

# Procedure to Release Stored Energy in Side to Side Systems Prior to Service



**Automated Covering Systems**

*Roll Rite, LLC and its entire staff would like to thank you for your purchase of one of what we feel to be the finest line of tarping systems in the industry.*

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## Familiarization with Control of Hazardous Energy During Service

The primary purpose of this document is to inform and direct activity related to isolation and dissipation of hazardous energy prior to service of *Roll Rite Automated Covering Systems*.



*Roll Rite Automated Covering Systems* may contain **Hazardous Energy** which must be dissipated and isolated prior to service. Workers performing service or maintenance on machinery and equipment are at risk of exposure, injury, and death from the unexpected energization, startup of the machinery or equipment, or release of stored energy in the equipment. It is strongly recommended that the organizations performing service on *Roll Rite Automated Covering Systems* adopt a culture prioritizing worker safety over all other activities. In doing so, the organization will become informed and create procedures which greatly reduce the hazards associated with stored energy.

For more information, consult the United States Department of Labor, Code of Federal Regulations (CFR) standard specific to **Control of Hazardous Energy** (29 CFR:1910.147). Reference:  
<https://www.osha.gov/dts/osta/lototraining/tutorial/printer.html>

## Sources of Energy in the Roll Rite Side to Side System

Roll Rite **Side-to-Side** Automated Covering System Contains Two Sources of Hazardous Energy:





- **Connections to Electrical Energy** Stored in Vehicle Batteries
- **Stored Potential Spring Energy** in Mechanical System Pivot Points
  - **Spring Energy in Passenger Side Stow System within arm pivots and knuckles**
  - **Spring Energy in Driver Side Stow System within arm pivots and knuckles**

## Connections to Electrical Energy

The connections in **Table 1** contain electrical potential which is “hot at all times” and will short circuit when connected to the ground, creating a potential arc hazard.



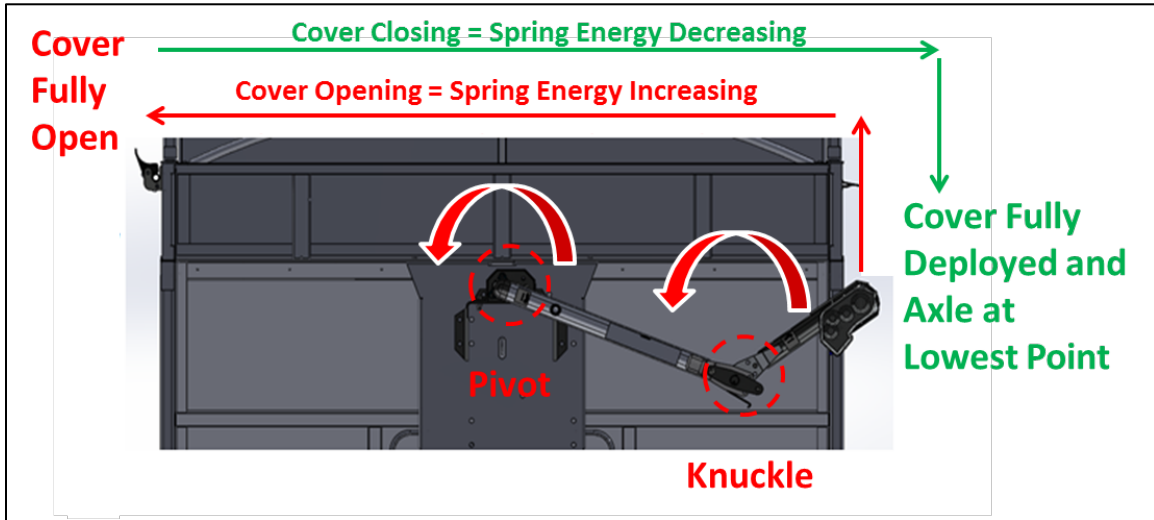
**Table 1: Electrical Connections**

Connection Type	Connection Description/Color	Illustration/Photo
Truck 12V Battery Positive Terminal	0 to 8 AWG Wire with Red Insulation	 <i>Typical Positive Terminal</i>
All Terminal Connections to a Roll Rite Circuit Breaker	2 to 8 AWG Wire with Red Terminal Cover Rubber Boot	
Trailer Power Plug 12V Positive Terminal	ShurFlex Trailer Plug with 1 Battery <b>Positive</b> and 1 Battery <b>Negative</b> Terminal	
Motor Control Relay B+ or BAT+ Terminal (Red)	6 or 8 AWG Wire with Red Terminal Cover Rubber Boot	

## Stored Potential Spring Energy – Passenger Side Stow System

Figure 1 shows diagram describing spring energy **increasing** as the system moves from **Cover Fully Deployed** to **Cover Fully Open**. **Counter Clockwise Rotation** of the Pivot and Knuckle winds the springs in the front arm assembly. Stored Potential Spring Energy increases to maximum when the cover is fully opened.

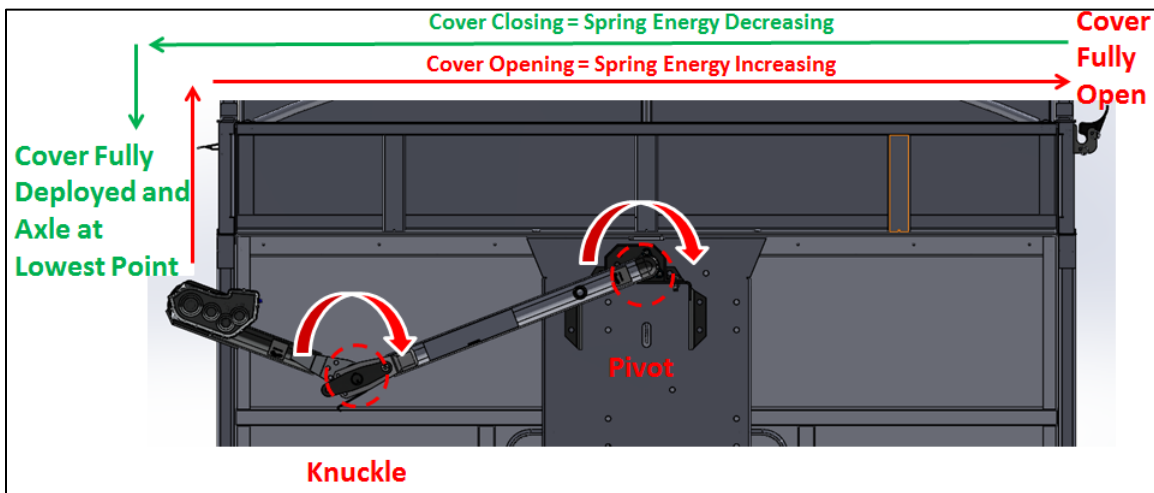
Figure 1: Front of Trailer, Front Arm, and Spring Energy for Passenger Side Stow System



## Stored Potential Spring Energy – Driver Side Stow System

Figure 2 shows diagram describing spring energy **increasing** as the system moves from **Cover Fully Deployed** to **Cover Fully Open**. **Clockwise Rotation** of the **Pivot** and **Knuckle** winds the springs in the front arm assembly. Stored Potential Spring Energy increases to maximum when the cover is **Fully Opened**.

Figure 2: Front of Trailer, Front Arm, and Spring Energy for Driver Side Stow System



## Required Tool Set for Automated Tarp Covering System Service

- Hazardous Area Markers:
  - o Hazardous Work Area Barrier Stands and Chain
  - o Hazardous Work Area Sign
  - o OSHA Do Not Operate Tag
- Minimum 2" Wide Locking Ratchet Strap
- 10mm Hex Nut Driver or 6 point socket with ratchet wrench
- Hex Nut Driver or 6 point socket with ratchet wrench for Bat+ and GND terminals on motor controller
- 3mm Allen Wrench for Brake Removal
- 5/16" Allen Wrench for Motor Removal

## Preparing Tarp Covering System Work Area

- Clear work area, removing any trip/fall obstacles
- Prepare and test man-lift device, ladder, or service scaffold which is required to access tarp covering system components during service
- Lay out required tool set from list in the **Required Tool Set** section of this document
- Assemble caution barriers and chain around vehicle, preventing human traffic into service area

## Isolating All Forms of Energy in the Automated Tarp Covering System Prior to Service



*Failure to complete all actions stated in this section may result in hazardous condition resulting in bodily injury or property damage*

It is required to isolate all sources of energy in the tarp covering system prior to service by completing the following procedures:

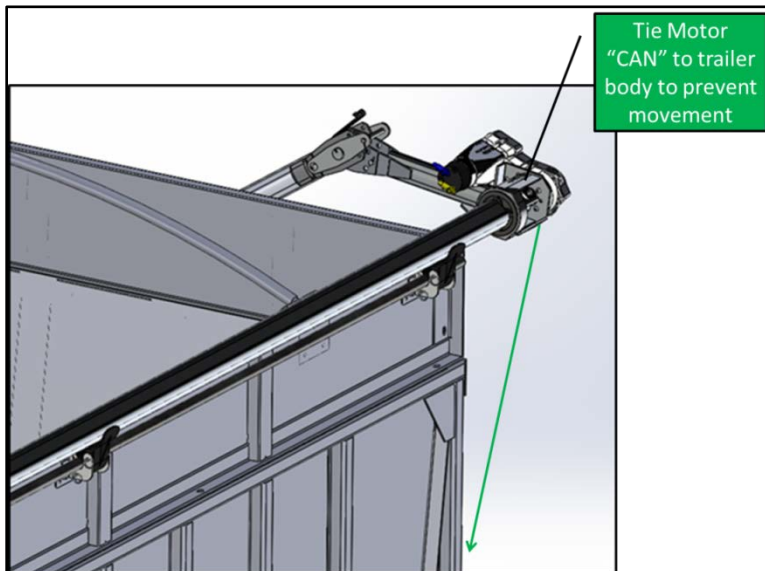
1. Dissipate Stored Spring Energy in System
2. Remove and Isolate the Source of Electrical Power

## Dissipating Stored Spring Energy Prior to Service

1. Test if the system will operate to close the tarp cover by pressing **Close** on the Covering System Motor Controller
  - a. If the motor will operate and close the tarp cover:

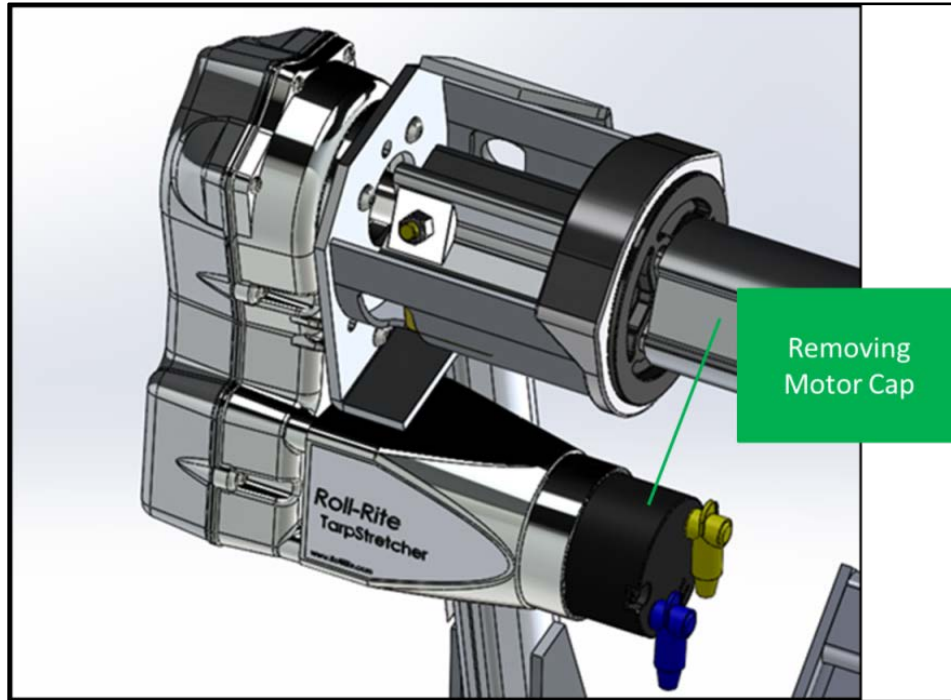
- i. Roll the Axle toward the **Cover Fully Deployed** position shown at the right side of **Figure 1 (If System is Passenger Stow)** or shown at left side of **Figure 2 (If System is Driver Stow)** above
- ii. Stop rolling the axle when it has rolled to its lowest height position on the trailer as shown in **Figure 1 (Passenger)** or **Figure 2 (Driver)** above
- iii. The stored spring energy is now at its lowest point and the hazard is minimized
- b. If the motor will not operate or the axle is not at its lowest point as shown in **Figure 1 (Passenger)** or **Figure 2 (Driver)**.
  - i. Referring to **Figure 3**, and using the 2" ratchet strap, securely fasten the top portion of the Front Arm Stabilizer "Can" down to a rigid location on the trailer body or frame. **IMPORTANT NOTE: The attachment point on the frame and the ratchet mechanism must be accessible from ground level while standing on the Cover Fully Open side of the vehicle.**

**Figure 3: Securing the Axle with to Prevent Movement During Motor Brake Removal**



- ii. Ratchet the front arm down firmly to the trailer top rail or tarp stops to prevent movement of front arm from Stored Spring Energy.
- iii. Using the 10mm socket and wrench, remove the power wires from the motor terminals.
- iv. Using the 10mm socket and ratchet wrench, remove the black plastic motor cap located directly under the motor wire terminals as shown in **Figure 4**

Figure 4: Removing the Motor Cap



- v. Using the 3 mm Allen Wrench, remove (3) three screws which hold the brake to the electric motor. See Figure 5

Figure 5: Removing Brake Plate Mounting Screws



- vi. Remove brake from the motor by pulling away from the top of the motor housing. The hex shaped brake coupler will become free of the brake assembly. See Figure 6. **Note: The brake circuit will prevent the brake from being completely removed from the assembly. It is OK to leave the brake motor hanging from the wire leads.**



**Figure 6: Removing Brake From Motor**



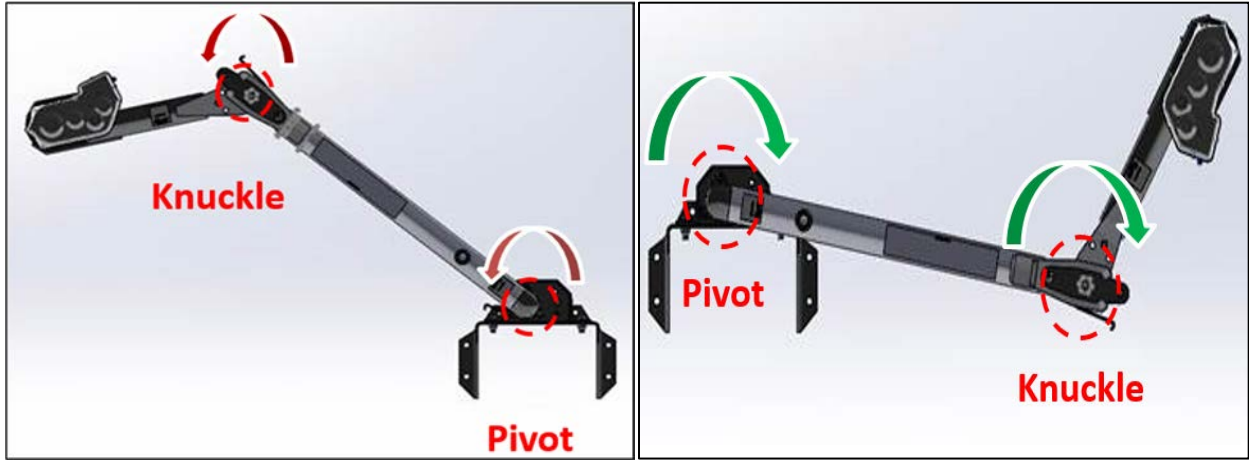
- vii. Stand at ground level on the **Cover Fully Open** side of the vehicle. See **Figure 1 (Passenger Side)** or **Figure 2 (Driver Side)**.



- viii. Slowly release the ratchet strap in small increments. **Important Note:** *By removing the motor brake, the arm is now free to move using stored potential spring energy. Letting out the ratchet strap will release the spring energy and rotate the Front Arm about the Front Pivot Pin and the Knuckle, see Figure 7 (passenger side) or Figure 8 (driver side). The internal gearing of the motor will create a controlled release of the spring energy as the ratchet strap is slowly loosened.*

**Figure 7: Pivot and Knuckle Positions, Passenger Side Stow System**

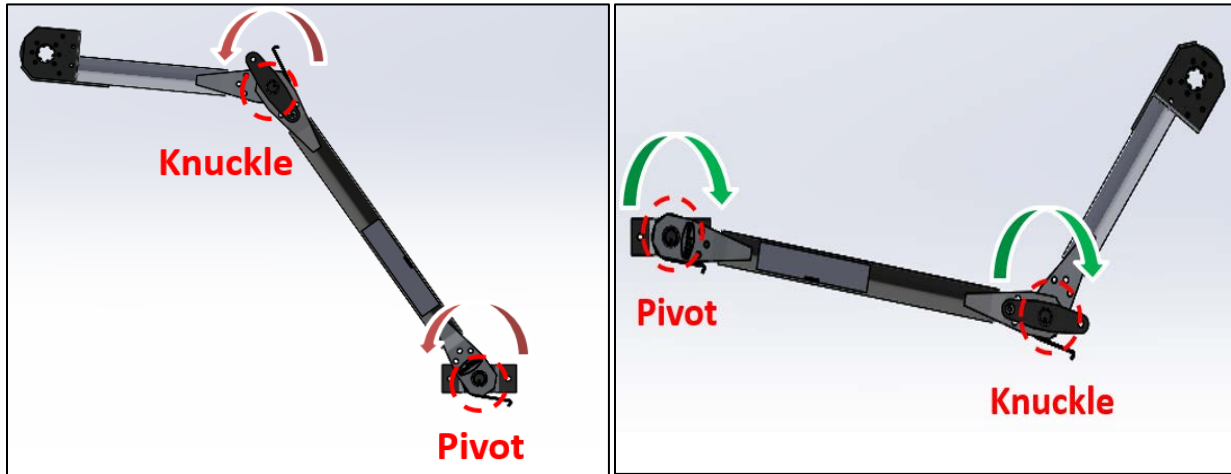
*Top Mount Passenger Side / Right Side of Vehicle*



Energized

De-Energized

*External Mount Passenger Side / Right Side of Vehicle*

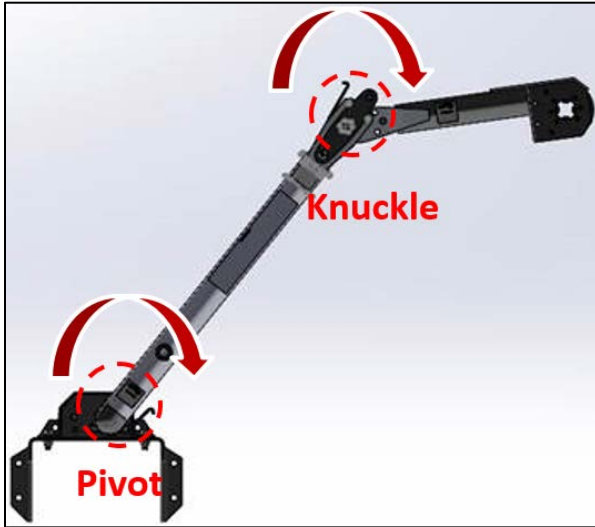


Energized

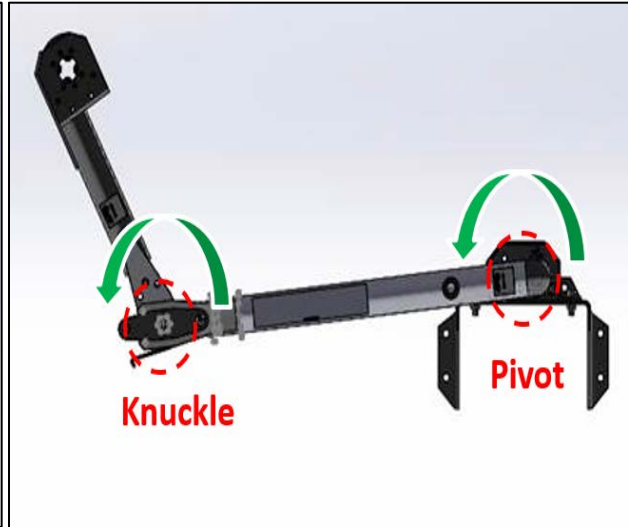
De-Energized

Figure 8: Pivot and Knuckle Positions, Driver Side Stow System

*Top Mount Driver Side / Left Side of Vehicle*

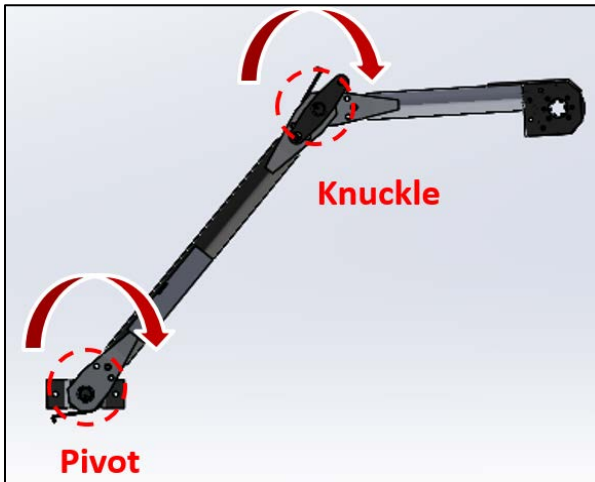


Energized

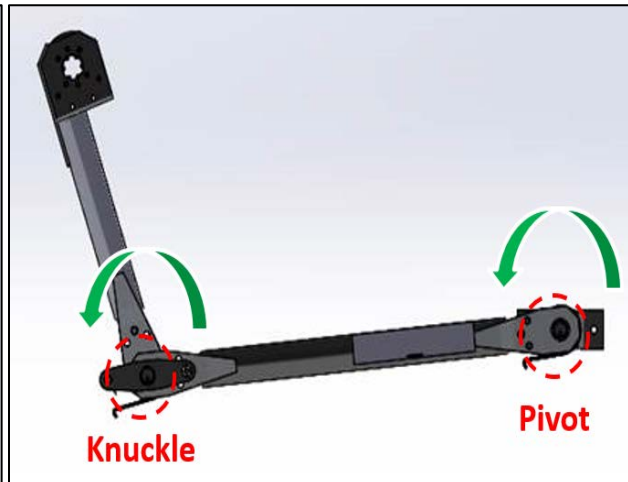


De-Energized

*External Mount Driver Side / Left Side of Vehicle*



Energized

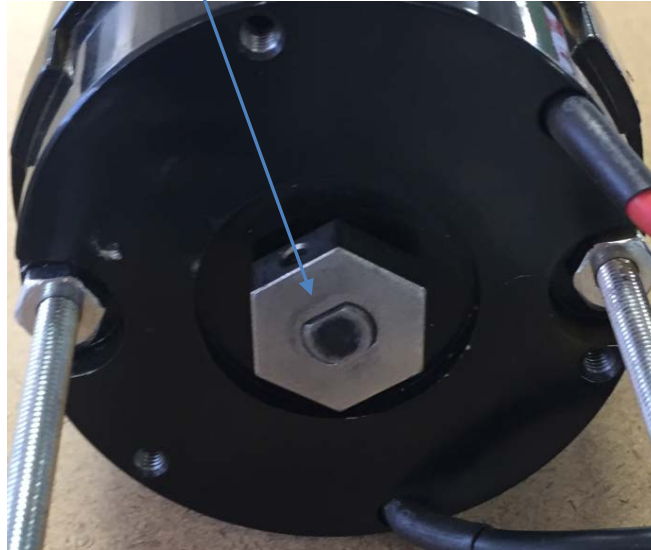


De-Energized

- ix. Continue to release the ratchet strap in small increments until the cover is **Fully Deployed** and **Axle is at rest the Lowest Position** as shown in **Figure 1 (Passenger)** or **Figure 2 (Driver)**.

- x. If the system does not move with the brake removed, it will be necessary to move the motor shaft with a  $\frac{3}{4}$ " hex socket with 12" extension, and  $\frac{1}{2}$ " drive ratchet. Then rotate the motor head clockwise for the passenger side, and counter clockwise for the driver side until the **Axle is at rest at the Lowest Position.** See Figure 9.

**Figure 9: Hex on Motor Shaft**



*Failure to complete required actions in the order specified in this document may result in Hazardous Condition leading to serious personal injury or property damage*

## **Remove and Isolate the Source of Electrical Power**

*Any of the following steps will remove all sources of power from the Automated Tarp Covering System*

### **First Priority:**

Disconnect all of the Negative Terminals from the 12V Battery System on the Truck Chassis (see Table 1). Disconnecting the negative terminals will remove all power on the chassis, preventing current flow to and from the stored energy in the battery system.



**Second Priority:**

Disconnect the Trailer Plug from the Trailer Front Bulkhead (see Table 1). Lift the spring loaded cover lock and pull the plug out of the connector on the trailer front bulkhead. Disconnecting the trailer plug will remove all power from the trailer chassis and tarp covering system components.



**Third Priority:**

If neither of the first and second priority are available options, contact Roll Rite at 800-297-9905

## Motor Removal Procedure



***DANGER: Do not proceed to Motor Removal without completing the following procedures outlined previously in this document:***

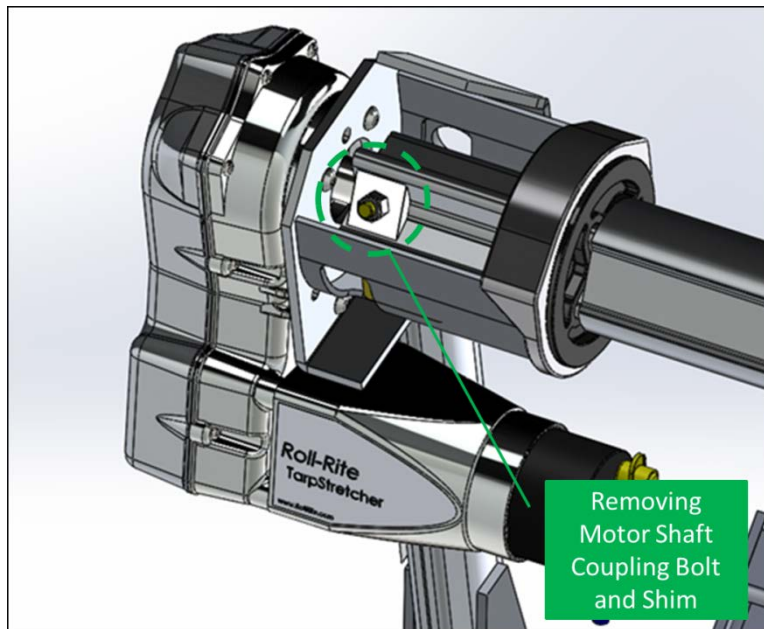
1. Acquire and assemble the Required Tool Set
2. Clear the Tarp Covering System Work Area
3. Dissipate Stored Spring Energy in System
4. Remove and Isolate the Source of Electrical Power



***Failure to complete required actions in the order specified in this document may result in Hazardous Condition leading to serious personal injury or property damage***

1. Using the Hex socket and ratchet wrench, remove the Motor Shaft to Axle Coupling Bolt, Nut and Wedge Shims. **See Figure 10.**

**Figure 10: Removing Axle Shaft Bolt and Shims**



***The follow step in the Motor Removal Procedure requires lifting and turning, while managing a small amount of non-hazardous stored spring energy***

2. While preparing to support the weight of the motor and arm which rotates about the pivot, pull the front arm and motor approximately three inches away from the front of the vehicle, allow the motor shaft to become free of the axle. Slowly move the arm down to the lowest height position on the vehicle.
3. **Note: Support the motor during the following step, as it will become free of the arm mount.** Using the 5/16" allen head wrench, remove the six 5/16" button-head bolts and washers holding the motor onto the front arm bracket. The motor can now be removed from the assembly area.

## **Motor Reinstallation Procedure**

1. Slide the new Motor into position and bolt it to the Upper Arm Bracket using the NEW 5/16" button-head bolts

2. With motor installed, lift the arm against a small amount of spring energy, align to the axle, and pull back on the arm to engage the motor shaft to the axle receiver
3. Reattach the axle with NEW 3/8" connecting nuts and bolts, and the Original Wedge shaped shims to lock the axle to the Motor Shaft. Torque the axle connecting bolt to 84 to 108 in-lbs (7 to 9 ft-lbs).
4. Apply Dielectric Grease to Both Motor Terminals
5. Apply Dielectric Grease to the ring connection of the motor harness inside the Yellow and Blue wire boots.
6. Reattach the Wire in the Upper Arm to the Motor Terminals
  - a. Passenger Side System
    - i. Yellow Boot on **Negative** Terminal
    - ii. Blue Boot on **Positive** Terminal
  - b. Driver Side System
    - i. Yellow Boot on **Positive** Terminal
    - ii. Blue Boot on Negative Terminal
7. Cover the motor studs with insulated terminal boots
8. Reconnect Power and Ground to the truck or trailer
9. Operate the Tarp System