

Pendulum System Preventive Maintenance

⚡ ⚠ WARNING ⚠ ⚡

- Before attempting any maintenance on this equipment all involved personnel should follow plant internal regulations along with any state, federal, or province regulations.
- The maintenance inspection, checks, and procedures listed in the preventive maintenance tables are assumed with the gated area electrically locked out.
- Before attempting any maintenance or service operation, make sure that:
 - You do not begin any repair procedure until the proper shutdown procedures and the appropriate power lockout procedures have been applied.
 - The system is de-energized; main electrical switches are open.

ⓘ NOTICE ⓘ

The maintenance inspection, checks, and procedures listed in the preventive maintenance tables and corrective procedures should be performed when the equipment is immobilized and locked out.

This section contains preventive maintenance schedules with recommended lubrication intervals. Assemblies in this section include:

- **Skid/Body Lock/Unlock**
- **Pendulum Inlet Table**
- **Pendulum Outlet Table**
- **Pendulum Chain**
- **Pendulum Drive Assembly**
- **Pendulum Take-Up**
- **Penduls**

Daily Checks

Observe

- Obvious signs of damage to the equipment. Listen to the conveyors - an unusual sound like screeching, grinding, or whining, are indicators of a problem.
- Damage or noticeable wear on the carrying and guide rollers.
- Signs of oil leaks on the equipment or on the floor below any gearbox.

Evaluate


- If you notice any of the above issues, evaluate the cause and the risk involved.

Act

- Schedule or perform necessary maintenance repairs as appropriate.

Mechanical Preventive Maintenance - key

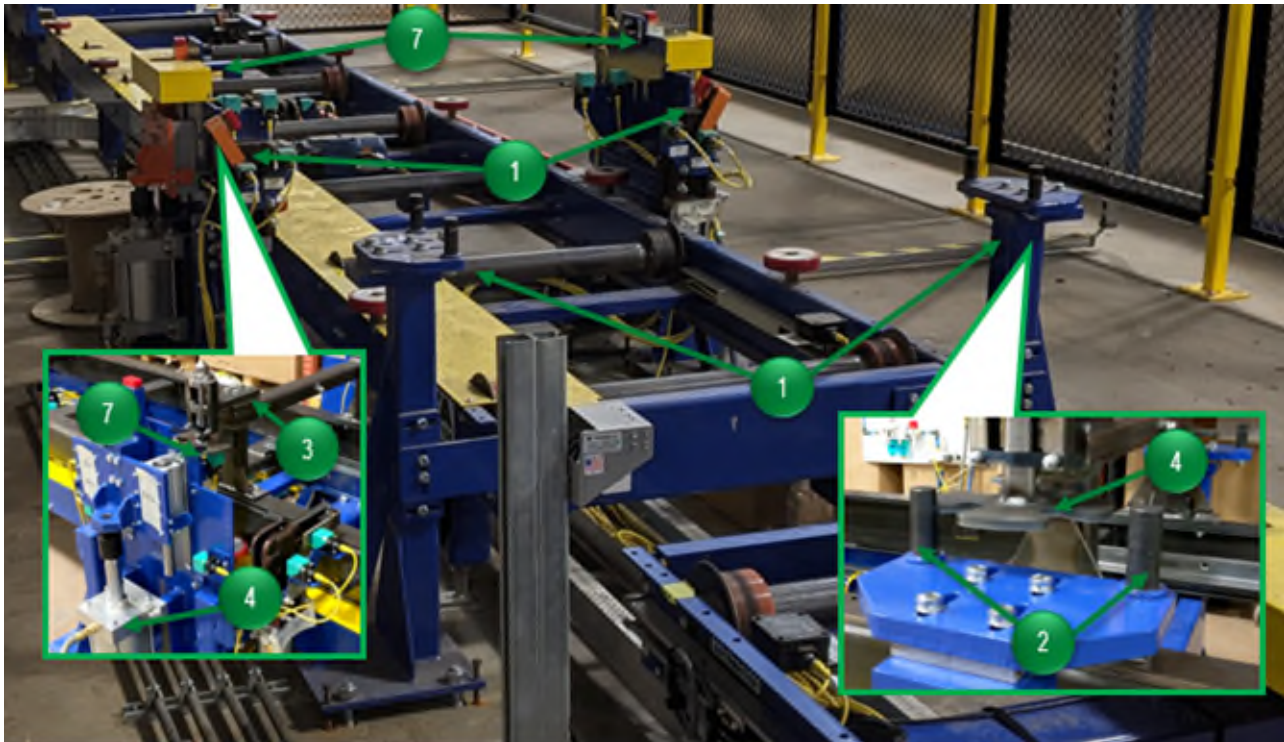
Preventive Maintenance tables consists of:



Item No.	Item Name	Required Operation	Description	Interval
1	Gearmotor	Inspection	<ul style="list-style-type: none"> Visually inspect gear unit for oil leakage. Check for oil film or grease deposits – clean if necessary. Check mounting hardware, check paint marks... 	6 Months

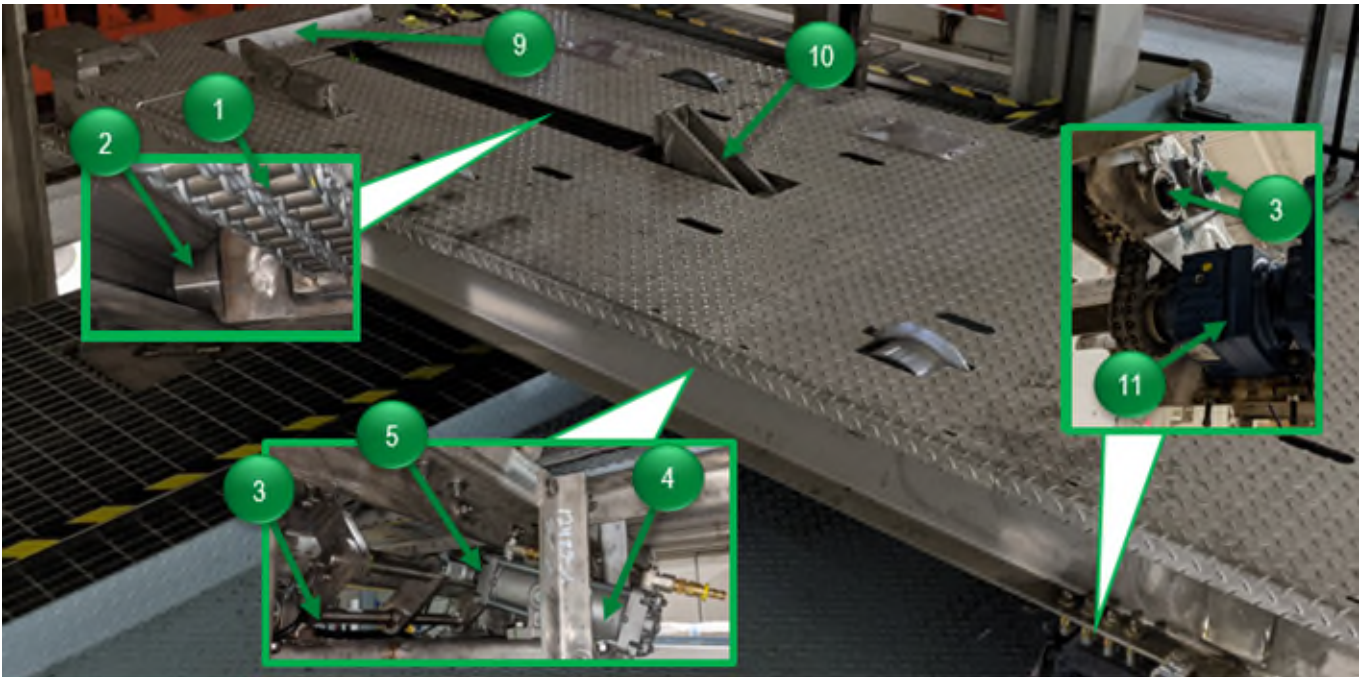
- A. Indicates the callout number associated on the schematic drawing, image or figure.
- B. Component name within the assembly.
- C. Required preventive maintenance operation - i.e., inspection or lubrication.
- D. Detailed description of the operation(s) to be performed.
- E. Recommended frequency of PM task.

Skid/Body Lock/Unlock Assembly Preventive Maintenance Items

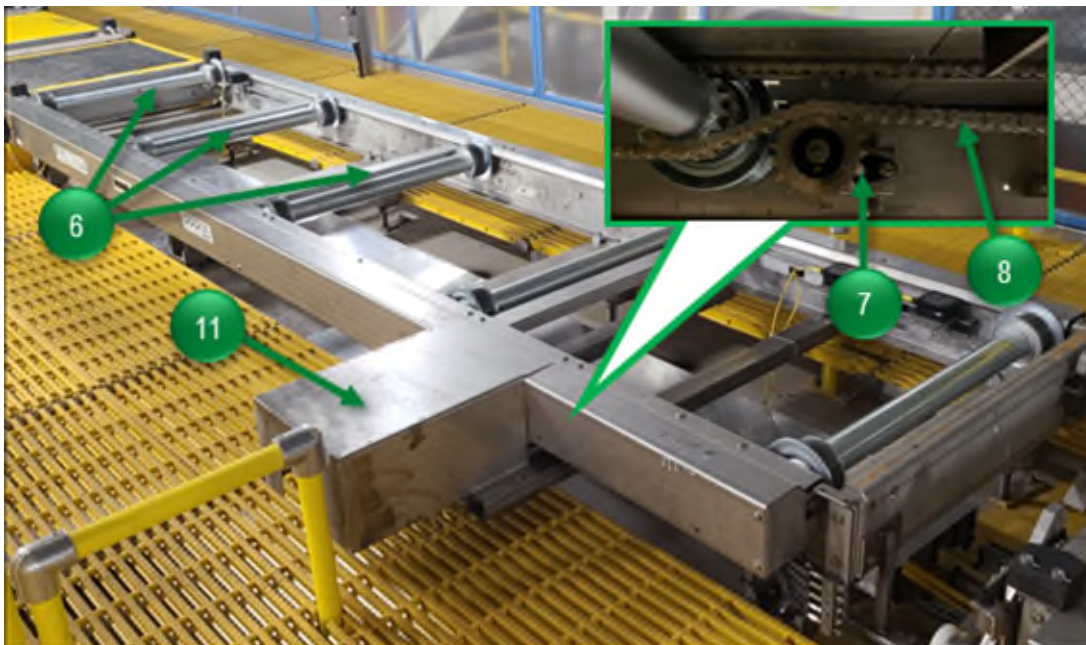


Item No.	Item Name	Required Operation	Description	Interval
1	Lock Operator Pins	Inspection	<ul style="list-style-type: none"> Check for wear and/or damage. Repair or replace as necessary. 	3 Months
2	Skid Clamp	Inspection	<ul style="list-style-type: none"> Check for wear, damage, and proper operation. Repair or replace as necessary. 	
3	Thumper Bearings	Inspection	<ul style="list-style-type: none"> Check for wear, damage, and/or proper operation. Replace if necessary. 	
4	Air Cylinders	Inspection	<ul style="list-style-type: none"> Check cylinder fittings and hoses for leaks and/or damage. 	
5	Clevis	Inspection	<ul style="list-style-type: none"> Check for wear, damage, and/or proper operation. Replace as necessary 	
6	Pad	Inspection	<ul style="list-style-type: none"> Check pad for looseness, wear, or damage. 	
7	Sensors	Inspection	<ul style="list-style-type: none"> Check for proper operation, and secure mounting and connection to cables. 	

Inlet Power Roll Table Preventive Maintenance Items



▲ Inlet Power Roll Table

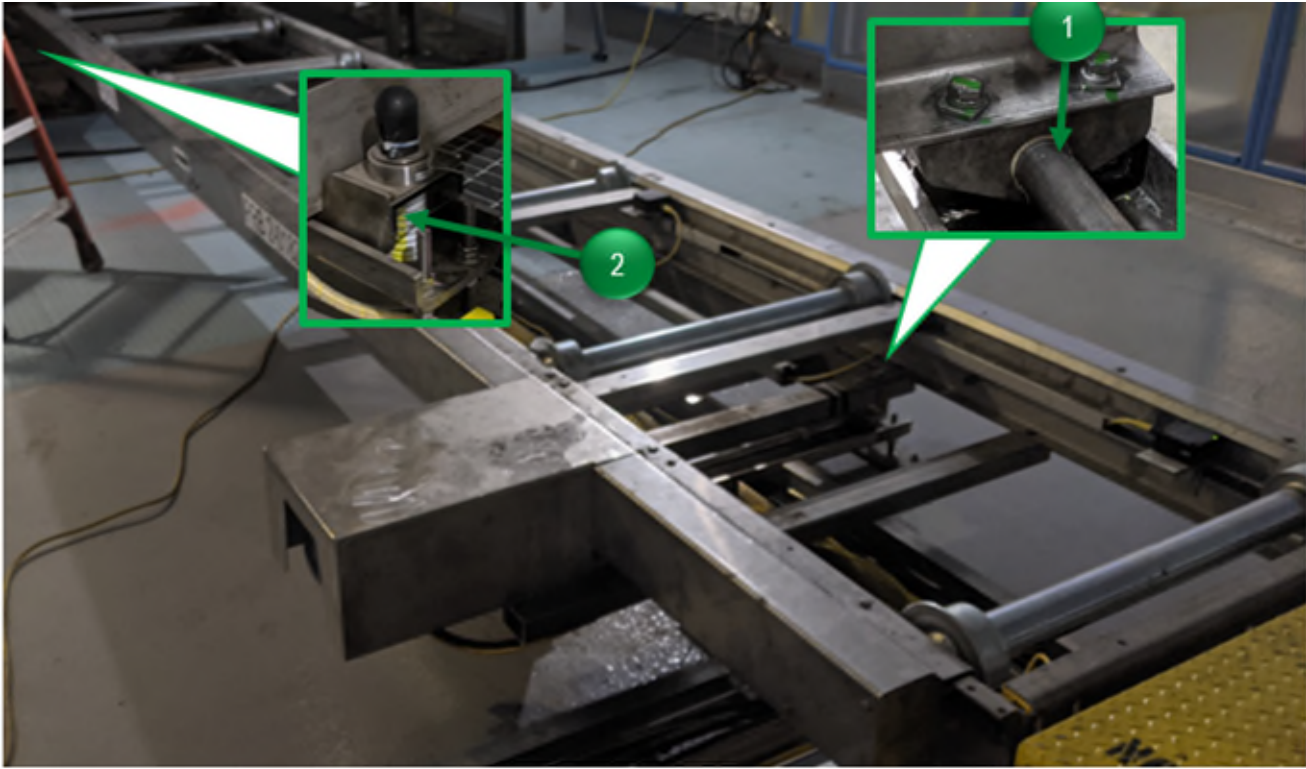


▲ Wet Area Power Roll Bed Example

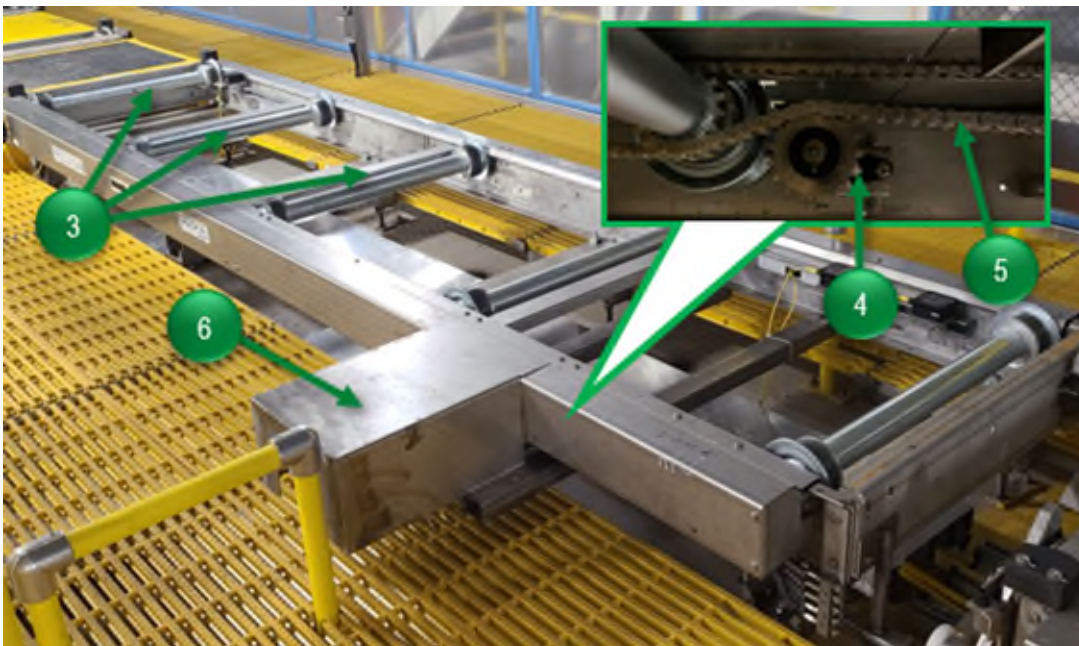
Item No.	Item Name	Required Operation	Description	Interval
1	Transmission Chain	Inspection	<ul style="list-style-type: none"> Inspect transmission chain tension and wear. Adjust or replace chain as necessary. 	3 Months
2	Roller Bearing	Inspection	<ul style="list-style-type: none"> Inspect the roller bearings for efficiency and noise. Replace roller if needed. 	
3	Bearings	Inspection Lubrication	<ul style="list-style-type: none"> Check for smooth operation. If necessary, add lubrication through manifolds. 	
4	Air Cylinder	Inspection	<ul style="list-style-type: none"> Check cylinder fittings and hoses for leaks and/or damage. 	
5	Clevis	Inspection	<ul style="list-style-type: none"> Check for wear, damage, and/or proper operation. Replace as necessary. 	
6	Rollers	Inspection	<ul style="list-style-type: none"> Inspect all rollers for wear or damage on surface. Check the sprocket teeth for unusual wear. Make sure that the shaft end is fitted securely into the slot in the frame. Inspect ending bolts for witness mark. Tighten if required. Inspect Poly Roller surface for gouging or signs of delamination. Replace if affecting PRB performance. Make sure the rollers are free of grease or oil. They must be clean to operate correctly. 	
7	Chain Tensioner	Inspection	<ul style="list-style-type: none"> Check for paint marks on mounting hardware. Tighten if needed. Tensioning sprocket should have at least three teeth engaged with the chain. 	
8	Chain	Inspection	<ul style="list-style-type: none"> Inspect Chain for kinks or stiff bending of chain, turned pins, enlarged holes or battered links. Check the contact between chain and the frame or the guards, look for contact marks. Inspect the chain appearance, inspect for built up dirt or, corrosion. Clean with cloth if needed. 	
9	Skid Stop	Inspection	<ul style="list-style-type: none"> Check for wear, and/or damage. Replace as necessary. 	
10	Electric Pusher	Inspection	<ul style="list-style-type: none"> Check that it is free moving and without obstruction. 	

11	Gearmotor	Inspection	<ul style="list-style-type: none"> • Use the oil sight glass or remove the oil level plug to check the level of oil. • Check that all electrical connections are secure. If loose, tighten. • Check the electrical connections for evidence of arcing. If evidence of arcing has occurred, replace the damage connection. 	6 Months
		Lubrication	<ul style="list-style-type: none"> • Replace the oil in the gearbox after 3 years of use. 	36 Months

Outlet Power Roll Table Preventive Maintenance Items



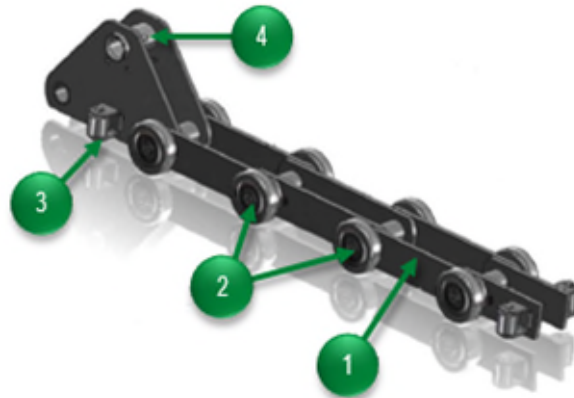
▲ *Outlet Power Roll Table*



▲ *Wet Area Power Roll Bed Example*

Item No.	Item Name	Required Operation	Description	Interval
1	Bushing	Inspection	<ul style="list-style-type: none"> Check bushing for wear. Replace as necessary. 	3 Months
2	Spring	Inspection	<ul style="list-style-type: none"> Check spring for wear. Replace as necessary. 	
3	Rollers	Inspection	<ul style="list-style-type: none"> Inspect all rollers for wear or damage on surface. Check the sprocket teeth for unusual wear. Make sure that the shaft end is fitted securely into the slot in the frame. Inspect ending bolts for witness mark. Tighten if required. Inspect Poly Roller surface for gouging or signs of delamination. Replace if affecting PRB performance. Make sure the rollers are free of grease or oil. They must be clean to operate correctly. 	
4	Chain Tensioner	Inspection	<ul style="list-style-type: none"> Check for paint marks on mounting hardware. Tighten if needed. Tensioning sprocket should have at least three teeth engaged with the chain. 	
		Lubrication	<ul style="list-style-type: none"> Grease directly with grease gun, or manifold if present, carefully pump grease into the zerk fitting. Clean off excess. 	
5	Chain	Inspection	<ul style="list-style-type: none"> Inspect Chain for kinks or stiff bending of chain, turned pins, enlarged holes or battered links. Check the contact between chain and the frame or the guards, look for contact marks. Inspect the chain appearance, inspect for built up dirt or, corrosion. Clean with cloth if needed. 	
6	Gearmotor	Inspection	<ul style="list-style-type: none"> Use the oil sight glass or remove the oil level plug to check the level of oil. Check that all electrical connections are secure. If loose, tighten. Check the electrical connections for evidence of arcing. If evidence of arcing has occurred, replace the damage connection. 	6 Months
		Lubrication	<ul style="list-style-type: none"> Replace the oil in the gearbox after 3 years of use. 	36 Months

Pendulum Chain Preventive Maintenance Items

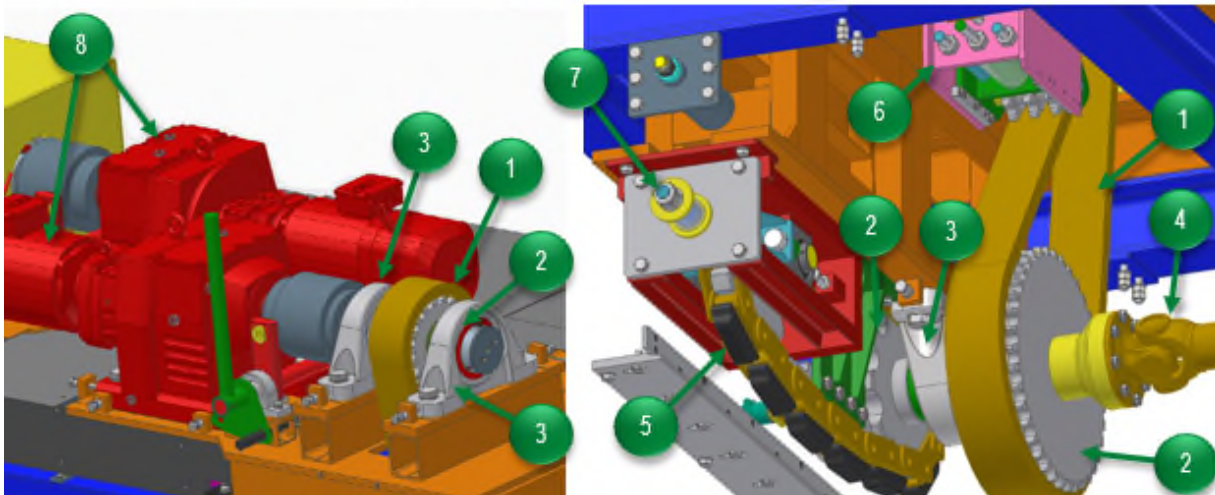
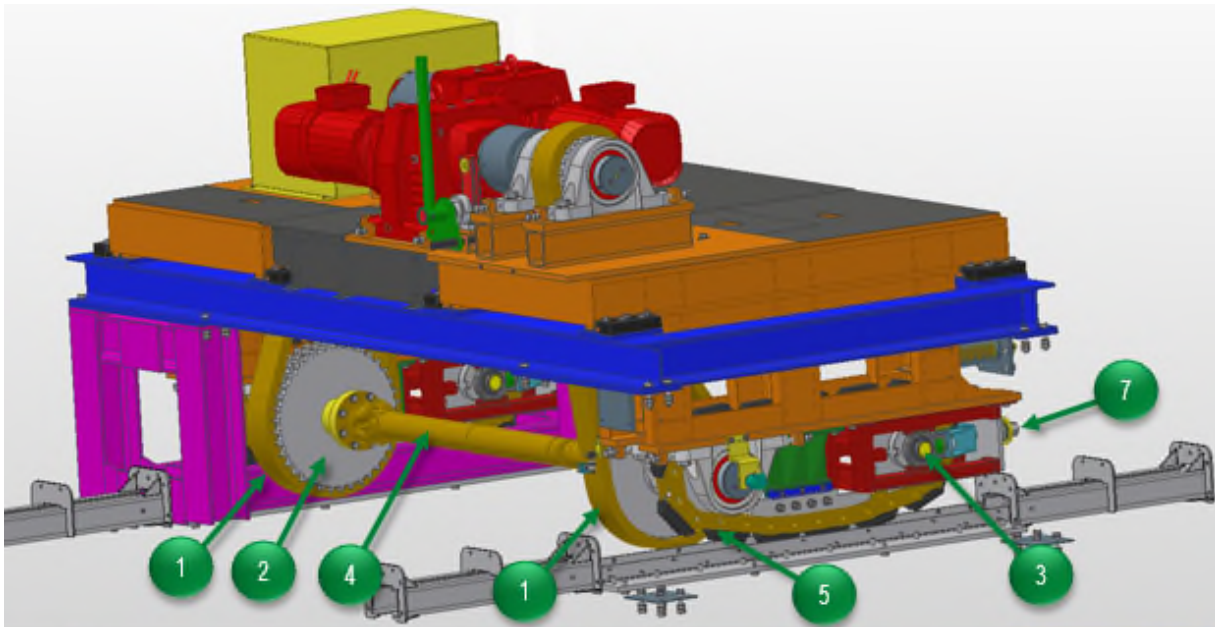


Item No.	Item Name	Required Operation	Description	Interval
1	Transmission Chain	Inspection	Inspect transmission chain pins, axles, and connections for wear. Replace chain or components as necessary.	1 Month
2	Bearings	Inspection	Inspect all the roller bearings for efficiency and noise. Replace if noisy at chain inspection station.	3 Months
3	Side Guide Rollers	Inspection	Check for wear and rotation.	
4	Pendul Bushing Mount	Inspection Lubrication	Check for wear. Lubricate through fitting.	

ⓘ NOTICE ⓘ

Please refer to the ZMC documentation — *Maintenance and Use Manual ZMC W497BL-CL* — for complete maintenance and service instructions for the conveyor chain. You will find this manual in the Appendix section of this manual.

Pendulum Drive System Preventive Maintenance Items



Item No.	Item Name	Required Operation	Description	Interval
1	Triple Chain Loop	Inspection	<ul style="list-style-type: none"> Inspect chain for wear and broke links. 	3 Months
2	Sprockets	Inspection	<ul style="list-style-type: none"> Check tooth side and depth for wear. With abnormal wear: examine sprockets for misalignments or cross-settings 	
3	Pillow Block Bearing	Inspection	<ul style="list-style-type: none"> Check mounting hardware for proper tightness. Look for paint mark alignment on hardware – retighten if necessary. Check for housing damage. Check for binding or sticking in the bearing housing. Check alignment of the shaft between bearings. 	
		Lubrication	<ul style="list-style-type: none"> Grease directly with grease gun, or manifold if present, carefully pump grease into the zerk fitting. Bearing is fully lubricated when you see grease leak around shaft. Clean off all excess grease. 	
4	Cardan Shaft	Inspection	<ul style="list-style-type: none"> Inspect all connections and make sure they are secure, check all paint marks. Retighten as necessary. Inspect shaft and flanges for any cracks or damage, replace if damage is found. 	
		Lubricate	<ul style="list-style-type: none"> Use a grease gun to apply grease, carefully pump grease into the zerk fitting. Coupling is fully lubricated when you see grease leak from all four seals. Clean off all excess grease. 	
5	Caterpillar Chain	Inspection	<ul style="list-style-type: none"> Check for lube and wear. 	
6	Triple Chain Tensioner	Inspection	<ul style="list-style-type: none"> Check spring for wear. 	
7	Caterpillar Chain Tensioner	Inspection	<ul style="list-style-type: none"> Check spring for wear. Check tensioner is function properly. 	

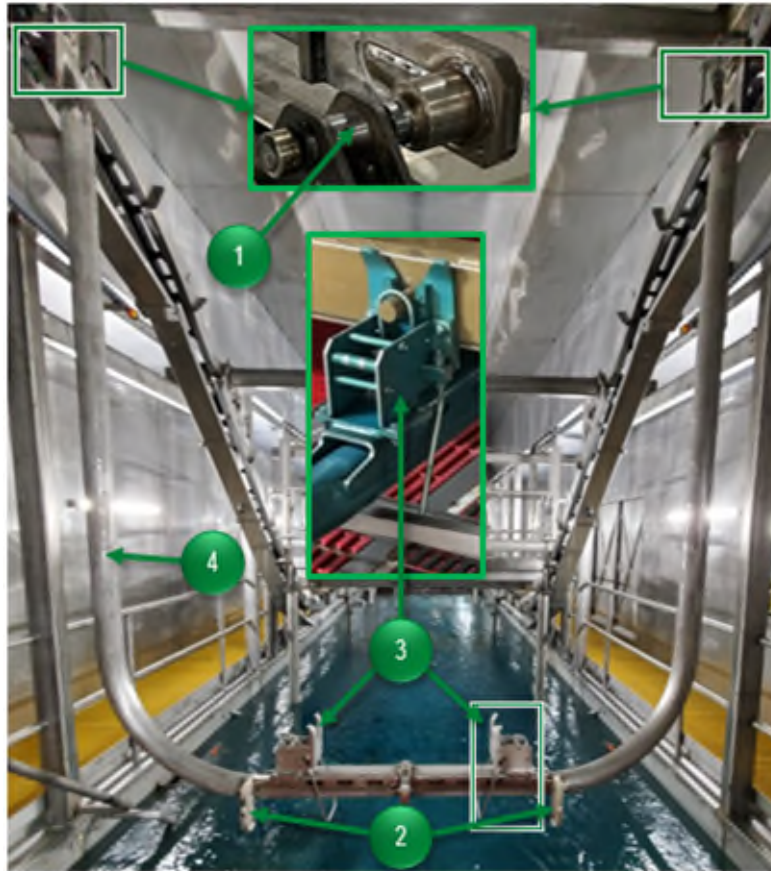
Item No.	Item Name	Required Operation	Description	Interval
8	Gearmotor	Inspection	<ul style="list-style-type: none"> Use the oil sight glass or remove the oil level plug to check the level of oil. Check that all electrical connections are secure. If loose, tighten. Check the electrical connections for evidence of arcing. If evidence of arcing has occurred, replace the damage connection. 	6 Months
		Lubrication	<ul style="list-style-type: none"> Replace the oil in the gearbox after 3 years of use. 	36 Months

Pendulum Take-Up Preventive Maintenance Items



Item No.	Item Name	Required Operation	Description	Interval
1	Slide Guides	Inspection	<ul style="list-style-type: none"> Inspect slide guides. Be sure the guides are moving freely and there is no excessive wear. Replace as needed. 	3 Months
2	Conveyor Chain Track	Inspection	<ul style="list-style-type: none"> Inspect the conveyor chain track. Be sure chain is moving freely around the curve. 	
3	Sensors	Inspection	<ul style="list-style-type: none"> Inspect the sensors for secure mounting, proper position, and function. 	12 Months

Penduls Preventive Maintenance Items



Item No.	Item Name	Required Operation	Description	Interval
1	Connecting and Pivot Points	Inspection	<ul style="list-style-type: none"> Inspect all connecting and pivot points for freedom of movement and wear. 	3 Months
2	Sliding Block	Inspection	<ul style="list-style-type: none"> Check for wear. Ensure that hardware is secure. Replace if worn. 	
3	Locking Devices	Inspection	<ul style="list-style-type: none"> Inspect locking devices for freedom of movement and function. Ensure that hardware is secure. 	
4	Pendul Arm	Inspection	<ul style="list-style-type: none"> Inspect arm for warped condition and check details for accurate seating. 	

Lubrication Requirements - Gearmotor Oil Lubrication

Gearmotor oil can be determined by reading the attached data plates on each gearmotor. The examples below highlight the location to observe the required oil on the data plates. Do not mix oil grades when adding oil. Refer to the manufacturer's instruction manual for additional service requirements and technical data.

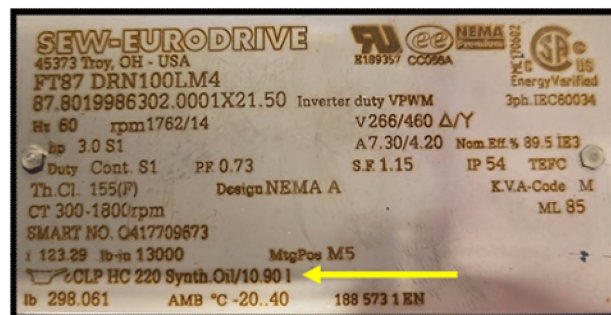
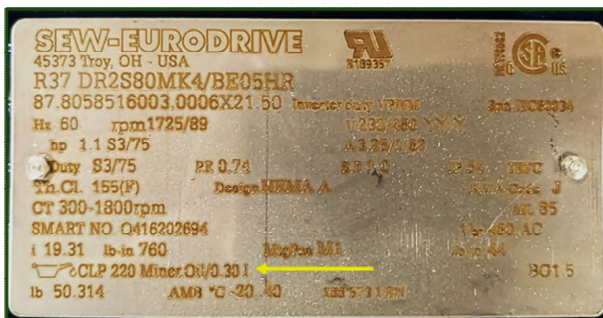
ⓘ NOTICE ⓘ

If you are doing a lubricant drain and refill, gearmotor manufacturers typically recommend that you use the same brand of lubricant originally supplied. If you are refilling the gearbox with a non-compatible lubricant, FATA recommends that you first remove any residual with a petroleum solvent or a hot water wash.

⚠ CAUTION ⚠

Do not use trichloroethylene as a washing solvent.

Data plates on the gearmotors identify the oil type and quantity that they use.



▲ Gearmotor Data Plate Examples

Lubrication Requirements - Grease

The table below lists the plant approved lubricants to use in conveyor components that need lubrication.

Plant Approved Lubrication Chart

Lubrication Name	Manufacturer	Conveyor Asset	Application Points
<i>See complete manual for plant approved lubricants.</i>			

Re-Lubrication Best Practices:

- Always clean the grease fitting of all dirt before attaching the grease gun. Failure to clean the grease fitting before applying grease could result in introducing contaminants into the component resulting in increased wear or clogging the grease fitting orifice so as not to allow the entry of grease. Inspect and replace any damaged fittings. It is helpful to use grease-fitting caps to keep them clean, but still wipe fittings clean before applying grease.
- Always make sure the dispensing nozzle of the grease gun is clean before using. Pump a small amount of grease out of the dispensing nozzle, then wipe the nozzle off with a clean rag or lint-free cloth before attaching it to the grease fitting.
- Do NOT over lubricate or apply excessive amounts of grease. This could lead to ruptured seals and excessive grease outside the fitting, which can attract contaminants and create additional unwanted conditions.
- Know that some greases are not compatible with each other. Ensure that the proper grease is used at every grease point. Applying the wrong grease can cause an incompatibility problem which can quickly cause failures.
- Once relubrication service is complete, clean off old grease and contaminants from the boot, grease/zerk fittings and surrounding components.