

ASSEMBLY INSTRUCTIONS

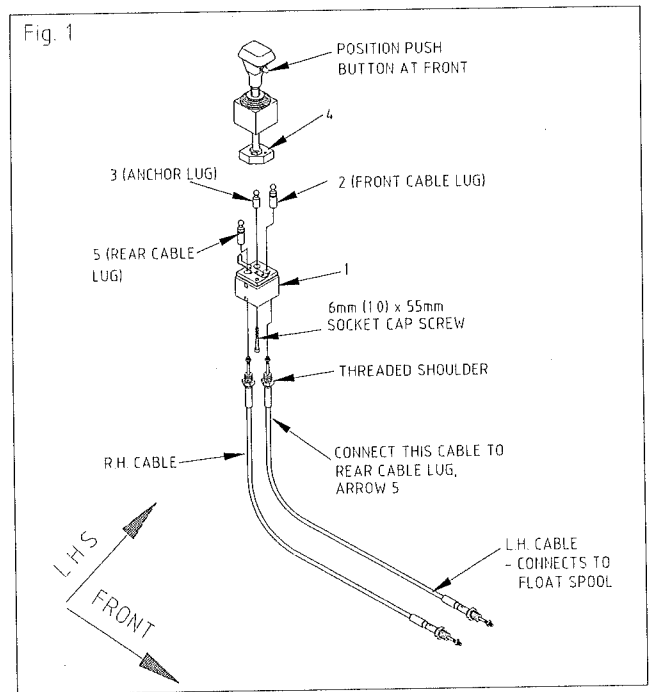
HYDRA-ELECTRICAL JOYSTICK CONTROL SYSTEM

(INCLUDES WALVOIL LOAD SENSING VALVE)

1. CONNECT CONTROL CABLES TO DOUBLE JOYSTICK CONTROL

- See Fig. 1

- a) Remove rubber cover from base of joystick control.
- b) Remove one (1) 6mm (1.0) x 55mm socket cap screw from bottom of joystick base, arrow 1. This allows joystick handle to be lifted off base, releasing two (2) cable lugs, arrow 2, arrow 5 and the anchor lug, arrow 3.
- c) Next, attach cable lugs, arrow 2 and arrow 5 to end of cables. Use approximately 5/16" of thread on cable. **Do not** screw cable lug all the way on to cable. Lock cable to lug by tightening jam nut to bottom of cable lug.
- d) Install each cable and lug assembly through bottom of joystick base. Screw threaded shoulder of each cable into bottom of joystick base, arrow 1. Use half of the thread length on each cable. Tighten locknut.



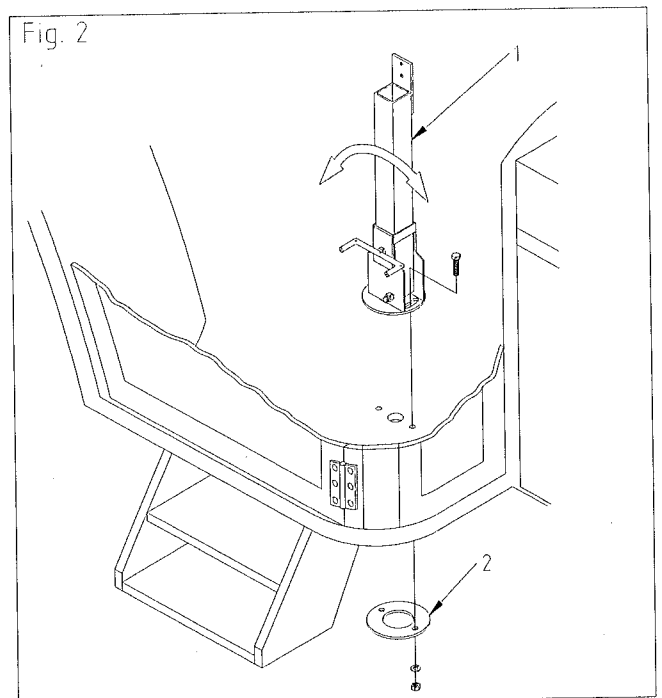
NOTE: *L.H. cable which is used for float spool of valve, must be connected to front cable lug, arrow 2.*

- e) Install anchor lug, arrow 3, and cable lugs, arrow 2 and arrow 5 in slots of handle base, arrow 4. Install anchor lug, arrow 3, in hole of joystick base. Secure anchor lug to base with one (1) 6mm (1.0) x 55mm socket cap screw which is installed from bottom of joystick base. To prevent 6mm cap screw from coming loose, be sure special locking washer is installed.
- f) Install rubber cover over joystick base.

2. MOUNTING JOYSTICK CONTROL

- a) FLOOR MOUNT TILT PEDESTAL - See Fig. 2

Locate pedestal, arrow 1, in R.H.S. of cab as required. Pedestal must be free to swing from a 15 degree forward position to 40 degree rear tilt position. Pedestal is designed to swing out of the way allowing operator to exit or enter cab through R.H. door. Drill holes in floor of cab. Secure pedestal to cab floor with two (2) 1/2" x 2" bolts c/w nuts and lockwashers and a backing plate, arrow 2, located at bottom side of cab floor.



MOUNTING JOYSTICK CONTROL CONTINUED:

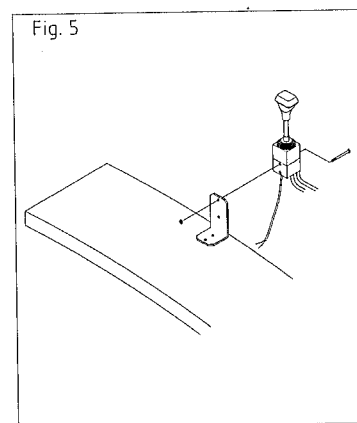
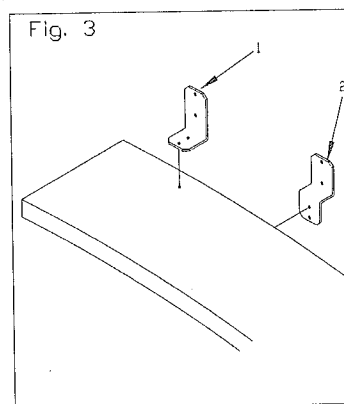
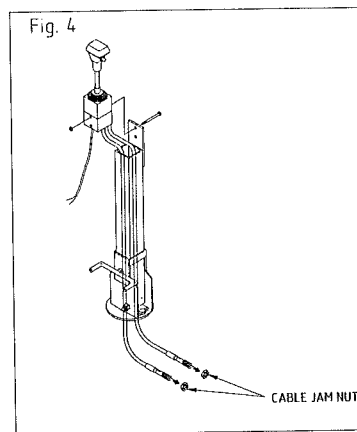
b) FENDER MOUNT BRACKETS - See Fig. 3

Determine position of joystick control on R.H. fender. Choose a 90 degree bracket, arrow 1, or "Z" type bracket, arrow 2, to secure joystick control. Fasten bracket to fender, bolts not supplied. Drill a hole in floor of cab for cables to run through. Be sure cables do not interfere with other tractor controls or operator.

c) INSTALLING JOYSTICK CONTROL

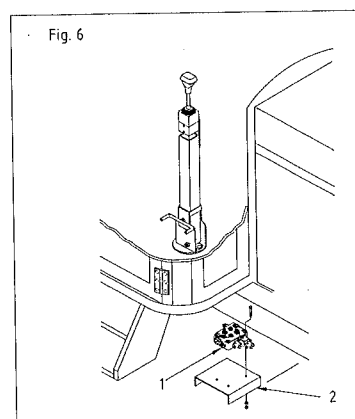
PEDESTAL MOUNT - Fig. 4. Remove cable jam nuts from end of each control cable then thread cables through center of pedestal and through floor of cab. Secure control to two holes at top of pedestal with two (2) 1/4" x 3-1/4" bolts c/w nuts and lockwashers. Control should be positioned with (red) push button at front. Replace jam nuts on end of each cable.

FENDER MOUNT - Fig. 5. Fasten control to two holes in fender bracket with two (2) 1/4" x 3-1/4" bolts c/w nuts and lockwashers. Thread control cable through cab floor.



3. MOUNTING 2 SPOOL CONTROL VALVE - See Fig. 6

- Find the ideal location for control valve, arrow 1. Valve can be located ahead or behind the exit hole for control cables. **Do not** position valve in a location that will require sharp bends in control cables. Gentle cable radios will permit smooth operation of joystick control.
- After determining control valve position, secure valve support bracket, arrow 2, to loader mount frame or tractor frame. Bracket may be welded to loader mounts. If valve bracket must be bolted to tractor or mount bracket, fabricate attaching lug(s) as required and weld them to valve bracket.
- Bolt control valve, arrow 1, to valve bracket, arrow 2, with three (3) 5/16" x 2-3/4" N.C. hex bolt c/w nuts and lockwashers.



4. CONNECT CONTROL CABLE TO CONTROL VALVE:- See Fig. 7 and Fig. 8

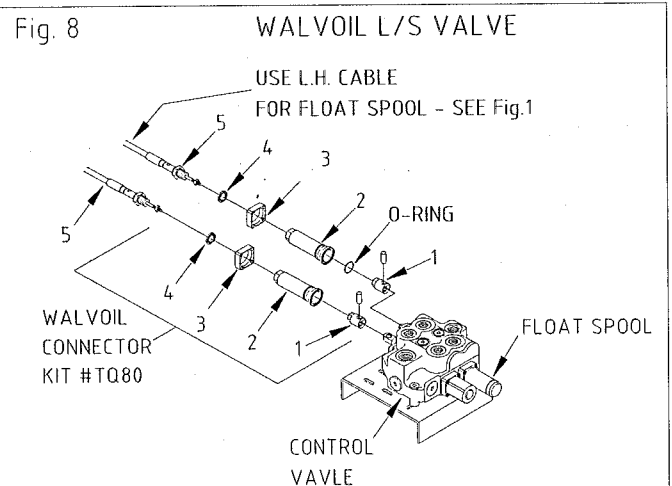
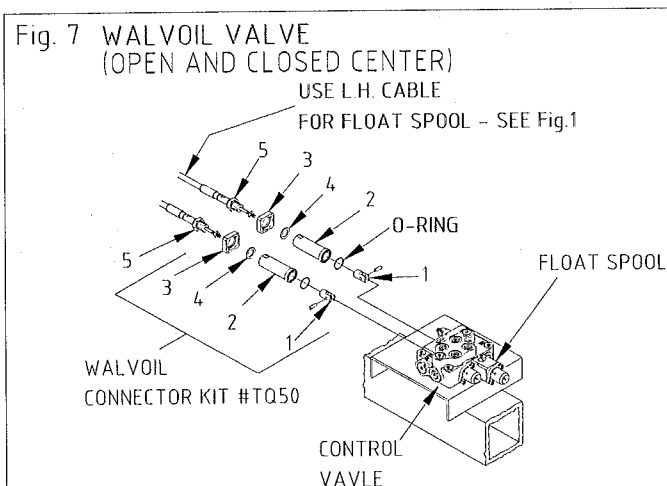
NOTE: Walvoil Open and Closed Center Valves use Connector Kit #TQ50. Walvoil Load Sensing Valves use Connector Kit #TQ80.

- Turn cable jam nuts, arrow 5, clockwise (nut moves towards joystick) until they run off thread. Install four bolt flange, arrow 3, over each cable as shown on Fig. 7 and 8. Install cable seal, arrow 4, over threaded end of cable. Screw each connector tube, arrow 2, completely over each cable until connector tube comes off thread.
- Fasten one (1) cable connector, arrow 1, to threaded end of each cable. The Walvoil Open and Closed Center Valve (shown in Fig. 7) uses a round lug with a slot at one end. The Walvoil Load Sensing Valve uses a round lug with a rectangular hole in one end. Use approximately 5/16" thread on cable. Do not screw lug all the way on to cable. Tighten locknut, arrow 5, which will place cable seal, arrow 4, tight against end of connector tube, arrow 2.
- Pin each cable to spool on control valve. The cable from L.H. side of valve must be connected to spool with float position. (See ILL. 1)

NOTE: The pin for Load Sensing Valve can be installed through one side of cable connector only. Insert pin into the side of connector that it will slide easy. Pin will need to be taped into the opposite side of connector.

- Install O-Ring in groove on outer end of each connector tube. Next slide connector to thread at end of each cable and screw connector onto thread.

Use one flange plate, fasten each connector tube to valve. Secure each plate with four (4) 1/4" N.C. bolts. See Section (1) of "Adjustments" on page 11 before tightening bolts.

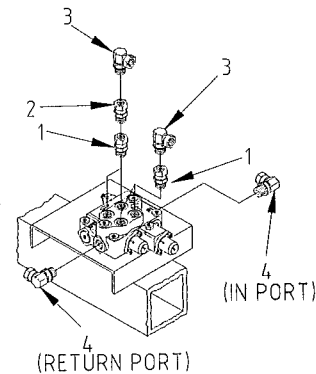


5. INSTALLING SPOOL PORT FITTINGS

WALVOIL OPEN AND CLOSED CENTER VALVE - Fig. 9. Install one (1) 3/4" - 16 male O.R.B. x 1/2" N.P.T. female swivel adapter, arrow 1, in each of the four spool ports. Then install one (1) 1/2" N.P.T. male x 1/2" N.P.T. female swivel adapter, arrow 2, in the two rear spool ports. Install one (1) 1/2" N.P.T. male x 1/2" N.P.T. female x 90 degree swivel street elbow, arrow 3, in the four spool ports.

WALVOIL LOAD SENSING VALVE - Fig. 10. Install one (1) 7/8" - 14 male O.R.B. x 1/2" N.P.T. female swivel adapter, arrow 1, in each of the four spool ports. Then install one (1) 1/2" N.P.T. male x 1/2" female swivel adapter, arrow 2, in the two rear spool ports. Install one (1) 1/2" N.P.T. male x 1/2" N.P.T. female x 90 degree swivel street elbow, arrow 3, in the four spool ports.

Fig. 9 WALVOIL OPEN CENTER AND CLOSE CENTER (2 SPOOL)

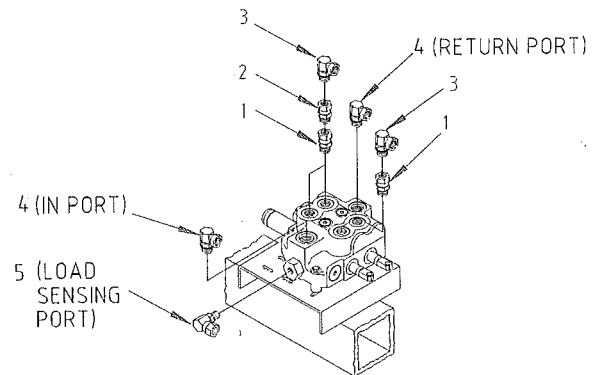


6. INSTALLING "IN" AND "RETURN" PORT FITTINGS - See Fig. 9 and 10

WALVOIL OPEN AND CLOSED CENTER VALVE - Fig. 9. Install one (1) 3/4" - 16 male O.R.B. x 1/2" N.P.T. female x 90 degree swivel street elbow, arrow 4, in "IN" port and "RETURN" ports of valve.

WALVOIL LOAD SENSING VALVE - Fig. 10. Install one (1) 1-1/16 - 12 male O.R.B. x 1/2" N.P.T. female x 90 degree swivel street elbow, arrow 4, in "IN" port and "RETURN" ports of valve. Then install one (1) 9/16" O.R.B. male x 1/4" N.P.T. female x 90 degree street elbow, arrow 5, in "LOAD SENSING" port.

Fig. 10 WALVOIL L/S VALVE (2 SPOOL)



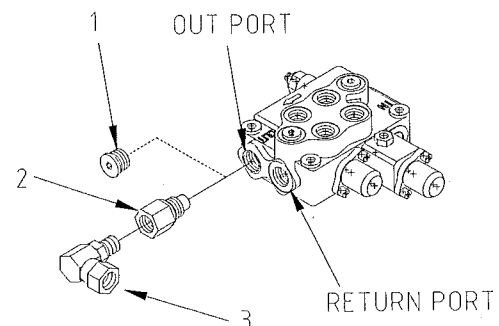
7. INSTALLING POWER BEYOND PORT (WALVOIL VALVES ONLY) - See Fig. 11.

Remove plug, arrow 1, from "OUT" port, next install the Power Beyond Port, arrow 2, in the "OUT" port.

NOTE: Power beyond port may have been installed at factory.

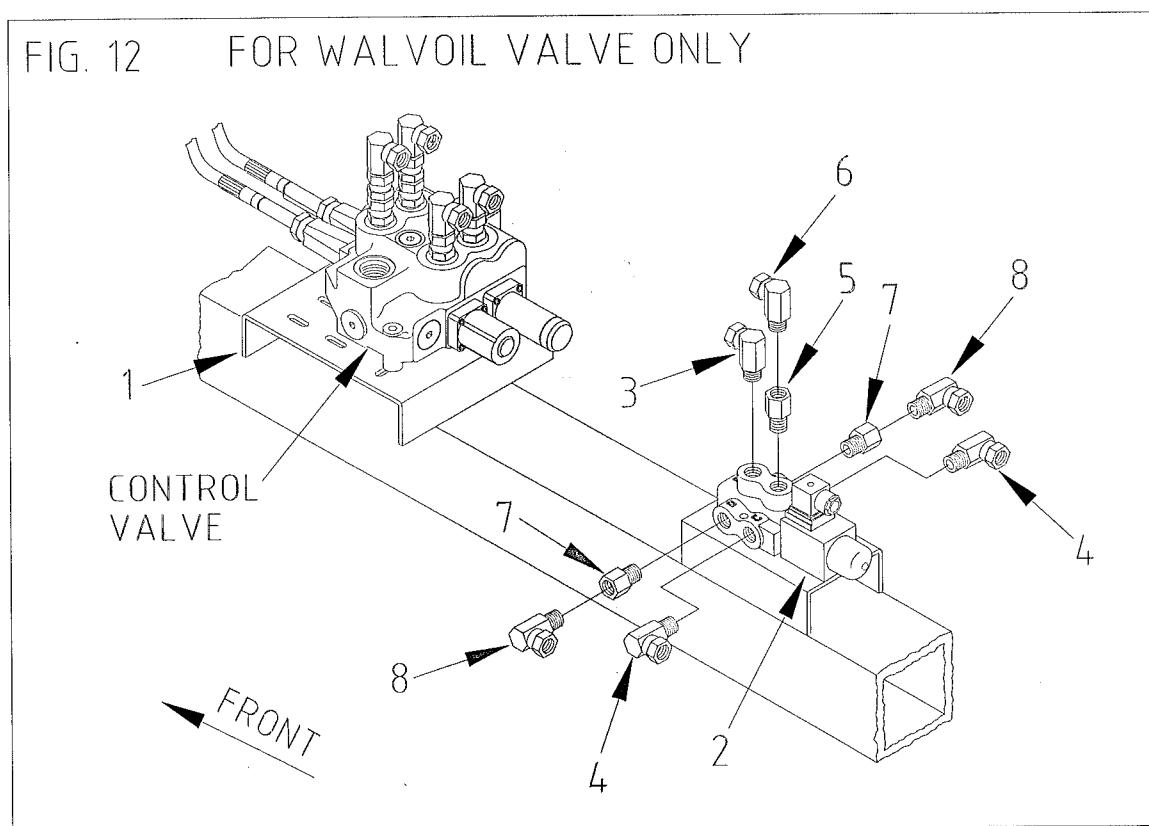
Install one (1) 3/4" - 16 male O.R.B. x 1/2" N.P.T. female x 90 degree swivel elbow, arrow 3, in power beyond port.

Fig. 11 WALVOIL (2 SPOOL)



8. **MOUNTING SOLENOID DIVERTER VALVE** - Supplied for 3 Function Systems Only - See Fig. 13

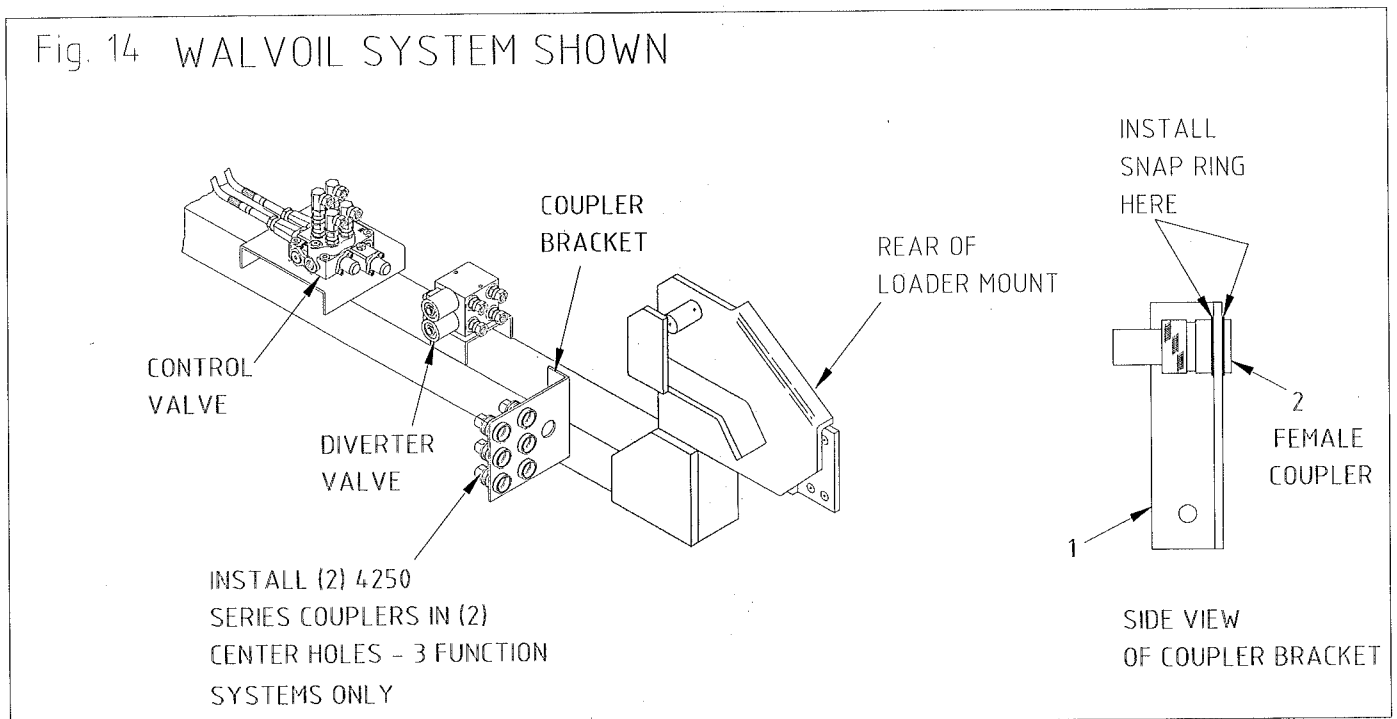
- a) Locate solenoid mount bracket, arrow 1, approximately 18" ahead of control valve. Bracket maybe welded to loader mounts. If bracket must be bolted to tractor, fabricate attaching lug(s) as required and weld them to solenoid bracket.
- b) Bolt solenoid diverter valve, arrow 2, to valve bracket with two (2) 5/16" x 2-1/2" HIC. hex bolts c/w nuts and lockwasher. As shown in Fig. 17.
- c) Install one (1) 7/8" O.R.B. male x 1/2" N.P.T. female x 90 degree swivel elbow, arrow 3, in top front port of diverter valve, arrow 2.
- d) Install two (2) 7/8" O.R.B. male x 1/2" N.P.T. female x 90 degree swivel street elbow, arrow 4, into the rear side ports of diverter valve, arrow 2.
- e) Install one (1) 7/8" O.R.B. male x 1/2" N.P.T. female swivel adapter, arrow 5, in top rear port of diverter valve, arrow 2. Then install one (1) 1/2" x 90 degree swivel street elbow, arrow 6, in swivel adapter, arrow 5.
- f) Install two (2) 7/8" O.R.B. male x 1/2" N.P.T. female swivel adapter, arrow 7, in front side ports of diverter valve, arrow 2. Then install one (1) 1/2" x 90 degree swivel street elbow, arrow 8, in swivel adapter, arrow 7.



10. **MOUNTING HYDRAULIC QUICK COUPLER** - See Fig. 14 (For Walvoil Open Center, Closed Center and Power Beyond Valve)

NOTE: 3 Function Systems are supplied with two (2) 4250 Series Couplers which do not couple under pressure. Use these for the function which operates the grapple fork. This coupler is shorter than the 8200 Series Coupler.

- a) Locate quick coupler bracket, arrow 1, ahead of control valve and diverter valve (if supplied). Bolt to loader mount bracket or tractor frame (if bolted to loader mount bracket, holes must be drilled in mount). Bracket should be in an unobstructed location to allow quick and easy hose connection. Bracket should be located to the rear and beneath loader yoke. (**Note: Loader yoke is the frame which slides onto mount brackets**).
- b) Install female ½ of quick couplers, arrow 2, in mount bracket. Two function system requires four (4) couplers, three function system requires six (6) couplers. For three function systems install the two (2) 4250 Series Couplers in the two center holes. Install each female coupler in a hole of bracket then lock each coupler to bracket by installing a snap ring on both the front side and back side of coupler as shown in the side view.



11. CONNECTING HYDRAULIC HOSES - VALVE(S) TO QUICK COUPLERS

NOTE: Before connecting hoses to quick couplers, install color coded bands on hoses. See Section 14 on page 9.

a) TWO FUNCTION HYDRAULIC SYSTEM (Hoses Not Supplied)

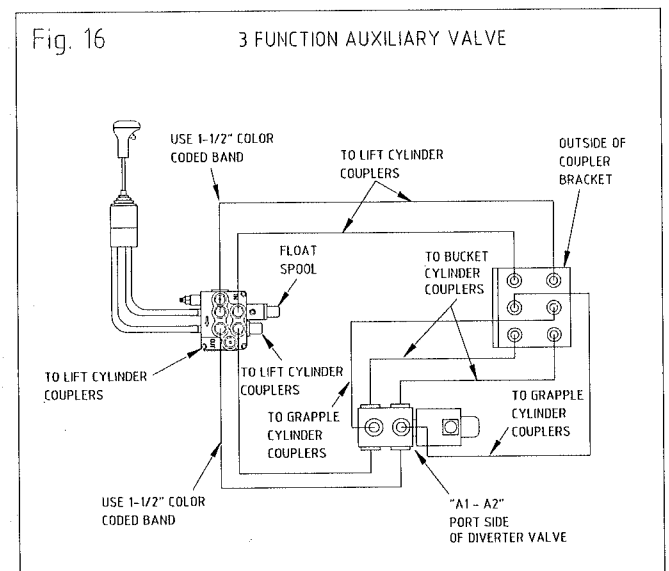
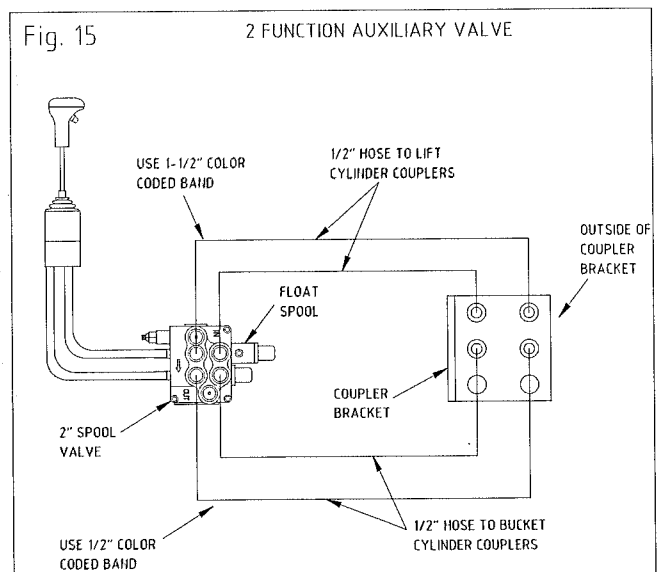
Connect one (1) 1/2" hose between each spool port of two spool control valve and quick coupler. Connect float spool hoses to lift cylinder couplers only. See Fig. 15.

b) THREE FUNCTION HYDRAULIC SYSTEM - For Walvoil Load Sensing Control Valve Only (Hoses Not Supplied) - See Fig. 16.

Connect one (1) 1/2" hose between each port of "float" spool of two spool control valve and one (1) set of quick couplers for lift cylinders only.

Connect one (1) 1/2" hose between each port of "non-float" spool of two spool control valve and the two "IN" ports. The two "IN" ports are marked A1 and A2 and are located on the R.H.S. of diverter.

Connect one (1) 1/2" hose between the four "OUT" ports of the diverter valve and quick coupler. The two "OUT" ports marked B1 and B2 are located on the L.H.S. of diverter. Run hoses from these two ports and run to couplers for bucket cylinders. The other two out ports are located on the top side of diverter. Run hoses from these two ports to couplers for grapple cylinders. See Fig. 16.

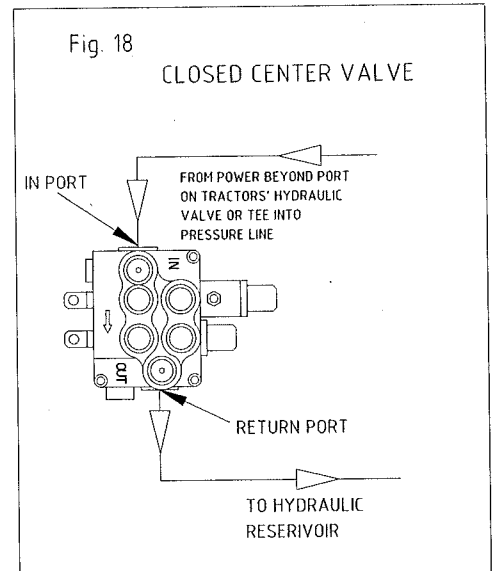


12. CONNECTING TWO SPOOL CONTROL VALVE TO TRACTOR HYDRAULIC SYSTEM

- a) OPEN CENTER SYSTEM - Fig. 18. (Walvoil Shown) (Hoses Not Supplied)

Connect a 1/2" hose between "IN" port of two spool control valve and power beyond port of tractor hydraulic systems.

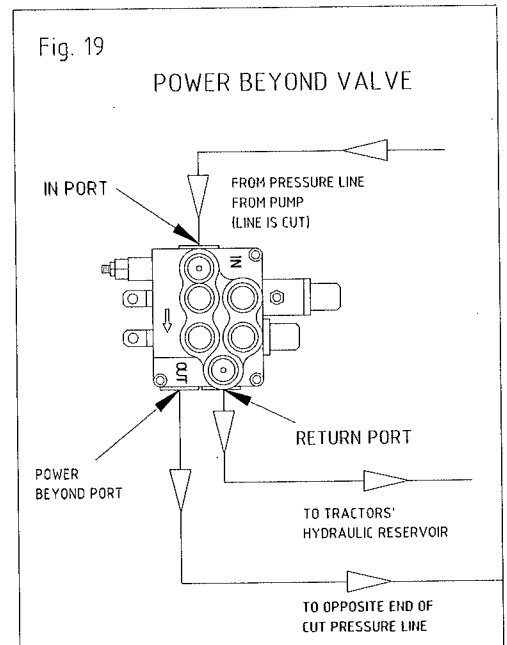
Connect a 1/2" hose between "RETURN" port of two spool control valve and hydraulic reservoir of tractor hydraulic system.



- b) CLOSED CENTER SYSTEM - Fig. 19 (Walvoil Shown) (Hoses Not Supplied)

Connect a 1/2" hose between "IN" port of two spool control valve and pressure source of tractor hydraulic system. The pressure source can be obtained by teeing into pressure line from hydraulic pump or from a power beyond port on tractor hydraulic system.

Connect a 1/2" hose between "RETURN" port of two spool control valve and tractors' hydraulic reservoir.

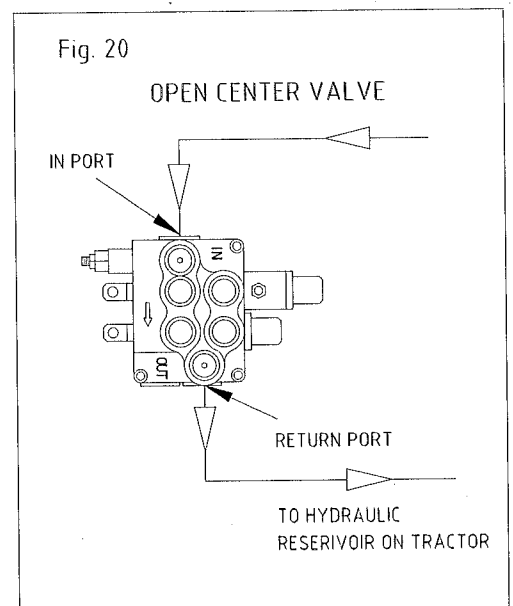


- c) OPEN CENTER SYSTEM WITH POWER BEYOND - Fig. 20 (Walvoil Shown) (Hoses Not Supplied)

Connect a 1/2" hose between "IN" port of two spool valve and pressure line from pump. (Pressure line is cut, diverting oil flow to auxiliary valve).

Connect a 1/2" hose between "Power Beyond Port" of 2 spool control valve and opposite end of pressure line. (Oil flow returns to pressure line)

Connect a 1/2" hose between "RETURN PORT" of two spool control valve and hydraulic reservoir of tractor hydraulic system.



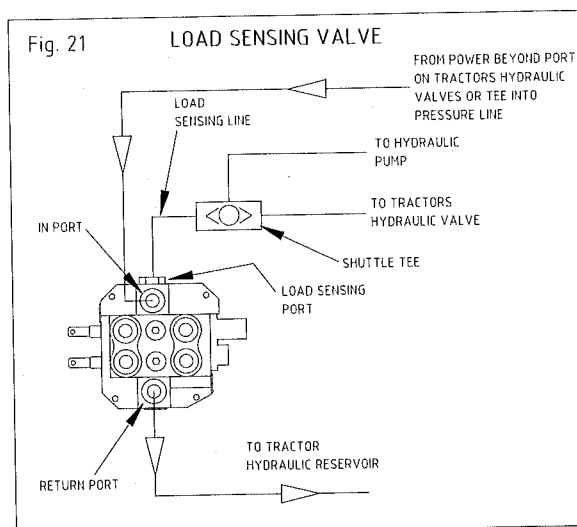
d) **PRESSURE COMPENSATED LOAD SENSING SYSTEMS - Fig. 21 (Hoses Not Supplied)**

Connect a 1/2" hose between "IN" port of two spool valve and pressure source of tractor hydraulic system. The pressure source can be obtained by teeing into pressure line from hydraulic pump or from a power beyond port on tractor hydraulic system.

Connect a 1/2" hose between "RETURN" (out) port of two spool valve and hydraulic reservoir of tractor hydraulic system.

Connect a 1/4" hose between "LOAD SENSING" port of a two spool valve and load sensing oil line of tractor hydraulic system.

Connect load sensing hose to tractors' load sensing line with a shuttle tee. Fig. 18 shows proper position of shuttle tee.



13. Connect one (1) 1/2" x 12' hose to each oil line at rear of loader. Next fasten one male coupler tip to each 1/2" x 12' hose. See Fig. 14 on page 9.

NOTE: Before connecting hoses from loader to quick couplers. Install color code bands on hoses. See Section 14 on page 9.

Before connecting hoses from loader to quick couplers, check hose color code. Each color identifies a function. Hoses with short bands must be matched with short band hoses with same color on opposite side of coupler bracket. Hoses with long bands must also match. Hoses with short bands should be connected to the oil lines on loader that supply oil to extend cylinders. Be sure the top set of couplers from float spool are used for lift cylinders.

14. **COUPLER DUST CAP INSTALLATION AND HOSE COLOR CODING - See Fig. 22**

- a) Two (2) 1-1/2" and two (2) 3" bands of same color are supplied for hoses for each function. Each function uses a different color.

Install a band of same color and length on hoses that run from coupler to loader and coupler to valve.

Install 1-1/2" bands on hoses that run to outer couplers only.

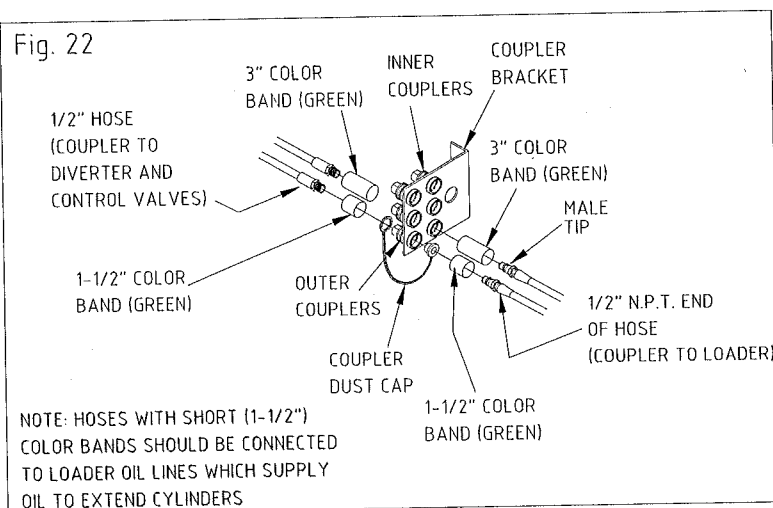
Install 3" band on hoses that run to inner couplers.

After each band is placed over hoses, heat band then allow to cool. The band will shrink around hose.

NOTE: For hoses that run from couplers to loader, be sure color band is installed on end with 1/2" N.P.T.

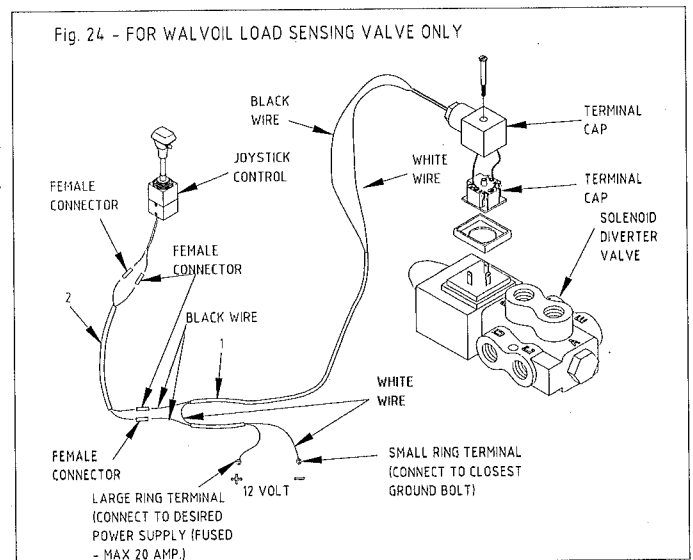
- b) Before installing hoses from couplers to diverter and control valves, install ring end of coupler dust cap over threaded end of coupler.

Fig. 22



16. **WIRING SOLENOID DIVERTER VALVE** - (3 Function Hydraulic System Only) - See Fig. 24

- a) Using ring terminals, connect one (1) end of 16-2 SJ wire, arrow 1, to power supply, cut a length of wire as required. Use one small and one large ring terminal as shown below. Thread opposite ends of wire, arrow 1, through terminal cap and fasten to two terminals on terminal block on solenoid diverter valve. Attach wires as shown.
- b) Connect a length of 16-2 SJ wire, arrow 2, to lead wires coming from joystick control with two (2) female connectors. Run opposite end of same wire up to wire, arrow 1, that runs between power supply and diverter valve. Cut as required.
- c) Remove insulation from a 2" long section of wire, arrow 1, that runs between power supply and solenoid diverter valve. Cut the black wire and connect both ends to wire, arrow 2, which runs from joystick control. Connect with two (2) female connections.
- d) Plug in terminal block to diverter valve. Install terminal cap over terminal block and secure with screw.

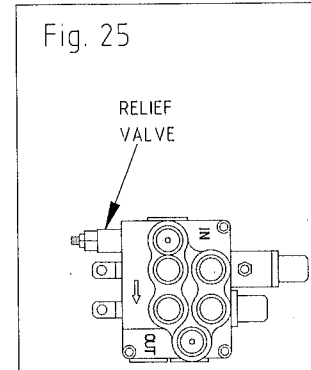


ADJUSTMENTS

1. ADJUSTING CONTROL CABLES - See Fig. 7 or 8

Adjust joystick handle so it is centered on joystick base. This is done by turning the cable connectors, arrow 2, (on valve) "IN" or "OUT". After cable adjustments are complete tighten flange bolts for each cable connector and lock each cable to connector by tightening jam nut, arrow 5, against end of connector.

2. See Fig. 25. The Walvoil open center or open center power beyond valve has an adjustable relief valve. If hydraulic pressure coming out of valve is less than the pressure of tractors' hydraulic system, the pressure can be increased by turning screw on relief valve "IN". Turn screw $\frac{1}{2}$ turn and take a pressure test. If more pressure is required screw "IN" another $\frac{1}{2}$ turn. Continue this process until desired pressure is obtained.



OPERATIONS

1. JOYSTICK OPERATION - See Fig. 26

a) TWO FUNCTION SYSTEM

Move joystick forward to raise loader. Pull joystick back to lower loader.

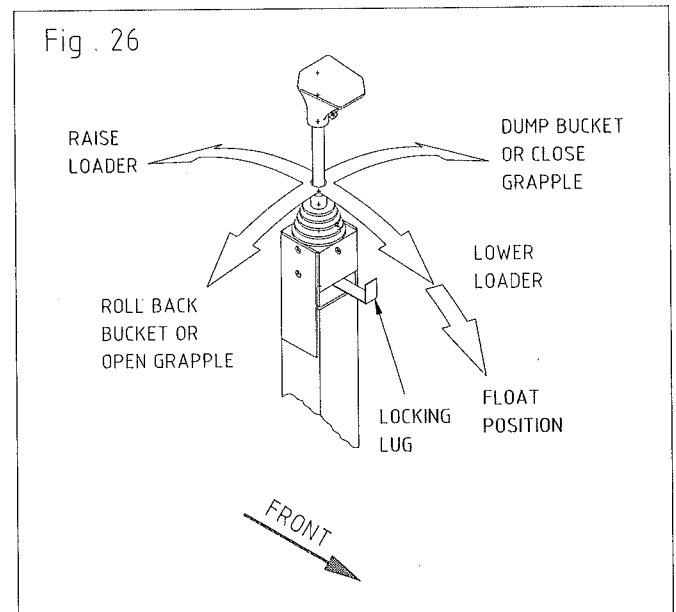
Move joystick towards L.H.S. to dump bucket. Move joystick towards R.H.S. to roll back bucket.

NOTE: Push button not used for two function operation.

b) THREE FUNCTION SYSTEM - See Fig. 26

Bucket and lift operation same as two function system. To operate bucket, button is not depressed, (normally off position).

To operator grapple depress button to "IN" position and move joystick from side to side to operate grapple.



CAUTION: ACTIVATE FLOAT ONLY WHEN LOADER IS IN DOWN POSITION. LOADER WILL DROP WHEN VALVE IS PLACED IN FLOAT POSITION.

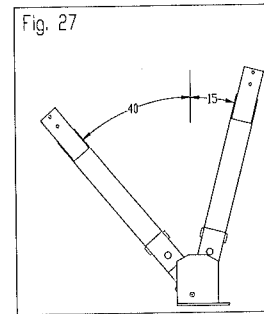
IMPORTANT: LOADER TO COUPLER HOSES MUST BE CONNECTED PROPERLY FOR JOYSTICK TO OPERATE AS DESCRIBED ABOVE. IF HOSES ARE CROSSED OR CONNECTED TO A DIFFERENT SET OF COUPLERS, JOYSTICK WILL OPERATE LOADER DIFFERENTLY.

IMPORTANT: SEE FIG. 26. IF JOYSTICK IS NOT BEING USED WHILE OPERATING TRACTOR, JOYSTICK HANDLE SHOULD BE LOCKED IN NEUTRAL POSITION. TO LOCK CONTROL PUSH LOCKING LUG "IN". LOCKING THE JOYSTICK CONTROL WILL PREVENT OPERATOR FROM ACCIDENTALLY MOVING JOYSTICK CAUSING LOADER OR BUCKET TO DROP.

OPERATIONS CONTINUED:

2. **FLOOR MOUNT PEDESTAL** - See Fig. 27

When operating loader, pedestal can be tilted towards operator up to 40 degrees. To exit R.H. cab door pedestal can be moved to forward position up to 15 degrees past vertical. To adjust, loosen clamp level and move pedestal as required, tighten clamp lever when pedestal is in desired position.



3. **FLOAT POSITION** - See Fig. 26. All valve types have a float spool. This spool must be connected to lift cylinders. To place loader in "FLOAT" position push joystick control forward until lever locks into float position.



CAUTION: **ACTIVATE FLOAT ONLY WHEN LOADER IS IN DOWN POSITION. LOADER WILL DROP WHEN VALVE IS PLACED IN FLOAT POSITION.**

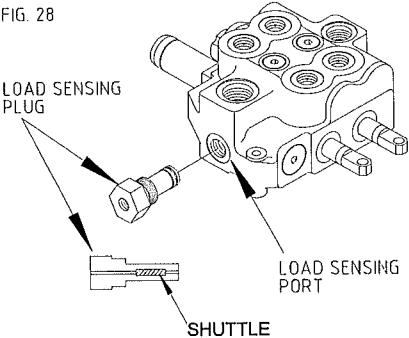
4. **CONNECTING HOSES FROM LOADER TO QUICK COUPLERS**

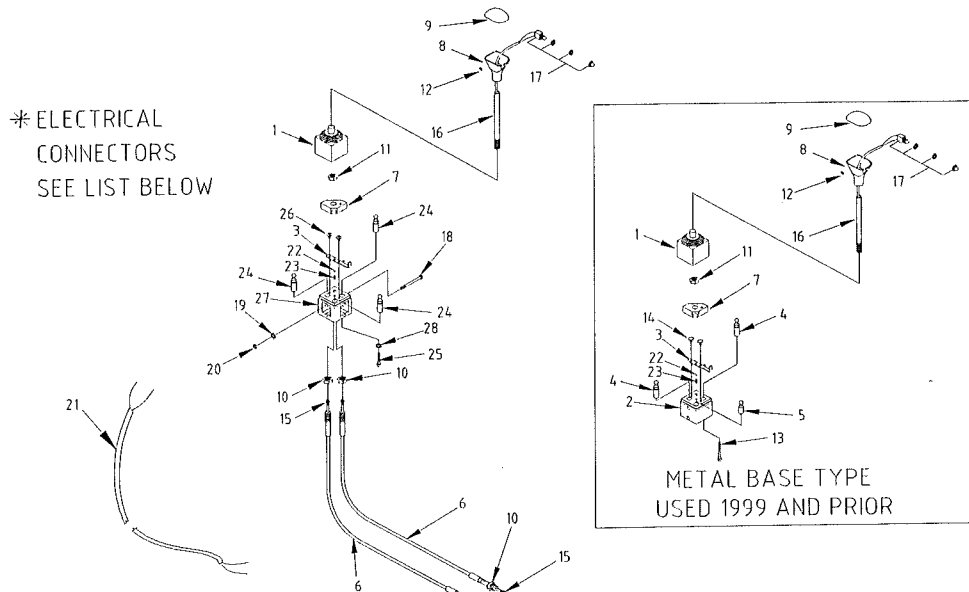
Hoses from valves to couplers and couplers to loader are color coded with short and long color bands. The color and length of band must be matched. For example, a loader hose with a short green band must be connected to the coupler with hose that has a short green band.

IMPORTANT: LOADER TO COUPLER HOSES MUST BE CONNECTED PROPERLY FOR JOYSTICK TO OPERATE AS SHOWN IN FIG. 26. IF HOSES ARE CROSSED OR CONNECTED TO A DIFFERENT SET OF COUPLERS, JOYSTICK WILL OPERATE LOADER DIFFERENTLY.

5. When loader has been removed from tractor be sure to install dust caps in quick couplers. See Fig. 22.

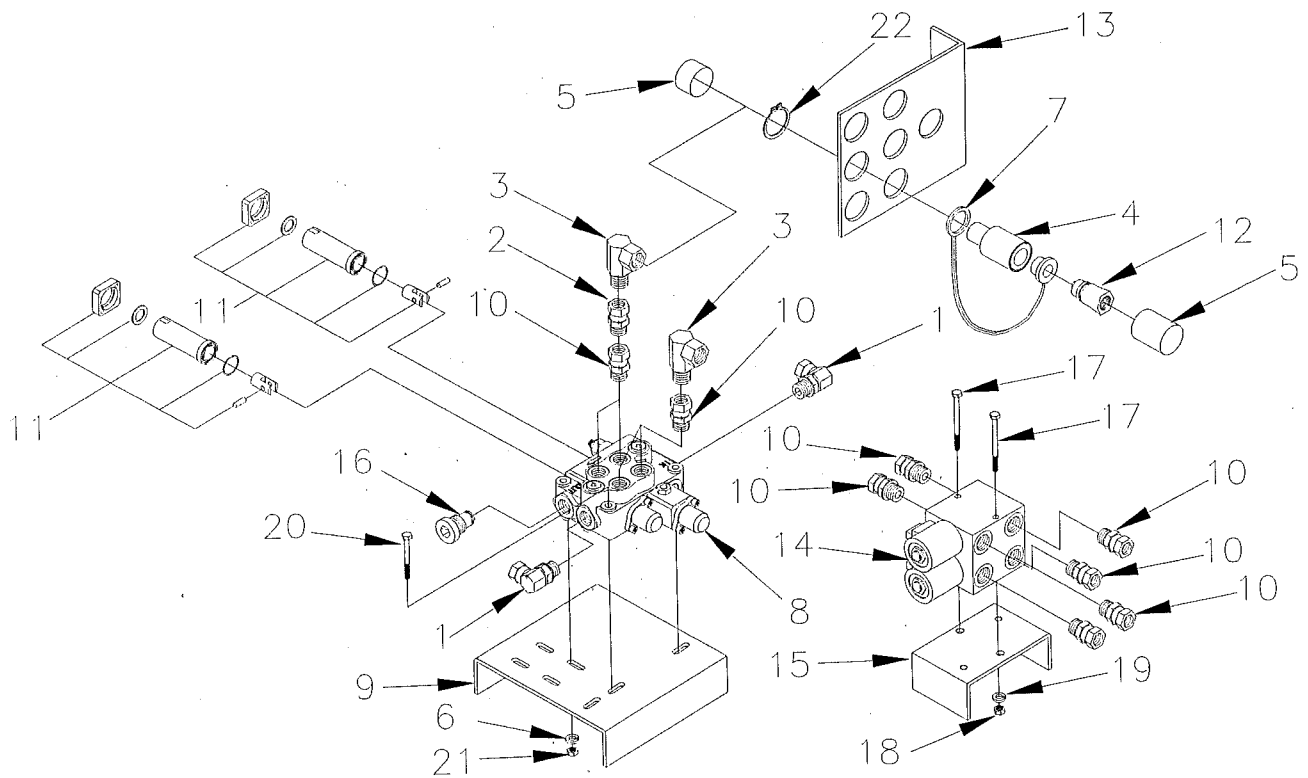
TROUBLE SHOOTING

PROBLEM	CAUSE AND REMEDY
Joystick control will not move	- Release control locking lug - See Fig. 26
Joystick control will not move freely	- Sharp bends in control cable. Route cables differently
Joystick control will not fully activate valve spool	- Joystick control not centered properly. See Adjustments.
Open Center Valve Only - hydraulic pressure coming out of valve is less than pressure going into valve	- Increase hydraulic pressure by increasing relief valve pressure - See Fig. 25.
Load Sensing Valve Only - loader will not operate at high pressure high volume when joystick control is moved - Load Sensing Valve Only - tractor's high pressure pump will not shut down when valve is in neutral position.	- Shuttle tee is not installed properly or is not installed at all, install as shown in Fig. 22. - O-Ring mounted on inner end of load sensing plug may be damaged causing a loss of oil pressure. See Fig. 28. - Shuttle inside load sensing plug is stuck in "IN" position and not allowing oil to go into the load sensing line. - Bleed off orifice in shuttle (inside load sensing plug) is plugged, not allowing oil pressure to drop in load sensing line. - Shuttle inside load sensing plug is stuck in "OUT" position which allows high pressure oil to come into load sensing line preventing pump from shutting down. FIG. 28 
Can not keep bolt tight that secures anchor lug (see Fig. 1) to base of double joystick control.	- 6mm x 55mm Allen head cap screw used to fasten anchor lug is missing special locking washer.
Three Function System Only - when button on joystick is pushed, function does not shift to grapple	- Joystick control is not wired properly - See Fig. 23 and 24. - Poor electrical connections at one of the terminals, tighten terminals
Open Center Control - valve leaks on front spools	- Control valve is connected to tractors' hydraulic system between hydraulic pump another control such as tractors' control valves. (The open center valve is feeding oil to another function causing back pressure in valve). - Convert open center valve to open center power beyond valve. See Fig. 11 and Fig. 20.



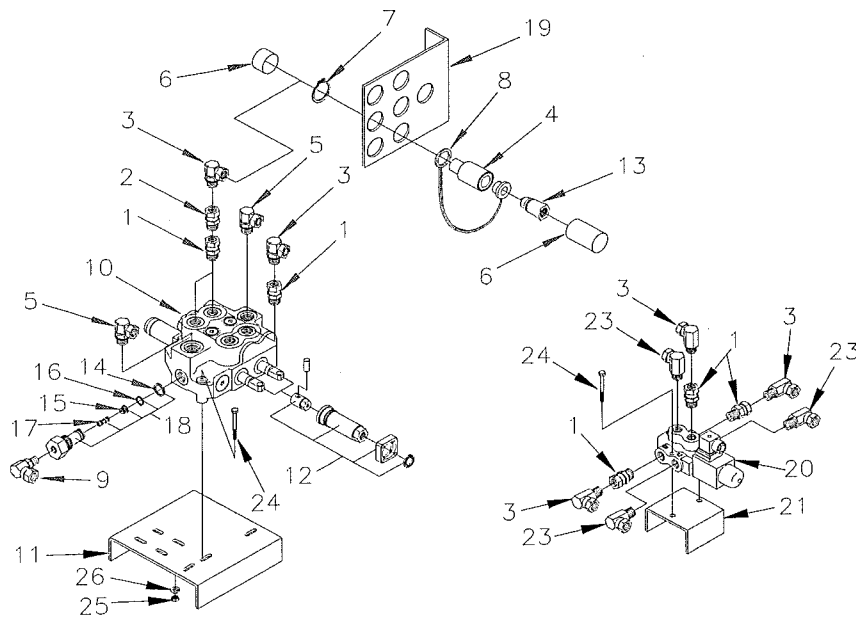
**WALVOIL JOYSTICK DOUBLE CONTROL ASSEMBLY
(HYDRA-ELECTRICAL)**

REF. NO.	PART NO.	DESCRIPTION	QTY. REQ'D
1	L3728	Rubber Cover - Double Control	1
2	L3786	Base - Double Control (Metric Type)	1
3	L3787	Locking Lug - Double Control	1
4	L3744	Cable Lug - Double Control w/Metal Base	2
5	L3745	Anchor Pivot Post - Double Control w/Metal Base	1
6	LB3691	Cable - 1-1/2 meter c/w nuts	2
	LB3693	Cable - 2 meter c/w nuts	2
7	L3756	Handle Base (Fulcrum) - Double Control	1
8	L3790	Knob - For Hydra-Electrical Double Control Only	1
9	L3792	Knob Cover - for Hydra-Electrical Double Control Only	1
10	L3779	16mm (1.5) Jam Nut - Cable	4
11	L3778	14mm (.15) Jam Nut	1
12	L3793	3/32" - 32 U.N.C. Allen Head Cap Screw	1
13	L3727	6mm (1.0) x 55mm Set Screw	1
14	L3769	3/16" x 5/16" Bolts (Special)	2
15	L3805	6mm (1.0) Hex Nut	6
16	L3776	Handle - For Hydra-Electric Double Control Only	1
17	LB3806	Push Button Assembly	1
18	--	1/4" N.C. x 3-1/4" N.C. Hex Bolt (Plated)	2
19	--	1/4" Lockwasher (Plated)	2
20	--	1/4" N.C. Hex Nut (Plated)	2
21	L3717	Wire - 2/16-SJ - (21') Walvoil Electric Joystick Control	1
*	L3718	Insulated Ring Terminal Walvoil	--
*	L3719	Insulated Connector - Female Walvoil	--
*	L3720	16 GA. Wire Splicer Connector Walvoil	--
22	L3742	Ball For Locking Lug - Double Control	1
23	L3743	Spring For Locking Lug - Double Control	1
24	L3652	Cable Lugs & Anchor Lugs- Double Control (New Plastic Type)	3
25	L3682	6mm (1.0) x 20mm Allen Head Cap Screw	1
26	L3653	3/16" x 5/16" Bolt (Not Special)	2
27	L3684	Base - Double Control (New Plastic Type)	1
28	L4060	6mm I.D. Schnorr Washer (Serrated)	1



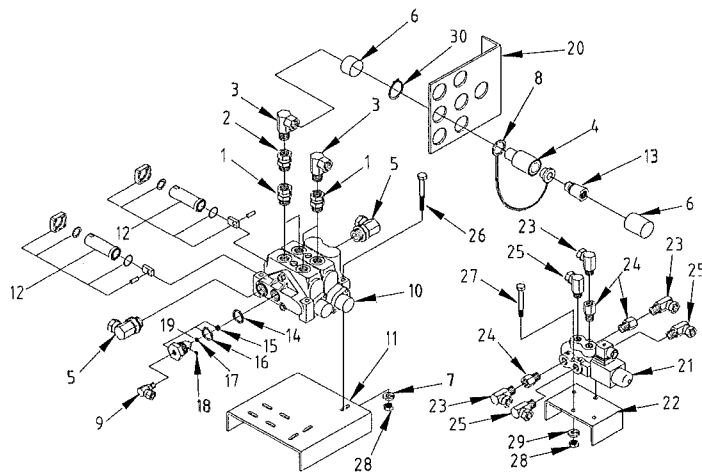
**WALVOIL 2 SPOOL O/C OR C/C VALVE AND SOLENOID VALVE
(HYDRA-ELCTRICAL)**

REF. NO.	PART NO.	DESCRIPTION	QTY. REQ'D
1	L3767	3/4" - 16 O.R.B. Male x 1/2" N.P.T. FEMALE x 90 DEGREE SWIVEL STREET ELBOW	2
2	DC27	1/2" N.P.T. MALE x 1/2" N.P.T. FEMALE SWIVEL ADAPTER	2
3	DL9777	1/2" N.P.T. x 90 DEGREE SWIVEL STREET ELBOW	4
4	L4036	8250 QUICK COUPLER - Female Half	6
5	LB3721	HOSE IDENTIFICATION KIT (Green and Yellow) - 4 Hoses	1
	LB3760	HOSE IDENTIFICATION KIT (White) - 2 Hoses	1
6	--	5/16" LOCKWASHERS	3
7	L3750	DUST CAP	6
8	LB3702	WALVOIL CONTROL VALVE - 2 Spool Open Center	1
	LB3704	WALVOIL CONTROL VALVE - 2 Spool Closed Center	1
9	L3694	VALVE MOUNT BRACKET	1
10	L4043	3/4"-16 MALE O.R.B. x 1/2" N.P.T. FEMALE SWIVEL ADAPTER	8
11	LB3697	CABLE CONNECTOR KIT (Walvoil)	2
12	L397	8250 MALE TIP - Hydraulic Coupler	6
13	L3696	COUPLER BRACKET	1
14	LB3705	SOLENOID DIVERTER VALVE - Aluminum Type	1
15	L3695	DIVERTER VALVE MOUNT BRACKET	1
16	L3712	POWER BEYOND PLUG	1
17	--	1/4" x 4" N.C. HEX BOLT	2
18	--	1/4" N.C. HEX NUT	2
19	--	1/4" LOCKWASHER	2
20	--	5/16" x 2-3/4" N.C. HEX BOLT	3
21	--	5/16" N.C. HEX NUT	3
22	L3716	SNAP RING	12
***	LB3727	SEAL KIT - Walvoil Control Valve - 2 Spool	--



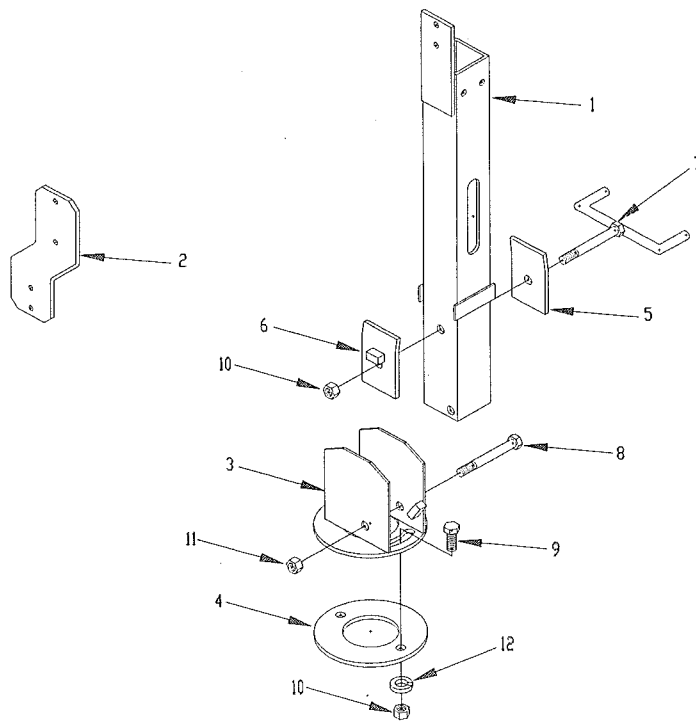
WALVOIL 2 SPOOL LOAD SENSING VALVE AND SOLENOID VALVE (HYDRA-ELECTRICAL)
USED JULY/2000 AND LATER

REF. NO.	PART NO.	DESCRIPTION	QTY. REQ'D	
			2 SPOOL	3 SPOOL
1	L3730	7/8" - 14 Male x 1/2" N.P.T. Female Swivel Adapter	7	9
2	DC27	1/2" N.P.T. Male x 1/2" N.P.T. Female Swivel Adapter	2	3
3	DL9775	1/2" N.P.T. x 90 Degree Swivel Street Elbow	4	6
4	L4036	8250 Quick Coupler - Female Half	4	6
5	L3739	1-1/16" - 12 O.R.B. Male x 1/2" N.P.T. Female x 90 Degree Swivel Adapter	2	2
6	LB3721	Hose Identification Kit - (Green and Yellow) - 4 Hoses	1	1
	LB3760	Hose Identification Kit - (White) - 2 Hoses	2	2
	L4061	Hose Identification Sleeve - Green 3" Long	2	2
	L4062	Hose Identification Sleeve - Yellow 3" Long	--	2
	L4066	Hose Identification Sleeve - White 3" Long	2	2
	L4063	Hose Identification Sleeve - Green 1-1/2" Long	2	2
	L4064	Hose Identification Sleeve - Yellow 1-1/2" Long	--	2
	L4065	Hose Identification Sleeve - White 1-1/2" Long	--	1
7	LB3716	Snap Ring	8	12
8	L3750	Dust Cap	4	6
9	L3600	9/16" Male O.R.B. x 1/4" N.P.T. Female x 90 Degree Swivel Street Elbow	1	1
10	LB3601	Walvoil L/S Control Valve - 2 Spool	1	--
	LB3602	Walvoil L/S Control Valve - 3 Spool	--	1
11	L3694	Valve Bracket	1	1
12	LB3603	Cable Connector Kit #TQ80 (Walvoil)	2	3
13	L397	8250 Male Tip - Hydraulic Coupler	2	3
14	L3604	Outer O-Ring (Large)	1	1
15	L3606	Threaded End Cap - Socket	1	1
16	L3605	Outer O-Ring (Small)	1	1
17	L3619	Shuttle Valve	1	1
18	L3629	Load Sensing Port	1	1
19	L3696	Coupler Bracket	1	1
20	LB3681	Solenoid Diverter Valve (Walvoil)	1	1
21	L3695	Diverter Valve Bracket	1	1
23	L4042	7/8" O.R.B. Male x 1/2" N.P.T. Female x 90 Degree Swivel Street Elbow	3	3
24		5/16" x 2-1/2" N.C. Hex Bolt	5	5
25		5/16" N.C. Hex Nut	5	5
26		5/16" Lockwashers	5	5
***	L4006	Seal Kit - Walvoil L/S Control Valve - 2 Spool	--	
***	L4008	Seal Kit - Walvoil L/S Control Valve - 2 Spool		--



**GRESEN 2 SPOOL LOAD SENSING VALVE AND SOLENOID VALVE (HYDRA-ELECTRICAL)
USED PRIOR TO JULY/2000**

REF. NO.	PART NO.	DESCRIPTION	QTY. REQ'D
1	L3730	7/8" - 14 Male x 1/2" N.P.T. Female Swivel Adapter	7
2	DC27	1/2" N.P.T. Male x 1/2" N.P.T. Female Swivel Adapter	2
3	DL9775	1/2" N.P.T. x 90 Degree Swivel Street Elbow	7
4	L4036	8250 Quick Coupler - Female Half	6
5	L3739	1-1/16" - 12 O.R.B. Male x 1/2" N.P.T. Female x 90 Degree Swivel Adapter	2
6	LB3721	Hose Identification Kit - (Green and Yellow) - 4 Hoses	1
	LB3760	Hose Identification Kit - (White) - 2 Hoses	1
	L4061	Hose Identification Sleeve - Green 3" Long	2
	L4062	Hose Identification Sleeve - Yellow 3" Long	2
	L4066	Hose Identification Sleeve - White 3" Long	--
	L4063	Hose Identification Sleeve - Green 1-1/2" Long	2
	L4064	Hose Identification Sleeve - Yellow 1-1/2" Long	2
	L4065	Hose Identification Sleeve - White 1-1/2" Long	--
7	--	5/16" Lockwashers	3
8	L3750	Dust Cap	6
9	L3775	7/16" -20 Male O.R.B. x 1/4" N.P.T. Female x 90 Degree Swivel Street Elbow	1
10	LB2689	Gresen Control Valve - 2 Spool	1
11	L3694	Valve Bracket	1
12	LB3701	Cable Connector Kit - #TC/GK (Gresen)	2
13	L397	8250 Male Tip - Hydraulic Coupler	6
14	L4037	11/16" I.D. x 7/8" O.D. x 3/32" Inner O-Ring Seal	1
15	L4038	Threaded End Cap - Socket	1
16	L4039	7/8" I.D. x 1-1/8" O.D. x 1/8" Outer O-Ring Seal	1
17	L4040	Back Up Washer	1
18	L3689	Bleed Off Screw	1
19	L3662	Load Sensing Port Assembly c/w Item 18	1
20	L3696	Coupler Bracket	1
21	LB3681	Solenoid Diverter Valve (Walvoil) - For Valves Sold 1999 and Prior, Order New Valve Bracket #L3695	1
22	L3695	Diverter Valve Bracket	1
23	L4042	7/8" O.R.B. Male x 1/2" N.P.T. Female x 90 Degree Swivel Elbow	3
24	--	5/16" x 2-3/4" N.C. Hex Bolt	3
25	--	5/16" x 2-1/2" N.C. Hex Bolt - Used 1999 and Prior	2
		1/4" x 3-1/4" N.C. Hex Bolt - Used After 1999	2
26	--	5/16" N.C. Hex Nut - Used 1999 and Prior	5
		1/4" N.C. Hex Nut - Used After 1999	5
27	--	5/16" Lockwashers - Used 1999 and Prior	2
		1/4" Lockwasher - Used After 1999	2
28	LB3716	Snap Ring	12
***	LB3733	Seal Kit - Gresen Control Valve - 2 Spool	--
29	--	Shuttle Tee (Installed on L/S Line on Tractor)	1
30	L3609	Cap - Float Spool	1
31	L4051	Cap - No Float Spool	1



HYDRAULIC MOUNTS (WALVOIL CONTROL)

REF. NO.	PART NO.	DESCRIPTION	QTY. REQ'D
1	LA3804	Pedestal - Floor Mount	1
2	L3798	Fender Mount Bracket - Double Control	1
3	L3800	Base Floor Mount	1
4	L3801	Backing Plate - Floor Mount	1
5	L3802	L.H. Clamp Plate - Floor Mount	1
6	LA3803	R.H. Clamp Plate - Floor Mount	1
7	L3772	Clamp Crank - Floor Mount	1
8	--	1/2" x 3-1/2" N.C. Hex Bolt	1
9	--	1/2" x 1-1/4" N.C. Hex Bolt	1
10	--	1/2" N.C. Hex Nut	2
11	--	1/2" N.C. Hex Nylon Locknut	1
12	--	1/2" Lockwasher	1