



MANUAL

**DUSTLESS LOADING SPOUT
POSITIONER**

TABLE OF CONTENTS

1	MANUAL OVERVIEW	1
1.1	MANUAL CONTENTS.....	1
1.2	PRODUCT OVERVIEW	1
1.3	STORAGE RECOMMENDATIONS	1
1.4	GENERAL INSTALLATION.....	1
1.5	OPERATION	1
1.6	MAINTENANCE RECOMMENDATIONS.....	1
1.7	WARRANTY.....	1
2	PRODUCT OVERVIEW.....	2
2.1	DLSP COMPONENTS	2
2.2	DUAL-AXIS SPECIFIC COMPONENTS.....	3
2.3	OPTIONAL COMPONENTS	4
3	STORAGE RECOMMENDATIONS	5
3.1	GENERAL REQUIREMENTS	5
3.2	ELECTRICAL EQUIPMENT.....	5
3.3	ADDITIONAL REQUIREMENTS.....	5
4	GENERAL INSTALLATION	6
4.1	RECEIVING INSPECTION.....	6
4.2	INSTALLATION WARNING	6
4.3	MOUNTING AND INSTALLATION	6
4.4	TORQUE LIMITER COUPLING RUN-IN	7
5	OPERATION	9
6	MAINTENANCE RECOMMENDATIONS	10
6.1	MAINTENANCE PROGRAM IMPORTANCE	10
6.2	WEAR PARTS.....	10
6.3	MAINTENACE SCHEDULE	10
6.3.1	Suggested Maintenance Schedule	11
6.3.2	Spare Part Installation Log.....	11
6.4	SAFETY PRECAUTIONS	11
6.5	GENERAL INSPECTION	12
6.6	LUBRICATION	12
6.7	SEAL ADJUSTMENT AND REPLACEMENT	12
6.7.1	Hopper Adjustment.....	13
6.7.2	Hopper Seal Replacement	13
6.7.3	Housing Seal Replacement (Dual-Axis Positioners).....	15
6.8	DRIVE CHAIN ADJUSTMENT	16
6.8.1	Hopper Positioner Chain Adjustment.....	16
6.8.2	Housing Positioner Chain Adjustment.....	16
6.9	TORQUE LIMITER COUPLING ADJUSTMENT	17
6.10	TROUBLESHOOTING	17
7	WARRANTY.....	19

1 MANUAL OVERVIEW

1.0 MANUAL CONTENTS

This Section of the manual will familiarize you with the contents of the other manual sections. This manual is general in approach and may not include everything you want to know about the specifics of your particular application. Specific technical information can be found on the drawings which are a part of this manual.

If you have any questions, which cannot be answered by the written material provided, call **PEBCO®** (270) 442-1996 or FAX (270) 442-5214.

2.0 PRODUCT OVERVIEW

Section 2 details both standard and optional components for **PEBCO®** Single-Axis and Dual-Axis Dustless Loading Spout Positioners (DLSP).

3.0 STORAGE RECOMMENDATIONS

Section 3 covers recommendations for proper storage. In some cases, scheduling requirements or construction delays result in the equipment being stored prior to installation. The guidelines suggested in this section are to aid the installer in selection of proper storage conditions. Because of variability in site conditions/facilities, proper equipment storage/protection is the responsibility of the purchaser or his agent.

PEBCO® is not responsible for any equipment damage which results from inadequate storage/protection efforts.

4.0 GENERAL INSTALLATION

Section 4 covers installation and start-up procedures. Pay special attention to the **!!! WARNING !!!** in **Section 4.2**. Generally, installation of DLSP systems requires working aloft. Extreme care and good safety procedures should be used whenever working at height or around moving equipment.

5.0 OPERATION

Section 5 is designed to familiarize you with the operation of the **PEBCO®** Dustless Loading Spout Positioner.

6.0 MAINTENANCE RECOMMENDATIONS

Section 6 covers recommendations for maintenance procedures. Information is presented on lubrication, seal replacement, drive chain adjustment and torque limiter adjustment.

7.0 WARRANTY

Section 7 is **PEBCO®**'s Warranty to the purchaser of a Dustless Loading Spout Positioner.

2 PRODUCT OVERVIEW

The **PEBCO®** Dustless Loading Spout Positioner is designed to allow lateral movement of a Dustless Loading Spout (DLS) or Self Contained Dustless Loading Spout (SCDLS) while completely supporting the spout. This decreases the time required to spot a vehicle and allows for loading of vehicles with of multiple configurations, such as rail cars with center and side mounted hatches.

Dustless Loading Spout Positioners are available in both single-axis and dual-axis designs. Single-axis units allow for linear movement (East to West movement, for example) of the spout to any point along the travel length of the spout. Dual-axis units allow for planar movement (North to South and East to West) of the spout.

Single-axis and Dual-axis units operate by moving a hopper and connected DLS or SCDLS unit located under a stationary inlet. Product enters the unit through the inlet and drops into the hopper below. The top of the hopper is constructed to be wide enough to ensure it captures the product flow regardless of the position of the spout. The hopper then funnels the product to the outlet, and into the spout.

2.1 SINGLE & DUAL -AXIS DLSP COMPONENTS

The following components can be found on all **PEBCO®** Single-Axis DLSP units:

HOUSING ASSEMBLY

The housing assembly is mounted by means of support brackets located on either side of the housing assembly. Additionally, the inlet of the housing assembly is mounted to the equipment above to allow for product to flow into the positioner. Secure connection of the housing assembly to the support steel is highly important, as all other components of the positioner are supported directly by the housing assembly.

DRIVE MOTOR AND GEAR REDUCER

The motor and gear reducer are mounted to the outside of the housing assembly to provide easy access. The motor is powered by a three phase power source and is engaged by a command from the operator. Motor and gear reducer combinations vary depending on the application; see manufacturer's component data in the associated cut sheet for more information.

DRIVE SHAFT AND DRIVE CHAINS

The drive shaft is supported by flange bearings mounted on either side of the housing assembly. The shaft moves the hopper by means of chains attached to the hopper driven by sprockets on the shaft. For chain adjustment, see **Section 6.8**.

IDLER SHAFT

The idler shaft is located opposite the drive shaft and is also supported by flange bearings. Unlike the drive shaft, however, the flange bearings on the idler shaft are not mounted directly to the housing assembly. Instead, the bearings are mounted within adjustable take-up frames connected to the side of the housing assembly to allow the chain tension to be adjusted.

TORQUE LIMITER COUPLING

The torque limiter coupling is located between the gear reducer output shaft and the drive shaft and provides the means for stopping the hopper at its limits of travel. The torque limiter transmits power to the drive shaft using an adjustable frictional disk. During normal operation within the limits of travel, the disk directly transfers torque to the drive shaft. When the hopper reaches the travel limit, however, the torque required to move the hopper increases and the disk slips. For torque limiter coupling adjustment, see **Section 6.9**. For run-in, see **Section 4.4**. Manufacturer data can be found in the associated cut sheet.

HOPPER

The hopper is mounted to slide bars which are held in place by adjustable slide bar supports located inside the housing. The ends of each slide bar are connected to the chain drive; as the chain moves, the hopper is repositioned. Felt seals are installed at the top of the hopper to provide dust containment.

SPOUT SUPPORT

The spout support is mounted to the hopper frame and moves in tandem with the hopper. Spout supports are engineered to mate with and fully support the weight of the DLS or SCDLS system attached to the positioner.

2.2 DUAL-AXIS SPECIFIC DLSP COMPONENTS

Many of the components of Dual-Axis DLSP units are the same as that of single-axis units; however, some differences, as well as additional components, are required to provide planar movement of the spout. Dual-axis specific components are as follows:

STATIONARY TOP PLATE

Unlike single-axis units, the housing assembly on dual-axis units is not the means of support for the unit. Instead, a stationary top plate mounts to support steel. Product flows into the positioner through an inlet installed on the top plate.

HOUSING ASSEMBLY

The housing assembly is supported by cam followers connected to the chain connection plates which roll on supports on the top plate. The chain connection plates protrude through slots in the top plate and are connected to the chain drives. The inlet to the housing assembly is elongated to allow for unobstructed flow of product from the top plate regardless of the position of the housing assembly. The junction between the inlet and the top plate is sealed using a felt seal.

DRIVE SYSTEMS

Dual-axis units require two separate drive systems. The upper drive system is mounted to the top plate and controls the position of the housing assembly; the lower system is mounted to the housing assembly and controls the position of the hopper and spout support. The lower system is identical to the single-axis system described in **Section 2.1**. The upper system is similar, also composed of a motor, gear reducer, torque limiter, drive shaft, and chain drive; however, instead of using a single

idler shaft, the idler sprockets are mounted to two much shorter, independent idler shafts. The idler shafts on the upper drive system are not adjustable. The chains are adjusted, instead, by tensioner sprockets attached to each chain connection plate.

2.3 OPTIONAL COMPONENTS

In addition to the standard DLSP components, optional components may be installed to meet the needs of the particular application and include the following:

AIR OR ELECTRIC VIBRATORS

Vibrators may be installed on the hopper of the positioner to assist in the flow of sticky materials or materials that tend to bridge. Additionally, vibrators may be installed to assist in clearing the unit of product after the loading cycle. The supply air for air vibrators must be filtered, regulated, and lubricated and should not exceed 80 psi. For manufacturer data on vibrators, see the manufacturer's component data in the associated cut sheet.

END OF TRAVEL LIMIT SWITCHES

End of travel limit switches may be used to drop out the motor contact and stop the unit when the limit of travel has been reached. When limit switches are employed, the torque limiter on the drive shaft is often not installed; however, it may be used in combination with the limit switches to provide a fail-safe if a limit switch fails. For manufacturer data on end of travel limit switches, see the manufacturer's component data in the associated cut sheet.

SPOUT VENT KIT

A spout vent kit may be used to provide a flexible link between the dust outlet on a DLS and stationary ductwork.

PENDANT CONTROL (WIRED OR UNWIRED)

PEBCO® can provide a pendant control for the unit if desired. Controls are engineered to meet the needs of the customer, and vary in configuration depending on the application. See the manufacturer's component data in the associated cut sheet for more information.

3 STORAGE RECOMMENDATIONS

3.1 GENERAL REQUIREMENTS

If PEBCO® equipment is to be stored for a period of time longer than three weeks prior to installation, the following procedures are recommended:

- Equipment should be stored in enclosed areas. Indoor storage area should be clean and dry. Storage should be off of the floor, preferably on skids or pallets.
- Storage area should be free from rapid temperature changes. If necessary, an additional heat source should be used.
- Storage area should not subject equipment to vibration.
- All interior and exterior surfaces of the positioner must be thoroughly coated with Cosmoline. Any unpainted surfaces, such as shafts, rollers, bearings, and pins should be given special attention to ensure a thorough covering of Cosmoline.
- Storage must be above any possible water or snow line.
- All bearings must be fully charged with grease.
- Periodic inspections should be made, checking the covering, any moisture present, cleanliness and general appearance to ensure the absence of corrosion and the integrity of the Cosmoline coating.
- If outdoor storage is necessary, the equipment should be fully covered with weather-proof material, vented so as not to trap moisture, but drip-proof so the water cannot enter or splash up into it.

3.2 ELECTRICAL EQUIPMENT

- All electrical device enclosures must be opened and coated with CRC Stor & Lube.
- All electrical connections (terminations) must be coated with CRC Stor & Lube.
- All electrical openings must be capped or plugged as necessary to be sealed to atmosphere.
- Electrical junction boxes included with the equipment should be opened and any exposed wire and terminations should be coated with CRC Stor & Lube. Open conduit connections should be plugged or capped to atmosphere and the enclosure door should be securely tightened to ensure sealing integrity.

3.3 ADDITIONAL REQUIREMENTS

Prior to long-term storage, and start-up after storage, please refer to any and all applicable instructions published by individual component manufacturers in the associated cut sheet.

4 GENERAL INSTALLATION

4.1 RECEIVING INSPECTION

Upon receipt of the equipment, a thorough inspection of the equipment should be made. The following points should be noted:

- Condition of the shipping crate/skid that would indicate rough handling or possible equipment damage
- Condition of the equipment itself; obvious dents, bent flanges, loose or broken accessories, oil leaks, etc.
- Check packing list to see if any parts were shipped loose, and if they are packed with the equipment.

REPORT ANY DAMAGE OR MISSING COMPONENTS TO THE DELIVERING CARRIER.

4.2 INSTALLATION WARNING

!!! WARNING !!!

Follow all local fall protection/falling object protection requirements whenever working aloft. Anchor all large equipment that is to be installed BEFORE lifting. Moving parts can cause serious injury or death. DO NOT perform any installation or maintenance procedures on the equipment while power is connected.

4.3 MOUNTING AND INSTALLATION

1. Remove the bolts and straps holding the DLSP in the shipping frame.

NOTE: Do not remove packing or skid until the positioner has been bolted in place, with provided bolts, nuts, and lock-washers secure tightly.

2. Check the alignment of the bolt holes on both the mating flange and the support steel to determine if the bolt holes will match correctly with the unit. Do not attempt to correct alignment by drilling through the flange, as this will possibly weaken the flange and result in a poor seal. Check the mating flange for level.
3. Install the appropriate gasket material or sealant on the top flange.
4. Using a fork truck or other appropriate equipment, lift the positioner to the mating flange and support steel.
5. Install nuts and washers, **HAND TIGHTEN ONLY**. Use only a high grade hex head bolt with an equal grade of nut, flat and lock washer. Angle supports on top of the housing assembly or top plate must be utilized for additional support to ensure that the housing assembly/top plate is installed securely; the unit **CANNOT** be supported solely by the flange.

6. With the mounting bolts hand tightened, check to ensure the unit is level and true using a laser light. Check the entire length of the unit. Ensure that there is no bowing or cupping and that any deviation from true is less than 1/16 of an inch. This is necessary to ensure that the hopper (and housing assembly on dual-axis units) can translate freely without binding. Adjust as necessary and securely tighten the mounting bolts as you go.
7. The skid and packing can now be removed.
8. If an air vibrator is installed on the positioner, it may now be connected to the supply air. Vibrator supply air should be filtered, regulated, and lubricated and should not exceed 80 psi. For manufacturer data on air vibrators, see the manufacturer's component data in the associated cut sheet.
9. Electrical connections can now be made. See the provided wiring diagrams for more information.
10. Check the motor for correct rotation. If end of travel limit switches are installed, they should be tested at this time.
11. The torque limiter coupling should now be run-in. For instructions, see **Section 4.4**.
12. Check the drive chains for correct adjustment. Chains should be adjusted such that chain deflects approximately 1 inch midway between the sprockets with thumb pressure. If this is not the case, chains can be adjusted by moving the take-up frames on the idler shaft; for housing positioner chains on dual-axis units, adjust the tensioner sprocket.
13. Connect the DLS or SCDLS unit to the positioner as described in the information accompanying that unit.
14. If a spout vent kit is provided, it may now be installed.

4.4 TORQUE LIMITER COUPLING RUN-IN

CAUTION: Before attempting to run-in the torque limiter coupling, all overload safety devices should be run-in.

1. Loosen the set screws on the adjustment nut and disassemble the coupling.
2. Inspect the friction contact facing. Remove any dirt, burrs, rust, or oil.
3. Reassemble the coupling.
4. With the coupling reinstalled, hand-tighten the compression nut. Tighten the nut an additional 1/4 turn past hand tight.
5. Operate the machine against the end stop, allowing the coupling to slip, for approximately 450 revolutions. (For a 1200 rpm motor with a 60:1 gear reducer, this will take approximately 25 minutes.)

!!! WARNING !!!

COUPLING WILL BE HOT. Allow coupling to cool before setting torque.

6. Adjust the torque limiter coupling, beginning with the adjustment nut flush against the spring. Make small adjustments to the compression, attempting to move the positioner between each adjustment.
7. Once the positioner moves in both directions without coupling slippage, tighten the adjustment nut an additional 1/8 turn or to the next position where the setscrews will tighten against a flat.

5 OPERATION

!!! WARNING !!!

Before beginning a loading operation, make sure the area around the spout is clear of personnel. As direct exposure to the product stream can result in seriously injury or death.

1. After the vehicle/container has been positioned below the spout, move the positioner as required to position the spout directly above the hatch.
2. Once the hatch has been opened, begin lowering the loading spout to the vehicle or container opening.
3. The dust extractor should be turned on at this point.
4. Continue to lower the outlet assembly until it is firmly seated in the vehicle/container hatch. If fine adjustments of the positioner are required, this may be done with the spout extended. If large motions are required, however, the spout should be raised before adjusting the positioner.

!!! WARNING !!!

Large adjustments will cause the spout to sway, which could cause damage or injury.

5. Start the product feed. The vehicle or container should be properly filled with little or no visible dust.
6. When the vehicle is full, raise the spout completely and turn off the dust extractor. This completes the loading cycle.

6 MAINTENANCE RECOMMENDATIONS

6.1 MAINTENANCE PROGRAM IMPORTANCE

An inspection and maintenance program should be established to ensure the successful operation of the equipment during its working life.

One of the most important aspects of any maintenance program lies in establishing a good set of operating records. Daily log sheets should be set up to record all important operating parameters of the equipment. Inspection at predetermined intervals is essential. The frequency of inspections may vary with operating conditions and the environment of operation. Complete records will also indicate spare parts used and on-hand, and the historical details of any maintenance or overhaul which takes place.

The purpose of a good maintenance program is to achieve maximum operating performance while holding down maintenance costs.

6.2 WEAR PARTS

Parts exposed to high frictional forces, whether due to the sliding of two parts against each other, or due to exposure to the product flow, are expected to wear and may need to be replaced. **PEBCO®** does not consider the wearing of Seals, Retainers, or Liners due to friction to be a defect as covered under the product warranty, and replacement of said parts is considered to be the responsibility of the purchaser.

6.3 MAINTENANCE SCHEDULE

Scheduled inspection of equipment and active preventive maintenance are essential for optimum performance and long equipment life. This section lists suggested schedules for maintenance. However, actual service conditions and environment greatly affect equipment reliability and such schedules should be adjusted as necessary to suit the specific requirements of the installation. Additional maintenance may be required for components not manufactured by **PEBCO®**; see the manufacturer's component data in the associated cut sheet for manufacturer recommendations.

6.3.1 Suggested Maintenance Schedule

Weekly		Monthly		Quarterly		Yearly	
Visually Check for Loose Hardware	<input type="checkbox"/>	Grease Flange Bearings	<input type="checkbox"/>	Tool Check for Loose Hardware	<input type="checkbox"/>	Check all Wiring for Fraying or Damage	<input type="checkbox"/>
Check Air Pressure (Air Vibrator)	<input type="checkbox"/>	Tool Check Air Vibrator Mounting Bolts	<input type="checkbox"/>	Check Gear Reducer Oil Level	<input type="checkbox"/>	Inspect Mounting Bolts	<input type="checkbox"/>
	<input type="checkbox"/>		<input type="checkbox"/>	Check Chains	<input type="checkbox"/>		<input type="checkbox"/>
	<input type="checkbox"/>		<input type="checkbox"/>	Grease Drive Bearings	<input type="checkbox"/>		<input type="checkbox"/>
	<input type="checkbox"/>		<input type="checkbox"/>	Check Electric Motors	<input type="checkbox"/>		<input type="checkbox"/>
	<input type="checkbox"/>		<input type="checkbox"/>	Check Limit Switch(es)	<input type="checkbox"/>		<input type="checkbox"/>

6.3.2 Spare Part Installation Log

Date	Part	Qty.	Comments

6.4 SAFETY PRECAUTIONS

!!! WARNING !!!

Before conducting any maintenance on or around the system, it should be fully isolated from all power sources. Failure to do so may result in injury or death.

Follow all local fall protection/falling object protection requirements whenever working aloft. Anchor all large equipment that is to be removed/installed BEFORE removing/lifting.

6.5 GENERAL INSPECTION

In order to ensure maximum operating efficiency and to prevent excessive down-time and costly replacements, it is recommended that an inspection of the systems and sub-systems of the unit be conducted every 90 days.

- Electrical motors, and limit switches, both rotating and/or lever type, should be checked and tested to ensure they are in good working order.
- Drive coupling, shaft keys, sprockets, and set screws should be tool checked for loose connections.

6.6 LUBRICATION

General recommendation is for lubrication:

6.3.1 Flange Bearings

Flange bearing(s) that support the drive shaft(s) and idler shaft(s) should be greased every 100 hours of operation using NLGI #2 Lithium based grease, if the particular bearing has a grease fitting.

6.3.2 Gear reducer

Gear reducer lubrication level must be visually inspected every 90 days on non-sealed units to ensure that proper level is maintained. Gear reducers are filled to the proper level at the factory with AGMA No. 7 compounded oil. After installation of the breather plug, unit is ready for use. Before installing the breather plug, refer to instruction tag and determine the proper position according to reducer mounting.

Consult the component data sheets for additional recommendations on gear reducer lubrication from the manufacturer.

6.3.3 Drive Motor

Refer to the manufacturer's recommendations listed in the specific component data sheet(s).

6.3.4 Drive Bearings

Drive bearings should be lubricated with NLGI #2 Lithium based grease every 90 days.

6.7 SEAL ADJUSTMENT AND REPLACEMENT

!!! WARNING !!!

Disconnect the positioner from all power sources before performing seal adjustment or replacement. If the drive system engages while maintenance is being performed, serious injury or death could occur. Use extreme care when working aloft and follow all local fall protection/falling object protection regulations.

The felt dust seals on DLSP units are designed to operate effectively with minimal contact pressure to minimize wear and ensure long life of the seals. However, over the operating life of the positioner, the seals will experience some wear and may occasionally require adjustment or replacement.

6.4.1 Hopper Adjustment

If dust leakage from the hopper seal becomes apparent, the hopper may be adjusted to tighten the seal. Before adjusting the hopper, visually inspect the seal for any signs of damage. If damage to the seal is present, the seal must be replaced.

1. To adjust the hopper, first loosen slide bar support bolts (**Figure 1**).
2. Tighten the adjustment nuts (**Figure 1**). Be sure to tighten each nut evenly, failure to do so could result in twisting of the hopper, which may result in poor sealing or binding of the hopper.
3. Tighten until the seal makes light contact with the housing. Do not over-tighten as this will cause the seals to excessively wear and may result in binding of the hopper.
4. Using a feeler gauge, check to ensure that the seal contact is not too tight. The gauge should slide freely between the housing and the seal.

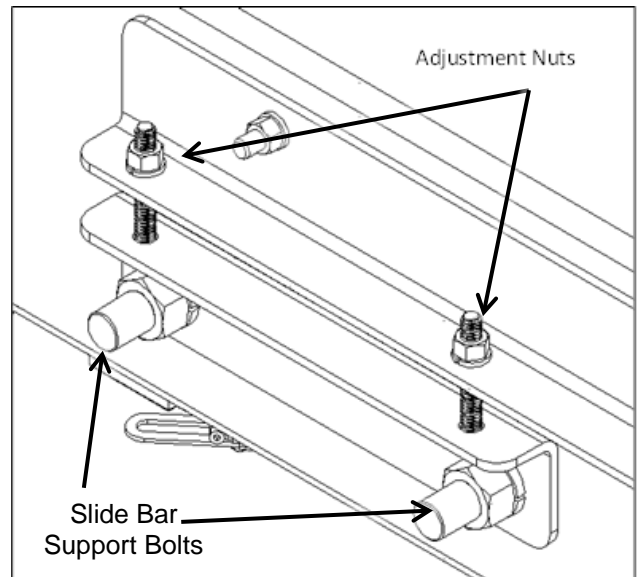


Figure 1: Hopper Adjustment

5. Once adjustments are complete, tighten the slide bar support bolts.

6.4.2 Hopper Seal Replacement

If hopper seals are damaged or excessively worn they can be replaced by removing the hopper from the housing. Depending on the size of the unit, and the accessibility of the positioner, this may require removing the DLSP from its operational position.

!!! WARNING !!!

DO NOT attempt to remove the hopper through the bottom of the housing assembly, as this may damage the housing assembly and result in binding or structural failure.

1. Remove the spout from the positioner using the lifting lugs provided on the housing assembly of the spout. For more information on spout lifting and mounting procedures, see the manual accompanying your DLS or SCDLS unit.
2. If removal of the positioner is not required proceed to **step 5**.

3. If removal of the positioner is required, secure rigging to the lifting lugs, and remove the mounting bolts that secure the positioner to the support steel and the equipment above the positioner.
4. Lower and secure the unit. Be sure that any support structure does not obstruct the access panels. Follow all local falling object protection and hoisting safety requirements.

!!! WARNING !!!

DO NOT REST THE UNIT ON THE HOPPER. This could not only damage the hopper, but is also an unstable position for the unit. Tipping of the positioner could lead to injury or death.

5. Remove the access panel on the idler shaft side of the positioner.
6. Disconnect the chains from the hopper by removing the link connected to the chain anchor.
7. Loosen the set screws on the idler sprockets so that the sprockets can slide along the shaft.
8. Remove the take-up frames and slide the shaft out of the housing (**Figure 2**).
9. The hopper can now be removed from the housing by sliding it out through the side access.

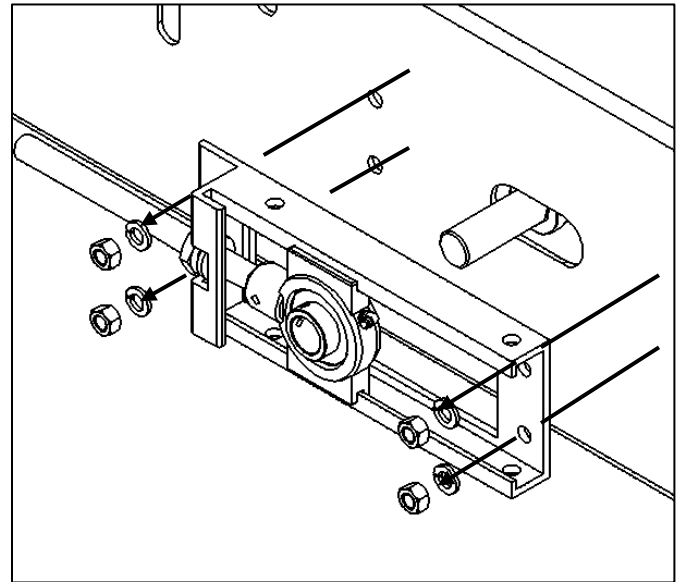


Figure 2: Take-Up Frame Removal

!!! WARNING !!!

The hopper may be very heavy, use caution and follow all local lifting requirements when removing the hopper.

10. Remove the old seal material and install the new seals.
11. Reinstall the hopper.
12. The hopper may need to be adjusted so that the new seals properly contact the housing. Refer to **Section 6.4.1** for hopper adjustment.
13. Reinstall the idler shaft, positioning the idler sprockets in line with the drive sprockets. Apply Loctite 262 to all threaded fasteners.
14. Run the drive chains back over the sprockets and connect them to the hopper.

15. Reinstall the access panel. If the positioner was removed from its operating position, it may now be remounted. For mounting procedures, see **Section 4.3**.
16. Reinstall the spout according to the instructions provided with the DLS or SCDLS.

6.4.3 Housing Seal Replacement (Dual-Axis Positioners)

If dust leakage from the housing seal is apparent, the seal cannot be adjusted but must be replaced.

1. Remove the spout from the positioner using the lifting lugs provided on the housing assembly of the spout. For more information on spout lifting and mounting procedures, see the manual accompanying your DLS or SCDLS unit.
2. Remove the chain guards from the top plate to allow access to the chain connection plates (**Figure 3**).
3. Disconnect the chains from the chain connection plates (**Figure 3**).
4. Secure the housing assembly using appropriate lifting techniques. Do not attempt to support from the hopper.
5. Remove the cam rollers from the chain connection plates so that the housing assembly and hopper can be lowered.
6. Lower and secure the housing assembly and hopper.

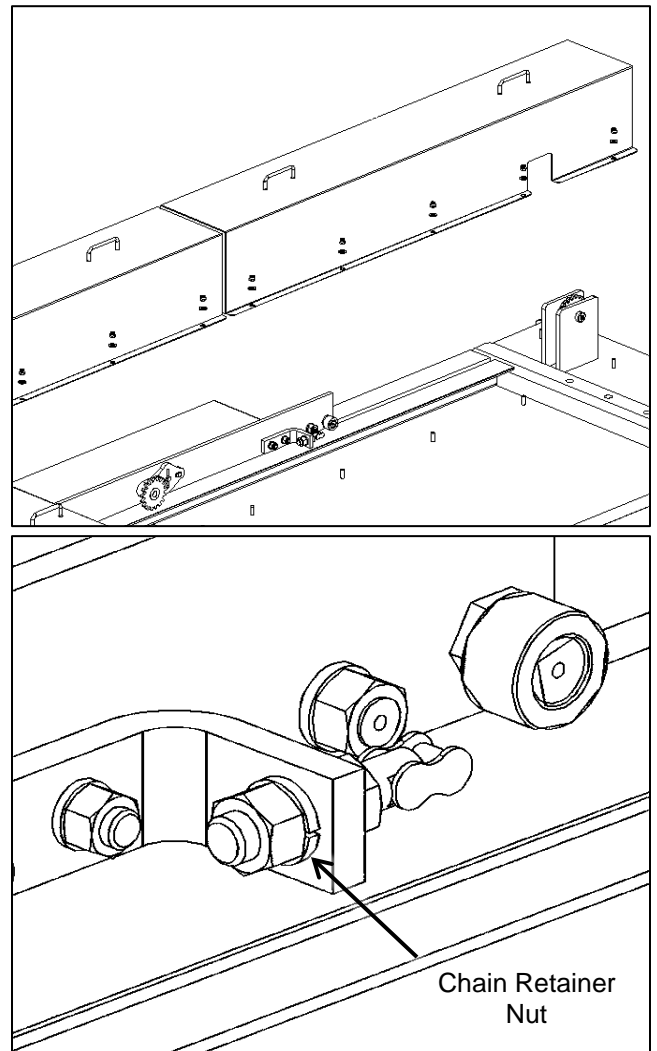


Figure 3: (Left) Chain Guard Removal, (Right) Chain Removal

!!! WARNING !!!

DO NOT REST THE UNIT ON THE HOPPER. This could not only damage the hopper, but is also an unstable position for the unit. Tipping of the positioner could lead to injury or death.

7. Remove the old seal material and install the new seals.

8. Raise the housing assembly to the top plate such that the chain connection plates slot through the top plate.
9. Reinstall the cam rollers, chains, and chain guards.

6.8 DRIVE CHAIN ADJUSTMENT

Drive chains on DLSP units should be adjusted as needed to ensure maximum operational efficiency and to minimize maintenance costs. Chains should be adjusted such that when the unit is against the end stop the midpoint of the chain can be deflected approximately 1 inch under finger pressure.

Chains that are too loose may increase sprocket and chain wear and may cause the chain to misalign or come free of the sprockets. Over-tightened chains will increase the load on the drive system, which may decrease the life of the bearings and motor, as well as increase operational costs.

6.5.1 Hopper Positioner Chain Adjustment

!!! WARNING !!!

Disconnect the positioner from all power sources before performing chain adjustment. If the drive system engages while chain adjustment is being performed, serious injury or death could occur.

Hopper positioner chains on both single-axis and dual-axis units can be adjusted by turning the adjustment nut on the take-up frames that support the idler shaft, or by repositioning the anchor blocks within the hopper frame (Refer to **Figure 4**). Adjustments should be made evenly to each end of the shaft to ensure that the shaft is seated squarely.

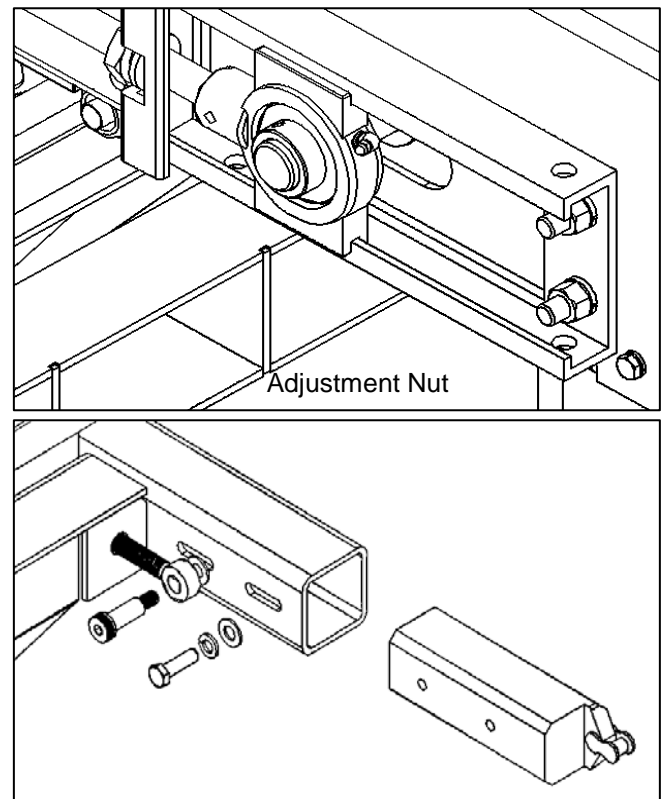


Figure 4: (Left) Take-Up Frame Adjustment (Right) Anchor Block Adjustment

6.5.2 Housing Positioner Chain Adjustment

!!! WARNING !!!

Disconnect the positioner from all power sources before performing chain adjustment. If the drive system engages while chain adjustment is being performed, serious injury or death could occur.

Housing positioner chains on dual axis units can be adjusted by means of tensioner sprockets located on the chain connection plates (**Figure 5**) or by adjusting the

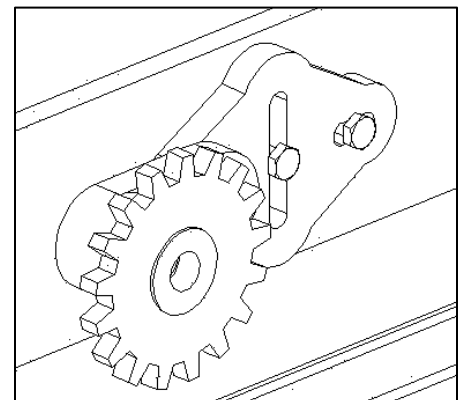


Figure 5: Tensioner Sprocket

chain retention bolts (**Figure 3**). To access the tensioner sprockets, remove the chain guards from the unit. Adjust the sprocket arm until the chain is tensioned properly, and replace the chain guards.

6.9 TORQUE LIMITER COUPLING ADJUSTMENT

The torque limiter coupling may occasionally need to be adjusted to ensure correct operation of the positioner. The need to adjust the torque limiter will be evident by slipping of the coupling while the positioner is traveling or by failure of the coupling to slip when the end stops have been reached.

If the coupling is slipping, make small adjustments to the compression and attempt to move the positioner between each adjustment. Once the positioner moves in both directions without coupling slippage, tighten the adjustment nut an additional 1/8 turn or to the next position where the setscrews will tighten against a flat.

If the coupling still slips when completely tightened, remove the coupling and inspect the frictional disk. Clean away any oil or debris and look for signs of wear. If excessive wear is found, the coupling should be replaced.

If the coupling fails to slip at the end stops, remove the coupling and inspect the frictional disk, clean any debris and remove any burrs that may exist.

6.10 TROUBLESHOOTING

Positioner operates slowly or cannot fully travel:

- Debris buildup in drive system
- Drive chain over-tightened
- Torque limiter set too low

Positioner does not operate:

- No power to motor
- Control system incorrectly wired
- Damage to the control system or control system wiring
- Debris buildup in drive system
- Drive chain over-tightened
- Drive chain not connected
- Drive chain damaged
- Torque limiter set too low
- End of travel limit switch (if installed) not operating correctly

- Motor not operating

Spout discharges slowly or does not discharge:

- Gate/conveyor above the positioner is not operating properly
- Spout is not operating properly
- Vibrator (if installed) not operating correctly
- Material buildup in the hopper

6.11 HYDRAULIC SYSTEMS

Refer to manufacturer's data sheets on items furnished on this order.

If Hydraulic Power Unit is supplied on this order by **PEBCO®**, refer to the Hydraulic System Manual for detailed operation.

7 WARRANTY

WARRANTY: PEBCO® DUSTLESS LOADING SPOUT POSITIONER

WARRANTY

PEBCO® warrants to purchaser, upon the terms set forth, that the equipment purchased, so far as the same is of PEBCO®'s manufacture, is free from defects in material and workmanship under normal use and service for a period of twelve (12) months from the date of shipment. All equipment, including motors, manufactured by others, is warranted solely and exclusively by their manufacturers and not by PEBCO®, and PEBCO® hereby assigns to purchaser without recourse to PEBCO® such warranty as is given by the manufacturer.

TERMS

PEBCO®'s obligation under this warranty is limited to and shall be fully discharged by PEBCO® repairing or at its option replacing f.o.b. point of manufacturer any part which is shown to PEBCO®'s satisfaction to have been defective as to material or workmanship, provided that written notice of defect is delivered to PEBCO®'s office in Paducah, Kentucky, within sixty (60) days after defect is discovered, and in no event more than twelve (12) months and sixty (60) days after shipment.

PURCHASER'S ACTS VOIDING WARRANTY

The warranty furnished by PEBCO® herein will be rendered void by improper erection or installation, if executed by other than PEBCO®, misuse, unauthorized alteration, substitutions, repairs or modifications, neglect or accident, or damage to the equipment caused by improper storage, abrasion, corrosion, and/or operation outside the rated load limitations for use of the equipment. PEBCO® shall not be liable for any repairs, replacements or adjustments to the equipment or any cost of labor performed by the purchaser or others without PEBCO®'s prior written approval.

EXCLUSION OF ALL OTHER WARRANTIES AND LIMITATION OF CONSEQUENTIAL AND INCIDENTAL DAMAGES.

1. THE WARRANTY FURNISHED BY PEBCO® AS EXPRESSLY INCLUDED HEREIN IS IN LIEU OF ANY OTHER WARRANTIES OR GUARANTIES EXPRESSED OR IMPLIED. PEBCO® MAKES NO OTHER WARRANTY OR REPRESENTATION OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, EXCEPT THAT OF TITLE AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF DESIGN, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED.
2. IN NO EVENT, BE IT DUE TO A BREACH OF WARRANTY OR ANY OTHER CAUSE ARISING OUT OF PERFORMANCE OR NONPERFORMANCE OF THIS PROPOSAL OR CONTRACT, SHALL PEBCO® BE LIABLE FOR (1) CONSEQUENTIAL OR INDIRECT LOSS OR DAMAGE INCLUDING BUT NOT LIMITED TO LOSS OF PROFITS, COSTS TO PURCHASE SUBSTITUTE POWER, PLANT DOWNTIME, PRODUCTION, INCREASED COSTS OF OPERATION, OR SPOILAGE OF MATERIAL, OR (2) LOSS OR DAMAGE ARISING OUT OF THE NEGLIGENCE OF THE PURCHASER, ITS EMPLOYEES, AGENTS, ENGINEERS OR ARCHITECT.