



**Fisher Engineering**

P.O. Box 529 Rockland, Maine 04841 • www.fisherplows.com

**29999 MC**

August 1, 2006  
Lit. No. 26157, Rev. 09



## **HEADGEAR KIT**

### **MC Series**

### **Installation Instructions**

**⚠ CAUTION**

Read this document before installing the snowplow.

**⚠ CAUTION**

See your FISHER® outlet for specific vehicle application recommendations before installation. The Kit Selection Guide has specific vehicle and snowplow requirements.

**SAFETY DEFINITIONS**

**⚠ WARNING**

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

**⚠ CAUTION**

Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

**NOTE:** Indicates a situation or action that can lead to damage to your snowplow and vehicle or other property. Other useful information can also be described.

**WARNING/CAUTION AND 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.

**NOTE:** If labels are missing or cannot be read, see your sales outlet.

**Warning/Caution Label**

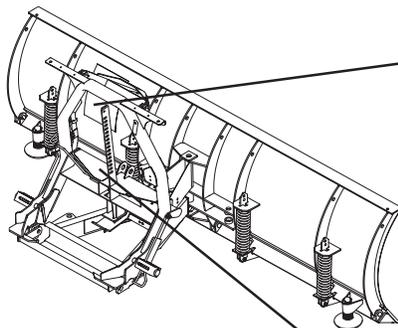
**⚠ WARNING**

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.  
 SEE YOUR SALES OUTLET FOR APPLICATION RECOMMENDATIONS.



**Instruction Label**

ATTACH  
DETACH

1. Push **Pin Release Handle** down to pull out **Connecting Pins**.
2. Drive vehicle slowly to engage **Pushplates** into **Attachment Arms**.
3. Stand in front of blade. Fully raise **Pin Release Handle** to release **Connecting Pins**.
4. Push **Headgear** toward vehicle to allow **Connecting Pins** to fully engage **Pushplates**. If unable to push **Headgear** from in front of blade, stand in front of **Headgear** on driver side and push **Headlamp Bracket**.
5. Pull out **Jack Lock**. Push **Pin Release Handle** into **Stop**.
6. While holding **Jack Lock** out, use **Jack Handle** to raise **Jack** fully. Release **Jack Lock**.
7. Attach all electrical connectors.

U.S. Patents 4,280,062; 4,999,935; 5,353,530; 5,420,480; RE 35,700; 6,253,470; CAN Patent 2,060,425; and other patents pending.

Read Owner's Manual For Complete Instructions

1. Place control in Lower/Float to put blade down.
2. Pull and hold **Jack Lock** out. **Jack** will drop to ground. Then pull **Pin Release Handle** away from **Stop** and **Jack Lock**. Release **Jack Lock**. Verify **Jack** is locked by trying to lift **Jack**.
3. Stand in front of blade. While pushing **Headgear** toward vehicle with left hand, push **Pin Release Handle** down to disengage **Connecting Pins**. Make sure **Connecting Pins** are fully retracted. If unable to push **Headgear** from in front of blade, stand in front of **Headgear** on driver side and push **Headlamp Bracket**.
4. Detach all electrical connectors.

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## 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**

**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.**

### **⚠ WARNING**

**Remove blade assembly before placing vehicle on hoist.**

### **⚠ 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

- Remove ignition key and put the vehicle in park or in gear to prevent others from starting the vehicle during installation or service.
- 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.

## HYDRAULIC SAFETY

### **⚠ WARNING**

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

- 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.

**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 lethal fumes. Breathing these fumes, even in low concentrations, can cause death. Never operate a vehicle in an enclosed area without venting exhaust to the outside.

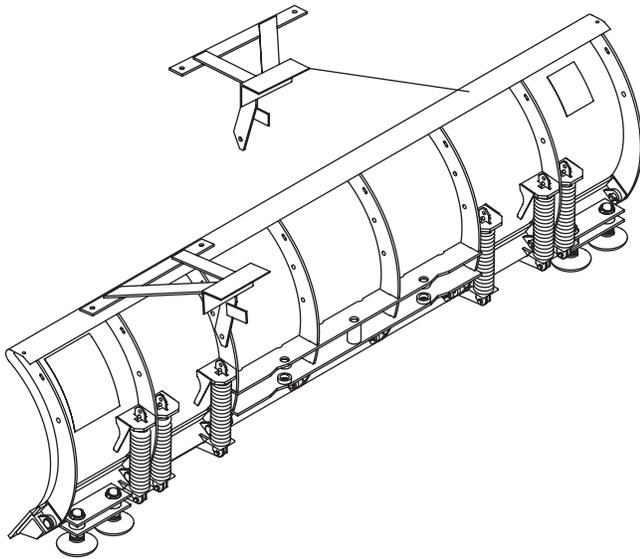
**TORQUE CHART**

**⚠ CAUTION**  
 Read instructions before assembling. Fasteners should be finger tight until instructed to tighten according to the torque chart. Use standard methods and practices when attaching snowplow including proper personal protective safety equipment.

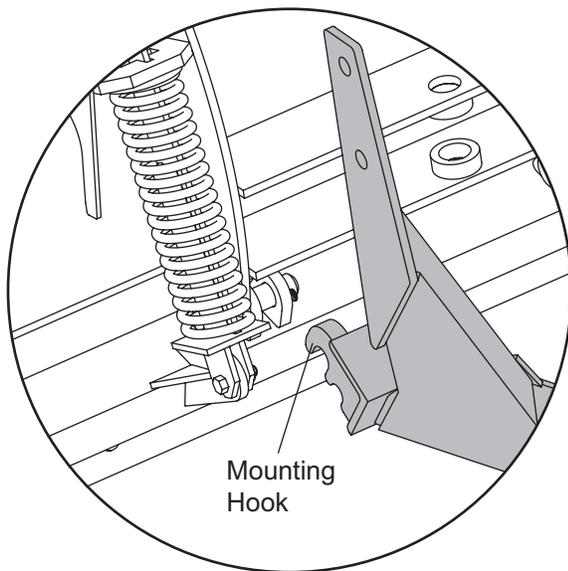
<b>Recommended Fastener Torque Chart (Ft.-Lb.)</b>			
Size	 SAE Grade 2	 SAE Grade 5	 SAE Grade 8
1/4-20	6	9	13
5/16-18	11	18	28
3/8-16	19	31	46
3/8-24	24	46	68
7/16-14	30	50	75
1/2-13	45	75	115
9/16-12	66	110	165
5/8-11	93	150	225
3/4-10	150	250	370
7/8-9	150	378	591
1-8	220	583	893
<b>Metric Grade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

**BLADE, ANGLE FRAME, A-FRAME AND HEADGEAR ASSEMBLY**

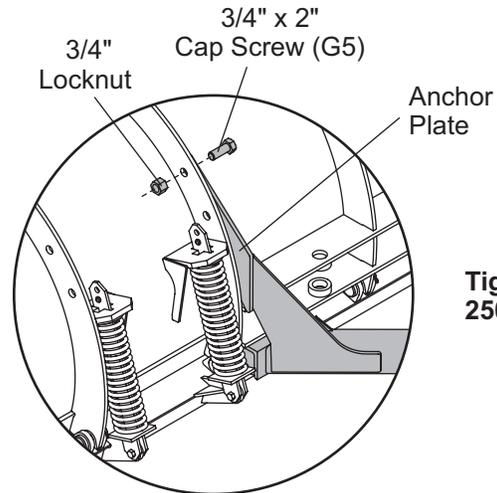
1. Lay the blade face down on cardboard to protect the finish. If present, remove black packing brackets attached to ribs.



2. Place the slots in the angle frame mounting hooks over the pins that attach the rib to the base angle.

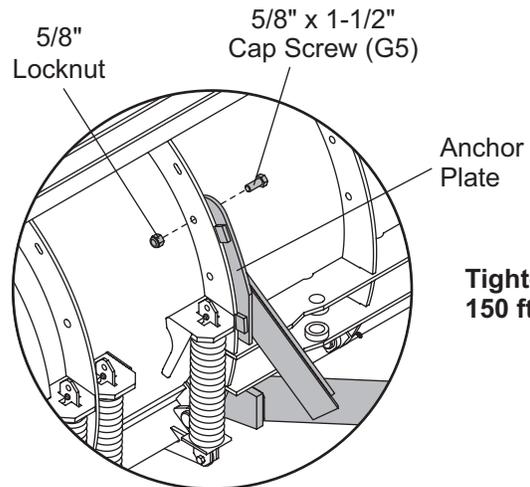


3. Rotate the angle frame up until the anchor plate holes line up with the holes in the ribs.



**Tighten to 250 ft-lb.**

**Blades made after December 2004**



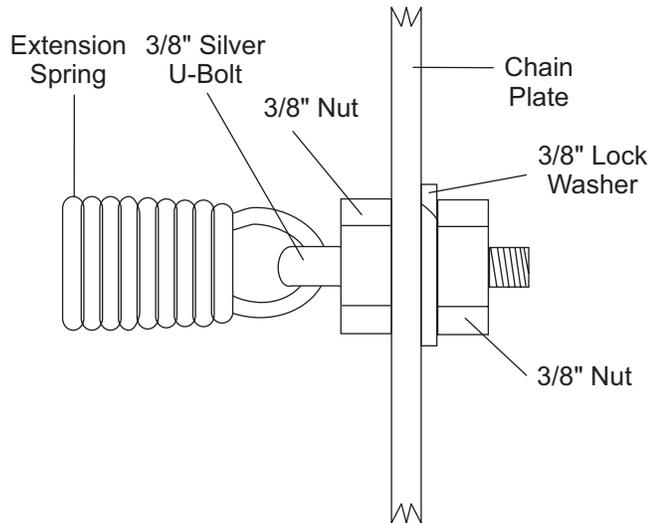
**Tighten to 150 ft-lb.**

**Blades made through December 2004**

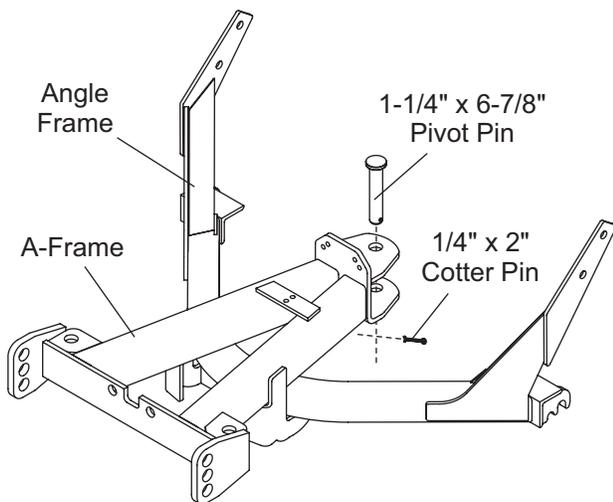
4. Attach the anchor plates to the ribs using the four pairs of fasteners and torque noted above.

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5. Place 3/8" silver U-bolt on to extension spring. Place 3/8" nut on each side of U-bolt and fully tighten. Put U-bolt through the holes in the back of the chain plate located on top of A-frame rails. Attach with two 3/8" lock washers and nuts and tighten.

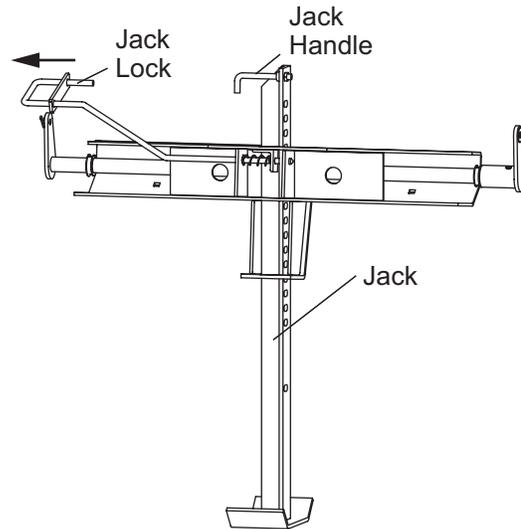


6. Attach the A-frame to the blade and angle frame according to the diagram below. **The A-frame cross member should be parallel to the blade.**

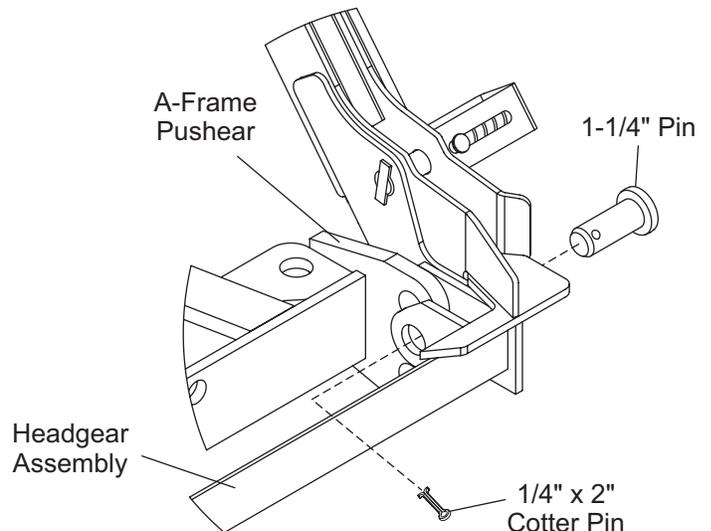


7. Return the blade to its upright position.

8. Install the jack to the headgear assembly by pulling the jack lock out and inserting the jack up through the slot in the headgear. Release the jack lock to hold the jack in place. Attach the jack handle to the jack with a 3/8" lock washer and nut.



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

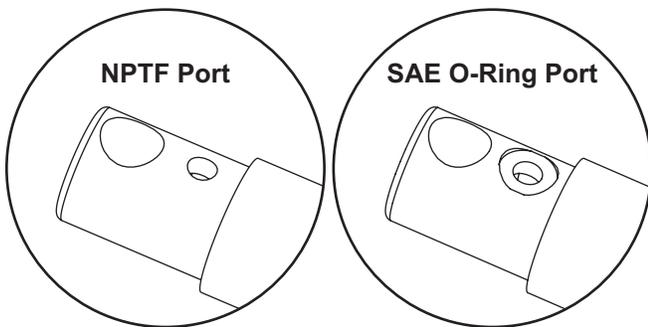


## HYDRAULIC UNIT INSTALLATION

### Attaching Hydraulic Fittings to Rams

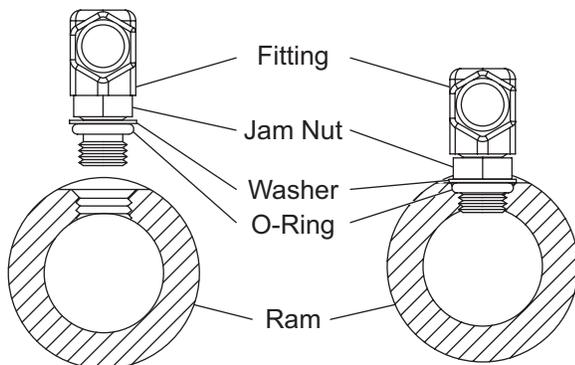
Do not use thread sealant/tape on hoses or fittings. This could damage product.

1. Remove the plugs from the angle and lift ram ports.
2. Before installing hydraulic fittings, identify whether the ram is equipped with NPTF or SAE O-ring ports. SAE O-ring ports can be easily identified by the flat machined area around the port. See illustrations below.



#### Lift Ram (SAE O-Ring Port)

3. Turn the jam nut on the fitting as far back as possible.



4. Lubricate the O-ring with clean hydraulic fluid.
5. 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.
6. Unscrew fitting to proper position, no more than one full turn.
7. 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.



Lift Ram

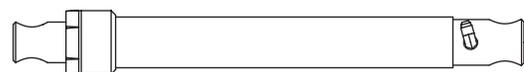
8. Attach the 22" HP hose to the lift ram elbow.

#### Angle Rams (NPTF Ports)

3. Install a 1/4" x 90° NPTF street elbow into each port so that, when the rams are mounted to the A-frame, the fittings face inward, point up, and are turned forward slightly.



Driver-Side Ram

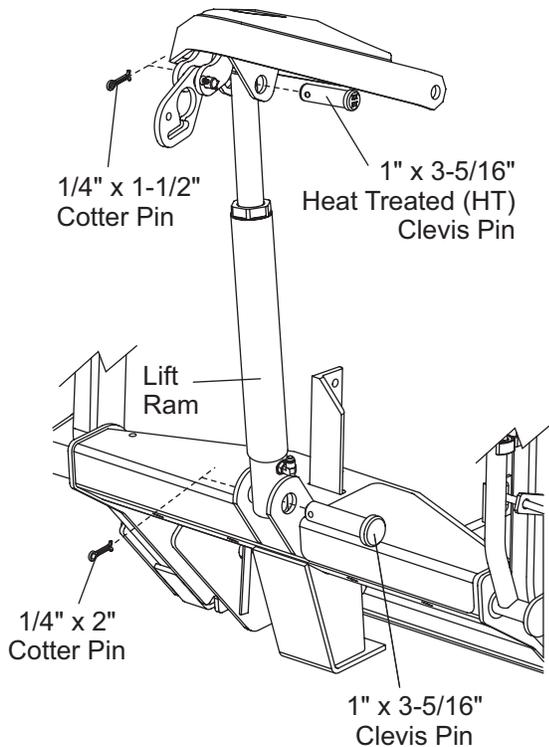


Passenger-Side Ram

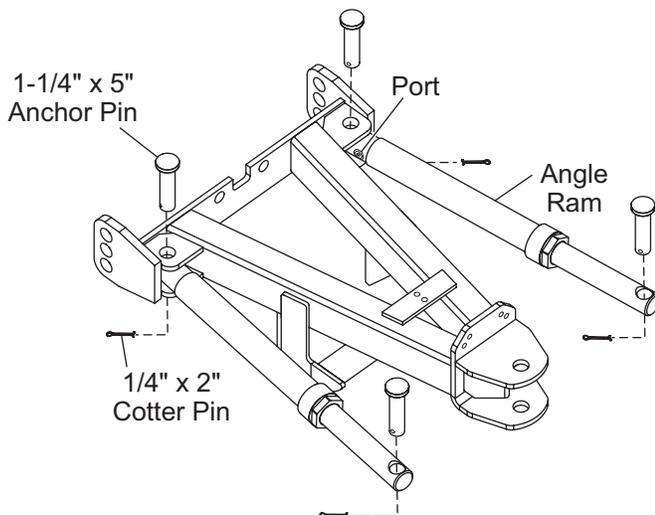
4. Attach a 36" HP hose to the passenger-side ram and a 42" HP hose to the driver-side ram.

## Attaching Lift and Angle Rams

1. Attach the lift ram to the headgear using one 1" x 3-5/16" clevis pin and 1/4" x 2" cotter pin. Attach lift ram to the lift arm using one 1" x 3-5/16" heat treated (head marked "HT") clevis pin and 1/4" x 1-1/2" cotter pin.

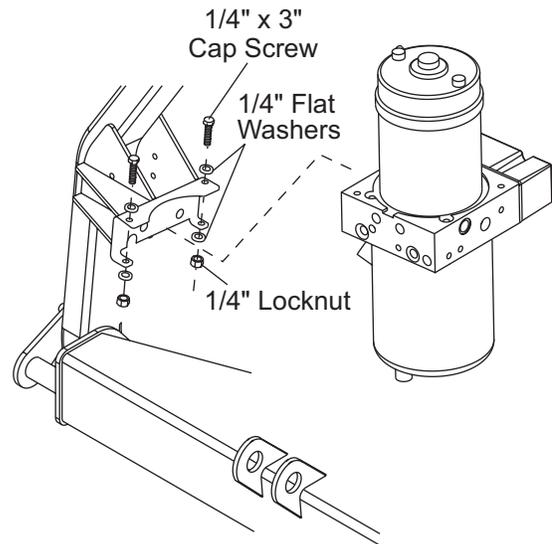


2. Attach the angle rams to the A-frame and blade with the four 1-1/4" x 5" anchor pins and 1/4" x 2" cotter pins. Note that the ram ports are on the inside, nearest the A-frame.

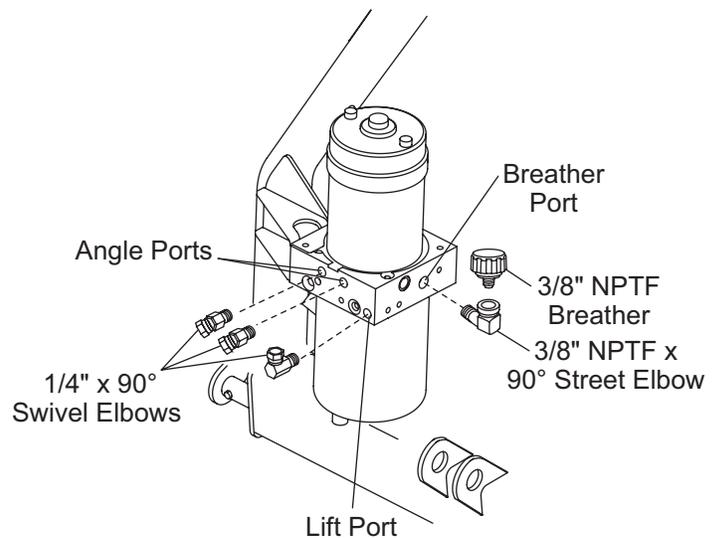


## Mounting Hydraulic Unit

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



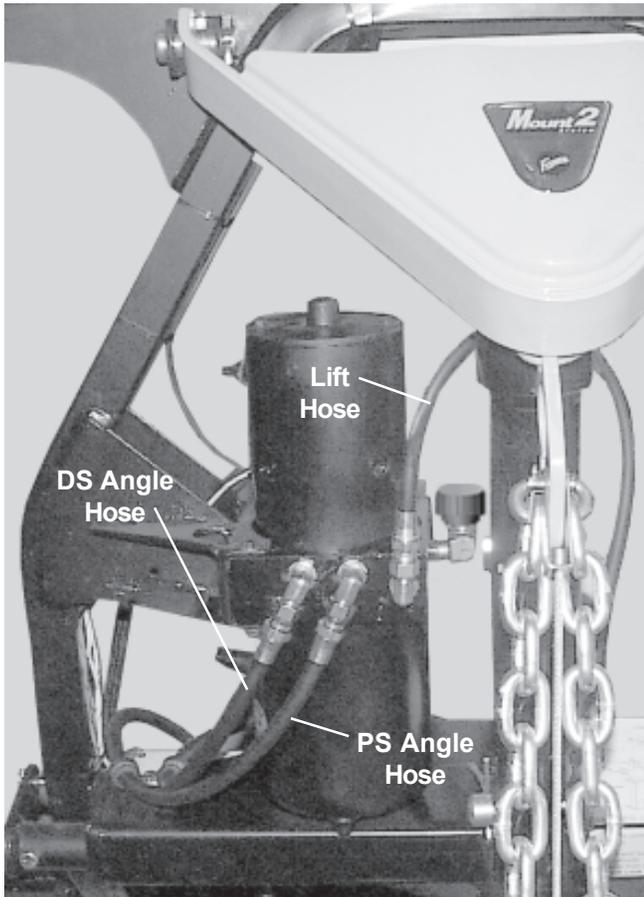
2. Remove the plugs from the angle ports, lift port and the 3/8" NPTF plug from the breather port. Screw the fittings into the angle and lift ports as shown. Assemble the 3/8" NPTF breather to the 90° street elbow and screw into the breather port.



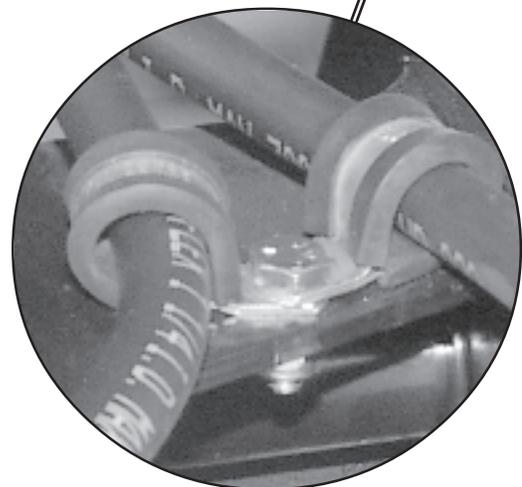
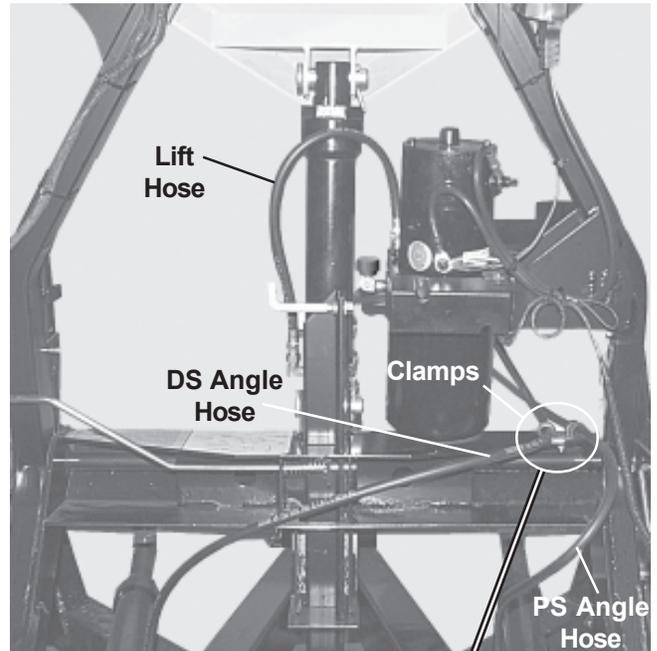
3. Orient fittings in the angle and lift ports as shown. The 3/8" x 90° street elbow in the breather port should point straight up.

4. Route hydraulic hoses as shown. Attach each angle ram hose to the headgear near the hydraulic unit with clamp loops. Attach each clamp loop to the headgear with a cap screw and locknut using the holes provided.

Front View



Back View

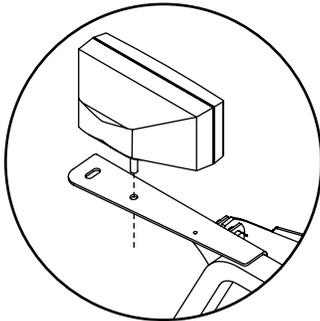


**HEADLAMP INSTALLATION**

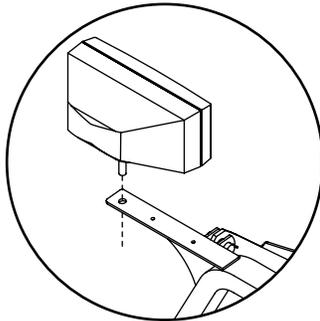
**⚠ WARNING**  
**Your vehicle must be equipped with snowplow headlamps and directional lights.**

If installation instructions were included with the headlamps, follow them now.

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. Mount the headlamp to the headgear light bracket as shown. Secure with a lock washer and nut.

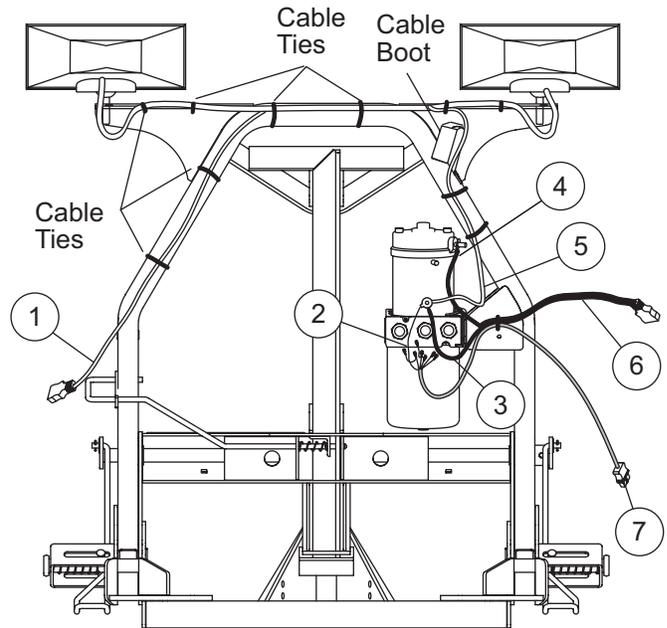


New Style



Old Style

3. Repeat steps 1 and 2 on the passenger side.
4. Route the snowplow lighting harness as shown, connecting the black/orange ground wire to the NEGATIVE (-) motor terminal.
5. Read, follow, and remove the headlamp label if one is present.

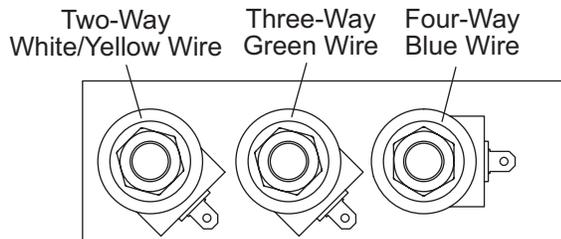


Cable Routing	
1	Snowplow Lighting Harness
2	Black/Orange Wire
3	Black Wire
4	Black/Red Wire (connected to POSITIVE (+) motor terminal)
5	Black/Orange Ground Wire (connected to NEGATIVE (-) motor terminal)
6	Snowplow Battery Cable, shrouded plug (plug into cable boot for storage)
7	Snowplow Control Harness (plug into snowplow lighting harness for storage)

## SNOWPLOW CONTROL HARNESS AND CABLE INSTALLATION

**NOTE: Use dielectric grease to prevent corrosion on all electrical connections. Fill receptacles and lightly coat ring terminals and blades before assembly.**

1. Remove the valve cover, and connect the snowplow control harness to the valve coil terminals according to the instructions inside the valve cover.



Black/Orange Wire to Each Coil

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

2. Apply anti-seize lubricant to the fasteners and reinstall the valve cover.
3. Attach the snowplow battery cable 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.
4. Cable tie harnesses to the headgear as shown on the previous page.
5. Attach the cable boot bracket to the tab on the headgear.

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

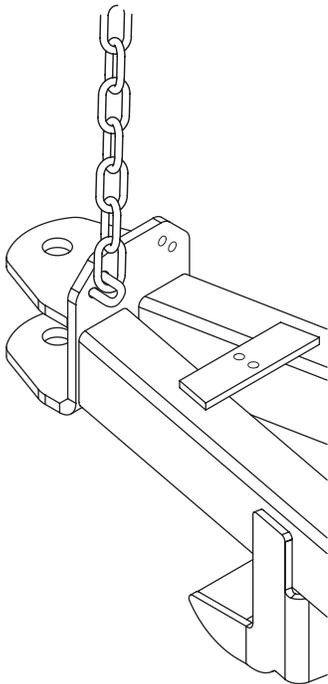
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## FINAL ASSEMBLY AND ADJUSTMENTS

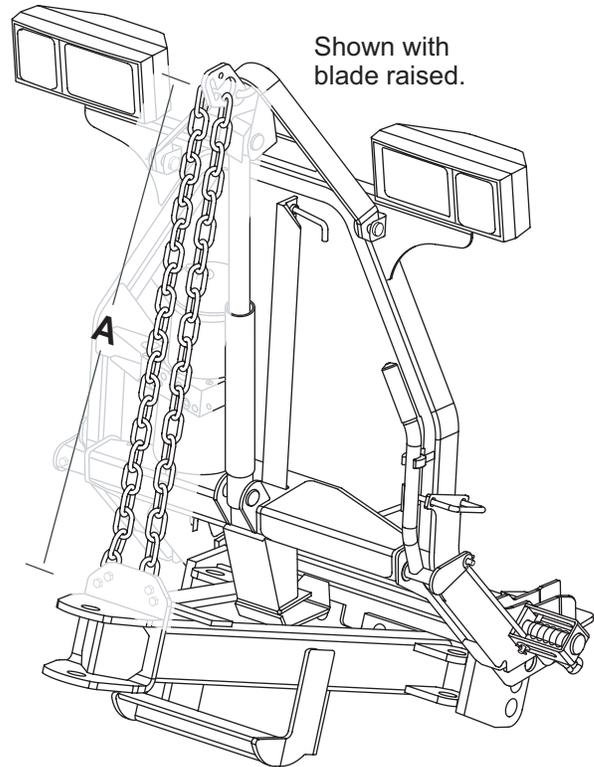
1. Complete electrical installation in vehicle and install control. Attach plow to vehicle.
2. With plow attached to properly ballasted vehicle, the A-frame should be parallel with the ground. If not, reposition A-frame using upper or lower pusher holes.

### Lift Chain Assembly

1. Install a 3/8" black U-bolt through a link in one end of the lift chain. Attach U-bolt and chain to the holes on the driver-side of the chain bracket on the A-frame with two 3/8" lock washers and nuts. Tighten. The other end of the lift chain will pass loosely through the stop link on the lift arm.



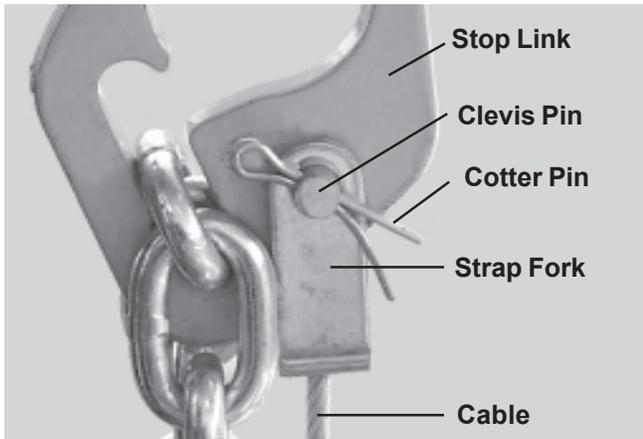
To prevent the snowplow from blocking the snowplow headlamps during travel, adjust lift chain using the following steps:



A-Frame Adjustment Holes	Minimum Dimension "A"
Top	30"
Middle	28-1/2"
Bottom	27"

2. With lift ram collapsed, adjust the chain to the minimum length indicated in the chart. (Chain will be slack.)
3. Attach the loose end of the lift chain to the passenger side of the A-frame using a 3/8" black U-bolt and two 3/8" lock washers and nuts. Chain should be the same length on both sides.
4. Fully tighten U-bolts before lifting blade.

## Lift Arm Retraction Cable Assembly



1. Insert the cable down through the hole in the strap fork. Attach the strap fork to the hole in the stop link on the lift arm with a 3/8" x 1" clevis pin and 1/8" x 1" cotter pin. Slip the cable thimble onto the top loop in the spring previously installed in the front of the A-frame.



**NOTE: The slotted end of the thimble may need to be opened to slip it onto the loop. Fully close the slot after attaching the thimble to the spring.**

2. For reliable operation and to 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 ram fully collapsed, loop the end of the cable around the thimble. Pull the cable up against the thimble until the slack is removed. Be sure to wrap the cable tightly around the thimble, and attach the end of the cable back onto itself with two cable clamps installed close to the thimble.

3. After adjustment, excess cable should be trimmed off close to the second cable clamp. Cover cut end of cable with electrical tape. Excessive spring tension will make attaching/detaching difficult and overextend the spring.

## Filling Hydraulic Unit

### ⚠ CAUTION

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

1. 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

### ⚠ 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.**

2. Raise and lower the snowplow several times. Be sure to completely retract the lift ram each time. Return to the lower position, retracting the lift ram completely.
3. 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.
4. With the lift ram fully retracted, add enough additional hydraulic fluid to bring fluid level to top of fill hole.

## Install Blade Guides

1. Install a blade guide on each end of the top of the blade. For each guide, put one washer and one nut on either side of the moldboard.

## VEHICLE LIGHTING CHECK

1. Check the operation of vehicle and plow lights with plow mounted to vehicle and all harnesses connected.

### Turn signals and parking lamps

Parking lamps ON:

- Both vehicle and plow parking lamps should be on at the same time.

Driver-side turn signal ON:

- Both vehicle and plow driver-side turn signal lamps should flash at the same time.

Passenger-side turn signal ON:

- Both vehicle and plow passenger-side turn signal lamps should flash at the same time.

### Headlamps

Move vehicle headlamp switch to the ON position. Connecting and disconnecting the headlamp harness plug from the vehicle harness connector should switch between vehicle and plow headlamps as follows:

Headlamp harness plug DISCONNECTED:

- Vehicle headlamps should be on.
- Plow headlamps should be off.

Headlamp harness plug CONNECTED:

- Plow headlamps should be on.
- Vehicle headlamps should be off.

Dimmer switch should dim whichever headlamps are operating. The high beam indicator on the dash should light when either set of headlamps is on high beam.

## Daytime Running Lamps (DRLs)

With headlamp switch off, activate the DRLs.

Headlamp harness plug DISCONNECTED:

- Vehicle DRLs should be on.
- Plow headlamps should be off.

Headlamp harness plug CONNECTED AND vehicle uses the headlamp bulbs for DRLs:

- Plow headlamps should be on in DRL mode (with reduced intensity compared to high or low beam).
- Vehicle DRLs should be OFF.

Headlamp harness plug CONNECTED AND vehicle uses lamps **other than** the headlamp bulbs for DRLs:

- Plow headlamps should be on in DRL mode (with reduced intensity compared to high or low beam).
- Vehicle DRLs should be on.
- Vehicle headlamps should be off.

## Joystick Control or Hand-Held Control

The control indicator light should light whenever the control ON/OFF switch and the ignition (key) switches are both in the ON position. The plow plugs do not need to be connected to the vehicle harness connectors.

2. Connect all plow and vehicle harnesses. Raise the plow and aim plow headlamps according to the Snowplow Headlamp Beam Aiming instructions included with the headlamps and any state or local regulations.
3. Check aim of vehicle headlamps with plow removed.
4. When the plow is removed from the vehicle, install the plug cover on the vehicle battery cable connector and insert the plow battery cable connector into the cable boot on the plow. On both the vehicle and plow, the lighting harness and control harness connectors plug into one another for storage.

## **OWNER'S MANUAL PACKET**

If the completed plow will be delivered immediately, the Owner's Manual should be reviewed with and given to the purchaser.

If the plow is completed prior to delivery to the purchaser, attach the Owner's Manual Packet to the electrical cable of the cab control for safekeeping.

Fisher Engineering reserves the right under its product improvement policy to change construction or design details and furnish equipment when so altered without reference to illustrations or specifications used. Fisher Engineering or the vehicle manufacturer may require or recommend optional equipment for snow removal. Do not exceed vehicle ratings with a snowplow. Fisher Engineering offers a limited warranty for all snowplows and accessories. See separately printed page for this important information. The following are registered (®) trademarks of Douglas Dynamics, L.L.C.: FISHER®, Insta-Act®, Minute Mount® 2.

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