



WIRING DIAGRAMS & SCHEMATICS

Retrofit Kit for Solenoids

Related Instructions,
How-To Videos & More



PDF: Deluxe High Amp Switch Kit - 12 Volt



PDF: Smart Switch Basic Kit - 12 Volt



PDF: Smart Switch Basic Kit - 24 Volt

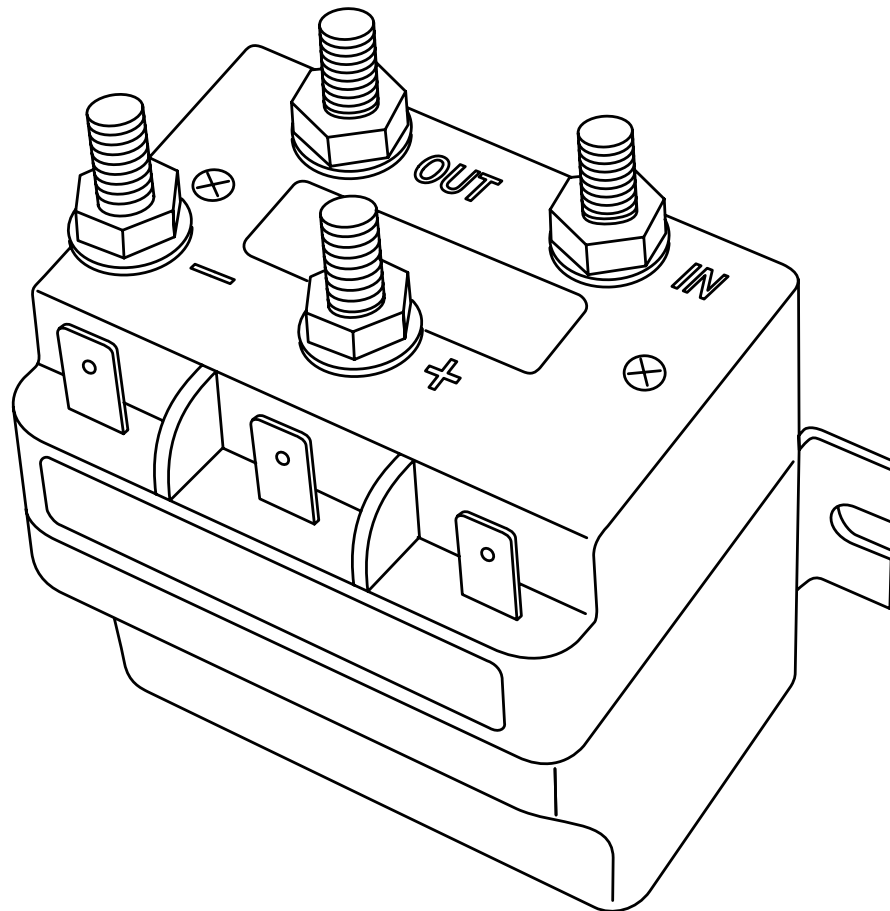


PDF: Cab External Switch - 12 Volt



Video: Electric Drive Unit Operation

514-9996 (shown) / 514-9967 / 514-9978 Solenoids



Document #: 607-0157
Revised: 03/28/22 WLH

DURING INSTALLATION, SOME FABRICATION MAY BE REQUIRED.



A Safe Fleet Brand



Table of Contents

Safety & System Requirements	Components & Wiring Diagrams
Safety Requirements..... 2	Solenoids 7
Vehicle Battery Connection Requirements 3-4	Wiring Diagram with Solenoid #514-9996 8
Switch Requirements 5	Wiring Diagram with Solenoid #514-9978 9
	Wiring Diagram with Solenoid #514-9967 10



A Safe Fleet Brand



SAFETY & SYSTEM REQUIREMENTS



A Safe Fleet Brand



Safety Requirements



Failure to comply with requirements outlined in this document may result in serious injury or property damage.

The following requirements shall be met when installing or servicing electrical components in Pulltarps Automated Tarp Systems:

- All connections to vehicle battery systems, vehicle battery chargers, and external power supplies shall be disconnected during all installation procedures.
- Prior to installing wiring on positive terminals, check voltage on all wires and connection points using a voltmeter.
- The following personal protective equipment shall be worn at all times while installing components:
 - » Safety Glasses or Prescription Glasses with Side Shields.
 - » Steel or Composite Toe Protective Shoes.

Tools and Equipment Required for Installation

The following tools are required for installation of electrical components

- Torque Wrench with range between 50 to 150 in.lb.
- Nut Driver Set.
- Wire Cutters up to 2AWG size wire.
- Wire Insulation Stripping Tool for wire size range from 2 to 8 AWG.
- Wire Insulation Stripping Tool for wire size range from 16 to 18 AWG.
- Wire Terminal Crimping Tool for wire size range from 2 to 8 AWG.
- Wire Terminal Crimping Tool for wire size range from 16 to 18 AWG.
- Heat Gun for application of heat shrink insulation.
- Multi-meter with DC voltage measurement capability.
- Zip Ties.
- Vehicle Chassis Wiring insulated c-clamps capable of carrying 2 to 8 AWG wiring.



A Safe Fleet Brand



Vehicle Battery Connection Requirements

Main Power to Pulltarps System

- Source Voltage Line to Motor Reversing Relay shall be connected directly to the vehicle battery system.
- The Source Voltage Line shall include an in-line Pulltarps supplied circuit breaker. The circuit breaker shall be no greater than 12 inches from the positive terminal of the vehicle battery system.
- Main Power and Ground Connection through a power distribution box are forbidden.

Main Ground to the Pulltarps System

- Ground line to the Motor Reversing Relay shall be connected directly to the negative terminal of the vehicle battery system.
- Battery terminals shall be coated with dielectric grease to prevent corrosion.
- Appropriate ring terminal or battery terminal at the vehicle battery connection are required.

System Circuit Breaker Requirements

- The breaker shall be installed on the main positive wire within 12 inches of the positive terminal of the vehicle battery system.
- Circuit Breaker shall be mounted on a vertical surface with the input and output wires entering and exiting from the sides. This is the only approved installation orientation for the circuit breaker.
- Terminals of the circuit breaker shall be no less than 2 inches from any surface on the vehicle in all directions.

Motor Reversing Relay Requirements



Failure to properly follow all requirements may result in present or future property damage. Pulltarps Motor Reversing Relays contain a hot at all times connection to the vehicle battery system. Care must be taken to prevent contact between battery supply terminals and conductive surfaces of the chassis



Motor Reversing Relay Requirements (Continued)



The positive terminal of Pulltarps Motor Reversing Relay is hot at all times, breaker connected to the positive terminal of the vehicle battery energy system. Care must be taken to ensure the positive terminals meet the following:

- 1. Connected only with the supplied fasteners to the correct torque (8-11 ft.lb) to prevent a loose, high resistance connection, and...*
- 2. Strain relieved to prevent wire torque and vibration from loosening connection.*
- 3. Completely covered with the proper Red terminal boot.*

Failure to comply may result in excessive heat in the connection due to high resistance.

Mechanical Reversing Relay Requirements (Part Number 514-9978)

- The Motor Reversing Relay shall be installed on a vertical plane with the wires from terminals (B+, B-, M2, M1) facing down. This is the only approved orientation of the motor reversing relay.
- Mount the relay in a location that it is protected from road debris, ice, snow, and road spray or bombardment.
- Use the terminal boots supplied with the motor reversing relay, according to the following color codes:
 - » B+ is RED indicating the terminal is un-switched, fused, and hot at all times (POSITIVE).
 - » B- is Black (NEGATIVE).
 - » M2 is Black (BLUE - COVER).
 - » M1 is Red (YELLOW - UNCOVER).
- All terminals shall be coated with dielectric grease to prevent corrosion and long term connection from debris between electrical terminals.
- Install the motor reversing relay such that the terminals are facing the vertical mounting surface on the vehicle body
- The motor reversing relay shall be attached to the surface using only threaded fasteners with torque specification consistent with the fastener size and type.
- All terminal wires shall be strain relieved using insulated C-clamps attached to vehicle body to prevent wire vibration and torque loading from loosening electrical connections.
- Route all electrical wires from the Motor Reversing Relay in a manner that will avoid wire insulation chafing, pinching, and wear from other items on the truck chassis or wear from the environment.
- Torque all electrical connection fasteners to minimum 8-11 ft.lb.



A Safe Fleet Brand



Switch Requirements

Momentary Rocker Switch and Rotary Switch



Pulltarps Rocker and Rotary switches contain hot-at-all-times connection at the center terminal of the switch. No exterior installation of the rocker or rotary switch is permitted. Contamination from an outside environment may connect the switch center input to the command line, resulting in unexpected movement of the tarp system.

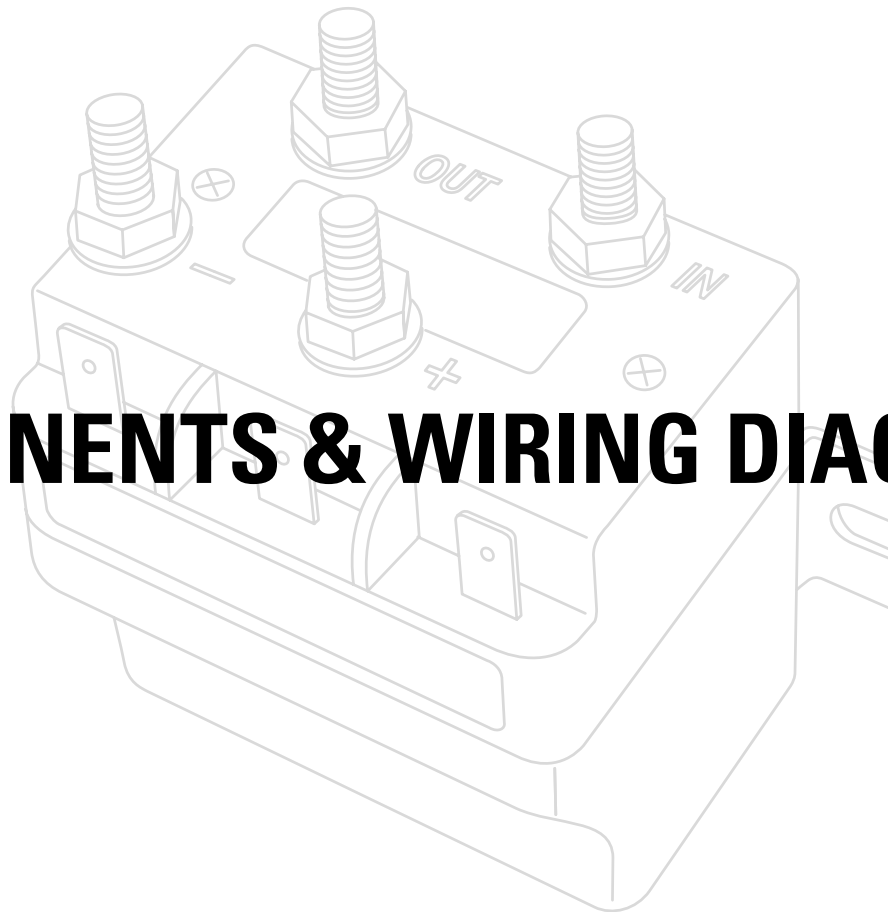
- Use only a Pulltarps supplied Rocker Switch or Rotary Switch with the motor reversing relay.
- Switch terminals shall be protected from contact with conductive materials.
- Switch harness shall be fully insulated.
- Switch spade terminal connections shall be fully seated, preventing exposed conductive surfaces.
- Rocker switch shall be installed such that the switch labels read from left to right.

Gear Motor Installation Requirements

- Gear Motor shall be mounted using all mounting locations provided.
- Electric Motor connections shall be fully coated in dielectric grease.
- Electric motor connection torque requirement: 15 to 22 in.lb.
- To prevent terminal damage - ***Do not exceed 25.5 in.lb.***



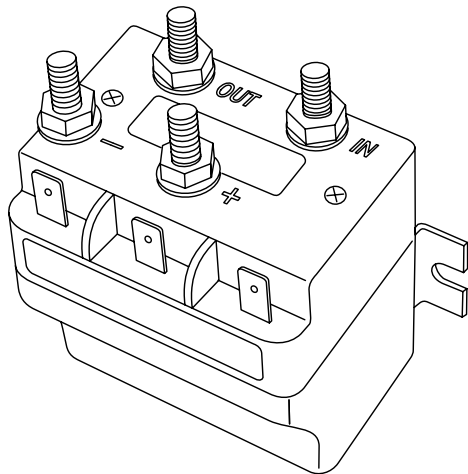
COMPONENTS & WIRING DIAGRAMS





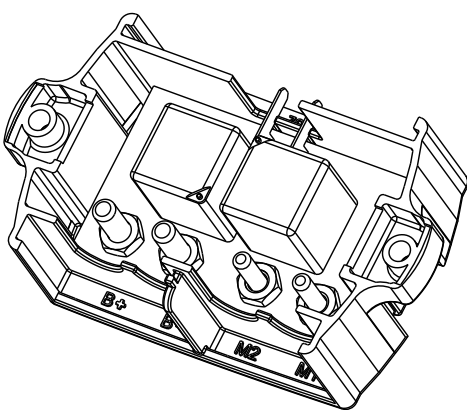
Solenoids

Available - 514-9996



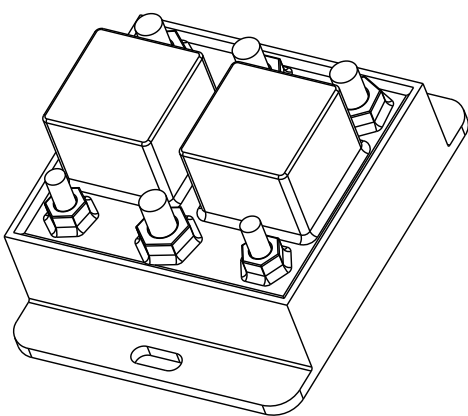
ITEM	PART #	DESCRIPTION	QTY
1	514-9996	REVERSING HIGH AMP CONTACTOR - 12V (DELUXE)	1

Available - 514-9978



ITEM	PART #	DESCRIPTION	QTY
1	514-9978	50 AMP REVERSING CONTACTOR - RR#105624	1

Deprecated - 514-9967



ITEM	PART #	DESCRIPTION	QTY
1	514-9967	50 AMP REVERSING CONTACTOR	1

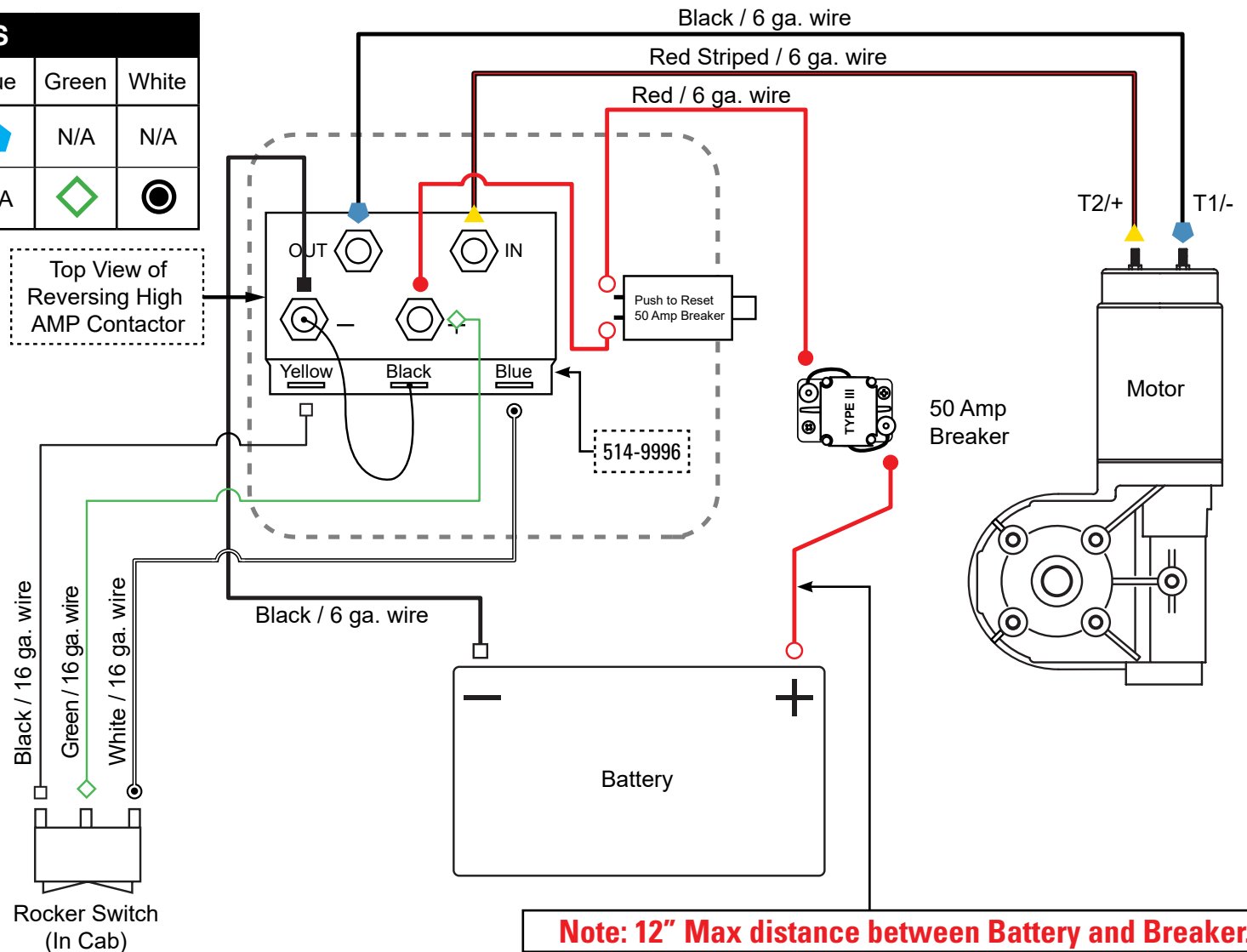
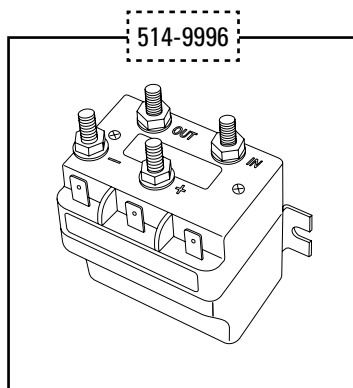


Wiring Diagram with Solenoid #514-9996

BOOT COLORS

	Red	Black	Yellow	Blue	Green	White
With Boot					N/A	N/A
No Boot			N/A	N/A		

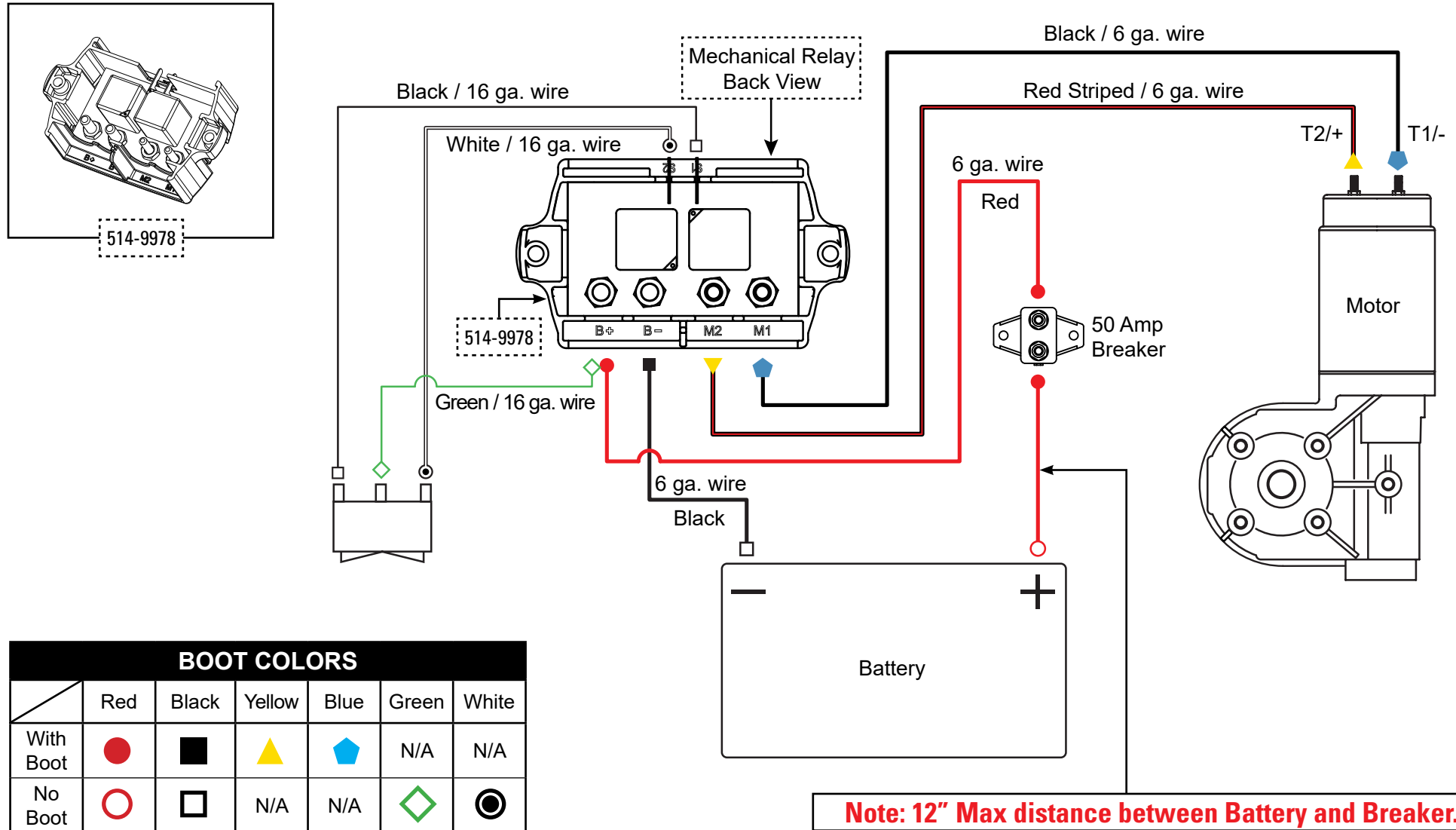
Top View of Reversing High AMP Contactor











Note: 12" Max distance between Battery and Breaker.



Wiring Diagram with #514-9978 Solenoid



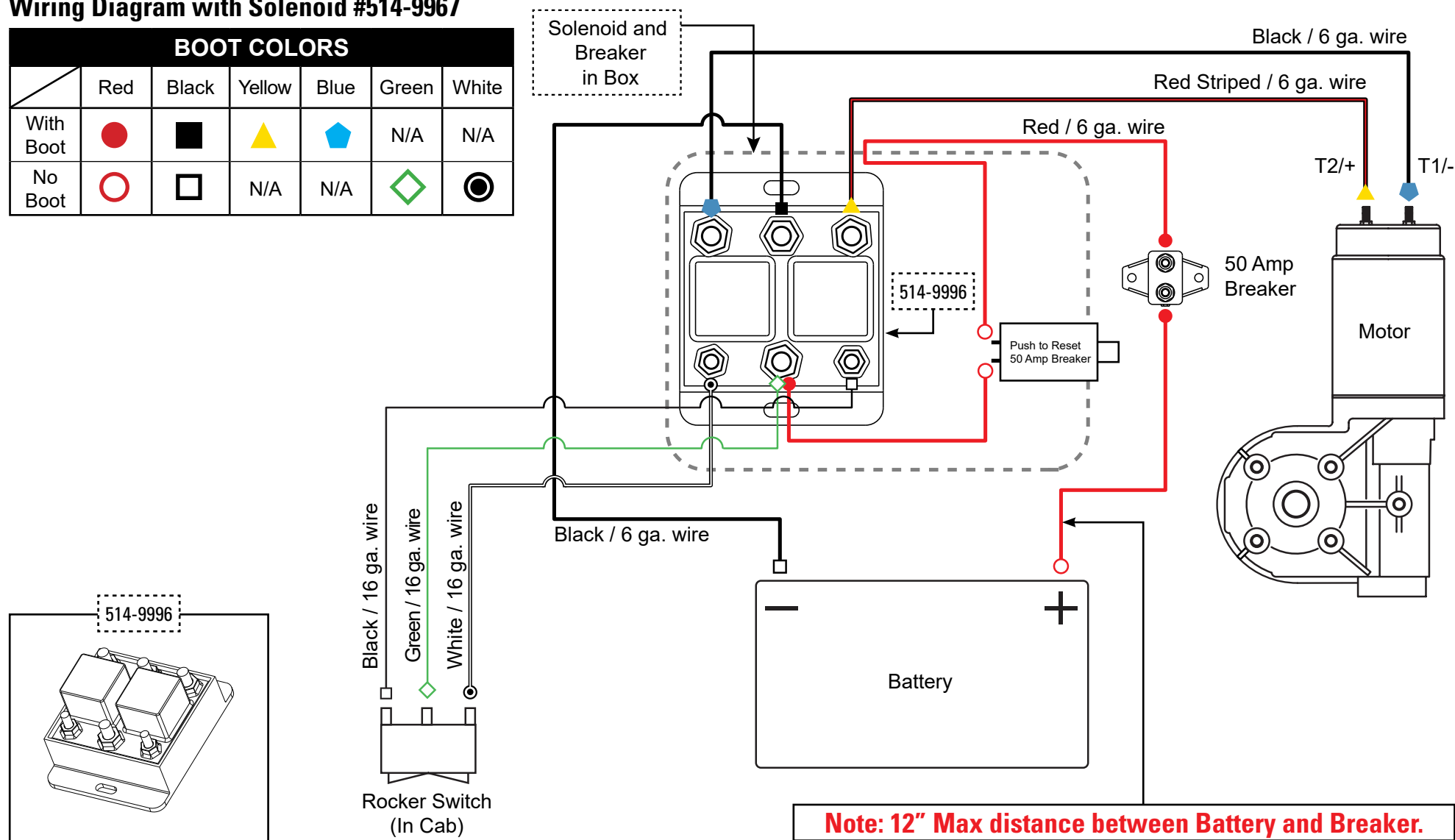
BOOT COLORS						
	Red	Black	Yellow	Blue	Green	White
With Boot					N/A	N/A
No Boot			N/A	N/A		



Wiring Diagram with Solenoid #514-9967

BOOT COLORS

	Red	Black	Yellow	Blue	Green	White
With Boot					N/A	N/A
No Boot			N/A	N/A		



Note: 12" Max distance between Battery and Breaker.