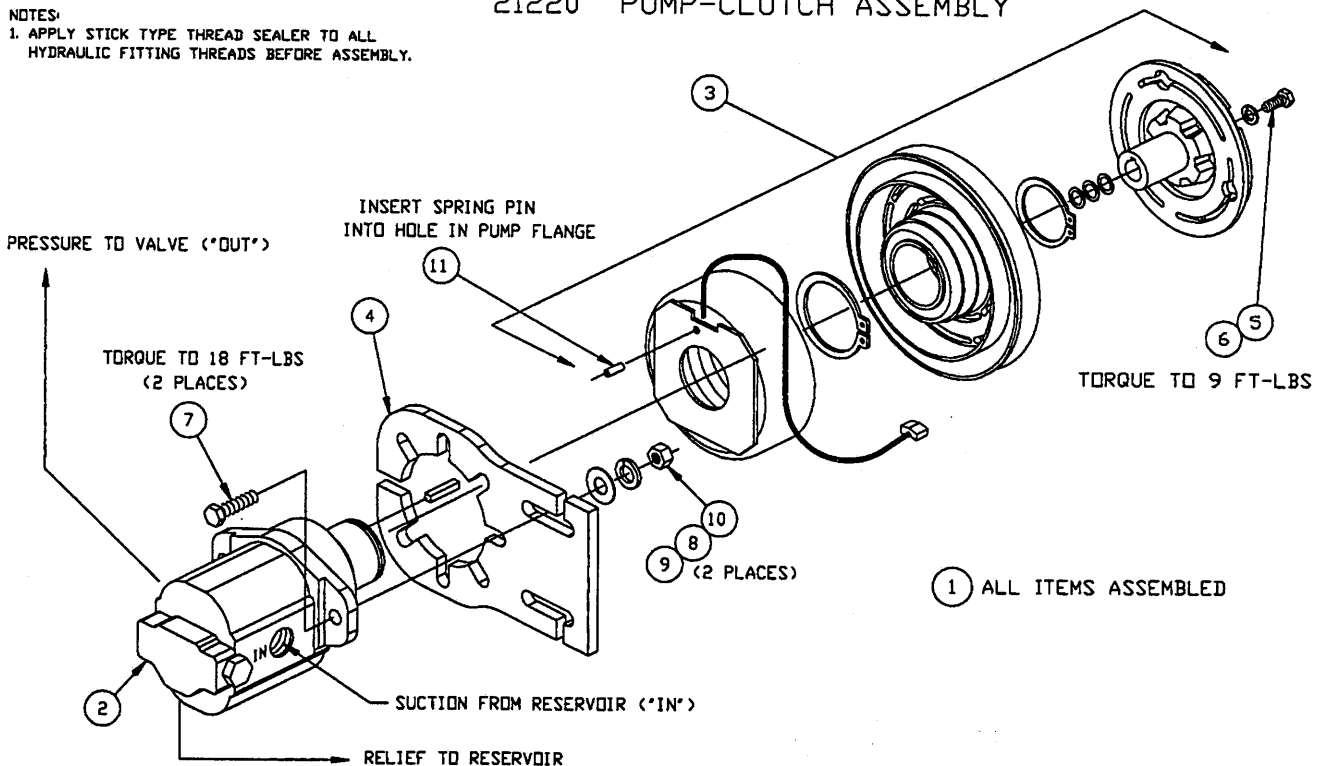


NOTES:

1. APPLY STICK TYPE THREAD SEALER TO ALL HYDRAULIC FITTING THREADS BEFORE ASSEMBLY.

### 21220 PUMP-CLUTCH ASSEMBLY



**Parts List**  
**8840-40B Electric Clutch Common Hydraulic Kit**

Ref #	Assy	Comp	Qty	Part #	Description
	1		1	21220	Pump - Clutch Assembly
		2	1	21221	Pump Assy
		3	1	21222	Electric Clutch
		4	1	21219	Pump Plate
		5	1	90461	1/4 x 3/4 NC Gr 5 Cap Screw
		6	1	90359	1/4 Lock Washer
		7	2	90048	5/16 x 1-1/4 NC Gr 5 Cap Screw
		8	2	90360	5/16 Lock Washer
		9	2	90313	5/16 Plain Washer
		10	2	90332	5/16 Hex Nut (NC)
		11	1	90707	5/32 x 1/2 Spring Pin
12			1	8389	Oil Reservoir
13			1	8843	Valve Assembly - Elec. Clutch - Solenoid
		14	1	7921	Valve Manifold Assy Sol - 4000
		15	1	8851	Valve Bracket
		16	1	8852	Mounting Plate - Valve
		17	2	8849	1/8 Nptm to 1/4 Nptf Swivel Adapter
		18	1	8848	1/8 Nptm to 1/4 Nptf Reducing Adapter
		19	3	90696	1/4 x 3-1/2 (NC) Gr. 5 Cap Screw
		20	3	90359	1/4 Lock Washer
		21	3	90311	1/4 Plain Washer
		22	2	90111	3/8 x 1-1/2 (NC) Gr. 5 Cap Screw
		23	2	90361	3/8 Lock Washer
		24	2	90334	3/8 (NC) Nut
		25	1	3719	O-Ring - 013
		26	2	5827	O-Ring - 012
27			1	7714	Dash Bracket Bag (not shown)
28			1	20116	10" Lift Cylinder Assembly - XL
29			2	20117	12" Angle Cylinder Assembly - XL
30			1	8764	Filter Kit (not shown)
31			1	20040	Control Harness - clutch & sol. valve
32			1	8292	Solenoid Control
33			1	21295	Bolt Bag for 8840-40B
		34	2	6814	Clevis Pin - 1 OD x 3-5/16
		35	4	6816	Anchor Pin - 1 OD x 4
		36	1	21296	Bolt Bag - Part of 21295
		37	6	90601	1/4 x 1-1/2 Cotter Pin
		38	2	21270	3/4-16 O-ring to 3/8 NPT Swivel Elbow
		39	1	5804	1/4" Hex Male Pipe Nipple
		40	1	2318	1/4 NPT x 90° Union Elbow
		41	1	8850	Quill - 1/4 NPTF Male to 3/8 ID Hose
		42	2	8391	Quill - 3/8 NPTF Male to 1/2 ID Hose
		43	2	2780	1/4 Npt x 90 degree Street Elbow
		44	3	A1587	Hose Disconnect Assembly
		45	4	1588	Dust Plug - Closure/Male
		46	1	3042	Grommet - Rubber, Split
		47	1	4477	Grommet - Split Hose (not shown)
		48	1	8329K	Dielectric Grease Tube (not shown)
		49	1	4302	3M 560 in-line Connector
		50	1	4303	Female Connector (not shown)
		51	1	5048	Male Connector (not shown)

**Parts List**  
**7537B Electric Clutch Peculiar Hydraulic Kit**

Ref #		Qty	Part #	Description
Assy	Comp			
59		1	2707	26" HP Hose, 1/4P to 3/8P
61		1	5192	60" HP Hose, 1/4P To 1/4P
62		1	3074	22" HP Hose, 1/4P To 1/4P
63		4	4424	36" HP Hose, 1/4P To 1/4P
65		1	8393	1/2" LP Hose - 19"
66		1	1687	3/8" LP Hose - 42"
67		1	20497	3VX-600 Ind Gr. V-Belt (not shown)
68		1	8911	Drive Sheave
69		1	5588	3/16 Fan Spacer (not shown)
70		1	9050	Pump Bracket
71		1	8638	Pump Bracket Brace
73		1	8871	Valve Plate
74		2	5975	Valve Plate Brace
75		1	8205	Valve Plate Brace
77		1	9084	Bolt Bag for 7537B
	78	1	765	1/4 Npt x 90 degree Street Elbow
	79	5	319	1/4 Npt x 90 degree Swivel Adapter Union
	80	1	4486	Bulkhead Adapter
	81	3	4485	7/8" Snap Ring
	82	1	8741	Bracket - Cable Boot
	83	1	8284	Cable Boot
	84	1	8688	QD/Electric Plate (short)
	85	1	8686	2 QD Plate (short)
	86		8914	Grille Bracket (in Pec Att Kit)
	87		8324	Tie Wrap - 3/16 x 14 (not shown) (in Pec Att Kit)
	88	8	3666	Tie Wrap - 3/16 x 8 (not shown)
	89	2	8127	1/4 x 45 degree Street Swivel
	90	1	8476	1/4 NPT x 45 degree Street Elbow
	94	1	8850	Quill - 1/4 Nptf to 3/8 ID Hose
	96	2	90111	3/8 x 1-1/2 (NC) Gr.5 Cap Screw
	97	1	90160	3/8 x 4 -1/2 (NC) Gr.5 Cap Screw
	99	5	90361	3/8 Lock Washer
	100	2	90334	3/8 (NC) Nut
	101	2	90315	3/8 Plain Washer
	102	7	90042	5/16 x 1 (NC) Gr.5 Cap Screw
	103	4	90048	5/16 x 1-1/4 (NC) Gr.5 Cap Screw
	105	14	90360	5/16 Lock Washer
	106	11	90332	5/16 (NC) Nut
	107	6	90313	5/16 Plain Washer
	109	1	90534	3/4 x 4-1/2 (NF) Gr.5 Cap Screw
	110	3	90666	5/16x3-1/2 (NC) Gr.5 Cap Screw
	111	3	90570	3/8 x 5 (NC) Gr.5 Cap Screw
	112		90615	1/4 x 1/2 (NC) Gr.5 Cap Screw (in Pec Att Kit)
	113		90350	1/4 Locknut (in Pec Att Kit)
	114		90461	1/4 x 3/4 (NC) Gr.5 Cap Screw (in Pec Att Kit)
	115		90359	1/4 Lock Washer (in Pec Att Kit)
	116		90330	1/4 Nut (in Pec Att Kit)
	117		90311	1/4 Flat Washer (in Pec Att Kit)

**Note: The 20850 Fish-Stik™/Clutch Relay Kit is required for installations that will use the 9400 Fish-Stik Push Button Hand-Held Control.**

### 1. Cylinder and Cylinder Hose Assembly

- A. Attach the female half of the disconnect (44) and a 1/4" NPT 45° Street Elbow (90) to the 22" HP hose (62). Using a bench vise to hold the Lift Cylinder (28), remove the closure from the Lift Cylinder's hose port and screw the other end of the hose directly into this port. Orient the lift cylinder so that the hose points toward the passenger side of the vehicle and insert it into the ears on the Lift Arm and into the Upper Gear. Secure with clevis pins (34) and cotter pins (37).
- B. Attach a male disconnect half (44) to one end of a 36" HP hose (63). Place a dust cover (45) on the end of the other 36" HP hose (63) and put another male disconnect half (44) on this hose.
- C. Using a bench vise to hold the Angle Cylinders (29), remove the closures from the ports. Screw brass forged street ells (43) into ports. Ells should point forward toward live end of cylinder and slightly upward as they will be installed on the A-Frame. The driver side cylinder uses the 36" HP hose with the dust cover and male disconnect half. The passenger side cylinder uses the 36" HP hose with the male disconnect half and **no dust cover**. Install cylinders to their respective sides so that ells are between the cylinders and A-frame. Secure cylinders with anchor pins (35) and cotter pins (37) at each end.

### 2. Drive Sheave Installation

**Note: Apply a removable loosening prevention compound (such as "Lock-tite") to all drive sheave fasteners prior to installation.**

DIAMETER- THREADS PER INCH	GRADE		
	G2	G5	G8
1/4 - 28	6	10	14
5/16 - 24	12	19	27
3/8 - 24	23	35	50
7/16 - 20	38	55	80
1/2 - 20	55	85	120
9/16 - 18	80	120	170
5/8 - 18	110	170	240
3/4 - 16	200	300	420
7/8 - 14	180	470	670
1 - 12	270	700	980

- A. **For 5.9L V8 only:** Remove fan from water pump and install 3/16" fan spacer (69) and reinstall fan.
- B. Remove and discard 3/4" cap screw and washer from center of crankshaft pulley. Remove and discard every other 5/16" cap screw from inside of crankshaft pulley (total of three cap screws).
- C. Install drive sheave (68) with a 3/4 x 4-1/2" (NF) gr. 5 cap screw (109) through center hole into center of crankshaft pulley. Install three 5/16 x 3-1/2" (NC) gr. 5 cap screws (110) with 5/16 lock washers (105) through remaining holes in drive sheave and crankshaft pulley. Snug up the 3/4 x 4-1/2" cap screw first then snug up the three 5/16 fasteners and torque them to 18 foot pounds. Last, torque the 3/4 x 4-1/2" cap screw to 100 foot pounds on V8 engines.

DIAMETER- THREADS PER INCH	GRADE		
	G2	G5	G8
1/4 - 20	6	9	13
5/16 - 18	11	18	28
3/8 - 16	19	31	46
7/16 - 14	30	50	75
1/2 - 13	45	75	115
9/16 - 12	66	110	165
5/8 - 11	93	150	225
3/4 - 10	150	250	370
7/8 - 9	150	378	591
1 - 8	220	583	893

### 3. Pump Bracket and Pump-Clutch Assembly

- A. Remove the two water pump bolts between the idler tensioner pulley and fan. Remove and discard the bolt beside the lower alternator bolt. Place pump bracket (70) behind serpentine belt and install three 3/8 x 5 (NC) grade 5 cap screws (111) with lock washers (99) and "Locktite" on threads (do not tighten fasteners at this time). Remove lower alternator bolt through relief hole in pump bracket. Discard bolt and save nut. Install a 3/8 x 4-1/2 (NC) grade 5 cap screw (97) through alternator. Place pump bracket brace (71) on bolt and reinstall previously removed nut.
- B. Install a 3/4 o-ring x 3/8 swivel elbow (38) into the inlet and outlet ports on the pump. Install the 1/4 NPT close nipple (39), union elbow (40), and 1/4 NPT x 3/8 quill (41) into the relief port on the pump. Position the fitting as shown in the illustration on page 1.
- C. Place pump-clutch assembly (1) against the front of the pump bracket to determine how the pump will need to be rotated on pump plate. Place pump plate in vise. Rotate the pump 90° so the relief port points toward the mounting slots in the pump plate. (On 5.9L engines with air pumps, move only 45°). Tighten fasteners on pump plate and reinstall pump-clutch assembly to front of pump bracket. Install two 3/8 x 1-1/2 (NC) cap screws (96) with flat

washers (101) through slotted holes and two inner holes on pump bracket and through pump bracket brace on top hole in pump bracket. Secure with two lock washers (99) and nuts (100). Tighten all pump bracket fasteners. Place 60" V-Belt (67) over drive sheave and clutch pulley. Tighten belt and alternator and clutch plate fasteners. If vehicle has air conditioning, tie hose on top of pump away from clutch pulley.

**4. Valve Assembly and Valve Plate**

- A. Attach valve assembly (13) to second set of holes in valve plate (73) with two 5/16 x 1 (NC) grade 5 cap screws (102), lock washers (105), and nuts (106). Attach two valve plate braces (74) to holes next to valve fasteners with two 5/16 x 1 (NC) grade 5 cap screws (102), lock washers (105), and nuts (106). Attach valve plate brace (75) to opposite end of plate (see illustration) with a 5/16 x 1 cap screw (102), lock washer (105) and nut (106). Locate valve plate with braces attached on fender beside pump with long braces on inside of fender. Using holes in braces and corner hole on valve plate as guides, mark and drill four 11/32" holes through fender. Attach valve plate to fender with four 5/16 x 1-1/4 cap screws (103), flat washers (107), lock washers (105), and nuts (106). Tighten all fasteners.
- B. Using the illustration as a reference, install two 1/4 Npt x 90 degree swivel adapter unions (79) to angle cylinder ports on valve tightened to a 4:00 o'clock position. Install two 1/4 Npt x 90 degree swivel adapter unions (79) to "Lift" and "Pressure" ports on valve. Install a 1/4 Npt x 90 degree street elbow (78) and a 1/4 Nptf to 3/8 ID hose quill (94) to "Return" port on valve. These fittings should be tightened to the following positions: lift hose swivel at 9:00 o'clock, center swivel fitting at 8:00 o'clock, and 90 degree street elbow with quill at 3:00 o'clock.

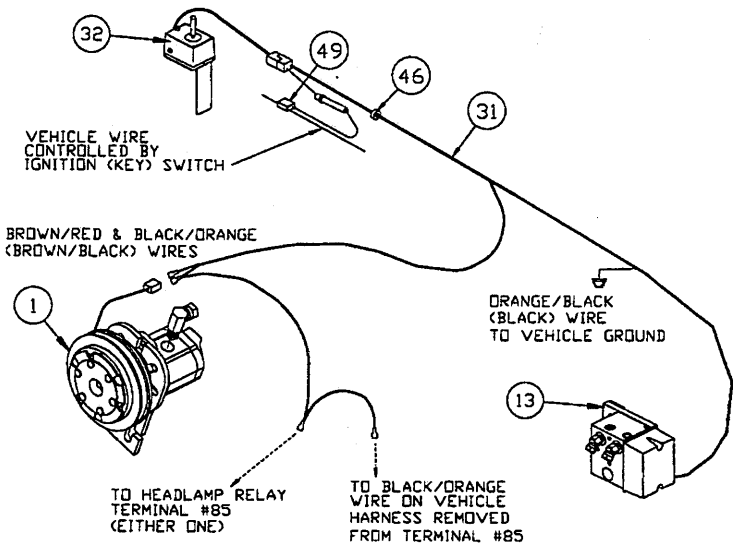
**Caution: Reservoir tank fill must be vertical to engine.**

- C. Place oil reservoir (12) between air intake and fire wall with quills facing engine. Position reservoir so that it does not contact air intake and using holes in reservoir as guides, drill two 11/32" holes through fender. Fasten reservoir to fender with two 5/16 x 1 cap screws (102), flat washers (107), lock washers (105) and nuts (106).

**5. Solenoid Control and Harness Installation**

**Note: Use dielectric grease (48) to prevent corrosion on all under-hood electrical connections. Fill receptacles and lightly coat ring terminals and blades before assembly.**

- A. Check both sides of fire wall for wires and hot or moving engine parts. Then, on the driver side, drill a 5/8" hole in the fire wall for the control harness (31).
- B. Install the solenoid control (32) and dash bracket as per the instructions found in the Dash Bracket Bag (27) located in the common hydraulic bolt bag.
- C. Remove negative battery cable from battery. **Warning! Disconnect battery before installing, removing or replacing electrical components.**
- D. Insert control harness (31) through hole drilled in fire wall. Attach connector to plug on Solenoid Control. Connect the red wire from the fuse holder to a circuit which is on only when the ignition key is on. Use in-line connector (49). Route the main portion of harness (white, green, blue and black wires) to the valve. Place a grommet (46) around control harness where it passes through fire wall. Remove plastic cover from valve and install solenoid wires according to instructions inside cover. With the harness strain relief in place inside the cover, install the cover. Attach orange/black (black) wire with ring terminal exiting loom near valve to a good vehicle ground. Route portion of harness with brown/red and black/orange wires with female spade terminals to the electric clutch.



**Note: Install the 20850 Fish-Stik™/Clutch Relay Kit at this time, if necessary.**

Attach female spade terminals to clutch plug (brown/red to black with white stripe and black/orange to black). Fasten other black/orange wire with female spade connector to head lamp relay and male spade connector to black/orange ground wire from vehicle harness (see Diagram 1).

**Note: The relay & vehicle harness are found in peculiar light kit.**

- E. Install plow headlamps as per the light kit instructions. Stretch the rectangular opening of the plug cover strap (from light kit) over grille connector ends of the long battery cable (from hydraulics box) and vehicle harness (from light kit). Place the plug cover over the mold on the harness.

- F. Reconnect negative battery cable to battery terminal.

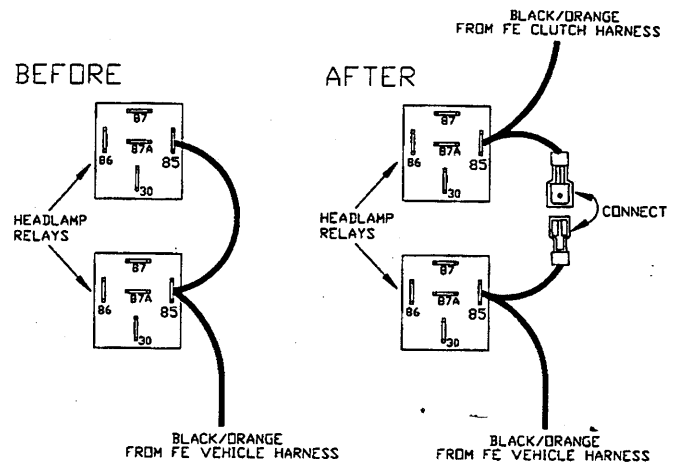


Diagram 1

## 6. Hydraulic Hose Installation

**Caution: Keep hoses away from hot or moving engine components. Failure to do so may cause hose to burst resulting in a possible engine fire.**

- A. Measure the distance from the lower quill on the reservoir and the bottom of the relief quill on pump (it should be about 23" long). Cut the needed length from the 3/8 x 42" LP hose (66) and install onto quills. Use the remaining section to install onto upper quill on reservoir and quill on valve. Install a 1/2" quill (42) to the 90° swivel on bottom of pump facing fire wall and a second 1/2" quill (42) to rear of reservoir. Install the 1/2 x 19" LP hose (65) to these quills. Install in-line oil filter as per filter kit instructions (30) located in the common hydraulics kit.
- B. Position swivel elbow on top of pump (pump's outlet port) towards valve and turn 1/4 x 90° swivel on valve towards grille. Install 3/8" end of 26" HP hose (59) to pump and other end to valve. This hose is long enough to provide a loop of sufficient radius to prevent crimping.
- C. Attach one end of the 60" HP hose (61) to the 90° swivel on the driver-side angle cylinder port on valve and route out beside the radiator and through driver-side of bumper. Attach a 36" HP hose (63) to the 90 degree swivel on the passenger-side angle cylinder port on valve and a 36" HP hose (63) to the Lift Cylinder port on valve. Route these hoses to the passenger-side of bumper.
- D. Attach a female quick disconnect half (44) to the QD/Electric grille plate (84) with a snap ring (81). Install a dust plug (45) and 1/4 x 90° swivel adapter (79) to the disconnect. Place grille bracket (86) on back of grille plate as shown in illustration. Attach with two 1/4 x 1/2 cap screws (112) and locknuts (113). Place grille plate and bracket into large hole in driver-side of bumper as far toward the fender as possible. Drill two 1/4" holes in top inside lip of bumper using the holes in angle as guides. Angle the disconnect plate outwards on vehicle using the two holes in angle. Fasten bracket with two 1/4 x 3/4 cap screws (114), flat washers (117), lock washers (115), and nuts (116).

Attach 60" angle hose (61) to swivel on disconnect and slide head light connector (with dust plug) into slot provided in the grille plate. Install a female quick-disconnect half (44) to one hole in the 2-QD grille plate (85) with a snap ring (81) and a bulkhead adapter (80) to the other hole with another snap ring (81). Install a male quick disconnect half (44) to the bulkhead adapter and two 1/4 x 45° swivel adapters (89) with dust covers (45) to disconnects on back side of grille plate. Attach grille bracket (86) to grille plate as shown on illustration with two 1/4 x 1/2 cap screws (112) and locknuts (113). Place grille plate and bracket into large hole in passenger-side of bumper as far toward the fender as possible. Using the holes in the angle as guides, drill two 1/4" holes in the top inside lip of bumper. Use the two holes on the angle to angle the disconnects outward on vehicle. Fasten bracket with two 1/4 x 3/4 cap screws (114), lock washers (115), and nuts (116) placing female disconnect to outside of vehicle. Attach lift hose to swivel with male disconnect and angle hose to female disconnect.



**Note: Grille brackets, fasteners, and tie wraps are in the peculiar attachment kit bolt bag to be available for electric hydraulic pak options.**

- E. Install cable boot bracket (82) on driver-side headgear brace, between brace and fasteners. Insert cable boot (83) on over bracket.

## 7. OPERATIONS

- A. Check all fittings and fasteners for tightness. Secure hoses with nylon tie wraps (88).
- B. Attach hose disconnects, push lift arm all the way down, and fill reservoir with FISHER® High Performance Hydraulic Fluid (recommended for superior cold-weather performance) or type "A" automatic transmission fluid. Start engine, lift and angle blade several times. **If blade angles opposite from control lever position, reverse the two angle hoses at the valve.** Raise front end of vehicle until plow is clear of ground with lift cylinder fully retracted. Check reservoir oil level. Angle blade (with lift cylinder retracted) to remove air from system. Recheck oil level.

**Note: The installer must inform the end user of the proper procedure for removing any residual hydraulic pressure that may be trapped in the raise or angle hoses. The plow will be much easier to install or remove if the proper procedures are followed.**

Before coupling or uncoupling the hydraulic disconnects you must turn off the engine and then turn the key to the "on" position. (The red LED light will be lit.) Move the control to the four plowing positions. Activate lower/float before removing or installing the plow.