



MORRISON METERING CUSTOM DRIVE ASSEMBLY



MORRISON CONTAINER HANDLING SOLUTIONS
SLEEVE SEAL
SERIAL NO. 40-0-90385-001 | PO 20-02044

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Please note: Photos appearing in this manual are standard photos and may not be exact replicas of your application. However, in all cases, these photos are representative of steps you will take with the installation of your custom drive assembly.

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1 Welcome

Congratulations and thank you for your purchase of one of many Morrison Container Handling Solutions. Read through this manual carefully before installing the equipment. It offers many useful safety and operational pointers.



This chapter covers:

- 1.1 General Description
- 1.2 Disclaimer
- 1.3 General Safety
- 1.4 Electrical Safety
- 1.5 Lockout/Tagout
- 1.6 Safety Considerations
- 1.7 Contact Information

1.1 General Description

MORRISON METERING CUSTOM DRIVE ASSEMBLY:

Custom drive assembly designed to accept full/sealed round cans from a backlog and space them to a desired pitch for (see timing screw section) for your sleeving application. A backlog is required for system to function effectively. NOTE: Conveyor speed ultimately determines product spacing regardless of timing screw discharge pitch.

Drive components:

- Left hand infeed orientation
- Designed for 250 containers a minute
- continuous
- 1/2 HP 230/460V 1800 RPM inverter rated painted fan cooled motor/reducer
- Timing belt drive

Timing Screw:

- 30" lgt. x 4" dia. black UHMW designed for round 12 oz sleek (108mm pitch)
- 30" lgt. x 4" dia. black UHMW designed for round 200ml/250ml (103mm pitch)
- "NO TOOLS" quick change

1.2 Disclaimer

Satisfactory operation of this equipment depends on setup and installation following our guidelines and maintenance per our recommendations.

Modifications to the equipment may result in less than satisfactory performance and company safety. Morrison Container Handling Solutions makes every effort to provide safe equipment, but the ultimate responsibility for its safe application, including safeguarding electrical and mechanical hazards, lies with the integrator and user.

Be aware of hazard levels noted in this manual:

ICON	HAZARD LEVEL
 Red	<u>DANGER:</u> Failure to obey a safety warning will result in serious injury or death to yourself or others. Always follow safety precautions to reduce the risk of fire, electric shock, and personal injury.
 Orange	<u>WARNING:</u> Failure to obey a safety warning can result in property damage or personal injury to yourself or to others. Always follow safety precautions to reduce the risk of fire, electric shock and personal injury.
 Yellow	<u>CAUTION:</u> Failure to obey a safety warning may result in property damage or personal injury to you or to others. Always follow safety precautions to reduce the risk of fire, electric shock and personal injury.
	<u>NOTE:</u> Advises you of information or instructions vital to the operation or maintenance of the equipment.

Morrison Container Handling Solutions has been producing quality equipment used in the packaging industry since 1971. In that time, we have continually upgraded our equipment to provide the highest efficiency, quality, value, and reliability possible. In addition, Morrison has produced machines incorporating almost every conceivable combination of special features to satisfy customer requirements. Since it would impossible for this portion of this manual to cover every machine variation shipped in nearly fifty years of business, the safety portion of the manual covers the most typical machines, features, and options.

1.3 General Safety



IMPORTANT:

Before performing any maintenance or repairs, be sure to de-energize and secure the machine according to your company's Lockout/Tagout policy. Also be sure to wear all safety gear required by your company, including, but not limited to, safety glasses.

- Fully understand this Operational Manual before operating the machine. **If questions arise, please contact Morrison Container Handling Solutions at (708) 756-6660.**
- The manual should be kept near the machinery for easy access.
- **If a new manual is required, please contact Morrison Container Handling Solutions. Please have the Serial No. available at time of order.**
- **Keep work area clean and well lit.** Cluttered or dark areas invite personal injury and damage to the machine.
- **Dress Properly.** Do not wear loose clothing or jewelry as these may get caught in rotating parts and cause serious injury. Wear protective hair covering to contain long hair. Keep hands and gloves away from moving parts.
- **Use personal safety equipment.** Everyone in the work area should wear all Personal Protective Equipment (PPE) required by your company, including but not limited to safety goggles or glasses complying with current safety standards.
- **Check for damaged parts.** Do not operate machine with damaged or worn parts. If a part becomes damaged or worn, inspect the part to determine if it will operate properly and perform its intended function. If it will not, contact **Morrison Container Handling Solutions** for repair or replacement service.
- **Stay alert.** Do not attempt to operate or repair machinery if you are tired, distracted or under the influence of drugs, alcohol or any medication which causes decreased control.
- **Do not operate machine without all included safety guarding.** Failure may result in personal injury.
- **Make no modifications to the equipment without consulting Morrison Container Handling Solutions.** Failure to do so may result in personal injury and will void the warranty on the machine.

1.4 Electrical Safety



DANGER: This machine uses electricity of sufficient voltage to cause serious injury or death if mishandled.



When appropriate drive settings have been adjusted and set at Morrison Container Handling Solutions. Consult the Appendix containing the machine assembly drawings for drive settings.

- **PERMIT** only trained/qualified electrical technicians to work on electrical components, regardless of whether the components are live or dead.
- **KNOW** the location of all electrical disconnects, shutoffs, and similar devices and know what each disables. Refer to the machine assembly drawings for this information.
- **KEEP** electrical areas (and the machine in general) dry. Never work on electrical components while standing on or near wet surfaces.
- **ALWAYS** assume a circuit/component is live until proven dead by proper testing. Always test circuits/components with appropriate test equipment (not your fingers).
- **ALWAYS** be on the lookout for electrical wires and components that are frayed, cut, loose, broken, or exposed. Repair/replace such wires and components before machine power is restored and the machine is operated.
- **PRIOR** to machine operation, make sure wires, motor plugs, cables and similar devices are securely connected.

NEVER remove a lockout device or "Do Not Start" tag unless you were the one who put it there. Notify everyone in the machine area when you remove your lockout/tagout that power is going to be restored to the machine.

1.5 Lockout/Tagout



CAUTION: It is the machine purchaser's responsibility to establish and implement comprehensive lockout/tagout and safety policies for the protection of machine users. Morrison Container Handling Solutions has established the following guidelines for the lockout/tagout policy to assist you in this effort:

- **Shut down** the machine using the normal stop control.
- **Notify** all personnel in the area that you will be placing a lockout/tagout on the machine and the reason for the lockout/tagout.
- **Operate** the appropriate disconnects, switches, valves, and other energy isolating devices to disconnect and/or isolate all energy sources. This applies to all electrical, pneumatic, hydraulic, and mechanical energy sources. Stored energy in capacitors, springs, flywheels, water systems, etc. must be dissipated or restrained by methods such as grounding, repositioning, blocking, bleeding, etc.
- **Lockout** the energy isolating devices with an assigned individual lock. Hang "Do Not Start" tags on the start controls.

The "Do Not Start" tags CANNOT be used as the only means of lockout, they must be used in conjunction with approved locks and/or other lockout devices.

Examples of other lockout devices include the removal of an isolated circuit element, blocking of a controlling switch, or opening of an extra disconnecting device.

A lock can be used without a tag provided only one circuit/machine section is de-energized and the lockout period does not extend into the next shift and persons exposed to the hazards associated with re-energizing the circuit or machine section are familiar with the re-energizing procedure.

- Clear personnel from the machine area and perform checks (using appropriate energy measuring devices) to ensure that the circuit/machine is de-energized.
- After performing the checks, double check that the circuit/machine is de-energized by trying to operate it using the controls (screen template, pushbutton, switch, etc.) related to that machine function. The circuit/machine is locked out if the initiated function/component movements DOES NOT occur.
- Individually keyed locks shall be issued to all employees who are required to lockout equipment. Locks shall be identified via label or numbering system which identifies the lock owner. A record shall be kept listing lock(s) assigned to each employee. No Master Keys are permitted.
- A multiple lockout device may be used for attaching more than one lock to a single power source.

- Reference facility procedures for removing tags that are installed by an employee that is no longer present to remove the lockout device

1.6 Safety Considerations

Automated machinery uses **high voltage** and **rotating/moving** equipment. Improper use of this equipment can result in **serious injury or death**.

- **Be** sure you understand the operation of the machine and all its safety features before attempting to run production or perform maintenance.
- **Never** override the safety systems for any reason.
- **Follow** proper lockout-tagout procedures for maintenance and service (see previous section).

1.7 Contact Information

Morrison Container Handling Solutions, Inc. is located in Glenwood, Illinois, a south suburb of Chicago. We are near major airports and can perform factory service quickly. Please reference job number 14/67615 when contacting us at:

708-756-6660

info@morrison-chs.com

www.morrison-chs.com

2 Mounting the Custom Drive Assembly (CDA)

1. Mark mounting distance of drive assembly angle brackets.

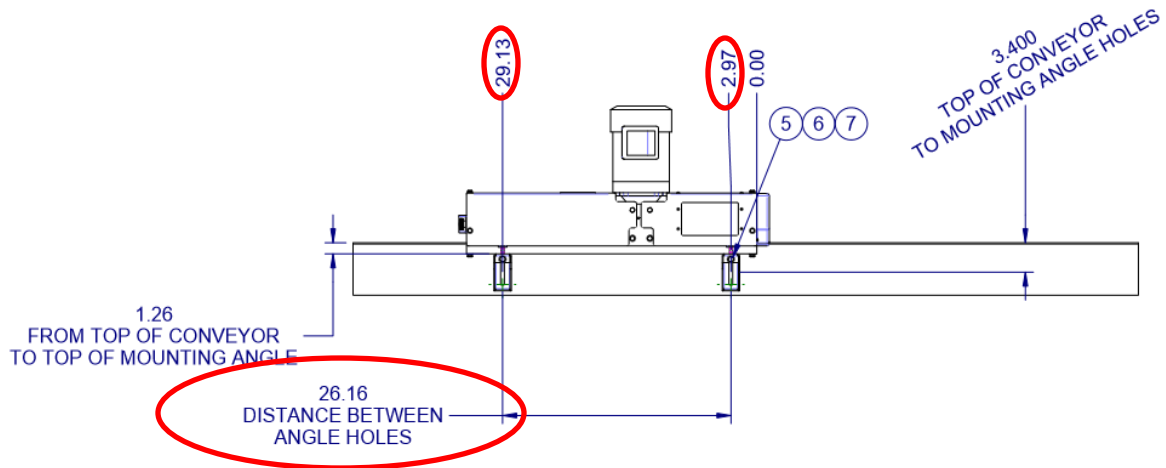


Illustration reference: assembly drawing #40-0-90385-001

2. Mark bolt locations for proper height of the drive assembly mounting angles.
 - a. $\frac{3}{8}$ x 16 bolts should be $1\frac{1}{2}$ " apart leaving $\frac{1}{2}$ " of up/down adjustment.

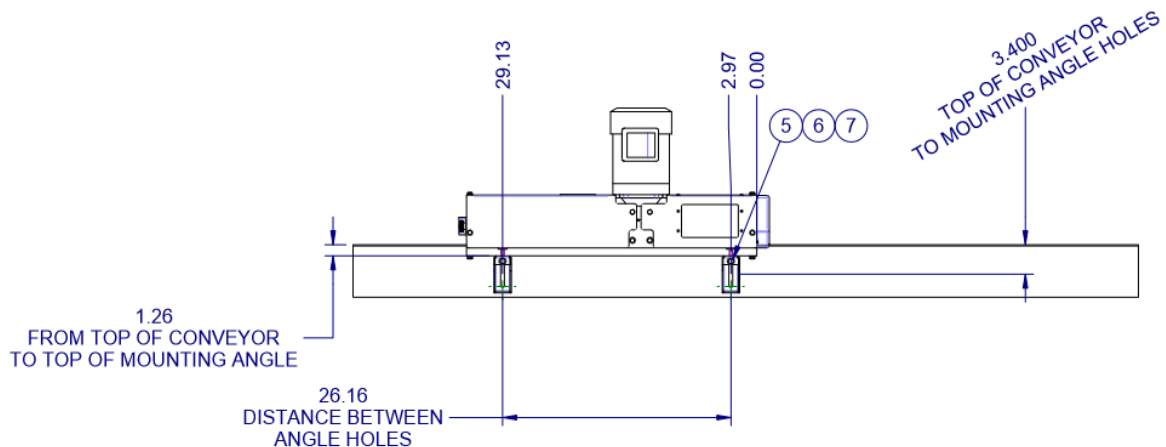
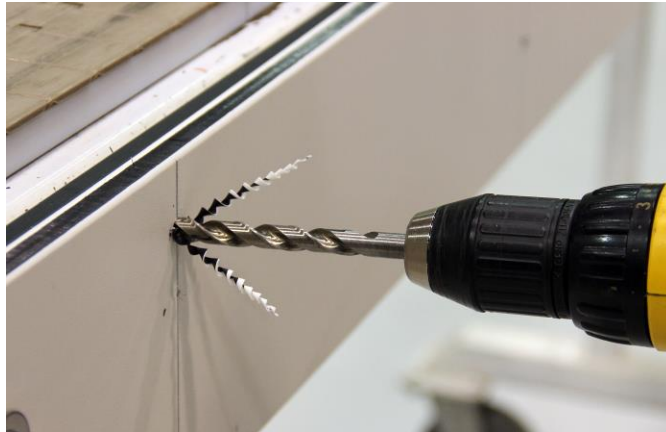


Illustration reference: assembly drawing #40-0-89285-001

3. Drill Holes with Pilot Drill.



4. Open holes using .316 drill.
a. TAP with $\frac{3}{8}$ -16 TAP.



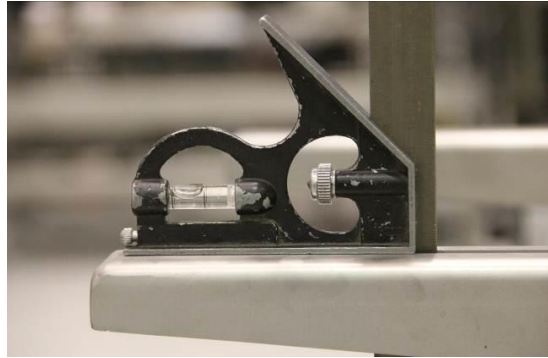
5. Attach mounting angles with (4) $\frac{3}{8}$ x 16 bolts w/lock & flat washers.



6. Once angles are installed, attach floor leg support if applicable (see *installing floor legs*)



NOTE: angles with legs should be level perpendicular to conveyor this can be done using level in square head.



3 Positioning the CDA

1. For proper positioning of the CDA ensure that the adjuster angles in the previous section were installed leveled with one another.
2. Remove the stainless steel cover.

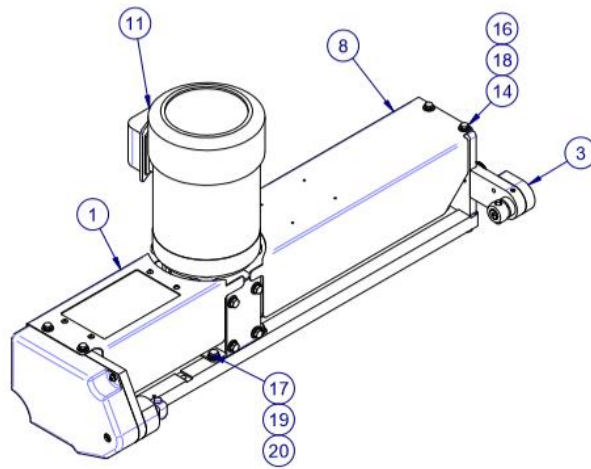
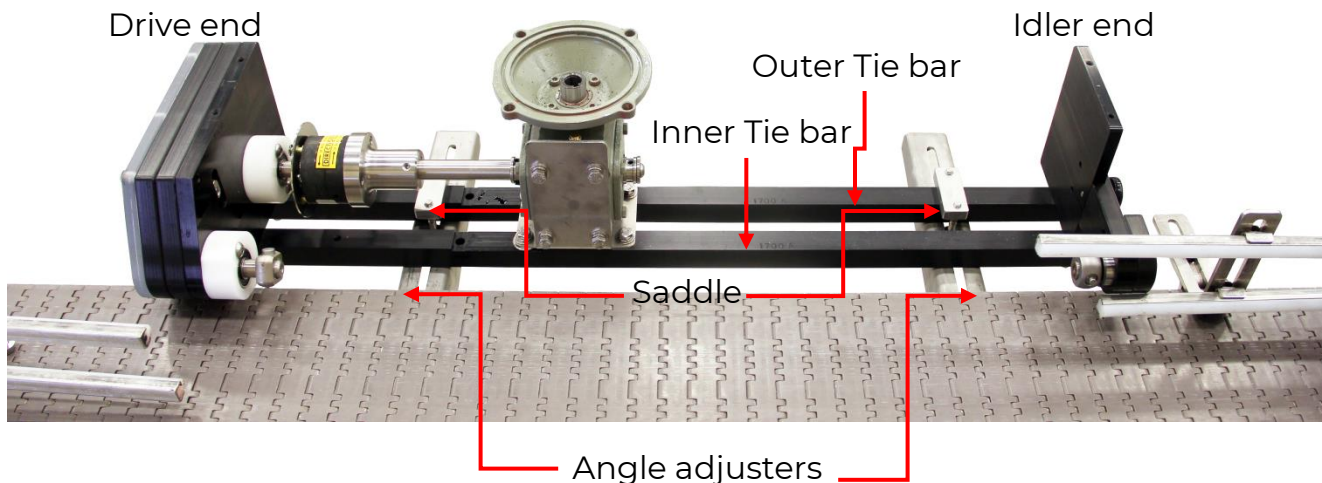


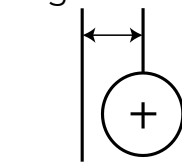
Illustration reference: assembly drawing #01-1-90385-001

3. Mount the custom drive assembly (CDA) tie bar on top of adjuster angles
4. Bolt the saddles down onto the inner tie bar using the provided bolts.
Tighten CDA enough to set in place.



4 CDA Setup

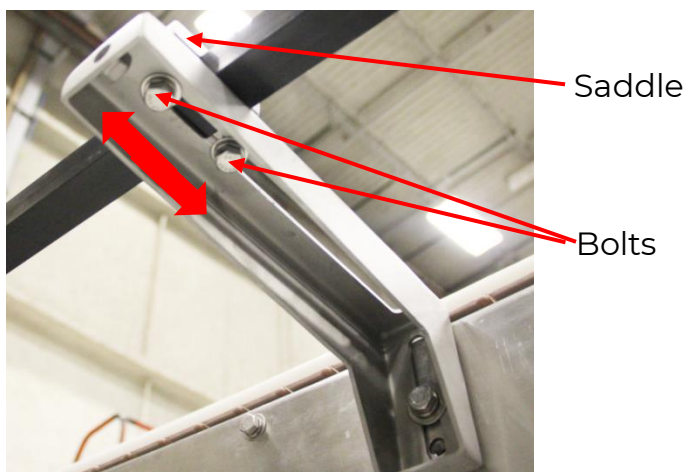
1. Set the horizontal distance from the center line of the timing screw's drive shaft to the center line of the timing screw's drive shaft.



Centerline of the timing screw to
Centerline of the conveyor

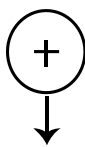
M#	Container	In between dimension
90385-1	250ML	2.3"
90385-2	12 OZ	2.3"

2. To move the CDA **toward or away** from the conveyor:
 - a. Loosen but do not remove the bolts securing the saddles to the angle adjusters and adjust the CDA to move (in or out). Tighten CDA in place.



The center line of the screw can be determined from the square driver, measure from the set screw in the center of the driver shaft to the center of the conveyor.

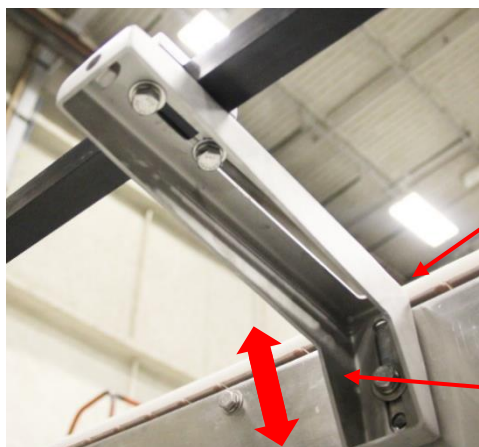
3. Set the vertical distance between the top of the conveyor chain and the center line of the timing screw's drive shaft.



Centerline of timing screw to
Top of conveyor

M#	Container	Above dimension
90385-1	250ML	2.13"
90385-2	12 OZ	2.13"

4. To move the CDA **up or down**:
 - a. Loosen but do not remove the bolt securing the angle adjusters to the conveyor and adjust the CDA to move (up or down). Tighten CDA in place.



Conveyor

Bolts



Centerline is the desired container position on the conveyor; typically, the center of the bottle will align with the center of the conveyor.

5. Install the stainless steel cover.

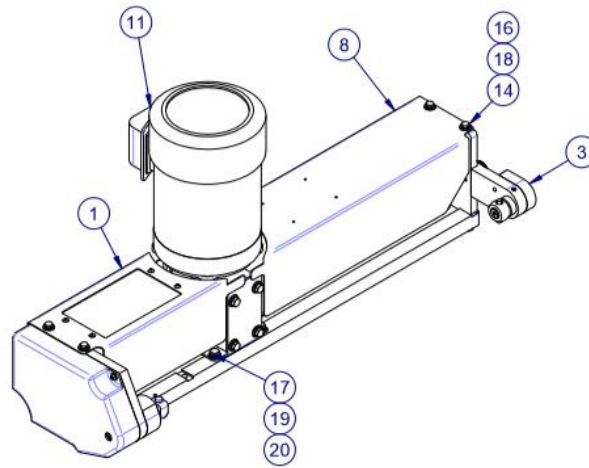


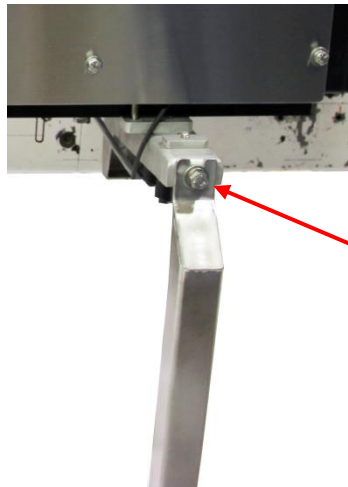
Illustration reference: assembly drawing #01-1-90385-001

5 Installing the Floor Legs

1. If 3/8-16 bolt is not already installed on the angle adjuster, insert and tighten the 3/8-16 bolt with 9/16" wrench in the hole provide.



Note: leave loose enough to slot the leg into place and tighten bolt.



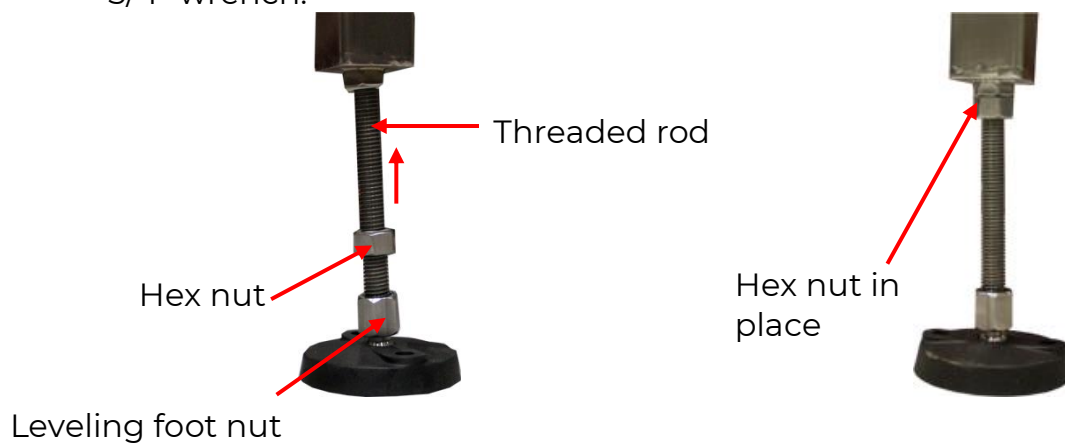
3/8-16 bolt

2. Adjust leg elevation by turning the leg base clockwise until level with floor.



Leg base

3. Once leveled use vise grip to hold the leveling foot nut and turn hex nut counter clockwise to the top of the threaded rod and firmly tighten with 3/4" wrench.



6 Installing the Timing Screw

This chapter covers:

- 6.1 Installing the Timing Screw
- 6.2 Removing the Timing Screw

6.1 Installing the Timing Screw



Grease the hubs with food grade grease before installing new or changeover timing screws. Hubs must be kept lubricated to avoid wear and tear prolonging driver life.

1. Install the timing screw in place on the drive end of the drive assembly aligning drive pin with timing screw hub slot.



Hub slot

Drive

2. Supporting the timing screw with your free hand place the idler bracket aligning idler pins with timing screw hub slots and the locating pins located on the CDA.

Hub slots
not shown in
this photo



Locating pins
one shown in this photo

Idler pins
one shown in this photo

3. Secure the timing screw with the hand knob. (turn clockwise)

Hand knob



6.2 Removing the Timing Screw



In the event that the timings screws are removed for any maintenance reasons remember to grease the hubs with food grade grease; hubs must be kept lubricated to avoid wear and tear prolonging driver life

1. Shut off the timing screw motor.
2. Shut off/lockout the conveyor and clear out all containers in the timing screw.
3. Remove hand knob on the idler end of the CDA (counterclockwise)

Hand knob



4. Remove the idler bracket. Important: Support the screw with your free hand to avoid damage.

Idler bracket



5. Gently pull the timing screw away from the drive end and store in a safe location to avoid damage.



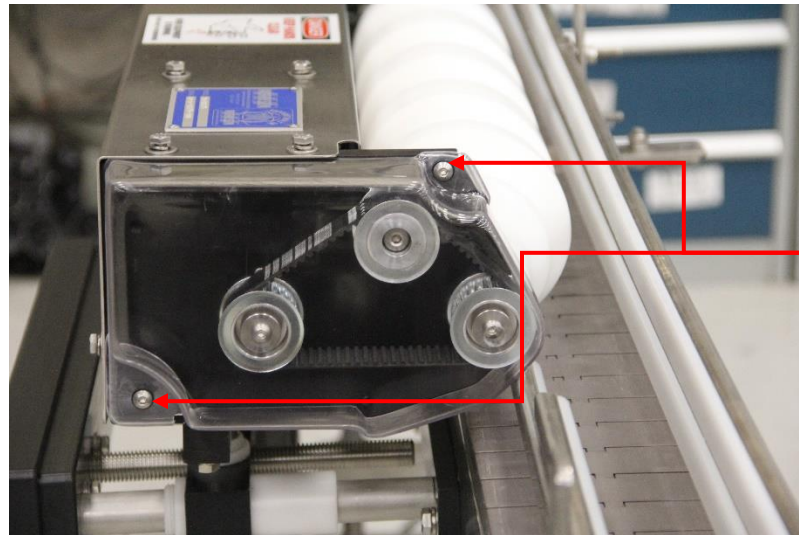
7 Timing the Timing Screw



The timing screws in this system are pinned. To adjust timing utilizes servo controls to independently retard or advance timing screws to proper timing.

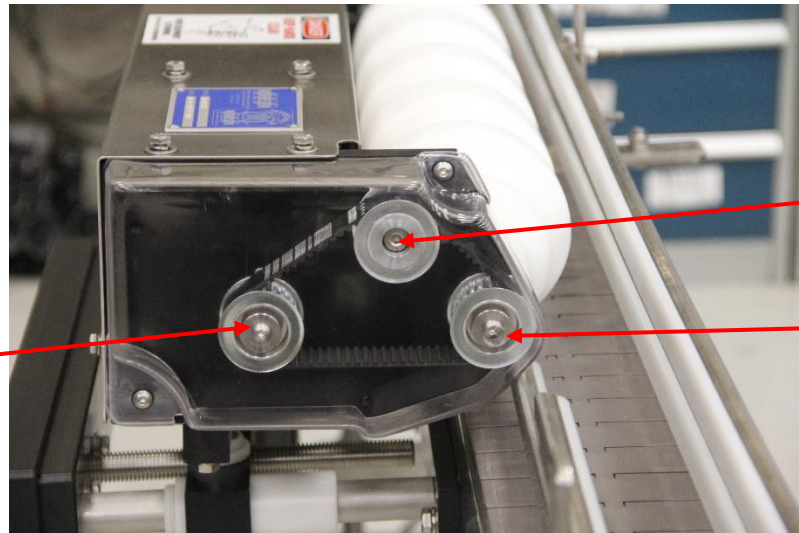
8 Changing the Drive Gear Belt

1. Remove the Lexan/UHMW cover to the belt drive.



Button head caps

2. With an Allen wrench, loosen the idler pulley and pull down to relieve belt tension.



Drive pulley

Idler pulley

Timing screw pulley

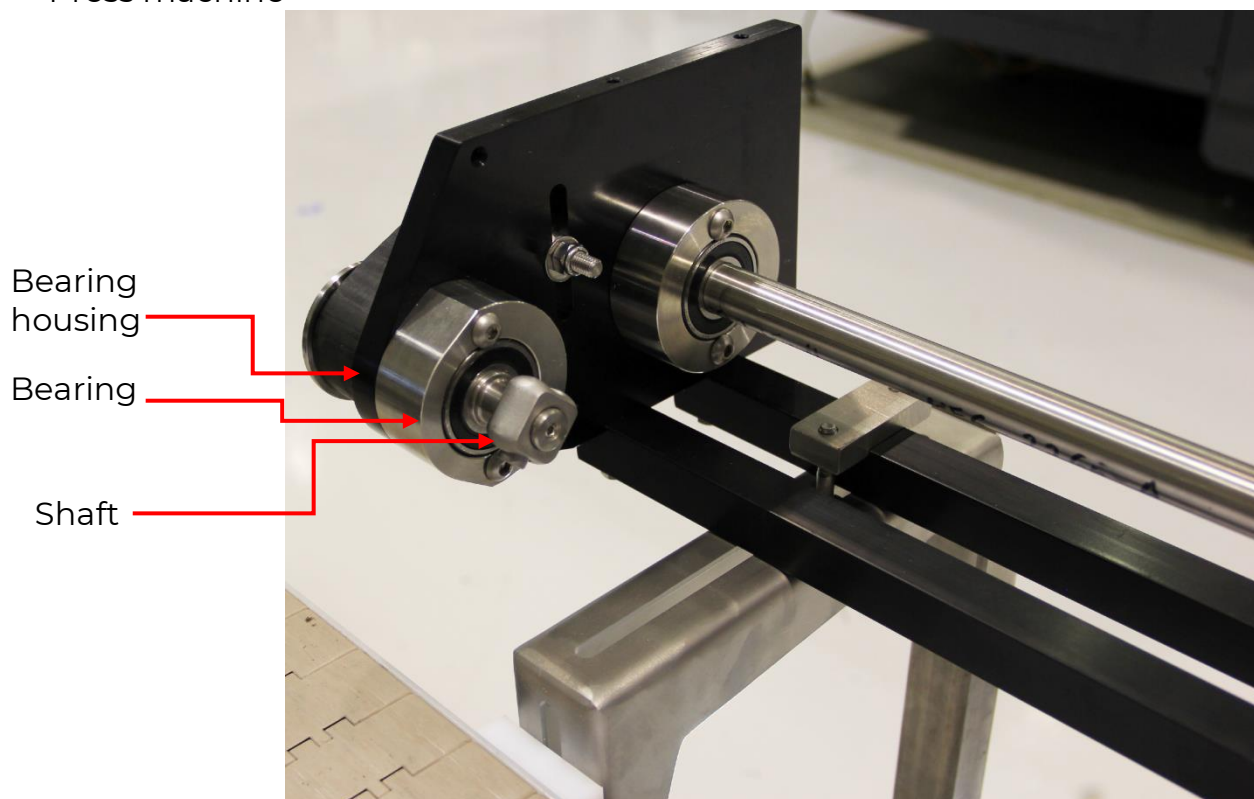
3. Carefully remove belt from timing screw and drive pulley.
4. When reassembling, make sure the belt is situated securely around all pulleys and replace the Lexan/UHMW cover once the belt has been tensioned.

9 Changing the Bearings – Press Fit

Bearing/Shaft has a press fit connection

Required tools:

- ✓ Allen wrench
- ✓ Retaining pin pliers
- ✓ Press machine



1. Locate the worn bearing and remove attached shaft components. (see *Figure CB1 and CB2*)

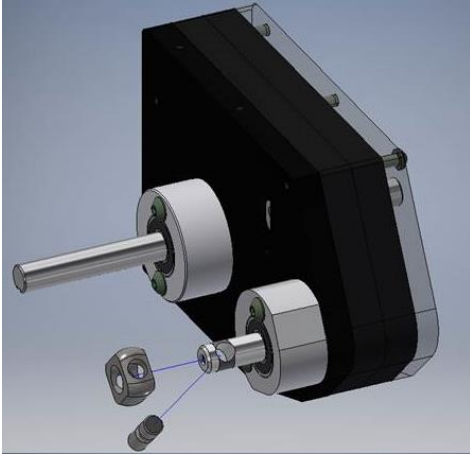


Figure CB1

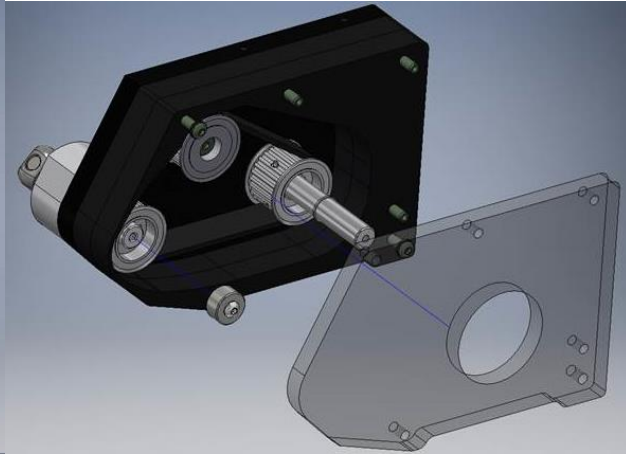


Figure CB2

2. Remove button head socket cap screws. (see *Figure CB3*)

Socket Cap
Screws
5/16-18
BHSC

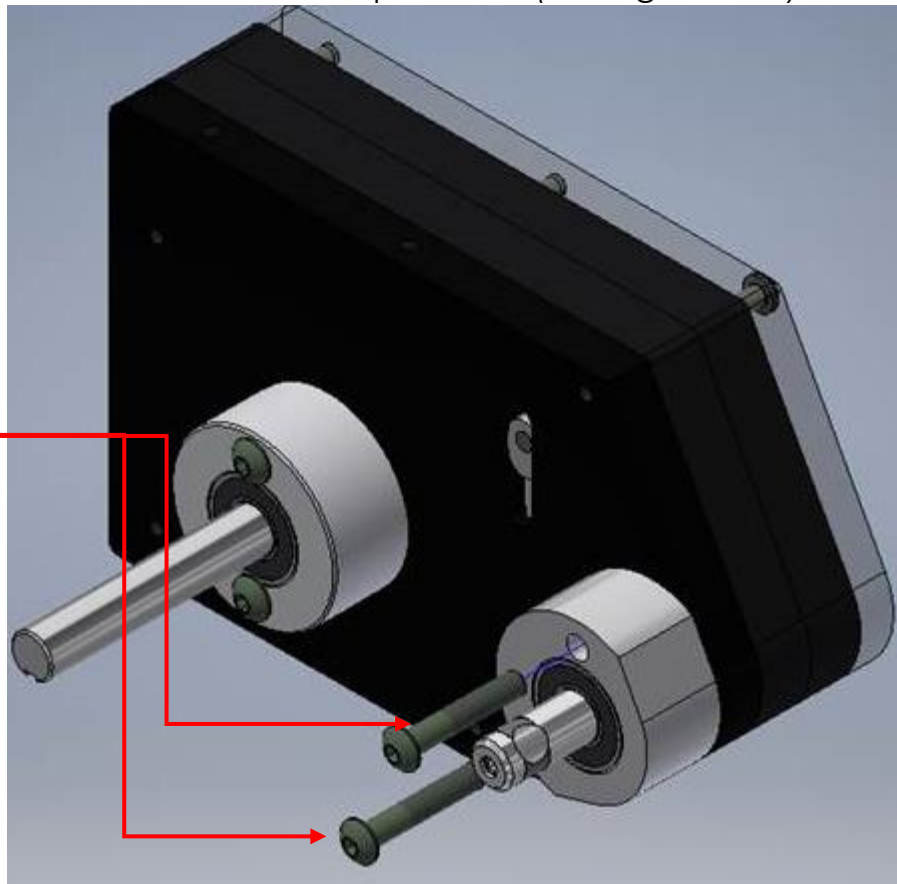


Figure CB3

3. Remove bearing shaft assembly (see *Figure CB4*).

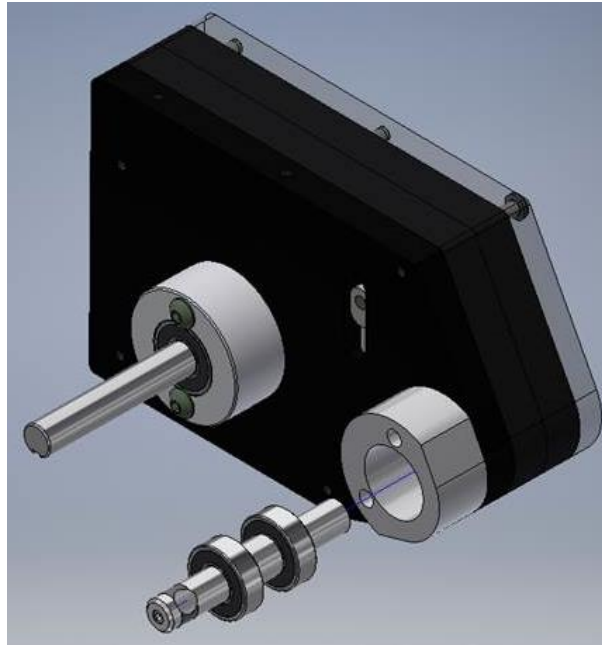
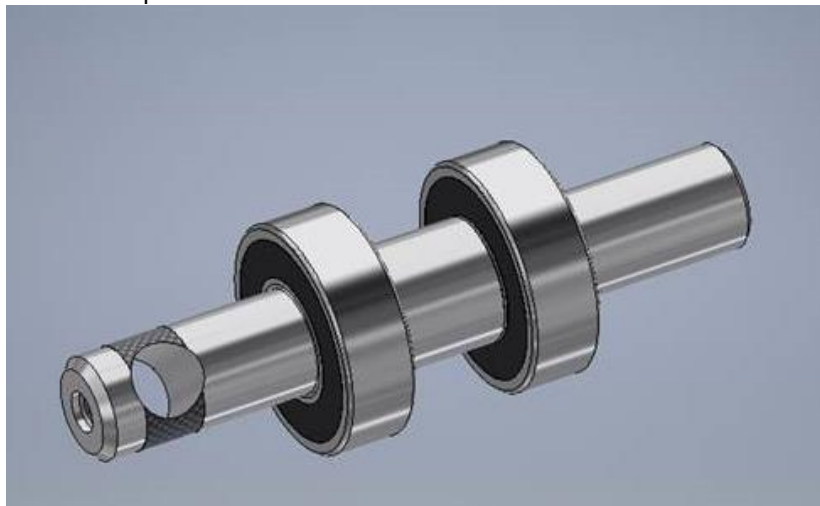
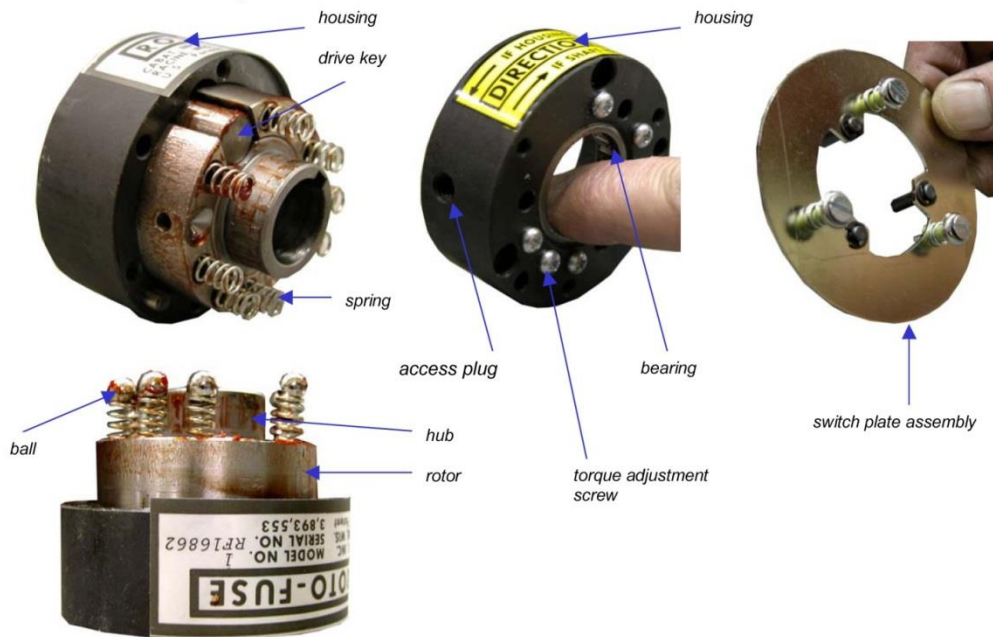


Figure CB4

4. Use press machine to remove bearing from shaft (USE CAUTION NOT TO DAMAGE SHAFT)
 - a. Clean shaft
 - b. Press on new bearing
 - c. Insert into bearing hub assembly
 - d. Secure into housing with 5/16-18 button head socket cap screw
 - e. Attach components



10 Maintaining the Overload Release Clutch



The overload release clutch has a thru-bore hub for shaft mounting. The housing incorporates tapped holes in the end faces for mounting sprockets, pulleys, or gears, etc. Piloting of the mounted member can be by means of two dowel holes in the clutch end faces, or by using the housing O.D. as a register. Input can be to either the clutch hub or clutch housing.

Installing the Clutch

1. Determine the direction of rotation required for the drive and install clutch in accordance with the "Direction of Rotation" label.
2. Anchor the clutch axially on the shaft by use of the setscrews provided in the clutch hub. This setscrew should be inserted from the hub bore – do not try to remove it by backing it out.

Installing the Switch Plate

The switch plate assembly consists of the plate, screws, springs, and three actuating pins.

1. With the actuation pins inserted in the mating holes in the clutch face, draw up shoulder screws evenly until they bottom.
2. When the clutch disengages, the switch-plate will automatically extend. Upon clutch re-engagement, the switch-plate will automatically retract.

Engagement/Re-Engagement

When a torque overload occurs and the clutch releases, it will rotate freely until the drive is stopped.

1. To re-engage the clutch, simply rotate output member forward or input member reverse for one revolution or less and the clutch will automatically snap back into engagement at the same angular relationship between input and output.
2. Such rotation can be accomplished at any point in the drive line as long as prescribed relative rotation occurs between input and output members.

External Torque Adjustment

This clutch model incorporates an external torque adjustment feature, with a series of tapped holes in each clutch endplate. These holes will be covered on one end of the clutch by the sprocket; pulley or coupling member used, but will be exposed on the other end of the clutch. These tapped holes line up with the internal drive balls in the clutch, and these drive balls can be disengaged individually by inserting the proper screw provided.

1. (+) screw set is used to plug the holes and do not affect torque. (see *Figure OC2*)
2. (–) screws, when fully inserted in the endplate, disengage the corresponding ball and thus reduce torque capacity. (see *Figure OC3*)
3. By inserting the full complement of (–) screws in the exposed endplate, the torque capacity can be reduced to approximately 60% of maximum (+ screws act as plugs and do not affect torque adjustment).
4. Torque reducing screws can be used singly, in any order, or all can be used to reduce torque to level desired. The torque adjusting screws must always be **completely screwed in** to perform their function. **DO NOT USE** other than factory supplied screws since improper screws or usage can cause clutch malfunction.



Figure OC2



Figure OC3

11 Resetting the Clutch

All of our clutch systems have a single position overload clutch, if or when the system jams the clutch will kick out preserving the mechanical components. There is a proximity sensor looking for the clutch kick out plate when the clutch kicks out the kick out plate goes beyond the sensing distance shutting the system off.

Clear the jam and rotate the screws back into position (in the same direction the timing screws rotate when operating), and the clutch will re-engage at a single point.

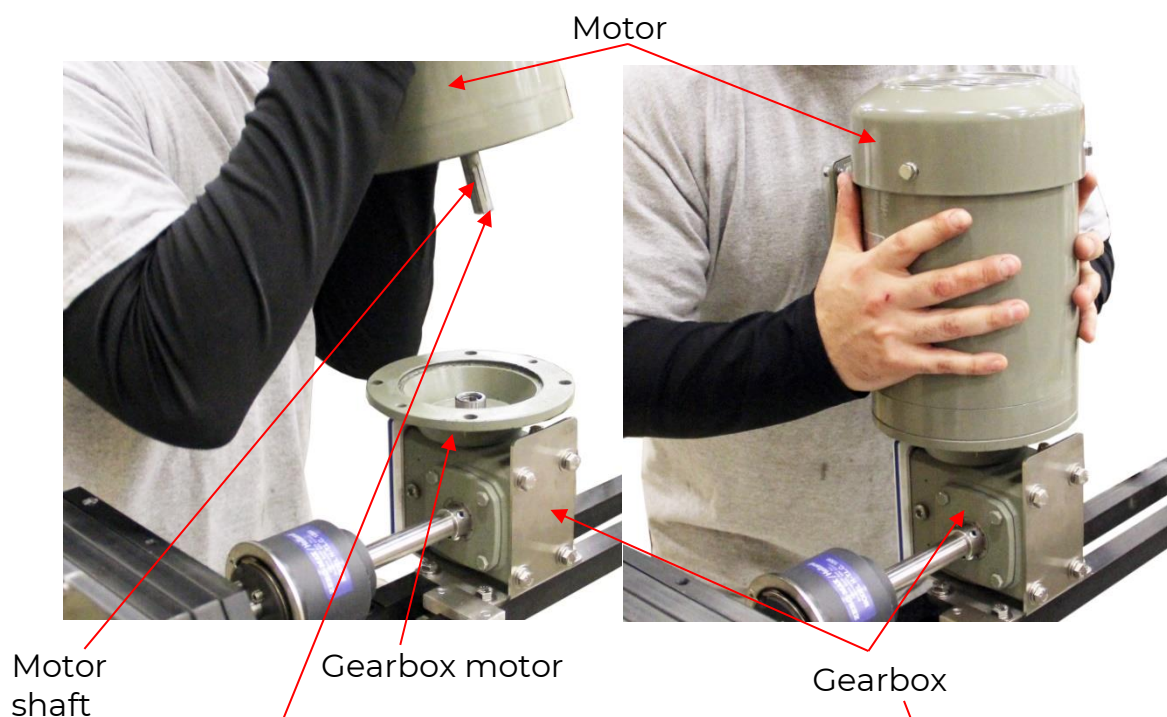
12

Installing the 56C Inverter Rated Motor



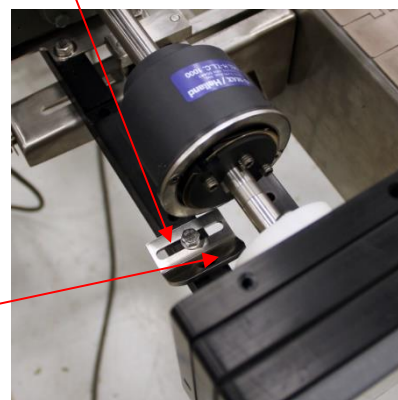
Reference Appendix B – Manufacturer's Product Information for general and maintenance information.

4. Place the 56C washdwn inverter rated motor onto the gearbox motor mount via the motor shaft.



Ensure the key is in place

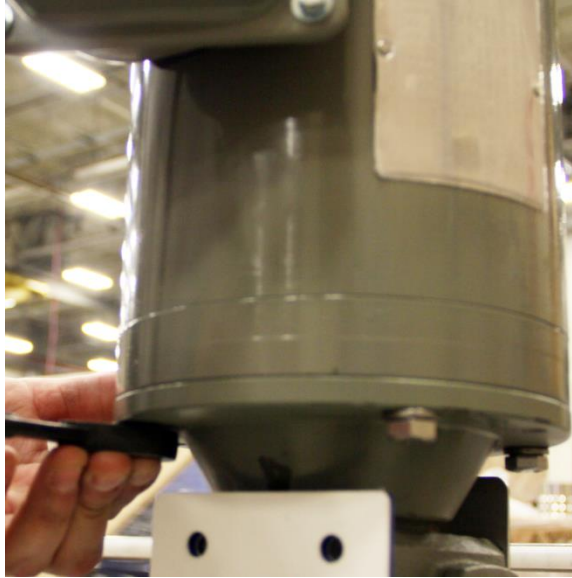
Clutch prox mounting bracket



5. Secure the motor in place using the bolt hardware provided.



The motor may have to be twisted to locate and match bolt hole pattern.



3. Install the stainless steel cover.

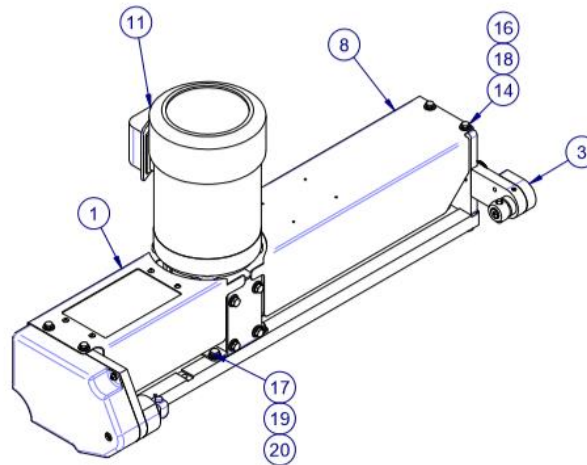


Illustration reference: assembly drawing #01-0-90385-001

13

Power the 56C Inverter Rated Motor



Reference Appendix B – Manufacturer's Product Information for wire schematic diagram.



Power the motor per plant process/procedure.

14 Preventative Maintenance

This chapter covers:

- 14.1** Daily Inspection
- 14.2** Weekly Inspection
- 14.3** Quarterly Inspection
- 14.4** Yearly Inspection

14.1 Daily Inspection

14.1.1 Timing Belt Inspection

Inspect all timing belts for:

Visible cracks

Frayed cords

Worn teeth which can cause slippage.

14.1.2 MFG Inspection

Inspect MFG's for wear spots such as shiny spots or non-uniform worn surfaces.

14.1.3 Drive Components

The entire machine, including drive components, should be inspected daily for signs of normal wear which may indicate the need for further maintenance.

Inspect the Timing Screws and Guides for build-up that may scuff the containers.

The machine should be cleaned daily to prevent the build-up of material that may prevent normal operation. All gearboxes, bearings, and belts should be free of debris, and should be moving freely.

14.2 Weekly Inspection

14.2.1 Timing Screw Driver

The Timing Screw Drivers are metal to metal contact. The Timing Screws should be separated from the driver weekly and a small amount of food grade lubricant added to the spherical drives to extend their life. This should also be done any time the Timing Screw is removed from the machine. Prior to re-installing the Timing Screw, check the pins and ball for wear. Replace as necessary.

14.3 Quarterly Inspection

14.3.1 Gearbox/Motor

Your Sterling Electric reducer has been tested and adjusted at the factory. Dismantling or replacement of components must be done by Sterling Electric to maintain the warranty.

Frequently check the oil level of the reducer. If oil level is low, (refer to reducer vent and level position chart) add proper lubrication through the filler plug until it comes out the oil level plug

14.4 Yearly Inspection

14.4.1 Bearing Inspection

Inspect all bearings

Look for noise, slop, wear and tear, etc.

Replace bearings when necessary
n necessary

15

Recommended Spare Parts List

Part Number	Description	Quantity
CMFG-2494-P	1-1/2" SQ LEG, FOR 44" MOUNTING HEIGHT	2
MFG-0991	BEARING, MODIFIED WATER PUMP	1
MFG-0034-H	COUPLING, SPHERE DRIVER FOR CROSS PIN W/FLATS	1
MFG-0033	PIN, DRIVE SHAFT WITH ROUNDS	1
MFG-1271	SQUARE, DRIVER FOR CROSS PIN	1
MFG-1272	PIN, TIMING SCREW DRIVER CROSS PIN	1
M-4708-P	CAST IRON, 5:1 56C FLG HOLLOW SHAFT, FOOTLESS (ORDER WITH DOUBLE SEAL)	1
M-1874-P	CLUTCH, SINGLE POSITION, 5/8 SHAFT ID, 75-150 IN*LB, STEEL	1
M-0798-P	PLATE FOR ROTOFUSE MOD 1	1
M-4406-P	BELT, 5M, 415mm, SINGLE SIDE, 25mm WIDE	1
M-0635-P	BALL BEARING, DEEP GROOVE, 0.375" x 0.906" x 0.313", STEEL, DOUBLE SEAL	2
M-1685-P	BALL BEARING, DEEP GROOVE, 0.625" x 1.375" x 0.438", STEEL, DOUBLE SEALED	4
EP-2891-P	PROX SWITCH, PNP, N.O., 60 MM, M12	1
EP-2091-P	56C FRAME, 1/2 HP, 3 PH, 1800 RPM	1
IDL-1-0002	IDLER, ARM ASSEMBLY	1
IDL-1-0001	IDLER, 26 TOOTH 5MM HTD ASSEMBLY	1
F-0050	WASHER, FLAT, 3/8, SS	2

16

APPENDIX A – Timing Screw Set Up





335 West 194th Street | Glenwood, IL 60425 | P: 708.756.6660 | F: 708.756.6620

Single Timing Screw Set Up

Screw # 90385-1 Customer Name SLEEVE SEAL Shipping Date _____ Setup by: JH

FEED: ☒ Choke
☐ Random

Container size: 250 ML

CONTAINER: ☒ Round ☒ Full ☐ Handle Leads
☐ Rectangle ☐ Empty ☐ Spout Leads
☐ Oval ☐ Handle Trails
☐ Square ☐ Spout Trails
☐ _____

Container dimension: 2.09 ROUND

TIMING SCREW COLOR:

BLACK

COLOR PLUG:

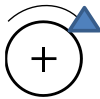
☐ Yes ☒ No Color: _____

TIMING MARKS: ☐

☐ Discharge ☐ Infeed ☒ N/A

for CDA Assembly use

TIMING SCREW ROTATION
viewed from infeed



ADJUSTABLE - ☒ IN/OUT
☒ UP/DOWN

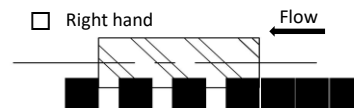
CONVEYOR - 92.6 FT/MIN

SCREWS - 250 REV/MIN

SETUP

= 2.3 BETWEEN
Center line of timing screw to
centerline of the conveyor

= 2.13 ABOVE
Centerline of timing screw to
Top of conveyor



SPECIAL SET UP: (explain)



335 West 194th Street | Glenwood, IL 60425 | P: 708.756.6660 | F: 708.756.6620

Single Timing Screw Set Up

Screw # 90385-2 Customer Name SLEEVE SEAL Shipping Date _____ Setup by: JH

FEED: ☒ Choke
☐ Random

Container size: 12 OZ

Container dimension: 2.27 ROUND

CONTAINER: ☒ Round ☒ Full ☐ Handle Leads
☐ Rectangle ☐ Empty ☐ Spout Leads
☐ Oval ☐ Handle Trails
☐ Square ☐ Spout Trails
☐ _____

TIMING SCREW COLOR:

BLACK

COLOR PLUG:

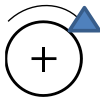
☐ Yes ☒ No Color: _____

TIMING MARKS: ☐

☐ Discharge ☐ Infeed ☒ N/A

for CDA Assembly use

TIMING SCREW ROTATION
viewed from infeed

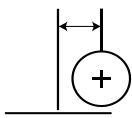


ADJUSTABLE - ☒ IN/OUT
☒ UP/DOWN

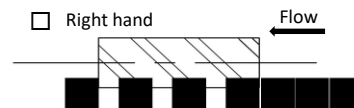
CONVEYOR - 88.54 FT/MIN

SCREWS - 250 REV/MIN

SETUP

 = 2.3 BETWEEN
Center line of timing screw to
centerline of the conveyor

 = 2.13 ABOVE
Centerline of timing screw to
Top of conveyor

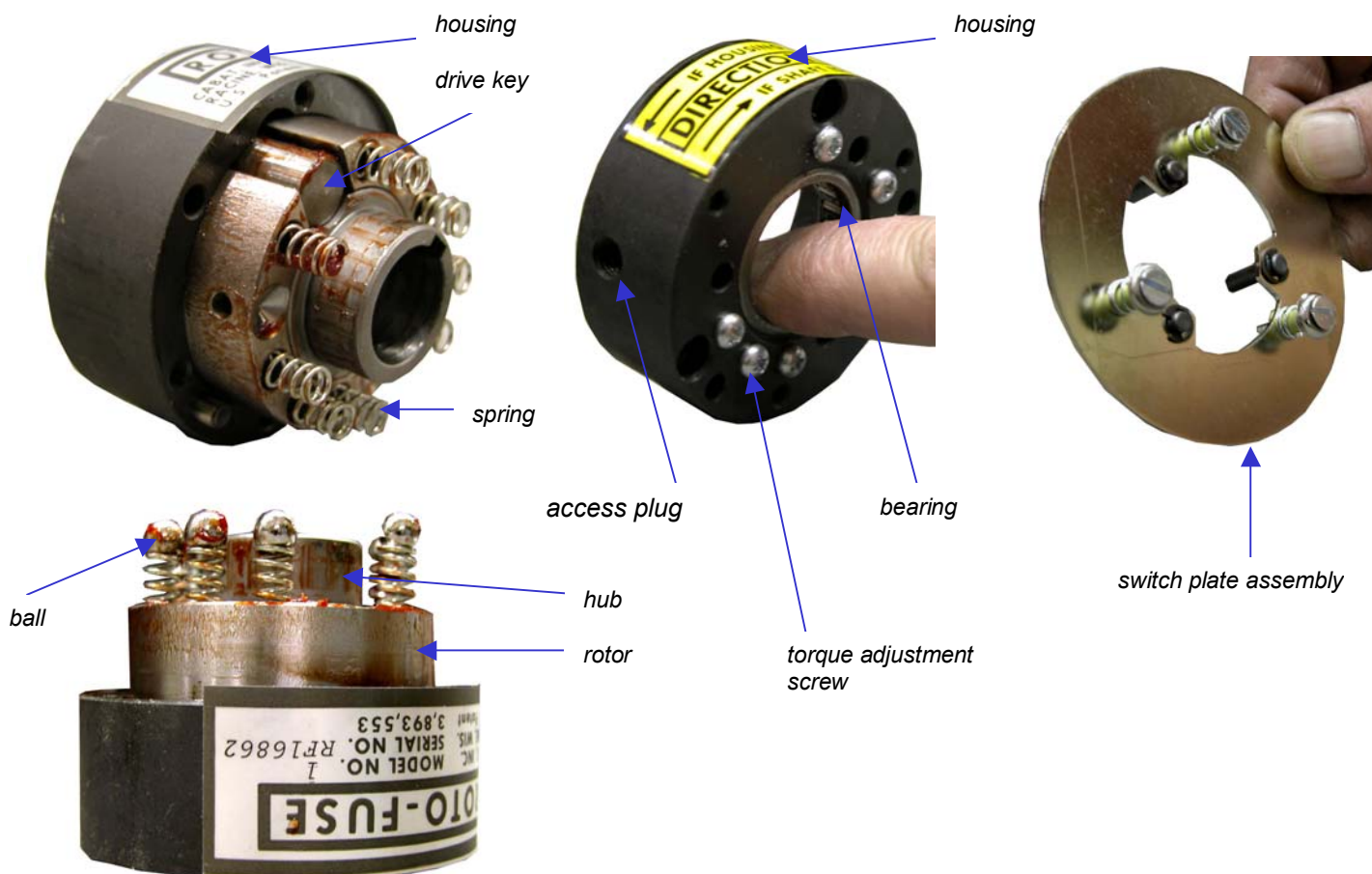


SPECIAL SET UP: (explain)

17 APPENDIX B – Manufacturer's Product Information



Maintaining the Overload Release Clutch



The overload release clutch has a thru-bore hub for shaft mounting. The housing incorporates tapped holes in the end faces for mounting sprockets, pulleys, or gears, etc. Piloting of the mounted member can be by means of two dowel holes in the clutch end faces, or by using the housing O.D. as a register. Input can be to either the clutch hub or clutch housing.

Installing the Clutch

1. Determine the direction of rotation required for the drive and install clutch in accordance with the "Direction of Rotation" label.
2. Anchor the clutch axially on the shaft by use of the setscrews provided in the clutch hub. This setscrew should be inserted from the hub bore – do not try to remove it by backing it out.

Installing the Switch Plate

The switch plate assembly consists of the plate, screws, springs, and three actuating pins.

1. With the actuation pins inserted in the mating holes in the clutch face, draw up shoulder screws evenly until they bottom.
2. When the clutch disengages, the switch-plate will automatically extend. Upon clutch re-engagement, the switch-plate will automatically retract.

Engagement/Re-Engagement

When a torque overload occurs and the clutch releases, it will rotate freely until the drive is stopped.

1. To re-engage the clutch, simply rotate output member forward or input member reverse for one revolution or less and the clutch will automatically snap back into engagement at the same angular relationship between input and output.
2. Such rotation can be accomplished at any point in the drive line as long as prescribed relative rotation occurs between input and output members.

External Torque Adjustment

This clutch model incorporates an external torque adjustment feature, with a series of tapped holes in each clutch endplate. These holes will be covered on one end of the clutch by the sprocket, pulley or coupling member used, but will be exposed on the other end of the clutch. These tapped holes line up with the internal drive balls in the clutch, and these drive balls can be disengaged individually by inserting the proper screw provided.

1. One set is used to plug the holes and do not affect torque. (See Figure OC2)



Figure OC2

2. The other screws, when fully inserted in the endplate, disengage the corresponding ball and thus reduce torque capacity. (See Figure OC3)



Figure OC3

3. The use of the  or  symbols on the screws symbolizes adding or subtracting torque capacity of the clutch. By inserting the full complement of minus screws in the exposed endplate, the torque capacity can be reduced to approximately 60% of maximum.
4. Torque reducing screws can be used singly, in any order, or all can be used to reduce torque to level desired. The torque adjusting screws must always be **completely screwed in** to perform their function. **DO NOT USE** other than factory supplied screws since improper screws or usage can cause clutch malfunction.

STERLING
ELECTRIC, INC.

2000RA[®]

WORM GEAR REDUCER

INSTALLATION AND MAINTENANCE MANUAL

August 19, 2009

Indianapolis, Indiana (800) 866-7973
Hamilton, Ontario (800) 809-0330

e-mail: sales@sterlingelectric.com
www.sterlingelectric.com

OIL CAPACITIES (FLUID OUNCE)

Mounting Position	UNIT SIZE									
	2133	2154	2175	2206	2238	2262	2300	2325	2425	2525
Worm Over	6	11	12	18	22	33	55	60	100	178
Worm Under	11	18	20	28	31	54	74	108	140	303
Vertical Output	10	17	17	26	29	51	67	91	105	220
Vertical Input	7	14	16	22	25	44	60	81	116	240

16 floz = 1 pint
 2 pints = 1 quart
 4 quarts = 1 US gallon

SYNTHETIC LUBRICANTS

All standard reducers ordered from the factory are shipped with Mobil SHC 634 or equal synthetic oil. Double reduction units have separate oil sumps and must be filled and checked independently. Synthetic lubricants provide the potential for numerous benefits including wider operating temperature range and increased interval between changes. Use of synthetics can cause problems if they are not compatible with the seals or conventional lubes they replace. The synthetic lubrication provided with the reducer is good for ambient temperature ranges of – 10° F to 105° F and is compatible with standard compounded oil. For synthetic oil used in helical reducers of helical/worm combinations, contact factory. **Prior to startup, verify that the oil is at the level shown on the drawings above.** If the ambient temperature will be outside the range for the lubricant installed at the factory, drain and refill the reducer with the proper viscosity lubricant prior to use. Consult the chart above or the factory for alternate lubricants.

Change Intervals: Standard compounded lubricants should be changed every six months or 2500 operating hours, whichever comes first. Synthetic lubricants should be changed every two years or 6000 hours, whichever comes first.

CAUTION: Oil should be changed more often if reducer is used in a severe environment. (*i.e. dusty, humid*)

CAUTION: In the Food and Drug Industry (including animal food), consult the lubrication supplier for recommendation of lubricants which are acceptable to the Food and Drug Administration and/or other authoritative bodies having jurisdiction.

SPECIAL LUBRICATION REQUIREMENTS – SIZES 2175 & LARGER

Units shipped from the factory are assembled to properly lubricate all internal components based on a specific assumed horizontal mounting orientation, worm over. If a size 2175 or larger unit will be mounted in a different orientation, or run with sustained input speeds less than 900 RPM, it should be specified with the order. The unit can then be modified to assure proper lubrication.

The maximum input HP rating as shown in the published Rating Tables is based on a stabilized oil bath temperature not exceeding 200° F for normal ambient temperatures. Higher oil bath temperatures or continued operation in excess of rated input HP will tend to shorten the useful life of a lubricant. For high ambient temperatures in excess of 100° F, special lubricants or de-rating of the Gearmotor may be required. Consult the Factory or Local Office with complete application engineering data if this occurs.

MAINTENANCE

Your Sterling Electric reducer has been tested and adjusted at the factory. Dismantling or replacement of components must be done by Sterling Electric to maintain the warranty.

Frequently check the oil level of the reducer. If oil level is low, (refer to reducer vent and level position chart) add proper lubrication through the filler plug until it comes out the oil level plug.

Inspect vent plug often to insure it is clean and operating.

CAUTION: Mounting bolts should be routinely checked to ensure that the unit is firmly anchored for proper operation.

Seals: The Sterling Electric line of speed reducers utilizes premium quality Viton® seals which are the state-of-the-art in sealing technology. Seals are, however, a wear item and eventually need to be replaced. Seal kits are available and contain all the necessary seals, O-rings, and shims for a given reducer size based on style. Refer to the parts list for available kits. Replacement of the seals can be easily accomplished by following the steps below:

1. Remove the worn seal without damaging the shaft surface or the seal bore. This can be done by drilling a .062 diameter hole in the seal casing (being careful not to drill into the bearing behind the seal). Screw a #10 sheet metal screw into the hole and pry out the seal.
2. Clean the seal bore of sealant.
3. Before installing the new seal, use electrical tape to cover any keyways on the shaft to prevent seal lip damage.
4. Grease the seal lips with bearing grease and apply a sealant to the seal bore.
5. Slide the seal into the shaft being careful not to fold the inner lip over on any shaft steps.
6. Press the seal into its bore with a sleeve that presses on the seal casing, being careful to keep the seal square in its bore.

CLASS OF SERVICE

All capacity ratings are based on American Gear Manufacturers Association (AGMA) Standards. Load conditions must be within cataloged ratings published in the current Sterling Electric Catalog (available upon request).

LONG-TERM STORAGE (6 MONTHS UP)

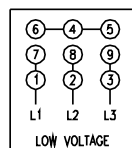
Units must be stored indoors, in a dry, warm temperature.

Completely fill the unit with oil.

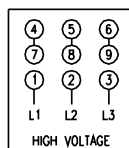
Rotate the input shaft so that the output shaft rotates at least one revolution per month.

Completely cover the input and output shaft with grease.

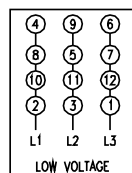
At the time of start up, drain the storage oil, install the breather, and fill to the proper oil level with correct lubricant for the operating condition.



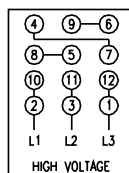
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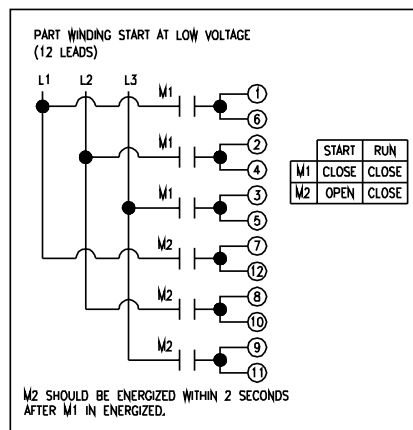
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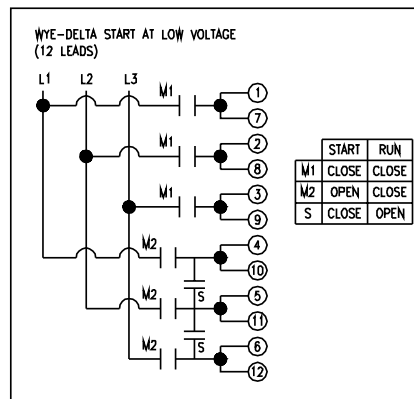
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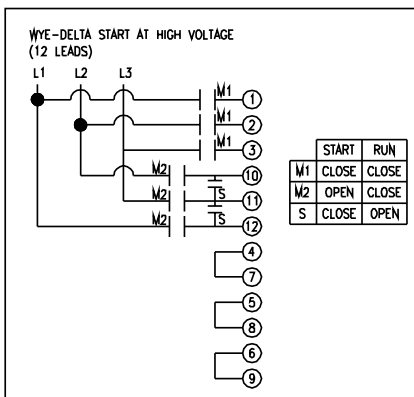
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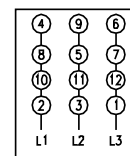
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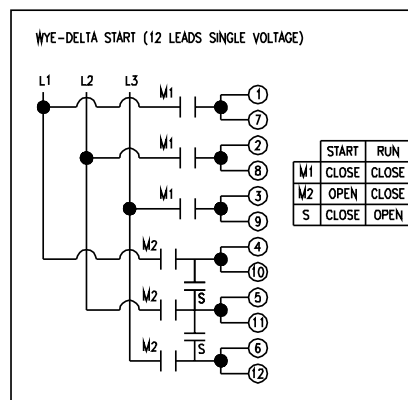
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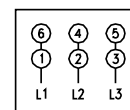
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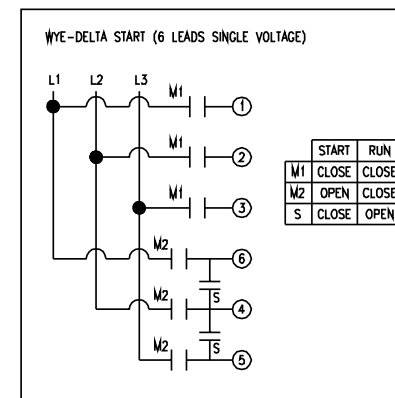
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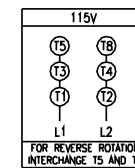
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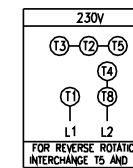
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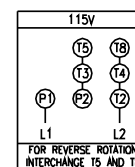
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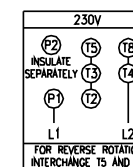
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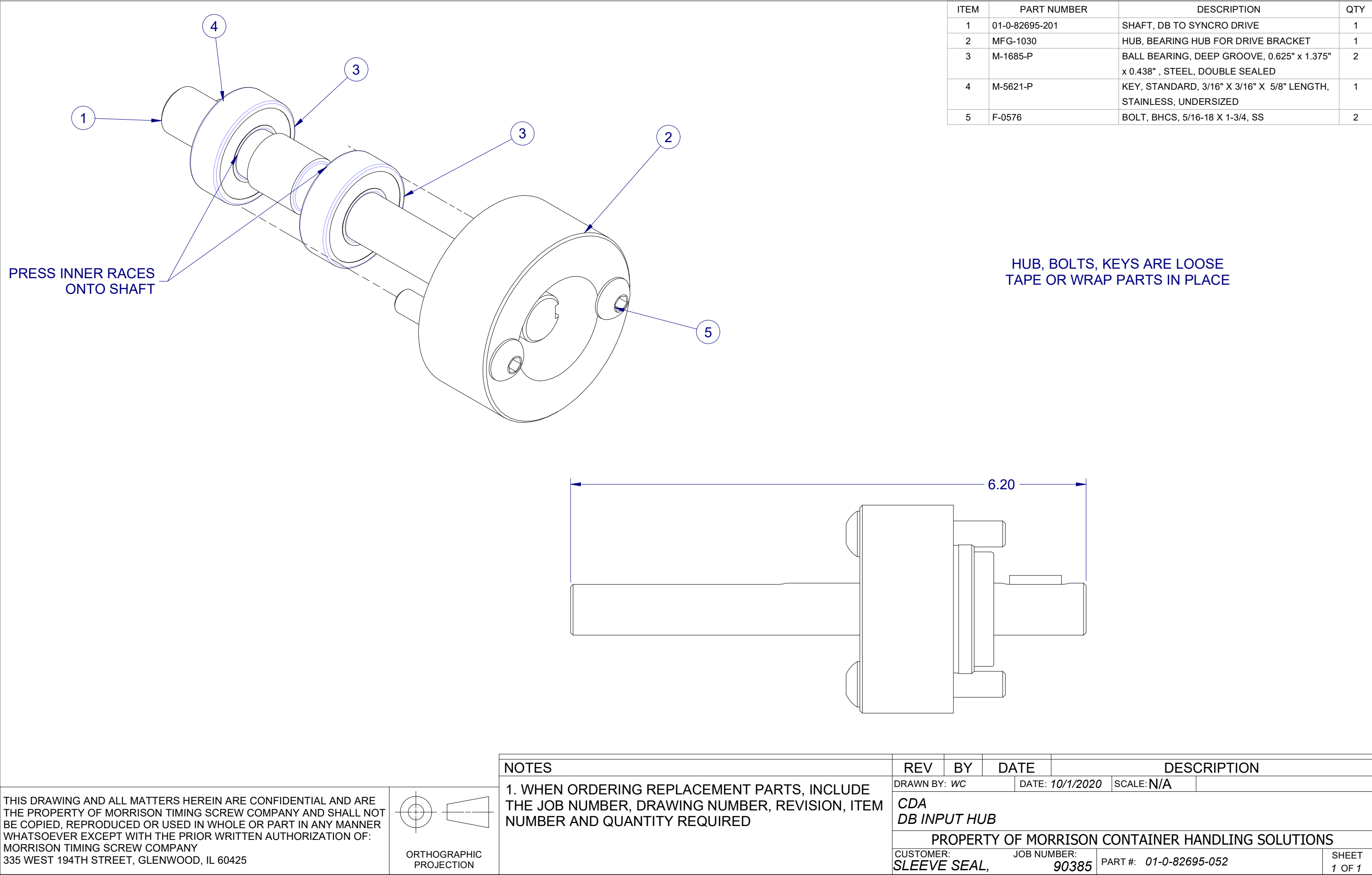


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18

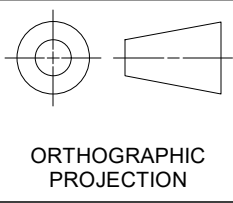
APPENDIX C – Mechanical Assembly Drawings





ITEM	PART NUMBER	DESCRIPTION	QTY
1	01-0-82695-201	SHAFT, DB TO SYNCRO DRIVE	1
2	MFG-1030	HUB, BEARING HUB FOR DRIVE BRACKET	1
3	M-1685-P	BALL BEARING, DEEP GROOVE, 0.625" x 1.375" x 0.438" , STEEL, DOUBLE SEALED	2
4	M-5621-P	KEY, STANDARD, 3/16" X 3/16" X 5/8" LENGTH, STAINLESS, UNDERSIZED	1
5	F-0576	BOLT, BHCS, 5/16-18 X 1-3/4, SS	2

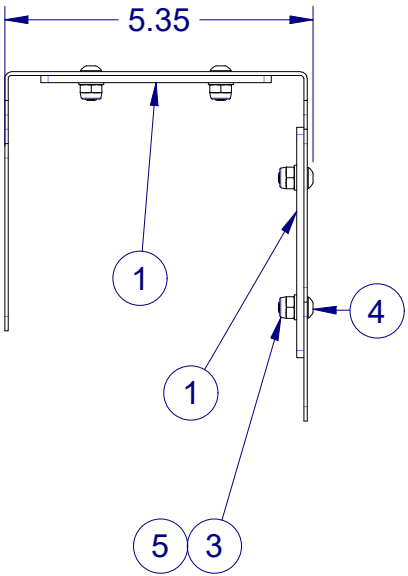
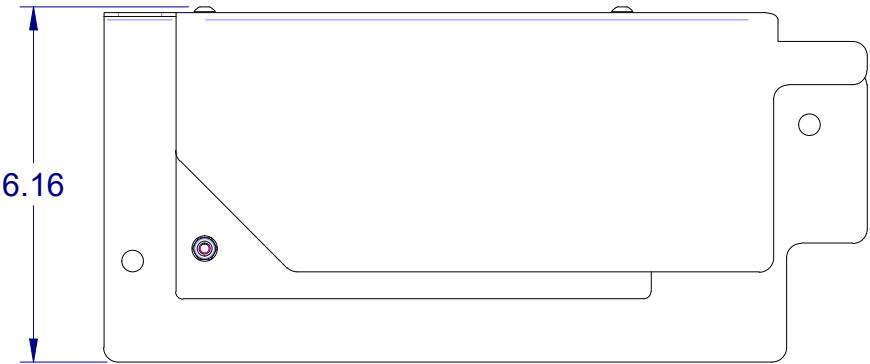
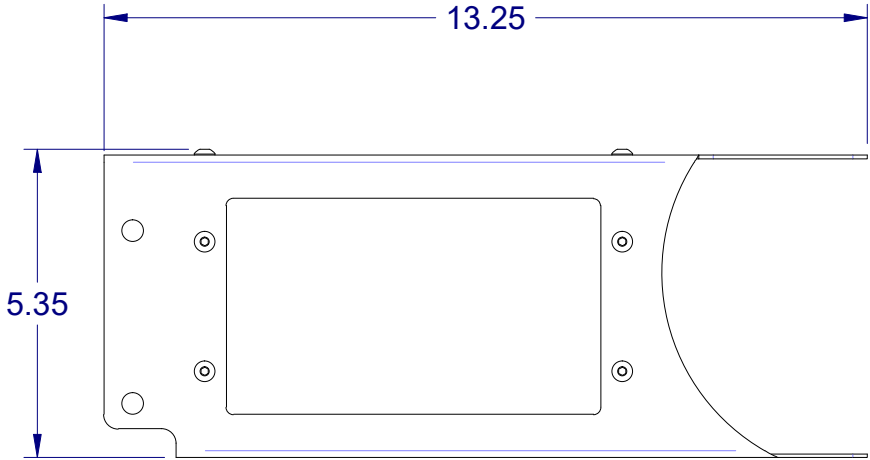
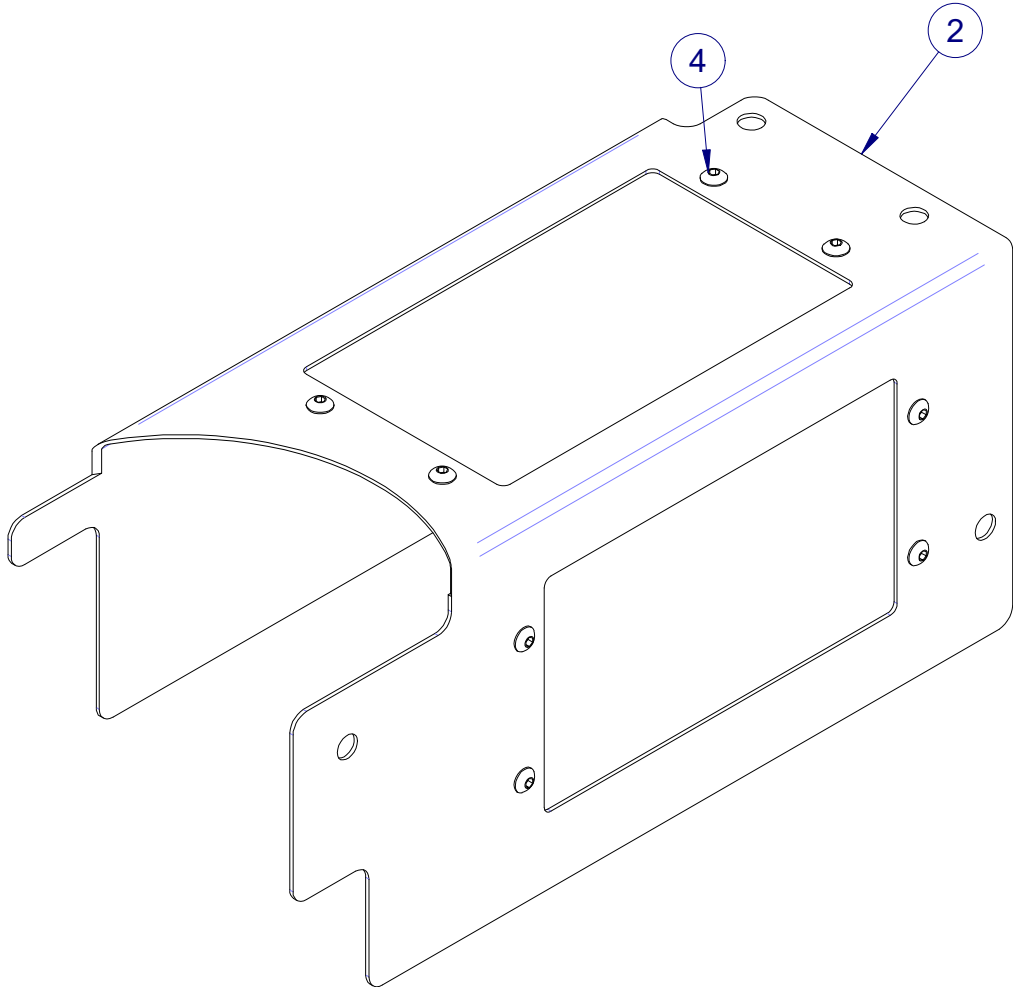
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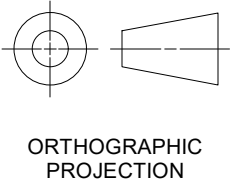
ORTHOGRAPHIC
PROJECTION

NOTES		REV	BY	DATE	DESCRIPTION	
1. WHEN ORDERING REPLACEMENT PARTS, INCLUDE THE JOB NUMBER, DRAWING NUMBER, REVISION, ITEM NUMBER AND QUANTITY REQUIRED		DRAWN BY: WC		DATE: 10/1/2020	SCALE: N/A	
		CDA DB INPUT HUB				
		PROPERTY OF MORRISON CONTAINER HANDLING SOLUTIONS				
CUSTOMER: SLEEVE SEAL,		JOB NUMBER: 90385		PART #: 01-0-82695-052		SHEET 1 OF 1

ITEM	PART NUMBER	DESCRIPTION	QTY
1	01-2-68325-150	LEXAN, CDA WINDOW	2
2	01-2-68325-700	SHEET METAL, COVER, FRONT, LH	1
3	F-0047	WASHER, FLAT, #10, SS	8
4	F-0820	BOLT, BHCS, #10-32 X 1/2, SS	8
5	F-0830	NUT, NYLOCK, #10-32, SS	8



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NOTES

1. WHEN ORDERING REPLACEMENT PARTS, INCLUDE THE JOB NUMBER, DRAWING NUMBER, REVISION, ITEM NUMBER AND QUANTITY REQUIRED

REV

BY

DATE

DESCRIPTION

DRAWN BY: WC

DATE: 10/1/2020

SCALE: N/A

CDA
WINDOW COVER ASSEMBLY

PROPERTY OF MORRISON CONTAINER HANDLING SOLUTIONS

CUSTOMER:

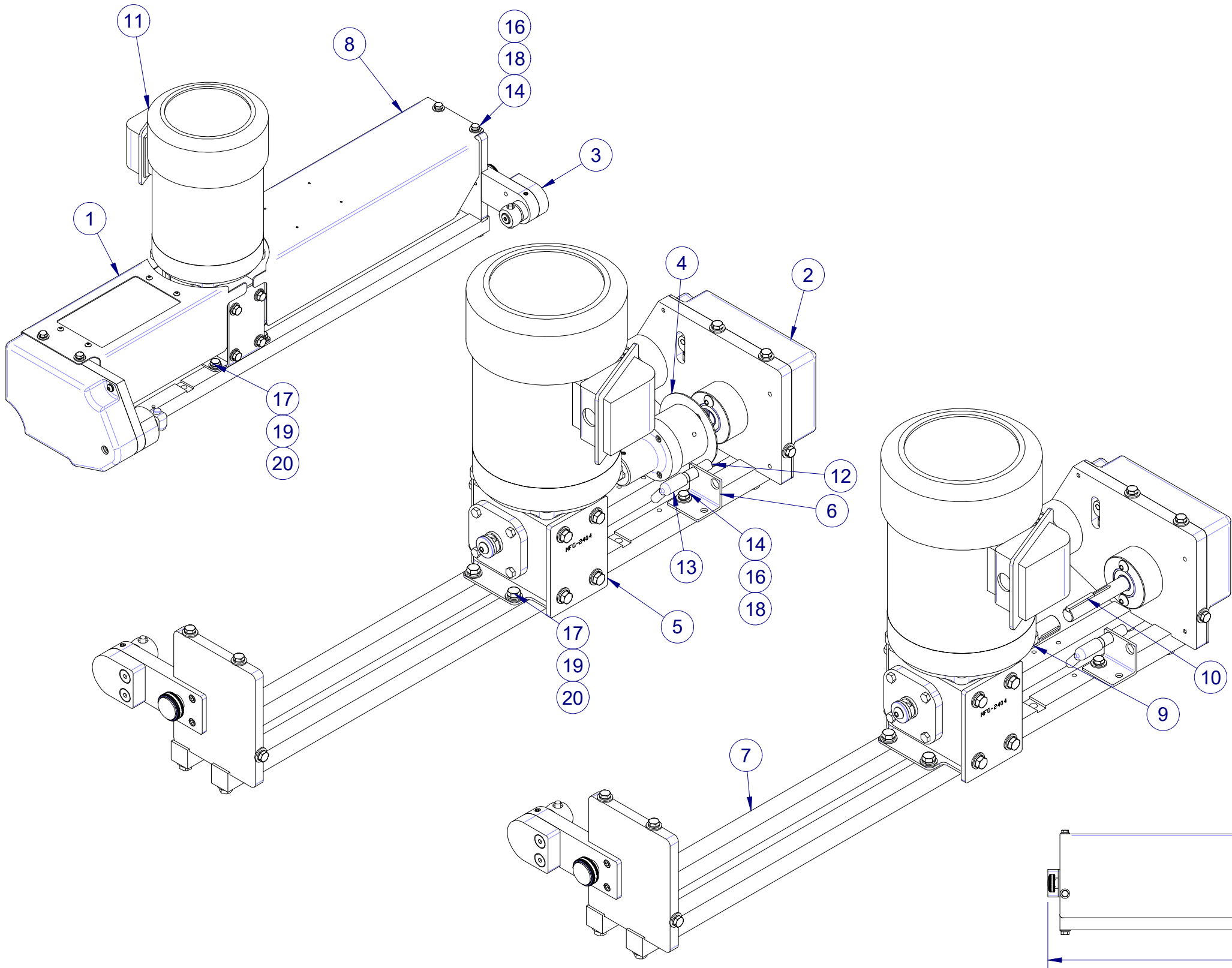
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PART #: 01-0-88195-050

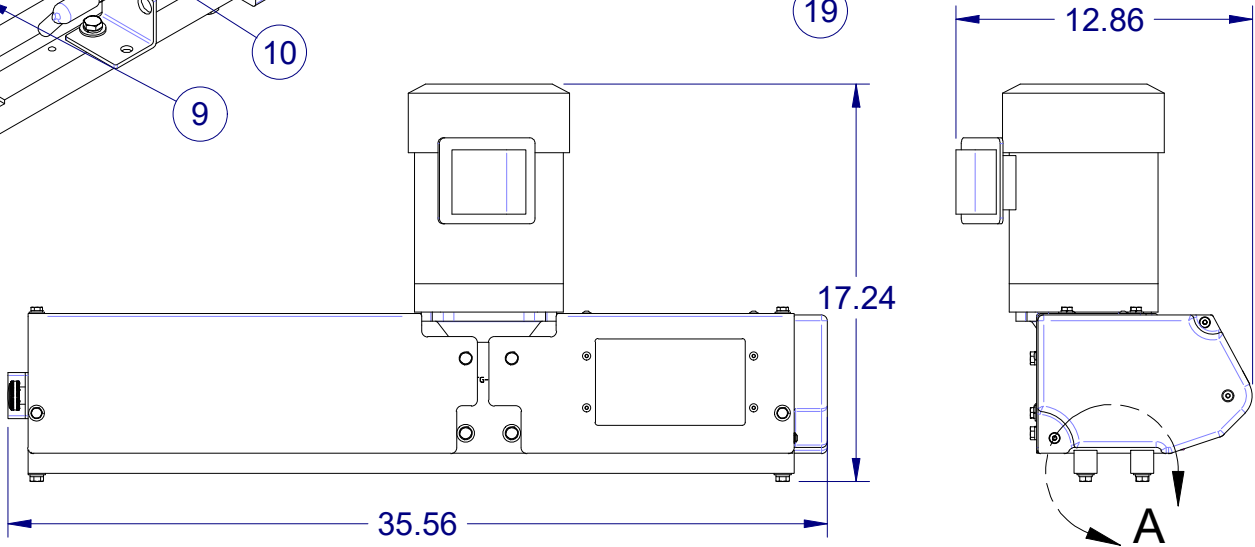
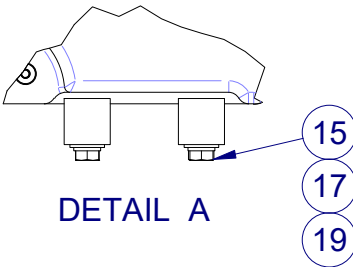
SLEEVE SEAL,

90385

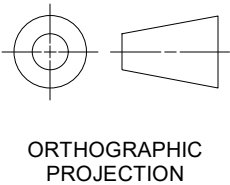
SHEET
1 OF 1



ITEM	PART NUMBER	DESCRIPTION	QTY
1	01-0-88195-050	WINDOW COVER ASSEMBLY	1
2	DB-1-0014A	DRIVE BRACKET, 2-1/4IN RD, ALUMINIUM, LEFT HAND	1
3	IB-1-0002A	IDLER BRACKET, 1-5/8IN RD, ALUMINUM LEFT HAND	1
4	MCA-1-0001A	MECHANICAL CLUTCH ASSEMBLY, 75-150 IN*LB, STEEL	1
5	PDA-1-0001A	POWER DRIVE ASSEMBLY, 56C, 5:1 LEFT SIDE	1
6	MFG-0724	SHEET METAL, CLUTCH PROX MTG BKT	1
7	MFG-2423	TIE BAR, 30" TIE BAR FOR 56C MOTOR	2
8	MFG-2514	SHEET METAL, COVER, BACK 30", LH	1
9	M-5623-P	KEY, STANDARD, 3/16" X 3/16" X 1" LENGTH, STAINLESS, UNDERSIZED	1
10	M-5624-P	KEY, STANDARD, 3/16" X 3/16" X 1-9/16" LENGTH, STAINLESS, UNDERSIZED	1
11	EP-2091-P	56C FRAME, 1/2 HP, 3 PH, 1800 RPM	1
12	EP-2891-P	PROX SWITCH, PNP, N.O., 60 MM, M12	1
13	EP-2896-P	M12 CABLE, 5M, SINGLE ENDED, 90F	1
14	F-0012	BOLT, HHCS, 1/4-20 X 1/2, SS	7
15	F-0022	BOLT, HHCS, 5/16-18 X 1-1/2, SS	4
16	F-0048	WASHER, FLAT, 1/4, SS	7
17	F-0049	WASHER, FLAT, 5/16, SS	8
18	F-0053	WASHER, LOCK, 1/4, SS	7
19	F-0054	WASHER, LOCK, 5/16, SS	8
20	F-0154	BOLT, HHCS, 5/16-18 X 3/4, SS	4



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NOTES

1. WHEN ORDERING REPLACEMENT PARTS, INCLUDE THE JOB NUMBER, DRAWING NUMBER, REVISION, ITEM NUMBER AND QUANTITY REQUIRED

REV

BY

DATE

DESCRIPTION

DRAWN BY: WC

DATE: 10/1/2020

SCALE: N/A

CDA
LEFT HAND ASSEMBLY

PROPERTY OF MORRISON CONTAINER HANDLING SOLUTIONS

CUSTOMER:

SLEEVE SEAL,

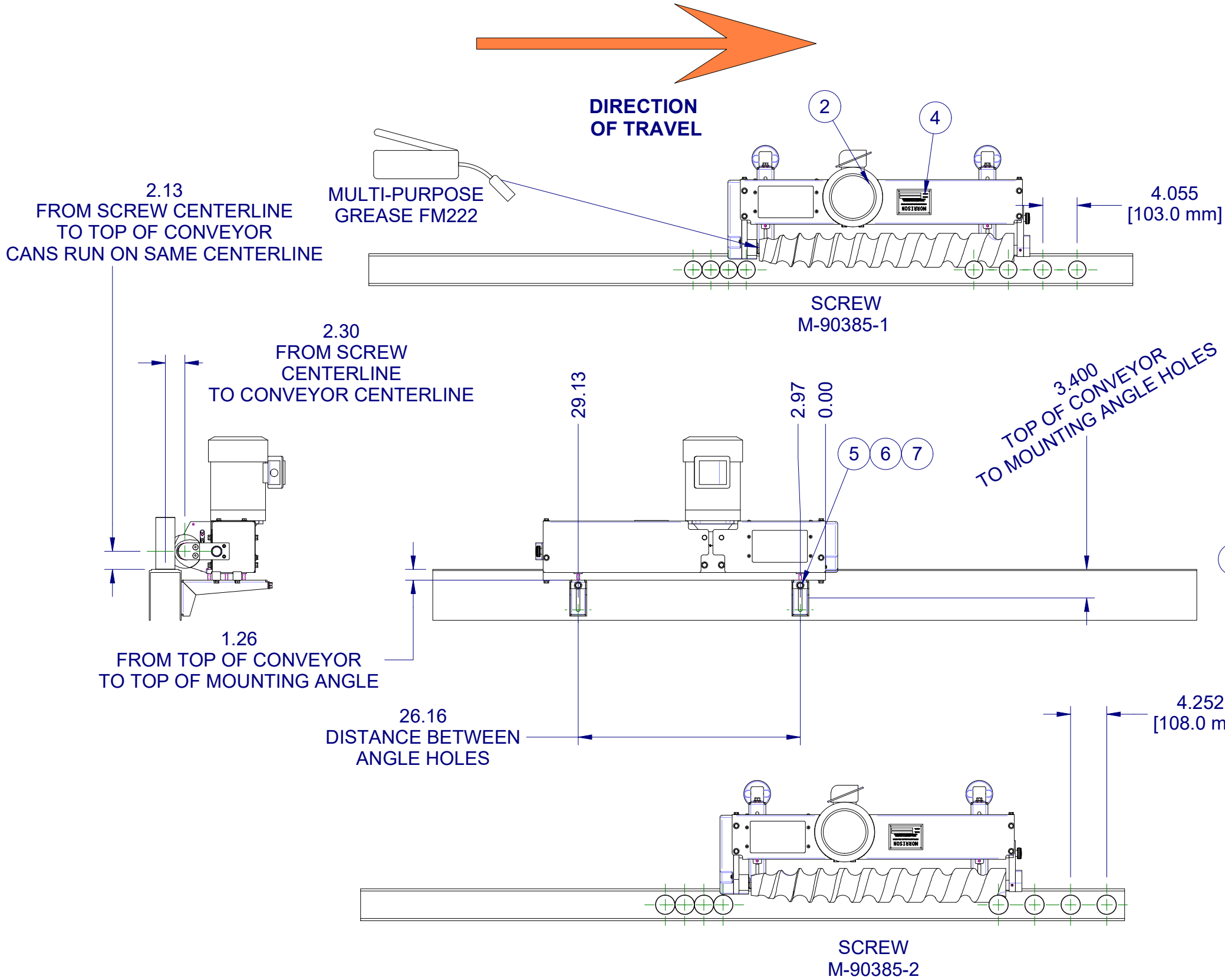
JOB NUMBER:

90385

PART #: 01-0-90385-001

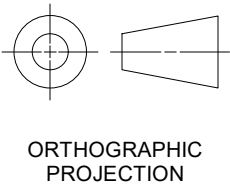
SHEET
1 OF 1

ITEM	PART NUMBER	DESCRIPTION	QTY
1	01-0-89285-030	CONVEYOR MOUNTING ASSEMBLY	2
2	01-0-90385-001	LEFT HAND ASSEMBLY	1
3	CMFG-2494-P	1-1/2" SQ LEG, FOR 44" MOUNTING HEIGHT	2
4	M-0049-P	NAME PLATE	1
5	F-0050	WASHER, FLAT, 3/8, SS	2
6	F-0055	WASHER, LOCK, 3/8, SS	2
7	F-0121	BOLT, HHCS, 3/8-16 X 3/4, SS	2



SLEEVE SEAL
MOTOR: 56C FRAME, 1/2 HP, 3 PH, 1800 RPM
SPEED: 250rpm AT 41Hz
FOR SCREWS
M-90385-1: 200/250ml CAN, DISCHARGE PITCH 103mm
M-90385-2: 12OZ CAN DISCHARGE PITCH 108mm

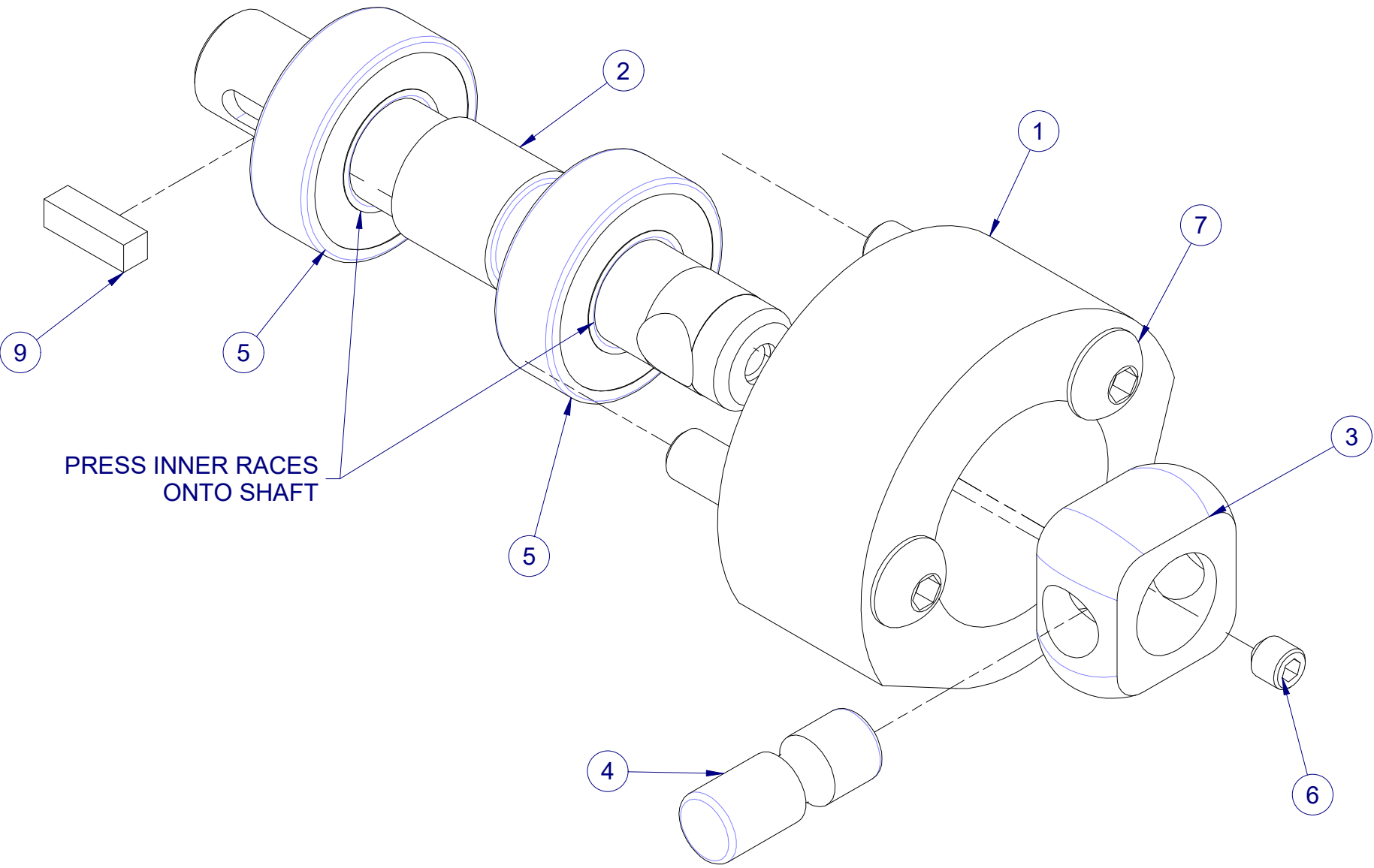
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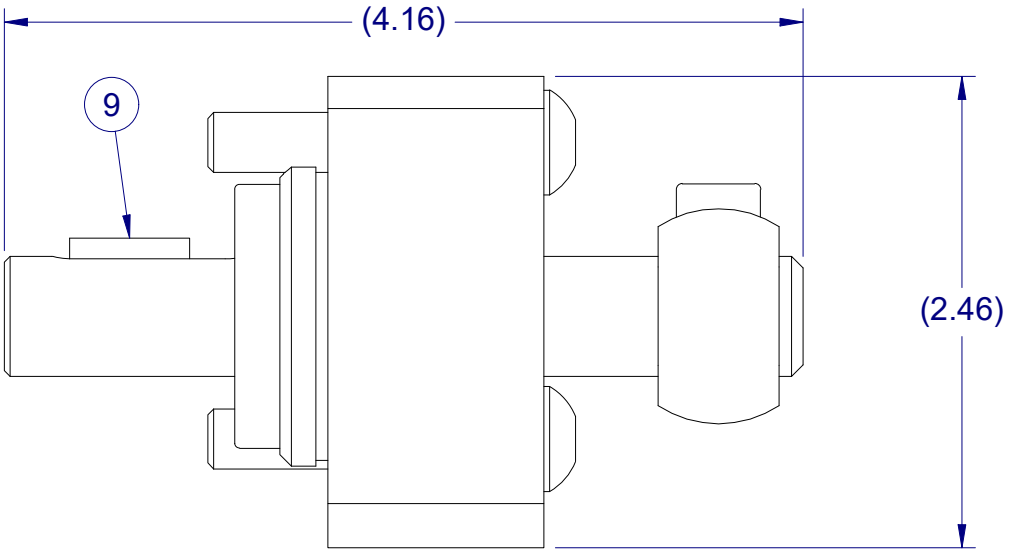
ORTHOGRAPHIC
PROJECTION

NOTES		REV	BY	DATE	DESCRIPTION	
1. WHEN ORDERING REPLACEMENT PARTS, INCLUDE THE JOB NUMBER, DRAWING NUMBER, REVISION, ITEM NUMBER AND QUANTITY REQUIRED APPLY MULT-PURPOSE, FOOD GRADE GREASE, MOBILGREASE FM222 TO TIMING SCREW DRIVERS		DRAWN BY: WC		DATE: 10/1/2020	SCALE: N/A	
		CDA LEFT HAND OVERALL ASSEMBLY				
		PROPERTY OF MORRISON CONTAINER HANDLING SOLUTIONS				
CUSTOMER: SLEEVE SEAL,		JOB NUMBER: 90385		PART #: 40-0-90385-001		SHEET 1 OF 1

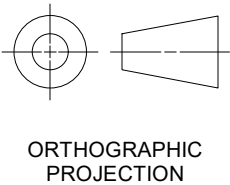
ITEM	PART NUMBER	DESCRIPTION	QTY
2	01-2-70025-203	SHAFT, DRIVE BRACKET SCREW DRIVER SHAFT	1
3	MFG-1271	SQUARE, DRIVER FOR CROSS PIN	1
4	MFG-1272	PIN, TIMING SCREW DRIVER CROSS PIN	1
1	MFG-1323	HUB, BEARING HUB - 2.13"RD	1
5	M-1685-P	BALL BEARING, DEEP GROOVE, 0.625" x 1.375" x 0.438" , STEEL, DOUBLE SEALED	2
9	M-5621-P	KEY, STANDARD, 3/16" X 3/16" X 5/8" LENGTH, STAINLESS, UNDERSIZED	1
6	F-0077	SETSCREW, 1/4-20 X 1/4, SS	1
7	F-0576	BOLT, BHCS, 5/16-18 X 1-3/4, SS	2



HUB, BOLTS, KEY ARE LOOSE
TAPE OR WRAP IN PLACE



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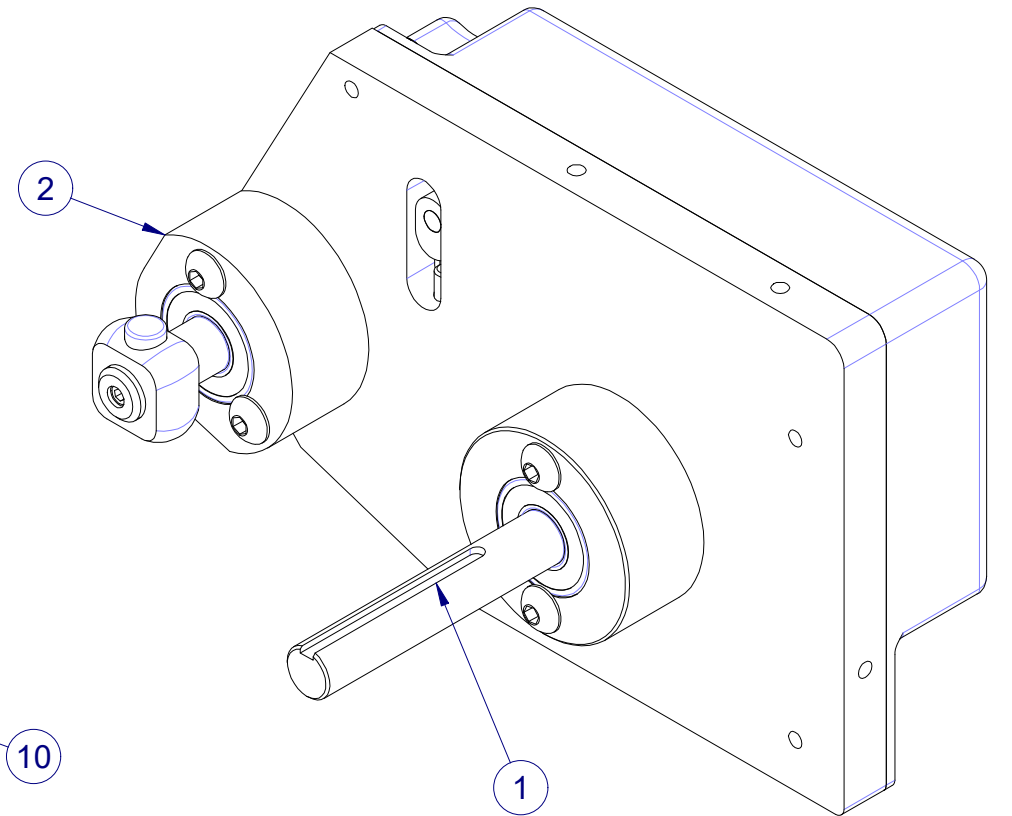
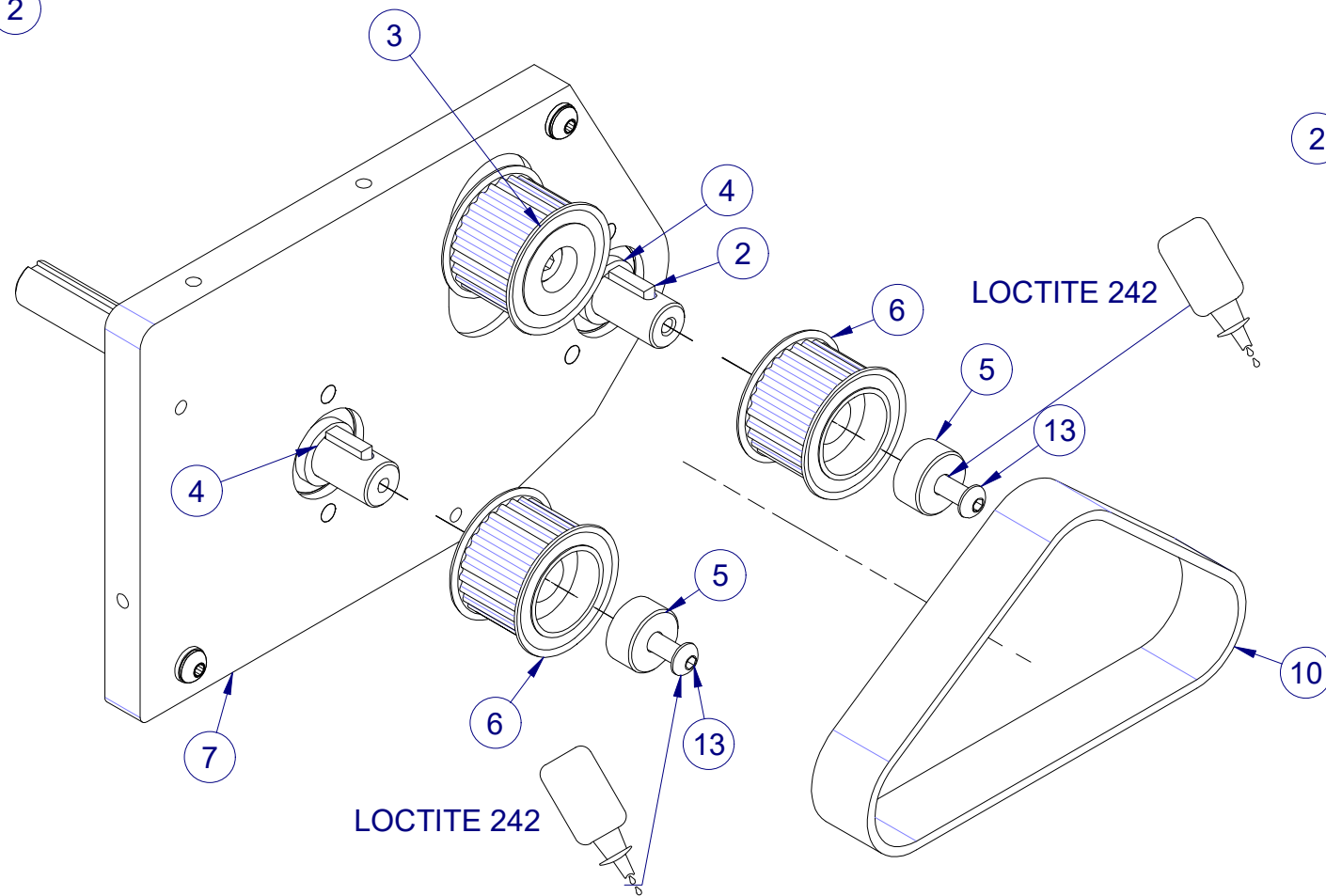
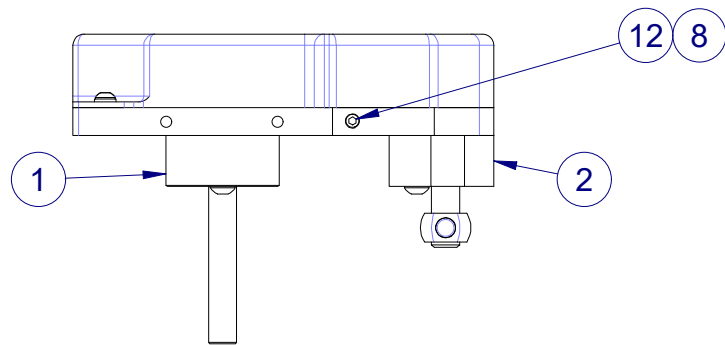
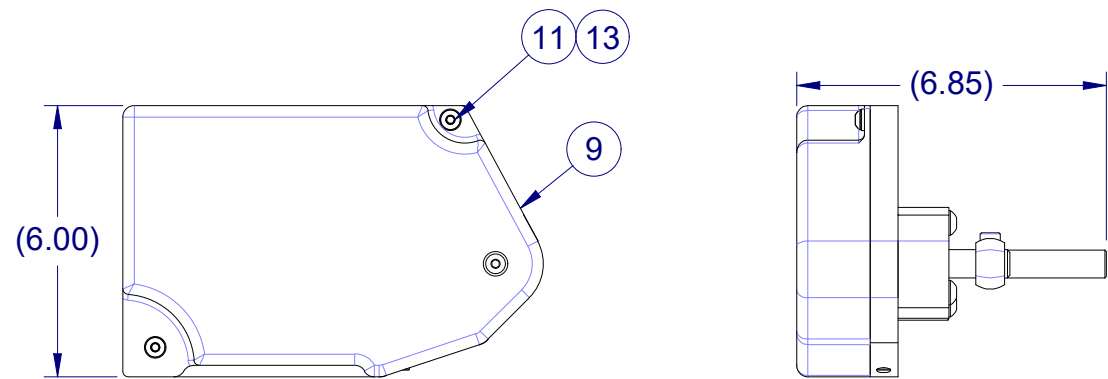


ORTHOGRAPHIC
PROJECTION

NOTES

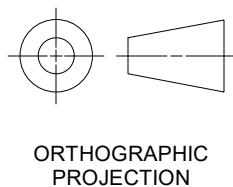
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REV	BY	DATE	DESCRIPTION
DRAWN BY: WC	DATE: 10/1/2020	SCALE: N/A	
CDA DB SCREW DRIVE HUB, PRESS FIT			
PROPERTY OF MORRISON CONTAINER HANDLING SOLUTIONS			
CUSTOMER: SLEEVE SEAL,	JOB NUMBER: 90385	PART #: BHA-1-0017	SHEET 1 OF 1



ITEM	PART NUMBER	DESCRIPTION	QTY
1	01-0-82695-052	DB INPUT HUB	1
2	BHA-1-0017	DB SCREW DRIVE HUB, PRESS FIT	1
3	IDL-1-0001	IDLER, 26 TOOTH 5MM HTD ASSEMBLY	1
4	MFG-1391	SPACER, DRIVE BRACKET SPACER	2
5	MFG-1399	KEEPER, PULLEY RETAINING CAP	2
6	MFG-1487	PULLEY, TIMING PULLEY 26T	2
7	MFG-1936	PLATE, DRIVE BRACKET LH	1
8	MFG-2567	PIN, IDLER HOLDER	1
9	MFG-2570	LEXAN, DB COVER, BLOW MOLDED	1
10	M-4406-P	BELT, 5M, 415mm, SINGLE SIDE, 25mm WIDE	1
11	M-5198-P	FASTENER, WASHER, 0.252ID X 0.472OD X 0.065THK, NYLON, BLACK	4
12	F-0137	SETSCREW, 5/16-18 X 1/2, SS	1
13	F-0795	BOLT, BHCS, 1/4-20 X 3/4, SS	6

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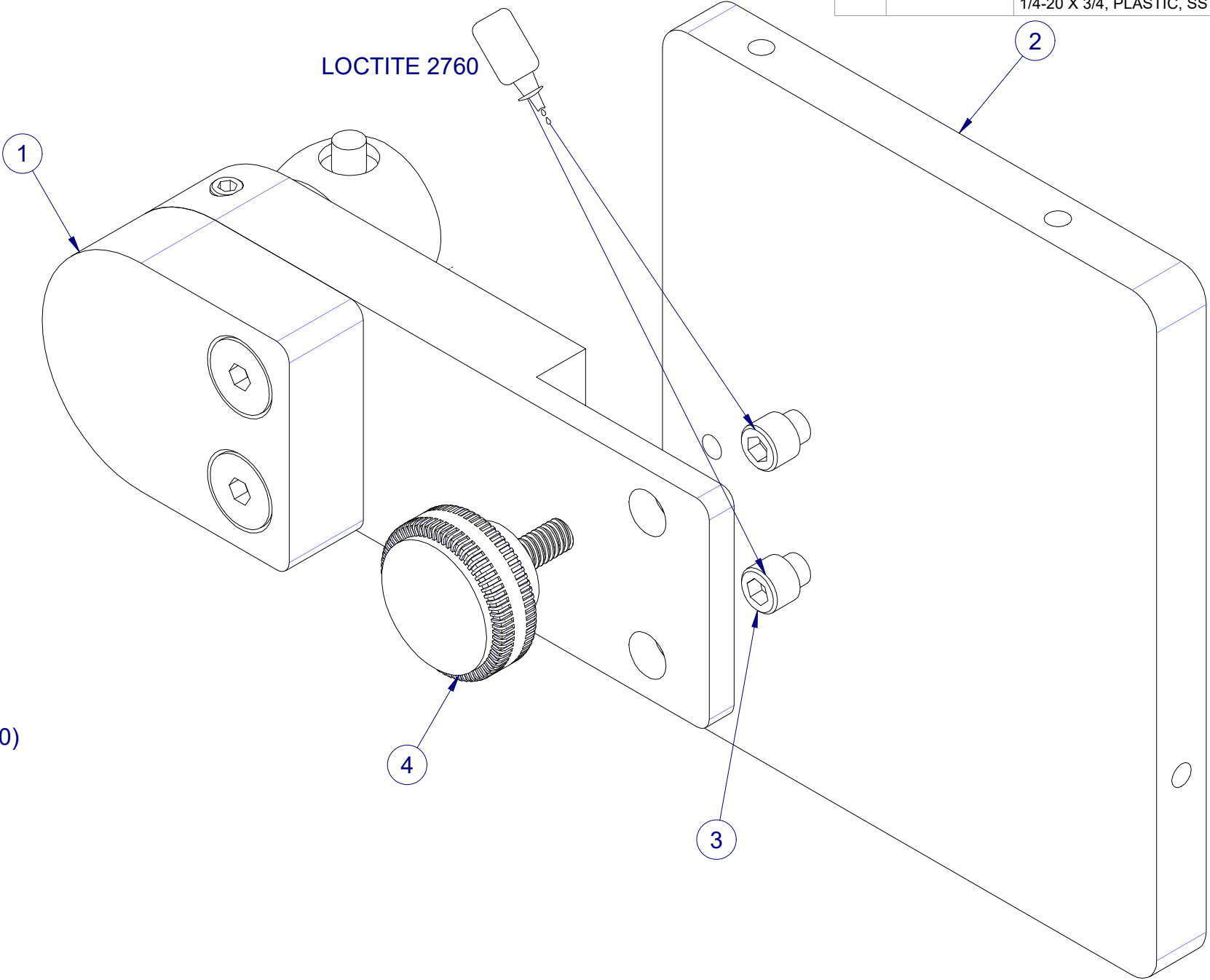
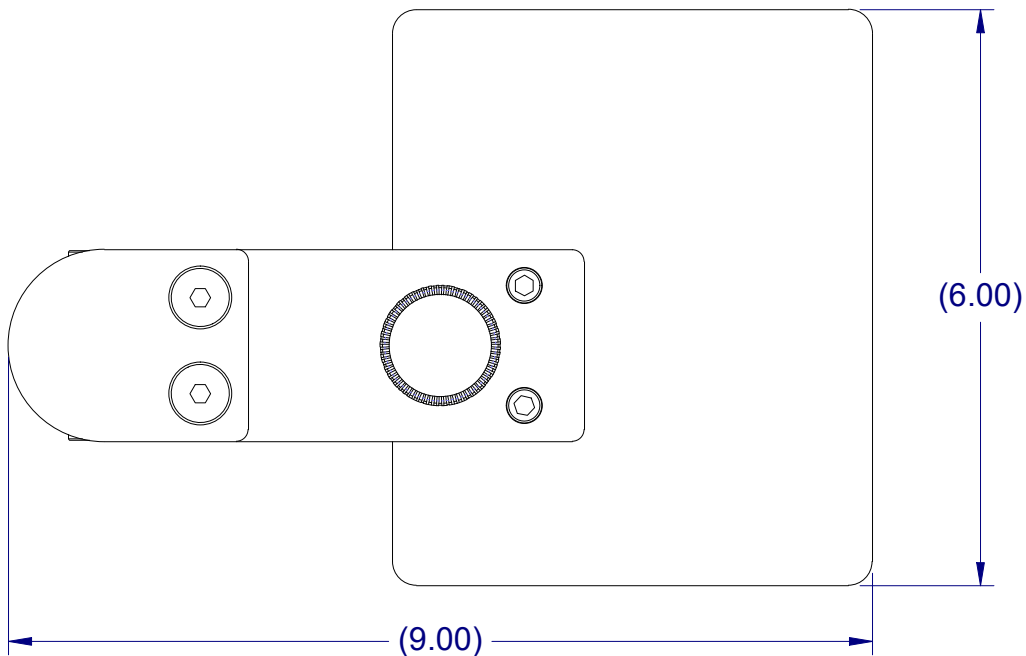
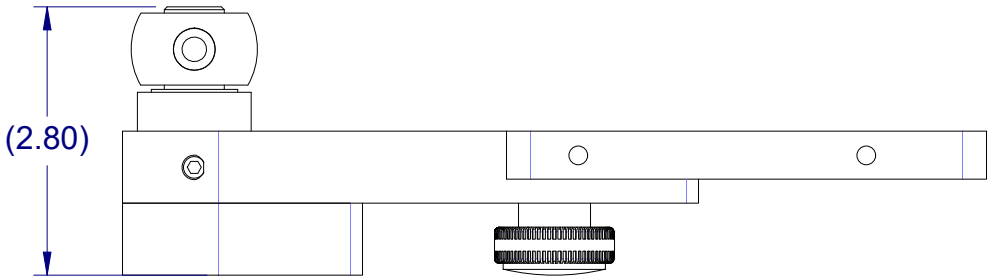
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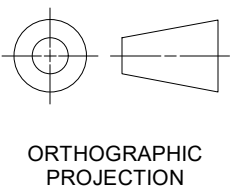
**FIRST APPLY LOCTITE 7088 PRIMER
THEN ADD INDICATED LOCTITE TYPE**

REV	BY	DATE	DESCRIPTION
DRAWN BY: WC	DATE: 10/1/2020	SCALE: N/A	
CDA DRIVE BRACKET, 2-1/4IN RD, ALUMINIUM, LEFT HAND			
PROPERTY OF MORRISON CONTAINER HANDLING SOLUTIONS			
CUSTOMER: SLEEVE SEAL,	JOB NUMBER: 90385	PART #: DB-1-0014A	SHEET 1 OF 1

ITEM	PART NUMBER	DESCRIPTION	QTY
1	IDL-1-0002	IDLER, ARM ASSEMBLY	1
2	MFG-1932	PLATE, IDLER FOR DUAL TIE BAR (2.47 CENTERS) ALUM	1
3	MFG-2431	FASTENER, SOCKET CAP 1/4-20 X 3/8 ALTERATION	2
4	M-5185-P	HAND KNOB, W/THREADED STUD, 1/4-20 X 3/4, PLASTIC, SS THREAD	1



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NOTES		REV	BY	DATE	DESCRIPTION	
1. WHEN ORDERING REPLACEMENT PARTS, INCLUDE THE JOB NUMBER, DRAWING NUMBER, REVISION, ITEM NUMBER AND QUANTITY REQUIRED FIRST APPLY LOCTITE 7088 PRIMER THEN ADD INDICATED LOCTITE TYPE		DRAWN BY: WC		DATE: 10/1/2020	SCALE: N/A	
		CDA IDLER BRACKET, 1-5/8IN RD, ALUMINUM LEFT HAND				
		PROPERTY OF MORRISON CONTAINER HANDLING SOLUTIONS				
		CUSTOMER: SLEEVE SEAL,		JOB NUMBER: 90385	PART #: IB-1-0002A	SHEET 1 OF 1

