

CATALOG NO.
TP-890

TRI  PLOW

**OWNER'S MANUAL
AND
MECHANIC'S GUIDE**

WESTERN
SNOWPLOWS

PREFACE

Welcome to the growing family of WESTERN® Snowplow owners. This manual has been prepared to acquaint you with the operation and maintenance of your new WESTERN TRI-PLOW and to provide safety information. We urge you to read this manual carefully and to follow its recommendations. This will help assure profitable and trouble-free operation of your TRI-PLOW.

When service is necessary, your local WESTERN Distributor knows your TRI-PLOW best and is interested in your complete satisfaction. Return your TRI-PLOW to him 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 TRI-PLOW Isarmatic® Mark IIIa Hydraulic Unit is serialized. For your information and protection, it is wise to record this serial number and keep it in a safe place.

Your vehicle should have a MINIMUM 4,000 pound front GAWR. The vehicle should be equipped with all vehicle manufacturer's options for snowplowing.



SAFETY 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.

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 the damage caused by the use of these unauthorized items.

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

WESTERN®
Roll-Action™

ISARMATIC®
PRO-GUARD™

Hydra-Turn®

OWNER'S MANUAL

OWNER'S MANUAL

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TRI-PLOW COMPONENTS

BLADE

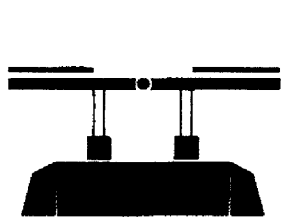
The two blade wings on your new TRI-PLOW are constructed of heavy gage steel. To increase rigidity and strength, each wing is reinforced with several vertical ribs. The top edge of each wing is rolled for added strength and improved appearance.

The exclusive Roll-Action™ blade is designed to roll snow ahead and to the side instead of just pushing snow. This action gives your vehicle a power reserve as it moves snow easily. You move more snow and move it faster using less power, saving fuel and reducing wear and tear on both truck and plow.

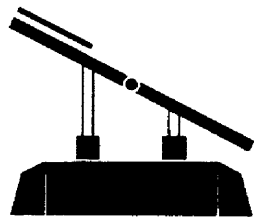
Blade life is extended with replaceable high carbon steel cutting edges bolted to the bottom of each wing. Periodically switch cutting edges to the opposite wing to equalize wear. Cutting edge ends are rounded to help ride over obstacles and prevent digging and gouging.

The blade also features heavy duty, adjustable, disc-type skid shoes. These rotate 360° for longer wear and better blade flotation over all surfaces. See the Care & Maintenance section for adjustment.

Your new TRI-PLOW 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.



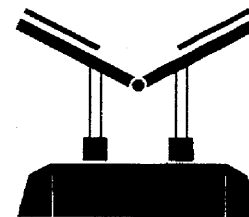
1. STRAIGHT BLADE



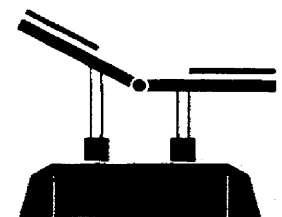
2. ANGLED BLADE



3. "V" BLADE



4. SCOOP BLADE



5. DOGLEG BLADE

Blade guides with replaceable flags are furnished with your TRI-PLOW. These help improve operator visibility and blade control.

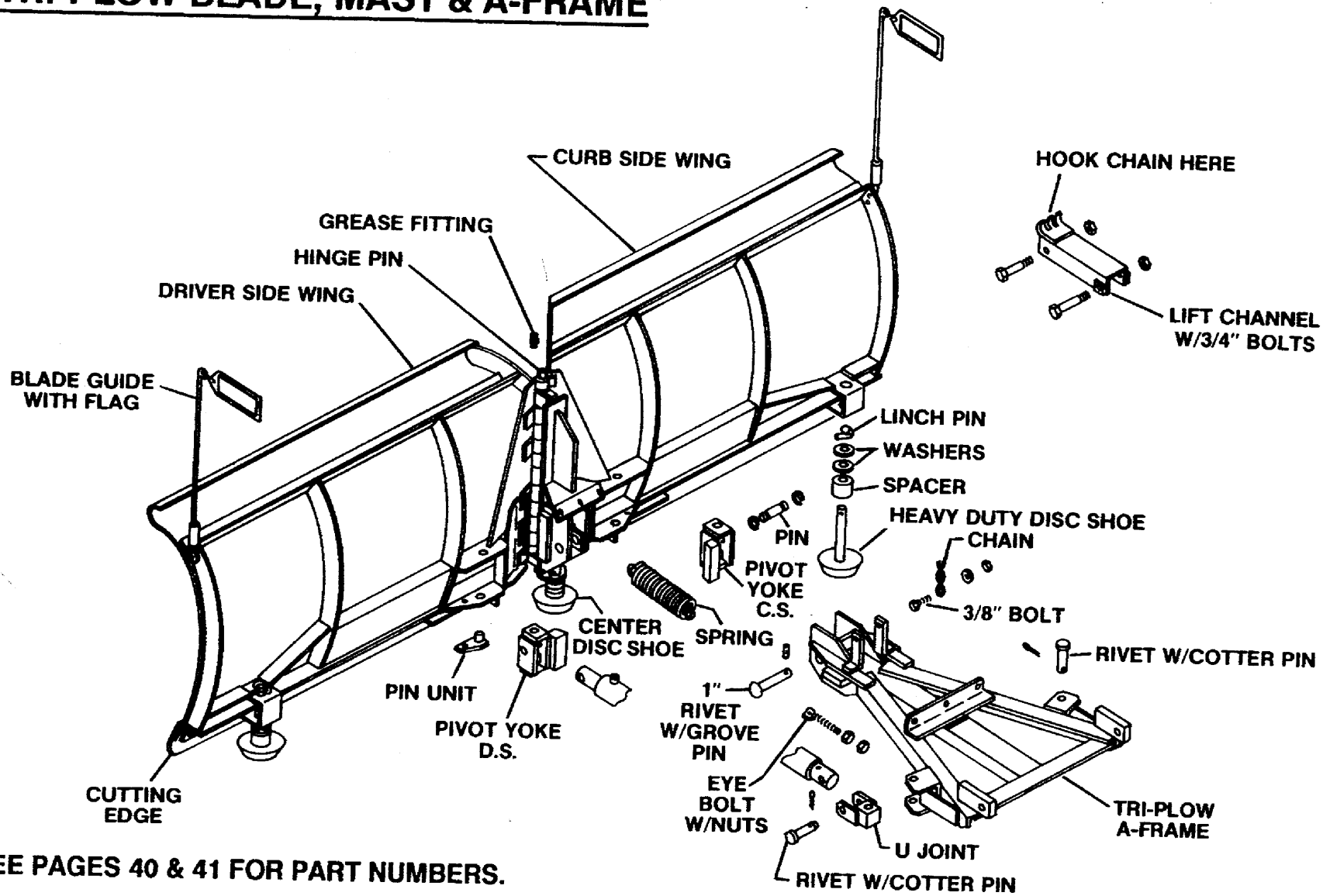
BLADE POSITIONS

The TRI-PLOW can be used in five basic plowing positions:

1. **Straight Blade** - move both wings to form a straight blade for wide path plowing or "stacking" snow. Use this position to transport plow between job sites.
2. **Angled Blade** - Move one wing "OUT" and the other wing "IN" to form an angled blade in either direction for general plowing and widening.
3. **"V" Blade** - Move both wings "IN" towards the vehicle for initial break through plowing and plowing paths or walkways.
4. **Scoop Blade** - Move both wings "OUT" away from the vehicle to form a scoop to "carry" snow with minimum spill-off.
5. **Dogleg Blade** - Move one wing to straight blade position and the other "OUT" to scoop blade position for clean up of windrows.

For best road clearance, the straight blade position is recommended during transport. The scoop and "V" positions are NOT RECOMMENDED during transport.

TRI-PLOW BLADE, MAST & A-FRAME

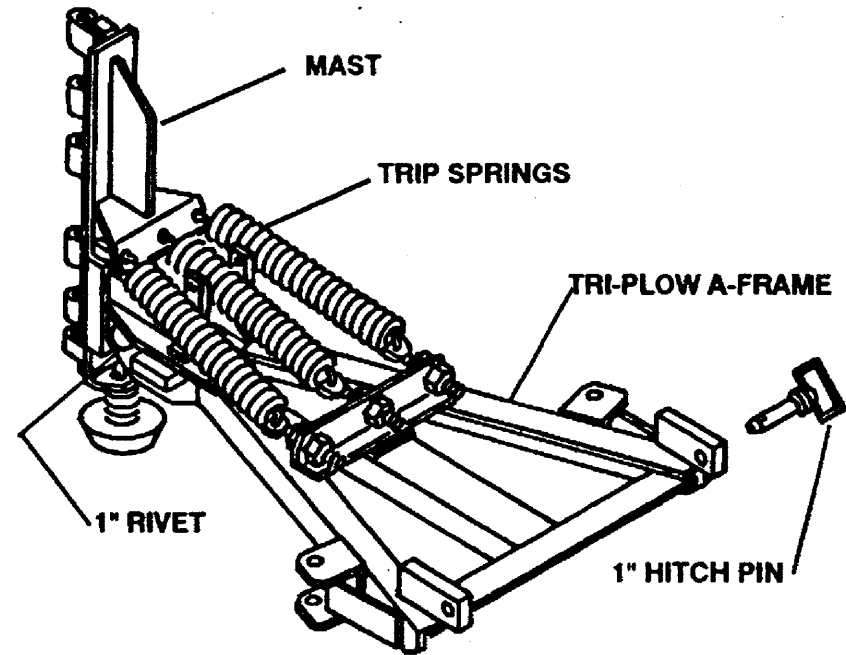


SEE PAGES 40 & 41 FOR PART NUMBERS.

MAST & A-FRAME

Blade wings are hinged at the Mast. The A-Frame connects the mast to the vehicle. The mast attaches to the strong triangular shaped A-Frame with a 1" diameter rivet and heavy duty trip springs. Heavy 1" diameter hitch pins are used to secure the A-Frame to the vehicle mount. These hitch pins can't be bent and will not shear in normal operation, assuring a solid connection.

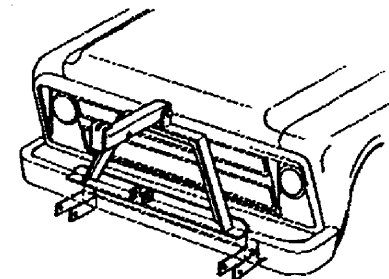
Three heavy duty trip springs hold the mast vertical to the ground. The springs are a safety device which allow the blade, when in certain positions (see page 9), to trip forward and ride over obstacles such as low curbs, manhole covers, etc., without damage to the blade wings, vehicle or injury to the driver. Eye bolts are used to adjust the tension of the trip springs.



LIFT-MOUNT

WESTERN® has designed custom lift-mount assemblies for most vehicles. Due to differences between vehicle models, there is only limited interchangeability of lift-mount assemblies.

The mount is fastened to the underside of the vehicle frame and provides the primary connecting link between the snowplow and the vehicle. The lift provides the mounting framework for the hydraulic unit and is mounted on top of the front extensions of the vehicle frame.



LIFT MOUNT ASSEMBLY

TRI-PLOW HYDRAULIC POWER

The TRI-PLOW Isarmatic® Mark IIIa provides a fast and uniform speed of lifting and wing positioning. The TRI-PLOW System (1-1/2" Ram) raises the blade in 2 seconds, moves a wing "IN" in 5 seconds and "OUT" in 4 seconds. The Heavy Duty System (2" Ram) raises the blade in 4 seconds, moves a wing "IN" in 5 seconds and "OUT" in 4 seconds.

The Isarmatic® Mark IIIa reservoir should be filled with automatic transmission (ATF) fluid. Fill the reservoir only thru the fill opening as it is designed to prevent over-filling. Fill with both wings IN towards the vehicle ("V" position) and the IIIa Control in the "LOWER" (float) position. Do not collapse the lift ram.

System Capacity:

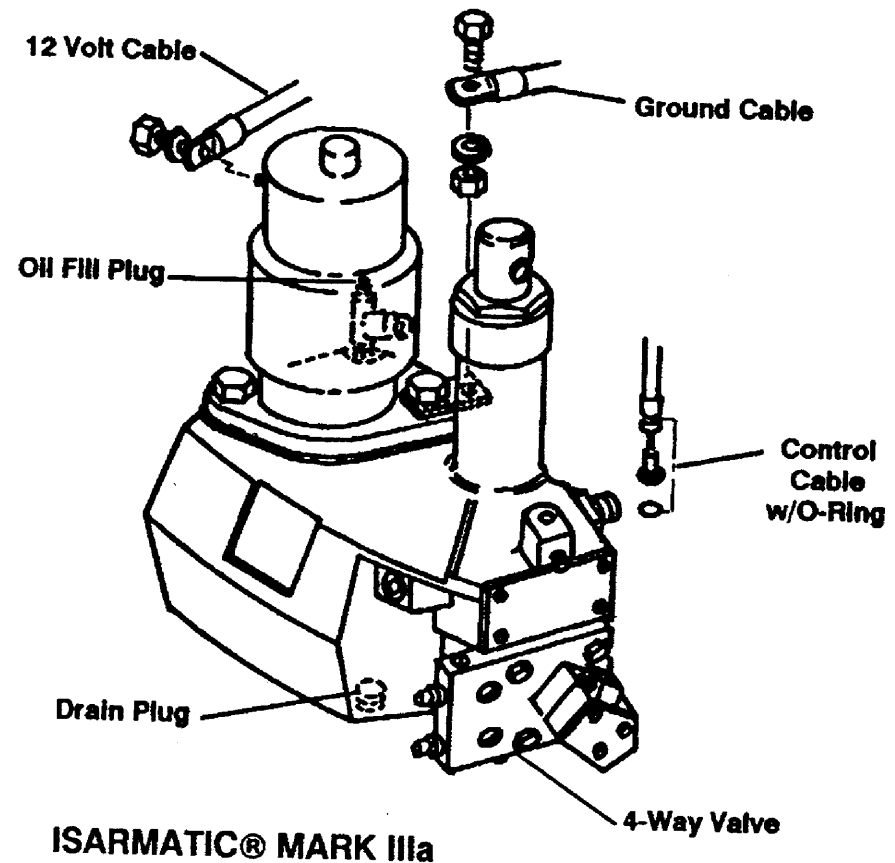
All Isarmatic® Mark IIIa Reservoirs - 1-1/2 quarts

All Isarmatic® Mark IIIa & TRI-PLOW Cylinders - 2-1/4 quarts.

Replacing the 18" long hose installed in the Isarmatic® Mark IIIa 4 way valve with a standard 38" long hose will allow this power source to be used to operate any WESTERN® standard, PRO-PLOW or heavy weight blade.

NOTE

The TRI-PLOW is equipped with coil/cartridge valves. Changing hydraulic fluid once per plowing season is required to assure long life for your hydraulic system.



TRI-PLOW VALVE

Your TRI-PLOW includes an electrically operated TRI-PLOW Valve to give you full control of blade wing positioning. When wing positioning is called for by the IIIa Control, fluid from the Isarmatic® Mark IIIa unit is directed by this valve to one of the double acting cylinders attached between a wing and the A-Frame.

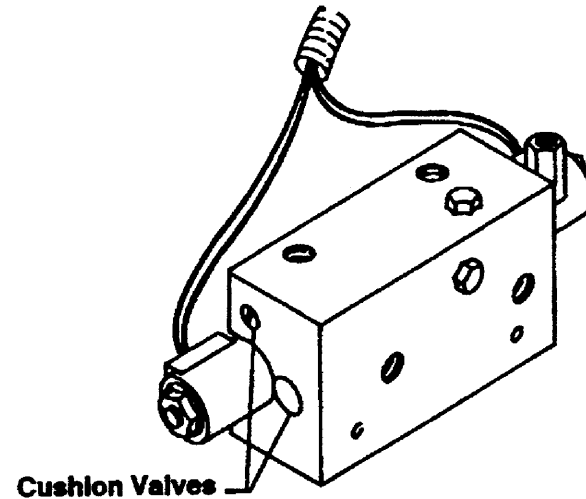
The TRI-PLOW Valve has two cushion valves built in to prevent damage to the blade wings or your vehicle if obstacles are hit. When force against the blade causes pressures in the cylinder to exceed set limits, the cushion valves allow oil to escape and the cylinder rod retracts. The blade is protected in certain positions (see page 9). Plowing speed should not exceed 5 MPH.

NOTE

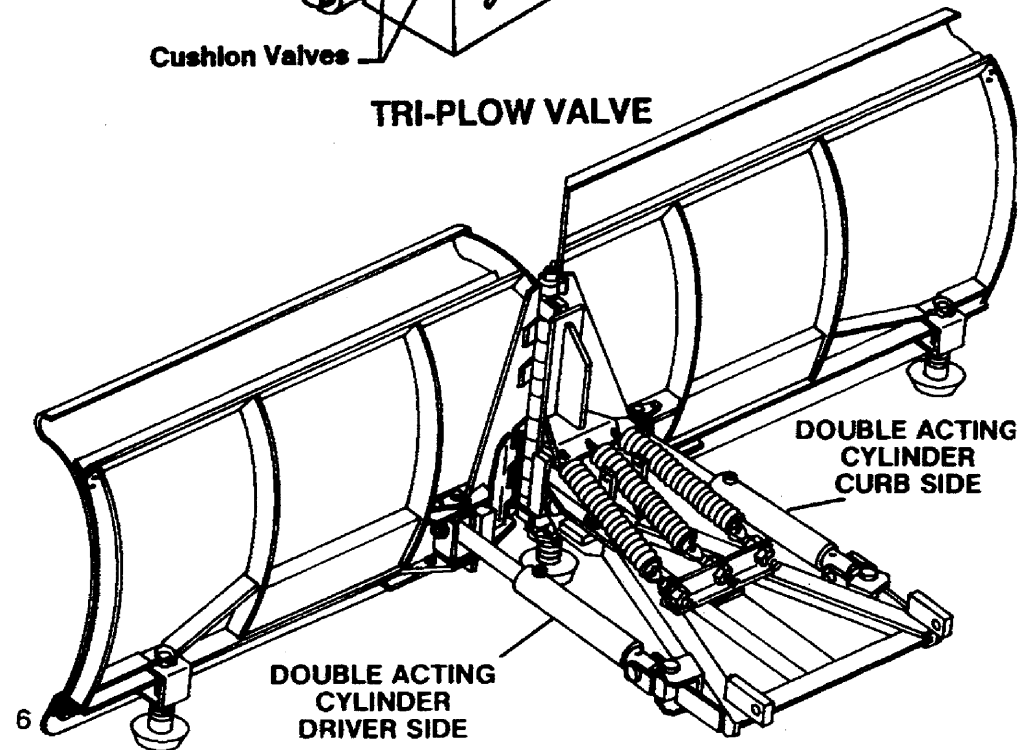
If a wing moves inward while plowing, DO NOT change cushion valve setting.



WARNING: DO NOT stand between the vehicle and blade or directly in front of blade when it is being raised, lowered or wings positioned. 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.



TRI-PLOW VALVE



IIIa CONTROL & TRI-PLOW SWITCH

The IIIa Control and the TRI-PLOW Switch can be mounted on the dash or on the floor. Operation is as follows:

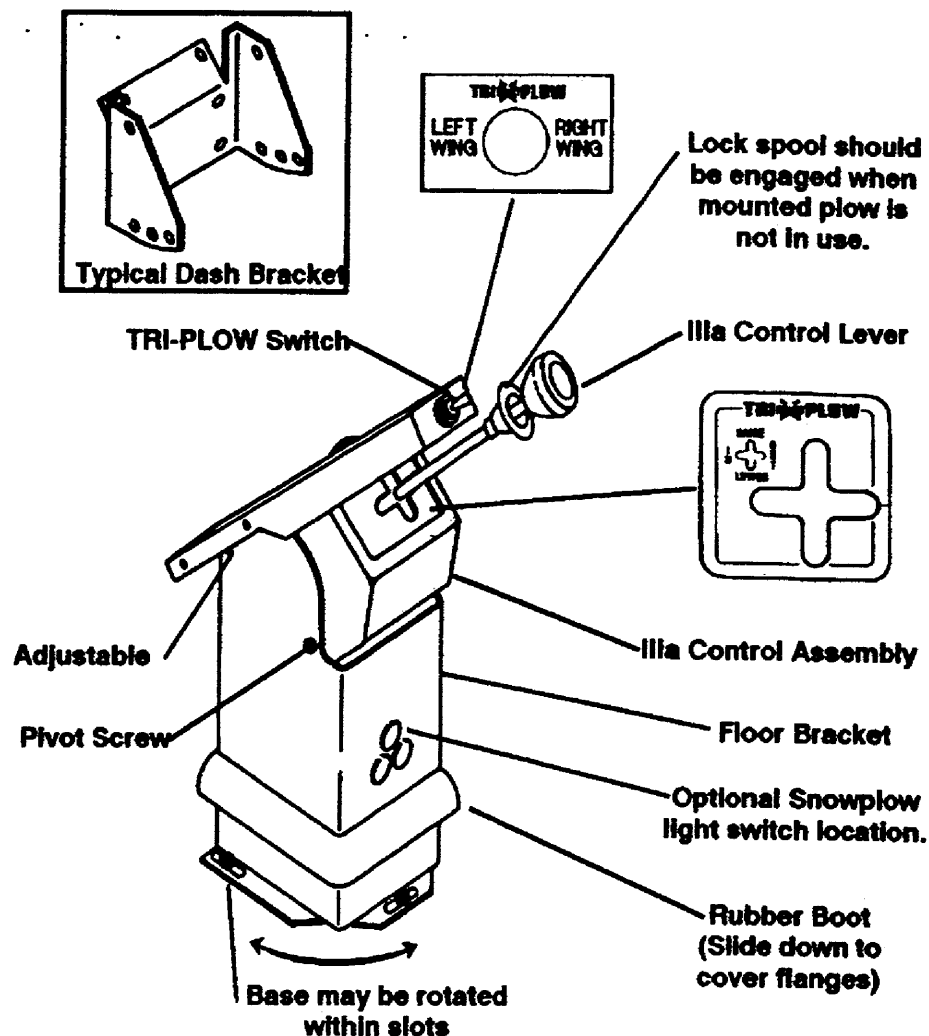
- RAISE/LOWER:** Move IIIa Control lever UP (forward) to "RAISE" the plow. Move lever DOWN (back) to "LOWER" (float) the plow.
- LEFT WING:** Place TRI-PLOW toggle switch to the LEFT WING position. Moving the IIIa Control lever to the right moves the wing "OUT" (away from the vehicle). Moving the lever to the left brings the wing "IN" (towards the vehicle).
- RIGHT WING:** Place TRI-PLOW toggle switch to the RIGHT WING position. Moving the IIIa Control lever to the right moves the wing "OUT" (away from the vehicle). Moving the lever to the left brings the wing "IN" (towards the vehicle).

The lever should be moved all the way into the desired position smoothly and without hesitation. Always return the lever to the neutral position except when float is desired. The "LOWER" position has a detent to allow the plow to float (move up and down) on the surface being plowed.

The IIIa Control is equipped with a manual lock to prevent accidental lowering or movement of the wings. Push the lock spool down into the center of the cross slots to prevent the plow from being moved. Pull the lock spool up out of the cross slots to move the plow. Lock spool should be engaged whenever plow is not in use.

WESTERN'S control cables are built for the most brutal winters. They're designed with stainless steel wire, conduit lined with high density polyethylene and permanently lubricated for low temperature operation.

During the off season, the IIIa Control lever can be removed by unscrewing the lever from the control. Store lever in glove box of vehicle.



NOTE

DO NOT hold IIIa Control lever in "RAISE" or "IN/OUT" position longer than 5 seconds beyond hydraulic function demand. To do so, increases battery drain and could result in 4" motor burn-out.

LIGHT KIT

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.

Pre-wired harness (Patented) with plug-in module requires no headlamp wire splicing. Lights conform to Federal Safety Standards.

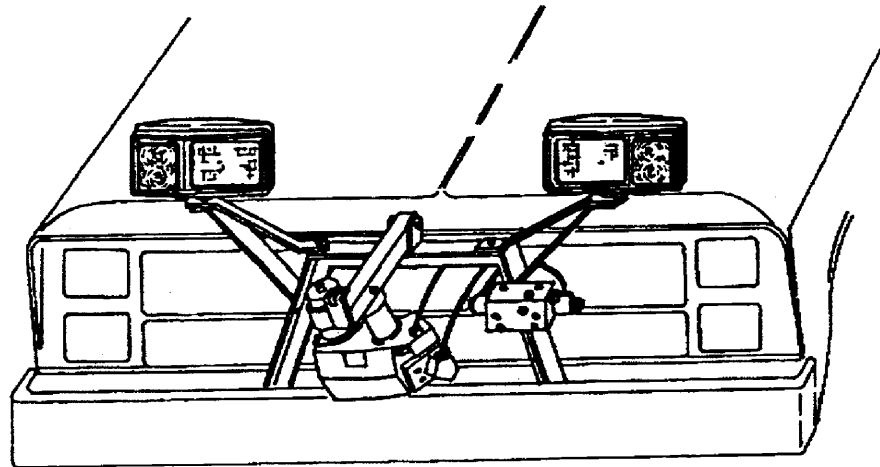
Plow headlamps are to be used **ONLY** when plow is attached.

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



WARNING: 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.



LOW PROFILE LIGHT KIT

BLADE PROTECTION

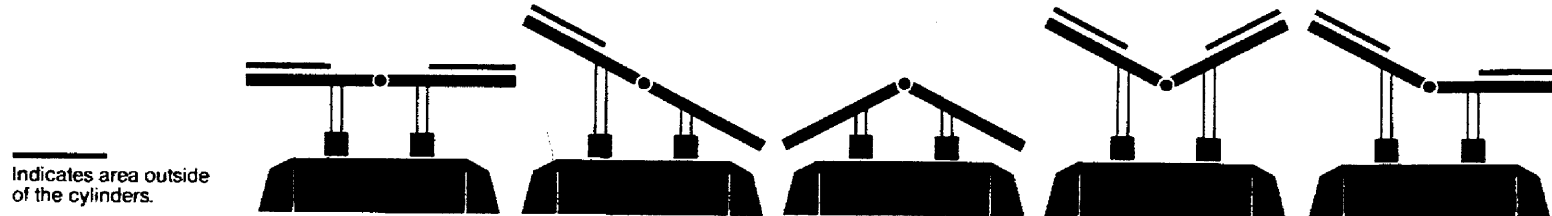
Your TRI-PLOW has two forms of obstacle protection.

BLADE TRIP PROTECTION

The trip springs allow the blade to trip forward and ride over obstacles when the blade is in certain positions (see below).

CUSHION VALVE PROTECTION

When force against the blade causes pressure in the cylinder to exceed a set limit, the cushion valve allows oil to escape and the cylinder rod retracts. This protection is available when the blade is in certain positions (see below).



	STRAIGHT BLADE	ANGLED BLADE	"V" BLADE	SCOOP BLADE	DOGLEG BLADE
FUNCTION:	First pass plowing and "stacking."	General plowing and widening.	Initial breakthrough and plowing paths or walkways.	"Carry" snow with minimum spilloff.	Clean-up of windrows.
BLADE TRIP PROTECTION:	FULL trip action.	NO trip action when fully angled. SOME trip when slightly angled.	Trip action ONLY when an obstacle is struck at the point of the "V."	NO trip action.	NO trip action.
CUSHION VALVE PROTECTION:	Relieves ONLY when an obstacle is struck outside of the cylinders.	Relieves ONLY when extended wing strikes an obstacle outside of the cylinder.	NO cushion relief (cylinder rods are already retracted).	Relieves ONLY when an obstacle is struck outside of the cylinders.	Relieves ONLY when an obstacle is struck outside of the cylinders.

MOUNTING TRI-PLOW TO VEHICLE

1. Hook chains to lift channel.



WARNING: Inspect lift channel 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.

2. Lift slowly using hydraulic power until lugs of A-Frame align with holes on mount.



WARNING: Do not place finger in A-Frame or mount lug holes to check alignment. Sudden motion of the TRI-PLOW could severely injure a finger.

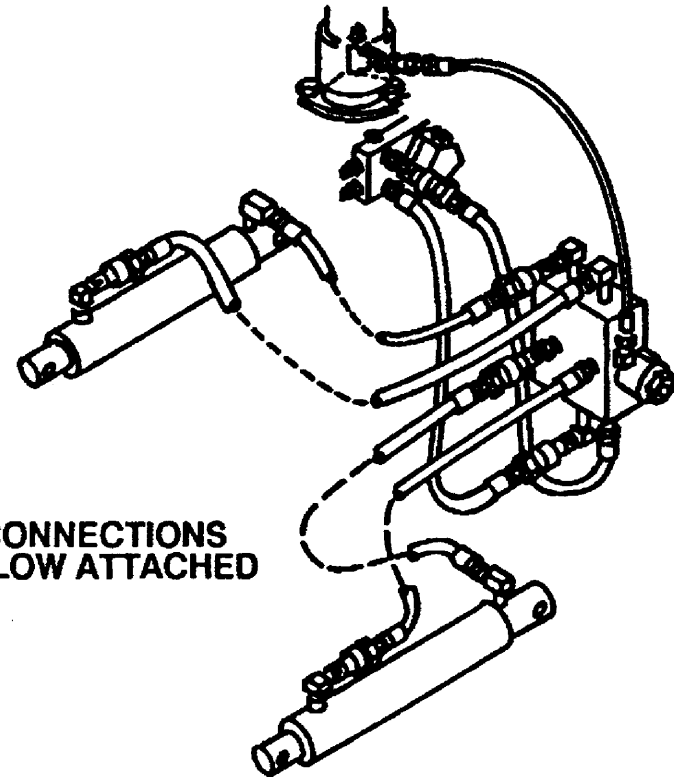
3. Insert hitch pins and hairpin cotters.
4. Connect hoses between TRI-PLOW valve and cylinders (See diagram at right).

IMPORTANT: Temperature changes from cold to warm may cause pressure within the TRI-PLOW cylinders great enough to prevent recoupling of the hoses. If this occurs place a clean rag over the male coupler and lightly tap the ball until the pressure is released.

5. Move the Illia Control into the "LOWER" (float) position.
6. Push lift channel all the way down. Pull the chains tight and hook them to the lift channel. After they are hooked, they will have the correct amount of slack for plow "float".
7. Raise, lower and angle both wings to assure that all systems are in working order.



WARNING: DO NOT stand between the vehicle and blade or directly in front of blade when it is being raised, lowered or wings positioned. 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.



HOSE CONNECTIONS WITH PLOW ATTACHED

NOTE

Care must be taken in routing of hydraulic hoses to prevent pinching of hoses between vehicle bumper and A-Frame.

REMOVAL & STORAGE OF TRI-PLOW

WESTERN'S recommended quick disconnect system will allow you to easily remove the TRI-PLOW from your vehicle. The Blade, Mast and A-Frame are usually removed and stored as a complete assembly.

REMOVING YOUR TRI-PLOW:

1. Drive your vehicle to the location where you will store the TRI-PLOW. Move the wings into the "V" position and lower plow to the ground. Leave Illa Control in "LOWER" (float) position. (Storing plow in "V" protects cylinder rods from rusting or pitting.)

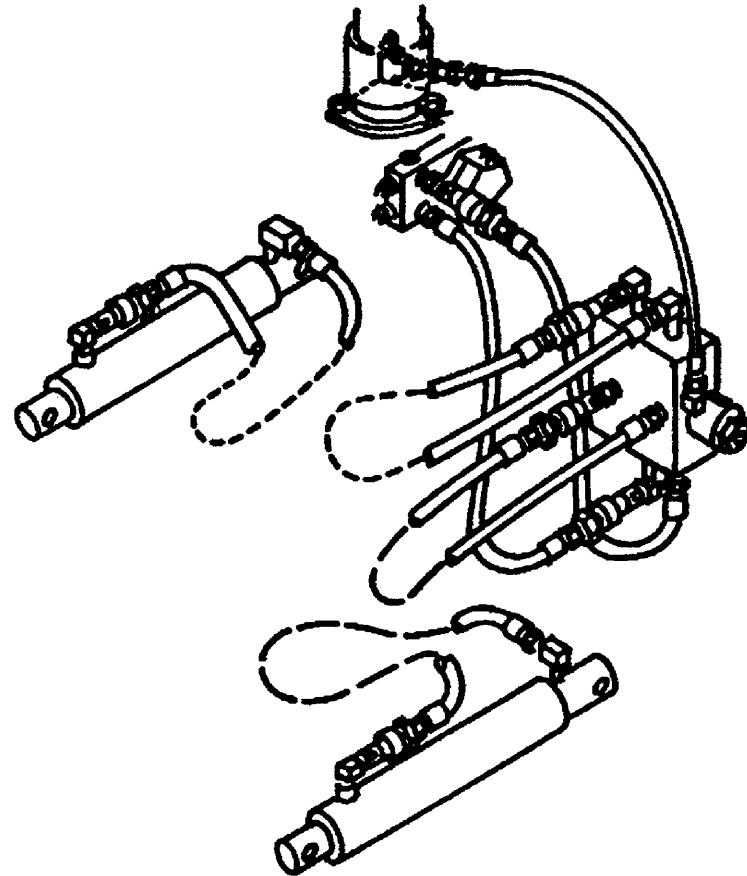


WARNING: Keep hands and feet clear of blade and A-Frame when removing or attaching TRI-PLOW. Moving or falling assemblies can cause serious bodily injury.

2. Disconnect hoses from cylinders. Cross connect male coupler of cylinder hose to female coupler on each cylinder. Cross connect male coupler of TRI-PLOW valve hoses to female couplers on TRI-PLOW valve. See diagram at right. This method of hose connection prevents foreign matter from entering the hydraulic system while the TRI-PLOW is off the vehicle.
3. Push the lift channel all the way down. Leave lift channel in down position to protect lift ram from rusting and pitting.
4. Pull hairpin cotters from hitch pins at rear of A-Frame and remove hitch pins. Store pins in convenient location or install into A-Frame lugs after disassembly.
5. Unhook chains.



WARNING: Inspect lift channel and bolts whenever hooking or unhooking the plow, and before travelling. Worn or damaged components could result in the plow dropping to the pavement while driving causing an accident.



HOSE CONNECTIONS WITH PLOW REMOVED

TIPS ON USING THE TRI-PLOW

Operating a vehicle equipped with a TRI-PLOW is not difficult if you follow these few simple suggestions –

- Be sure you know of any obstructions hidden beneath the snow - bumper stops in parking lots, abutments, 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.



WARNING: 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.



WARNING: 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.

- Hard packed snow - for better clean up, raise the disc shoes so that the cutting edge comes into direct contact with the pavement. Use lowest gear to place maximum power behind cutting edge.
- Deep snow conditions - move the blade into the "V" position and raise plow 3 to 4 inches for the initial pass. Clean up and widen the initial pass with angle, scoop or dogleg blade as the situation requires. When plowing deep snow, be sure to keep vehicle moving. Ballast is required for maximum traction. See Step 1 of "Countdown for Plowing", page 14.
- Stacking snow - move the blade into the scoop or straight blade position. As the "stacking" location is approached, begin raising the blade to start the ride-up onto the stack. NOTE: Stacking snow with either wing in less than straight blade position could result in damage to the bumper.
- Driveways and sidewalks - make first pass with the wings in the "V" position. Widen as required using "V", angle, scoop or dogleg blade as the situation requires.
- Traveling - for normal travel to and from jobs, carry the blade in the straight position. DO NOT carry blade in scoop or "V" position. For long trips, the blade should be removed from the front of the vehicle.

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 blade in "V". Stay to building side of drive. Widen drive by rolling snow away from building with angled blade.
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 with angle or scoop blade plow forward toward street, removing remaining snow from driveway. Check municipal ordinances for disposing 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. Make multiple passes with the blade in the "V" position to create windrows.
3. Move the blade into the dogleg or scoop position to "carry" snow to end of lot. As the "stacking" location is approached, begin raising the blade to start the ride-up onto the stack.



WARNING: 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

Before the snow flies, check your equipment and make sure it's ready for action. Here's an 8 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 (plow in "V" and lift ram NOT collapsed). Replace worn or defective parts.
7. Check all mountings of snowplow to vehicle - tighten fasteners.
6. Repaint mountings with rust resistant, high grade enamel. Touch-up blade with WESTERN® Red Paint available in aerosol or quart can.
5. Check windshield wipers, heaters, headlights and auxiliary lights.
4. Install auxiliary and flashing lights for safety. 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 TRI-PLOW to rise and fall (float) with contour of ground, push lift channel all the way down. Pull chains tight and hook them to the lift channel. After they are hooked, they will have the correct amount of slack for plow "float".



WARNING: Inspect lift channel 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.

1. We suggest a minimum of 500 pounds ballast for pick-up trucks...NOW HEAD FOR THE SNOW!

SAFE OPERATING RULES

TRANSPORTING PLOW

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

1. Only the driver should be in the vehicle when plow is attached for plowing or during transport.
2. When transporting plow, engage Illa Control lock 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. DO NOT carry plow in scoop or "V" positions. For long trips, the plow should be removed from the front of the vehicle.



WARNING: 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 plow is attached for plowing or during transport.
2. Plowing speed should not exceed 5 MPH.
3. Driver must always wear seat belt when plowing snow. A hidden obstruction could cause the vehicle to stop suddenly.
4. Never plow with head out of the vehicle windows. Sudden stops or protruding objects could cause severe neck or head injury.
5. When plowing, vehicle speed should not exceed 5 MPH, to provide vehicle control.

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 wings moved "IN".
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 positioning blade wings.

REMOVING OR MOUNTING BLADE

1. Always use care when disconnecting or connecting TRI-PLOW from/to vehicle. Keep feet and hands clear when any part is in motion.
2. Inspect lift channel and bolts whenever hooking or unhooking the blade, and before traveling. Worn or damaged components could result in the blade dropping to the pavement while driving causing an accident.
3. Do not place finger in hitch pin holes to check alignment. Any sudden motion of the TRI-PLOW could severely injure a finger.
4. Keep people clear of blade when raising or positioning blade wings.

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 a hoist, or lower blade if vehicle is being serviced on the ground.

CARE & MAINTENANCE

Your WESTERN® TRI-PLOW is designed for rugged, dependable service. But like the vehicle on which it is mounted, it needs a certain amount of care and maintenance. To insure continued good service, the following should be checked regularly –

- Check all fasteners, mounting bolts, hydraulic and electrical connections....make sure they are tight!
- Annually clean and retighten positive and negative connections at 4" motor.
- At beginning of the plowing season, inspect and test your battery. Recharge or replace, if necessary. Suggested MINIMUM vehicle electrical system: 70 amp hr./550 CCA battery, 55 amp alternator.
- Check all plugs and seals for oil leaks. Repair as necessary.
- **Disc Shoe Adjustment**
 1. To adjust shoes, raise blade and place on blocking.
 2. Remove linch pin (wing shoes) or groove pin (center shoe), 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 (wing shoes) or groove pin (center shoe). NOTE: Do not discard any washers.

– **Cutting Edge**

Replace cutting edge when worn to the bottom of blade sheet. To equalize wear, raise blade and place on blocking. Remove cutting edges from both wings and switch cutting edges to opposite wings.

– **Mast & Wing Hinge Pin**

Lubricate hinge pin with multipurpose grease before storage at end of season.

– **Trip Spring Adjustment**

Trip springs are adjusted by tightening the eyebolts located on top of the A-Frame. Springs are correctly adjusted when the coils begin to separate (a sheet of paper should pass between the second and third coils). To adjust tension, back-off nut closest to spring. Tighten other nut to correct tension and lock in place with first nut.

– **PRO-GUARD™ Blade Finish**

When 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 Paint**

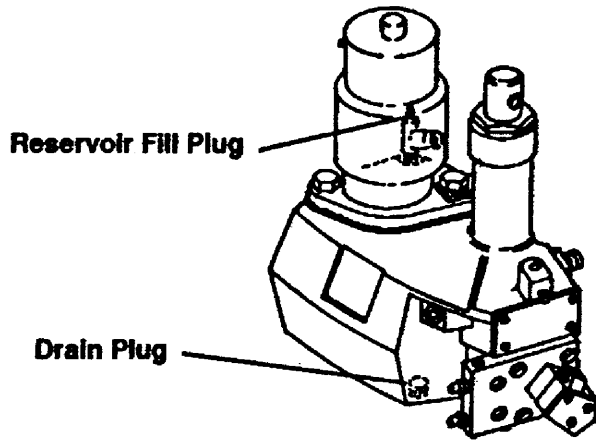
Parts painted black should be repainted with a rust resistant, high grade enamel.

— **Oil Level**

Move blade to "V" position (cylinders fully retracted). With chains properly hooked to lift channel, raise plow and then lower to the ground. DO NOT collapse lift channel. Fill unit with ATF fluid thru fill plug in tee at left rear corner of reservoir behind motor (see diagram).

— **Oil Change**

Changing fluid once each plowing season is required to assure long life for your hydraulic system. Completely drain the hydraulic reservoir and refill with new automatic transmission fluid (ATF). A drain plug is located in the bottom of the right front corner of the reservoir (see diagram). System Capacity - all Isarmatic ® Mark IIIa Reservoirs - 1-1/2 quarts, all Isarmatic ® Mark IIIa Reservoirs & TRI-PLOW Cylinders - 2-1/4 quarts



NOTE

Fill through reservoir fill hole. Never fill through motor/pump opening if, for instance, the motor has been removed for servicing. Overfilling can damage the unit.

— **Isarmatic ® Mark IIIa Lift Ram**

Periodically check lift ram nut to see if it has loosened. If loose or leakage appears while lifting, tighten not more than 1/4 turn after you feel packing nut contact the packing. Over tightening affects operation and life of the packing. Packings not used for a period of time may show signs of oil weep which usually disappear after useage.

— **TRI-PLOW Cylinders**

If these cylinders leak, replace the seals.

To prevent premature chrome pitting and to increase the life of the hydraulic cylinders of your TRI-PLOW, store your plow in the "V" position with cylinders completely retracted. Leave the Isarmatic ® Mark IIIa unit with the lift channel pushed all the way down. Apply grease to plungers and rods not fully retracted.

It is suggested that the WESTERN® Emergency Parts Kit #49205 and the following items be kept in the vehicle for emergency use.

EMERGENCY PARTS

- 1 - 93028 Hitch Pin 1" x3-1/2"
- 1 - 91965 Hairpin Cotter
- 1 - 56225 High Pressure Hose 1/4" x 48" Lg.
- 1 - 90061 Chain Bolt 3/8"-16 x 1-1/2" - Grade 5
- 1 - 91333 Locknut - 3/8"-16
- 1 - Flat Washer - 3/8" Std.
- 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.

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SAFETY GUIDELINES

TO PREVENT ACCIDENTS THAT COULD RESULT IN SERIOUS INJURY AND/OR DAMAGE TO YOUR VEHICLE OR EQUIPMENT, CAREFULLY FOLLOW THESE SAFETY RULES AND TEST PROCEDURES.

GENERAL

Be sure to disconnect the plow prior to performing any tests or making adjustments.

Scratching, denting or marring machined surfaces can make parts un-serviceable. Cleanliness is essential when servicing the unit.

SAFETY EQUIPMENT

Fire Extinguisher

Never work on your vehicle without having a suitable fire extinguisher handy. A 5-lb. or larger CO₂ or dry chemical unit specified for gasoline/chemical/electrical fires is recommended.

SAFETY GOGGLES

We recommend wearing safety goggles when working on your vehicle to protect your eyes from battery acid, gasoline, and dust and dirt flying off moving engine parts.

LOOSE CLOTHING AND LONG HAIR (MOVING PARTS)

Be very careful not to get your hands, hair, or clothing near any moving parts such as fan blades, belts, and pulleys. Never wear neckties or loose clothing when working on your vehicle.

JEWELRY

Never wear wrist watches, rings, or other jewelry when working on your vehicle. You'll avoid the possibility of catching on moving parts or causing an electrical short circuit which could shock or burn you.

VENTILATION

The carbon monoxide in exhaust gas is highly toxic. To avoid asphyxiation, always operate vehicle in a well ventilated area. If vehicle is in an enclosed area, exhaust should be routed directly to the outside via leakproof exhaust hose.

SETTING THE BRAKE

Make sure that your vehicle is in park or neutral and that the parking brake is firmly set.

HOT SURFACES

Avoid contact with hot surfaces such as the engine, radiator, and hoses.

SMOKING AND OPEN FLAMES

Never smoke while working on your vehicle. Gasoline vapor is highly flammable, and the gas formed in a charging battery is explosive.

BATTERY

Do not lay tools or equipment on the battery. Accidentally grounding the "POS + " battery terminal can shock or burn you and damage wiring, the battery or your tools and testers. Be careful of contact with battery-acid. It can burn holes in your clothing and burn your skin or eyes. Disconnect the cable from the negative battery terminal before replacing the motor, motor solenoid or Illa Control.

(During Electrical Diagnosis)



WARNING: Protect top of battery. Sparks from testing operations could cause battery gases to explode causing severe eye or body burns or other personal injury.

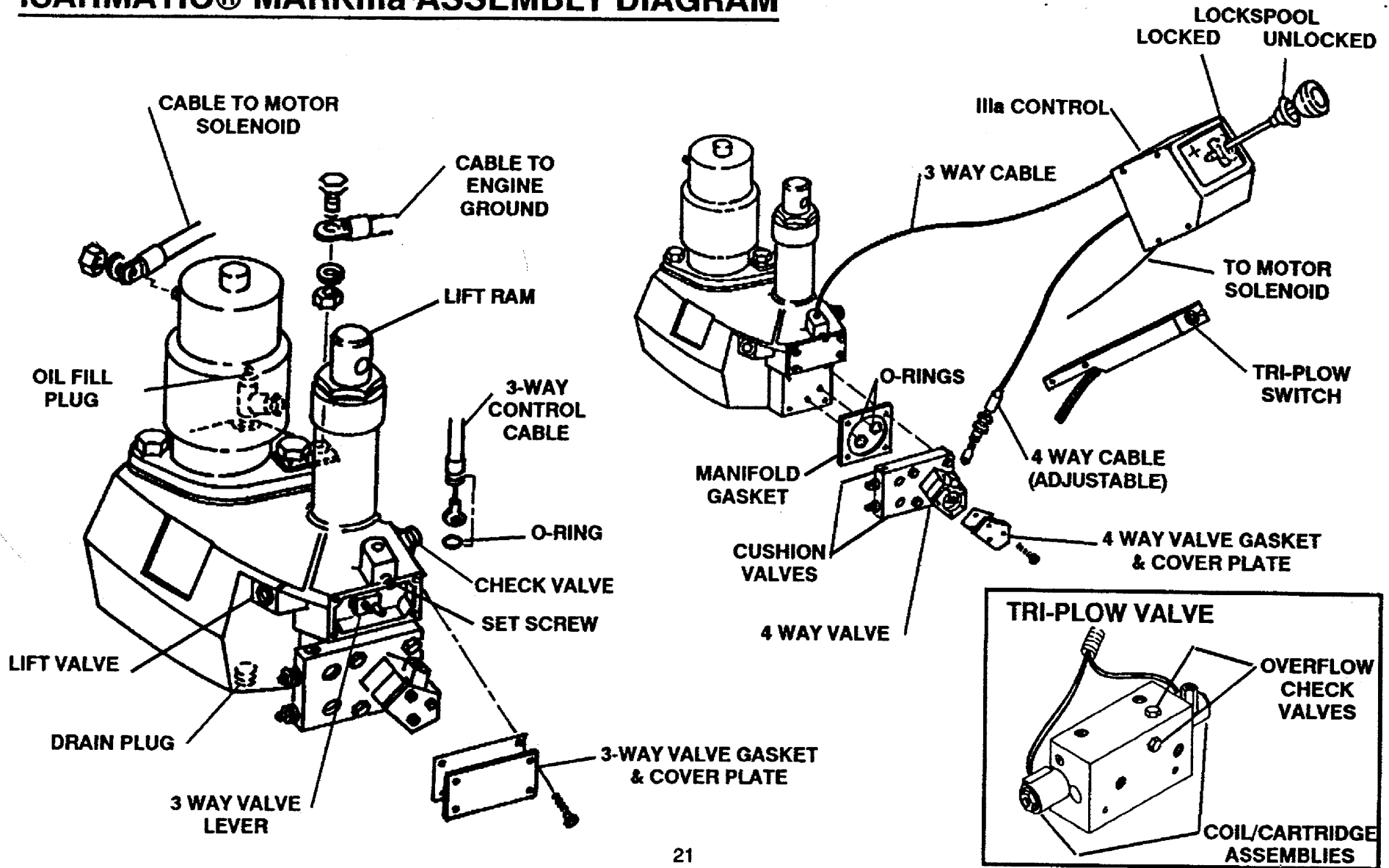
HYDRAULIC SAFETY

Be sure to replace frayed, kinked, cracked or otherwise damaged hydraulic components.

NOTE:

Manufacturer assumes no liability for accidents or damages notwithstanding the fact that suggestions have been followed.

ISARMATIC® MARKIIIa ASSEMBLY DIAGRAM



THEORY OF OPERATION

The TRI-PLOW Isarmatic® Mark IIIa Hydraulic System performs four functions:

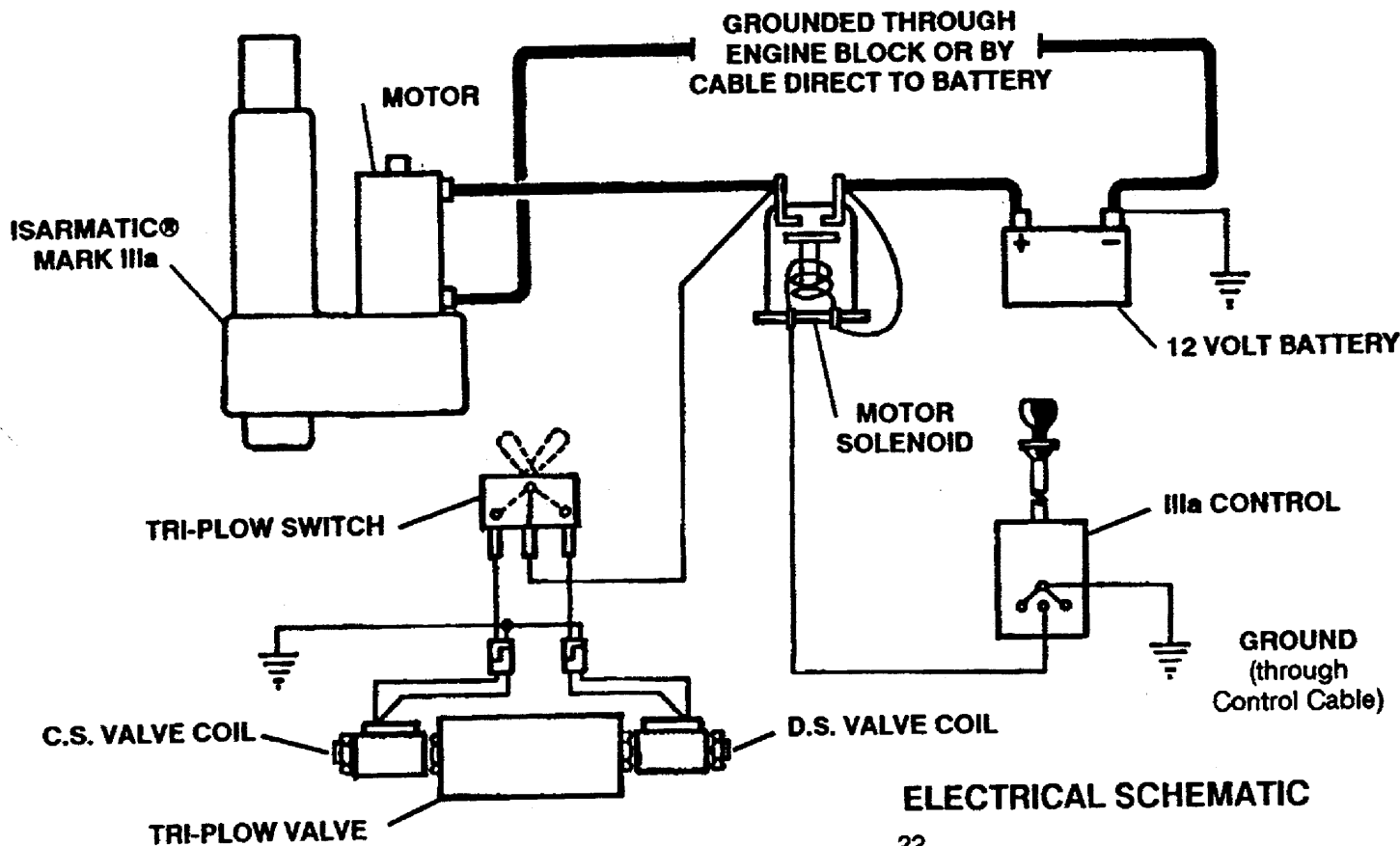
- RAISE the blade
- LOWER the blade
- Position blade wings IN
- Position blade wings OUT

Three of these functions (RAISE, wing IN, wing OUT) are accomplished by electrical and mechanical means. The fourth (LOWER) operates only by mechanical means.

ELECTRICAL SYSTEM

When the IIIa Control is moved into the "RAISE", wing "IN", or wing "OUT" position, contacts inside the control are grounded. This completes the motor solenoid coil circuit, energizing the motor solenoid coil. The coils magnetic field causes the contacts inside the motor solenoid to close. The closed contacts provide a low resistance/high current path from the battery to the motor. Current flows from the battery, through the motor solenoid contacts, the motor, the motor grounding tab, the ground cable and back to the battery.

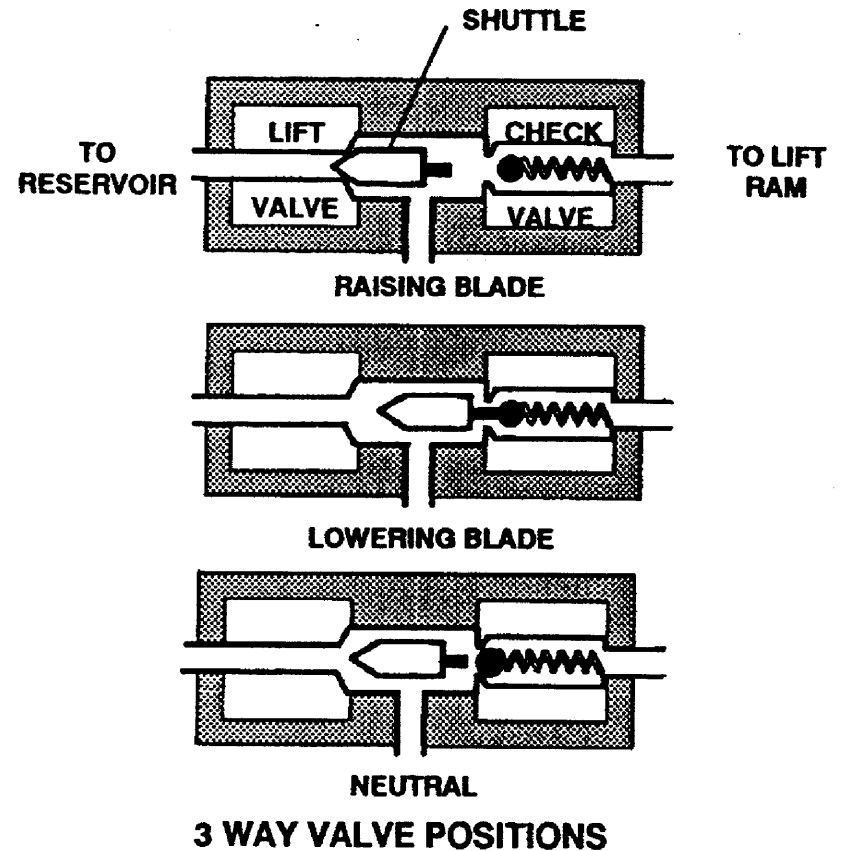
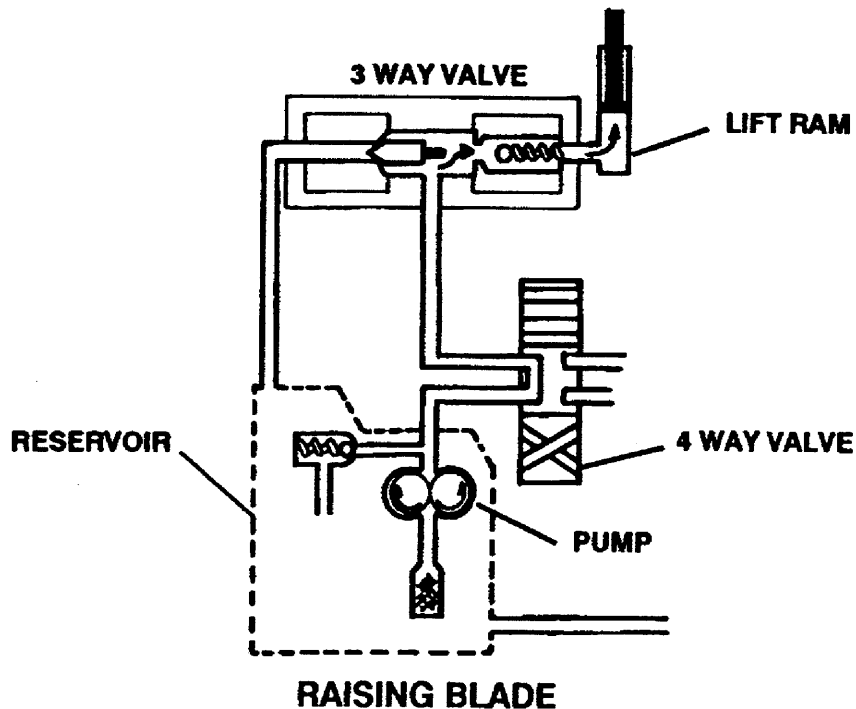
Whenever the motor solenoid contacts close, electrical power is also supplied to the TRI-PLOW switch. This switch, depending on position, will furnish power to one of the two coils on the TRI-PLOW valve.



RAISE BLADE

When the Illa Control is moved to the "RAISE" position, the motor solenoid contacts operate the motor turning the pump, and the control cable moves the shuttle into the lift valve closing the passage to the reservoir. Oil from the pump passes through the 4 way valve, into the 3 way valve. With the reservoir passage closed, the oil forces the check valve ball off its seat allowing oil to flow around the shuttle into the lift ram pushing the plunger (and blade) up.

When the Illa Control is moved to neutral, the pump stops and the shuttle is moved to the centered position. The oil in the lift ram pushes the check ball into its seat preventing oil from leaving the lift ram which holds the blade up off the ground.



LOWER BLADE

When the Illa Control is moved to the "LOWER" (float) position, the control cable moves the shuttle from its centered position to push the check valve ball off its seat. This opens a passage from the lift ram to the reservoir. The weight of the TRI-PLOW collapses the lift ram, pushing oil past the open check valve ball, around the shuttle, through the open lift valve back to the reservoir. Note: No electrical power is used for this function.

WING POSITIONING

Two valves control wing positioning:

4 Way Valve controls direction - "IN" or "OUT"

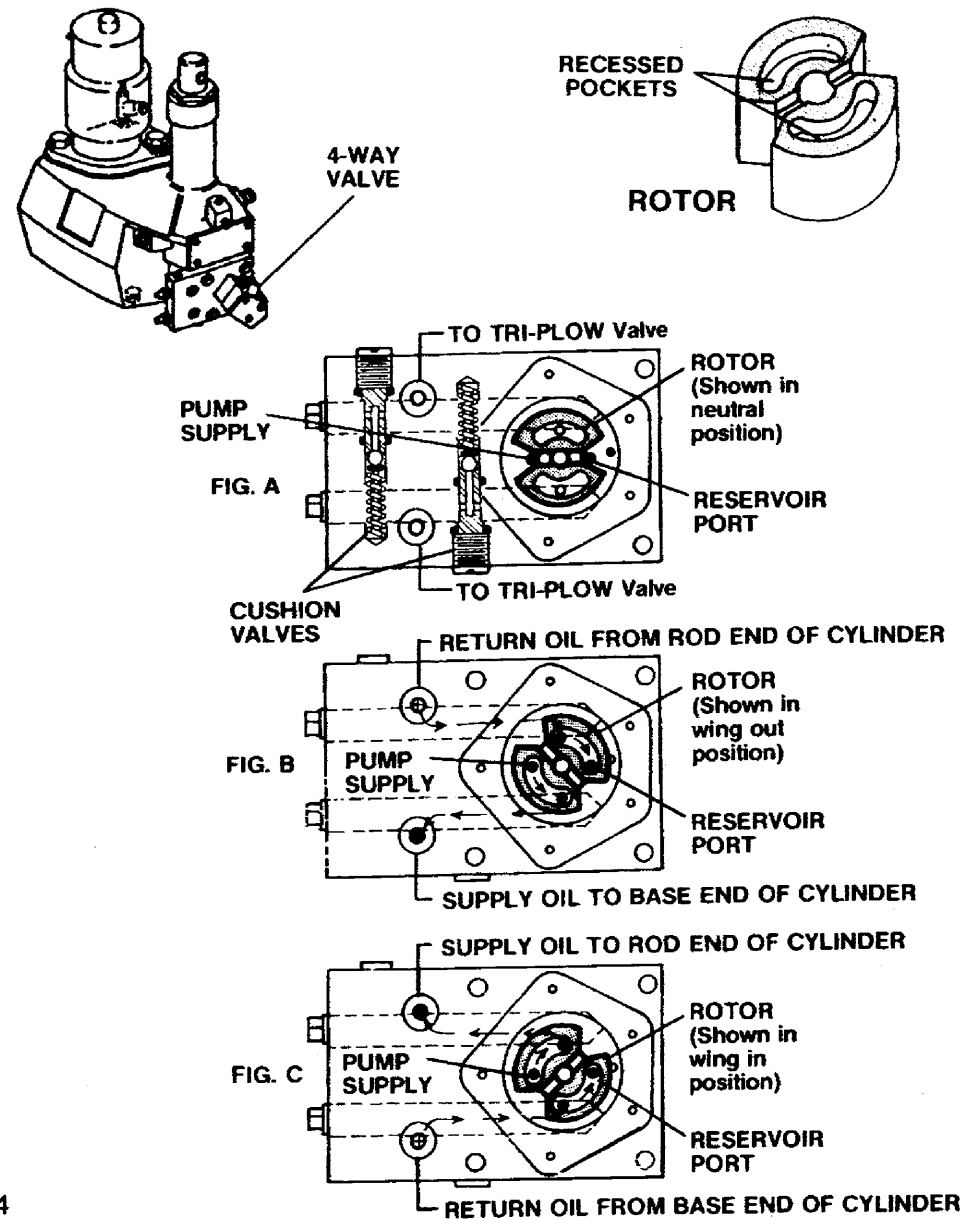
TRI-PLOW Valve controls which wing - "LEFT WING" or "RIGHT WING"

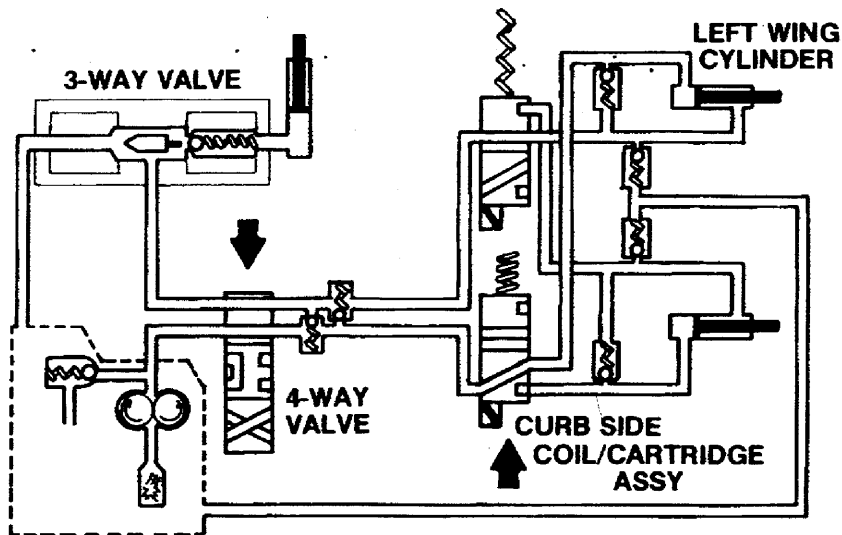
4 WAY VALVE

NEUTRAL POSITION (Fig. A) Anytime the wings of the blade are NOT being operated, the rotor of the 4 way valve is in the neutral position. When the plow is raised, oil will enter the 4 way valve through the pump port, flow around the rotor, and exit through the reservoir port.

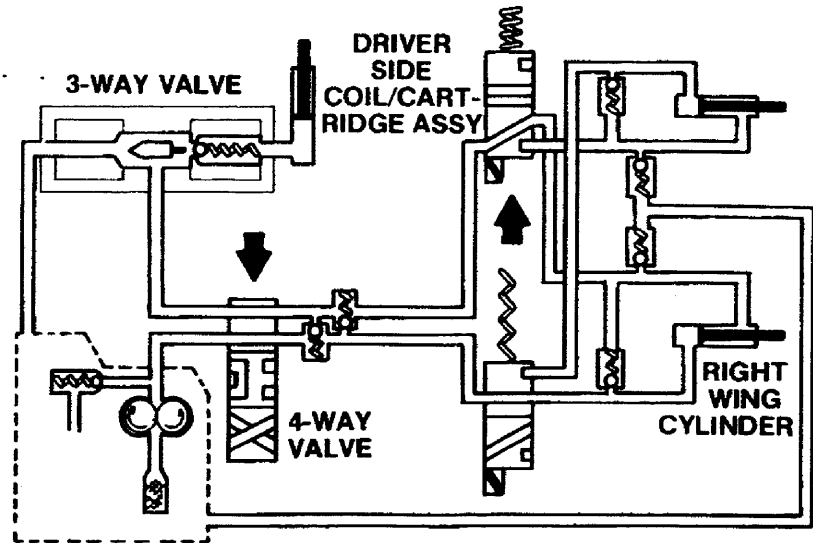
WING OUT (Fig. B) When the Illa Control lever is moved to the right, the control cable pulls the 4 way valve rotor 45 deg. clockwise. This moves the 2 recessed pockets in the side of the rotor so that one pocket connects the pump port to the lower manifold port. The other pocket connects the upper manifold port to the reservoir port. Oil from the pump flows in the pump port, through the recessed pocket, out the lower manifold port, through the TRI-PLOW valve, to the base end of a cylinder. As the rod extends, oil leaving the rod end of the cylinder passes through the TRI-PLOW valve, into the upper manifold port, through the recessed rotor pocket, out the reservoir port, through the 3 way valve, to the reservoir.

WING IN (Fig. C) When the Illa Control lever is moved to the left, the control cable pushes the 4 way valve rotor 45 deg. counterclockwise. This positions a rotor pocket over the pump port and the upper manifold port. The other pocket connects the lower manifold port to the reservoir port. Oil from the pump flows in the pump port, through the rotor pocket, out the upper manifold port, through the TRI-PLOW valve, to the rod end of a cylinder. As the rod retracts, oil leaving the base end of the cylinder passes through the TRI-PLOW valve, into the lower manifold port, through the rotor pocket, out the reservoir port through the 3 way valve, to the reservoir.

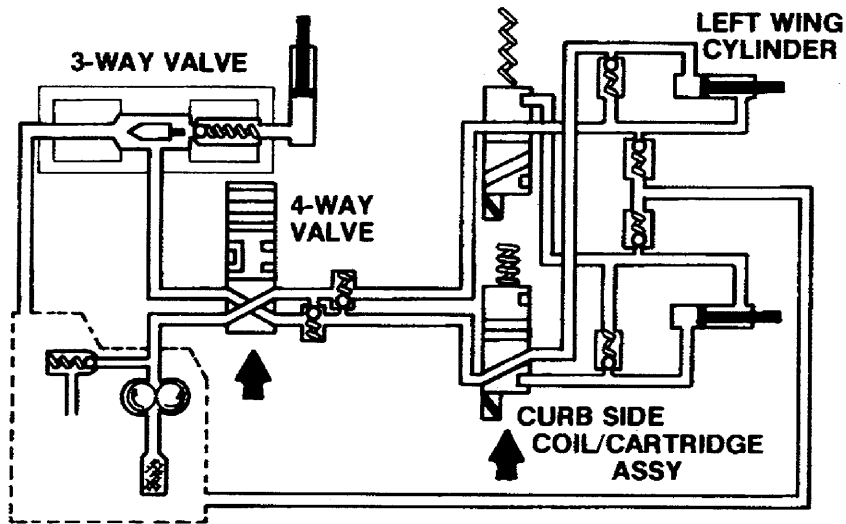




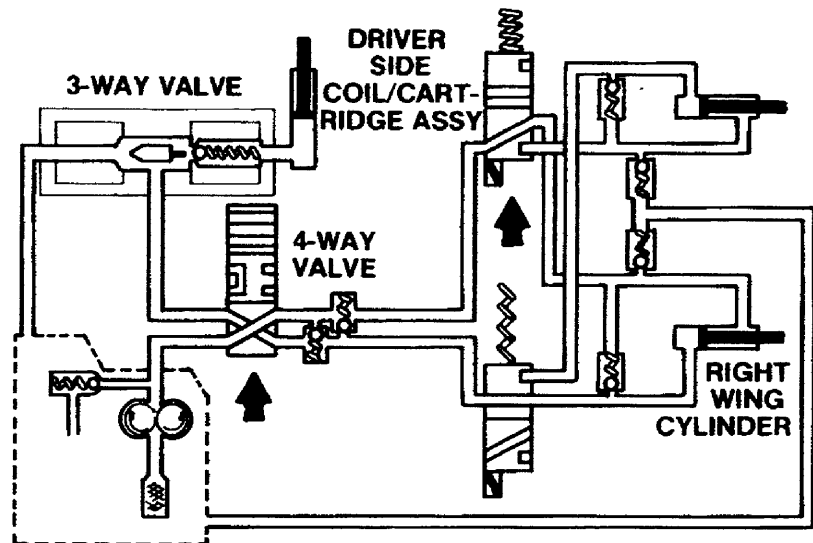
LEFT WING "OUT"



RIGHT WING "OUT"



LEFT WING "IN"



RIGHT WING "IN"

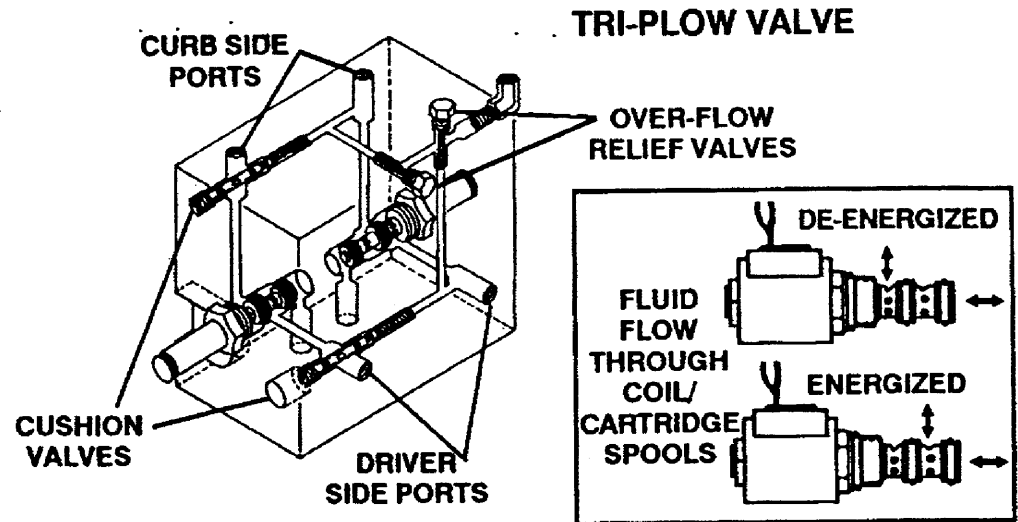
WING POSITIONING (Con't.)

TRI-PLOW VALVE

This valve determines which wing will be moved. Anytime the motor solenoid is activated, during "RAISE", wing "IN" or wing "OUT", one of the two coil/cartridge assemblies in the TRI-PLOW valve is activated. The TRI-PLOW switch next to the IIIa Control determines which coil will be energized.

The driver side coil/cartridge assembly allows oil flow into or out of:
 the rod end of the left cylinder when de-energized.
 the rod end of the right cylinder when energized.

The curb side coil/cartridge assembly allows oil flow into or out of:
 the base end of the right cylinder when de-energized.
 the base end of the left cylinder when energized.



FUNCTION		NEUTRAL	RAISE	LOWER	LEFT WING		RIGHT WING	
					IN	OUT	IN	OUT
4 Way Valve		Centered	Centered	Centered	Counter-clockwise	Clockwise	Counter-clockwise	Clockwise
3 Way Valve	Shuttle	Centered	Moved into lift valve	Moved to open check valve	Centered	Centered	Centered	Centered
	Lift Valve	Open	Closed	Open	Open	Open	Open	Open
	Check Valve	Closed	Opened by oil flow	Opened by shuttle	Closed	Closed	Closed	Closed
TRI-PLOW Valve	Driver Side Coil/Cartridge Assembly		*				Energized	Energized
	Curb Side Coil/Cartridge Assembly		*		Energized	Energized		

* The TRI-PLOW switch will determine which Coil/Cartridge Assembly is energized.

WING POSITIONING (Con't.)

CUSHION VALVES

When plowing with either of the wings extended, (all blade positions except fully retracted "V"), oil is trapped in the base end of the cylinder. When an obstacle strikes outside the cylinder attaching point of an extended wing, pressure rises in the base end of the cylinder. As pressure in the base end of the cylinder exceeds the spring force holding the cushion valve ball against its seat, the ball unseats allowing oil to flow to the rod end of the cylinder. This allows the wing to swing "IN" protecting the blade from damage.

The left wing cylinder base end oil is trapped by the curb side coil/cartridge assembly. The right wing cylinder base end oil is trapped by the 4 way valve as the de-energized curb side coil/cartridge assembly allows oil to pass through the cartridge. The right wing cylinder has the TRI-PLOW cushion valve and the Isarmatic® Mark IIIa cushion valve in the system.

The TRI-PLOW hydraulic system has two sets of cushion valves:

Isarmatic® Mark IIIa 4 way valve manifold set at 3500 PSI

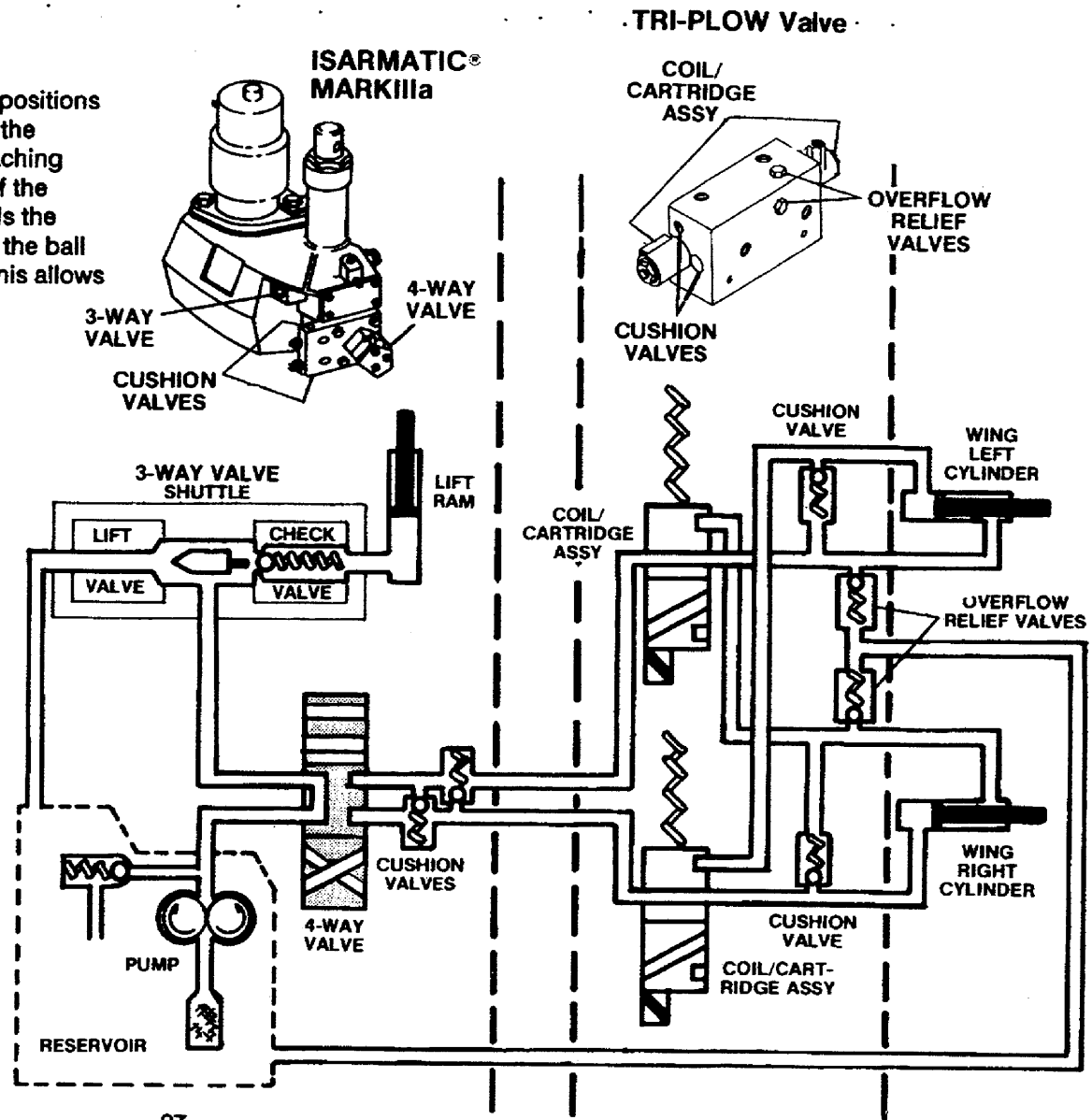
TRI-PLOW Valve block set at 1950 PSI.

OVERFLOW RELIEF VALVES

As the cylinder collapses, more oil will leave the base end of cylinder than can enter the rod end. The excess oil will unseat the overflow relief valve ball to let the extra oil back to reservoir through the 1/8" external hose.

NOTE

Whenever a wing cylinder is being retracted, the maximum pressure in the system is limited by the overflow relief valves in the TRI-PLOW Valve.



TROUBLESHOOTING GUIDE

IIIa CONTROL POSITION	PROBLEM DESCRIPTION	DEFINE PROBLEM AND FOLLOW STEPS BELOW.						
Wing "IN" or "OUT"	Wing will not move or moves slowly. Times: Wing "IN" - 5 seconds Wing "OUT" - 4 seconds	Check if motor runs, if not, see Electrical Diagnosis A (page 30)	Check oil level. (page 17)	Perform Performance Adjustment B. (page 30)	TRI-PLOW Valve Checks G. (page 34)	Cushion Valve Inspection H. (page 35)	Check disconnect couplers.	Remove pump. Clean filter screen. ↓
Raise	Plow will not raise or raises too slowly. Times: 1-1/2" Ram - 2 seconds 2" Ram - 4 seconds			Verify 3-way valve lever travel. See D (page 31)	Adjust lift valve in. See E1 (page 32)	Check lift ram packing nut.		
Neutral	Wing will not remain out while plowing.	Adjust cushion valves. See H (page 35)					FURTHER TROUBLESHOOTING REQUIRES THE USE OF TEST EQUIPMENT. SEE AUTHORIZED WESTERN DISTRIBUTOR OR SEE WESTERN HYDRA-ELECTRIC™ TEST KIT AND/OR WESTERN SERVICE MANUAL	
Neutral	Wing will not remain "IN" when "Back Dragging".	Remove hex headed plug for Overflow Relief Valves. Clean and inspect. Drop ball into hole - reseal ball by lightly striking flat punch with hammer. Install spring and plug.						
Neutral	Motor continues to run in neutral.	Disconnect IIIa Control wire from motor solenoid.	If motor runs, solenoid is shorted. Replace solenoid. If motor stops, short is in primary (IIIa Control) circuit. Isolate and repair.					
Wing "IN" or "OUT"	Blade raises while positioning wing "IN" or "OUT".	Verify 3-way valve lever travel. See D (page 31)	Adjust lift valve (out). See E1. (page 32)					
Neutral	Blade lowers in neutral.		Adjust check valve (out). See E2 (page 32)	Remove check valve. Inspect O-ring & seat. See Service Manual.				
Lower	Blade lowers too fast.							
Lower	Blade will not lower or lowers too slow.		Adjust check valve (in). See E2 (page 32)	Check lift ram packing nut.				

Note:
Manufacturer assumes no liability for accidents or damages notwithstanding the fact that suggestions have been followed.

GENERAL INFORMATION

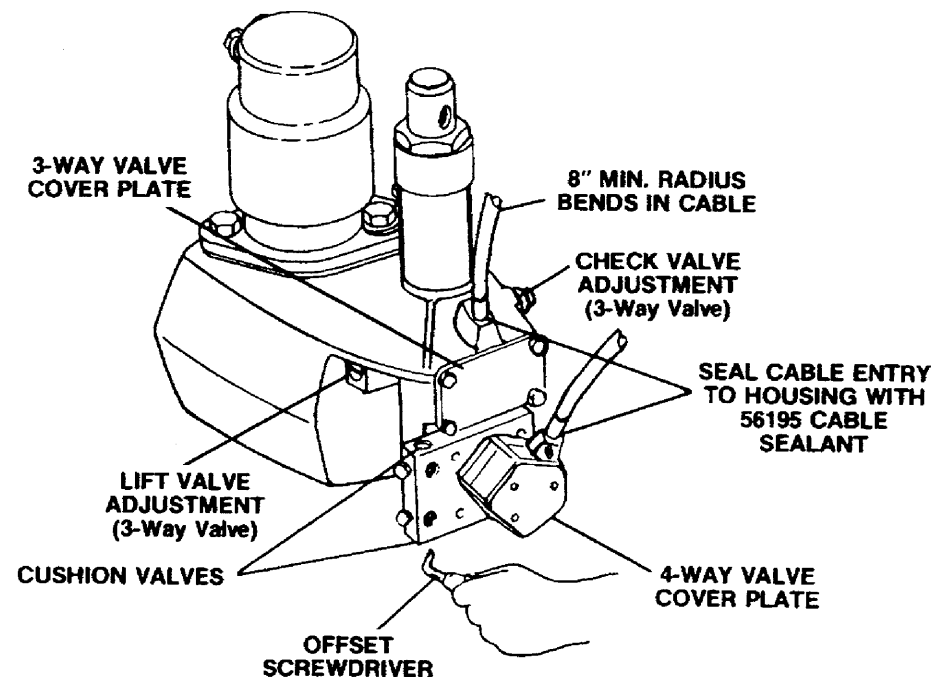
Most service can be performed with the hydraulic components left on the vehicle. This should be done whenever possible because it permits evaluation of the entire system (vehicle electrical system, cables, Ila Control, TRI-PLOW valve, etc) as well as saving considerable time.

Disconnect the NEGATIVE battery cable before replacing motor solenoid or Ila Control.



WARNING: DO NOT stand between the vehicle and blade or directly in front of blade when it is being raised, lowered or wings positioned. 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.

PACKING NUT ADJUSTMENT — Isarmatic® Mark Ila. If leaking, tighten packing nut NOT MORE THAN 1/4 TURN AFTER YOU FEEL PACKING NUT CONTACT PACKINGS. Over-tightening affects cylinder operation and packing life.



NOTE

Manufacturer assumes no liability for accidents or damages notwithstanding the fact that suggestions have been followed.

A ELECTRICAL DIAGNOSIS

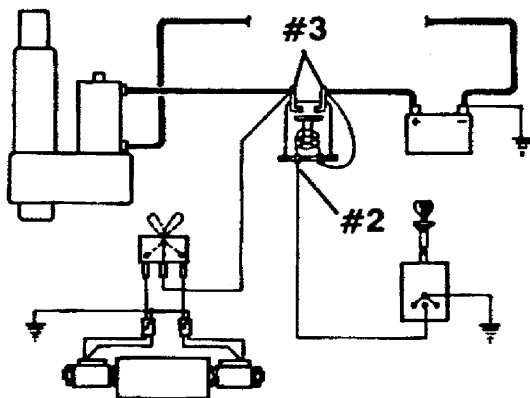
Condition - Motor does not run with Ila Control in "RAISE", wing "IN" or "OUT" positions. Battery has sufficient charge to start engine.

1. Check all electrical cables and connections including grounds. Clean and tighten if necessary.



WARNING: Protect top of battery, sparks from testing operations could cause battery gases to explode causing severe eye or body burns, or other personal injury.

2. Ground the primary terminal (small black wire) of the motor solenoid. If motor runs, problem is in Ila Control circuit. Check for broken wire, loose connection or bent contacts in Ila Control. Check if Ila Control is grounded (through push-pull cables). If motor does not run...
3. By-pass (jump) the secondary (large) terminals of the motor solenoid. If motor runs, replace the motor solenoid. If motor does not run...
4. Remove motor and check pump shaft. If tight, repair/replace pump. If loose replace motor.



ELECTRICAL SCHEMATIC (SEE PAGE 22)

B PERFORMANCE ADJUSTMENT

Performance standards for TRI-PLOW Isarmatic® Mark Ila

	1-1/2" Ram	2" Ram
Raise Plow	2 seconds	4 seconds
Wing In	5 seconds	5 seconds
Wing Out	4 seconds	4 seconds
Lower Plow	All units - adjust to desired drop rate.	

If your unit does not meet the above times, perform the following sequence of adjustments to your Isarmatic® Mark Ila and then retest cycle times.



WARNING: DO NOT stand between the vehicle and blade or directly in front of blade when it is being raised, lowered or wings positioned. 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.

1. Verify the vehicle electrical system has the battery fully charged. TRI-PLOW valve coil/cartridge assemblies may not function correctly below 12.0 volts.
2. Verify hydraulic pump pressure of 1700 - 1900 PSI (1-1/2" ram) or 1450 - 1850 PSI (2" ram). See C, page 31
3. Verify 3 way valve lever travel per D, page 31
4. Adjust lift valve per E1, page 32.
5. Adjust check valve per E2, page 32.
6. Adjust 4 way valve per F, page 33.

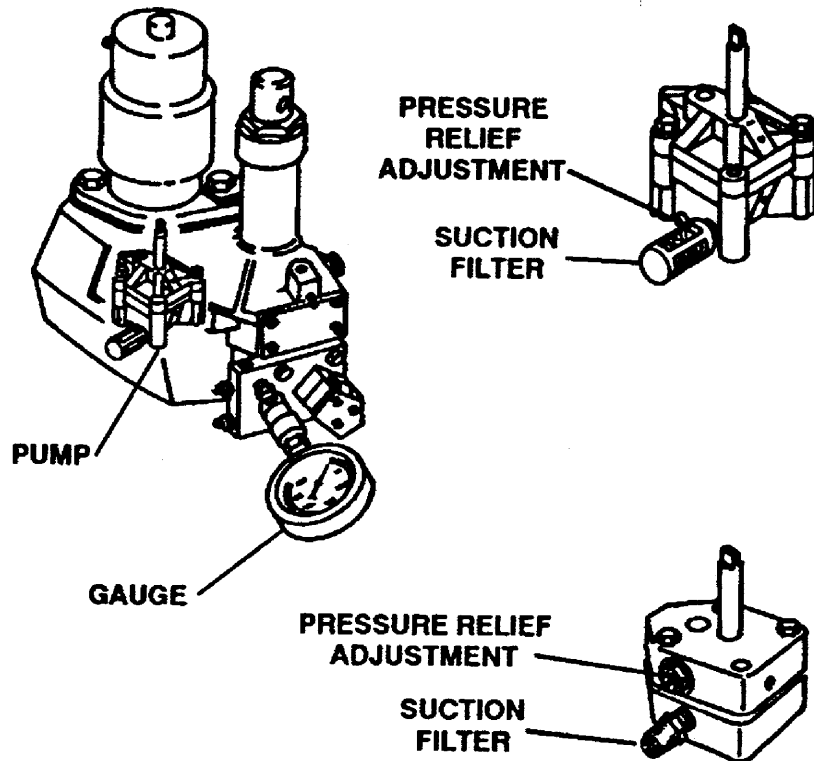
NOTE

Whenever a wing is being retracted, the maximum pressure in the system is limited by the overflow relief valves in the TRI-PLOW Valve. If chattering is heard when moving wings "IN", check lift valve and 4 way valve adjustments.

C PUMP PRESSURE TEST

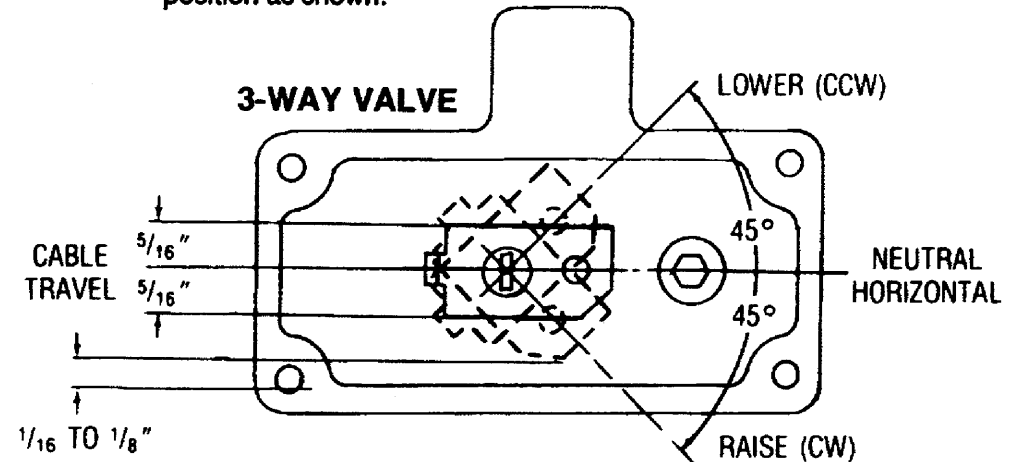
1. Disconnect lift chains and hoses going to TRI-PLOW valve.
2. Install 3,000 PSI minimum gauge into female coupler on 4 way valve.
3. Move Illa Control to wing "IN" (TRI-PLOW switch in either position) and read gauge.
4. If pressure is 1700-1900 PSI (1-1/2" ram) or 1450-1850 PSI (2" ram), pump pressure is "OK".

If pressure is low, remove pump, clean or replace filter and adjust pressure. (1/4 turn equals approximately 225 PSI on all pumps.)



D 3 WAY VALVE TRAVEL

1. Disconnect lift chain and hoses going to TRI-PLOW valve.
2. Remove 3 way (rectangular) cover.
3. Move Illa Control between "RAISE" and "LOWER". Observe valve lever travel and positions.
4. Lock Illa Control in neutral. 3 way lever should be in the neutral position as shown.



POSSIBLE CAUSE OF INADEQUATE TRAVEL OR INCORRECT VALVE LEVER POSITIONS.

1. Dirt, or ice buildup in enclosure.
2. Cable disconnected in valve enclosure or in Illa Control.
3. Binding, kinked or broken cable. (8" minimum radius)
4. Set screw not in groove in cable.
5. Lift valve too far in (see E1, page 32)

NOTE

Seal cable entry into housing with 56195 Cable Sealant.

E 3 WAY VALVE ADJUSTMENT

E1 LIFT VALVE ADJUSTMENT

Move blade wings into scoop position. From initial adjustment below, using 1/8 turn increments, turn OUT (counterclockwise) lift valve until "RAISE" does NOT function properly. Turn lift valve IN in 1/32 turn increments until unit is JUST ABLE to lift plow.

E2 CHECK VALVE ADJUSTMENT

Hold check valve (hex socket wrench) while loosening or tightening jam nut. To prevent O-ring from "blowing out" loosen jam nut 1/4 turn maximum.

If plow will not lower or lowers too slowly, turn valve IN (CW).

If plow lowers too fast, turn valve OUT (CCW).

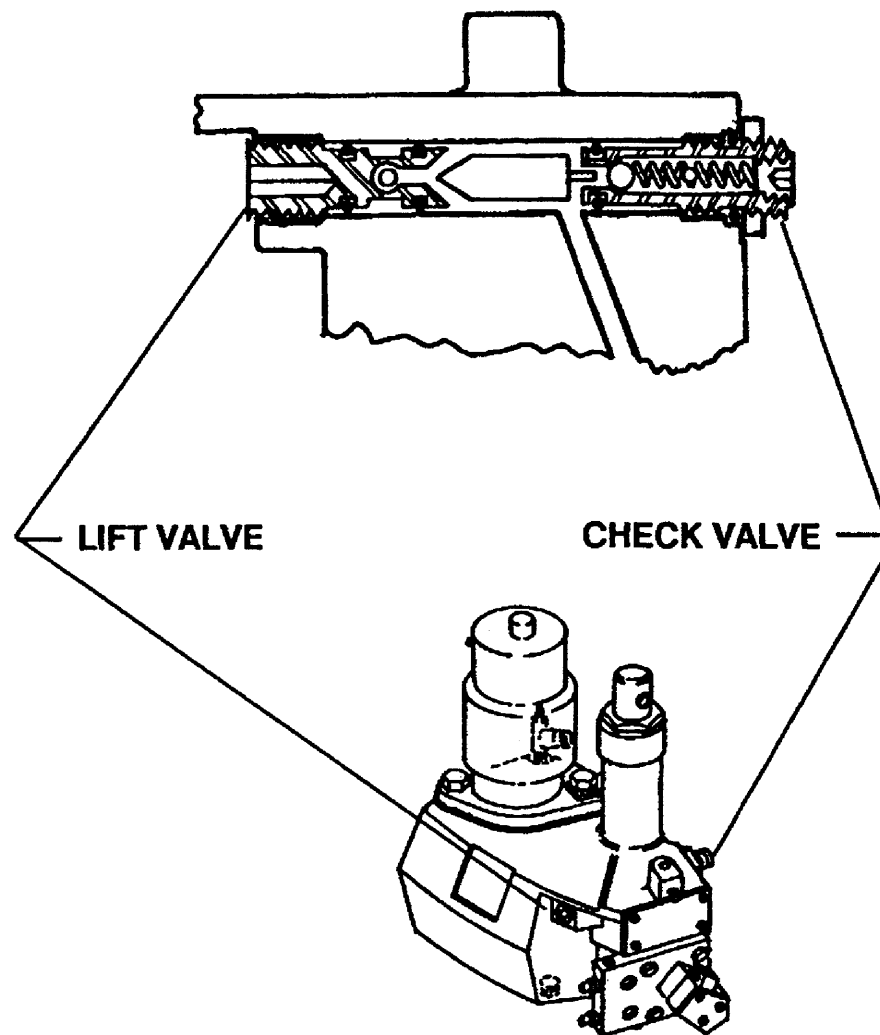
INITIAL ADJUSTMENTS (IF VALVES HAVE BEEN DISTURBED OR REMOVED)

LIFT VALVE

Remove cable from pin and place valve lever in neutral position (see D, page 31). Turn lift valve IN until it is flush to the casting surface. Rotate lever to the "RAISE" position. It should stop 1/16" to 1/8" from enclosure bottom. If not, turn valve IN or OUT until this dimension is obtained.

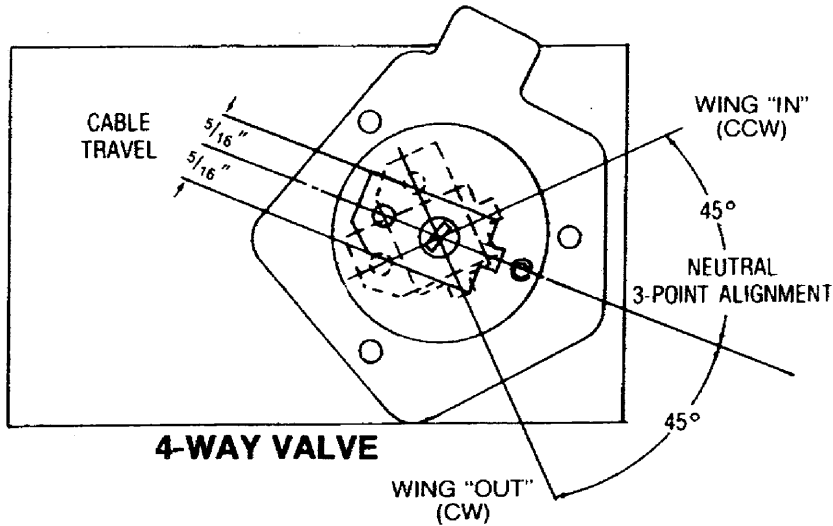
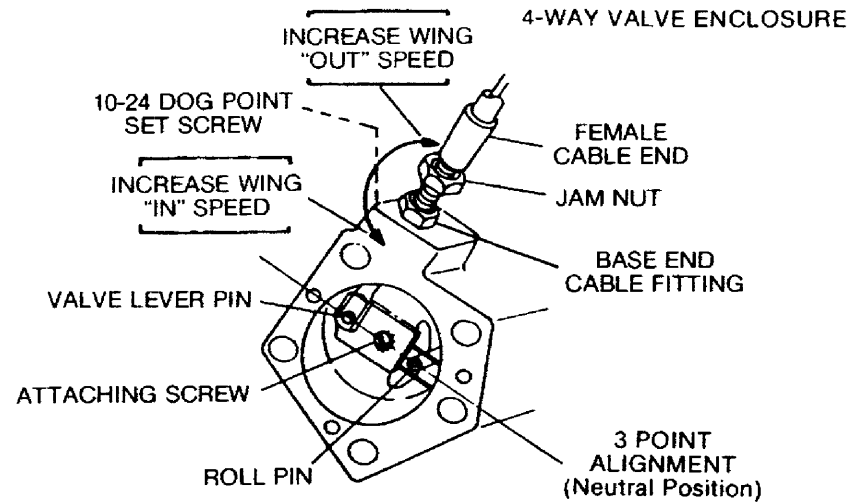
CHECK VALVE

Turn check valve IN until three (3) full threads protrude from the jam nut with jam nut bottomed on housing.



F 4 WAY VALVE ADJUSTMENT

1. Disconnect lift chain and hoses going to TRI-PLOW valve.
2. Remove 4 way (5 sided) cover.
3. Move Illa Control between "IN" and "OUT". Observe lever movement especially for EQUAL TRAVEL IN EACH DIRECTION. If unequal, adjust cable per right diagram, this page.
4. When travel is equal in both directions, lock Illa Control in neutral. 4 way lever may be in line or slightly down from the indicated 3 Point Alignment in diagram.



POSSIBLE CAUSE OF INADEQUATE TRAVEL OR INCORRECT VALVE LEVER POSITIONS.

1. Dirt or ice buildup in enclosure.
2. Cable disconnected in valve enclosure or in Illa Control.
3. Binding, kinked or broken cable. (8" minimum radius)
4. Set screw not in groove in cable.
5. Cable out of adjustment or insufficient ring/rotor clearance.

NOTE

If unit is not equipped with adjustable cable, see your Western distributor.

NOTE

Seal cable entry into housing with 56195 Cable Sealant.

G TRI-PLOW VALVE CHECKS

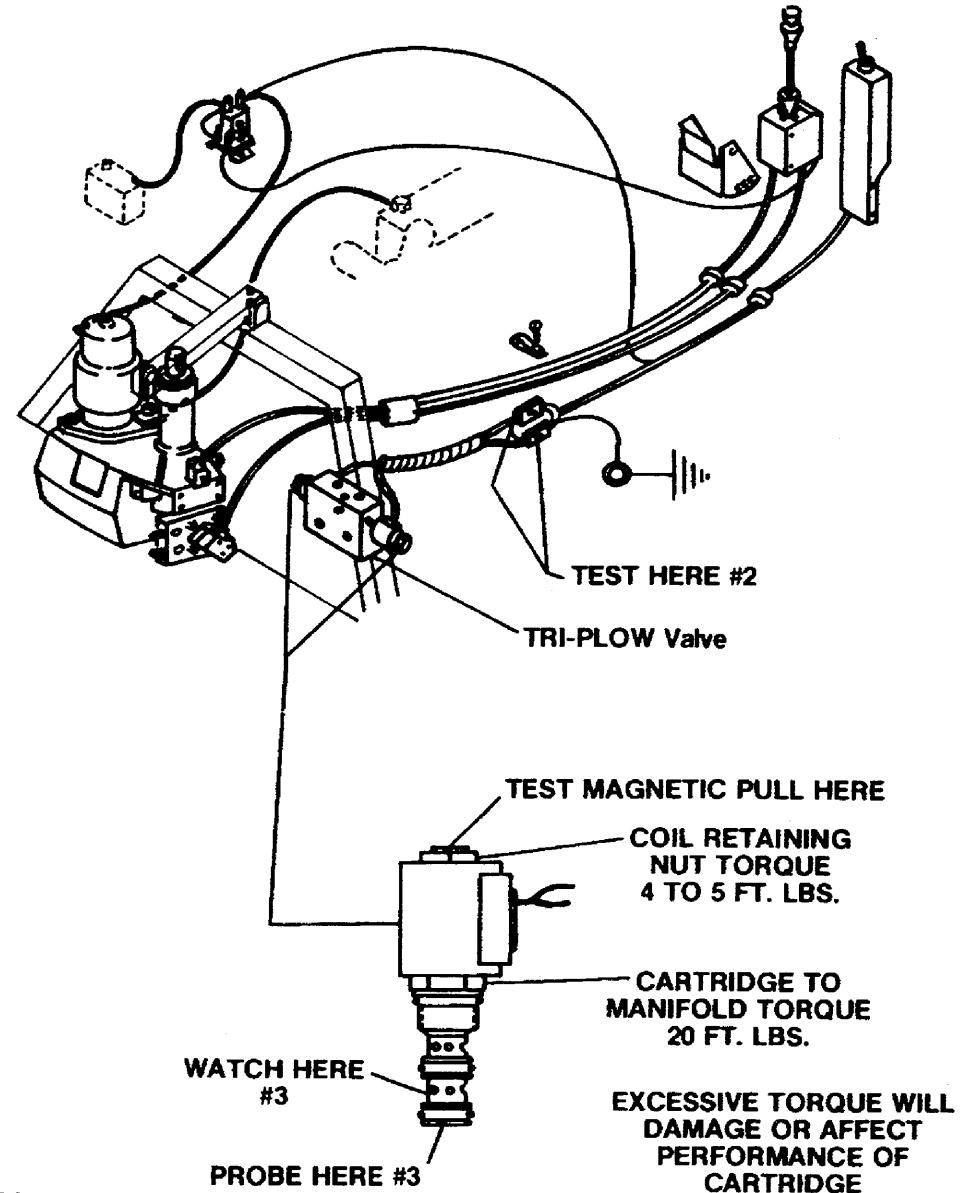
Curb side coil is energized (magnetized) with TRI-PLOW switch in LEFT WING. Driver side is energized with switch in RIGHT WING.

IMPORTANT See diagram at right for test points and torque values.

- 1 Disconnect hoses to bottom of TRI-PLOW Valve.
- 2 Use steel screwdriver to test coil/cartridge assembly stem for good magnetic pull (energized)
 - If energized — proceed to step 3.
 - If not energized — test for current at coil to harness connection in engine compartment. Check harness ground next to test point.
 - If current available — replace coil.
 - If current not available — check harness, switch or connections for problem.
- 3 Remove coil from cartridge and remove cartridge. Inspect for visible contamination. Check for stuck spool using non-marring or scratching (plastic, aluminum or soft brass) probe to push spring loaded spool.
 - If stuck — replace cartridge.
 - If free — install coil on stem, and 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

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



H CUSHION VALVE ADJUSTMENTS

NOTE

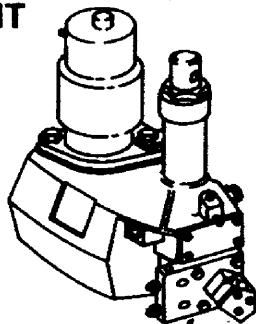
Cushion Valve Stems are NOT interchangeable between the TRI-PLOW Valve and 4 way valve.

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

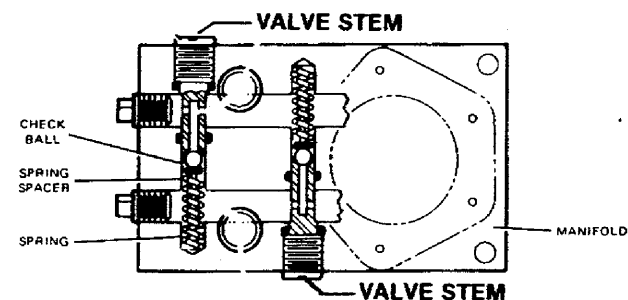
DISASSEMBLY & INSPECTION

1. Remove cushion valve stem. Use a magnet to remove ball, spring spacer and spring. Inspect parts.

TRI-PLOW ISARMATIC® MARKIIIa CUSHION VALVE ADJUSTMENT



Tighten cushion valve stem as much as possible (until spring is fully compressed). Then back off valve stem (rotate counterclockwise) 1-1/4 turns. This adjustment will cause the cushion valve to open at approximately 3,500 PSI.



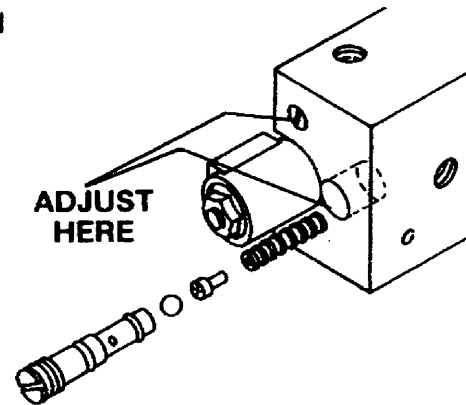
2. Replace O-rings or complete assembly if damaged.
3. If OK, place ball on wooden block, hold stem seat on ball, and lightly strike stem with hammer.

NOTE: Stem can be bent by not striking squarely.

4. Reassemble components (See note on TRI-PLOW valves below) and adjust per directions.

TRI-PLOW VALVE CUSHION VALVE ADJUSTMENT

Valve stem should be 1/4 TURN OUT FROM BEGINNING OF THREADS IN MANIFOLD. This adjustment will cause the cushion valve to open at approximately 1,950 PSI. (1/4 turn of stem equals approximately 350 PSI.)



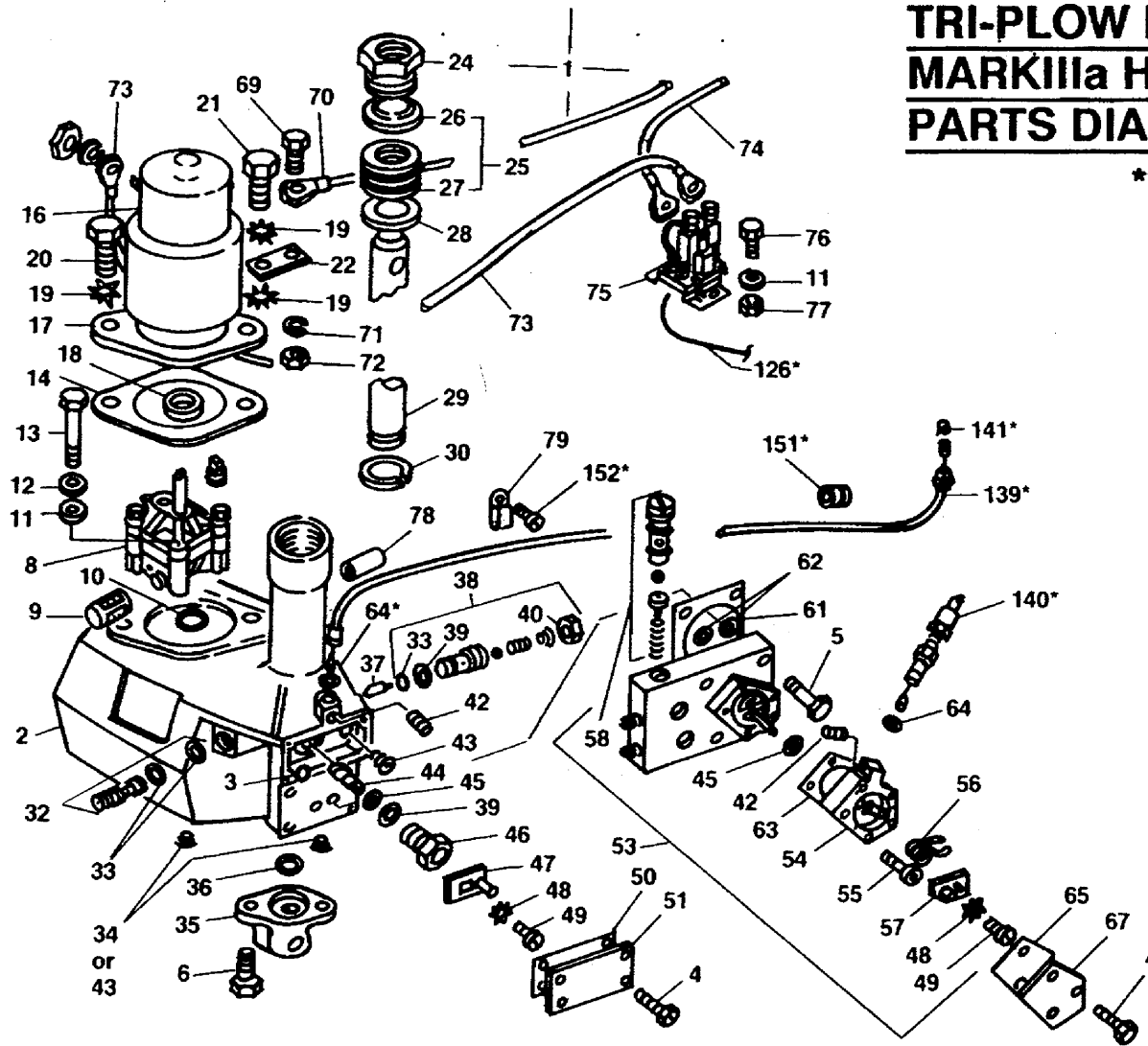
CAUTION: DO NOT ADJUST cushion valves so MANIFOLD THREADS ARE VISIBLE. Visible threads can result in damage to your TRI-PLOW, mount or vehicle.

NOTE

Cushion valve ball and spring spacer may fall into a cross passage during disassembly or assembly. Use a magnet or grease to hold parts together, or position valve manifold so parts can be dropped straight in.

TRI-PLOW ISARMATIC® MARK IIIa HYDRAULIC SYSTEM PARTS DIAGRAM

***SEE PARTS LIST PAGE 39**



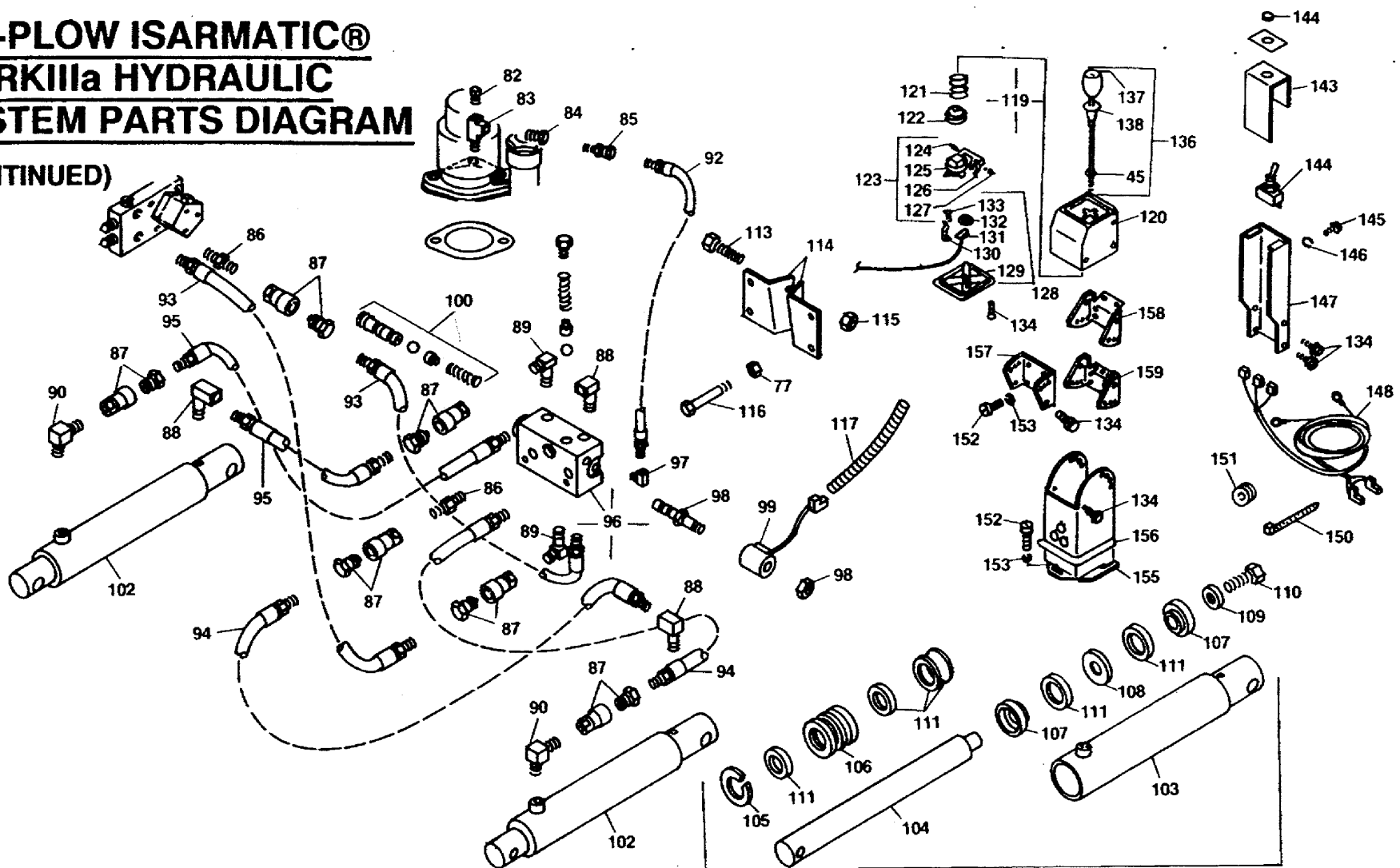
USE ONLY GENUINE WESTERN® REPLACEMENT PARTS

ITEM	PART NO	QTY.	DESCRIPTION
1	49217	1	Isarmatic® TRI-PLOW Hydraulic Unit w/4W Valve
2	55946	1	Main Housing - 1-1/2" Ram (Service)
3	55591	1	Expansion Plug - 1/4"
4	90666	4	Hex Head Tapping Screw #10-24 x 5/8"
5	93165	4	Capscrew - Thread Forming - 1/4"-20 x 1-3/4"
6	93166	2	Capscrew - Thread Forming - 5/16"-18 x 1-1/4"
8	49211	1	Hydraulic Pump Assembly (MTE)
9	56185	1	Suction Filter
10	25620	1	O-Ring - 115
11		2	Flat Washer - 1/4" Standard
12	91220	2	Belleville Spring Washer
13	90025	2	Capscrew - 5/16"-18 x 2-1/4" - Gr. 5
14	25861	1	Gasket
16	56133	1	Motor Assembly - 4"
17	49084	1	Flange w/Bearing & Seal - 4"
18	49014	1	Oil Seal Only
19	91265	3	Lock Washer - 7/16" - External Tooth
20		1	Capscrew - 7/16"-14 x 1-1/4"
21		1	Capscrew - 7/16"-14 x 1-1/2"
22	55757	1	Ground Clip
24	25944K	1	Packing Nut - 1-1/2" Ram
25	25205K	1	Packing Set w/Wiper - 1-1/2" Ram
26	55137	1	Wiper Ring - 1-1/2" Ram
27	55136	1	Packing Set - 1-1/2" Ram
28	91167	1	Special Washer - 1-1/2" Ram
29	25202	1	Plunger - 1-1/2" x 6" Ram
30	25203	1	Retainer Ring - 1-1/2" Ram
32	49064K	1	Lift Valve w/2 #25730 O-Rings
33	25730	2	O-Ring - 012
34	92072	2	Socket Head Pipe Plug - 1/4" (Early Models)
35	25968K	1	Base Lug w/#25618 O-Ring
36	25618	1	O-Ring - 216
37	55570	1	Shuttle
38	55568K	1	Check Valve Assembly
33	25730	1	O-Ring - 012
39	55587	1	O-Ring - 112
40	55569	1	Jam Nut - 5/8"-18
42	90600	1	Half Dog Point Set Screw #10-24 x 3/8"
43	92071	3	Socket Pipe Plug - 1/8" (Late Models)
44	55571	1	Camshaft

ITEM	PART NO	QTY.	DESCRIPTION
45	55371	1	O-Ring - 008
39	55587	1	O-Ring - 112
46	55572	1	Hub Nut
47	55573	1	Valve Lever
48	91259	1	Lock Washer #6 - External Tooth
49	90655	1	Pan Head Screw #6-32 x 1/4"
50	55350	1	Cover Plate Gasket
51	55958	1	Valve Cover Plate
53	49020	1	4 Way Valve Assembly
42	90600	1	Half Dog Point Set Screw #10-24 x 3/8"
54	55342	1	Cable & Linkage Enclosure
55	90909	5	Socket Head Capscrew - 1/4"-20 x 1-1/2"
56	55359	1	Torsion Spring
57	55364	1	Valve Lever
48	91259	1	Lock Washer #6 - External Tooth
49	90655	1	Pan Head Screw #6-32 x 1/4"
58	49138	1	Cushion Valve Kit (2 Sets)
60	49005	1	4W Valve Gasket & O-Ring Kit (Not Shown)
61	55374	1	Manifold Gasket
62	55252	2	O-Ring - 015
45	55371	1	O-Ring - 008
63	55951	1	Shim Spacer .0005 (Silver) Standard
63	55735	1	Shim Spacer .00035 (Clear) Option
64	25731	1	O-Ring - 010
65	55357	1	Cover Gasket
66	56195	1	Cable Sealant (Not Shown)
67	55959	1	Enclosure Cover
4	90666	3	Hex Head Tapping Screw #10-24 x 5/8"
69		1	Capscrew - 3/8"-16 x 3/4"
70	55984	1	Ground Cable - 60" - 6 Ga. (Black)
71		1	Lock Washer - 3/8"
72		1	Hex Nut - 3/8"-16
73	25635	1	Battery Cable - 60" - 4 Ga. (Red)
74	22511	1	Battery Cable - 22" - 4 Ga. (Red)
75	56131K	1	Motor Solenoid - Heavy Duty
76		2	Capscrew - 1/4"-20 x 3/4"
11		2	Flat Washer - 1/4" Standard
77	91331	2	Locknut - 1/4"-20
78	55511	1	Hose Grommet
79	55381	1	Cable Clamp

TRI-PLOW ISARMATIC® MARKIIIa HYDRAULIC SYSTEM PARTS DIAGRAM

(CONTINUED)



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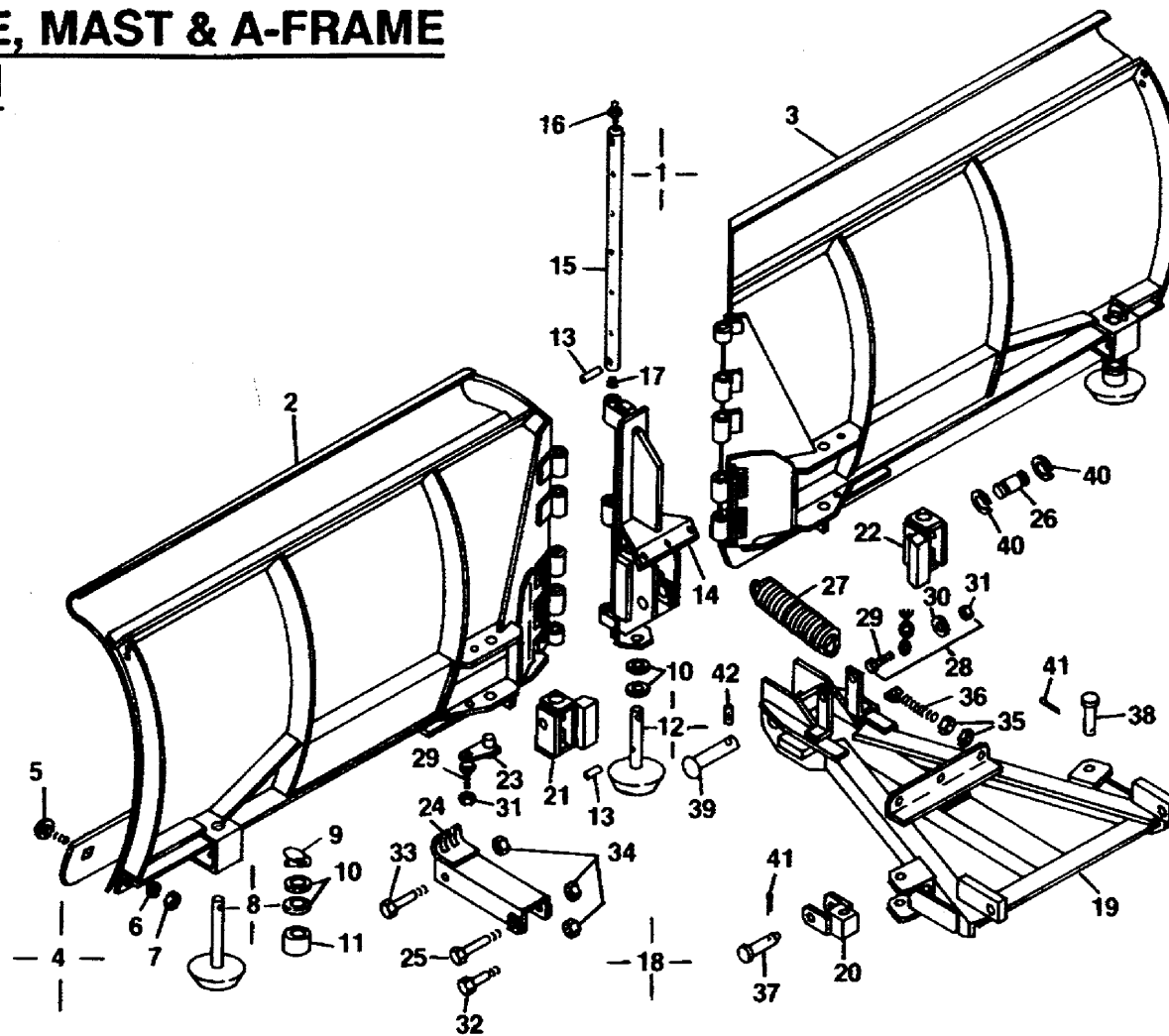
USE ONLY GENUINE WESTERN® REPLACEMENT PARTS

ITEM	PART NO	QTY.	DESCRIPTION
82	92079	1	Pipe Plug - 3/8"
83	92253	1	Pipe Tee - 3/8"
84	92179	1	Reducer Bushing - 3/8" x 1/8"
85	92924	1	Female Adapter Union (Swivel) - 1/8"
86	25519	2	Hex Nipple - 1/4"
87	25232	6	Hydraulic Coupler - 1/4"
88	92208	3	Street Elbow - 1/4" x 90° - Long
89	92275	2	Male Pipe Elbow - 1/4" x 90° - Long
90	92278	2	Male Pipe Elbow 1/4" x 90° - Short
92	56226	1	Low Pressure Hose - 3/16" x 24"
93	56224	2	High Pressure Hose - 1/4" x 18"
94	55020	2	High Pressure Hose - 1/4" x 38"
95	56225	2	High Pressure Hose - 1/4" x 48"
96	56240	1	TRI-PLOW Valve Assembly
97	92202	1	Street Elbow 1/8" x 90°
98	49221	2	Cartridge 33 w/ Jam Nut
99	49222	2	Coil w/ Leads
100	49219	1	Cushion Valve Kit TP (2 Sets)
102	56206	2	Hydraulic Cylinder Assembly - 2" x 9-1/2" D.A.
103	56207	1	Cylinder Unit - 2" x 9-1/2" D.A.
104	56325	1	Plunger - 2" x 9-1/2" D.A.
105	56218	1	Retaining Ring - Internal
106	56214	1	Stop Plug
107	56209	2	Piston
108	56212	1	Spacer - Piston
109	56326	1	Retainer
110	90124	1	Capscrew - 9/16"-12 x 1-1/4" Gr. 5 Special
111	49218	1	Seal Kit 2" x 9-1/2" D.A.
113		1	Capscrew - 3/8"-16 x 1-1/2"
114	56229	2	Mount Plate, TRI-PLOW Valve Assembly
115	91333	1	Locknut - 3/8"-16 - Nylon Insert Type
116		2	Capscrew - 1/4"-20 x 2-1/2"
77	91331	2	Locknut - 1/4"-20
117	56255	1	Wire Loom - 24"
119	56231	1	Illa Control Assembly - TRI-PLOW
120	49220	1	Body w/Label - TRI-PLOW
121	56022	1	Centering Spring
122	56023	1	Spring Retainer
123	49015	1	Platen Assembly
124	56027	2	Ball Stud

ITEM	PART NO	QTY.	DESCRIPTION
125		1	Pivot Platen
126	56026	1	Contact Strip
127	93152	1	Hex Head Screw #10 x 3/8" Hi-Lo
128	56028	1	Bottom Cover Assembly
129		1	Bottom Cover
130	56030	1	Detent Spring
131	56032	1	Contact Tube Assembly
132	93168	1	Retaining Ring 3/8"
133	93153	1	Hex Head Screw #6 x 3/8" Hi-Lo
134	93154	10	Hex Head Screw #8 x 5/8" Hi-Lo
136	49016	1	Knob & Lever Assembly - Standard
136	49147	1	Knob & Lever Assembly - Short (Optional)
137	56039	1	Lens Label
138	49017	1	Lockspool w/Label
45	55371	1	O-Ring - 008
139	56158	1	Cable - 90" (Optional)
139	56035	1	Cable - 108" (Black) Standard
139	56180	2	Adjustable Cable - 144" (Optional)
140	56130	1	Adjustable Cable - 108" Standard
140	56159	1	Adjustable Cable - 90" (Optional)
64	25731	2	O-Ring - 010
141	49019	1	Ball Spring Clip
143	56253	1	Switch Bracket
144	56239	1	Toggle Switch - SPDT - w/ Knurled Facenut
145	93157	1	Capscrew - Thread Cutting #8-32 x 3/8"
146	91231	1	Lock Washer #8
147	56254	1	Mounting Bracket
148	56247	1	Harness - TRI-PLOW
150	59223	3	Cable Tie
151	25301	5	Rubber Grommet
152		5	Tapping Screw #10 x 1"
153		4	Lock Washer #10
Parts Listed Below are Furnished in Appropriate Lift-Mount Box.			
155	56079	1	Floor Bracket (Universal)
156	56043	1	Rubber Boot (For Floor Bracket)
157	56080	1	Dash Bracket
158	56081	1	Dash Bracket
159	56082	1	Dash Bracket

NOTE: Only those items listed with a PART NUMBER are available for service.

TRI-PLOW BLADE, MAST & A-FRAME PARTS DIAGRAM



USE ONLY GENUINE WESTERN® REPLACEMENT PARTS

ITEM	PART NO	QTY.	DESCRIPTION
1	60950	1	8-1/2 Ft. Blade & Mast Assembly - TRI-PLOW
2	61015	1	Blade Assembly - Driver Side - 8-1/2 Ft.
3	61005	1	Blade Assembly - Curb Side - 8-1/2 Ft.
4	49212	2	Cutting Edge Assembly 8-1/2 Ft. (1 Required for each blade half.)
5	90238	5	Carriage Bolt - 1/2"-13 x 1-3/4" Long - Grade 8
6	91205	5	Lock Washer - 1/2"
7	91415	5	Hex Nut - 1/2"-13
8	49071	2	Disc Shoe Assembly - Heavy Duty
9	93010	1	Linch Pin
10	91109	13	Flat Washer - 1" SAE
11	60045	1	Spacer
12	49213	1	TRI-PLOW Center Shoe Kit
10	91109	11	Flat Washer - 1" SAE
13	91882	1	Roll Pin - 1/4" x 1-1/4" Long - Coiled Type
14	60947	1	Mast
15	61016	1	Hinge Pin
16	92117	1	Grease Fitting
17	92071	1	Hex Socket Head Pipe Plug - 1/8" NPTF
13	91882	2	Roll Pin 1/4" x 1-1/4" Long - Coiled Type
18	60945	1	A-Frame Box Assembly - TRI-PLOW
19	60946	1	TRI-PLOW A-Frame
20	60974	2	U-Joint
21	60970	1	Pivot Yoke - Driver Side
22	61062	1	Pivot Yoke - Curb Side
23	60977	4	Pin Unit
24	49215	1	Lift Channel Assembly
25	90160	1	Capscrew - 3/4"-10 x 4-1/2" Long - Grade 5
26	61018	2	Pin
27	23039	3	Trip Spring
28	49214	1	Replacement Chain Assembly - 72"
29	90061	2	Capscrew - 3/8"-16 x 1-1/2" Long - Grade 5
30		2	Flat Washer - 3/8"
31	91333	2	Locknut - 3/8"-16
29	90061	4	Capscrew - 3/8"-16 x 1-1/2" Long - Grade 5
32	90159	1	Capscrew - 3/4"-10 x 3-1/2" Long - Grade 5
33	60161	1	Capscrew - 3/4"-10 x 4" Long - Grade 5
31	91333	4	Locknut - 3/8"-16
34	91338	3	Locknut - 3/4"-10
35	91416	6	Hex Nut - 5/8"-11

ITEM	PART NO	QTY.	DESCRIPTION
36	90490	3	Eyebolt - 5/8"-11 x 4"
37	93079	2	Rivet - 1" x 3-1/2"
38	93077	2	Rivet - 1" x 4"
39	93080	1	Rivet - 1" x 5"
40	61019	4	Retaining Ring - External
41	91911	4	Cotter Pin - 5/32" x 1-1/2"
42	92005	1	Groove Pin - 3/16" X 1-3/4"

NOTE: Only those items indicated with a **PART NUMBER** are available for service.



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