

# SK1001 SPEED KIT For 48-volt Club Car 1995-2005 DS Model Installation Instructions



## SK1001 Club Car DS Speed Kit Installation Instructions

Thank you for purchasing our exclusive SK1001 Speed Kit. We take great pride in our products and feel certain that this kit will offer you many years of trouble-free service. We ask that you take a moment to read these instructions completely before beginning your installation. Familiarity with the parts and an understanding of the procedures will ensure that your installation goes smoothly and safely. Additionally, it will give you an opportunity to determine if your cart might have any damaged, corroded, or missing parts which will need replacing prior to using your new speed kit.

### About This Speed Kit

This speed kit is designed specifically for Club Car DS 48 volt electric golf carts. If you are unsure of your golf cart type, please see our catalog or contact our technical department, toll free a 1-888-444-9994, or online at [www.buggiesunlimited.com](http://www.buggiesunlimited.com). During the installation of this kit you will be upgrading four major electrical components from your golf cart, with four high performance components in our SK1001 Speed Kit. These parts are: the motor, the speed controller, the solenoid, and the forward reverse assembly. All of your electrical connections will be made between these components and the battery group. You should allow about 4 hours for installation.

### Parts Included In Our Kit

- 1) Electric motor (per application).
- 2) 488 ~ 727 amp speed controller.
- 3) Electric solenoid (48 V. high performance).
- 4) 4 Gage High Performance Cable kit including:
  - a) 1 red coded cable.
  - b) 2 blue coded cables.
  - c) 1 white coded cable.
  - d) 1 orange coded cable.
  - e) 1 green coded cable.
  - f) 1 black coded cable.
  - g) 1 yellow coded cable.
  - h) 5 red/black coded cables.
- 5) Forward & reverse switch assembly.
- 6) Jumper Buss Bar.
- 7) Bridge Resistor, 250 ohm.
- 8) Hardware kit.



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888-444-9994  
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## Tools And Materials Required To Install Kit

- 1) SAE socket set, with ratchet and 3” and 6” extensions.
- 2) SAE combination wrench set.
- 3) #2 Phillips and Flat Tip screwdrivers.
- 4) Wire cutters.
- 5) Wire crimpers.
- 6) Heavy weight grease.
- 7) Safety goggles/glasses.



## Additional Tools Which Make The Job Better And Faster

- 1) Battery Carrying Strap. Part #BT8001.
- 2) Battery Terminal Protector Spray. Part # BT60512.
- 3) Battery Terminal Re-Facer. Part # BU6002.
- 4) Electronic Multi-meter. Part # BU6001.
- 5) Small Box of Baking Soda. Local store purchase.



**BT8001**



**BT60512**



**BU6002**



**BU6001**

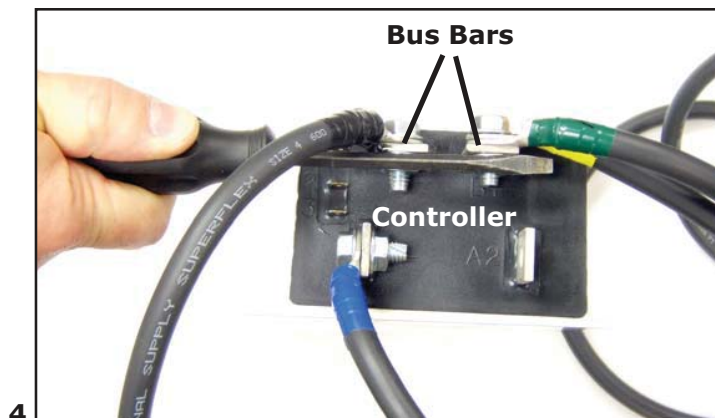
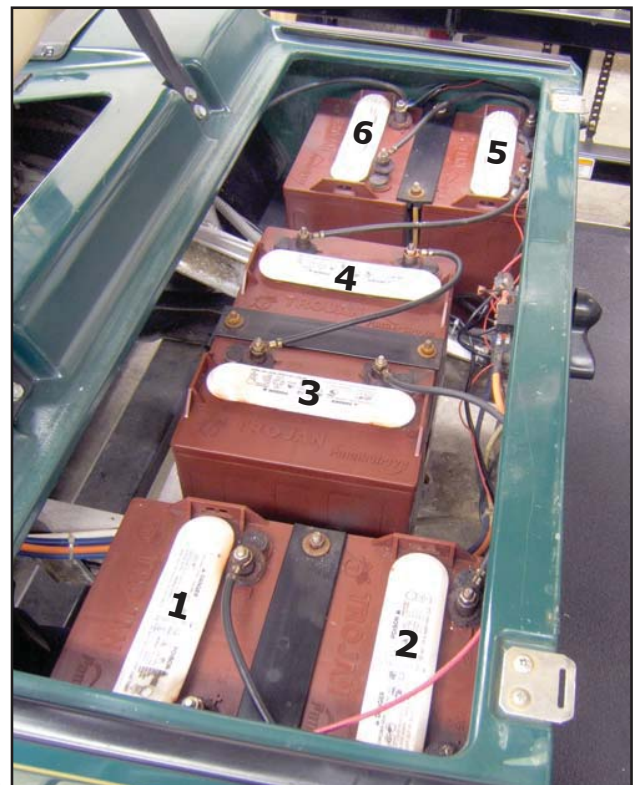
## A Note Before Starting

Throughout this installation, we will be discussing the connection of #4 heavy gauge cables to several different electrical components. Some cables will be attached to threaded lugs or “posts”, and others will be attached to flat bus bars. An understanding of each of these cable connections is important. Let’s first cover the threaded lugs. You will notice these lugs utilize a set of double nuts to hold the cable terminal firmly in place. Typically, a cable terminal and a washer will be sandwiched between these two nuts. An open-end wrench of the appropriate size should be held on the bottom nut, while use of an opposing wrench relieves the threaded lug of excessive stress and eliminates the possibility of damaging the seals at the base of these lugs. Failure to use the opposing wrench technique on double-nutted lugs can permanently damage the component. You will also want to use the opposing wrench technique when making connections at the flat bus bars, but care should also be given to avoid twisting or bending the bars. Again, these seals at the base of the connection points are fragile and subject to damage, if handled improperly. Seal damage at these electrical contact points will **void** the warranty for that component.

## Installation

**Caution:** During this installation it is advised to wear eye protection at all times. It is highly recommended jack stands and lifting devises be used as required.

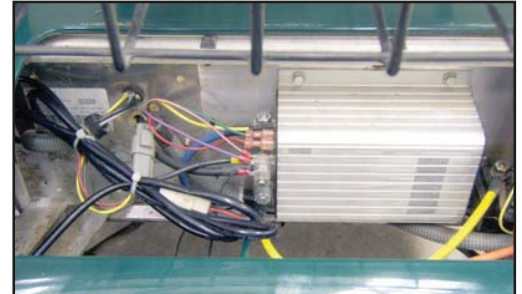
- 1) **Seat Removal:** Grasp the seat handles and rotate the seat forward and lift the seat from the hinges.
- 2) **Access Panel Removal:** Remove the black plastic rear access panel that is located between and behind the front seats using a #2 Phillips screwdriver. It will be easier to get at the necessary connections, if you remove the sweater basket or any other seats or cargo boxes on the rear of the cart. You can also access the components from under the cart if needed.
- 3) **Battery Disconnect:** Making sure you have the correct eye protection remove the battery cable connections at battery #1 and #6. Remove all battery cables from each battery at this point. It will not be necessary to remove the batteries for the kit installation. It is however recommended to clean the batteries with one small box of baking soda and a gallon of water mixture. Also, for the best results for the new battery cable connections, reface the battery posts to achieve optimal electrical flow. Allow time for the cart to dry and then continue with the component removal.
- 4) **Controller Discharge:** With the cart in reverse and key switch on, hold the accelerator pedal half way until the back up buzzer stops. It may take some time for this to occur. If the back up buzzer is inoperative, you will need to use a flat bladed insulated screw driver and short the connection between "B-" and "B+". Do this by using the screwdriver to bridge these two bus bars on the controller. This will cause a spark and do not be concerned as this is normal.



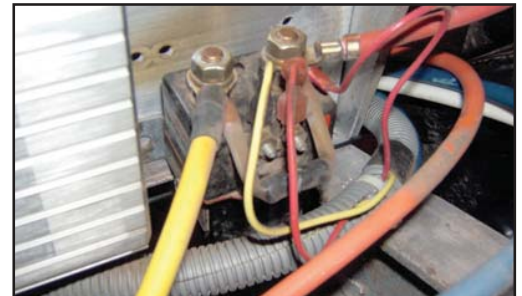
- 5) **Cable Removal:** All cart cables can now be removed and all small activation wiring can be disconnected at each component. Be sure to use the opposing wrench technique for the removal of component cables.
- 6) **Controller and Solenoid Removal:** Depending on the year of the cart you are working on the controller mounting and the solenoid mounting area may be different. See the appropriate picture (6a-d) that corresponds with the proper mounting of your cart. First, to remove the controller, use the appropriate socket to remove the four mounting bolts that connect the controller to the mounting area. Be sure to use a criss cross pattern, moving from bolt to bolt, when loosening the bolts. Retain these four bolts, which hold the controller, as they will be used later. Next, using the appropriate socket, remove the two mounting bolts that connect the solenoid to its mounting area. Again, retain these two bolts, as they will be used later.
- 7) **Motor Removal:** Using the proper lifting device such as a floor jack, lift the cart high enough for you to lie under. **MAKE SURE THE PROPER USE OF JACK STANDS IS USED BEFORE LYING UNDER THE CART!** Before removing the motor, clean the surrounding area of any excessive mud or dirt, which may have accumulated on nearby parts. We want to ensure that internal parts stay as clean as possible. Once the area is clean you will see 4 mounting bolts on the drive unit mounting area. Using a 7/16" socket on the top three bolts and a 1/2" socket on the bottom bolt, you will now want to remove these bolts. Support the motor with both hands placed on the motor, wiggle and pull outward until the motor is loose. **CAUTION THE MOTOR WILL DROP SUDDENLY!** Be prepared for this sudden drop to protect your fingers and hands from injury.



5. Opposing Wrench Technique



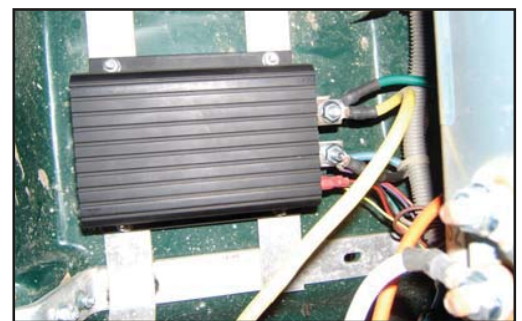
6a. Controller Mounting 1



6b. Solenoid Mounting 1



7. Gentle Back and Forth Pressure To Remove Motor

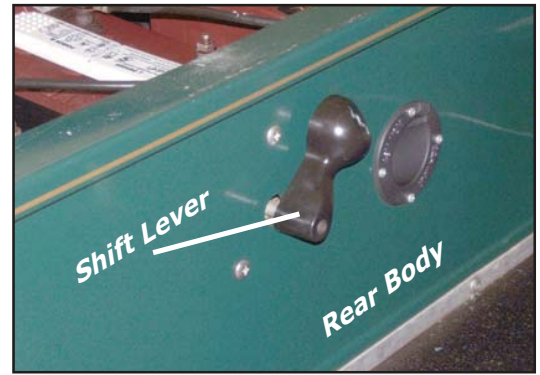


6c. Controller Mounting 2



6d. Solenoid Mounting 2

8) **Forward and Reverse Assembly Removal:** Locate the forward and reverse switch assembly which is found in the center of the rear body. First remove the shift lever by removing the Phillips head screw, retaining for use later (8a). Now remove the three 1/4" bolts holding the forward and reverse assembly to the mounting area on the cart. The entire assembly can now be removed. Save the three 1/4" bolts, as they will be used later. Now that the entire assembly is removed from the cart, it will be easier to remove the microswitches from the assembly. Using a 3/16" socket remove the two small screws that retain the three micro switches to the forward and reverse assembly (8c). **NOTE: Take great care not to lose the two nuts located on the back side of the microswitches (8d).** Remember to save the hardware, as it will be used later.



8a. Shift Lever

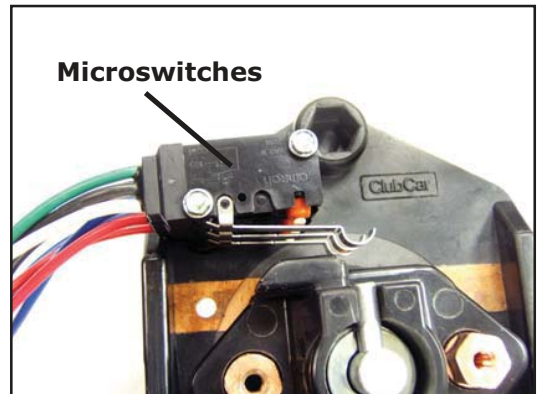


8b. Forward and Reverse (Back)

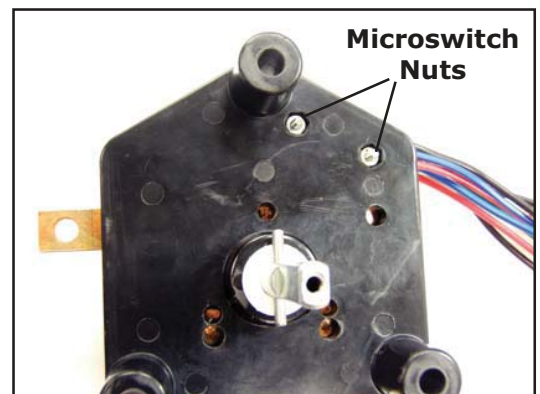
9) **Component Installation Preparation:** Before installing our SPEED KIT in your cart, take a little time to clean the areas now exposed by the removed components. The motor mount may have some grit or dirt around the opening of the mount. A moist rag or small brush can be used to clean that area. Avoid letting dirt fall into the housing. While the mounting surface of the controller should be quite clean, inspect it and wipe it down with a damp cloth to remove dirt or film. This area acts as a heat sink and dirt will interfere with its performance.



9. Clean the Motor Mount Area



8c. Microswitches on Assembly



8d. Two Microswitch Nuts

### 10) Motor Installation:

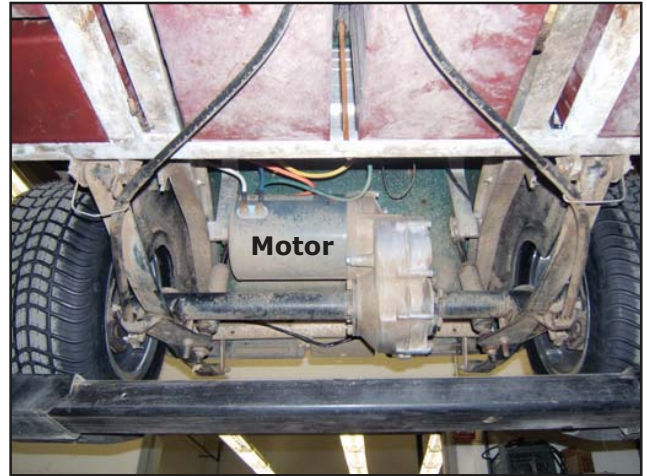
Before mounting the motor, lubricate the splines, but not the end of the motor shaft with quality heavy-weight grease...available at any auto parts store. Lifting the new motor up, slide it onto the shaft inside the motor mount housing. With some gentle back and forth movement and pressure toward the housing, the motor should mount up to the housing with little effort. Align the mounting holes of the housing and the mounting holes of the motor by rotating the motor slightly. Observe a rotating or criss-cross pattern as you tighten the mounting bolts, to ensure that the motor is not binding or stressed. Tighten securely...but avoid over tightening.



10a. Motor Installation

### 11) Forward and Reverse Assembly Installation:

First, using the original hardware, attach the three microswitches that you removed from the old forward and reverse switch to the new forward and reverse switch. Next place the entire assembly in the same mounting location as the original assembly. Attach the assembly to the mounting area on the cart using the original hardware that you have retained. Finally, secure the shift lever back to its original location using the original Phillips screw. Refer to pictures 8a-d.



10b. Motor Location (view from under cart)

### 12) Controller and Solenoid Installation:

Using the original hardware for each component, install the new controller and the new solenoid in the original mounting location for each. Refer to pictures 6a-d. Remember to use the criss cross pattern for tightening the bolts.



13a. Resistor Installation

### 13) CONNECTING THE CABLES:

It is now time to connect the cables to your new controller, solenoid, forward and reverse switch and motor.

- a) Install the Pre-Charge Resistor in place across the two large solenoid posts.
- b) Route the 23" Red coded cable from one of the empty large solenoid posts. The other end of this cable will connect to the main positive post of #1 battery. Keep in mind to use the opposing wrench technique to prevent twisting of stud connections or bus bar connections.



13b. Red Cable on Solenoid

c) Route the 14" Yellow coded cable from the other empty large post on the solenoid to "B+" on the controller. Also from "B+" route the 16" Green coded cable to "A1" on the motor. Keep in mind to use the opposing wrench technique to prevent twisting of stud connections or bus bar connections.

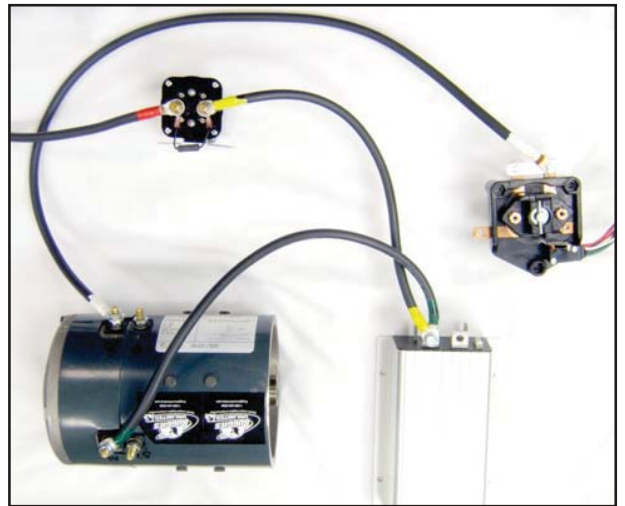
d) Route the 65" White coded cable from the "A2" connection on the motor to the left hand forward and reverse solid terminal. At this time add the jumper lead from the left hand solid terminal to the right hand solid terminal. Keep in mind to use the opposing wrench technique to prevent twisting of stud connections or bus bar connections.

e) Route the 61" Blue coded cable to "M-" on the controller to the right hand solid terminal on the forward and reverse assembly. Keep in mind to use the opposing wrench technique to prevent twisting of stud connections or bus bar connections.

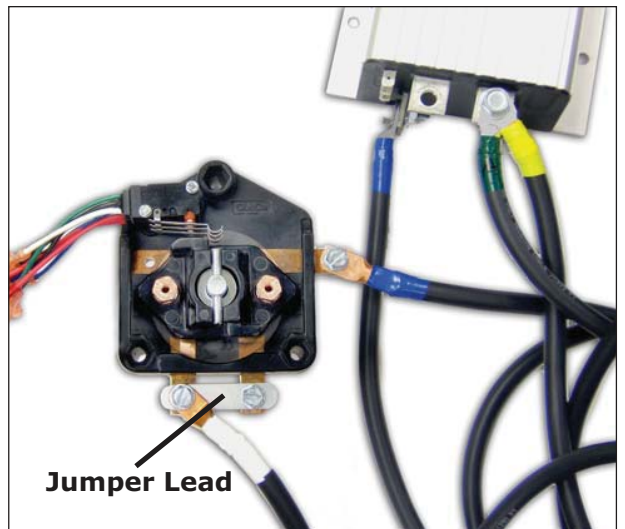
f) Route the 65" Blue coded cable to "S2" on the motor and to the left hand moving contact on the forward and reverse assembly. Keep in mind to use the opposing wrench technique to prevent twisting of stud connections or bus bar connections.

g) Route the 60" Orange coded cable to "S1" on the motor and to the right hand moving contact on the forward and reverse assembly. Keep in mind to use the opposing wrench technique to prevent twisting of stud connections or bus bar connections.

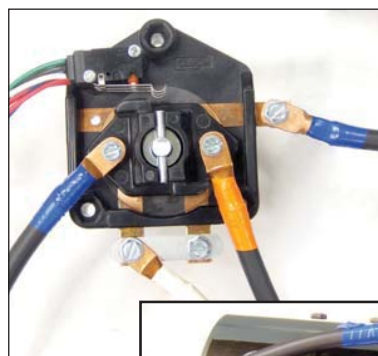
**NOTE: If when the cart is completed and tested, you find that forward and reverse are switched, remove the A1 and A2 cables from the motor and switch them.**



**13c & d. Yellow, Green & White Cable Installation**



**13e & f. Blue Cable Installation**

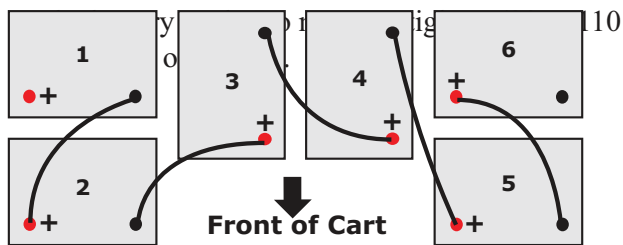


**13g. Orange Cable Installation**

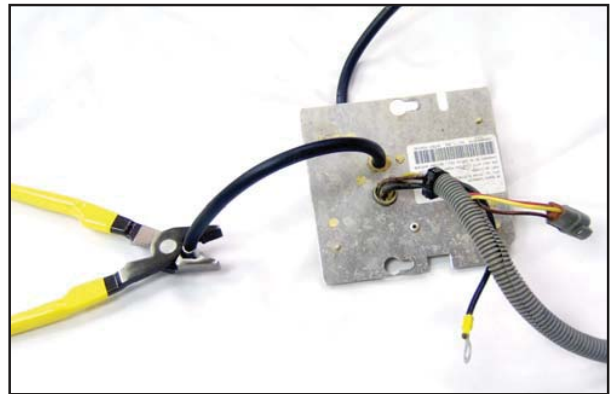
**h)** Route the 30” Black coded cable through the center hole in the computer and crimp on the new 5/16” lug. One end of this cable connects to the “B-” terminal on the controller. The other end is connected to the negative post on battery #6 of the battery pack. Keep in mind to use the opposing wrench technique to prevent twisting of stud connections or bus bar connections.

**i)** Route the 14” cable (with the red and black coded ends) as per the battery drawing (13i). Red connects to the positive post of the battery and black to the negative. These cables are connected in series

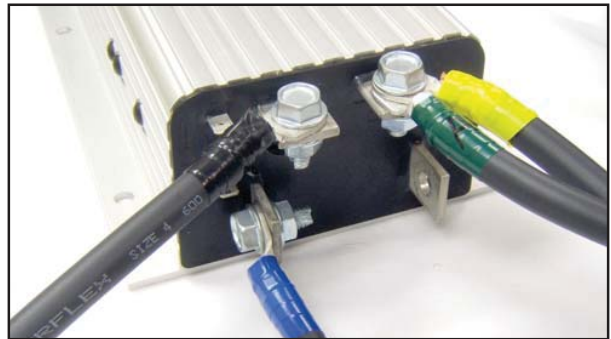
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**13i. Battery Pack Wiring Diagram**



**13h. Black Cable Installation Through Center Hole in Computer**



**13h. Black Cable Installation**

**14)ACTIVATION WIRING**

**a)** All activation wiring will remain the same, pay special attention to the wiring connections on the small solenoid posts. You will see a small diode across the two posts and the wiring is polarity sensitive. You will notice a white band marking on the one end; this is the positive connection on the solenoid. See the Activation Diagram (pg. 11) for more detail of this area. The white/black wire and the solid red wire (18 gauge wires) connect to diode end with the white band. The other small post is the negative connection and the small 18 gauge yellow wire will connect on this post.

- b)** Connect the controller pin connections as follows:
- 1)** Pin #1 on the controller is connected with the small red (wire) push on terminal connector.
  - 2)** Pin #2 on the controller is connected with the small green (wire) push on terminal connector.
  - 3)** Pin #3 on the controller is connected with the small yellow (wire) push on connector.

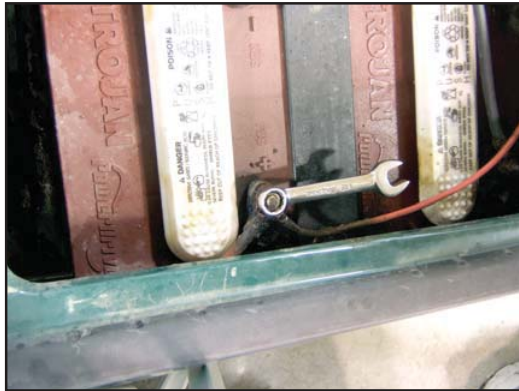
**c)** The small 18 gauge Purple and Red/White wires are connected to “B-” on the controller. It will be necessary to remove the 5/16” bolt and nut to install the small wires. Again use the opposing wrench technique when tightening the nut and bolt to prevent twisting or distortion of the bus bar.

**d)** Connect the small 18 gauge green and red wires to the large solenoid post that has the 23” Red coded cable attached. Note: when tightening the large solenoid post nuts make sure the nut lock washer totally compresses and no movement is found in the connections.

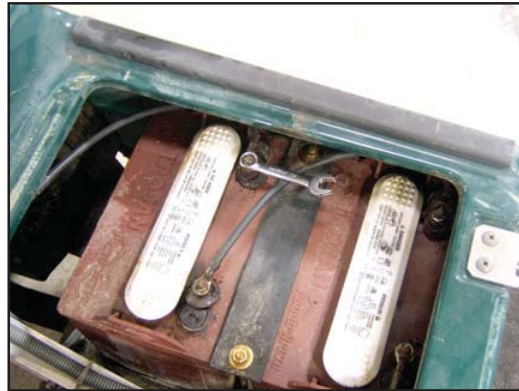
**e)** At this time check and recheck all wiring and cable connections for proper torque and routing. If all is in good order, it is time to make the final battery connections.

## 15) FINAL BATTERY CABLE CONNECTIONS

- a) After all wiring and cable connections have been made and are in correct areas of connection, the battery connections can now be made. Connect the 23" Red coded cable to #1 battery positive post. Make sure the red 12 gauge charging cable is connected as well. Torque to 90 to 110 inch pounds.
- b) Connect the 30" Black coded cable to the negative post of #6 battery. You may notice some light arcing at the point of contact. This is normal and merely indicates the pre-charge of the capacitors in the controller. **NOTE:** A very heavy arc will indicate wiring problems and the wiring will need to be rechecked. Torque to 90 to 110 inch pounds.
- c) After the final connection is made (cart still on jack stands) place the car in the forward position and with the key switch on, push on the accelerator. The cart should now run in the slow mode and as you accelerate the speed should gradually increase to full speed. Stop the wheels by applying the brakes and test run in the reverse mode. If all tests well, let the cart back down on the ground and test drive the cart. Install all removed accessories such as rear seats and inspection covers. Make sure all cables are tie strapped to solid areas as not to rub or bind on any moving parts.



15a) Positive Battery Connection



15b) Negative Battery Connection

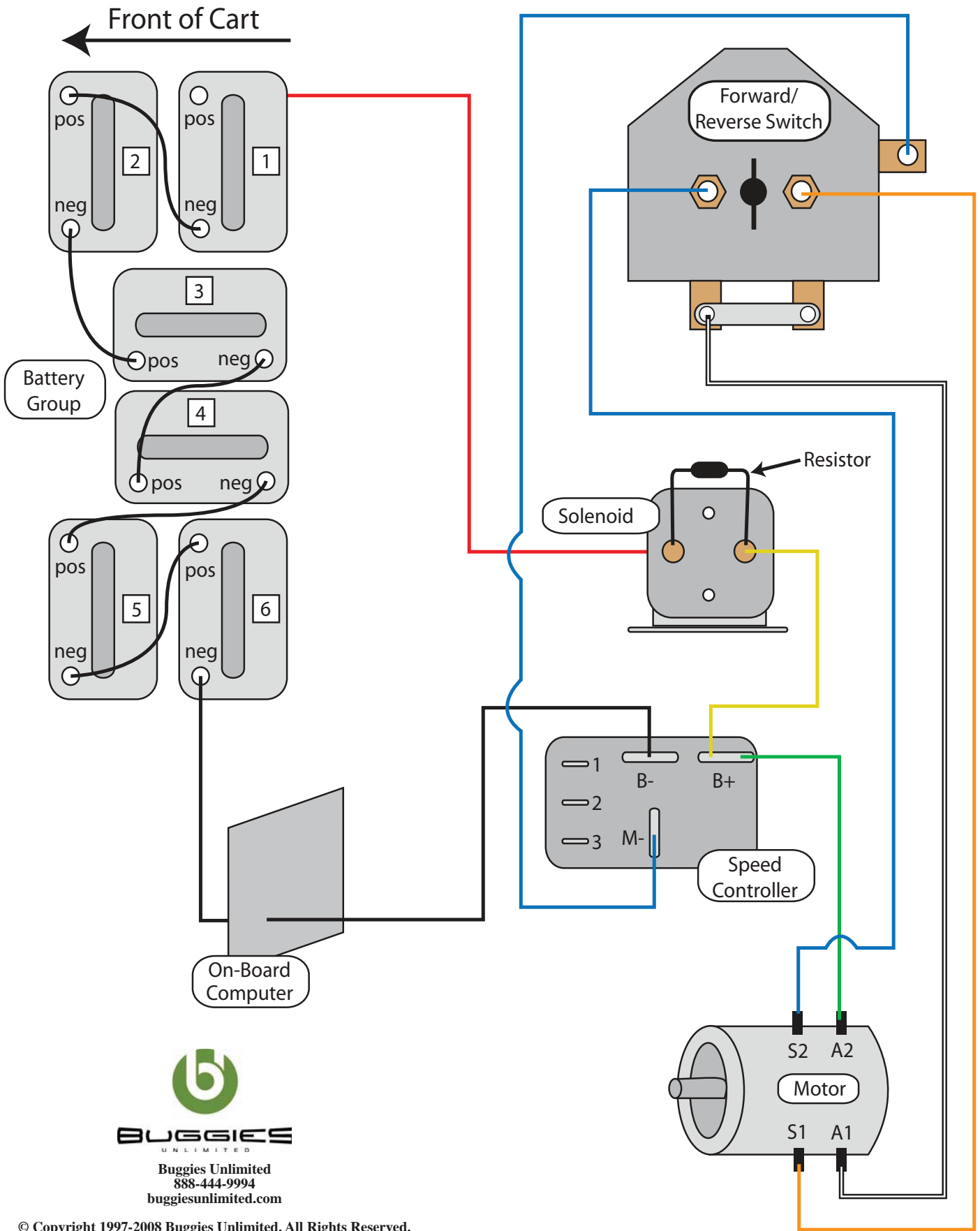
### INDEMNIFICATION AND INSURANCE AGREEMENT

High speed motor installation should be performed by a professional. The high speed motor purchaser assumes sole and entire responsibility for, and shall indemnify and save harmless Mattison Avenue Corporation (d.b.a. Buggies Unlimited), from any and all claim, liability, responsibility, and damage, or any costs or expenses resulting from any loss of life or injuries or claimed injuries to persons or property that may be sustained in connection with the use of any product before or after purchase, including but not limited to high speed motors. The high speed motor purchaser also shall indemnify Mattison Avenue Corporation (d.b.a. Buggies Unlimited) and save Mattison Avenue Corporation (d.b.a. Buggies Unlimited) harmless with respect to any and all liability that may be incurred.

Golf carts are recommended for use only by those aged 16 and older. Golf carts can be especially hazardous to operate. Always remember that riding and alcohol/drugs don't mix. Never ride on public roads. Never carry more than two passengers (except shuttles and trams). Never engage in stunt driving. Avoid excessive speeds and be particularly careful on difficult terrain. Buggies Unlimited reserves the right, at any time, to discontinue or change specifications, prices, designs, features, models or equipment without notice and without incurring any obligation.

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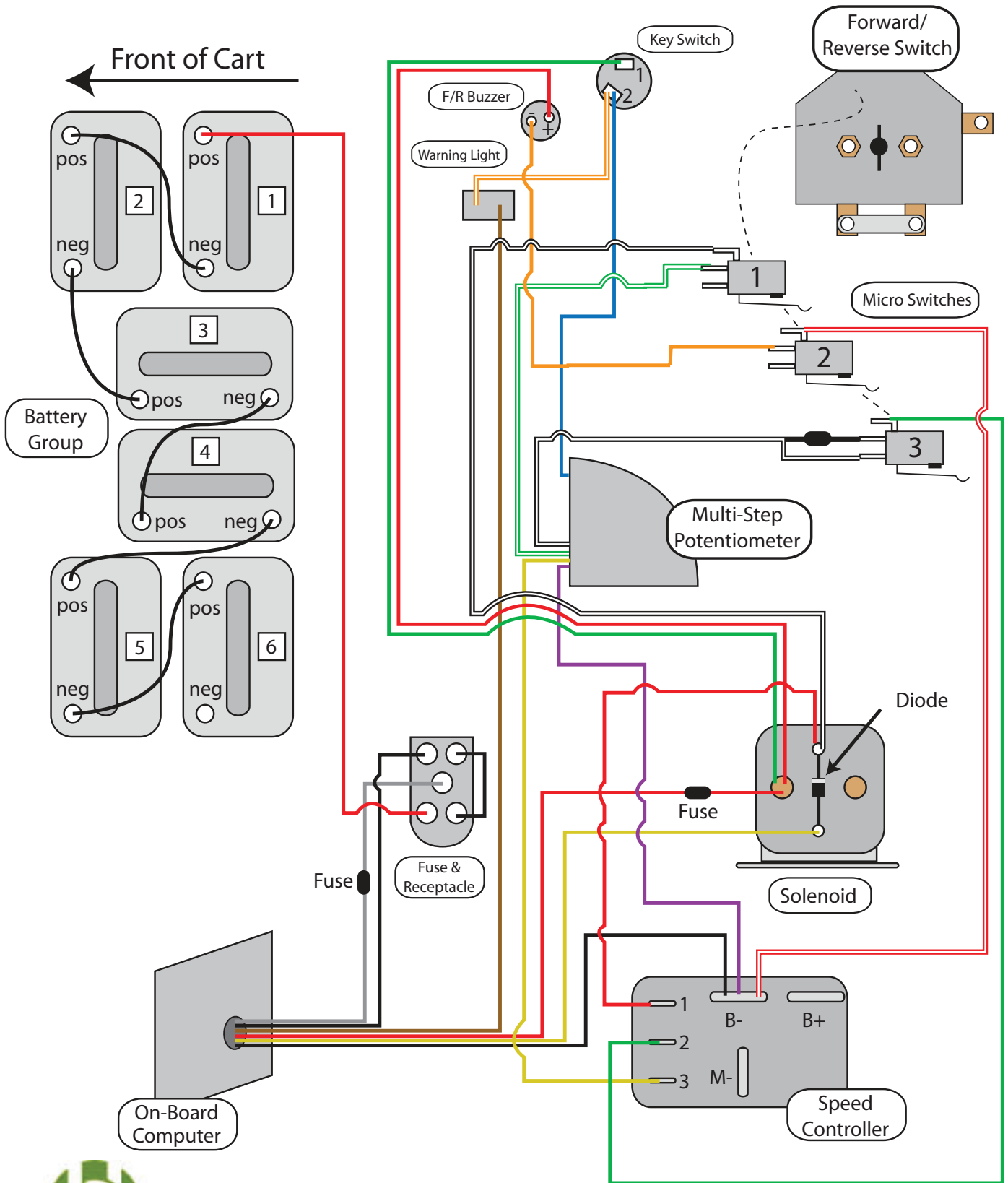
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SK1001 Heavy Gauge Wiring



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SK1001 Activation Wiring