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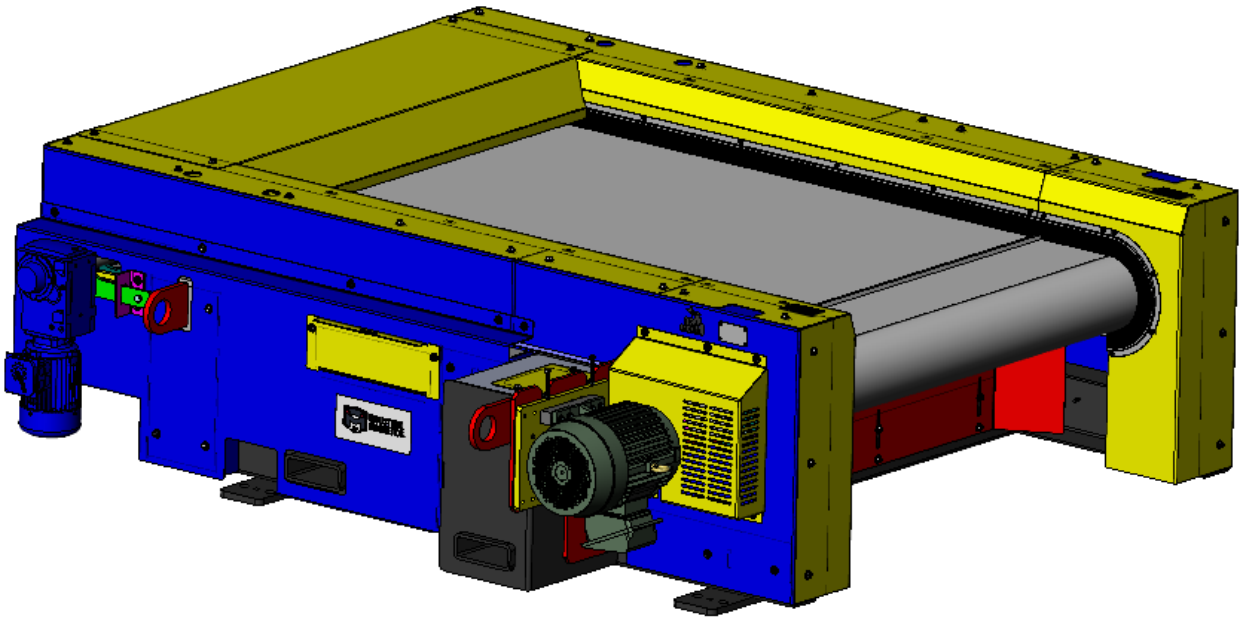
EDDY CURRENT SEPARATOR

SERVICE MANUAL

P.O.# | Order # | Part #:



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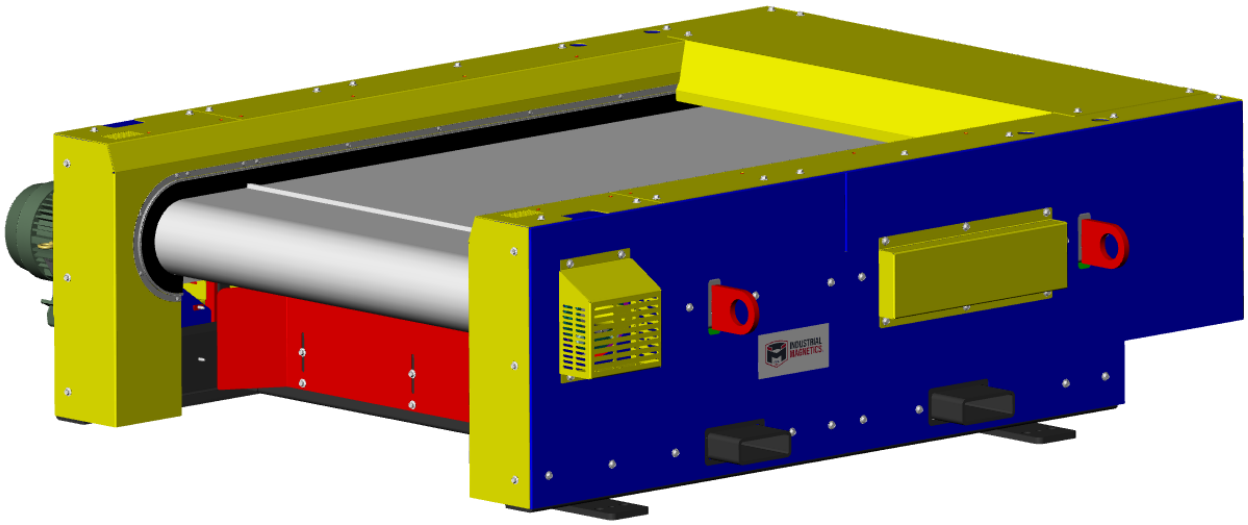


Eddy Current Overview

The Eddy Current Separator (ECS) is designed to separate conductive, non-ferrous metals from non-reactive / non-conductive materials. The applications for use of the ECS can vary, but there are some specific applications for which its use has proven to be the most effective, such as material recovery facilities (MRF) and scrap yards.

The IMI Eddy Current Separator is manufactured in many combinations of polarities and sizes. Each unit is designed specifically for the application, capacity, and space requirements.

The eddy current operates as a volume device. The separation and recovery of material is highly dependent of the presentation of the material to the ECS. It is recommended to use a metering device, such as a vibratory feeder, to keep the burden depth to a single layer. If feeding with a conveyor, it is essential to have the proper speed ratio between the feed belt and the ECS belt to ensure proper spread of material. Operation of the ECS with deeper burden depths can decrease the recovery and purity of the sorted material.

This service manual is tailored for the endless belt configuration.

Sizing and Frames

Units are manufactured in standard widths of 24”, 30”, 36”, 48”, 60”, and 80”. Effective widths are as measured between the corrugated sidewall profiles on the material conveyor belt.

Standard lengths for the eddy currents are 90” and 144”. The lengths are as measured from the rotor centerline to the rear pulley centerline.

The ECS main frame assembly is fabricated from heavy gauge steel, laser cut and formed along with welded tubular supports for stability. The finish is polyurethane enamel coated to match specific RAL color codes or custom colors.

All guards are fabricated from mild steel and are designed for easy maintenance and removal. Side guards are screwed in place for ease of removal. All units are fitted with cleaning brushes to help minimize material migration. Guards are powder-coated safety yellow unless specified otherwise.

Splitter Box

The splitter box is a combination of an adjustable splitter vane and chute to capture the separated process material. The splitter vane is a mechanical divider that is fabricated inside the opening of the splitter box to deflect parts into one of two areas of the splitter box. There is a single vane model as well as a double vane model.

The single vane model separates the process material into non-ferrous and non-reactive only.

The double vane model is designed to separate process material into three (3) grouping types: non-reactive and two (2) non-ferrous cuts. The double vane model is used in applications where it is required to throw certain non-ferrous metals farther than other non-ferrous metals.

Splitter box

The ECS operates on specific gravity and conductivity; materials that are highly conductive and very light tend to be thrown farther than denser materials.

Certain alloys may also react differently when being processed by the ECS. The shape and size of process material will also affect the throw of the material.

Example 1: Aluminum is highly conductive and very light. Based on these physical properties, aluminum will throw farther than copper, zinc, brass, lead, etc.

Example 2: Aluminum sheet will throw farther than cast due to the difference in composition and density of the alloys.

Example 3: Non-ferrous material that is flat compared to non-ferrous material that is bent or folded may react differently due to the saturation of the material by the changing magnetic field at the point of separation.

The splitter vanes are used to separate the materials by types. Non-reactive material will fall closest to the rotor. The non-ferrous metal being excited by the eddy currents will be repelled from the belt and be deposited farther away from the rotor. Operating at higher belt speeds will discharge all the process material farther from the rotor. The vanes are adjustable, so they can be rotated into a position that will optimize recovery.

Particle size is very important in setting the position of the splitter box and adjusting the speed of the belt. Consistent recovery requires that the belt speed and splitter box position are adjusted and optimized together; the splitter vane may also need to be rotated towards or away from the rotor for consistent recovery.

Rotor

The magnetic rotors are offered in polarities of 8 poles or 16 poles. The alternate pole configurations are designed for specific material sizes, types of material, and applications.

The rotor is dynamically balanced to ISO 1940 G0.4 or better at the specified rotational speed. The nominal speeds for the rotors are as follows:

8 pole rotor: 1760 RPM @ 60 Hz

16 pole rotor: 3000 RPM @ 51 Hz

16 pole maximum VFD setting is 55 Hz.

Heat can severely damage the magnetic rotor. Once magnetism is lost due to heat, the degradation is permanent. Heat can be introduced by the following factors:

- **FERROUS METAL:** Ferrous metal that is trapped in the magnetic field will become super-heated and can transfer heat to the magnetic rotor surface causing a magnetism loss or degradation.

  It is highly recommended that a magnetic separation device be located and operating inline ahead of material discharge onto the ECS. See **Ferrous Materials** section on page 15 of this manual.

- **BROKEN OR DAMAGED SHELL:** A foreign object, such as dirt or process material, may infiltrate a crack or hole in the carbon fiber shell. This will cause scraping or rubbing between the inside of the carbon fiber shell and magnetic rotor surface resulting in a build-up of heat due to friction. Visually inspecting the shell on a regular schedule can prevent shell and/or magnetic rotor damage.

Industrial Magnetics, Inc. does not warrant rotor damage due to negligence or improper maintenance and rotor warranty is limited to workmanship only. All spare parts are obtainable in the US either from IMI or as noted later in the manual.

Carbon Fiber Shell

The ECS shell is constructed using high-strength carbon-fiber material. The completed shell is also equipped with ceramic coating to minimize wear due to abrasion. The ceramic has a 2-color indication system that will indicate when a shell is due to be replaced or recoated:

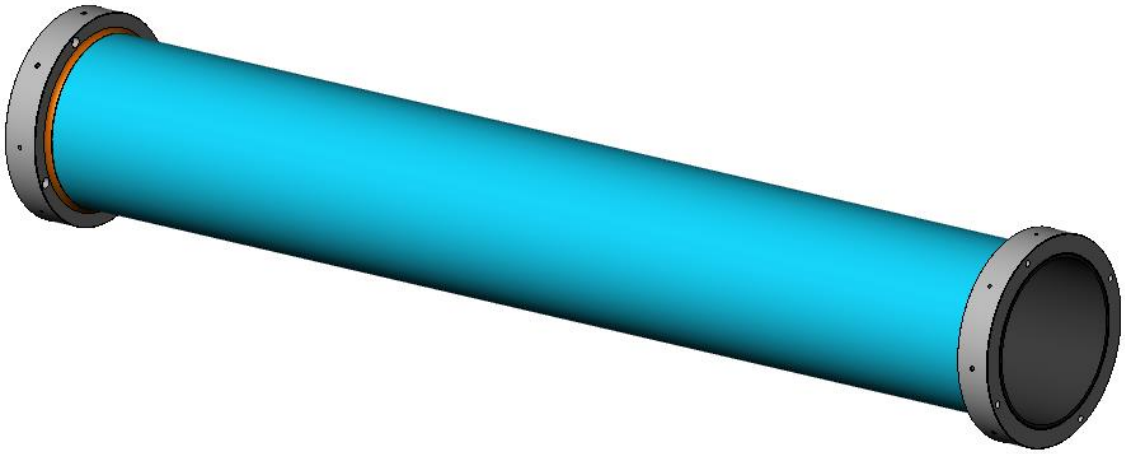
- The light blue color indicates that a shell is in suitable operating condition.
- The red color indicates that the blue layer has been worn off the shell and should be recoated or replaced.

The ceramic is a two-part, brush-on mixture that can be applied to the shell while it is in the machine if the structural integrity of the shell is not compromised. The ceramic coating is available in kits for field applications.

NOTE: The ceramic coating is designed to increase the life of the shell and is not intended to repair a broken shell. Failures such as holes or cracks will require the shell to be replaced.

Regular inspection of the shell can prevent downtime by identifying wear before it leads to inoperable conditions. To inspect the shell, remove necessary guarding on the front end and both sides of the ECS unit and visually inspect the backside surface of the shell for uneven wear, grooves, holes, or cracks.

It is recommended to keep a spare shell on hand for immediate replacement if damage is evident. All spare parts are obtainable in the US either from IMI or as noted later in the manual.



Conveyor Drive

The belt conveyor is driven by a gearmotor mounted at the tail end of the unit, with provisions to run at speeds independent of the magnetic rotor at the head end.

The pulley surface is crowned and equipped with lagging or a knurled finish to prevent belt slippage and provide for simplified belt tracking. The knurled finish is recommended in harsh environments with corrosive chemicals or abrasive materials

The belt drive pulley is mounted on take-up tensioning brackets for adjustment and tracking.

Magnetic Rotor Drive Motor

The rotor motor is a Toshiba EQP Global 3-phase, general purpose electric motor. The RPM of each motor is specific to the application. The magnetic rotor is belt-driven by two V-belts. The rotor motor mount plate is equipped with jack screws to both align and tension V-belts on the motor.

The specific motor model number and specifications are listed in the parts list contained in the Appendix.

Conveyor Belting

The endless conveyor belt is a two-ply clear urethane belt with white corrugated sidewalls to minimize material migration under the belt. The belt has three (3) one-half inch (½”) high cleats equally spaced along the length of the belt.

For reference, alternate standard belting is supplied with a Flexco® unibar clipper stainless steel lace; optional heavy-duty Alligator® RS62 SS lacing is available upon request. These belts are thin (0.090”), durable polyurethane cover over a synthetic cross rigid carcass with an interwoven polyester monofilament. This belting is also supplied with 1-¼” high corrugated sidewalls and three (3) one-half inch (½”) high cleats.

Red Novitane® belts are also optional and available upon request. These belts are equipped with a heavy-duty Alligator® RS62 SS lacing or can be heat welded endless by our vendor for single piece belt change, or can be heat welded in the field with a heat welding kit supplied by the belt vendor.

Bearings

Shell bearings are XLS 5-1/2" open-type ball bearings with Micropoly® lubricant / potting. The rotational speed should never exceed 400 rpm. They are press fit into the shell bearing housing. These bearings do not need to be lubricated due to being equipped with the potting compound.

Rotor bearings are piloted Dodge® Imperial high-speed bearings rated at 3500 RPM. The ECS unit is equipped with one fixed bearing (drive side) and one floating bearing (opposite) to accommodate linear thermal expansion of the rotor shaft.

The rotor bearings are approximately 33% pre-lubricated from the manufacturer and are ready for operation. In addition, IMI performs a ***Bearing Break-In*** procedure which is key for insuring trouble-free design life of the bearings. These procedures are also required for bearing replacement in the field.

Rotor Bearing Break-In
Moderate ramp-up to operational speed is required for new bearing installation. This involves an initial ramp-up and a monitored cold-start after a cool-down period. The following sequence is recommended; data log forms are provided in the appendix.

8 pole rotor:

- Set VFD to 30 Hz for the first ½ hour, then run at 60 Hz (1760 RPM)
- Run unit for four (4) hours, record temperature and amperage data every ½ hour

16 pole rotor:

- Set VFD to 30 Hz (1760 RPM)
- Run unit for one hour, record temperature and amperage data every ½ hour
- As temperatures level off at less than 160°F, ramp up VFD by 5 Hz every 30 minutes up to 51 Hz (~3000 RPM).
- Run at operating speed of 51 Hz for two (2) hours

Shut down

- The conveyor belt needs to run until the rotor has come to a complete stop. The rotor may continue to spin for 2-3 minutes after disconnect; allow for that time before turning off conveyor drive.
- Allow unit to cool overnight

Rotor Bearing Break-In continued

Cold start – both 8 and 16 pole models

- Set conveyor VFD to 30 Hz (~86 RPM / 192 FPM)
- Insure that belt is tracking correctly
- Set rotor VFD to operating speed (8 pole: 60 Hz; 16 pole 51 Hz)
- Observe temperatures & amperage every 15 minutes; record & shut down after two (2) hours of stable running
- Add one (1) pump lithium grease to rotor bearings after one (1) hour of operation

Under normal operating conditions it is typical for a small amount of grease to purge from the seals at initial start-up. This will stop once the optimum fill is reached.

New bearings will initially run a little hotter than normal and the temperature will level out after the break-in period. Normal operating temperatures can reach 180°F, and should not exceed 200°F. If temperatures exceed the normal operating temperature of 180° F, lubricate bearings according to recommended lubrication intervals found in the DODGE® bearings installation procedure located in the **APPENDIX** near the end of this manual.

Lubrication schedule for these bearings is at a frequency of once every 40 hours of run time. The recommended grease for these bearings is MOBIL Grease XHP 222 (Lithium grease) or equivalent. This grease is reversible; it will return to its original state when cooled. These bearings are equipped with labyrinth seals and cannot be damaged by over-lubrication, but excessive lubrication can purge grease into the rotor cavity on the inside of carbon fiber shell in extreme cases. Under normal circumstances and lubrication, the excess grease will purge from the outer labyrinth seals.

NOTE: Greasing frequency values are given as guidelines only. Individual operations may require more or less frequent greasing. Closely monitor the bearings during initial start-up, giving particular attention to heat and noise.

All spare parts are obtainable in the US either from IMI or as noted later in the manual.

Eddy Current Setup & Operation

Important Safety and Precautionary Advisory

Any operation, service, maintenance and/or repairs to the IMI Eddy Current Separation Conveyor System components should only be attempted by authorized, trained and qualified personnel familiar with all safety and lock-out / tag-out procedures, and those familiar with employing proper Personal Protective Equipment (PPE).

Read and obey ALL Danger, Warning, Safety and other Notification Signs or Labeling on Control Panel(s) and Mechanical Equipment to assure all precautions are understood.

This section of the instruction manual will give the user a general overview of the factors that influence how the IMI Eddy Current Separation Conveyor System performs, what basic control adjustments are offered to the user, and what result each may have on the overall performance of the system. Adjustments to one factor may affect another, either positively or negatively.

Adjustments to the IMI Eddy Current Separation Conveyor System will vary depending upon several factors, including:

- Mix (non-reactive versus reactive) of products sorted
- Overall mass of product traveling across the conveyor system
- Differential of non-ferrous material sizes
- Amount of non-ferrous contamination (grease/oil, dirt, or other wastes)
- Adhesion of materials to each other
- Type and grade of non-ferrous material

The basic separation processes can be controlled by three (3) methods on the conveyor system:

- Conveyor Belt Speed
- Eddy Current Magnetic Rotor Speed
- Splitter Box Chute Angle

Conveyor Belt Speed Control

The Conveyor Belt Speed dictates the speed at which the product is conveyed across the unit. The speed is controlled via a Variable Frequency Drive (VFD) which may be located either in a dedicated Control Panel for the unit or in a local Main Control Panel. VFD may be supplied by IMI with the unit or provided by customer.

The Speed Control will allow the overall belt speed to be increased or decreased by adjustments to the VFD controls. Only authorized, experienced personnel should adjust this control system, as the adjustment will require access inside the appropriate Control Panel. Contact authorized plant personnel prior to making any adjustments to this control feature.

If equipped, the VFD manufacturer's User Manual has been included with the ECS Operator's Manual. It is advised to ensure the latest revision matches the installed unit. The internal drive pulley can be operated safely between 0-72 Hz. The motorized pulley will generate the same instantaneous torque throughout the listed range.

NOTE: At 60 Hz, the belt is traveling at 384 FPM.

Eddy Current Rotor Speed

The Eddy Current Rotor Speed dictates the speed at which the internal magnet array spins inside the carbon fiber shell assembly. Once the process materials reach close proximity to the rotor, the alternating magnet array generates the powerful eddy current that excites the reactive properties internal to the materials traveling across the conveyor.

The RPM (Revolutions-Per-Minute) speed of the magnet array is controlled with a VFD (Variable Frequency Drive) located either in a dedicated Control Panel for the unit or in a local Main Control Panel. The Speed Control will allow the rotation speed (RPM) to be increased or decreased by adjustments to the VFD controls. Only authorized, experienced personnel should adjust this control system, as the adjustment will require access inside the Main Control Panel. Contact authorized plant personnel prior to making any adjustments to this control feature.

Regarding the dynamic balancing and calculated critical speed of the magnetic rotor: running at higher RPM can cause excess vibration, irreversible damage to the rotor, and potentially premature failure of the rotor bearings. **Running at a higher RPM does not always facilitate better recovery.**

NOTES:

1) **During setup, it may be necessary to run at a slightly higher or lower RPM to eliminate excess vibration caused by a resonance frequency or harmonic. Adjustment should never exceed 2-3 Hz over recommended operational Hz stated below for both 8 pole and 16 pole rotors. Otherwise, it is advised to operate at or below recommended Hz.**

   8 pole rotor: 1760 RPM @ 60 Hz

   16 pole rotor: 3000 RPM @ 51 Hz

2) **The rotor is designed to spin in the same direction as the belt travel.**

Belt / Rotor Sequence

To prevent damage to ECS components and the loss of material during start-up and shutdown of the ECS, the following proper sequencing needs to be programmed into the VFD controller. The ECS unit must start prior to all upstream equipment and must stop after all upstream equipment. The recommended sequencing is as follows:

Start-up: The conveyor belt should be free of material and can be started at the same time as the ECS rotor motor. There should be approximately 45 – 60 second delay from the start-up of the ECS before the upstream system is started. This will allow the ECS to achieve full operational speed before any material is fed onto the ECS.

Shutdown: During system shutdown, the ECS should not begin the shutdown process until all upstream equipment has stopped. The conveyor belt will need to run until the rotor has come to a complete stop. The kinetic energy of the rotor may allow it to spin up to 2-3 minutes before coming to a complete stop. Allowing the belt to run will discharge all material from the ECS belt and prevent any heat damage to the belt, shell or rotor.

NOTE: Take precaution to ensure that the belt is always running if the rotor is spinning. This will prevent any material from sitting in the changing magnetic field if the belt is static. If there are metals in the field and the belt is static, this will cause the metal to heat up and could damage the belt, shell, and magnet.

Note also that if equipped, the splice for the conveyor belt is stainless steel; it is advised to avoid parking the belt with the splice stationary over the rotor.

Even if the belt is free of process material, it is always recommended to have the belt moving if the rotor is turning.

Ferrous Materials

It is highly recommended that a magnetic separation device or a combination of multiple magnetic devices, i.e. drum magnet, head pulley magnet, and/or cross belt magnet be operating inline ahead of material discharge onto the ECS. Ferrous material can severely damage the Eddy Current Rotor, Shell, and Belt.

NOTE: Ferrous burnout is the result of ferrous material getting stuck in the changing magnetic field of the rotor and becoming superheated. As stated in the Belt / Rotor Sequence section, heat can severely damage the rotor. Once magnetism is lost due to heat, the degradation is permanent.

As no process is 100% efficient, it may be impossible to get all ferrous metal out of the stream prior to the ECS. Minimizing the amount of ferrous metal with multiple magnetic separators will decrease the chances of ferrous burnout. Ferrous burnout is not considered a warranty item.

Splitter Box Initial Setup

This splitter box is to be adjusted in the field at start-up. It should be placed in front of the rotor but not secured in place until test runs are complete to determine the best placement of the splitter box. For close adjustments the vanes can be rotated into positions that further pinpoint the desired divisions. These adjustments are made by moving a lever arm to the desired position and then locking that position in place by tightening the knob to the guide.


Splitter box

It should be noted that at initial start-up, the machine should be tested without metal in the process stream to set the vane. By doing this it can be seen where the waste or non-recoverable material is landing. The waste stream should be hitting 1” - 2” below the top of the first splitter vane. This adjustment is made by increasing or decreasing the speed of the belt via the VFD. **Faster belt speed does not necessarily facilitate better separation**.

Next, run the desired recoverable material to be sure it throws over the first vane. This is accomplished by adjusting the splitter vane by rotating the lever to capture the recoverable items. The belt speed, rotor RPM, and splitter box position are independent variables that need to work in sync with one another. Generally, once the rotor speed is set, there is no need to change the operating RPM for the rotor.

Daily Maintenance

1. Inspect and ensure that all guarding is installed.
2. Check for foreign objects that could jam inside the machine.
3. Blow out the entire machine with compressed air. Wipe off any material stuck to the discharge end (rotor / shell) of the ECS.
4. Replace all guarding if removed to inspect / clean the ECS unit.
5. Start the machine and run for 5 minutes to check belt tracking and tensioning (see Start-up Sequence below).
6. Visually inspect belt to see if there are any splits or holes.
7. Check brushes to make sure they are not damaged and are touching the belt surface.
8. Listen for any unusual bearing / motor noise after unit is at full operational speed.
9. Lubricate bearings if needed (refer to Bearings section page 10).

Start-Up Sequence

1. Make sure all power is energized.
2. Start conveyor belt and wait until it has come up to full speed.
3. Start rotor and wait until rotor has come up to full speed.
4. Begin feeding material slowly onto belt.
5. Adjust speed controls and splitter vane to optimum positions, if required.

NOTE:

Pay close attention to the ECS while it is working well to help identify potential mechanical problems in the future. If any erratic changes in functionality or excessive noise are observed, it is recommended to go through the daily maintenance checklist to eliminate any simple problems.

If there is any condition that requires special attention, i.e. bad bearing, broken carbon fiber shell, ripped belt, etc., please contact IMI Manufacturing or the company through which the equipment was purchased to arrange a service call or to order replacement parts.

Belt Change Procedure

1. De-Energize ALL power to the IMI Eddy Current Separation Conveyor System.

NOTE: Follow proper LOCK OUT / TAG OUT safety procedures.

NOTE: Extremely strong magnetic field will still be present after machine is de-energized. Use caution when working near the magnetic rotor. Do not forget that most hand tools are metal and could cause injury. Remember to remove cell phones and wallets from pockets prior to working near the magnetic rotor.

2. Remove back brace, drive side top guard and all guarding non-drive side of unit. Brush assemblies can remain attached to the top guards; non-drive top guard can remain attached to the side guard. All fasteners are 3/8-16 hex head cap screws. See **Figure 1**.

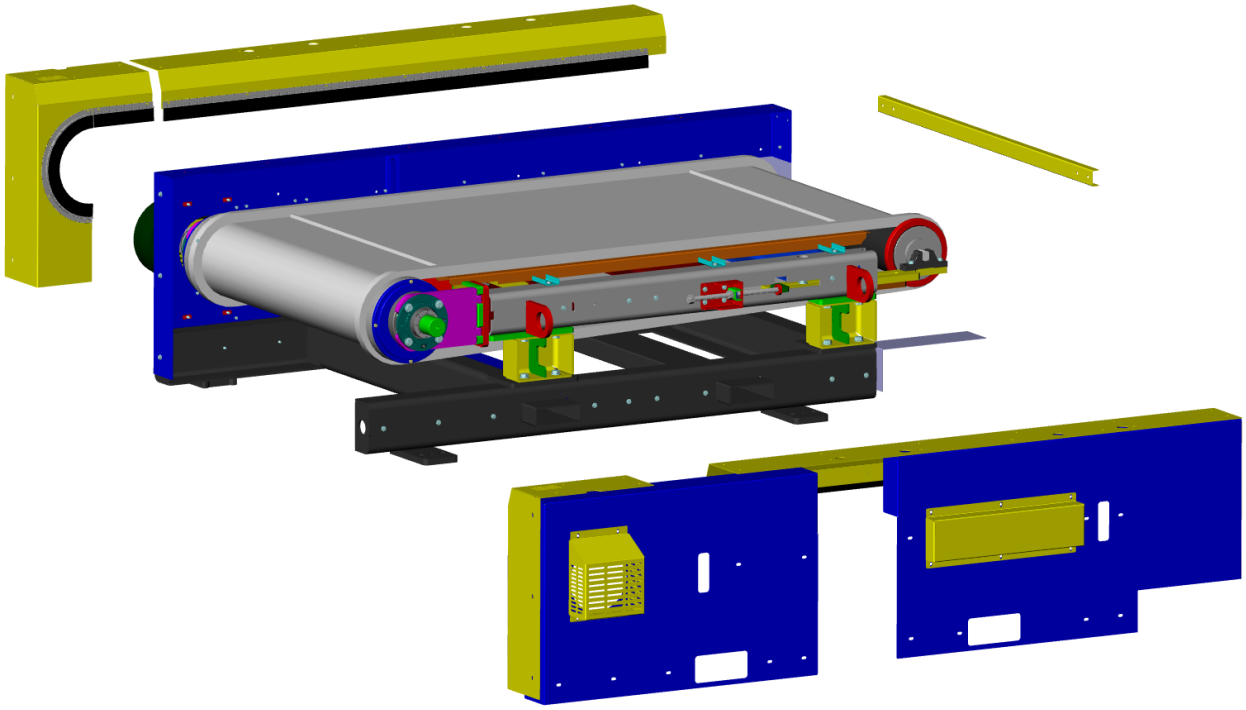


Figure 1

3. Remove tail clamp ring from the non-drive side of the drive pulley. See **Figure 2**.

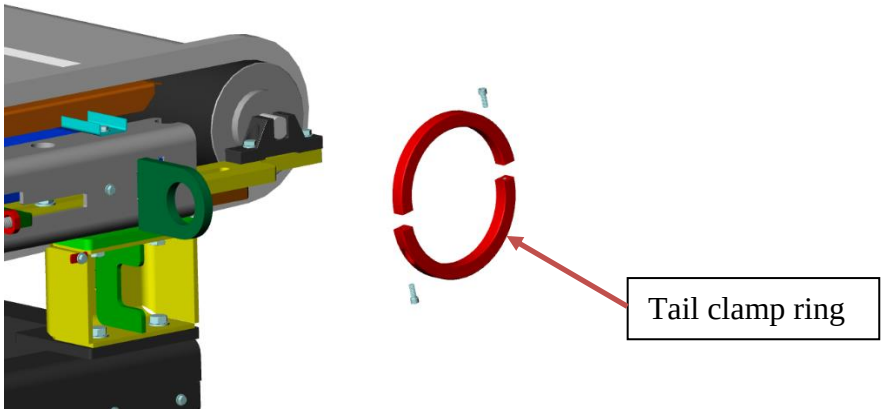


Figure 2

4. Remove the tail pulley guard on the drive side to expose take-up bracket. Loosen the two (2) locking bolts each side, access is provided by through-holes in the top frame channel. Then loosen the take-ups both sides by turning the threaded rod counter-clockwise to retract the rear drive pulley. See **Figure 3**.

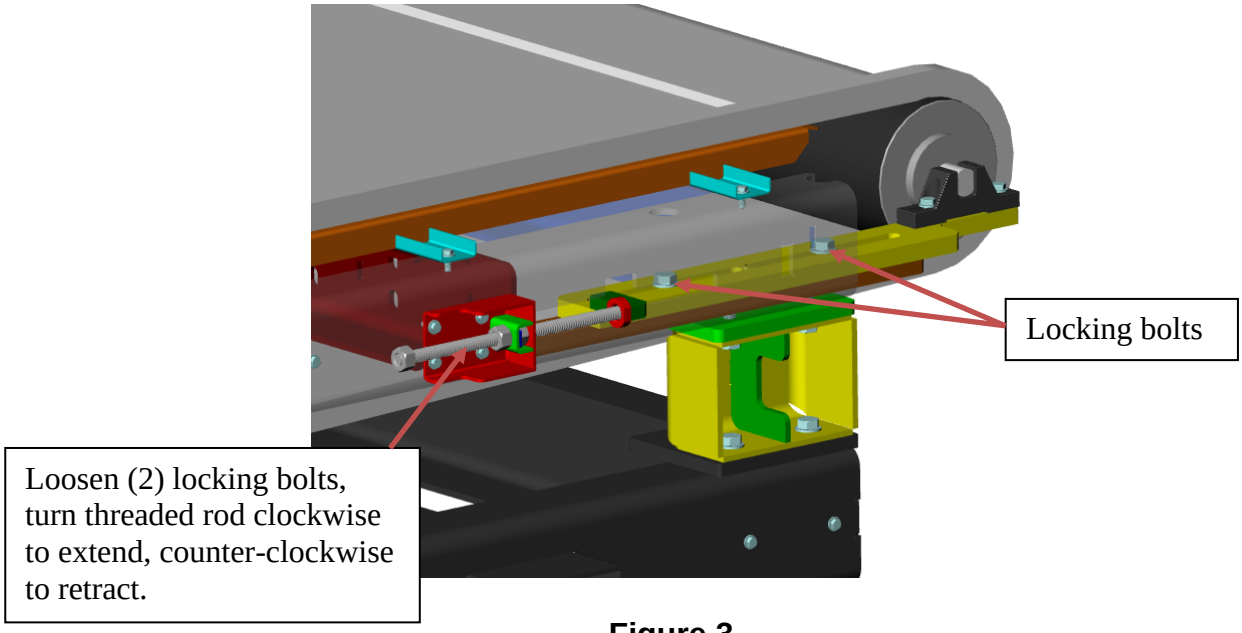


Figure 3

5. Remove the frame mount blocks from the non-drive side of the unit. Four ¾-10 hex head bolts secure each frame block, two to the upper frame and two to the lower. See **Figure 4**.

   Note that the frame will support the cantilever load of the upper frame and pulleys without additional support.

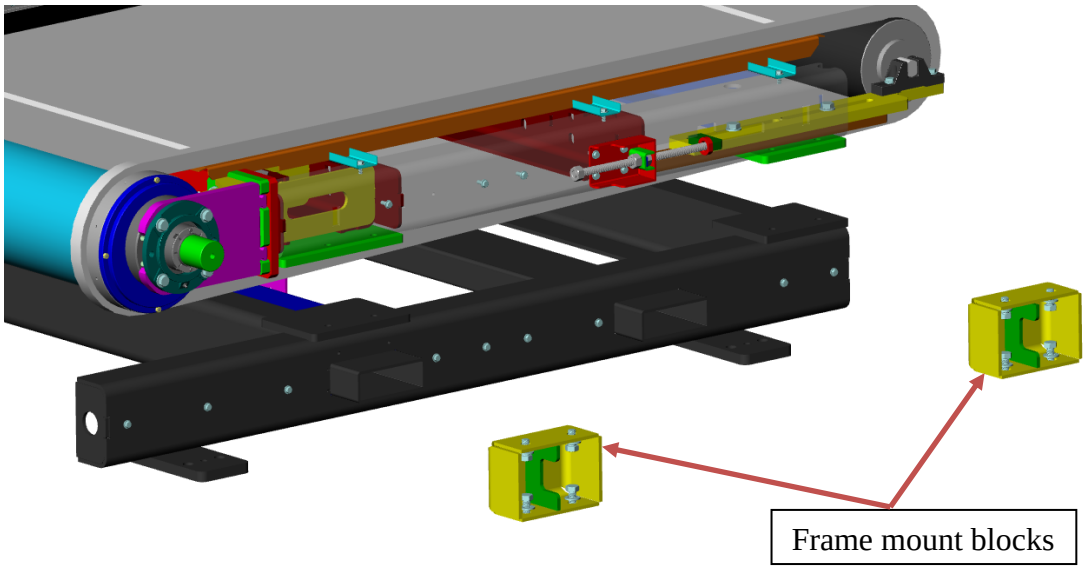


Figure 4

6. Remove the belt by sliding it out over the pulleys and upper frame assembly. See **Figure 5**.

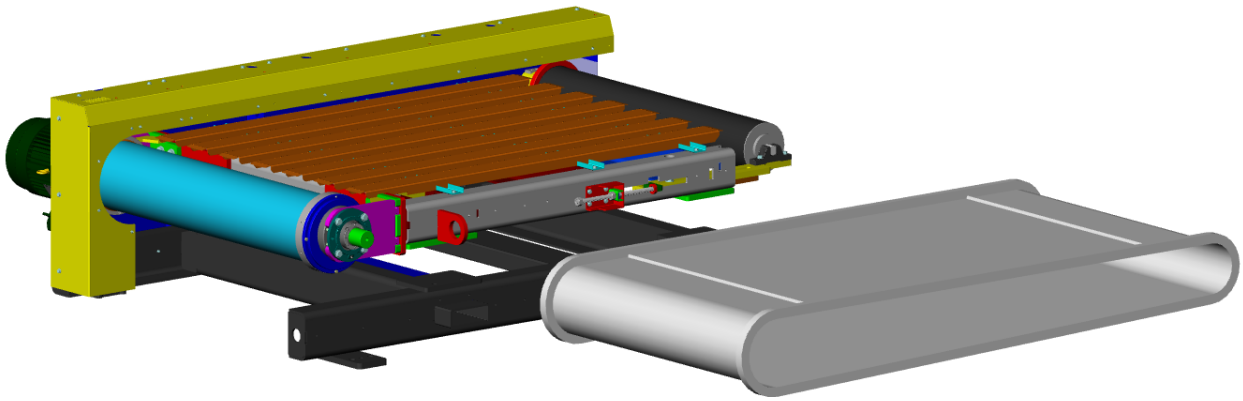


Figure 5

Prior to installing the new belt, clean any dirt or debris from the frame and carbon fiber shell surface. Visually inspect the carbon fiber shell for any signs of wear or damage, i.e. holes, grooves, cracks. If shell needs to be replaced, see instructions in the section of the manual labeled “Shell Change Procedure”.

7. Install the new belt by sliding it over the pulleys and upper frame assembly.

8. Extend the belt tensioning brackets by turning the take-up threaded rod clockwise. Following proper LOCK-OUT/TAG-OUT procedure, start the conveyor portion of the eddy current unit to track the belt. Once the belt is tracking properly, shut off the power, tighten the take-up locking bolts, and re-assemble the unit by replacing the tail clamp ring, all brushes, access panels and guards.

Tracking tips

When tracking the belt, start with the take-ups set at an equal distance, then start the conveyor slowly to see how the belt tracks. Adjust belt tension and tracking accordingly, gradually increasing speed. Belt tension should not be too tight; over-tightening the belt can damage carbon fiber shell and / or tear lacing. Tension the belt just tight enough to get it to grip on the motorized pulley and then extend ¼” further. There will be sag on the return strand of the belt. Make sure that the belt does not rub on any of the framework underneath.

If the belt consistently rides toward one side and does not seem to respond by adjusting take-ups, and if it is equipped with a stainless steel splice, pull the stainless lacing pin, move the tail end of the belt 1-2 teeth over towards the direction that the belt needs to move, and replace the lacing pin. Start tracking process with take-ups at an equal distance.

Shell Change Procedure

1. Remove belt as per instructions in **Belt Change Procedure.**

2. Remove motor guard / belt guard and front guard cover. Machine should appear as in **Figure 6.**

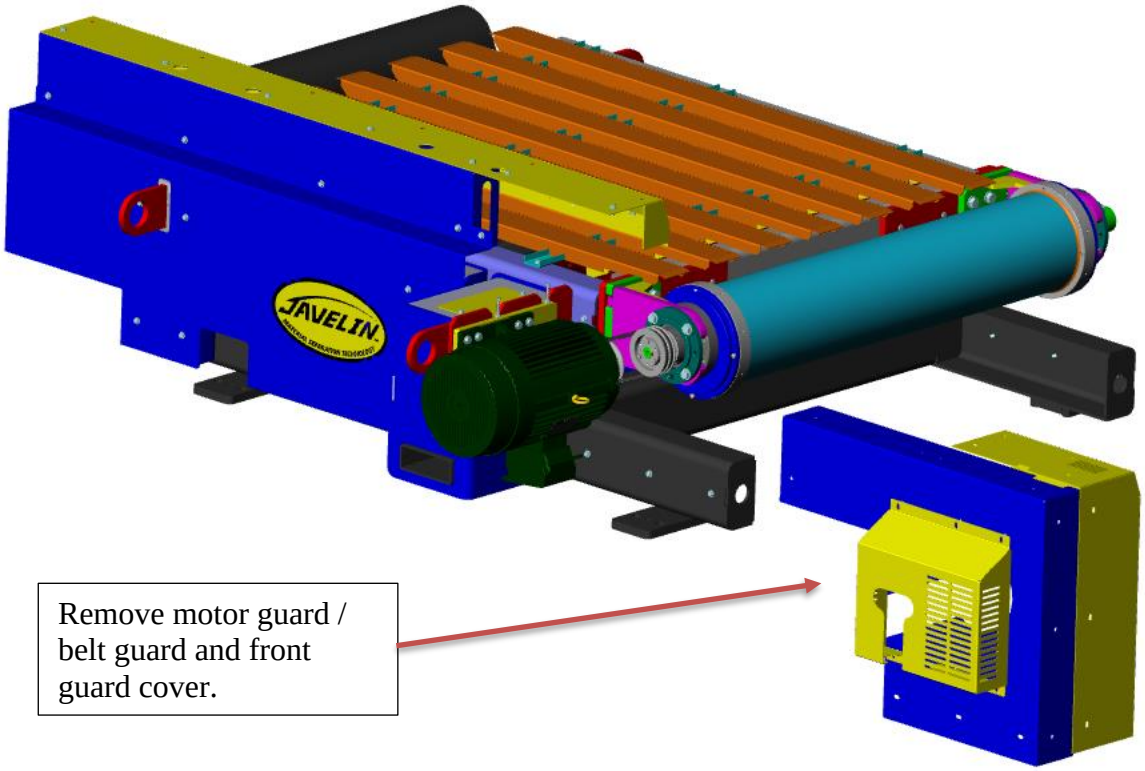


Figure 6

3. Reinstall the frame mount blocks to stabilize the off-drive side of the upper frame assembly. See **Figure 7**.

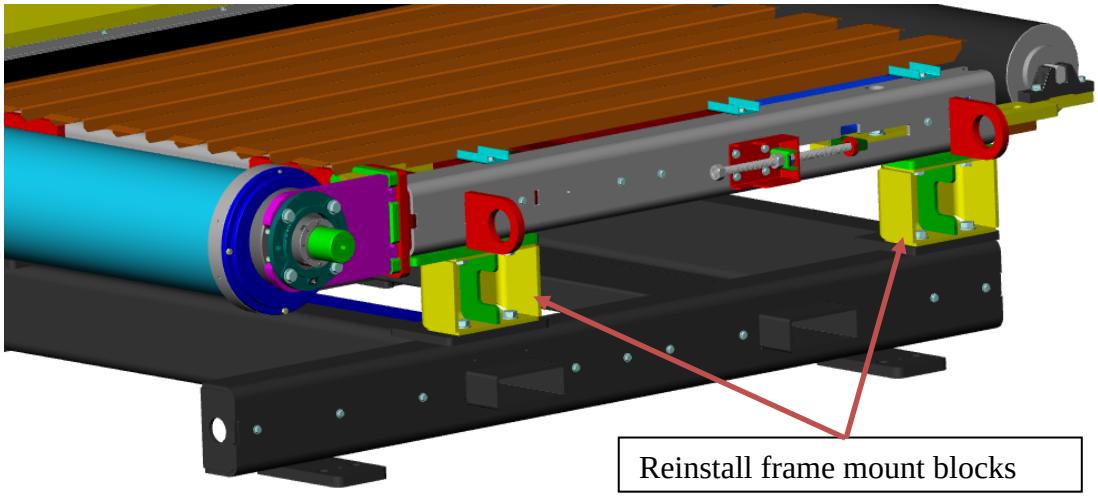


Figure 7

4. Removal of drive motor: remove the two 3/8-16 hex head bolts that secure the motor mount access cover and remove cover. See **Figure 8**.

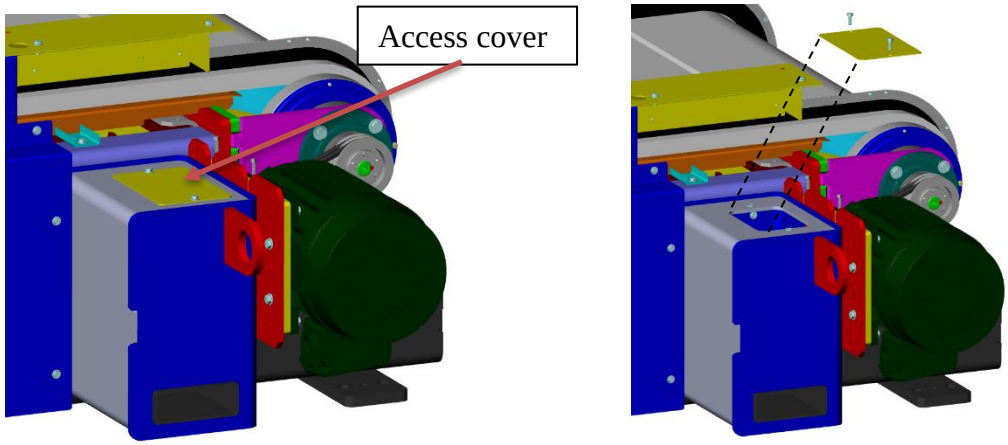


Figure 8

5. Loosen the jack screw nuts and the four ½-13 hex head bolts that secure the motor slide plate to the motor support. See **Figures 9 and 10**.

   Note: Prior to moving the motor or V-belt sheaves, it is suggested to mark where the motor and sheaves are located to facilitate reassembly.

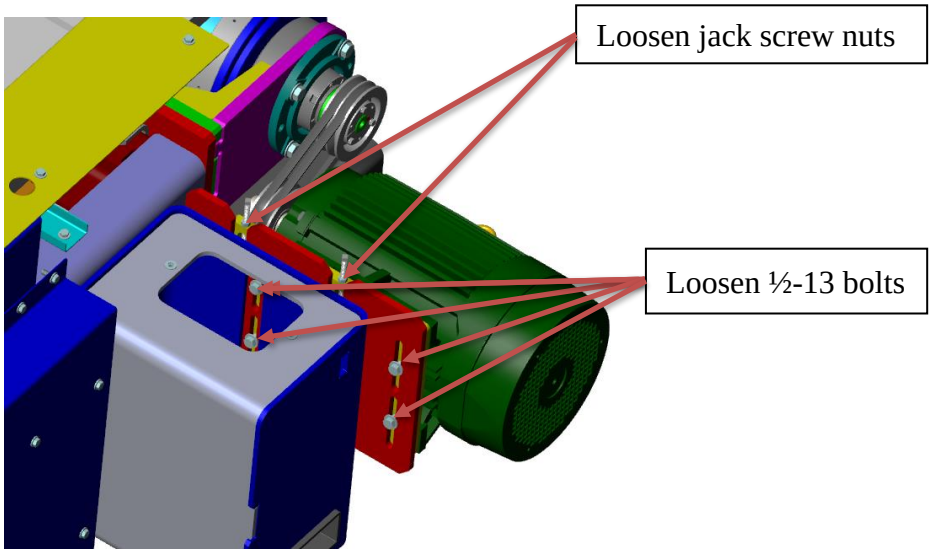


Figure 9

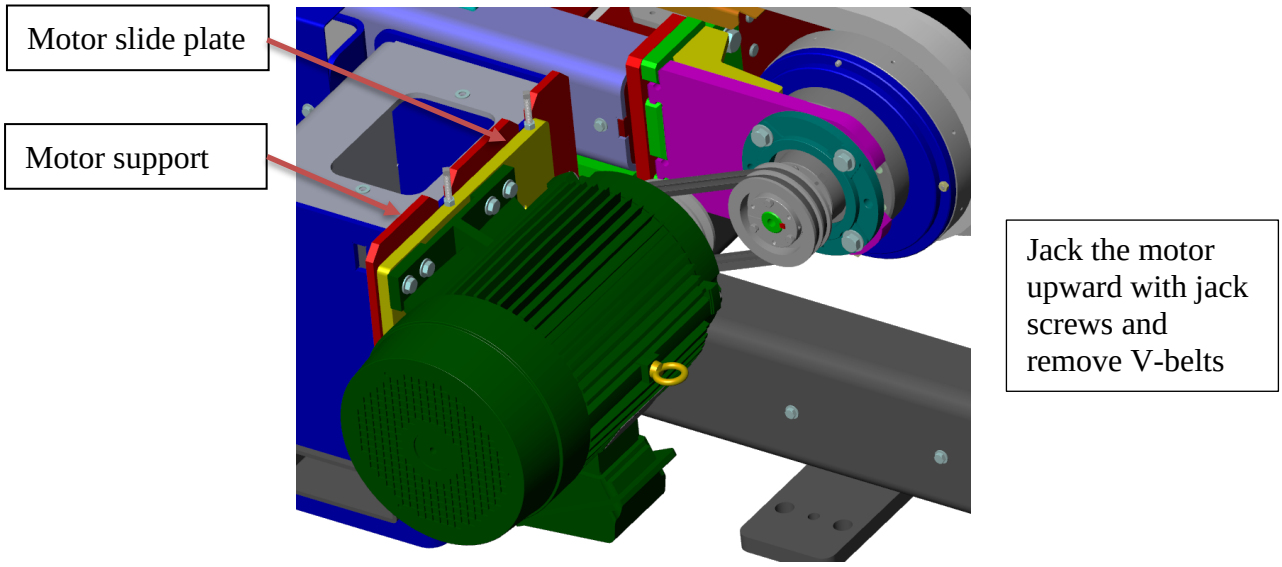
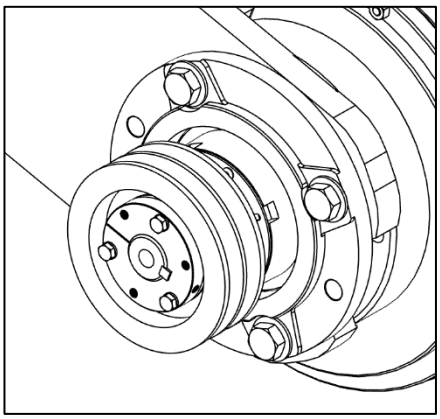


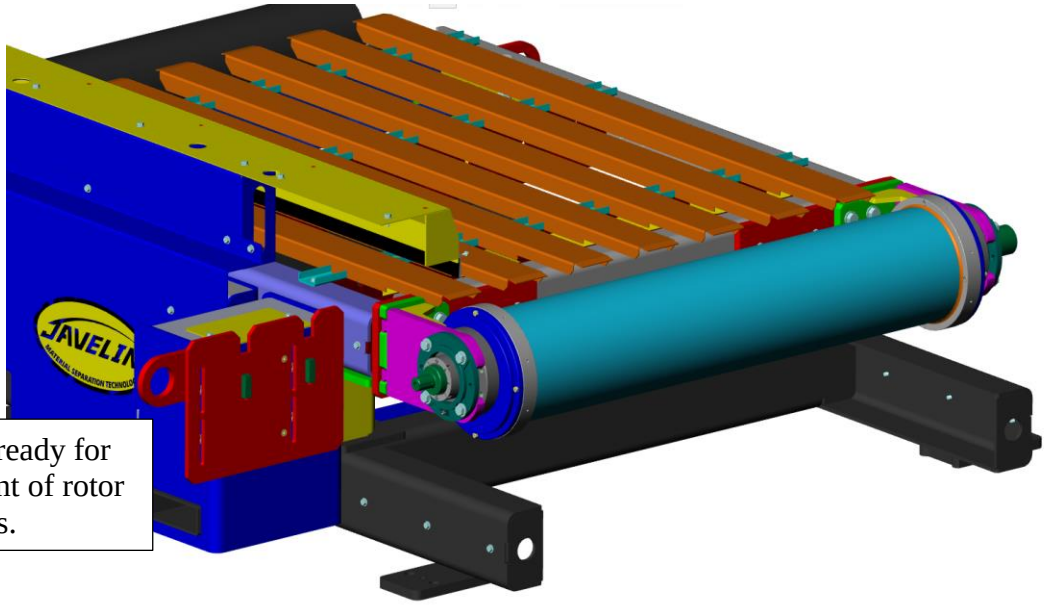
Figure 10

6. After loosening the motor slide bolts, use the jack screws to pull the motor upward to loosen the V-belts for removal. Once the V-belts are removed, attach a strap or sling to the top of the motor and remove the bolts securing the motor slide plate to the motor support. Remove the motor / slide with an appropriate lifting apparatus.

7. Remove V-belt sheave on the rotor shaft by removing the 3 bolts that lock the taper-lock bushing to the pulley. Then, using the same bolts, utilize the threaded holes on the bushing to separate it from the sheave.



NOTE: Evenly tighten the 3 bolts to separate bushing from sheave. This will prevent damage to the bushing by moving it straight and square to the pulley and shaft. Do not pry on the bushing. Machine should appear as in **Figure 11.**



Unit is ready for dismount of rotor bearings.

Figure 11

8. After the V-belt sheave has been removed, the next step is to begin the process of removing the DODGE® rotor bearings. Using the threaded holes on each end of the shaft, insert 5/8”–11 lifting eyes. Using an appropriate lifting apparatus, attach a sling to the lifting eyes and apply slight upward tension on the sling.

   The instructions for dismounting the DODGE® bearings are found in the appendix section of this manual labeled "DODGE® Bearings Install Procedure". **Before removing the rotor bearings, use a marker to indicate where the edge of each rotor bearing is on the rotor shaft. This will help center the rotor during the reassembly process. A more detailed method of centering the rotor shaft is found in step 17.**

9. Once the rotor bearings are loosened as per the "DODGE® Bearings Install Procedure", and with the sling still pulling tension on the rotor shaft, gently slide the pilot of the rotor bearing out of the pilot insert of the horizontal bearing mount weldments. This process will require the bearing on each side to be removed independently.

NOTE: If bearings do not slide freely, verify that they are loosened. Using the bearing bolts and threaded holes on the bearing housing, thread the bolts into the threaded holes and use them to push bearing pilot out of pilot hole in horizontal mount weldment. Keep fingers clear of frame; rotor may shift after bearing pilots are removed from pilot holes.

See **Figures 12 & 13.**

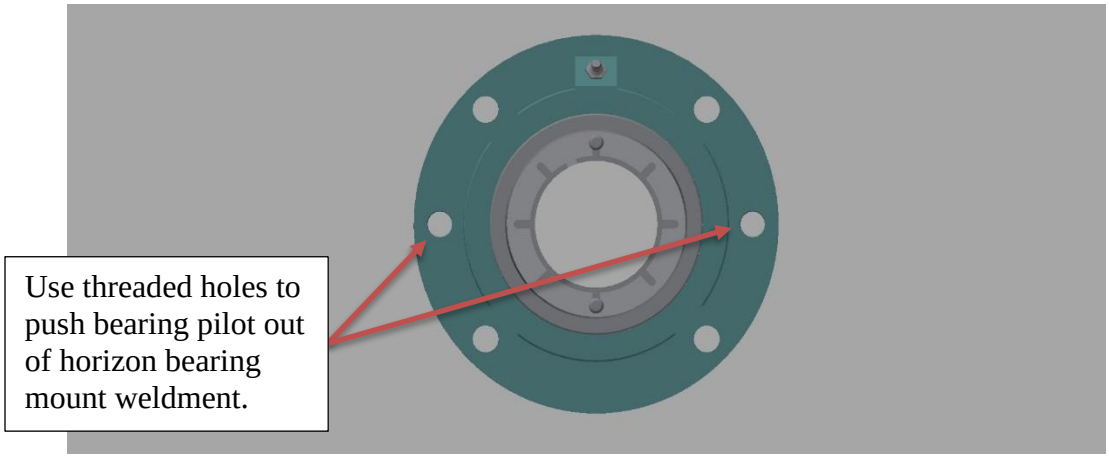


Figure 12

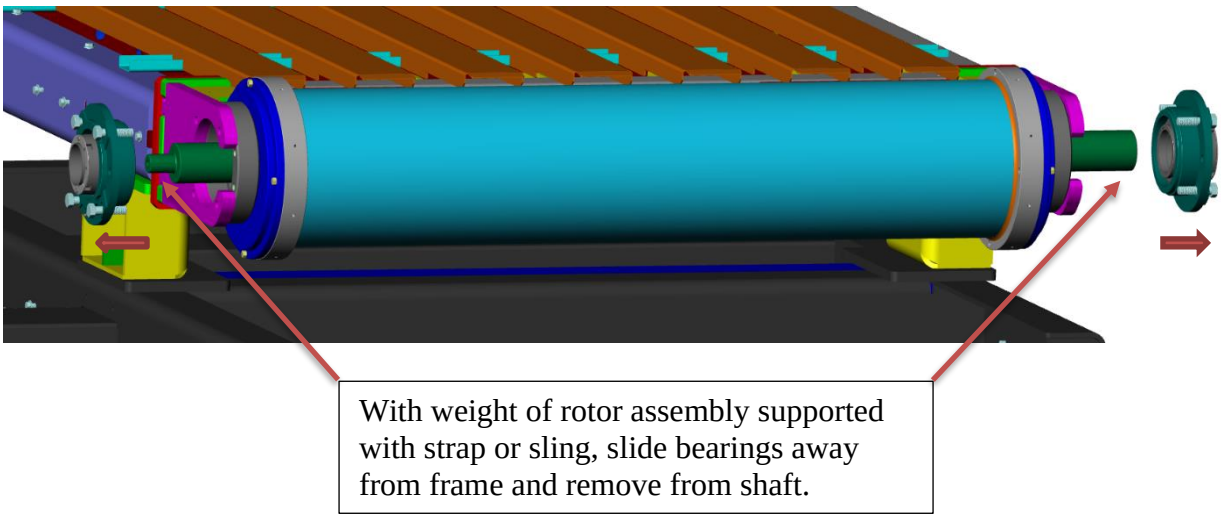


Figure 13

10. The rotor / shell front end assembly can now be removed from the horizontal mount weldments. The non-drive side vertical mount weldment may need to be loosened to facilitate front end assembly removal. See **Figure 14**.

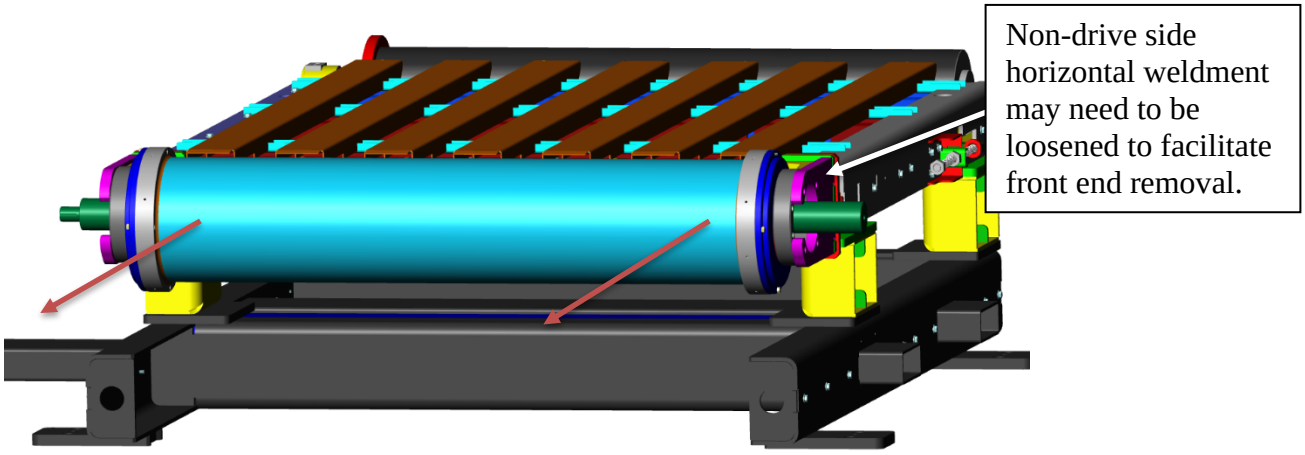


Figure 14

Exercise caution while removing front end assembly from sub-frame. The magnetic rotor could swing and become attracted to surrounding framework or other machines.

Transport the front end assembly to a clean and safe work environment that can accommodate the shell replacement. If front end cannot be transported due to limited space, the slider bed pan can be used. If slider bed location is to be used for shell change procedure, remove all debris from slider bed pan prior to removing front end assembly.

NOTE: Always keep a pallet or other type of non-metallic buffer between the rotor and the slider bed. Place exposed rotor shaft ends on wood blocks or risers to elevate rotor so that the weight of the rotor does not rest on the carbon fiber shell. See **Figure 15.**

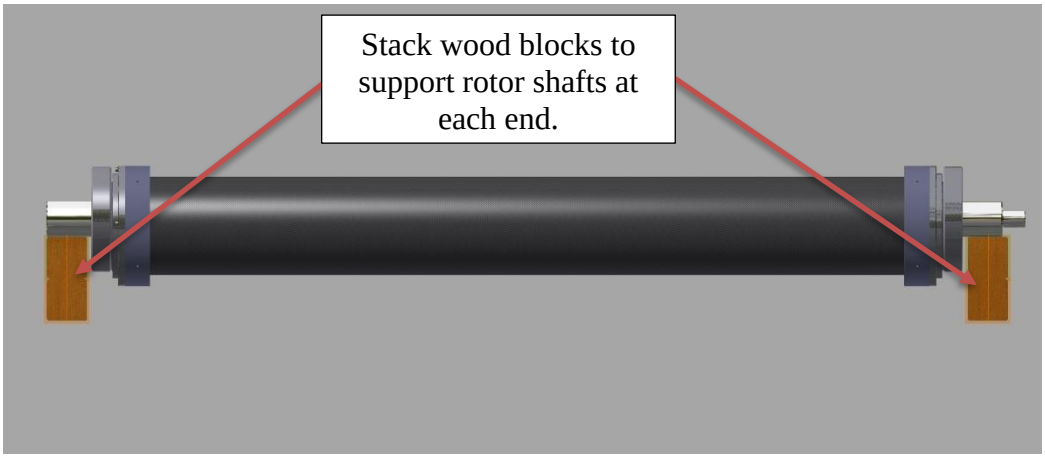


Figure 15 – Front End Assembly

11. After the front end assembly is staged in a location to change the shell, the next step is to remove the bearing mount / bearing hub assembly from each end of carbon fiber shell. Use compressed air to remove as much dirt or debris as possible from the front end assembly before removing the bearing mount / bearing hub assemblies.

    Using a ¼" hex key (allen wrench) remove the four (4) stainless steel socket head bolts attaching the shell to the bearing hub on each end. Verify that there is not any dirt on exposed threads of the bolts. Any dirt can cross thread bolts and / or damage threaded holes on bearing hub flange.

NOTE: Most units will have 5/16-18 nylon locking nuts threaded onto end of bolts. Remove and replace. See **Figure 16.**

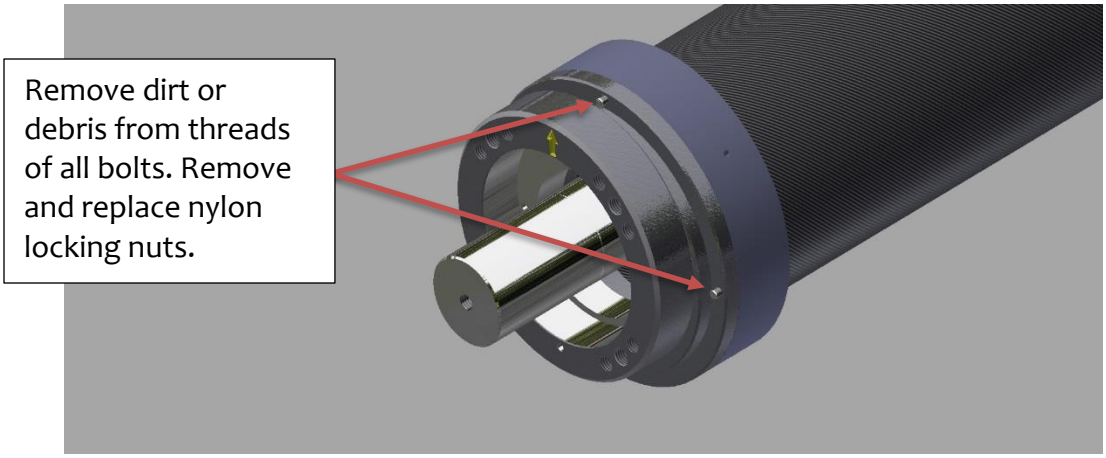


Figure 16

12. After the four (4) socket head cap screws are removed from each bearing mount / bearing hub assembly, use a 3" ID pipe that is at least 2 feet longer than the length of the carbon fiber shell to cantilever the rotor by securing a strap on one end. See **Figure 17.** Exercise caution when lifting the end of the rotor with the pipe to make sure the other end of the rotor shaft does not roll off the wood support.

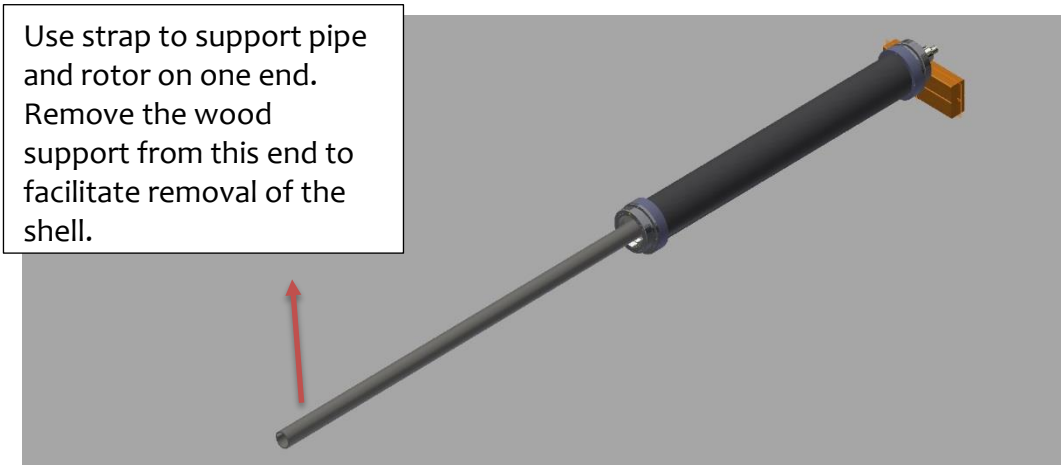


Figure 17

13. Once end of rotor is supported, slide shell / bearing mount / bearing hub assembly onto the pipe and replace wood support under the rotor shaft. Gently lower rotor back onto the wood supports.
    Remove bearing mount / bearing hub assembly and shell from pipe.
    Remove bearing mount / bearing hub assembly from other end of the rotor by using a strap to hang rotor for removal. See **Figures 18 & 19.**

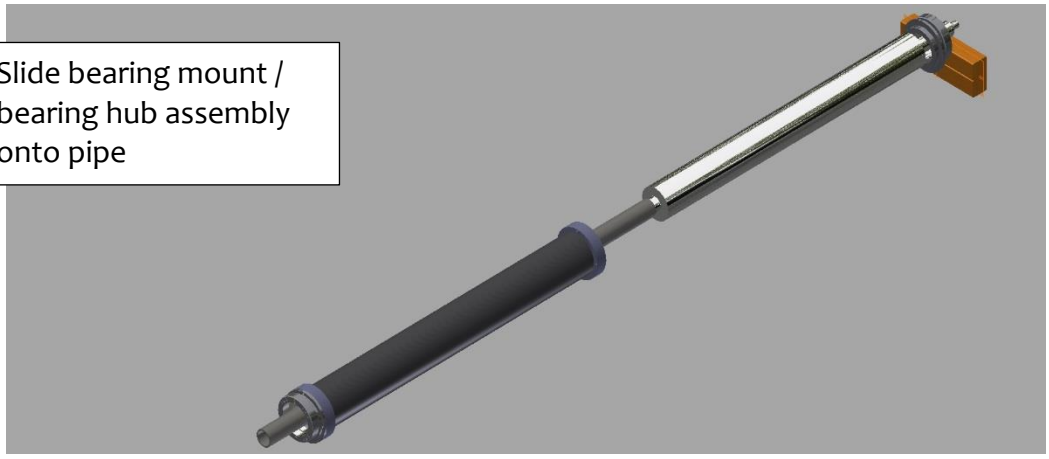


Figure 18

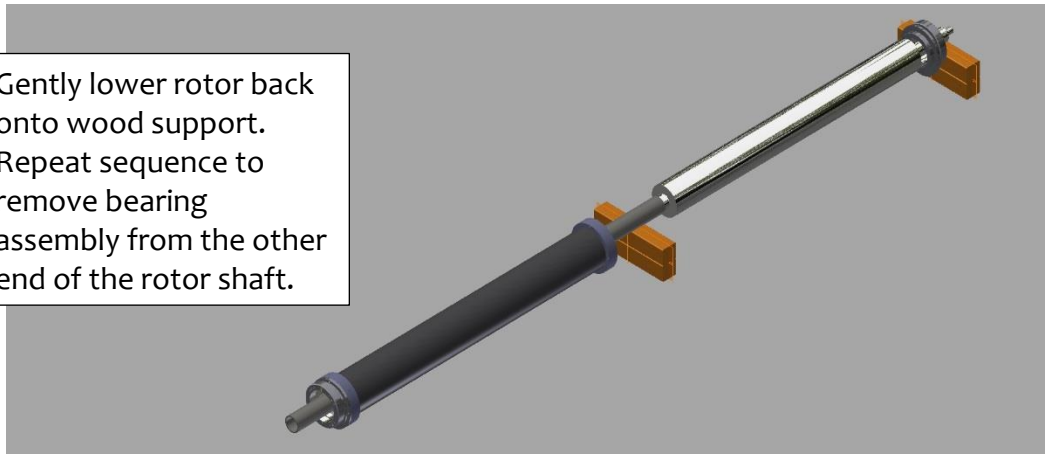


Figure 19

14. Rotor should appear as in **Figure 20.**

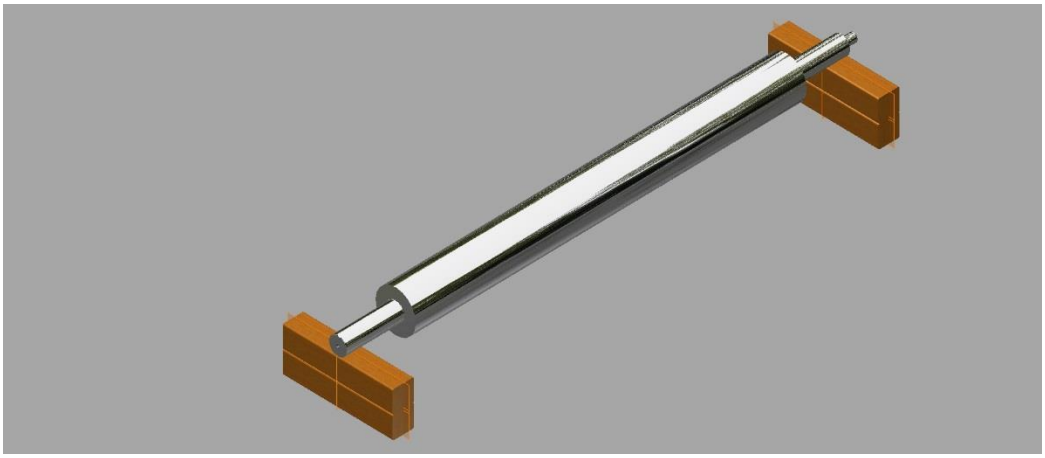


Figure 20

15. Visually inspect rotor for any foreign objects that may be on surface of rotor. Clean rotor to remove dirt, debris, etc. Visually check bearing mount / bearing hub assembly for damage and spin hub to make sure shell bearings are in proper working condition. Use compressed air to remove any build-up of debris within assembly. If shell bearings are damaged or need replacement, follow instructions in "Shell Bearing Removal / Assembly" section of this manual.

16. Replace new shell and offset bearing mount / bearing hub assemblies by using the same method outlined in **Steps 11 & 12.** Securely fasten socket head bolts into shell and bearing hub flange, replace nylon locking nuts. ***Torque to 29 ft-lbs.***

NOTE: The bearing mount / bearing hub assemblies are identical, and the orientation of the bolt hole pattern is important. This is explained in Step 18.

17. Place front end assembly back into the horizontal mount weldments of the unit. Horizontal mount weldments may need to be loosened to re-install the front end assembly. This can be done by loosening the bolts on each side of the sub-frame horizontal mount weldments. If one or both horizontal mount weldments are loosened, use a marker to outline the original position of the weldments for future reference. This will help to center the front end in the machine.

NOTE: The machined base of the sub-frame that the horizontal mount weldments attach to are slightly oversized for centering and belt tracking purposes. If adjusting for belt tracking, loosen horizontal mount weldments on the non-drive side to avoid exerting binding forces on the shell bearings. See Figure 21.

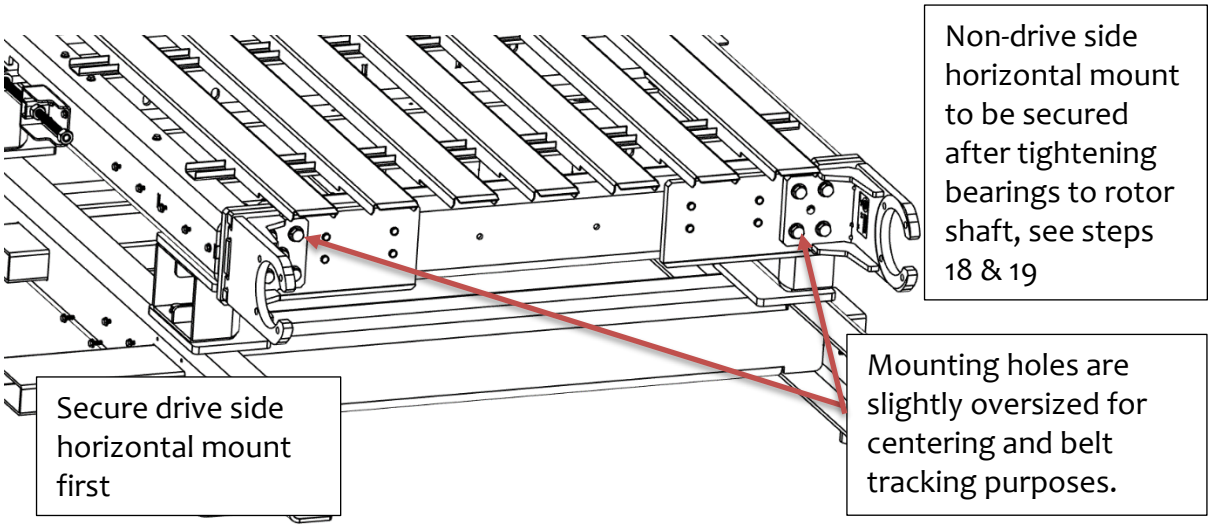


Figure 21

18. Slide rotor bearings onto the shafts and insert bearing pilots into the vertical mount weldments and into the bearing mounts. Be sure to install the **fixed** bearing on the motor side and the **expansion** bearing on the non-drive side. The difference between the bearings is that the expansion bearing has a **floating** shaft collar.

    Before inserting the four 5/8 – 11 bearing bolts, determine the desired position of the "magnetic hot spot" of the rotor. The arrow on the bearing mount will indicate where the "magnetic hot spot" is with relation to the carbon fiber shell circumference. See **Figure 22.** Certain "magnetic hot spot" settings will work better for various material types. The various settings will determine where and how long the material is in the changing magnetic field. Recommended settings are usually top center or toward the discharge end of the ECS.

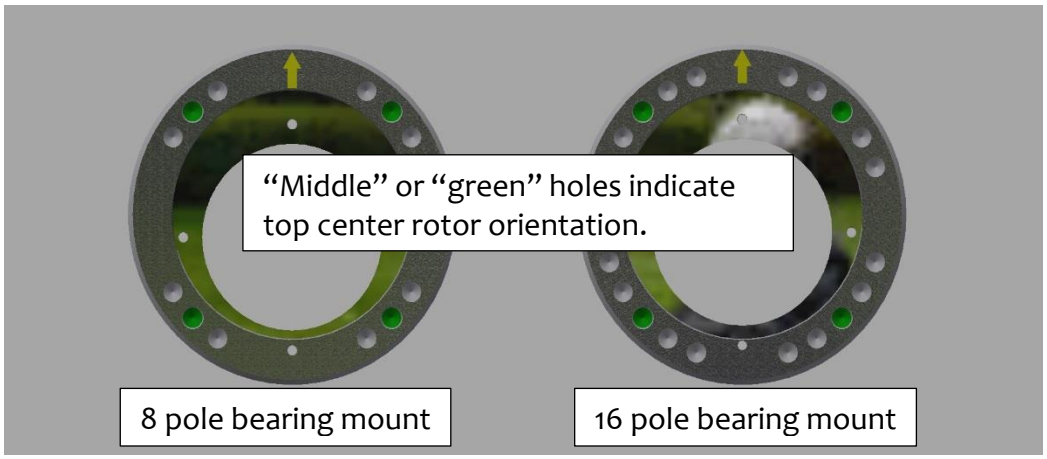


Figure 22

Follow installation procedure outlined in "DODGE® Bearings Install Procedure". Make sure the ***floating*** bearing collar is pushed in towards the center of the machine.

NOTE:

Before tightening bearings onto the shaft, the rotor will need to be centered. This can be accomplished with the following procedure:

- **Push on the end of the shaft until the rotor reaches the positive stop.**
- **Mark the shaft with a marker at the edge of the bearing collar.**
- **Push the shaft in the other direction until it reaches the positive stop.**
- **Mark the shaft again at the edge of the same bearing collar.**
- **Measure the distance between the two lines; divide this distance by two and place a mark in the center of the two original lines.**
- **Move the shaft so that the center line is at the edge of the bearing collar.**

The rotor should now be centered in the machine; tighten bearings onto the shaft.

19. Once the bearings are tightened onto the shaft secure the non-drive end horizontal mount to the frame.

20. Replace the V-Belt sheave on the rotor. Take care not to overtighten the bolts for the taper grip bushing. Torque each bolt evenly to 9 ft/lbs until all bolts are tight.

21. Replace motor and motor mount. If the original location of the motor and motor mount were marked during the disassembly process in Step 5, move the motor and motor mount back to this location.

    NOTE: The markings are intended to achieve close alignment, then may require fine adjustments.

22. For V-belt installation, reduce the center distance so the belts may be placed in the sheave grooves without force. Arrange the belts so that both the top and bottom spans have about the same amount of sag. Apply tension to the belts by increasing the center distance until the belts are snug and have a live, springy action when struck with the hand.

    Operate the drive a few minutes to seat the belts in the sheave grooves. Observe the operation of the drive under its highest load condition (usually starting). A slight bowing of the slack side of the drive indicates adequate tension. If the slack side remains taut during the peak load, the belts are too tight. Check the tension on a new drive several times during the first 24 hours of operation by observing the slack side span.

    NOTE: **If the rotor bearings are being replaced new, run through the bearing break-in procedures. Refer to BEARING section of this manual (page 10) and the data logs provided in the appendix.**

    Keep the drive free of foreign material which might cause slippage or damage to the belt and sheave surfaces. If a V-belt slips, it is too loose. Increase the tension by increasing the center distance. Never apply belt dressing, as this will damage the belt and cause early failure.

23. Replace conveyor belt as per instructions in **Belt Change Procedure.**

Shell Bearing Removal / Assembly

The shell bearings are an open type NTN® XLS 5-1/2" cartridge bearing with a MicroPoly® lubricant. MicroPoly® is self-lubricating and will never require manual lubrication. When the bearings heat up, the MicroPoly® potting compound will lubricate the bearings. The MicroPoly® also acts as a seal to keep out foreign objects and dirt.

The following steps will guide the user through the process of replacing the shell bearings. Following these steps will minimize the risk of damage during installation.

1. Disassemble the ECS machine by following the instructions in the **"Belt Change Procedure"** and **"Shell Change Procedure"** sections of the manual.

2. Disassemble to the point that the bearing mount assemblies are removed from the shell. See **Steps 7-10.**

   When changing bearings, it is recommended that the shell is removed from the magnetic rotor. Always verify that there is no contamination or foreign objects on the surface of the rotor. Offset bearing mount assembly is shown in **Figure 23.**

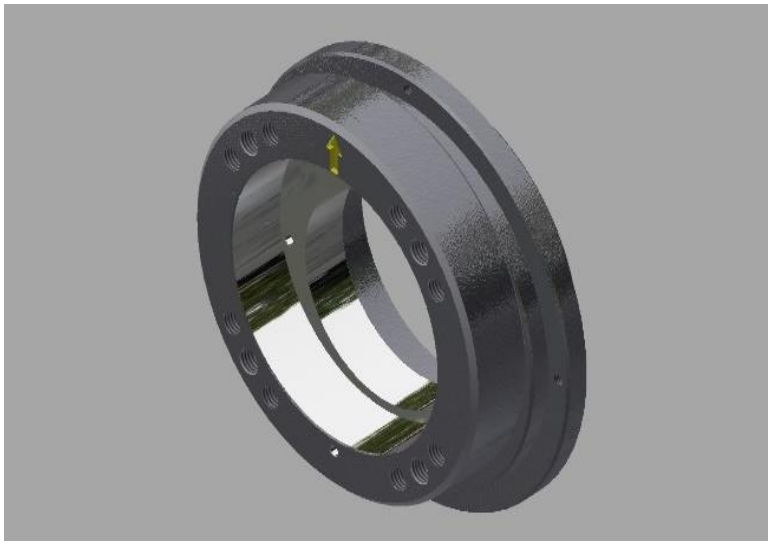


Figure 23

3. The bearing can be removed by using a press to separate the rotor bearing mount and the shell bearing mount from the XLS bearing. **Figure 24** shows an exploded view of the rotor bearing mount / shell bearing mount assembly.

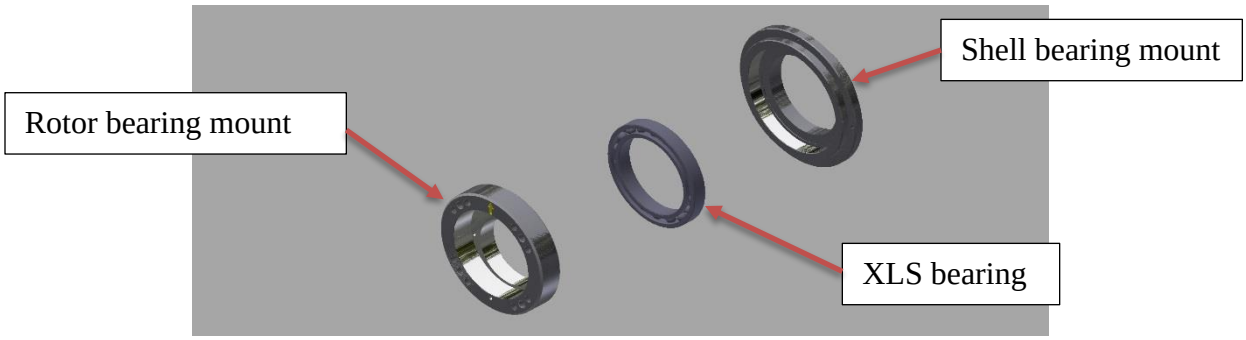


Figure 24

4. This step will require a 5.625” diameter x ¼” thick plate.

   Insert the plate into the front of the shell bearing mount as shown in **Figure 25.** The plate will be used to capture the outer race of the XLS bearing.

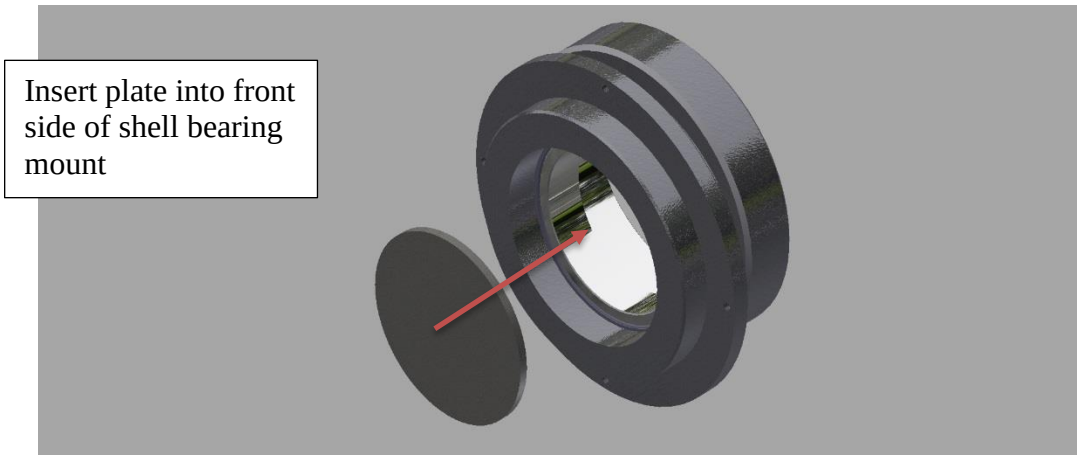


Figure 25

5. Place spacers under the flange portion of the shell bearing mount on the opposite side from where the plate was inserted. This will support the shell bearing mount while the bearing and rotor bearing mount are pressed apart from the shell bearing mount. See **Figure 26.**

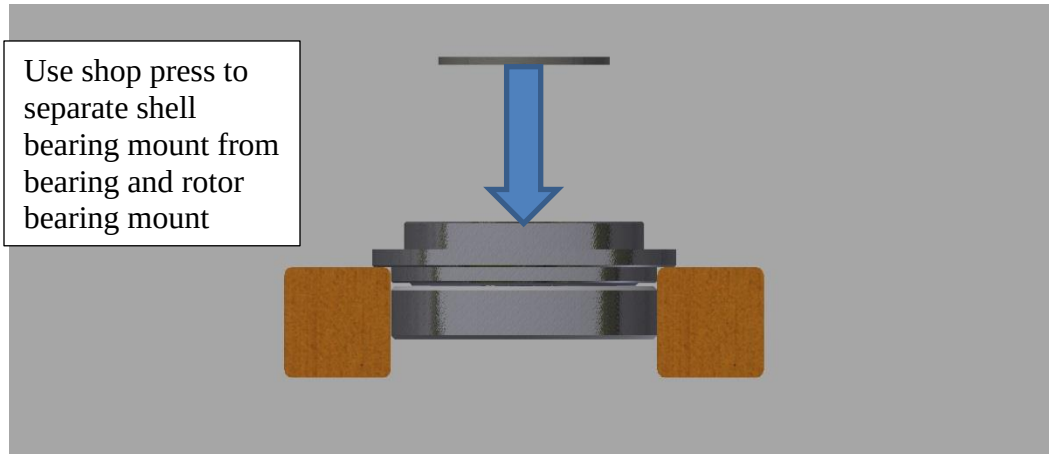


Figure 26

6. Once the shell bearing mount is separated from the XLS bearing and rotor bearing mount, remove any residual retaining compound from the shell bearing mount using a putty knife. Clean with denatured alcohol.

7. Separate the XLS bearing from the offset rotor bearing mount by utilizing the four (4) holes shown in **Figure 27.** Insert drift pins into holes and press bearing off of bearing mount.

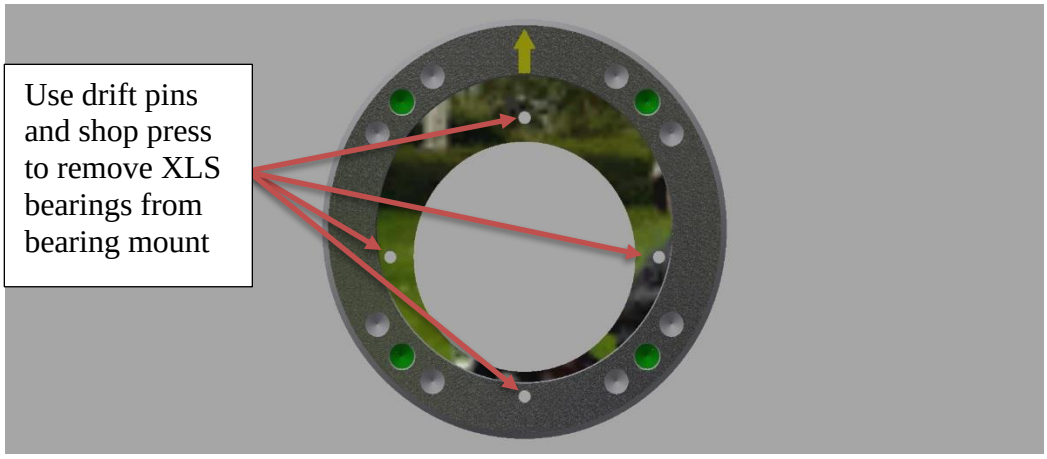


Figure 27

8. Once the XLS bearing is separated from the rotor bearing mount, clean any dirt or debris from the bearing mount by using compressed air and denatured alcohol.

9. To overcome the functional design tolerances between the XLS bearing/mount and shell bearing mount, assembly can be facilitated using thermal expansion and contraction: cool the bearing and rotor bearing mount, heat the shell bearing mount.

   Preparation: place the bearing and rotor bearing mount in a freezer; place the shell bearing mount in front of a floor heater or in an oven. The shell bearing mount should be heated to 225° - 240° F.

10. Once the components have been adequately heated / cooled (estimate 1-2 hours), the cold bearing should slip into the bearing cavity of the shell bearing mount.

    This process requires the assembler to work quickly to take advantage of the difference in component temperatures. If the bearing does not seat completely into the hub, use a shop press to seat the bearing into the shell bearing mount so that the outer race of the bearing seats against the raised lip on the bearing cavity of the mount.

NOTE: If the fit is loose between the XLS bearing and the shell bearing mount, retaining compound can be applied to the cavity portion of the shell bearing mount. Loctite® Retaining Compound 609 is recommended. See **Figure 28.**

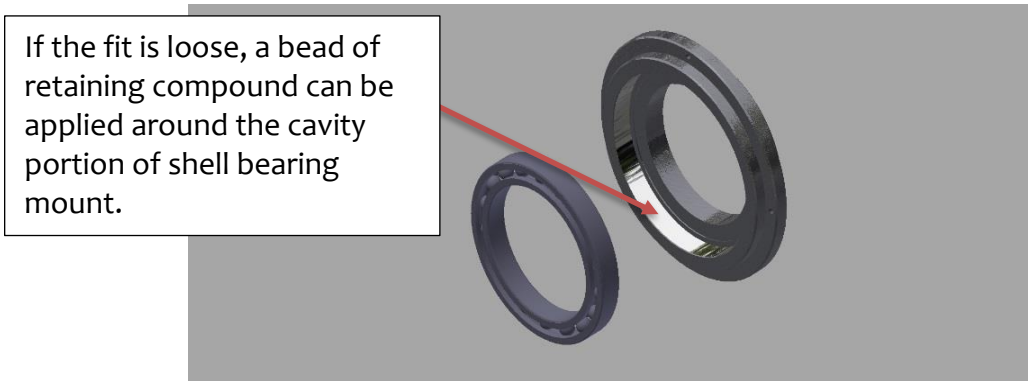


Figure 28

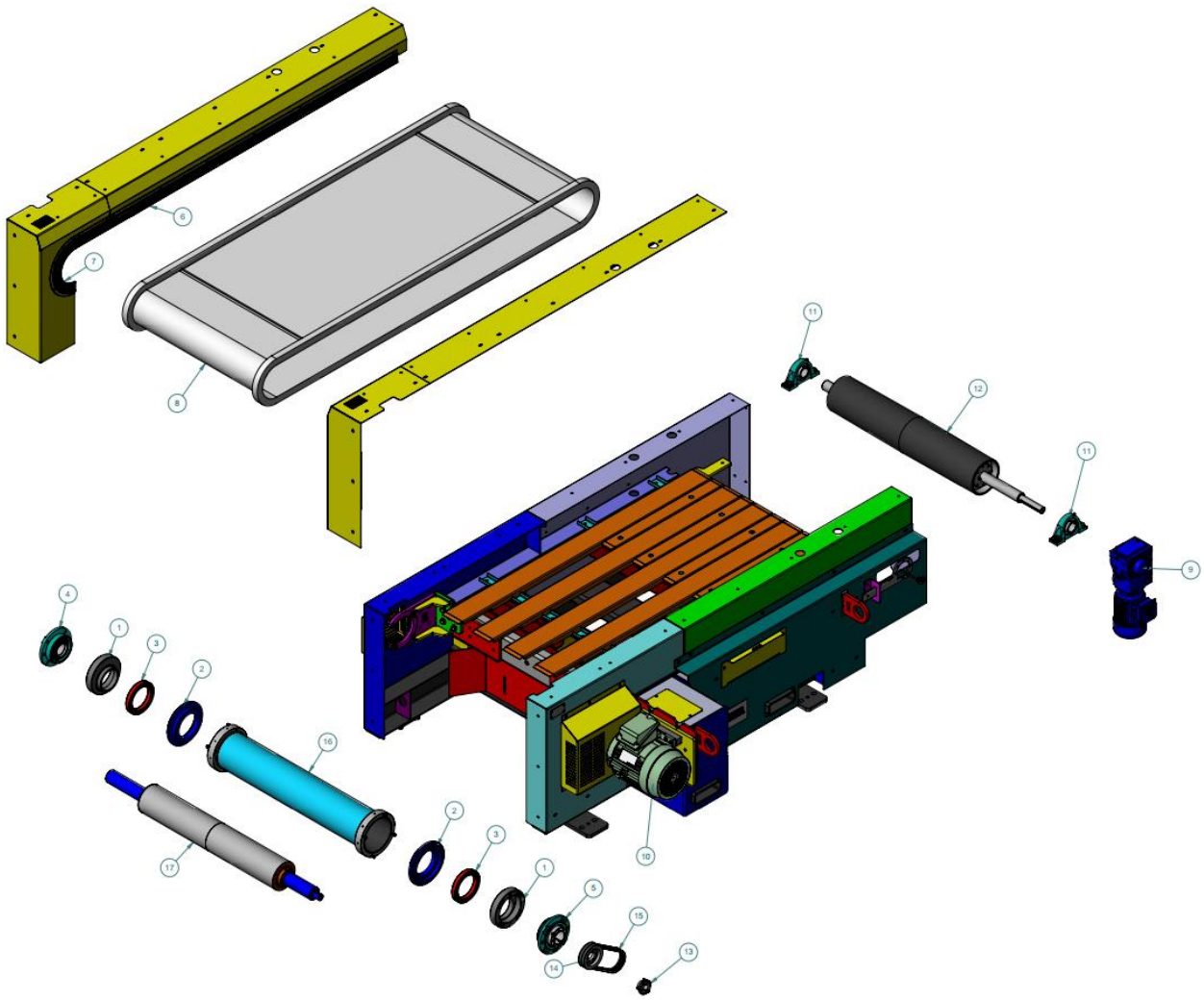
11. Once the XLS bearing has been installed into the shell bearing mount, raise the temperature of the assembly using either a floor heater or oven.

12. After the XLS bearing and shell bearing mount have been heated, insert the shaft portion flange of the offset rotor bearing mount into the inner race of the XLS bearing. This does not require the use of retaining compound. If the XLS bearing does not seat completely against the raised lip for the inner race of the XLS bearing, use a shop press to seat the bearing.

13. After the rotor bearing mount, XLS bearing and shell bearing mount have been assembled, let the temperature normalize back to room temperature before installing.

Replacement Parts List

1 Rotor bearing mount
2 Shell bearing housing
3 Shell bearing
4 Rotor bearing piloted flange EX
5 Rotor bearing piloted flange NE
6 Brush and holder x 96 in lg
7 Brush curved
8 Endless belt (optional spliced)
9 Gearmotor (conveyor / tail pulley)
10 Motor (magnetic rotor)
11 Tail pulley bearing
12 Tail pulley w/shaft
13 Quick disconnect bushing
14 V-belt 2 groove pulley
15 V-belt
16 Carbon fiber shell assembly
17 Eddy current rotor



Appendix

1. DODGE® Bearings Install Procedure (page 1 of 2)

Instruction Manual for Dodge Imperial & ISAF Bearing

These instructions must be read thoroughly before installation or operation. This instruction manual was accurate at the time of printing. Please see **baldor.com** for updated instruction manuals.

Note! The manufacturer of these products, Baldor Electric Company, became ABB Motors and Mechanical Inc. on March 1, 2018. Nameplates, Declaration of Conformity and other collateral material may contain the company name of Baldor Electric Company and the brand names of Baldor-Dodge and Baldor-Reliance until such time as all materials have been updated to reflect our new corporate identity.

WARNING: To ensure the drive is not unexpectedly started, turn off and lock-out or tag power source before proceeding. Failure to observe these precautions could result in bodily injury.

WARNING: All products over 25 kg (55 lbs) are noted on the shipping package. Proper lifting practices are required for these products.

Inspection

Inspect shaft to ensure it is smooth, straight, clean, and within commercial tolerances.

Mounting

Install the Non-Expansion unit first.

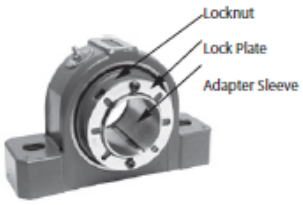


Figure 1

1. Remove lock plate located on the face of the locknut.
2. Turn locknut counter clockwise until bearing will freely slide onto the shaft.
3. Slide bearing to the desired position on the shaft.

   NOTE: All Weight Must Be Removed from the Bearing When Obtaining The ZERO Reference Point".

4. The "ZERO Reference Point" is defined as the point when the clearance between the adapter sleeve, shaft and bearing bore has been removed.

WARNING: Because of the possible danger to person(s) or property from accidents which may result from the improper use of products, it is important that correct procedures be followed. Products must be used in accordance with the engineering information specified in the catalog. Proper installation, maintenance and operation procedures must be observed. The instructions in the instruction manuals must be followed. Inspections should be made as necessary to assure safe operation under prevailing conditions. Proper guards and other suitable safety devices or procedures as may be desirable or as may be specified in safety codes should be provided, and are neither provided by ABB nor are the responsibility of ABB. This unit and its associated equipment must be installed, adjusted and maintained by qualified personnel who are familiar with the construction and operation of all equipment in the system and the potential hazards involved. When risk to persons or property may be involved, a holding device must be an integral part of the driven equipment beyond the speed reducer output shaft.

To reach the "ZERO Reference Point" rotate locknut clockwise, using both hands, as tight as possible. When mounting bearing with shaft sizes 3-15/16" and larger, the following TEST must be performed. As a test to insure you have reached the "ZERO Reference Point" tap on the O. D. of the nut with a hammer and attempt to rotate the nut using both hands. If the nut will not rotate then you have reached the "ZERO Reference Point" and you should proceed to step 5. If you can rotate the nut, using both hands, then you have not reached the true "ZERO Reference Point", and should repeat step 4A until "ZERO Reference Point" is obtained. When the "ZERO Reference Point" is reached, the bearing will not be able to move by hand axially on the shaft.

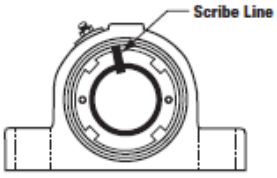


Figure 2

5. Scribe a line through the locknut face and adapter race.
6. Using a Spanner or Drift & Hammer, rotate locknut clockwise by the number of turns shown in Table 1.

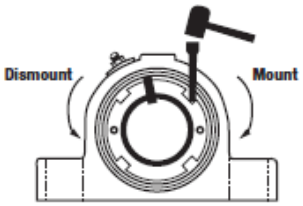


Figure 3

Table 1 - Locknut Rotation from "Zero Reference Point"

Shaft Size (inches)	Locknut Rotation
1-1/8 - 1 7/16	3/4 to 7/8 turn
* 1-1/2	3/4 to 7/8 turn
** 1-1/2	7/8 to 1 turn
1-5/8 - 2	7/8 to 1 turn
2-3/16 - 3	1 to 1-1/4 turns
3-3/16 - 4	1-1/4 to 1-1/2 turns
4-7/16 - 4 1/2	1-1/8 to 1-3/8 turns
4-15/16 - 5 1/2	1-3/8 to 1-5/8 turns
5-15/16 - 6	1 to 1-1/4 turns
6-7/16 - 7	1-1/8 to 1-3/8 turns

* IMPERIAL IP & ISAF

** IMPERIAL IP With Type E Dimensioned Housing

1

DODGE® Bearings Install Procedure (page 2 of 2)

7. Slide lock plate over shaft and align tang of lock plate with slot in adapter sleeve.
8. TIGHTEN NOT LOOSEN locknut until lock plate slots overlap the two threaded holes on the locknut face.
9. Insert and tighten button head screws to locknut face.
10. Bolt down pillow block or flange unit to the structure.

Install the Expansion Unit

1. Remove lock plate located on the face of the locknut.
2. Turn locknut counter clockwise until bearing will freely slide onto the shaft.
   a. If Locknut Facing Outboard: Align housing mounting holes with substructure mounting holes and snug bolts. Push insert as far as possible in the direction of the fixed bearing.
   b. If Locknut Facing Non-Expansion Bearing: Align housing mounting holes with substructure mounting holes and snug bolts. Position Expansion bearing insert in center of housing (NOTE: This is necessary because in the process of mounting, the bearing is being drawn toward the locknut.)

   Note: All Weight Must be Removed from the Bearing when Obtaining the "ZERO Reference Point".
3. Follow steps 4 through 10 found under mounting of the Non-Expansion bearing.

Dismounting

1. Remove weight off bearing via slings or jacks.
2. Remove mounting bolts from bearing.
3. Remove button head screws and lock plate from locknut.
4. (Figure 3) Rotate locknut counter clockwise until bearing freely slides from the shaft.

Successful operation is dependent upon adequate lubrication. Precaution should be taken during handling and recycling grease, oil or water glycol mixtures.

Field Conversion of a Non-Expansion Bearing into an Expansion Bearing

Imperial IP

1. Move snap ring opposite collar side, to the outmost snap ring groove.
2. Remove Non-Expansion nameplate and re-label as an Expansion bearing.

ISAF

1. Remove bearing cap.
2. Remove stabilizing ring.
3. Reassemble cap on base and torque cap bolts to values in Table 2.

Table 2 - Cap Bolt Torque for ISAF Grade 5 Bolts

ISAF Shaft Size (inches)	2 Bolt Base		4 Bolt Base	
	Bolt Size	Torque Ft-Lbs.	Bolt Size	Torque Ft-Lbs.
1-7/16 - 1-11/16	3/8 - 16	24 - 30		
1-15/16 - 2-3/16	7/16 - 14	40 - 50		
2-7/16 - 2-1/2	1/2 - 13	60 - 75	1/2 - 13	60 - 75
2-11/16 - 3	5/8 - 11	120 - 150	5/8 - 11	120 - 150
3-3/16 - 3-1/2	3/4 - 10	208 - 260	3/4 - 10	208 - 260
3-11/16 - 4			3/4 - 10	208 - 260
4-7/16 - 4-1/2			7/8 - 9	344 - 430
4-15/16 - 7			1 - 8	512 - 640

Grease Lubrication

DODGE IP and ISAF bearings are pre-packed with NLGI #2 Lithium Complex grease. For re-lubrication select a grease that is compatible with a #2 Lithium Complex grease. Re-lubricate in accordance with Table 3.

Storage or Special Shutdown

If exposed to wet or dusty conditions or to corrosive vapors, extra protection is necessary. Add grease until it shows at the seals; rotate the bearing to distribute grease; cover the bearing. After storage or idle period, add a little fresh grease before running.

Table 3 - Re-Lubrication Intervals (Months) Based on 12 hours per day, 150° F M

Shaft Size (inches)	RPM								
	250	500	750	1000	1250	1500	2000	2500	>3000
1-1/8 to 2	4	3	2	2	1	0.5	0.25	0.25	0.25
2-3/16 to 2-1/4	3.5	2.5	1.5	1	0.5	0.5	0.25	0.25	0.25
2-3/8 to 3	3	2	1.5	1	0.5	0.25	0.25	0.25	0.25
3-3/16 to 3-1/2	2.5	1.5	1	0.5	0.25	0.25	0.25	0.25	-
3-11/16 to 4-1/2	2	1.5	1	0.5	0.25	0.25	0.25	-	-
4-15/16 to 5-1/2	1.5	1	0.5	0.25	0.25	0.25	-	-	-
5-15/16 to 6	1	0.5	0.5	0.25	0.25	0.25	-	-	-
6-7/16 to 7	1	0.5	0.25	0.25	0.25	-	-	-	-

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5711 R. S. Boreham Jr. Street
Fort Smith, AR 72901
Ph: 1.479.646.4711

Mechanical Power Transmission Support
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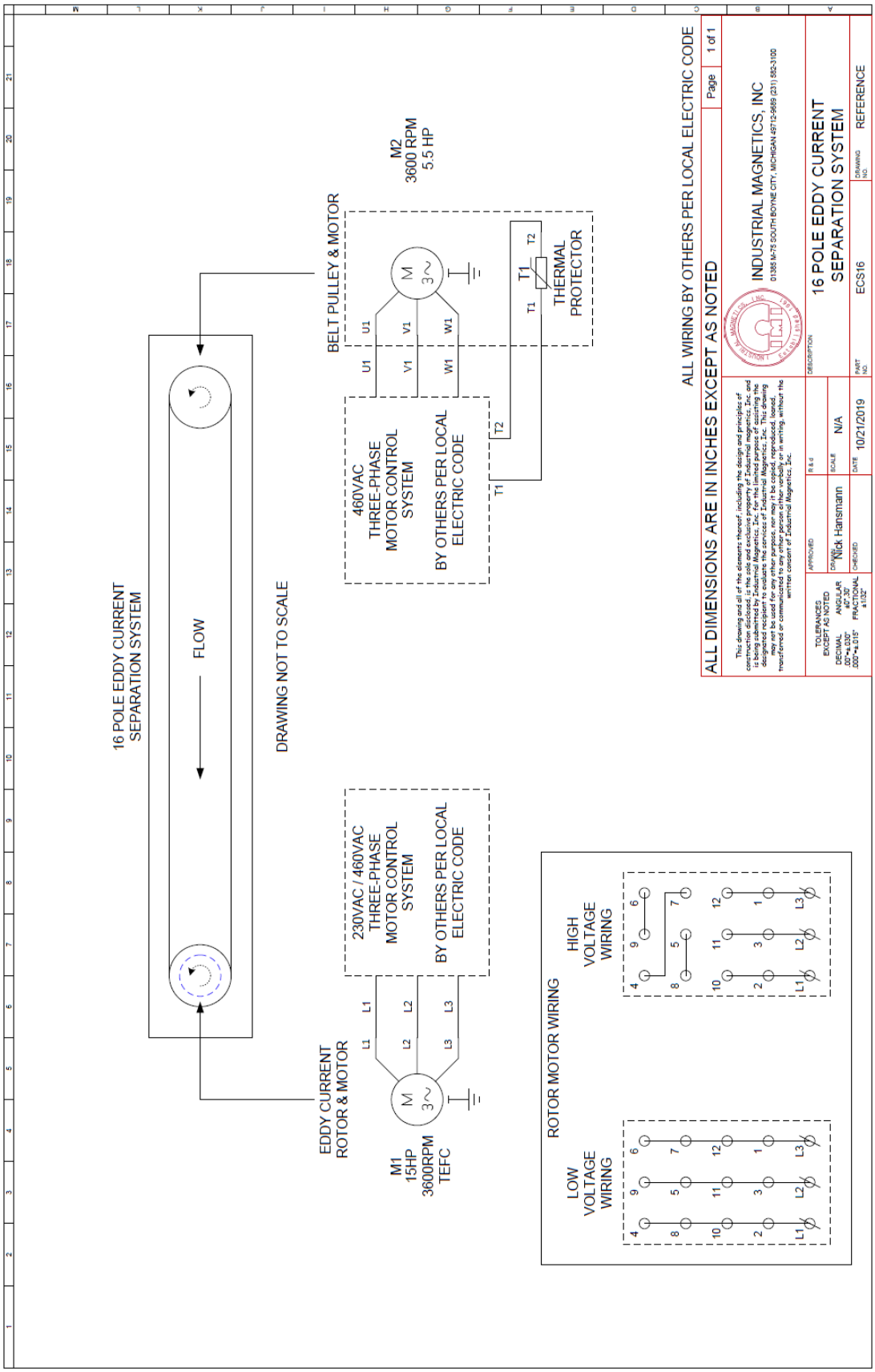
new.abb.com/mechanical-power-transmission
baldor.com

MN3009 (Replaces 499331)

07/2018 Litho 25,000

Toshiba Rotor Motor Wiring Schematic



TOSHIBA
Leading Innovation

LOW VOLTAGE MOTORS INSTRUCTION MANUAL (IM)

900505 (03/23)

MOTOR MAINTENANCE:

INSPECTION:

Inspect motor at regularly scheduled intervals. Keep motor clean and ventilation openings clear of dust, dirt, or other debris.

LUBRICATION:

(1) All motors that are supplied with grease fittings should be lubricated in accordance with the grease label attached to the motor. **See IOM manual.**
(2) Bearings and grease must be kept free of dirt.
(3) Do not over grease! Excessive lubrication will cause overheating, reduce bearing life, and may cause premature bearing failure.
(4) Oil leakage around bearing caps is an indication of over greasing and excess grease should be purged out by operating motor temporarily with grease relief open.

Recommended Greases for STANDARD Applications

Use the greases listed in the **IOM Manual** for the given temperature range, unless otherwise shown by the motor's grease nameplate.

Recommended Greases for SPECIAL Applications

The greases shown in the IOM Manual recommended for special applications only should be used only for motors specifically built for such conditions. In general it is not recommended to mix greases of different brands. The mixing of different types of thickeners may destroy the composition and physical properties of the grease. In the event that a different grease is required by the end user, the following steps can be taken. Using the instructions for lubrication, open grease outlet and purge the system as much as possible of the old or unwanted grease. Repeat this same operation after one (1) week of service.

READ CAREFULLY BEFORE INSTALLING AND STARTING MOTOR (OWNERS RESPONSIBILITY TO SAVE THESE INSTRUCTIONS)

RECEIVING:

(1) Check Nameplate.
(2) Check whether any damage has occurred during transportation. (Motors are normally shipped FOB factory. Freight claims must be submitted by the consignee to the carrier.)
(3) When supplied - be sure to remove bearing lock plate before start-up.
(4) Turn shaft by hand to check that it turns freely.

LOCATION:

(1) All motors should be located in an area where ventilation is not restricted and affects the operation of the motor.
(2) Open Drip Proof Motors are designed for installation in a well ventilated place where the atmosphere is reasonably free of dirt and moisture.
(3) Totally Enclosed Motors may be installed where dirt, moisture (not running water) and corrosion are present, or in outdoor locations.
(4) Explosion Proof Motors are designed and built for hazardous locations. They are UL listed and nameplated for a specific hazardous area of classification as well as CSA listed.

MOUNTING:

(1) Mount motor securely on a firm, flat base. All ball and roller bearing normal thrust motors through the 447 frame should be capable of mounting in any position, mechanically. Consult TOSHIBA for frames larger than 447. Proper drains and construction may be required due to the present environment.
(2) Align motor accurately, using a flexible coupling, if possible. For drive recommendations, consult with drive or equipment manufacturer, or TOSHIBA.
(3) V-belt Sheave Pitch Diameters should not be less than the NEMA recommended values.
(4) Do not over tension the belts as excess tension may damage the motor or driven equipment. Belt speed should not exceed 5000 ft. per minute.
(5) Motors must not be subjected to vibration exceeding 0.5 G force. (Motors should not be mounted to shaker screens.)

POWER SUPPLY & CONNECTIONS:

(1) Nameplate voltage and frequency should agree with power supply. Motor will operate satisfactorily on line voltage within 10% of nameplate value; or frequency within 5%; combined variation not to exceed 10%. 230 Volt motors can be used on 208-volt network systems, but with slightly modified performance characteristics.
(2) Dual voltage motors can be connected for the desired voltage by following the connection diagram shown on the nameplate, or by the connection diagram found in the conduit box cover. Alternate starting connections are shown in the conduit box connection diagrams. **See IOM Manual.**
(3) Explosion Proof Motors have Temperature Limiting Devices in the motor enclosure to prevent excessive external surface temperature of the motor in accordance with UL standards. Terminals of thermal protectors shall be connected to the motor control equipment. Wiring instructions for thermal protectors are listed on the nameplate.
(4) Wiring of motor, control, overload protection and grounding should be in accordance with the National Electrical Code and local building codes.
(5) Disconnect motor from power supply before opening conduit box or working on motor.
(6) Megger test before energizing. A minimum of 10 megohms are recommended.

FOR FURTHER INFORMATION CONTACT:
TOSHIBA INTERNATIONAL CORPORATION
INDUSTRIAL EQUIPMENT DIVISION
13131 WEST LITTLE YORK ROAD, HOUSTON, TX 77041
PHONE (713)466-0277 FAX (713) 466-8773 TOLL FREE (800)231-1412
WWW.TOSHIBA.COM/IND

195-0100 (08/2010)

IMI Javelin Eddy Current Separator
Inspection Test Plan and Report - 8 pole

Model No:			Date:	
Serial No:		MO:		
Customer:		CO:		

ECS Rotor	8 pole	Part no:	
Motor:			

Tail pulley		

Rotor bearing data - 8 pole

Time		Hz			Temperatures ˚F			
set	actual	set	actual	Amps	Drive bearing	Shell	Non-drive brg	
0		30						
0:30		60						
1:00		60						
1:30		60						
2:00		60						
2:30		60						Ramp-down time to rotor stop
3:00		60						
3:30		60						
4:00		60						

Cold start run - day 2

Time		Hz			Temperatures ˚F			
set	actual	set	actual	Amps	Drive bearing	Shell	Non-drive brg	Ramp-down time to rotor stop
0:15		60						
* 1:00		60						
2:00		60						

* Add one (1) pump luthium grease to rotor bearings after one (1) hour of operation

IMI Javelin Eddy Current Separator
Inspection Test Plan and Report - 16 pole

Model No:			Date:	
Serial No:		MO:		
Customer:		CO:		

ECS Rotor	16 pole	Part no.	
Motor:			

Tail pulley		

Rotor bearing data - 16 pole

Time		Hz			Temperatures °F			
set	actual	set	actual	Amps	Drive bearing	Shell	Non-drive brg	
0:15		30						
0:30		30						
0:45		30						
1:00		35						
1:15		35						
1:30		35						
1:45		35						
2:00		40						
2:15		40						
2:30		40						
2:45		40						
3:00		45						
3:15		45						
3:30		45						
3:45		45						
4:00		51						
4:15		51						
4:30		51						
4:45		51						
5:00		51						
5:15		51						Ramp-down time to rotor stop
5:30		51						
5:45		51						
6:00		51						

Cold start run - day 2

	Time		Hz			Temperatures °F			
	set	actual	set	actual	Amps	Drive bearing	Shell	Non-drive brg	
	0:15		51						Ramp-down time to rotor stop
*	1:00		51						
	2:00		51						

* Add one (1) pump luthium grease to rotor bearings after one (1) hour of operation

Limited Warranty

INDUSTRIAL MAGNETICS, INC. warrants this eddy current separator to be free from defects in material and workmanship under normal operating conditions for a period of one year from date of shipment to original purchaser. One year represents 2080 operating hours. Without limitation, use or service in highly corrosive environments is not deemed normal. **INDUSTRIAL MAGNETICS, INC**. does not warranty against magnetic rotor damage caused by ferrous burnout, neglect, or any use that is deemed abnormal. **INDUSTRIAL MAGNETICS, INC**. sole obligation under this warranty is limited to repairing or replacing any piece of equipment or part that is determined to have been defective within one year of shipment. Defective parts shall be returned to **INDUSTRIAL MAGNETICS, INC**., FOB our shop and a replacement part shall be returned to purchaser FOB our shop. **INDUSTRIAL MAGNETICS, INC**. does not warranty components manufactured by others, but will submit upon purchaser's request, the warranty of the specific manufacturer. **INDUSTRIAL MAGNETICS, INC**. does not warranty installation or labor associated with replacement parts granted under the normal warranty conditions. In the case of a motor failure please contact the nearest authorized service center of the motor manufacturer.

The foregoing represents the entire liability of **INDUSTRIAL MAGNETICS, INC**. to the purchaser. **INDUSTRIAL MAGNETICS, INC**. makes no other warranties either express or implied. In no event will **INDUSTRIAL MAGNETICS, INC**. be liable for any direct or indirect, incidental or consequential loss or damages or economic loss (including, but not limited to, loss of product, production time, or equipment) to any person or property arising from operation of this equipment.