

SECTION 1 SNOW PLOW— SNOW PLOW POWER PACKS

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SNOW PLOWS

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GENERAL

The various installations and combinations of Snow Plow Kits are covered separately for clarity in these procedures. Before beginning installation, identify the parts in the kit against the parts list.

ALTERED VEHICLE REGULATIONS

Federal regulations require that anyone altering a vehicle in such a manner that its stated weight ratings are no longer valid must not allow the original certification to remain on the vehicle. An additional label of the type enclosed with the kit must be affixed to the altered vehicle.

Installing snow plows on the vehicles listed below affects compliance with the Federal Motor Vehicle Safety Standards and the installer is required to certify and place an alterer's label on the vehicle (fig. 1-1).

Fill in the required information and locate as follows:

- **CJ Models:** Affix decal (AMC Part Number SF 5354425) near existing weight rating tag on instrument panel.
- **Cherokee-Wagoneer-Truck:** Affix decal (AMC Part No. SF 5354424) on hinge pillar of left door. Be sure to cover the decal with clear protective film provided.

CERTIFICATION OF ALTERED VEHICLE

----- This label for Snow Plow application Only. -----

JEEP CORPORATION MODEL CJ5 CJ6 CJ7

Vehicle and axle weight ratings applicable with tire (or tire of equivalent load rating) and heavy duty front & rear springs as specified in vehicle manufacturer's Special Equipment Manual.

GAWR FRT: 2640 lbs. max.
GAWR RR: See Original Certification Label
GVWR: See Original Certification Label

This vehicle was altered by _____ in _____ mo. _____ yr. and as altered it conforms to all applicable Federal Motor Vehicle Safety Standards, in effect _____ date.

90315

CERTIFICATION OF ALTERED VEHICLE

----- This label for Snow Plow application Only. -----

JEEP CORPORATION MODEL WAGONEER/CHEROKEE AND TRUCK MODELS 25, 26, 45, 46

Vehicle and axle weight ratings applicable with Tire (or tire of equivalent load rating) and extra heavy duty front spring as specified in vehicle manufacturer's Special Equipment Manual.

GAWR FRT: 3540 lbs. max. for Wagoneer, Cherokee & Models 25, 26, 45
3750 lbs. max. for Model 46
GAWR RR: See Original Certification Label
GVWR: See Original Certification Label

This vehicle was altered by _____ in _____ mo. _____ yr. and as altered it conforms to all applicable Federal Motor Vehicle Safety Standards, in effect _____ date.

J42998

Fig. 1-1 Altered Vehicle Certification Labels

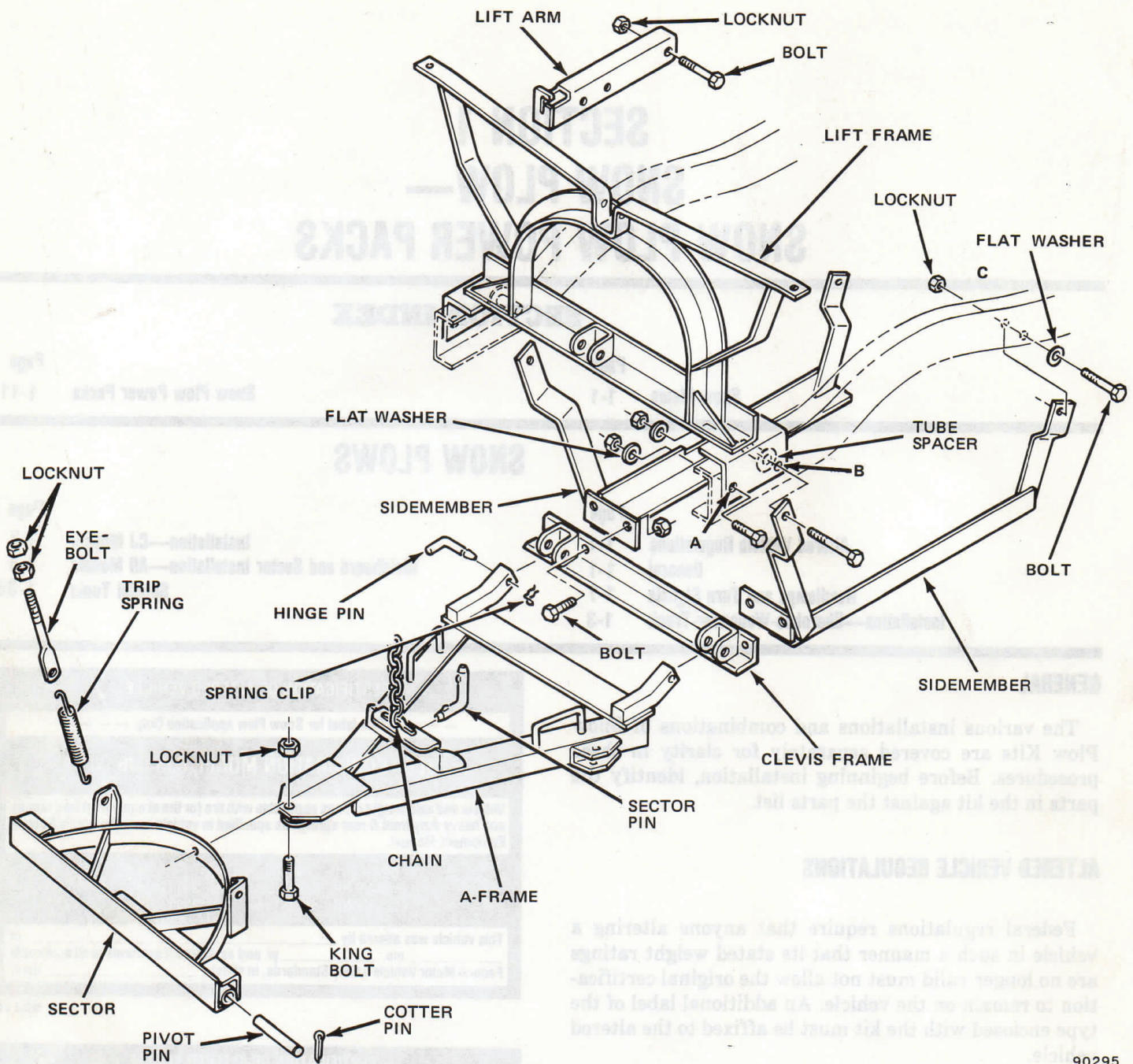


Fig. 1-2 Mounting Frame Installation—CJ Models

90295

INSTALLATION—CJ MODELS

NOTE: Do not tighten nuts and bolts until installation is complete (unless otherwise specified).

- (1) Remove nuts and bolts attaching front bumper to frame and remove bumper. Retain attaching parts.
- (2) For boxed frame applications, install tube spacers at holes B (fig. 1-2).
- (3) Position and attach lift frame to frame rails, at holes A only.
- (4) Attach sidemembers to rear of lift frame and to frame rails.

CAUTION: Check brake lines in the vicinity of the required left side frame hole. Relocate brake lines, if necessary.

- (5) Using rear hole of sidemembers as a pilot hole, drill a 17/32-inch diameter hole through the inside frame rail. Install bolts, flat washers and locknuts.

NOTE: Flat washers must be on outside of frame rails.

- (6) Attach clevis frame to sidemembers.
- (7) Install lift arm to lift frame.
- (8) Install original bumper (fig. 1-3).

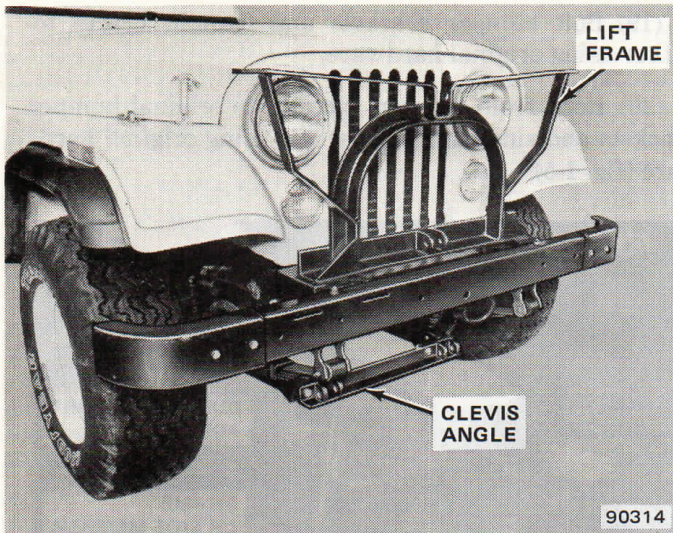


Fig. 1-3 Lift and Mounting Frame Installed—CJ Models

(9) Connect A-frame to clevis angle with hinge pins and spring clips.

- (10) Attach chain from A-frame to lift arm.
- (11) When installation is complete tighten 1/2-inch bolts to 66 to 74 foot-pounds (89 to 100 N•m) torque, 5/8-inch bolts to 128 to 142 foot-pounds (174 to 193 N•m) torque, and 3/4-inch bolts to 228 to 252 foot-pounds (309 to 342 N•m) torque.

INSTALLATION—CHEROKEE-WAGONEER-TRUCK 1976-1978 MODELS

- (1) Remove complete front bumper assembly. Retain all original parts.
- (2) Grind face of front frame crossmember around bolt holes to remove weld splatter and burrs to ensure a flat surface.
- (3) Remove front stabilizer bar from frame rail brackets.
- (4) Remove each frame stabilizer bracket pad welded to the frame rail. Be careful not to damage the frame rails with oxy-acetylene torch.
- (5) Using the same method remove the welded spacer located on each sidemember provided in mounting frame installation kit (fig. 1-4).

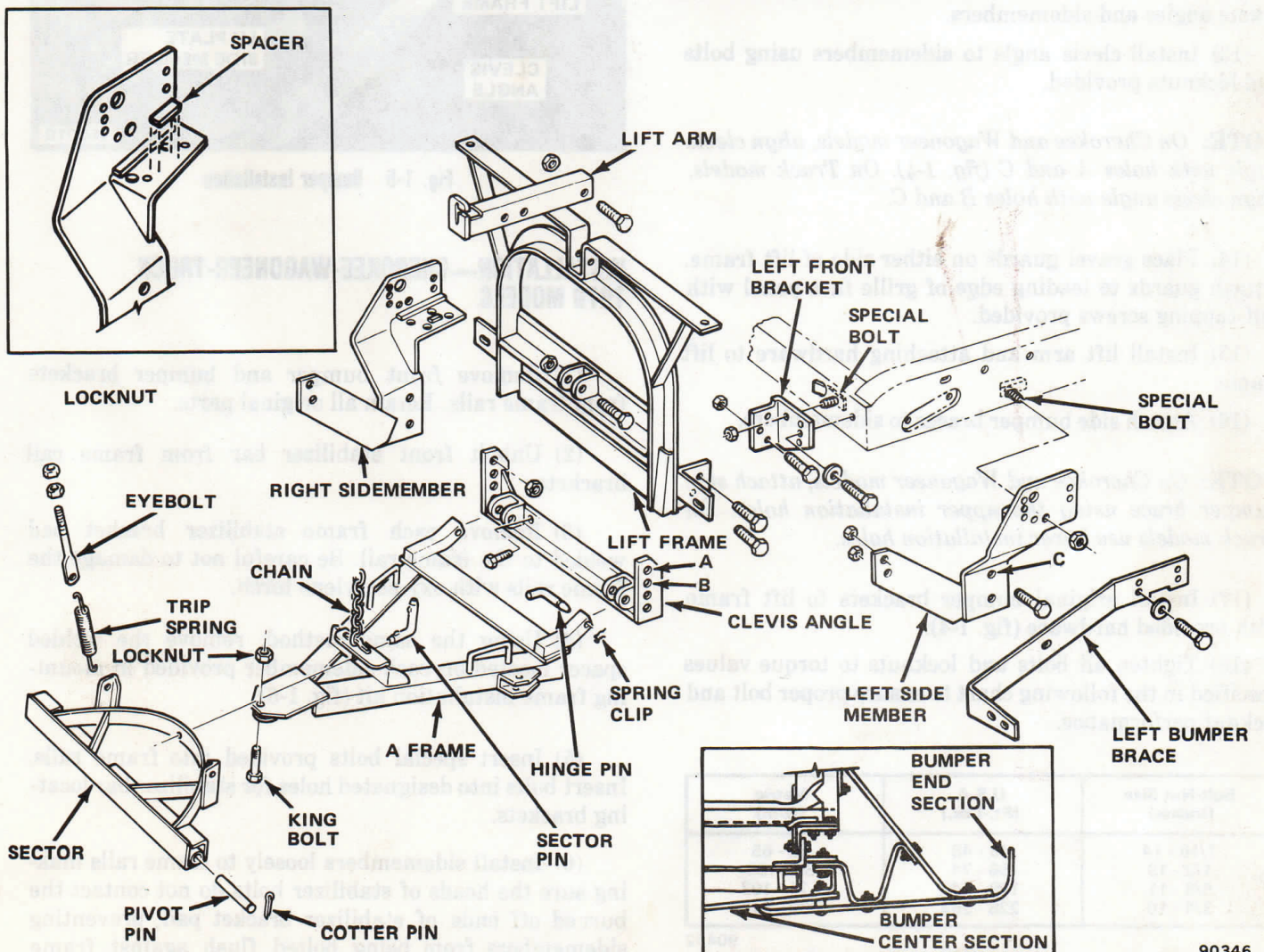


Fig. 1-4 Mounting Frame Installation—Cherokee-Wagoneer-Truck 1976-78 Models

1-4 SNOW PLOW—SNOW PLOW POWER PACKS

(6) Insert special bolts provided into frame rails. Insert bolts into designated holes for stabilizer bar locating brackets.

(7) Attach sidemembers loosely to frame rails. Make sure the heads of stabilizer bolts do not contact the burned off ends of stabilizer bracket pad, preventing sidemembers from being bolted flush against frame rails.

(8) After sidemembers have been positioned on frame rails, push stabilizer assembly upward until stabilizer locating bracket bolts align with holes located on bracket.

(9) Install lockwashers and nuts on stabilizer mounting bracket bolts.

(10) Install special front frame angle bolts into front frame rail holes.

(11) Install front frame angles and remaining hardware.

(12) Place lift frame on front frame angles. Using bolts and locknuts provided, assemble lift frame to front frame angles and sidemembers.

(13) Install clevis angle to sidemembers using bolts and locknuts provided.

NOTE: On Cherokee and Wagoneer models, align clevis angle with holes A and C (fig. 1-4). On Truck models, align clevis angle with holes B and C.

(14) Place gravel guards on either side of lift frame. Attach guards to leading edge of grille face panel with self-tapping screws provided.

(15) Install lift arm and attaching hardware to lift frame.

(16) Attach side bumper braces to sidemembers.

NOTE: On Cherokee and Wagoneer models, attach side bumper brace using the upper installation holes. On Truck models use lower installation holes.

(17) Install original bumper brackets to lift frame with provided hardware (fig. 1-4).

(18) Tighten all bolts and locknuts to torque values specified in the following chart to ensure proper bolt and locknut performance.

Bolt-Nut Size (Inches)	U.S.A (Ft.-Lbs.)	Metric (N-m)
7/16 - 14	43 - 48	58 - 65
1/2 - 13	66 - 74	89 - 100
5/8 - 11	128 - 142	174 - 193
3/4 - 10	228 - 252	309 - 342

90452

Torque Chart

(19) Bolt bumper brackets and bumper braces together using original hardware.

(20) Refit front bumper sections to original bumper brackets and side bumper brackets using original hardware (fig. 1-5).

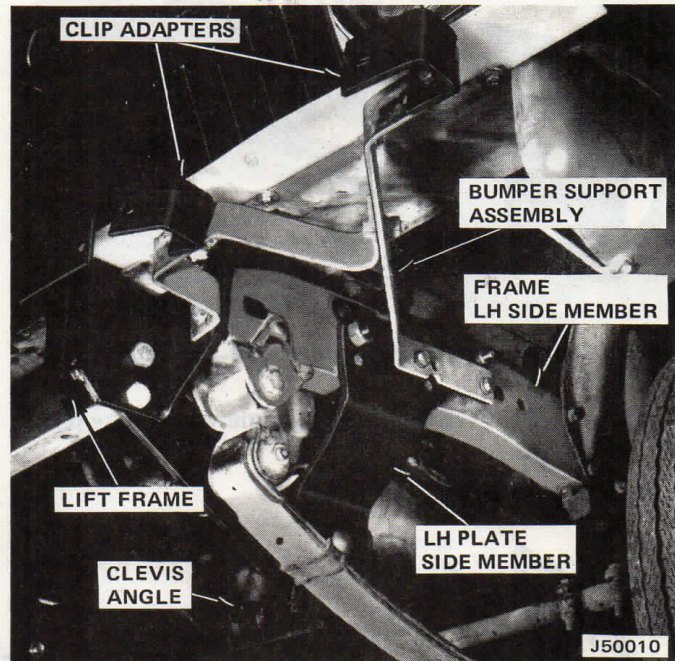


Fig. 1-5 Bumper Installation

INSTALLATION—CHEROKEE-WAGONEER-TRUCK 1979 MODELS

(1) Remove front bumper and bumper brackets from frame rails. Retain all original parts.

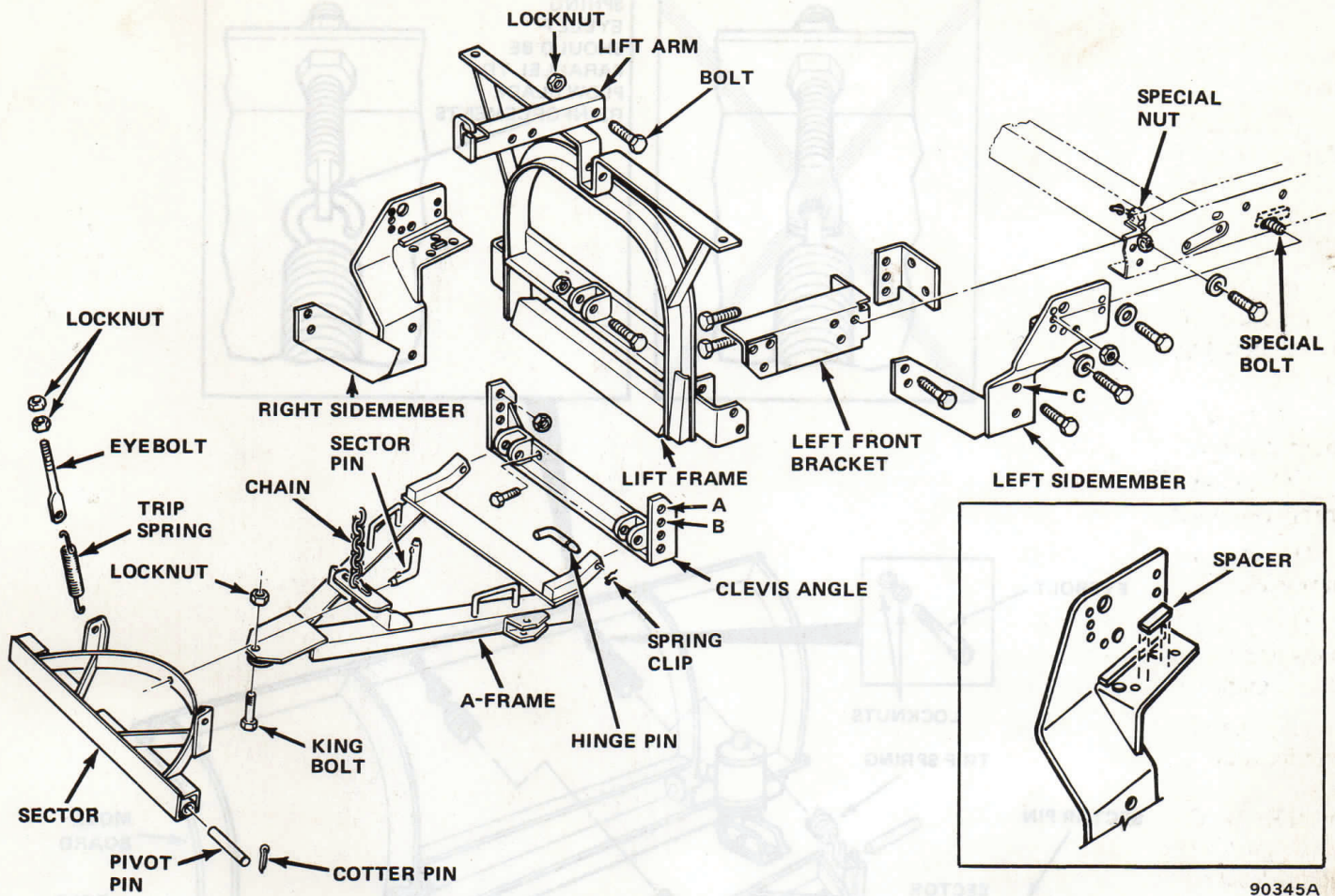
(2) Unbolt front stabilizer bar from frame rail brackets.

(3) Remove each frame stabilizer bracket pad welded to the frame rail. Be careful not to damage the frame rails with oxy-acetylene torch.

(4) Using the same method, remove the welded spacer located on each sidemember provided in mounting frame installation kit (fig. 1-6).

(5) Insert special bolts provided into frame rails. Insert bolts into designated holes for stabilizer bar locating brackets.

(6) Install sidemembers loosely to frame rails making sure the heads of stabilizer bolts do not contact the burned off ends of stabilizer bracket pad, preventing sidemembers from being bolted flush against frame rails.



90345A

Fig. 1-6 Mounting Frame Installation—Cherokee-Wagoneer-Truck 1979 Models

(7) After sidemembers have been positioned on frame rails, push stabilizer assembly upward until stabilizer locating bracket bolts align with holes located on brackets.

(8) Install nuts and lockwashers on stabilizer mounting bracket bolts.

(9) Place front brackets on frame rails per illustration. Align holes in bracket with holes in frame. Drill additional 9/16-inch front bracket hole, using the other holes and front bracket as a template.

(10) Insert special nuts into opening in front cross-member. Position front brackets on frame rail and bolt together using flat and lockwashers.

(11) Insert bolts through outer front bracket and sidemember and install locknuts.

(12) Place lift frame into front frame rails. Install lift frame attaching hardware to front brackets and sidemembers.

(13) Install clevis angle to sidemembers using bolts and locknuts provided.

(14) Place gravel guards on either side of lift frame. Attach guards to leading edge of grille face panel with self-tapping screws provided.

(15) Install lift arm and hardware to lift frame.

(16) Before tightening mounting frame bolts, pull top of lift frame forward to take out slack in bolt holes. Tighten all bolts and locknuts to torque values specified in the following chart to ensure proper bolt and locknut performance.

Bolt-Nut Size (Inches)	U.S.A (Ft.-Lbs.)	Metric (N·m)
7/16 - 14	43 - 48	58 - 65
1/2 - 13	66 - 74	89 - 100
5/8 - 11	128 - 142	174 - 193
3/4 - 10	228 - 252	309 - 342

90452

Torque Chart

MOLDBOARD AND SECTOR INSTALLATION—ALL MODELS

(1) Attach sector to moldboard assembly with pivot pins and cotter pins (fig. 1-7). Lubricate pivot pins with brake support plate lubricant 8992356 or equivalent before installing.

NOTE: On Cherokee and Wagoneer models, align clevis frame with through holes A and C. On Truck models, align clevis frame with holes B and C.

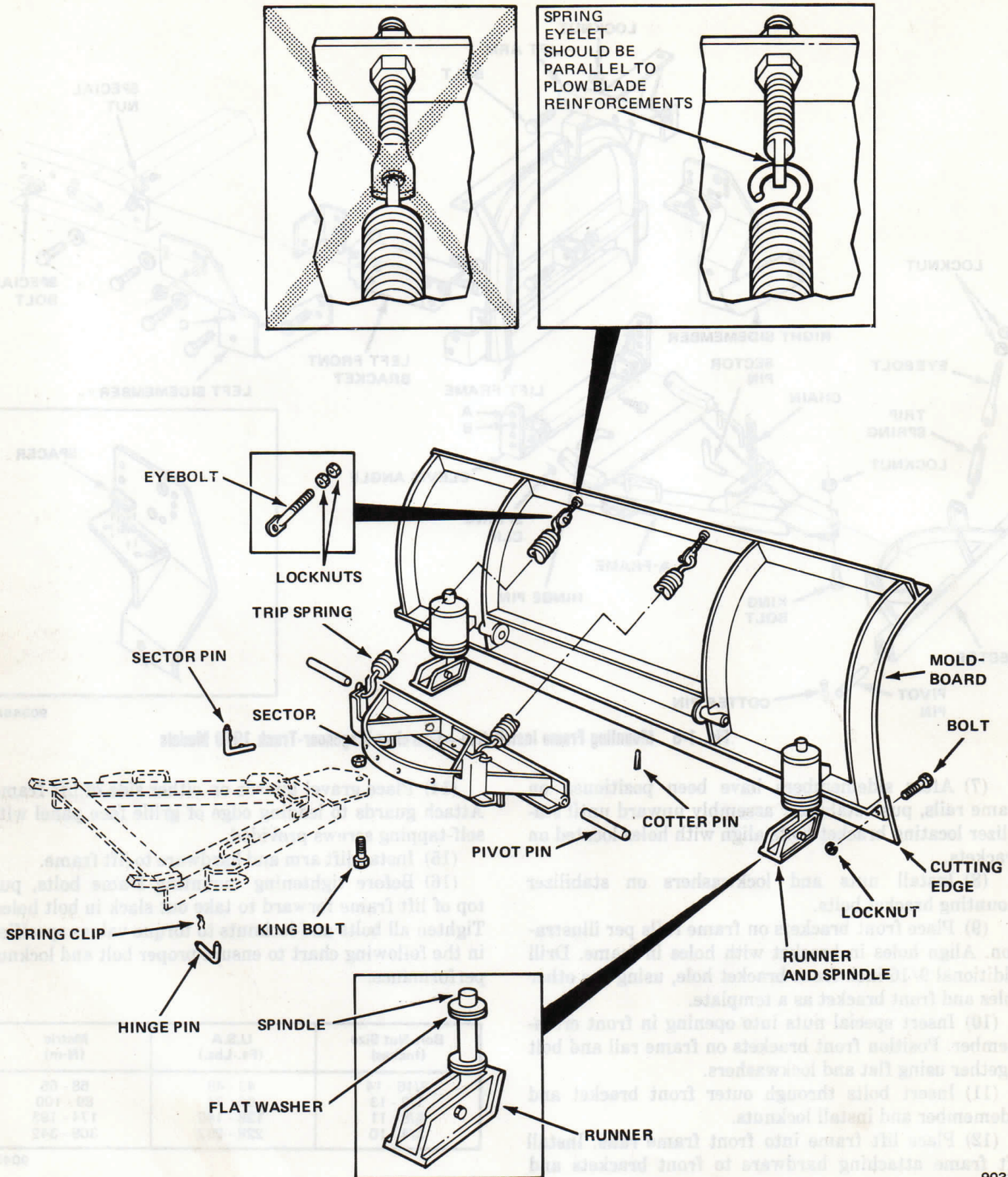


Fig. 1-7 Moldboard and Sector—Components and Installation

NOTE: Cotter pins should pass through tubing only. Do not engage pivot pins with cotter pins.

(2) Attach eyebolts and trip springs to moldboard and sector assembly.

NOTE: Proper tension is attained when trip spring coils just begin to separate and then tighten top locknuts four additional turns. Be sure eyebolt is in a vertical position to prevent spring from twisting when tightening nuts.

(3) Attach moldboard and sector assembly to A-frame with sector angle between nose plates of A-frame.

(4) Install kingbolt through sector and A-frame and secure with locknut. Be sure to install kingbolt so that locknut is on top.

NOTE: For installations without hydraulic power angling rams, set plow in desired position and insert sector pin in A-frame to sector. The sector pin will lock plow in position.

(5) Connect A-frame to clevis angle with hinge pins and spring clips.

(6) Attach A-frame chain to lift arm.

CAUTION: Do not install sector pin if unit is equipped with hydraulic power angling rams.

MARKER INSTALLATION—ALL MODELS

Install plow marker at each end of moldboard top angle with bolt, clamp, and locknut.

NOTE: If moldboard does not have the necessary holes, drill a 5/16-inch diameter hole in the top angle at each end of the moldboard (fig. 1-8).

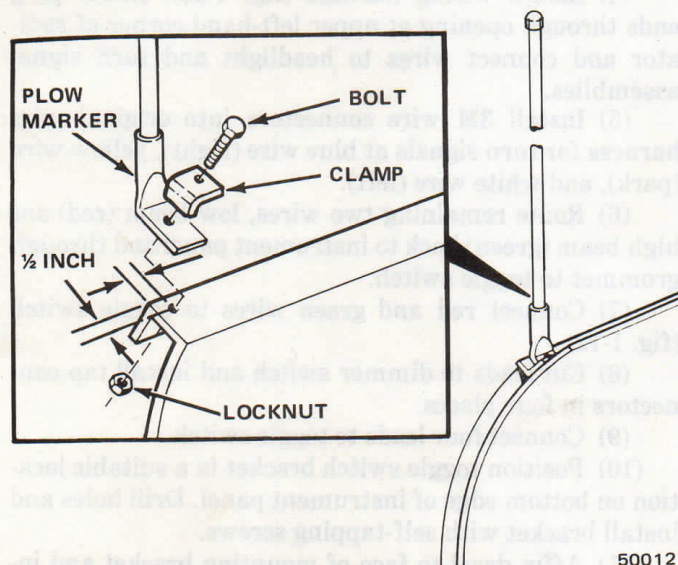


Fig. 1-8 Marker Installation 50012

SNOW PLOW MOLDBOARD SNOW DEFLECTOR INSTALLATION—ALL MODELS

(1) Lay out rubber deflector on a flat surface and cut to moldboard length.

(2) Fit support angles as shown in figure 1-9. Using support angle as a template, drill locating holes through moldboard.

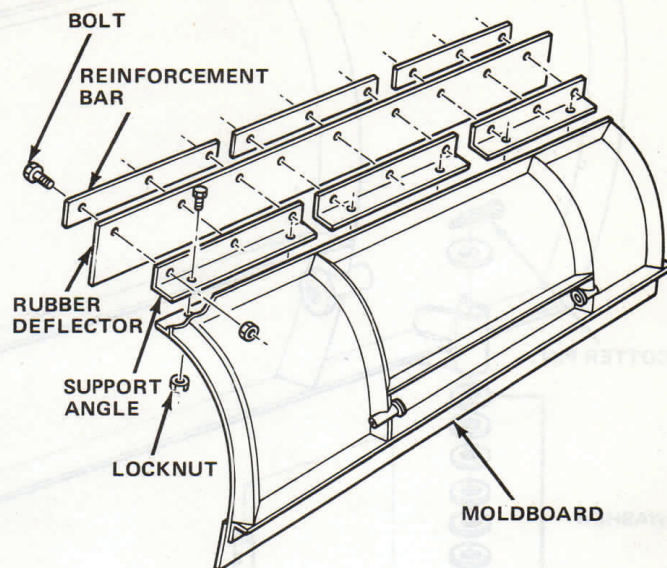


Fig. 1-9 Snow Deflector Installation 90377

(3) Attach support angles to moldboard using bolts and locknuts provided.

(4) Fit rubber deflector over support angles. Using holes in support angles as a template, drill locating holes through rubber deflector.

(5) Attach rubber deflector and reinforcement bars to support angles using bolts and locknuts provided.

MOLDBOARD ASSEMBLY—ALL MODELS

Runner and Spindle Replacement

(1) Remove cotter pin and separate components. Remove nut and bolt and separate runner from spindle (fig. 1-10).

(2) Replace worn components and assemble runner and spindle.

(3) Position spindle in moldboard bracket and install washers and cotter pin.

Cutting Edge Replacement

(1) Remove nuts and carriage bolts and remove cutting edge (fig. 1-10).

(2) Replace cutting edge and secure with carriage bolts and nuts.

HEADLAMPS AND TURN SIGNALS

General

The headlamps and turn signals must be installed parallel to the ground. Adjust lamps to illuminate the roadway for same distance ahead as the original headlights.

NOTE: Installer must certify that the installation conforms to the Federal Motor Vehicle Safety Standard 108.

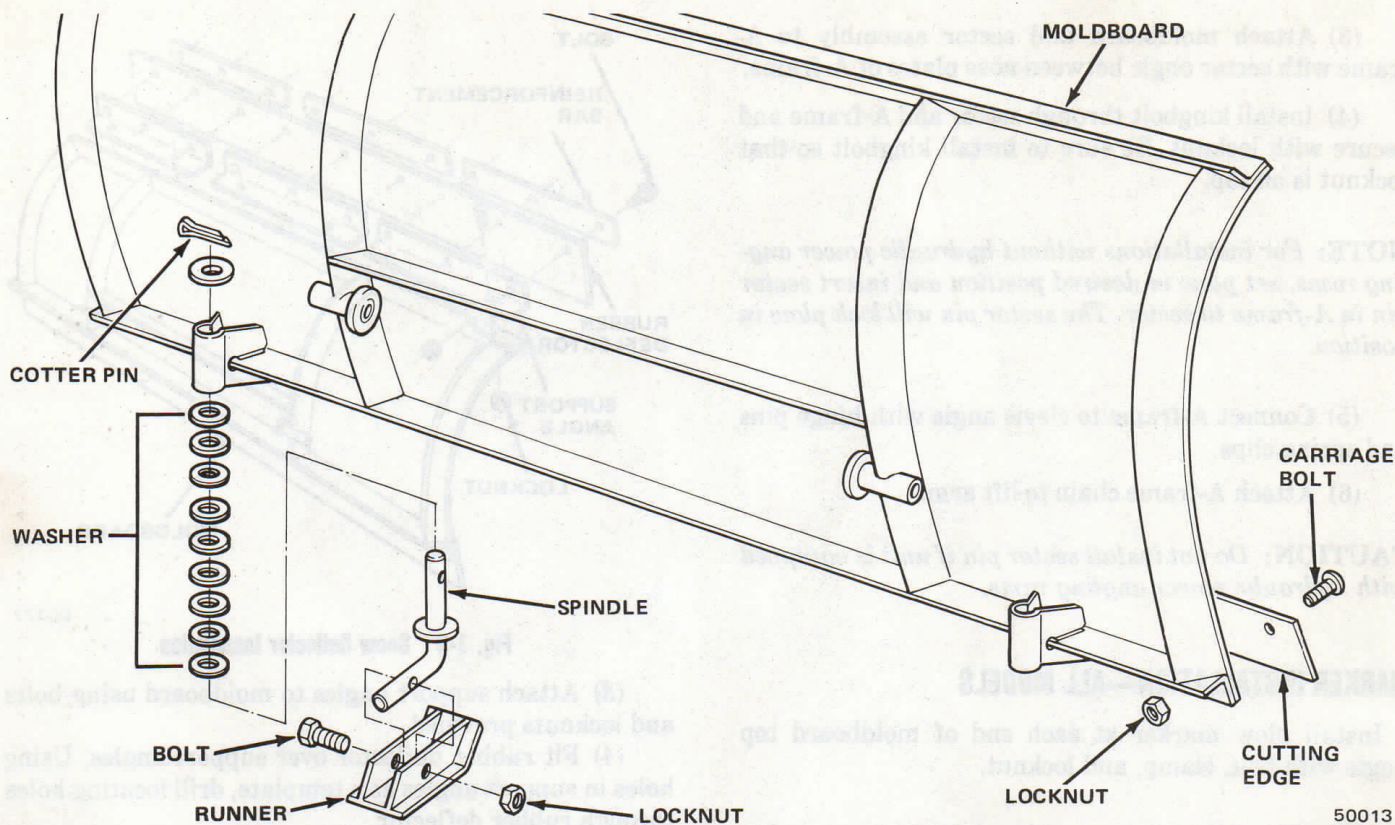
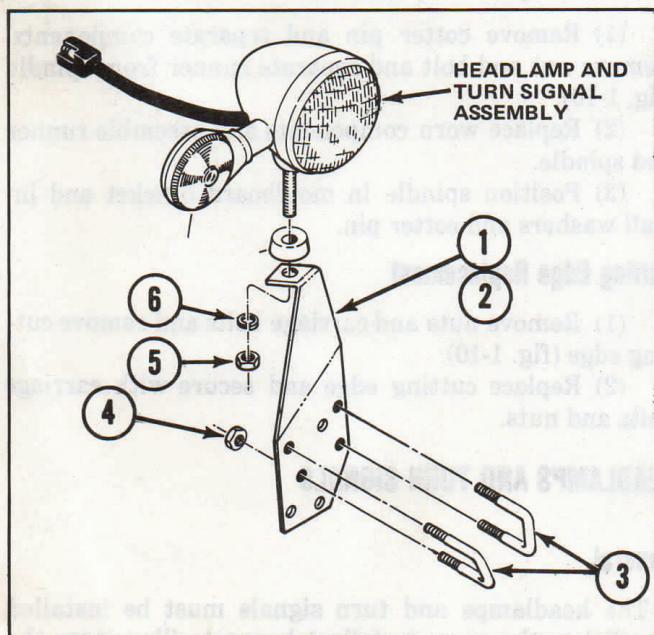


Fig. 1-10 Moldboard Assembly

Installation—1976-78 Models

- (1) Disconnect negative battery cable.
- (2) Install headlamp brackets to lift frame with U-bolts and locknuts (fig. 1-11).



- | | |
|------------------------|---------------|
| 1. RH MOUNTING BRACKET | 4. LOCKNUT |
| 2. LH MOUNTING BRACKET | 5. NUT |
| 3. U-BOLT | 6. LOCKWASHER |

Fig. 1-11 Headlamp and Turn Signal Installation

(3) Attach headlamp and turn signal assembly to mounting brackets with lockwashers and nuts.

(4) Install wiring harness (fig. 1-12). Route plug ends through opening at upper left-hand corner of radiator and connect wires to headlight and turn signal assemblies.

(5) Install 3M wire connectors into original wire harness for turn signals at blue wire (right), yellow wire (park), and white wire (left).

(6) Route remaining two wires, low beam (red) and high beam (green) back to instrument panel and through grommet to toggle switch.

(7) Connect red and green wires to toggle switch (fig. 1-12).

(8) Cut leads to dimmer switch and install tap connectors in four places.

(9) Connect four leads to toggle switch.

(10) Position toggle switch bracket in a suitable location on bottom edge of instrument panel. Drill holes and install bracket with self-tapping screws.

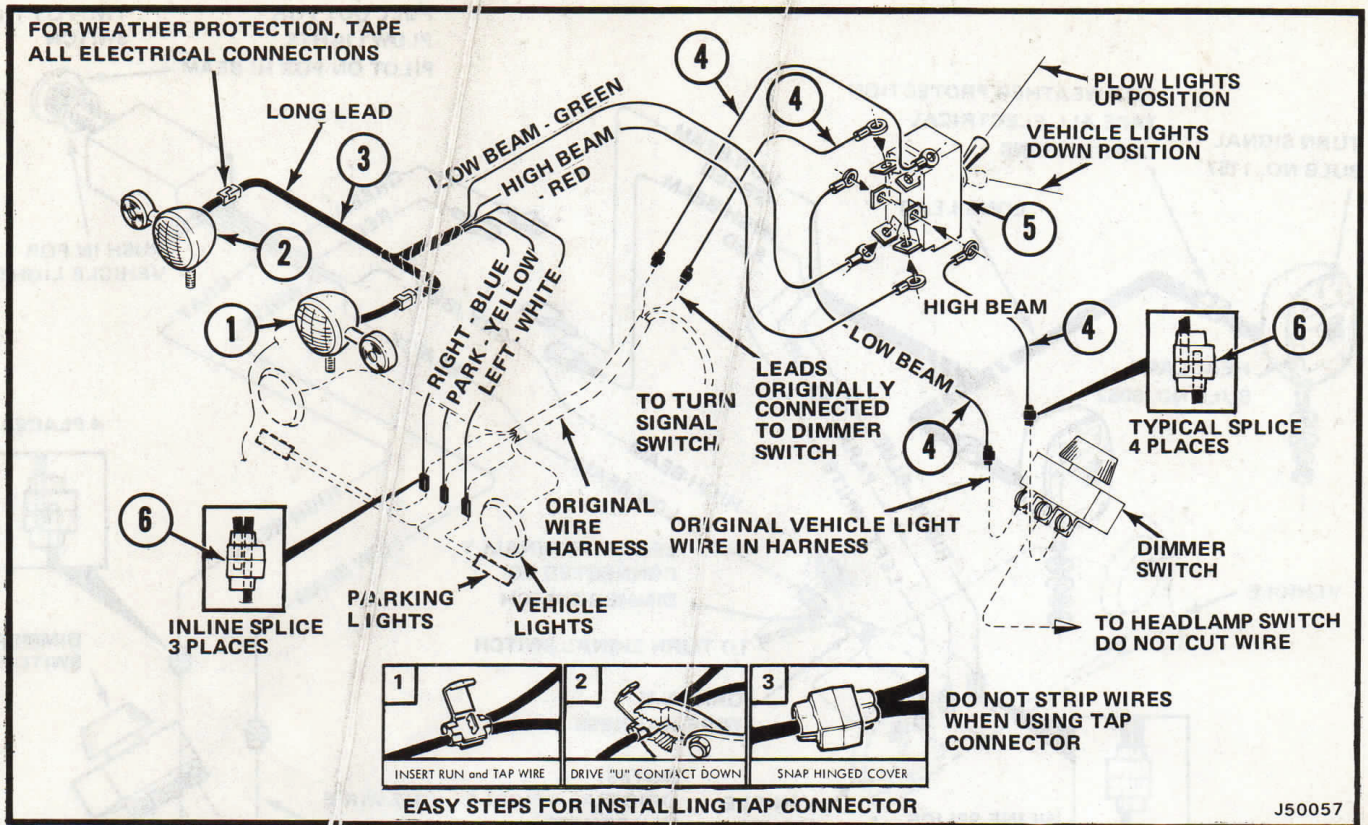
(11) Affix decal to face of mounting bracket and install toggle switch.

(12) Tape all connections in wiring installation.

(13) Connect negative battery cable and test installation.

Installation—1979 Models

- (1) Disconnect negative battery cable.
- (2) Install headlamps to lift frame ends with washers, lockwashers, and nuts (fig. 1-13).



- 1. LH HEADLAMP ASSEMBLY
- 2. RH HEADLAMP ASSEMBLY
- 3. HARNESS ASSEMBLY
- 4. BLACK WIRE
- 5. TOGGLE SWITCH
- 6. TAP CONNECTOR

Fig. 1-12 Headlamp and Turn Signal Wiring Installation

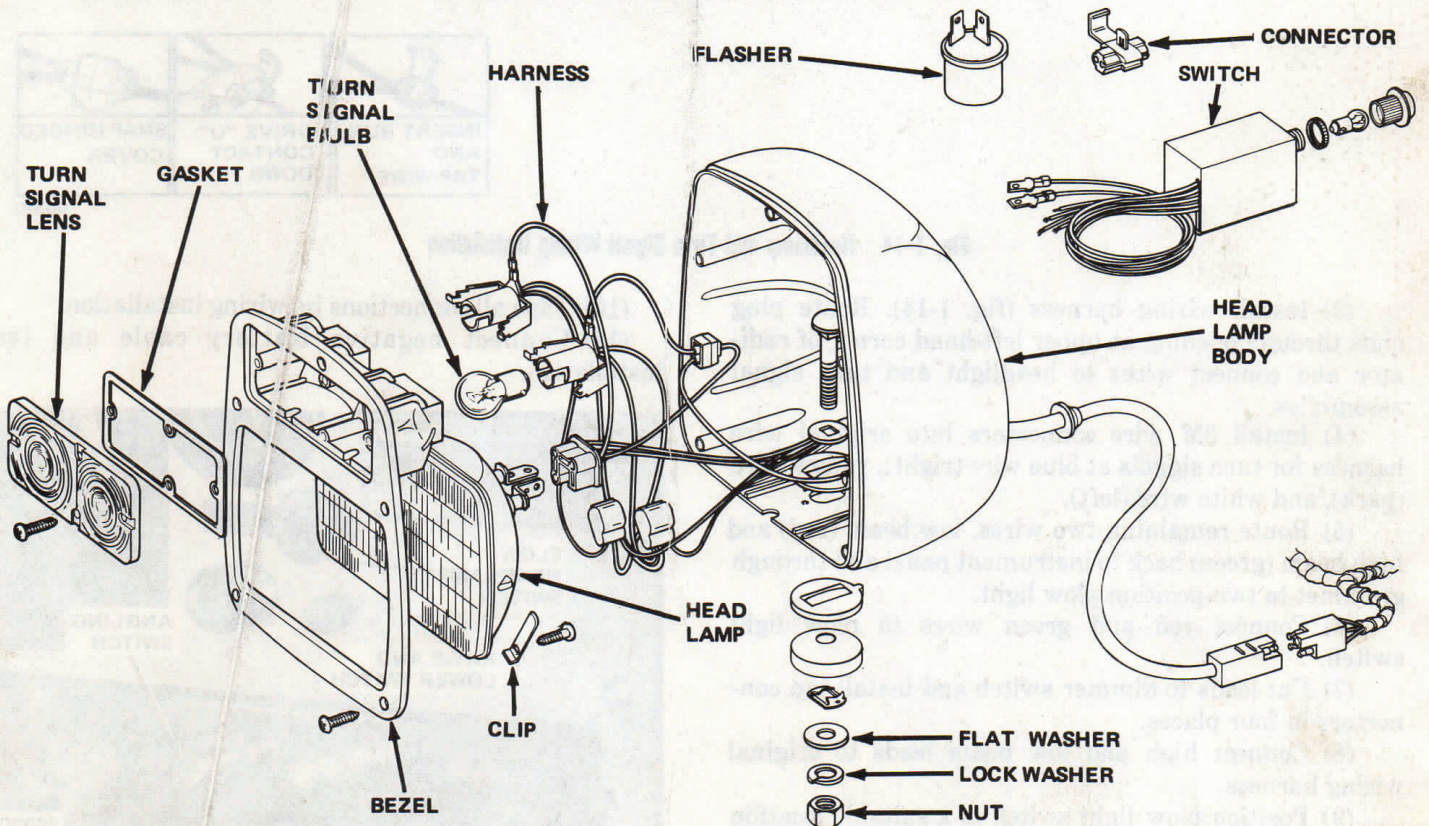
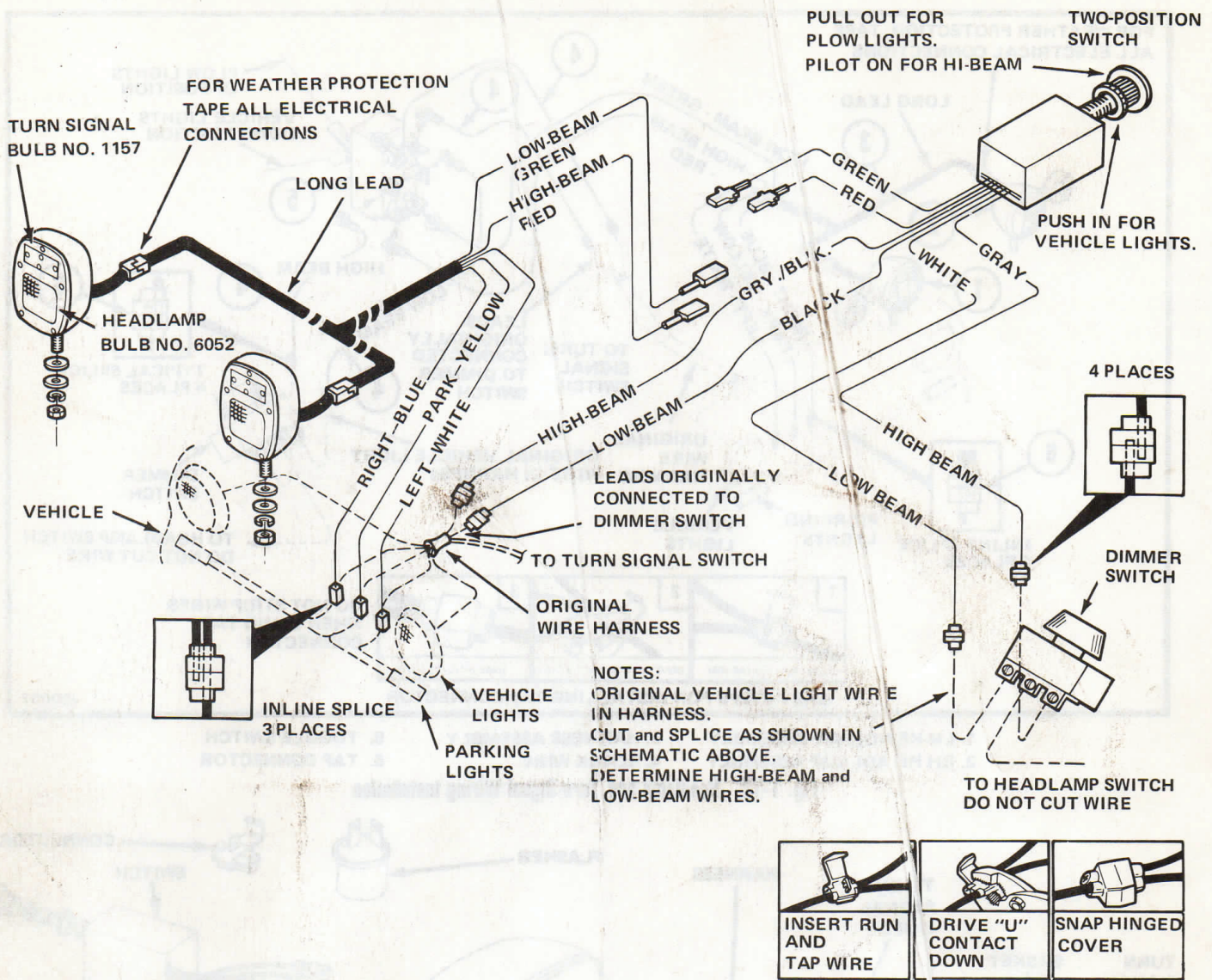


Fig. 1-13 Headlamp and Turn Signal Components



90391

Fig. 1-14 Headlamp and Turn Signal Wiring Installation

(3) Install wiring harness (fig. 1-14). Route plug ends through opening at upper left-hand corner of radiator and connect wires to headlight and turn signal assemblies.

(4) Install 3M wire connectors into original wire harness for turn signals at blue wire (right), yellow wire (park), and white wire (left).

(5) Route remaining two wires, low beam (red) and high beam (green) back to instrument panel and through grommet to two-position plow light.

(6) Connect red and green wires to plow light switch.

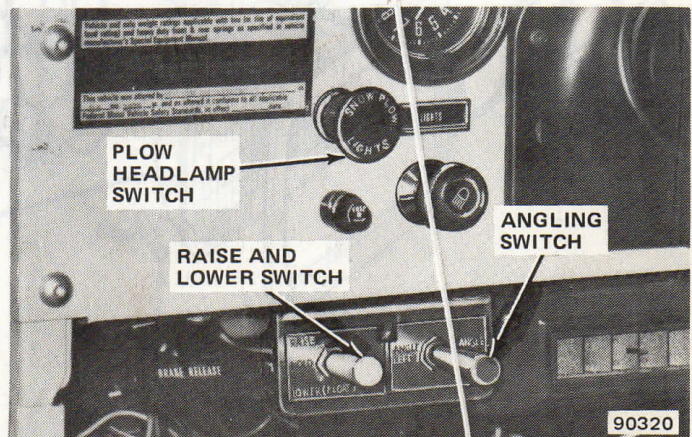
(7) Cut leads to dimmer switch and install tap connectors in four places.

(8) Connect high and low beam leads to original wiring harness.

(9) Position plow light switch in a suitable location on left side of instrument panel (fig. 1-15). Drill a 9/16-inch hole and install plow light switch.

(10) Tape all connections in wiring installation.

(11) Connect negative battery cable and test installation.



90320

Fig. 1-15 Headlamp and Plow Controls Installation

SNOW PLOW POWER PACKS

Electronic Power Pack Models E-46 and E-47 1-11

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ELECTRONIC POWER PACK MODELS E-46 AND E-47

General

These power packs combine the upper electrolift unit with an all-electric control system. Hydraulic plow lift and angling cylinder operations are controlled by electric solenoid valves positioned by toggle switches mounted on the instrument panel. A pilot-operated solenoid, mounted under the hood, supplies battery power to energize the pump motor.

Capabilities of these units vary from raising and lowering of the plow to raising, lowering, holding, angling of the plow, depending on the number of solenoids in the power pack unit.

Before the electronic power pack is disassembled for repair or replacement of components, be sure that all general maintenance and troubleshooting procedures have been performed, and that the proper service parts are on hand.

If the unit is to be overhauled, it is recommended that the master seal kit be used. This kit contains most seals necessary for rebuilding. The kit also contains one quart of hydraulic fluid. Individual seal kits are also available for specific applications.

Prior to disassembly, drain fluid from reservoir by loosening pressure relief valve from cover and removing the drain plug located on base. Clamp base firmly into vise and proceed with disassembly.

Installation

NOTE: Installation for Electronic Power Pack Model E-46 is the same as for E-47 except for fewer components.

- (1) Disconnect negative battery cable.
- (2) Position lift unit with electric motor on right side of vehicle. Attach lift unit to lift frame and lift arm using bolts and locknuts (fig. 1-16).

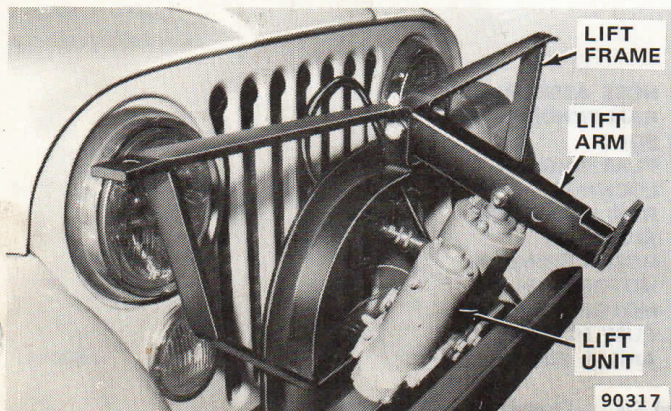


Fig. 1-16 Lift Unit, Frame and Arm Installation

- (3) Attach power angling rams to A-frame and sector (fig. 1-17) with bolts and locknuts.

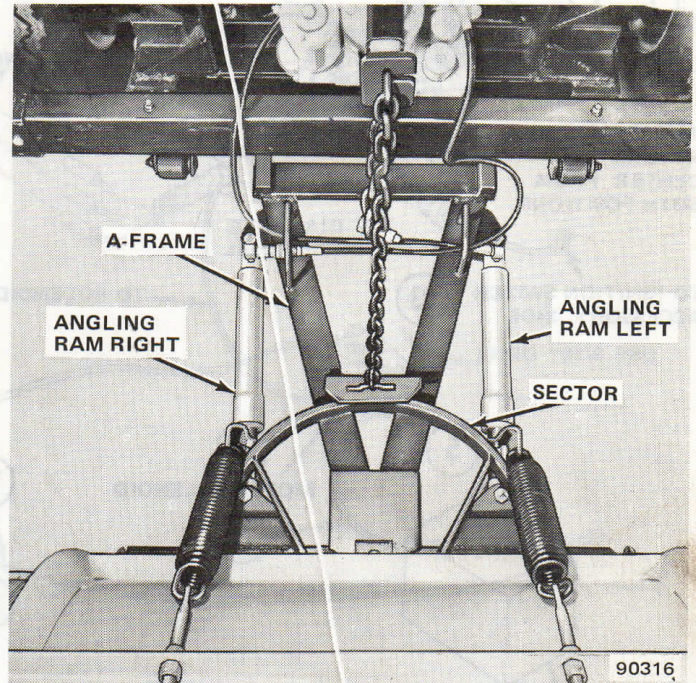


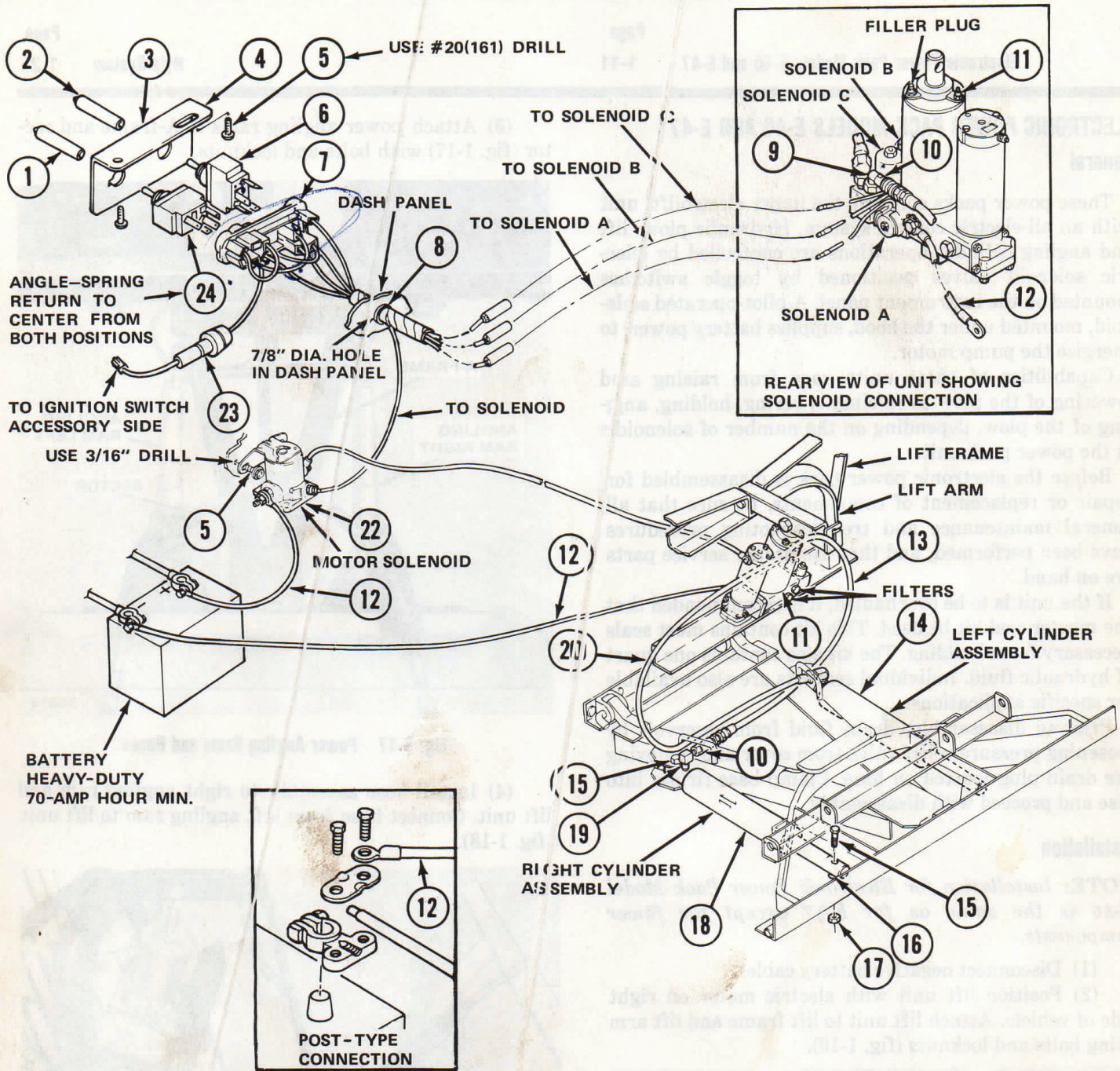
Fig. 1-17 Power Angling Rams and Hoses

- (4) Install hose assembly to right angling ram and lift unit. Connect hose from left angling ram to lift unit (fig. 1-18).



Fig. 1-18 Electronic Power Pack Models E-46 and E-47 Installations

- (5) Install ground cable from lift unit to existing bolt on engine or battery ground cable clamp (fig. 1-19).



- 1. BLACK HANDLE
- 2. YELLOW HANDLE
- 3. DECAL
- 4. SWITCH BRACKET
- 5. SELF-TAPPING SCREW
- 6. RAISE AND LOWER SCREW
- 7. FUSE AND HARNESS ASSEMBLY
- 8. SPLIT BUSHING
- 9. SWIVEL ELL.
- 10. COUPLER
- 11. LIFT UNIT
- 12. POWER CABLE

- 13. HOSE ASSEMBLY
- 14. RAM W/HOSE AND FITTING
- 15. BOLT
- 16. FLAT WASHER
- 17. LOCKNUT
- 18. RAM W/FITTINGS
- 19. RIGID ELL
- 20. HOSE ASSEMBLY
- 21. MOTOR CABLE
- 22. MOTOR SOLENOID
- 23. FUSE HOLDER
- 24. ANGLE SWITCH

Fig. 1-19 Electronic Power Pack Models E-46 and E-47—Components and Installation

(6) Drill holes and install solenoid with screws to right front inner fender (fig. 1-20).

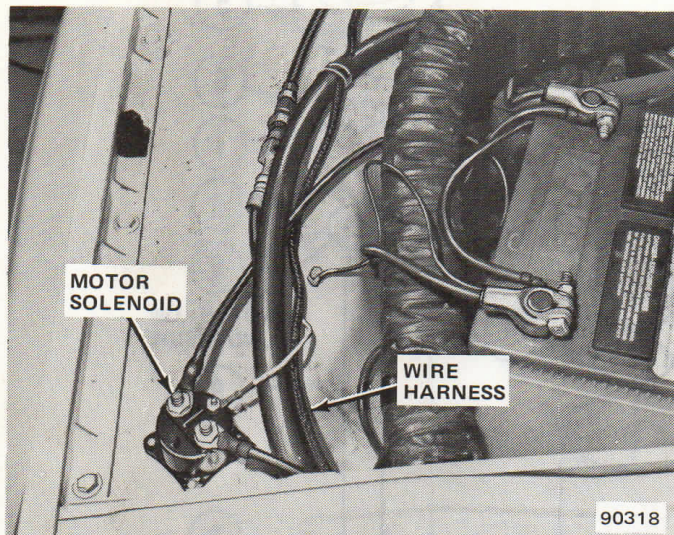


Fig. 1-20 Motor Solenoid Installation

(7) Install motor cable from lift unit to motor solenoid.

(8) Install power cable from motor solenoid to battery.

(9) Drill 1-7/8-inch diameter hole in instrument panel on left side of vehicle. Install bushing.

(10) Route lift and power angling wire harness through bushing in instrument panel hole.

(11) Route lift and power angling wire harness across front of instrument panel to left side of vehicle to motor solenoid. Make connection at motor solenoid and continue routing harness to front of vehicle.

(12) Plug in connection from wire harnesses to lift unit wiring (match color coded wires).

(13) Attach toggle switch bracket to instrument panel. Using bracket as template, drill two 5/32-inch (0.161-inch) diameter holes and install toggle switch bracket with self-tapping screws.

(14) Affix decal to toggle switch bracket.

(15) Connect wires and wiring harness connector to toggle switches.

(16) Install toggle switches on toggle switch bracket and install handles.

(17) Connect fuse assembly and wire to accessory side of ignition switch.

(18) Connect negative battery cable and test operation.

Charging and Bleeding System

Power angling cylinders furnished with the electronic power pack have been filled with the proper amount of fluid and are ready for operation.

If for any reason, fluid must be added to the reservoir or the power angling cylinders, they must be bled first. Proceed as follows.

(1) Remove filler plug from power lift reservoir to enable fluid to be added during charging and bleeding (fig. 1-21).

NOTE: *Maintain a constant check on fluid level.*

(2) Loosen female coupler at the right angling cylinder and hose at left angling cylinder.

NOTE: *Base end of cylinders must be higher than rod end to allow trapped air to escape.*

(3) Angle plow in both directions repeatedly, until fluid leaks out at both points in a steady flow.

(4) Tighten coupler and hose.

CAUTION: *Proper fluid level is one inch below top of filler hole. Fluid level must be checked with lift arm fully retracted. Over- or under-filling may damage electronic power pack.*

TROUBLESHOOTING ELECTRONIC POWER PACKS E-46 AND E-47

When encountering malfunctions in Models E-46 and E-47 Power Packs, refer to Diagnosis Charts and Hydraulic Flow Charts before disassembling.

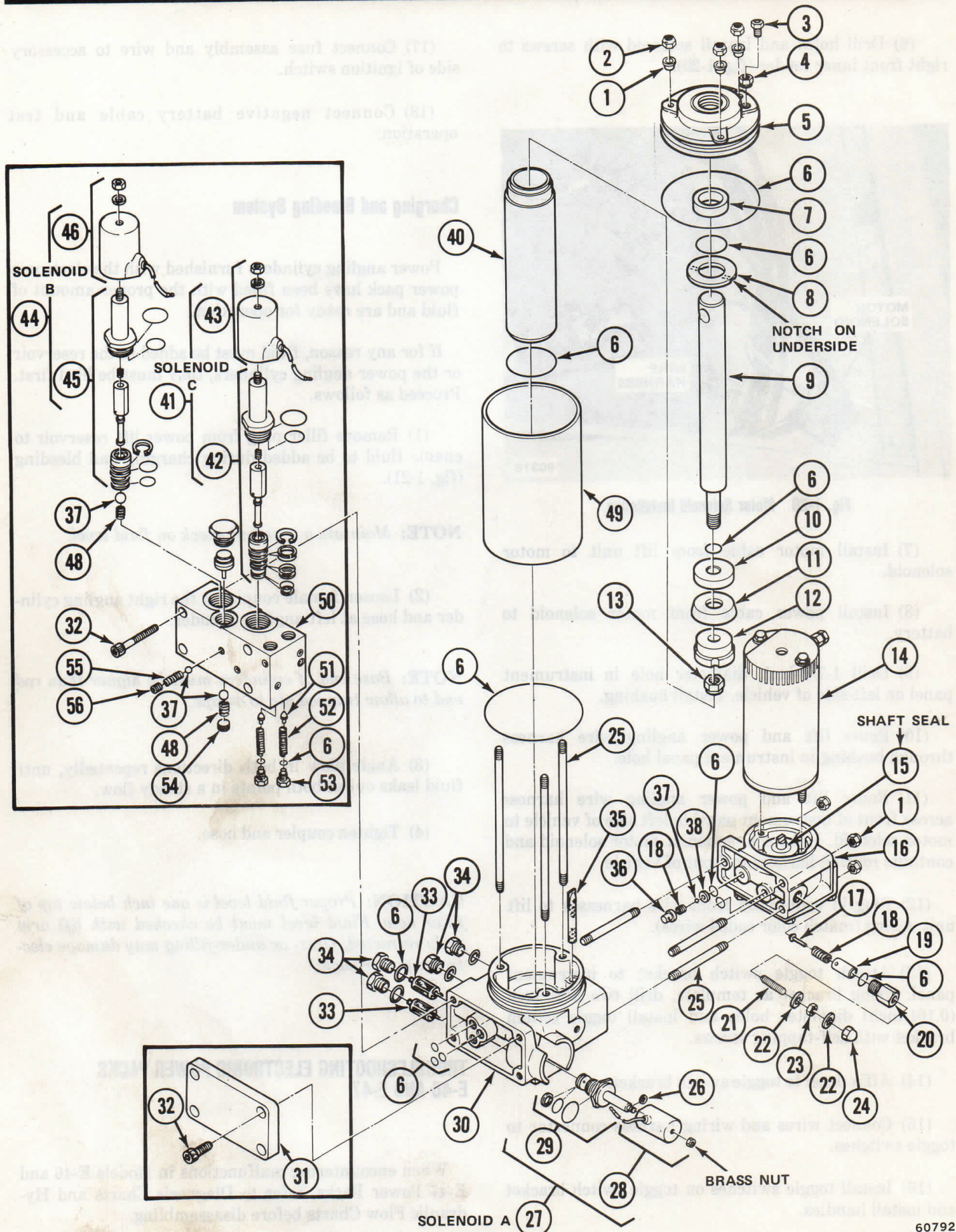


Fig. 1-21 Electronic Power Pack—Exploded View

- | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ol style="list-style-type: none"> 1. PLASTIC WASHER 2. LOCKNUT 3. PRESSURE RELIEF VALVE 4. FILLER PLUG 5. COVER AND SEAL ASSEMBLY 6. O-RING 7. SLEEVE 8. WASHER 9. RAM ASSEMBLY 10. PISTON 11. PACKING CUP 12. PISTON FOLLOWER 13. LOCKNUT 14. MOTOR 15. SHAFT SEAL 16. PUMP ASSEMBLY 17. POPPET 18. SPRING 19. GUIDE | <ol style="list-style-type: none"> 20. RETAINER 21. SETSCREW 22. ALUMINUM WASHER 23. JAMNUT 24. ACORN NUT 25. STUD 26. BRASS WASHER 27. 2-WAY SOLENOID 28. 2-WAY COIL 29. 2-WAY VALVE 30. BASE AND STRAINER ASSEMBLY 31. END PLATE 32. SOCKET HEAD CAP SCREW 33. FILTER 34. PLUG 35. STRAINER 36. CHECK VALVE RETAINER 37. BALL 38. INSERT VALVE | <ol style="list-style-type: none"> 39. CYLINDER TANK 40. CYLINDER 41. 4-WAY SOLENOID 42. 4-WAY VALVE 43. 4-WAY COIL 44. 3-WAY SOLENOID 45. 3-WAY VALVE 46. 3-WAY COIL 47. CAP PLUG 48. CHECK SPRING 49. PISTON ASSEMBLY 50. VALVE BLOCK 51. X-OVER POPPET 52. X-OVER SPRING 53. PLUG END 54. PRESSURE PLUG 55. VALVE SPRING 56. PRESSURE PLUG |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Legend For Figure 1-21

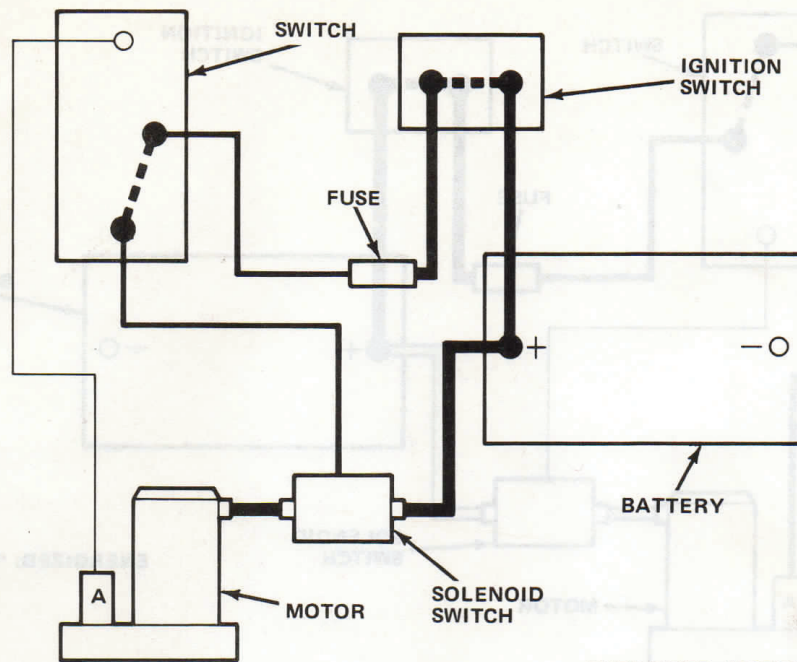
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Electronic Power Pack Models E-46 and E-47 Diagnosis Chart

Model	Condition	Possible Cause	Correction
All	MOTOR DOES NOT OPERATE	<ol style="list-style-type: none"> (1) Discharged or defective battery. (2) Loose or corroded electrical connections. (3) Inoperative solenoid switch. (4) Malfunctioning control switch. (5) Malfunctioning motor. 	<ol style="list-style-type: none"> (1) Recharge or replace battery. (2) Clean and tighten electrical connections. (3) Replace solenoid switch. (4) Replace control switch. (5) Repair or replace motor.
All	PLOW DOES NOT LOWER	<ol style="list-style-type: none"> (1) No current to "A" coil. (2) "A" cartridge jammed in closed position. (3) Inoperative "A" coil. 	<ol style="list-style-type: none"> (1) Locate malfunction and repair. (2) Clean or replace "A" cartridge. (3) Replace "A" coil.
E-46 and E-46H	PLOW CREEPS DOWN.	<ol style="list-style-type: none"> (1) Leaking "A" cartridge. (2) Leaking "A" cartridge O-ring. (3) Leaking Pump Check Valve. (4) Leaking Ram Packing Cup. (5) Leaking O-ring at bottom of lift cylinder. 	<ol style="list-style-type: none"> (1) Clean or replace "A" cartridge. (2) Replace O-ring. (3) Clean or replace Pump Check Valve. (4) Replace Ram Packing Cup. (5) Replace O-ring.
E-46 and E-46H	PLOW DOES NOT LIFT OR LIFTS SLOWLY — MOTOR OPERATES	<ol style="list-style-type: none"> (1) Low hydraulic fluid level. (2) Discharged battery. (3) Loose or corroded electrical connections. (4) Leaking or open "A" cartridge. (5) Malfunctioning motor. (6) Malfunctioning pump. 	<ol style="list-style-type: none"> (1) Add fluid to proper level. (2) Recharge battery. (3) Clean and tighten electrical connections. (4) Clean or replace "A" cartridge. (5) Repair or replace motor. (6) Replace pump.

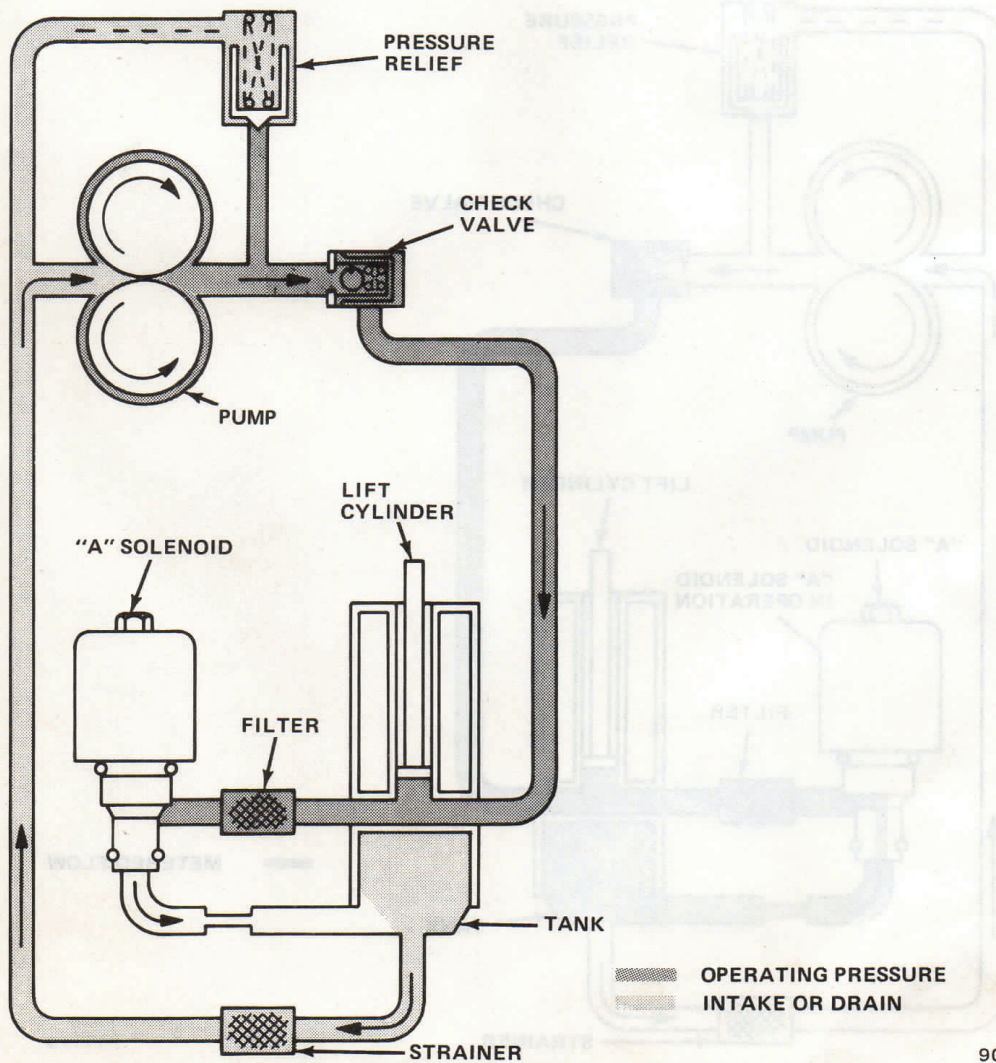
Electronic Power Pack Models E-46 and E-47 Diagnosis Chart

Model	Condition	Possible Cause	Correction
E-47 and E-47H	PLOW CREEPS DOWN	<ol style="list-style-type: none"> (1) Leaking "A" cartridge. (2) Leaking "A" cartridge O-ring. (3) Leaking "B" check valve. (4) Leaking ram packing cup. (5) Leaking O-ring at bottom of lift cylinder. 	<ol style="list-style-type: none"> (1) Clean or replace "A" cartridge. (2) Replace O-ring. (3) Clean or replace "B" check valve. (4) Replace ram packing cup. (5) Replace O-ring.
E-47 and E-47H	PLOW DOES NOT LIFT OR LIFTS SLOWLY — MOTOR OPERATES	<ol style="list-style-type: none"> (1) Low hydraulic fluid level. (2) Discharged battery. (3) Leaking or open "A" cartridge. (4) No current to "B" coil. (5) Inoperative "B" coil. (6) Malfunctioning motor. (7) Malfunctioning pump. 	<ol style="list-style-type: none"> (1) Add fluid to proper level. (2) Recharge battery. (3) Clean or replace "A" cartridge. (4) Locate malfunction and repair. (5) Replace "B" coil. (6) Repair or replace motor. (7) Replace pump.
E-47 and E-47H	PLOW DOES NOT ANGLE RIGHT — MOTOR OPERATES	<ol style="list-style-type: none"> (1) Improper coupler engagement. (2) Mechanical bind or interference. (3) Malfunctioning coupler. (4) No current to "C" coil. (5) Inoperative "C" coil. (6) Inoperative "C" cartridge. (7) Leaking or open crossover relief valve. 	<ol style="list-style-type: none"> (1) Engage coupler properly. (2) Eliminate mechanical bind (3) Repair or replace coupler. (4) Locate malfunction and repair. (5) Replace "C" coil. (6) Clean or replace "C" cartridge. (7) Clean or replace crossover relief valve.
E-47 and E-47H	PLOW DOES NOT ANGLE LEFT — MOTOR OPERATES	<ol style="list-style-type: none"> (1) Improper coupler engagement. (2) Mechanical bind or interference. (3) Malfunctioning coupler. (4) Leaking or open crossover relief valve. 	<ol style="list-style-type: none"> (1) Engage coupler properly. (2) Eliminate mechanical bind or interference. (3) Repair or replace coupler. (4) Clean or replace crossover relief valve.
E-47 and E-47H	PLOW WILL NOT ANGLE — MOTOR OPERATES	<ol style="list-style-type: none"> (1) Improper coupler engagement. (2) Mechanical bind or interference. 	<ol style="list-style-type: none"> (1) Engage coupler properly. (2) Eliminate mechanical bind or interference.
E-47 and E-47H	PLOW WILL NOT HOLD IN ANGLED POSITION	<ol style="list-style-type: none"> (1) Air in cylinders and hoses. (2) Leaking "C" cartridge O-rings. (3) Leaking or open pilot check valve. (4) Leaking crossover relief valve. (5) Crossover relief valve opening at too low a pressure. 	<ol style="list-style-type: none"> (1) Bleed cylinders and hoses. (2) Replace O-rings. (3) Clean or replace pilot check valve. (4) Clean or replace crossover relief valve. (5) Replace crossover relief valve.



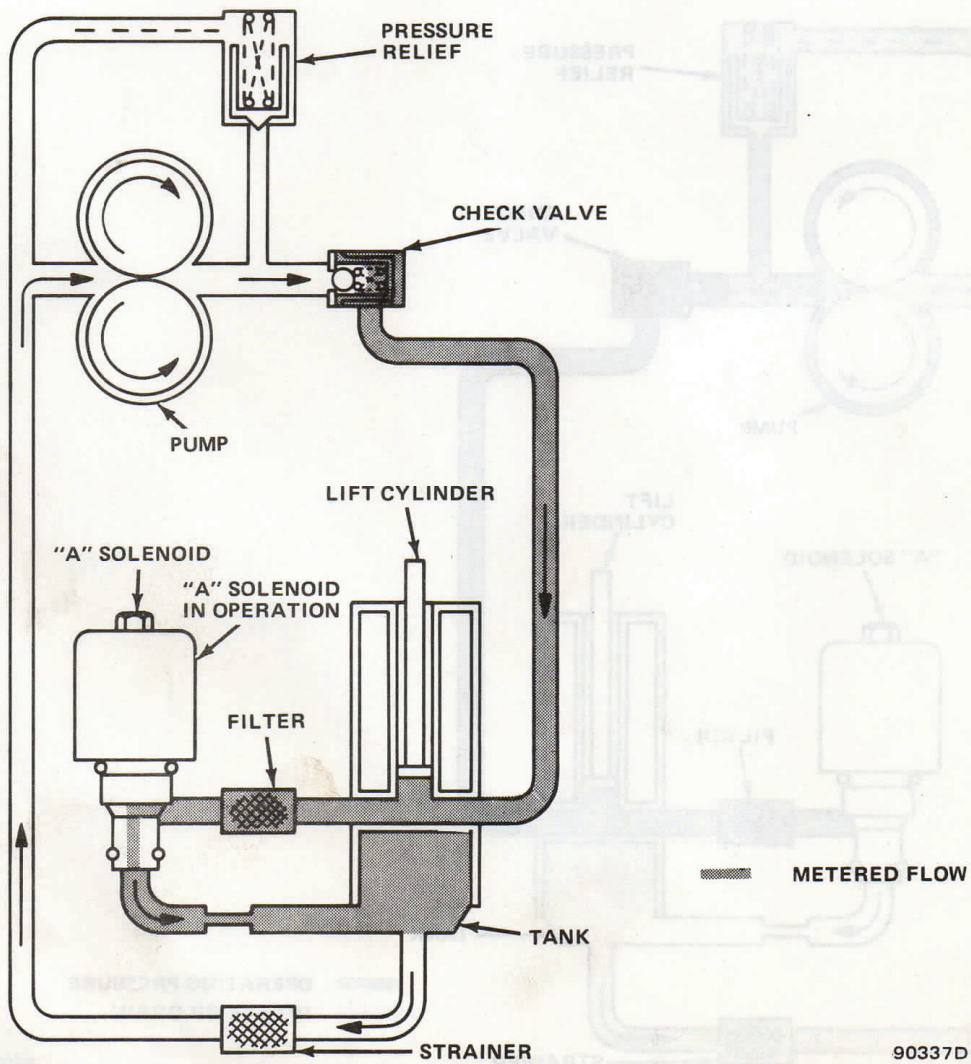
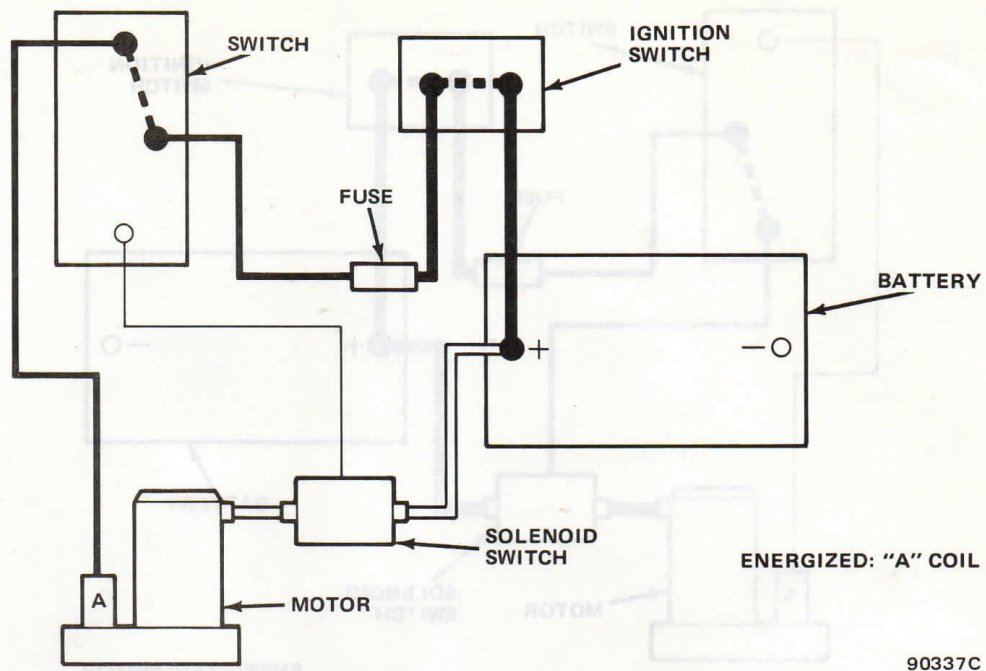
ENERGIZED: MOTOR

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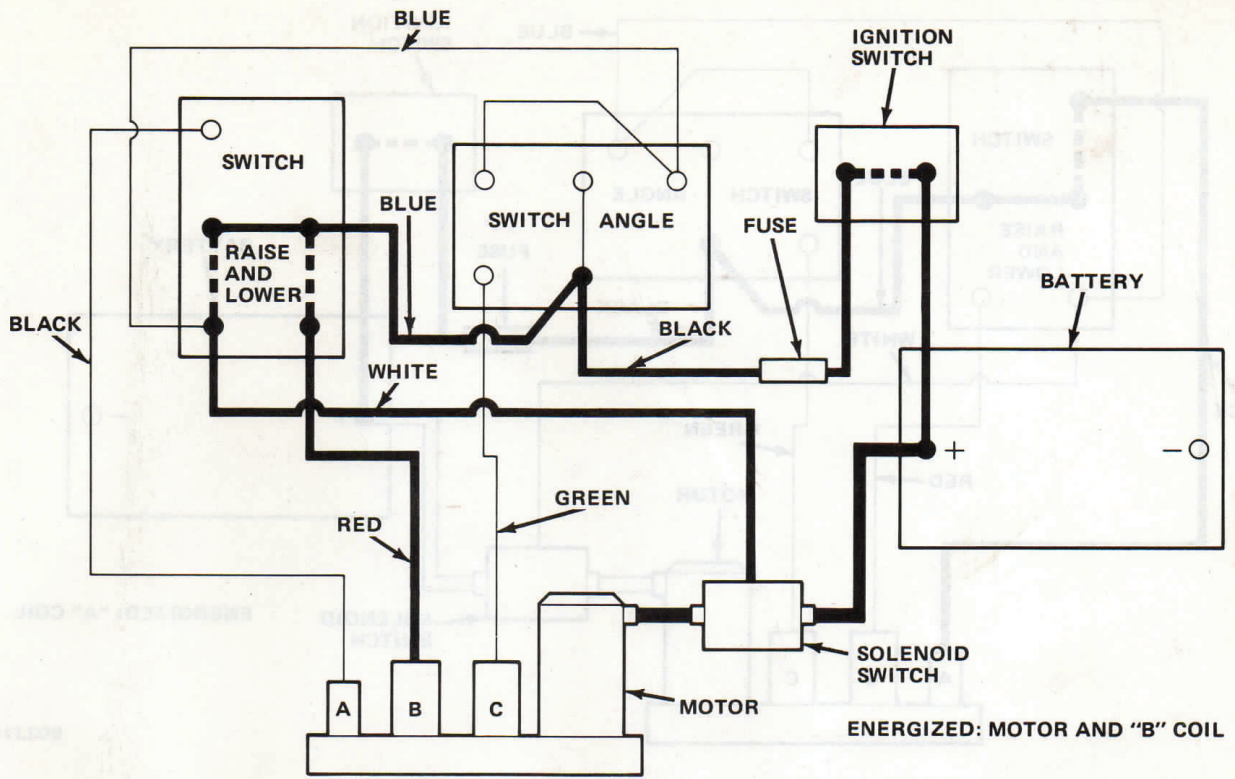


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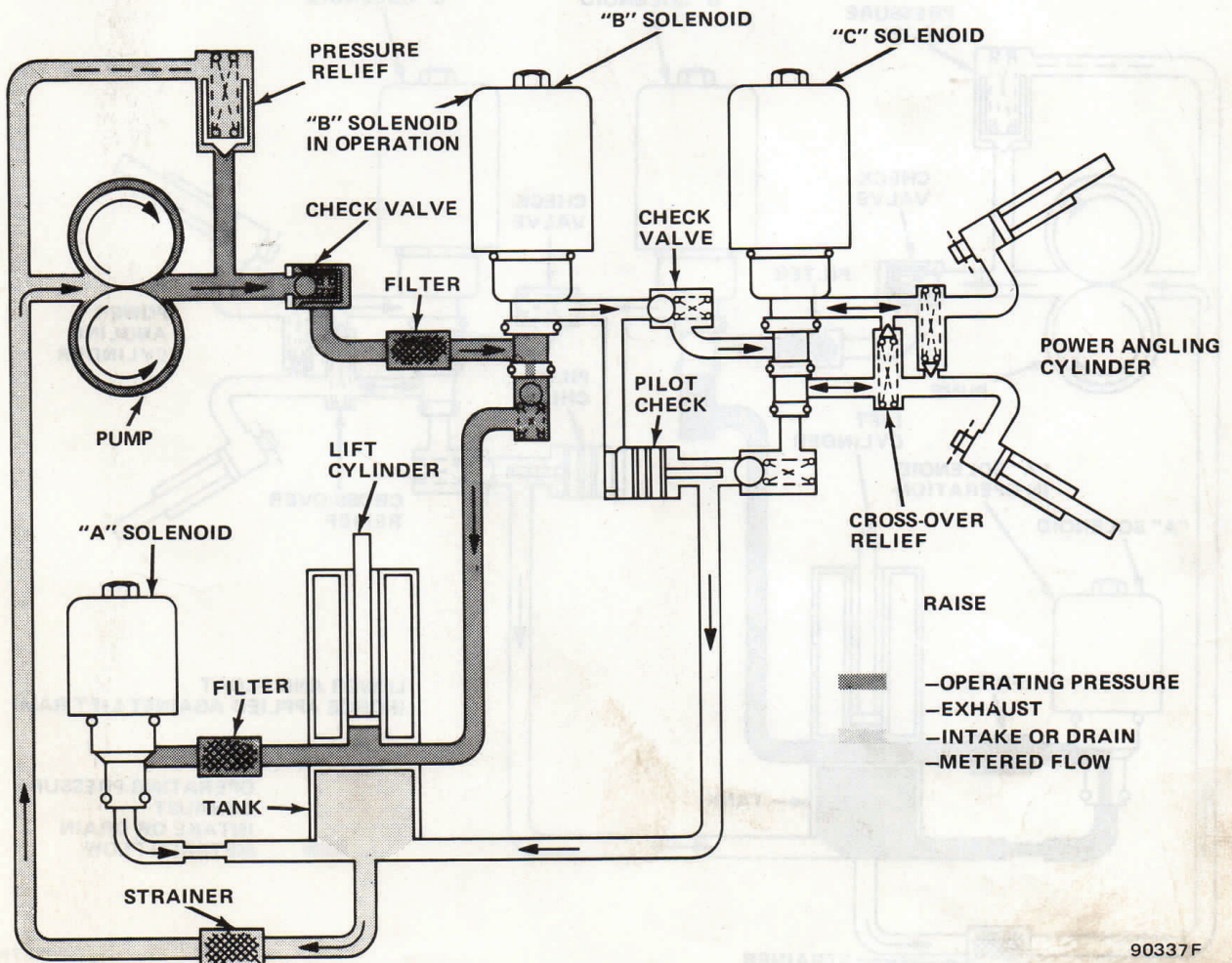
Hydraulic Flow Chart Model E-46—Raise



Hydraulic Flow Chart Model E-46—Lower and Float

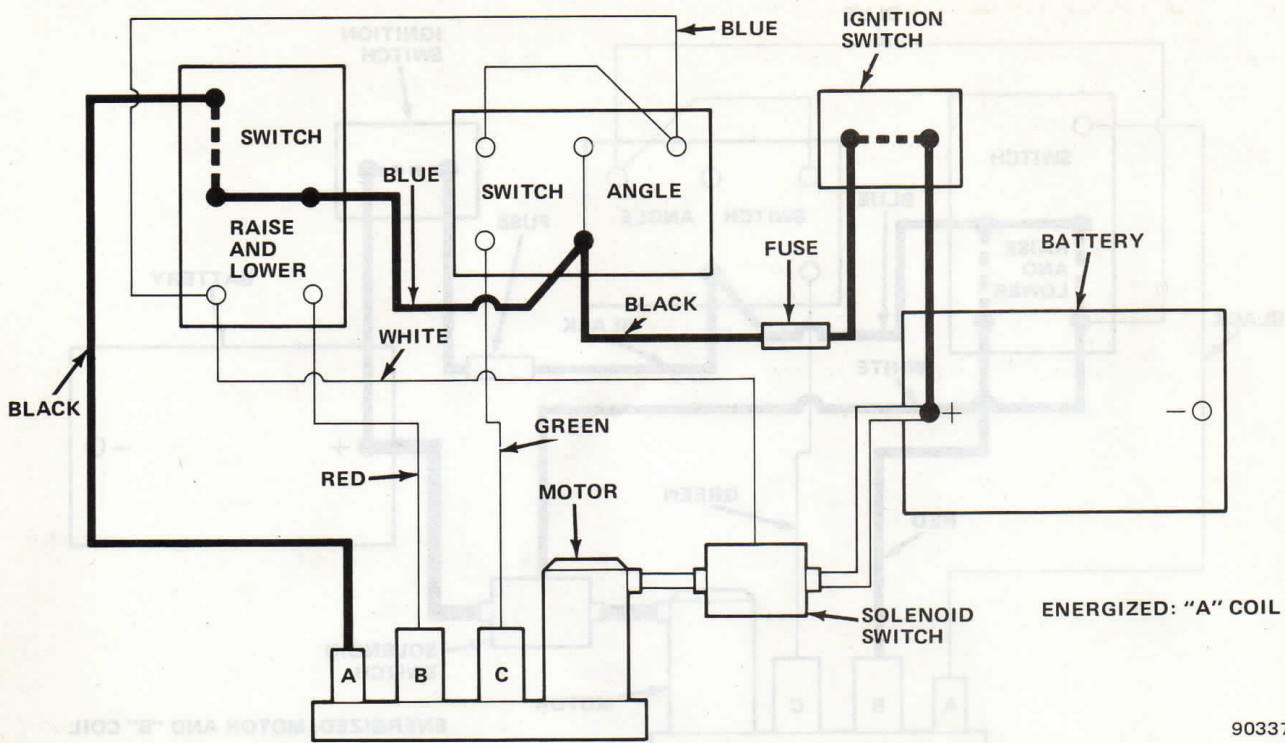


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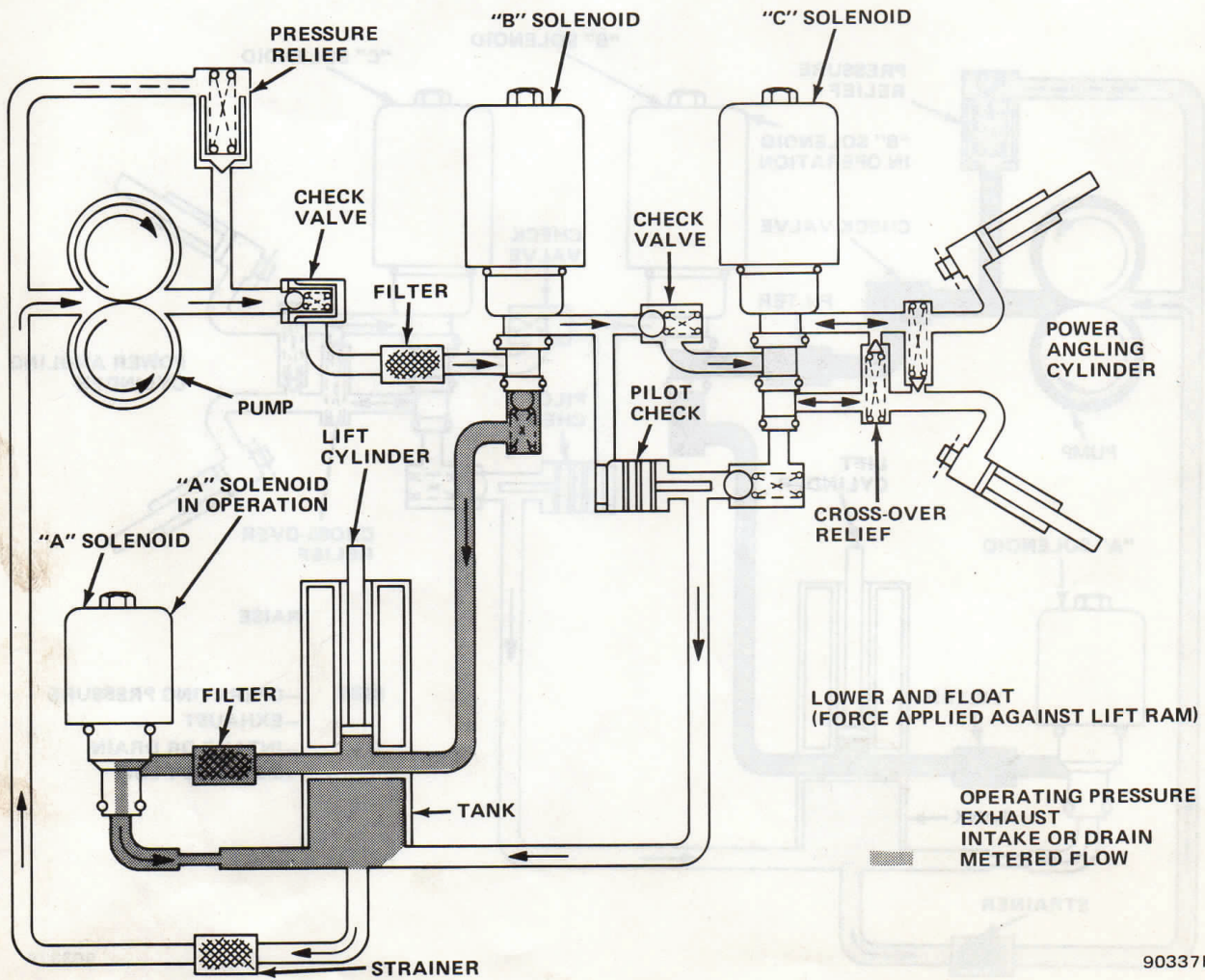


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Hydraulic Flow Chart Models E-47 and E-47H—Raise

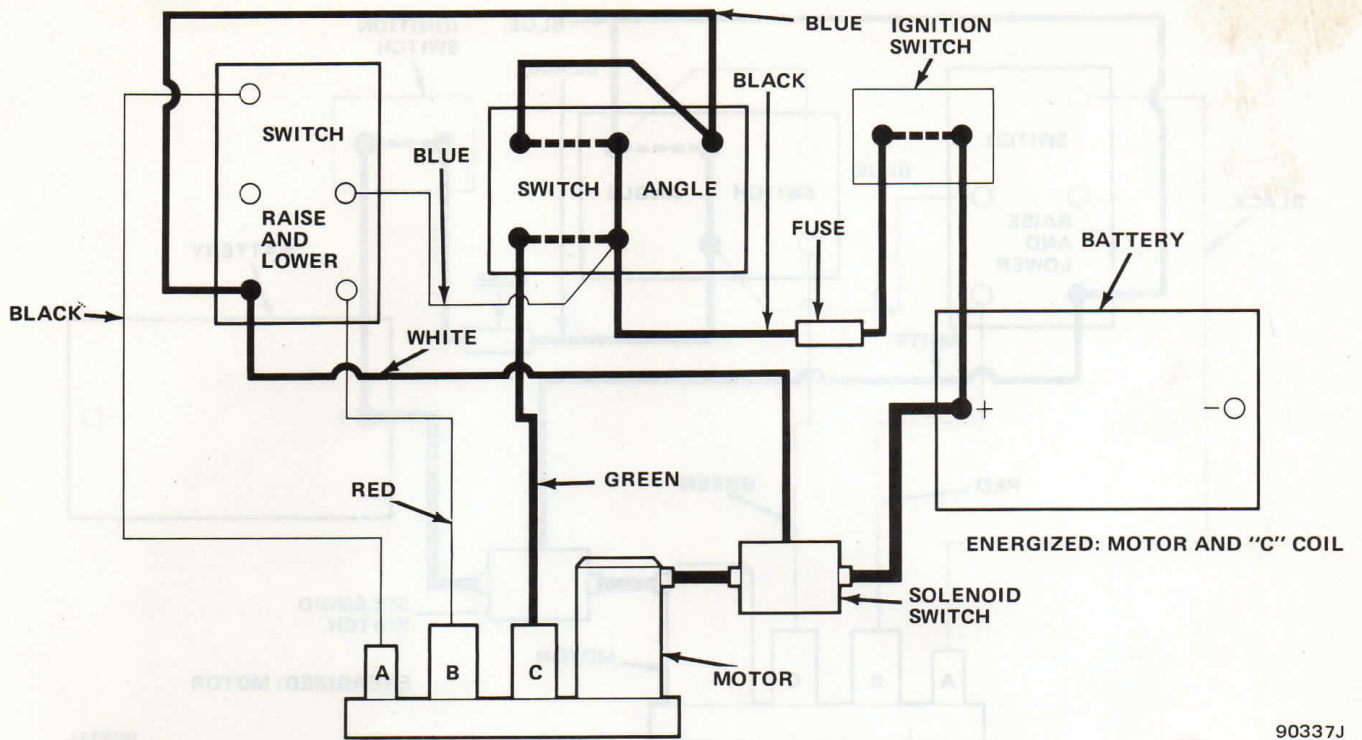


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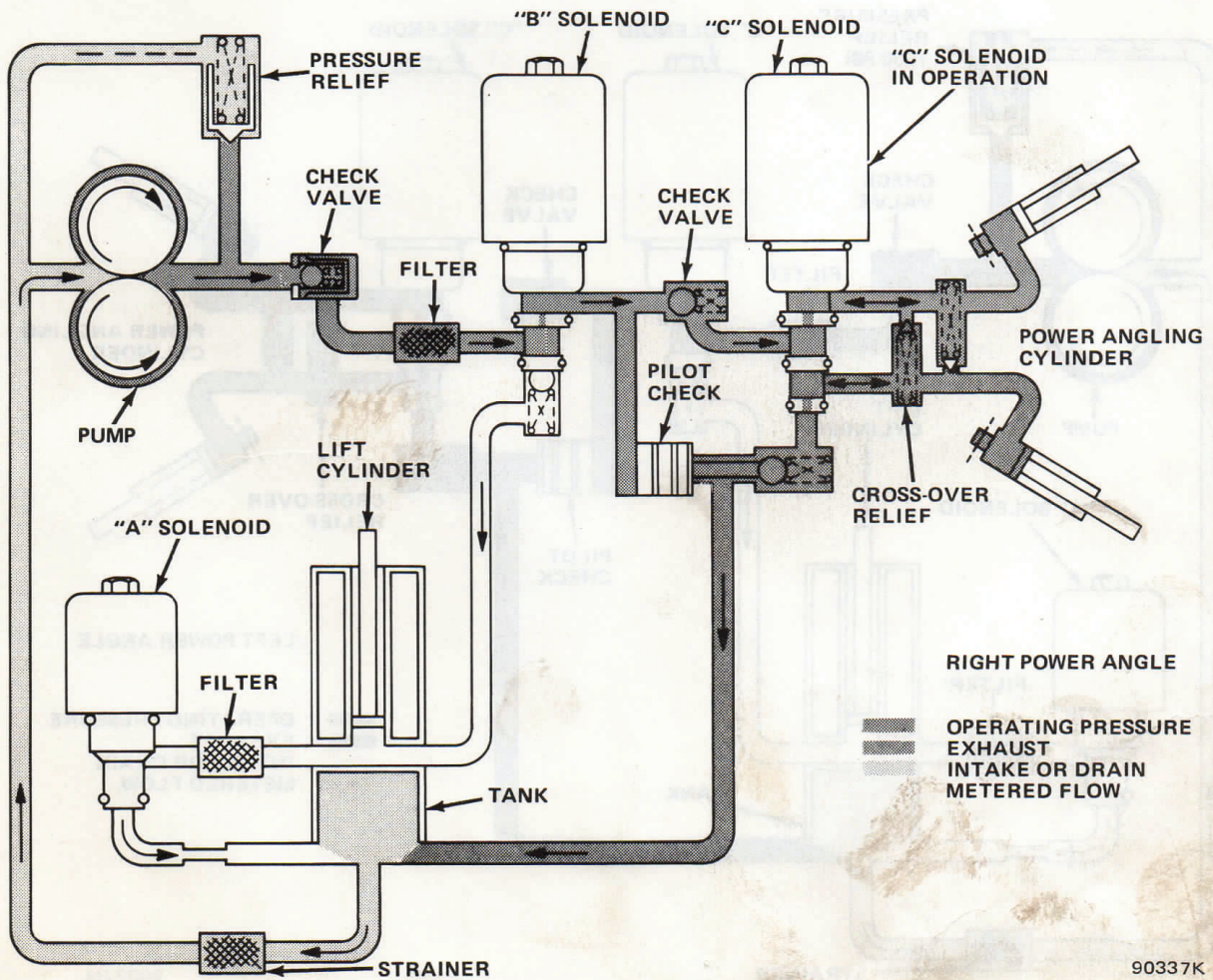


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Hydraulic Flow Chart Models E-47 and E-47H—Lower and Float

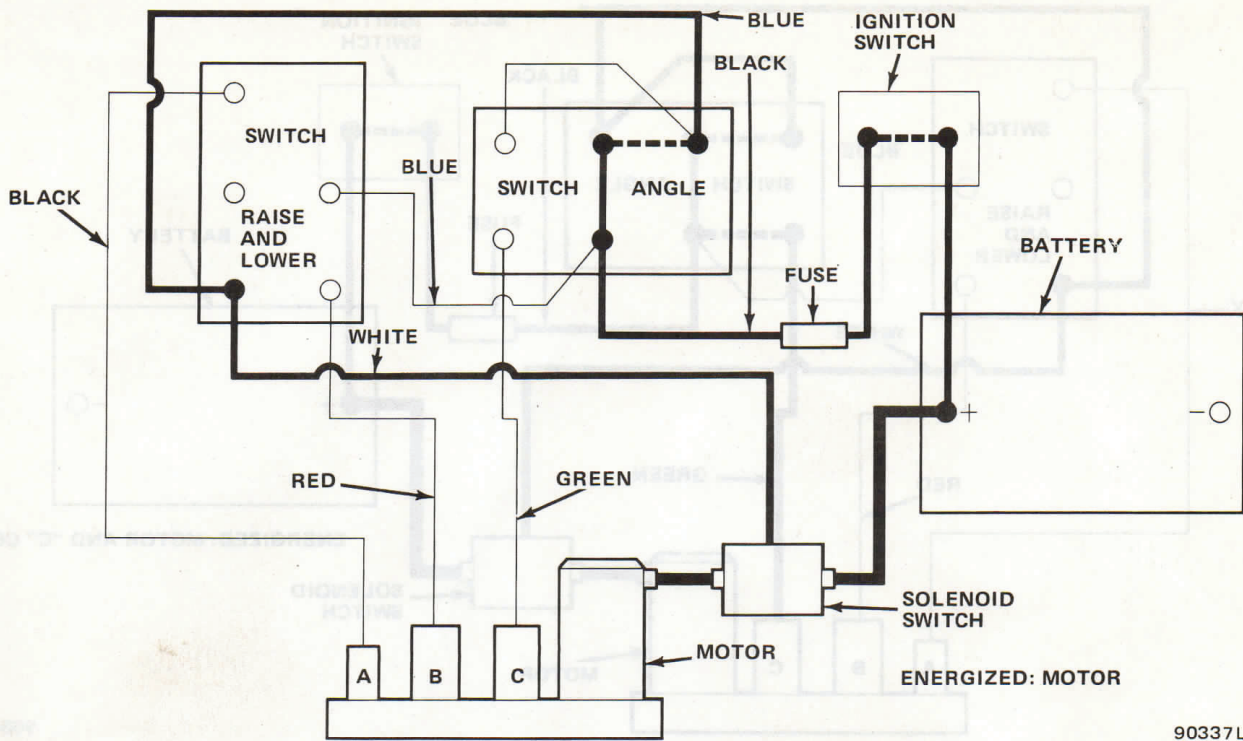


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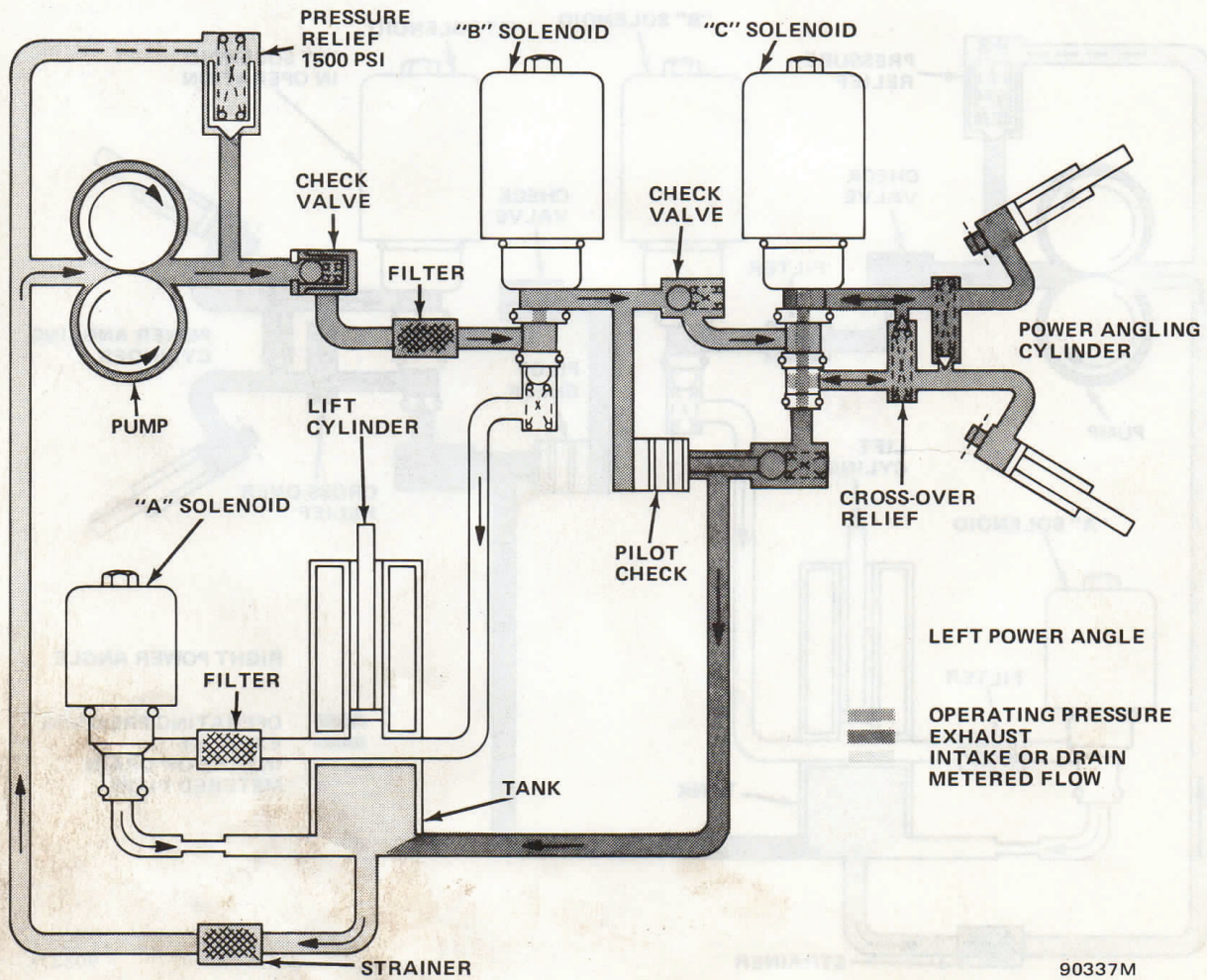


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Hydraulic Flow Chart Models E-47 and E-47H—Angle Right



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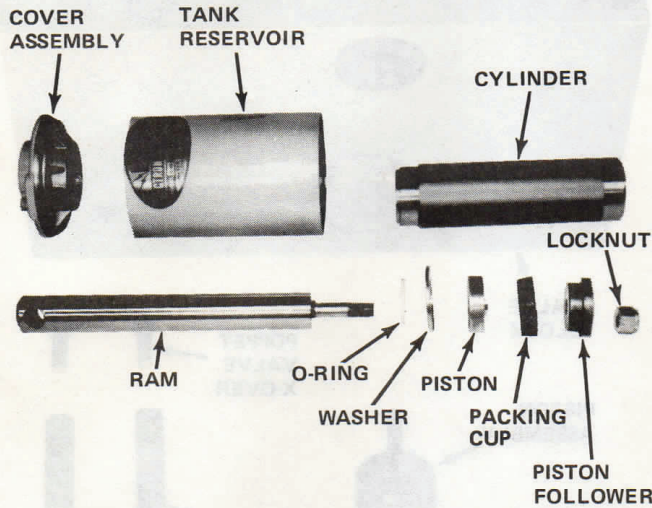


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Hydraulic Flow Chart Models E-47 and E-47H—Angle Left

Disassembly and Inspection

- (1) Remove locknuts from reservoir cover (fig. 1-21).
- (2) Remove cover assembly. Check for casting cracks or damage (fig. 1-22). Inspect seal for cuts.



J50047

Fig. 1-22 Lift Cylinder Components

- (3) Remove ram and piston. Check nylon sleeve, piston, and piston follower for excessive wear.
- (4) Inspect cylinder for scoring and pitting in bore.
- (5) Inspect ram for nicks, scratches, rust and corrosion.
- (6) Inspect piston packing cup for wear or a cut sealing lip.
- (7) Clean and inspect base strainer.
- (8) Replace all O-rings at assembly.
- (9) Loosen motor attaching bolts. Do not remove bolts from motor assembly.

NOTE: Be sure that motor endplate is held in place during removal.

- (10) Temporarily install two 1/4-20 nuts on motor attaching bolts to keep motor intact.

NOTE: Both Prestolite and American Bosch motors are used. Prestolite can be identified by a domed top cover and the name stamped on the body. American Bosch motors have a flat top cover and no identifying marks.

NOTE: Do not disassemble pump. Proper assembly and adjustment cannot be accomplished without special tools and instruments.

- (11) Remove pump drive shaft seal (if damaged) with a pointed tool.

NOTE: Check seal kits before overhaul is attempted to verify correct replacement components are on hand.

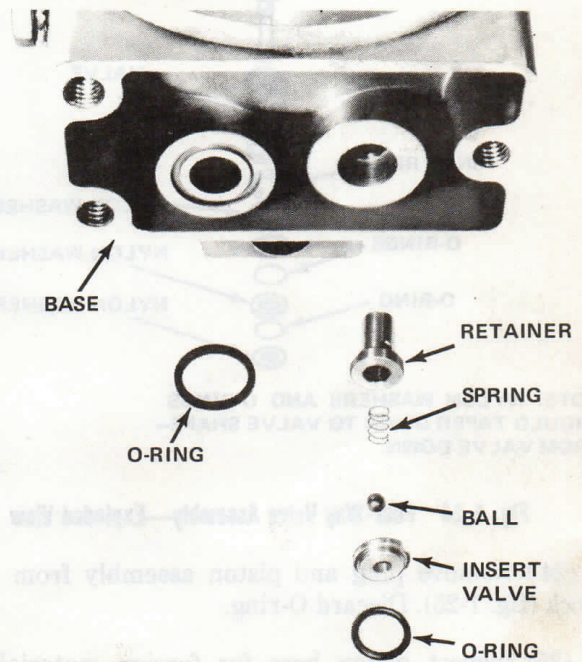
- (12) Dip new seal in oil and slip over pump shaft with lip down.
- (13) Press seal into pump housing and position slightly below face of boss.

- (14) Remove 2-way solenoid A from base using 1-1/8 inch deepwell socket and inspect for external damage.

- (15) Remove coil and test for electrical continuity. Normal coil resistance is 7.6 ohms.

- (16) Clean filter assembly screen with solvent and compressed air. Discard O-ring and nylon retaining ring.

- (17) Remove pump housing and insert valve, ball, spring and retainer from base (fig. 1-23). Inspect for damage or dirt. Discard O-rings.



J50048

Fig. 1-23 Insert Valve—Exploded View

- (18) Remove socket-head screws and remove valve block from base. Discard O-rings.

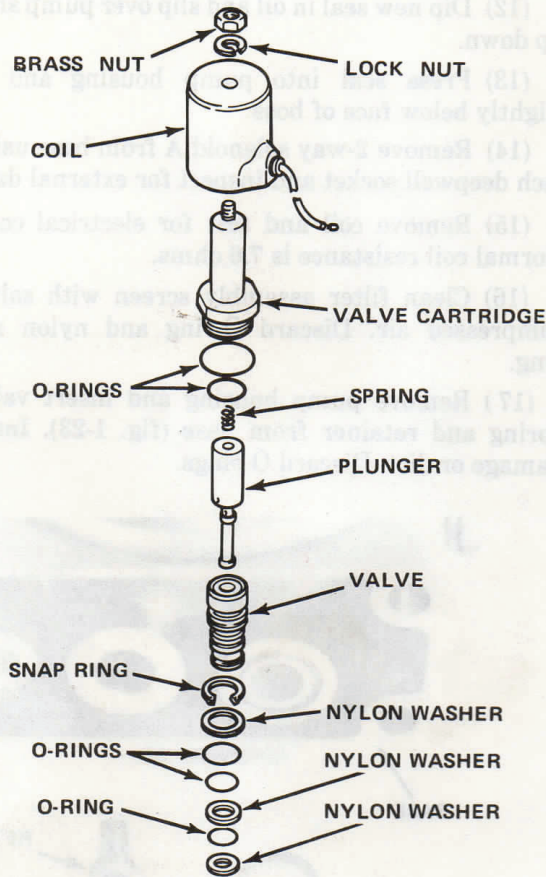
- (19) Remove 3-way solenoid B with Solenoid Socket Wrench J-25399. Remove ball and spring from valve block. Clean solenoid and inspect for external damage.

- (20) Disassemble 3-way valve. Discard O-ring.

- (21) Remove and clean 4-way solenoid C valve with Solenoid Socket Wrench J-25399. Inspect solenoid for external damage.

(22) Disassemble 4-way valve. Discard O-rings (fig. 1-24).

(23) Test coils and 4-way valve for electrical continuity. Normal coil resistance is 3.5 ohms.



NOTE: NYLON WASHERS AND O-RINGS SHOULD TAPER DOWN TO VALVE SHAPE—FROM VALVE DOWN.

50049

Fig. 1-24 Four-Way Valve Assembly—Exploded View

(24) Remove plug and piston assembly from valve block (fig. 1-25). Discard O-ring.

(25) Inspect piston bore for foreign material and scratches. Piston must move freely in bore.

CAUTION: Pressure plugs are spring loaded and care must be used during removal.

(26) Remove pilot check valve plug, spring, and ball from bottom of valve block.

(27) Inspect spring for damage and ball seat for nicks.

(28) Remove acorn nut to gain access to crossover valve components.

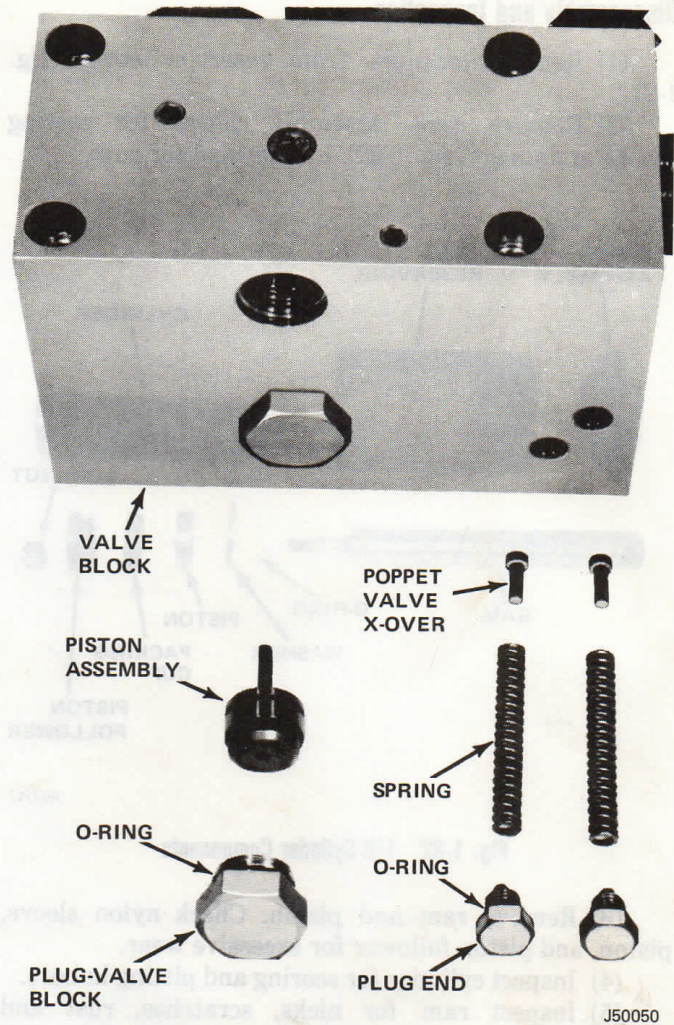


Fig. 1-25 Piston Assembly and Poppet Valves—Exploded View

(29) Remove crossover valve components (fig. 1-26). Inspect for external damage. Discard O-rings.

(30) Seat poppets if necessary after block is cleaned.

(31) With all parts removed from block, clean block with compressed air to remove foreign particles.

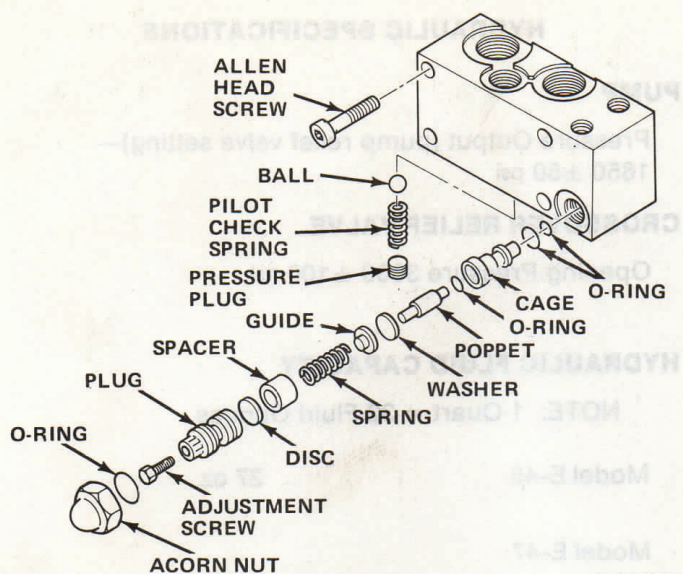
SOLENOID VALVES A, B and C

The solenoid valve coils can be easily checked to determine whether they are receiving current and functioning properly, using the following procedure:

(1) Hold a steel screwdriver blade approximately 1/8-inch above the retaining nut on the coil being checked.

(2) Have an assistant position the control switch which energizes the coil. (Example: Place Raise and Lower Switch in Lower and Float positions to energize A coil.)

(3) When the coil is receiving current and is functioning properly, the magnetism produced will pull the screwdriver blade down to the retaining nut.



90332

Fig. 1-26 Crossover Valve Components

NOTE: Absence of magnetic attraction only focuses in on the problem area. An ohmmeter or continuity tester should then be used to determine whether current is reaching the coil.

Assembly

NOTE: Before assembly, be sure all components are clean and free of dirt, dust, and other foreign matter. Use replacement gaskets and seals during assembly. The application of petroleum jelly or equivalent may aid in the location and installation of rubber O-rings.

- (1) Install crossover valve components in valve block using replacement O-rings.
- (2) Install ball, spring and pressure plug using replacement O-ring in bottom of valve block.
- (3) Assemble 4-way valve with replacement O-rings and nylon retaining rings.
- (4) Install 4-way solenoid C valve with solenoid Socket Wrench J-25399.
- (5) Assemble 3-way valve using replacement O-ring.
- (6) Install ball, spring and 3-way solenoid B valve with Solenoid Socket Wrench J-25399.
- (7) Install valve block and replacement O-rings to base.
- (8) Install pump housing and retainer, spring, ball and insert valve using replacement O-rings. Tighten pump attaching nuts to 100 to 125 inch-pounds (11 to 14 N•m) torque.

NOTE: Apply petroleum jelly or equivalent to O-ring to promote proper placement of outer O-rings.

- (9) Install filter screws.
- (10) Install 2-way solenoid to base.
- (11) Install A coil.
- (12) Install motor to pump engaging gear shaft tang with notch in motor output shaft. Tighten motor attaching bolts to 45 to 55 inch-pounds (5 to 6 N•m) torque.
- (13) Install ram and piston using replacement O-rings.
- (14) Position cover assembly on reservoir and secure with locknuts.

ELECTRICAL SPECIFICATIONS

MOTOR

American Bosch M0551046A

No load (motor not attached to pump)

NOTE: Do not operate motor continuously for more than 30 seconds.

Applied Voltage	12 Volts DC
Max. Current Draw	24 Amperes
Speed (Min.)	5900 RPM

Under load (pump operating in relief)

NOTE: Do not operate motor continuously for more than 5 seconds.

Applied Voltage	12 Volts DC
Max. Current Draw	230 Amperes

Prestolite MGL4105

No load (motor not attached to pump)

NOTE: Do not operate motor continuously for more than 30 seconds.

Applied Voltage	10 Volts DC
Max. Current Draw	45 Amperes
Speed (Min.)	10,000 RPM

Under load (pump operating in relief)

NOTE: Do not operate motor continuously for more than 5 seconds.

Applied Voltage	12 Volts DC
Max. Current Draw	230 Amperes

SOLENOID VALVES A, B AND C

A Coil

Applied Voltage 12 Volts DC
 Current Draw 0.83 Amperes

Nominal resistance (ohmmeter lead connected to coil lead, other meter lead connected to metal coil cover)—7.6 ohms.

B and C Coils

Applied Voltage 12 Volts DC
 Current Draw 1.24 Amperes

Nominal resistance (ohmmeter lead connected to coil lead, other meter lead connected to metal coil cover)—3.5 ohms.

SOLENOID SWITCH

Applied Voltage 12 Volts DC
 Max. Current Draw 5 Amperes

Nominal resistance (ohmmeter lead connected to coil lead, other meter lead connected to metal foot)—2.65 - 4.5 ohms.

TORQUE SPECIFICATIONS

	Thread Size	U.S.A. Torque (In. Lbs.)	Metric Torque (N•m)
Reservoir Cover Retaining Nuts	5/16-24	100-125	11-14
Pump Assembly Retaining Nuts	5/16-24	100-125	11-14
Endplate or Valve Block Retaining Capscrews	5/16-18	100 ± 5	11 ± 1
Motor to Pump Retaining Capscrews	1/4-20	45-55	5-6

HYDRAULIC SPECIFICATIONS

PUMP

Pressure Output (pump relief valve setting)—1650 ± 50 psi

CROSSOVER RELIEF VALVE

Opening Pressure 3000 ± 100 psi

HYDRAULIC FLUID CAPACITY

NOTE: 1 Quart = 32 Fluid Ounces

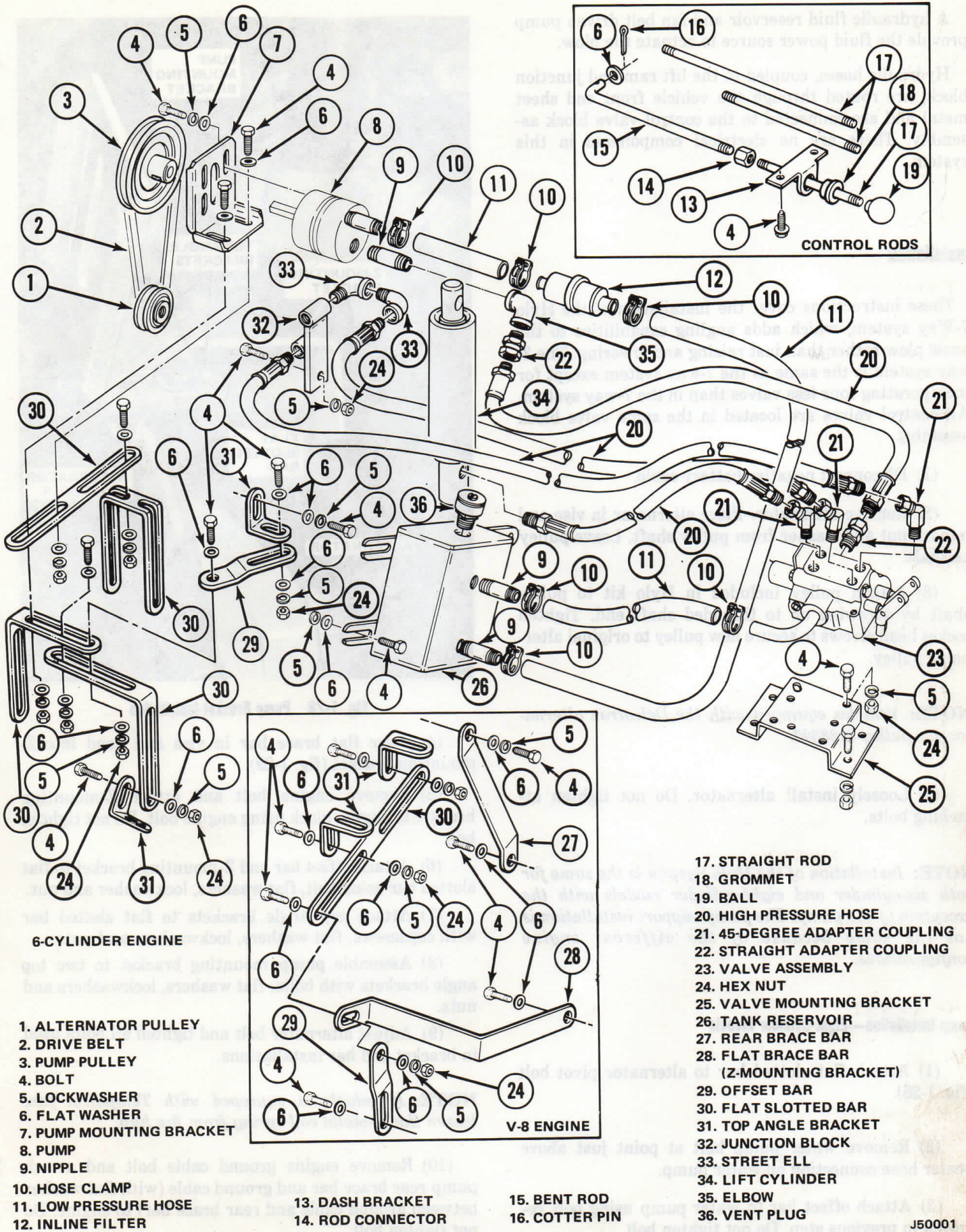
Model E-46	27 oz.
Model E-47	
Unit	28 oz.
Hoses & 1½ x 10 Cylinders	16 oz.
Total	1 qt., 12 oz. (44 oz.)
Model E-47	
Unit	28 oz.
Hoses & 1½ x 12 Cylinders	19 oz.
Total	1 qt., 15 oz. (47 oz.)
Model E-47H	
Unit	1 qt., 4.5 oz. (36.5 oz.)
Hoses & 2 x 12 Cylinders	28 oz.
Total	2 qt., .5 oz. (64.5 oz.)

HYLO SYSTEM

General

With the exception of the plow lift cylinder and angling rams, most of the hydraulic system components are mounted under the hood, including the hydraulic pump, reservoir and control valve block assembly (fig. 1-27).

This unit is controlled by rods operated from the instrument panel which are linked to a 3-way hydraulic control valve block for raising and lowering the plow, or to a combination control valve which adds angling capabilities to the plow.



6-CYLINDER ENGINE

- 1. ALTERNATOR PULLEY
- 2. DRIVE BELT
- 3. PUMP PULLEY
- 4. BOLT
- 5. LOCKWASHER
- 6. FLAT WASHER
- 7. PUMP MOUNTING BRACKET
- 8. PUMP
- 9. NIPPLE
- 10. HOSE CLAMP
- 11. LOW PRESSURE HOSE
- 12. INLINE FILTER

V-8 ENGINE

- 13. DASH BRACKET
- 14. ROD CONNECTOR
- 15. BENT ROD
- 16. COTTER PIN

- 17. STRAIGHT ROD
- 18. GROMMET
- 19. BALL
- 20. HIGH PRESSURE HOSE
- 21. 45-DEGREE ADAPTER COUPLING
- 22. STRAIGHT ADAPTER COUPLING
- 23. VALVE ASSEMBLY
- 24. HEX NUT
- 25. VALVE MOUNTING BRACKET
- 26. TANK RESERVOIR
- 27. REAR BRACE BAR
- 28. FLAT BRACE BAR (Z-MOUNTING BRACKET)
- 29. OFFSET BAR
- 30. FLAT SLOTTED BAR
- 31. TOP ANGLE BRACKET
- 32. JUNCTION BLOCK
- 33. STREET ELL
- 34. LIFT CYLINDER
- 35. ELBOW
- 36. VENT PLUG

Fig. 1-27 Hylo System

A hydraulic fluid reservoir and fan belt driven pump provide the fluid power source to actuate the plow.

Hydraulic hoses, coupled to the lift ram and junction block, are routed through the vehicle front end sheet metal and are connected to the control valve block assembly. There are no electrical components in this system.

Installation

These instructions cover the installation of the Hylo 7-Way system, which adds angling capabilities to the snow plow rather than just raising and lowering. The 3-way system is the same as the 7-way system except for incorporating four less valves than in the 7-way system. All control valves are located in the same valve block assembly.

- (1) Disconnect negative battery cable.
- (2) Remove alternator. Place alternator in vise and remove nut and washer from pulley shaft. Leave pulley on shaft.
- (3) Attach pulley included in Hylo kit to pulley shaft by screwing on to threaded shaft end. Tighten socket head screws to secure new pulley to original alternator pulley.

NOTE: Vehicles equipped with the Delcotron alternator use pulley 8123892.

- (4) Loosely install alternator. Do not tighten attaching bolts.

NOTE: Installation of the Hylo System is the same for both six-cylinder and eight-cylinder models with the exception of the pump. The pump support installation is not the same because of the different engine configurations.

Pump Installation—Eight-Cylinder Models

- (1) Attach flat slotted bar to alternator pivot bolt (fig. 1-28).
- (2) Remove water pump bolt at point just above heater hose connection on water pump.
- (3) Attach offset bar to water pump using bolt removed in previous step. Do not tighten bolt.

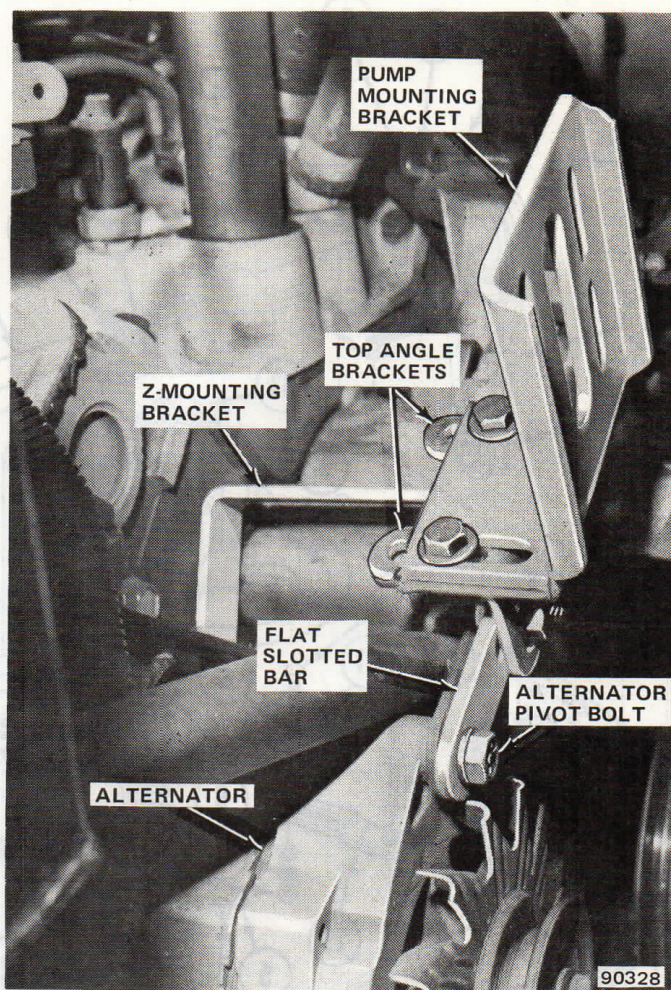


Fig. 1-28 Pump Bracket Installation

- (4) Place flat brace bar in vise and bend into Z-mounting bracket (fig. 1-29).
- (5) Remove engine bolt and attach Z-mounting bracket to engine block using engine bolt. Do not tighten bolt.
- (6) Attach offset bar and Z-mounting bracket to flat slotted bar using bolt, flat washers, lockwasher and nut.
- (7) Attach top angle brackets to flat slotted bar with capscrews, flat washers, lockwashers and nuts.
- (8) Assemble pump mounting bracket to two top angle brackets with bolts, flat washers, lockwashers and nuts.
- (9) Adjust alternator belt and tighten all bolts used in bracket and bar installations.

NOTE: If vehicle is equipped with Tempatrol fan, loosen the bi-metal coil spring from fan hub.

- (10) Remove engine ground cable bolt and attach pump rear brace bar and ground cable (with flat washer between ground cable and rear brace bar) to engine. Do not tighten bolt.

CAUTION: When routing hose, be sure it doesn't interfere with accelerator linkage.

(11) Remove shipping plugs from pump. Install high pressure hose and coupling adapter to back of pump housing.

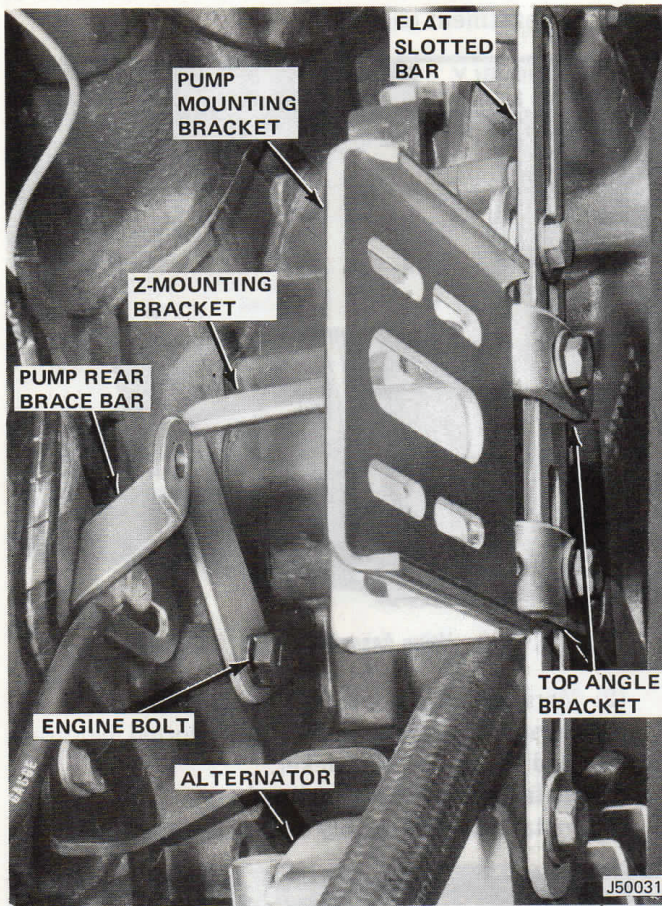


Fig. 1-29 Pump Support Bracket Installation

(12) Attach pump to pump mounting bracket with screws, lockwashers and flat washers (fig. 1-30). Do not tighten screws.

(13) Adjust pump rear brace bar as required for proper alignment and attach to pump with screw, lockwasher, and flat washer. Tighten ground cable mounting bolt. Tighten all bolts (except ground cable bolt) and screws on bracket installation.

(14) Install pump pulley on pump shaft, align with drive pulley on alternator using straightedge, and tighten pump pulley setscrews.

(15) Install pump drive belt. Move pump up on pump mounting bracket to tighten belt, and tighten screws holding pump on mounting bracket.

Pump Installation—Six-Cylinder Models

NOTE: If vehicle is equipped with Tempatrol fan, loosen the bi-metal coil spring from fan hub.

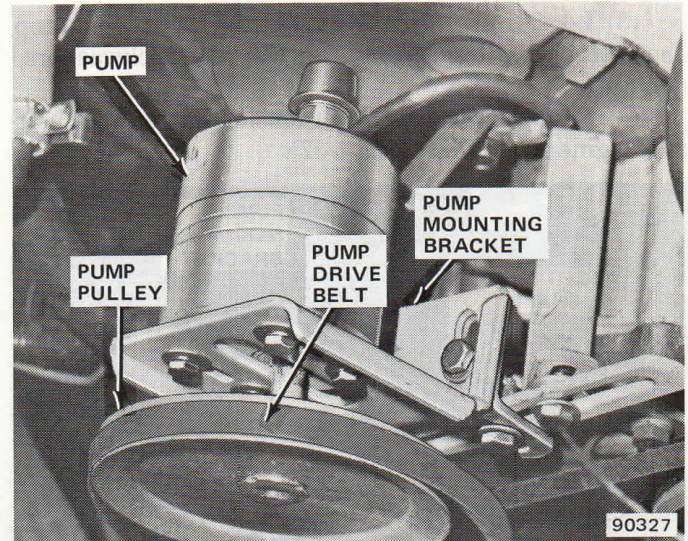


Fig. 1-30 Pump Installation

(1) Four slotted bar pieces are required for six-cylinder model pump installation. One flat piece is required. Using vise, bend two slotted bar pieces into L-shape and one into U-shape (fig. 1-27).

(2) Remove alternator pivot bolt and install U-shape slotted bar piece at alternator pivot point. Replace bolt but do not tighten (fig. 1-31).

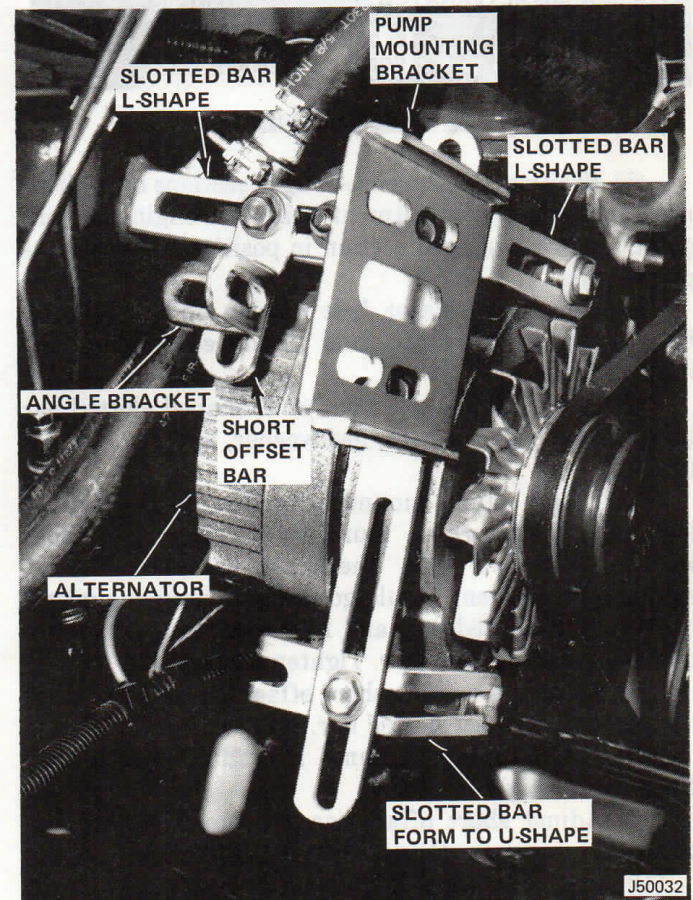


Fig. 1-31 Pump Support Bracket Installation—Six-Cylinder

(3) Loosely assemble two L-shaped sections and top angle bracket using screws, flat washers, lockwashers, and nuts.

(4) Remove alternator belt tension adjustment bolt and engine ground bolt (fig. 1-32).

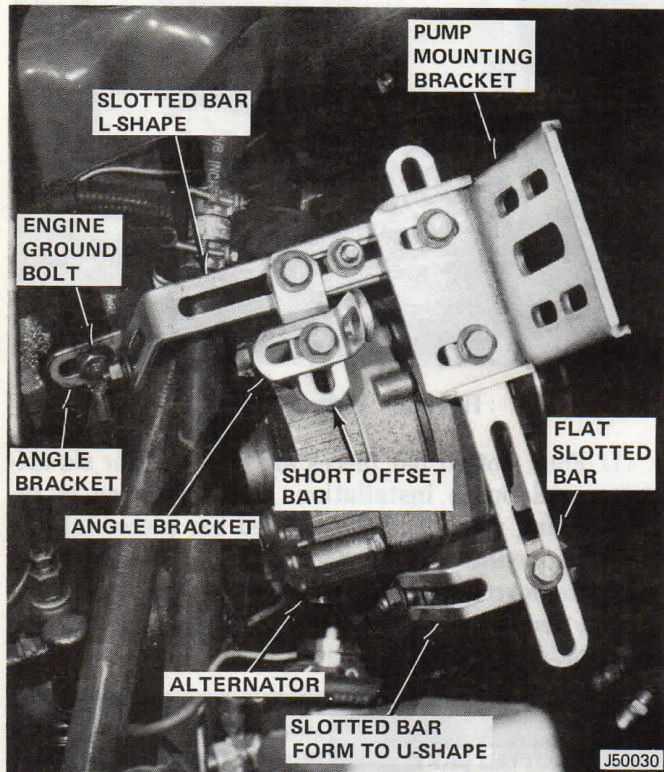


Fig. 1-32 Pump Bracket Installation

(5) Position assembled L-shaped sections over alternator belt tension adjustment point and engine ground point. Secure L-shaped section in position using appropriate bolts.

(6) Adjust alternator belt tension and tighten all bolts used in L-shaped and U-shaped slotted bar installation.

(7) Attach flat slotted bar to U-shaped slotted bar using screw, flat washers, lockwasher, and nut. Do not tighten.

(8) Attach pump mounting bracket to flat slotted bar using two screws, four flat washers, two lockwashers, and two nuts. The screw nearest center of engine compartment should go through pump mounting bracket, flat slotted bar, and L-shaped slotted bar section attached to alternator. Tighten all screws.

(9) Loosely assemble short offset bar and top angle bracket on L-shaped slotted bar.

(10) Attach pump to pump mounting bracket (fig. 1-30). Do not tighten screws.

(11) Adjust short offset bar and top angle bracket and attach to pump. Do not tighten screws.

(12) Install pump pulley on pump shaft, align with drive pulley on alternator using straightedge, and tighten pump pulley setscrews.

(13) Install pump drive belt.

(14) Move pump up on pump mounting bracket to tighten drive belt. Tighten all bolts and screws.

Hydraulic System and Controls Installation

(1) Install valve attaching bracket on left side of engine compartment (fig. 1-33).

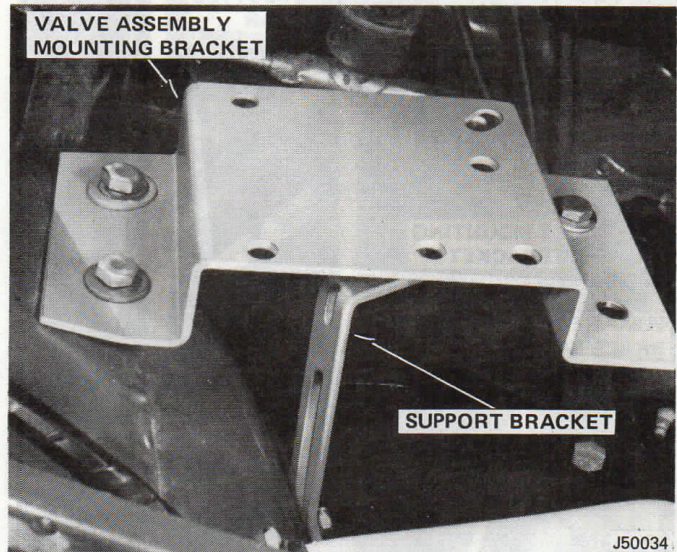


Fig. 1-33 Valve Assembly Bracket Installation

(2) Mark and drill holes for valve bracket.

(3) Form support brackets out of slotted bar stock for rear and inner side of bracket.

(4) Install valve mounting bracket.

(5) Install valve assembly on bracket (fig. 1-34).

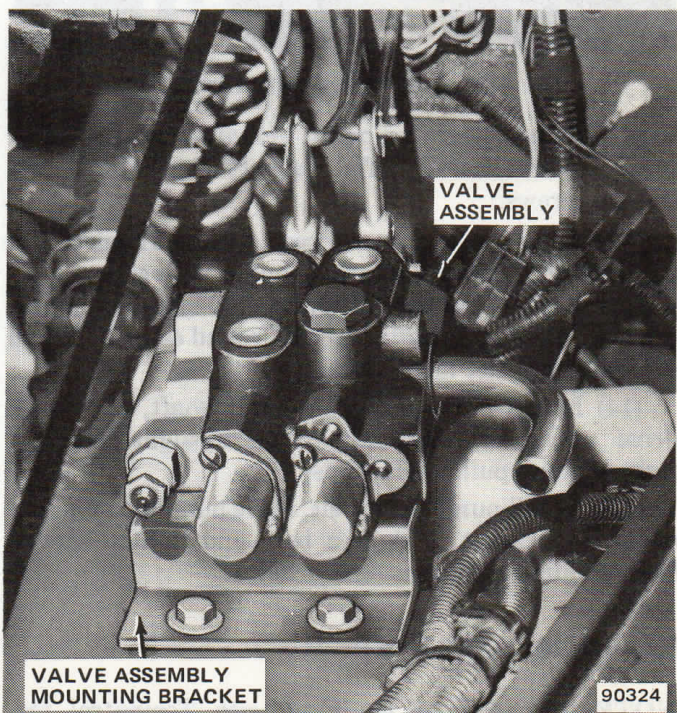


Fig. 1-34 Valve Assembly Installation

(6) Remove shipping plugs and position reservoir as follows:

(a) Cherokee-Wagoneer-Truck—Position on left side of engine compartment (fig. 1-35).

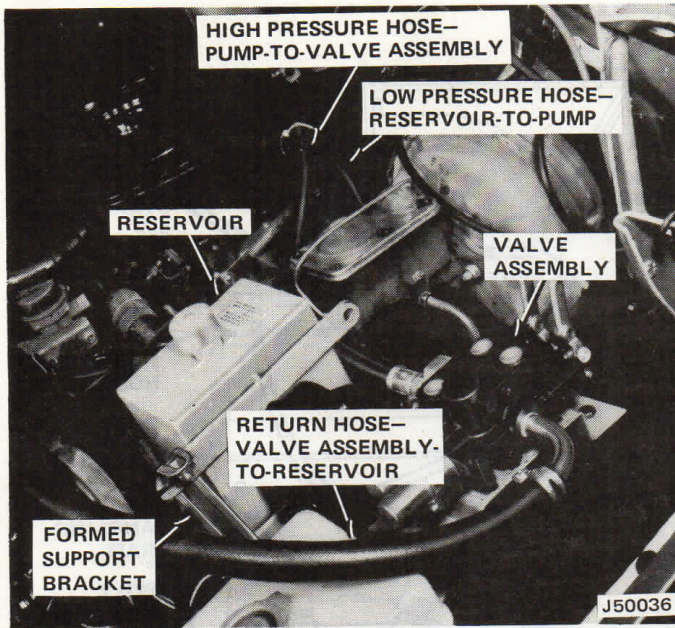


Fig. 1-35 Reservoir Installation—Cherokee-Wagoneer-Truck

(b) CJ Models—Position on right side of engine compartment (fig. 1-36).

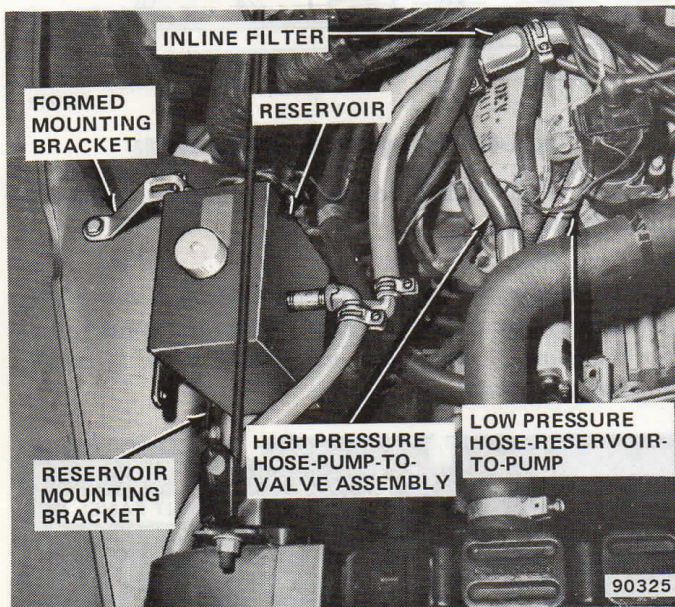


Fig. 1-36 Reservoir Installation—CJ Models

(7) Form bracket as required for installation of reservoir. (Bracket material is supplied with kit.)

(8) Drill necessary holes and install reservoir with screws, flat washers, lockwashers, and nuts (fig. 1-35 and 1-36).

(9) Install low pressure (return) hose from lower outlet on reservoir to upper connection on hydraulic pump. Secure with hose clamps.

(10) Cut hose and install inline filter. Secure with hose clamps (fig. 1-37).

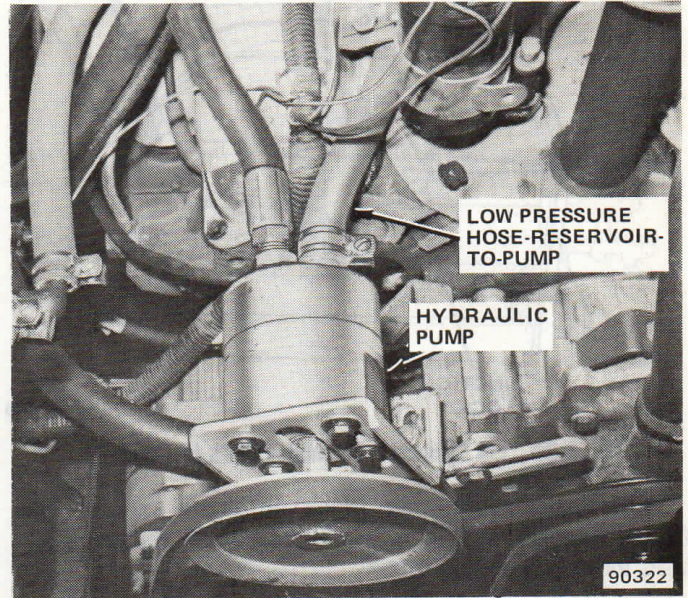


Fig. 1-37 Hydraulic Pump Connections

CAUTION: When routing hose, be sure it does not interfere with accelerator linkage.

(11) Install high-pressure hose assembly from coupling on hydraulic pump to inlet connection on valve assembly with nipple, 45-degree elbow, and coupling (fig. 1-38) if high pressure line has not already been installed.

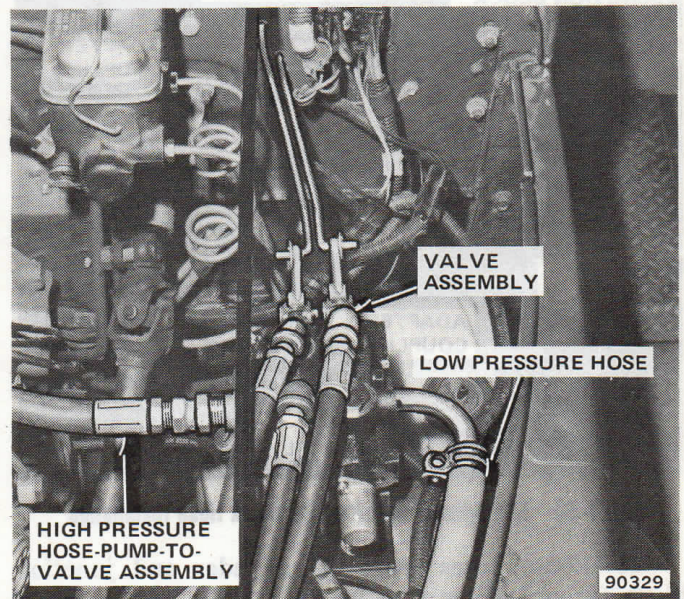


Fig. 1-38 Hose Installation

(12) Install low pressure return hose from valve assembly to inlet on reservoir. Secure with two hose clamps.

(13) Install lift cylinder, lift frame, and lift arm, using two bolts and locknuts (fig. 1-39).

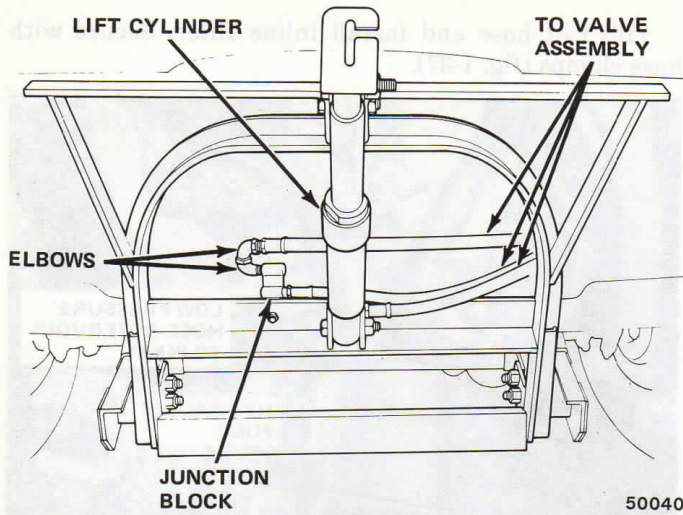


Fig. 1-39 Lift Cylinder and Junction Block Installation

(14) Position junction block on right side of lift frame angle and drill one 3/8-inch hole. Secure with bolt, lockwasher, and nut.

(15) Install street ells in upper right opening in junction block.

(16) Route hoses from junction block and lift cylinder through front end sheet metal to valve assembly.

(17) Install elbows, adapter couplings, and adapter at valve assembly (fig. 1-40).

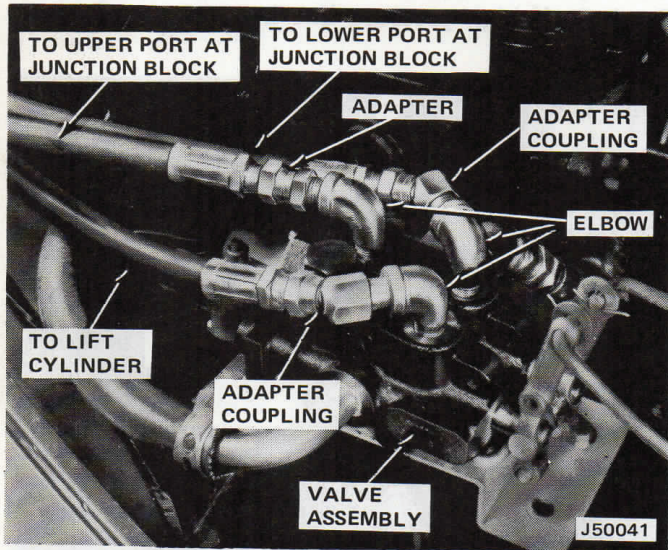


Fig. 1-40 Lift Cylinder and Junction Block Hose Installation

(18) Route hoses from lift cylinder and junction block through grommets in front end sheet metal to valve assembly and connect.

(19) Install angling rams on A-frame and sector assembly (fig. 1-41).

(20) Install two nipples, one into right angling ram and one into bottom of junction block.

(21) Install 90-degree elbows on angling rams.

(22) Install couplers, one to nipple on right angling ram and one to nipple on valve block.

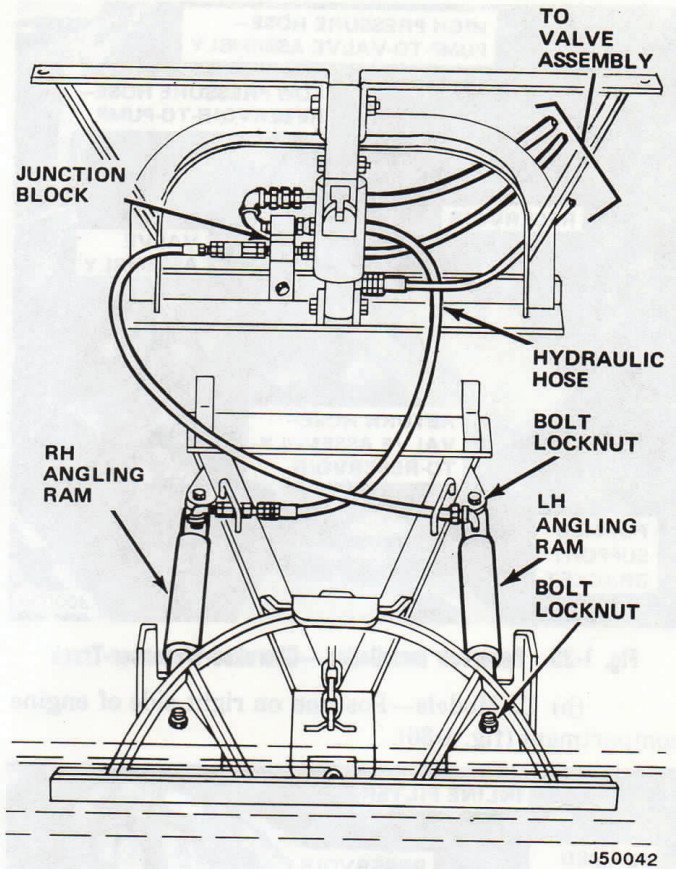


Fig. 1-41 Angling Ram and Hose Installation

(23) Install hydraulic hoses to angling rams and junction block.

NOTE: Control rods may be installed by either of two methods: (1) by drilling holes through instrument panel (fig. 1-42) or (2) under the instrument panel by use of mounting brackets (fig. 1-43).

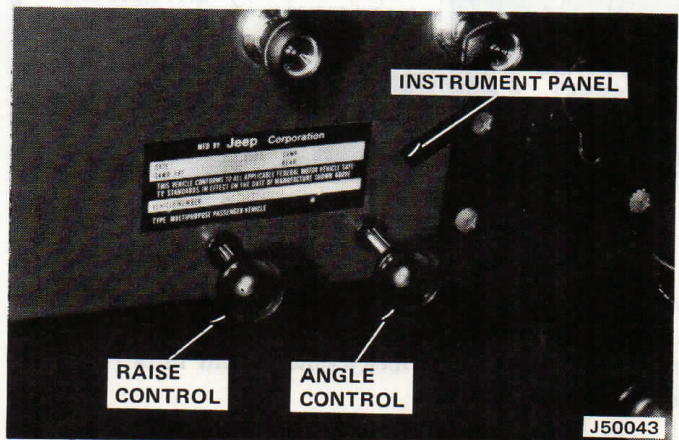


Fig. 1-42 Control Rods Installation Through Instrument Panel

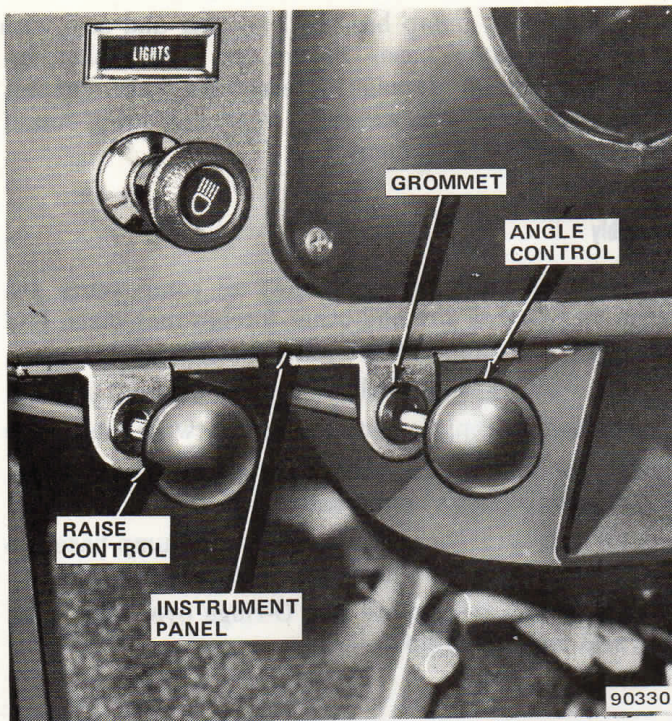


Fig. 1-43 Control Rods Installation Under Instrument Panel

(24) **Instrument Panel Installation**—Drill two 9/16-inch holes in instrument panel.

(25) **Bracket Installation**—Position brackets and drill holes.

(26) Insert ends of rods through control arms on valve assembly and secure with flat washers and cotter pins (fig. 1-44).

(27) Insert center control rod section through instrument panel openings and secure rods with connectors. Shape rods as necessary so that no bind or

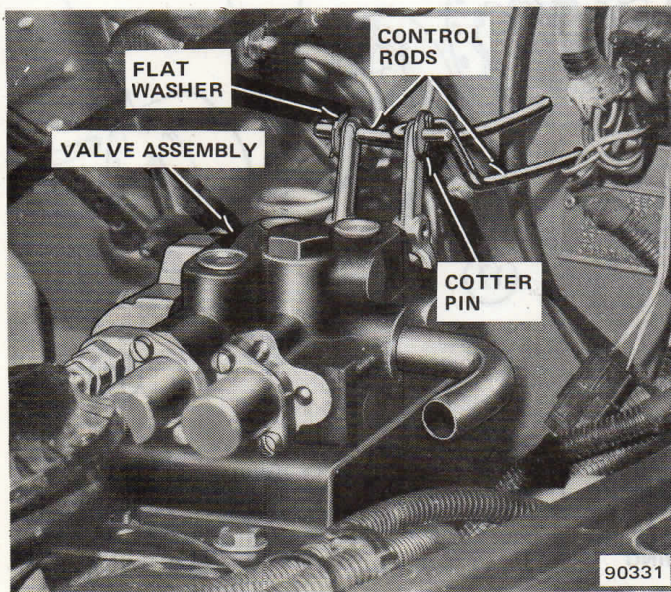


Fig. 1-44 Control Rod Routing Through Instrument Panel

interference is noted against any adjacent body or electrical components.

(28) Insert control rods through instrument panel or bracket and secure with connectors.

(29) Install knobs.

(30) Install and connect battery.

(31) Fill oil reservoir to 1/2-inch from top with cylinder in down position. Allow engine to run for three minutes to purge system of air.

CAUTION: Use SAE 10W-30 motor oil only. Any other type of oil or fluid may cause unit to fail.

Maintenance

(1) Remove and clean in-line filter after five hours of engine operation. Replace if necessary.

(2) Flush and clean oil reservoir at least twice a year.

(3) Be sure pump pulley setscrews are tight.

(4) Check fluid level.

Troubleshooting

Since there are no electrical components in this system, troubleshooting consists of:

(1) Checking hydraulic connections, hydraulic pump function, and operation of control valve assembly.

(2) Checking oil reservoir. Fluid level should be 1/2-inch from top.

(3) Checking system for oil leaks and tighten clamps and connections as required.

(4) Being sure setscrews on pump pulley are tight and that drive belt is not slipping.

NOTE: If system does not operate properly after performing basic checks and adjustments, refer to Service procedures.

HYLO SYSTEM SERVICE PROCEDURES

Hydraulic Pump

Disassembly and Inspection

Before removing hydraulic pump assembly or control valve assembly, be sure that all maintenance and troubleshooting procedures have been performed. If repairs are to be made, it is recommended that the proper kit or kits be purchased prior to disassembly. These kits contain proper seals and gaskets or gear sets to repair the unit.

NOTE: When removing the units from vehicle, be sure disconnected hose ends are secured above the level of the reservoir to prevent loss of oil from the system.

(1) Remove pump. Pull nipple and adapter from suction plate.

(2) Remove capscrews and suction plate (fig. 1-45). Remove drive shaft thrust ball bearing and discard O-ring. Inspect plate for cracks or damage.

(3) Remove cylinder plate and discard O-ring and vinyl seal. Inspect bearings and cylinder plate for damage.

(4) Remove wear plate, discard O-rings and inspect wear plate for damage.

(5) Remove drive shaft, idler shaft, alignment pins, and bearings from pump base. Inspect bearings for damage.

(6) Remove lockrings, keys and gears. Inspect gears and shafts for excessive wear.

(7) Remove pump base ball bearing and seal with gasket from pump base. Discard seal with gasket. Inspect bearing for damage or excessive wear. Inspect pump base for cracks, excessive wear, and out-of-round in drive or idler shaft holes.

Assembly

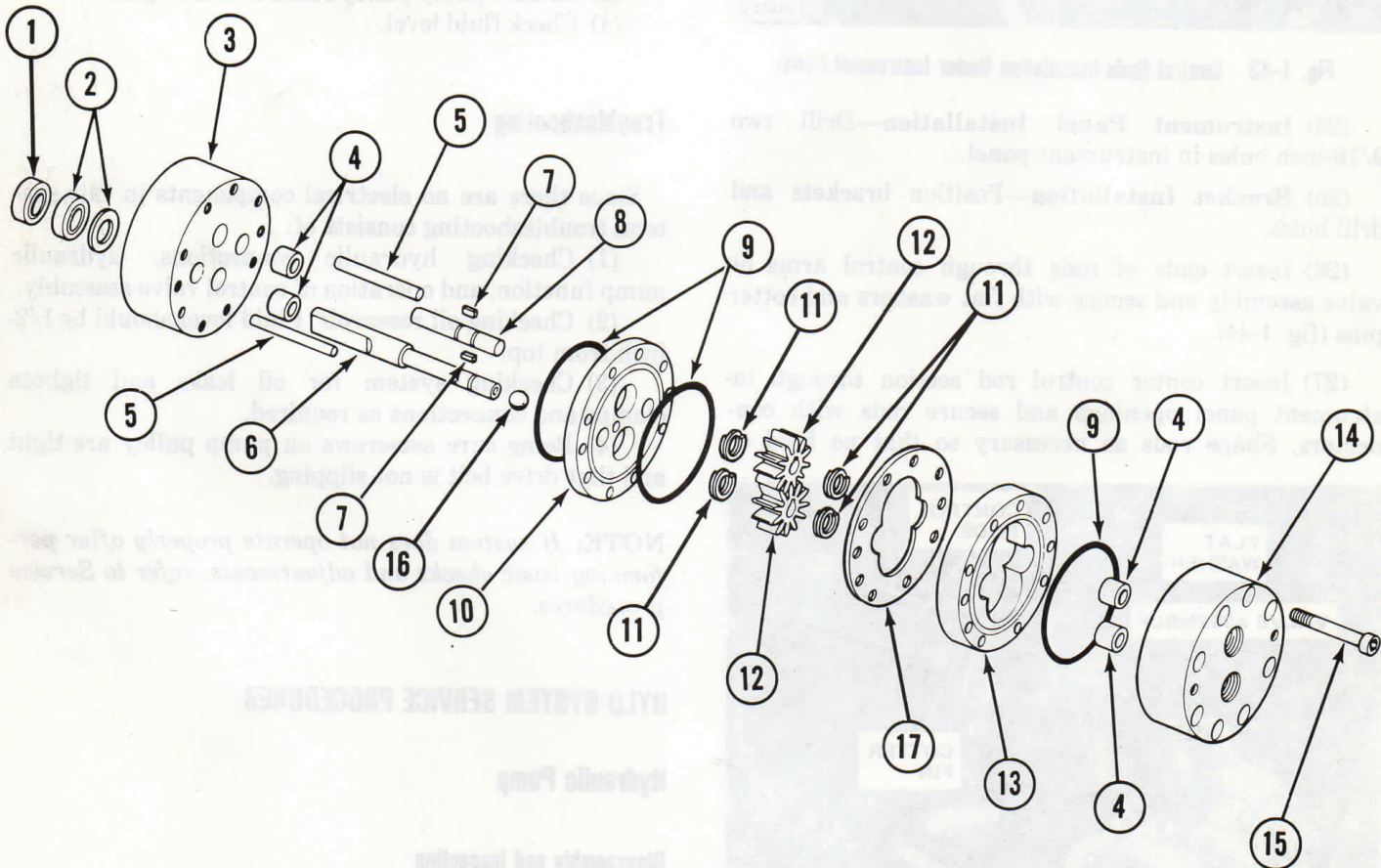
Before assembly, be sure that all components are clean and free of dirt and other foreign materials. Use new seals and gaskets when assembling unit.

(1) Install gasket, seal and bearing in pump base.

(2) Install replacement O-rings on wear plate. Use petroleum jelly or equivalent to retain O-rings to properly machined areas on the wear plate.

(3) Install drive and idler shafts in pump base. Install alignment pins in holes provided in pump base.

(4) Install wear plate and O-rings over align pins and seat against pump base.



- | | | |
|---------------------------|-----------------|---------------------------|
| 1. PUMP BASE BALL BEARING | 7. KEY | 13. CYLINDER PLATE |
| 2. SEAL W/GASKET | 8. IDLER SHAFT | 14. SUCTION PLATE |
| 3. PUMP BASE | 9. O-RING | 15. ALLEN HEAD CAPSCREW |
| 4. NEEDLE BEARING | 10. WEAR PLATE | 16. THRUST BALL BEARING |
| 5. ALIGNMENT PIN | 11. KEEPER RING | 17. THIN CLEAR VINYL SEAL |
| 6. DRIVE SHAFT | 12. GEAR | |

Fig. 1-45 Hylo Hydraulic Pump

(5) Install lower lockrings and keys on idler and drive shafts.

(6) Install gears on idler and drive shafts. Before installing upper lockrings, check that gears are installed correctly on their respective keyways.

(7) Using petroleum jelly or equivalent, lightly coat both sides of the cylinder plate, and outer end of drive shaft. Install seal and O-ring on cylinder plate.

(8) Install cylinder plate over alignment pins and seat against wear plate.

(9) Install thrust ball bearing on the end of drive shaft. Carefully place suction plate in position and install capscrews.

(10) Tighten capscrews. Install and securely tighten pump input nipple and adapter.

Valve Assembly

Disassembly and Inspection

The 3-way and 7-way control valve assembly uses the same disassembly and assembly procedures with minor changes necessary because of the additional spool valve assembly. The procedures outlined below deal with the 7-way, 2-spool valve system. This procedure should be used for the 3-way valve, disregarding any reference concerning the disassembly and assembly of the second control valve and its attendant pieces.

(1) Remove control handle C-clip and pivot pin.

NOTE: On dual spool valve systems the control handle may have to be moved fully in opposite directions to successfully remove the pivot pins and related hardware.

(2) Remove pivot pins, links, and control handles.

(3) Remove capscrews holding spool valve bodies against endplate. Discard O-rings, but retain clear vinyl seals for later assembly procedure.

(4) Remove check valve assembly, and discard components.

(5) Clean valve bodies endplate and blow dry.

Assembly

(1) Install replacement O-rings on endplate and valve body. Install clear vinyl seals using petroleum jelly or equivalent on both seals and O-rings to properly retain them during assembly procedure.

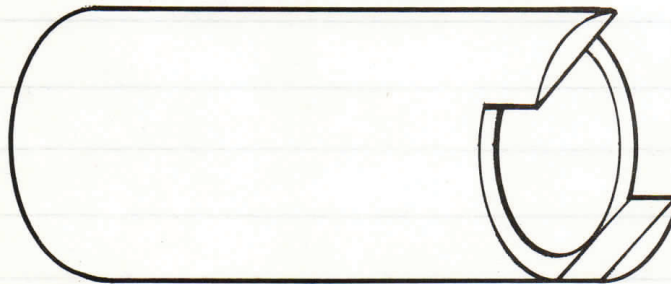
(2) Loosely install links on spool valves and install capscrews in control valve assembly.

(3) Insert link into control handle and retain assembly to control valve by installing pivot pin and C-clip. Duplicate above procedure for second control handle assembly.

(4) Install check valve assembly.

(5) Tighten endplate retention screws.

Special Tools



J-25399
SOLENOID SOCKET WRENCH

J50199