



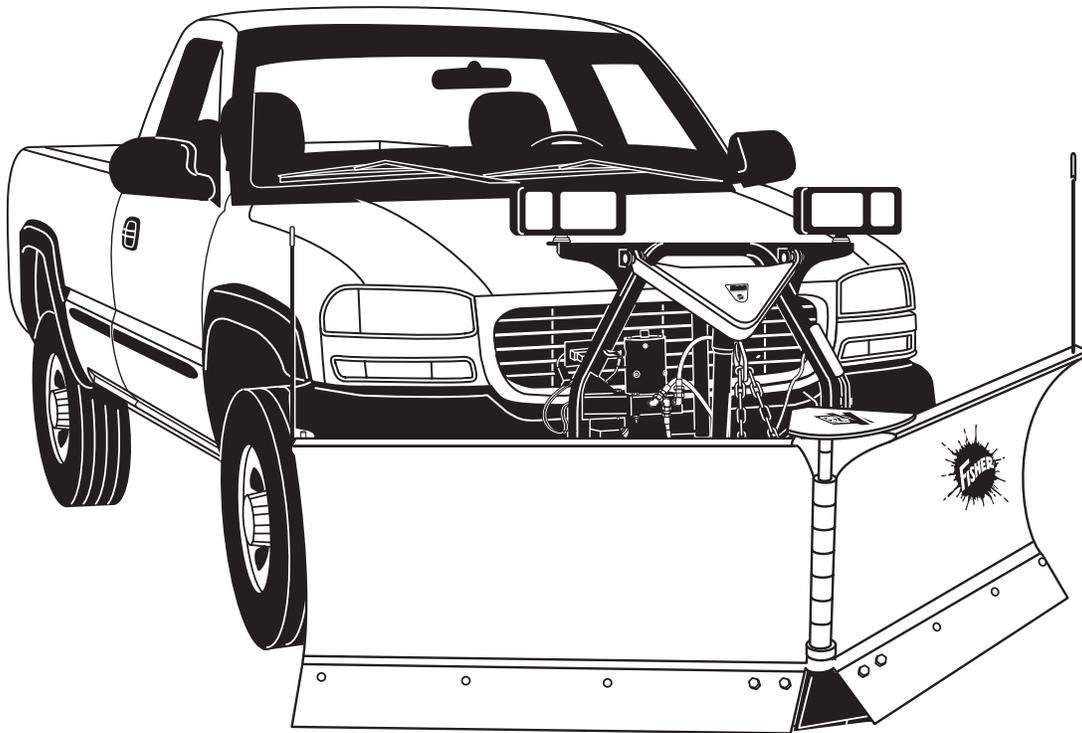
Fisher Engineering

July 1, 2005
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Minute²
Mount
SYSTEM

EZ-V[®]

Owner's Manual



⚠ CAUTION

Read this manual before operating or servicing snowplow.

This document supersedes all editions with an earlier date.

SNOWPLOW OWNER DATA SHEET

Owner Name: _____

Date Purchased: _____

Outlet Name: _____ Phone: _____

Outlet Address: _____

Vehicle Model/Year: _____

Snowplow Model/Year: _____

Snowplow Type/Size: _____ Weight: _____ lbs/kg

Ballast: No ___ Yes ___ Amount _____ lbs/kg

Insta-Act® Hydraulic Unit Serial Number: _____

Blade Serial Number (located above Warning/Caution label) _____

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PREFACE

This manual has been prepared to acquaint you with the safety information, operation and maintenance of your new FISHER® EZ-V® snowplow. Please read this manual carefully and follow all recommendations.

Before installing a snowplow, make sure your vehicle is equipped with all the vehicle manufacturer's and our required options for snowplowing. This will help ensure profitable and trouble-free operation of your snowplow. Keep this manual accessible. It is a handy reference in case minor service is required.

Your FISHER snowplow Insta-Act® hydraulic unit and blade both have a serial number. Record these serial numbers on the second page of this manual so that you can refer to it when necessary.

When service is necessary, bring your snowplow to your local FISHER outlet. They know your snowplow best and are interested in your complete satisfaction.

The illustrations found in this manual represent typical components. They may not match your exact installation.

SAFETY

SAFETY DEFINITIONS

⚠ WARNING

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

⚠ CAUTION

Indicates a situation that, if not avoided, could result in damage to product or property.

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.

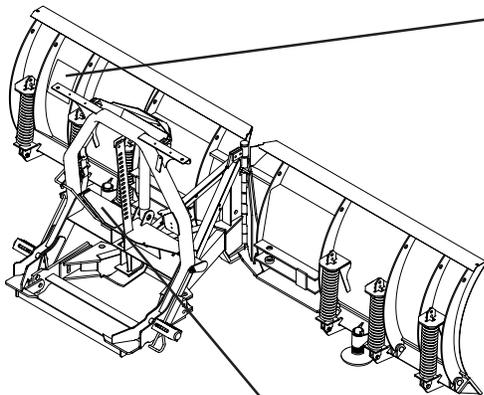
Warning/Caution Label

⚠ WARNING

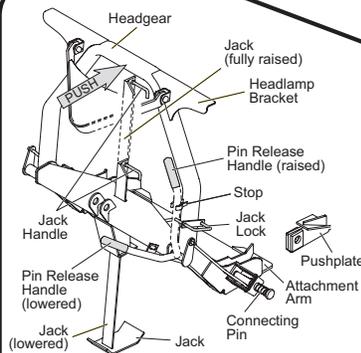
LOWER BLADE WHEN VEHICLE IS PARKED.
 REMOVE BLADE ASSEMBLY BEFORE PLACING VEHICLE ON HOIST.
 DO NOT EXCEED GVWR OR GAWR INCLUDING BLADE AND BALLAST.

⚠ 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



U.S. Patents 4,280,062; 4,999,935; 5,353,530; 5,420,480; RE 35,700; 6,253,470; CAN Patent 2,000,423; 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.

ATTACH

DETACH

SAFETY

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

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

⚠ CAUTION

Read Owner's Manual before operating or servicing snowplow.

⚠ CAUTION

Transport speed should not exceed 45 mph. Reduce speed under adverse travel conditions.

⚠ CAUTION

Plowing speed should not exceed 10 mph.

⚠ CAUTION

See your FISHER® outlet for application recommendations.

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.

SAFETY

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.

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.

FUSES

The FISHER® vehicle control harness contains two automotive blade-type fuses. One fuse is for the snowplow park/turn lamp power and the other is for the snowplow control power. If a problem should occur and fuse replacement is necessary, the replacement fuse should be of the same value as the original. Installing a fuse of a larger value could damage the system.

See Fuse Replacement in the Maintenance section of this Owner's Manual for fuse locations.

NOISE

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

VEHICLE APPLICATION INFORMATION

⚠ CAUTION

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

Vehicle application recommendations are based on the following:

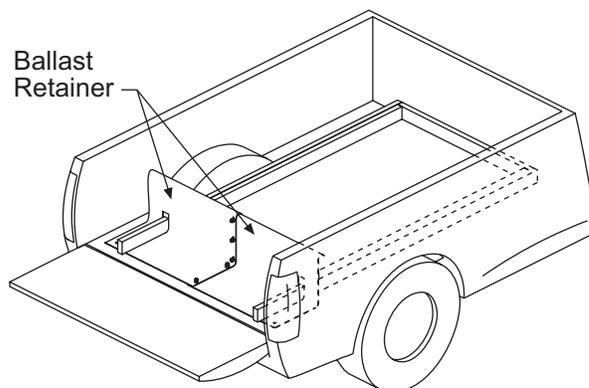
- The vehicle with the snowplow installed must comply with applicable Federal Motor Vehicle Safety Standards (FMVSS).
- The vehicle with the snowplow installed must comply with the vehicle manufacturer's stated gross vehicle and axle weight ratings (found on the driver-side door cornerpost of the vehicle) and the front and rear weight distribution ratio. In some cases, rear ballast may be required to comply with these requirements. See Ballast Requirements section.
- FISHER® *Kit Selection Guide* is based on available vehicle capacity for snowplow equipment on a representative vehicle equipped with options commonly used for snowplowing and with 300 lb. of front seat occupant weight.
- Weights of front seat occupants can be adjusted above 300 lb. but vehicle with snowplow must not exceed vehicle GVWR or GAWR.
- In some cases there may be additional limitations and requirements.
- Installation, modification and addition of accessories must comply with published FISHER recommendations and instructions. Available capacity decreases as the vehicle is loaded with cargo or other truck equipment or snowplow accessories are installed.
- If there is uncertainty as to whether available capacity exists, the actual vehicle as configured must be weighed.

BALLAST REQUIREMENTS

Ballast (additional weight) is an important part of qualifying vehicles for snowplow eligibility. Rear ballast must be used when necessary to remain in compliance with axle ratings and ratios as specified by the vehicle manufacturer.

If ballast is required, it is important that it be secured properly behind the rear axle. A ballast retainer kit is available.

NOTE: The ballast retainer kit is for snowplow vehicles requiring ballast. See your FISHER® outlet for the correct amount of ballast required. Include the weight of the retainer as part of the ballast requirement. Sand bags are recommended for use as ballast.



GETTING TO KNOW YOUR SNOWPLOW

Minute Mount® 2 SYSTEM

The Minute Mount 2 System from Fisher Engineering continues to set the industry standard for detachable snowplow design. *The quickest and easiest mounting system available, the Minute Mount 2 System is twice the mount because it takes half the time.* The Minute Mount 2 System should be installed according to instructions supplied. FISHER® outlets are trained to perform this service and other services for this snowplow.

EZ-V® SNOWPLOW

The FISHER difference, the integral trip edge design, is incorporated in the EZ-V snowplow. When an obstacle is encountered, only the edge trips, not the entire blade. The trip action works in all blade configurations. The plowed snow stays in front of the vehicle even when the edges trip because the blade remains upright.

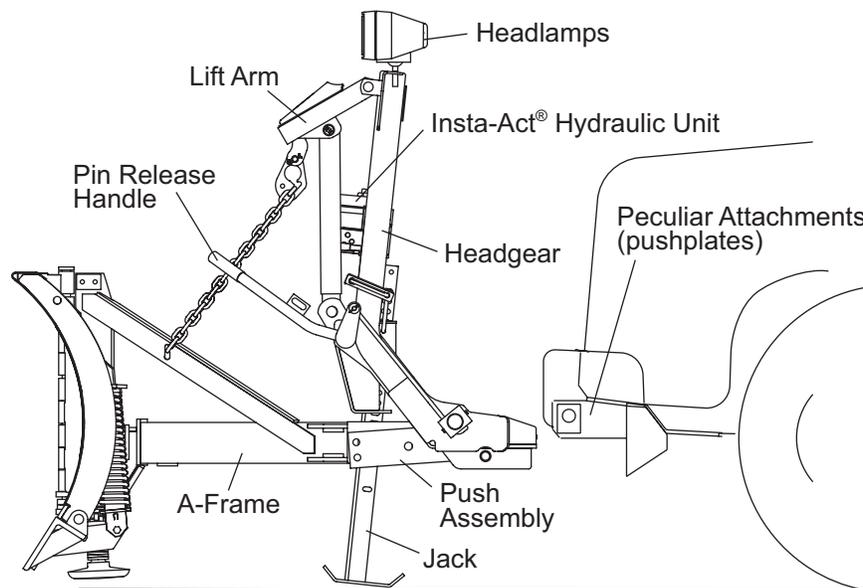
The blade halves are constructed of heavy gauge steel with a formed top edge. The blades are reinforced with a steel framework to increase rigidity and strength, and are designed using the latest advances in computer design techniques.

The blade is curved to pick up snow and cast it aside smoothly – rolling snow instead of pushing it. This action allows you to move more snow faster, using less power, saving fuel and reducing wear and tear on the vehicle and snowplow.

The base angle is designed with a unique trip edge. Each end of the trip edge is backed with a hardened steel wear bar welded behind the base angle. Heavy compression springs hold each edge in the plowing position. The springs are a safety device that allow the trip edge to ride over obstacles without damaging the blade, vehicle or injuring the driver. The springs need no adjustments and offer protection in all blade configurations.

A-FRAME/PUSH ASSEMBLY

The A-frame is designed with a connecting assembly that allows adjustment for variations in vehicle height. The feature ensures that blade edges can be parallel to the road surface when plowing. The diagonal brace holds the top of the hinge pin and the blade vertical.



GETTING TO KNOW YOUR SNOWPLOW

HEADGEAR KIT

The headgear kit is composed of the headgear, linkage mechanism, lift arm, and jack. The headgear is connected to the pushplates, which are mounted directly to the vehicle frame. The headgear also provides the mounting framework for the FISHER® Insta-Act® Hydraulic Unit and the lift arm. The lift arm raises and lowers the blade by moving the lift arm and lift chain. The jack, when lowered, supports the snowplow during and after its removal from the vehicle.

PECULIAR ATTACHMENT KIT

Fisher Engineering has designed a peculiar (custom) attachment kit for most vehicles. Due to the differences between vehicle models, the kits are not interchangeable.

The peculiar attachment kit fastens to the vehicle frame. It is engineered to provide the primary connecting points between the plow assembly and the vehicle. The weight of the Minute Mount® system is distributed to the frame of your vehicle by the pushplates.

SNOWPLOW HEADLAMPS

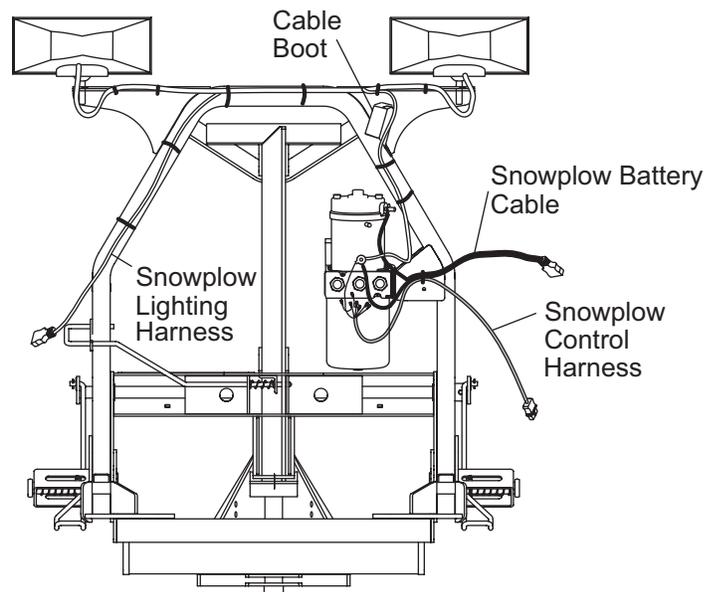
⚠ WARNING

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

The snowplow headlamps include a set of rectangular, dual-beam halogen headlamps with combination park and turn signals. A prewired harness with a plug-in module requires no headlamp wire splicing. The headlamps conform to Federal Motor Vehicle Safety Standards (FMVSS).

When the electrical plugs are connected, the vehicle headlamps will automatically switch to the snowplow headlamps when they are turned on. When the electrical plugs are disconnected, the headlamps will automatically switch to vehicle headlamps when they are turned on.

Replacement 2E1 Sealed Beam headlamps are available through your local FISHER outlet.

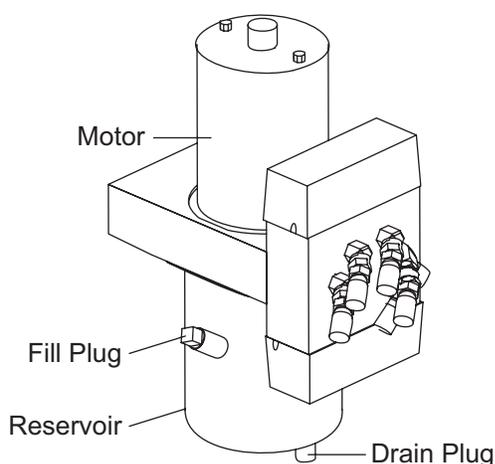


GETTING TO KNOW YOUR SNOWPLOW

Insta-Act® HYDRAULIC UNIT

The Insta-Act Hydraulic Unit delivers fast and uniform speed for lifting and angling. It raises the blade in approximately 3 seconds and angles side to side in approximately 5 seconds.

The Insta-Act Hydraulic Unit's angling gives you full control of the snowplow from within the cab. A double-acting hydraulic ram moves each wing independently or as a single unit. The rams are operated by the control.



CAB CONTROLS

⚠ WARNING

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.

The EZ-V® snowplow is equipped with one of three special controls – the Fish-Stik® 9-button hand-held control, Fish-Stik 6-button hand-held control or a joystick-style control. The controls allow you to go from a V-plow, to a scoop, to a standard straight-blade plow, all at the touch of a button or single-lever movement.

Each control has its own ON/OFF switch with an indicator light to show when the control is powered up. Your vehicle ignition (key) switch controls a fused circuit that powers your cab control directly from the battery.

The ON/OFF switch on the cab control allows you to turn off the control and prevent blade movement even when the ignition switch is on. **The control ON/OFF switch serves as an emergency stop if required.**

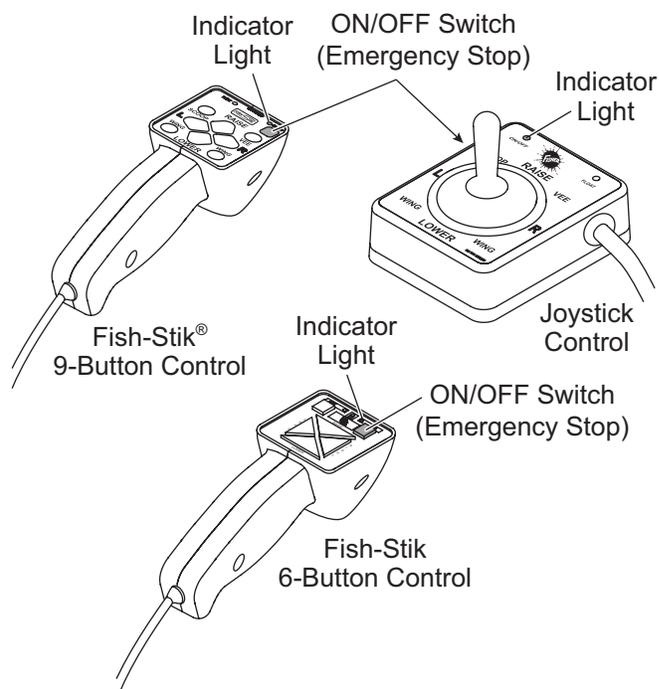
All controls have on-board fuses. See Fuse Replacement in the Maintenance section of this Owner's Manual.

System Capacity

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

Pump Motor Specifications

12 volt DC with +/- connection
1700-1800 psi pump relief valve
3950-4050 psi angling relief valve
4.5" dia. 1.04 kw motor
.000477 GAL/REV Pump
Hydraulic Hose SAE 100R1



ACCESSORIES AND OPTIONS

RUBBER DEFLECTOR

Keeps fluffy snow from flowing over the top of the blade. Easily installed and attractively priced.

REPLACEABLE CARBON STEEL CUTTING EDGE

The two cutting edges are made of high carbon steel that bolt onto the base angle for maximum blade life.

FISHER® EZ Flow HYDRAULIC FLUID

Improve the performance of your hydraulic systems, especially in extremely cold weather, with FISHER EZ Flow Hydraulic Fluid. Special antiwear and antifoaming additives keep your system running longer and smoother.

ANTIWEAR SHOES

These shoes offer maximum protection against blade wear. The more the blade is used, the more important the shoes become.

TOUCH-UP PAINT

FISHER touch-up paint is available to keep your snowplow protected from rust.

Minute Mount® SYSTEM SKID PLATES

These off-season inserts for the Minute Mount System pushplates offer protection by filling and covering the receiver portion of the pushplates. They also add to the vehicle's off-season appearance.



ATTACHING SNOWPLOW TO VEHICLE

ATTACHING SNOWPLOW

⚠ WARNING

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

⚠ WARNING

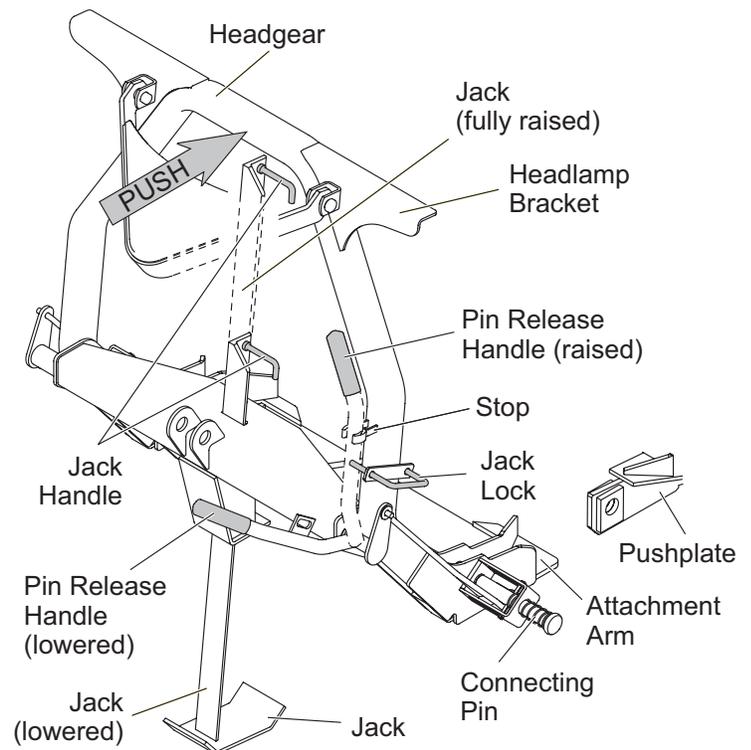
Inspect snowplow components and bolts for wear or damage whenever attaching or detaching the snowplow. Worn or damaged components could allow the snowplow to drop unexpectedly.

NOTE: The blade must be in the straight position when attaching or detaching the snowplow.

NOTE: Use dielectric grease to prevent corrosion on all connections.

Attaching Steps:

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.



OPERATING YOUR SNOWPLOW

FISH-STIK® HAND-HELD CONTROL (9 BUTTON)

⚠ WARNING

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.

1. Turn the vehicle ignition switch to the ON or the ACCESSORY position.
2. Press the ON/OFF switch on the control. The control indicator light glows red, indicating the control is on. The indicator light glows red whenever the control and the vehicle ignition switch are both on and the electrical connections to the plow are completed.

The ON/OFF switch operates as an emergency stop if required.

Function Time Outs

All control functions, except LOWER/Float, time out (stop) automatically after a period of time. This is to limit the amount of electrical energy required from the vehicle. The time-out period for the RAISE function is 3.0 seconds, while all others are 5.5 seconds.

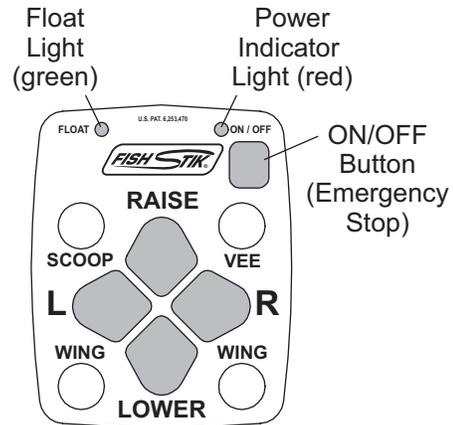
NOTE: If control function times out before desired blade movement is complete, release button and press again.

Automatic Shutdown

The control will automatically turn off after being idle for 20 minutes.

Smooth Stop

The control automatically allows the blade to coast to a stop when the button is released. This results in smoother operation, reduces the shock to the hydraulic system and increases hose and valve life.



Control Functions

Raise, Lower, Float, Angle

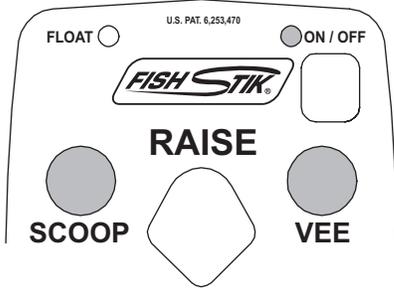
The four diamond-shaped buttons in the center of the control face, when pressed, will result in the following blade movements:

Function	Description of Operation
RAISE	Press this button to raise the snowplow and cancel the float mode. Function times out after 3.0 seconds.
LOWER	Press this button to lower the snowplow. Release the button to stop blade at desired height.
FLOAT	Press the LOWER button and hold 3/4 second to activate this mode. The FLOAT indicator light in the upper left corner of the control face will illuminate. The blade will lower to the ground surface and follow the contour of the surface as it dips or raises. Function does not time out, but control will shut down after 20 minutes of nonuse. Press RAISE button momentarily to cancel float. Angling left or right will interrupt (stop) the float function while the blade angles, but will return to float when angling is complete.
L – Angle Left	With wings in a straight line, press the L button to move both wings to the angle left position to cast snow to the driver's left side. The left wing retracts while the right wing extends. Function times out after 5.5 seconds.
R – Angle Right	With wings in a straight line, press the R button to move both wings to the angle right position to cast snow to the driver's right side. The right wing retracts while the left wing extends. Function times out after 5.5 seconds.

OPERATING YOUR SNOWPLOW

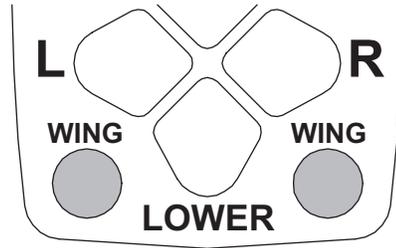
Scoop/Vee Blade Position

The two round buttons located to the left and right of the RAISE button move both wings at the same time into the following blade positions:



Wing Positions

The two round buttons located to the left and right of the LOWER button move either wing independently of the other as described below.



Function	Description of Operation
SCOOP	Press this button to extend both wings forward into the scoop position. Function times out after 5.5 seconds.
VEE	Press this button to retract both wings into the vee position. Function times out after 5.5 seconds.

Function	Description of Operation
L WING	Press the round WING button on the left side of the control to move the left wing. The first time the button is pressed after the control is turned on or another function is used, the wing will extend. Repeated use of the same button, without using another function, results in movement in the opposite direction from the previous movement. Function times out after 5.5 seconds.
R WING	Press the round WING button on the right side of the control to move the right wing. The first time the button is pressed after the control is turned on or another function is used, the wing will extend. Repeated use of the same button, without using another function, results in movement in the opposite direction from the previous movement. Function times out after 5.5 seconds.

NOTE: If control function times out before desired blade movement is complete, release button and press again.

OPERATING YOUR SNOWPLOW

JOYSTICK CONTROL

⚠ WARNING

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.

1. Turn the vehicle ignition switch to the ON or the ACCESSORY position.
2. Move the slide switch on the side of the control to the ON position. The control ON/OFF indicator light glows red, indicating the control is on. The indicator light glows red whenever the control and the vehicle ignition switch are both on and the electrical connections to the plow are completed.

The ON/OFF switch operates as an emergency stop if required.

Function Time Outs

All control functions, except LOWER/Float, time out (stop) automatically after a period of time. This is to limit the amount of electrical energy required from the vehicle. The time-out period for the RAISE function is 3.0 seconds, while all others are 5.5 seconds.

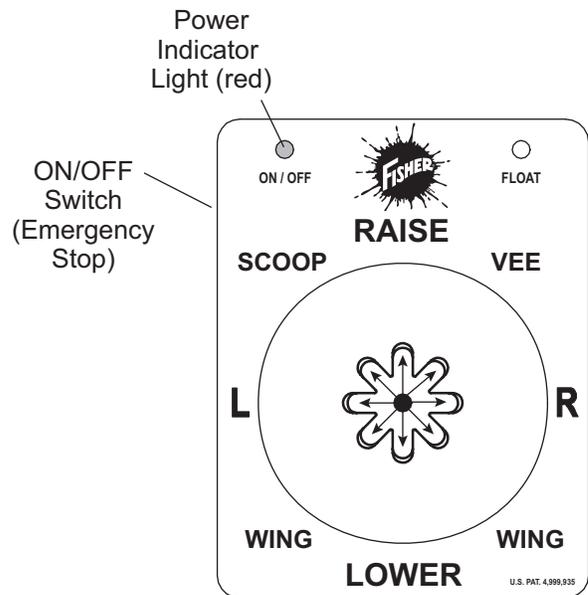
NOTE: If control function times out before desired blade movement is complete, release the lever to the center position, then move back into the desired function.

Automatic Shutdown

The control will automatically turn off after being idle for 20 minutes. To reactivate the control after a shut down, move the ON/OFF switch to OFF, then back to ON.

Smooth Stop

The control automatically allows the blade to coast to a stop when the lever returns to center position. This results in smoother operation, reduces the shock to the hydraulic system and increases hose and valve life.

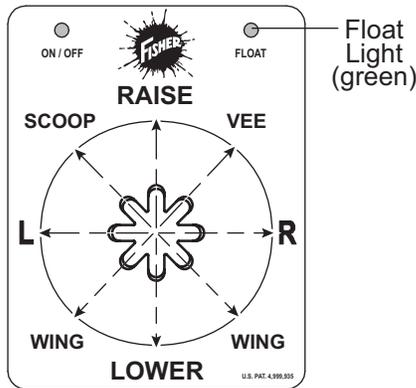


Control Lever Movement

From the center position, the control lever can be moved in one of eight (8) directions to control various movements of the snowplow blade. To change from one movement of the blade to another, the control lever must be moved back to the center position before selecting the desired function. Whenever the lever is released, it should spring back into the center position to stop any blade movement.

OPERATING YOUR SNOWPLOW

Control Functions



Raise, Lower, Float, Angle

Movement of the control lever in straight lines up and down or from side to side on the control body will result in the following blade movements:

Function	Description of Operation
RAISE	Move the control lever toward the top of the control body to raise the snowplow and cancel the float mode. Function times out after 3.0 seconds.
LOWER	Move the control lever toward the bottom of the control body to lower the snowplow. Release the lever to stop blade at desired height.
FLOAT	Move the control lever to the LOWER position and hold 3/4 second to activate this mode. The FLOAT indicator light in the upper right corner of the control face will illuminate. The blade will lower to the ground surface and follow the contour of the surface as it dips or raises. Function does not time out; however, control will shut down after 20 minutes of nonuse. Move lever to the RAISE position momentarily to cancel float. Angling left or right will interrupt (stop) the float function while the blade angles, but will return to float when angling is complete.
L – Angle Left	With wings in a straight line, move the control lever straight to the left to move both wings to the angle left position to cast snow to the driver's left side. The left wing retracts while the right wing extends. Function times out after 5.5 seconds.
R – Angle Right	With wings in a straight line, move the control lever straight to the right to move both wings to the angle right position to cast snow to the driver's right side. The right wing retracts while the left wing extends. Function times out after 5.5 seconds.

NOTE: If control function times out before desired blade movement is complete, release the lever to the center position, then move back into the desired function.

Scoop/Vee Blade Position

Move the control lever from the center position toward the “SCO” of SCOOP or the “EE” of VEE on the face of the control body. The use of either of these slots will cause both the left and right wings to move at the same time into the following blade positions:

Function	Description of Operation
SCOOP	Move the control lever toward the word, SCOOP, on the control face to extend both wings forward into the scoop position. Function times out after 5.5 seconds.
VEE	Move the control lever toward the word, VEE, on the control face to retract both wings into the vee position. Function times out after 5.5 seconds.

Wing Positions

Move the control lever from the center position toward the word, WING, on either side of the face of the control body. The use of either of these slots will allow movement of either wing independently of the other as described below.

Function	Description of Operation
L WING	When the control lever is moved to the left side of LOWER , the left wing will move either in or out. The first time the lever is moved into the slot after the control is turned on or another function is used, the wing will extend. Repeated use of lever in the same slot, without using another function, results in movement in the opposite direction from the previous movement. Function times out after 5.5 seconds.
R WING	When the control lever is moved to the right side of LOWER , the right wing will move either in or out. The first time the lever is moved into the slot after the control is turned on or another function is used, the wing will extend. Repeated use of lever in the same slot, without using another function, results in movement in the opposite direction from the previous movement. Function times out after 5.5 seconds.

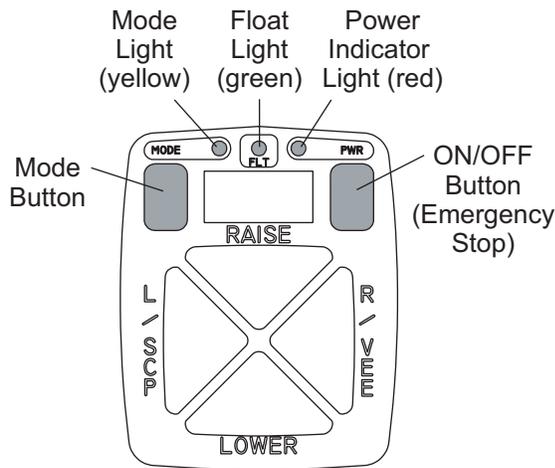
OPERATING YOUR SNOWPLOW

Fish-Stik® HAND-HELD CONTROL (6 BUTTON)

⚠ WARNING

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

1. Turn the vehicle ignition switch to the ON or the ACCESSORY position. The controller logo area illuminates.
2. Press the ON/OFF button on the control. The control indicator light glows red indicating the control is on. The control indicator light glows red whenever the control ON/OFF switch and the vehicle ignition switch are both ON and the electrical connections to the plow are completed. **The ON/OFF switch operates as emergency stop if required.**



Function Time Outs

All control functions, except LOWER, automatically time out – stop – after a period of time. This helps prevent unnecessary battery drain. The time-out period for the RAISE function is 2.5 seconds, while the angle function is 4.25 seconds.

Automatic Shutdown

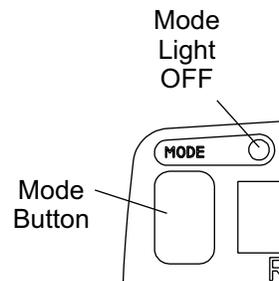
The control automatically turns off after being idle for 20 minutes.

Smooth Stop

The control automatically allows the blade to coast to a stop. This results in smoother operation, reduces the shock to the hydraulic system and increases hose and valve life.

Straight Blade Mode (Default)

The **control** automatically defaults to the straight blade mode when turned on. The MODE LIGHT, near the MODE button in the upper left corner of the keypad, is not illuminated or flashing when the control is in the straight blade mode.



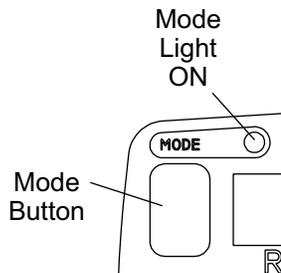
The following functions are performed in the straight blade mode:

Button	Description of Operation
RAISE	Press this button to raise the snowplow and to cancel the float mode. NOTE: Snowplow automatically stops raising after 2.5 seconds. To resume raising the snowplow, release the button and press again.
LOWER	Press this button to lower the snowplow. NOTE: After reaching the desired height, release the button. Holding the button down for more than 3/4 second activates the float mode, indicated by green FLT LIGHT. This allows the blade to move up and down to follow the contour of surface being plowed.
L / SCP	Press this button to angle both wings to the left.
R / VEE	Press this button to angle both wings to the right.

OPERATING YOUR SNOWPLOW

Vee/Scoop Mode

Quickly press and release the MODE button to put the control into the vee/scoop mode. The MODE LIGHT, near the upper left corner of the keypad, lights. Quickly pressing and releasing the MODE button toggles the control between straight blade mode and vee/scoop mode.

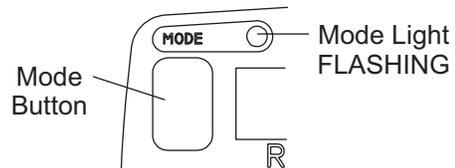


The following functions are performed in the vee/scoop mode:

Button	Description of Operation
RAISE	Press this button to raise the snowplow and to cancel the float mode. NOTE: Snowplow automatically stops raising after 2.5 seconds. To resume raising the snowplow, release the button and press again.
LOWER	Press this button to lower the snowplow. NOTE: After reaching the desired height, release the button. Holding the button down for more than 3/4 second activates the float mode, indicated by green FLT LIGHT. This allows the blade to move up and down to follow the contour of surface being plowed.
L / SCP	Press this button to extend both wings to the scoop position.
R / VEE	Press this button to retract both wings to the vee position.

Wing Mode

To put the control into the wing mode, press and hold the MODE button for about two seconds until the MODE LIGHT near the upper left corner of the keypad is flashing. The L / SCP and R / VEE buttons are used to activate the four functions of the wing mode. The RAISE and LOWER buttons function the same as in the other modes.



To deactivate the wing mode, quickly press and release the MODE button. This puts the control in the straight blade mode.

The following functions are performed in the wing mode:

Button	Description of Operation
RAISE	Press this button to raise the snowplow and to cancel the float mode. NOTE: Snowplow automatically stops raising after 2.5 seconds. To resume raising the snowplow, release the button and press again.
LOWER	Press this button to lower the snowplow. NOTE: After reaching the desired height, release the button. Holding the button down for more than 3/4 second activates the float mode, indicated by green FLT LAMP. This allows the blade to move up and down to follow the contour of surface being plowed.
L / SCP	Pressing this button the first time retracts the left wing. Pressing this button the next time extends the left wing.
R / VEE	Pressing this button the first time retracts the right wing. Pressing this button the next time extends the right wing.

OPERATING YOUR SNOWPLOW

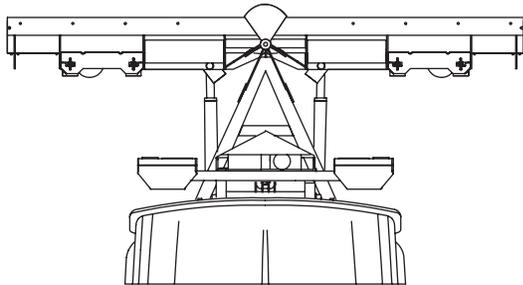
BLADE POSITIONS

NOTE: For best road clearance during transport, place the blade halfway between the straight and vee positions. The scoop position is NOT RECOMMENDED during transport.

The EZ-V® snowplow can be used in five basic plowing positions:

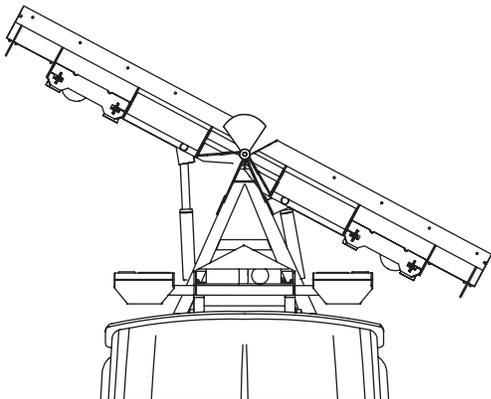
Straight Blade

Move both wings to form a straight blade for wide path plowing or "stacking" snow.



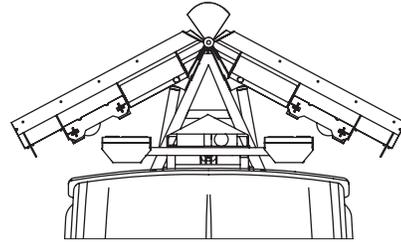
Angled Blade

Move one wing "OUT" and the other wing "IN" to form an angled blade in either direction for general plowing and widening.



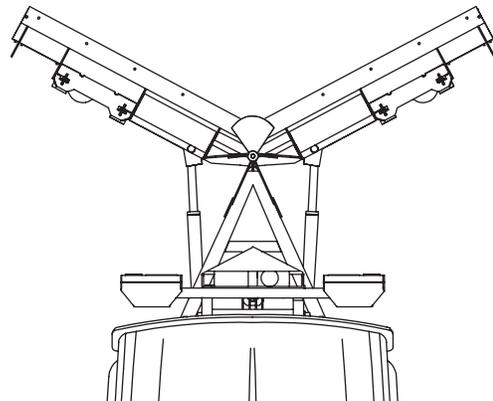
Vee Blade

Move both wings "IN" towards the vehicle for initial break through plowing and plowing paths or walkways.



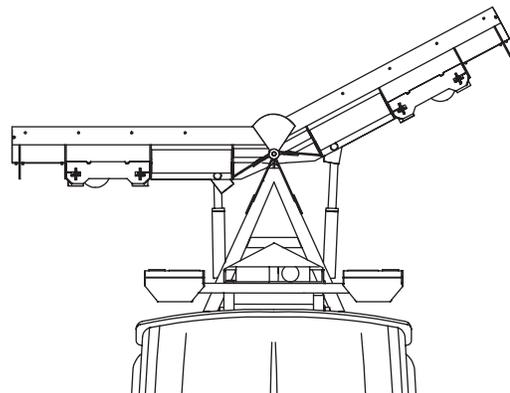
Scoop Blade

Move both wings "OUT" away from the vehicle to form a scoop to "carry" snow with minimum spillover.



Dogleg Blade

Move one wing to straight blade position and the other "OUT" to scoop blade position for clean up of windrows.



OPERATING YOUR SNOWPLOW

SNOWPLOW HEADLAMP CHECK

With both electrical plugs connected, check the operation of vehicle and snowplow headlamps.

Lights	Results
Parking Lamps	Both vehicle and snowplow lamps should be on.
Right Turn Signal	Both vehicle and snowplow lamps should be on.
Left Turn Signal	Both vehicle and snowplow lamps should be on.

Connecting and disconnecting the electrical plugs should switch between the vehicle and snowplow headlamps as follows:

- Electrical plugs DISCONNECTED – The vehicle headlamps should light up.
- Electrical plugs CONNECTED – The snowplow headlamps should light up.

Aiming the Headlamps

- Aim the snowplow headlamps with the snowplow mounted and raised in the transport position. See Aiming Headlamp Beams in the Maintenance section for instructions.
- Aim the vehicle headlamps with the snowplow removed from the vehicle.

ANTIWEAR SHOE ADJUSTMENT

⚠ WARNING

Blade can drop unexpectedly. Place blade on jack stands. Failure to do so could result in serious personal injury.

⚠ CAUTION

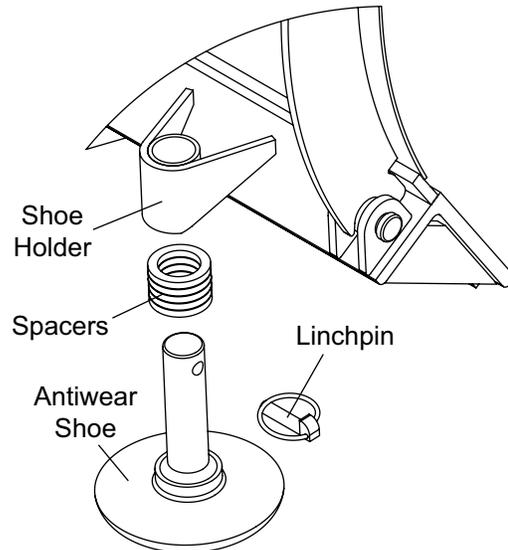
Do not store unused spacers on top of the shoe holder. This could damage the blade.

Recommended Shoe Adjustments

For gravel surfaces: The bottom surface of the shoe should be 1/4" to 1/2" below the cutting edge.

For hard surfaces (concrete or asphalt): The bottom surface of the shoe should be even with the cutting edge.

Adjustment Procedure



1. Raise the blade 1' off the road surface, turn the control to the OFF position, and from in front of the blade, place jack stands or sturdy blocking under the cutting edge.
2. Turn the control to the ON position, and lower the blade onto the jack stands or blocking. Turn the control and the vehicle ignition to the OFF position.
3. Remove the linchpin, and slide the antiwear shoe down and out of the shoe holder.
4. Remove one or more spacers from the shoe stem, and reinstall the shoe into the shoe holder.
5. Reinstall the linchpin.
6. Turn the vehicle ignition to the ON position, and turn the control to the ON position. Raise the blade slightly from the jack stands. Turn the control to the OFF position, and remove the jack stands.
7. Stand 8' clear of the blade drop zone when checking the height adjustment of the cutting edge to the road surface.
8. Do not store unused spacers on top of the shoe holder.

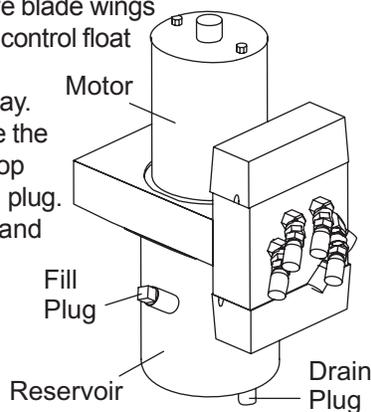
OPERATING YOUR SNOWPLOW

HYDRAULIC SYSTEM

The Insta-Act Hydraulic Unit's valve manifold includes four cushion valves to prevent damage to the blade or vehicle if an obstacle is hit at either end of the blade. When force against the blade causes the pressure in an **extended ram** to exceed set limits, the cushion valve opens allowing fluid to escape and the ram retracts.

Fluid Level

With Minute Mount® 2 system attached to the vehicle, activate control and move blade wings to Vee position. Activate control float function and manually collapse lift ram all the way. Turn off control. Remove the fill plug. Fill reservoir to top of fill hole and replace fill plug. For hydraulic fluid type and filling instructions, see Hydraulic System, Annual Fluid Change, in the Maintenance section of this manual.



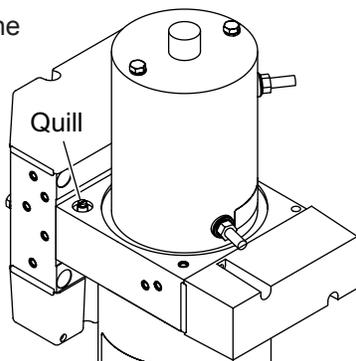
BLADE DROP SPEED ADJUSTMENT

⚠ WARNING

Keep 8' clear of the blade drop zone when it is being raised, lowered or angled. Do not stand between the vehicle and blade or directly in front of blade. If the blade hits you 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. Turn the quill IN (clockwise) to decrease drop speed. Turn the quill OUT (counterclockwise) to increase drop speed.



NOTE: Turning quill too far IN can slow raise time.

3. Stand 8' clear of the blade drop zone when checking adjustment.

TRANSPORTING SNOWPLOW

⚠ WARNING

Position blade so it does not block headlamp beam.

Do not change blade position while traveling. You could suddenly lower blade accidentally.

⚠ CAUTION

Transport speed should not exceed 45 mph. Reduce speed under adverse travel conditions.

NOTE: Use care when driving or entering driveways with the snowplow in the vee position. The outer ends of the cutting edges could contact the ground.

These instructions are for driving short distances to and from plowing jobs. Remove the snowplow from the vehicle for long trips and place in pickup box. The lift arm hook can be used as an attaching point to lift and move the snowplow following recommended mechanical lifting cautions and procedures.

1. Completely raise the blade.
2. Adjust the blade height for maximum snowplow headlamp illumination.
3. Adjust the blade to the straight position.
4. Move the control ON/OFF switch to OFF to lock blade in place.

NOTE: Overheating is unlikely under normal driving conditions, but occasionally the snowplow may be positioned where it deflects air away from the radiator. If this occurs, stop the vehicle and raise, lower or angle the snowplow slightly to correct overheating.

NOTE: Only the driver should be in the vehicle cab when the snowplow is attached.

OPERATING YOUR SNOWPLOW

DRIVING AND PLOWING ON SNOW AND ICE

CAUTION

Drinking then driving or plowing is very dangerous. Your reflex, perceptions, attentiveness and judgement can be affected by even a small amount of alcohol. You can have a serious or even fatal collision if you drive after drinking. Please, do not drink and then drive or plow.

Refer to vehicle owner's manual instructions for driving in snow and ice conditions. Remember when you drive on snow or ice, your wheels will not get good traction. You cannot accelerate as quickly, turning is more difficult and you will need longer braking distance.

Wet and hard packed snow or ice offers the worst tire traction. It is very easy to lose control. You will have difficulty accelerating. If you do get moving, you may have poor steering and difficult braking which can cause you to slide out of control.

Here are some tips for driving in these conditions:

- Drive defensively.
- Do not drink, then drive or plow snow.
- Plow or drive only when you have good visibility for operating a vehicle.
- If you cannot see well due to snow or icy conditions, you will need to slow down and keep more space between you and other vehicles.
- Slow down, especially on higher speed roads. Your headlamps can light up only so much road ahead.
- If you are tired, pull off in a safe place and rest.
- Keep your windshield and all glass on your vehicle clean to see around you.
- Dress properly for the weather. Wear layers of clothing, as you get warm you can take off layers.

PLOWING SNOW

WARNING

Never plow snow with head out the vehicle window. Sudden stops or protruding objects could cause personal injury.

CAUTION

Wear a seatbelt when plowing snow. Hidden obstructions could cause the vehicle to stop suddenly resulting in personal injury.

CAUTION

Flag any obstructions that are hard to locate under snow to prevent damage to product or property.

CAUTION

Never stack snow with the blade angled. This could damage the snowplow or the vehicle bumper.

CAUTION

Plowing speed should not exceed 10 mph.

NOTE: Only the driver should be in the vehicle cab when the snowplow is attached.

General Instructions

1. Before plowing, make sure you know of any obstructions hidden beneath the snow such as: bumper stops in parking lots, curbs, sidewalk, shrubs, fences or pipes sticking up from the ground. If unfamiliar with the area to be plowed, have someone familiar with the area point out obstacles.
2. If possible and you have good visibility, plow during the storm rather than letting snow accumulate.
3. Do not exceed 10 mph (16 kph) when plowing snow.
4. When you are stacking snow, begin raising the blade as you come close to the stack. This will let the blade ride up the stack.

OPERATING YOUR SNOWPLOW

Hard-packed Snow

1. On blades equipped with a shoe kit, raise the antiwear shoes so that the cutting edge comes into direct contact with the pavement. **Do not stack spare spacers on top of shoe holder.**
2. Use lowest gear to place maximum power behind cutting edge.
3. An angled blade is more effective for removing hard-packed snow.

Deep Snow

1. Shear off top layers by plowing with the blade raised 3 to 4 inches for the initial pass.
2. Bite into the edges using only partial blade width until job is cut down to size for full blade plowing.

Rule of thumb:

- 6" of snow — plow with entire blade width;
- 9" of snow — plow with 3/4 blade width; and
- 12" of snow—plow with 1/2 of the blade.

Experience and "feel" are the best guides.

3. When plowing deep snow, be sure to keep vehicle moving.
4. Ballast is suggested for maximum traction. Secure ballast behind the rear wheels. Do not exceed vehicle's GVWR and GAWR.
5. For increased traction use tire chains where legal.

Clearing Driveways

1. Head into the driveway with the blade angled and plow the snow away from any buildings. Widen driveway by rolling snow away from any buildings.
2. If a building is at the end of the driveway, plow to within a vehicle length of the building. Push as much snow as possible off the driveway.
3. With a raised blade, drive through remaining snow to building. Drop blade and "back-drag" snow away from the building at least one vehicle length. Repeat if necessary.
4. Back vehicle to the building and plow forward, removing the remaining snow from the driveway. Check municipal ordinances for proper disposal of snow.

Clearing Parking Lots

1. Clear areas in front of buildings first. With blade raised, drive up to the building. Drop blade and "back-drag" the snow away from building. When snow is clear of the buildings, turn the vehicle around and push snow away from the buildings towards outer edges of lot.
2. Plow a single path down the center in the lengthwise direction.
3. Angle the snowplow towards the long sides, and plow successive strips lengthwise until the area is cleared and snow is "stacked" around the outer edges.
4. If snow is too deep to clear in above manner, clear main traffic lanes as much as possible.

PARKING WITH SNOWPLOW ATTACHED

WARNING

Lower blade when vehicle is parked. Keep 8' clear of blade drop zone. Temperature changes could change hydraulic pressure, causing the blade to drop unexpectedly or damaging hydraulic components. Failure to do this can result in serious personal injury.

Whenever you park your vehicle, completely lower the blade to the ground.

TOWING DISABLED OR STUCK VEHICLE

Do not use any snowplow components as an attaching point when retrieving, towing, or winching a disabled or stuck vehicle.

DETACHING SNOWPLOW & STORAGE

DETACHING SNOWPLOW

⚠ WARNING

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

⚠ WARNING

Inspect snowplow components and bolts for wear or damage whenever attaching or detaching the snowplow. Worn or damaged components could allow the snowplow to drop unexpectedly.

NOTE: The blade must be in the straight position when attaching or detaching the snowplow.

During the off-season, the control can be removed. Disconnect the connector in the cab and store the control in the glovebox of the vehicle.

⚠ CAUTION

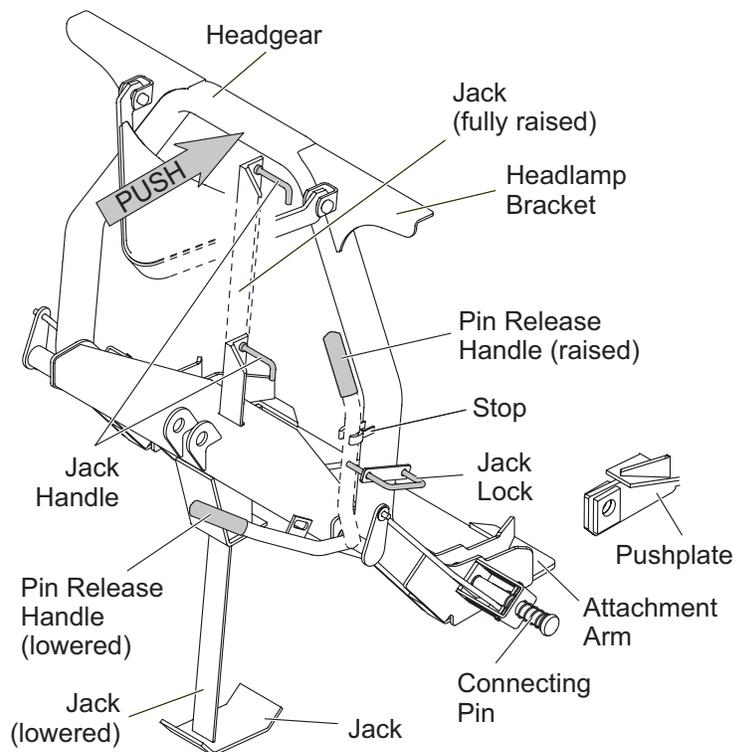
Never pull jack lock when blade assembly is not attached to vehicle. The headgear assembly will suddenly drop.

Detaching Steps:

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.

NOTE: After each use of the snowplow, reapply dielectric grease to the electrical plugs to maintain the protective coating on the terminals.

NOTE: Place electrical plugs in storage position. On the snowplow, connect control and lighting electrical plugs together. Insert battery cable into boot. On the vehicle, connect control and lighting electrical plugs together. Cover battery cable with attached boot.

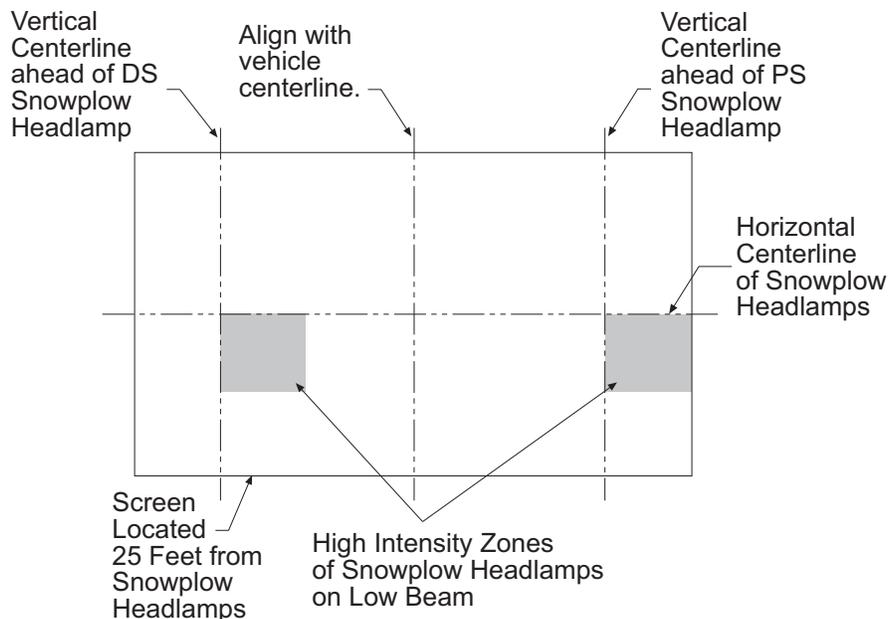


MAINTENANCE

AIMING HEADLAMP BEAMS

Torque headlamp fasteners to 45 ft-lb once correct visual aim is achieved.

1. Place vehicle on a level surface 25 feet in front of a matte-white screen, such as a garage door. The screen should be perpendicular both to the ground and to the vehicle centerline.
2. The vehicle should be equipped for normal operation. The snowplow blade should be in place and in raised position. Below are steps listed by the Society of Automotive Engineers (SAE) pertinent to headlamp aiming in specification #SAE J599d.
3. Prepare vehicle for headlamp aim or inspection. Before checking beam aim, the inspector will:
 - a. Remove ice or mud from under fenders.
 - b. Set tire inflation pressures to the values specified on vehicle information label.
 - c. Check springs for sag or broken leaves.
 - d. See that there is no load in the vehicle other than the driver and ballast as specified in the Kit Selection Guide.
- e. Check functioning of any automatic vehicle leveling systems and specific manufacturer's instructions pertaining to vehicle preparation for headlamp aiming.
- f. Clean lenses.
- g. Check for bulb burnout and proper beam switching.
- h. Stabilize suspension by rocking vehicle sideways.
4. Mark (or tape) the vertical centerline of the snowplow headlamps and the vertical centerline of the vehicle on the screen. Mark the horizontal centerline of the snowplow headlamps on the screen (distance from ground to snowplow headlamp centers).
5. Align the top edge of the high intensity zone of the snowplow lower beam below the horizontal centerline and the left edge of the high intensity zone on the vertical centerline for each snowplow headlamp. (Refer to diagram below.)



MAINTENANCE

PRESEASON CHECK

⚠ WARNING

Lower blade when vehicle is parked. Keep 8' clear of blade drop zone. Temperature changes could change hydraulic pressure, causing the blade to drop unexpectedly or damaging hydraulic components. Failure to do this can result in serious personal injury.

Before the snow season, check your equipment to make sure it's in working condition. Here are some tips for getting your equipment ready:

- Clean and tighten all electrical connections and coat with dielectric grease to prevent corrosion.
- Check hydraulic system for leaks and cracked or damaged hoses.
- Drain hydraulic system and refill with recommended hydraulic fluid. For hydraulic fluid type and filling instructions, see Hydraulic System, Annual Fluid Change, in this section of the manual.
- Replace worn or defective parts.
- Check all mounting points and tighten fasteners, on both snowplow and vehicle.
- Repaint blade assembly and attachments, as necessary, to protect the metal.
- Install auxiliary and flashing lights for compliance and visibility in accordance with local regulations.
- Check headlamps, auxiliary lights, heater and windshield wipers for proper operation.
- Inspect and test your battery. Recharge or replace as necessary.
- Ballast may be necessary, or beneficial, on some vehicles to provide maximum traction, braking and handling.
- Any ballast material (such as sand and blocks) must be solidly secured to the vehicle preventing it from moving under harsh plowing conditions.

POSTSEASON MAINTENANCE

⚠ CAUTION

Servicing the trip springs without special tools and knowledge could result in personal injury. See your authorized FISHER® outlet for service.

NOTE: Coat all electrical connections with dielectric grease.

- Clean and paint blade and attachments as needed.
- Be sure lift ram is collapsed so the rod is not exposed.
- Coat angle ram rods with general purpose petroleum grease.
- Lubricate all pivot points (for example, connecting pin assembly and lower spring anchor) with general purpose petroleum grease.

MAINTENANCE

MAINTENANCE AND ADJUSTMENT

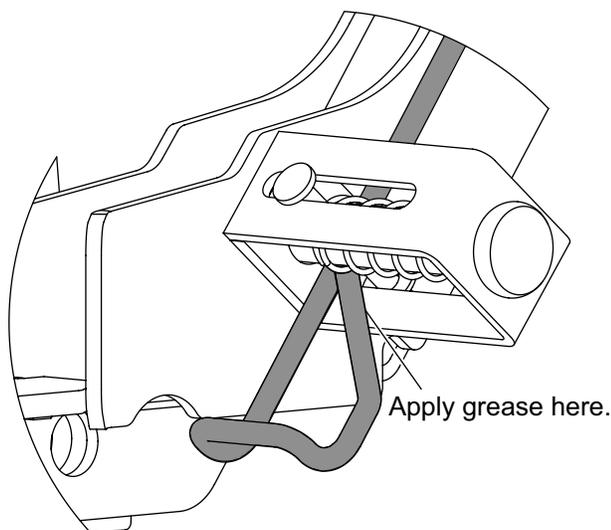
⚠ WARNING

Lower blade when vehicle is parked. Keep 8' clear of blade drop zone. Temperature changes could change hydraulic pressure, causing the blade to drop unexpectedly or damaging hydraulic components. Failure to do this can result in serious personal injury.

Your FISHER® snowplow is designed for rugged, dependable service. Though, like the vehicle on which it is mounted, it needs regular care and maintenance.

Check that all fasteners, mounting bolts, hydraulic and electrical connections are tight before each storm and frequently throughout season. Also check all plugs and seals for leaks. Repair as necessary.

Lubricate all moving parts, especially the connecting pin extractors, for ease of operation. Not doing so will make operation of the mount difficult and possibly damage components.



Lifting

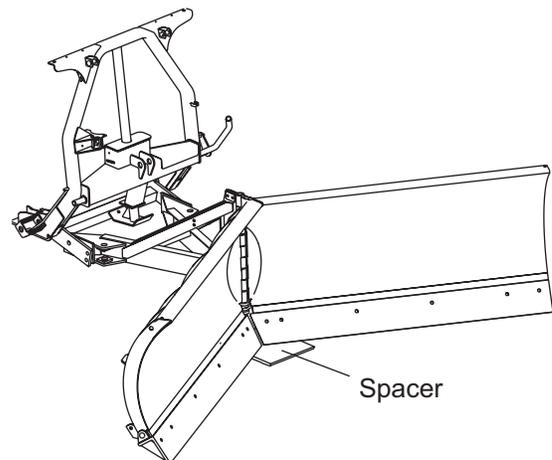
The lift arm hook can be used as an attaching point to lift and move this snowplow following recommended mechanical lifting cautions and procedures.

A-Frame to Push Assembly Adjustment

In the operation of "V"-type snowplows, it is crucial that the blade pivot separating the two wings be kept as close to perpendicular with the ground as possible. This perpendicular position of the blade pivot allows the blade wings to maintain complete contact with the ground through their full range of motion. Your snowplow was set up at the time of purchase to have the blade pivot perpendicular with the ground when mounted on your particular vehicle. There may be times that you will want to readjust the plow to A-frame angle in order to maintain the perpendicular blade pivot due to cutting edge wear, vehicle loading, or tire changes. Your EZ-V® snowplow has a means of allowing you to do this.

To adjust the A-frame for a perpendicular blade pivot:

1. Remove the snowplow antiwear shoes and the center rubber flap.
2. Attach the blade to the vehicle that the snowplow will be used on. The vehicle must be loaded and equipped as it will be when plowing. Park the vehicle on a flat surface and lower blade to ground.
3. Loosen the four fasteners that connect the push assembly to the A-frame. Remove the nuts from the 3/4" fasteners, remove the locking plates and reinstall the 3/4" nuts only tight enough to allow the bolt to move in the slot.
4. Position the snowplow in full scoop and raise the snowplow. Place a 1/4" spacer under the middle of the snowplow and lower the snowplow so the inner edges of the wings are on the spacer and the outer edges of the wings are on the flat surface.



MAINTENANCE

5. If this position of the wings can not be achieved, use a different push assembly-to-headgear hole. If the outer edges of the wings will not touch the flat surface, raise the back end of the push assembly. If the inner edges of the wings will not touch the 1/4" spacer lower the back of the push assembly.

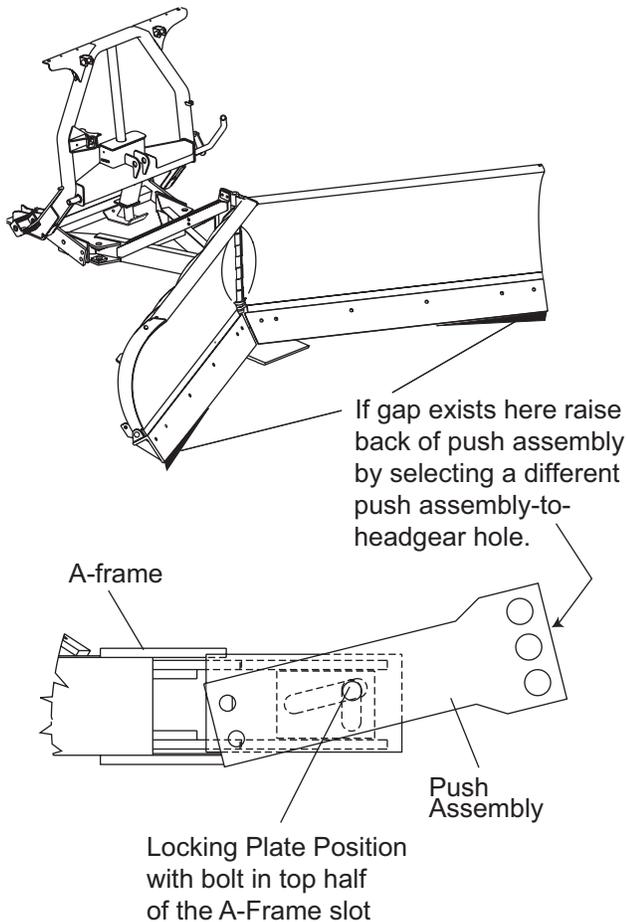
Reposition the push assembly to the headgear such that the wings' inner and outer edges touch.

6. Tighten the two forward 5/8" fasteners to 250 ft-lb.
7. Detach the snowplow from the vehicle and back the vehicle away from the snowplow.

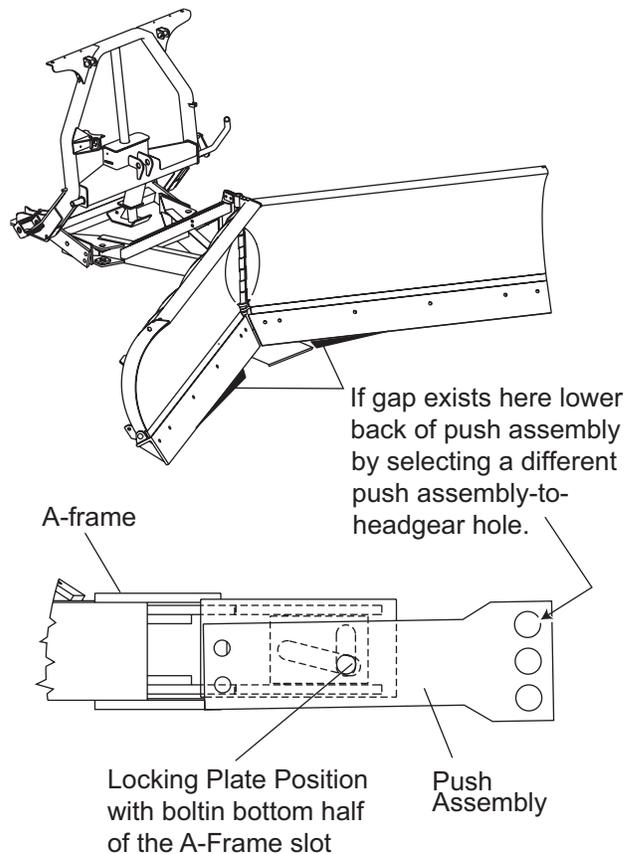
8. Determine the final position of the locking plates and install them. (See illustrations).
9. Reinstall the 3/4" nuts and torque them to 350 ft-lb.

After five A-frame adjustments, the four nuts and bolts that connect the push assembly to the A-frame should be replaced. Only use FISHER® original factory replacement parts. These fasteners are available from your local FISHER outlet.

Raise Push Assembly

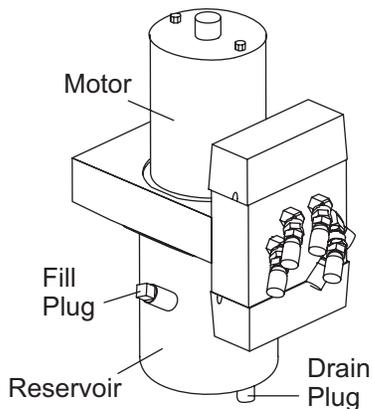


Lower Push Assembly



MAINTENANCE

HYDRAULIC SYSTEM



Fluid Level

⚠ CAUTION

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

NOTE: Add fluid only when all rams are retracted.

With the Minute Mount® 2 system attached to the vehicle, activate control and move blade wings to Vee position. Activate control float function and manually collapse lift ram all the way. Turn off control. Remove the fill plug. Fill reservoir to top of fill hole and replace fill plug. For fluid recommendations see the Annual Fluid Change section below.

Annual Fluid Change

⚠ CAUTION

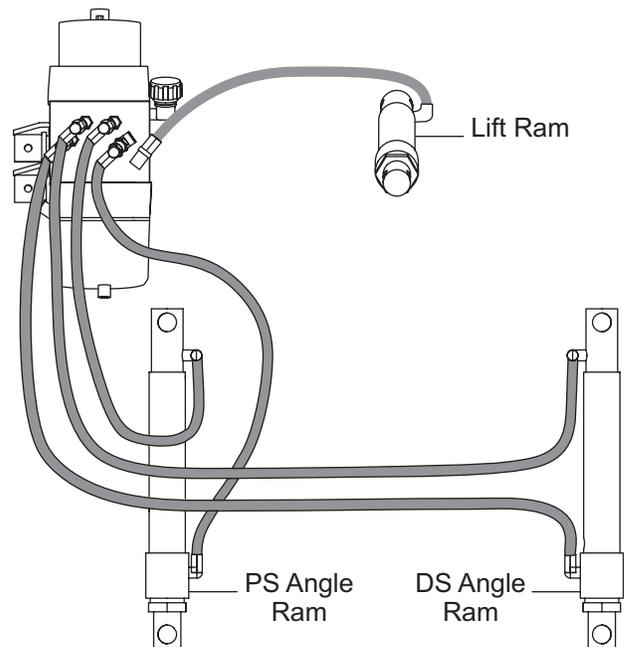
Change the fluid at the beginning of each plowing season. Failure to do this could result in condensation buildup during the non-snowplow season.

⚠ CAUTION

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

1. Perform this operation with the plow attached to the truck on a hard level surface.
2. Lower blade to ground.

3. Activate control float function and manually collapse lift ram all the way. Turn control off.
4. Remove drain plug located in the bottom of the hydraulic reservoir.
5. Completely drain reservoir and replace drain plug.
6. Remove the angle ram hoses from the fittings on the hydraulic unit and place in a drain pan or suitable container. (See illustration below and Hydraulic Hose or Fitting Replacement instructions.)



7. Manually angle the blades fully in each direction to remove fluid from the angle rams. Do not allow the hose from the opposite side of the ram to take fluid back in.
8. Reconnect the angle ram hoses to the proper fittings. (See illustration above and Hydraulic Hose or Fitting Replacement instructions.)

⚠ WARNING

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

⚠ CAUTION

Do not raise blade during fill process as this may cause pump cavitation.

MAINTENANCE

NOTE: Add fluid only when all rams are retracted.

9. With snowplow in Vee position and lift ram fully retracted, fill the reservoir with FISHER® EZ Flow Hydraulic Fluid to -40°F (-40°C), or other fluid conforming to Military Specification MIL-H-5606A, such as Mobil Aero HFA or Shell AeroShell® Fluid 4. Replace fill plug.
10. Turn control on and completely extend and retract the driver-side wing several times. With all rams fully retracted, turn control off.
11. Fill reservoir to top of fill hole and replace fill plug.
12. Repeat steps 10 and 11 for the passenger side wing.
13. Turn control on and raise and lower the snowplow several times. Activate control float function and manually collapse lift ram all the way after each lowering of the blade. With all rams fully retracted, turn control off.
14. Fill reservoir to top of fill hole and replace fill plug.

⚠ WARNING

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.

Hose or Fitting Replacement

DO NOT use thread sealant/tape on hoses or fittings. This could damage product. Follow recommended replacement procedures for fittings and hoses.

⚠ WARNING

Lower blade when vehicle is parked. Keep 8' clear of blade drop zone. Temperature changes could change hydraulic pressure, causing the blade to drop unexpectedly or damaging hydraulic components. Failure to do this can result in serious personal injury.

1. Turn off control.
2. Loosen hoses or fittings slowly to bleed off any residual pressure.

3. To remove a hose, loosen and unscrew the hose flare nut from the fitting.
4. To remove a fitting, loosen the jam nut and unscrew the fitting from the port.

Procedure for Installing Hydraulic Fittings and Hoses

NOTE: Over torquing JIC hose fitting ends will result in a fractured fitting.

DO NOT use any type of sealant or tape on the fittings or hoses. This could damage product. Always use two wrenches to ensure proper tightening of fittings and hoses.

Use the following procedure to install SAE O-ring fittings in valve block and rams.

1. Turn jam nut on fitting as far back as possible.
2. Lubricate O-ring with clean hydraulic fluid.
3. Screw fitting into port by hand until the washer contacts port face and shoulder of the jam nut threads.
4. Unscrew fitting to proper position no more than one full turn.
5. Using two wrenches, hold fitting body in position and tighten jam nut until the washer again contacts port face, then tighten an additional 1/8 to 1/4 turn to lock fitting in place. Final torque on the jam nut should be approximately 20 ft-lb.

Use the following procedure to install hydraulic hoses.

1. Screw flare nut onto fitting flare and hand tighten.
2. Align hose so there are no twists or sharp bends.
3. Using two wrenches, hold the hose in position and tighten flare nut 1/8 to 1/4 turn beyond hand tight. Final torque on the flare nut should be approximately 20 ft-lb.

Pump Inlet Filter Screen

Clean the pump inlet filter screen whenever the pump is removed. Replace the screen if it is damaged. Torque the die cast pump mounting cap screws to 150-160 in-lb.

MAINTENANCE

FUSE REPLACEMENT

The vehicle control harness contains two automotive blade-style fuses. The 15-amp fuse is for the snowplow park/turn power, and the 10-amp is for the snowplow control power. The 10-amp fuse is "hot" when the vehicle ignition switch is on and the electrical connections to the plow are completed.

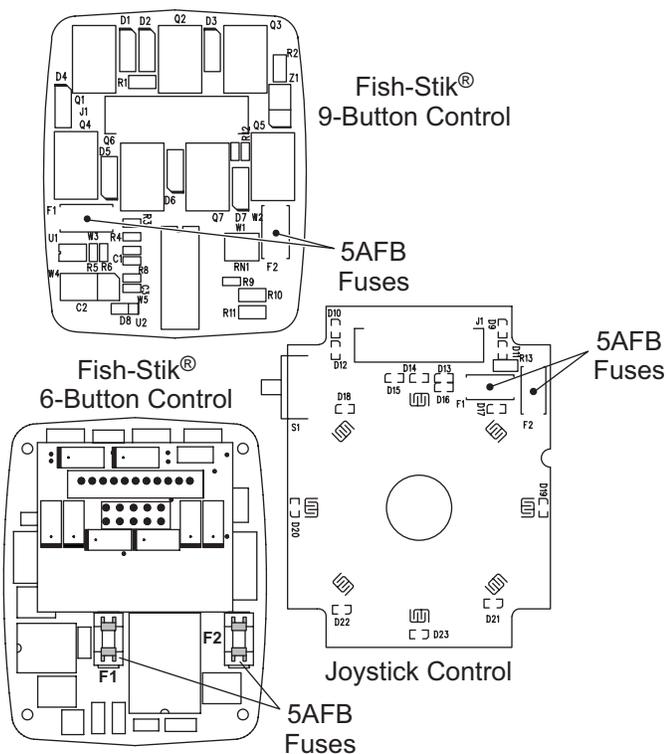
If a problem should occur and fuse replacement is necessary, the replacement fuse should be of the same value as the original. Installing a fuse of a larger value could damage the system.

See Harness Diagram on page 35 for fuse location.

⚠ CAUTION

Circuit board may be damaged by static electricity. Always touch ground before handling PC board.

The cab control contains two 5AFB printed circuit board (PCB) mounted fuses. These fuses are to protect the solid state devices that control the six solenoid valves and the motor relay coil. If the control does not function and the 10-amp fuse under the vehicle hood is not blown, one or both of these 5AFB PCB-mounted fuses may be blown.



If fuse F1 on the board is blown, the motor relay and solenoid coils on the main manifold block (1 cover) will not function.

If fuse F2 on the board is blown, the solenoid coils on the secondary manifold block (2 covers) will not function.

VEHICLE

The snowplow operating vehicle shall be maintained according to manufacturer's recommendations. Tire pressure shall be maintained according to manufacturer's recommendation.

RECYCLE

When your snowplow has performed its useful life, the majority of its components can be recycled as steel or aluminum. Hydraulic fluid shall be disposed according to local regulations. Balance of parts made of plastic shall be disposed in customary manner.

EMERGENCY PARTS / TOOLS

- 2 – 10" Adjustable Wrench
- 1 – Medium Screwdriver
- 1 – Pair of Pliers
- 1 – #20 TORX® Driver / 1/4" socket
- 7.5, 10, 15 Amp Automotive Blade-Type Fuses
- Funnel
- Test Light
- Flashlight
- 1/8" Allen Wrench
- 1/4" Ratchet, 6" Extension, 5/16" Socket
- Electrical Tape
- 1 – Quart FISHER® EZ Flow Hydraulic Fluid



TROUBLESHOOTING GUIDE

Some of the following guide corrections listed here are complicated. Unless you are very experienced in electrical and hydraulic repair, let your trained FISHER® outlet service personnel do the repairs.

Condition	Possible Cause	Correction
Control power indicator not on	Control not turned on.	Turn on control.
	No power to control.	Blown fuse. Part of the FISHER® vehicle control harness. Replace fuse.
	Plow/vehicle lighting harness not connected.	Properly connect both harnesses.
Motor does not run	Plow/vehicle harnesses not connected.	Properly connect both harnesses.
	Blown fuse in FISHER vehicle control harness.	Replace blown fuse in control harness.
	Control malfunction or fault in wiring.	See FISHER outlet for repair information.
Motor will not shut off	Motor relay or control malfunction or fault in wiring.	See FISHER outlet for repair information.
Snowplow won't raise or raises slowly or partially	Excess weight on blade.	Remove snow and/or ice buildup or aftermarket accessories (excess weight).
	Hydraulic fluid level low or wrong fluid is used.	Fill reservoir to proper level with recommended fluid. Do not mix different hydraulic fluid types.
	Blown fuse in FISHER vehicle control harness.	Replace blown fuse.
	Vehicle battery weak or charging system defective.	Replace battery and check charging system.
	Motor worn or damaged or fault in wiring.	See FISHER outlet for repair information.
	Pump filter clogged, worn or damaged pump, or hydraulic system malfunction.	See FISHER outlet for repair information.
Snowplow angles or wings move slowly or partially	Hydraulic fluid level low or wrong fluid is used.	Fill reservoir to proper level with recommended fluid. Do not mix different hydraulic fluid types.
	Vehicle battery weak or charging system defective.	Replace battery and check charging system.
	Air trapped in angle rams.	Cycle wings per procedure to remove air from rams.
	Angle rams damaged.	See FISHER outlet for repair information.
	Motor worn or damaged, or fault in wiring.	See FISHER outlet for repair information.
	Pump filter clogged, worn or damaged pump, or hydraulic system malfunction.	See FISHER outlet for repair information.

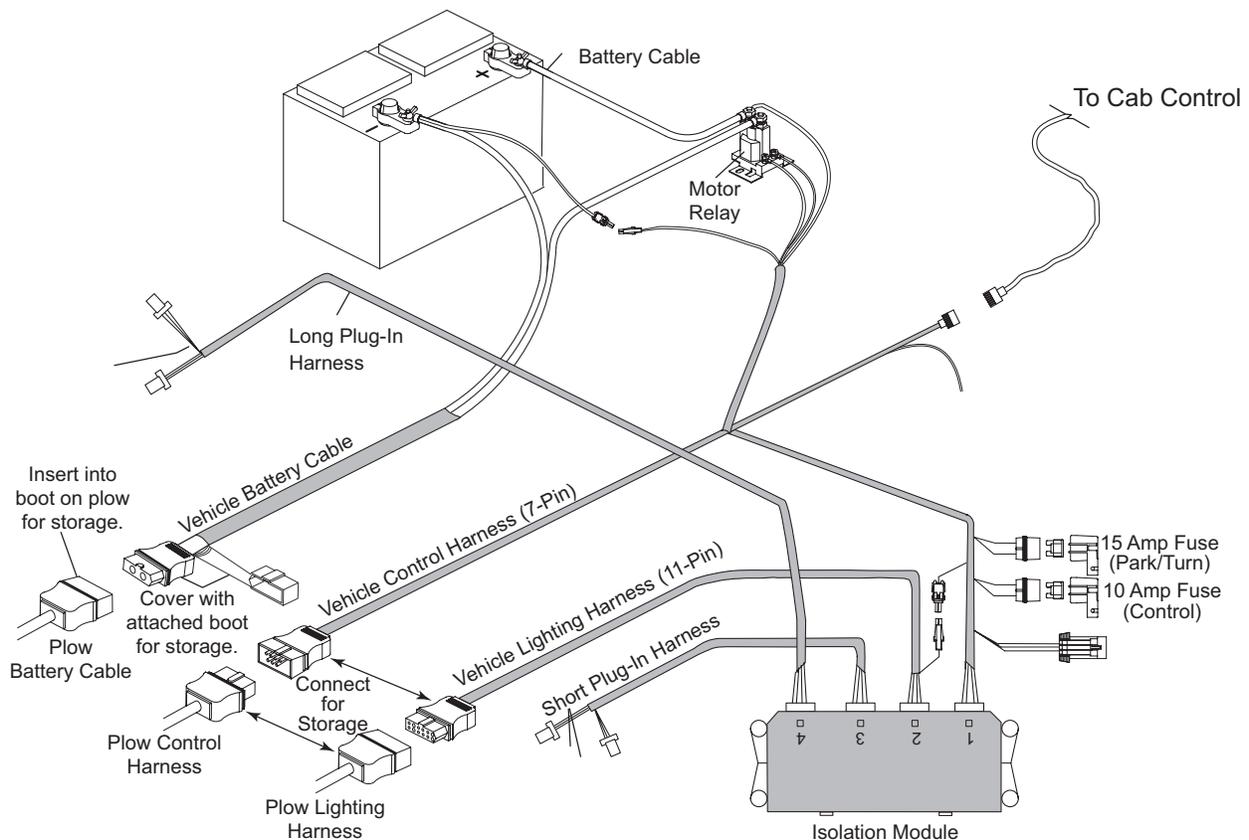
TROUBLESHOOTING GUIDE

Condition	Possible Cause	Correction
Snowplow won't lower, lowers slowly, or won't float	Hydraulic fluid not correct for outside temperature.	Use recommended fluid.
	Blown fuse in FISHER® vehicle control harness.	Replace blown fuse.
	Control or hydraulic system malfunction or fault in wiring.	See FISHER outlet for repair information.
Snowplow lowers by itself or won't stay in raised position	Hydraulic fittings or hoses loose or damaged.	Tighten or replace components or see FISHER outlet for repair information
	Control or hydraulic system malfunction.	See FISHER outlet for repair information.
Wings will not lock hydraulically or hold position	Hydraulic fittings or hoses loose or damaged	Tighten or replace components or see FISHER outlet for repair information
	Air in angle rams	Check fluid level. Cycle wings per procedure to remove air from rams.
	Hand-held control or hydraulic system malfunction, or fault in wiring.	See FISHER outlet for repair information.
Snowplow does not perform the selected function or performs a different function	Hydraulic hose routing incorrect.	See FISHER outlet for repair information.
	Control or hydraulic system malfunction, or fault in wiring.	See FISHER outlet for repair information.
Fluid leaks from hydraulic system	Reservoir overfilled.	Do not fill reservoir beyond filler plug.
	Failed seal/O-ring.	See FISHER outlet for repair information.
	Loose or damaged hydraulic fittings, hoses, plugs, or hardware.	Tighten loose components. See FISHER outlet for repair information.
Fluid leaks from angle or lift ram	Hydraulic fittings or hoses loose or damaged.	Tighten or replace components or see FISHER outlet for repair information
	Angle or lift rams damaged.	See FISHER outlet for repair information.
Fuse in FISHER control harness blown	Motor relay or control malfunction, or fault in wiring.	See FISHER outlet for repair information.
Vehicle fuse blows	Circuit overloaded, or fault in wiring.	See FISHER outlet for repair information.
Excessive load on vehicle electrical system while using snowplow	Hydraulic fluid not correct for outside temperature.	Use recommended fluid.
	Vehicle battery weak or charging system defective.	Replace battery and check charging system.
	Worn or damaged motor or pump, or fault in wiring.	See FISHER outlet for repair information.
	Vehicle electrical system inadequate.	Check vehicle specifications and FISHER recommendations.
Vehicle battery loses charge when snowplow is not being used.	Vehicle battery weak.	Replace battery.
	Wiring fault.	See FISHER outlet for repair information.

TROUBLESHOOTING GUIDE

Condition	Possible Cause	Correction
Snowplow headlamps operate irregularly or not at all (plow attached).	Plow and vehicle lighting harnesses are not mated correctly.	Properly connect both harnesses.
	Burned out bulbs or corroded sockets.	Replace bulbs, clean contacts.
	Isolation Module not operating or fault in wiring.	See FISHER® outlet for repair information.
Vehicle headlamps operate irregularly or not at all, with snowplow removed.	Burned out bulbs.	Replace bulbs.
	Defective vehicle fuse.	Replace fuse.
	Fault in peculiar harness wiring.	See FISHER outlet for repair information.
Vehicle daytime running lights (DRL) do not work with snowplow removed.	Parking brake on. Gear selector not in drive. Vehicle light sensor has activated headlamps.	Fully release parking brake.
	Power or DRL circuit has been interrupted.	Turn on light and/or ignition switch to cycle the DRL circuitry.
Plow park/turn lamps not operating.	Blown fuse. Part of the FISHER vehicle control harness.	Replace fuse.

HARNESS DIAGRAM





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