

Dragon Products, Ltd.

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**Product:** ST6 Roll-Off Trailer  
**Model:** ST6-262 & ST6-286

# Owners, Operators, & Parts Manual

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# Table of Contents

<b>Introduction</b>	<b>2</b>		
<b>Disclaimer</b>	<b>2</b>		
<b>Ordering Parts</b>	<b>2</b>		
<b>Technical Disclaimer</b>	<b>2</b>		
<b>!! WARNING !!</b>	<b>2</b>		
 <b>CHAPTER 1</b>			
<b>Safety Requirements</b>	<b>3</b>		
<b>Additional Safety Precautions</b>	<b>4</b>		
<b>Lock-Out Procedure</b>	<b>5</b>		
 <b>CHAPTER 2</b>			
<b>Operator \ Employee Responsibility's</b>	<b>6</b>		
<b>Owner \ Employer Responsibility's</b>	<b>7</b>		
 <b>CHAPTER 3</b>			
<b>Hoist Start-Up Procedure</b>	<b>8</b>		
<b>Operational Procedures</b>	<b>9-12</b>		
 <b>CHAPTER 4</b>			
<b>General Service &amp; Maintenance</b>	<b>13</b>		
<b>Cable Replacement Procedure</b>	<b>14-15</b>		
		<b>CHAPTER 5</b>	
		<b>Recommended Parts List</b>	<b>16-23</b>
		 <b>CHAPTER 6</b>	
		<b>Warranty</b>	<b>24-25</b>

## **Introduction**

This manual is designed to cover trailer mounted roll-off hoists. In order to accomplish this, composite drawings and charts are used.

## **Disclaimer**

This manual has been compiled from many different sources and should be used only as a reference tool. The information herein is believed to be accurate. However, Dragon Products, Ltd.. disclaims any warranty expressed or implied or any liability or responsibility for the accuracy or correctness of any calculation or information which is critical.

## **Ordering Parts**

When ordering parts assembly's and accessories, in addition to the part number, description, and quantity, please state the trailer model number and serial number. These numbers can be found on the VIN tag located on the front drivers side of the trailer.

## **Technical Disclaimer**

The information in this manual is intended to give the user a basic knowledge of the operation of this equipment. Fully trained and authorized personnel should perform any service or repair needed.

# **!! WARNING !!**

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

**OPERATOR SHOULD BE  
TRAINED IN SAFE  
METHODS OF USE, LOCATE  
AND UNDERSTAND ALL  
SAFETY DECALS, AND  
READ THIS ENTIRE  
MANUAL BEFORE  
OPERATING, SERVICING OR  
ADJUSTING THIS  
EQUIPMENT.**

## **NOTICE**

**ONLY FULLY TRAINED AND  
AUTHORIZED  
PERSONNEL SHOULD  
OPERATE THIS EQUIPMENT**

## **SAFETY REQUIREMENTS**

**P**revent serious injury by always following the safety precautions. It is the owner-user's responsibility to insure these guidelines are always followed.

- **ALWAYS** check for overhead obstructions before operating hoist.
- **NEVER** work under or place your hands or body under the hoist when it is in the up position.
- **ALWAYS** inspect the condition of the cable before loading a container. Check for broken or worn cable strands, check for fraying or cuts in cable. Cable must be replaced before operation if it exhibits any of the above conditions.
- **NEVER** weld on hoist frame or trailer frame.

## **ADDITIONAL SAFETY PRECAUTIONS**

### **!! WARNING !!**

#### **READ THIS BEFORE OPERATING THE HOIST THE FOLLOWING PRECAUTIONS SHOULD ALWAYS BE OBSERVED!!**

The following information contains guidelines for operating your roll-off trailer. The comments are **NOT** intended to exhaust every possible situation that could arise while operating the hoist, but are intended generally to promote safe operation of the trailer

**CAUTION:** Before using your hoist, be sure the operating area is clear of people. Check the area for low power lines or any other obstacle, which may endanger personnel or damage equipment. The loading, unloading and dumping area should be as level and solid as possible.

**CAUTION:** Extreme care should be taken if a loaded container is in the raised position when moving. Proper operation would require never moving the trailer with hoist in raised position.

**CAUTION:** Extreme care should be taken if chains are used to transfer container. The hydraulic system has enough force to break most chains.

**CAUTION:** Never adjust the hydraulic pressure setting without the use of a working pressure gauge. Do not set the pressure to exceed 2,000 P.S.I.

**CAUTION:** Use only one hydraulic valve control at a time. The hydraulic valve is not designed to operate two or more functions simultaneously.

**CAUTION:** Do not alter the hydraulic valves or the hydraulic system in any way without prior approval, in writing, from the factory.

**CAUTION:** Never use a locking device to hold the valve open, as the valves are designed to return to the center position to stop the hydraulic system movement, as a safety factor.

**CAUTION:** Check the cable for excessive wear and replace as needed. Cable manufacturers recommend changing the cable once a year and factory concurs.

**CAUTION:** Observe and obey all "CAUTION" & "WARNING" decals on both trailer and containers.

**CAUTION:** Always power hoist down. DO NOT let the weight of the hoist push itself down.

**CAUTION:** Check to ensure the cable, cable hook, and container are securely attached before trying to load a container.

**CAUTION:** DO NOT use a chain to hook onto the container for loading purposes.

**CAUTION:** NEVER drive the truck with the P.T.O. engaged

**CAUTION:** NEVER drive the truck unless the hoist is in the full down position.

**CAUTION:** Hydraulic oil warm-up is required in very cold weather. Engage P.T.O. and let truck idle for five minutes.

Your roll-off trailer has been designed to give extended service when used with good safety habits, within its rated capacity and a regular maintenance and lubrication program.

**RESPECT YOURSELF, OTHERS, AND THIS EQUIPMENT DURING USE.  
GOOD SAFETY HABITS AND COMMON SENSE SHOULD BE USED WHEN  
OPERATING THIS EQUIPMENT**

## **LOCK-OUT PROCEDURE**

The purpose of this procedure is to establish performance habits, which provide for the protection from injury of personnel in, on, or around the equipment during repair, maintenance, and other associated activities.

A suggested plan to achieve this purpose is outlined as follows:

1. Remove key from ignition.
2. Tag all controls to inform personnel the equipment is “under repair”, “do not operate”, or whatever the situation dictates. All affected personnel must be previously informed as to the meaning and appearance of the Lockout Tag.

The Lockout Tags must be made out of a material capable of withstanding the environment to which they are exposed (Ex. Oil, grease, fuel,... etc.).

3. Only an authorized individual should be able to release the equipment after the repair has been made.
4. Lockout procedure should be tested to verify safe performance. All personnel should be informed and clear of working area during performance test.

### **RESPONSIBILITIES OF LOCKOUT PROCEDURE:**

1. Compliance with and development of the Lockout Procedure shall be the responsibility of the employer and employee.
2. The employer should verify the correct use of the Lockout Procedure and perform periodic inspections of the procedure.

All individuals affected must be notified and trained of the requirements for compliance with the Lockout Procedure.

## **OPERATOR \ EMPLOYEE RESPONSIBILITY'S**

Employees \ Operators who work on mobile equipment shall be responsible for:

1. Using all applicable safety features provided on the equipment.
2. Using equipment only after being properly instructed and trained in accordance with Owner \ Employer Responsibility Items (1) and (2).
3. Reporting any damage to, or malfunction of, the equipment by submitting a report to the employer or responsible authority either when the damage occurs or as soon thereafter as practical at the termination of the operating day. The employer shall document such reports.
4. Ensuring the area of operation around the container dumping system is clear of all persons during all phases of the dumping operations prior to energizing the dumping system.
5. Ensuring all persons are clear of tailgate before the tailgate is opened or shut. The operator shall warn all persons not to cross under an open tailgate.
6. Operating all equipment in accordance with the manufacturer's instructions.
7. Riding only in the cab and not on any other part of the mobile equipment.
8. Never bypass or remove safety devices, which have been installed on the equipment.
9. Do not operate equipment if work ability is impaired by fatigue, illness, or other causes.
10. **BE ALERT TO ALL POSSIBLE HAZARDOUS SITUATIONS AND CONDITIONS!**

**PLEASE NOTE THE OWNER\EMPLOYER AND OPERATOR\EMPLOYEE RESPONSIBILITIES LISTED ARE ONLY A GUIDELINE. THERE ARE OTHER RESPONSIBILITIES, AS DICTATED BY THE UNIQUENESS OF EACH INSTALLATION, FOR WHICH THE OWNER\EMPLOYER AND OPERATOR\EMPLOYEE ARE RESPONSIBLE.**

## **OWNER \ EMPLOYER RESPONSIBILITY'S**

The employer shall properly maintain mobile equipment to meet all applicable regulatory safety standards and shall be responsible for:

1. Providing instruction and training in safe methods of work to employees before assigning them to operate clean, service, maintain, or repair the equipment. Such instruction and training shall include procedures provided by the manufacturer.
2. Monitoring the employee's operation of equipment and taking appropriate action to ensure proper use of the equipment, including adherence to safe practices.
3. Establishing and following a program of periodic and regular inspections of all equipment to ensure all parts, component equipment, and safeguards are in safe operating condition and adjusted in accordance with the manufacturer's recommended procedures. This shall include keeping all malfunction reports, and records of inspections and maintenance work performed.
4. Repairing, prior to placing equipment into service, any mechanical malfunction or breakdown that affects the safe operation of the equipment.
5. Ensuring the hoist will not be used to lift and haul any weight that is believed to exceed the load rating of any of the individual components of the entire piece of equipment (Ex: hoist, tires, truck chassis, suspension, ...etc.)
6. Ensuring component equipment, bodies, or hoist, when raised for service or maintenance, have additional support by utilizing hoist props, and/or any other means necessary as each situation dictates.
7. Following the manufacturer's lockout procedures.

On hoists that carry detachable containers, the employer shall affix a sign or mark near the cab on the driver's side stating the minimum overhead clearance required for the vehicle height dimension when all equipment, including the container, is positioned for normal over-the-road travel.



## **HOIST START-UP PROCEDURE**

**OPERATOR IS RESPONSIBLE FOR COMPLIANCE WITH LOCAL, STATE, AND FEDERAL WEIGHT REGULATIONS.**

### **!! CAUTION !!**

**PROPERLY TRAINED PERSONNEL SHOULD OPERATE THIS EQUIPMENT. THE HOIST SHOULD NOT BE USED TO LIFT AND HAUL ANY WEIGHT THAT IS BELIEVED TO EXCEED THE LOAD RATING OF ANY OF THE INDIVIDUAL COMPONENTS OF THE ENTIRE PIECE OF EQUIPMENT. (EX. HOIST, TIRES, TRUCK CHASSIS, SUSPENSION, ETC....) IMPROPER USE, MISUSE, OR LACK OF MAINTENANCE COULD CAUSE INJURY TO PERSONS AND OR DAMAGE TO PROPERTY.**

### **!! WARNING !!**

**DO NOT ATTEMPT TO OPERATE THE HYDRAULIC SYSTEM BEFORE FILLING HYDRAULIC TANK WITH HYDRAULIC OIL.**

- Step #1: Grease all working points on hoist.
- Step #2: Fill hydraulic system with a good grade of S.A.E. hydraulic oil, such as:  
Shell-Turbo 46, Tellus 46  
Citgo-Pacemaker 46, Tellus AW46  
Exxon-Teresstic 46, Nuto 46  
Chevron, AW46  
Texaco-Rando 46  
Unical - Duro 46
- Never use a foaming type (detergent) hydraulic oil.
- Step #3: Recheck all clearances before raising hoist.
- Step #4: Slowly extend all cylinders and add balance of oil required.
- Step #5: Check all clearances with hoist in raised position.
- Step #6: Cycle single stage cylinders at least twice to purge air from system. Air must be bled from telescopic cylinders through bleeder screws located at the ends of the cylinder.
- Step #7: All hydraulic connections and components should be checked for leaks while system is under pressure.

## **OPERATIONAL PROCEDURE**

The following information is a guideline for operating a Roll-Off Trailer. These instructions do not exhaust every possible situation that could occur when operating the equipment, but are intended to promote efficient and proper operation.

### **!!WARNING!!**

#### **BEFORE OPERATING THIS EQUIPMENT**

1. **BE SURE** the area is clear of people.
2. **CHECK** the area for low power lines or any other obstacle which may interfere with hoist operation.
3. **NEVER** operate equipment which is damaged and \ or improperly maintained.
4. **ALWAYS** operate the equipment within its rated capacity.
5. **STUDY** this entire manual and become properly trained with this equipment before attempting to operate.
6. **RESPECT** yourself, others, and this equipment. Use safe working habits and common sense when operating this equipment.

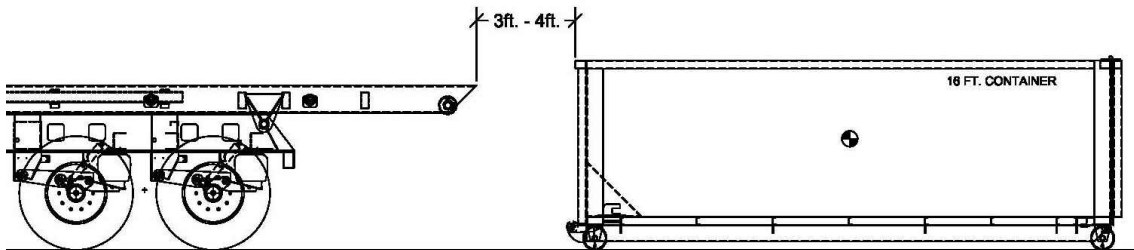
### **!!WARNING!!**

**FAILURE TO FOLLOW THE ITEMS LISTED ABOVE MAY RESULT IN DAMAGE TO EQUIPMENT AND \ OR TO PERSONS.**

## **OPERATIONAL PROCEDURE**

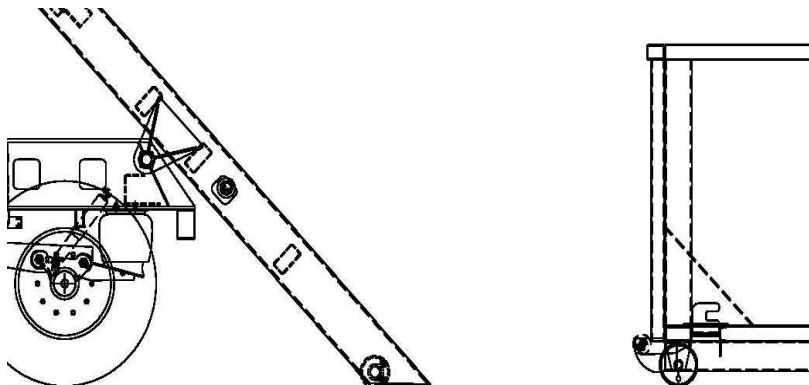
### **RECOMMENDED LOADING PROCEDURES**

- Step #1: Align the truck and trailer with the with the center of the container, back up the truck and trailer squarely as possible to the container. Allow approximately 3–4 ft. between the container and rear of trailer.  
**See Figure A.**



**Figure A**

- Step #2: Put the transmission in neutral and engage the P.T.O. Set the brakes on the trailer and release the brakes on the truck. Go to the hydraulic control station on the trailer.
- Step #3: Raise the hoist on the trailer until the tail touches the ground.  
Note: Do not allow the hoist to lift the rear of the trailer off of the ground. **See Figure B.**



**Figure B**

Step #4: Connect the cable end to the container hook.

## **!! DANGER !!**

**Check to be sure the cable connection is securely attached and in good working condition.**

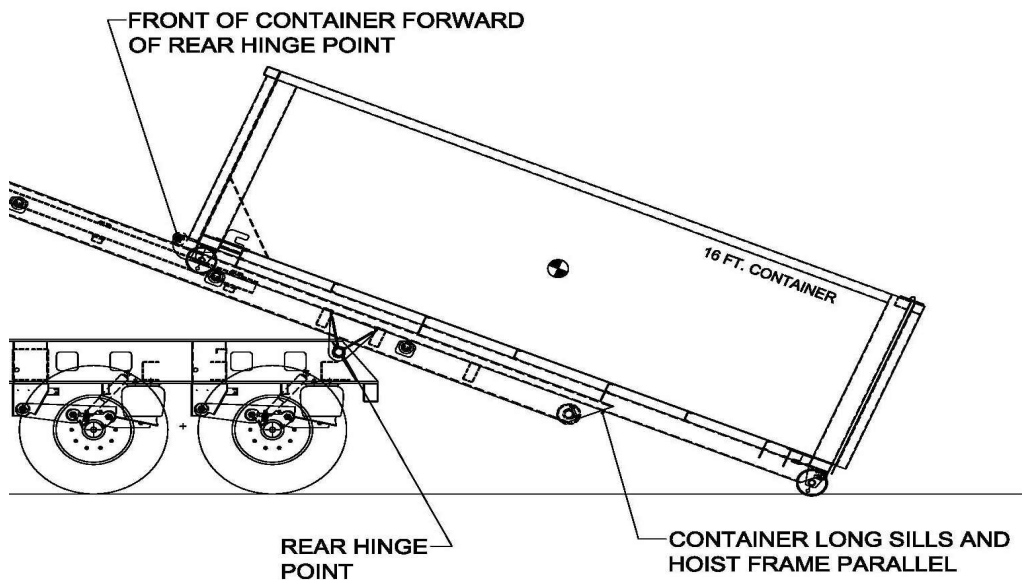
Step #5: Release the trailer brakes. Pull the container onto the hoist allowing the truck and trailer to roll under the container.

## **!! CAUTION !!**

**Be absolutely sure the container long sills are lined up on the hoist properly.**

Step #6: Continue pulling the container onto the hoist. After the container front nose rollers are ahead of the hoist rear hinge point, lower the hoist enough to keep the container long sills and hoist rails in line and parallel with each other.

**See Figure C.**



**Figure C**

Step #7: After the Center of Gravity (C.G.) of the container is past the rear hinge point of the hoist, lower the hoist completely.

## **!! CAUTION !!**

**Do not attempt to power the hoist down before the C.G. of the container is forward of the rear hinge point of the hoist. Failing to do so can cause excessive stress and \ or damage to the equipment.**

Step #8: Pull the container completely forward to the front of the hoist frame. Make sure container is pulled securely into front stops. Secure container to trailer using the side strap winches.

## **!! CAUTION !!**

**THE CONTAINER AND HOIST MUST BE EQUIPPED WITH THE PROPER FRONT STOPS AND SECUREMENT DEVICES. THE CONTAINER SPECIFICATIONS MUST MATCH THE HOIST SPECIFICATIONS. (EX: ROLLER SIZE & LOCATION, PROPER STYLE HOOK-UP, SPACING BETWEEN LONG SILLS, ETC...) THE CONTAINER AND HOIST MUST BE IN GOOD WORKING ORDER. NON-COMPLIANCE COULD RESULT IN DAMAGE TO EQUIPMENT AND \ OR INJURY TO PERSONS AND IS THE OPERATOR \ OWNER'S RESPONSIBILITY.**

## **GENERAL SERVICE & MAINTENANCE**

1. Daily check should be made of the cable, cable ends, lights, and an inspection of bolts, pins, and brackets to insure their safe and proper working condition. (Make repairs, if necessary, before using.)
2. Grease : All grease fittings should be properly greased every forty (40) hours of service as a minimum, or once a week for average usage. NOTE: With severe or heavy usage, greasing may be required in less than forty (40) hours of service.
3. Hydraulic Oil: Use any of the following hydraulic oils  
Shell-Turbo 46, Tellus 46  
Citgo-Pacemaker 46, Tellus AW46  
Exxon-Teresstic 46, Nuto 46  
Chevron, AW46  
Texaco-Rando 46  
Unical - Duro 46  
Hydraulic oil should be checked daily and added if needed. Oil that is dirty or smells burned should be replaced. If in cold weather, before using a thinning agent, check with the oil manufacturer.
4. Cable: The cable should be thoroughly inspected every day for breakage, unraveling, or flat spots. If any of these signs exist the cable should be replaced immediately.

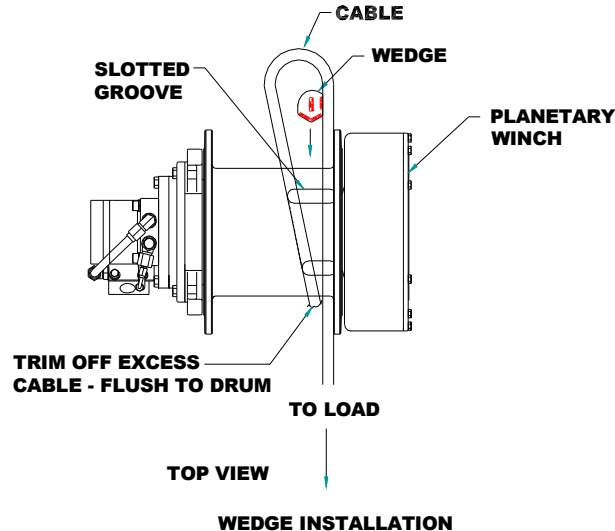
### **!! NEVER !!**

**Operate the roll-off trailer with a damaged cable. Cable ends, cable clamps, and cable pins should also be inspected for wear or damage. Replace any worn or damaged part before operation.**

5. Hydraulic Oil Return Line Filter: The oil filter should be replaced after thirty 30 days of service and regularly thereafter on a routine maintenance program.
6. Mechanical: All nuts, bolts, shafts, cotter keys, etc. must be checked and properly re-tightened after one (1) week of service and once a month thereafter.
7. Axle Wheel Ends: Check oil in axle wheel ends and fill to the full line. DO NOT OVERFILL.
8. Suspension: Daily visual inspection is recommended for all suspension components. After the suspension has been in operation for 1,000 miles, all nuts and bolts should be checked and tightened according to the manufacturer's recommendations (supplied with trailer inside of toolbox). Dragon Products, Ltd. recommends a regular periodic inspection of the suspension, such as every 6 months or 20,000 miles of service.

## **CABLE REPLACEMENT PROCEDURE**

1. 40,000 lb. Hydraulic Planetary Gear Main Winch  
Tulsa Winch Model: 3541RLB  
Cable Size: 7/8" Dia. EXIWRC 6 x 36  
Step #1: Unwind the cable by rolling it out along the ground to prevent kinking. Securely wrap the cable end, opposite hook, with tape to prevent fraying.  
Step #2: Insert the cable end, opposite hook end, into the slotted groove on drum (NOTE: insert through the load side of winch). Loop loose end of cable back through slotted groove. Insert the cable wedge inside of cable loop, with appropriate labeled side toward load side of cable. NOTE: Load side of cable should be against flange side of drum (See Figure below).



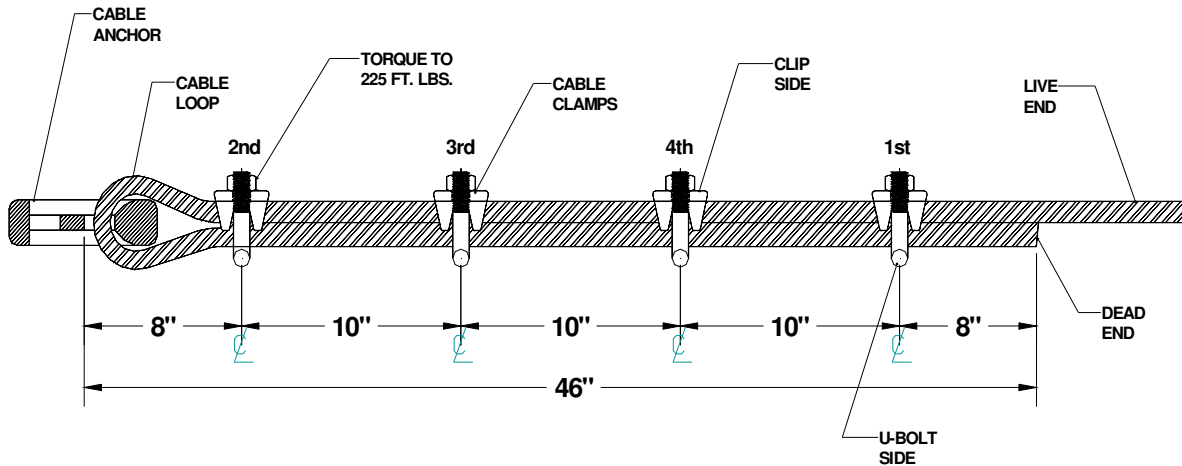
Pull on cable to securely "cinch" cable and wedge into slotted groove. Trim off excess cable sticking through drum.  
Note: Make sure wedge is securely positioned inside of the slot.

- Step #3: Carefully run the winch in the "reel-in" direction, keeping tension on the end of the cable, spooling all the cable onto to cable drum. Take care to form neatly wrapped layers.
- Step #4: A winch, like and other machinery, must be "broken-in" if it is to perform properly. DO NOT overspeed the winch during initial cable installation. Run the winch at no more than one half rated load and speed for the first thirty minutes.

## **CABLE REPLACEMENT PROCEDURE**

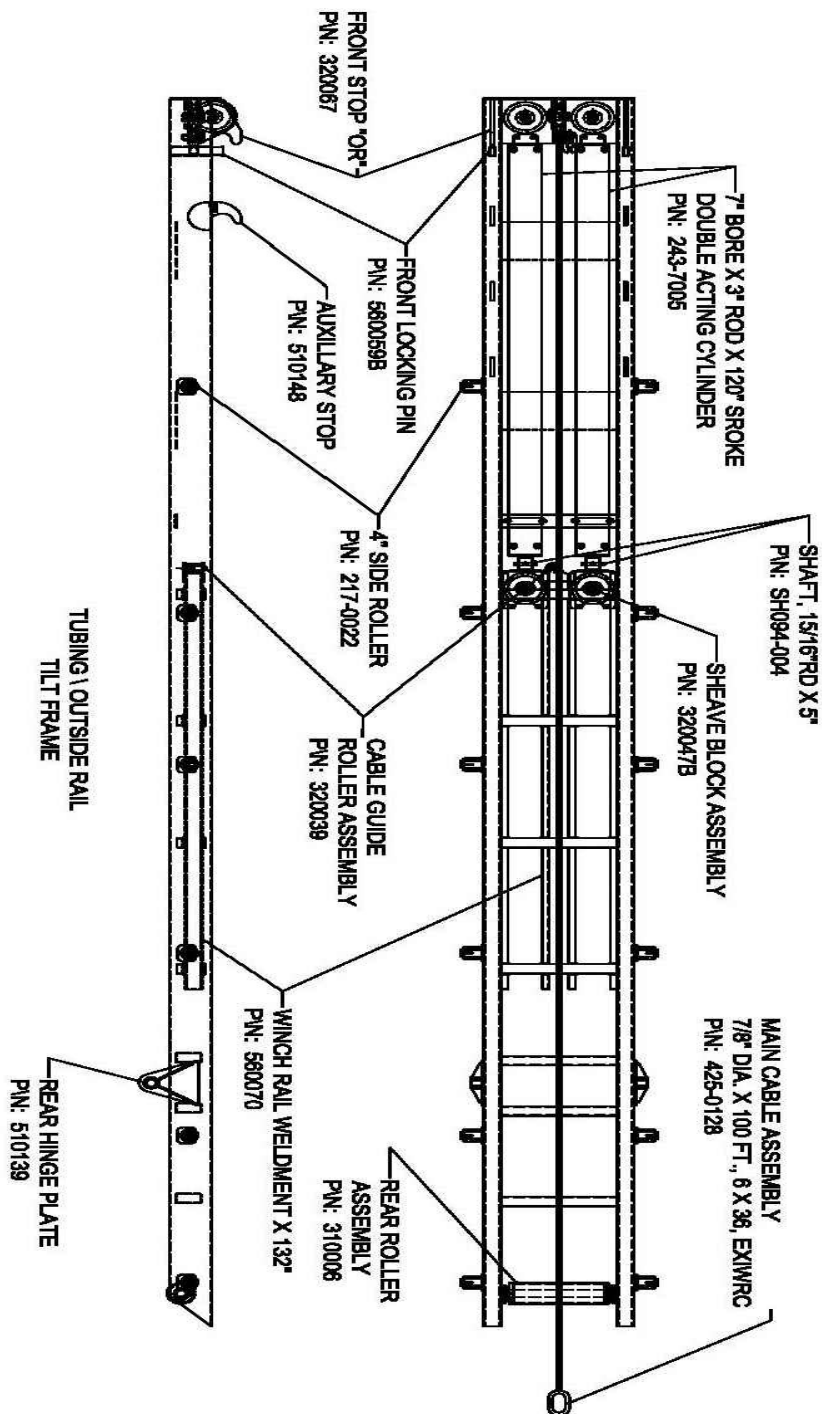
6. Reeving Style - Hydraulic Cylinder and Sheave Arrangement  
Cable Size: 7/8" Dia. EXIWRC 6 x 36 – 100 ft. (P/N: 425-0128)

- Step #1: Thread cable through sheaves and guides.
- Step #2: Loop cable through cable anchor.
- Step #3: Install cable clamps according to the diagram below
- Step #4: Torque all cable anchor bolts evenly to 225 ft. lb.  
Cut off excess cable.

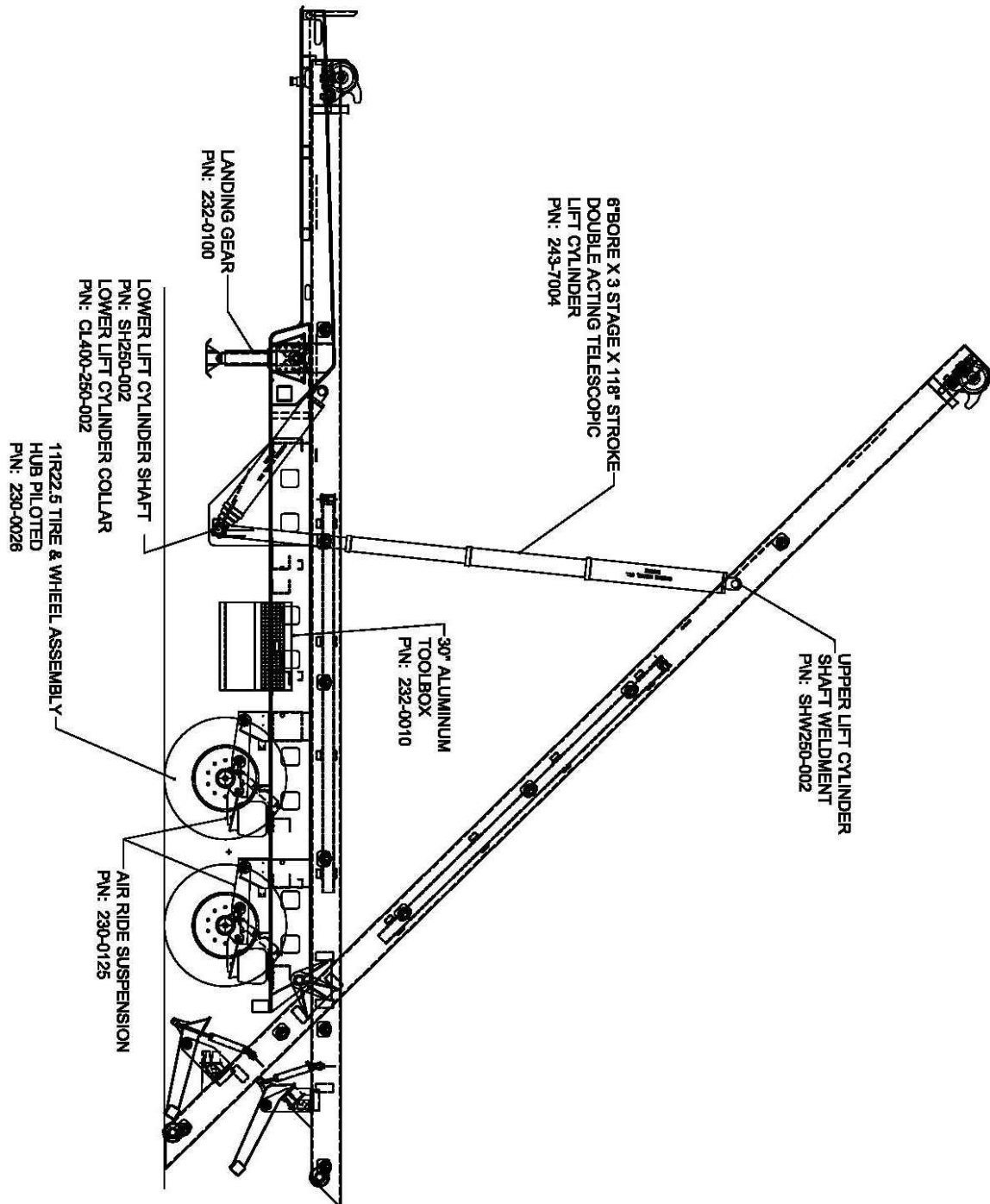




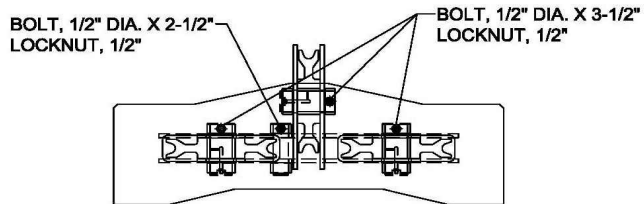
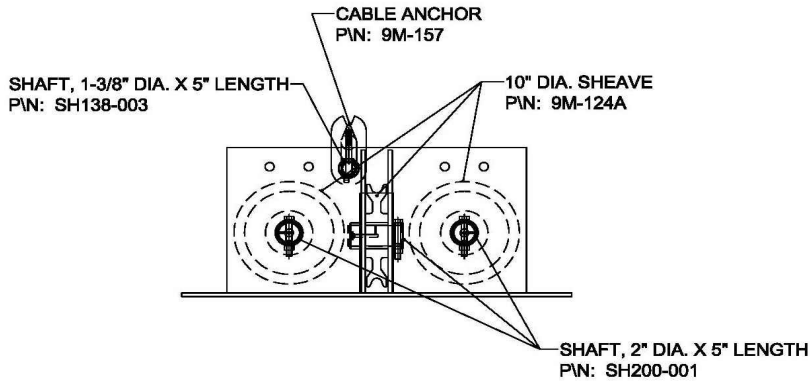
## REPLACEMENT PARTS LIST



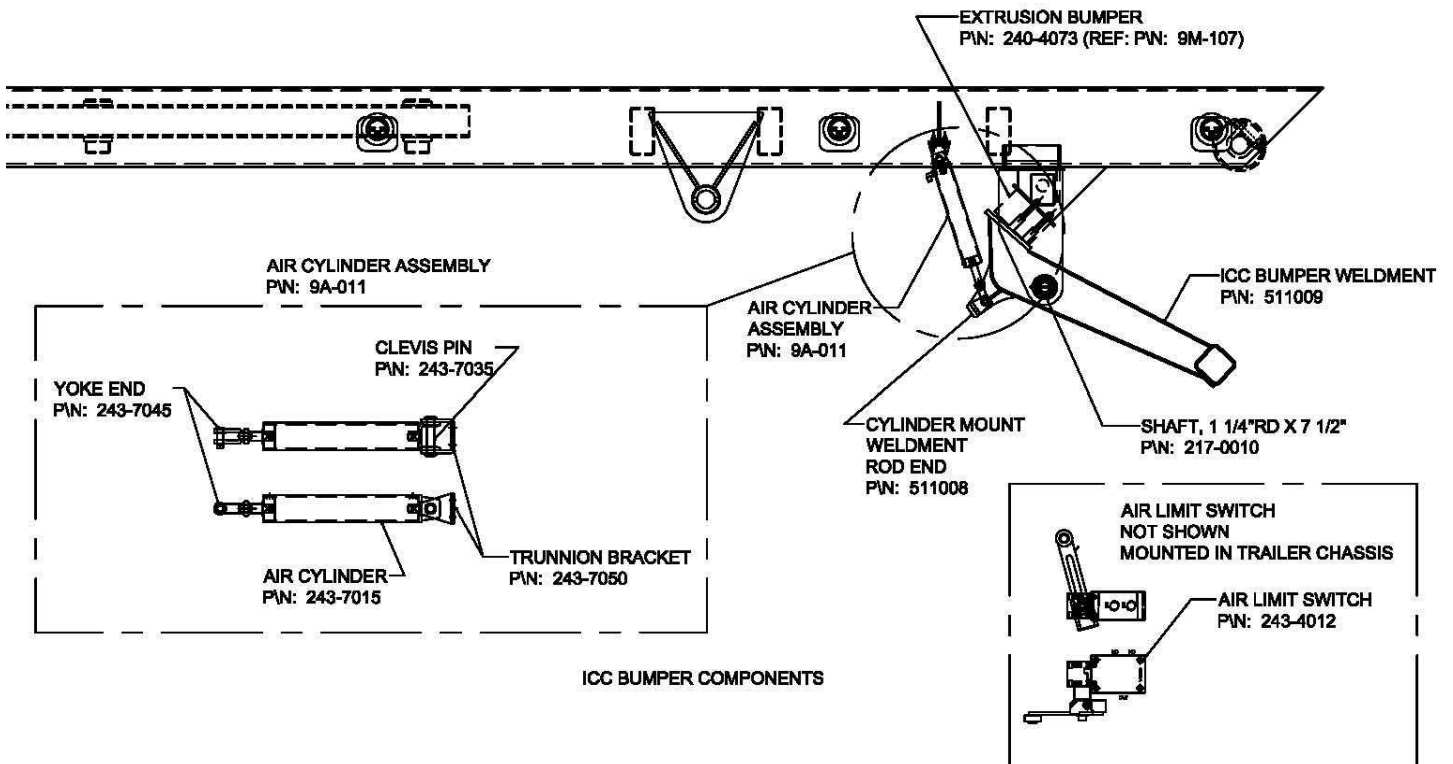
## REPLACEMENT PARTS LIST



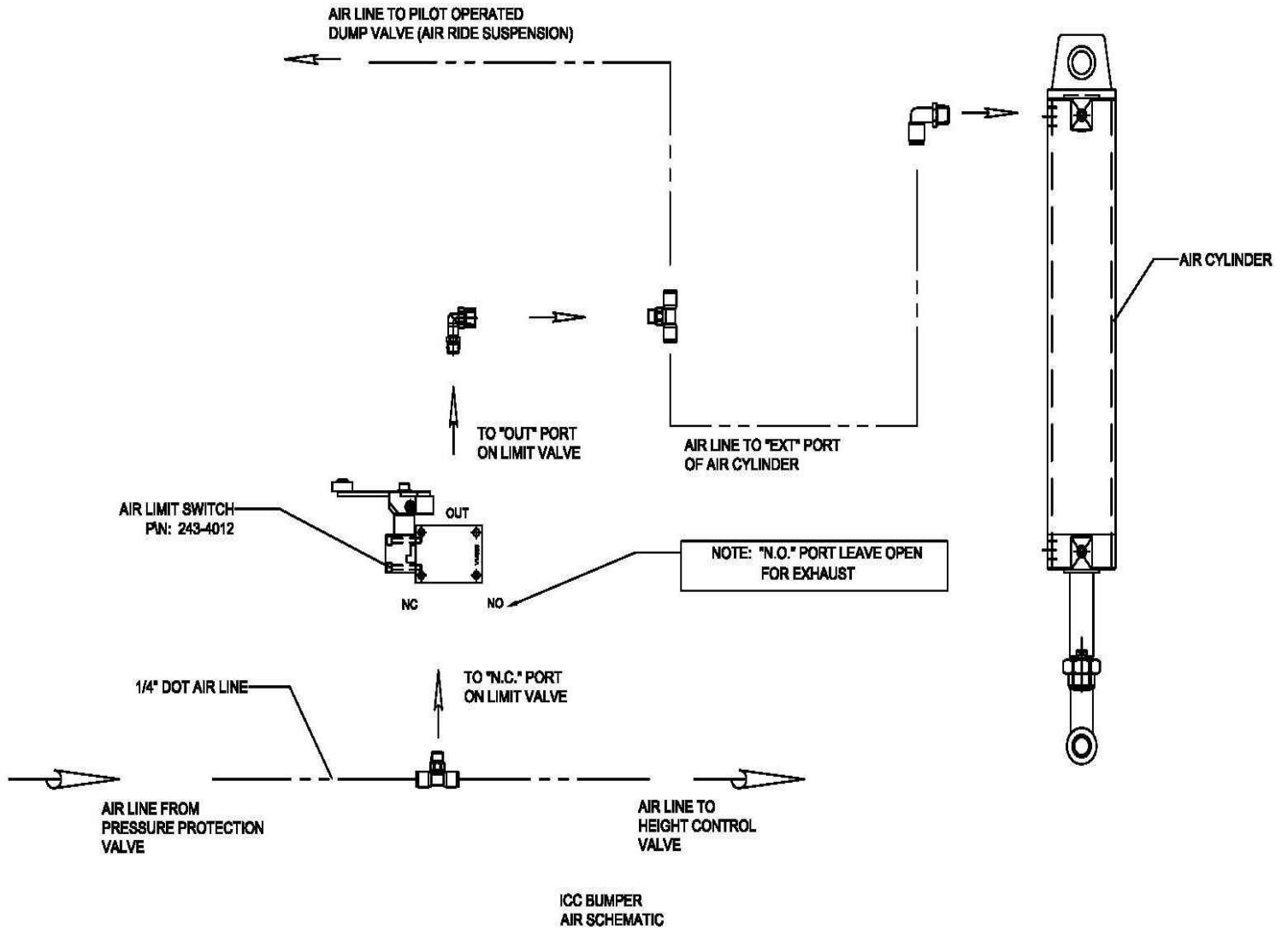
## REPLACEMENT PARTS LIST



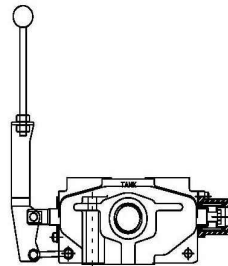
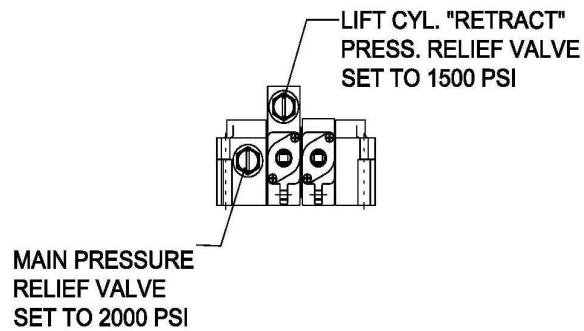
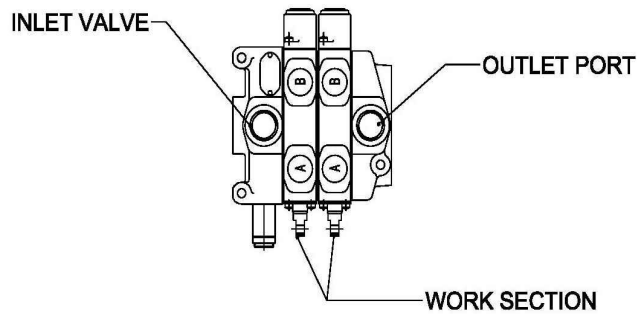
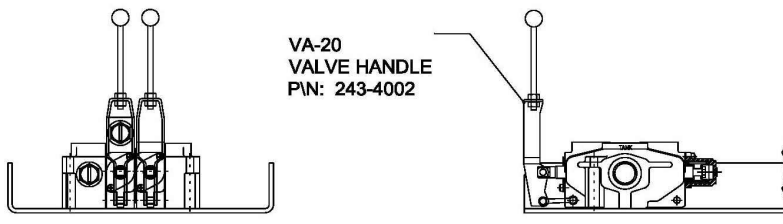
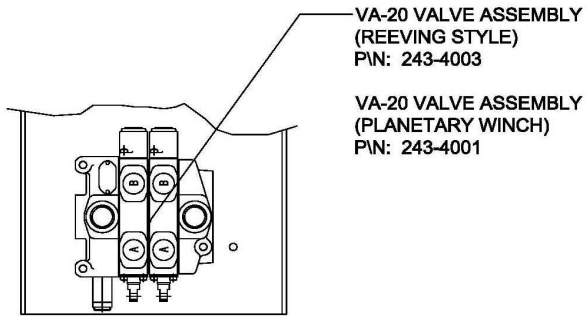
FRONT SHEAVE ASSEMBLY COMPONENTS



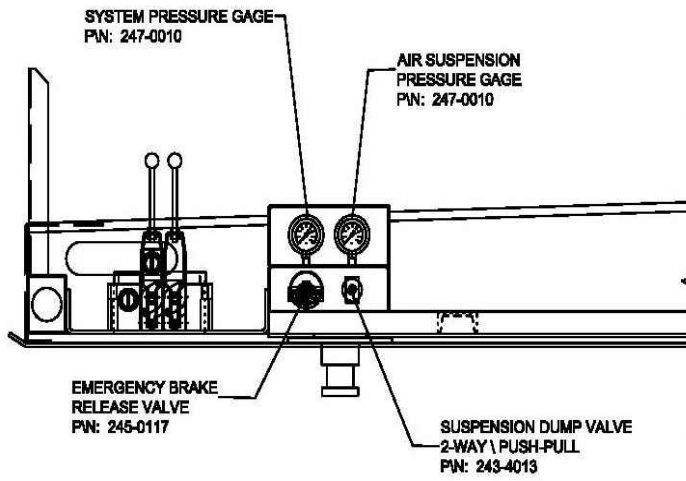
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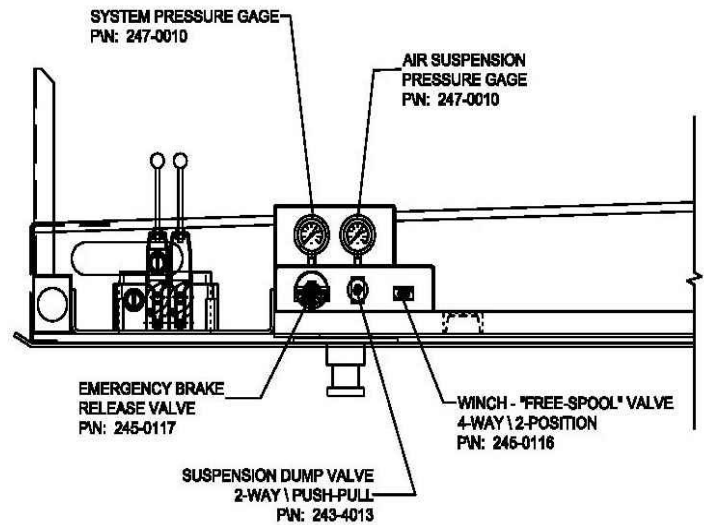
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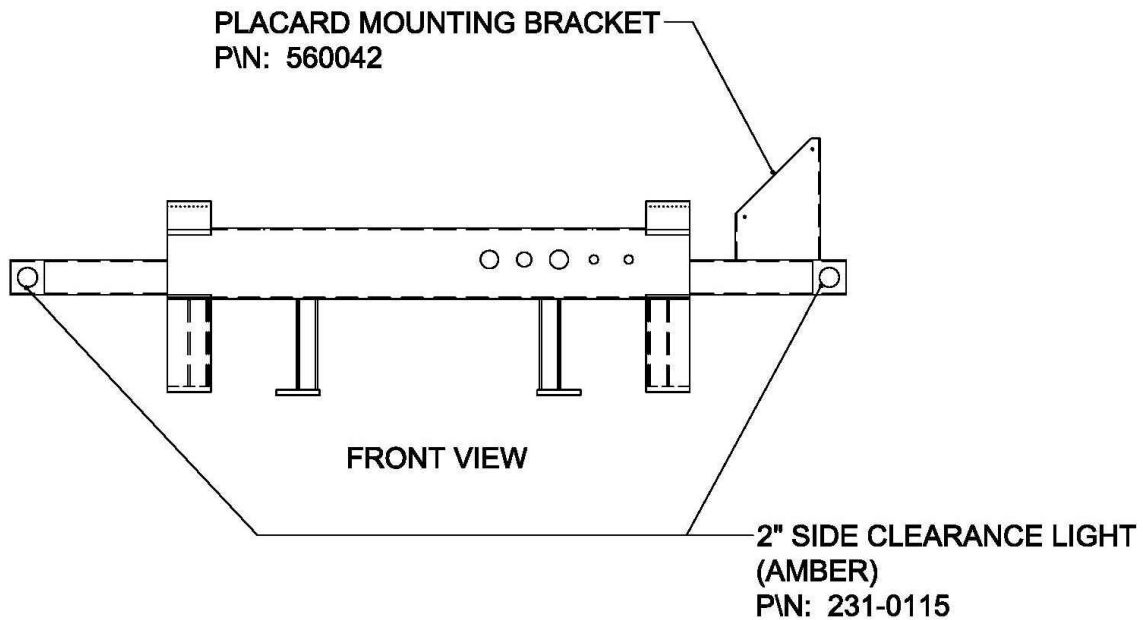
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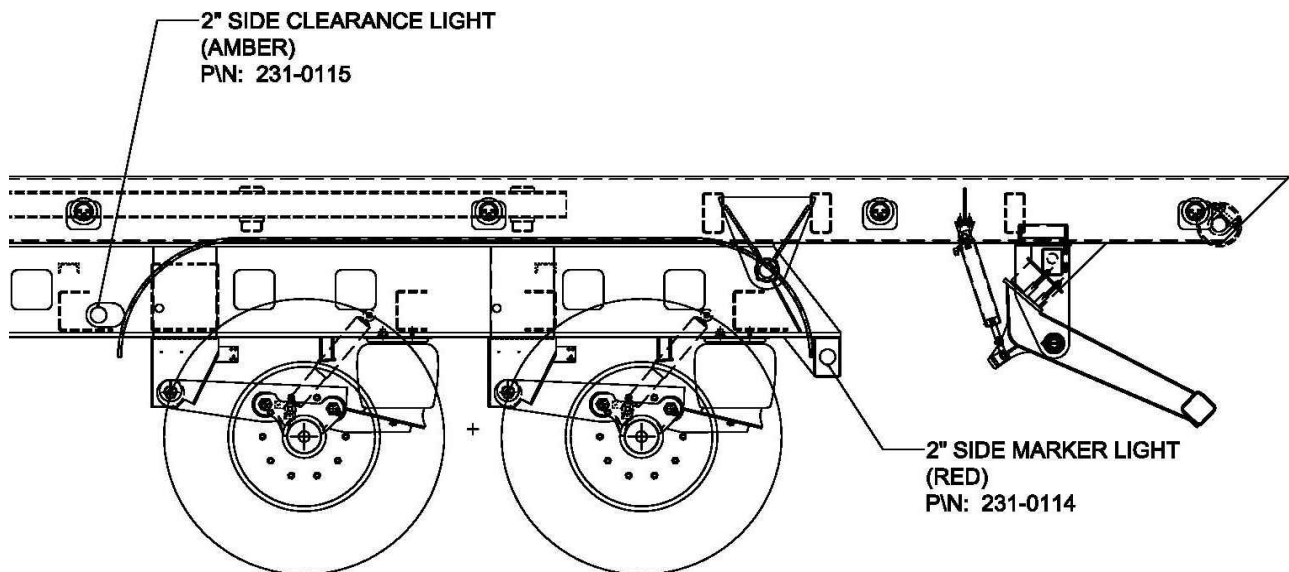
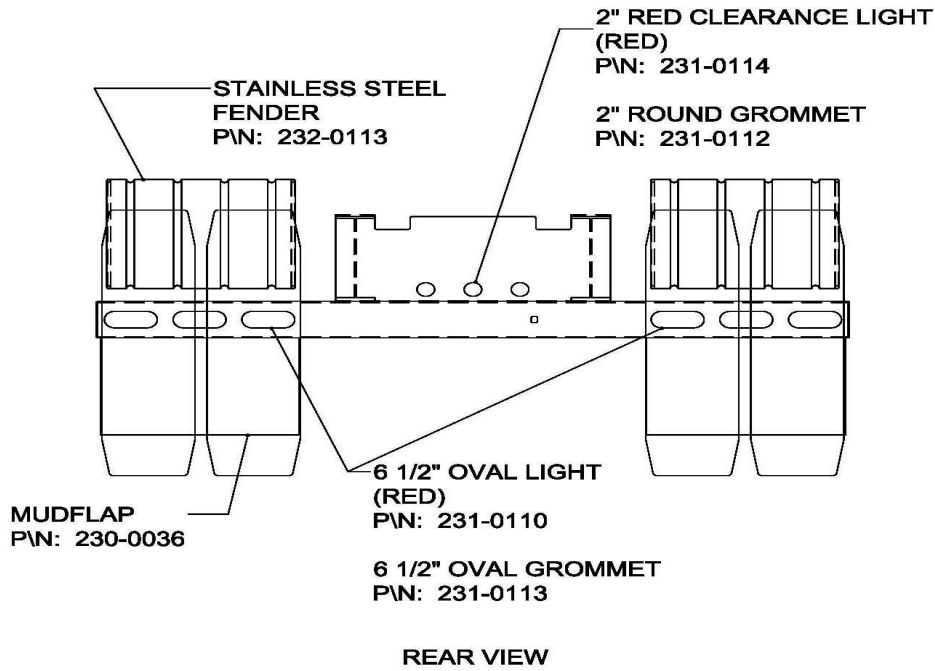
REEVING SYSTEM CONFIGURATION



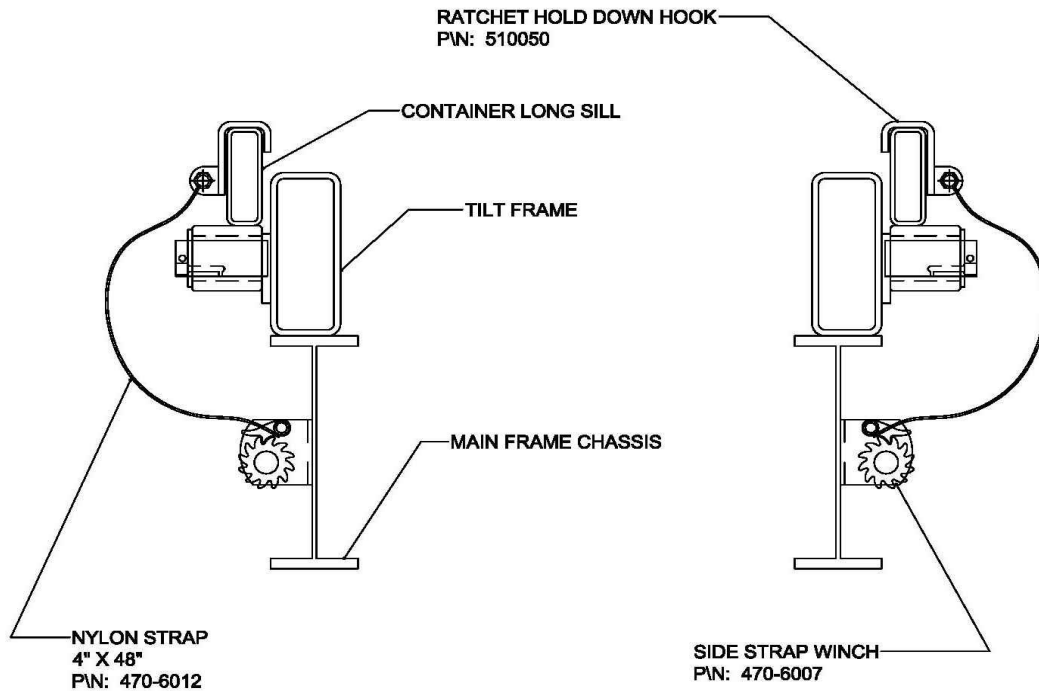
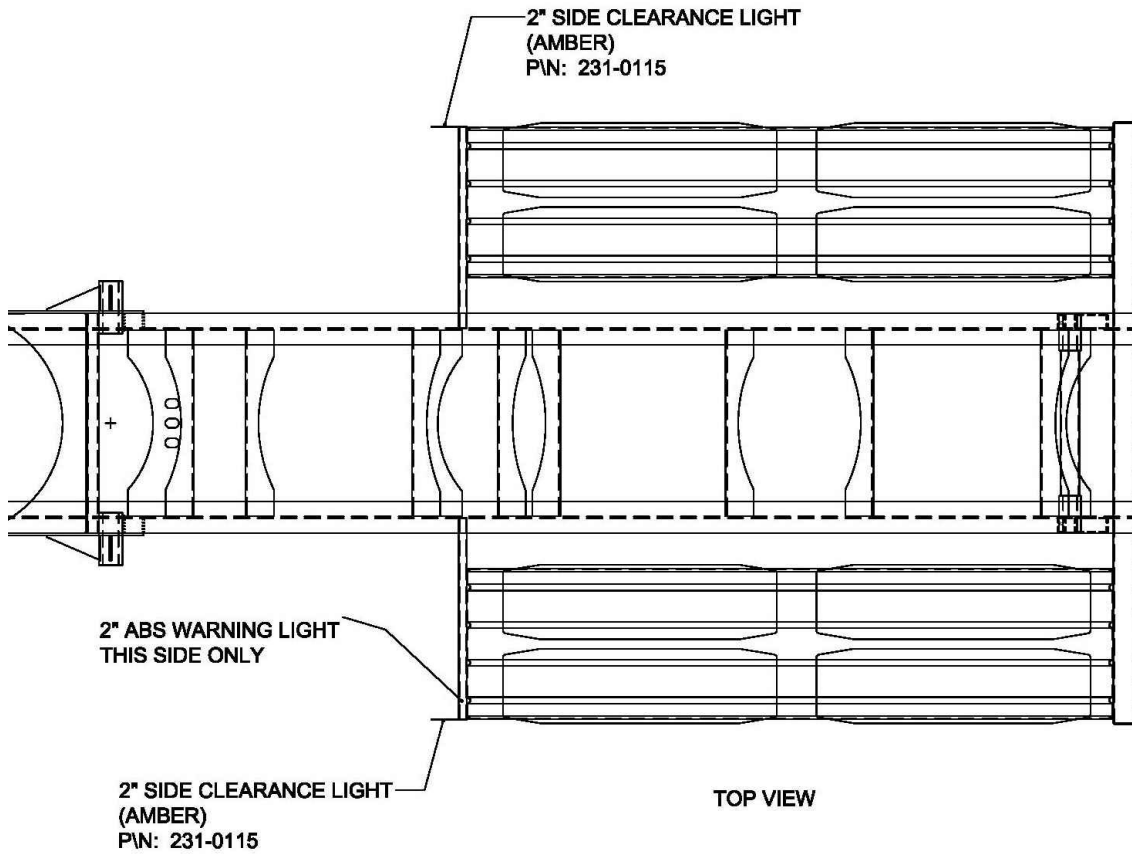
PLANETARY WINCH SYSTEM CONFIGURATION



## **REPLACEMENT PARTS LIST**



## REPLACEMENT PARTS LIST





## Warranty Information

### TRAILER PRODUCTS LIMITED WARRANTY

Effective May 12, 2003

Dragon Products, Ltd. warrants only products of its manufacture against operational failure caused by defective materials or workmanship which occur during proper and normal use. Dragon Products, Ltd.. reserves the right to determine what is proper and normal use.

Warranties shall not apply to normal wear and tear, maintenance, service, adjustments, any equipment which has been altered or repaired in any way, or any items subject to misuse, negligence or accident.

Dragon Products, Ltd. makes no warranty on any of its equipment used in any way except as it was designed, intended, and sold to perform. These may be restricted and are subject to individual state guidelines.

#### **Structural I-Beam Main Frame Design**

The duration of this warranty is as follows:

1. Trailer Main Frame – 1 year from the date of purchase from Dragon Products, Ltd.
2. All products purchased by Dragon Products, Ltd. from an outside vendor shall be covered by the warranty of that respective vendor only. Dragon Products, Ltd. does not participate in or obligate itself to any such warranty.

#### **Structural Tubing Tilt Frame Design**

The duration of this warranty is as follows:

1. Tilt Frame – 1 year from the date of purchase from Dragon Products, Ltd.
2. All products purchased by Dragon Products, Ltd. from an outside vendor shall be covered by the warranty of that respective vendor only. Dragon Products, Ltd. does not participate in or obligate itself to any such warranty.

All products purchased by Dragon Products, Ltd. from an outside vendor shall be covered by the warranty of that respective vendor only. Dragon Products, Ltd. does not participate in or obligate itself to any such warranty.

Dragon Products, Ltd. uses high strength materials in the design of structural load bearing members of our trailer products. These materials require the appropriate welding techniques. Any work performed or required on these structural load bearing components without the consent or approval of Dragon Products, Ltd. authorized personnel shall null and void all appropriate warranties.

**Dragon Products, Ltd.. shall not, under any circumstances, be liable for labor for removal and installation expenses, loss of time, manufacturing costs, materials, loss of profits, incidental, special or consequential damages, direct or indirect.**

A return authorization number must be obtained from authorized Dragon Products, Ltd.. personnel prior to returning any products for warranty consideration. All claims must be accompanied by a complete written explanation of claimed defects and the circumstances of operational failure. Products returned for warranty consideration shall be shipped to Dragon Products, Ltd., freight prepaid, with the return authorization attached. In the event a product is repaired under warranty, that product shall carry the remainder of the original warranty period. In the case of emergencies, an authorization number must be obtained the next business day.

This limited warranty is expressly in lieu of all other warranties, expressed or implied, and of all other obligations or liabilities on the part of Dragon Products, Ltd. and it neither assures nor authorizes any other person to assure to it any other liability or connection with the sale herein contemplated.

**What is *not* covered by this warranty:**

**Dragon Products, Ltd. DOES NOT warrant:**

- (a) Any product, components or parts not manufactured by Dragon Products, Ltd.
- (b) Damage caused by use of the trailer for purposes other than those for which it was designed.
- (c) Damage caused by accident or the negligence of the purchaser or any third party or by disasters such as fire, flood, wind and lightning.
- (d) Damage caused by the purchaser's failure to provide normal maintenance as customarily accepted in the industry or as set forth in maintenance guidelines.
- (e) Tires, bearings, bushings, and parts which are a part of normal maintenance replacement.
- (f) Damage caused by unauthorized or improper installation of attachments, repairs, modifications or alterations.
- (g) Damages caused by replacement of original parts or components with unauthorized substitutes.
- (h) Damage during shipment.
- (i) Any other abuses or misuse by the purchaser.