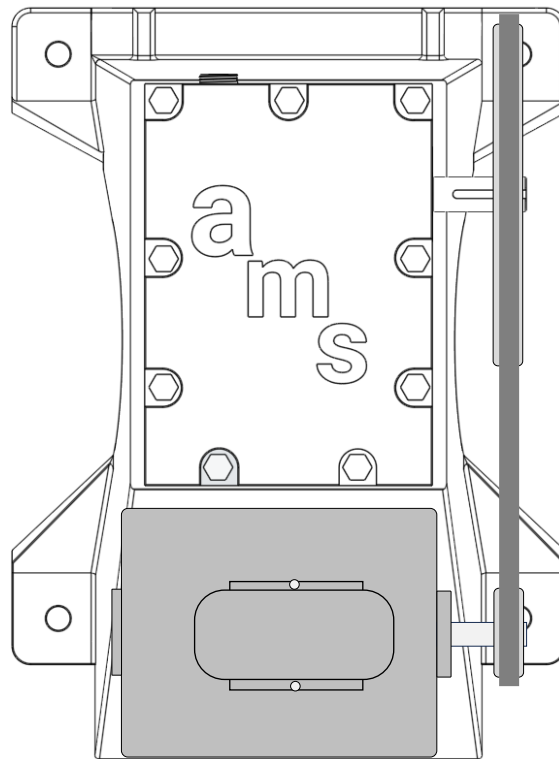


# AMS Enclosed Belt Drive (EBD<sup>®</sup>)

MODELS 3000 / 4000








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## **⚠ WARNING**

**Read this material before using this product. Failure to do so can result in serious injury. SAVE THIS MANUAL**

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WARNING SYMBOLS AND DEFINITIONS	
	This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid injury or death
	Indicates a hazardous situation which, if not avoided, will result in death or serious injury
	Indicates a hazardous situation which, if not avoided, Could result in death or serious injury
	Indicates a hazardous situation which, if not avoided, Could result in minor or moderate injury
	Addresses practices not related to personal injury

## IMPORTANT SAFETY INFORMATION

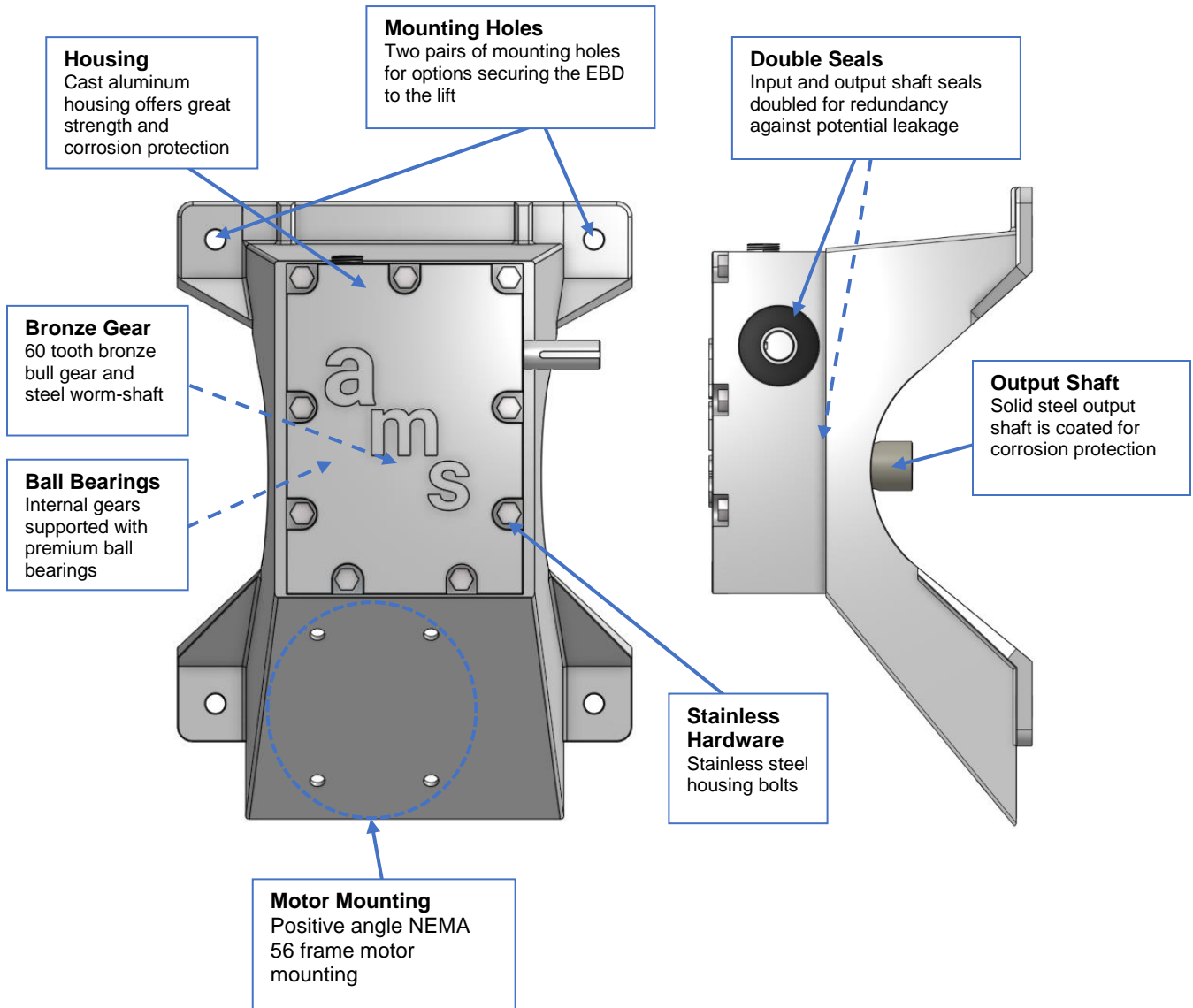
### **DANGER**

**TO PREVENT SERIOUS INJURY AND DEATH:**

### Basic Safety Information

- Do not lift people or lift loads near people.**  
Falling loads can injure or kill people.  
Do not use as elevator for human use.
- Do not operate the hoist when load is not centered in lift**
- Do not operate hoist with kinked or damaged lift cables**  
Inspect lift cables before every use
- Do not operate hoist if damaged or malfunctioned in any way**
- If servicing or replacing parts, ensure the load is removed and cables are slack**
- Lift should be installed in a location that allows the operator to move and stay clear of the load
- Keep clear of moving parts during operation
- Electrical equipment should only be installed and maintained by a qualified electrician

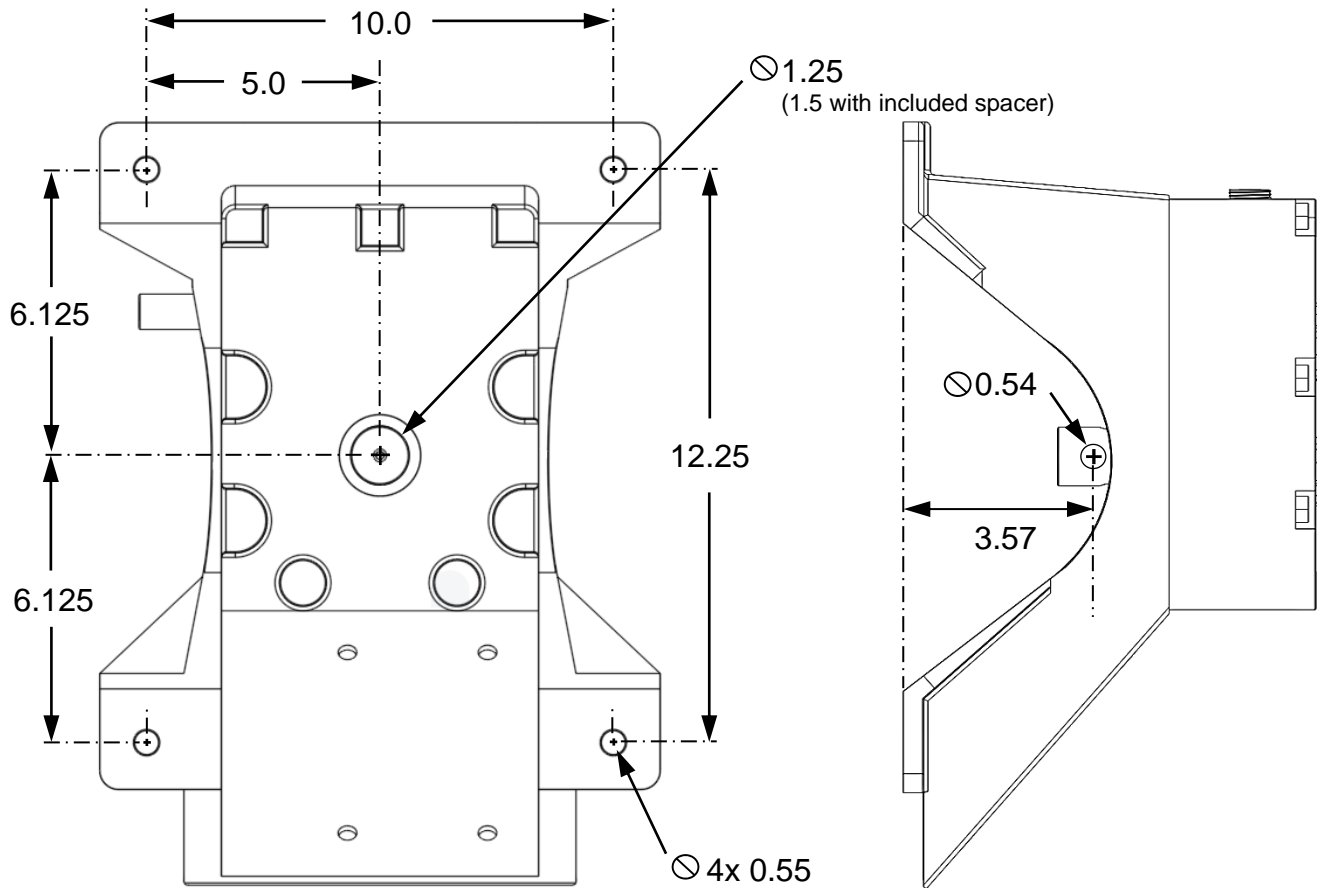
**Overview & Features**



**General Description**

The AMS Enclosed Belt Drive (EBD®) is an electric-powered, enclosed-gear mechanical hoist intended for use primarily in boat lifts, but also cargo lifts and other specialized applications. The gearing is intentionally designed to be inefficient to hold the rated load without the need for other equipment such as a brake motor. The first reduction stage is achieved with a pulley and belt similar to the Flat Plate. However, unlike the Flat Plate hoist, the gearing of the EBD® is enclosed in an oil-bath which eliminates the need for periodic greasing.

**Mounting Dimensions**



**Technical Information**

**MODELS**

The AMS Enclosed Belt Drive® is available in 2 main models, the EBD-3000 and the EBD-4000. Both models have identical mounting dimensions and gear ratios. The difference comes from the electric motor size only.

Considering Aqua Marine Supply/Hefty Hoist does not create the entire lift, these model numbers DO NOT refer to the weight capacity of the hoist, but rather the maximum amount of torque (in inch-pounds) that they can handle. The diameter of the winding drum/pipe and the rigging of the lift cables (not supplied by AMS) will greatly affect the speed and weight capacity of a hoist. The lift manufacturer who utilizes our hoist and sells the lift as a package is the only party that can determine the final weight capacity.

**Standard EBD® Configurations**

Model	Gear Ratio	Motor HP	Drive Pulley	Belt
3000	60:1	3/4	10"	AX41
4000	60:1	1	10"	AX41

**SPEED & TORQUE**

Speed and torque are an inverse relationship, and anything done to speed the EBD® up will decrease its output torque. The EBD® uses a belt and two different sized pulleys as the first reduction stage. In most cases, the pulley on the electric motor is 2 inches in diameter. The pulley on the input shaft of the EBD® is normally 10 inches but can be sized down to speed the hoist up. However, downsizing the drive pulley will reduce the output torque by the same margin. The pulley should never be downsized by an end user unless authorized by the lift manufacturer.

**Installation Information**

**NOTICE**

**CAUTION**

**Alignment:** It is important that the EBD® be mounted so that the winding pipe is concentric and in line with the EBD® output shaft. Misalignment at this point can cause binding, wear, and noise and will void the warranty.

**Bearing Placement:** It is important that the drive shaft or winding pipe being used on the lift be supported properly with bearings. AMS drives are made to turn the pipe and are not to be load-bearing. Therefore, it is important that a support bearing be installed as close as possible to the EBD®.

**Orientation:** The EBD® should be mounted vertically with the motor at the lowest point but can be mounted horizontally if necessary for clearance.

**Mounting Holes:** The EBD® should be fastened to the lift piling, beam, or structural joist to prevent the hoist from rotating under operation. It is recommended that only one pair of mounting holes is utilized. This will allow the hoist to flex slightly under load to prevent binding. Using multiple pairs of mounting holes may create too rigid of a mount could break off the mounting feet under shock load.

**Drive Bolt & Nut:** The provided drive bolt is a grade 5, zinc-plated, casehardened 1/2 inch bolt with yield and breaking strength far superior to the maximum load rating of the hoist. DO NOT replace this bolt with a stainless steel bolt for any reason. The provided nut is a reversible lock nut which can be installed in either direction and will lock in position similar to a nylon lock nut. This nut should NOT be tightened all the way against the drive pipe. The nut is only good for one use and should be replaced if needed to be removed for any reason.

**Winding/Drive Pipe:** The EBD® output shaft is made to attach to a 1-1/4 inch pipe (1.66 inch outside diameter). However, with the provided spacer, the EBD® is designed to attach to a 1-1/2 inch (1.9 inch OD) pipe. If a larger pipe than 1-1/2 is being used, then another spacer or adapter must be added (not provided by AMS) to take up the empty space.

**⚠WARNING**

**Failure to fill this empty space with a spacer can cause the provided drive bolt to bend or fail which could lead to catastrophic failure.**

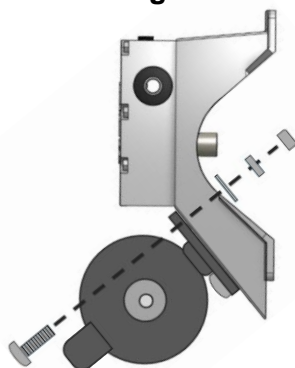
**Mounting the Electric Motor**

**⚠WARNING**

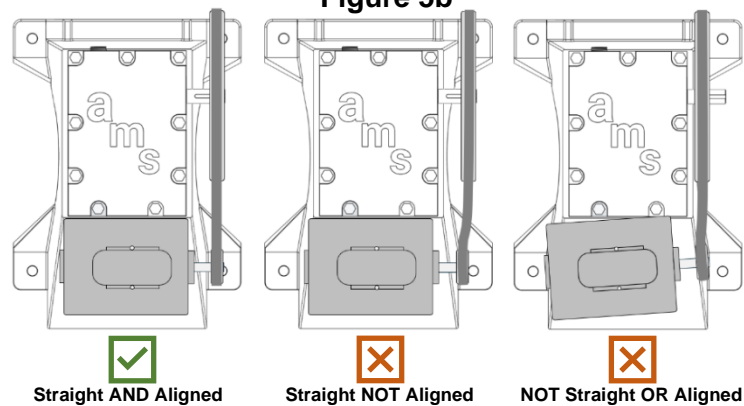
**TO PREVENT SERIOUS INJURY, ENSURE THE ELECTRICAL CIRCUIT IS SWITCHED OFF BEFORE PROCEEDING**

1. Position the mounting foot of the electric motor onto the EBD®.
2. Using the (4) provided 5/16" carriage bolts, washers and nuts, loosely secure as shown in Figure 5a to hold the motor in position.
3. Install the Drive Belt around both pulleys with the cogs facing inward
4. Pull the motor downward to remove the slack from the Drive Belt.
5. Ensuring that the motor is straight across the EBD® and the motor pulley and drive pulley are aligned (see Figure 5b), tighten two of the mounting nuts to keep the motor in place.
6. See **Page 6** for tensioning the Drive Belt further

**Figure 5a**



**Figure 5b**



## Tensioning the Drive Belt

### ⚠ WARNING

TO PREVENT SERIOUS INJURY, ENSURE THE ELECTRICAL CIRCUIT IS SWITCHED OFF BEFORE PROCEEDING

1. Attach motor and Drive Belt according to steps on **Page 5**.
2. Make a mark on the EBD® housing with a fine marker around one corner of the motor mounting foot to reference the current location.
3. Loosen the mounting hardware slightly until the Motor can be moved.
4. Remove the Drive Belt temporarily.
5. Reposition the Motor to the mark made in Step 2 and then move the Motor straight down approximately 1/4 inch and retighten at least two of the nuts. Be sure to maintain the alignment of the pulleys and that the Motor is still straight across the EBD®.
6. Install the Drive Belt fully around the Motor Pulley and install as much of the Drive Belt into the larger Drive Pulley as possible.
7. Rotate the Drive Pulley by hand until the Drive Belt fully positions into the groove.

**Note: If it requires too much effort to execute step 7, Go back to Step 5 and position the motor closer to the original mark.**

## Electric Motor Connections

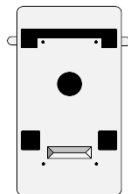
The provided electric motor from Aqua Marine Supply/Hefty Hoist, Inc is a 115/230V, single phase, reversible motor that should only be installed by a qualified electrician. The electrical circuit should be GFCI protected and should contain the proper size wiring to ensure full voltage to the motor on the hoist. Failure to supply the correct and full electrical voltage to the motor or failing to make the proper connections will permanently damage the motor and is not covered by warranty.

For electric motors that were not wired to controls from factory, wiring schematics can be found at [www.HeftyHoist.com/wiring-diagrams](http://www.HeftyHoist.com/wiring-diagrams). Please do not contact us with questions about compatibility with non-AMS equipment as we will not be able to assist.

## EBD Clamshell Cover Installation



**EBD Clamshell Cover - Front**



**EBD Clamshell Cover - Rear**

### EBD Hardware Package

#### Cover Hardware

- (4) 1/4-20 x 1/2" Hex Head Bolt SS
- (2) 5/16-18 x 1-1/4" Hex Head Bolt SS
- (2) 5/16-18 Hex Nyloc Nut SS

#### Drive Bolt

- (1) 1/2-13 x 3-1/2" Zinc G5 Bolt
- (1) 1/2-13 Zinc Reverse Lock Nut

#### Motor Mounting Hardware

- (2) 5/16-18 x 1" Carriage Bolt SS
- (2) 5/16-18 x 1-1/2" Carriage Bolt SS
- (4) 5/16-18 Split Lock Washer SS
- (4) 5/16-18 Flat Washer SS
- (4) 5/16-18 Hex Nut SS

1. Prior to mounting the EBD® gearbox to the lift, slide the rear portion of the cover over the drive pipe. The pipe should come through the round hole in the middle of the rear cover.

2. Once the EBD® is connected to the drive pipe and the motor mounted, the rear portion of the cover can be attached to the EBD® housing using (4) 1/4 – 20 x 1/2" stainless hex-head bolts from the provided EBD® hardware package. Once the rear cover is fastened, the mounting feet of the EBD® can be fastened to the mounting bracket of the lift (AMS does not provide such a bracket or hardware as it is specific to the lift manufacturer).

3. Attach the front portion of the cover at the bottom using (2) 5/16 – 18 x 1-1/4" stainless hex-head bolts and nyloc nuts to create the bottom hinge.

4. Raise the front portion of the cover until it contacts the rear portion

5. While maintaining pressure towards the back portion, grab the sides of the top part of the front cover with both hands and pull outwards gently to get the two pieces to snap together

## Before Operating Hoist

1. Familiarize yourself with all operating controls of the hoist and with the operation(s) of the manufacturer's lift. Also familiarize yourself with the instructions, including the warning(s) on the hoist and lift and with the safety information within this manual. Read all information provided by the lift manufacturer regarding your specific lift.
2. **TO PREVENT SERIOUS INJURY FROM LIFT FAILURE:**  
**Do not use damaged equipment. If repairs are necessary or any defect known, have the issues corrected before use.**
3. Inspect the EBD® and other lift components thoroughly before use.

## Operating the EBD®

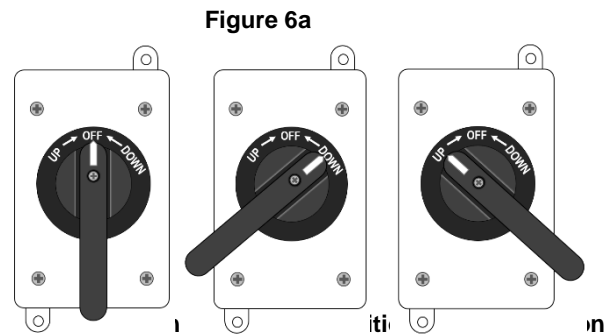
### For AMS Reversing Switch installations:

Rotate the switch handle to the desired lifting direction (UP or DOWN). See Figure 6a

*NOTE:* A **Momentary** style switch will require the user to hold the handle in the desired operating position and if released, the handle should return to the OFF position automatically. A **Maintaining** style switch will allow the switch handle to maintain the position selected throughout operation and the handle needs to be rotated back by the user to the OFF position when finished.

### For Remote Control installations:

Follow directions provided by the Remote Control manufacturer for proper operation.



## Lubrication Information

The EBD® is sold factory filled with a special gearbox lubricant. In a normal, non-commercial/industrial application, the lubricant should not need to be replaced for the lifetime of the gearbox. However, the oil level and consistency should be checked on a periodic basis to ensure proper operation and maintain the associated warranty.

### Lubricant Type

The AMS EBD® hoist is factory-filled with Mobilux EP 023 semi-fluid grease. This lubricant spec is specially designed for enclosed gears and bearings. Do not refill with any other type of lubrication.

### Lubricant Level & Adding Oil

The EBD® is factory-filled with 28 FL OZ of lubricant which fills the cavity approximately 3/4 full. To inspect the level or to add lubricant, remove the pipe plug from the top side of the housing with a 3/8 hex key. Use a zip-tie or other item to gauge the oil level.

## Specifications

Model	3000	4000
Torque Rating	3,000 in-lb	4,000 in-lb
Motor HP	3/4	1
Motor Amps (115/230)	12.2 / 6.1	12.2 / 6.1
Standard Hoist Ratio	300:1	
Standard Output RPM	5.75	
Standard Belt Size	AX41	
Rated Motor RPM	1725	
Lubricant Type	Mobilux EP 023	
Straight-pull maximum load (1.5 inch OD pipe) see Page 8	3,000 lb	4,000 lb

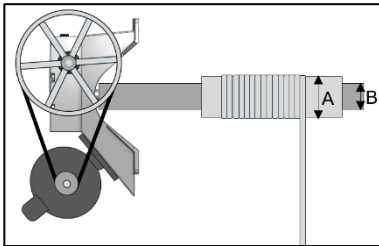
## Max Load & Lift Speed Chart

The following chart can be used to determine the maximum load a particular hoist can lift based on the winding pipe and cable configuration. The chart only accommodates for lifts with one hoist; if multiple hoists are used on the same lift, then multiply the Max Load value in the chart by the number of EBD® units on the lift.

\*\*"Winding Pipe" refers to the surface where the cable actually winds up. If a sleeve, winder, or spool is used over the nominal drive pipe, use the OD of that item and see corresponding line in chart (**Figure 8a** below). The chart assumes neatly wrapped lift cable and does not accommodate for overlap which will affect speed and max load.

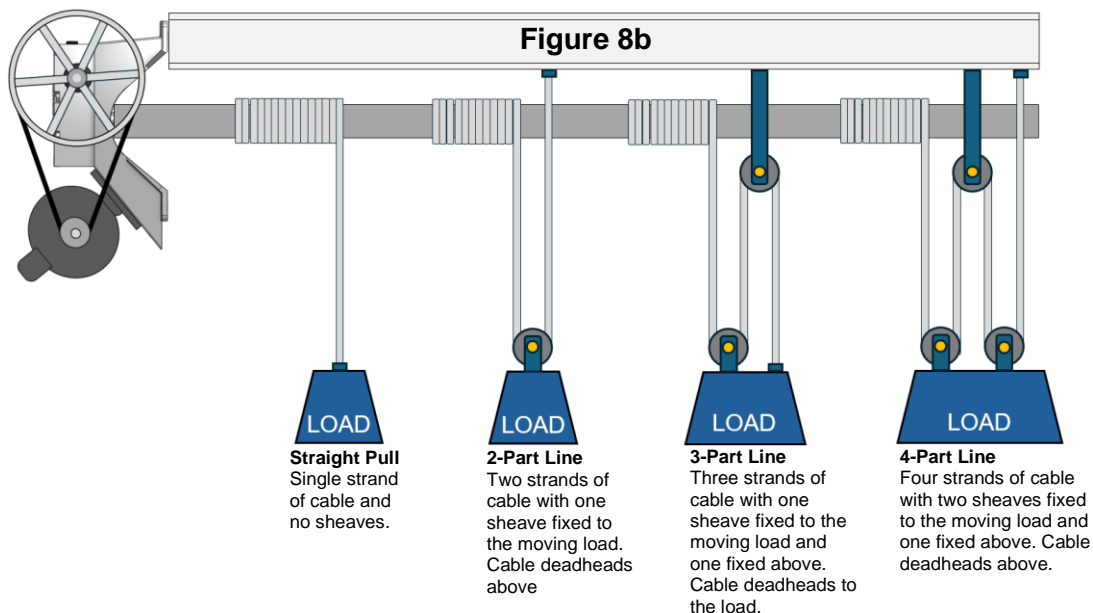
\*\*See **figure 8b** for Cable Compounding information

**Figure 8a**



In the above example, dimension "A" would be the value used in the load chart, NOT "B"

Winding Pipe	Lift Cable Compounding	3000 EBD (10" Pulley)		4000 EBD (10" Pulley)	
		Max Load per Hoist (Lb)	Vertical Speed (in/min)	Max Load per Hoist (Lb)	Vertical Speed (in/min)
1.5" Pipe (1.9" OD)	Straight Pull	3000	21.5	4000	21.5
	2 Part Line	5684	10.7	7579	10.7
	3 Part Line	8053	7.2	10737	7.2
	4 Part Line	10105	5.4	13474	5.4
2" Pipe (2.38" OD)	Straight Pull	2526	26.8	3368	26.8
	2 Part Line	4547	13.4	6063	13.4
	3 Part Line	6442	8.9	8589	8.9
	4 Part Line	8084	6.7	10779	6.7
2.5" Pipe (2.88" OD)	Straight Pull	2087	32.5	2783	32.5
	2 Part Line	3757	16.2	5009	16.2
	3 Part Line	5322	10.8	7096	10.8
	4 Part Line	6678	8.1	8904	8.1
3" Pipe (3.5" OD)	Straight Pull	1714	39.5	2286	39.5
	2 Part Line	3086	19.8	4114	19.8
	3 Part Line	4371	13.2	5829	13.2
	4 Part Line	5486	9.9	7314	9.9
3.5" Pipe (4" OD)	Straight Pull	1500	45.2	2000	45.2
	2 Part Line	2700	22.6	3600	22.6
	3 Part Line	3825	15.1	5100	15.1
	4 Part Line	4800	11.3	6400	11.3
4" Pipe (4.5" OD)	Straight Pull	1333	50.8	1778	50.8
	2 Part Line	2400	25.4	3200	25.4
	3 Part Line	3400	16.9	4533	16.9
	4 Part Line	4267	12.7	5689	12.7
5" Pipe (5.56" OD)	Straight Pull	1079	62.8	1438	62.8
	2 Part Line	1941	31.4	2589	31.4
	3 Part Line	2750	20.9	3667	20.9
	4 Part Line	3451	15.7	4602	15.7
6" Pipe (6.63" OD)	Straight Pull	906	74.8	1208	74.8
	2 Part Line	1630	37.4	2174	37.4
	3 Part Line	2309	24.9	3079	24.9
	4 Part Line	2898	18.7	3864	18.7





## **PLEASE READ THE FOLLOWING CAREFULLY**

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THE INFORMATION IN THIS MANUAL ARE A REFERENCE TOOL ONLY. WE DO NOT MAKE ANY REPRESENTATION OR WARRANTY OF ANY KIND TO THE BUYER THAT THEY ARE QUALIFIED TO MAKE ANY REPAIRS OR REPLACE ANY PARTS OF THE PRODUCT. IN FACT, AQUA MARINE SUPPLY/HEFTY HOIST, INC EXPRESSLY STATES THAT ALL REPAIRS SHOULD BE UNDERTAKEN BY CERTIFIED AND LICENSED TECHNICIANS, AND NOT BY THE BUYER. THE BUYER ASSUMES ALL RISK AND LIABILITY ARISING OUT OF HIS OR HER REPAIRS TO THE ORIGINAL PRODUCT OR REPLACEMENT PARTS THERETO, OR ARISING OUT OF HIS OR HER INSTALLATION OF REPLACEMENT PARTS THERETO.

### Warranty

The following warranty applies to the components of the models of hoists manufactured by Hefty Hoist, Inc dba Aqua Marine Supply©. This warranty applies to manufacturing defects and/or failures due to design or fabrication. Replacement parts or a new product will be supplied at no charge at the option of Aqua Marine Supply. This does NOT include labor or freight.

- Electrical Components including electric motor, wire, switch, GFCI power cords, etc (1 Year)
- Enclosed Belt Drive Gearbox (2 Years)

This warranty is void if product is improperly installed, maintained or greased. Any changes or alterations to the original design will also void the warranty. The warranty does not cover acts of nature or criminal activity. The warranty is predicated on proof of annual inspection by a qualified technician and a record of inspection must be presented for any warranty claim. The warranty applies only to the original owner and is void if transfer of ownership.

To take advantage of this warranty, the product must be returned to us for evaluation with transportation charges prepaid (unless otherwise directed). Proof of purchase date and an explanation of the complaint must accompany the product otherwise no warranty will be given and the product will only be returned at the cost of the sender.



## Troubleshooting

Problem	Possible Causes	Probable Solutions
Drive belt slipping	<ol style="list-style-type: none"> <li>1. Belt needs tensioned more</li> <li>2. Grease or debris on belt or in pulley groove</li> <li>3. Mechanical binding in lift adding additional stress</li> <li>4. Hoist is overloaded</li> </ol>	<ol style="list-style-type: none"> <li>1. Follow steps on Page 6 to further tension the belt. Also ensure belt size is correct</li> <li>2. Clean belt and pulley grooves or replace if necessary</li> <li>3. Check lift components according to lift manufacturers instructions for binding including lubricating sheaves and guides.</li> <li>4. Make sure your boat or load is within the rated capacity of the lift/hoist</li> </ol>
Drive belt flipping	<ol style="list-style-type: none"> <li>1. Pulleys misaligned</li> <li>2. Defective/damaged drive belt</li> </ol>	<ol style="list-style-type: none"> <li>1. Check pulley alignment and ensure the electric motor is mounted straight across the backing plate</li> <li>2. Replace belt</li> </ol>
Electric motor getting hot  <i>Note: Limit use as much as possible when this occurs. Permanent, irreversible damage could be done to the electric motor</i>	<ol style="list-style-type: none"> <li>1. Low voltage due to insufficient wire size (most common)</li> <li>2. Improper wiring connections</li> <li>3. Mechanical binding in lift adding additional stress</li> </ol>	<ol style="list-style-type: none"> <li>1. Have the voltage checked under load at the motor by a qualified electrical professional. If voltage drop present, check wire size from main panel and ensure sufficient size for the length of the run based on the amp draw of the motor(s) on the EBD hoist(s). <i>Note: If possible, switch a 115V installation to 230V</i></li> <li>2. Ensure the electrical connections are correctly made at the electric motor as well as the control. See HeftyHoist.com for wiring schematics</li> <li>3. Check lift components according to lift manufacturers instructions for binding including lubricating sheaves and guides.</li> </ol>
Electric motor humming in one or both directions	For new installations: <ol style="list-style-type: none"> <li>1. Improper connections</li> <li>2. Defective motor or control</li> </ol> For existing installations: <ol style="list-style-type: none"> <li>1. Corrosion</li> <li>2. Damaged wiring</li> </ol>	For new installations: <ol style="list-style-type: none"> <li>1. Ensure the electrical connections are correctly made at the electric motor as well as the control (switch or remote control panel). See HeftyHoist.com for wiring schematics</li> <li>2. Have electrician try to isolate issue is either at the electric motor or control and replace as necessary.</li> </ol> For existing installations: <ol style="list-style-type: none"> <li>1. Have electrician check connections at motor and control for corrosion not allowing full power through. Issue may be internal and faulty item may need replaced.</li> <li>2. Inspect wiring circuit from control to electric motor for possible damage and repair/replace as necessary.</li> </ol>
Electric motor does nothing	<ol style="list-style-type: none"> <li>1. GFCI has tripped</li> <li>2. Circuit breaker has tripped</li> <li>3. Open circuit</li> </ol>	<ol style="list-style-type: none"> <li>1. Check all GFCI including the one provided by AMS on the power cord if applicable and reset.</li> <li>2. Check the circuit breaker belonging to the lift and reset if turned off. If breaker continues to trip:               <ol style="list-style-type: none"> <li>a. Check if breaker defective</li> <li>b. If breaker working properly, there is a dead short somewhere in the circuit from the breaker to the electric motor. DO NOT use hoist and consult an electrician right away</li> </ol> </li> <li>3. Electrical circuit is open at some point from the breaker to the electric motor. Consult an electrician to isolate the issue</li> </ol>
Electric motor is full of water inside	<ol style="list-style-type: none"> <li>1. Motor submerged during flooding/storm surge</li> <li>2. Motor was not mounted in correct orientation</li> <li>3. Weep hole plugs were not removed</li> </ol>	<ol style="list-style-type: none"> <li>1-3 Replace the motor and ensure it is mounted in correct orientation and that the weep hole drain plugs are removed at the lowest point in the new installation.</li> </ol>

Problem	Possible Causes	Probable Solutions
Lift stops as soon as boat comes fully out of water	<ol style="list-style-type: none"> <li>1. Low voltage due to insufficient wire size</li> <li>2. Mechanical binding in lift adding additional stress</li> </ol>	<ol style="list-style-type: none"> <li>1. Have the voltage checked under load at the motor by a qualified electrical professional. If voltage drop present, check wire size from main panel and ensure sufficient size for the length of the run based on the amp draw of the motor(s) on the EBD hoist. <i>Note: If possible, switch a 115V installation to 230V</i></li> <li>2. Check lift components according to lift manufacturers instructions for binding including lubricating sheaves and guides.</li> </ol>
Drive bolt bending or breaking	<ol style="list-style-type: none"> <li>1. Shock load from cable hanging up and going slack and then the lift falling some amount</li> <li>2. Empty space between the hoist and the drive pipe not filled with a spacer or adapter</li> <li>3. Bolt was replaced with a stainless steel bolt</li> </ol>	<ol style="list-style-type: none"> <li>1. Inspect hoist and rest of lift for damages. Highly recommend contacting lift manufacturer or service technician to inspect culprit and/or resulting damages. Replace with new G5 or G8 bolt/nut</li> <li>2. A spacer or adapter must be fabricated/sourced to fill any empty space between the drive pipe and the opening in the main gear assembly</li> <li>3. Replace with correct G5 or G8 bolt immediately</li> </ol>



**ALL TROUBLESHOOTING, MAINTENANCE, AND REPAIR SHOULD BE COMPLETED ONLY BY A LICENSED PROFESSIONAL AND/OR ELECTRICIAN. FOLLOW ALL WARNING LABELS ON THE HOIST OR SERIOUS INJURY COULD OCCUR**