



Sherman + Reilly™ Revolution Series

PLW-400 Pilot Line/Drum Puller

Operator Manual

Rev. December 2015

Table of Contents

Introduction.....	6
Liability	7
Specifications.....	8
General Overview: PLW-400	8
Specifications Details.....	9
Safety.....	10
Hazard Overview	10
General Warnings.....	11
Operator Safety Precautions	12
Employer Safety Precautions.....	13
Pre-Operation Inspection	14
Safety.....	15
Terms You Need to Know PLW-400	15
.....	15
Operation	17
Control Panel PLW-400.....	17
Operator Controls.....	18
Levelwind/Drum Joystick.....	19
Quick Start Guide.....	21
Towing and Road Safety	23
Positioning the Machine.....	25
Start-Up Procedure.....	26
Throttle	26
Safety Brake.....	27

Payout Operations.....	28
Pulling Operations - Tensioning.....	31
EMERGENCY WHILE PULLING.....	33
Troubleshooting	34
Cab Lights	37
Climate Control / Heating + A/C.....	37
Reel Drive Coupling Shifter.....	38
Filling the Reel	38
Service	39
Safety Precautions	40
Hydraulic System.	41
Cab Windshield.....	41
Engine Service.....	41
Parts.....	44
PUMP ASSEMBLY	44
HYDRAULIC TANK ASSEMBLY	45
DRUM ASSEMBLY	47
DRIVE MOTOR ASSEMBLY	50
LEVELWIND ASSEMBLY	50
WHEEL AND AXLE ASSEMBLY	52
TRAILER LIGHTING	53
TROUBLESHOOTING	55
Quick Tips	55
AIR PLUMBING DIAGRAM (ABS AIR BRAKES).....	56
TRAILER LIGHTS SCHEMATIC	59
Heater Assembly Schematic	60
TORQUE SPECIFICATIONS.....	61
Appendices	64
<ul style="list-style-type: none"> • Torque Procedure for Hydraulic Fittings • Engine Manual – Kubota (on CD-ROM) 	

Introduction

It is important that every machine is operated in a safe manner. To properly, safely operate this machine, it required that operators and service people read and understand the information in this and the engine manufacturer's manual. ANYONE working around the machine should read the safety precautions in the manuals. Be aware each warning and precaution is to help protect against needless injury. Taking unnecessary risks and ignoring warnings is the primary cause of personal injury and fatal accidents in the work place. If you have any questions regarding operation or safety of a procedure or situation, contact the Sherman+Reilly™ Customer Service Manager at 1-800-251-7780.

This manual is of no value if the operator does not read and understand the instructions and precautions (before starting and trying to operate the machine).

The operator must be aware of the machine's capacities and limitations.

It is the operator's responsibility to watch for situations and conditions which could affect the normal performance of the machine and safety in the work area.



Publication of this manual and the safety precautions in it does not in any way represent an all-inclusive list. It is the operator's responsibility to make sure the machine is operated in accordance with all state and local safety requirements and codes, including all applicable OSHA (Occupational Safety and Health Act) and ANSI (American National Standards Institute) regulations.

Sherman + Reilly also recommends following the guidance published by the Institute of Electrical and Electronics Engineers (IEEE), and specifically IEEE Standard 524 – Guide to the Installation of Overhead Transmission Line Conductors (IEEE 524-2003 or Subseq.).

Should a problem or unsafe condition arise, shut the machine down using the normal shutdown procedure. In the event of an emergency, use the emergency stop procedure.

- Turn ignition key off, then apply the emergency -parking brake by pressing the SAFETY BRAKE OVERRIDE switch to "STOP".
- Notify the proper authority or follow your employer's prescribed procedure for an emergency situation.

Sherman + Reilly strongly recommends that only personnel that are literate in the English language and who verbally understand the English language be considered as operators or service personnel for this machine.



Liability

Publication of this manual and the safety precautions in it does not in any way represent an all-inclusive list and should not be interpreted as an all-inclusive comprehensive list of precautions and procedures. It is the operator's responsibility to make sure the machine is operated in accordance with all state and local safety requirements and codes, including all applicable OSHA- (Occupational Safety and Health Administration) and EPA- (Environmental Protection Agency) regulations, as well as ANSI- (American National Standards Institute) accredited standards. . If you have questions regarding any operational steps or the safety of a procedure listed in this manual, contact Sherman+Reilly at 1-800-251-7780 or 423-756-5300.

Should a problem or unsafe condition arise, shut the machine down using the normal shut-down procedure. In the event of an emergency, use the Emergency Stop procedure described on page 21 of this manual, and then notify the proper authorities or follow your employer's prescribed procedure for an emergency situation.

Sherman+Reilly strongly recommends that only persons who have a full understanding of the provided manual and who are competent in the use of overhead line pulling and tensioning machines, to include all applicable laws, regulations, and safety standards, be allowed to operate this machine. There are significant hazards inherent to the use of this machine; therefore, all operators should be educated on all functions, procedures, and safety measures outlined in this manual prior to their use or maintenance of this machine.

Specifications

General Overview: PLW-400



The Sherman + Reilly™ PLW-400 is a multi-purpose pilot line winder for pulling heavy overhead ropes as well as for pulling overhead distribution, sub-transmission, and some transmission-class conductors. A waterfall reel design permits overhead pulling of up to four lines/ conductors at a time. This puller has the power to handle big jobs in a single, compact, and adaptable configuration, helping to stretch equipment budgets and enhancing operational flexibility.

The PLW-400 is equipped with an ACG (advanced control group). This allows a single operator to control payout speed, tension, and overspin independent electronic payout brake adjustment and joystick operation. Four hydraulically-driven, manually controlled levelwinds help assure an even distribution of rope when rewinding or pulling, minimizing the risk of tangles and maximizing rope life.

The PLW-400 is equipped with a 84 hp industrial diesel engine capable of delivering a full 4,000 lbs. line pull (at the top of each drum loaded with 12,000 feet of 5/8 inch synthetic pulling rope) enabling operation independent of other sources of power and hydraulics. The tandem axle trailer is equipped with a hydraulic front and rear leveling jacks, adjustable pintle eye, safety chains, US DOT LED lighting, and new Synchro Drive Drum Engagement System.



Key Features

- 12,000 ft. capacity for 5/8 inch rope
- Full enclosure Safe-Zone™ Cab with HVAC
- Waterfall design for concurrent deployment of 4 (four) lines
- Pay-out brakes, electronically operable from the cab
- ACG (Advanced Control Group)
- Synchro Drive™ Drum Engage System
- Electro-damping Brake System

Specifications Details: PLW-400

(Dimensions, weights, and capacities listed are approximate. All specifications are subject to change without notice.)

Pulling Capacity	4,000 lbs. <i>rated at the top of drum</i>	
Max Line Speed	4 mph <i>average</i>	
Max Torque	95,000 in.-lbs.	
Pulling Drum (4)	Core Diameter:	12 ¾ in.
	Total Width:	27 ¾ in.
	Flange Diameter:	54 in.
Drum Capacity	12,000 ft. of .625 in. rope	
	(Opt.) 22,000 ft. of .44 in. Unitrex	
rope Drive System	Hydraulic motor, chain and	
sprocket Engine	Diesel, 84 HP, water cooled	
Fuel Capacity	27 gallon	
Hydraulic Fluid	ISO Grade 32	
Hydraulic Reservoir (Main)	35 gallon	
Hydraulic Fluid Filtration	10 microns	
Drum Locking Dogs (4)	Manually engaged	
Payout Brake	Hydraulic disc-caliper, electronically adjusted	
Levelwind (4)	Hydraulically driven, electrically controlled	
Operator's Safety Enclosure	Safe-Zone™ Cab, fully-enclosed/double door	
Frame Construction	Steel tubing, continuous weld	
Length (Overall, Nom.)	21 ft., 4	
in.		
Width (Overall, Nom.)	8 ft.	
Height (Overall, Nom.)	10 ft., 10 in	
Weight (Overall, Nom., Without Rope)	22,500 lbs.	
GVWR	33,500 lbs.	
Suspension	Leaf spring	
Axle Configuration	Tandem	
Wheel Configuration and Tires	Dual, 215/75R 17.5	
Brakes (Trailer)	Electric, with break-away switch	
Towing Attachment	3 in. adjustable pintle eye, w/2 safety chains and hooks	
Tie Downs (4)	1 in. dia. steel D-	
Rings Rear Jacks (2)	Hydraulic, with shoe	
Front/Nose Jack	Hydraulic, with shoe	
Electrical System	12 VDC	
Battery	12 V, group 24	
Lights / Navigation	12 V LED, US DOT	
Grounding (4)	.75 in. dia. copper-clad steel loops	
Wheel Chocks and Holders	Standard	
Fire Extinguisher	ABC	
Color	S+R White	



S+R REVOLUTION SERIES PLW-400 Pilot Line/Drum Puller

Safety

Hazard Overview

Please pay attention to all safety warning labels and information placards posted on the machine, components, and trailer assembly. These labels and placards are provided to assist in identifying areas containing potential hazards while also providing information regarding equipment specification and limitations. Please see below for examples:



Warning Terms: Are signal words in this manual that call the operator's attention to safety concerns.

The word **CAUTION** indicates the information pertains to a potential hazard or unsafe practice which, if disregarded, may result in minor personal injury or equipment damage.

The word **NOTE** indicates the information is important to the correct operation or maintenance of the machine.

The word **WARNING** indicates the information relates to a specific immediate hazard or unsafe practice which, if disregarded, could result in personal injury or death.

The word **DANGER** indicates the information relates to a specific immediate hazard which, if disregarded, will result in severe personal injury or death.

General Warnings

WARNING: Ear protection should be worn when operating machines with operator ear noise levels above 85dB.

WARNING: This machine must not be used as a winch for pulling another vehicle. For trailer models: this trailer must not be modified to allow towing of another trailer behind and in tandem with this trailer.

WARNING: California Proposition 65: Engine exhaust, some of its elements, and certain vehicle components contain or emit chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

WARNING: Batteries produce explosive gases, contain corrosive acid, and supply levels of electrical current high enough to cause burns.

WARNING: To prevent serious injury from hot and high pressure oil, never use your hands to check for oil leaks, use paper or cardboard. Hydraulic fluid escaping under pressure can have sufficient force to penetrate skin. If fluid is injected into the skin it must be surgically removed within a few hours by a doctor familiar with this form of injury, otherwise gangrene may develop.

WARNING: To prevent the possibility of electrocution, do not enter or leave the unit while it is operating, or allow anyone to touch or lean on the machine when it is in use.

Safety

Operator Safety Precautions

- Do not place any part of the body into a potential pinch point. The machine must be turned off and locked out in accordance with OSHA regulations before attempting to correct a problem, work on the machine, or perform preventive maintenance.
- Do not attempt to operate any Sherman+Reilly equipment without proper instruction, including reading and understanding the provided manual.
- Obey and enforce all warnings including OSHA requirements and ANSI standards.
- Never allow anyone to ride on the unit while it is being towed.
- Always wear proper safety equipment as required by employer.
- Never bypass safety switches or operate equipment with faulty safety devices.
- Be sure all guards and access covers are in place and secured when the machine is being operated.
- Be aware of people in the work area who may be at risk during operation.
- Know all emergency shutdown procedures.
- Do not obstruct controls or fire extinguisher and make sure fire extinguisher is fully charged.
- Never operate equipment while under the influence of any substance which could impair ability or judgment.
- Do not operate equipment if work ability is impaired by fatigue, illness, or other causes.
- Always use employer approved grounding procedures when operating the machine.



- Never use hands to check for hydraulic system leaks. Hydraulic fluid escaping under pressure can cause personal injury.
- Avoid contact with pumps, cylinders, hoses, engine components, and exhaust system.
- Do not refuel unit while the engine is running or hot.
- Keep all body parts, to include head and limbs, away from all moving parts.
- Refer to engine manufacturer's manual for all additional safety precautions which relate to engine operation and service.
- Know location and function of all controls, gauges, instruments, and protective devices.
- Never use unit to tow or winch another vehicle.
- Never use controls or hoses for hand holds.
- Do not exceed unit specifications and limitations, to include weight.
- Know where to get help in the event of an emergency or injury.



- When towing this machine/unit trailer, the driver should use caution and adjust speed based on road, weather, and terrain conditions, as well as applicable laws and speed limits.
- Do not make physical contact with rope or cable as it enters or leaves the machine or drum.
- To prevent the possibility of electrocution, do not enter or leave the unit while it is operating or allow anyone to touch or lean on the machine when in use.

Safety

Employer Safety Precautions

This guideline is intended to assist owners/employers to ensure equipment is serviced and operated in a safe manner. Each job site may have additional situations and conditions which need consideration.

Monitor the operators to be sure they observe and practice safety procedures and operate the support equipment as outlined in this manual.

Establish a regular inspection program which includes malfunction reports, inspection, and service records. This inspection should cover the machine condition, adjustment, and ensure all safeguards are in place and functional. Additionally, all pre/post-operation inspections should be conducted at prescribed intervals.

Make sure that any malfunction or breakdown affecting the safe operation of the equipment is properly corrected or repaired before returning the machine to service.

The employer shall provide training and instruction in chemical safety and safe methods of work before assigning workers to operate, service, or repair the machine and equipment. A record of training dates, employee names, and level of training shall be maintained. Only persons who have a full understanding of the provided manual- (*provided in English only*), and who are competent

in the use of overhead line tensioning machines; to include all applicable laws, regulations, and safety standards, should be allowed to operate this machine. There are significant hazards inherent to the use of this machine, therefore all operators should be educated on all functions, procedures, and safety measures outlined in this manual- prior to their use or maintenance of this machine.

Employer shall utilize a lock-out/tag-out procedure which complies with OSHA Standard, Part 1910.147, Title 29 of the Code of Federal Regulations. This procedure must include control of all keys.

The employer will specifically inspect all safety equipment and protective devices on the equipment to ensure they are not bypassed or disabled. Operation of equipment will not be permitted unless all safety devices are in place and functional. The employer shall meet all appropriate information dissemination and protection requirements for the worker.



Safety

Pre-Operation Inspection

It is recommended pre-operation inspection be done before leaving the yard or garage.

- Check fuel level on tank gauge.
- Check engine oil and radiator coolant levels.

It is necessary to remove the engine cover to make these checks. Be sure they are replaced and latched in position properly.

- Check hydraulic fluid level in reservoir.

As you continue the inspection, look for structural damage, bent or broken parts, cracked or broken welds, missing pins and retainers.

- Inspect pump and hoses for loose fittings, leaking fluid, damaged hoses.
- Inspect drive motor/gear box and brake.
- Inspect drive chain for proper lubrication and excessive wear.
- Check chain tension and make sure the chain guard is secure.
- Inspect pillow block bearings on reel shafts (6 locations).
- Inspect disc brake assemblies (4 locations).
- Check reel engage linkage for damage (4 locations).
- Inspect levelwind. Make sure the rollers move freely.
- Check cylinders and hoses for fluid leaks.
- Make sure locking dogs operate correctly and are not damaged (4 locations).
- Start the engine.



Safety

Terms You Need to Know PLW-400

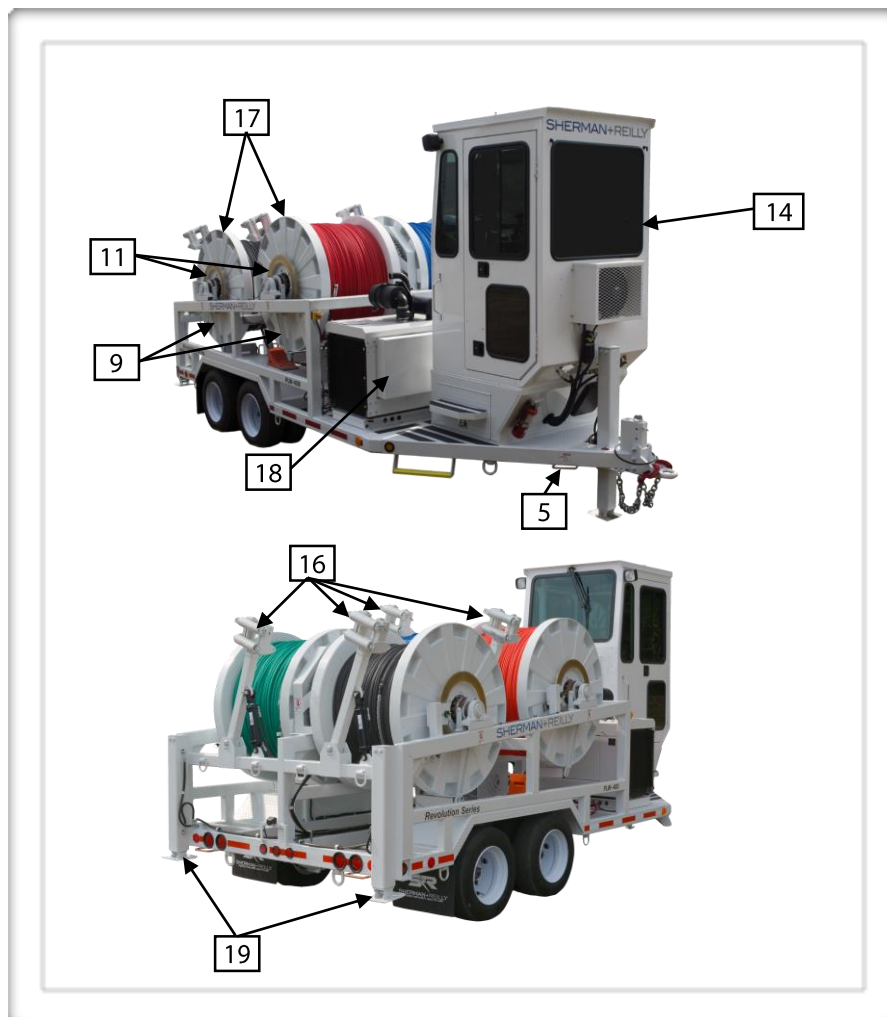
- | | |
|--|---|
| 1 Adjustable Pintle Eye | 9 Reel Drive Coupling Shifter |
| 2 Safety Chains | 10 Reel Locking Pins (4) |
| 3 Breakaway Safety Switch | 11 Payout Brake (Disc) |
| 4 Electrical Junction Box | 12 Hydraulic Fluid Reservoir |
| 5 Grounding Loop (4 locations) | 13 Hydraulic Fluid Level & Temperature Gauge |
| 6 Hydraulic Return Filter & Gauge | 14 Safe Zone Cab |
| 7 Fuel Tank with Gauge | 15 Manual Holder |
| 8 Air Conditioning Unit | 16 Hydraulic Levelwind (4) |



Safety

Terms You Need to Know: PLW-400

- 5 Grounding Loop (4 locations)
- 9 Reel Drive Coupling Shifter
- 11 Payout Brake (Disc)
- 14 Safe Zone Cab
- 16 Hydraulic Telescoping Levelwind (4)
- 17 Reel
- 18 Engine and Cover
- 19 Rear Stabilizer Jacks (2)



S+R REVOLUTION SERIES PLW-400 Pilot Line/Drum Puller

Operation

Control Panel PLW-400

The PLW-400 has a sophisticated electronic control system, designed to make many formerly-manual tasks automatic.



Operations

Operator Controls

****For control locations see Operator Control Panel Section on page 18.**

Master Power Key Switch

This switch is used to turn on power to the operator controls. This switch must be turned to the On position to start the machine.



Emergency Stop Button

When pushed, this red push button stops all puller functions, turning off system and engine power, and disengaging all controls. After being depressed, the button must be rotated and released to restore power to the system and reengage operator controls.



Engine Control Display



The engine control display shows general system and operation specific information

System Pressure Gauge

This gauge shows the overall pressure in the main hydraulic system. This gauge is also used to measure the line tension during operations. With a single drum engaged in normal operating conditions, the system pressure gauge will reflect a higher pressure as the line tension is increased. The higher the system pressure, the more pulling tension is available to the system.



Engine Throttle Control

This control is used to throttle the engine speed up and down. The control switch operates in a rocking pattern depressing upward for increased engine speed and downward for decreased engine speed. The throttle can be adjusted up and down as needed.



Engine Start Button

To start the engine, first ensure that the master power key switch is turned to the on position, then depress the rocker start button upward to the Start/Run position.

Jacks

The three hydraulic leveling jacks are controlled by three switches at the right of the control console.

The switches are arranged in a pattern similar to their position under the machine; one jack is in the front, center of the trailer (just behind the operator cab), and the other two are at the rear corners of the machine.

The controls are labeled "RAISE" and "LOWER", which refers to the trailer from the operator point of view. For example, if the "RAISE" end of the rear left side control is pressed, the rear left side of the trailer will elevate.

The jacks may be adjusted at any time, so be careful when attempting to change the height of the trailer during a pilot line operation.



Operation

Operator Controls

***For control locations see Operator Control Panel Section on page 17.*

Levelwind/Drum Joystick

The joystick controls two (2) functions:

1. The selection of a particular levelwind/drum for engagement
2. The lateral direction of travel of the selected levelwind.



- ✓ The **Trigger** must first be depressed to select one of the four drums.



- ✓ The **Joystick** has buttons and indicator lights that represent the four drums on the machine, arranged in the same order as the drums.



- ✓ To select and engage a drum, depress the button that corresponds to the desired drum. The indicator light for that drum will flash then stay lit when the drum is engaged.

NOTE: Only one drum/levelwind may be engaged at a time. The trigger switch must first be depressed to activate the drum switches.

NOTE: The engine must be running to select a new drum/levelwind. Speed is not critical; the engine can be idling.

- ✓ To change drums/levelwind, the current drum/levelwind must be deselected by again depressing the Trigger and depressing the selected drum's button.
- ✓ Moving the Joystick laterally, left and right, will adjust the levelwind left and right.
- ✓ Continuous pressure or bumping motions can both be used to position the levelwind where needed.
- ✓ When released, the joystick will return to the neutral upright position and the levelwind will stop moving.

NOTE: The SAFETY BRAKE switch must be set to "FREE" to engage a drum. If it is left in the "STOP" position, all four lights on the joystick will flash for 3 seconds to indicate that an error has occurred.

Drum Engagement

The drum clutch mechanism is designed to automatically "self-pilot" without user intervention. If the drum fails to engage after 20 seconds, press the same selector button again, which will cause the clutch mechanism to disengage. Then, press it a third time and the clutch will move forward and attempt to engage again.

If the drum clutch fails to engage again, make sure there is no line tension prohibiting the drum from rotating. The drum must be free to rotate in order to "jog" to align for clutch engagement.

WARNING: Before switching the SAFETY BRAKE switch to FREE, understand that any drum with rope tension on it that is not being held by its individual drum brake will be free to move, and may cause line slack.

Operation

Line Speed Control

This control determines the direction-(Payout or Pull In) and speed of the drum/reel rotation. The control knob can be rotated 90 degrees in clockwise or counterclockwise motions, with the knob locking to the downward center Stop position. Rotate the knob clockwise to Pull In, and counterclockwise to Payout, with more increase in speed as the knob is rotated farther in each direction. To decrease speed, slowly rotate the knob back toward the stop position.



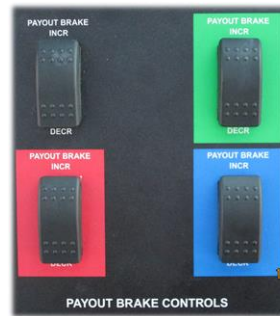
CAUTION: To prevent possible damage to the machine during normal operating conditions, the drum rotation should be slowed before stopping. Rapid changes in the line speed/drum rotation to an abrupt stopped positions creates rapid changes in system pressure putting excessive stress on the system.

Line Tension Control

This control determines the tension to the line as it leave and enters the drum/reel. This is achieved by regulating the overall torque applied to the drive system. As the overall torque is increased, so does the overall system pressure. By monitoring the overall system pressure, the operator can increase line tension by rotating the knob clockwise, and decrease the tension by rotating the knob counterclockwise. The line tension control knob is equipped with a position locking ring, allowing the operator to set and lock the tension knob at a set interval, and thus preventing accidental rotation of the knob.



Payout Brake Pressure Control Switches



Each drum/reel payout brake can be set to the amount of tension/drag desired by pushing and holding the corresponding control switch.

Each control switch operates in a rocking pattern depressing upward for increased pressure and downward for decreased pressure. The operator can press and hold or knock the switch in either direction to obtain the desired brake pressure.

The payout brake system has its own independent hydraulic system that is battery powered, allowing full use without running the engine.

NOTE: The payout brake should be engaged while transporting the machine to prevent the drum/reel rotation.

Payout Brake Pressure Gauge

These gauges measure the amount of pressure applied to the payout brake caliper. This measurement gives the operator a reference when setting the payout brake pressure during payout operations.



Operation

Quick Start Guide

Sherman + Reilly PLW-400

Acronym/Terms Key:

CW – Clockwise

CCW – Counter Clockwise

DANGER – Indicates the information relates to a specific immediate hazard which, if disregarded, will result in severe personal injury or death.

WARNING – Indicates the information relates to a specific immediate hazard or unsafe practice which, if disregarded, could result in personal injury or death.

CAUTION – Indicates the information pertains to a potential hazard or unsafe practice which, if disregarded, may result in minor personal injury or equipment damage.

NOTE – Indicates the information is important to the correct operation or maintenance of the machine.

Start-Up Procedure		
Step	Action	Note
1	Perform all pre-operation inspections.	See Pre-Operation Inspection Checklist on page 62 for details.
2	Chock wheels.	Wheels should be chocked to prevent rolling.
3	Ensure that all controls (levers, switches, etc.) are in the neutral and disengaged position.	**Except when transitioning from payout to pulling operations. See Operator Controls section starting on page 17.
4	With the key inserted, turn master switch to the [ON] position.	See Operator Controls section on page 18.
5	Start the engine: Once the display and panel lights are on, place the Engine Start button to the [START/RUN] position.	The preheat function- (glow plugs), are automatically engaged once the Engine Start button is placed in the [START/RUN] position. After the preheat cycle has concluded- in about 10 seconds, the engine will start automatically. (See Operator Controls section on page 18)
6	Check the engine oil pressure to ensure everything is working properly.	The engine oil pressure is found on the engine control display. (See Operator Controls section on page 17)
7	Check the hydraulic filter indicator to ensure that the filter does not need replacing.	If filter gauge shows red, filter replacement may be necessary. See Hydraulic System section on page 29.
8	With the engine running, move each control , to make sure all functions operate correctly.	**Except when transitioning from payout to pulling operations. See Operator Controls section starting on page 17.
9	Level and stabilize the machine- using the Jacks	Also, use the attached bubble gauges for leveling. See Jack Controls section on page 18.

Start Payout Operations

Step	Action	Note
1	Perform all Start-Up Procedures.	*Must include pre-operation inspections- if not already completed. See Start-Up Procedures on page 14.
2	Select the levelwind: With the engine at idle speed, depress the joystick trigger, then press the selector button on the front of joystick.	The selector button light will illuminate once selected and engaged. See Levelwind Control section on page 19.
3	Adjust levelwind position: Use left and right joystick motions to position levelwind. NOTE: If model is equipped with levelwind extensions the operator can adjust levelwind vertical position by depressing the corresponding levelwind extension button.	The operator can position the levelwind to the outside of the unit, with the line/rope removed from the levelwind head during payout. However, the operator may need to unfasten the head assembly to re-thread rope prior to pulling operations.
4	Adjust drum brake tension: Each drum payout brake can be set to the amount of tension and drag desired by pushing and holding the corresponding control switch.	Each control switch operates in a rocking pattern depressing upward for increased pressure and downward for decreased pressure. See Payout Brake Pressure Control section on page 20.
5	Begin payout: Pull line off of drum.	Further adjustment of payout brake may be required to prevent over-spin of the drum. The engine can be turned off during payout operations, after initial start-up and payout procedures are complete.

CAUTION: After completing payout operations, and before transitioning to pulling operations, the operator must ensure that the line does not continuing to payout under any existing line tension. Therefore, the operator must leave the payout brake applied until the drum drive coupling is engaged.

Start Pulling Operations

Step	Action	Note
1	Perform all Start-Up Procedures.	To include restarting engine. See Start-Up Procedures on page 26.
2	Put safety brake override in the [FREE] position.	See Operator Controls Section on page 27.
3	Engage drum/reel.	With engine at idle speed, depress lever, then push lever away from the operator to engage drum. It may be required to rotate drum slightly to align coupler teeth. See Levelwind/Drum Joystick on page 19
4	Select, adjust, and place rope in levelwind.	
5	Release payout brake.	Payout brake must be fully released.
6	Slowly increase line speed to begin drum rotation.	Turn control knob CW toward PULL IN. See Line Speed Control Section on page 32.
7	Slowly increase line tension/pressure.	Rotate control knob CW to increase tension. See Line Tension Control Section on page 20.
8	Continue to monitor line tension, system pressure, and levelwind adjustment.	See Operator Controls on page 17.

Operation

Towing and Road Safety

Connecting to the Tow Vehicle

- ✓ Make certain tow vehicle has the capacity and rating to tow machine safely.

NOTE: The PLW-400 weighs approximately **20,500 lbs.** with reels empty.

- ✓ Inspect pintle eye and safety chains for excessive wear, corrosion, cracked welds or structural damage.
- ✓ Inspect tow vehicle hitch and ensure hitch is in good working order.
- ✓ Make sure trailer brakes are operable.

WARNING: Do not attempt to tow machine/trailer if there is any question about the condition of the safety chains, hitch or trailer brakes.

- ✓ Make sure the unit is safe for towing with tires in good condition and properly inflated- (*See Trailer Tires Section*).
- ✓ Make sure the drum payout brakes are set on all four drums to hold them in place.
- ✓ Make sure there are no tools, objects, or trash items which could fall off during transport.
- ✓ Chock wheels on both sides of the machine/unit trailer, then start

machine/unit engine- *See Operator Controls pg.17 and Start-Up Procedure pg. 26.*

- ✓ Make sure levelwind cylinder rods are retracted- *See Levelwind Controls Section on page 21.*



- ✓ Open the tow vehicle hitch and back vehicle into position under the pintle eye. Set tow vehicle parking brake.
- ✓ Slowly retract trailer front nose/hitch jack, so that pintle eye goes over and rests correctly on hitch.
- ✓ Close and secure the hitch.

CAUTION: Ensure that the nose/hitch jack and all jacks are fully retracted prior to transport.

CAUTION: The hitch coupler is a pinch point. Keep hands and fingers clear.

Operation

Towing and Road Safety

Connecting to the Tow Vehicle (cont.)

- ✓ After trailer is secured to the vehicle, stop the machine/unit engine, and remove the key from the ignition key switch.
- ✓ Attach the break-away switch cable to the tow vehicle.



- ✓ Properly connect the safety chains by latching in a crisscross pattern, as this provides added directional control. The safety chains should be crossed and short enough to prevent the tongue from digging into the ground, should the unit unintentionally become disconnected from the hitch. The chains should be no longer than necessary to allow slack for turning.
- ✓ Connect the electrical plug to the tow vehicle and check:
 - Clearance lights
 - Brake Lights
 - Turn Signals
 - Brakes
- ✓ Remove the wheel chocks.

CAUTION: Do not tow the machine/unit unless all the trailer lights and brakes are working correctly.



NOTE: When towing the machine/trailer assembly, the driver should be knowledgeable and obey all applicable transportation laws and speed limits. Laws for towing speed of trailers differs widely between states, provinces, and localities.

CAUTION: Drivers should use caution and drive slower at night and when hazardous conditions are present, such as heavy traffic, bad weather, or uneven or rough terrain.

Unless otherwise indicated by applicable laws, posted speed limits, or cautionary conditions (stated above), a recommended maximum safe operating speed for normal road conditions is 50/55mph for night/day conditions, and 30mph in residential, urban, and business districts.

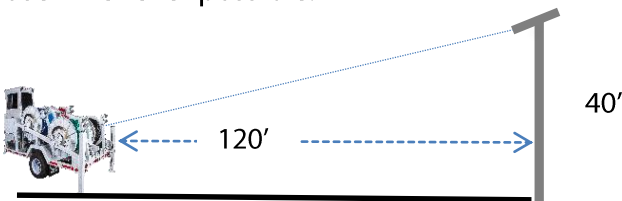
NOTE: The brakes should be set to high-pressure (1500 PSI or above) for road transport, in order to prevent the drums from rotating on their own during transport.

Operation

Positioning the Machine

The driver/operator should position the puller in a suitable location where it will be free from obstructions and clear of any obvious hazards. For overhead pulling the puller should be approximately three times the distance of the first structure/pole height.

Example: If the first structure/pole is 40 feet high, it is recommended that the puller be positioned approximately 120 feet from the base whenever possible.



- ✓ The unit should be set up as level as possible, centered on the lead block and parallel to the line being pulled.
- ✓ Start the engine using the recommended start up procedure.
- ✓ Chock or block the trailer tires on both sides and disconnect the unit from the tow vehicle.
- ✓ Lower the front jack; this will allow the rear stabilizer jacks room to be extended.
- ✓ Extend the rear stabilizer jacks as close to the ground as possible.

- ✓ Insert the pins and pin retainers.
- ✓ Raise the front jack to remove as much weight as possible from the tires and axles.
- ✓ Shut the engine down.
- ✓ All appropriate grounding and protective equipment must be installed and secured to machine prior to operations.



Operation

Start-Up Procedure

- ✓ Follow Pre-Operation Inspection Checklist.
- ✓ Make sure all controls are in neutral and SAFETY BRAKE is in STOP position.
- ✓ Check engine oil pressure and ammeter to be sure everything is working properly.
- ✓ Check hydraulic filter indicators (2) to be sure the filter is serviceable.
- ✓ Start the engine.

- ✓ ****Refer to engine manufacturer's manual for complete starting instructions.***

Start Up:

- ✓ Set the master key switch must be in the "ON"
- ✓ When the master key switch is turned to the "ON" position, the panel display will indicate that the system is booting up, please wait.
- ✓ The engine is started by pressing the engine switch to "Start/Run" position.
- ✓ A green light on the engine Start/Run switch indicates the engine is beginning the start sequence and the display will read "Glow Plugs Heating." After the engine is preheated, the engine will begin to crank and be running in a few seconds.

NOTE: that there may be a delay or several seconds before the engine cranks due to preheating ("glow plugs"). This is normal.

- ✓ Adjust the idle speed to a smooth-running condition with the Throttle rocker switch.

The key can only be removed when the switch is in the "off" position.

Throttle

With the engine running, use the "Throttle" switch to change the engine speed.

Pulling operations should be performed with the engine at full power.

Press and hold the switch in the "Increase" or "Decrease" positions to speed up or slow down the engine. Release the switch when the desired speed is reached.



Operation

Safety Brake

The PLW-400 has a built-in “fail safe” hydraulic SAFETY BRAKE that engages automatically in the event of an engine power failure or loss of hydraulic pressure. The brake locks the drive system so that any tension on the line will be maintained.

The SAFETY BRAKE, located on the far right side of the control panel, can be applied manually in situations where the operator wishes to hold tension without using the payout brake.

The SAFETY BRAKE is applied using a toggle switch on the console. The switch has a “FREE” position, which indicates normal use, where the brake is not applied, and a “STOP” position, where the brake is applied and cannot be overridden.

The SAFETY BRAKE is spring applied and released by hydraulic pressure. The brake holds the gearbox input shaft which is common to all engaged reels through the gearbox, chain, sprockets and reel shafts.

- The drive dog for a given reel must be engaged for the brake to be effective for that reel.
- The brake is operated by the SAFETY BRAKE OVERRIDE switch located on the right side of the control panel.
- Set the control switch to this “FREE” position to release the brake while hydraulic pressure is available.
- Set the control switch to the “STOP” position to engage the hydraulic brakes.
- Should you lose hydraulic pressure, the brake will engage automatically.



NOTE: The hydraulic SAFETY BRAKE OVERRIDE must be in the “FREE” position before pulling can begin.

Operation

Payout Operations

NOTE: Before beginning payout operations, the operator must perform all pre-operation inspections. See *Pre-Operation Inspection Checklist* on page 62. Pre-operation inspections are important for the safe operation of the machine, and are required under OSHA Regulations.

The PLW-400 equipped with an electro-hydraulic disk payout brake system where each drum has a brake disk/caliper assembly that can apply friction braking to the individual drums. The amount of pressure being fed to each drum controls the amount of braking force for that drum; the pressure is applied or released via four (4) rocker switches on the control panel. These are color-coded, corresponding to the drum layout.

The unit is designed to prevent engaging a drum that has the payout brake applied. To engage a drum the operator must ensure that all hydraulic payout brake pressure is released from that drum prior to engagement. Do not engage the Drum/Reel clutch while under line tension, even with the drum/reel lock pins holding the reel. **Line should be secured (tied-off) before and after engaging the reel drum. Failure to do so may damage the linkages**

For any drum switch, pressing "INCR" will raise the drum pressure with a minimum threshold of 300 psi. Similarly, "DECR" will reduce the drum pressure in 25psi increments. There is a slight lag in response of the gauge as the system pressure is equalized. To completely remove all braking, hold the "DECR" switch for a few seconds to completely "bleed off" pressure in the system. The system is temperature-compensated to allow for some change in air temperature over the course of the work shift.

The brake controls will operate at any time under electric power (as long as the battery is charged), regardless of whether the engine is running, which allows for field adjustments when the equipment is in use but unpowered.

- ✓ Ensure that all controls (levers, switches, etc.) are in the neutral and disengaged position. See *Operator Controls Section* starting on page 18.
- ✓ With the key inserted, turn master switch to [ON] position. See *Operator Controls Section* on page 19.
- ✓ Once display and panel lights are on, place Engine Start button to the [START/RUN] position to start the engine.
- ✓ Check engine oil pressure to be sure everything is working properly. Engine oil pressure is found on the engine control display- (See *Operator Controls Section* on page 19).
- ✓ Check hydraulic filter indicator to ensure that filter does not need replacing. If replacement is required see Hydraulic System Section on page 45.



Operation

- ✓ Select/position the levelwind- (See *Levelwind/Drum Joystick Section on page 19.*



- ✓ Disengage the drum/reel from the drive coupling- (See *Levelwind/Drum Joystick Section on page 19).*



- ✓ Adjust drum brake tension as needed- (See *Payout Brake Pressure Control Section on page 21).*

NOTE: The operator can position the levelwind to the outside of the unit, and remove the line/rope from the levelwind head during payout. However, they will need to unbolt the head assembly to re-thread rope prior to pulling operations

WARNING: Line must be tied off at the pole or close to the machine when switching from Payout to Pulling operations.

NOTE: The operator must ensure that all hydraulic Payout Brake pressure is released from a drum prior to engaging that drum.

NOTE: The operator CANNOT use the Payout Brake to hold line tension when engaging the drum, as this will prevent the drum from engaging.

- ✓ Begin pulling the line/rope off of the drum/reel.

NOTE: The system will not allow a drum to engage if the Joystick button is pressed while there is still hydraulic Payout Brake pressure on that drum.



Operation

Payout Operations

- ✓ **The engine can be turned off during payout operation, after initial start-up and payout setup procedures are completed.** After the engine is turned off the hydraulic payout brake system will continue to function as normal, as it is not dependent upon the power of the engine. The independent hydraulic pump that actuates the drum payout brakes is powered directly from the battery. As the pressure is applied to the drum brakes, it is held in place by constant back pressure when the hydraulic motor is not engaged. Minimal operation and short cycle times of the drum payout brake pump help to ensure adequate battery charge. The operator can always start the engine to recharge the battery- if necessary.
- ✓ Further adjustment of payout brake may be required to prevent over-spin of drum. The operator should continually monitor the payout brake pressure, and maintain contact with other machine/system operators and spotters to ensure that adequate line tensions is maintained.
- ✓ Once the drum drive coupling is engaged the drum payout brake can be released, as the drive motor safety brake will hold pressure on the drum/line.

CAUTION: Before transitioning to pulling operations, and to prevent the line from continuing to payout or from paying out on its own, the operator must leave the payout brake applied until the drum/reel lock pins are engaged.

CAUTION: Do not engage the Drum/Reel clutch while under line tension, even with the drum/reel lock pins holding the reel. Line should be secured (tied-off) before and after engaging the reel drum. Failure to do so may damage the linkages.



CAUTION: If brake pressure is not monitored and excessive slack is allowed to form in the line/rope, there can be a safety hazard- especially when conducting operations adjacent to or around energized lines..



Operation

Pulling Operations - Tensioning

The PLW-400 model is equipped with integral tensioning capability. Active “Pullback” can be accomplished against a pulling machine, allowing the PLW to hold a constant line tension. This prevents line sag that could occur with the traditional use of the passive payout brake.

Tensioning is accomplished using two controls: LINE TENSION and LINE SPEED.



NOTE: Before beginning pulling operations, the operator must perform all pre-operation inspections. *See Pre-Operation Inspection Checklist on page 62.* Pre-operation inspections are important for the safe operation of the machine, and are required under OSHA Regulations.

CAUTION: After completing payout operations, and before transitioning to pulling operations, the operator must ensure that the line is tied-off at the end closest to the machine in order that line doesn’t continue to payout or drop causing slack under any existing line tension.

CAUTION: The operator **CANNOT** use the **PAYOUT BRAKE** to hold tension when engaging the drum.

CAUTION: Holding tension with the **PAYOUT BRAKE** or **SAFETY BRAKE** will prevent the drum from engaging..

The system relief valve should be adjusted to allow a no more than a maximum of 3,000 PSI peak pressure. Higher pressure may cause damage to the hydraulic components, gearbox, chain and sprockets. It will also cause excessive engine loading and possible engine stalling.

WARNING: Keep maximum system pressure below 3000 PSI.

- ✓ Once the payout brake is set, start the engine by turning the master key switch to [ON] position. *See Operator Controls Section on page 19.*
- ✓ Once display and panel lights are on, place Engine Start button to the [START/RUN] position to start the engine.
- ✓ Check engine oil pressure and hydraulic filter indicator again to be sure everything is working properly.
- ✓ Check and adjust levelwind position as needed- (*See Levelwind Control Section on page 21*).

- ✓ If rope/line was removed from levelwind head or the levelwind was not used during payout, position the levelwind in relation to the rope and insert the rope into the levelwind head.
- ✓ Ensure that the brake override switch is set to the FREE position.
- ✓ Engage the drum drive coupler for the pulling drum being used.
- ✓ Once the drum drive coupler is engaged, fully release the drum payout brake.

CAUTION: Make sure the payout brake for the pulling drum being used is completely released, to prevent excessive wear or heat on the brake pad and rotors.

Operation

Pulling Operations

1. Start the engine and allow it to run at a fast idle until the engine is operating smoothly.
2. Release the emergency/parking brake by switching the SAFETY BRAKE OVERRIDE to "FREE".
3. Slowly advance the LINE SPEED control knob in the PULL-IN direction. Slowly increase line speed to begin drum rotation.
4. With the LINE SPEED Control knob in the PULL IN position, slowly rotate the LINE TENSION Control knob in the INCR direction. As the knob is rotated the reel speed should increase
5. Continue to rotate the LINE TENSION knob until there is no further increase in the drum speed.
6. Slowly increase line tension: Rotate the LINE TENSION control knob clockwise to increase tension.
7. Continue to monitor line tension and system pressure- (*See Operator Controls on page 19*).



NOTE: The levelwind needs to be operated in conjunction with the pulling speed to guide the pulling line/rope onto the pulling drum as evenly as possible, avoiding build-up at any point on the drum. The levelwind head is controlled by pushing the joystick to the left and right. Moving the stick farther away from center moves the levelwind faster



Operation

8. Once line/rope pulling operations are completed and drum is full, reduce line tension and speed controls to their neutral/stopped position, throttle down the engine, then set SAFETY BRAKE OVERRIDE to the STOP position to allow the conductor to be tied off.
9. After line/rope is released from conductor and fully wound on drum/reel, set safety brake override to FREE position, and disengage drum drive coupler.
10. Place the Engine Start button to the [Off] position to turn off the engine.
11. Turn the master key switch to the Off position and remove the key.
12. Complete all Post-Operation Inspections on page 65.
13. Complete all towing and road safety procedures prior to towing machine- (See Towing and Road Safety Section on page 26).



EMERGENCY WHILE PULLING

Depress the SAFETY BRAKE OVERRIDE switch and press the EMERGENCY STOP switch on the control panel. Alternatively push the Reel Speed/ Direction Control lever to the "Neutral" (center) position.



Troubleshooting

Quick Tips

ENGINE WILL NOT START OR RUN

- ✓ Manual ignition switch, located in the engine compartment, is turned to [OFF] position- switch to [REMOTE & AUTO] and retry.
- ✓ Dead battery- could be caused by pulled breakaway switch.
- ✓ No fuel- check tank gauge.
- ✓ Other- Refer to engine manufacturer's manual. *(Also, see General Faults section.)*

REEL WILL NOT RUN

- ✓ Low system pressure brake not releasing.
- ✓ Pump linkage loose or out of adjustment.

HYDRAULIC JACK CREEPS DOWN

- ✓ If motor running, control valve seals bad.
- ✓ If motor off, holding valve on jack is malfunctioning.

UNIT WILL NOT BUILD MAXIMUM HYDRAULIC SYSTEM PRESSURE

- ✓ Line tension control valve blocked or malfunctioning.
- ✓ Pump relief valve malfunctioning.
- ✓ System pressure relief valve inside control panel out of adjustment or malfunctioning.
- ✓ Contamination in hydraulic system.

HYDRAULIC FLUID TEMPERATURE IS ABOVE NORMAL

- ✓ Clogged cooler fins restricting air flow.
- ✓ Gearbox brake not fully releasing.
- ✓ Contamination in hydraulic system blocking cooler.

TRAILER LIGHTS DO NOT WORK AFTER CONNECTED TO VEHICLE

- ✓ Check vehicle/trailer wire connectors for damage or corrosion.
- ✓ The vehicle/trailer wire connectors can vary dependent upon owner/customer requirements. *(Also, see Trailer Lighting Section).*

Troubleshooting

General Faults

<i>Fault</i>	<i>Possible Cause</i>	<i>Solution</i>
Diesel engine does not start, and indicator lights do not come on.	The emergency stop switch is still locked after it has been pressed.	Release the emergency stop switch.
Function errors at the control.	Cable break, defective sensor.	See System Display and Error Codes.
	Error in electronics.	

System Display and Error Codes

<i>Display Code</i>	<i>Description</i>
'System Booting, Please Wait'	System initiation and communication check
'Controller COMM Error'	Controller has lost communications
'Console ESTOP pushed'	Release console E-Stop
'Node 2 Error'	Input/output module has lost communications
'Trailer ESTOP pushed'	Release trailer E-stop
'Levelwind JS Error'	Levelwind Joy Stick communication error
'Turret JS Error'	Turret Joy Stick communication error
'Line Speed Pot Error'	Line Speed and Direction communication error
'CAN Switch Error'	CAN switch communication error

Operation

PULL-IN continued

If the initial pressure setting is too high, the reel speed will not increase when the LINE TENSION Control knob is rotated clockwise. In this case, rotate the knob counterclockwise until the reel speed slows slightly. It may be necessary to rotate the control more as the load (conductor) increases to give the unit additional pulling force.

WARNING: Do not leave the LINE TENSION control adjusted to full system pressure. The system pressure gauge indicating the pressure used to pull the conductor is actual pressure being used.

If the control is adjusted above that setting, or if the pulling line or conductor can foul or hang up, pressure will spike or build rapidly jerking the pulling line and may create a safety hazard or cause damage to the pulling line, conductor or stringing block, etc.

As the pulling rope fills the reel, it will be necessary to increase the pressure. When the reel speed slows slightly, rotate the LINE TENSION CONTROL knob as necessary to compensate.



By following this procedure at all times, the maximum obtainable pressure will only be slightly greater than required to pull the rope. If the pulling rope becomes fouled, the puller should stall, thereby minimizing the damage to the pulling rope, conductor and stringing block.

When the machine is not in use, rotate the LINE TENSION control knob counterclockwise to the minimum pressure setting. This practice minimizes the possibility of leakage in the pump control circuit.

Operation

Cab Lights

There are two light switches on the operator console. The switch marked "CAB LIGHTS" controls the overhead dome light inside the cab, and is useful in dim lighting or when the machine is being serviced in a dimly-lit garage.

The switch marked "WORK LIGHT" controls the LED flood lighting mounted outside the cab at the top of the main operator window. These can be used to monitor a pulling operation in fading light, or to prepare the machine for transport at the end of a workday.

Note: Remember that these lights consume electrical power, and should not be left on for extended periods without the engine running, as this can drain the trailer battery, preventing starting the engine.

NOTE: Lights consume electrical power and can drain the trailer battery if left on for extended periods without the engine running.

Climate Control / Heating + A/C

The **PLW-400** has an environmentally controlled cab designed for operator comfort. It is equipped with both heat and air-conditioning for year-round comfort.

The unit is located on the ceiling of the cab, above the operator's chair.

A toggle switch located on the left end of the unit switches between heating and cooling.



Two (2) rheostat knobs located on the right end of the unit control the fan speed and temperature.



The A/C system is equipped with a conventional compressor, and uses R134a refrigerant. For service or repairs on this system, consult a local HVAC specialist.

Operation

Engine Oil Pressure

Measures the internal oil pressure of the engine when running.

Fuel Gauge

The fuel level is indicated on the panel display.

Block Heater (Diesel Only)

This pushbutton is used to activate the engine block "coolant" heater, for preheating the engine in cold weather.

Engine Temperature

The temperature is indicated on the panel display. Operating the engine at the correct temperature will extend service life, ensure maximum power, and provide better fuel economy.

Voltmeter

Alternator charging voltage.

Tachometer

The tachometer displays the operating engine RPM when the engine is running.

Hourmeter

This gauge registers the number of hours the engine runs and is useful in keeping accurate service records.

Emergency Stop

This button shuts the engine down immediately when pressed and should only be used in emergency situations.

Reel Drive Coupling Shifter

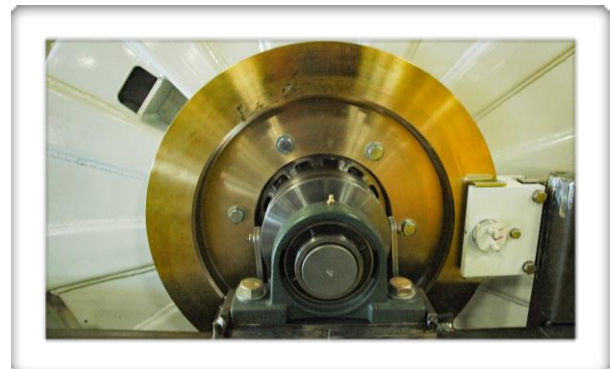
Each reel has a coupling shifter to engage and disengage the reel. These couplers are automatic, controlled from the operator console joystick (refer to "Operations" pg. 13)

Filling the Reel

This unit is designed for a **MAXIMUM rope weight (not including the reel) of 1,800 lbs. per reel.**

If this weight is exceeded there could be damage to the shafts, bearings and frame.

The machine is designed for SYNTHETIC PULLING ROPES and the use of steel pulling lines may overload the machine. **Only synthetic ropes with low elongation such as Uniline or Sarlex braided rope should be used.** Ropes with high elongation or high elasticity, such as nylon, may cause damage to the reel and should not be used.



NOTE: The unit is designed for overwind reeving; that is, for the rope to wind on and off the top of the reel.

NOTE: The initial filling of the reel should be done with the rope under light tension. Care should be taken to ensure that the rope is initially level wound on the reel.

Service



Pay close attention to proper preventive measures and service procedures will ensure and extend trouble-free operation of equipment. Proper lubrication and careful attention to the hydraulic system suction filter are two vital areas. The objective of scheduled service should be to anticipate and prevent operational problems before they require extended shutdown for repairs.

IMPORTANT INFORMATION

The service guidelines outlined in this manual are effective methods. These guidelines are not all inclusive. Anyone who performs service or repair on a Sherman + Reilly™ machine must be completely satisfied that no one's safety will be jeopardized and take responsibility for those service actions.

If there are any questions about safety, procedure or precautions, contact Sherman + Reilly at 800-251-7780 before attempting to do the work.

Service should be scheduled to allow adequate time so the procedure can be completed correctly. It must be done by skilled, trained service personnel with a good basic knowledge of equipment, procedures, and safety practices.

Accurate records should be kept of all service and repairs.

Service

Safety Precautions

- Make sure the machine is “locked out” and your company’s “lock out” procedures are followed in accordance with OSHA requirements.
- Make sure that all precautions are taken to support components before loosening or removing bolts.
- When working on any hydraulic connection or part, be sure there is no pressure on fluid at the location of the work.
- Make sure nothing will move or drop when loosening a connection.
- Collect all the hydraulic fluid which will drain from the loosened connection.
- Use oil-dry or some other type of oil-absorbent material to soak up any fluid spills to keep working surfaces from becoming slippery.
- Cover all open connections to prevent loss and contamination to the hydraulic system.

When the hydraulic system has a problem or is opened at any point, filters and fluid should be replaced to prevent contamination or damage to the system.

- Take all fire prevention safety measures before using a welder or cutting device, including grinders. Have a fully charged fire extinguisher near the location of the work.
- Be sure that everyone involved in the maintenance, service or repair process understands what is being done and all of the safety precautions which need to be taken during the procedure.
- Make sure all lifting devices, chains, slings, and hooks are in good condition and have the rated capacity to do the job. Use guide lines when necessary for control during the lifting process.
- Always wear appropriate PPE (personal protective equipment) - proper protective clothing and equipment when performing service.
- To avoid damage to electrical components, disconnect all electrical controllers and components prior to conducting any welding on the machine.

Service

Hydraulic System.

Keep the hydraulic system clean and free of dirt, grit, and foreign material. The smallest amount of foreign material in the system can cause extensive damage to the pump, motor or valves. Sherman + Reilly has precautions to assure that each component and fitting was thoroughly cleaned and the system purged before this machine was delivered. Maintenance of the system should be carried out with extreme care.

Adding Hydraulic Oil

Wipe all dirt and grime from around reservoir filler cap before removing.

Component Replacement

When replacing hoses, fittings or other components, clean thoroughly and then assemble carefully. See the S+R document included in the Appendices: **"TORQUE PROCEDURES FOR HYDRAULIC FITTINGS"**

NOTE: The hydraulic fluid and filter should be changed after the first 25 hours of operation.

Cab Windshield

NOTE: Do not use ammonia based cleaners.

Use only non-ammonia-based cleaners to clean the front polycarbonate window. Using ammonia on polycarbonate will cause structural damage to the polycarbonate material, thereby degrading the impact resistance of the front window. This can create a hazard for the operator should a line breakage situation occur.

Engine Service

Fluids

Engine Oil: (See Kubota Manual)

Oil should be MIL-L-2104C or have properties of API classification CF or higher.
>77° F - SAE30 or SAE10W-30 or 15W-40
14° to 77° F - SAE10-30 or SAE15W-40
<14° F - SAE 10W-30

Gearbox Oil:

SAE 80W-90 Limited Slip Gear Oil API GL-5

Wheel Bearing Oil:

SAE 80W-90 Limited Slip Gear Oil API GL-5

- Service the engine according to the instructions in the engine manufacturer's manual.
- Keep all fluids at their proper level.

NOTE: Make sure the unit is level when checking fluid levels.

CAUTION: Never add ETHER to fuel to start cold engine. Ether CAN damage small diesel engines.

CAUTION: Do not exceed 50% of anti-freeze in the coolant. More anti-freeze will damage small diesel engines.

Always premix the correct coolant (50-50) before adding to cooling system.

Service

DAILY

Check:

- ☒ Engine oil level.
- ☒ Engine coolant level.
 - **Do not exceed 50% of anti-freeze in the coolant. More anti-freeze will damage small diesel engines.**
 - **Always premix the correct coolant (50-50) before adding to cooling system.**
 - **Never add ETHER to fuel to start cold engine. Ether WILL damage small diesel engines.**

Check:

- ☒ Hydraulic fluid reservoir level.
- ☒ Hydraulic fluid filter condition.
 - **There is a gauge on the filter which indicates the serviceability of the filter. When the indicator gets near or reaches the red zone, the filter should be changed.**
- ☒ Wheel bearing reservoir fluid level.
 - **If it is necessary to add fluid, use SAE-90 Hypoid gear oil.**
- ☒ Tire condition, damage and wear.

WEEKLY

- ☒ Perform daily inspection requirements.

- ☒ Check gearbox oil level.

There is a removable plug on the side of the gear box. Remove the plug. Gear oil should be level with the bottom edge of the opening.

- ☒ Inspect payout brake pads.

The pads should be replaced before the rivets make contact with the disc.

- ☒ Inspect axle assembly and springs for alignment, broken or damaged spring leaves.

- ☒ Check battery electrolyte level.
Replenish as required.

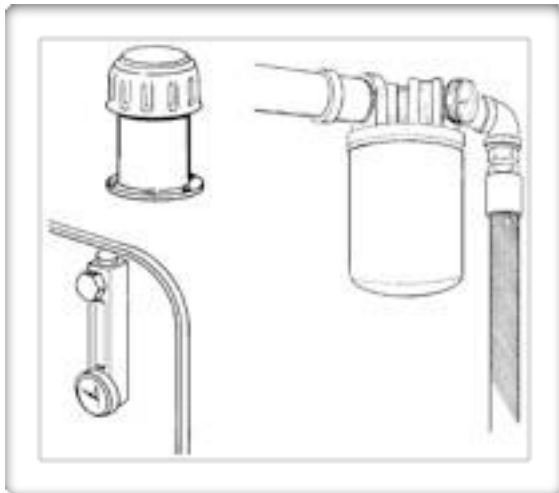
- ☒ Coat drum coupler teeth with marine grade

- ☒ Anti-seize compound like Bostik® NEVER-SEEZ® Mariner's Choice as required to ensure ease of movement.

Service

SEMI-ANNUAL OR EVERY 100 hours

- ☑ Replace the hydraulic fluid in the hydraulic system.
- ☑ Replace the oil filter.
- ☑ Inspect trailer brake linings for wear and replace as necessary.
- ☑ In extremely dirty or dusty conditions, filter and fluid should be changed every 50 hours of service.



REEL AND PILLOW BLOCK BEARINGS

The reels are fitted with a ball bearing cartridge in each end and the drive shafts are mounted on pillow block bearings attached to the machine frame. These bearings should all be greased every 25 hours of service with a lithium base every purpose grease, grade 2. In extreme hot or cold climate a heavier or lighter grade may be required.

PAYOUT BRAKE

Payout brake lining should be inspected every 25 hours of service and replaced before there is a danger of the rivet heads contacting the disc during operation.

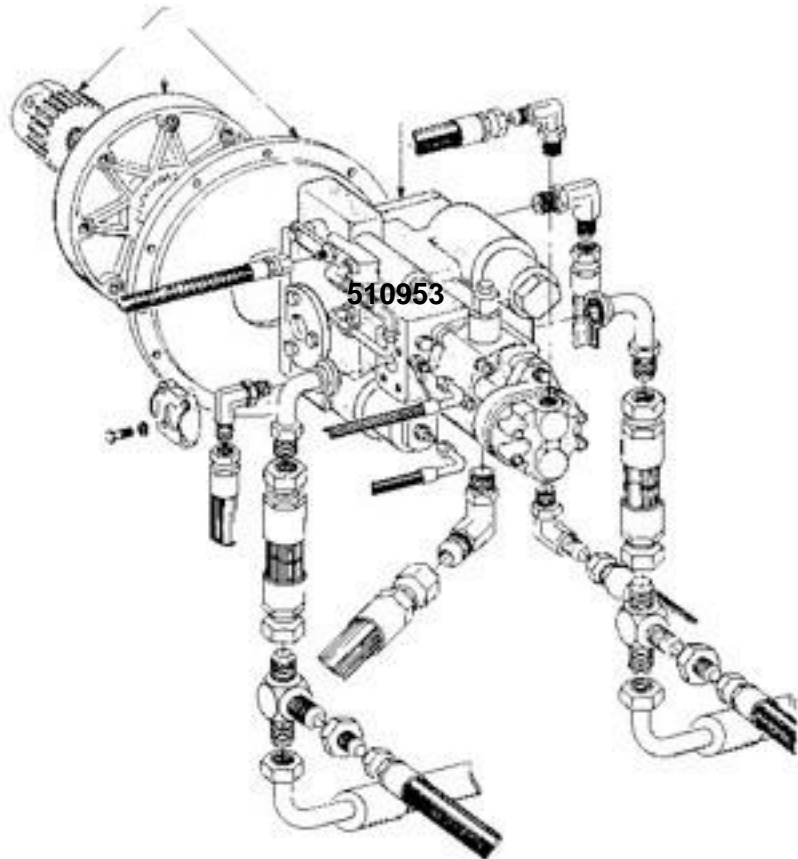
CHAIN AND SPROCKET

Chain and sprocket should be inspected before operating the machine. At any sign of excessive wear, the worn component (chain or sprockets) should be replaced.

The chain should be oiled before each operating period with 30W motor oil. In extremely dusty or sandy conditions, the chain should be wiped dry and only lubricated when the machine is out of service for a period of time.

Parts

PUMP ASSEMBLY

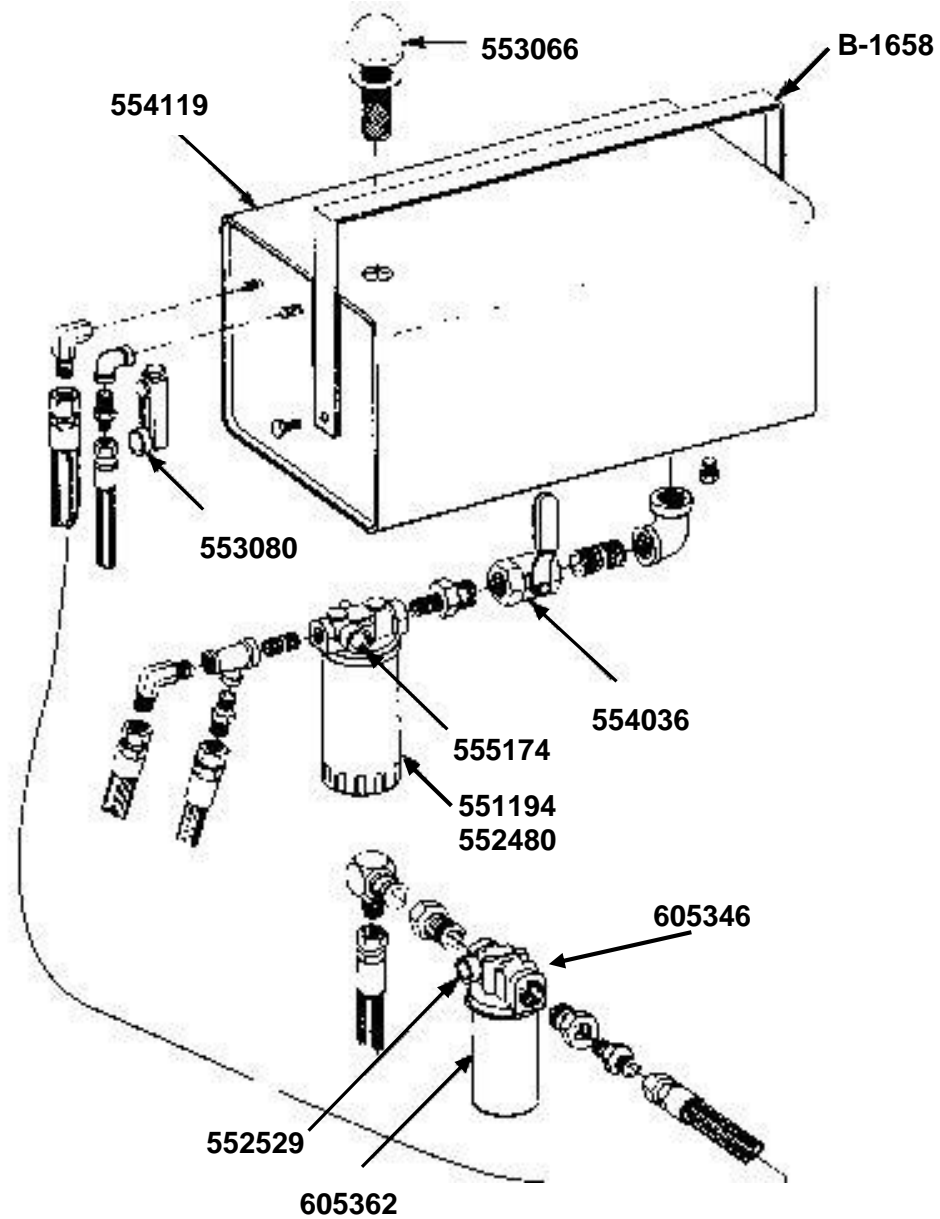


**** 510796**

Part #	Description	Qty.
510953	Pump, Eaton 3921-020, 3.9 CIR, CW	1
510796	Kubota Tier IV 84.5 HP Engine V3600TF-2SR2	1

Parts

HYDRAULIC TANK ASSEMBLY



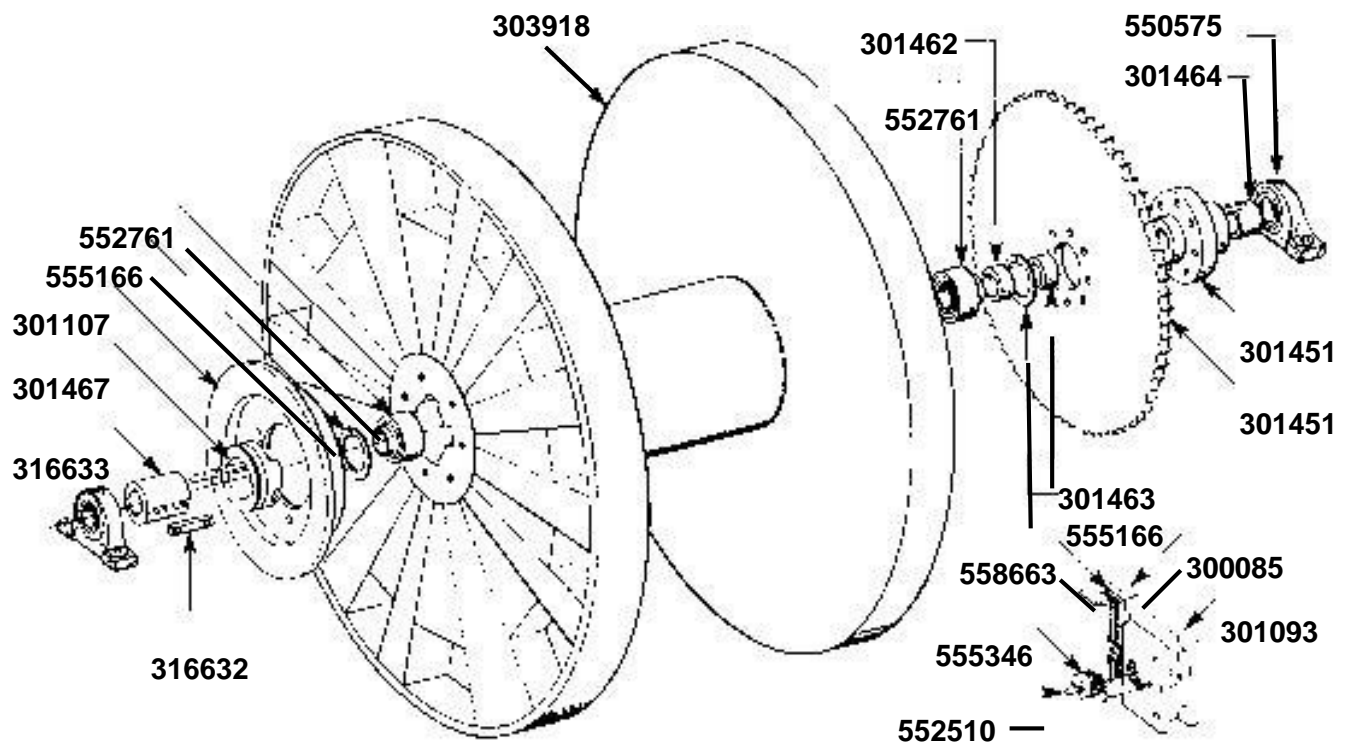
Parts

HYDRAULIC TANK ASSEMBLY

Part #	Description	Qty.
605362	Filter, 10 Micron, Return	1
554036	Valve, Ball with Lever Handle, 1/2"	1
552529	Indicator, Return	1
551194	Filter, 10 Micron, Suction	1
552480	Element	1
555174	Indicator, Suction	1
999035	Filter, Breather Cap Assembly	1
554119	Hydraulic Tank	1
553080	Gauge, Sight/Temp	1

Parts

DRUM ASSEMBLY



Parts

DRUM ASSEMBLY

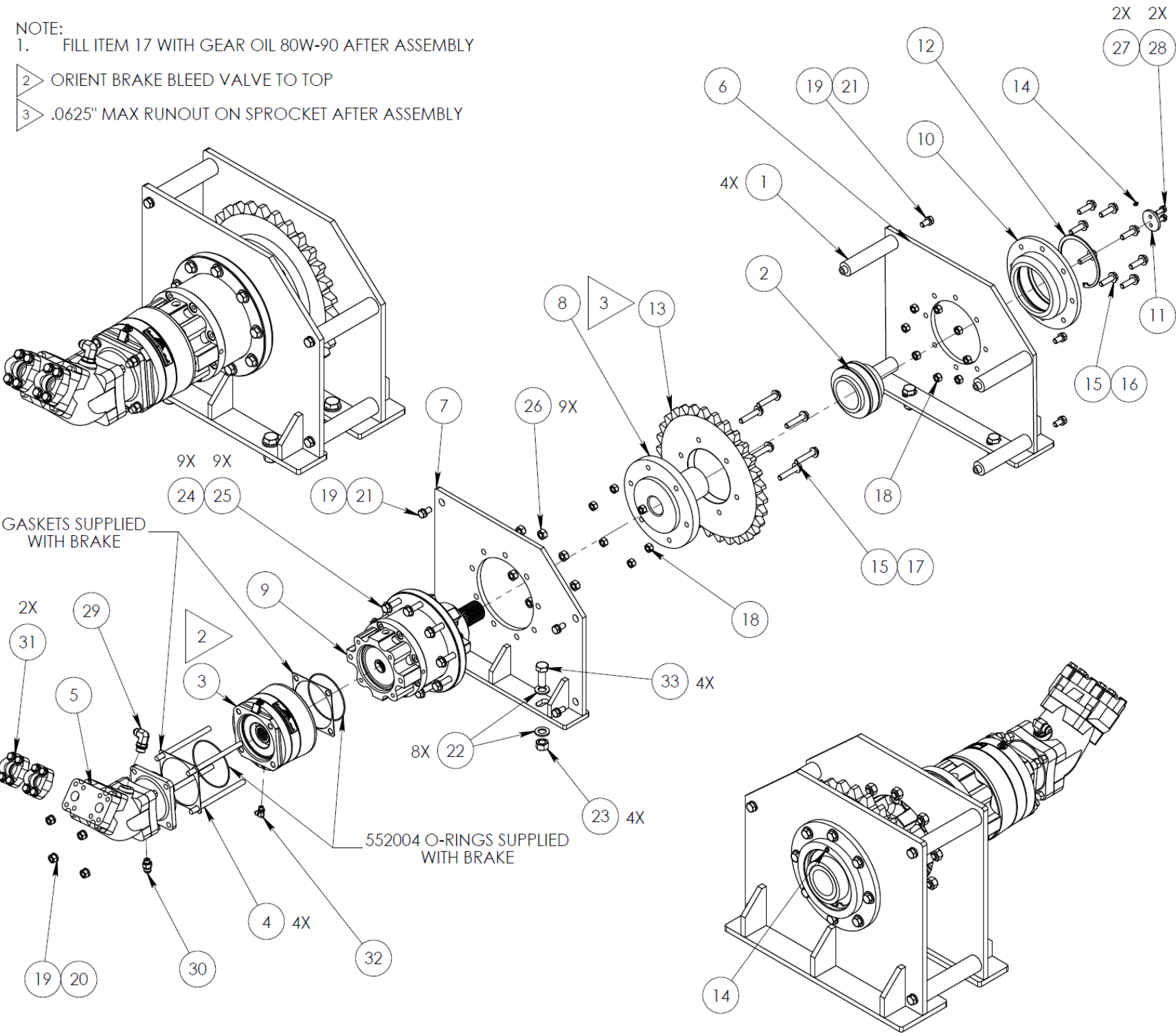
Part #	Description	Qty.
550536	Pillow Block Bearing	6
552510	Bleeder Valve	4
552761	Bearing	8
555166	Snap Ring	8
555346	Piston	4
316632	Key	1
558663	Brake Pad	8
301462	Spacer	2
301463	Spacer	2
301464	Spacer	2
301093	Caliper Frame	4
300085	Pad Mount	8
316633	Drive Sleeve	4
310467	Shifting Coupler	4
301107	Brake Disc	4
301451	Drive Sprocket	2
301452	Sprocket Hub	2
303918	Drum	4

[DRIVE MOTOR ASSEMBLY]

Parts

DRIVE MOTOR ASSEMBLY

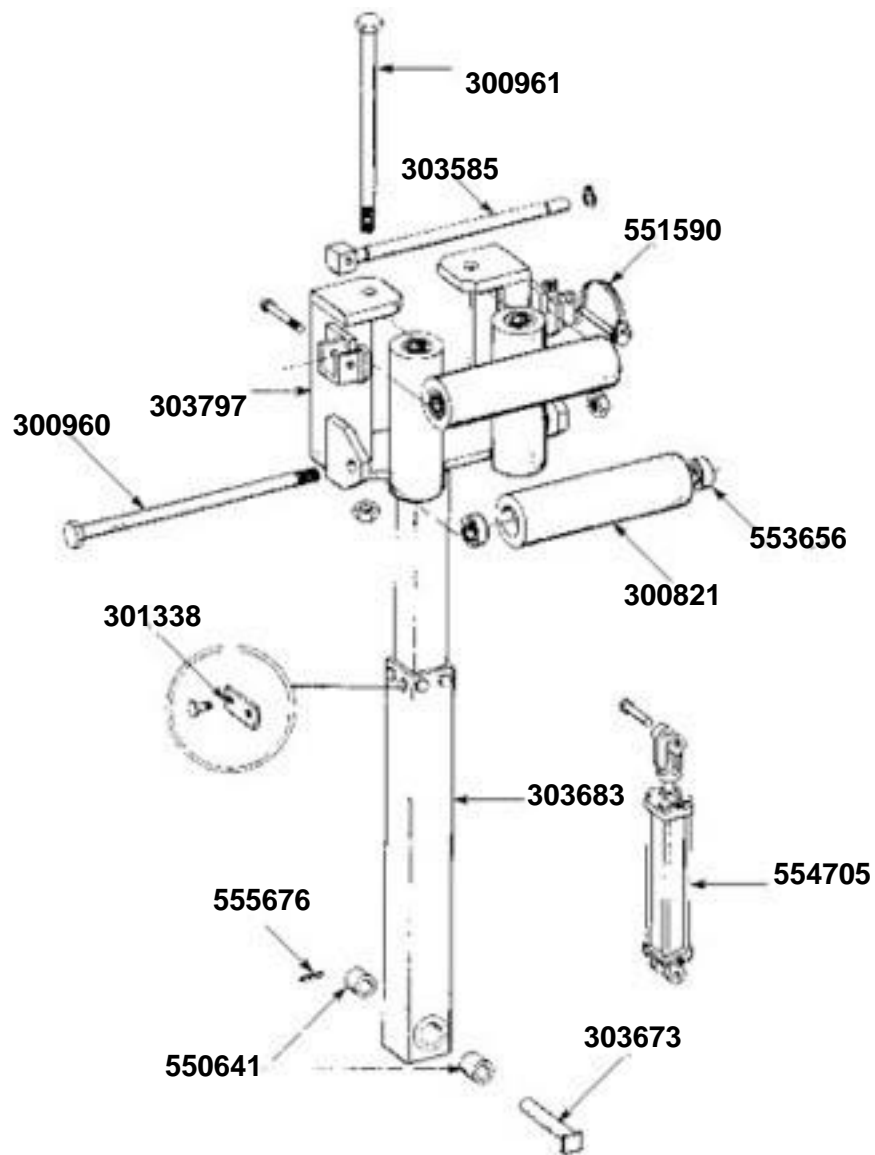
- NOTE:
1. FILL ITEM 17 WITH GEAR OIL 80W-90 AFTER ASSEMBLY
2. ORIENT BRAKE BLEED VALVE TO TOP
3. .0625" MAX RUNOUT ON SPROCKET AFTER ASSEMBLY



ITEM	QTY	PART NUMBER	DESCRIPTION
1	4	301352	GEAR BRKT DRIVE SPACER
2	1	552071	BEARING, CYLINDRICAL OD
3	1	552171	HYDRAULIC SPRING BRAKE
4	4	603642	HYD MOTOR MNT ROD
5	1	511053	HYD MOTOR - BENT AXIS
6	1	303848	GEAR MNT BRKT WMT
7	1	303847	GEAR MNT BRKT WMT
8	1	301353	SPROCKET HUB
9	1	552980	GEAR DRIVE REDUCER
10	1	303849	BEARING HUB
11	1	301068	GEAR DRIVE END CAP
12	1	551402	SNAP RING, INTERNAL
13	1	301354	SPROCKET, PITCH DIA 14.351"
14	1	551637	FTTNG, GREASE - 3/16 DRIVE STR
15	14	554295	WASHER, FLAT, SAE, 1/2
16	8	552517	SCREW, HEX, 1/2-13UNCx1.75, GR5
17	6	551914	SCREW, HEX, 1/2-13UNCx2.5, GR5
18	14	555604	NUT, HEX, LOCK, 1/2-13UNC, GR5
19	12	552188	WASHER, LOCK, 1/2
20	4	555808	NUT, HEX, 1/2-13UNC, GR5
21	8	554772	SCREW, HEX, 1/2-13UNCx1.0, GR5
22	8	552555	WASHER, FLAT, SAE, 3/4
23	4	550009	NUT, HEX, LOCK, 3/4-10UNC, GR5
24	9	551642	WASHER, FLAT, SAE, 9/16
25	9	557068	SCREW, HEX, 9/16-12UNCx2.25, GR5
26	9	552260	NUT, HEX, LOCK, 9/16-12UNC, GR5
27	2	556426	WASHER, LOCK, 3/8
28	2	551352	SCREW, HEX, 3/8-16UNCx1.0, GR5
29	1	552630	ADP, ELB-90, 08MJ-10MB
30	1	559293	ADP, STR, 08MJ-06MB
31	2	603284	SPLT FLNG KIT, CODE 62, -16
32	1	550534	ADP, ELB-90, 04MJ-04MB
33	4	557148	SCREW, HEX, 3/4-10UNCx2.0, GR5

Parts

LEVELWIND ASSEMBLY



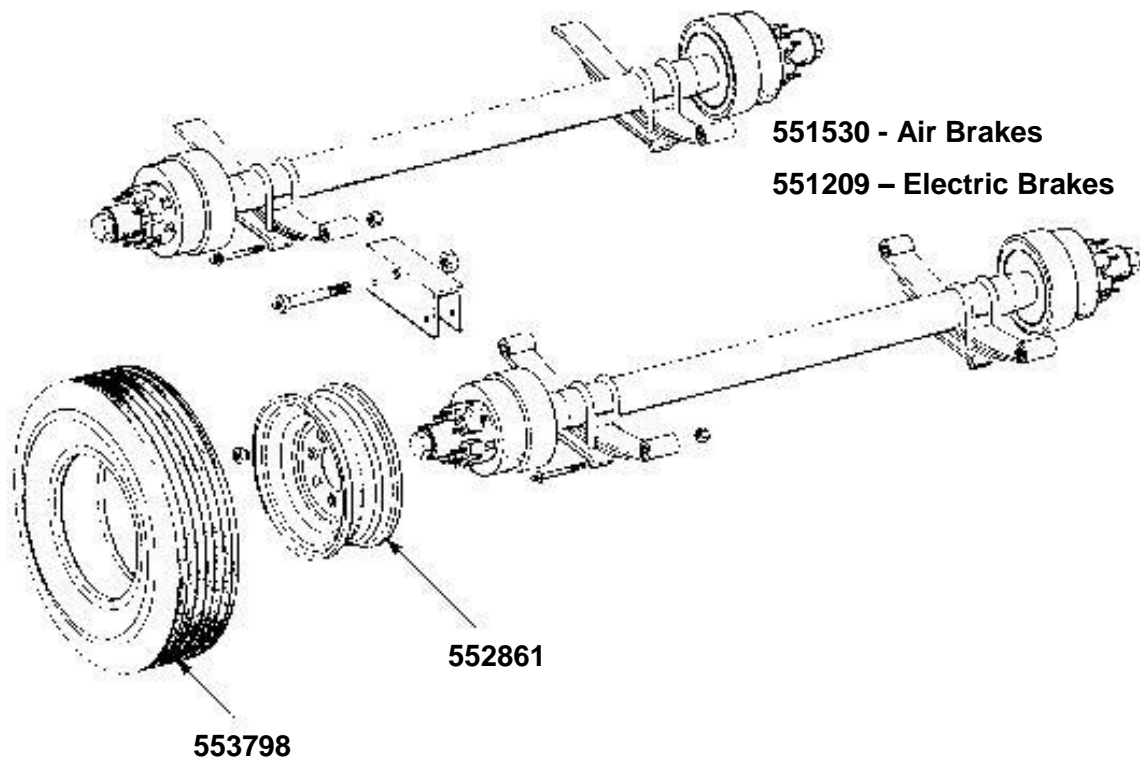
Parts

LEVELWIND ASSEMBLY

Part #	Description	Qty.
553656	Roller Bearing	8
550641	Bronze Bushing	2
554705	Cylinder	1
551590	Locking Retaining Pin	1
555676	Roll Pin	1
301338	Locking Bar	4
300820	Vertical Roller, 7 7/8"	2
300821	Horizontal Roller, 9 1/2"	2
300960	Horizontal Roller Shaft	1
300961	Vertical Roller Shaft	2
303585	Top Horizontal Roller Shaft	1
303683	Outer Tube Weldment	1
303673	Pivot Pin/Levelwind	1
303797	Levelwind Head Weldment	1

Parts

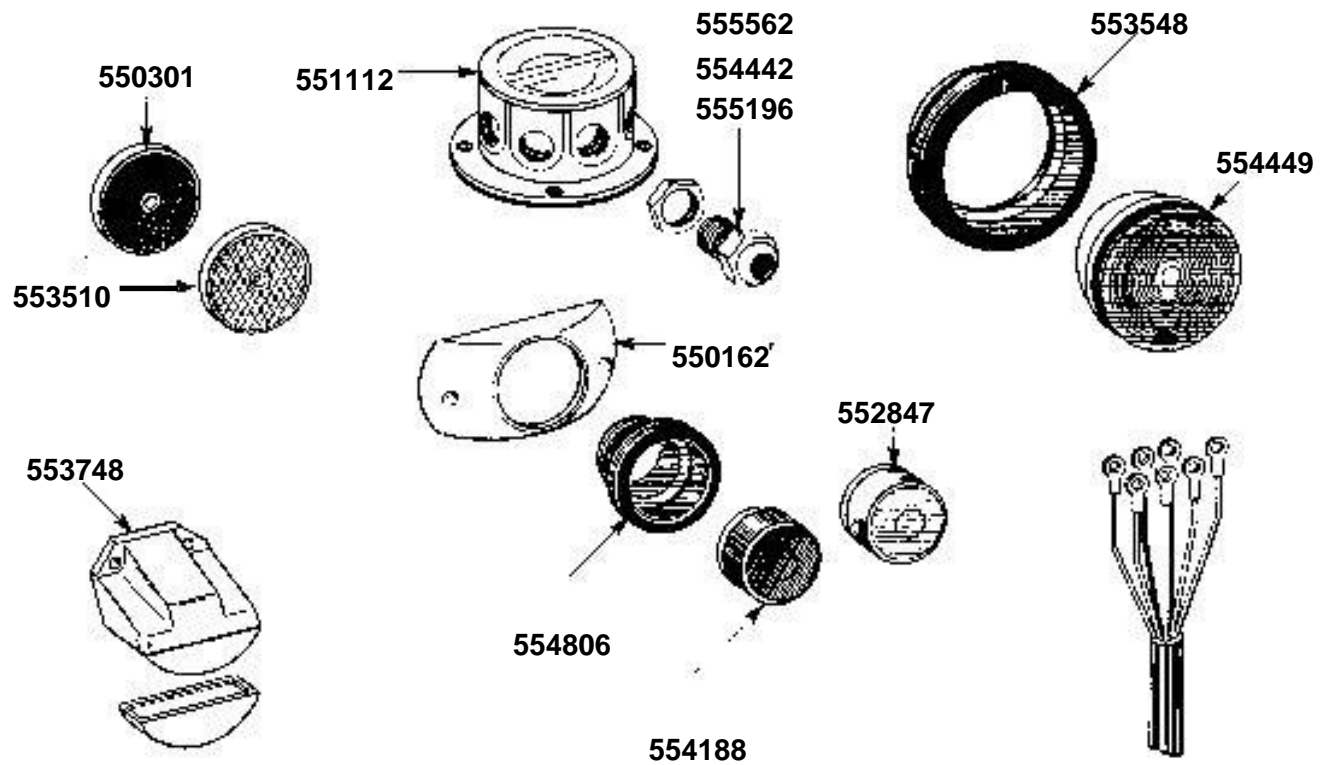
WHEEL AND AXLE ASSEMBLY



Part #	Description	Qty.
552861	Wheel 17.5 x 6.75 HC	4
553798	Tire, Tubeless Radial 235-75R-17.5H	4
551209	Tandem Axle Assembly 15,000 lb. with Electric Brakes	1
551530	Tandem Axle Assembly with Air Brakes	1

Parts

TRAILER LIGHTING



Parts

TRAILER LIGHTING

Part #	Description	Qty.
553748	Light, License Plate Kit	1
553548	Grommet, MTG Kit, 4 1/2"	4
551112	Junction Box	1
555562	Compression Fitting, 3/8"	3
554442	Compression Fitting, 1/2"	2
555196	Compression Fitting, 3/4"	1
554449	Light, Stop, Turn and Tail	4
550301	Reflector, Red	4
553510	Reflector, Amber	4
554806	Grommet, 3 1/2"	8
550162	Plastic Bracket	8
552847	Clearance Light, Amber	4
554188	Clearance Light, Red	4
551433	7 Cond. Main Cable	1

TROUBLESHOOTING

QUICK TIPS

ENGINE WILL NOT START OR RUN

- Dead battery, could be caused by pulled breakaway switch.
- No fuel, check tank gauge.
- Refer to engine manufacturer's manual.

REEL WILL NOT RUN

- Gearbox spline not engaged correctly.
- Low system pressure brake not releasing.
- Pump linkage loose or out of adjustment.

REEL DOES NOT STOP WHEN CONTROL LEVER IS SHIFTED TO NEUTRAL

- Pump linkage loose or out of adjustment.
- Air or contamination in brake line.
- Broken brake spring.

HYDRAULIC JACK CREEPS DOWN

- Motor running, control valve seals bad.
- Motor off.
- Counter balance valves on jacks are set too low.

REEL DOES NOT ENGAGE

- Air Brake pressure not set to zero (0).

LEVELWIND CYLINDERS NOT MOVING

- Levelwind unloader valve set too low
- Levelwind Manifold cartridges clogged with debris.

UNIT WILL NOT BUILD MAXIMUM HYDRAULIC SYSTEM PRESSURE

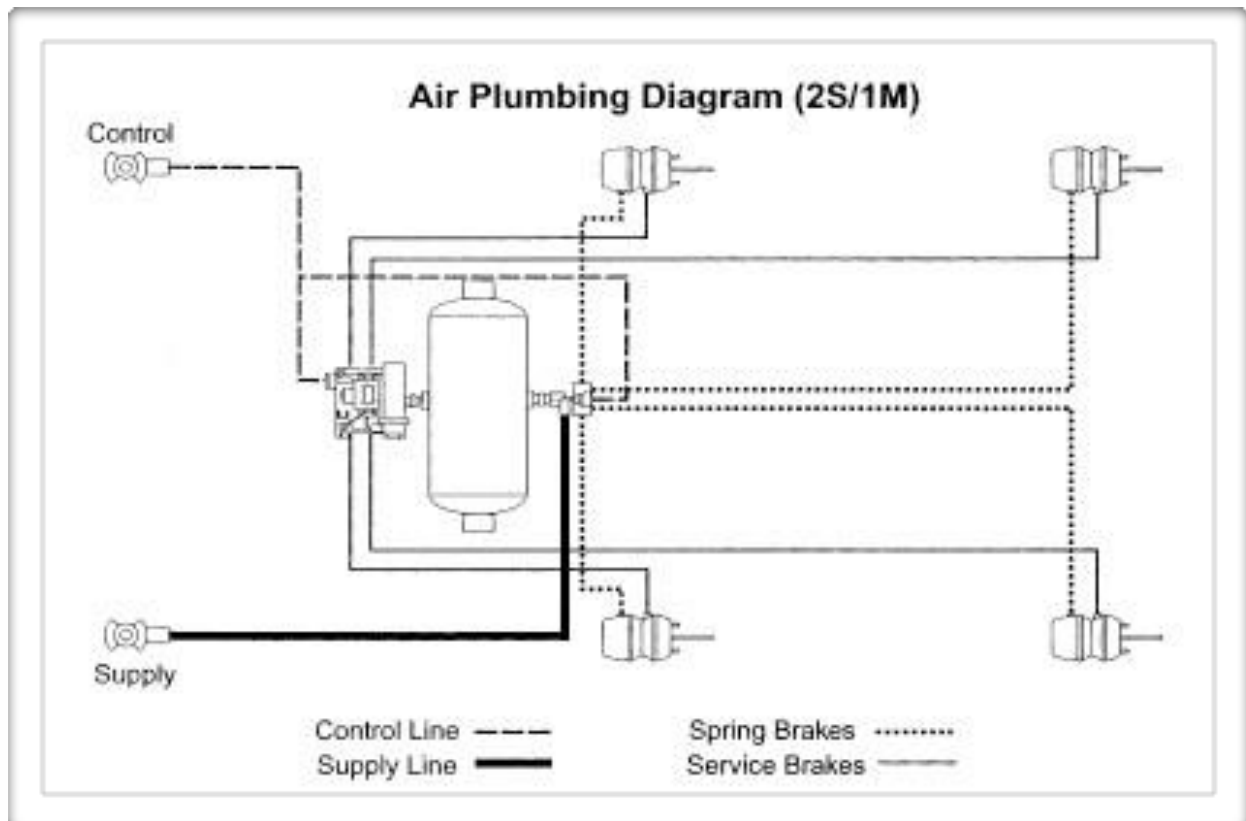
- Pump linkage loose or out of adjustment.
- Line tension control valve blocked or malfunctioning.
- Pump relief valve malfunctioning.
- System pressure relief valve inside control panel out of adjustment or malfunctioning.
- Contamination in hydraulic system.

HYDRAULIC FLUID TEMPERATURE IS ABOVE NORMAL

- Clogged cooler fins restricting air flow.
- Payout brake and gearbox spline connected to the drive bar at the same time.
- Gearbox brake not fully releasing.
- Contamination in hydraulic system blocking cooler.

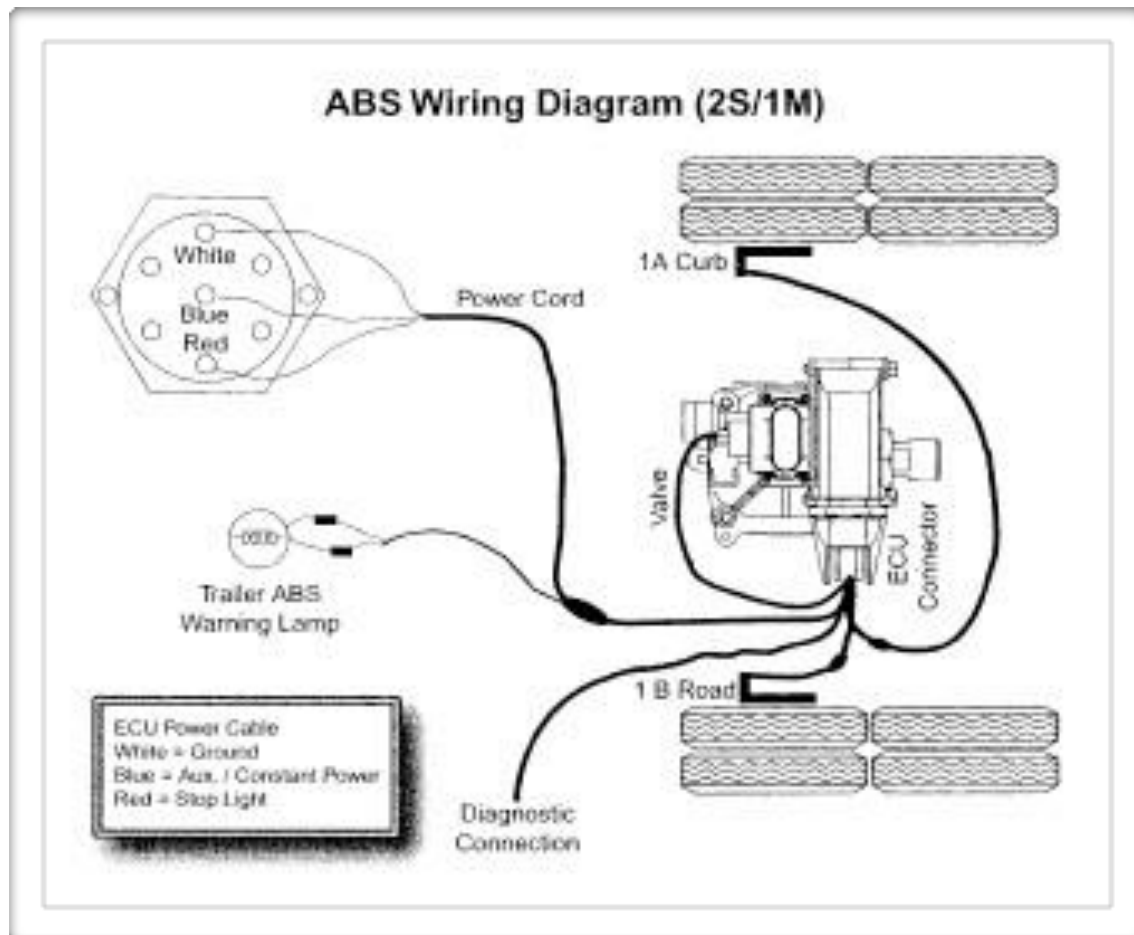
TROUBLESHOOTING

AIR PLUMBING DIAGRAM (ABS AIR BRAKES)



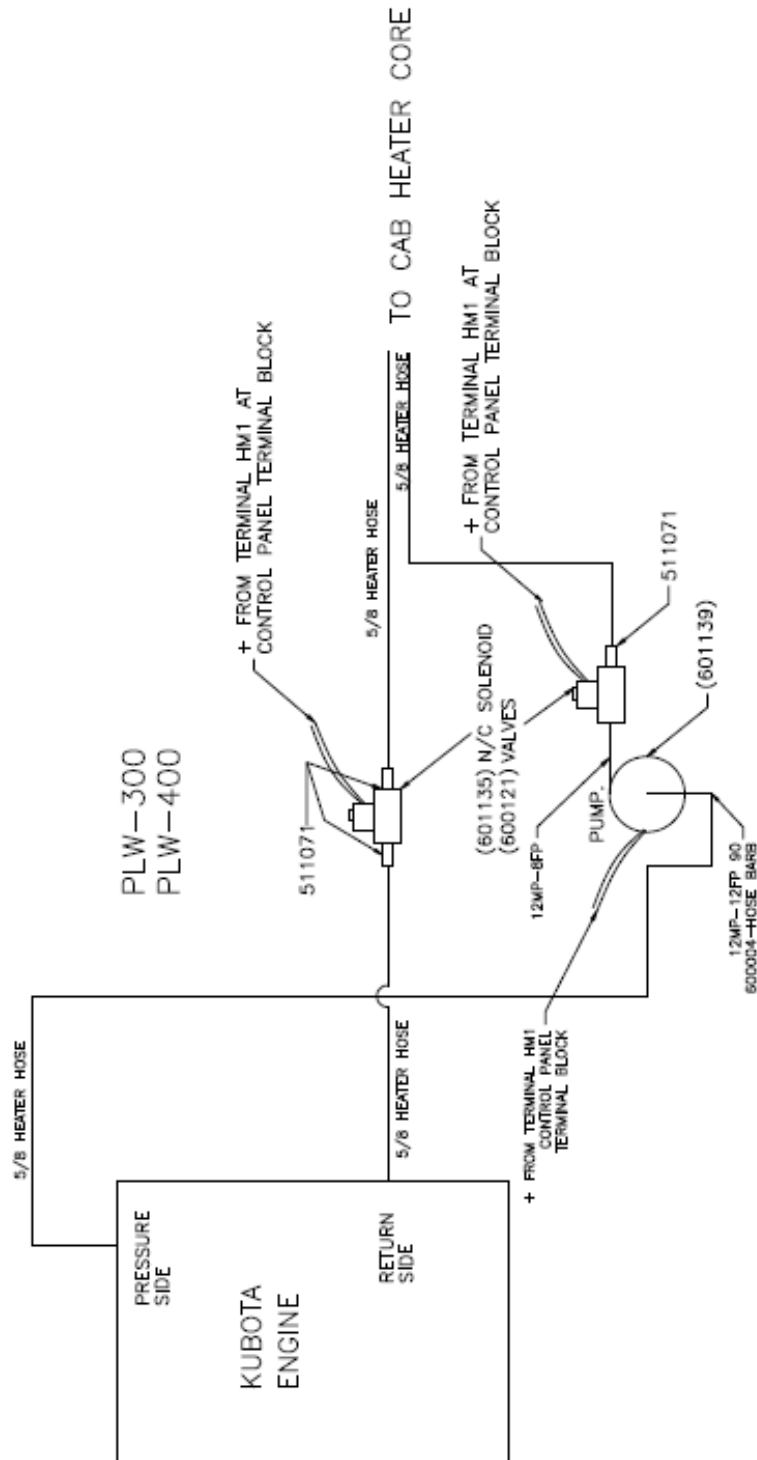
TROUBLESHOOTING

ABS AIR BRAKES WIRING DIAGRAM



{TRAILER LIGHTS SCHEMATIC}

HEATER ASSEMBLY SCHEMATIC



TORQUE SPECIFICATIONS

NOTE: For hydraulic fittings, see in the Appendices:
[Torque Procedures for Hydraulic Fittings](#)

In general, fasteners on this piece of equipment follows ASME / ANSI guidelines for tightening torque. There are some exceptions, noted below:

Recommended Torques for Selected Fasteners

<i>Item</i>	<i>Torque, lb-ft</i>
Wheels and Tires	475
Pintle Eye Mount	300
Brake Disk	125
Drive Sprocket	125
Reel Shaft Pillow Blocks	300
Jack Top Covers	50
A/C Compressor Mounts	30

Other than the above, as a general rule, tightening torque should be set according to this table, with a tolerance of approximately $\pm 5\%$:

General Recommended Torque for Fasteners by Size, ft-lbs

Size, in	Grade 5		Grade 8	
	UNC	UNF	UNC	UNF
1/4	5	7	9	10
5/32	13	14	18	20
3/8	23	26	33	37
7/16	37	41	52	58
1/2	57	64	80	90
9/16	82	91	115	129
5/8	112	128	159	180
3/4	200	223	282	315
7/8	325	350	450	500

MAINTENANCE NOTES

PLW-400

EQUIPMENT INFORMATION

Company Name: _____

Date of Purchase: _____

Date of Manufacture: _____

Equipment/Unit Model Number: _____

Equipment/Unit VIN Number: _____

Engine Serial Number: _____

Major Fault:

A "major fault" describes a system malfunction or other system degradation that, by equipment failure, operator error, or other environmental condition, renders that machine inoperable. A major fault can be identified when, through normal operations, the machine would create; an unsafe condition, further or permanent equipment damage, or other situations deemed outside of the operator's ability to effectively and safely operate the machine.

When to send for Service or Repair:

If after troubleshooting an issue or fault that cannot be resolved, or a major fault has been identified, the operator should stop all operation attempts and contact the Sherman+Reilly Parts & Service Department. Further operation should not continue until the issue or fault is resolved.

Scan with Smartphone to complete
and email repair request form.



MAINTENANCE NOTES

PLW-400[illegible]

Appendices



We're **dedicated** to getting **every** lineman home
every night, no exceptions

Follow Sherman + Reilly!



Scan with Smartphone to complete and
email an information request form.



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