	1
10	4951-004	Hose 48.00	2
11	4931-001	Restrictor Elbow MJ-MAORB	2
12	4933-001	Elbow BT-MAORB	2
13	5001841	Pin Asm	4
14	4295	Cylinder 3 x 10	2
15	4300030	Battery cable #2 x 25’	1
16	4350	Cable lug	1
17	5701260	Cable retainer	4
18	8180126	Screw .38-16 x 1.50	5
19	8106-010	Internal Tooth Lockwasher .38	10
20	8120377	Nut .38	5
21	8120388	Flatwasher .38	4
22	4934-001	Tee BT-BT-MAORB	1
23	4921-012	Tubing 42.00	2
24	4938-001	Swivel Elbow MAORB-FJS 45°	1
25	31446	Toggle Switch Asm	1
26	4422850	Pushbutton Control	1
27	8111-005	Screw #10 x .75	2
28	4318-002	Ground Cable #2 x 2'	1
29	8104-006	Screw .31 x 1	1
30	4319-002	Heat Shrink	1
31	4318-001	Battery Cable #2 x 2'	1
32	4301770	Circuit Breaker	1



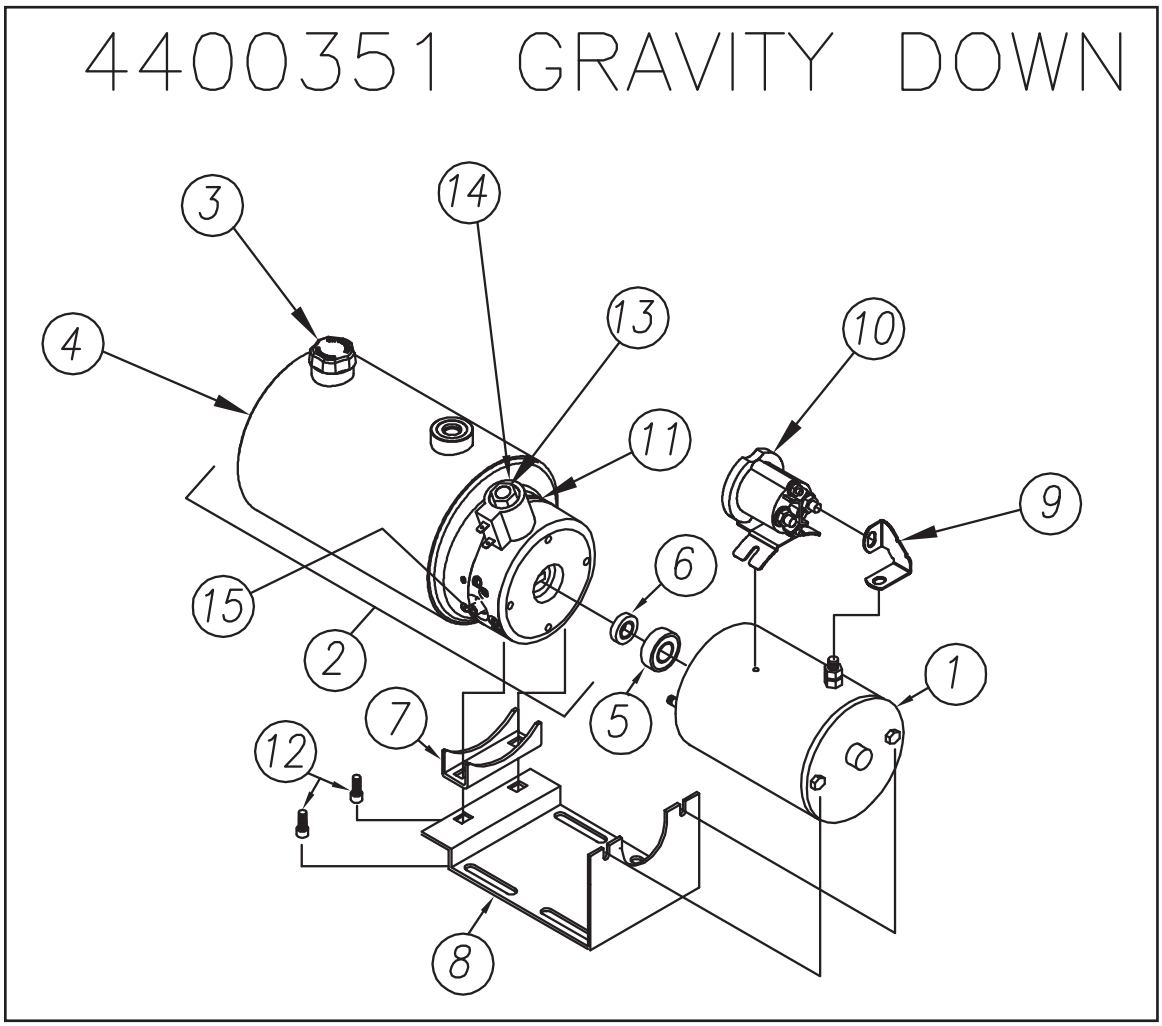
4404 PUMP PARTS

Item	Part Number	Description	Qty
1	4423520	Motor 8111	1
2	4439	Pump and Reservoir Only	1
3	4420410	Breather Cap	1
4	4480	Buss Bar	1
5	4421520	Bearing	1
6	4421530	Seal	1
7	8109-012	Screw .25 x .75	2
8	4421420	Bracket	1
9	4468	Solenoid	1
10	4421600	O-Ring	2
11	4452	Solenoid Coil Only	2
12	4445	Solenoid Valve Asm (lower)	1
13	4438	Solenoid Valve Asm (raise)	1
14	4457	Reservoir ø4.50 x 12.00	1
15	4421660	Self Tap Screw #10 x .38	6



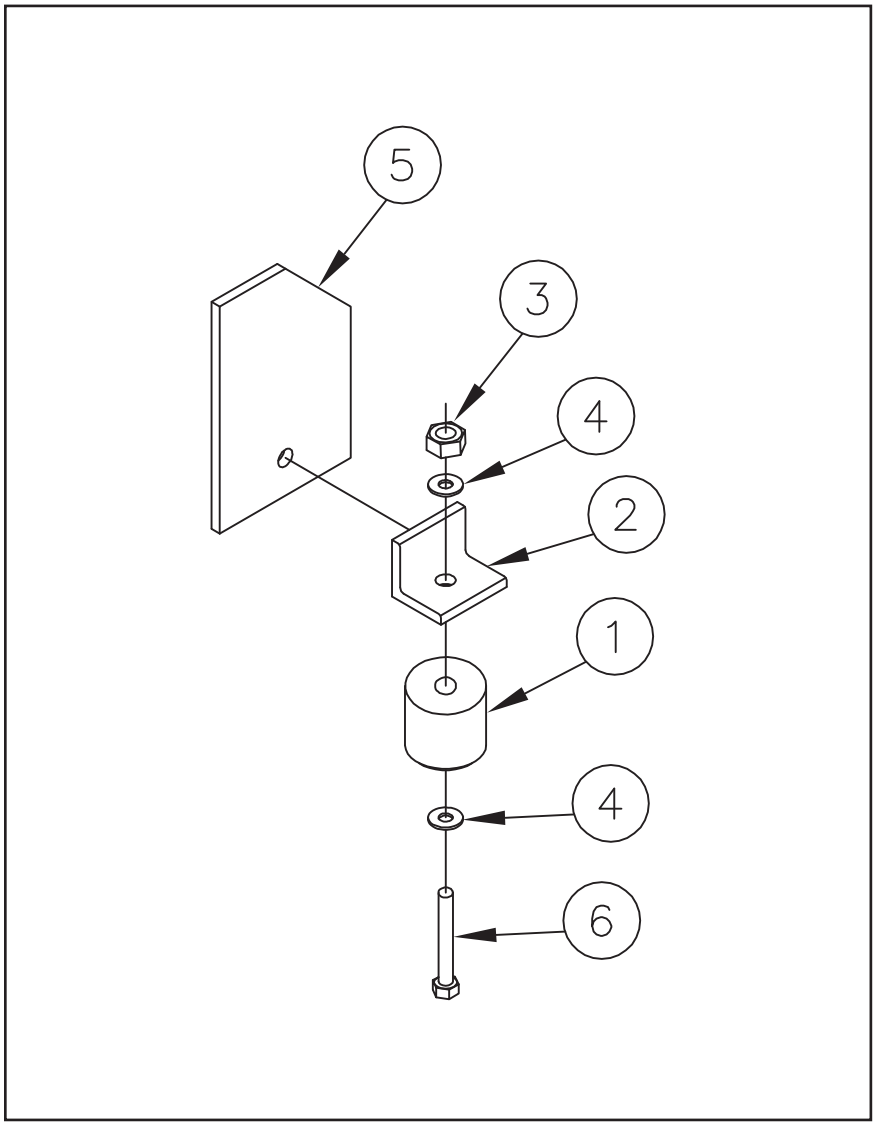
4400351 PUMP PARTS

Item	Part Number	Description	Qty
1	4423520	Motor 8111	1
2	4400359	Pump and Reservoir Only	1
3	4420410	Breather Cap	1
4	4403	Reservoir ø6 x 9	1
5	4421520	Bearing	1
6	4421530	Seal	1
7	4421350	Bracket	1
8	4421420	Bracket	1
9	4480	Buss Bar	1
10	4468	Solenoid	1
11	4421600	O-Ring	1
12	8109-009	Screw .25 x 1.38	2
13	4445	Valve Asm	1
14	4452	Coil Only	1
15	4421660	Self Tap Screw #10 x .38	6



SNUBBER KIT 172

Item	Part Description	Part Number	Qty
	Snubber Kit Items 1 to 6	3735330	1
1	Snubber	5702290	2
2	Mounting Angle	2019033	2
3	Locknut .31-18	9413447	2
4	Flat Washer .31	8120386	4
5	Base Plate	23049-001	2
6	Screw .31-18	8180091	2



TROUBLESHOOTING GUIDE
ST22/31ET

Test Equipment:
1. 0-5000 psi pressure gauge
2. DC voltmeter/ohm meter
3. DC amp meter
4. standard mechanics tools

Note: Please refer to the electrical diagrams and hose connection drawings in the liftgate's owners manual when troubleshooting. This guide is only for standard Thieman liftgates. Special liftgates with options other than those in the owner's manual will require special diagrams for troubleshooting. Read and understand this entire guide completely before doing any troubleshooting. Certain listed problems may be related to other problems listed so a comprehensive knowledge is required before proceeding.

1. Problem - Pump motor will not run in the raise mode

Causes -
a. Tripped circuit breaker
b. Blown 20A fuse
c. Defective or undercharged battery(ies)
d. Improper battery cable connection or improper ground connection
e. Defective or improperly wired raise switch
f. Defective or improperly wired solenoid start switch
g. Defective pump motor

Corrections -
a. Reset the circuit breaker located within 2ft of the liftgate supply battery(ies).
b. Replace 20A fuse
c. The "at rest" voltage for the batteries without the engine running and under no load should be at least 12.5V. The minimum voltage between the motor stud and ground is 9V at maximum load conditions. If proper voltage is not present, charge or replace the batteries. The battery(ies) on the vehicle should be that which has a minimum 150 amp reserve capacity.
d. Trace battery and ground cable connections to locate improper connection(s). Make sure the ground cable is installed going from the aluminum pump base to bare metal on the truck frame. Make sure the ground cable from the batteries to the frame is a heavy 2ga. cable and that it too is connected to bare metal on the frame. Make sure there is 12.5V present at the large terminal on the motor start solenoid where the 2ga. cable from the batteries is connected. Replace any damaged cables and repair any bad connections.
e. Check for voltage on the black wire at the control switch. If no voltage is present the black wire from the motor start solenoid is loose or broken and needs repaired. If voltage is present then check for voltage at the green and white wire on the switch with the switch in the "RAISE" position. If no voltage is present, replace the switch.
f. Check for voltage on the white wire at the motor start switch when the switch is activated. If no voltage exists the white wire is loose or broken between the switch and the motor start solenoid. Check that the purple ground wire on the start solenoid is connected properly and there are no bad connections. If there is voltage on the white wire and the coil does not energize or if there is no voltage present at the motor terminal then replace the start switch.
g. With the switch activated in the "RAISE" position and the motor start solenoid is activated, check for voltage at the motor terminal. If voltage is present and the motor is not running, replace the motor.

2. Problem - Liftgate will not raise to bed with a load and the pump motor running

Causes-
a. Low hydraulic fluid
b. Overload condition
c. Improperly adjusted or defective main relief valve
d. Lift cylinders are bypassing, liftgate is drifting down
e. Broken hydraulic line
f. Clogged or disconnected suction line
g. Defective pump

Corrections -
a. Make sure the reservoir has the proper amount of fluid. Either check for the fluid line through the plastic reservoir or for metal reservoirs remove the breather cap and check the fluid line through the fill hole. The hydraulic fluid should be within 1/2" of the top of the reservoir with the liftgate in the lowered position. Fill with Dexron III automatic transmission fluid.
b. The power unit on the M is equipped with a lifting relief valve to prevent overloading of the liftgate. The relief settings should be as follows:
ST22-2200PSI
ST31-2200PSI
c. See section “c” above for relief valve setting. Plumb a pressure gauge into the high pressure circuit of the liftgate. Remove all loads from the liftgate’s platform. Engage the “RAISE” switch until the liftgate is fully raised. Keep the “RAISE” switch engaged until the pump bypasses through the relief valve and note the pressure on the gauge at this time. If the rated relief pressure is not present during relief, adjust the high pressure relief valve setting as necessary. If the relief pressure is not attainable the relief valve must be cleaned and/or replaced or the pump is defective. See part “g” below.
d. If the liftgate will not raise with a load on the platform but empty is raising slowly or only partially, the cylinder(s) may be bypassing. To check for a bypassing cylinder(s) do the following. Lower the gate to the ground to relieve all pressure from the cylinder(s). Disconnect the cylinder(s) from the liftarm. Press the “RAISE” switch until the cylinder(s) is fully retracted. Disconnect the return line from the power unit and put the end of the line in a container to catch any oil which comes out during this test. Press the “RAISE” switch for 15 to 20 seconds and watch for a steady stream of fluid coming out of the return line into the container. If no steady stream of oil is present connect the hose to the butt end of the cylinder(s) after removing the return line and fitting. Re-attach the return line and fitting to the rod end port. Put the loose end of the return line in a container to catch any oil, which comes out during this test. Press the “RAISE” switch until the cylinder(s) is fully extended. Press the “RAISE” switch for 15 to 20 seconds and watch for a steady stream of fluid coming out of one of the disconnected hose ends into the container. Replace or rebuild any cylinder with fluid coming out of the return line, as this indicates fluid is bypassing the piston seals on the cylinder. Reconnect rebuilt or replaced cylinder(s) and hoses as before.
e. Broken or punctured hydraulic lines and fittings must be replaced with care to avoid injury from high pressure oil streams.
f. With the liftgate at the ground, disconnect the power unit and remove the reservoir. Check to see if the suction tube is clogged or has fallen out of the pump base. Clean the screen or reattach the suction tube as required.
g. If all else fails replace the power unit, it is probably worn out.

3. Problem - Liftgate will not lower
   Causes - a. Defective lowering solenoid coil or valve
   b. Clogged or defective hydraulic lines, fittings or flow controls
   Corrections - a. With the “LOWER” switch engaged check for voltage on the green wire at the switch. If no voltage is present replace the switch. If voltage is present, with the “LOWER” switch engaged, check for voltage at the green wire on the lower solenoid valve coil terminal. If no voltage is present, the green wire from the “LOWER” switch is loose or broken and needs replaced. If there is voltage (minimum of 9.5 volts) and the valve is not opening to allow the gate to lower, either the lower coil is bad or the entire lower coil/valve assembly is bad. To check to see if the coil is defective, remove the green wire from the spade terminal on the lower coil and check for continuity between the spade terminal and the nut, which holds the coil on the valve stem. If continuity does not exist, replace the defective coil, otherwise replace the defective lower coil/valve assembly.
   b. Remove any obstruction in the hoses, fittings or flow controls or replace any hose, fitting or flow control, which does not allow fluid to flow through freely.

4. Problem - Liftgate raises slowly - The raise speed of the ST22/31 on a 56” bed height while empty at 70° F is approximately 10-15 seconds. The raise speed loaded for the same conditions is approximately 21-28 seconds. These speeds vary with each model.
   Causes - a. Overload condition
   b. Cold weather
   c. Partially blocked suction screen
   d. Lift cylinders are bypassing
   e. Improperly adjusted or defective raise relief valve
   f. Low voltage and/or bad ground
   g. Worn out pump
   Corrections - a. See section 2b
   b. Refer to Owner’s Manual for alternative oils to use for cold weather conditions.
   c. Remove reservoir and clean or replace suction screen as necessary.
   d. See section 2d
   e. See section 2c
   f. The minimum voltage between the motor stud and ground is 9.5 volts at maximum load conditions. See section 1b and 1c
   g. After all other corrections are performed it will be necessary to replace the pump.

5. Problem - Foamy oil flowing from reservoir breather
   Causes - a. Air is present in the system
   Corrections - a. This can occur if air enters the system if the fluid level is low, see problem 2, part a, or if the suction tube is disconnected, see problem 2, part f. Also air may enter through fittings, which are not tightened properly, so check for any leaks around fittings or hoses. Once the source of the air is determined, the cylinders must be bled of all air. Most air can be removed from the system by lowering the gate to the ground to relieve all pressure from the cylinders, unpinning the cylinders and cycling them back and forth several times from fully extended to fully retracted and allowing the pump to bypass through the relief valves for a few seconds in each direction.

If you have any questions or problems that are not covered in this guide please call Thieman’s Engineering Department at 1-800-524-5210.