

Gantry Box Lift – Maintenance & Service

This section will describe service procedures for major mechanical elements of your Gantry Box Lift.

⚠ WARNING ⚠

Only qualified and trained personnel should perform the disassembly and assembly of electrical and mechanical components.

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Switching to Secondary Fork Drive Gearmotor

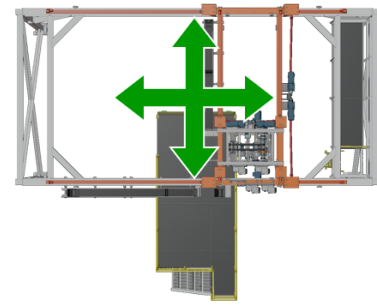
Replacing a Fork Drive Gearmotor

Pre-Lockout Safety

1

Before initiating lockouts, use Manual Mode to position the Gantry so you can access the needed parts from a safe location.

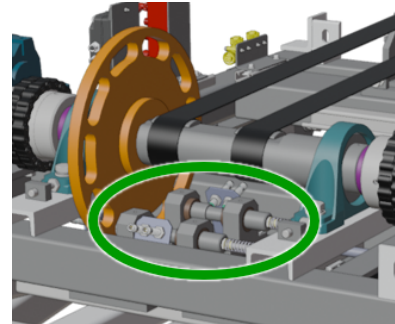
Note: Always use an appropriate ladder or stepstool. NEVER climb on railings or other machinery to access Gantry components.



2

The box lift features a locking pin mechanism on the star wheel.

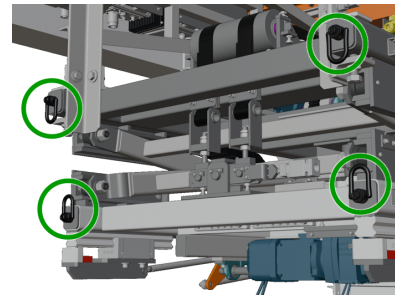
These pins should be engaged whenever performing maintenance on the Gantry to prevent unwanted movement.



3

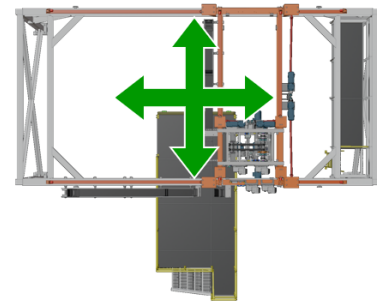
Secure the Box Lift by connecting the hoist rings on each corner of the frame to their upper/lower counterparts.

(4 pairs of rings, 8 total)



Shuttle Guide Wheel Replacement

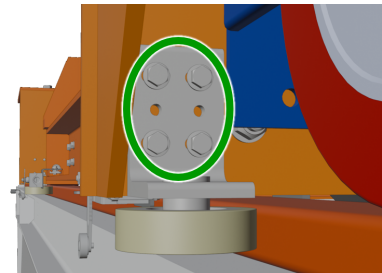
- 1 Position the Gantry, engage locking pins, and secure the box lift's hoist rings.



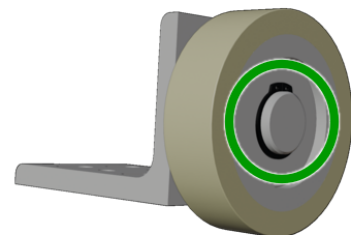
- 2 Lock out power to the Gantry and surrounding machinery per your plant's procedures.



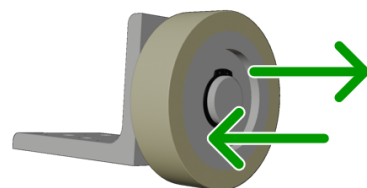
- 3 Remove the 4 bolts and washers from the guide wheel's mounting bracket, then remove the bracket & wheel from the shuttle frame.



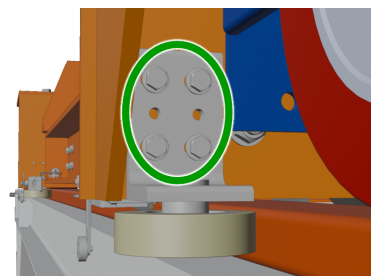
- 4 Remove the retaining ring on the old wheel.



- 5 Remove the old wheel and replace with a new wheel and retaining ring.

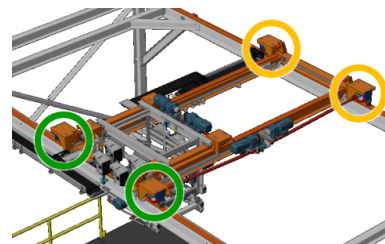


- 6 Loosely reinstall the wheel bracket with the 4 bolts and washers.
Do not completely tighten down the bolts yet.



Left/Right Shuttle Only: If the guide wheel is on the rail closest to the central platform (green), position the wheel bracket until there is no gap between the wheel and the rail.

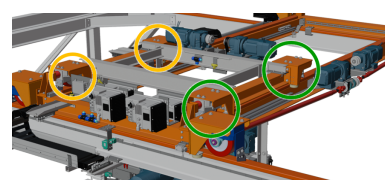
If the guide wheel is on the farther rail (yellow), leave a gap of 1-2mm between the wheel and the rail.



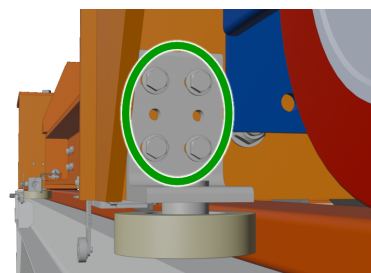
7

Fore/Aft Shuttle Only: If the guide wheel is on the rail closest to Left/Right motors (green), position the wheel bracket until there is no gap between the wheel and the rail.

If the guide wheel is on the other rail (yellow), leave a gap of 1-2mm between the wheel and the rail.



- 8 Finish tightening down the bracket bolts.



- 9 Restore power to the system. Run the shuttle and verify proper function. Correct if necessary.

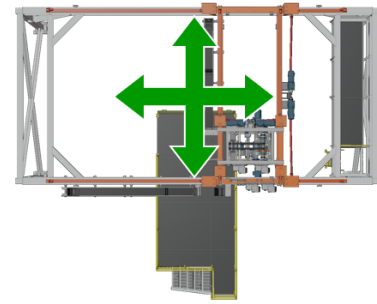


- 10 Remove all tools and equipment from the area before removing lockouts and restoring the system to service.



Shuttle Idle Wheel Replacement

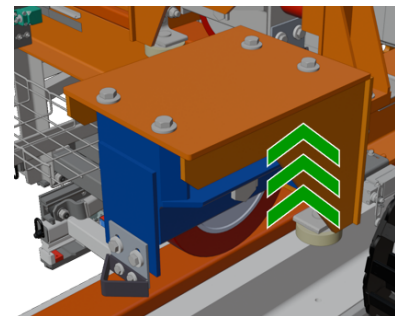
- 1 Position the Gantry, engage locking pins, and secure the box lift's hoist rings.



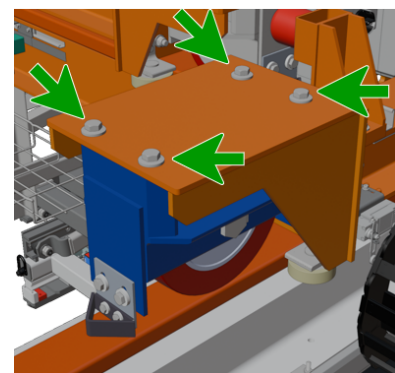
- 2 Lock out power to the Gantry and surrounding machinery per your plant's procedures.



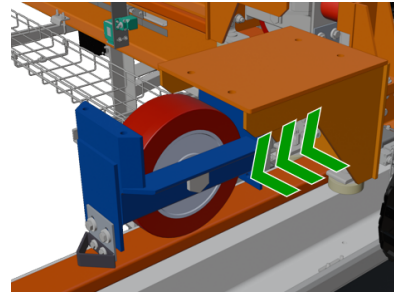
- 3 Use a jack/overhead lift to slightly raise the shuttle and take pressure off the wheel assembly.



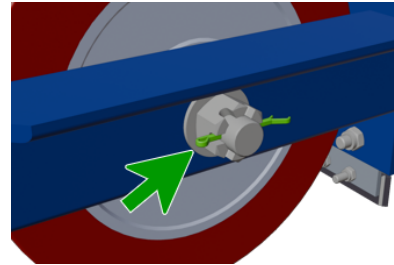
- 4 Remove the 4 bolts and washers from the idle wheel's frame.



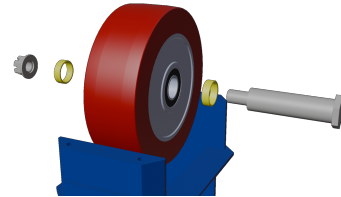
- 5 Slide the loose wheel assembly away from the shuttle to free it from the frame.



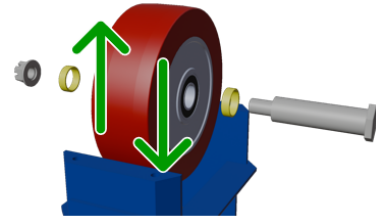
- 6 Remove the cotter pin from the wheel shaft's nut.



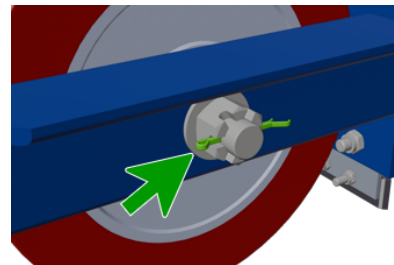
- 7 Remove nut, shaft, spacers, and old wheel from the assembly.



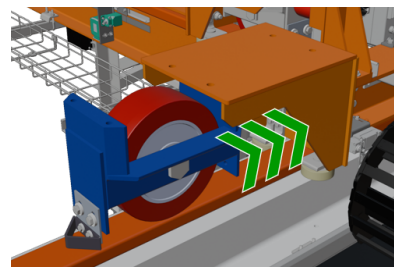
- 8 Replace old wheel with the new wheel, then reassemble the shaft in the wheel's frame.



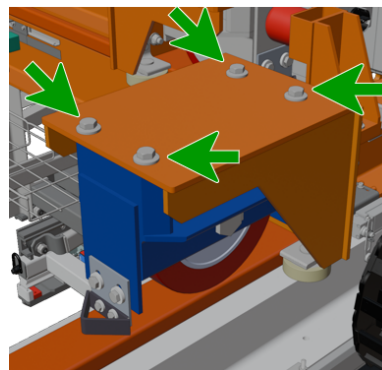
- 9 Once tightened down, reinstall a cotter pin on the wheel shaft's nut.



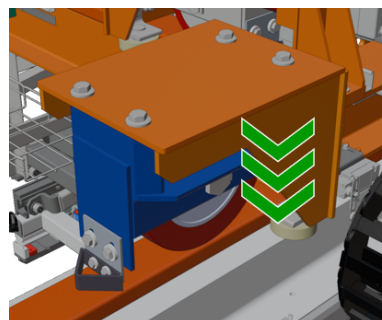
- 10 Slide the reassembled wheel assembly back into location on the shuttle frame.



- 11** Line up and reinstall the 4 bolts and washers onto the shuttle frame.



- 12** Lower the jack/overhead lift until the wheel assembly is resting on the rail and supporting its own weight



- 13** Restore power to the system. Run the shuttle and verify proper function. Correct if necessary.

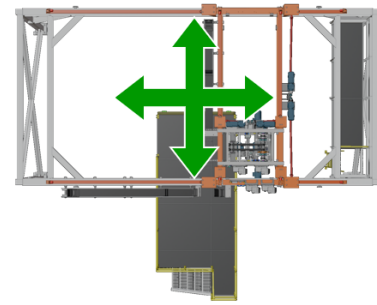


- 14** Remove all tools and equipment from the area before removing lockouts and restoring the system to service.



Shuttle Drive Wheel Replacement

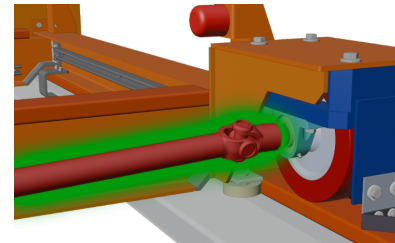
- 1 Position the Gantry, engage locking pins, and secure the box lift's hoist rings.



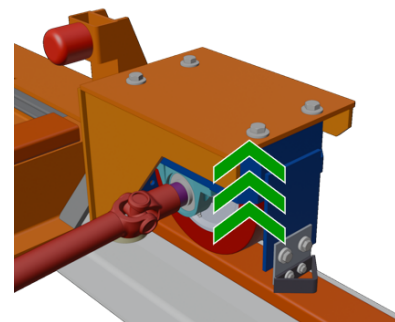
- 2 Lock out power to the Gantry and surrounding machinery per your plant's procedures.



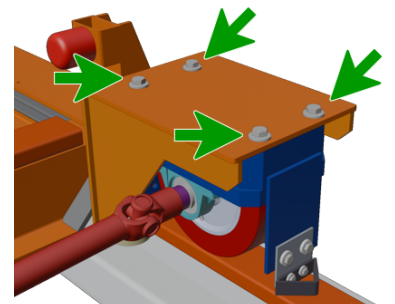
- 3 Support the cardan shaft so that it will not fall when removed from the wheel shaft.



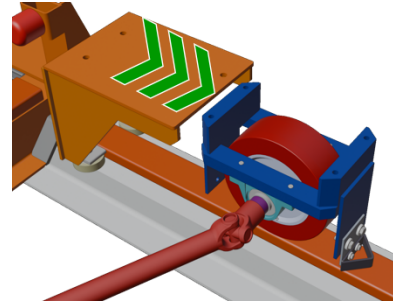
- 4 Use a jack/overhead lift thing to slightly raise the shuttle and take pressure off the wheel assembly.



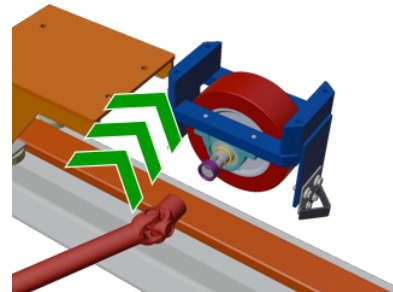
- 5 Remove the 4 bolts and washers from the drive wheel's frame.



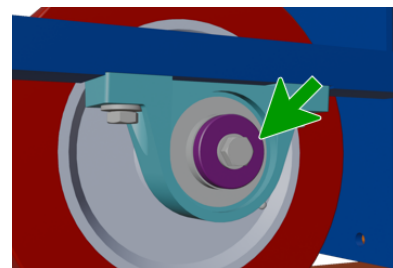
- 6 Slide the loose wheel assembly away from the shuttle to free it from the frame.



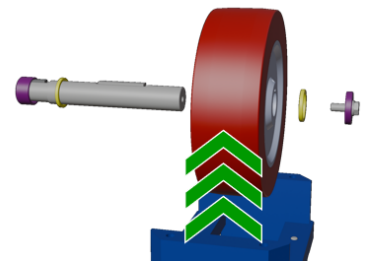
- 7 Slide the entire drive wheel assembly off of the (still supported) cardan shaft



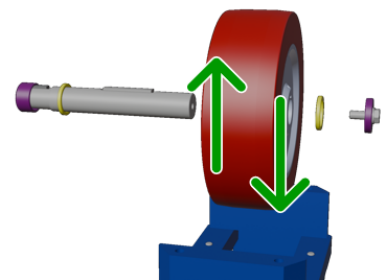
- 8 Loosen and remove the bolt, washer, and end cap from the wheel's shaft.



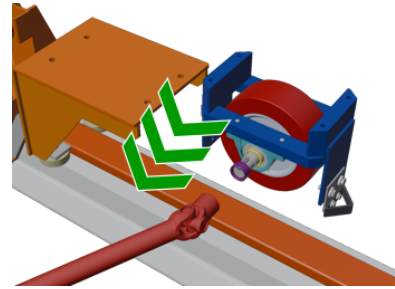
- 9 Slide the shaft out of the wheel and pillow blocks until the old wheel can be removed.
Inspect the shaft keys and replace/reuse as necessary.



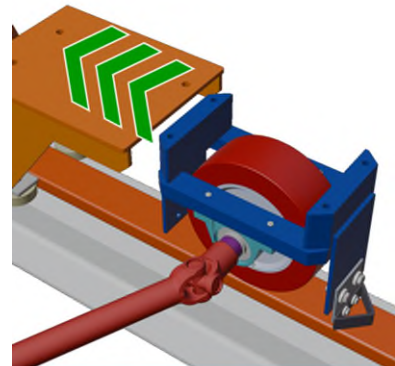
- 10 Replace old wheel with the new wheel, then reassemble the shaft in the wheel's frame and pillow blocks



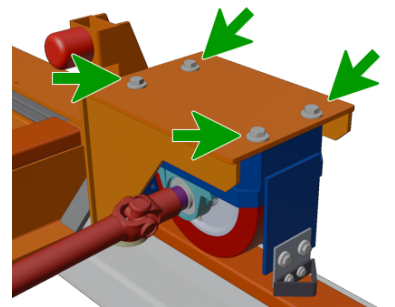
- 11** Slide the reassembled wheel assembly back onto the cardan shaft.



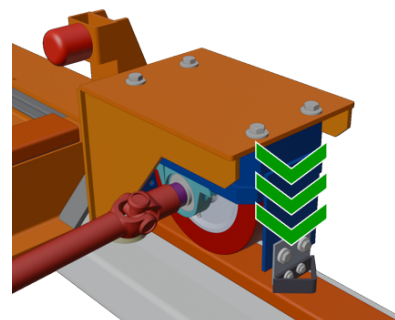
- 12** Slide the wheel assembly and cardan shaft back into location on the shuttle frame.



- 13** Line up and reinstall the 4 bolts and washers onto the shuttle frame.



- 14** Lower the jack/overhead lift until the wheel assembly is resting on the rail and supporting its own weight



- 15** Restore power to the system. Run the shuttle and verify proper function. Correct if necessary.

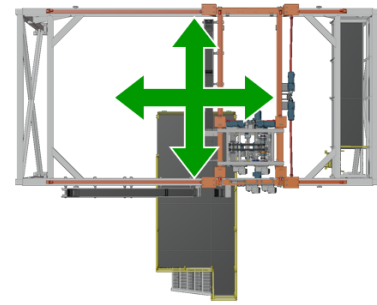


- 16** Remove all tools and equipment from the area before removing lockouts and restoring the system to service.



Shuttle Cardan Shaft Replacement

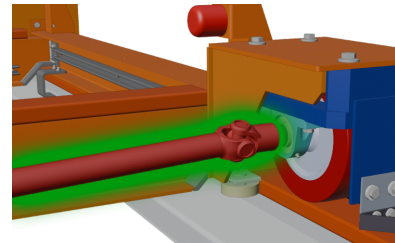
- 1 Position the Gantry, engage locking pins, and secure the box lift's hoist rings.



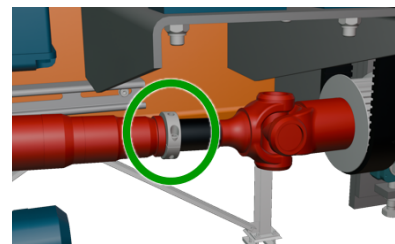
- 2 Lock out power to the Gantry and surrounding machinery per your plant's procedures.



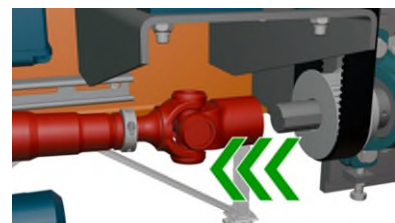
- 3 Support the cardan shaft so that it will not fall when removed.



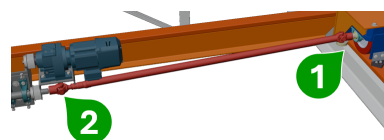
- 4 On the drive-end of the cardan shaft, loosen the retaining collar to allow the end of the shaft to slide inward.



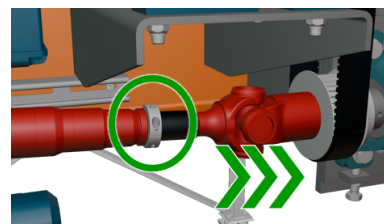
- 5 Slide the end of the shaft inward to create a gap, then remove the cardan shaft from the drive and wheel shafts.



- 6 Install the new cardan shaft by sliding on the wheel-end first, followed by the drive shaft end.



- 7 Slide the drive-end of the shaft back into position, then tighten down the retaining collar to prevent it from moving.



- 8 Restore power to the system. Run the shuttle and verify proper function. Correct if necessary.

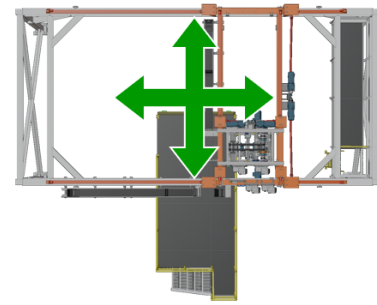


- 9 Remove all tools and equipment from the area before removing lockouts and restoring the system to service.



Shuttle Drive Belt Replacement

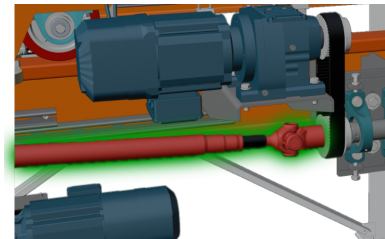
- 1 Position the Gantry, engage locking pins, and secure the box lift's hoist rings.



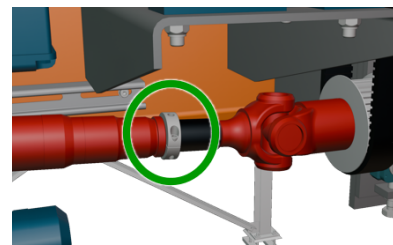
- 2 Lock out power to the Gantry and surrounding machinery per your plant's procedures.



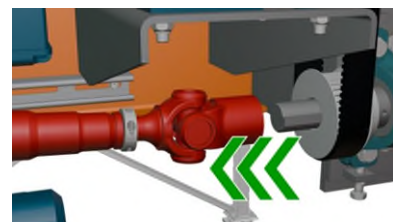
- 3 Support the belt-side cardan shaft so that it will not fall when removed from the drive shaft.



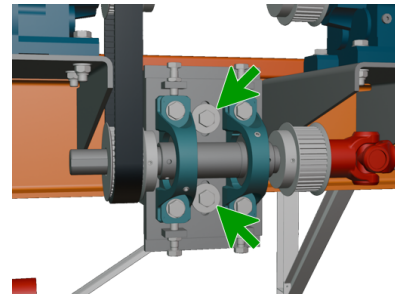
- 4 On the drive-end of the cardan shaft, loosen the retaining collar to allow the end of the shaft to slide inward.



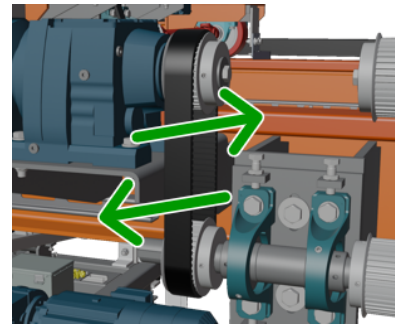
- 5 Slide the end of the shaft inward to create a gap, then move the cardan shaft out of the way.



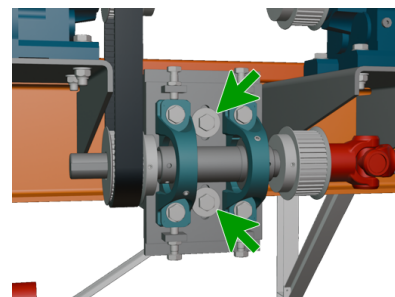
- 6 Loosen the two bolts of the pillow block mount until it can be moved slightly to give the belt slack.



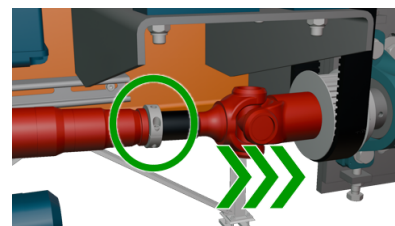
- 7 Remove the old belt from the sprockets and replace with the new belt.



- 8 Move the pillow block mount back to its original position to put tension on the new belt. Once tensioned, retighten the mounting plate's bolts.



- 9 Bring the cardan shaft back into position, then tighten down the retaining collar to prevent it from moving.



- 10 Restore power to the system. Run the shuttle and verify proper function. Correct if necessary.

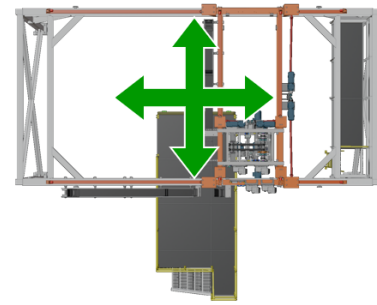


- 11 Remove all tools and equipment from the area before removing lockouts and restoring the system to service.



Switching to Secondary Shuttle Gearmotor

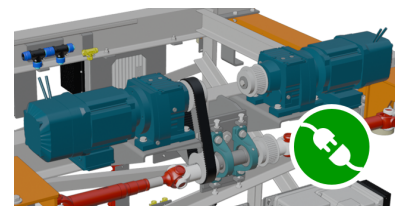
- 1 Position the Gantry, engage locking pins, and secure the box lift's hoist rings.



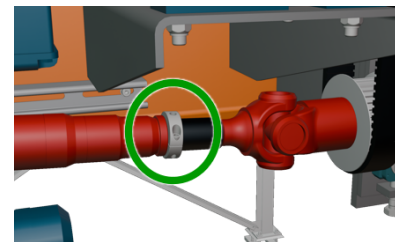
- 2 Lock out power to the Gantry and surrounding machinery per your plant's procedures.



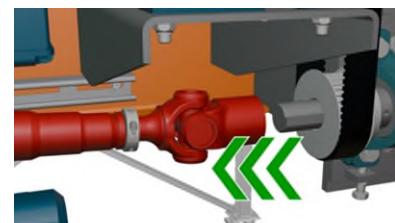
- 3 Disconnect all cables and wires from the gearmotors.



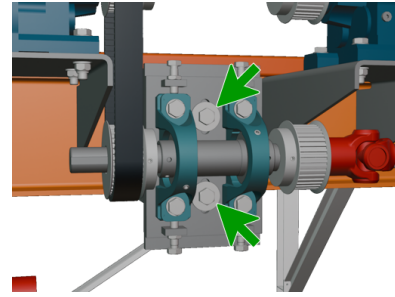
- 4 On the drive-end of both cardan shafts, loosen the retaining collar to allow the end of the shaft to slide inward.



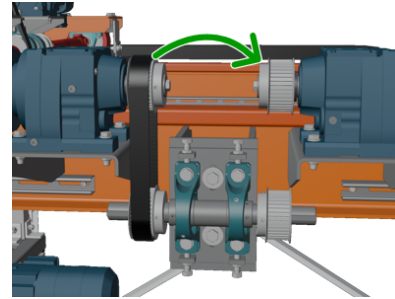
- 5 Slide the ends of the shafts inward to create a gap, then move the cardan shafts out of the way.



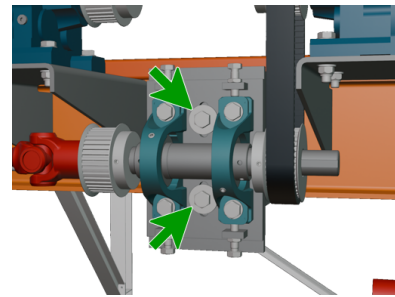
- 6** Loosen the two bolts of the pillow block mount until it can be moved slightly to give the belt slack.



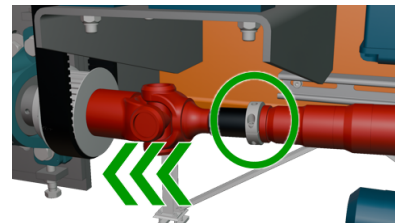
- 7** Remove the drive belt from the active gearmotor and inspect for wear and tear, replace with new belt if necessary, then place the belt onto the secondary motor's sprockets.



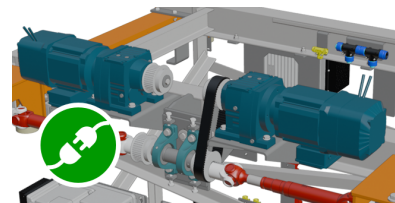
- 8** Move the pillow block plate back to its original position to put tension on the belt. Once tensioned, retighten the mounting plate's bolts.



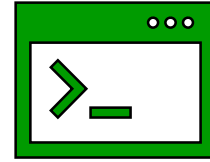
- 9** Bring both cardan shafts back into position, then tighten down the retaining collars to prevent them from moving.



- 10** Reconnect all cables and wires to the gearmotors.



- 11 Access the HMI and inform the system controller that you switched to the standby motor.



- 12 Restore power to the system. Run the shuttle and verify proper function. Correct if necessary.



- 13 Remove all tools and equipment from the area before removing lockouts and restoring the system to service.

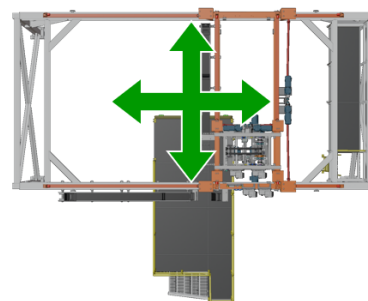


Replacing a Shuttle Gearmotor

- 1 **Note:** The following steps assume you are removing the currently INACTIVE gearmotor. If you first need to switch the active gearmotor, please perform the previous **Switching to Secondary Shuttle Gearmotor** procedure.



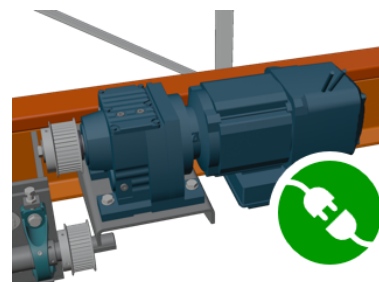
- 2 Position the Gantry, engage locking pins, and secure the box lift's hoist rings.



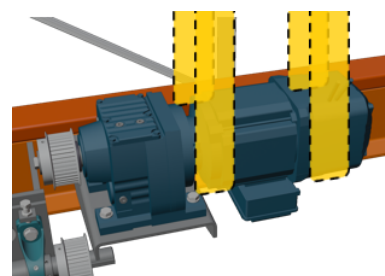
- 3 Lock out power to the Gantry and surrounding machinery per your plant's procedures.



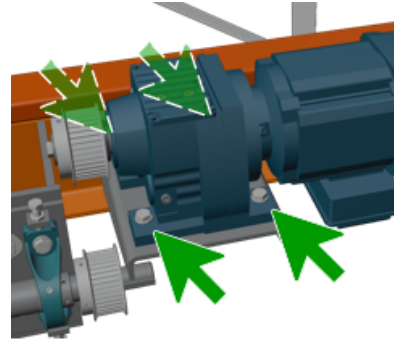
- 4 Disconnect all cables and wires from the target gearmotor.



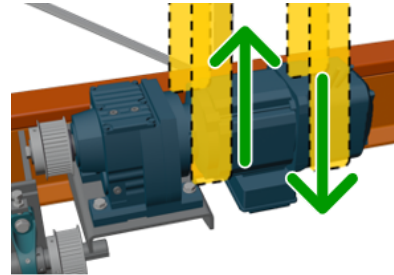
- 5 Support the gearmotor from the overhead service rail to prevent it from falling.



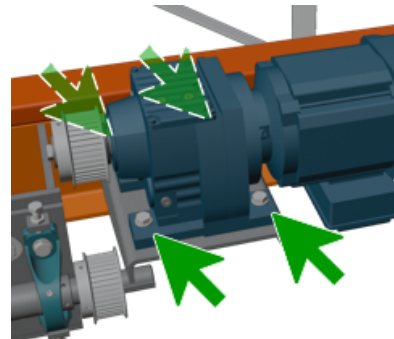
- 6 Loosen and remove the 4 bolts securing the gearmotor to its mounting bracket.



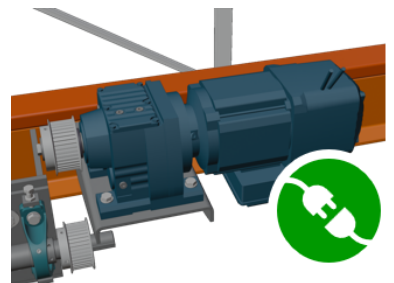
- 7 Using the overhead service rail, lower the old gearmotor to ground level and replace it with the new unit.



- 8 Line up the new gearmotor and retighten the 4 bolts securing it to the mounting bracket.



- 9 Remove the supports from the service rail and reconnect all cables and wires to the gearmotors.

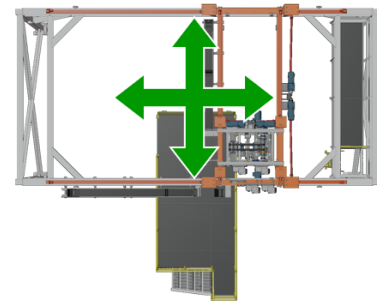


- 10 Remove all tools and equipment from the area before removing lockouts and restoring the system to service.

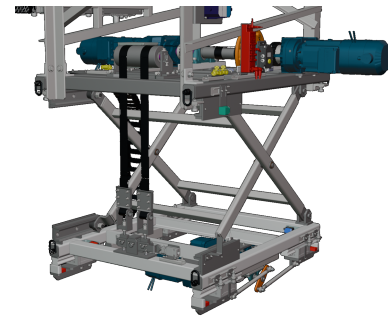


Replacing the Lifting Belts

- 1 Position the Gantry.



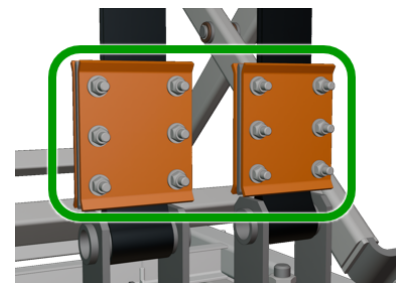
- 2 Fully lower the box lift before engaging the locking pins and securing the hoist rings



- 3 Lock out power to the Gantry and surrounding machinery per your plant's procedures.



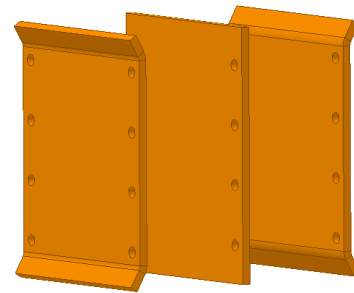
- 4 Loosen and remove the bolts that hold the belt clamping plates together around the turnbuckles.



Discard the torque nuts but keep the bolts and washers.

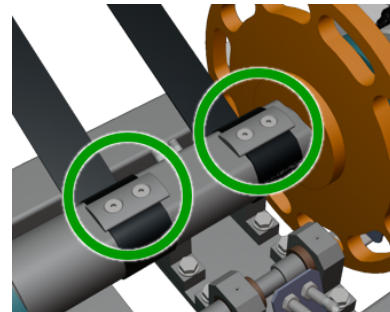
5

Stow the clamping plates in a safe location.



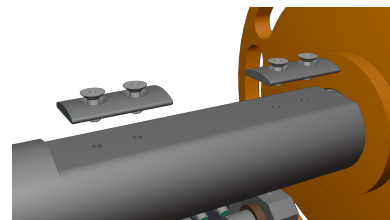
Unwrap the loose belts around the lifting shaft until their lockdown clamps are exposed.

6



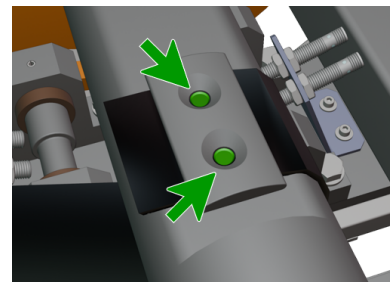
Remove the lockdown clamps and discard the old belts.

7



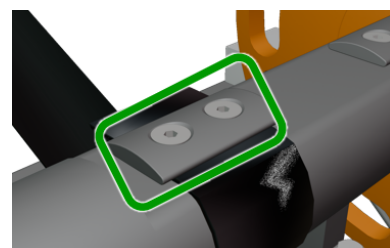
Partially wrap the “hole punched” end of the new belt around the lifting shaft until the belt holes are aligned with the holes in the shaft.

8

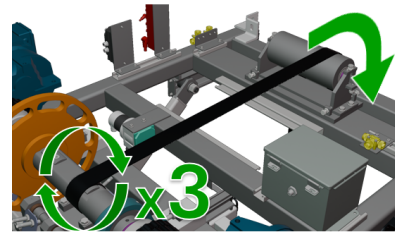


Reinstall and tighten down the lockdown clamps on top of the new belt.

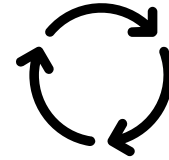
9



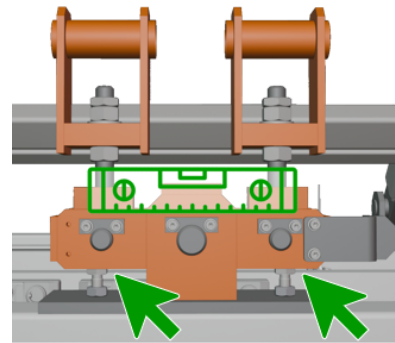
- 10** Wrap the new belt around the lift shaft 3 times before dropping the loose end over the drum and down to the turnbuckles.



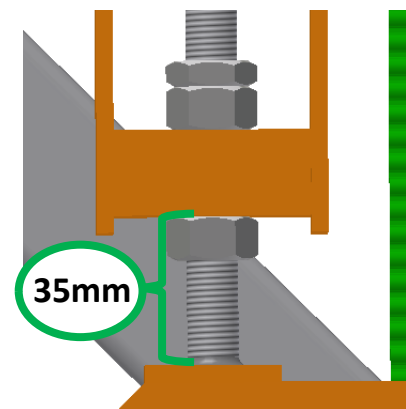
- 11** Repeat steps 8-10 for the second belt.



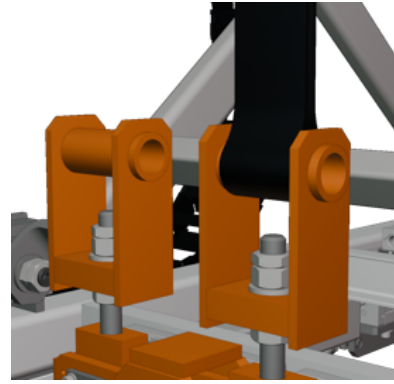
- 12** Raise the support bolts underneath the slack belt actuator lever until they hold it level.



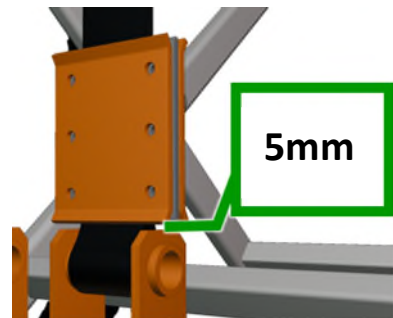
- 13** Reposition the turnbuckles' height above the lever to a setup value of 35mm using the locking and adjusting nuts.



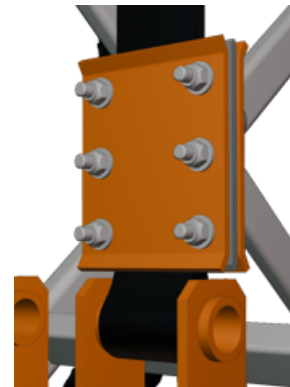
- 14** Wrap one end of a new belt around its turnbuckle.



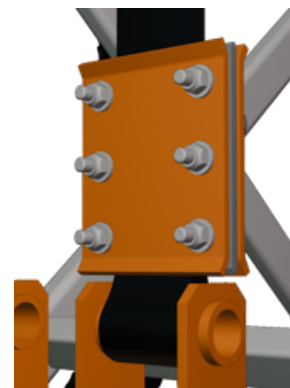
- 15** Place the clamping plates with the bottom of the clamp plates 5mm above the top of the turnbuckle.



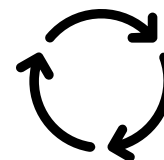
- 16** Insert and hand tighten the bolts, washers, and new torque nuts to hold the clamping plates together.



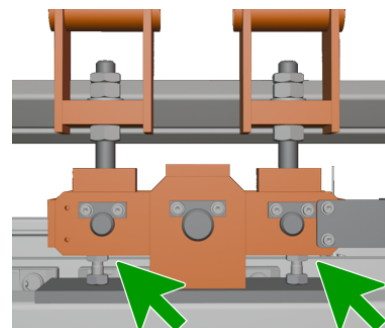
- 17** Make the lifting belt as taut as possible as it hangs from the lifting drum and around the turnbuckle.
Tighten the clamping plates nuts and bolts in steps up to **26Nm**. Paint witness marks on the bolts to the clamping plates when completed.



- 18 Repeat steps 14-17 for the second belt.



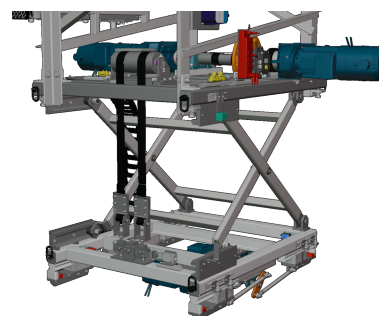
- 19 Lower the support bolts down into the lift carriage frame.



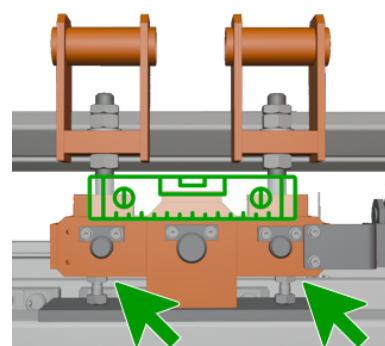
⚠ WARNING ⚠

Not lowering these support bolts will prevent the slack/broken belt sensor from working properly.

- 20 Remove any used chains/straps from the hoist rings.
Note: There should be load tension on the lifting belts now.



- 21 Check that the slack/broken belt lever is level. If not, adjust a turnbuckle as necessary to level the lever.



- 22** Restore power to the system. Run the lift to verify proper function. Correct if necessary.

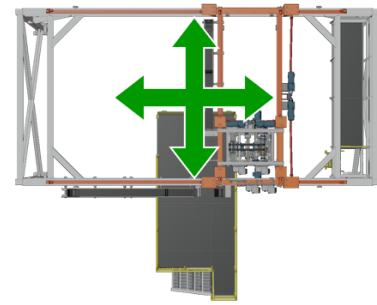


- 23** Remove all tools and equipment from the area before removing lockouts and restoring the system to service.



Switching to Secondary Box Lift Gearmotor

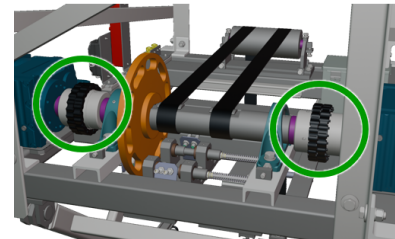
- 1 Position the Gantry, engage locking pins, and secure the box lift's hoist rings.



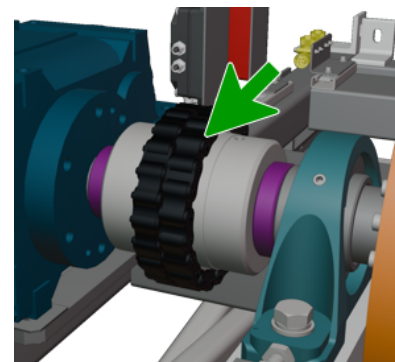
- 2 Lock out power to the Gantry and surrounding machinery per your plant's procedures.



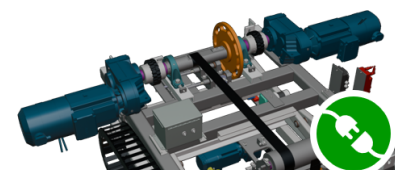
- 3 The lifting shaft is connected to the gearmotors using chain couplers.
 If the secondary motor and coupler is already engaged, it is being back-driven and you can switch the active gearmotor through the system's HMI controller.



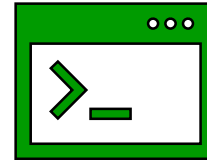
- 4 If the secondary motor and coupler is NOT engaged, you must first wrap the chain around the secondary coupler.



- 5 Verify that all required cables and wires are connected to the secondary gearmotor.



- 6 Access the HMI and inform the system controller that you switched to the standby motor.



- 7 Restore power to the system. Raise and lower the lift and verify proper function. Correct if necessary.



- 8 Remove all tools and equipment from the area before removing lockouts and restoring the system to service.

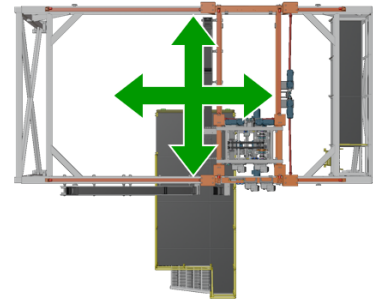


Replacing a Box Lift Gearmotor

- 1 **Note:** The following steps assume you are removing a currently INACTIVE gearmotor. If you first need to switch the active gearmotor, please perform the previous **Switching to Secondary Box Lift Gearmotor** procedure.



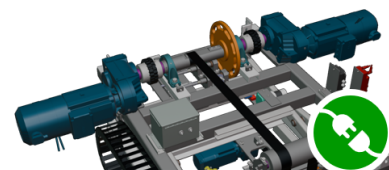
- 2 Position the Gantry, engage locking pins, and secure the box lift's hoist rings.



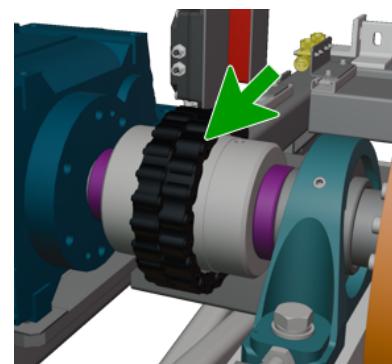
- 3 Lock out power to the Gantry and surrounding machinery per your plant's procedures.



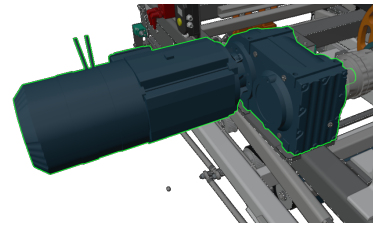
- 4 Disconnect all cables and wires from the target gearmotor.



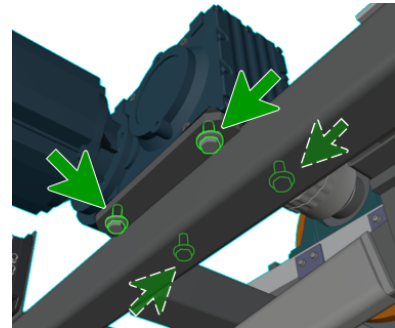
- 5 If the motor's chain coupling is engaged (still has the chain), you must first remove the chain before continuing.



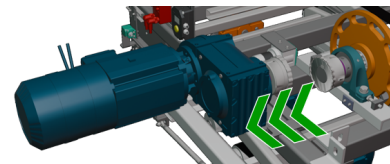
- 6 Support the gearmotor's weight so that it does not fall when removed.



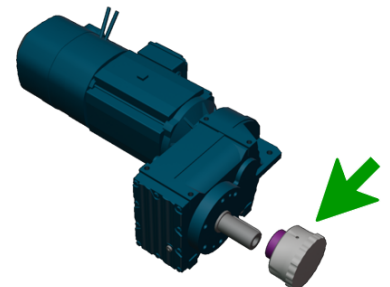
- 7 Underneath the motor, remove the 4 bolts and washers securing the motor to the lift frame.



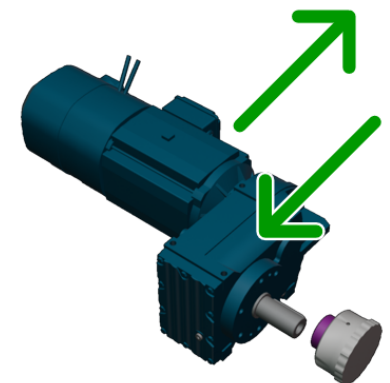
- 8 Using a lift/hoist/crane: Remove the old gearmotor, shaft, and coupler as one piece.



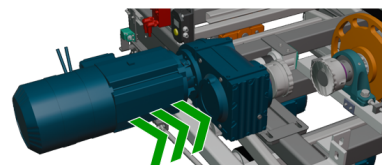
- 9 Remove the coupler, spacer, and shaft key from the old gearmotor. Inspect for damage and replace if necessary.



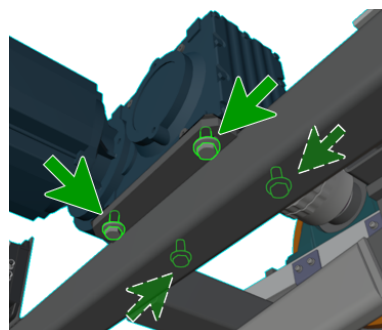
- 10 Replace the old motor with the new unit, then reinstall the shaft key, spacer, and coupler.



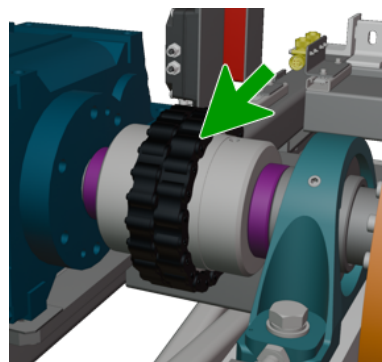
- 11** Place the new gearmotor into position using a lift/hoist/crane



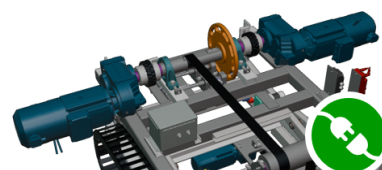
- 12** Align the chain coupler to its counterpart on the lifting shaft, then reinstall the 4 washers and bolts securing the new motor to the frame.



- 13** Reinstall the chain connecting the couplers together, as desired.



- 14** Remove any used supports from the new motor, then reconnect all cables and wires.

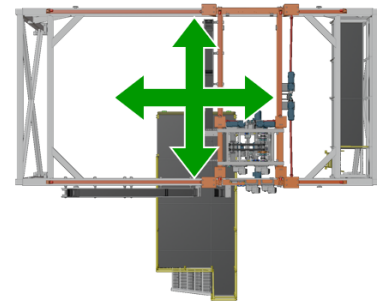


- 15** Remove all tools and equipment from the area before removing lockouts and restoring the system to service.



Replacing a Fork Drive Belt

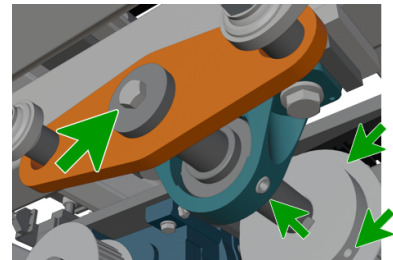
- 1 Position the Gantry, engage locking pins, and secure the box lift's hoist rings.



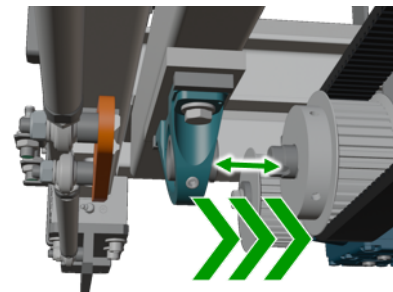
- 2 Lock out power to the Gantry and surrounding machinery per your plant's procedures.



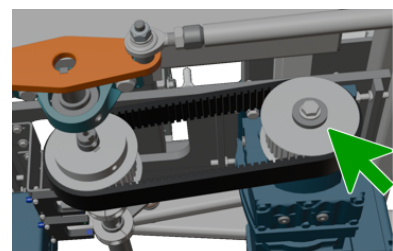
- 3 Loosen the set screws on both of the fork shaft's pillow blocks, loosen the set screws on the central sprocket, and remove the end bolt and plate from the drive-end of the shaft.



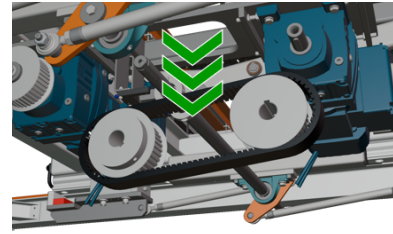
- 4 Slide the fork drive shaft inward until there is enough room to remove the belt.



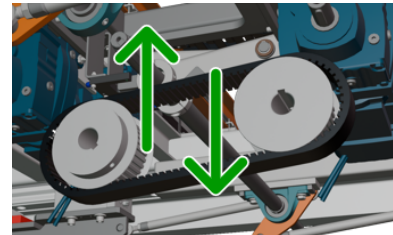
- 5 Remove the bolt and end cap from the drive shaft.



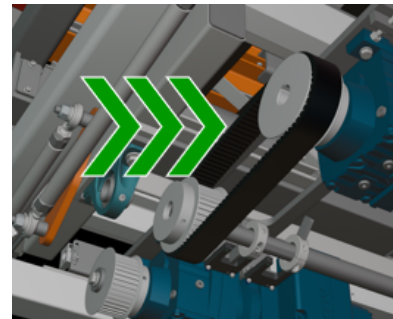
- 6 Slide the drive sprocket and center sprocket off of their respective shafts to release tension on the belt.



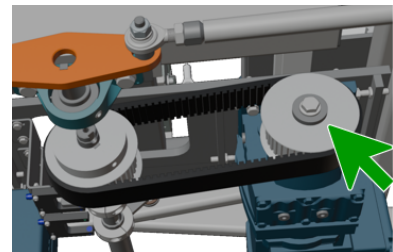
- 7 Remove the old belt and replace it with the new one.



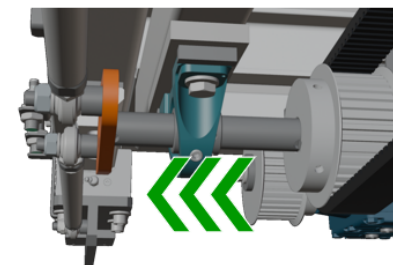
- 8 Keeping the new belt taut, slide the drive sprocket and center sprocket back onto their respective shafts.



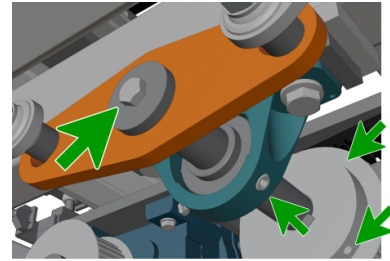
- 9 Once in position, place and tighten the bolt and end cap back onto the drive shaft sprocket.



- 10 Slide the fork central shaft back into position through the pillow block.



- 11** Reinstall the end bolt and plate onto the shaft, then retighten the set screws on the pillow blocks and the central sprocket.



- 12** Restore power to the system. Test the forks and verify proper function. Correct if necessary.

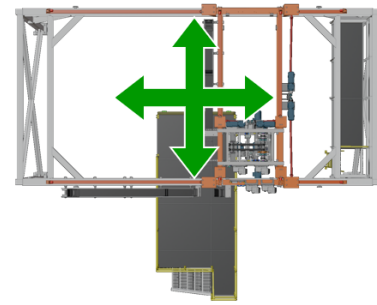


- 13** Remove all tools and equipment from the area before removing lockouts and restoring the system to service.



Switching to Secondary Fork Drive Gearmotor

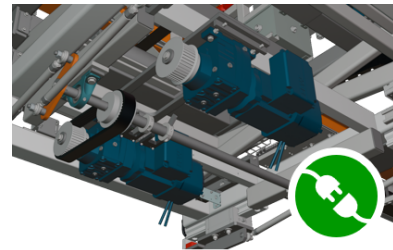
- 1 Position the Gantry, engage locking pins, and secure the box lift's hoist rings.



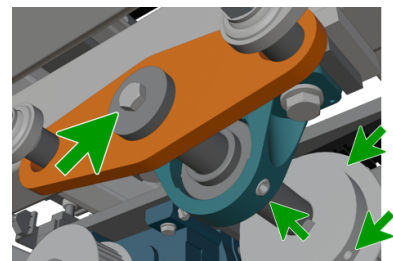
- 2 Lock out power to the Gantry and surrounding machinery per your plant's procedures.



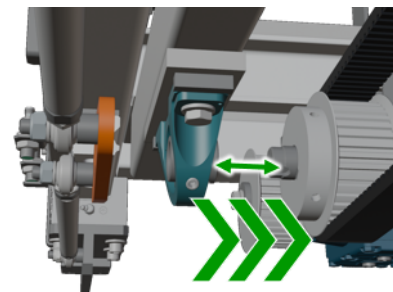
- 3 Disconnect all cables and wires from the gearmotors.



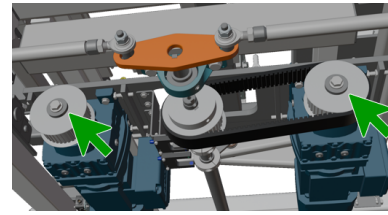
- 4 Loosen the set screws on both of the fork shaft's pillow blocks, loosen the set screws on the central sprocket, and remove the end bolt and plate from the drive-end of the shaft.



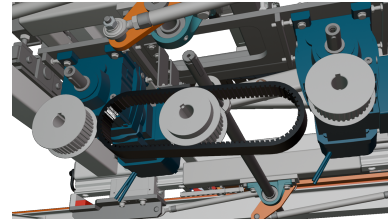
- 5 Slide the fork drive shaft inward until there is enough room to remove the belt.



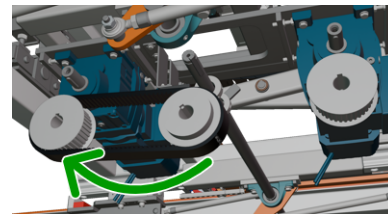
- 6** Remove the bolt and end cap from the drive sprocket on both gearmotors.



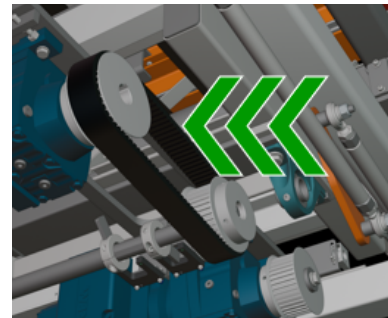
- 7** Slide the drive sprockets and center sprocket off of their respective shafts to release tension on the belt.



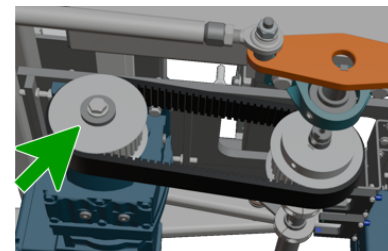
- 8** Replace the belt if necessary before swapping it to the secondary gearmotor.



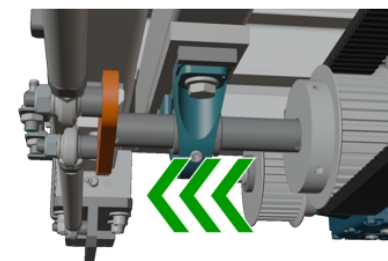
- 9** Keeping the belt taut, slide the drive sprocket and center sprocket back onto their respective shafts.



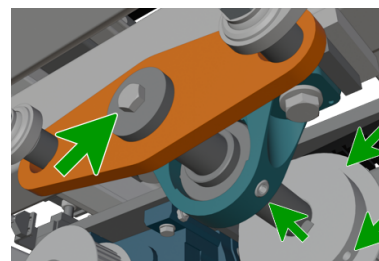
- 10** Once in position, place and tighten the bolt and end cap back onto the drive shaft sprockets.



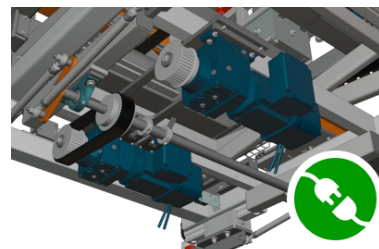
- 11** Slide the fork central shaft back into position through the pillow block.



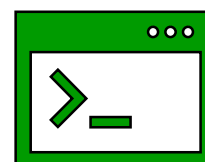
- 12** Reinstall the end bolt and plate onto the shaft, then retighten the set screws on the pillow blocks and the central sprocket.



- 13** Reconnect all cables and wires to the gearmotors.



- 14** Access the HMI and inform the system controller that you switched to the standby motor.



- 15** Restore power to the system. Index the forks and verify proper function. Correct if necessary.



- 16** Remove all tools and equipment from the area before removing lockouts and restoring the system to service.

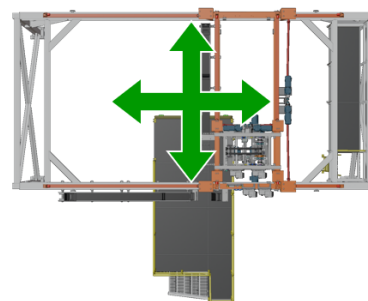


Replacing a Fork Drive Gearmotor

- 1 **Note:** The following steps assume you are removing the currently INACTIVE gearmotor. If you first need to switch the active gearmotor, please perform the previous **Switching to Secondary Fork Drive Gearmotor** procedure.



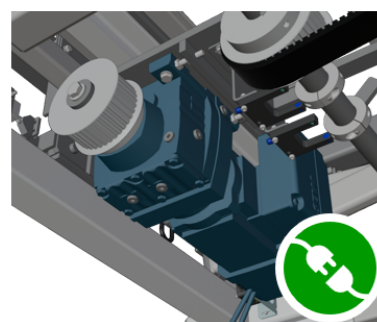
- 2 Position the Gantry, engage locking pins, and secure the box lift's hoist rings.



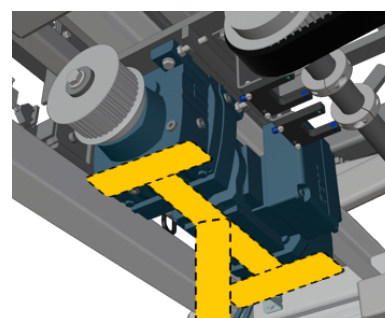
- 3 Lock out power to the Gantry and surrounding machinery per your plant's procedures.



- 4 Disconnect all cables and wires from the target gearmotor.

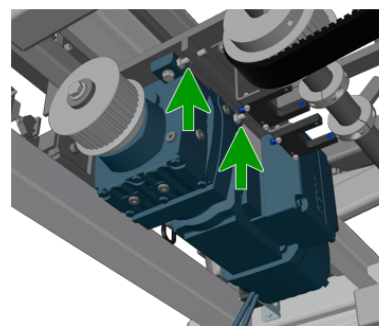


- 5 Support the gearmotor from below to prevent it from falling.

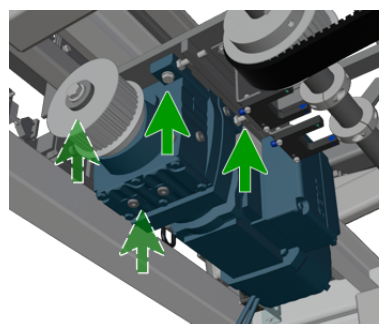


Loosen the two inside alignment bolts.

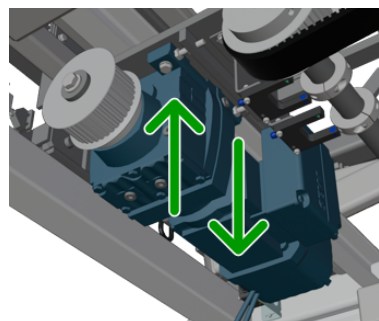
- 6 Do not adjust the outside alignment bolts, these will be used when installing the new gearmotor.



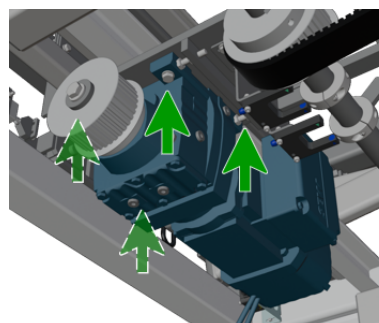
- 7 Loosen and remove the 4 bolts securing the gearmotor to its mounting bracket.



- 8 Lower the old gearmotor to the ground and hoist up the new unit.



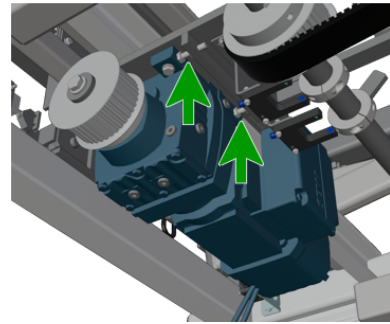
- 9 Line up the new gearmotor and partially tighten the 4 bolts securing it to the mounting bracket.



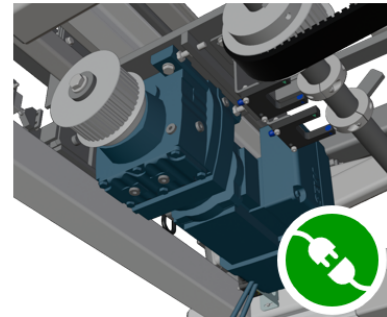
10

Tighten the two inside alignment bolts.

Once in position, finish tightening down the 4 mounting bolts.

**11**

Remove the supports from and reconnect all cables and wires to the gearmotors.

**12**

Remove all tools and equipment from the area before removing lockouts and restoring the system to service.

