

## TROUBLESHOOTING SECTION

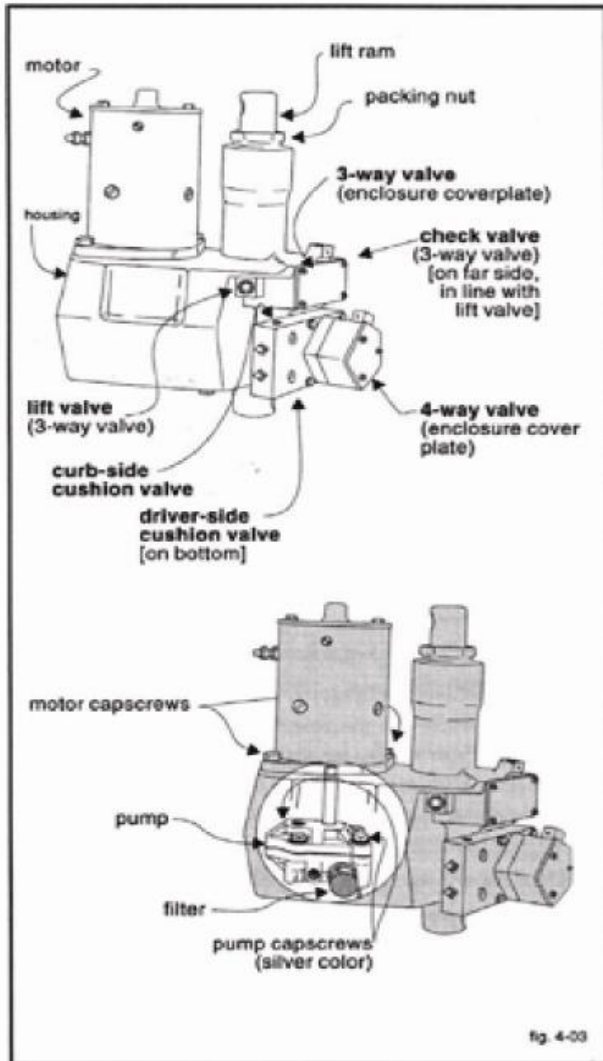
TROUBLESHOOTING GUIDE								
	Problem	Define problem & follow steps indicated						
Angle	Blade will not angle or angles too slowly. Time: 4 secs Heavy duty: 8 secs	Motor does not run. See (B)	Check oil level	All functions are slow See (A)	Verify 4-way valve lever travel See (E)	Adjust lift valve out See (F & F1)	Check disconnect couplers & hydraulic ram nuts	Remove pump. Clean filter screen ↓
Raise	Blade will not raise or raises too slowly. Time: 2 secs Heavy duty: 4 secs				Verify 3-way valve lever travel See (D)	Adjust lift valve in See (F & F1)	Check lift ram packing nut adjust. Refer to plow tune up & inspection section	
Neutral	Blade will not remain angled while plowing	Inspect & adjust cushion valves. See ©					Further troubleshooting requires the use of test equipment	
Neutral	Motor continues to run in neutral	Dis connect lila control from motor relays	If motor runs, motor relay is shorted. Replace motor relay  If motor stops, short is in primary (lila control) circuit. Isolate & repair				See an authorized western distributor  or	
Angle	Blade raises while angling	Verify 3-way valve lever travel See (D)	Adjust lift valve out. See(F & F1)				Refer to the western hydra-lectric test kit, & or a western hydraulic service school video	
Neutral	Blade lowers in neutral		Adjust check valve out. See (F & F2)	Remove check valve Inspect O ring & soat. Refer to breakdown & reassembly section				
Lower	Blade lowers too fast							
Lower	Blade will not lower, or lowers too slowly		Adjust check valve in. See (F & F2)	Check lift ram packing nut adjustment. Refer to plow tune up & inspection section				

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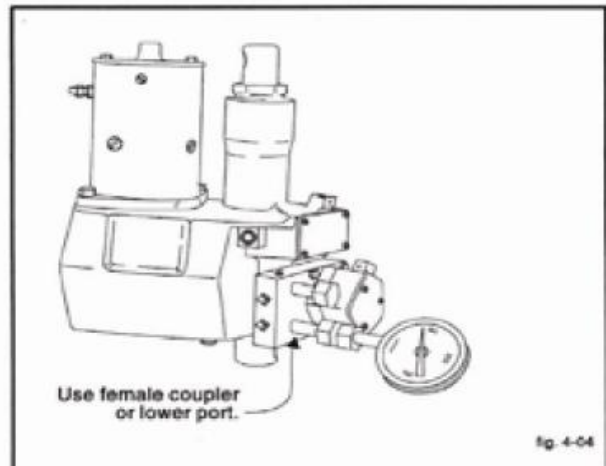
### ISARMATIC® Mark IIIa - Cable

#### Hydraulic Unit - Part Reference

The following illustration shows the parts of the hydraulic unit:

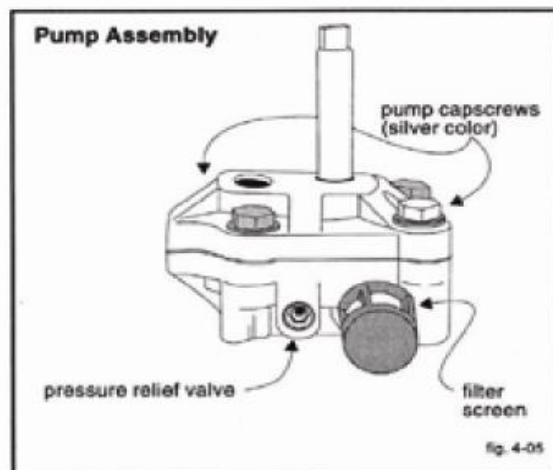


#### A. Pump Pressure Test



**NOTE:** Poor condition of the battery or motor will cause invalid test results.

1. Disconnect the lift chain and hoses to Hydra-Turn® rams.
2. Install a 2000 PSI minimum pressure gauge into female coupler on the valve manifold.
3. Move the IIIa cab control to angle LEFT (L) and read gauge.
4. The pump is OK if the pressure is 1650-1850 PSI (1450-1650 for sport/utility blades).
5. If the pressure is low:



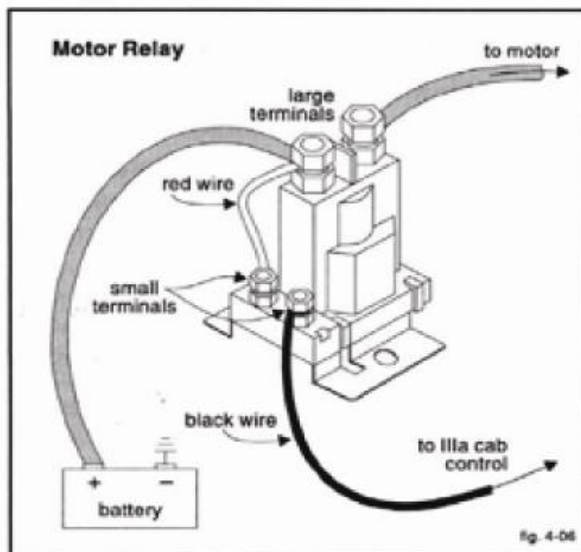
- a) Remove the pump.
- b) Clean or replace the filter.

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- c) Adjust the pressure relief valve. 1/4 turn equals approximately 225 PSI.
- d) Re-assemble. The pump capscrews require 175/185 in. lbs. torque. The motor capscrews require 15/20 ft. lbs torque.

## B. Relay Test



**NOTE:** Perform this test if the motor does not run with IIIa cab control in RAISE, ANGLE RIGHT (R), or ANGLE LEFT (L). Battery has sufficient charge to start the engine.

1. Disconnect the lift chain and hoses to the Hydra-Turn® rams.
2. Check all electrical cables and connections, including grounds. Clean and tighten, if necessary.

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

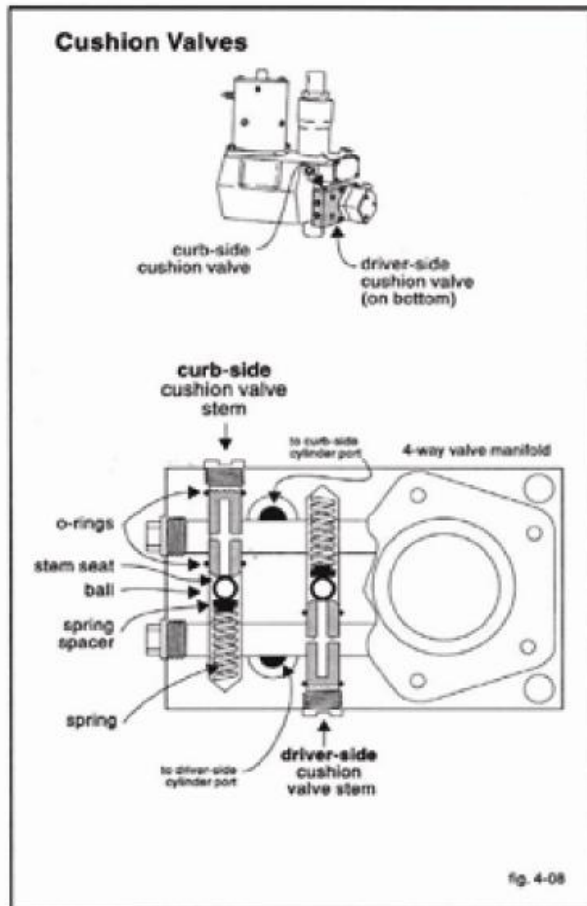
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3. Use a jumper wire to connect the small terminal with BLACK wire on the motor relay to the NEG - terminal of the battery.
  - a) If the motor runs, the problem is in the IIIa control (primary) circuit.
    - Check for broken wire, loose connections, or bent contacts in the IIIa cab control.

- Check to see if the IIIa control is grounded (through push-pull cables).
- b) If the motor does not run:
  - Use a jumper wire to connect the POS + terminal of the battery to the small terminal with RED wire attached on the motor relay.
  - Operate the IIIa control to RAISE, angle LEFT or RIGHT.
- c) If the motor then runs, check for broken or damaged RED wire on the relay.
- d) If the motor still does not run, use heavy jumper cables to jump the two large terminals on top of the motor relay.
- e) If the motor runs, replace the motor relay.
- f) If the motor does not run:
  - Remove the motor.
  - Check the pump shaft rotation.
    - If the pump shaft is tight, repair or replace the pump.
    - If the pump shaft is loose, replace the motor.

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**C. Cushion Valve Adjustment**



**1. Valve inspection:**

- a) Remove cushion valve stem, ball, spring spacer, and spring. (A magnetic probe may be necessary to remove the ball, spring spacer, and spring on the upper valve.)
- b) Inspect valve stem, seat, and o-rings for contamination or wear. Clean stem and o-rings. Replace o-rings if damaged.
- c) Inspect ball, spring spacer, and spring for contamination or wear. Clean or replace as necessary.

- d) Before re-installing a new or used valve stem, re-seat by placing ball on wooden block. Hold stem seat on the ball and lightly strike the stem squarely with a hammer.



**CAUTION:** The valve stem may bend if not struck squarely.

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- e) Apply anti-seize compound or grease to the threads of the stem.
- f) Re-assemble the components and adjust. See *Valve Adjustment* below.

**2. Valve adjustment:**

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

### D. 3-Way Valve Lever Travel

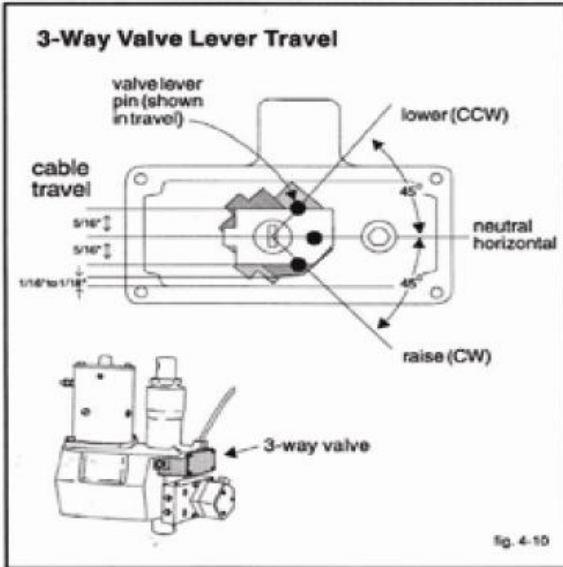


Fig. 4-10

### E. 4-Way (Angle) Valve Lever Travel and Adjustment

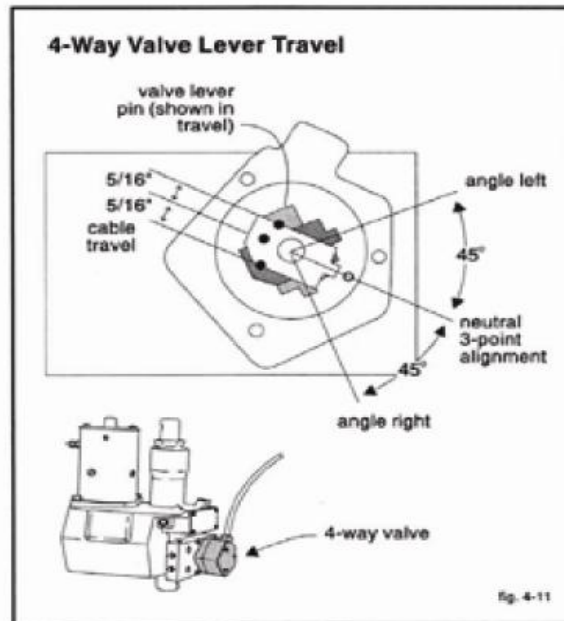


Fig. 4-11

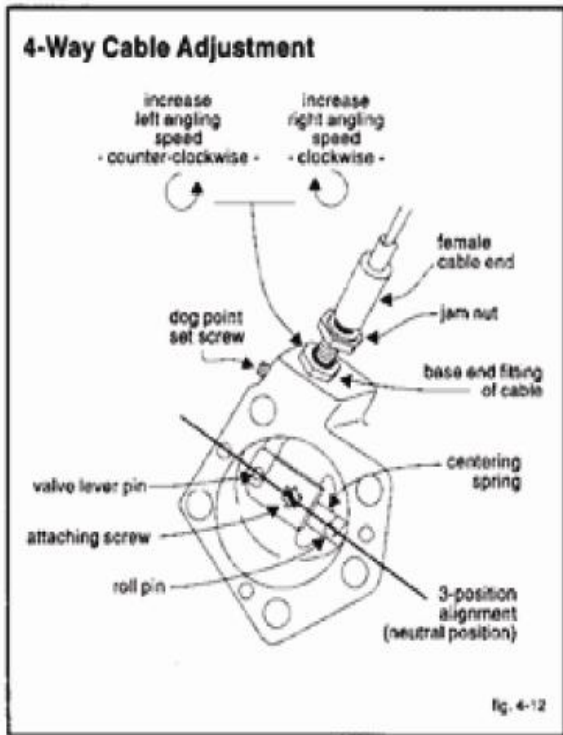
1. Check the valve lever travel:
  - a) Disconnect the hydraulic hoses and the lift chain.
  - b) Remove the 3-way valve (rectangular) cover plate.
  - c) Move the IIIa cab control between RAISE (R) and LOWER (L). Observe the valve lever travel and positions. Verify 45° travel in each direction..
  - d) Lock the IIIa cab control in neutral. The 3-way lever should be in the neutral position, as shown.
2. Possible causes of inadequate travel, or an incorrect valve lever position:
  - Dirt or ice buildup in the enclosure.
  - The cable is disconnected in the valve enclosure, or in the IIIa cab control.
  - The cable is bound, kinked, or broken. (8" minimum radius)
  - The dog point set screw is not positioned in groove of the control cable.
  - The lift valve is adjusted too far in (3-way valve only). See F and F1.

**NOTE:** Seal cable entries into the housing with WESTERN® #56195 Cable Sealant.

1. Check the 4-way (angle) valve lever travel:
  - a) Disconnect the hydraulic hoses and the lift chain.
  - b) Remove the 4-way valve (5 sided) cover.
  - c) Move the IIIa cab control between angle RIGHT (R) and LEFT (L), and observe the lever movement. Verify 45° travel in each direction.
  - d) Adjust per the illustration for equal travel in each direction.




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**F. 3-Way (Raise/Lower) Valve Adjustment**

**WARNING:** Do NOT stand between the vehicle and blade, or directly in front of the blade when it is being raised, lowered, or angled.

 Clearance between the vehicle and the blade **decreases** as the blade is operated. Serious bodily injury can result from the blade striking a body or dropping on the feet or hands.

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**NOTE:**  
Sensitive adjustment.  
Make 1/8 turn at a time.

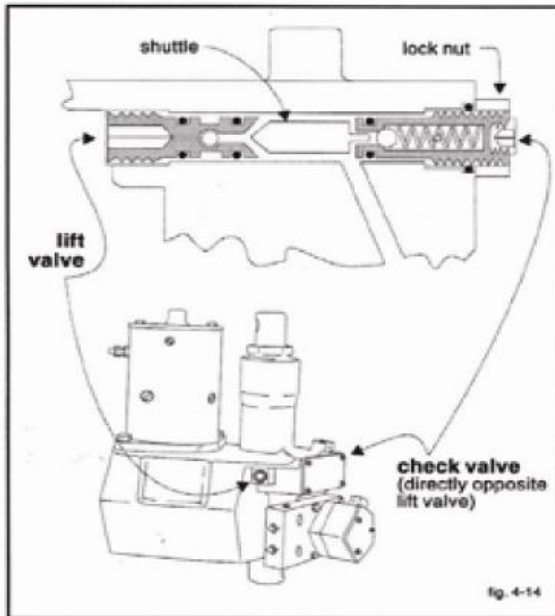
**General Directions:**

- e) Lock the IIIa control in neutral. The 4-way lever should be in line, or slightly down from the "neutral 3-point alignment" indicated in the illustration.
- 2. Possible causes of inadequate travel or incorrect valve lever position are:
  - Dirt or ice buildup in the enclosure.
  - The cable is disconnected in the valve enclosure, or in the IIIa control.
  - The cable is bound, kinked, or broken. (8" minimum radius)
  - The dog point set screw is not positioned in the groove of the control cable.
  - Valve may have insufficient ring/rotor clearance. If so, obtain WESTERN® 4-Way Rebuild Kit, #49005.

**NOTE:** Seal cable entries into the housing with WESTERN® #56195 Cable Sealant.

- Make all adjustments with the blade on the ground and the control in neutral.
- Stand back after the adjustment to avoid being pinched by the blade while checking the operation.

## F1. Lift Valve Adjustment



1. Turn the valve stem out (counterclockwise) in 1/8 turn increments until RAISE (R) does **not** function properly.
2. Turn the lift valve in using 1/8 turn increments until the unit is able to lift the blade.

**NOTE:** Turning the valve in more than 1/4 turn beyond the lifting point may slow the angling speed.

### VALVE REPLACEMENT OR MAJOR ADJUSTMENTS:

1. Remove the cable from the valve lever pin and place the valve lever in the neutral position.
2. Apply anti-seize compound to valve threads and turn the lift valve in until it is flush to the casting surface.
3. Rotate the lever to the RAISE position. It should stop 1/16" to 1/8" from the enclosure bottom (see D.)
4. If dimension is not correct, continue to turn the valve in or out until the correct dimension is obtained.
5. Refer to the General Directions in this section for the final adjustment.

## F2. Check Valve Adjustment

### Adjustment techniques:

- Hold the check valve with a hex wrench when loosening or tightening the jam nut.
- Limit loosening the jam nut to 1/4 turn maximum to prevent the o-ring from being blown out.
- Tighten the jam nut to a maximum of 10 ft. lb.

### Adjustments:

- If the plow will not lower, or lowers too slowly, turn the check valve IN (CW).
- If the plow lowers too fast, turn the check valve OUT (CCW).

### VALVE REPLACEMENT OR MAJOR ADJUSTMENTS:

1. Apply anti-seize compound to the threads and turn the check valve in until the threads are flush with the jam nut. Jam nut must be bottomed on housing.

**NOTE:** Earlier models used a thinner sectioned 3/16" jam nut. Three threads protrude from the jam nut when the nut is bottomed on the housing.

2. Refer to Adjustments in the section above for the final adjustment.