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# SNOWPLOWS

OWNER'S MANUAL  
AND  
MECHANICS GUIDE

SOLENOID ISARMATIC® MARK IIIa

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## PREFACE

Welcome to the growing family of WESTERN® snowplow owners. This manual will teach you how to operate and maintain your new WESTERN Snowplow and will provide safety information. Please read this manual carefully and follow its recommendations.

When service is needed, your local Western Distributor knows your plow best. Return your snowplow to the distributor for maintenance service or any other assistance you may require. We have enclosed in your owner's manual packet a "Report Card" for your use.

Your WESTERN Snowplow Solenoid ISARMATIC® Mark IIIa Hydraulic Unit has a serial number. Record this serial number and keep it in a safe place so that you can refer to it if needed.

Before using your WESTERN snowplow, make sure your vehicle is equipped with all vehicle manufacturer's and WESTERN recommended options for snowplowing.



**S**AFETY NOTE: Whenever you see this symbol, it notes a SAFETY WARNING. To avoid serious injury to yourself or others, follow all warnings. Read this manual and plow labels before using snowplow.

Western offers a one-year limited warranty for all snowplows and accessories. See separately printed page for this important information. Western does not warranty non-Western service parts or accessories or any damage caused by the use of these unauthorized items.

The following are registered® or unregistered™ Trade Marks of Douglas Dynamics, Inc.

WESTERN®	ISARMATIC®	Hydra-Turn®
UniMount®	Roll-Action™	PRO-GUARD™

# OWNER'S MANUAL

## GETTING TO KNOW YOUR SNOWPLOW

### BLADE

The blade on your new WESTERN® snowplow is constructed of heavy gauge steel. To increase rigidity and strength, the blade is reinforced with several vertical ribs. The top edge is rolled for added strength and improved appearance.

The exclusive Roll-Action™ blade is designed to roll snow ahead and to the side instead of just pushing snow. This action means you can move more snow and move it faster using less power, saving fuel and reducing wear and tear on both vehicle and plow.

The blade has a replaceable high-carbon steel cutting edge bolted to the bottom. This cutting edge is reversible to equalize wear (except Sport/Utility plows) and should be replaced when it is worn to the bottom edge of the blade. (See Regular Maintenance and Adjustments.)

The blade also features large, adjustable disc-type skid shoes. These rotate 360° for longer wear and better blade flotation over all surfaces. For severe service, heavy duty disc shoes are available from your local Western Distributor.

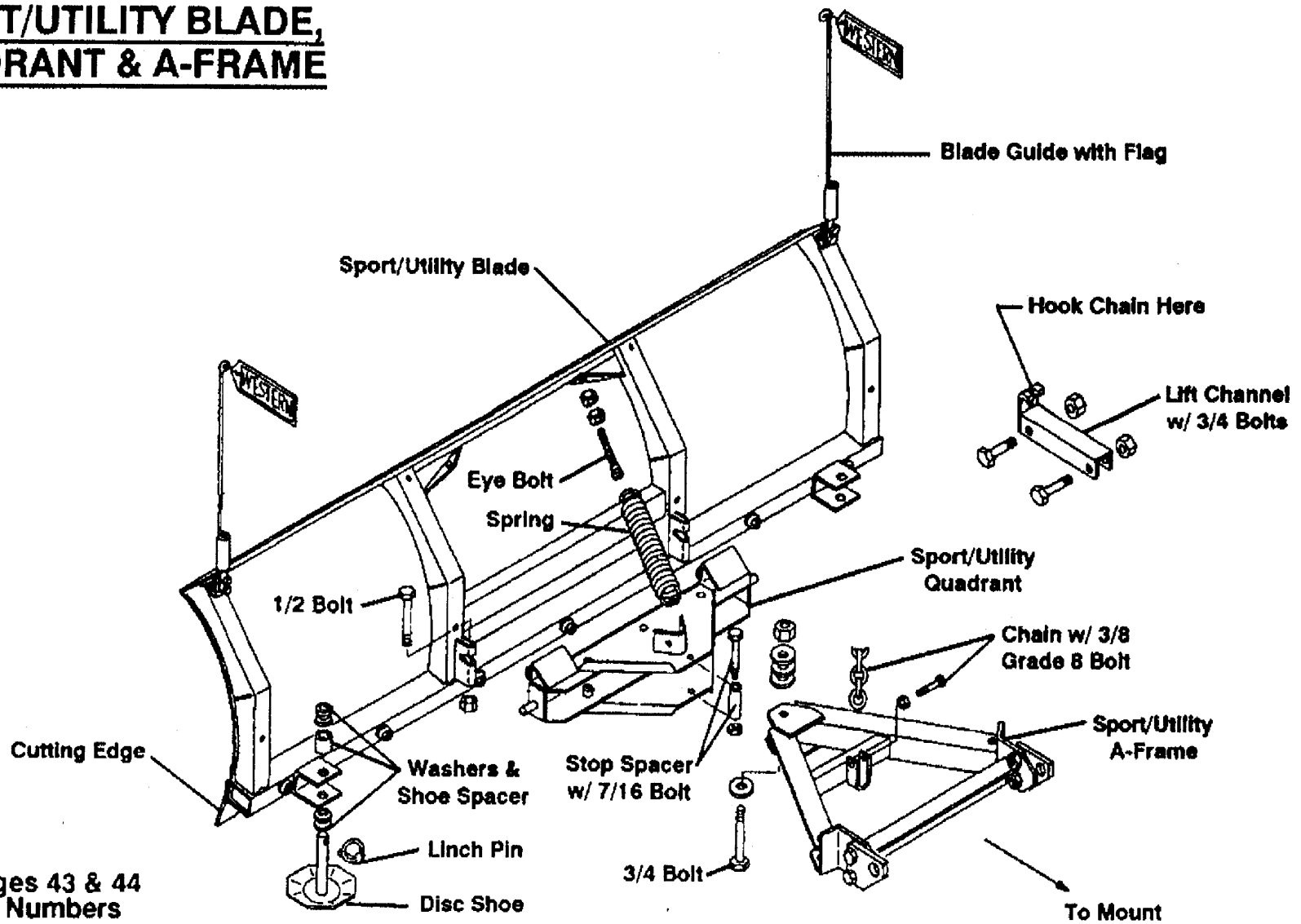
Your new blade is protected with PRO-GUARD™ — a baked-on powder finish that resists cracking, corrosion, scratching and rust. The PRO-GUARD™ coating - many times thicker than paint - will maintain its luster and glossy good looks longer than any other snowplow blade finish in the industry. It can be touched up when necessary.

Blade guides with replaceable flags are furnished with your complete snowplow. These help improve operator visibility and blade control.

### BLADE ACCESSORIES - OPTIONAL

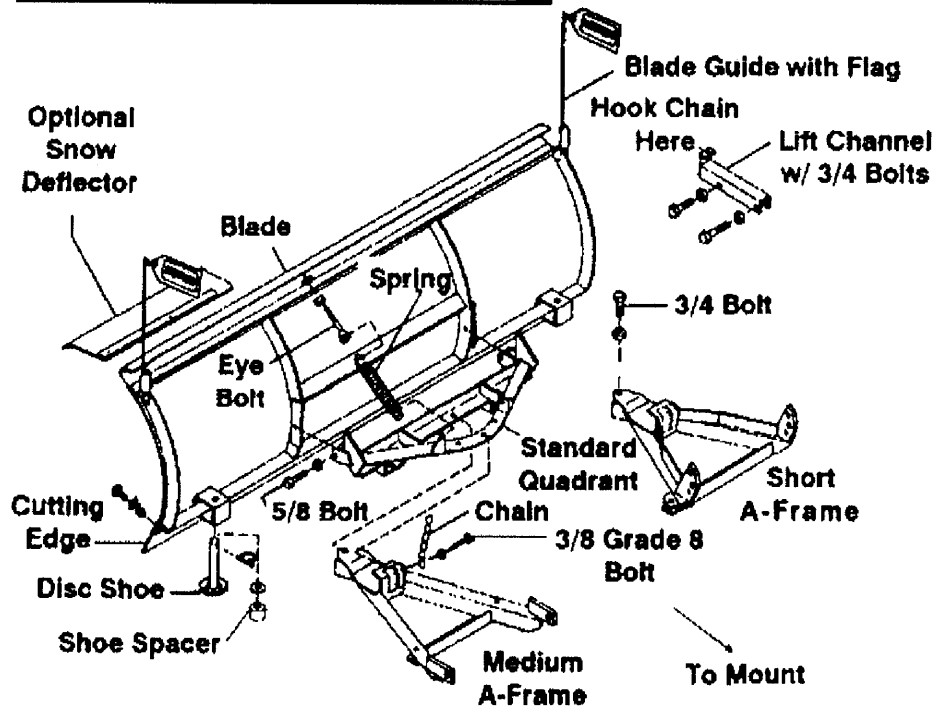
**Snow Deflector** — Optional snow deflector keeps snow off the windshield and away from the radiator. The deflector improves Roll-Action™ and increases plow efficiency. (Not for Sport/Utility Plows)

# SPORT/UTILITY BLADE, QUADRANT & A-FRAME

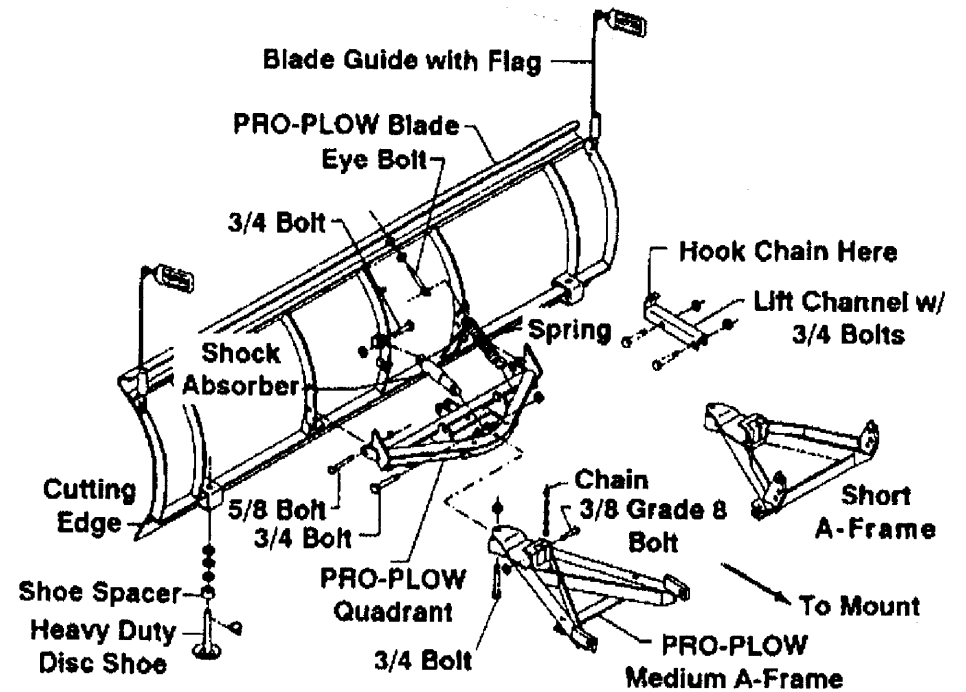


See Pages 43 & 44  
for Part Numbers

## STANDARD BLADE, QUADRANT & A-FRAME



## PRO-PLOW BLADE, QUADRANT & A-FRAME



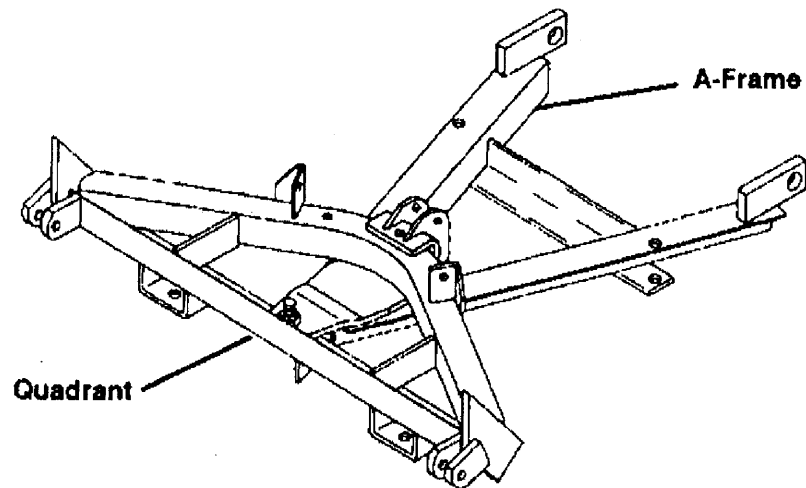
See Page 45 for Part Numbers.

See Page 46 for Part Numbers.

## A-FRAME & QUADRANT

The quadrant is attached to the back of the blade with bolts and lock-nuts and heavy-duty trip springs. The trip springs allow the blade to trip forward and ride over obstacles such as low curbs, manhole covers, etc., without damage to the blade or vehicle or injury to driver. The tension of the trip springs is adjustable (See Regular Maintenance and Adjustments.)

The quadrant is attached to the triangular A-frame with a pivot bolt, which allows the quadrant and blade to swing right or left. Heavy 1" diameter hitch pins are used to secure the A-frame ears to the vehicle mount. These hitch pins can't be bent and will not shear in normal operation, assuring a solid connection.

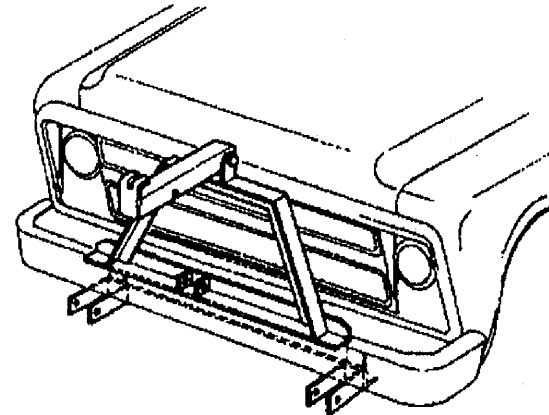


**A-FRAME & QUADRANT ASSEMBLY**

## LIFT-MOUNT

Western has designed custom lift-mount assemblies for most vehicles. Due to differences between vehicle models, lift-mount assemblies are generally not interchangeable.

The mount is fastened to the underside of the vehicle frame and provides the primary connecting point between the snowplow and the vehicle. The lift, welded to the mount at the front of the vehicle, provides the supporting framework for the hydraulic unit.



**LIFT-MOUNT ASSEMBLY**

## HYDRAULIC POWER

Western's Solenoid ISARMATIC® Mark IIIa System provides a fast and uniform speed of lifting and angling. The system raises the blade in 2 seconds and angles side to side in less than 4 seconds.

The ISARMATIC® Mark IIIa reservoir should be filled with automatic transmission (ATF) fluid (Mobil One or Texaco 1537 Aircraft Hydraulic Oil may be used for low temperature operation). Push lift channel all the way down. Remove fill plug (behind motor) and fluid level plug on the driver-side front corner of reservoir. Fill reservoir through filler plug hole until fluid runs out of fluid level hole. Replace both plugs.

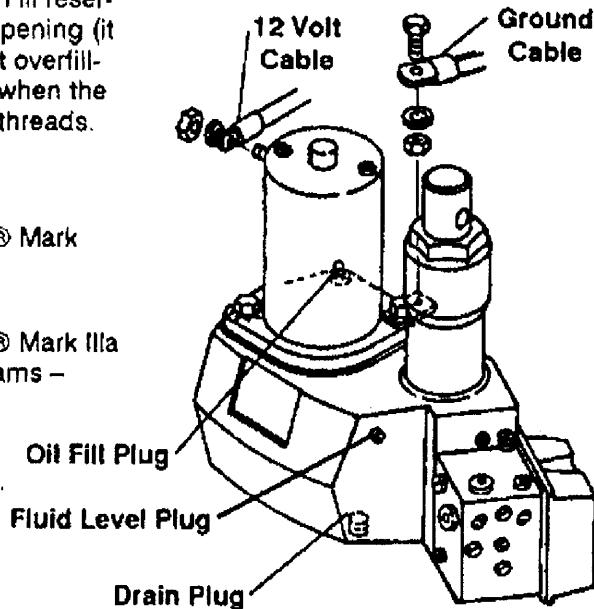
Alternate method: Push lift channel all the way down. Remove fill plug (behind motor). Fill reservoir only through fill opening (it is designed to prevent overfilling). Reservoir is full when the oil level reaches hole threads. Replace fill plug.

## SYSTEM CAPACITY

Solenoid ISARMATIC® Mark IIIa Unit Reservoirs – 1-1/2 quarts.

Solenoid ISARMATIC® Mark IIIa & 10" Hydra-Turn® Rams – 2-1/8 quarts.

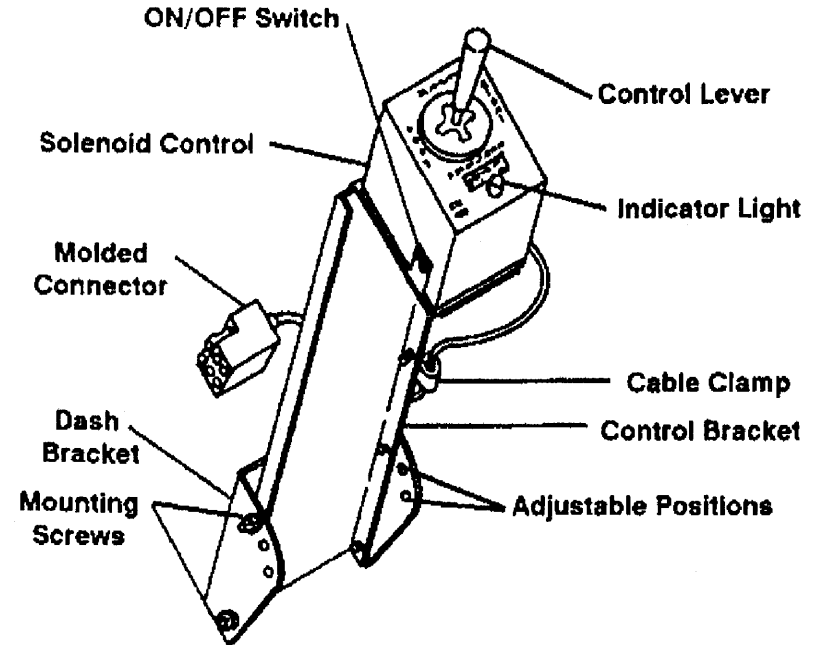
Solenoid ISARMATIC® Mark IIIa & 6" Hydra-Turn® Rams – 1-7/8 quarts.



**SOLENOID ISARMATIC® MARK IIIa**

## SOLENOID CONTROL

The solenoid control is electrically powered through the ignition (key) switch of your vehicle and is protected by a replaceable 10 amp in-line fuse. The ON/OFF switch allows you to turn off the control and prevent blade movement even when the ignition is on.



**SOLENOID CONTROL & MOUNTING BRACKET**



## HYDRA-TURN® ANGLING

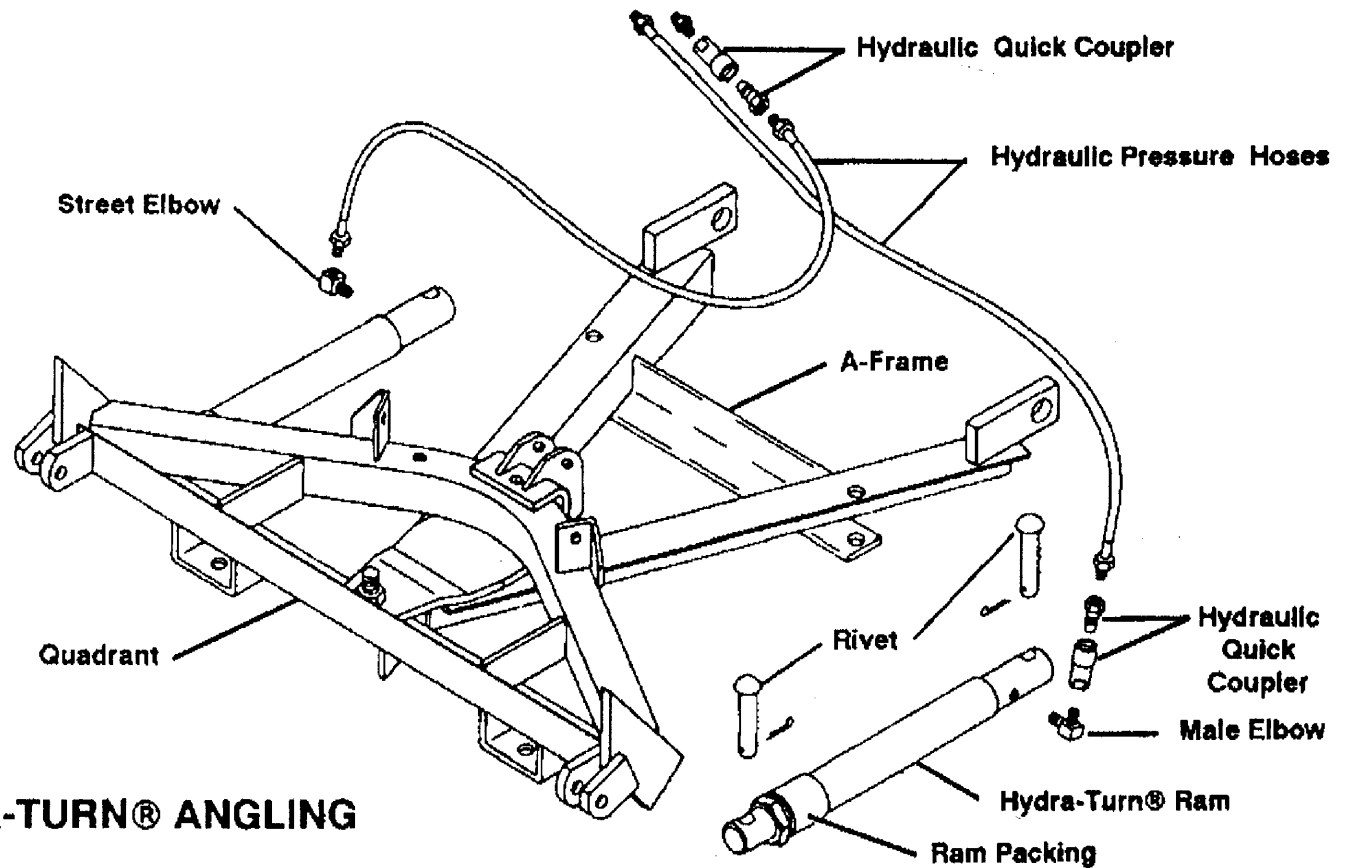
Hydra-Turn® power angling gives you full control of the plow from within the cab of the vehicle – you'll never have to get out in the snow to change the angle of the blade. Two single-acting hydraulic rams hold the blade at the desired angle. The rams are operated by the solenoid control.

The Solenoid ISARMATIC® Mark IIIa Valve Manifold has two cushion valves built in to prevent damage to the blade or vehicle if obstacles are hit. When the force against the blade causes pressure in an extended ram to exceed set limits, the cushion valve opens allowing oil to escape and the ram plunger retracts.

**NOTE:** In the event of Hydra-Turn® angling failure, place a 5/8" bolt through the holes in the A-frame and quadrant (not applicable to Sport/Utility plows). This will hold the blade in position until the problem is corrected.



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



## HYDRA-TURN® ANGLING

## HEADLAMP KIT

The headlamp kit includes a set of rectangular dual-beam halogen headlamps plus combination park and turn signals.

A patented pre-wired harness with plug-in module requires no headlamp wire splicing. Lights conform to federal safety standards.

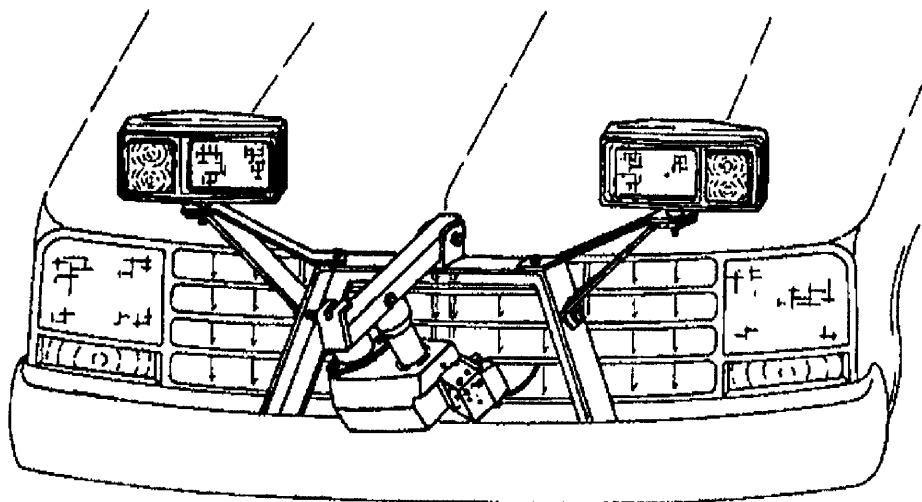
Use plow headlamps **ONLY** when plow is attached. Use vehicle headlamps when plow is **NOT** attached.

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

**C**AUTION: Lights may be damaged by brush-type automatic car washes.



**W**ARNING: Before traveling, position blade so it does not block headlamp beam. Do not change blade position while traveling.



**LOW PROFILE HEADLAMP KIT**

## MOUNTING SNOWPLOW TO VEHICLE

**N**OTE: Lift-mount assembly must already be installed.

WESTERN® plows are easy to mount and remove from your vehicle. The blade, quadrant and A-frame are usually removed and stored as a complete assembly.

1. Position your vehicle close behind plow so that the A-frame ears are approximately in line with coupling lugs on mount.
2. Hook chain to lift channel.



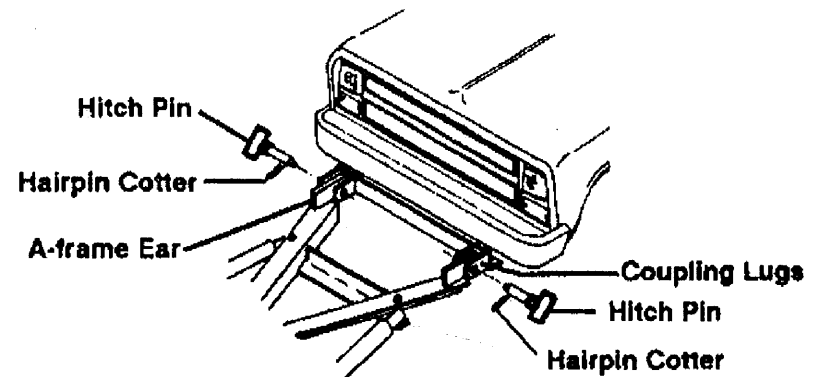
**W**ARNING: Inspect lift channel and bolts for wear or damage whenever mounting or removing the plow. Worn or damaged components could permit plow to drop unexpectedly.

3. Turn vehicle ignition switch to ON or ACCESSORY position.
4. Turn solenoid control unit ON.
5. Move solenoid control lever to RAISE and raise lift channel slowly until A-frame ear holes align with coupling lug holes on mount.



**W**ARNING: Never put a finger in A-frame ear or mount coupling lug holes to check alignment. If the plow moved, your finger could be crushed.

6. Insert hitch pins and hairpin cotters as shown.



7. Connect hoses between hydraulic unit and Hydra-Turn® rams on each side of A-frame.

**N**OTE: Temperature changes may cause a pressure build-up within the Hydra-Turn® rams that prevents recoupling of the hoses. If this occurs, place a clean rag over the male coupler and lightly tap the ball on a block of wood to release the pressure.

8. Move solenoid control lever to LOWER and release lever (style 2). Style 1 controls, slip lever into the detent (float) position.
9. Push lift channel all the way down. Pull the chain tight and hook it to the lift channel. After chain is hooked, it will have the correct amount of slack for plow to "float" (move up and down to follow the contour of the surface being plowed).
10. Move the control lever to raise, lower and angle plow in both directions to make sure all systems are in working order.
11. Move plow light switch from vehicle lights to plow lights.



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

# OPERATING YOUR PLOW

## CONTROLLING THE BLADE

### TURNING ON

Turn vehicle ignition (key) switch to ON or ACCESSORY position.

Move solenoid control ON/OFF switch to ON position. The control indicator light (red) should light whenever the control ON/OFF switch and the ignition (key) switch are both turned ON.

**RAISE:** Move control lever UP (forward) to raise blade until blade has reached desired height.

**LOWER (Float):** Move lever DOWN (back) to lower blade.

For blade float (This allows the blade to move up and down to follow the contour of surface being plowed.)



Style 1 Control — Leave lever in detent for blade float.

### Style 1 Control Label



Style 2 Control — Moving lever to lower will automatically allow blade float (even when lever returns to neutral position).

To cancel float — momentarily move lever to raise.

Turning off the control ON/OFF switch or the vehicle ignition (Key) switch will also cancel float. Angling left or right does not cancel float.

### Style 2 Control Label

**ANGLE LEFT:** Move lever to the LEFT to angle blade to the left until blade has reached desired angle.

**ANGLE RIGHT:** Move lever to the RIGHT to angle blade to the right until blade has reached desired angle.

**LOCK BLADE IN POSITION:** With control lever in neutral, turn control ON/OFF switch to OFF. Blade is now locked and cannot be accidentally moved.



**WARNING:** To prevent accidental movement of the blade, always turn the ON/OFF switch to OFF whenever plow is not in use.

**CAUTION:** DO NOT hold solenoid control lever in RAISE, ANGLE LEFT or ANGLE RIGHT position more than 5 seconds after blade has reached desired position. To do so increases battery drain and could result in motor burn-out.

## PARKING WITH PLOW ATTACHED

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



**WARNING:** Always lower blade fully when vehicle is parked. Temperature changes could change hydraulic pressure, causing the blade to drop unexpectedly or damaging hydraulic components. Failure to do this can result in serious injury.

## TRANSPORTING PLOW

**NOTE:** These instructions are for driving short distances to and from plowing jobs. For long trips, remove plow from front of vehicle.

1. Raise blade.

2. Adjust blade height for maximum plow light illumination.



**WARNING:** Your vehicle must be equipped with plow headlights and directional lights. Be sure the plow lights are operating properly before traveling.

3. Adjust blade to straight position.



**WARNING:** Make sure blade does not block headlight beams.

4. Move solenoid control ON/OFF switch to OFF to lock blade in place.



**WARNING:** Never exceed posted road speeds. Under bad weather conditions or when driving on uneven surfaces such as railroad tracks or bumpy roads reduce speed.

5. Monitor vehicle operating temperature. Overheating is unlikely under normal driving conditions, but occasionally the plow may be positioned where it deflects air away from the radiator. If this occurs, stop the vehicle and raise or lower the plow slightly to correct overheating.

**NOTE:** Only the driver should be in the vehicle when the plow is attached during transport of vehicles with less than a 3/4 ton rating.

# **PLOWING SNOW**

## **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 edges, shrubs, fences, or pipes sticking up from the ground.

**CAUTION:** To prevent damage to plow or vehicle, flag any obstructions that are hard to locate.

2. Only the driver should be in the vehicle when plow is attached for plowing.



**WARNING:** Always wear seat belt when plowing snow. A hidden obstruction could cause the vehicle to stop suddenly, throwing you forward and injuring you.

3. Plow during the storm rather than letting snow accumulate.



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

4. When you are stacking snow, begin raising the blade as you come close to the stack. This will let the blade with its load ride up onto the stack.

**CAUTION:** Never pile snow with the blade angled more than halfway or the bumper could be damaged.

## **SPECIAL SNOW CONDITIONS**

### **- Hard-packed Snow**

1. Raise the disc shoes so that the cutting edge comes into direct contact with the pavement. (See Regular Maintenance and Adjustments.)
2. Use lowest gear to place maximum power behind cutting edge.
3. An angled blade is more effective to remove 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" 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.
3. When plowing deep snow, be sure to keep vehicle moving.
4. Secure ballast behind wheels for better traction. Recommendations: full-size pick-ups: 500-700 lbs.; compact pick-ups: 300 lbs.; sport/utility vehicles: 150 lbs.
5. For increased traction use tire chains.

## **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 building is at end of driveway, plow up to within a vehicle length of building. 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 building at least one vehicle length. Repeat if necessary.
4. Back vehicle to building 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. With raised blade, drive up to building. Drop blade and "back-drag" snow away from buildings. When snow is clear of buildings, turn vehicle around and push snow 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, and plow successive strips lengthwise 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.

## REMOVING SNOWPLOW & STORAGE

1. Lower the plow to the ground (keep tension on chain). Style 2 controls, momentarily move control to raise position or turn off ON/OFF switch. Style 1 controls, move solenoid control to neutral.



**WARNING:** Keep hands and feet clear of blade and A-frame when removing or mounting plow. Moving or falling assemblies can pinch or crush.

2. Disconnect hose couplers between Solenoid ISARMATIC® Mark IIIa and Hydra-Turn® rams.
  - A. Connect curb-side ram hose into the quick coupler on the driver-side ram.
  - B. Loop Solenoid ISARMATIC® Mark IIIa hoses around the lift assembly and couple hose into manifold quick coupler. This will protect the quick coupler ends and keep foreign matter out of the quick couplers while the snowplow is off the vehicle.

**NOTE:** Because of hydraulic pressure, hoses may be hard to disconnect immediately after angling blade. Allow time for system pressure to bleed off to tank.

3. Pull hairpin cotters from hitch pins at rear of A-frame and remove hitch pins. After disassembly, replace hitch pins and hairpin cotters in A-frame ears for ready access when reinstalling plow.
4. Move the solenoid control lever to LOWER (float) position.

5. Push the lift channel all the way down. Leave lift channel in down position to protect lift ram from rusting and pitting.
6. Unhook chain.



**WARNING:** Inspect plow components and bolts for wear or damage whenever mounting or removing the plow. Worn or damaged components could permit plow to drop unexpectedly.

7. Move control ON/OFF switch to the "OFF" position. Style 1 controls, return control lever to neutral.
8. Move plow light switch from plow lights to vehicle lights position.

**NOTE:** For long-term storage, grease exposed chrome surfaces of the Hydra-Turn® rams to prevent rust.

**CAUTION:** To prevent the shock absorber on the PRO-PLOW A-frame from collecting water, store plow with A-frame horizontal.

During the off season, the solenoid control and bracket can be removed from the dash/floor bracket by disconnecting the molded connector in the cab and removing the four mounting screws. Store control and bracket in glove box of vehicle.



# **MAINTENANCE**

## **PRE-SEASON CHECK**

Before the snow flies, check your equipment and make sure it's ready for action. Here's a checklist for making sure your equipment is set for the snowplowing season —

1. Inspect hydraulic system for leaks and cracked or damaged hoses. Check oil level (push lift channel all the way down).
2. Inspect all parts of plow and mount system. Replace worn or defective parts.
3. Clean all electrical connections, including grounds. Inspect and clean harness connections to coils on Solenoid ISAR-MATIC® Mark IIIa hydraulic unit. (Remove plastic cover to access connections.) Recoat coil connections with dielectric grease (Part # 56099).

**CAUTION: An electrical sealant has been applied to the terminals. DO NOT remove this sealant.**

4. Inspect and test your battery and recharge or replace if necessary. Suggested MINIMUM vehicle electrical system: 70 amp hr./550 CCA battery, 55 amp alternator.
5. Check mounting of snowplow to vehicle and tighten any loose fasteners.
6. Repaint mountings with rust resistant, high grade enamel. Touch-up blade with Western Red Paint available in aerosol or quart can.
7. Check windshield wipers, heater, and vehicle and plow lights for proper operation. Check that plow headlights are properly aimed. Plow headlights should be aimed with plow attached and in raised position.
8. Secure ballast behind rear wheels. Suggested ballast for full size pick-ups is 500-700 lbs., compact pick-ups is 300 lbs., and sport/utility is 150 lbs.

## **REGULAR MAINTENANCE AND ADJUSTMENTS**



**WARNING:** To prevent injuries, always lower snowplow to the ground when parked. Always remove snowplow before servicing vehicle when automotive lifts or hoists are used. Failure to do this can result in serious injury.

Your WESTERN® Snowplow is designed for rugged, dependable service. But like the vehicle on which it is mounted, it needs a certain amount of regular care and maintenance. Check the following before and frequently during the plowing season:

- Make sure all fasteners, mounting bolts, hydraulic and electrical connections are tight.
- Check all plugs and seals for oil leaks. Repair as necessary.
- **Disc Shoe Adjustment**

Recommended shoe adjustments:

1. For gravel surfaces — bottom surface of shoe should be 1/2" below cutting edge.
2. For hard surfaces (concrete or asphalt) — bottom surface of shoe should be even with cutting edge.

### **ADJUSTMENT PROCEDURE**

1. Raise blade and place on blocking.
2. Remove linch pin and slide shoe down out of bracket.
3. Remove one or more washers from shoe stem and reinstall shoe into bracket.
4. Place removed washers onto shoe stem above bracket.
5. Install linch pin. NOTE: Do not discard any washers.

## REGULAR MAINTENANCE AND ADJUSTMENTS (Condt.)

### - Cutting Edge

To equalize wear, cutting edge can be reversed (except Sport/Utility Plows). Replace cutting edge when worn to the bottom of blade sheet.

1. Raise blade and place blocking under A-frame.
2. Remove cutting edge, and turn end for end.
3. Reinstall.

NOTE: Sport/Utility cutting edge is not reversible.

### - Trip Spring Adjustment

To adjust trip spring tension, adjust the eyebolts located at the top of the blade.

1. Loosen locknut (nut closest to spring).
2. Tighten adjusting nut (nut closest to plow) until coils begin to separate. When tension is properly adjusted, a sheet of paper should pass between the second and third coils.
3. Tighten locknut.

### - PRO-GUARD™ Blade Finish

If the PRO-GUARD™ powder coated finish is nicked or scratched, repair the blade surface with Western Red Paint in aerosol or quart can.

### - Black Iron Mount Parts - Powder Coated or Painted

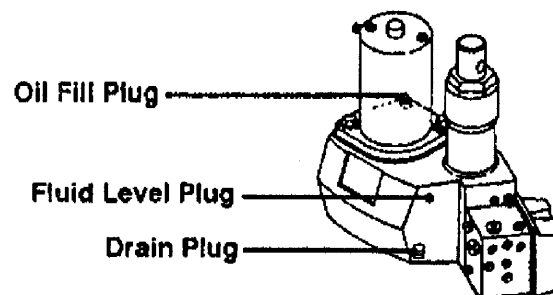
Parts should be cleaned and touched up with a rust resistant high-grade enamel paint.

## HYDRAULIC SYSTEM

### - Oil Level

Push lift channel all the way down. Remove fill plug (behind motor) and fluid level plug on the driver-side front corner of reservoir. Fill reservoir through filler plug hole until fluid runs out of fluid level hole. Replace both plugs.

Alternate method: Push lift channel all the way down. Remove fill plug (behind motor). Fill reservoir only through fill opening (it is designed to prevent overfilling). Reservoir is full when the oil level reaches hole threads. Replace fill plug.



### - Annual Fluid Change

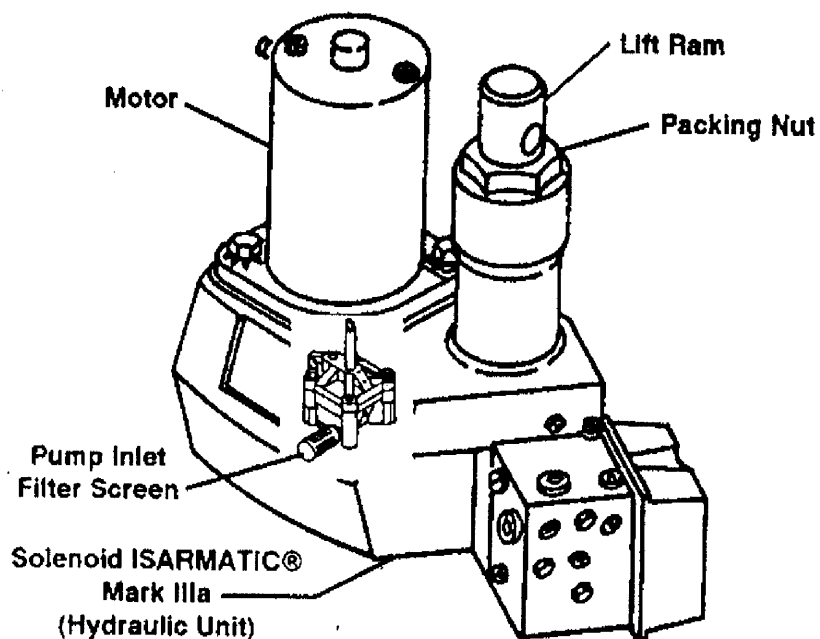
**IMPORTANT: Change fluid at the beginning of each plowing season.**

1. Remove drain plug located in the bottom of the right front corner of the reservoir (see diagram).
2. Completely drain the hydraulic reservoir.
3. Refill through fill hole with new automatic transmission fluid (ATF). (Mobil One or Texaco 1537 Aircraft Hydraulic Oil may be used for low-temperature operation. DO NOT mix different types of oils.)

– **System Capacity**

- Solenoid ISARMATIC® Mark IIIa Reservoir – 1-1/2 quarts.
- Solenoid ISARMATIC® Mark IIIa (1-1/2" Ram) with 10" Hydra-Turn® Rams – 2-1/8 quarts.
- Solenoid ISARMATIC® Mark IIIa (1-1/2" Ram) with 6" Hydra-Turn® Rams – 1-7/8 quarts.

**C**AUTION: Fill reservoir through fill hole ONLY. Never fill through motor/pump opening. Overfilling can damage the unit.



– **Packing Nut Adjustment**

Periodically check lift ram and Hydra-Turn® ram packing nuts for tightness. If packing nuts are loose or leakage appears while lifting or angling plow, tighten not more than 1/4 turn after you feel packing nut contact the packing.

**C**AUTION: Do not overtighten packing nut.

Packings not used for a period of time may show signs of oil weep. This will usually stop after use.

– **Pump Inlet Filter Screen**

Clean the pump inlet filter screen whenever the pump is removed. If the screen is damaged, replace it. Torque die-cast pump mounting capscrews to 175-185 in.-lbs, motor mounting capscrews to 15/20 ft.-lbs.

### EMERGENCY PARTS

We suggest that you keep Western Emergency Parts Kit #49205 and the following items in your vehicle for emergency use.

- 1 - 93028K Hitch Pin 1" x 3-1/2"
- 1 - 91965K Hairpin Cotter 5/32"
- 1 - 90045 Chain Bolt 3/8"-16 x 2-1/2" - Grade 8
- 1 - 91333 Locknut - 3/8"-16
- 1 - 56134K Relay - Solenoid Hydraulic System
- 1 - 10" Adjustable Wrench
- 1 - Medium Screw Driver
- 1 - Pair of Pliers
- 1 - Quart Automatic Transmission Fluid (ATF)

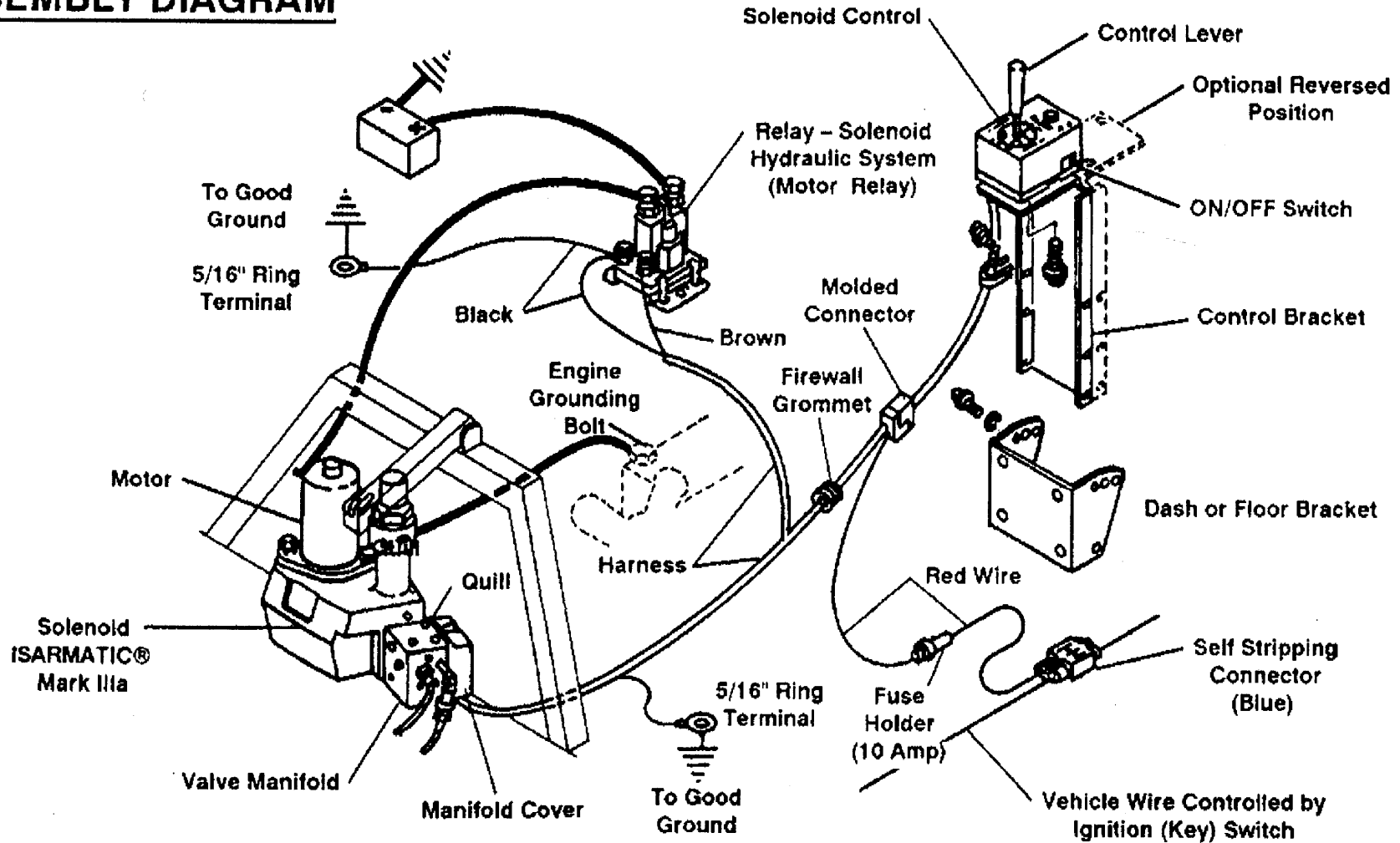
Always use Western designed and tested replacement parts.



# **MECHANICS GUIDE**

## **SOLENOID ISARMATIC® MARK IIIa**

# SOLENOID ISARMATIC® MARK IIIa ASSEMBLY DIAGRAM



# THEORY OF OPERATION

The Solenoid ISARMATIC® Mark IIIa Hydraulic System performs four functions:

RAISE the snowplow

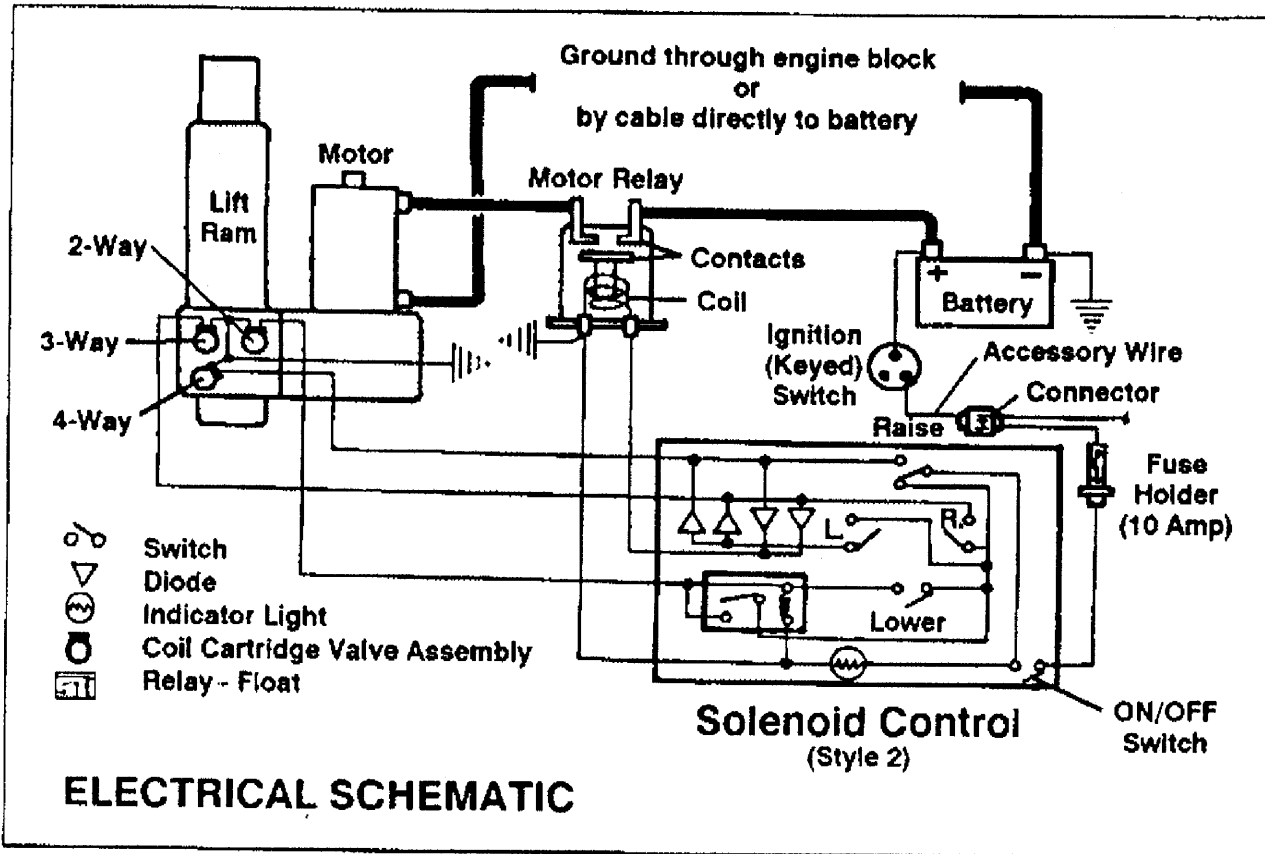
LOWER the snowplow

ANGLE snowplow RIGHT

ANGLE snowplow LEFT

For all functions, the vehicle ignition (key) switch must be set at ON or ACCESSORY, and the solenoid control ON/OFF Switch must be ON.

For RAISE, ANGLE RIGHT and ANGLE LEFT, cartridge valve spools shift, and the motor runs to drive the hydraulic pump. For LOWER, a cartridge valve spool shifts, but the motor does not run.



## ELECTRICAL OPERATION OF MOTOR

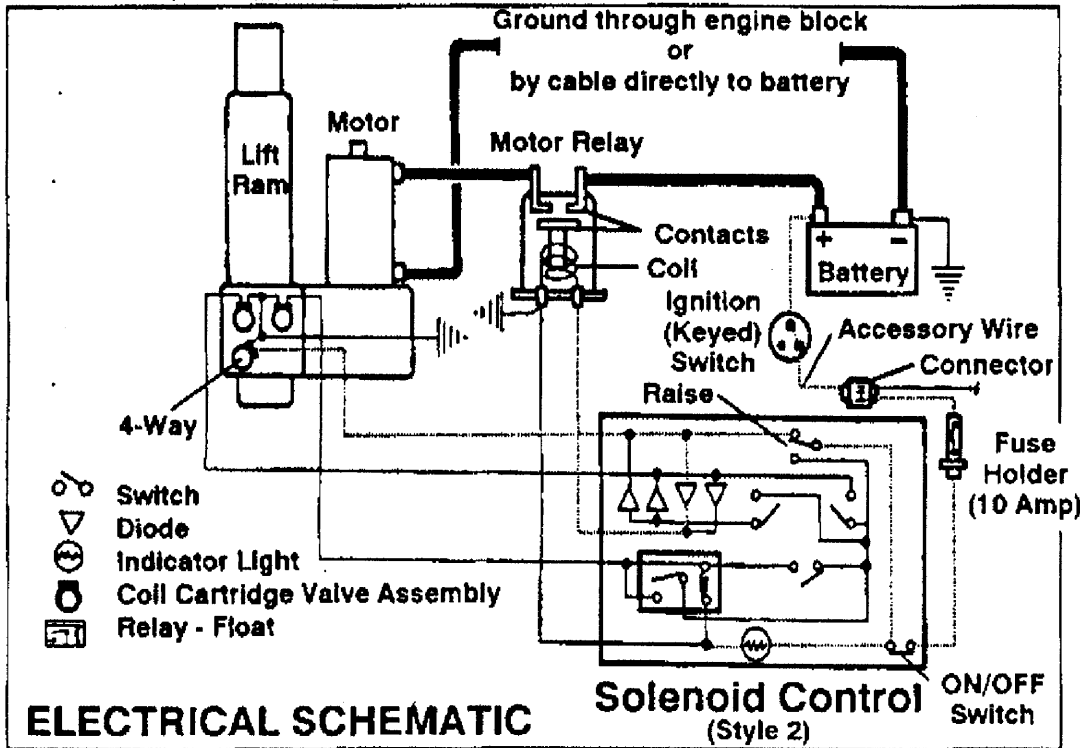
When the control lever is moved to RAISE, LEFT, or RIGHT, a switch inside the control closes. This allows electrical current to flow through the switch, through the coil of the motor relay, through the ground, and back to the battery. The current flow through the motor relay coil closes the motor relay contacts. Closing these contacts connects heavy cables between the motor and the battery. These cables carry a large current flow which enables the motor to run.

## RAISING PLOW

ACTION: Move control lever to RAISE.

SYSTEM RESPONSE:

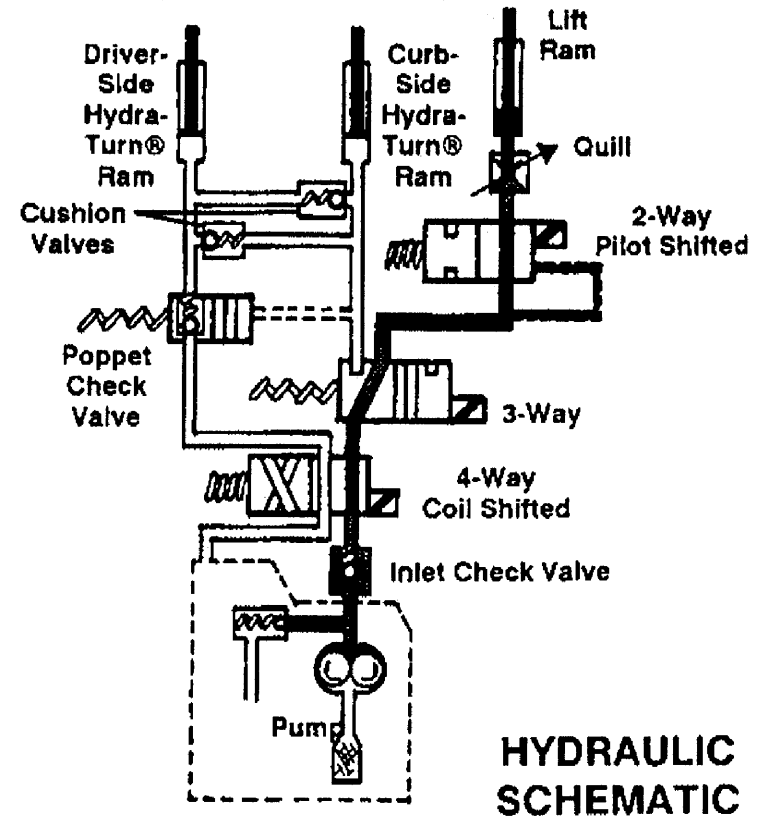
1. Raise switch in control changes current flow path from normally closed contacts to normally open contacts.
2. Current flows to motor relay (activating motor) and to 4-way cartridge valve coil (shifting spool).
3. Hydraulic oil from pump flows through 4-way and 3-way cartridge valves to 2-way cartridge valve.
4. Oil pushes open the spring-loaded 2-way spool and flows into the lift ram, pushing plunger up.



ACTION: Move control lever to NEUTRAL.

SYSTEM RESPONSE:

1. Raise switch in control changes current flow path from normally open contacts to normally closed contacts. This stops current flow and deactivates motor relay and 4-way cartridge valve coil.
2. Oil flow to ram stops.
3. Spool of 2-way cartridge valve closes, trapping oil in lift ram and holding it up.



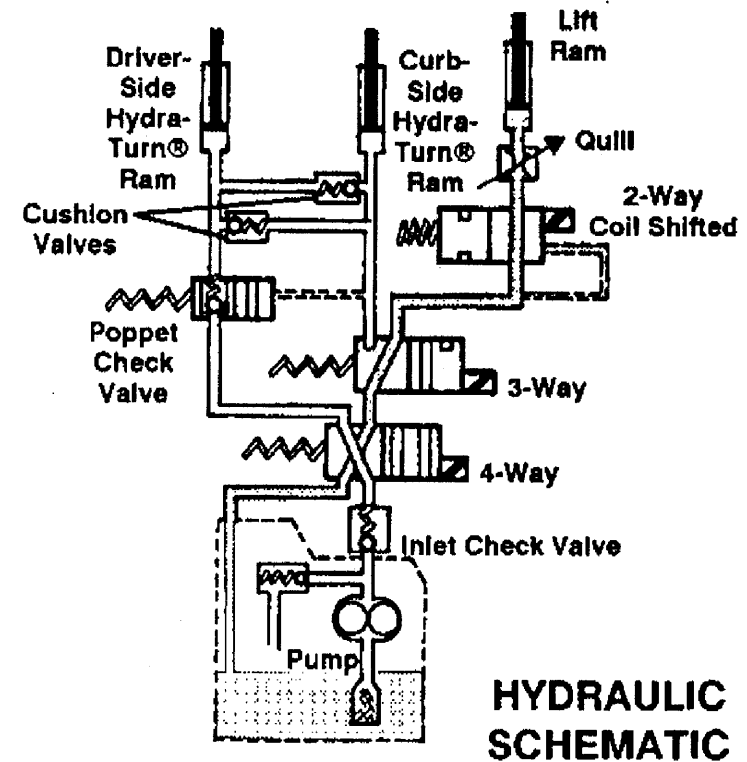
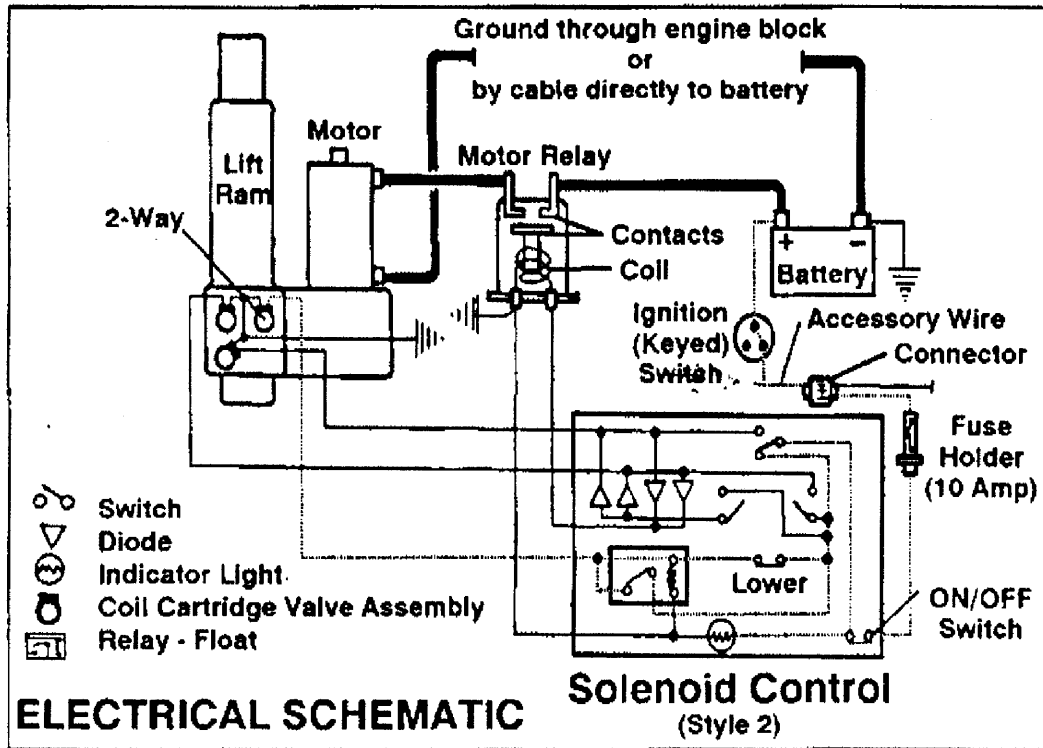


## LOWERING FLOW

ACTION: Move control lever to LOWER.

SYSTEM RESPONSE:

1. Lower switch in control closes.
2. Current flows to 2-way cartridge valve coil (shifting spool).
3. Hydraulic oil escapes from the lift ram and flows past the adjustable quill (which controls the rate of blade lowering), through the 3-way and 4-way cartridge valves, and back to the reservoir.



## PLOW FLOAT/CANCELING

There are two styles of controls. Each operates the same except for the float function. Identify control style by label on control.



Style 2 Control Label



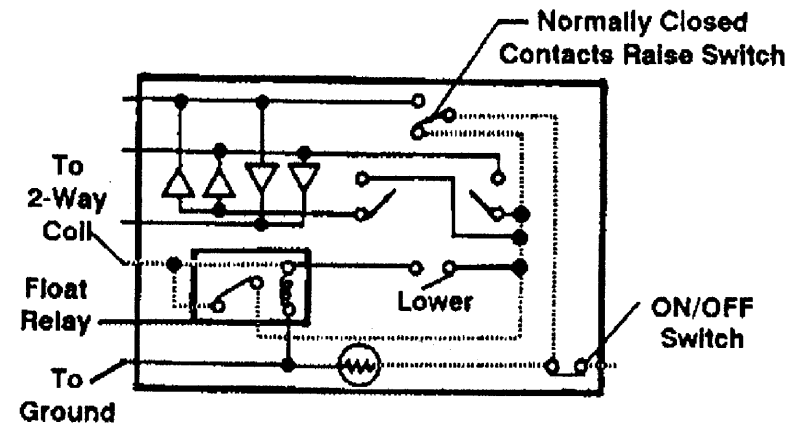
Style 1 Control Label  
See Next Page.

### PLOW FLOAT (Style 2 Control)

**ACTION:** Move control lever to lower and release lever to neutral.

**SYSTEM RESPONSE:**

1. Lower switch in control closes.
2. Current flows to 2-way cartridge valve coil (shifting spool) and through float relay coil (closing normally open contacts).
3. When control lever is released – lower switch in control opens. Current flows through the closed contacts of the float relay to the 2-way cartridge valve coil (holding spool shifted) and to the float relay coil (holding contacts closed)
4. The 2-way spool remains shifted, which permits the blade to follow the road contour, or "float"



### Current Flow in Float (Lever in Neutral)

Style 2 Control

### CANCELING PLOW FLOAT (Style 2 Control)

**ACTION:** Move control lever momentarily to raise to cancel "float".

**SYSTEM RESPONSE:**

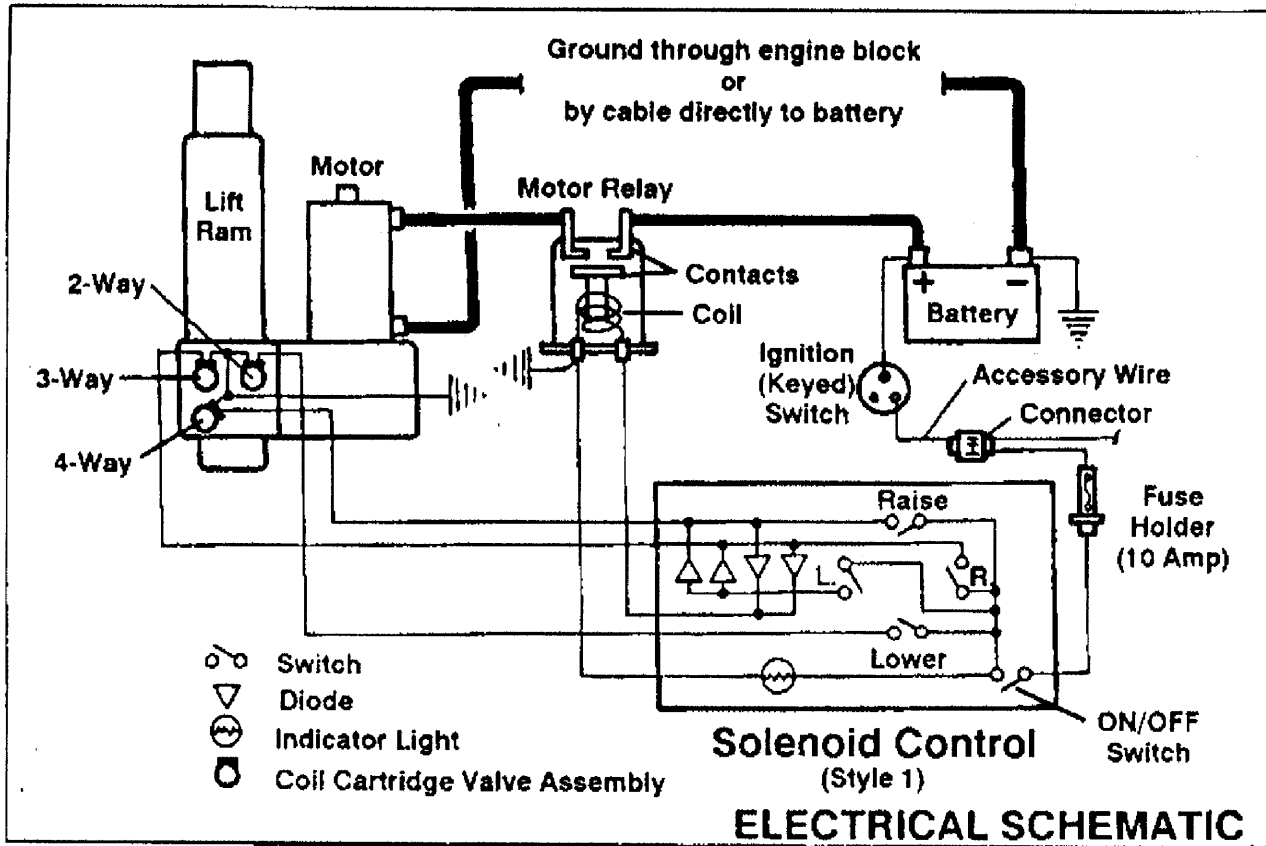
1. The normally closed contacts of the raise switch are opened.
2. Current flow to the 2-way cartridge valve coil stops (spool closes) trapping oil in lift ram and holding it in position.
3. Current flow through the float relay coil stops (relay contacts open).

**NOTE:** Whenever lever is moved to lower the plow, the plow will be in float until:  
 the control lever is moved to raise.  
 the control ON/OFF switch is turned off.  
 the vehicle ignition (key) switch is turned off.

**NOTE:** Plow can be angled while in float.

**NOTE:** If the float relay fails, the blade will still lower and float as long as the lever is manually held in lower position.

## ELECTRICAL SCHEMATIC (Style 1 Control)



## FLOW FLOAT (Style 1 Control)

**ACTION:** Leave control lever in the detent position (lower).

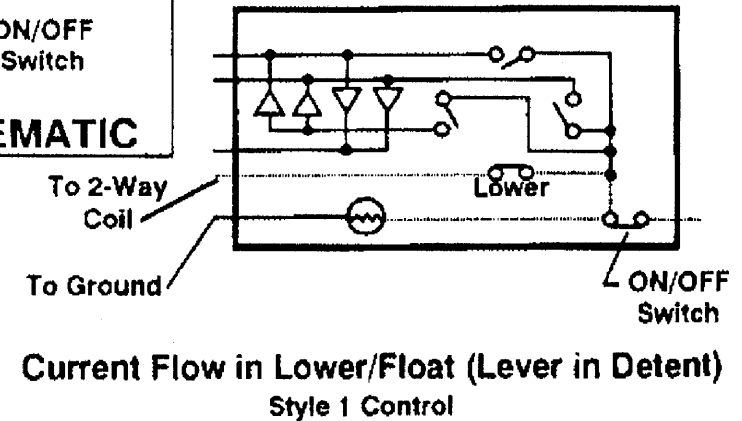
**SYSTEM RESPONSE:** The spool remains shifted, which permits the blade to follow the road contour, or "float"

## CANCELING FLOW FLOAT (Style 1 Control)

**ACTION:** Return control lever to NEUTRAL.

**SYSTEM RESPONSE:**

1. Lower switch in control opens.
2. Spool of 2-way cartridge valve closes, trapping oil in lift ram and holding it in position.



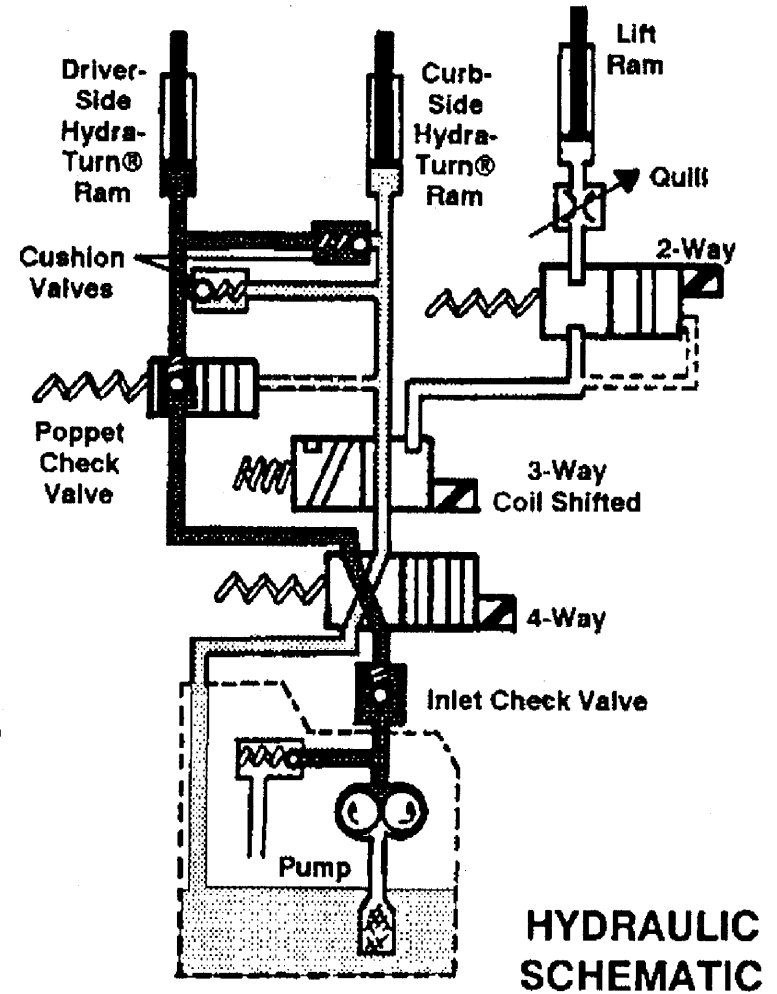
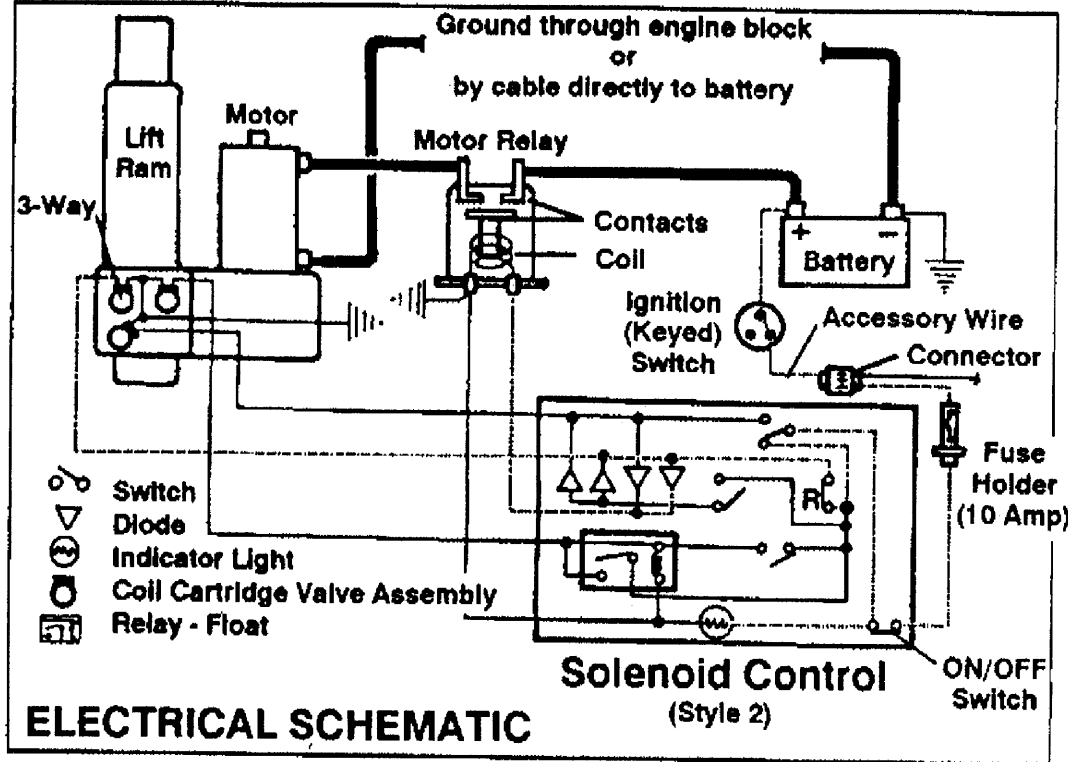
## ANGLE RIGHT

**ACTION:** Move control lever to ANGLE RIGHT.

**SYSTEM RESPONSE:**

1. Angle right switch in control closes.
2. Current flows to motor relay (activating motor) and to the 3-way cartridge valve coil (shifting spool).
3. Hydraulic oil from the pump flows through the 4-way cartridge valve, pushes open the poppet check valve, and flows into the driver-side Hydra-Turn® ram to angle the blade to the right.

4. As the driver-side ram extends, the curb-side ram collapses, pushing its oil into the manifold, through the shifted 3-way cartridge valve, through the 4-way cartridge valve, and back to the reservoir.

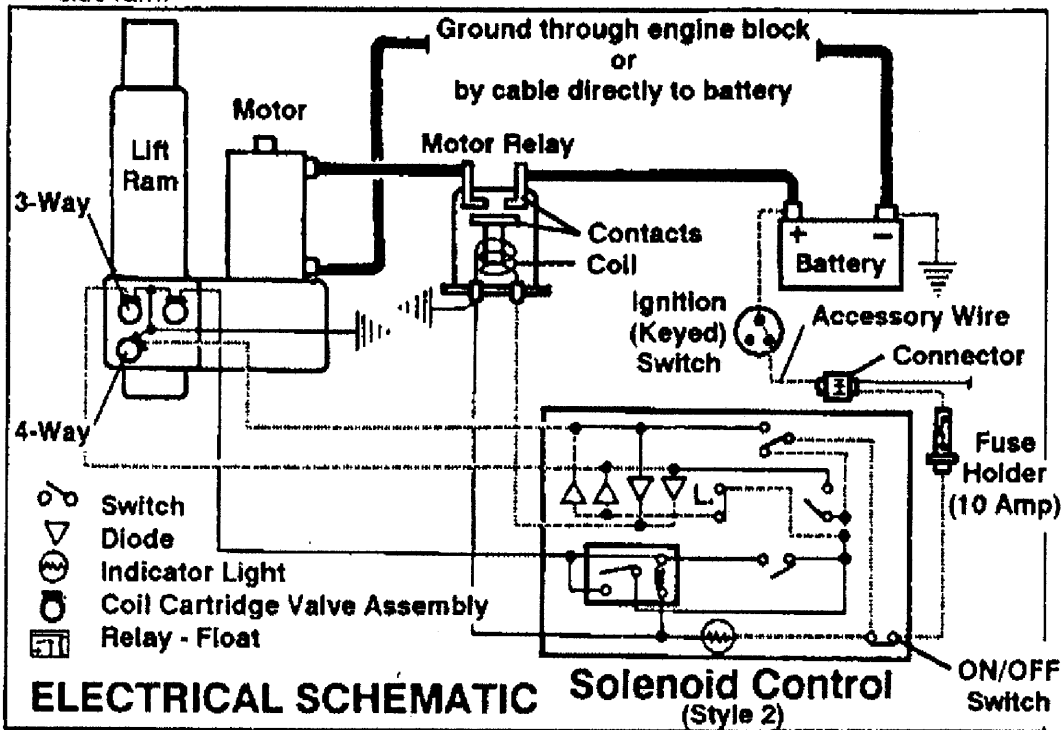


## ANGLE LEFT

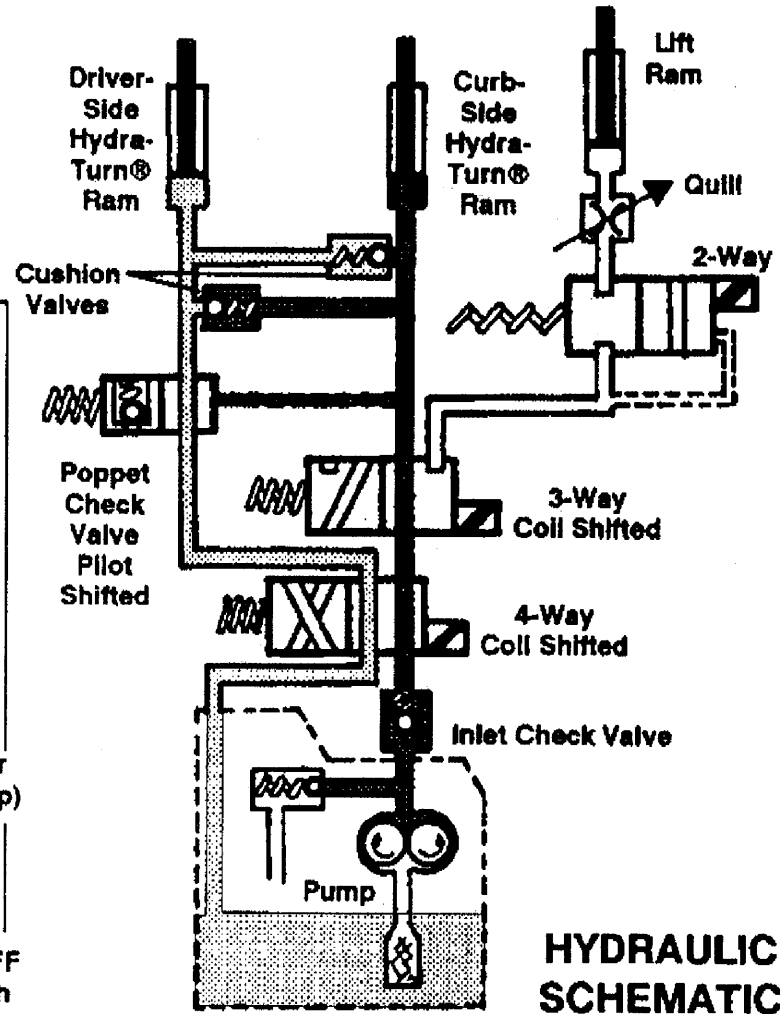
**ACTION:** Move control lever to ANGLE LEFT.

**SYSTEM RESPONSE:**

1. Angle left switch in control closes.
2. Current flows to motor relay (activating motor) and to the 3-way and 4-way cartridge valve coils (shifting spools).
3. Hydraulic oil from the pump flows through the 4-way and 3-way cartridge valves and into the curb-side Hydra-Turn® ram to angle the blade to the left.
4. As the oil flows to the curb-side ram, it shifts the poppet check valve spool, opening the poppet in the manifold port for the driver-side ram.

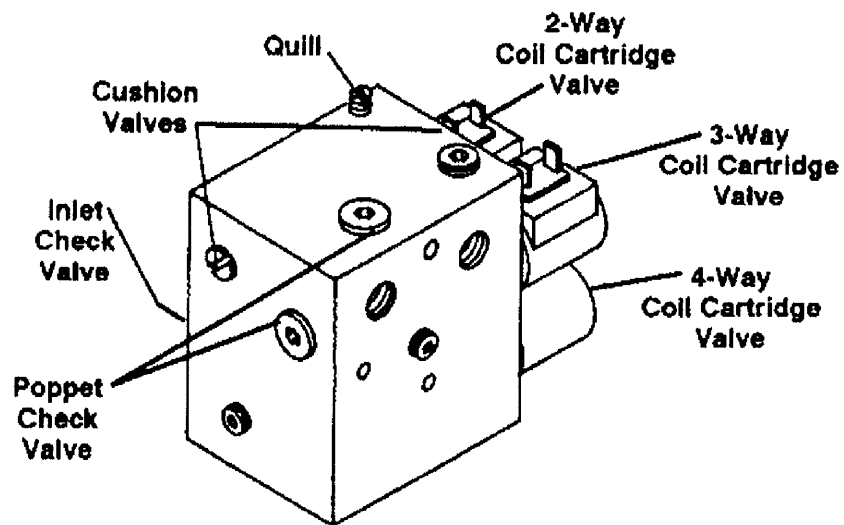


5. As the curb-side ram extends, the driver-side ram collapses, pushing its oil into the manifold, through the open poppet check valve, through the 4-way cartridge valve, and back to the reservoir.



## CUSHION VALVES

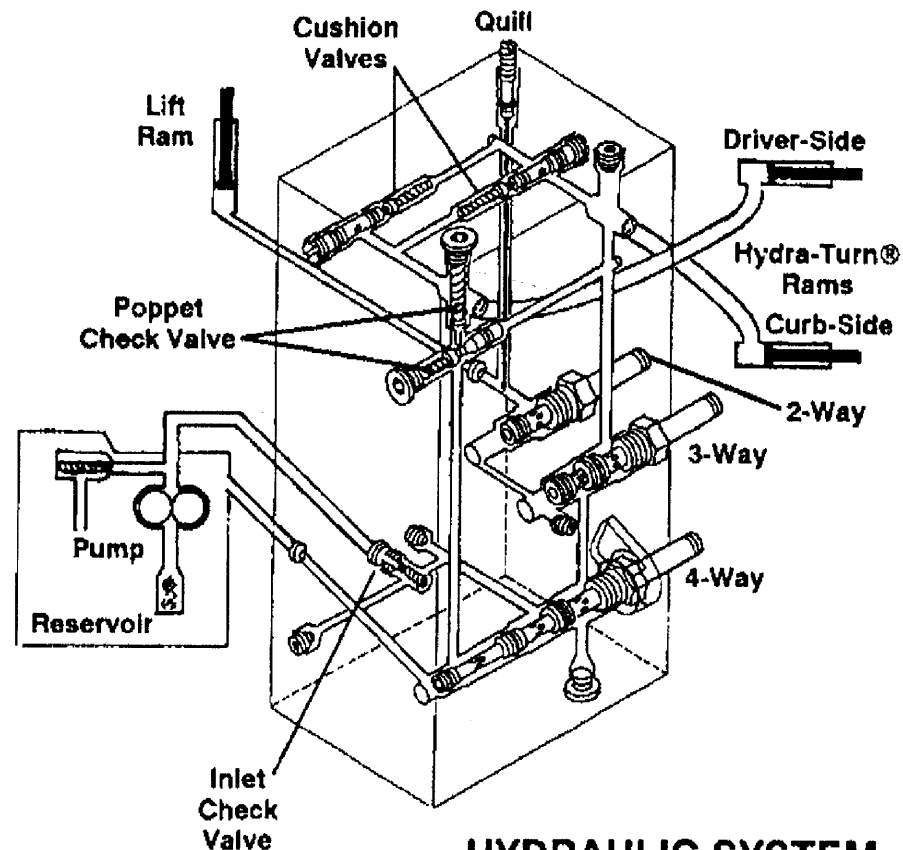
While plowing, oil is trapped in the extended Hydra-Turn® ram. When the blade meets an object, pressure rises in the extended Hydra-Turn® ram. As pressure in the ram exceeds the spring force holding the checkball against the seat, the checkball unseats. This allows oil to flow to the collapsed ram, and angles the blade in the opposite direction, preventing damage to the hydraulic system, blade or vehicle. Oil is trapped in the curb-side ram by the 3-way cartridge valve and in the driver-side ram by the poppet check valve.



**VALVE MANIFOLD COMPONENTS**

## POPPET CHECK VALVE

This check valve prevents oil from flowing out of the driver-side Hydra-Turn® ram while the blade is being raised. Without this check valve, whenever the blade is raised to stack snow, oil could flow from the driver-side ram, through the 4-way cartridge valve, and back to the reservoir.



**HYDRAULIC SYSTEM**

## INLET CHECK VALVE

The pump supply passage in the valve manifold has an inlet check valve (one-way check valve) which allows oil to flow from the pump into the valve manifold. This check valve prevents oil from flowing back to reservoir whenever the pump is not in operation.

## TROUBLESHOOTING GUIDE

SOLENOID CONTROL POSITION	PROBLEM DESCRIPTION	DEFINE PROBLEM AND FOLLOW STEPS BELOW				
Angle	Blade will not angle or angles too slow. Time: 4 seconds	Check oil level, page 17.	See Solenoid Isarmatic® Mark IIIa Malfunction, B, page 33.	All functions slow, check pump pressure, see A, page 33.	Check disconnect couplers & Hydra-Turn® ram nuts.	Remove pump. Clean filter screen.
Raise	Blade will not raise. Time: 2 seconds				Check lift ram packing nut.	
Lower	Blade will not lower.					
Neutral	Blade will not remain angled while plowing.	Inspect and adjust Cushion Valves, see F, page 37.	Verify Coil Cartridge Test, see E, page 36.	See Poppet Check Valve inspection, G, page 38.		
Neutral	Motor continues to run in neutral.	Disconnect BROWN WIRE attached to small terminal of motor relay. If motor continues to run, motor relay is shorted. Replace motor relay. If motor stops, test Solenoid Control, see D, page 35, or repair/replace harness.				
Raise while "stacking" snow	Blade angles to left while raising blade during "stacking" operation.	See Poppet Check Valve inspection, G, page 38.				
Neutral	Blade lowers in neutral.	2 way valve stuck open or 2 way valve cartridge defective, see E, page 36.				
Lower	Blade lowers too fast.	See Quill Adjustment, H, page 38.				
	Blade lowers too slowly.					
Raise	Blade raises too slowly.	Check lift ram packing nut.	Check oil level, page 17.		Check pump pressure, see A, page 33.	

## SAFETY RULES



**WARNING:** Read all instructions, including safety information, before performing any service or maintenance on your snowplow.

### BEFORE YOU BEGIN

1. Park the vehicle on a level surface, place shift lever in PARK or NEUTRAL, and set parking brake.
2. For most service procedures, leave the hydraulic components on the vehicle.



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

### PERSONAL SAFETY

1. Wear only snug-fitting clothing while working on your vehicle or snowplow. Do not wear jewelry or a necktie. Secure long hair. Be especially careful near moving parts such as fan blades, pulleys, and belts.
2. Wear safety goggles to protect your eyes from battery acid, gasoline, and dust and dirt from machinery.
3. Avoid touching hot surfaces such as engine, radiator, exhaust pipes, and hoses.
4. Always have a fire extinguisher rated for flammable liquids and electrical fires (rated BC) handy.

### VENTILATION



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

If you work on your vehicle or plow in a garage or other enclosed area, be sure to vent exhaust gas directly to the outside through a leakproof exhaust hose.

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



## BATTERY SAFETY



**WARNING:** A charging battery gives off gases that can explode if touched by spark or flame. Cover top of battery with electrically non-conductive material to keep sparks from testing operations away from battery gases.

1. Never lay tools or equipment on the battery. You could accidentally ground the POSITIVE (+) battery terminal, resulting in electrical shock or burns or damage to the vehicle or equipment.
2. Avoid contact with battery acid. It can burn your eyes or skin, and burn holes in clothing.
3. Always disconnect the battery ground before removing or replacing electrical components such as the motor relay or battery cables.

## HYDRAULIC SAFETY



**WARNING:** Hydraulic oil under pressure can cause skin injection injury. If left untreated, these injuries can result in amputation or death. If you are injured by hydraulic oil, get medical treatment immediately.

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

## A PUMP PRESSURE TEST

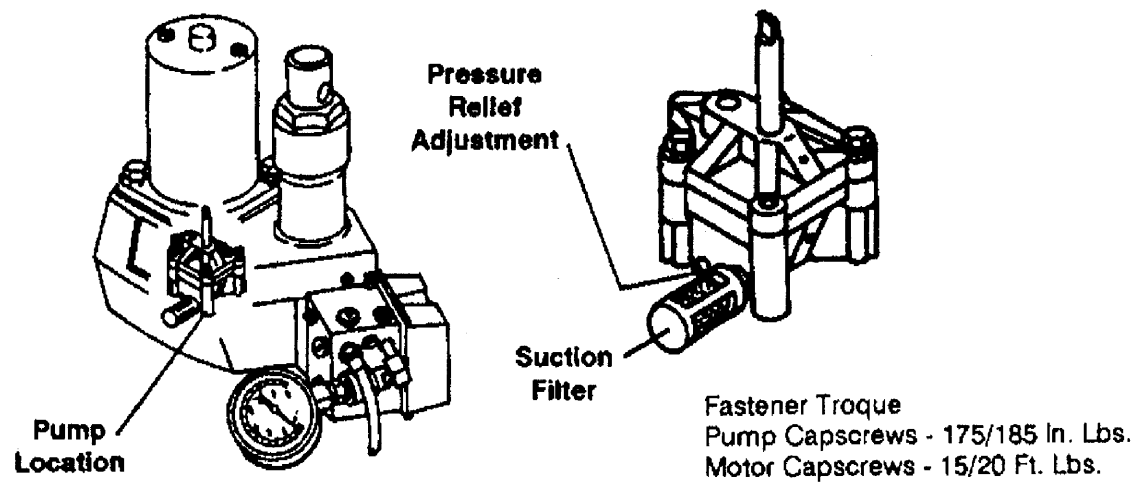
**NOTE:** Battery or motor in poor condition will cause invalid test results.

1. Disconnect lift chain and hoses to Hydra-Turn® rams.
2. Install 2,000 PSI (minimum) gauge into female coupler on valve manifold.



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

3. Move solenoid control to ANGLE LEFT and read gauge.
4. If pressure is 1450-1850 PSI, pump pressure is OK.
5. If pressure is low, remove pump, clean or replace filter and adjust pressure. Turn adjusting screw clockwise (CW) to increase pressure (1/4 turn equals approximately 225 PSI).



## B SOLENOID ISARMATIC® MARK IIIa MALFUNCTION

1. Turn ignition (key) switch of vehicle to ON or ACCESSORY.
2. Turn ON/OFF Switch on solenoid control to ON.

**NOTE:** If indicator light on solenoid control does not light, check 10-amp fuse in fuse holder under dash or black ground wire between control and motor relay.

3. Move control lever to RAISE, ANGLE RIGHT and ANGLE LEFT.  
IF motor does not run in any position - go to Relay Test C, page 34.  
IF motor runs in one or two positions - go to Solenoid Control Test D, page 35.  
IF motor runs in all three positions - go to Coil Cartridge Test E, page 36.

## C RELAY TEST

CONDITION: Motor does not run with solenoid control in RAISE, ANGLE RIGHT or ANGLE LEFT. Battery has sufficient charge to start vehicle engine. Vehicle ignition (key) switch and solenoid control ON/OFF switch are both ON. Red indicator light on control is glowing, indicating that the 10 amp fuse located under dash is OK.

1. Disconnect Hydra-Turn® hoses and lift chain from lift channel.
2. Check all electrical cables and connections including grounds. Clean and tighten if necessary.



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

3. Use a jumper wire to connect POSITIVE (+) terminal of battery to small terminal on motor relay with BROWN wire attached. If motor runs, see Solenoid Control Test, D, page 35, and inspect harness from control to motor relay for broken or damaged wires. If motor does not run...



**WARNING:** A charging battery gives off gases that can explode if touched by spark or flame. Cover top of battery with electrically non-conductive material to keep sparks from testing operations away from battery gases.

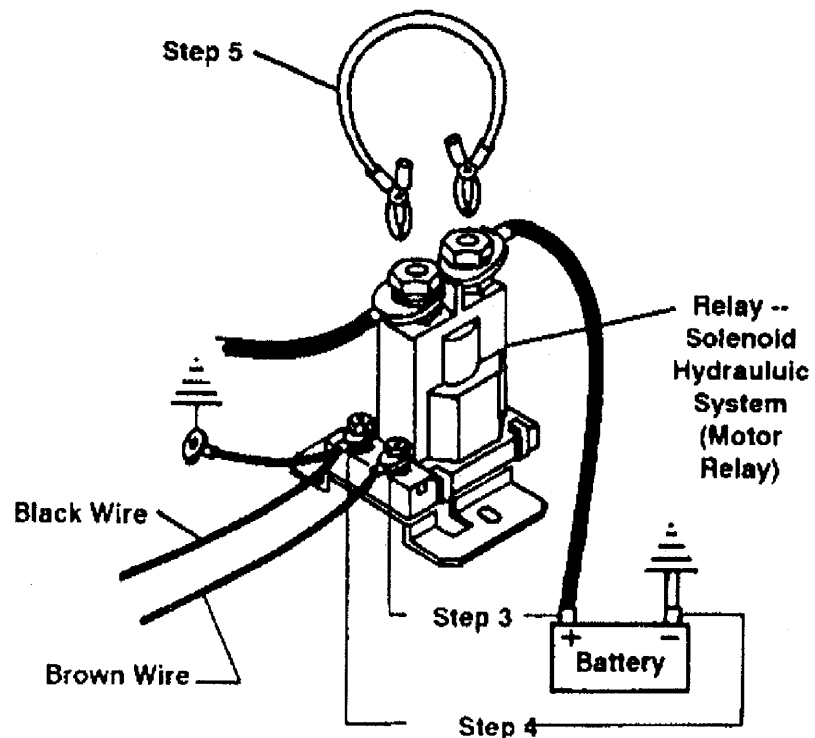
4. Use jumper wire from step 3 to connect NEGATIVE (-) terminal of battery to small terminal on motor relay with BLACK wire attached. Use a second jumper wire to repeat Step 3. If motor runs, repair black wire ground. If motor does not run...

5. Use heavy jumper cables to by-pass (jump) the two large terminals on top of the motor relay. If motor runs, replace motor relay. If motor does not run...



**WARNING:** Always disconnect the battery ground before removing or replacing electrical components such as the motor relay, or battery cables.

6. Remove motor and check pump shaft rotation. If tight, repair or replace pump, if loose replace motor.



## D SOLENOID CONTROL TEST

DO NOT use continuity testers for this test.

1. Disconnect the solenoid control connector. Turn control ON/OFF switch ON.
2. Attach 12-volt power supply to terminal shown in diagram.
3. In each position of the lever indicated in the chart below, use a grounded circuit tester light to test each numbered terminal. The chart indicates the condition of the circuit tester light.

Control Position	Pin No.				
	2	3	4	5	6
Neutral	Off	*	Off	Off	Off
Raise	Off	*	On	On	Off
Angle Right	On	*	On	Off	**Off
Angle Left	On	*	On	On	**Off
Lower	Off	*	Off	Off	On

\* Indicator light will be on and the circuit tester light will not be as bright.

\*\*Style 2 Control – If on, move lever to raise. Retest angle right and left. If tester light is now out, control is OK.

4. If solenoid control tests OK, check harness for broken wires and/or corroded connections.

If test light is OFF when chart indicates it should be ON replace printed circuit board in control box.

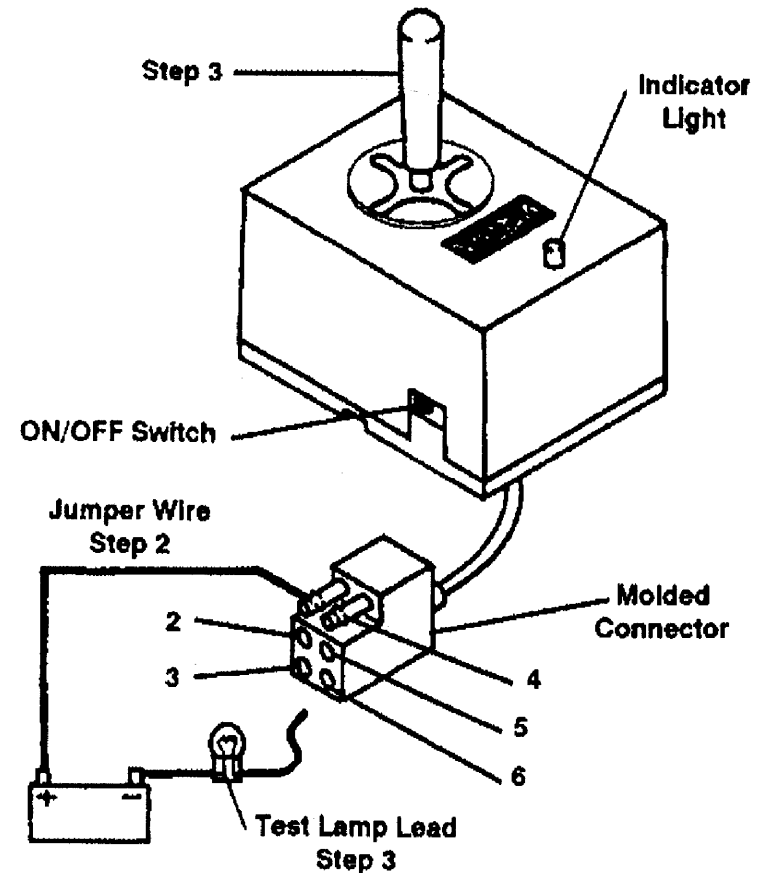
IF test light is ON when chart indicates it should be OFF replace printed circuit board in control box.



Style 1 Control Label



Style 2 Control Label



## E COIL CARTRIDGE TEST

1. Disconnect Hydra-Turn® hoses and lift chain from lift channel.
2. Move control lever to position in chart and test coil cartridge assembly stem for good magnetic pull (energized) using a steel screwdriver. Follow sequence shown in chart.

Position	Valve		
	2 Way	3 Way	4 Way
Raise	No	No	<b>Yes</b>
Lower	<b>Yes</b>	No	No
Right	*No	<b>Yes</b>	No
Left	*No	<b>Yes</b>	<b>Yes</b>

### Wire Connections at Coils

2 Way White Wire  
 3 Way Green Wire  
 4 Way Blue Wire  
 Ground Black Wire

\* Style 2 Control — If yes, move lever to raise, pull should stop.

If coil activation **MATCHES** the above chart - proceed to Step 3.

If coil activation **DOES NOT** match chart - test for current at coil spade-to-harness connections on valve manifold.

If current is available - use a jumper wire to create a good ground at coil spade terminals with **BLACK** wires attached.

If coil energizes - repair ground at coil spade or body bolt in engine compartment.

If coil not energized - replace coil.

If current not available - test solenoid control per D, page 35.

3. Remove coils from cartridges and remove cartridges from manifold. Inspect cartridges for visible contamination or damaged seals. Check for stuck spools using a non-marring or scratching (plastic, aluminum or soft brass) probe to push spring loaded spool.

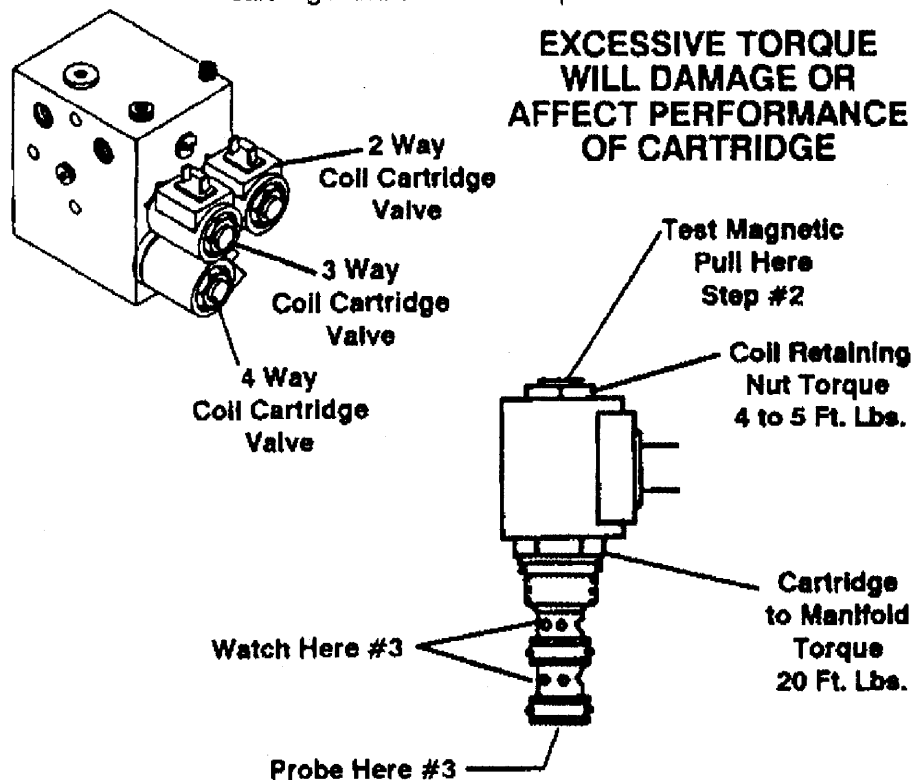
**NOTE:** Using probe to move spool may shear contamination which was affecting spool movement.

If stuck - replace cartridge.

If free - install coil on stem. Bench-test using jumper wires to energize coil while watching for spool movement.

If no movement seen - replace cartridge.

If movement seen - clean and oil cartridge. Reinstall cartridge and coil. Note torques shown.



## F CUSHION VALVE INSPECTION AND ADJUSTMENT

Whenever stems are removed, apply anti-seize compound or grease to threads of stem before assembly.

### Disassembly and Inspection:

1. Remove cushion valve stem. Use a magnet to remove ball, spring spacer and spring. Inspect parts.
2. Replace o-rings or complete assembly if damaged.
3. If OK, place ball on hard wood block, hold stem seat on ball and lightly strike stem with a hammer.

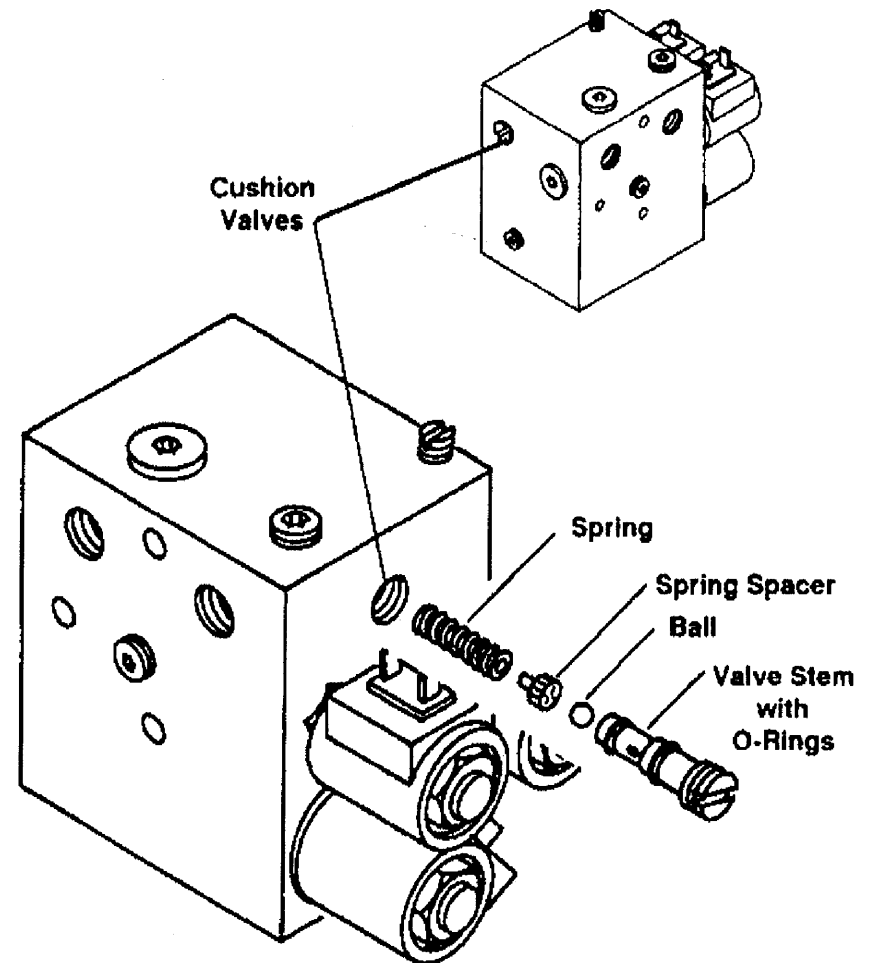
**CAUTION:** Be careful to strike stem squarely. You can bend stem if you do not strike it squarely.

4. Reassemble components into manifold.

### Adjustment

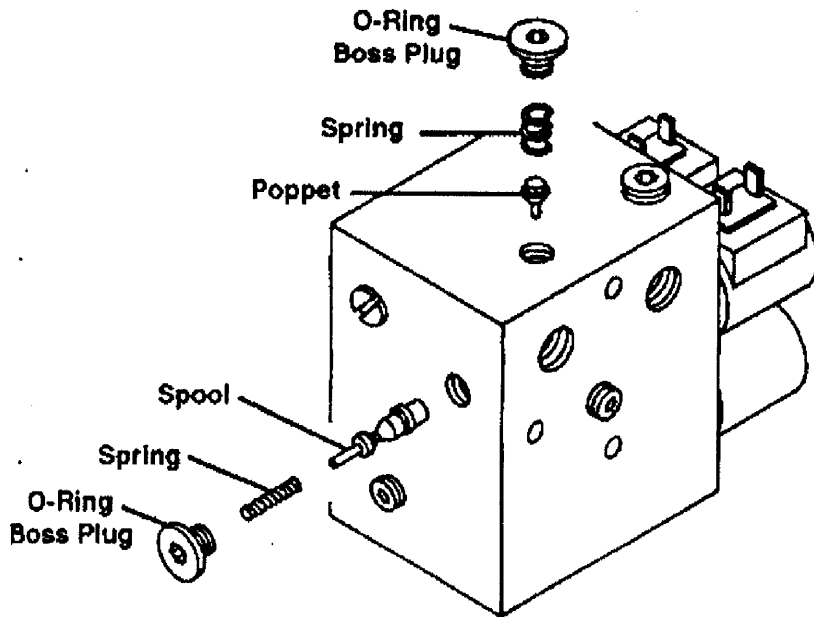
1. Adjust by tightening cushion valve stem as much as possible (until spring is fully compressed).
2. Back off valve stem (rotate counterclockwise) the number of turns indicated in the chart.

Hydra-Turn® Ram (Dia. X Stroke)	Back Off Valve Stem (CCW) No. of Turns	Approximate Cushion Valve Pressure (PSI)
1-1/2" x 6"	1-3/4	2500
1-1/2" x 10"	1-1/4	3500



## G POPPET CHECK VALVE

1. Remove o-ring boss plug, spring and poppet from top of valve manifold.
2. Remove o-ring boss plug, spring and spool with o-ring from front side of valve manifold (use needle-nose pliers to remove spool).
3. Inspect parts, poppet seat and spool bore for damage or contamination.
4. Install spool in bore. Spool must insert smoothly.
5. Install poppet, springs and o-ring boss plugs.



## H QUILL ADJUSTMENT

To adjust blade drop speed:

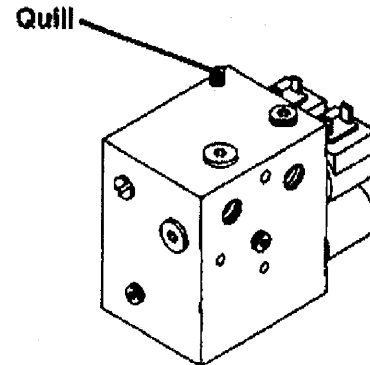
1. Lower blade to ground before making adjustment.
2. SENSITIVE ADJUSTMENT – MAX. 1/8 TURN AT A TIME.  
Turn quill IN (clockwise) to slow drop speed.  
Turn quill OUT (counterclockwise) to increase drop speed.

**N**OTE: Turning quill too far IN can slow raise time.

3. Stand clear of blade when checking adjustment.



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



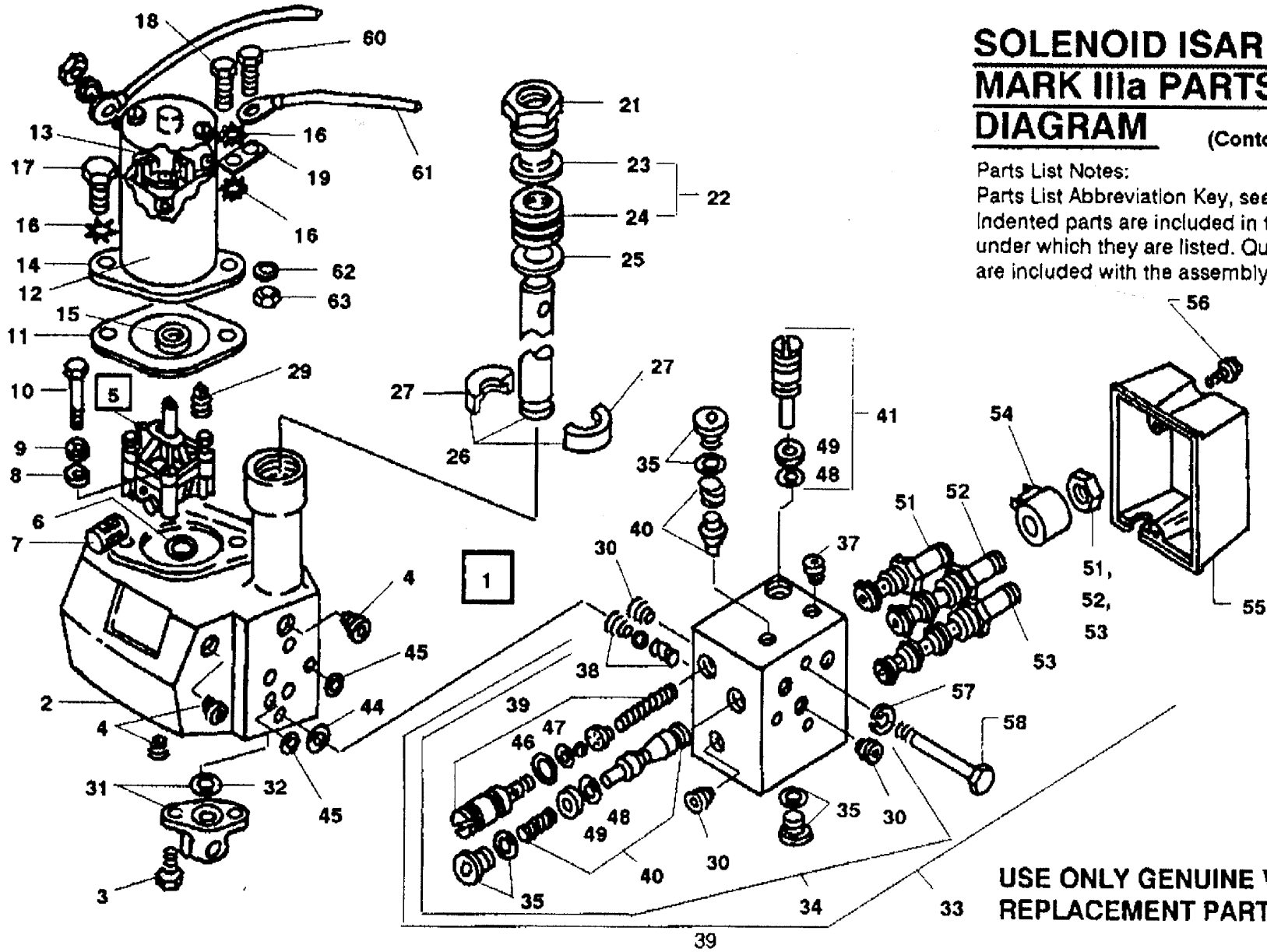
# SOLENOID ISARMATIC® MARK IIIa PARTS DIAGRAM

(Contd. on page 41)

Parts List Notes:

Parts List Abbreviation Key, see page 44.

Indented parts are included in the assembly under which they are listed. Quantities shown are included with the assembly.



**USE ONLY GENUINE WESTERN®  
REPLACEMENT PARTS**



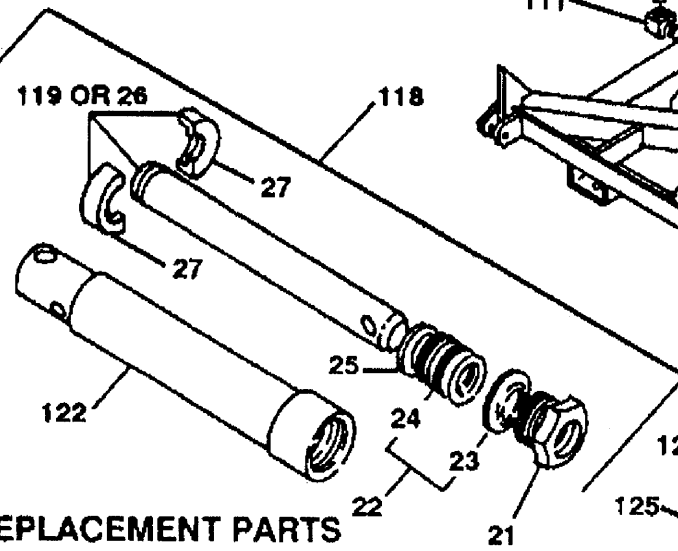
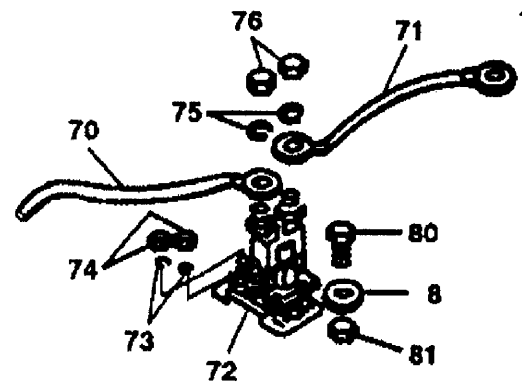
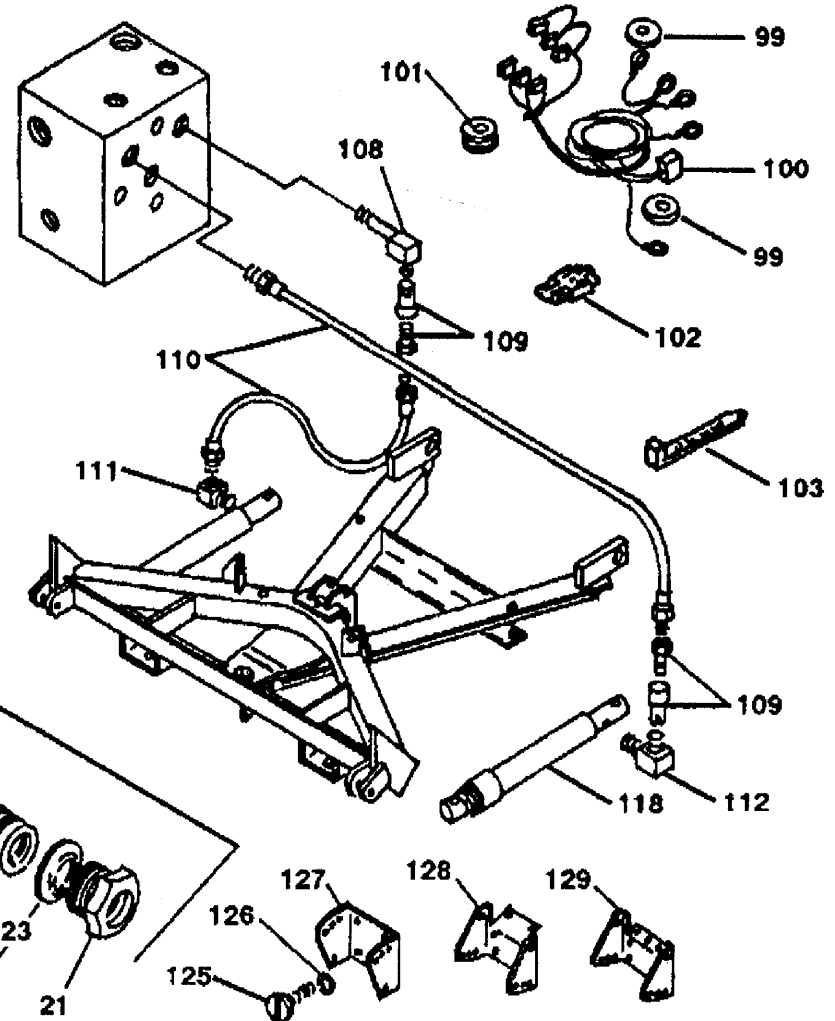
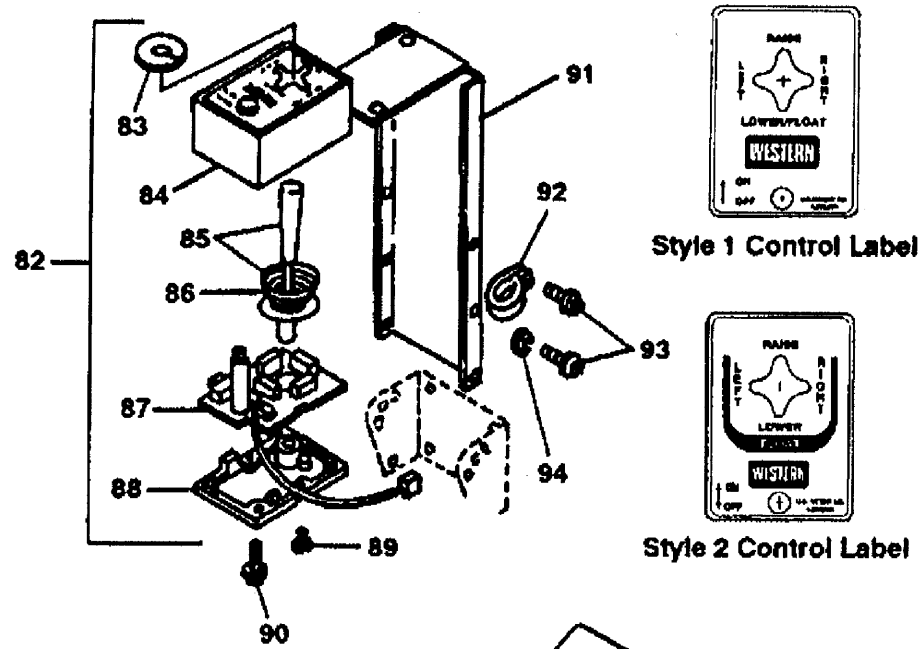
# SOLENOID ISARMATIC® MARK IIIa PARTS LIST

(Contd. on page 42)

ITEM	PART NO.	QTY.	DESCRIPTION	ITEM	PART NO.	QTY.	DESCRIPTION
1	49253	1	HYDRAULIC UNIT 1-1/2" SOL 3500	34	49224	1	MANIFOLD ASSY SOL 3500 (W/O CARTRIDGES)
	49280	1	HYDRAULIC UNIT 1-1/2" SOL 2500		49279	1	MANIFOLD ASSY SOL 2500 (W/O CARTRIDGES)
2	49252	1	SERVICE HOUSING KIT 1-1/2" SOL				
3	93166	2	5/16-18X1-1/4 HXW TRTS TY TR-3				
4	92072	3	PLUG 1/4 NPTF HX SO (W/Fluid Level Plug)	35	92960	3	3/8-24 HX SO O-RING BOSS PLUG
	92071	2	PLUG 1/8 NPTF HX SO (W/O Fluid Level Plug)	30	92071	3	PLUG 1/8 NPTF HX SO
5	49211	1	PUMP KIT DIE CAST	37	92072	1	PLUG 1/4 NPTF HX SO
6	25620	1	O-RING - 115	38	49225	1	INLET CHECK VALVE KIT
7	56185	1	SUCTION FILTER	39	49138	1	CUSHION VALVE REPAIR KIT-SET
8	91101	2	1/4 PLAIN WASHER TY A STD ZP	40	49226	1	POPPET CHECK VALVE KIT
9	91220	2	BELLEVILLE SPRING WASHER	41	56330	1	QUILL ASSY
10	90025	2	5/16-18X2-1/4 HX CS G5 ZP		49257	1	BACK-UP/O-RING KIT - SOL
11	25861	1	GASKET	44	56274	1	O-RING - 013
12	56133	1	MOTOR ASSY 4-1/2"	45	25730	2	O-RING - 012
13	49262	1	BRUSH KIT - PR 56133	46	25731	2	O-RING - 010
14	49084	1	MOTOR FLANGE BRG & SEAL	47	55371	2	O-RING - 008
15	49014	1	OIL SEAL	48	25622	2	O-RING - 006
16	91265	3	7/16 EX TOOTH LK WASHER ZP	49	56315	2	BACK-UP RING - 006 PARBAK SPLIT
17	90066	1	7/16-14X1-1/4 HX CS G5 ZP	51	49227	1	CARTRIDGE 20 W/JAM NUT
18	90067	1	7/16-14X1-1/2 HX CS G5 ZP		49258	1	SEAL KIT - CARTRIDGE 20
19	55757	1	GROUND CLIP	52	49228	1	CARTRIDGE 30 W/JAM NUT
21	25944K	1	PACKING NUT 1-1/2"	53	49229	1	CARTRIDGE 40 W/JAM NUT
22	25205K	1	PACKING SET W/WIPER 1-1/2"		49259	2	SEAL KIT - CARTRIDGE 30, 33 & 40
23	55137	1	WIPER RING - 1-1/2"	54	49230	3	COIL W/SPADE TERMINALS
24	55136	1	PACKING SET 1-1/2"	55	56291	1	COVER ASSY
25	91167	1	WASHER - SPECIAL	56	90650	2	#8-18X1/2 SL HXW TFTS TY B ZP
26	25202	1	PLUNGER 1-1/2" X 6"	57	91201	3	1/4 SP LK WASHER ZP
27	56267	1	SPLIT BEARING KIT	58	90083	3	1/4-20X3-1/4 HX CS G5 ZP
29	92079	1	PLUG 3/8 NPTF SQ	60	90038	1	3/8-16X3/4 HX CS G2 ZP
31	25968K	1	BASE LUG W/#25618 O-RING	61	55984	1	GROUND CABLE 60" BLACK
32	25618	1	O-RING - 216	62	91203	1	3/8 SP LK WASHER ZP
33	49265	1	VALVE MANIFOLD ASSY SOL 3500	63	91413	1	3/8-16 HX NUT ZP
	49278	1	VALVE MANIFOLD ASSY SOL 2500				

# SOLENOID ISARMATIC® MARK IIIa PARTS DIAGRAM

(Contd. from page 39)



**USE ONLY GENUINE WESTERN® REPLACEMENT PARTS**

# SOLENOID ISARMATIC® MARK IIIa PARTS LIST (Contd. from page 40)

ITEM	PART NO.	QTY.	DESCRIPTION
70	25635	1	BATTERY CABLE 60" RED
71	22511	1	BATTERY CABLE 22" RED
72	56134K	1	RELAY - SOLENOID HYDRAULIC SYSTEM
73	91242	2	#10 SP LK WASHER BPO
74	91402	2	#10-32 HX NUT ZP
75	91202	2	5/16 SP LK WASHER ZP
76	92842	2	5/16-24 JAM NUT
80	90002	2	1/4-20X3/4 HX CS G2 ZP
8	91101	2	1/4 PLAIN WASHER TY A STD ZP
81	91331	2	1/4-20 PT HX LK NUT NYIS ZP
82	56285	1	* SOLENOID CONTROL
83	56283	1	SHIELD
84	49231	1	* BODY W/LABEL, LENS & SPRING (Style 1)
	49286	1	* BODY W/LABEL & LENS (Style 2)
85	49232	1	* LEVER, SPRING & ACTUATOR KIT (Style 1)
	49287	1	* LEVER, SPRING & ACTUATOR KIT (Style 2)
86	55923	1	SPRING - CONICAL
87	49255	1	* PC BOARD ASSY (Style 1)
	49284	1	* PC BOARD ASSY (Style 2)
88	56199	1	BASE
89	93153	2	#6-19X3/8 SL HXW Tfts HI-LO
90	93154	2	#8-18X5/8 SL HXW Tfts HI-LO
91	56308	1	CONTROL BRACKET
92	55381	1	CABLE CLAMP
93	93157	5	#8-32X3/8 SL HXW TCTS TY T BP
94	91231	4	#8 SP LK WASHER BP
99	91098	2	#10 PLAIN WASHER TY B NAR ZP
100	56307	1	HARNESS - CONTROL (10 Amp Fuse)
101	66130	2	RUBBER GROMMET
102	59114	1	SELF STRIP WIRE CONNECTOR
103	59223	5	CABLE TIE

ITEM	PART NO.	QTY.	DESCRIPTION
108	92275K	1	MALE ELBOW 1/4 NPTF X 90 SPL
109	25232K	2	QUICK COUPLER
110	55020K	2	PRESSURE HOSE 1/4" X 38"
111	92210K	1	STREET ELBOW 1/4 NPTF X 90
112	92278K	1	MALE ELBOW 1/4 NPTF X 90
118	56102	2	RAM ASSY 1-1/2" X 10"
	56337	2	RAM ASSY 1-1/2" X 6"
21	25944K	1	PACKING NUT 1-1/2"
22	25205K	1	PACKING SET W/WIPER 1-1/2"
23	55137	1	WIPER RING 1-1/2"
24	55136	1	PACKING SET 1-1/2"
25	91167	1	WASHER - SPECIAL
119	56105	1	PLUNGER 1-1/2" X 10"
26	25202	1	PLUNGER 1-1/2" X 6"
27	56267	1	SPLIT BEARING KIT
122	56104	1	CYLINDER 1-1/2" X 10"
	56336	1	CYLINDER 1-1/2" X 6"
125	90388	4	#10X1 SL PN Tfts TY AB BZP
126	91242	4	#10 SP LK WASHER BPO

**Parts Listed Below are Furnished in Appropriate Lift Mount Box.**

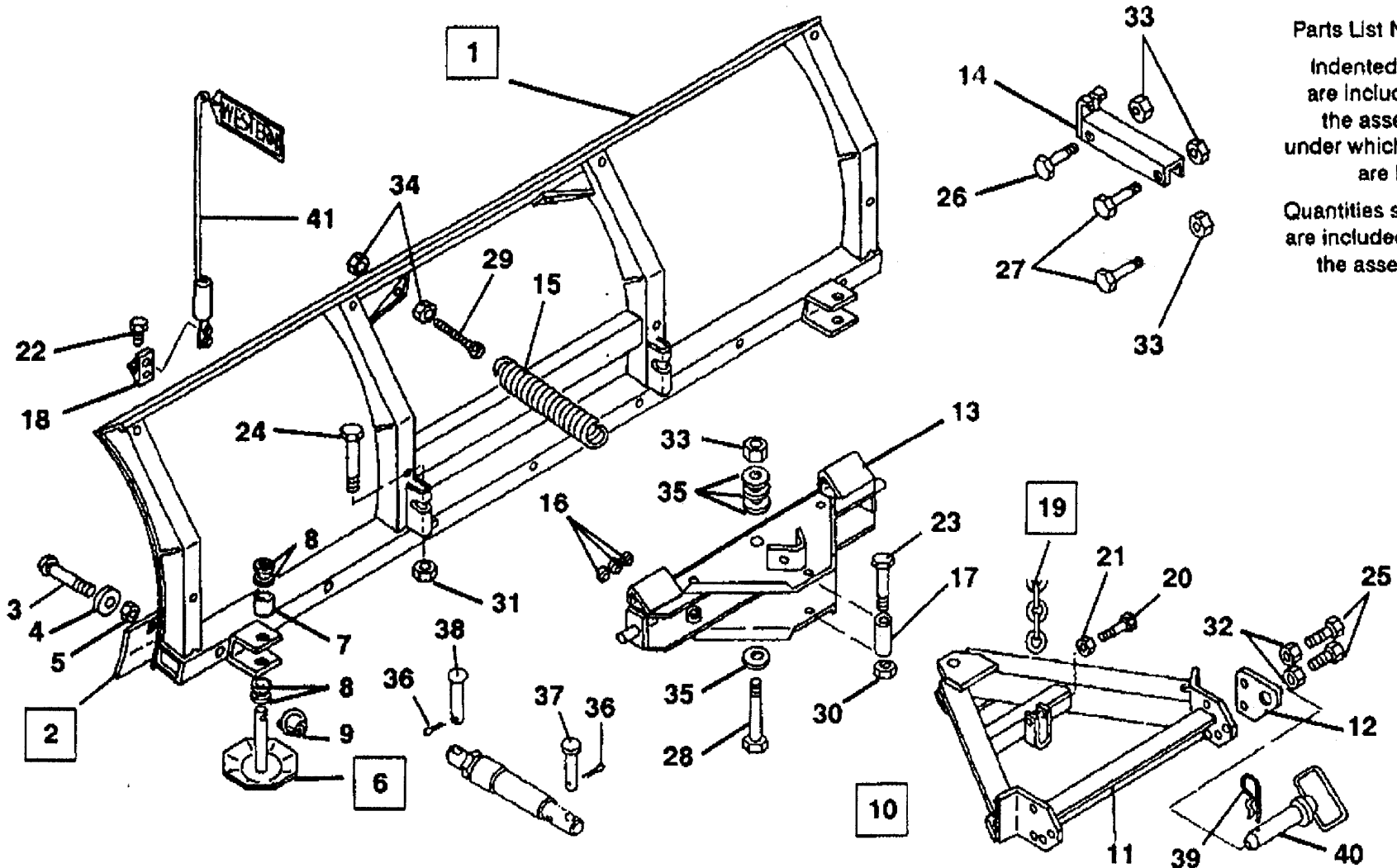
127	56080	1	DASH BRACKET
128	56081	1	DASH BRACKET
129	56082	1	DASH BRACKET

\* Orders for complete control assemblies will be filled with Style 2 controls. Component parts, where indicated, are not interchangeable between the two styles. Order according to the label on the body of your control.

Indented parts are included in the assembly under which they are listed. Quantities shown are included with the assembly.

Parts List Abbreviation Key, see page 44.

# SPORT/UTILITY PLOW PARTS DIAGRAM (Contd. on page 44)



Parts List Notes:  
 Indented parts are included in the assembly under which they are listed.  
 Quantities shown are included with the assembly.

**USE ONLY GENUINE WESTERN® REPLACEMENT PARTS**

# SPORT/UTILITY PLOW PARTS DIAGRAM

(Contd. from page 43)

ITEM	PART NO.	QTY.	DESCRIPTION
1	61300	1	6-1/2 FT. BLADE ASSY SU
2	49264	1	*CUTTING EDGE ASSY 6-1/2' SU
3	90229	7	7/16-14X3-1/2 CB G5 ZP
4	91104	7	7/16 PLAIN WASHER TY A STD ZP
5	91334	7	7/16-14 PT HX LK NUT NYIS ZP
6	49266	2	DISC SHOE ASSY SU
7	60045	1	SPACER
8	91109	13	WASHER - SPECIAL
9	93010K	1	LINCH PIN 7/16" X 1-3/4"
10	61295	1	A&Q ASSY SPORT/UTILITY
11	61280	1	A-FRAME SU
12	61282	2	ADAPTER LUG 1.0
13	61270	1	QUADRANT SU
14	60342	1	LIFT CHANNEL SHORT
15	23039	2	TRIP SPRING
16	61095	6	BUMPER - NO. 2250 1.0 DIA
17	61161	1	BUSHING - STOP
18	61287	2	BLADE GUIDE BRACKET
19	49033	1	REPLACEMENT CHAIN ASSY
20	90045	1	3/8-16X2-1/2 HX CS G8 ZP
21	91333	1	3/8-16 PT HX LK NUT NYIS ZP
22	91040	2	5/16-18X1 HX FLG SCREW G5ZP
23	90074	1	7/16-14X4-1/2 HX CS G5 ZP
24	90110	2	1/2-13X5 HX CS G5 ZP
25	90129	4	5/8-11X2 HX CS G5 ZP
26	90157	1	3/4-10X3 HX CS G5 ZP
27	90159	2	3/4-10X3-1/2 HX CS G5 ZP
28	90189	1	3/4-10X6 HX CS G5 ZP
29	90490	2	5/8-11X4 EYEBOLT G2 ZP

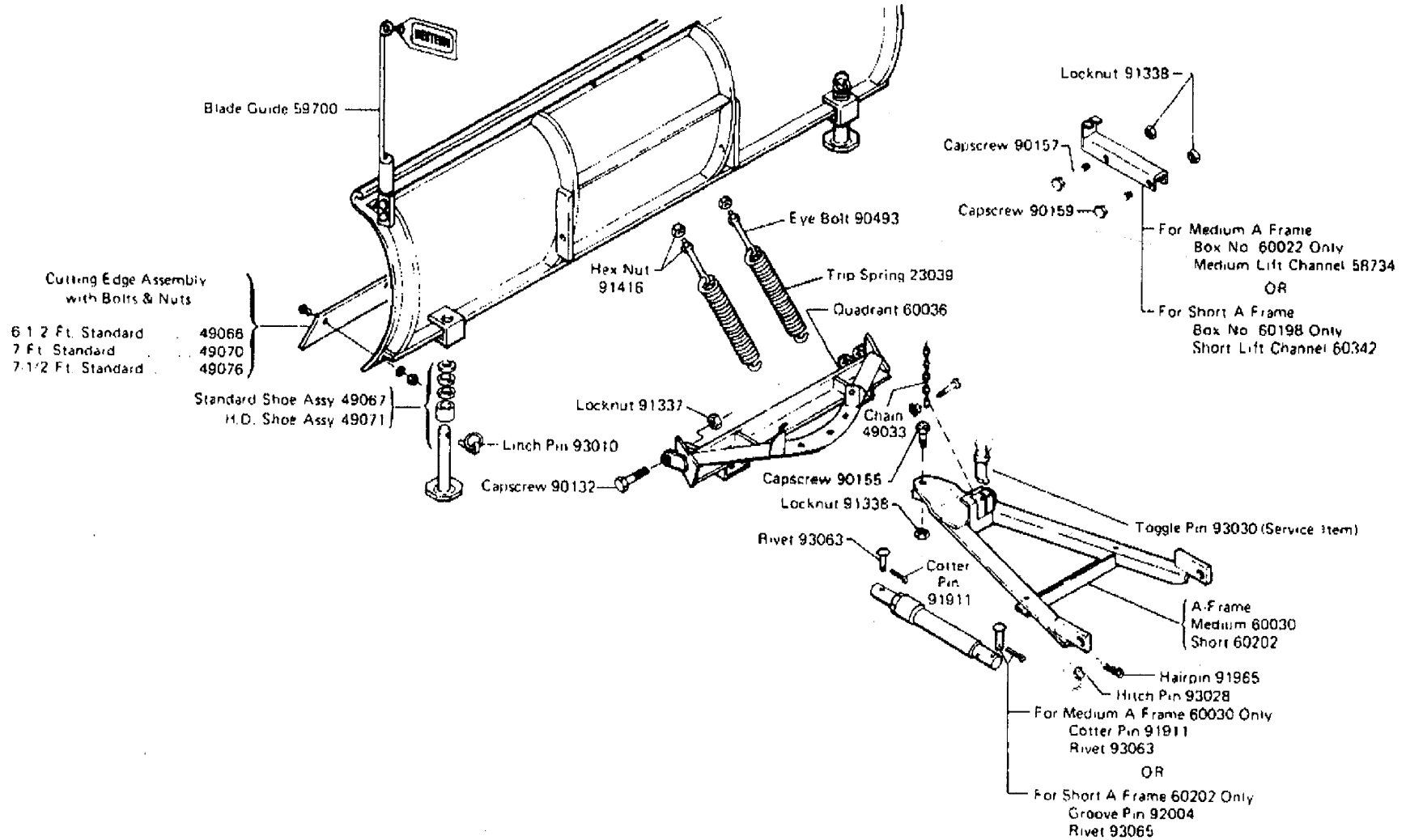
ITEM	PART NO.	QTY.	DESCRIPTION
30	91334	1	7/16-14 PT HX LK NUT NYIS ZP
31	91335	2	1/2-13 PT HX LK NUT NYIS ZP
32	91337	4	5/8-11 PT HX LK NUT NYIS ZP
33	91338	4	3/4-10 PT HX LK NUT NYIS ZP
34	91416	4	5/8-11 HX NUT ZP
35	91147	4	3/4 PLAIN WASHER TY A SAE ZP
36	91911	4	5/32X1-1/2 COTTER PIN ZP
37	93063K	2	RIVET 3/4" X 3-1/2"
38	93061K	2	RIVET 3/4" X 4"
39	91965K	2	HAIRPIN COTTER - 5/32"
40	93028K	2	HITCH PIN 1' X 3-1/2"
41	59700	1	BLADE GUIDE PACK ASSY, PAIR

\*Cutting Edge Assembly includes appropriate number of fasteners.

Abbreviations	
ASSY	Assembly
BP	Black Phosphate
BPO	Black Phosphate & Oil
BRG	Bearing
BZP	Black Zinc Plate
A&Q	A-Frame & Quadrant
CB	Carriage Bolt
CS	Capscrew
DIA	Diameter
EX	External
FLG	Flange
G	Grade
HD	Heavy Duty
HX	Hex
HXW	Hex Washer
LK	Lock
NAR	Narrow
NO.	Number
NPTF	National Pipe Thread (Fluid)
NYIS	Nylon Insert
PC	Printed Circuit
PN	Pin
PR	Prestolite
PSI	Pound per Square Inch
PT	Prevailing Torque
SAE	Society of Automotive Engineers
SL	Slotted
SO	Socket Head
SOL	Solenoid
SP	Spring
SPL	Special
SQ	Square
STD	Standard
SU	Sport/Utility
TCTS	Thread Cutting Tapping Screw
TFTS	Thread Forming Tapping Screw
TRTS	Thread Rolling Tapping Screw
TY	Type
W/	With
W/O	Without
ZP	Zinc

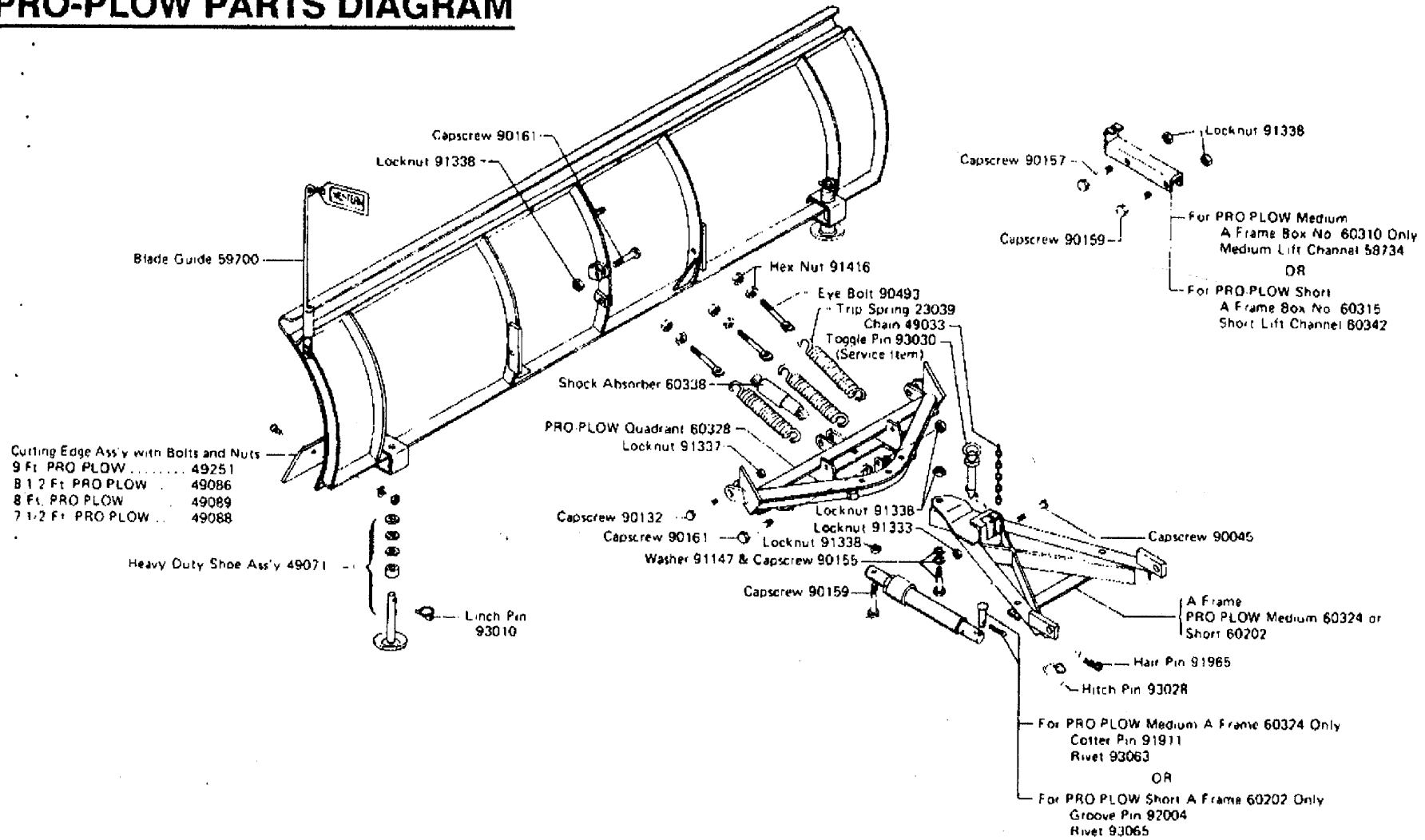
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# STANDARD PLOW PARTS DIAGRAM



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# PRO-PLOW PARTS DIAGRAM



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