



**OWNER'S / PARTS MANUAL
FOR
SKID STEER
V- PLOWS**

**28VSKD SERIES SNOW PLOW
FOR PLOW SERIAL NUMBERS AFTER
28VSKD100000**

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INTRODUCTION

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

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

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



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

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

 WARNING
FAILURE TO HEED CAN RESULT IN INJURY OR DEATH.

 CAUTION
Information, that if not carefully followed, can cause minor 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 Skid Steer V-Plow Serial Number, Controller Serial Number, Blade Model Number and Blade Serial Numbers in the space provided below as a handy record for quick reference. The Skid Steer V-Plow Serial Number is located on the main frame. The Blade Serial Numbers are located on one of the middle ribs of each wing. The Blade Model Number should be recorded from your sales invoice. These plates contain information that your Dealer needs to answer questions or to order replacement parts, if needed, for your unit.

NAME PLATE DATA	
SKID STEER V-PLOW SERIAL NUMBER	_____
CONTROLLER SERIAL NUMBER	_____
BLADE MODEL NUMBER	_____
RIGHT WING SERIAL NUMBER <small>(Located on Blade Frame)</small>	_____
LEFT WING SERIAL NUMBER <small>(Located on Blade Frame)</small>	_____
(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.



SAFETY



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

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

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

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

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

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

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

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

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

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

NEVER allow children or unauthorized person to operate this unit.

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

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

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

NEVER place fingers in A-frame or mount lug holes to check alignment when attaching snow plow. Sudden motion of the plow could severely injure a finger.

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

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

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

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

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

THEORY OF OPERATION

General

The Sno-Way Skid Steer V-Snow Plow is mounted as a conventional skid steer attachment. The hydraulics are powered by the auxiliary circuit, which is left on at all times. The V-Plow is actuated by a wireless hand control that is mounted in the cab.

Plow Operational Limits

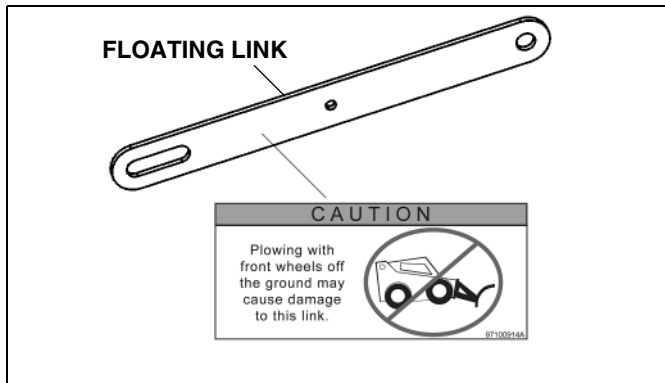


Figure 1-1

The Sno-Way Skid Steer Plows are designed to plow snow within certain operational limits. A pair of floating links enable the plow to "float" over the contours of an uneven grade during operation. In addition, these links are designed to be the "weakest link" of the plow system. If excessive loading is encountered the links will collapse, requiring replacement. Plowing with all four skid steer wheels "on the ground" is recommended for optimum plowing performance and reduced loading on plow components.

Skid Steer Power Unit

Features

- 18-30 gpm (gallons per minute)
- 3000 psi max. operating pressure
- 3000 psi relief
- Auxiliary hydraulic lines

The skid steer is the primary hydraulic source to the V-Plow. A typical system operates at a maximum pressure of 3000 psi and maximum flow rate of 30 gpm. The hydraulic system has a 3000 psi relief that dumps all excess hydraulic fluid to the tank when the system is loaded beyond 3000 psi. The auxiliary hydraulic circuit consists of two lines that come directly from the skid steer hydraulic pump and are actuated by an auxiliary control in the cab. The lines are connected to the V-Plow Valve Block Assembly so that one line feeds pressure and the other dumps to the tank.

Skid Steer V-Plow Hydraulic System

The auxiliary hydraulics are routed to the Lower Valve Block where hydraulic fluid is diverted either to the tank, or to the Upper Valve Block for wing functions. To activate the wing function, a Diverter Valve is actuated and routes hydraulic pressure to the Upper Valve Block. Depending on which Solenoid Valve is activated, the Wings either move independently or together.

The Plow Wings can be moved in the following manner:

- Scoop (V)
- Plow (straight across)
- Angled (left or right)
- Inverted (V)
- Combination Move

In the event of obstacle interference, Pressure Relief Valves are built into the system to protect the Wings from damage.

Hydraulic Valve Block Assembly

The Hydraulic Valve Block Assembly consists of a Valve Body containing five (5) Electric Solenoid Valves and five (5) Pressure Relief Valves.

The Valve Body directs hydraulic fluid to operate two (2) hydraulic circuits; angle left side and angle right side. The angle circuits receive fluid under pressure.

IMPORTANT: The Electric Coils, which operate the Solenoid Valves, require a minimum of 9-1/2 volts DC for proper operation. Lower voltage will cause erratic operation, or failure to operate.

Wing Angling Mode Of Operation

Each Wing can be angled forward or rearward independently by operating the Wing Angle Switch for either the Right or Left Wing. Operating the Wing Angle Switch energizes the Diverter Valve and either the Extend or Retract Solenoid for the Wing. This directs hydraulic fluid, under pressure, to either the base end (Extend) or rod end (Retract) of the Wing Cylinder, which then moves the Wing forward or rearward. Each Wing Angling Circuit is protected by a Crossover Relief Valve set at 2150 psi as well as the System Relief Valve set at 1800 psi and a Wing Cylinder Relief Valve set at 2150 psi.

Controls

Left Wing Angle Switch:

Used to angle the Left Wing forward and rearward.

Right Wing Angle Switch:

Used to angle the Right Wing forward and rearward.

NOTE: Refer to Plow Control Package Owner's, Installation and Operation Manual, part #97100737 for control functionality. Use section "Switches and Functions - V Plow" for information on Wing angling function. Ignore "Raise" and "Lower" information, these functions are not available on the Skid Steer V-Plow.

PLOWING OPERATION

Before The Season Begins

1. Inspect vehicle safety equipment for proper operation; brakes, headlights, plowing lights, windshield wipers, flashers, etc.
2. Inspect the Plow, Plow Frame and all attaching hardware for wear and corrosion. Replace worn or damaged parts and clean and repaint exposed metal parts with a high quality, corrosion resistant enamel.
3. Inspect all fasteners to insure that they are properly tightened. If any fasteners are loose, re-tighten to the proper torque (refer to the Torque Specification Chart in this manual) and carefully inspect the adjacent area for damage or wear as well as carefully inspecting all adjacent fasteners for proper torque.
4. Apply a small amount of light oil to the Hitch Pins and pivots, to Pivot Pins between the A-Frame and Center Blade Assembly, between Swing Cylinder Pivot Pins and the Lift Linkage.
5. Check the Wing Pivots for free movement of the wings on the Pivot Shafts. Lubricate the Wing Pivot Shafts with a good quality light weight HP Lithium based grease.
6. For extremely cold weather plowing, continuous sub-zero operation, an alternative is to remove the grease fittings and fill the grease cavity with SAE 140 Gear Oil, and then replace the grease fitting.
7. Check the reservoir oil level (see maintenance instructions) and repair any oil leaks and worn hoses.
8. Install auxiliary and flashing lights (if not equipped).

Transporting Vehicle With Plow Attached

1. Position the Blade out of the beam path of the headlights before driving.
2. Inspect Plow and Plow attaching hardware for wear or damage before transporting and beginning Plow operations.

Plowing Like A Pro



WARNING

- **Never exceed 10 mph when plowing! Serious personal injury can result, as well as damage to equipment and property, if an unseen obstruction is encountered while plowing.**

- **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 HEED CAN RESULT IN INJURY OR DEATH.

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

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

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

Plow Storage

1. To avoid corrosion during storage, coat the exposed (chrome) portion of the Angle Cylinders with a light grease.
2. Grease all pivot points.
3. Make sure that protective caps are on all electrical connections. A small amount of dielectric grease may be used to insure a moisture proof seal on the caps.
4. Check and replace any worn and/or damaged component, such as Cutting Edges or Deflectors. Performing preventative maintenance tasks in the spring when Plow is stored will ensure that you will be ready to plow in the fall.

TROUBLESHOOTING GUIDE

Introduction

Whenever service is necessary, your local Dealer knows your Plow best and is interested in your complete satisfaction. Return your V-Plow to your local Dealer for maintenance service or any other assistance you may require. If you are unable to do so, this Troubleshooting Guide should help you determine the problem. 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 manual carefully and are certain that all of the suggestions pertaining to your problem have been attempted.
2. You should have the following information available.
 - A. Date Snow Plow was originally installed.
 - B. Main Frame Serial Number.
 - C. Blade Model Number.
 - D. Blade Serial Number.

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

Trouble Shooting

Quick Reference General

1. Check oil level in hydraulic system reservoir.
2. Check for external leakage at cylinders, hoses and power unit.

TROUBLESHOOTING

PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
Blade Wing moves in one direction only	Solenoid Valve sticking or defective	Refer to Dealer
	Crossover Relief Valve defective or sticking	Refer to Dealer
	Low or No current available at Extend or Retract Solenoid Valve	Refer to Dealer
	Crossover Relief Valve pressure setting too low	Refer to Dealer
	Angle Cylinder defective, allowing movement in one direction only	Refer to Dealer
	Machine failure	Refer to Dealer
Blade Wing will not move	Hydraulic fluid level low	See Maintenance section
	Crossover Relief Valve setting too low	Refer to Dealer
	Solenoid Valve sticking or defective	Refer to Dealer
	Low or no current available at Solenoid Valve	Refer to Dealer
	Wing Cylinder binding or frozen	Refer to Dealer
	Machine failure	Refer to Dealer
Blade Wing moves very slowly	Hydraulic fluid level low	See Maintenance section
	Crossover Relief Valve defective or sticking	Refer to Dealer
	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
	Defective Wing Cylinder	Refer to Dealer
	Dirt or Debris in Solenoid Valve	Refer to Dealer
Blade Wings will not hold position (fold rearward)	Defective or dirt/debris in Wing Relief Valve	Refer to Dealer
	Defective or sticking Solenoid Valve	Refer to Dealer
	Dirt or debris in Solenoid Valve	Refer to Dealer
	Defective Wing Cylinder	Refer to Dealer

MAINTENANCE

General

- Before operating, perform a thorough visual inspection of the equipment. Look for fluid leaks, cracked, bent or broken components, loose nuts, bolts or attachments and proper fluid levels.
- A clean hydraulic system is essential to long pump life and proper performance.
- When adding oil to the reservoir, wipe the area around the filler port clean before removing the breather cap. Use clean oil and a clean funnel, (DO NOT use a cloth or rag to strain the oil).
- The operational environment for snow plows is an extremely harsh and corrosive one.
- Ensure all electrical connections are clean and tight.
- To prevent rust from forming, clean and repaint exposed metal surfaces.
- NEVER operate the equipment with the protective covers or guards removed.

Periodic Inspection

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

1. Inspect the Plow assembly for any damage or excessive wear. Also inspect all fasteners to insure that they are properly tightened. If any fasteners are loose re-tighten to the proper torque (Refer to the Torque Specification Chart in this manual). Also carefully inspect adjacent area for damage or wear as well as carefully inspecting all adjacent fasteners for proper torque.
2. Apply a small amount of light oil to the Hitch Pins and pivots, to Pivot Pins between the Center Blade Assembly and the Intermediate Pivot Assembly, between Swing Cylinder Pivot Pins and the Lift Linkage.
3. Lubricate the Wing Pivot Shafts with a good quality HP Lithium based grease.

NOTE: For extremely cold weather plowing, continuous sub-zero operation, an alternative is to remove the grease fittings and fill the grease cavity with SAE 140 Gear Oil, and then replace the grease fitting.

Special Fasteners Torques and Requirements

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

- ALWAYS check to make sure you are using the correct torque specification for the fastener you are using.
- DO NOT use any lubricants on the threads of any fastener unless specifically called for in the assembly or maintenance story for that component.
- NEVER use liquid locking materials, such as Loctite™ or Threadmaker™, on any fasteners unless specifically called for in an assembly or maintenance story for that component.

Standard Fasteners:

The Torque Specifications Chart on page 15 of this manual should be used as the guide for fastener torque requirements for most standard fasteners used on the plow.

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

Hydraulic Fittings:

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

Wing Cylinder Attaching Fasteners:

Base end and Rod end attachment Cap Screws are always assembled with the Cap Screw head UP.

Always use a Nylock Nut and only torque the Nut to 25 to 30 lb.-ft. DO NOT overtighten these fasteners. Overtightening of Wing Cylinder attachment fasteners may bind Cylinder and cause excessive Cylinder wear and/or restrict Wing movement.

Pivot Frame Assembly:

Install the 1" Slotted Nut on the threaded end of the Special Screw and tighten finger tight. Then tighten the Nut another 2/3 to 1 full turn and line up a slot in the Nut with the cross hole in the Special Screw. Install the 3/16"x2" Cotter Pin in the Special Screw and spread the ends of the Cotter Pin.

Hydraulic Cylinders

To avoid corrosion during storage, coat the exposed (chrome) portion of the Angle Cylinders with a light grease

Fluid Compatibility

Hydraulic fluid used in skid steers is compatible with the Plow system.

Electrical Quick Disconnect Plugs

Install protective caps on quick disconnect ends to prevent corrosion from forming on terminal ends during storage or when Plow is disconnected from vehicle.

Battery Maintenance and Charging

The Battery provided with the Skid Steer V-Snow Plow is a 12VDC 20 amp hour rated Battery.

Battery Charging Kit

The Battery Charging Kit consists of two Terminals and a Conductor. The two Terminals are crimped onto the lead wires of a battery charger provided by the end user. Fit the Silicone Rubber Seals over the Terminals prior to inserting the Terminal into the Connector ports. The positive Terminal is inserted into the "A" Connector port. Close the Seal retainer clip over the end of the Connector.



WARNING

Verify that the Terminals are connected to the correct positive/negative orientation. Reverse charging will cause leakage, heating and bursting of the Battery.

FAILURE TO HEED CAN RESULT IN INJURY OR DEATH.

Charging the Battery

- **Charger:**
Requires a 12-volt charger with a maximum of 5-amp charge current.
- **Charging time:** 6-8 hours.
- **Temperature:**
Charging at 32 Deg F or below and 104 Deg F or higher is not recommended. At lower temperatures the Battery may not be charged adequately. At high temperatures, the Battery may become deformed.
- **Overcharging:**
Overcharge is an additional charge after the Battery is fully charged. Continued overcharging shortens Battery life. Do not continue charging for 24 hours or longer, as it may accelerate deterioration of the Bat-

tery. Do not recharge a fully charged Battery repeatedly, as overcharge may accelerate deterioration of the Battery.

To charge the Battery, disconnect the Battery Power Harness from the Receiver Harness. Connect the Charging Adapter into the Battery Power Cable. Connect the charger to the power source and charge the Battery.

When charging is complete, unplug the charger from the power source. Disconnect the Battery Power Harness from the Charging Adaptor and reconnect it to the Receiver Harness.

INSTALLATION

Mechanical Installation

Wing Assembly

1. Remove the Center Blade Assembly from shipping container.
2. Remove the Cap Screws from the Hold Down Plates at the top of each of the two Wing Pivot Shafts and then remove the Pivot Shafts from the Center Blade Assembly. (See Figure 2-1)

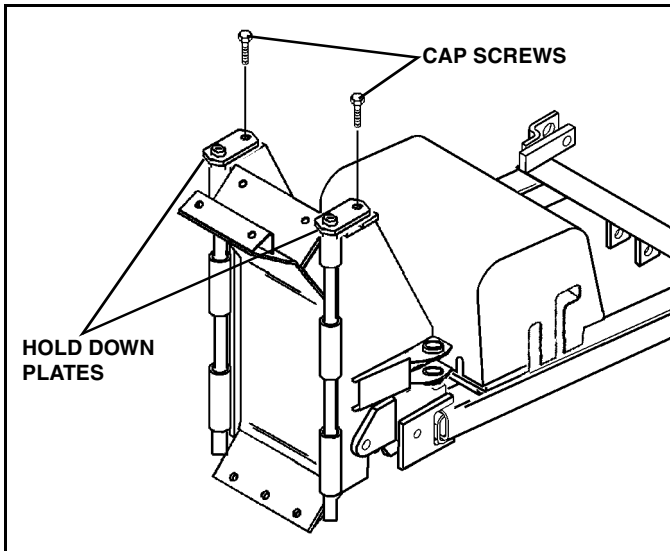


Figure 2-1

3. Swing the Wing Cylinders out to the side so they will be out of the way for installing the Wings. (See Figure 2-2)

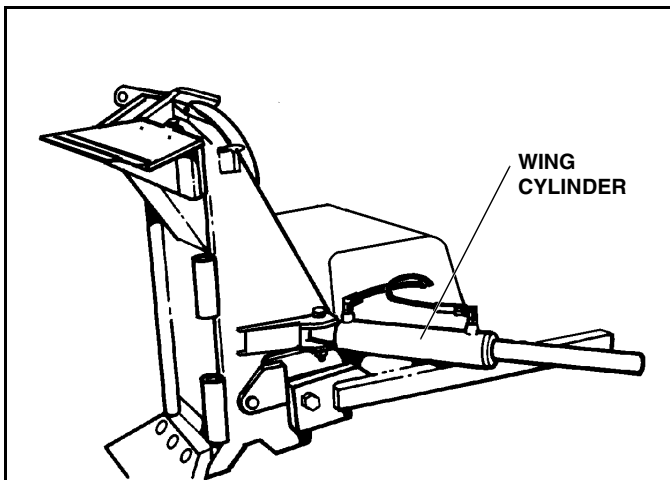


Figure 2-2



CAUTION

Wings weigh 125 lbs. Use proper lifting device and methods to lift and support wings during installation.

4. Place the Right Wing next to the right side of the Center Blade Assembly and position it so that the hinge tubes on the Center Blade Assembly and the hinge tubes on the Wing Assembly are lined up. Insert one Wing Pivot Shaft down through the hinge tubes on the Center Blade and Wing Assemblies.



WARNING

Once Wing Pivot Shafts are installed, Wings are free to rotate and may create pinch points between Wings and Center Blade Assembly or floor. Remember, Wings are heavy and will be hard to stop once they start moving.

FAILURE TO HEED CAN RESULT IN INJURY OR DEATH.

NOTE: Oiling the Pivot Shaft and pivot tubes will aid in shaft installation.

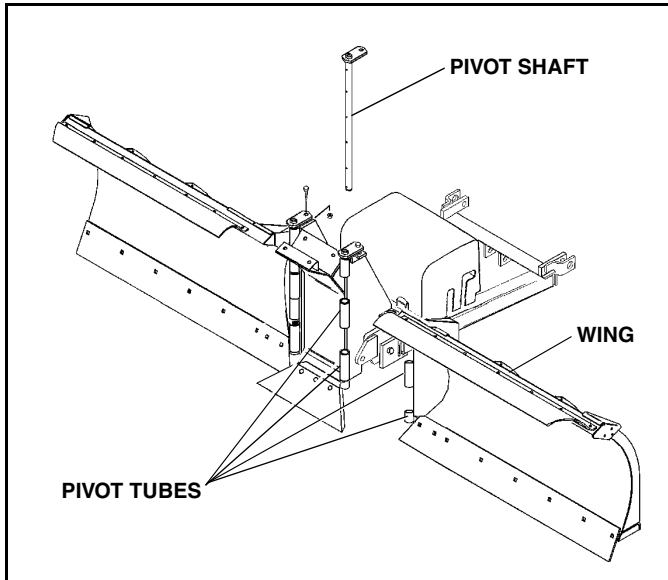


Figure 2-3

5. Repeat this procedure for the Left Wing Assembly.

6. Line up the hole in the Pivot Shaft Hold Down Plates and the retainer brackets on the Center Wing Assembly. Do not re-install the Cap Screws and Nuts at this time. This hardware will be re-installed after the Center Deflector is installed.

7. Lubricate both Pivot Shafts with a good quality EP lithium base grease.

NOTE: For extremely cold weather plowing, continuous sub-zero operation, an alternative is to remove the grease fittings and fill the grease cavity with SAE 140 gear oil, and then replace the grease fitting.

8. Remove the 5/8" x 4" Cap Screw and Locknut from the rod end of the two Wing Cylinders. Swing the rod end of the Cylinders towards the Wings until the hole in the rod end of the Cylinder lines up with the holes in the cylinder mounting brackets on each Wing. Secure with Cap Screws removed earlier and torque to 25-30 lb.-ft.

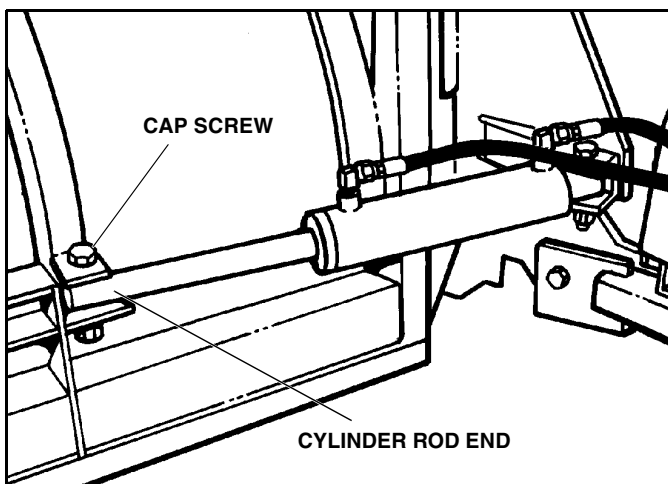


Figure 2-4

9. Center Deflector mounting holes on top of Plow Blade.

NOTE: Install Deflectors with beveled end of Deflector at outer end of Plow Wing.

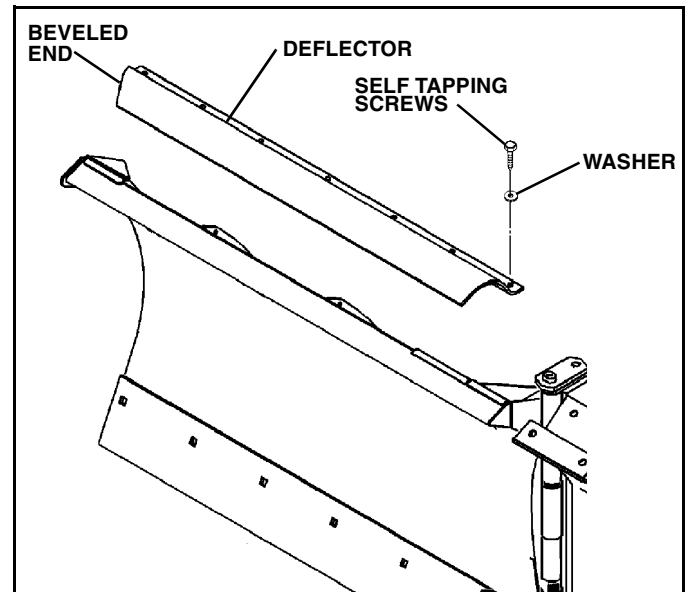


Figure 2-5

10. Use holes in Deflector as template to center punch and drill 9/32" holes for Self-Tapping Screws.

NOTE: It is recommended that LOCTITE® or similar thread lock be used on these Self-Tapping Screws.

11. Install 5/16" X 1" Self-Tapping Screws (#98019176) and Flat Washers in every hole in Deflector. Do not tighten until all Screws are installed.

12. After all Screws are installed, torque to 15 lb.-ft.

13. Remove the two (2) 5/16x2" Cap Screws, Flat Washers, and the two (2) Spacers (#96102938) from the parts bag. Install the Center Deflector using the two (2) Spacers, 5/16x2" Cap Screws and Flat Washers removed earlier. Torque to 15 lb.-ft.

14. Install the 1/2" Cap Screws and Nylock Nuts, removed in step #2, into the holes in the Pivot Shaft Hold-down Plates and the retainer brackets on the Center Wing Assembly with a Flat Washer on top of the Center Deflector, and torque the Nylock Nut to 25-30 lb.-ft.

15. OPTIONAL: Install Blade Guides (blade side markers) to holes in outside Blade ribs, secure using hardware supplied with Blade Guide Kit. (See Figure 2-6)

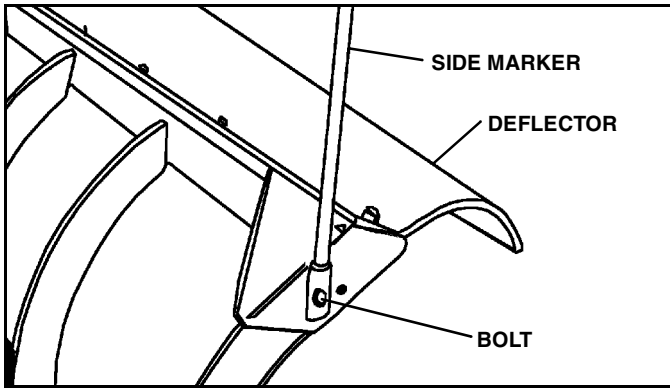


Figure 2-6(Optional)

Mounting Snow Plow To Vehicle

1. Drive up to the Snow Plow and tilt the universal mount slightly forward.
2. Hook the top of the universal mount under the lip on the Skid Steer Adapter Plate of the Snow Plow.
3. Position the Snow Plow so that it rests flush against the universal mount and lock the Snow Plow in place.
4. Connect the Hydraulic Hoses to the auxiliary hydraulic connectors on the vehicle.

Removing Snow Plow From Vehicle

1. Lower the Snow Plow to the ground.
2. Disconnect the Hydraulic Hoses from the vehicle.
3. Unlock the universal mount from the Snow Plow and slowly back away from the Snow Plow, while tilting the universal mount slightly forward.

Disk Shoe Adjustment

NOTE: The V-Plow Frame height should be adjusted relative to the optimum resting position of the loader arms. To adjust, remove the Clevis Pins that secure the rear of the Main Frame to the mounting lugs of the universal adapter, move the Frame to a higher or lower position and re-install the Clevis Pins to secure.

IMPORTANT: This Plow is equipped with three (3) Disk Shoes. To ensure the best function of this Snow Plow, it is a requirement that all three Disk Shoes be used at ALL times. Two Disk Shoes are located at the outboard end of each Wing. The third Disk Shoe is located under the Trip Springs on the Center Plow Assembly. All three Disk Shoes must be adjusted equally.

1. Drive the vehicle, with Snow Plow mounted, onto a smooth, level surface. Park the vehicle, move the Plow Wings until the Wings are straight out on each side and lower the Plow to the optimum position.
2. Turn ignition switch OFF and apply the emergency brake. Turn Hand-Held Controller off.

3. Inspect both Float Limiter Screws and be sure that the hex head of the Screws are not contacting the Wear Plate underneath the hex head of the Screw. If necessary, adjust each Screw upward so that the Screw head is not contacting the Wear Plate when the pivot tubes are vertical.

NOTE: After Disk Shoe adjustment is completed, the Float Limiter adjustment must be made. See "Float Limiter Adjustment" on page 14

4. Place a level against the front of the Wing pivot tubes and pull or push the top of the Center Section until the level indicates that the pivot tubes are vertical (Not tipped either forward or rearward).

5. Determine whether the center Disk Shoe or the center Wearstrip is off the ground and measure the amount that it is off the ground. (See Figure 2-7)

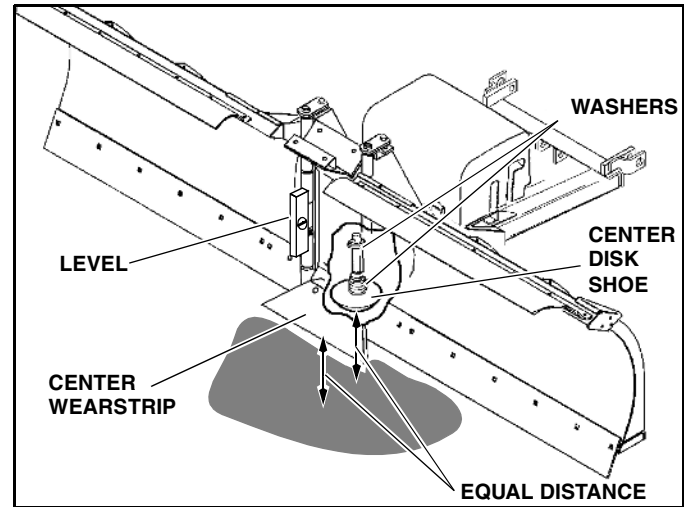


Figure 2-7

NOTE: Gap may be measured by sliding Shims or Washers between the ground and/or the center Disk Shoe or the center Wearstrip, then measuring the Shim/Washer stack. The center Disk Shoe will need to be adjusted until the Disk Shoe and center Wearstrip both contact the ground at the same time.

- If the center Disk Shoe was off the ground - Washers must be ADDED below the Disk Shoe Mounting Tube.
- If the center Wearstrip was off the ground - Washers must be REMOVED from below the Disk Shoe Mounting Tube.

IMPORTANT: If Washers must be added, add one Washer LESS than the amount the Disk Shoe was off the ground. If Washers must be removed, remove one Washer MORE than the amount the Wearstrip was off the ground.

6. Raise Plow and place suitable blocking under the Plow to allow at least eight inches (8") of clearance from the bottom of the center Disk Shoe to the ground.
7. Lower Plow onto blocking.



WARNING

Keep hands and feet clear of Wings and Center Section when setting blocking and lowering Plow. Moving or falling assemblies could result in injury.

FAILURE TO HEED CAN RESULT IN INJURY OR DEATH.

8. Adjust center Disk Shoe Assembly by removing the Disk Shoe Mounting Pin and adding or subtracting Washers on the top or bottom of the Disk Shoe Mounting Bracket as required according to measurements taken in step #4.

9. After the center Disk Shoe position is properly adjusted, place Washers on the Disk Shoe stem - above the Disk Shoe Mounting Bracket, and below the Retaining Pin - to remove all up and down movement of the Disk Shoe in the Bracket. Failure to do this will result in excessive wear of the holes in the Disk Shoe Mounting Bracket and will also result in bending the Disk Shoe stem.

10. After the center Disk Shoe adjustment is completed, lower the Plow to the ground. If this Disk Shoe adjustment is correct, the center Disk Shoe and the Center Wearstrip will both be on the ground and the wing tubes will be vertical (Recheck the wing tubes with a level). If wing tubes are not vertical, repeat steps #3 to #9 until wing tubes are vertical.

NOTE: If assembling and mounting a Snow Plow for the first time, the adjustment of the center Disk Shoe can be done with just the Center Section mounted on the vehicle, prior to assembling the Wings onto the Center Section of the Plow.

11. With each Wing extended straight out to the side, measure the amount the Wing Shoes are off the ground, or if they are on the ground, measure the amount that the Wearstrip is off the ground (measured in front of the Disk Shoe Bracket).

12. Raise Plow and place suitable blocking under the Plow to allow at least six inches (6") of clearance from the bottom of the Wing Disk Shoes to the ground.

13. Lower Plow onto blocking.



WARNING

Keep hands and feet clear of Wings and Center Section when setting blocking and lowering Plow. Moving or falling assemblies could result in injury.

FAILURE TO HEED CAN RESULT IN INJURY OR DEATH.

14. Adjust each Disk Shoe Assembly by removing Disk Shoe Mounting Pin and adding or subtracting Washers on the top or bottom of the Disk Shoe Mounting Bracket as required according to measurements taken in step #11 (See Figure 2-8)

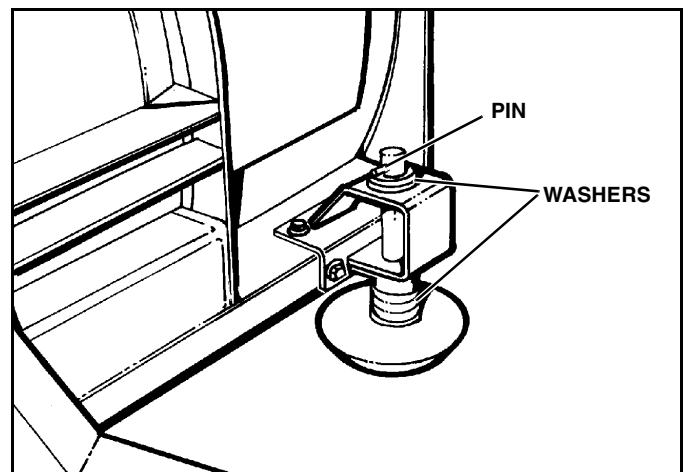


Figure 2-8

15. After the Disk Shoe position is properly adjusted, place Washers on the Disk Shoe stem - above the Disk Shoe Mounting Bracket, and below the Retaining Pin - to remove all up and down movement of the Disk Shoe in the Bracket. Failure to do this will result in excessive wear of the holes in the Disk Shoe Mounting Bracket and will also result in bending the stem of the Disk Shoe.

16. After the Wing Disk Shoe adjustment is complete, lower the Plow to the ground. If this Disk Shoe adjustment is correct, the Shoes and the Wearstrips will all be on the ground at the same time, if not, repeat steps #11 to #15.

17. Move the Wings forward and rearward. If the Wing Wearstrips and the Center Wearstrips are not on the ground at all times recheck the position of the Wing pivot tubes. The tubes must be vertical, if they are not vertical, the center Disk Shoe will need to be adjusted.

Trip Spring Adjustment

NOTE: The Trip Springs are factory installed and adjusted, but adjustment should be checked during Plow set-up and installation.

Springs are properly adjusted when two or more coils

allow a 0.010" feeler gauge to just pass between the separated coils. (A 3 x 5 post card is approximately the same thickness.)

If re-adjustment is required:

1. Raise the Plow to transport position and install Transport Lock under the Plow to prevent the Plow from inadvertently dropping.

2. Turn off the vehicle ignition, apply the parking brake and remove the vehicle ignition key. Turn Hand-Held Controller off.

3. Check to make sure that the Spring is installed as illustrated with open end of top loop facing vehicle. (See Figure 2-9)

4. Using a 15/16" socket wrench through the holes in the bottom plate of the Main Frame, loosen the two (2) 5/8" Nuts on the Trip Spring Eyebolts. (See Figure 2-9)



CAUTION

- Do not overtighten Springs. If more than 0.015" (1/64") gap appears between coil with Plow at rest, damage could occur to equipment during plowing.

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

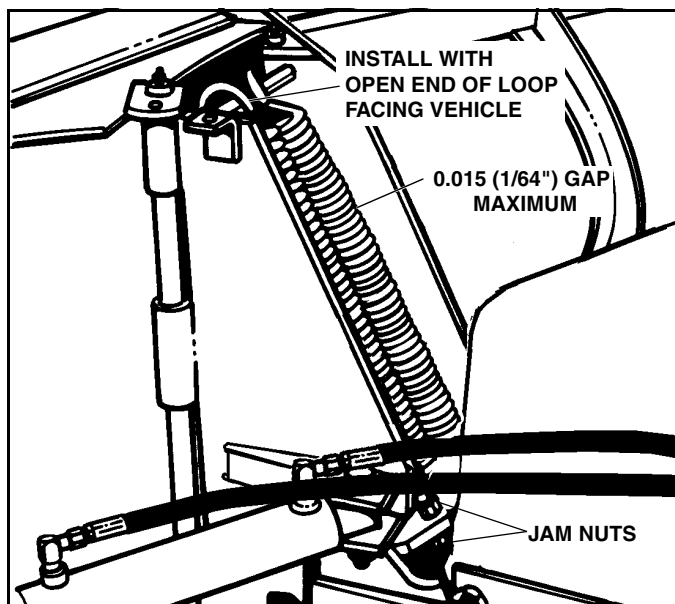


Figure 2-9

5. After the two lower Nuts have been loosened, the two upper Nuts can be rotated on the Eye Bolts to allow the Trip Springs to be shortened or lengthened.

6. While holding the two upper Nuts, re-tighten the two lower Nuts and then re-check the Spring adjustment.

Float Limiter Adjustment

IMPORTANT: The Disk Shoes must be properly adjusted prior to adjusting the Float Limiter. If the Shoes are not properly adjusted, the Float Limiter adjustment cannot be properly made.

1. With the vehicle and Snow Plow on a smooth, level surface move the Wings forward into the "Scoop" position and lower the Plow to the ground.

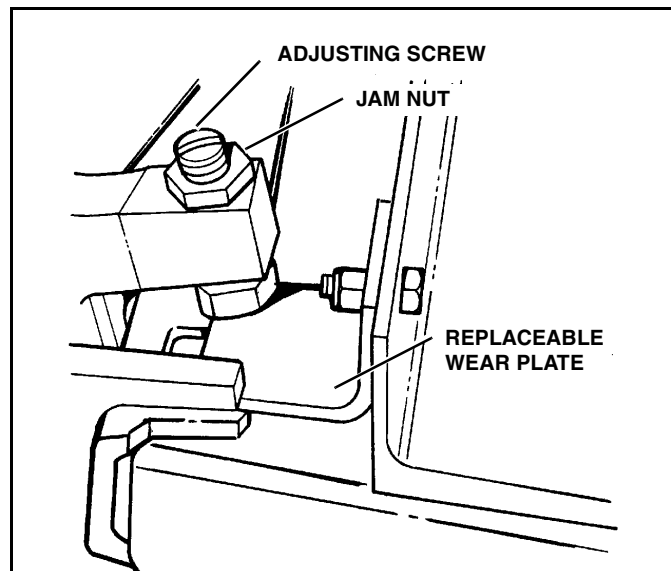


Figure 2-10

2. Loosen the 5/8" Jam Nut on the top of the Float Limiter Adjusting Screw.

3. Using the screwdriver slot in the top of the Float Limiter Adjusting Screw, turn the Adjusting Screw down until the hex head of the Adjusting Screw touches the surface of the replaceable Wear Plate.







4. Turn the Adjusting Screw up two turns to provide a gap between the Wear Plate and the head of the Adjusting Screw for proper float allowance.

5. While holding the Adjusting Screw driver slot, to prevent turning of the Adjusting Screw, tighten the 5/8" Jam nut to lock the Adjusting Screw and prevent turning of the Adjusting Screw during operation.

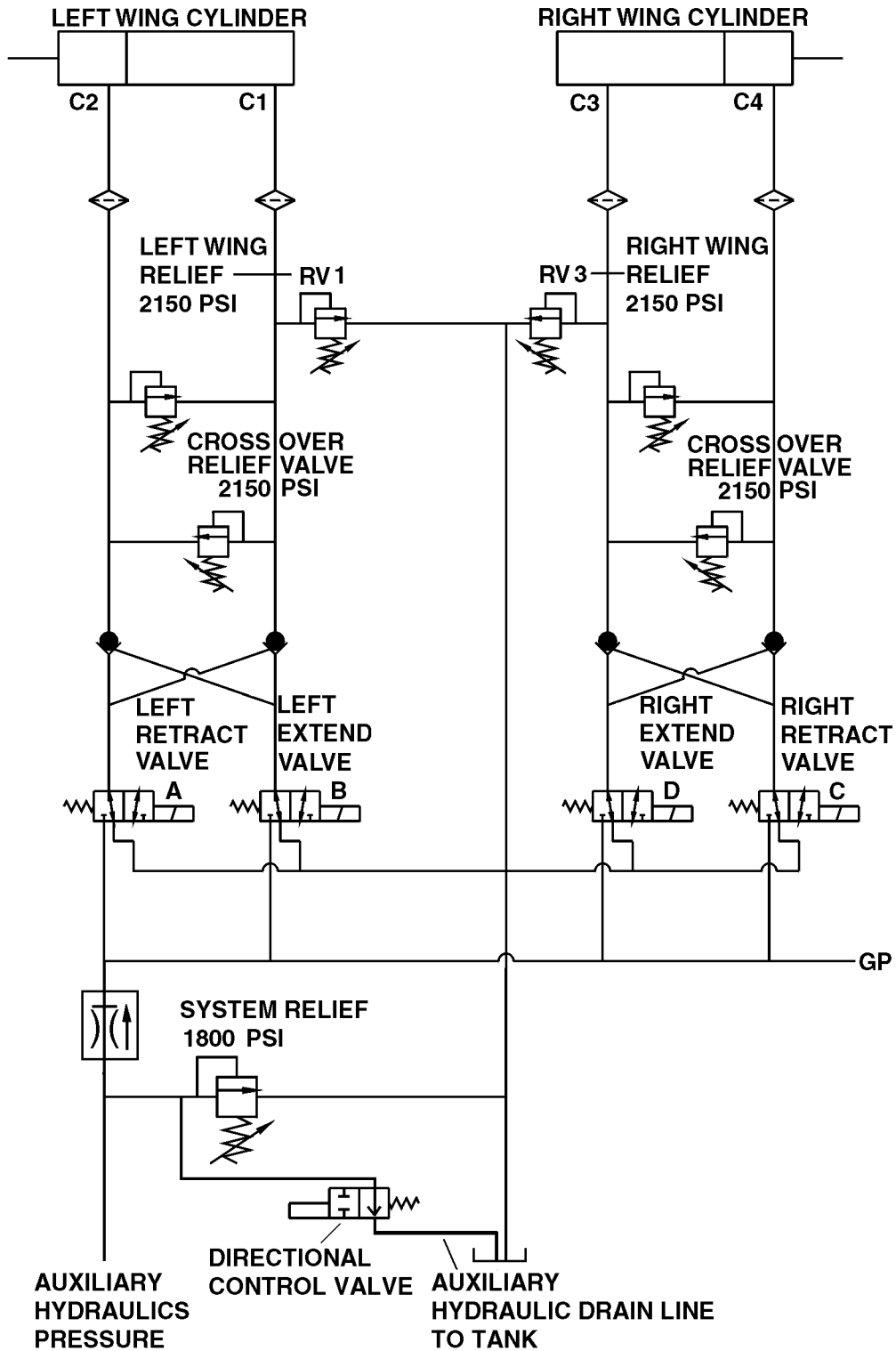
TORQUE SPECIFICATIONS

NOTE: Use these torque values when tightening Sno-Way hardware (excluding: Locknuts and Self-tapping, Thread Forming and Sheet Metal Screws) unless specified otherwise.

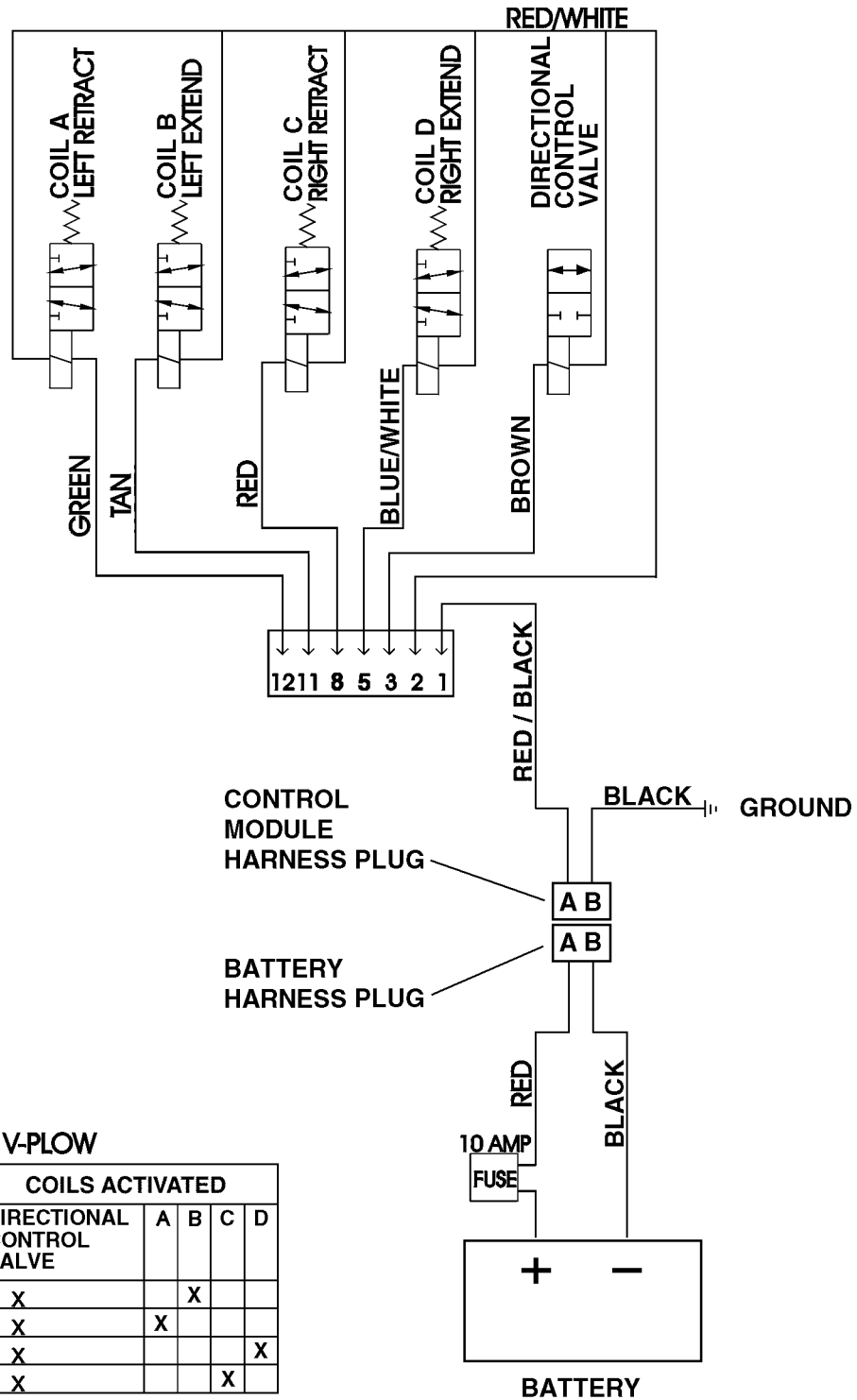
All torque values are in Lb-Ft except those marked with an * which are Lb-In
(For metric torque value Nm, multiply Lb-Ft value by 1.355 or Lb-In value by 0.113)

Unified National Thread	Grade 2		Grade 5		Grade 8	
	Dry	Lubed	Dry	Lubed	Dry	Lubed
8-32	19*	14*	30*	22*	41*	31*
8-36	20*	15*	31*	23*	43*	32*
10-24	27*	21*	43*	32*	60*	45*
10-32	31*	23*	49*	36*	68*	51*
1/4-20	66*	50*	9	75*	12	9
1/4-28	76*	56*	10	86*	14	10
5/16-18	11	9	17	13	25	18
5/16-24	12		19	14		20
3/8-16	20	15	30	23	45	35
3/8-24	23	17	35	25	50	
7/16-14	32	24	50	35	70	55
7/16-20	36	27	55	40	80	60
1/2-13	50	35	75	55	110	80
1/2-20	55	40	90	65	120	90
9/16-12	70	55	110	80	150	110
9/16-18	80	60	120	90	170	130
5/8-11	100	75	150	110	220	170
5/8-18	110	85	180	130	240	180
3/4-10	175	130	260	200	380	280
3/4-16	200	150	300	220	420	320
7/8-9	170	125	430	320	600	460
7/8-14	180	140	470	360	660	500
1-8	250	190	640	480	900	680
1-14	270	210	710	530	1000	740
Metric Course Thread	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

HYDRAULIC SCHEMATIC



WIRING SCHEMATIC



PARTS LIST INTRODUCTION

Our dealership network stands by to provide you with any assistance you may require, including genuine Sno-Way service parts. All parts should be obtained from or ordered through your Dealer. Give complete information about the part as well as the Model Number and Serial Number of your machine.

Record the Serial Number in the space provided in your Owner's Manual for quick reference.

"Right" and "Left" are determined from a position sitting on the Operator's Seat of the vehicle.

We reserve the right to make changes or improvements in the design or construction of any part without incurring the obligation to install such changes in any unit previously delivered.

USING THIS PARTS LIST

Below is parts listing with four columns. The first column is the "ITEM", the second is the "PART NUMBER", The third is the "DESCRIPTION" and the fourth is the "QUANTITY".

The "**ITEM**" is the number used in the corresponding illustration.

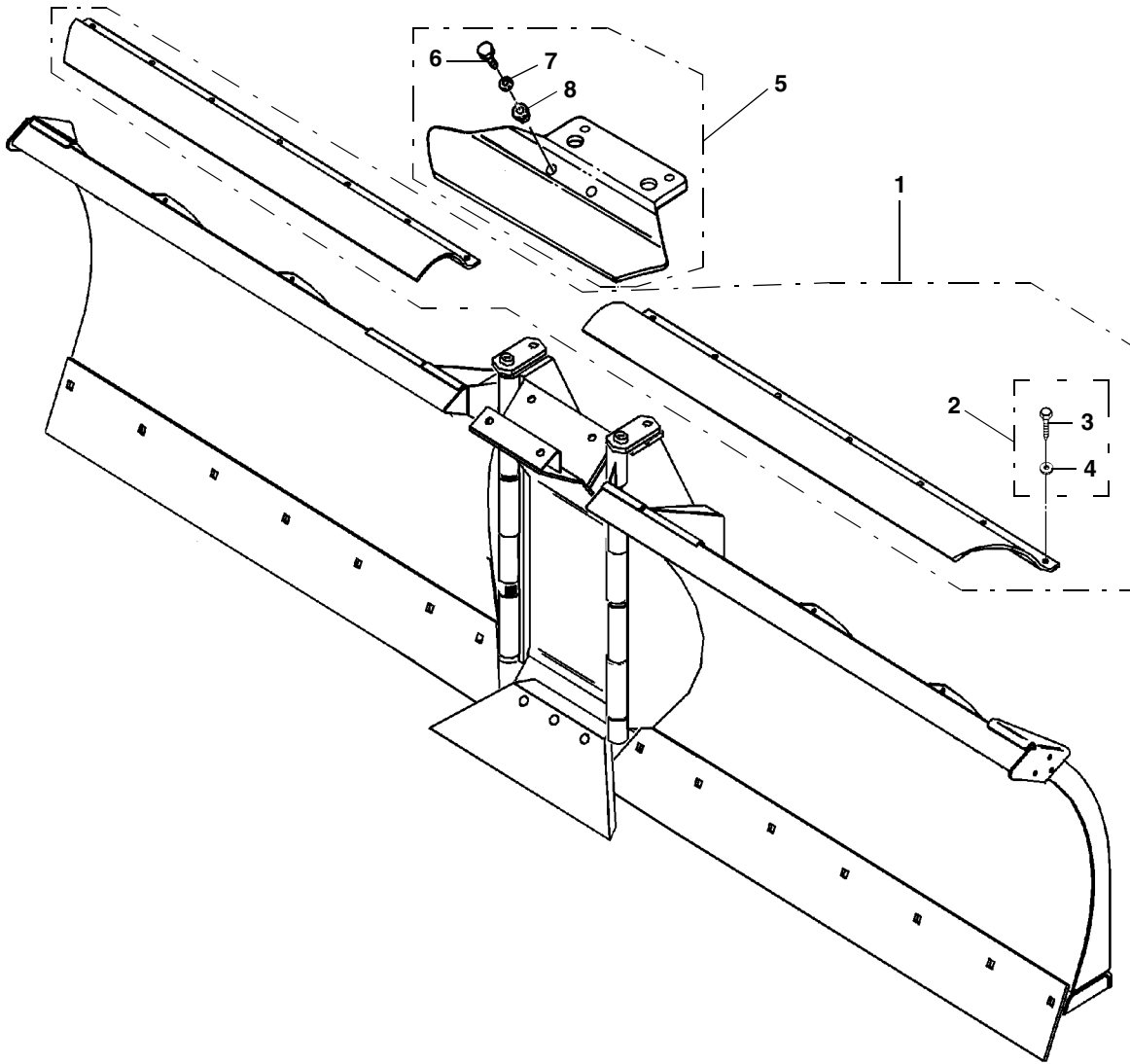
The "**PART NO.**" Is the number used to order replacement parts. If a number does not appear in the column the part is only available by ordering the complete assembly.

The "**DESCRIPTION**" is the name of the replacement part. At times the name may be indented, this means that the indented parts are part of the preceding assembly.

The "**QTY.**" Is the quantity needed to service the assembly illustrated, not the complete product.

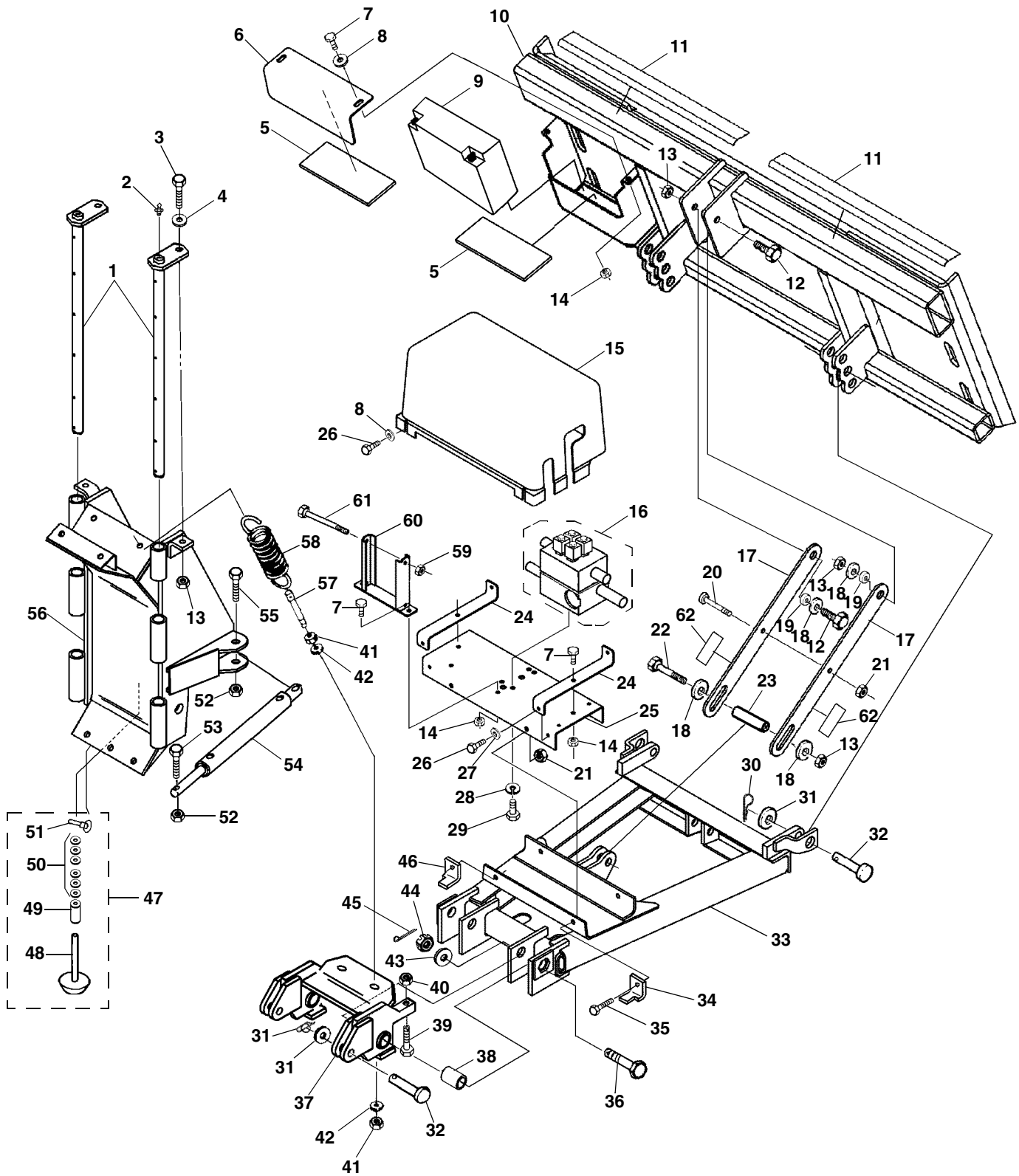
ITEM	PART NO.	DESCRIPTION	QTY.
1	96100083	O-ring	1
2	96001529	Elbow	3
3	98100036	Capscrew, Hex., 3/8"-16NC x 7/8"	9

DEFLECTORS



ITEM	PART NO.	DESCRIPTION	QTY
1	96102605	Wing Deflector Kit (99" Plow)(Includes Mtg. Hdwr.).....	1
	96102606	Wing Deflector Kit(109" Plow)(Includes Mtg. Hdwr.).....	1
2	96102482	HARDWARE KIT (Wing Deflectors).....	1
3	98019176	Screw, Self Tapping, 5/16" x 1".....	14
4	98019230	Washer, Plain, 5/16".....	14
5	96102604	Deflector, Center, (Includes Mtg. Hdwr.).....	1
6	98100167	Cap Screw, Hex, 5/16"-18NC x 2".....	2
7	98019230	Washer, Plain 5/16".....	2
8	96102938	Spacer.....	2

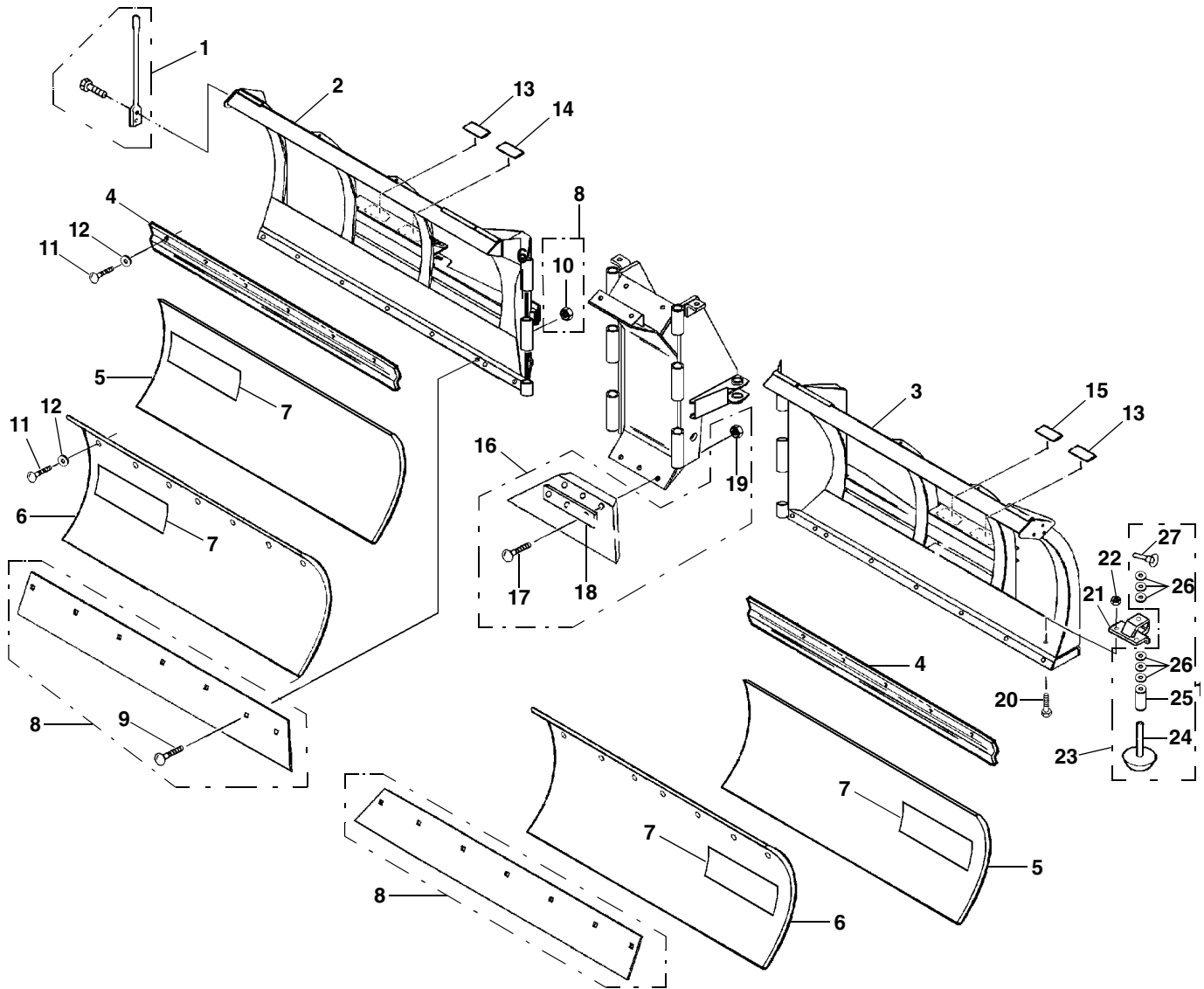
28VSKD FRAME



28VSKD FRAME

ITEM	PART NO.	DESCRIPTION	QTY
1	96101833	Pin, Pivot.....	2
2	98100098	Zerk, 1/8"NPT	2
3	98100010	Cap Screw, Hex, 1/2"-13 x 2".....	3
4	98009011	Washer, Flat, 1/2".....	2
5	96106270	Pad, Battery, Adhesive Backed.....	2
6	96106200	Cover, Battery.....	1
7	98009149	Bolt, Hex, 5/16"-18 x 1".....	6
8	98009230	Washer, Flat, 5/16".....	4
9	96104756	Battery, 12 Volt.....	1
10	96106296	Adapter, Skid Steer, SV.....	1
11	96106279	Roughing Strip, Anti-Slip.....	2
12	98009010	Bolt, Hex, 1/2"-13 x 1-1/2".....	2
13	98009013	Nut, Hex Nylock, 1/2"-13.....	5
14	98009150	Nut, Hex Nylock, 5/16"-18.....	6
15	96106197	Cover, Valve Block.....	1
16	96106205	Assembly, Valve Block (See Page 26 for Detail).....	1
17	96106194	Link, Lift.....	2
18	98100176	Washer, Special Hardened.....	4
19	96100082	Spacer, Upper Link.....	2
20	98009134	Cap Screw, Hex, 3/8"-16 x 2-1/2".....	1
21	98009009	Nut, Hex, 3/8"-16.....	5
22	98009036	Bolt, Hex, 1/2"-13 x 3-1/2".....	1
23	96100081	Spacer, Lower Link.....	1
24	96106211	Bracket, Cover Mount.....	2
25	96106203	Platform, Valve Block.....	1
26	98019176	Screw, Self-Tapping 5/16" x 1".....	4
27	98019230	Washer, Flat, 5/16".....	4
28	98009008	Washer, Lock, 3/8".....	4
29	98009022	Bolt, Hex, 3/8"-16 x 1".....	4
30	98009004	Pin, Locking.....	2
31	98009030	Washer, Flat, 3/4".....	4
32	98100165	Pin, Clevis.....	4
33	96106204	Frame, Main, V-Plow.....	1
34	96102916	Plate, Wear, LH.....	1
35	98009034	Cap Screw, Hex, 3/8"-16 x 1-1/4".....	4
36	98100169	Screw, Special Pivot.....	2
37	96103000	Frame, Pivot, w/ Bushings.....	1
38	96102832	Bushing.....	2
39	98100164	Screw, Special.....	2
40	98100157	Nut, Hex Jam, 5/8"-11.....	2
41	98009078	Nut, 5/8"-11.....	4
42	98009039	Washer, Flat, 5/8".....	4
43	98100170	Washer, Special.....	2
44	98009068	Nut, Slotted, 1"-14.....	2
45	98009069	Pin, Cotter, 5/32" x 2".....	2
46	96102915	Plate, Wear, RH.....	1
47	96102542	Assembly, Shoe.....	1
48		Shoe, Cast, 1" Shaft.....	1
49		Spacer, 1".....	1
50	98009005	Washer, Flat, 1".....	14
51	98009169	Pin, Lynch, 1/4" x 1-9/16".....	1
52	98009038	Nut, Nylock, 5/8"-11.....	4
53	98009194	Cap Screw, Hex, 5/8"-11 x 4".....	2
54	96101977	Cylinder, Angle (See ANGLE CYLUINDERS on page 24).....	2
55	98009042	Cap Screw, Hex, 5/8"-11 x 3-1/2".....	2
56	96105260	Frame, Blade Center.....	1
57	96102781	Eyebolt.....	2
58	96001392	Spring, Trip.....	2
59	98100255	Nut, Nylock, 1/4"-20.....	1
60	96106208	Bracket, Receiver.....	1
61	98100266	Cap Screw, Hex, 1/4"-20 x 5".....	1
62	97100914	Decal, Floating Link Caution.....	2

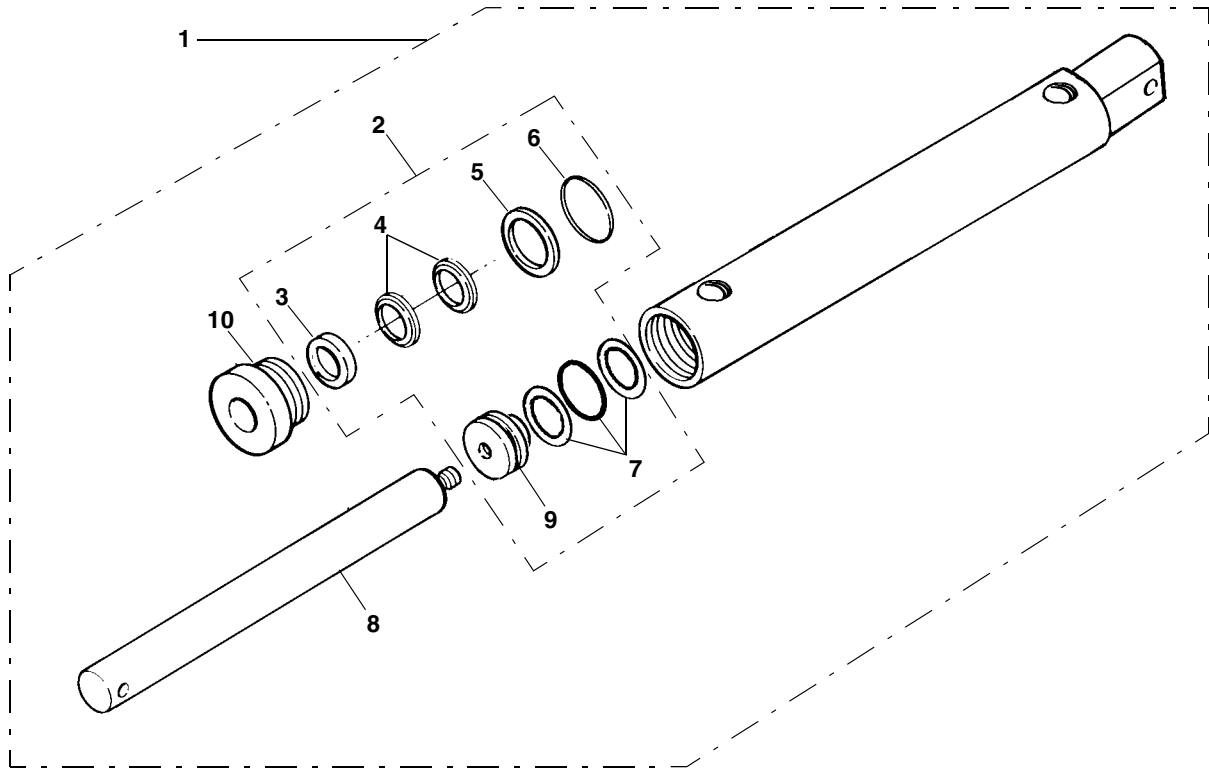
BLADES



BLADES

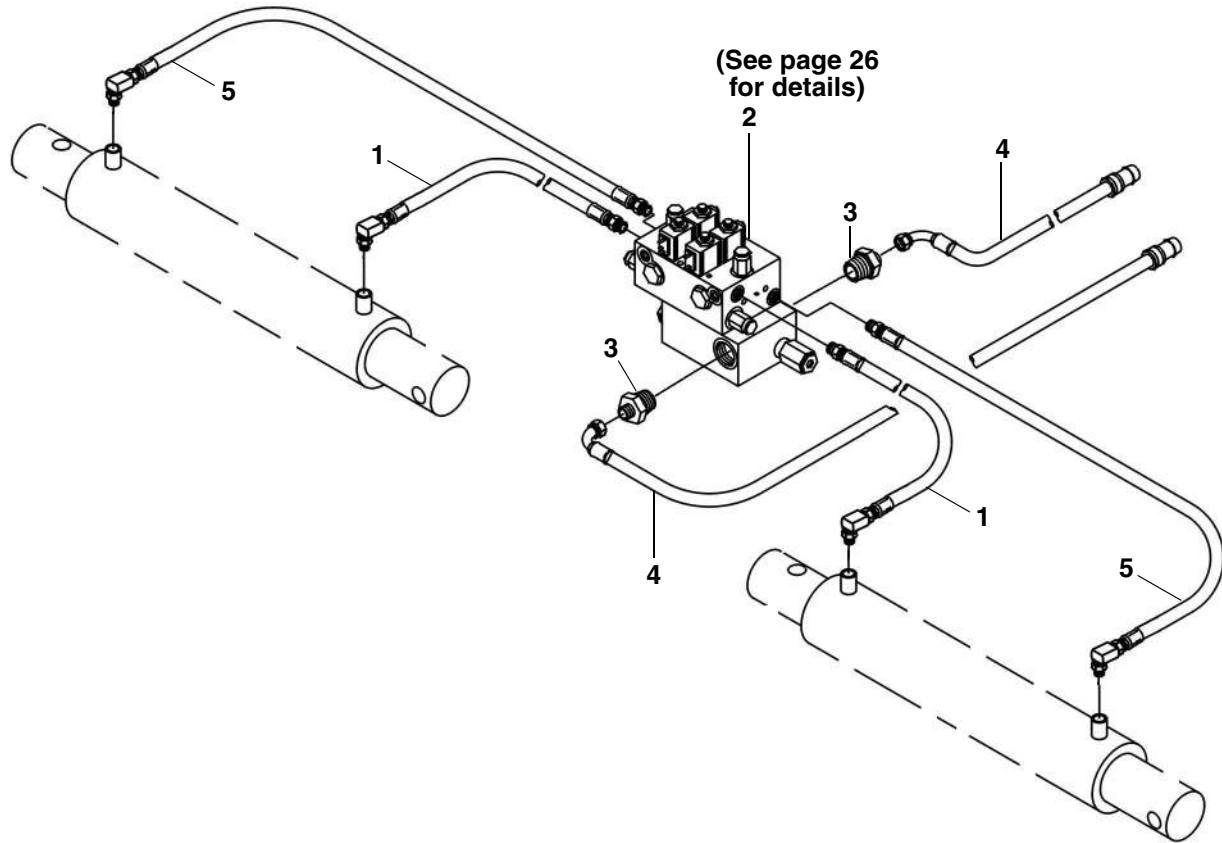
ITEM	PART NO.	DESCRIPTION	QTY
1	96006002	Kit, Guide, Blade (Includes 2 Guides And Mtg. Hdwr.)	1
2		Frame, 99", RH	1
		Frame, 109", RH.....	1
3		Frame, 99", LH	1
		Frame, 109", LH	1
4	96105978	Retainer, Blade, 99"	2
	96105979	Retainer, Blade, 109"	2
5	96105976	Blade, Lexan, 99"	2
	96105977	Blade, Lexan, 109"	2
6	96102474	Blade, Steel, 99" (Bolt On Style)	2
	96101844	Blade, Steel, 109" (Bolt On Style)	2
7	97100664	Decal, Sno-Way	2
8	96103891	Wearstrip Kit, Steel, 99" (Includes Mtg. Hdwr.)	2
	96103892	Wearstrip Kit, Steel, 109" (Includes Mtg. Hdwr.)	2
		NOTE: Each Wearstrip Kit will replace Wearstrip on one Wing only. To replace Wearstrips on both Wings, two Kits are required.	
9	98100171	Bolt, Carriage, Gr. 5, 1/2"-13 NC x 1-3/4"	16
10	98009013	Nut, Nylock, 1/2" - 13 NC	16
11	98019176	Screw, Self Tapping.....	10
12	98019230	Washer, Flat, 5/16"	10
13	97100018	Decal, Warning.....	2
14	97100006	Decal, Important.....	1
15	97100001	Decal, Warning.....	1
16	96103890	Wearstrip Kit, Center, Urethane (includes Mtg. Hdwr.)	1
17	98009151	Bolt, Carriage, Gr. 5, 7/16"-14 NC x 2".....	3
18		Strip, Mounting	1
19	98009050	Nut, Nylock 7/16"-14 NC	3
20	98009034	Cap Screw, Hex., 3/8"-16 NC x 1-1/4".....	8
21	96101401	Bracket, Shoe.....	2
22	98009009	Nut, Nylock, 3/8"-16 NC	8
23	96102542	SHOE ASSEMBLY	2
24		Shoe, Cast, 1" Shaft.....	1
25		Spacer, 1"	1
26		Washer, Flat, 1"	14
27		Pin, Lynch, 1/4" x 1-9/16"	1

ANGLE CYLINDERS



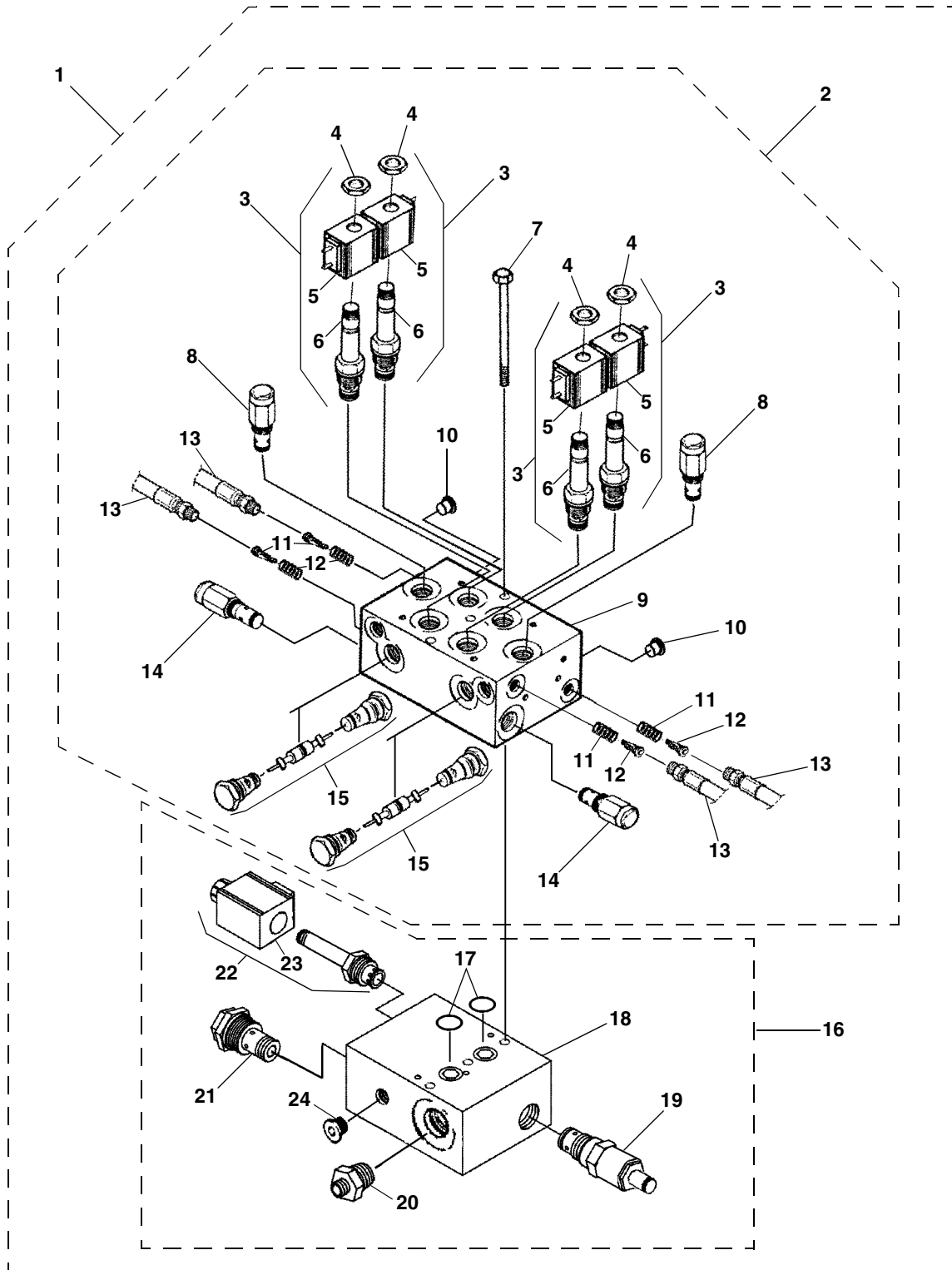
ITEM	PART NO.	DESCRIPTION	QTY
1	96101977	Cylinder, Angle, 2-1/4"	1
2	96102537	Kit, Seal 2-1/4"	1
3		Wiper, Rod	1
4		Seal, Rod	1
5		Ring, Back Up	1
6		O-Ring	1
7		Seal, Piston	1
8		Rod, Cylinder	1
9		Piston	1
10	96102536	Nut, Gland 2-1/4"	1

HYDRAULIC SYSTEM



ITEM	PART NO.	DESCRIPTION	QTY
1	96104246	Hose, Hydraulic, 27"	2
2	96106205	Assembly, Valve, 12 VDC (See page 26 for details)	1
3	96106271	Fitting, Adapter	2
4	96105513	Hose, Hydraulic, 69"	2
5	96104243	Hose, Hydraulic, 29.5"	2

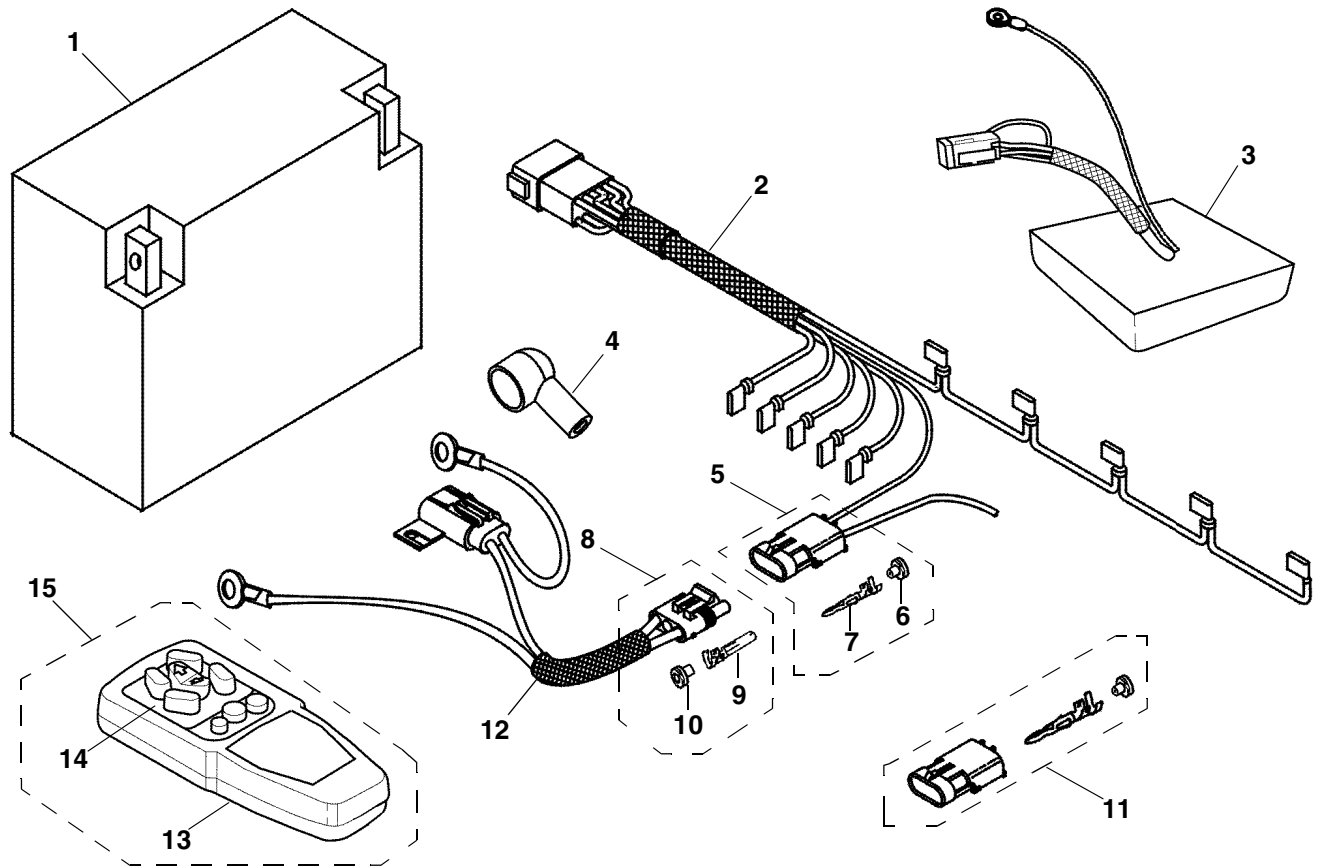
HYDRAULIC VALVE BLOCK ASSEMBLY



HYDRAULIC VALVE BLOCK ASSEMBLY

ITEM	PART NO.	DESCRIPTION	QTY
1	96106205	Assembly, Valve, 12 VDC	1
2	96106206	Assembly, Upper Valve Block	1
3	96105235	Valve, 12 VDC	4
4	96105275	Nut, Coil Retaining	4
5	96105274	Coil, 10 VDC	4
6	96105309	Cartridge	4
7	96105237	Cap Screw, Socket Head, 1/4-20 x 2-1/4"	3
8	96106317	Valve, Relief, 2150 PSI	2
9	96106281	Valve Block, Upper	1
10	96105234	Fitting, Plug	5
11	96105251	Spring, Retaining	4
12	96105250	Filter, Inline	4
13	96104246	Hose, Hydraulic, 27"	4
14	96105732	Valve, Relief, 2150 PSI	2
15	96106273	Kit, Check Valve (kit includes springs, check valve and (2) plugs)	2
16	96106207	Assembly, Lower Valve Block	1
17	96102551	O-Ring	2
18	96106280	Valve Block, Lower	1
19	96106284	Valve, Relief, 1800 PSI	1
20	96106271	Fitting, Adapter	2
21	96106283	Valve, Flow Control	1
22	96106282	Valve, Directional Control	1
23	96106285	Coil, Directional Control Valve	1
24	96105240	Fitting, Plug	2

CONTROL SYSTEM WIRING



ITEM	PART NO.	DESCRIPTION	QTY
1	96104756	Battery, 12VDC	1
2	96106269	Harness, Module	1
3	96105165	Module, Wired Control	1
4	96106374	Boot, Cable	1
5	96106301	Connector, Packard, Male	1
6	96106305	Seal, Cable.....	2
7	96106303	Terminal, Male.....	2
8	96106302	Connector, Packard, Female.....	1
9	96106304	Terminal, Female.....	2
10	96106305	Seal, Cable.....	2
11	96106310	Kit, Charger Adapter (includes terminals and seals).....	1
12	96106267	Harness, Battery	1
13	96105299	Housing, Controller	1
14	96104681	Touch-Pad, V-Plow	1
15	96106266	Assembly, Controller	1

NUMERICAL INDEX

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96100081	21	23	96105732	27	14	97100914	21	62
96100082	21	19	96105976	23	5	98009004	21	30
96101401	23	21	96105977	23	5	98009005	21	50
96101833	21	1	96105978	23	4	98009008	21	28
96101844	23	6	96105979	23	4	98009009	21	21
96101977	21	54	96106194	21	17		23	22
	24	1	96106197	21	15	98009010	21	3
96102474	23	6	96106200	21	6	98009011	21	4
96102482	19	2	96106203	21	25	98009013	21	13
96102536	24	10	96106204	21	33		23	10
96102537	24	2	96106205	21	16	98009022	21	29
96102542	21	47	96106205	25	2	98009030	21	31
	23	23		27	1	98009034	21	35
96102551	27	17	96106206	27	2		23	20
96102604	19	5	96106207	27	16	98009036	21	22
96102605	19	1	96106208	21	60	98009038	21	52
96102606	19	1	96106211	21	24	98009039	21	42
96102781	21	57	96106266	28	15	98009042	21	55
96102832	21	38	96106267	28	12	98009050	23	19
96102915	21	46	96106269	28	2	98009068	21	44
96102916	21	34	96106270	21	5	98009069	21	45
96102938	19	8	96106271	25	3	98009078	21	41
96103000	21	37	96106271	27	20	98009134	21	20
96103890	23	16	96106273	27	15	98009149	21	7
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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 decals are in place.
- All pivot pins and cotters are installed and secure.
- Trip springs are adjusted.
- Disk Shoe assemblies are installed and adjusted.

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

CHECK THAT

- Blades swing.
- Cylinders, hoses and fittings **DO NOT** leak.
- No abnormal noises or vibrations are present; Repair or replace as necessary.

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.
- Explain connect and disconnect procedures.
- Explain the necessity of Disk Shoe usage at all times to ensure optimum plow performance.
- Fill out Warranty Registration Card and mail COPY 1 to the factory to validate Warranty. NO Warranty claims can be honored if the Warranty Card is not on file at the factory.**

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