



the  
snowplow  
professionals

# **OWNER'S MANUAL**

FISHER ENGINEERING • PO BOX 529 • ROCKLAND, MAINE 04841

## PREFACE

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Welcome to the growing family of FISHER Snowplow owners.

This manual has been prepared to acquaint you with the operation and maintenance of your new FISHER Snowplow and to provide safety information. We urge you to read this manual carefully and to follow its recommendations. This will help ensure profitable and trouble-free operation of your snowplow.

When service is necessary, your local FISHER Dealer, Service Center, or Distributor knows your plow best and is interested in your complete satisfaction. Return your snowplow there for maintenance service or any other assistance you may require.

Your vehicle should be equipped with all vehicle manufacturer's options for snowplowing.



**S**AFETY NOTE: Whenever you see this symbol, it notes a SAFETY WARNING. For your own protection and safety these warnings must be followed. Failure to do so could result in serious bodily injury to yourself or others.

FISHER offers a one year limited warranty for all snowplows and accessories. See separately printed page for this important information. FISHER does not warranty non-Fisher Service Parts or Accessories or the damage caused by the use of these unauthorized items.

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The procedures and illustrations in this guide are based on latest production information available at time of publication. 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 herein.

## UNIQUE FEATURES OF FISHER SNOWPLOWS

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### H.S. Series -

6-1/2' and 7' blade custom designed for compact trucks - High Strength (H.S.) low alloy steel is used in building these unique snowplow kits. Standard abrasion resistant polymer cutting edge picks up snow easily and casts it aside smoothly.

### "L" Series -

Our L-Series blade is available in 6-1/2', 7', 7-1/2', 8' & 9' widths. Speed-cast moldboard with unique trip Base Angle backed with wear resistant bars. \*

Improved location of the moldboard bottom bar makes the L-Series even tougher than the earlier G & H Series.

The 7-1/2, 8, and 9 foot blades are available with replaceable cutting edges.

### H.C. Series -

10 ft. Commercial designed for rugged snow removal for up to 27,500 pound Gross Vehicle Weight (GVW), two-wheel drive vehicles. Replaceable cutting edge, four cast iron shoes, standard 2" cylinders, plow lights and flexible blade guides make a combination to do the job easier.

\*These are two 1/2" x 2-1/2" x 12" special steel wear-bars welded at the corners behind the base angle.

## FISHER SNOWPLOW ACCESSORIES AND OPTIONS

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### PlowMate™

An attractive off-season alternative to the standard Fisher headgear. Available in black semi-gloss finish coat or grey primer coat.

### PumpMate™

A custom clutching pump pulley. Provides the convenience of disengaging the hydraulic pump without removing the belt.

### SnoFoil

A rigid extension to your snowplow blade to deflect light snow away from the windshield, improving your plowing visibility, efficiency and speed. Bolts onto existing blades with ease. Available in 7', 7-1/2', 8' and 9'. Primarily intended for the extra duty use of the commercial snowplow, where time efficiency is a must.

### Snowplow Deflector

Keeps fluffy snow from boiling over the snowplow blade. Fits "L" Series FISHER blades. Easy installation and attractively priced.

### Replaceable Cutting Edge

3/8" or 1/2" cutting edges made of high carbon steel to bolt onto your base angle for maximum blade life. Intended for the commercial snowplow and available in 7-1/2', 8', 9' and 10' sizes.

### Anti-wear Shoes

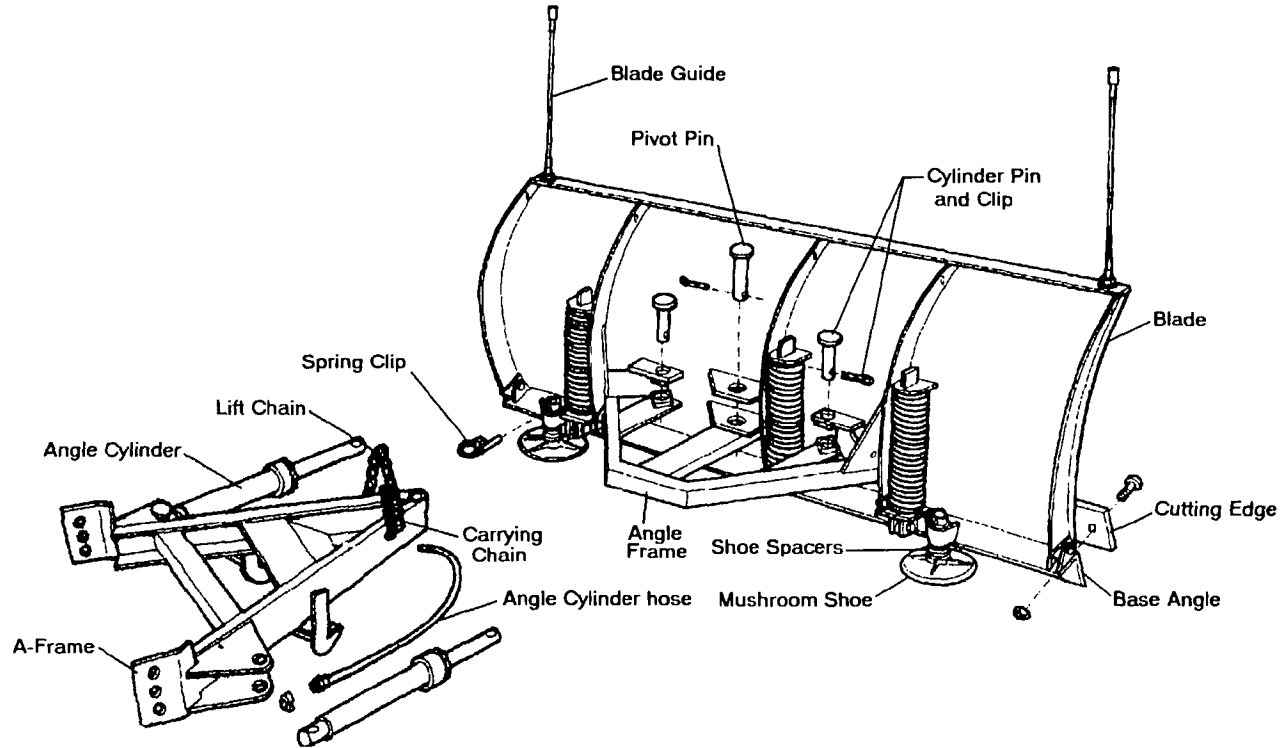
These shoes are offered for maximum protection against wear. The more the blade is used, the more important the shoes become.

### Touch-up Paint

FISHER yellow touch-up paint is available to keep your plow protected from rust - a must for the long duration of summer.

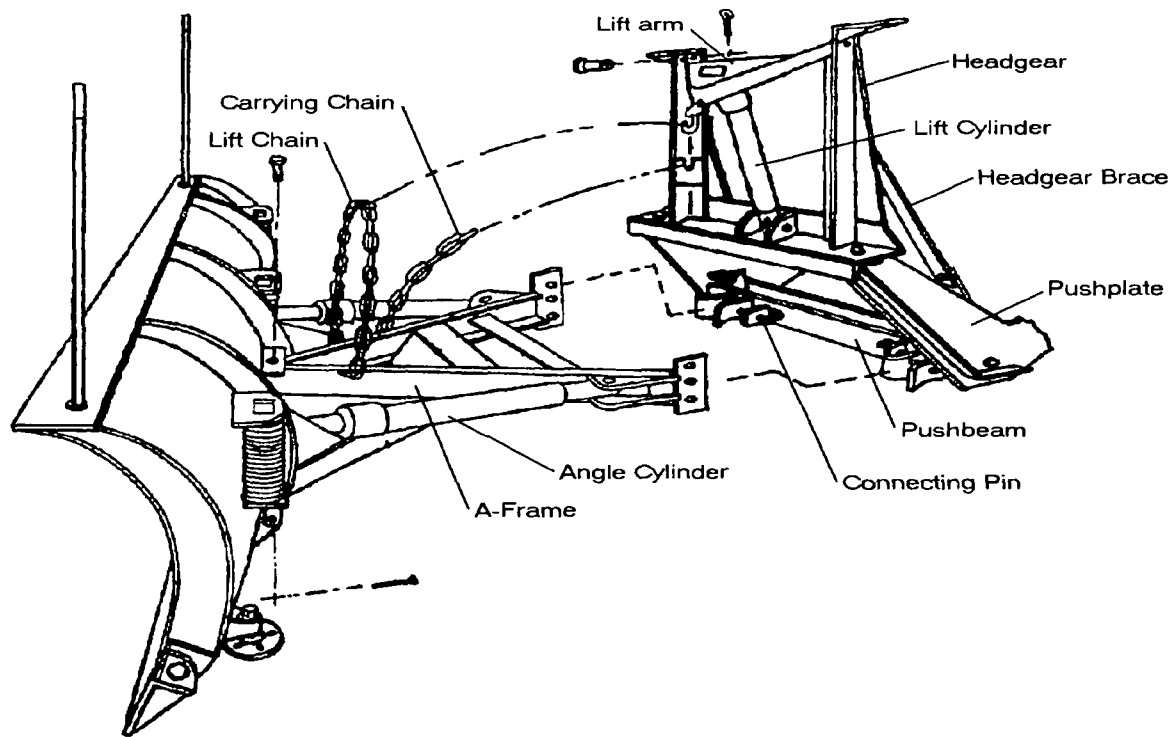
**NOTE:** Should you find that your local Fisher outlet is temporarily out of stock, please contact FISHER ENGINEERING - P.O. BOX 529 - ROCKLAND - MAINE 04841 (207)594-4446. We will make sure that you are able to purchase whatever you desire. FROM ANYWHERE: 1-800-FISHER1

# BLADE AND A-FRAME



## ATTACHMENTS

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## HYDRAULIC POWER

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The heart of any snowplow is its hydraulic system - the components that raise, lower and angle the plow blade. No one gives you more hydraulic options than Fisher! Under the hood hydraulics as well as our front-mounted Electric Hydraulic Pak and Solenoid Electric Hydraulic Pak are available to power your Fisher blade.

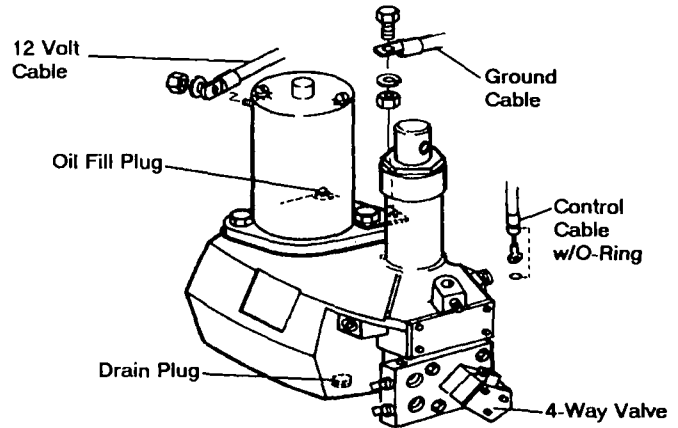
### UNDER THE HOOD HYDRAULICS

With this system, the major hydraulic components are mounted under the vehicle hood - protected from snow, ice and possible theft. Engine heat helps keep the hydraulic oil at its optimum operating temperature, ensuring consistent hydraulic performance.

The Fisher Belt Drive is the most dependable hydraulic system available to power a snowplow. With Fisher belt drive, the hydraulic pump is powered by a drive pulley, usually connected to the engine crank shaft. The pump then delivers oil to the control valve where it is directed to the lift or angle cylinders. Using belt drive you avoid potential electrical system overload - especially important during night -time plowing when electrical demands on your battery are already high.

### FRONT- MOUNTED ELECTRIC

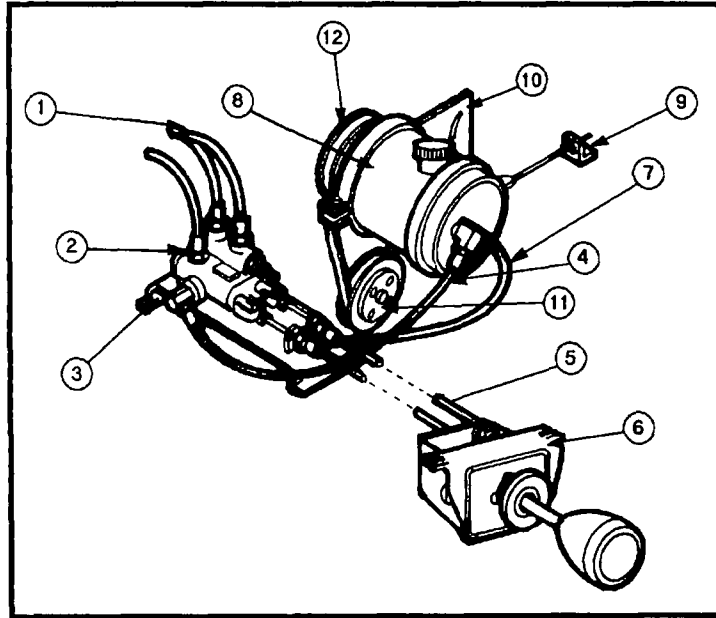
The Fisher Electric Hydraulic Pak and Solenoid Electric Hydraulic Pak is the ideal alternative when under-the-hood hydraulics are not available. These self-contained, sealed units provide fast, reliable lifting and angling action. See separate manuals for operation and maintenance recommendations.





## BELT DRIVE HYDRAULICS WITH SINGLE LEVER CONTROL

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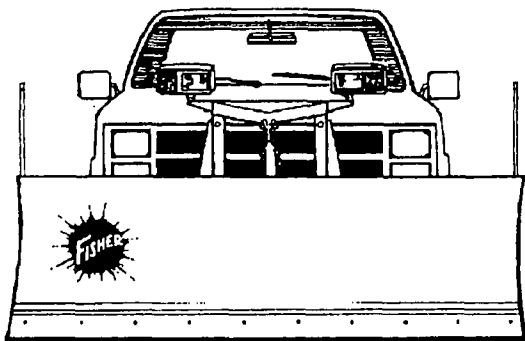
1. Hydraulic Hoses
2. Control valve
3. Valve mounting plate
4. High pressure hose
5. Control cables
6. Single lever control
7. Low pressure return hose
8. Belt drive pump
9. Brace rod and tab
10. Saddle bracket
11. Drive sheave
12. Pump sheave

## LIGHT KIT

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The rectangular design of the Low Profile Lights provides up to date styling while allowing maximum driver visibility. The light kit includes a set of approved dual beam rectangular Halogen headlamps plus combination park and turn signals, brackets and a switch.

Plow headlamps are to be used **ONLY** when plow is attached. Vehicle headlamps are to be used when plow is **NOT** attached.



**W**ARNING: Before traveling, position blade so it does not block headlamp beam. Do not change blade position while traveling. Incorrect plow position blocking headlamp beam can result in an accident.

Replacement 2E1 Seal Beam headlamps are available through Chrysler Product dealers or may be ordered through NAPA dealers or other parts houses.

## MOUNTING SNOWPLOW TO VEHICLE

FISHER plows are easy to mount and remove from your vehicle. The Blade and A-Frame are usually removed and stored as a complete assembly.

### Mounting Blade to Vehicle:

1. Position vehicle so the pushbeam connecting pins are located over the rear ears of the A-frame. Apply parking brake or otherwise secure vehicle.
2. Using the release hook furnished with the snowplow, pull both connecting pin assemblies on the pushbeam to the "Open" position and turn one-quarter of a turn to hold in "Open" position.



**W**ARNING: Inspect Lift Arm and bolts whenever hooking or unhooking the plow, and before traveling. Worn or damaged components could result in the plow dropping to the pavement while driving causing an accident.

3. Attach the lift chain to the lift arm hook. Be sure lift chain is centered on lift hook so the blade weight will be carried equally on both sides of the lift chain.



**W**ARNING: DO NOT place finger in A-frame and pushbeam lug holes to check alignment. Sudden motion of the plow could severely injure a finger.

4. Using the Single Lever Control, slightly lift the A-frame so the holes in the A-frame ears are aligned with the pushbeam connecting pins. Where possible, pin the hole which will keep the A-frame level with truck.
5. Using the release hook, release the pushbeam connecting pins to secure the A-frame and blade to the pushbeam
6. Connect the angle cylinder hose disconnects to their opposite halves on the headgear disconnect plate.
7. Switch to plow light operation.
8. The plow is now ready for operation.



**W**ARNING: DO NOT stand between the vehicle and blade or directly in front of blade when it is being raised, lowered or angled. Clearance between vehicle and blade decreases as blade is operated. Serious bodily injury can result from blade striking a body or dropping on feet or hands.

## REMOVAL & STORAGE OF SNOWPLOW

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1. Drive vehicle to blade storage location, apply parking brake and unhook carrying chain from headgear.



**W**ARNING: Keep hands and feet clear of blade and A-Frame when removing or attaching plow. Moving or falling assemblies can cause serious bodily injury.

2. Lower plow to ground. Turn off engine. Release pressure in angling cylinders by actuating control lever to angle left and angle right repeatedly. Leave control lever in float position.
3. Cause slack in lift chain and remove the chain from hook.
4. Disconnect the angling cylinder hoses at quick disconnects. Reconnect the hoses, one to another, to exclude dirt from the hose disconnects.
5. Place dust plugs/caps on disconnects remaining on the vehicle.

**PLEASE EXERCISE CAUTION** with the following operation as the blade assembly will drop free from the pushbeam - it is NOT self supporting. You may "block up" the A-frame so that it does not drop and is positioned such that you may later attach it to the vehicle more easily by driving ahead into the A-frame ears.

6. Pull the two beam connecting pins with release hook to release the blade/A-frame assembly from the vehicle.



**W**ARNING: Inspect Lift arm and bolts whenever hooking or unhooking the plow, and before traveling. Worn or damaged components could result in the plow dropping to the pavement while driving causing an accident.

7. Switch back to vehicle headlight operation.

**NOTE - For long term storage, grease exposed chrome surfaces of the angle cylinder rams to prevent rust.**

## TIPS ON USING THE PLOW

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Operating a vehicle equipped with a snowplow is not difficult if you follow these simple suggestions --

- \* Be sure you know of any obstructions hidden beneath the snow - bumper stops in parking lots, abutment, curbs, sidewalk edges, shrubs, fences, or pipes sticking up from the ground. Flag these if necessary to prevent an accident or damage to plow or vehicle.



**W**ARNING: Driver must always wear seat belt when plowing snow. A hidden obstruction could cause the vehicle to stop suddenly. Head, neck or body injury can result from hitting the windshield, dash or steering wheel.

- \* Plow with the storm rather than letting snow accumulate.



**W**ARNING: Never plow with head out of the vehicle window. Sudden stops or protruding objects could cause severe neck or head injuries.

- \* Overheating is unlikely under normal driving conditions. Occasionally, however, the plow may be in a position where air is deflected away from the radiator. Stop the vehicle and raise or lower the plow slightly to correct overheating.

- \* Auxiliary headlights and directional lights provide added safety and better lighting for night work and are a National Highway Traffic Safety Administration (NHTSA) requirement. Before transit, adjust the raised blade height for maximum illumination from auxiliary lights.
- \* Deep snow conditions -- in snow a foot or more deep, you may need to shear off top layers by plowing with the blade raised 3 to 4 inches for the initial pass. Bite into the edges using only partial blade width until job is cut down to size for full blade plowing. Rule of thumb: 6" snow may be plowed with entire blade width; 9" with 3/4 blade; 12" with 1/2 blade. Experience and "feel" are the best guides. When plowing deep snow, be sure to keep vehicle moving. Ballast is suggested for maximum traction. See Step 1 of "Count-down for Plowing", page 13.
- \* Stacking snow - As the "stacking" location is approached, begin raising the blade to start the ride-up onto the stack.
- \* Traveling - for normal travel to and from jobs, carry the blade in the straight position. For long trips, the blade should be removed from the front of the vehicle.

## TIPS ON USING THE PLOW

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### DRIVEWAYS AND PARKING LOTS

The two most common snowplowing sites are driveways and parking lots. General directions for clearing both areas are detailed below.

#### Clearing Driveways

1. Head into drive with angled blade and plow snow away from buildings. Widen drive by rolling snow away from building.
2. If garage is at end of driveway, plow up to within several vehicle lengths of garage. Then push as much snow as possible off driveway.
3. With raised straight blade, drive through remaining snow to building. Drop blade and "back-drag" snow away from garage door at least one vehicle length. Repeat if necessary.
4. Back vehicle to garage door and plow forward toward street, removing remaining snow from driveway. Check municipal ordinances for disposal of snow.

#### Clearing Parking Lots

1. Clear areas in front of buildings first. "Back-drag" near walls. Work away from buildings towards outer edges of lot.
2. Plow a single path down center in long direction.
3. Angle plow toward the long sides, continue until area is cleared and snow is "stacked" around outer edges.
4. If snow is too deep to clear in above manner, clear main traffic lanes as much as possible.



**W**ARNING: ALWAYS "LOWER" blade when vehicle is parked. In a warm area or where extreme temperature change is likely, this will prevent possible damage to housing or packings due to oil expansion. Personal injury could result from sudden blade drop.

## COUNTDOWN FOR PLOWING

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Before the snow flies, check your equipment and make sure it's ready for action. Here's an Eight Step Countdown for getting your equipment set for the snowplowing season --

8. Check hydraulic system for leaks and cracked or damaged hoses. Check oil level (push lift arm all the way down). Replace worn or defective parts.
7. Check all mountings of snowplow to vehicle - tighten fasteners.
6. Repaint Blade Assembly and attachments as necessary to protect the metal from rusting when exposed to adverse conditions (salt, etc.).
5. Check windshield wipers, heaters, headlights and auxiliary lights.
4. Install auxiliary and flashing lights for safety when in accordance with regulations. Vehicle headlamps should be aimed without plow attached to the vehicle. Plow headlamps should be aimed with plow attached and in raised position.
3. Use chains on tires if additional traction is needed.
2. To permit snowplow to rise and fall (float) with contour of ground, leave some slack in the lift chain.
1. Counterbalancing (sand, blocks, etc.) may be necessary or beneficial on some vehicles to provide maximum traction. Any counterbalancing material used must be solidly secured to the vehicle to prevent it from moving under harsh snowplowing conditions that will be encountered. **DO NOT** exceed the Gross Vehicle Weight (GVW) or the Gross Axle weight Rating (GAWR) of your vehicle.

## SAFE OPERATING RULES

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### TRANSPORTING PLOW

Plow vehicle should be equipped with all vehicle manufacturer's options for snowplowing.

1. Only the driver should be in vehicle when plow is attached for plowing or during transport.
2. When transporting plow, slide Solenoid EHP ON/OFF Switch to the "OFF" Position or slide Single Lever Control lock spool into "Lock" position to prevent plow from being lowered accidentally.
3. Under ideal road conditions, transporting plow should be within posted road speeds. Reduce speed when crossing railroad tracks, road irregularities, or as road conditions deteriorate.
4. For normal travel to and from jobs, carry the blade in straight blade position. For long trips, the plow should be removed from the front of the vehicle.
5. Attach carrying chain from A-frame to Headgear post when carrying blade over the road.



**W**ARNING: Before traveling, position blade so it does not block headlamp beam. Do not change blade position while traveling. Incorrect plow position blocking headlamp beam can result in an accident.

### WHILE PLOWING

1. Only the driver should be in the vehicle when the plow is attached for plowing or during transport.
2. Driver must always wear seat belt when plowing snow. A hidden obstruction could cause the vehicle to stop suddenly.
3. Never plow with head out of the vehicle windows. Sudden stops or protruding objects could cause severe head or
4. When plowing, vehicle speed should be moderate and determined by conditions to provide vehicle control.



## SAFE OPERATING RULES

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### PARKING YOUR VEHICLE

1. Whenever you park your vehicle, lower blade to the ground to prevent accidental blade lowering.
2. ALWAYS "LOWER" blade when vehicle is parked. In a warm area or where extreme temperature change is likely, this will prevent possible damage to housing or packings due to oil expansion. Personal injury could result from sudden blade drop.

### SAFETY AROUND THE BLADE

1. Do not stand between the vehicle and the blade when it is being raised or angled. Clearance between vehicle and blade is decreased as blade is raised or angled.
2. Do not place hands, feet or any part of body under raised blade. Accidental lowering could cause injury.
3. Keep people clear of blade when raising or angling.

### SERVICING VEHICLE OR PLOW

1. Always lower the blade to the ground before performing any service to the vehicle or plow, or whenever the vehicle is left unattended.
2. Use extreme care when searching for electrical or mechanical problems which could energize the system without warning.
3. Use only recommended practices when using jumper or quick - start power source cables. Arcing near the battery could cause the battery to explode.
4. Always remove the blade if the vehicle is to be placed on hoist, or lower blade if vehicle is being serviced on the ground.

## SUMMER MAINTENANCE AND STORAGE

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- \* Clean and paint blade assembly as needed.
  - \* Connect angle hose male and female disconnects together and apply a light grease to exposed cylinder rods.
  - \* If blade is to be left in one location for an extended period of time - place blocks under the cutting edge and shoes to eliminate ground contact. This will reduce the chances of rust on the lower part of the plow.
  - \* Collapse lift cylinder so that cylinder rod is not exposed.
  - \* Remove pump belt (belt-driven hydraulics).
  - \* Disconnect power supply (electric hydraulics only).
  - \* Lubricate valve spools with a light grease.
  - \* Drain and flush hydraulic system and refill with automatic transmission fluid.
  - \* Remove the attachments and hydraulics to help improve fuel economy during the summer months.
1. Unplug lights from wiring harness - pull wiring harness behind the grill, seal the connector ends with tape and secure.
  2. If vehicle has an underhood mounted valve, remove the two bolts securing the disconnect plate with hoses to the headgear and secure plate to grill. Connect dust plug/cap to disconnect halves.
  3. Remove the bolts securing the headgear and headgear braces to the pushplates and remove headgear liftarm, lift cylinder, lights and braces as an assembly. Reverse this process in the fall to reinstall.

## TROUBLESHOOTING GUIDE

GENERAL		
Condition	Possible Cause	Correction
Blade angles in opposite direction and will not raise	1. Supply hose (high pressure) from pump is installed in wrong port valve.	Check that high pressure hose is installed in "in" port of valve.
Blade angles one way, but not the other	1. Low on fluid 2. Disconnect not completely connected 3. Blocked disconnect 4. Cables incorrectly adjusted so valve spool is not throwing full stroke.	Refill with type "A" automatic transmission fluid Connect disconnect. Replace disconnect halves Adjust cables. (Refer to Cable Section)
Blade will not Drop	1. Cables incorrectly adjusted so valve spool is not throwing full stroke 2. Cylinder seized  3. Carrying chain attached at headgear 4. Tight cylinder packing nut	Adjust cables. (Refer to Cable Section)  Place lever in "LOWER" position and manually exert leverage on lift arm to collapse cylinder. Remove and repair or replace cylinder. If manual leverage will not collapse cylinder, disconnect blade, remove and replace extended cylinder. New cylinder can be manually extended using a bench vise at the base and a bar thru the hole in the ram. Unhook carrying chain at headgear. Loosen packing nut
Blade will not raise	1. Low fluid level 2. Low pump pressure 3. Control handle not actuating valve spool fully	Refer to "Pump Section." Refer to "Pump Section." Refer to "Cable Section."  continued to page 18

## TROUBLESHOOTING GUIDE

Condition	Possible Cause	Correction
Control lever sticks on "Raise" or "Angle" positions	<ol style="list-style-type: none"> <li>1. Exposed spools on control valve where control cables attach are frozen from moisture or dirt.</li> </ol>	Apply lubricating grease. Valve spools must move freely, in valve body. A stuck spool may cause the pump to go on relief, resulting in premature failure.
Blade will not hold an angle	<ol style="list-style-type: none"> <li>1. Control cables out of adjustment.</li> <li>2. Control lever/valve not centering properly.</li> <li>3. "O" rings damaged on crossover cartridge.</li> </ol>	Refer to Cable Section. Control handle will be in centered position when both valve spools are in neutral when adjusted properly.
Blade raises slow but angles O.K.	<ol style="list-style-type: none"> <li>1. Low pump pressure.</li> <li>2. Raise cable incorrectly adjusted so valve spool is not throwing full stroke.</li> <li>3. Restriction in lift cylinder hose or fittings.</li> </ol>	Refer to appropriate "Pump Section." Refer to "Cable Section."  Check hoses and fittings.
Base angle/cutting edge wearing excessively	<ol style="list-style-type: none"> <li>1. Mushroom shoes not adjusted properly.</li> </ol>	Mushroom shoes should be adjusted to provide 1/4" to 1/2" clearance between cutting edge and surface. Place the supplied spacer rings between the shoe bracket to obtain this clearance. DO NOT store unused spacers on top of shoe bracket.
Pump shaft seal leaks (Belt drive)	<ol style="list-style-type: none"> <li>1. Reservoir overfilled.</li> <li>2. Shaft seal worn or defective.</li> </ol>	Refer to "Pump Section." Install new shaft seal.
Pump overheats, fluid boils	<ol style="list-style-type: none"> <li>1. Low on fluid.</li> <li>2. Pump on relief for extended periods.</li> </ol>	Fill to "Full" mark. DO NOT OVERFILL Make sure valve centers properly. (Refer to "Valve Section")

continued to page 19

## TROUBLESHOOTING GUIDE

Condition	Possible Cause	Correction
Pump overheats, fluid boils	3. Valve not centering properly	Adjust cable so valve spools throw full stroke (1/4"). Refer to "Cable Section." Do not hold control handle in "Raise" position after plow has completed lifting or angling.
Noisy Belt (Belt drive)	<ol style="list-style-type: none"> <li>1. Loose belt</li> <li>2. Worn or cracked belt</li> <li>3. Worn or rusted pulleys</li> <li>4. Misalignment of pump and drive pulleys.</li> <li>5. Oily belt</li> </ol>	<p>Tighten to proper tension.            Replace Belt.            Replace pulleys.            Realign pulleys.            Repair hydraulic leaks to prevent premature belt failure or slippage. Do not apply belt dressing.</p>
Hose Leaks	<ol style="list-style-type: none"> <li>1. Loose fittings</li> <li>2. Worn hose or fittings</li> </ol>	<p>Seal and tighten fittings            Replace hose. Do not attempt to repair.</p>
Loose pushbeam	1. Pushbeam bolts loose/worn.	Pushbeams must be installed using the drilled capscrew, slotted nut, and cotter pin provided.

Contact your nearest authorized FISHER outlet for assistance if any conditions are encountered which are not covered in this Guide.

## TROUBLESHOOTING GUIDE

BELT- DRIVE PUMP		
Condition	Possible Cause	Correction
Pump leaks	<ol style="list-style-type: none"> <li>1. Leaking at front washer/gasket</li> <li>2. Leaky shaft seal</li> <li>3. Leaks at brazing of front or rear reservoir cover</li> <li>4. Leaks at fittings or ports</li> </ol>	<p>Tighten the (4) capscrews in the front face washer (behind pulley) using a 9/16" open end wrench which must be thin enough to get between pulley and pump.</p> <p>Reservoir probably overfilled. Install new shaft seal and fill to full mark on dipstick. (Be sure lift cylinder is fully collapsed before filling.)</p> <p>Return to authorized FISHER outlet for repair or replacement.</p> <p>Tighten fittings using pipe thread sealant.</p>
Noisy pump	<ol style="list-style-type: none"> <li>1. Low on fluid</li> <li>2. Loose bolts</li> <li>3. Loose belt</li> <li>4. Worn or cracked belt</li> <li>5. Worn or rusted pulleys</li> <li>6. Misaligned pulleys</li> <li>7. Oily belt</li> <li>8. Contaminated fluid filter inside pump</li> <li>9. Pressure hose in contact with vehicle sheet metal</li> </ol>	<p>Fill to full mark with lift cylinder fully collapsed. <b>DO NOT OVERFILL.</b></p> <p>Tighten all bolts.</p> <p>Tighten belt.</p> <p>Replace belt.</p> <p>Replace Pulleys.</p> <p>Realign pulleys.</p> <p>Repair hydraulic leaks. Never use belt dressing.</p> <p>Drain fluid and flush system. Refill system with type "A" automatic transmission fluid.</p> <p>Isolate hose from sheet metal. Foam type air conditioning tubing insulation may be helpful.</p>
Low pump pressure	<ol style="list-style-type: none"> <li>1. Low on fluid</li> <li>2. Restricted hoses, fittings or disconnect.</li> <li>3. Loose belt</li> </ol>	<p>Fill to full mark with lift cylinder fully collapsed. <b>DO NOT OVERFILL.</b></p> <p>Check and replace as required.</p> <p>Tighten or replace belt.</p>

## TROUBLESHOOTING GUIDE

Condition	Possible Cause	Correction
Low pump pressure	4. Check pressure	Normal pressure 1400-1700 psi. Lower pressure may be acceptable for smaller blades without affecting performance.
Pump shaft will not turn	1. Contamination jamming gears. 2. Bearings seized.	Replace pump. Replace pump.
Pump overheats, fluid boils	1. Low on fluid  2. Pump on relief for extended periods 3. Valve not centering properly	Fill to "Full" mark with lift cylinder fully collapsed. <b>DO NOT OVERFILL.</b> Check control head lever to assure that it is in "Neutral" position. Adjustments may be made as per "Cable Section."
<b>VALVES</b>		
Control lever angles blade, but blade will not hold position	1. Control lever not returning to center position  2. Blown crossover relief in control valve	Check control cables for binding by disconnecting at control valve. Control valve spools must be in "Neutral" when control handle is centered. Return valve to authorized FISHER outlet for service.
Control valve leaks at spools or end caps	1. Worn/damaged O-rings or spools seals. 2. Dirt or contaminants in spool seal seats.	Return to authorized FISHER outlet. Return to authorized FISHER outlet.
Hydraulic leaks at fittings	1. Fittings are loose	Fittings on control valve are O-ring and must not be overtightened (Torque to 24-26 ft. lbs.)  VALVES CONTINUED ON PAGE 22

## TROUBLESHOOTING GUIDE

Condition	Possible Cause	Correction
Hydraulic leaks at fittings	2. Fittings too tight  3. Broken fittings	Fittings on control valve are O-ring sealed. If O-rings are damaged, replace (torque fittings to 24-26 ft. lbs.) Replace fittings as necessary.
Valve leak in casting	1. Pinholes, cracked or broken casting	Return to authorized FISHER outlet.
<b>CABLES</b>		
Cables bind	1. Cable routing  2. Cable bent in the control head	Check cable routing for excessive bends or obstruction at exposed travel portion of cable. Replace cable.
Control lever will not return to center position or works one way only	1. Control lever is in "Down" position  2. Out of adjustment  3. Cable routing	Normal operation. Position as to allow blade to follow contour of ground. Adjust cable at valve bulkhead. Control handle will be in centered position when both valve spools are centered. There will be approximately 1/4" of spool travel each way. Check control cables at pivot connection in control head to be sure cables have not unhooked from pivot ball or become bent. Grease pivot balls regularly.
<b>LIGHTS AND WIRING HARNESS</b>		
Turn signals flash weakly	1. Flasher 2. Flasher connection  3. Bulb	Replace flasher with H.D. flasher. Check flasher connection to insure good clean connection. Check bulb to insure correct bulb is used (G.E.#1157 bulb)  continued on page 23



## TROUBLESHOOTING GUIDE

Condition	Possible Cause	Correction
Turn signals flash rapidly	1. Flasher	Needs H.D. flasher.
Inability to switch from truck lights to plow lights	1. Auxillary light switch shorted internally	Replace switch.
<b>CYLINDERS</b>		
Leaking cylinder at cylinder nut	1. Loose cylinder nut 2. Worn packing 3. Cracked cylinder nut	Tighten cylinder nut. Replace packing. Replace cylinder nut.
Leaking cylinder at weld	1. Pinhole in weld	Replace as necessary.
Leaking cylinder at pressure port fitting	1. Fitting not tightened 2. Pipe thread sealant not used on threads of fitting	Tighten fitting. Remove fitting from cylinder and liberally apply pipe sealant on threads of fitting. Reinstall fitting in pressure port of cylinder. We do not recommend the use of Teflon tape.
Rusted/pitted rod	1. Cylinder has not been used for a long period of time	Using emery/crocus cloth, clean rod. Lightly oil or grease rod. If cleaning does not remove rust and pits, replace cylinder rod.
Fitting broken in pressure port	1. Hose and fitting not installed between cylinder and A-frame as specified.	Remove broken fitting from pressure port. Install new fitting in pressure port. Reinstall cylinder with hose and fitting between cylinder and A-frame assembly.
Rod seized in cylinder assembly	1. Wiper ring wedged between nut and rod 2. Guide segments wedged in barrel	Remove nut and replace wiper. Remove rod if possible. Replace worn parts. Replace cylinder if necessary.

## NOTES

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