EG-06: PM Retrieval Crane (Mechanical)

SAFETY FIRST

- ☐ Follow all Caterpillar facility safety standards when performing this task.
- ☐ Crane must be powered down during PM check.
- ☐ If the transfer car and crane need to be moved during the PM check, notify personnel in the area when movement is expected.
- ☐ The area beneath the crane is dimly lit; use a flashlight as needed.
- ☐ A tripping hazard exists when moving around the rails in the aisle area.
- ☐ An overhead hazard exists due to building joists and frames. Check your overhead clearance.
- ☐ A heat hazard exists during the summer months when working within 10-20 feet of the ceiling. Be sure to drink plenty of water before spending an extended amount of time in the area.

EQUIPMENT

- ☐ flashlight
- ☐ prybar
- ☐ clean shop towels
- ☐ support blocks
- ☐ replacement parts
- ☐ channel locks
- ☐ 3/8” Allen wrench
- ☐ hammer
- ☐ pliers
- ☐ cotton gloves
- ☐ Visco
- ☐ 1 1/2” open end wrench

RESOURCES

- ☐ parts book
- ☐ PM Work Order form

PM Retrieval Crane (Mechanical)

Preparation

1. Ride in the crane and listen for unusual operating noises or sounds.

- ☐ Listen for excessive wheel bearing noise and grinding, popping, or squeaks.
- ☐ Check alignment of the rails.
- ☐ Check the wheels for flat sides.

2. Position the transfer car so it can be moved into the North Bay.

- ☐ Turn the air compressor valve fully counterclockwise to the open position. The air pressure must be 50-100psi for transfer car operation.
- ☐ Turn the air compressor power switch to the ON position.
- ☐ At the transfer car Control Panel, ensure that the RAM IN light is green.
- ☐ Using the foot switch, move the transfer car to the aisle where the crane is located. As you move the car, watch for the alignment light; slow the car movement as you approach the alignment light.
- ☐ When the TOP ALIGN light illuminates on the Control Panel, stop the car and press the RAM EXTEND pushbutton. The red RAM OUT light will illuminate. The top of the transfer car is now locked into position.

Note: The JOG ENABLE feature is now enabled. The JOG pushbutton is used for positioning.

3. Move the crane into the transfer car.

- ☐ Using the Panel Mate touchpad, select MANUAL MODE. Press CONFIRM MODE. Look at the display to verify that MANUAL is displayed.
- ☐ Ensure that both shuttles are centered. Look at JOG SHUTTLE 1 and JOG SHUTTLE 2. If the North or South indicator is blinking, then the shuttle is off-center.

  Example - Shuttle 2 is off-center: You correct the off-center by pressing RECENTER SHUTTLE 2 FROM SOUTH. Shuttle 2 will center.
- ☐ Enable the SAFETY BYPASS.

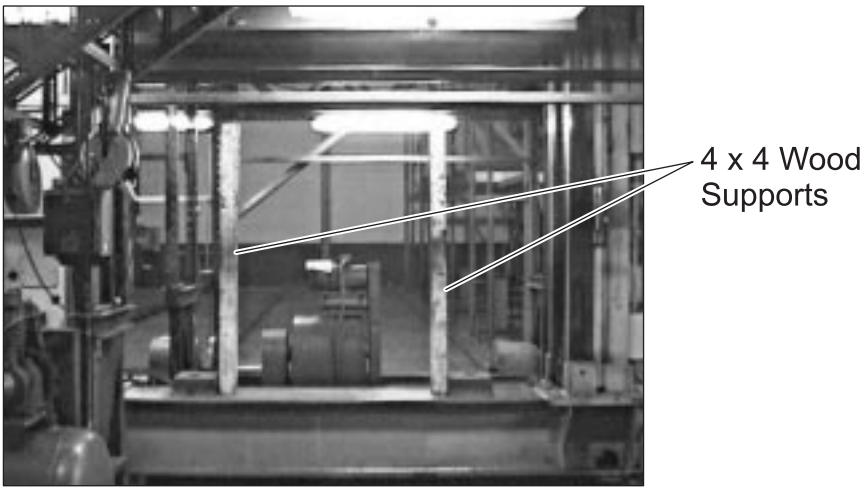
- ☐ Press JOG BRIDGE EAST SELECT to select the direction for crane movement.
- ☐ Press JOG BRIDGE CREEP SPEED EAST to select the speed of movement. After the crane passes the cabinet door, change the speed to SLOW. Continue crane movement until the crane is positioned 1/3 the way into the transfer car. After the crane is 1/3 way into the transfer car, place the crane into the CREEP mode.

Note: You have a risk of dislodging and/or damaging the collectors if the crane moves too fast. Position the elevator on the support blocks. See the figure below.

- ☐ Press JOG HOIST UP SELECT.
- ☐ Press JOG HOIST SLOW SPEED UP.

Note: Slow movement allows the Operator to stop the elevator if any overhang lights are detected in the elevator's path.

- ☐ Place the support blocks on the elevator base. See the figure below.



- ☐ Lower the elevator. Press JOG HOIST DOWN SELECT. Press JOG HOIST CREEP SPEED DOWN. Lower the elevator until it rests on the blocks.
- ☐ Using the power switch located below the Control Panel, power down the crane.

4. Lock out and tag the crane.

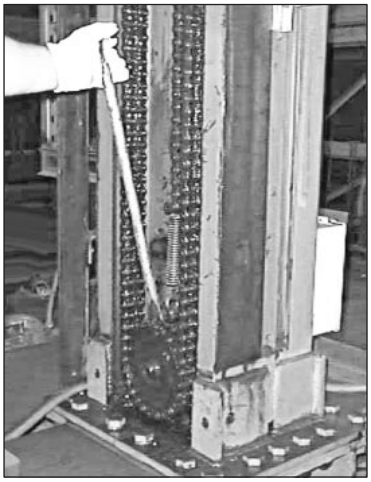
- ☐ Open the door to the transfer car Power Panel.
- ☐ Shut off the power to the North Main Bay.
- ☐ Close the cabinet door and apply lock and tag.

Sprocket Check

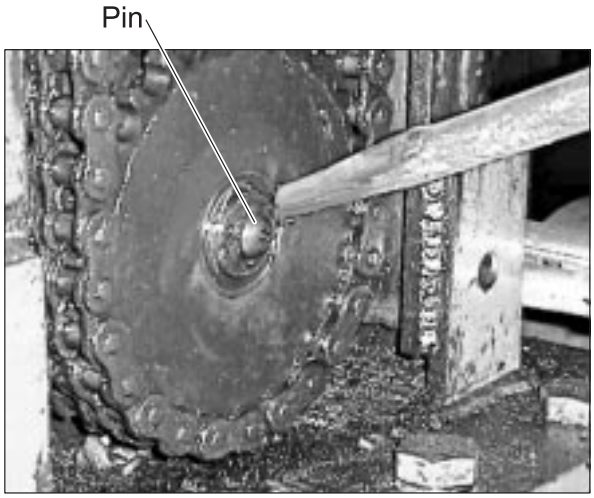
1. Ask the Electrician to release the brake.

2. Perform an inspection of the sprocket at the bottom of the elevator.

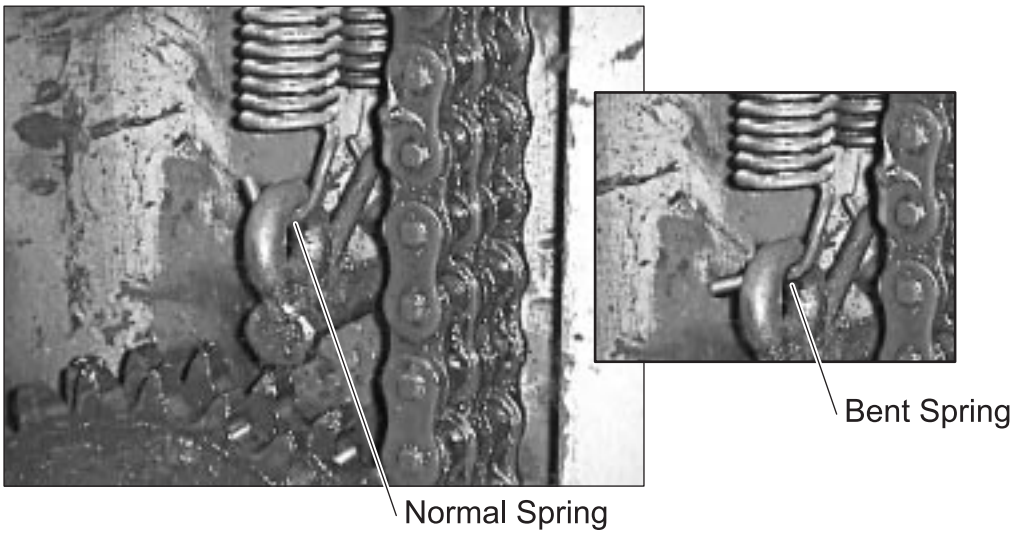
- ☐ Using a prybar, wedge the prybar behind the sprocket and try to pull out on the bar to check for looseness. See the figure below.



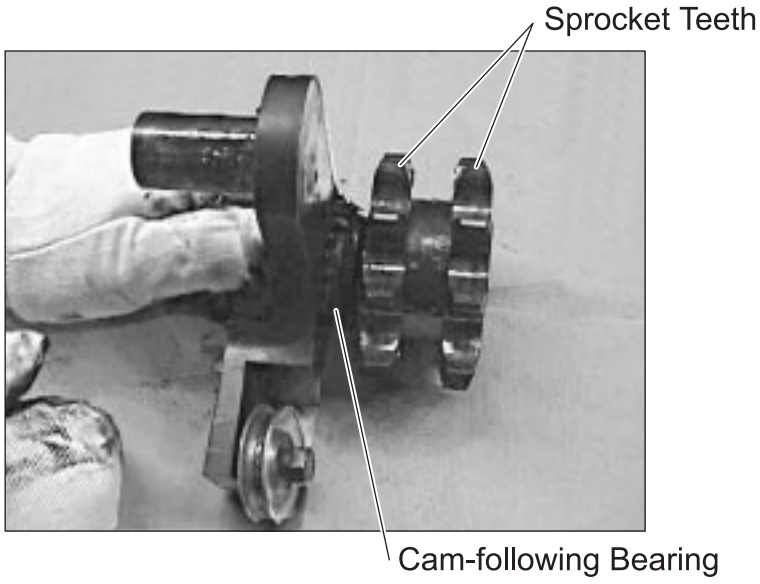
- ☐ Looseness may indicate a broken weld where the pin is welded to the block. If the pin is broken, replace the sprocket. To replace the sprocket, remove the springs and Allen nut.



- ☐ Ensure that the top of the spring is securely hooked through the eyebolt (not bent out). If bent, replace the spring. See the figure below.



- ☐ Inspect the sprocket teeth; pointed teeth indicate excessive wear. Replace the sprocket if the teeth are worn.



3. At the top of the crane, check the slack chain sprocket for wear.

- ☐ Check the cam following bearing and sprocket for wear.
- ☐ If worn, replace the sprocket. Using channel locks and an Allen wrench, remove the 3/8" nut. See the figure below.

- ☐ Pull the chain out of the way and remove the sprocket. Install the new or rebuilt sprocket. Rethread the cable over the pulley.

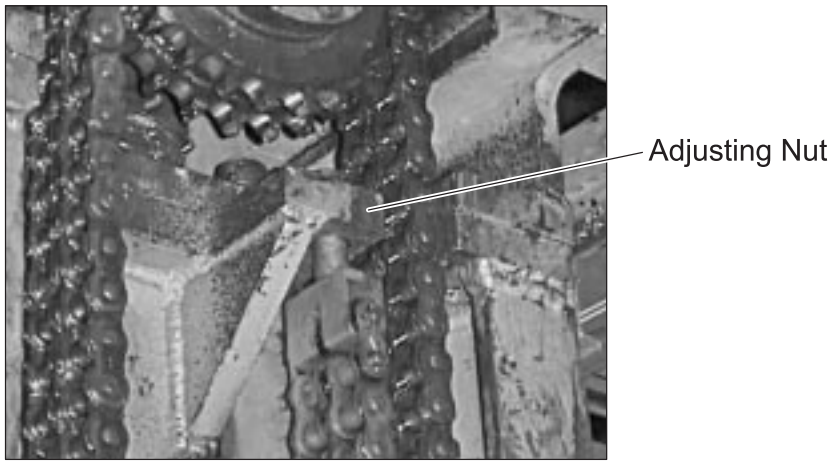
Note: The following inspections are performed at the top of the elevator. Using Visco and clean shop towels, wipe down the top of the elevator. Clean off dirt and debris to avoid slipping.

Shaft, Bearings, Gear Box

1. Check the bearings on the shaft.

- ☐ Check the bearing on the east and the west sides.
- ☐ Check the shafts for wear.

- ☐ Ensure that the nut threads are not stripped. See the figure below.



2. Check the gear box coupling to the main shaft.

- ☐ Check the bolts on the coupling for tightness. A flashlight may be necessary for this check.
- ☐ Check the bearings on the main shaft for looseness.

3. Ensure that the grease lines are connected.

Guide Rollers

1. Check the guide rollers.

- ☐ Ensure that the rollers spin freely, without binding.
- ☐ Ensure that the rollers are not nicked or cracked. See the figure below.

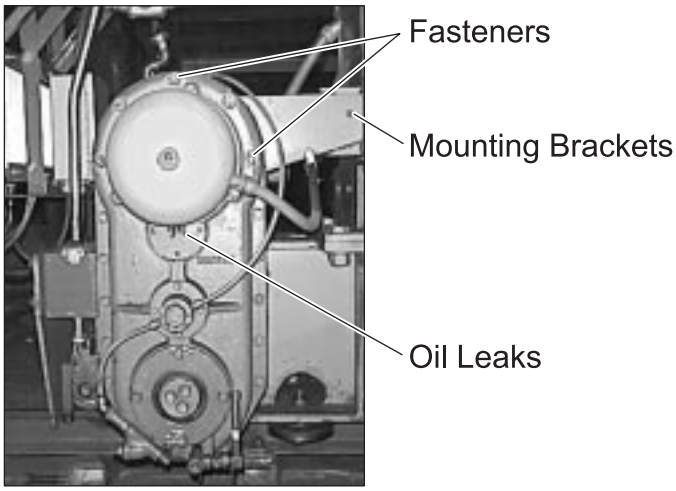
- ☐ Inspect the guide rollers for wear patterns.

Note: The following inspections are performed at the bottom of the elevator. Run the car out and lower the elevator.

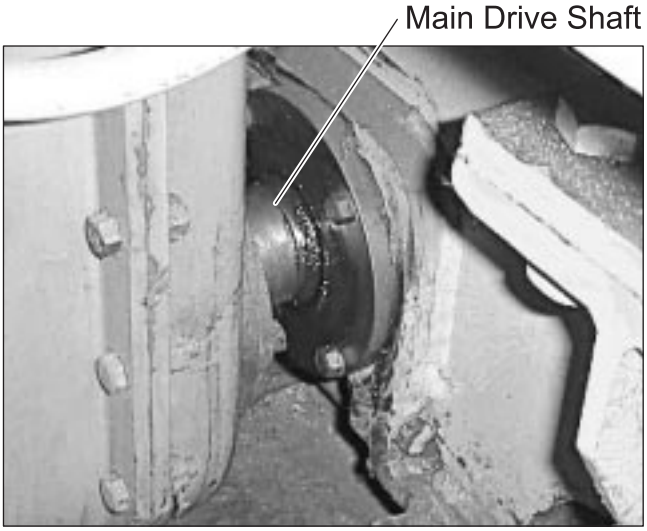
Gear Box

1. Check the gear box.

- ☐ Check the gear box fasteners for tightness. See the figure below.



- ☐ Inspect for broken welds on mounting brackets.
- ☐ Inspect for excessive oil leaks; ensure that the seal is not leaking.
- ☐ Check the bolts at the bottom of the main drive shaft for tightness. See the figure below.



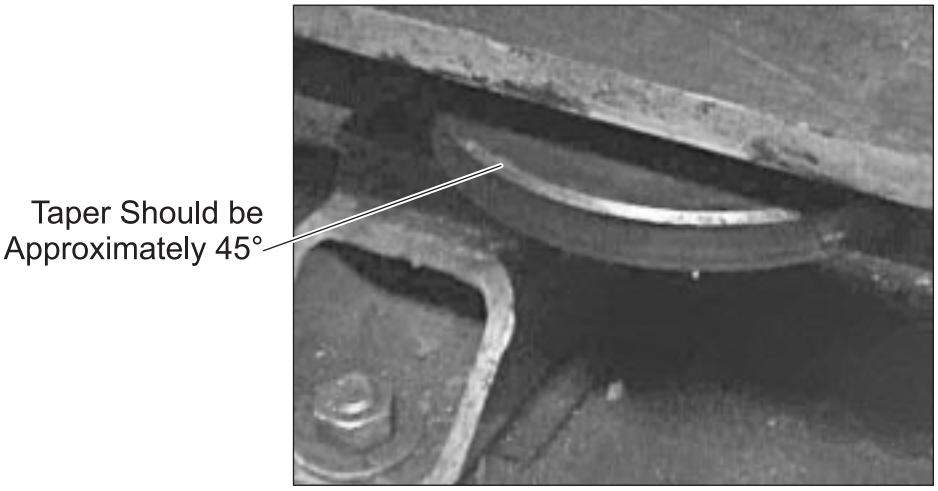
2. Check the front and back bearing housing.

- ☐ Check the bolts for tightness.

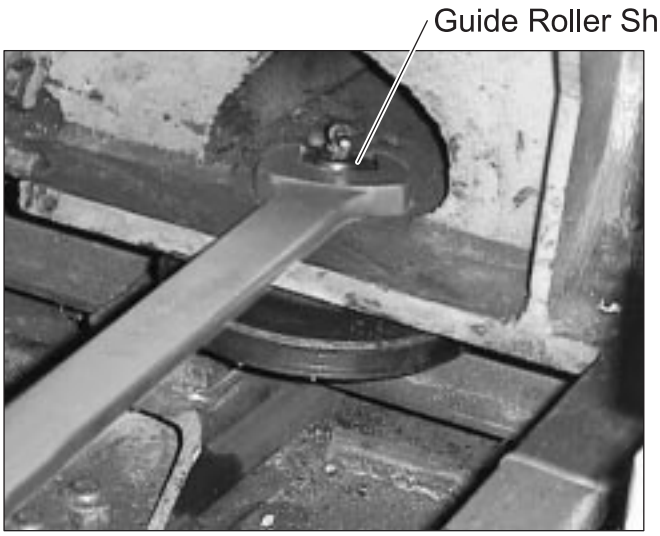
Guide Rollers

1. Check the four bottom guide rollers.

☐ Check for wear on the taper. See the figure below.



☐ Check for bearing play on the guide roller shaft. See the figure below.



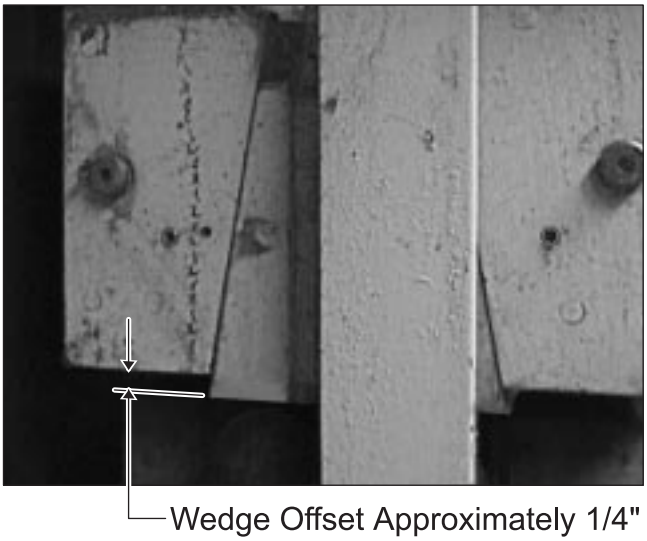
Speed Sensor Box

1. Check the speed sensor for the brake.

- ☐ Pull out on the chain to check for excessive slack between the bottom of the chain and the brake housing.
- ☐ Ensure that the turnbuckle (inside the brake housing) is not bent.
- ☐ Check for excessive chain slack above the housing. Wiggle the chain back and forth; chain must not slap against boxes or frame.

2. Check the brake wedges.

- ☐ When the brake is cocked, the wedge offset should not be more than approximately 1/4". See the figure below.



Shuttle

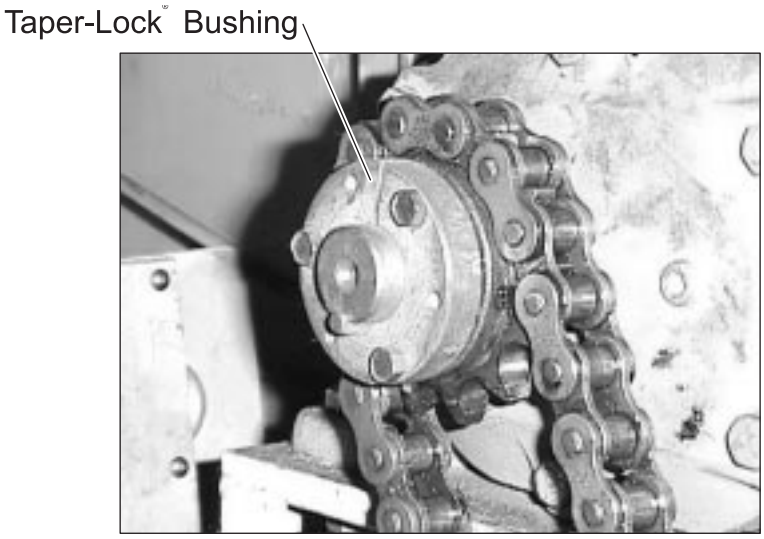
1. Check for excessive oil leaks.

2. Check the rubber pads.

☐ Ensure that the pads are in place, not peeling up. Apply glue and weights, as necessary, to repair. See the figure below.

3. Check the drive gear box.

☐ Check for fatigue cracks in the taper-lock bushing. See the figure below.



4. Check the chain for stretch.

- ☐ If stretch is excessive, tighten the chain. To tighten the chain, first loosen the adjusting screw on the gear box. Next, loosen the gearbox mounting screws.
- ☐ Using a 3/16" Allen wrench, turn the adjusting bolt counterclockwise until the slack is removed from the chain. See the figure below.

- ☐ Tighten the gear box mounting screws and adjusting screw.

5. Clean up the work area.

6. Complete the PM form to document the work history.