

# TITAN

60,000 LB Cable Hoist

## *Installation Manual*

INSTALLATION • HYDRAULICS • ELECTRICAL



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# Spartan Titan Cable Hoist Manual Revisions

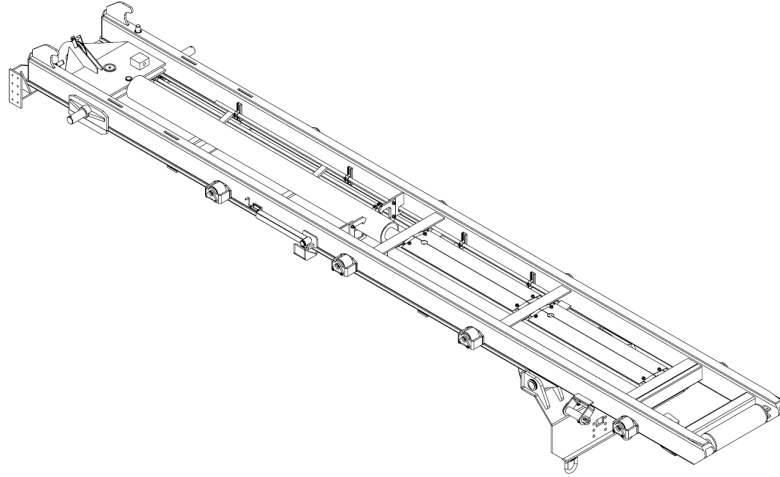
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# Section 1: Titan Kit Introduction

Spartan Truck Company has been a leader in the manufacturing of truck bodies since 1972. Spartan is known for its high-quality components and extremely durable, low-maintenance systems. To promote this longevity, carefully study the information contained in this manual before putting the equipment into service. Though it is not intended to be a training manual for beginners, this manual should provide solid guidelines for the safe and proper usage of the cable hoist during installation and operation.



*The Spartan Titan Cable Hoist*

Once comfortable with the material contained in this manual, strive to demonstrate the knowledge gained for the cable hoist to be both operated in a safe manner and properly maintained. This process is critical to the proper use of the unit.

## **A few notes on this manual:**

A copy of this manual is provided with every cable hoist and should **always** remain with the cable hoist. Information contained within this manual does not cover all maintenance, operating, or repair instructions pertinent to all possible situations.

Please be aware that some sections of this manual contain information pertaining to Spartan Truck manufactured cable hoists in general and may or may not apply to your specific model.

This manual is not binding. Spartan Truck Company, Inc. reserves the right to change, at any time, any or all the items, components, and parts deemed necessary for product improvement or commercial/production purposes. This right is kept with no requirement or obligation for immediate mandatory updating of this manual.

## **Summary:**

If more information is required or technical assistance is needed, or if you feel that any part of this manual is unclear or incorrect, please contact Spartan Truck Company at 818-899-1111 [Headquarters] or 602-584-5001 [Casa Grande facility] or email at [info@spartantruck.com](mailto:info@spartantruck.com).

## **ATTENTION:**

Failure to follow the instructions could result in property damage or even serious bodily injury to the operator or others close to the cable hoist.

# Section 1: Titan Kit Introduction Continued

## Maintenance Introduction

Trained, qualified and competent personnel should perform all operation, inspections, service, and maintenance on this equipment. Spartan Truck Co. strongly urges each owner/operator set up a preventive maintenance program that will provide adequate inspection, servicing and repair of roll-off unit and its components for the purpose of providing safe operation and to maximize the service life of this equipment. Note: Suggested preventative maintenance inspections and time intervals may need to be adjusted due to factors such as: severe or heavy usage, muddy or dusty environment, special application, warranty, and maintenance history issues.

## Suggested Preventative Maintenance

### **Lubrication**

Proper lubrication is essential to all types of bearings, gearing, and friction producing mechanical devices. Lack of adequate and proper lubrication will result in premature wear of components due to increased abrasion or excessive heat. Lubricate unit weekly.

### **Grease**

All grease fittings should be properly greased after 50 hours of service or once a week.

### **Hydraulic System**

Inspections should be performed daily for leaks, loose hydraulic lines and fittings, oil level and proper operation of hydraulic system.

### **Hydraulic Oil & Filter**

Every three months: Inspect oil for proper color, odor and feel. Replace oil if milky or darkens in color, begins to have an odor, or lacks lubricity to the touch. **Metal particles in oil indicate serious damage – schedule to bring to service center immediately!** Every six months: Replace oil filter.

Every twelve months: Replace oil with AW ISO 68 hydraulic oil.

### **Suction Strainer**

Inspect suction strainer when changing hydraulic oil.

### **Hydraulic Cylinders**

Inspect cylinder rods, fittings, and operation. Apply grease to the grease fittings on the hydraulic cylinder every week.

## **MECHANICAL SYSTEM**

### **Structural & Weld Integrity**

Check to insure proper and safe working condition of structural members. Make sure it is within normal wear guidelines. Inspect weld joints.

### **Front & Adjustable Stops**

Check to insure proper and safe working condition of stops.

### **Nuts, Bolts, Shafts, Cotter Keys, Etc.**

Check to insure proper and safe working condition. Make sure items are within normal wear and proper torque guidelines.

### **Rollers, Pulleys, Trolleys, Rear Hinge**

Check to insure proper lubrication, adjustment, and operating functions.

### **Container Hold Down Devices**

Check to insure proper and safe working condition.

### **Hoist Cable**

Cable should be inspected daily, along with a thorough inspection every 50 hours for breakage, unraveling or flat spots as well as cable ends and clamps. Cable should be replaced when you see 6 or more broken wires in 1 lay or every 6 months.

# Section 1: Titan Kit Introduction Continued

## Suggested Preventative Maintenance Continued

### Reflectors/Lights

Daily inspection all lamps and reflectors. Make sure they are cleaned and in proper working order.

### Electrical Wiring

Inspect all visible wiring to see that it is not frayed and is properly supported and protected and that all connections are tight.

### Hoist Up & Back Up Alarms

Check to insure proper and safe operation.

These inspections are intended to verify that the hoist and its components are in the proper and safe operating condition and are within normal wear guidelines. If there are any items that do not pass your inspection, you must notify your supervisor and a lockout tag must be placed on the equipment if it is unsafe to operate.

### QUICK REFERENCE PREVENTATIVE MAINTENANCE INTERVAL CHART

Daily Inspections	<ul style="list-style-type: none"><li>• Hydraulic components</li><li>• Hydraulic and air leaks<ul style="list-style-type: none"><li>• Oil level</li></ul></li><li>• Structural components and welds<ul style="list-style-type: none"><li>• Front and adjustable stops</li></ul></li><li>• Sheave blocks/reeving trolley<ul style="list-style-type: none"><li>• Rear hinge</li><li>• Rollers</li></ul></li><li>• Cable and cable ends</li><li>• Nuts, bolts, and cotter pins<ul style="list-style-type: none"><li>• LED lights</li><li>• Reflectors</li><li>• Electrical wiring</li></ul></li><li>• Back up and hoist up warning alarms<ul style="list-style-type: none"><li>• Safety props</li></ul></li></ul>
Weekly Inspections	<ul style="list-style-type: none"><li>• Grease all grease fittings every forty hours of operation. It may be necessary to grease more frequently during periods of heavy usage.</li><li>• Grease reeving trolley and tracks.</li></ul>
Recurring 3-month inspections	<ul style="list-style-type: none"><li>• Inspection the condition of the hydraulic oil for proper color, odor and feel.</li></ul>
Recurring 6-month inspections	<ul style="list-style-type: none"><li>• Replace hydraulic oil filter</li></ul>
Recurring 12-month inspections	<ul style="list-style-type: none"><li>• Replace hydraulic oil</li><li>• Replace suction strainer</li><li>• Inspect cable and replace if worn or damaged.</li></ul>

# Section 1: Titan Kit Introduction Continued

For Technical Questions, Information, Parts, or Warranty, Please Call  
**818-899-1111 [Headquarters] or 602-584-5001 [Casa Grande Facility]**  
Hours: Monday - Friday, 7:00 a.m. - 3:30 p.m. PST

Or email at the following addresses:

Technical Questions, and Information

[service@spartantruck.com](mailto:service@spartantruck.com)

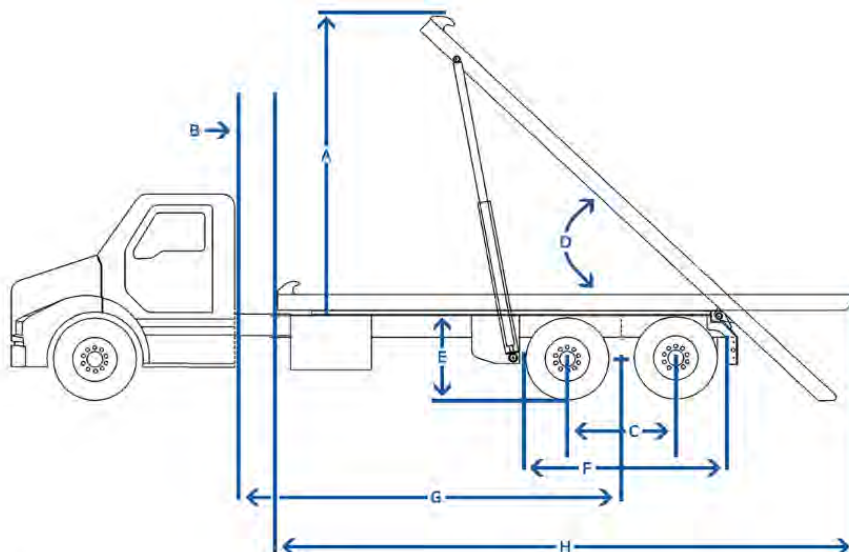
Order Parts

[parts@spartantruck.com](mailto:parts@spartantruck.com)

Warranty Information

[warranty@spartantruck.com](mailto:warranty@spartantruck.com)

# Section 1-1: Specifications



References from Above Figure	Titan-OR Model
	<b>186" CA/CT</b>
A - Height above Frame	164"
B - Back of Cab to Front of Hoist	18"
C - Axle Spread	50 - 55"
D - Raised Dump Angle	46°
E - Top of Truck Frame to Ground	43"
F - Tire OD to OD	98" max.
G - Usable Cab to Trunnion (CT)	186"
H - Hoist Length	287"
I - After Frame (Add 2" for Air Ride)	30

Cable	7/8" x 80'
Cable Strength	78,000 lbs.
Sheaves	10' cast sheaves with bronze inserts
Container Size	Up to 22'
Frame Rails	8" x 4" x 1/2" rectangular tubing
Sub frame	3" x 2" x 3/16" rectangular tubing
Outside Frame	34.5" or 35.5"
Dump Angle	46° minimum
Hoist Tare Weight	7,265 lbs. fully installed (est. not including options & tarping system)
Outside Rollers	(8) 4" x 3.5" x 2" with extractable pin and roller
ICC Bumper Bar	Automatically collapsible (mechanically operated)



# Section 1-1: Specifications Continued

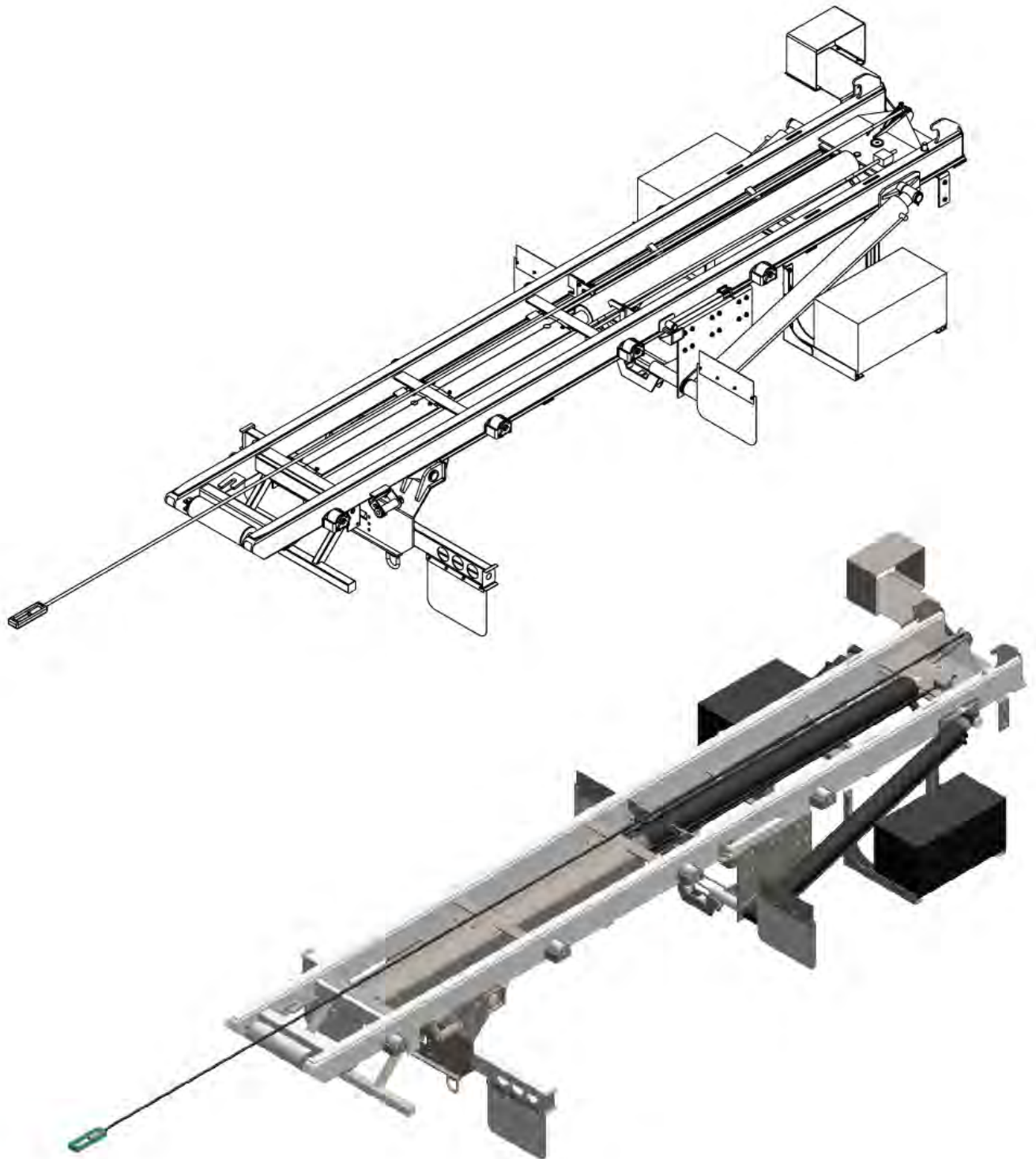
Fenders	Customer specified
Lighting	LED lighting standard
Wiring	Plug and play wiring harness
Toolbox	Heavy duty toolbox (36x18x18 steel as standard)
Adjustable Bin Stops	Moveable nose roller stops
Wear Strips	Full length 1/2" rail mounted wear strips
Lubrication	High quality zerk fittings – all wear points
Hoist System Capacity	60,000 lbs.
Tie Downs	Dual ratchet tie downs with 3" straps
Nose Roller Locking Pins	In rail gravity actuated
Safety Props	Quick release rail mounted props
Back-up Alarm	Audible rear mounted alarm
Warning Lights	Console mounted PTO and raised rail warning light
Inside Controls	Dual lever air controls
Outside Controls	Hydraulically operated control handles
Hoist & Reeving Cylinders	120,000 lb. lift capacity
Hoist Cylinder Specs	6" bore, 4" rod, 74" stroke, single stage, double acting
Reeving Cylinder Specs	7" bore, 4" rod, 90" stroke
Oil Filter	Thru-wall sump strainer and 10 micron return oil filter
Operating Pressure	2200 PSI
Oil Tank Capacity	40 gallons

# Section 1-2: Kit Contents

## 20-02-01329 Base Kit, Titan

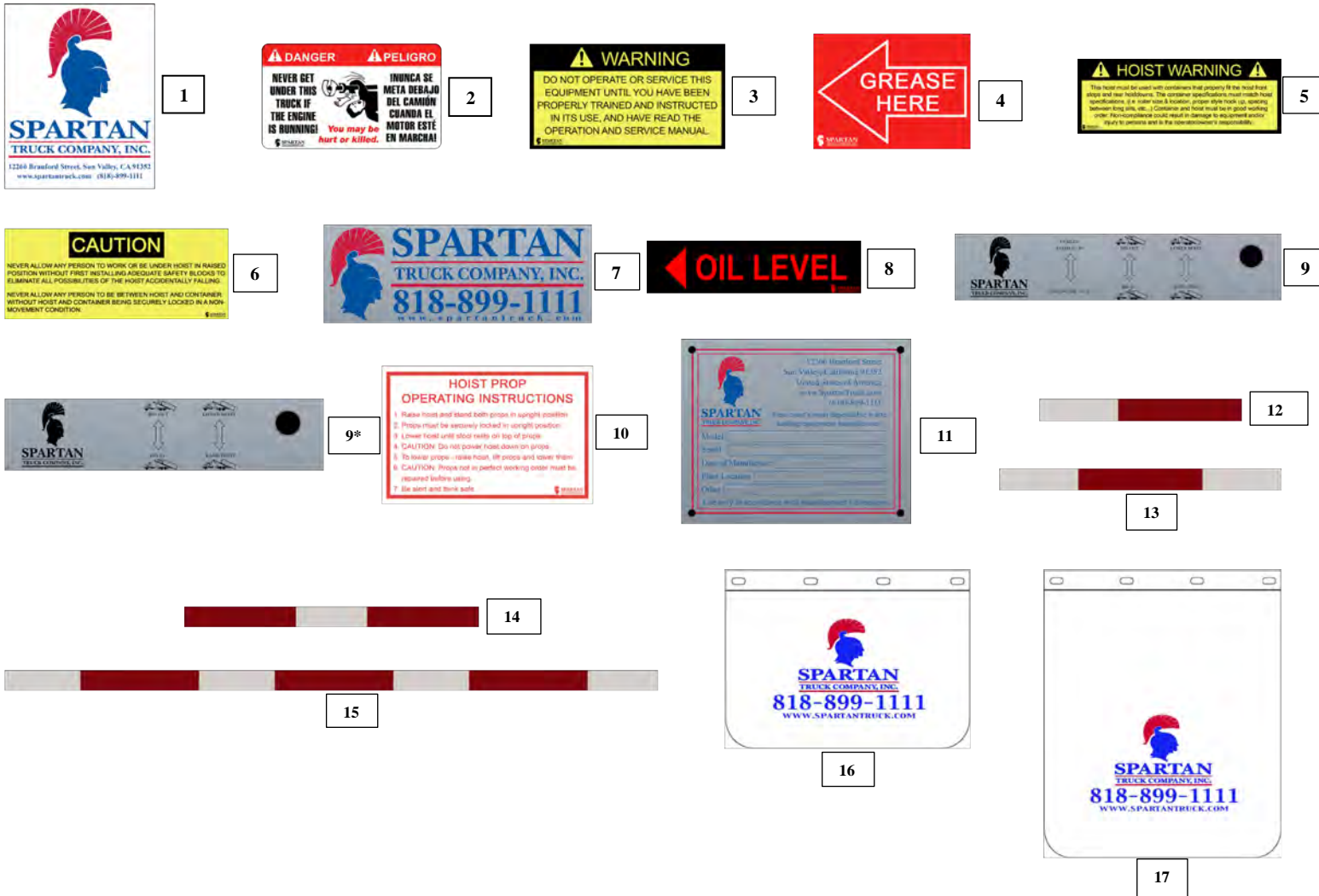
ITEM NO.	PartNo	DESCRIPTION	QTY.
1	10-11-01323	Assembly, Rail, Titan	1
2	10-02-00535	Mount, Left, Lower Shaft, Titan	1
3	10-02-00536	Mount, Right, Lower Shaft, Titan	1
4	14-06-00904	Lower Shaft Assembly, 35.5in Frame, Titan	1
5	10-01-00436	Gusset, Lower Shaft	2
6	10-06-00440	Spacer, Lower Shaft, 1/4in, Titan	4
7	10-06-01326	Spacer, Lower Shaft 1/8in, Titan	2
8	10-03-01008	Collar, Large, Shaft, Titan	2
9	10-11-00869	Assembly, Top Pin and Body Guide, Titan	2
10	10-06-01327	Spacer, Top Shaft, Titan	2
11	10-03-00859	Collar, 2.5in Pin, Titan	2
12	10-02-01221	Front Mount, Titan	2
13	11-03-00889	Cylinder, Hoist, 6in bore, 4in rod, 90in closed, 74in stroke	2
14	10-08-00769	Bracket, Left, Oil Reservoir Toolbox, Titan	2
15	10-08-00768	Bracket, Right, Oil Reservoir Toolbox, Titan	2
16	10-07-00926	Crossmember, Oil Reservoir Bracket, Titan	1
17	11-12-00890	Oil Reservoir, 45 Gal, Steel	1
18	14-06-00452	Tool Box, 18"x18"x36", T-Handle, Steel	1
19	10-11-00906	Weldment, Light Bar, Curbside, Titan	1
20	10-11-00907	Weldment, Light Bar, Streetside, Titan	1
21	14-03-00845	Reeving Cable, 7_8in X 85ft	1
22	10-08-01034	Bracket, Valve, Titan	1
23	10-10-01037	Cover, Valve, Titan	1
24	10-11-01330	Weldment, Bumper, ICC, Air Operated	1
25	10-08-01324	Bracket, Mudflap, Front, Titan	2
26	15-01-00874	Mudflap, Spartan 24in X 18in with Logo	4
27	10-05-01325	Plate, Retainer, Mudflap, Titan	4
28	10-08-01322	Bracket, Adjustable Bin Locks, Titan	1
29	10-11-01319	Bin Lock, Adjustable, Titan	2
30	12-02-00616	Sensor, Body Down	1
31	02-01-00085	Washer, Zinc, F436 Flat Washer Type 1, 5/8"	72
32	02-01-00339	Bolt, Grade 8, Zinc, 5/8in-11 X 2 1/2", Hex Head Cap Screw	36
33	02-01-00088	Nut, Grade 8, Zinc, Finished Hex, 5/8"-11	36
34	02-01-00059	Washer, Zinc, F436 Flat Washer Type 1, 1/2"	36
35	02-01-00043	Bolt, Grade 8, Zinc, 1/2in13 X 2in, Hex Head Cap Screw	10
36	02-01-00065	Nut, Grade C Zinc, 1/2in-13, Hex	18
37	02-01-00058	Washer, Zinc, Flat, 1-3/8in	48
38	02-01-01313	Bolt, Grade 8 Zinc, 3/8"-16 x 5-1/2", Hex Head	2
39	02-01-00064	Nut, Grade C Zinc, 3/8in-16, Hex Lock	24
40	02-01-00239	Bolt, Grade 8 Zinc, 3/8in-16 x 4 1/2in, Hex Head	2
41	02-01-01312	Bolt, Grade 8 Zinc, 3/8"-16 x 1-1/2", Hex Head	4
42	02-01-00041	Bolt, Grade 8 Zinc, 3/8"-16 x 1-1/4", Hex Head	4
43	02-01-00009	Bolt, Grade 8, Zinc, 1/2in13 X 1 1/4, Hex Head Cap Screw	4
44	02-01-00023	Bolt, Grade 8, Zinc, 3_8in-16 X 1in, Hex Head Cap Screw	16
45	02-01-01004	Tube Clamp, 3/4in, Channel, Cushioned	8
46	11-13-01285	Tube, Hoist, Branch, Titan	2
47	10-02-01153	Mount, Hydraulic Tubes, Titan	3
48	11-13-01286	Tube, Hoist, Under Frame, Bottom, Titan	1
49	11-13-01287	Tube, Hoist, Under Frame, Top, Titan	1

## Section 1-2: Kit Contents Continued



# Section 1-2: Kit Contents Continued

## DECALS AND MUDFLAPS



ITEM	PART NUMBER	DESCRIPTION
1	02-02-00837	SPARTAN LOGO ON WHITE VINYL DECAL
2	02-02-00816	PTO PINCH POINT DECAL
3	02-02-00817	INSTRUCTION WARNING DECAL
4	02-02-00818	GREASE ARROW LABEL [LEFT] DECAL
5	02-02-00820	HOIST WARNING DECAL
6	02-02-00821	CAUTION LABEL DECAL
7	02-02-00822	SPARTAN NAME PLATE
8	02-02-00824	OIL LEVEL DECAL
9	02-02-00825	3 POSITION VALVE LABEL PLATE
9*	02-02-00826	2 POSITION VALVE LABEL PLATE [IF APPLICABLE]
10	02-02-00825	HOIST PROP OPERATING INSTRUCTION DECAL
11	02-02-00828	SPARTAN TRUCK COMPANY SERIAL PLATE
12	02-02-00830	ICC TAPE 18" x 2"
13	02-02-00831	ICC TAPE 25" x 2"
14	02-02-00832	ICC TAPE 29" x 2"
15	02-02-00833	ICC TAPE 60.5" x 2"
16	MUDFLAP24X18POLY-WHITE-IMP	24X18 MUDFLAP
17	MUDFLAP24X30RPOLY-WHITE	24X30 MUDFLAP



# Section 1-3: Safety

## **OWNER, OPERATOR AND SERVICE PERSONNEL SAFETY**

**IF USED INCORRECTLY, THIS EQUIPMENT CAN CAUSE SEVERE INJURY OR DEATH.**

As the owner or employer, it is your responsibility to instruct the operator in the safe operation of this equipment and to provide the operator with properly maintained equipment.

**FAILURE TO READ THIS MANUAL BY ANYONE WHO WILL OPERATE, SERVICE, OR WORK AROUND THIS CABLE HOIST IS CONSIDERED A MISUSE OF THE EQUIPMENT.**

Occupational safety is a prime concern of Spartan Truck Company in the design and production of this cable hoist.

**THOSE WHO USE AND MAINTAIN THIS EQUIPMENT SHOULD BE TRAINED IN ITS PROPER USE, WARNED OF ITS DANGERS, AND SHOULD READ AND FULLY UNDERSTAND THE ENTIRE MANUAL BEFORE ATTEMPTING TO SET UP, OPERATE, ADJUST OR SERVICE THE EQUIPMENT. PUBLICATION OF THESE PRECAUTIONS DOES NOT IMPLY OR IN ANY WAY REPRESENT AN ALL-INCLUSIVE LIST. IT IS THE OPERATOR'S RESPONSIBILITY TO BE FAMILIAR WITH THE OWNER'S SAFETY REQUIREMENTS. IT IS THE OPERATOR'S RESPONSIBILITY TO BE FAMILIAR WITH AND ENSURE THE OPERATION IS IN ACCORDANCE WITH SAFETY REQUIREMENTS AND CODES INCLUDING ALL APPLICABLE OCCUPATIONAL SAFETY & HEALTH ACT (OSHA) AND AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) REGULATIONS.**

You shall make these available and known to all personnel working with and around the equipment, so that all of you will take the necessary and required safety pre-cautions.

Modification to any part of this cable hoist can create a safety hazard and therefore shall not be made without the manufacturer's written approval. Use only factory approved accessories, options, and parts on this equipment. The rebuilding or remounting of this equipment requires the mounting procedures and retesting to be in accordance with factory instructions. Safety covers and devices must remain installed and maintained in proper working condition. Safety decals must be maintained, be completely legible, and be properly located. If safety covers, devices, or decals are missing, they must be replaced with the proper designated Spartan Titan part.

**Be capable, careful, and concerned! Make safety the number one priority!**

# Section 2: Installation

## GENERAL INSTALLATION GUIDELINES

### **Safety**

Read all the safety notations in the assembly instructions for your protection. Accidents can be prevented by recognizing the cause of an accident before it can happen.

### **Assembly**

Select an area for assembly that will be large enough to accommodate the completed unit. The surface of the work area should be as level as possible. Use the proper hand tools to ensure proper bolt tightness.

### **Proper Bolt Use**

Do not use these values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only. Check tightness of fasteners periodically.

Shear bolts are designed to fail under pre- determined loads. Always replace shear bolts with identical grade. Fasteners should be replaced with the same or higher grade. If higher grade fasteners are used, these should only be tightened to the strength of the original.

Tighten plastic insert or crimped steel-type lock nuts to approximately 110 percent of the dry torque values shown in the chart below, applied to the nut, not to the bolt head. Tighten toothed or serrated-type lock nuts to the full torque value.

Know the model number of the Spartan Titan hoist being mounted. Use this model number whenever referring to the assembly or parts listing pages. The number is stamped on the name plate which is located on the front frame member.

Right and left sides can be established by standing behind the truck frame and looking towards the front, or the direction of travel.

*Note: "Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings. "Dry" means plain or zinc plated without lubrication. Tighten lubricated bolts to approximately 80% of dry bolts.*

# Section 2: Installation Continued

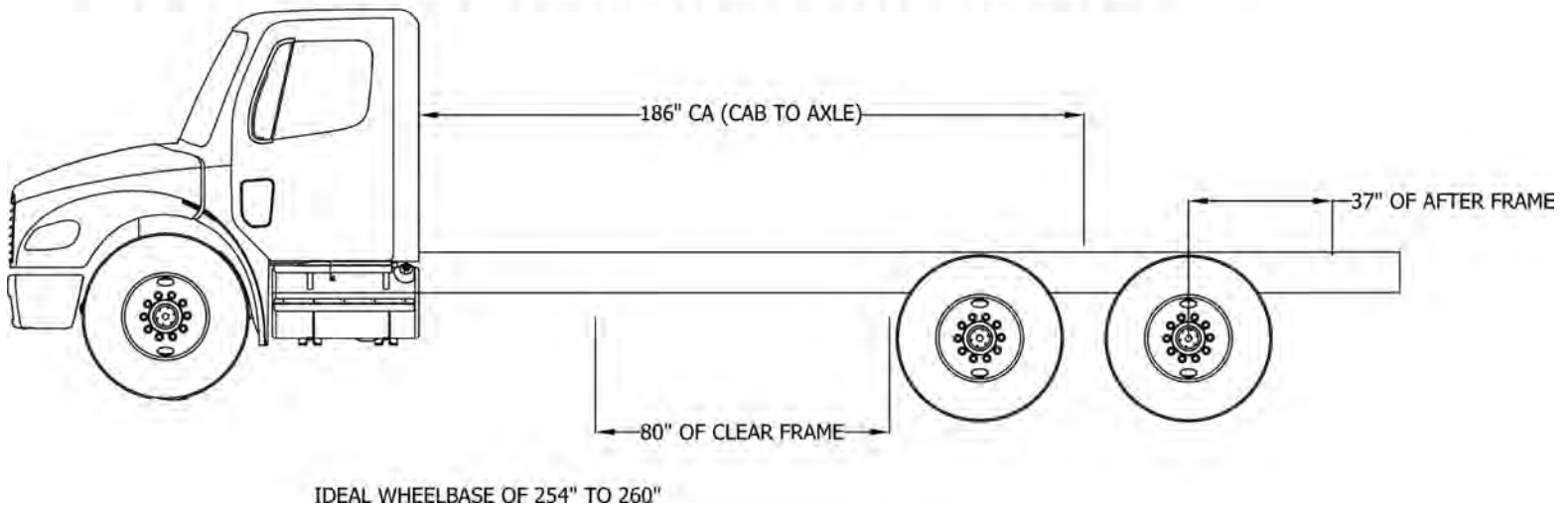
## GENERAL INSTALLATION GUIDELINES CONTINUED

### TRUCK CHASSIS SPECIFICATIONS

#### ROLL OFF BODY REQUIRED MEASUREMENTS



- 1) CA (CAB TO AXLE) - IDEAL MEASUREMENT 186"
- 2) CLEAR FRAME (BOTH SIDES) - WE NEED AT LEAST 80" FROM THE BEGINNING OF THE REAR SUSPENSION HARDWARE GOING FORWARD
- 3) AFTER FRAME - WE NEED AT LEAST 37" MEASURED FROM THE CENTER OF THE BACK WHEEL GOING BACK



*Required Chassis Measurements for Titan Roll Off Hoist Diagram*

# Section 2: Installation Continued

## TRUCK CHASSIS FRAME RAIL CUT-OFF

Measure and mark the truck chassis frame rail as shown below using provided chassis measurement diagram in addition to marker tool (P/N: 02-01-01311) provided. Use the dimensional drawing below to determine where to mark the first vertical cut on the frame rail. Reference the “*Titan Forward Mount Dimensional Diagram*” (Section 2-1: Hoist and Front Mounts) for proper clearance and spacing of hoist assembly. After confirming the measurements, cut the truck frame as shown below.



*Chassis Frame Rail Cut-Off Measurement Diagram*



*1. Vertical mark determination on chassis frame rail.*



*2. Step cut mark determination on chassis frame rail.*



*3. Vertical and step marks on chassis frame rail (existing roll off chassis).*



*4. The removal of the excess chassis frame rail from the vertical and step mark determinations.*



## Section 2: Installation Continued

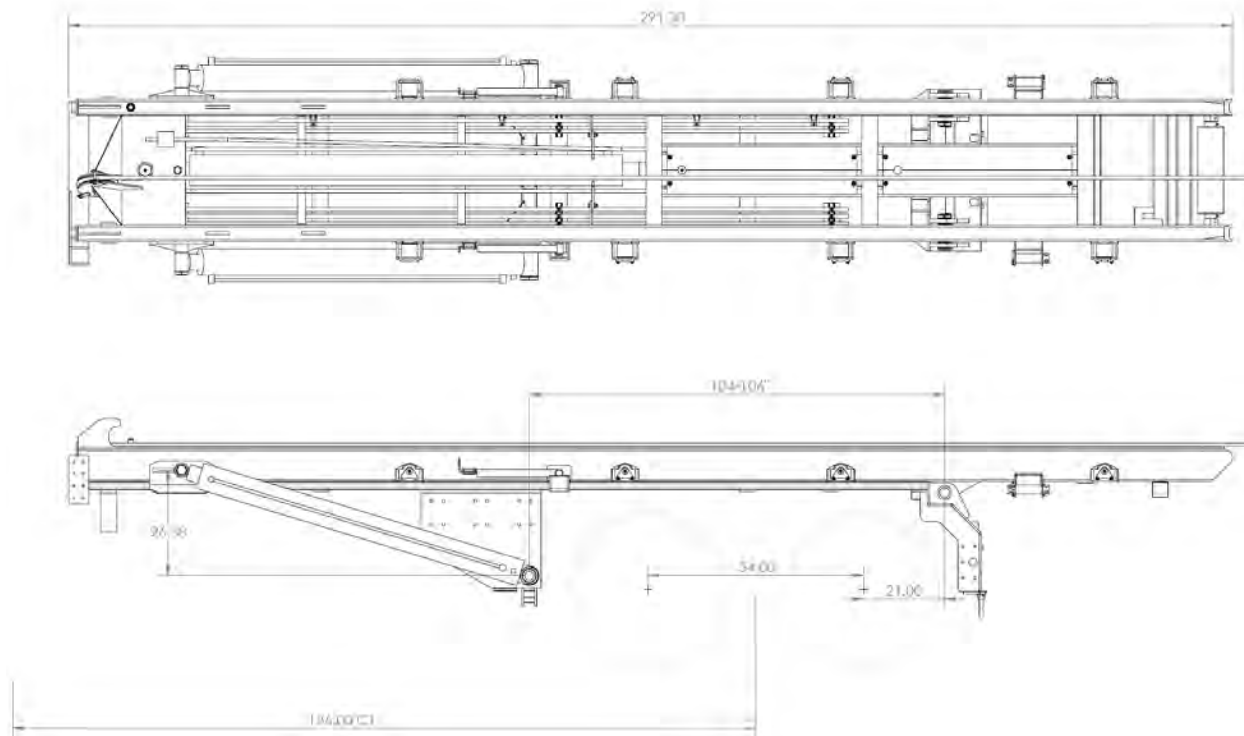
### TRUCK CHASSIS FRAME RAIL CUT-OFF CONTINUED



*5. The completed truck frame rail cut-off utilizing a grinder to smooth any lag from the welding torch.*

# Section 2-1: Hoist and Front Mounts

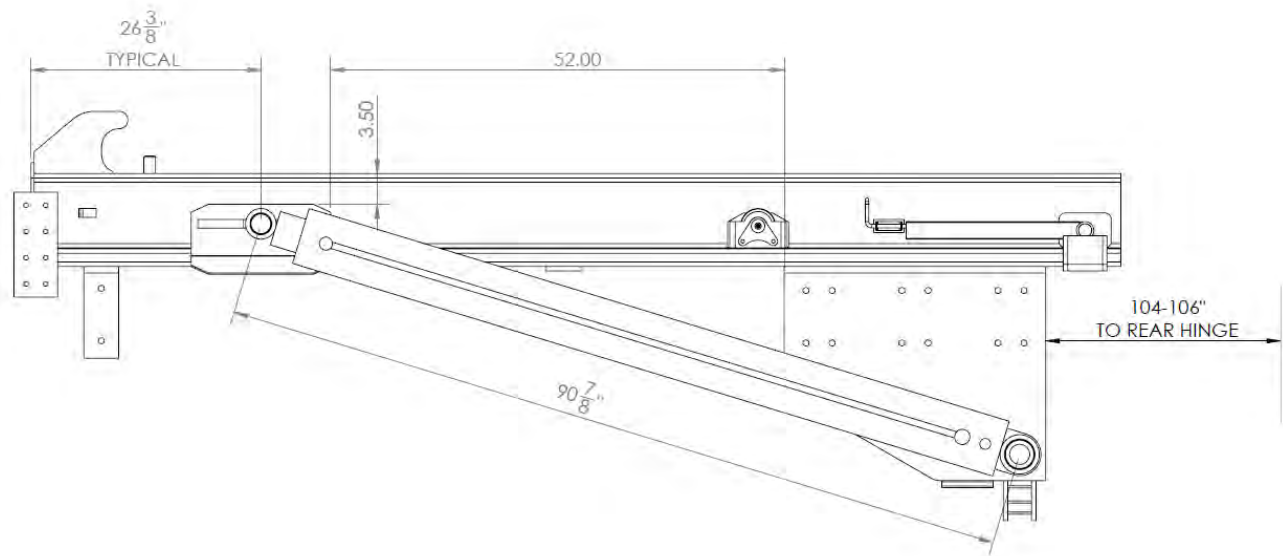
## **DIMENSIONS: FORWARD MOUNT**



*Titan Forward Mount Dimensional Diagram*

# Section 2-1: Hoist and Front Mounts Continued

1. Mark the location for the hoist cylinder mounting plates on the chassis frame and remove any bolts, rivets etc. from outside of the frame.

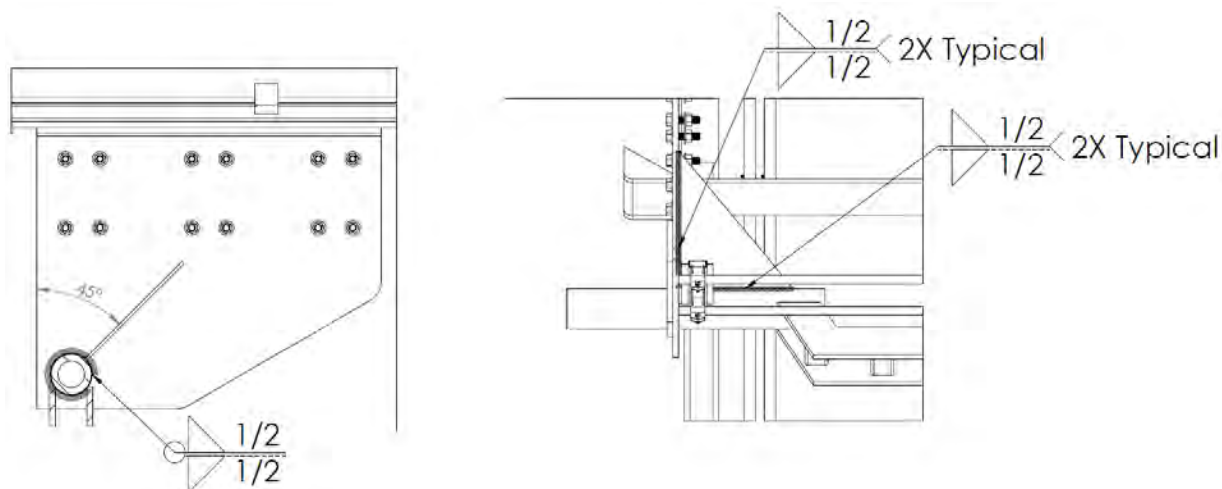


*Hoist Cylinder Assembly Dimensional Diagram*

2. A **minimum of 12 5/8"** Grade 8 bolts must be used to secure each of the cylinder mounting plates. Existing chassis bolt holes may be used otherwise approximate according to figure above.
3. Starting on one side, hang the hoist cylinder mount plate over the frame rail and below the sub frame in the location referenced in the figure "*Titan Forward Mount Dimensional Diagram*". Clamp the plate firmly in place and mark the existing or new hole locations on the hoist mount plate. Remove the plate and drill out the holes with an 11/16" drill bit. Drill out the matching holes on the chassis frame if necessary.
4. Install the hoist cylinder mount plate onto the chassis frame using 12 5/8" x 2 1/2" Grade 8 bolts, washers, and locknuts provided.
5. Repeat the process for the opposite side hoist cylinder plate. However, **do not** bolt this plate into position at this time.
6. Insert the lower shaft into the two mounting plates.
7. Bolt the remaining hoist cylinder plate with the 5/8" x 2 1/2" Grade 8 bolts, locknuts, and washers provided.
8. Position the lower shaft so that the drop is in a vertical position and the ends are equally spaced from each mounting plate. Tack the lower shaft to each mounting plate.
9. Position the lower shaft gussets at 45° as shown in the figure below and tack into place.

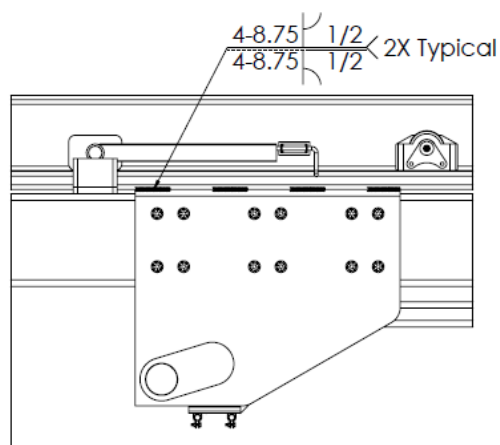
## Section 2-1: Hoist and Front Mounts Continued

10. Weld the lower shaft, gussets, and mounting plates according to “*Hoist Cylinder Plate & Lower Shaft Assemblies*” below.



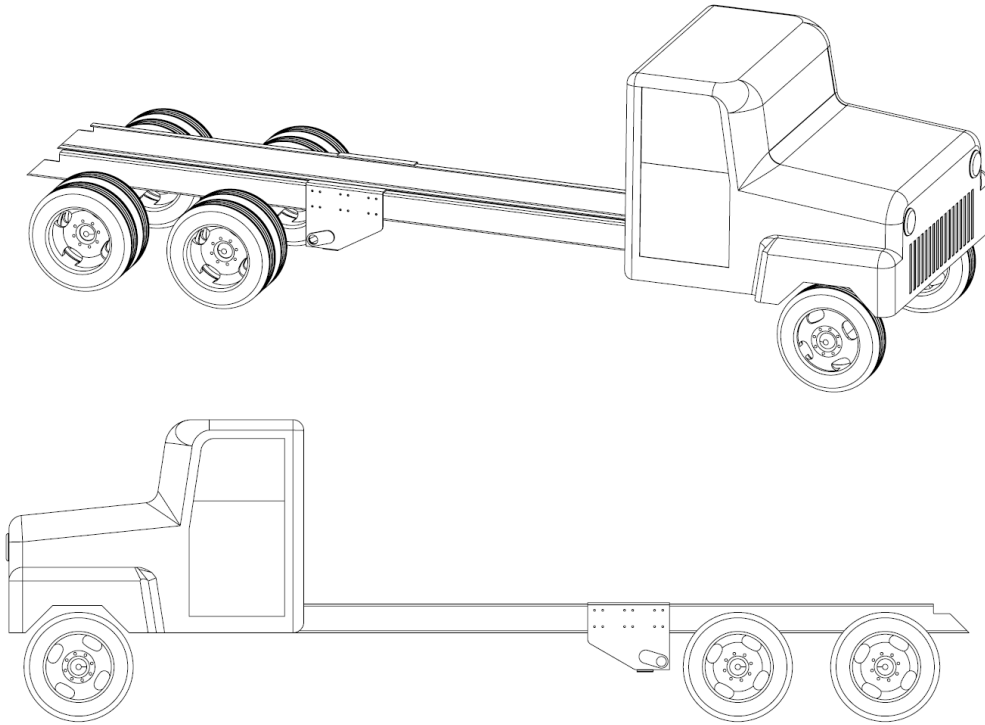
*Hoist Cylinder Plate & Lower Shaft Assemblies Diagram*

11. Weld the hoist cylinder mounting plates to the subframe as shown in the “*Hoist Cylinder Plate Welding Diagram*” figure.



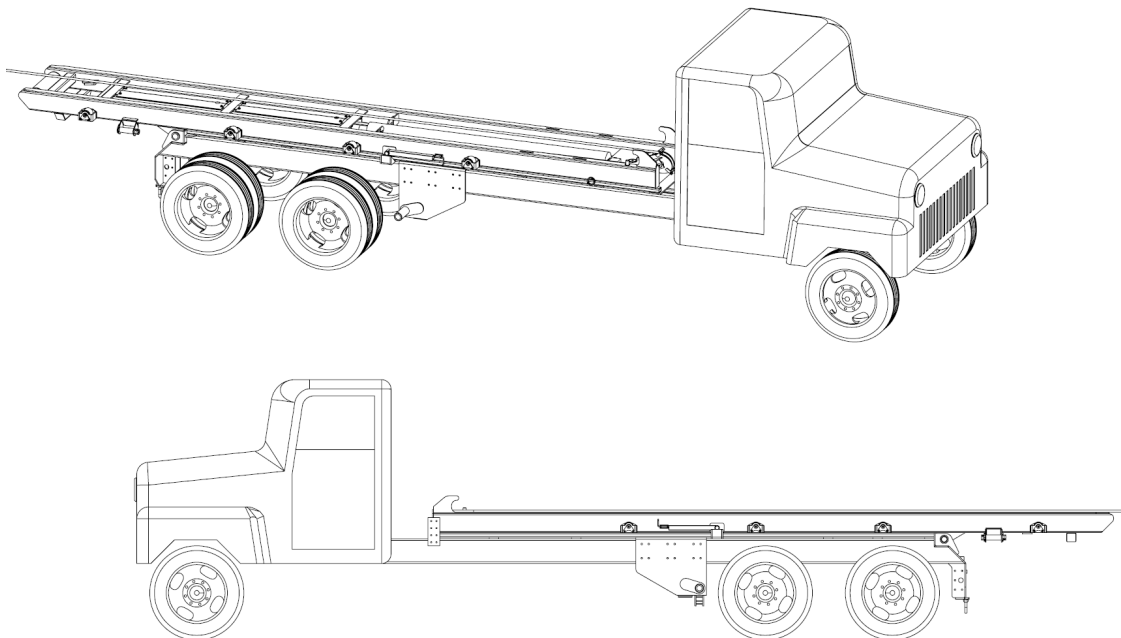
*Hoist Cylinder Plate Welding Diagram*

## Section 2-1: Hoist and Front Mounts Continued



*Prepped Chassis Frame Rail with Hoist Mounting Plates Installed Figure*

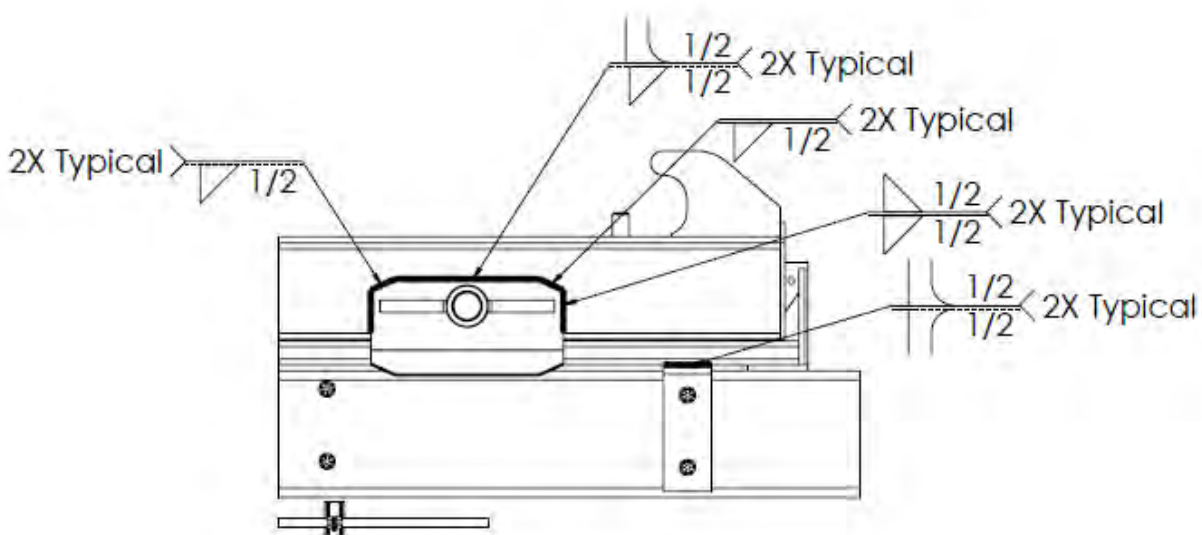
12. Position the hoist assembly onto truck frame, aligning and squaring up with truck frame. Clamp the hoist assembly to the truck frame and then heavily tack weld the rear apron in place.



*Hoist Assembly Positioned onto Frame Rail Figure*

## Section 2-1: Hoist and Front Mounts Continued

13. Mark the location for each top shaft on each main frame according to the "*Hoist Cylinder Assembly Dimensional Diagram*" figure, measuring from each hoist cylinder mount plate. Tack the top shaft plates in place.
14. Lift the hydraulic hoist cylinder into position. Slide the base end of the cylinder onto the lower shaft of the hoist cylinder plate and then the rod end of the cylinder onto the top shaft on the frame rail, with both processes occurring at the same time. Push the cylinder into position. Each cylinder should be equally extended approximately  $7/8$ ".
15. Once the placement is confirmed remove the cylinders and weld the top shaft plates in place according to the figure "*Top Shaft and Front Mount Welding Diagram*".
16. Mark the location for the front mount plates on the chassis within 12" from the end of the subframe and remove any bolts, rivets etc. from outside of the frame.
17. 2  $5/8$ " Grade 8 bolts must be used to secure each of the front mount plates. Existing chassis bolt holes may be used otherwise approximate according to figure "*Top Shaft and Front Mount Welding Diagram*".
18. Clamp the plates firmly in place and mark the existing or new hole locations on the front mount plates. Remove the plates and drill out the holes with an  $11/16$ " drill bit. Drill out the matching holes on the chassis frame if necessary.
19. Install the front mount plates onto the chassis frame using 2  $5/8$ " x 2  $1/2$ " Grade 8 bolts, washers, and locknuts provided for each plate. Weld to the subframe according to the "*Top Shaft and Front Mount Welding Diagram*".

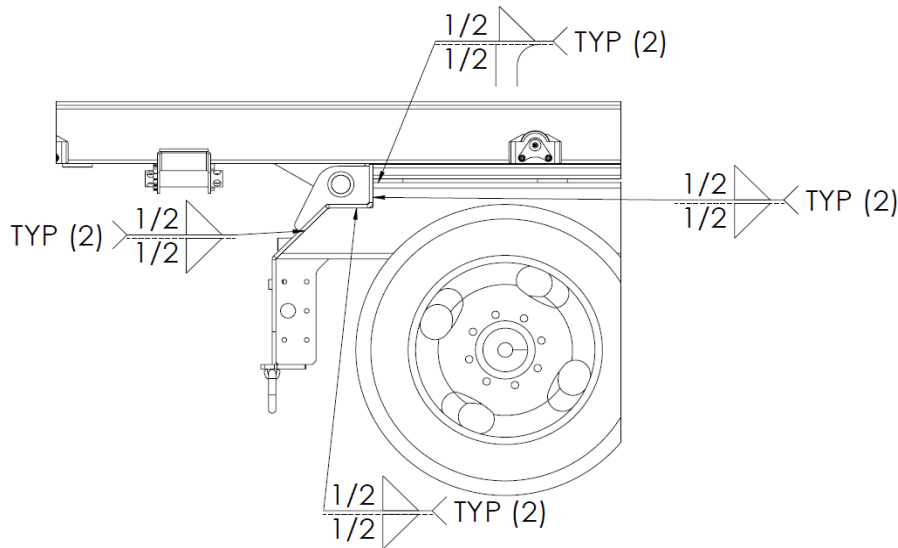


*Top Shaft & Front Mount Welding Diagram*

## Section 2-2: Rail Assembly

### WELDING THE REAR APRON TO THE TRUCK FRAME

1. Fully weld the hoist rear apron to the truck frame. Weld a 100% 1/2" weld on both sides of truck frame to hoist sub-frame.



*Rear Apron Welding Location Diagram*



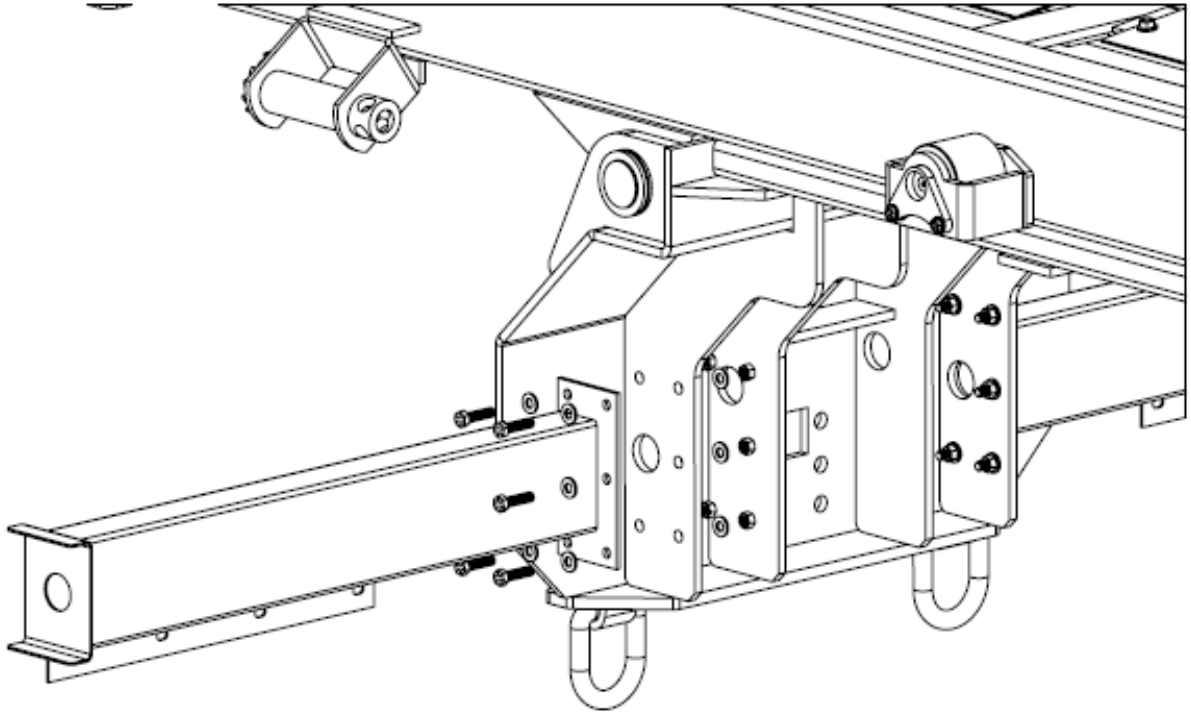
*Left hand side full welded to apron.*



*Right hand side full welded to apron.*

## Section 2-3: Bumpers and Fenders

### LIGHTED BUMPER INSTALLATION



*Lighted Bumper Installation Diagram*

1. Install the lighted bumpers to the side of the apron by positioning so that the mud flap brackets are downward and using 5 2" x 1/2" grade 8 bolts, washers, and locknuts per side. Reference the "*Lighted Bumper Installation Diagram*" figure above.



# Section 2-3: Bumpers and Fenders Continued

## ICC BUMPER INSTALLATION

1. Lift the main bar into position on the rail assembly and secure with pins on both sides, then fully secure with washer and cotter pin.
2. Secure left- and right-hand pivot arm onto main bar, insert pins (1" x 3 1/8"), and secure the other end with cotter pin and washer onto the main apron.
3. Raise and lower rails to ensure the self-collapsing ICC bumper operates correctly and uniformly.

## FENDER INSTALLATION (EACH SIDE)

1. Determine location of fender above tandem axles.
2. Locate and weld rear fender mount plate to light bar.
3. With fenders straight to chassis locate and drill (4) mounting holes in rear of fender to the mounting plate.
4. Put (2) bolts in holes to maintain the alignment of the fender.
5. Locate and install the front fender mount support bar on the chassis (bolt to chassis, never weld to chassis frame).
6. Locate and install the front fender mount plate to the support bar.
7. Locate and drill (4) mounting holes in front lip of fender and mount plate.
8. Secure fenders to mounting plates with necessary hardware (3/8-16 bolts).

*It is recommended for fender to be supported in center (front to rear) with a support bar.*



*Fenders Installation Figure 1*



*Fenders Installation Figure 2*

# Section 2-3: Bumpers and Fenders Continued

## FENDER INSTALLATION CONTINUED

### STEEL FENDERS



*Full Length Steel Fenders Example Figure*

### PLASTIC FENDERS



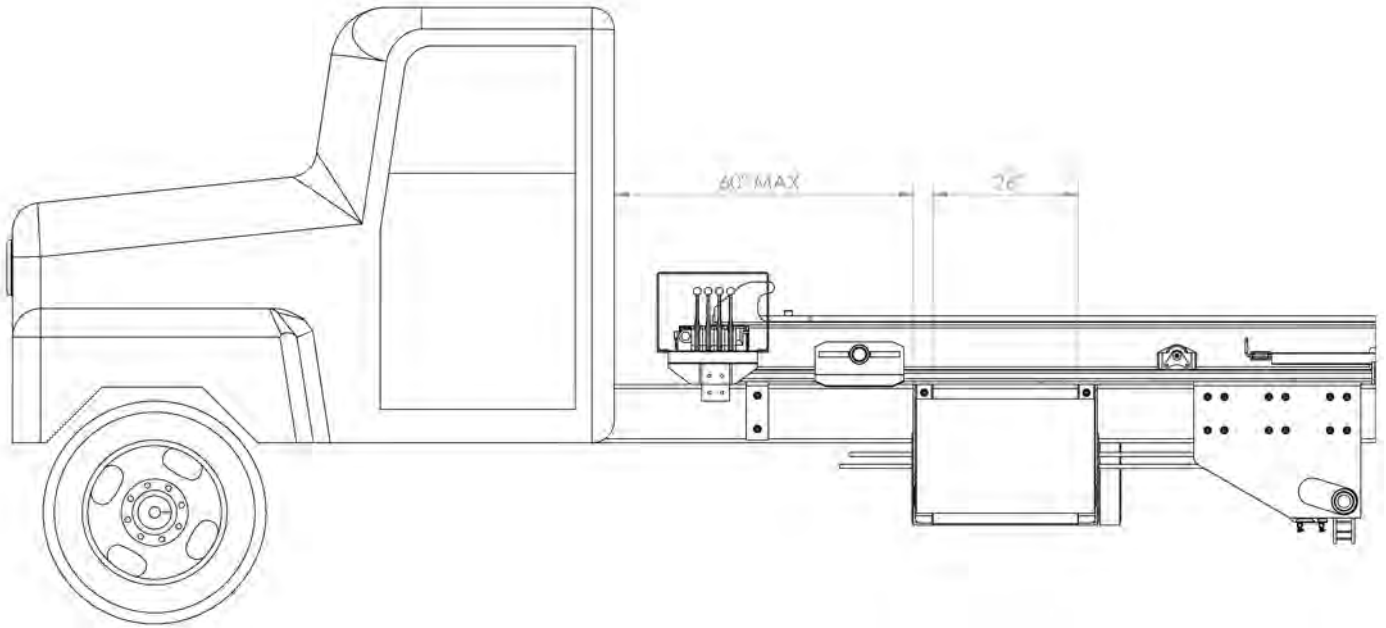
*Full Length Plastic Fenders Example Figure*

# Section 2-4: Hydraulics

## HYDRAULIC TANK INSTALLATION

*Refer to chassis layout below for proper placement of tank on frame rails*

1. The hydraulic tank should be positioned on the valve-side of the truck and within 60" of the back of cab. Mark the intended location on the chassis frame and verify that the suction hose will reach from the tank to the pump.



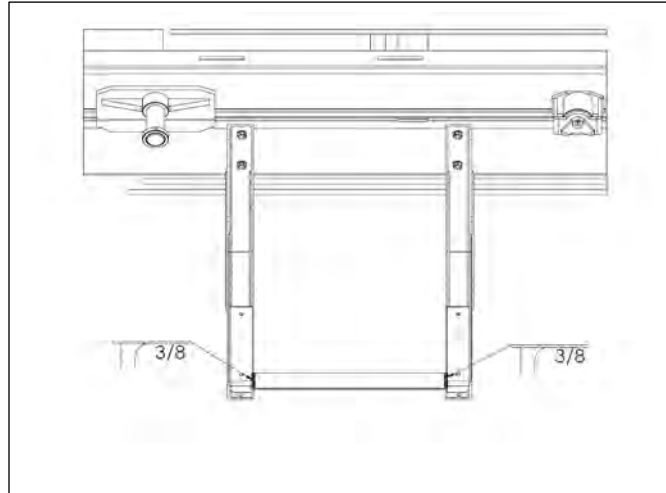
*Hydraulic Tank Location Diagram*

2. 2 5/8" Grade 8 bolts must be used to secure each of the front mount plates. Existing chassis bolt holes may be used otherwise approximate according to figure "Hydraulic Tank Support Legs Installation Diagram". Mark a 1" horizontal line from the top of the channel to where the top of both hydraulic tank supports will sit.
3. Clamp the brackets firmly in place and mark the existing or new hole locations on the brackets. Remove the brackets and drill out the holes with an 11/16" drill bit. Drill out the matching holes on the chassis frame if necessary.

## Section 2-4: Hydraulics Continued

### HYDRAULIC TANK INSTALLATION CONTINUED

4. Install the brackets onto the chassis frame using 2 5/8" x 2 1/2" Grade 8 bolts, washers, and locknuts provided for each plate. Weld to the subframe according to the "Top Shaft and Front Mount Welding Diagram".



*Hydraulic Tank Support Legs Installation Diagram*

5. Cut the suction hose to length and install to the pump and tank barbed fittings using the included clamps, two on each side.



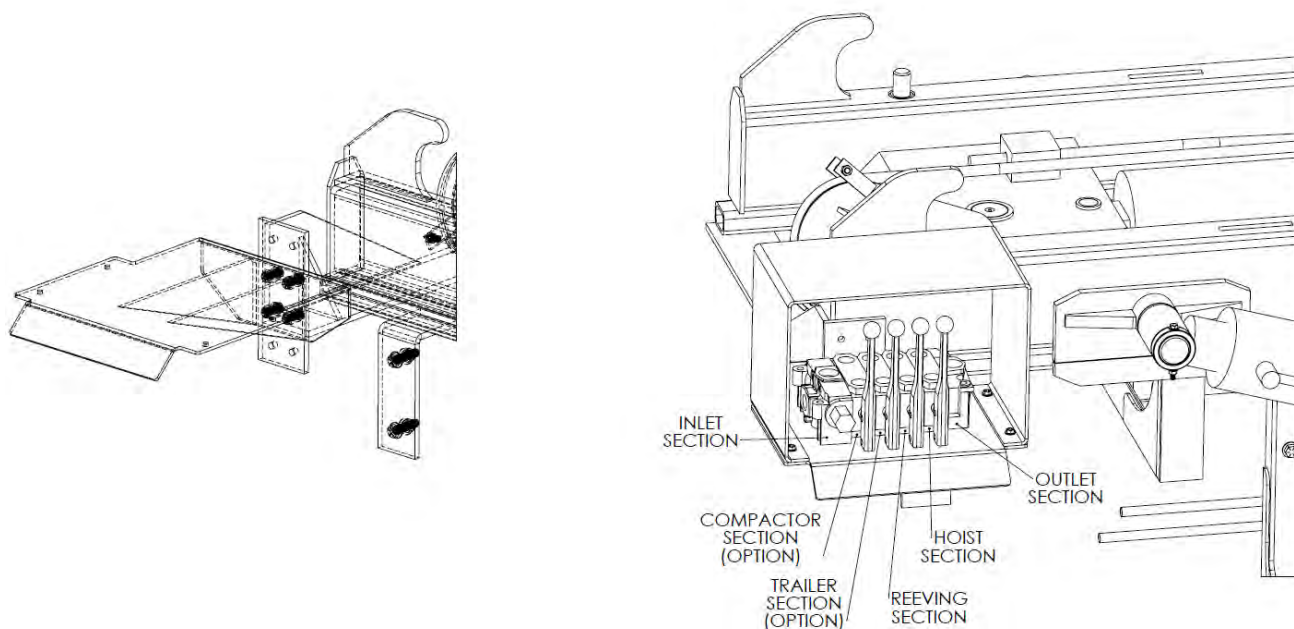
*The Complete Hydraulic Tank Assembly*



# Section 2-4: Hydraulics Continued

## HYDRAULIC VALVE BODY INSTALLATION

1. Place the valve plate into the desired position on the subframe mount bracket. There are three available heights that the valve can be installed at. Install the plate using 4 1/2" x 1-1/2" Grade 8 bolts, washers, and locknuts.
2. Locate the valve on top of the plate so that it is centered from side to side, with room behind the valve for fittings and connections, and with the handles beneath the cover (if used). Mark and drill 3 9/16" holes. Install the valve using 3 1/2" x 4-1/2" Grade 8 bolts, washers, and locknuts.
3. Install the air and plumbing onto the valve.
4. Install the valve cover in place over the valve using 4 3/8"x1-1/4" Grade 8 bolts, washers, and locknuts.



*Hydraulic Valve Body Installation Diagram*

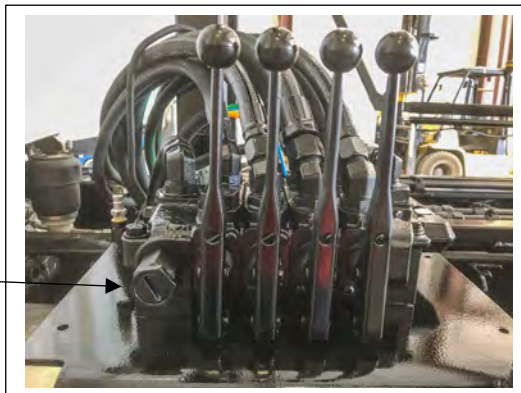
## HYDRAULIC VALVE RELIEF PRESSURE SETTING WITHOUT DIVERTER VALVE

1. Locate the pressure test port and install 0-5000 PSI gauge.
2. Start the unit and turn the PTO on.
3. With the rails in the down position, actuate the rails-down control (dead-head the cylinders) and observe the pressure reading then release the control.
4. Loosen the main relief lock nut.
5. Use a 5/8" x 1/8" slotted tip on a ratchet to adjust the main relief pressure (tighten for more, loosen for less) to 2200 PSI (+/- 50 PSI).
6. Actuate the rails down control and observe the pressure reading then release the control.
7. Tighten the lock nut on the main relief cartridge.
8. Actuate the rails-down control to confirm pressure adjustment is correct.

## Section 2-4: Hydraulics Continued

### HYDRAULIC VALVE RELIEF PRESSURE SETTING CONTINUED

Pressure Relief Valve



*Location of Pressure Relief Valve*

### HYDRAULIC VALVE RELIEF PRESSURE SETTING WITH DIVERTER VALVE

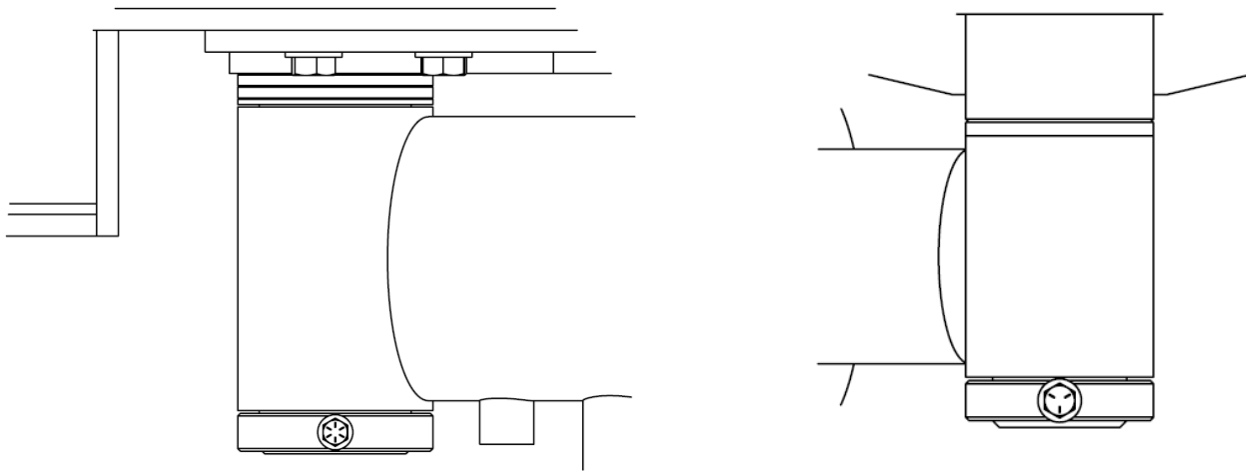
If the unit is equipped with a hydraulic diverter valve, it is recommended to set the diverter valve main relief at 200 PSI more than the valve main relief. To set the diverter valve main relief please reference the following procedure:

1. Locate the pressure test port and install a 0-5000 PSI gauge.
2. Start the unit and turn the PTO on.
3. With the rail in the down position, actuate the rails-down control (dead-head the cylinders) and observe the pressure reading then release the control.
4. Loosen the main relief cartridge locking nut on the rail's control valve.
5. Use a 5/8" x 1/8" slotted tip on a ratchet to adjust the main relief pressure (tighten for more, loosen for less) to 2600 PSI.
6. Tighten the main relief cartridge lock nut on the rail's control valve.
7. Actuate the rails-down control and observe the pressure reading then release the control.
8. Loosen the locking nut on the diverter valve main relief cartridge.
9. Adjust the pressure at the diverter valve to 2400 PSI (+/- 50 PSI).
10. Actuate the rails-down control and observe the pressure reading.
11. Tighten the locknut on the diverter valve main relief cartridge and actuate the rails-down control, observe the pressure reading then release the rails-down control. This confirms the relief pressure at the diverter valve has been adjusted correctly the 2400 PSI. If the pressure reading is not 2400 PSI (+/- 50 PSI) then return to step 8 and re-adjust the diverter valve main relief pressure.
12. Loosen the main relief cartridge locking nut on the rails control valve.
13. Re-adjust the rail's control valve relief pressure to 2200 PSI (+/- 50 PSI) then tighten the main relief cartridge locking nut on the rail's control valve.
14. Actuate the rails-down control to confirm the main relief pressure is now 2200 PSI.
15. Main relief pressures have now been set correctly.

# Section 2-4: Hydraulics Continued

## HOIST CYLINDER INSTALLATION

1. Measure the clearances distances from the top and lower shafts along the length where the cylinder will be positioned. 1/8" and 1/4" and spacers maybe used to maintain clearance. However, the same spacing must be used on each side.
2. Lift the hydraulic hoist cylinders into position. Slide the base ends of the cylinders onto the lower shaft and then the rod ends of the cylinders onto the top shaft, with both processes occurring at the same time. Push the cylinders into position.

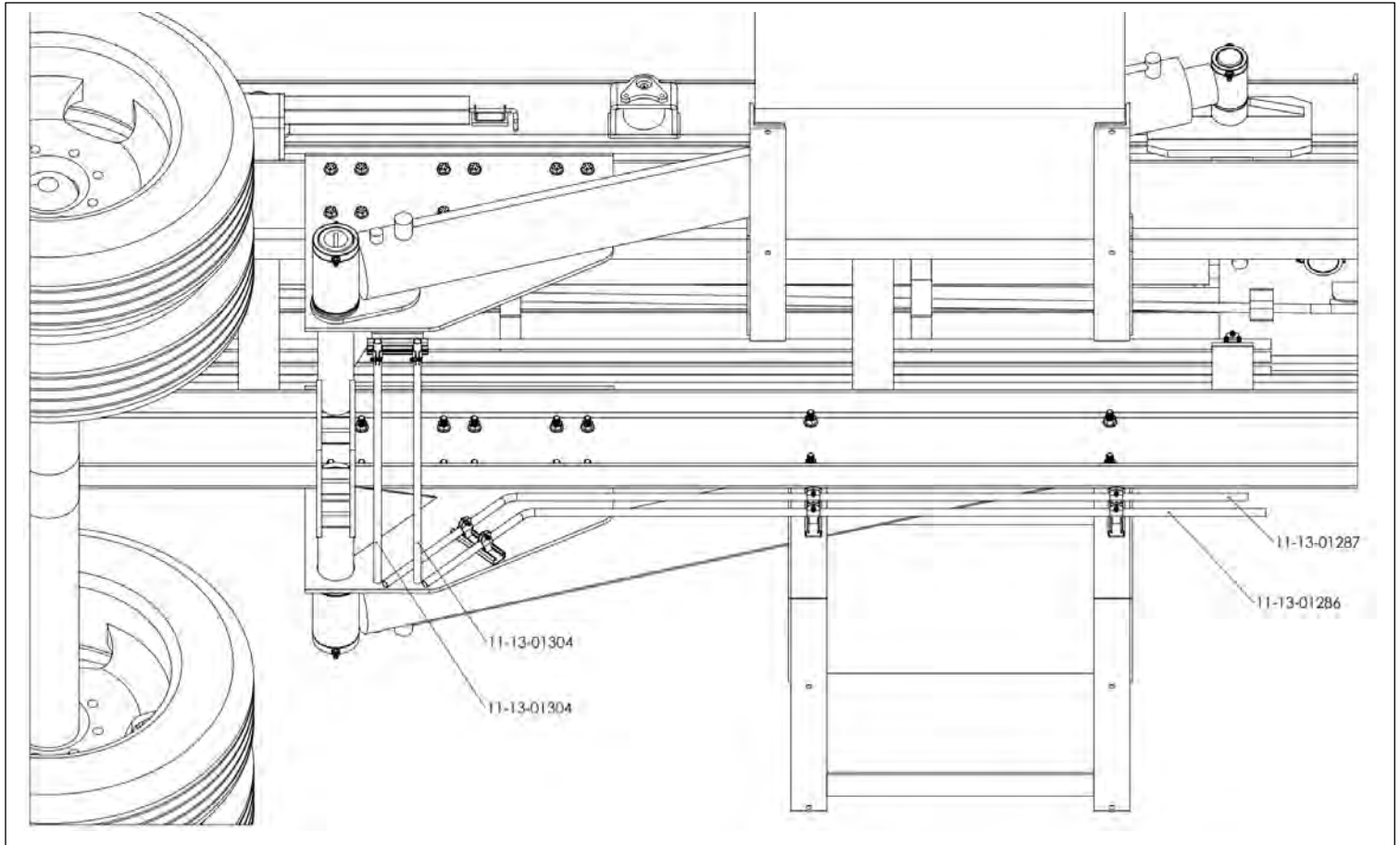


*Hoist Cylinder Installation Diagram*

3. Slide the cylinder retaining rings onto the top shaft and secure with 3/8" x 4-1/2" Grade 8 bolts, washers, and locknuts.
4. Slide the cylinder retaining rings onto the lower shaft and secure with 3/8" x 5-1/2" Grade 8 bolts, washers, and locknuts.
5. Install hoses from the right-hand side hoist cylinder to pipework under right hand side hoist cylinder plate per the hydraulic system schematic.

## Section 2-4: Hydraulics Continued

### HOIST CYLINDER TUBING LOCATION

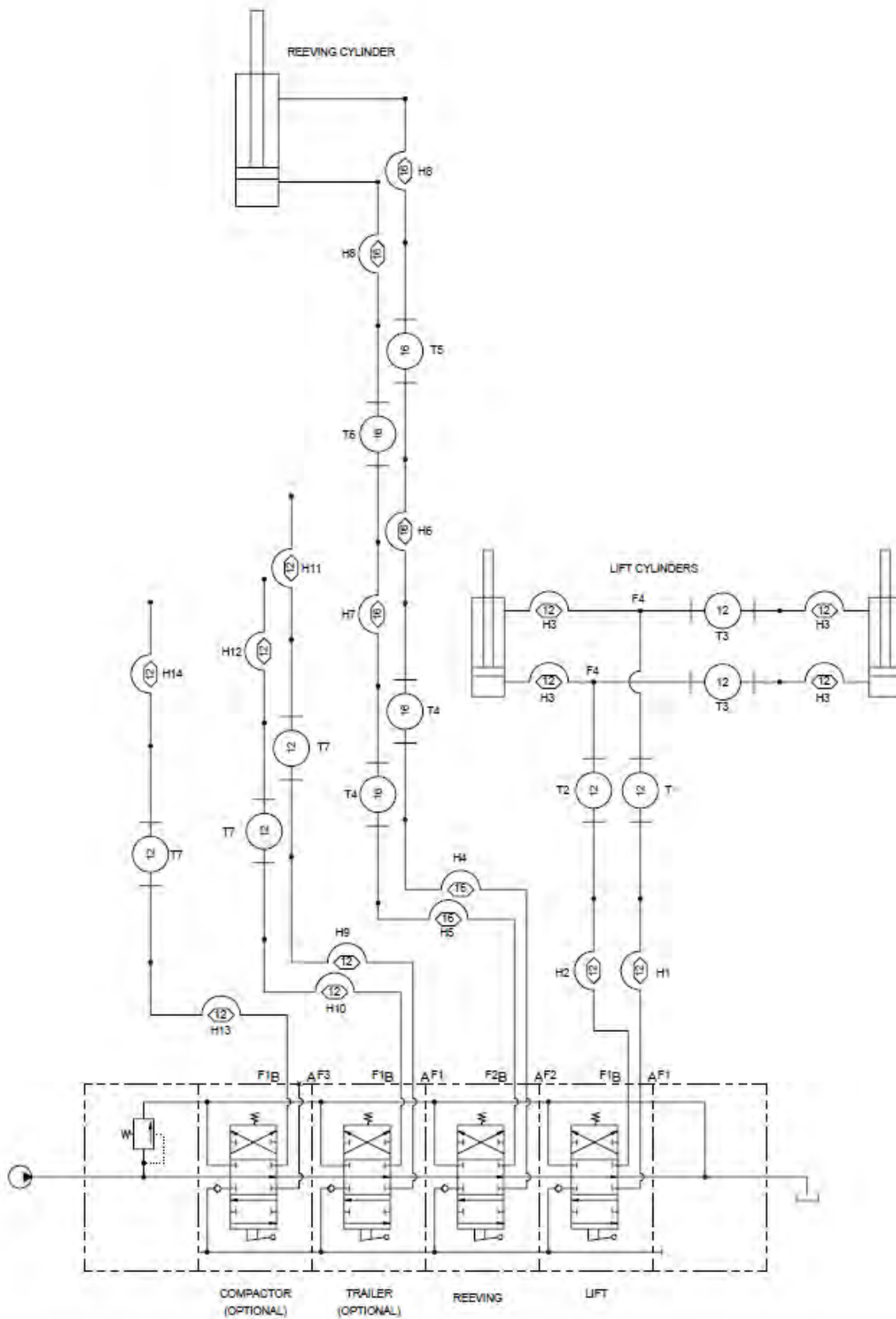


*Hoist Cylinder Tubing Location Figure*



# Section 2-4: Hydraulics Continued

## HYDRAULIC SCHEMATIC



Hydraulic Schematic Figure

# Section 2-4: Hydraulics Continued

## HYDRAULIC SCHEMATIC CONTINUED

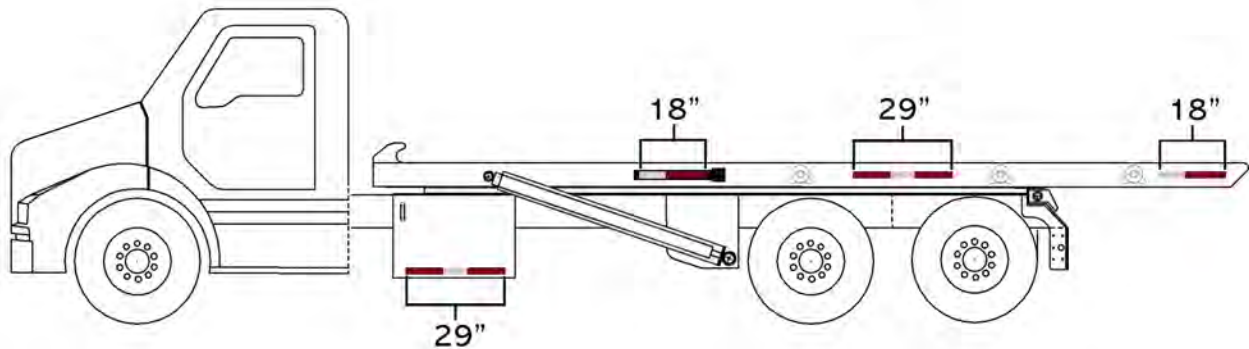
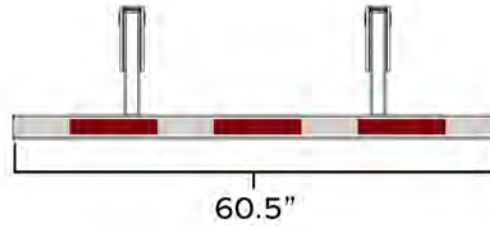
ITEM	QTY	P/N	DESCRIPTION
F1	4	11-01-01309	Hydraulic Adapter, 16MORB-12MJIC 45 Deg
F2	2	11-01-01310	Hydraulic Adapter, 16MORB-16MJIC 45 Deg
F3	1	11-01-01029	Hydraulic Fitting, 16MORB Hex Plug
F4	2	11-01-01289	Hydraulic Adapter, 12MJIC- 12MJIC- 12FJIC Tee
H1	1	11-02-01290	Hose Assembly, Hoist Rod, Valve to Tube, Titan
H2	1	11-02-01291	Hose Assembly, Hoist Base, Valve to Tube, Titan
H3	4	11-02-01292	Hose Assembly, Hoist, Tube to Cylinder, Titan
H4	1	11-02-01293	Hose Assembly, Reeving Rod, Valve to Tube, Titan
H5	1	11-02-01294	Hose Assembly, Reeving Base, Valve to Tube, Titan
H6	1	11-02-01295	Hose Assembly, Reeving Rod, Tube to Tube, Titan
H7	1	11-02-01296	Hose Assembly, Reeving Base, Tube to Tube, Titan
H8	2	11-02-01297	Hose Assembly, Reeving, Tube to Cylinder, Titan
H9	1	11-02-01298	Hose Assembly, Trailer Right, Valve to Tube, Titan
H10	1	11-02-01299	Hose Assembly, Trailer Left, Valve to Tube, Titan
H11	1	11-02-01300	Hose Assembly, Trailer Right, Tube to Apron, Titan
H12	1	11-02-01301	Hose Assembly, Trailer Left, Tube to Apron, Titan
H13	1	11-02-01302	Hose Assembly, Compactor, Valve to Tube, Titan
H14	1	11-02-01303	Hose Assembly, Compactor, Tube to Bumper, Titan
T1	1	11-13-01286	Hydraulic Tube, Hoist Rod, Under Frame, Titan
T2	1	11-13-01287	Hydraulic Tube, Hoist Base, Under Frame, Titan
T3	2	11-13-01304	Hydraulic Tube, Hoist, Branch, Titan
T4	2	11-13-01305	Hydraulic Tube, Reeving, Subframe, Titan
T5	1	11-13-01306	Hydraulic Tube, Reeving Rod, Main Frame, Titan
T6	1	11-13-01307	Hydraulic Tube, Reeving Base, Main Frame, Titan
T7	3	11-13-01308	Hydraulic Tube, Auxiliary, Subframe, Titan

# Section 2-7: Decals

## REFLECTIVE TAPE INSTALLATION

### Without Tarping System

(Please refer to section 1-2 (*kit contents*) for reflective tape part numbers.)

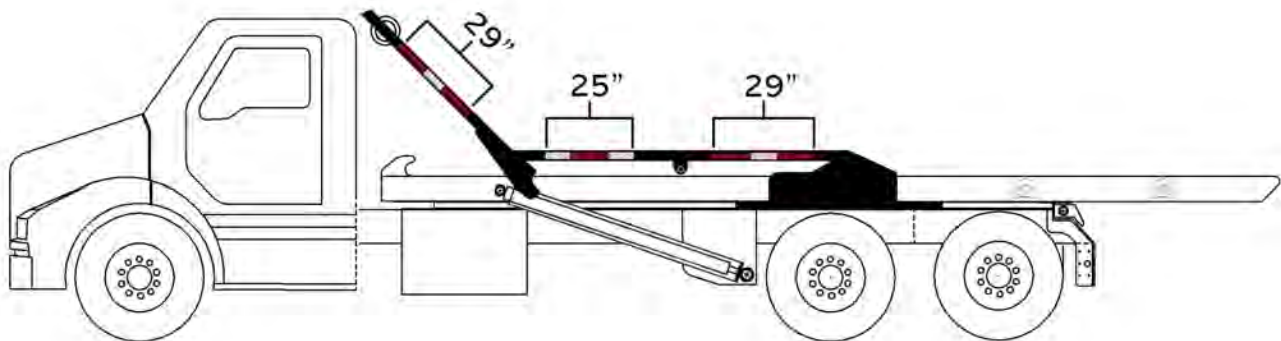


### Toolbox location



### With Tarping System

(Please refer to section 1-2 (*kit contents*) for reflective tape part numbers. Reflective tape lengths are subject to change.)

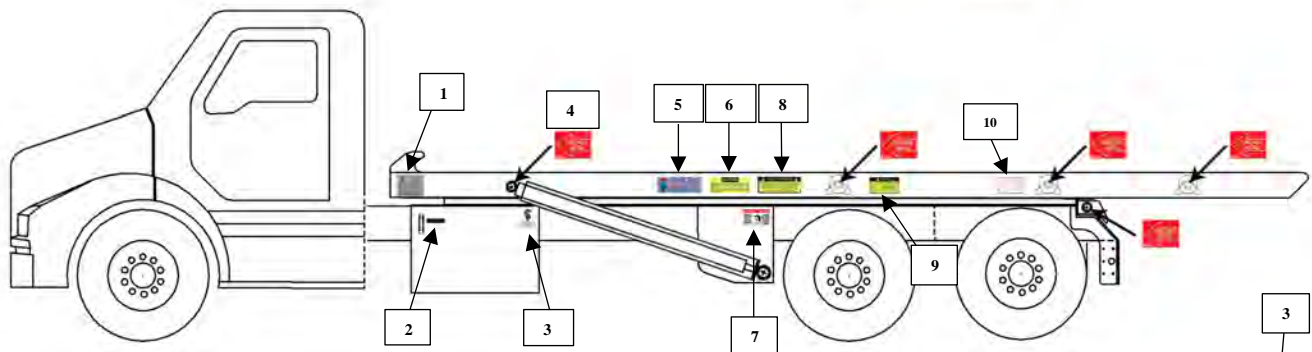


# Section 2-7: Decals Continued

## BRANDING AND SAFETY DECAL INSTALLATION

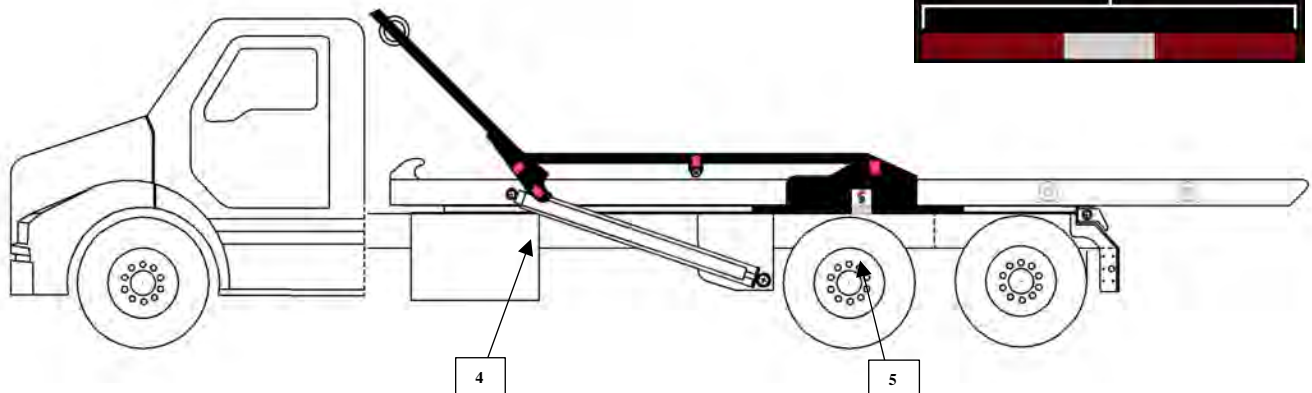
### Without Tarping System

(Please refer to section 1-2 (*kit contents*) for part numbers.)



### With Tarping System

(Please refer to section 1-2 (*kit contents*) for part numbers.)



ITEM	DESCRIPTION	SUGGESTED LOCATION	QUANTITY
1	SPARTAN TRUCK COMPANY SERIAL PLATE	MOUNTED ON HOIST RAIL [REFERENCE FIGURE]	1
2	OIL LEVEL DECAL	MOUNTED ON HYDRAULIC RESERVIOR [REFERENCE FIGURE]	1
3	SPARTAN LOGO ON WHITE VINYL DECAL	MOUNTED ON HYDRAULIC RESERVIOR & TOOLBOX [REFERENCE FIGURE]	1
4	GREASE ARROW LABEL [LEFT] DECAL	UNIT LUBRICATION POINTS BOTH LEFT AND RIGHT SIDES [REFERENCE FIGURE]	14
5	SPARTAN NAME PLATE	MOUNTED ON HOIST RAIL [REFERENCE FIGURE]	1
6	CAUTION LABEL DECAL	MOUNTED ON HOIST RAIL [REFERENCE FIGURE]	2
7	DANGER, PINCH POINT DECAL	MOUNTED ON CYLINDER FISH PLATE [REFERENCE FIGURE]	2
8	HOIST WARNING LABEL DECAL	MOUNTED ON HOIST RAIL [REFERENCE FIGURE]	2
9	WARNING LABEL DECAL	MOUNTED ON HOIST RAIL [REFERENCE FIGURE]	2
10	HOIST PROP OPERATING DECAL	MOUNTED ON HOIST RAIL [REFERENCE FIGURE]	2
11	VALVE BODY OPERATING DECAL [3 WORK SECTIONS]	MOUNTED ON SIDE OF VALVE MOUNTING PLATE	1
11*	VALVE BODY OPERATING DECAL [2 WORK SECTIONS]	*IF APPLICABLE MOUNTED ON SIDE OF VALVE MOUNTING PLATE [NOT REFERENCED]	*1

