

G-09: Repair Conveyor (Power & Free - Track Section/Extender/ Pull Chain)

SAFETY FIRST

- Follow all Caterpillar facility safety standards when performing this task.
- The conveyor must be locked out and tagged when replacing a track section, adding an extender, or replacing a pull chain.
- An overhead hazard exists due to the rails and track components of the overhead conveyor system.
- A manlift will be required to access the system. Look for possible obstruction in the area where the manlift will be operated.
- A flashlight may be needed due to low lighting.
- A heat hazard exists when working within 10-20 feet of the ceiling during the warm months, drink plenty of water. A heat hazard also exists from the hot metal as a result of the welder cutting the track.
- Prior to performing the task you must call a fire watch to ensure that there is no risk of welding sparks igniting material in the area. Be sure to clear the area of any combustible items prior to welding.
- Watch for pinch points when releasing the air cylinder.
- The pull chain is heavy; be careful when lifting and lowering the pull chain. Ask for assistance, as necessary.

EQUIPMENT

Part A: Replace Track Section

- manlift
- replacement track section
- 9/16-inch open end box wrench
- C-clamps
- socket/ratchet
- hammer
- flat tip screwdriver
- measuring tape
- 4-inch air grinder
- tyvek suit





- cotton gloves
- scribe
- lock and tag
- tri-square

Part B: Add Extender

- manlift
- 5/8-inch combination wrench
- 3/4-inch combination wrench
- flat tip screwdriver
- replacement parts
- tyvek suit
- cotton gloves
- lock and tag

Part C: Replace Pull Chain

- manlift
- 9/16-inch open end wrench
- 9/16-inch socket wrench
- come-a-long
- two straps
- replacement pull chain segment
- hammer
- screwdriver
- tyvek suit
- cotton gloves
- lock and tag

RESOURCES

- none required

Repair Conveyor (Power & Free - Track Section/Extender/Pull Chain)

Part A: Replace Track Section

1. **Lock out and tag the conveyor system at the disconnect switch.**
2. **Prepare the work area.**
 - Clean the floor area underneath the section of track that will be replaced. Clear the area of any materials that could be ignited by a welding spark.
 - Call a fire watch.
3. **Close the two valves on the air cylinder to release the tension on the pull chain.**
 - Using a manlift, position yourself underneath the track section to be removed.

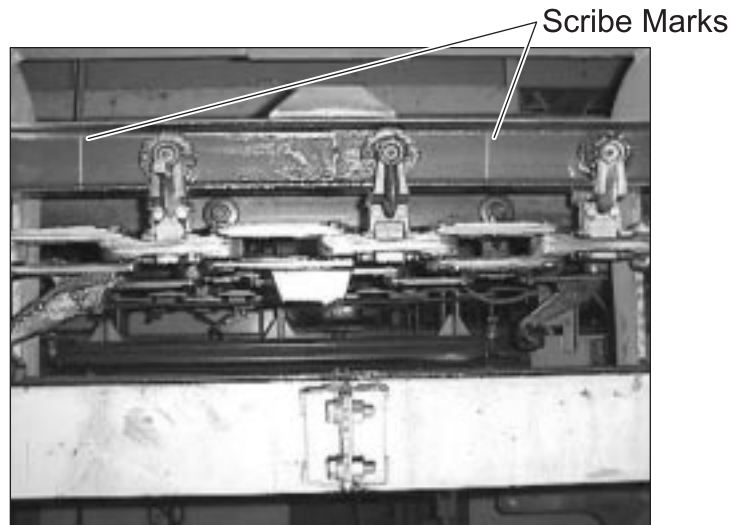
Warning: In the next step, when you close the two valves, the cylinder will move backwards rapidly. Keep your hands and arms out of the path of the cylinder.

- Close the valves.
4. **Cut the two ends of the defective track section.**

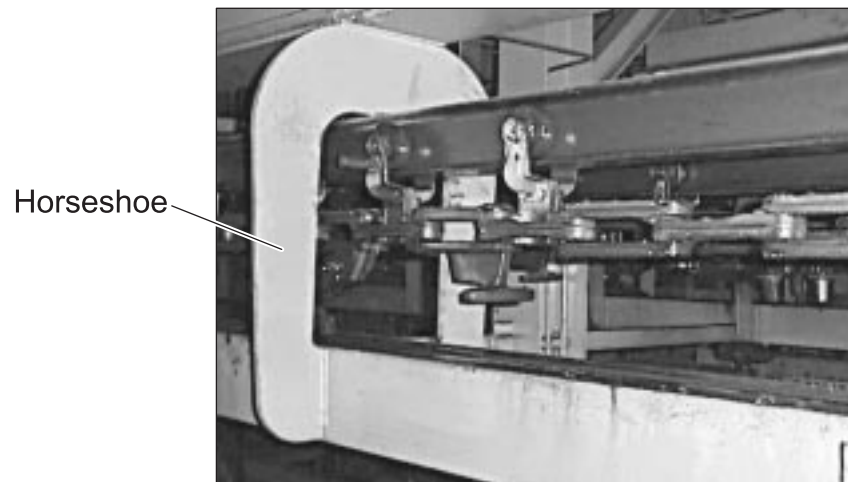
Note: You will need the assistance of a Welder. The Welder will be cutting the track during this step; exercise caution when handling the hot metal.

- Position the manlift under the section of track that will be replaced.

- Scribe vertical lines on the section (at the left and right ends) that needs to be replaced. See the figure below.

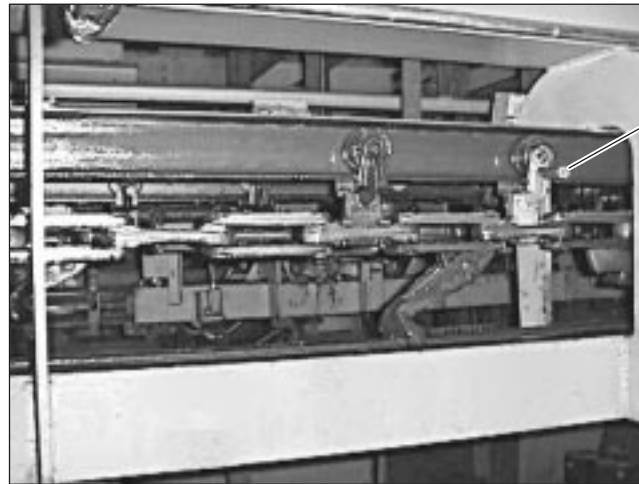


- Ask the Welder to cut the track at the two scribe marks; leave the track connected at the horseshoes. See the figure below.



5. Remove the trolley hangers.

Note: Before removing the trolley hangers, note the location of the hangers equipped with locator pins. When replacing the trolley hangers, the pins must be located in the same position. If these locator pins are not in their original configuration, the pull chain timing will be off. This will cause jamming, resulting in downtime. See the figure below.



Locator Pin

- Using a 9/16-inch open end wrench and socket/ratchet, remove the two bolts and lock nuts on each hanger over the section.

6. Ask the Welder to cut the defective track from the horseshoes.

- Using an air grinder, clean the rough edges and burrs from both ends of the track and the horseshoes (where the new section will mate). Make a good chamfer for welding.

7. Cut the new section of track to length.

- Using a tape, measure the length of new track needed to replace the track that was removed.
- Ask the Welder to cut the new track to length. A portable bandsaw can be used.
- Using an air grinder, clean the rough edges and burrs from both ends of the track (where the new section will mate). Make a good chamfer for welding.

8. Install the new track.

- Position the new track in the line.
- Use C-clamps to secure it in place.
- Ask the Welder to tack both ends of the track to the mating track.
- Inspect the track to ensure that the track is aligned with the mating track. If aligned, ask the Welder to weld the new section to the existing track and to the horseshoes.
- Using the air grinder, smooth the weld areas to ensure a smooth transition across the new section.

9. Install the trolley hangers.

Note: Trolley hangers equipped with pins must be configured as they were prior to removal.

- 10. Open only one air valve to tension the pull chain. Use caution when performing this step.**
- 11. Clean up the work area.**
- 12. Lower the manlift.**
- 13. Remove the lock and tag.**
- 14. Check the conveyor operation.**
- 15. Document the work history.**

Part B: Add Extender

- 1. Lock out and tag the conveyor system at the disconnect switch.**
- 2. Check to ensure that the track has the space to mount additional extenders.**
 - Using a manlift, position yourself so that you can access the track and extenders closest to the take-up wheel.



- Check to ensure that there are bolt holes available for installing additional extenders. See the figure below.



Extender
Mounting Holes

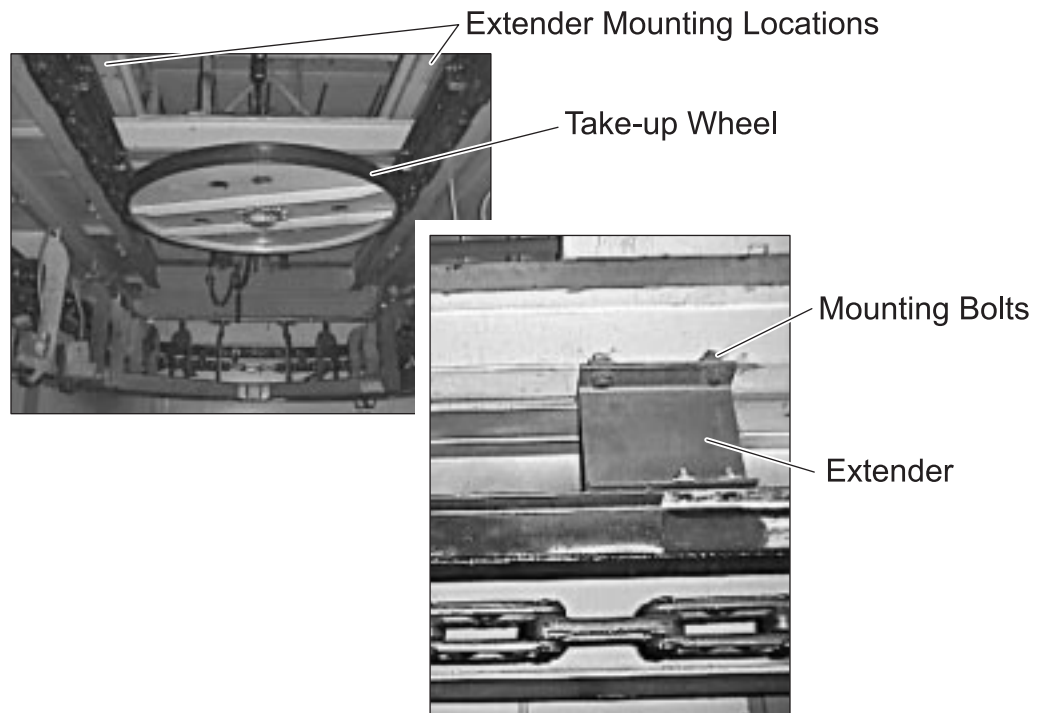
Note: If there is no space to add the extenders, remove a pitch from puller dog to puller dog. Each conveyor length will be different lengths.

3. **Close the valve on the air cylinder to release the tension on the pull chain.**

Warning: The valve is designed to bleed off pressure when closed. When the valve is closed, the cylinder will move backwards rapidly. Keep your hands and arms out of the path of the cylinder.

4. Open the space for the additional extenders.

- Using a 5/8-inch open box wrench, remove the mounting bolts from the extenders closest to the take-up wheel (one on either side). See the figure below.



- Slide the extenders into the rail.

5. Install the extenders.

- Extenders are stored above the conveyor rails. You will need two extenders, one for each side.
- Position the extender in the rail.
- Using a screwdriver and 5/8-inch wrench, install the bottom mounting bolts. Use a flat-headed screw on the bottom of the mounting bracket to ensure that the head is flush with the rail surface.
- Using a 5/8-inch wrench, install the top mounting bolts to secure the bracket to the rail.

6. Clean up the work area.

7. **Open the air valves to tension the pull chain.**

Warning: When the valve is opened, the cylinder will move forward rapidly. Keep your hands and arms out of the path of the cylinder.

8. **Lower the manlift.**
9. **Remove the lock and tag.**
10. **Check conveyor operation.**
 - Check to ensure that the pull chain crosses the extenders smoothly, without bumping. If not, adjust the extenders as necessary.
11. **Document the work history.**

Part C: Replace Pull Chain

1. **Lock out and tag the conveyor system at the disconnect switch.**
2. **Close the valve on the air cylinder to release the tension on the pull chain.**
 - Position manlift underneath the air cylinder.

Warning: When the valve is closed, the cylinder will move backward rapidly. Keep your hands and arms out of the path of the cylinder.

3. **Remove the trolley hangers.**
 - Position the manlift underneath the section of defective pull chain.

Note: Before removing the trolley hangers, note the location of the hangers equipped with locator pins. When replacing the trolley hangers, the pins must be located in the same position. If these locator pins are not in their original configuration, the pull chain timing will be off. This will cause jamming, resulting in downtime.

- Using a 9/16-inch open end box wrench and socket/ratchet, remove the two bolts and lock nuts on each hanger over the section.



4. Separate the pull chain.

Note: Before separating the pull chain, note the position of the puller and pusher dogs. The placement of the puller and pusher dogs is critical.

- Connect a strap to either end of the pull chain segment requiring replacement. See the figure below.



- Connect both straps to the come-a-long. See the figure below.



- Adjust/tighten the come-a-long until the tension is relieved from the pull chain links.
- Using a hammer and screwdriver, remove the pin connecting the first and last link of the defective section.

5. **Remove both straps and the come-a-long.**
6. **Remove the defective pull chain and set aside.**
7. **Assemble a new segment of pull chain.**

- Count the number of links in the defective pull chain segment.
- Go to the crib and obtain a new segment of pull chain.

Note: The pull chain is packaged in 10-link segments. You may need to get more than one segment if the defective pull chain segment has more than ten links.

- Assemble a pull chain segment of equal number of links.

Note: The chain should be shorter due to no stretch in the new links. Either add or remove links, as necessary.

8. **Install the new pull chain segment and trolleys.**

- Select one end of the pull chain (either end) and insert the pin to connect the new pull chain to the existing pull chain.
- Install the trolley hangers as you install the pull chain.
- Using a 9/16-inch open end box wrench and socket/ratchet, install the two bolts and lock nuts on each hanger over the section.

Note: If you have difficulty connecting the last link to the existing pull chain, use the come-a-long to create enough slack to install the last link.

9. **Open the valve on the air cylinder to restore the tension on the pull chain.**

Warning: When the valve is closed, the cylinder will move forward rapidly. Keep your hands and arms out of the path of the cylinder.

10. **Clean up the work area.**
11. **Remove the lock and tag.**
12. **Run the conveyor to check the pull chain operation.**

- Check to ensure that the pins are seated and that the timing pins are located as specified by the system.

