

BOSS PRODUCTS
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RT3 POWER-V BLADE WITH SMARTHITCH2™ INSTALLATION MANUAL

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This product is covered under one or more of the following patents:
5,568,694 4,074,448 4,658,519 6,108,946 6,170,178 6,134,814
Other Patents Pending

PUSHING THE EDGE

MSC04082-11

WARNING

Many newer trucks are equipped with air bags. **DO NOT** under any circumstances disable or remove or relocate any sensors or other components related to the operation of the air bags.

WARNING

Always follow the vehicle manufacturer's recommendations relating to snowplow installation. For recommended vehicle models refer to the BOSS Snowplow Application Chart and Selection Guide.

WARNING

Vehicles equipped with air bags are designed such that the air bags will be activated in a frontal collision equivalent to hitting a solid barrier (such as a wall) at approximately 14 mph or more, or, roughly speaking, a frontal perpendicular collision with a parked car or truck of similar size at approximately 28 mph or more. Careless or high speed driving while plowing snow, which results in vehicle decelerations equivalent to or greater than the air bag deployment threshold described above, would deploy the air bag.

WARNING

Read this manual carefully before operating this snowplow.

WARNING

When transporting, position plow so as not to block vision or plow headlights.

WARNING

DO NOT change blade position when traveling.

WARNING

DO NOT exceed 40 mph when transporting plow.

WARNING

DO NOT exceed 14 mph when plowing.

WARNING

Always lower blade when vehicle is not in use.

WARNING

Make sure plow is properly attached before moving vehicle.

WARNING

To comply with Federal Regulations and to assure a safe vehicle, the Front Gross Axle Weight Rating (FGAWR), Rear Gross Axle Weight Rating (RGAWR), and the Gross Vehicle Weight Rating (GAWR) must not be exceeded at any time.

WARNING

Due to the variety of equipment that can be installed on this vehicle, it is necessary to verify that the Front Gross Axle Weight Rating (FGAWR), Rear Gross Axle Weight Rating (RGAWR), and the Gross Vehicle Weight Rating (GAWR) are not exceeded at any time. This may require weighing the vehicle and adding ballast as necessary. It may also limit payload capacity of the vehicle. It is the operator's responsibility to verify that these ratings are not exceeded.

BOSS

SNOWPLOW

RT3 POWER

Smart Hitch 2™

MOUNTING INSTRUCTIONS

CAUTION

BOTH COUPLER SPRING PINS MUST BE FULLY ENGAGED. FAILURE TO COMPLETELY ENGAGE BOTH SPRING PINS MAY RESULT IN PERSONAL INJURY AND PROPERTY DAMAGE.

SNOWPLOW MOUNTING

STEP 1

- Place the snowplow control in the FLOAT position.
- Line up the vehicle with the snowplow and drive straight in until the lower pin contacts the push beam pin receiver.
- Remove the electrical plug dust covers. Connect the electrical plugs, turn levers to the ON position.

STEP 2

- Push the SmartHitch2 switch upward to raise the coupler tower until the spring pins snap in.
- Check that both spring pins have fully engaged the coupler. SEE CAUTION INSERT. Move the coupler tower to align spring pins with the pin receiver holes until both pins engage completely.
- Release the SmartHitch2 switch to stop movement of the coupler tower.
- Turn truck/plow switch to plow position.

SNOWPLOW REMOVAL

STEP 1

- Turn truck/plow switch to truck position.
- Retract both wings to the Vee position and place the snowplow control in the FLOAT position.
- Turn the levers to the OFF position.
- Push the SmartHitch2 switch upward to raise the coupler tower and release the coupler spring pins.

STEP 2

- Push the SmartHitch2 switch downward until the coupler tower completely lowers to the plow.
- Disconnect the electrical plugs and install the electrical plug dust covers.
- Back the vehicle away from the snowplow slowly.

MSC04606-5

Figure 1. Mounting and Removal Instructions

Snowplow Assembly Procedure

Note: This manual is used for the installation of all V-Plows. Part numbers and illustrations may vary.

1. Begin the assembly procedure by cutting down each corner of the plow box so that each wall of the box will lie flat on the floor. The box can be used as a mat and will help prevent scratching the blade halves during installation.
2. Remove Left Blade Half (5) and Right Blade Half (4) from the crate. Lay each blade half flat on the box, face down.

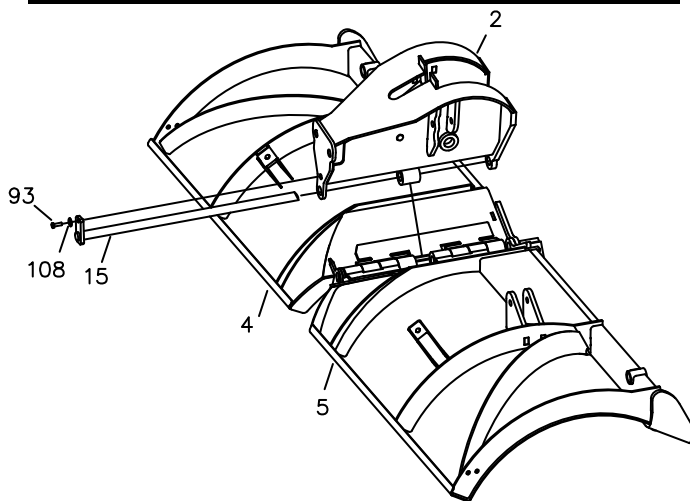


Figure 2. Blade Assembly Procedure.

G10123

3. Align the center bushings on Left Blade Half (5) with the center bushings on Right Blade Half (4). Position **CHA09716** Center Section (2) on top of both blades so that all bushings align.
4. Insert **MSC01507** Center Hinge Pin (15) through Left Blade Half (5), Right Blade Half (4) and Center Section (2).

5. Secure Center Hinge Pin (15) to the top of Center Section (2) using one **HDW01771** 3/8"-16 X 1 1/4" Hex Head Cap Screw (93), and one **HDW01718** 3/8" Split Lock Washer (108).

Note: Plow shoes are optional. If added they should be mounted flush with the bottom of the cutting edge when the plow is mounted on the vehicle. When plowing on a solid level area (parking lots, roads, and driveways) plow shoes can be raised up to increase cutting edge contact on the plowed surface. When plowing dirt, gravel, or grass plow shoes should be lowered below the cutting edge surface to prevent the plow from digging into the plowed surface.

Snowplow Assembly Procedure

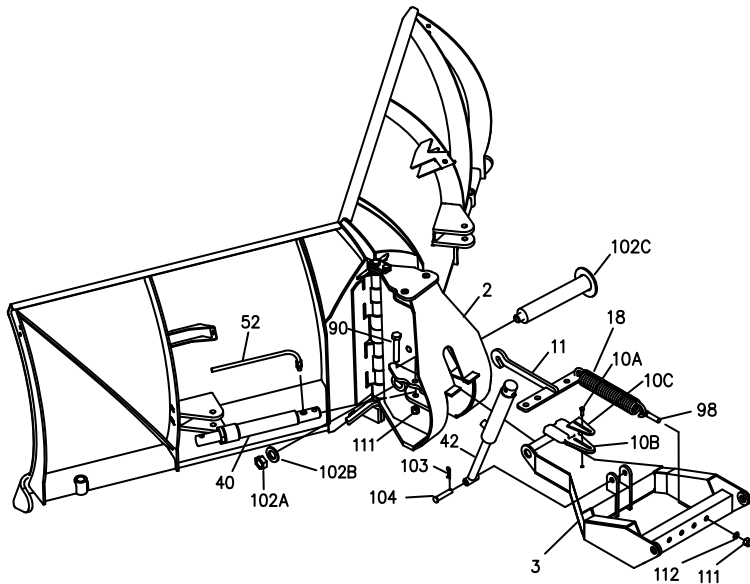


Figure 3. Push Frame Assembly Procedure. G10122

6. Stand Blade Assembly and Center Section (2) on the Cutting Edges with both wings forward in the scoop position.
7. Remove the loose Horizontal Hinge Pin (102C) that is inserted in the Center Section (2).
8. Slide **TFR09708** Push Frame (3) into Center Section (2). Re-insert Horizontal Hinge Pin (102C) through Center Section (2) and Push Frame (3) then secure with washer (102B) and nut (102A).
9. Attach Lift Cylinder (42) to Push Frame (3) with **HDW05563** Clevis Pin (104) and **HDW05544** Hairpin Cotter (103).
10. Hook **MSC04200** Spring Yoke (11) to the cross rod inside Center Section (2).
11. Hook one end of **MSC01509** Trip Spring (18) to Spring Yoke (11). Attach the opposite end of Trip Spring (18) to the rear angle of Push Frame (3) using HDW05601 Eyebolts (98), 5/8" Flat Washers (112) and 5/8" Self-Locking Nuts (111). Tighten Self-Locking Nuts (111) finger tight.
12. Attach **HYD09731** Angle Cylinders (40) to Center Section (2) using **HDW01706** 5/8"-11 X 4" Hex Head Cap Screws (90) and **HDW01709** 5/8"-11 Self Locking Nuts (111). DO NOT over-tighten the nuts.

Note: You should be able to slightly slide the cylinder up and down on the bolt after it has been tightened.

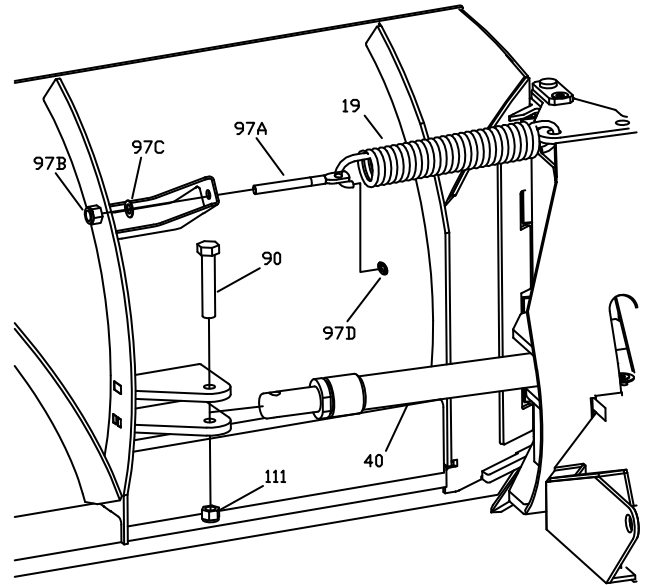


Figure 4. Angle Cylinder Installation. G10121

13. Pull both wings back into the 'V' position.
14. Hook one end of Return Spring (19) to the top hole on Center Section (2). Hook the opposite end of Return spring (19) to the blade spring mounting bracket using 1/2" Spadebolt (97A), 1/2" Flat Washer (97C), and 1/2" Self-Locking Nut (97B). Tighten Spring (19) until there is a 1/32" space between spring coils. Repeat this process for Return Spring (19) on the opposite side of the plow.
15. Install one Push Nut Retainer (97D) on each end of the Return Spring (19).
16. Bolt the rod end of Angle Cylinder (40) to each blade half using 5/8"-11 X 4" Hex Head Bolt (90) and 5/8"-11 Self Locking Nuts (111). DO NOT over tighten bolts. Repeat this process for Angle Cylinder (40) on the opposite side of the plow.

Note: You should be able to slightly slide the cylinder up and down on the bolt after it has been tightened.

Snowplow Assembly Procedure

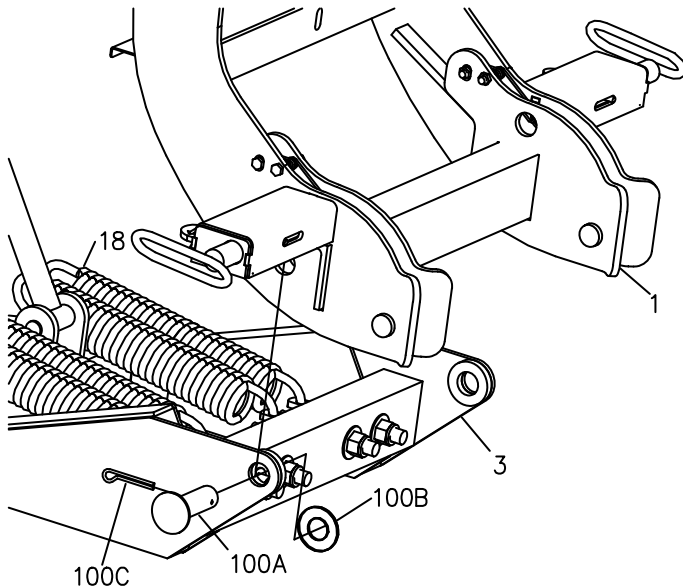


Figure 5. Coupler Assembly to Push Frame. G10119

17. Align pivot holes of Coupler Assembly (1) and pivot holes of Push Frame (3).
 18. Insert 1" X 2 1/2" Pivot Pin (100A) through Coupler Assembly (1) and Push Frame (3). Secure with 1" Flat Washer (100B) and 3/16" Cotter Pin (100C).
- Note:** The 10' V-Blade plow uses a 5/16" x 2" Bolt and a 5/16" Locknut in place of 3/16" Cotter Pin (100C).
19. Tighten the four Trip Springs (18) on Push Frame (3) until there is a 1/32" space between each spring coil.

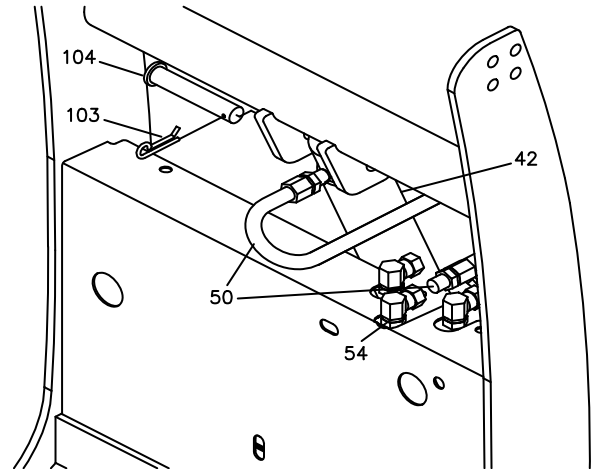


Figure 6. Assembly of Lift Cylinder Hydraulics. G10138

20. Remove the plug from the top end of Lift Cylinder (42).
21. Attach one end of Hydraulic Hose (50) to Lift Cylinder (42). Be sure to apply thread sealant compound to the pipe threads on Hydraulic Hose (50). Tighten connection securely.
22. Attach the top end of Lift Cylinder (42) to Coupler Assembly (1) using **HDW05563** Clevis Pin (104) and **HDW05544** Hairpin Cotter (103).
23. Route Hydraulic Hose (50) in "S" shape and connect the loose end to the rear Hydraulic Fitting (54). Tighten connection securely.

Snowplow Assembly Procedure

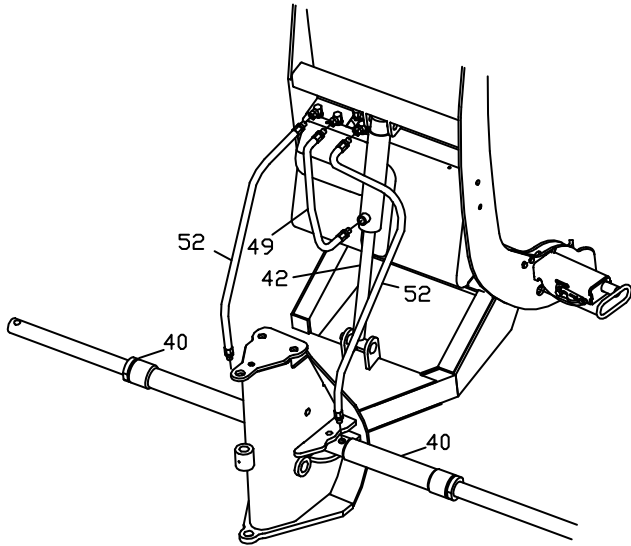


Figure 7. Assembly of Hydraulic Connections. G10013

24. Attach one end of Hydraulic Hose (49) to the lower port of Lift Cylinder (42). Attach the opposite end of Hydraulic Hose (49) to the center Hydraulic Fitting (54). Tighten connection securely.

25. Apply thread sealant compound (do not use Teflon Tape) to the threads of the 3/8" MNPT end of **HYD07042** Hydraulic Hose (52). Thread the hose into the port on Angle Cylinder (40) and tighten securely.

Note: Do not apply thread compound to the 1/4" end of the hose.

Note: Do not get thread compound on the end of the hose as the thread compound will contaminate the hydraulic system.

26. Attach the loose end of **HYD07042** Hydraulic Angle Hose (52) to the corresponding fitting on the hydraulic manifold. Tighten all hydraulic connections securely.

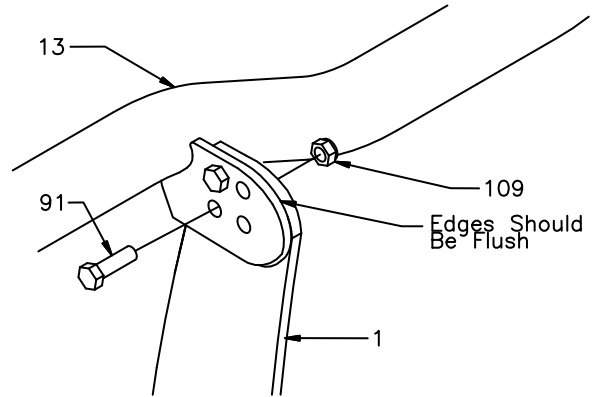


Figure 8. Light Bar Assembly. (Standard) G10132

27. Attach Light Bar (13) to the top of Coupler Assembly (1) using two Hex Head Cap Screws (91) and Hex Head Self Locking Nuts (109).

Note: The light bar should be positioned as close to the Coupler Tower as possible. Only two holes will be aligned for normal installations. Only two bolts per side are needed to secure the light bar.

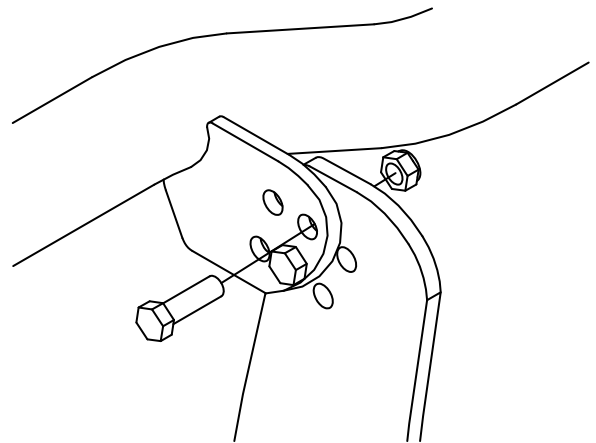


Figure 9. Light Bar Assembly Adjustment. G10131

Note: Figure 9 illustrates that the Coupler Assembly and Light Bar have two sets of 1 inch adjustment holes for mounting on different vehicles. These adjustment holes may be needed in order to move the light bar away from the vehicle's hood.

Snowplow Assembly Procedure

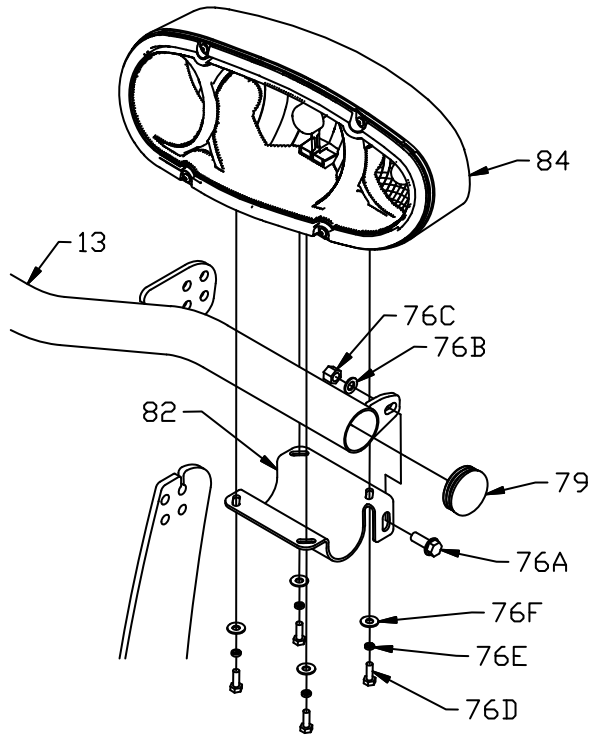


Figure 10. Headlight Mounting Assembly G10115

28. Check that End Cap (79) is properly inserted into Light Bar (13).
29. Place Driver Side Headlight Bracket (82) below Light Bar (13) and secure with one 3/8"-16 X 1" Hex Head Shoulder Bolt (76A), one 3/8" Flat Washer (76B), and one 3/8" Nylon Lock Nut (76C).
30. Fasten Driver Side Headlight (84) to Driver Side Headlight Bracket (82) using four 1/4"-20 X 3/4" Hex Head Bolts (76D), four 1/4" Split Lock Washers (76E), and four 1/4" Flat Washers (76F). Leave fasteners finger tight until Headlight orientation has been completed. See Figure 10 for proper fastener placement.
31. Repeat Steps 28 through 30 for Passenger Side Headlight Bracket (83) and Passenger Side Headlight (85).

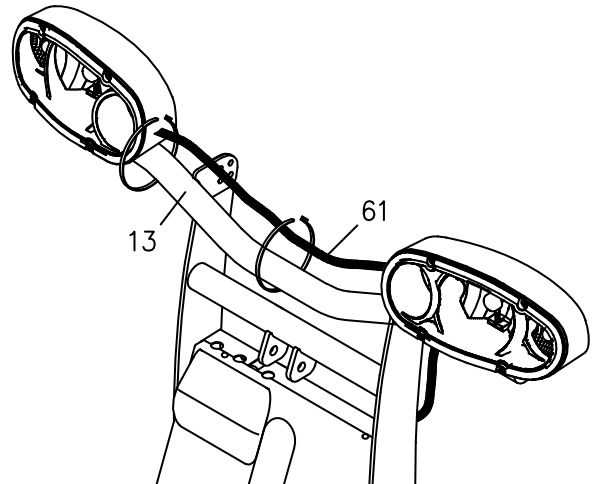


Figure 11. Secure Wiring Harness G10126

32. Secure Wiring Harness (61) to Light Bar (13) using wire ties as shown above.
33. Attach headlight connectors to headlight bulbs by inserting the connectors up through the bottom of the headlight housings.

Note: See Headlight Aiming Procedure within this manual for proper adjustment of the headlights.

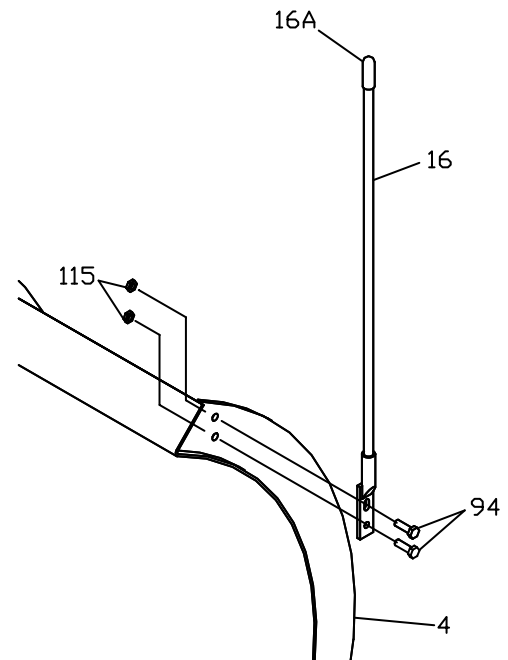


Figure 12. Assembly of Blade Guides. G10071

34. Attach Blade Guides (16) to Blade Assembly (4) using Hex Head Cap Screws (94) and Self Locking Nuts (115).

Electrical System Wiring Procedure

WARNING!

Before starting any Electrical Wiring Procedure make sure that the engine is not running and that the engine has had sufficient time to cool down. Failure to do so may result in serious bodily injury or death.

WARNING!

Before starting any Electrical Wiring Procedure make sure to disconnect the battery. Failure to do so may result in serious bodily injury or death.

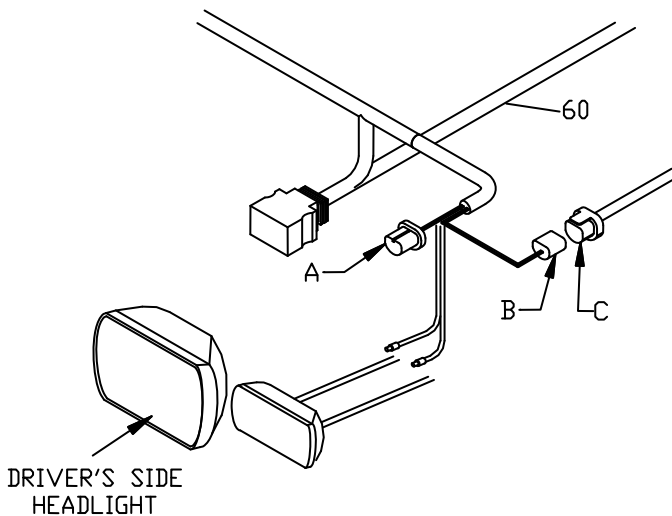


Figure 13. Driver Side Headlight

G10140

Note: Dielectric grease should be applied to all electrical connections.

1. Disconnect the driver side headlight connector plug (C) from the back of the driver side vehicle headlight.
2. Connect the Blue Sealed Beam Connector (A) from Wiring Harness (60) into the back of the driver side vehicle headlight.
3. Connect the Black Rubber Connector (B) from Wiring Harness (60) into the OEM Wiring Harness (C). OEM Wiring Harness (C) is the vehicle connector that was unplugged from the back of the headlight in Step 1.

Note: If your connectors do not match the connectors on the wiring harness or you have a four-headlight system a Headlight Adapter Kit will be needed. If you are installing a Headlight Adapter Kit, See "Headlight Adapter Installation Procedure" located in this manual.

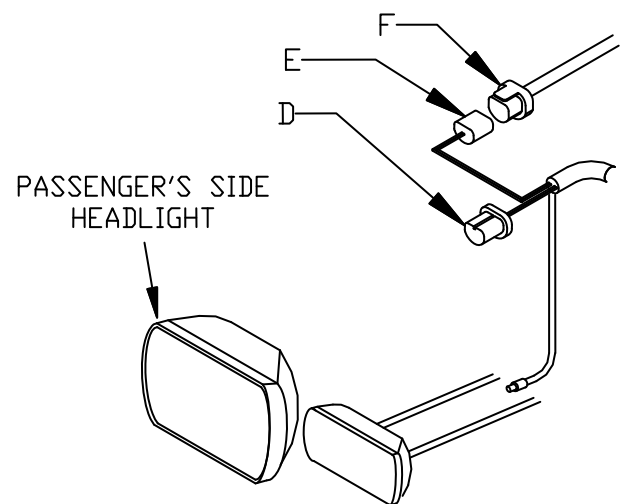


Figure 14. Passenger Side Headlight

G10141

4. Disconnect the passenger side OEM Wiring Harness (F) from the back of the passenger side vehicle headlight.
5. Connect the Blue Sealed Beam Connector (D) from Wiring Harness (60) into the back of the passenger side vehicle headlight.
6. Connect the Black Rubber Connector (E) from Wiring Harness (60) into the OEM Wiring Harness (F). OEM Wiring Harness (F) is the vehicle connector that was unplugged from the back of the headlight in Step 4.

Electrical System Wiring Procedure

NOTICE

Before splicing into any electrical circuit, identify the circuit with a test lamp. Failure to test circuits may result in vehicle damage.

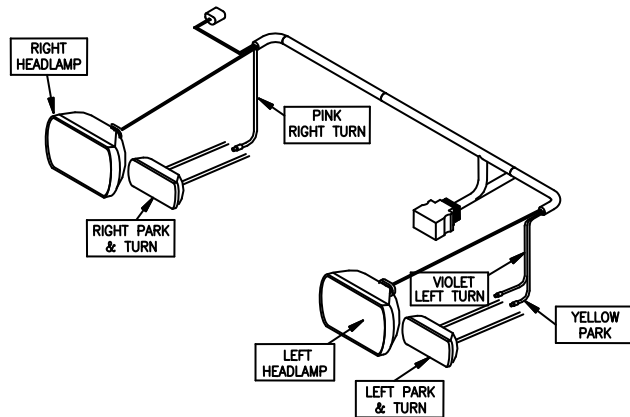


Figure 15. Connecting Park and Turn G10143

Note: Some trucks require a turn signal relay kit.

7. Connect the PINK wire from Wiring Harness (60) to the passenger side turn signal wire. Use the splice connector provided to you in the hardware kit.
8. Connect the VIOLET wire from Wiring Harness (60) to the driver side turn signal wire. Use the splice connector provided to you in the hardware kit.
9. Connect the YELLOW wire from Wiring Harness (60) to the driver side park light wire. Use the splice connector provided to you in the hardware kit.

Note: Be sure that the firewall is clear of obstructions before drilling in Step 10.

10. Drill a 1-1/4" diameter hole through the firewall. The hole should be located on the driver side, in an easily accessible area.

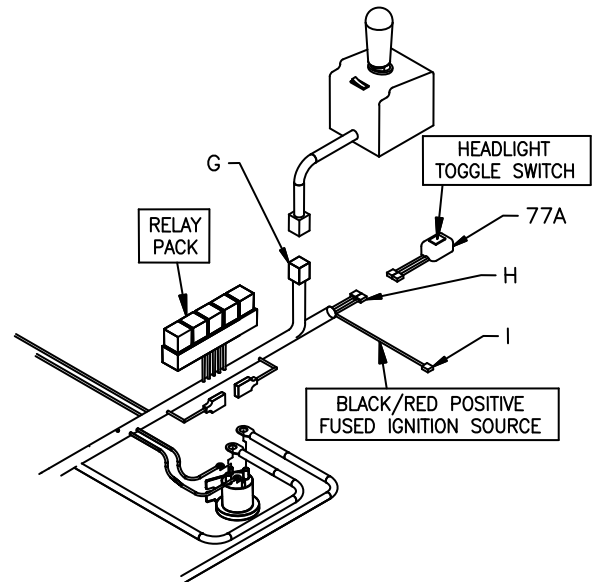


Figure 16. Internal Cab Wires G10144

11. Pull the two BLACK wires (H), BLACK/RED wire (I), and the 9 Pin Molex connector (G) from the engine compartment into the cab through the 1-1/4" diameter hole in the firewall.
12. Install **MSC03761** Split Rubber Grommet (Not Shown) into the hole that was cut in the firewall.
13. Connect the Two Tab Connectors (H) to **MSC04747** Headlight Toggle Switch (77A) as illustrated in the figure above.

NOTICE

Position the switch where it will not interfere with driver's ability to see and where it will not affect the driver's ability to operate the motor vehicle.

14. Choose an area of the vehicle's dashboard for the light toggle switch to be mounted. Clean the area thoroughly. Allow the area to dry completely.
15. Remove the adhesive backing and apply the switch to the clean area of the dashboard. Apply pressure for 30 seconds.

Electrical System Wiring Procedure

NOTICE

Be sure the wire loom does not interfere with the operation of the vehicle's pedals.

16. Secure the 9 Pin Molex Connector (G) and wire loom underneath the dashboard.
17. Plug the controller into the 9 Pin Molex Connector (G).
18. Mount the plow control in a location that is comfortable for the operator to reach, and where the operator will not contact the control in the event of a crash. (See "V-Blade Controller Mounting Instructions" located in this manual.)
19. Connect the BLACK/RED wire (I) to a "keyed" 12V+ ignition source.

Note: This 12V+ source should only be active when the key is in the ON position. Failure to wire to a "keyed" source can allow a condition to occur causing the battery to drain.

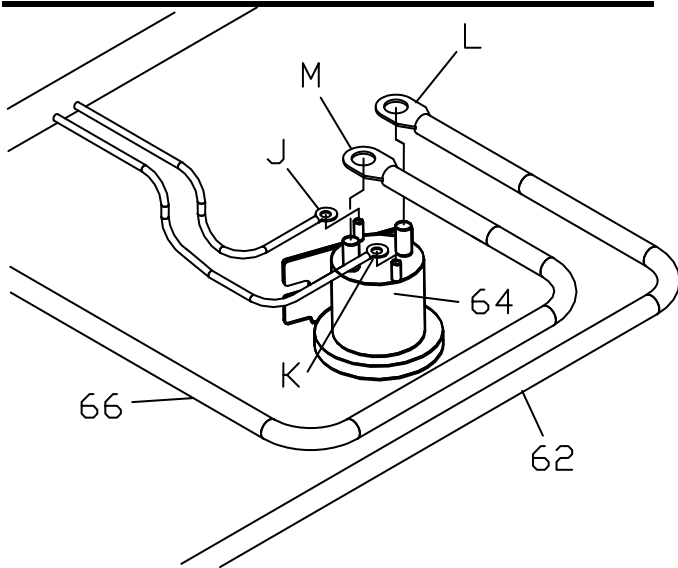


Figure 17. Solenoid Connections. G10145

20. Connect the WHITE/BLACK wire (J) of Wiring Harness (60) to the small terminal on Pump Solenoid (64).
21. Connect the BROWN wire (K) of Wiring Harness (60) to the small terminal on Pump Solenoid (64).

Note: Location of the wires on the small terminals does not matter.

22. Attach Power Unit Solenoid (64) securely inside the engine compartment. The Power Unit Solenoid should be mounted in the upright position as illustrated above.

Note: The solenoid must be installed so that the solenoid posts do not contact the body, hood, or any other conductive material on the vehicle.

23. Attach the eyelet end of RED Power/Ground Cable (62) to the top of Pump Solenoid (64).
24. Connect Battery Cable (66) to the top post of Pump Solenoid (64).

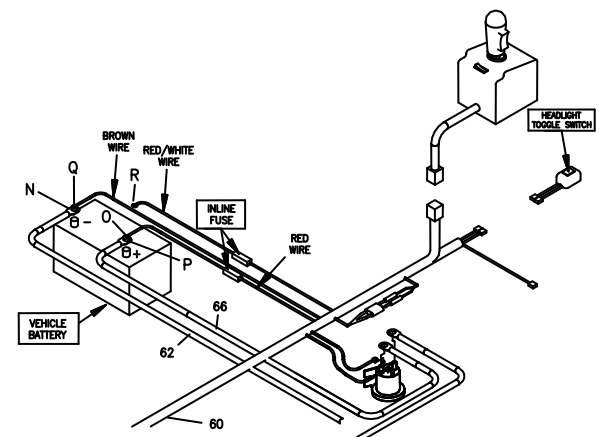


Figure 18. Battery Connections

G10146

25. Attach the eyelet end (N) of BLACK Power/Ground Cable (62) to the negative battery terminal.
26. Connect the BROWN wire (Q) to the negative battery terminal.
27. Connect the unattached end (P) of Battery Cable (66) to the positive battery terminal.
28. Connect the RED Fused wire (O) to the positive battery terminal.

Electrical System Wiring Procedure

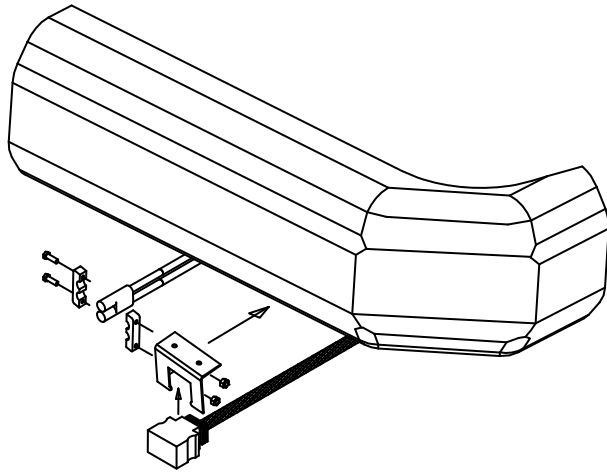


Figure 19. Vehicle Connections

G10148

29. Mount the Black 15 Pin Control Harness Connector to the lower area of the bumper using **MSC03813** Control Harness Mounting Bracket.
30. Mount the BLACK and RED 2 Pin Power Ground Connector to the lower area of the bumper using **MSC03491** Power Ground Mounting Bracket.

Note: Installation location will vary depending on truck.

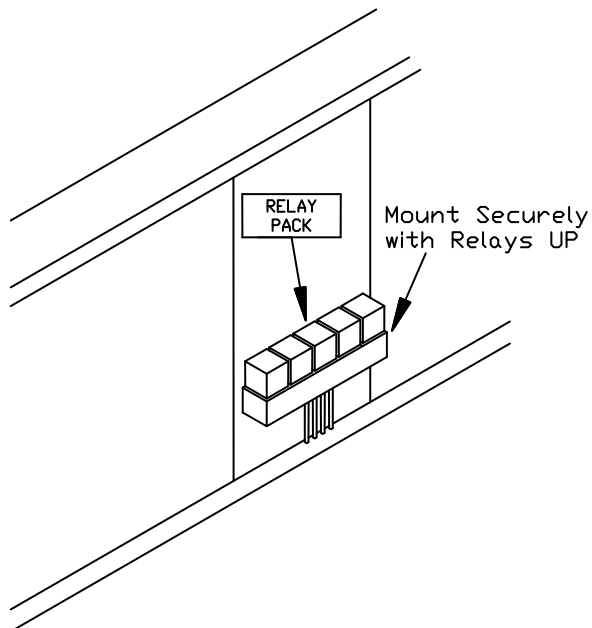


Figure 20. Relay Mounting.

G10152

31. Attach the Relay Pack securely to the inside of the engine compartment using four **HDW01766** Sheet Metal Screws. The relays should be positioned upright as illustrated above.

Electrical System Wiring Procedure

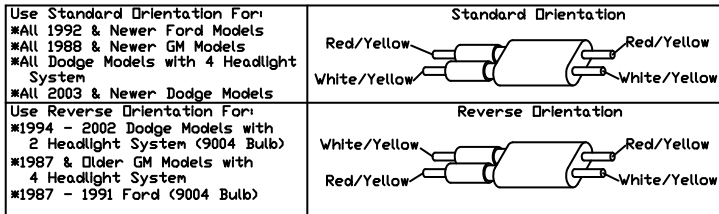


Figure 21. Vehicle Option Connector

G10202

NOTICE

All plow wiring should be secured within the engine compartment in a position that provides sufficient room so that hot or moving parts will not be contacted. Vehicle damage could occur if wires are not properly secured.

32. Locate vehicle option connector. Align the connector so that the Vehicle Option Connector is positioned to match the vehicle it is installed on. This is illustrated in Figure 21.

Note: If your vehicle is not listed in the above figure use the Standard Orientation. If the Vehicle Option Connector is not properly connected the lights on the plow will not function correctly.

"DUAL BURN" WIRE PLACEMENT

THIS WIRE SHOULD BE PLACED ON THE (-) NEGATIVE BATTERY TERMINAL FOR THE VEHICLES LISTED:
 CHEVROLET/GMC 1999-2002
 DODGE 1999-2002
 TOYOTA 2000-2006

FOR ALL OTHER VEHICLES THIS WIRE SHOULD BE PLACED ON THE (+) POSITIVE BATTERY TERMINAL

Figure 22. RED/WHITE Wire Placement

G10522

Note: Connection of RED/WHITE wire (R) is dependent on the grounding system of the vehicle that it is installed on. If the placement of RED/WHITE wire (R) is not correct the Low Beam bulb will not be illuminated when Plow Lights are on High Beam.

33. Connect RED/WHITE wire (R) to the correct battery terminal for your vehicle. See Figure 22 for proper placement for your vehicle.
34. Secure all plow harness wiring.
35. Attach the snowplow to the vehicle. Use the "Snowplow Mounting Procedure" that is located in this manual to properly attach the snowplow to the vehicle.

36. Test for the proper operation of the Headlight Wiring Harness. Follow the procedures below.

Note: To test plow lights, the **IGNITION** must be in the **ON** position.

- *LOW BEAM (Truck Lights)*
 - ◆ Vehicle Headlight Switch – ON
 - ◆ Low Beam Lights on Truck Indicator
 - ◆ Plow Headlight Toggle Switch –TRUCK

RESULTS - Only vehicle low beam headlights should be illuminated.

- *HIGH BEAM (Truck Lights)*
 - ◆ Vehicle Headlight Switch – ON
 - ◆ High Beam Indicator Light – ON
 - ◆ Plow Headlight Toggle Switch –TRUCK

RESULTS - Only vehicle high beam headlights should be illuminated.

- *LOW BEAM (Plow Lights)*
 - ◆ Ignition - ON
 - ◆ Vehicle Headlight Switch – ON
 - ◆ Low Beam Lights on Truck Indicator
 - ◆ Plow Headlight Toggle Switch - PLOW

RESULTS - Only plow low beam headlights should be illuminated.

- *HIGH BEAM (Plow Lights)*
 - ◆ Ignition - ON
 - ◆ Vehicle Headlight Switch – ON
 - ◆ High Beam Indicator Light – ON
 - ◆ Plow Headlight Toggle Switch – PLOW

RESULTS - Both plow high beam and low beam headlights should be illuminated.

- *TURN SIGNALS (Plow and Truck)*
 - ◆ Left Turn Signal Indicator – ON

RESULTS - Both Left Plow and Left Truck turn signal bulbs should be flashing.

- ◆ Right Turn Signal Indicator – ON

RESULTS - Both Right Plow and Right Truck turn signal bulbs should be flashing.

- *PARK LIGHTS (Plow and Truck)*
 - ◆ Park Lights on Vehicle – ON

RESULTS - All Four, Left Plow, Right Plow, Left Truck, and Right Truck Park Lights should be on.

Note: If any of the lights are not working properly, re-check the wiring against the "Electrical Wiring Diagram" located in this manual and make any necessary corrections.

Headlight Adapter Installation Procedure

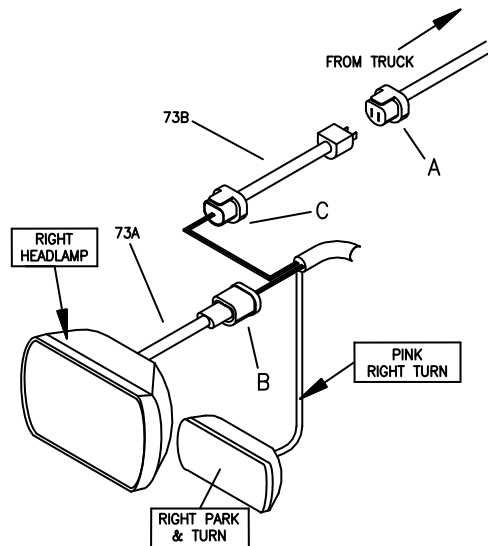


Figure 23. Single Headlight Adapter Connections G10149

Note: This is a general diagram for most 2-headlight vehicles. All vehicles and headlight adapters may not be identical. Installation will be very similar.

1. Disconnect the OEM Headlight Connector Plug (A) from the back of the vehicle headlight.
2. Connect one end of Headlight Adapter (73A) into the back of the vehicle headlight.
3. Connect the Black Rubber Female Socket (B) of Headlight Adapter (73A) into the plow wiring harness.
4. Connect the Blue Sealed Beam Connector (C) of Headlight Adapter (73B) into the plow wiring harness.
5. Connect the opposite end of Headlight Adapter (73B) into the OEM Headlight Connector Plug (A).
6. Repeat Steps 1 through 5 for the opposite side headlight.

Note: In some older vehicles it is not necessary to pull power from both sides of the headlights. In this case only three adapters will be needed. Follow the Headlight Adapter Installation Instructions that are packaged with the Headlight Adapter Kit.

7. Continue with the Step 7 of "Electrical System Wiring Procedure" located in this manual.

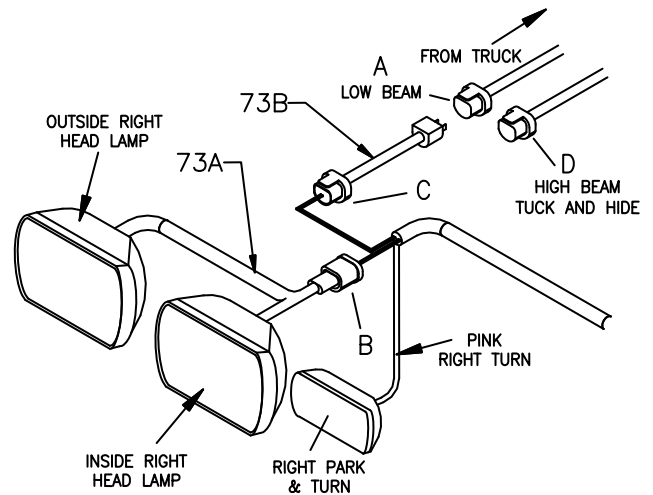


Figure 24. Dual Headlight Adapter Connections G10151

Note: This is a general diagram for most 4-headlight vehicles. All vehicles and headlight adapters may not be identical. Installation will be very similar.

1. Disconnect OEM Headlight Connector Plugs (A and D) from the back of the vehicle headlight.
2. Connect two ends of Headlight Adapter (73A) into the back of the vehicle headlights.
3. Connect the Black Rubber Female Socket (B) of Headlight Adapter (73A) into the plow wiring harness.
4. Connect the Blue Sealed Beam Connector (C) of Headlight Adapter (73B) into the plow wiring harness.
5. Connect the opposite end of Headlight Adapter (73B) into the OEM Wiring Harness (A).
6. Grease, tuck, and secure OEM Connector Plug (D). This connector is not used.
7. Repeat Steps 1 through 6 for the opposite side headlight.
8. Continue with the Step 7 of "Electrical System Wiring Procedure" located in this manual.

Electrical System Wiring Schematic (Plow Side)

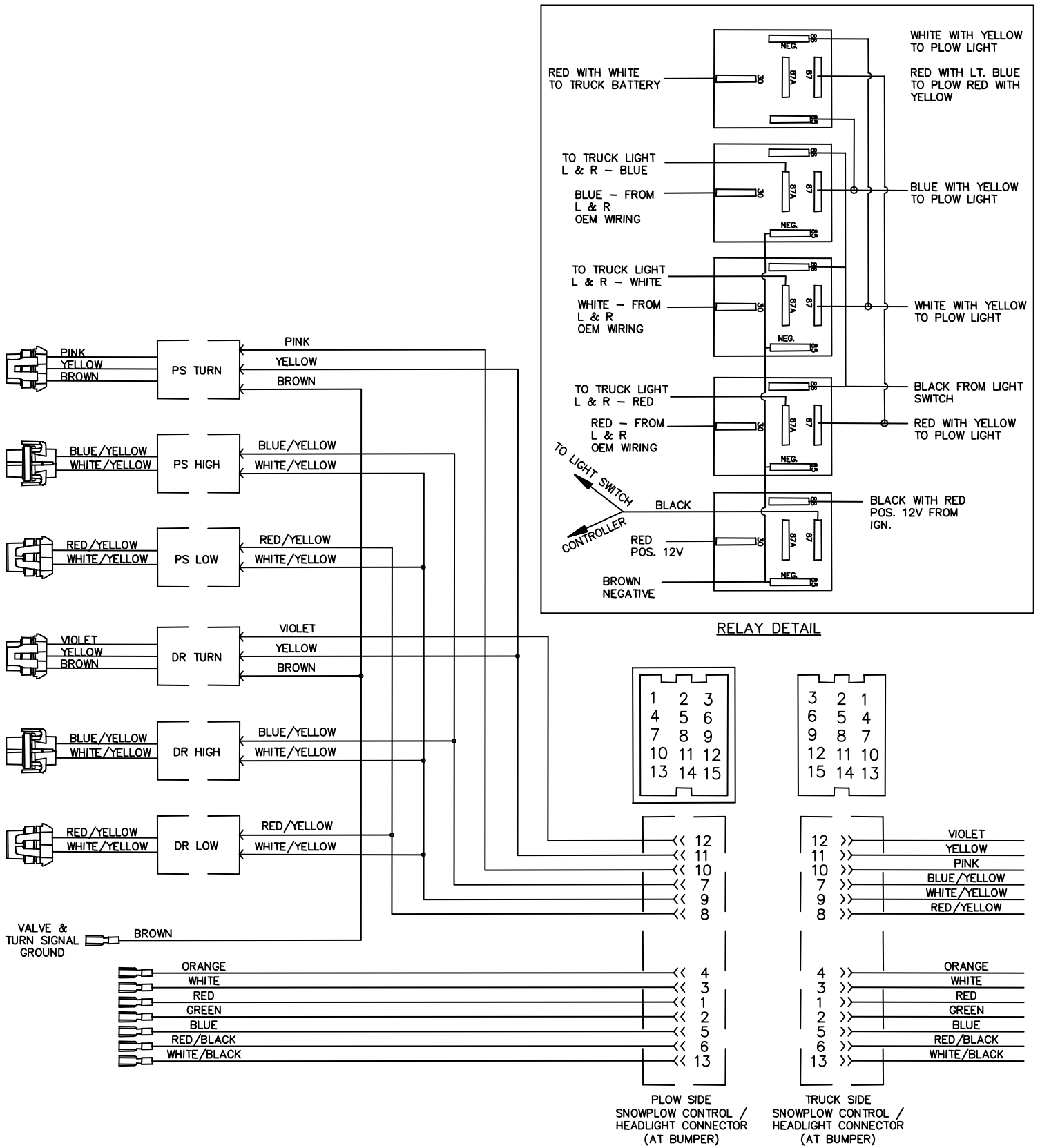


Figure 25. Electrical System Wiring Schematic (Plow Side)

G10271

Electrical System Wiring Schematic (Truck Side)

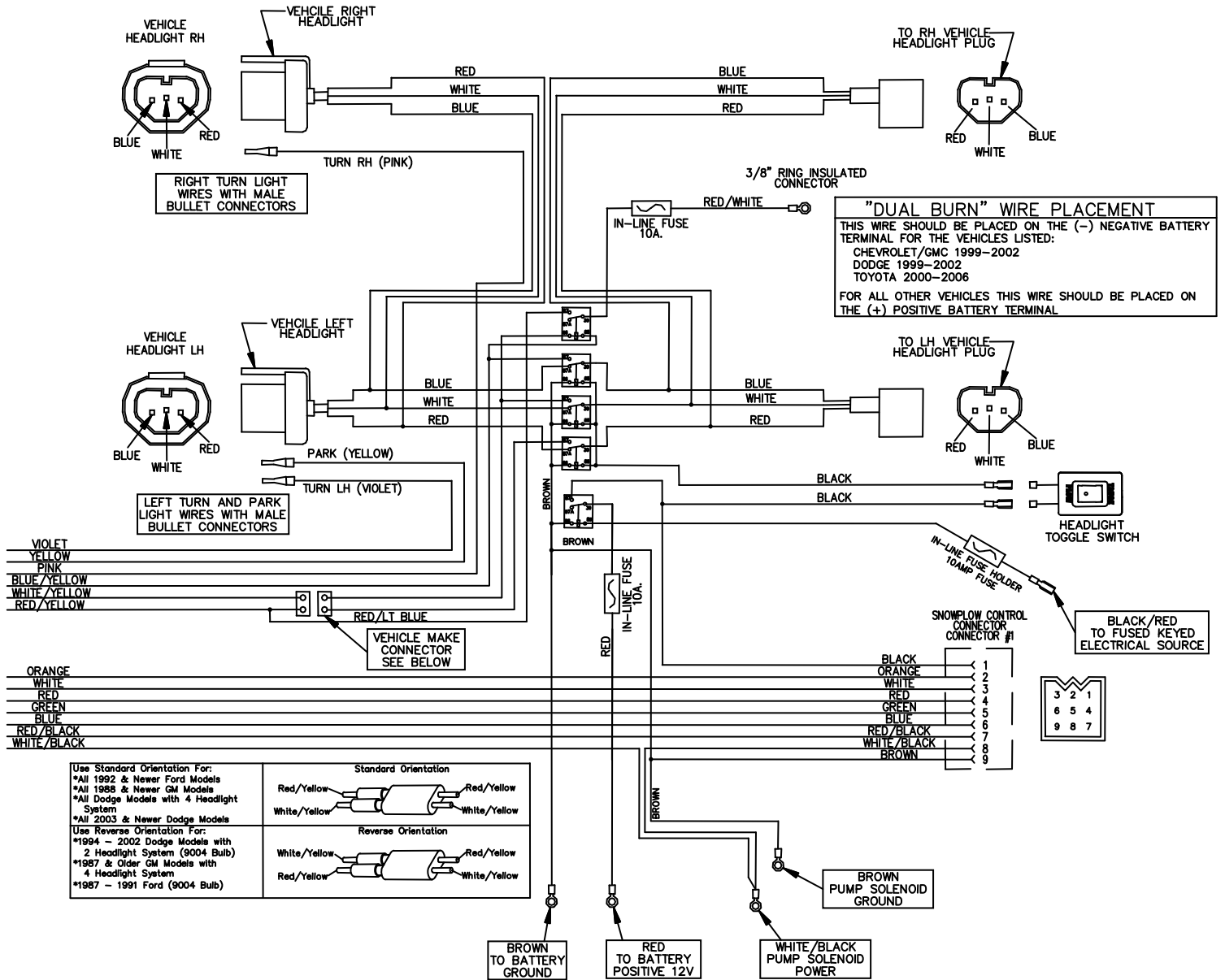


Figure 26. Electrical System Wiring Schematic (Truck Side)

Electrical System Wiring Diagram

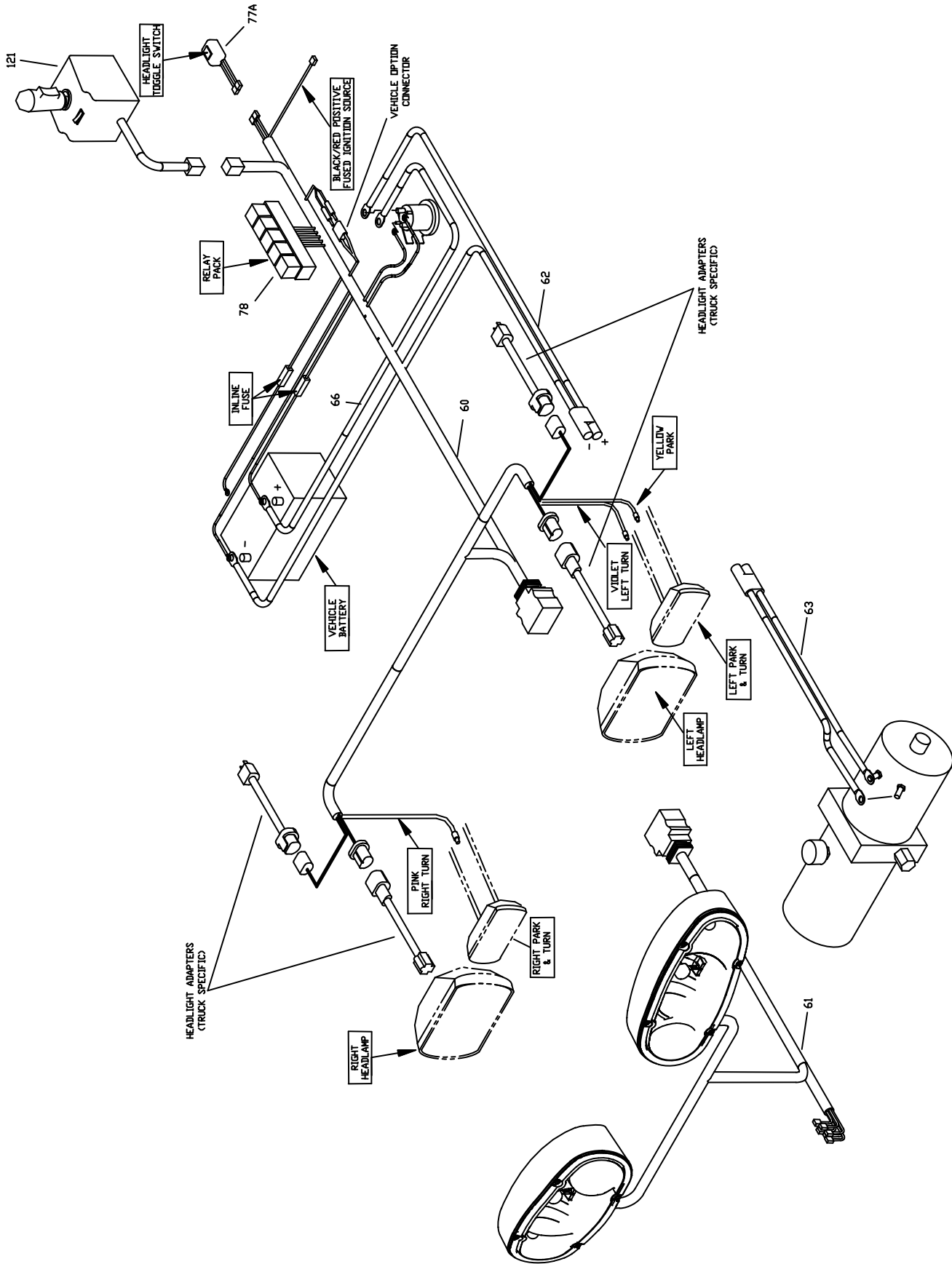


Figure 27. Electrical System Wiring Diagram

SmartHitch 2™ Wiring Diagram

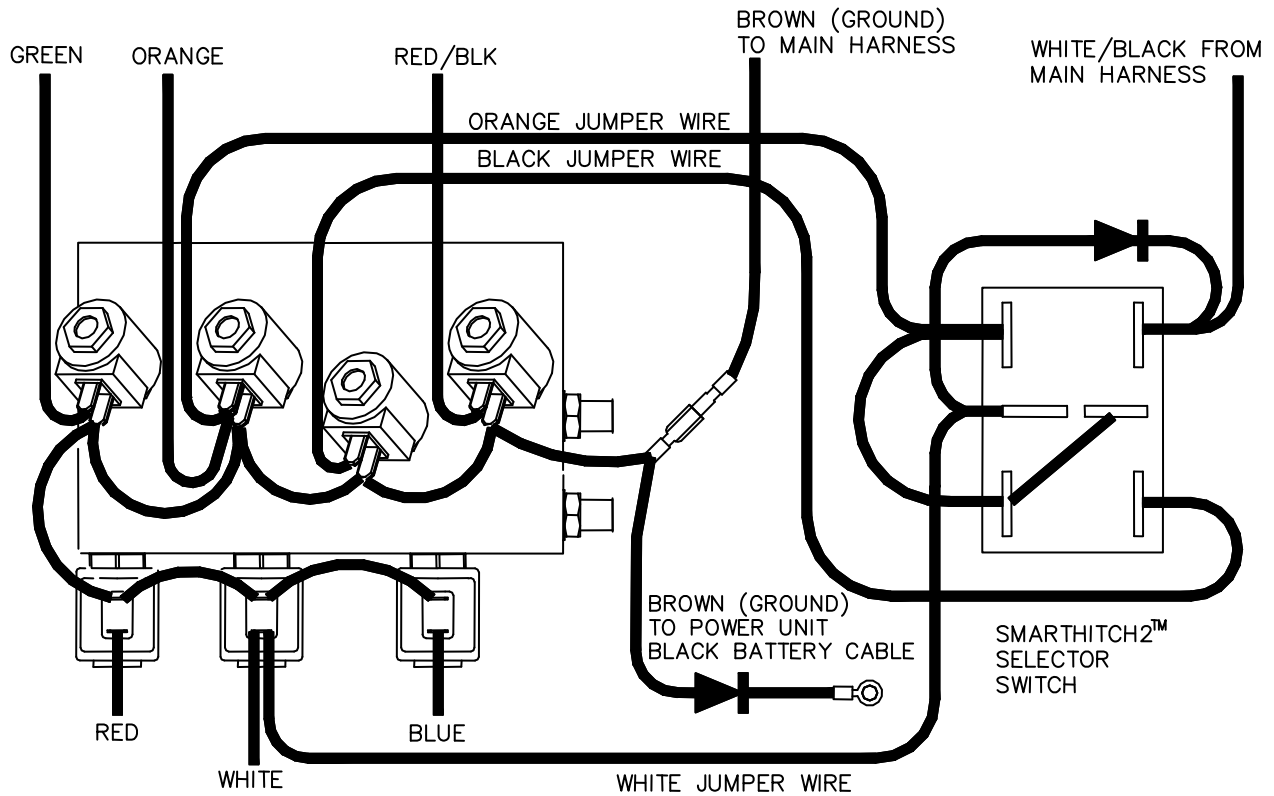


Figure 28. HYD07044 with SmartHitch2™ Wiring Diagram

G10445

Wire Color	Wire Function
Green	Right Wing In
Red	Right Wing Out
White	Lift
Orange	Lower
Red/Black	Left Wing In
Blue	Left Wing Out
Black	SmartHitch2™ (12V)
White/Black	Pump Solenoid
Brown	Ground

Hydraulic Valve Assembly Parts List

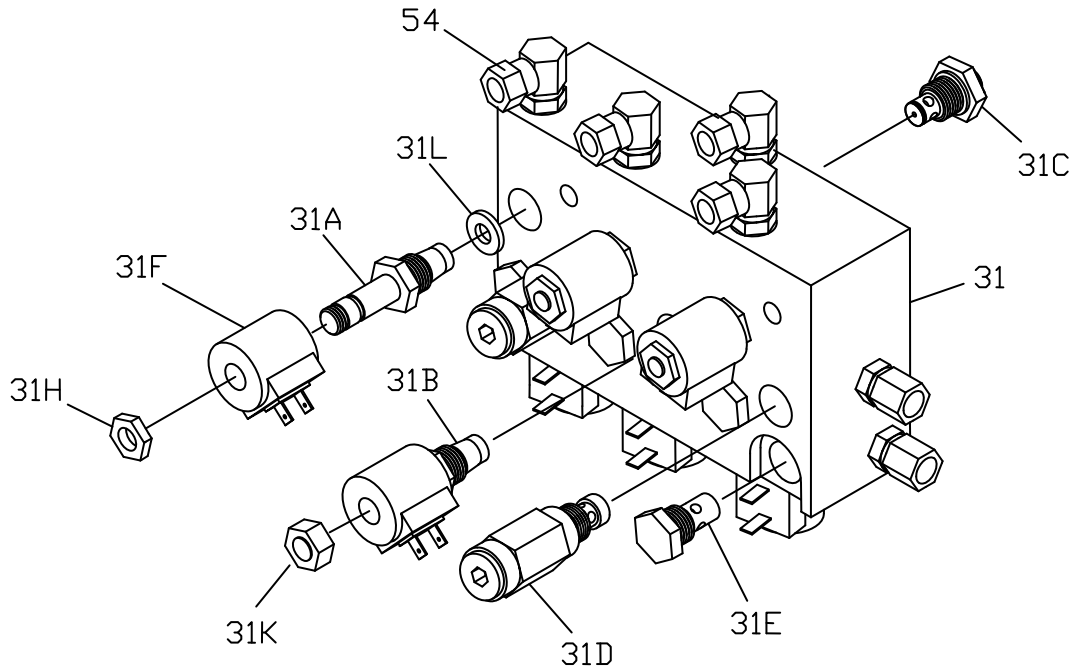


Figure 29. Hydraulic Valve Manifold Assembly.

G10000

Ref.	Description	Part Number	Qty
31	Valve Manifold, RT3 V-Blade w/ SmartHitch2™ (7'6", 8'2", & 9'2" Power-V)	HYD07092	1
	Valve Manifold, RT3 V-Blade w/ SmartHitch2™ (10'0" Power-V)	HYD07044	1
31A	Valve, Lift / Angle	HYD01637	6
31B	Valve, SmartHitch2™ Attach	HYD07047	1
31C	Valve, Flow Control	HYD07048	1
31D	Valve, Relief V-Blade (2800psi)	HYD01639	2
31E	Valve, Check	HYD01640	4
31F	Valve Coil	HYD01638	7
31H	Coil Nut	HYD07059	6
31K	Coil Nut (SmartHitch2™ Valve)	HYD07060	1
31L	Orifice Disc, 0.08" ID (HYD07092 only)	HYD07108	2
31N	Ground Strap, Power-V	MSC08850	1
54	Hydraulic Swivel Fitting	HYD01620	4

Headlight Aiming Procedure

NOTICE

The installer of these snowplow lights must certify that installation conforms to applicable Federal Motor Vehicle Safety Standards.

1. Place the vehicle on a level surface 25 feet in front of a matte-white screen, such as a garage door. The screen should be perpendicular to both the ground and the vehicle.
2. The vehicle should be equipped for normal operation. The snowplow blade should be in place and in the raised position.
3. Below are some points listed by the Society of Automotive engineers (SAE) pertinent to headlight aiming. These points can be found in publication #SAEJ5991D.

Preparation for Headlight Aim or Inspection
Before checking beam aim, the inspector shall:

- Remove ice or mud from under fenders.
- See that no tire is noticeably deflated.
- Check vehicle springs for sag or broken leaves.
- See that there is no load in the vehicle other than the driver.
- Check functioning of any "level-ride" controls.
- Clean lenses and aiming pads.
- Check for bulb burnout, broken mechanical aiming pads, and proper beam switching.
- Stabilize suspension by rocking vehicle sideways.

4. Mark (or tape) the vehicle centerline of the headlights and the vehicle itself on the screen. Mark the horizontal centerline of the headlights on the screen (distance from ground to headlight centers).

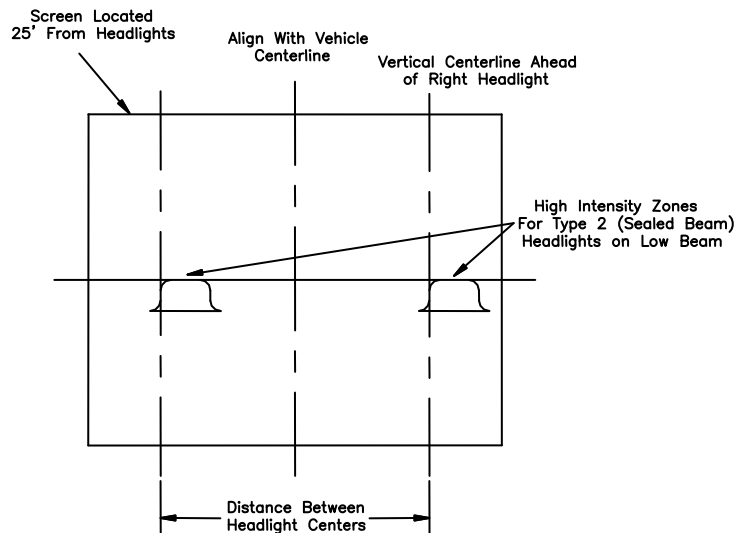


Figure 30. Headlight Aiming Procedure

G10153

5. The correct visual aim for Type 2 headlights is with the top edge of the high intensity zone of the lower beam below the horizontal centerline and the left edge of the high intensity zone on the vertical centerline. See diagram above.

Hydraulic Power Unit Fill Procedure

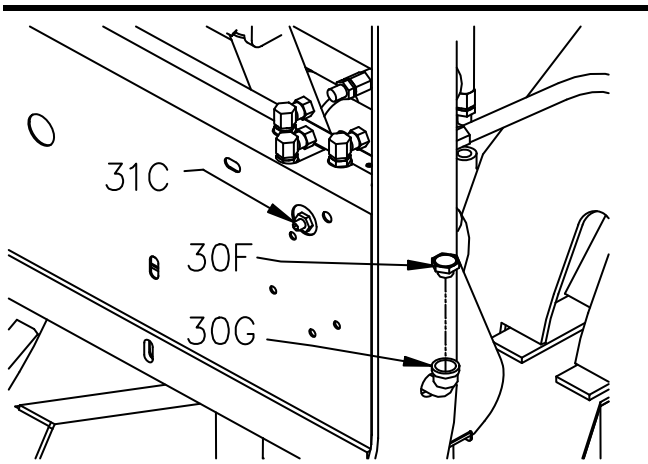


Figure 31. External Fill – Backside View G10043

Step 1 of the following fill procedure is intended for a new plow with an empty hydraulic system.

Initial Plow Position: Start with the plow un-attached from the vehicle and the lift cylinder completely collapsed. The light tower will be tilted forwarded.

1. Remove Fill Cap (30F) from Street Elbow (30G) and fill with Boss High Performance Hydraulic Fluid. Continue to fill Street Elbow (30G) until no more fluid will be accepted. (Approx. 2 quarts.)
2. Attach the plow to the vehicle.

Note: If your plow is equipped with SmartHitch2™ you must hydraulically power the light tower up. Do not manually push the tower up. Failure to hydraulically power the light tower up will create an air pocket in the hydraulic system. Oil will spill out of your internal filler cap.

3. Raise the plow.
4. With the plow in the raised position, extend and retract the right wing.
5. With the plow in the raised position, extend and retract the left wing.
6. Lower the plow to the ground.

Note: If your plow will not lower, Flow Control Valve (31C) is completely closed. Refer to Step 8 to adjust Flow Control Valve (31C).

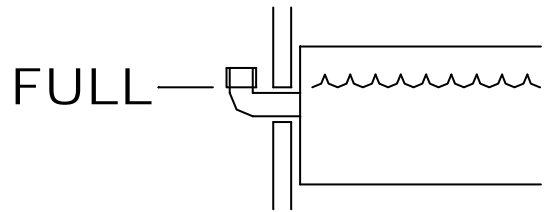


Figure 32. Oil Full Level

G10411

Plow Position to Check Oil: The plow should be attached to the truck, sitting flat on the ground, with both wings retracted.

7. With both wings retracted and the plow lowered to the ground, check the fluid level. Fluid should be visible in the external fill port. If fluid is not visible, fill until visible. Your reservoir should now be properly filled.

Note: Hydraulic fluid should be replaced annually with BOSS Snowplow High Performance Hydraulic Fluid.

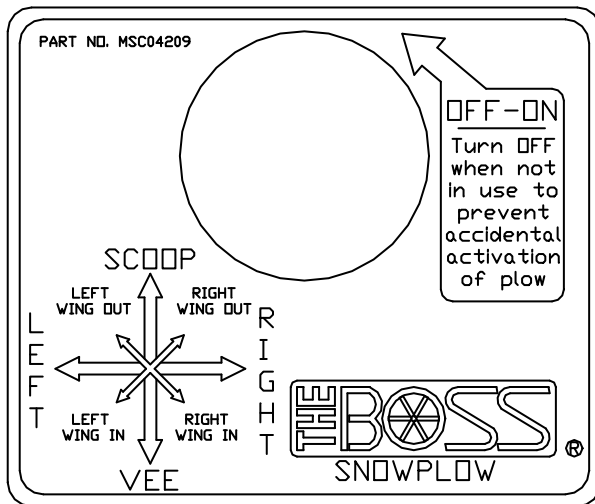
Note: If your plow is equipped with SmartHitch2™ you must hydraulically power the light tower down. Do not manually pull the tower down. Failure to hydraulically power the light tower down will create an air pocket in the hydraulic system. Oil will spill out of your internal filler cap.

WARNING!

When adjusting Flow Control Valve (31C) make sure all appendages are clear of the plow blade and observers are standing a safe distance away from the plow blade. The plow may drop if your controller is in the FLOAT position. Make sure your controller is in the OFF position before attempting to adjust the plow. Failure to follow this warning could result in bodily harm.

8. Adjust Flow Control Valve (31C) to obtain the speed desired for lowering the plow by loosening the jam nut, then adjusting the set screw. Counter-clockwise adjustment will increase the speed the plow descends. Retighten the jam nut when the desired speed is obtained.

Joystick Control Operating Instructions



10. To VEE (Both LEFT and RIGHT wings IN), pull the controller stick directly backward.
11. To angle the entire blade LEFT (Right Wing out – Left Wing In) push the controller stick directly to the left.
12. To angle the entire blade RIGHT (Right Wing in – Left Wing out) push the controller stick directly to the right.
13. The control should be turned off when not in use. It can then be unplugged and stored.

Figure 33. V-Blade Control Operation G10157

1. Toggle the ON/OFF switch to the ON position. A red indicator light will illuminate on the switch. The joystick is now active.
2. To RAISE the blade of the plow, toggle the switch on the joystick handle upward.
3. To LOWER the blade of the plow, toggle the switch on the joystick handle downward.
4. To FLOAT the blade along the contour of the plowing surface, toggle the switch on the joystick handle downward until the switch reaches the detent position. (You will feel the switch click into the detent position.) The switch will stay in the FLOAT position until the switch is physically re-centered.
5. To move the RIGHT wing OUT, push the controller stick to the right and forward.
6. To move the LEFT wing OUT, push the controller stick to the left and forward.
7. To SCOOP (Both LEFT and RIGHT wings OUT), push the controller stick directly forward.
8. To move the RIGHT wing IN, pull the controller stick to the right and backward.
9. To move the LEFT wing IN, pull the controller stick to the left and backward.

JOYSTICK CONTROL UNIVERSAL MOUNTING KIT MSC04026

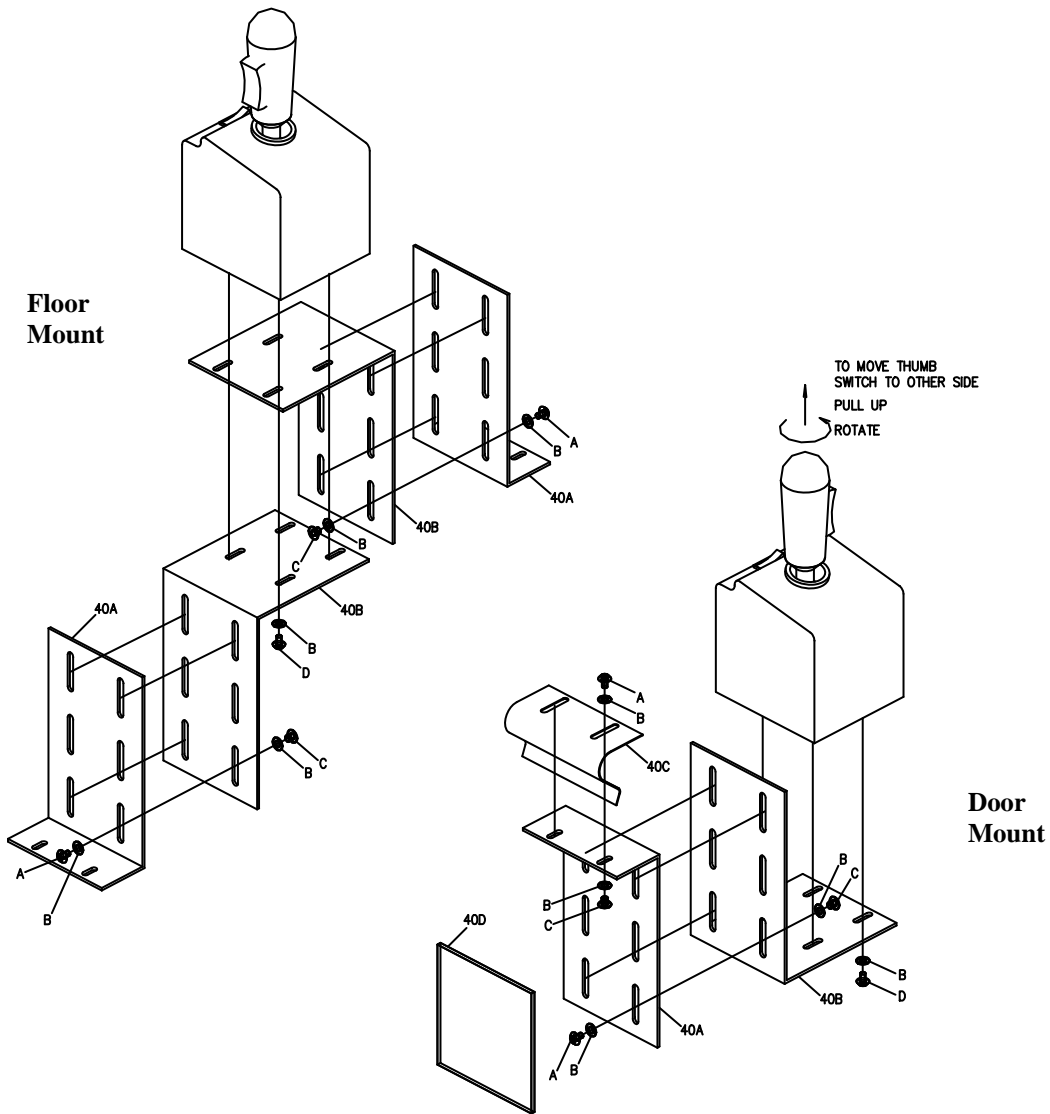


Figure 34. Joystick Control Universal Mounting Kit Components

G10109

Reference Number	Description	Part Number
40A	Joystick, Intermediate Mounting Bracket	MSC04028
40B	Joystick, Mounting Bracket	MSC04029
40C	Joystick, Spring Clip	MSC04027
40D	Pad, Foam	MSC04038
A	Screw, #8-32 X 1/4 Machine Black	HDW05591
B	Washer, #10 Flat washer Black	HDW05592
C	Nut, #8-32 X 3/16 Alum Binding Post	HDW05593

EBCS **Smart Hitch 2** Control Operating Instructions

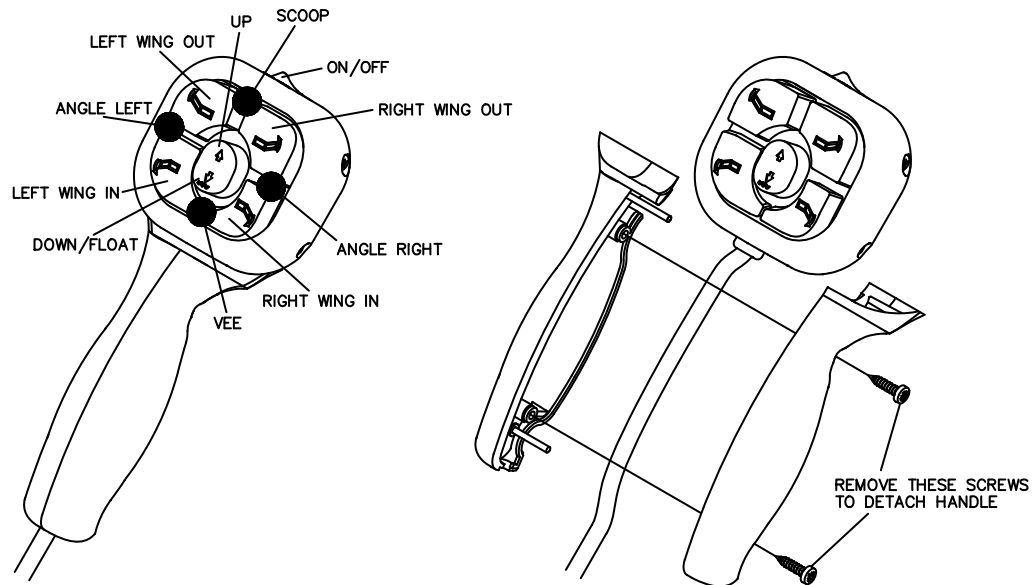


Figure 35. V-Blade Control Instructions

G10365

ON/OFF: Push the ON/OFF switch to the left ON position to turn the control on. Green LED indicators will light up on the control. Push the ON/OFF switch to the right OFF position to turn the control off.

RAISE: To raise the blade of the plow, quickly press the center button upward twice. You can also press and hold the center button upward until the blade is fully raised.

LOWER: To lower the blade of the plow, quickly push the center button downward twice. You can also press and hold the center button downward until the blade is fully lowered.

FLOAT: The plow will automatically activate the FLOAT feature when the center button is quickly pressed downward twice. (The center LED indicator will turn RED). You can also press and hold the center button downward for 2 seconds. (The center LED indicator will turn RED). Press the raise button to turn the FLOAT function off.

“What Is FLOAT?”: The FLOAT feature allows the plow blade to follow the contour of the ground. Press the raise button to turn FLOAT function off.

Note: The control MUST be in FLOAT to use SmartHitch2™ to attach or detach the snowplow.

ANGLE LEFT: To plow snow to the left, press and hold the left wing out and left wing in buttons simultaneously until the blades are fully angled.

ANGLE RIGHT: To plow snow to the right, press and hold the right wing out and right wing in buttons simultaneously until the blades are fully angled.

VEE: To create the Vee shape with the plow blades, press both the left wing in and right wing in buttons simultaneously until the blades are fully retracted.

SCOOP: To create the Scoop shape with the plow, press both the left wing out and right wing out buttons simultaneously until the blades are fully extended.

Note: The control should be turned off when not in use. It can then be unplugged and stored.

SLEEP mode: If the controller is ON but not used for 20 minutes, the automatic SLEEP mode will be activated. The controller LED lights will flash green and red when the controller is in SLEEP mode. Turn the controller OFF to deactivate SLEEP mode.

BOSS
SmartTouch2™ Control
Mounting Instructions

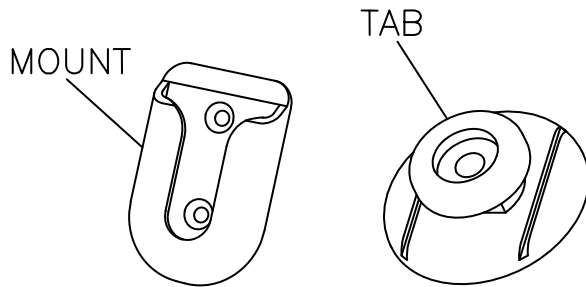


Figure 36. SmartTouch2™ Mounting Hardware G10311

1. Remove the Swivel Mount and Tab from the **MSC05058** Swivel Mount Kit.
2. Use the enclosed alcohol wipe to clean a spot on the vehicle interior where you want to place the SmartTouch2™ Control. Wipe dry immediately with a cloth or paper towel.
3. Do not apply when the surface temperatures are lower than +60°F (Working temperature range of the adhesive is -40°F to +200°F).
4. Peel off the paper backing on one side of the adhesive and apply to Swivel Mount. Apply maximum pressure to all areas.
5. Apply the Swivel Mount onto the spot of the interior that was just cleaned. (MAKE SURE IT IS IN THE CORRECT PLACE) Once it is placed it cannot be removed without destroying the adhesive.
6. Clean the back of the SmartTouch2™ Control with the alcohol wipe.
7. Peel off adhesive backing of tape, apply to Tab, and press firmly.
8. Remove remaining backing and apply the Tab to the back of the SmartTouch2™ Control. Apply pressure for 30 seconds.

NOTICE

After attaching the Swivel Mount, let it sit unused for 72 hours before attaching the SmartTouch2™ Control to allow the adhesive to bond to the surface and ensure secure mounting.

9. Place SmartTouch2™ Control on the Swivel Mount.

Note: Other mounting options are available. Contact your BOSS Snowplow dealer for more information.

Troubleshooting Guide

Glossary of Problems:

1. Pump motor does not run.
2. Pump continues to run with switch in neutral.
3. Pump will not lower.
4. Plow will not raise or raises slowly, motor runs.
5. While trying to raise the plow, blades extend and wings will not retract.
6. Wings drift back when extended.
7. Plow lowers too fast.
8. Wing(s) will not extend, but motor runs.
9. Wing(s) will extend, but will not retract or retract slowly.
10. Wing(s) retract too easily while plowing.
11. Oil leaks from cylinders.
12. Battery goes dead with all switches in neutral.
13. Plow lights are dim, will not come on or flicker.
14. Turn signals flash at a rapid rate.
15. High beam indicator light not functioning properly.
16. Blade digs into the ground in the V position.
17. Blade does not lay flat against the ground in the scoop position.
18. Blade trips too easily.
19. Plow does not clean-up snow from low areas.
20. Oil runs out of fill cap of hydraulic pump.
21. Pump chatters when raising the plow or extending wings.
22. SmartHitch2™ will not attach plow.
23. Plow lights and truck lights are on at the same time.
24. Plow and truck High and Low beam lights are on at the same time.
25. Plow High beam turns off Plow Low beam bulbs.

PROBLEM	DIAGNOSTIC CHECK	RESULT
1. Pump motor does not run.	Check that power/ground cables and control cables are connected properly.	Connect.
	Check for voltage at pump motor while ignition switch is on and LIFT control button is pushed.	If voltage is present, pump motor has failed or pump has seized. Motor brushes may be replaced, otherwise replace pump/motor assembly.
	Check for power to the solenoid by testing for voltage between both large terminals and ground.	If voltage is not present between one large terminal and ground, the cable between the battery and solenoid is disconnected or broken.

Troubleshooting Guide

PROBLEM	DIAGNOSTIC CHECK	RESULT
	Check for voltage between the other large terminal of the solenoid and ground while jumping power to the small terminals with the white wire.	If NO voltage is present, solenoid has failed and must be replaced. If voltage is present, wire from small terminal of solenoid to ground may be disconnected or broken.
	Test power to the control box by checking voltage between black wire and ground at the white 9-pin connector.	If NO voltage is present, power from relay has become disconnected. If voltage is present check wiring and controller switches.
2. Pump continues to run with switch in neutral.	Disconnect control box, ignition ON.	If pump continues to run, solenoid has failed in the closed position. Quickly remove power to the pump by disconnecting the power/ground cables to the plow. Replace solenoid.
		If pump stops running, check wiring of controller for short between black and white/black wire in controller, or failed switch.
3. Plow will not lower.	Check power/ground cables and control cables are connected properly.	Connect.
	Check flow control valve.	If flow control valve is completely closed, place RAISE/LOWER switch in NEUTRAL, then open the flow control valve.
	Check wiring on valve block for proper connections.	Refer to the wiring diagram in this manual.
	Check for voltage between solenoid valve terminal and ground with ignition switch on and control switch in FLOAT position.	If voltage is present solenoid valve or valve coil has failed. Replace valve.
	Test power to the control box by checking voltage between black wire and ground at the white 9-pin connector.	If NO voltage is present, power from relays has become disconnected. If voltage is present, check wiring and switch of controller.
4. Plow will not raise or raises slowly (pump motor runs).	Check hydraulic fluid level.	Hydraulic fluid level should be within $\frac{3}{4}$ " from top of reservoir when lowered and in the V-position.

Troubleshooting Guide

PROBLEM	DIAGNOSTIC CHECK	RESULT
	Check power/ground cables and control cable are connected properly.	Connect.
	Check wiring on valve block for proper connections.	Refer to the manifold wiring diagram in this manual.
	Load test battery.	Replace battery if weak or defective.
	Check pressure at pressure port of pump.	If pressure is less than 2500 psi (at end of lift). Motor brushes may be defective, pump pressure relief valve may be contaminated, damaged, or set less than 2500 psi, pump may be worn.
	Check LIFT Solenoid Valve.	Lift solenoid valve not opening completely. Replace.
		Check wiring and switch box control.
5. While trying to raise plow, wing(s) extend prior to raising plow and will not retract.	Check the pressure and return line routing.	Pressure line MUST be connected from P on pump to P on valve manifold. Return line MUST be connected from R on pump to T on valve manifold.
6. Wings drift back when extended.	Check wing return solenoid valve on manifold Check pressure	If solenoid valve is contaminated, clean or replace. If pressure relief valve is contaminated, clean or replace.
7. Plow lowers too fast.	Check flow control valve.	Close flow control valve to desired drop speed.
8. Wing(s) will not extend or extend slowly, motor runs.	Check hydraulic fluid level.	Hydraulic fluid level should be within $\frac{3}{4}$ " from top of reservoir when lowered and in the V-position.
	Check power/ground cables and control cable are connected properly.	Connect.
	Check wiring on valve block for proper connections.	Refer to the wiring diagram in this manual.
	Load test battery.	Replace battery if weak or defective.

Troubleshooting Guide

PROBLEM	DIAGNOSTIC CHECK	RESULT
	Check pressure at pressure port of pump.	If pressure is less than 2500 psi (at end of lift). Motor brushes may be defective, pump pressure relief valve may be contaminated, damaged, or set less than 2500 psi, pump may be worn.
	Check WING OUT solenoid valve.	WING OUT solenoid valve not opening completely. Replace.
		Check wiring and control box.
9. Wing(s) extend, but will not retract or retract slowly.	Check power/ground cables and control cables are connected properly.	Connect.
	Check wiring on valve block for proper connections.	Refer to the wiring diagram in this manual.
	Check for voltage between solenoid valve terminal and ground with ignition switch on and control switch in WING IN position.	If voltage is present, solenoid valve or valve coil has failed. Replace valve. If NO voltage is present, check wiring and switch box control.
10. Wing(s) retract too easily while plowing.	Pressure relief valve pressure set too low.	See an Authorized BOSS Dealer for pressure relief valve adjustment.
11. Oil leaks from cylinders.	Loose packing.	Tighten packing 1/8-turn increments until leak stops.
	Check rod condition.	If rods are pitted or rough, polish with copus cloth or extra fine steel wool.
12. Battery goes dead with all switches in neutral.	Possible short in switches.	Inspect wiring of control box switches, replace switch(es).
	Possible short in wiring harness.	Repair damaged wire.
	Possible short in valve coils.	Replace coils.
13. Plow lights are dim, will not come on or flicker.	Check electrical connections.	Clean and repair any corroded or damaged terminals.
	Check headlight adapter wires.	Verify proper headlight adapters are being used and are correctly installed.
	Check relays for corrosion and function.	Relays should click when energized.
14. Turn signals flash at a rapid rate.	Check flasher.	Replace original vehicle flasher with heavy-duty six-lamp flasher provided.

Troubleshooting Guide

PROBLEM	DIAGNOSTIC CHECK	RESULT
15. No high beam indicator or does not function properly.	Check headlight adapters.	Verify proper headlight adapters are being used and are correctly installed.
16. Blade digs into the ground in the V-position.	Center shoe adjusted too low.	Add washers to the center shoe to raise the tip of the plow.
	Push beam installed too high.	Lower the push beam.
17. Blade does not lay flat against the ground in the scoop position.	Center Shoe Adjusted too High.	Remove washers from the center shoe to raise the tip of the plow.
	Push beam installed too low.	Raise the push beam. If push beam is at highest setting, Adjust the Bumper Stop further into the center section.
18. Blade trips too easily.	Check trip spring adjustment.	Tighten springs. Replace springs if permanently deformed or damaged.
19. Plow does not clean-up snow from low areas.	UP/DOWN switch not in FLOAT position.	Place switch in FLOAT position.
20. Oil running out of fill cap of hydraulic pump.	Power light tower down. Do not pull the tower down.	Follow the dismounting instructions in this manual.
	Plowing on steeply inclined terrain.	Avoid too steeply sloped areas.
	Pump reservoir over filled.	Reservoir should be filled to $\frac{3}{4}$ " from top.
	Hitting snowbanks too hard.	Do not plow recklessly. Place plow in V-position and break up hard snowbanks.
21. Pump chatters when raising plow or extending wing(s).	Hydraulic fluid low.	Add hydraulic fluid. Reservoir should be filled to $\frac{3}{4}$ " from top.
22. SmartHitch2™ will not attach plow.	Make sure key is on and controller is in FLOAT.	Turn key on and put controller in FLOAT.
	Make sure controller is staying in the Float position	If controller comes out of Float when using the SmartHitch2™ switch, replace the controller.
	Check valve block and SmartHitch2™ switch for proper connections.	Refer to manifold wiring diagram located within this manual.
23. Plow lights and truck lights are on at the same time.	Check vehicle harness wiring to truck headlights.	Refer to electrical system wiring instructions located within this manual. Ensure OEM is not plugged into truck headlight.

Troubleshooting Guide

PROBLEM	DIAGNOSTIC CHECK	RESULT
24. Plow and truck High beam and Low beam are on at the same time.	Check headlight adapters for correct connections.	Light adapters for GM trucks can be plugged in two ways. Make sure all four adapters are connected in the proper orientation for your vehicle.
25. Plow High beam turns off Plow Low beam bulbs.	Check vehicle option connector and RED/WHITE wire.	Refer to electrical system wiring instructions located within this manual. RED/WHITE wire may need to be placed on opposite battery terminal.

Recommended Push Beam Height

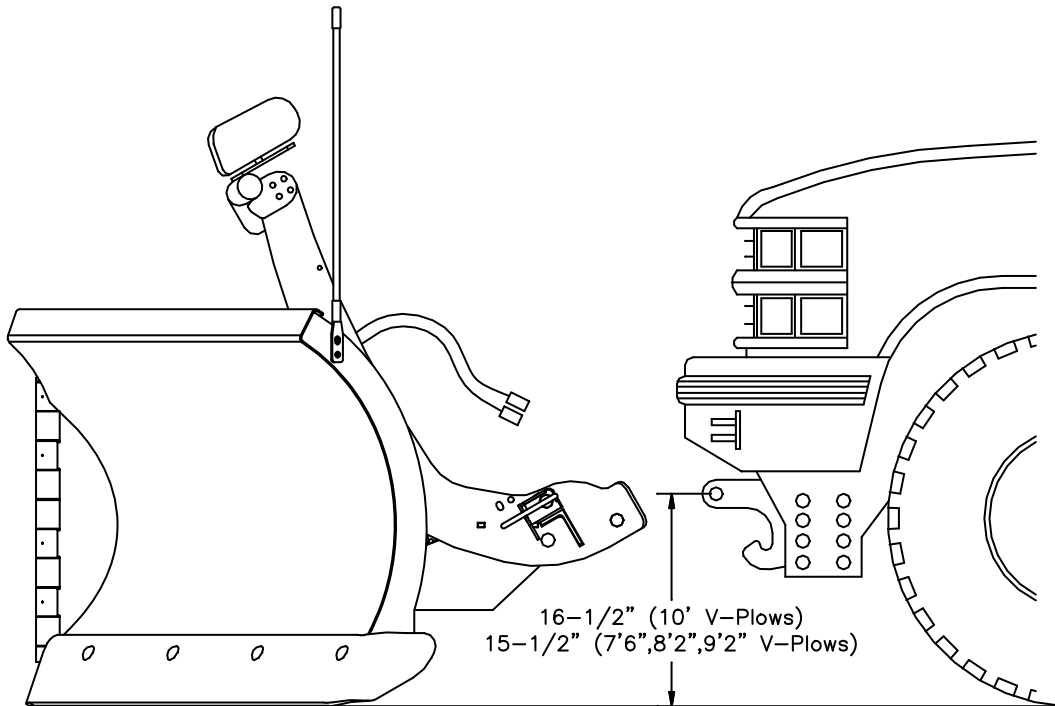
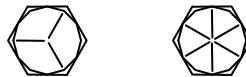


Figure 37. Recommended Push Beam Height

G10364

Recommended Bolt Torque



DIAMETER / PITCH	GRADE 5	GRADE 8	GRADE 8.8	GRADE 10.9
1/4-20	6	9		
5/16-18	14	19		
3/8-16	23	33		
7/16-14	38	53		
1/2-13	56	80		
9/16-12	82	116		
5/8-11	113	159		
3/4-10	201	283		
M10 X 1.25			36	
M10 X 1.5				49
M12 X 1.75				71
M14 X 2.0				80

ALL TORQUE VALUES ARE IN FOOT-POUNDS (FT.-LB.)

Figure 38. Recommended Bolt Torque

G10410

NOTE: The torque values listed above are based on dry, coated bolts, variables such as oil, or other lubrications may appreciably alter these values and must be taken in to consideration.

NOTICE: IT IS IMPORTANT THAT ALL FASTENERS BE PROPERLY TORQUED TO ASSURE A SAFE OPERATING PLOW.