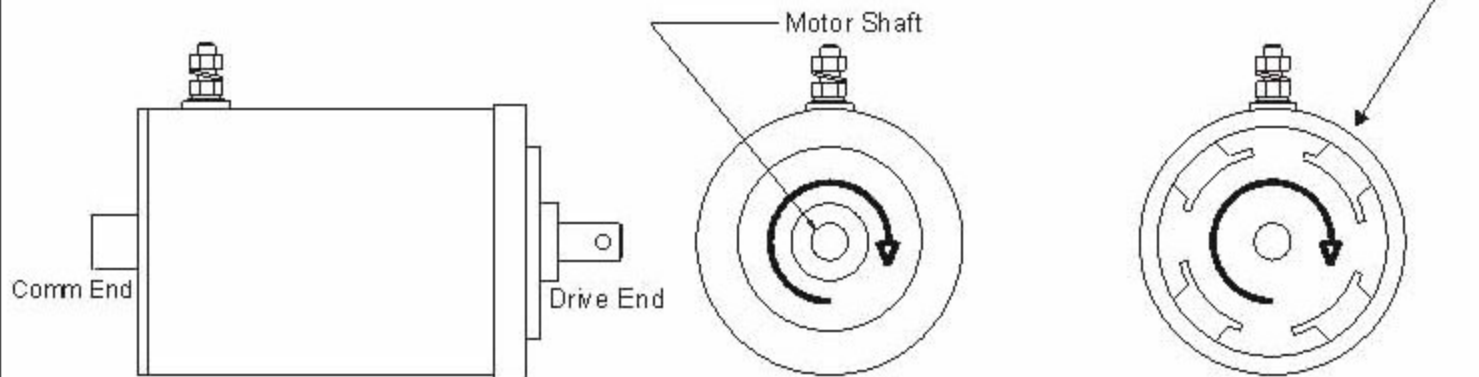


## Motor Viewed From the Drive End



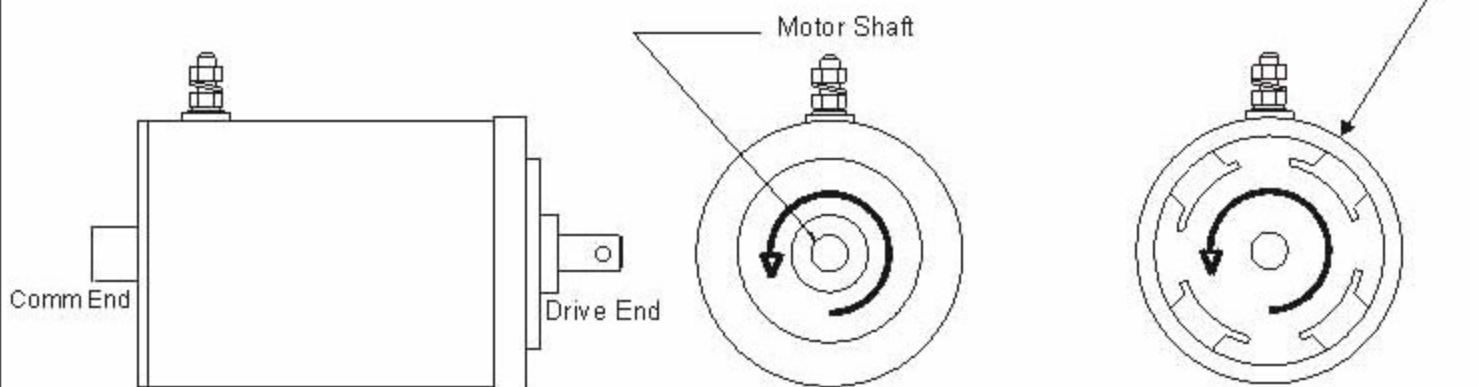
Clockwise (CW) rotation of the armature shaft looking at the motor from the drive end with the connection posts at 12:00.

Clockwise (CW) rotation of the drive shaft looking at the motor from the drive end with the connection post at 12:00 and using the long lips on the pole shoes to determine the rotation on a non-functional unit.

*(The long lip points in the direction of rotation)*

## How to determine CW Rotation of a Motor

## Motor Viewed From the Drive End

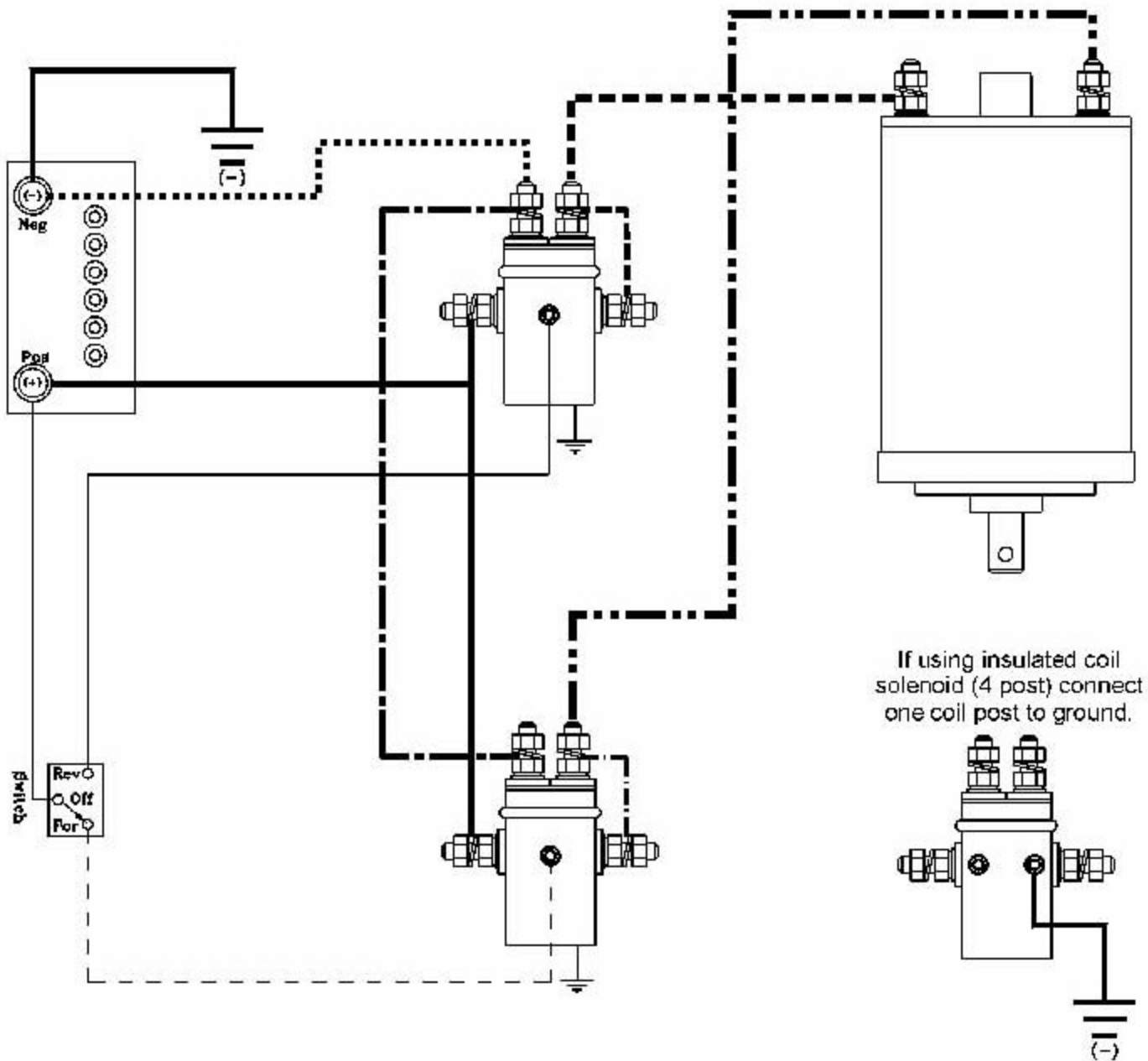


Counter Clockwise (CCW) rotation of the armature shaft looking at the motor from the drive end with the connection posts at 12:00.

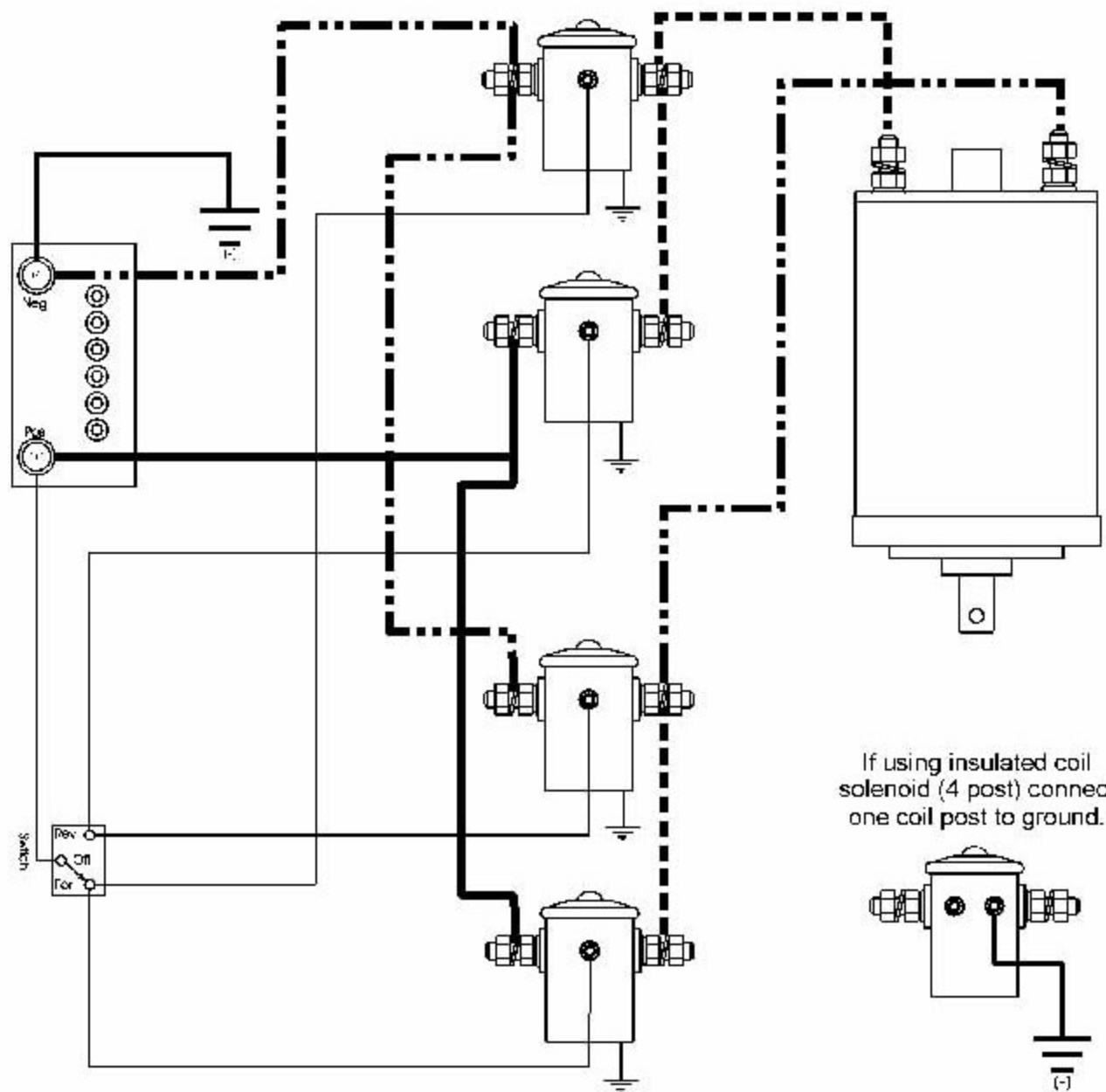
Counter Clockwise (CCW) rotation of the drive shaft looking at the motor from the drive end with the connection post at 12:00 and using the long lips on the pole shoes to determine the rotation on a non-functional unit.

*(The long lip points in the direction of rotation)*

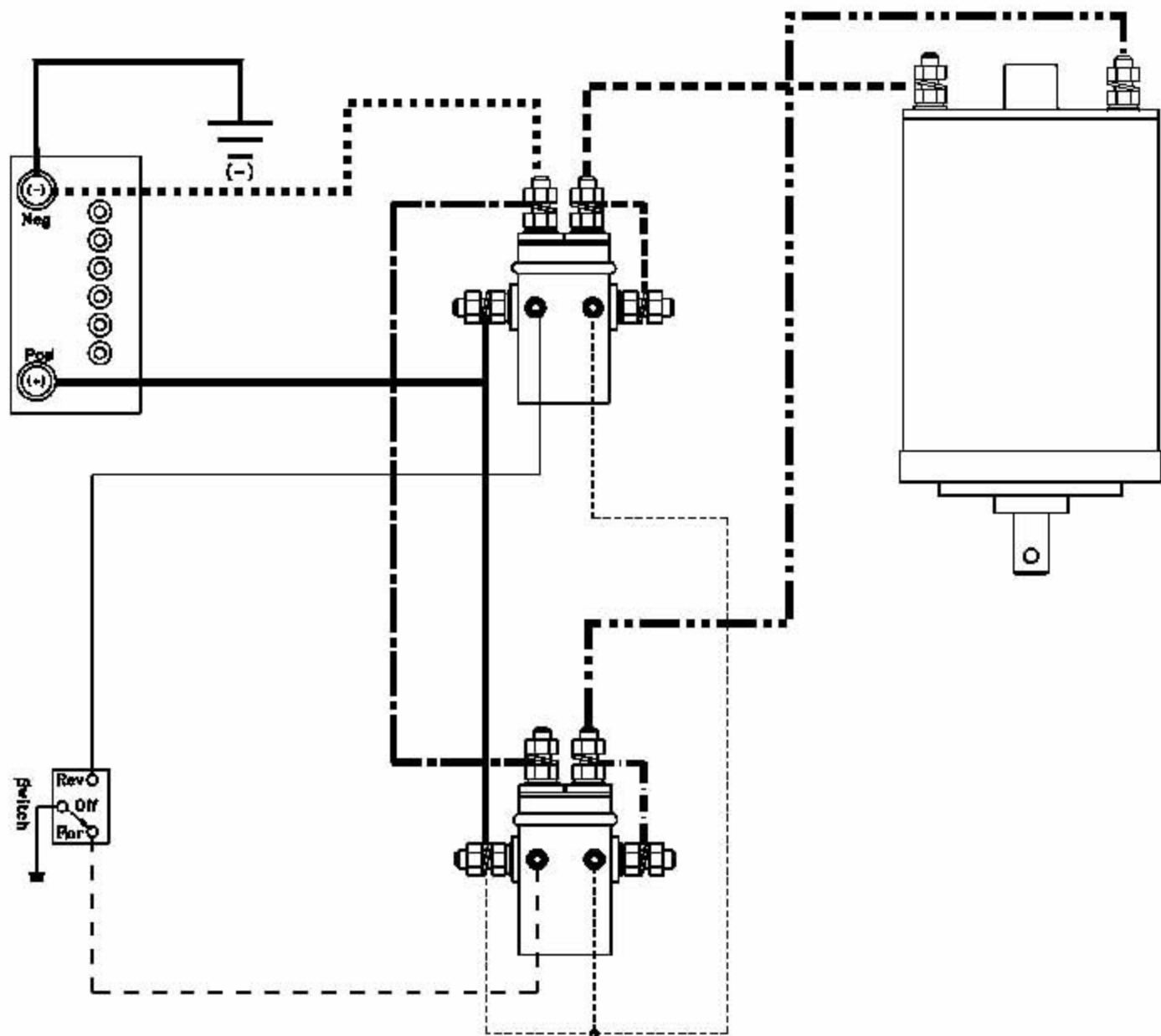
## How to determine CCW Rotation of a Motor



**( Late Wiring Design )**  
 Permanent magnet  
 bi-directional motor

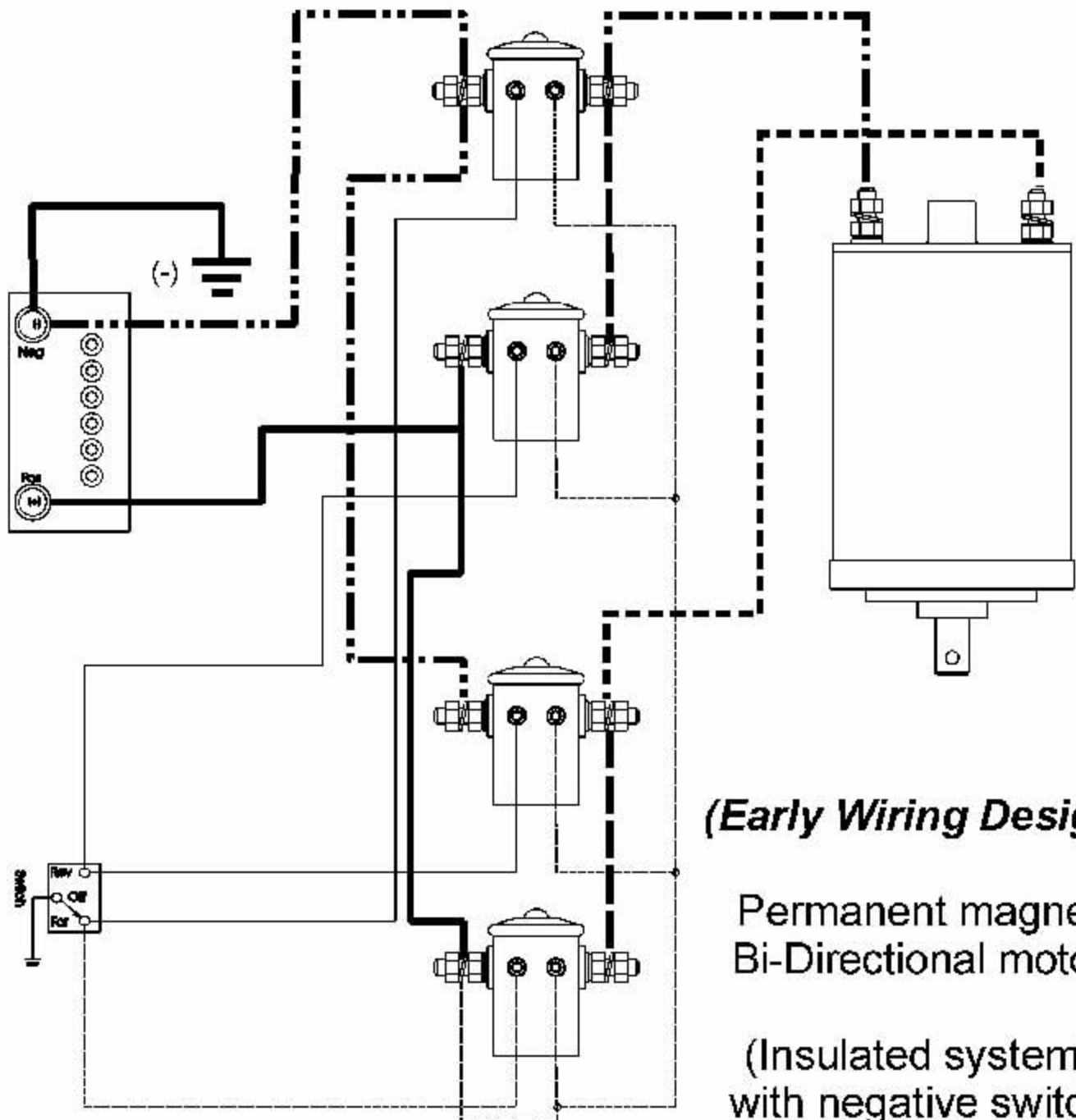


**( Early Wiring Design )**  
**Permanent magnet**  
**Bi-directional motor**



**( Late Wiring Design )**

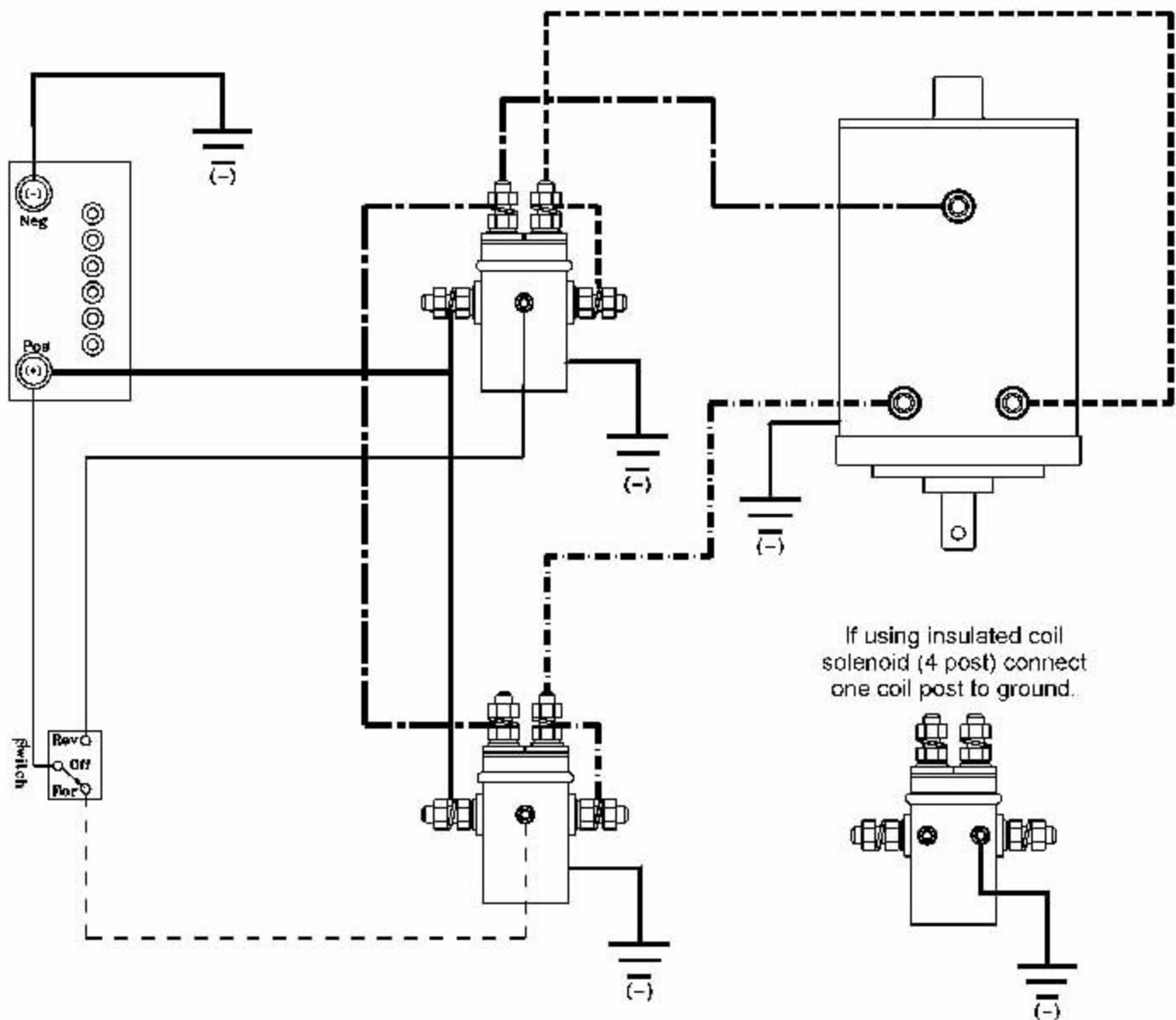
Permanent magnet Bi-directional motor  
 ( Insulated System )  
 with negative switch activation



*(Early Wiring Design)*

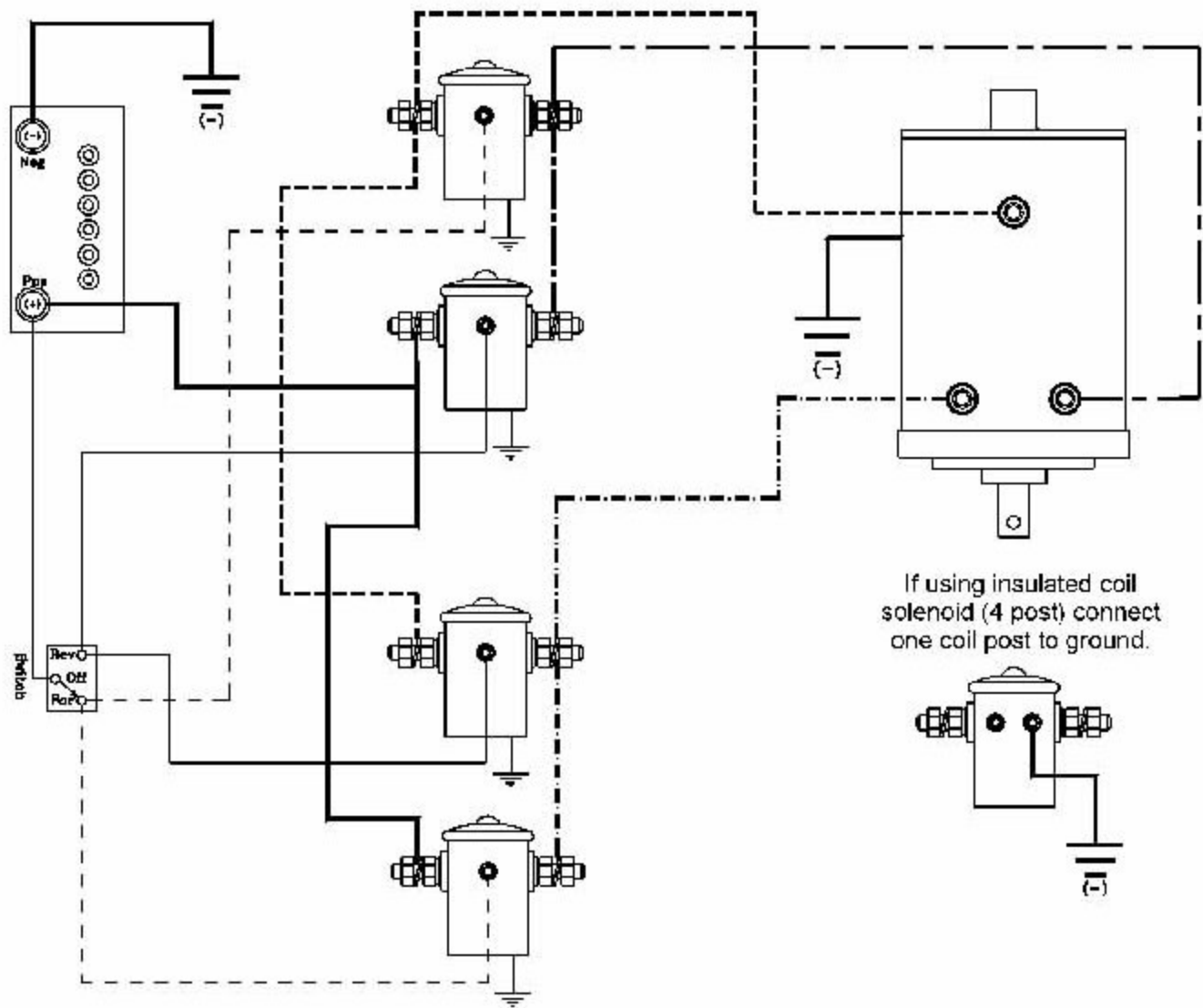
Permanent magnet  
Bi-Directional motor

(Insulated system)  
with negative switch  
activation

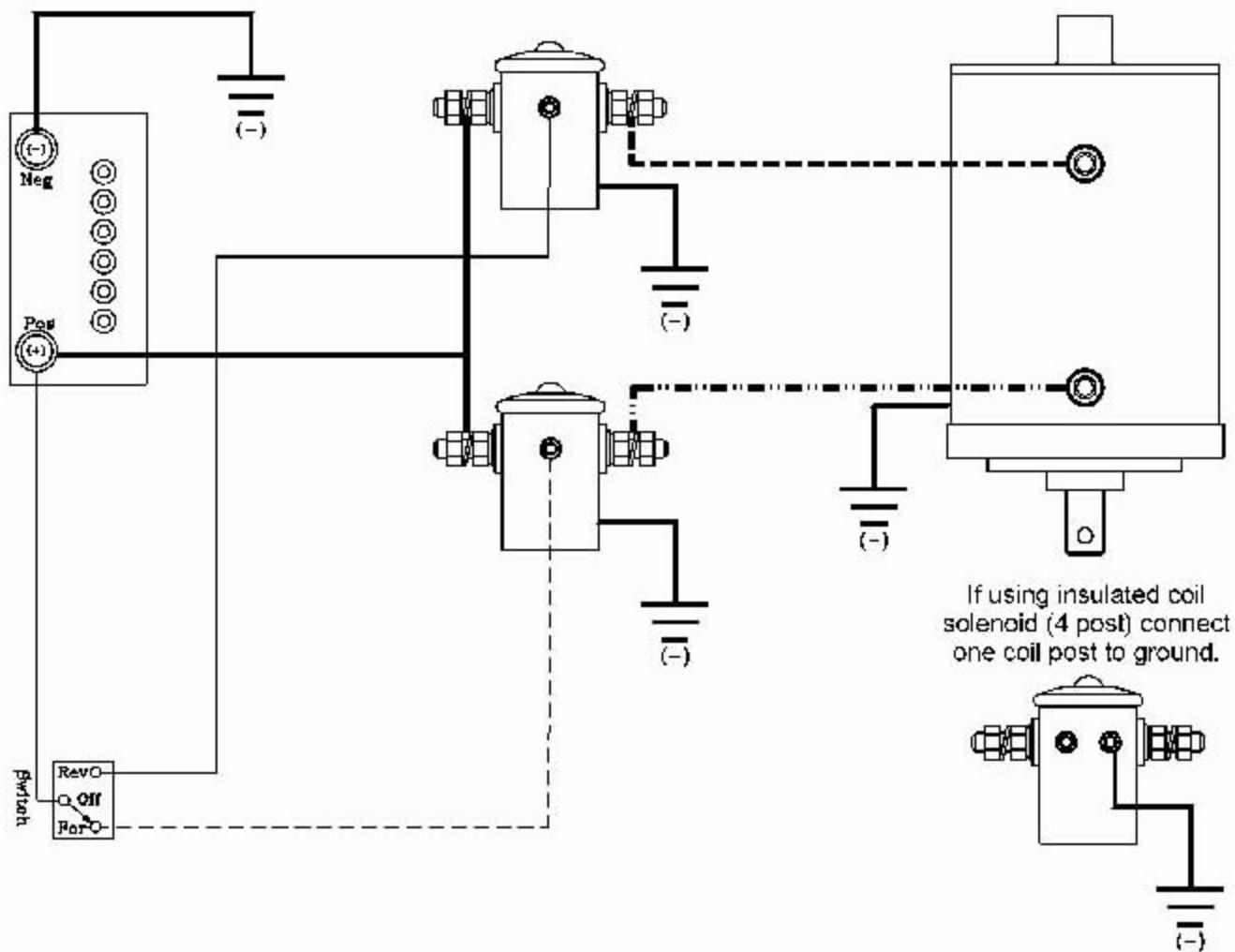


**( Late Style Wiring Design )**

This is for a three post bi-directional motor with field coils

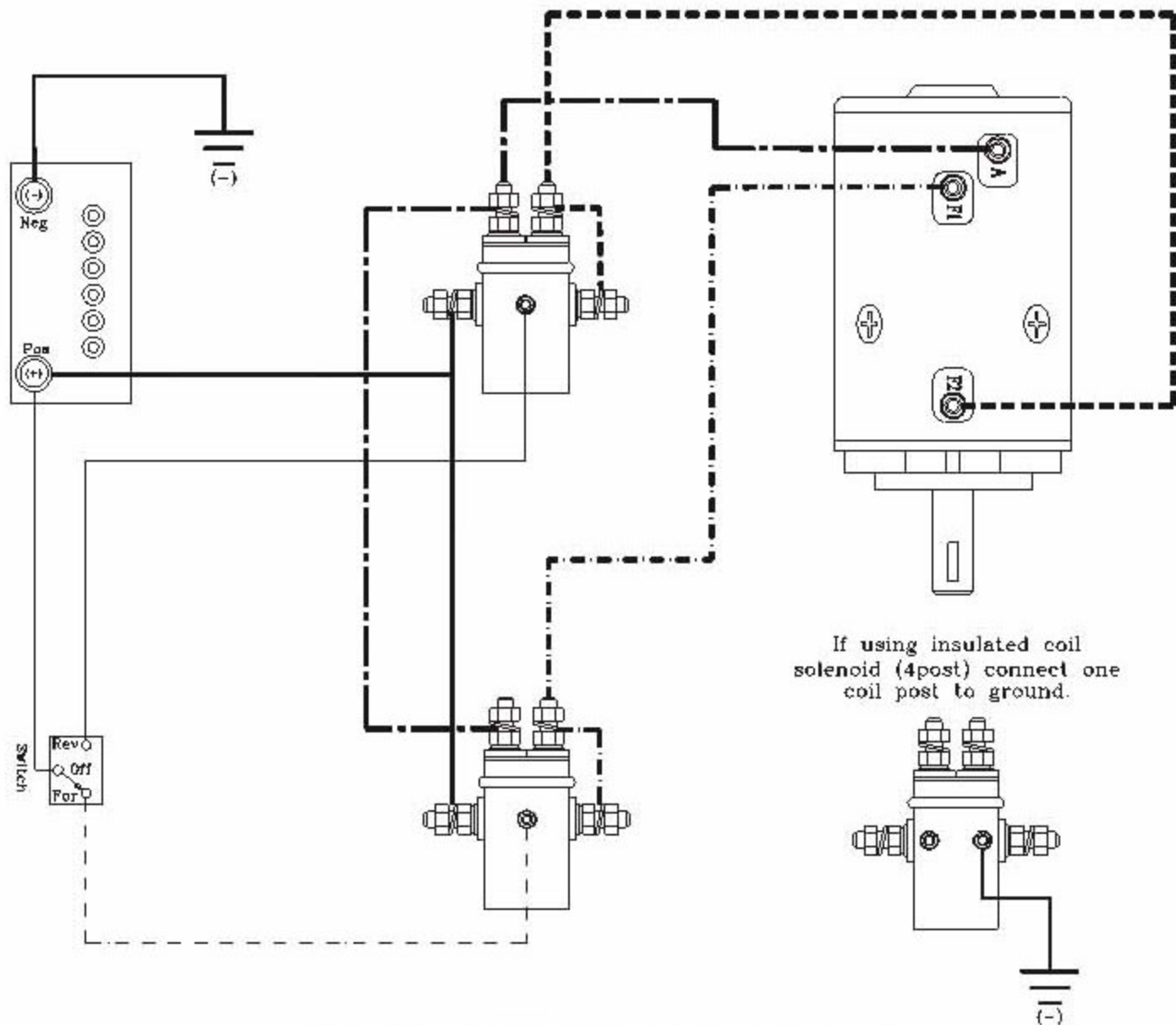


***( Early Wiring Design )***  
 Three post bi-directional motor  
 with field coils



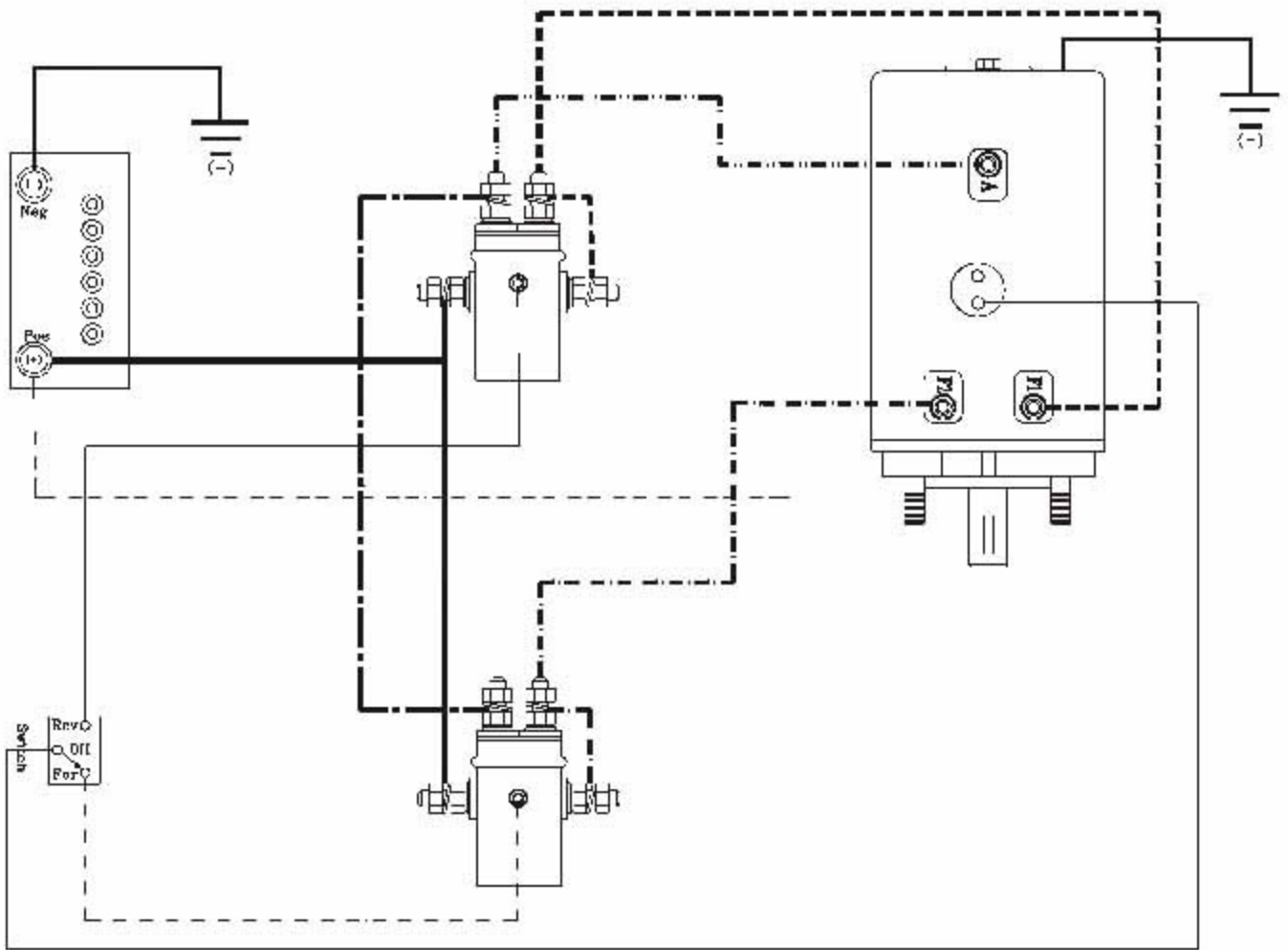
**This is for a two post bi-directional motor with field coils**





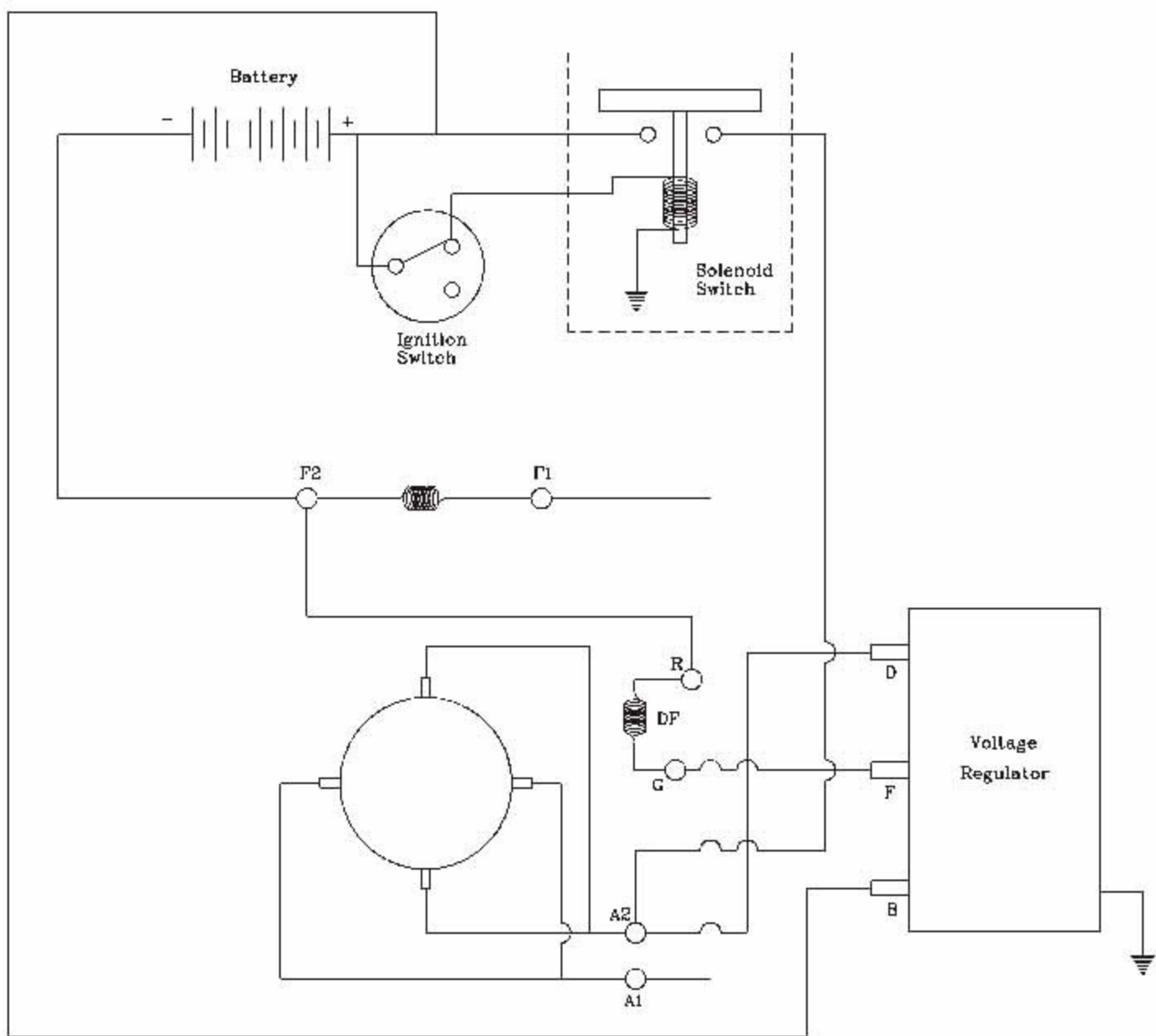
***( Late Wiring Design )***

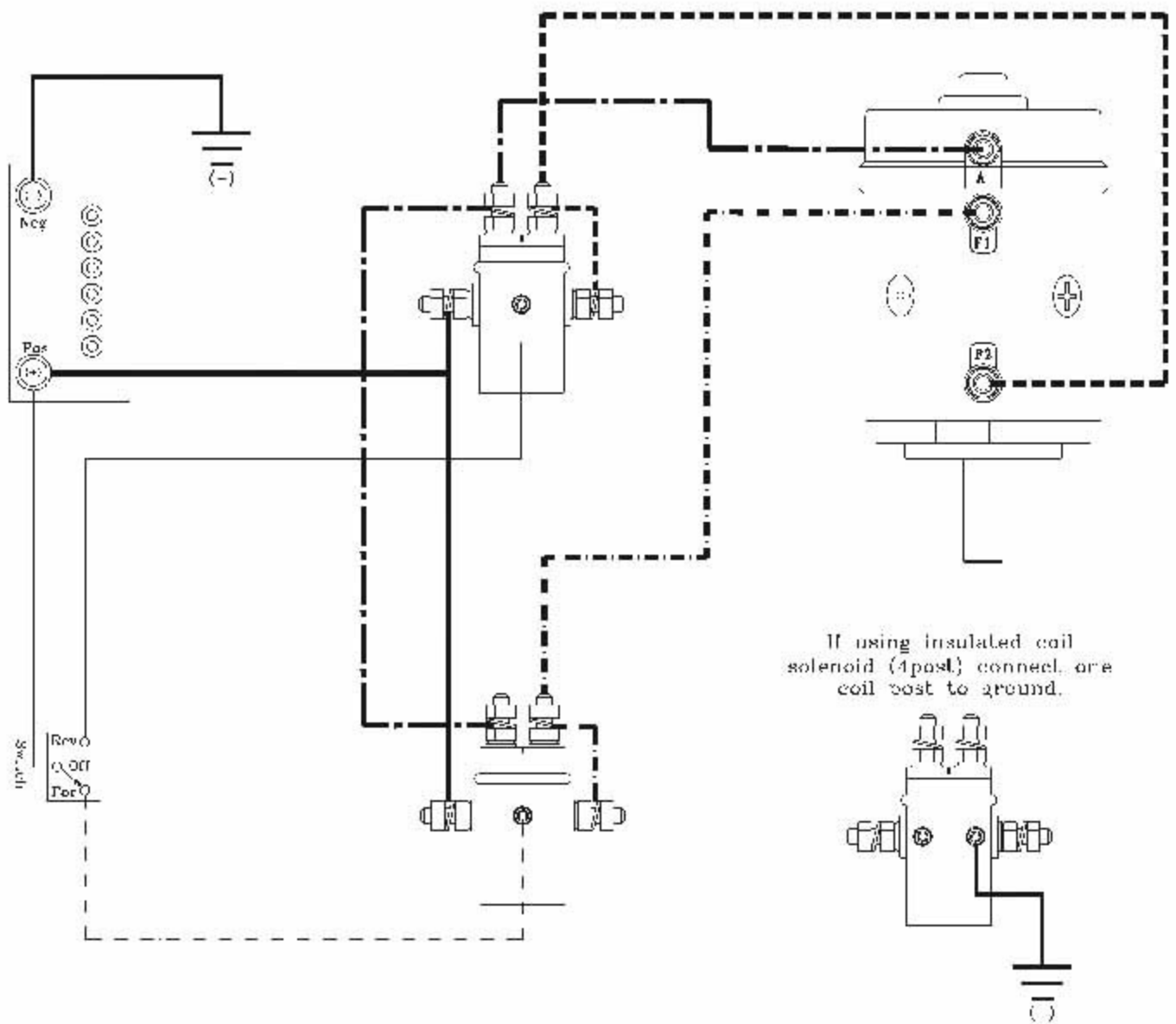
**This is for a Three post bi-directional winch motor with field coils W-7618 Style**



*( Late Wiring Design )*

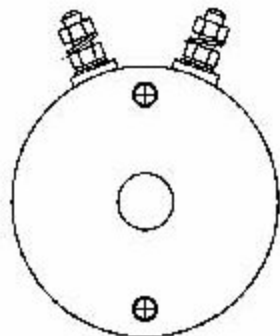
**This is for a Three post bi-directional winch motor with field coils and overload**



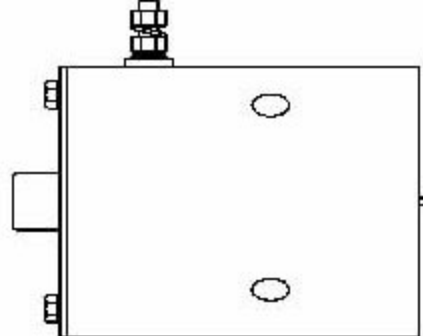


**( Late Style Wiring Design )**

This is for a three post bi-directional XOT style motors with field coils

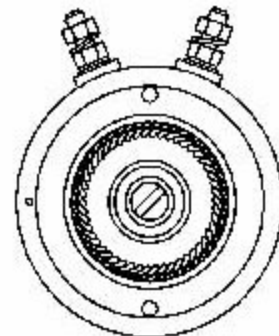


Com End  
Thru bolts at the 6 & 12 Position  
Looking from the Com End

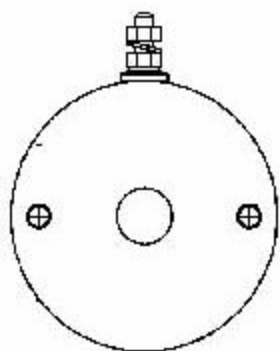


Com End

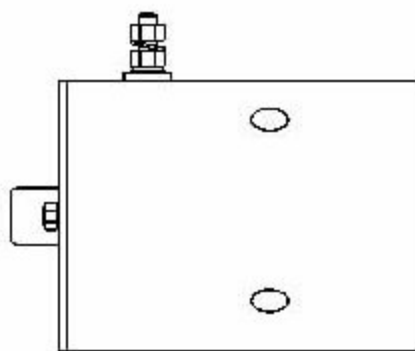
Drive End



Drive End

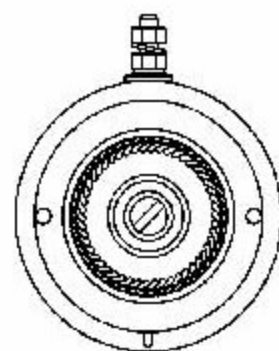


Com End  
Thru Bolts at the 3 & 9 Position  
Looking from the Com End

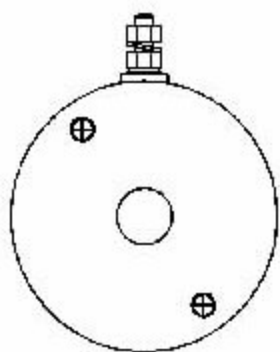


Com End

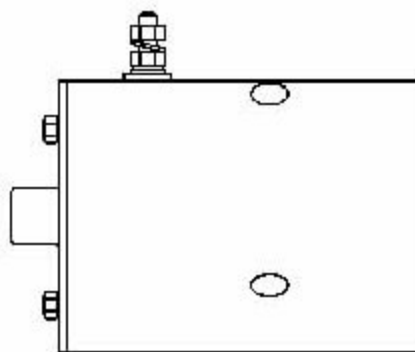
Drive End



Drive End

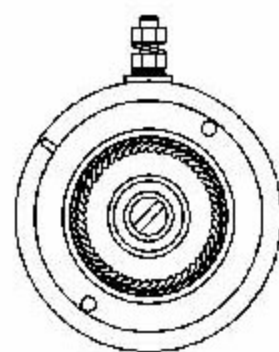


Com End  
Thru Bolts at the 5 & 11 Position  
Looking from the Com End

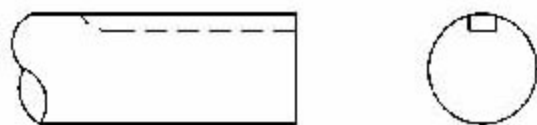
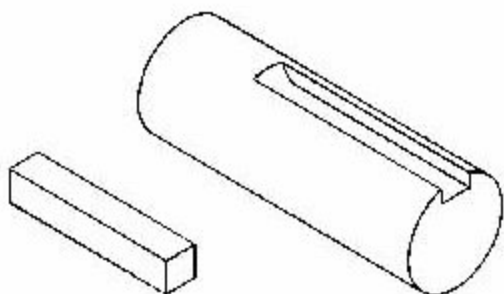


Com End

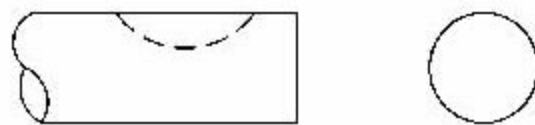
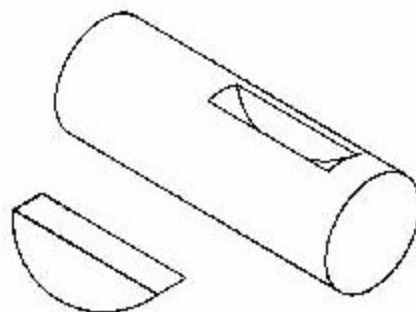
Drive End



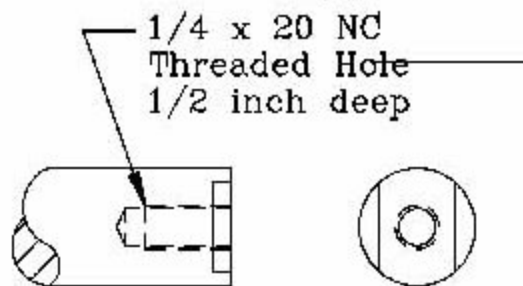
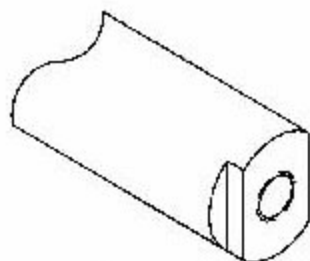
Drive End



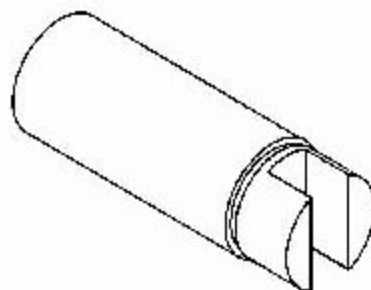
Bar Key Shaft Design



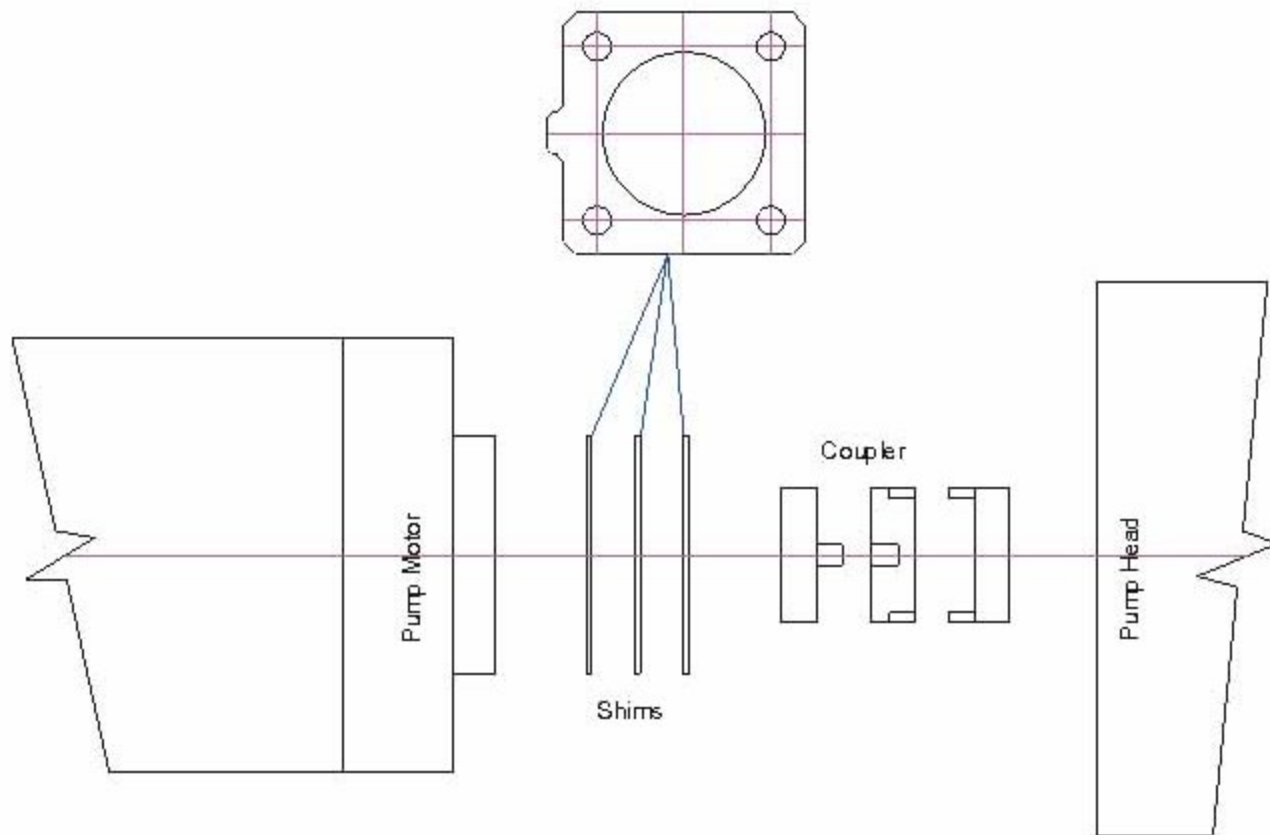
Woodruff Key Shaft Design



Amplex Shaft Design

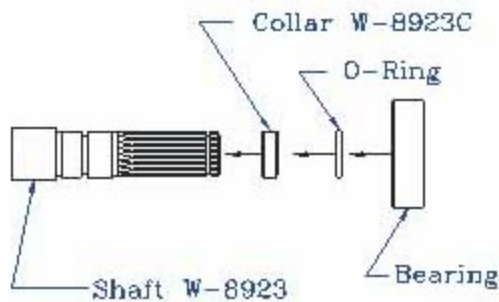


Slot Shaft Design



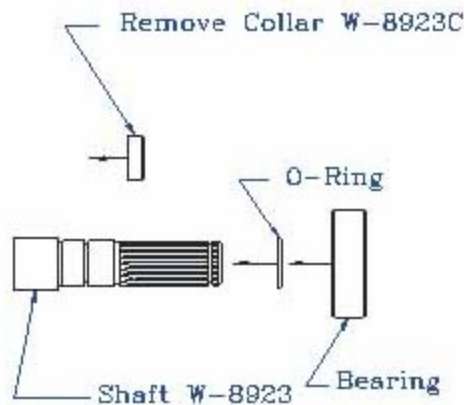
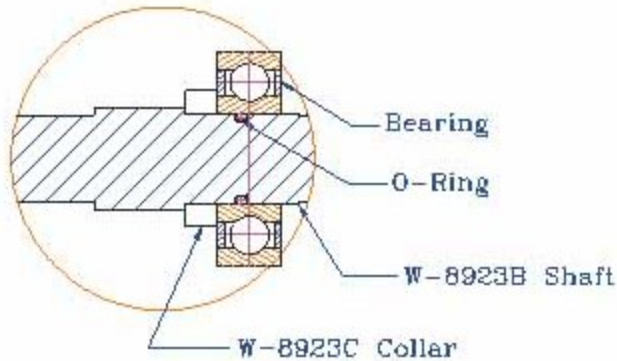
### NOTICE VERY IMPORTANT INSTALLATION INSTRUCTIONS

1. When the technician assembles the new motor to the pump head make sure that you use the enclosed shims to shim the coupler to the proper tension.
2. There are 3 shims included, use however many are required to properly space the coupler.
3. Using too few shims could result in damage to the motor or the pump head.
4. Using too many shims could result in improper coupling of the motor to the pump head.



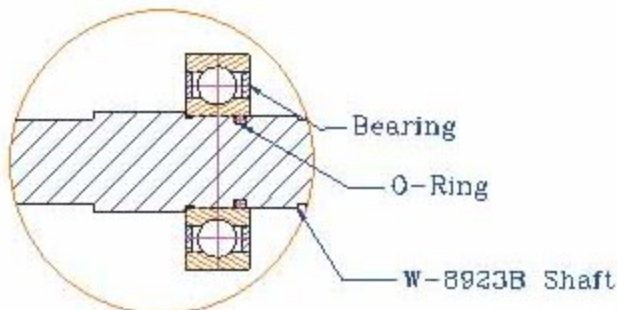
Notes:

When Replacing a Motor with a Flange use the motor as it arrives with the collar, O-ring, and bearing. Install the motor flange then install the assembly on the winch

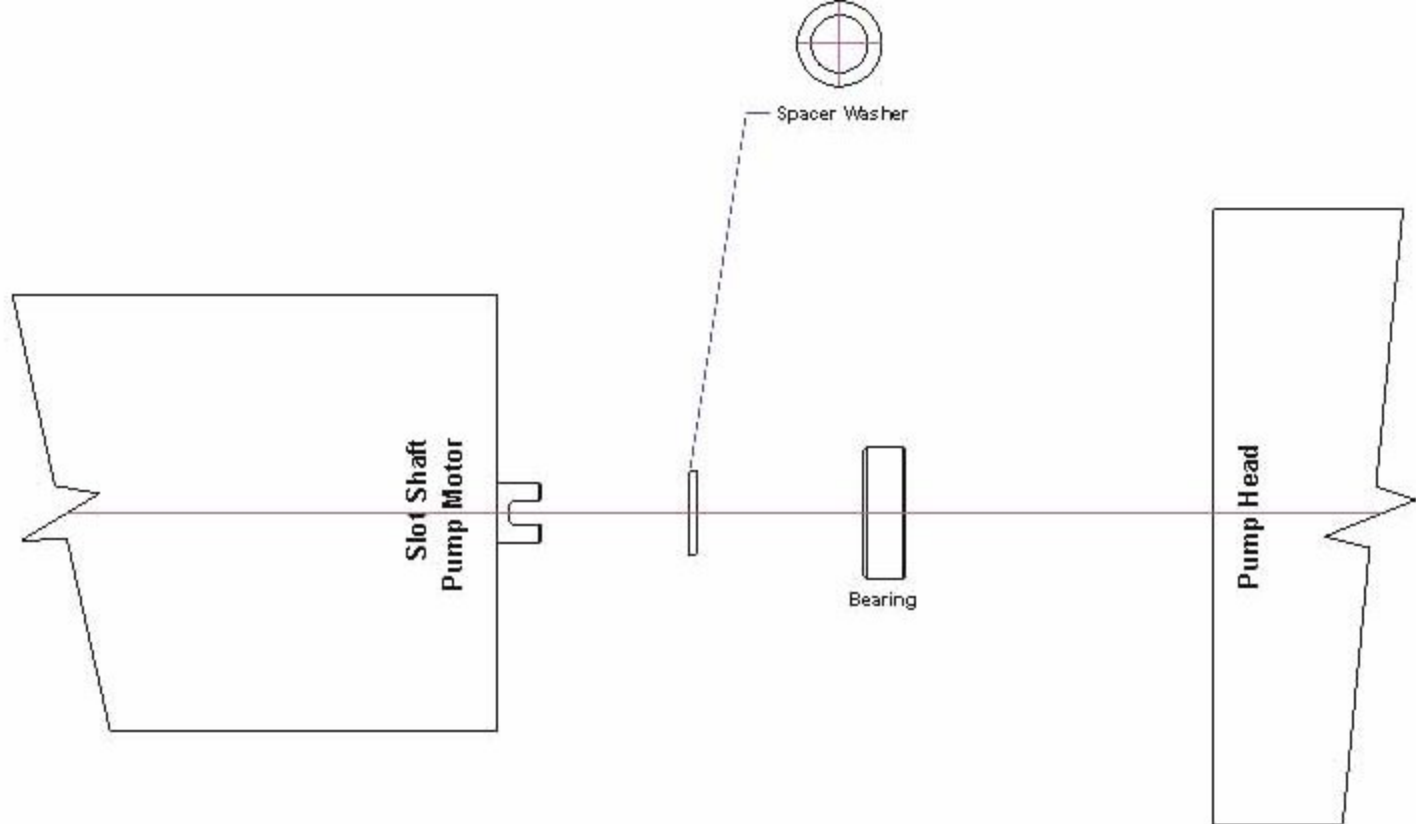


Notes:

When replacing a motor that does not have a flange, you must remove the bearing, O-ring and spacer, then install the O-ring and bearing, leaving off the collar. The assy should now look like the bottom drawing. Now the motor will fit the winch correctly

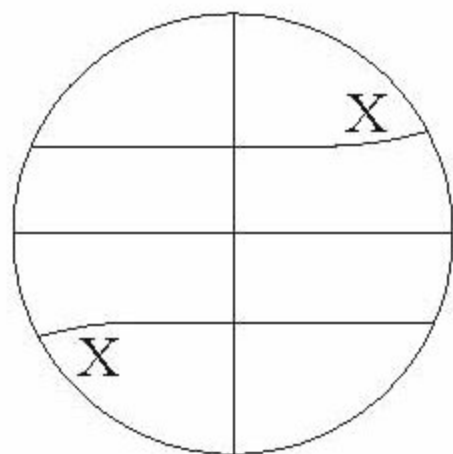






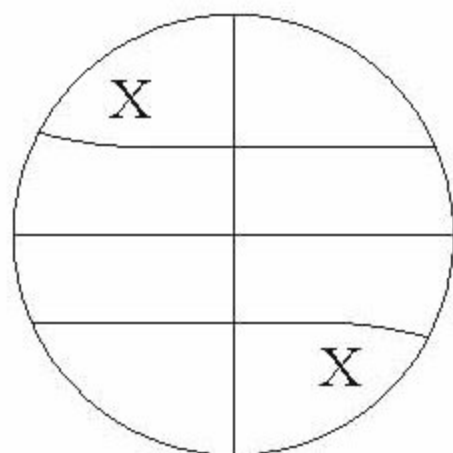
## **\*\* Notice\*\* Very Important Installation Instructions**

1. When the technician assembles the new motor to the pump head make sure that they check the spacing to see if the spacer washer needs to be removed for correct fit.
2. The motor comes with one spacer washer behind the ball bearing.
3. Having too tight a fit could result in damage to the motor or the pump head.
4. Having too loose a fit could result in damage to the motor or the pump head.
5. For MTE style motors use the spacer washer.
6. For Monarch motors remove the washer.



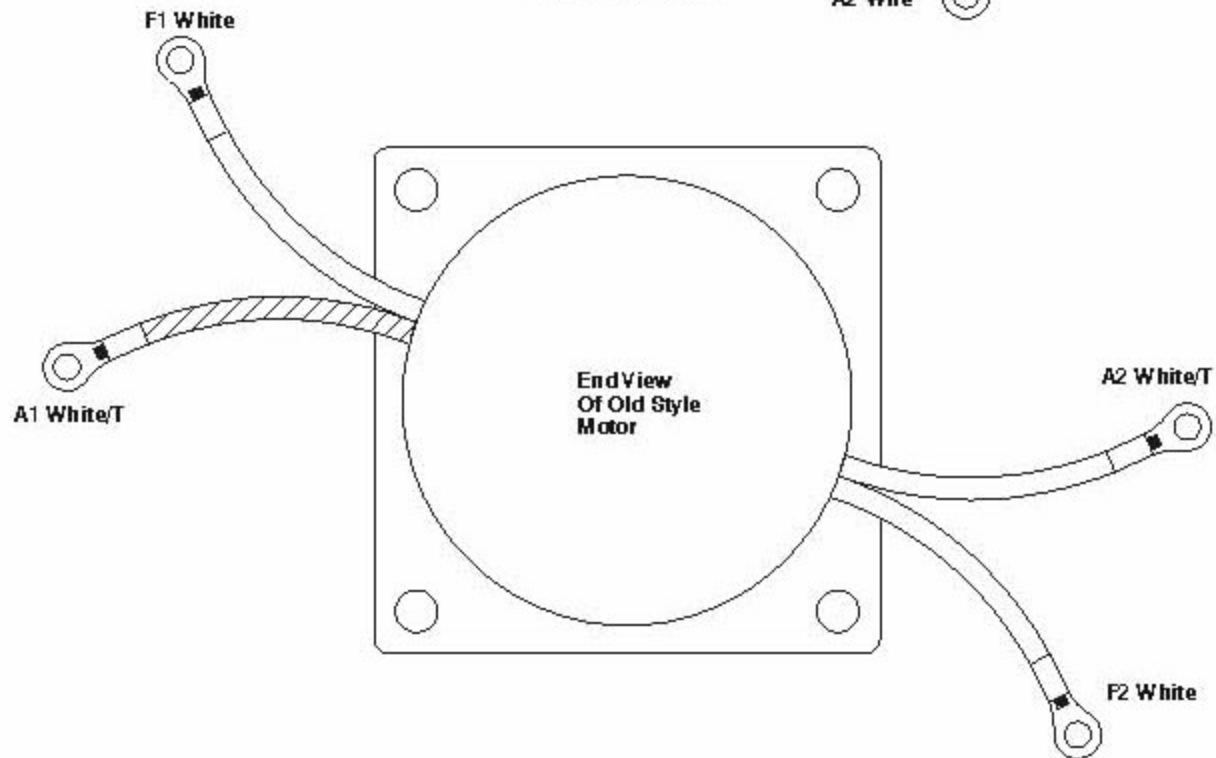
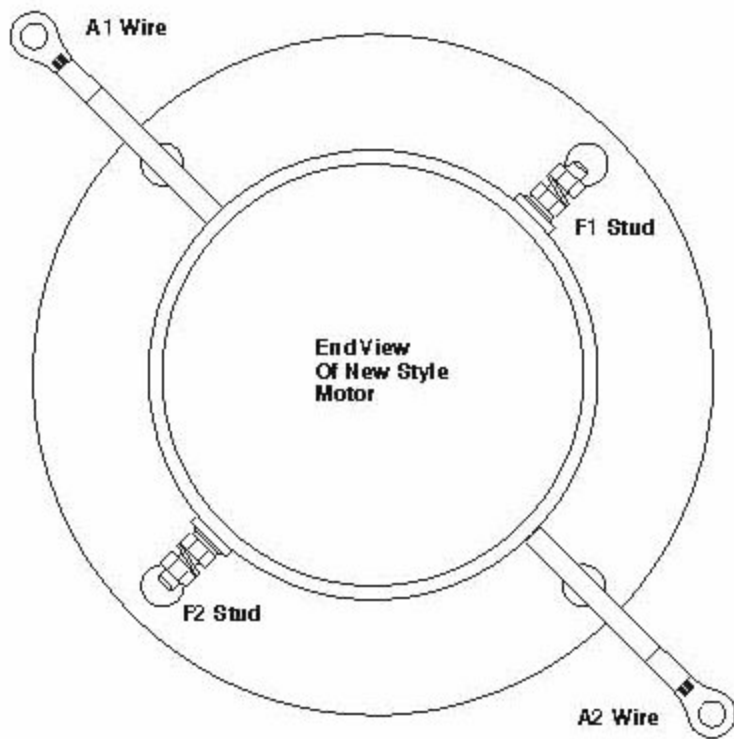
Look at the slot and see if it is worn or polished at the points marked by the “X”. If the wear is at the indicated points than the motor rotation is clockwise.

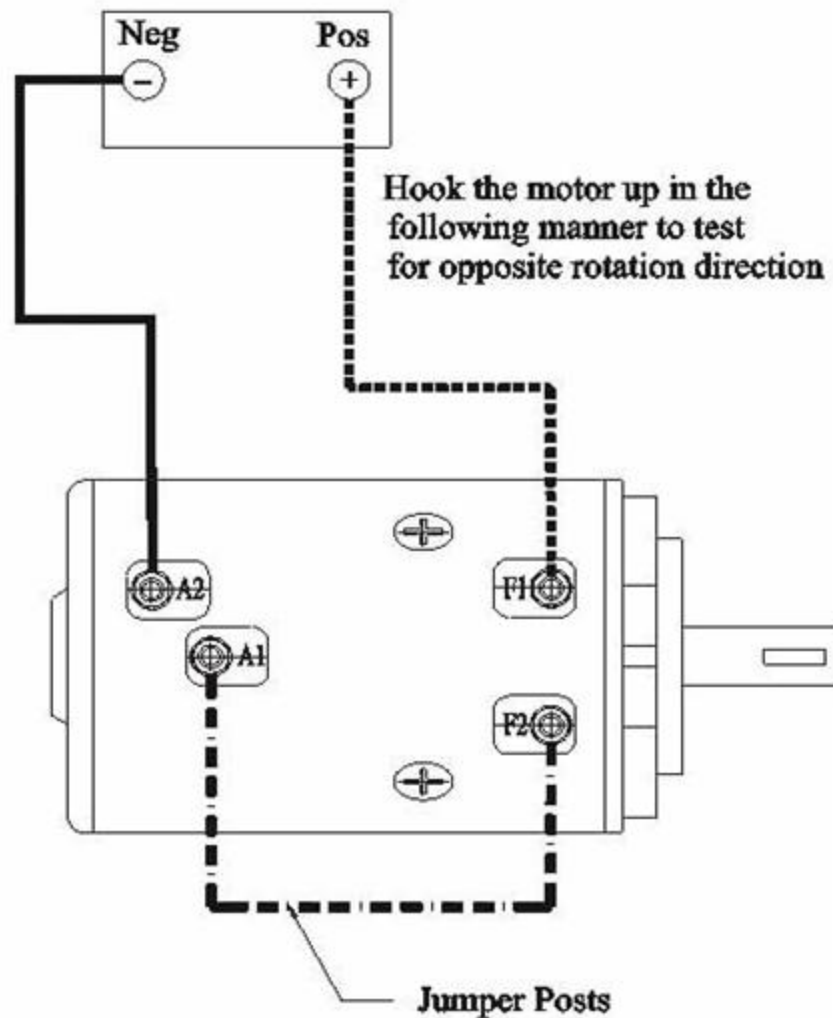
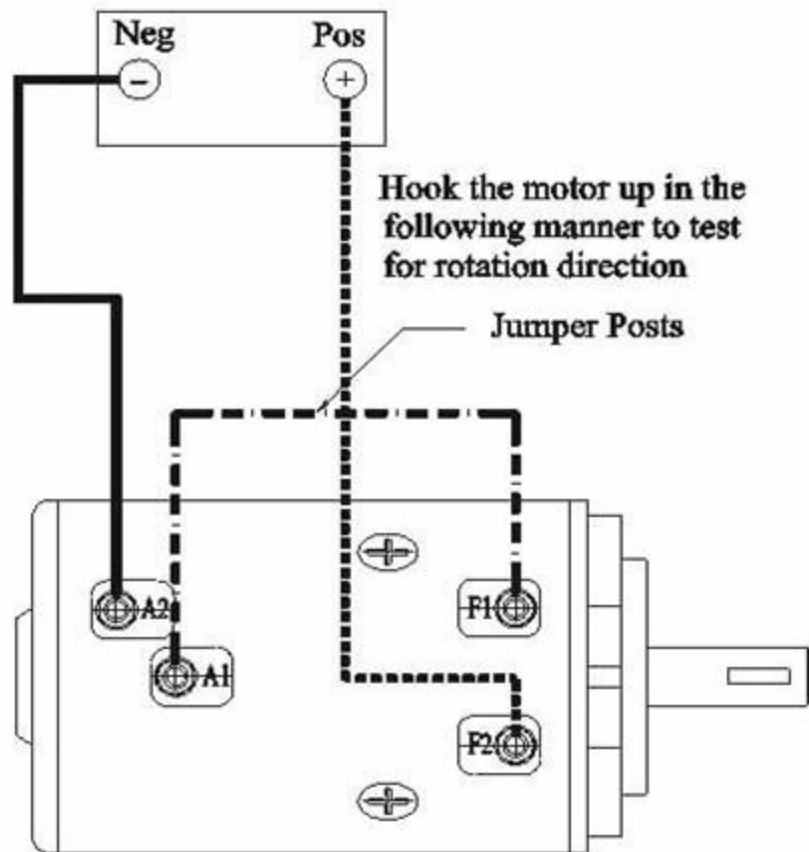
**CW**



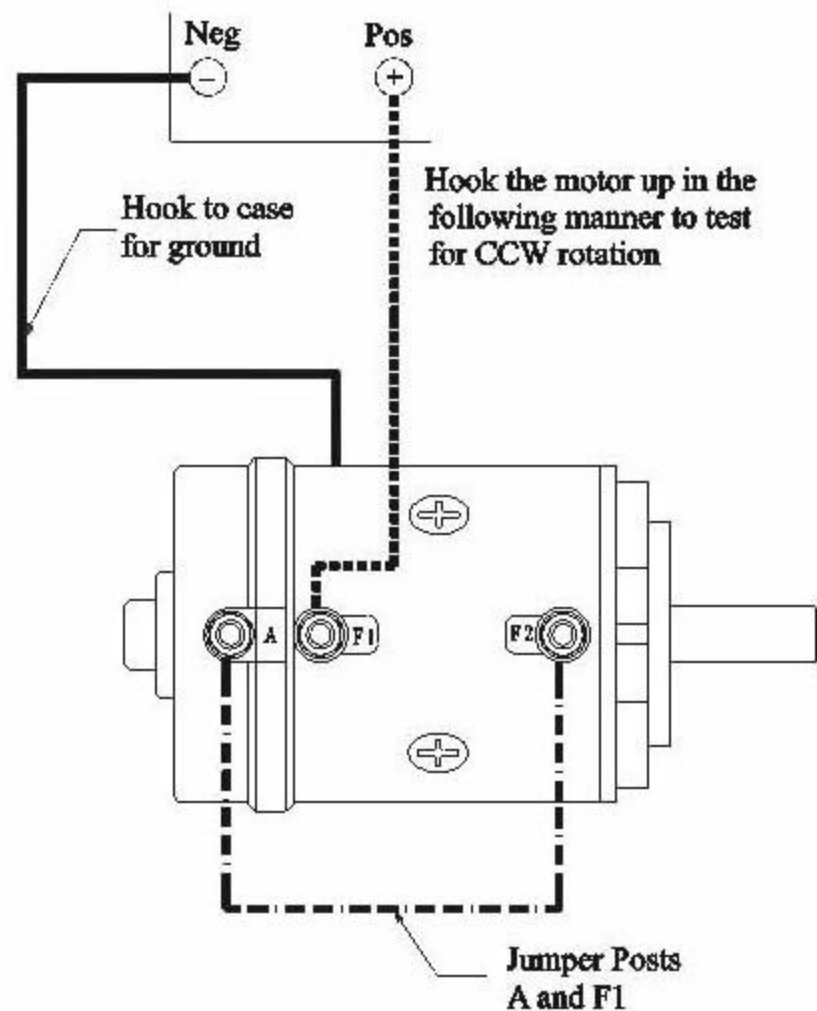
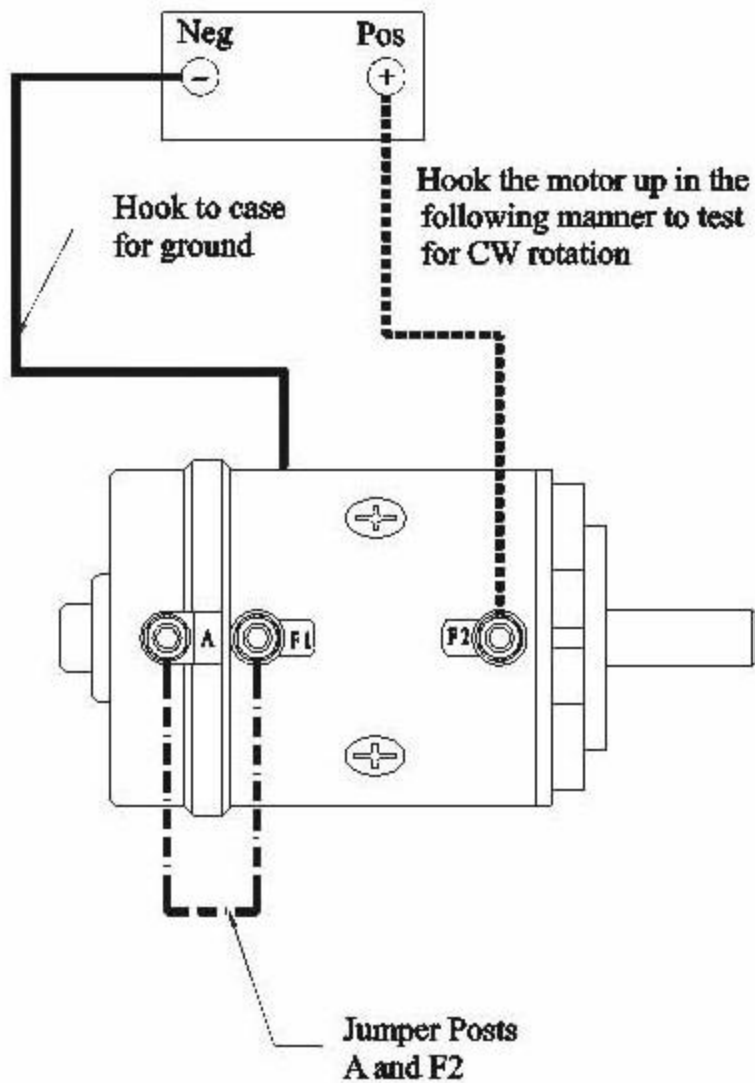
Look at the slot and see if it is worn or polished at the points marked by the “X”. If the wear is at the indicated points than the motor rotation is counter clockwise.

**CCW**



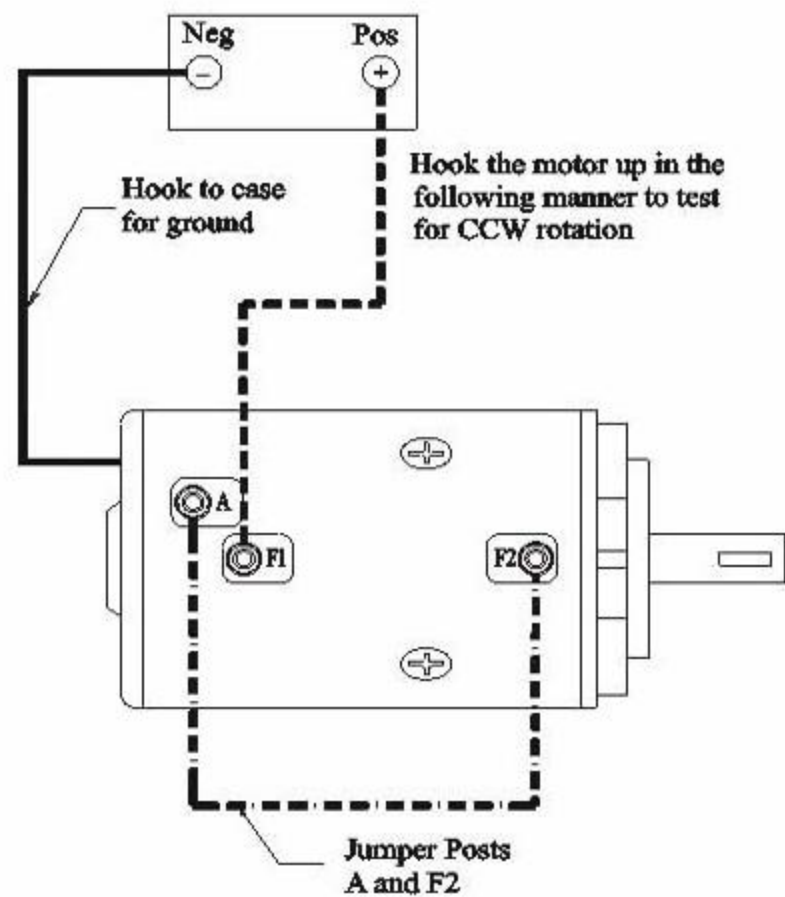
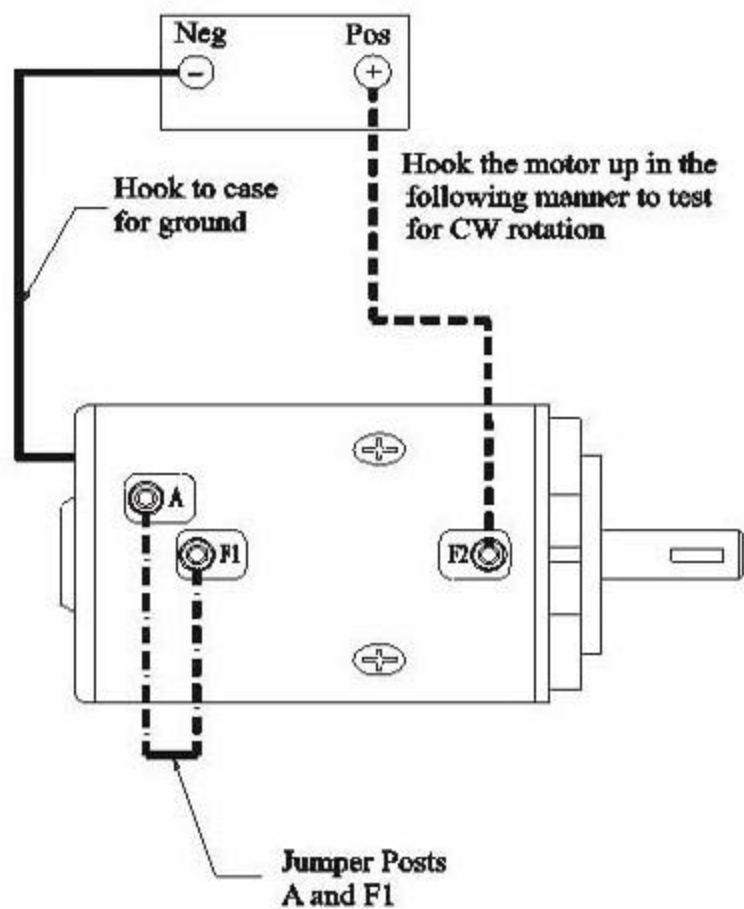


Notes:  
Hook up 4 post motors for testing as illustrated above



Notes:

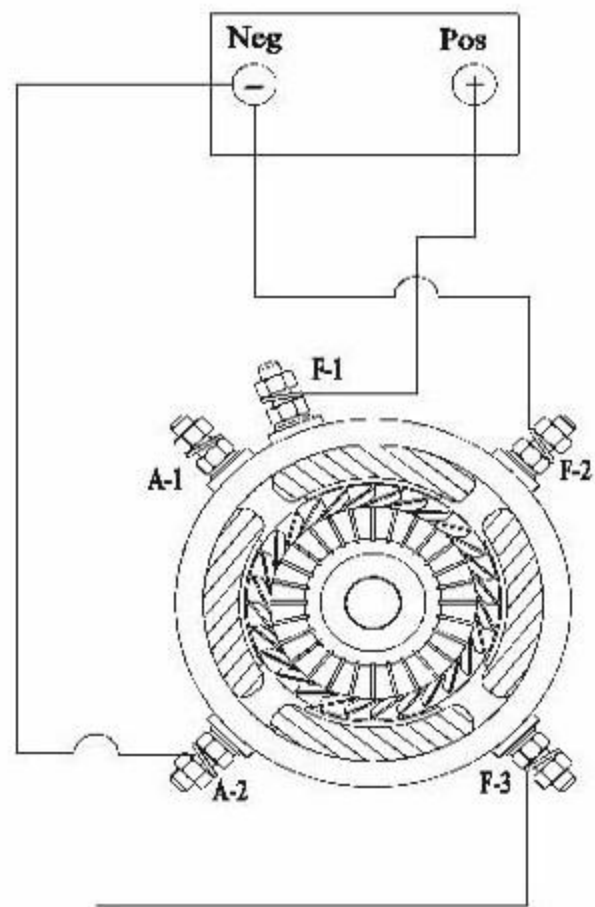
Hook up 3 post motors for testing as illustrated above



Notes:

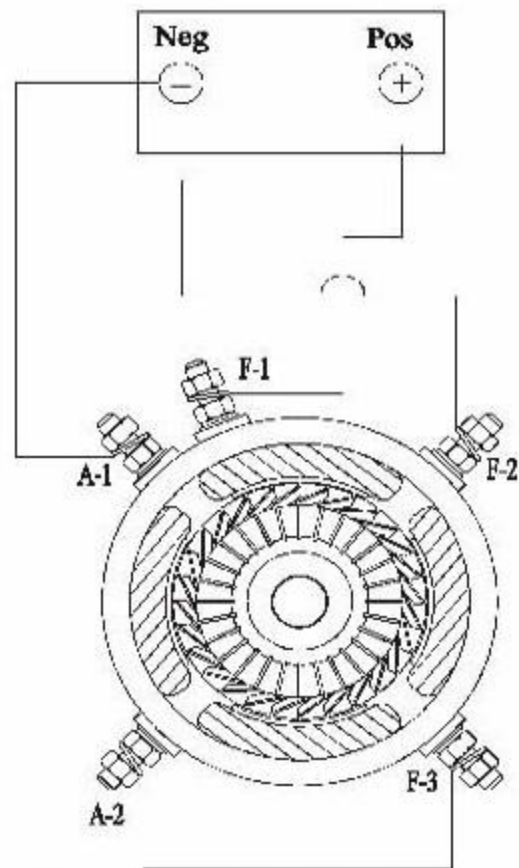
Hook up 3 post motors for testing as illustrated above

Clockwise at the drive end



Viewed from the commutator end

Counter clockwise at the drive end



Viewed from the commutator end

Notes:

Hook up 5 post motors for testing as illustrated above