



WESTERN PRODUCTS
P.O. BOX 245038
MILWAUKEE, WISCONSIN 53224-9538

A DIVISION OF DOUGLAS DYNAMICS, INC.

Box No. 56140

Isarmatic® Mark IIIa H.D.
Hydraulic System with
Hydra-Turn® Angling

December 5, 2003

IMPORTANT: A 550 CCA or 70 amp hour battery and 55 amp or larger alternator are recommended.

INSTALLATION INSTRUCTIONS

ISARMATIC® MARK IIIa MOUNTING

Attach lift channel per instructions in A-frame box. Attach Isarmatic® Mark IIIa to lower U-clip with 3/4" x 3-1/2" bolt and locknut and Isarmatic® Mark IIIa lift ram to lift channel with 3/4" x 3" bolt and locknut. Tighten bolts to permit free pivotal motion.

IIIa CONTROL

Using bracket and instructions furnished in lift-mount box, mount IIIa control bracket in vehicle cab.

CONTROL CABLES

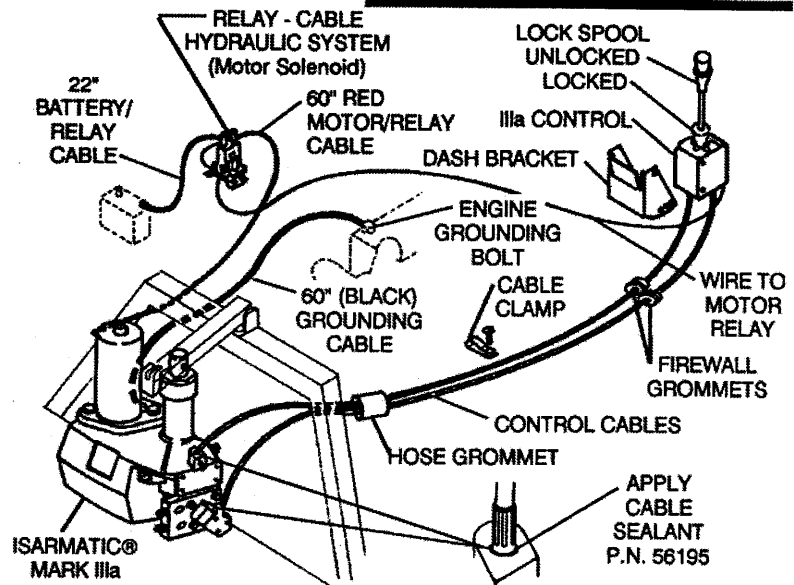
Drill two 1/2" holes through firewall to align with IIIa control. **IMPORTANT:** Holes should be placed to avoid hot or moving engine parts. Feed IIIa control cables and wire through holes into engine compartment. Mount control into bracket. Slide rubber grommets over ends of cable and wire and install in firewall holes. If required, drill two 1/2" holes through top edge of bulkhead adjacent to radiator. Pass cables through drilled holes or existing openings and through grill. Install rubber grommets in drilled holes. Slip hose grommet over cables for protection in grill area.

RAISE – LOWER CABLE – NON-ADJUSTABLE (See Diagram, page 4)

Remove rectangular cover plate (3-way valve) and gasket from Isarmatic® Mark IIIa unit. Insert cable into hole above rectangular opening until you can place cable end over lever pin. Position cable to allow set screw to enter groove. Tighten set screw. Replace cover and gasket and secure with four screws.

HYDRA-TURN® ANGLING CABLE – ADJUSTABLE (See Diagram, page 4)

Remove 5 sided cover (4-way valve) and gasket. Insert cable into hole above opening and place end over lever pin. Position cable to allow set screw to enter groove. Leave set screw loose enough to rotate base end of cable. Activate IIIa control lever in all directions and return to neutral. Lock control lever in neutral by pushing lock spool down into center of cross slots. Adjust base end of cable to align valve lever pin, screw, and roll pin (3 point alignment). For final adjustment procedure, see VALVE ADJUSTMENT CHECKS paragraph, page 4. Make sure there are no sharp bends (min 8" radius) in control cables. Clamp cables to wheel well at their mid-point. Drill 9/64" hole and secure cable clamp with # 10 x 1" tapping screw.



ELECTRICAL



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

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

Make the following battery cable connections (See diagrams this page)

Route all battery cables to avoid sharp edges.

22" red cable between "BAT" terminal of relay and "POS" terminal on battery.

60" red cable between other large motor relay terminal and motor terminal.

Torque nuts to 50-60 in. lbs.

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 external tooth lock washer.

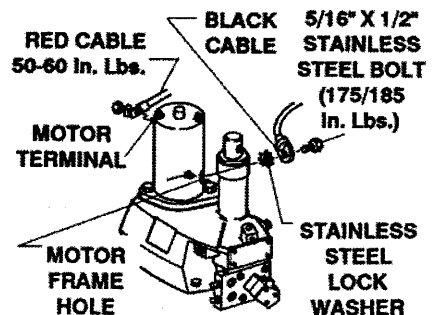
Torque to 175/185 in. lbs.

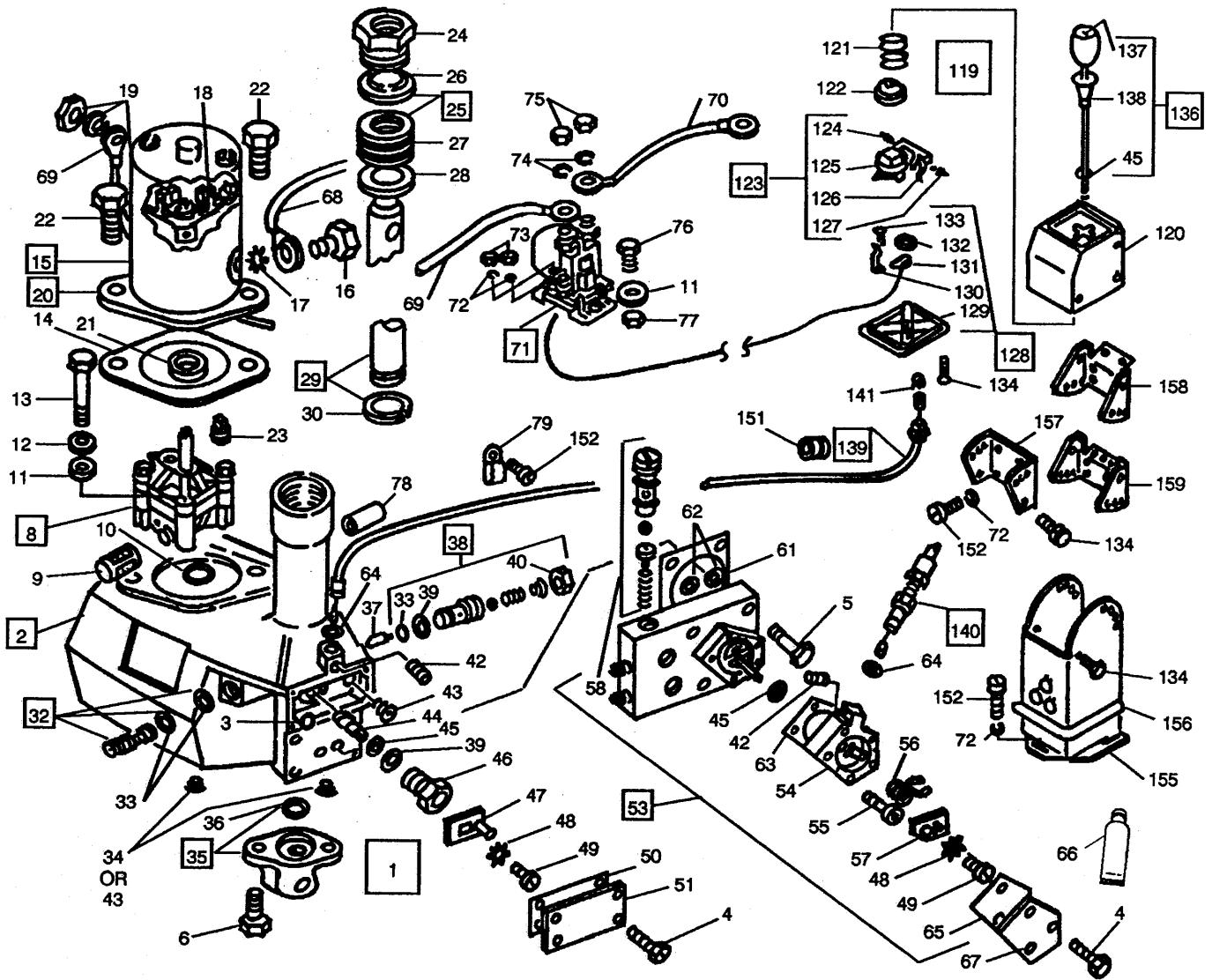
Connect IIIa control wire to unused small terminal on motor relay.

Remove slack from all wires and tape in place. Reconnect the vehicle battery.

Continued on Page 4.

Form No. 13359





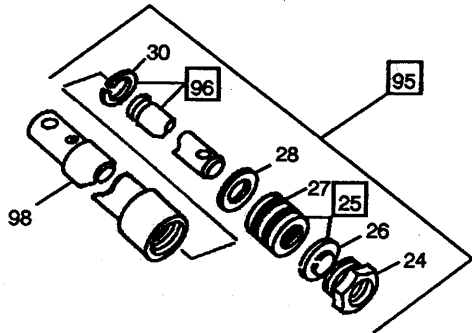
ITEM	PART NO.	QTY.	DESCRIPTION
1	56097	1	HYDRAULIC UNIT 2" HD
2	55945	1	SERVICE HOUSING KIT 2"
3	55591	1	EXPANSION PLUG 1/4"
4	90666	4	#10-24X5/8 TY T SL HX TCTS
5	93165	4	1/4-20X1-3/4 HXW TRTS TY TR-3
6	93166	2	5/16-18X1-1/4 HXW TRTS TY TR-3
8	49211	1	PUMP KIT DIE CAST
9	56185	1	SUCTION FILTER
10	25620	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
15	56133	1	MOTOR ASSY 4-1/2"
16	90088	1	5/16-18X1/2 HX CS 18-8 STS
17	91263	1	5/16 EX TOOTH LK WASHER STS
18	49262	1	BRUSH KIT - PR 56133
19	49296	1	TERMINAL STUD PACKAGE PR 56133
20	49084	1	MOTOR FLANGE BRG & SEAL
21	49014	1	OIL SEAL
22	90066	2	7/16-14X1-1/4 HX CS G5 ZP
23	92079	1	PLUG 3/8 NPTF SQ
24	25948	1	PACKING NUT 2"
25	25215	1	PACKING SET W/WIPER 2"
26	55210	1	WIPER RING 2"
27	55209	1	PACKING SET 2"
28	91174	1	WASHER - SPECIAL
29	25212	1	PLUNGER 2" X 6"
30	25213	1	RETAINER RING 2"
32	49064K	1	LIFT VALVE W/2-#25730 O-RINGS
33	25730	2	O-RING - 012

ITEM	PART NO.	QTY.	DESCRIPTION
34	92072	2	PLUG 1/4 NPTF HX SO (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
39	25730	1	O-RING - 012
39	55587	1	O-RING - 112
40	55569	1	5/8-18 JAM NUT SPL
42	90600	1	#10-24X3/8 SO SS HDP STS
43	92071	3	PLUG 1/8 NPTF HX SO (Late Models)
44	55571	1	CAMSHAFT
45	55371	1	O-RING - 008
39	55587	1	O-RING - 112
46	55572	1	HUB NUT
47	55573	1	VALVE LEVER ASSY
48	91259	1	#6 EX TOOTH LK WASHER ZP
49	90655	1	#6-32X1/4 PN MS ZP
50	55350	1	COVER GASKET 3W
51	55958	1	ENCLOSURE COVER 3W
53	49020	1	VALVE KIT 4W
42	90600	1	#10-24X3/8 SO SS HDP STS
54	55342	1	CABLE & LINKAGE ENCLOSURE
55	90909	5	1/4-20X1-1/2 SO CS PLAIN
56	55359	1	TORSION SPRING
57	55364	1	VALVE LEVER ASSY 4W
48	91259	1	#6 EX TOOTH LK WASHER ZP
49	90655	1	#6-32X1/4 PN MS ZP
58	49138	1	CUSHION VALVE REPAIR KIT-SET
	49005	1	REPAIR KIT - 4W VALVE (Not Shown)
(Items 61 & 62 Not included w/Item 53)			
61	55374	1	MANIFOLD GASKET 4W

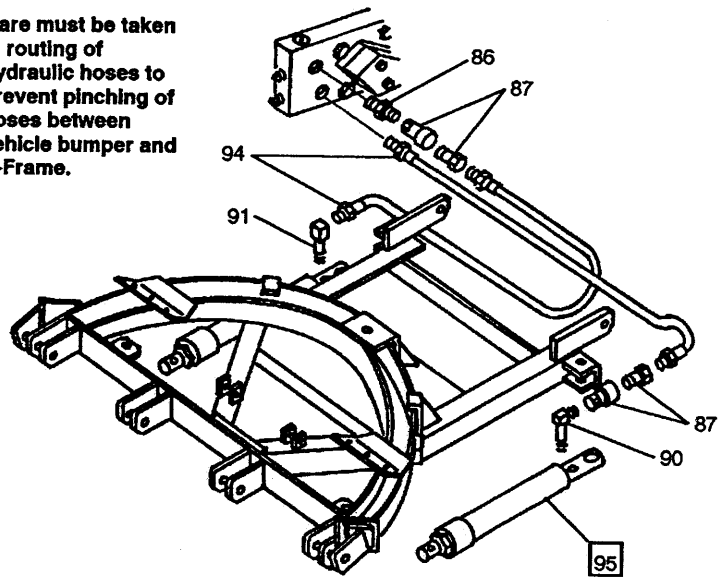
Box No. 56140

Isarmatic® Mark IIIa H.D.
Hydraulic System with
Hydra-Turn® Angling

PARTS DIAGRAM & LIST



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



ITEM	PART NO.	QTY.	DESCRIPTION
62	55252	2	O-RING - 015
45	55371	1	O-RING - 008
63	55951	1	SHIM SPACER .0005 SILVER
	55735	1	SHIM SPACER .00035 CLEAR
64	25731	1	O-RING - 010
65	55357	1	COVER GASKET 4W
66	56195	1	CABLE SEALANT
67	55959	1	ENCLOSURE COVER 4W
4	90666	3	#10-24X5/8 TY T SL HX TCTS
68	55984	1	GROUND CABLE 60" BLACK
69	25635	1	BATTERY CABLE 60" RED
70	22511	1	BATTERY CABLE 22" RED
71	56131K	1	RELAY - CABLE HYDRAULIC SYSTEM
72	91242	2	#10 SP LK WASHER BZP
73	91402	2	#10-32 HX NUT ZP
74	91202	2	5/16 SP LK WASHER ZP
75	92842	2	5/16-24 HX JAM NUT ZP
76	90002	2	1/4-20X3/4 HX CS G2 ZP
11	91101	2	1/4 PLAIN WASHER TY A STD ZP
77	91331	2	1/4-20 PT HX LK NUT NYIS ZP
78	55511	1	HOSE 5/8" X 3"
79	55381	1	CABLE CLAMP
86	25519K	1	HEX NIPPLE 1/4"
87	25232K	2	QUICK COUPLER
90	92275K	1	MALE ELBOW 1/4" X 90° SPL
91	92208K	1	STREET ELBOW 1/4" X 90° SPL
94	55020K	2	PRESSURE HOSE 1/4" X 38"
95	25878	2	RAM ASSY 2" X 16"
24	25948	1	PACKING NUT 2"
25	25215	1	PACKING SET W/WIPER 2"
26	55210	1	WIPER RING 2"
27	55209	1	PACKING SET 2"
28	91174	1	WASHER - SPECIAL
96	25703	1	PLUNGER 2" X 16"
30	25213	1	RETAINER RING 2"
98	25949	1	CYLINDER 2" X 16"
119	56018	1	IIIa CONTROL ASSY
120	49021	1	BODY W/LABEL
121	56022	1	SPRING CENTERING
122	56023	1	SPRING RETAINER

ITEM	PART NO.	QTY.	DESCRIPTION
123	49015	1	PLATEN ASSY
124	56027	2	BALL STUD
125		1	PIVOT PLATEN
126	56026	1	CONTACT STRIP
127	93152	1	#10-16X3/8 SL HX Tfts HILO
128	56028	1	BOTTOM COVER ASSY
129		1	BOTTOM COVER
130	56030	1	SPRING DETENT
131	56032	1	CONTACT TUBE ASSY
132	93168	1	RETAINING RING 3/8"
133	93153	1	#6-19X3/8 SL HXW Tfts HILO
134	93154	4	#8-18X5/8 SL HXW Tfts HILO
136	49016	1	KNOB & LEVER ASSY
	49147	1	KNOB & LEVER ASSY SHORT
137	56039	1	LENS LABEL
138	49017	1	LOCKSPool W/LABEL
45	55371	1	O-RING - 008
139	56035	1	CABLE ASSY 9' BLACK
	56180	2	CABLE ASSY 12' BLACK ADJUST
140	56130	1	CABLE ASSY 9' BLACK ADJUST
64	25731	2	O-RING - 010
141	49019	2	BALL SPRING CLIP
151	25301	4	RUBBER GROMMET
152	90388	4	#10X1 SL PN Tfts TY AB BZP
72	91242	4	#10 SP LK WASHER BZP
134	93154	4	#8-18X5/8 SL HXW Tfts HILO

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

56150	1	CARTON ASSY LOOSE PARTS
56066	1	BOLT BAG ASSY LARGE (56140)
56047	1	BOLT BAG ASSY SMALL

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

155	56079	1	FLOOR BRACKET
156	56043	1	RUBBER BOOT
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.

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

ASSY	Assembly
ADJUST	Adjustable
BRG	Bearing
BZP	Black Zinc Plate
CS	Cap screw
EX	External
ED	Extra Duty
G	Grade

HD	Heavy Duty
HDP	Half Dog Point
HX	Hex
HXW	Hex Washer
LK	Lock
MS	Machine Screw
NPTF	National Pipe Thread (Fluid)
NYIS	Nylon Insert
PN	Pan

Abbreviations

PR	Prestolite	STD	Standard
PT	Prevailing Torque	STS	Stainless Steel
SL	Slotted	TCTS	Thread Cutting Tapping Screw
SO	Socket Head	Tfts	Thread Forming Tapping Screw
SP	Spring	TRTS	Thread Rolling Tapping Screw
SPL	Special	TY	Type
SQ	Square	W	Way
SS	Set Screw	W/	With
		ZP	Zinc Plate

USE ONLY GENUINE WESTERN® REPLACEMENT PARTS

CYLINDER ATTACHMENT

Attach Hydra-Turn® rams per instructions in A-frame and quadrant box. 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 cylinder hose into driver-side cylinder coupler. Loop Isarmatic® Mark IIIa hose around lift frame and couple hose to manifold quick coupler. These hose connections exclude foreign matter from the hydraulic system while the blade is off the vehicle.

OIL FILL

Push lift channel all the way down. Remove fill plug. Fill through fill plug opening until fluid reaches hole threads. Replace fill plug. (Mobil One or Texaco 1537 Aircraft Hydraulic Oil may be used for low temperature operation.)

IMPORTANT Fill the reservoir only through the fill opening as it is designed to prevent overfilling. Isarmatic® Mark IIIa reservoir capacity is 1-1/2 quarts — 2-3/4 quarts with Hydra-Turn® cylinders.

OPERATION

The operating instructions are affixed to the top of the IIIa control. Move the lever:

- up (forward) to raise the plow,
- down (back) to lower/float blade,
- to either side to angle right or left.

Move the lever all the way into the desired position smoothly and without hesitation. Always return the lever to the neutral position when not in operation. The IIIa control is equipped with a manual lock to prevent accidental lowering or movement of the blade. Push the lock spool down into the center of the cross slots — the blade cannot be moved. Pull the lock spool up away from the cross slots — the blade can be moved. The lock spool should be engaged whenever mounted plow is not in use.

VALVE ADJUSTMENT CHECKS



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

A correctly adjusted unit should produce a four (4) second lift time and a eight (8) second angling time in either direction. (Refer to diagrams)

If lift is too slow, turn lift valve in (max. 1/8 turn at a time).

If angling is slow in **BOTH** directions — turn lift valve out (max. 1/8 turn at a time).

If angling is slow in **ONE** direction — adjust adjustable cable:

increase angle right speed — turn base end of cable clockwise.

increase angle left speed — turn base end of cable counterclockwise.

Adjust blade drop speed to desired rate. Lower blade to ground. To prevent O-ring "blow-out", loosen check valve jam nut 1/4 turn max. (Turn valve max. 1/8 turn at a time)

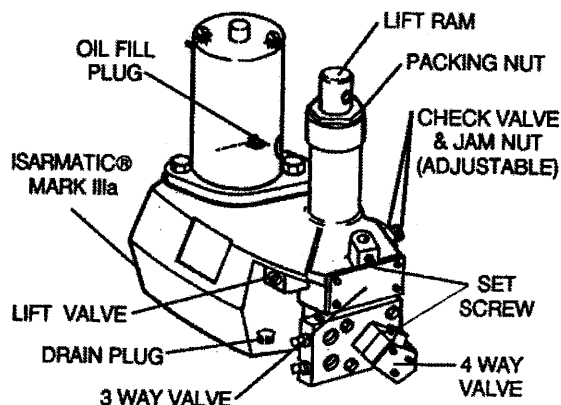
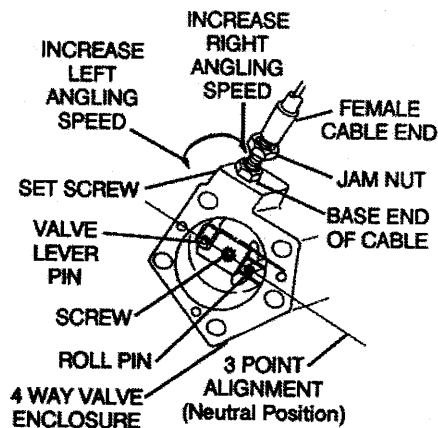
Blade lowers too fast — turn check valve out (counterclockwise)

Blade lowers too slow — turn check valve in (clockwise)

After adjustments - tighten set screws, tighten jam nuts to 12 in-lb and replace gaskets and covers. Seal cable entries to housing with 56195 cable sealant (see diagram, page 1).

FINAL INSPECTION

As a final check, make sure all fasteners and hydraulic and electrical connections are tight. After cycling several times to remove air, recheck fluid level. Check cylinder packing nuts for oil leakage while raising and angling the blade. If any leakage is observed, tighten not more than 1/4 turn after you feel packing nut contact the packing. Over-tightening affects cylinder 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™

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