SNO-WAY®

SNOW & ICE CONTROL EQUIPMENT

INSTALLATION & OWNER'S MANUAL

MEGABLADE™ REVOLUTION™ SERIES SNOW PLOW

WITH SERIAL NUMBERS
MBR100000 - MBR109999

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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 below are the SAFETY ALERT messages and how they will appear in this manual.

WARNING

FAILURE TO FOLLOW CAN RESULT IN INJURY OR DEATH.

CAUTION

Information, that if not carefully followed, can cause injury or damage to equipment!

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. This plate contains 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 _____
(Located on Lower Light Lift Bar - Drivers Side)

CONTROLLER SERIAL NUMBERS:

TRANSMITTER S.N. _____

RECEIVER S.N. _____

BLADE MODEL NUMBER _____

BLADE SERIAL NUMBER _____
(Located on Blade Frame)

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.

Graphics and illustrations may be used which may show equipment and/or options not included in every installation without incurring the obligation to install such parts or make changes on units previously delivered.

Sno-Way Service Parts Manuals are available for purchase from your authorized Sno-Way dealer. Request part number 97101506 for the Mega Blade Revolution Series Snow Plows. Factory contact information is available at www.snoway.com.

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

2,121,948	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	7,137,724	7,146,754
7,171,769	7,171,770	7,640,682		

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 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 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 injury.

ALWAYS shut off the vehicle engine, place the transmission in Neutral or Park, turn the ignition switch to the “OFF” position, firmly apply the parking brake of the vehicle and turn "OFF" the plow controller 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 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 CO^2 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 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).

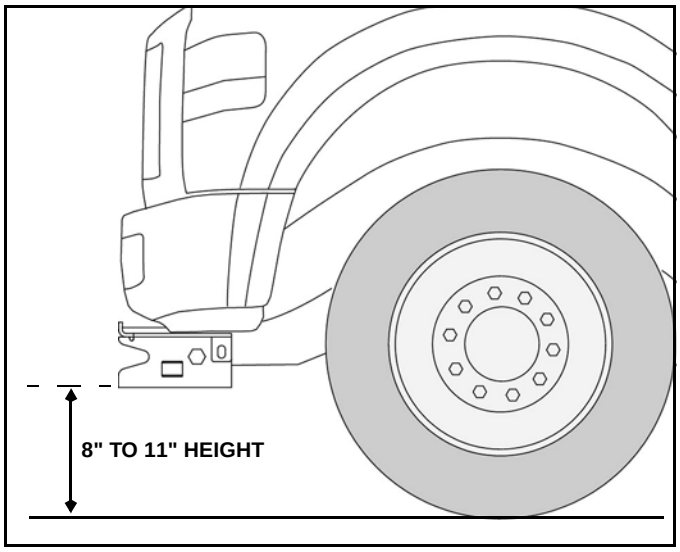


Figure 1-1

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).

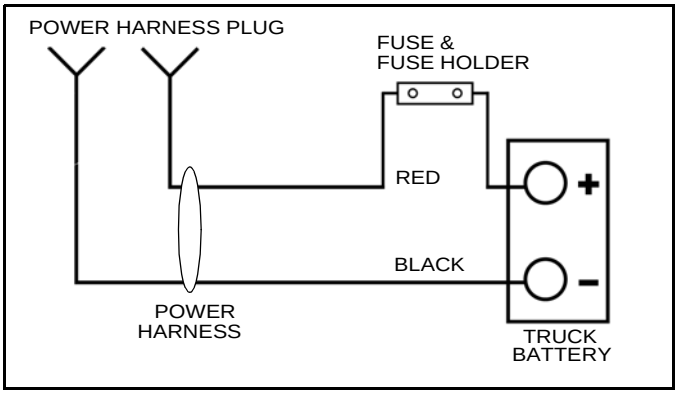


Figure 1-2

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.)

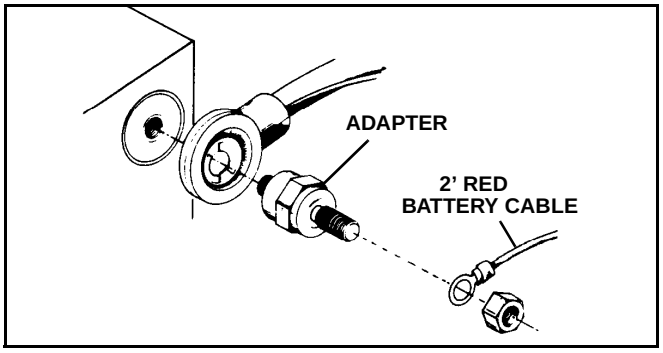


Figure 1-3

Mechanical Installation

Assemble Blade, Swing Frame and Trip Springs

1. Open the power pack carton and remove the blade parts bag.

2. Lay blade face down on floor, using cardboard or similar material to prevent paint damage.

3. Install a stop pad to one side of the blade using two 5/16"-18 x 1-1/2" hex head cap screws, two 5/16" flat washers and two 5/16"-18 lock nuts. (See Figure 1-4).

NOTE: Hold head of cap screws and tighten nuts until the rubber stop pad just begins to show signs of being pinched by the flat washer.

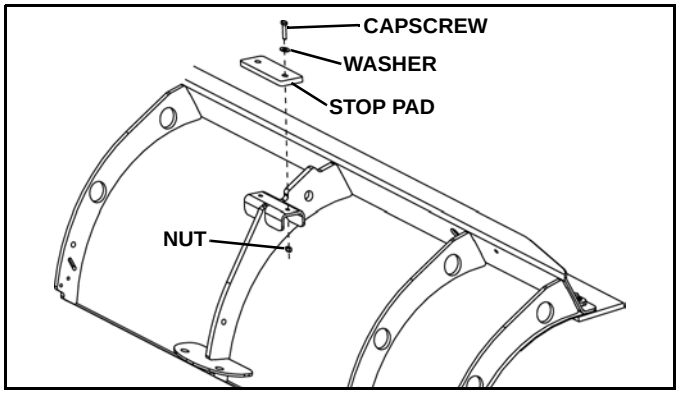


Figure 1-4

4. Repeat Step 3 for the opposite stop pad.

5. Remove A-Frame and swing frame assembly from box. Place A-Frame and swing frame assembly on blade and insert two 1" x 2" clevis pins from blade parts bag. The ribs on either side of the center rib should be between the swing frame lugs. (See Figure 1-5).

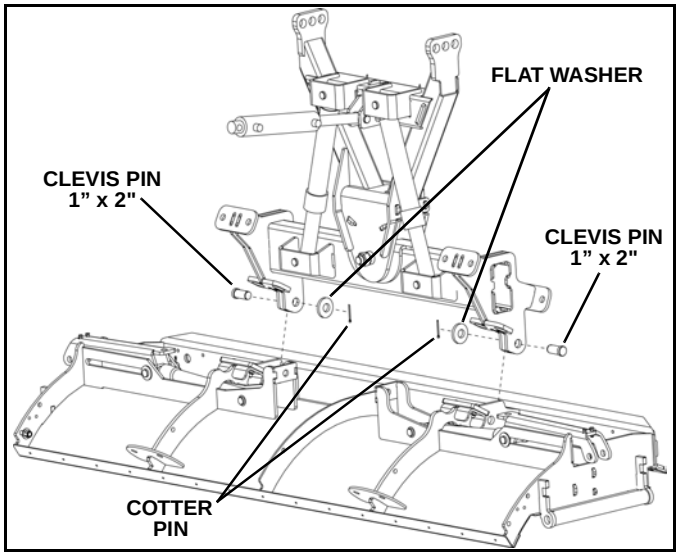


Figure 1-5

6. Secure each clevis pin with a 1" flat washer and 5/32" X 1 3/4" cotter pin.

NOTE: Make sure cotter pin is properly bent or pin may work loose (See Figure 1-6).

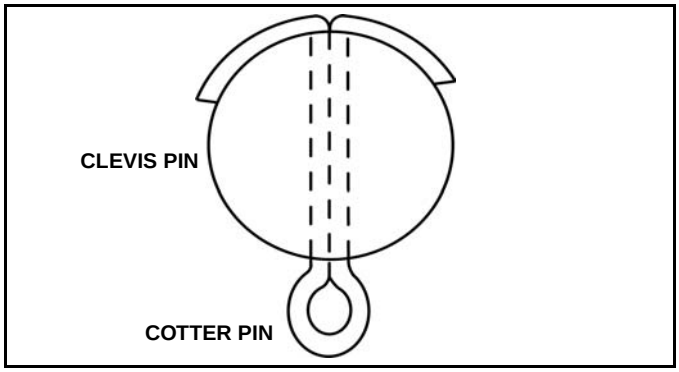


Figure 1-6

7. Rotate blade upward, and hook springs on to the swing frame spring eyelets: (See Figure 1-7).

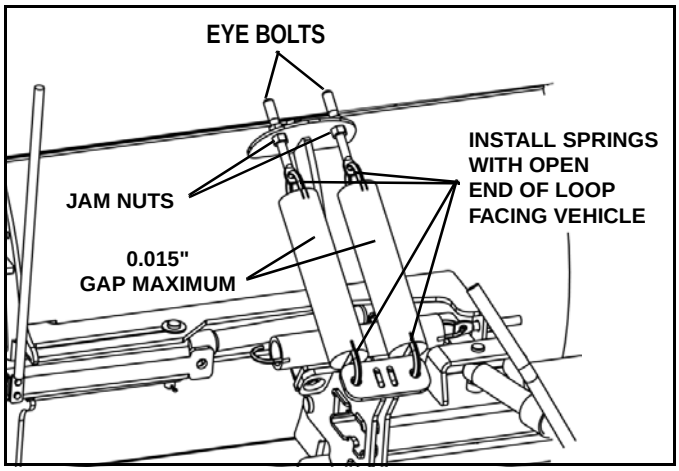


Figure 1-7

a. Place a 5/8"-11 jam nut on one 5/8"-11 x 6.00" eye-bolt and thread the nut to approximately 1/2" from the eyelet.

b. Place eye bolt on the hook of the spring.

c. Feed the eyelet through the blade spring mount bracket.

d. Install the eyebolt 5/8"-11 and tighten until a 0.010" feeler gauge can pass between two or more coils (a 3x5 postcard is approximately 0.010").

CAUTION

Do not over tighten springs. If more than 0.015" (1/64") gap appears between coils damage could occur during plowing.

Spring must be installed with open end of top loop facing vehicle. Bottom loop position will vary.

e. Secure the spring tension adjustment by tightening the eyebolt jam nut.

8. Repeat step 7 for the remaining springs.

9. Align left wing with blade. Coat pin with grease and insert completely through blade and wing. Secure the pin with a 1/2"-13 x 1-1/2" hex head cap screw, two 1/2" flat washers and 1/2"-13 lock nut. (See Figure 1-8).

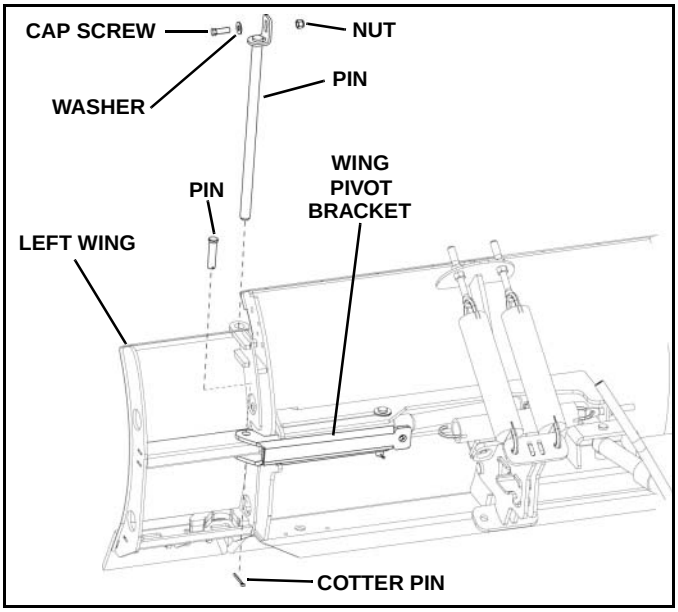


Figure 1-8

10. Install the wing pivot bracket to the wing and secure with a clevis pin and 5/32" x 1-1/2" cotter pin.

11. Install the retract spring to the wing bracket. Install the opposite end of the spring to the 5/8"-11 x 4-1/2" eye bolt on the blade frame. (See Figure 1-9).

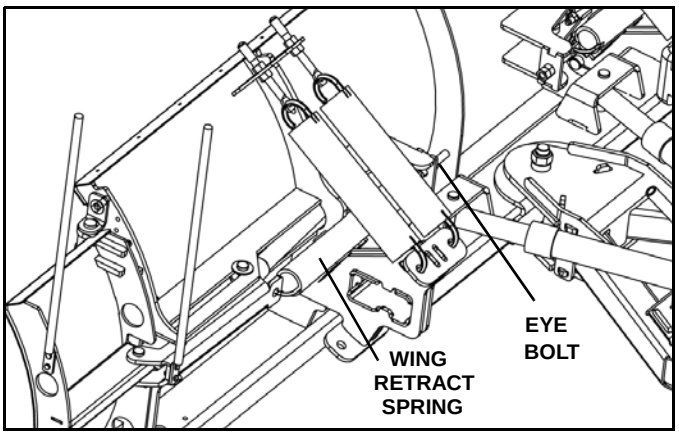


Figure 1-9

12. Install a 5/8"-11 nut on the eye bolt and tighten to tension the spring until a 0.010" feeler gauge can pass between two or more coils (a 3x5 postcard is approximately 0.010"), and secure the adjustment with a second 5/8"-11 nut.

13. Repeat steps 9 through 12 to install the right wing.

14. 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 1-10).

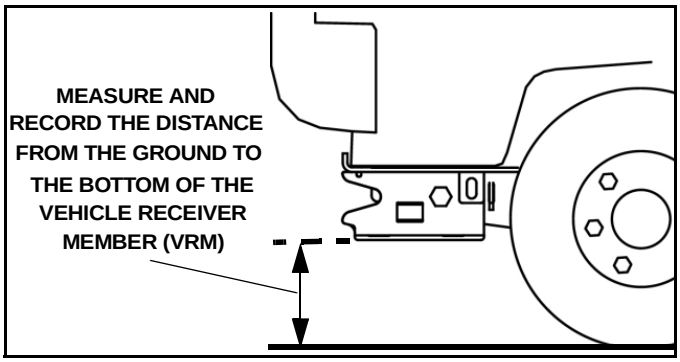


Figure 1-10

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

15. 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 15a.**
- **9" to 10" proceed to Step 15b.**
- **10" to 11" proceed to Step 15c.**

a. With a dimension of 8" to 9", the bottom lug holes are used to connect the A-Frame to the Lower Light Lift Bar (LLLB) frame. Insert the 1.00-8 x 5" hex head cap screw from the outside through the LLLB frame, spacer, A-Frame lug bottom hole and LLLB frame. Secure with 1.00 x 8 lock nut. Position the Stacking Stop as shown and secure with two 1/2"-13 X 5.00 hex head cap screws and two 1/2"-13 lock nut as shown. Repeat this step for the opposite side. (See Figure 1-11). Proceed to Step 16.

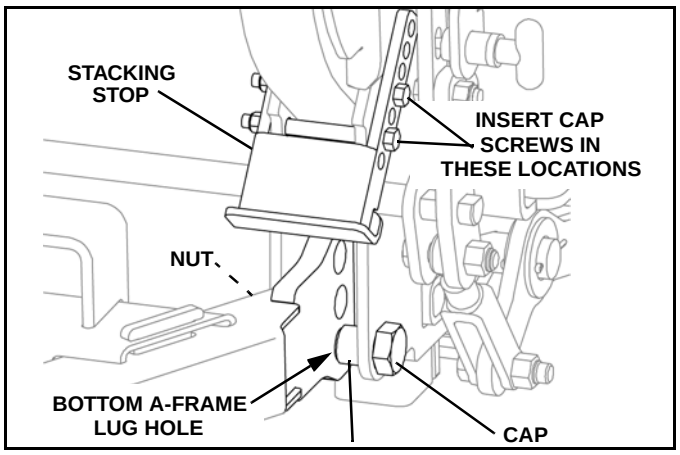


Figure 1-11

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 (LLLB) frame. Insert the 1.00-8 x 5" hex head cap screw from the outside through the LLLB frame, spacer, A-Frame lug center hole and LLLB frame. Secure with 1.00 x 8 lock nut. Position the Stacking Stop as shown and secure with two 1/2"-13 X 5.00 hex head cap screws and two 1/2"-13 lock nuts as shown. Repeat this step for the opposite side. (See Figure 1-12). Proceed to Step 16.

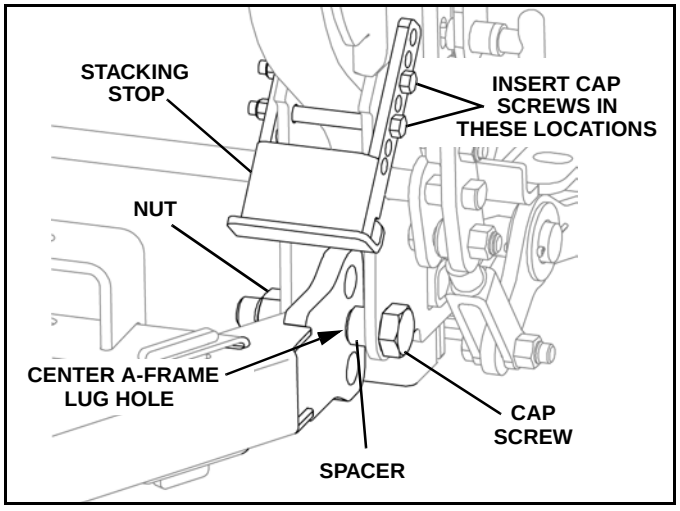


Figure 1-12

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 1.00-8 x 5" hex head cap screw from the outside through the LLLB frame, spacer, A-Frame lug top hole and LLLB frame. Secure with 1.00 x 8 lock nut. Position the Stacking Stop as shown and secure with two 1/2"-13 X 5.00 hex head cap screws and two 1/2"-13 lock nuts as shown. Repeat this step for the opposite side. (See Figure 1-13).

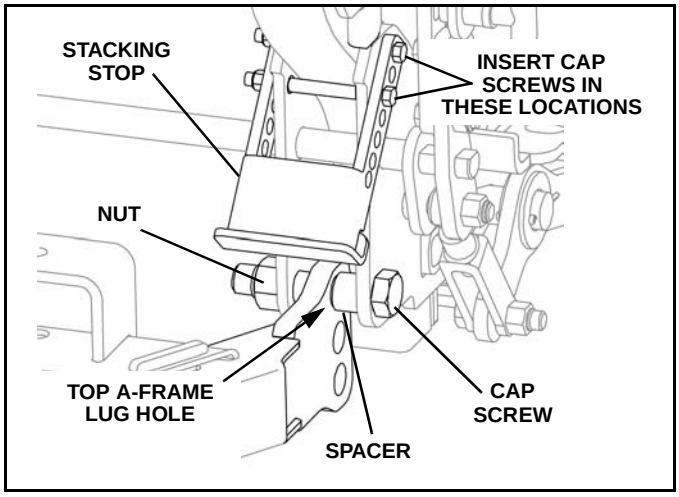


Figure 1-13

16. Remove four 5/16"-18 wing nuts and four 5/16" flat washers. Remove power unit cover. (See Figure 1-14).

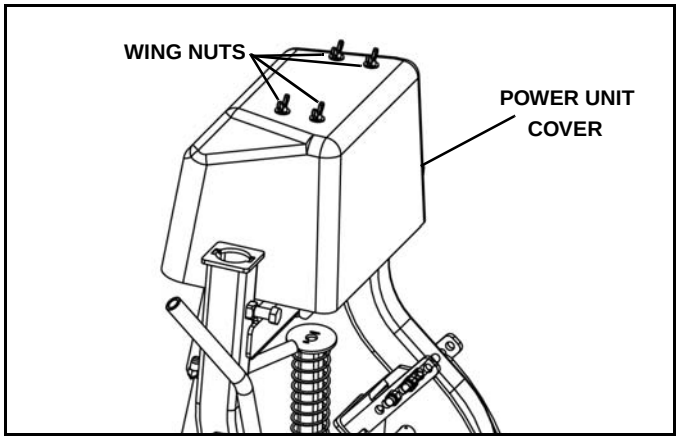


Figure 1-14

17. 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 18.

• If the top lug hole was used, proceed to Step 19.

18. When the middle or bottom A-frame lug holes are used, the lift cylinder lower mounting brackets (p/n 96112622) must be used to provide a lower connection point for the lift cylinder. (See Figure 1-15).

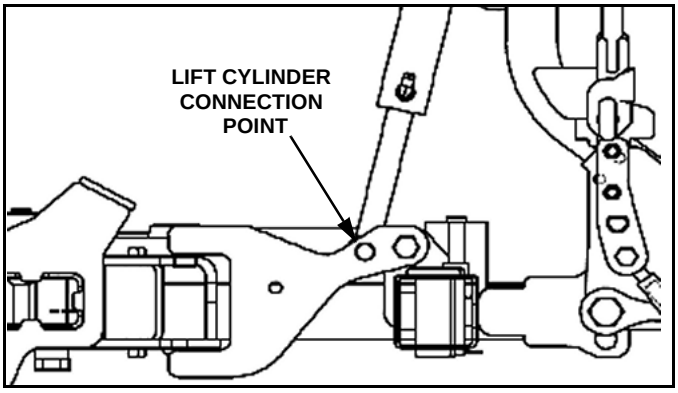


Figure 1-15

a. Position the mounting brackets (p/n 96112622) on the A-frame crossmember with the lift cylinder connection point positioned as shown. (See Figure 1-15).

b. Remove the cap screw securing the base of the left (driver's side) cylinder to the A-frame. (See Figure 1-16).

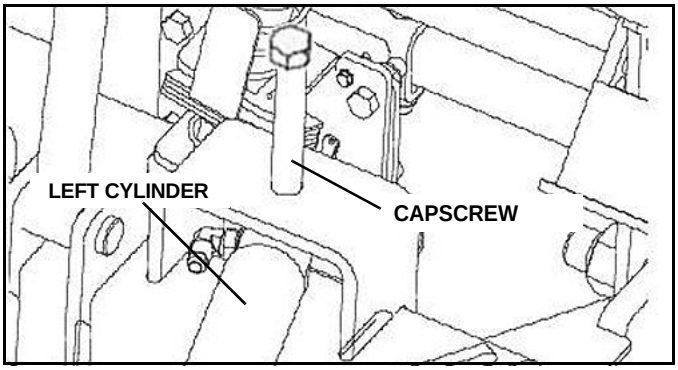


Figure 1-16

c. Rotate the swing frame to the right as shown. (See Figure 1-17).

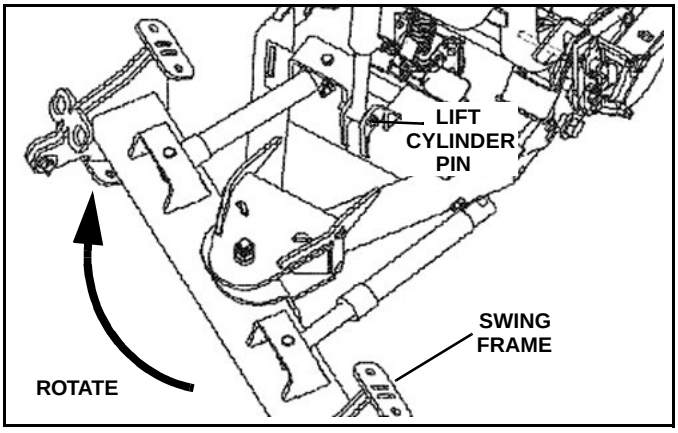


Figure 1-17

d. Remove the cotter pin securing the lift cylinder lower pin and discard. Remove the lift cylinder pin. (See Figure 1-17).

e. Two washers (p/n 98009030) and one spacer (p/n 96112873) will be placed as shown in the following steps. (See Figure 1-18).

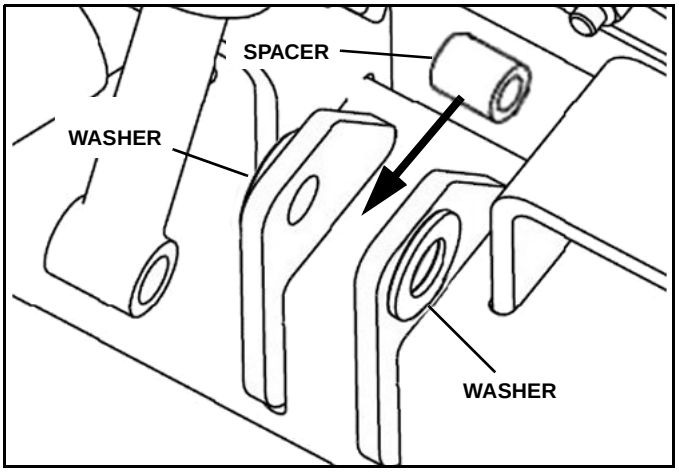


Figure 1-18

f. Position two lift brackets (p/n 96112622) and four washers as shown. (See Figure 1-19).

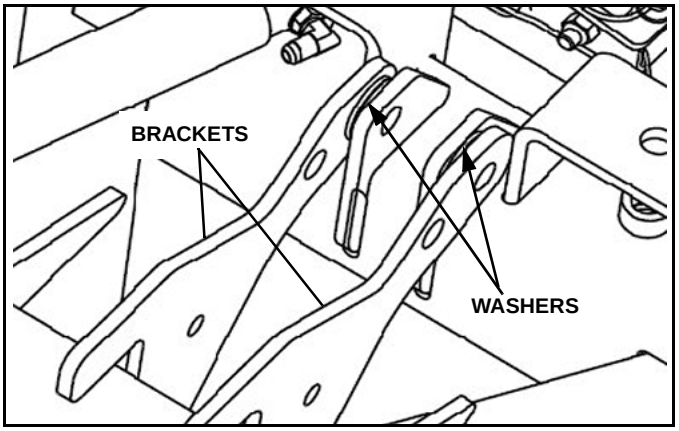


Figure 1-19

g. Insert 3/4" x 5" cap screw and three washers (p/n 98009030) through left bracket, two washers, A-frame lug, spacer, lug, two washers and right bracket. (See Figure 1-20).

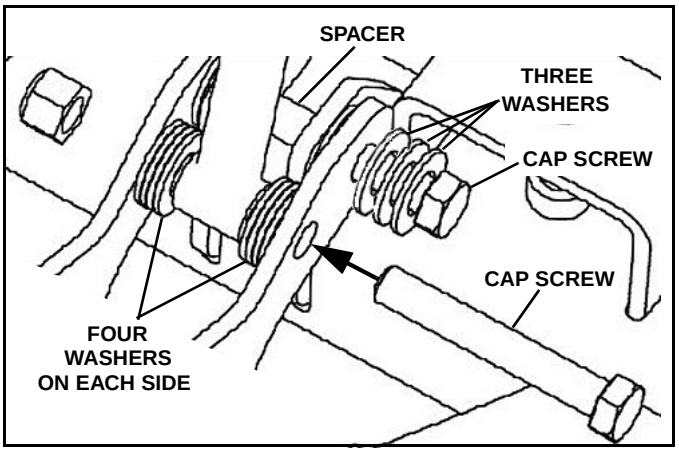


Figure 1-20

h. Insert 3/4" x 5" cap screw through left bracket, four washers, lift cylinder rod end, four washers and right bracket. (See Figure 1-20).

i. Install 3/4" locknuts on both cap screws. The lift cylinder rod end must be able to pivot in the brackets - Do not over-tighten this locknut. (See Figure 1-21).

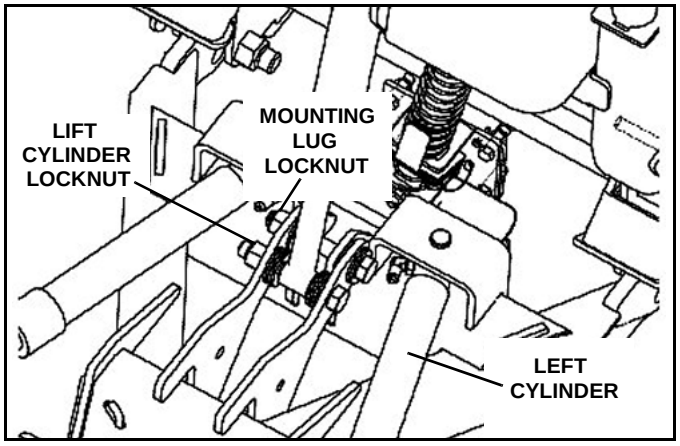


Figure 1-21

j. Reposition left cylinder base in A-frame and secure with original cap screw and locknut.(See Figure 1-21).

k. Proceed to step 20.

19. When the top A-frame lug holes are used, the lift cylinder lower mounting brackets (p/n 96112623) must be used to provide a higher connection point for the lift cylinder. (See Figure 1-22).

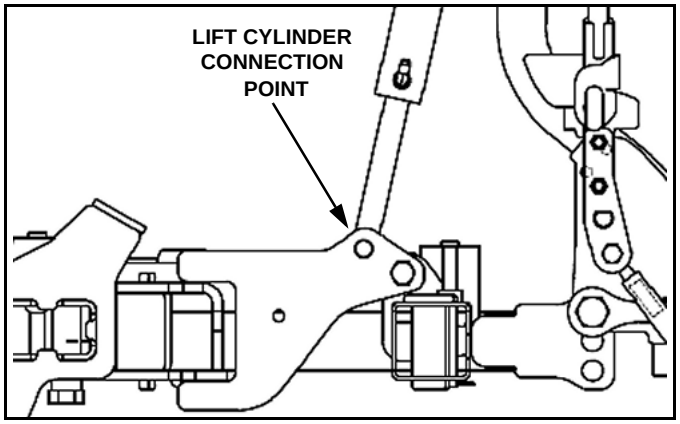


Figure 1-22

a. Position the mounting brackets (p/n 96112623) on the A-frame crossmember with the lift cylinder connection point positioned as shown. (See Figure 1-22).

b. Remove the cap screw securing the base of the left (driver's side) cylinder to the A-frame. (See Figure 1-16).

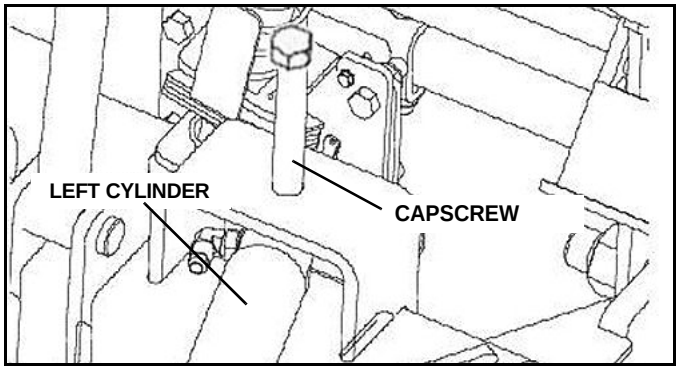


Figure 1-23

c. Rotate the swing frame to the right as shown. (See Figure 1-24).

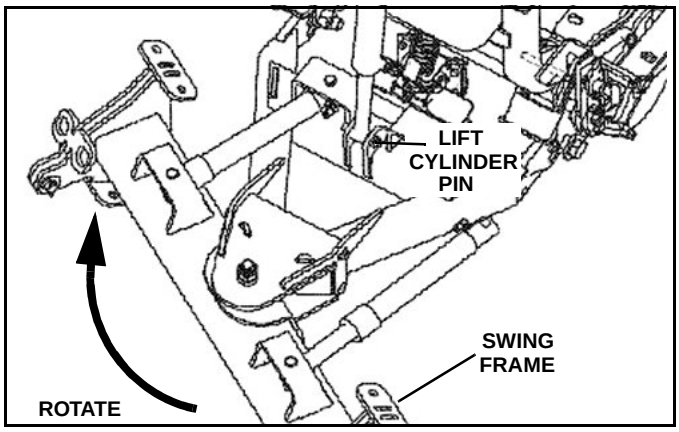


Figure 1-24

d. Remove the cotter pin securing the lift cylinder lower pin and discard. Remove the lift cylinder pin. (See Figure 1-24).

e. Two washers (p/n 98009030) and one spacer (p/n 96112873) will be placed as shown in the following steps. (See Figure 1-25).

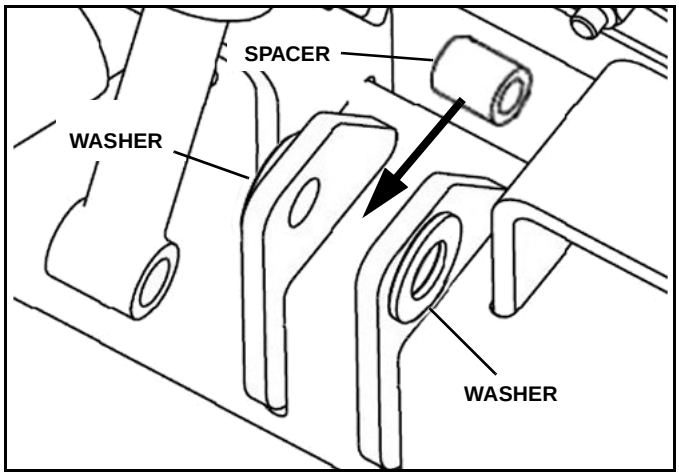


Figure 1-25

f. Position two lift brackets (p/n 96112623) and four washers as shown. (See Figure 1-26).

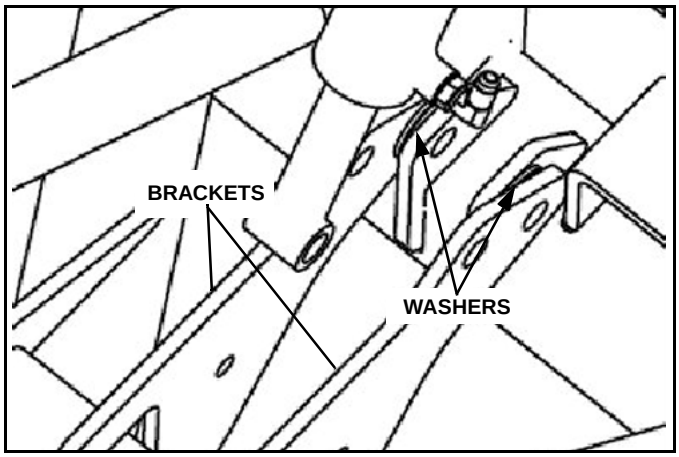


Figure 1-26

g. Insert 3/4" x 5" cap screw and two washers (p/n 98009030) through left bracket, two washers, A-frame lug, spacer, lug, two washers and right bracket. (See Figure 1-27).

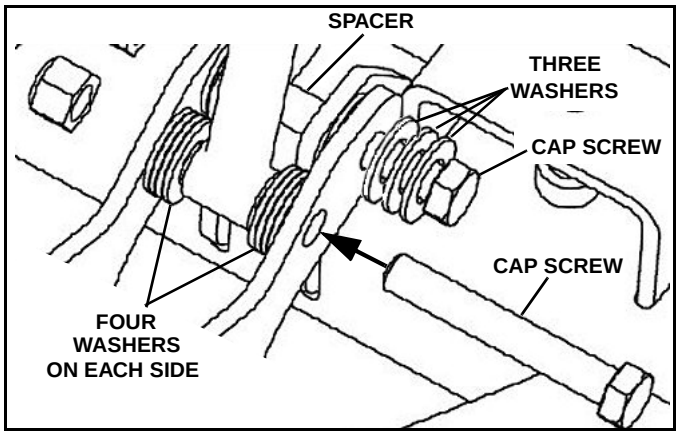


Figure 1-27

h. Insert 3/4" x 5" cap screw through left bracket, four washers, lift cylinder rod end, four washers and right bracket. (See Figure 1-27).

i. Install 3/4" locknuts on both cap screws. The lift cylinder rod end must be able to pivot in the brackets - Do not over-tighten this locknut. (See Figure 1-28).

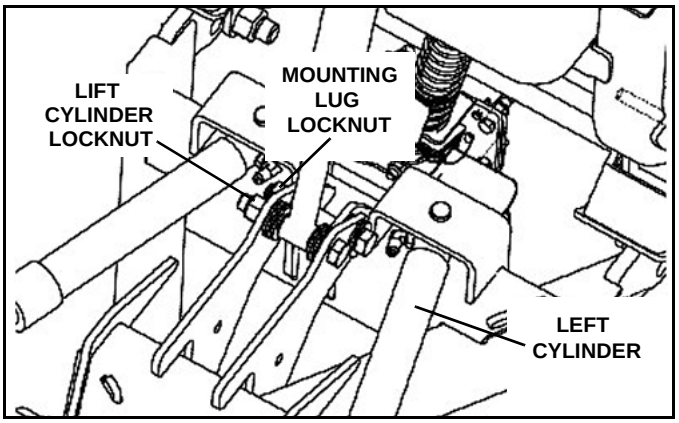


Figure 1-28

20. Flip lift cylinder up and secure to the light bar frame with a 3/4" clevis pin and 5/32" x 1-1/2" cotter pin. (See Figure 1-29).

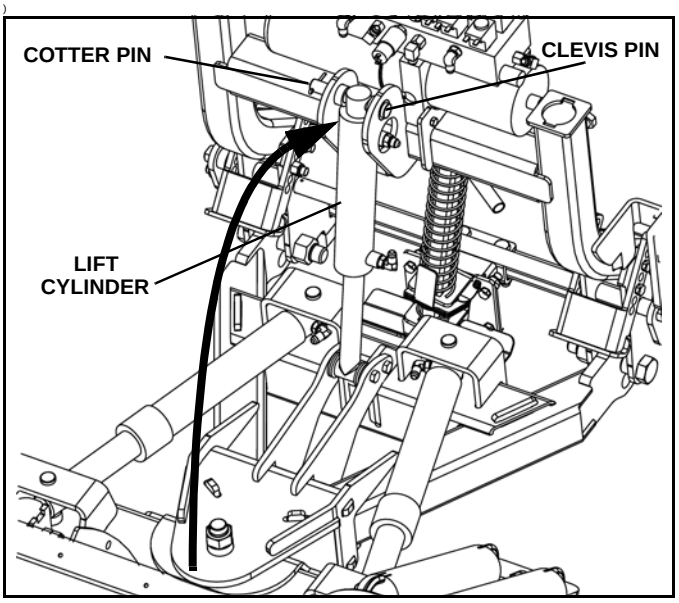


Figure 1-29

21. Connect hoses from C1 and C2 on the valve to the swing cylinders and from C3 and C4 to the lift cylinder as shown. Check hoses for pinching or binding. (See Figure 1-30).

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

NOTE: Covers on hydraulic hoses sets are not shown in the following illustrations for clarity.

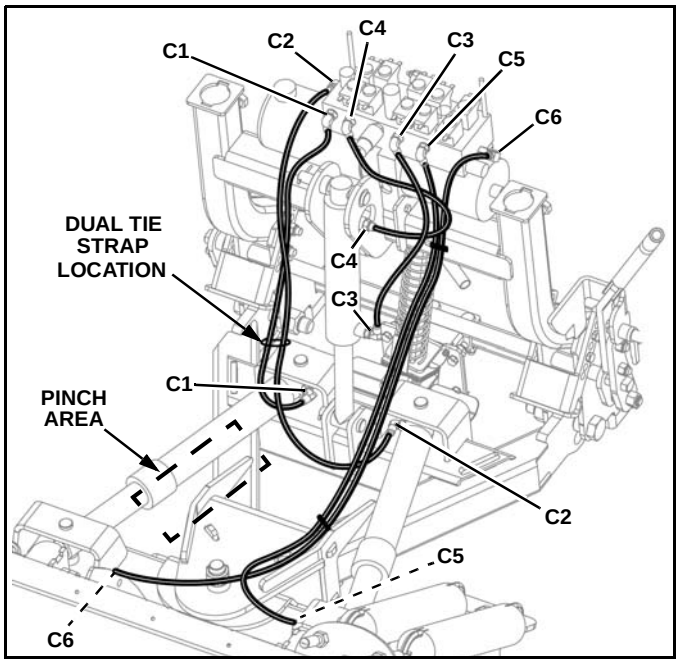


Figure 1-30

22. Connect hoses from C5 and C6 to the wing cylinders. (See Figure 1-30).

23. Install a dual tie strap (p/n 96112692) in the approximate location shown to prevent hoses from pinching between either swing cylinder and A-frame when stacking. Lift plow to ensure that hoses are free of pinch area. (See Figure 1-30).

24. To prevent hoses from pinching between the left swing cylinder and A-frame when stacking, install a hose clamp (p/n 96112500) on the wing cylinder hose set and secure to the A-frame with a self-tapping screw (p/n 98100386) in the location shown. Ensure that hoses are free of pinching and binding through full vertical range of A-Frame movement. (See Figure 1-31).

NOTE: If installing self-tapping screw with an impact wrench, ensure that the wrench in adjusted to its lowest torque setting to avoid fastener damage.

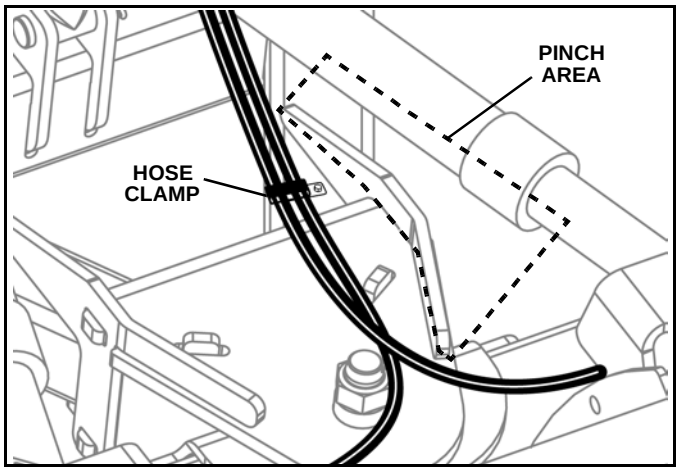


Figure 1-31

25. 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.

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

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

28. 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 1-32).

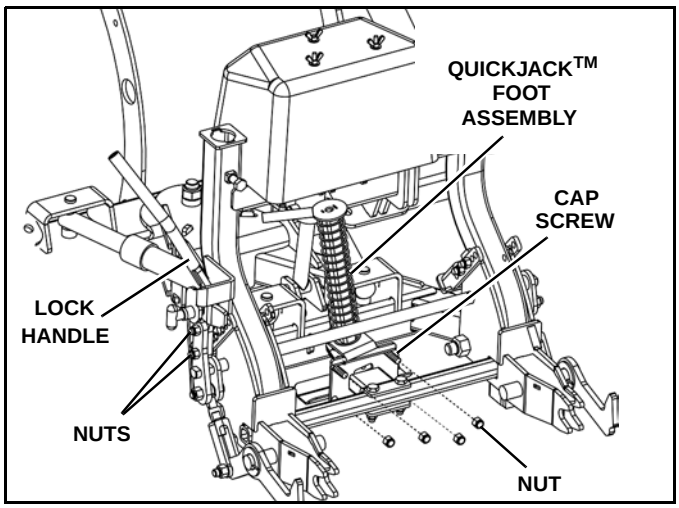


Figure 1-32

29. 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.

30. 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 1-32).

31. 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 1-33).

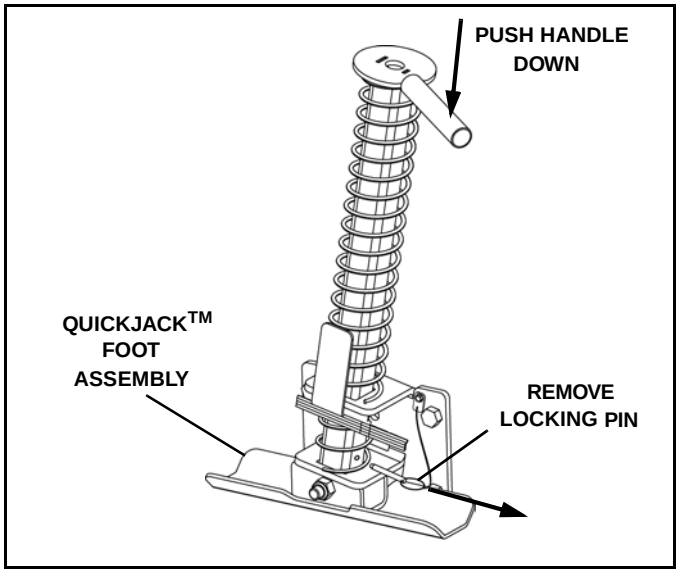


Figure 1-33

32. Release the lock handle safety pin and lower the lock handle fully. (See Figure 1-34).

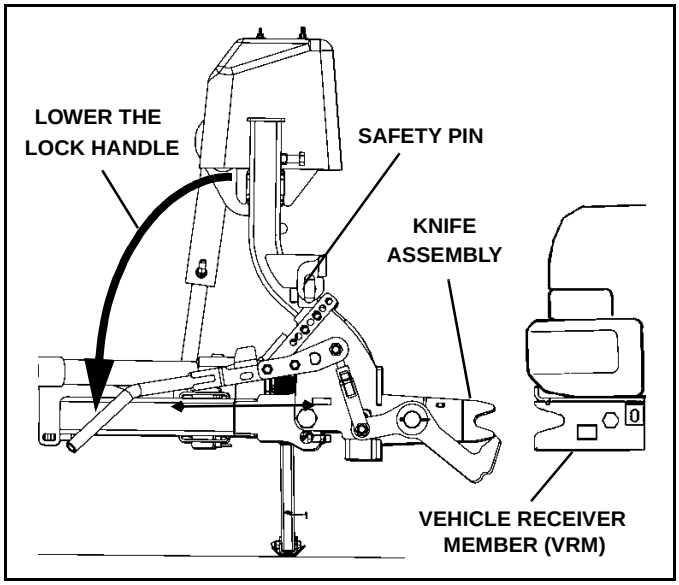


Figure 1-34

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

34. Drive truck up to plow and engage the plow knife assembly with the VRM on the truck. (See Figure 1-34).

35. Plug in main power to plow and lights.

36. Pull up engagement handle to engage plow onto stud on VRM, ensuring that the safety pin is fully engaged. (See Figure 1-35).

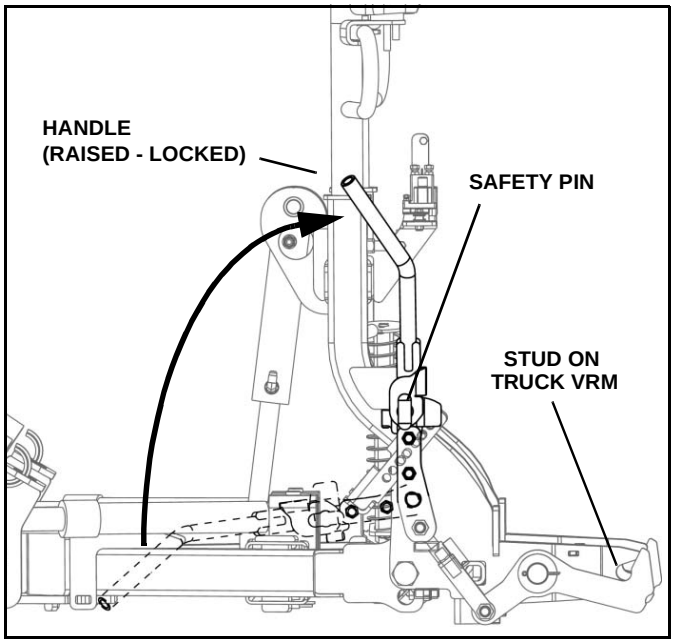


Figure 1-35

37. 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 1-36).

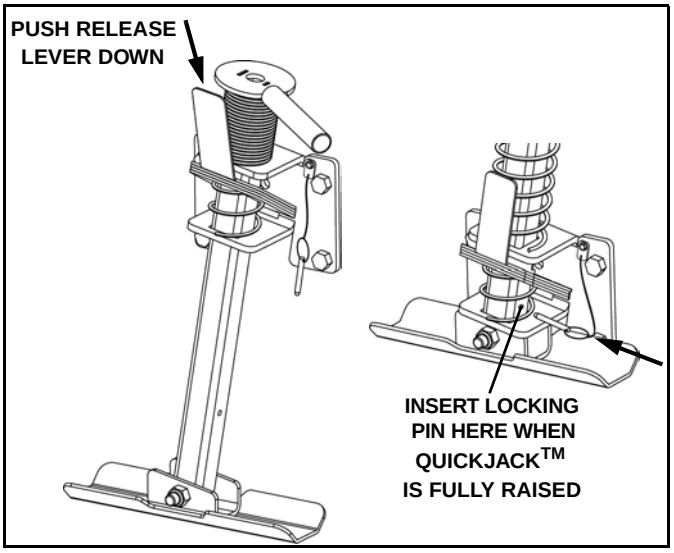


Figure 1-36

38. 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).

39. Ensure hydraulic hoses do not pinch or bind throughout entire range of plow motion.

40. Attach a plow marker to each wing and wing link as shown and secure using 5/16 x1" cap screws and locknuts. (See Figure 1-37).

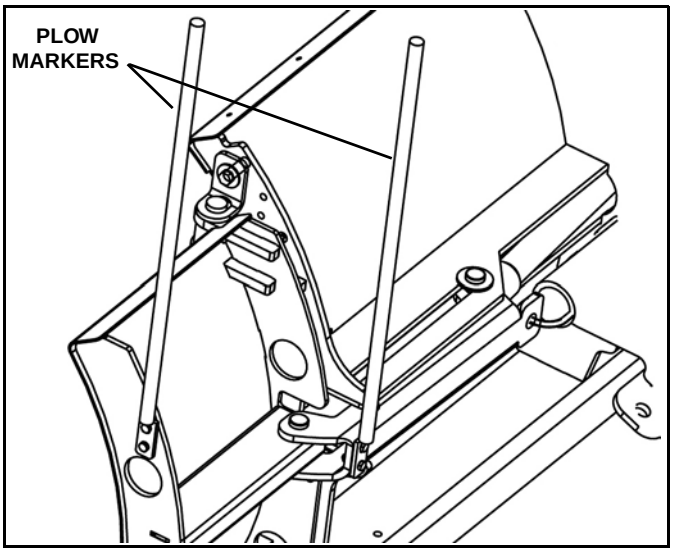


Figure 1-37

41. Remove upper light bar from container.

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

43. 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 1-38).

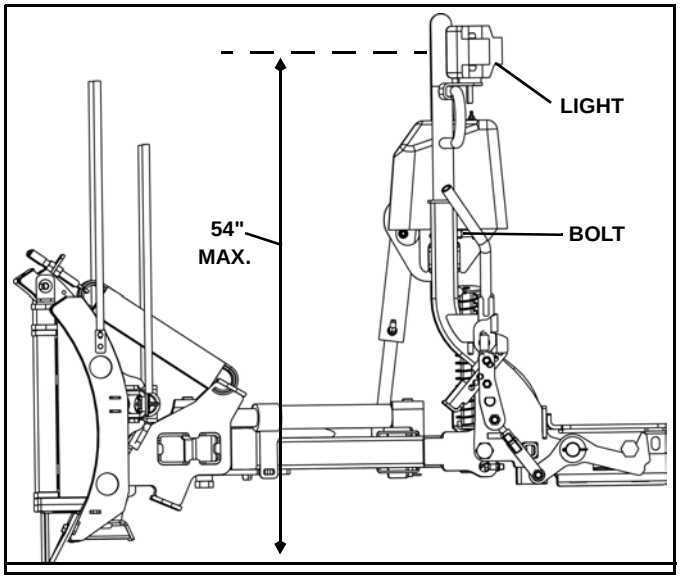


Figure 1-38

44. 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.

45. 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. (See Figure 1-39).

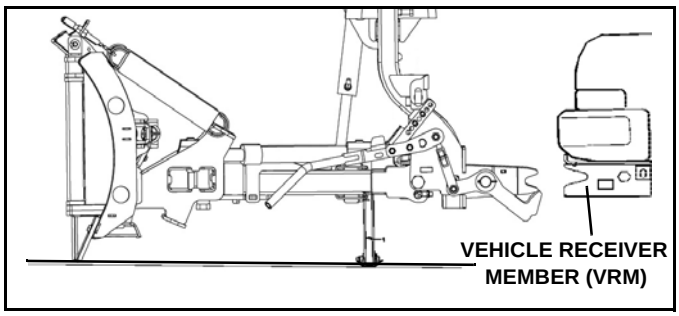


Figure 1-39

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 1-40).

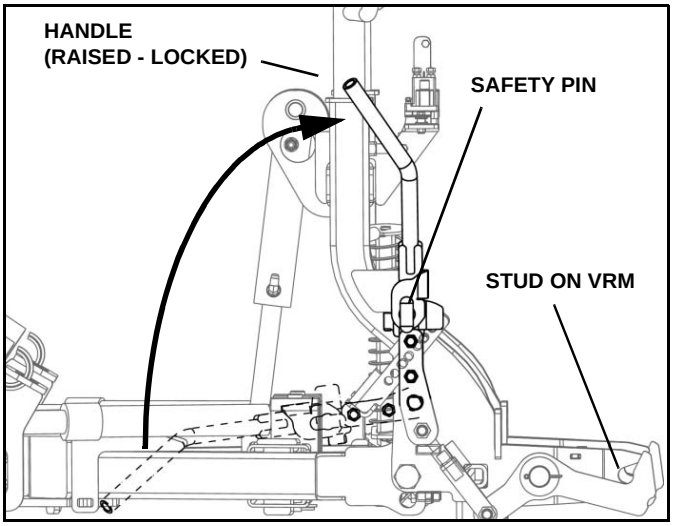


Figure 1-40

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 1-41).

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.

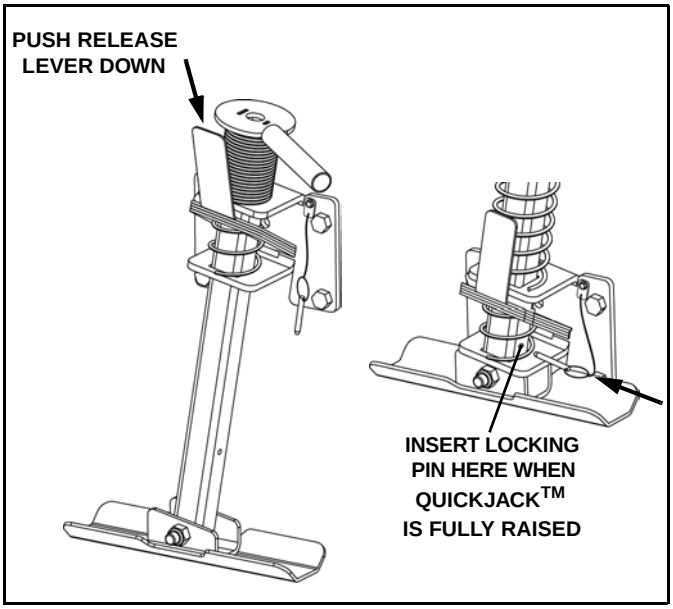


Figure 1-41

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 1-42).

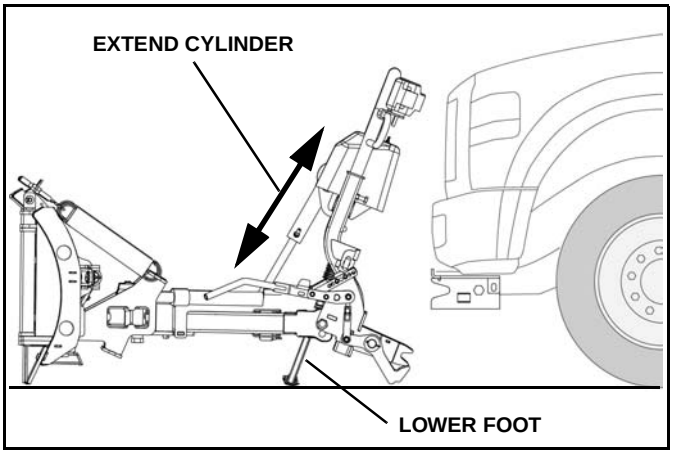


Figure 1-42

3. Retract the lift cylinder (raise the plow) until the A-Frame contacts the stacking stop. (See Figure 1-43).

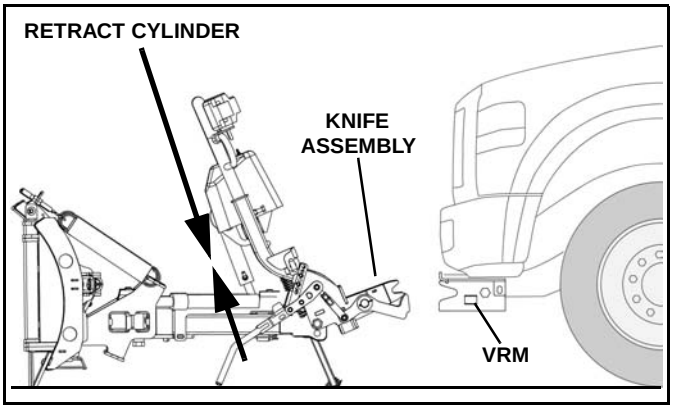


Figure 1-43

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).

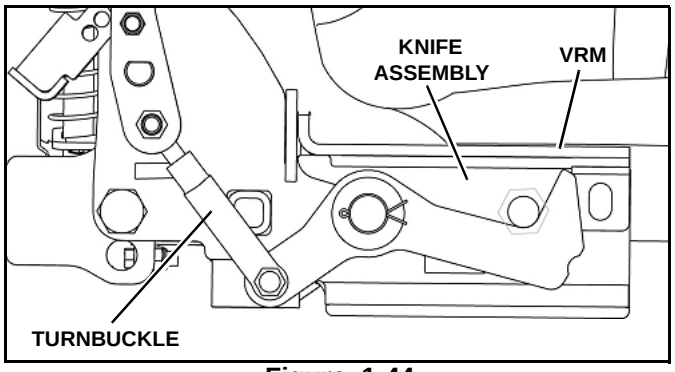


Figure 1-44

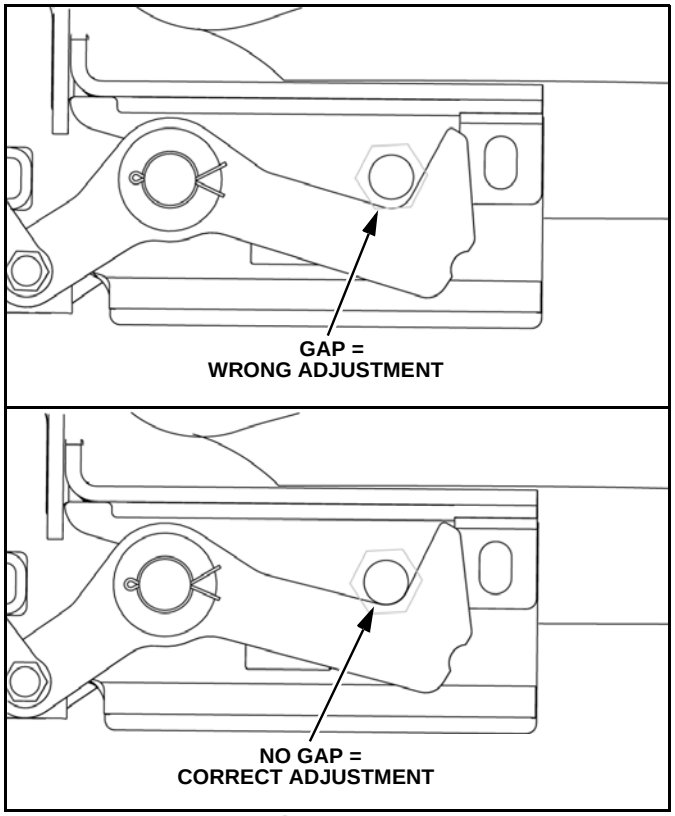


Figure 1-45

5. Once mounted, raise and lock the engagement handle. (See Figure 1-44).

NOTE: Turnbuckles are set to an approximate length from factory. Further adjustment may be needed after installation. Over extending the turnbuckle could cause the handle to become difficult to rotate completely. Periodically the turnbuckle will need to be adjusted due to wear and tear of the VRM. (See Figure 1-44 and Figure 1-45).

6. Release the foot, insert the foot locking pin (see Figure 1-41) 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 1-46).

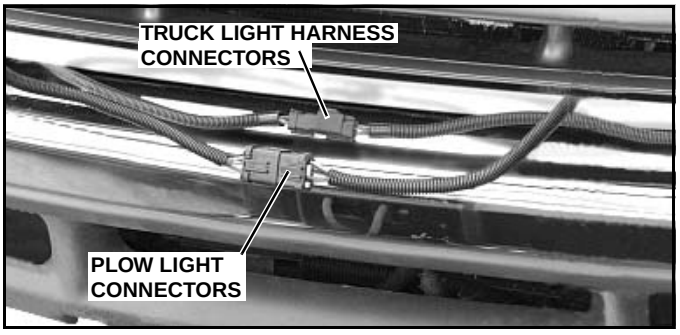


Figure 1-46

2. Plug EIS® plow light connectors into mating connectors on truck light harness. (See Figure 1-47).

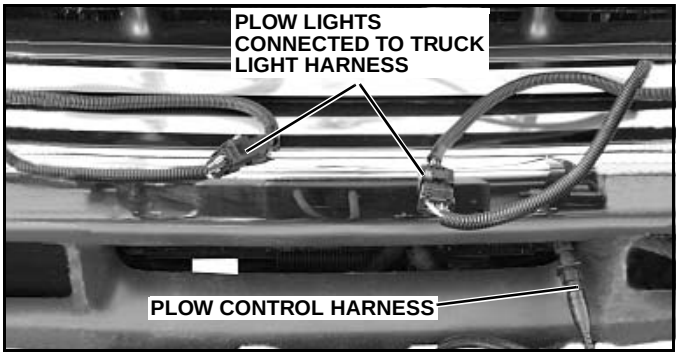


Figure 1-47

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 1-48). Disconnect the plow control harness and replace the protective cap.

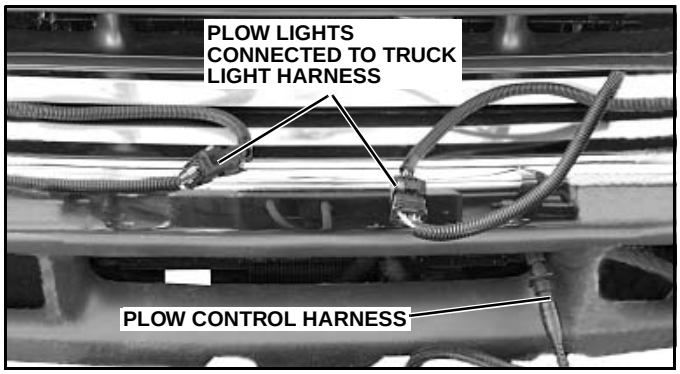


Figure 1-48

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 1-49).

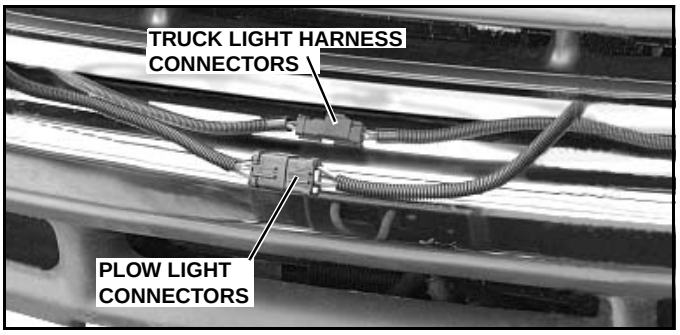


Figure 1-49

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 1-50).

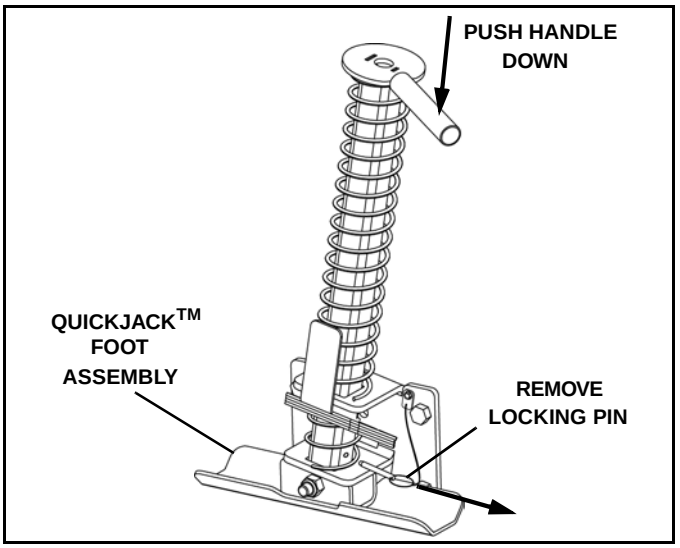


Figure 1-50

7. Pull safety pin on engagement handle to release and lower handle to disengage plow from truck. (See Figure 1-51).

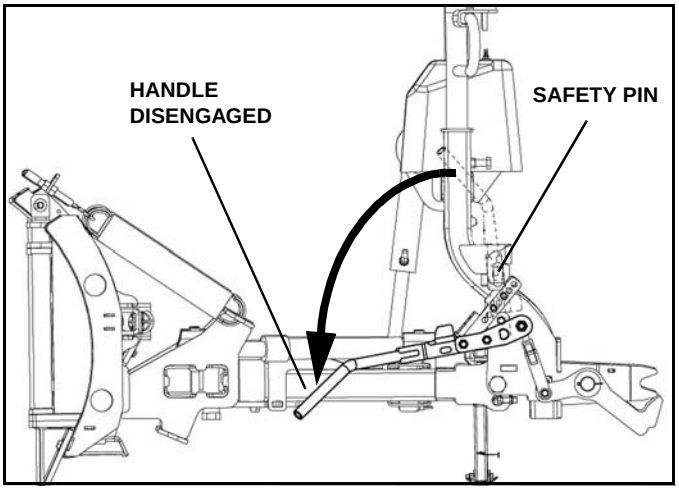


Figure 1-51

8. Back truck away from plow. (See Figure 1-52).

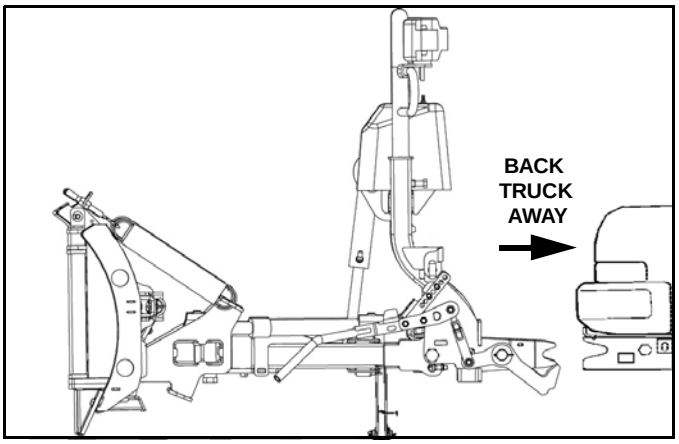


Figure 1-52

Plow Storage

When storing the plow for long periods of time use the following guidelines.

1. If the plow will not be stored on pavement, place a board under the jack stand to prevent it from sinking into the ground.

2. To prevent corrosion, coat the exposed portion of the cylinders with light grease.

3. Grease all pivot points.

4. Fill hydraulic reservoir to the fill line to minimize trapped air.

5. Place dielectric grease on the terminals of all electrical plugs, including those under pump cover. Make sure protective caps are in place or plugs are plugged together.

6. Check and replace any worn or damaged component, such as cutting edges, deflectors, and bushings.

MAINTENANCE

General

WARNING

Before servicing plow, lower plow to the ground or onto cylinder lock clamp and disconnect main power harness.

FAILURE TO FOLLOW CAN RESULT IN INJURY OR DEATH

• Before operating, perform a through 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 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 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.

Break In Period

The plow will go through a break in period during which the A-frame and swing frame will settle in. After 15-20 hours of operation check for free play of the A-frame and swing frame pivot.

1. Push down on end of blade as far as it will go on the right or left side. Measure and record the distance from the ground to the bottom edge of the wear strip.

2. Pull upwards on the same end of the plow as far as it will go. Measure and record the distance from the ground to the bottom edge of the wear strip.

3. Subtract the two measurements. If the number is greater than 1-1/2" then the free play needs to be adjusted.

To Remove Excessive Free Play

1. Tighten the pivot bolt nut (typically 1/6 to 1/3 turn, one or two flats).

Periodic Inspection

After every 20 hours of operation perform the following inspections:

1. Inspect plow assembly including sub frame for any damage or excessive wear. Replace parts as necessary.

2. Inspect all fasteners to insure they are properly tightened. Re-tighten loose fasteners to the proper torque. (Refer to torque specification chart in this manual.)

3. Apply a small amount of light oil to: attachment pin and handle assemblies, pivot pins between the blade and swing frame, and pivot pins at lift, swing and wing cylinders. Also lubricate jackstand pins. (See Figure 1-53).

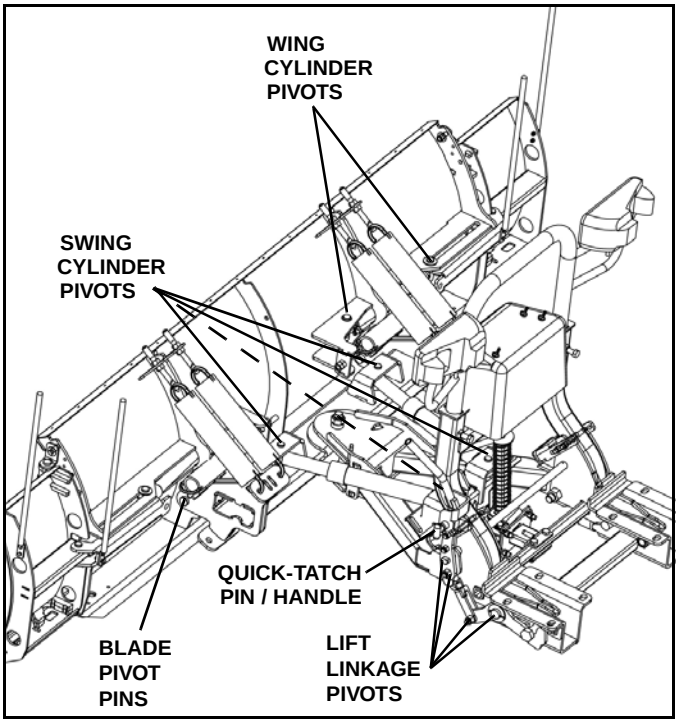


Figure 1-53

4. Fold the wings slightly and apply oil or grease to the wing pivot pins through two lubrication holes provided in each pin housing. (See Figure 1-54).

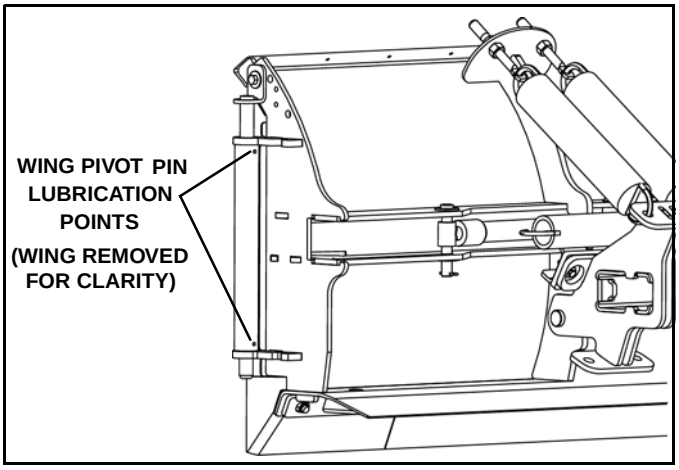


Figure 1-54

5. If wear is noticed between the A-frame and the swing frame apply a good quality anti-seize lubricant to this area.

6. Periodically the turnbuckle will need to be adjusted due to wear and tear of the VRM. (See Figure 1-55).

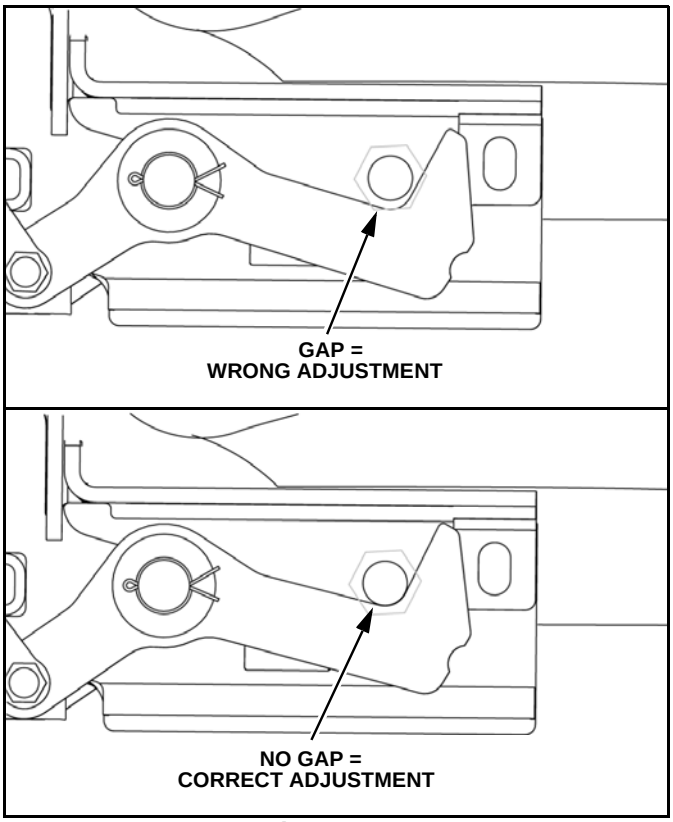


Figure 1-55

Fluid Requirements

IMPORTANT: Hydraulic unit comes from factory 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 cylinders.**
- **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. Burns can result from contact with hot oil.**
- **Never disconnect any hydraulic line or fitting with the plow in the raised position. Always lower the plow and relieve pressure before removing any lines or caps.**

FAILURE TO FOLLOW CAN RESULT IN INJURY OR DEATH

1. Move plow to a clean, dry area with a solid surface. Lower the plow to the ground, put vehicle in park, turn off the engine and vehicle ignition, set the park brake, and turn off the plow controller.

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 (4) wing nuts and flat washers from the cover. Remove the cover. (See Figure 1-56).

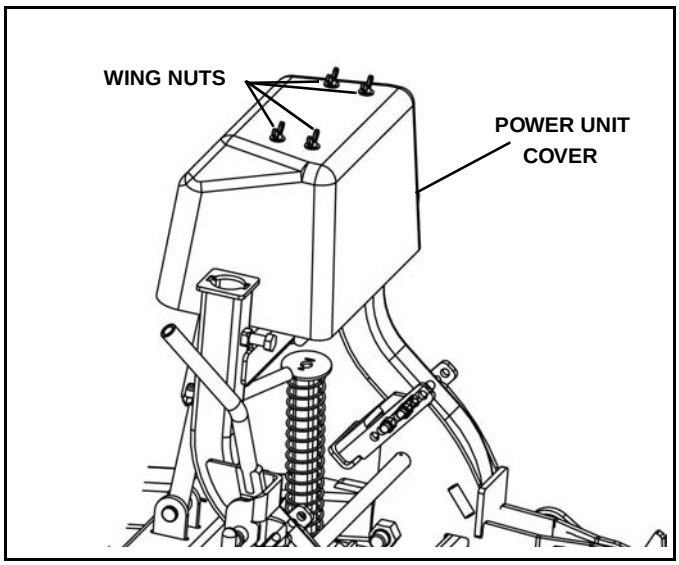


Figure 1-56

4. Remove the filler/breather cap from the reservoir.

5. Using a suction gun, drain the oil (most of it) from the power unit 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 and wing 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 1-57).

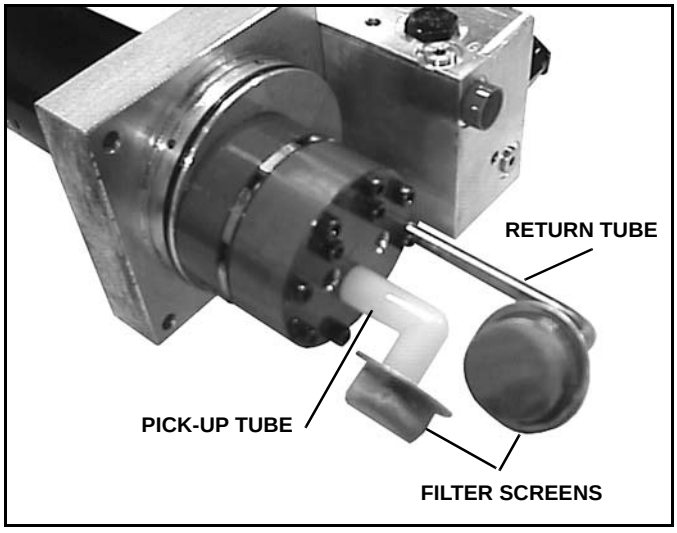


Figure 1-57

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 1-57). 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 hoses and tighten fittings as follows:

- 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.

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 (With Blade Serial Numbers before 118R101000)

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 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 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 1-58).

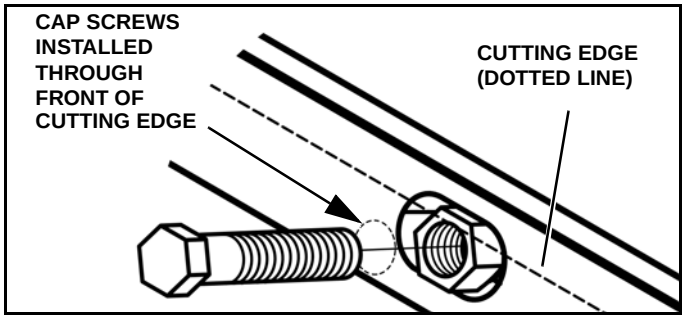


Figure 1-58

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 two (2) plow shoes. The plow shoes are located at the outboard end on each side of the blade.

To ensure the best function of this snow plow, it is a requirement that both 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 1-59).

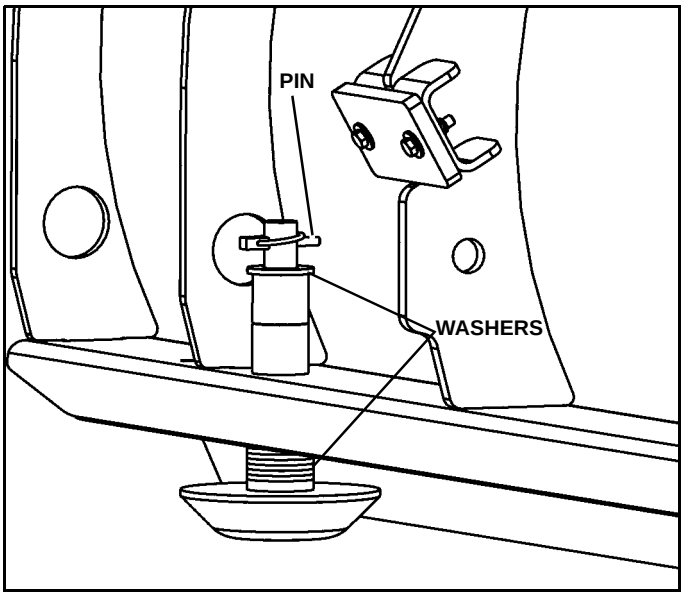


Figure 1-59

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 A-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 blade 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 swing frame. (See Figure 1-60).

NOTE: The strap can be installed either right or left of the plows center line. It is shown installed on the right side in the following illustration.

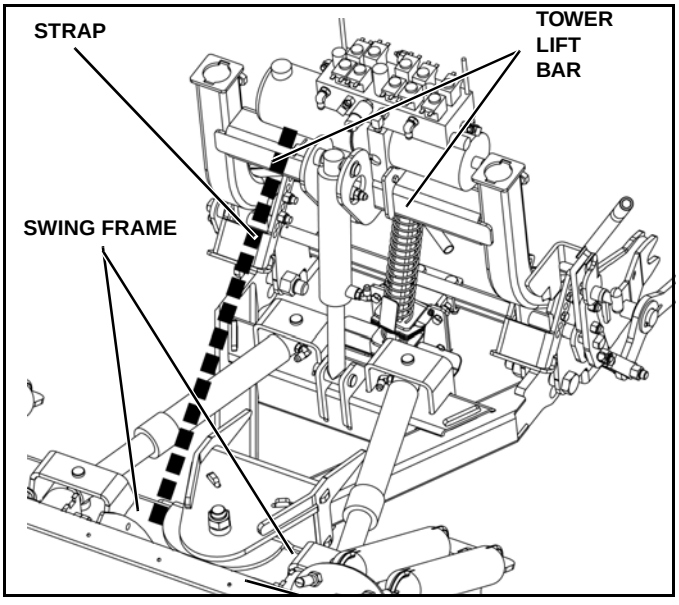


Figure 1-60

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 1-61).

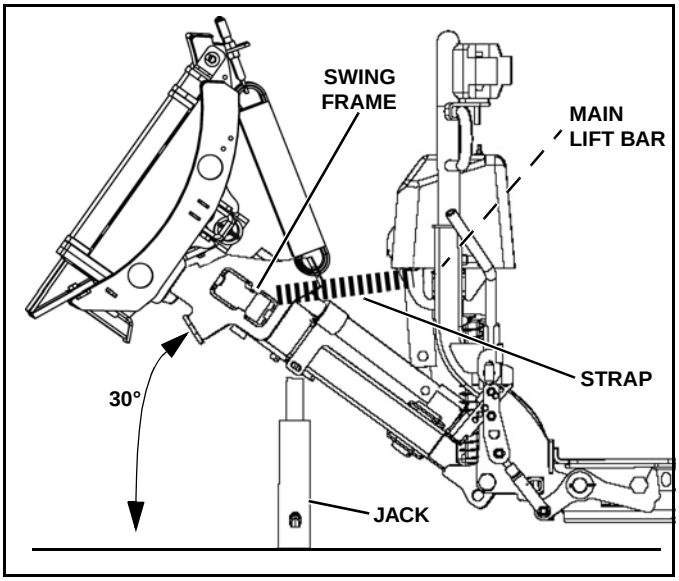


Figure 1-61

3. Put strap around center of swing 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 1-62).

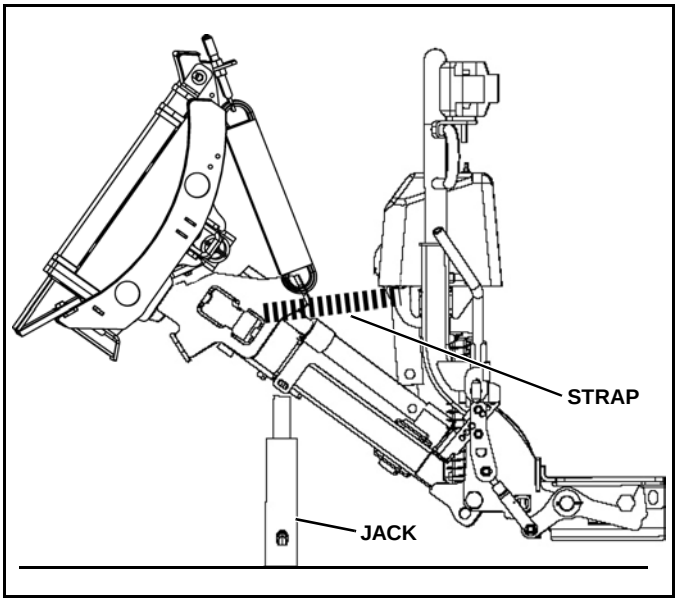


Figure 1-62

2. Release strap and lower jack. (See Figure 1-62).

3. Remove the QuickJack™ locking pin and push the jackstand handle down to fully lower the foot to the ground. (See Figure 1-63).

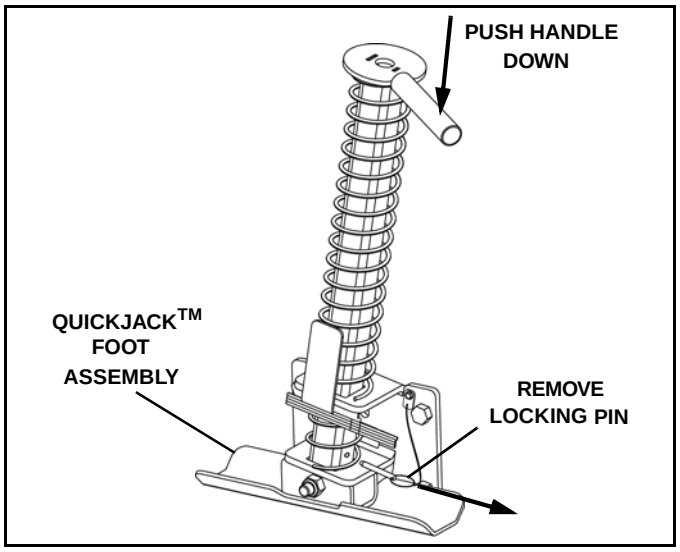


Figure 1-63

4. Pull safety pin on engagement handle to release and lower handle to disengage plow from truck. (See Figure 1-64).

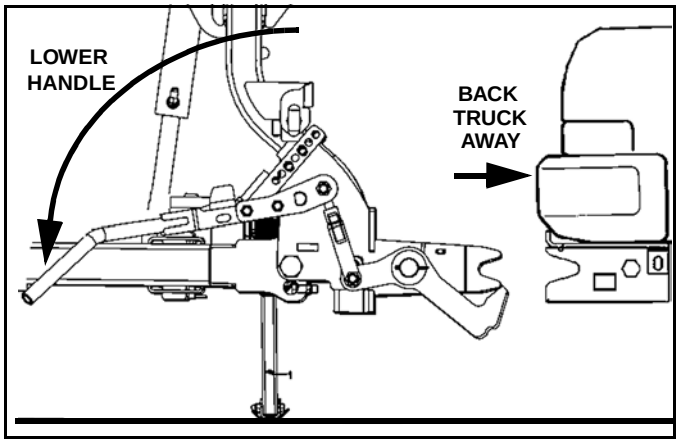


Figure 1-64

5. Disconnect light, main and controller harnesses. Reconnect truck harness.

6. Back truck away from plow.

PLOWING OPERATION

Operating Class

The Sno-Way MegaBlade™ MVR Series plow is specifically designed for heavy commercial applications on trucks with a GVWR of 10,000 to 26,000 lbs. The 9'10" blade can also be installed on many 3/4 ton trucks.

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 plow vehicles brakes, headlights, plowing lights, windshield wipers, flashers, electrical system, and cooling system for proper operation.

2. Inspect plow assembly including sub frame for any damage or excessive wear. Replace parts as necessary

3. Inspect all fasteners to insure they are properly tightened. Re-tighten loose fasteners to the proper torque (Refer to torque specification chart in this manual).

4. Apply a small amount of light oil to: attachment pin and handle assemblies, pivot pins between the blade and swing frame, and pivot pins at lift and swing cylinders. Also lubricate jackstand pins. (See Figure 1-53).

5. If wear is noticed between the A-frame and the swing frame apply a good quality anti-seize lubricant to this area.

6. Clean and repaint any exposed metal parts with corrosion resistant enamel.

7. Check free play between the A-frame and swing frame pivot. Adjust if necessary. (See "Break In Period" on page 20.)

8. Check the oil level and repair any oil leaks.

9. Inspect electrical connectors. Make sure the contacts are clean, and apply a small amount of dielectric grease.

10. Install auxiliary and flashing lights (if not equipped). Ensure auxiliary lights are aimed properly (with the plow raised).

11. If ballast is required, position and secure 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

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.

FAILURE TO FOLLOW CAN RESULT IN INJURY OR DEATH

2. Do not exceed 45 M.P.H. when driving with the snowplow attached. Braking distance is increased and handling impaired 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 attaching hardware for damage before transporting or plowing.

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 air bag is factory set to deploy at a certain acceleration level. 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.

NOTE: For better clean up of hard packed snow; raise the disc shoes so that the cutting edge of the blade comes into direct contact with pavement. Use the lowest possible gear to place maximum power behind the cutting edge.

For instructions on using the plow controller to manipulate the plow see the manual included with your plow control package.

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 when the next storm comes.

2. Plow with the storm. The “Pros” are out early removing only several inches at a time. Allowing snow to accumulate to unmanageable levels can cause removal problems and wear and tear on equipment. The plow is not a “Ram” or a “Bulldozer”. If used properly, it will give 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 or moved across roads or highways.

4. Research state department of transportation rules on maximum width restrictions for snow plows. Certain blades may require permits.

Using The Down Pressure™ (DP) Hydraulic System

The Down Pressure™ (DP) Hydraulic System was designed for removing hard packed snow from hard surfaces that has been driven on prior to plowing.

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

Activating the system applies down pressure to the down pressure side of the lift cylinder. This down pressure will force the cutting edge through hard packed snow. If down pressure decreases as a result of a low spot, more down pressure will be applied to the lift cylinder. When a high spot is encountered the down pressure will be relieved to allow the plow to follow the contour without lifting the front of the truck.

Clearing Driveways

1. Head into driveway with the blade angled to move snow away from buildings. Continue to widen the drive path by rolling snow away from buildings on successive passes.

2. If there is a garage at the end of the driveway, plow to within several vehicle lengths of the garage and push the snow off the driveway.

3. Raise the blade and drive through the snow up to the garage. Drop the blade and “Back Drag” the snow 1-1/2 vehicle lengths back. Repeat as necessary.

4. Back the vehicle to garage door and plow forward toward street, removing the remaining snow.

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, angle the blade to either side and plow a single path down the center. The roadway can then be widened by making successive passes on each side of the first path, with the blade angled to move snow toward the outer edge of the roadway.

Clearing Parking Lots

CAUTION

Excessive stacking of snow causes undo 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.

1. “Back Drag” areas in front of buildings and near walls then work away from buildings towards the outer edges of the lot.

2. Plow a single path down the center in the longest direction.

3. Angle plow toward the outside and make successive passes until the area is cleared and the snow is “Stacked” around the outer edges. If snow is too deep to clear in the above manner, clear main traffic lanes and stack snow at intermediate positions.

TROUBLESHOOTING

Introduction

Whenever service is necessary, your local dealer knows your plow best and is interested in your complete satisfaction. Return your snowplow 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. 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 available:

A. Date snowplow 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, fuse, solenoid, 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 solenoid valves to be sure that the voltage at the coils is a minimum of 10.5 volts DC.

TROUBLESHOOTING CHARTS

PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
Motor will not run	Fuse blown	Refer to dealer
	Motor solenoid failed	Refer to dealer
	Motor seized	Refer to dealer
	Motor brushes worn/commutator worn or dirty	Refer to dealer
	Seal between motor and pump damaged allowing oil to enter motor housing	Refer to dealer
Motor continues to run and will not shut-off	Wires shorted out at solenoid or damaged receiver or transmitter	Refer to dealer
Blade will not lift (motor runs)	Hydraulic fluid level low	See Maintenance section
	Improper main pressure relief valve pressure setting or debris causing valve to stick	Refer to dealer
	Breather cap plugged	See Maintenance section
	Lower valve (B) stuck in “Lower” position	Refer to dealer
	Raise cylinder binding	Refer to dealer
	Pick-up tube filter plugged	See Maintenance section
	Worn/failed pump	Refer to dealer
	Pick-up tube is not submerged in fluid	See Maintenance section
	Down pressure valve (E) stuck open	Refer to dealer
	Raise valve (C) not functioning	Refer to dealer
Blade lifts slowly	Hydraulic fluid level low	See Maintenance section
	Breather cap plugged	See Maintenance section
	Improper main relief pressure setting or 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
	Weak system pump	Refer to dealer
	Low battery voltage	Refer to dealer
Unit lifts but does not hold - first action.	Dirt in check valve	Cycle raise and lower system to flush debris
	Dirt in lower valve (B)	Cycle raise and lower system to un-stick valve

PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
Unit lifts but does not hold- Second action.	Dirt or debris in check valve	Refer to dealer
	Lower valve (B) sticking or dirt in valve	Refer to dealer
	Seals, O-ring(s) on lower valve (B) damaged	Refer to dealer
	Current available at lower coil (B) without activating function	Refer to dealer
	Piston seals leaking on raise cylinder	Refer to dealer
Unit will not lower (Down pressure switch OFF)	Plugged breather cap	See Maintenance section
	Low or no current available at lower coil (B)	Refer to dealer
	Lower valve (B) sticking or stuck	Refer to dealer
	Lower coil (B) inoperative	Refer to dealer
	Raise cylinder damaged allowing movement in one direction only	Refer to dealer
Unit will not apply Down pressure (Down pressure switch ON)	Lower valve (B) sticking or stuck	Refer to dealer
	Inoperative down pressure, pressure switch	Refer to dealer
	Down pressure relief valve setting to low	Refer to dealer
	Broken wire/ open circuit in down pressure electrical circuit	Refer to dealer
Blade will not angle (motor runs)	Hydraulic fluid level low	See Maintenance section
	Crossover pressure relief valve setting too low	Refer to dealer
	Low or no current available at angle coil (A or D)	Refer to dealer
	Angle coil (A or D) inoperative	Refer to dealer
	Angle cylinder binding or bent	Refer to dealer
	Pick-up tube not submerged in fluid	See Maintenance section
	Angle valve (A or D) not operating	Refer to dealer
Unit angles very slowly	Hydraulic fluid level low	See Maintenance section
	Crossover relief valve pressure setting too low	Refer to dealer
	Improper oil viscosity for outside air temperature, unit not at normal operating temperature	See Maintenance section
	Damaged cylinder	Refer to dealer
	Cylinder packing improperly torqued or dry	Refer to dealer
Unit angles in one direction only	Crossover relief valve sticking or stuck	Refer to dealer
	Angle coil (A or D) inoperative	Refer to dealer
	Low or no current available at angle coil (A or D)	Refer to dealer
	Angle valve (A or D) stuck/sticking	Refer to dealer
	Angle cylinder binding	Refer to dealer

PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
Unit does not hold angle. Note: This problem is usually noted when pushing snow.	Crossover relief valve pressure setting too low	Refer to dealer
	Crossover relief valve sticking or stuck	Refer to dealer
	Pilot check valve has debris or damaged piston	Refer to dealer
Fluid leaking at power unit	Hydraulic fittings not torqued properly (too tight, too loose)	Refer to dealer
	0-rings between valve block and base are worn/ missing or not seating properly	Refer to dealer
	0-rings between base and reservoir worn or not seating properly	Refer to dealer
	Reservoir over-full	See Maintenance section
	Pump shaft seal leaking	Refer to dealer
	Valve block Cap Screws loose	Refer to dealer
	Reservoir fasteners loose	Refer to dealer

THEORY OF OPERATION

Hydraulic Power Unit

The hydraulic power unit consists of:

12V DC Motor
Hydraulic pump rated at 1.54 GPM @ 1500 PSI
1.35 quart capacity reservoir
Fine mesh intake and return filters
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 12V DC 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 that 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.
- One crossover relief valve, set to 3000 PSI.
- Two three-way two position hydraulic valves for angle left or right functions.
- Two single acting hydraulic cylinders for angle left and right 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, set to 460-500 PSI.
- Two single acting spring return hydraulic cylinders for left and right wing functions.
- Two three-way two position, two-way two position valves and two pressure relief valves set to 2150 PSI.

Electro-Hydraulic Operation

All hydraulic functions are controlled by the 12V DC electrical system which actuates coils on the hydraulic valves and the solenoid for the electric motor of the power unit.

12V DC power is fed from the battery post of the motor start solenoid through a 10 amp fuse to a control circuit board on the plow and from the circuit board to each coil.

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

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 start solenoid and the coil for the 'C' valve.

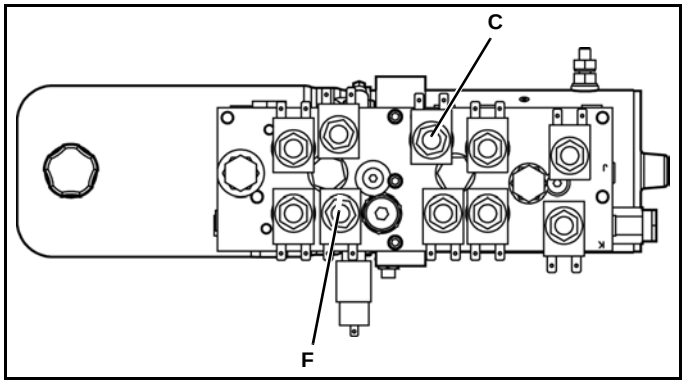


Figure 1-1

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, the motor stops, the circuits to the coils for the 'C' and 'F' valves are interrupted and these valves go 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. This actuates the coil for the 'B' valve and the 'F' valve, allowing hydraulic fluid to flow from the lift cylinder to the reservoir.

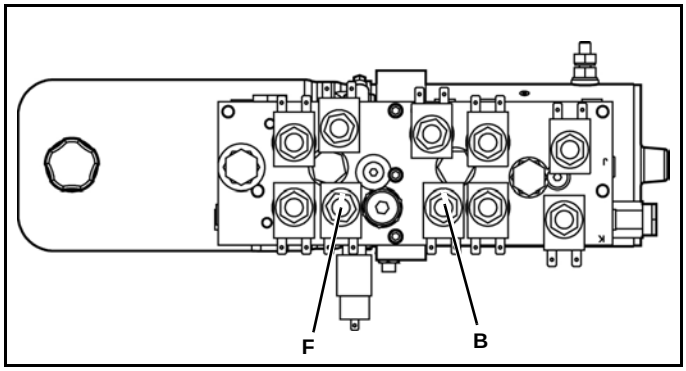


Figure 1-2

Once the 'Lower' switch has been actuated, the system will stay in this mode until the 'Raise' function is actuated or control is shut off, allowing hydraulic fluid to flow between the reservoir and the lift cylinder. This allows the lift cylinder to 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 both the 'DP' switch and the 'Lower' switch on the hand-held controller are actuated.

Actuating the 'DP' switch actuates the pressure switch, the 'B' valve coil, the 'E' valve coil and, through the pressure switch, the start solenoid as required. When the 'E' is actuated and the hydraulic pump operates, hydraulic fluid is directed to the rod end of the lift cylinder, retracting the cylinder and forcing the plow down.

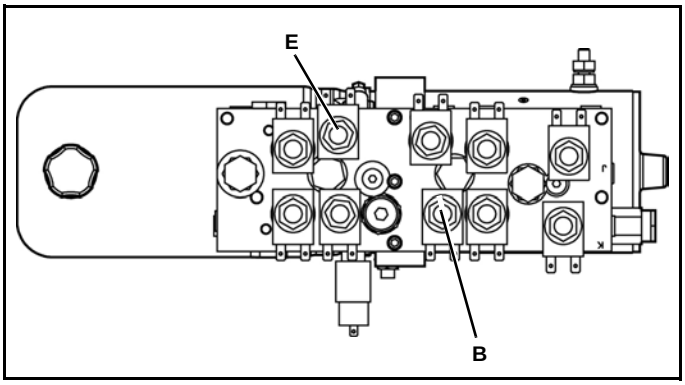


Figure 1-3

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 the pump.

The system is protected by a relief valve set at 460-500 PSI, 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, which will also lower the pressure. If the pressure becomes too low (<325 PSI), the pressure switch will activate the motor and pump as mentioned above to return pressure to normal levels.

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

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

Angle Left or Right Mode of Operation

Actuating the 'Angle Right' switch on the hand-held controller sends a signal to the control circuit board on the plow. This actuates the start solenoid and the coil for the 'A' valve, allowing hydraulic fluid under pressure to flow through the 'A' valve to the swing cylinder. At the same time, the hydraulic fluid passing through the 'A' valve unseats a check valve in the circuit for the 'D' valve, allowing hydraulic fluid to flow from the opposite swing cylinder through the 'D' valve and back to the reservoir.

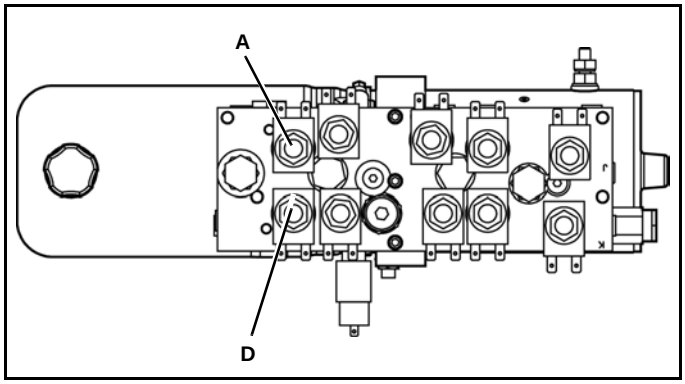


Figure 1-4

Actuating the 'Angle Left' switch on the hand-held controller sends a signal to the control circuit board on the plow. This actuates the start solenoid and the coil for the 'D' valve, allowing hydraulic fluid under pressure to flow to the swing cylinder. This fluid also unseats a check valve in the circuit for the 'A' valve, allowing fluid to flow from the opposite swing cylinder through the 'A' valve and back to the reservoir.

The angle circuits are protected by a crossover relief valve set to relieve pressure on the circuit at 3000 PSI. If the blade of the plow contacts an obstacle during plowing operations, the crossover relief valves will allow fluid to flow out of the swing cylinder on the side encountering the obstacle, allowing the cylinder to retract and allowing the blade to adjust its angle to relieve the force from the outside.

Left or Right Wing Mode of Operation

Actuating the 'Right Wing Extend' switch on the hand-held controller sends a signal to the control circuit board on the plow. This actuates the start solenoid and the coil for the 'G' valve, allowing hydraulic fluid under pressure to flow through the 'J' valve in its rested position to the right wing cylinder.

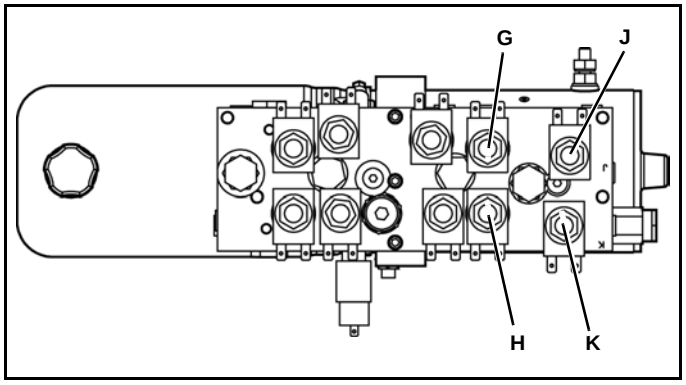


Figure 1-5

Actuating the 'Right Wing Retract' switch on the hand-held controller sends a signal to the control circuit board on the plow. This actuates the coil for the 'J' valve, allowing hydraulic fluid to flow through the 'G' valve in its rested position and back to the reservoir.

Actuating the 'Left Wing Extend' switch on the hand-held controller sends a signal to the control circuit board on the plow. This actuates the start solenoid and the coil for the 'H' valve allowing hydraulic fluid under pressure to flow through the 'K' valve in its rested position to the left wing cylinder.

Actuating the 'Left Wing Retract' switch on the hand-held controller sends a signal to the control circuit board on the plow. This actuates the coil for the 'K' valve, allowing hydraulic fluid to flow through the 'H' valve in its rested position and back to the reservoir.

Both wing circuits are protected by a relief valve set to relieve pressure on the circuit at 2150 PSI. If either wing contacts an obstacle during plowing operations, the relief valves will allow fluid to flow out of the wing cylinder on the side encountering the obstacle and allow the cylinder to retract.

Dual Wing Mode of Operation

Actuating the 'Dual Wing Extend' switch on the hand-held controller sends a signal to the control circuit board on the plow. This actuates the start solenoid and the coils for the 'G' and 'H' valves, allowing hydraulic fluid under pressure to flow through the 'J' and 'K' valves respectively, allowing hydraulic fluid under pressure to flow to both wing cylinders.

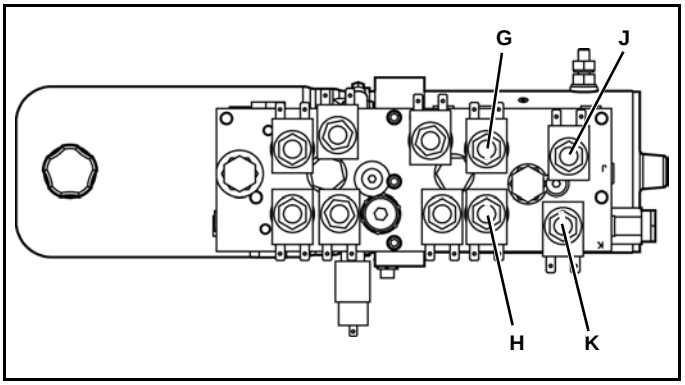


Figure 1-6

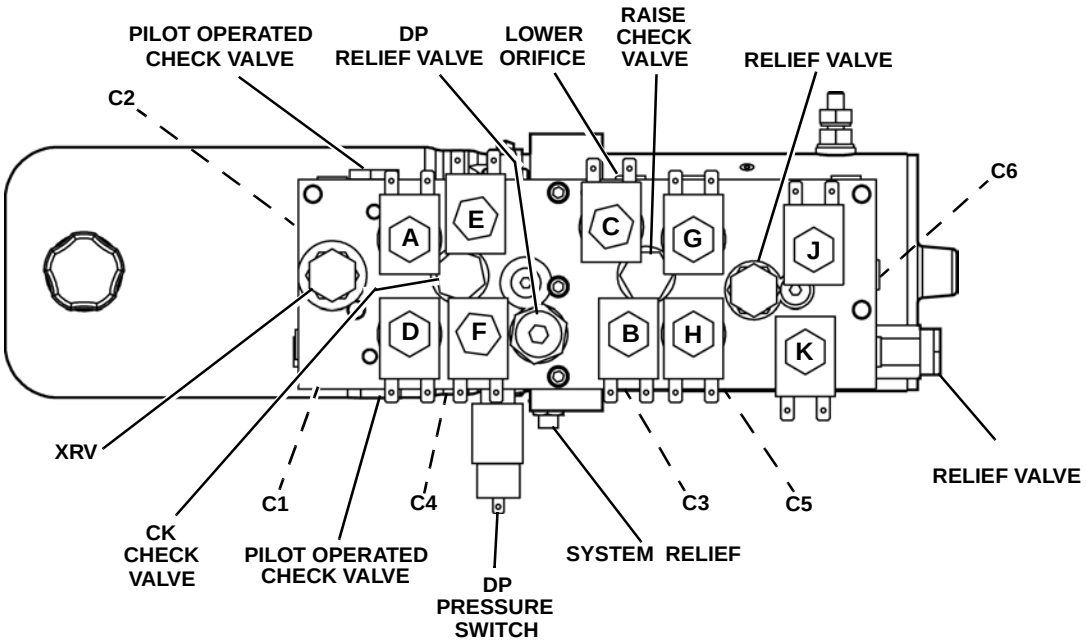
Actuating the 'Dual Wing Retract' switch on the hand-held controller sends a signal to the control circuit board on the plow. This actuates the coils for the 'J' and 'K' valves, allowing hydraulic fluid to flow through the 'G' and 'H' valves respectively and back to the reservoir.

Both wing circuits are protected by a relief valve set to relieve pressure on the circuit at 2150 PSI. If either wing contacts an obstacle during plowing operations, the relief valves will allow fluid to flow out of the wing cylinder on the side encountering the obstacle and allow the cylinder to retract.

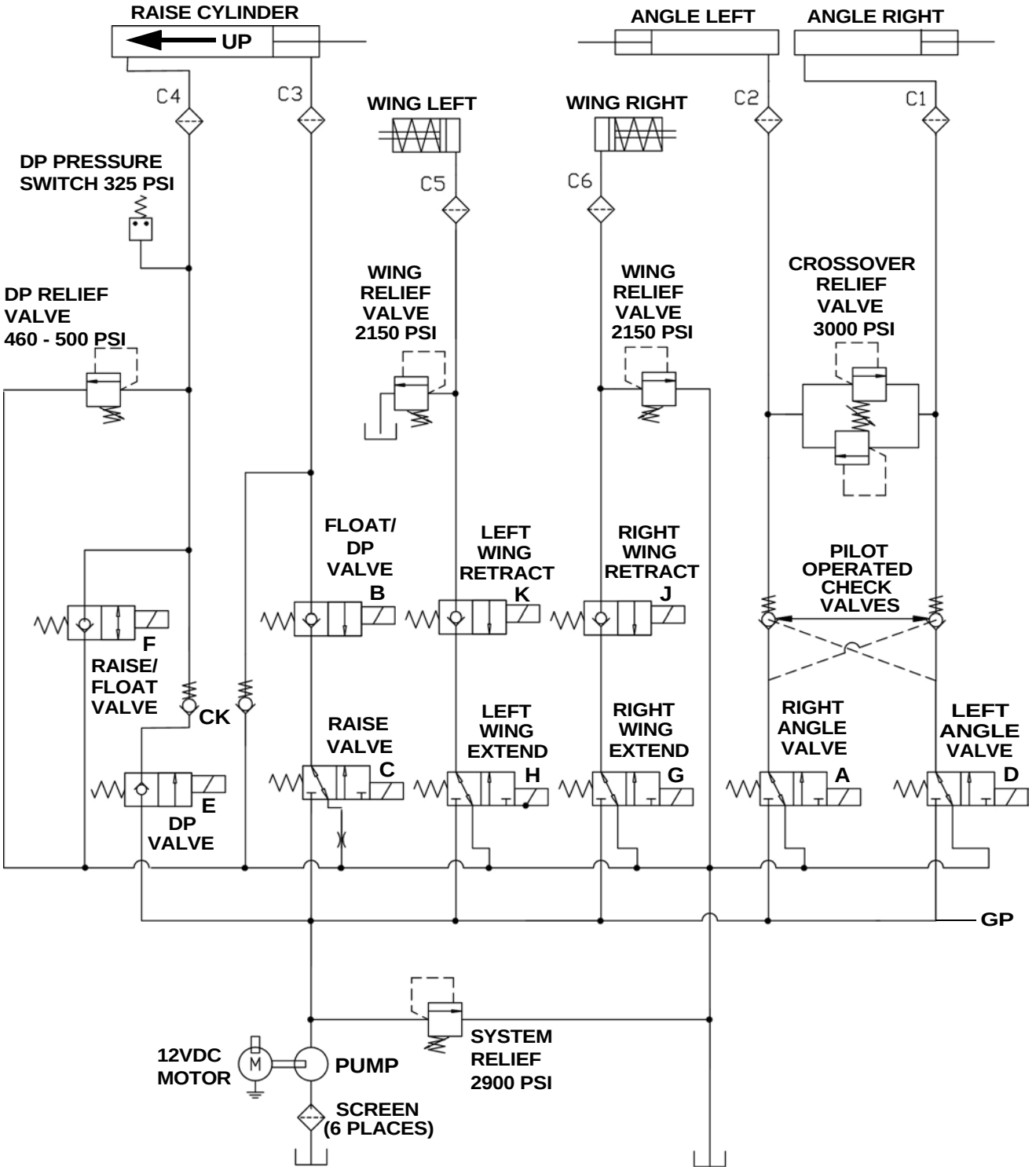
Fuse

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.

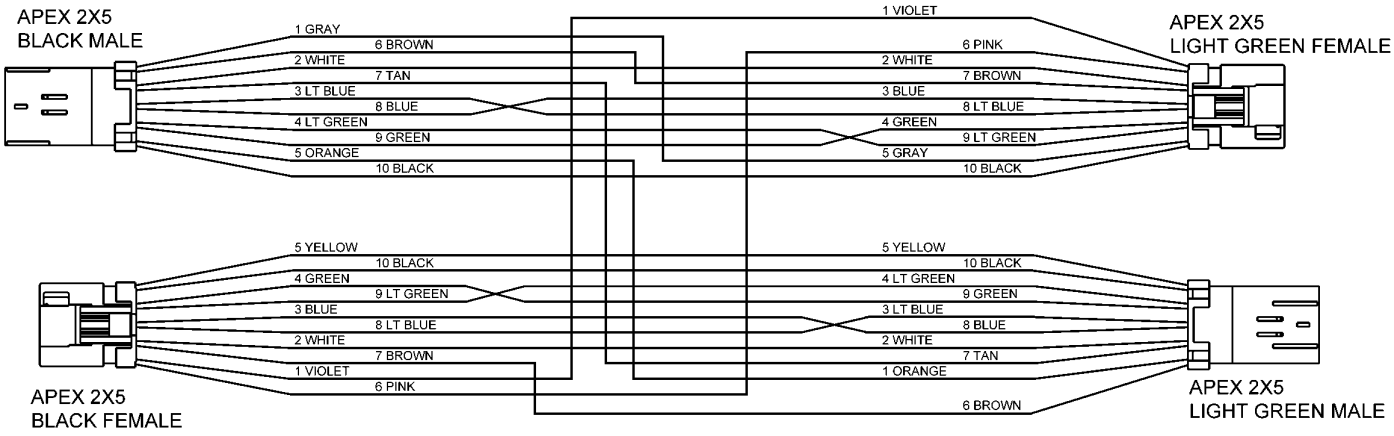
Power Unit Components



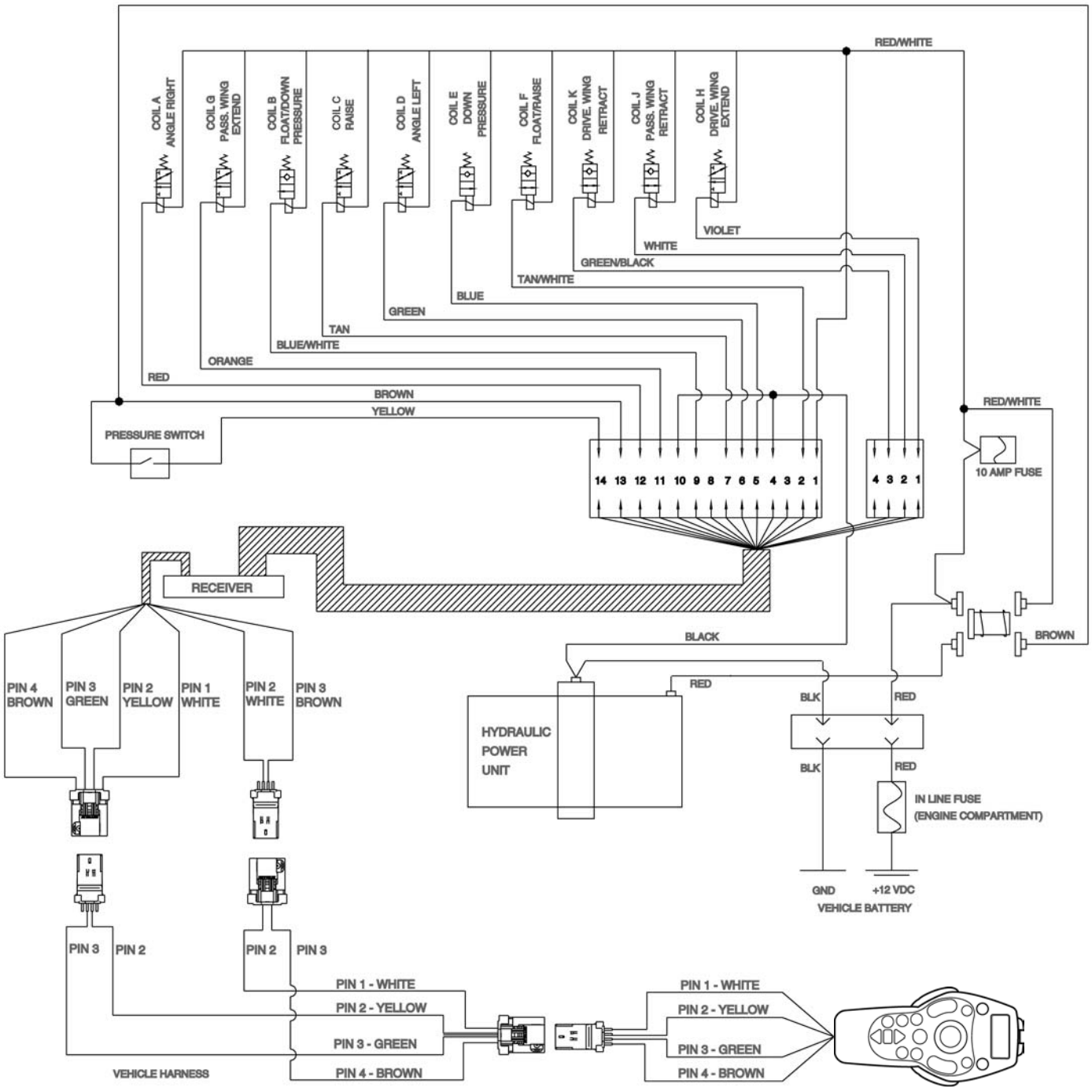
HYDRAULIC SCHEMATIC



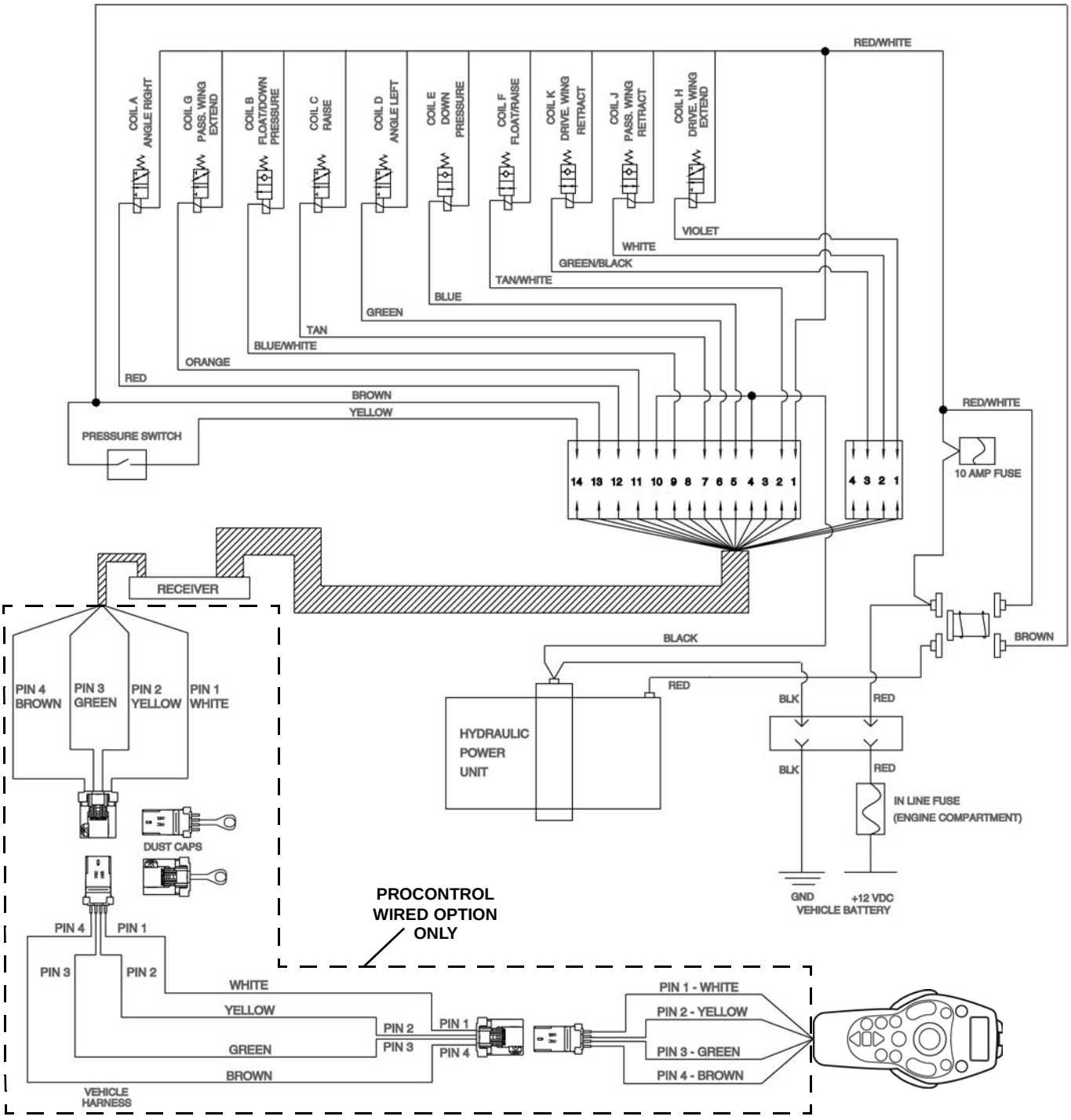
MAIN WIRING HARNESS SCHEMATIC
EIS® (Energy Interruption System)



WIRING SCHEMATIC
With S.N. Before: MBR100499



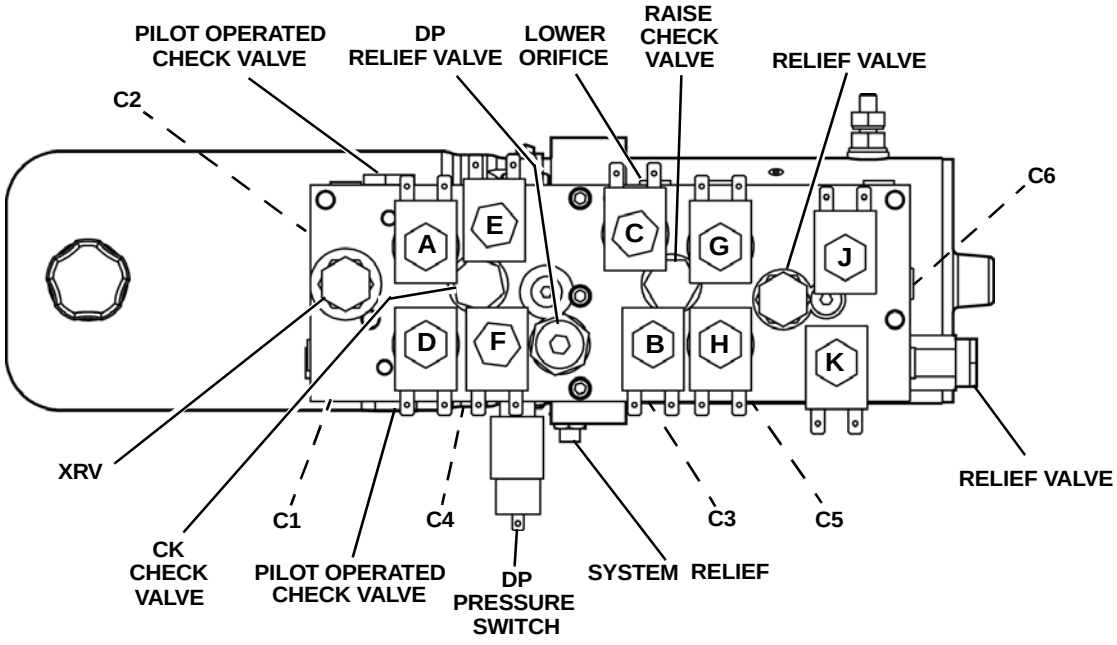
WIRING SCHEMATIC
With S.N. After: MBR100500



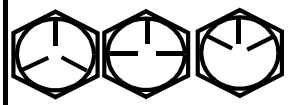
POWER UNIT SOLENOID FUNCTION, WIRING AND LOCATION

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

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



TORQUE SPECIFICATIONS

SAE Grade and Head Markings	**No Marks**		
SAE Grade and Nut Markings	**No Marks**		

	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

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.**

SNO-WAY® INTERNATIONAL, INC.

SNO-WAY® SNOW & ICE CONTROL EQUIPMENT

Hartford, WI 53027 USA
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