



SHERMAN + REILLY™ **Revolution Series**

P1400X Puller

Operator's Manual

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Revolution Series

P1400X Puller

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Introduction



Liability

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 Administration) and EPA- (Environmental Protection Agency) regulations, as well as ANSI- (American National Standards Institute) accredited standards. 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 subsequent).

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 in 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.

Introduction

Terms of Use

To properly, safely operate this machine, operators and service people must read and understand the information in this and the engine manufacturer's manual. Anyone working in the vicinity of the machine should read the safety precautions in the manuals. Be aware that each warning and precaution is to help protect against personal injury and/or damage to the machine. 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 800-251-7780, via email at help@sherman-reilly.com, or via www.sherman-reilly.com.



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.

This manual was prepared to help the operator use and service the machine in a safe manner. Responsibility for safety during operation and service rests with the person(s) performing the work. Being alert of surroundings and observing all safety precautions, including OSHA, EPA, IEEE and all rating requirements and standards, is a must to help reduce the possibility of an accident. This manual is of no value if the operator does not read and understand the instructions and precautions before starting or 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 the safety of the operating/work environment.

The Sherman+Reilly™ Model P-1400X Puller is a diesel engine powered, hydraulically actuated machine. This machine has variable speed and line tension controls; however, if pulling multiple conductors using a running board, the total line tension applied from all conductors must not exceed the pulling capacity of the machine.

Specifications



P-1400X General Overview

The Sherman+Reilly™ Revolution Series P-1400X is a Single Drum Puller capable of pulling up to 14,000 lbs., and has the option of adding a re-conductoring drum. This transmission class puller utilizes an automatic horizontal floating levelwind that permits overhead rope retrieval with precision control. The P-1400X is equipped with an ACG (advanced control group), allowing for a single operator at a protected central console to control payout speed, pulling speed, levelwind controls, and jack position. The operator controls employ electronic machine control with CAN-bus technology, providing accurate to-the-second display readouts of the machine system status.

The hydraulically actuated, automatic floating levelwind helps ensure even distribution of rope during pulling operations, thereby minimizing the risk of tangles and overlap, and maximizing rope life. The horizontal floating style of the levelwind also allows for easy upright standby positioning during payout operations. The P-1400X is equipped with a 173 HP industrial diesel engine capable of delivering a full 14,000 lbs. of line pull, at the top of the drum. This machine also employs a first-of-its-kind drum engagement system, utilizing lateral sliding sides and drum support rollers. These unique hydraulically actuated sides of the machine extend to allow for easy changing of the drum. The fully hydraulic direct drive system provides the operator with precise and intuitive automatic drive/drum braking. The P-1400's tandem air brake axle trailer is equipped with three hydraulic jacks, an adjustable pintle eye, safety chains/hooks, and U.S. DOT-approved LED lighting.

The P-1400X features a Safe-Zone™ Cab providing ultimate safety and comfort for the operator. The Safe-Zone™ Cab employs a floor to ceiling polycarbonate front window for maximum visibility while providing superior protection against impact. The cab includes climate control, a fully adjustable ergonomic seat, and all required electronic controls and gauges. The Safe-Zone™ Cab is designed to reduce operator fatigue and provide an “off-ground” envelope for greatly reducing the risk of “touch potential” in energized environments.



Key Features

- Fully Hydraulic/Direct Drive System
- First-of-its-Kind Lateral Drum Engagement
- Safe-Zone™ Cab
- 54 inch Drum with Opt. 15,000 ft. (Max) Unitrex™ Synthetic Rope
- Horizontal Floating Automatic Levelwind
- 3 Hydraulic Jacks
- 10.4 cu. ft. Frame Mounted Tool Box
- Centralized Engine Controls- CAN-bus technology

Specifications

Specifications Details: P-1400X

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

Pulling Capacity	<i>14,000 lbs., (Rated at the top of drum)</i>	
Average Line Speed	Pulling: 4 mph / Payout: 10 mph	
Controls	Digital with real-time tension monitoring and recording	
Drum Dimensions	Core Diameter:	30 in.
	Total Outside Width:	76 in.
	Inside Width:	64 in.
	Flange Diameter:	54 in.
Drum Capacity	18 mm. dia. Unitrex™	15,000 ft.
	5/8 in. dia. Steel	15,000 ft.
Drive System	Drum, w/Direct Hydraulic Drive	
Drive System Engine	Diesel, 173 HP, water cooled Tier 3	
Fuel Capacity	40 gallons	
Hydraulic Fluid	ISO Grade 32	
Hydraulic Reservoir	32 gallons	
Hydraulic Fluid Filtration (2)	10 micron, both supply and return filters	
Levelwind	Hydraulically driven, automatically-controlled	
Operator's Safety Enclosure	Safe-Zone™ Cab, fully-enclosed/single door	
Frame Construction	Steel tubing, steel plate.	
Length (Overall, Nom.)	22 ft., 8 in.	
Width (Overall, Nom.)	8 ft., 6 in.	
Height (Overall, Nom.)	9 ft., 8 in.	
Weight (w/o rope)	w/ Standard Drum: 16,500lbs; w/ Reconductoring Reel: 15,300lbs	
GVWR	27,000lbs	
Suspension	Leaf-spring	
Axle Configuration	Tandem	
Wheel Configuration and Tires	Single 245/70R 17.5	
Brakes (Trailer)	Air brakes w/anti-lock feature on both axles	
Towing Attachment	3 in. pintle eye, with two safety chains and hooks	
Tie Downs (4)	(2) 5/8 in. dia. steel D-Rings, (2) 1 in. dia. steel D-Rings	
Rear (R/L) Jacks (2)	Hydraulic, horizontal folding, with shoe	
Front/Nose Jack	Hydraulic, vertical column, with shoe	
Electrical System	12 VDC	
Battery (2)	12 V, 720 CCA, BCI group 27	
Lights / Navigation	12 V, LED, U.S. DOT-approved	
Grounding (4)	¾ in. dia. copper-clad steel loops	
Wheel Chocks	Standard	
Fire Extinguisher	ABC	
Color	S+R White	



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 specifications and limitations. Please see below for examples:



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

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

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

Safety

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.

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 working 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.
- 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 operating.
- 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.

Employer Safety Precautions

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

Operators should be monitored to ensure they observe and practice safety procedures and operate the support equipment as outlined in this manual.

A regular inspection program which includes malfunction reports, inspection, and service records should be established and maintained. 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.

Any malfunction or breakdown affecting the safe operation of the equipment must be properly corrected or repaired before returning the machine to service.

The employer should 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 should be maintained. Only personnel who have a full understanding of the provided manual- (*provided in English only*), and who are competent in the use of overhead pulling and 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.

Owner/Employer/Maintenance personnel should 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 should specifically inspect all safety equipment and protective devices on the equipment to ensure they are not bypassed or disabled. Operation of equipment must not be permitted unless all safety devices are in place and functional. The employer should meet all appropriate information dissemination and protection requirements for the workers.



Chemical Safety

Exposure to chemicals during normal operation of the machine is limited; however, chemical exposure may be encountered through preventive maintenance and repair. Operators and maintenance/service personnel should take appropriate precautions, to include wearing all (PPE)-Personal Protection Equipment, prior to the operation, maintenance, or service of the machine. All Material Safety Data Sheets (MSDS's) or Safety Data Sheets (SDS's) for OEM chemicals present upon initial manufacture/shipment of machine can be made available upon request to Sherman+Reilly™.

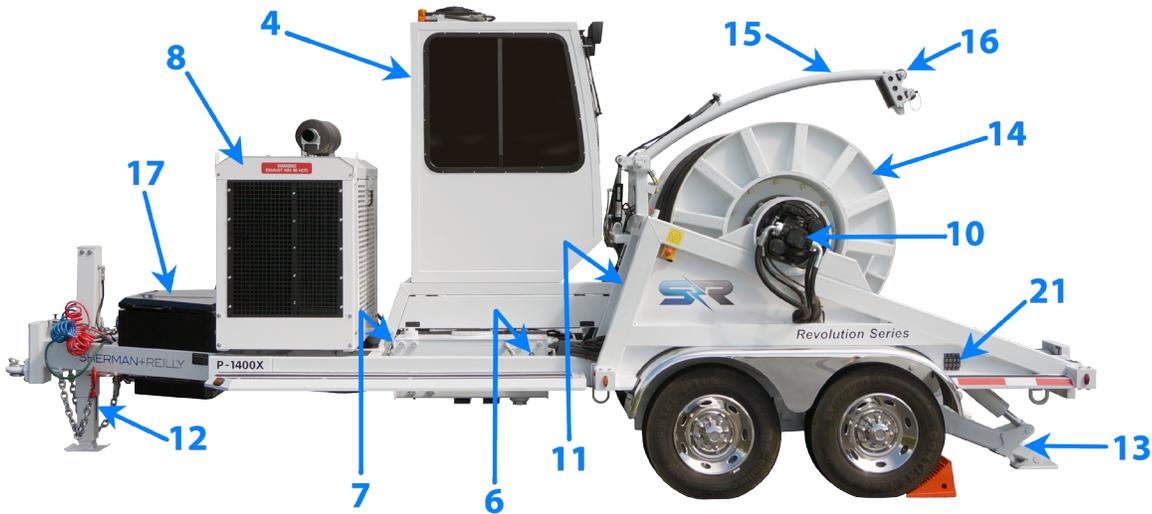
Any additional chemicals introduced to the machine or used in conjunction with maintenance or repair of the machine must have a MSDS/SDS available for work being done, and would thereby be the responsibility of the operator's employer or the organization providing the maintenance. All chemical handling and disposal should be done in accordance with environmental, federal, state, and local laws and regulations. Sherman+Reilly™ is not liable for the mishandling, misuse, or improper disposal of chemicals, with regard to the use or maintenance of Sherman+Reilly™ machines or equipment.

All responsibilities, including but not limited to: handling and disposal of chemicals, availability and maintenance of MSDS's/SDS's, labeling of chemical containers, and training of employees and operators, should be fulfilled in accordance with the Hazard Communication Act, Hazardous Materials Transportation Act, OSHA's Hazard Communication Standard- (29 CFR) Part 1910.1200 or subsequent, and all applicable EPA Standards and Regulations- (*additional standards may apply*). For further information on safety standards regarding chemicals, see OSHA and EPA websites.

Operation

Terms You Need to Know

- | | | |
|----------------------------|-------------------------------|--------------------------------------|
| 1. Pintle Hitch | 9. Hydraulic Pump | 17. Tool Box |
| 2. Safety Chains | 10. Hydraulic Drive Motor(s) | 18. Fire Extinguisher |
| 3. Air Brake Connections | 11. Emergency Manual Override | 19. Battery |
| 4. Safe-Zone™ Cab | 12. Rear/Nose Jack | 20. Grounding Bracket (4) |
| 5. Diesel Fuel Tank | 13. Side [L/R] Jacks (2) | 21. Exterior Hydraulic Control Panel |
| 6. Hydraulic Tank w/Filter | 14. Drum | 22. Drum/Drive Coupling(s) |
| 7. Sight Gauge | 15. Levelwind Arm | |
| 8. Hydraulic Power Engine | 16. Levelwind Head | |



Operation

Safe-Zone™ Cab

The Safe-Zone™ Cab is designed to keep the operator off the ground while the equipment is in use, and is built with a polycarbonate front window, fully adjustable ergonomic seat, high-resolution color LCD screen, and a full set of electronic controls. The Safe-Zone™ Cab comes in several sizes and forms, dependent upon the machine. It is designed to reduce operator fatigue, reduce errors and injuries in the field, and also reduce the risk of “touch potential” in energized environments.



Operators Controls



A 12-Volt DC power port has been provided on the operator control console. This port can be used to charge field radios or cellular telephones, or provide power for other similar devices.



Ergonomic Operators Chair



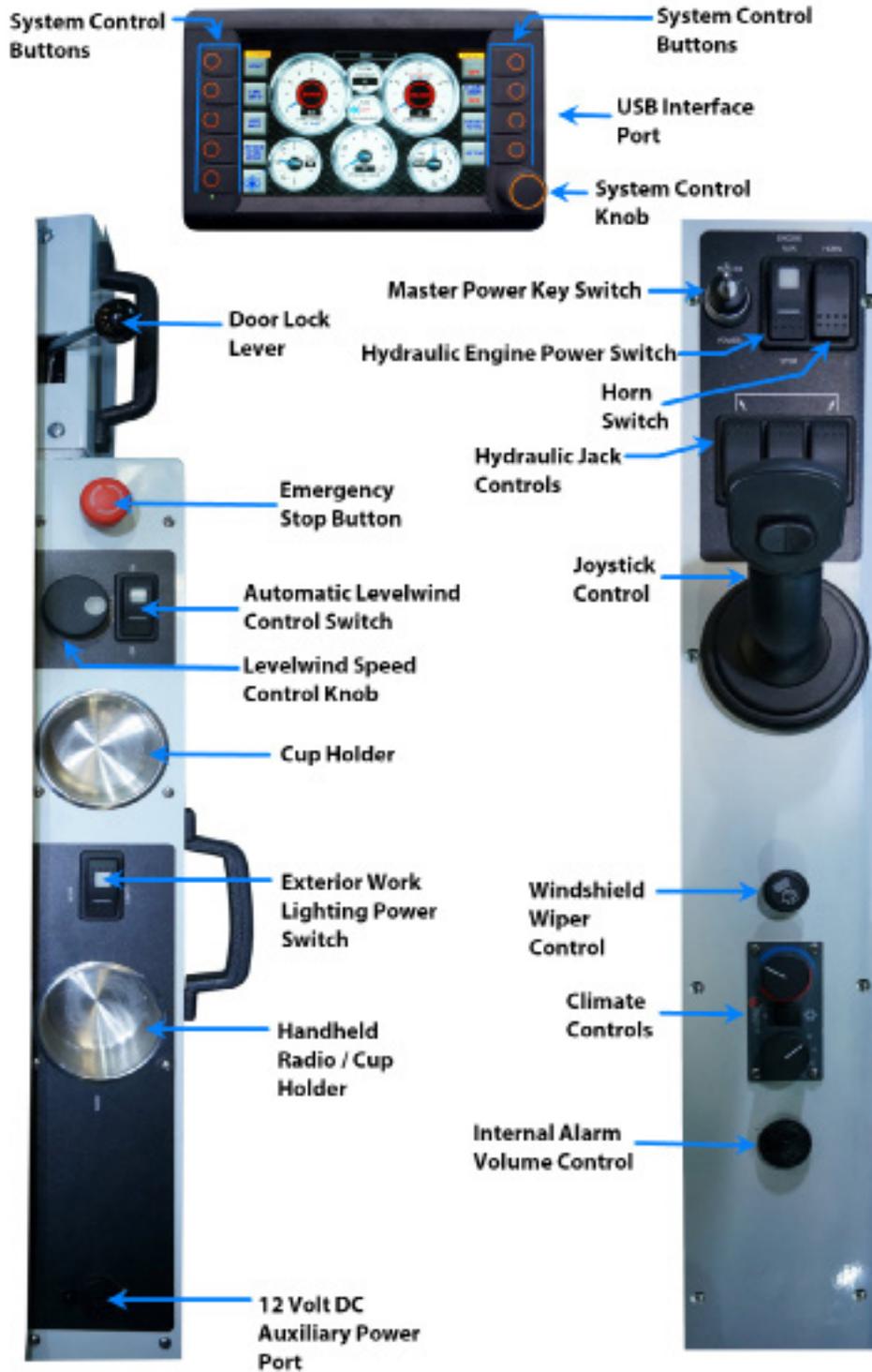
CAUTION: The Operator must remain seated during operations. If the seat is vacated for 8 seconds during operations, the machine will automatically go into a control stop.

CAUTION: 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.



Operation

Operator Controls



Operation

Operator Controls

***For control locations see Operator Control Panel Section on page 12.*

Master Power Key Switch

Controls power to the operator controls. This switch must be turned to the On (/) position to start the machine.



Exterior Work Lighting Power Switch

Located on the door panel, this rocker-switch turns on and off the exterior work lights. When the switch is engaged, the light in the center of the switch will illuminate.



Emergency Stop Button

Located on the cab door, to the right of the operator's seat, this red push-button stops all operation functions, turning off system and engine power, while disengaging all controls. After being depressed, the button must be rotated and released to the disengaged position to restore power and reengage operator controls.



Automatic Levelwind Controls

Located on the door panel, this switch and rheostatic knob are used to control the automatic levelwind function. The switch is pushed up to turn On/Off the automatic levelwind function. Then knob is used to increase and decrease the overall speed of the levelwind. ***For more information, see the Automatic Levelwind Controls section.***

Engine Power Switch

To start the engine, first turn the master power key switch to the On position, then push the engine power switch upward to the [START] position. There will be a beeping and pause while the the diesel engine initiates start-up.



Operation

Operator Controls

**For control locations see Operator Control Panel Section on page 12.

System Control Panel

The system control panel has nine (9) soft key buttons and a rotational control knob/button for control of machine and computer functions. The panel is equipped with a seven inch widescreen high-definition color liquid crystal display which indicates system and operation information.



HOME Screen

Once the Master Power Key Switch is turned on and the system loads, the first screen the operator sees (after the S+R logo screen) is the MAIN menu screen. This screen allows the operator to access the functions of the system controls.

This screen contains system gauges that indicate line speed, a footage counter, line tension, fuel level, engine RPM's, and engine temperature, in addition to the selection buttons. To return to this screen from any other screen, press the [BACK] button.

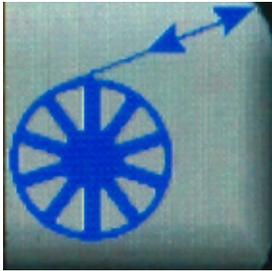
Rotational Control Knob/Button

This knob, when pushed then rotated, controls the value of a selected variable field on the display. Rotate the knob Clockwise to increase the value and Counter clockwise to decrease the value. Once the value is set, the knob must be pushed in again, as a button, to save the setting.

Operation

Operator Controls

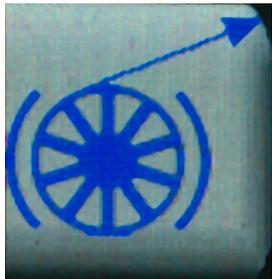
Operational Modes



Power Mode

This symbol represents the operational mode where the machine uses the engine and hydraulics to pull in rope and to pay out rope, both of which are controlled by the joystick.

When in Power Mode, the P1400X controls Speed and Resistance, and employs the hydraulics to “drive” or power the drum.



Drag Mode

This symbol represents the operational mode where the machine uses the hydraulics to provide LINE DRAG.

When in this mode, the machine will provide dynamic hydrostatic line drag for rope coming off of the drum. There is no power assistance, and the engine will run at a lower RPM.

The amount of LINE DRAG is applied with the joystick.

When the joystick is all the way forward, the LINE DRAG is at its minimum. As the joystick is brought back to the Center/Neutral position, the LINE DRAG is increased. Once the Center/Neutral position is reached, the Brake is applied.

Operation

Operator Controls

**For control locations see Operator Control Panel Section on page 12.

System Control Panel

SELECT MODE (cont.)

The **POWER Mode** is used when conducting normal pulling operations with rope, cable, or re-conducting with old conductor.



The **POWER mode** is also used when assisting with unspooling line from the drum, and will use hydraulic pressure to “drive” the line at a determined speed and resistance. This is controlled with the joystick.

The **DRAG mode** provides LINE DRAG. When in this mode, the machine will provide dynamic hydrostatic line drag. There is no power assist, and the engine will run at a lower RPM.

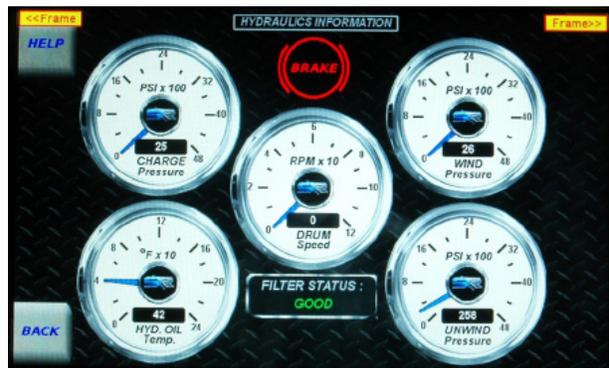


The amount of **LINE DRAG** that is applied is controlled with the joystick.

When the joystick is all the way forward, the amount of **LINE DRAG** is at its minimum. As the joystick is pulled back toward the Center/Neutral position, the **LINE DRAG** is increased. At the Center/Neutral position, the brakes are applied.

HYDRAULIC INFO

Displays hydraulic system monitoring gauges, including drum RPM, hydraulic oil temperature, hydraulic pressures, and hydraulic oil filter status.



JACK CONTROL OFF/ON

Located on the **SETUP** screen, controls the jack functions. When a jack is enabled, a view from the jack cameras will show on the screen, and the hydraulic jacks can be extended or retracted.



NOTE: If the jack control buttons are not pushed for a period of time after enabling the jacks on the control panel screen, the system will time out, and the jacks will again be disabled.

Operation

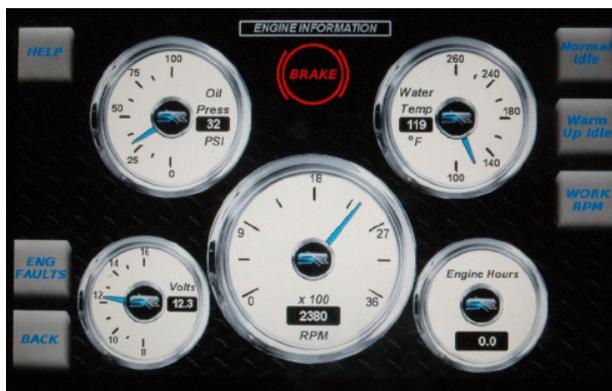
Operator Controls

**For control locations see Operator Control Panel Section on page 12.

System Control Panel

ENGINE INFO

Displays engine monitoring gauges and allows manual control of the engine idle speeds.



NOTE: WARM-UP HYDRAULIC FLUID. For safe operations, it is recommended that the hydraulic fluid be allowed to warm-up to a working temperature prior use of any hydraulic functions. Cold hydraulic fluid can damage the machine.

This blue temperature icon on the System Control Panel indicates that the oil temperature is below 60 ° F (16 ° C). It will disappear once the hydraulic oil exceeds 60 ° F (16 ° C).



*Based on ISO32 hydraulic fluid.

WARNING: Failure to allow the hydraulic oil to warm prior to operations may damage hydraulic components and cause operational failures.

NOTE: The Control System will automatically adjust the engine's RPM when the hydraulic system is engaged (e.g. jack movement, drum rotation, etc.).

IDLE CONTROL BUTTONS



Normal Idle
Used to return to a normal system managed idle.

Warm Up Idle
Will increase the engine's RPM to a high idle.

Work RPM
Will increase the engine's speed to a working RPM.

NOTE: The Control System will manage the engine's RPM during operations, increasing and decreasing the RPM as necessary, depending upon operational demands.

ENGINE FAULTS

Flashes red when there is an active engine fault. When pushed, it will display all of the active engine faults. If a fault is detected, it will generate a fault message on the home screen prompting the user to view the engine fault screen.



Operation

Operator Controls

**For control locations see Operator Control Panel Section on page 12.

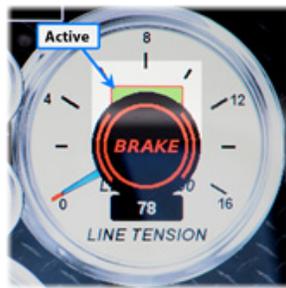
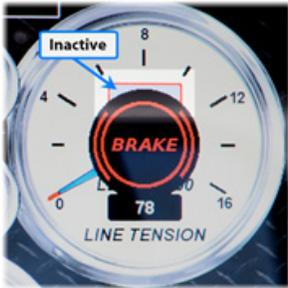
System Control Panel

SETTING LINE TENSION LIMIT

1) Depress the control knob to activate the tension adjustment.



2) Rotate the control knob clockwise (CW) to increase the tension limit and counter-clockwise (CCW) to decrease the tension limit.



3) The selected tension limit “lock” can be activated by again pressing the control knob. This is illustrated above. (see Rotational Control Knob/Button section).

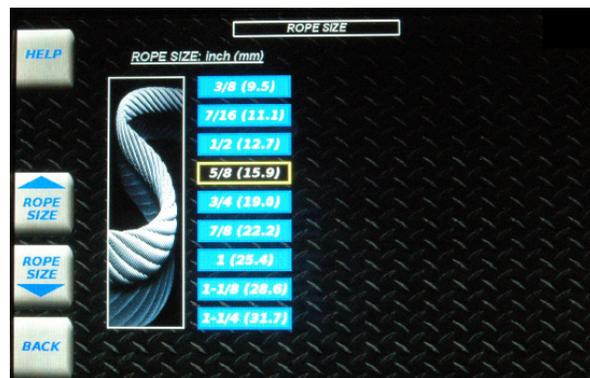
SETUP

Change settings and set data input factors that are programmed in the system to regulate how the machine operates - access to the DRUM/ROPE SETUP, DATA Record SETUP, Input/Output Check, JACK Control, LEVEL WIND, and FRAME Control and HELP.



ROPE SIZE

Rope size information programmed into the system can be adjusted here. Provides information for the counter calculations that the system uses to determine the rope/cable footage counter. Press the up or down arrow control buttons to change settings.



Operation

Operator Controls

**For control locations see Operator Control Panel Section on page 12.

System Control Panel

SETUP (cont.)

FRAME CONTROL

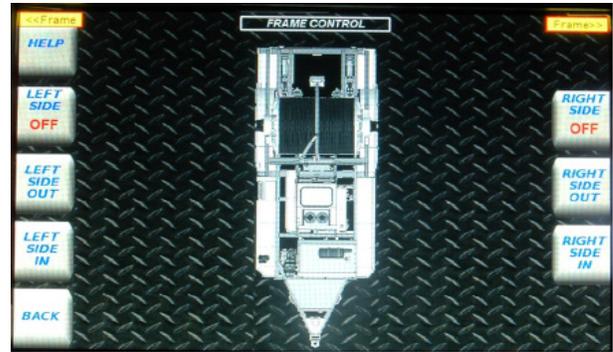
Used to actuate the right and left frame holding the drum couplers - this function causes the sides of the machine to extend and retract as the buttons are pressed.

CAUTION: FRAME LOCK PINS must first be pulled and rotated to release the frame sides.

The P1400X has two (2) Frame Lock Pins, one on each side, that, when locked, prohibit the frame from vibrating open during transportation. Prior to extending the frame to change the drum, the Frame Lock Pins must be turned 180 degrees so that they are “unlocked” or retracted, by twisting the handle.

WARNING: FRAME LOCK PINS MUST BE RETRACTED!

Failure to retract the Frame Lock Pins prior to frame extension will cause the frame to bind, bend, and be severely damaged, to the point that it may not retract or extend.



DANGER: Death or injury may occur if personnel are caught between the articulating sides of the machine or drum. Operators must use extreme caution to ensure that all personnel are clear of the machine and the area surrounding the machine prior to enabling and actuating the sides.



**Unlocked
Frame Pin**



NOTE: If sides are not fully retracted and the drum coupler is not fully seated, the system will not allow drum rotation. The system monitors the drum engagement to ensure that both sides are safely seated prior to allowing drum rotation operations.

To actuate either side Out or In, the operator must enable the sides by pressing and holding the RIGHT SIDE or LEFT SIDE button to toggle On/Off.

NOTE: When navigating away from the FRAME CONTROL screen, the ON/OFF switch for both sides will switch to OFF regardless of their current position. This is a safety feature of the machine to prevent unintended actuation of the sides. The default position will always be Off when first accessing the screen.

CAUTION: Sides of the machine must be fully extended outward before attempting to remove the drum. Damage to the machine or drum may occur should the drum strike the machine. Precaution should be taken to ensure safe removal/changing of drum, to include keeping personnel clear of crush hazards and pinch points.

Operation

Operator Controls

**For control locations see Operator Control Panel Section on page 12.

System Control Panel

SETUP (cont.)

LEVELWIND

Controls the levelwind function, and the setting of the levelwind direction, float arm on/off, lift and lowering, and speed knob calibration. To set the direction of the levelwind, press and hold the [DIR LEFT/RIGHT] button to toggle between right and left directions.



To conduct the initial set-up of the levelwind calibration, press and hold the [SET-UP OFF/ON] button to toggle the system to On. Once On, follow the on-screen instructions and utilize the [SET RIGHT/LEFT LIMIT] buttons to set the outermost range, reverse points, or “turnarounds” for the levelwind to operate.



To raise or lower the levelwind, press and hold the corresponding [LIFT ARM] / [LOWER ARM] buttons.

NOTE: When either [LIFT ARM] or [LOWER ARM] buttons are pressed to actuate the vertical movement of the levelwind, the [FLOAT ARM] function will automatically change to the [OFF] position. The operator will have to re-enable the float arm if it is needed during pulling operations.

FLOAT ARM ON/OFF

Toggles the Float Arm function of the levelwind.



- ON - the levelwind will freely move vertically with the line, i.e. “float.”
- OFF- the vertical hydraulic cylinders will hold the levelwind vertically in position.

CAUTION: If using the levelwind during pulling operations, the Float Arm function should be set to [ON]. Failure to enable the float arm function could result in damage to the levelwind as upward line tension forces might exceed the downward holding strength of the levelwind and its retainers.



WARNING: CRUSH HAZARD: Use extreme caution if personnel are in the vicinity of the levelwind, as the weight and hydraulic action could cause **injury or death** if it strikes a person.

Operation

Operator Controls

***For control locations see Operator Control Panel Section on page 12.*

System Control Panel

RESET TOTAL



When this button is pushed and held for three seconds, it will reset the footage counter to zero. The footage counter is displayed at the top center on the HOME screen.



NOTE: The footage counter should only be reset when the line is all the way out from or onto the drum. Otherwise, the values will not accurately represent how much line is on/off the drum.

FLOAT ARM ON/OFF



This button is the same as the [FLOAT ARM] button on the Levelwind screen. When this button is pushed, it will toggle the Float Arm function of the levelwind. When the float arm is On, the levelwind will float freely with the line. When the Float Arm is Off, the vertical hydraulic cylinders will hold the levelwind in position.

CAUTION: If using the levelwind during pulling operations, the Float Arm function should be set to [ON]. Failure to enable the float arm function could result in damage to the levelwind as upward line tension forces might exceed the downward holding strength of the levelwind and its retainers.

WARNING: CRUSH HAZARD: Use extreme caution if personnel are in the vicinity of the levelwind, as the weight and hydraulic action could cause injury or death if it strikes a person.

Operation

Operator Controls

***For control locations see Operator Control Panel Section on page 12.*

System Control Panel

BRAKE ON / BRAKE OFF

The drum brake status is shown on the center of the system control panel screen.



By default, the drum brake will be ON when the machine is started up. To disengage the hydraulic drum brake, depress the joystick trigger then pull the joystick slightly backward and out of neutral. It may take a few seconds for the system to build up hydraulic pressure before the brake is released and the drum will begin to spin. Returning the joystick to center without the trigger depressed will activate the brake.

To set the drum brake, place the joystick control into the center neutral position with the trigger released.

CAUTION: Once the hydraulic brake is released, the trigger must be held when pushing the joystick forward through center neutral to keep the brake from reapplying. The trigger is used to release the brake when the joystick is pulled back from center neutral and to keep the brake released when passing forward through center neutral. Once the joystick is forward of center neutral, the trigger should be released.

WARNING: To avoid potential personal injury and/or equipment damage, ensure that any vehicle actively pulling out line has completely stopped before returning the joystick to the center neutral position and setting the brake. Limit pull off vehicle speed to account for sudden accidental changes in line tension.

WARNING: Once the hydraulic brake is released, the operator should release the joystick trigger. This ensures that if the brake is needed for a rapid halt and the operator returns the joystick to the neutral position, the trigger will not be inadvertently pressed preventing the brake from engaging.

CAUTION: Before handling any pilot, pulling, or conductor lines attached to this machine, the operator must ensure that the hydraulic drum brake is set and the joystick is in the neutral position with the trigger released.



Operation

Operator Controls

***For control locations see Operator Control Panel Section on page 12.*

System Control Panel

SCREEN INFO/WARNING INDICATORS

Operations indicators: *for more information see Payout and Pulling Operations sections.*

WARNING: APPROACHING MAXIMUM LINE SPEED!

**WARNING: MAXIMUM LINE SPEED REACHED!
REDUCE LINE SPEED IMMEDIATELY TO AVOID POSSIBLE MACHINE FAILURE!**

**DRUM STOPPED DUE TO
JOYSTICK COMM. ERROR**

**DRUM STOPPED DUE TO
TENSION LIMIT. CENTER
JOYSTICK TO RESET.**

**ENGINE AT HP LIMIT.
REDUCE DRUM SPEED OR
LINE TENSION.**

**DRUM STOPPED DUE TO
LOW ENG RPM. CENTER
JOYSTICK TO RESET.**

System warning indicators: *for more information see Troubleshooting section.*

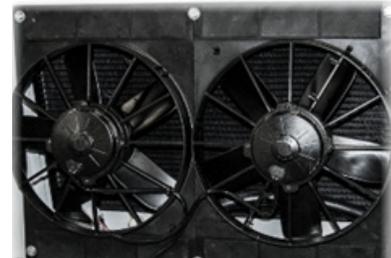
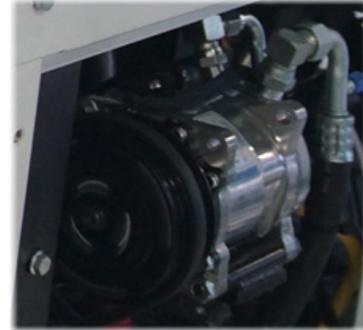
<<Frame	EStop	EStop	SEAT	Controller	Engine	HydOil	HydTemp	HydFiltr	EStop	Frame>>
	LEFT	CAB	Sw	CommError	CommError	LOW	HIGH	DIRTY	RGHT	

Operation

Safe-Zone™ Cab

Climate Control System

The P-1400X Safe-Zone™ Cab comes equipped with a climate control system providing customized air temperature controls for both heating and cooling.



The climate control system has multiple air fan speeds- [OFF, LO, MED, HI], with overhead and foot level multidirectional vents.



Operation

Operator Controls

**For control locations see Operator Control Panel Section on page 12.

Joystick Control

The joystick can control the Levelwind position, Pulling Speed and Tension, or Drag Line Speed and Resistance



Levelwind Control:

The drum levelwind can be manually positioned using the thumb rocker switch on top of the joystick. This is a proportional/variable switch that will move the levelwind left and right, slowly or quickly depending upon the pressure applied. When the switch is released, the motion will stop.



NOTE: The levelwind is automatically controlled; however, the operator will need to set the initial direction and left/right boundaries of the levelwind to being pulling operations- (See *Automatic Levelwind Control* section).

Drum/Line Control:

In the POWER Mode, the operator can control the drum speed and tension, and the drum direction using the joystick.

POWER Mode: With the trigger depressed, the operator can rotate the drum forward to payout the line by pushing the joystick forward, but the joystick must first be pulled back to release the brake. The farther forward the joystick is pushed, the faster the drum will spin, thereby increasing line speed. To decrease speed, pull the joystick backward toward the operator, towards the center/neutral position.

The joystick trigger should always be released once the hydraulic brake is released or after crossing over center/neutral to begin forward payout rotation- see *BRAKE ON/ BRAKE OFF* Section.

The joystick itself can be released once the desired line speed is achieved, and it will stay in place. To stop the drum at any time, return the joystick to the center neutral position with the trigger released. This allows the operator to set the line speed for extended operations, without the need to constantly hold the joystick in position.

To rotate the drum backward in order to pull in line, depress the trigger and pull the joystick backward toward the operator. The farther the joystick is pulled backward, the faster the drum will spin, thereby increasing line speed. Push the joystick forward toward neutral to decrease line speed. To stop the drum at any time, return the joystick to the center neutral position with the trigger released.

NOTE: There is a small delay from the time the joystick is moved out of neutral, to when the drum will engage. This delay allows the time for the hydraulic system to raise the pressure needed to hold any existing line tension to the drum prior to releasing the brake. **It is recommended that the operator position the joystick slightly out of the neutral position, wait until the hydraulic drum brake releases, then slowly increase drum speed.** Avoiding abrupt joystick movements will prevent any rapid jolts or increases in drum speed when the brake releases.

NOTE: To slowly decrease speed after releasing the joystick, the operator can slowly move the joystick toward the neutral position. If feathering speed close to the neutral position, be ready to place the joystick in the neutral position with the trigger released.

Operation

Operator Controls

**For control locations see Operator Control Panel Section on page 12.

Joystick Control (cont.)

Drum/Line Control (cont.):

DRAG Mode: In the DRAG mode, the P1400X provides dynamic hydrostatic line drag. There is no power assist.



To begin line drag operations:

- 1) Depress the trigger then slowly pull back on the joystick to release the brake.
- 2) Once the brake has released, with the trigger still depressed, move the joystick forward through the center/neutral position.

Minimum hydrostatic drag is when the joystick is all the way forward. Drag increases as the joystick is pulled back towards center/neutral.

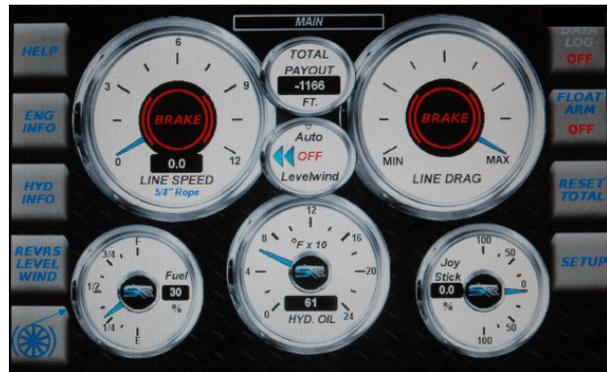
Maximum hydrostatic drag is when the joystick just forward of the center/neutral position.

In Drag Mode, the joystick has no pulling functions and no power is applied.

NOTE: If the joystick is placed in or passes through center/neutral with the trigger released, the hydraulic drum brake will set halting operations.

CAUTION: Hydraulic Oil temperature may rise during Drag Mode and could cause a change in the amount of hydrostatic drag.

CAUTION: Always ensure that the hydraulic drum brake is set before attempting to tie off any line or conductor that is tied to or being managed by this machine. The operator should never hold tension on the line using the drive system while the line is being tied off. Always set the brake first.



Operation

Operator Controls

***For control locations see Operator Control Panel Section on page 12.*

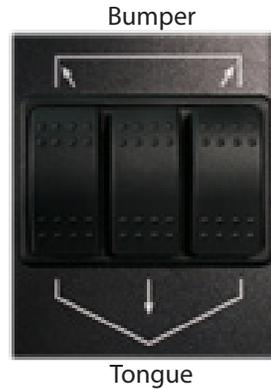
Jack Controls

The P-1400X Puller has three (3) hydraulically actuated jacks for leveling: two (2) jacks located on the rear/bumper of the trailer, and one (1) located on the front/tongue of the trailer. **From the perspective of the operator's seat "front" and "rear" are reversed; the rear/bumper jack indicates on the control panel as "front" when activated and the front/tongue jack indicates as "rear".**

The engine must be running to use the jack controls. Each jack can be operated from both inside the cab- through the console buttons, and from the outside hydraulic control panel and manual override controls- (See *Exterior Hydraulic Control Panel and Manual Override Controls* sections).

Interior Jack Controls:

To lower the jacks using the inside console rocker buttons, first ensure that the engine is on, and then push and hold the [JACK Control ON/OFF] button on the SETUP screen to toggle ON and enable the jacks. When a jack is enabled, a view from the jack cameras will show on the screen, and the hydraulic jacks can be extended or retracted using the respective jack rocker switches.



Interior Cab Jack Controls



Exterior Hydraulic Controls



Override Controls



CAUTION: Ensure that all jacks are fully raised and clear of the ground before attempting to tow trailer.

NOTE: If the jack controls switches are not pushed for a period of time after enabling the jacks on the control panel screen, the system will time out, and the jacks will again be disabled.

Operation

Operator Controls

**For control locations see Operator Control Panel Section on page 12.

Automatic Levelwind Controls



The levelwind can be manually operated, if needed, using the joystick, outside panel, and manual override controls; however, the levelwind is designed to operate

automatically during pulling.

1. To initiate automatic levelwind functions, the operator must first manually position the levelwind down, centered on the rope end leading off of the drum, with the rope threaded through the levelwind head. This can be done either using the inside control panel [LEVELWIND] screen or by using the outside control panel.



2. Using the top joystick lateral rocker switch, adjust the R/L starting position of the levelwind so that the levelwind is centered over the exit rope.



WARNING: CRUSH HAZARD: Personnel should not stand underneath or in proximity to the Levelwind arm/head when it is raised or being hydraulically adjusted.

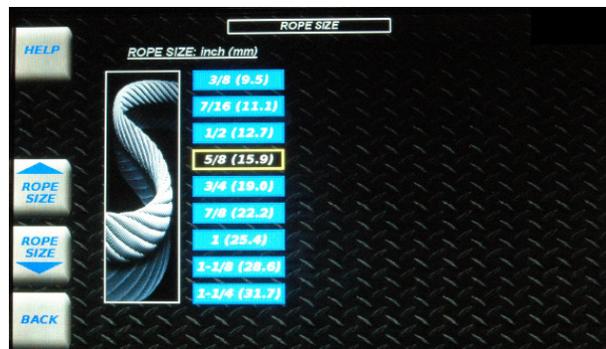
3. Place the pulling rope through the levelwind head and secure all rollers and retaining pins.



4. In the cab, turn the levelwind automatic control switch to the ON position.



5. Ensure that the correct rope and drum configurations are set in the system- see *ROPE SETTINGS* screen.



NOTE: The only time the operator will have to review or alter the rope diameter/levelwind set-up criteria is if the rope was changed to a different diameter rope.

Operation

Operator Controls

**For control locations see Operator Control Panel Section on page 12.

Automatic Levelwind Controls (cont.)

6. Ensure that the levelwind float arm is set to ON.



7. Set the levelwind starting direction by pressing and holding the [DIR LEFT/RIGHT] button for three seconds. The arrow indicators in the center of the screen will toggle showing which way the levelwind is programmed to move.



NOTE: The operator will need to set the initial direction (Right/Left) of the levelwind before beginning operations. The direction will depend on which side of the drum the rope end leading off is located.

NOTE: On the HOME screen, the Reverse Levelwind button allows the operator to change the direction of the levelwind.



8. The system will now automatically manage the levelwind functions. The operators can adjust the speed of the levelwind, if needed, by rotating the levelwind speed control knob clockwise (CW) to increase speed and counter-clockwise (CCW) to decrease speed.



Operation

Outside Hydraulic Control Panel

This exterior hydraulic control panel, located on the rear street side, provides the operator with additional outside controls for the jacks and levelwind. The jack and levelwind functions found on this control panel can also be controlled from inside the cab. The levelwind switches raise and lower the levelwind arm, which can be used with outside line rigging and drum changing operations.

WARNING: CRUSH HAZARD: Personnel should not stand underneath or in proximity to the Levelwind arm/head when it is raised or being hydraulically adjusted.

NOTE: The engine must be running before the outside hydraulic control panel can be used to operate the levelwind and jacks.



To operate the control, simply push and hold the button to move the machine component. When the button is released, the motion will stop. All buttons are labeled with their corresponding function and motion direction.



CAUTION: Line of sight view of the jacks and levelwind should always be established prior to operating these components using the outside hydraulic control panel. Operators should first ensure that all personnel are clear of the area.

Operation

Manual Override Controls

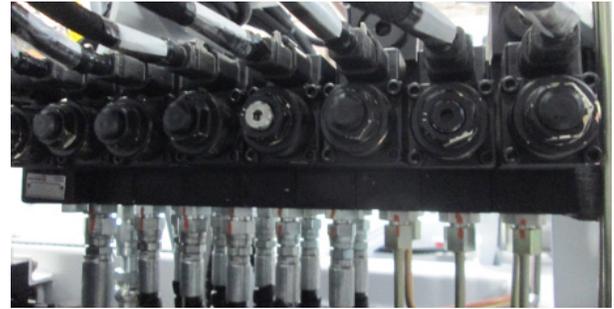
The outside manual override controls each have a push-in spring-loaded valve that is used to operate the jack and levelwind functions. Each valve has a protective cap that, when removed, reveals a small hole to insert a 3 mm Allen wrench or something smaller to press in the valve button. When the valve button is released, that valve will close.

Levelwind Adjustment: The levelwind lateral and vertical position can be adjusted using the manual override controls, but the engine must be running.

Jack Adjustment: To operate the jacks using the manual override, first ensure that engine is running. To lower the jacks, push and hold the corresponding jack valve button. To raise the jack, push and hold the corresponding lever upward. When the lever is released, the spring loaded valve will return to closed, and the jack motion will stop.

WARNING: CRUSH HAZARD: Personnel should not stand underneath or in proximity to the Levelwind arm/head when it is raised or being hydraulically adjusted.

CAUTION: Ensure that all jacks are fully raised and clear of the ground before attempting to tow trailer.



Manual override controls at hydraulic valves.



CAUTION: Line of sight view of the jacks and levelwind should always be established prior to operating these components using the outside hydraulic control panel. Operators should first ensure that all personnel are clear of the area.



Operation

Quick Start Guide

Sherman+Reilly™ P-1400X
 Single Drum Puller– 14,000 lb. Capacity



Start-Up Procedure		
Step	Action	Note
1	Perform all pre-operation inspections.	
2	Position machine and chock wheels.	The machine should be positioned in line with the tower and centered as much as possible on the line being pulled. Wheels should be chocked to prevent rolling.
3	Ensure that all controls (levers, switches, etc.) are in the neutral and disengaged position.	
4	With the key inserted, turn master power key switch Clockwise to the [ON] position.	Wait for the system display to light up and the system to load.
5	Start the engine: Once the display and panel lights are on, place the Engine Start button to the [START/RUN] position.	In colder climates (below 40°F), the preheat function may automatically engaged once the Engine Start button is placed in the [START/RUN] position. After the preheat cycle has concluded, the engine will start automatically.
6	Ensure that there are no warnings listed on the system control display screen.	The engine oil pressure and hydraulic pressure are monitored by the system.
7	<p>WARM-UP HYDRAULIC FLUID. For safe operations, it is recommended that the hydraulic fluid be allowed to warm-up to a working temperature prior use of any hydraulic functions. Cold hydraulic fluid can damage the machine.</p> <p>This blue temperature icon on the System Control Panel indicates that the oil temperature is below 60 °F (16 °C). It will disappear once the hydraulic oil exceeds 60 °F (16 °C).</p> 	<p>WARNING: Failure to allow the hydraulic oil to warm prior to operations may damage hydraulic components and cause operational failures.</p> <p>*P1400X ships with ISO32 Hydraulic Fluid.</p>
8	Level, stabilize, and anchor the machine.	Use the jack control buttons to level the machine.

CAUTION: Ensure that all personnel and objects are free and clear of the drum prior to attempting to rotate.

NOTE: In all modes, the operator can stop the drum and apply the hydraulic drum brake by placing the joystick to the center neutral position. The icon will change to [BRAKE] and the drum brake will set.

Start Payout Operations		
Step	Action	Note
1	Perform all Start-Up Procedures.	*Must include pre-operation inspections.
2	Raise the levelwind to the upward standby position, then attach appropriate swivel to pulling line.	Utilize hydraulic controls to raise the levelwind. WARNING: CRUSH HAZARD
3	Turn off the automatic levelwind control.	To turn off the automatic levelwind control.
4	  Select: POWER Mode or DRAG Mode	If the system is in POWER Mode, set the tension limit on the system control display.
 5 Pwr	-- POWER Mode Begin payout: Depress the joystick trigger and pull the joystick back from center/neutral to release the brake.	POWER Mode will drive the drum. Drum Speed/Tension and Drum Direction are controlled with the joystick. Once rotation speed is achieved, the joystick and trigger can be released. Trigger should be released after brake releases.
 5 Drg	-- DRAG Mode (No Power - Hydrostatic Drag only) Begin payout: Depress the joystick trigger and pull the joystick back from center/neutral to release the brake. Continue to depress the trigger and move forward through center/neutral.	When the joystick is all the way forward, the LINE DRAG is at its minimum. As the joystick is brought back to the Center/Neutral position, the LINE DRAG is increased. Once the Center/Neutral position is reached, the Brake is applied.
6	Continue to monitor line speed and operations.	To stop rotation at any time, return the joystick control to the center stop position <u>with the joystick trigger released.</u>

CAUTION: Before handling any pilot, pulling, or conductor lines attached to this machine, the operator must ensure that the hydraulic drum brake is set, and the joystick is in the neutral position with the joystick trigger released.

CAUTION: If using vehicle to pull out line, ensure vehicle has stopped prior to setting hydraulic brake.

Start Pulling Operations		
	Action	Note
1	Lower the levelwind back down, position levelwind centered over exit rope, and place rope through levelwind head. WARNING: CRUSH HAZARD	Utilize either the exterior hydraulic control panel or interior controls to lower the levelwind. Use the top joystick lateral rocker switch to adjust the R/L starting position of the levelwind. Ensure that all levelwind rollers and retaining pins are re-secured.
2	Turn on the automatic levelwind control.	Push the Automatic Levelwind Control Power Switch forward-(away) to the On position.
3	Set drum/rope configuration, enable levelwind control and float arm, then set the levelwind direction.	Set levelwind/drum configuration, then turn the levelwind float to [ON] using the [HOME] screen. The levelwind direction is set by pushing and holding the [DIR Left/Right] button.
4	Ensure that the mode is set to POWER Mode on the system control display.	If not, push and hold the [SELECT MODE] button for three seconds to toggle through modes- repeat as needed.
5	Set the line tension limit.	The tension limit can be changed without halting operations by using the rotating control knob at the top of the display. Press the control knob to lock in tension.
6	Begin pull: Depress the joystick trigger and pull the joystick back from center/neutral to release the brake, then slowly increase drum rotation by pulling back on the joystick.	Once rotation speed is at the desired level, the joystick and trigger can be released.
7	Continue to monitor line speed/tension and levelwind adjustment.	To stop rotation at any time, return the joystick control to the center stop position with the trigger released. An override adjustment can be made to the levelwind position using thumb rocker switch on top of joystick.

Operation

Towing and Road Safety

Connecting to the Tow Vehicle

1. Make certain tow vehicle has the capacity and rating to tow machine safely.
2. Inspect pintle eye and safety chains for excessive wear, corrosion, cracked welds or structural damage.
3. Make sure trailer brakes are operable- *(See Trailer Brakes section)*.

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

4. Make sure the unit is safe for towing with tires in good condition and properly inflated- *(See Trailer Tires section)*.
5. Make sure there are no tools, objects, or trash items which could fall off during transport.



6. Chock wheels on both sides of the machine/unit trailer, then start machine/unit engine- *(See Start-Up Procedure section)*.
7. Make sure the right and left jacks are fully retracted- *(See Jack Controls section)*.
8. Open the tow vehicle hitch and back vehicle into position under the pintle eye. Set tow vehicle parking brake.

NOTE: Without rope, approximate trailer weight is **16,000 lbs.**



9. Slowly retract trailer nose/hitch jack, so that the pintle eye goes over and rests correctly on hitch.

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

10. Close and secure the hitch.

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

Operation

Towing and Road Safety

Connecting to the Tow Vehicle (cont.)

11. After trailer is secured to the vehicle, stop the machine/unit engine and remove the key from the ignition key switch.

12. Connect all appropriate air hoses and electrical plugs for the trailer brakes. For air brake systems, begin charging the trailer air system.



13. 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.

14. If not already, connect the electrical plug to the tow vehicle and check:

- Clearance lights
- Brake Lights
- Turn Signals
- Brakes

(For issues see Trailer Assembly section.)

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

15. Remove and stow the wheel chocks.



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 differ 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.

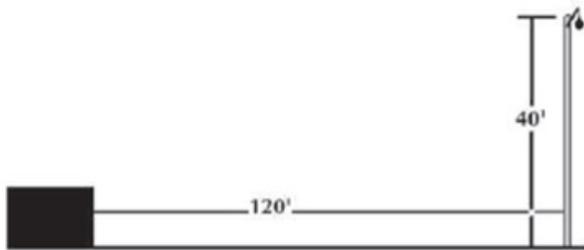
Unless otherwise indicated by applicable laws, posted speed limits, or cautionary conditions (stated above), a recommended maximum safe operating speed for normal road conditions is 50/55mph for night/day conditions and 30mph in residential, urban, and business districts.

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 lead block height.

Example: If the lead block is 40 feet high, it is recommended that the puller be positioned approximately 120 feet from the base of the pole whenever possible. By allowing the distance to the lead block as specified, this reduces the direct downward forces that would be created otherwise. In some situations, however, it may not be possible to achieve these distances- (see note below).



NOTE: In some situations, (i.e., due to rough terrain), it may not be possible to achieve these safe distances from the lead block. In these situations, operators should try and achieve as much distance as possible from the lead block and be aware of the increased down forces during operations.

The unit should be leveled as much as possible, centered on the lead block, and parallel to the line being pulled prior to beginning operations.

CAUTION: All jacks must be extended for stabilization, and the machine must be leveled prior to conduction operations.

The operator must chock all trailer wheels prior to operations and any time the vehicle is parked. All appropriate grounding, anchoring, and protective equipment must be installed and secured to machine prior to operations.



Operation

Start-Up Procedure

NOTE: Before beginning operations, the operator must perform all pre-operation inspections. (See *Pre-Operation Inspection Checklist on page 49.*) Pre-operation inspections are important for the safe operation of the machine, and are required under OSHA Regulations.

1. Perform all pre-operation inspections.
2. Position the machine and chock wheels. The machine should be positioned centered on the lead block, and parallel to the line being pulled prior to beginning operations. Wheels should be chocked to prevent the unit from rolling- (see *Positioning the Machine* section).
3. Ensure that all controls (levers, switches, etc.) are in the neutral and disengaged position- (see *Operator Controls* section).
4. With the key inserted, turn master power key switch to the On position- (see *Operator Controls* section).
5. Once display and panel lights are on, place Engine Start button to the [START/RUN] position to start the engine.



6. View the control panel screen to ensure there are no warning or fault messages.



NOTE: Warnings and faults are displayed as a red icon or button. If warnings or faults are present, see the faults and diagnostics screens, and check system components prior to beginning operations- (see *General Faults in the TROUBLESHOOTING* section).

7. **WARM-UP HYDRAULIC FLUID.** For safe operations, it is recommended that the hydraulic fluid be allowed to warm-up to a working temperature prior use of any hydraulic functions. Cold hydraulic fluid can damage the machine.

This blue temperature icon on the System Control Panel indicates that the oil temperature is below 60 °F (16 °C). It will disappear once the hydraulic oil is 60 °F (16 °C) or greater.



WARNING: Failure to allow the hydraulic oil to warm prior to operations may damage hydraulic components and cause operational failures.

8. Level and stabilize the machine using the available hydraulic jacks- (see *Jack Controls* section).
9. Properly ground and anchor the machine to prevent the machine from moving under tension or line load.

CAUTION: All jacks must be extended for stabilization, and the machine must be leveled and anchored prior to conduction operations.

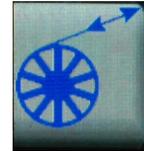
Operation

Payout Operations - POWER Mode

Power Assisted Payout

NOTE: Before beginning payout operations, the operator must perform all pre-operation inspections. (See *Pre-Operation Inspection Checklist on page 49.*) Pre-operation inspections are important for the safe operation of the machine and are required under OSHA Regulations.

For power assisted payout operations, select the POWER Mode, represented by this symbol.



This assisted payout method is useful when manually pulling out with a vehicle or “walking out” the line.

1. Perform Start-Up Procedure on p. 37.

2. Raise the levelwind to the upward standby position.

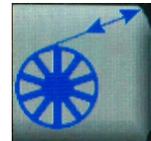


4. Turn off the automatic levelwind control using rocker switch in the cab.

3. Alternatively, the operator can use the exterior hydraulic control panel to raise the levelwind.



5. Select POWER Mode on the system control display by pressing and holding the button. This setting is defaulted to whatever was last set for the system.



WARNING: CRUSH HAZARD: Personnel should not stand underneath or in proximity to the Levelwind arm/head when it is raised, lowered, or being hydraulically adjusted.

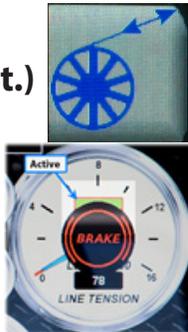
NOTE: With the system in **POWER Mode**, the operator will be able to payout the line at a speed that is consistent with **walking or driving out the line with a truck or other off road vehicle**. This is accomplished by using the drive system to drive out the line with minimal or no tension “force”.

Operation

Payout Operations - POWER Mode

Power Assisted Payout (cont.)

6. Set the tension limit for the machine to **Zero** using the rotational control knob. Once the tension is set, press the knob to lock in the new limit.



7. Begin paying out the rope by depressing the joystick trigger. Pull back slightly on the joystick, bringing it out of neutral, and then pause for about three seconds for the brake to release. Once the brake releases, with the joystick trigger still depressed, slowly move the joystick forward to begin forward payout drum rotation. Once the joystick has crossed over neutral, the joystick trigger should be released. Once rotational speed is at the desired level, the joystick itself can be released.

NOTE: The reason the joystick must first be pulled back during payout is that this motion triggers the release of the hydraulic brake and begins the hydraulic pressure building sequence. As soon as the brake releases, the operator will notice the drum beginning to rotate very slowly backward toward the operator. This is also designed to pull any slack out of the line.

NOTE: The brief pause allows the hydraulic system time to build enough pressure to sustain any pre-existing line tension before releasing the brake. This is a safety feature of the system that prevents the drum from rapidly paying out or jolting as soon as the brake is released.

8. Continue to monitor the line speed and the footage counter.



NOTE: To stop drum rotation at any time, return the joystick control to the center neutral position **with the joystick trigger released**, and the hydraulic drum brake will set.

9. Once the rope is paid out and operations have concluded, place the joystick control into the center neutral position with the trigger released, and ensure that the hydraulic drum brake is set.



WARNING: To avoid potential personal injury and/or equipment damage, ensure that any vehicle actively pulling out line has completely stopped before returning the joystick to the center neutral position and setting the brake. Limit pull off vehicle speed to account for sudden accidental changes in line tension.

CAUTION: Before handling any pilot, pulling, or conductor lines attached to this machine, the operator must ensure that the hydraulic drum brake is set, and the joystick is in the neutral position with the joystick trigger released.

CAUTION: Never payout all of the rope off of the drum. Leave at least one layer of rope wrapped on the drum. Otherwise, the rope end could be pulled from its anchor point.

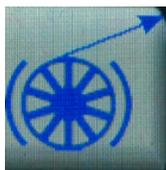


Operation

Payout Operations - DRAG Mode

Non-Power Payout

This mode of operation uses the inherent hydrostatic drag of the hydraulic system to provide a dynamic drag for managing drum spin when line is being pulled off.



4. Turn off the automatic levelwind control using rocker switch in the cab.

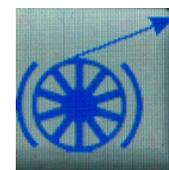


1. Perform Start-Up Procedure.

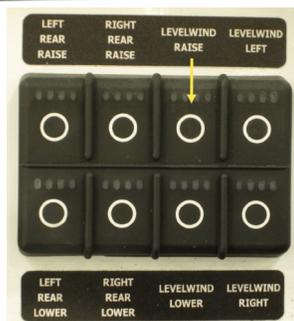
2. Raise the levelwind to the upward standby position using LEVELWIND screen.



5. Select DRAG Mode on the system control display by pressing and holding the button. This setting is defaulted to whatever was last set for the system.



3. Alternatively, the operator can use the exterior hydraulic control panel to raise the levelwind.



WARNING: CRUSH HAZARD: Personnel should not stand underneath or in proximity to the Levelwind arm/head when it is raised or being hydraulically adjusted.

WARNING: When the line speed reaches 8 mph in pull out mode, a warning message will appear on the bottom of the control panel screen that reads:

WARNING: APPROACHING MAXIMUM LINE SPEED!

WARNING: When the line speed reaches its maximum of 10 mph in pull out mode, a warning message will appear on the bottom of the control panel screen that reads:

**WARNING: MAXIMUM LINE SPEED REACHED!
REDUCE LINE SPEED IMMEDIATELY TO AVOID POSSIBLE MACHINE FAILURE!**

WARNING: If the maximum limit is reached, this warning message will appear, explaining why the drum stopped rotating. The operator can then increase the tension limit.

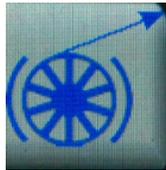
DRUM STOPPED DUE TO TENSION LIMIT. CENTER JOYSTICK TO RESET.

Operation

Payout Operations - DRAG Mode

Non-Powered Payout (cont.):

6. Begin payout operations by depressing the joystick trigger. Pull back slightly on the joystick, bringing it out of neutral, and then pause for about 3 seconds for the brake to release. Once the brake is released, slowly push forward on the joystick, through neutral while still holding trigger. Once past center/neutral, the trigger should be release. Once the desired speed is reached, the joystick can be released.



NOTE: The reason the joystick must first be pulled back during payout is that this motion triggers the release of the hydraulic brake and begins the hydraulic pressure building sequence. As soon as the brake releases, the operator will notice the drum beginning to rotate very slowly backward toward the operator. This is also designed to pull any slack out of the line.

NOTE: The three second pause allows the hydraulic system time to build enough pressure to sustain any pre-existing line tension before releasing the brake. This is a safety feature of the system that prevents the drum from rapidly paying out or jolting as soon as the brake is released.

8. Once the rope is paid out and operations have concluded, place the joystick control into the center neutral position with the trigger released, and ensure that the hydraulic drum brake is set. This will conclude payout operations.

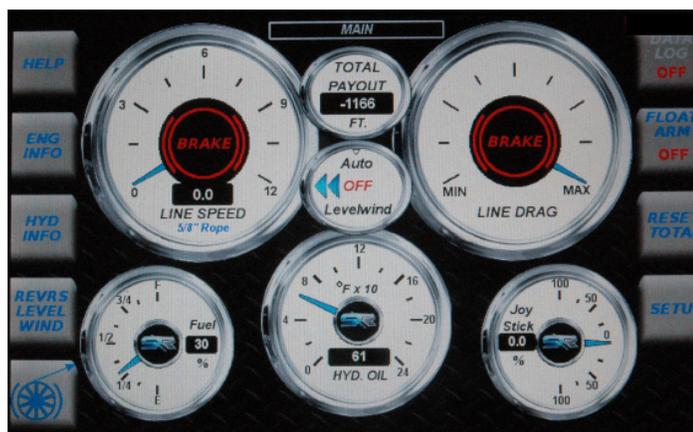


CAUTION: Before handling any pilot, pulling, or conductor lines attached to this machine, the operator must ensure that the hydraulic drum brake is set and the joystick is in the neutral position with the joystick trigger released.

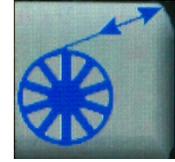
CAUTION: Never payout all of the rope off of the drum. Leave at least one layer of rope wrapped on the drum. Otherwise, the rope end could be pulled from its anchor point.

NOTE: To stop drum rotation at any time, return the joystick control to the center neutral position **with the joystick trigger released**, and the hydraulic drum brake will set.

7. Continue to monitor the line speed and the footage counter.



Operation



Pulling Operations - POWER Mode

NOTE: Before beginning pulling operations, the operator must perform all pre-operation inspections. (See *Pre-Operation Inspection Checklist* on page 49.) Pre-operation inspections are important for the safe operation of the machine and are required under OSHA Regulations.

Sherman+Reilly™ P-1400X Puller utilizes hydraulically driven motor(s) that apply up to 14,000 lbs. of pulling force to the pulling line. This puller comes equipped with a variable speed drive system.

1. Once the pulling line is safely tied off at the pole, and with the machine running, lower the levelwind back down using the LEVELWIND screen.



NOTE: The operator can manually lower the levelwind down by pressing the lower button on the exterior hydraulic control panel. However, if the pulling line is strung over energized lines, it is safer to limit the handling of the line or machine, while standing on the ground.

WARNING: CRUSH HAZARD: Personnel should not stand underneath or in proximity to the Levelwind arm/head when it is raised, lowered, or being hydraulically adjusted.

2. Using the top joystick lateral rocker switch, adjust the R/L starting position of the levelwind so that the levelwind is centered over the exit rope.



3. Place the pulling rope through the levelwind head, and secure all rollers and retaining pins.



4. If not completed already, have the cable end and the conductor pulling grips attached to opposite sides of swivel on the conductor side.

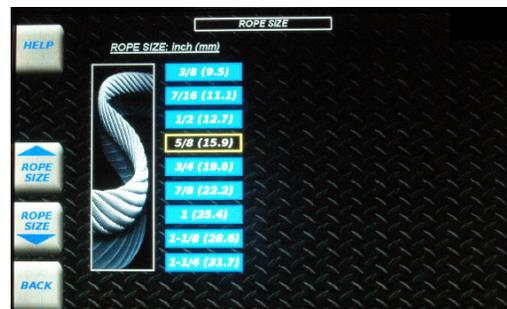
5. Turn on the automatic levelwind control using the rocker switch in the cab.



6. Ensure that the levelwind float arm is set to ON.

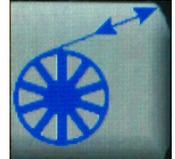


7. Ensure that the correct rope and drum configurations are set on the DRUM and ROPE SETTINGS screen.



NOTE: The only time the operator will have to review or alter the rope diameter/levelwind set-up criteria is if the rope was changed to a different diameter rope or the drum was changed.

Operation

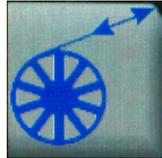


Pulling Operations (cont.)

8. Set the levelwind starting direction by pressing and holding the [DIR LEFT/RIGHT] button for three seconds. The indicator will toggle on the center screen showing which way the levelwind is programmed to move.



9. Ensure that the system is set to POWER Mode. If not, select POWER Mode on the system control display by pressing the adjacent button for three seconds to toggle modes.



10. Set the line tension limit for the pull using the rotating control knob at the top of the display. Turn the knob CW to increase the line tension limit and CCW to decrease the line tension limit. After the knob is rotated to the desired tension limit setting, the operator must push the knob in to lock in the new tension limit.



NOTE: The tension limits can be changed without halting operations by using the rotating control knob on the display.

11. Begin pulling by depressing the joystick trigger, then pulling back slightly on the joystick, bringing it out of center/neutral.

Pause for about three seconds for the brake to release. Once the brake releases, release the joystick trigger

Pull backward on the joystick until the desired rotation speed is reached. Once the speed is at the desired level, the joystick itself can be released.

NOTE: The reason the joystick must first be pulled back during payout is that this motion triggers the release of the hydraulic brake and begins the hydraulic pressure building sequence. As soon as the brake releases, the operator will notice the drum beginning to rotate very slowly backward toward the operator. This is also designed to pull any slack out of the line.

NOTE: The brief pause allows the hydraulic system time to build enough pressure to sustain any pre-existing line tension before releasing the brake. This is a safety feature of the system that prevents the drum from rapidly paying out or jolting as soon as the brake is released.

Operation

Pulling Operations

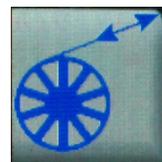
12. Continue to monitor the line speed, tension, and the footage counter. Adjust line tension as needed using the rotation control knob.



NOTE: To stop drum rotation at any time, return the joystick control to the center neutral position with the joystick trigger released, and the hydraulic drum brake will set.

13. Once the rope end reaches within sight of the drum, begin to slow the line speed by pushing forward slowly on the joystick.

14. When rope end reaches within its last several feet of length, bring the drum to a complete stop by placing the joystick control in the neutral position with the joystick trigger released. The hydraulic drum brake will set.



CAUTION: Before handling any pilot, pulling, or conductor lines attached to this machine, the operator must ensure that the hydraulic drum brake is set and the joystick is in the neutral position with the joystick trigger released.

15. Once the conductor is safely tied off, the operator may need to provide slack on the pulling line/old conductor to detach the rope/old conductor from the new strung conductor.



To provide slack, depress the joystick trigger then pull back slightly on the joystick, bringing it out of neutral. Then pause for about three seconds for the brake to release. Once the brake releases, with the joystick trigger still depressed, cross over neutral by pushing the joystick forward.

Once the joystick has crossed over neutral, release the joystick trigger, and continue slowly moving the joystick forward to begin forward payout drum rotation.

After slack is generated, the operator can place the joystick back into the neutral position with the joystick trigger released to stop the drum and set the brake.

Operation

Pulling Operations

16. Remove the conductor pulling grip from the strung conductor and the swivel. Also, remove the swivel from the rope/old conductor end, remove any pulling grips from the old conductor-(if applicable), and store pulling grip(s) and swivel in the tool box- unless further operations are planned.

17. Once completed with pulling operations, remove the rope/old conductor from the levelwind head, and pull the remaining rope/old conductor onto the drum.

NOTE: Ensure that all pins and rollers are re-secured after removing the rope/old conductor from the levelwind head.

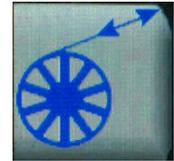


18. When using a rope drum, ensure that the joystick is in neutral with the trigger released, and the hydraulic drum brake is set (shown on screen).



Then, using a tie-off rope around the drum, secure the rope end to the drum.

19. Raise all jacks prior to transport.



20. If tools were used during operations, store them in the tool box, unless further operations are planned.

21. Turn the hydraulic power engine off, by pushing the rocker switch backward.

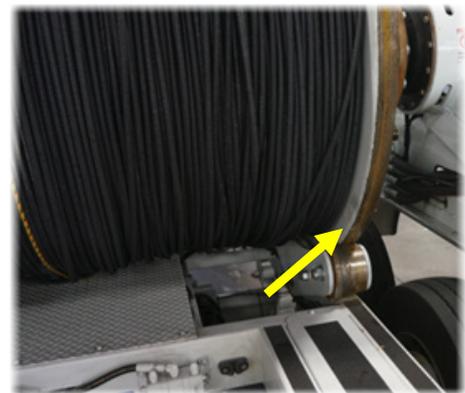
22. Once the engine is off, turn the master power key switch CCW to the Off (0) position, and remove the key.



23. Complete all towing and road safety procedures prior to towing machine- (See *Towing and Road Safety* section).

CAUTION: The rope end and levelwind must be secured prior to transport.

24. Complete all Post-Operation Inspections.



CAUTION: It is recommended that a minimum of 2 inches of "freeboard" be maintained at the drum edge. Over loading a drum may result in damage to the rope.

Operation

Drum Removal and Installation

When changing from a rope drum to a reconductoring drum, reverse the steps listed in this section.

1. Rotate the rope drum using the joystick control, so that the drum hoisting loop/bracket is at the top.

NOTE: When transitioning from a rope drum, ensure that the rope end is secured to the drum using a tie-off rope around the drum. This will prevent the rope from paying out and the rope end from being damaged.

2. Turn off the engine and remove the key.

CAUTION: The engine must be off and the key removed prior to proceeding to the next step.

3. Attach the hoisting chain to the drum loops.

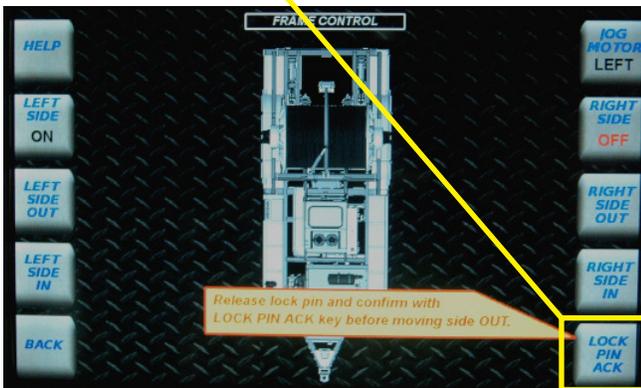
CAUTION: It is highly recommended that the drum be attached to the hoisting chains prior to proceeding to the next step. This will help ensure that the drum does not fall, damaging equipment or injuring personnel, in the event of an accident.

4. Retract the Frame Lock Pins

WARNING: FRAME LOCK PINS MUST BE RETRACTED. Failure to retract the Frame Lock Pins will cause the frame to bind, bend, and be severely damaged, to the point that it may not retract or extend.



5. The system will require the operator to acknowledge that the Frame Lock Pins are retracted. [LOCK PIN ACK]



WARNING: Injury or Death: CRUSH HAZARD: Personnel assisting during Drum/Reel lifting must be wearing appropriate PPE and must remain vigilant and ready to quickly move clear of the machine in the event of a load shift or restraint failure.

6. Next, use the FRAME CONTROL screen to disengage the drive couplings from the drum. To do this, first enable each side, then press the LEFT/RIGHT SIDE OUT buttons to move the sides out.

CAUTION: Sides of the machine must be fully extended outward before attempting to remove or lift the drum. Otherwise, damage to the machine or drum could result if the drum strikes the coupler, coupler teeth, or sides of the machine. Every precaution should be taken to ensure safe removal/changing of drum, to include keeping personnel clear of hazard areas and pinch points.

7. Once the sides are fully extended, lift the rope drum up and off of the machine.

8. Lower the rope drum to a level surface on the ground, and install chocks on both sides of the drum to prevent it from rolling.

9. Position the reconductoring drum so that the hoisting loop/bracket is at the top, then lift the reconductoring drum, and place into the machine ensuring that the drum base seats correctly into the drum rollers.

CAUTION: Ensure that all non-essential personnel are clear of the area before lifting and moving the drum.

Continued on the next page.

Operation

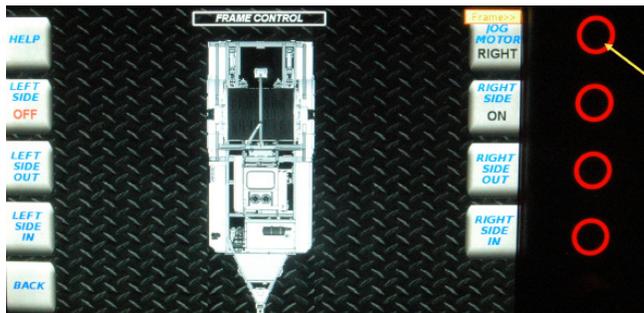
Drum Removal and Installation

When changing from a rope drum to a reconductoring drum, reverse the steps listed in this section.

10. With the reconductoring drum seated correctly into the drum rollers, re-enable the sides using the FRAME CONTROL screen to retract both sides.

Retracting the sides to reengage the drum coupler, should happen slowly and with very close attention to the alignment of the teeth on the drum coupler and the receiving slots on drum arbor.

In the the FRAME CONTROL screen, use the JOG button to jog the drive couplings in order to align the drive teeth with the receiving drum arbor.



NOTE: If sides are not fully retracted and the drum coupler is not fully seated, the system will not allow drum rotation. The system monitors the drum engagement to ensure that both sides are safely seated prior to allowing drum rotation operations.



WARNING: CRUSH HAZARD: Personnel should not stand underneath or in proximity to the Levelwind arm/head when it is raised or being hydraulically adjusted.

WARNING: CRUSH HAZARD: Removing and installing Drums/Reels presents a Crush Hazard. Personnel should use extreme caution when removing and installing drums/reels.

11. With the lifting straps/chains still attached to the reconductoring drum, inspect both drum engagements, the drum, drum rollers, and all surrounding machine areas to ensure that there are not damages, debris or other items that could create a hazard for drum rotations or operations.

12. Once completed with the inspection, and the machine is cleared for operations, remove the lifting straps/chains.

DANGER: Injury or death may occur if personnel are caught between the articulating sides of the machine and the frame or drum. Operators must use extreme caution to ensure that all personnel are clear of the machine and area surrounding the machine prior to enabling and actuating the sides.

Operation

Emergency Stop Procedure

In the event of an emergency, the operator must be aware of how to shut down the machine so as to avoid any additional injuries or equipment damage. In these emergency situations, the lives of linemen, work crews, surrounding bystanders, as well as the operator may become at risk- dependent upon the severity of the situation. As an operator in these situations, the level of operating knowledge and proficiency can be tested. These factors alone make this procedure one of the most important to know.

1. The first step of an emergency shut down during operations is to de-energize the drive system/engine and stop all equipment rotation and power as quickly as possible. This is done by **pushing the Emergency Stop Button** located on the control panel.



2. Quickly assess the situation and assist any injured personnel to get free from hazards- only if safe to do so.

3. Notify proper authorities and get help.

4. Follow all employer emergency procedures.

Fire Extinguisher Usage:

Most Sherman+Reilly™ equipment comes standard with a fire extinguisher mounted somewhere on the equipment for quick access by the operator. However, should a fire occur with S+R equipment; **the operator should only utilize the provided fire extinguisher, if trained in its use, if safe to do so, if in accordance with employer policy, and in these described situations:**

1. To save your own life, if in jeopardy from fire.
2. To save someone else's life, if in jeopardy as a result of a fire- but only if safe to do so.
3. To put out small equipment fires to avoid further damage to equipment or prevent a dangerous explosion- but only if safe to do so.

CAUTION: Operators should exercise caution when attempting to put out fires, as **the provided extinguisher is only intended to suppress small localized fires**, and is not intended to put out or "fight" large scale fires, should one occur.

With the presence of flammable fluids and other operational environment factors, even small fires can grow out of control quickly. Operators must maintain awareness of these factors.

Proper training should also be provided by employer before engaging in any firefighting efforts. Should a fire occur with Sherman+Reilly™ equipment, the operator should **not** use the equipment until it has been inspected for safety and approved to be returned to service- regardless of the size of the fire.

Operation

Pre-Operation Inspection Checklist (Page 1)

NOTE: Pre-operation checklist should be conducted in accordance with OSHA requirements, to include OSHA Standard- 29 CFR, Parts 1926.601, 1926.952, 1926.955, and 1926.150, as well as NFPA Standard No. 10-2013. It is recommended that pre-operation inspections be done before leaving the yard or garage.

- 1. Check fuel level-** With key inserted in master power key switch, turn key to the On position to activate the display. Once activated, the fuel level will show on the color display. 
- 2. Check the engine radiator coolant level** at the fill port located on top of the engine. Use caution if the engine is already hot. 
- 3. Check for proper engine oil level.** After checking oil level, wipe dipstick clean of any debris prior to reinserting into spout.
- 4. Ensure proper hydraulic fluid level in reservoir for hydraulic system** by viewing the sight gauge on the side of the tank.
- 5. Inspect hydraulic pump and hoses for loose fittings, leaking fluid, and damaged hoses.**
- 6. Inspect for structural damage, bent or broken parts, cracked or broken welds, missing pins and retainers.**
- 7. Inspect drive motor(s), drum, drum rollers, and drum couplers** to sure they are secure and that there are no obvious signs of damage- if damaged, do not operate; service may be required.

NOTE: It may be necessary to remove the engine cover to check the oil level. Be sure it is replaced and secured in position properly before transporting or operating the machine.

Operation

Pre-Operation Inspection Checklist (Page 2)

8. **Inspect levelwind** for any obvious signs of damage, leaking hydraulic cylinders or hoses, and ensure rollers move freely.



9. **Inspect all equipment grounds** for any signs of damage.



10. **Inspect all jacks** for damage or leaking hydraulic components.

11. **Conduct towing readiness inspection.**

- a. Inspect trailer hook up: air hose connections, hitch is secure, safety chains are in place (crisscross pattern), and trailer lighting is connected.
- i. Inspect tail lights to ensure all lights work- replace bulbs as needed. If none of the lights work, inspect vehicle fuses, then trailer wiring for corrosion.
 - ii. Ensure that trailer brakes work and that wheel chocks are available.
- b. Check tire pressure: tire pressure should be checked cold and read in accordance with manufacturer specifications.
- i. If tire pressure is low, inspect tire for damage or punctures. If damaged or punctured, repair or replace.



Operation

Pre-Operation Inspection Checklist (Page 3)

12. Inspect fire extinguisher.

- a. Inspect fire extinguisher charge, and ensure that gauge shows within charge limits.

NOTE: If undercharged or overcharged, see instructions on label: replacement may be required. **(Additional minimum monthly/annual inspections required- see instruction label on extinguisher for details.)**



- b. Inspect the physical condition of the extinguisher- (cylinder, hose/cone assembly, etc.), for any signs of damage or corrosion.
- c. Ensure that the hinge pin is in place to prevent accidental discharge.
- d. Ensure that the plastic safety seal is secured to the hinge pin, and that it has not been removed.



NOTE: If the safety seal is missing or is broken, extinguisher may have been tampered with or may have already been used- indicating the need for re-inspection/replacement.

- e. Inspect mounting strap/bracket assembly to ensure extinguisher is secured to structure.



Operation

Post-Operation Inspection Checklist

NOTE: Post-operation checklist should be conducted in accordance with OSHA requirements, to include OSHA Standard- 29 CFR, Part 1926.600, or subsequent.

1. Check engine oil and radiator coolant levels to ensure no leakage after operations.

NOTE: It is necessary to remove the engine covers to check the oil levels. Be sure all covers are replaced and latched in position properly before transporting or operating the machine. If machine is to be parked in a publicly accessible area or area adjacent to a roadway or construction site, the engine compartments must be closed and locked.

2. Close all windows on the Safe-Zone Cab, remove the master keys from the control panel, and shut and lock the door.



NOTE: It is important that the windows are closed, the door is locked, and that all keys are removed to prevent unauthorized access or tampering with the equipment, especially when the machine is parked in a publicly accessible area or area adjacent to a roadway or construction site.

3. If leaving machine parked/unattended at night adjacent to a roadway or occupied construction area, caution should be taken to ensure that there is no obstruction of the reflectors- all reflectors must be visible.

4. When parking the machine, the wheel chocks and parking brake should be set- (Parking brakes may not be available on all trailer models).



5. Store all grips, blocks, and other tools/equipment used during operations back into the tool box. Then close and lock tool box.



6. Secure the rope end to the drum using a tie-off rope around the drum. Also, secure the levelwind to the rear trailer frame using a tie down to prevent the levelwind from bouncing during transit.

7. Remove any trash, rags, or other loose material from the machine to keep the machine clean, so as not to create a fire hazard.

Troubleshooting

System Warning Indicators

In the event of an issue, these messages will appear at the top of the control screen.



EStop LEFT	Indicates that the LEFT (curb side) emergency stop button is activated. When activated, all control power output is off - the engine and hydraulic system are shut down.
EStop RGHT	Indicates that the RIGHT (curb side) emergency stop button is activated. When activated, all control power output is off - the engine and hydraulic system are shut down.
EStop CAB	Indicates that the emergency stop button is activated inside the cab. When activated, control power output is off - the engine and hydraulic system are shut down.
SEAT Sw	Indicates that the operator's seat is vacated. If the seat is vacated for 8 seconds, the machine automatically goes into a controlled stop. Operator should remain seated during operations.
Controller CommError	Indicates that the System Control Panel and the main computer are not communicating. The display will not update. There may be loss of machine functions and engine may shut off. Ongoing operations (Pull/Payout) will continue only until stopped. Check system components for damage, loose, or frayed wires/connections.
Engine CommError	Indicates that the main computer and the engine control unit (ECU) are not communicating. Check system components for damage, loose, or frayed wires/connections. See service and repair section for additional instructions. The engine may shut down.
HydOil LOW	Indicates that the hydraulic oil is low. Check hydraulic oil/fluid level and inspect hydraulic system components. Continued operation with low oil can result in damage to the hydraulic pump and valves and consequent loss of machine's operational functions.
HydTemp HIGH	Indicates that the hydraulic oil's temperature is elevated. Check hydraulic fluid temperature and inspect hydraulic system components. Continued operation with overheated oil can result in damage to the hydraulic system and consequent loss of machine's operational functions.
HydFiltr DIRTY	Indicates that the hydraulic filter is dirty. Inspect hydraulic filter and change as needed.
Frame>> <<Frame	Indicates that either the left (curb side) or right (street side) frame is not fully actuated into the drum. If this occurs prior to operations, then the system will not allow operations. If this Error occurs during a Pull, the Pull can be continued until stopped, but the Pull cannot be restarted until this fault is corrected. Cause could be that the frame is not fully actuated; there may be a loose wire, loose sensor, or a faulty sensor. Check the sensor mounts and wires.
DRUM STOPPED DUE TO JOYSTICK COMM. ERROR	Indicates a loss of power or communications to the joystick. Results in an automatic controlled stop. Tie off as necessary. Shut down and reboot the system. If a system reboot does not remedy the fault, check Fuse # 2.

Troubleshooting

Diagnostic Trouble Codes

The following errors and warning will show for ten seconds in the message window at the bottom of the control screen.

VDC = Voltage Direct Current GND = Ground VBB = Voltage at controller (See Wiring Schematics)

System Messages	Response / Guidance	→
01 System initializing, please wait,	System is starting up. If system does not start, check to make sure all Emergency Stop buttons are reset.	
03 WARNING: low controller supply voltage.	IMMEDIATELY: Operator initiates controlled stop -Joystick to Center	
04 ERROR: output group#1 [Q00-Q07] supply voltage.	Centering the Joystick will engage the brakes. CHECK FUSE 08	
05 ERROR: output group#2 [Q08-Q15] supply voltage.	Initiate controlled stop -Joystick to Center. Operator will need to decide whether to continue or not. There is a loss of one or more feedback sensors: Line Speed, Tension, or Payout feet. CHECK FUSE 09	
06 ERROR: output group#3 [Q00_E-Q07_E] supply voltage.	IMMEDIATELY: Joystick to Center to apply the brake. Machine will lose tension. Reel will reverse direction. Shut down. CHECK FUSE 10	
07 ERROR: output group#4 [Q08_E-Q15_E] supply voltage.	Loss of brakes will result in immediate stop. Engine will shut down due to loss of Engine Ignition signal. CHECK FUSE 11	
08 ERROR: output group#5 [Q16_E-Q23_E] supply voltage.	Initiate controlled stop -Joystick to Center. Shut down. CHECK FUSE 12	
09 ERROR: supply voltage error [Q00_E-Q23_E].	None. Shut down. CHECK FUSE 07 - power to controller.	
10 ERROR: levelwind speed control knob supply voltage.	Levelwind speed control knob does not work. Operator may continue to operate with the fault.	
11 ERROR: levelwind speed control knob input signal.	Levelwind speed control knob does not work. Operator may continue to operate with the fault.	
12 ERROR: joystick communications.	Automatic controlled stop. CHECK FUSE 02 and connections.	
13 ERROR: external keypad.	External Hydraulic keypad will no longer function. CHECK FUSE 02 and connections.	
16 ERROR: LEFT drum diameter sensor ultrasonic signal lost.	Feedback sensors are not reading. Lineman is operating visually only, without some instruments. Operator will need to decide whether to continue or not. There is a loss of drum feedback sensors. May initiate controlled stop -Joystick to Center. Shut down and cycle power to sensor.	

→	Failure Mode	Solution
	System will not initialize	If system does not start up, check Emergency Stop buttons.
	Loss of Power	CHECK: VDC across wires 1) VBBS_10 / GND_20, 2) VBB15_32 / GND_20
	Loss controller voltage outputs to: drum pressure, payout, pull-in, or frame.	CHECK: fuse F8; VDC across wires VBBO_19 / GND_37
	Loss of hydraulic valves that control the levelwind.	CHECK: fuse F9; VDC across wires VBBR_01 / GND_37
	Loss of freewheel valve	CHECK: fuse F10; VDC across wires VBB1_19E / GND_37E
	Loss of Brakes. Engine may shut down.	CHECK: fuse F11; VDC across wires VBB2_01E / GND_37E
	Loss of power to outputs	CHECK: fuse F12; VDC across wires VBB3_32E / GND_37E
	Loss of power to controller. Brakes come on. Display off.	CHECK: fuse F7; VDC across wires VBBREL_51E / GND_37E
	Loss Levelwind supply voltage	CHECK: connection; VDC across wires VREF_51 / I00GND [5VDC]
	Loss Levelwind supply voltage/input signal	CHECK: connection; wire I00_55; VDC across I00_55/ GND_20 [0.3-4.7VDC]
	Loss of Power/Communications to Joystick.	CHECK: connection; fuse F2; VDC across wires 1)JSX7/JSGND,2)CAN3H/GND[2-4VDC], 3)CAN3L/GND[2-4VDC]
	Loss of Power/Communications to external keypad	CHECK: connection; fuse F2; VDC across wires 1)X7KEYP/KEY_GND, 2)CAN3H/GND [2-4VDC], 3)CAN3L/GND [2-4VDC]
	Sensor is out. Line tension, speed, and payout feet are affected and flashing RED	Cycle power to sensor. If error remains, replace sensor.

Troubleshooting Diagnostic Trouble Codes

The following errors and warning will show for ten seconds in the message window at the bottom of the control screen.

VDC = Voltage Direct Current GND = Ground VBB = Voltage at controller (See Wiring Schematics)

System Messages	Response / Guidance	→
17 ERROR: RIGHT drum diameter sensor ultrasonic signal lost.		
18 ERROR: LEFT drum diameter sensor input signal lost.	Operator will need to decide whether to continue or not. There is a loss of one or more feedback sensors: Line Speed, Tension, or Payout feet. Feedback sensors are not reading. Lineman is operating visually only, without some instruments. May initiate controlled stop -Joystick to Center. CHECK FUSE 02	
19 ERROR: RIGHT drum diameter sensor input signal lost.		
20 ERROR: LEFT drum diameter sensor signal out of operating range.	Operator will need to decide whether to continue or not. There is a loss of one or more feedback sensors: Line Speed, Tension, or Payout feet. Feedback sensors are not reading. Lineman is operating visually only, without some instruments. May initiate controlled stop -Joystick to Center.	
21 ERROR: RIGHT drum diameter sensor signal out of operating range.		
22 ERROR: Pull In pressure transducer input signal lost.	Operator will need to decide whether to continue or not. There is a loss of one or more feedback sensors: Line Speed, Tension, or Payout feet. Feedback sensors are not reading. Lineman is operating visually only, without some instruments. May initiate controlled stop -Joystick to Center. CHECK FUSE 02	
23 ERROR: Pay Out pressure transducer input signal lost.		
24 ERROR: Charge pressure transducer input signal lost.	Operator will need to decide whether to continue or not. There is a loss of one or more feedback sensors: Line Speed, Tension, or Payout feet. Feedback sensors are not reading. Lineman is operating visually only, without some instruments. May initiate controlled stop -Joystick to Center. CHECK FUSE 02	
25 ERROR: fuel sensor input signal out of range.	Unknown fuel level. Loss of fuel will cause an immediate loss of power and operations. Operator decision to continue or not. Monitor fuel level closely visually or with a dip stick. Running out of fuel during operations could have seriously harmful consequences.	
26 ERROR: hydraulic fluid temperature sensor input signal out of range.	Hyd. Oil Temp gauge is out of range. Could be a failure of the sensor. Check connections. System Control Panel cannot sense temperature of hydraulic oil. Cold oil and overheated oil can damage hydraulic systems, resulting in operational failures.	
29 ERROR: Lost engine ECU communications	Engine may shut off automatically. Initiate controlled stop -Joystick to Center. Investigate communications error. CHECK FUSE 11.	
SEAT SWITCH ERROR	Automatic Controlled Stop. Joystick to center. Must restart the machine.	

→	Failure Mode	Solution
	Sensor is out. Line tension, speed, and payout feet are affected and flashing RED	Cycle power to sensor. If error remains, replace sensor.
	Sensor is out. Line tension, speed, and payout feet are affected and flashing RED	CHECK: connection; wire I03_35; VDC across wires I03_X7 / I03GND
	Sensor is out. Line tension, speed, and payout feet are affected and flashing RED	CHECK: connection; wire I04_53; VDC across wires I04_X7 / I04GND
	Sensor feedback signal is out of normal operating range. Line tension, speed, and payout feet are affected and flashing RED	CHECK: sensor mounting position; drum core distance set-up
	Sensor feedback signal is out of normal operating range. Line tension, speed, and payout feet are affected and flashing RED	CHECK: sensor mounting position; drum core distance set-up
	Inaccurate Line Tension display - will flash RED and read "0".	CHECK: connection; wire I05_34; VDC across wires I05X7 / I05CMN
	Inaccurate Line Tension display - will flash RED and increase.	CHECK: connection; wire I06_52; VDC across wires I06X7 / I06CMN
	No effect. Charges the Hyd. Pump. Lost feedback.	CHECK: connection; wire I07_33; VDC across wires I07X7 / I07CMN
	Fuel gauge digital readout is now RED. Loss of fuel gauge.	CHECK: connection; ohms across wires I12_22 / I12GND [33-240 ohms]
	Hydraulic oil temp gauge digital readout is now RED.	CHECK: connection; ohm across wires I13_39/I13GND [15-6500ohms]
	No feedback from engine to vehicle	CHECK: fuse F11; VDC across wires VBB2_01E / GND; engine ECU connection
	If open for 8 seconds, the machine initiates an Automatic Controlled Stop	Seat switch indicator. Operator should must stay seated during operations.

John Deere™ Engine DTCs

SPN Code	SPN Name	SPN Code	SPN Name
27	EGR Valve Position Signal	168	Unswitched Battery Voltage
28	Digital Throttle Signal	174	Fuel Temperature Signal
29	Secondary Analog Throttle Signal	177	Transmission Oil Temperature Signal
51	Air Throttle Actuator Position Signal	189	Engine Speed Derate
54	Throttle Signal	190	Engine Speed
91	Primary Analog Throttle Signal	191	Engine/Pump Speed
94	Low Pressure Fuel Signal	237	VIN Security Data
96	Fuel Level	412	EGR Temperature Signal
97	Water-in-fuel Signal	569	Rear Axle Diff Lock Signal
100	Engine Oil Pressure Signal	611	Injector Drive #1
101	Crankcase Pressure Signal	612	Injector Drive #2
102	Manifold Air Pressure Signal	620	Sensor Supply Voltage
103	Turbocharger Speed Signal	627	All Injector Circuits
105	Manifold Air Temperature Signal	628	ECU Programming
107	Air Filter Pressure Differential	629	ECU EEPROM
108	Barometric Pressure Signal	632	Fuel Shutoff Valve
109	Engine Coolant Pressure Signal	636	Camshaft Position Signal
110	Engine Coolant Temperature Signal	637	Crankshaft Position Signal
111	Engine Coolant Level Alarm Switch	638	Rack Position
127	Transmission Oil Pressure Signal	639	CAN Bus
157	Fuel Rail Pressure Signal	640	External Engine Protection
158	ECU Power Down	641	VGT Actuator

John Deere™ Engine DTCs

SPN Code	SPN Name	SPN Code	SPN Name
644	Lead ECU Sync Circuit	1109	Engine Protection Approaching
647	Engine Fan Drive Circuit	1110	Engine Protection
651	Injector #1	1136	ECU Temperature Signal
652	Injector #2	1172	Intake Air Temperature
653	Injector #3	1176	Intake Air Pressure
654	Injector #4	1180	Calculated VGT Turbine Inlet Temp
655	Injector #5	1209	Exhaust Manifold Pressure Signal
656	Injector #6	1321	Engine Starter Control Circuit
676	Cold Start Aid Relay Output Signal	1347	Suction Control Valve Circuit
729	Inlet Air Heater Signal	1348	Fuel Pump Control Valve #2
833	Rack Position Sensor	1349	Redundant Fuel Rail Pressure Signal
834	Rack Actuator	1485	Pump Power Relay
898	Requested Engine Speed Signal	1568	Torque Curve Selection
970	External Shutdown Switch	1569	Engine Power Derate
971	External Derate Switch	1638	Hydraulic Oil Temperature Signal
974	Remote Throttle Signal	1639	Fan Speed Signal
1075	Low Pressure Fuel Pump Data	1762	Hydraulic Oil Pressure Signal
1076	Fuel Inj Pump Control Valve	2000	Incorrect ECU
1077	Fuel Inj Pump Control Valve	2002-2253	Source Address 2-253
1078	Fuel Inj Pump Spd/Pos Sensor	2629	Fixed Turbo Comp Outlet Temp Signal
1079	Sensor Supply 1 Voltage	2630	Charge Air Cooler Outlet Temp Signal
1080	Sensor Supply Voltage	2659	EGR Flow Signal

John Deere™ Engine DTCs

SPN Code	SPN Name	SPN Code	SPN Name
2790	Fixed Turbocharger Comp Outlet Temp	3660	Spill Valve Circuit #2
2791	EGR Valve Drive Circuit	3661	Spill Valve Circuit #3
2795	VGT Calibration Version	3662	Spill Valve Circuit #4
2797	Injector High Voltage Supply #1	3663	Spill Valve Circuit #5
2798	Injector High Voltage Supply #2	3664	Spill Valve Circuit #6
3246	DPF Outlet Temperature	3711	DOC Inlet Temp
3251	DPF Differential Pressure Signal	3719	Calculated Soot Level
3464	Air Throttle Actuator Drive Circuit	3720	Calculated Ash Level
3471	Fuel Dosing Control Valve Signal	3822	Rear EGR Valve Position Signal
3480	Fuel Dosing Inlet Pressure Signal	3936	DPF Fault Occurrences
3482	Fuel Dosing Shutoff Valve Signal	4077	Fuel Dosing Outlet Pressure Signal
3509	Sensor Supply #1 Voltage	4490	Intake Air Humidity
3510	Sensor Supply #2 Voltage	4765	DOC Inlet Temp
3511	Sensor Supply #3 Voltage	4766	DOC Outlet Temp
3512	Sensor Supply #4 Voltage	4795	DPF Missing
3513	Sensor Supply #5 Voltage	5018	DOC Fault Occurrences
3514	Sensor Supply #6 Voltage	5125	Sensor Supply #7 Voltage
3556	Fuel Dosing Nozzle	5126	Sensor Supply #8 Voltage
3587	Auto ether Control Circuit	5298	DOC Fault Occurrences
3597	Injector Power Supply Voltage	5456	Fuel Dosing Inlet Temp Signal
3598	Injector Power Supply Voltage #2	522458	Fuel Dosing Pump Data
3659	Spill Valve Circuit #1	522494	Intake Air Sensor Communication

John Deere™ Engine DTCs

SPN Code	SPN Name	FMI Code	FMI Name
522495	Exhaust Filter Temp Module	0	Extremely High
523379	Single Point Ground #7	1	Extremely Low
523744	A/C Compressor	2	Invalid
523926	Reverse Pump Pressure Sensor #1 Signal	3	Out of Range High
523926	Reverse Pump Pressure Sensor #1 Signal	4	Out of Range Low
523927	Forward Pump Pressure Sensor #2 Signal	5	High Resistance
523927	Forward Pump Pressure Sensor #2 Signal	6	Low Resistance
524037	MFWD Switch Circuit	7	Mismatch
524223	Rear Axle Diff Lock Signal	8	Signal Missing
524225	Engine Start Protection	9	Loss of Communication
524235	MFWD Solenoid Circuit Voltage	10	Change Abnormal
		11	Activated
		12	Error
		13	Fault
		14	Incorrect Message
		15	Slightly High
		16	Moderately High
		17	Slightly Low
		18	Moderately Low
		19	Communication Error
		31	Condition Exists

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 fuel gauge.
- Other- Refer to engine manufacturer's manual. *(Also, see General Faults section, page 57.)*

DRUM WILL NOT ROTATE

- Low system pressure drum clutch not releasing.
- Drum clutch out of adjustment.
- Obstruction between drum and inside fender/frame.
- Existing line tension in excess of line tension limit setting- brake set.
- Sides of machine are not fully retracted with drum coupler fully engaged.

HYDRAULIC JACK CREEPS DOWN

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

UNIT WILL NOT BUILD MAXIMUM HYDRAULIC SYSTEM PRESSURE

- Operator's tension setting set to low, restricting hydraulic pressure.
- Control valve blocked or malfunctioning.
- Pump relief valve malfunctioning.
- Pump Failure.
- System pressure relief valve at the pump out of adjustment or malfunctioning.
- Contamination in hydraulic system.
- Wiring damage to pump actuators.

HYDRAULIC FLUID TEMPERATURE IS ABOVE NORMAL

- Drum clutch not fully releasing.
- Contamination in hydraulic system.
- Wiring damage to the hydraulic cooling system- fan, wiring, coil, or sensor.

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.)*

General Faults

Fault	Possible Cause	Solution
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 brake, defective sensor.	
	Error in electronics.	

Maintenance



Safety and Reliability Disclaimer: The reliability and working life of the machine depends on the regular inspection and preventive maintenance of the machine. While this section may not include all maintenance for the machine, all inspections and preventive maintenance described in this section are deemed as critical to the safe operation of the machine and should be regarded as such.

The indicated intervals for maintenance work apply to normal operating conditions and stress. The manufacturer is not responsible for damages caused through faulty maintenance or inappropriate handling/operation of the machine.

Maintenance

Safety

Prior to work being performed, ensure the machine is locked/tagged out in accordance with OSHA safety requirements and all applicable safety regulations.

Take all fire prevention safety measures before using a welder or cutting device, including grinders. This should include having a fully charged fire extinguisher near the location of the work.

To avoid injury, make sure that all precautions are taken to support components before loosening or removing bolts.

Be sure 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 proper protective clothing and equipment when performing service: gloves, safety glasses, etc.

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

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

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

Maintenance

General Care and Inspections Instructions

Cleaning

Metal parts and canvas must be cleaned with a soft cloth and a neutral cleaning solution without solvents. Aggressive solvents like acetone or nitro thinners should not be used.

Clean petroleum ether is suitable to degrease the machine parts. No water should get on or around the bearings. If a steam blower is used

to clean the machine, water may penetrate the machine causing damage to the bearings.

Make sure that no dirt gets into the bearings when vacuum cleaning the machine. If necessary, cover those parts beforehand. Bare metal parts can be cleaned and at the same time protected by using a slightly oiled cloth.

Fault and Malfunction Detection

Faults detected in supporting parts or parts which have an impact on safety must be corrected immediately. So long as the faults are not corrected, the machine must not be operated.

Machines, including their support construction and rope blocks, should be inspected by an expert before being put into operation for the first time as well as after having undergone substantial modification.

Machines, including their support construction and rope blocks, should be inspected at least once a year by an expert. However; if necessary, machines should be inspected more often, depending on the operating and working conditions.

Essentially, the checking process consists of making sure that the *safety devices* are available, fitting properly and effective, as well as checking the state of the machine, the hitching gear, the rollers, the equipment, and the support construction.

Safety devices described are, e.g. brakes, rope reeling devices, devices against overcharging, etc.

Experts are persons who, through their education and experience, have sufficient knowledge in the field of pullers, lifters, and traction machines. Further, they are familiar with the valid regulations for protection at work, for the prevention of accidents, and with the regulations and rules generally accepted in technology. "Experts" referred to are also able to decide if the pullers, lifters and traction machines are in a safe working condition.

Source: BGV D8.

Maintenance

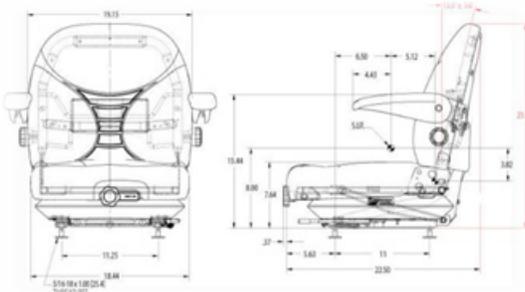
Safe-Zone™ Cab

CAUTION: Do not use ammonia-based cleaners. Use only non-ammonia-based cleaners to clean the front polycarbonate window.



Inspection of Operators Chair

The operators chair should be inspected for damage and loose or missing parts. (For replacement parts, contact S+R.)



CAUTION: For Turret Models: The operator must be seated while rotating the turret to avoid being accidentally thrown from the machine.

Climate Control System

(Not installed on open cab platforms, and may not be available on all models. System types vary by model.)

The climate control systems are designed for both cooling and heating comfort functions.



- Routine visual inspections of the machine/unit should include the climate control system, (compressor, condenser, fans, hoses, etc.).
- Climate control system should be regularly inspected for damages and leaks.



NOTES:

- Any maintenance or modifications to the climate control system must be in accordance with US Federal EPA and State regulations.
- Only qualified HVACR technicians should perform work on Safe-Zone™ climate control systems. For all maintenance concerns, contact the Sherman+Reilly Parts & Service Department at repairs@sherman-reilly.com.

Maintenance

Trailer Assembly

Disclaimer: Any modifications to the Sherman+Reilly™ P-1400X trailer assembly or attached structures could result in damages to equipment, injury to operators, personnel, or others, and voiding of the manufacturer's warranty.

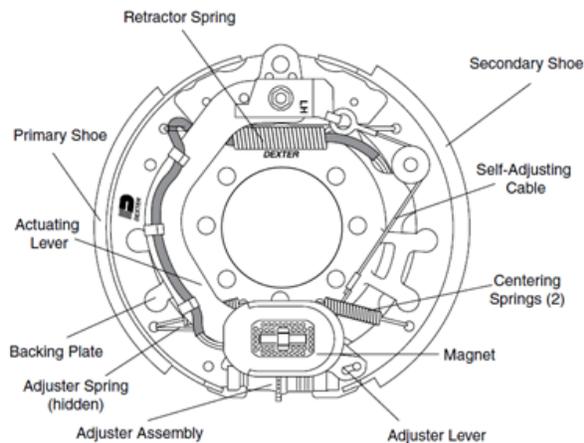
(United States Only) Any and all maintenance or modifications to the Sherman+Reilly™ P-1400X trailer assembly must be done in accordance with United States Federal and State Department of Transportation Standards, to include all applicable Federal Motor Vehicle Standards covered under Section 571 or subsequent.

Brakes

The P-1400X puller is equipped with a self-adjusting air brake system.

- Brakes should be adjusted after the **first 200 miles**, and then every **3,000 miles thereafter**- (see self-adjusting instructions in manufacturer's manual).

NOTE: Replacement of linings is necessary when thickness is worn to **1/16 inch or less**.



For all additional inspection, cleaning, adjustment, and replacement instructions, see the manufacturer's manual.

CAUTION: Some older brake linings may contain asbestos dust which can cause serious health problems. Certain precautions should be taken when servicing brakes- (see manufacturer's manual for instructions).

Towing

Prior to towing, the trailer must be hooked up to a vehicle and hitch capable of supporting and towing a trailer/machine of this size and weight, while ensuring that the hitch is secure, and trailer lighting and air hoses are connected.

- Hitches should be inspected prior to towing the vehicle.
- If air brake system does not fully charge with air after connecting vehicle air supply system, or there is an obvious air leak, a full inspection must take place.
- If air leaks are identified, they must be fixed prior to attempting to tow the trailer.

NOTE: The approximate trailer weight is **18,500 lbs.**

Maintenance

Trailer Assembly

Tires

- The P-1400X comes with four tires, size 235-75R/17.5.



- Tire pressure should be checked each time before towing/operation, and weekly thereafter to ensure proper inflation. (125PSI)
- Tires should be inspected for wear and damage at least every **3,000 miles or 3 months**.
- The specifications for the tires can be found on the tire sidewall.



CAUTION: Replacement tires must meet the same specifications as the originals. Tires for Sherman+Reilly machines meet specific duty requirements, as well as weight and roadway/speed ratings. Mismatched tires and rims may come apart with explosive force causing personal injury. Mismatched and underrated tires can also blow out causing vehicle and roadway accidents that can create serious injury or death for those involved.

Wheels

- Wheel lug nuts should be torqued in accordance with manufacturer's specifications.
- Wheel lug nut torque should be checked in accordance with the maintenance schedule to ensure safe towing operations.



CAUTION: Wheel nuts or bolts must be tightened and maintained at the proper torque levels to prevent loose wheels, broken studs, and potential dangerous separation of the wheel from the axle, which can cause accidents, personal injuries, and death.

For all additional inspection, cleaning, adjustment, and replacement instructions, see the axle manufacturer's manual.

Maintenance

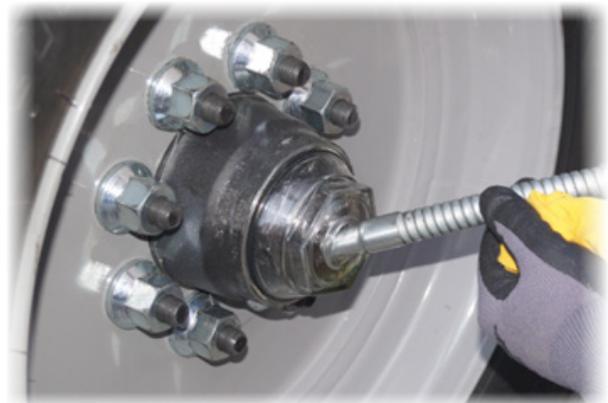
Trailer Assembly

Axle Drum Oil- (if equipped)

- If trailer is equipped with axle drum oil access, the oil level should be checked each time prior to towing or moving the trailer.
- If axle drum oil level is low, remove axle drum oil cap plug, pour in fluid until fluid level is just below oil cap plug hole, and replace the plug. *(A funnel may be required to avoid spilling fluid.)*



- Axle drum oil should be just below oil cap plug hole:



For all additional inspection, cleaning, adjustment, and replacement instructions, see the axle manufacturer's manual.

Maintenance

Trailer Assembly

Trailer Lighting

All trailer lights should be inspected to ensure they work prior to transport. (For replacement contact S+R.)



If none of the lights work:

- Check vehicle/trailer wire connectors for damage or corrosion.

(The vehicle/trailer wire connectors can vary dependent upon owner/customer requirements.)

- Also, check lighting junction box for damage. Open and inspect wires for loose or corroded connections.



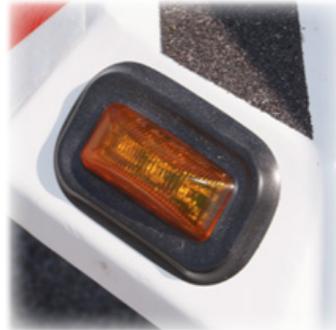
Maintenance

Trailer Assembly

Lighting Replacement

To replace trailer lighting, remove existing lighting by one of two methods, dependent upon which light is being replaced:

- Pop out: Remove pod from its rubber grommet holder by pushing from the inside toward the outside, or by pushing in from the outside and reaching into the hole to pull the pod back through to the outside of the trailer. Once out of the rubber, unplug the connection, and replace with new pod.
- Unscrew: Some lighting may require unscrewing the unit from its retainer.



Troubleshooting

Torque Ratings for Machine Fasteners

Torque ratings for fasteners on this piece of equipment follow ANSI accredited guidelines for ASTM/ASME specifications on tightening torque. As a general rule, tightening torque should be set according to the below table, with a tolerance of approximately + / - 5%, unless other specific torque rating is noted in this manual. The below table is for advisory purposes only.

General Recommended Torque for Fasteners by Size:

Nominal Dia. (in.)	 SAE J429 Grade 5			 SAE J429 Grade 8		
	Tightening Torque			Tightening Torque		
	K = 0.15	K = 0.17	K = 0.20	K = 0.15	K = 0.17	K = 0.20
Unified Coarse Thread Series						
1/4	76 in-lbs	86 in-lbs	101 in-lbs	107 in-lbs	122 in-lbs	143 in-lbs
5/16	157	178	209	221	251	295
3/8	23 ft-lbs	26 ft-lbs	31 ft-lbs	33 ft-lbs	37 ft-lbs	44 ft-lbs
7/16	37	42	49	52	59	70
1/2	57	64	75	80	90	106
9/16	82	92	109	115	130	154
5/8	113	128	150	159	180	212
3/4	200	227	267	282	320	376
7/8	322	365	429	455	515	606
1	483	547	644	681	772	909
1 1/4	840	952	1121	1363	1545	1817
1 1/2	1462	1657	1950	2371	2688	3162
Fine Thread Series						
1/4	87 in-lbs	99 in-lbs	116 in-lbs	123 in-lbs	139 in-lbs	164 in-lbs
5/16	174	197	231	245	278	327
3/8	26 ft-lbs	30 ft-lbs	35 ft-lbs	37 ft-lbs	42 ft-lbs	49 ft-lbs
7/16	41	47	55	58	66	78
1/2	64	72	85	90	102	120
9/16	91	103	121	128	146	171
5/8	127	144	170	180	204	240
3/4	223	253	297	315	357	420
7/8	355	403	474	502	568	669
1	542	614	722	765	867	1020
1 1/4	930	1055	1241	1509	1710	2012
1 1/2	1645	1865	2194	2668	3024	3557

Source: Fastenal

Torque ratings for 1/4" and 5/16" are listed in inch-pounds. All other torque ratings are listed in foot-pounds. Torque value formula T=KDF where (K = .15 for "lubricated" conditions) (K= .17 for Zinc plated and dry conditions) (K= .20 for plain and dry conditions).

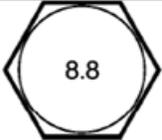
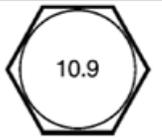
CAUTION: Under/Over tightening fasteners can result in costly equipment failure or personal injury.

Troubleshooting

Torque Ratings for Machine Fasteners

Torque ratings for fasteners on this piece of equipment follow ANSI accredited guidelines for ASTM/ASME specifications on tightening torque. As a general rule, tightening torque should be set according to the below table, with a tolerance of approximately +/- 5%, unless other specific torque rating is noted in this manual. The below table is for advisory purposes only.

General Recommended Torque for Fasteners by Size:

Nominal Dia. (mm)	 Class 8.8			 Class 10.9		
	Tightening Torque			Tightening Torque		
	Lubricated (ft-lbs)	Zinc Plated (ft-lbs)	Plain&Dry (ft-lbs)	Lubricated (ft-lbs)	Zinc Plated (ft-lbs)	Plain&Dry (ft-lbs)
4	1.7	1.9	2.3	2.4	2.7	3.2
5	3.4	3.9	4.5	4.9	5.5	6.5
6	5.8	6.6	7.7	8.3	9.4	11.1
7	9.7	11.0	13.0	13.9	15.8	18.5
8	14.1	16.0	18.8	20.2	22.9	26.9
10	27.9	31.6	37.2	39.9	45.2	53.2
12	48.7	55.1	64.9	69.6	78.9	92.8
14	77.8	88.1	103.7	111.3	126.1	148.4
16	121	137	161	173	196	230
18	167	189	222	239	270	318
20	236	267	314	337	382	449
22	321	364	428	460	521	613
24	407	461	543	582	660	777
27	597	676	796	854	968	1139
30	809	917	1079	1158	1312	1544
33	1101	1248	1468	1576	1786	2101
36	1415	1603	1886	2024	2294	2699

Source: Fastenal

All torque ratings are listed in foot-pounds. Torque value formula $T=KDF$ where; (K = .15 for "lubricated" conditions) (K= .17 for Zinc plated and dry conditions) (K= .20 for plain and dry conditions).

CAUTION: Under/Over tightening fasteners can result in costly equipment failure or personal injury.

Service & Repair

NOTE: For service or repair, please contact the Sherman+Reilly Parts & Service Department at help@sherman-reilly.com or call (423)756-5300 or 1-800-251-7780. www.sherman-reilly.com

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.





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every night, no exceptions

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