

OWNER'S MANUAL



- ASSEMBLY INSTRUCTIONS
- OPERATING INSTRUCTIONS
- ILLUSTRATED PARTS LIST

DANIELS
Pull Plow

EQUIPPED WITH MONARCH PUMP

Daniels Pull Plow

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Congratulations! By purchasing this Daniels Pull Plow, you can now benefit by owning the latest in state-of-the-art snow plowing equipment. While your first Pull Plow installation may take longer, most installations can be done by two people in less than three hours! It takes most operators 2 or 3 times to realize the efficiency of using the Daniels Pull Plow. When used with a front plow, you can easily improve your plowing efficiency by as much as 50%.

BEFORE YOU BEGIN

Prior to installing the Daniels Pull Plow, there are a few basic requirements that your truck must meet. It must have four-wheel drive (preferably 3/4 or 1 ton rating), and be equipped with a minimum 100 amp alternator and a heavy duty battery or batteries. It must also be equipped with a 2" square receiver-type hitch.

The Daniels Pull Plow is shipped as two basic pieces:

- ☒ Pull Plow
- ☒ Carton with 12-volt hydraulic power unit, cord and switch; hydraulic cylinder and all additional mounting brackets and components.

In addition to a normal set of shop tools, the following items are often required for the average Pull Plow installation:

- ☒ 2 - 6" C-clamps
- ☒ Wire crimping tool
- ☒ Soldering gun, solder and flux
- ☒ Electric power drill
- ☒ 1/8" steel drill bit
- ☒ 3/4" hole saw with metal cutting blade
- ☒ Hand grinder
- ☒ Electric arc welder
- ☒ Acetylene torch or cutoff saw (optional)

The customer will supply the following parts and materials.

- ☒ 2 Quarts Dexron Automatic Transmission Fluid
- ☒ Teflon thread sealing tape
- ☒ Wood block (approx. 6" X 6" X 12")
- ☒ Black Paint
- ☒ Steel stock for optional installation jig:
 - 8" - 2" x 2" tube
 - 27" - 1-1/2" x 1-1/2" angle
 - 14" - 1" x 1" tube



CAUTION: PRIOR TO STARTING THE INSTALLATION PROCESS, MAKE SURE CERTAIN SAFETY EQUIPMENT IS AVAILABLE AT THE WORK SITE. PROVIDE A FIRE EXTINGUISHER, AND HAVE IT IMMEDIATELY AVAILABLE WHEN WELDING. SAFETY GLASSES OR OTHER APPROVED EYE PROTECTION, GLOVES AND PROTECTIVE CLOTHING MUST BE WORN TO PROVIDE PROTECTION FOR WORKERS WHEN WELDING. HEARING PROTECTION MUST BE WORN WHEN USING GRINDERS OR CUTOFF SAWS.

INSTALLATION JIG FABRICATION (OPTIONAL)

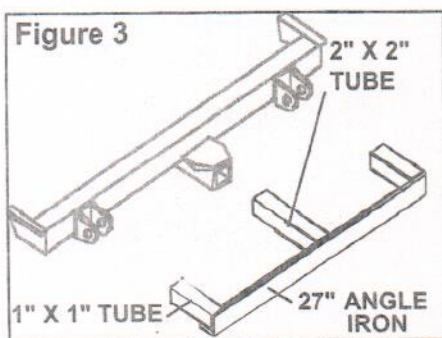
The following instructions describe how to fabricate a simple jig which can be used to assure accurate placement of drawbar mounting ears. The jig is recommended for multiple installations; however, careful measuring, clamping and re-measuring will work well for single unit installations. See list for customer-supplied materials.

Use a square to assure accurate alignment of components before welding.

Locate the center of the 27" 1-1/2" X 1-1/2" angle piece. Weld the 8" long 2" X 2" tube in the exact center, and square to the angle piece. Weld a 7" long, 1" X 1" square tube flush with each end of the 27" angle, parallel to the 2" X 2" tube. **Figure 3.** If the jig is inserted into the receiver and the 1" tubes do not align with the exact spot on the hitch frame, turn the jig over. The new position of the 1" tubes may be closer to the hitch frame which will better align the ears to the jig.

This jig will be used in Installation Step 3.

Figure 3



PRE-INSTALLATION CHECKS AND MEASUREMENTS

☑ Prior to installation of the Pull Plow, a FRONT PLOW should be mounted on the truck and be in the UP position. The truck should be positioned on a level surface.

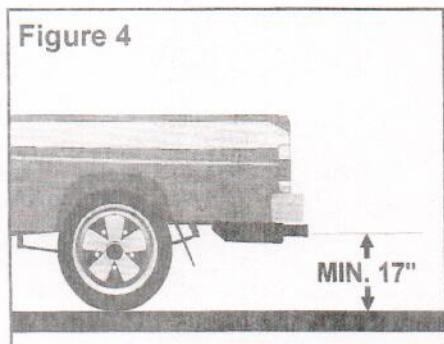


Important: Failure to observe this step could result in insufficient down pressure on the Pull Plow in normal operation when the front plow is raised.

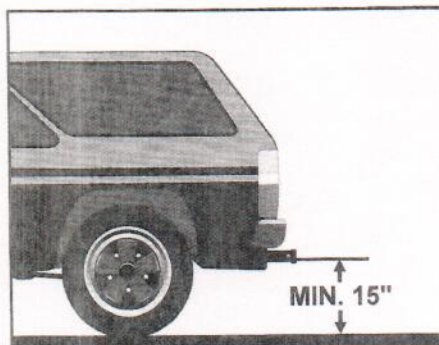
☑ If a spare tire is mounted on the rear of the truck, remove the tire, leaving the mounting bracket.

☑ On 3/4 ton trucks, the measurement from the BOTTOM of the square receiver tube to the ground, **MUST BE** at least 17 inches. If the measurement is **LESS** than 17", the truck must be modified by installing leaf springs, higher profile tires, or air shocks. **Figure 4.**

Figure 4



☑ When installing the 72" plow on a light duty truck or sport utility vehicle, the receiver-to-ground measurement **MUST BE** at least 15". Use the same methods of adjusting height as described for larger vehicles. **Figure 5.**



☑ On 1/2 ton trucks, the height of the hitch may be 17". However, when the Pull Plow is raised, the rear of the truck tends to pull down with the added weight of the plow. The adjustment of the plow, and correct function will be adversely affected. This condition is best corrected by modifying the suspension with the addition of leaf springs or air shocks.

PLOW INSTALLATION

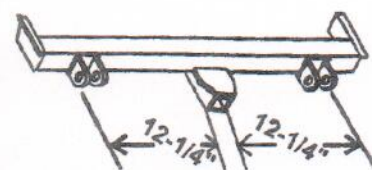
DRAWBAR EAR INSTALLATION

The location of the drawbar ears is most important in assuring the correct operating position and lifting action of the Pull Plow.

1. If the jig was fabricated earlier, it may be used to position the ears on the receiver hitch frame.

2. If the jig is not being used, measure out 12 1/4" from the **inside** edge of the receiver hitch, on both sides of the hitch. Place a mark on the hitch frame at this point. Align the mark with the **inside** surface of the **OUTER** ears, and clamp in place. **Figure 6.** Go to Step 6.

FIGURE 6



3. Insert the jig into the receiver hitch, place the drawbar ears over the ends of the 1" X 1" tubular legs of the jig, and mark the location on the hitch frame where the ears are to be welded. **Figure 7.**

FIGURE 7

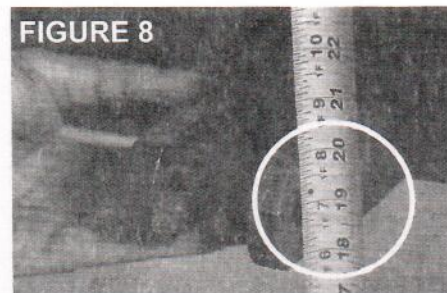


NOTE: 1997 and later Fords with factory-installed curved hitches will require an extra piece of flat stock for placement of ears.

4. Remove the jig.

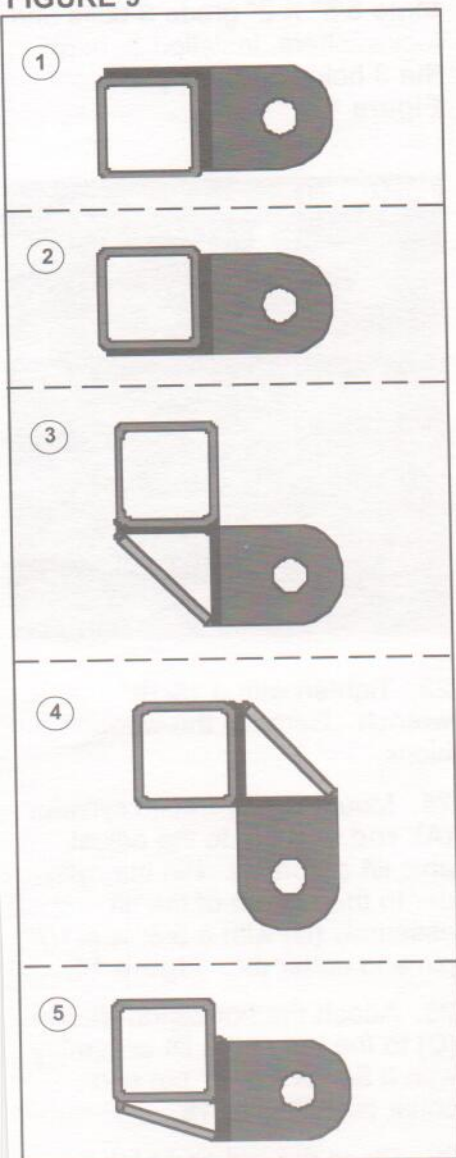
5. Determine the height of the ears. The dimension should be 16 to 23 inches from the center of the hole in the ears, to the ground. **Figure 8.**

FIGURE 8



6. The ears can be positioned in one of five ways. **Figure 9.**

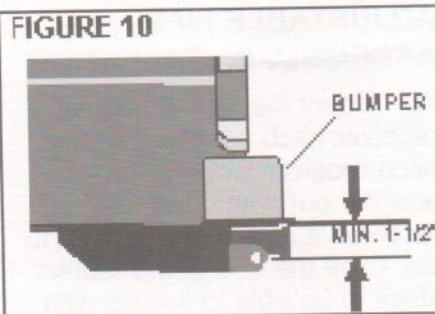
FIGURE 9



One of these positions will generally result in a height of 16-23" (18" or more is preferred).

REFER TO TABLE ON PAGE 8.

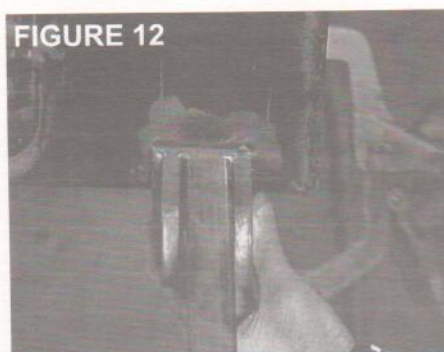
7. The ears **MUST** be square with the hitch frame. If the rear bumper is low, and close to the hitch, **MAKE SURE** the center of the holes in the ears is at least 1-1/2" below the bumper to provide adequate clearance, and to prevent the drawbar arms from hitting the bumper when raising the plow. **Figure 10.**



8. Remove the ears. Use a hand grinder to clean the area of the hitch frame where the ears will be welded. **Figure 11.**



9. Place the jig back into the receiver hitch. Position the ears in the proper location, center the ears on the jig, and clamp for welding. If the jig is not used, confirm the 12 1/4" measurement before welding. **Figure 12.**



10. Remove the jig.



Prior to beginning installation, the negative battery cable must be removed from all batteries in the truck to prevent electrical damage from possible stray voltages when welding.

11. Tack weld the ears into place. Make a final check to be sure the placement of the ears is correct. Re-check to be sure there is a minimum 1 1/2" distance between the center of the ear holes and the bottom of the bumper. Refer to **Figures 10 & 12.**

12. When confirmed, weld the ears with complete welds around the perimeter of the ears.



IMPORTANT: Use a qualified welder with good welding equipment. A 3/8" bead must be used on all welds.

13. Once the ears are cool, spray paint to prevent rust.

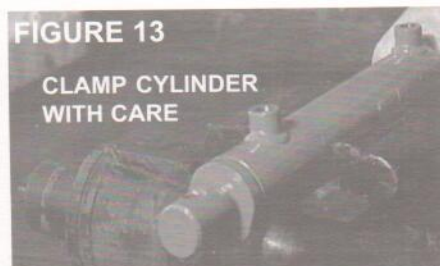
ASSEMBLY OF THE HYDRAULIC CYLINDER

14. Begin assembly of the hydraulic cylinder by first determining where the hydraulic pump will be mounted. If the pump is mounted on the driver's side, the hydraulic elbow fittings on the cylinder should be facing forward on the left side. Fittings should be on the right side if the pump is mounted on the passenger side.

15. Secure the cylinder in a vise. Place the cylinder so the two hydraulic ports are facing up. **Figure 13.**



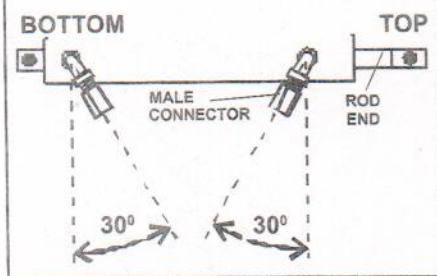
IMPORTANT: If securing the cylinder in a vise, use extreme care not to overtighten and distort the cylinder tube.



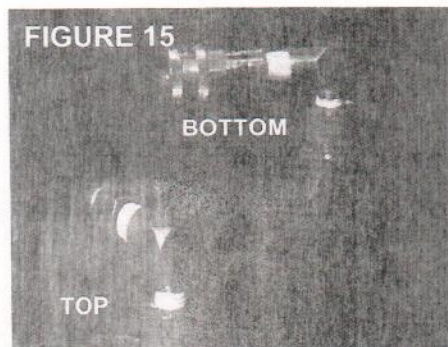
16. Locate the two elbow fittings and tape the threads with teflon thread sealing tape.

17. Thread the elbows into the cylinder ports, and tighten. Make sure the fittings are pointing in the correct direction when tight. Align the elbows to a 30 degree angle from the centerline of the cylinder. **Figure 14.**

FIGURE 14



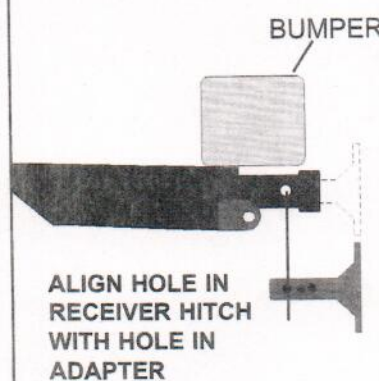
18. Locate the hydraulic quick connectors. Install the female connector in the bottom port, and the male connector to the top cylinder port. Tighten securely. **Figure 15.**



ADJUSTABLE LIFT ASSEMBLY INSTALLATION

19. Mount the 2" X 2" tubular receiver hitch adapter into the hitch receiver tube. If the adapter bottoms out in the receiver, it may be necessary to cut 1" off the end of the tubular stock to be able to line up with one of the three holes, and to position the stock as close to the bumper as possible. **Figure 16.**

FIGURE 16



20. Secure the adapter with a 5/8" X 3-1/2" pin and self-locking hair pin.

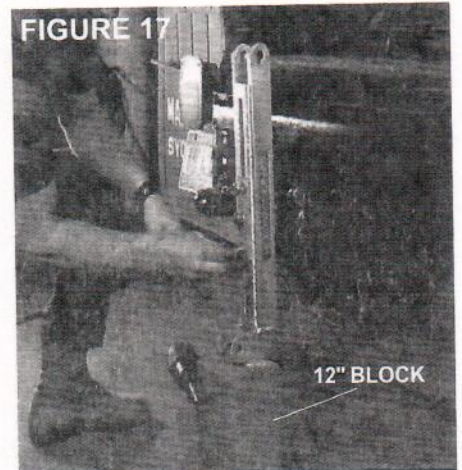
21. Place a 12" wooden block under the receiver hitch adapter.



Important: If a front plow will be used with the Pull Plow, but is not mounted to the truck during the installation of the Pull Plow, adjustments to the Pull Plow will need to be made after the front plow is installed and raised in the up position.

22. Set the adjustable hydraulic lift assembly on the block and secure it to the adapter with the three 5/8" X 2" grade 8 bolts and lockwashers, installed through the 3 hole sandwich plate. **Figure 17.**

FIGURE 17



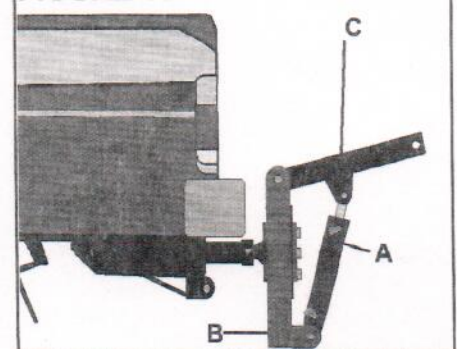
23. Tighten with a 15/16" wrench. Remove the wooden block.

24. Mount the hydraulic cylinder (A), rod end up, to the adjustable lift assembly. Pin the cylinder to the bottom of the lift assembly (B) with a 5/8" X 4-1/2" pin and cotter pin. **Figure 18.**

25. Attach the horizontal lift arm (C) to the top of the lift assembly with a 5/8" X 4-1/2" pin and cotter pin. **Figure 18.**

26. Place the rod end of the cylinder between the ears on the horizontal cylinder lift arm, and attach with a 5/8" X 3" pin and cotter pin. **Figure 18.**

FIGURE 18



ASSEMBLY OF DRAWBAR ARMS TO THE PULL PLOW

27. Move the Pull Plow to the back of the truck. The drawbar arms will be mounted to the **INSIDE** of the plates on the plow. **Figure 19.**

Determining which holes to use to attach the drawbar arms to the radius plates on the plow and to the drawbar ears is dependent upon the type of receiver hitch, the height of the receiver hitch, and the location of the drawbar ears. Refer to **Table A** on page 8 to determine how to position the drawbar arms.

28. The drawbar arms are installed with the straight, 4-hole end towards the Pull Plow. Insert a 5/8" x 2-1/2" bolt into the bottom hole on one of the drawbar arms, and into the bottom or second hole of the radius plate on the plow, as determined by Table A. Place the sandwich plate over the bolt, install a 5/8" lock nut, and finger tighten. Install the remaining three bolts through the curved slots and the sandwich plate and secure with 5/8" lock nuts. **Figure 19.**

29. Lift the draw bar arm and pin to the drawbar ear with a 5/8" X 3-1/2" pin. Repeat the procedure for the other arm.

30. Measure from the rear face of the lift assembly to the back of the plow, at the center of the lift arm mounting ears. This distance should be between 12" and 15". **Figure 20.**

If the distance is less than 12", reposition the drawbar arms to the second hole on the radius plate.

If the distance is greater than 15" when using the bottom hole, the drawbar arms will need to be shortened by cutting off the top hole of the drawbar arms.

31. If the drawbar arms are shortened, the top hole should be cut from the arm, midway between the first and second holes. **Figure 21.**

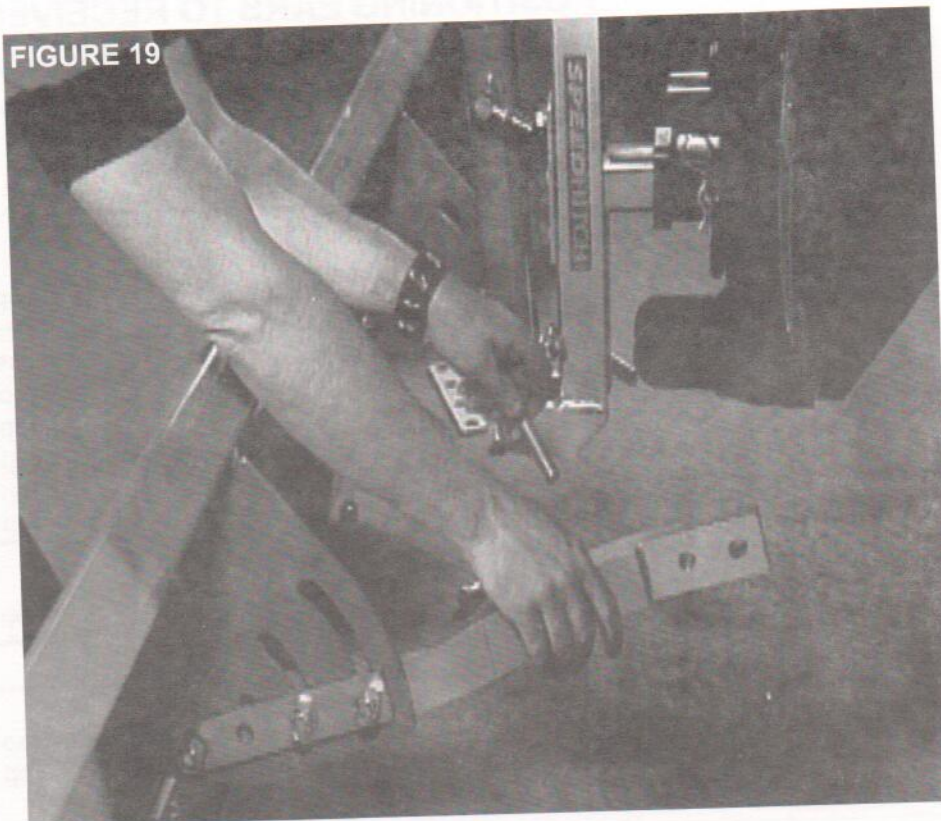
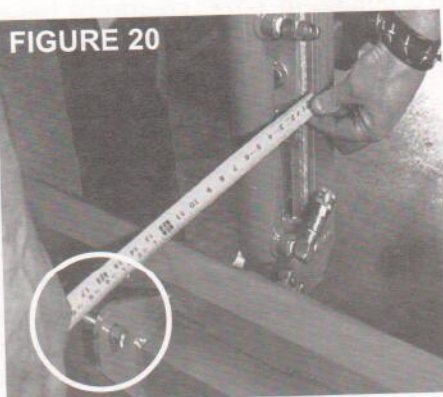


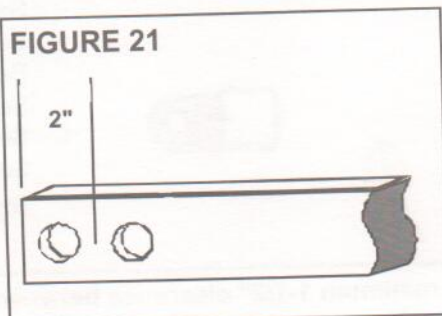
FIGURE 20



Install and re-check the measurement from the lift assembly to the plow. **Fig. 20.**

NOTE: On many Chevrolet and some light duty trucks, it may be necessary to cut one hole off the top of the draw bar arms to maintain the 12" to 15" distance.

FIGURE 21



32. Install the other draw bar arm to the radius plate as described in step 28. Tighten all nuts securely with a 15/16" impact wrench.

Note: The drawbar arms should be somewhat centered on the drawbar ears. It will be difficult to remove the plow if they are close to either side of the drawbar ears. This can be easily corrected by using a heavy maul hammer to bend either the radius plate or drawbar arms to center the drawbar arms on the drawbar ears.




When the installation is done correctly, the assembly will look like **Figure 21A**, when the Pull Plow has down pressure.




FIGURE 21A

TABLE A

POSITIONING EARS TO RECEIVER HITCH AND SECURING OF DRAWBAR ARMS

| For drop style hitch: | | | | |
|--|--|---|--|--|
| When distance from bottom of receiver hitch tube to ground is: | Distance from center hole of drawbar ears to ground should be: | Preferred position of drawbar ears: * | Pin top of drawbar arms to ears using: | Attach bottom of drawbar arms to radius plate on plow using: |
| 15-1/2" - 16" | 19" |  | Top hole | Bottom hole |
| 17" | 20" | | Top hole | Bottom hole |
| 18" | 21" | | Top hole | Bottom hole |
| 19" | 22" | | Top hole | Bottom hole |
| 20" | 23" | | Top hole | Bottom hole |
| 21" | 22" |  | Top hole | Bottom hole |
| 22" | 23" |  | Top hole | Bottom hole |
| 23" | 23-1/2" | | Top hole | Second hole |

* Note: Make sure that you maintain a minimum 1-1/2" clearance between truck bumper and draw bar ears.

| For in-line hitch: | | | | |
|--|--|---|--|--|
| When distance from bottom of receiver hitch tube to ground is: | Distance from center hole of drawbar ears to ground should be: | Preferred position of drawbar ears: * | Pin top of drawbar arms to ears using: | Attach bottom of drawbar arms to radius plate on plow using: |
| 15-1/2" - 16" | 18" |  | Second hole | Bottom hole |
| 17" | 19" | | Second hole | Bottom hole |
| 18" | 20" | | Second hole | Bottom hole |
| 19" | 21" | | Second hole | Bottom hole |
| 20" | 22" | | Second hole | Bottom hole |
| 21" | 23" | | Second hole | Bottom hole |
| | | | Second hole | Bottom hole |

Note: If the distance from the bottom of the receiver hitch to ground is greater than 21", ears should be welded to the bottom of the hitch as follows.

| | | | | |
|---------------|-----|---|-------------|-------------|
| 15-1/2" - 16" | 16" |  | Second hole | Bottom hole |
| 17" | 17" | | Second hole | Bottom hole |
| 18" | 18" | | Second hole | Bottom hole |
| 19" | 19" | | Second hole | Bottom hole |
| 20" | 20" | | Second hole | Bottom hole |
| 21" | 21" | | Second hole | Bottom hole |
| 22" | 22" | | Top hole | Bottom hole |

FINAL ASSEMBLY OF THE PULL PLOW

33. Connect the two remaining hydraulic quick connectors to the cylinder to allow air to pass from the cylinder.

34. Pin the vertical lift arm to the back of the plow with a 5/8" X 3-1/2" pin, and secure with a cotter pin. **Figure 24.**

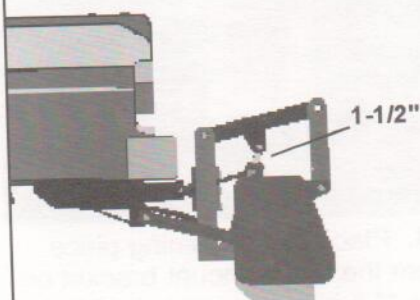
35. Pin the vertical plow lift arm to the horizontal lift arm with a 5/8" X 3-1/2" pin. Secure with a self-locking hairpin. **Figure 24.**

FIGURE 24



The cylinder should be exposed no more than 1-1/2". If not, slight adjustment to the height of the adjustable lift assembly will be necessary to assure adequate lift and down pressure on the plow for best operation. Lower the assembly to increase cylinder rod exposure, and raise the assembly to decrease exposure. **Figure 25.**

FIGURE 25



NOTE: The cylinder should be exposed no more than 1-1/2"

PUMP INSTALLATION

36. It is recommended that the pump be mounted in the engine compartment to keep the pump warm and dry. If undecided on where to mount the pump, contact Daniels Pull Plow at 1-800-386-2932 for mounting suggestions. The pump mounting bracket is designed to accommodate both frame or engine compartment mounting. If the pump cannot be mounted in the engine compartment, frame mounting or toolbox mounting are other acceptable locations. Go to step 46.

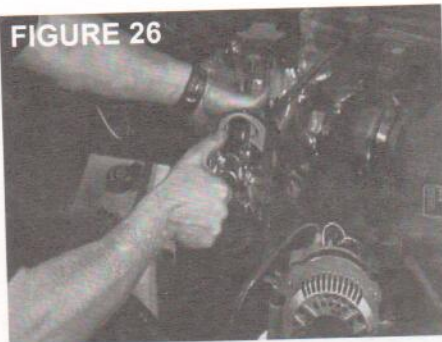
ENGINE COMPARTMENT INSTALLATION



CAUTION: DISCONNECT THE BATTERY NEGATIVE CABLE BEFORE STARTING PUMP INSTALLATION TO PREVENT ACCIDENTAL SHORTING TO ELECTRICAL COMPONENTS.

37. Dry-fit the pump into the engine compartment with the motor facing forward and the reservoir to the rear. Attempt to locate the pump squarely above the vehicle frame if possible for the most secure installation.

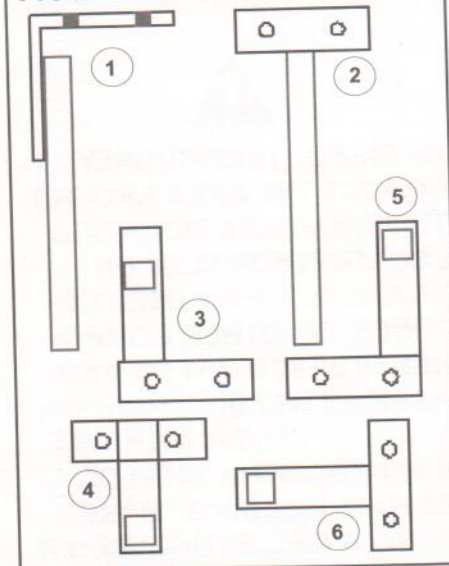
FIGURE 26



In some cases, the pump must be mounted vertically to fit properly. Refer to bracket 6, Figure 27, and Figure 32. Install the pump with the reservoir end down. Contact Daniels Pull Plow for more information. Mount the pump to allow clearance for the oil dipstick and other service or maintenance areas. Also, allow sufficient clearance for engine torque. **Figure 26.**

The bracket can be cut and welded in a variety of ways to accommodate various engine compartment layouts, allowing the pump to fit into the engine compartment without interfering with other components. See **Figure 27** for examples of various bracket configurations.

FIGURE 27



38. Once the bracket is cut, bolt the piece of the bracket with the two holes to the bottom of the hydraulic pump using two 3/8" X 1" bolts and lockwashers.

39. Place the pump in the engine compartment and position for the best fit. Make sure the pump does not protrude above other components where it may interfere with the hood when closed. Measure the distance from the frame to the bottom of the motor mount. **Figure 28.**

FIGURE 28



40. Cut the piece of 1" X 1" tubing to this length.

41. Insert the 1" X 1" tubing into the 1-1/2" X 1-1/2" tubular frame mount bracket assembly. Finger tighten the bolt and set the assembly on the frame.

42. With the bolt at the top of the bracket facing outward, mark the frame where the bracket should be attached. Clean the surface of the frame and weld the tubular frame mount bracket assembly to the frame. **Figure 29.**



WARNING: THOROUGHLY INSPECT THE AREA AROUND THE PROPOSED MOUNTING LOCATION FOR FUEL OR BRAKE SYSTEM HOSES OR TUBES, OR OTHER COMPONENTS WHICH MAY BE DAMAGED BY WELDING HEAT OR SPARKS. COVER WITH WET RAGS OR METAL SHIELDS BEFORE WELDING. MAKE SURE A FIRE EXTINGUISHER IS HANDY BEFORE WELDING.

FIGURE 29

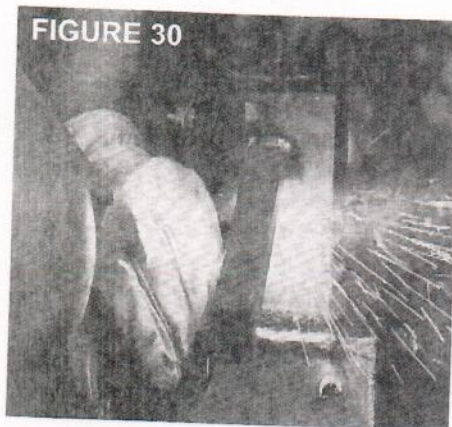


43. Place the remaining piece from the motor mount bracket on the 1" tubing assembly to determine the final bracket configuration.

44. It may be necessary to weld the pump mount bracket into a T or L-shaped configuration, using the remaining piece of the pump mount bracket. See **Figure 27.**

45. Weld the 1" X 1" tubing to the desired spot on the pump mount bracket. **Figure 30.**

FIGURE 30



46. Install the pump mount, complete with the 1" square tubing stand assembly into the 1-1/2" square tubular frame mount bracket assembly. **Figure 31.**

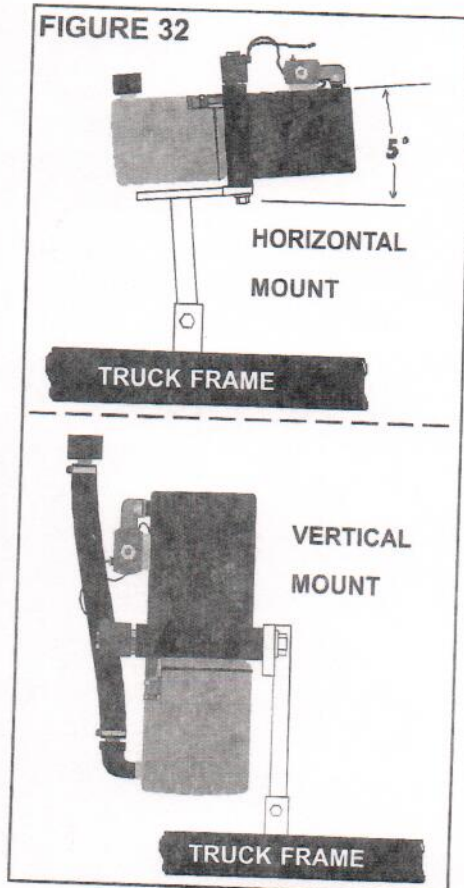
FIGURE 31



The reservoir tank must be toward the rear of the truck and be pitched down approximately 5°. This creates better draw of oil from the reservoir can. **Figure 32.**

NOTE: A 5° pitch is approximately 1-1/2" across the length of the pump.

FIGURE 32



47. Securely tighten the 1/2" bolt on the 1-1/2" square tubular frame mount bracket assembly.

NOTE: The prescribed method of mounting the pump will assure a good electrical ground for the motor on the hydraulic pump assembly. If any other kind of engine compartment mounting is used, such as attachment to a wheel well or to a fender, a ground wire must be run from the pump motor mounting plate to the truck frame to maintain a good ground. This is a MUST for correct pump motor operation.

FRAME OR UNDERBODY INSTALLATION

If an engine compartment installation is not possible, mount the pump into a pickup bed tool box, or to the frame under the truck.

NOTE: These locations may cause starter motor failure and corrosion, and should be avoided if possible. If the power unit is located more than 7' from the battery, a heavier gauge wire will be required.

48. Locate a spot for the pump mount bracket. Allow a minimum of 8" clearance above the bracket to allow oil to be poured into the reservoir tank. Locate the mount to minimize contact with excessive moisture and road spray. **Figure 33.**

FIGURE 33



49. Secure the pump mount bracket to the frame with two bolts, or weld the bracket to the frame.



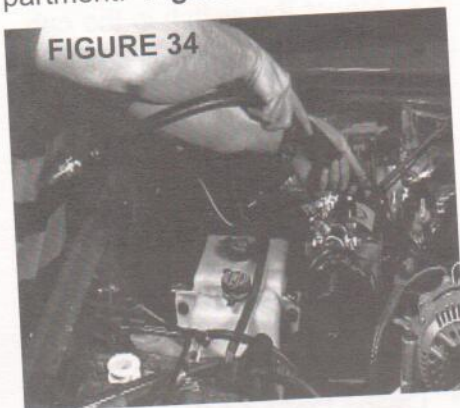
WARNING: THOROUGHLY INSPECT THE AREA AROUND THE PROPOSED MOUNTING LOCATION FOR FUEL OR BRAKE SYSTEM HOSES OR TUBES, OR OTHER COMPONENTS WHICH MAY BE DAMAGED BY WELDING HEAT OR SPARKS. COVER WITH WET RAGS OR METAL SHIELDS BEFORE WELDING. MAKE SURE A FIRE EXTINGUISHER IS HANDY BEFORE WELDING.

50. Secure the hydraulic pump to the mount with two 3/8" X 1" bolts and lockwashers.

HYDRAULIC HOSE INSTALLATION

51. Starting from the engine compartment, feed the two hydraulic hoses down along the frame of the truck, leaving the other ends in the engine compartment. **Figure 34.**

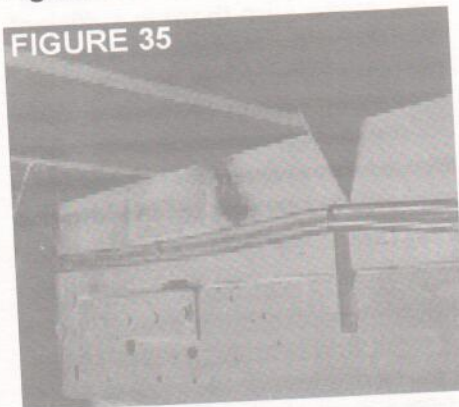
FIGURE 34



52. Keep the hoses as straight and taut as possible along the full frame of the truck. Make sure hoses are not twisted.

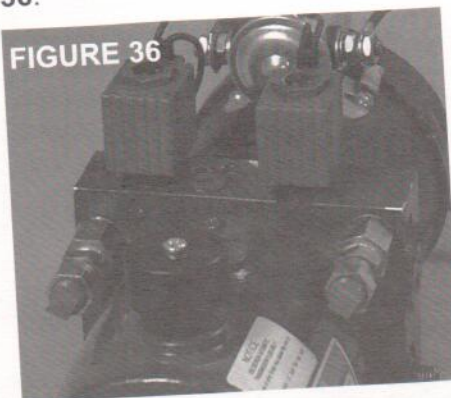
53. Secure the hoses to the frame with zip ties every few feet. Take care to keep hoses from rubbing, and away from moving parts and the exhaust system. **Figure 35.**

FIGURE 35



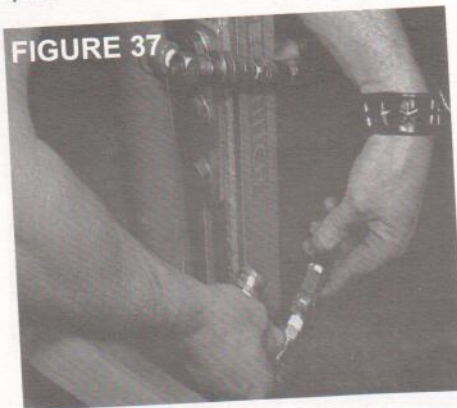
54. Wrap the threads on the hose end fittings, and install into the fittings on the pump. **Figure 36.**

FIGURE 36



55. Complete the hydraulic installation by wrapping the solid male fittings at the rear of the truck with teflon thread sealing tape, and attaching the hydraulic quick connectors. **Figure 37.**

FIGURE 37



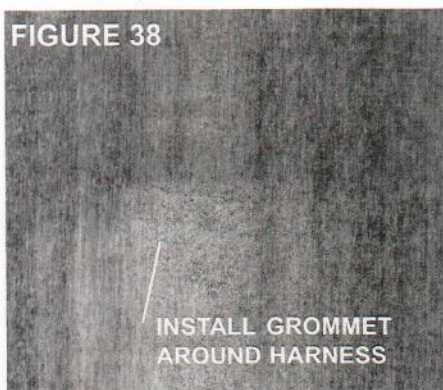
56. Tighten all fittings securely.

Note: The hose from the C1 port of the hydraulic pump must be connected to the bottom port of the hydraulic cylinder. If hoses are not connected properly, the plow will have a tendency to drift down.

CONTROL SWITCH INSTALLATION

57. Determine a suitable method of passing the wiring harness from the switch through the firewall and into the engine compartment. This may be through a boot along the steering column, or through a hole covered from the factory with a plug. If a hole must be drilled, select an area with no obstruction on either side, and drill a 1/8" pilot hole to verify the exact location before drilling a larger hole with a hole saw. Provide a boot or grommet to protect the harness from sharp edges. **Figure 38.**

FIGURE 38



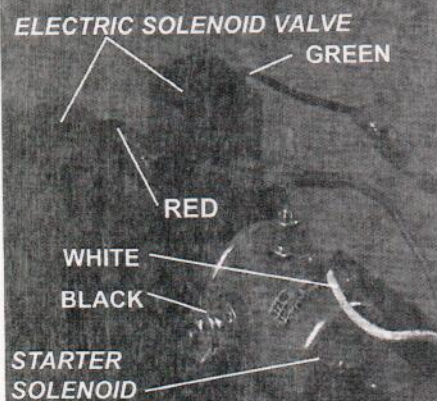
58. From inside the cab, run the wire harness through the firewall and route to the hydraulic pump motor. Make sure the harness does not interfere with moving components, and is not subjected to rubbing or chaffing.

59. Connect the green and red wires to the electric solenoid valve. These connections may be reversed later if the switch direction does not match the movement of the Pull Plow. **Figure 39.**

60. Connect the black wire to the side of the starter solenoid where the battery will connect. Finger tighten only. **Figure 39.**

61. Connect the white wire to the small terminal on the pump motor solenoid. **Figure 39.**

FIGURE 39



62. Mount the switch in the cab. Switch mounting options include:

- ♦ Any convenient position on the dash or front plow control pedestal
 - ♦ On the front plow control joystick
 - ♦ Left kick panel (for foot control, automatic transmission trucks only)
 - ♦ Laying loose on the seat
- Figure 40.**

For joystick mounting, remove the knob from the joystick. Place the control against the joystick rod, and secure with two hose clamps. The top of the Pull Plow control can be used as the joystick knob. **Figure 40.**

When using a kick panel installation, make sure there is sufficient clearance for foot movement, allowing convenient switch operation, and to prevent accidental switch engagement. Mount the switch low enough to operate the switch by rotating the foot up on the heel. **Figure 40.**

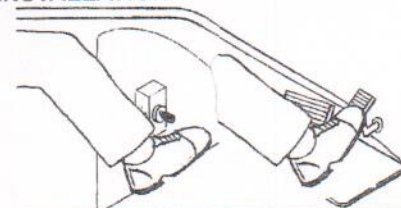
The control can be mounted with hose clamps around the box and a mounting bracket, or the cover can be removed, and holes drilled through the box for attaching screws.

SWITCH MOUNTING METHODS--FIGURE 40

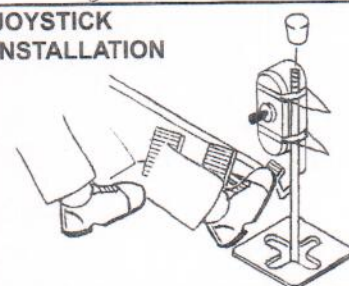
FIGURE 40



**KICKPANEL
INSTALLATION**



**JOYSTICK
INSTALLATION**



**IN-DASH
INSTALLATION**

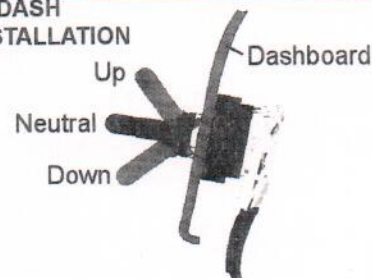
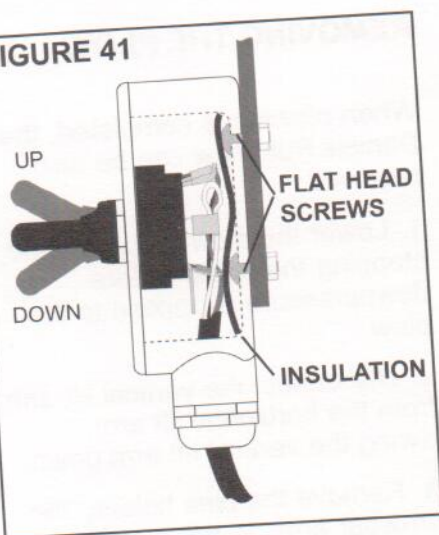


FIGURE 41



If the box is attached using screws through the back of the box, use pan head screws to allow sufficient clearance between electrical connections and screw heads.

Use nylon screws, or cover metal screws with several layers of electrical tape, a piece of rubber or other electrically insulating material. Check for clearance when installing the cover after screws are installed. **Figure 41.**



IMPORTANT: Make sure there is no possibility of electrical connections coming in contact with metal mounting screws which are grounded. Accidental grounding may damage the switch or other electrical system components.



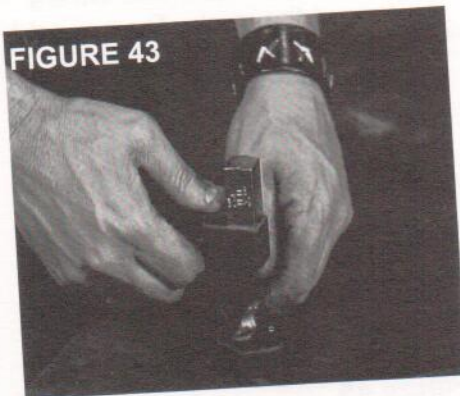
CAUTION: BE SURE THE BATTERY NEGATIVE CABLE IS DISCONNECTED BEFORE PROCEEDING TO THE FOLLOWING STEPS.

UNDERHOOD ELECTRICAL CONNECTIONS

63. Measure the distance from the starter solenoid to the battery. If the distance is greater than 7', the next heavier gauge cable will be required (#2 or #1).

64. Cut the battery cable to the desired length, allowing some slack for movement. Peel off 1/2" of insulation from each end of the cable and solder or pressure crimp the copper fittings to the wire. **Figure 43.**

FIGURE 43



65. Wrap ends with electrical tape. Connect one end of the wire to the solenoid terminal where the black wire was connected and tighten securely. **Figure 44.**

FIGURE 44



66. Connect the other end to the positive battery terminal and secure, making sure that the battery cable is clear of all obstructions.

START-UP AND INITIAL OPERATION

69. Fill the pump reservoir with one quart of red automatic transmission fluid, such as Dexron. Be sure to replace reservoir cap.



IMPORTANT: Check to be sure tools, parts and hoses are clear of the plow, and that other persons in the area are warned that the plow is about to be activated.

70. Connect the negative cable to the battery or batteries and cycle the system up and down until the reservoir can empty.



IMPORTANT: Observe the movement of the plow and its lift components to assure no interference or binding is occurring when raising the plow for the first time.

71. Refill the reservoir with the plow in the down position, taking care to not overfill. Install the reservoir lid.

72. Cycle the system in both directions until the plow moves smoothly in both directions. Raise the plow to its fullest height and lower to the ground with full downward pressure. Make a visual check for fluid leaks after installation.

If the plow does not move in the desired direction when operating the switch, the red and green wires at the end of the wiring harness can be reversed where they attach to the control valve solenoids on the pump assembly. See Figure 39.



CAUTION: THE LEAK CHECK IS VITAL IN THE ENGINE COMPARTMENT. A SMELL OF HOT OIL MAY BE DUE TO SPILLAGE ON THE EXHAUST MANIFOLD DURING ASSEMBLY, BUT SHOULD DISAPPEAR QUICKLY. CHECK IF SMELL PERSISTS, OR IF DRIPS ARE OBSERVED UNDER THE VEHICLE.



CAUTION: NEVER USE HANDS TO SEARCH FOR FLUID LEAKS. HIGH PRESSURE FLUID LEAKS CAN HAVE SUFFICIENT ENERGY TO PENETRATE SKIN. FLUID ENTRY INTO SKIN WILL CAUSE BLOOD POISONING, AND MUST BE TREATED BY PROFESSIONAL MEDICAL PERSONNEL IMMEDIATELY.

73. Be sure that all hardware is tightened securely and that all pins are installed properly and secured.

This completes the installation procedure. However, if a front plow has not yet been installed, the lift assembly will need to be adjusted to maintain a 12" distance from the ground to the bottom of the lift assembly, after the front plow is installed and in the raised position.

PULL PLOW OPERATION

☑ Prior to plowing, the tailgate should be removed and a flood light installed on top of the cab for best visibility.

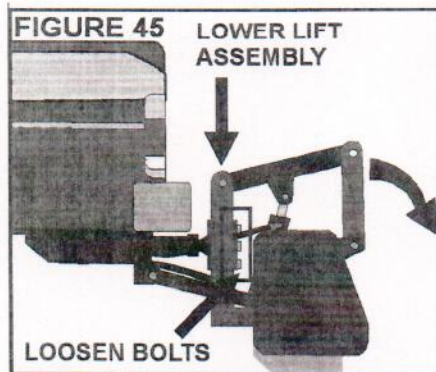
All hardware must be checked for proper tightness before every use, and after making adjustments or repairs.

☑ In operation, the truck should be configured in the same manner as when the Pull Plow was installed. Making changes such as **adding a front plow**, changing tire size or adding weight from sand, salt, or other cargo will affect the performance of the Pull Plow, and adjustments will be required.

☑ When operating the Pull Plow, you will have adequate down-pressure for good scraping results with the front plow up. For maximum down-pressure and to achieve best results, lower the front plow. Lowering the front plow transfers weight to the rear of the truck, and lowers the rear of the truck. **Do not add weight in an attempt to increase down-pressure.**

☑ To maintain proper downward pressure, adjust using the following steps:

1. Raise the front plow, if equipped.
2. Remove the upper pin and swing the vertical lift arm down. **Figure 45.**



3. With a 15/16" wrench, loosen the three bolts attaching the lift assembly to the tubular receiver adapter, and slide the lift assembly down approximately 1/2". Also loosen the bolts connecting the drawbar arms to the radius plates to assure the Pull Plow is level on the ground.

4. Tighten all bolts, and reconnect the lift arm.

REMOVING THE PLOW

When plowing is completed, the Daniels Pull Plow can be easily removed:

1. Lower the plow to the ground, stopping the pump before downpressure is applied to the plow
2. Disconnect the vertical lift arm from the horizontal lift arm. Swing the vertical lift arm down.
3. Remove the pins holding the drawbar arms to the drawbar ears on the receiver hitch. Slide the plow back.
4. Disconnect the hydraulic quick connectors at the cylinder.



IMPORTANT: When removing the hydraulic lift assembly, remember that the hydraulic connectors may be under pressure. Disconnect the white wire from the pump motor solenoid to disable the pump. Jog the switch in both directions to relieve pressure, allowing safe disconnection of the couplers. Connect the hose couplers together to keep contaminants out of the system. Re-connect the white wire to the pump motor solenoid. See Figure 39.

5. Pull the pin, allowing the lift assembly to slide out of the receiver hitch. Slide the assembly out, and rest against the plow. Make sure hydraulic connectors are kept up off the ground. Reconnect the hydraulic hoses and tuck up under bumper. Secure with a zip tie.

If the motor should get stuck in either the up or down position, it may be due to low battery voltage. This condition may be preceded by a dimming of lights, which should serve as a warning of a possible electrical problem. Check the battery voltage, alternator output and all wire connections. **A higher output alternator and new battery or batteries may be required.**

OFF SEASON STORAGE AND MAINTENANCE

✓ The hydraulic unit must be cycled periodically during the off season to keep the starter motor in good working order.

✓ Before each use of the Daniels Pull Plow, check to make sure that all hardware is secure. Tighten as necessary.

✓ Check the condition of the scraper bar. If the scraper bar is worn to a dimension of less than 1", replace the bar. The scraper bar is **NOT REVERSIBLE**.

✓ Inspect wear surfaces and pivot pins periodically for wear.

✓ **The cylinder should be collapsed for storage**, and the hydraulic hoses should be connected to keep out contaminants. Cover the couplers with grease, and secure up under the pickup bed or bumper.

✓ If you have more than one Daniels Pull Plow, we recommend that each plow be marked to assure that it is re-installed onto the exact vehicle to which it was originally mounted. The license or vehicle number are good identifying methods.

TIPS FOR SAFE AND PRODUCTIVE PLOWING

✓ If possible, perform a pre-season check of the areas to be plowed, observing obstructions such as drains or manholes which could be damaged by the plow, or could damage the plow or vehicle.

✓ Check the vehicle before each use to assure that all controls, lighting and safety equipment is in place and functioning properly.

✓ Constantly be aware of others in the area. This includes vehicle traffic and pedestrians.

✓ Be cautious and courteous when travelling or plowing across public roads. REMEMBER--Normal rules of the road apply, snowplowing equipment does not have the right-of-way.

✓ **Plow at safe speeds to maintain full vehicle control.**

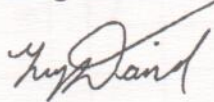
✓ Use care when backing up to doors, walls or vehicles to avoid collision.

✓ When moving alongside an object, such as a building, wall or vehicle, be aware of the width of your vehicle. This is especially important with plows on each end of a vehicle where a turn in either direction could cause the plow to swing over and hit.

✓ Make sure the plow is adjusted correctly, with sufficient downpressure, to provide clean scraping of snow and ice from the surface.

Now that your Daniels Pull Plow is fully installed, you'll be able to increase your snow plowing productivity by up to 50%! However, before trying to break any snow plowing records, give yourself some time to get used to your new Daniels Pull Plow. Thanks again for choosing Daniels.

Greg Daniels



Daniels Pull Plow

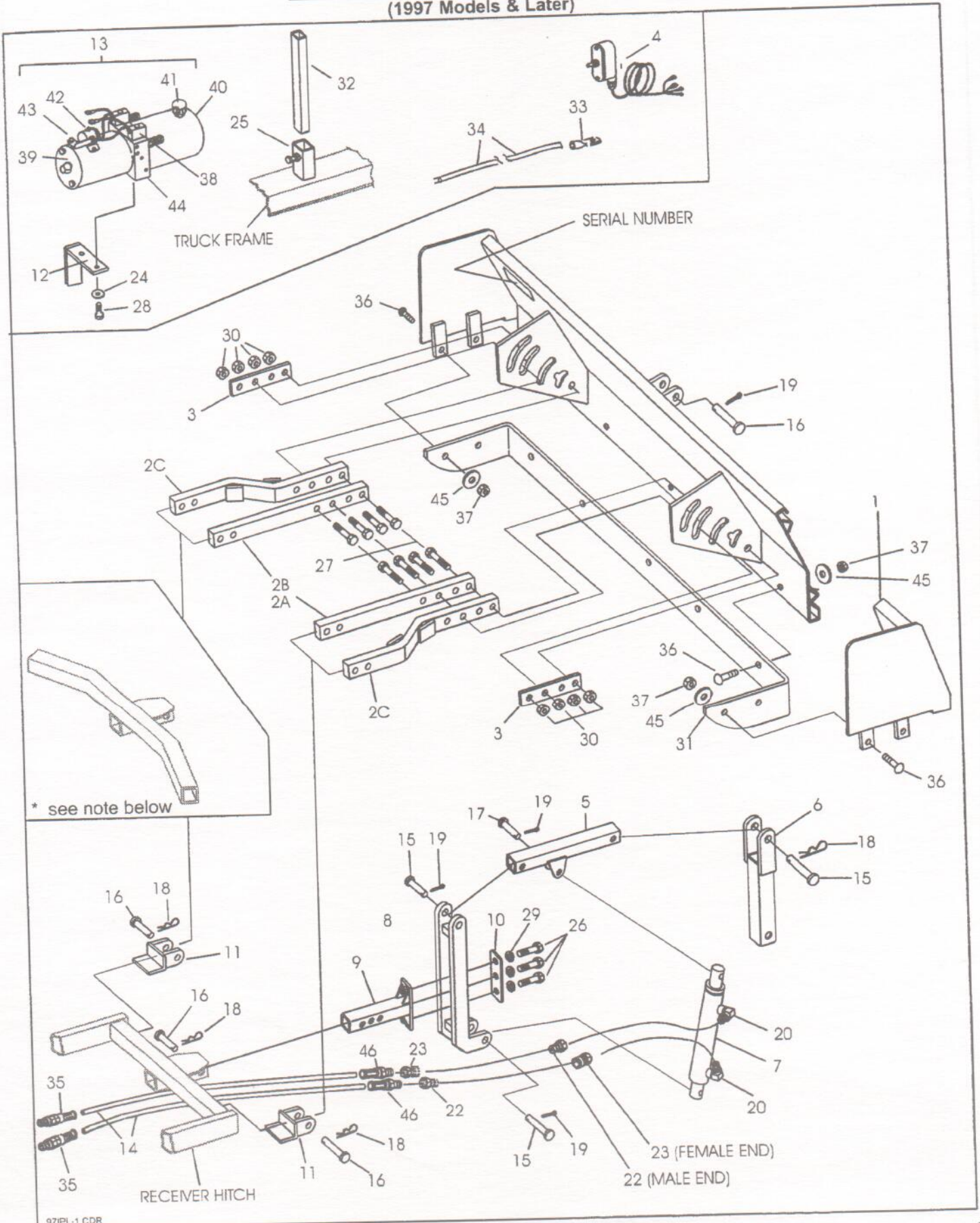
Parts List

(1997 Models & Later)

| REF. | DESCRIPTION | QTY. | REF. | DESCRIPTION | QTY. |
|------|--|------|------|---|------|
| 1A | 6' Blade Weldment (72") | 1 | 27 | Hex Head Bolt, 5/8"x 2-1/2" | 8 |
| 1B | 6'8" Blade Weldment (80") | 1 | 28 | Hex Head Bolt, 3/8"x 1" | 2 |
| 1C | 7'6" Blade Weldment (90") | 1 | 29 | Lock Washer, 5/8" | 3 |
| 1D | 8' Blade Weldment (96") | 1 | 30 | Lock Nut - Nylon, 5/8" | 8 |
| 2A | Drawbar Arm (3/4" x 2" Stock for 72") | 2 | 31A | Wear Bar (for 72") | 1 |
| 2B | Drawbar Arm (1" x 2" Stock for 80" & 90") | 2 | 31B | Wear Bar (for 80") | 1 |
| 2C | Drawbar Arm (1" x 2" Offset Stock for 96") | 2 | 31C | Wear Bar (for 90") | 1 |
| 3 | Sandwich Plate (4 Holes) | 2 | 31D | Wear Bar (for 96") | 1 |
| 4 | Switch | 1 | 32 | Tube, 1" x 1" (16" Long) | 1 |
| 5 | Horizontal Lift Arm | 1 | 33 | Electrical Connector (No. 4 Copper) | 2 |
| 6 | Vertical Lift Arm | 1 | 34 | Battery Cable | 1 |
| 7 | Hydraulic Cylinder | 1 | 35 | Hydraulic Pressure Swivel Fitting (1/4" NPT) | 2 |
| 8A | Adjustable Hydraulic Lift Assy (for 72") | 1 | 36A | Carriage Bolt, 7/16" x 1-1/2 (for 72") Grade 5 | 10 |
| 8B | Adjustable Hydraulic Lift Assy (for 80, 90, & 96") | 1 | 36B | Carriage Bolt, 7/16" x 1-1/2 (for 80" & 90") Grade 5 | 11 |
| 9 | Male Receiver Hitch (T-Fitting) | 1 | 36C | Carriage Bolt, 7/16" x 1-1/2 (for 96") Grade 5 | 12 |
| 10 | Sandwich Plate (3 Holes) | 1 | 37A | Lock Nut - Nylon, 7/16" (for 72") | 10 |
| 11 | Drawbar Mounting Ears | 2 | 37B | Lock Nut - Nylon, 7/16" (for 80" & 90") | 11 |
| 12 | Pump Mounting Bracket | 1 | 37C | Lock Nut - Nylon, 7/16" (for 96") | 12 |
| 13 | Pump, Monarch M-3551 (Incl items 38-44) | 1 | 38 | Electric Solenoid valves (Part of Item 13) | 2 |
| 14A | Hydraulic Hose, 3/8" x 15 Ft. (for 72") | 2 | 39 | Pump Motor (Included with Item 13) | 1 |
| 14B | Hydraulic Hose, 3/8" x 18 Ft. (for 80" & 90") | 2 | 40 | Can - Reservoir (Included with Item 13) | 1 |
| 14C | Hydraulic Hose, 3/8" x 20 Ft. (for 96") | 2 | 41 | Reservoir Cap (Included with Item 13) | 1 |
| 15 | Clevis Pin, 5/8"x 4-1/2" | 2 | 42 | Starter Solenoid (Included with Item 13) | 1 |
| 16 | Clevis Pin, 5/8"x 3-1/2" | 5 | 43 | Starter Motor (Included with Item 13) | 1 |
| 17 | Clevis Pin, 5/8"x 3" | 1 | 44 | Valve Body (Included with Item 13) | 1 |
| 18 | Hair Pin, Self Locking | 4 | 45A | Flat Washer, 7/16" (for 72") | 10 |
| 19 | Cotter Pin | 4 | 45B | Flat Washer, 7/16" (for 80" & 90") | 11 |
| 20 | Elbow - Hydraulic Fitting (1/4" NPT) | 2 | 45C | Flat Washer, 7/16" (for 96") | 12 |
| 22 | Hydraulic Quick Connector, Male (1/4" NPT) | 2 | 46 | Hydraulic Pressure Fitting (1/4" NPT) | 2 |
| 23 | Hydraulic Quick Connector, Female (1/4" NPT) | 2 | 47 | Spool Valve (Part of Item 13, Not Illustrated) | 1 |
| 24 | Lock Washer, 3/8" | 2 | 48 | Check Valve #C1/C2 (Part of Item 13, Not Illustrated) | 2 |
| 25 | Mounting Bracket Tube Assy (1-1/2" x 1-1/2") | 1 | 49 | Decal - Daniels (Not Illustrated) | 1 |
| 26 | Hex Head Bolt, 5/8" x 2" (Grade 8) | 3 | 50 | Decal - Speed Hitch (Not Illustrated) | 4 |
| | | | 51 | Decal - Reflective (Not Illustrated) | 5 |

Daniels Pull Plow

(1997 Models & Later)



97IPL-1 CDR

* If you have this type of hitch, contact Daniels for additional information on mounting drawbar ears.

NOTES



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