

# Procedure to Release Stored Energy in Front-to-Back Systems Prior to Service



A Safe Fleet Brand

*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* contain **hazardous energy** which must be dissipated and isolated prior to service. Workers performing service or maintenance on machinery and equipment are exposed to injuries 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 Front to Back System





Roll Rite **Front to Back** 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

## 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.

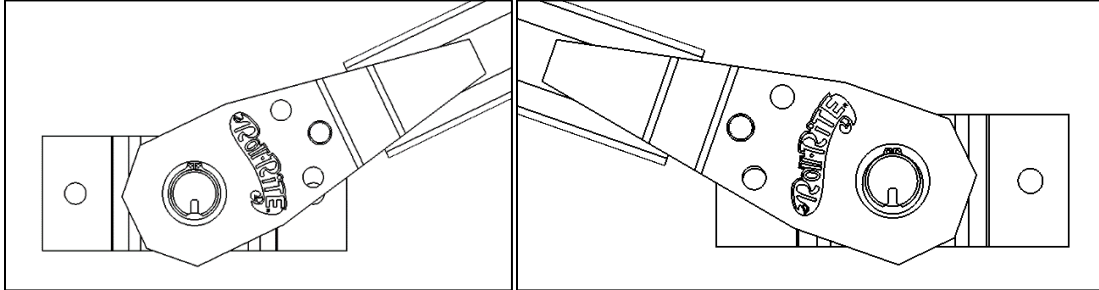
**Table 1: Electrical Connections**

Connection Type	Connection Description/Color	Illustration/Photo
Truck 12V Battery Positive Terminal	0 to 8 AWG Wire with Red Insulation	 <p><i>Typical Positive Terminal</i></p>
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	

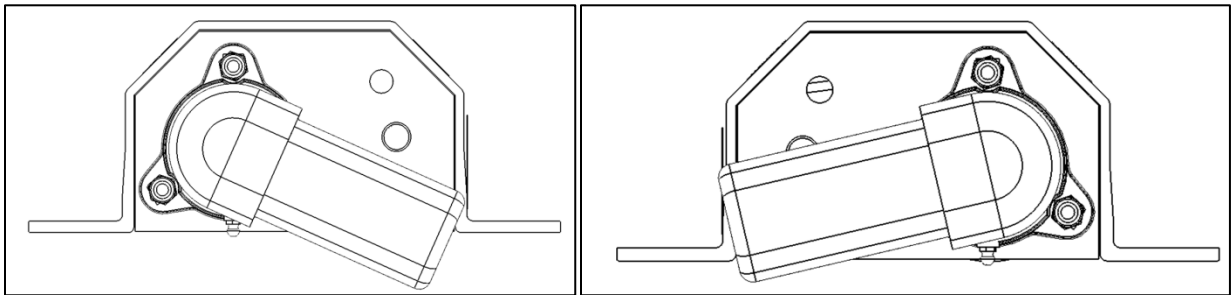
## Stored Potential Spring Energy in Pivots

There are three types of pivots in a Front-to-Back Roll Rite system:

### 1. External Pivot, Driver (Left) Side and Passenger (Right) Side



### 2. Top Mount Pivot Box, Driver (Left) Side and Passenger (Right) Side



### 3. Underbody Pivot Box

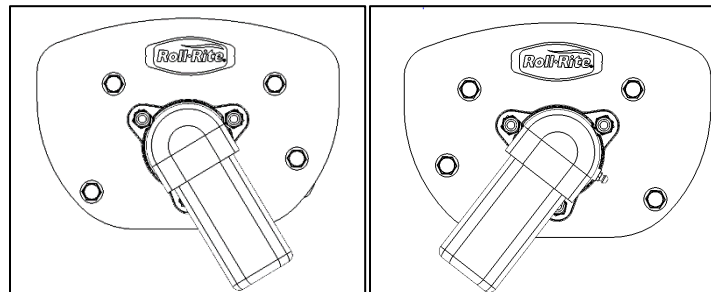


Figure 1a, 1b, and 1c show diagrams describing spring energy **increasing** as the system moves from **Fully Covered** to **Fully Uncovered**. On the driver (left) side of the vehicle, **counter clockwise rotation** of the pivot and knuckle winds the springs in the front arm assembly. Stored potential spring energy increases to maximum when the cover is fully uncovered.

Figure 1a: Driver (Left) Side External Pivot, Increasing Spring Energy

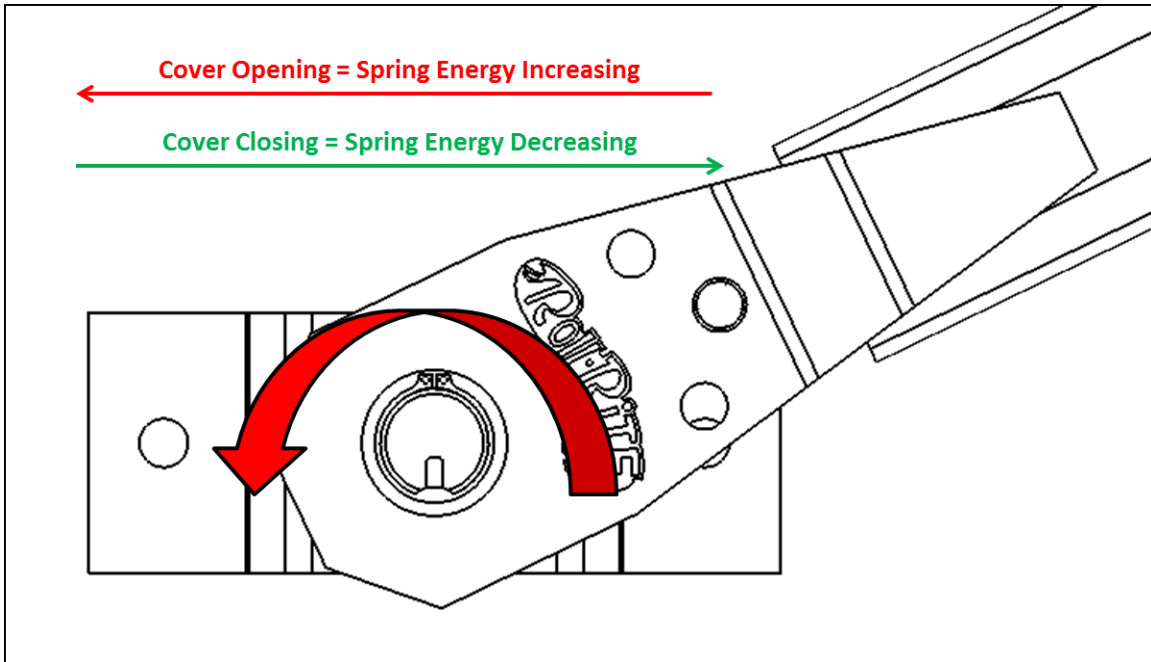


Figure 1b: Driver (Left) Side Top Mount Pivot, Increasing Spring Energy

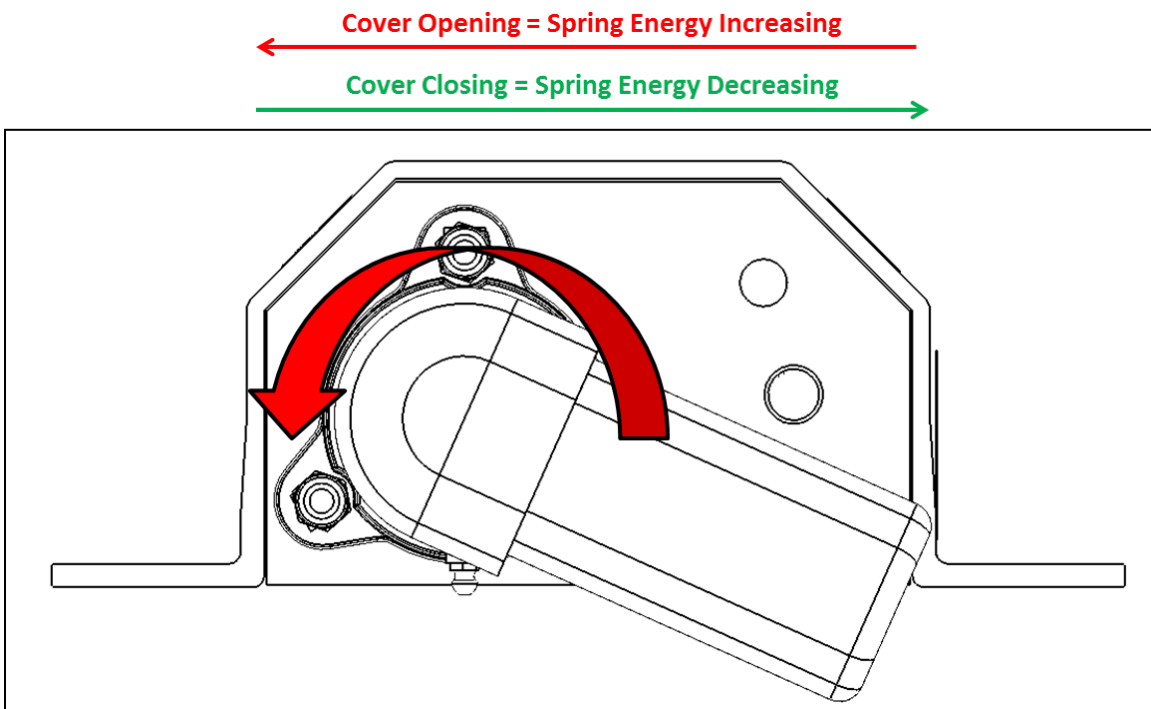


Figure 1c: Driver (Left) Side Underbody Pivot, Increasing Spring Energy

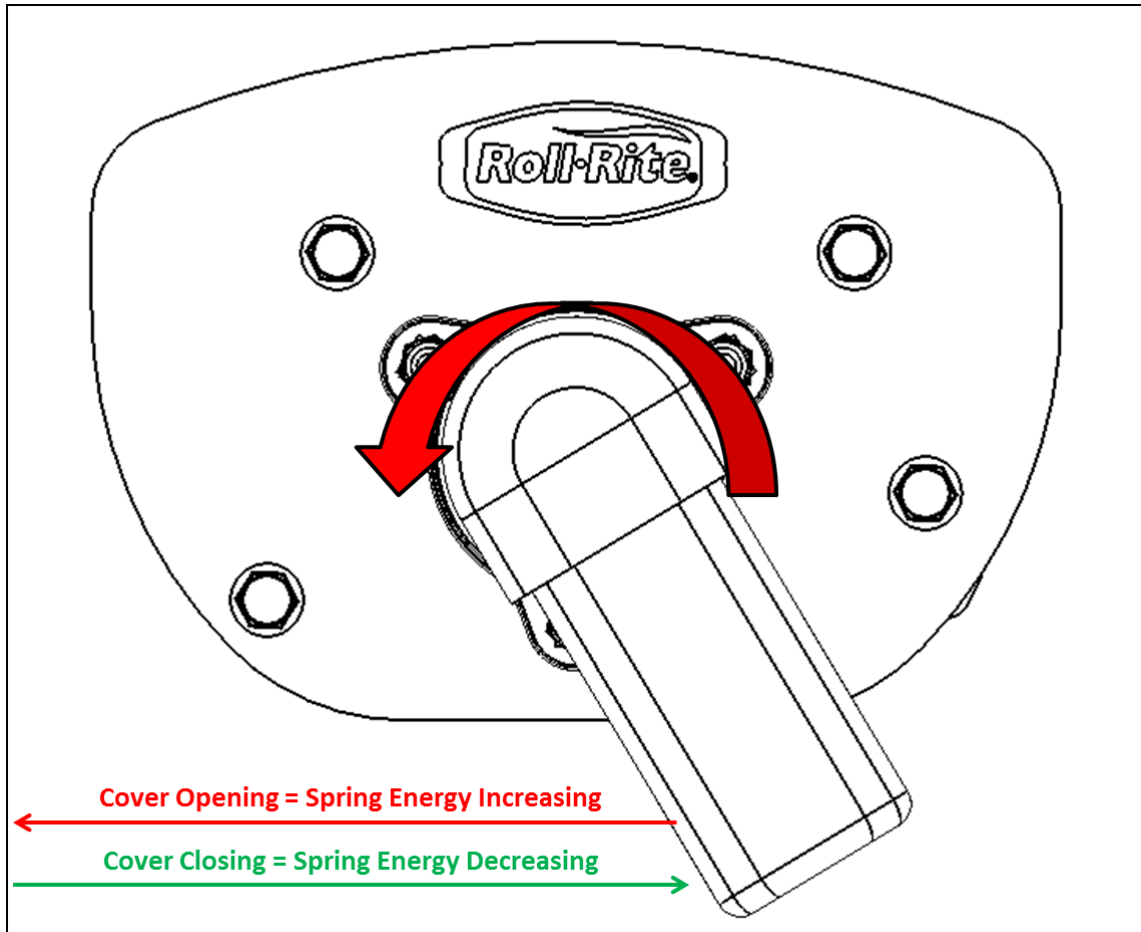
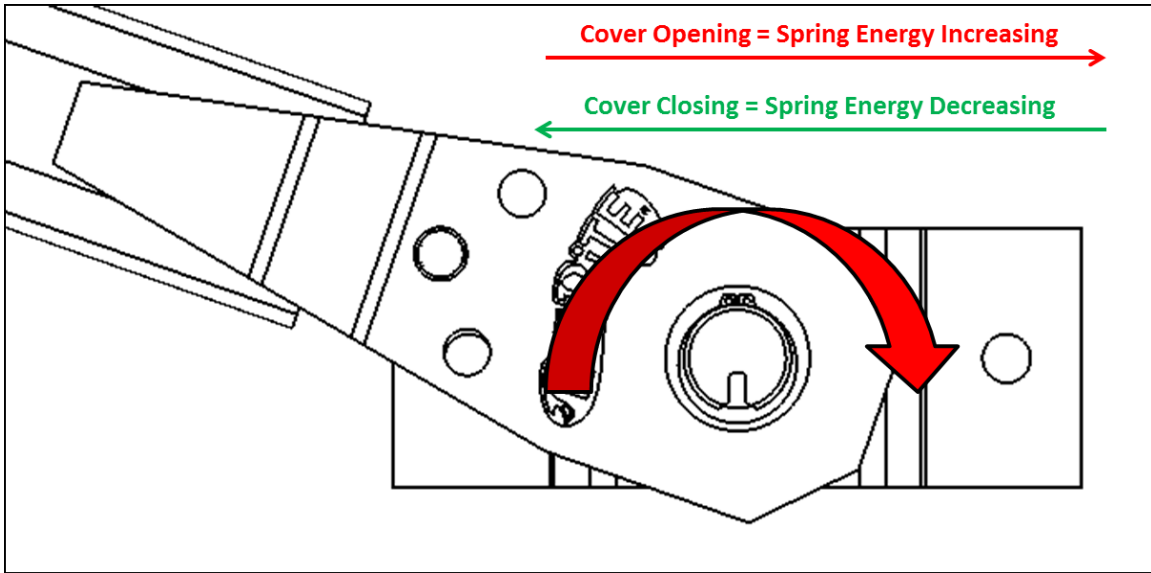


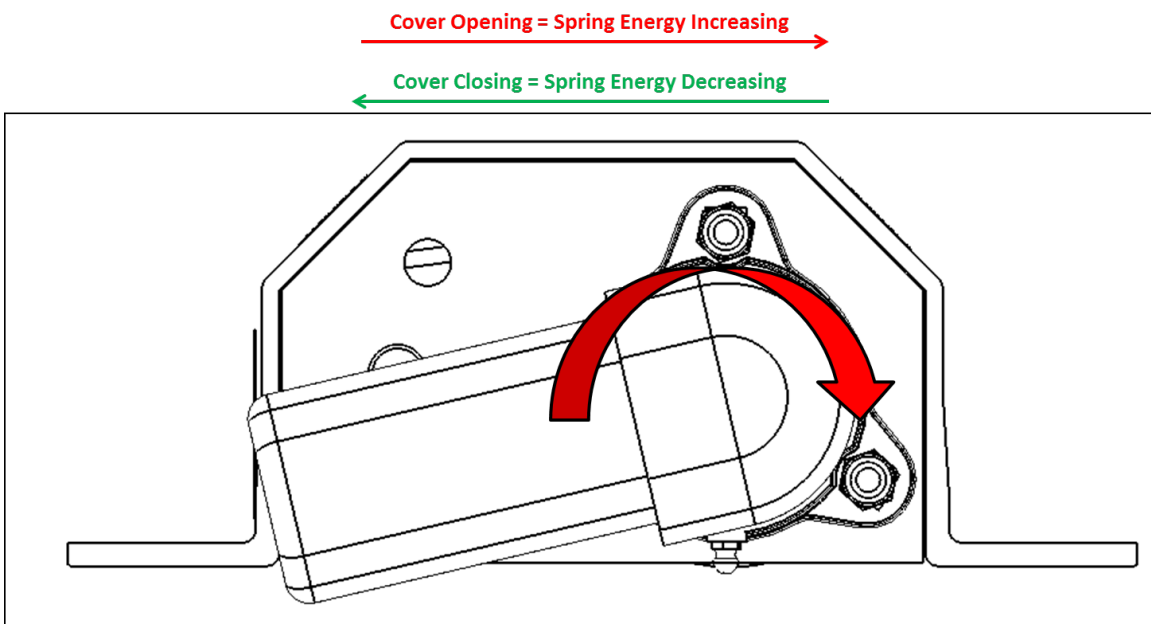
Figure 2a, 2b, and 2c show diagrams describing spring energy **increasing** as the system moves from **Fully Covered** to **Fully Uncovered**. On the driver (left) side of the vehicle, **counter clockwise rotation** of the pivot and knuckle winds the springs in the front arm assembly. Stored potential spring energy increases to maximum when the cover is fully uncovered.



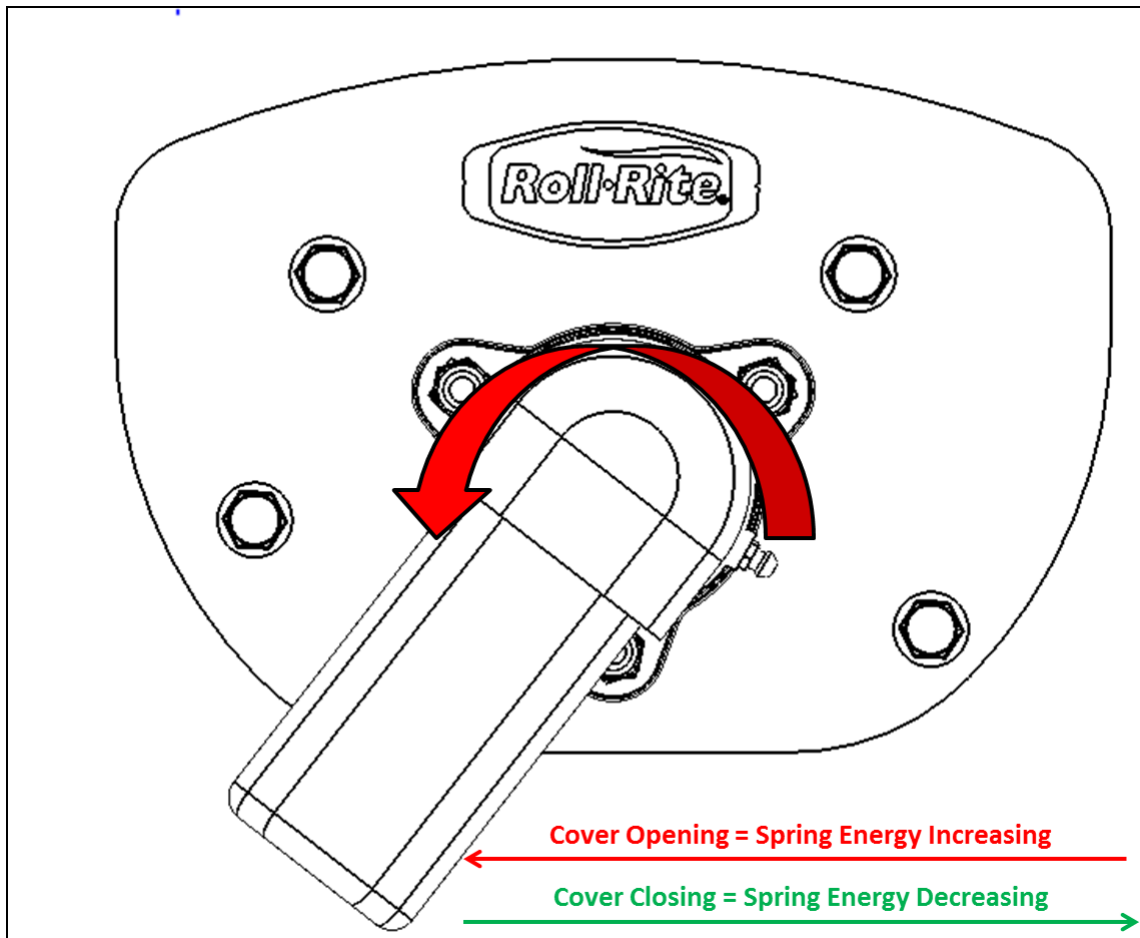
**Figure 2a: Passenger (Right) Side External Pivot, Increasing Spring Energy**



**Figure 2b: Passenger (Right) Side Top Mount Pivot, Increasing Spring Energy**



**Figure 2c: Passenger (Right) Side Underbody Pivot, Increasing Spring Energy**



### **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



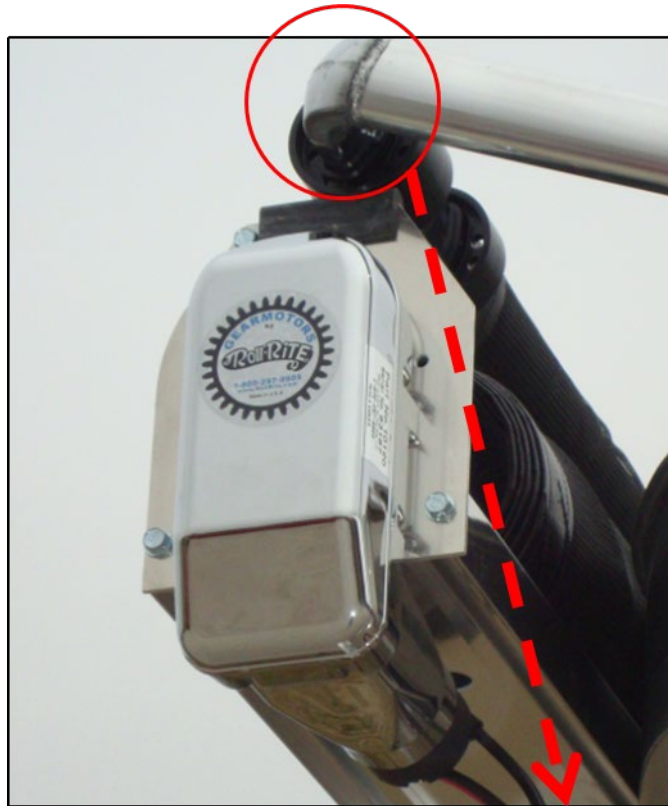
*Failure to complete all actions stated in this section may result in hazardous condition resulting in bodily injury or property damage*

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

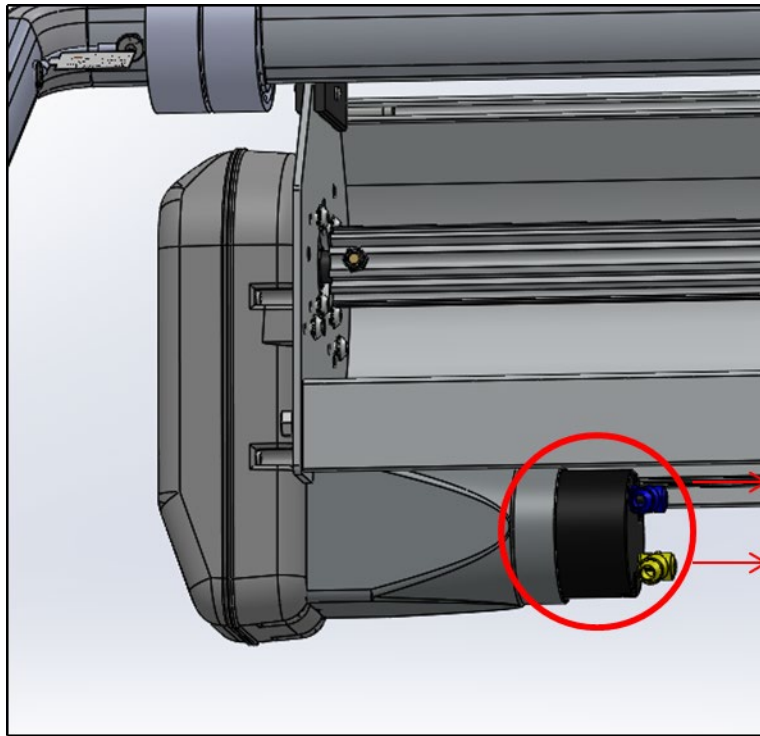
### Dissipating Stored Spring Energy Prior to Service

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 tarp arm toward the **Fully Covered** position.
    - ii. Stop rolling the tarp arm when it comes to rest on the dump body, or as the lowest height at the end of the truck or trailer.
    - iii. The stored spring energy in the pivot is now at its lowest point and the hazard is minimized
  - b. If the motor will not operate:
    - i. Referring to **Figure 3**, and using the 2" ratchet strap, securely fasten the top portion of the Front Arm down to a rigid location on the truck or trailer body.  
**IMPORTANT NOTE: The attachment point on the frame and the ratchet mechanism must be accessible from ground level at a later point in the process of removal and isolation of spring energy.**



- ii. Ratchet the front arm down firmly to the truck or trailer body to prevent movement of the arm from stored spring energy.
- iii. Using the 10mm socket and wrench, remove the power wires from the motor terminals.
- iv. For Roll Rite Super Duty Motor, with integrated brake
  1. 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**

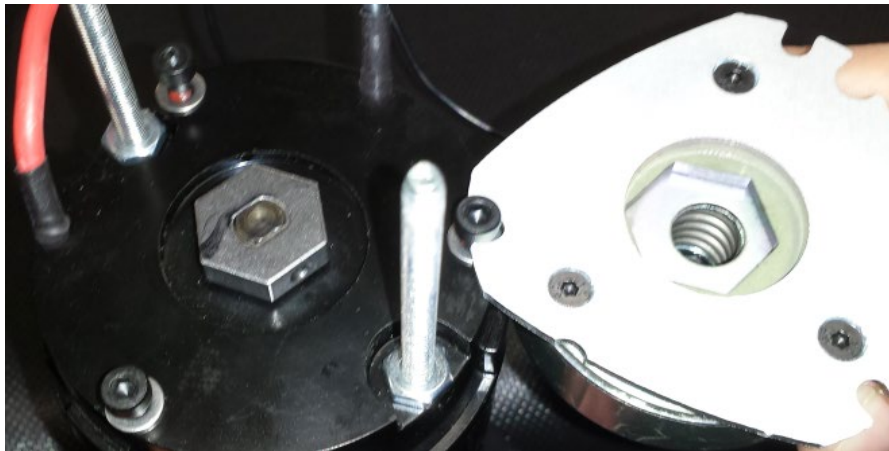


2. Using the 3 mm Allen Wrench, remove (3) three screws which hold the brake to the electric motor. See **Figure 5**

**Figure 5: Removing Brake Plate Mounting Screws**

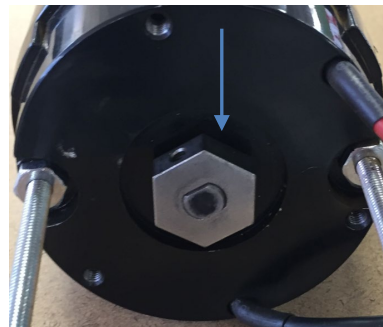


3. Remove brake from the motor by pulling away from the top of the motor housing. The hex shaped brake coupler will become free of the brake assembly. See **Figure 6**. **Note: The brake circuit will prevent the brake from being completely removed from the assembly. It is OK to leave the brake motor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



4. Stand at ground level in front of the tarp axle, and away from the tarp arms.
5. 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 Arm about the Front Pivot Pin.**
6. Continue to release the ratchet strap in small increments until the cover is **Fully Covered** and the Tarp Arm is at its lowest position.
7. 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 Tarp Arm **is at rest at the Lowest Position. See Figure 9.**

**Figure 9: Hex on Motor Shaft**



- v. For Roll Rite Tarp Master Motor, with worm gear brake:
  1. Using a 9/16 socket, ratchet, and box end wrench, disconnect the nut from the axle connecting the motor shaft to the axle shaft.
  2. Using a punch, tap the bolt through the axle and motor stub shaft to dislodge the bolt, freeing axle rotation.
  3. Stand at ground level in front of the tarp axle, and away from the tarp arms.
  4. 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 Arm about the Front Pivot Pin.**
  5. Continue to release the ratchet strap in small increments until the cover is **Fully Covered** and the Tarp Arm is at its lowest position.

## 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:**

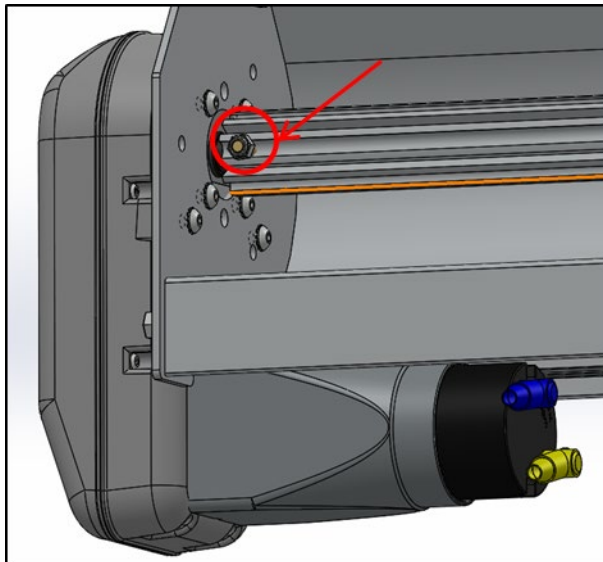
1. **Acquire and assemble the required tool set**

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 conditions leading to serious personal injury or property damage***

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

**Figure 10: Removing Axle Shaft Bolt**



***The follow step in the Motor Removal Procedure requires lifting and turning.***

2. ***Note: Support the motor during the following step, as it will become free of the Spool Housing End Cap.*** Using the 5/16" Allen head wrench, remove the six 5/16" button-head bolts and washers holding the motor onto the Spool Housing End Cap.
3. Pull the motor out from the Axle and away from the Spool Housing End Cap. Carefully remove the motor from the work area.



## Motor Reinstallation Procedure

1. Slide the new motor into position and reattach the axle to the Motor Output shaft with NEW 3/8" connecting nuts and bolts to lock the axle to the Motor Shaft. Torque the axle connecting bolt to 84 to 108 in-lbs (7 to 9 ft-lbs).
2. Bolt the new motor to the Spool Housing End Cap using the NEW 5/16" button-head bolts.
3. Apply dielectric grease to both motor terminals
4. Apply dielectric grease to the ring connection of the motor harness inside the yellow and blue wire boots.
5. Using a 10mm socket and wrench reattach the power wires and nuts to M1 & M2 Motor Terminals.
6. Cover the motor studs with insulated terminal boots.
7. Reconnect power and ground to the truck or trailer.
8. Operate the tarp system.