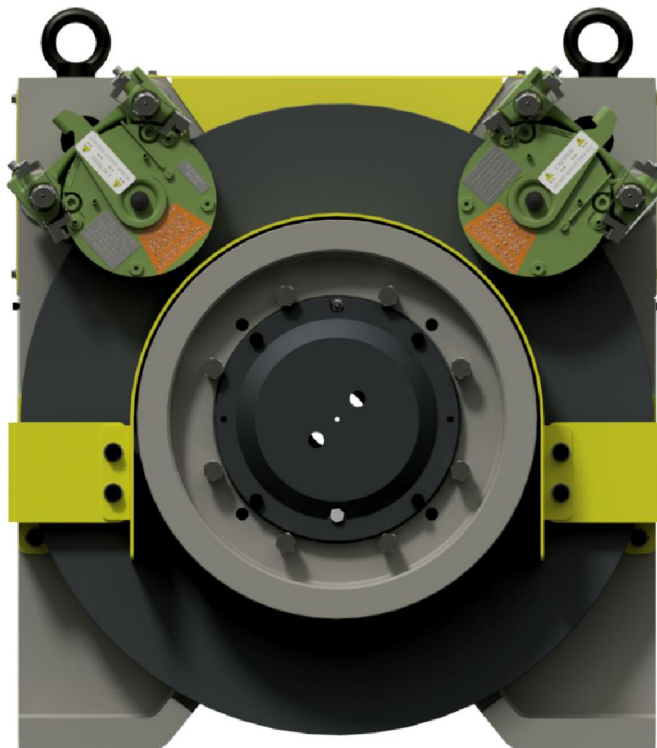




A **VANTAGE** Company

Installation & Service Manual GL080 AC Permanent Magnet Gearless Traction Machine



© Hollister-Whitney Elevator Co. LLC
#1 Hollister-Whitney Parkway
Quincy, IL 62305
Phone 217.222.0466 • Fax 217.222.0493
6/3/2020



WARNING

This installation and service manual is intended for the use of qualified and authorized elevator personnel ONLY. For your safety and the safety of others, do not attempt ANY procedure that you are not qualified and authorized to perform. Recommended procedures must be done in accordance with the applicable rules of the latest edition of the National Electrical Code; the latest edition of ASME A17.1; and all governing local codes. Every attempt has been made to ensure that this guide is accurate and up to date. Hollister-Whitney Elevator Co. LLC assumes no liability for consequences resulting from any error or omission. Please notify Hollister-Whitney Elevator Co. LLC regarding any difficulties with this guide.

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1

1 Introduction

1.1 Description

Thank you for choosing the GL080 Permanent Magnet AC Gearless Machine!

The GL080 machine has been designed for use in 2:1 roped, machine room and machine-room-less (MRL) applications with VVVF controls. The machine is designed with 20 poles to provide smooth, quiet, and long-lasting operation.

Hollister-Whitney machines are designed to perform in a tolerant machine space. The machine space working temperature should be held between 35°F & 104°F, (1.7°C & 40°C) and humidity should be held to an average of 90% non-condensing.

1.2 Warranty Information

All parts and equipment manufactured by Hollister-Whitney Elevator Co. LLC. are guaranteed against defects in material and workmanship for a period of one (1) year from the date of shipment.

Warranty covers only the repair or replacement of parts, F.O.B. our factory, upon determination by inspection at our factory that warranty is applicable.

Equipment and components not of our manufacture are warranted only to the extent of the original manufacturer's warranty.

Our warranty specifically does not include any other incidental liability or expense such as transportation, labor, and unauthorized repairs.

2

2 Safety Precautions

Read this section before any work is performed on elevator equipment.

*** IMPORTANT** —The procedures contained in this manual are intended for the use of qualified elevator personnel. In the interest of your personal safety and the safety of others, do NOT attempt ANY procedure that you are NOT qualified to perform.

All procedures must be done in accordance with the applicable rules in the latest edition of the National Electrical Code; the latest edition of ASME A17.1; and any governing local codes.

2.1 Terms in This Manual

⚠ CAUTION: Caution Statements identify conditions that could result in damage to the equipment or other property if improper procedures are followed!

⚠ WARNING: Warning Statements identify conditions that could result in personal injury if improper procedures are followed!

2.2 General Safety

Specific warnings and cautions are found where they apply, and DO NOT appear in this summary.

2.3 Electrical Safety

All wiring must be in accordance with the National Electrical Code and must be consistent with all state and local codes.

2.4 Electrical Hazards

Electric shocks can cause personal injury or loss of life. Circuit breakers, switches and fuses may NOT disconnect all power to the equipment. Always refer to the wiring diagrams. Whether the A/C supply is grounded or not, high voltage will be present at many points.

2.5 Mainline Disconnect

Unless otherwise suggested, always turn OFF. Lock and Tag out the mainline disconnect to remove power from the equipment.

2.6 Test Equipment Safety

Always refer to manufactures' instruction book for proper test equipment operation and adjustments.

Megger testing, or buzzer type continuity testers, can damage electronic components. Connection of devices such as voltmeters on certain low-level analog circuits may degrade electronic system performance. Always use a voltmeter with a minimum impedance of 1M Ohm/Volt. A digital voltmeter is recommended.

2.7 When Power Is On

Dangerous voltages exist at several points in some products. To avoid personal injury, do NOT touch exposed electrical connections or components while power is On.

2.8 Product Specific Warnings

WARNING

GL080 series machines MUST be balanced during hoisting. See paragraph 3.3 for proper lifting configurations.

WARNING

Hang the elevator car before removing ANY bolts. Failure to do so may result in severe injury and equipment damage.

3



3 Arrival of the Equipment

3.1 Receiving

Immediately upon arrival of the machine, make a visual check for any external damage. If any damage incurred in transit is found, make notice of the claim in the presence of the carrier and notify Hollister-Whitney. If necessary, do not put these machines into operation without first consulting Hollister-Whitney.

If the machine has gotten wet during transportation, make notice of the claim in the presence of the carrier and notify Hollister-Whitney. See also Section 3.5.

Check the machine data tag to ensure the machine conforms to your order.

PM-AC GEARLESS ELEVATOR MACHINE			
MODEL:		CONT. SER. NO:	
HP:		HZ:	
VOLTS:		AMPS:	
RPM:		POLES:	
DUTY:		INSUL. CLASS:	
AMB:		MACH. WT.:	
SPEED:		CAPACITY:	
TORQUE:		SUSPENSION:	
BRAKE PICK:		E. BRAKE PICK:	
BRAKE HOLD:		E. BRAKE HOLD:	
 HOLLISTER-WHITNEY ELEVATOR CO., LLC		 CSA B44.1 ASME A17.5 FILE #88181	

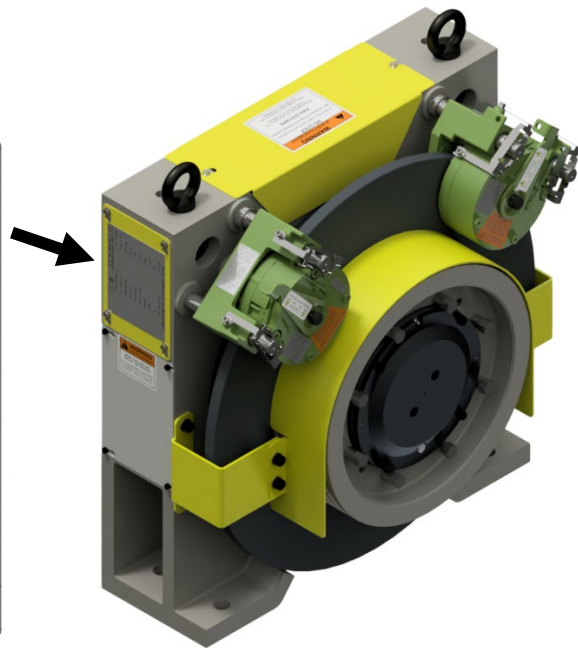


Figure 1 Data Tag

3.2 Handling

The machine will be delivered on a wooden pallet. It can be left on the pallet and moved with a standard fork truck or pallet jack.

3.3 Hoisting

The machine weighs approximately 1100 lbs. (500 kg). When the machine is removed from the pallet, it must be lifted by using the hoisting eyebolts provided at the top of the machine.

When lifting the machine, pull straight up on the hoisting eyebolts using a spreader beam or other suitable rigging apparatus to prevent damage to or failure of the eyebolts, which could result in dropping the machine. See Figure 2 for proper lifting illustrations.

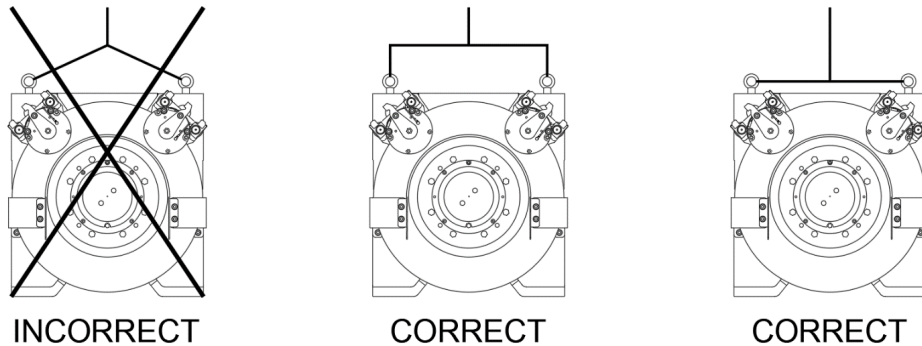


Figure 2 Proper Lifting Illustration



WARNING

Use only the hoisting eyebolts when lifting the machine! Do not use any other machine component to lift the machine! Lifting the machine by any other component will result in damage to the machine or possible failure of the component resulting in the machine falling from the hoisting system!

Follow all the necessary precautions to avoid damage to the machine or risk to personnel when moving or hoisting the machine.

3.4 Storage

During storage in a warehouse or on the elevator job site, precautions must be taken to protect the machine from dust, dirt, moisture, metal shavings and temperature extremes.

For short term storage, place the machine in a warm, dry and clean environment.

Protect the machine from harsh weather conditions and temperature variations that can lead to condensation.

Protect from dust and metal shavings. Metal dust and shavings can be attracted into the machine by the magnets.

For longer term storage, follow the recommendations above plus; place the machine in a sealed, waterproof enclosure. Add a dehydrating packet that is sized for the enclosure's volume and humidity level.

3.5 Moisture, Condensation

Before installing the machine, and before any voltage is applied, check the machine for condensation, or any evidence of moisture or water. If any evidence of wetness is found, contact Hollister-Whitney for drying instructions.

After the machine has been dried per factory instructions, it will be necessary to verify the insulation between each coil phase and earth ground. Using an insulation tester (or megohm-meter) check the insulation resistance at 500VDC. The resistance should be *NO LESS* than 100 Mohm.

4

4 Application

4.1 Overview

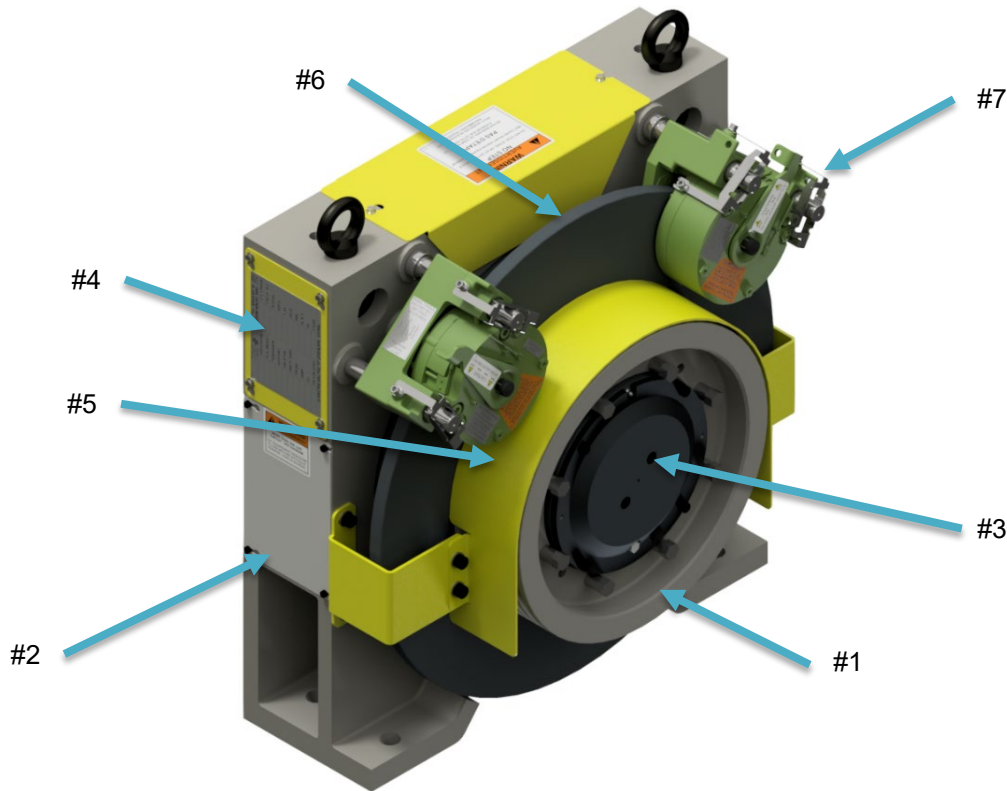


Figure 3 Machine Components

The GL080 series machine is synchronous permanent magnet gearless machine designed for elevators. The machine has 20 poles to provide smooth, quiet and long-lasting operation. Its configuration allows speeds up to 350 fpm (maximum) and an elevator capacity up to 2500 lbs. with 2:1 roping, single wrap arrangement at 50% counterbalance. See Section 4.4 for complete specifications.

The GL080 machine brake system uses two independent disc brakes: a normal brake and an emergency brake.

The following is a list of major components of the GL080 series machines. Along with a description of their functions, there is an overview of some of the critical adjustments and maintenance information. See Installation and Maintenance for detail.

1. **Traction Sheave** - A grooved sheave is connected directly to the machine rotor. The grooves provide traction between the sheave and the hoist ropes.
2. **PM Motor Housing** - The housing contains the PM windings used to provide the necessary torque and speed to move the elevator in operation.
3. **Encoder** – (Behind Cover) This device is directly coupled to the rotor of the machine. It is provided to give the absolute speed feedback of the hoist motor to the inverter drive system and to the elevator controller.
4. **Nameplate** – Displays the machine rated data and manual factory serial number information.
5. **Sheave Guard/Rope Retainer** – Provides rope retention and keeps hoist ropes away from contact after rope installation.
6. **Machine Rotor & Brake Disc** - The smooth surfaced disc is connected to the main shaft. When the brake is energized, the brake is released from the brake disc.
7. **Brake** - The electromechanical device is used to prevent the elevator from moving when the car is at rest.

4.2 Codes and Standards

These machines are designed to comply with ASME A17.1/CSA B44 code. The motors are designed with insulation class F minimum and have been approved by and carry a CSA approved label.

4.3 Environmental Specifications

- Operating ambient temperature: 35° F to 104° F (1.7 C to 40 C)
- Humidity average of 90% non-condensing

4.4 Machine Specifications

- Traction Sheave (removeable) Diameter: 15.75 in (400 mm)
- Rope Size: 3/8" dia. (9.5 mm) or 10mm
- Main and emergency disc brakes, each capable of holding 125% of the load
- Brake switches, wired normally open standard
- Heidenhain EnDat01 ECN1313 2048 encoder and 20-meter long cable (standard)
- Eyebolts for hoisting the machine
- Sheave guard/rope retainer

Model	Voltage (AC)	Current (Amps)	Cap. 2:1 @ 50% CB		System Load*		Car Speed		RPM	Power		Torque		BTU/Hour
			lbs	kg	lbs	kg	ft/min	m/sec		HP	kW	ft/lbs	Nm	
GL080-35H	460	30	2500	1134	13228	6000	350	1.78	170	19	14	581	788	3450

Table 1- Maximum Detailed Specifications

* Note: The overall system load is calculated by adding the following items:

Empty Car Weight + Counterbalance Weight + Capacity + Hoist Rope Weight + Compensation Weight + Traveling Cable Weight

4.5 Brake Specifications

- 2 brakes are supplied standard from the factory
- One brake is designated as “Emergency Brake” with a tag/sticker. The other is therefore the primary service brake.
- Brake switch rating 250 VAC 3A
 - Recommended switching current 24 VDC, 10 to 50 mA (minimum switching current 12 VDC, 10mA)
- Switches can be wired –
 - Normally Open – Black & Blue wires (as shipped)
 - Normally Closed – Black & Gray wires

Description	UOM	Mayr 6
Pick (over-excitation) Voltage: 3 seconds max.	VDC	104 @ 1.49A
Pick Power	W	155
Hold Voltage	VDC	52 @ 0.75A
Hold Power	W	39
Resistance	ohms	69.8

- The machine brakes are mounted in 2 locations.

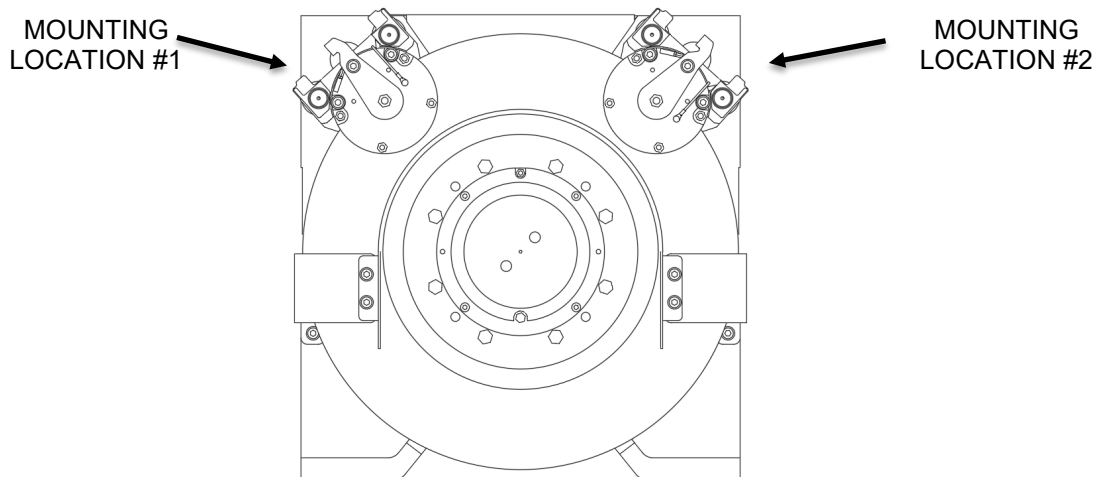


Figure 4 Brake Locations

- Machine dimensions and parts list can be found at the end of this book.
- The latest Hollister-Whitney manuals, bulletins and procedures are available for download from the Hollister-Whitney website.

5

5 Installation

5.1 Machine Mounting

- Before hoisting the machine into place, verify all the hoisting equipment is rated for the 1100 lbs. weight of the machine. See Section 3.3
- Provide a level, structurally supported (rated for the load on the machine) machine space with proper clearance around the machine for maintenance and adjustments.
- This machine is primarily intended to be mounted in traditional overhead and MRL (machine-room-less) applications with down-pull forces on the traction sheave.
- It may be used in a basement application if the machine is inverted and may be mounted horizontally for additional flexibility.

5.1.1 Traditional Overhead Mounting

- Anchor the machine to the structural support surface using the (4) mounting hole locations in the base. The hardware required to anchor the machine to the support surface should be at least 7/8" diameter, grade #5 minimum, with standard washers. Hardware adhering to ASME A325 is also suitable.

Note - Due to the varying mounting surface thicknesses, no mounting hardware is shipped with the machine.

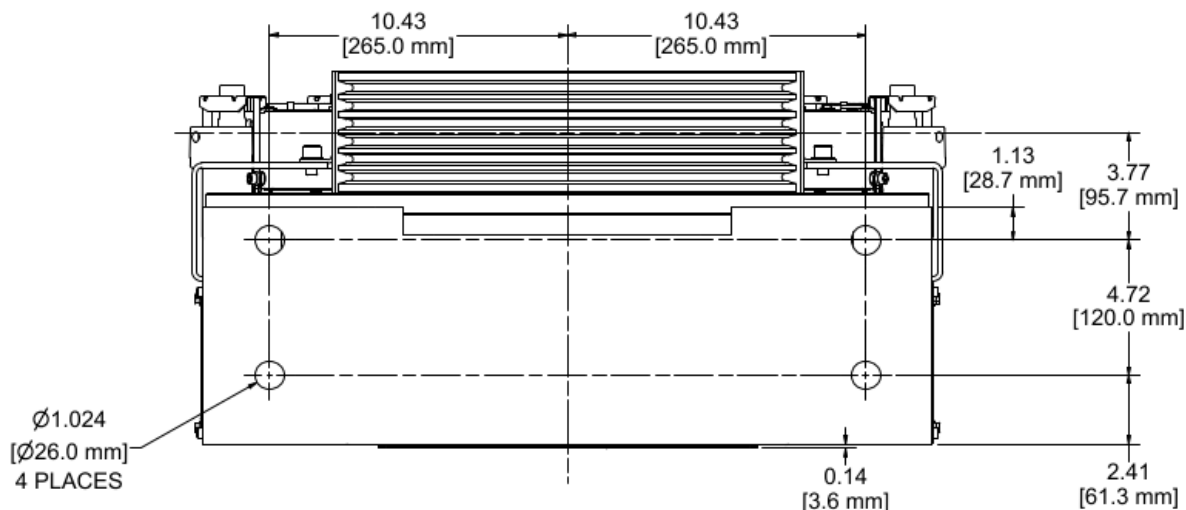


Figure 5 Mounting Hole Locations

5.1.2 Basement Set Mounting

- When used in a basement application, the machine must be **inverted** and mounted either within a specially designed tie-down frame supplied by Hollister-Whitney, or to the underside of substantial structural framing supplied by others.

- It is required that the mounting create the necessary “down-pull” on the traction sheave relative to the base mounting.
- Refer to all applicable building codes and ASME A17.1 when selecting hardware to anchor the machine to the structural supports in an up-pull application.
- Use the more stringent criteria between the building codes, ASME-A17.1 and the minimum hardware grades identified above.

5.1.3 Horizontal Mounting

- When used in a horizontal application, the machine must rest on a suitable support and be mounted either with a specially designed tie-down frame supplied by Hollister-Whitney, or to the vertical structural framing supplied by others.
- It is extremely important to follow the brake centering instructions (see Section 5.3) when the machine is mounted horizontally.
- It is required that the mounting create the necessary “down-pull” on the traction sheave relative to the base mounting.
- Refer to all applicable building codes and ASME A17.1 when selecting hardware to anchor the machine to the structural supports in such an application.
- Use the more stringent criteria between the building codes, ASME-A17.1 and the minimum hardware grades identified above.

5.2 Electrical Connection

- Use the project wiring diagrams (with the motor configuration information) to connect the motor to the controller.

5.2.1 Machine Wiring

WARNING

Before performing any electrical connections, make sure that power supply is turned off. Only then proceed with connecting electrical leads to power supply. Never work in machine electrical enclosure while power supply is on!

Direct connection to the three-phase power is forbidden, it may destroy the motor.

- The Thermal Protection Switch (TPS) is wired with leads labeled and supplied into the machine electrical enclosure. Refer to Figure 6.
- Consult your controller manufacturer for appropriate TPS connections.
- Verify the electrical supply from the elevator drive and brake power supplies match the machine data tag. Refer to Figure 1.

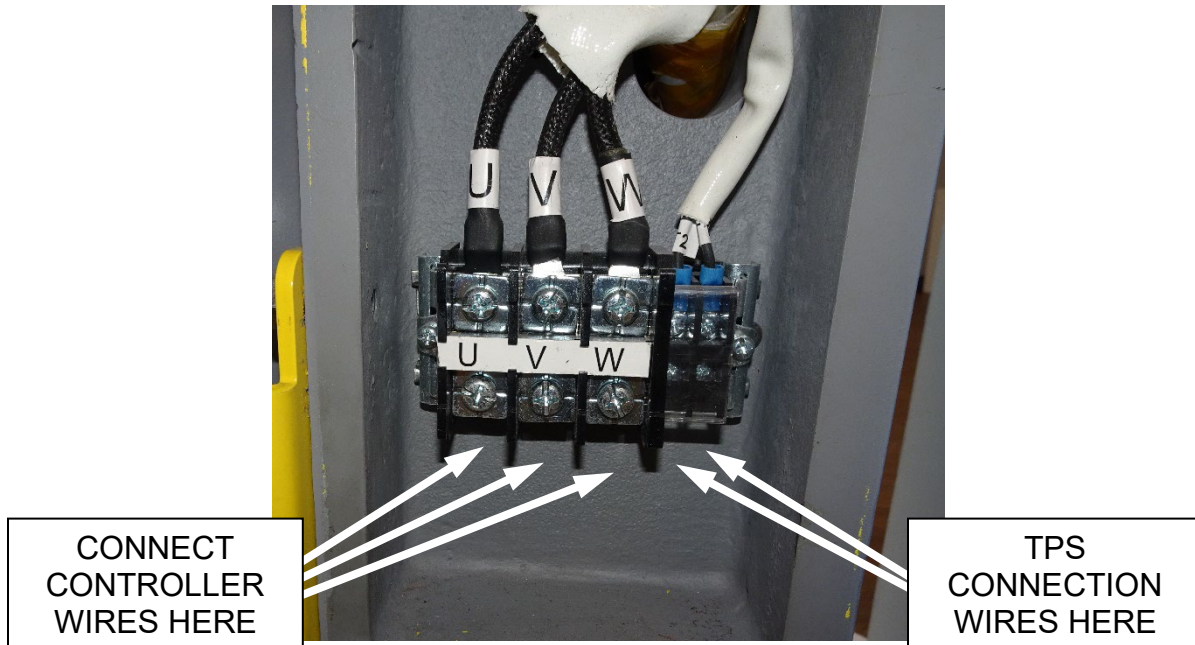


Figure 6

- Connect the U-V-W lines from the drive as shown in Figure 6.
- Earth Ground connects to the ground lug terminal inside the electrical enclosure.

Note: Check and tighten all leads (motor side and line side) on installation.

⚠ WARNING

THE MACHINE AND EMERGENCY BRAKE COILS MUST BE INDEPENDENT!

IT IS THE RESPONSIBILITY OF THE USER TO CONNECT THE MOTOR IN ACCORDANCE WITH THE CURRENT LEGISLATION AND REGULATIONS IN THE COUNTRY OF USE. THIS IS PARTICULARLY IMPORTANT IN REGARD TO WIRE SIZES USED TO CONNECT THE POWER AND EARTH GROUND AND THE TYPE AND SIZE OF FUSES.

5.2.2 Brake Connection

- Connect the machine brake and emergency brake where shown in Figure 7 below.
- The brake switches are wired normally open from Hollister-Whitney.
- To change the switches to function as normally closed, remove the blue wire from the terminal block in the electrical enclosure, and replace it with the spare gray wire coming from the brake switch.

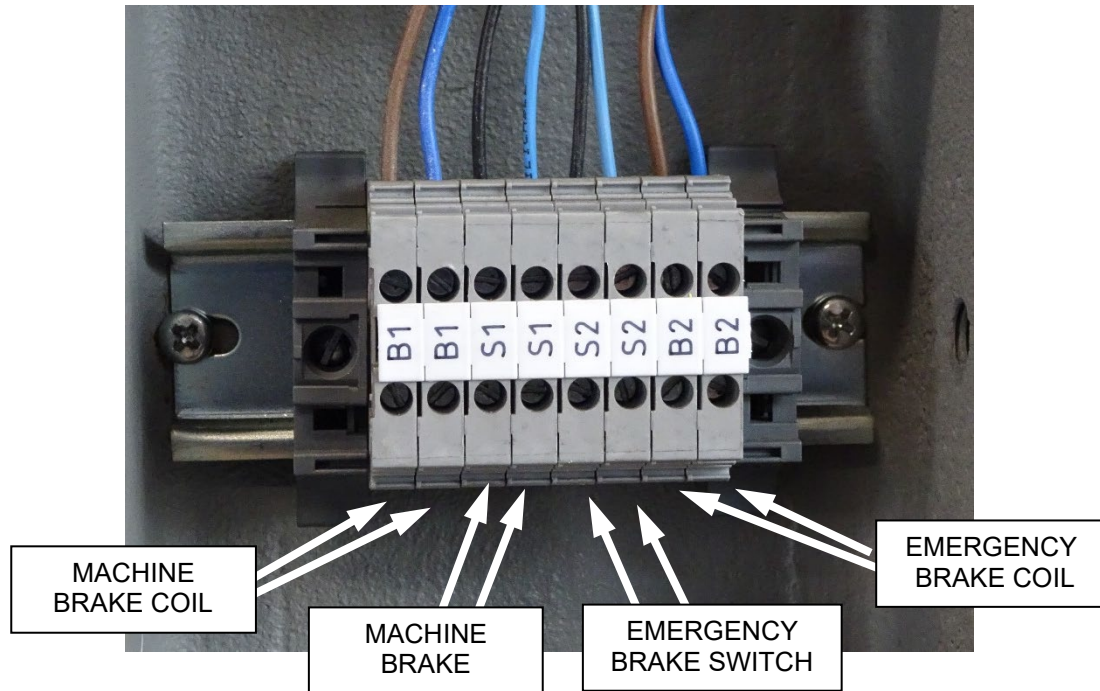


Figure 7 Normal & Emergency Brake Wiring

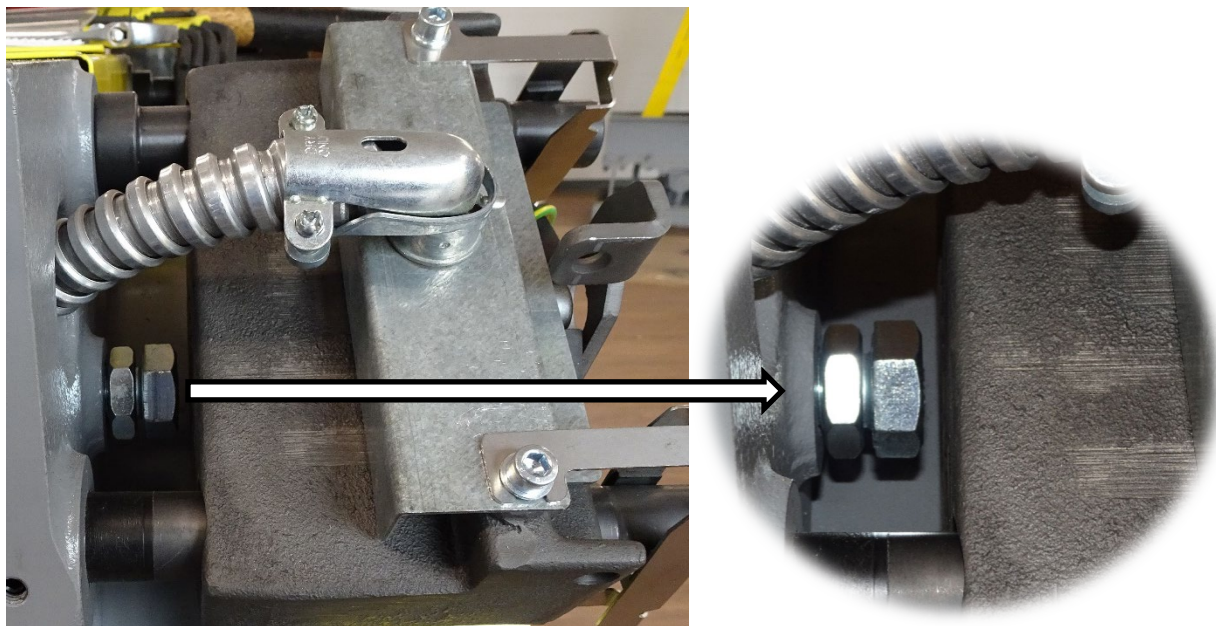
5.3 Brake Adjustment/Centering

- Brake air gap is checked with brake de-energized.

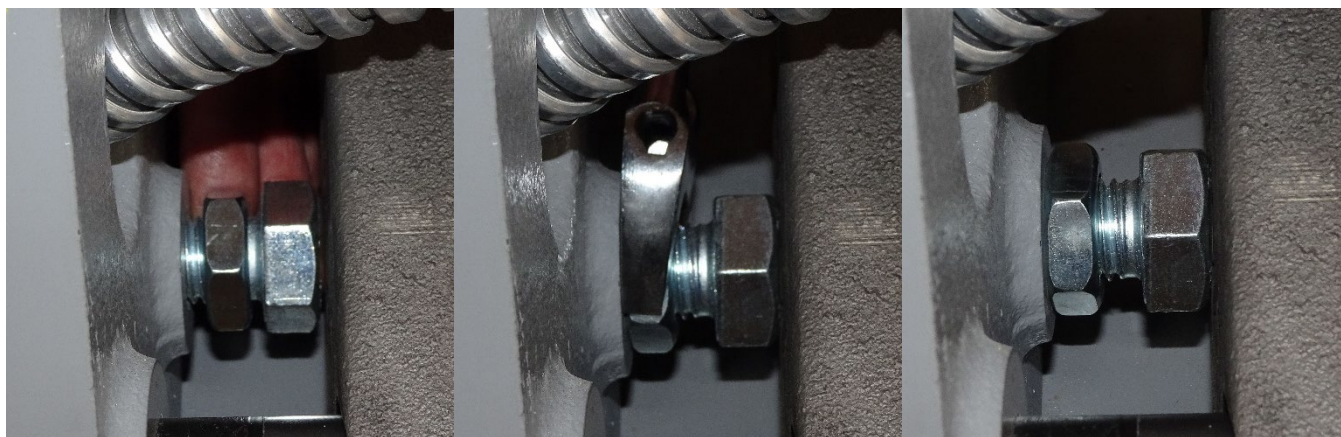


Figure 8

- Move rubber dust shield to expose Air Gap.
- Check Air Gap between Coil Carrier Assembly and Armature Disc. Brake Air Gap is factory set and should be approximately 0.020 inch (new condition). See Figure 8.

**Figure 9**

- When brake gap is confirmed check/adjust Stop Bolt so that the brake when picked is centered on the disc (Figure 9). Center will be indicated by an equal gap from brake pad to rotor on both sides. (For 0.02" Air Gap, the Pad/Rotor gap will be approximately 0.01" on both sides.)

**Figure 10**

- Tighten the stop bolt jam nut (Figure 10).

5.4 Encoder Connection

- The machines are supplied with Heidenhain EnDat01 ECN1313 2048. A 1.5-meter encoder cable is connected to the encoder and extends from the back of the machine.
- Connect the supplied encoder cable to the encoder cable extending from the back of the machine.
- When using a KEB drive, the encoder cable can be used "as-is."

- When using any other manufacturer's drive, consult control manufacturer for cable compatibility and availability. DO NOT modify the KEB cable without first consulting the control manufacturer. Any modification of the KEB cable voids its warranty.
- There are 2 cable classifications, and each has its own color coding per cable. See the attachments at end of this manual for diagrams.

5.5 Startup

- Brake Disc (rotor) surfaces should be examined and cleaned of all foreign material prior to startup. See Sections 5.3 and 5.6.
- Verify all the motor related settings in the elevator controller match the information on the machine data tag. Refer to Figure 1.
- Verify that all the brake parameters match the information on the machine data tag. Refer to Figure 1.
- Remove any dirt, grease or rust that may have accumulated on the brake rotor during storage or installation. Use fine sandpaper or emery cloth with light pressure to remove rust from the rotor, taking care to keep the rust and metal dust out of the machine.
- Follow the controller manufacturer's procedure for alignment of the magnets.
- Briefly run the machine to verify the machine functionality and brake operation.
- Verify the drive sheave is plumb and aligned with the rope drop locations.
- Install the hoist ropes, adjust the rope shackles and check the ropes for equal tension. The rope tension must be uniform, or it may cause vibration and premature wear on the traction sheave and hoist ropes.
- Re-verify the traction sheave is plumb once the machine is fully loaded.

5.6 Brake Burnishing

- Brake Disc (rotor) surfaces should be examined and cleaned of all foreign material. Use only Isopropyl Alcohol (IPA) for brake cleaning. **DO NOT use Commercial Brake Cleaning products** to clean the brakes or brake rotors as these products may affect the brake pad (friction lining) materials. Never spray liquids of any kind directly on Hollister-Whitney equipment. Apply IPA to a clean, lint-free cloth prior to wiping the brake clean. Brake Guide Rods/Pins can be cleaned in the same way.

WARNING

BRAKES MUST BE BURNISHED TO ACHIEVE FULL STOPPING TORQUE!

- **Each brake on the machine must be burnished separately.** Repeat the following procedure for each brake.
- Clamp the brake on the rotor. (De-energize the brake circuit.)
- Run the elevator in the direction of the load at 11 RPM for 1 minute
- If the overall travel of the elevator will not allow the burnishing time listed to be met on one pass, open (energize) the brake at the bottom of the hoist way, lift the load back to the top and repeat the run until the full burnishing time has been achieved.

- Stop occasionally to ensure the rotor and brake do not overheat.
- After burnishing, re-verify the air gap between the brake pads and the rotor. For brake check procedure and service follow Section 5.3.
- Air gap should remain at approx. 0.020 inch.

*** NOTE: Air gap can surpass 0.020 inch but must not exceed 0.040 inch. ***

5.7 Manual Brake Release (Optional Equipment)

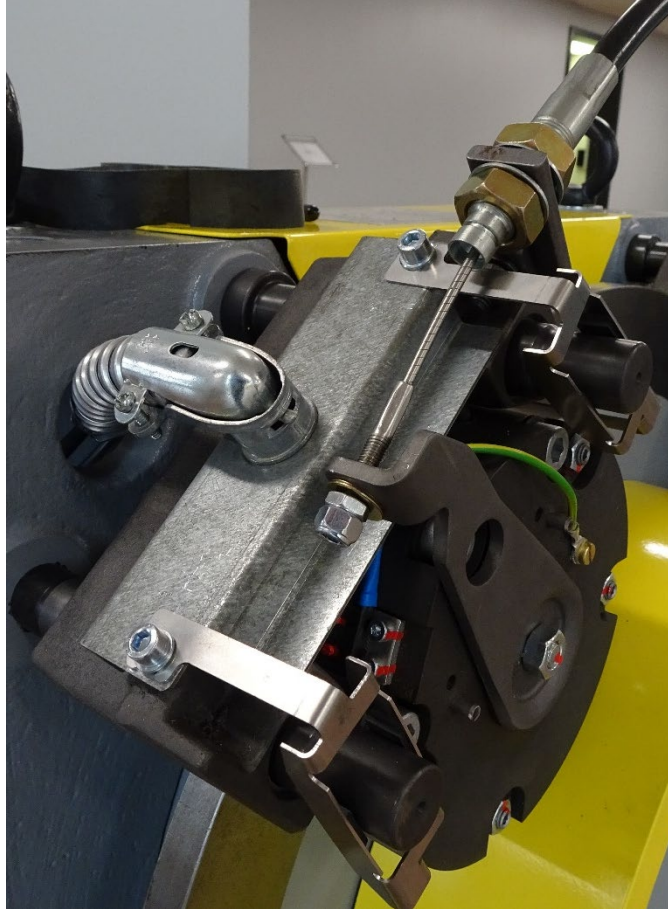


Figure 11 Manual Brake Release

- The manual brake release cable is optional equipment (Figure 11) that should be specified at the time of ordering. The standard cable length is 8'. Other lengths are available by special order up to 30'. H-W does not recommend cable lengths greater than this.
- Care must be taken when routing of brake release cables to reduce the number of tight bends. Avoid "looping" extra cable length. Tight bends or looping the cable casing can restrict the movement of cable within the casing and can have an undesirable effect on the ability of the cable to activate the Brake Release mechanism. Best practice is to keep the cable run as straight as possible. Cable bend radius is recommended to be greater than 12" Radius and must not be below 6" minimum radius. Testing of the cable routing is prudent to assure proper operation. If proper operation is not possible with current routing and no other routing options are available, shortening the cable to remove the routing restriction(s) is recommended.

- The brake release handle mounting plate may be mounted in any location that will be easily accessible to maintenance personnel.
- The manual brake release handle must be removed from the mounting plate prior to normal elevator operation.

NOTICE TO THE CUSTOMER:

Concerning sealing Hollister-Whitney PMAC Gearless Machine Brakes;

- As the customer may know, ASTM A17.1-2013/CSA B44-13 states in part (see section 8.6.4.20.4);

...” For elevators installed under ASME A17.1-2000/CSA B44-00 and later editions, have the brake setting verified in accordance with the data on the brake marking plate. Upon completion of the test, the means of adjusting the holding capacity shall be sealed to prevent changing the adjustment without breaking the seal....”

- Hollister-Whitney uses the following MAYR Corporation#6 ROBA-diskstop, #6/894.510.03s disc brakes on the GL080
- These brakes are factory set and holding capacity of these brakes is not adjustable.
- Note again the code statement above; “...the means of adjusting the holding capacity shall be sealed...”
- Since no “means of adjusting the holding capacity” are available, and brake holding capacity is not adjustable, no means are necessary or provided to modify the brake to accept a seal.

6

6 Maintenance

WARNING

Before performing any maintenance checks on equipment, take all the necessary safety precautions to immobilize the car and counterweight to prevent any unintended movement during the maintenance period that may result in injury or death!

6.1 General

- To keep equipment functioning efficiently, good maintenance practices must be established, observed and maintained. Systematic inspections of the equipment should be scheduled, and records kept of these inspections. Monitoring these records will indicate any sign of a potential issue.
- Each installation has its own special conditions, so it is not possible for Hollister-Whitney to outline an overall plan for periodic maintenance. Hollister-Whitney would recommend, at a minimum, yearly inspections, but installation conditions may warrant a more frequent schedule. The maintenance contractor will need to make the final determination.

6.2 Cleaning

- Dirt, dust, excess lubrication, and moisture are the greatest enemies of electrical equipment and of maintenance teams in general. Dirt and dust layers on a machine can prevent heat dissipation, which can lead to overheating and eventual insulation breakdown. Many types of dust in an elevator machine room are electrically conductive and can also lead to insulation failure. Dust and dirt can draw moisture to unpainted surfaces such as brake rods causing oxidation that can cause brake faults. Excess lubrication can draw dust and dirt as well.
- Dust and dirt can be removed from surfaces with a dry, lint-free cloth, or with suction. With suction, however, care must be taken to not build up or discharge static electricity while cleaning. Dry, compressed air (at less than 50psi) may also be used to remove dirt and dust, however, this must be closely monitored as the compressed air will re-suspend the dust and dirt in the machine room atmosphere.
- Brake Disc (rotor) surfaces should be examined and cleaned of all foreign material. Use only Isopropyl Alcohol (IPA) for brake cleaning. **DO NOT use Commercial Brake Cleaning products** to clean the brakes or brake rotors as these products may affect the brake pad (friction lining) materials. Never spray liquids of any kind directly on

Hollister-Whitney equipment. Apply IPA to a clean, lint-free cloth prior to wiping the brake clean. Brake Guide Rods/Pins can be cleaned in the same way.

6.3 Bearings

- Bearings have been sized for the maximum speeds, loads and capacities found in this manual at 50% duty. Bearings must be greased at least yearly, but greasing frequency will ultimately depend on duty and hoistway conditions.



Figure 12

- To grease bearings, first remove the pressure relief plug on the rotor (front) of the machine. See Figure 12.



Figure 13

- The grease point is opposite the relief plug. See Figure 13.
- Apply 2-3 oz. of grease (use Shell “**Gadus S3 V220C 2**” or equal) at least yearly or according to the maintenance schedule for the installation conditions.

- Bearings L₁₀ calculated life rating (based on speed, loads and 50% duty) is approximately 15 years. Please note that installation conditions vary, so shorter or longer bearing life may be experienced.

6.4 Brake Wear

WARNING

If the brake lining wears too much, the brake will be disabled.

6.4.1 Suggested check cycle

- Every 3 months after install in the first 6 months.
- Every 1 year afterwards.

6.4.2 Benchmark Criteria

- Brake Air Gap must be less than 0.04" (1mm)
- Brake air gap is checked with brake de-energized.



Figure 14

- Move rubber dust shield to expose Air Gap.
- Check Air Gap between Coil Carrier Assembly and Armature Disc. Brake Air Gap (new condition) is should be approximately 0.020" (0.51mm).
- The brake lining wear, indicated by the air gap measurement, must be less than 0.04" (1mm). Use feeler gauges to check gap around the brake between Coil Carrier

Assembly and Armature Disc. If brake wear is excessive replace the brake lining or replace the whole brake assembly. See Figure 14.

6.5 Other Items

- Traction Wheels, Brake Shoes, and Brake Discs are typically the only items that will exhibit any wear. Of these, the Brake Disc is the least likely to exhibit wear. Brake Shoes are also unlikely to wear but can be monitored using feeler gages. Consult the Brake Section of this manual for brake inspection procedures. In general;
 - Check Brake(s) for maximum air gap. If air gap is greater than .040 inch, replace brake pads.
 - With Brake(s) energized, push then pull on Brake Caliper, Brake should slide free on rods (pins). If Brake(s) do not move, clean or replace Brake pins and or Brake Caliper.
 - Check Brake Rotor surface for rust. If rust is present it can be removed with fine sandpaper (suction must be used to remove sanded material). Moisture causing the rust must be eliminated.
- Traction Wheels are the most likely item on the Hollister-Whitney PMAC machines to wear. Periodic measurements of rope depth and the evenness of wear for all ropes (groove depth should wear evenly) should be monitored. Cable should not be more than 0.125 inch (1/8") below the outer rim of the Traction Wheel. If Cable(s), are below 0.125 inch, or if wear is uneven, replace Traction Wheel and Cables.
- Check machine guarding and rope retainers for clearance and attachment hardware for tightness. Adjust as necessary.



7 Replacement

WARNING

Only qualified personnel are allowed to perform the replacement work. The person who performs the replacement work must make sure that the machine power is off and that the elevator will not move unexpectedly.

7.1 Front Encoder Replacement

Required Tools & Materials:

- Encoder (ECN1313)
- Hex wrench
 - 2mm
 - 4mm
 - 6mm
 - 8mm
- Hex sockets
 - 2mm
 - 4mm
- Torque Wrench (Need to measure 9 in-lbs. and 44 in-lbs.)
- M10 bolt (at least 1" or 25mm in length)

7.1.1 Encoder Removal

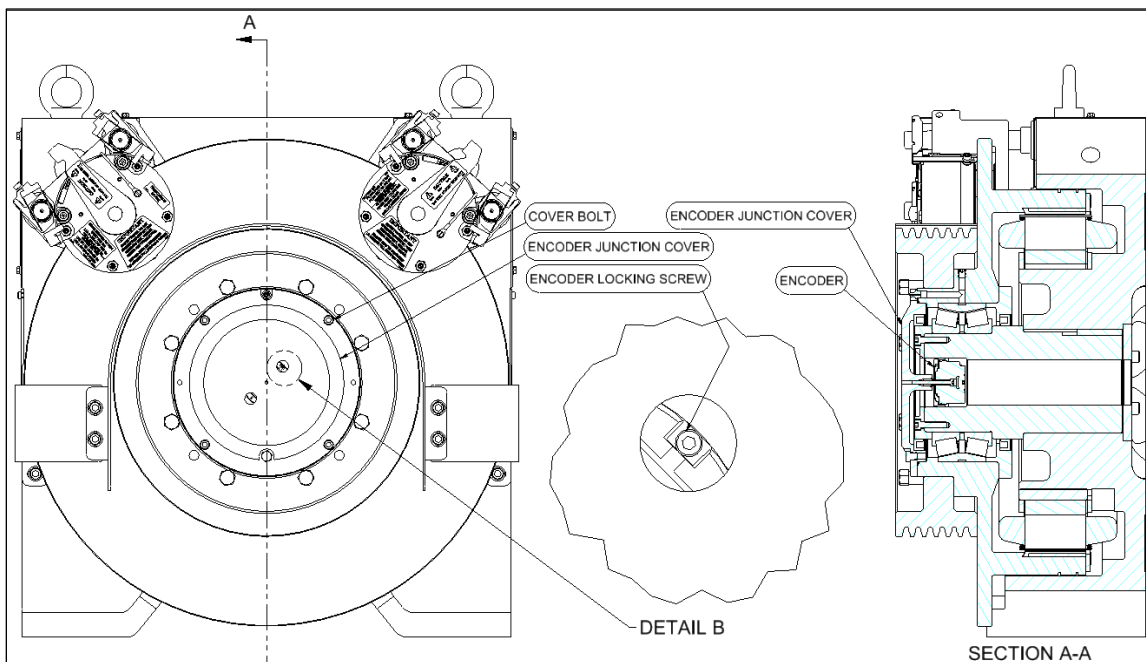


Figure 15 Machine/Encoder Detail

1. Rotate the machine so that the encoder locking screw is visible from the access hole on the encoder cover, as shown in Figure 15, Detail B.

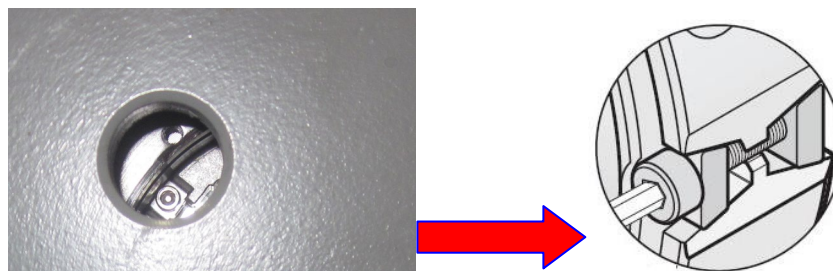


Figure 16 Loosen M2.5 Locking Screw

2. Loosen the encoder locking screw M2.5, as shown in Figure 16, with hex wrench (2mm) through the encoder cover hole. The screw does not need to be removed.
3. Ensure there is enough encoder cable so that it can be pulled through machine when the encoder is removed.



Figure 17

4. Remove the four bolts (M8x25) using the hex wrench (6mm). See Figure 17.
5. Insert 2 bolts (M8x25) in jacking holes and jack the cover off.



Figure 18

6. Remove Cover and attached Encoder. See Figure 18.



Figure 19 Remove Covers

7. Remove the encoder bolt cover using the hex wrench (4mm) and the encoder cable protective cover. See Figure 19.



Figure 20 Remove Wiring Harness

8. Carefully Remove Wiring Harness, See Figure 20. **Note: Do not apply excessive pressure on the cable. It may destroy the encoder cable.**
9. Leave the encoder cable in the machine. It does not need to be removed.

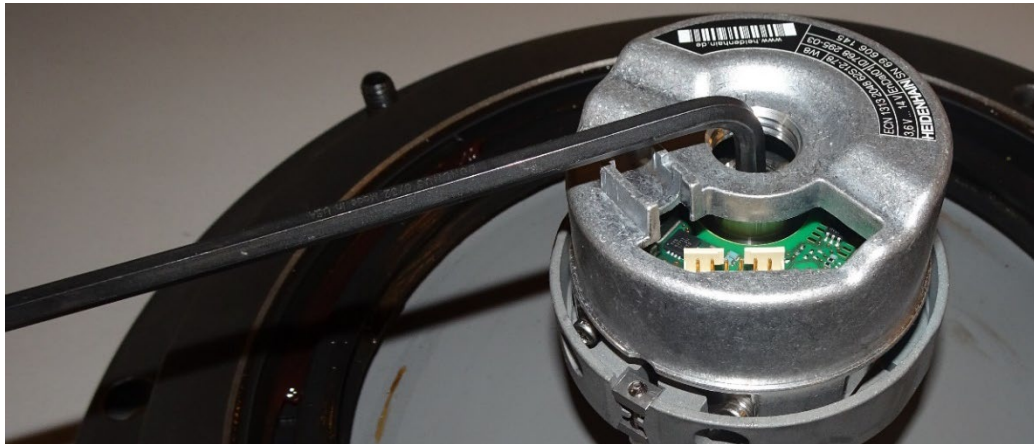


Figure 21

10. Loosen the bolt M5 inside by hex wrench (4mm) 2~3 turns only. Do not remove this bolt yet (**M5 bolt must remain in the encoder so the M10 bolt can push against it**). See Figure 21.



Figure 22

11. Insert an M10 bolt into the encoder housing. See Figure 22.



Figure 23

12. Turn the M10 bolt against the M5x50 bolt to push the encoder from the shaft. The encoder will “pop” free and will be loose to the touch yet still retained by the M5 bolt. See Figure 23.



Figure 24

13. Remove both bolts and the encoder, Figure 24.

Note: Steps 11 and 12 may have to be repeated until the encoder can be freely removed.

7.1.2 Encoder Installation



Figure 25 What's in the Box



Figure 26

1. Loosen and remove the bolt M2.5 and nut assembly in the new encoder. See Figure 26.



Figure 27

2. Flip the screw and nut assembly, and then reinstall it as shown in Figure 27. Be sure the screw can be accessed from outside the machine.

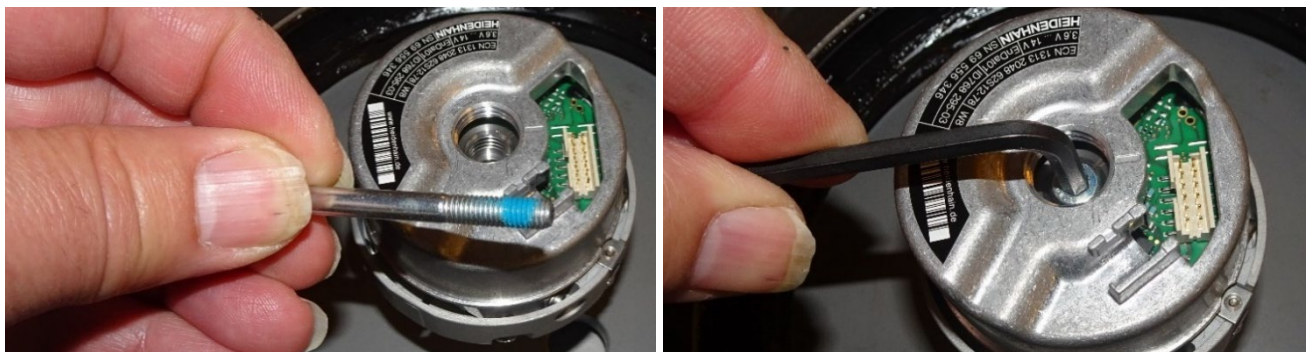


Figure 28

3. Install the encoder to the encoder cover. Use the bolt M5 to secure the encoder to the encoder cover by hex wrench (4mm). Use 4mm socket Allen and torque wrench to tighten the bolt to 44 in-lbs. See Figure 28.



Figure 29

4. Reinstall the encoder cable on the encoder. Take care to orient the plug and socket correctly. See Figure 29.



Figure 30

5. Place the cable cover on the encoder and secure with the cover nut (and cover) to the encoder. See Figure 30.



Figure 31

6. Replace Cover and attached Encoder. See Figure 31.
Note: Verify no encoder wiring is pinched by cover.



Figure 32

7. Install the four bolts (M8x25) using the hex wrench (6mm). See Figure 32.
Note: Align the M2.5 bolt on the encoder with the hole on the encoder cover so that the M2.5 bolt is visible and accessible from outside of the machine.

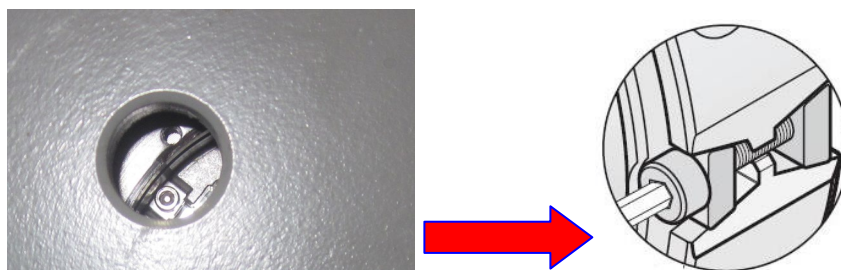


Figure 33

8. Tighten the bolt (M2.5) of the encoder collar with the torque wrench and socket Allen wrench (2mm) to 9 in-lbs. through the encoder cover hole. See Figure 33.
9. Reconnect the power supply of machine and test it.
10. Align the encoder per controller instructions.

7.2 Brake Replacement

Required Tools & Materials:

- Adjustable wrench
- Hex wrench (4mm, 5mm)
- Small flat head screwdriver

WARNING

Before performing any maintenance on the machine brake(s), land the counterweight and take all the necessary safety precautions to immobilize the car and counterweight to prevent any unintended movement during the maintenance period that may result in injury or death!

Read the entire brake replacement procedure before beginning any of the steps outlined below. Contact Hollister-Whitney with any questions prior to beginning the brake repair or replacement.

Before opening any electrical enclosures on the machine, remove all electricity from the machine and brakes to prevent electrical shock that may result in injury or death during the maintenance period!

7.2.1 Brake Removal

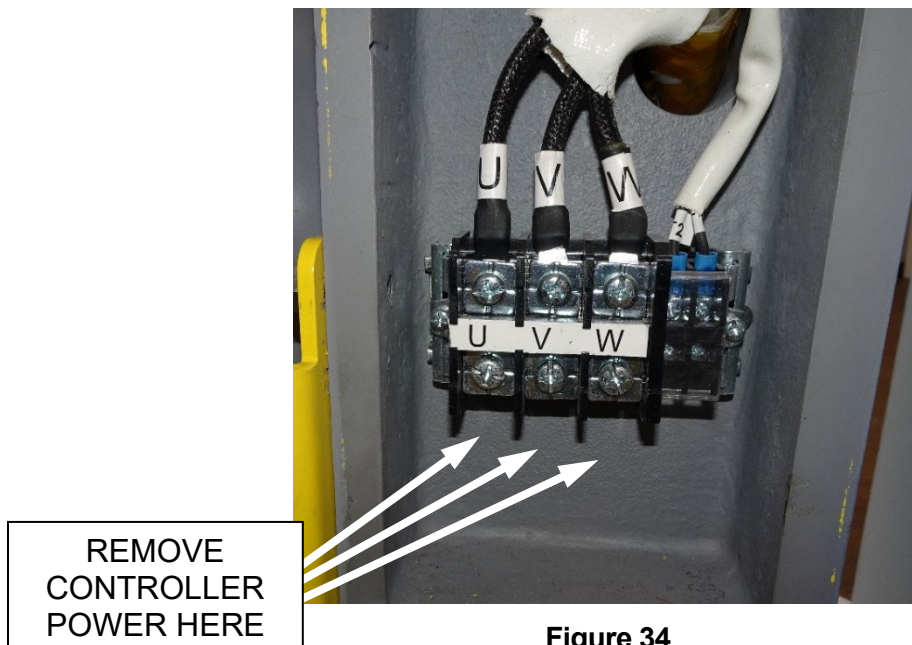


Figure 34

1. Remove Covers as necessary to access Terminal Blocks and Brake Pin Set Screw (4mm hex key).
2. Disconnect Machine Power, see Figure 34.

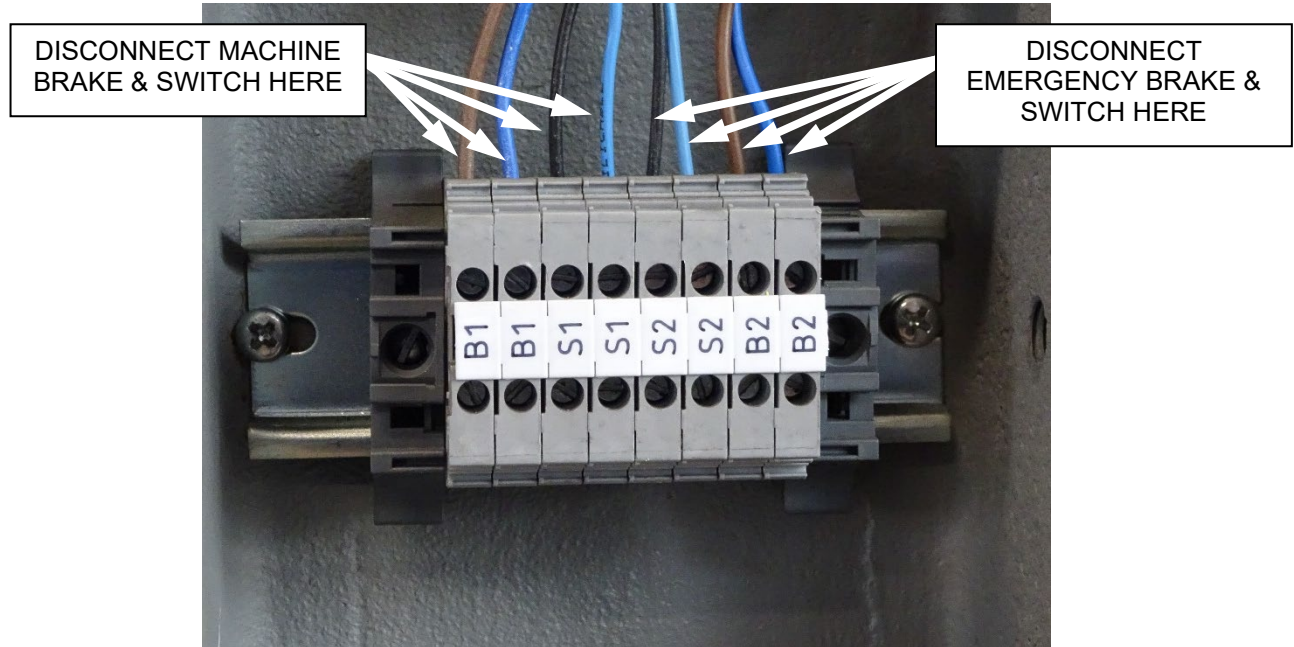


Figure 35

3. On the MACHINE side disconnect the Brake and Brake Switch wires for the brake that is to be worked on (Figure 35).

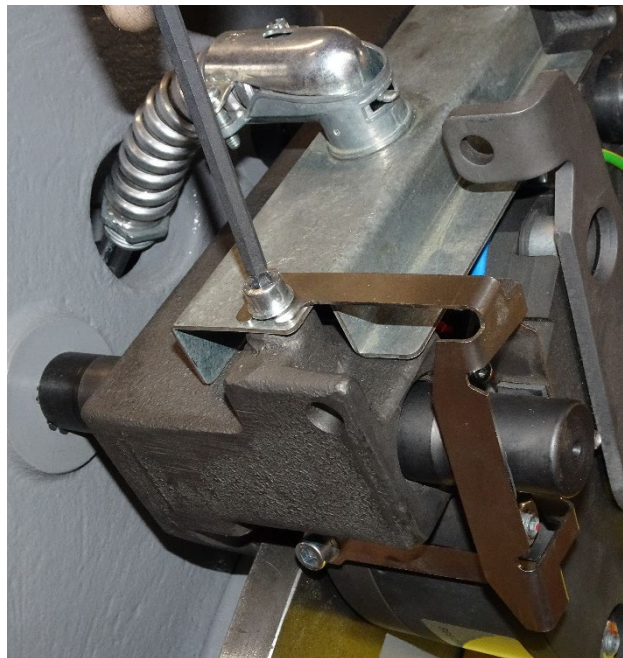


Figure 36

4. Remove the brake centering device (5mm hex key) if so equipped (Figure 36).

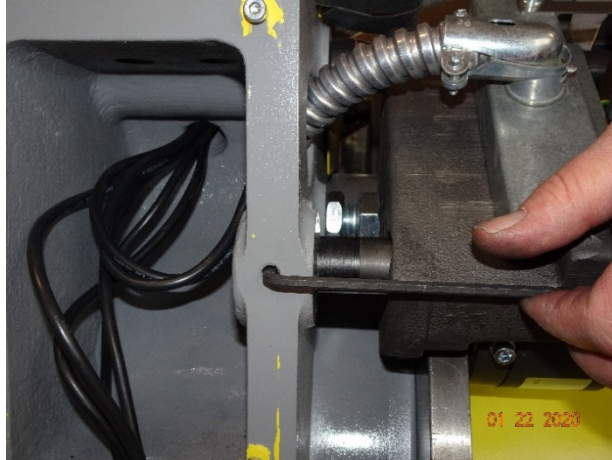


Figure 37

5. Loosen the set screw (4mm hex key, Figure 37).

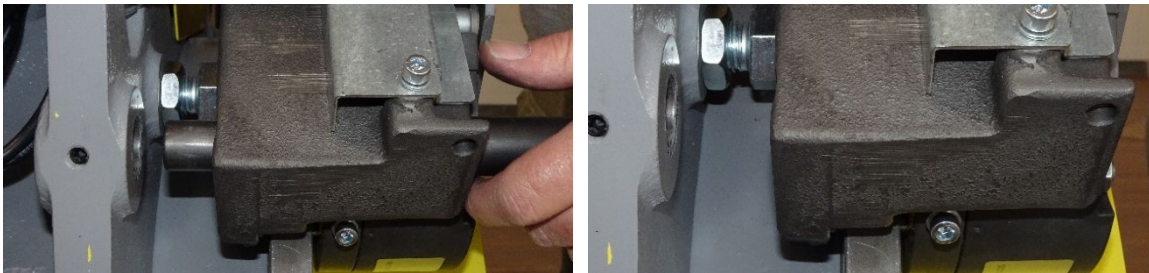


Figure 38

6. Remove the brake pin (Figure 38).

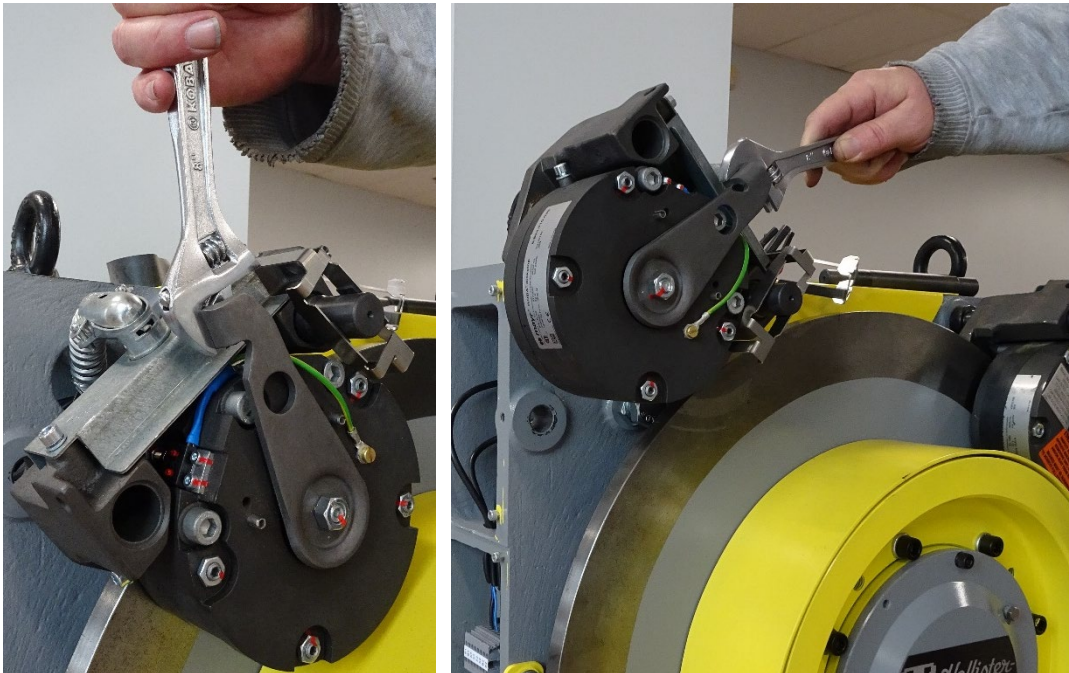


Figure 39

7. Using an adjustable wrench on the brake release lever tip the brake up out of position until the brake clears the rotor. Pressure on the brake release lever opens the brake to allow this to happen (Figure 39).

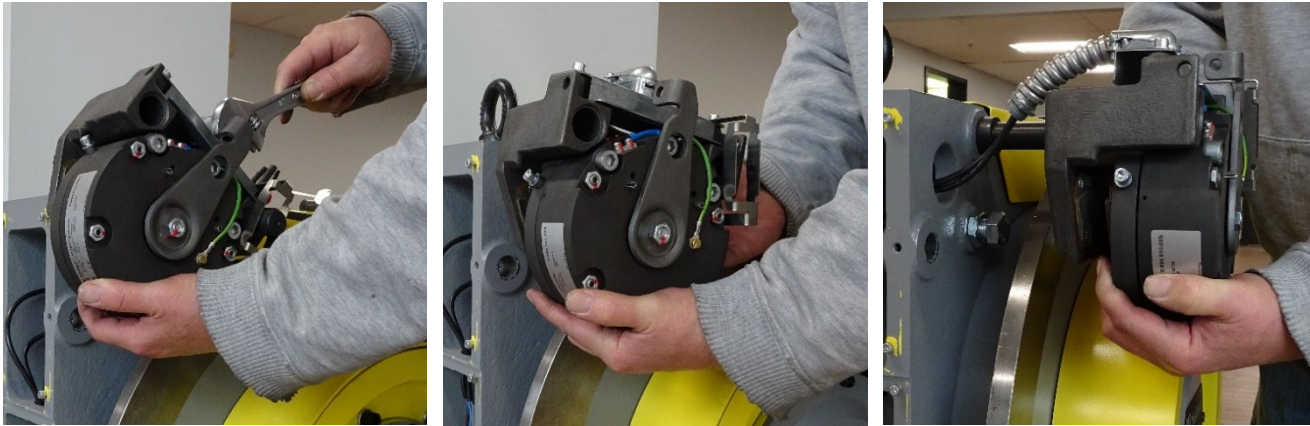


Figure 40

8. Slide the brake off the remaining brake pin and transfer it to a convenient work surface (Figure 40).
9. New or repaired brakes are replaced in the reverse order of the above instructions.
10. After new or repaired brakes are installed, follow the procedures for brake burnishing found in Section 5.6. Each brake on the machine must be burnished separately.

⚠WARNING

BRAKES MUST BE BURNISHED TO ACHIEVE FULL STOPPING TORQUE!

7.2.2 Brake Adjustment

- After installation of the brake, please refer to Section 5.3 to confirm brake is centered and air gap has been restored to factory specifications.

7.2.3 Brake Pad Replacement

- Please refer to Bulletin 1158 at <https://www.hollisterwhitney.com/support/> for instructions. Replacement kit part number is #146-004.

7.2.4 Brake Switch Replacement

- Please refer to Bulletin 1158 at <https://www.hollisterwhitney.com/support/> for instructions. Replacement kit part number is #146-005.

8

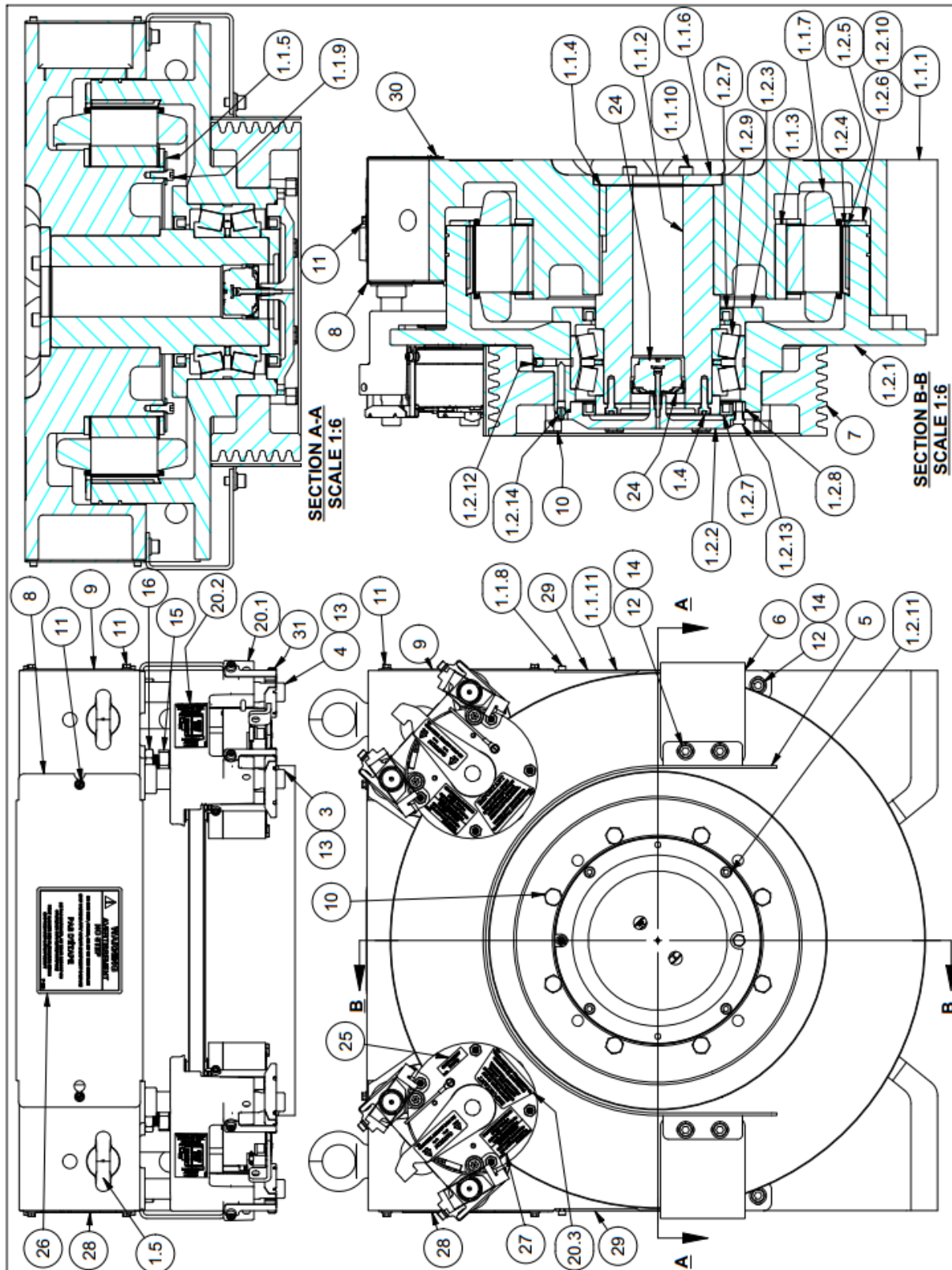
8 Drawings and Support Documents

8.1 Parts List

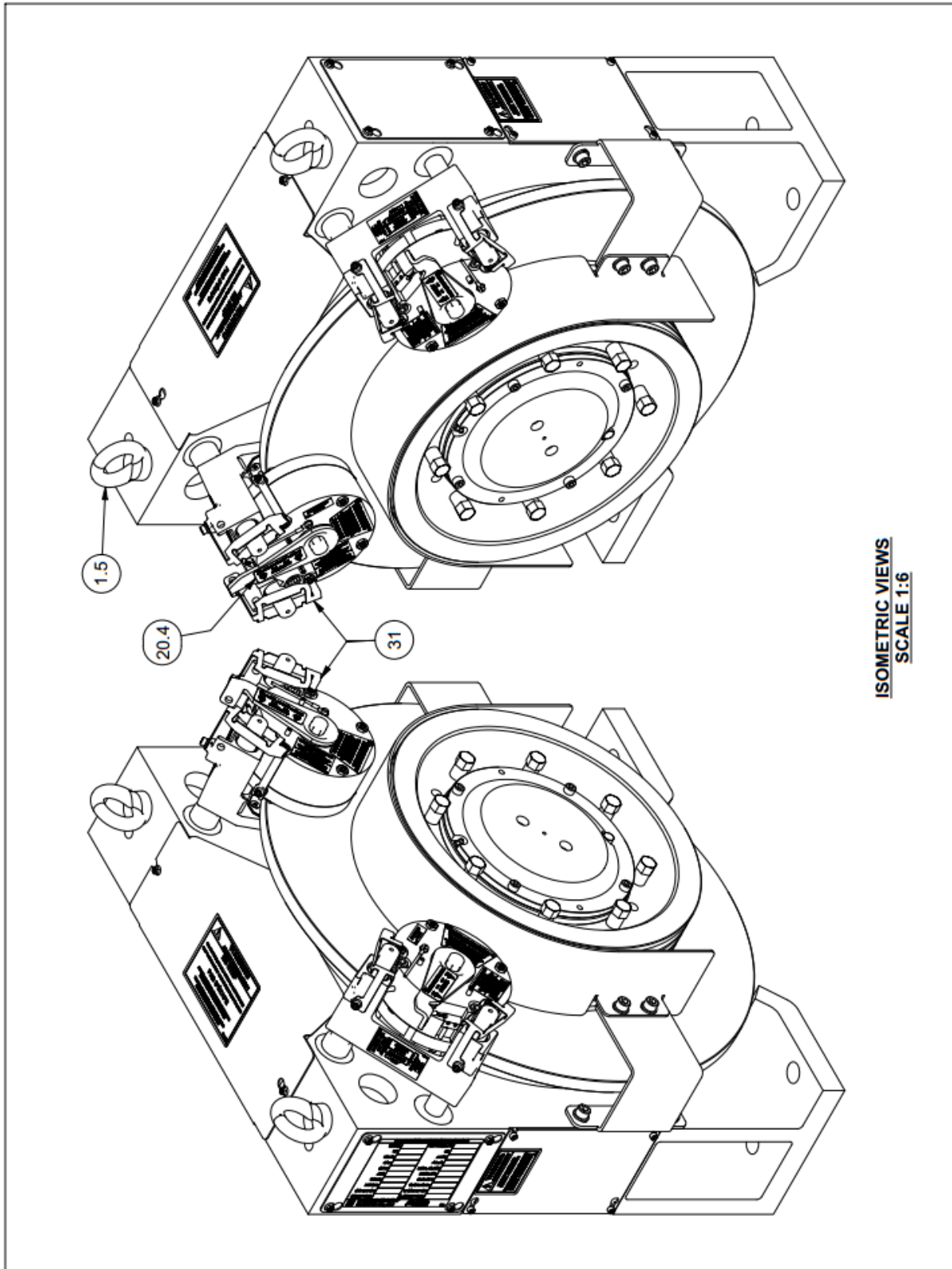
GL080-35L PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	GL080-35H-SA	SUB-ASSEMBLY - GL080-35 GEARLESS MACHINE
1.1	1	GL080-001-01	STATOR ASSEMBLY
1.1.1	1	GL080-001-01-001	STATOR FRAME
1.1.2	1	GL080-001-01-002	SHAFT
1.1.3	1	GL080-001-01-006	FLAT KEY 1
1.1.4	1	GL080-001-01-007	FLAT KEY #2
1.1.5	2	GL080-001-01-008	STATOR PLATE
1.1.6	1	GL080-001-01-012	SHAFT PLATEN
1.1.7	1	GL080-001-01-013	STATOR CORE
1.1.8	8	GL080-001-04-002	M5 - 0.8 X 12MM SHCS - METRIC
1.1.9	2	GL080-001-04-004	M8 - 1.25 x 20MM SHCS - METRIC
1.1.10	4	GL080-001-04-010	M10 - 1.5 X 40MM SHCS - METRIC
1.1.11	2	GL080-001-03-004	JUNCTION BOX COVER PLATE
1.2	1	GL080-001-02	ROTOR ASSEMBLY
1.2.1	1	GL080-001-02-001	BRAKE WHEEL
1.2.2	1	GL080-001-02-003	ENCODER JUNCTION COVER
1.2.3	1	GL080-001-02-004	BACK BEARING COVER
1.2.4	20	GL080-001-02-005	MAGNET
1.2.5	20	GL080-001-02-006	MAGNET ISOLATOR
1.2.6	6	GL080-001-02-007	PERMANENT MAGNET PLATEN
1.2.7	2	GL080-001-02-008A	SEAL, 160-190
1.2.8	1	GL080-001-02-008B	ROTOR CAP SEAL O-RING
1.2.9	1	130KBE031	BEARING
1.2.10	18	GL080-001-04-003	M8 x 1.25 x 16MM FHMS - METRIC
1.2.11	8	GL080-001-04-005	M8 - 1.25 X 35MM SHCS - METRIC
1.2.12	1	GL080-001-04-006	M10 - 1.5 X 12MM FLAT POINT SET SCREW - METRIC
1.2.13	1	GL080-001-04-011	1/8 BSPT 28 TPI PIPE PLUG
1.2.14	1	GL080-001-04-014	1/8 BSPT 28 TPI GREASE FITTING
1.3	1	GL080-001-01-005	BEARING FRONT COVER
1.4	6	GL080-001-04-005	M8 - 1.25 X 35MM SHCS - METRIC

1.5	2	GL080-001-04-021	STEEL EYEBOLT - FOR LIFTING
2	1	TB10+60DCK-1409-05P	MOTOR & THERMAL SWITCH TERMINAL BLOCK (NOT SHOWN)
3	2	GL080-001-01-009	BRAKE ROD, SHAFT 1
4	2	GL080-001-01-010	BRAKE ROD SHAFT 2
5	1	GL080-001-03-009	GUARD - 15.75" TRACTION SHEAVE
6	2	GL080-001-03-010	BRACKET - ROPE GUARD
7	1	GL080-001-03-011	TRACTION WHEEL
8	1	GL080-001-03-012	TOP COVER
9	2	GL080-001-03-013	SIDE COVER
10	8	GL080-001-03-014	BODY BOLT
11	10	GL080-001-04-001	M5 - 0.8 X 10MM FLANGE HS
12	8	GL080-001-04-007	M10 - 1.5 X 16MM SHCS - METRIC
13	4	GL080-001-04-008	M8 - 1.25 X 16MM CUP POINT SET SCREW - METRIC
14	8	GL080-001-04-009	M10 FLAT WASHER
15	2	GL080-001-04-012	M20-2.5 X 30MM
16	2	GL080-001-04-013	M20 JAM (THIN) NUT
17	2	GL080-001-04-018	GROUNDING LUG (NOT SHOWN)
18	2	GL080-011-04-019	M6 SCREW (NOT SHOWN)
19	1	GL080-001-04-020	HEIDENHAIN ENCODER CABLE W/PLUGS, 1.5 METER LG ID# 730736-22 (NOT SHOWN)
20	2	GL100-146-115S	MAYR #6 BRAKE WITH STANDARD STICKERS
20.1	2	GL100-146-115	MAYR #6 RSD6/894.510.03S 52V #8275067
20.2	2	P-175	TAG, GEARLESS MACHINE BRAKE AIRGAP DATA
20.3	2	P-190	ROTOR INSPECTION & BRAKE BURNISHING STICKER - GEARLESS MACHINE BRAKES
20.4	2	P-229	CAUTION LABEL - DO NOT ADJUST THIS NUT (MAYR GEARLESS BRAKES)
20.5	1	142-050	BLACK VINYL CAP
21	1	GL100-159-4	DIN RAIL (NOT SHOWN)
22	2	GL100-159-5	END STOP (NOT SHOWN)
23	8	GL100-159-7	TERMINAL BLOCK (NOT SHOWN)
24	1	ENC-1313	HEIDENHAIN ENCODER ID # 768295-03 "ECN1313 2048 62S12-78"
25	1	P-176	TAG, GEARLESS EMERGENCY BRAKE
26	1	P-183	WARNING LABEL, NO STEP
27	2	P-209	TAG - BRAKE RATINGS FOR MAYR #6
28	1	P-220	GENERIC MOTOR TAG - PMAC GEARLESS MACHINE
29	2	P-221	WARNING LABEL, LIVE CIRCUITS
30	1	P-222	WARNING LABEL, HOT SURFACE
31	2	146-030	ALIGNMENT MECHANISM, MAYR #6 BRAKE

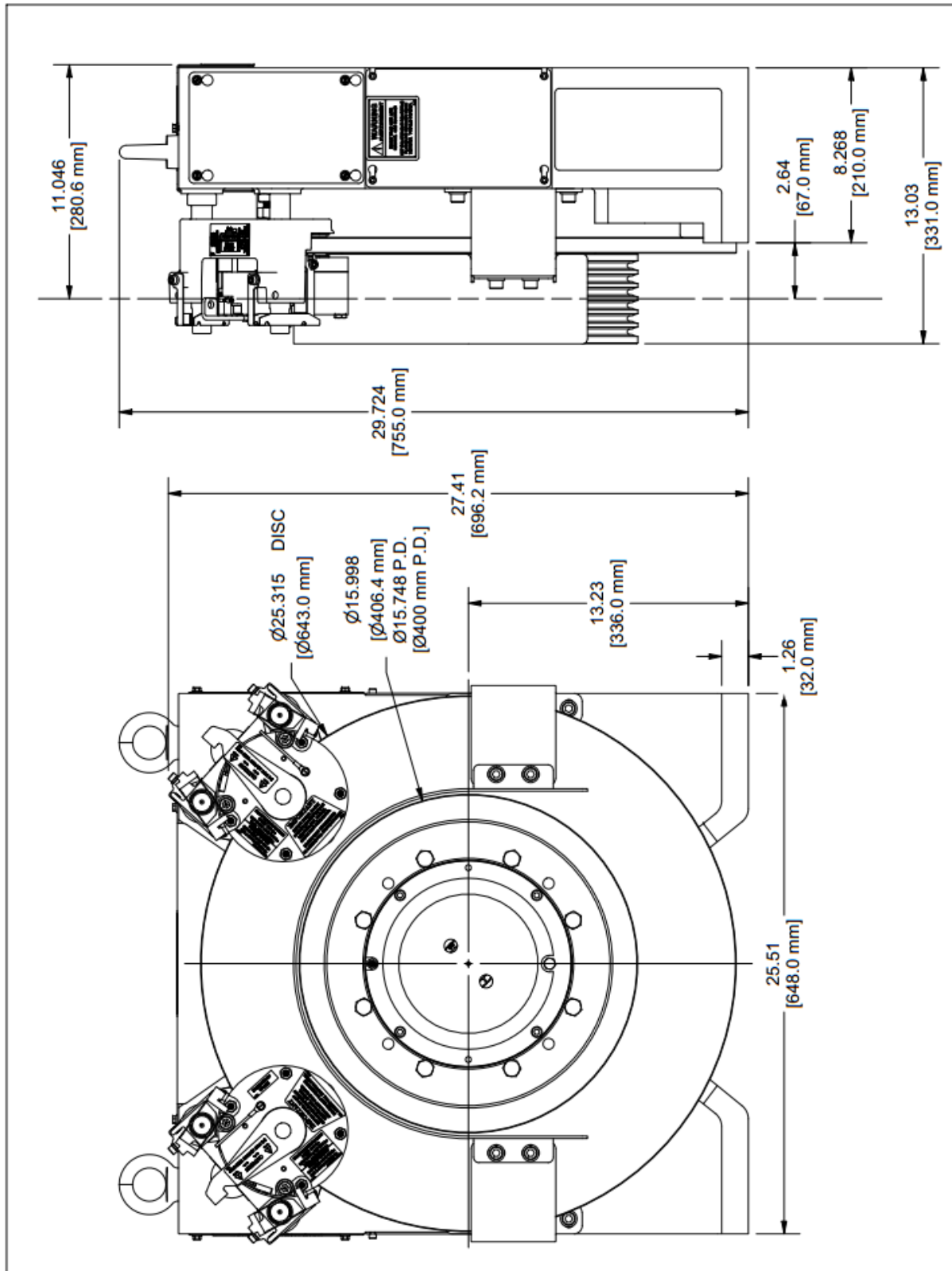
8.2 Item Drawing



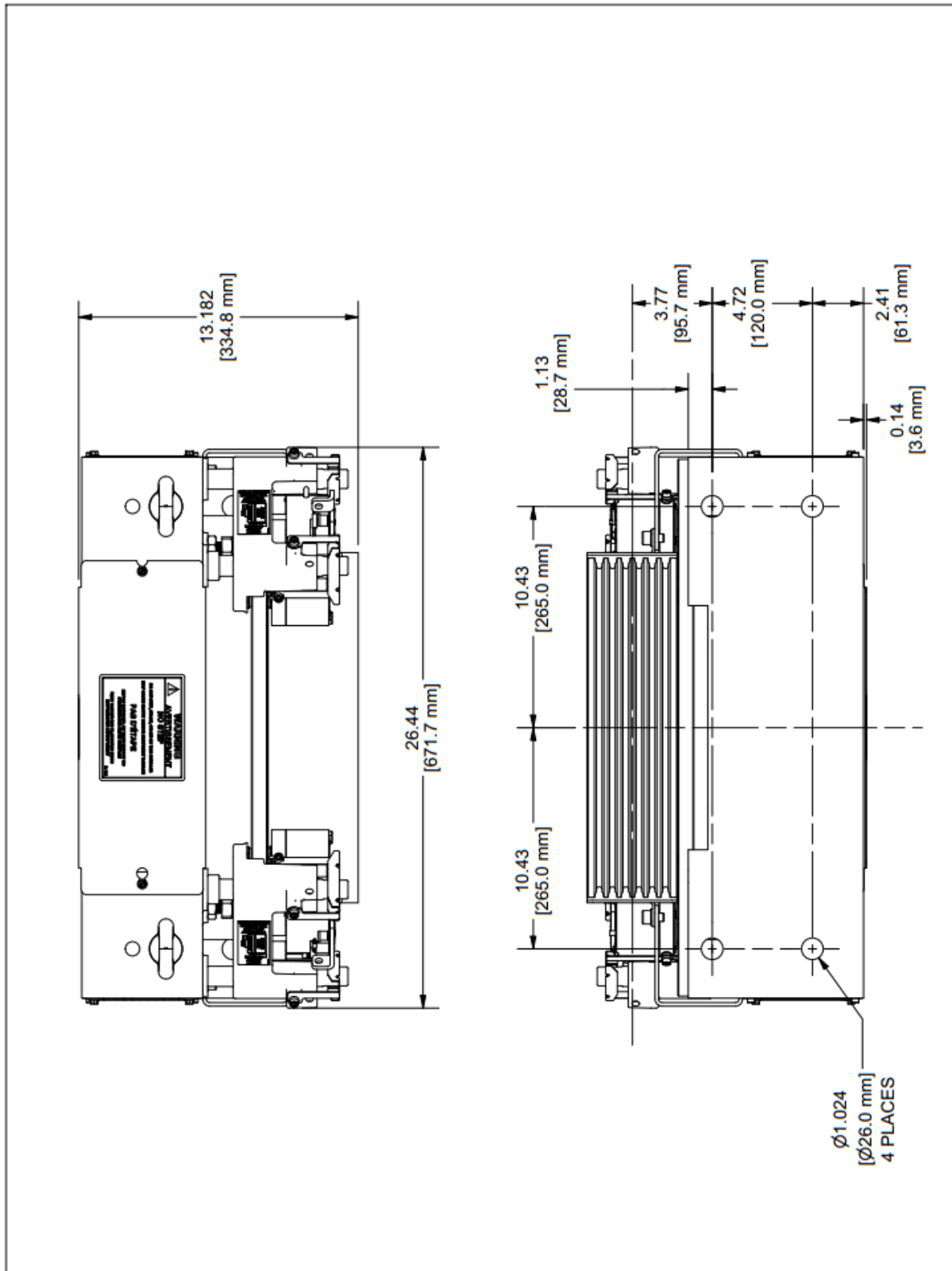
8.3 Isometric View



8.4 Front and Side View



8.5 Top and Bottom View



8.6 Encoder Information

Encoder information begins next page.



HEIDENHAIN



Product Information

ECN 1313

ECN 1325

ERN 1387

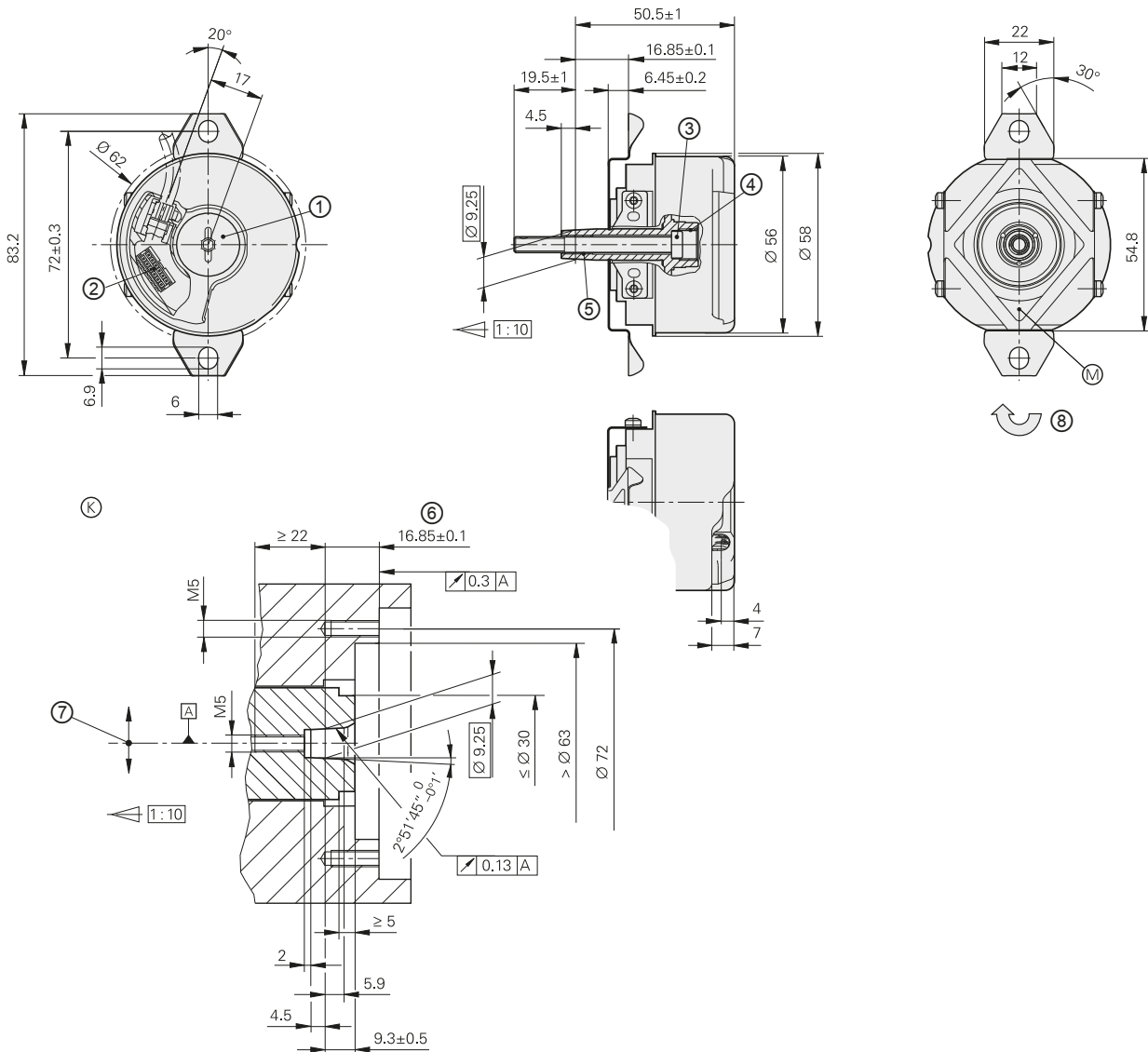
Rotary Encoders with
Plane-Surface Coupling for
Elevator Servo Drive
Control

July 2017

ECN/ERN 1300 series

Rotary encoders with integral bearings for elevator technology

- Simple installation
- Rigid shaft coupling
- Plane-surface coupling for large mounting tolerances
- Uniform dimensions for various electrical interfaces



mm

 Tolerancing ISO 8015
 ISO 2768 - m H
 < 6 mm: ±0.2 mm

- ▢ = Bearing of mating shaft
- ▣ = Bearing of encoder
- ⊙ = Required mating dimensions
- ⊗ = Measuring point for operating temperature
- 1 = Screw plug, width A/F 3 and 4. Tightening torque: 5+0.5 Nm
- 2 = PCB connector
- 3 = Self-tightening screw M5 x 50 DIN 6912 width A/F 4, tightening torque 5+0.5 Nm
- 4 = M10 back-off thread
- 5 = M6 back-off thread
- 6 = Max. permissible tolerance during motor shaft rotation ±1.5 mm
- 7 = Max. permissible static radial offset of motor shaft in indicated direction ±0.13 mm
- 8 = Direction of shaft rotation for output signals as per the interface description

	Absolute		Incremental
	ECN 1325	ECN 1313	ERN 1387
Part number	683643-xx	768295-xx	749146-xx
Interface¹⁾	EnDat 2.2		$\sim 1 V_{PP}$
Ordering designation	EnDat22	EnDat01	–
Position values/revolution	33554432 (25 bits)	8192 (13 bits)	Z1 track ³⁾
Electrically permissible speed/error ²⁾	$\leq 15000 \text{ rpm}$ (for continuous position value)	$\leq 1500 \text{ rpm} \pm 1 \text{ LSB}$ $\leq 12000 \text{ rpm} \pm 50 \text{ LSB}$	–
Calculation time t_{cal} Clock frequency	$\leq 7 \mu\text{s}$ $\leq 16 \text{ MHz}$	$\leq 9 \mu\text{s}$ $\leq 2 \text{ MHz}$	– –
Incremental signals ¹⁾	–	$\sim 1 V_{PP}$	$\sim 1 V_{PP}$
Line count/system accuracy	2048/ $\pm 20''$		
Reference mark	–		One
Cutoff frequency –3 dB	–	$\geq 400 \text{ kHz}$	$\geq 210 \text{ kHz}$
Electrical connection Via PCB connector	<i>Rotary encoder</i> : 12-pin <i>Temperature sensor⁴⁾</i> : 4-pin	12-pin	14-pin
Voltage supply	DC 3.6 V to 14 V		DC 5 V $\pm 0.25 \text{ V}$
Power consumption ¹⁾ (maximum)	3.6 V: $\leq 600 \text{ mW}$ 14 V: $\leq 700 \text{ mW}$		–
Current consumption	5 V: 85 mA (typical, without load)		$\leq 130 \text{ mA}$ (without load)
Stator coupling	Plane-surface coupling		
Shaft	Taper shaft $\varnothing 9.25 \text{ mm}$; taper 1:10		
Mech. permiss. speed n	$\leq 2000 \text{ rpm}$		
Starting torque	$\leq 0.01 \text{ Nm}$ (at 20 °C)		
Moment of inertia of rotor	$2.6 \cdot 10^{-6} \text{ kgm}^2$		
Permissible axial motion of measured shaft ⁵⁾	$\pm 1.5 \text{ mm}$		
Radial runout of the measured shaft	0.13 mm		
Vibration 55 Hz to 2000 Hz Shock 6 ms	$\leq 300 \text{ m/s}^2$ ^{2) 6)} (EN 60068-2-6) $\leq 2000 \text{ m/s}^2$ (EN 60068-2-27)		
Operating temperature	–40 °C to +115 °C		–40 °C to +120 °C
Protection EN 60529	IP40 when mounted		
Mass	$\approx 0.25 \text{ kg}$		

¹⁾ See *Interfaces of HEIDENHAIN Encoders* brochure

²⁾ Velocity-dependent deviations between the absolute value and incremental signals

³⁾ One sine and one cosine signal per revolution

⁴⁾ Evaluation optimized for KTY 84-130

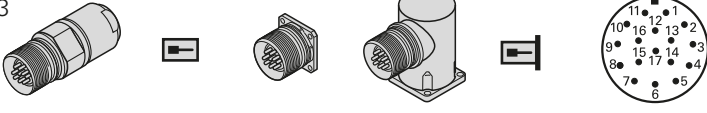
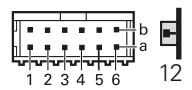



⁵⁾ Compensation of mounting tolerances and thermal expansion, not dynamic motion




⁶⁾ As per standard for room temperature; for operating temperature
Up to +100 °C: $\leq 300 \text{ m/s}^2$
Up to +115 °C or +120 °C: $\leq 150 \text{ m/s}^2$

Electrical connection

Pin layouts

ECN 1313 pin layout

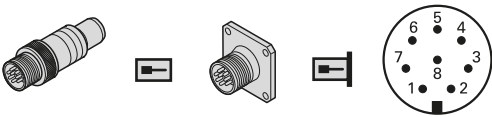
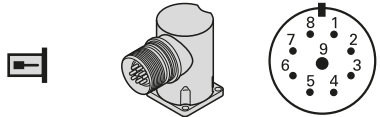
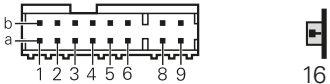




17-pin coupling or flange socket M23						12-pin PCB connector								
														
	Power supply						Incremental signals ¹⁾				Serial data transfer			
	7	1	10	4	11	15	16	12	13	14	17	8	9	
 12	1b	6a	4b	3a	/	2a	5b	4a	3b	6b	1a	2b	5a	
	U _P	Sensor U _P	0 V	Sensor 0 V	Internal shield	A+	A–	B+	B–	DATA	DATA	CLOCK	CLOCK	
	Brown/ Green	Blue	White/ Green	White	/	Green/ Black	Yellow/ Black	Blue/ Black	Red/ Black	Gray	Pink	Violet	Yellow	

	Other signals	
	5	6
	/	/
 12	/	/
	Brown ²⁾	White ²⁾

Cable shield connected to housing; **U_P** = Power supply voltage; **T** = Temperature
Sensor: The sensor line is connected in the encoder with the corresponding power line.
Vacant pins or wires must not be used.

¹⁾ Only with ordering designations EnDat 01 and EnDat 02
²⁾ Only for cables inside the motor housing

ECN 1325 pin layout

8-pin coupling or flange socket, M12					9-pin flange socket, M23						
											
16-pin PCB connector											
											
	Voltage supply				Serial data transfer				Other signals		
 M12	8	2	5	1	3	4	7	6	/	/	
 M23	3	7	4	8	5	6	1	2	/	/	
 16	1b	6a	4b	3a	6b	1a	2b	5a	8a	8b	
	U _P	Sensor U _P	0 V	Sensor 0 V	DATA	<u>DATA</u>	CLOCK	<u>CLOCK</u>	T+	T–	
	Brown/ Green	Blue	White/ Green	White	Gray	Pink	Violet	Yellow	Brown	Green	

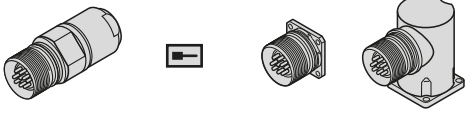
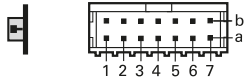



Cable shield connected to housing




U_P = Power supply; **T** = Temperature

Sensor: The sensor line is connected in the encoder with the corresponding power line.

Vacant pins or wires must not be used.

ERN 1387 pin layout

17-pin coupling or flange socket M23						14-pin PCB connector					
											
	Voltage supply					Incremental signals					
	7	1	10	4	11	15	16	12	13	3	2
	1b	7a	5b	3a	/	6b	2a	3b	5a	4b	4a
	U _P	Sensor U _P	0V	Sensor 0V	Internal shield	A+	A-	B+	B-	R+	R-
	Brown/ Green	Blue	White/ Green	White	/	Green/ Black	Yellow/ Black	Blue/Black	Red/Black	Red	Black

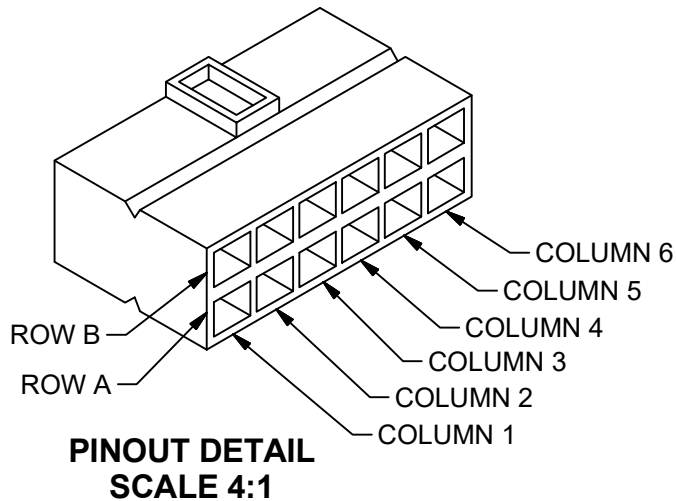
	Other signals					
	14	17	9	8	5	6
	7b	1a	2b	6a	/	/
	C+	C-	D+	D-	T ¹⁾	T ¹⁾
	Gray	Pink	Yellow	Violet	Green	Brown

Cable shield connected to housing;

U_P = Power supply; **T** = Temperature

Sensor: The sensor line is connected internally with the corresponding power line.
Vacant pins or wires must not be used.

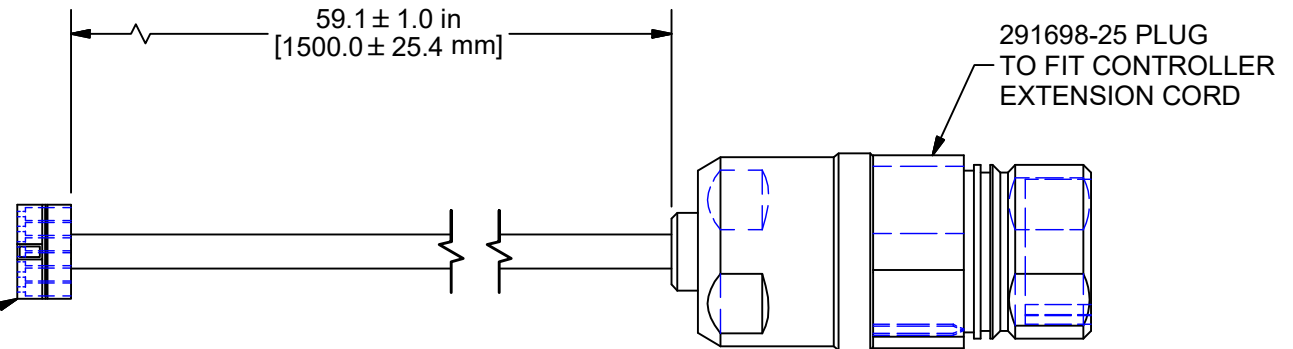
¹⁾ Only for cables inside the motor housing



PIN LAYOUT		
PIN	WIRE COLOR	FUNCTION
1A	PINK	DATA -
2A	GREEN/BLACK	A+
3A	WHITE	SENSOR (V0)
4A	BLUE/BLACK	B+
5A	YELLOW	CLOCK -
6A	BLUE	SENSOR (Up)
1B	BROWN/GREEN	POWER (Up)
2B	PURPLE	CLOCK +
3B	RED/BLACK	B-
4B	WHITE/GREEN	ZERO V (V0)
5B	YELLOW/BLACK	A-
6B	GREY	DATA +

NOTES: HEIDENHAIN CABLE
ASSEMBLY. REF. ID No.
730736-22

291614-02 PLUG
SEE PINOUT DETAIL ABOVE
REF. HEIDENHAIN DRAWING
#D332202-05-A-01
FOR PLUG AND CABLE



WEIGHT: 0.5 lbmass

				HOLLISTER-WHITNEY ELEVATOR CO. LLC			
				TITLE ENCODER CABLE WITH PLUGS - 1.5 METER LENGTH			
A PRODUCTION RELEASE, PUR #1103				LTL 6/26/19			
THIS DRAWING IS SUPPLIED AS A REPRESENTATION OF THE EQUIPMENT HOLLISTER-WHITNEY ELEVATOR CO. LLC ("MANUFACTURER") HAS AGREED TO SUPPLY. SLIGHT ADJUSTMENTS MAY OCCUR DURING MANUFACTURING AND INSTALLATION. ANY MODIFICATIONS NOT APPROVED IN WRITING BY MANUFACTURER MAY AFFECT OPERATION, VOIDS ANY WARRANTY AND RELEASES MANUFACTURER OF ALL LIABILITY. THIS DOCUMENT CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION THAT CANNOT BE REPRODUCED OR DIVULGED, IN WHOLE OR IN PART, WITHOUT WRITTEN AUTHORIZATION FROM THE MANUFACTURER.				THIRD ANGLE PROJECTION			
DRAWN BY LTL		SCALE 1 : 1		MATERIAL AS PURCHASED, SEE NOTES		REFERENCE TOL. ALL DIMENSIONS REFERENCE UNLESS OTHERWISE SPECIFIED	
SHEET SIZE A		DATE 4/30/2019		GL080-001-04-020 SHEET 1 OF 1			

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Auto — CAD

Ohne unsere vorherige Zustimmung darf diese Zeichnung weder vervielfältigt, noch Dritten zugänglich gemacht werden, und sie darf durch Empfänger oder Dritte auch nicht in anderer Weise mißbräuchlich verwendet werden.

Stiftsteckverbinder : SUB-D 15 pol.
Metallgehäuse mit Schirmanbindung
Gehäusebreite max 31 mm

Kabel : 4 x (2 x 0,14) + 2 x (0,5)
Geeignet für Energieführungsketten
Dauerbetriebstemperatur 80 Grad
Ölbeständig
Farbe orange RAL 2003

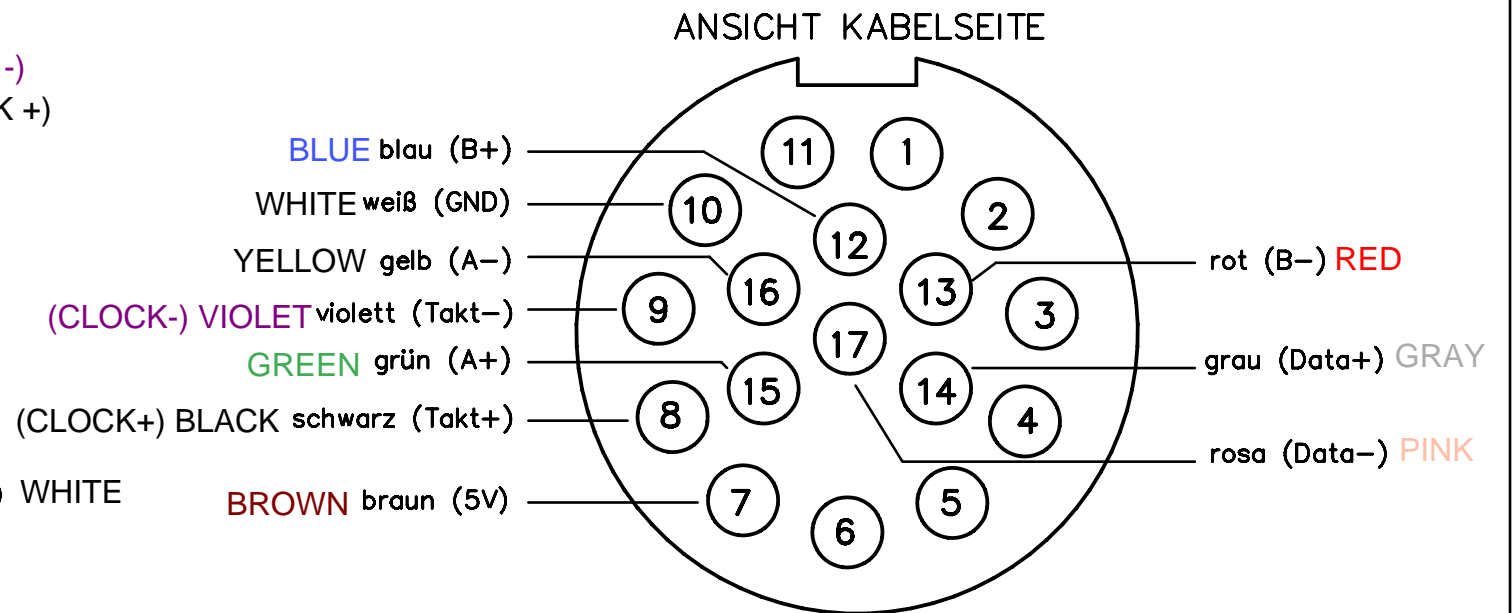
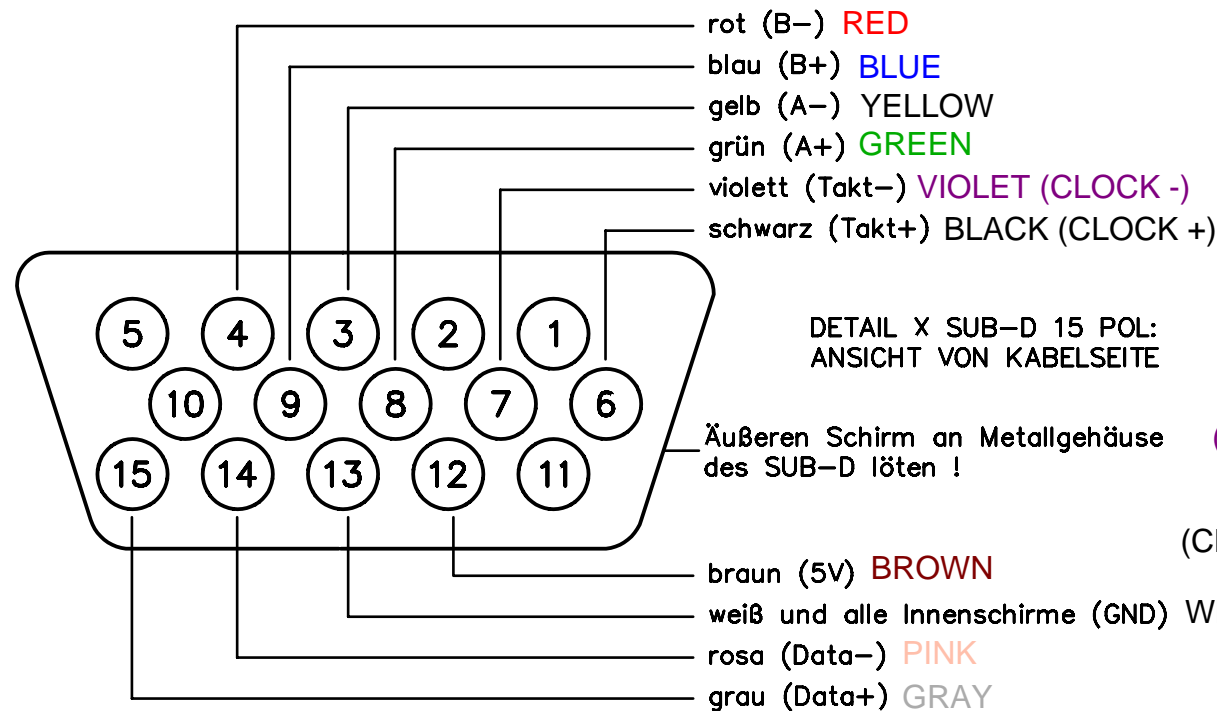
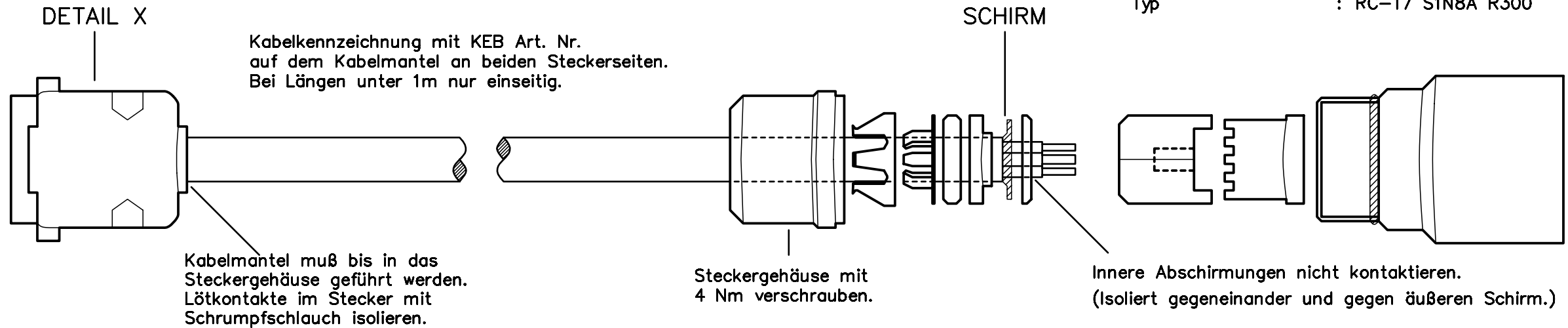
Buchsensteckverbinder : Metallgehäuse mit
Schirmanbindung, Kontaktbuchsen

Hersteller 1 : Intercontec
Typ : ASTA 035 FR 11 12 0005 000

Hersteller 2 : Interconnectron
Typ : SPN A 17B NN NN 169



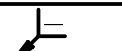


Hersteller 3 : Coninvers
Typ : RC-17 S1N8A R300

CABLE LENGTH UP TO 30 M



00.F5.0C1-4xPx KABELLAENGE x,x METER

00.F5.0C1-4xxx KABELLAENGE xxx METER

Änderungen : /Modifications		g					Rohmaß: /Rough size:	Ident-Nr.:	Menge: /Qty.:	ME	Werkstoff: /Material:	Rohteil-Nr.: /Blank-No.:	Benennung: /Title			Kantenbruch/Break of sharp edges			
		f											Geberkabel F5						
		e					verzinkt, blau passiviert / Schichtdicke:				Schutzvermerk DIN 34 beachten		Zeichnungs-Nr.: /Drawing No.:			Datum	Name	$\sqrt{x} = \sqrt{\quad}$ Rz 100	
		d					zinc-plated, blue passivated / Thickness of coat:				Observe protection note DIN 34		00.F5.0C1-4005		gez.:	05.04.02	Horn	$\sqrt{y} = \sqrt{\quad}$ Rz 25	
		c					Allgemeintoleranz DIN 6930-m		Tolerierung ISO 8015		Oberflächenangaben DIN ISO 1302		Werkstückkanten DIN 6784		gepr.:			$\sqrt{z} = \sqrt{\quad}$ Rz 6,3	
		b					general tolerance		Tolerancing		Surface details		Workpiece edges		Format Size	Maßstab Scale		geschliffen/ground	
		a																$\sqrt{w} = \sqrt{\quad}$ Rz 4	
		Nr.:		Datum	Name	Paßmaß Size of fit	Abmaß Deviation	Keine Maße aus der Zeichnung abnehmen/Do not scale				Alle Maße in Millimeter/All dimensions in millimetres				 Karl E. Brinkmann GmbH D 32677 Barntrup			

Stiftsteckverbinder : SUB-D 15 pol.
Metallgehäuse mit Schirmanbindung
Gehäusebreite max 31 mm

Kabel : (4 x (2x0,25) + 2 x 1,0)
Geeignet für Energieführungsketten
Helukabel Topgeber 510 77750
Aderfarbkode nicht nach DIN 47100

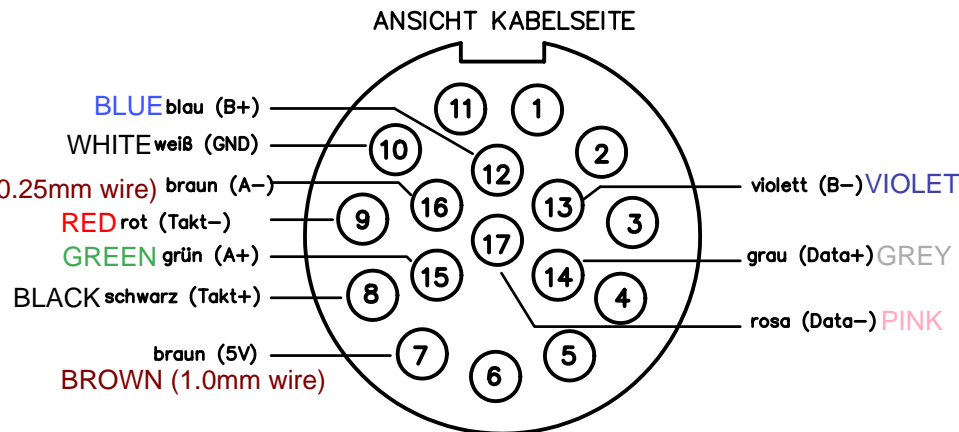
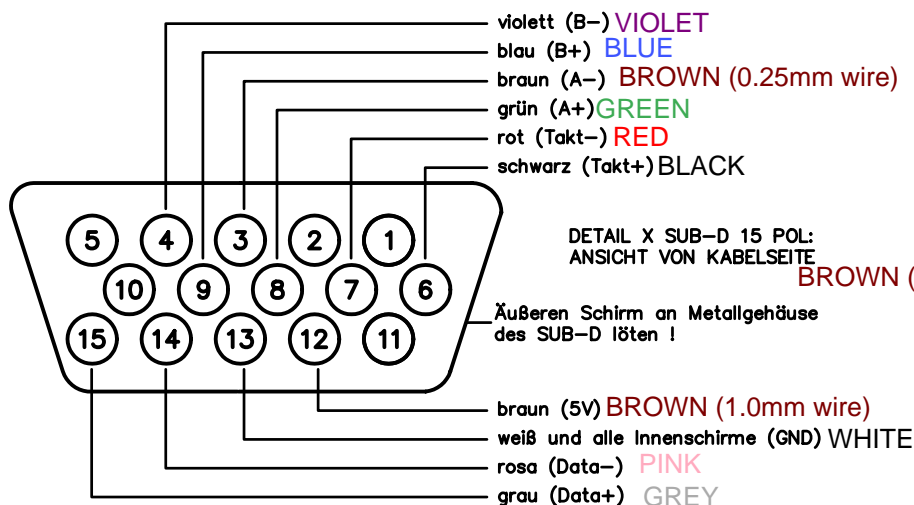
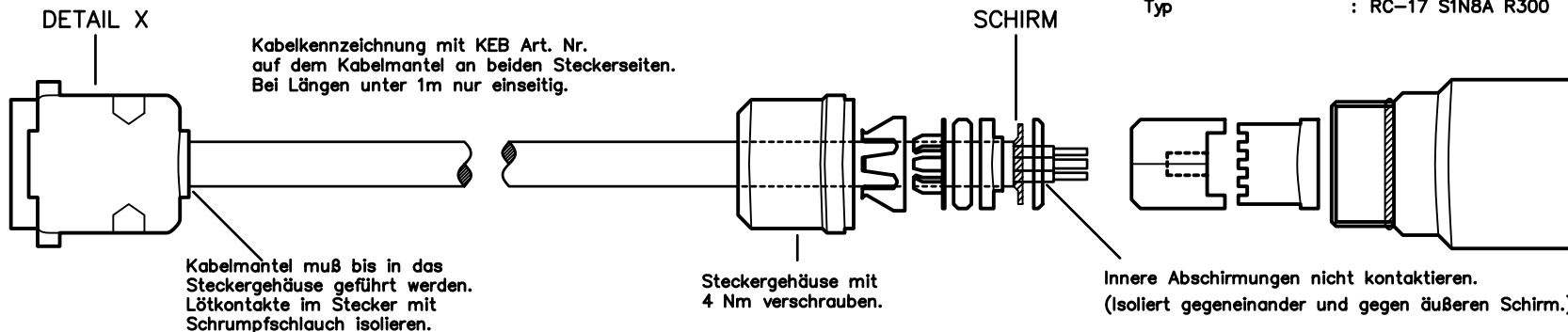
Buchsensteckverbinder : Metallgehäuse mit
Schirmanbindung, Kontaktbuchsen

Hersteller 1 : Intercontec
Typ : ASTA 035 FR 11 12 0005 000

Hersteller 2 : Interconnectron
Typ : SPN A 17B NN NN 169

Hersteller 3 : Coninvers
Typ : RC-17 S1N8A R300

CABLE LENGTH OVER 40 METERS



00.F5.0C1-LxPx KABELLAENGE x,x METER

00.F5.0C1-Lxxx KABELLAENGE xxx METER

Änderungen : / Modifications	g				Rohmaß: / Rough size	Ident-Nr.:	Menge: / Qty.:	ME	Werkstoff: / Material:	Rohteil-Nr.: / Blank-No.:	Benennung: / Title	Kantenbruch/Break of sharp edges			
	f										Geberkabel F5				
	e				verzinkt, blau passiviert / Schichtdicke:				um	Schutzvermerk DIN 34 beachten	Zeichnungs-Nr.: / Drawing No.:	Datum	Name	x/ = √ Rz 100	
	d				zinc-plated, blue passivated / Thickness of coat:					Observe protection note DIN 34	00.F5.0C1-L005	gez.: 15.06.07	Horn	y/ = √ Rz 25	
	c				Allgemeintoleranz	Tolerierung	Oberflächenangaben	Werkstückkanten			Format	Maßstab	Scale	z/ = √ Rz 6,3	
	b				DIN 6930-m	ISO 8015	DIN ISO 1302	DIN 6784			Size	Scale		w/ = √ Rz 4	
	a				general tolerance	Tolerancing	Surface details	Workpiece edges							
Nr.:					Keine Maße aus der Zeichnung abnehmen/Do not scale					Alle Maße in Millimeter/All dimensions in millimetres					
Datum															
Name															
Paßmaß															
Size of fit															
Abmaß															
Deviation															



Hollister-Whitney Elevator Corporation

#1 Hollister-Whitney Parkway
Quincy, IL 62305
Phone: 217-222-0466

Fax: 217-222-0493
e-mail: info@hollisterwhitney.com
www.hollisterwhitney.com

GERMAN

ENGLISH

ROT  RED

BLAU  BLUE

GELB  YELLOW

GRÜN  GREEN

VIOLETT  VIOLET

SCHWARZ  BLACK

BRAUN  BROWN

WEIß WHITE

ROSA  PINK

GRAU  GREY