



FISHER ENGINEERING

P.O. Box 529 Rockland, Maine 04841

27000 RD/HD  
27200 RD/HD

August 1, 2001  
Lit. No 26916

# Minute<sup>2</sup> Mount<sup>®</sup> SYSTEM

## Installation Instructions 27000 RD/HD

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**⚠ CAUTION**

Read this document before installing the snowplow.

**⚠ CAUTION**

See your FISHER<sup>®</sup> outlet for application recommendations. The Kit Selection Guide has specific vehicle and snowplow requirements.

**SAFETY INFORMATION**

Read these instructions and labels on the snowplow before beginning installation.

**⚠ WARNING**

Indicates a potentially hazardous situation that may result in death or serious injury if not avoided.

**⚠ CAUTION**

Indicates a potentially hazardous situation that may result in minor or moderate injury and/or property damage if not avoided.

**NOTE:** Identifies tips, helpful hints and maintenance information the owner/operator should know.

**WARNING/CAUTION & INSTRUCTION LABELS**

Become familiar with and inform users about the warning labels on the back of the blade, and the instruction label on the headgear.

**Warning/Caution Label**

**⚠ WARNING**

LOWER BLADE WHEN VEHICLE IS PARKED.  
REMOVE BLADE ASSEMBLY BEFORE PLACING VEHICLE ON HOIST.  
DO NOT EXCEED GVWR OR GAWR INCLUDING BLADE AND BALLAST.

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**⚠ CAUTION**

READ *OWNER'S MANUAL* BEFORE OPERATING OR SERVICING SNOWPLOW.  
TRANSPORT SPEED SHOULD NOT EXCEED 45 MPH. REDUCE SPEED UNDER ADVERSE TRAVEL CONDITIONS.  
PLOWING SPEED SHOULD NOT EXCEED 10 MPH.  
REMOVE SLACK FROM CARRYING CHAIN BEFORE TRAVELING.  
SEE YOUR FISHER OUTLET FOR APPLICATION RECOMMENDATIONS.

21793

**Instruction Label**

**ATTACH**

1. Verify that release handle is lowered. Fully engage vehicle pushplates into attachment arms.
2. Raise release handle, push headgear toward vehicle. Verify connecting pins have engaged pushplates.
3. Push down on jack lock while fully raising jack handle. Verify jack retaining pin is engaged.
4. Attach all electrical connectors.

**DETACH**

1. Place control in lower/float position.
2. Push headgear toward vehicle while lowering release handle.
3. Detach all electrical connectors.

US Patents 4,280,062, 4,999,935, 5,353,530, 5,420,480, RE 35,700 and other patents pending

27049

## SAFETY PRECAUTIONS

Improper installation and operation could cause personal injury, and/or equipment and property damage. Read and understand labels and the *Owner's Manual* before installing, operating or making adjustments.

### WARNING

Lower blade when vehicle is parked. Temperature changes could change hydraulic pressure, causing the blade to drop unexpectedly or damaging hydraulic components. Failure to do this could result in serious personal injury.

### WARNING

Remove blade assembly before placing vehicle on hoist.

### WARNING

Keep well clear of the blade when it is being raised, lowered or angled. Do not stand between the vehicle and blade or directly in front of the blade. If the blade hits you or drops on you, you could be seriously injured.

### WARNING

The driver shall keep bystanders clear of the blade when it is being raised, lowered or angled. Do not stand between the vehicle and the blade or within 8 feet of a moving blade. A moving or falling blade could cause personal injury.

### WARNING

Keep hands and feet clear of the blade and A-frame when mounting or removing the snowplow. Moving or falling assemblies could cause personal injury.

### WARNING

Do not exceed GVWR or GAWR including the blade and ballast. The rating label is found on the driver-side vehicle door cornerpost.

### CAUTION

Refer to the Kit Selection Guide for minimum vehicle recommendations and ballast requirements.

### CAUTION

To prevent accidental movement of the blade, always turn the ON/OFF switch to OFF whenever the snowplow is not in use. The control indicator light will turn off.

## PERSONAL SAFETY

- Wear only snug-fitting clothing while working on your vehicle or snowplow.
- Do not wear jewelry or a necktie, and secure long hair.
- Wear safety goggles to protect your eyes from battery acid, gasoline, dirt and dust.
- Avoid touching hot surfaces such as the engine, radiator, hoses and exhaust pipes.
- Always have a fire extinguisher rated BC handy, for flammable liquids and electrical fires.

## FIRE AND EXPLOSION

### WARNING

Gasoline is highly flammable and gasoline vapor is explosive. Never smoke while working on vehicle. Keep all open flames away from gasoline tank and lines. Wipe up any spilled gasoline immediately.

Be careful when using gasoline. Do not use gasoline to clean parts. Store only in approved containers away from sources of heat or flame.

**VENTILATION**

**⚠ WARNING**

Vehicle exhaust contains deadly carbon monoxide (CO) gas. Breathing this gas, even in low concentrations, could cause death. Never operate a vehicle in an enclosed area without venting exhaust to the outside.

**TORQUE CHART**

**⚠ CAUTION**

Read instructions before assembling. Bolts should be finger tight until instructed to tighten according to the torque chart. Use standard methods and practices when attaching snowplow including wearing safety glasses during cutting, drilling and welding.

**HYDRAULIC SAFETY**




**⚠ WARNING**

Hydraulic oil under pressure can cause skin injection injury. If you are injured by hydraulic oil, get medical attention immediately.

**⚠ CAUTION**

Do not mix different types of hydraulic fluid. Some fluids are not compatible and may cause performance problems and product damage.

- Always inspect hydraulic components and hoses before using. Replace any damaged or worn parts immediately.
- If you suspect a hose leak, DO NOT use your hand to locate it. Use a piece of cardboard or wood.

<b>Recommended Fastener Torque Chart (Ft.-Lb.)</b>			
Size	 SAE Grade 2	 SAE Grade 5	 SAE Grade 8
1/4-20	6	9	13
5/16-18	11	18	28
3/8-16	19	31	46
3/8-24	24	46	68
7/16-14	30	50	75
1/2-13	45	75	115
9/16-12	66	110	165
5/8-11	93	150	225
3/4-10	150	250	370
7/8-9	150	378	591
1-8	220	583	893
<b>Metric Grade 8.8 (Ft.-Lb.)</b>			
Size	Torque	Size	Torque
M 6	7	M 12	60
M 8	17	M 14	95
M 10	35	M 16	155
These torque values apply to mount assembly fasteners except those noted in the instruction.			

## INSTALLATION INSTRUCTIONS

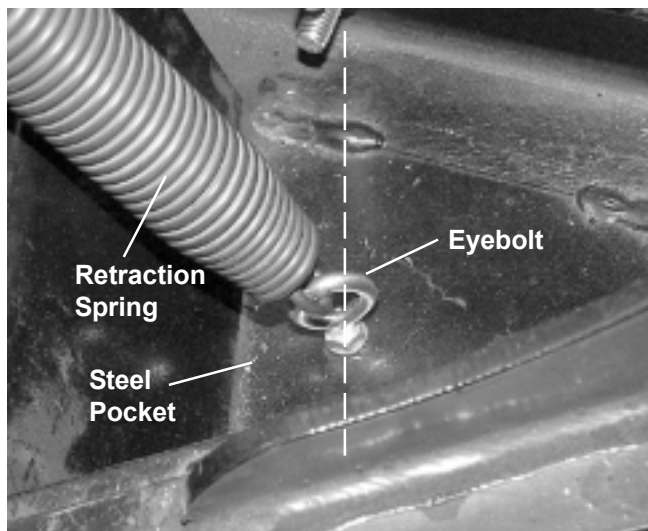
### Blade, Headgear Assembly and A-frame Preparation

1. Snap the slotted end of the 6-1/2" extension spring onto the 1/4" x 1" eyebolt. Close the slot in the spring to prevent it from detaching from the eyebolt.

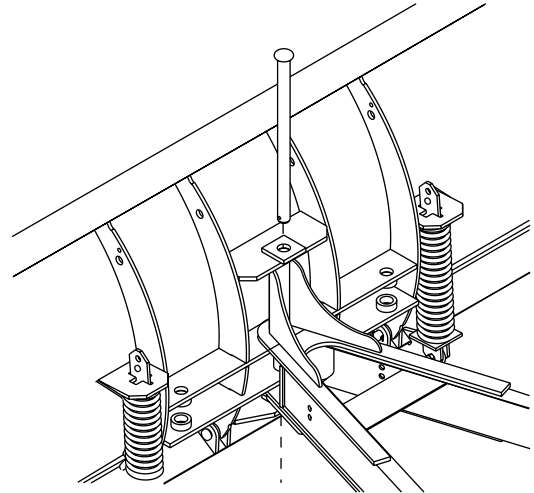
**M-blade A-Frame:** Attach the spring and eyebolt to the formed steel pocket in the front of the A-frame using two 1/4" flat washers and locknuts.

**L-Blade A-Frame:** The eyebolt should be attached so that only a few threads protrude past the nut on the underside of the A-frame. This is necessary to prevent the eyebolt from hitting the channel in the center of the angle frame.

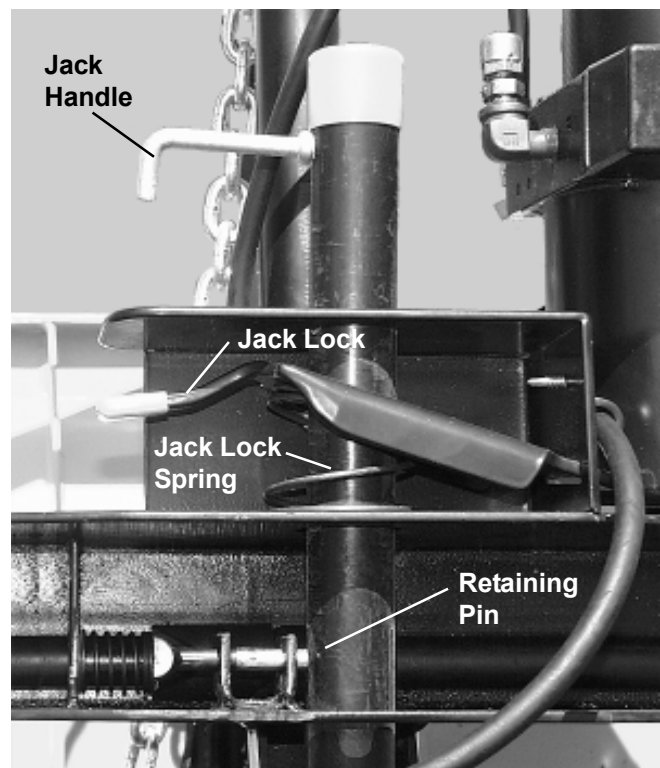
If no hole exists in the formed pocket of the L-blade A-frame, mark the location for a 9/32" hole in-line with the fasteners for the lift chain. This location is important to prevent damage to the lift arm retraction spring when the blade is raised.



2. Attach the A-Frame to the blade. Insert the 1" x 16" pivot pin down through the blade and A-frame and secure with a 1/4" x 2" slotted spring pin.

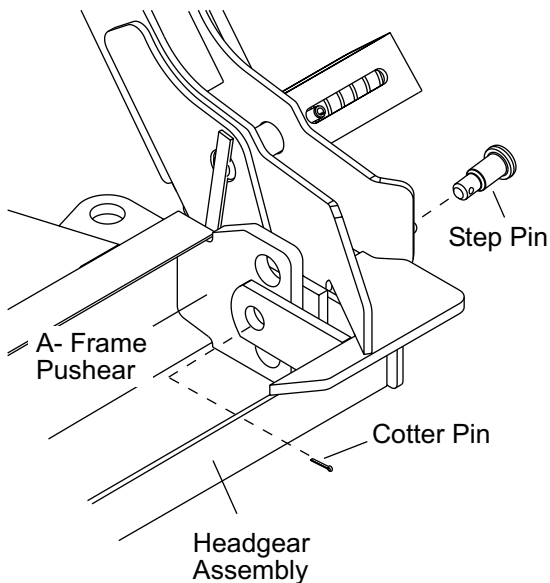


3. Install the blade guides on each end of the top of blade.
4. Place the jack lock and jack lock spring into the boxed-in area behind the lift cylinder ears. The

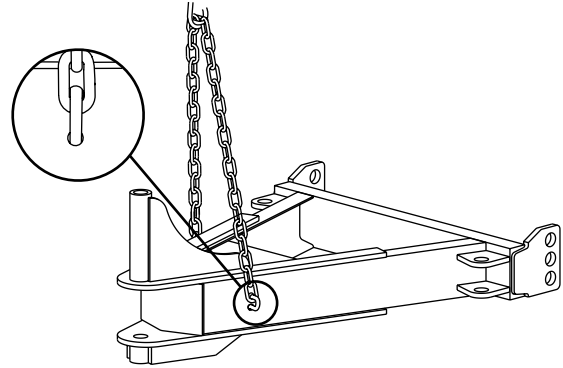


spring should be centered between the round bushing on the jack lock and MM2 unit. Lower the release handle to withdraw the jack leg retaining pin out of the way and insert the jack leg up through the holes in the unit, spring and jack lock. To align the hole in the jack lock, the spring will need to be compressed by pushing down on the handle portion of the jack lock. Attach the jack handle to the jack leg with a 3/8" nut.

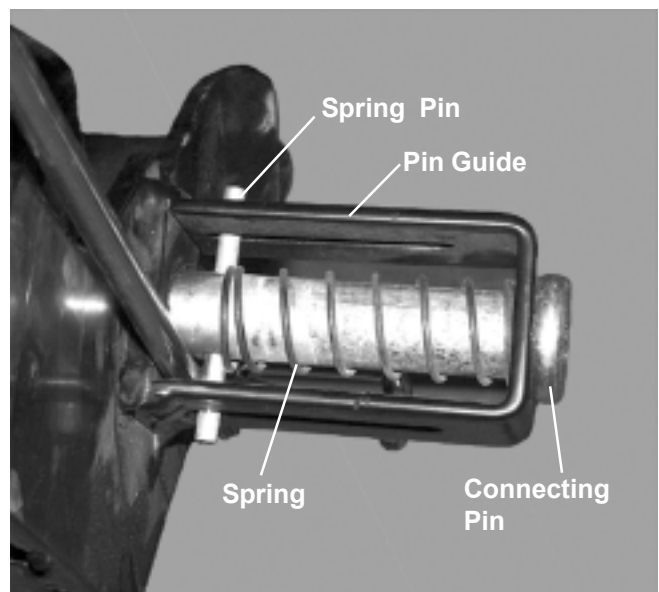
5. Align holes in headgear assembly with the middle hole in the A-frame pushears. Attach the A-frame to the headgear assembly with two step pins and 1/4" x 1-1/2" cotter pins. Insert the step pins from the outside of headgear. Verification of proper A-frame position will be made during "Final Adjustments" at the end of these instructions.



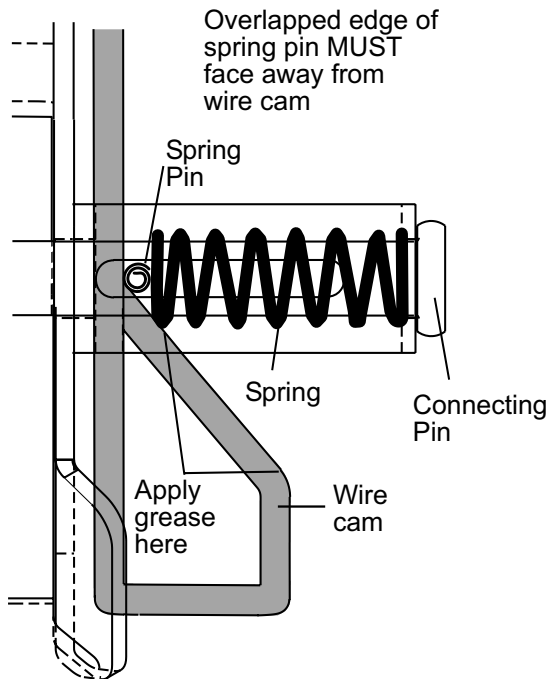
6. Install a 3/8" U-bolt through a link in one end of the lift chain. Attach U-bolt and chain to the front two holes on the driver-side of the A-frame with two 3/8" lock washers and nuts. Tighten. The other end of the lift chain will be attached to the passenger side of the A-frame after hydraulic unit is installed.



7. Attach the connecting pins to the headgear by inserting the springs into the pin guides. Insert the connecting pin through all three holes. Pull the spring back to clear the hole in the connecting pin. Insert a 3/8" x 3" spring pin through slot in pin guide and into the hole in the connecting pin. Align the overlapped edge of the spring pin away from the pin extractor. This position is important for smooth operation of the wire cam pin extractors and to reduce wear. Tap spring pin down through



the connecting pin until an equal amount protrudes on either side of the pin guide.

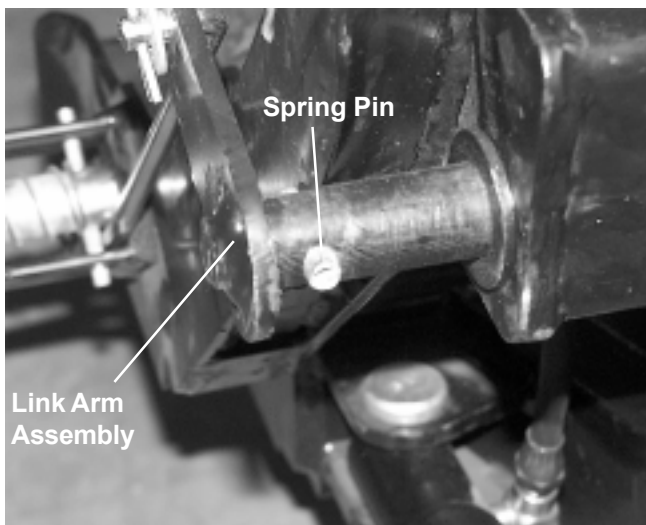
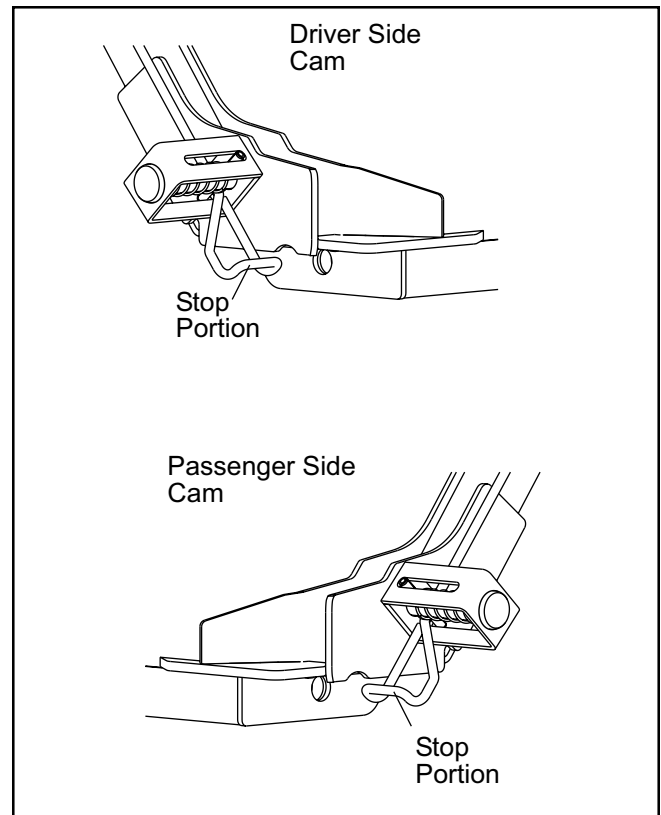


- Apply hard grease to the ramp portions of the wire cams. Greasing those surfaces is required for trouble-free extraction of the connecting pins.

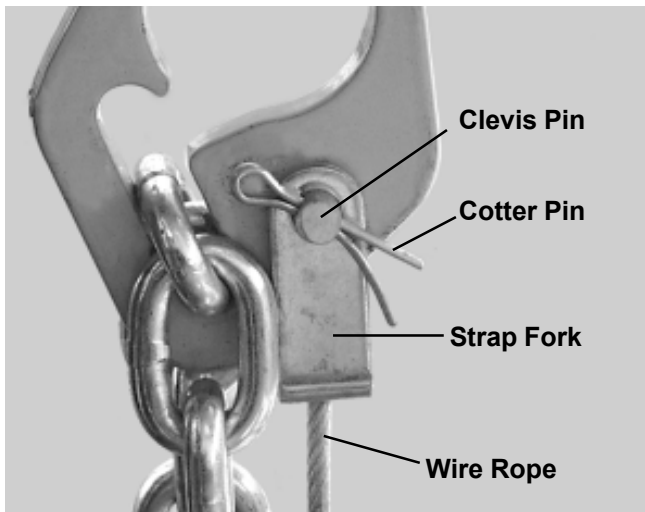
The driver side and passenger side wire cams are shaped differently. The "stop" portion of the wire cam is designed to contact the connecting pin when the release lever is rotated forward fully. To maintain proper clearances to vehicle components and to insure reliable function, make sure that the wire cams are installed as shown.

Insert the driver-side wire cam between the connecting pin and connecting pin guide. Pull the connecting pin out and position the wide portion of the wire cam to fit under the 3/8" spring pin. While connecting pin is being held out, insert other end of cam to link arm assembly. Attach wire cam to link arm with a 3/8" flat washer and 1/8" x 1" cotter pin. The release handle may have to be rotated to allow the holes in the link arms to align with the "pin" portion of the wire cam. Repeat for passenger-side wire cam.

- Attach the link arm assembly to the passenger's side of the heagear unit by inserting the pin portion into the end of the tubing attached to the release handle. Rotate the link arm until the holes in the tubing and link arm are aligned and the position of the link arm corresponds with its counterpart on the driver's side. Support the tubing to avoid damaging the plastic bushing and attach the link arm by tapping a 3/8" x 1-1/4" spring pin through the holes in the tubing and pin.

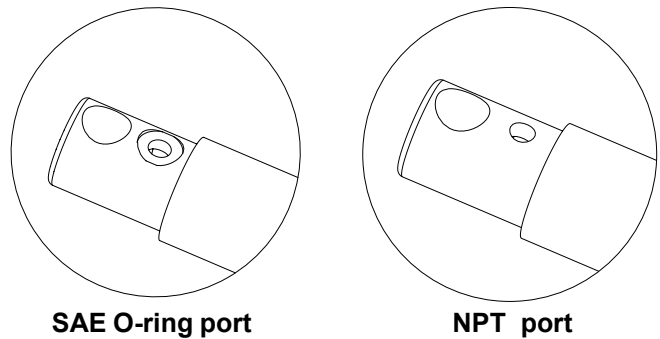


10. Attach retaining clip for the release handle to the headgear by inserting a #8 machine screw in through the clip and slot on the headgear. Fasten with a #8 locknut. Use the slot to center the clip onto the release handle.
11. Place the appropriate yellow vinyl covers on the end of the release handle, jack leg and jack lock.
12. Insert the wire rope down through the hole in the strap fork. Attach the strap fork to the hole in the chain link on the lift arm with a 3/8" x 1" clevis pin and 1/8" x 1" cotter pin. Pass the opposite end the wire rope around solid loop in the spring previously installed in the front of the a-frame. Pull the cable up against the spring until the slack is removed. Attach the end of the wire back onto itself with two cable clamps. Due to varying vehicle heights, the length of the cable must be adjusted for the vehicle in the "Final Adjustments" section at the end of these instructions.



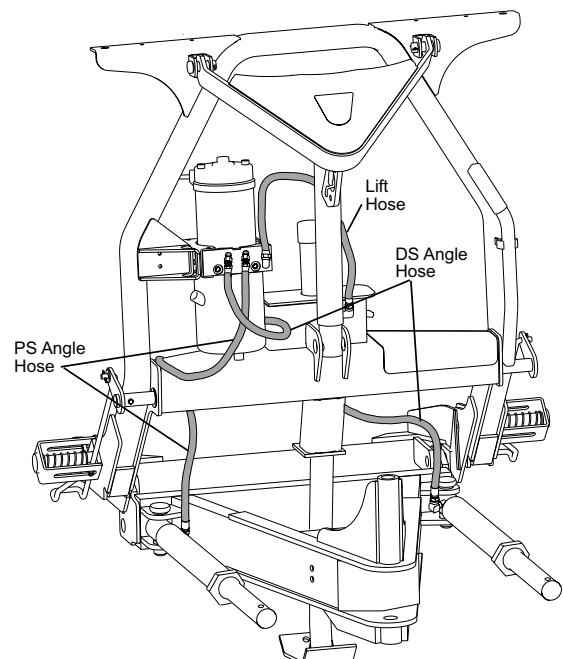
## HYDRAULIC UNIT INSTALLATION

**NOTE:** Before installing hydraulic fittings, identify whether the cylinder is equipped with NPTF or SAE O-ring ports. SAE O-rings ports can be easily identified by the flat machined area around the port.



### Angle Cylinders with NPTF Port

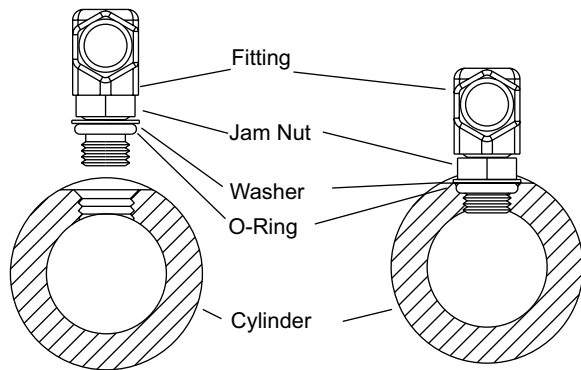
1. Remove the plugs from the angle cylinder ports. Install a 1/4" x 90° NPTF street elbow in each port so when the cylinders are mounted to the A-frame, the fittings face as shown.
2. Attach a 36" HP hose to the passenger-side cylinder and a 42" HP hose to the driver-side cylinder.





### Lift Cylinder with SAE O-Ring Port

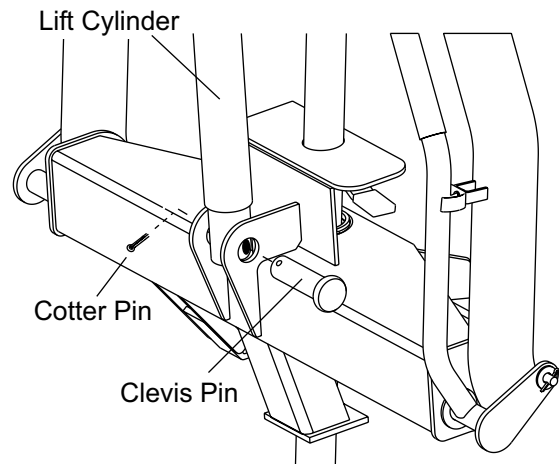
1. Remove the plug from the lift cylinder port.
2. Turn the jam nut on the fitting as far back as possible.



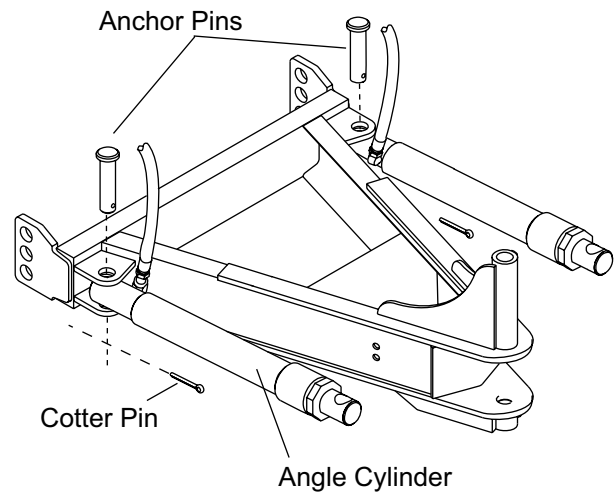
3. Lubricate the O-Ring with clean hydraulic oil.
4. Screw fitting into port by hand as far as it will go. The washer should contact port face and shoulder of the jam nut threads.
5. Unscrew fitting to proper position, no more than one full turn.
6. Use one wrench to hold the fitting body in position and tighten the jam nut with another wrench until the washer again contacts port face. Tighten 1/8 to 1/4 turn to lock fitting in place.
7. Attach the 22.0" HP hose to the cylinder elbow.

### Attaching Lift and Angle Cylinders

1. Attach the lift cylinder to the headgear and lift arm with two 1" x 3-5/16" clevis pins and 1/4" x 1-1/2" cotter pins.

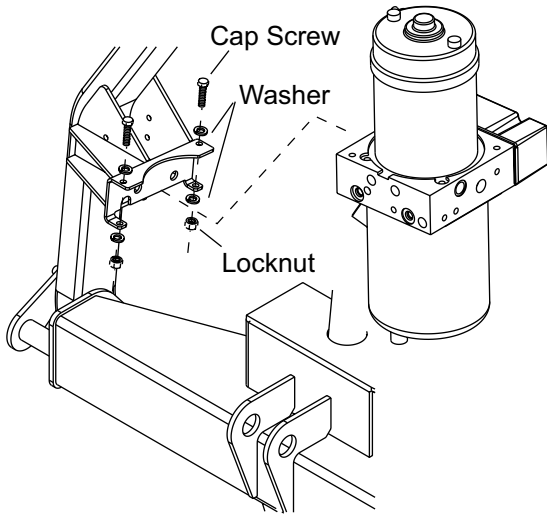


2. Attach the angle cylinders to the A-frame with the two anchor pins and cotter pins.

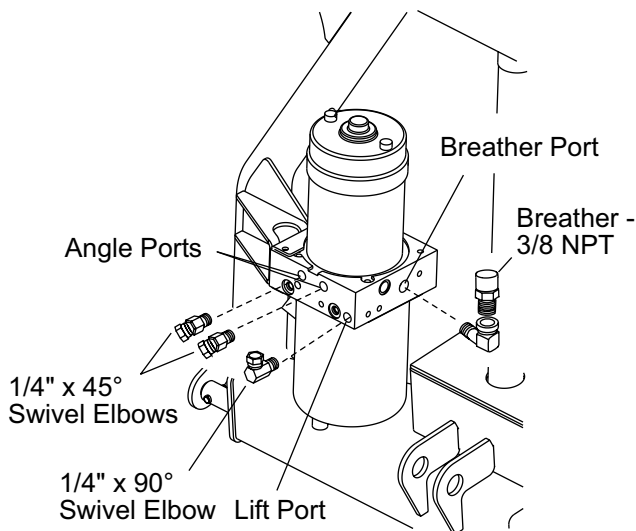


## Mounting Hydraulic Unit

1. Bolt the Insta-Act® hydraulic unit to the headgear using two 1/4" x 3" cap screws, flat washers and locknuts.

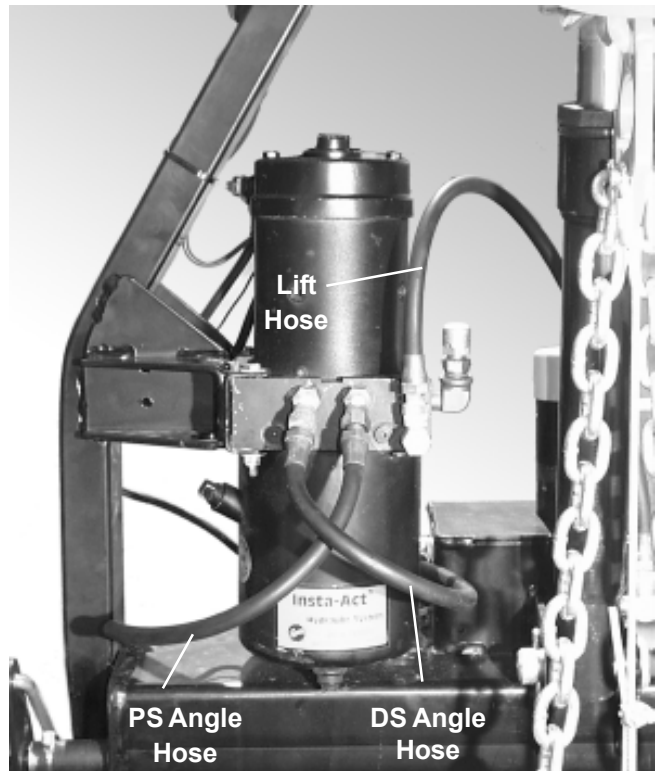


2. Remove the plugs from the angle ports, lift port and the 3/8" NPTF plug from the breather port. Screw the 45° elbows into the angle ports. Screw a 90° swivel elbow into the lift port and a 3/8" NPTF x 90° street elbow into the breather port .



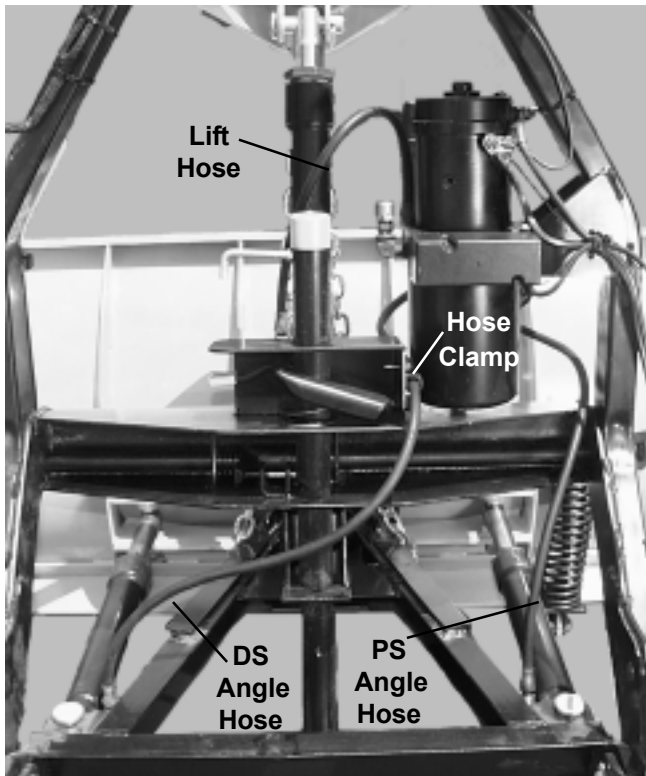
3. Looking at the front of the vehicle, orient the 45° swivel elbows in the angle ports as shown and the 90° swivel lift port should be at 12 o'clock. The 3/8" x 90° street elbow in the breather port should point straight up. Screw the breather into the street elbow.

Front View



- Route hydraulic hoses as shown. To provide uncluttered access to the jack handle, attach the driver's side angle cylinder hose to the headgear near the hydraulic unit using a clamp loop and tapping screw in the hole provided.

**Back View**



- Fill the hydraulic unit to top of fill hole with hydraulic fluid.

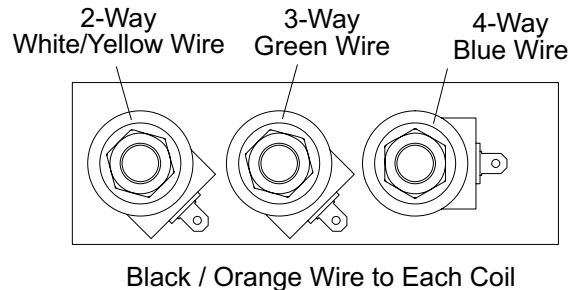
System Capacity:

Reservoir—1-3/4 quart

Complete System—2-3/8 to 2-3/4 quarts

**Snowplow Control Harness and Cable Installation**

- Connect the snowplow control harness to the valve block according to the instructions inside the solenoid cover.




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**NOTE: The strain relief must be inside the cover to prevent unnecessary strain on the solenoid connectors.**

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- Attach the snowplow cable assembly to the motor terminals. Connect the black and red striped wire to the positive terminal. Connect the black wire to the negative terminal. Connect the smaller black wire (from control harness) with the orange stripe to the negative terminal of the motor.
- Cable tie harnesses and cable assembly to the headgear as shown on the following page.

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**NOTE: Snowplow lighting and control harnesses plug into one another for storage.**

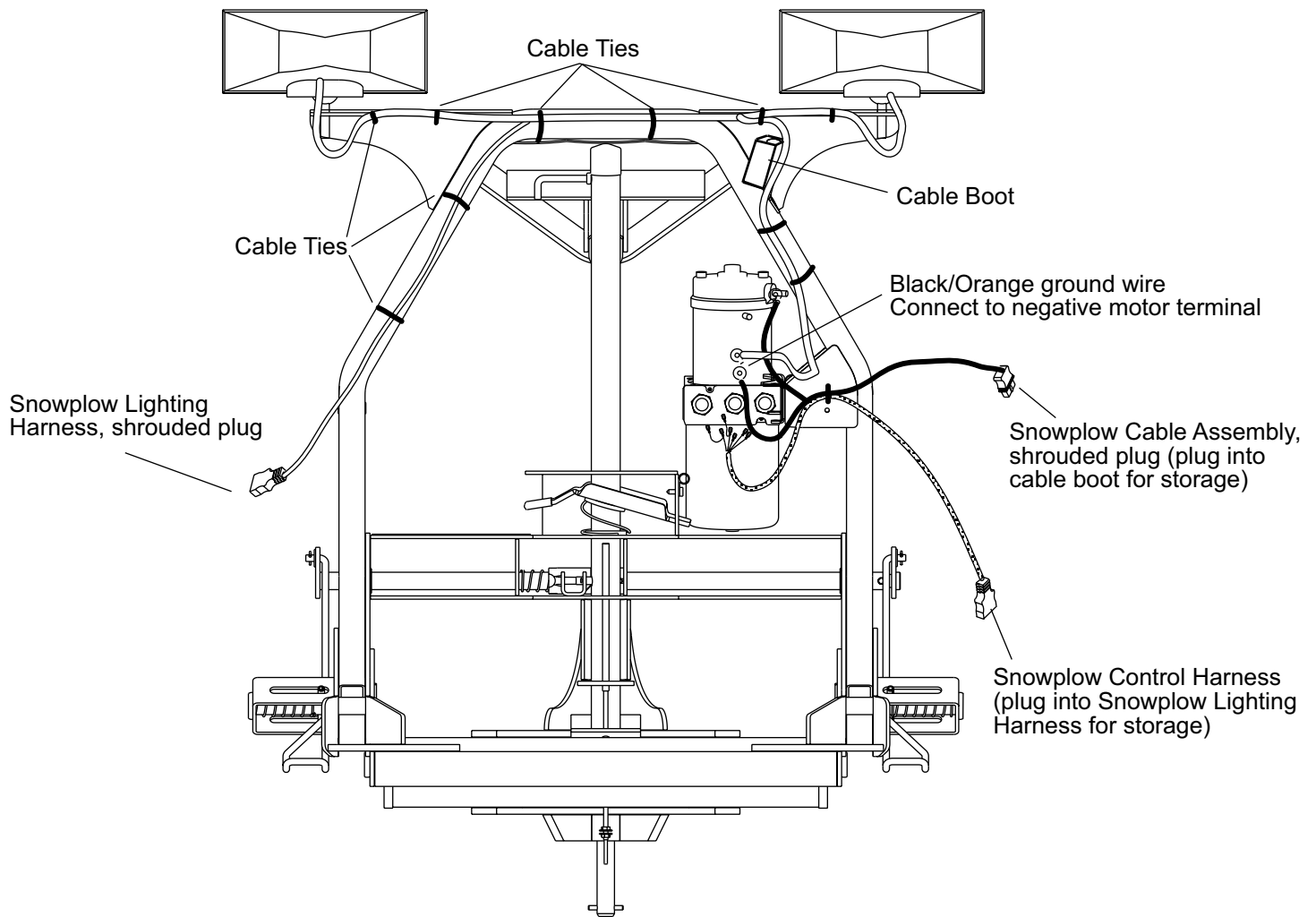
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## Headlight Installation

**⚠ WARNING**

**Your vehicle must be equipped with snowplow headlights and directional lights.**

1. Slide a headlamp swivel onto the threaded stem on the underside of the driver side headlamp assembly. The park/turn lamp should be to the outside of the headlamp.
2. Fit through the hole nearest the end in the top of the headgear on the driver side. Secure with a locknut and washer.
3. Repeat steps 1 and 2 on the passenger side.
4. Route the snowplow lighting harness as shown, connecting the ground wire to the negative motor terminal. Secure the snowplow lighting harness to the headgear using cable ties as needed.
5. Read, follow, and remove the headlamp label if one is present.



### Final Adjustments (on vehicle)

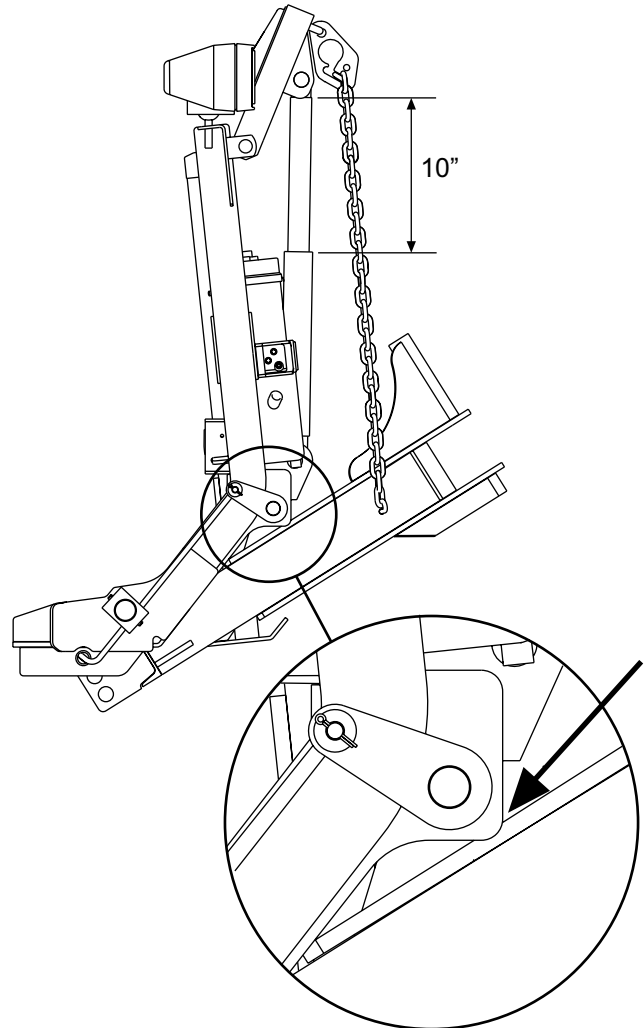
1. Complete installation of lift chain by inserting other end of lift chain through stop link on the lift arm. Fasten the end to the front pair of holes in the A-frame using a 3/8" U-bolt, lock washer and nut. Tighten.
2. Complete electrical installation in vehicle and install control. Attach plow to vehicle.
3. Fill the hydraulic unit to top of fill hole with hydraulic fluid.

**⚠ WARNING**

**Keep 8' clear of the blade when it is being raised, lowered or angled. Do not stand between the vehicle and blade or directly in front of the blade. If the blade hits or drops on you, you could be seriously injured.**

4. Raise and lower the snowplow several times. Be sure to completely retract the lift cylinder each time. Return to the lower position, retracting the lift cylinder completely.
5. With the blade lowered, add more hydraulic fluid to the reservoir. Keeping the blade to the ground, angle the blade several times in each direction.
6. With the lift cylinder fully retracted, add enough additional hydraulic fluid to bring fluid level to top of fill hole.
7. With plow attached to properly ballasted vehicle and blade lowered to ground, the A-frame should be parallel with the ground. If not, verify that clearance exists in raised position and re-position A-frame so the lower or upper pusher holes align with holes in headgear.

8. Adjust the length of the lift chain so the A-frame hits the lower portion of the headgear when the lift cylinder is fully raised (10"). Tighten U-bolts.



9. For reliable operation and prevent damage to the 6-1/2" lift arm retraction spring, the length of the cable must be adjusted when attached to the vehicle it will be used on. With the lift cylinder fully collapsed, loosen the cable clamps and shorten/lengthen the cable to remove all slack from the cable then tighten the cable clamps. After adjustment, excess cable should be trimmed off close to the second cable clamp. Cover cut end of cable with electrical tape.

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