

SNO-WAY®

SNOW & ICE CONTROL EQUIPMENT

INSTALLATION & OWNER'S MANUAL

**SKID STEER STRAIGHT BLADE
SNOW PLOWS
SERIES 22SKD, 26SKD, 29HDSKD,
29THDSKD & 32CSKD**

**FOR PLOW SERIAL NUMBERS AFTER:
22SKD200000, 26SKD200000, 29HDSKD200000,
29THDSKD200000, 32CSKD200000**

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INTRODUCTION

This manual was written for the assembly, installation and maintenance of your new Sno-Way Skid Steer Straight 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 FOLLOW 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 A-Frame Serial Number, Blade Model Number and Blade Serial Number in the space provided below as a handy record for quick reference. The Blade Serial Number is located on one of the middle ribs of the blade. These plates contain information that your Dealer needs to answer questions or to order replacement parts, if

needed, for your unit.

NAME PLATE DATA	
A-FRAME SERIAL NUMBER	_____
BLADE MODEL NUMBER	_____
BLADE 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.

REMEMBER after the snow plow is installed on the vehicle, the Pre-Delivery Check List and Delivery Check List (on the outside back cover of this manual) must be completed.



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.

ASSEMBLY INSTRUCTIONS

Assembly

IMPORTANT: Graphics and illustrations may be used which may show equipment and/or options not included in every installation.

Assemble Blade and Swing Frame (22 Series)

NOTE: The 22 series blade uses blade stops. Make sure the proper stops are installed.

1. Open the carton and remove the blade parts bag. The blade stops are in the blade parts bag.
2. Place stops between the lugs on the swing frame. Secure with 3/8" x 1-3/4" bolts and locking nuts. (See Figure 1-1). The bolts and nuts are in the blade parts bag.

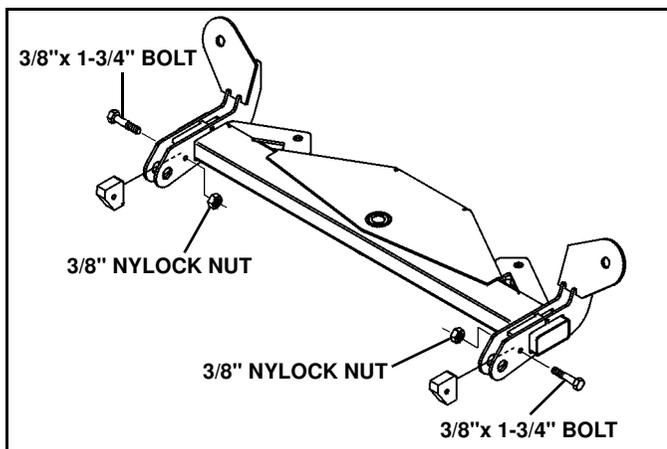


Figure 1-1

3. Lay blade face down on floor.
4. Place swing frame on blade, positioning the two inside ribs between the swing frame lugs. Insert a 3/4" x 1-5/8" clevis pin from blade parts bag to fasten each side. (See Figure 1-2).

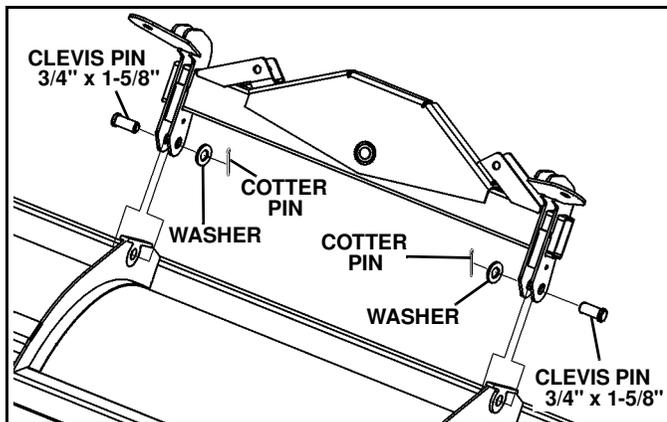


Figure 1-2

5. Insert washer on end of each clevis pin and secure with cotter pin. Make sure cotter pin is properly bent or pin may work loose. (See Figure 1-9)

Assemble Blade and Swing Frame (26 Series)

1. Open the carton and remove the blade parts bag and the trip stop bag. The blade parts bag contains the face plates and stop blocks.
2. Slide the metal face plates into the blade stops from the side. Place the stops between the lugs on the swing frame. Secure with 3/8" x 2-1/2" bolts and locking nuts. (See Figure 1-3). Bolts and nuts are in the blade parts bag.

NOTE: The 26 Series blade uses green stops. Make sure the proper stops are installed.

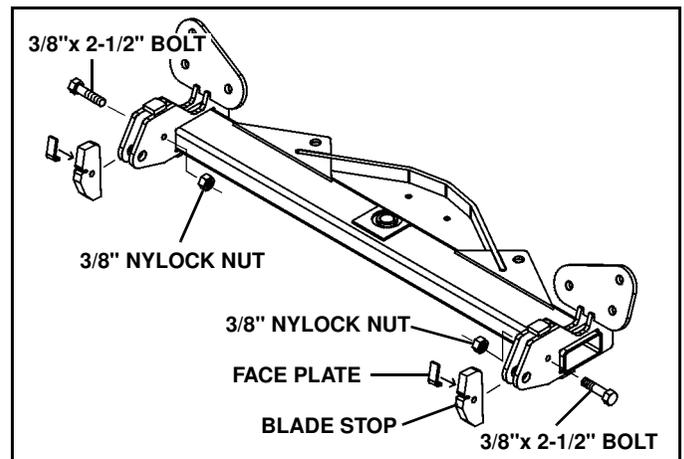


Figure 1-3

3. Lay blade face down on floor.
4. Install swing frame on blade, aligning the ribs on either side of the center rib between the swing frame lugs. Insert 3/4" x 2" clevis pins and washers from blade parts bag through the mounting holes in the swing frame and blade from the outside. (See Figure 1-4)

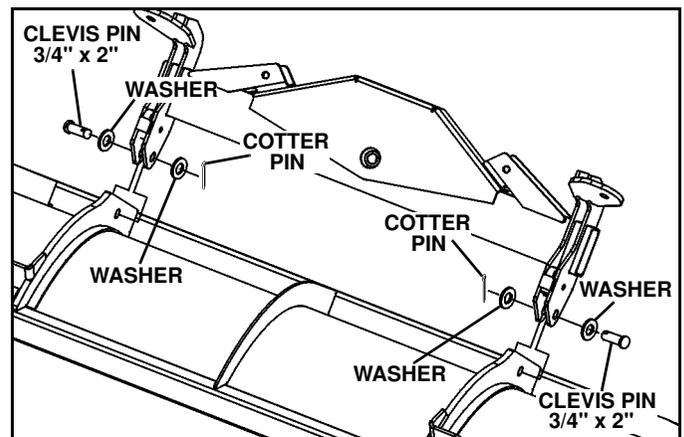


Figure 1-4

Insert washer on end of each clevis pin and secure with cotter pin. Make sure cotter pin is properly bent or pin may work loose. (See Figure 1-9)

Assemble Blade and Swing Frame (29 Series)

1. Open the carton, remove the blade parts bag. Face plates are in the bag with the stop blocks.
2. Slide the metal face plates into the slot in the blade stops from the side. Place the stops between the lugs on the swing frame. Secure with 3/8" x 2-1/2" bolts and locking nuts. (See Figure 1-5) Bolts and nuts are in the blade parts bag.

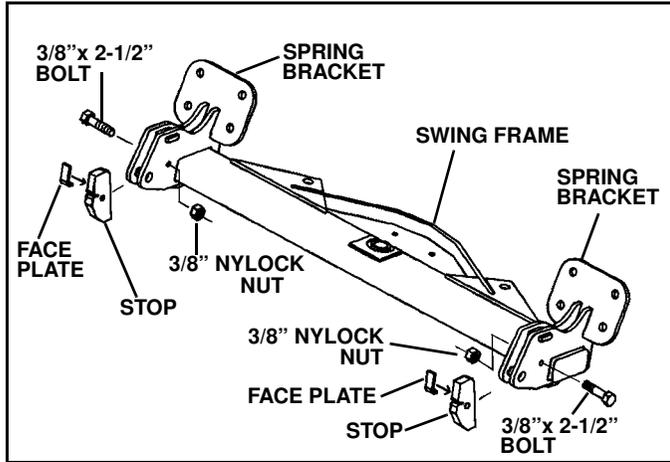


Figure 1-5

3. Lay blade face down on floor, using cardboard or similar material to prevent paint damage.
4. Place swing frame on blade and insert 3/4" x 2" clevis pin from blade parts bag. The ribs on either side of the center rib should be between the swing frame lugs. (See Figure 1-6)

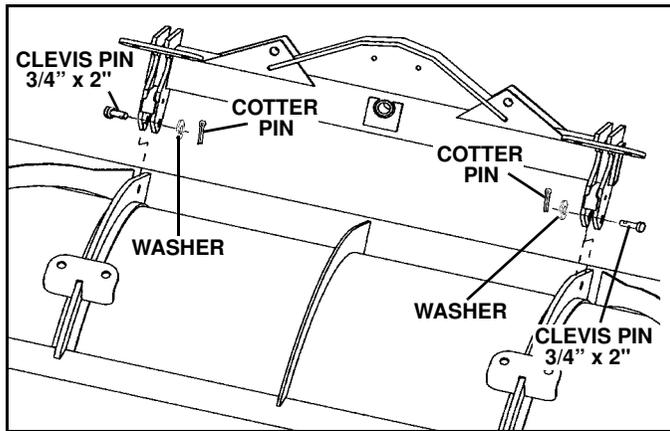


Figure 1-6

5. Insert washer on end of clevis pin and secure pin with cotter pin.

NOTE: Make sure cotter pin is properly bent or pin may work loose. (See Figure 1-8)

Assemble Blade and Swing Frame (32 Series)

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. Remove swing frame from box. Place swing frame 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 1-7)

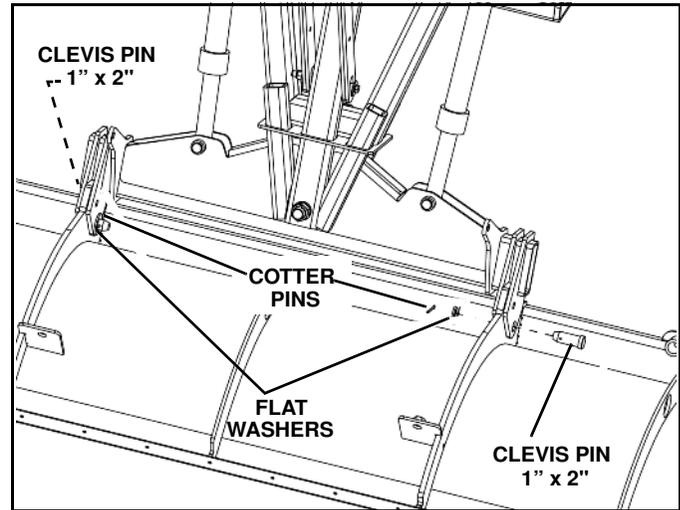


Figure 1-7

4. 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 1-8)

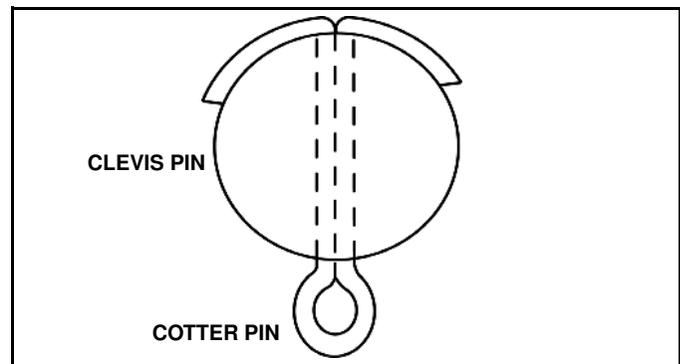


Figure 1-8

Assemble Blade Trip Springs (22, 26 and 29HD Series)

1. Remove the springs from the carton. Two springs are needed for all 29 Series blades.
2. Hook springs onto blade with open end of loop facing up. (See Figure 1-9)
3. Hook other end of spring onto eyebolt. Insert one eyebolt on each side of the blade into the single upper hole on the swing frame spring bracket. Use a jam nut on either side of bracket to secure. (See Figure 1-9)

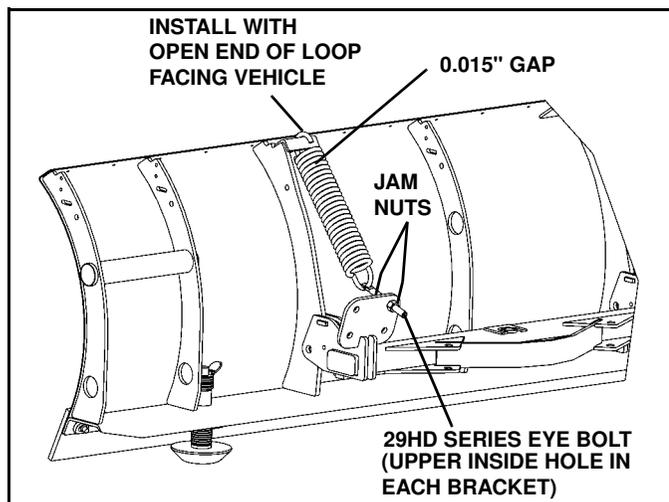


Figure 1-9

4. Tighten springs until a .015" feeler gauge can pass between two or more coils (a 3x5 postcard is approximately .015").



CAUTION

Do not over tighten trip springs. If more than .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.

Assemble Blade Trip Springs (32 Series)

1. Remove the springs from the carton. Four springs are needed for a 32 Series blade.
2. Hook a spring on an outer swing frame spring eyelet. (See Figure 1-10)

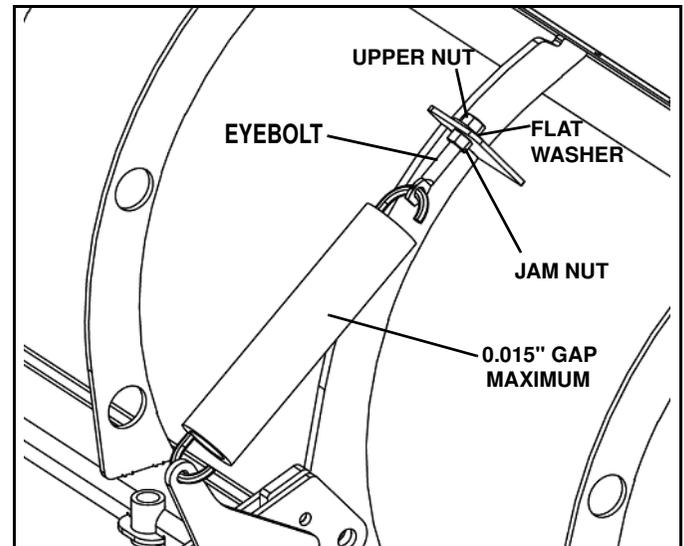


Figure 1-10

3. Place a nut on the eyebolt and thread the nut to approximately 1/2" from the eyelet.
4. Place eyebolt on the hook of the spring.
5. Feed the eyebolt through the outer blade spring mount bracket.
6. Install a flat washer and upper retaining nut to the eyebolt.
7. Tighten the upper nut 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.

8. Tighten the lower jam nut securely.
9. Repeat this step for the remaining springs.

Assemble Blade Trip Springs (29THD Series)

1. Open the carton and remove the blade parts bag (part number 96114724).
2. Lay blade face down on floor, using cardboard or similar material to prevent paint damage.
3. Install three 3/4" nuts onto the long threaded end of the spring trip rod. (See Figure 1-11)

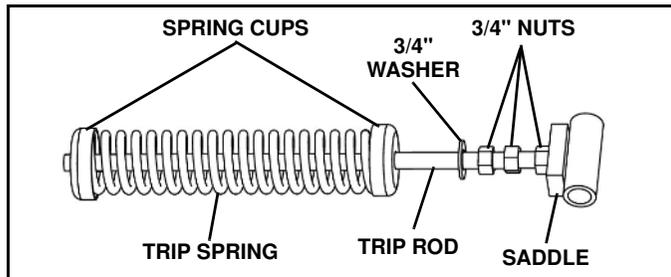


Figure 1-11

4. Install the long threaded end of the trip rod into the saddle completely.
5. Tighten the closest 3/4" nut closest to the saddle.
6. Thread the two remaining 3/4" nuts down toward the saddle as far as they will go (this puts minimum pressure on the spring for following steps).
7. Install the 3/4" washer, spring cup, trip spring and second spring cup on the free end of the trip rod.
8. Slide the trip rod assembly into a trip rod guide hole in the blade. (See Figure 1-12)

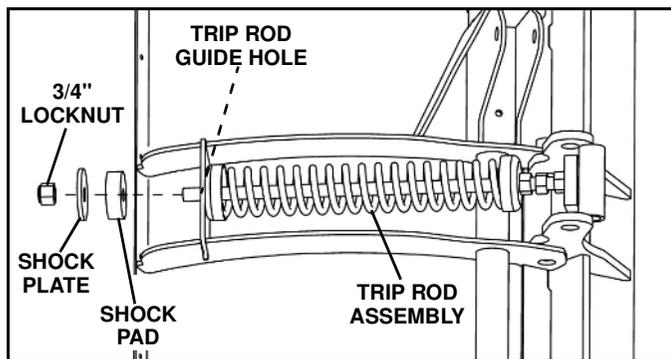


Figure 1-12

9. Install the shock pad and shock plate onto the free end of the trip rod.
10. Loosely install a 3/4" locknut on the free end of the trip rod.

11. Apply a thin coating of grease to the main trip bolt shank.

12. With an assistant and pry board or other suitable tool, apply pressure to the lower part of the saddle until it aligns with the mounting holes in the blade. (See Figure 1-13)

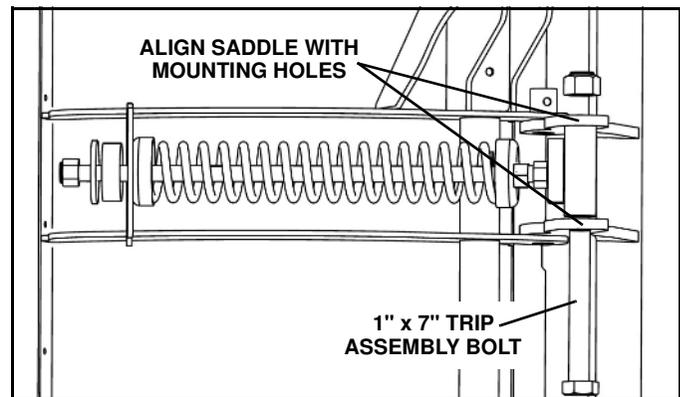


Figure 1-13

13. Install the greased 1" x 7" trip assembly bolt through the blade and saddle.
14. Rotate the trip bolt to ensure that grease has covered the inside surfaces of the saddle.
15. Install a 1" locknut on the trip bolt. Tighten the nut to remove all freeplay from the bolt, but still allow it to spin in the mounting holes and saddle. (See Figure 1-14)

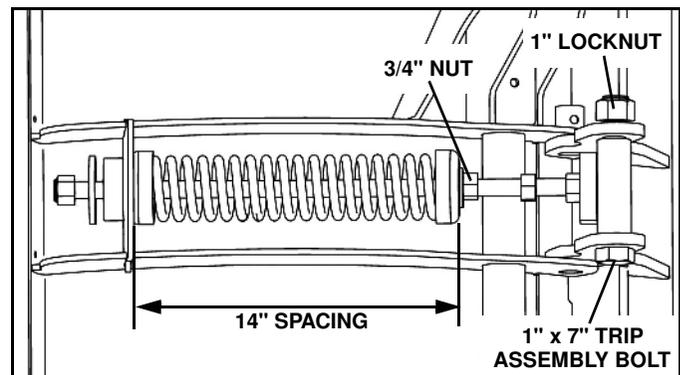


Figure 1-14

16. Tighten the 3/4" nut against the washer and lower spring cup until the distance between both spring cups is 14 inches.

17. Tighten the 3/4" jam nut against the adjustment nut to secure the 14" spring cup spacing. (See Figure 1-15)

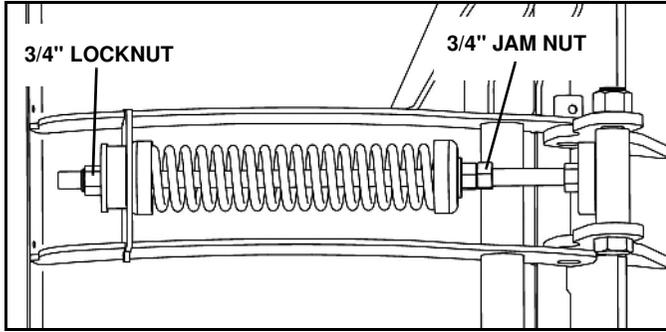


Figure 1-15

18. Tighten the top 3/4" locknut on the trip rod against the shock plate and shock pad until the lower trip assembly bolt can be spun with minimal effort with a wrench.

NOTE: The shock plate keeps the lower blade and cutting edge from slamming into the stops on the main blade. Minimal pretension on the shock bushing is required to keep the blade from this impact. The ability to spin the lower trip assembly bolt with minimal effort indicates proper preload on the trip spring assembly.

19. Repeat these steps to install the second trip spring on the opposite side of the blade. (See Figure 1-16)

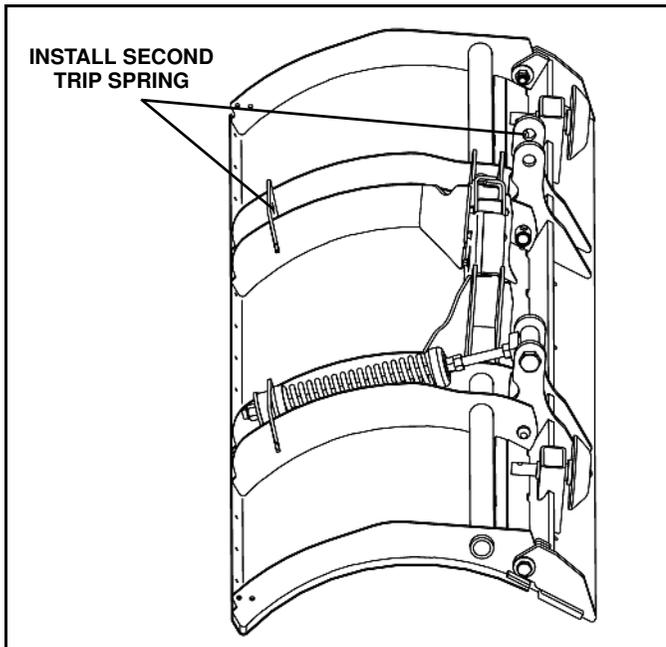


Figure 1-16

Assemble A-Frame to Blade (All)

1. Remove 1" locknut and bolt. Slide swing frame into A-frame. Replace 1" bolt and locknut and tighten. (See Figure 1-17 or Figure 1-18)

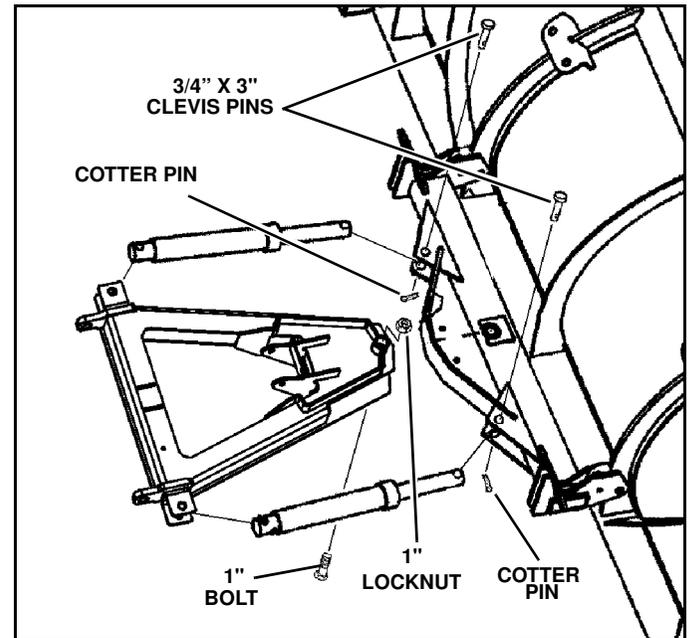


Figure 1-17

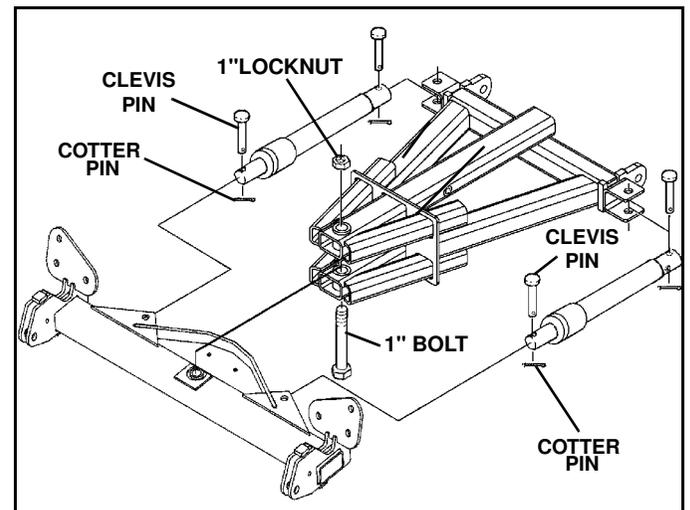


Figure 1-18

2. Remove cotter pins and 3/4" clevis pins from rod end of cylinders. Extend cylinders using plow control to align holes in cylinder rod and swing frame. Insert 3/4" clevis pins and secure with cotter pins. (See Figure 1-17 or Figure 1-18) Bend cotter pin as shown in to prevent it from working loose.

3. Cycle all plow functions and refill reservoir. Repeat until all air is removed from hydraulic system.

4. Review the "Break In Period" in the Maintenance section to determine if the 1" pivot bolt and lock nut installed in step 4 are tightened appropriately.

5. Install side marker into pre-drilled holes on blade frame using hardware included in package. Install optional deflector, if equipped.

Final Assembly

1. Insert bushings into the a-frame lugs. (See Figure 1-19)

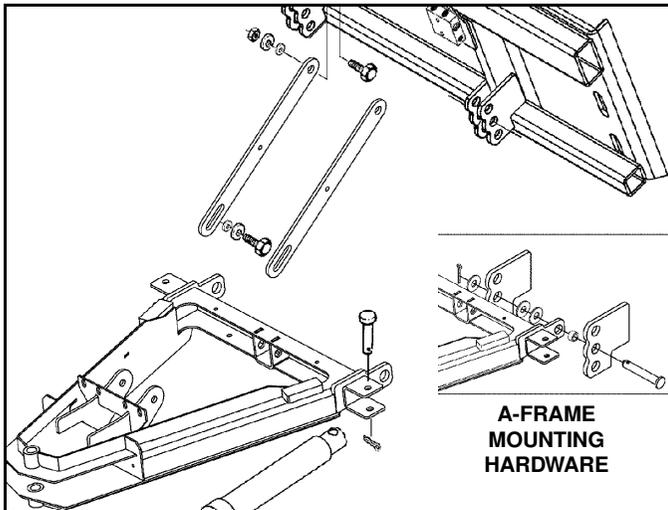


Figure 1-19

2. Slide the A-frame into the middle position of the universal adaptor bracket. (See Figure 1-19)
3. Insert pin into the a-frame lugs. On one side add the additional washers to prevent the a-frame from sliding side to side. Push the pin all the way through the adaptor plate and insert cotters to retain pins in position. (See Figure 1-19)
4. Located the slider links and mount them to the adaptor plate. Insert bushings into the slider link pivot hole. Insert the bolts with washers (to retain the bushing in position) and attach a nut on the inside of the adaptor plate pivot point. Tighten the nuts down. (See Figure 1-19)

NOTE: On the 32C and 29 Trip Edge series there are two links per side and the slider links are retained by one bolt. (See Figure 1-20)

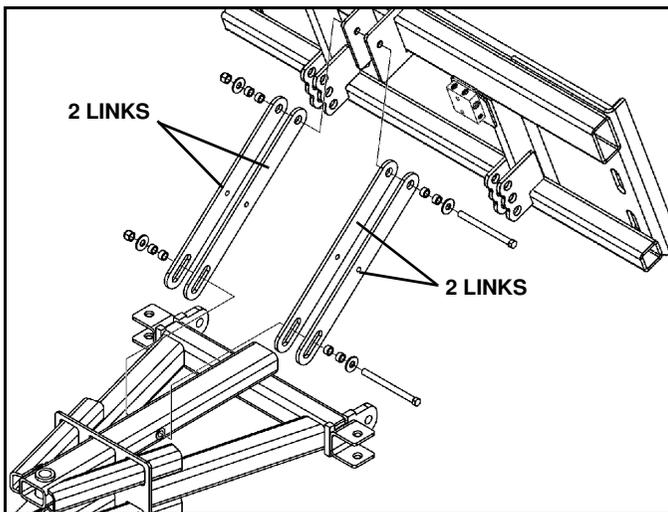


Figure 1-20

5. Attach the cross over relief valve to the adaptor plate using the two bolts. (See Figure 1-21)

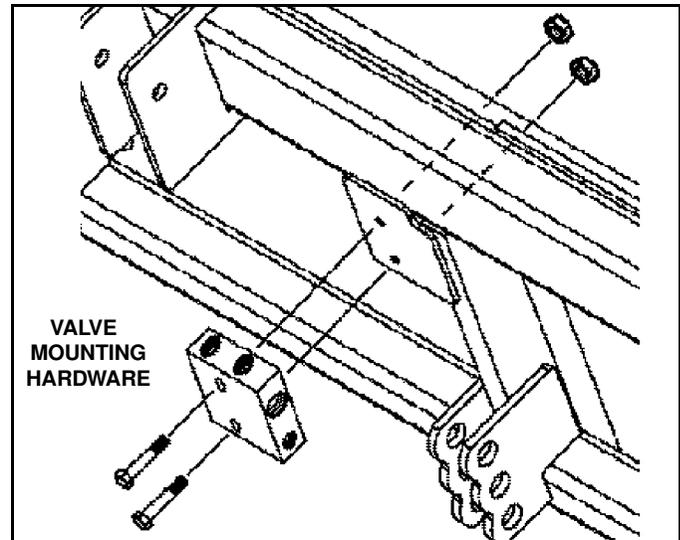


Figure 1-21

6. Mount quick-release couplers to the hydraulic hoses (not shown).

Disk Shoe Adjustment

1. Raise the plow.
2. Place suitable blocking under plow to allow at least 10" of clearance to the ground.
3. Lower plow onto blocking.



WARNING

Keep hands and feet clear of blade and A-Frame when setting blocking and lowering plow. Moving or falling assemblies could result in injury.

FAILURE TO FOLLOW CAN RESULT IN INJURY OR DEATH.

4. Adjust shoe assemblies by removing Shoe Mounting Pin and adding or subtracting washers on the top or bottom of the shoe mounting bracket. (See Figure 1-22)

NOTE: Adjust shoe assemblies to meet surface conditions. 1/4" to 1/2" off the ground for hard surfaces, 1" to 2" for gravel roads, etc.

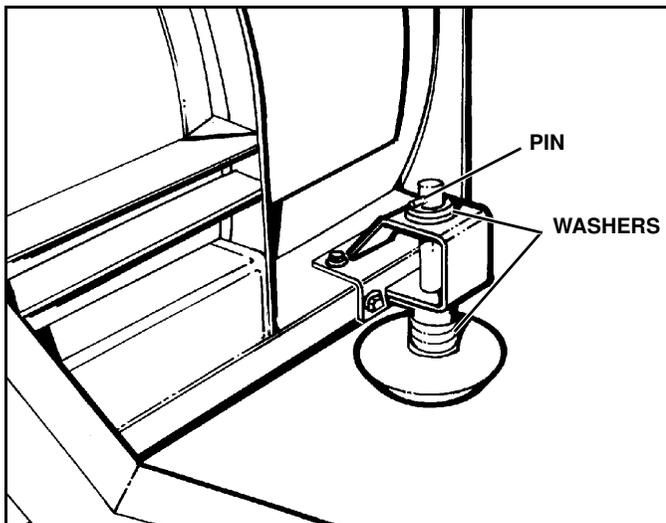


Figure 1-22

5. 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 Disk Shoe Stem.

THEORY AND PLOWING OPERATION

System Operation Theory

The Skid Steer Straight Blade Snow Plow functions as an accessory for a skid steer or any vehicle that has a Universal Mount system.

The plow is mounted to the Universal Mount system, and the auxiliary hydraulics lines are connected to the swing cylinders. The plow is raised or lowered using the loader arms. The blade is angled when the auxiliary hydraulics are turned on. The fluid pressure from the auxiliary hydraulics causes one of the angling cylinders to become pressurized and therefore extend. The extended cylinder causes the blade to angle. The fluid from the retracting cylinder returns to the skid steer fluid reservoir tank via the other auxiliary hydraulics port. To cause the blade to angle in the opposite direction, the auxiliary hydraulics flow is reversed. The connection of the hoses for left to right orientation is vehicle dependent as to which auxiliary port connects to which cylinder.

To limit the angling speed of the blade, an orifice is located in the left cylinder elbow.

NOTE: Any altering or removal of this orifice voids the warranty.

A cross over relief system protects the unit from potential damage. When the blade hits an obstacle it causes the blade to angle. If the load is higher than 2000 PSI. in the cylinders, then the cylinder rod retracts via the cross over relief and protects the blade from potential damage. The blade, however, is not protected if the cylinder is fully retracted and against the stops. Potential damage to the blade and the stops can occur if significant obstacles are encountered while the blade is against a stop.

Plow Operational Limits

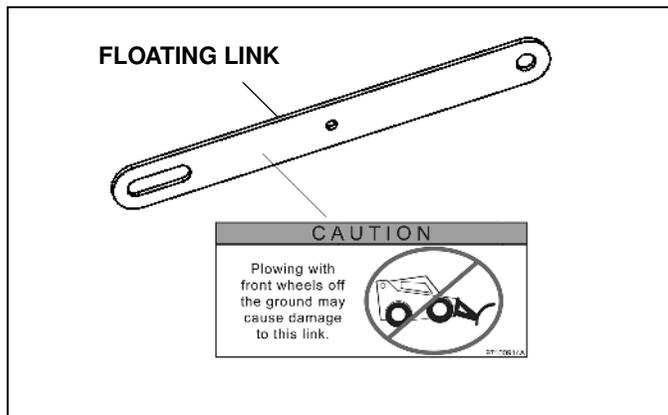


Figure 2-1

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.

Plowing Operation

Before The Season Begins

1. Inspect safety equipment for proper operation; headlights and windshield wipers.
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 Blade Assembly and the Swing Frame, between Swing Cylinder pivot Pins and the Lift Linkage.
5. Check for excessive free play between the A-Frame and Swing Frame Pivot. If there is excessive free play adjust the Swing Frame Pivot Pin as described in the of this manual.
6. If wear is noticed between the A-Frame and Swing Frame apply a good quality Anti-Seize lubricant to this area.

Clearing Driveways

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.

1. Head into driveway with the blade angled to plow snow away from buildings. Continue to widen drive path by rolling snow away from buildings on successive passes.
 1. If there is a garage at the end of the driveway, plow to within several vehicle lengths of the garage. Then push as much snow as possible off the driveway.
 1. With a raised straight blade, drive through remaining snow to building. Drop blade and "back-drag" snow away from garage door at least one and one-half vehicle lengths. Repeat as necessary.
 1. Back vehicle to garage door and plow forward toward street, removing the remaining snow.

Clearing Parking Lots

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.

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.

NOTE: Stacking snow; As the "stacking" location is approached, begin raising the blade to facilitate the ride-up onto the stack.

Angle plow toward the exterior sides, and continue with successive passes until area is cleared and snow is "stacked" around outer edges. If snow is too deep to clear in the above manner, clear main traffic lanes as much as possible and stack snow at selected intermediate positions.

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.

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 FOLLOW 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.

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

TROUBLESHOOTING GUIDE

Introduction

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

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 should have the following information available.
 - A. Date snow plow was originally installed.
 - B. A-Frame Serial Number.
 - C. Blade Model Number.
 - D. Blade Serial Number.

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



CAUTION

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

Trouble Shooting General Quick Reference

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

PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
Blade will not angle	Hydraulic fluid level low	See Maintenance section
	Crossover pressure relief valve setting too low	Refer to dealer
	Angle cylinder binding or bent	Refer to dealer
	Crossover relief valve sticking or stuck	Refer to dealer
	Faulty skid loader valve	Refer to skid loader dealer
Unit angles very slowly	Hydraulic fluid level low	See Maintenance section
	Crossover relief valve sticking or stuck	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
	Damaged cylinder	Refer to dealer
	Cylinder packing improperly torqued or dry	Refer to dealer
	Faulty skid loader valve	Refer to skid loader dealer
Unit angles in one direction only	Crossover relief valve sticking or stuck	Refer to dealer
	Crossover relief valve pressure setting too low	Refer to dealer
	Angle cylinder binding	Refer to dealer
	Faulty skid loader valve	Refer to skid loader dealer
Unit does not hold angle. Note: This problem is usually noted when pushing snow or when plow is being transported.	Crossover relief valve pressure setting too low	Refer to dealer
	Crossover relief valve sticking or stuck	Refer to dealer
	Snow too heavy / wet	Take smaller passes
	Faulty skid loader valve	Refer to skid loader 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.**
- **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

During the first few hours of operation the Plow will go through a break in period during which mating surfaces of the A-Frame and Swing Frame pivots will settle in. After 15 to 20 hours of operation check for free play of the A-Frame and Swing Frame Pivot.

To check for free play:

1. Raise the plow
2. Push down on end of blade, either right or left side, as far as it will go
3. Using a tape measure, measure and record the distance from the ground to the bottom edge of the wear strip
4. Pull upwards on the same end of the plow until edge of blade is raised as far as it will go
5. Measure and record the distance from the ground to the bottom edge of the wear strip
6. Subtract the two measurements to determine the amount of free play between the Swing Frame Pivot and the A-Frame

NOTE: Allowable free play range is 1/2" to 1-1/2". If free play exceeds this range it must be adjusted using the following steps.

Swing Frame/A-Frame Free Play Adjustment

22 SKD, 26SKD, 29HDSKD, 29THDSKD & 32CSKD

1. Tighten the Pivot Bolt Lock Nut (typically 1/6 to 1/3 turn, one or two flats)

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 Blade Assembly and the Swing Frame, between Swing Cylinder pivot Pins and the Linkage Pivots.
3. Check for excessive looseness between the A-Frame and Swing Frame Pivot. If there is excessive looseness adjust the Swing Frame Pivot Pin as described in the "BREAK-IN PERIOD" section of this manual.
4. If wear is noticed between the A-Frame and Swing Frame apply a good quality Anti-Seize lubricant to this area.

Hydraulic Cylinders

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

Polycarbonate Blade Care

- **DO NOT use abrasive or highly alkaline cleaners on Polycarbonate Blade.**
- **Never scrape Polycarbonate Blade with squeegees, razor blades or other sharp instruments.**
- **Benzene, gasoline, acetone or carbon tetrachloride should never be used on Polycarbonate Blade.**
- **DO NOT clean Polycarbonate Blade in hot sun or at elevated temperatures.**

Polycarbonate Blade Cleaning Instructions

Wash with a mild soap or detergent and luke-warm water using a clean cloth or soft sponge. Dry thoroughly with a chamois or moist cellulose sponge to prevent water spots.

Disk Shoe Adjustment

1. Raise the plow to the UP position.
2. Place suitable blocking under plow to allow at least 10" of clearance to the ground.

**WARNING**

Keep hands and feet clear of blade and A-Frame when setting blocking and lowering plow. Moving or falling assemblies could result in injury.

FAILURE TO FOLLOW CAN RESULT IN INJURY OR DEATH.

3. Lower plow onto blocking.
4. Turn ignition switch OFF and apply the emergency brake.
5. Adjust shoe assemblies by removing Shoe Mounting Pin and adding or subtracting washers on the top or bottom of the shoe mounting bracket. (See Figure 3-1)

NOTE: Adjust shoe assemblies to meet road conditions. 1/4" to 1/2" off the ground for hard surfaces, 1" to 2" for gravel roads, etc.

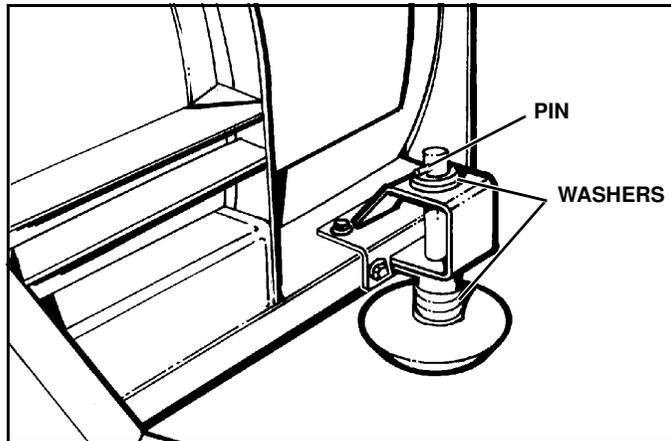


Figure 3-1

6. 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 Disk Shoe Stem.

Cutting Edge

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

1. Raise the plow UP 8".
2. Place suitable blocking under A-Frame of plow to allow at least 6" of clearance to the ground.

**WARNING**

Keep hands and feet clear of blade and A-Frame when setting blocking and lowering plow. Moving or falling assemblies could result in injury.

FAILURE TO FOLLOW CAN RESULT IN INJURY OR DEATH.

3. Lower plow onto blocking.

NOTE: If Plow is equipped with Lexan Blade the blade must be retained prior to removing the Cutting Edge. This can be accomplished by using a pair of 6" C-clamps located at the center of the curved portion of the blade.

**CAUTION**

Cutting edge may be sharp. Handle with care to avoid injury.

4. Remove mounting bolts holding old Cutting Edge to blade. Discard old Cutting Edge and hardware.
5. Consult Parts Manual for proper replacement Cutting Edge.
6. Install new Cutting Edge using new hardware.

Trip Spring Adjustment (Except 29THDSKD Series)

1. Lower plow to the full down position.
2. Insure that blade springs are installed with upper open end of top loop facing vehicle.

NOTE: See specific model information in assembly section of manual.

3. Adjust springs by loosening jam nuts on end of the eye bolts and turning opposing nut in proper direction.

NOTE: 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.)



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

Trip Spring Adjustment (29THDSKD Series)

1. Loosen the 3/4" locknut on the top of the trip rod and the 3/4" jam nut below the lower spring cup. (See Figure 3-2)

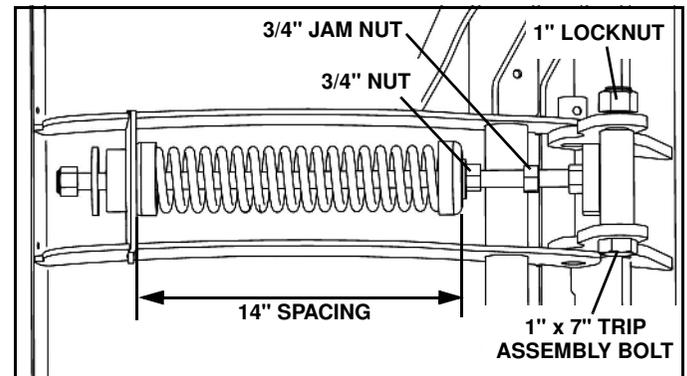


Figure 3-2

2. Tighten the lower 3/4" nut against the washer and lower spring cup until the distance between both spring cups is 14 inches.

3. Tighten the 3/4" jam nut against the adjustment nut to secure the 14" spring cup spacing. (See Figure 3-3)

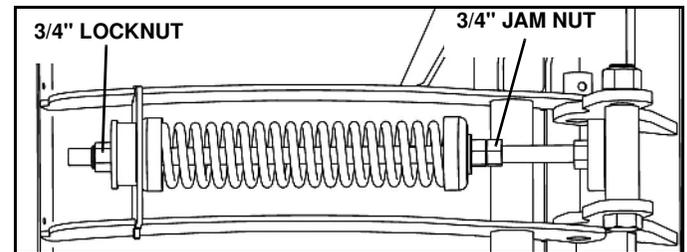


Figure 3-3

4. Tighten the top 3/4" locknut on the trip rod against the shock plate and shock pad until the lower trip assembly bolt can be spun with minimal effort with a wrench.

NOTE: The shock plate keeps the lower blade and cutting edge from slamming into the stops on the main blade. The ability to spin the lower trip assembly bolt with minimal effort indicates proper preload on the trip spring assembly.

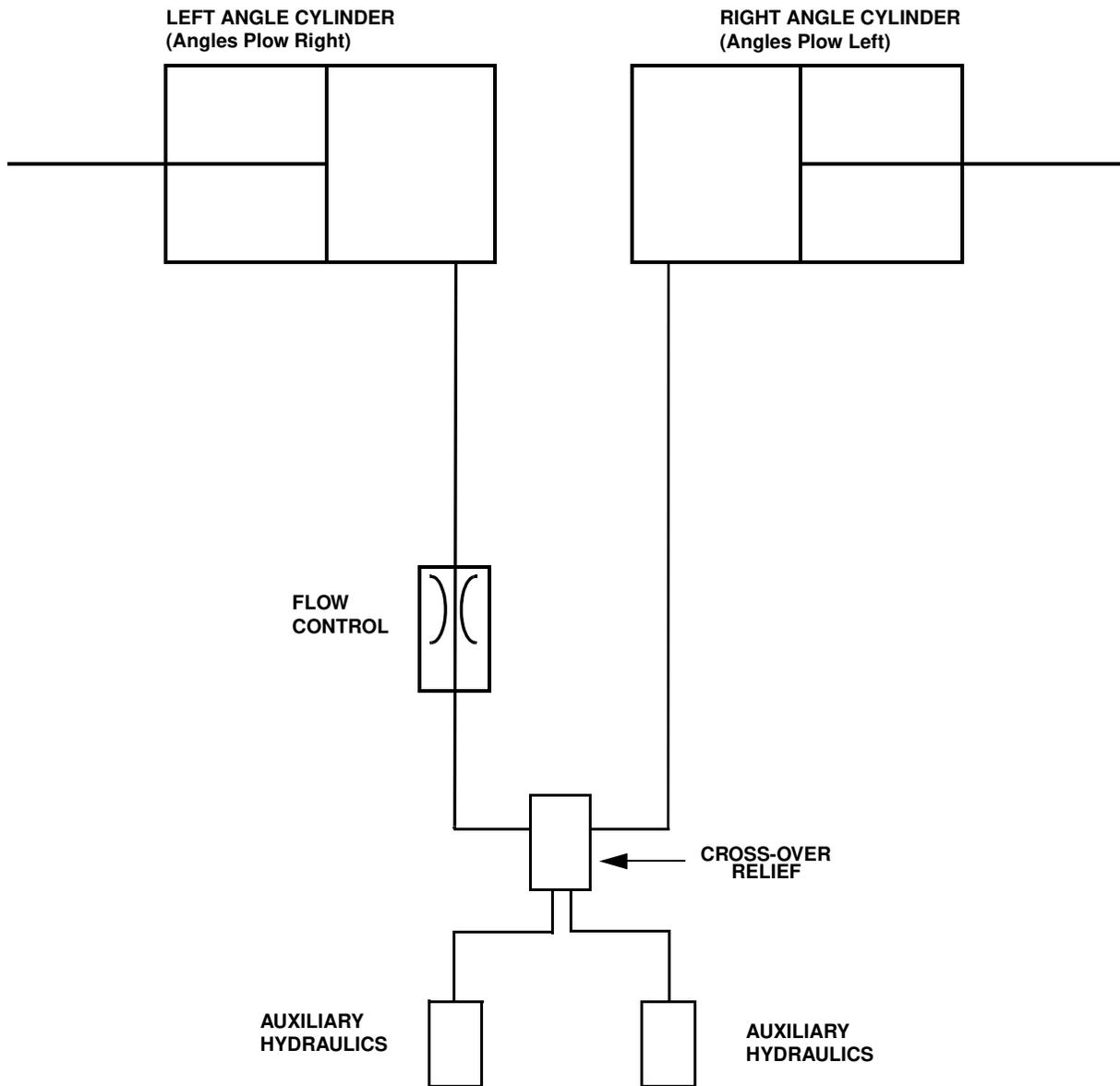
TORQUE SPECIFICATIONS

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



NOTES

NOTES

SNO-WAY[®] INTERNATIONAL, INC.

SNO-WAY[®]
SNOW & ICE CONTROL EQUIPMENT

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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:

- Cylinders, hoses and fittings **DO NOT** leak.
- Blade swings.
- 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.**

SNO-WAY[®] INTERNATIONAL, INC.

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SNOW & ICE CONTROL EQUIPMENT

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