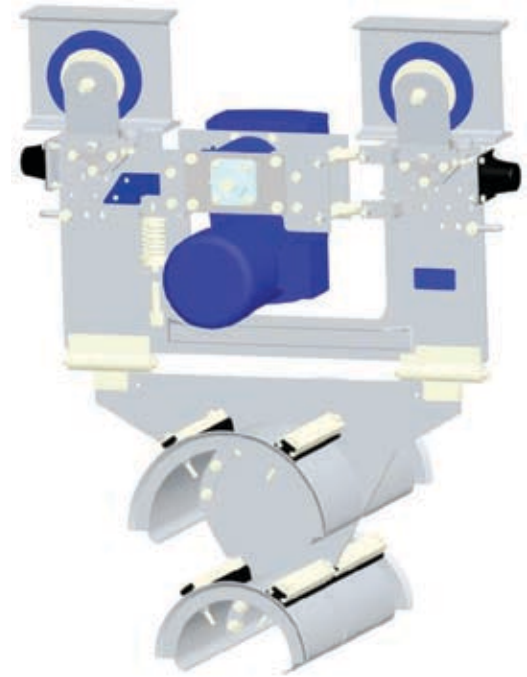


# Festoon System Motorized Trolley



# Conductix Incorporated

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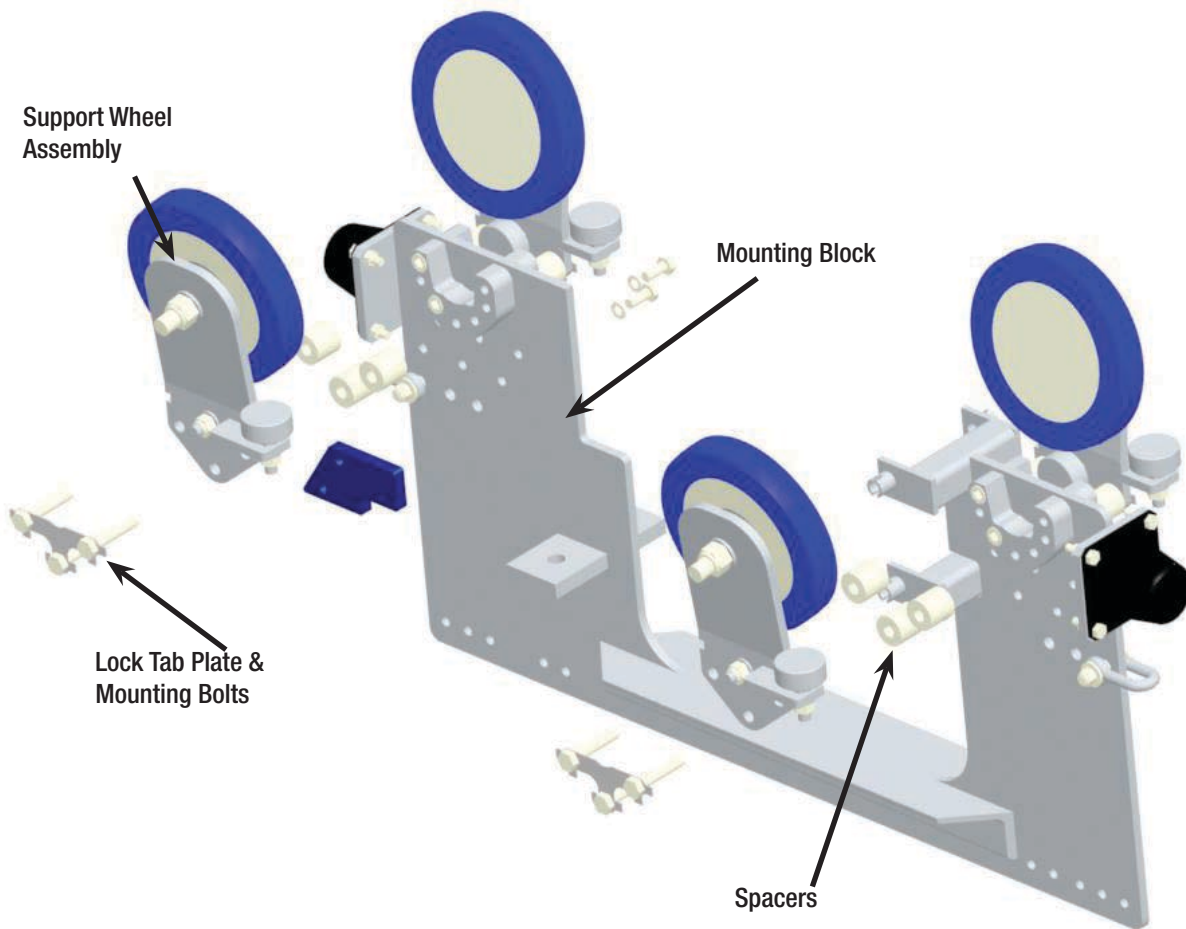
## **9.0 Passive Mode Operating Instructions**

# 1.0 Installation

## 1.1 Preparation (retrofit or new install) Conductix-Wampfler HD Festoon Systems.

- 1.1.1 Check system specifications to determine where motorized trolleys are to be located in the system.
- 1.1.2 Check storage space restrictions as the motorized trolleys are much larger than standard trolleys. See original approval drawings for motorized trolley dimensions.
- 1.1.3 Add motorized trolley power cables for each motorized trolley to the system, up to the location where each motorized trolley is to be installed. Allow 3 feet (915mm) of cable at the trolley for hook up to the motor.
- 1.1.4 Install storage position limit switches on crane.
- 1.1.5 If the installation is a retrofit of an existing system, remove existing passive trolleys at locations where motorized trolleys are to be installed.
- 1.1.6 Block or tie the two passive trolleys between which the motorized trolley is to be installed at least 46 inches (1169mm) apart.

## 1.2 Mounting the Frame Assembly:



# 1.0 Installation

## Tools Required:

19mm socket and ratchet or box end wrench

Small hammer

Small chisel

Torque wrench(es) (60lb-ft (81N-m) to 130lb-ft (176N-m))

- 1.2.1 Remove support wheel assemblies from one side of motorized trolley frame assembly by using a hammer and chisel to bend back locking tabs from side shield mounting bolts and removing the 6 bolts (3 per wheel) that hold the wheel side plate to the frame.

**Warning: There is one loose spacer between the side shield and the mounting block to which the bolt is threaded. These spacers must be retained during bolt removal to prevent dropping them from the crane!**

- 1.2.2 Hook remaining support wheels and frame assembly on one flange of beam and hold in place.

- 1.2.3 Mount Support Wheel assembly to trolley body. Insert M12 bolts through lock tab plate, then Support Wheel assembly, then spacers, and finally into trolley mounting block. Thread bolts in finger tight.

- 1.2.4 Loosen but do not remove all twelve (12) bolts that hold the four (4) support wheels to the frame. Adjust the wheels as needed to ensure even weight distribution and side guide roller alignment with flange of beam.

- 1.2.5 Torque M12 bolts to 60 lb-ft (81 N-m).

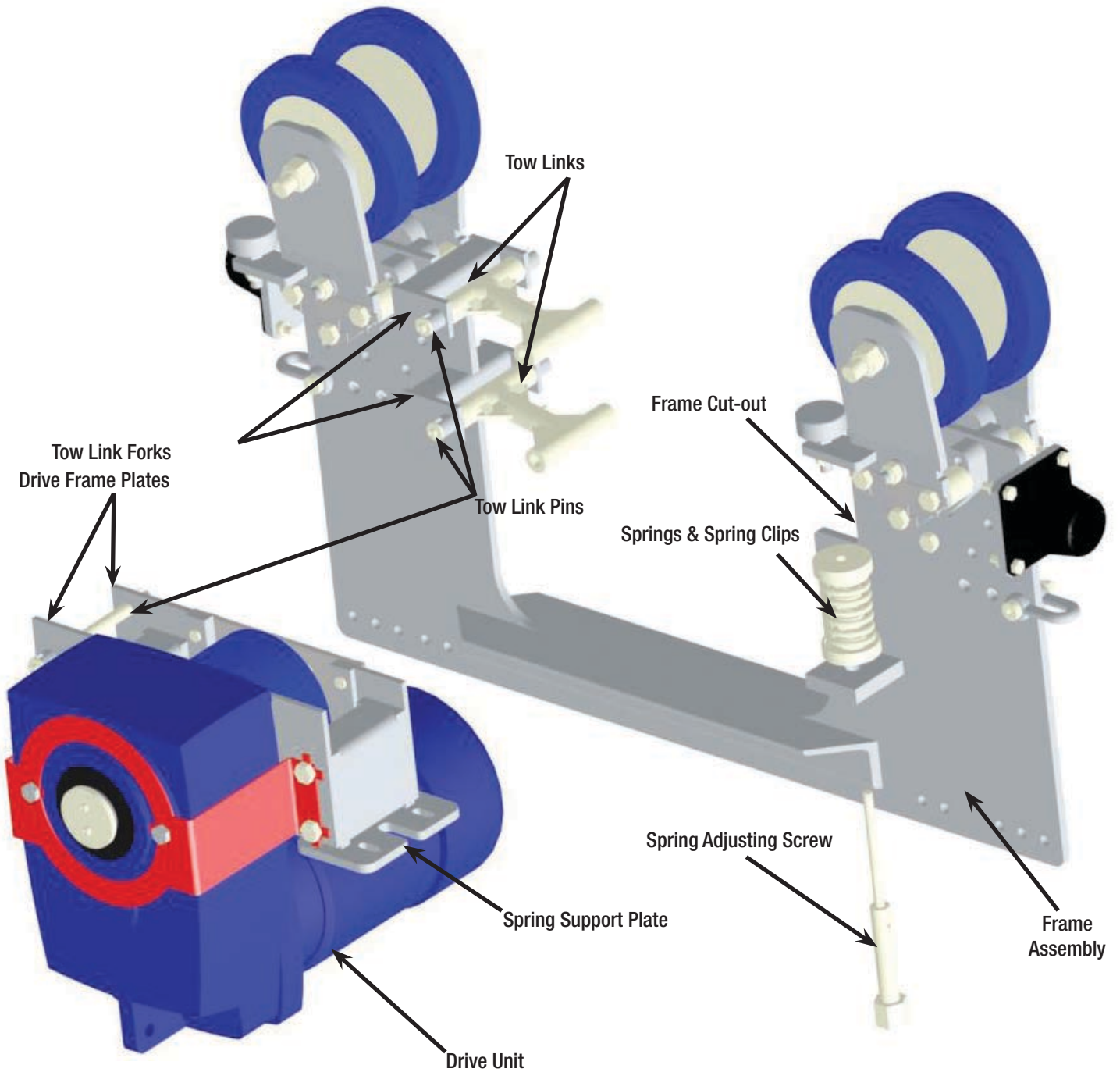
- 1.2.6 Using the hammer (and chisel if needed), bend one of the lock tabs tightly over a flat side of the bolt head.

**Warning: Ensure motorized trolley bumpers align with passive trolley bumpers. Consult factory if misaligned.**

- 1.2.7 Install triggers (supplied by customer) as needed for storage position limit switches. The trolley frame is supplied with a series of 12, 3/8 inch (10mm) holes just below the wheel mounts that can be used in any combination to mount triggers for the limit switches.

# 1.0 Installation

## 1.3 Mounting the Drive Unit Assembly



# 1.0 Installation

## Tools Required:

1-1/8 inch open end wrench or adjustable wrench  
1-1/8 inch socket and ratchet (optional)  
4mm Allen wrench.  
Drive unit lifting bracket

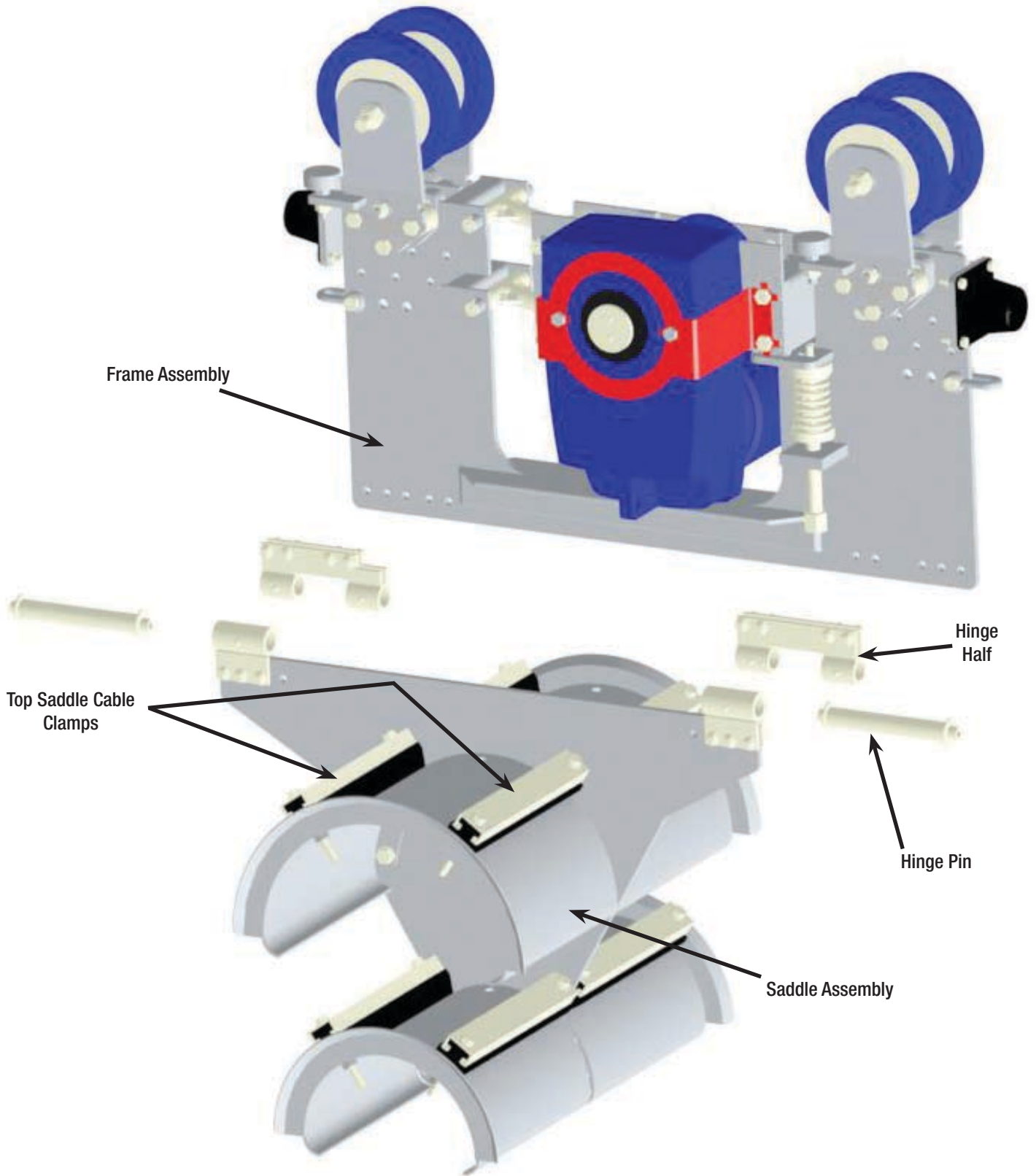
- 1.3.1 Install the two (2) tow links into the frame assembly.
  - a. Install tow links with grease zerks positioned for ease of access.
  - b. Slip one end of the tow link between the forks.
  - c. Install the tow link pin until the roll pin is in the slots of the fork frame.
  - d. Install retaining bolt and washer from other side. Apply locking compound to cap screw and thread into pin. Torque M5 bolt to 5 lb-ft (7 N-m).
- 1.3.2 Insert drive unit assembly into frame assembly.
  - a. Install drive unit lifting bracket on threaded bolt hole pattern provided in the gearbox, opposite of the motor, using four (4), M10 bolts.
  - b. Drive unit must be installed in frame such that the tow links can be inserted between the drive frame plates and the spring support plate is over the frame spring plates.
  - c. Drive unit must be inserted motor first.
  - d. Slide spring support plate over step in frame cut out, and slide back so that the spring support plate cut out straddles the edge of the frame cut out. Allow spring support plate to sit on step in frame.
  - e. Raise front of drive unit and rotate top tow link between drive unit frame plates. Align the tow link end with the top set of holes in the drive frame plates and insert pin until roll pin engages into slots in frame plates.

**WARNING: Do not allow front of drive unit to drop. It is not supported at this point and damage to the motor may result.**

- f. Rotate bottom tow link into drive unit frame. Align with bottom set of holes in frame plates and install pin.
  - g. Install retaining bolt and washer from other side. Apply locking compound to cap screw and thread into pin. Torque M5 bolt to 5 lb-ft (7 N-m).
  - h. All supports used to raise drive unit into place can be removed at this time. Drive unit will be supported in the trolley frame by the two (2) tow links on the one end and the spring support plate resting on the step in the frame on the other end.
- 1.3.3 Place one smaller spring inside the larger spring and place between the two (2) spring cups. The springs will fit in the counter bores of the cups on each end.
- 1.3.4 Slide the spring and cup assembly between the spring support plate of the drive unit and the spring plate of the frame.
- 1.3.5 Insert the small end of the spring adjusting screw through the spring plate of the frame, the center of the spring assembly, and into the spring support frame of the drive unit. The threaded portion will thread into the frame spring plate. Thread adjusting screw into the spring plate until flush with the top of the plate - this will be indicated when the bottom spring cup begins to rise.
- 1.3.6 Repeat steps 1.3.3 - 1.3.5 for the other side.
- 1.3.7 Grease suspension joints with a multipurpose grease. Apply grease until a small amount is visible around the tow link ends. Wipe off excess grease.

# 1.0 Installation

## 1.4 Mounting the Saddle Assembly





# 1.0 Installation

## Tools Required

16mm socket and ratchet  
16mm box end wrench

- 1.4.1 Bolt hinge halves to each end of saddle assembly using M10 bolts. Torque M10 bolts to 30 lb-ft (40 N-m)
- 1.4.2 Insert hinge pin into each half bolted to saddle assembly.
- 1.4.3 Slide remaining loose hinge halves onto hinge pins.
- 1.4.4 Raise saddle assembly and pre-assembled hinges into place over frame assembly and install M10 bolts. Torque M10 bolts to 30 lb-ft (40 N-m)
- 1.4.5 Install cables onto saddles in the same way as the rest of the festoon system.

**Note: If retrofitting an existing passive system without replacing the existing cable, the cable loops at the motorized trolleys will hang lower due to the height of the motorized trolleys.**

- 1.4.6 Grease saddle hinges with a multipurpose grease. Apply grease to each zerk until a small amount of grease is visible between the hinge halves. Wipe off excess grease.

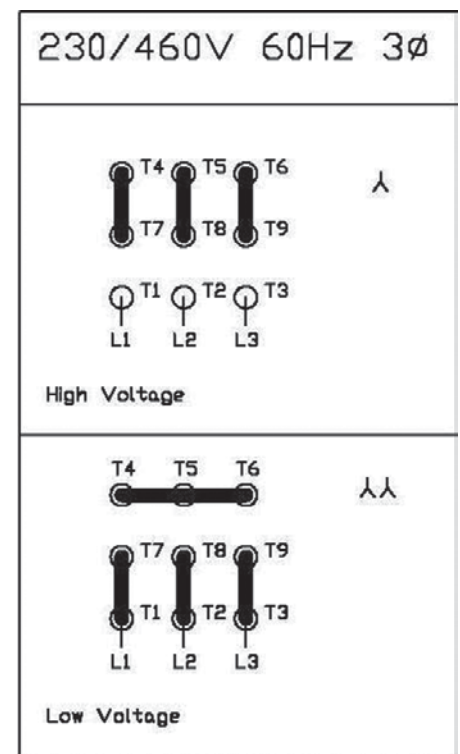
## 1.5 Lanyard Mounting Instructions (from gear motor side)

- 1.5.1 Insert shackle end through thimble ends of cable assemblies.
- 1.5.2 Insert shackle onto gear motor.
- 1.5.3 Secure shackle pin with cotter key.
- 1.5.4 Insert 3/8 - 16 bolt through 3/8 washer and retaining collar.
- 1.5.5 Insert bolt and collar assembly into the socket end of the cable assembly.
- 1.5.6 Place 2 5/8 washers between the socket end of lanyard and trolley body and insert bolt through hole.
- 1.5.7 Place 3/8 flat washer and 3/8 locking nut on opposite side of trolley body and torque to 30 lb.-ft (40 N-m)
- 1.5.8 Repeat steps 1.5.3 - 1.5.6 for other end of lanyard.

## 1.6 Electrical Connections

**WARNING: Disconnect all power from the motorized trolley prior to making any electrical connections.**

- 1.6.1 Motorized trolley power cables must be clamped under both cable clamps of the top saddle of the motorized trolley. Then they should be routed through the watertight of the motor junction box and electrical terminations made in the box. See wiring diagram:



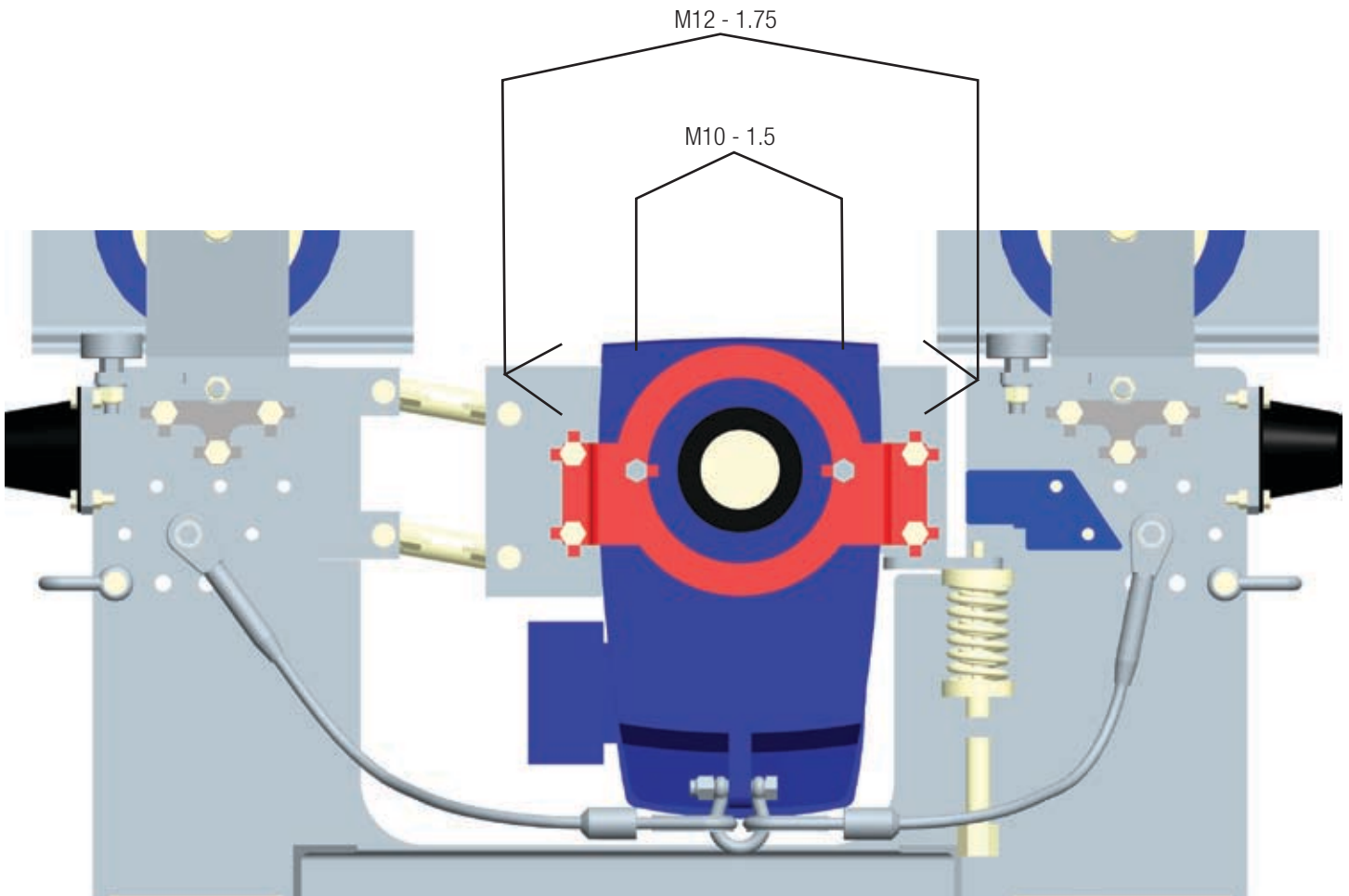
## 1.0 Installation

### 1.7 Gearbox Retaining Strap Installation Instructions (from gear motor side)

- 1.7.1 Remove the four M12-1.75 bolts holding the gear motor mounting plate to drive unit.
- 1.7.2 Place retaining strap over gearbox making sure the holes align with those on the gearbox mounting flange.
- 1.7.3 Re-install bolts in the gear motor mounting plate, using the holes in the retaining strap. (use thread locking compound Loctite 242 or equivalent)
- 1.7.4 Torque M12-1.75 bolts to 60 lb.-ft (81 N-m)
- 1.7.5 Bend lock tabs over the flats of the bolt heads. Only one tab must be used per bolt.
- 1.7.6 Install two new M10-1.5 bolts in the mounting flange of the gearbox, using the holes in the retaining strap. (use thread locking compound Loctite 242 or equivalent)
- 1.7.7 Torque M10-1.5 bolts to 30 lb.-ft (40 N-m)
- 1.7.8 Bend lock-tabs over the flats of the bolt heads.

### 1.8 Travel Stop Installation (from gear motor side)

- 1.8.1 Align tapped holes in travel stop with the two holes in the frame nearest the springs.
- 1.8.2 Insert M10-1.5 bolt through lock-washer.
- 1.8.3 Install bolt through frame (on opposite side of travel stop) and into travel stop. (use thread locking compound Loctite 242 or equivalent)
- 1.8.4 Repeat steps 1.8.2-1.8.3 for other bolt.
- 1.8.5 Torque M10-1.5 bolts to 30 lb.-ft (40 N-m).

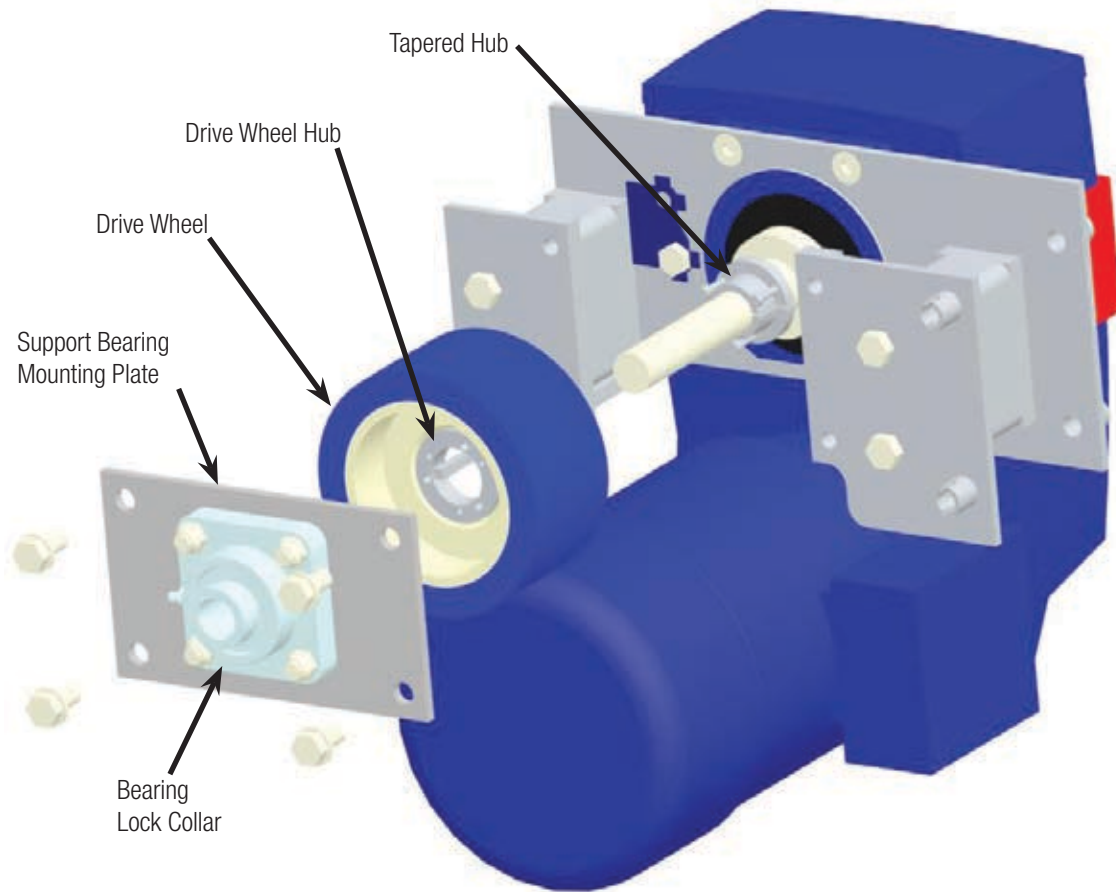


## 2.0 Maintenance and Repair

### 2.1 Drive Wheel Inspection

Inspect the drive wheel monthly for damage and abnormal wear. Visually check the drive wheel surface for cracks or voids. If the drive wheel is found to be cracked, pitted, or delaminating in any way, replace the drive wheel. The drive wheel should also be replaced if the diameter of the wheel becomes less than 5.50 in. (140mm) or if the trolley speed or traction is decreased. The drive wheel must be replaced annually, regardless of visible condition.

### 2.2 Drive Wheel Replacement



#### Tools Required:

- 1-1/8 inch open end wrench or adjustable wrench
- 1-1/8 inch socket and ratchet (optional)
- 19mm socket and ratchet or box end wrench
- Torque wrench(es) (5lb-ft (7N-m) to 60lb-ft (81N-m))
- 5/32 Allen (hex) drive socket and extensions to fit torque wrench
- 3mm Allen Wrench
- Small Hammer
- 1/8 inch diameter pin punch
- Tape measure or ruler (4 in. (100mm) minimum)

## 2.0 Maintenance and Repair

- 2.2.1 Loosen lock nut on suspension spring adjusting screws by turning counter clockwise.
- 2.2.2 Turn spring adjusting screws counter clockwise 5 turns at a time alternating sides. Keep doing this until the drive wheel no longer contacts the beam.

**Note: Limiting the travel to 5 turns at a time and alternating sides keeps the load supported more evenly from one side to the other.**

- 2.2.3 Loosen the set screw in the bearing lock collar.
- 2.2.4 Using a hammer and pin punch, rotate lock collar to release it from the shaft.
- 2.2.5 Remove the four (4) M12 bolts from the support bearing mounting plate and slide the bearing and plate assembly off the shaft.
- 2.2.6 Remove the three (3) #10 socket head cap screws from the wheel hub.
- 2.2.7 Reinstall the #10 screws into the threaded holes of the outer ring of the drive wheel hub.
- 2.2.8 Sequentially tighten the screws in the three holes. As the screws are tightened, they will push the wheel assembly off the inner tapered hub.
- 2.2.9 Clean all corrosion off of the tapered hub on the shaft.

**Note: Do not loosen the tapered hub.**

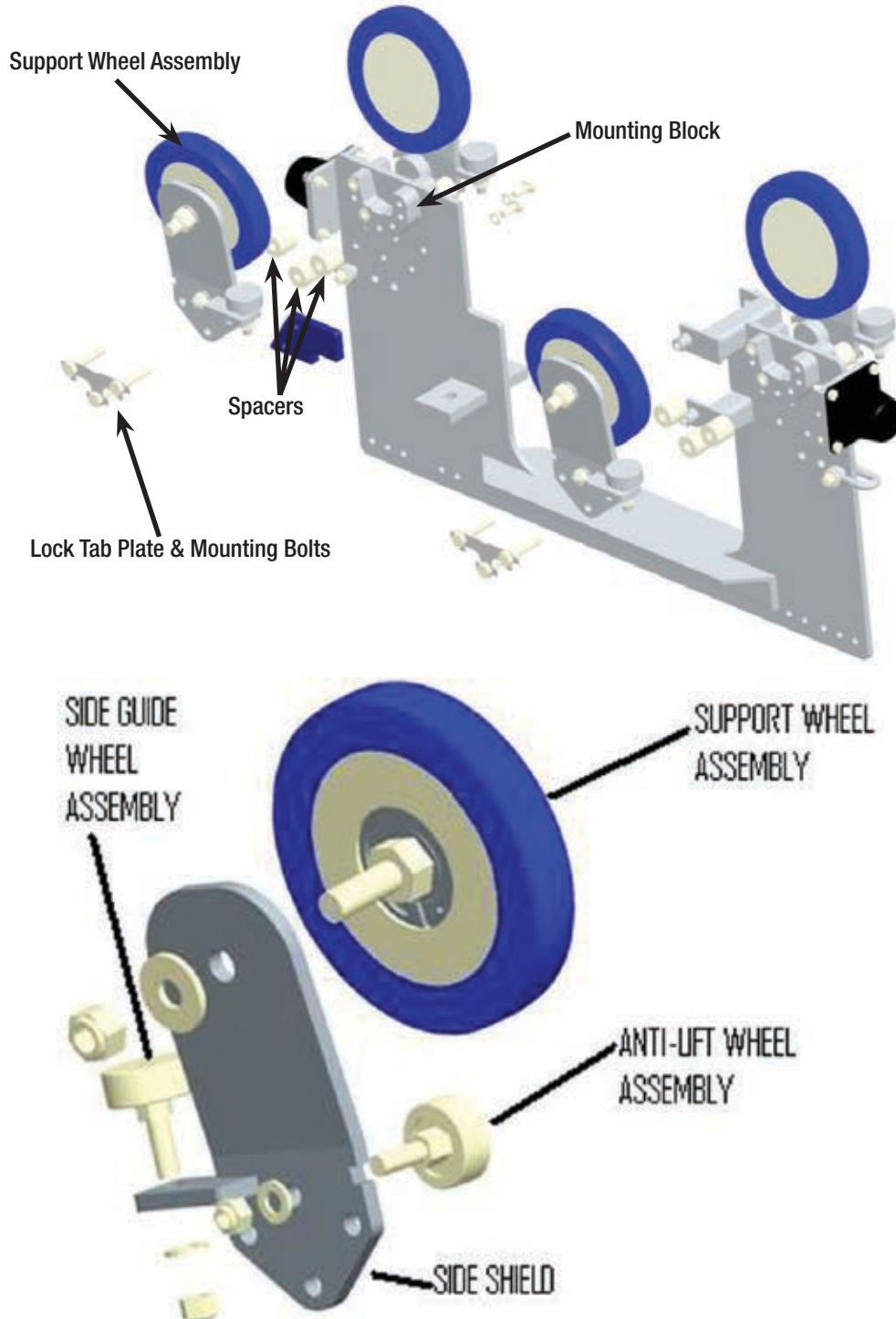
- 2.2.10 Apply a small amount of grease to tapered surface of hub.
- 2.2.11 Position new drive wheel onto the tapered hub.
- 2.2.12 Install #10 socket head cap screws through clearance holes of wheel hub and into threaded holes of shaft hub.
- 2.2.13 Sequentially torque screws to 5 lb-ft (7 N-m). Be sure to go around the three (3) screws several times as this will assure the wheel has minimal run-out and ensures even torque on all screws.
- 2.2.14 Reinstall the support bearing mounting plate. Install the four (4) M12 bolts and flat washers applying Loctite 242 removable thread locker or equivalent. Torque bolts to 60 lb-ft (81 N-m).
- 2.2.15 Reinstall bearing lock collar by placing collar on shaft and bearing cam ring. Using a hammer and pin punch, rotate the collar on the cam ring until it is tight. Tighten setscrew to hold collar in place. Because of the position, using a torque wrench is not feasible.
- 2.2.16 Turn spring adjusting screws clockwise no more than 5 turns per side at a time. Adjust until the distance between the outer edges of the spring retaining cups is 3.2 in. (81mm).
- 2.2.17 Thread locking nut up against frame plate and tighten. Because of the position, using a torque wrench is not feasible.

## 2.0 Maintenance and Repair

### 2.3 Support Wheel and Side Guide Wheel Inspection

Inspect the support wheels monthly for damage and wear. Visually check the support wheel surfaces for cracks or voids. If a support wheel is found to be cracked, pitted, or delaminating in any way, replace the support wheel assembly. Support wheel assemblies should also be replaced if the diameter of a wheel becomes less than 5.75 in. (146mm), or if the trolley shows signs of uneven load distribution because of uneven wheel wear. All support wheels must be replaced annually, regardless of condition. Inspect the side guide wheels for wear. If wear is in excess of 1/4 inch (6mm) on the diameter, side guide wheel should be replaced.

### 2.4 Support and Side Guide Wheel Replacement



## 2.0 Maintenance and Repair

### Tools Required:

19mm socket and ratchet or box end wrench

11/16 inch open end wrench

1-1/4 inch thin open end wrench

27mm wrench

Small hammer

Small chisel

Torque wrench(es) (60lb-ft (81N-m) to 130lb-ft (176N-m))

- 2.4.1 Install a safety cable around the trolley assembly to prevent the trolley from slipping off the opposite side of the beam from where the wheel is to be removed.
- 2.4.2 Use hammer and chisel to bend back locking tabs from side shield mounting bolts.
- 2.4.3 Remove the three (3) M12 mounting bolts.

**Warning: There is one loose spacer between the side shield and the mounting block the bolt is threaded to. These spacers must be retained during bolt removal to prevent dropping them from the crane! Also note ONLY ONE WHEEL ASSEMBLY CAN BE REMOVED FROM THE TROLLEY AT A TIME without other support means!**

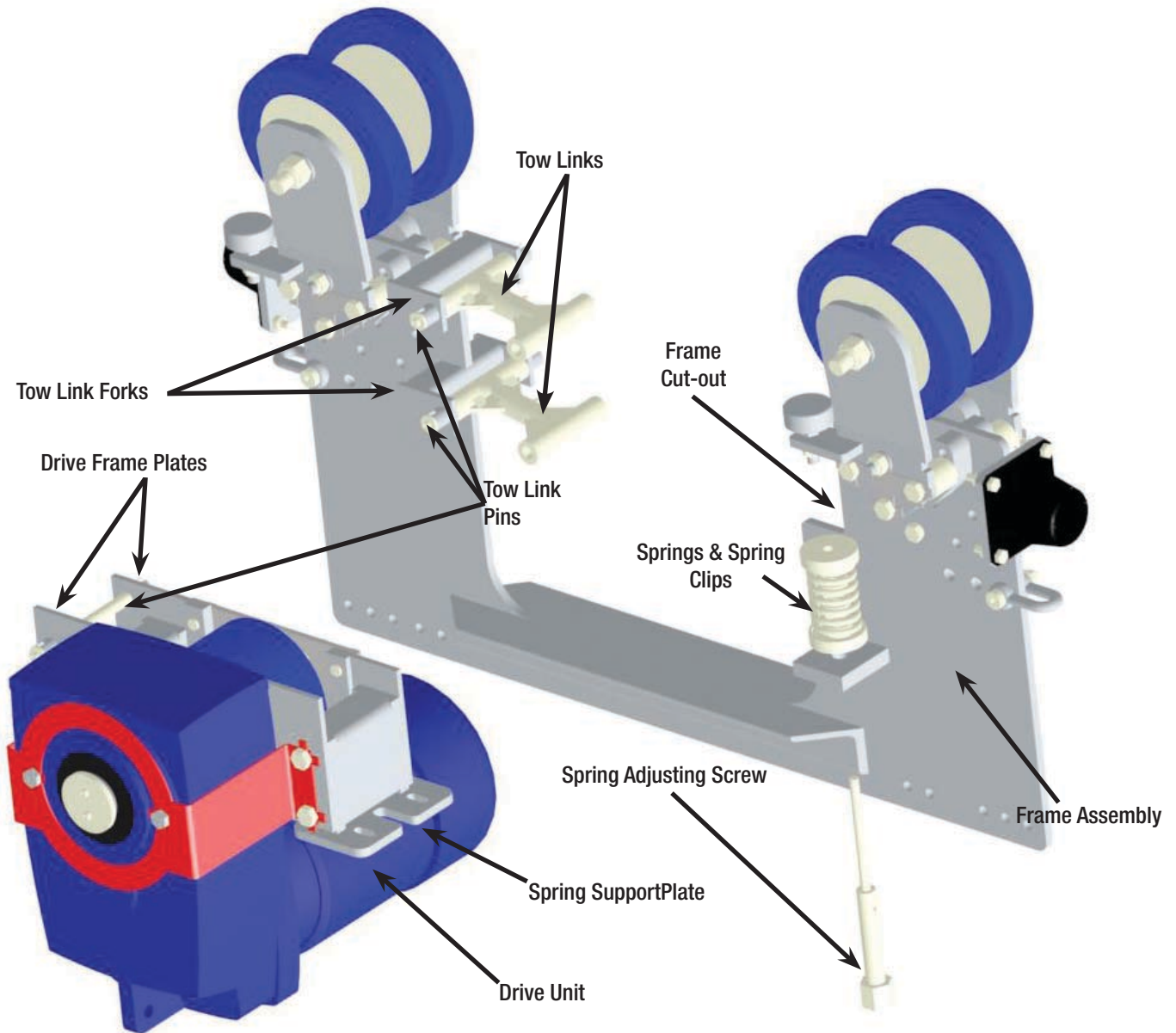
- 2.4.4 Entire side shield assembly, including side guide and anti-lift rollers, can be replaced at this time if desired. Continue to step 5 if replacing individual wheels. Skip to step 15 if replacing entire side shield assembly.
- 2.4.5 Remove M18 nylon insert lock nut and flat washer from main support wheel axle.
- 2.4.6 Remove axle from side shield.
- 2.4.7 Insert new wheel and axle assembly into side shield.
- 2.4.8 Install flat washer and a new M18 nylon insert lock nut onto the axle. The hex portion of the axle can be used to prevent the axle from turning.
- 2.4.9 Torque the M18 nut to 130 lb-ft (176 N-m).
- 2.4.10 Remove M12 nylon insert lock nuts and flat washers from side guide and anti-lift wheel axles.
- 2.4.11 Remove axle from side shield.
- 2.4.12 Insert new wheel and axle assembly into side shield.
- 2.4.13 Install flat washer and new M12 nylon insert lock nuts onto axle. The hex portion of the axle can be used to prevent the axle from turning.
- 2.4.14 Torque the M12 nuts to 60 lb-ft (81 N-m).
- 2.4.15 Mount side shield assembly to trolley body. Insert M12 bolts through lock tab plate, then side shield, then spacers, and finally into trolley mounting block. Install bolts finger tight to remove free space, but do not tighten yet.
- 2.4.16 Remove safety cable and ensure the trolley weight is equally distributed on all the wheels when riding on a flat, straight portion of the beam.
- 2.4.17 Torque the M12 bolts to 60 lb-ft (81 N-m).
- 2.4.18 Using the hammer (and chisel if needed), bend one of the lock tabs tightly over a flat side of the bolt head.

## 2.0 Maintenance and Repair

### 2.5 Suspension and Drive Unit Inspection

Inspect the suspension pivot points annually for damage and wear. Visually check for drive wheel misalignment by confirming that the drive wheel rolls down the center of the beam. If the drive wheel shifts side to side more than ¼ inch (6.3 mm) in each direction, change the drive suspension pins and tow links. Remove the pins and look for excessive wear. Pin diameter should be no less than 0.450 inches (11.4 mm) and the tow link bearings should be no greater than .550 diameter.

### 2.6 Suspension and Drive Unit Replacement



#### Tools Required:

- 1-1/8 inch open end wrench or adjustable wrench
- 1-1/8 inch socket and ratchet (optional)
- 4mm Allen wrench.
- Drive unit lifting bracket

## 2.0 Maintenance and Repair

**Warning: Disconnect power from the motor.**

- 2.6.1 Unhook power supply cable from the motor.
- 2.6.2 Loosen lock nut on suspension spring adjusting screws by turning counter clockwise.
- 2.6.3 Turn spring adjusting screws counter clockwise 5 turns at a time, alternating sides. Keep doing this until adjusting screws are completely unthreaded from frame.

**Note: Limiting the travel to 5 turns at a time and alternating sides keeps the load supported more evenly from one side to the other.**

**Warning: When adjusting screws are removed, the suspension springs and retaining cups are freely sitting in the frame and could fall if not secured.**

- 2.6.4 Slip springs and retaining cups out of the frame.
- 2.6.5 Mount lifting bracket to back side of gear box in mounting holes using M10 x 1.5 bolts. Make sure lift eyelet is over top of gear box.
- 2.6.6 Using some mechanical form of lifting means, hook into the lifting eyelet and support the weight of the drive unit. Note: Drive unit weight is approximately 200lbs.
- 2.6.7 Remove the M5 socket head cap screw and retaining washer from each of the two (2) suspension pins closest to the drive unit.
- 2.6.8 Carefully remove the suspension pins.

**Warning: The drive unit will be off balance. It will be heavy to the motor side.**

- 2.6.9 If only replacing suspension, the drive unit does not have to be removed from the frame. If the drive unit is also being replaced, remove drive unit from the frame assembly to the gearbox side. The drive unit must first slip forward for the spring plate on the rear to clear the frame. Then it will pass out toward the gearbox.
- 2.6.10 Remove remaining two (2) M5 socket head cap screws from the remaining two (2) suspension pins.
- 2.6.11 Remove the suspension pins and tow links.
- 2.6.12 Install two (2) new tow links and suspension pins into the trolley frame assembly.
- 2.6.13 Install M5 socket head cap screws using 242 Loctite or equivalent and retaining washers to the tow link pins.
- 2.6.14 Torque the M5 socket head cap screws to 5 lb-ft (7 N-m).
- 2.6.15 Install drive unit in reverse of step 2.6.9.
- 2.6.16 Flip tow links up into position in drive unit and install suspension pins.
- 2.6.17 Install M5 cap screws, washers, and Loctite the same as steps 2.6.13 and 2.6.14.
- 2.6.18 Position suspension spring retaining cups on each end of suspension springs and slide assembly into place between the trolley main frame and the drive unit support plates.
- 2.6.19 Insert spring adjusting screw. Make sure straight rod portion of the screw passes through the center of both springs in the stack and into the hole in the drive unit support plate.
- 2.6.20 Turn spring adjusting screws clockwise no more than 5 turns per side at a time. Adjust until the distance between the outer edges of the spring retaining cups is 3.2in. (81mm).
- 2.6.21 Thread locking nut up against frame plate and tighten.
- 2.6.22 Grease suspension joints with a grease gun and multipurpose grease. Apply grease until a small amount is visible around the tow link ends.

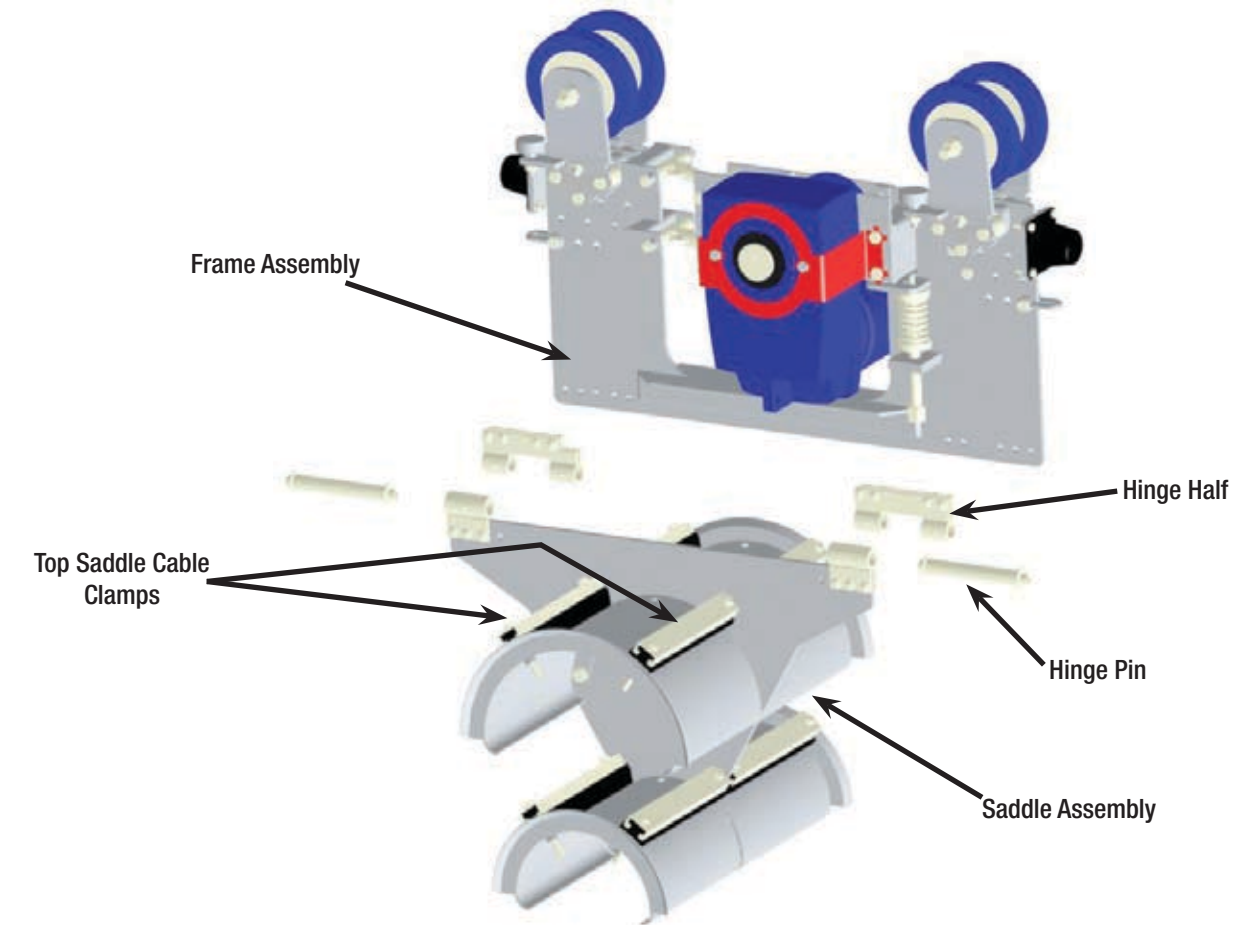


## 2.0 Maintenance and Repair

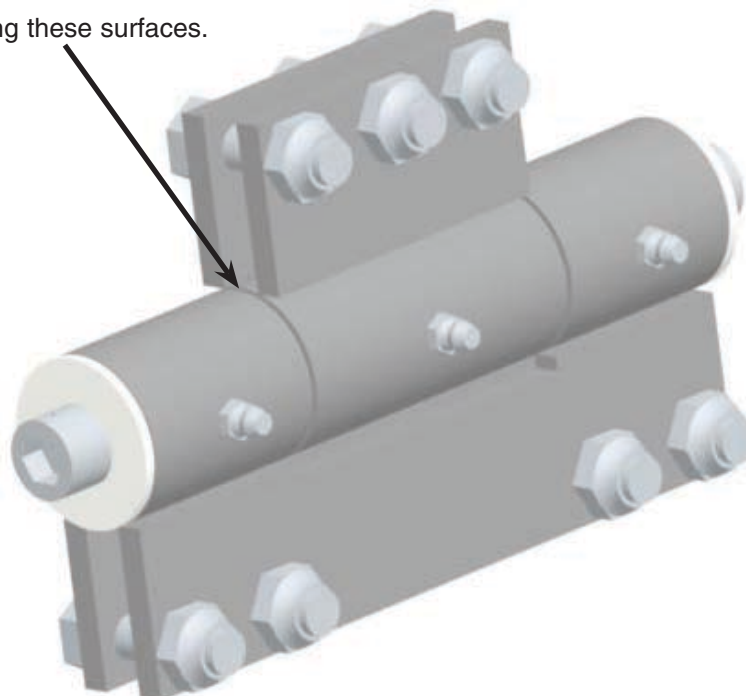
### 2.7 Saddle Hinge Inspection

Inspect the saddle hinges quarterly for wear. Measure the height difference between the mating surfaces of the adjacent hinge halves. If this difference exceeds 0.19 inches (5 mm), replace hinge assemblies.

### 2.8 Saddle Hinge Replacement



Check wear by measuring these surfaces.



## 2.0 Maintenance and Repair

### Tools Required:

16mm socket and ratchet

16mm box end wrench

2.8.1 Securely support saddle assemblies.

2.8.2 Remove the M10 bolts and nuts from the hinge assemblies.

**WARNING: There are no retainers or keepers holding the hinge halves and hinge pin together. Parts could fall if not secured.**

2.8.3 Install new hinge assemblies with new bolts and nylon insert lock nuts.

2.8.4 Torque M10 nuts and bolts to 30 lb-ft (40 N-m).

2.8.5 Grease saddle hinges with a grease gun and multipurpose grease. Apply grease to each zerk until a small amount of grease is visible between the hinge halves.

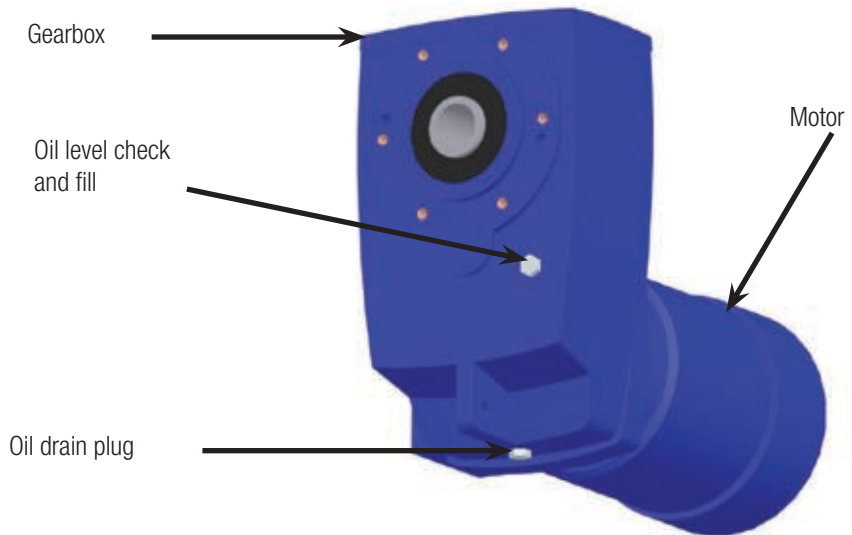
## 2.9 Gearbox Inspection and Maintenance

Check gearbox quarterly for signs of deterioration. This could include a hot running temperature (over 160°F (71°C)), noisy operation, locked shaft, or oil leakage. Regularly check lubrication level and condition. The gearbox is supplied with a view window fill plug to monitor lubricant level and a magnetic drain plug to collect any chips that may form. The lubricating oil must be changed every 10,000 hours when using the standard conventional oil (as supplied from the factory) and every 20,000 hours when using synthetic. Replacement oils must be of viscosity VG 220 per ISO NLGI. Use either a conventional mineral or a synthetic PAO oil.

### Tools Required:

17mm socket or wrench

6mm Allen wrench



Replacement Oil Cross Reference

Viscosity ISO NLGI	Formulation	Mobil	Shell	Castrol	Kluber	BP	Tribol
VG220	Conventional Mineral	Mobilegear 630	Omala 220	5EP	Kluberoil GEM 1-220	Energol GR-XP 220	Tribol 1100/220
	Synthetic PAO	Mobil SHC 630	Omala 220HD	Isolube EP 220	Klubersynth EG 4-220	N/A	Tribal 1510/220

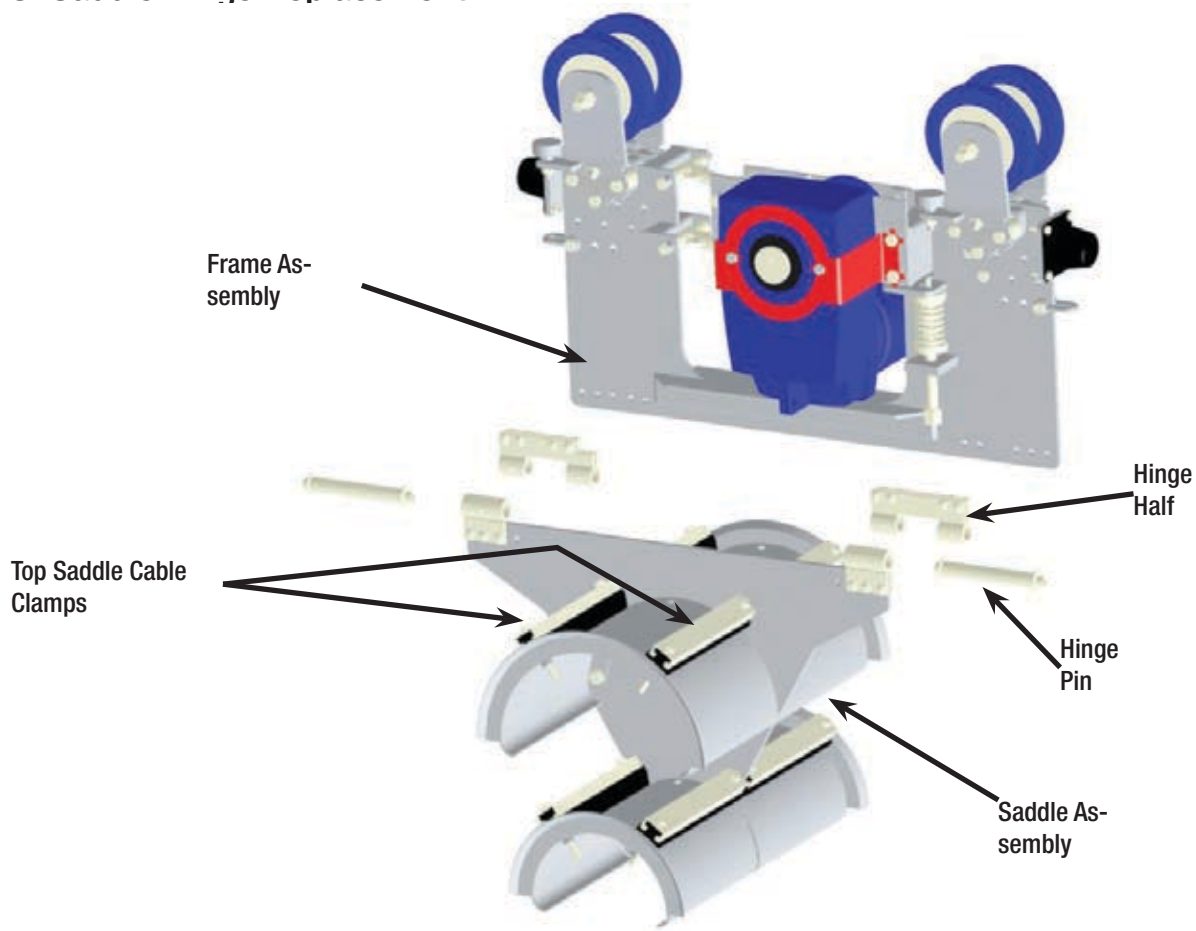
## 2.10 Gearbox Replacement

For gearbox Replacement instructions, see suspension and drive unit replacement section (Page 16).

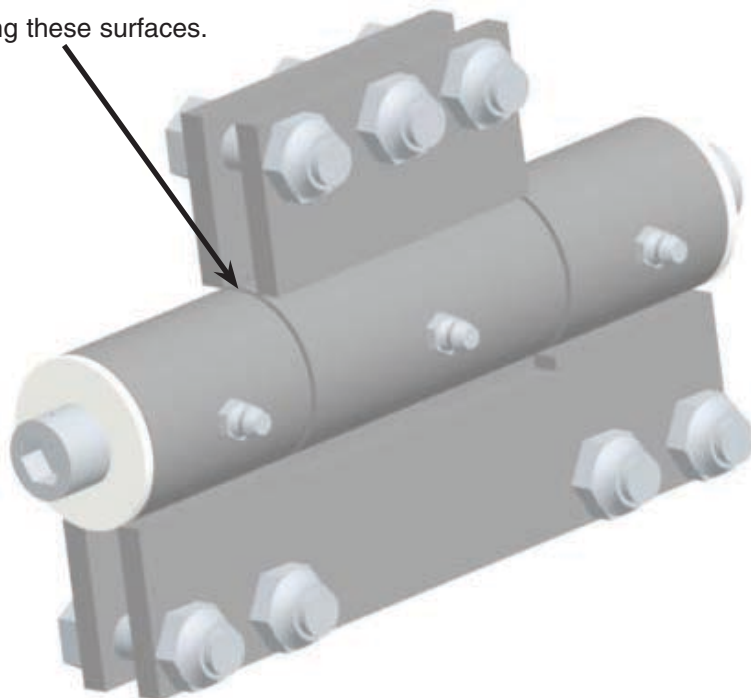
### 2.7 Saddle Hinge Inspection

Inspect the saddle hinges quarterly for wear. Measure the height difference between the mating surfaces of the adjacent hinge halves. If this difference exceeds 0.19 inches (5 mm), replace hinge assemblies.

### 2.8 Saddle Hinge Replacement



Check wear by measuring these surfaces.



## 2.0 Maintenance and Repair

### Tools Required:

16mm socket and ratchet

16mm box end wrench

2.8.1 Securely support saddle assemblies.

2.8.2 Remove the M10 bolts and nuts from the hinge assemblies.

**WARNING: There are no retainers or keepers holding the hinge halves and hinge pin together. Parts could fall if not secured.**

2.8.3 Install new hinge assemblies with new bolts and nylon insert lock nuts.

2.8.4 Torque M10 nuts and bolts to 30 lb-ft (40 N-m).

2.8.5 Grease saddle hinges with a grease gun and multipurpose grease. Apply grease to each zerk until a small amount of grease is visible between the hinge halves.

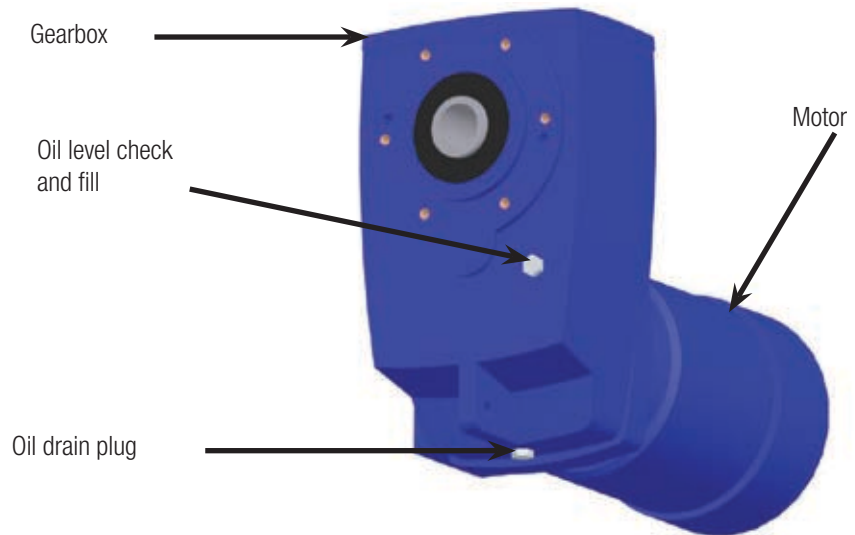
## 2.9 Gearbox Inspection and Maintenance

Check gearbox quarterly for signs of deterioration. This could include a hot running temperature (over 160°F (71°C)), noisy operation, locked shaft, or oil leakage. Regularly check lubrication level and condition. The gearbox is supplied with a view window fill plug to monitor lubricant level and a magnetic drain plug to collect any chips that may form. The lubricating oil must be changed every 10,000 hours when using the standard conventional oil (as supplied from the factory) and every 20,000 hours when using synthetic. Replacement oils must be of viscosity VG 220 per ISO NLGI. Use either a conventional mineral or a synthetic PAO oil.

### Tools Required:

17mm socket or wrench

6mm Allen wrench



Replacement Oil Cross Reference

Viscosity ISO NLGI	Formulation	Mobil	Shell	Castrol	Kluber	BP	Tribol
VG220	Conventional Mineral	Mobilegear 630	Omala 220	5EP	Kluberoil GEM 1-220	Energol GR-XP 220	Tribol 1100/220
	Synthetic PAO	Mobil SHC 630	Omala 220HD	Isolube EP 220	Klubersynth EG 4-220	N/A	Tribal 1510/220

## 2.10 Gearbox Replacement

For gearbox Replacement instructions, see suspension and drive unit replacement section (Page 16).

### 2.11 Motor Inspection and Maintenance

Inspect the motor monthly for the following conditions:

- a. Check external surfaces for accumulation of dirt or debris. Wipe the motor clean as needed with a lint-free cloth or a stiff-bristled nylon brush.
- b. Check external surfaces for oil film or grease deposits. Clean oil film and grease deposits from the motor surfaces using a lint-free cloth. If needed, moisten the cloth with an approved non-flammable, residue-free solvent.
- c. Check for evidence of damage or overheating. If damage is present, replace motor. See suspension and drive unit replacement section.
- d. Check that mounting hardware is secure.
- e. Check that all electrical connections are secure.
- f. Check electrical connections for evidence of arcing. Replace connections that show damage.
- g. Using an ohmmeter, check and record the resistance of motor winding insulation. Compare results to previous readings. A sudden drop in resistance is a sign of insulation damage or deterioration.

### 2.12 Motor Replacement

#### Tools Required:

19mm socket and ratchet or box end wrench  
Torque wrench(es) (5lb-ft (7N-m) to 60lb-ft (81N-m))  
5/32 Allen (hex) drive socket and extensions to fit torque wrench  
3mm Allen Wrench  
Small Hammer  
1/8 inch diameter pin punch  
Tape measure or ruler (4 in. (100mm) minimum)  
1-1/8 inch open end wrench or adjustable wrench  
1-1/8 inch socket and ratchet (optional)  
Drive unit lifting bracket  
16mm socket, ratchet, and extensions  
10mm box end wrench  
6mm Allen (hex) socket to fit torque wrench

- 2.12.1 See suspension and drive unit replacement section for removal of drive unit (Page 16).
- 2.12.2 With drive unit removed from the crane and placed in a safe work area, follow drive wheel replacement section to remove the drive wheel.
- 2.12.3 Drain oil from the gearbox.
- 2.12.4 Un-bend locking tab ears and remove the two (2) M10 hex head bolts and two (2) M10 flat head bolts that mount the drive unit frame to the gearbox. Remove frame from gearbox.
- 2.12.5 (Optional) Remove the two (2) M5 socket head cap screws from the shaft retaining cap located on the back side of the gearbox and remove the shaft from the gearbox. This will allow more visibility and work space, but is not needed to remove motor.
- 2.12.6 Support the motor and remove the four (4) M6 motor mounting bolts. These bolts pass through the mounting flange from the gearbox side and thread into the motor front face plate.
- 2.12.7 Remove the motor from the gearbox.
- 2.12.8 Clean the gasket faces on the new motor and the gearbox, making sure no cleaning debris enters the gearbox.

## 2.0 Maintenance and Repair

- 2.12.9 Check the replacement motor to make sure the motor flange, motor shaft, and motor pinion are identical to the motor that was removed.
- 2.12.10 Place a new gasket between the gearbox and the new motor.
- 2.12.11 Position the motor on the gearbox, making sure the output pinion of the motor meshes with the input gear of the gearbox. Rotate the motor as necessary to align the bolt holes, and seat the motor flange. Make sure the gasket remains properly aligned and seated.
- 2.12.12 Apply Loctite 242 to the M6 bolt threads. Install bolts and tighten securely. Because of the position, using a torque wrench is not feasible.
- 2.12.13 Refill the gearbox with new oil. See gearbox maintenance and inspection section (page 18). Note: The gearbox must be oriented in its typical running position for oil fill plug to show the proper level.

**Warning: Never mix different types of oil.**

- 2.12.14 Mount drive unit frame onto gear box.
- 2.12.15 Insert bolt through locking tab. The tab on the spring side of the drive wheel should use the hole furthest from the flat edge of the tab. The tab on the tow link side of the mdrive wheel should use the hole closest to the flat edge of the tab.
- 2.12.16 Apply Loctite 242 removable thread locker or equivalent to the threads of the bolt.
- 2.12.17 Re-install bolt making sure the flat edge of the locking tab engages the crossbar weldment nearest the hole and the locking tab lies flat against the gear motor mounting plate.
- 2.12.18 Torque bolt to 30lb-ft (40 N-m).
- 2.12.19 Bend locking tab ear over a flat on the head of the bolt.
- 2.12.20 Repeat steps 2.12.15 - 2.12.19 for other bolt.
- 2.12.21 Apply Loctite 242 removable thread locker or equivalent to the two (2) flat head M10 bolts.
- 2.12.22 Re-install flat head bolts and torque to 30lb-ft (40 N-m).
- 2.12.23 If removed, reinstall shaft into the gearbox.
  - a. Install the shaft retaining cap. Apply Loctite 242 to M5 socket head cap screws and install into shaft.
  - b. Torque M5 screws to 5 lb-ft (7 N-m).
- 2.12.24 Install drive wheel. See drive wheel replacement section (page 10).
- 2.12.25 Reinstall drive unit trolley. See suspension and drive unit replacement section (page 16).

### 2.13 Lanyard Inspection

- 2.13.1 Check cable for abrasion and fraying. If cable is frayed or any strands are worn through or broken it should be replaced.
- 2.13.2 Check thimble ends for wear. If cable around thimbles is frayed or any strands are worn through or broken it should be replaced.
- 2.13.3 Check shackle for wear, twisting, and stretching. If shackle is deformed it should be replaced.
- 2.13.4 Ensure mounting hardware is secure.

### 2.14 Lanyard Replacement

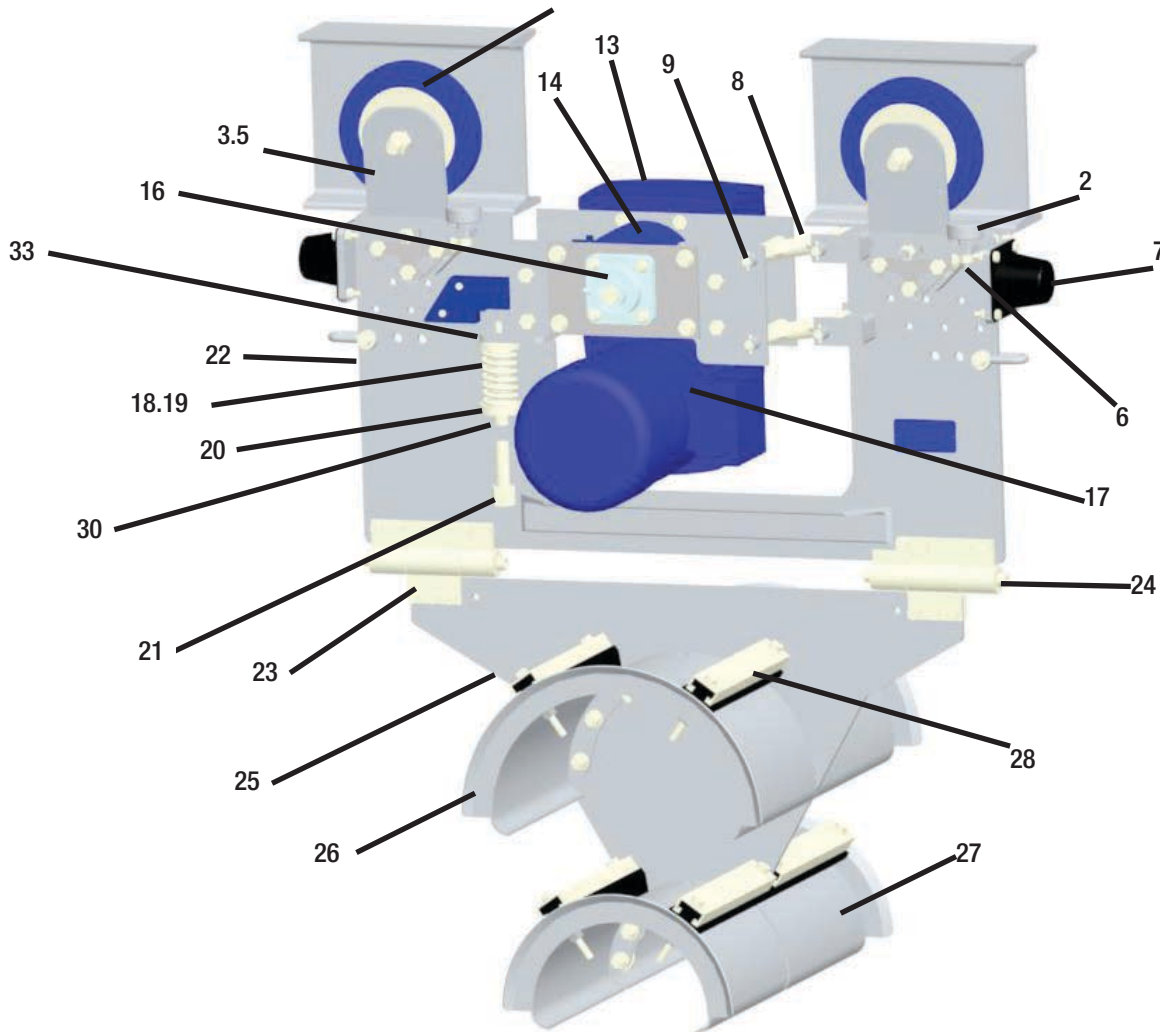
- 2.14.1 Remove bolt, washers, and retaining collar from socket end of assembly.
- 2.14.2 Repeat 2.14.1 for other end of lanyard
- 2.14.3 Remove shackle from gear motor
- 2.14.4 See Lanyard Mounting Instructions to re-install lanyard (page 8).

### 3.0 Maintenance Frequency

Maintenance Frequency	Process
Monthly	Drive Wheel Inspection
	Support Wheel Inspection
	Side Guide Wheel Inspection
	Motor Inspection
	Grease Saddle Hinges
	Grease Tow Links
	Check all Hardware for Tightness
Grease Shaft Support Bearing	
Quarterly (In addition to the above)	Saddle Hinge Inspection
	Lanyard Inspection
	Gearbox Inspection
Annually (In addition to the above)	Suspension Tow Link Inspection
	Drive Wheel Replacement
	Support Wheel Replacement
	Gearbox Oil Change

\*Proof of festoon maintenance / inspection history may be required during manufacturer inspections.

### 4.0 Replacement Parts



## 4.0 Replacement Parts

Item No.	Part Number	Description	Qty. Per Trolley
1	44582	Support Wheel Assembly	4
2	40798A	Side Guide / Anti-Lift Wheel	8
3	44926	Side Shield Right Hand (not shown)	2
4	44927	Side Shield Left Hand (not shown)	2
5	44583	Running Gear (Items 1, 2, 3 and 4)	2
6	44342	Side Shield Mounting Block	4
7	30605	Bumper	2
8	47224	Tow Link Assembly with gussets	2
9	44814	Tow Pin Assembly	4
10	103744	Electric Motor	1
11	103745	Gasket Motor to Gearbox	1
12	103746	Pinion Gear	1
13	C/F	Gearmotor (Items 10, 11, 12 and Gearbox)	1
14	44912	Drive Wheel	1
15	103669	Tapered Hub (not shown)	1
16	44535	Drive Shaft	1
17	44579	Drive Unit Assembly (Items 13, 14, 15, 16 & Frame)	1
18	103492	Suspension Spring Large	2
19	103641	Suspension Spring Small	2
20	44565	Spring Retaining Cup	4
21	44545	Spring Adjusting Screw	2
22	44543	Frame	1
23	46174	Saddle Hinge Assembly LH	1
24	46172	Saddle Hinge Assembly RH	1
25	47275	Saddle Plate	1
26	40630K	Upper Saddle	2
27	40630L	Lower Saddle	2
28	40626E	Saddle Clamp	8
29	44581	Saddle Assembly (Items 23 - 28 and Hardware)	1
30	102659	Nut 3/4 - 10 Hex Jam SS304 (not shown)	2
31	104359	Pin 0.125 x 1.25 Cotter SS (not shown)	2
32	47228	Retaining Strap Gearmotor (not shown)	1
33	47242	Drive Unit Stop	2
34	47239	Locking Tab (not shown)	2
35	C/F	Motorized Trolley	1



## 5.0 Recommended Spare Parts

Quantities listed are per system.

Part No.	Description	Quantity
44912	Drive Wheel	1
44579	Drive Unit Subassembly	1
C/F	Support Wheel Assembly	4
44814	Tow Link Pin Assembly	4
47224	Tow Link Assembly	2
30605	Bumper	2
40798A	Side Guide Wheel	4
44467	Lock Tab Plate (for side shield mounting block)	4
C/F	Tow Cables	2
46174 / 46172	Saddle Hinge Assembly	2

C/F = Consult Factory

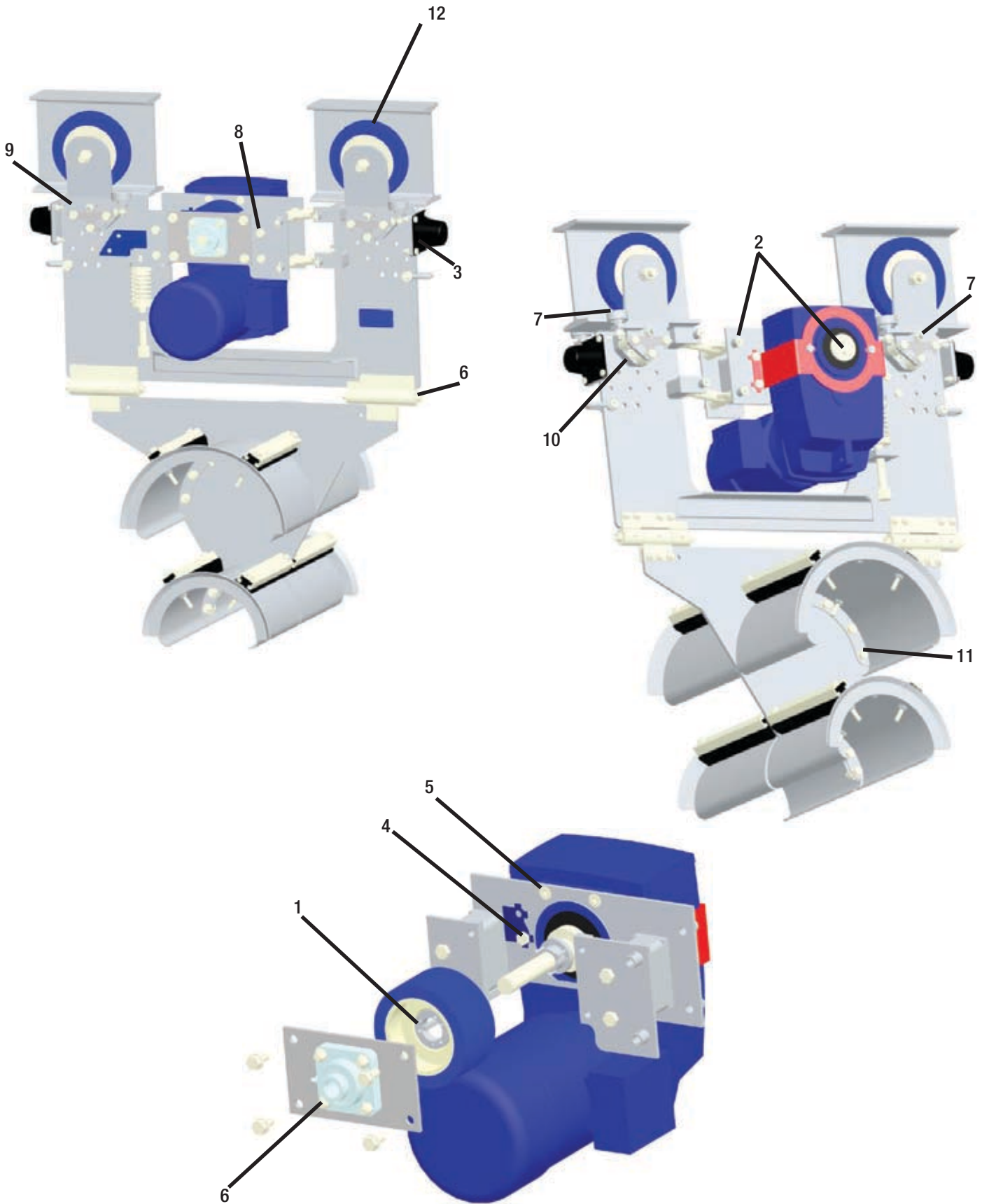
## 6.0 Wear Items

The following items will wear in the normal course of operation. It is recommended that an inventory of these items be retained.

Part No.	Description	Quantity
44912	Drive Wheel	1
C/F	Tow Cables	2
30605	Bumper	2
40798A	Side Guide / Anti-Lift Wheel	8
44467	Lock Tab Plate (for side shield mounting block)	4

C/F = Consult Factory

## 7.0 Bolt Torque Quick Reference



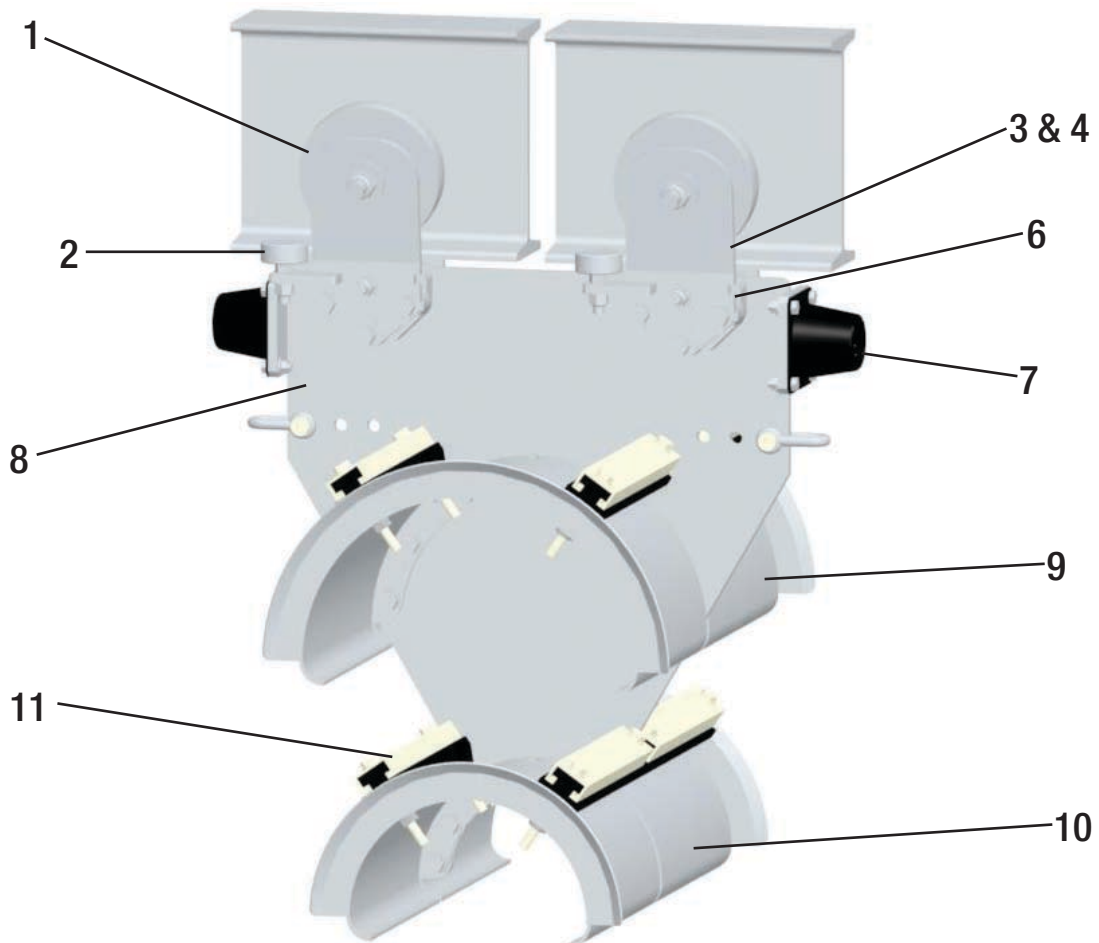
## 7.0 Bolt Torque Quick Reference

### Conductix Motorized Heavy Duty Festoon Trolley Bolt Torque Specifications

Item	Bolt Size	Bolt Location	Mating Thread	Loctite Required	Torque Value lb-ft (N-m)
1	#10 Socket Head Cap Screw	Drive Wheel Mounting Hub	Tapped Hub Holes	N/A	5 (7)
2	M5-.8 Socket Head Cap Screw A4 SS	Suspension Pins/Drive Shaft Retainer	Tapped Pin Hole	242 Removable	5 (7)
3	M8-1.25 Hex Head A4 SS	Bumper Mounts	Nylon Insert Lock Nut A4 SS	N/A	16 (21)
4	M10-1.5 Hex Head A4 SS	Drive Frame to Gearbox	Tapped Holes in Gearbox	242 Removable	30 (40)
5	M10-1.5 Flat Head A4 SS	Drive Frame to Gearbox	Tapped Holes in Gearbox	242 Removable	30 (40)
6	M10-1.5 Hex Head A4 SS	Hinge Mounts / Shaft Support Bearing	Nylon Insert Lock Nut A4 SS	N/A	30 (40)
7	M12-1.75 Nylon Insert Lock Nut A4 SS	Side Guide/Anti-Lift Wheels	Roller Axle	N/A	60 (81)
8	M12-1.75 Hex Head A4 SS	All Drive Frame Assembly	Tapped Holes in Frame	242 Removable	60 (81)
9	M12-1.75 Hex Head A4 SS	Side Shield Assemblies	Tapped Mounting Block	N/A	60 (81)
10	M12-1.75 Socket Head Cap Screw A4 SS	Side Shield Mounting Blocks	Tapped Mounting Block	242 Removable	60 (81)
11	M12-1.75 Hex Head A4 SS	Saddle Bolts	Nylon Insert Lock Nut A4 SS	N/A	66 (89)
12	M24-3 Nylon Insert Lock Nut A4 SS	Main Support Wheel Axles	Wheel Axle	N/A	130 (176)

## 8.0 550 Series Passive Trolley Spare Parts

Item No.	Part Number	Description	Qty. Per Trolley
1	44582	Support Wheel Assembly	4
2	40798A	Side Guide / Anti-Lift Wheel	8
3	44926	Side Shield Right Hand	2
4	44927	Side Shield Left Hand (not shown)	2
5	44583	Running Gear (Items 1, 2, 3 and 4)	2
6	44342	Side Shield Mounting Block	4
7	30605	Bumper	2
8	44266	Center Plate	1
9	40630K	Upper Saddle	2
10	40630L	Lower Saddle	2
11	40626E	Saddle Clamp	8



## 9.0 Passive Mode Operating Instructions

In the event of a motor failure operation, any or all of the motorized trolleys can be operated in passive mode. Only the trolley(s) that are malfunctioning should be operated in passive mode. Operation in passive mode is not recommended for more than 8 hours. Prior to operation in passive mode all trolleys and running gear should be inspected. The following components should be inspected on all trolleys in the system:

- 9.1.1 Inspect support wheels and side guide wheels for wear per the manual.
- 9.1.2 Inspect drive unit suspension for wear not within operating specifications as identified in the manual.
- 9.1.3 Inspect Saddle Hinges for wear and loose hardware.
- 9.1.4 Inspect bumpers for cracking, splitting, and deformation. Bumpers should extend at least 2 inches from the bumper mounting plate and be free of cracks and splits.
- 9.1.5 Inspect Drive Unit for loose and / or broken hardware. If during the above inspection, components are found to be out of operating specification, those components are to be replaced before altering the festoon system.

9.2 If all components are found to be within operating specifications as described in the manual, the motorized trolleys may be operated in passive mode. The following steps should be taken before attempting to operate the system passively.

- 9.2.1 Install 4 shock cords on the motorized trolley plus the two trolleys before and two trolleys after the failed motorized trolley (24 shock cords total, 4 per loop, 6 loops).
- 9.2.2 Loosen jack screws on the motorized trolley to back the drive wheel away from the beam. Remove the springs and spring cups from the trolley
- 9.2.3 Remove the retaining pin from each jack screw and remove jack screw from the trolley.
- 9.2.4 Band the drive unit assembly to center plate of trolley to prevent movement of drive assembly during operation using a tie-down strap.
- 9.2.5 Reduce the operating speed of the crane to no greater than 375 fpm.

9.3 After no more than 4 hours of operation in passive mode the system should be inspected. The following components should be inspected;

- a) Inspect drive unit suspension for wear or bending in pins and bending or cracks in tow links.
- b) Inspect bumpers for cracking, splitting, and deformation.
- c) Inspect drive units for loose and/or broken hardware.

9.4 If any components are found to be damaged or not within operating specifications as identified in the manual, discontinue use of the festoon system until the damaged components are replaced. If all components are within operating specifications operation of the system may be resumed for no more than another 4 hours. Once the system has operated in passive mode for 8 total hours, it's use should be discontinued until Motorized repairs are complete.

## Notes

# Notes

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