

HIGH SPEED CAPSTAN HOIST



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GENERAL WARNINGS

NOTICE

ABOUT THIS MANUAL

The equipment covered in this manual should only be installed, used, and serviced by qualified personnel trained in proper work and safety procedures. This manual is intended to assist such trained individuals in the installation and use of this equipment and is not intended as a substitute for proper training and experience.

This document or any other information regarding this equipment is not intended to cover all of the possible situations which may be encountered while using the equipment described herein. Should specific situations arise which are not covered by the information provided, or should the user desire further details, the specifics should be directed to Wurtec, Inc.



WARNING

- This hoist shall be used with synthetic rope of 5/8" (16mm) to 3/4" (19mm) diameter.
- This hoist shall be used with both a **T-Rail Hoist Rig** (11-293) and **Black Diamond 26kN Rotor Swivel** (BD62000).
- Care must be used to prevent injury when rolling the hoist on its wheels.



DANGER

- Overhead loads can fall, causing damage to equipment and property, severe injury, or death.
- Do not allow people to stand under or near the load.
- Never use this hoist to lift people.
- Always keep the rope securely on the capstan drum and under control by the operator.
- Always lift a load with the fall line (not the load line) running through the **rope lock**.
- Failure to use the Rope Lock can result in damage to equipment and property, severe injury, or death.
- Do not remove wraps of rope from the capstan drum while supporting a load.
- Do not allow the rope to overwrap itself or to ride off the end of the capstan drum.

DESCRIPTION

The **High Speed Capstan** is a durable hoisting tool used to lift moderate loads at relatively high speeds. Used for hoisting rails and brackets, the High Speed Capstan can greatly reduce the time required to install rails in long hoistways.

SAFETY FEATURES

- To increase safety and improve control over the load, the hoist is designed to only rotate in the counterclockwise direction when viewed from the end of the capstan drum.
- The rotational speed of the capstan drum can be controlled by turning a knob on the control panel, allowing the user to run the hoist at the most appropriate speed for a given application.
- The gear motor is equipped with a brake that prevents rotation of the drum when the footswitch is released or the power is turned off.
- A pair of rope locks have been integrated to prevent loss of control of the fall line.
- A heavy-duty footswitch has been provided to allow for safe control of the rope while hoisting.
- **Handrail** and **toe guard brackets** are provided to barricade the hoistway opening and can be positioned on any of the (4) sides of the hoist.
- Removable **mounting brackets** can be used for anchoring or reversed and stored should they be in the way.
- A **shear plate** can be positioned on any of the (4) sides of the hoist to provide anchoring in shear when positioned over the edge of the hoistway opening.
- When used as directed, the High Speed Capstan can safely, quickly, and accurately hoist and position rails on a wide range of installations.
- The included **wheel kit** adds to the ease of positioning the hoist on the jobsite.

SPECIFICATIONS

Weight	393 lbs (179 kg)
Rated Load Capacity	1000 lbs (454 kg)
Rated Max. Speed	150 ft/min (0.762 m/s)
Power Source	220-240 VAC, 1phase, 60Hz
Service Current Requirement	35 A
Ambient Temperature Range	32-104 F (0-40 C)
Control Circuit	24 Vdc
Capstan Drum Rotation	CCW as user faces cabinet

PERSONAL PROTECTIVE EQUIPMENT

The following PPE are recommended when installing and using the Wurtec High Speed Capstan:

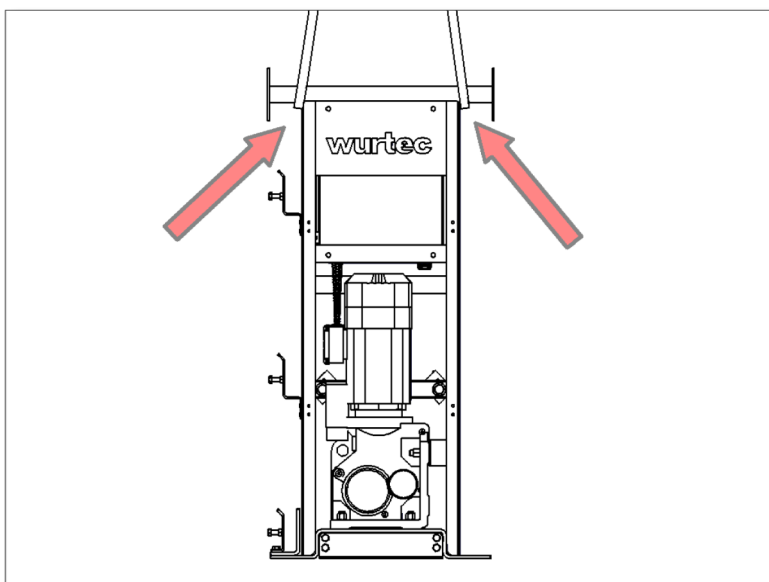
- Safety glasses
- Hard hat
- Work boots with steel toe and sole

INSTALLATION/ASSEMBLY TOOLS REQUIRED

The following tool list is the minimum required for installing and performing the daily checks on the High Speed Capstan. The High Speed Capstan can be installed by one person who should have all these tools.

- (1) 1/8" hex key
- (1) 5/32" hex key
- (2) 7/16" combo box wrenches
- (1) 3/4" combo box wrench
- (2) 15/16" combo box wrenches
- 1-1/8" socket with extension and ratchet
- Hammer drill and bits for 5/8" concrete anchors

INSTALLATION



A. Safely Moving the Hoist

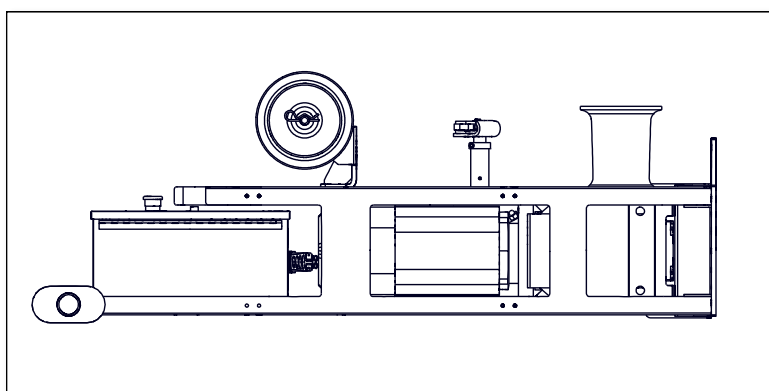
1. Rolled on included wheel kit.

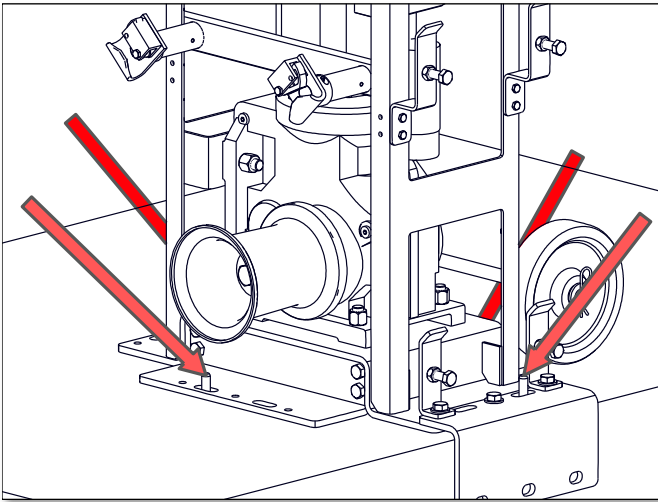
2. Picking from the upper bar.

- A strap of appropriate capacity can be used to lift the hoist from the top lifting bar.
- For stability, position the strap ends to the outside of the vertical frame members and inside the end caps.

3. On a pallet.

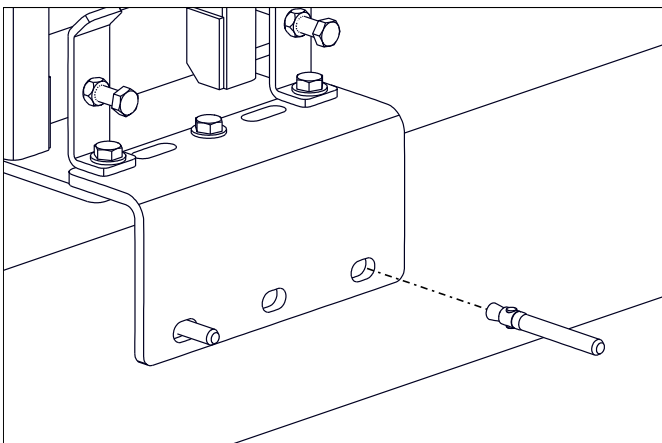
- The hoist can also be moved and stored by strapping the unit to a pallet.
- Remove the wheel kit and strap to frame cross-member before laying down on pallet.
- The hoist shall not be operated while mounted to a pallet and must be anchored to the floor using the appropriate concrete anchors through the slots in the base of the unit.





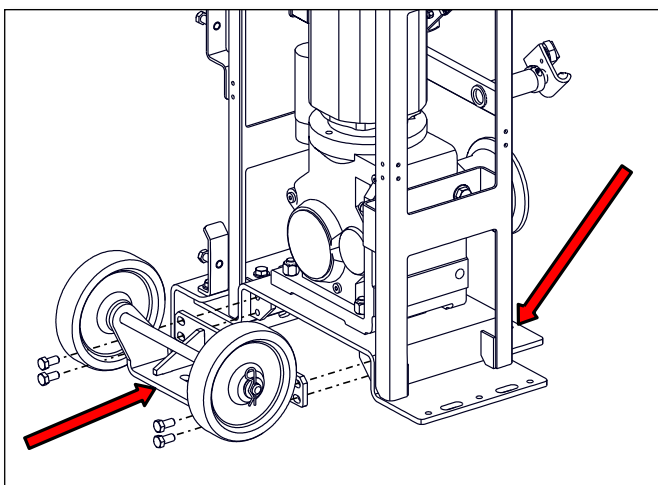
B. Recommended Anchors

- 5/8" Red Head concrete anchors (or equivalent) shall be used to anchor the hoist to the floor through the slots in the base of the unit.
- The number of anchors to be used must be determined based on the application. However, a minimum of (4) anchors are recommended to provide stability to the hoist while in operation.
- Should it be required to use the anchor slot beneath the capstan drum, mark the location of the hole beneath the drum, remove the bracket, drill the hole for the anchor, replace the bracket, set the anchor, and then proceed to drill and set the other anchors as required.



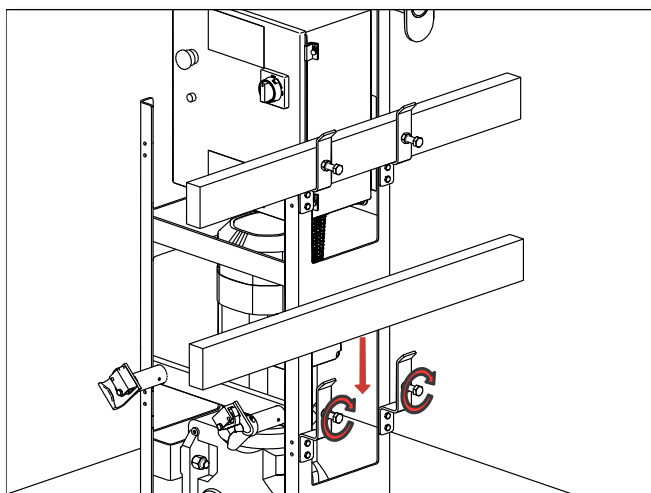
C. Recommended use of Shear Plate

- 5/8" Red Head concrete anchors (or equivalent) are to be used to anchor the shear plate to the concrete below the sill of the hoistway entrance.
- The shear plate can be positioned on any of the (4) sides of the hoist to allow for maximum flexibility.
- At least (2) anchors are recommended to be used through the shear plate to provide maximum stability to the hoist.



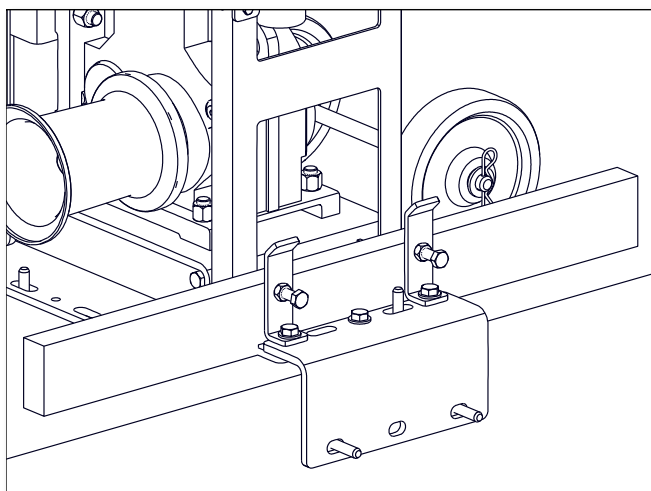
D. Removable Brackets

- If space constraints dictate, the removable bracket/wheel kit can be removed. The front bracket can be rotated 180 degrees and reinstalled under the base of the unit.
- If there are no space constraints, the removable brackets should be left in the extended position and should have at least (1) anchor through each bracket.
- Anchors should be installed in the slots in the wheel kit.



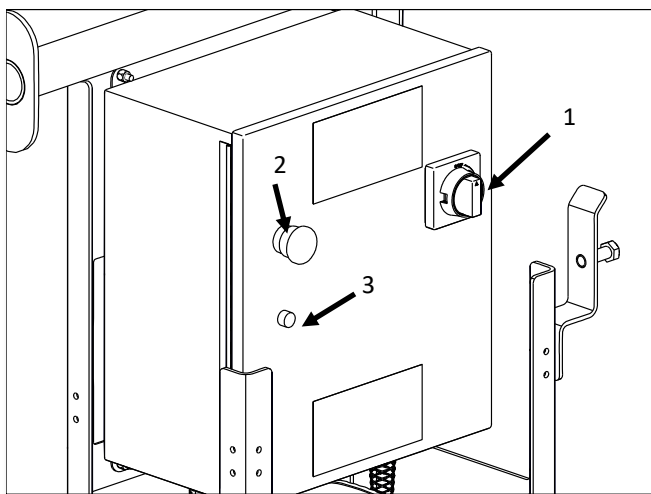
E. Handrail Brackets

- The handrail brackets are provided to enable the installation of a barricade in the hoistway opening. The brackets can be positioned on any side of the hoist depending on the required position.
- Once the hoist has been positioned and anchored in the hoistway opening, 2x4 or 2x6 lumber can be cut to length and placed in the handrail brackets. The bolts in the brackets should then be tightened against the lumber, forming a secure barricade between the workers and the open hoistway.



F. Toe Guard Brackets

- The toe guard brackets are provided to enable the installation of a barricade along the floor in front of the hoistway opening. The brackets can be positioned on any side of the hoist depending on the required position.
- In order to seat the barricade flush with the floor, a notch needs to be cut out of the 2x4 or 2x6 lumber. The approximate dimensions of the notch are 11" long by 1/2" deep. Once the notch has been cut from the lumber, the barricade can be inserted and the bolts tightened against the lumber.



G. Power and Control

- Main power - make sure the hoist is plugged into a suitable power supply.
 - Foot switch - make sure the foot switch cable is plugged in and positioned in a comfortable location while pulling the rope through the rope lock.
1. Disconnect switch - make sure it is in the locked/on position.
 2. E-stop button - make sure it is in the extended position.
 3. Variable Frequency Drive - used to adjust drum

OPERATION

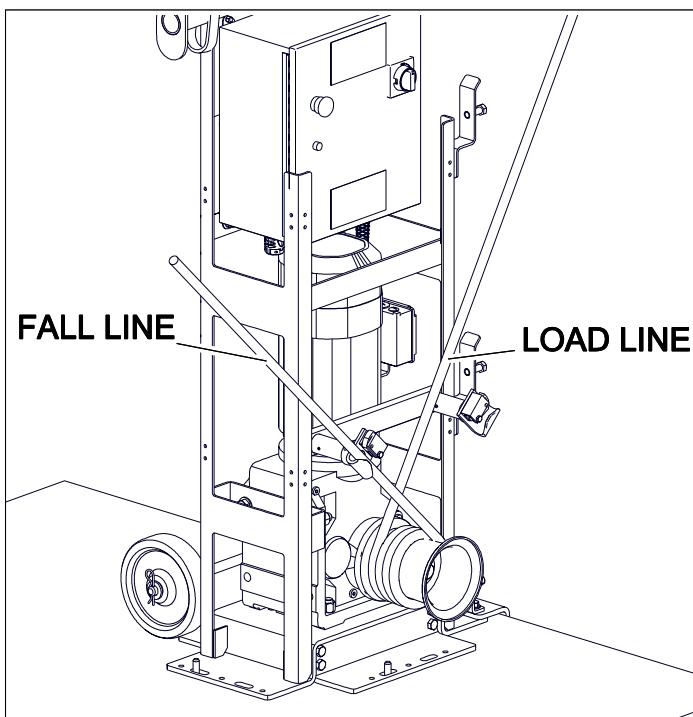
WARNING



Never operate the Capstan with enough wraps around the drum such that the operator does not need to pull on the Fall Line to lift the load.

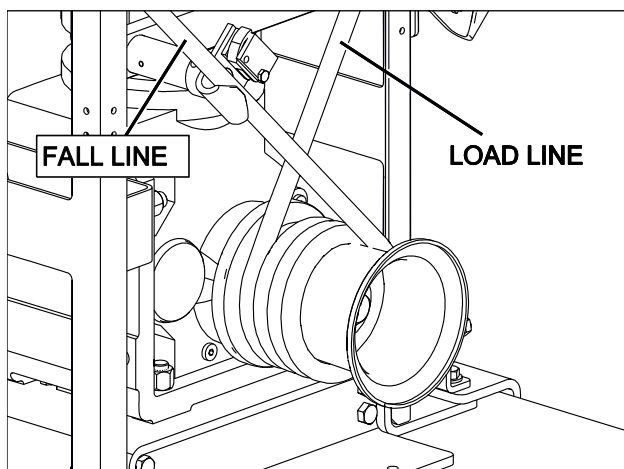
Capstan Drum Theory

- The Capstan Hoist functions due to the friction between the drum and the rope.
- As the number of wraps of rope around the drum increases, the amount of rope in contact with drum also increases. This increased contact area applies more of the force from the load line to the drum and gearmotor, allowing the operator to apply less force on the fall line to move the same load.
- As the number of wraps of rope around the drum decreases, there is less rope contacting the drum and therefore more of the load is transferred to the fall line.
- A very dangerous condition can arise if the fall line is wrapped around the drum enough times such that no force is required on the fall line to move the load on the load line. This can cause the rope to wrap up over itself, causing loss of control of the load.



H. Proper orientation of load line and fall line

- The load line is the rope which comes off the drum, is run through any tackle in the system, and is attached to the load to be lifted.
- The fall line is the free end of the rope which comes off the drum and is run through the rope lock. This end is used to control the speed of the load being lifted.
- When lowering the load, the drum should be rotating in order to improve the stability and control of the load. If the situation arises such that the drum has stopped rotating and lowering of the load is still desired, press the foot pedal to start the drum rotating before lowering the load. This will likely cause a slight lifting of the load before lowering is possible. If the load is in such a position that it cannot safely be lifted slightly before lowering, lower the load a small distance without the drum rotating, start the drum rotating, and then lower the load the rest of the way.

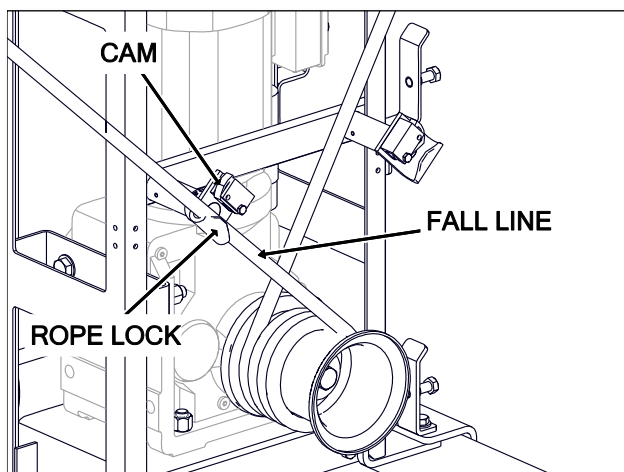
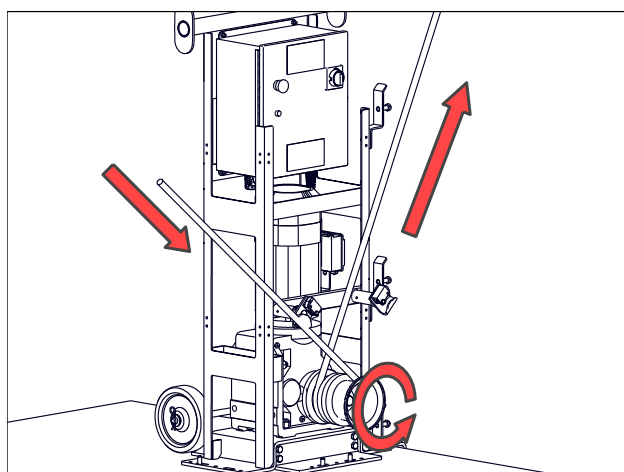


I. Rope Position

The load line shall always be positioned on the capstan drum such that it is closest to the gearmotor. This places the greatest load on the strongest area of the drum and gearmotor shaft. The rope is then wrapped around the drum the appropriate number of times to create the optimal force on the fall line, which is about 20 lb (9.1 kg). The force required on the fall line depends on many factors, including the load to be raised, the amount of mechanical advantage achieved by any tackle in the system, and the age and condition of the rope.

NOTICE

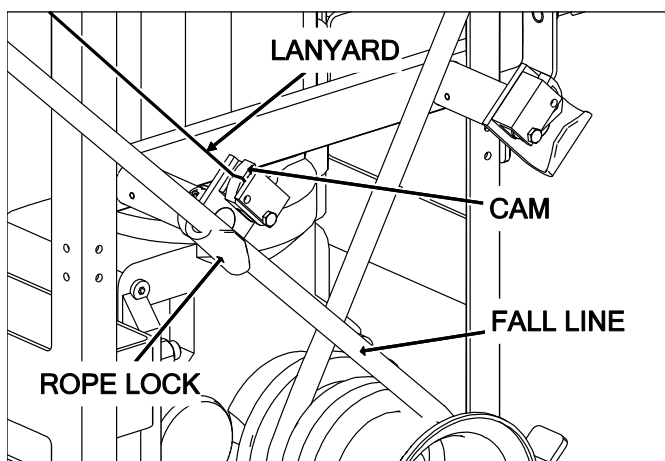
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J. Rope Lock

- The rope lock **SHALL** be used at all times. Proper alignment of the rope lock is key to safely operating the hoist. The round rope guide portion of the rope lock should be positioned in such a way that when the operator is pulling the rope off the drum, the rope runs smoothly through the rope lock. The rope lock CAM should be above the rope and the set screw should be tightened such that the rope lock cannot rotate.
- The rope should pull smoothly through the rope lock away from the drum and should catch on the CAM when the tension on the rope is released.

(Note: The set screw can be removed in order to remove the rope lock from the frame if the positions need to be switched.)



K. Lowering the load

- With the fall line in one hand and the lanyard attached to the CAM in the other, pull the fall line to slightly disengage the CAM, and then pull the lanyard attached to the CAM to fully retract the CAM away from the rope. While continuing to hold the lanyard in the retracted position and with the drum still spinning, slowly start to allow the fall line to feed back through the Rope Lock.
- To stop the rope from moving back through the Rope Lock simply release the lanyard attached to the CAM.

DAILY CHECKS

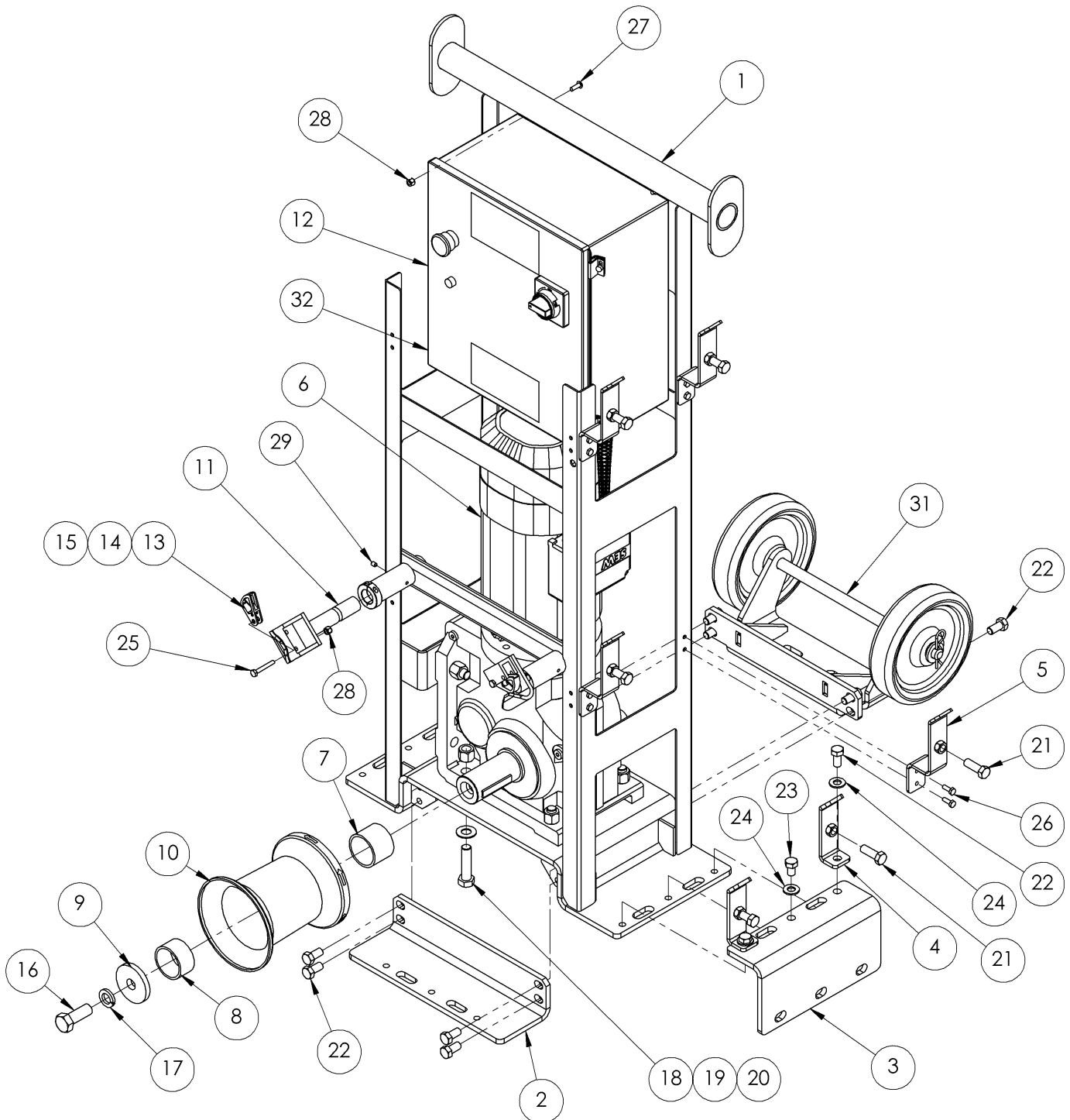
- Inspect drum for wear and cracks.
- Inspect rope locks for proper function, alignment, and tightness of rotation-locking set screw.
- Inspect motor operation.
- Check the oil level in the gearmotor.
- Notice any unusual sounds from the gearbox.
- Make sure the drum cannot rotate unless powered and foot switch depressed.
- Inspect power cables for wear or cuts.
- Inspect proper installation of handrails in the hoistway opening.

MAINTENANCE

- General - periodically clean the High Speed Capstan to remove debris.
- Gearmotor:
 - Oil type: Shell Omala S2G2200 (or equivalent).
 - Oil volume: 5.5 liters.
 - Ball and roller bearing grease: Shell Alvania Grease R3 (or equivalent).
 - Frequency:
 - Replace oil every (2) years or 10,000 hours of operation. If synthetic oil is used, the period can be increased to (4) years or 20,000 hours of operation.
 - Repack ball and roller bearing grease every (2) years or 10,000 hours of operation.

For more information on the Gearmotor maintenance, please refer to: SEW Operating Instructions document No: 01 805 52 US.

BILL OF MATERIALS - EXPLODED VIEW



BILL OF MATERIALS - SPARE / WEAR BOM

ITEM	QTY	PartNo	Description	Size	Length
1	1	11-281-01	FRAME	-	-
2	1	11-281-09	REMOVABLE BRACKET	-	-
3	1	11-281-10	SHEAR PLATE	-	-
4	2	11-281-13	TOE GUARD BRACKET	-	-
5	4	11-281-15	HANDRAIL BRACKET ARM	-	-
6	1	10052337	K 77DRN100L4BE5HR-MB4-270-3	-	-
7	1	70-10001579	PIPE	2" SCH. 40	1.75
8	1	70-10001580	PIPE	2" SCH. 40	1.25"
9	1	70-10001581	WASHER - THICK		
10	1	70-10001582	CAPSTAN DRUM- MODIFIED		
11	2	70-10001831	ROPE LOCK - HD	-	-
12	1	70-10003625	VARIABLE SPEED CAPSTAN CONTROLLER	-	-
13	2	70-10016780	ROPE LOCK RELEASE STRING	-	4'
14	2	P308-0853P	CAM & TRIGGER	-	-
15	2	P308-0854P	SPRING		
16	1	13361	HEX HEAD CAP SCREW	3/4-10	2 in
17	1	33632	SPRING LOCKWASHER	3/4"	
18	6	13313	HEX HEAD CAP SCREW	5/8-11	2 1/2 in
19	6	37578	NYLON INSERT LOCK NUT	5/8-11	
20	6	33090	FLATWASHER	5/8"	
21	6	13209	HEX HEAD CAP SCREW	1/2-13	1 1/2 in
22	10	13205	HEX HEAD CAP SCREW	1/2-13	1 in
23	1	13203	HEX HEAD CAP SCREW	1/2-13	3/4 in
24	3	33086	FLATWASHER	1/2"	-
25	2	13010	HEX HEAD CAP SCREW	1/4-20	1 3/4 in
26	8	13003	HEX HEAD CAP SCREW	1/4-20	3/4 in
27	4	94051	BUTTON HEAD SCREW	1/4-20	3/4 in
28	11	70860	NYLON INSERT LOCK NUT	1/4-20	
29	4	85398	SOCKET HEAD SET SCREW, CUP POINT- NYLON PATCH	1/4-28	3/8 in
30	1	INSTRUCTIONS_11-281	HIGH SPEED CAPSTAN MANUAL	-	-
31	1	11-282	HIGH SPEED CAPSTAN WHEEL KIT	-	-
32	1	11-281-PEDAL	HIGH SPEED CAPSTAN FOOT PEDAL	-	-