

G-35: PM and Repair Carrier (Power & Free)

SAFETY FIRST

- Follow all Caterpillar facility safety standards when performing this task.
- Cleaning carrier components requires the use of chemical solutions such as Visco. Wear rubber gloves to protect your hands and arms.
- Wheel assemblies are lubricated with Lubecon during preventive maintenance. Wear gloves to protect your hands from the hazards presented by the lubricant.
- The cabinet behind the maintenance rack houses 440 volt equipment. Do not open the cabinet when working in the area.
- An overhead hazard is present when working on the system. Lifting devices and parts may be moving on the carrier system.
- When the carrier is positioned on the maintenance stand it is important that the STOP be in the "closed" position. The STOP must also be in the "closed" position when the carrier is returned to service. Be aware of pinch points when moving the carrier.
- Jeeps and trains move around the aisles of the work area. Be aware of personnel working near the maintenance rack.

EQUIPMENT

- Visco or other approved degreaser
- Lubecon
- protective cloth gloves, rubber gloves
- cleaning tank
- shop towels
- replacement parts
- dovetail gauge
- drift pin
- air scribe
- punch
- impact wrench
- hammer

RESOURCES

- PM form



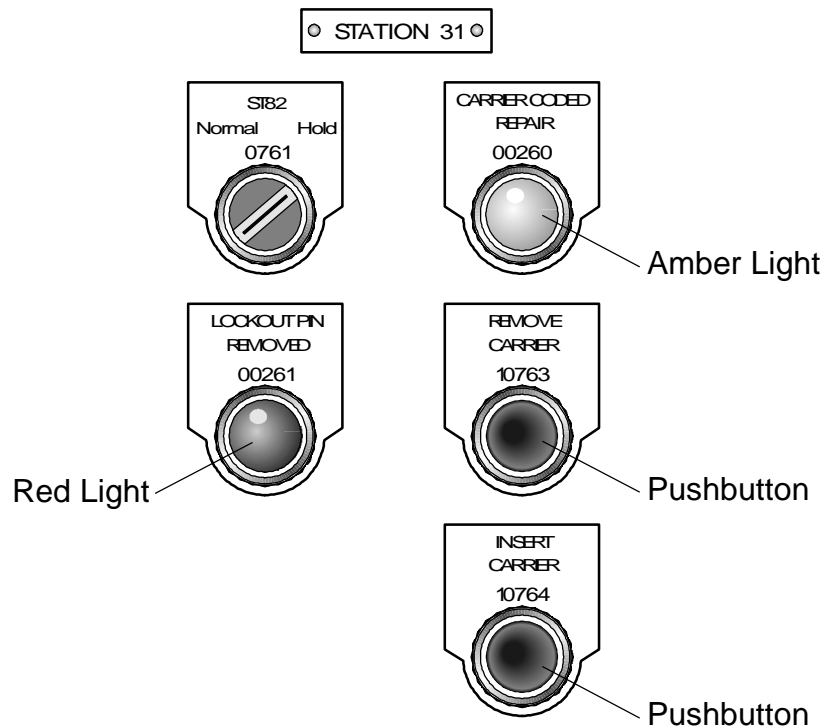
PM and Repair Carrier (Power & Free)

Part 1: Load Carrier on Maintenance Rack

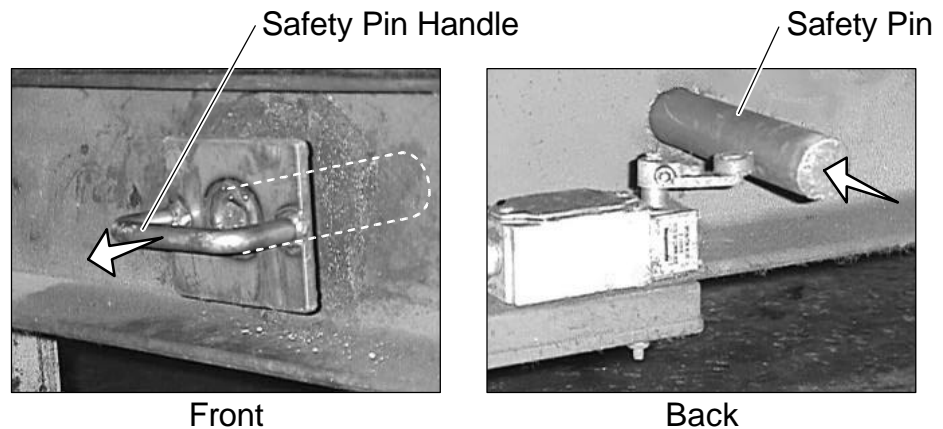
1. Ask for the carrier.

Note: There are two methods of asking for a carrier. You can hang a red "Send to Repair" tag on the carrier; or the Electrician can code the carrier to the maintenance station.

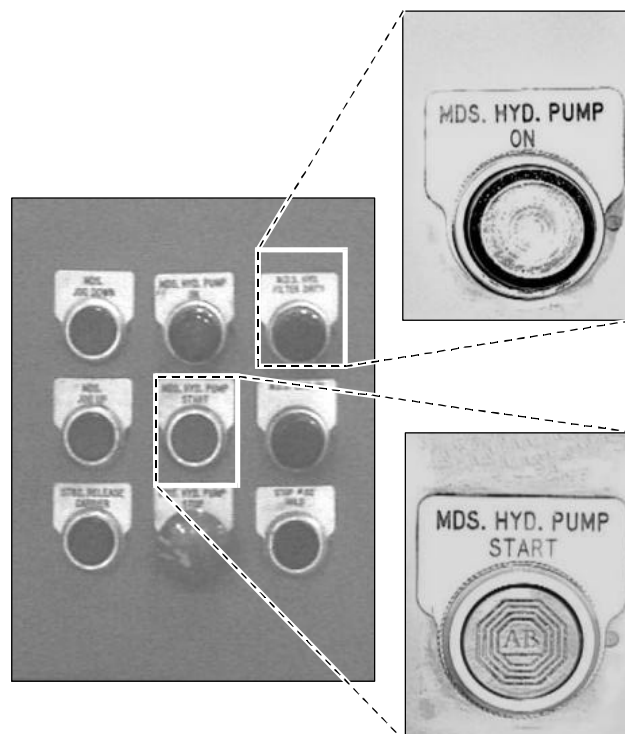
- Supply the Electrician with the carrier number or tag the carrier.
- When the carrier is coded to the maintenance station (Station 31), the amber light illuminates on the Station 31 Control Panel.
- Place the ST82 switch in the HOLD position. The Station 31 Control Panel is shown below.



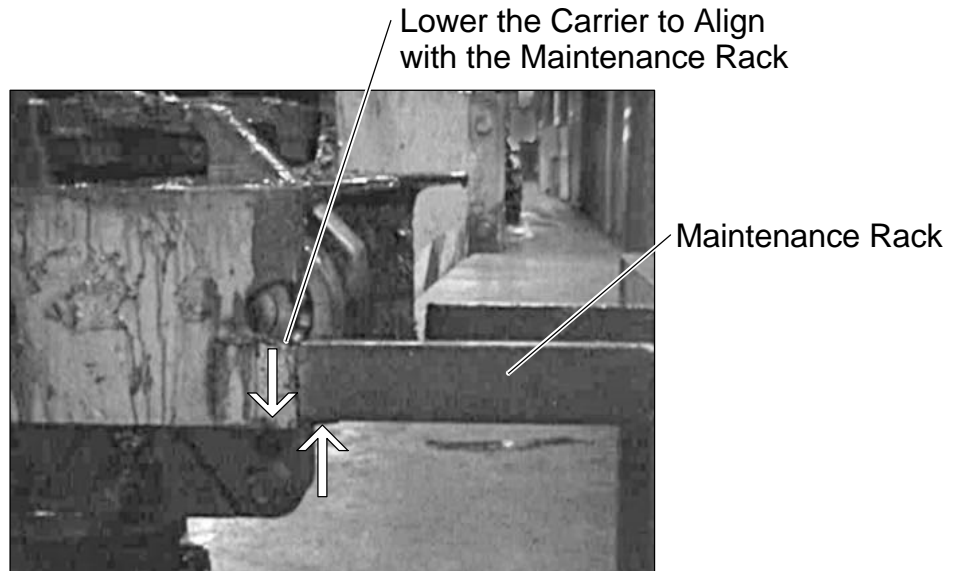
2. Remove the safety pin from the hydraulic lift.
 - The safety pin is located on the bottom section of the hydraulic lift. Removing the pin permits hydraulic lift movement. See the figure below.



3. Power up the hydraulic lift.
 - Press the MDS. HYD. PUMP START pushbutton located on the hydraulic lift Control Panel. The MDS. HYD. PUMP ON light will illuminate. See the figure below.

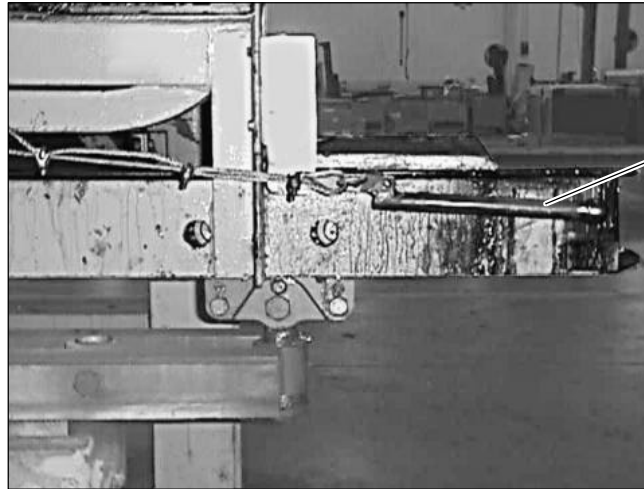


4. Remove the hanging devices from the carrier.
 - Press the MDS. JOG DOWN pushbutton to lower the carrier. Lower the carrier enough to access the lifting devices.
 - Unhook the devices and set them aside.
5. Vertically align the carrier to the maintenance rack.
 - Using the air control, move the carrier maintenance rack horizontally so that it is positioned to receive the carrier. It will hit positive stop.
 - Using the MDS. JOG DOWN pushbutton, continue to lower the carrier until it is parallel with the rack. The lift will “bottom out” when aligned (parallel) with the maintenance rack. See the figure below.



6. Open the STOP.

- The STOP is located on the hydraulic MDS (Main Drop Section) lift frame. See the figure below.



STOP Handle in Open Position

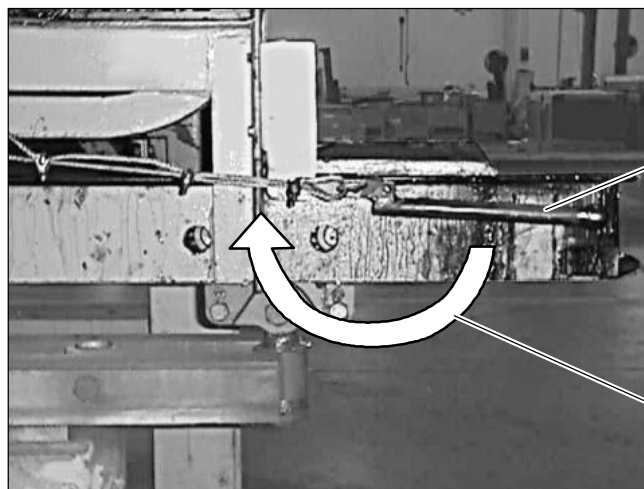
7. Push the carrier out of the hydraulic lift and onto the rack.

Caution: Be aware of potential pinch points when moving the carrier.

8. Close the STOP.


Note: It is very important to close the STOP. If left in the open position, the STOP handle will hang up on the puller dogs in the drive chain.

- Swing the STOP handle in the counterclockwise direction, as shown below.



STOP Handle in Open Position

Turn to Close

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9. Using the MDS. JOG UP pushbutton, move the lift up approximately two inches.
 10. Move the carrier maintenance rack station back to its original position.
 11. Restore the hydraulic lift to the normal operating position.
 - Using the hand-operated control, raise the lift until the two safety pin holes align.
 - Insert the safety pin.
 - Press the MDS. HYD. PUMP STOP pushbutton to shut off the hydraulic pump.
 12. Release the next carrier at Stop 81.
 - Press the REMOVE CARRIER pushbutton. The amber light will go out.
 - Set the Station 31 switch to NORMAL.
 - Press ST82 RELEASE CARRIER.

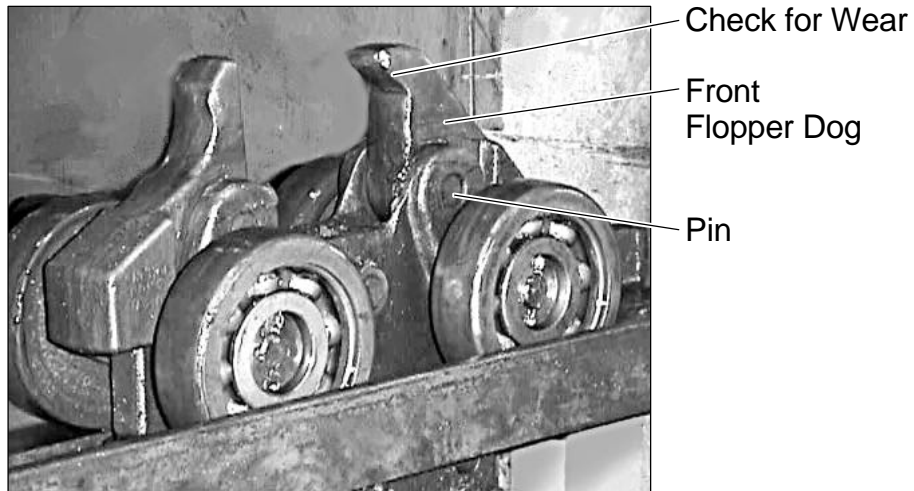
Part 2: Inspect the Carrier Components

Note: Before beginning inspection, lock open the anti-backup dogs. Place a shop towel or other item under the anti-backup dogs to hold them in the “released” position. See the figure below.



Front Flopper Dog:

1. Check for movement.
 - The front flopper dog should move freely on the shaft, without binding or rocking side-to-side. Excessive looseness may indicate a worn pin or worn dog.
 - Replace the trolley assembly, as necessary.
2. Inspect for wear.
 - Check for wear on the point of the front flopper dog. Look for rounded edges. If the edges are worn, the flopper dogs will not pick up the carriers.



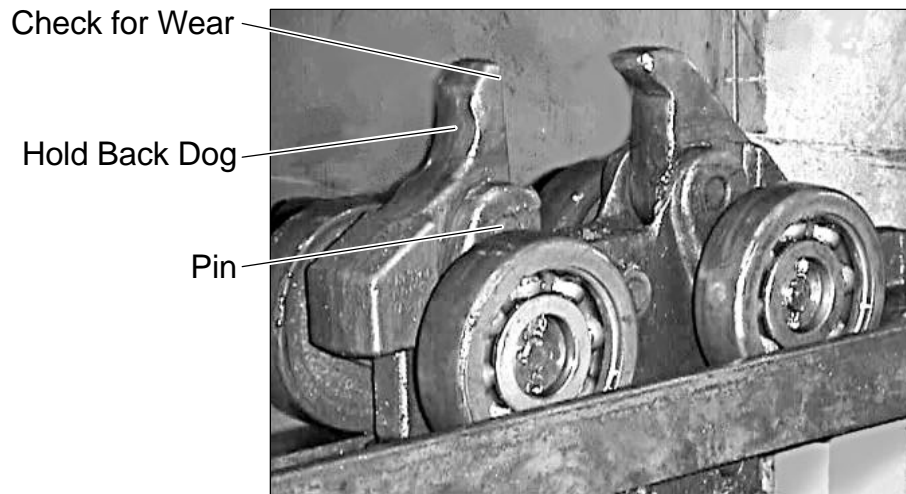
- Replace, as necessary.

Hold Back Dog:

1. Check for movement.
 - The hold back dog should move freely on the shaft, without binding or rocking side-to-side. Excessive looseness may indicate a worn pin.
 - Replace the trolley assembly, as necessary.

2. Inspect for wear.

- Check for wear on the point of the hold back dog. Look for rounded edges. If the edges are worn, the hold back will not stop the carriers. See the figure below.

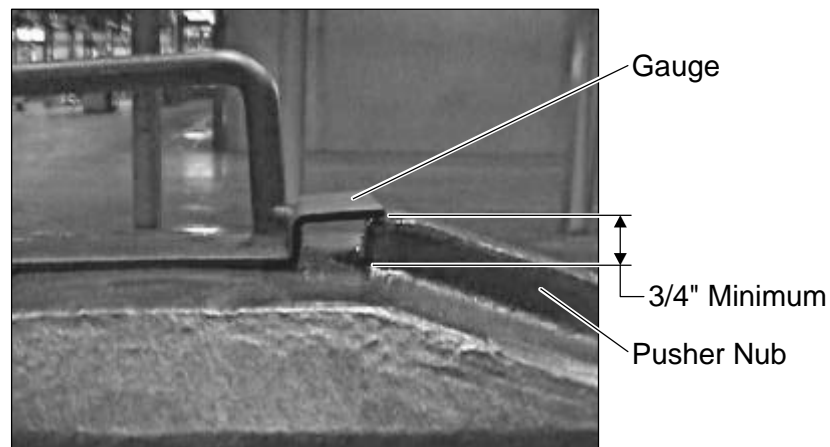


- Replace the trolley assembly, as necessary.

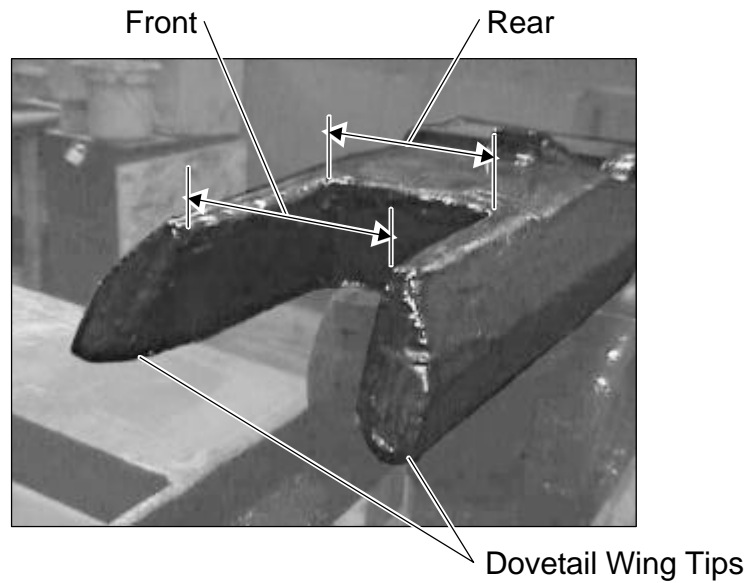
Dovetail:

1. Inspect the pusher nub for excessive wear.

- Slide the gauge onto the dovetail until the “L-shape” slides over the pusher nub.
- Look for the gap between the gauge and the top of the nub. If the height of the nub is less than 3/4 inch, the nub must be built up. See the figure below.

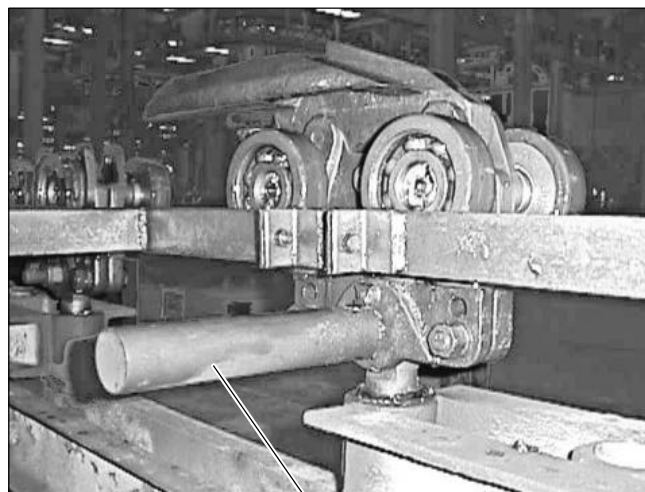


- If the nub must be built up, notify a Welder. The Welder will use a hard surface rod to build up the nub.
2. With the gauge mounted on the dovetail, check the clearance between the wing tips.
- Clearance between the wing tips should be the same from the front of the tips to the rear of the tips. See the figure below.



3. Check the tripping pin for tightness. See the figure below.

Note: The tripping pin actuates the switches on the line.



- If the tripping pin is worn, turn the pin over; if bent, straighten.

- The tripping pin should not be loose. If the tripping pin is loose, tighten the nut.

Anti-Backup Dog:

1. Check for movement.

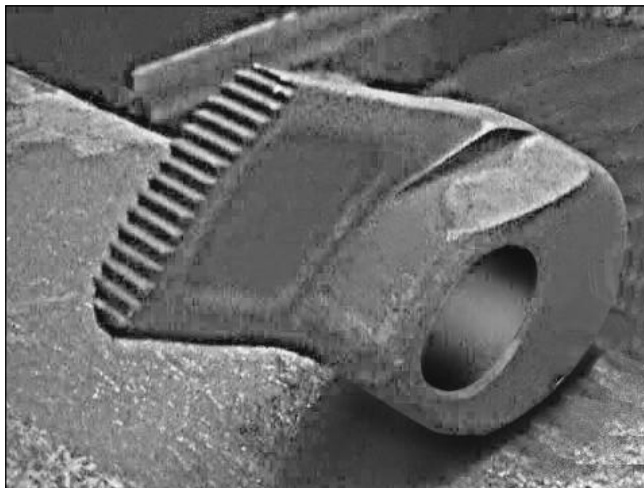
- The anti-backup dog should move freely on the shaft and without binding.
- Place shop towels under the weights. See the figure below.



- Replace dog, sleeve, or shaft, as necessary.

2. Check the teeth for wear.

- Check the teeth for rounded or broken corners. Worn teeth allow backward movement. A new anti-backup dog is shown below.



- Remove the towels from underneath the weights.

- Push the carrier backwards. The teeth should catch.

Center Guide Rollers:

1. Check for movement.

- The rollers should spin freely, without side-to-side movement. Excessive movement could indicate worn or broken bearings or shaft. See the figure below.



Center Guide Roller

- Replace the bearing assemblies or shaft, as necessary.

Pin Sleeves:

1. Check the cap plug.

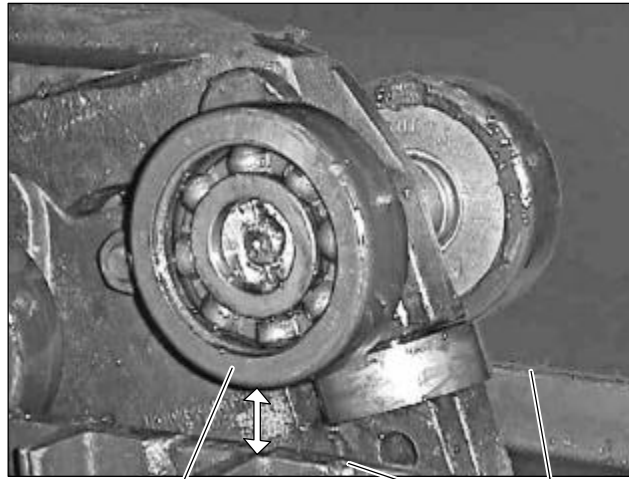
- The cap plug should fit tightly. Replace loose fitting or missing caps. See the figure below.



2. Check for broken or missing grease fittings. Replace, as necessary.

Wheels and Wheel Bearings:

1. Check wheels and wheel bearings for looseness.
 - Using the air hoist, lift the wheels off the rail. See the figure below.



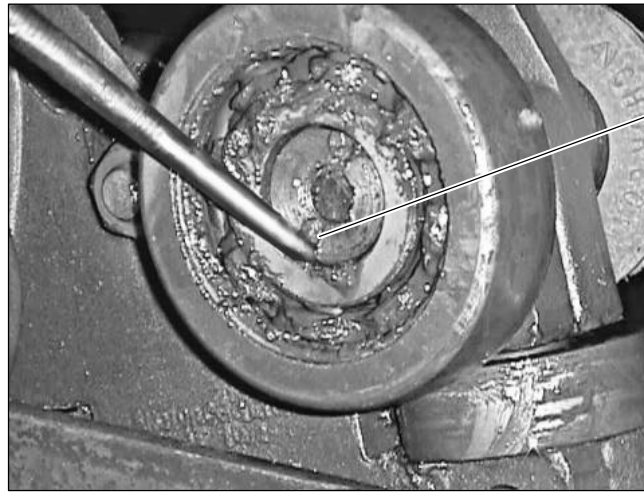
Wheels Lifted
Off Rails

Rails

- Spin the wheels to check the wheel bearings for play. Try to move the wheels side-to-side to check for looseness. Excessive bearing play indicates worn or damaged bearings.
 - If a wheel assembly needs replacement, continue to step 2. If not, go to Part 3.
2. Replace the wheel assembly.

Note: If replacing the wheels on a dovetail trolley, use a strap to lift the trolley off the rail.

- Using a hammer and drift pin, break the nut loose and remove the nut. See the figure below.



Tap Drift Pin
to Loosen Nut

- Pull the wheel off the shaft and discard the wheel in the scrap metal bin.

Note: If replacing the wheel on the opposite side, tap the end of the shaft to force the shaft out the other side of the trolley.

- Obtain new wheels from the crib.
- Using an air scribe, write the current date on the side of the new wheel. See the figure below.

Date Scribed on Wheel



Note: Documenting the installation date will provide information on longevity.

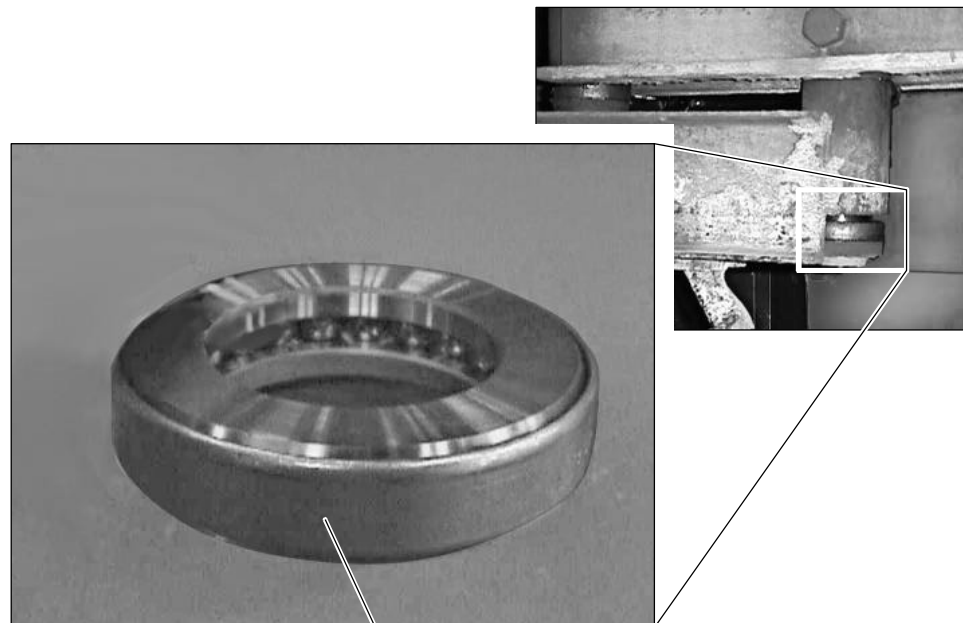
- Slide the wheel on the pin.
- Align the keyway on the pin with the key in the bore.
- Using a hammer, tap the pin into the trolley.

Note: Be sure that the second key is in place before installing the second wheel.


- Install the wheel on the other end of the pin.
- Using an impact wrench, install the nuts.
- Seat nuts using a drift pin and hammer.
- Center punch the nuts to prevent the nuts from loosening.
- Lower the trolley and remove the lifting device.

Part 3: Lubricate and Clean Carrier Components

1. Using a grease gun, apply grease to the side and bottom fittings on each rail assembly.
2. Inspect the pin thrust bearings.
 - Attach the tee lifting device and the hoist to remove the weight from the bearings.
 - Check the bearings for wear. Replace as necessary. A pin thrust bearing is shown below.



Thrust Roller Bearing

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- Using a grease gun, grease the two fittings for the pin thrust bearings. Trigger the grease gun approximately three times at each fitting.
 - 3. Apply grease to the side and bottom fittings on each rail assembly.
 - 4. Coat the wheel assemblies with a heavy coat of Lubecon.
 - 5. Clean and check the card code bracket and number plate.
 - Using Visco cleaner and shop towels, wipe off the surfaces and edges of the bracket.

Note: A clean carrier number plate can be identified easily from the floor. The bracket reads the code for the carrier.

- Check the card code fasteners for tightness. Tighten wrench-tight, as necessary.

Part 4: Return Carrier to Service

1. Prepare to position the carrier in the hydraulic lift.
 - Using a shop towel, open the backup dogs.
 - Check to ensure that no carriers have been released from Stop 81.
 - Move the Station 31 switch to the HOLD position.

Note: This will prevent the carrier from moving.

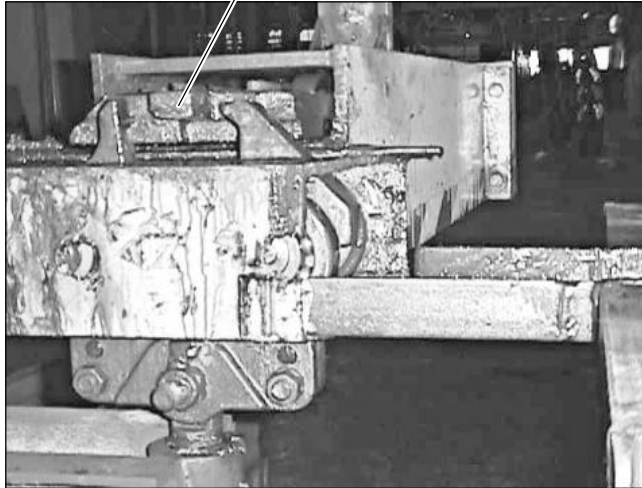
- Remove the safety pin. The red PIN REMOVED light will illuminate.
- Press MDS. HYD. PUMP START to power up the hydraulic pump.

CAUTION: Check to ensure that no carriers are on the way to the station. The area must be clear of obstructions when lowering the hydraulic lift. There must be no lifting devices in the path and the line must be clear.

2. Move the maintenance stand out until it is horizontally aligned with the hydraulic lift.
3. Press MDS. JOG DOWN to lower the hydraulic lift.
4. Open the manual STOP.

5. Push the carrier onto the lift until the carrier is aligned with the STOP.

Align the Stop with the Carrier



6. Close the manual STOP.

Note: It is very important to close the STOP. If the STOP is left in the open position, the handle will hang up on the puller dogs in the drive chain and/or the carrier may takeoff unexpectedly.

7. Release the backup dogs.
8. Using the hydraulic lift, raise the carrier into position.
 - Press the MDS. JOG UP pushbutton to raise the carrier to a height that allows easy installation of the lifting devices on the hooks.
9. Install the safety pin.

WARNING: An overhead hazard exists when working under the carrier area. Lifting devices and parts may be moving on the carrier system.

- Continue to jog the lift up until the safety pin holes are aligned.

- Insert the safety pin.

10. Return the maintenance rack to its original position.

Note: You must move the maintenance stand. If the stand is not moved back, Stop 82 will not open.

11. Restore the station to normal operating condition.

- Press MDS. HYD PUMP STOP to power down the hydraulic pump.
- Return the Station 31 switch to the NORMAL position.

CAUTION: When the Station 31 switch is in the NORMAL position, carrier movement is enabled. If the carrier does not move, press the INSERT CARRIER pushbutton.

12. Clean up the work area.

13. Document the work history.

