

EMS Maintenance & Service

This section will describe service procedures for major mechanical elements of your EMS system.

⚠ WARNING ⚠

- Only qualified and trained personnel should perform the disassembly and assembly of electrical and mechanical components.
- Before attempting any maintenance on this equipment all involved personnel should follow plant internal regulations along with any state, federal, or province regulations. Do not begin any repair procedure until the proper shutdown procedures and the appropriate power lockout procedures have been applied.

Replacing the EMS Trolley Assembly

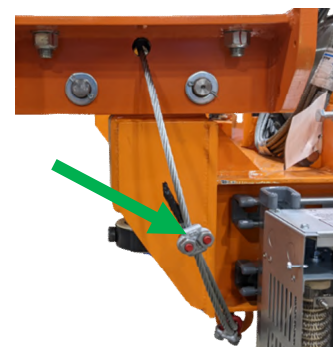
- 1 Direct the EMS Carrier to be serviced into the maintenance spur of the system if possible.



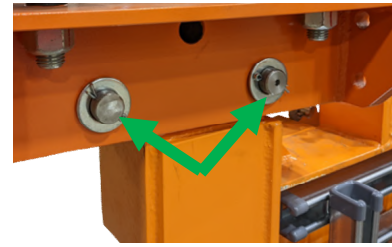
- 2 Remove all power to the rail and lockout all power sources to the area.



- 3 Remove the safety cable.



- 4 Remove the two mounting pins that hold the kingpin assembly to the upper frame assembly.



- 5 Remove the locking collar on the kingpin.



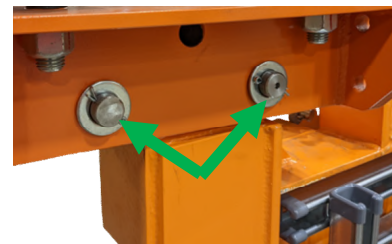
- 6 The trolley assembly will be free at this point. Remove the original trolley assembly and replace with a new assembly.



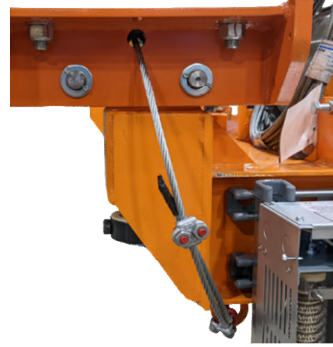
- 7 Reattach the locking collar on the kingpin.



- 8 Inspect mounting pins for wear or damage prior to installation of the trolley. Replace pivot pins with new if worn or damaged.



-
- 9** Install the safety cable. Inspect the safety cable for wear or damage prior to install. Replace with new if worn or damaged. Install new wire rope clips and tighten to 20Nm.



-
- 10** Remove all tools and insert carrier back into system.



Replacing the EMS Trolley Side Guide Rollers

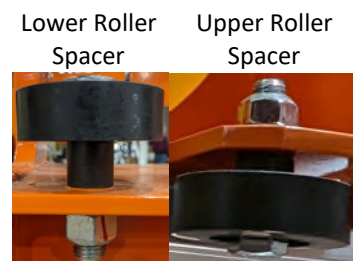
- 1 Locate the trolley wheel assembly to be serviced.



- 2 Remove the fastenings for the appropriate side guide roller:
 - Upper Roller = M16 Hex Nut
 - Lower Roller = M20 Hex Nut



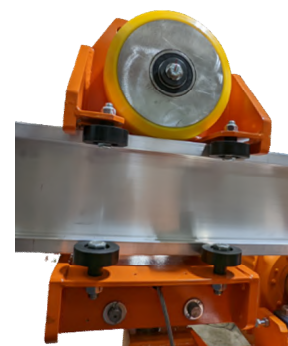
- 3 Inspect the spacer for damage or wear. Replace as necessary.



(i) NOTICE (i)

The Upper Roller and Lower Roller spacers are different sizes. Use correct spacer part or guide wheel will not sit properly.

- 4 Replace the original side guide roller and retighten the fastenings.



Replacing the EMS Drive Trolley Wheel & Gearmotor

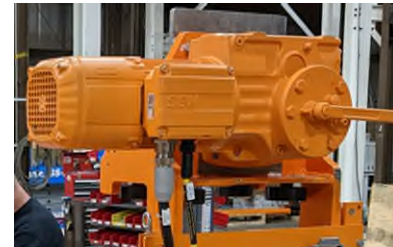
- 1 Direct the EMS Carrier to be serviced into the maintenance spur of the system if possible.



- 2 Remove all power to the rail and lockout all power sources to the area.



- 3 Support the gearmotor prior to continuing.

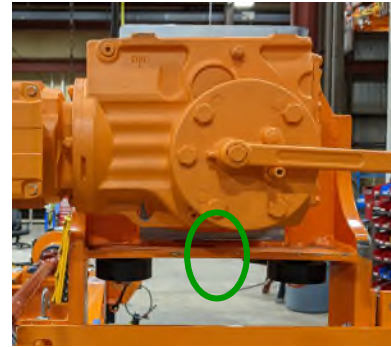


- 4 Remove connection cables from the drive motor.



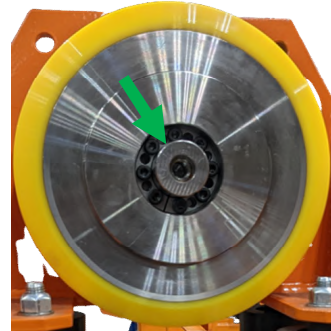
Using chain fall with nylon lifting straps, support the trolley load bar near the load bar connection.

- 5** Tighten strap just enough to lift the load off the trolley drive wheel. This should leave a gap of 1-2 mm (1/32" - 1/16") between the EMS rail and drive trolley wheel.



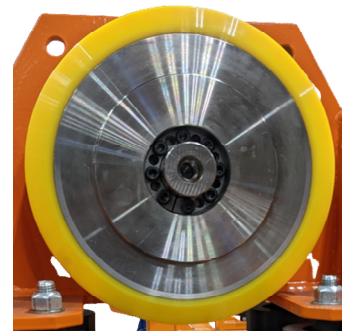
Remove the drive wheel Clampex internal clamp.

- 6** See manufacturer's procedure for removal.



Remove the drive wheel.

- 7**



Continue to step 9 to change the gearmotor.

- 8** Skip to step 12 if only changing the drive wheel.



9

Loosen and remove M16 motor mounting screws (4) to free the gearmotor.

Remove and replace the gearmotor.



10

Complete the following tasks:

- Transfer the motor power cable from the old gearmotor to the new gearmotor.
- Transfer the key from the old gearmotor drive shaft to the new gearmotor.
- Check the new gearbox for proper oil fill level.



11

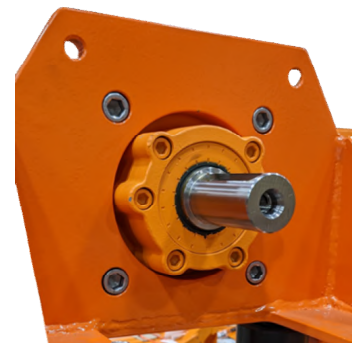
Support & install the new gearmotor using the existing M16 gearmotor mounting screws.

Tighten the screws to 219 Nm of torque.

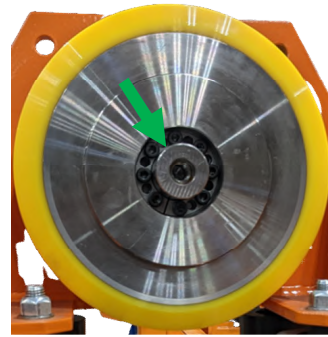


12

If required, install new drive wheel or re-install existing on the shaft of the new gearmotor.



- 13** Install the Clampex internal clamp on the drive wheel.
See manufacturer's procedure for installation.



- 14** Remove support by lowering the chain fall so that the drive trolley wheel sets back onto the rail.



- 15** Re-install cable connections to the drive motor.



- 16** Remove support from the new gearmotor.



- 17** Remove all tools, restore power, and insert carrier back into system.



Set Up for EMS Upper Frame Wire Rope

ⓘ NOTICE ⓘ

The following is a delicate procedure and should only be completed by personnel with extensive knowledge of this system and its component interactions. It is advised to contact FATA customer service for completion of this procedure.

⚠ CAUTION ⚠

When performing this procedure, all ropes (4) will need to be completed. ***It is not recommended to complete anything less than all the ropes.***

- 1 Direct the EMS Carrier to be serviced into the maintenance spur of the system if possible.



- 2 Remove all power to the rail and lockout all power sources to the area.



- 3 Ensure the wire rope is the correct length of 16,300 mm (53.3 ft) with an attached spelter on one end.



⚠ WARNING ⚠

Verify each rope lay direction (left or right) and which drum it should be installed on. Failure to do so could result in reduced lifespan of the wire rope and damage to components during operation.

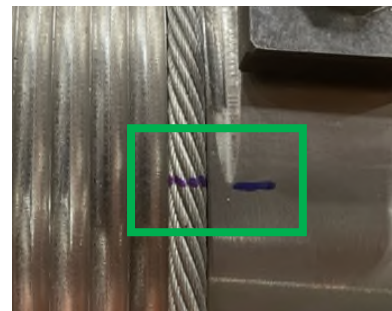
- 4 Loosen the wire rope clip fastenings on the drum.



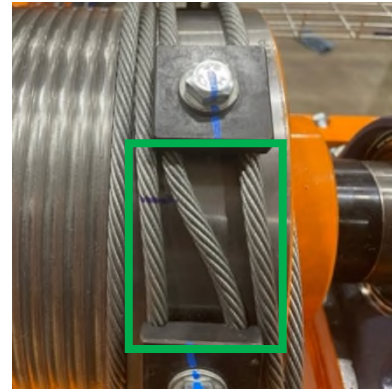
- 5 Measure 13,747 mm (45.1 ft) of wire from the center pin of the spelter toward the end and mark the rope.



- 6 Find the initial groove on the drum and make a mark. Line up the marking on the drum and the rope.



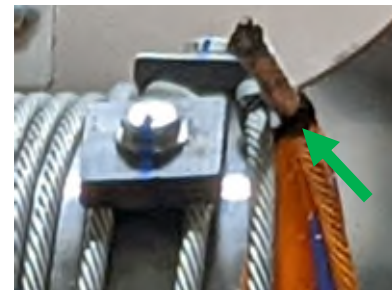
- 7** Wind the rope around the drum through the grooved slots on the wire rope clips. Cross to the second set of grooved slots once completed with the first revolution.



- 8** Once the rope is in position, tighten down the wire rope clip fastenings (55 Nm) and make witness marks for future inspections.



- 9** Cut the wire rope after the last rope clip to accommodate heat shrink sleeve.



- 10** Wind the rope through the grooved slots of the drum eleven times with the excess hanging below.



- 11** Remove the UHMW guides on the link arms.



- 12 Feed the wire rope through the pulley.



⚠ WARNING ⚠

DO NOT spin or twist the rope as the wire is fed, keep the original orientation. Failure to do so could result in reduced lifespan of the wire rope and damage to components during operation.

- 13 Reattach the UHMW guides.



- 14 Secure the spelter to the carrier via the upper frame pin.



Replacing the EMS Upper Frame Cardan Shaft

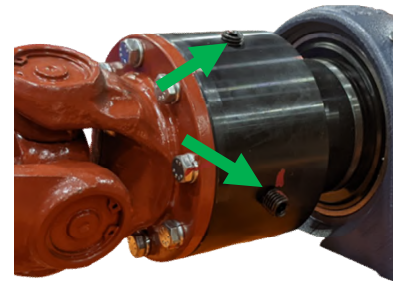
- 1 Direct the EMS Carrier to be serviced into the maintenance spur of the system if possible.



- 2 Remove all power to the rail and lockout all power sources to the area.



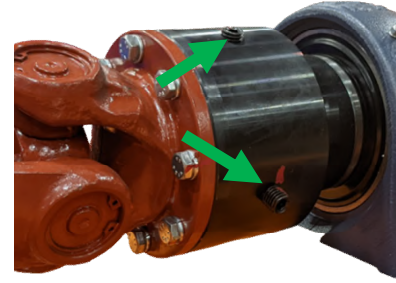
- 3 Undo the setscrews in the companion flanges at both ends of the cardan shaft.



- 4 Remove the original cardan shaft and replace with a new one.



- 5 Tighten the set screws.



- 6 Remove all tools, restore power, and insert carrier back into system.



Replacing the EMS Upper Frame Gearmotor

- 1 Direct the EMS Carrier to be serviced into the maintenance spur of the system if possible.



- 2 Remove all power to the rail and lockout all power sources to the area.



- 3 Support the gearmotor to be serviced.



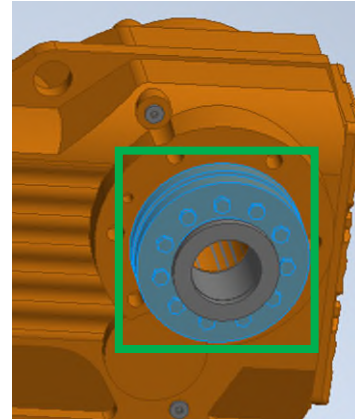
- 4 Remove the locking collar from the drive shaft.



- 5 Remove the gearmotor end cap cover.



- 6 Remove the gearmotor b-lock.



- 7 Remove the bolt securing the gearmotor to the motor mount.



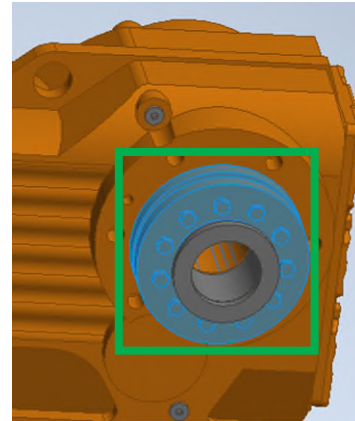
- 8 Carefully remove the gearmotor from the drive shaft and replace with the new gearmotor.



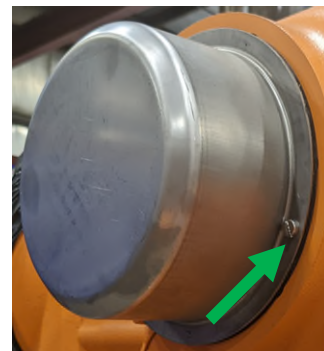
- 9 Secure the new gearmotor to the motor mount.



- 10 Secure the gearmotor b-lock.



- 11 Place and tighten the gearmotor end cap.



- 12 Reinstall the locking collar to the drive shaft.



- 13 Remove the support device for the gearmotor.



- 14 Remove all tools, restore power, and insert carrier back into system.



Replacing the EMS Upper Frame Drum Wear Bar Assembly

- 1 Direct the EMS Carrier to be serviced into the maintenance spur of the system if possible.



- 2 Remove all power to the rail and lockout all power sources to the area.



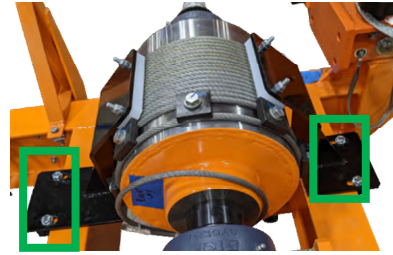
- 3 Remove the M8 bolts (4) securing the wear bar assemblies.



- 4 Remove and replace each wear bar assembly.



- 5 Torque the M8 bolts (4) to 23.1 Nm and create witness marks on each.



- 6 Remove all tools, restore power, and insert carrier back into system.



Replacing the EMS Grounding Shoe

- 1 Direct the EMS Carrier to be serviced into the maintenance spur of the system if possible.



- 2 Remove all power to the rail and lockout all power sources to the area.



- 3 Remove the M10 bolt.



- 4 Remove the M10 bolt securing the assembly from behind.



- 5 Remove the M10 bolt securing the copper cable.



- 6 Remove and replace the worn grounding shoe assembly with the new one.



ⓘ NOTICE ⓘ

The attachment locations for the grounding shoe are ceramic. Use care not to overtighten or else they may break from added stress.

- 7 Secure the M10 bolt (50Nm) for the copper wire.



- 8 Secure the M10 bolt (50Nm) for the assembly from behind.



- 9 Secure the M10 bolt (50Nm).



- 10 Remove all tools, restore power, and insert carrier back into system.



Replacing the EMS Shuttle Alignment Gearmotor

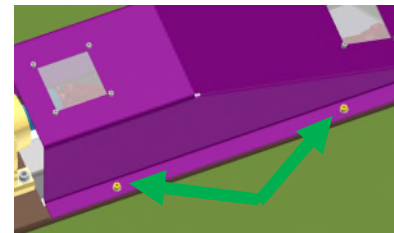
- 1 Remove all power to the rail and lockout all power sources to the area.



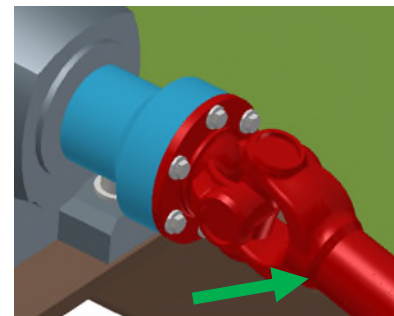
- 2 Support the gearmotor to be serviced.



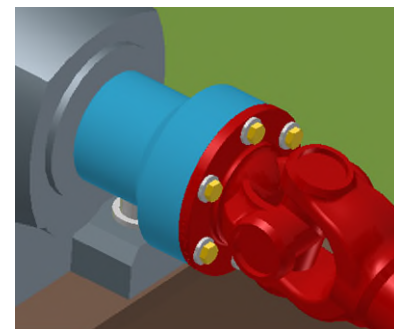
- 3 Remove the cardan shaft cover by taking out the bolts (4) securing it.



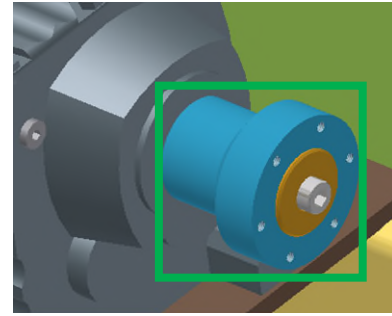
- 4 Loosen the cardan shaft setscrew.



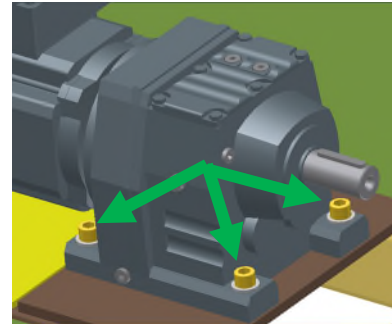
- 5 Remove the M5 bolts (6) attaching the cardan shaft flange to the gearmotor flange.



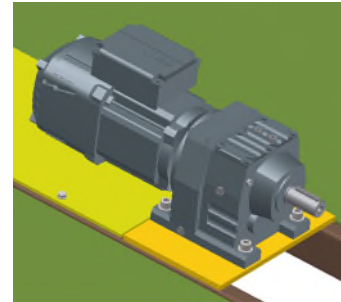
- 6 Remove the cardan shaft hub.



- 7 Remove the M12 bolts (4) securing the gearmotor.
Note: Retain the gearmotor key to be used with the new motor.

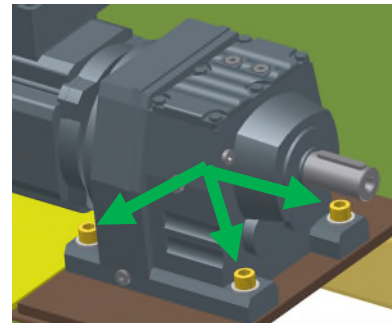


- 8 Remove the original gearmotor and replace with the new one.

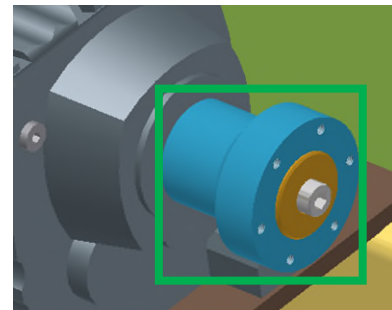


- 9 Place and secure the new gearmotor on the mounting plate.
Tighten the M12 bolts (4) to 88Nm.

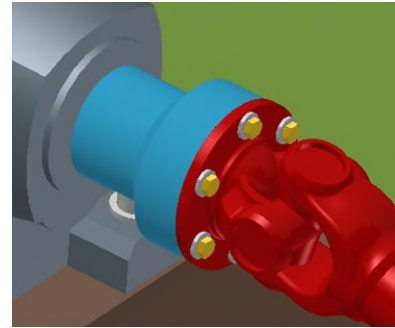
Place the key from the original gearmotor with the new one.



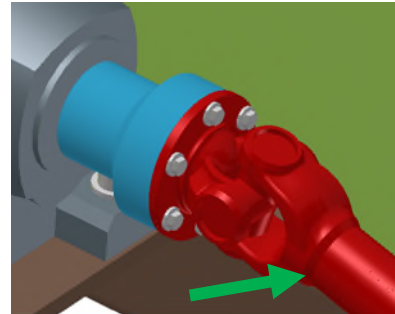
- 10 Place the cardan shaft hub on the new gearmotor.



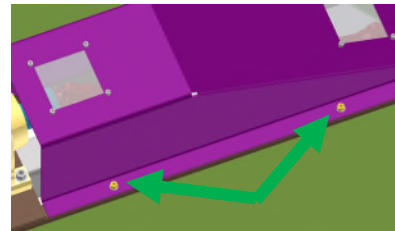
- 11** Secure the M5 bolts (6) attaching the cardan shaft flange to the gearmotor flange.



- 12** Tighten the cardan shaft setscrew.



- 13** Secure the cardan shaft cover with the bolts (4).



- 14** Remove the support from the gearmotor.



- 15** Remove all tools, restore power, and verify functionality.



Replacing the EMS Shuttle Alignment Cardan Shaft

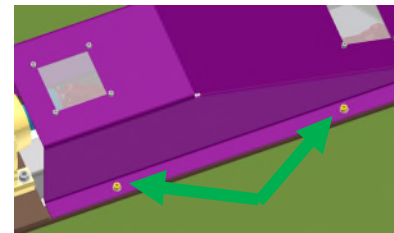
- 1 Remove all power to the rail and lockout all power sources to the area.



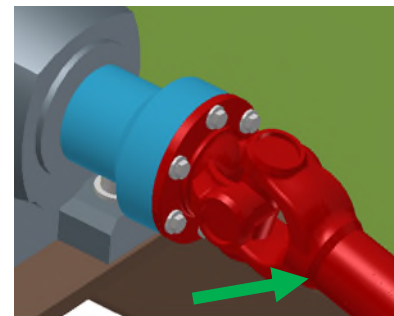
- 2 Support the cardan shaft.



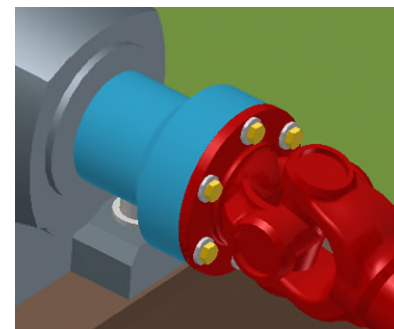
- 3 Remove the cardan shaft cover by taking out the bolts (4) securing it.



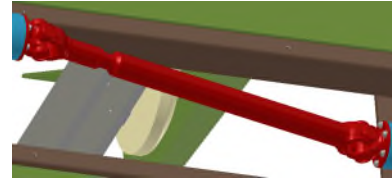
- 4 Loosen the cardan shaft setscrew on both ends.



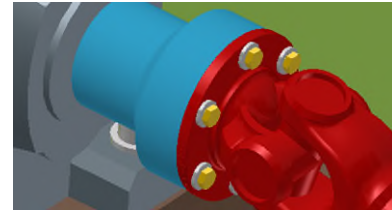
- 5 Remove the M5 bolts (6) attaching the cardan shaft flange to the companion flange on both ends.



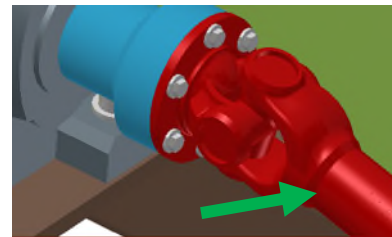
6 Remove and replace the original cardan shaft with a new one.



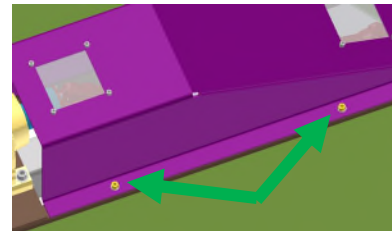
7 Secure the M5 bolts (6) attaching the cardan shaft flange to the companion flange on both ends.



8 Tighten the cardan shaft setscrews on both ends.



9 Secure the cardan shaft cover with the bolts (4).



10 Remove the cardan shaft support.



12 Remove all tools, restore power, and verify functionality.



Replacing the EMS Shuttle Drive Gearmotor

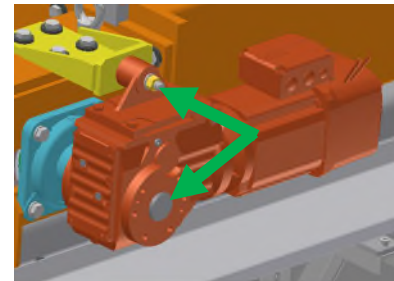
- 1 Remove all power to the rail and lockout all power sources to the area.



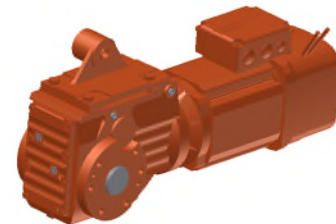
- 2 Support the gearmotor to be serviced.



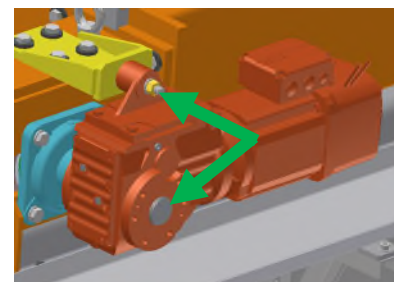
- 3 Loosen and remove the M16 bolts (2) securing the motor to the mounting bracket and shaft.



- 4 Remove the original gearmotor and replace with a new one.



- 5 Tighten the M16 bolts (2) to 219Nm securing the gearmotor to the shaft and mounting bracket.



- 6 Remove the gearmotor support.



- 7 Remove all tools, restore power, and verify functionality.



Replacing the EMS Shuttle Drive Cardan Shaft

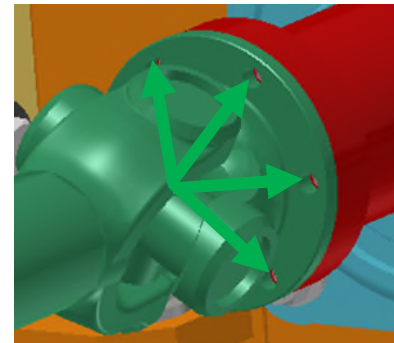
- 1 Remove all power to the rail and lockout all power sources to the area.



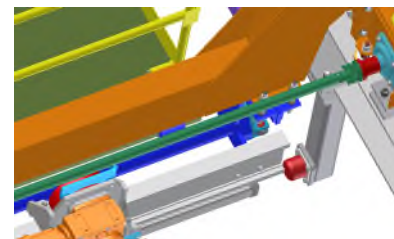
- 2 Support the cardan shaft.



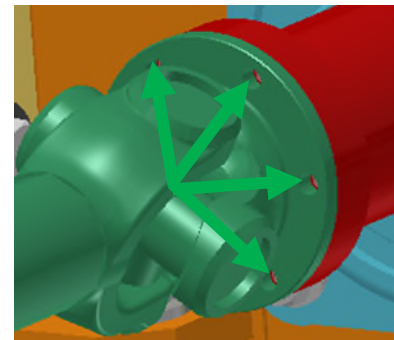
- 3 Remove the M5 bolts (6) attaching the cardan shaft flange to the shaft hub on both ends.



- 4 Remove and replace the original cardan shaft with a new one.



- 5 Mount the cardan shaft flange to the cardan shaft hubs on both sides and tighten the M8 bolts (6) to 25Nm.



- 6 Remove the cardan shaft support.



- 7 Remove all tools, restore power, and verify functionality.

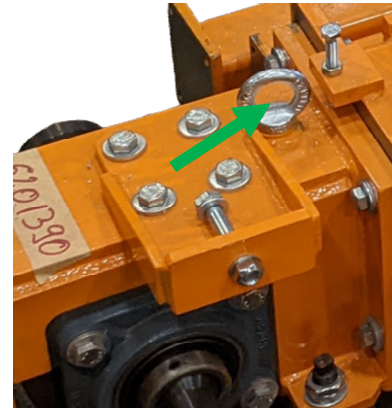


Replacing the EMS Shuttle Drive Wheel With Gearmotor

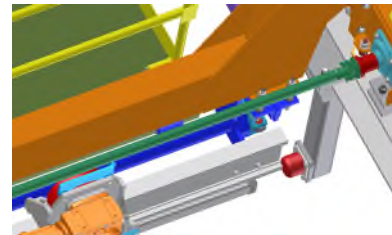
- 1 Remove all power to the rail and lockout all power sources to the area.



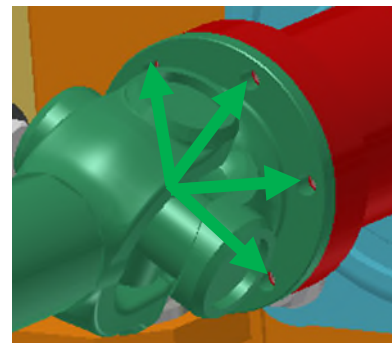
- 2 Support the trolley to be serviced using the eyebolt.



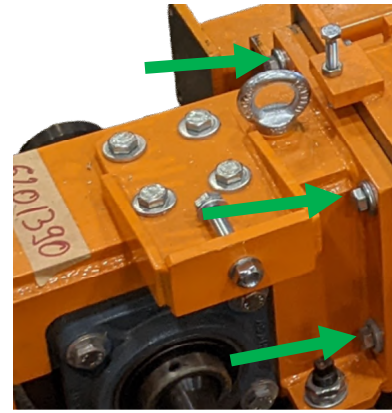
- 3 Secure the cardan shaft.



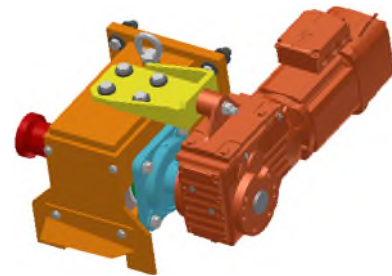
- 4 Remove the M8 bolts (6) securing the cardan shaft to the cardan shaft hub.



- 5** Loosen and remove the M16 bolts (4) securing the trolley to the middle frame.



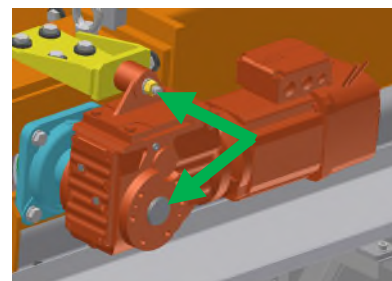
- 6** Remove the trolley assembly with gearmotor and transfer to the workbench before continuing steps.



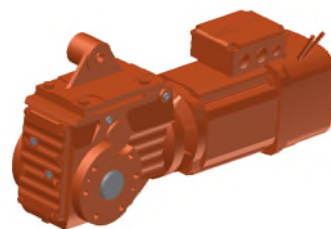
- 7** Secure the gearmotor.



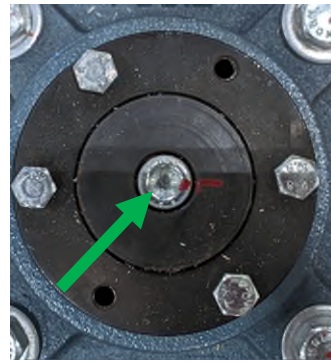
- 8** Loosen and remove the M16 bolts (2) securing the motor to the mounting bracket and shaft.



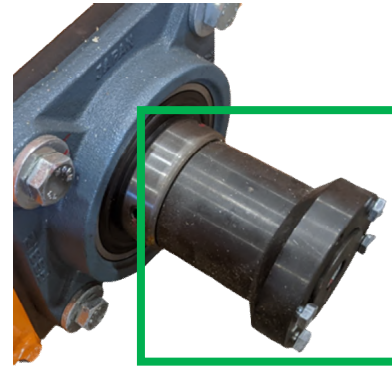
- 9** Remove the gearmotor.



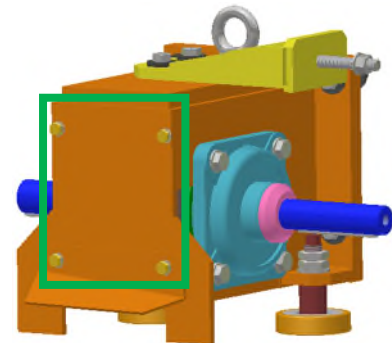
- 10** Remove the M12 bolt securing the shaft hub to the shaft.



- 11** Remove the shaft hub.
Note: Retain the shaft key for later use.



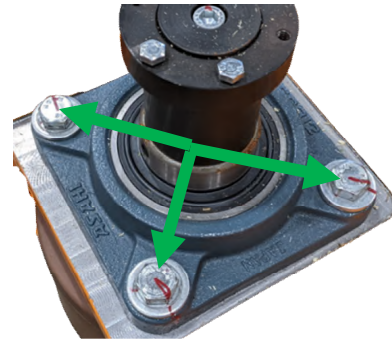
- 12** Remove the M10 bolts (4) to take out the keeper plates.



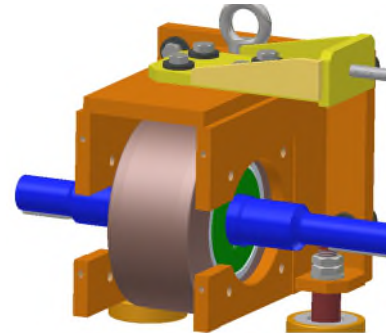
- 13** Loosen the set screws (2) on each flange bearing collar for both sides.



- 14** Loosen and remove the M16 bolts (4) securing each flange bearing on both sides.

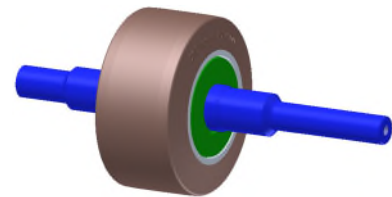


- 15** Remove both flange bearings and retain all spacers.



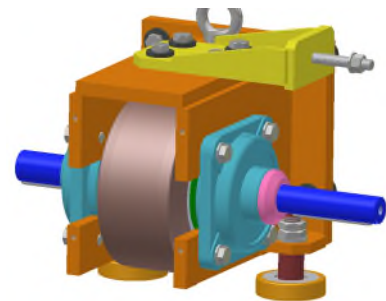
Slide the wheel and shaft assembly from the steel housing.

- 16** Remove existing wheel and replace. Reassemble wheel and shaft assembly as previously installed.



- 17** Place the new wheel and shaft assembly in the trolley housing and secure the flange bearings. Tighten the M16 bolts to 219Nm.

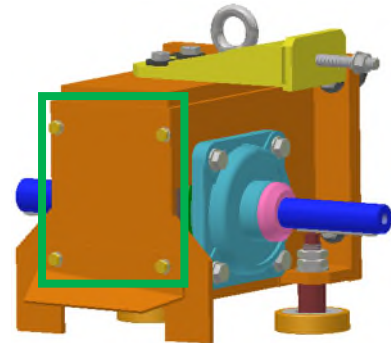
Note: Return any spacers as they were present before.



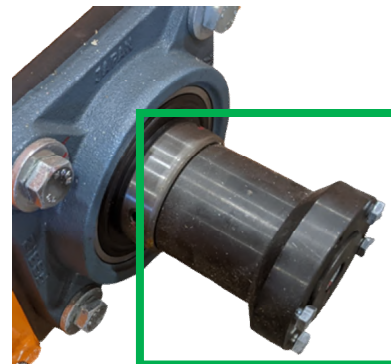
- 18** Tighten the set screws (2) for each flange bearing collar on both sides.



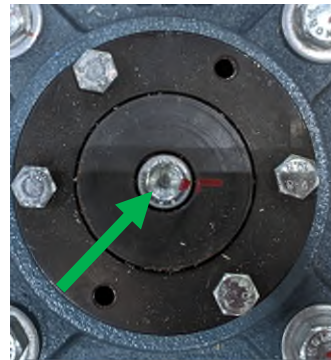
- 19** Return the keeper plates and tighten the M10 bolts (4) to 50Nm.



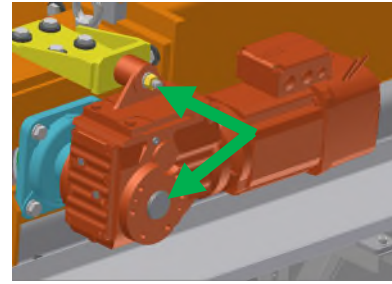
- 20** Return the shaft hub with the appropriate key.



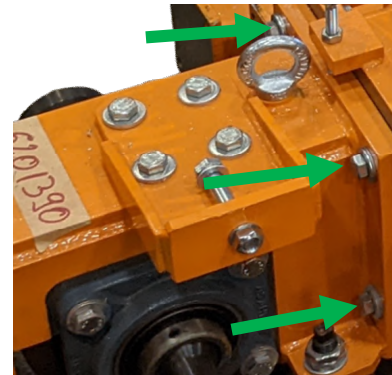
- 21** Tighten the shaft hub M12 bolt to 88Nm securing it to the shaft.



- 22 Tighten the M16 bolts (2) to 219Nm securing the gearmotor to the shaft and mounting bracket.



- 23 Return the trolley wheel assembly with gearmotor and tighten the M16 bolts (4) to 219Nm securing the trolley to the middle frame.



- 24 Mount the cardan shaft to the cardan shaft hub and tighten the M8 bolts (6) to 25Nm.



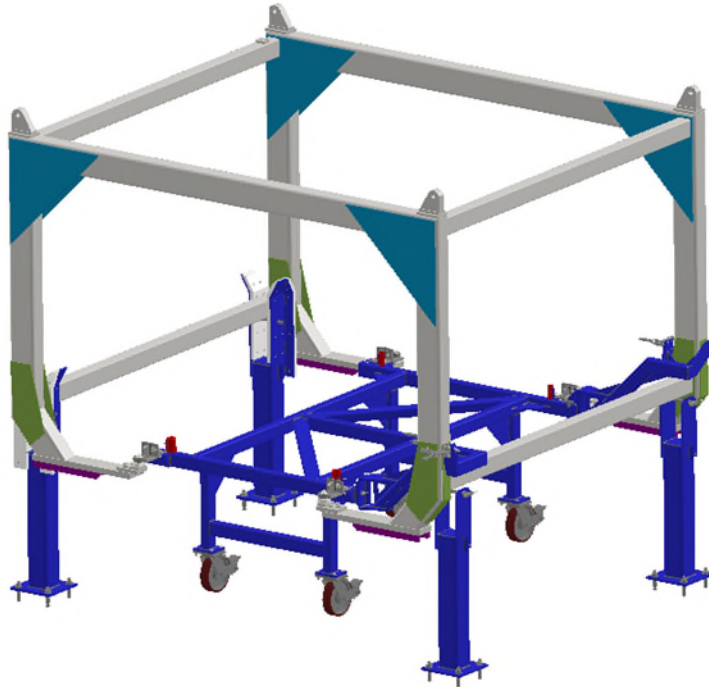
- 25 Remove the supports from the cardan shaft and trolley eyebolt.



- 26 Remove all tools, restore power, and verify functionality.



EMS Carrier Lower Frame Mastery

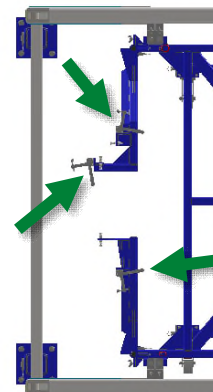


Mastery Procedure for EMS Carrier Lower Frame

- 1 Direct the EMS Carrier to the repair spur.

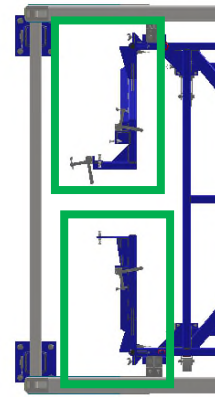


- 2 Verify all (3) clamps are in the open position.



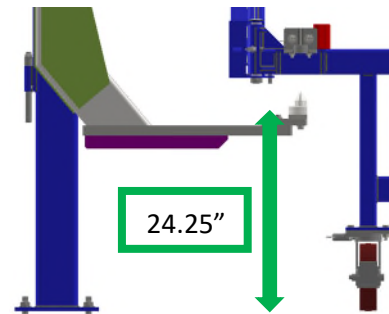
Top View

- 3 Verify all (2) checking arms are in secured in the travel position with the locking pins in place.



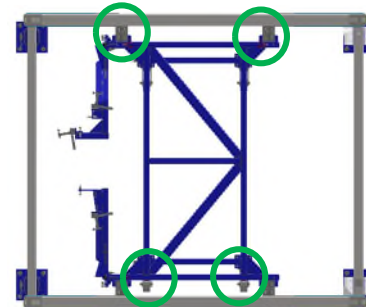
Top View

- 4 Using a tape measure, lower the carrier centered on the guides to an elevation of 24.25 "(616.0 cm). The measurement should read from the finished floor to pin rest surface.



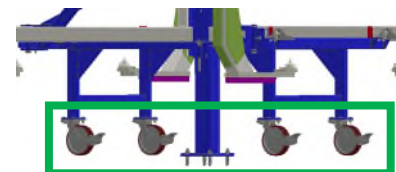
Front View

- 5 Roll checking fixture into position above the carrier with all (4) pins and pin fixtures aligned.

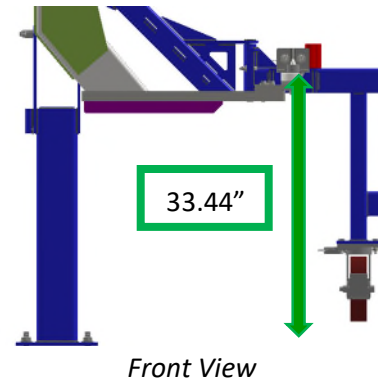


Top View

- 6 Lock all (4) wheel locks on checking fixture.

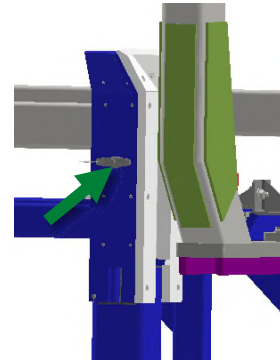


- 7 Using a tape measure, raise the carrier to an elevation of 33.44" (849.3 cm). The measurement should read from the finished floor to pin rest surface.

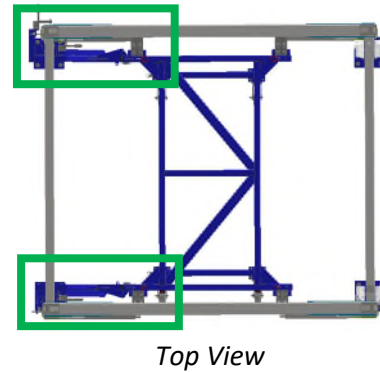


- 8 Insert all (4) pins into the guides located in the corners of the checking fixture.

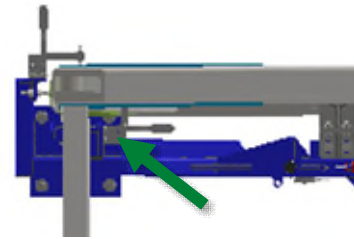
Note: Maintain carrier elevation – do not set carrier on pins.



- 9 Remove the locking pins and extend the checking arms to the check position. Secure the checking arms using the locking pins.

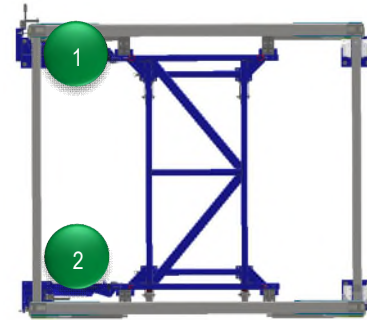


- 10 Lock the rear clamp about the carrier.



Top View

- 11 Lock both (2) side clamps beginning with the rear.



Top View

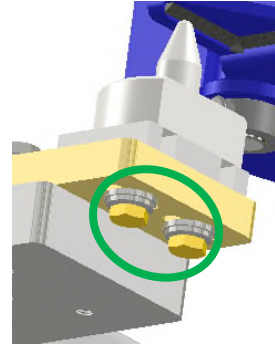
- 12 Using the round Go-No-Go Gauge, check the position of both (2) front & (2) rear pins.
Note: The front and rear Go-No-Go Gauges are different sizes to accommodate for the different pin sizes.



- 13 If adjustments are necessary, continue to step 14.
If no adjustment is necessary, skip to step 17.



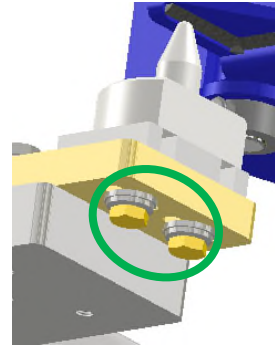
14 Loosen the securing bolts below the pin.



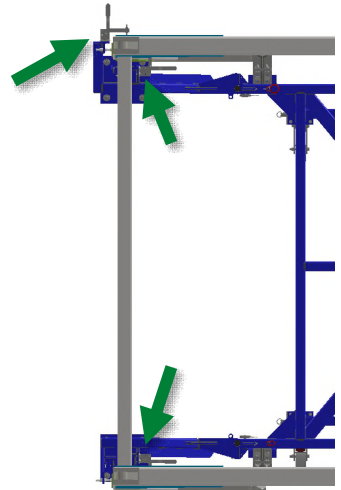
15 Using shims reset the feature to the Set-up Gauge specifications.



16 Tighten any loose securing bolts.

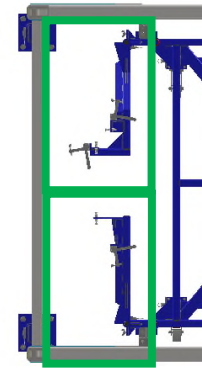


17 Unlock all (3) clamps.



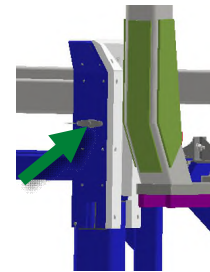
Top View

- 18** Remove the locking pins and retract the checking arms to the travel position. Secure the checking arms using the locking pins.

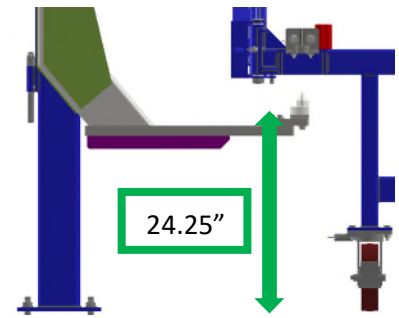


Top View

- 19** Remove all (4) pins in the guides located in the corners of the checking fixture.

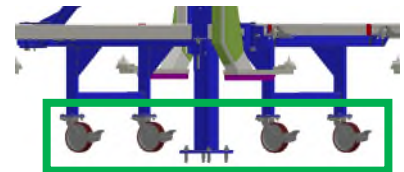


- 20** Using a tape measure, lower the carrier centered on the guides to an elevation of 24.25 "(616.0 cm). The measurement should read from the finished floor to pin rest surface.



Front View

- 21** Unlock all (4) wheel locks on checking fixture.



- 22** Roll the checking fixture out of the carrier. Remove lockouts, restore power, and return the carrier back to the system.

