

SNO-WAY®

SNOW & ICE CONTROL EQUIPMENT

INSTALLATION & OWNER'S MANUAL

**MEGABLADE™ V-WING™ SERIES
SNOW PLOW**

**WITH SERIAL NUMBER AFTER
MBV100000**



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INTRODUCTION

This manual was written for the assembly, installation and maintenance of your new Sno-Way plow. Most importantly, this manual provides an operating plan for safe use. Refer to the Table of Contents for an outline of this manual.

Please keep this manual with your machine at all times as reference material and so it can be passed on to the next owner if the machine is sold.

We require that you read and understand the contents of this manual COMPLETELY, especially the chapter on SAFETY, before attempting any procedure contained in this manual.



The Society of Automotive Engineers has adopted this SAFETY ALERT SYMBOL to pinpoint characteristics that, if NOT carefully followed, can create a safety hazard. When you see this symbol in this manual or on the machine itself, BE ALERT!, your personal safety and the safety of others, is involved.

• Defined in the next column, are the SAFETY ALERT messages and how they will appear in this manual.

	<h2>WARNING</h2>
<p>FAILURE TO FOLLOW CAN RESULT IN INJURY OR DEATH.</p>	

	<h2>CAUTION</h2>
<p>Information, that if not carefully followed, can cause injury or damage to equipment!</p>	

NOTE: Additional information concerning the equipment or the procedure that may or may not be contained elsewhere in this manual.

BE AWARE! It is illegal to remove, deface or otherwise alter the safety decals mounted on this equipment.

Record the Power Pack Model Number, Power Pack Serial Number, Controller Serial Numbers, Blade Model Number, Blade Serial Number and the Pump Serial Number in the space provided below as a handy record for quick reference. The Power Pack Serial Number is

located on the Lower Light Lift Bar (driver's side), the blade serial number is located on one of the middle ribs of the blade. These plates contain information that your Dealer needs to answer questions or to order replacement parts, if needed, for your unit.

NAME PLATE DATA	
POWER PACK MODEL NUMBER	_____
POWER PACK SERIAL NUMBER <small>(Located on Lower Light Lift Bar - Drivers Side)</small>	_____
CONTROLLER SERIAL NUMBERS:	
TRANSMITTER S.N.	_____
RECEIVER S.N.	_____
BLADE MODEL NUMBER	_____
BLADE SERIAL NUMBER <small>(Located on Blade Frame)</small>	_____
PUMP SERIAL NUMBER	_____
(FILL IN)	

DEALER	
NAME	_____
ADDRESS	_____
CITY	_____ STATE _____ ZIP _____
PHONE ()-	_____
(FILL IN)	

ORIGINAL PURCHASER	
NAME	_____
ADDRESS	_____
CITY	_____ STATE _____ ZIP _____
PHONE ()-	_____
(FILL IN)	

We reserve the right to make changes or improve the design or construction of any part(s) without incurring the obligation to install such parts or make any changes on any unit previously delivered.

Sno-Way Service Parts Manuals are available for purchase from your authorized Sno-Way dealer. Request part number 97101511 for the Mega Blade V Series Snow Plows. Factory contact information is available at www.snoway.com.

Snow-Way Products are built under one or more of the following patents:

5,524,368	5,832,637	5,894,688	5,987,785	6,154,986
6,691,435	6,701,646	6,702,208	6,775,933	6,778,932
6,860,039	6,860,040	2,121,948		

SAFETY

BEFORE ATTEMPTING ANY PROCEDURE IN THIS BOOK, READ AND UNDERSTAND ALL THE SAFETY INFORMATION CONTAINED IN THIS SECTION. IN ADDITION, ENSURE ALL INDIVIDUALS WORKING WITH YOU ARE ALSO FAMILIAR WITH THESE SAFETY PRECAUTIONS.

For your safety Warning and Information Decals have been placed on this product to remind the operator to take safety precautions. It is important that these decals are in place and are legible before operation begins. New decals can be obtained from Sno-Way or your local dealer.

REMEMBER The careful operator is the best operator. Most accidents are caused by human error. Certain precautions must be observed to prevent the possibility of injury to operator or bystanders and/or damage to equipment.

NEVER operate Plow when under the influence of alcohol, drugs or other medications that could hamper your judgement and reactions. An accident may result in serious injury or death to other persons or yourself.

ALWAYS operate vehicle in a well-ventilated area. The carbon monoxide in exhaust gas is highly toxic and can cause serious injury or death.

NEVER allow hands, hair or clothing to get near any moving parts such as fan blades, belts and pulleys. Never wear neckties or loose clothing when working on the vehicle.

NEVER wear wrist watches, rings or other jewelry when working on the vehicle or individual equipment. These things can catch on moving parts or cause an electrical short circuit that could result in serious personal injury.

ALWAYS wear safety goggles when working on the vehicle to protect your eyes from battery acid, gasoline, and dust or dirt from flying off of moving engine parts.

ALWAYS be aware of and avoid contact with hot surfaces such as engine, radiator, and hoses.

ALWAYS wear safety glasses with side shields when striking metal against metal! In addition, it is recommended that a softer (non-chipable) metal material be used to cushion the blow. Failure to heed could result in serious injury to the eye(s) or other parts of the body.

NEVER allow children or unauthorized person to operate this unit.

NEVER exceed 45 m.p.h. when snow plow is attached to vehicle. Braking distances may be increased and handling characteristics may be impaired at speeds above 45 m.p.h.

ALWAYS lock the vehicle when unattended to prevent unauthorized operation of the plow.

ALWAYS check the job site for terrain hazards, obstructions and people.

NEVER exceed 10 m.p.h. when plowing. Excessive speed may cause serious injury and damage of equipment and property if an unseen obstacle is encountered while plowing.

ALWAYS position blade so it does not block path of headlamps beam. Do not change blade positions while traveling. An incorrect plow position blocking headlamp beam may result in an accident.

ALWAYS check surrounding area for hazardous obstacles before operating this unit.

ALWAYS inspect the unit periodically for defects. Parts that are broken, missing or plainly worn must be replaced immediately. The unit, or any part of it should not be altered without prior written approval of the manufacturer.

ALWAYS insert the cylinder lock when plow is not in use. If the cylinder lock is not installed, the plow blade could inadvertently drop and cause serious injury.

ALWAYS shut off the vehicle engine, place the transmission in Neutral or Park, turn the ignition switch to the "OFF" position and firmly apply the parking brake of the vehicle before attaching or detaching the blade from the vehicle or when making adjustments to the blade.

ALWAYS inspect lift system bolts and pins whenever attaching or detaching the plow, and before traveling. Worn or damaged components could result in the plow dropping to the pavement while driving, causing an accident.

ALWAYS keep hands and feet clear of blade and A-Frame when attaching or detaching plow.

NEVER stand between the vehicle and blade or directly in front of blade when it is being raised, lowered or angled. Clearance between vehicle and blade decreases as blade is operated and serious injury or death can result from blade striking a body or dropping on hands or feet.

NEVER work on the vehicle without having a fully serviced fire extinguisher available. A 5 lb or larger CO² or dry chemical unit specified for gasoline, chemical or electrical fires, is recommended.

NEVER smoke while working on the vehicle. Gasoline and battery acid vapors are extremely flammable and explosive.

NEVER use your hands to search for hydraulic fluid leaks; escaping fluid under pressure can be invisible and can penetrate the skin and cause a serious injury! If any fluid is injected into the skin, see a doctor at once! Injected fluid **MUST BE** surgically removed by a doctor familiar with this type of injury or gangrene may result.

REMEMBER it is the owner's responsibility for communicating information on the safe use and proper maintenance of this machine.

INSTALLATION INSTRUCTIONS

General

Install the subframe on the vehicle using the instructions supplied with the subframe package. The vehicle receiver member (VRM) bracket height should be 8" - 11" off the ground (See Figure 1-1).

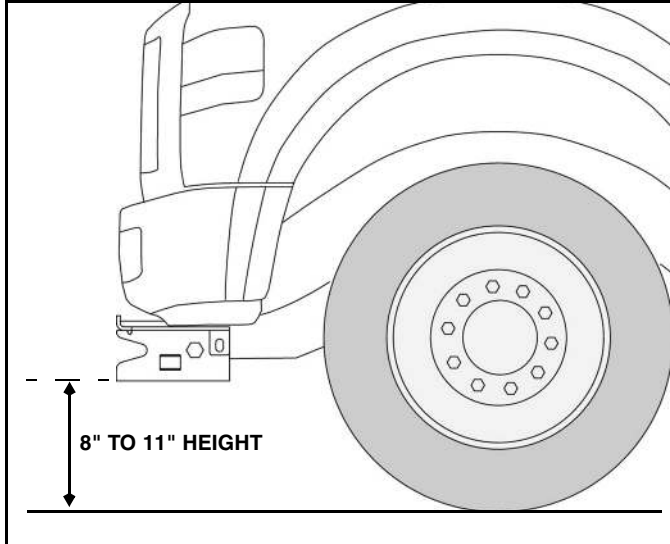


Figure 1-1

Electrical Installation

1. Remove the battery power harness and power harness parts bag from the power pack carton.

NOTE: Take extra time needed to plan the routing of wiring harnesses. Make sure harnesses do not interfere with, or contact, any moving parts and route wires away from excessive heat areas. Read all the instructions carefully to ensure a safe and professional installation.



WARNING

Disconnect the vehicle NEG. (-) battery cable while performing steps 2 - 5 to avoid serious bodily injury from electrical shock, fire, or explosion. Do not re-connect battery cable until indicated in step 8.

FAILURE TO FOLLOW CAN RESULT IN INJURY OR DEATH

2. Mount the fuse holder near the battery using (2) #10 x 1" self-tapping screws.

3. Take the cover off of the fuse holder and remove the nuts on the studs. Place one end of the 2 ft. long power wire on one stud. (See Figure 1-2).

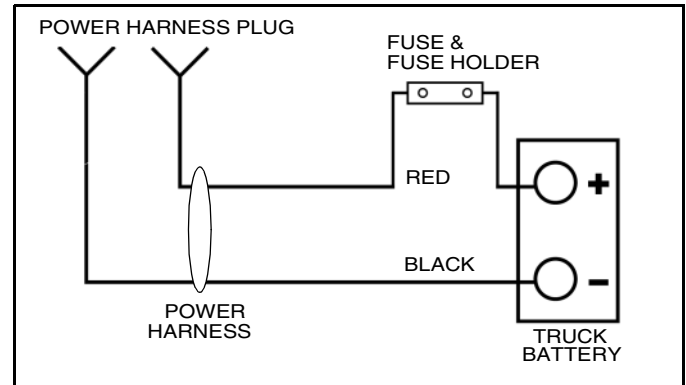


Figure 1-2

4. Attach the other end of one 2 ft. long power wire to the positive terminal on the battery.

5. Attach the power harness red wire to the other terminal of the fuse holder.

6. Place the fuse between the two studs and replace the nuts and cover.

7. Route power harness to convenient point on front of vehicle for connection to plow.

8. Attach the power harness black wire to the NEG. (-) terminal of the battery and re-connect the negative battery terminal.

9. Spray all terminal connections with a battery terminal protective coating.

10. Secure harness with plastic tie straps.

11. Install truck control harness if needed, using instructions included with controls.

12. Remove the main light harness from the power pack carton. Route the harness from the headlights to the front of the truck and through the grille or bumper. The ends with the green plugs go to the headlights and the ends with the black plugs go to the front of the truck.

13. Open the adapter harness bag, remove the harness and plug the proper adapters into the green plugs on the main harness. Connect the adapters to the truck wiring following the included instructions.

14. Secure the main harness and adapters. Make sure that the harnesses are not in contact with moving or hot engine parts.

15. Plug the male and female black plugs at the front of the truck together. These must be connected to allow the truck lights to operate.



WARNING

Failure to connect the main light harness on the truck when plow is not attached will cause truck lights to not operate, which could cause an accident.

FAILURE TO FOLLOW CAN RESULT IN INJURY OR DEATH.

16. Apply included dielectric grease to all connectors.

NOTE: An adapter is recommended for vehicles with a side post battery. (See Figure 1-3). (Adapters can be purchased from your Sno-Way dealer, Part #96100773.)

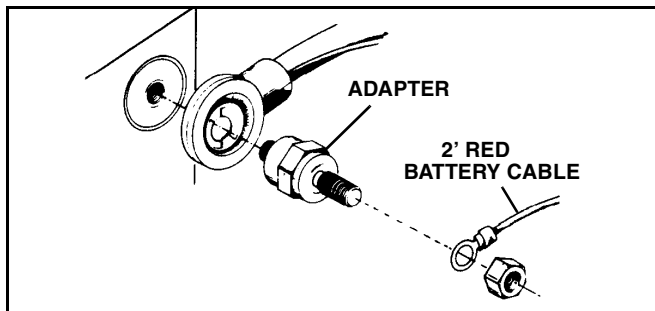


Figure 1-3

Mechanical Installation

Assemble Blades and Frame

1. Remove the A-frame/V-tower assembly from the box.
2. Position the left and right blade in front of the A-frame/V-tower assembly. (See Figure 1-4).

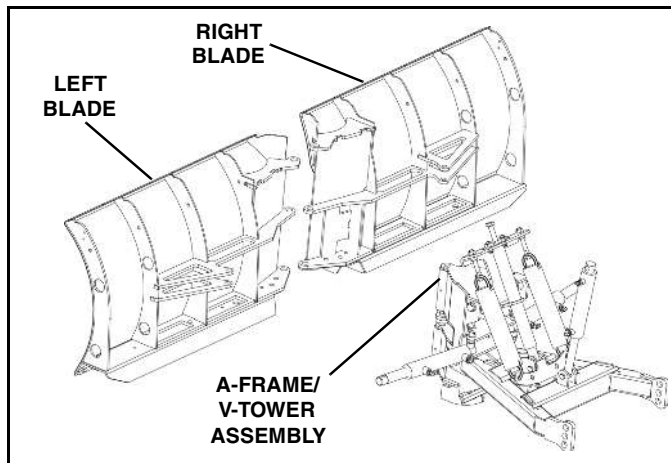


Figure 1-4

3. Insert two spacers (p/n 96112217) between the pivot point of both blade sections and the A-Frame assembly. (See Figure 1-5).

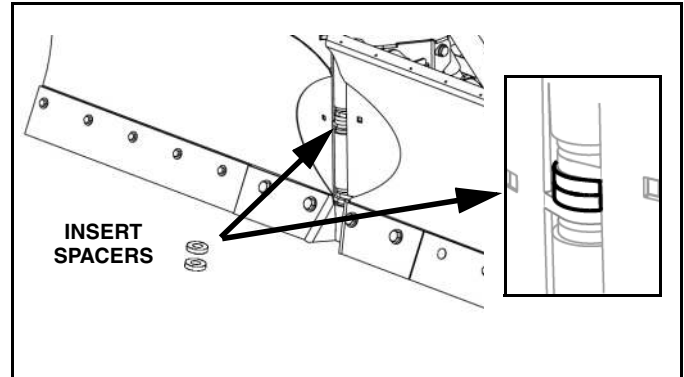


Figure 1-5

4. Coat clevis pin with grease and insert completely through the A-Frame and blade section pin holes. (See Figure 1-6).

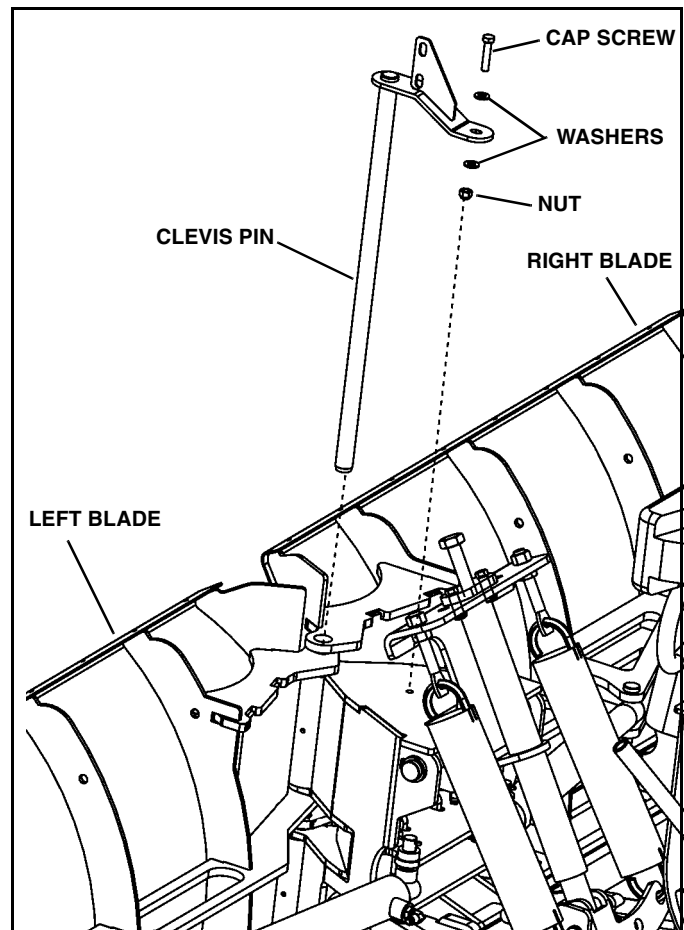


Figure 1-6

5. Secure the clevis pin to the A-Frame assembly with one 5/16-18 x 1-1/2" hex head cap screw, two 5/16" flat washers (p/n 98009024) and one 5/16" lock nut (p/n 98009150).

6. Install the center shield on the clevis pin retainer bracket, and secure with two 5/16-18 x 1" hex head cap screws (p/n 98009149), four 5/16" flat washers (p/n 98009024) and two 5/16" lock nuts (p/n 98009150). (See Figure 1-7).

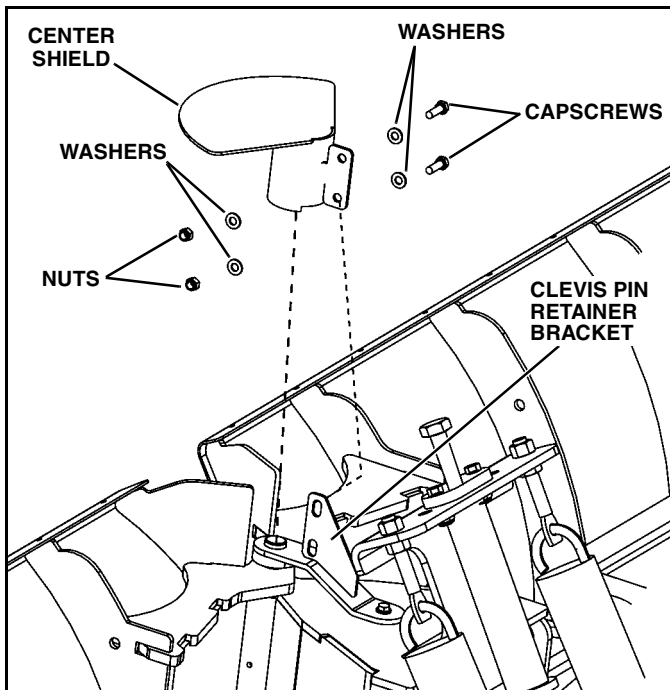


Figure 1-7

7. Lower each angle cylinder end, and attach angle cylinder to the each blade frame with 3/4" x 4" clevis pin (p/n 98100007) and 5/32" x 1-1/2" cotter pin (p/n 98009085). (See Figure 1-8). Repeat for opposite side.

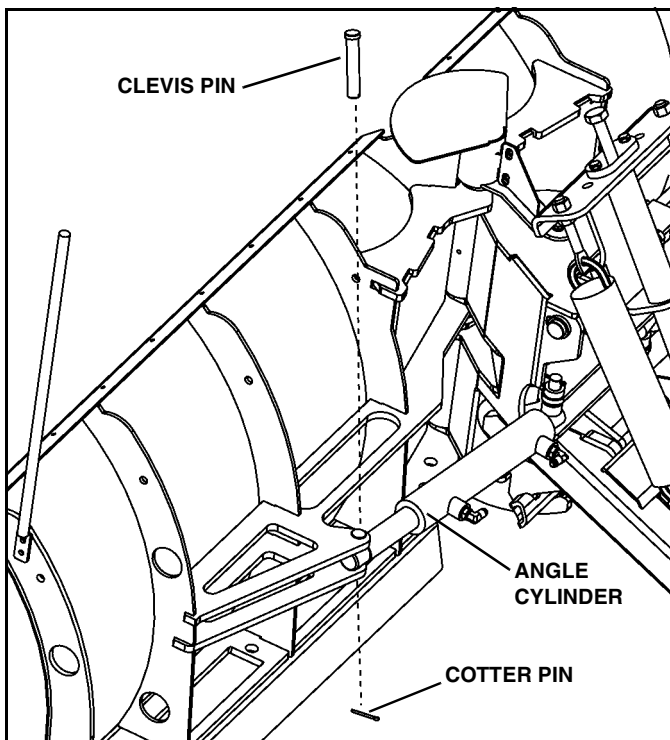


Figure 1-8

NOTE: For this next step, it is important that the surface be relatively flat and even. A concrete floor or paved surface is recommended.

8. With the truck parked on a flat level surface, measure and record the distance from the ground to the bottom of the Vehicle Receiver Member (VRM). (See Figure 1-9).

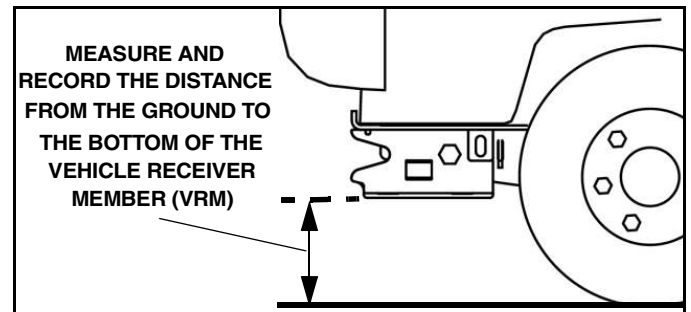


Figure 1-9

NOTE: The measurement will be between 8" and 11."

9. The measurement recorded above will be used to determine which A-Frame Adjust System (Patent pending) lug hole will be utilized when attaching the A-Frame to the Lower Light Lift Bar. If the measurement is:

- 8" to 9" proceed to Step 9a.
- 9" to 10" proceed to Step 9b.
- 10" to 11" proceed to Step 9c.

a. With a dimension of 8" to 9", the bottom A-Frame lug holes are used to connect the A-Frame to the Lower Light Lift Bar (LLL) frame. Insert the cap screw (from the outside) through the LLLB frame, spacer, A-Frame lug bottom hole and LLLB frame. Secure with nut. Position the Stacking Stop as shown and secure with two cap screws and nuts as shown. Repeat this step for the opposite side. (See Figure 1-10) Proceed to Step 10.

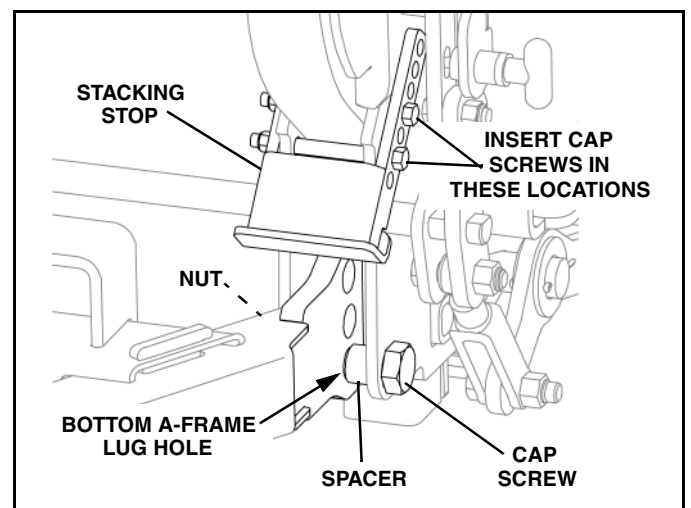


Figure 1-10

b. With a dimension of 9" to 10", the center lug holes are used to connect the A-Frame to the Lower Light Lift Bar (LLL) frame. Insert the cap screw (from the outside) through the LLLB frame, spacer, A-

Frame lug center hole and LLLB frame. Secure with nut. Position the Stacking Stop as shown and secure with two cap screws and nuts as shown. Repeat this step for the opposite side. (See Figure 1-11) Proceed to Step 10.

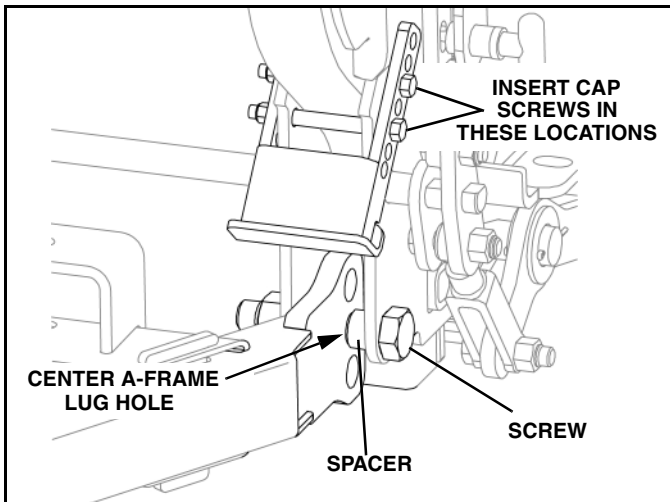


Figure 1-11

c. With a dimension of 10" to 11", the top lug holes are used to connect the A-Frame to the Lower Light Lift Bar (LLLB) frame. Insert the cap screw (from the outside) through the LLLB frame, spacer, A-Frame lug top hole and LLLB frame. Secure with nut. Position the Stacking Stop as shown and secure with two cap screws and nuts as shown. Repeat this step for the opposite side. (See Figure 1-12)

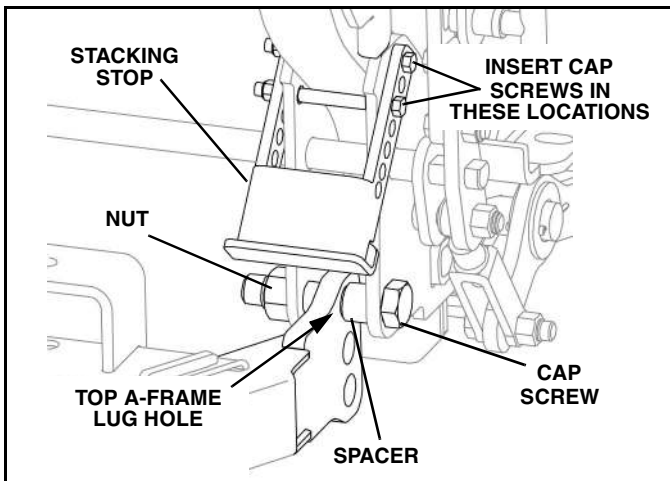


Figure 1-12

10. Remove four wing nuts and flat washers. Remove power unit cover. (See Figure 1-13).

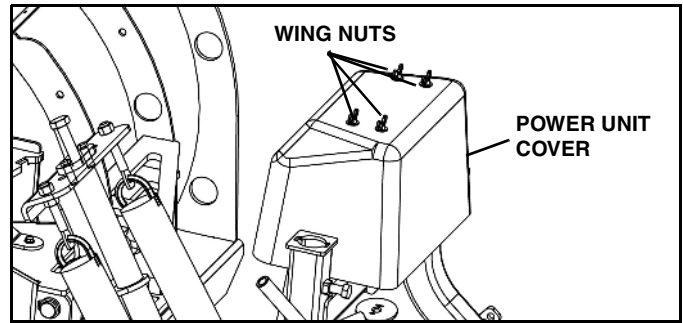


Figure 1-13

11. The A-frame lug hole location used will determine how the lift cylinder lower mounting bracket will be installed.

- If the bottom or middle lug hole was used, proceed to Step 12.
- If the top lug hole was used, proceed to Step 13.

12. The lift cylinder lower mounting bracket must be assembled to provide a lower connection point for the cylinder to the A-frame when the middle or bottom lug holes are used. (See Figure 1-14).

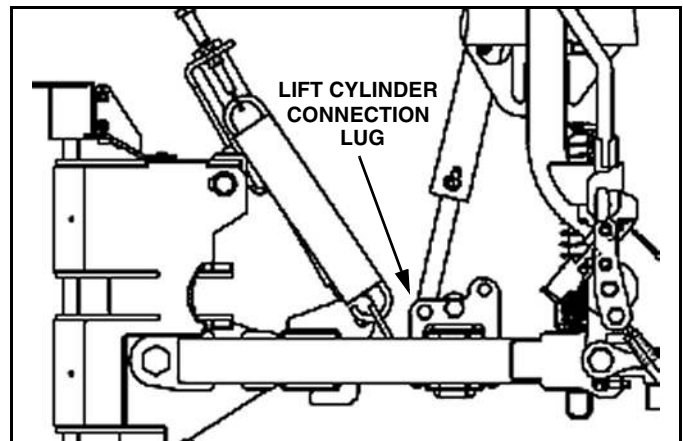


Figure 1-14

a. Position the mounting brackets on the A-frame crossmember with the raised tabs positioned toward the rear of the A-frame. (See Figure 1-15).

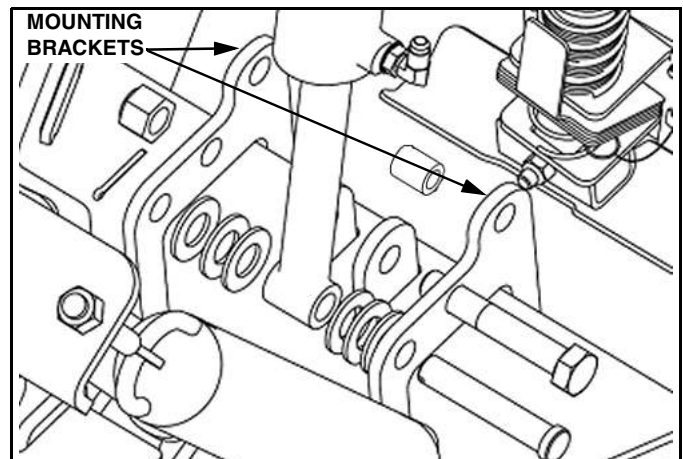


Figure 1-15

- b. Install the lift pin through the left bracket, three washers, lift cylinder rod, three washers and the right bracket. (See Figure 1-16).
- c. Install the 3/4 x 4.5" cap screw through the left lug, spacer and right lug. (See Figure 1-16).

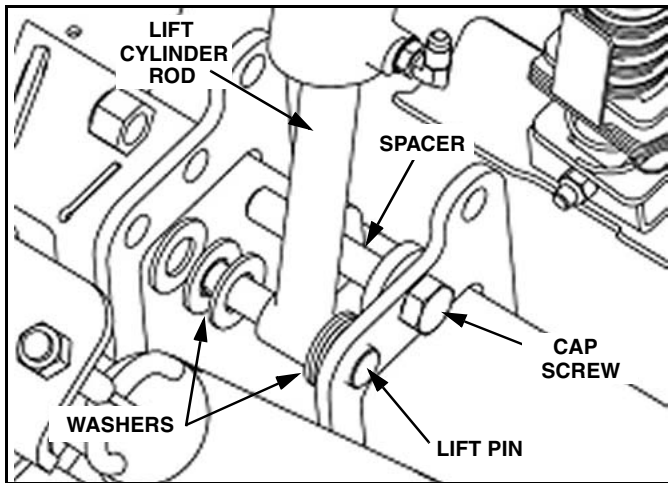


Figure 1-16

- d. Slide the brackets together. Secure the lift pin with a cotter pin and the cap screw with a 3/4" locknut. (See Figure 1-17).

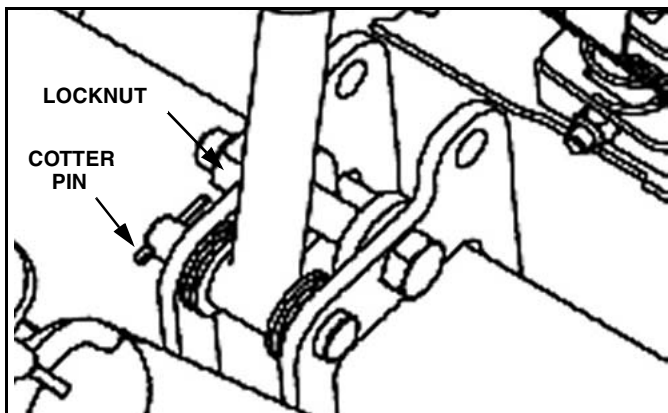


Figure 1-17

- e. Proceed to step 14.

- 13. The lift cylinder lower mounting bracket must be assembled to provide a higher connection point for the cylinder to the A-frame when the top lug hole is used. (See Figure 1-18).

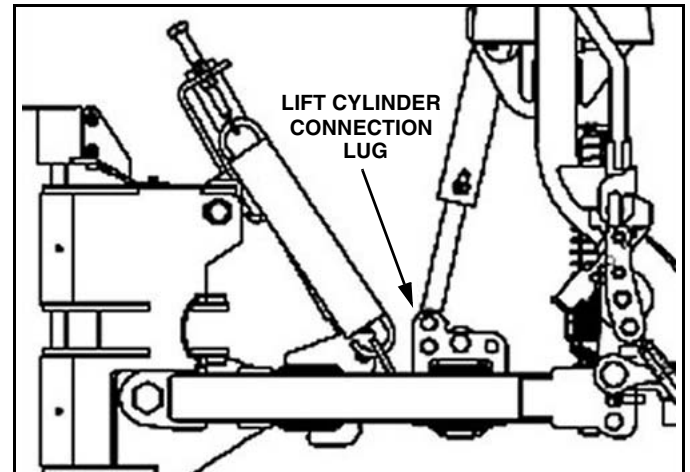


Figure 1-18

- a. Position the mounting brackets on the A-frame crossmember with the raised tabs positioned toward the front of the A-frame. (See Figure 1-19).

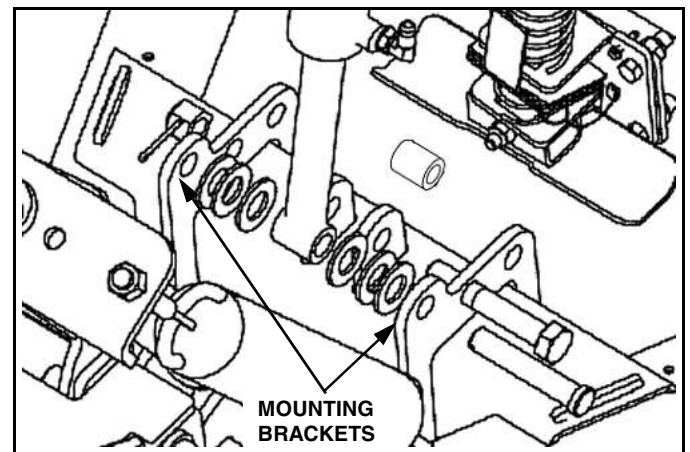


Figure 1-19

- b. Install the lift pin through the left bracket, three washers, lift cylinder rod, three washers and the right bracket. (See Figure 1-20).
- c. Install the 3/4 x 4.5" cap screw through the left lug, spacer and right lug. (See Figure 1-20).

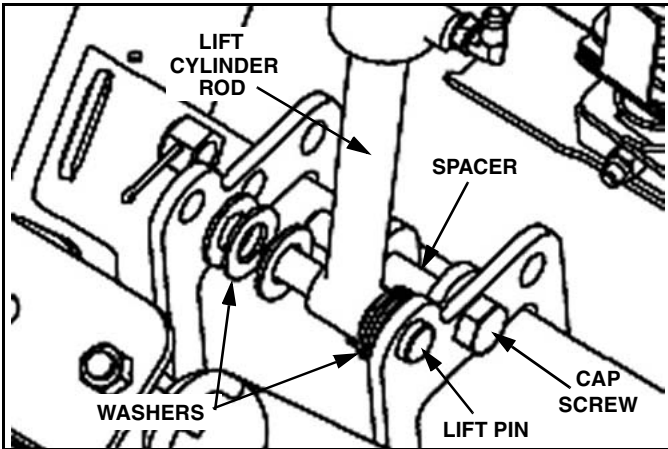


Figure 1-20

- d. Slide the brackets together. Secure the lift pin with a cotter pin and the cap screw with a 3/4" locknut. (See Figure 1-21).

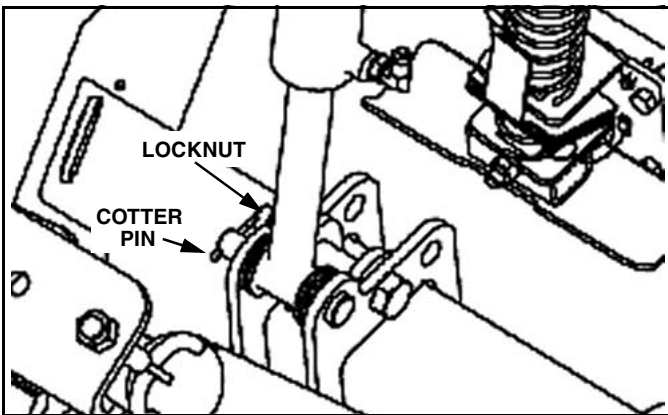


Figure 1-21

- 14. Flip lift cylinder up and secure to the light bar frame with a 3/4" clevis pin and cotter pin. (See Figure 22).

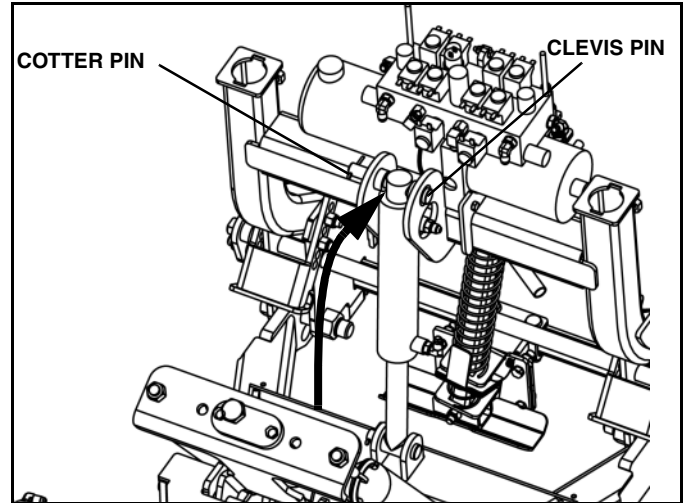


Figure 1-22

- 15. Connect hoses to the lift and swing cylinders. (See Figure 1-23).

NOTE: C1 through C6 references are ports on the valve that are marked accordingly. (See "HYDRAULIC SCHEMATIC" on page 37.)

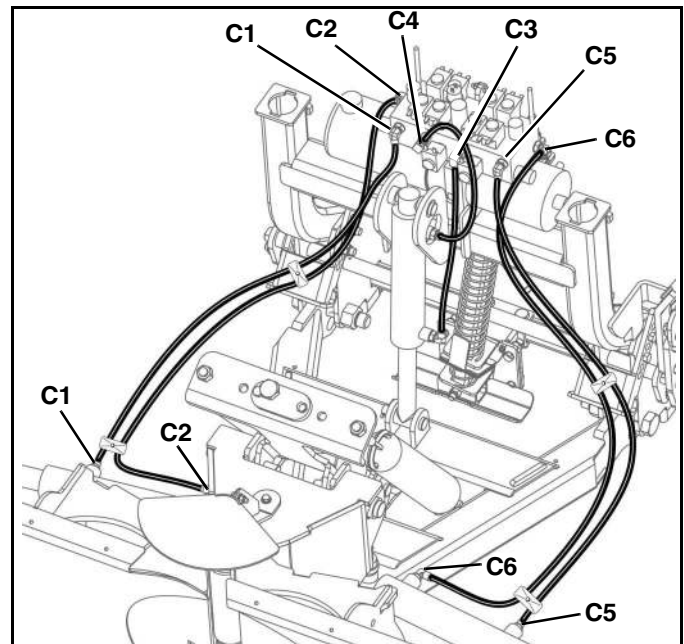


Figure 1-23

16. Secure the right hydraulic hose set with one Hose Clamp Kit (p/n 96112909) as follows (See Figure 1-24):

- Install a hose clamp set (A - 5/16 X 2" self-tapping screw, B - plate, C - clamp blocks) around the hydraulic hoses and secure to the right stacking stop bracket.

NOTE: The clamp set with hoses must be positioned at a 45° angle relative to the stop bracket as shown.

If installing screw with an impact wrench, ensure that the wrench is adjusted to its lowest torque setting to avoid fastener damage.

- Install a hose clamp set (D - 5/16 X 2.25" cap screw, B - plate, C - clamp blocks, B - plate and E - 5/16 locknut) around the hydraulic hoses close to the swing cylinder as shown.

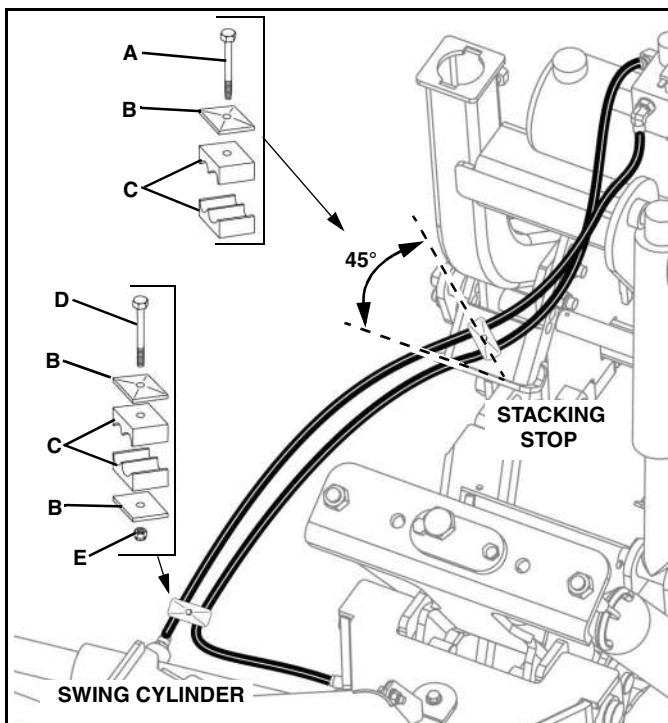


Figure 1-24

17. Secure the left hydraulic hose set with one Hose Clamp Kit (p/n 96112909) as follows (See Figure 1-25):

- Install a hose clamp set (A - 5/16 X 2" self-tapping screw, B - plate, C - clamp blocks) around the hydraulic hoses and secure to the left stacking stop bracket.

NOTE: The clamp set with hoses must be positioned at a 45° angle relative to the stop bracket as shown.

If installing screw with an impact wrench, ensure that the wrench is adjusted to its lowest torque setting to avoid fastener damage.

- Install a hose clamp set (D - 5/16 X 2.25" cap screw, B - plate, C - clamp blocks, B - plate and E - 5/16 locknut) around the hydraulic hoses close to the swing cylinder as shown.

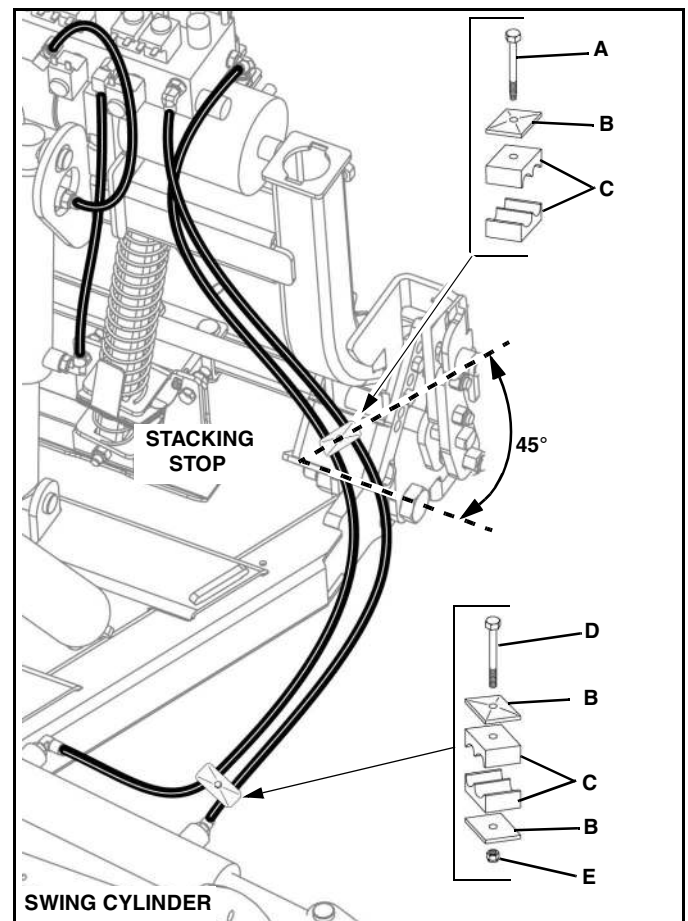


Figure 1-25

18. Install the ProControl™ Receiver Module mounting bracket to the Lower Light Lift Bar using two 1/4"-20 x 1" hex head cap screws and two 1/4"-20 lock nuts.

19. Referring to the ProControl™ Operating System Installation & Owner's Manual (p/n 97101382), install the complete Receiver Module and wiring system.

20. Install power unit cover and secure with four 5/16" flat washers and four 5/16"-18 wing nuts.

21. Install QuickJack™ foot assembly on bracket using four 1/2"-13 x 1-1/2" hex head cap screws and four 1/2"-13 lock nuts. (See Figure 1-26).

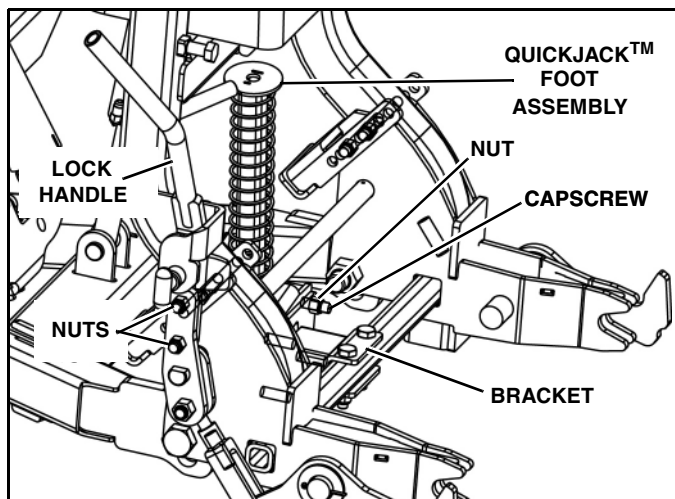


Figure 1-26

22. Install foot assembly with bracket to Lower Light Lift Bar using two 1/2"-13 x 3" hex head cap screws and two 1/2"-13 lock nuts. (See Figure 1-26).

23. Position the lock handle on the Lower Light Lift Bar linkage and secure with two 1/2"-13 x 1-3/4" cap screws and two 1/2"-13 lock nuts. (See Figure 1-26).

24. Raise the rear of the plow assembly, remove the QuickJack™ locking pin and push the handle down to fully lower the foot assembly. (See Figure 1-27).

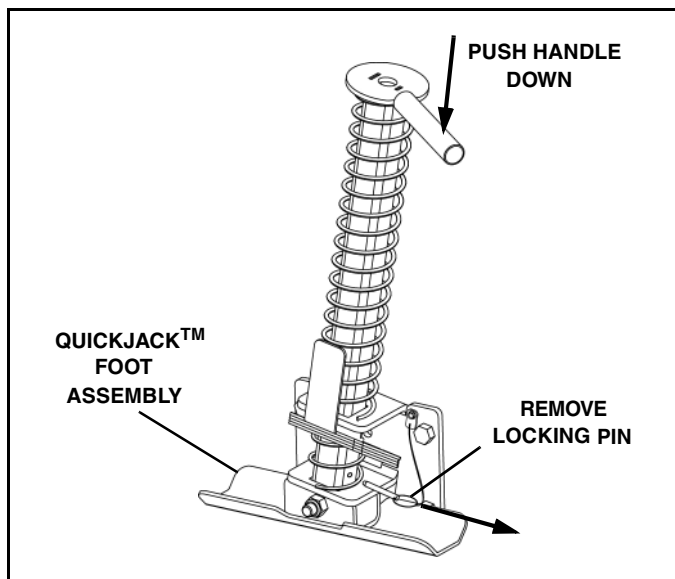


Figure 1-27

25. Release the lock handle safety pin and lower the lock handle fully. (See Figure 1-28)

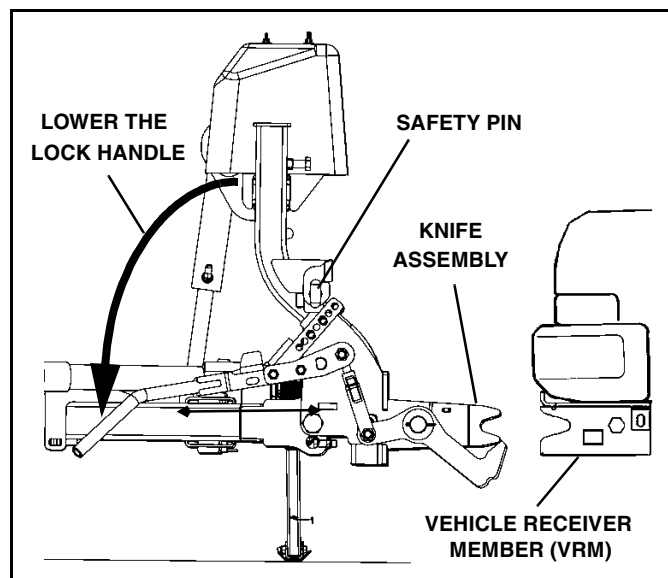


Figure 1-28

26. Fill power unit hydraulic reservoir (Use Sno-Way hydraulic oil only! See oil specifications section).

27. Drive truck up to plow and engage the plow knife assembly with the VRM on the truck. (See Figure 1-28)

28. Plug in main power to plow and lights.

29. Pull up engagement handle to engage plow onto stud on VRM, ensuring that the safety pin is fully engaged. (See Figure 1-29).

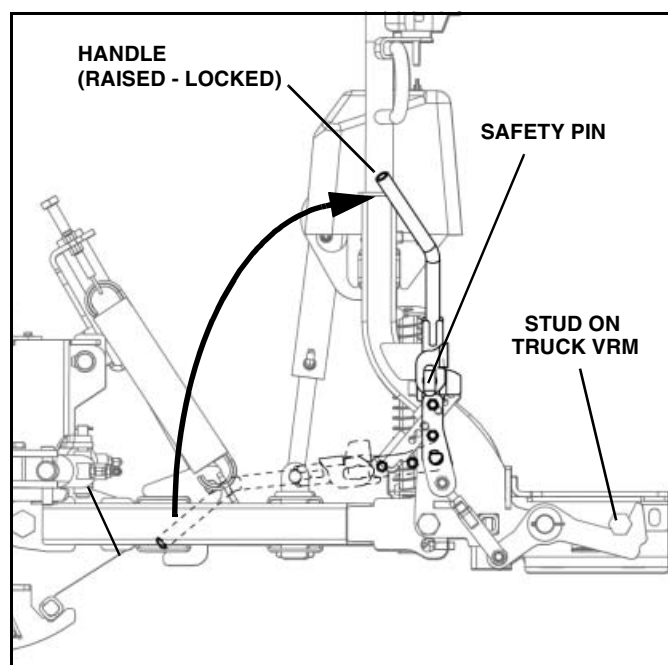


Figure 1-29

30. Raise QuickJack™ foot by pushing down on its release lever. Insert the locking pin in the QuickJack™ tube to prevent the jack from dropping during transport or plowing operations. (See Figure 1-30).

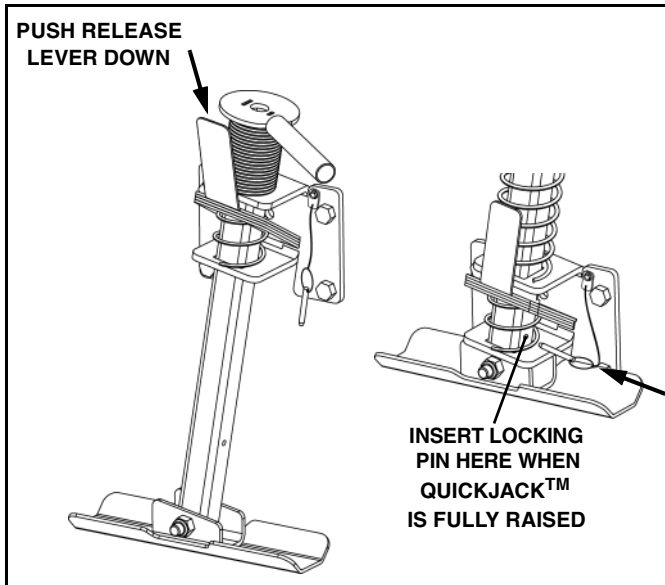


Figure 1-30

31. Cycle plow until it runs smoothly with no hesitation. Refill hydraulic oil reservoir to proper levels (See specifications section for fill limits; do not overfill).

32. This plow is equipped with the MaxAdjust™ System (Patent pending). Adjust capscrew as required to position center of moldboard at a 90° angle to the ground. (See Figure 1-31).

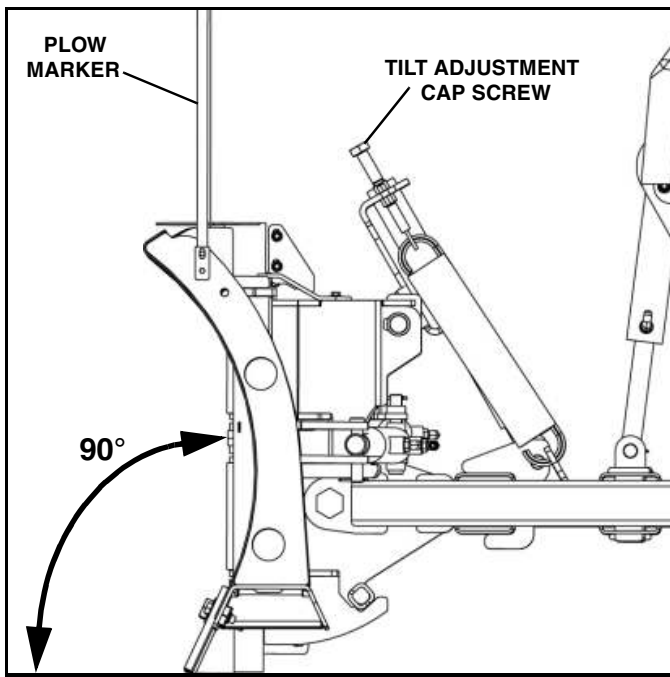


Figure 1-31

33. Attach a plow marker to each wing as shown and secure using 5/16 x1" cap screws and locknuts. (See Figure 1-31).

34. Remove upper light bar from container.

35. Attach lights onto upper light bar brackets with washers and nuts.

36. The height of the light bar is adjustable. Position light bar so that center of lights is 54" maximum off the ground when plow is on the ground. The lights should clear the plow when it is fully raised. (See Figure 1-32).

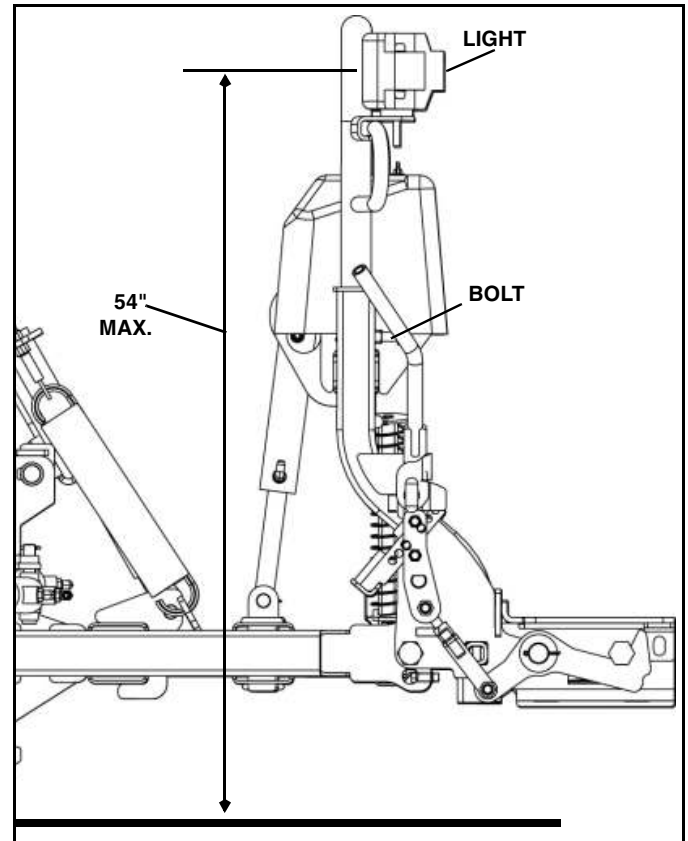


Figure 1-32

37. Tighten two light bar swage 5/8"-11 x 1-1/2" hex head cap screws to approximately 10 lb-ft. Do not overtighten, or it may significantly crush the tube.

38. Route light cables to back of power unit.

Mounting Snow Plow To Vehicle



WARNING

The power cable in front of the truck is wired directly to the battery. The power cable is always energized, even if the truck is turned off. Always replace the protective cap after disconnecting the plow power cable. Allowing an unprotected plug to contact metal parts of the truck may cause electrical component damage. Never use a metal object to clean the plug contacts.

FAILURE TO FOLLOW CAN RESULT IN INJURY OR DEATH



WARNING

When using the hand held controller to raise or lower the plow A-frame for mounting the plow to the vehicle, be especially careful of the movement of the light bar. This movement will occur when raising or lowering the A-frame or jack stand.

FAILURE TO FOLLOW CAN RESULT IN INJURY OR DEATH



WARNING

Pressing the blade angle functions will result in the A-frame swinging if it is not secured to the truck. Do not press the angle function during plow installation.

FAILURE TO FOLLOW CAN RESULT IN INJURY OR DEATH

1. Drive truck up to plow.
2. Plug in main power to plow and lights.

3. Pull up engagement handle to engage plow onto stud on VRM, ensuring that the safety pin is fully engaged. (See Figure 1-33).

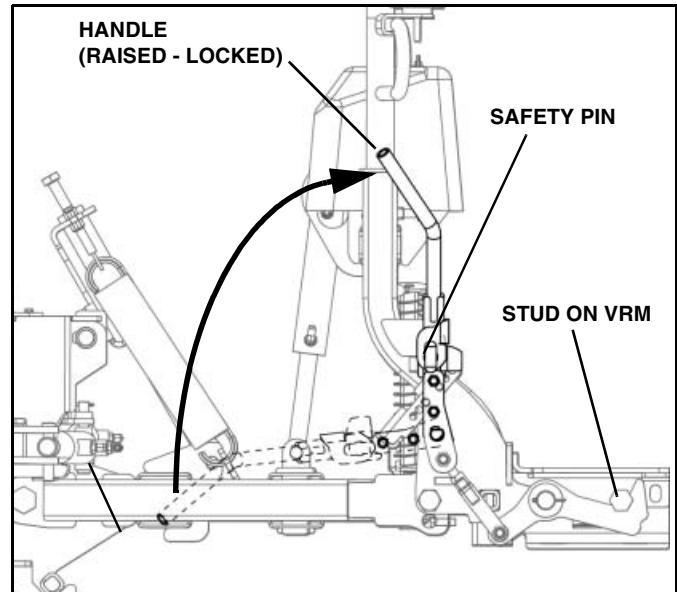


Figure 1-33

4. Raise QuickJack™ foot by pushing down on its release lever. Insert the locking pin in the QuickJack™ tube to prevent the jack from dropping during transport or plowing operations. (See Figure 1-34).

NOTE: Two operating conditions may result in the jack locking plates becoming "set" or "jammed" on the foot support tube.

- *If the foot is extended while the plow is in a raised position, and the plow is subsequently lowered, the plates may "set."*
- *If the plow is raised while the foot is extended, the plates may "set."*

If the jack locking plates become "set" put plow in down-pressure to relieve pressure on foot. The foot will then release freely.

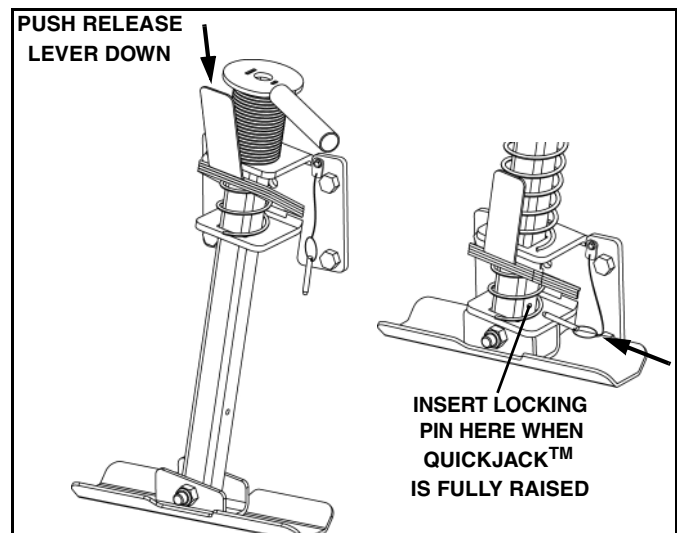


Figure 1-34

Mounting Plow with Retracted QuickJack™ Foot

Should the foot be released while the plow is not mounted, the Down Pressure function can be used to position the plow for attachment to the truck as follows:

1. Drive truck up to plow and plug in the main power connector.
2. Using Down Pressure™, extend the cylinder (lower the plow) until the lift cylinder is fully extended. Lower the foot. (See Figure 1-35).

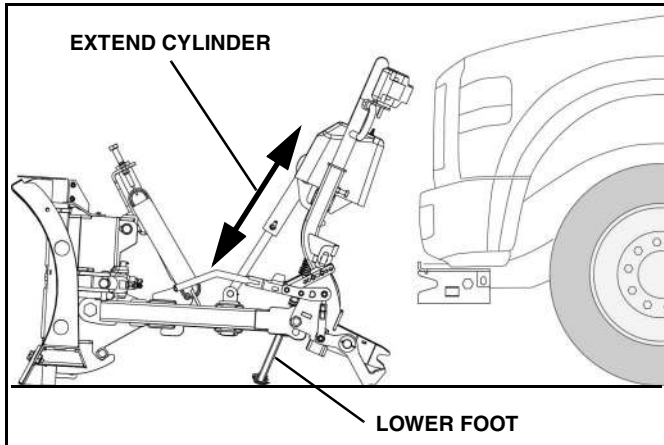


Figure 1-35

3. Retract the lift cylinder (raise the plow) until the A-Frame contacts the stacking stop. (See Figure 1-36).

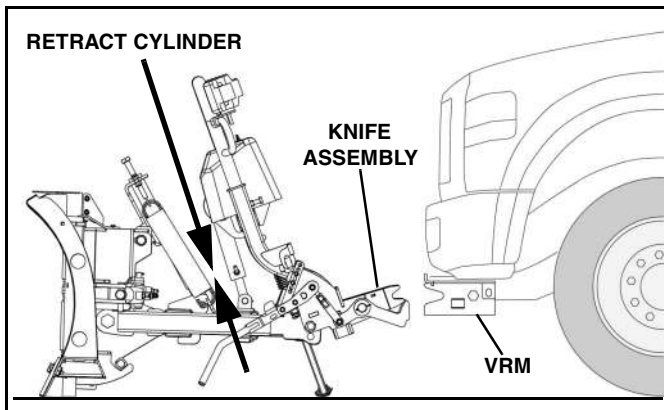


Figure 1-36

4. Drive truck in to the plow slowly, and use Down Pressure™ as required to horizontally align the plow knife assembly with Vehicle Receiver Member (VRM).
5. Once mounted, raise and lock the engagement handle, release the foot, insert the foot locking pin and connect the lighting harness.

Light Connection Procedures



CAUTION

Many new vehicles are equipped with onboard circuit sensors designed to display a dashboard LED when a headlight fails. Generally, these sensors are activated or tripped any time the circuit is being called upon to function while the headlight circuit is incomplete. This means that if a headlight fails while the headlight is in operation, the sensor will trip and the dashboard indicator will light up. It also means that if a headlamp socket is left empty—or a faulty lamp is installed—and the circuit is then activated, the sensor will trip and the dashboard indicator will light up.

These headlight circuit sensors are often engineered with pre-designated failure limits. This means that a sensor may be tripped a limited number of times. After that limit is reached the sensor may need to be reset by the dealer or replaced by the manufacturer.

Sno-Way EIS® (Energy Interruption System™) plow light systems essentially operate through a planned interruption of the headlight circuit. When the truck-side connectors are detached from one another, the vehicle headlamps are disconnected from the truck circuits which otherwise power them. Until those truck-side connectors are attached to the plow-side light connectors, the truck-side circuits are open. This means that if the truck's onboard sensors are active while the plow lights are being attached to the truck, the truck's sensors may trip.



CAUTION

To avoid unnecessarily tripping the truck's sensor, every time the plow lights are being attached to the truck circuits or the truck circuits are being reattached to the vehicle lights, the truck's lights should be turned off.

Due to the aforementioned concerns, operators of vehicles equipped with EIS[®] (Energy Interruption System) lights should make themselves aware of whatever circuit sensors may be installed on their vehicles. Operators should further become familiar with their vehicle manufacturer's description of how their truck's sensors are actuated or tripped. Finally operators should know whether predesignated failure limits may be engineered into their truck's sensors and what repair or replacement procedures are recommended should those limits be reached. Currently, the vehicle models affected are as follows:

2006 and later-Dodge Dakota and Durango - All packages.

2006 and later-Dodge 1500, 2500 and 3500- All packages.

2008 Ford F250-F550 - All packages.

The EIS[®] Energy Interruption System is the latest revolution in plow lighting. The relay and module-free design simplifies the installation and durability of the lighting system.

1. Unplug EIS[®] light harness connectors on truck, and disconnect plow light connectors, which had been plugged together for corrosion protection during storage. (See Figure 1-37).

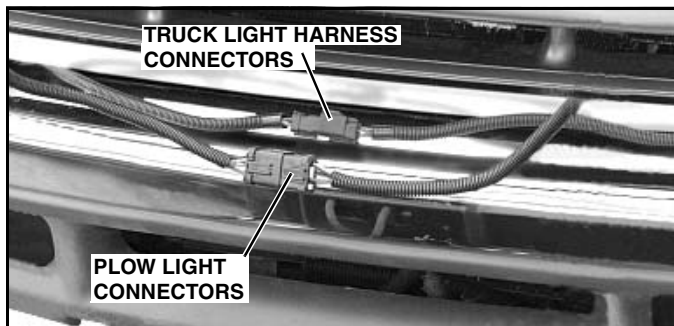


Figure 1-37

2. Plug EIS[®] plow light connectors into mating connectors on truck light harness. (See Figure 1-38).

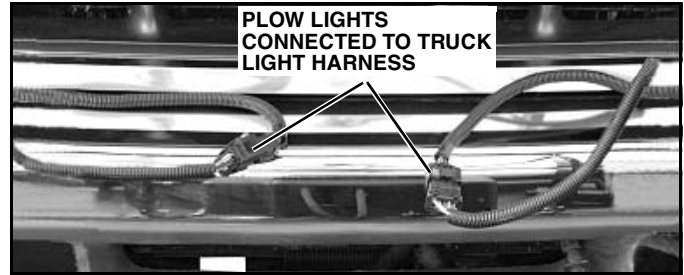


Figure 1-38



WARNING

Failure to properly connect plow lights to vehicle light harness will prevent plow lights from functioning. Follow proper procedure to connect light harnesses and test lights before operating.

FAILURE TO FOLLOW CAN RESULT IN INJURY OR DEATH

3. Plug control harness on plow into truck. Plug plow control inside truck cab.

4. Raise, lower and angle plow to make sure no hoses or wires pinch in the plow mechanism.



WARNING

When using the hand held controller to raise or lower the plow A-frame for mounting the plow to the vehicle, be especially careful of the movement of the light bar. This movement will occur when raising or lowering the A-frame or jack stand.

FAILURE TO FOLLOW CAN RESULT IN INJURY OR DEATH



WARNING

Pressing the blade angle functions will result in the A-frame swinging if it is not secured to the truck. Do not press the angle function during plow installation.

**FAILURE TO FOLLOW CAN RESULT IN INJURY
OR DEATH**



WARNING

The power cable in front of the truck is wired directly to the battery. The power cable is always energized, even if the truck is turned off. Always replace the protective cap after disconnecting the plow power cable. Allowing an unprotected plug to contact metal parts of the truck may cause electrical component damage. Never use a metal object to clean the plug contacts.

**FAILURE TO FOLLOW CAN RESULT IN INJURY
OR DEATH**

Removing Snow Plow From Vehicle

Choose a location for the plow storage, which will allow the plow to be removed from the vehicle and not be moved after removal. Also, choose a location that will not allow the plow stand to sink into the ground. A dry, protected area is recommended.

The basic procedure is as follows:

- Lower plow to ground.
- Unplug plow lights and plug truck light harness together.
- Unplug main power harness.
- Remove QuickJack™ locking pin and push foot handle down.
- Move plow locking handle to release position (Forward).
- Back truck away.

NOTE: These same steps are illustrated below:

1. Lower plow to the ground, put vehicle in park, turn off the engine and set the parking brake.

2. Disconnect the plow lights from the truck light harness. (See Figure 1-39). Disconnect the plow control harness and replace the protective cap.

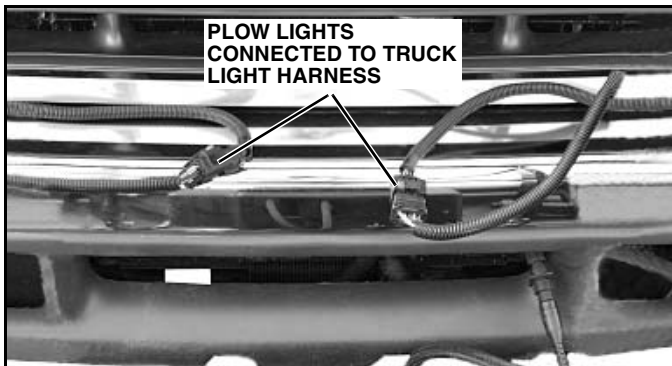


Figure 1-39

3. To prevent corrosion on the contacts, plug the male and female connectors on the plow together.

4. To make the truck lights operable, plug the male and female EIS® connectors on the truck light harness together (See Figure 1-40).

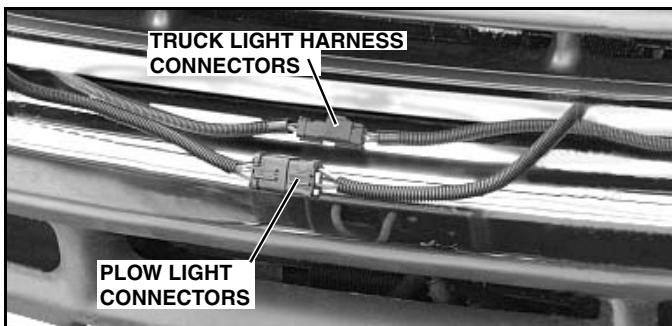


Figure 1-40

WARNING

Failure to reconnect the main light harness on the truck when removing plow will cause truck lights to not operate, which could cause an accident. Test lights before operating.

FAILURE TO FOLLOW CAN RESULT IN INJURY OR DEATH

5. Disconnect power harness and replace protective caps.

6. Remove the QuickJack™ locking pin and push the jackstand handle down to fully lower the foot to the ground. (See Figure 1-41).

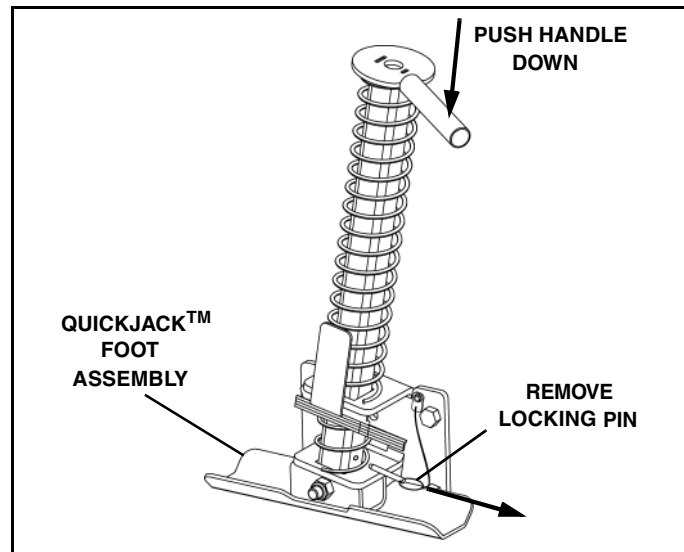


Figure 1-41

7. Pull safety pin on engagement handle to release and lower handle to disengage plow from truck. (See Figure 1-42).

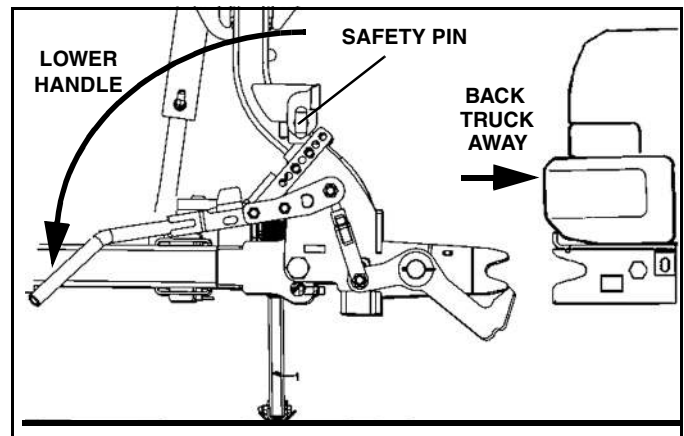


Figure 1-42

8. Back truck away from plow. (See Figure 1-42).

Plow Storage

1. If the plow will not be stored on a firm surface (i.e. concrete or asphalt), place a board or piece of plywood, etc. under the jackstand to prevent the jackstand foot from sinking into the ground.

2. To avoid corrosion during storage, coat the exposed (chrome) portion of the lift and angle cylinders with a light grease.

3. Grease all pivot points.

4. Top off hydraulic reservoir to minimize trapped air.

5. Make sure that protective caps are on all electrical connections. Apply a small amount of dielectric grease to ensure a moisture proof seal on the caps.

6. Check and replace any worn and/or damaged component, such as cutting edges or deflectors. Performing preventative maintenance tasks in the spring when plow is stored will ensure that you will be ready to plow in the fall.

MAINTENANCE

General



WARNING

Before servicing plow, lower plow to ground and disconnect main power harness.

FAILURE TO HEED CAN RESULT IN INJURY OR DEATH.

- Before operating, perform a thorough visual inspection of the equipment. Look for fluid leaks, cracked, bent or broken components, loose nuts, bolts or attachments and proper fluid levels.
- A clean hydraulic system is essential to long pump life and proper performance.
- When adding oil to the reservoir, wipe the area around the filler port clean before removing the breather cap. Use clean oil and a clean funnel, (DO NOT use a cloth or rag to strain the oil).

IMPORTANT: Hydraulic unit comes from factory charged with Sno-Way oil. If additional oil is added it must be compatible with Sno-Way oil. If another type of oil has been used in the system the same type of oil must be used for topping off system. Improper hydraulic fluid can cause operating problems in cold weather.

- Do **NOT** use synthetic oil.
- Oil must contain an anti-foam additive.
- The operational environment for snow plows is an extremely harsh and corrosive one.
- Ensure all electrical connections are clean and tight.
- To prevent rust from forming, clean and repaint exposed metal surfaces.
- **NEVER** operate the equipment with the protective covers or guards removed.

Periodic Inspection

After approximately every 20 hours of operation perform the following inspections procedures:

1. Inspect the plow assembly including the sub-frame assembly for any damage or excessive wear. Replace parts as necessary.
2. Inspect all fasteners to insure that they are properly tightened. If any fasteners are loose re-tighten to the proper torque (Refer to the Torque Specification Chart in this manual).

3. Apply a small amount of light oil to the hitch pins and pivots, to pivot pins between the center blade assembly and the intermediate pivot assembly, between lift and swing cylinder pivot pins and the lift linkage pivots. (See Figure 1-43).

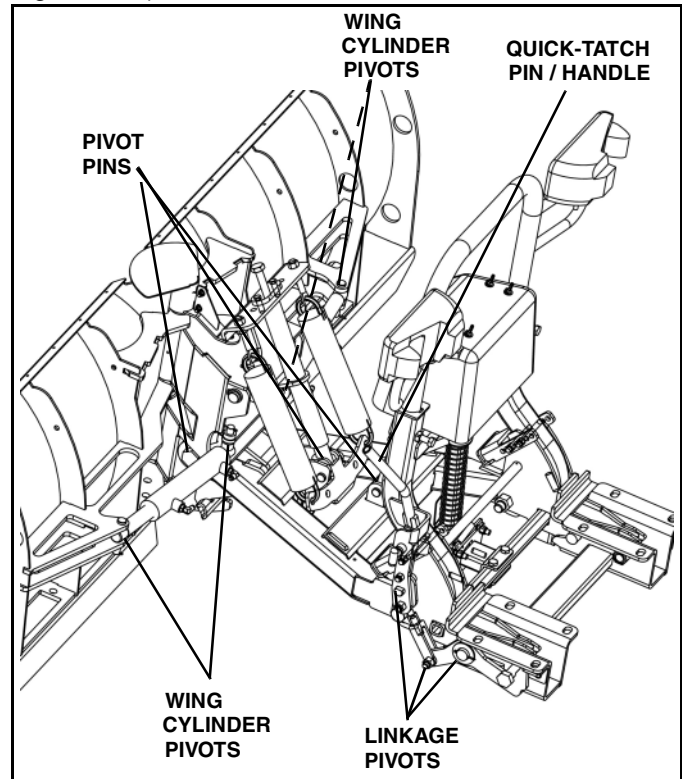


Figure 1-43

4. Apply oil or grease to the wing pivot pin through two lubrication holes provided in the pin housing. (See Figure 1-44).

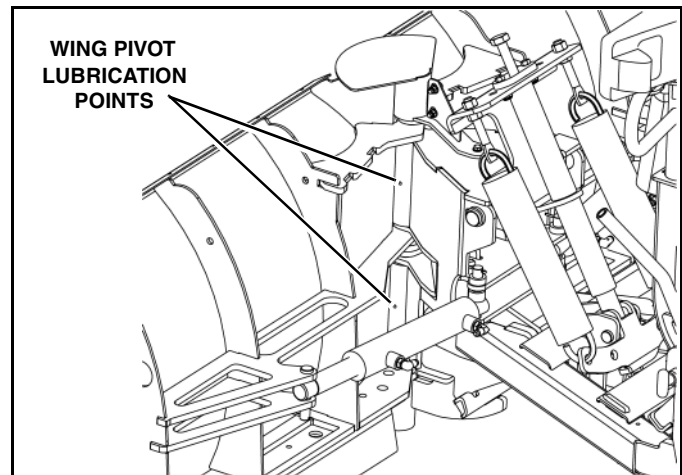


Figure 1-44

Special Fasteners Torques and Requirements

IMPORTANT: Incorrectly securing fasteners may result in incorrect operation, excessive wear, and early failure of plow components. It may also void your warranty.

- **ALWAYS** check to make sure you are using the correct torque specification for the fastener you are using.

- **DO NOT** use any lubricants on the threads of any fastener unless specifically called for in the assembly or maintenance story for that component.

- **NEVER** use liquid locking materials, such as Loctite™ or Threadmaker™, on any fasteners unless specifically called for in an assembly or maintenance story for that component.

Standard Fasteners:

The Torque Specifications Chart on page 41 of this manual should be used as the guide for fastener torque requirements for most standard fasteners used on the plow.

Standard fasteners with special torque requirements will be noted in assembly or service stories pertaining to the specific piece of equipment.

Hydraulic Fittings:

Hydraulic fittings with lock nuts should be assembled with at least three full turns of the fitting in the port and then the lock nut should be tightened to 27 lb-ft.

Hydraulic fittings with 37 degree flare end swivels should be torqued to 18-20 lb-ft.

Hydraulic Cylinders

To avoid corrosion during storage, coat the exposed (chrome) portion of the lift and angle cylinders with a light grease.

Electrical Quick Disconnect Plugs

This plow is equipped with the EIS® (Energy Interruption System™). Any time the plow is removed from the vehicle, plug the electrical lighting quick disconnect ends together to prevent corrosion from forming on terminal ends.

Fluid Requirements

IMPORTANT: Hydraulic unit comes from factory filled with Sno-Way oil. If additional oil is added it must be compatible with Sno-Way oil.

It is recommended that the fluid in the hydraulic system be changed once a season.

Do NOT use synthetic oil.

Oil must contain an anti-foam additive.



CAUTION

- **Using the proper oil increases the life expectancy of the most critical part of your plow; the Hydraulic power unit.**
- **Failure to use the proper oil can cause extensive damage to the power unit, seals and hydraulic rams.**
- **Improper oil can cause operating problems and poor performance in cold weather.**

Changing Oil and Cleaning Filter Screen



CAUTION

Using the proper oil increases the life expectancy of the most critical part of your unit; the Hydraulic power unit.

NOTE: We recommend cleaning the filter screen at every oil change, this will help ensure maximum life and maximum performance from the pump assembly.



WARNING

- Allow the system to cool down before draining oil or handling system components. Serious burns can result from contact with hot oil.
- Never disconnect any hydraulic line or fitting with the unit in the raised position. Always lower the unit and relieve pressure before removing any lines or caps.

FAILURE TO HEED CAN RESULT IN INJURY OR DEATH.

1. Lower plow assembly to ground, put vehicle in park and turn off engine. Turn hand-held controller off.



WARNING

Ensure engine is OFF and set parking brake before working on plow. Vehicle movement, equipment failure or inadvertent operation of the control switches during maintenance could result in serious injury

FAILURE TO HEED CAN RESULT IN INJURY OR DEATH.

2. To prevent inadvertent short circuit or electrical shock, disconnect the power harness and control harness at the vehicle bumper.

3. Remove four wing nuts and four flat washers from the cover. Remove the cover. (See Figure 1-45).

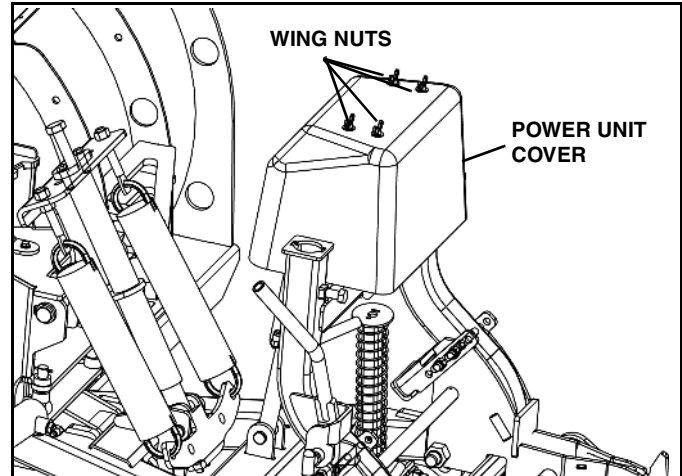


Figure 1-45

4. Remove the filler/breather cap from the reservoir. (See Figure 1-46).

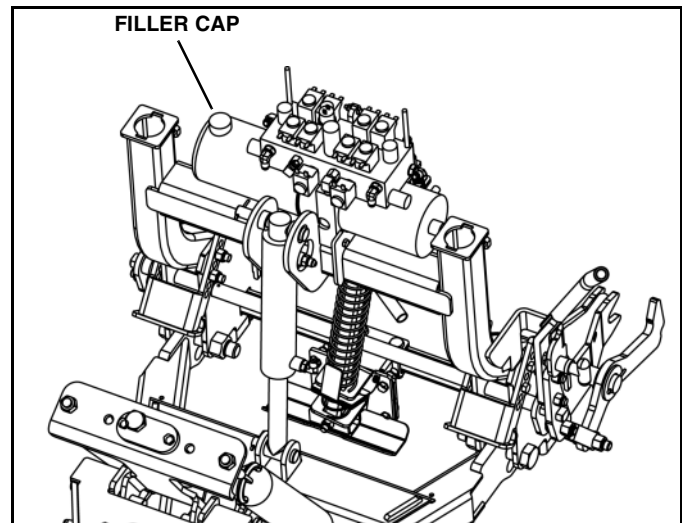


Figure 1-46

5. Using an oil suction gun or similar tool, remove the oil from the oil reservoir.

NOTE: Be careful to avoid contacting and damaging the filter screen while removing the oil.

6. Remove the lift cylinder hose(s) from the valve block. Remove the swing cylinder hoses from the fitting in the valve block. Mark hoses before removal to be certain they are reinstalled in the correct location.

7. Place the hoses in a container to catch oil expelled from cylinders. Cycle the lift cylinder by disconnecting hitch pins and pushing and pulling on light bar. Cycle swing cylinders by disconnecting from swing frame and pushing and pulling on cylinder rod.

8. Loosen the clamp securing the oil reservoir to the pump assembly and remove the oil reservoir being careful not to damage the filter screen while removing the oil reservoir. (See Figure 1-47).

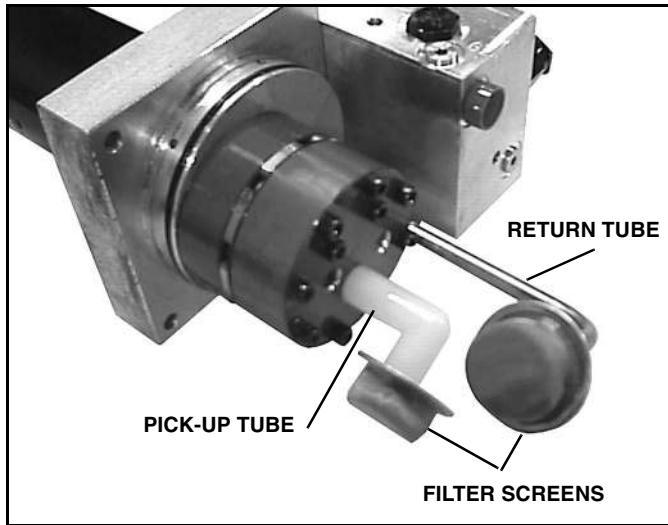


Figure 1-47

9. Pull the filter screens off the return and suction tubes (hold it by the metal cover, not by the screen) and clean with a suitable solvent. Blow dry with low pressure compressed air from the inside.

10. Carefully reinstall the filter screens.

11. Visually check that the pickup tube and filter face down. (See Figure 1-4). If not, rotate the pickup tube until the tube and filter face down.

12. Clean the oil reservoir inside and out with a suitable solvent.

13. Inspect the O-ring seal for damage, replace if needed, lubricate with fresh oil and reinstall reservoir carefully to avoid damaging the O-ring.

14. Reconnect hydraulic fittings and hoses in their correct position and torque to 20-25 lb-ft. If unit utilizes O-ring and jam nut type connectors tighten jam nut to 15-20 lb-ft.



CAUTION

Do Not use Teflon® tape or pipe compound on hydraulic fittings. These can dislodge and jam valves in the hydraulic system.

15. Fill the hydraulic oil reservoir until the fluid level registers full on oil level mark on oil reservoir.

NOTE: Vehicle must be parked on level ground, Plow must be in the lowered position, and Wings must be folded rearward ("V") in order to properly check the oil level. Checking oil level with plow elevated or with wings straight or folded forward will give wrong reading.

16. Refer to plow operation instructions and operate the plow to purge all air from the hydraulic system.

17. Replenish the fluid in the reservoir until the fluid level registers full on oil level mark on oil reservoir.

18. Operate system and check for leaks, repair or tighten as necessary.

19. Replace the cover, and secure with (4) wing nuts.

Cutting Edge Replacement

This plow is equipped with a Cutting Edge Nut Holder (retaining plate system - patent pending) used to secure the wear strips to the plow blades. The nuts are held in place, so it is not necessary to hold them with a wrench as the cap screws are being removed.

NOTE: Cutting edge must be replaced when it is worn to the bottom edge of the frame.

1. With the Down Pressure™ Hydraulic System OFF, lower plow to ground.
2. Remove all existing cutting edge bolts, allowing the nuts to drop to the ground.
3. Staying clear of the blade and loose cutting edge, raise the plow 8" from the ground. Discard the worn cutting edge.
4. Place a jack stand under both ends of the blade bottom rail.
5. With the Down Pressure™ Hydraulic System OFF, lower plow until firmly resting on jack stands.
6. Position new cutting edge up to bottom rail.
7. Insert and hand tighten one cap screw with nut in either end of the of the cutting edge. (See Figure 1-48).

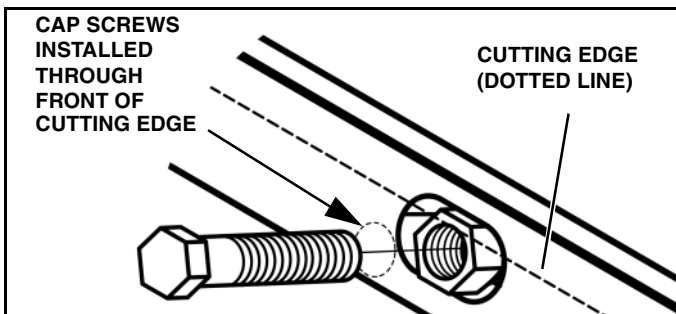


Figure 1-48

8. Insert and hand tighten one cap screw with nut on the opposite end of the cutting edge.
9. Start remaining cap screws in nuts (two thread engagement minimum).
10. Beginning on either side, tighten all cap screws securely.

Plow Shoe Adjustment

This plow is equipped with the ability to utilize four (4) plow shoes. Two plow shoes are located at the outboard end of each wing. The two inner plow shoes are located inboard on the wing underneath the cylinder mounting area.

To ensure the best function of this snow plow, it is a requirement that all four plow shoes be used at ALL times.



WARNING

Keep hands and feet clear of wings and center section when setting blocking and lowering plow. Moving or falling assemblies could result in serious injury.

FAILURE TO HEED CAN RESULT IN INJURY OR DEATH.

Adjust the plow shoes as follows:

1. Raise plow to full up position.
2. Support blade with a jack.
3. Turn vehicle ignition switch and plow control OFF and apply emergency brake.
4. Adjust shoe assemblies by removing shoe mounting lynch pin and adding or subtracting washers on the top or bottom of the shoe-mounting bracket. (See Figure 1-49)

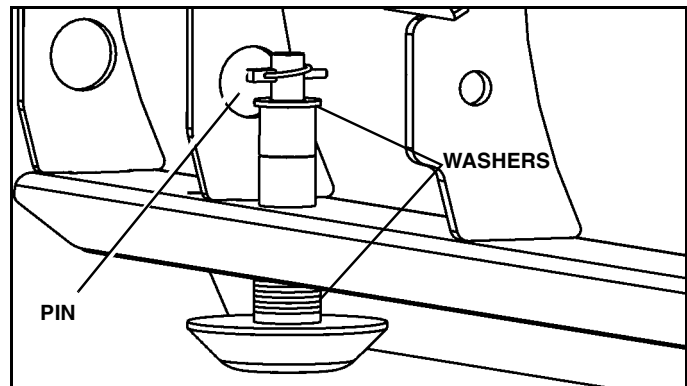


Figure 1-49

5. After the disk shoe position is properly adjusted place washer on the shoe stem - above the disk shoe mounting bracket and below the retaining lynch pin - to remove all up and down movement of the disk shoe in the bracket. Failure to do so will result in excessive wear of the holes in mounting bracket or bending of the disk shoe stem.

IMPORTANT: Snap lynch pin ring over so that it contacts the pin. If ring does not contact lynch pin, rotate the pin and reverse the direction of the ring. If the ring does not contact the pin it is not locked and could fall out.

Trip Spring Adjustment

See "Mechanical Installation" on page 5.

Emergency Plow Transport

If your snowplow becomes inoperable for any reason, follow the instructions below to raise the plow for transport to your nearest Sno-Way Dealer.

- Move truck to level hard ground.
- Place a jack under the swing frame as close to the A-frame as possible.
- Raise jack until the A-frame is at approximately 30 degrees with the ground.
- Make sure the plow and jack are stable. Place a jack stand or wood blocking under the plow frame to prevent the plow from suddenly dropping.



WARNING

Failure to place a jack stand under the plow could result in the plow rapidly falling.

FAILURE TO FOLLOW CAN RESULT IN INJURY OR DEATH

- Install strap or chain, securing the upper spring frame to main lift bar on Lower Light Lift Bar. (See illustrated "RAISE PLOW" procedure that follows.)
- Remove jack and jack stand or other blocking.
- Drive to your nearest Sno-Way dealer for service.

To Raise Plow:

In advent of plow malfunction, the plow may be raised without power and retained in the UP position using straps mounted on the light tower lift bar and the upper spring frame. (See Figure 1-50).

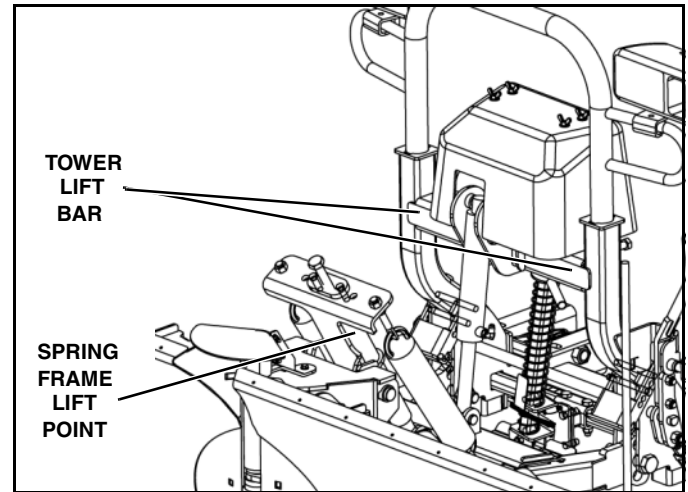


Figure 1-50

1. Disconnect all power to the plow. Because hydraulic functions will not be possible (and are not recommended when lifting manually up on plow). Loosen the top cylinder lift hose to relieve hydraulic lift resistance. Then jack up plow accordingly.

2. To lift plow, position jack under A-frame and angle up to a minimum of 30 degrees (or up to the lift stops). (See Figure 1-51).

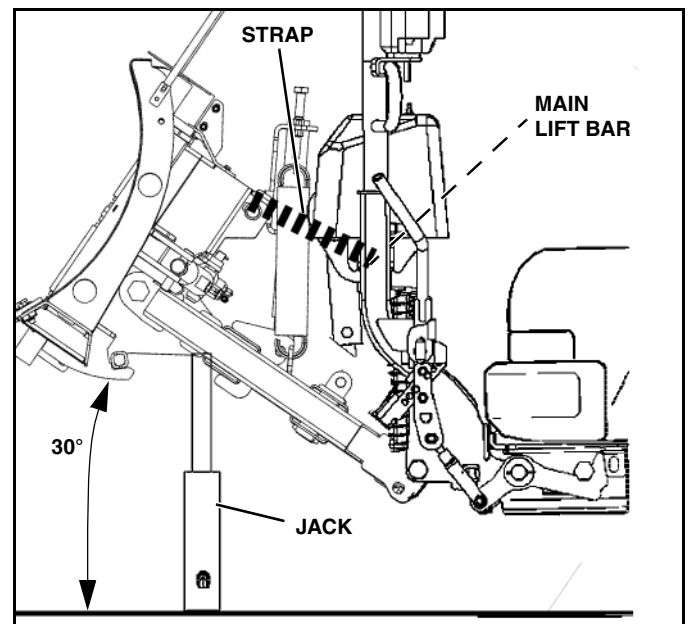


Figure 1-51

3. Put strap around upper spring frame and around the main lift bar on the Lower Light Lift Bar.

4. Remove jack after strap has been tightened.

To Release Lifted Plow:

1. Set jack under plow. (See Figure 1-52).

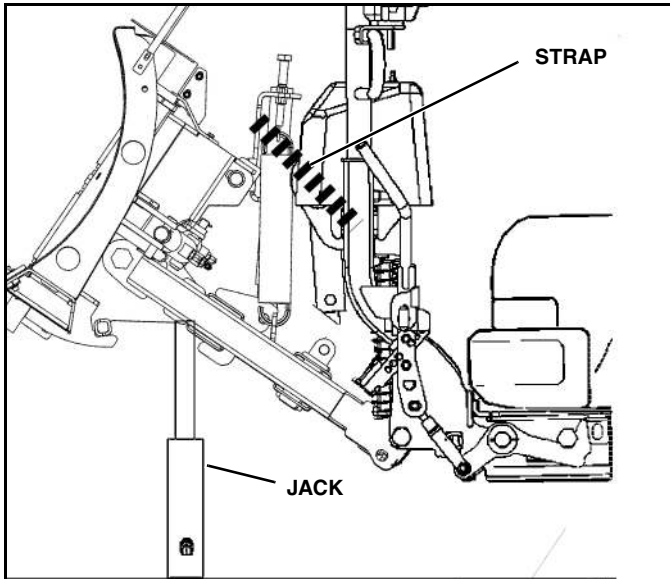


Figure 1-52

2. Release strap and lower jack. (See Figure 1-52).
3. Remove the QuickJack™ locking pin and push the jackstand handle down to fully lower the foot to the ground. (See Figure 1-53).

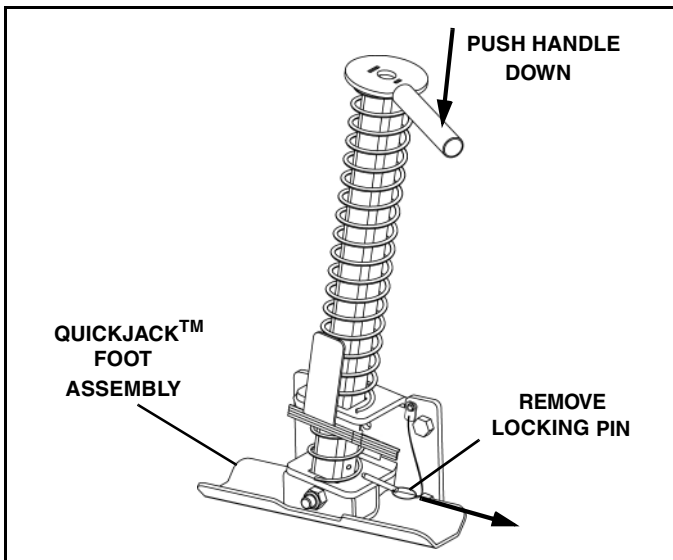


Figure 1-53

4. Pull safety pin on engagement handle to release and lower handle to disengage plow from truck. (See Figure 1-54).

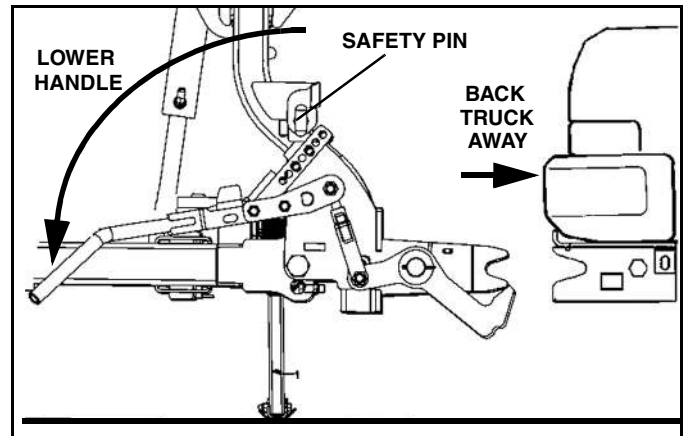


Figure 1-54

5. Disconnect light, main and controller harnesses. Reconnect truck harness.
6. Back truck away from plow.

PLOWING OPERATION

Operating Classes

MBV Series

The Sno-Way MegaBlade™ MBV Series plow is specifically designed for heavy duty snow plowing with many full size 3/4 ton, all 1 ton 4x4 and other vehicles with a GVWR rating up to 20,000 lbs.

NOTE: The loaded vehicle, including any ballast weight and optional equipment, must not exceed the Gross Vehicle Weight (GVW) or front or rear Gross Axle Weight (GAW) ratings specified on the Safety Compliance Certification Label located on the driver's side door opening.

NOTE: All vehicles that are equipped with Sno-Way snow plows should be equipped with all vehicle manufacturer's recommended options for snow plowing.

For additional information, refer to your dealer and the Sno-Way Application Guide for proper vehicle applications.

Before The Season Begins


1. Inspect vehicle safety equipment for proper operation; brakes, headlights, plowing lights, windshield wipers, flashers, etc.
2. Inspect the plow, plow frame and all attaching hardware for wear and corrosion. Replace worn or damaged parts and clean and repaint exposed metal parts with a high quality, corrosion resistant enamel.
3. Inspect all fasteners to insure that they are properly tightened. If any fasteners are loose, re-tighten to the proper torque (refer to the Torque Specification Chart in this manual) and carefully inspect the adjacent area for damage or wear as well as carefully inspecting all adjacent fasteners for proper torque.
4. Apply a small amount of light oil to the hitch pins and pivots, to pivot pins between the A-frame and center blade assembly, between lift and swing cylinder pivot pins.
5. Check the wing pivots for free movement of the wings on the pivot shafts. Lubricate the wing pivot shafts with a good quality light weight HP Lithium based grease. To lubricate, use the holes in the sides of the tubes for filling with grease. Press the grease nozzle onto the holes and pump full of grease.
6. For extremely cold weather plowing, continuous sub zero operation, an alternative is to remove the grease fittings and fill the grease cavity with SAE 140 gear oil, and then replace the grease fitting.
7. Check the reservoir oil level (see maintenance instructions) and repair any oil leaks and worn hoses.

8. Inspect electrical connectors. Make sure the contacts are clean, and apply a small amount of dielectric grease.
9. Install plow lights and ensure they are aimed properly (with plow in full UP position).
10. If ballast is required position ballast behind rear wheels for optimum performance.

Transporting Vehicle With Plow Attached

1. Position the blade out of the beam path of the headlights before driving.

	WARNING
<p>The MegaBlade™ Series will partially block the plow lights when fully raised, especially if a deflector is present. Always lower the plow so the lights are able to go past the blade in the raised position for transportation. Blocked plow lights could result in an accident.</p>	
<p>FAILURE TO FOLLOW CAN RESULT IN INJURY OR DEATH</p>	

	CAUTION
<p>Remove the plow when driving extended distances at temperatures above 40° F. The plow blocks enough airflow to the vehicle's radiator to cause it to overheat at temperatures above 40° F.</p>	

2. DO Not exceed 45 m.p.h. when driving with the snow plow attached. Braking distance is increased and handling is impaired dramatically at speeds above 45 m.p.h.
3. Reduce speed when crossing railroad tracks or when road conditions deteriorate.
4. Never change blade angle or height while driving.
5. Inspect plow and plow attaching hardware for wear or damage before transporting and beginning plow operations.

Plowing Like A Pro



WARNING

Wear your seat belt! Contact with a hidden obstruction can cause serious personal injury from bodily contact within the vehicle cab or whiplash from sudden stops.

FAILURE TO FOLLOW CAN RESULT IN INJURY OR DEATH.



WARNING

- **Never exceed 10 m.p.h. when plowing! Serious personal injury can result, as well as damage to equipment and property, if an unseen obstruction is encountered while plowing.**
- **Never plow with your head protruding from the vehicle side window. Serious head or neck injuries can result from sudden stops or coming into contact with tree branches, signs or other stationary objects.**

FAILURE TO FOLLOW CAN RESULT IN INJURY OR DEATH.

NOTE: The vehicle air bag is factory set to deploy at a pre-determined level of impact. The air bag will deploy with the plow attached if an obstruction is hit with enough force to reach this level. Always plow within the recommended plowing speeds and know the area you are plowing to avoid any obstructions.

1. Become familiar with the area to be plowed and mark potential hazards before the snow falls. Many immovable objects cannot be seen when covered with snow. Developing a plan early can save valuable time and equipment damage. Allow sufficient room to pile snow, out of the traffic area, with enough space for snow when the next storm comes.

2. Plow with the storm. The “Pros” are out early removing only several inches of snow at a time. Allowing snow to accumulate to unmanageable levels can cause difficult removal problems and can be costly in terms of “wear and tear” on equipment. The plow is not a “Ram or Bulldozer”, if used properly, it will give you many years of safe and reliable service.

3. Research municipal ordinances for restrictions on the disposal of snow. Many municipalities do not allow snow to be placed in roads or throughway.

Using The Down Pressure™ (DP) Hydraulic System

The Down Pressure™ (DP) system was designed for removing hard packed snow from hard surfaces that have had traffic on them prior to being plowed.

The system should be turned OFF when plowing surfaces such as gravel, dirt, sand, etc., to prevent cutting into the surface being plowed.

Activating the system applies hydraulic pressure to the down side of the hydraulic lift cylinder. This down pressure will force the blade through the hard-packed snow and down to the pavement. If down pressure decreases, (results if a valley or low spot is encountered by the blade), more down pressure is applied to lower side of the lift cylinder and the blade will follow the contour of the valley. When a hill or a high spot is encountered by the blade, the down pressure will be relieved on the down side of the lift cylinder, this will allow the blade to follow the contour of the hill without lifting the front of the vehicle off the ground.

Plowing Roadways

A roadway covered with unpacked snow that is not over 4-6" deep can be plowed by angling the plow wings to move the snow all to one side.

If the roadway is covered with deep and/or hard packed snow, position the plow wings in a "V"-position to move snow equally to each side to open the first path through the roadway. The roadway can then be widened by making successive passes on each side of the first path, with the wings angled to move snow to one side.

Clearing Parking Lots

1. Plow a single path, with the plow in a "V" position, through the lot at right angle to the side of the lot where you want to "stack" the snow.

2. With the plow angled to one side, widen the path until the snow piled to the side of the path is large enough for a full "scoop" to be moved to the edge of the lot for stacking.

3. With the blade in "scoop" position, push the snow plowed to the edge of the path to the edge of the lot and "stack" it in a pile.

4. If the snow plowed to the edge of the path is too large to push the entire pile to the edge of the lot, fill the blade, in "scoop" position, and then push the pile over into the cleared path and then to the edge of the lot. Then return, and with the blade in "scoop" position, push the remaining row of plowed snow to the edge of the lot.

5. When "stacking" snow, pushing the plow filled with snow into the existing pile will usually cause the plow to raise somewhat as it goes into the pile allowing the "stack" to be built higher.



CAUTION

Excessive stacking of snow causes undue stress to the snowplow and vehicle. Repeated loading of this nature may result in the failure of plow components designed to protect the snowplow and vehicle from major damage.

6. If the snow in the lot is deep and/or hard packed, plow all the paths through the lot with the blades in the "V" position. This will put less sideload on the vehicle and will make plowing the paths easier.

TROUBLESHOOTING

Introduction

Whenever service is necessary, your local dealer knows your plow best and is interested in your complete satisfaction. Return your snow plow to your local dealer for maintenance service or any other assistance you may require. If you are unable to do so, this Trouble Shooting Guide should help you determine the problem. Also, there are Repair Manuals available from your local dealer. However, before attempting the servicing of your plow, you should possess good mechanical abilities and a total understanding of the mechanism.



CAUTION

First read all warning instruction, the safety messages, and directions before attempting any adjustments or repairs to your unit!

PLEASE: Before calling parts and service personnel be certain that:

1. You have read this guide carefully and are certain that all of the suggestions pertaining to your problem have been attempted.
2. You have the following information available.
 - A. Date Snow Plow was originally installed.
 - B. Power Pack Serial Number
 - C. Controller Serial Number
 - D. Blade Serial Number
 - E. Pump Serial Number

This information should be recorded on page 2 of this Owners Manual.

Troubleshooting Quick Reference

- General

1. Check vehicle electrical system for proper operation.
2. Check to see that ProControl™ controller is “on”.
3. Check all wiring to be sure that battery terminals are clean and connections to battery, circuit breaker, solenoid, switches and all connectors on plow harness are clean and tight.
4. Check oil level in hydraulic system reservoir.
5. Check for external leakage at cylinders, hoses and power unit.
6. Check the voltage at the coils which operate the solenoid valves to be sure that the voltage at the coils is a minimum of 10.5 volts DC.

TROUBLESHOOTING CHART

PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
Plow will not lift (Motor runs)	Hydraulic fluid level low	See Maintenance Section
	Defective Control Unit	Refer to Dealer
	Improper main pressure relief valve pressure setting, debris causing valve to stick	Refer to Dealer
	Breather cap plugged	See Maintenance Section
	Faulty raise or raise/float solenoid coil	Refer to Dealer
	Raise/lower solenoid valve stuck in lower position	Refer to Dealer
	Raise/lower cylinder frozen or binding	Refer to Dealer
	Defective or sticking Down Pressure Solenoid Valve	Refer to Dealer
	Pick-up tube filter plugged	See Maintenance Section
	Pick-up tube is not submerged in fluid	See Maintenance Section
	Machine failure	Refer to Dealer
	Weak battery and/or charging system	Refer to Dealer
Motor continues to run and will not shut-off	Motor Solenoid defective	Refer to Dealer
	Electrical short	Refer to Dealer
Plow lifts slowly	Hydraulic fluid level low	See Maintenance Section
	Breather cap plugged	See Maintenance Section
	Improper main relief pressure setting, debris causing valve to stick	Refer to Dealer
	Pick-up tube filter plugged	See Maintenance Section
	Improper oil viscosity for outside air temperature, unit not at normal operating temperature	See Maintenance Section
	Defective Lift Cylinder	Refer to Dealer
	Machine failure	Refer to Dealer

PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
Fluid leaking at Pump Assembly	Hydraulic fittings not torqued properly (too tight, too loose)	Refer to Dealer
	O-Rings between valve block and endhead are cut or not seating properly	Refer to Dealer
	O-Rings between endhead and reservoir cut or not seating properly	Refer to Dealer
	Reservoir over-full	See Maintenance Section
	O-Ring on solenoids or pressure switches defective	Refer to Dealer
	Endhead cracked	Refer to Dealer
	Valve body cracked	Refer to Dealer
Unit lifts but does not hold - first action	Dirt in check valve or Float/DP solenoid valve	Cycle raise and lower system to flush debris
	Float/DP solenoid valve sticking	Cycle raise and lower system to unstick valve
Unit lifts but does not hold - second action	Dirt or debris in check valve	Refer to Dealer
	Check valve spring broken	Refer to Dealer
	Float/DP solenoid valve sticking	Refer to Dealer
	Seals O-Ring(s) on Float/DP solenoid valve damaged	Refer to Dealer
	Raise/lower ram defective	Refer to Dealer
	Machine failure	Refer to Dealer
Unit will not lower <i>NOTE: Only in non- down pressure mode</i>	Plugged breather cap	See Maintenance Section
	Low or no current available at Float/DP Solenoid	Refer to Dealer
	Float/DP solenoid valve sticking	Refer to Dealer
	Float/DP solenoid coil defective	Refer to Dealer
	Raise lower ram defective allowing movement in one direction only	Refer to Dealer
	Machine failure	Refer to Dealer

PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
Unit will not lower <i>NOTE: In down pressure mode only</i>	See all above conditions	Refer to Dealer
	Raise lower ram defective allowing movement in one direction only	Refer to Dealer
	Defective Control Unit	Refer to Dealer
	Defective down pressure solenoid	Refer to Dealer
	Machine failure	Refer to Dealer
Motor will not run	Motor brushes worn/commutator worn or dirty	Refer to Dealer
	Seal between motor and pump defective allowing oil to enter motor housing	Refer to Dealer
	Defective Start Solenoid	Refer to Dealer
	Motor seized	Refer to Dealer
	Machine failure	Refer to Dealer
Blade wing moves in one direction only	Solenoid valve sticking or defective	Refer to Dealer
	Crossover relief valve defective or sticking	Refer to Dealer
	Low or no current available at extend or retract solenoid valve	Refer to Dealer
	Angle cylinder defective allowing movement in one direction only	Refer to Dealer
	Machine failure	Refer to Dealer
Blade wing will not move	Hydraulic fluid level low	See Maintenance Section
	Crossover pressure relief valve setting too low	Refer to Dealer
	Solenoid valve sticking or defective	Refer to Dealer
	Low or no current available at solenoid valve	Refer to Dealer
	Wing cylinder binding or frozen	Refer to Dealer
	Pick up tube not submerged in fluid	See Maintenance Section
	Machine failure	Refer to Dealer
Blade wing will not move, but plow raises when trying to move wings	Raise solenoid valve defective or sticking	Refer to Dealer

PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
Blade wing moves very slowly	Hydraulic fluid level low	See Maintenance Section
	Crossover Relief Valve defective or sticking	Refer to Dealer
	Improper oil viscosity for outside air temperature, unit not at normal operating temperature	See Maintenance Section
	Defective Wing Cylinder	Refer to Dealer
	Dirt or debris in Solenoid Valve	Refer to Dealer
Blade wings will not hold position (fold rearward)	Defective or dirt/debris in Wing Relief Valve	Refer to Dealer
	Defective or sticking Solenoid Valve	Refer to Dealer
	Dirt or debris in Solenoid Valve	Refer to Dealer
	Defective Wing Cylinder	Refer to Dealer

THEORY OF OPERATION

Hydraulic Power Unit

The hydraulic power unit consists of:

- 12VDC Motor
- Hydraulic pump rated at 1.54 GPM @ 1500 PSI
- 1.35 quart capacity reservoir
- Fine mesh intake filter
- Filter screens on all outlet ports

The fluid supply line for the pump is submerged in the hydraulic fluid reservoir and is equipped with a fine mesh intake filter screen.

The 12VDC motor is protected electrically by a 250 Amp fuse located between the battery and the motor solenoid.

The hydraulic pump is protected by a 2900 PSI system relief valve.

This unit is equipped with a Down Pressure function which allows the operator to selectively switch the system to provide additional hydraulic force to the cutting edge of the plow.

IMPORTANT: The electric coils, which operate the solenoid valves, require a minimum of 10.5 volts DC for proper operation. Lower voltage will cause erratic operation, or failure to operate.

Hydraulic Controls

The hydraulic controls consist of:

- System pressure relief valve, set to 2900 PSI.
- Two crossover relief valves, set to 2600 PSI.
- Two wing relief valves, set to 3000 PSI.
- Four three-way two position hydraulic valves and four pilot operated check valves for wing angling functions.
- Two double acting hydraulic cylinders for wing angling functions.
- One three-way two position, three two-way two position valves and two check valves for raise, lower and down pressure functions.
- One down pressure relief valve.

Electro-Hydraulic Controls

All hydraulic functions are controlled by the 12VDC electrical system which actuates coils on the hydraulic valves and the solenoid for the electric motor of the power unit. 12VDC power is fed from the battery post of the motor start solenoid to a control circuit board on the plow and from the circuit board to each coil.

Each valve is actuated by completing a circuit to ground through the coil, and through the circuit board by means of a wire transmitted signal to the circuit board from the hand-held controller in the vehicle.

NOTE: This is a ground switching system and has power on the coils as soon as power is connected to the plow. The receiver module energizes the coils by providing a ground path to them.

Raise Mode of Operation

Actuating the 'Raise' switch on the hand-held controller sends a signal to the control circuit board on the plow which then actuates the motor solenoid and the coils for the 'C' valve and 'F' valve.

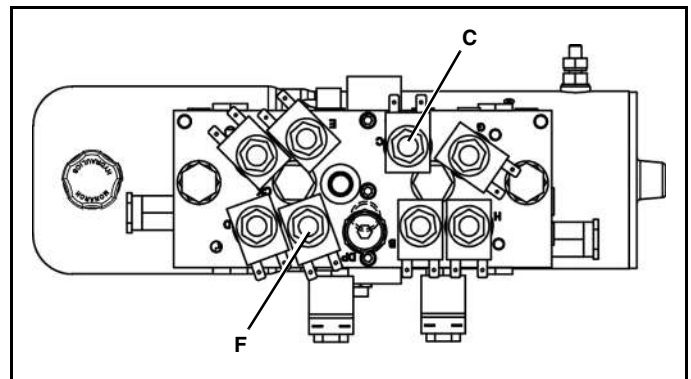


Figure 1-55

Actuating the start solenoid sends current to the power unit motor to cause the power unit to pump hydraulic fluid. Hydraulic fluid, under pressure, is directed through the 'C' valve to the lift cylinder causing it to extend and raise the plow. The 'F' valve is also actuated to allow fluid in the rod end of the double acting raise cylinder to return to the reservoir.

When the 'Raise' switch on the hand-held controller is released the start solenoid circuit is broken and the motor stops, the circuit to the coil for the 'C' valve and the 'F' valve is broken and these valves get to their normally closed positions.

Lower Mode of Operation - Gravity Down and Float

Actuating the 'Lower' switch on the hand-held controller sends a signal to the control circuit board on the plow which then actuates the coil for the 'B' valve and the 'F' valve allowing hydraulic fluid to flow from the lift cylinder to the reservoir.

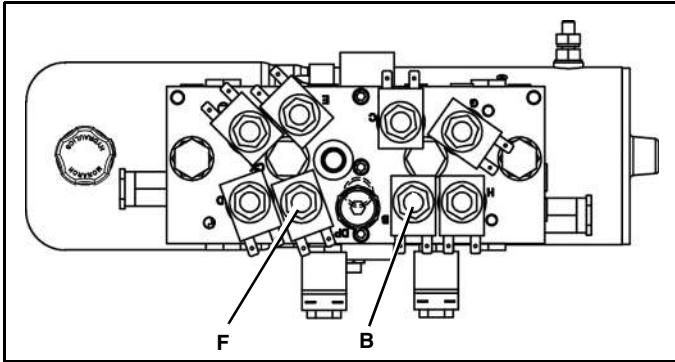


Figure 1-56

Once the 'Lower' switch has been actuated, the system will stay in this mode until the raise function is actuated, allowing hydraulic fluid to flow between the reservoir and the lift cylinder and let the lift cylinder extend and retract as necessary to follow ground contours while plowing.

Lower Mode of Operation - Down Pressure™ Hydraulic (DP) System

This system operates only when the 'DP' switch and the 'Lower' switch on the hand-held controller is actuated. Actuating the 'DP' switch (a red LED will be lit) actuates the pressure switch, the 'B' valve coil, the 'E' valve coil and, through the pressure switch, the start solenoid as required.

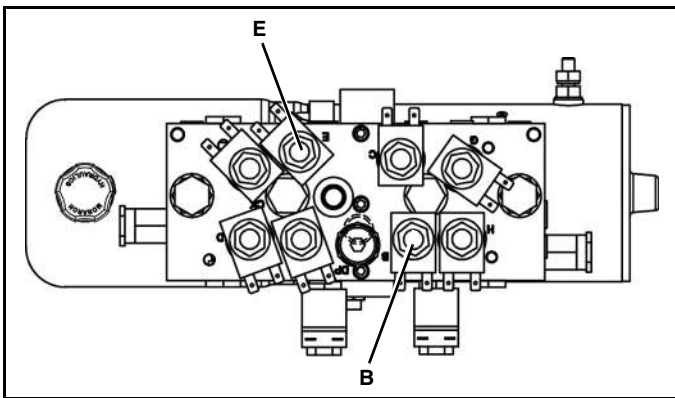


Figure 1-57

When the 'E' valve is actuated and the hydraulic pump operates, hydraulic fluid is directed to the rod end of the lift cylinder compressing the cylinder and forcing the plow down. The pressure switch in this system senses the pressure of the fluid in the lift cylinder and closes when the pressure becomes low, allowing the motor and the pump

to pump fluid into the rod end of the cylinder.

When the pressure reaches the proper level, the switch opens, shutting off the motor and pump. The system is protected by a relief valve which relieves excess pressure if the plow is forced up, such as by a bump or obstacle in the roadway.

Once any obstacle is cleared, the plow can return to a lower position lowering the pressure in the system. If the pressure is lowered sufficiently, the pressure switch will then sense the lowered pressure and cause the pump to pump fluid into the system and return it to the proper pressure.

The down pressure system is overridden any time the plow control is placed in the 'Raise' mode, but will resume when placed back into the 'Lower' position.

Also, note that the 'E' valve is deactivated anytime an angle function is activated, but returns to its previous condition as soon as the angle function is completed.

Wing Angling Mode of Operation - Independent Wing Angling

Each wing can be angled forward or rearward independently by operating the forward or rearward switch for either the right or left wing. Operating the right extend switch on the controller will energize the motor solenoid and the 'A' coil, which will allow hydraulic oil under pressure to be directed too the base end of the right wing cylinder.

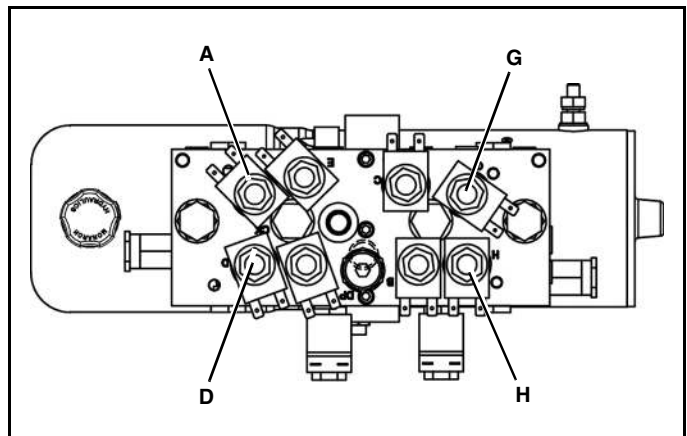


Figure 1-58

Operating the right retract switch on the controller will energize the motor solenoid and the 'D' coil, which will allow hydraulic fluid under pressure to be directed to the rod end of the right wing cylinder.

Operating the left wing extend switch will perform the same function as the right except that the 'G' coil will be energized instead of the 'A' coil.

Operating the left retract switch will perform the same function as the right retract except that the 'H' coil will be energized instead of the 'D' coil.

Combination Wing Angling

Both wings can be moved together using the control switches on the controller. Operating the forward combination switch on the controller will extend both wings in the 'scoop' position. Operating this combination will energize the motor solenoid and both the 'A' and 'G' coils.

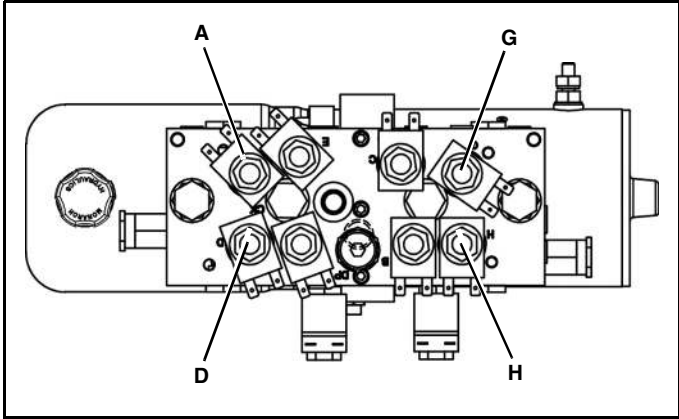


Figure 1-59

Operating the rearward combination switch on the controller will retract both wings into the 'V' position. Operating this combination switch will energize the motor solenoid and both the 'D' and 'H' coils.

Operating the right side combination switch on the controller will extend the left wing and retract the right wing to plow all snow to the right. Operating this combination switch will energize the motor solenoid and both the 'D' and 'G' coils.

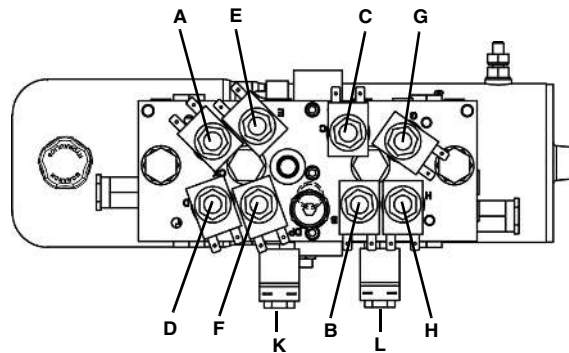
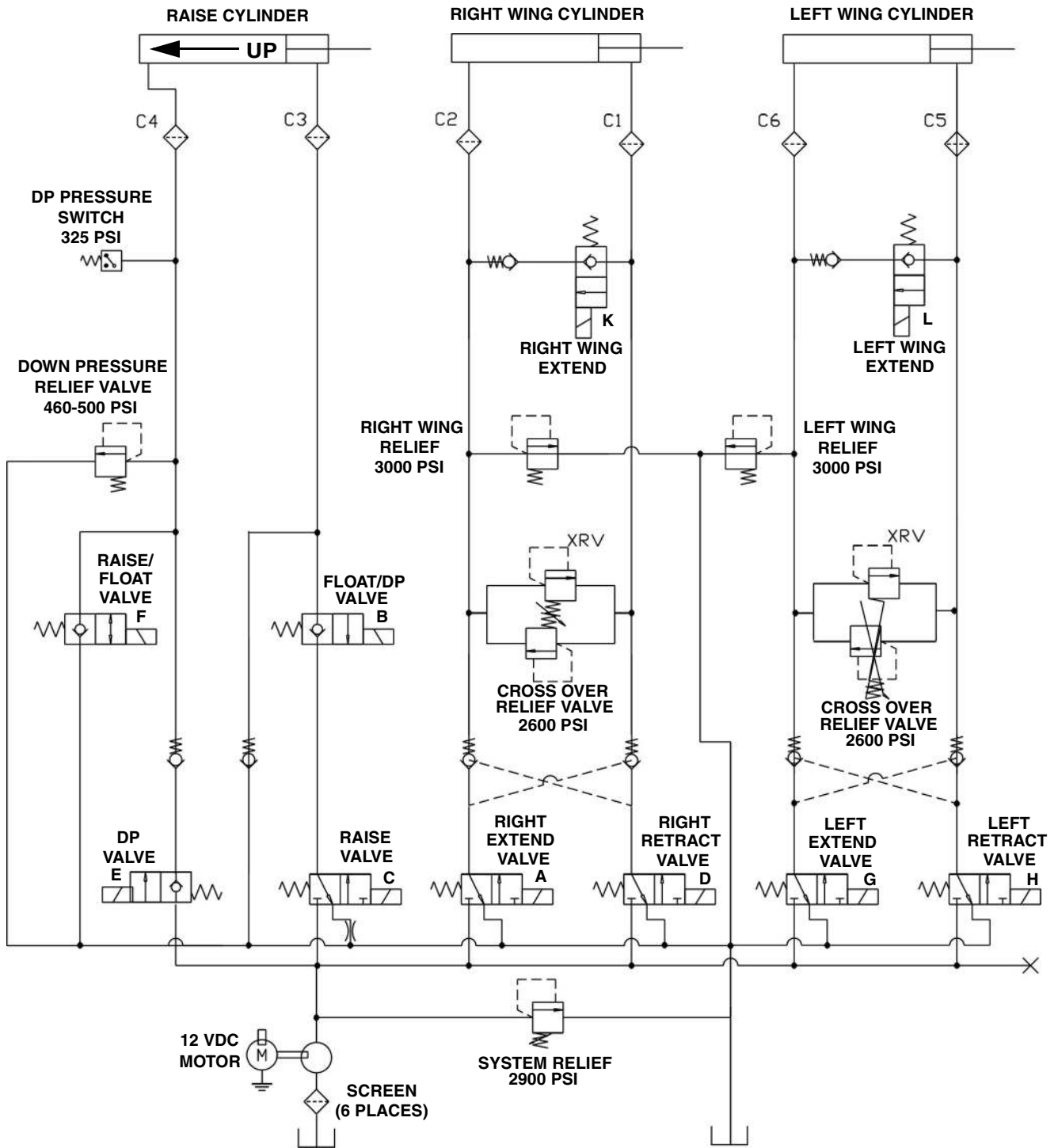
Operating the left side combination switch on the controller will extend the right wing and retract the left wing to plow all snow to the left. Operating this combination switch will energize the motor solenoid and both the 'A' and 'H' coils.

Each wing angling circuit is protected by a crossover relief valve set to relieve pressure on the wing angling circuit at 2600 PSI. Each wing also has a relief valve set at 3000 PSI.

Fuse

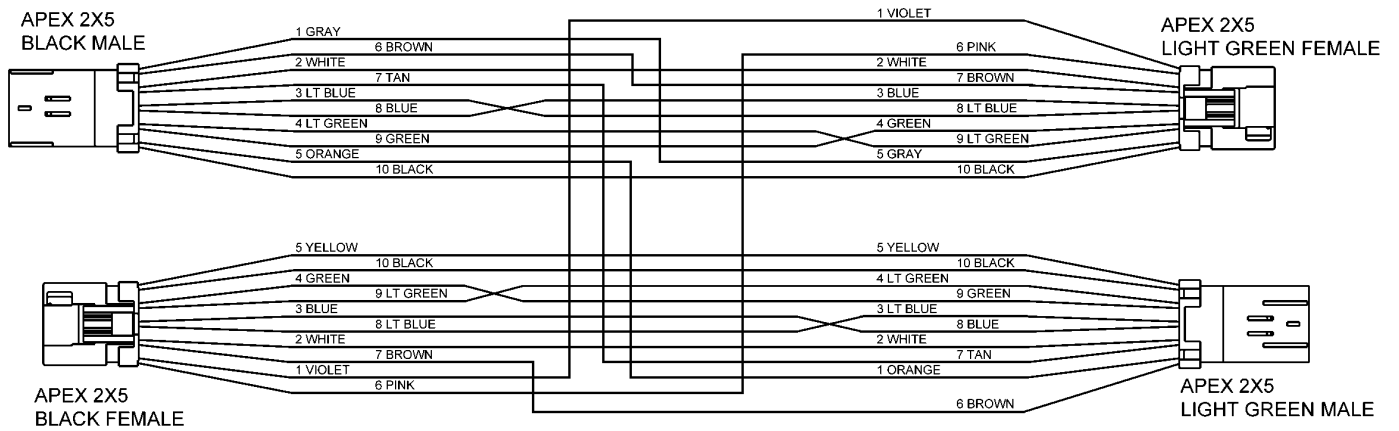
A 250 Amp fuse is located near the battery in the primary 12V DC positive power circuit and is in place to protect the electrical system against direct shorts. A high current draw condition will cause the fuse to open and interrupt power to the plow. Once the cause of the high current situation is identified and corrected replace the fuse.

HYDRAULIC SCHEMATIC



MAIN WIRING HARNESS SCHEMATIC

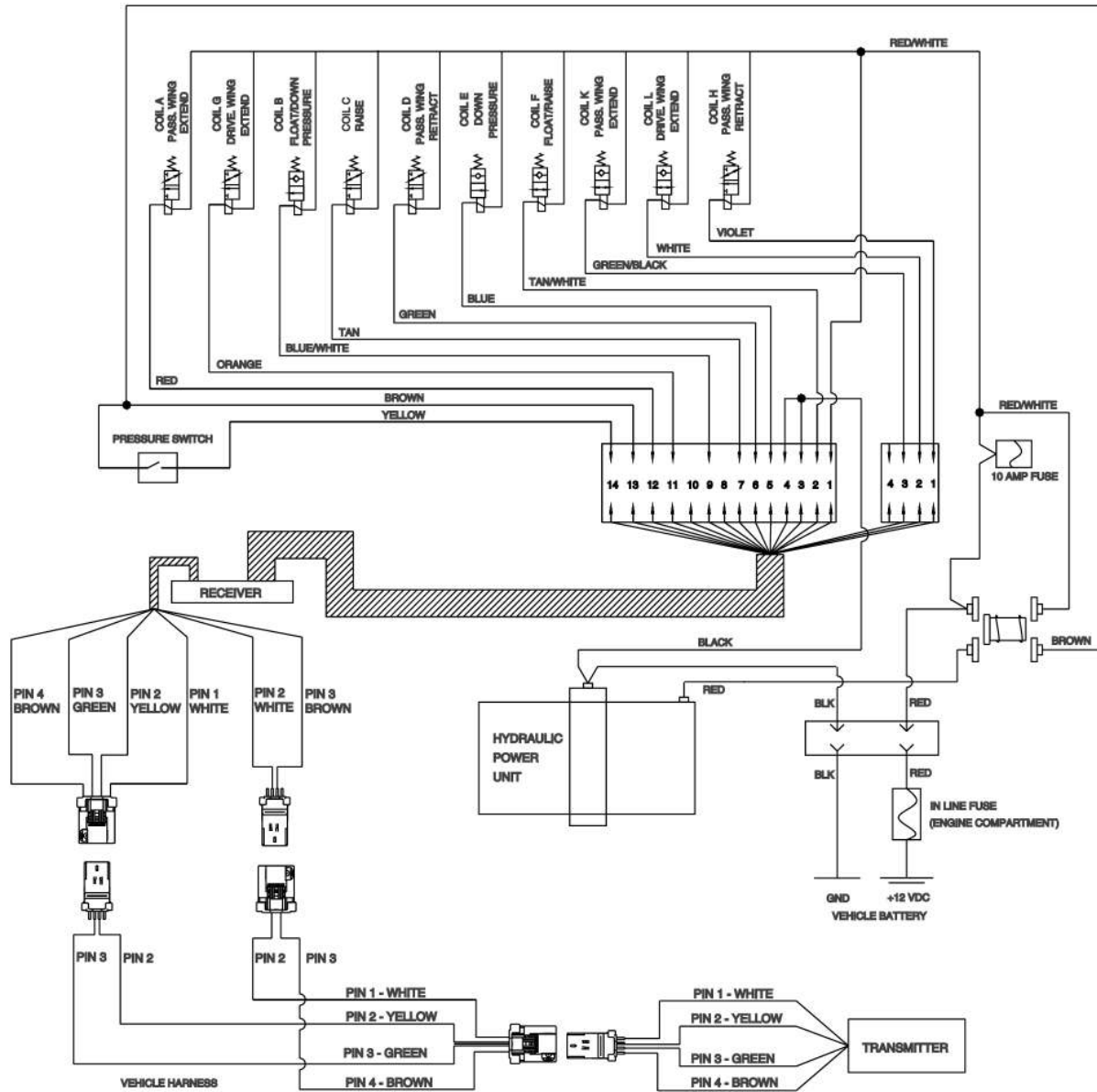
EIS[®] (Energy Interruption System[™])



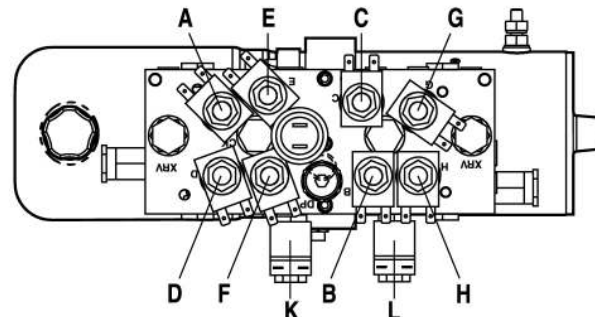


WIRING SCHEMATIC

With S.N. Before: MBV100499



FLOW FUNCTION	MOTOR SOLENOID	A	B	C	D	E	F	G	H	K	L	PRESSURE SWITCH
WIRE COLOR	BROWN	RED	BLUE/WHITE	TAN	GREEN	BLUE	TAN/WHITE	ORANGE	VIOLET	GREEN/BLACK	WHITE	YELLOW AND BROWN
RAISE	X			X			X					
DOWN (FLOAT)			X				X					
DOWN PRESSURE™			X			X						X
DRIVE SIDE WING EXTEND	X							X	X		X	
DRIVE SIDE WING RETRACT	X								X			
PASS. SIDE WING EXTEND	X	X			X					X		
PASS. SIDE WING RETRACT	X				X							
VEE POSITION	X				X				X			
SCOOP POSITION	X	X			X			X	X	X	X	
ANGLE LEFT	X	X			X				X	X		
ANGLE RIGHT	X				X			X	X		X	

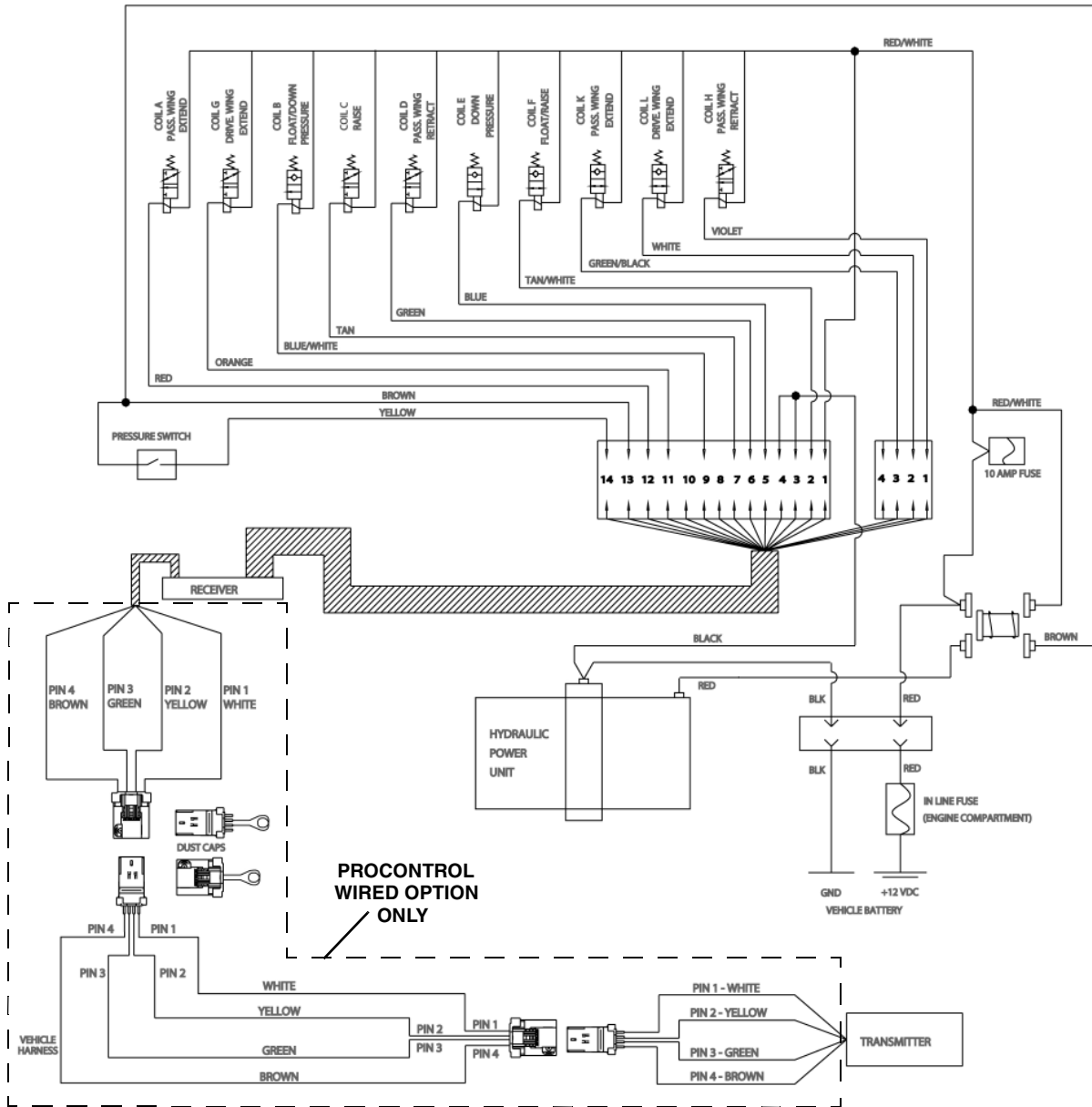


NOTE: COIL E MUST BE DEACTIVATED FOR ANGLE AND WING FUNCTIONS



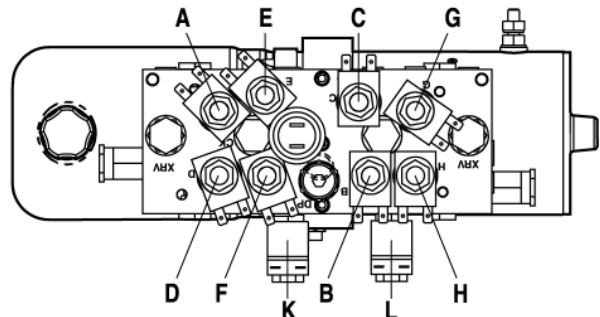
WIRING SCHEMATIC

With S.N. After: MBV100500











PLow FUNCTION	MOTOR SOLENOID	A	B	C	D	E	F	G	H	K	L	PRESSURE SWITCH
WIRE COLOR	BROWN	RED	BLUE/WHITE	TAN	GREEN	BLUE	TAN/WHITE	ORANGE	VIOLET	GREEN/BLACK	WHITE	YELLOW AND BROWN
RAISE	X			X			X					
DOWN (FLOAT)			X				X					
DOWN PRESSURE™			X			X						X
DRIVE SIDE WING EXTEND	X							X	X		X	
DRIVE SIDE WING RETRACT	X								X			
PASS SIDE WING EXTEND	X	X			X					X		
PASS SIDE WING RETRACT	X				X							
VEE POSITION	X				X				X			
SCOOP POSITION	X	X			X			X	X	X	X	
ANGLE LEFT	X	X			X				X	X		
ANGLE RIGHT	X				X			X	X		X	

NOTE: COIL E MUST BE DEACTIVATED FOR ANGLE AND WING FUNCTIONS



TORQUE SPECIFICATIONS

SAE Grade and Head Markings	1 or 2 No Marks 	5 5.1 5.2 	8 8.2 
SAE Grade and Nut Markings	2 No Marks 	5  	8  

	Grade 1		Grade 2		Grade 5, 5.1 or 5.2		Grade 8 or 8.2	
	Lubricated ^a	Dry ^b	Lubricated ^a	Dry ^b	Lubricated ^a	Dry ^b	Lubricated ^a	Dry ^b
SIZE	lb-ft	lb-ft	lb-ft	lb-ft	lb-ft	lb-ft	lb-ft	lb-ft
8-32			14*	19*	22*	30*	31*	42*
10-24			21*	27*	32*	43*	45*	60*
1/4	2.8	3.5	4.5	5.5	7	9	10	12.5
5/16	5.5	7	9	11	15	18	21	26
3/8	10	13	16	20	26	33	36	46
7/16	16	20	26	32	41	52	58	75
1/2	25	31	39	50	63	80	90	115
9/16	36	45	56	70	90	115	130	160
5/8	50	62	78	100	125	160	160	225
3/4	87	110	140	175	225	280	310	400
7/8	140	175	140	175	360	450	500	650
1	210	270	210	270	540	675	750	975
METRIC COARSE THREAD Grade 8.8			Grade 8.8		Grade 10.9		Grade 12.9	
			Dry	Lubed	Dry	Lubed	Dry	Lubed
M6-1			8	6	11	8	13.5	10
M8-1.25			19	14	27	20	32.5	24
M10-1.5			37.5	28	53	39	64	47
M12-1.75			65	48	91.5	67.5	111.5	82
M14-2			103.5	76.5	145.5	108	176.5	131
M16-2			158.5	117.5	223.5	165.5	271	200

DO NOT use these values if a different torque value or tightening procedure is given for a specific application.

Fasteners should be replaced with the same or higher grade. If higher grade fasteners are used, these should only be tightened to the strength of the original.

^a "Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings.

^b "Dry" means plain or zinc plated without any lubrication

* Values with asterisk are in lb-in.

NOTES

SNO-WAY® INTERNATIONAL, INC.

SNO-WAY
SNOW & ICE CONTROL EQUIPMENT

Hartford, WI 53027 USA
Website: www.snoway.com
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DEALER PRE DELIVERY CHECKLIST

The following inspections **MUST** be accomplished prior to delivering the snowplow to the customer. Place an X in the box after accomplishing each item on the checklist.

CHECK THAT

- Parts have not been damaged in shipment. Repair or replace items that are loose, dented or missing.
- All covers, guards and decals are in place and attached securely.
- All pivot pins and cotters are installed and secure.
- Trip springs are adjusted.
- Shoe assemblies are installed and adjusted.
- Snow plow headlamps are adjusted properly.
- Snow plow headlamps are functional.
 - High Beam Low Beam Park Lamps
 - Left Turn Right Turn Headlamp Beam Aimed Correctly
- Cylinder lock clamp is installed.

Start the vehicle engine and place an X in the box after accomplishing each item on the checklist.

CHECK THAT

- ALL** blade functions work properly.
- Cylinders, hoses and fittings **DO NOT** leak.
- Listen for abnormal noises or vibrations; Repair or replace as necessary.
- The Power Unit is properly filled.

DELIVERY CHECKLIST

The following checklist is to be accomplished with the customer present, Place an X in the box after accomplishing each item on the checklist.

- After giving the Customer his Owner's Manual, instruct him to read it **PRIOR** to operating the Snow Plow. If he has any questions or does not understand part(s) of the Manual, ask him to contact the Dealer for answers or explanations **BEFORE** operating the unit.
- Record the Serial Numbers, Date of Purchase, Purchaser's Name and Address, and the Dealers Name, Address and Phone Number in the space provided on Page 1 of the Owner's Manual.
- Demonstrate the mount and dismount procedures.
- Demonstrate plow on ground (jackstand too low) mounting.
- Demonstrate power plow controller operation.
- Demonstrate emergency transport procedures.
- Demonstrate Down Pressure hydraulic system function and operation.
- Fill out Warranty Registration Card and mail COPY 1 to the factory to validate Warranty. NO Warranty claims can be honored if the Warranty Card is not on file at the factory.**

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