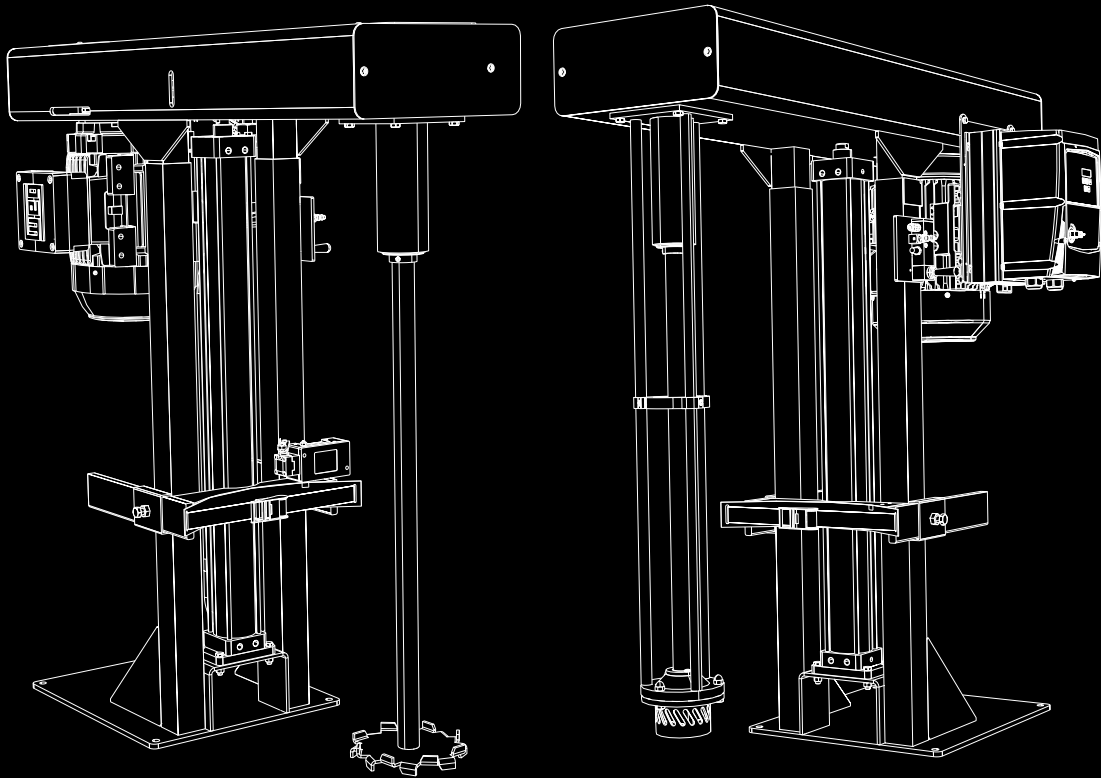


Post Mount Dispenser and Rotor Stator Size 3 Mixer Manual



Installation, Operation, & Maintenance for Post Mount Dispenser and Rotor Stator Size 3 Mixer Manual



Every Process We Touch, We Improve

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General Safety

Safety is the most important element of the operation and maintenance of your new equipment. Knowledge of the procedure to be performed and safe work habits are essential to preventing death, personal injury, or property damage. Use the following statements as a common-sense guide to proper work and tool-use habits.

Prepare for the Job

Preparation is essential to complete a procedure in a safe and efficient manner.

- Wear proper clothing. Loose or baggy clothing could become tangled in moving parts.
- Use eye/face protection. Always use proper eye/face protection to protect your eyes from flying debris or chemical splatters.
- Wear protective footwear. Wear safety shoes (steel-toe) to protect your feet from falling objects.
- Use gloves when handling parts. Parts may have sharp edges or may be hot.
- Remove jewelry prior to servicing electrical systems.
- Prepare proper tools and equipment. Always use the correct tool for the job. Improper or homemade tools can cause injury or machine damage.
- Prepare needed parts and materials. Gather the needed parts and materials before beginning the procedure.
- Many components can get hot during operation. Be sure to allow enough time for components to cool before beginning service.
- Prepare proper work-space lighting. A well-lit work area can make the job easier.
- Follow procedures and safety warnings. Service procedures are written to be as safe and efficient as possible. Never take shortcuts.
- Be prepared for emergencies. Accidents can happen, even under the best conditions. Fire extinguishers and first aid kits should be well maintained and easily accessible.

Safety Notices

Please read this entire manual before attempting to operate or service equipment. Failure to follow these instructions could result in serious bodily injury or death.

Throughout this manual, the following key safety words will be used to alert the reader of potential hazards. Become familiar with these words and their meaning. Take all precautions to avoid the hazards described.

DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious bodily injury.

WARNING

Indicates a potentially hazardous situation which, if not avoided, may result in serious or moderate bodily injury.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate bodily injury.

NOTICE

Indicates a situation which, if not followed, may involve deterioration or damage to equipment.

Maintenance Safety

WARNING

Before doing any service or maintenance on this machine, Follow all safety procedures. This should include:

- Disconnect the electrical power supply.
- Relieve any pressure from the pneumatic system.
- Mechanically secure any part of the machine that may shift while doing maintenance.

Electric Motor Safety

 **WARNING**

ELECTRICAL SHOCK!

De-energize unit before servicing. Failure to follow this instruction may result in serious injury.

 **WARNING**

AVOID POSSIBLE INJURY, ROTATING PARTS!

Please make sure to keep your hands, hair and loose clothing away from rotating parts to avoid any injuries. Failure to do so, may result in serious injury.

 **CAUTION**

HOT PARTS DO NOT TOUCH!

During and after operation, motor and auxiliary components can become hot. To avoid severe burns, do not touch motor and component parts while in use or immediately after stopping.

NOTICE

All Electric Motors should be in accordance with National Electrical Code, NEMA along with local codes. All grounding should be in accordance with National Electrical Code (NEC) Article 430.

ATTENTION: *Under no circumstances should anyone other than qualified professionals be responsible for electrical connections and repairs. The potential dangers of electricity are far too great to be taken lightly. Therefore, it is imperative that safety is prioritized above all else and that only individuals with the necessary qualifications and expertise are entrusted with electrical work.*

Variable-Frequency Drive (VFD) Safety

 **WARNING**

ELECTRICAL SHOCK!

This device will store a charge for up to 3 minutes after removing the main voltage from the unit. Always discharge or allow ample time before servicing. Failure to follow this instruction may result in serious injury.



Introduction

Congratulations on your purchase of the MXD Process Post Mount Dispenser (DP3) or Post Mount Rotor Stator (RP3). This manual provides comprehensive guidance on the installation, set-up, operation, maintenance, and repair of your DP3 and RP3, as well as general information. We recommend reading this operation and maintenance manual in its entirety before setting up or using the mixer to ensure safe and efficient operation. We thank you for choosing our product and look forward to providing you with any assistance you may need.

Configurations

The MXD Process Post Mount Dispenser (DP3) and Post Mount Rotor Stator (RP3) can come with the following motor options.

DP3

- Standard Totally Enclosed Fan Cooled (TEFC) Electric Motor
- C1D1 Explosion Proof Inverter Duty Electric Motor

RP3

- Standard Totally Enclosed Fan Cooled (TEFC) Electric Motor
- C1D1 Explosion Proof Inverter Duty Electric Motor

READ BEFORE UNPACKING

NOTICE

Please note that your MXD Process mixer has undergone rigorous quality testing before shipment. It is important to exercise proper care and handling when moving, uncrating, and securing the mixer components to their mounting surface. Failure to adhere to the guidelines below may result in damage to the equipment or serious injury to those operating the products.

Inspection and Receiving

Upon receipt of the equipment, it is imperative to conduct a thorough inspection to ensure accuracy and identify possible shipping damage. It is highly recommended to take note of any missing components and promptly report any observed damage or missing items to both the shipping carrier and MXD Process. It is advisable to refrain from discarding the packaging provided until all components have been accounted for, and product has been confirmed to be free from transit damage. For a detailed list of components, please refer to the Spare Parts Section of the manual.

Storage

When it comes to storing mixing equipment, it is important to select a location that is free from exposure to elements of nature, moisture, and excessive mechanical vibrations. This is especially important as electrical components are not designed to withstand moisture. In the event that the mixer has been

in storage for more than a year, it is recommended that the gear lubricant be checked prior to the mixer being put into service. Additionally, exposed carbon steel surfaces, such as the gearbox's hollow bore, should be inspected for any corrosion that may have occurred during storage. For corrective actions, please refer to the maintenance section or contact MXD Process if further assistance is required. To prepare the equipment for long-term storage, please follow these steps:

- Check mixer functionality before storing.
- For optimal storage of the mixing equipment, keep it at an ambient temperature between 32°–104° F (-0°–40° C) and avoid relative humidity over 60%.
- To ensure proper storage of the gearbox, it is recommended that it be kept in its actual mounting position, with a horizontal orientation and the mount parts facing downward.
- It is recommended to cover the unit to prevent excessive dust buildup, which can have a detrimental effect on the equipment's overall performance.
- To prevent corrosion and ensure optimal performance, it is recommended to apply a protective lubricant coating to all unpainted carbon steel surfaces, including the gearbox hollow shafts. This step is crucial in maintaining the integrity of the equipment and extending its lifespan. Additionally, regular inspections should be carried out to check for any signs of corrosion.
- To prevent any potential corrosion inside the unit, it is recommended to overfill the gearbox with oil. By taking this step, it is possible to ensure that the equipment is properly lubricated and protected against potential damage.
- To ensure that the oil is properly distributed to internal surfaces and to prevent brinelling of the bearing races, it is recommended to rotate the gearbox once a month, approximately 10–20 revolutions in both directions. By following this approach, it is possible to maintain optimal equipment functionality and extend its lifespan.

Customer Support

If you encounter any problems or have any questions, feel free to contact us. We are here to help in any way we can.

Contact information

- MXD Process Technical Support
(812) 202-4047 x2
support@mxdprocess.com
8am - 5pm EDT
- MXD Process Technical Sales
(812) 202-4047 x1
sales@mxdprocess.com
8am - 5pm EDT



Warranty

MXD Process prides itself on providing high-quality products to our customers. To ensure you get the most out of our equipment, we kindly remind you that any alteration, customization, misuse, or improper assembly of our mixer or mixer components is not our responsibility. Such actions may void your warranty and can result in serious harm or damage. We encourage you to carefully follow the instructions provided to ensure safe and proper use of our equipment.

Our products are crafted with the highest standards of materials and workmanship, and we stand behind them with confidence. In the unlikely event that you encounter defects, we offer a one-year warranty on items we manufacture and the manufacturer's warranty on other items we do not manufacture. All component parts are covered by these warranties, except for normal wear items like belts, bearings, set screws, etc.

To initiate a warranty repair, please contact us for a Return Material Authorization (RMA) number. Returns must be made within the specified window and packaged comparably to their initial shipment. We recommend using the original packaging, if reusable.

At MXD Process, we value your business and are committed to providing only the best products and services. Our warranty is the only one we offer and supersedes all other warranties, whether expressed or implied, so you can have peace of mind knowing that you are covered.

Return Policy

All returns require approval from our Technical Support Team and are subject to a re-stocking fee. In order to return a product, you need to obtain a Return Material Authorization (RMA) number. We will not process any return or credit without an authorized RMA number. Please make sure to package your return in a comparable manner to how it was initially shipped. If the original packaging is reusable, we recommend using it for the return. Please note that products must be returned within 10 business days from the date of issuance of the RMA.

If you need to return any of our products, please do not hesitate to reach out to our Technical Support team at (812) 202-4047 x2. Our team is available to assist you and make the process as easy as possible. To help us expedite your request, kindly have the following information ready when you call:

- Mixer Serial Number (located near the motor tag), Sales Order Number, or Purchase Order Number
- Part number and description of the product you purchased
- Reason for returning the product

We appreciate your business and are committed to ensuring your satisfaction.



Pre-Assembly Checklist

- Manual has been read in its entirety
- Mixer removed from packaging and inspected for damage or missing components
- Mounting hardware is prepared, if applicable.
- Tools such as a calibrated torque wrench, sockets, ratchets, Allen keys (hex keys), and anti-seize are readily available
- Professionals, such as riggers, are on-site ready to move the equipment
- Qualified electricians are informed of the electrical requirements and prepared to wire the necessary equipment
- Installation site is prepped, cleaned, and all relevant personnel are informed

Motor Installation

Electrical Motor

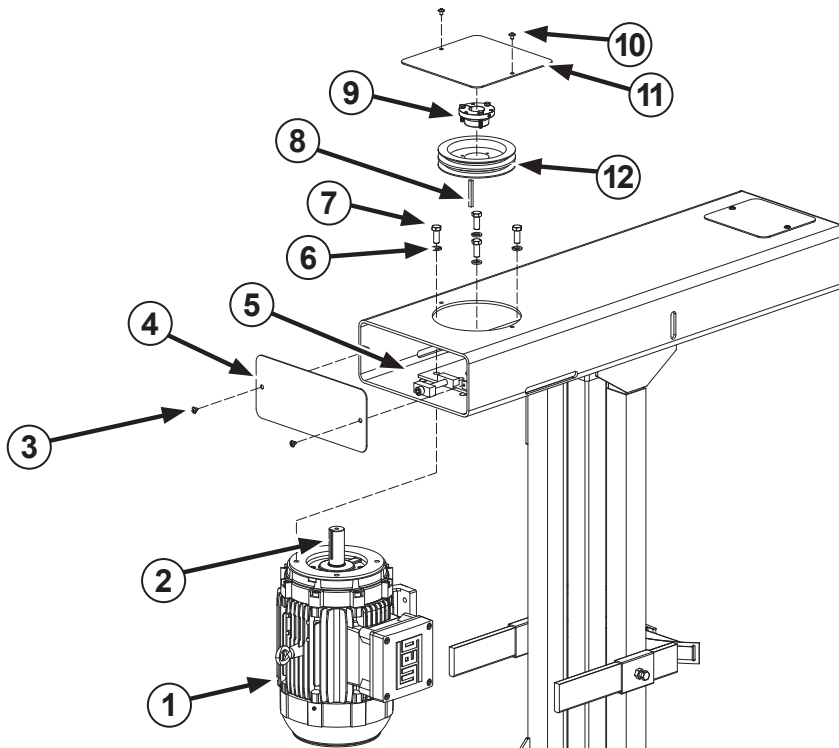


Figure 1. Electrical Motor Install

WARNING

AVOID INJURY, HEAVY COMPONENT!

It is important to utilize appropriate lifting equipment or have additional personnel present to aid in lifting heavy objects into place. Noncompliance with this directive may result in physical harm.

1. Lift the motor (1) into place on the frame assembly motor plate (6).
2. Install four cap screws (7), four lock washers (6) securing the motor to the frame assembly motor plate. Tighten to specification. See "Information Tables" on page 40.
3. Install the key (8) into the keyseat on the motor shaft (2)
4. Install the split taper bushing (9) onto the belt sheave loosely.
5. Slide the assembly over the motor shaft, and align the keyway on the belt sheave (12).
6. Install and adjust the belt, see "Belt Drive Installation and Tensioning" on page 14
7. Install the inspection covers (4) and secure with two socket head cap screws (3).
8. Install the top inspection cover (11) and secure with two socket head cap screws (10). Tighten to specifications. See "Information Tables" on page 40.

Variable-Frequency Drive (VFD) Installation (if applicable)

The Variable Frequency Drive (VFD) Speed Controller for the electric motor DP3 and RP3 mixers enables the operator to adjust the RPM incrementally to match the specific mixing requirements and achieve the best impeller tip speed. In the case of hazardous area mixers, the VFD should be installed outside the hazardous area, with a hazardous area control panel mounted on the mixer.

Variable Frequency Drive

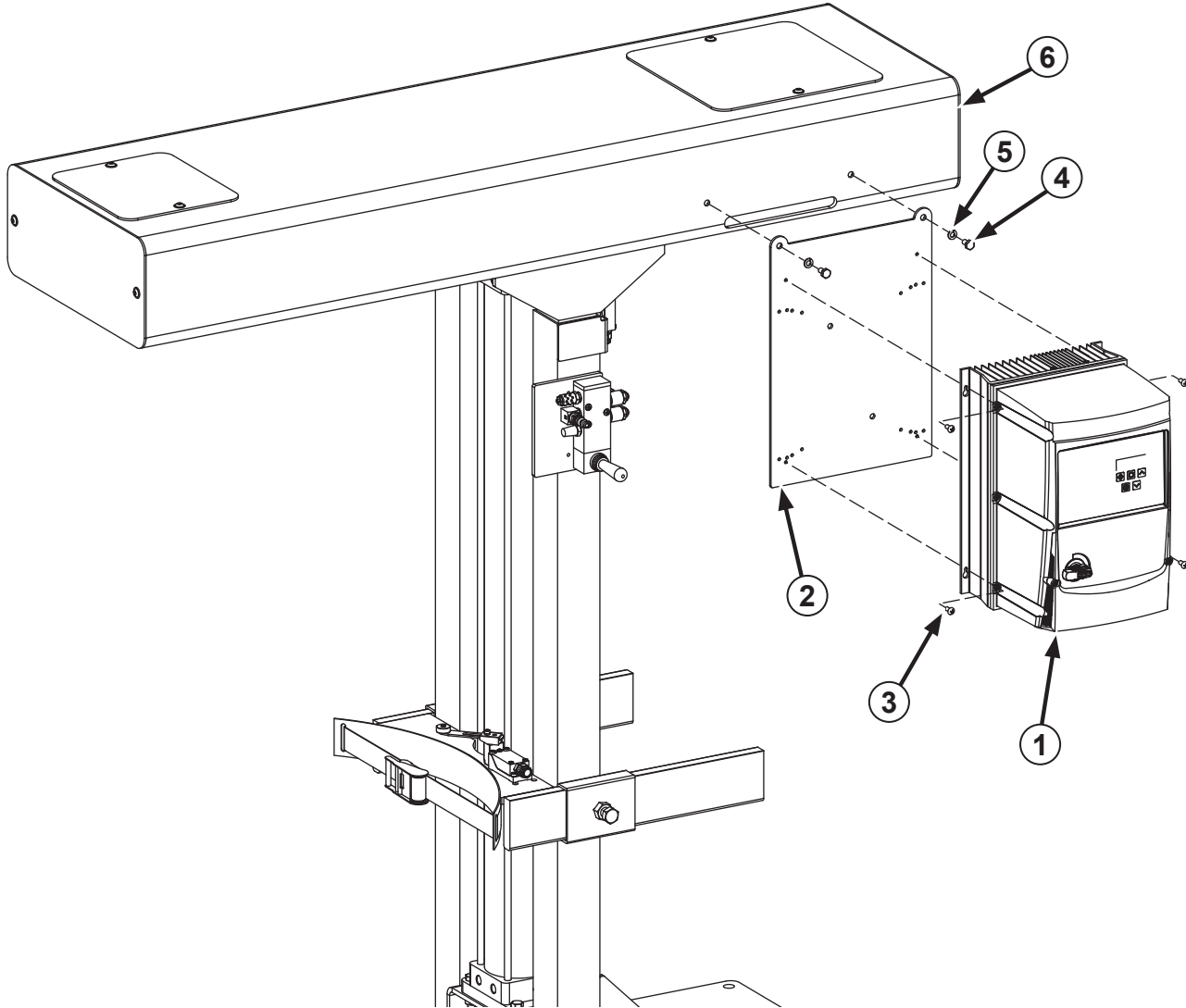


Figure 2. Variable Frequency Drive (VFD)

1. Install the Variable Frequency Drive (VFD) mounting plate (2) to the frame assembly (6).
2. Secure the VFD mounting plate with two cap screws, (4) and two lock washers (5), tighten cap screws to specification. See "Information Tables" on page 40.
3. Install the VFD Speed Controller (1) to the VFD mounting plate, and secure with four screws (3).
4. For electrical connections see, "Wiring/Electrical" on page 20.

Hazardous Area Control Panel

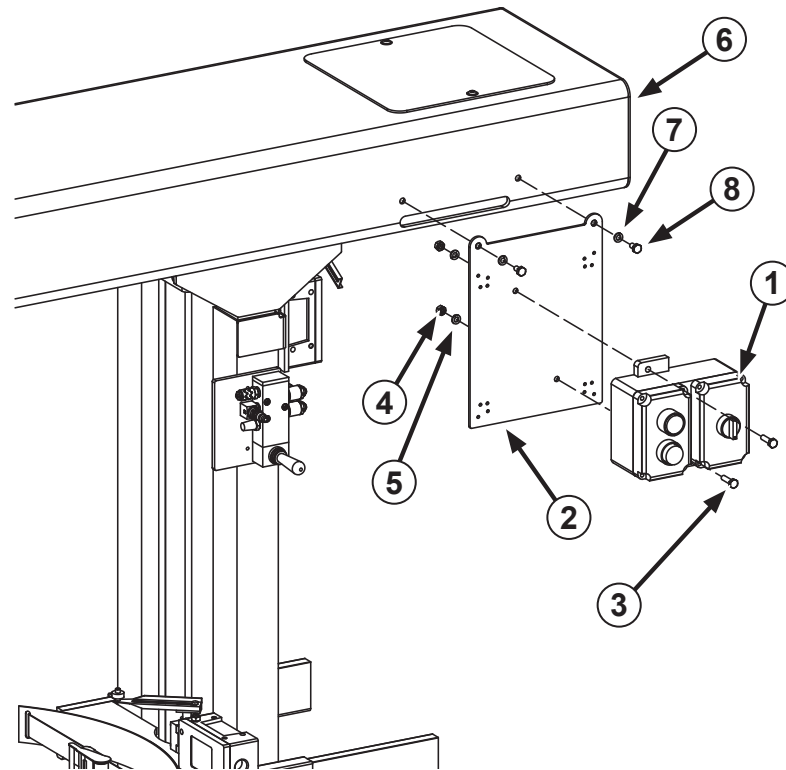


Figure 3. Control Panel

1. Install the control panel mounting plate (2) to the frame assembly (6).
2. Secure the mounting plate with two lock washers (7) and two cap screws, (8), tighten cap screws to specification. See "Information Tables" on page 40.
3. Install the control panel (1) to the mounting plate, and secure with two cap screws (3) two lock washers (5) and two nuts, (4). Tighten to specification. See "Information Tables" on page 40.
4. For electrical connections see, "Wiring/Electrical" on page 20.

Bearing and Shaft Installation

DP3 Bearing Installation

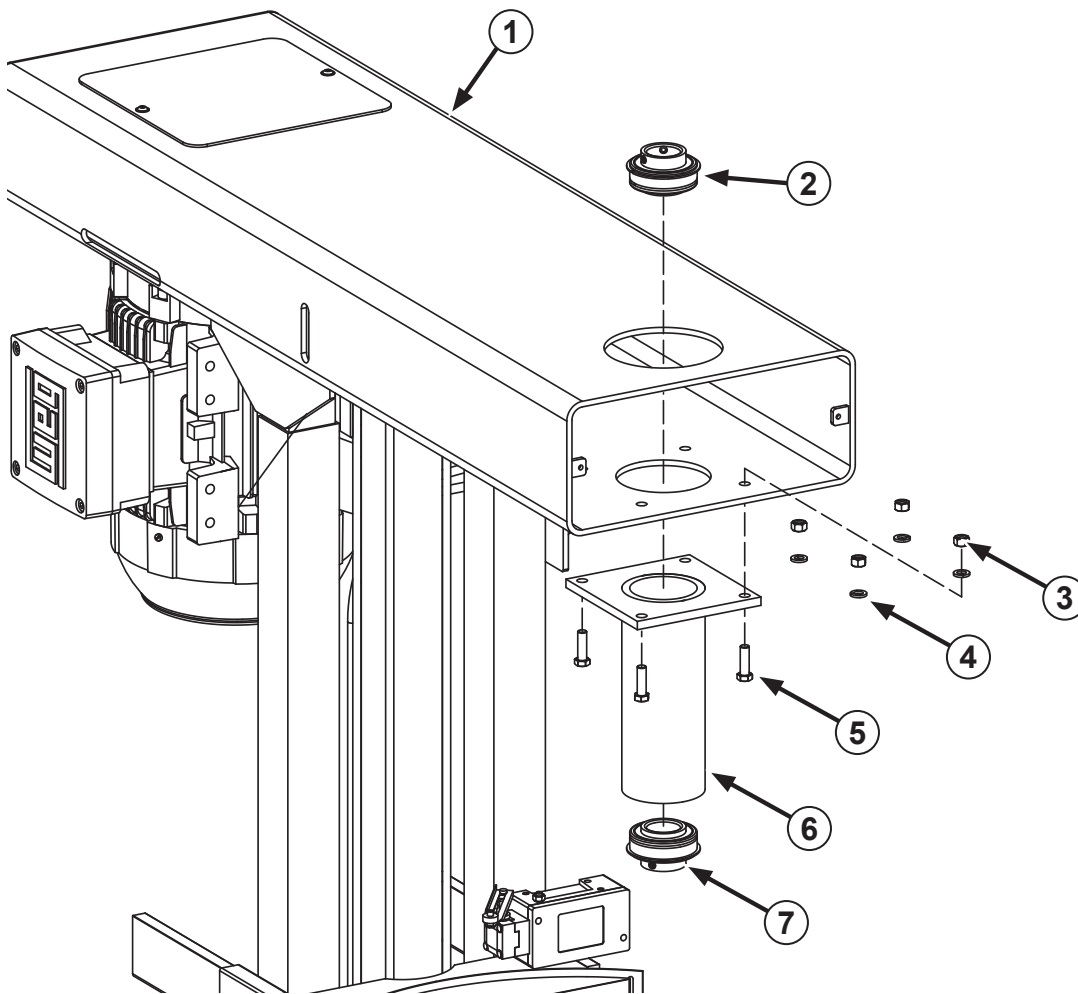


Figure 4. Bearing Installation.

1. Install the upper bearing (2) and lower bearing (7) into the bearing housing (6).
2. Install the bearing housing assembly to the frame (1) using four cap screws (5), four split washers (4), and four nuts (3). Tighten to specifications. For more information, please refer to the "Information Tables" on page 40.

RP3 Bearing Installation

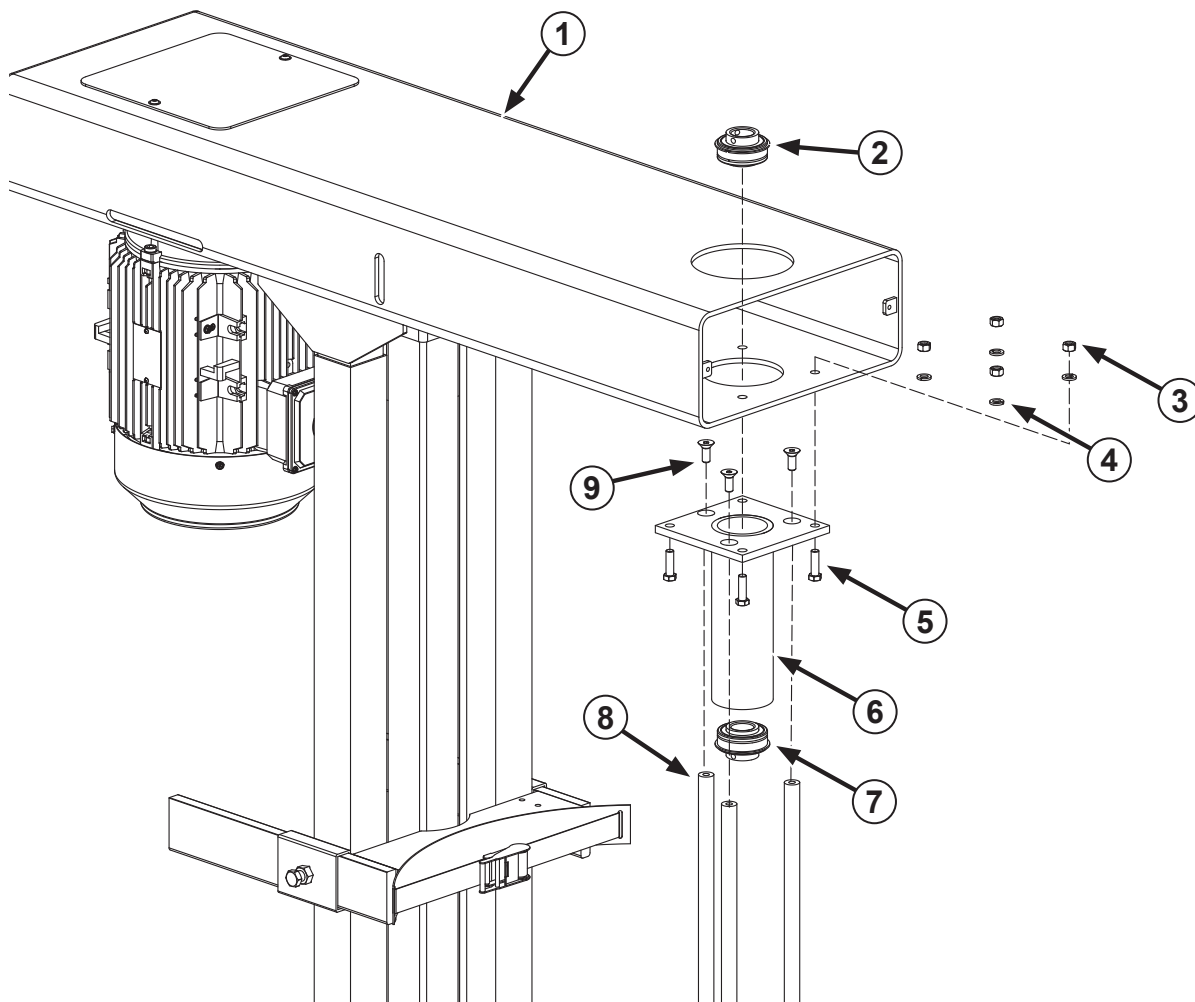


Figure 5. Bearing Installation.

1. Install the upper bearing (2) and lower bearing (7) into the bearing housing (6).
2. Install the three rotor stator support shafts (8) to the bearing housing and secure with three flat head socket cap screws (9). Tighten to specifications. For more information, please refer to the "Information Tables" on page 40.
3. Install the bearing housing assembly to the frame (1) using four cap screws (5), four split washers (4), and four nuts (3). Tighten to specifications. For more information, please refer to the "Information Tables" on page 40.

DP3 Shaft Installation

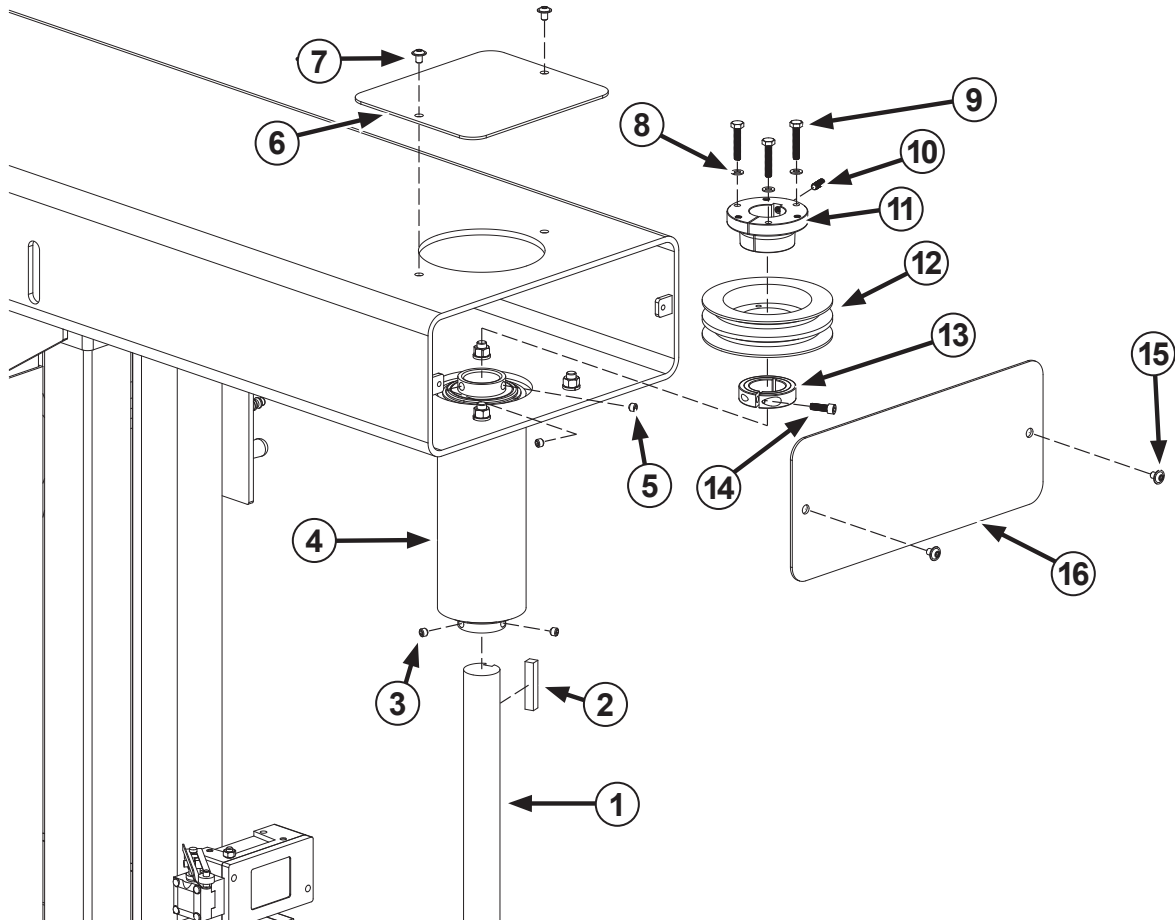


Figure 6. Shaft Installation

1. Install the shaft (1) through the bottom of the bearing housing (4).
2. Install the collar (13) and socket head cap screw (14).
3. Install the key (2) into the keyseat on the shaft, and install the driven sheave (12), split taper bushing (11), set screw (10), three washers (8) and three cap screws (9). Leave socket set screw and cap screws loose until aligned.
4. Using a straight edge or string, align the driven sheave with the drive sheave.
5. When the sheaves are aligned tighten all of the hardware and tighten to specification. See "Information Tables" on page 40.
6. Install the inspection cover (6) and secure with two screws (7).
7. Install the second inspection cover (16) and secure with two screws (15).

RP3 Head Installation

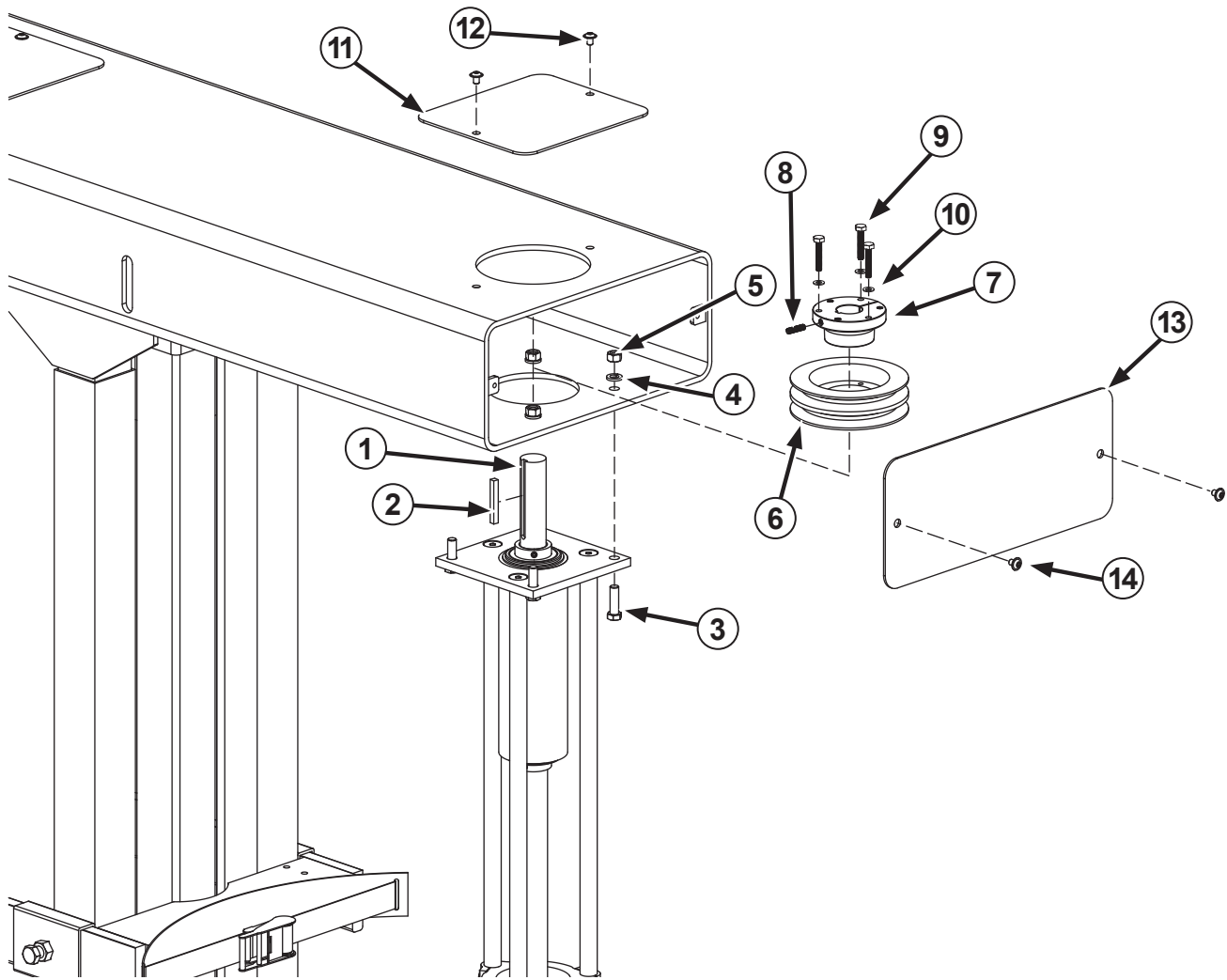


Figure 7.

1. Install the RP3 head assembly (1) through the bottom of the frame.
2. Secure the RP3 head assembly with four cap screws (3), four split washers (4), four hex nuts (5). Tighten cap screw to specification. See "Information Tables" on page 40.
3. Install the key (2) into the keyseat on the shaft, install the driven sheave (6), split taper bushing (7), set screw (8), three washers (10) and three cap screws (9). Leave socket set screw and cap screws loose until aligned.
4. Using a straight edge or string, align the driven sheave with the drive sheave.
5. When the sheaves are aligned tighten all of the hardware and tighten to specification. See "Information Tables" on page 40.
6. Install the inspection cover (11) and secure with two screws (12).
7. Install the second inspection cover (13) and secure with two screws (14).

Belt Drive Installation and Tensioning

Belt Adjustment

To ensure the longest possible life of the belt drive system, use a belt tension gauge to adjust the belt for proper tension. For a the acceptable deflection force limits, see Table 1. Belt Deflection.

Table 1. Belt Deflection

DP3	HP	Advertised RPM	DriveR Sheave Size	DriveN Sheave Size	Tension New/Used (LBS)	Deflection (Inches)
	3	4000	Larger	Smaller	2.8/1.9	0.55
	5	3200	Smaller	Larger	3.9/2.6	0.55
	7.5	2400	Larger	Smaller	4.0/2.7	0.55
	10	1900	Larger	Smaller	5.7/3.8	0.55

RP3	HP	Advertised RPM	DriveR Sheave Size	DriveN Sheave Size	Tension New/Used (LBS)	Deflection (Inches)
	5	3600	Equal	Equal	4.0/2.7	0.55
	10	3600	Equal	Equal	4.1/2.7	0.55

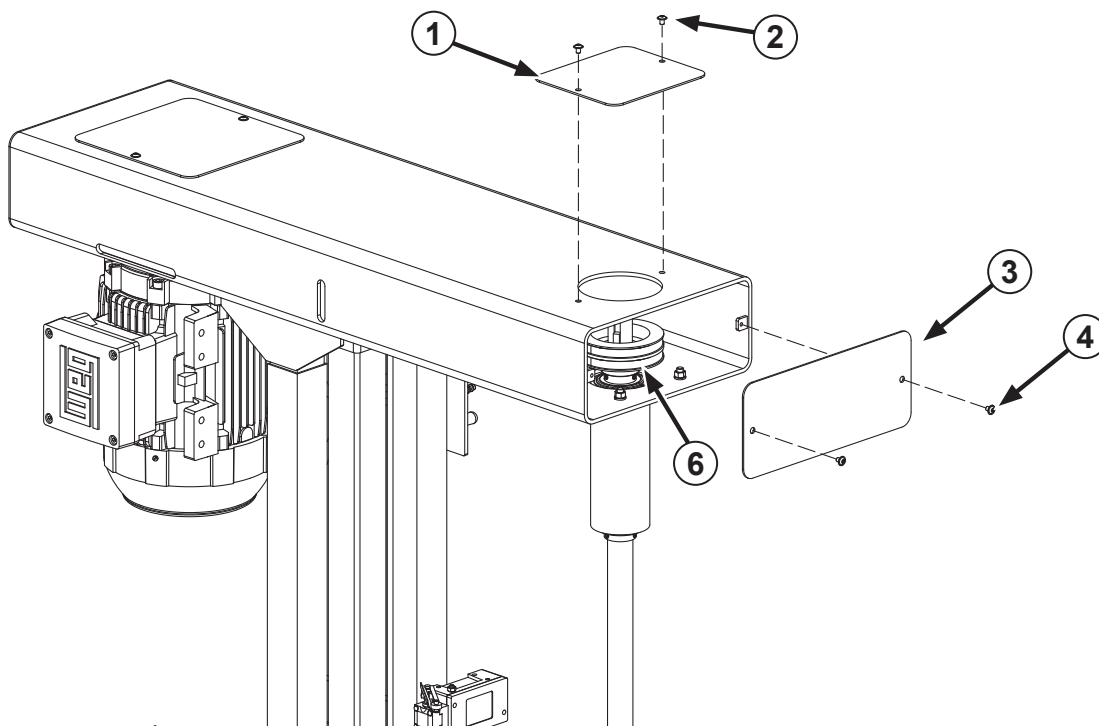


Figure 8.

1. Remove two socket head cap screws (2) and inspection cover (1) from the top of the mixer.
2. Remove two socket head cap screws (4) and inspection cover (3) from the front of the mixer.
3. Using a straight edge or string, check the alignment of both sheaves.
4. If alignment is needed, loosen cap screws on the split taper bushing on the driven sheave (6), adjust as needed, and tighten to specification. See "Information Tables" on page 40.



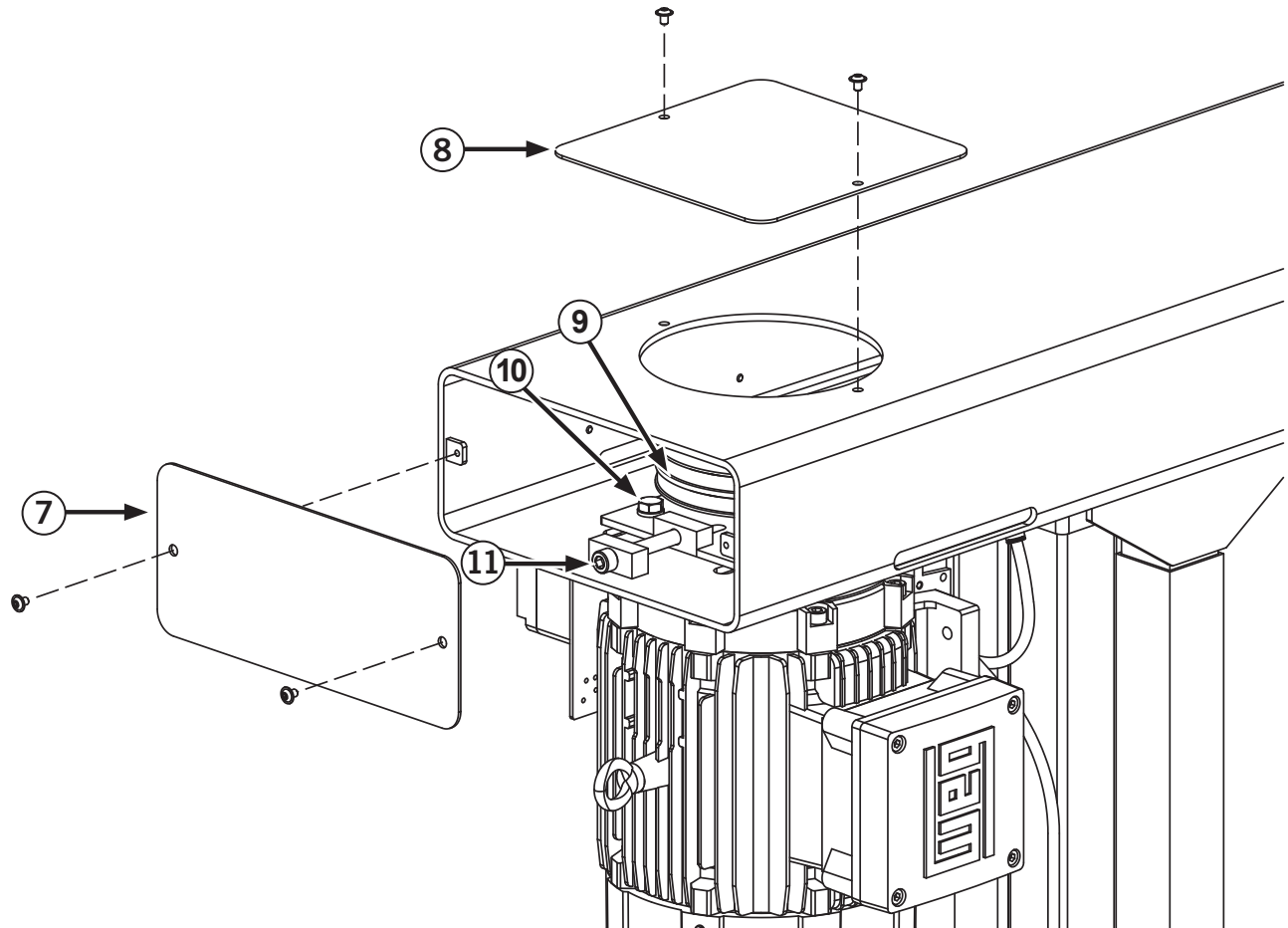


Figure 9.

5. Remove the inspection cover (8) from the top of the mixer and the inspection cover (7) from the back of the mixer.
6. Loosen the four cap screws (10) to allow the rear sheave (9) and motor to slide forward.
7. Place the belt around the rear sheave and remove any slack in the belt.
8. Turn the socket head cap screw (11) to adjust the belt deflection. See Table 1. Belt Deflection for the acceptable deflection force limits.
9. Once the belt tension has been adjusted, tighten four cap screws (10). Tighten cap screws to specification. See "Information Tables" on page 40.
10. Install all inspection covers to the front, rear, and top of mixer.

Impeller Installation

Dispersion Blade

NOTE: It is important to install the dispersion blade in a specific orientation, see rotation in Figure 10. Dispersion Blade Impeller below.

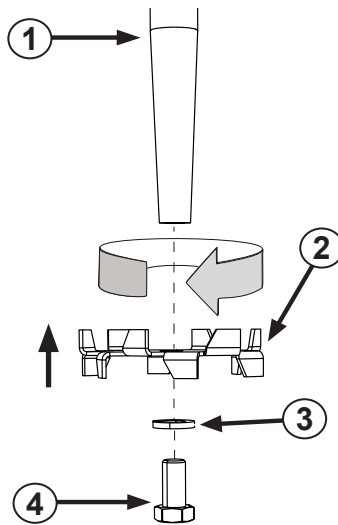


Figure 10. Dispersion Blade Impeller

1. Install the dispersion blade (2) onto the shaft (1).
2. Secure with a split washer (3), and cap screw (4), tighten to specification. See "Information Tables" on page 40.

Impeller Rotor

NOTE: It is important to install the impeller rotor in a specific orientation, see rotation in Figure 11. Impeller Rotor below.

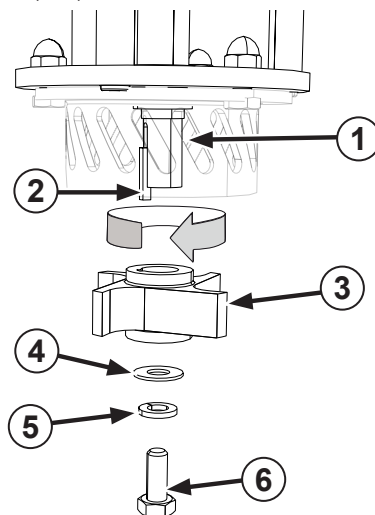


Figure 11. Impeller Rotor

1. Install the key (2) into the keyseat on the shaft (1)
2. Noting the specific orientation, see rotation in Figure 11. Impeller Rotor. Align the key to the keyway on the impeller rotor (3) and install to the shaft.
3. Secure with a flat washer (4), split washer (5), and cap screw (6) and tighten to specification. See "Information Tables" on page 40.

Limit Switch Installation

XP Lift Limit Switch

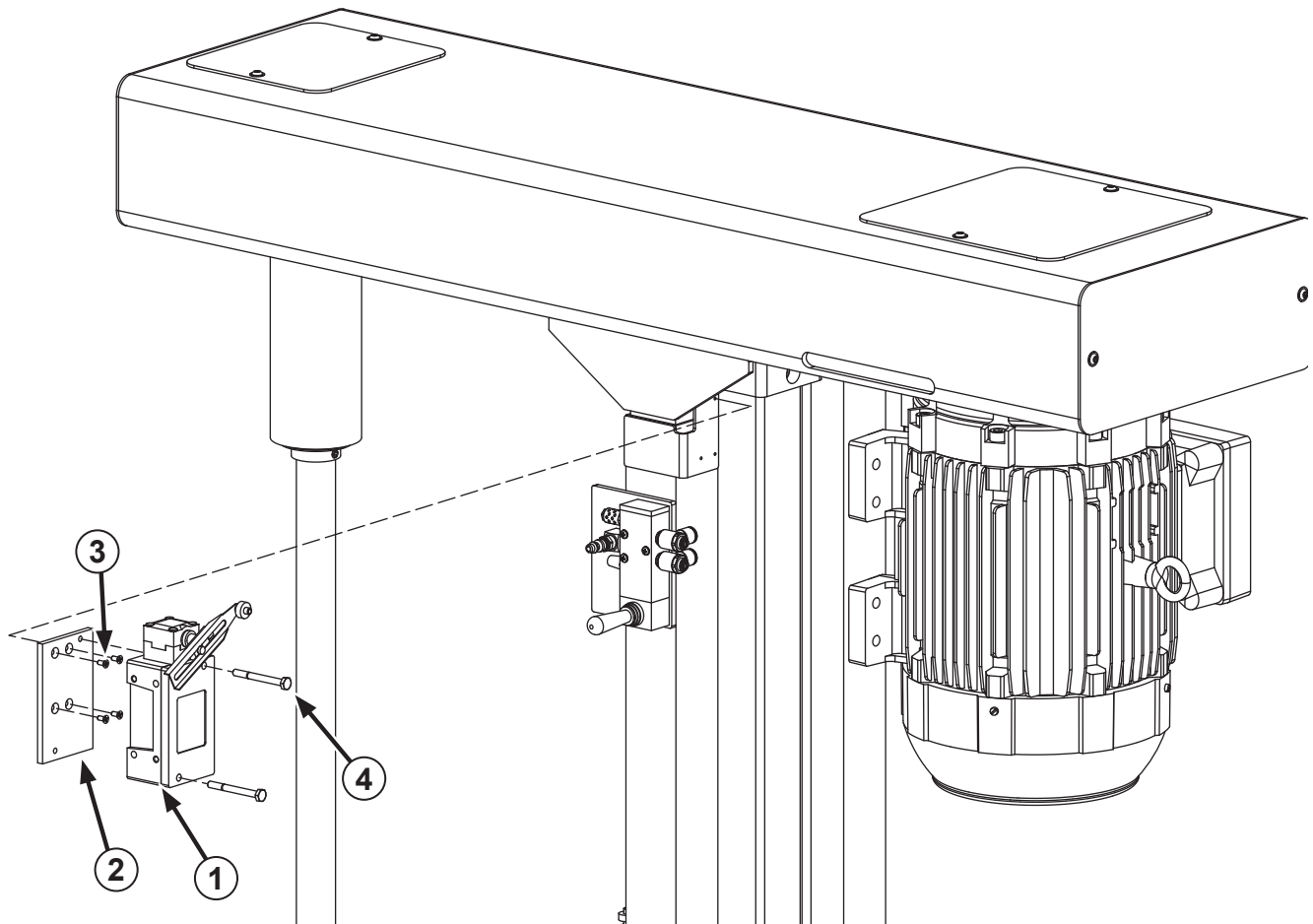


Figure 12.

1. Install the lift limit mount bracket (2) to the frame and secure it with four screws (3). Tighten to specification see "Information Tables" on page 40.
2. Install the xp lift limit switch (1) to the lift limit mount bracket and secure with two cap screws (4). Tighten to specification see "Information Tables" on page 40.

Bracket Adjustment

Adjust the limit switch and bracket to ensure that the switch is activated when fully lowered.

Standard Lift Limit Switch

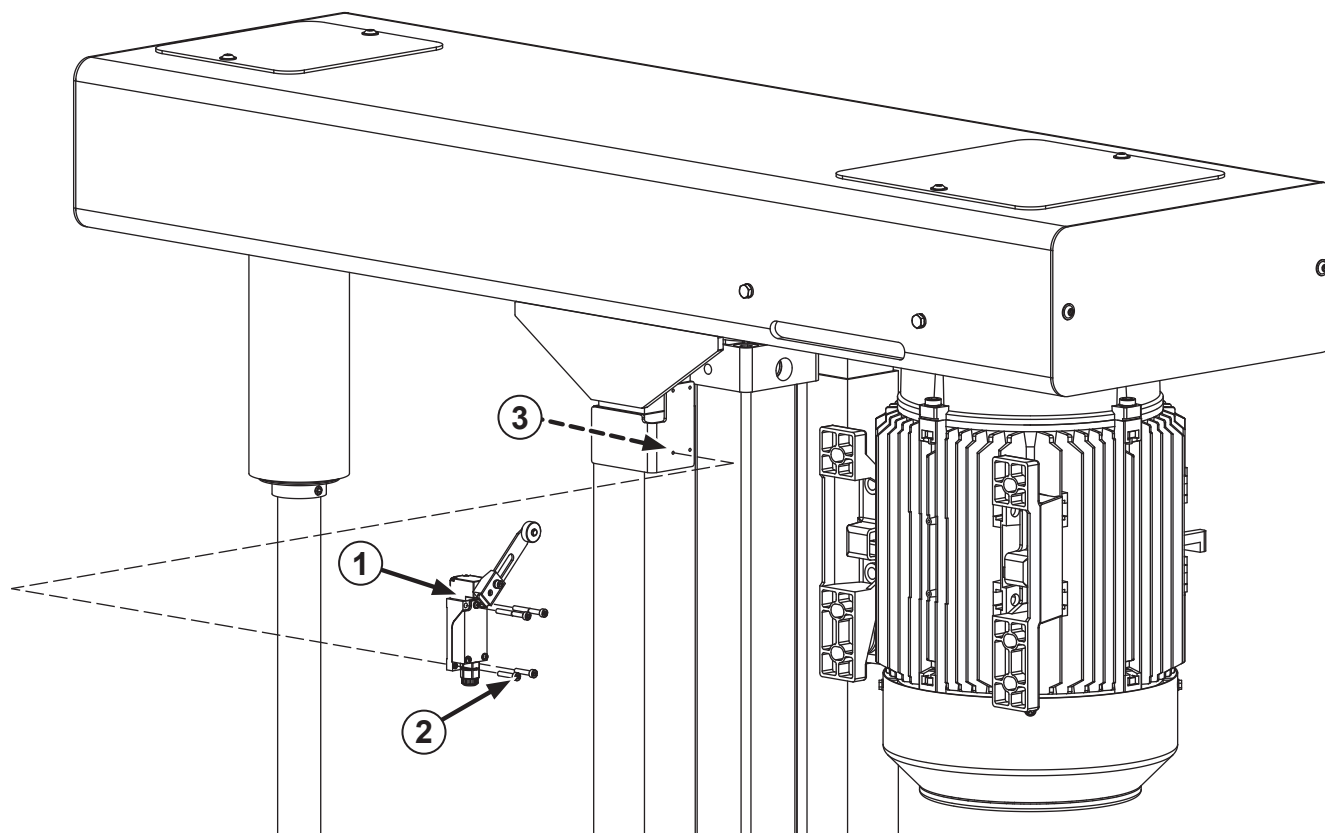


Figure 13.

1. Install the standard lift limit switch (1) to the frame and secure with four socket head cap screws (2) and four nuts (3). Tighten to specification see "Information Tables" on page 40.

Bracket Adjustment

Adjust the limit switch and bracket to ensure that the switch is activated when fully lowered.

XP Container Limit Switch

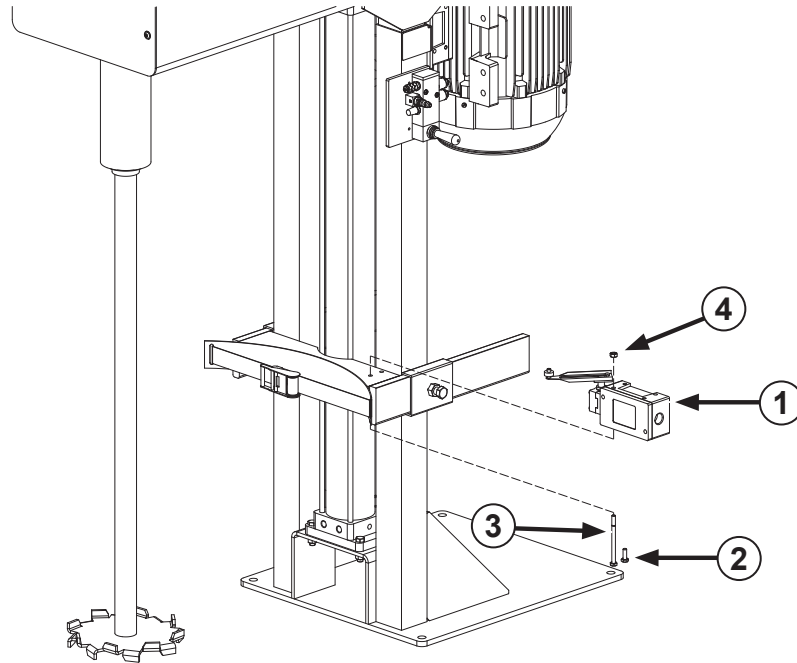


Figure 14.

1. Install the container limit switch (1) and install one cap screw (3), secure with hex nut (4), tighten to specification. See "Information Tables" on page 40.
2. Install one short cap screw (2) to the underside of the container brace. Tighten to specification see "Information Tables" on page 40.

Standard Container Limit Switch

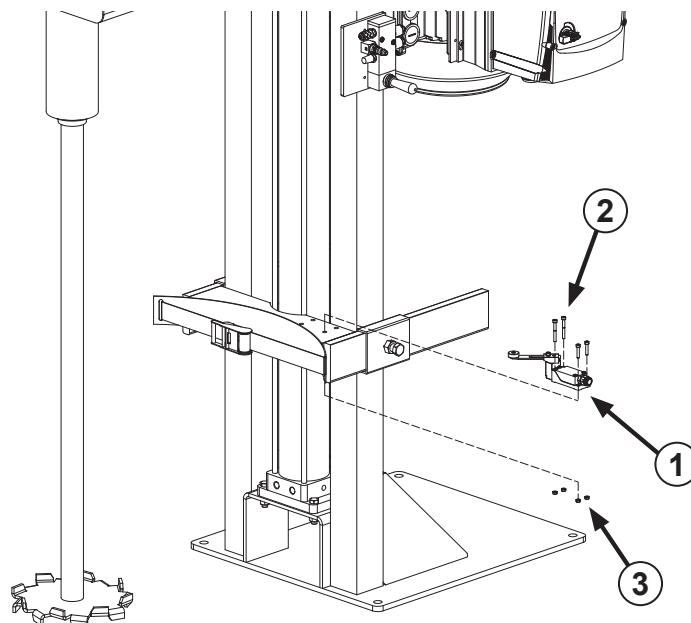


Figure 15.

1. Install the container limit switch (1) to the frame using four socket head cap screws (2), and four hex nuts (3). Tighten to specification see "Information Tables" on page 40.

Wiring/Electrical

⚠ WARNING

ELECTRICAL SHOCK HAZARD!

When working with high-voltage equipment, always de-energize unit before servicing. Failure to follow this instruction may result in serious injury.

⚠ WARNING

AVOID POSSIBLE INJURY, ROTATING PARTS!

Please make sure to keep your hands, hair, jewelry and loose clothing away from rotating parts to avoid any injuries. Disconnect the motor from the air line before any adjustment operation. If you fail to do so, it may result in serious injury.

NOTICE

It is important to note that all electrical work must be completed by a licensed electrician. We strongly advise against performing such work without the appropriate qualifications and training, as it can pose a serious risk to both the individuals involved and the property being serviced. Therefore, it is recommended that qualified electricians be contacted and utilized for any electrical work required.

NOTICE

All electric motors should be in accordance with National Electrical Code (NEC) NEMA along with local codes. All grounding should be in accordance with National Electrical Code (NEC) Article 430.

It is important for installers to be aware of all the electrical codes and safety standards. To make maintenance and servicing easier, MXD Process suggests having an electrical disconnect switch or circuit breaker for each mixer unit to de-energize the power. All motors and VFDs must be wired according to the provided wiring diagrams for ease of de-energizing electrical power during maintenance and servicing.

It is imperative to verify the appropriate shaft rotation after wiring. When viewed from above, the impeller's rotation direction should be clockwise. Should a counterclockwise rotation be observed, it is critical to adhere to all relevant electrical codes and safety standards, as well as to de-energize power and secure the unit before adjusting the wiring. To reverse the unit's operation, for 3-phase motors, including all mixers with VFDs, swap any two line wires (L1, L2, or L3) according to the wiring diagram on the motor. For 1-phase motors, refer to the motor nameplate wiring diagram to determine which wires should be swapped (usually T5 and T8).

NOTE: Please refer to the wiring diagram attached to the motor for proper connection and reversing instructions.

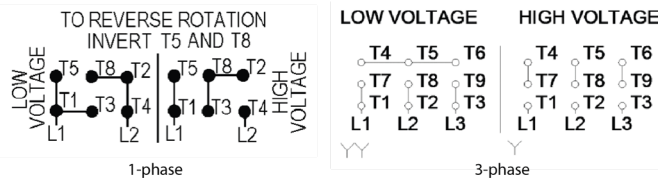


Figure 16. Typical NEMA Wiring Diagrams

(Optional) Variable Frequency Drive (VFD) Wiring

VFDs are usually shipped without wiring. When wiring, it is important to follow the VFD speed controller manual included in the package or refer to the wiring instructions provided below. For your convenience, the speed controllers are unboxed and pre-programmed by MXD Process. Please contact MXD Process if you need a digital copy of the VFD Manual or refer to the Invertek website. (www.invertekdrives.com)



(Optional) Limit Switch Wiring

The following wiring instructions are crucial for the optional limit switches on all DP/RP mixers and with the XP local control panel. These instructions ensure proper installation and functionality, contributing to operational efficiency and reliability.

The limit switches have their normally open (N.O.) contacts wired in series and connected to terminals 1 and 2 on the VFD terminal strip, replacing any existing jumper. Refer to the following wiring diagram example for more clarity.

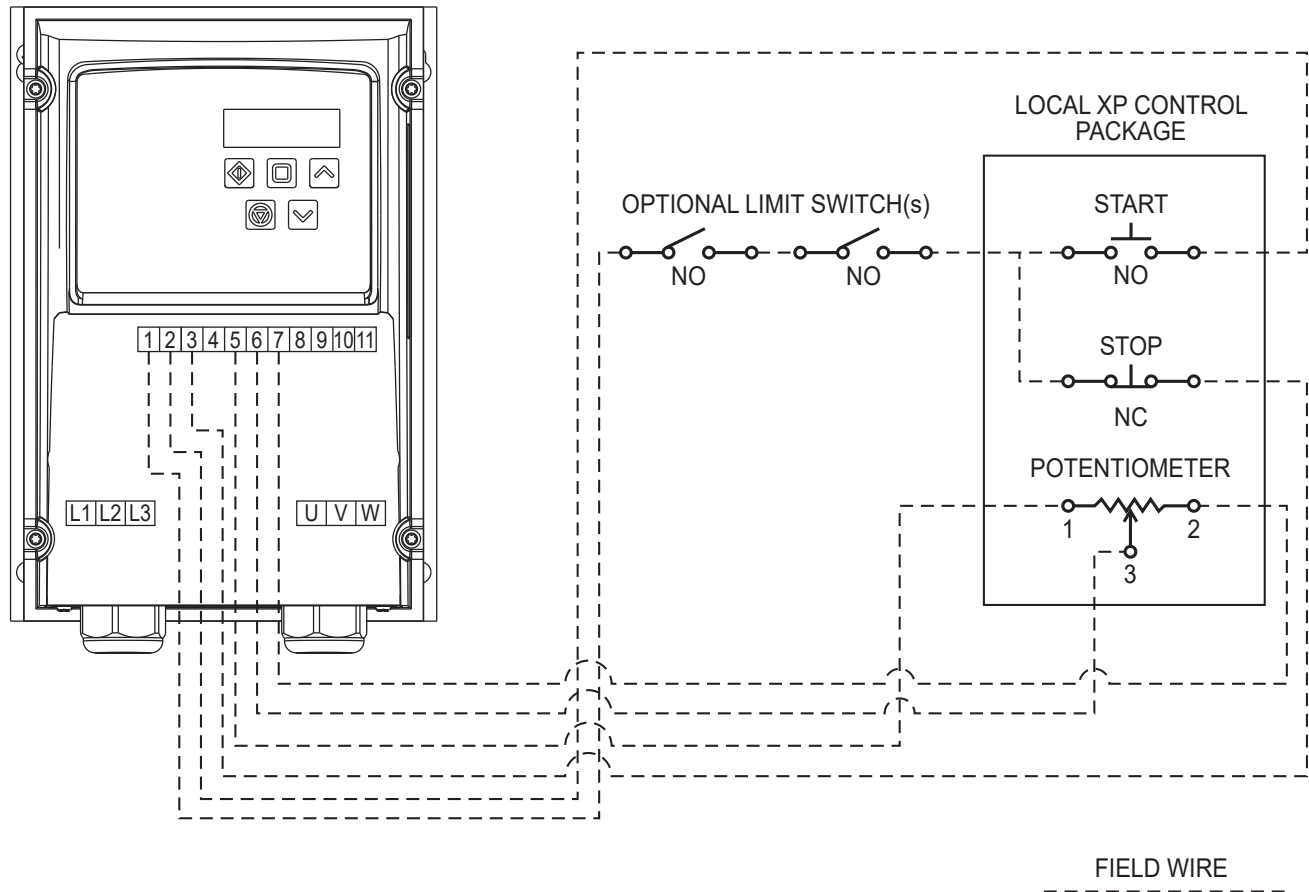


Figure 17.

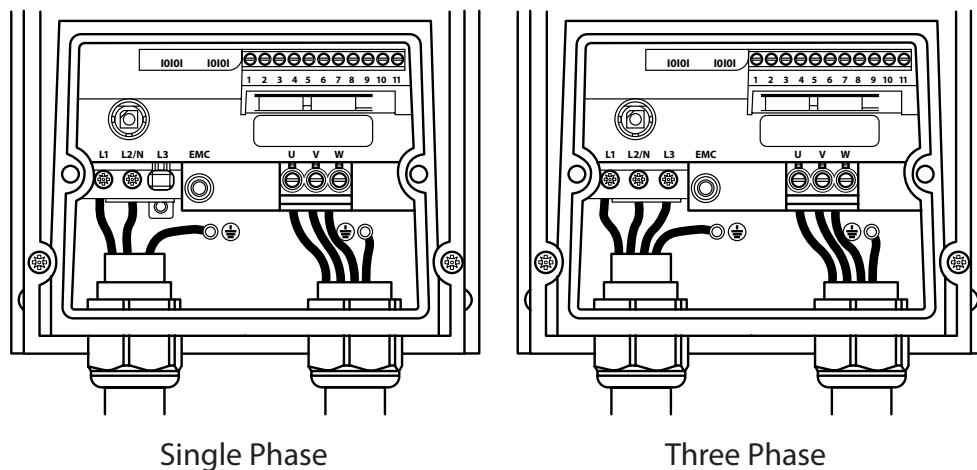


Figure 18.

Startup and Operation

Rotation Direction

When looking down into the container, the mixer rotates in a clockwise direction. If the rotation is reversed or impeller installed upside down, it may result in overloading and ineffective mixing of the contents. The impellers used in the mixer are selected according to the horsepower of the mixer.

NOTE: Operation of a DP3 in reverse for any period of time can cause the impeller to become detached, damage the equipment or cause serious injury. It is important to check the mixer operation direction before installing the blade.

General Operation Principles

It is important to note that the mixer should not be operated for an extended period of time when the tank is empty, when the liquid level is at or near the bottom of an impeller, or when impellers are splashing. For proper mixing and stabilizing of the mixing shaft, MXD recommends maintaining at least one impeller diameter of liquid level above the impeller. Additionally, it is crucial to ensure that the mixer is securely fastened to a suitable mounting location before attempting to operate it. Finally, it is recommended to only operate the mixer at speeds outlined in the document or pre-programmed in the optional Variable Frequency Drive (VFD).

These mixers are also not designed for outdoor use and are not rated for extreme temperatures, whether hot or cold. It is recommended to maintain normal operating temperatures between 14°–104°F (-10°–40°C) to ensure optimal performance.

To ensure the mixer's longevity and efficiency, it is essential to keep the motors free of foreign debris, including but not limited to oil, dust, dirt, water, or chemicals. Protect the air intakes and outputs from any foreign material that may cause blockages or damage the equipment.

Furthermore, it is important to follow the manufacturer's recommendations for maintenance and cleaning to ensure that the equipment is in good working condition. Regular inspections and maintenance will help prevent equipment failure, reduce downtime, and extend the life of the equipment.

Startup and Operation Checklist

- Please ensure that the manual has been read and the instructions have been followed.
- The shaft rotation must be clockwise when looking down at the mixer.
- Do not handle the mixer by the shaft. Lifting and handling the mixer by the shaft will cause damage.
- The equipment should be kept in an appropriate environment.
- The impeller(s) should be installed correctly.
- Make sure that the mounting/impeller bolts are tightened to the proper torque.
- Check the straightness of the shaft by slowly rotating by hand before operation in fluid.
- The mixer support should be sufficient for the mixer application.
- Use the proper type and amount of lubricant.

- Check if the wiring is correctly installed, grounded, and insulated.
- Fluid level must be a minimum of the equivalent to one diameter above the impeller for proper mixing.

Operation

NOTICE

It is important to remember that a mixer should never be operated without an impeller. Similarly, an impeller should never be operated outside of a container. Following these guidelines will help ensure safe and proper use of the equipment.

Electric Motor Operation

After successfully wiring the electric motor, it is imperative to check the rotation to ensure that the mixer shaft is moving in a clockwise direction. To do this, you can simply look down into the container and observe the direction of the mixer shaft. If it is moving in a counterclockwise direction, you may need to adjust the wiring to rectify the issue. Checking the rotation of the mixer shaft is a crucial step to ensure that the mixer operates efficiently and effectively.

Lift

Pneumatic

Post-mount mixers with an air lift are controlled by a 3-position lift directional control valve. The valves come with a standard 1/4" male quick-connect air supply fitting and are configured to operate with an 80-100 psi air supply. It is important to ensure that the air supply is free from moisture and lightly lubricated. The lift will maintain its position even when the air supply is disconnected. However, moving the lift control valve up or down with the air supply disconnected will cause the mixer to lower.



Variable Speed Drive (VFD) Operation

MXD Process mixers are outfitted with Variable Speed Drives (VFDs) that feature Optidrive E3 drives from Invertek. Below is a summary of the essential mixer VFD operation. For comprehensive documentation on wiring, programming, and drive operation, please refer to the following link: <https://www.invertekdrives.com/variable-frequency-drives/optidrive-e3/documentation>.

NOTE: The drives are pre-programmed for use with the specific mixer. Modifying the programming may lead to performance issues and equipment damage. If there is a need for any programming or operation changes, please feel free to contact MXD support for assistance

VFDs provided with MXD Process mixers are operated using the integrated digital keypad. Mixers provided with a local control panel for utilization in hazardous areas are to be exclusively controlled via the local control panel. In this case, the built-in keypad on the drive will not be responsive to start/stop and speed control commands.

NOTE: Whenever power is supplied to the drive, it becomes active and ready for operation.

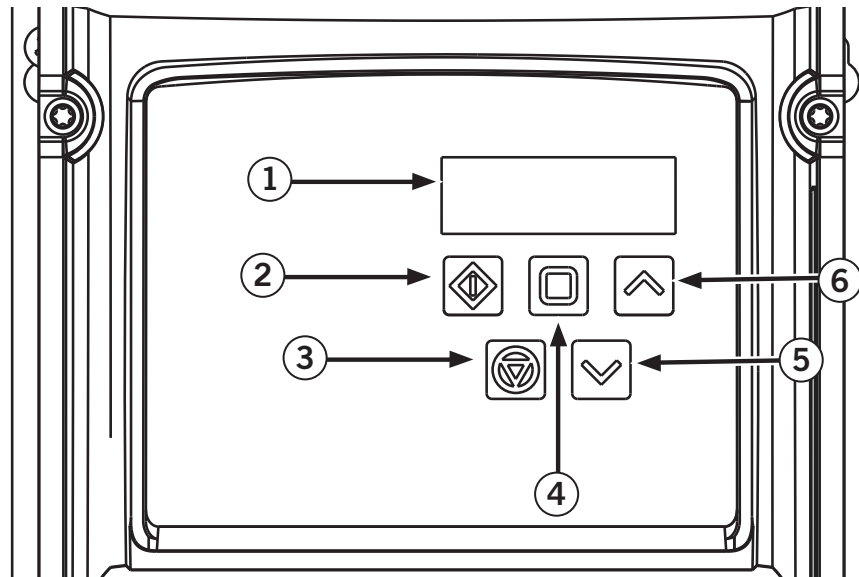


Figure 19.

(1) Display	(2) Start (green diamond with line)
(3) Stop (red circle with inverted triangle)	(4) Navigate (white rectangle)
(5) Down" (white down arrow)	(6) Up" (white up arrow),

1. Press the start button to start/run. The VFD will ramp up to the previously used speed.
2. Press or hold the up or down buttons to increase or decrease the speed. The drive will only operate within the programmed minimum and maximum speeds.
3. Press the stop button to stop the drive; the VFD will ramp down and display "STOP."

While running, pressing the navigation button will cycle through the available displays. On the left side of the display, a letter indicates what is being shown. "H" for the output frequency in hertz, "A" for the motor current draw in amps, "P" for the motor power in kilowatts, and no letter for the motor RPM display. On mixers that are not direct drive an additional operating display is typically programmed, indicated with a small "c" (for custom display), this display shows the shaft speed of the mixer, which is based on a ratio of the motor RPM related to the gearbox or belt reduction.

While stopped, pressing the stop button will bring up the current speed setpoint, allowing the speed to be changed before pressing start.

Most mixers come with the VFD enabled for forward operation only; some mixers that can be run in reverse will be set up to allow it. To change the operating direction while running forward, press the start button again. The VFD will ramp down to 0 and then ramp up in reverse. The speed display is negative for reverse.

Maintenance

Shaft Runout Check

CAUTION

AVOID DAMAGE!

It is strongly advised to abstain from utilizing heat or an open flame for the purpose of straightening the shaft. Such an approach is likely to result in irreparable distortions that may render the shaft unusable.

Ensuring that the mixing shaft is straight is crucial to prevent excessive vibrations and extend lifespan of the mixer. The runout of the mixing shaft should not exceed 0.002 in Total Indicated Runout (TIR) per foot. Refer to the diagrams provided to straighten the shaft as necessary.

ATTENTION: TOLERANCE = 0.002 in RUNOUT PER FT

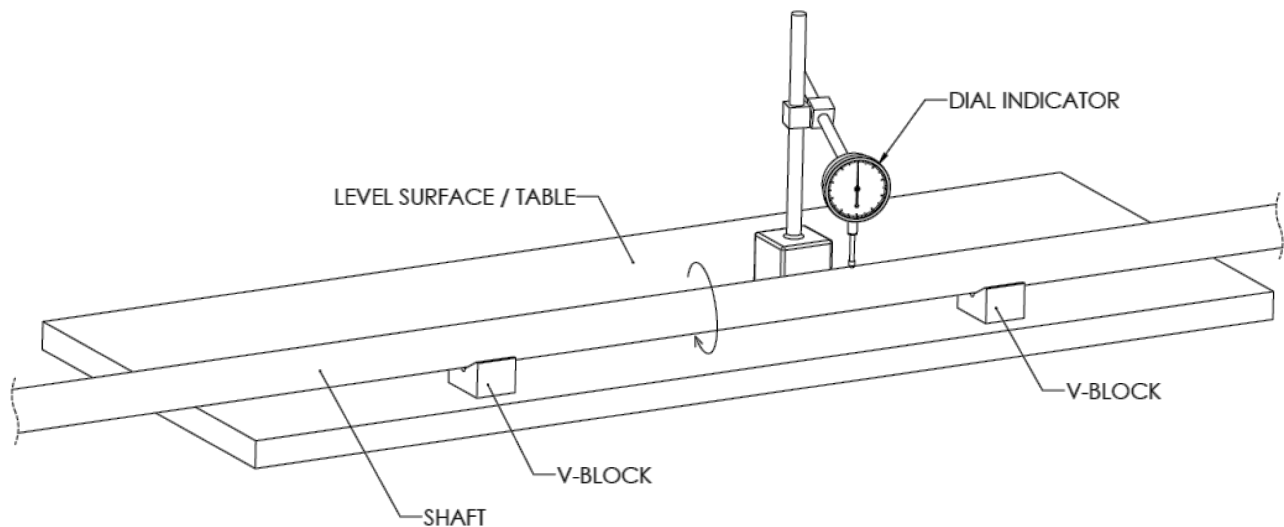


Figure 20.

1. Verify runout does not exceed 0.002 in by rotating the shaft and observing the dial indicator.

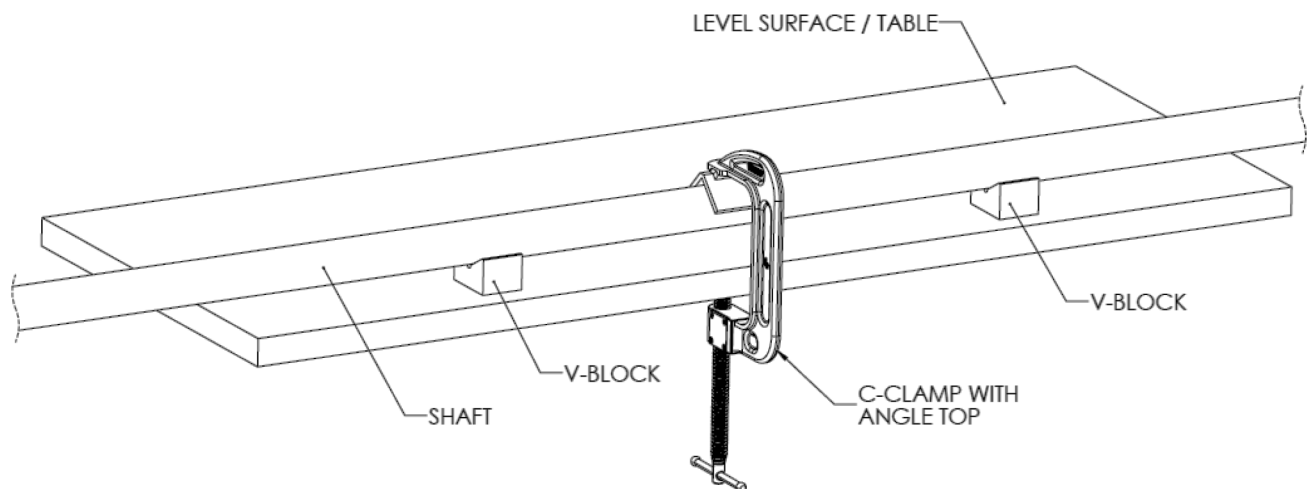


Figure 21.

2. If the shaft runout exceeds specifications, gently apply force to high spots using a C-clamp to bring the shaft within tolerance.

Shaft Bearing Replacement

Shaft Removal

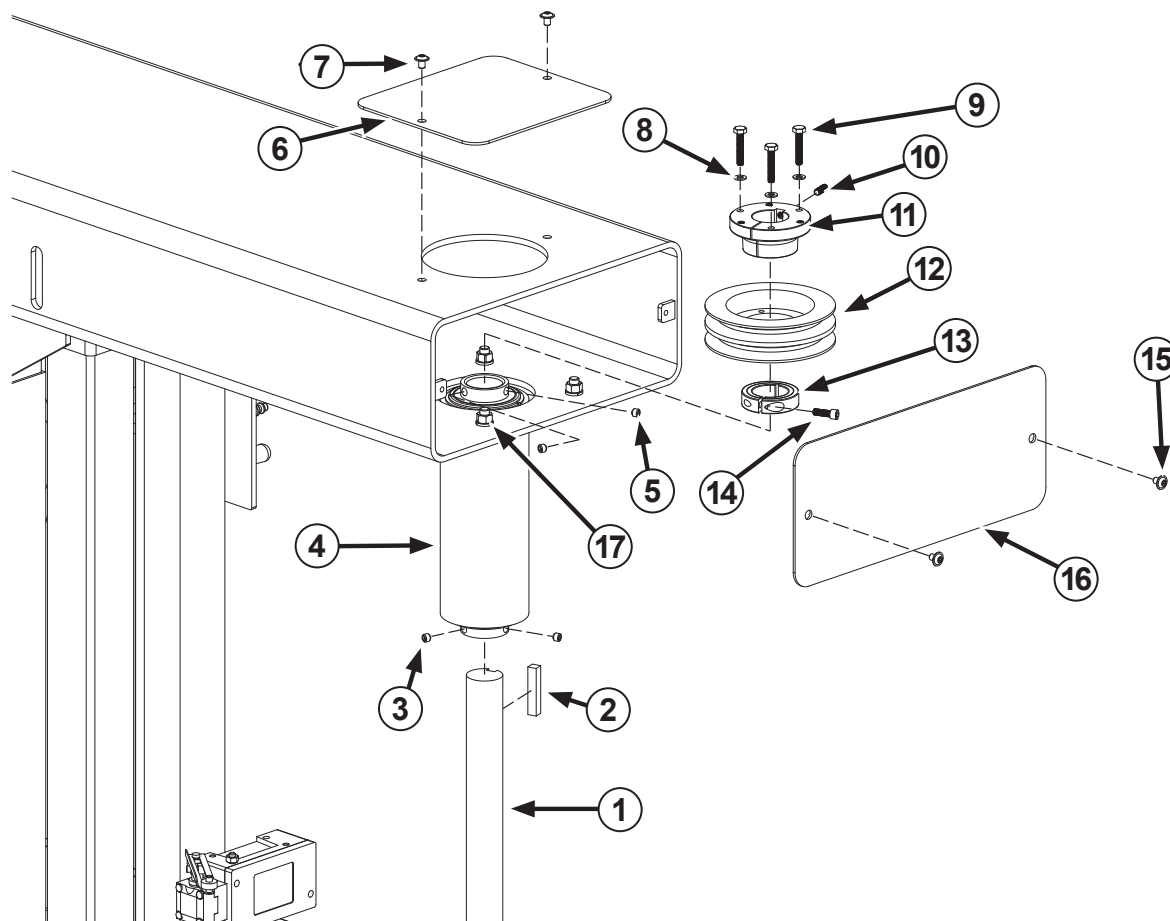


Figure 22. Shaft Installation

1. Remove two screws (7) and the inspection cover (6).
2. Remove two screws (15), and the second inspection cover (16).
3. Remove the three cap screws (9), three washers (8), set screw (10), and split taper bushing (11).
4. Remove the driven sheave (12).
5. Remove the socket head cap screw (14) and collar (13).
6. Loosen set-screws (5) from the upper bearing and set screws (3) from the lower bearing
7. When lowering the shaft (1), remove the key (2) from the keyseat on the shaft.
8. Remove the shaft from the bearing housing (4).
9. Remove four cap screws, four split washers, and four hex nuts (17).
10. Remove the bearing housing.

Bearing Removal

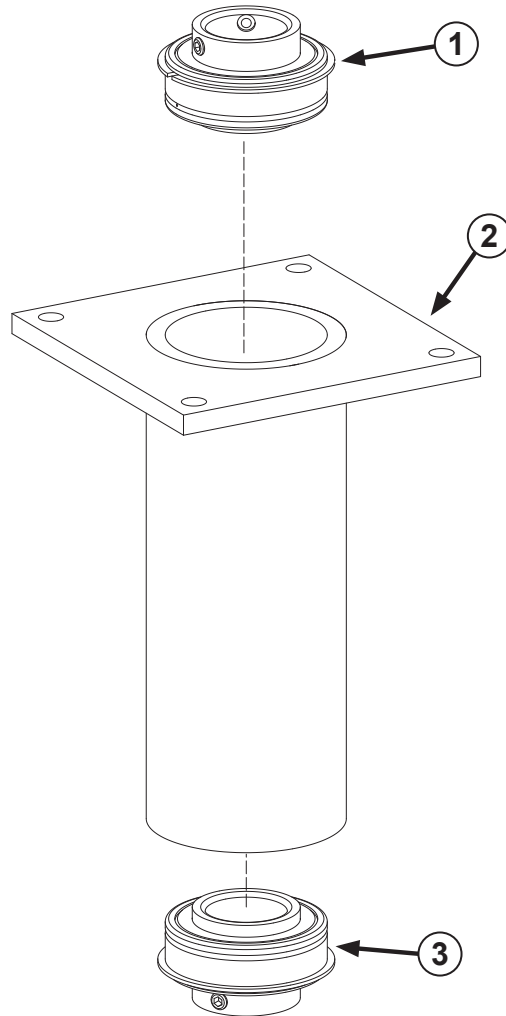


Figure 23. Bearing Installation.

1. Remove the upper bearing (1) from the bearing housing (2).
2. Remove the lower bearing (3) from the bearing housing (2).
3. Repair or replace parts as needed.

Bearing Installation

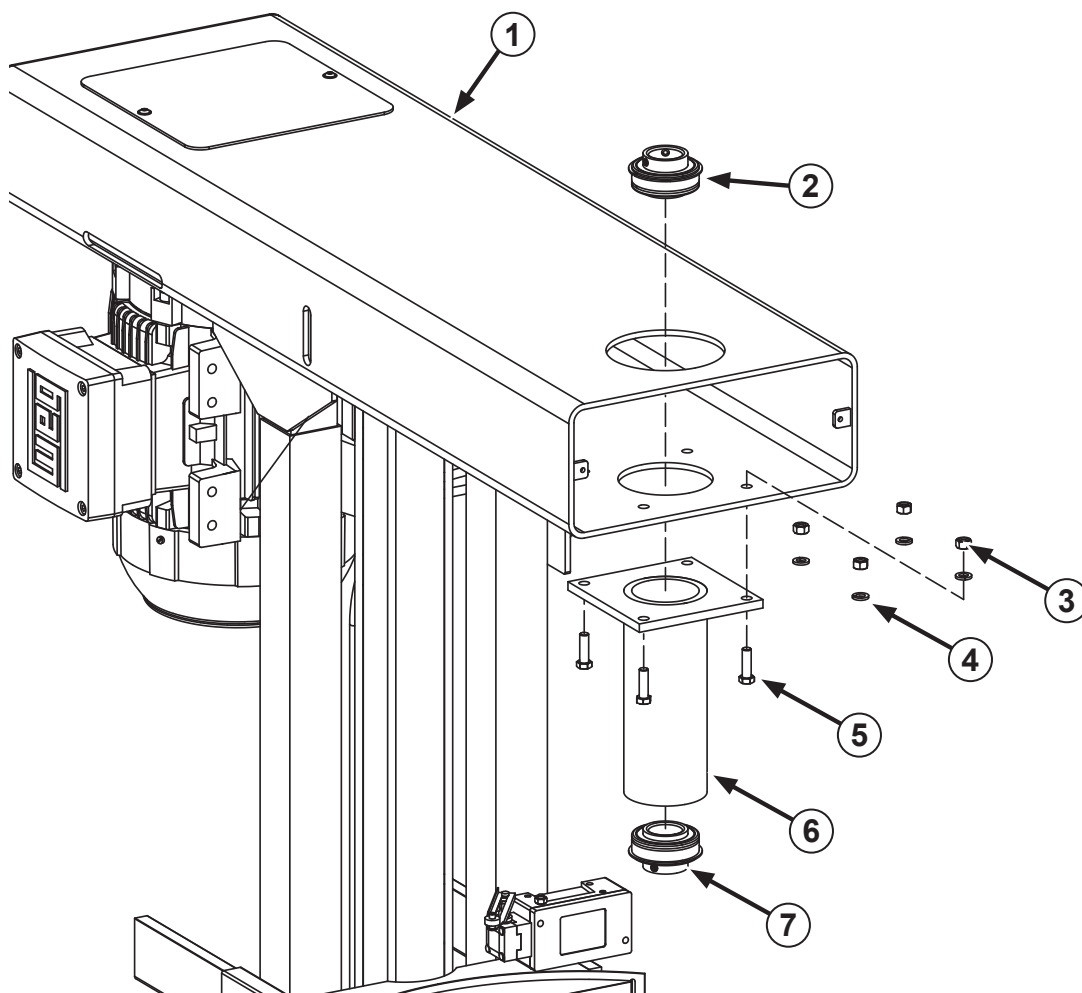


Figure 24. Bearing Installation.

1. Install the upper bearing (2) and lower bearing (7) into the bearing housing (6).
2. Install the bearing housing assembly to the frame (1) using four cap screws (5), four split washers (4), and four nuts (3). Tighten to specifications. For more information, please refer to the "Information Tables" on page 40.

DP3 Shaft Installation

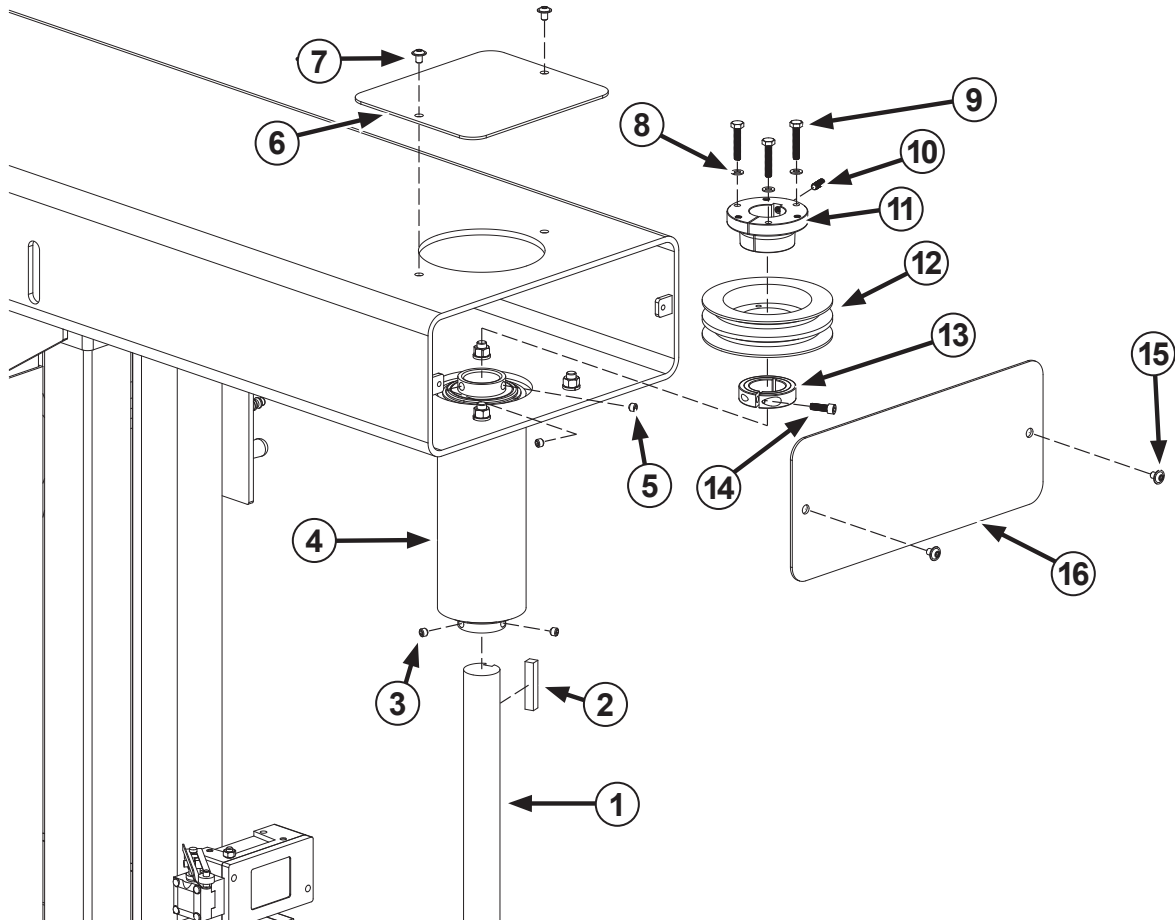


Figure 25. Shaft Installation

1. Install the shaft (1) through the bottom of the bearing housing (4).
2. Install the collar (13) and socket head cap screw (14).
3. Install the key (2) into the keyseat on the shaft, and install the driven sheave (12), split taper bushing (11), set screw (10), three washers (8) and three cap screws (9). Leave socket set screw and cap screws loose until aligned.
4. Using a straight edge or string, align the driven sheave with the drive sheave.
5. When the sheaves are aligned tighten all of the hardware and tighten to specification. See "Information Tables" on page 40.
6. Install the inspection cover (6) and secure with two screws (7).
7. Install the second inspection cover (16) and secure with two screws (15).

Stator Bearing Replacement (RP3)

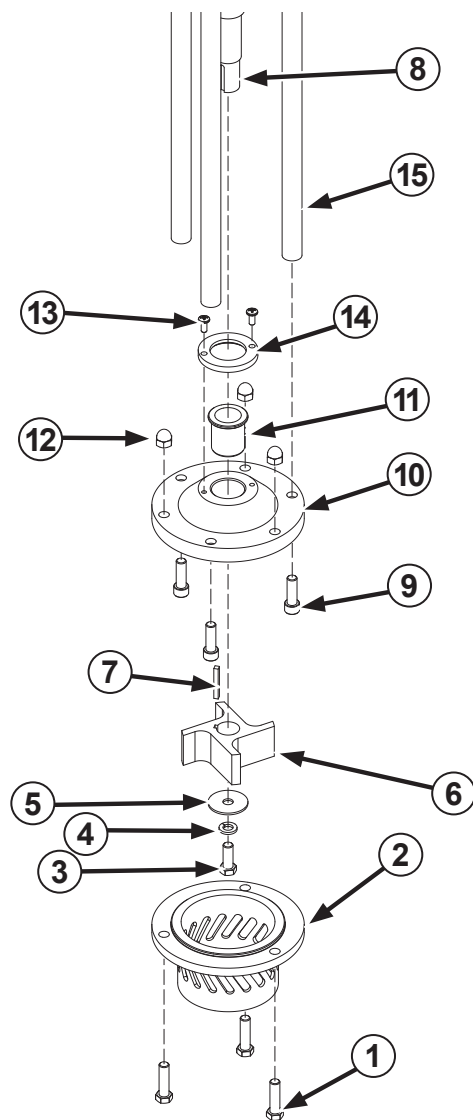


Figure 26.

1. Remove the three cap screws (1), three acorn nuts (12) and then remove the stator (2).
2. Remove the cap screw (3), split washer (4), and flat washer (5).
3. Remove the impeller rotor (6) and key (7) from the shaft (8).
4. Remove the three cap screws (9) from the lower bushing plate (10), and separate the three stator support shafts from the lower bushing plate.
5. Remove two phillip head cap screws (13) and remove the bushing retainer (14) and flange sleeve bearing (11).
6. Inspect parts for burrs or damage.
7. Replace flange sleeve bearing.

NOTE: Bearing is press-fit to bushing plate and depending on the tolerance may require reaming after install to fit the shaft.

8. Assembly is the reverse from disassembly.

Important: It is essential to ensure there is sufficient clearance from the shaft shoulder to the top of the flange sleeve bearing (11) after assembly. Adjust the shaft position in the coupler as necessary to avoid binding.

9. Tighten all hardware to specification see "Information Tables" on page 40.

Lift Maintenance

⚠ WARNING

AVOID POSSIBLE INJURY!

Air and electric lifts are designed to maintain their position when stopped. However, when working underneath a raised mixer, it is advisable to provide additional support to the mixer to mitigate the risk of injury or damage in the event of unexpected movement of the lift.

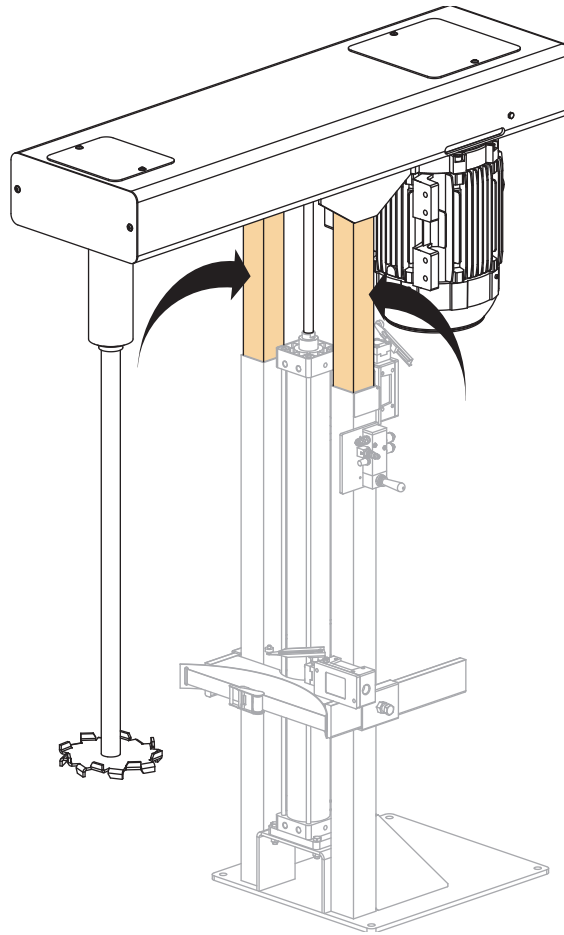


Figure 27.

It is recommended to lubricate DP3/RP3 frame spars with a suitable grease.

If contamination is present, it is advisable to conduct a thorough cleaning and re-greasing of the spars to mitigate unnecessary wear and ensure optimal operational smoothness.

An air lift in satisfactory condition should be capable of maintaining its position for a significant and undetermined period. Nevertheless, the incidence of damage and wear may lead to internal or external air leaks, resulting in the gradual drift or descent of the lift over time. Therefore, prudent reliance on the lift to sustain its position over protracted periods is ill-advised. In the event of excessive movement, a thorough examination of the air system for leaks is warranted, followed by the appropriate servicing or replacement of the valve and/or cylinder.

Air lift direction control valves are equipped with three flow controls to precisely modulate the lifting speed, ensuring both safety and smooth operation. Each direction (up and down) is managed by a dedicated valve, with an additional flow control exhaust to effectively regulate the downward speed of the mixer. The air lift systems are meticulously tuned at the factory to accommodate the specific weight of the mixer in use, minimizing the need for further adjustments. However, should any components be replaced, the valves may require readjustment to ensure optimal performance. In such instances, we recommend reaching out to MXD Process for professional assistance.

Troubleshooting Guide

Table 2.

PROBLEM	POSSIBLE CAUSE	SUGGESTED SOLUTION
Incorrect mixer rotation	Incorrect wiring to motor	Swap any two line-wires to reverse rotation. Refer to Motor Wiring Section for help.
	Incorrect plumbing to motor	Reverse the inlet and exhaust plumbing.
Mixer will not start	Incorrect wiring	Check wiring diagram and wire correctly
	Loose connections	Tighten connections
	Blown fuse	Replace fuse
	Impeller interference	Free all debris for rotation
	Damage to motor	Service or replace motor (consult factory)
	VFD Malfunction	Refer to VFD Manual
Mixer will not reach correct speed	Overload of motor	Check amperage against nameplate data
	Damage to gear reducer	Repair/replace reducer
	VFD Malfunction	Refer to VFD Manual
	Insufficient air pressure and flow	Remove supply air line restrictions,
		Adjust regulator
	Clogged exhaust	Clean/clear exhaust muffler
Worn out air motor	Replace or rebuild motor	
	Check oil supply	
Noisy	Insufficient lubricant	Fill proper amount of lubricant
	Foreign material in lubricant	Change lubricant
	Incorrect lubricant	Change to correct lubricant
	Worn or faulty bearings or gears	Replace bearings and/or gearbox
	Incorrect gearbox and bearing alignment	Adjust/align bearings and gearbox
	Bent/broken guards	Straighten/replace guards
	Worn belt	Replace worn belt
	Misaligned sheaves	Aligned the sheaves
Bearing failure	Bearing has worn beyond useful life See all items under "Noisy"	Replace bearing (check all other parts)
Shaft vibration	Impeller not immersed in liquid	Fill tank
	Bent mixer shaft	Consult factory
	Loose or improperly assembled	Assemble shaft securely
	Damaged bearings	Check and replace bearings if necessary
	Debris on impeller	Clean impeller
	Loose or bent impeller blades	Tighten or straighten blades (consult factory)
	Operating at critical speed	Decrease or increase speed until vibration is reduced
Seal leakage	Worn seal	Replace seal
	Scored shaft	Replace shaft
	Incorrect seal position	Consult factory
Lift function	Not enough air pressure	Increase Air pressure
	Air leaks	Find and repair leak
	Incorrect flow adjustment	Correct the flow
	Bad power supply	Replace power supply



Diagrams and Spare Parts

Air Lift Frame

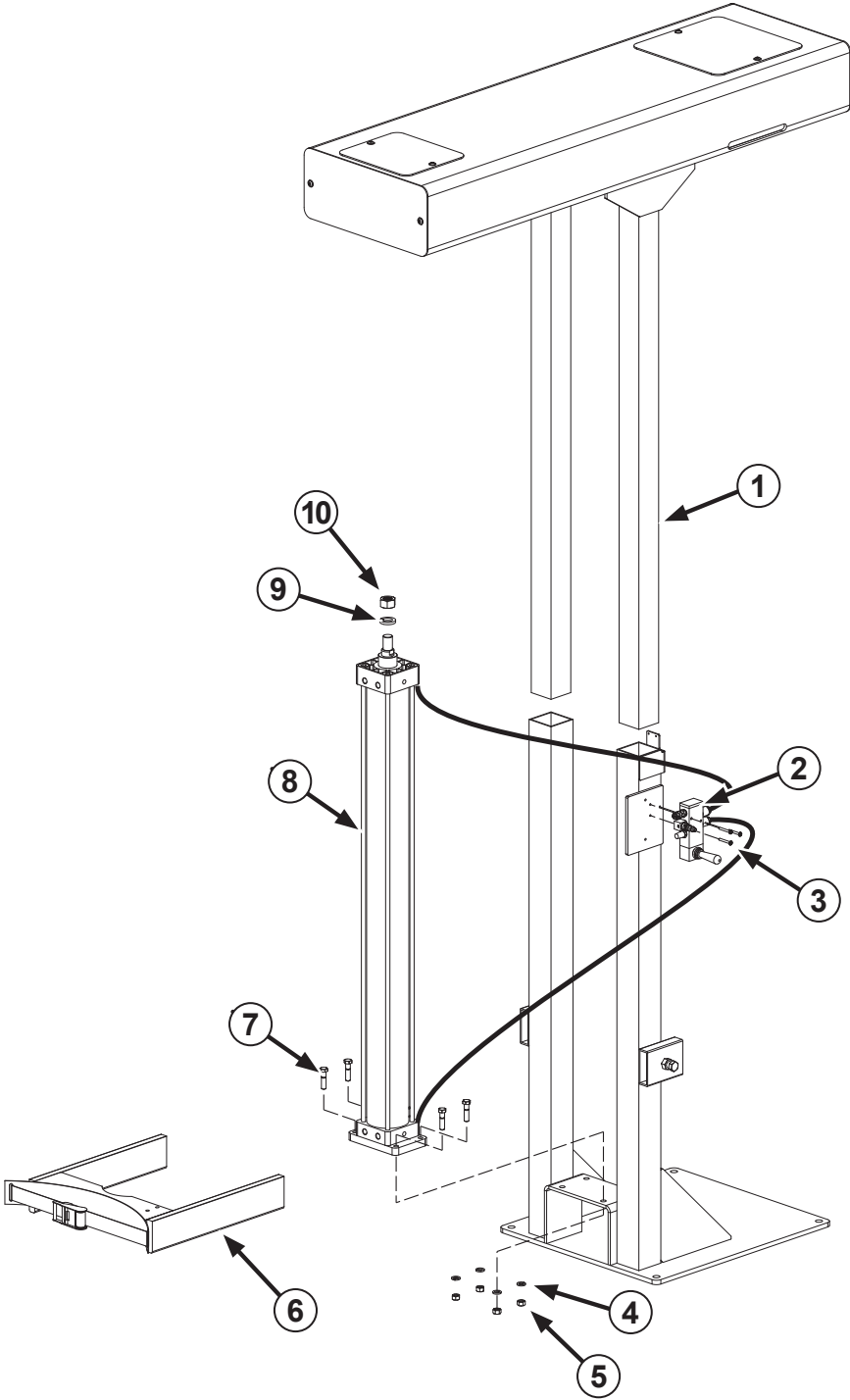


Figure 28. Frame Assembly Air Lift



Table 3.

ITEM	QTY	DESCRIPTION
1.	1	DP3 Frame Assembly
2.	1	DP3 Air Control Valve
3.	3	#8-32 x 1.25" Pan Head Screw
4.	4	3/8" Split Washer
5.	4	3/8"-16 Nut
6.	1	DP3 Container Brace
7.	4	3/8"-16 x 1.5" Cap Screw
8.	1	3.25" x 36" Air Cylinder
9.	1	3/4" Split Washer
10.	1	3/4"-16 Nut

DP3/RP3 Drive End

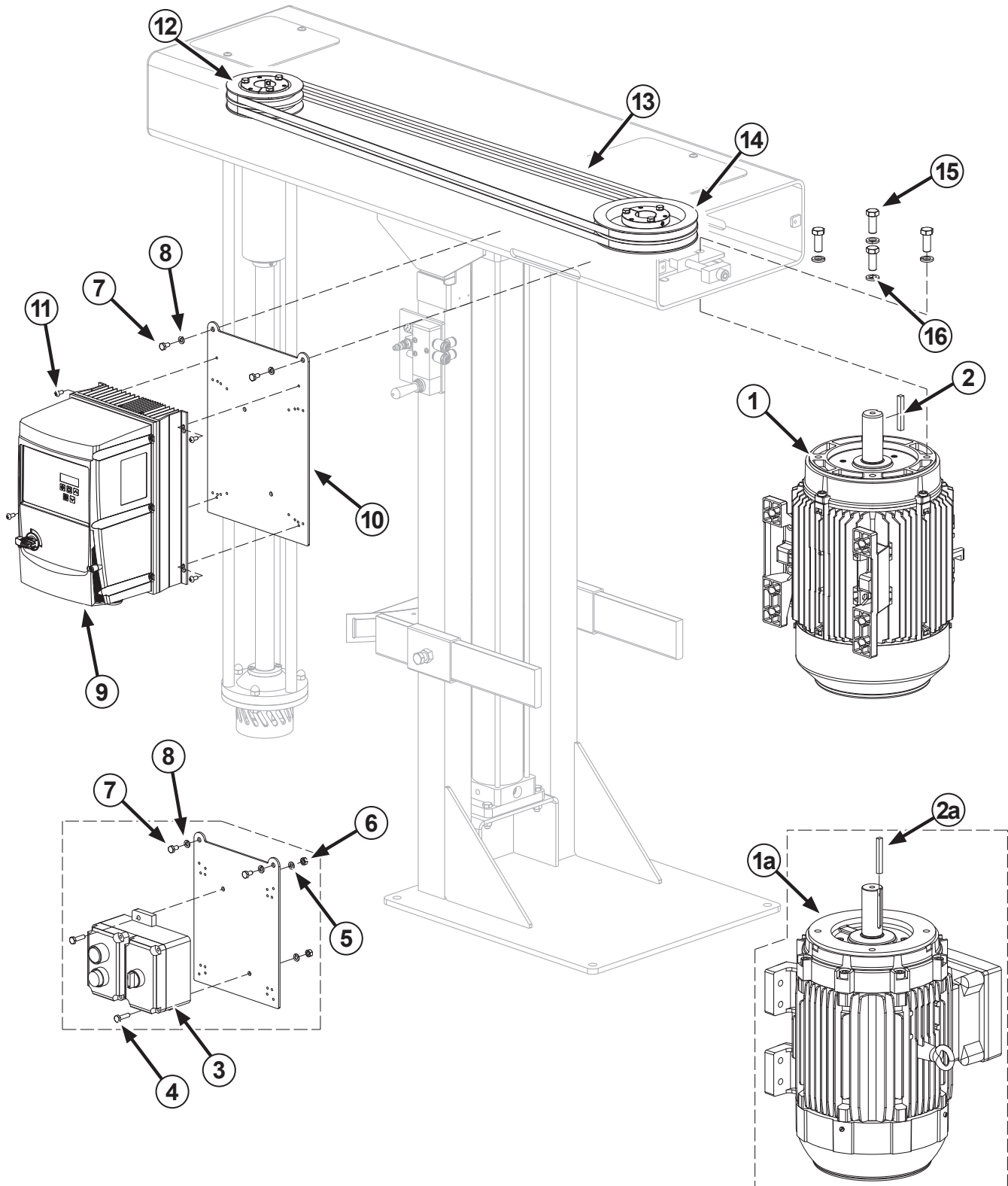


Figure 29. DP3/RP3 Drive End



Table 4.

ITEM	QTY	DESCRIPTION
1.	1	Standard Electric Motor
1a.	1	XP Motor
2.	1	Key
2a.	1	Key
3.	1	Control Panel
4.	2	1/4"-20 x 1" Cap Screw
5.	2	1/4" Split Washer
6.	2	1/4"-20 Nut
7.	2	1/4" Split Washer
8.	2	1/4"-20 x .50" Cap Screw
9.	3	Variable Frequency Drive (VFD)
10.	1	VFD Mount Plate
11.	4	#8-32 Phillips Head Screw
12.	1	Driven Sheave
13.	2	Belt
14.	1	DriveR Sheave
15.	4	3/8"-16 x 1.25" Cap Screw
16.	4	3/8" Split Washer

RP3 Head

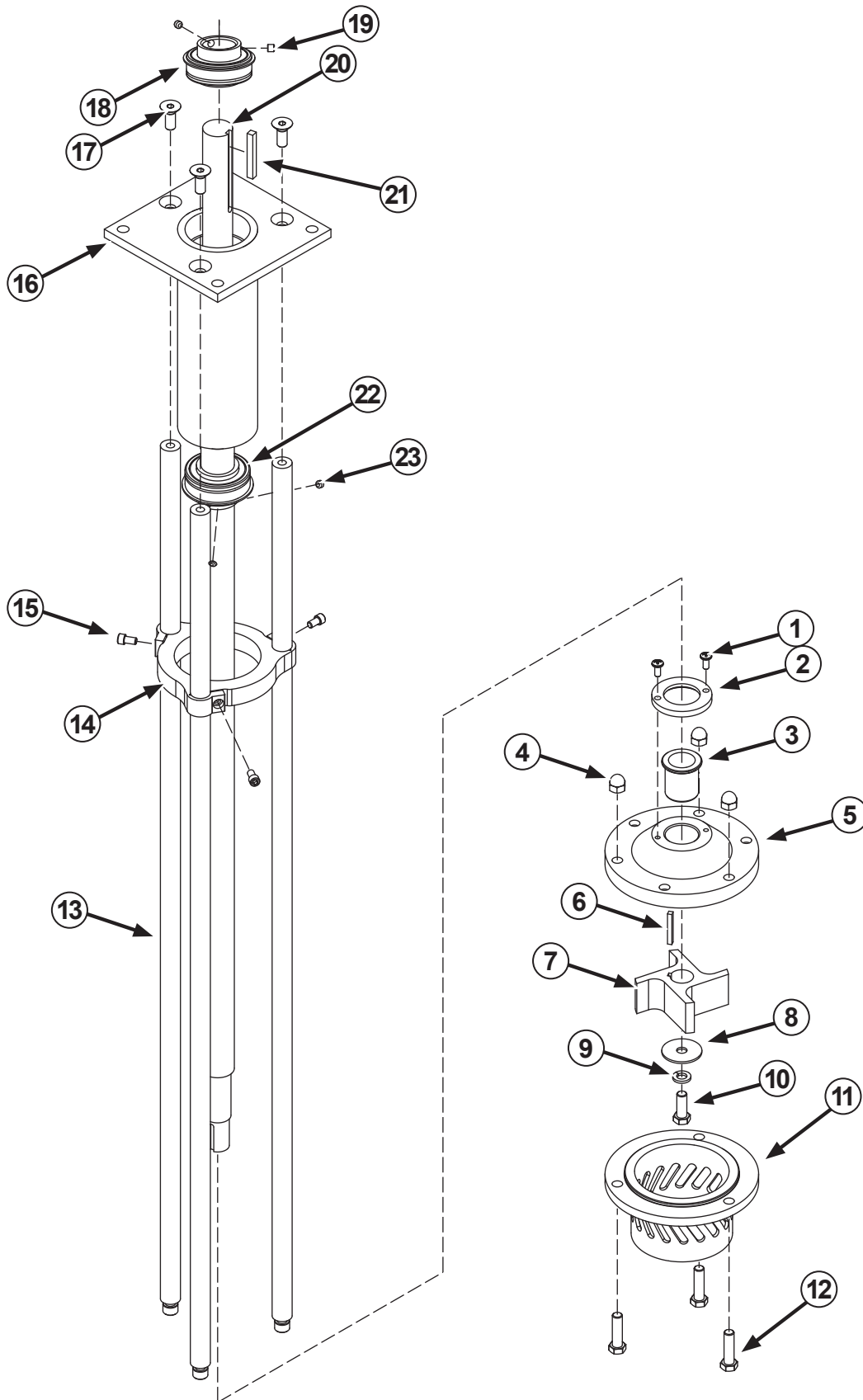


Figure 30. RP3 Head



Table 5.

ITEM	QTY	DESCRIPTION
1.	2	Philip Head Screw #12-24 x .5"
2.	1	Bushing Retainer
3.	1	Flanged Sleeve Bearing -1" Shaft Diameter, 1.25" OD, 1.5" Length
4.	3	3/8"-16 Acorn Nut
5.	1	RP3 Bushing Flange
6.	1	3/16" x 1" Key
7.	1	Rotor
8.	1	3/8" Flat Washer
9.	1	3/8" Split Lock Washer
10.	1	3/8"-16 x 1" Hex Bolt
11.	1	Stator
12.	3	3/8"-16 x 1.375" Hex Bolt
13.	3	RP3 Rotor Stator Support Shaft
14.	1	Clamp Mid Support
15.	3	1/4"-28 x 7/16" Socket Head cap Screw
16.	1	Bearing Housing
17.	3	Flat Socket Head Cap Screw 3/8"-16 x 1"
18.	1	Upper Bearing
19.	2	Set Screw
20.	1	RP3 Rotor Stator Shaft
21.	1	1/4"Key
22.	1	Lower Bearing
23.	2	Set Screw

DP3 Shaft

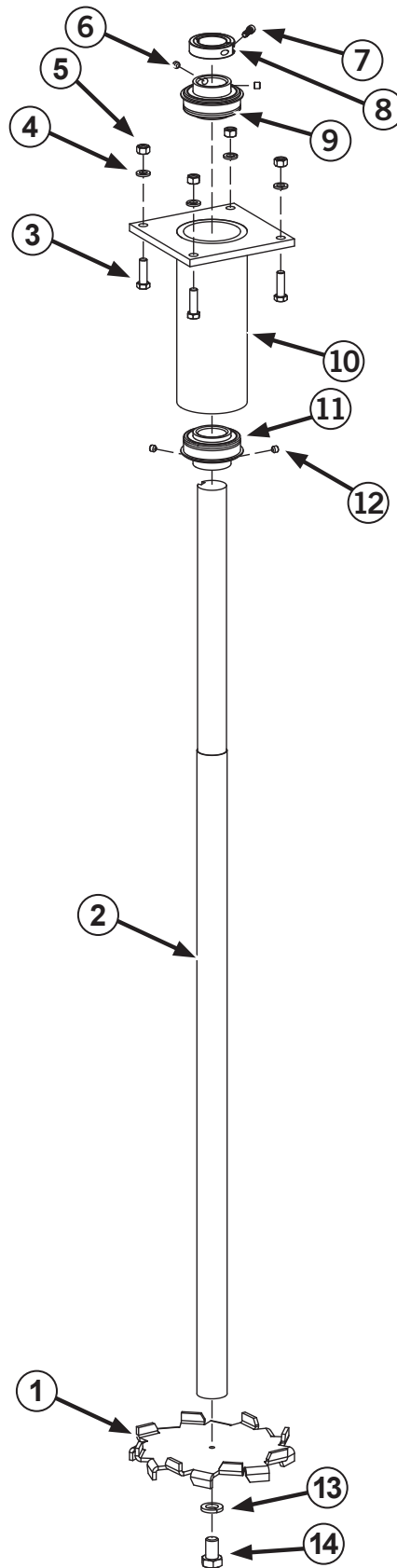


Figure 31. DP3 Shaft



Table 6.

ITEM	QTY	DESCRIPTION
1.	1	Dispersion Blade
2.	1	Shaft
3.	4	3/8"-16 x 1.25" Cap Screw
4.	4	3/8" Split Washer
5.	4	3/8"-16 Hex Nut
6.	1	Set Screw
7.	1	Socket Head Cap Screw
8.	1	Collar
9.	1	Upper Bearing
10.	1	Bearing Housing
11.	1	Lower Bearing
12.	1	Set Screw
13.	4	5/8" Split Washer
14.	4	5/8"-11 x 1" Cap Screw

Information Tables

Torque Specifications

NOTE: All values are for coarse thread lubricated fasteners

Table 7. Cap Screw and Screw Torque Values

	Nominal Size	SAE J429	SAE J429	ASTM A574	ASTM F593
		Grade 5	Grade 8	SHCS	304/316 SS
INCH LBS	#10	31	44	50	20
	#12	49	70	79	29
	1/4	76	107	120	62
	5/16	156	221	249	128
FOOT LBS	3/8	23	32	36	19
	7/16	36	52	58	30
	1/2	57	80	90	46
	5/8	113	159	179	92
	3/4	200	283	318	113
	7/8	322	455	512	182
	1	483	682	767	273
	1-1/8	684	966	1086	346
1-1/4	965	1363	1533	545	

Table 8. Clamp Coupling and Coupler Torque Values

	Largest Bore	Screw	Alloy Steel	Stainless	Hex Size
INCH LBS	3/8	#6-32	28	15	7/64
	1/2	#8-32	49	28	9/64
	5/8	#10-32	76	45	5/32
	3/4	1/4-28	170	110	3/16
	7/8	1/4-28	170	110	3/16
	1	1/4-28	170	110	3/16
	1-1/4	1/4-28	170	110	3/16
FT LBS		5/16-24	27	15	1/4
		3/8-24	47	28	5/16

Table 9. Set Screw Torque Values

	Nominal Size	Alloy Steel	Stainless	Hex Size
INCH LBS	#8	20	13	5/64
	#10	36	23	3/32
	1/4	87	57	1/8
	5/16	165	107	5/32
FOOT LBS	3/8	24	16	3/16
	7/16	35	23	7/32
	1/2	52	34	1/4
	9/16	52	34	1/4
	5/8	110	72	5/16
	3/4	200	130	3/8
	7/8	300	195	1/2
	1	417	271	9/16



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