



**Fisher Engineering**

**77500, 77000**

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Lit. No. 85888, Rev. 00



# **XRS™ Snowplow**

## **Installation Instructions**

**▲ CAUTION**

Read this document before installing the snowplow.

**▲ CAUTION**

See your FISHER® outlet/website for specific vehicle application recommendations before installation. The eMatch selection system 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**

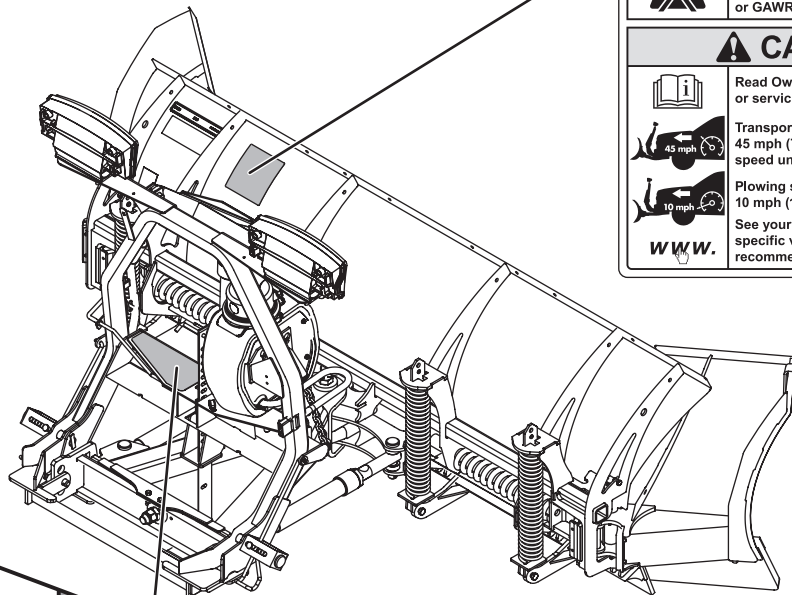
Become familiar with and inform users about the warning labels on the back of the blade and the instruction label on the headgear.

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

**NOTE:** Translated safety labels are available. Please contact your sales outlet.

Warning/ Caution Label

<b>⚠ WARNING</b>	
	Blade could drop unexpectedly, crushing or trapping limbs. Lower blade when vehicle is parked.
	Overloading could negatively affect vehicle handling. To avoid serious injury or death, do not exceed GVWR or GAWR including blade and ballast.
<b>⚠ CAUTION</b>	
	Read Owner's Manual before operating or servicing snowplow.
	Transport speed should not exceed 45 mph (72 km/h). Further reduce speed under adverse travel conditions.
	Plowing speed should not exceed 10 mph (16 km/h).
See your sales outlet/website for specific vehicle application recommendations.	
www.	



Instruction Label

US patents 7,681,334; 7,797,859; 9,200,418; 9,822,563; 10,793,056; CAN patents 2,843,990; and other patents pending.

**ATTACH**

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 that 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.

**DETACH**

Read Owner's Manual for complete instructions.

Multiple Pinch Points Label (both ends of blade)

**⚠ WARNING**

**Multiple Pinch Points**

## 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 the blade when the 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 vehicle and 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 blade and ballast. The rating label is found on driver-side (i.e. left) vehicle door cornerpost.**

### **⚠ WARNING**

**To prevent accidental movement of the blade, always turn the control OFF whenever the snowplow is not in use. The power indicator light will turn OFF.**

### **⚠ WARNING**

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

### **⚠ CAUTION**

**Refer to the current eMatch selection system for minimum vehicle recommendations and ballast requirements.**

## 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.

## FUSES

The FISHER® electrical and hydraulic systems contain several automotive-style fuses. If a problem should occur and fuse replacement is necessary, the replacement fuse must be of the same type and amperage rating as the original. Installing a fuse with a higher rating can damage the system and could start a fire. Fuse Replacement, including fuse ratings and locations, is located in the Maintenance section of the Owner's Manual.

## PERSONAL SAFETY

- Remove the 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.

**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.

**CELL PHONES**

A driver's first responsibility is the safe operation of the vehicle. The most important thing you can do to prevent a crash is to avoid distractions and pay attention to the road. Wait until it is safe to operate mobile communication equipment such as cell phones, text messaging devices, pagers, or two-way radios.

**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.**

**BATTERY SAFETY**

**⚠ CAUTION**

**Batteries normally produce explosive gases, which can cause personal injury. Therefore, do not allow flames, sparks, or lit tobacco to come near the battery. When charging or working near a battery, always cover your face and protect your eyes, and also provide ventilation.**

- **Batteries contain sulfuric acid, which burns skin, eyes, and clothing.**
- **Disconnect the battery before removing or replacing any electrical components.**

**NOISE**

Airborne noise emission during use is below 70 dB(A) for the snowplow operator.









**VIBRATION**

Operating snowplow vibration does not exceed 2.5 m/s<sup>2</sup> to the hand-arm or 0.5 m/s<sup>2</sup> to the whole body.

**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.**

Recommended Fastener Torque Chart					
Inch Fasteners Grade 5 and Grade 8					
Size	Torque (ft-lb)		Size	Torque (ft-lb)	
	 Grade 5	 Grade 8		 Grade 5	 Grade 8
1/4-20	8.4	11.9	9/16-12	109	154
1/4-28	9.7	13.7	9/16-18	121	171
5/16-18	17.4	24.6	5/8-11	150	212
5/16-24	19.2	27.3	5/8-18	170	240
3/8-16	30.8	43.6	3/4-10	269	376
3/8-24	35.0	49.4	3/4-16	297	420
7/16-14	49.4	69.8	7/8-9	429	606
7/16-20	55.2	77.9	7/8-14	474	669
1/2-13	75.3	106.4	1-8	644	909
1/2-20	85.0	120.0	1-12	704	995
Metric Fasteners Class 8.8 and 10.9					
Size	Torque (ft-lb)		Size	Torque (ft-lb)	
	 Class 8.8	 Class 10.9		 Class 8.8	 Class 10.9
M6 x 1.00	7.7	11.1	M20 x 2.50	325	450
M8 x 1.25	19.5	26.9	M22 x 2.50	428	613
M10 x 1.50	38.5	53.3	M24 x 3.00	562	778
M12 x 1.75	67	93	M27 x 3.00	796	1139
M14 x 2.00	107	148	M30 x 3.50	1117	1545
M16 x 2.00	167	231	M33 x 3.50	1468	2101
M18 x 2.50	222	318	M36 x 4.00	1952	2701
These torque values apply to fasteners except those noted in the instructions.					

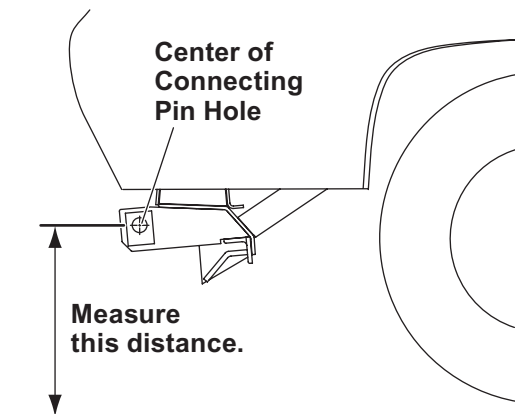
## HEADGEAR TO A-FRAME ASSEMBLY

**NOTE:** The parts box contains a bag with two 3/4" x 9" clevis pins and two 1/8" hairpin cotters. Set this bag aside unopened for delivery to the snowplow owner.

**NOTE:** For easier assembly and installation, vehicle and all snowplow components should be on a smooth, level, hard surface, such as concrete.

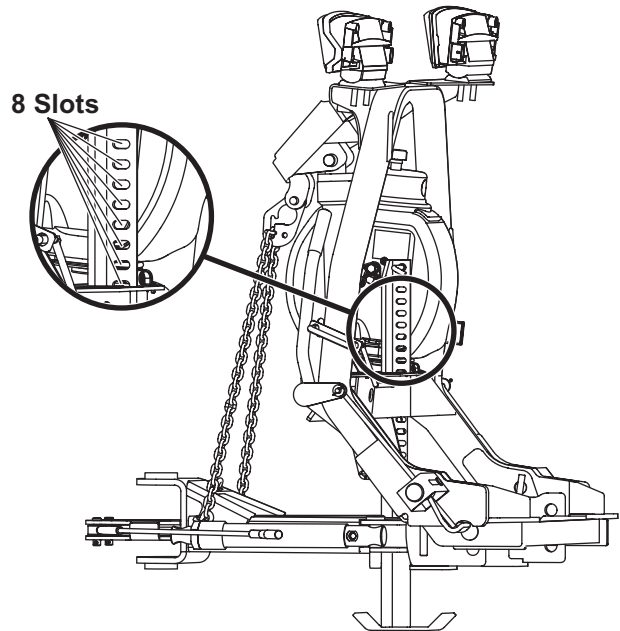
1. With the vehicle parked on a solid level surface, measure the distance from the center of the connecting pin hole to the ground. Using this measurement, refer to the hole selection table below to determine which rear hole should be used to attach the headgear to the A-frame.

Pushplate Height (hole center to ground)	Rear Hole
17" to 19"	Top
15" to 17" (typical)	Middle
13" to 15"	Bottom

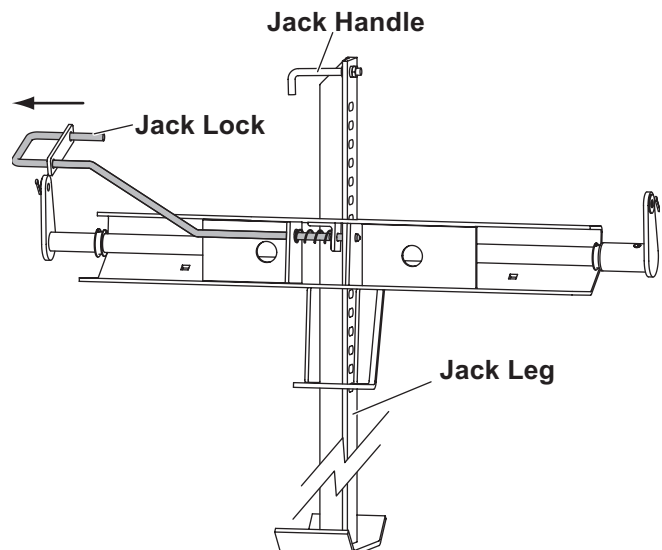


2. If the vehicle is unavailable, use the middle holes and reposition the headgear later.
3. The vehicle electrical harnesses and Owner's Manual packet are in the bag with the headlamps box.
4. Remove the hardware and board(s) securing the A-frame to the pallet.
5. Remove the hardware and bracket securing the headgear to the A-frame.

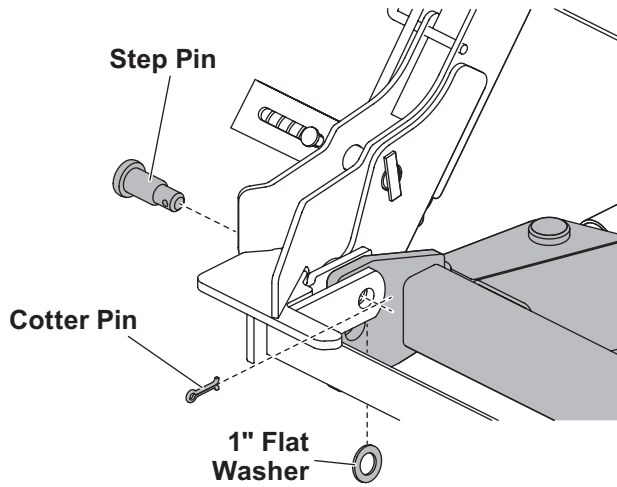
6. Adjust the lift chain so that there are an equal number of links on each side of the lift arm. Then, while supporting the headgear, remove and retain the two pins and discard the shipping brackets.
7. Lower the jack leg in the headgear assembly so that eight complete slots are showing through the top of the headgear cross bar.



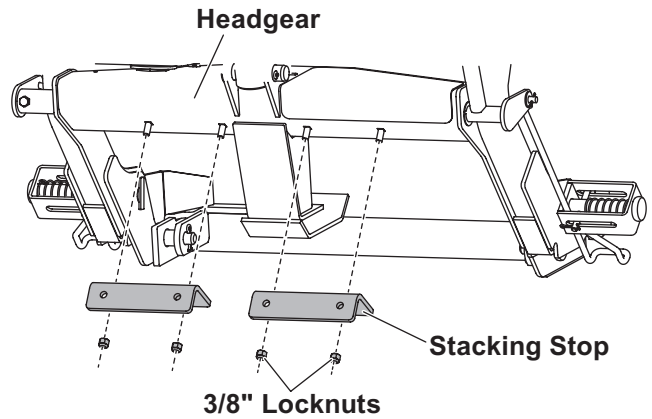
8. Release the jack lock to hold the jack in place. Place the headgear assembly on top of the A-frame assembly so that the headgear is tipped backward and the jack leg is between the A-frame and push assembly.



9. Position the headgear so that the holes in the headgear are aligned with the previously selected holes in the A-frame. 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 the headgear. Install a 1" flat washer between the headgear and the A-frame ear.



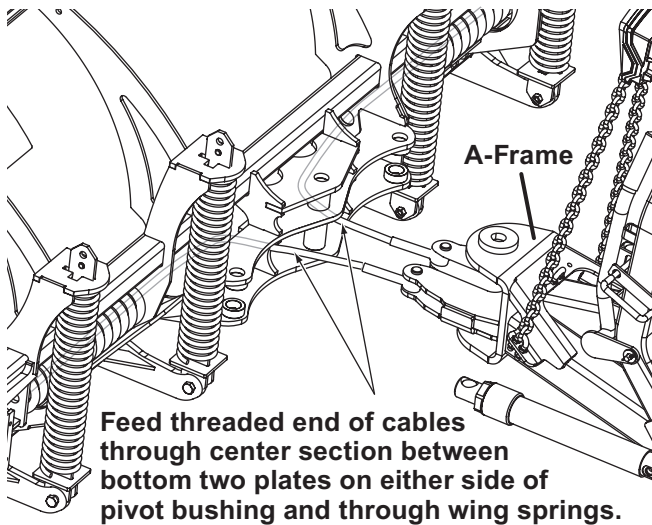
10. If the upper set of holes in the A-frame are used, install the stacking stops in the taller orientation to the headgear carriage bolts with 3/8" locknuts. If the middle or lower set of holes in the A-frame are used, install the stacking stops in the shorter orientation.



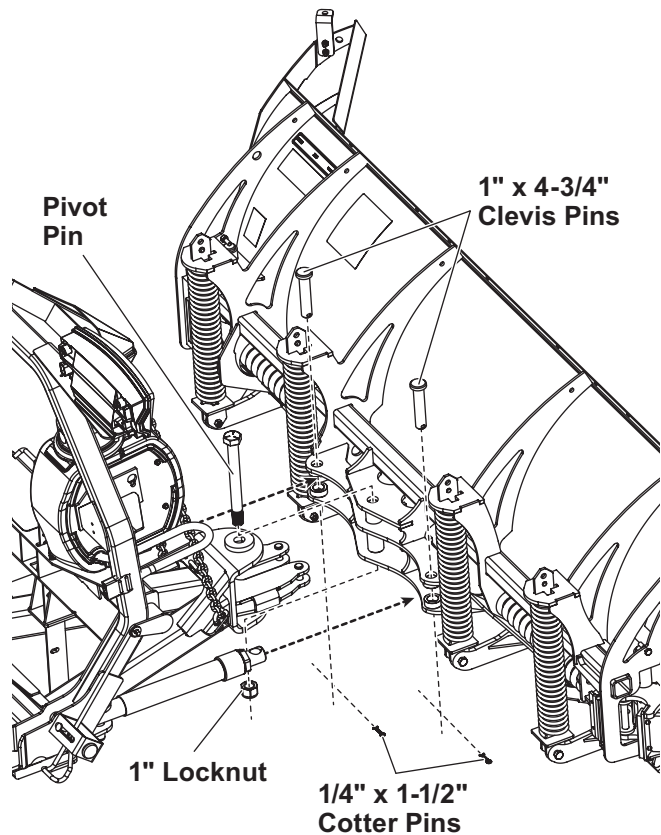
## A-FRAME TO XRS™ BLADE ASSEMBLY

**NOTE:** For easier assembly and installation, vehicle and all snowplow components should be on a smooth, level, hard surface, such as concrete.

1. Position the A-frame to the blade, aligning the angle rams with the brackets.
2. The wing cables come pre-assembled to the A-frame. Slide the threaded ends of the cables out through the pivot bushings on the blade assembly. As you position the A-frame, feed the wing cables through to the ends.

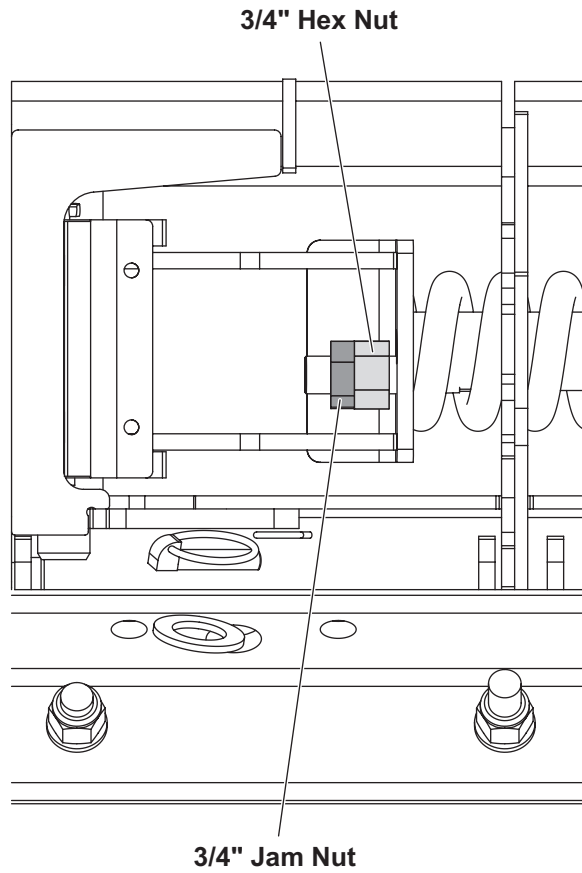


3. Install the 1" x 9-1/2" pivot pin from the top through the blade and the A-frame. Secure with a 1" locknut and tighten the locknut as much as possible while allowing the A-frame to pivot.

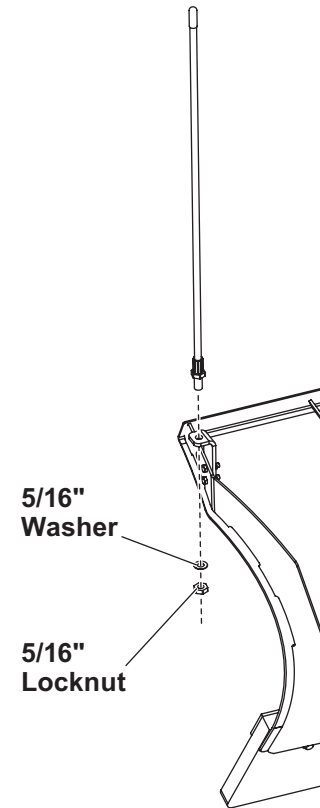


4. Attach each angle ram to the blade brackets with one 1" x 4-3/4" clevis pin from the top. Secure each clevis pin with a 1/4" x 1-1/2" cotter pin.

5. Assemble a 3/4" hex nut and 3/4" jam nut loosely onto the threaded end of each wing cable. Thread the nuts on just flush with the end of the cable.



6. Install the blade guides using 5/16" washers and 5/16" locknuts.



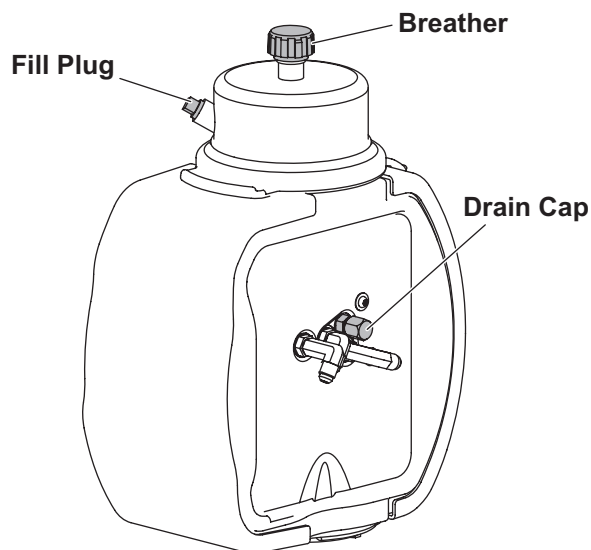
## HYDRAULIC UNIT

### ⚠ 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.

The XRS™ snowplow hydraulic unit comes from the factory pre-assembled, partially filled, and fully tested.

1. Attach the snowplow to the vehicle according to the instructions on the headgear.
2. Remove and discard the factory-installed pipe plug from the top of the reservoir and install the breather.



### ⚠ WARNING

To prevent accidental movement of the blade, always turn the control OFF whenever the snowplow is not in use. The power indicator light will turn OFF.

3. Turn the control ON and completely angle the blade to the left and right several times. Raise and lower the snowplow several times. Activate the control FLOAT function and manually collapse the lift ram all the way. Turn the control OFF.

### ⚠ CAUTION

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

4. Remove the fill plug and check the fluid level. With the lift ram fully retracted, the fluid level should reach the fill hole. If additional fluid is needed, fill the reservoir with FISHER® EZ Flow Hydraulic Fluid rated to -40°F (-40°C), or other fluid conforming to Military Specification MIL-H-5606 A, such as Mobil Aero HFA or Shell AeroShell® Fluid 4.

**NOTE: Loosen fill plug slowly to relieve any pressure in the reservoir.**

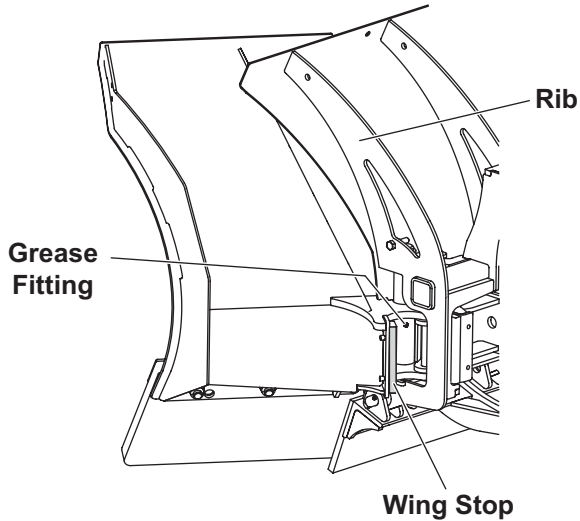
5. Replace and tighten the fill plug.

### FLUID CAPACITY

- Insta-Act® Unit Reservoir 1-3/4 quarts
- Insta-Act System Total 2-3/8 to 2-3/4 quarts

**WING CABLE ADJUSTMENT**

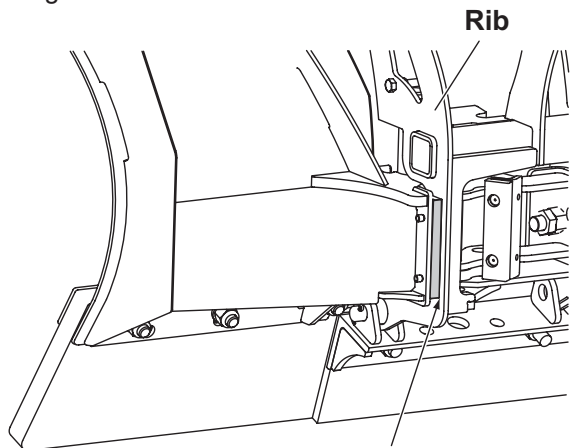
1. Angle the blade fully left and inspect the area between the left wing stop and the end blade rib.



2. If there is a gap between the wing stop and the rib, skip to Step 3.

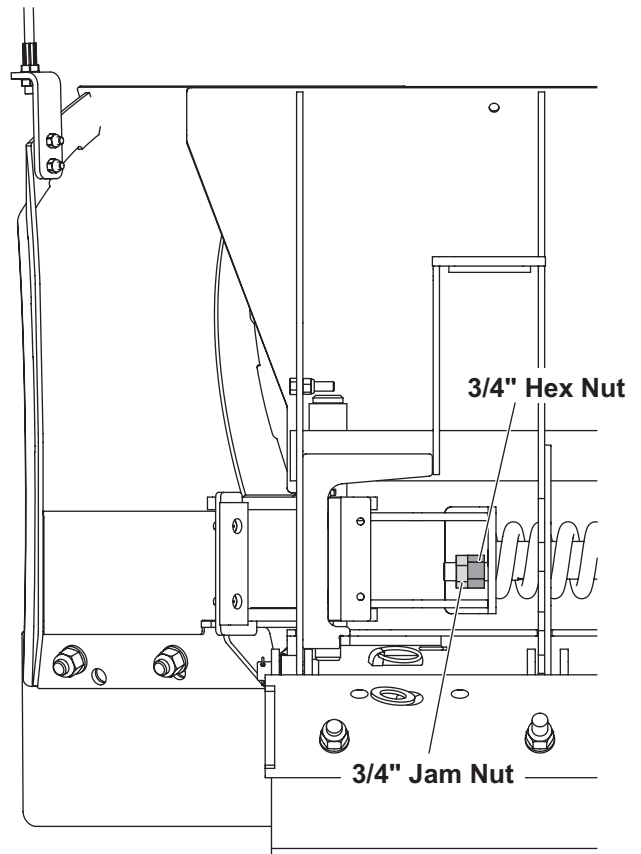
If there is no gap, return the blade to the straight position and loosen the 3/4" jam nut and 3/4" hex nut on the end of the wing cable 1/4 turn. Repeat this adjustment until a gap can be seen.

3. To lessen the gap between the wing stop and the rib, return the blade to the straight position and tighten the hex nut 1/4 turn clockwise. Angle the blade fully left and inspect the area between the wing stop and the rib again.
4. Continue making this adjustment until the wing stop just contacts the rib when the blade is fully angled left.



**Wing stop must just contact rib when blade is fully angled.**

5. Once the stop is making contact with the rib, lock the hex nut into position with the 3/4" jam nut.



6. Repeat Steps 1–5 on the passenger side of the blade assembly, this time angling the blade fully to the right.

**NOTE: Adjusting the 3/4" hex nut too far inward will cause the wing stop to contact the blade rib before the blade is fully angled. This condition can stretch the cables and shorten their service life.**

7. Grease the fittings on the wing hinges.

## HEADLAMPS

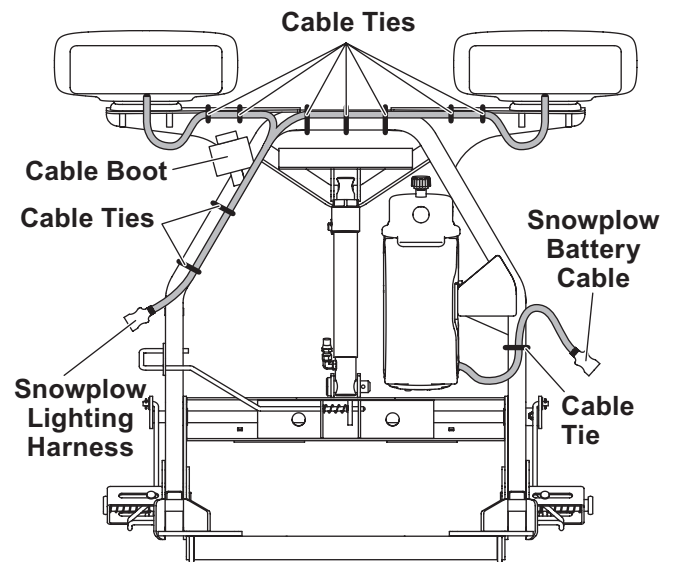
### ⚠ WARNING

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

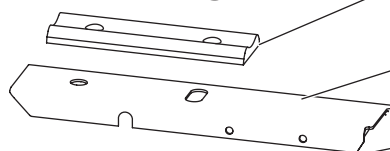
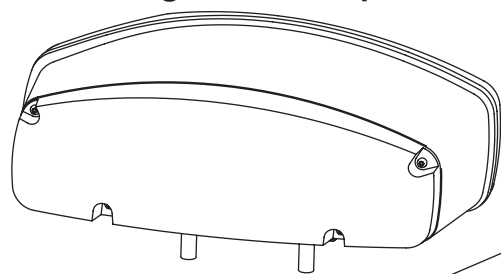
Headlamps, hardware, and instructions are found in the headlamp box.

1. Install the vehicle wiring according to the instructions provided.
2. With the driver- and passenger-side headlamps on the correct sides, set each headlamp and swivel into place on the headgear light bar.
3. Secure the headlamps with the correct hardware for the application as shown below. Inner and outer posts require different hardware. On LED headlamps, a rubber washer must be installed under the slotted holes. Hand tighten fasteners.
4. Connect the headlamp wires to the headlamps.
5. Aim the headlamps according to the Snowplow Headlamp Beam Aiming Instructions (Lit. No. 27769). For LED headlamps, tighten the fasteners to 22 ft-lb (30 N·m). For halogen headlamps, tighten the fasteners to 50 ft-lb (68 N·m).

6. Secure the snowplow harnesses and wires to the headgear with cable ties as shown.



### Halogen Headlamps



### Headlamp Swivel

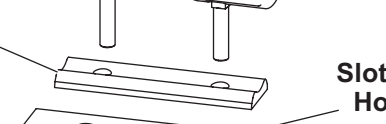
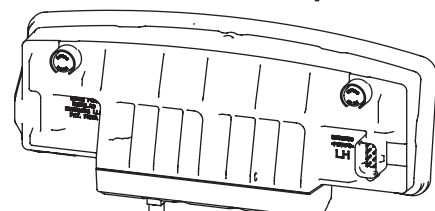
### Headgear Light Bar

### 1/2" Flat Washers

### 1/2" Lock Washers

### 1/2" Hex Nuts

### LED Headlamps



### 1/2" Rubber Washer

## BLADE DROP SPEED ADJUSTMENT

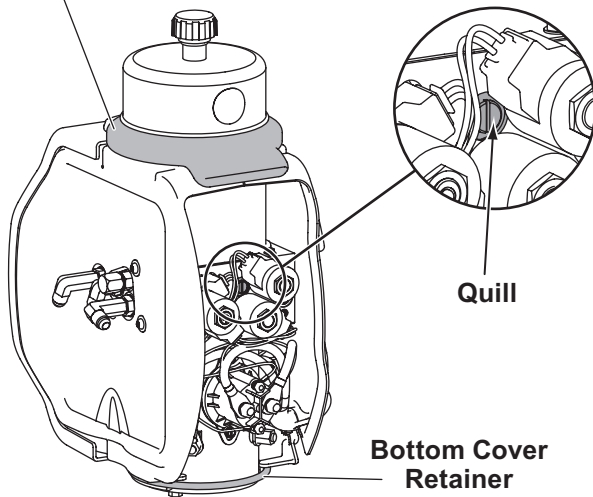
**⚠ WARNING**

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.

The quill in the top of the valve manifold adjusts the blade drop speed.

1. Lower the blade to the ground before making adjustment.
2. On the hydraulic unit, raise the top cover retainer, remove the bottom cover retainer and remove the rear cover.
3. Turn the quill IN (clockwise) to decrease drop speed. Turn the quill OUT (counterclockwise) to increase drop speed.
4. Stand 8 feet clear of the blade when checking adjustment.
5. Replace the cover and reinstall the O-ring and top cover seal.

Top Cover Retainer



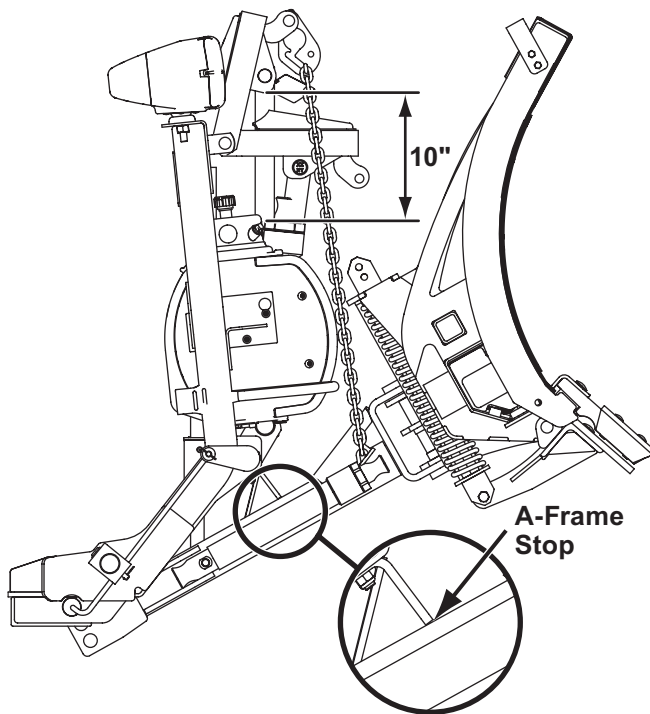
## FINAL ADJUSTMENTS

### **⚠ 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.

### Lift Chain

1. With the snowplow attached to a properly ballasted vehicle and the blade lowered to the ground, the A-frame should be parallel with the ground.
2. Adjust the length of the lift chain so that the A-frame hits the A-frame stop when the lift ram is fully raised (10").
3. Remove and retain the U-bolt and locknuts securing the lift chain on the right side of the A-frame. Reposition the U-bolt in the chain so that the chain is the same length as the chain on the right side.
4. Reinstall the U-bolt in the A-frame and tighten the locknuts. The chain link will pivot freely in the U-bolt.
5. Slide the heat-shrink tube down to the U-bolt and apply heat to shrink it into place.
6. Fully angle the blade in raised and lowered positions. Adjust the hose fittings and wraps so that the hoses do not contact the vehicle bumper, have no sharp bends, and are wrapped at contact points with the headgear and blade.

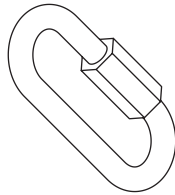


### Connecting Link and Lift Chain Spring

When the blade is lowered, the lift chain spring provides slack in the lift chain for ease of mounting and dismounting the blade.

The XRS™ snowplow uses a quick link to connect the lift chain and spring.

Quick Link



The lift chain spring is installed at the factory in the lift chain link number indicated in the table below.

Snowplow	Number of Links from Driver-Side U-Bolt
XRS™	14

However, due to variations in vehicle frame height, it may be necessary to adjust the spring location to ensure optimal performance.

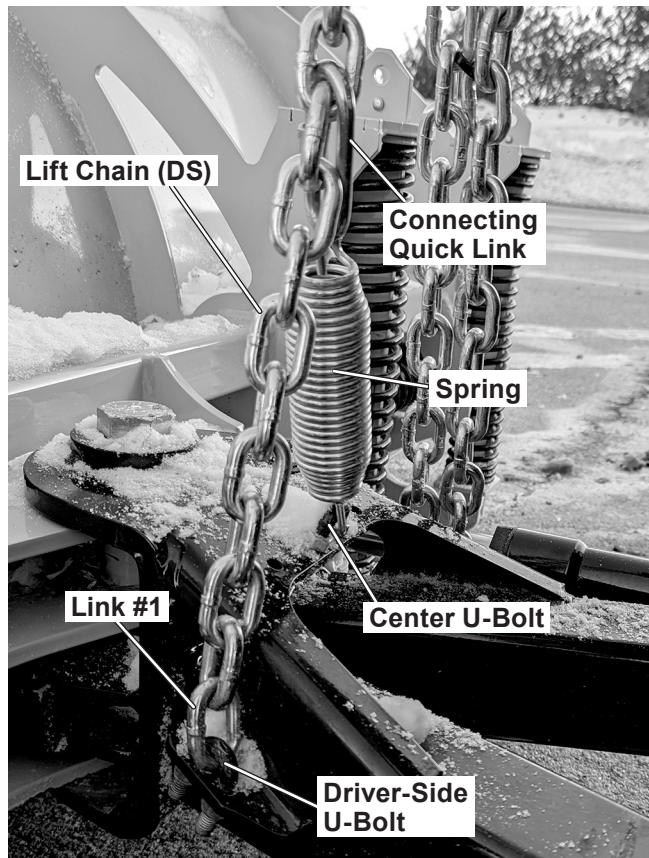
If you encounter mounting or dismounting difficulty, the attachment point of the connecting link and spring can be changed to add or remove slack from the lift chain.

With the snowplow attached to a properly ballasted vehicle, make one of the following adjustments:

**If there is not enough slack in the lift chain,** there will be difficulty getting the connecting pins to engage the vehicle pushplates while pushing back on the headgear. Adjust the connecting link *up* one link from the factory setting.

**If there is too much slack in the lift chain,** adjust the connecting link *down* one link from the factory setting.

Moving the connecting link more than one chain link higher or lower than the factory-installed location is not recommended.



## VEHICLE LIGHTING CHECK

1. Verify the operation of all vehicle front lighting prior to connecting the snowplow harness.
2. Check the operation of the snowplow lights with snowplow mounted to vehicle and all harnesses connected.

### Turn signals and parking lamps

Parking lamps ON:

- Both vehicle and snowplow parking lamps should be ON at the same time.

Driver-side turn signal ON:

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

Passenger-side turn signal ON:

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

### Headlamps

Move the vehicle headlamp switch to the "ON" position. Connecting and disconnecting the snowplow lighting harness plug should switch the lights between vehicle and snowplow as follows:

Snowplow lighting harness DISCONNECTED:

- Vehicle headlamps should be ON.
- Snowplow headlamps should be OFF.

Snowplow lighting harness CONNECTED:

- Snowplow headlamps should be ON.
- Vehicle headlamps should be OFF.

The dimmer switch should toggle headlamps between high and low beams. The high beam indicator on the dash should light when headlamps are placed in high beam.

### Daytime Running Lamps (DRLs)

An operational check of the vehicle and snowplow DRLs will depend on the vehicle model, vehicle DRL system, and type of isolation module installed. Due to the variations in the vehicle DRL systems and the different isolation module options available, checking the functionality of the snowplow DRLs will depend on the type of module installed on the vehicle.

With the headlamp switch OFF, activate the vehicle DRLs.

Snowplow lighting harness DISCONNECTED:

- Vehicle DRLs should be ON.
- Snowplow headlamps should be OFF.

Snowplow lighting harness CONNECTED and vehicle in DRL mode:

- Check snowplow DRL function per the type of isolation module installed.

Refer to the Mechanic's Guide for information on the isolation module DRL functions.

### Control power indicator light

The snowplow plugs **do** need to be connected to the vehicle harness connectors. The control power indicator light should illuminate whenever the control ON/OFF switch and the ignition (key) switches are both in the "ON" position.

3. Connect all snowplow and vehicle harnesses. Raise the snowplow and aim the snowplow headlamps according to the Snowplow Headlamp Beam Aiming Instructions included with the headlamps, and any state or local regulations.
4. Check the aim of the vehicle headlamps with the snowplow removed.

### CAUTION

**On 2-plug electrical systems, plug covers shall be used whenever snowplow is disconnected. Vehicle battery cable is 12V unfused source.**

5. When the snowplow is removed from the vehicle, install plug covers on the vehicle battery cable and lighting harness. Insert the snowplow battery cable and lighting harness into the cable boot on the snowplow.

### WING LOCK PINS

The parts box contains a bag with two 3/4" x 9" clevis pins and two 1/8" hairpin cotters. The 9" clevis pins are for pinning the wings in the straight position as a plowing option.

Give this parts bag to the snowplow owner. The Owner's Manual contains instructions for using these pins.

### OWNER'S MANUAL PACKET

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

If the snowplow 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 (®) or unregistered (™) trademarks of Douglas Dynamics, LLC: FISHER®, Insta-Act®, Minute Mount® 2, XRS™.

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