



OWNER'S MANUAL

# ***STW***SERIES

## **Top Running Wire Rope Hoist**



Warning: Upper Limits and Secondary Upper Limit Safety Switch must be adjusted before use!

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## **1.0 Important Information**

Please read, understand, and follow all aspects of this manual before the assembly and installation of this hoist system. Please observe and follow all safety and warning information during the operation of this system. Failure to do so may result in serious property damage, personal injury and/or loss of life.

### **1.1 Safety Precautions**

Because of the heavy loads being transported by this system, the operator and those around the serviceable area must be attentive to and aware of all potential risks involved with the operation of this system. The operator must pay careful attention to and abide by the safety rules and warnings listed below and found throughout this manual. All Safety Rules and Warnings must be followed.

### **1.2 Warnings**

1.2.1 Before operation, the operator must have a clear and unobstructed view of the entire service area of this system.

1.2.2 For your safety DO NOT attach the electrical supply wires to this unit before the completion of installation!

1.2.3 Before operation, inspect the hoist system to be sure it is in proper working condition. Check for any possible obstacles and/or personnel in the service area of the hoist system.

1.2.4 While operating the hoist system, the operator must take caution to prevent a situation where the changing of direction of travel and the resulting abrupt force may cause the load to swing. This may cause an overload of the trolley and/or hoist and loss of the load.

1.2.5 DO NOT modify this unit in ANY way or operate the unit in an OVERLOADED OR DAMAGED CONDITION. Any attempt to do so will put you, others, and property at serious risk.

1.2.6 Repairs to this unit must be performed by a qualified repair facility. Contact Starke America to locate the nearest repair facility. See warranty information at the end of this manual.

## **2.0 General Description**

### **2.1 User Manual**

All relevant personnel should carefully read this document to fully understand the installation, commissioning, and operation of this hoist system. It is advisable to have a copy of this document available to the operator for quick reference during day to day use of this system. This hoist system is a tool for lifting and transporting loads within the workspace which can

present many dangers to personnel and property within that space. Please be sure to follow all safety practices and procedures to maintain a safe working environment.


## 2.2 Operational Limits

Starke hoists are made for various applications and are under an **M5** working classification. Upon customer request, Starke can design a M4 or M6 classification. This hoist system is used for vertical lifting and horizontal logistical movement of materials. The safe working limits (SWL) shall be listed in the documentation and clearly labeled on the nameplate of this device. This hoist can be installed on a fixed position rail or movable bridge. The structural design of either must fully comply with all necessary codes and requirements and meet or exceed the specifications for this device listed herein. This hoist is designed for indoor operation in a non-corrosive atmosphere with a nominal temperature of 14 - 104F (-10 to 40C). Temperatures above the higher limit may reduce the operational lifespan of this device. This hoist is not intended to be used where temperatures exceed 176 F (80 C). Please consult your dealer prior to using this system outside of standard parameters as it may affect warranty coverage.

Starke wire rope hoists are fit for the lifting and carrying of loads subject to the maximum load capacity, FEM group and load group for which it was designed. Load capacity, FEM group and load group are indicated in the data sheet or test booklet of each hoist.

Abnormal conditions are included but not limited to the following:

- Safe Working Limits (SWL) exceeded.
- Lifting of loads at an angle (side pulling)
- Lifting or transporting personnel
- Erratic operation caused by improper use of controls.
- Operating hoist with worn or damaged wire rope, broken parts, or mechanical/electrical damage
- Deliberate tampering / triggering of safety limits

Load spectrum	Average daily operating time ISO/FEM (hours per day)					
	≤ 0.5	≤ 1	≤ 2	≤ 4	≤ 8	≤ 16
LIGHT			M3 1Bm	M4 1Am	M5 2m	M6 3m
MEDIUM		M3 1Bm	M4 1Am	M5 2m	M6 3m	M7 4m
HEAVY	M3 1Bm	M4 1Am	M5 2m	M6 3m	M7 4m	
 <b>VERY HEAVY</b>	M4 1Am	M5 2m	M6 3m	M7 4m		

## 2.3 Operational Specifications

The design, manufacture and operation of this device is in accordance with current CEN and ISO standards.

## 2.4 Warranty

Starke will assume no liability for any damage(s) to the crane and/or hoist system, property or personnel resulting from improper installation, operation, maintenance by unauthorized personnel for claims by third parties.

**▲ IMPORTANT NOTE: If modifications to any of the components comprising this hoist system are made by any party other than Starke, or their authorized agent, will invalidate the warranty and any liability obligations thereof for this hoist system.**

For safe, reliable operation and maintenance of this wire rope hoist only Starke replacement parts should be utilized. Please contact your dealer or Starke for assistance with obtaining service items for this hoist system.

Safe operation is only possible within the service life stated when the crane and hoist system are installed correctly and operated / maintained properly. Information on wire rope service life is specified in the appropriate sections of this manual. It is strongly recommended this hoist system be maintained and repaired by properly qualified, trained, and authorized personnel. Please contact your dealer or Starke for assistance.

Items to be completed by authorized and certified crane technician before operation of this system:

2.4.1 Complete pre-use inspection before placing system into operation.

2.4.2 Calibration of upper and lower limit controls.

2.4.3 Verification of weight limiter calibration is required during pre-use inspection.

## 2.5 Other Notes

The declaration of conformity is included in the test book as well as the date of manufacture of the hoist system.

This product will only continue to perform properly if it is operated, maintained, and repaired by personnel qualified to perform these tasks. Such personnel must be trained in the installation, operation, maintenance, safety regulations, and accident prevention procedures.



## 3.0 Typical Applications

### 3.1 Applications

Starke electric wire rope hoists may be installed on overhead “I” shaped steel rails (straight or curved). They are widely used in plants, mining, railway, port, warehouse, good yards, and service industries. Electric wire rope hoists improve productivity.

Starke electric wire rope hoists are used for:

- Simple cargo lifting
- Equipment installation
- Finished product handling.
- Loading and unloading parts in plants
- Production lines
- Construction Areas
- Lifting hot loads and liquid loads providing working classification is met.

### 3.2 Operational Conditions

Starke electric wire rope hoists are suitable to work in environments below an elevation of 3280 ft, temperature ranges 14°F - 104°F, and a humidity level less than or equal to 85%. These environments should also be free of fire and explosion risks, corrosion, and dust. Elevation requirements affect the ability of the electric motors to dissipate heat.

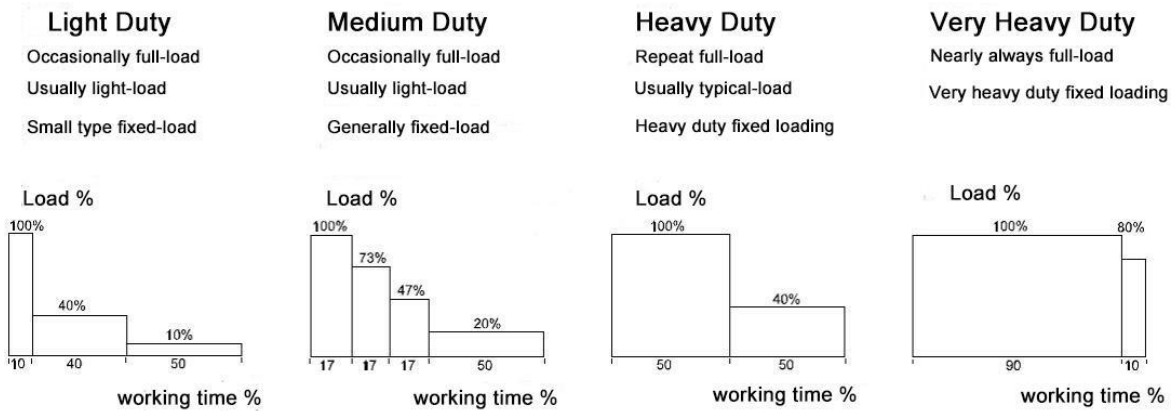
**▲ IMPORTANT NOTE: Lifting toxic, inflammable, or explosive items is prohibited.**

### 3.3 Power Supply

The standard power supply is 460V/3/60 the ampacity requirements will vary by system design. See the electrical information section below or consult your dealer or Starke if any further assistance is needed.

### 3.4 Safe Working Time

The load spectrum is as bellow:



FEM has relevant standards about hoist accidents caused by material fatigue and aging. The following form is referred to during designing of hoists.

Usage Period		Work Duty FEM (ISO)				
		1Bm(M3)	1Am(M4)	2m(M5)	3m(M6)	4m(M7)
Load Spectrum	Light	3200	6300	12500	25000	50000
	Medium	1600	3200	6300	12500	25000
	Heavy	800	1600	3200	6300	12500
	Very Heavy	400	800	1600	3200	6300

### **3.5 Estimation of Safe Working Time**

Experienced service technicians should routinely check and record the service condition of wire rope hoist, then estimate the remaining safe working time according to accepted standard.

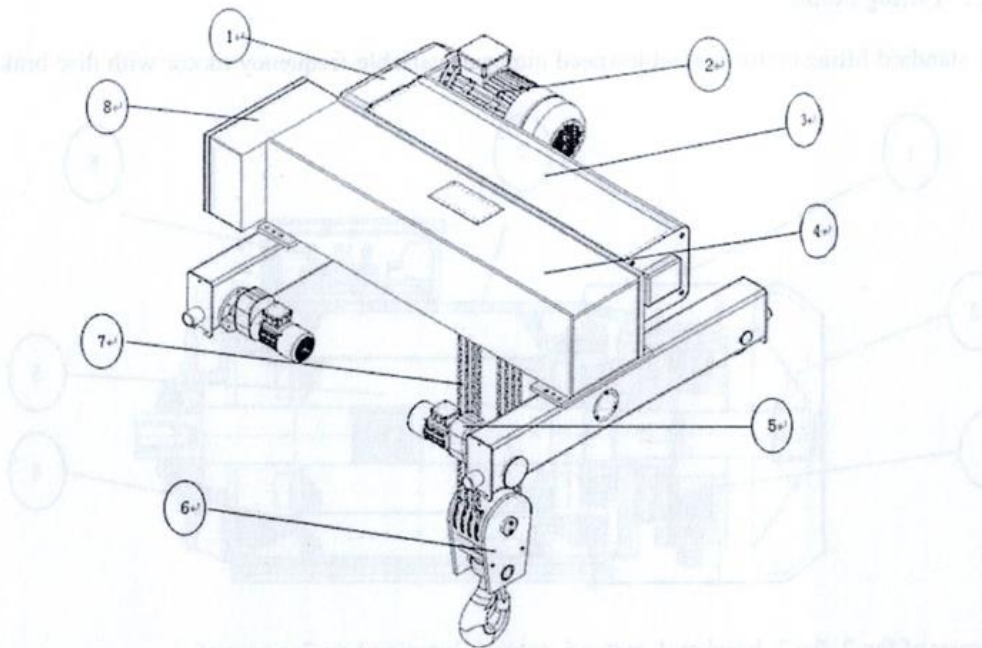
### **3.6 Solution for Limited Safe Working Time**

3.6.1 Suspend use of hoist system

3.6.2 If continued use is required qualified professional personnel should include the following:

- Qualified professional confirms safety of hoist system.
- Provide inspection records and reports of hoist system.
- Owner accepts responsibility for liabilities of operation past recommended safe usage life.

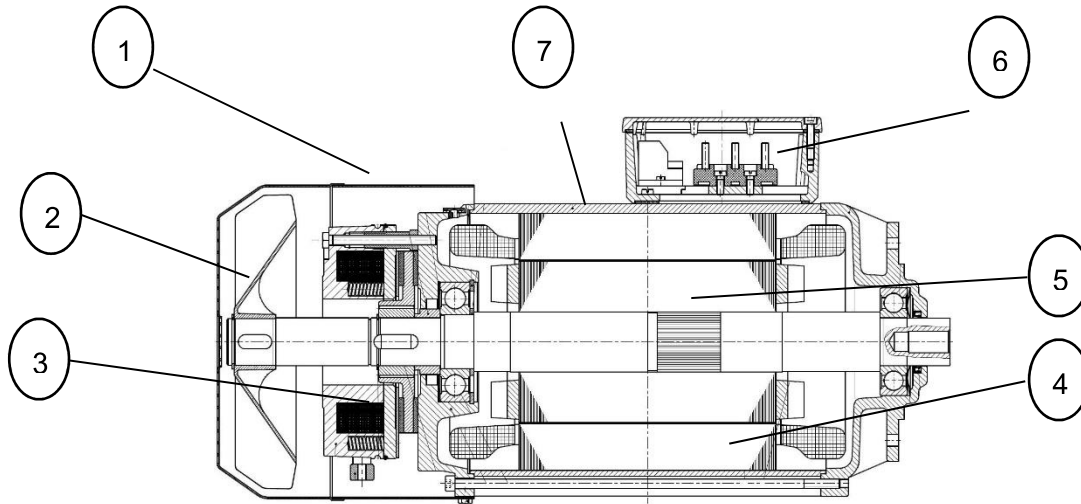
## 4.0 Components of Wire Rope Hoist



Drawing No.	Part Description
1	Hoisting Transmission
2	Lifting Motor
3	Wire Rope Drum
4	Trolley Frame
5	Trolley Traveling Motor
6	Hook & Block
7	Wire Rope
8	Hoist Panel

## 5.0 Lifting Motor

The standard lifting motor is a two-speed motor with electromagnetic disc brake. A variable speed motor is optional and has an electromagnetic brake.

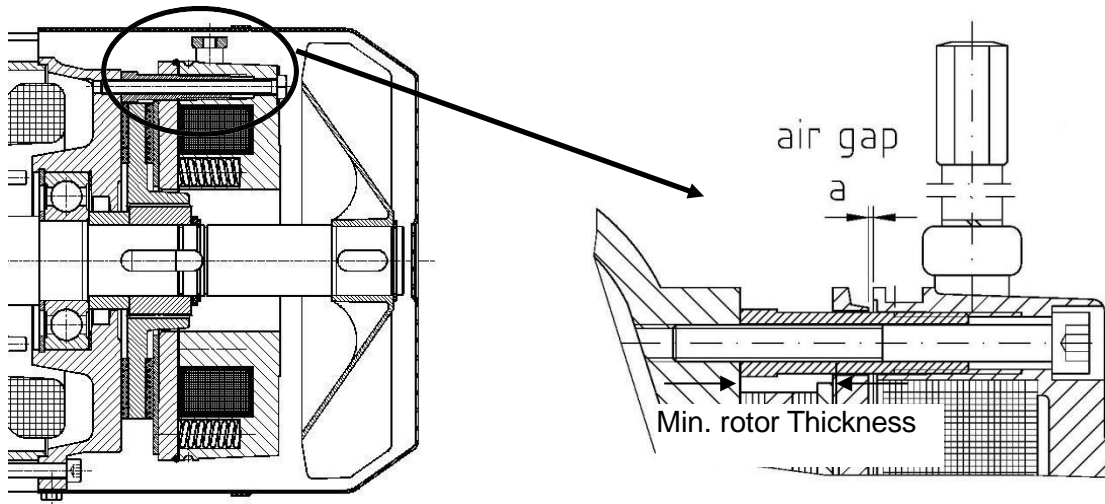


Drawing No.	Part Description
1	Fan Cover
2	Fan
3	Brake Pack
4	Stator
5	Rotor
6	Junction Box
7	Motor Frame

Two-speed (variable-frequency) motor has (three) thermostats or sensors. The windings of the motor are class F rated. When the temperature is above 300 F (150 °C), thermostats or sensors will remove power from the motor until temperature has lowered to safe operational level, the motor will then be allowed to operate. The maximum operational temperature of this hoist system is 105 F (40°C).

The lifting motor has an integrated electromagnetic disc brake (see figure below). When the hoist lifting motor is in the stop or de-energized state the electromagnetic disc brake will be engaged.

Verify that your building circuit breaker, if so equipped, can be set for the inrush amps needed for the lifting motor in second speed. Some circuit breaker types can be set to limit amps and prevent the lifting motor from operating in 2<sup>nd</sup> speed.



The IP grade of standard electromagnetic disc brake is IP54, the highest IP grade can be up to IP56. The electromagnetic brake can be manually released. The brake uses a dust-proof design, which doesn't need maintenance during normal operation. The brake/coil type should be listed on the brake device.

**▲ IMPORTANT NOTE: It is imperative to check brake clearances on a regular basis.**

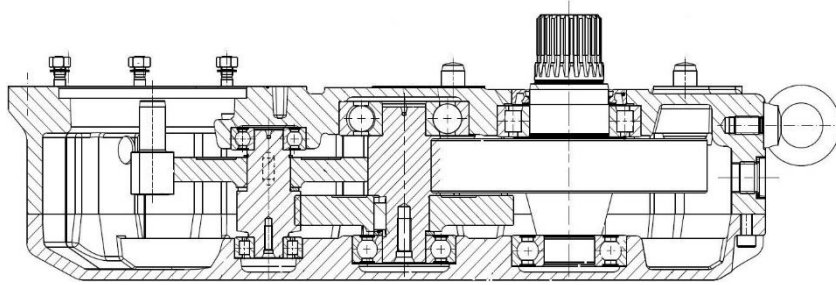
Specific reference values and adjustments are as below. (mm)

Brake Type	08	10	13	15	17	20	23	26	30
Normal Gap	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.5
Maximum Gap	0.6	0.7	0.8	0.8	1.0	1.1	1.1	1.2	1.2
Minimum Thickness of Brake Disc	4.5	5.5	7.5	7.5	11.5	12.5	14.5	16.5	16.5

**▲ IMPORTANT NOTE: Checking and adjustment of brake components are to be done by qualified professional maintenance personnel. During this period, the hoist must be under no load, and the main power must be locked out.**

## 6.0 Hoist Transmission Gearbox and Capacity

The wire rope drum is driven by the lifting motor via the gearbox. The output shaft has been designed with a volute spline to achieve optimal transmission reliability.



For the optimal performance and longevity of the gearbox please strictly follow FEM recommendations, and with the use of high quality lubricants, no other maintenance during the safe working time should be required under normal use conditions. The gearbox was filled with lubricant prior to shipment. Please observe the type and quantity of lubricants listed in the chart below. Please be sure the cover of gearbox is absolutely clean to prevent contamination during the addition of or changing of lubricants.

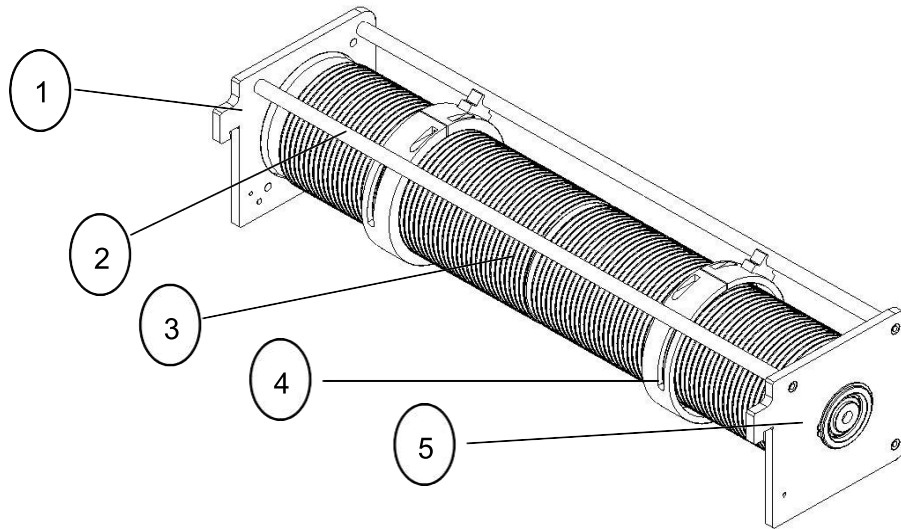
If the hoist is used in a cold environment, the lubrication oil must be changed to synthetic grease.

Time	Type	Model of Gearbox	Viscosity of Lubrication Oil	Volume of Lubrication Oil
Every 6 months or up to 3000 hours	Check lube level & condition	GH3201/STW3201	VG680	1.5 Qt
		GH5000A/STW5001	VG680	4.0 Qt
Every 3 years (operation under FEM)	oil change @ 3yrs	GH12500/SMW10001	VG680	5.2 Qt
		GH20000/	VG680	9.5 Qt
Every 5 years (operation under FEM)	If it is synthetic grease change @ 5yrs	GH25000/	VG220	13.75 Qt
		GH40000/	VG220	15.75 Qt

If the hoist system is utilized in a harsh environment, it is important to perform maintenance inspections more frequently, these environmental conditions may include:

- Extreme moisture
- Dust
- Caustic or corrosive elements
- Wide temperature variations

## 7.0 Drum and Guide Information



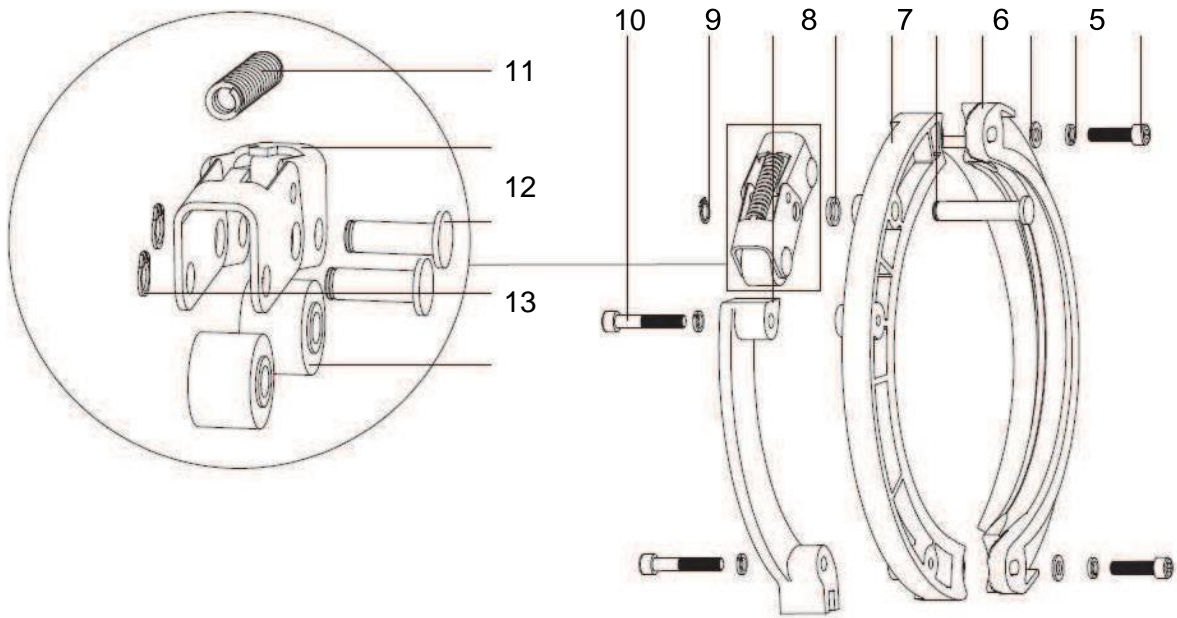
Item	Part Description	page
1	Left End Plate	70
2	Rope Guide Rod	70
3	Drum	70
4	Rope Guide	17
5	Right End Plate	70

The drum is manufactured from seamless tube, and the surface is machined into rope races according to different model requirements, such as right-handed rotation or left-and-right handed rotation. Both ends of the drum are flanged.

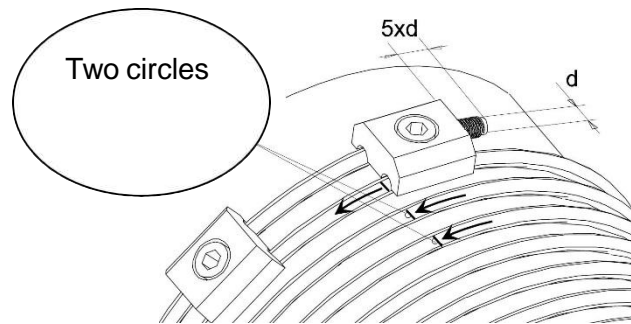
The drum has a rope guide which is constructed with a wearable engineered plastic inside which provides rope guidance into the races of the drum. It is split into two halves, and installed around cylinder with a nut, washer, and spring. Upon installation of the guide(s) assembly care should be taken to not overtighten bolts as the guide will need to float above wire rope slightly. The rope guide will traverse along the guide rod as wire rope is paid out or retracted to maintain proper winding of wire rope on the drum. In addition, the rope guide can also trigger an alternative limit device.

On some models with dual wire ropes, you will have two guides installed correspondingly.



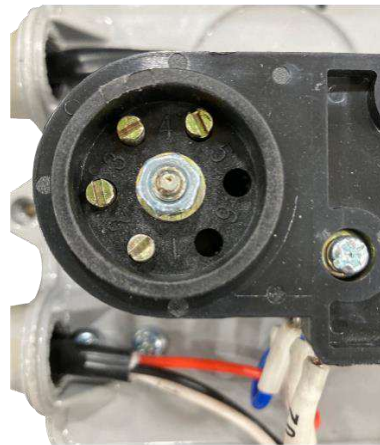
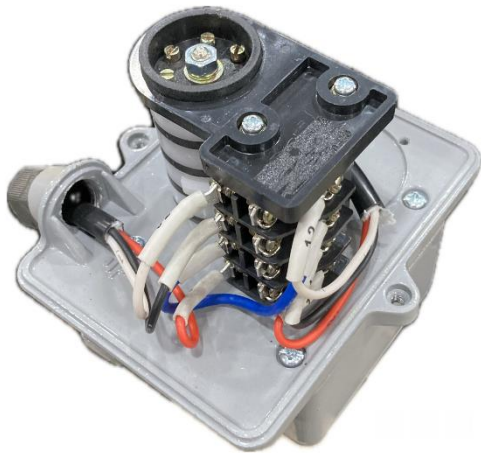


Winding methods include single winding and double winding. In the illustration below note the clamps used to secure wire rope to the drum. If the drum is double wound, you will have the same clamps on the opposite end. Industry standard requires that when the lifting hook is at its lowest design position in relation to the floor that two complete wraps of wire rope encircle the drum in addition to the length under clamps. This would apply to each end if the drum were a double wrap design.



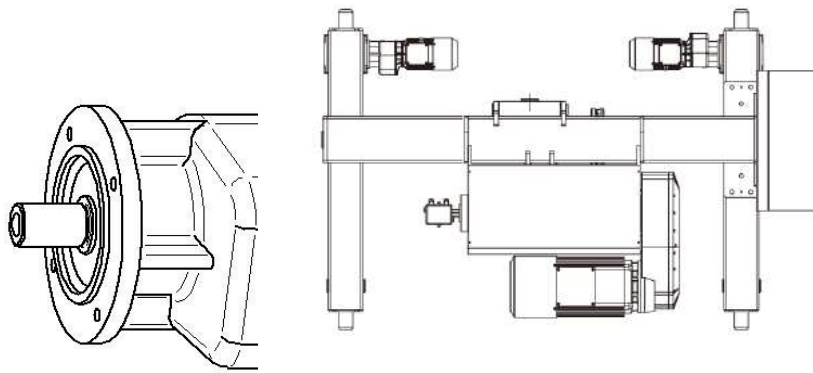
## 8.0 Upper and Lower Limits Warning: Set Limits Before Operation

The Starke wire rope hoist uses a screw type cam limit switch which is installed on side plate of wire rope drum making it convenient for precise adjustment. The switch has two separate contacts to allow the hoist to slow down upon tripping the first limit and safely stop upon tripping the second limit thus providing safe load handling in lifting and lowering motions. (see 16.2.1.4)



## 9.0 Trolley Frame

The trolley frame for a top running hoist is designed with a connecting tube and end trucks. The wire rope pulley and overload limiter are attached to the connecting tube. The size of trolley frame depends on capacity, lifting height, and other elements of system design.



## 10.0 Motorized Trolley

Motorized trolley includes squirrel-cage motor and gearbox. The motor is rated for variable frequency drive operation with IP54 rating and has internal high temperature limit switches. The motor is also provided with an electromagnetic brake pack. The trolley motor is designed and manufactured according to VDE0530, which can endure 1.5 times of rated current for two minutes without damage to motor windings.

The helical gearbox with parallel axle provides improved transmission efficiency and reduces operational noise. Under normal operation the gearbox is virtually maintenance free.

## 11.0 Overload Limits

The overload limiter will stop the hoist from lifting if the load is over the rated capacity. Load protection is provided by an electronic load cell. The load cell installation for the single reeved hoist is shown in the below photo:



**▲ IMPORTANT NOTE:** The overload limiter has been calibrated in the factory with rated load. When performing overload test on site, please disable overload limiter. After completion of testing be sure to enable the limiter. If the set point value of overload limiter is marginally different and needs recalibrated, please contact Starke or professional maintenance personnel to reset overload limiter.

## 12.0 Wire Rope

The wire rope is one of the main stressed parts as well as the most vulnerable part of hoist system. To make sure safe operation is maintained, operators should strictly follow the safety items listed in this manual. Operators should also frequently check and maintain wire rope.

Routine maintenance includes but not limited to:

- Visual inspection.
- Remove excessive dirt & grease.
- Check for lubrication and wear.
- Check for broken wire strands.
- Check for corrosion of wire rope.
- Check connectors and rope guides.
- Clean and lubricate. (see attachment of Lubrication)
- Verify upper limit operation.

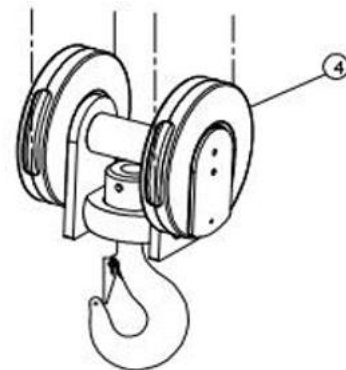
The inspection and scraping standard refer to ISO 4309:1990 which can be referenced online for the most up to date information.

**▲ IMPORTANT NOTE:** It is very important to frequently inspect and maintain wire rope. Please immediately cease operation and remove the load as soon as any abnormal issues of the wire rope are discovered. Contact qualified service/maintenance personnel to inspect and/or replace wire rope if necessary.

### 12.1 Hook Assembly and Cautions

The hook assembly is made up by following components:

- Hook forging
- Safety Latch
- Hook mount beam
- Hook collar
- Hanger plates
- Pulley assembly



Nothing on your hoist assembly is stressed more than the hook. The daily inspection and maintenance of hook includes but not limited to the following:

- Damage to the hook forging and safety latch
- Free rotation of hook

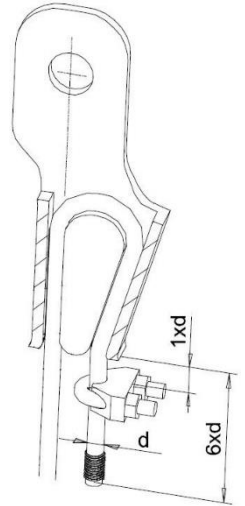
- Wear of pulleys
- If cover of pulley rubs wire rope

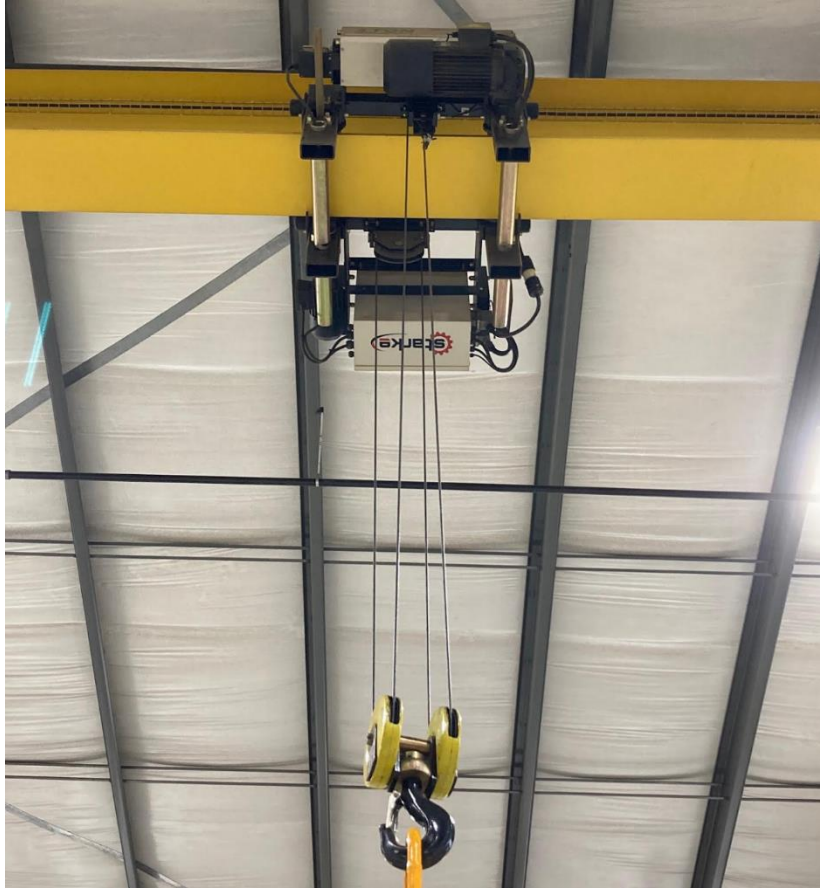
Perform required maintenance according to inspection results, such as changing worn parts or adding lubrication oil.

## 12.1 Routing of Wire Rope

Routing of the wire rope is shown in the picture below. Top running and monorail hoists are the same routing.

- From the upper drum to hook block pulley as shown
- Go up to idler pulley
- Out idler pulley down to hook block as shown in picture
- Back up to dead end wedge **side that is straight in line with mounting pin**. Dead end mounting pin hole shown in picture to right
- Around top of wedge and leaving enough for the rope clamp





## 13.0 Hoist Electrical Controls

Power supply requirements for Starke standard wire rope hoists are 460/3/60Hz and drive power is 24V/1/60Hz. The configuration for a standard wire rope hoist and trolley is two speeds, contact your dealer for optional configuration. Our Gen 2.0 hoist systems are now utilizing Danfoss variable frequency drives as standard equipment driving the trolley motor.





**▲IMPORTANT NOTE:** After disconnecting main power there is still a high voltage potential within the filter capacitors, please allow adequate time for this voltage to dissipate before performing any maintenance work on the VFD inverter. Please wait until the charge led is off and bus voltage is under 36V. The Danfoss VLT Micro Drive documentation is included within the information packet for hoist system, please refer to this manual for specific warnings and procedures in maintaining the VFD.

Due to the temperature, humidity, dust, and vibration the components of the control system will be operating in it is recommended to perform the daily and periodical maintenance. Items needing to be checked are, but not limited to, as follows:

- Observing abnormal change in motor sound during operation.
- Excessive vibration during motor operation.
- Motors stall during operation.
- VFD cooling fan is working properly.
- Control cabinet overheating.
- All electrical terminations are properly secured and torqued.

Control Voltage is 110V ac

Keep VFD fan and heatsink clean and remove dust build up with in control cabinet with gentle application of compressed air. Use caution if metallic dust is on the surfaces to avoid depositing it within the control cabinet and its components. If the cooling fan blades are clogged with oil impregnated dust and/or heat sink fins are dirty or clogged, it may require removal of the VFD(s) for proper cleaning. Refer to Danfoss manual for these procedures and should only be performed by a qualified technician.

## 14.0 Wire Rope Data

Diameter	Minimum	Strength Grade	Extruded Rope	Weight
6	31 kN	2160 N/m m <sup>2</sup>	Yes	0.17 kg/m
8	62 kN	2160 N/m m <sup>2</sup>	Yes	0.283 kg/m
11	120 kN	2160 N/m m <sup>2</sup>	Yes	0.54 kg/m
15	220 kN	2160 N/m m <sup>2</sup>	Yes	1.02 kg/m

Rope Lay- LH Rotation

## 15.0 Lubrication Information

Gearboxes and bearings have lubricants installed before delivery and under normal circumstances are within safe operational working levels. It is good practice to verify levels and add lubricant if needed prior to putting the hoist system into operation.

Recommended lubricants are:

- Shell Super ATF
- DEA 5060
- ESSO ATF D 21611

**▲IMPORTANT NOTE: Synthetic lubricants should not be mixed with mineral lubricants.**

## 16.0 Assembly and Commissioning

Please read all installation and operating manuals as well as the relevant safety regulations carefully before hoist installation and commissioning.

Unless stated otherwise, the standard shipping status for hoist rope, and hook, is that they have been assembled. The trolley wheel gage is set per listed gage for each unit. Electrical parts have been functionally tested at the factory but lifting height and weight limits are required to be adjusted on site at the time of installation.

If the wire rope hoist is not to be installed immediately it must be stored in a dry and clean place.

## 16.1 Preparation for Assembly

Before beginning assembly, please confirm the following are available:

- Properly qualified and trained personnel (quantity and skills)
- All required tools and rigging systems to install properly and safely.
- Adequate time to safely and properly commission system and document

### 16.1.1 Lifting the Hoist

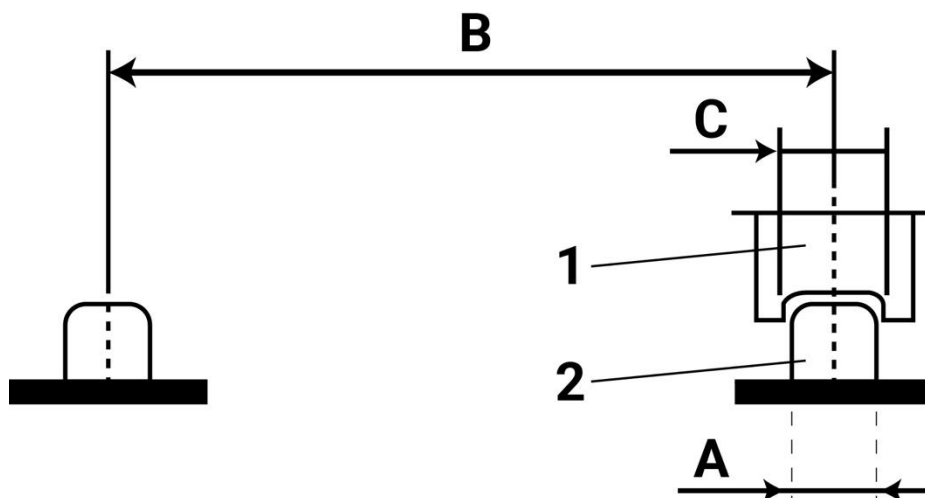
Lifting straps or chain attaching points are called out on the hoist trolley frame with decals. Lift the hoist only by the lifting points on the trolley frame or damage will result.

Before assembly, please confirm the dimensions of (B) and (C) below before lifting the hoist to the bridge.

### 16.1.2 Double Girder

The top running trolley frame wheel gage is set at the factory. The dimensions of rail measurement (B) will be listed in your order. The rail should be set to (+/-) 1/8" (2mm) measurement of the trolley gage ordered.

To verify that your rail size is within tolerance of the trolley wheel flanges. Standard dimension is  $(C) - (A) = 1/2"$  (14mm).



Drawing No.	Part Description
1	Trolley Wheel
2	Rail

## **16.2 System Commissioning Guide**

### **16.2.1 No-Load Checks**

#### **16.2.1.1 Electrical Supply System**

- Verify voltage and ampacity of the power supply circuit is in accordance with the hoist system specifications. Also verify proper phasing of power supply as hoist system is equipped with a phase monitor system that will prevent hoist from operating if phasing is incorrect. (By others)
- Verify power supply cabling is of the correct capacity ratings for the hoist system. (Supplied by others)
- Verify power disconnect device is in place and sized accordingly (Supplied by others)

According to standard electrical code requirements and best practices, wire rope hoist electrical power shall be equipped with the main power disconnect switch. The main power disconnect shall be installed at ground level within view of the hoist system.

#### **16.2.1.2 Pendant Control**

Pendant push button controls are one of several options to the configuration of your hoist system.

If a pendant is used to control the hoist system, please check the following on regular basis.

- Check that pendant control cable and strain relief attachment points are in good repair. The strain relief cable ends should be adjusted to take the load off control wire cable by tightening strain relief wire and securing with the cable U clamps.
- If equipped, verify audible and visual indicators are functioning properly during system operation.
- If directional indicators on pendant buttons are incorrect, they can be corrected by changing the tags contained inside button cavities.
- Verify the operation of the emergency stop button. Do not press the emergency stop button during normal lifting / traversing operations to stop movement in any event other than an emergency. In normal operation releasing the control button will allow system to safely cease movement. The emergency stop can be used to secure the hoist system when not in service.

### **16.2.1.3 Noise**

In normal use of the hoist system there will be obvious noise created by the operation of the mechanical components that comprise the system. In day to day use operators will learn what “normal” noise is as they become accustomed to the systems in operation.

If excessive vibrations or loud noises become noticeable it is advisable to stop the use of the hoist system and contact appropriate maintenance personnel to determine the cause and resolution of the issue.

Possible causes could include but are not limited to:

- Power supply issue – check voltage is correct, and all phases are present.
- Check trolley wheels and runway for obstruction or damage
- Gearbox lubrication is at proper level and wire rope is sufficiently lubricated.
- Check that wire rope is not rubbing or dragging on any component it has contact with. Also inspect for abrasions and fraying of wire strands

### 16.2.1.4 Upper and Lower Limit Switch Calibration

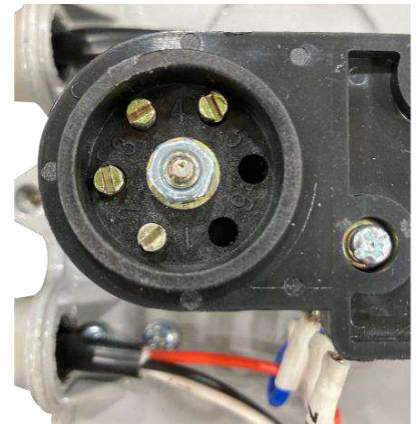
**▲IMPORTANT NOTE: Set Limits Before Normal Operation**

Check calibration of upper and lower limit switch to prevent damage to hoist system.

**This should be done during pre-use inspection** and subsequent annual inspections.

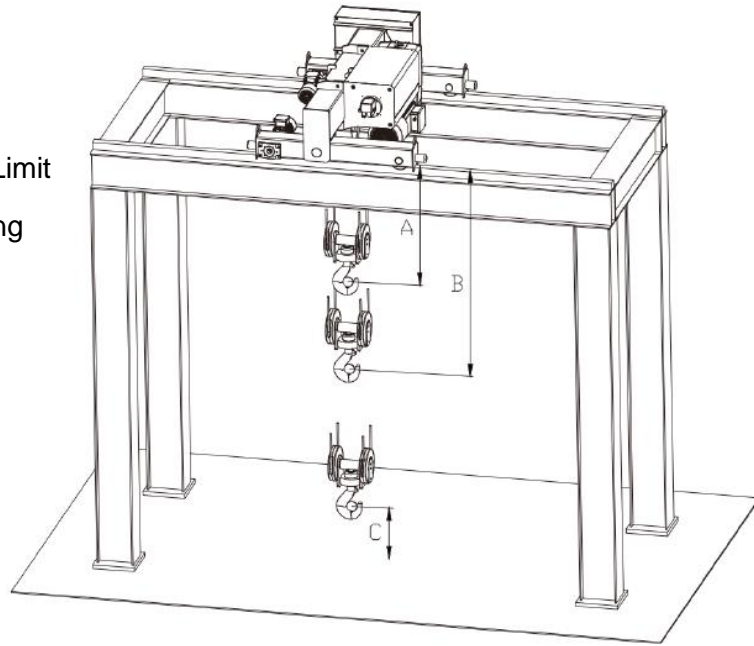
Adjustment screws are numbered next to screw.

- Stop the hook hoist around 8” above the floor
- Loosen the fixed screw about 2 full turns
- Turn No. 4 screw counterclockwise slowly, stop when you hear a click
- Turn No. 3 screw counterclockwise slowly, stop when you hear a click
- Lift and stop the hoist hook using the distance shown on the chart on the following page. (B)
- Turn the No. 1 screw clockwise slowly, stop when you hear a click
- Turn the No. 2 screw clockwise slowly, stop when you hear a click



Drawing No.	Limit settings
1	Upper (Stop)
2	Upper (Slow Speed Engage)
3	Lower (Slow Speed Engage)
4	Lower (Stop)

A= Minimum Upper Limit  
 B= Upper Limit Setting



Capacity	7.5T	10T	15T	20T
A	29.5"	29.5"	38.5"	38.5"
B	37.5"	37.5"	46.5"	46.5"
C	Floor to Hook Point = 8"			

#### 16.2.1.4.1 Secondary Safety Upper Limit

##### Installing, Wiring, & Testing

Testing should be done during pre-use inspection and subsequent annual inspections.

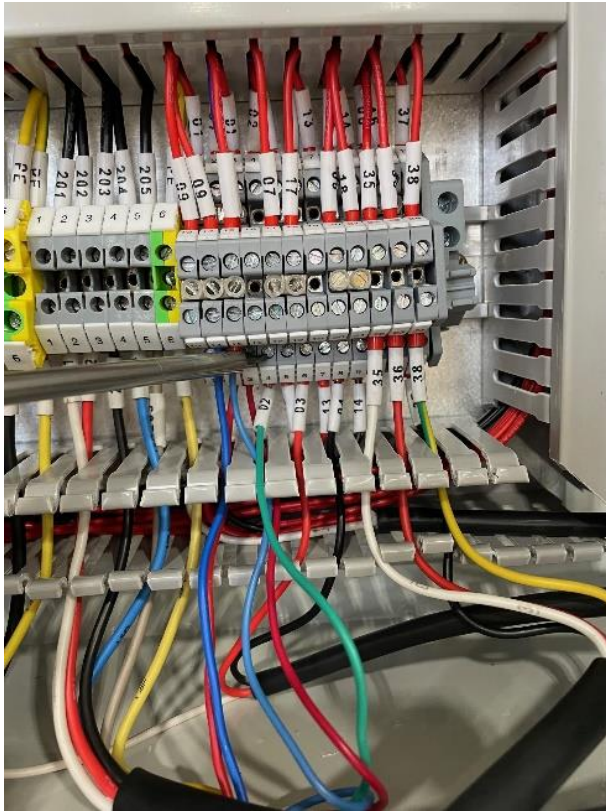


Mount the secondary limit switch as shown in this photo. Mount close to the dead end clamps so as to get the most lift height.

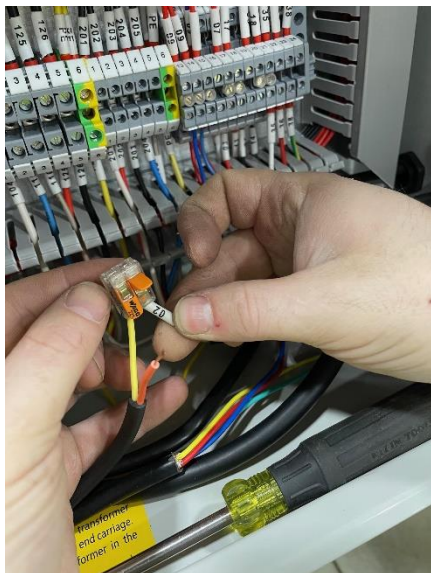
Route your harness the best way possible to achieve a route to the panel that will not be interfered with by moving parts.

Harness length may need to be increased in some situations.

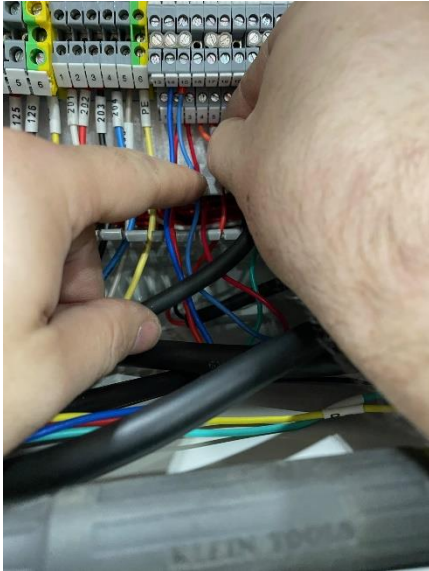




Look for terminal 4 in your panel. Remove wire marked 02 which is attached to terminal 4 as shown.



Using the 2 wires coming from the secondary limit switch attach the wire 02 removed earlier and attach it to either of the wires from the secondary limit switch harness.



Attach the other wire in the secondary limit switch harness to terminal 4 in the panel.

#### **16.2.1.6 Hook and Sheaves**

Inspect the wire rope sheaves and they are freely rotating within hook body.

Check that the hook can rotate freely within its mount.

#### **16.2.1.7 Wire Rope**

Inspect wire rope and that it has not been damaged during operation.

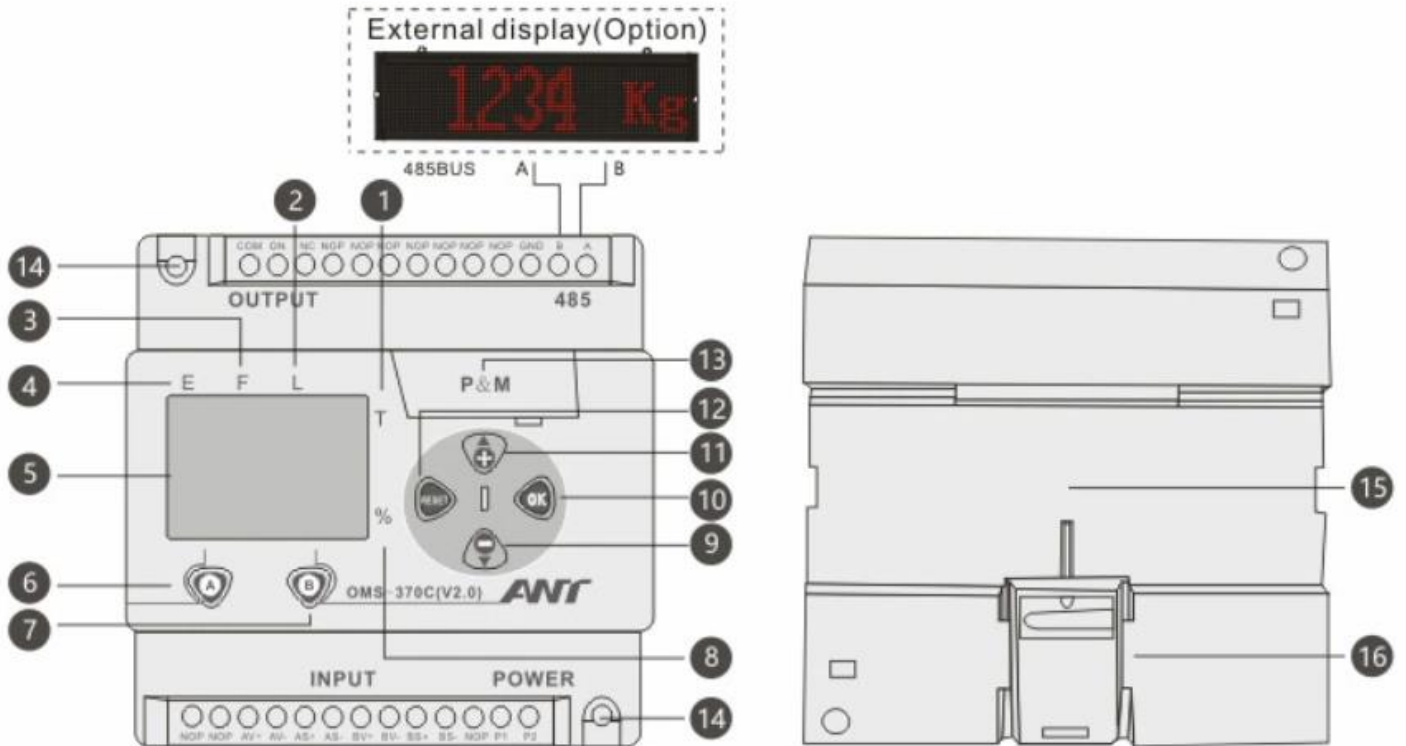
Visually inspect that wire rope is properly wound on the drum and that rope guides can freely track the coils in the grooves.

Check clamp fasteners on the end(s) of drum are tightened to proper torque specification and wire rope is securely held in place. Two complete wraps of wire rope around the drum in addition to the clamped section are present when lifting hook is at its lowest travel limit.

#### **16.2.1.8 Overload Protection**

Check calibration of overload system and that it is functional.

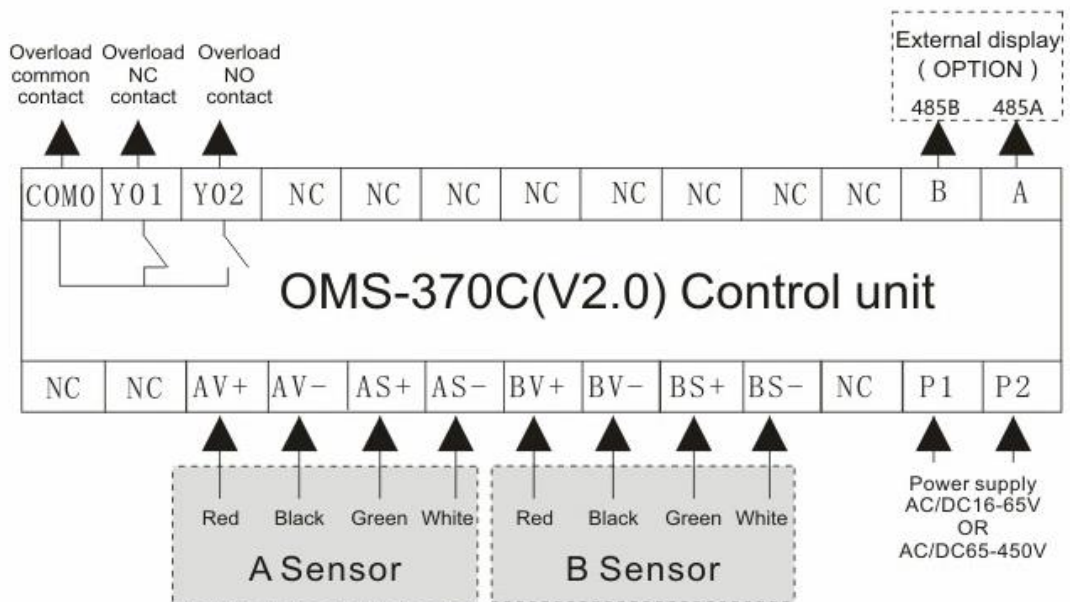
## 17.0 Summit Lifting Load Limiter



1 Load indicator defaulted KG, ( Not bright )	9 [-] Short press: Data decreasing Long press: Fast decreasing
2 Normal indicator	10 【OK】 Confirm
3 Warning indicator	11 【+】 Long press: Data increasing fast Short press: Data increasing
4 Overload indicator	12 【RESET】 Return
5 Data displays	13 Online programming port
6 【A】 Long press: Clear	14 Φ4 Screw the mouth
7 【B】 Long press: Rated load and sheave ratio program Short press: Load and percentage display	15 35mm Rail mounting groove
8 Load and percentage indicator	16 Rail fixed buckle



## Connections



# Calibration ( Choose one method )

## \*Remind:

- ① Tare indicator blinks means the absent of tare operation. Alarm indicator blinks means the absent of rated load setting.
- ② To modify the rated load after the calibration, you just need take the step B in the method 2.
- ③ In method 2, the weight used must be more than 50% of rated load. otherwise, the accuracy would be low.

## Method 1 : No weight calibration(recommended):

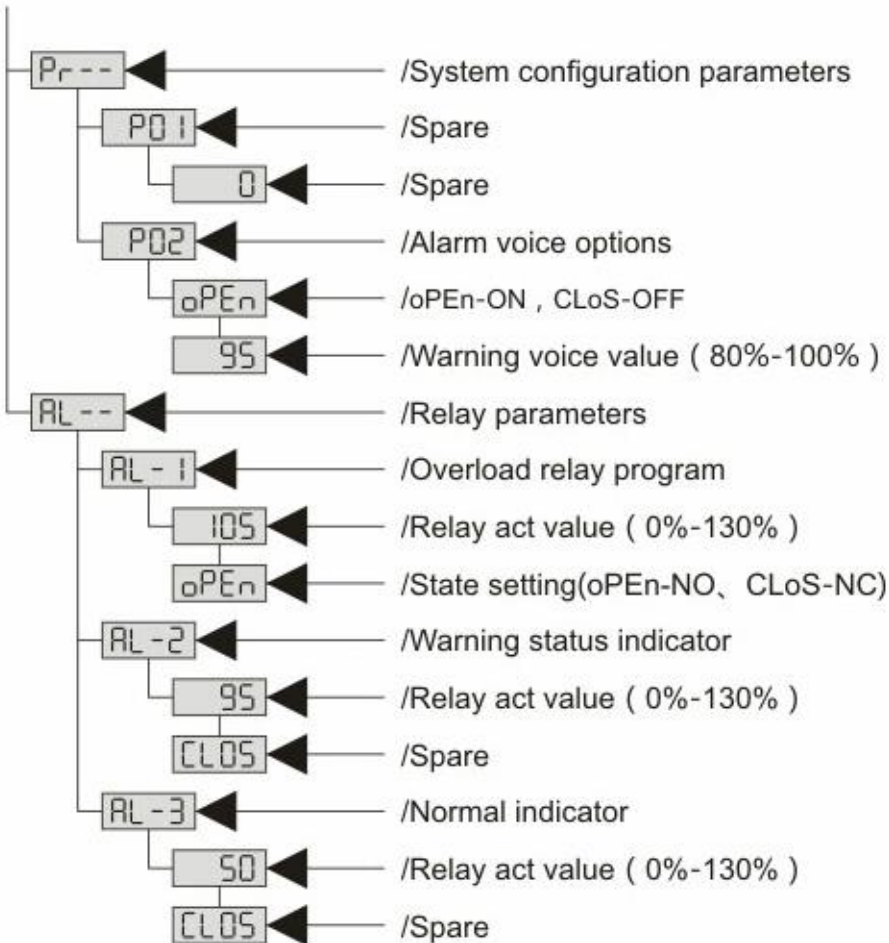
- A、 **Tare**→Empty car, long press[A] for 5s, display from **9999** to **0000** till display **Zero** .
- B、 **Rated load and roping calibration**→Long press [B] for 5s,it display **FULL** .push **[OK]** push [+] or [-] to input the rated load value. Then push **[OK]** to save data. **roPE** ,push **[OK]** , push [+] or [-] to input roping value. Then push **[OK]** to save data.

## Method 2: Know weight calibrations

- A、 **Tare**→Empty car, long press[A] for 5s, display from **9999** to **0000** till display **Zero** .
- B、 **Rated load calibration**→Long press [B] for 5s,it display **FULL** . push **[OK]** , push [+] or [-] to input the rated load value. push **[OK]** to save data. Then push **[RESET]** to return.
- C、 **Known weight**→Put the known weight in the car, long press [+] for 5s, data blinks to indicate the weight(KG). push [+] or [-] to modify the data to real weight, the push **[OK]** , it display from **9999** to **0000** and save data automatically.

## Menu functions

Push and release **[OK]** and **[ESC]** at the same time. It displays **[[00]**. Push **[+]** or **[-]** till it display **[[11]**. Then push **[OK]** into menu options.



**[OK]** to next menu step.

**[ESC]** to return to upper step.

**[+]** or **[-]** choose data in same level.

Push **[OK]** to save data after calibration

The value 80% means it is 80% of rated load.

## Error codes

Codes	Reasons	Solutions
<b>E01</b>	During known weight calibration, there is absent of TARE operation.	Make the cabin to be empty, Long press [A] for 5 seconds to finish TARE operation.
<b>E03</b>	During known weight calibration, the weight is less than 100KG.	Use the weight of more than 50% of rated weight to calibrate.
<b>E05</b>	The load is exceed the load cell MAX.capacity.	Make the load within the load cell capacity or change load cells with bigger capacity

## 18.0 BCQ-HD (W) European Weight Limiter

### Instruction Manual



Please read the instruction manual carefully before using the product.

The hardware drawings, styles and specifications listed in the manual are for reference only. All items are subject to change.

## 18.1 Overview

BCQ-HD (W) series hoisting weight limiter is an overload safety protection device mainly used in European single 1 beam and consists of a sensor and instrument. The main technical specification conforms to the requirements of GB/T 12602-2020 Technical specifications for Overload Protection Device of Hoisting Machinery. It not only features a compact structure, but also has detailed user-friendly functions such as zero tracking, one-key clear, system self-check and malfunction indication, 4-20ma output and a large screen or nonstandard control output interfaces are available to suit specific demands.

## 18.2 Main Technical Specifications

1. Scope of application: 0.5t~631 various European hoisting machines with single or dual beams
2. Synthesis deviation:  $<\pm 5\%$  F.S.
3. Action deviation:  $<\pm 3\%$  F.S.
4. Sensor overload headroom 150%
5. Operating ambient condition: Working temperature  $-20\sim+60^{\circ}\text{C}$  Relative humidity 90% RH
6. Power supply voltage: AC 100~500V
  - Please indicate on the purchase order if you need another power supply voltage (AC/DC 16-65V)
7. Alarm:
  - Warning Alarm: 90% of rated weight
  - Delay Alarm: 105% of rated weight (after continuous overload time of 2 seconds the relay will activate)
  - Immediate Alarm: 110% of rated weight
8. Capacity of relay contactor: 7A/250VAC
9. Protection grade of sensor: IP65
10. Display mode: 6-digit LED digital display

## 18.3 Principle of Operation

When the hoist lifts heavy weights, the sensor will output an electric signal which is in proportion with this load. This signal will be converted to a digital one and then enters the main control CPU which will process it and display the real-time weight.

When the lifted weight reaches 90% of the set point, the instrument will output a warning signal, the yellow light flickers without activating the relay.

When the lifted weight reaches 105% of the set point, both yellow and red lights will flicker, control relay will delay 1-2 seconds before activating and the buzzer will alarm at the same time.

When the lifted weight reaches 110% of the rated load set point, the control relay will open immediately and activate sound and light alarms.



## 18.4 Installation and Adjustment

### 18.4.1 Precautions

1. Please check if this product model is of appropriate capacity for your lifting equipment before installation.
2. Each time after starting up, press the self-test key to check whether the device is working normally.
3. The power supply of this product should be continuous if the main power disconnect is on.
4. This device is not intended for wet/corrosive environments, all precautions should be taken to protect it.

### 18.4.2 Instrument Installation

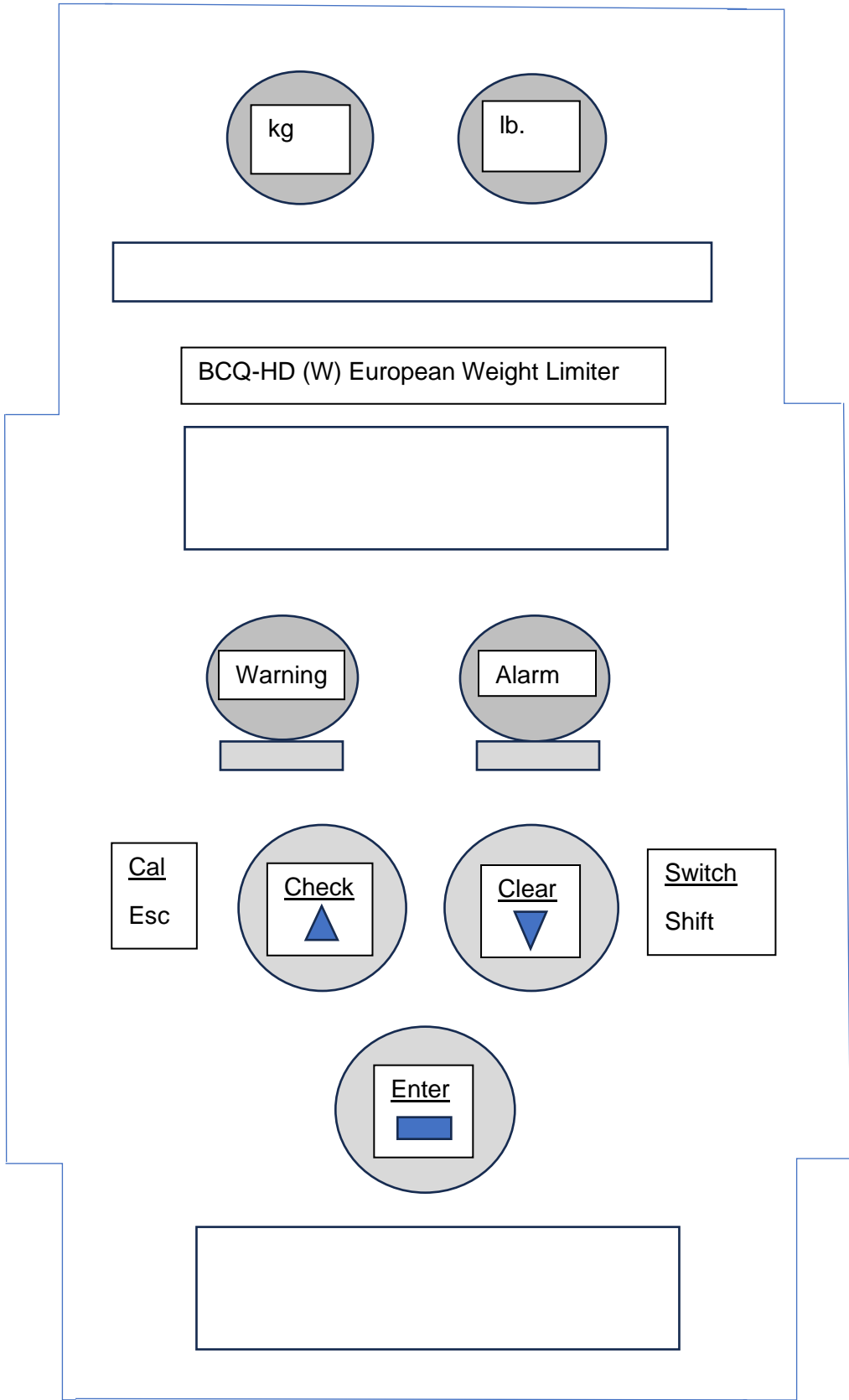
The instrument can be installed inside the electric control cabinet. Proper anti-vibration measures should be taken if the vibration of the hoisting machine is too strong. Do not install the instrument in a wet location with direct rain and/or strong corrosive environment.

### 18.4.3 Wiring

**Connect the power supply cord:** Connect two power leads to the power supply (the wiring should be correctly connected according to the label and pay attention to the supply voltage).

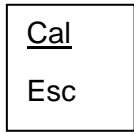
**Connect the control wire:** The control output of this product is a normally closed, dry contact relay. When connecting, the control is wired in series with the control circuit of the lifting motor **UP** contactor of the hoist. In case of alarm due to overload condition, the control relay will open, and the lifting motor **UP** contactor will be de-energized to achieve the protection.

**Connect the signal wires:** The sensor of the control instrument is connected via the aviation style connector located on the top of the control box, insert and tighten the captive ring nut.

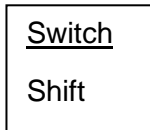


## 18.4.4 Adjustments and Usage

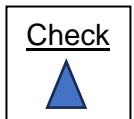
### 18.4.4.1 Keyboard Instructions:



Calibration Button: Press this button to enter the calibration function. It also has the function of Escape.



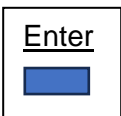
Switch/Shift Button: Press this button to switch the weight display unit kg or lb, and the corresponding indicator light will be on with Shift function.



Check Button: Press this button to check if the system of the instrument functions properly. It also is used to increase value.



Clear Button: Clear manually by long pressing (remove the gross weight). It also is used to decrease value.



Enter Button: Press this button to save the parameters you set.

Under the measuring interface, press the button to perform the functions. A short “beep” sound will be heard when the operation is effective.

#### 18.4.4.2 Display Instructions:

- START UP DISPLAY: "U1.01" displays the software version
- MEASURING INTERFACE: \*\*\*\*\* Displays the current weight.
- CHECK INTERFACE: \*\*\*\* Displays the overload set point weight. The red and yellow lights flashing.
- SAMPLING VOLTAGE INTERFACE: \*\*. \*\* Displays the current sensor reference voltage – the figure flashes.
- CALIBRATION INTERFACE: \*\*\*\*\* One of the figures flashing.
- PASSWORD INPUT INTERFACE: ----- is displayed, one of which flashes and "1111" is required to enter the calibration interface.

#### 18.4.4.3 Methods of Adjustment:

- CLEAR: For initial installation, due to the inconsistent weights of reel and steel cable, the instrument will display a value or display "0", press the CLEAR button when no load is present. Long press the CLEAR button for over 3 seconds. When you hear the "beep" the instrument will display "0", then release the CLEAR button which means the clearing operation is completed.
- CALIBRATION:
  - The instrument has been calibrated in the factory. Normally the users can skip this step. If the deviation is too large due to on-site mechanical installation etc., you can calibrate it.
  - For initial calibration, input the password "1111". You will hear three short "beeps" and you will see "Err" if the password is incorrect. The calibration must be finished within 5 minutes after the correct password is input. If you fail within the time limit, the password must be re-inputted (the double underlines below mean flickering display).
  - In Calibration Mode: Press the CAL button, it shows ----- then you can input the password. Use ▲ and "SHIFT" button to input "1111". Press "ENTER" button to enter the calibration mode, it will display \*\*\*\*\* , the figure displayed is the current weight. Press CAL button again to enter the calibration mode directly within 5 minutes after the correct password is input)
  - To calibrate use a calibration weight that is more than ½ of the rated weight capacity, lift the calibration weight and enter its known value weight by pressing "SHIFT" + ▲ + ▼ buttons. Then press the ENTER button to save calibration parameters. Then go back to the measuring interface \*\*\*\*\* and verify the calibration is complete.

**▲IMPORTANT NOTE: For a new initial installation, you must perform a clear operation which can only be done when no load is on the sensor.**

When the hoist is lifting 90%-105% of the rated weight, the instrument enters the warning state, the yellow light will flicker but will not cut off the up-control circuit. It reminds you that the hoist is almost fully loaded.

If you wish to test the hoisting machine's overload ability, it is possible to bypass the circuit with a jumper wire, the instrument will still display the current weight. NOTE: The control relay is a normally closed contactor in normal operation.

When overloaded, the relay will open and cut off the **UP** control circuit of the hoist. This device is part of the safety/protection system of a hoist. All testing, calibration and certifications must be performed by a qualified agency.

**▲ IMPORTANT NOTE: DO NOT USE HOIST UNTIL THIS UNIT IS PROPERLY CALIBRATED AND TESTED.**

### 18.4.5 Most Frequent Malfunctions and Solutions:

#### 18.4.5.1 Unable to display the loaded weight.

- Malfunction: After installation it displays "0". And after loaded still displays "0".
- Checking Methods: Long press both the ESC and SHIFT buttons for 3 seconds to view the current sampling voltage **\*\* . \*\***
- Possible Solutions: If the sampling voltage displays **\*\* . \*\*** it shows a valid figure, it means the sensor and instrument are functioning properly. You will need to press the CLEAR button when no load is present. If the sampling voltage shows a negative value, it means the instrument failed to connect the sensor or reverse connection of the sensor signal wire or the sensor wire is broken. You will need to connect the sensor to the instrument properly or replace the faulty wiring or sensor.

#### 18.4.5.2 Alarm after connection to the power supply (when no load is present)

- Malfunction: After connection to the power supply the unit displays **\*\*\*\*** or E-H and the red-light flashes and the alarm sounds.
- Checking Methods: Long press both the ESC and SHIFT button for 3 seconds to view the current sampling voltage **\*\* . \*\***
- Possible Solutions: After starting up if the sampling voltage is too high (greater than 2.00) it means the sensor is damaged or the wire is incorrectly connected. OR if the sampling voltage of the instrument is less than 2.00 and the figure also changes after loading it means the calibration is not correct and you will need to calibrate the instrument again.

## 18.4.6 Notices

- It is normal for the displayed figure to change due to weight swaying. The figure will be stable as the load weight becomes stationary. The slight difference of the weight between the upper and lower positions in hoisting is due to the change of the length of the steel rope on the drum as it winds, however, the weight deviation should be within  $\pm 5\%$ .
- This device is intended for measuring weight as a safety device and is not intended for commerce.
- Please strictly follow all recommended procedures listed in this manual to insure proper operation of this safety device.
- This device should be inspected on a regular basis every 6 months. The particulars to be inspected include display accuracy and alarm set point etc.
- The device has a 12-month limited warranty (from the date of shipment). Terms and conditions apply.

## 18.5 Trolley Frame

- Check for proper shaft alignment with frame.
- Check that all fasteners are at proper torque specifications.
- Check for proper clearance of 1/8" minimum on flange drive wheels.
- Check that trolley drive motor brake is functioning properly.

## 18.6 Load Test Inspection Items (at 100% rated load)

### 18.6.1 Motor Current

Check voltage and amperage on each leg of lifting motor power supply while under maximum load lifting operation at both speeds. Observe that each leg amperage is balanced with respect to the others and that none exceeds the FLA (full load amperage) rating on motor nameplate and that voltage is within required range per nameplate. If these measurements are in specification upon pre-use inspection be sure to document them and leave a copy in the control cabinet. These values will be useful when troubleshooting issues during the service life of the hoist.

### 18.6.2 Motor Thermal Protection

In operation of the hoist system, if lifting motor thermal protection is triggered frequently, be sure to inspect electrical and mechanical aspects of the system as this could indicate a potential issue with the system. Also take note of the ambient temperature of the working environment of the hoist system as this could be a contributing factor as well. See section 2.2

### 18.6.3 Trolley System

Check operation of trolley motor at both low and high speeds and both directions of travel

Check that the drive wheels are not slipping, and that the motor brake securely locks trolley in place when stopped. Make sure the runway surface is not painted and free of debris.

It is good practice to run the full length of runway 3 to 5 times in both directions and observe for any issues.

## **18.7 Testing Hoist System in Overload (110 to 125% of capacity)**

### **18.7.1 Test Overload Device**

Check that overload device prevents operation of hoist system.

### **18.7.2 Lifting Motor Brake**

Lower test load in low speed and test that brake will hold load in place when motor is stopped.

### **18.7.3 System Documentation**

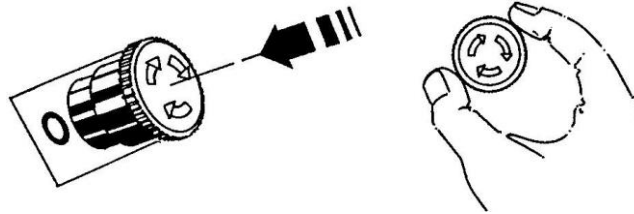
Please check that all documents included with the hoist system are in good order. Be sure to have all pre-use inspection documents properly filled out as well as owner required warranty cards and submitted to Starke. Keep inspection / maintenance logs in a safe place for reference during the service life of this hoist system.

## 19.0 Operation

### 19.1 Control Pendant

The typical control device of a hoist or crane system is the pendant. Pendants can be wired or wireless and perform the same functional control over the hoist / crane system.

Depending on the number of motions the system is capable of the number and function of buttons will vary by system. The most critical button is the emergency stop (Estop) button and is featured prominently by being red in color and a locking type of switch located at the top of the pendant for easy access. Once Estop is triggered all functions of the system will be disabled and must be manually reset before system is allowed to be put back in service. To reset Estop typically the button is rotated slightly to re-arm the trigger system within it and the button should raise up slightly.



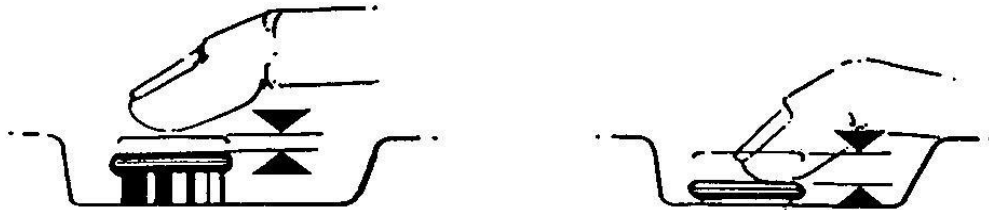
On most wireless radio pendants there will be a button called “start” and upon power up or resetting the Estop you will be required to press “start” to enable the system. This is an extra layer of safety to prevent unintentional operation of the system. In some cases, the radio system will automatically lock out the system after a period of inactivity that will also require pressing “start” to wake the system up.

The other buttons on the pendant are for motions the system can perform. The buttons typically are a two stage type. This means that by depressing the button halfway down the first speed of the motion is activated and by fully depressing the button the second speed of the motion is activated. The buttons are grouped by the motion they control, i.e. Up/Down, North/South, East/West. They are mechanically and/or electrically interlocked so that only one direction of motion for that grouping can be performed at a time.



## 20.0 Inspection and Repair

### 20.1 Inspection



It is recommended that a certified and accredited industrial hoist and crane service provider be utilized to inspect, maintain, and certify the hoist system. This organization should have the ability to provide the following.

- Provide technically qualified personnel familiar with hoist/crane systems and the maintenance of the electrical and mechanical components that comprise the system.
- Provide documentation of accreditation in service / inspection of hoist and crane systems that may be required by jurisdictions and underwriters.
- Understand and follow all on site, jurisdictional and underwriters' safety policies, and practices.
- Provide all documentation of inspection and maintenance records on the system to the owner and/or their representative.

### 20.2 Pre-Use Inspection of System

Ensure that wire rope hoists and load bearing structures are tested by experienced and certified personnel before placing this system in service.

The following items must be checked during the inspection and testing:

- Check technical parameters of the wire rope hoist system are consistent with the nameplate and design of the system.
- If there are any potential safety risks not accounted for during the design, manufacture, and installation of the system.
- All safety devices such as limit switches, brakes and controls have been calibrated and function properly.

That there are no defects in the wire rope hoist system and load bearing structures that may affect the safety of personnel and property

- All structural inspection and testing results should be recorded in the maintenance log form.
- Based on the results of inspections and tests, the qualified commissioning personnel shall determine if system is certified to be placed in service or if further testing and/or corrective action is required

- If any defects are found during load testing, commissioning personnel shall have the right to re-test.

**▲IMPORTANT NOTE: According to differing jurisdictional requirements, the content of the inspections and testing may differ. If the load testing requirement is to be performed at 110% the of rated load for the dynamic test and 125% of the rated load for static test, please contact your dealer for guidance on this subject.**

### **20.3 Certification After Overhaul and/or Modification**

Before placing hoist system back into service after overhaul/modification, testing procedures outlined in section 6.1.1 should be performed on the system again

Overhaul and/or modifications may include but are not limited to.

- Relocation of hoist and/or structural support system
- Modifications such as welding or splicing runway/support columns
- Structural design changes of building attached supporting members.
- Modifications to control system wiring, functionality, programming

### **20.4 Routine Inspections**

To ensure the safe and reliable operation of this hoist system it is recommended that the hoist system be inspected annually by an accredited agency with personnel that are experienced in the operation and maintenance of industrial hoist/crane systems. Please contact your dealer for recommended service providers

Annual inspections should include but are not limited to:

- Record model and serial numbers of system components and pertinent nameplate data for reference. Also include user identification of system
- Inspect structural assembly for broken or worn components or the presence of corrosion, stress cracks, warping, or bending.
- Validate all safety device functionality (Estop, lifting limiter, load limiter, horn/strobe, travel limits, motor brake function)
- Wear of motor bearings, support bearings, gearbox, and lubrication conditions
- Inspect electrical systems and terminals for loose wiring connections.
- Check VFD(s) cooling fan and heatsink for proper air flow, check brake resistor (if installed) is within tolerance of its nameplate specification.
- Unit "in service" hours and cycle count if available
- Wire rope condition (galling, abrasion, fraying, broken wires, corrosion), drum securing clamps are in good condition, lubrication conditions, rope guides function properly.
- Hook assembly reeving pulleys and hook rotation bearings

**▲IMPORTANT NOTE: If any deficiencies are discovered during the inspection, the hoist system should remain out of service and locked out until remedial action is taken to correct the issue(s)**

## 21.0 Inspection Checklist

Parts	Inspection content	Inspection cycle		
		Commissioning	Daily	Regular
Brake	Functional Testing	X	X	X
	Brake gap			X
Overload limiter	Functional Testing	X		X
Wire rope	Visual damage situation		X	X
	Lubricating	X	X	X
	Wearing situation			X
Rope guide	Visual appearance and Accessories	X		X
Hooks	Visual damage situation		X	X
	If safe lock can rotate freely	X	X	X
	If safe lock can rotate freely	X	X	X
	Wearing of hook			X
Electronic control	Functional Testing	X	X	X
	If wire is loose			X
Upper Limits	Functional Testing	X	X	X

**▲IMPORTANT NOTE: Only properly trained and certified technical personnel are authorized to maintain and service Starke wire rope hoists. Starke shall not be held liable and will not take any responsibility for any failure of or injury caused using non-authorized parts or service personnel, or incorrect maintenance, or the lack thereof. Please contact your dealer to obtain authorized parts and service for your Starke STW hoist system.**

## 22.0 Wire Rope Maintenance

### 22.1 Inspection of Wire Rope

Wire fractures will happen during normal use, because of continued wearing and fatigue stress. For safety reasons, it is required to check wire rope once a month. The hoist system shall be placed out of service and the wire rope must be changed if anyone of following three situations is discovered:

- Number of fractures is more than 4% of total amount of the distance and no longer than 6 times of wire rope's nominal diameter (FEM 1Bm~1Am)
- Number of fractures is more than 8% of total amount of the distance and no longer than 30 times of wire rope's nominal diameter (FEM 2m~4m)
  - broken wire rope's strands.
- In addition, if wire rope has suffered severe mechanical injury, such as deformation of cage type, permanent deformation, it must be changed immediately.

### 22.2 Maintenance and Lubrication of Wire Rope

Maintenance personnel should perform necessary lubrication depending on the system usage. The ideal lubrication method is using cotton cloth wetted by worm gear lubrication oil to scrub the whole wire rope. **If wire rope cannot be lubricated due to unforeseen circumstances, the service life of wire rope will be reduced and will require more frequent inspections.**

### 22.3 Replacement of Wire Rope

- Place the empty hook on the holder and remove the cover of drum.
- Remove wire rope from the fixed end and then remove rope guide(s). Next loosen the bolts of clamping plates for wire rope retention, and then remove the whole wire rope.
- According to standards ISO-4309, place wire rope on the drum attachment points and torque clamping plates to the specified torque required (see chart for torque specifications).
- Carefully start the motor to wind appropriate amount of wire rope on drum, take the opposite end of wire rope and continue to route wire rope through hook block pulley(s) and reeving pulley(s) (shown at 12.1)
- Once routing of the wire rope is correctly done affix the wedge block to the wire rope attachment point of the hoist
- Reinstall rope guide(s) and adjust as needed.
- Once the wire rope is installed set the hook to lowest position and observe wire rope for any signs of twisting or warping. Loosen wedge block and relieve twisting stress on wire rope so that hook hangs correctly.

## **22.4 Cleaning and Lubrication of Rope Guide**

During normal use, the rope guide will receive lubrication through contact with the wire rope. It may also become necessary to separately lubricate the rope guide when maintaining the hoist. When lubricating, the rope guide should be removed from the drum assembly, and then apply grease to the friction surfaces. Reinstall the guide(s) carefully and adjust so that guide can freely move with winding of rope.

## 23.0 Troubleshooting

**▲ IMPORTANT NOTE: Lock out and tag out power supply before attempting any of these tests.**

Fault Description	Possible Causes	Recommended Action	Remarks
Hoist doesn't operate	No power	Check power supply and collector Check emergency stop and contactor KI	
	Load limiter is tripped Limit switch is tripped	Check load limiter and limit switches	
The lifting motor does not operate	No power to hoist. Inrush of lifting motor start up too great for circuit breaker.	Check phase sequence of main power Check voltage of main power Insure building power system allows inrush amps at start of 2 <sup>nd</sup> speed.	
	wiring error of main power supply line	correct wiring error	
	Fuse blown	Replace fuse	
	Malfunction of Push Button	Check buttons and wiring of pendant cable	
Lifting motor does not move, but has humming sound when pressing buttons	Wiring error	Check wiring of incoming main power and all 3 legs are present and phased correctly	Motor may be damaged
	Contactors error	Replace contactor	
	Brake doesn't open	Refer to the correction of brake adjustment errors	
	Push button may have failed	Check buttons and replace them if necessary	
	Wiring faults	Check wiring	

Single-direction movement of lifting	Lifting limiter is tripped	Check limiter	
	Faulty contactor	Check contactor	
Brake doesn't operate	Power supply failure for brake actuator	Check wiring of and/or replace brake pack	
	Failure of rectifier	Check wiring and power supply of brake coil Replace broken rectifier	
Braking not effective	Clearance of brake disc	Adjust clearance	
Excessive wear of wire rope	Insufficient lubrication of wire rope	Lubricate wire rope frequently	
	Solid attachments on wire rope	Clean wire rope frequently	
	Pulleys are worn/broken due to extreme use	Replace with new parts	

## 24.0 Electrical Information

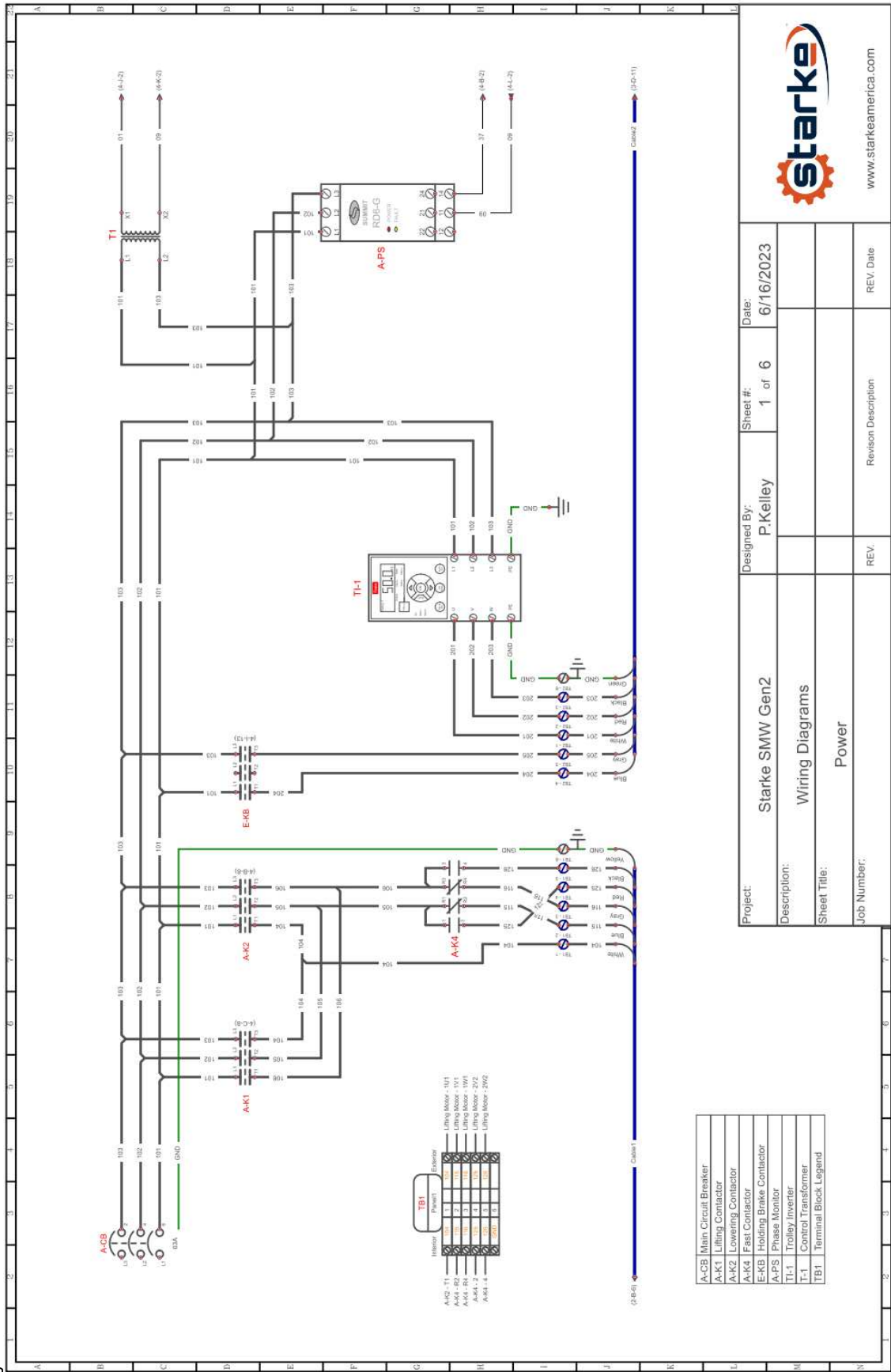
### 24.1 Electrical Specifications

Standard 460V/3 Phase

Model	Capacity	Lift	HMI Duty Rating	Lifting Speed	Lifting Motor (HP)	Travel Speed	Trolley Motor (HP)	Gauge (G)	Weight
STW0520-20	5 Ton	20'	H4	20/4 FPM	9	75/20 FPM	1.3	60	1078 lbs
STW0520-30	5 Ton	30'	H4	20/4 FPM	9	75/20 FPM	1.3	60	1188 lbs
STW0520-40	5 Ton	40'	H4	20/4 FPM	9	75/20 FPM	1.3	72	1342 lbs
STW0720-20	7.5 Ton	20'	H4	20/4 FPM	13	75/20 FPM	1.3	60"	1,642 lbs
STW0720-30	7.5 Ton	30'	H4	20/4 FPM	13	75/20 FPM	1.3	60"	1,693 lbs
STW0720-40	7.5 Ton	40'	H4	20/4 FPM	13	75/20 FPM	1.3	72"	1,743 lbs
STW1020-20	10 Ton	20'	H4	20/4 FPM	13	75/20 FPM	1.3	60"	1,642 lbs
STW1020-30	10 Ton	30'	H4	20/4 FPM	13	75/20 FPM	1.3	60"	1,693 lbs
STW1020-40	10 Ton	40'	H4	20/4 FPM	13	75/20 FPM	1.3	72"	1,743 lbs
STW1520-20	15 Ton	20'	H4	20/4 FPM	32	75/20 FPM	1.4	60"	2,563 lbs
STW1520-30	15 Ton	30'	H4	20/4 FPM	32	75/20 FPM	1.4	60"	2,629 lbs
STW1520-40	15 Ton	40'	H4	20/4 FPM	32	75/20 FPM	1.4	72"	2,694 lbs
STW2020-20	20 Ton	20'	H3	20/4 FPM	32	75/20 FPM	1.4	60"	2,563 lbs
STW2020-30	20 Ton	30'	H3	20/4 FPM	32	75/20 FPM	1.4	60"	2,629 lbs
STW2020-40	20 Ton	40'	H3	20/4 FPM	32	75/20 FPM	1.4	72"	2,694 lbs



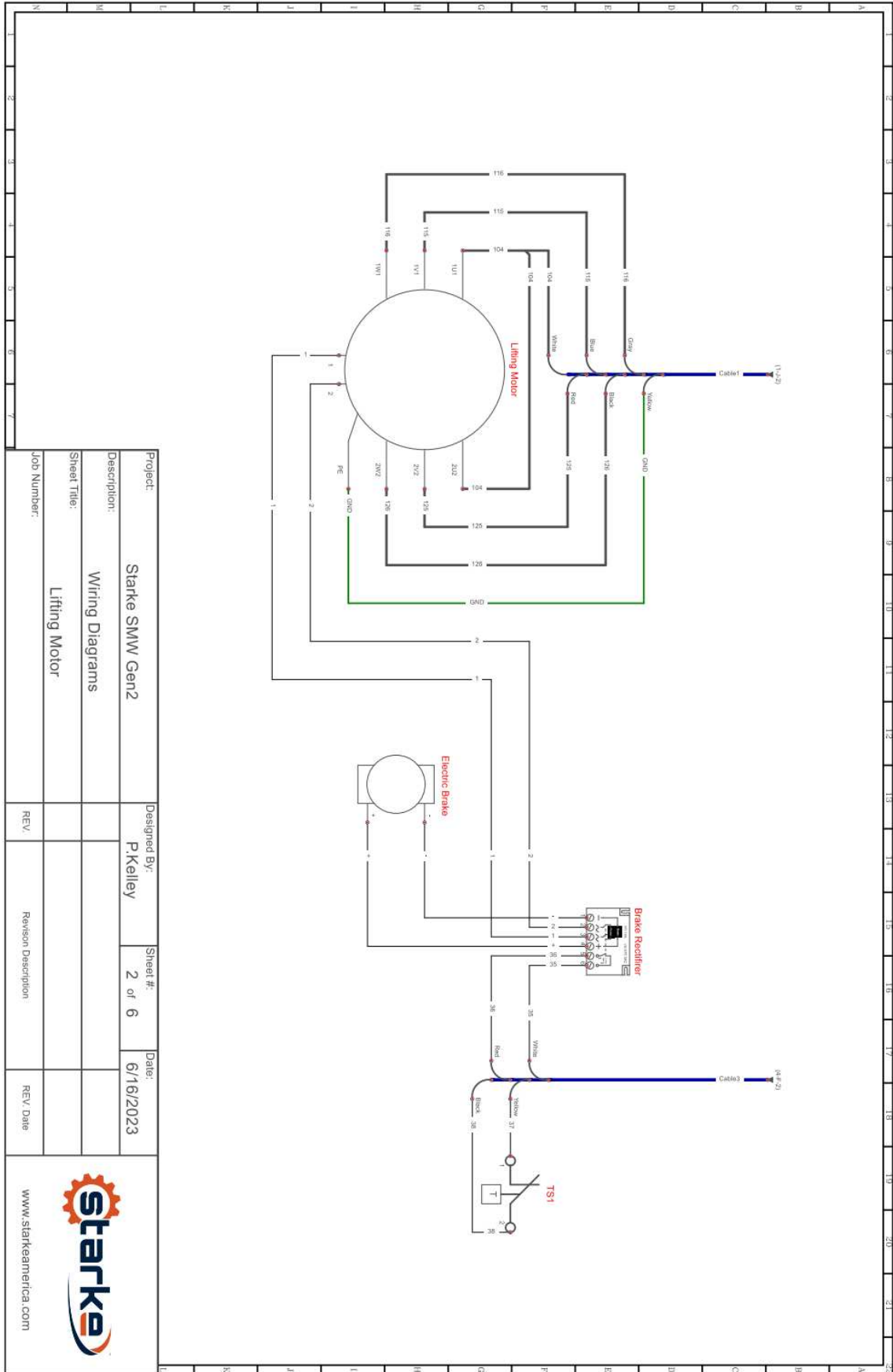
## 24.2 Electrical Schematics




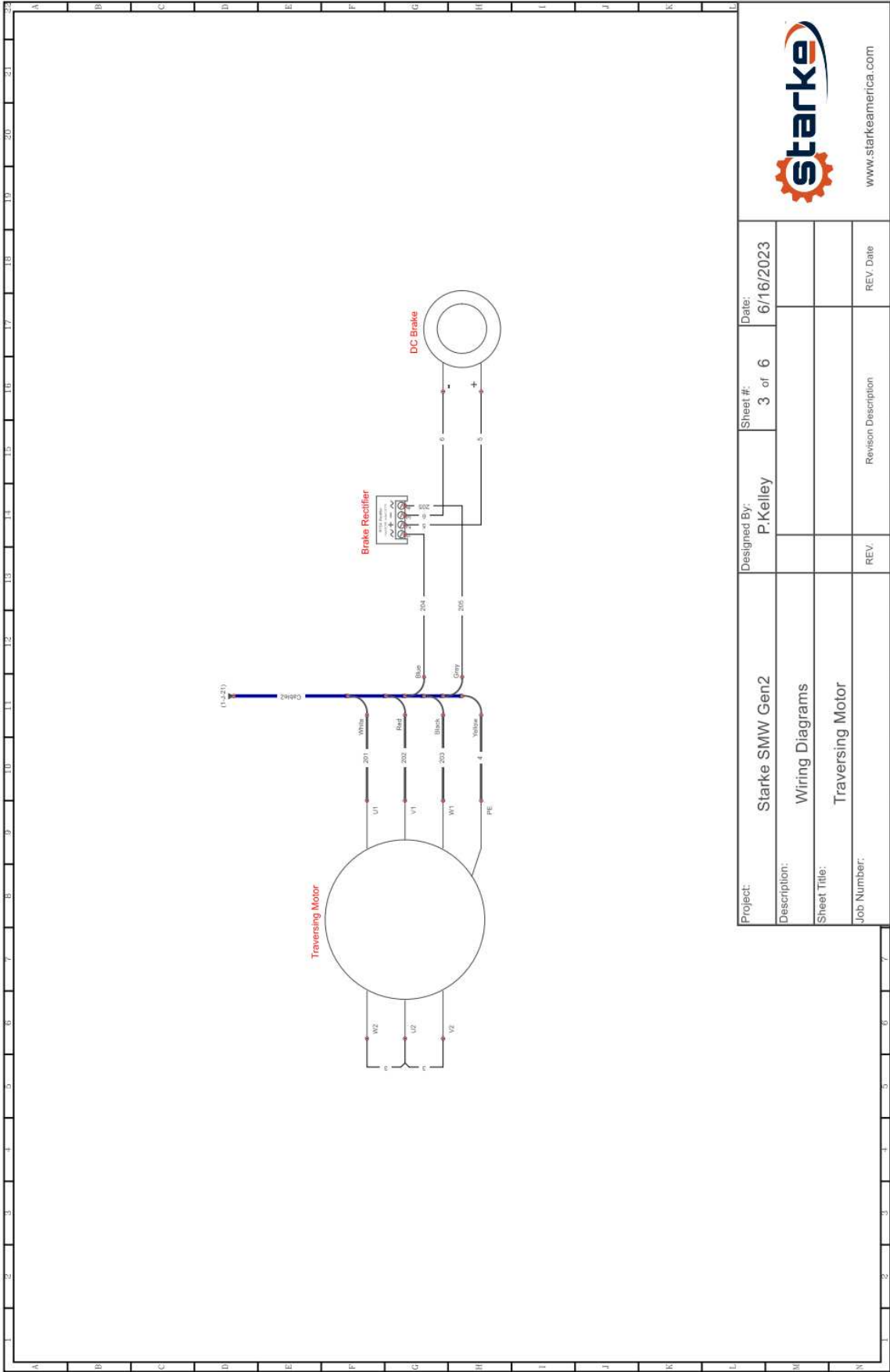
Project:	Starke SMW Gen2	Designed By:	P. Kelley	Sheet #:	1 of 6	Date:	6/16/2023
Description:	Wiring Diagrams						
Sheet Title:	Power						
Job Number:		REV.		Revision Description		REV. Date	



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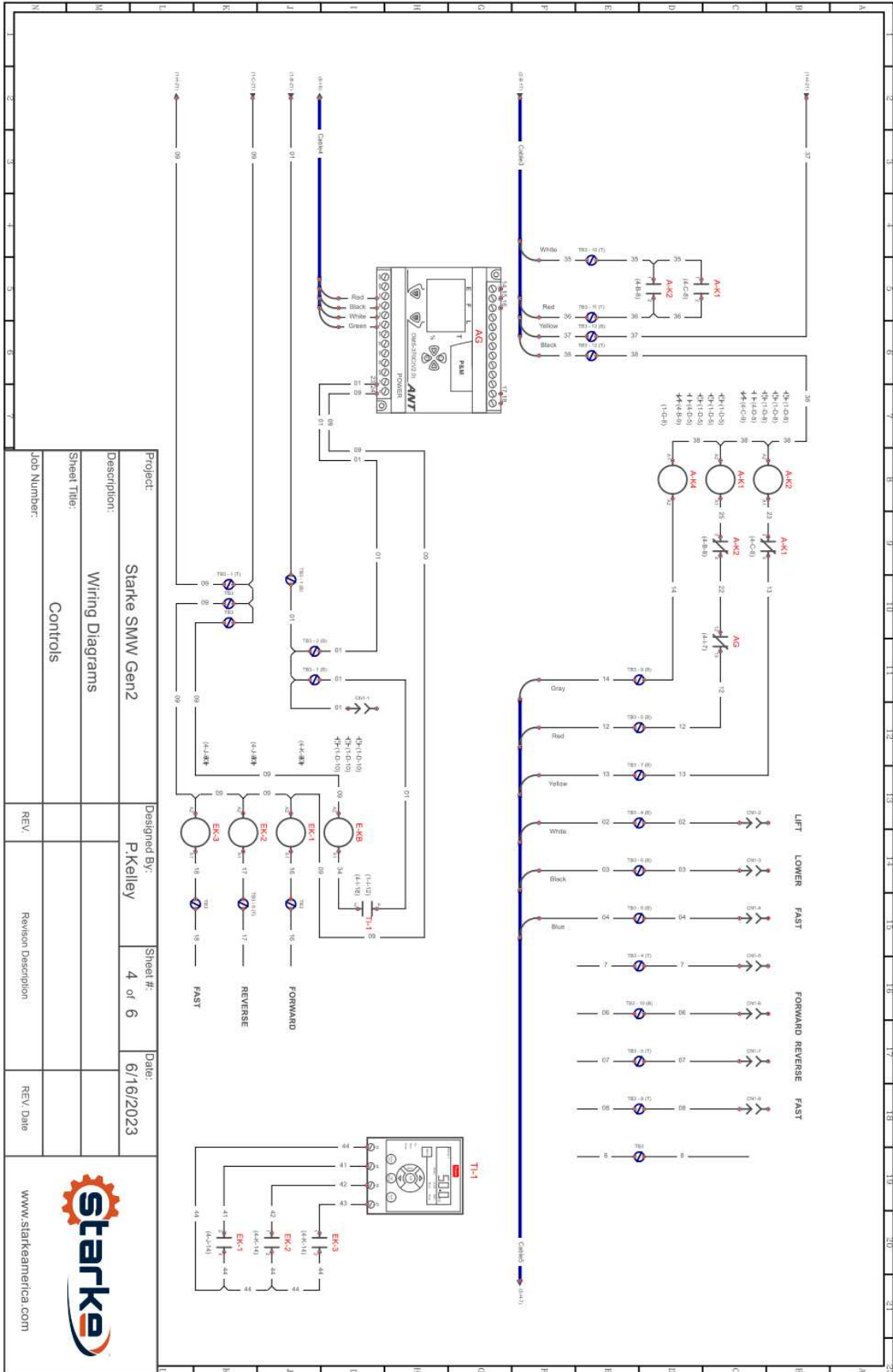
Project:	Starke SMW Gen2		Designed By:	P.Kelley		Sheet #:	2 of 6		Date:	6/16/2023	
Description:	Wiring Diagrams										
Sheet Title:	Lifting Motor										
Job Number:			REV		Revision Description				REV Date		
			<a href="http://www.starkeamerica.com">www.starkeamerica.com</a>								



Project:	Starke SMW Gen2	Designed By:	P.Kelley	Sheet #:	3 of 6	Date:	6/16/2023
Description:	Wiring Diagrams						
Sheet Title:	Traversing Motor						
Job Number:		REV.		Revision Description		REV. Date	



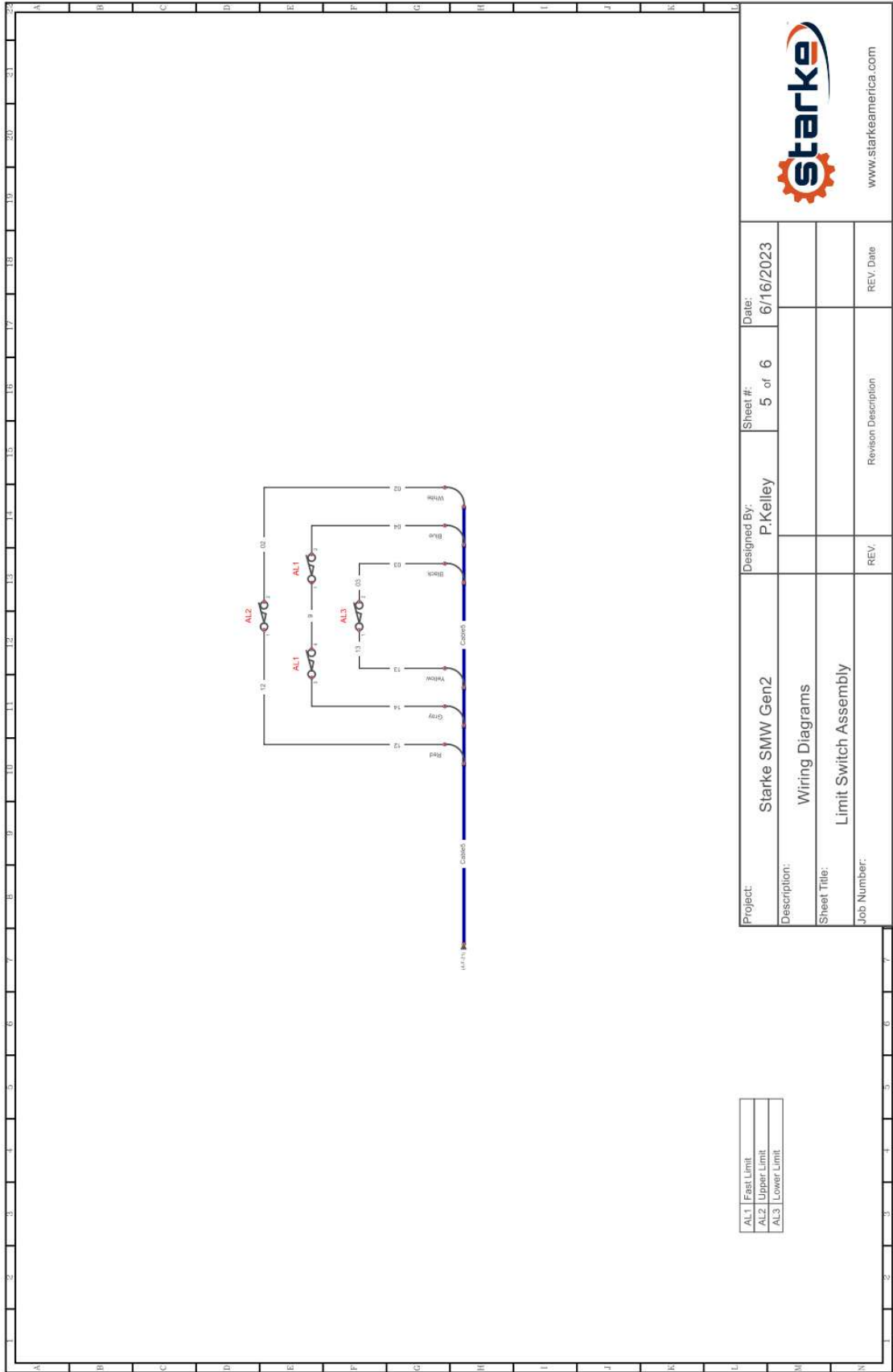
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Project:	Starke SMW Gen2	Designed By:	P. Kelley	Sheet #:	4 of 6	Date:	6/16/2023
Description:	Wiring Diagrams						
Sheet Title:	Controls						
Job Number:		Revision Description	REV.	Revision Description	REV.	Revision Description	REV.



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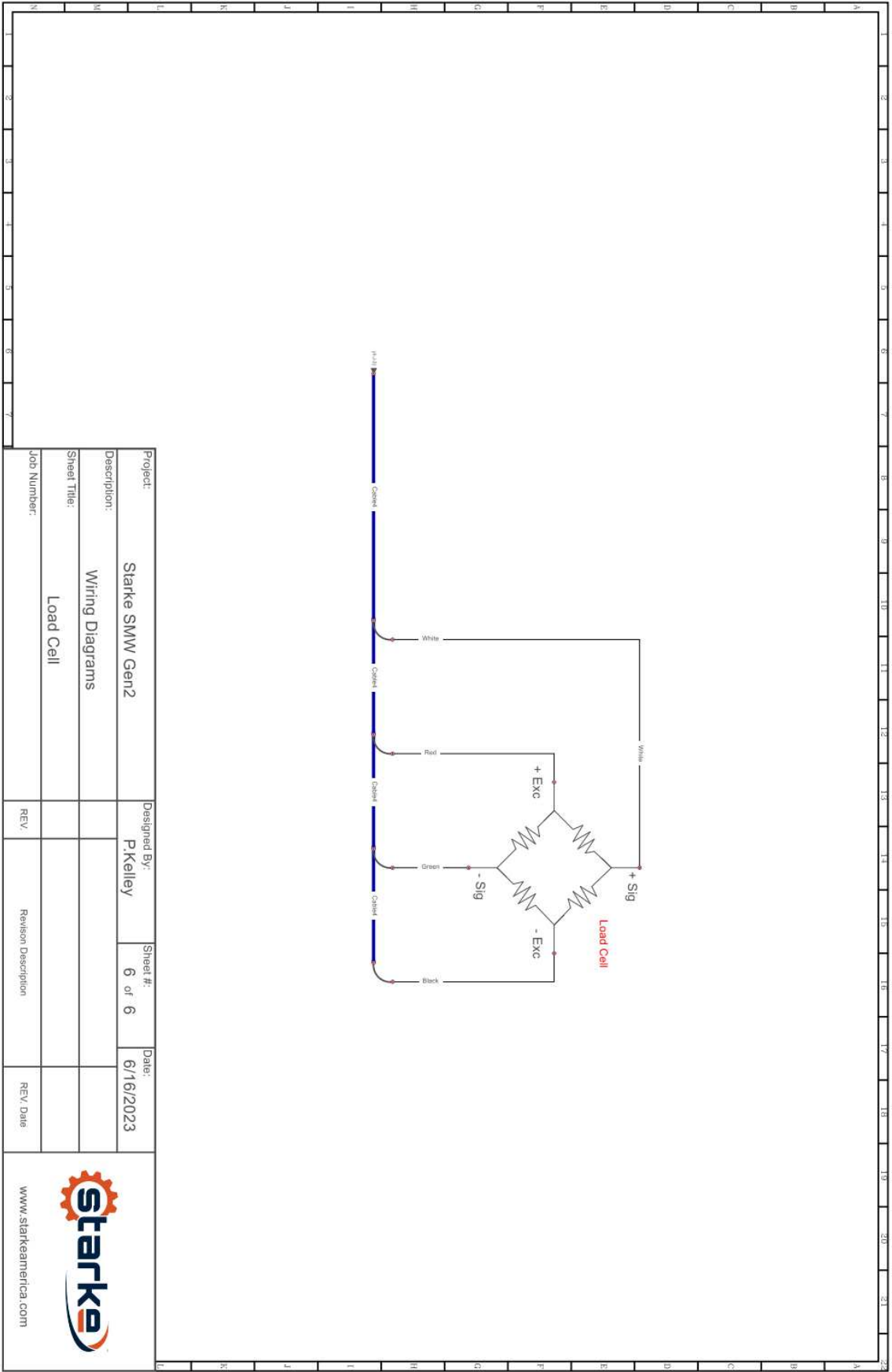


AL1	Fast Limit
AL2	Upper Limit
AL3	Lower Limit



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Project:	Starke SMW Gen2	Designed By:	P. Kelley	Sheet #:	5 of 6	Date:	6/16/2023
Description:	Wiring Diagrams						
Sheet Title:	Limit Switch Assembly						
Job Number:		REV		Revision Description		REV	REV Date



Project:	Starke SMW Gen2			Designed By:	P.Kelley	Sheet #:	6 of 6	Date:	6/16/2023
Description:	Wiring Diagrams								
Sheet Title:	Load Cell								
Job Number:				REV	Revision Description			REV/Date	



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Device Name	Code Name	Phase Sequence	A-PS
Contactora	A-K1	Height Limiter	AL
Contactora	A-K2	Trolley Limiter	EL
Contactora	A-K4	Contactora	A-F1
Contactora	A-K3	Connector	CZ11
Contactora	E-KB	Connector	CZ12
Intermediate Relay	E-K1	Overload Limiter	AG
Intermediate Relay	E-K2		
Intermediate Relay	E-K3		
Brake Resistor	BR		
Inverter	INVERTER		

## 25.0 Product Information

### 25.1 Wire Rope Hoist Maintenance Form

Below table to be filled in by client:

To be completed by the customer	
Company:	<hr/> <hr/> <hr/>
Date commissioned:	<hr/>
Location	<hr/>

Manufacturer:

Address:

Service hot line:

Type:

Serial number:

Manufacture date:

Working group:

Rated load:

Lifting height:

Lifting speed:

Electrical outlet:



## 26.0 Wire Rope Hoist Yearly Inspection Record

No	Inspection items	Test result	Inspector	Date
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				

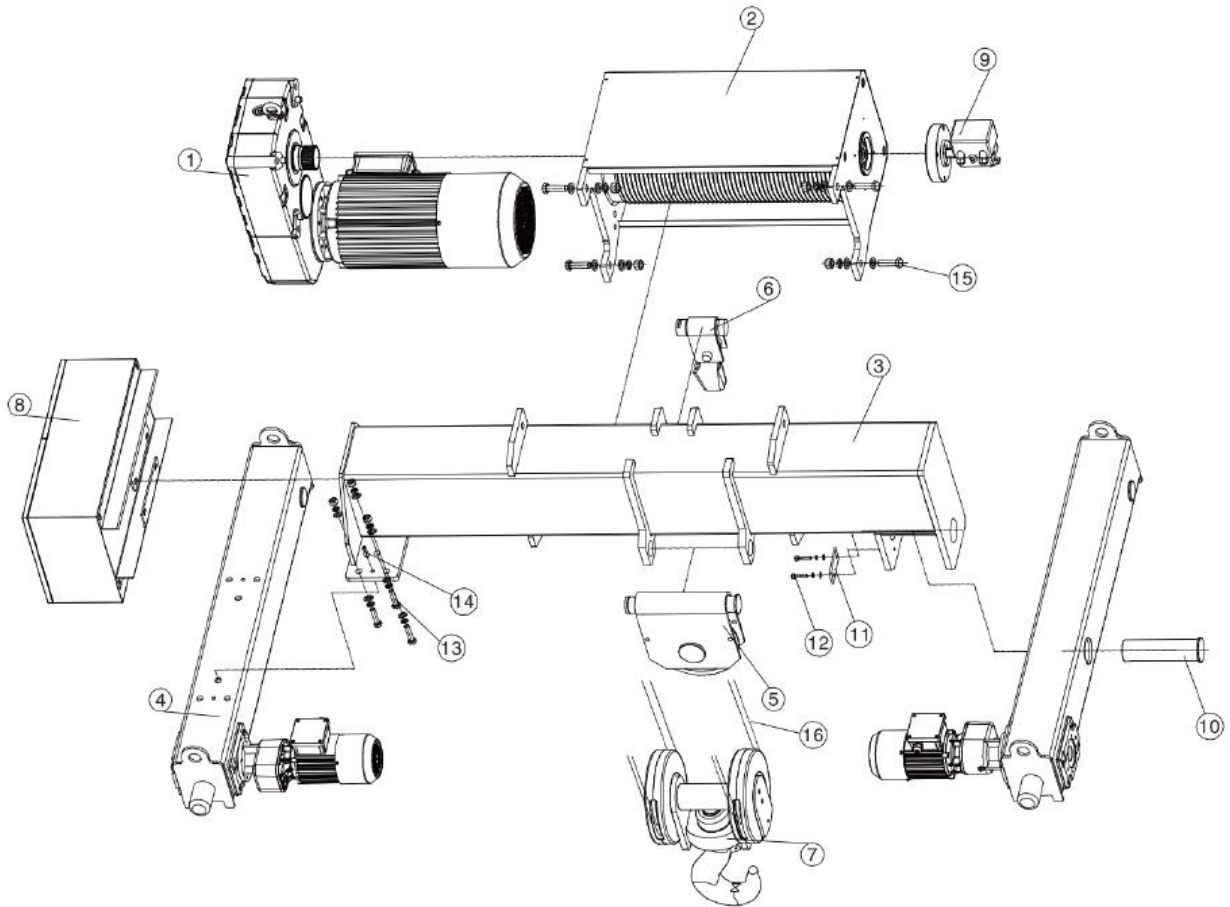
## 27.0 Torque Chart

Bolt Size	Thread	Ft/Lb Torque
6	1	8
8	1.25	19
8	1	20
10	1.5	55
10	1.25	58
10	1	66
12	1.75	81
12	1.5	83
12	1.25	84
14	2	136
14	1.5	150

**(Intentionally Left Blank)**

## 28.0 Exploded Part Drawings & Part Lists

### 28.1 Top Running Wire Rope Overview Drawing



For assistance with parts for your hoist please contact [Starkeamerica.com](http://Starkeamerica.com) with your:

Model \_\_\_\_\_ Voltage \_\_\_\_\_

Capacity \_\_\_\_\_

Serial Number \_\_\_\_\_

Lift Length \_\_\_\_\_

Assembly page \_\_\_\_\_

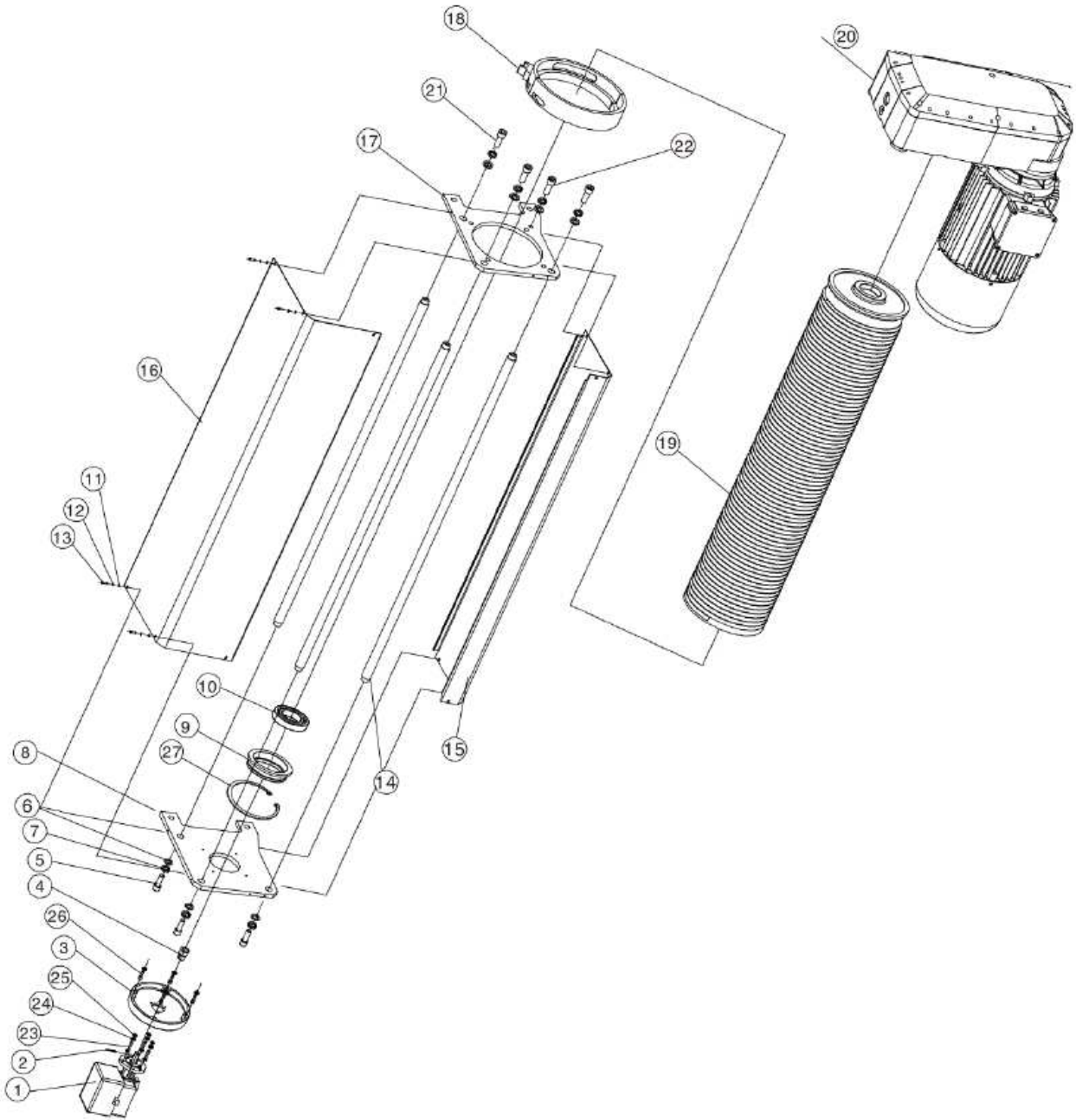
Item number \_\_\_\_\_

Critical spare parts are designated with an asterisk

## 28.2 Top Running Wire Rope Part List

Drawing No.	Part Description	Page
1	Lifting Motor Assembly	72
2	Drum Assembly	70
3	Trolley Frame	N/A
4	Trolley End Truck, RH (shown RH side of drawing)	76
4	Trolley End Truck, LH (Shown LH side of drawing)	76
5	Equalizer Pulley Assembly	80
6	Wire Rope Dead End Assembly	82
7	Hook Assembly	78
8	Control Panel	call
9*	Limit Switch	call
10	Balance Shaft	N/A
11	Balance Shaft	N/A
12	Plate Hdwr Kit	N/A
13	Trolley Frame Hdwr	N/A
14	Dowel Pin	call
15	Drum Assembly	70
16*	Wire Rope	call
17*	Wire Rope Guide Assembly	75

### 28.3 Drum Assembly Drawing



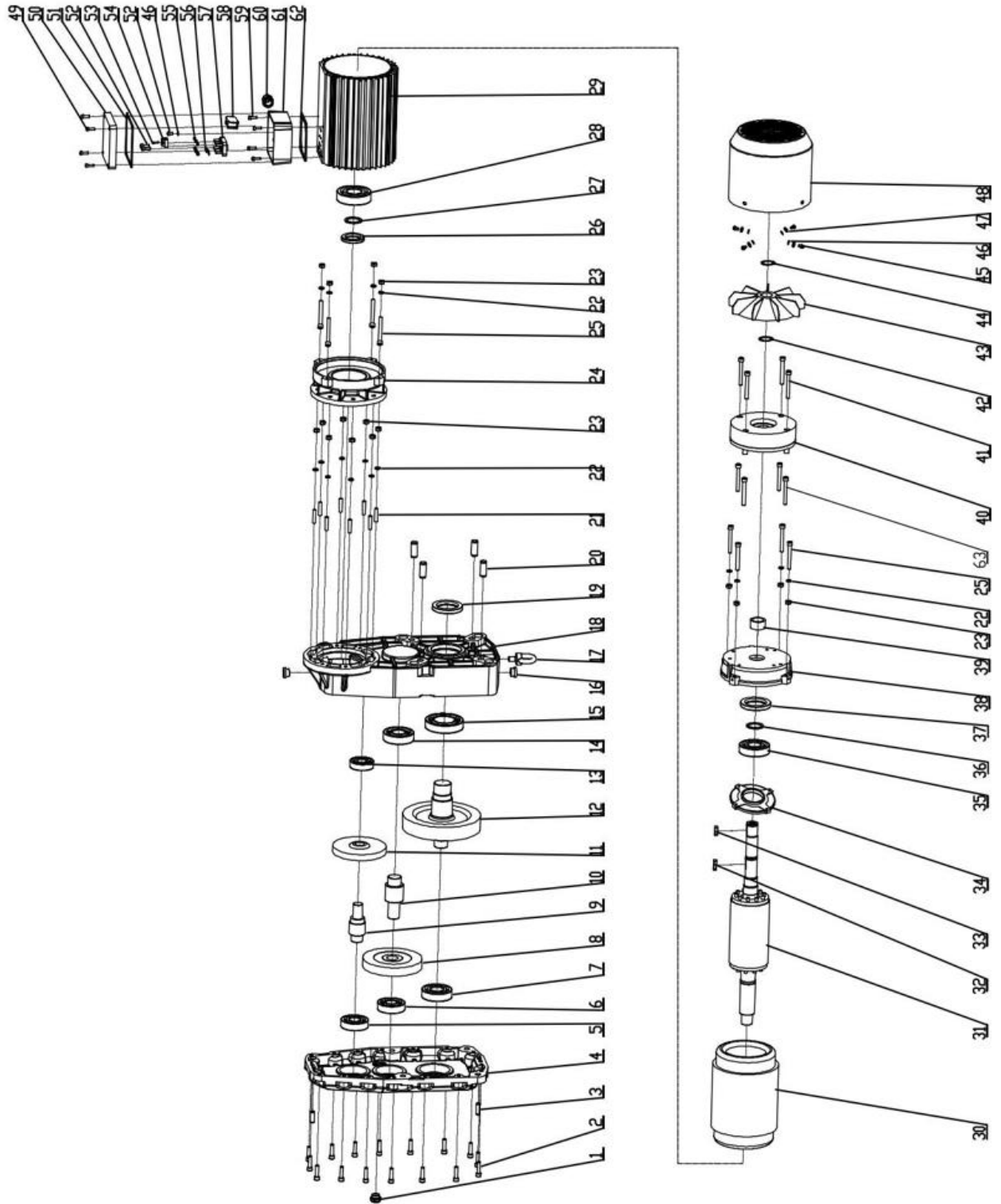
## 28.4 Drum Assembly Part List

Drum assembly parts differ based on capacity and wire rope diameter. Please contact [Starkeamerica.com](http://Starkeamerica.com) with parts requests referencing the below version number listed on each page and the page number along with your item name.

Critical spare parts are designated with an asterisk.

Drawing No.	Part Description	Qty
1*	Limit Switch, Primary	1
2	Cotter	1
3	Connect Asset	1
4	Connect Sleeve	1
5	Hexagon Socket Head Cap Screws	1
6	Flat Washer	1
7	Spring Washer	1
8	Left Flange	1
9	Bearing Block	1
10*	Bearing	1
11	Spring Washer	12
12	Flat Washer	12
13	Screw	12
14	Connect Rod	3
15	Lower Cover Plate	1
16	Top Cover Plate	1
17	Right Flange	1
18*	Rope Guide	1
19	Lifting Drum	1
20	Lifting Motor	1
21	Hexagon Socket Head Cap Screws	3
22	Hexagon Socket Head Cap Screws	1
23	Outer Hexagonal Bolt	3
24	Spring Washer	7
25	Flat Washer	3
26	Hexagon Socket Head Cap Screws	4
27*	Circlip for Shaft Washer	1

## 28.5 Lifting Motor & Gearbox Part List





## 28.6 Lifting Motor

Lifting motor & gearbox parts differ based on capacity. Please contact [Starkeamerica.com](http://Starkeamerica.com) with parts requests referencing the below version number listed on each page and the page number along with your item name.

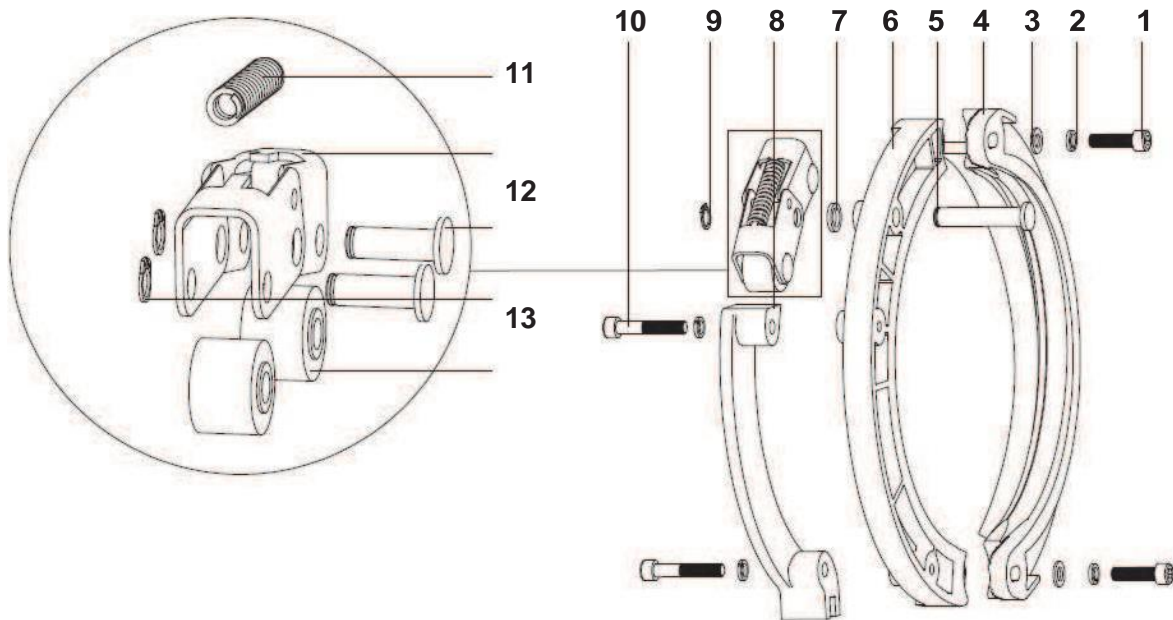
Critical spare parts are designated with an asterisk.

Drawing No.	Part Description	Part Numbers		
		5 Ton	7.5 & 10 Ton	15 & 20 Ton
1	Gearbox Assy Includes Ref #1-20	Starkeamerica.com	Starkeamerica.com	Starkeamerica.com
2	Hexagon Socket Head Cap Screws			
3	Dowel Pin			
4	Box Cover Plate			
5	Bearing			
6	Cylindrical Roller Bearing 310E			
7	Bearing			
8	Intermediate Disc Gear			
9	Intermediate Shaft Gear			
10	Output Disc Gear			
11	Input Disc Gear			
12	Output Gear			
13	Bearing			
14	Cylindrical Roller Bearing			
15	Cylindrical Roller Bearing			
16	Oil Plug			
17	Rings			
18	Box			
19	Oil Seal			
20	Dowel Pin			
21	Motor Assy Includes 21-63			
22	Spring Washer			
23	Nuts			
24	Motor Front Cover			
25	Hexagon Socket Head Cap Screws			
26	Skeleton Oil Seal			
27	Wave Mat			
28	Bearing			
29	Motor Shell			
30	Stator			
31	Rotor			
32	Ordinary Flat Key B			

## 28.6 Lifting Motor (Continued)

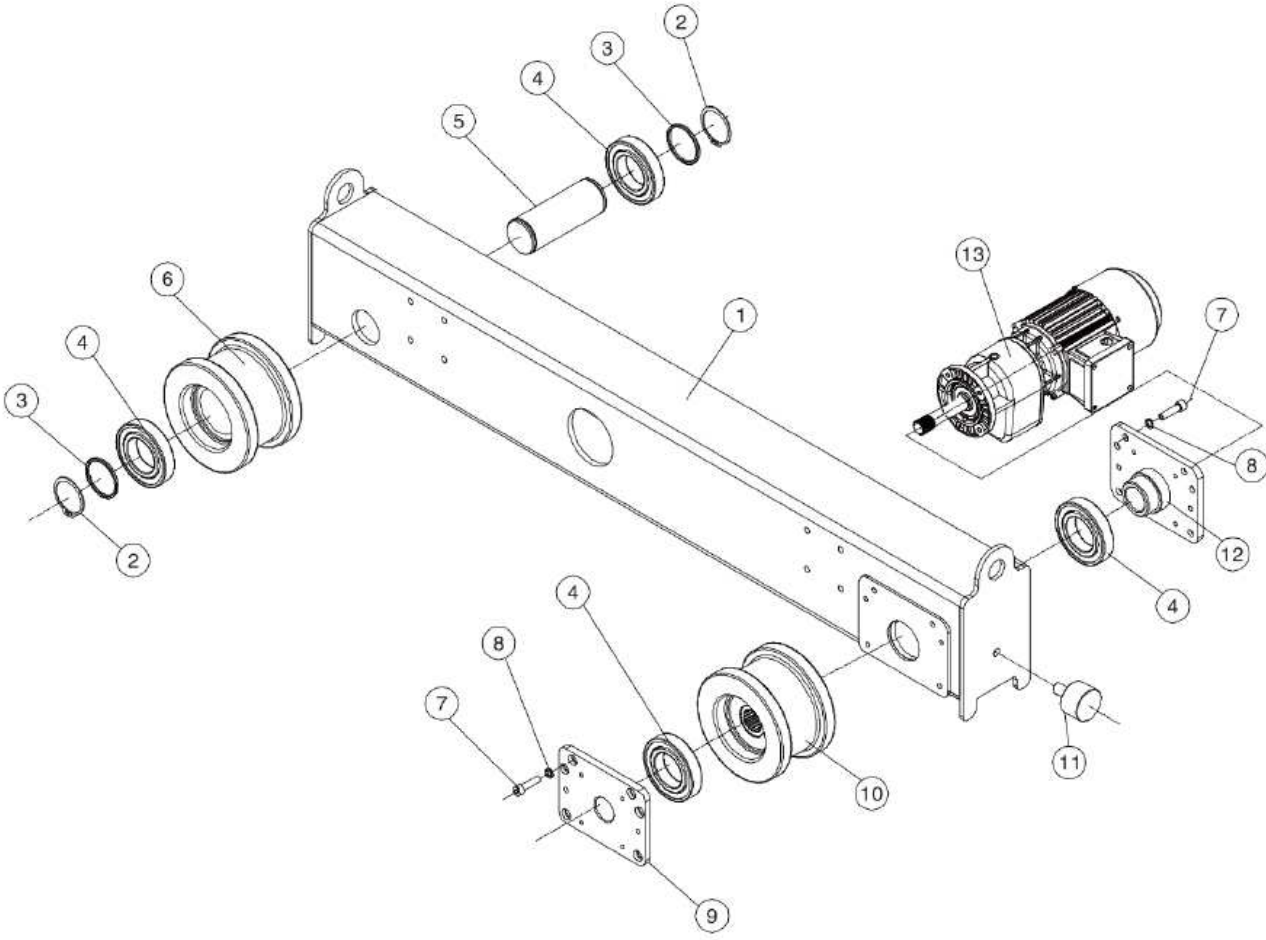
Drawing No.	Part Description	Part Numbers		
		5 Ton	7.5 & 10 Ton	15 & 20 Ton
33	Ordinary Flat Key A	Starkeamerica.com	Starkeamerica.com	Starkeamerica.com
34	Small End Cap			
35	Bearing			
36	Bearing Washer			
37	Skeleton Oil Seal			
38	Motor Cover			
39	Shaft Sleeve			
40*	Brake Includes 40 & 41			
40A	Brake Disc (Not Shown)			
41	Hexagon Socket Head Cap Screws			
42	Circlip for Shaft			
43*	Cooling Fan			
44	Circlip for Shaft			
45	Hexagon Socket Head Cap Screws			
46	Flat Washer			
47	Spring Washer			
48	Cooling Fan Cover			
49	Hexagon Socket Head Cap Screws			
50	Terminal Box Cover			
51	Terminal Box Cover Rubber Mat			
52	Hexagon Socket Head Cap Screws			
53	Hexagon Socket Head Cap Screws			
54	Terminal Protector			
55	Nuts			
56	Connect Plate			
57	Terminal			
58	Rectifier			
59	Hexagon Socket Head Cap Screws			
60	Gland			
61	Terminal Box			
62	Terminal Box Cover Rubber Mat			
63	Hexagon Socket Head Cap Screws			

## 28.7 Rope Guide Assembly



Item	Part Description	Qty
1	Hex Bolt	2
2	Spring Washer	2
3	Flat Washer	2
4*	Rope Guide Ring A	1
5	Clamping Roller Pin A	1
6*	Rope Guide Ring B	1
7	Washer	2
8	Rope Guide C	1
9	Snap Ring	1
10	Hex Bolt	2
11	Clamping Roller Spring	1
12	Clamping Roller Frame	1
13	Clamping Roller Pin B	2
14	Snap Ring	2
15	Clamping Roller	2

28.8 Trolley Assembly Diagram



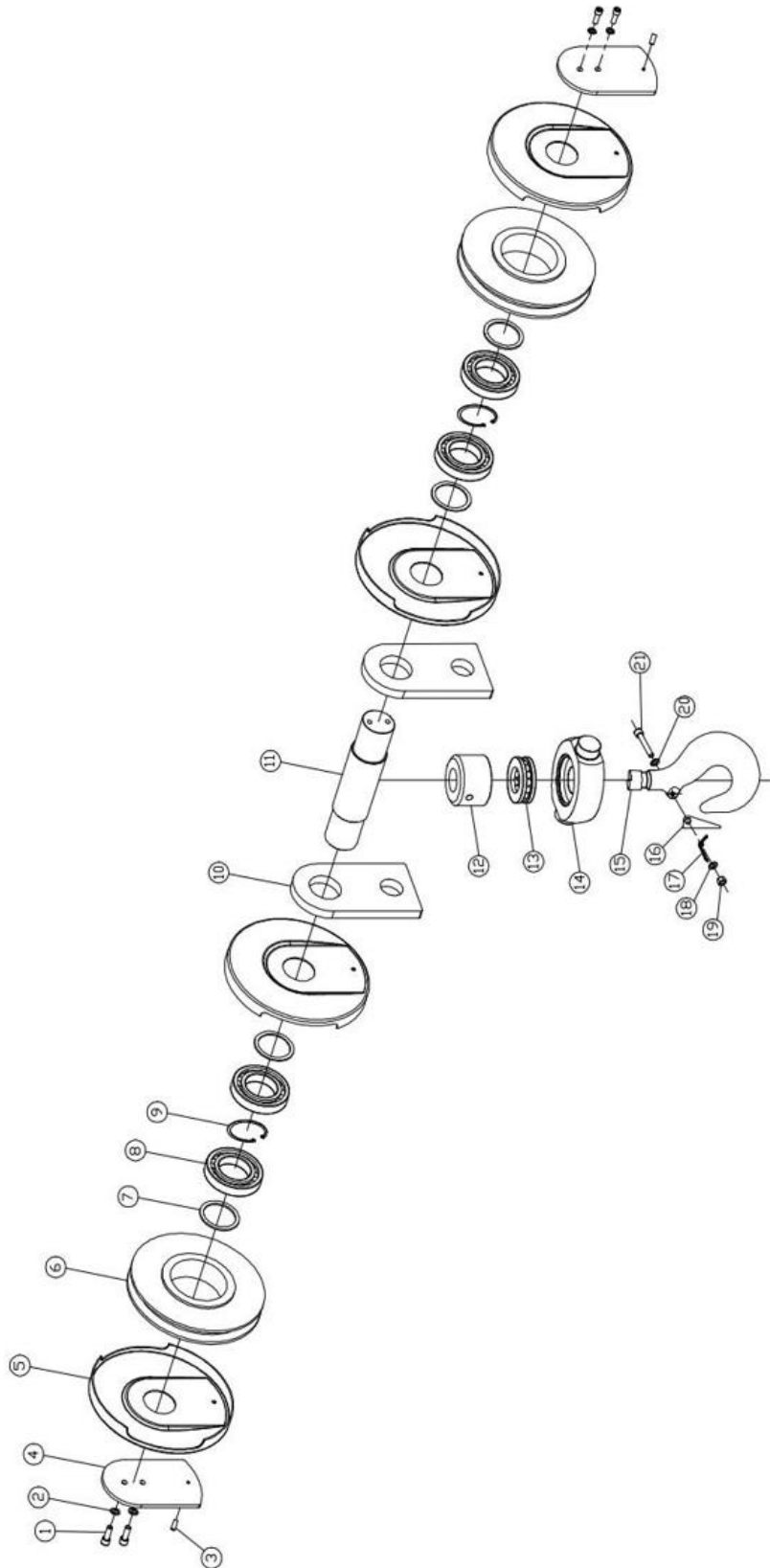
## 28.9 Trolley Assembly Part List

Trolley assembly parts differ based on capacity and wire rope diameter. Please contact [Starkeamerica.com](http://Starkeamerica.com) with parts requests referencing the below version number listed on each page and the page number along with your item name.

Critical spare parts are designated with an asterisk.

Drawing No.	Part Description	Qty
1	End Carriage Beam (specify LH/RH)	1
2	Spring Washer for Shaft	2
3	End Carriage Spacer	2
4*	Bearing	4
5	End Carriage Driven Shaft	1
6	End Carriage Driven Wheel	1
7	Hexagon Socket Head Cap Screws	12
8	Spring Washer	12
9	End Carriage Flange	1
10	End Carriage Drive Wheel	1
11	Bumper	2
12	End Carriage Flange	1
13*	Trolley Motor	1

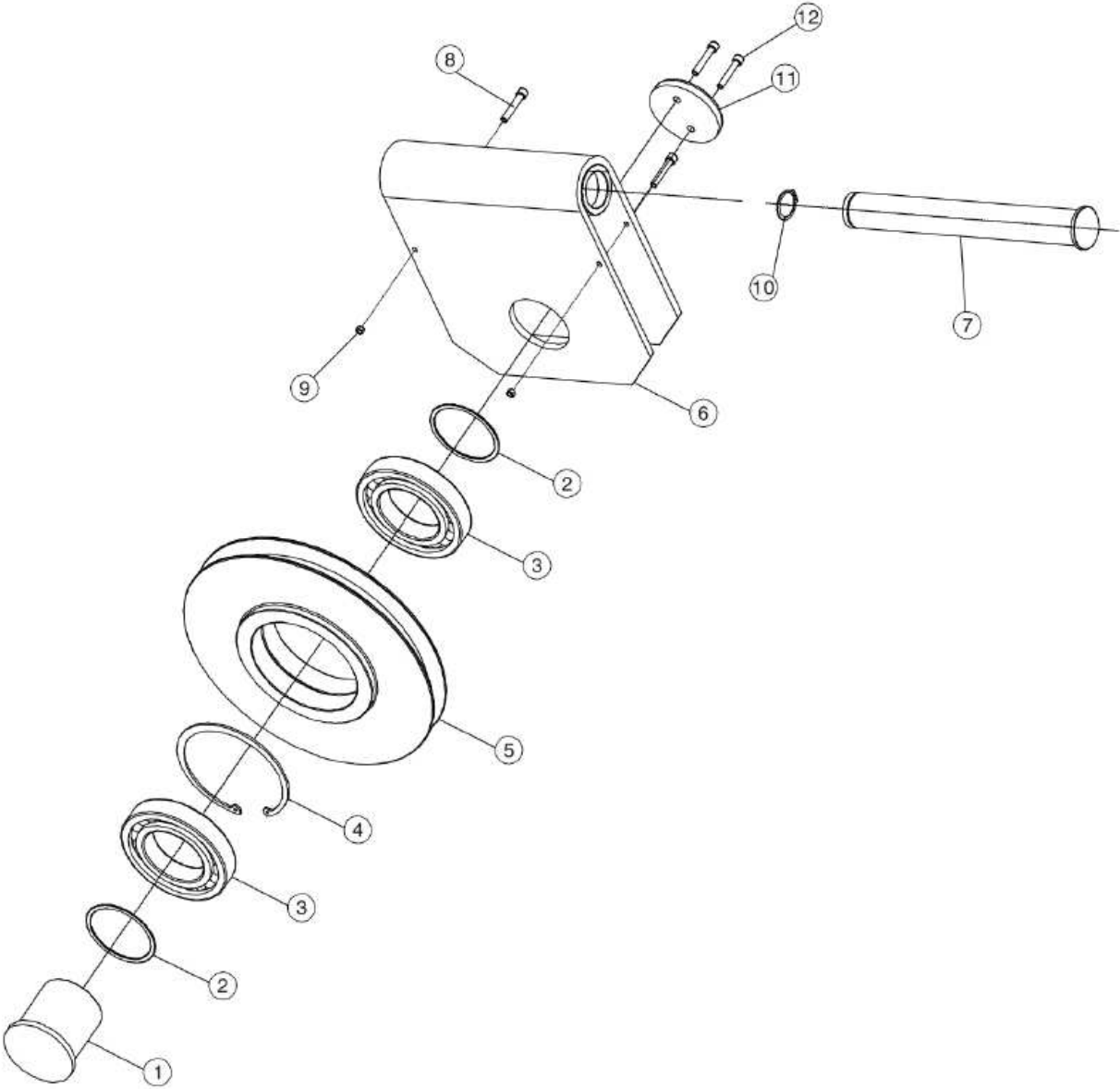
## 28.10 Lower Hook and Block



## 28.11 Lower Hook and Block Part List

Drawing No.	Part Description	Part Numbers		
		5 Ton	7.5 & 10 Ton	15 & 20 Ton
1	Lower Block Assy – Includes #1-21	Starkeamerica.com	Starkeamerica.com	Starkeamerica.com
2	Spring Washer			
3	Elastic Cylindrical Pin			
4	Outboard			
5	Side Cover			
6	Pulley			
7	Washer			
8*	Bearing			
9	Retaining Ring for Hole			
10	Inner Lift Plate			
11	Pulley Shaft			
12	Hook Screw			
13	Bearing			
14	Load-Bearing Beam			
15*	Lower Hook			
16*	Safety Latch			
17*	Safety Latch Spring			
18	Flat Washer			
19	Self-Locking Nuts			
20	Flat Washer			
21	Hexagon Socket Head Cap Screws			

### 28.12 Upper Equalizer Pulley Diagram





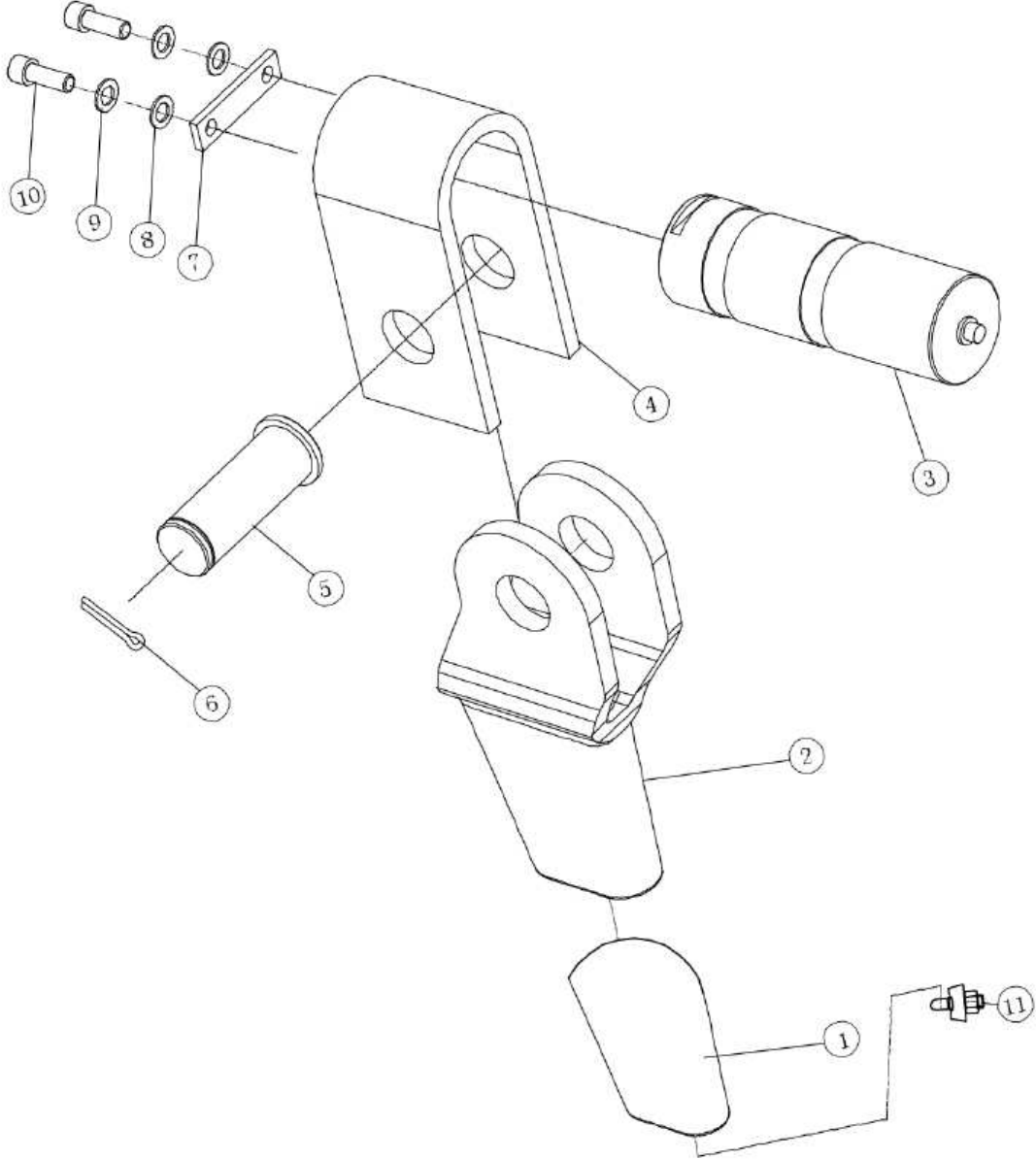
## 28.13 Upper Equalizer Pulley Part List

Equalizer pulley parts differ based on capacity and wire rope diameter. Please contact [Starkeamerica.com](http://Starkeamerica.com) with parts requests referencing the below version number listed on each page and the page number along with your item name.

Critical spare parts are designated with an asterisk.

Drawing No.	Part Description	Qty
1	Pulley Shaft	1
2	Washer	2
3*	Bearing	2
4	Retaining Ring for Hole	1
5	Pulley	1
6	Lift Plate	1
7	Support Shaft	1
8	Hexagon Socket Head Cap Screws	2
9	Self-Locking Nuts	2
10	Retaining Ring for Shaft	1
11	Self-Locking Nuts	1
12	Hexagon Socket Head Cap Screws	2

28.14 Dead End Wedge Assembly Diagram



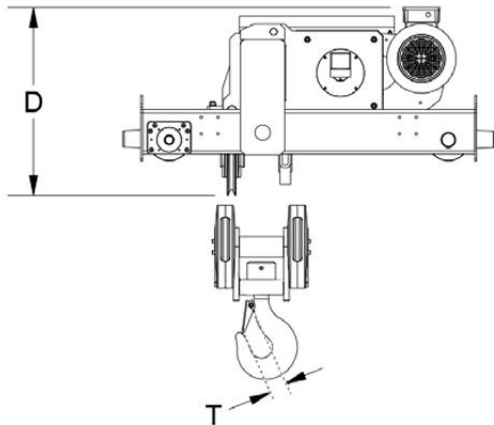
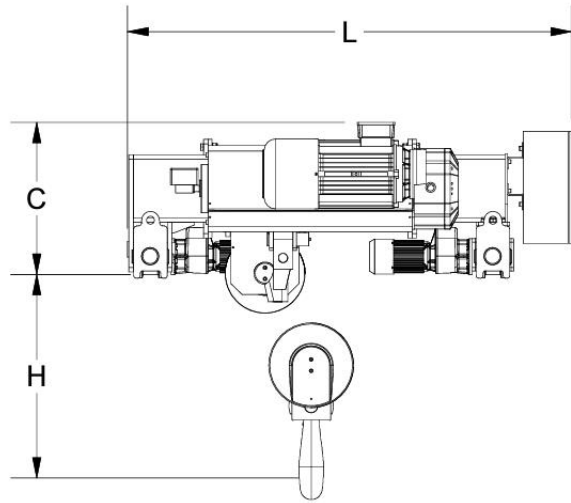
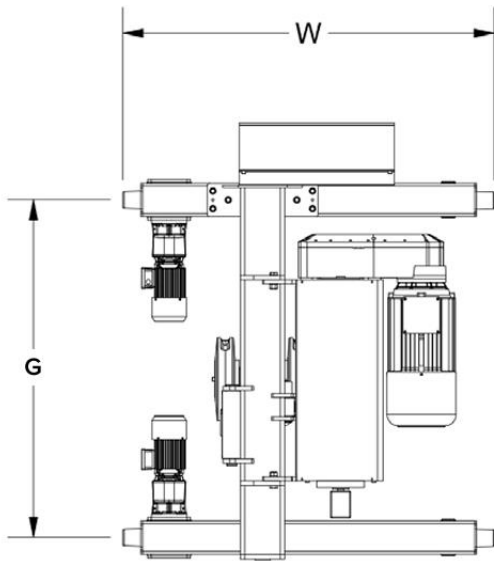
## 28.15 Dead End Wedge Part List

Dead end wedge parts differ based on capacity and wire rope diameter. Please contact [Starkeamerica.com](http://Starkeamerica.com) with parts requests referencing the below version number listed on each page and the page number along with your item name.

Critical spare parts are designated with an asterisk.

Drawing No.	Part Description	Qty
1	Lock Wedge	1
2	Wedge Joint	1
3*	Overload Protector Load Cell	1
4	Hanging Board	1
5	Mount Pin	1
6	Cotter Pin	1
7	Fixed Shaft Plate	1
8	Spring Washer	2
9	Flat Washer	2
10	Hexagon Socket Head Cap Screws	1
11	Wire Rope Clamp	1

## 29.0 Hoist Dimensions



Model	C	D	G	L	H	T	W
STW0520							
STW0720	21 13/16"	26 1/2"	60" MIN	77 3/16" MIN	28 3/4"	2 1/4"	54 3/16"
STW1020	21 13/16"	26 1/2"	60" MIN	77 3/16" MIN	28 3/4"	2 1/4"	54 3/16"
STW1520	26 5/8"	33 3/8"	60" MIN	77 11/16" MIN	28 11/16"	3"	66"
STW2020	26 5/8"	33 3/8"	60" MIN	77 11/16" MIN	28 11/16"	3"	66"

## 29.1 Standard Hoist Specifications

Model	ISO/FEM	Brake	Rating	Reeving	ASME	Elec	Cont. Volt.
STW0520	M5/2m	IP54	NEMA 3	Single/4 part	H4	460/230 3ph	110V ac
STW0720	M5/2m	IP54	NEMA 3	Single/4 part	H4	460/230 3ph	110V ac
STW1020	M5/2m	IP54	NEMA 3	Single/4 part	H4	460/230 3ph	110V ac
STW1520	M5/2m	IP54	NEMA 3	Single/4 part	H4	460/230 3ph	110V ac
STW2020	M4/1Am	IP54	NEMA 3	Single/4 part	H3	460/230 3ph	110V ac



## Starke Products Warranty

### 1 Year (12 Month) Parts & Labor Warranty

Unless otherwise specified, Starke guarantees that our products are free from material defects in design and workmanship under normal use, proper maintenance, and service.

This warranty is strictly limited to 12 months for single shift operation or 2,000 hours after installation, or 14 months after shipment, whichever is shorter. Within ten days after defect is found, warrantee must deliver a written notice to Starke providing defect information. All requested warranty information must be received promptly by Starke in no more than 5 business days.

**Customer is responsible for all shipping charges on returned/warrantable items. Starke will cover the repair (parts and labor) at no charge or provide a replacement item at Starke's discretion.**

This warranty does not cover defects or damage caused by acts of God, unusual wear and tear, improper use, or improper maintenance by the user. No responsibility for consequential damage is expressed or implied, and the responsibility under this warranty/guaranty is limited to the repair or replacement of the defective materials. Repair or replacement of the item is fully at the discretion of Starke.

*ALL OTHER REPRESENTATIONS, EXPRESS OR IMPLIED, WARRANTY, OR LIABILITY RELATING TO THE CONDITION OR USE OF THE PRODUCT ARE SPECIFICALLY DISAVOWED, AND IN NO EVENT SHALL STARKE BE LIABLE TO BUYER, OR ANY THIRD PARTY, FOR ANY DIRECT OR INDIRECT CONSEQUENTIAL OR INCIDENTAL DAMAGES*

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Contact Your Starke Representative for More Information on Products to Help Maximize Your Workplace Efficiency



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