EMS 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 for the following components or assemblies:

- **EMS Rail**
- **EMS Carrier - Trolley Assembly**
- **EMS Carrier - Upper Frame Assembly**
- **EMS Carrier - Lower Frame Assembly**
- **EMS Shuttle**

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:

A	B	C	D	E
Item No.	**Item Name**	**Required Operation**	**Description**	**Interval**
1	Gearmotor	Inspection	• 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.

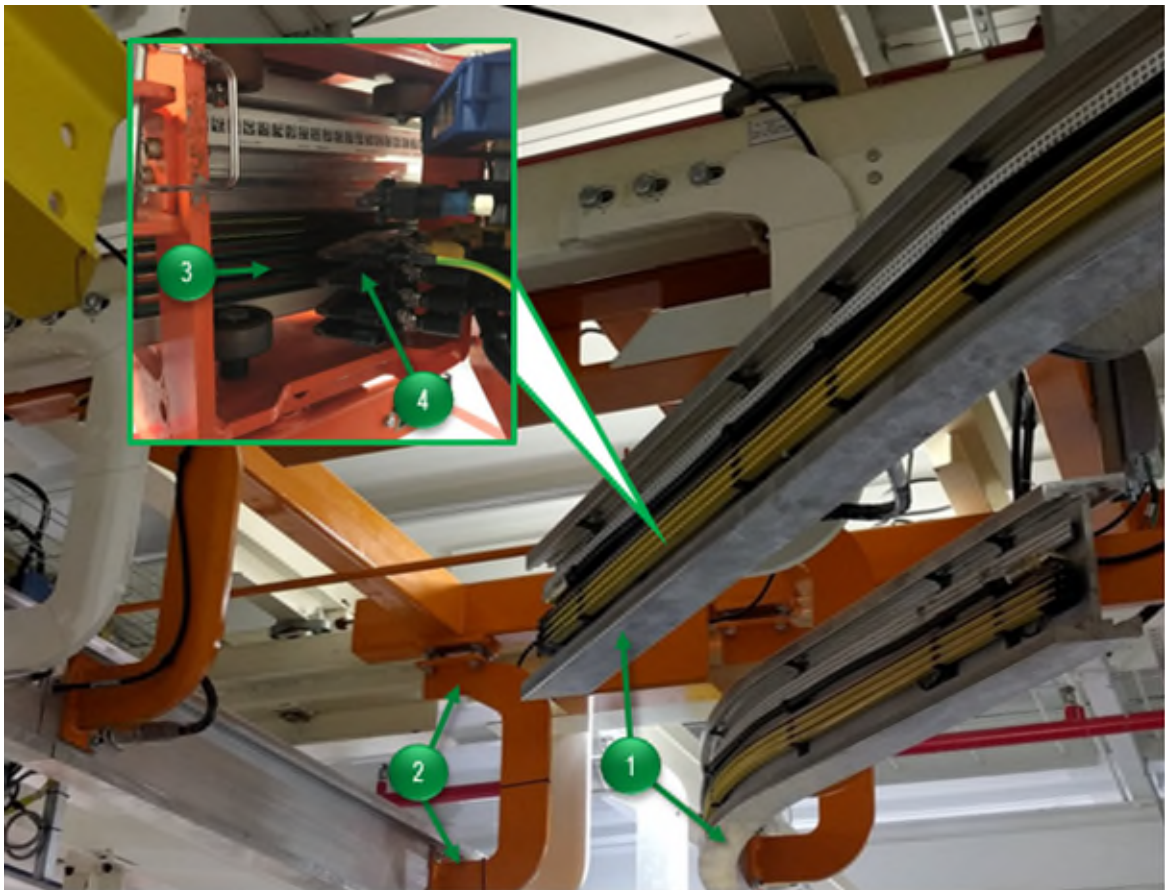
B. Component name within the assembly.

C. Required preventive maintenance operation - i.e., inspection or lubrication.

D. Detailed description of the operation(s) to be performed.

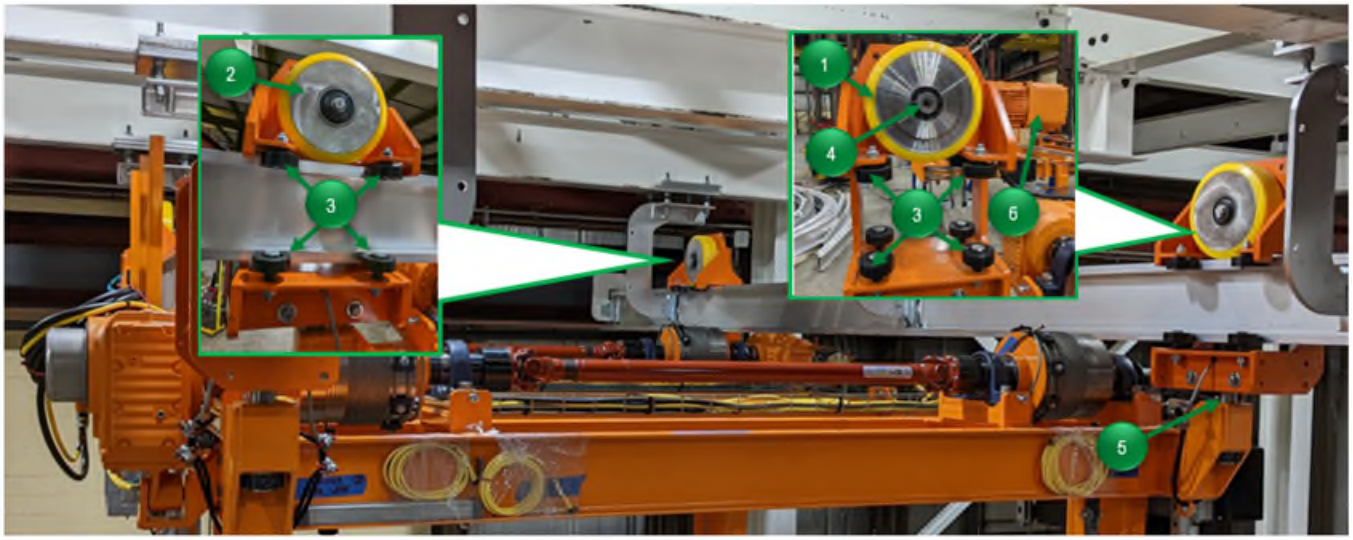
E. Recommended frequency of PM task.

EMS Rail Preventive Maintenance Items



Item No.	Item Name	Required Operation	Description	Interval
1	Rail	Inspection	• Inspect rail for damage and repair as needed.	**3 Months**
2	Yokes	Inspection	• Verify that mounting bolts are at their torque marking. Tighten if necessary.	
3	Rail Conductors	Inspection	• Check that the conductor rails are securely mounted to the rail.	
4	Vahle Brush Assembly/ Vahle Ground Brush	Inspection	• Check the brush assembly for wear, spring tension, and alignment. Misalignment is generally caused by a broken pressure spring. • Intermittent operation of the trolley control box maybe caused from worn brushes or springs. • Replace brushes when worn down to 2 mm [1/16”] or when the trolley control box functions intermittently. • Remove the brush plate assembly and check spring tension using a spring scale. Replace springs when spring tension is less than approximately 3.5 N [13 oz-ft]. Replace brushes or springs as required.	**6 Months**

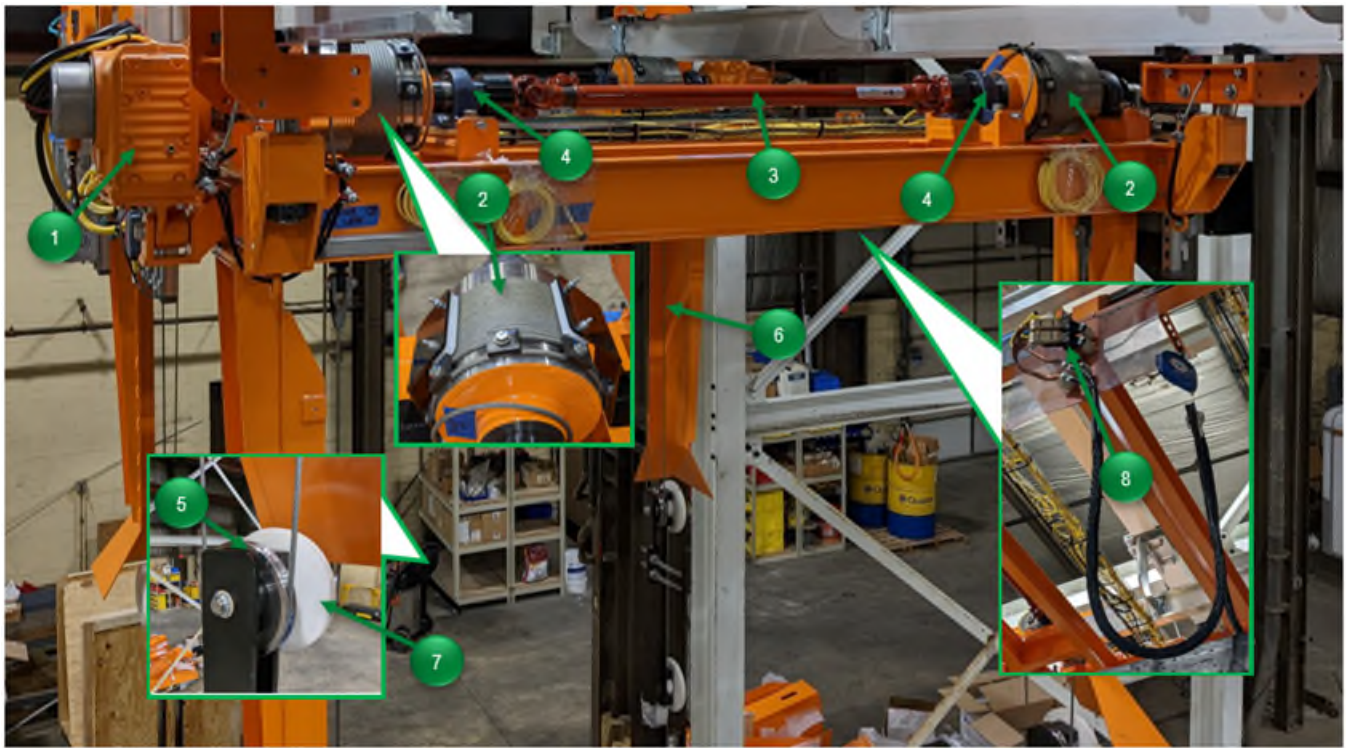
EMS Carrier Trolley Assembly Preventive Maintenance Items



Item No.	Item Name	Required Operation	Description	Interval
1	Drive Wheel	Inspection	• Check for cracks on the surface and sides of the drive wheel. • Check for wear of the 160mm diameter drive wheel. If the drive wheel has structural faults, or has worn to a diameter of less than 157.5mm, replace it.	**6 Months**
2	Idle Trolley Wheel	Inspection	• Check for cracks on the surface and sides of the wheel. • Check for wear of the 160mm diameter drive wheel. If the drive wheel has structural faults, or has worn to a diameter of less than 157.5mm, replace it. • Replace wheel when bearing noise is detected. • Check that the idle wheel is securely attached. If loose, tighten the M12 to appropriate torque value.	
3	Guide Rollers	Inspection	• Check the 50mm diameter guide rollers for wear, ease of rotation, and loose hardware. If the roller diameter is less than 48mm, replace it. • Replace roller when bearing noise is detected. If the guide roller bolt is loose, tighten it.	
4	B-Loc	Inspection	• Check the Clampex KTR-400 screw torque of the drive wheel's shrink disc. If loose, tighten according to manufacturer. ***See appendix item***.	

Item No.	Item Name	Required Operation	Description	Interval
5	Kingpin	Inspection	• Check the integrity of the kingpin. Replace if structural cracks or abnormal wear is detected. • Check that the kingpin is securely attached. If loose, tighten the M10 x 80mm lg. HHCS and M10 x 45mm lg. shoulder bolt with 8mm HRL nut to the appropriate torque values.	**6 Months**
6	Gearmotor	Inspection	• 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.	
		Lubrication	• Replace the oil in the gearbox after 3 years of use.	**36 Months**

EMS Carrier Upper Frame Assembly Preventive Maintenance Items

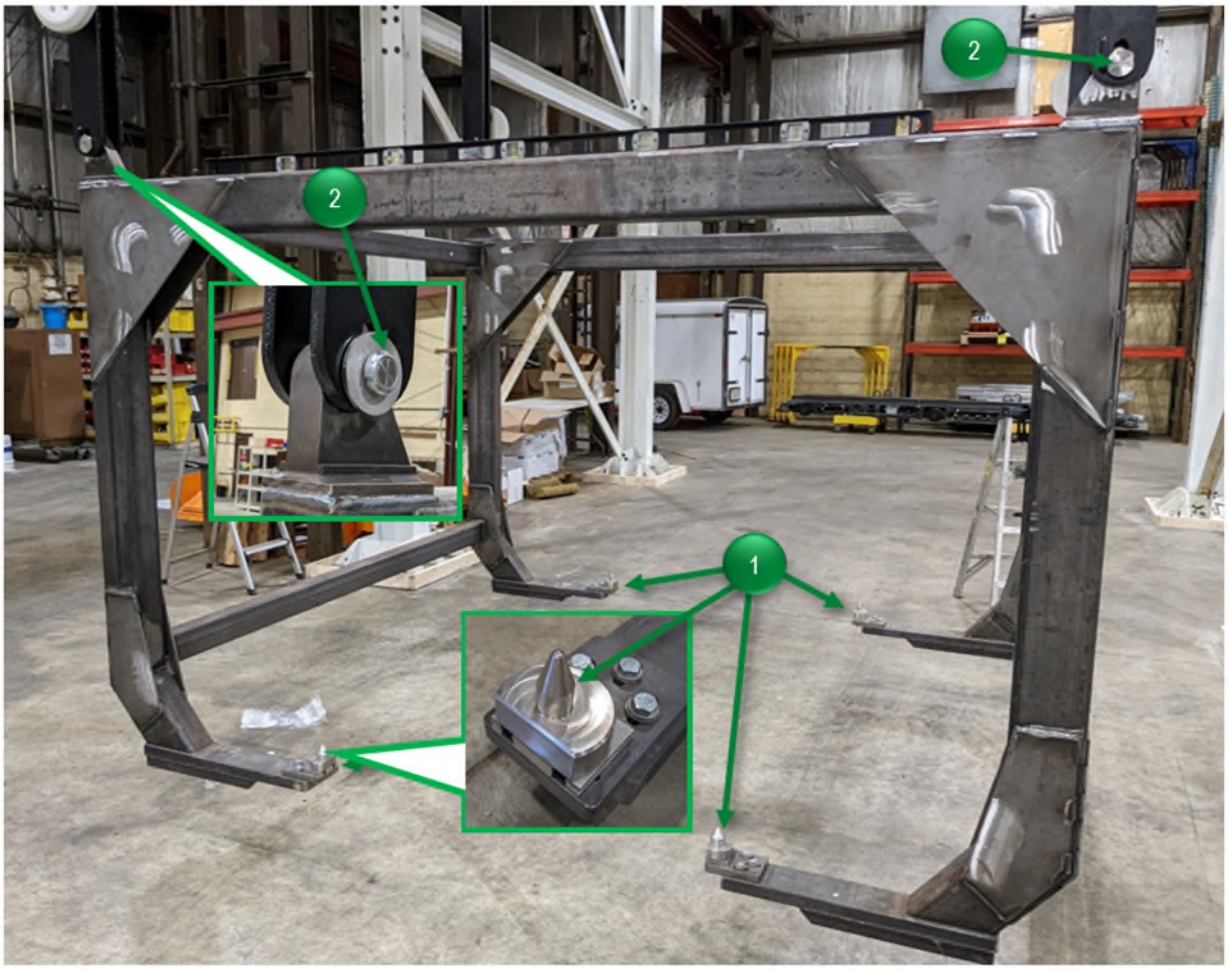


Item No.	Item Name	Required Operation	Description	Interval
1	Drum	Inspection	• Check surface for any damage that could affect proper use. • Verify that the wire rope has not shifted position on the drum.	**6 Months**
2	UHMW Rope Guide	Inspection	• Check wear surfaces are secure and functional. • Check for excessive wear or damage. Change as necessary.	
3	Cardan Shaft	Inspection	• Inspect all Cardan Shaft and Flange connections. Make sure they are secure by checking all paint marks. Retighten as necessary. • Inspect shaft and flanges for any cracks or damage, replace if any damage is found.	**3 Months**
		Lubrication	• Use a grease gun to apply plant approved grease, carefully pump grease into the zerk fittings. • Coupling is fully lubricated when you see grease leak from all four seals. Clean off all excess grease.	

Item No.	Item Name	Required Operation	Description	Interval
4	Pillow Block Bearings	Inspection	• 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.	**6 Months**
		Lubrication	• Grease directly with grease gun, or manifold if present, to apply plant approved grease, carefully pump grease into the zerk fitting. • Bearing is fully lubricated when you see grease leak around shaft. Clean off all excess grease.	
5	Pulley	Inspection	• Check for unobstructed movement of wire. • Check mounting hardware for proper tightness. Look for paint mark alignment on hardware – retighten if necessary.	
6	Wire Rope	Inspection	• Check rope connection for proper seating and attachment at anchor point. • Check for significant distortion of the wire rope structure such as kinking, crushing, unstranding, birdcaging, signs of core failure or steel core protrusion between the outer strands. • Make sure all wire rope clamps are secure. • See ***Appendix*** for additional wire rope instructions.	
		Lubrication	• Clean excess material and buildup prior to lubrication. • Using a brush or rag, apply a coat of plant approved lubricant.	**3 Months**
7	Link Guide Disk	Inspection	• Check for excessive wear or damage. Replace as necessary.	**6 Months**
8	Grounding Shoe Assembly	Inspection	• Check mounting hardware for proper tightness. Look for paint mark alignment on hardware – retighten if necessary. • Inspect the shoe and copper wire for excessive wear or damage. Replace as necessary.	

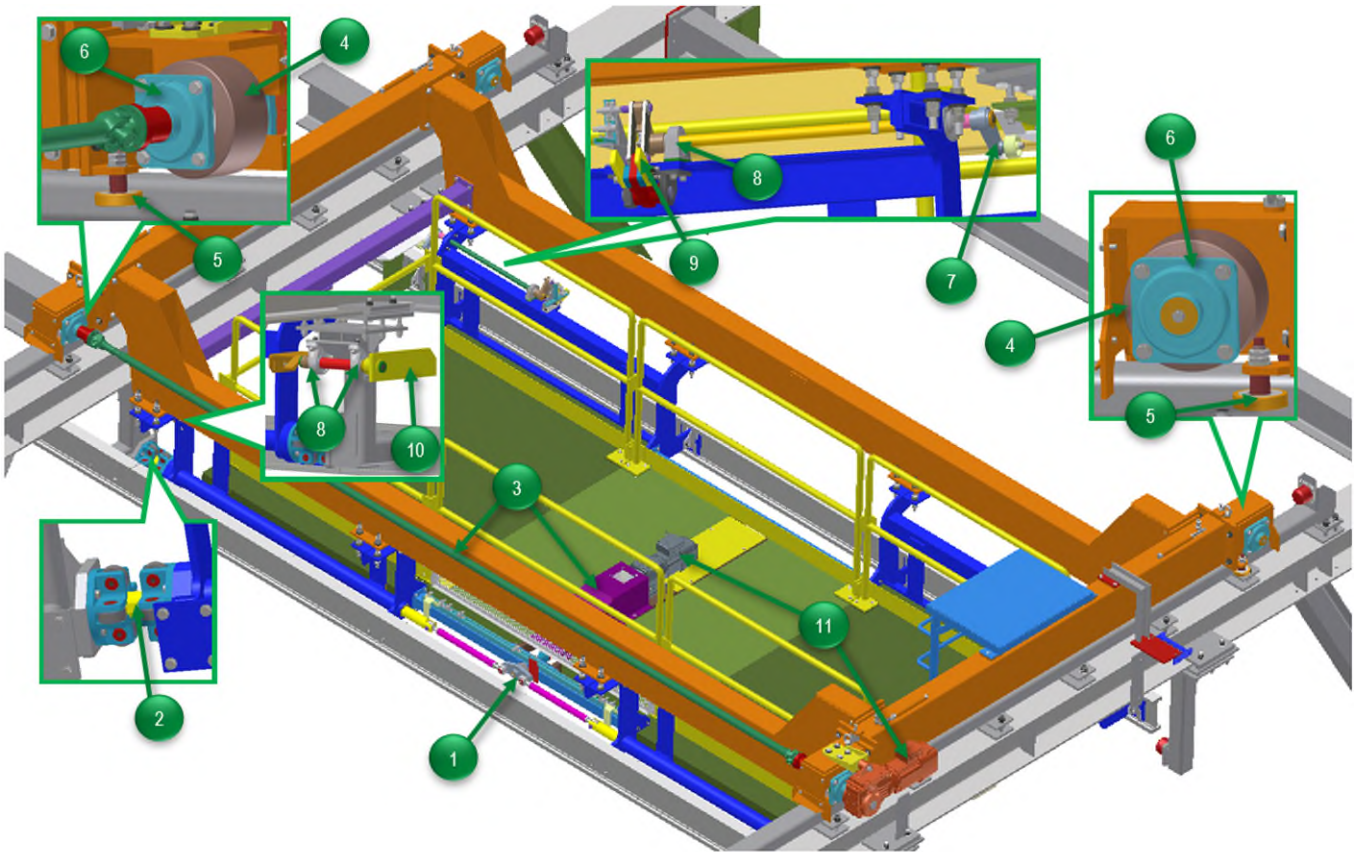
Item No.	Item Name	Required Operation	Description	Interval
9	Gearmotor	Inspection	• Use the oil sight glass or remove the oil level plug to check the level of oil. • Check that all electrical connections are secure. If loose, tighten. • Check the electrical connections for evidence of arcing. If evidence of arcing has occurred, replace the damage connection.	**6 Months**
		Lubrication	• Replace the oil in the gearbox after 3 years of use.	**36 Months**

EMS Carrier Lower Frame Preventive Maintenance Items



Item No.	Item Name	Required Operation	Description	Interval
1	Part Touching Details	Inspection	• Check for excessive wear or damage. Replace as necessary.	**6 Months**
2	Pins	Inspection	• Check for secure attachment.	

EMS Shuttle Preventive Maintenance Items



Item No.	Item Name	Required Operation	Description	Interval
1	Shot Pin Shaft	Inspection	• Check for bearing play and attachment.	**6 Months**
2	Shot Pin	Inspection	• Check pin for wear or damage, smooth operation.	
3	Cardan Shaft	Inspection	• Inspect all Cardan Shaft and Flange connections. Make sure they are secure by checking all paint marks. Retighten as necessary. • Inspect shaft and flanges for any cracks or damage, replace if any damage is found.	**3 Months**
		Lubrication	• Use a grease gun to apply plant approved 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.	
4	Shuttle Wheel	Inspection	• Check that abrasion does not exceed 6mm on diameter and that unevenness at the surface does not exceed 3mm.	**6 Months**

Item No.	Item Name	Required Operation	Description	Interval
5	Eccentric Guide Roller	Inspection	• Check guide roller for ease of movement and for bearing noise. • Check that the guide roller is properly secured to roller bracket weldment.	**6 Months**
6	Flange Bearing	Inspection	• Check mounting hardware for proper tightness. Look for paint mark alignment on hardware – retighten if necessary. • Check for housing damage.	
		Lubrication	• Grease directly with grease gun, or manifold if present, to apply plant approved grease, carefully pump grease into the zerk fitting. Clean off all excess grease.	
7	Locking Cam	Inspection	• Check wheel for abnormal wear, and/or cracks. • Examine for side and face cracks. Replace wheel if cracks are greater than 1mm or if worn down.	
8	Pillow Block Bearing	Inspection	• 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	• Grease directly with grease gun, or manifold if present, to apply plant approved grease, carefully pump grease into the zerk fitting. • Bearing is fully lubricated when you see grease leak around shaft. Clean off all excess grease.	
9	Trolley Locking Device	Inspection	• Inspect operation is functional and without sticking. • Inspect paddles for strike marks or wear.	
10	Carrier Locking Device	Inspection	• Inspect operation is functional and without sticking. • Inspect paddle for strike marks or wear.	

Item No.	Item Name	Require Operation	Description	Interval
11	Gearmotor	Inspection	• 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	• Replace the oil in the gearbox after 3 years of use.	**36 Months**

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.

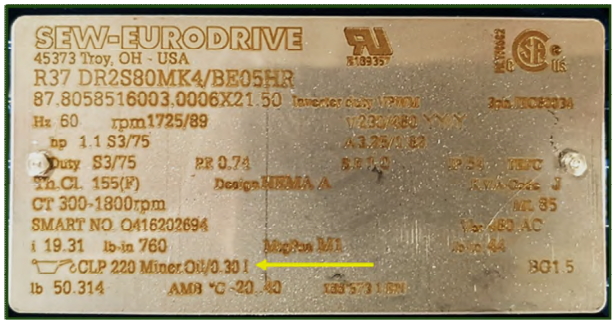
ⓘ NOTICE ⓘ

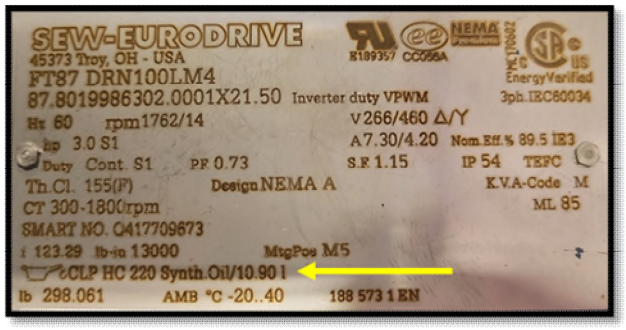
If you are doing a lubricant drain and refill, gearmotor manufacturers typically recommend that you use the same brand of lubricant originally supplied. If you are refilling the gearbox with a non-compatible lubricant, FATA recommends that you first remove any residual with a petroleum solvent or a hot 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
Mobilux EP-2	*Exxon Mobil*	4-Post Lift Pivot Table PRB NA PRB WA Shuttle	Bearings Cardan Shafts
Kluber Barierta L55/2	*Kluber Lubrication*	PRB HA	Bearings Cardan Shafts
Castrol #252	*Castrol*	PRB HA	Chains
Molub-Alloy 860/220-1	*Castrol*	EMS	Bearings Cardan Shafts
Lubecon 735	*Lubecon*	EMS 4-Post Lift	Wire Rope

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.