

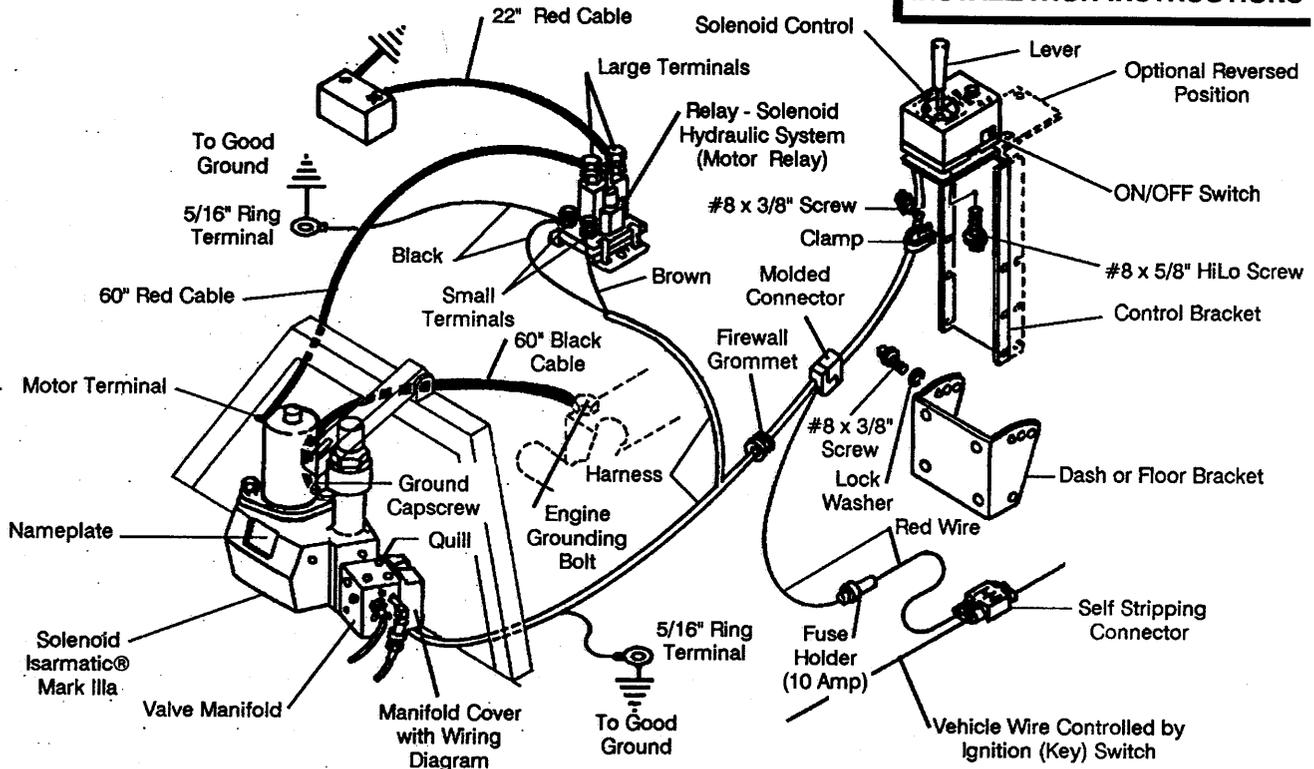


**WESTERN PRODUCTS**  
 7777 NORTH 73RD STREET  
 P.O. BOX 23045  
 MILWAUKEE, WISCONSIN 53223

A DIVISION OF DOUGLAS DYNAMICS, INC.

Box No. 56310 w/10" Angling Rams  
 Box No. 56350 w/6" Angling Rams  
 Solenoid Isarmatic® Mark IIIa  
 Hydraulic System with  
 Hydra-Turn® Angling  
 September 17, 1993

**INSTALLATION INSTRUCTIONS**



**INSTALLATION INSTRUCTIONS**

The Solenoid Isarmatic® Mark IIIa is assembled and ready to lift, lower and angle the plow. It is only required that you install the solenoid control in the cab, make the electrical connections and add fluid. A 550 CCA or 70 amp. hr. battery and 55 amp. or larger alternator are recommended.

**SOLENOID ISARMATIC® MARK IIIa MOUNTING**

Attach lift channel per instructions furnished in A&Q Box. Attach the Solenoid Isarmatic® Mark IIIa (nameplate to front) to the lower u-clip with 3/4" x 3-1/2" bolt and locknut. Secure lift ram to lift channel with 3/4" x 3" bolt and locknut. Tighten bolts to permit free pivotal motion.

**SOLENOID CONTROL**

Mount dash or floor bracket per instructions furnished in Lift-Mount Box. Determine direction of control bracket flange (NOTE optional reversed position for flange) and attach solenoid control to bracket with two #8 x 5/8" hilo screws. Select desired position of control bracket in dash bracket and secure with four #8 x 3/8" thread cutting screws and lock washers. Secure harness to bracket with cable clamp and #8 x 3/8" thread cutting screw. Bend top flange of control bracket to get optimum solenoid control position.

**ELECTRICAL**



**WARNING:** Accidentally grounding the "POS +" battery terminal can shock or burn you, or cause battery to explode. Battery acid can eat holes in your clothes and burn your skin or eyes. Disconnect the negative battery terminal cable before working on electrical connections.

Locate the motor relay within 18" of the vehicle primary battery in an area protected from road splash. Mount motor relay with terminals up or horizontal. Drill two 9/32" holes, using motor relay mounting as a template, and fasten with two 1/4" x 3/4" bolts, flat washers and locknuts.

Make the following battery cable connections (See Diagram, Page 1):

NOTE: Route battery cables to avoid sharp edges, hot surfaces, or moving parts.

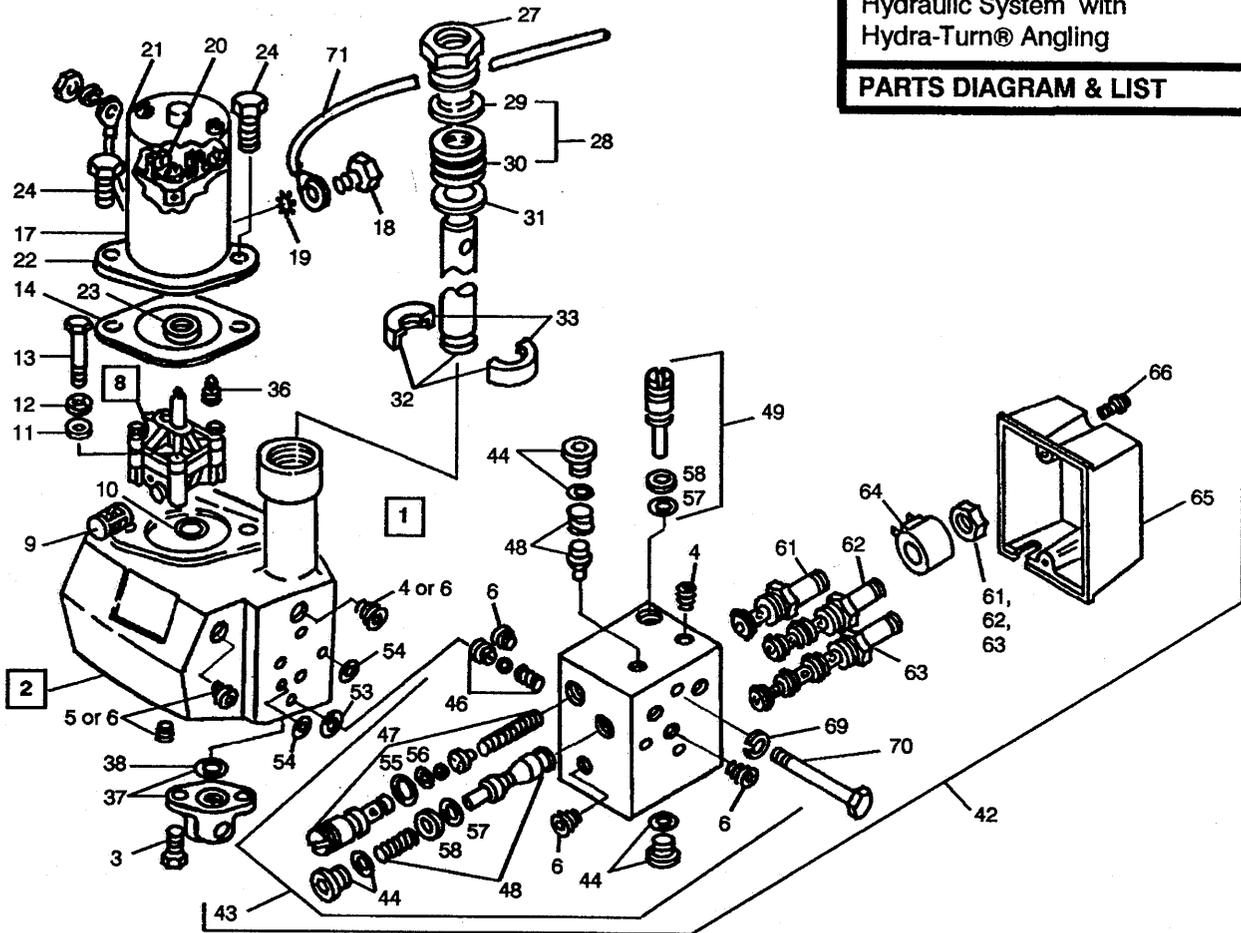
22" red cable between large motor relay terminal and "POS" terminal of battery.

60" red cable between other large motor relay terminal and motor terminal. (Nut torque, 50-60 in. lbs.)

Continued on page 4.

Box No. 56310 w/10" Angling Rams  
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 Solenoid Isarmatic® Mark IIIa  
 Hydraulic System with  
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**PARTS DIAGRAM & LIST**

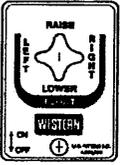


ITEM	PART NO.	QTY.	DESCRIPTION
1	49253	1	HYDRAULIC UNIT 1-1/2" SOL 3500
	49280	1	HYDRAULIC UNIT 1-1/2" SOL 2500
2	49252	1	SERVICE HOUSING KIT 1-1/2" SOL
3	93166	2	5/16-18X1-1/4 HXW TRTS TY TR-3
4	92095	1	PLUG 1/4 NPTF HX SO THREAD SEAL
5	92072	2	PLUG 1/4 NPTF HX SO (w/Fluid Level Plug)
6	92071	2	PLUG 1/8 NPTF HX SO (w/o Fluid Level Plug)
8	49211	1	PUMP KIT DIE CAST
9	56185	1	SUCTION FILTER
10	25620	1	O-RING - 115
11	91101	2	1/4 PLAIN WASHER TY A STD ZP
12	91220	2	BELLEVILLE SPRING WASHER
13	90025	2	5/16-18X2-1/4 HX CS G5 ZP
14	25861	1	GASKET
17	56133	1	MOTOR ASSY 4-1/2"
18	90088	1	5/16-18X1/2 HX CS 18-8 STS
19	91263	1	5/16 EX TOOTH LK WASHER STS
20	49262	1	BRUSH KIT - PR 56133
21	49296	1	TERMINAL STUD PACKAGE PR 56133
22	49084	1	MOTOR FLANGE BRG & SEAL
23	49014	1	OIL SEAL
24	90066	2	7/16-14X1-1/4 HX CS G5 ZP
27	25944K	1	PACKING NUT 1-1/2"
28	25205K	1	PACKING SET W/WIPER 1-1/2"
29	55137	1	WIPER RING - 1-1/2"
30	55136	1	PACKING SET 1-1/2"
31	91167	1	WASHER - SPECIAL
32	25202	1	PLUNGER KIT 1-1/2 X 6
33	56267	1	SPLIT BEARING KIT
36	92079	1	PLUG 3/8 NPTF SQ
37	25968K	1	BASE LUG W/#25618 O-RING
38	25618	1	O-RING - 216

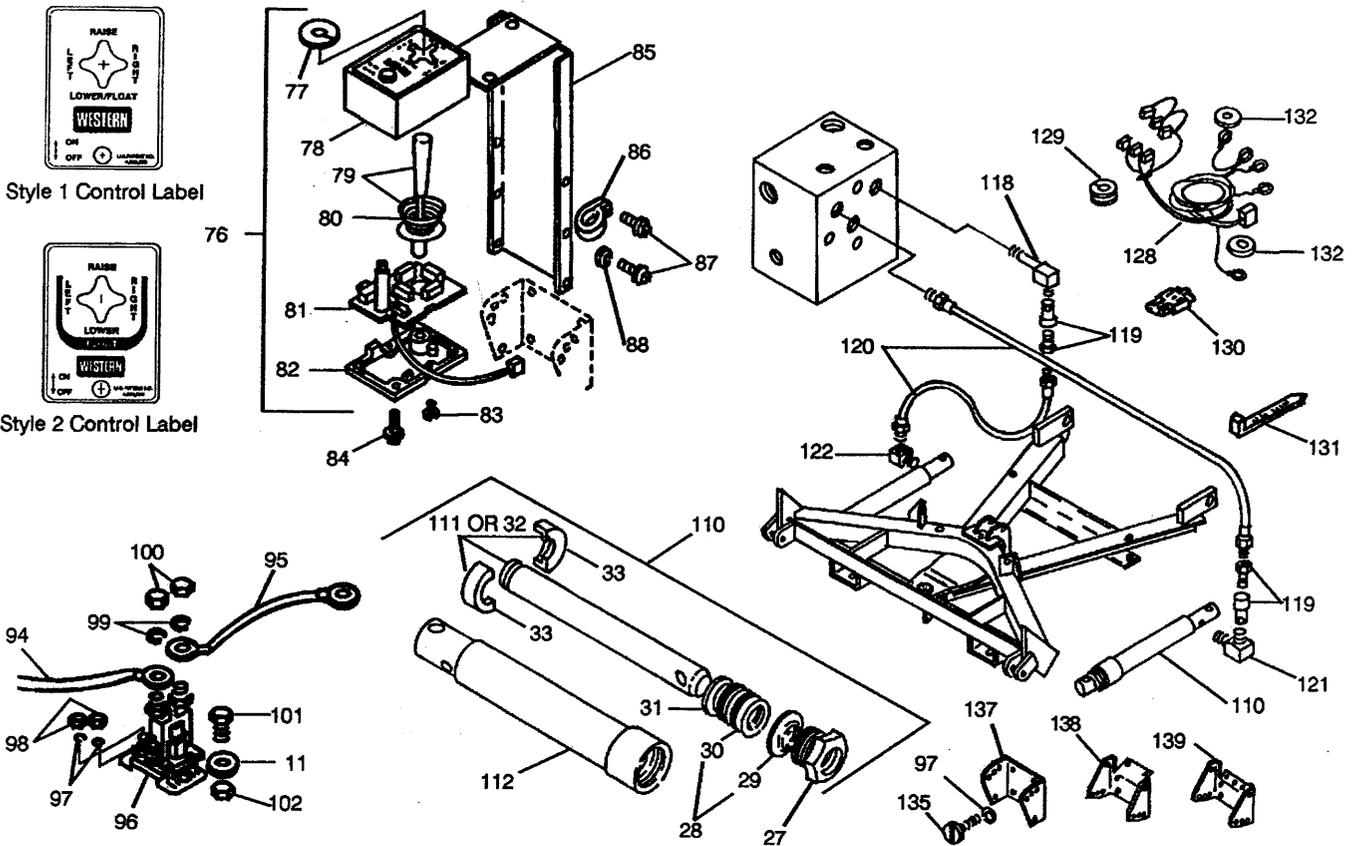
ITEM	PART NO.	QTY.	DESCRIPTION
42	49265	1	VALVE MANIFOLD ASSY SOL 3500
	49278	1	VALVE MANIFOLD ASSY SOL 2500
43	49224	1	MANIFOLD ASSY SOL 3500 (W/O CARTRIDGES)
	49279	1	MANIFOLD ASSY SOL 2500 (W/O CARTRIDGES)
44	92960	3	3/8-24 HX SO O-RING BOSS PLUG
6	92071	3	PLUG 1/8 NPTF HX SO
4	92095	1	PLUG 1/4 NPTF HX SO THREAD SEAL
46	49225	1	INLET CHECK VALVE KIT
47	49138	1	CUSHION VALVE REPAIR KIT-SET
48	49226	1	POPPET CHECK VALVE KIT
49	56330	1	QUILL ASSY
	49257	1	BACK-UP/O-RING KIT - SOL
53	56274	1	O-RING - 013
54	25730	2	O-RING - 012
55	25731	2	O-RING - 010
56	55371	2	O-RING - 008
57	25622	2	O-RING - 006
58	56315	2	BACK-UP RING - 006 PARBAK SPLIT
61	49227	1	CARTRIDGE 2004 W/JAM NUT
	49258	1	SEAL KIT - CARTRIDGE 20 & 2004
62	49228	1	CARTRIDGE 30 W/JAM NUT
63	49229	1	CARTRIDGE 40 W/JAM NUT
	49259	2	SEAL KIT - CARTRIDGE 30, 33 & 40
64	49230	3	COIL W/SPADE TERMINALS
65	56291	1	COVER ASSY
66	90650	2	#8-18X1/2 SL HXW TFTS TY B ZP
69	91201	3	1/4 SP LK WASHER ZP
70	90083	3	1/4-20X3-1/4 HX CS G5 ZP
71	55984	1	GROUND CABLE 60" BLACK



Style 1 Control Label



Style 2 Control Label



ITEM	PART NO.	QTY.	DESCRIPTION
76	56285	1	* SOLENOID CONTROL
77	56283	1	SHIELD
78	49231	1	* BODY W/LABEL, LENS & SPRING (Style 1)
	49286	1	* BODY W/LABEL & LENS (Style 2)
79	49232	1	* LEVER, SPRING & ACTUATOR KIT (Style 1)
	49287	1	* LEVER, SPRING & ACTUATOR KIT (Style 2)
80	55923	1	SPRING - CONICAL
81	49255	1	* PC BOARD ASSY (Style 1)
	49284	1	* PC BOARD ASSY - SAE STYLE 2
82	56199	1	BASE
83	93153	2	#6-19X3/8 SL HXW Tfts HILO
84	93154	2	#8-18X5/8 SL HXW Tfts HILO
85	56308	1	CONTROL BRACKET
86	55381	1	CABLE CLAMP
87	93157	5	#8-32X3/8 SL HXW Tfts TY T BP
88	91231	4	#8 SP LK WASHER BP
94	25635	1	BATTERY CABLE 60" RED
95	22511	1	BATTERY CABLE 22" RED
96	56134K	1	RELAY - SOLENOID HYDRAULIC SYSTEM
97	91242	2	#10 SP LK WASHER BZP
98	91402	2	#10-32 HX NUT ZP
99	91202	2	5/16 SP LK WASHER ZP
100	92842	2	5/16-24 HX JAM NUT ZP
101	90002	2	1/4-20X3/4 HX CS G2 ZP
11	91101	2	1/4 PLAIN WASHER TY A STD ZP
102	91331	2	1/4-20 PT HX LK NUT NYIS ZP
110	56102	2	RAM ASSY 1-1/2" X 10"
	56337	2	RAM ASSY 1-1/2" X 6"
27	25944K	1	PACKING NUT 1-1/2"
28	25205K	1	PACKING SET W/WIPER 1-1/2"
29	55137	1	WIPER RING 1-1/2"
30	55136	1	PACKING SET 1-1/2"

ITEM	PART NO.	QTY.	DESCRIPTION
31	91167	1	WASHER - SPECIAL
111	56105	1	PLUNGER KIT 1-1/2 X 10
32	25202	1	PLUNGER KIT 1-1/2 X 6
33	56267	1	SPLIT BEARING KIT
112	56104	1	CYLINDER 1-1/2" x 10"
	56336	1	CYLINDER 1-1/2" X 6"
118	92275K	1	MALE ELBOW 1/4" X 90° SPL
119	25232K	2	QUICK COUPLER
120	55020K	2	PRESSURE HOSE 1/4" X 38"
121	92210K	1	STREET ELBOW 1/4" X 90°
122	92278K	1	MALE ELBOW 1/4" X 90° SPL
128	56307	1	HARNES - CONTROL (10 Amp Fuse)
129	66130	2	RUBBER GROMMET
130	59114	1	SELF STRIP WIRE CONNECTOR
131	59223	5	CABLE TIE
132	91098	2	#10 PLAIN WASHER TY B NAR ZP
135	90388	4	#10X1 SL PN Tfts TY AB BZP
97	91242	4	#10 SP LK WASHER BZP

Parts listed above may be found in one of the following:

56311	1	CARTON ASSY LOOSE PARTS
56312	1	BOLT BAG ASSY LARGE
56309	1	BOLT BAG ASSY SMALL

Parts Listed Below are Furnished in Appropriate Lift Mount Box.

137	56080	1	DASH BRACKET
138	56081	1	DASH BRACKET
139	56082	1	DASH BRACKET

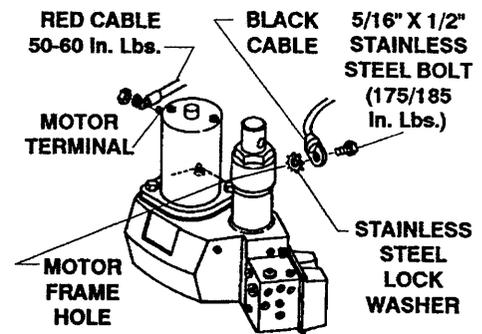
\* Orders for complete control assemblies will be filled with Style 2 controls. Component parts, where indicated, are not interchangeable between the two styles. Order according to the label on the body of your control

Abbreviations

ASSY	Assembly	HX	Hex	PSI	Pound per Square Inch	TCTS	Thread Cutting Tapping Screw
BP	Black Phosphate	HXW	Hex Washer	PT	Prevailing Torque	Tfts	Thread Forming Tapping Screw
BPO	Black Phosphate & Oil	LK	Lock	SL	Slotted	TRTS	Thread Rolling Tapping Screw
BRG	Bearing	NAR	Narrow	SO	Socket Head	TY	Type
BZP	Black Zinc Plate	NPTF	National Pipe Thread (Fluid)	SOL	Solenoid	W/	With
CS	Capscrew	NYIS	Nylon Insert	SP	Spring	W/O	Without
EX	External	PC	Printed Circuit	SPL	Special	ZP	Zinc
G	Grade	PN	Pan	SQ	Square		
HD	Heavy Duty	PR	Prestolite	STD	Standard		

USE ONLY GENUINE WESTERN® REPLACEMENT PARTS

60" black cable between hole in motor frame and engine ground bolt or to battery ground terminal. Secure ground cable to motor frame hole with a 5/16" x 1/2" stainless steel capscrew and lock washer. Torque to 175/185 in. lbs.



Drill a 5/8" hole thru firewall in any convenient location away from hot or moving engine parts. Feed spade ends of control harness through hole into engine compartment. Plug harness connector into solenoid control.

Inside cab, locate an unused fuse box terminal or accessory wire that is controlled by ignition switch (power is turned off when ignition switch is in "off" position). Route 10 amp fuse holder red wire to this location, and trim excess length of wire. Open blue self stripping connector. Place end of red wire against inner groove stop and accessory wire in outer groove. Close connector over wires with pliers and snap locking tab into place. NOTE: End of red wire should not be visible from connector.

Avoiding hot or moving engine parts, route spade end of harness through radiator bulkhead (drill 5/8" hole if necessary) to Solenoid Isarmatic® Mark IIIa. Remove manifold cover and attach harness receptacle ends to coil terminals as shown on label inside cover. An electrical sealant has been applied to the coil terminals. DO NOT wipe off terminals. With harness strain relief inside cover at slot, replace cover and secure. Inside engine compartment, attach control harness 5/16" ring terminal to a good ground with existing fastener. For a small sized ground screw, use #10 flat washer.

Route brown and black wire loom to motor relay. Avoid hot or moving engine parts, Attach each #10 ring terminal to a small motor relay terminal. Secure 5/16" ring terminal to a good ground using existing fastener. For a small sized ground screw, use #10 flat washer. Reconnect the vehicle battery. Secure all loose wires and harness away from hot or moving engine parts with cable ties. Install grommets at firewall hole and radiator bulkhead if drilled.

### CYLINDER ATTACHMENT

Attach Hydra-Turn® rams per instructions in A&Q Box.

### HOSE AND FITTING CONNECTIONS (See Diagram)

Install hoses, quick couplers and elbows as shown in Parts Diagram, Page 3.

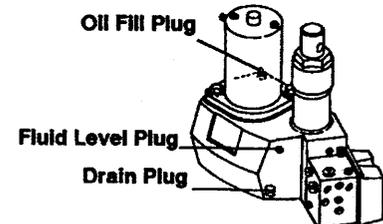
Attach blade to truck and connect hoses as shown in Parts Diagram, Page 3.

When removing blade from vehicle, disconnect hydraulic couplers. Connect curb side ram hose into driver side ram coupler. Loop valve manifold hose around lift frame and couple hose to manifold quick coupler. This will protect the quick coupler ends and keep foreign matter out of the quick couplers while the blade is off the vehicle.

### OIL FILL

Push lift channel all the way down. Remove fill and fluid level plug. Fill unit with automatic transmission fluid (ATF) through fill plug hole until fluid runs out fluid level hole. Replace both plugs. (Mobil One or Texaco 1537 Aircraft Hydraulic Oil may be used for low temperature operation.) Reservoir fluid capacity is 1-1/2 quarts --- 2-1/8 quarts with 10" angling rams, or 1-7/8 quarts with 6" angling rams.

ALTERNATE FILL METHOD: Push lift channel all the way down. Remove fill plug. Fill through fill plug opening until fluid reaches hole threads. Replace fill plug.



### OPERATION

Turn ignition (key) switch to "ON" or "Accessory" position. Turn the control ON/OFF Switch "ON", then move the lever: up (forward) to raise the plow, down (back) to lower/float the plow either right or left to angle plow right or left

Recheck fluid level in reservoir.

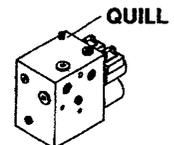
Turn solenoid control "OFF" when mounted plow is not in use to prevent accidental plow movement.

### BLADE DROP SPEED ADJUSTMENT

Blade drop speed is adjusted with the quill on the top rear of the valve manifold.

Turn quill "IN" (clockwise) to slow drop speed. (Quill turned to far "IN" can slow raise time.)

Turn quill "OUT" (counterclockwise) to increase drop speed.



### FINAL INSPECTION

As a final check, make sure all fasteners and hydraulic and electrical connections are tight. After cycling hydraulic system several times to remove air, recheck fluid level per instructions above. Check ram packing nuts for possible oil leakage while raising and angling the plow. If any leakage is observed, tighten not more than 1/4 turn after you feel packing nut contact the packing. Over-tightening affects ram operation and life of the packing. After plow is operated a short time, chevron packings become saturated and normally leakage stops.

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

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