



**SNOWPLOW**

A DIVISION OF M.J. ELECTRIC, INC.  
P.O. BOX 788 IRON MOUNTAIN, MI 49801-0788

# **POWER-V**

## **(WITH RAPID-TACH II™)**

# **SNOWPLOW ASSEMBLY**

# **INSTALLATION PROCEDURE**

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#### **PATENTS**

1. U.S. Patent No. 4,074,448
2. U.S. Patent No. 4,658,519
3. U.S. Patent No. 5,568,694


***PUTS SNOW IN ITS PLACE***

MSC 3910-0  
98-99

# POWER-V (WITH RAPID-TACH II™) SNOWPLOW ASSEMBLY INSTALLATION PROCEDURE

1. Begin the assembly procedure by cutting down each corner of the box so that each wall of the box will lay flat on the floor.
2. Stand each BLADE ASSEMBLY (Ref. 2, Fig. 2) on end, hinge side up. Attach the CUTTING EDGES (Ref. No. 5, Fig. 2) to the right and left hand BLADE ASSEMBLIES (Ref. No. 2, Fig. 2) using the GRADE 8 CARRIAGE BOLTS (Ref. No. 6, Fig. 2), 1/2" FLAT WASHERS and the GRADE C SELF LOCKING NUTS provided. Torque to 80 ft-lbs.
3. Mount the ADJUSTABLE BLADE PLOW SHOE ASSEMBLIES (Ref. No. 10, Fig. 3) on both BLADE ASSEMBLIES, using the 1" FLAT WASHERS (Ref. No. 45, Fig. 3) to achieve the desired blade height and secure with the QUICK PINS (Ref. No. 44, Fig. 3).
4. Position the CENTER HINGE ASSEMBLY (Ref. 3, Fig. 1) onto the T-FRAME (Ref. 4, Fig. 1). Align the T-FRAME bushing and the bushings on the CENTER HINGE ASSEMBLY then insert the HORIZONTAL HINGE PIN (Ref. No. 12, Fig. 1) through the bushings. Place a 1" washer on each end of the HORIZONTAL HINGE PIN and secure the HORIZONTAL HINGE PIN and 1" WASHERS in place by welding the washers to the pin.
5. Attach the TURNBUCKLE (Ref. No. 34, Fig. 1) hook end to the CENTER HINGE ASSEMBLY. Then attach the TRIP SPRING YOKE (Ref. No. 9, Fig. 1) to the jaw end of the TURNBUCKLE. Insert the TRIP SPRINGS (Ref. No. 33, Fig. 1) through the holes provided in the TRIP SPRING YOKE. By loosening the TURNBUCKLE, slack will be given to allow the loose TRIP SPRING ends to pass over the COUPLER PIN (Ref. No. 60, Fig. 1). The proper tension of the TRIP SPRINGS will be determined after the plow is completely assembled.
6. Position the blade halves so the bushings on the blade assemblies and the center hinge assembly are aligned. Position the right hand blade assembly first, as it has the lowest bushing. Coat the center hinge pin with a thin film of grease and insert it through all of the bushings. NOTE: During the snowplow season each bushing on the nose of the snowplow should be greased at least once per month (Fig. 7). When the center hinge pin has been fully inserted, it is to be secure with a 3/8" x 1 1/4" bolt (Ref. No. 70, Fig. 4), a 3/8" lock washer (Ref. No. 71, Fig. 4) and Lock-Tite.
7. Next place each of the two ANGLING CYLINDERS (Ref. No. 17, Fig. 5) in their respective positions as shown and fasten securely with a 5/8" X 5" hex head bolt and self locking nut (Ref. No. 96, Fig. 5) and a 5/8" X 4" hex head bolt and self locking nut (Ref. No. 55, Fig. 5).
8. With the BLADE ASSEMBLIES drawn back to the vee position, insert one end of the RETURN SPRINGS (Ref. No. 33, Fig. 6) through the holes provided in the top of the CENTER HINGE ASSEMBLY. Then slip one EYE BOLT (Ref. No. 47, Fig. 6) around the loose end of the RETURN SPRING and insert the threads on the EYE BOLT through the return spring bracket on the back of the blade. Secure the EYE BOLTS using 1/2" self locking nuts and 1/2" flat washers. Tighten the self locking nuts on the EYE BOLTS until there is 1/32" between the coils of the springs.

9. Now, position the LIGHT BRACKET ASSEMBLY (Ref. No. 73, Fig. 9) on the coupler and bolt in place using six (6) 1/2" x 1" hex head bolts and self locking nuts.

 10. With the BLADES and T-FRAME fully assembled and the blades drawn back to the V-position, the TURN-BUCKLE can now be tightened until the T-FRAME is drawn up to its full upward position. When properly tightened, the T-FRAME should be parallel to the ground.

11. Assemble the LATCH HANDLE as shown in Figure 10 using a 3/8" x 1 1/2" hex head bolts, washers, and self locking nuts. Check that both Coupler Latches close completely against the Coupler jaw when the LATCH HANDLE LEVER (Ref. 57, Fig. 10) is in the closed position. If the latches do not close completely, adjust the hand lever guide assembly (Ref. 59, Fig. 10) so that the latches close completely.

12. Connect the Angle Cylinder Hydraulic Hoses to the angle cylinders as shown in Figure 11. Do not apply thread sealant or teflon tape.

13. Connect the lift cylinder hoses to the lift cylinders as shown in Figure 11.

14. Place warning sticker on plow driver side outermost panel.

15. Attach BLADE GUIDE to the BLADE ASSEMBLY using 4 5/16" X 1" HEX HEAD BOLTS and the 5/16" SELF LOCKING NUTS.

**NOTE: IT IS IMPORTANT THAT ALL FASTENERS BE PROPERLY TORQUED TO ASSURE A SAFE OPERATING PLOW. SEE FIGURE 17**

## ELECTRICAL SYSTEM WIRING PROCEDURE

WIRING INSTALLATION - Refer to diagram

1. Mount the AUXILIARY HEADLIGHTS to the LIGHT BRACKET ASSEMBLY. Do not tighten the AUXILIARY HEADLIGHT mounting nut as the positioning of the headlights will have to be adjusted once the wiring has been completed.

2. Plug the driver's side auxillary headlights connector to the plow wiring harness marked D. Plug the passenger side auxillary headlight connection to the plow wiring harness marked P.


3. Disconnect left and right headlight connector plugs on vehicle.

4. Plug in both sealed beam connectors from the headlight adapter kit to vehicle headlights.

5. Connect wiring harness 3 prong male plug into female connector which was removed from left vehicle headlight. Tape and secure female connector which was removed from right hand vehicle headlight.

6. Referring to wiring diagram, complete wiring connections of turn signal and parking lights to vehicle electrical lighting system using splice connectors. Identify all circuits with test lamp.

7. Drill a 1 1/4" diameter hole in the firewall at the most convenient location and pull wire harness through firewall from the engine compartment into the cab until rubber grommet snaps into place.

 8. Connect 6 female tab connectors on end of harness to toggle switch (Ref. No. 4, Fig. 13) as shown in Figure 13.

9. Select suitable location on dash to mount the toggle switch and drill a 1/2" diameter hole through the dashboard.
10. Apply switch identification label (Ref. No. 5, Fig. 13) to dash by removing protective backing from label and pressing label over switch hole. Make sure switch is positioned with respect to label so that snowplow lamps are "ON" when switch toggle is in the upper position.
11. Remove knurled nut from the toggle switch; insert switch through the drilled hole and re-install the knurled nut. Tighten nut securely.
12. Connect BLACK wire to a fused and switch circuit that is wired so that the vehicle ignition switch shuts off all power to the plow electrical system.
13. Mount the hydraulic pump switch assembly (Ref. No. 40, Fig. 13). Note the pump switch assembly must be located where the operator will not contact it during sudden stops and still offer comfortable operation of the plow. This will reduce operator fatigue during extended periods of plowing. As an option to mounting the pump switch assembly to the dash, the rocker switches can be removed from the box and mounted (cut into) in the dash of the vehicle.
14. Connect the White/Black wire to Pump Solenoid (Ref. No. 39A, Fig. 13).
15. Drill two 5/16 holes into the front bumper using the CONTROL HARNESS MOUNTING BRACKET (Ref. 80, Fig. 16) as a template. Secure to the bumper using two 1/4"-20 x 3/4" HEX HEAD BOLTS and 1/4"-20 HEX HEAD SELF LOCKING NUTS.  
Secure the POWER/GROUND CABLE to the CONTROL HARNESS MOUNTING BRACKET using two POWER/GROUND CABLE MOUNTING BRACKETS (Ref. 101, Fig. 16). 1/4"-20 x 1 3/4" HEX HEAD BOLTS, AND 1/4" x 20 HEX HEAD SELF LOCKING NUTS.  
Push the electrical quick disconnect control plug through the rectangular hole of the CONTROL HARNESS WEATHER CAP.  
Align the groove on the electrical quick disconnect control plug with the mounting bracket and push the plug past the two retaining notches on the bracket.
16. Attach the snowplow to the vehicle.
17. Check for proper operation:
  - A. Turn on headlight switch and check that with the toggle switch in lower position, only the vehicle headlights are on. With the toggle switch in upper position, only the snowplow headlights should be on.
  - B. The foot dimmer switch should select high and low beams on both headlights.
  - C. Turn signal lights should be on in same sequence and at same time as the vehicle turn signal lights.
  - D. Parking lights should be on at same time as vehicle parking lights. If any light does not operate correctly, re-check the wiring against the wiring diagram and make necessary corrections in wiring hookup.
  - E. Check snowplow for proper height adjustment and hydraulic pump switch assembly for proper operation up, down, right and left.

## **SNOWPLOW LIGHT ALIGNMENT PROCEDURE**

- A. Place vehicle on a level surface 25 feet in front of a matte-white screen, such as a garage door. The screen should be perpendicular both to the ground and to the vehicle centerline.

B. The vehicle should be equipped for normal operation. The snowplow blade should be in place and in the raised position. Below are points listed by the Society of Automotive Engineers (SAE) pertinent to headlight aiming in specification #SAEJ5991D:

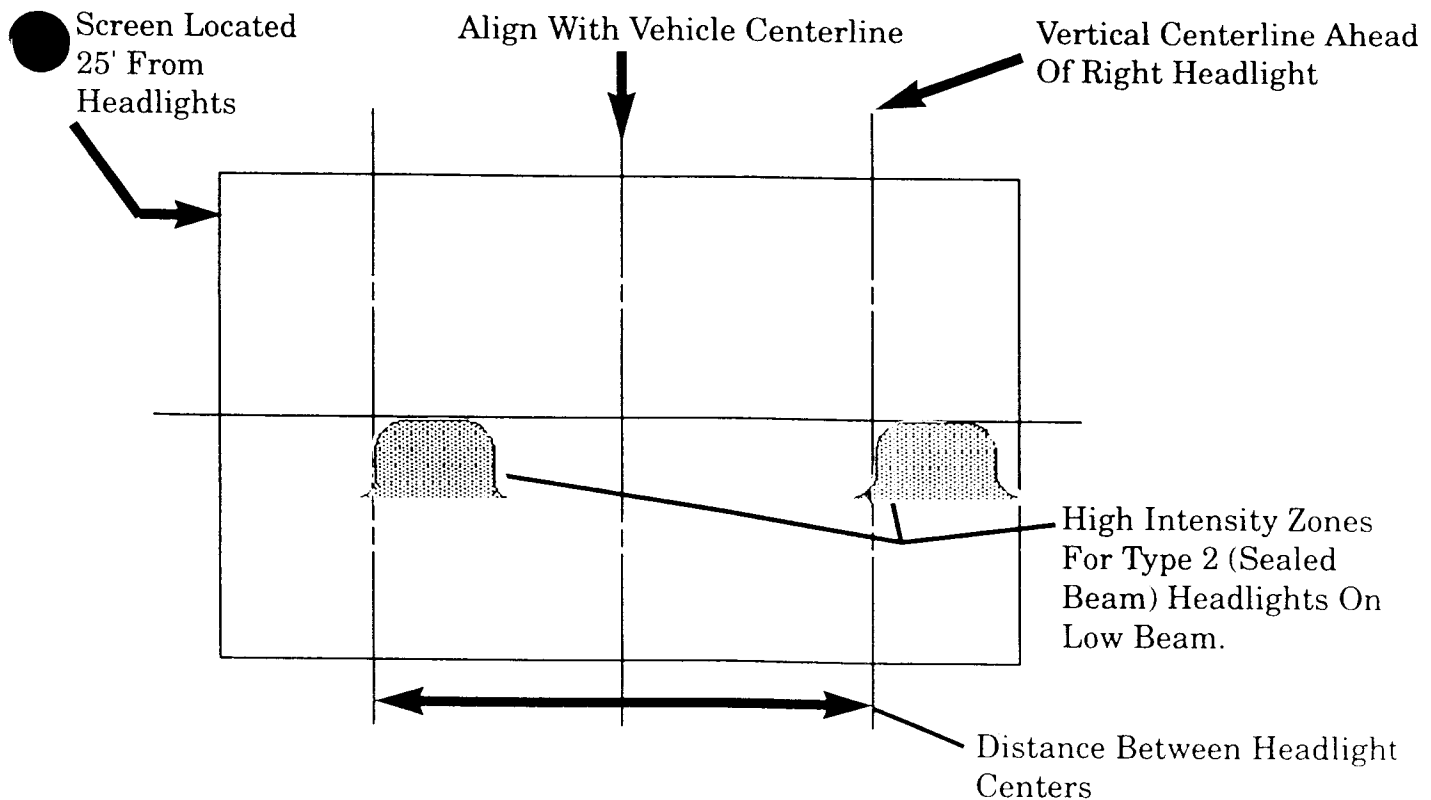
Preparation for Headlight Aim or Inspection.

Before checking beam aim, the inspector shall:

1. Remove ice or mud from under fenders.
2. See that no tire is noticeably deflated.
3. Check car springs for sag or broken leaves.
4. See that there is no load in the vehicle other than the driver.
5. Check functioning of any "level-ride" control.
6. Clean lenses and aiming pads.
7. Check for bulb burnout, broken mechanical aiming pads, and proper beam switching.
8. Stabilize suspension by rocking vehicle sideways.

C. Mark (or tape) the vertical centerline of the headlights and the vehicle itself on the screen. Mark the horizontal centerline of the headlights on the screen (distance from ground to headlight centers).

D. The correct visual aim for Type 2 headlights (snowplow headlights are Type 2; see number on face of sealed beam) is with the top edge of the high intensity zone of the lower beam below the horizontal centerline and the left edge of the high intensity zone on the vertical centerline (See diagram below).



**NOTE:** Installer of these snowplow lights must certify that installation conforms to applicable Federal Motor Vehicle Safety Standards.

# HYDRAULIC SYSTEM INTRODUCTION

The hydraulic portion of your snowplow plays an important role as it performs the various functions of the plow.

**IT IS VERY IMPORTANT DURING THE INSTALLATION OF THE HYDRAULIC PUMP, VALVE ASSEMBLY, AND HOSES THAT EXTREME CARE BE TAKEN TO MAINTAIN A CLEAN HYDRAULIC SYSTEM.** All precautions taken during the installation of the hydraulic system will help assure trouble free operation later.

1. The majority of the hydraulic installation has been done at the factory, and several checks have been made under Boss Products' in-house quality program. However, a visual check of all hose routing, and cable connections should be performed by installation personnel.
2. **BEFORE FILLING THE HYDRAULIC PUMP WITH FLUID, CHECK ALL HYDRAULIC CONNECTIONS FOR TIGHTNESS AND BE SURE ALL FASTENERS ARE SECURE.**
3. Remove the **FILLER CAP** on the **HYDRAULIC PUMP** reservoir and fill with **BOSS HIGH PERFORMANCE HYDRAULIC FLUID** to within 3/4" from the top. Raise and lower the plow three times. Add fluid to within 3/4" from the reservoir top. Extend and retract the left wing three times. Extend and retract the right wing three times. With both wings retracted lower the plow. Allow the fluid to settle and refill the reservoir to within 3/4" from the top.
4. Operate the hydraulic system checking for leaks at all connection points. Also, verify that all plow functions are correct (i.e. lift, drop, left wing, and right wing operate properly). This initial operation of the hydraulic system also purges any air from the system. The fluid level in the reservoir should be checked for a final time.
5. Adjust the flow control valve (Ref. 52, Fig. 11) to obtain the speed desired for lowering the plow. Turning the thumb screw clockwise to lower the plow slower. Turning the thumb screw counter clockwise will lower the plow more quickly.
6. Bolt cover into place using two 3/8" X 3/4" Hex Head Bolts and 3/8" Self Locking Nuts provided.

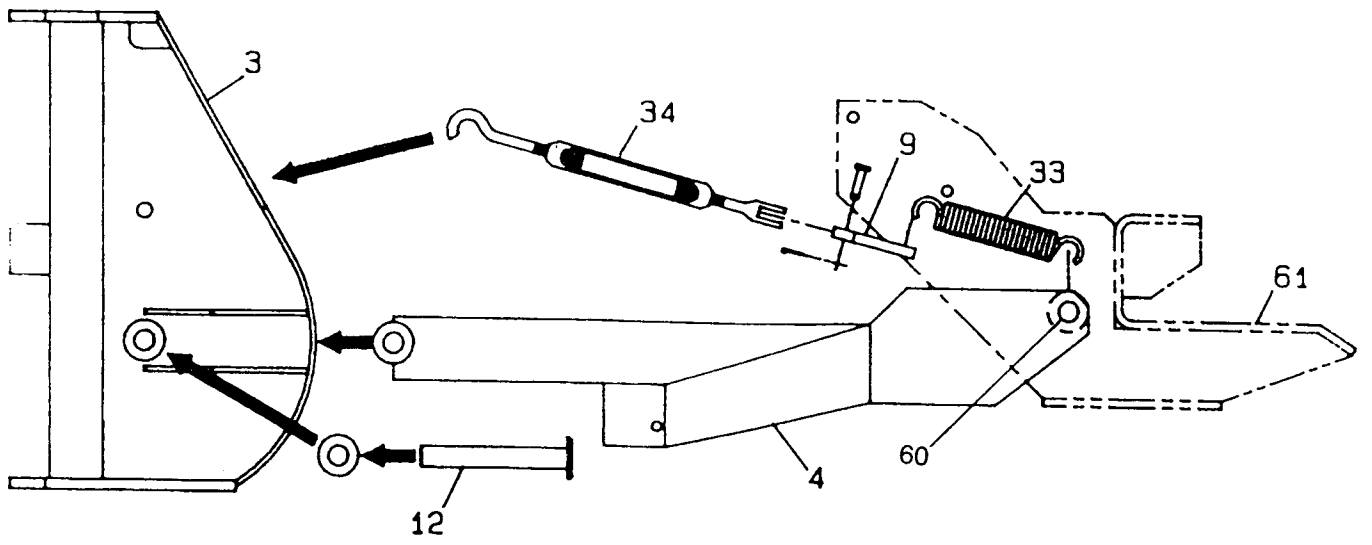


Figure 1

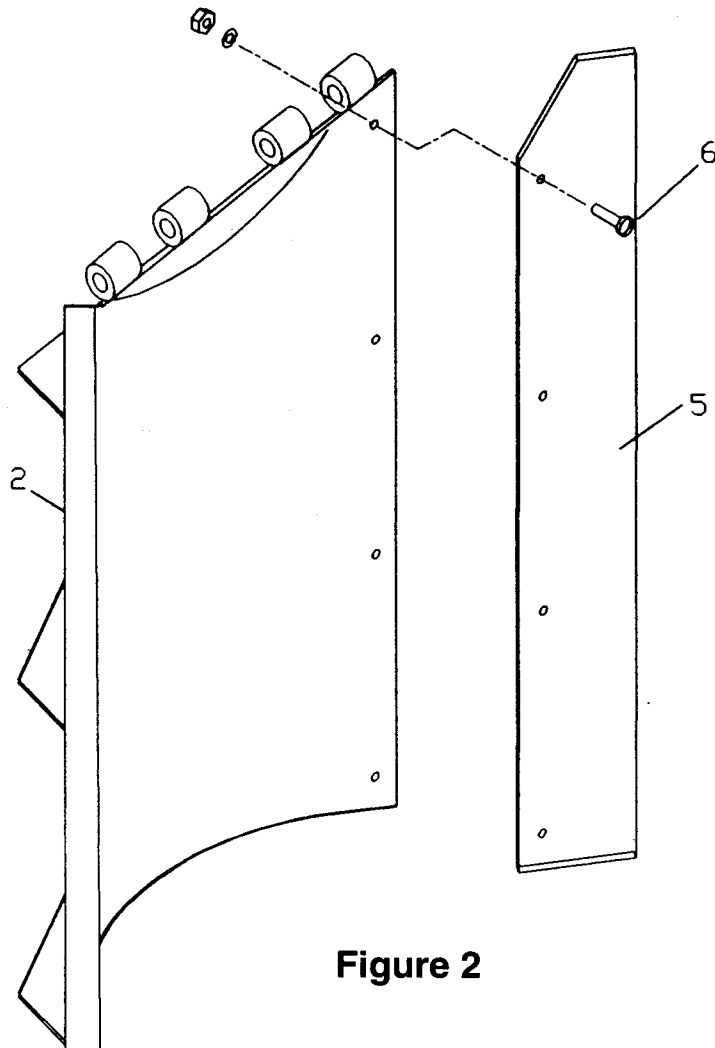


Figure 2

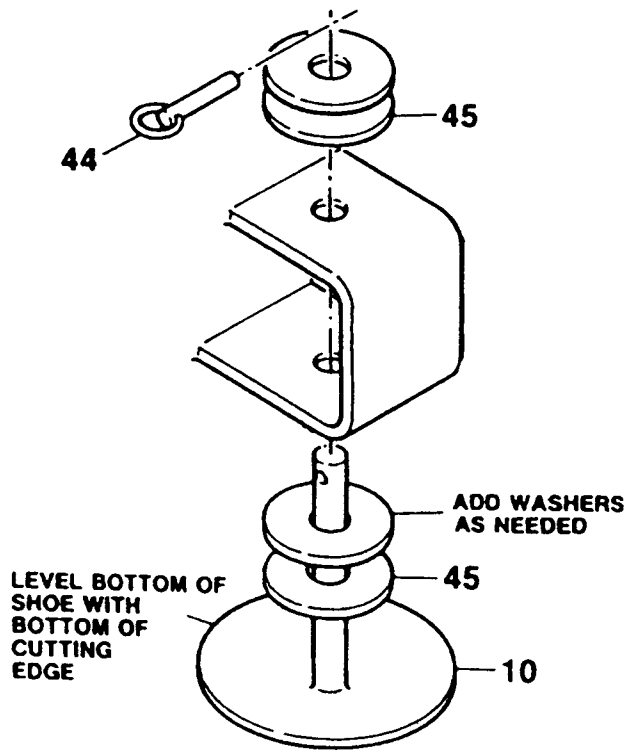


Figure 3

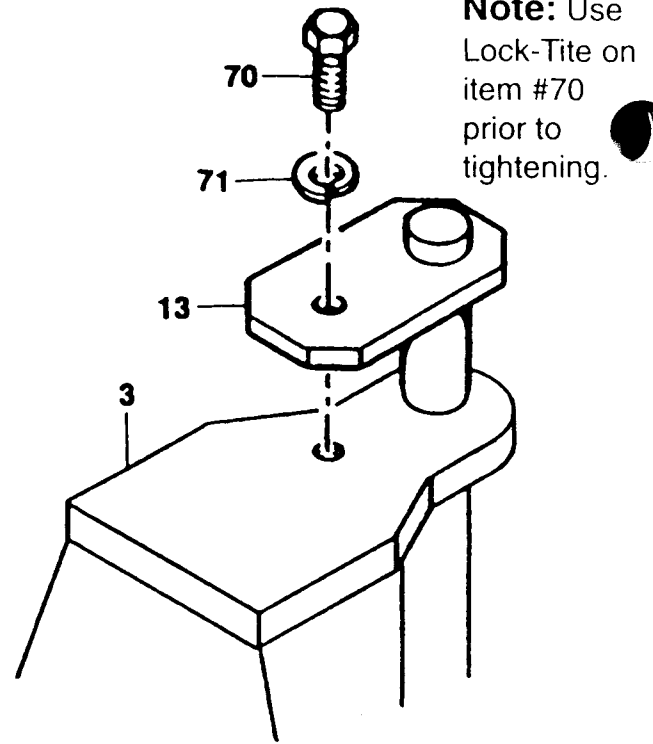


Figure 4

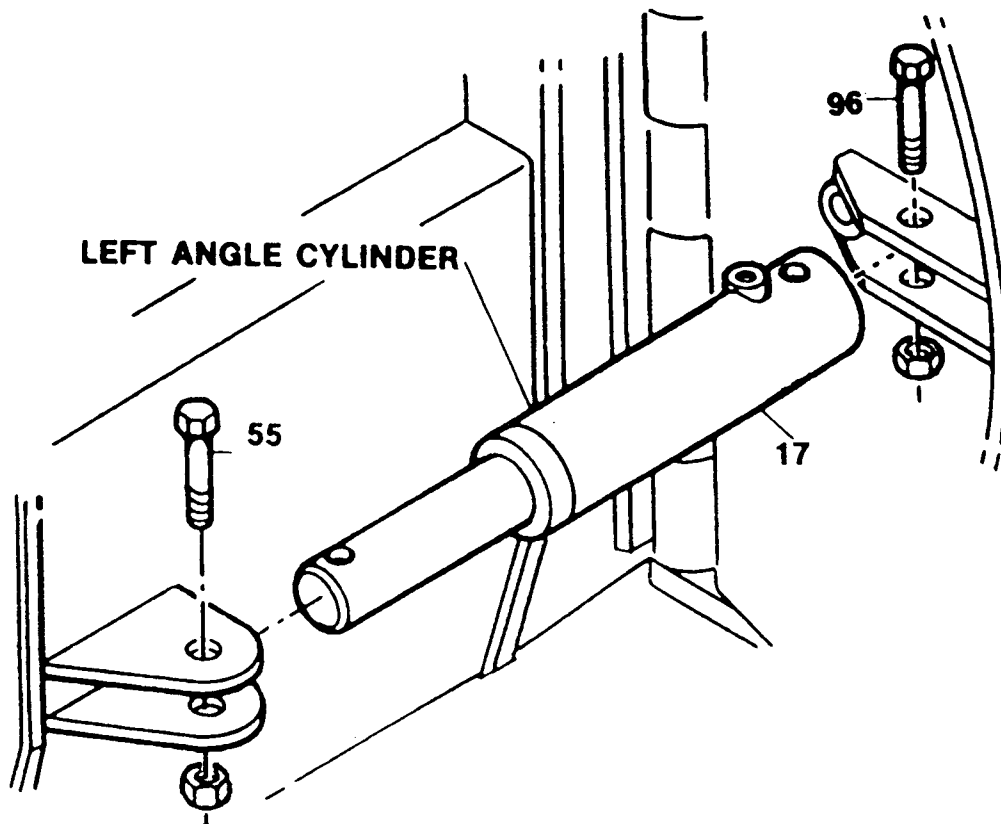


Figure 5



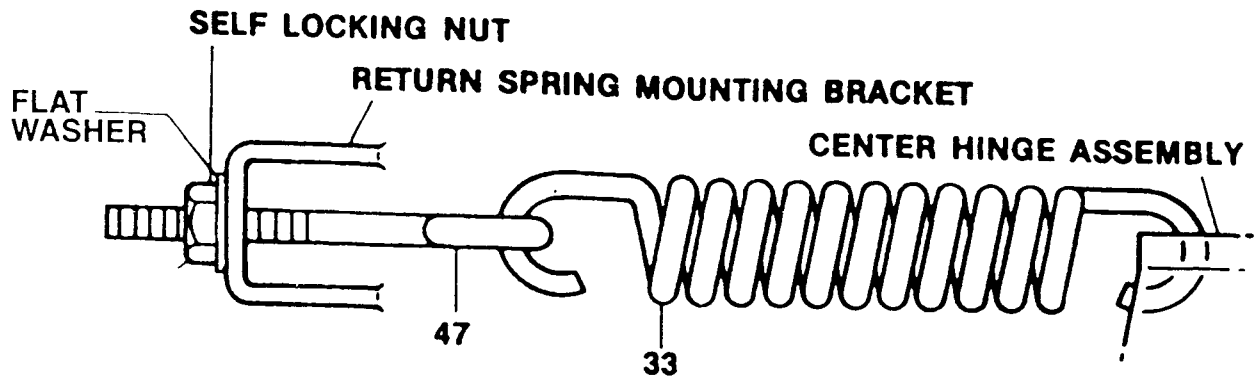


Figure 6

Figure 7

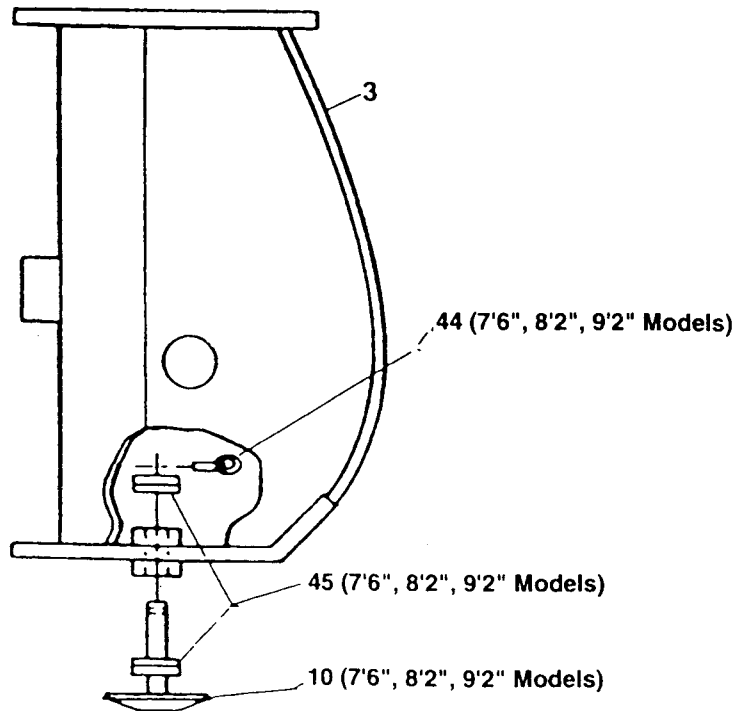
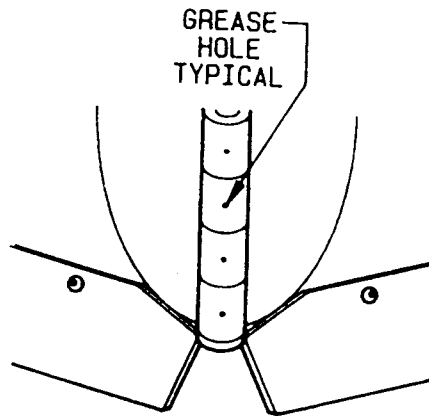


Figure 8

# LIGHT BRACKET ASSEMBLY INSTALLATION

| REF. NO. | DESCRIPTION                         | PART NO. | QTY. |
|----------|-------------------------------------|----------|------|
| 61       | Coupler Assembly                    | CPA4340  | 1    |
| 73       | Light Bracket Assembly              | LBA4360  | 1    |
| A        | 1/2" - 13 X 1" Hex Head Bolt        |          | 6    |
| B        | 1/2" - 13 Hex Head Self Locking Nut |          | 6    |
| 82       | Plastic End Cap                     | MSC3481  | 2    |

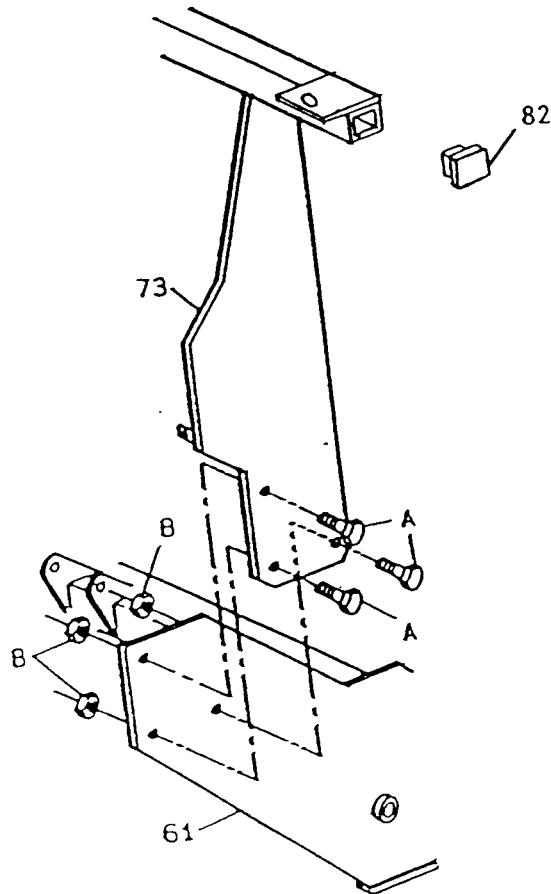
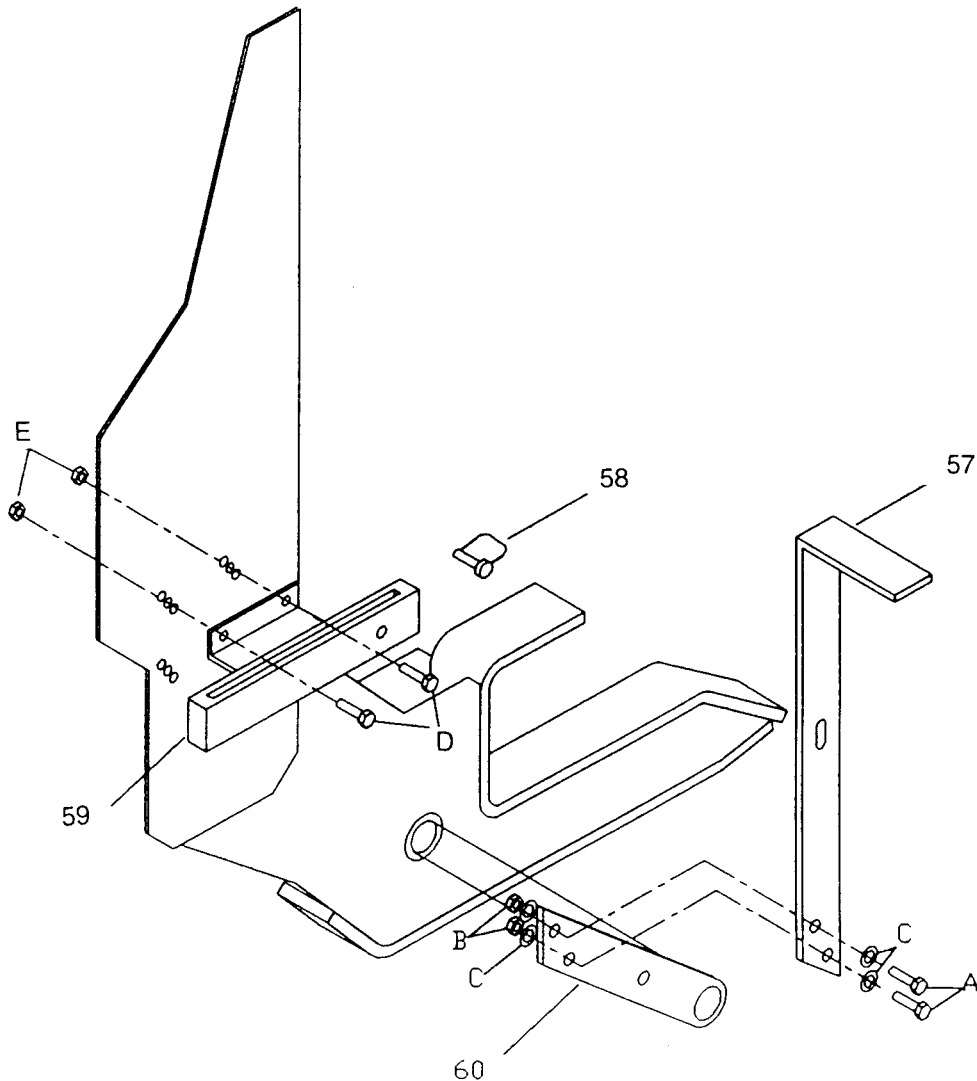


Figure 9

# LATCH HANDLE ASSEMBLY INSTALLATION

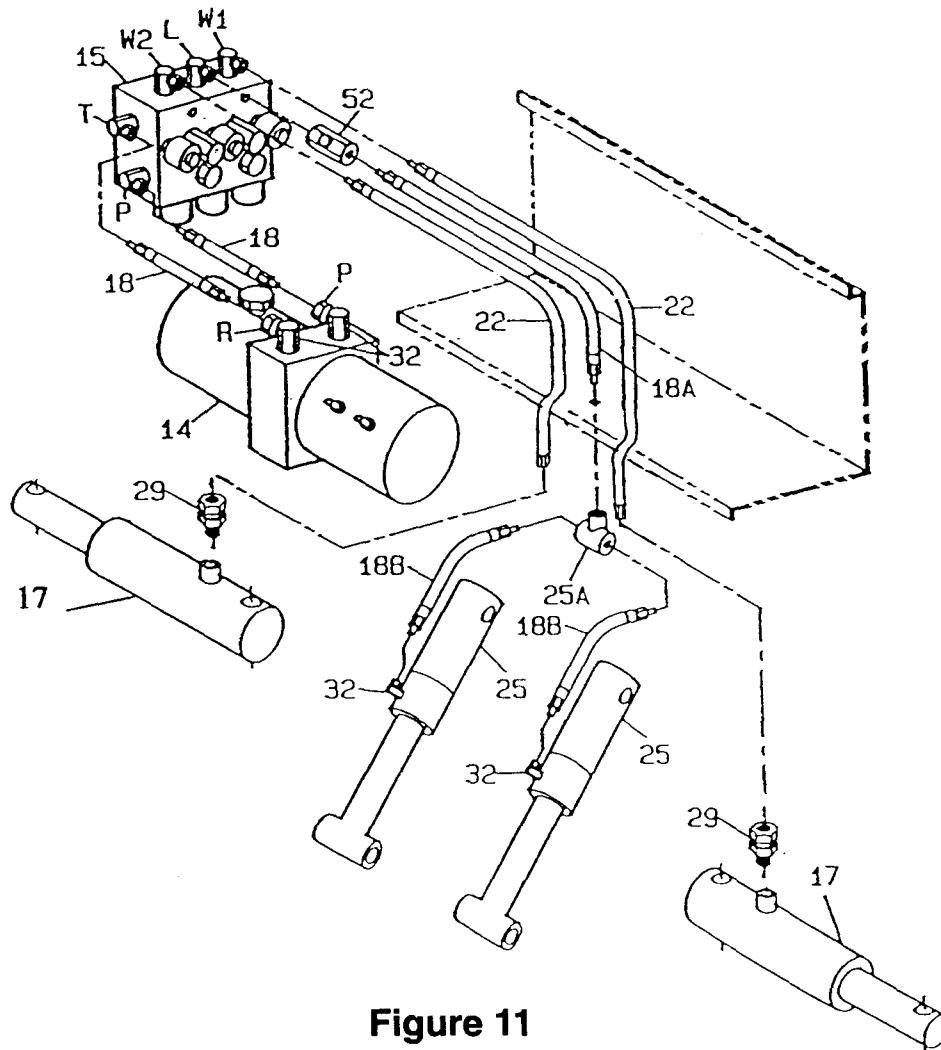
| REF. NO. | DESCRIPTION                         | PART NO. | QTY. |
|----------|-------------------------------------|----------|------|
| 60       | Coupler Latch Pin W/Link            | LTA3573  | 1    |
| 59       | Hand Lever Guide Assembly           | LTA3576  | 1    |
| 58       | Latch Handle Safety Pin             | HDW5509  | 1    |
| 57       | Hand Lever                          | LTA3555  | 1    |
| A        | 3/8" - 16 X 1 1/4" Hex Head Bolt    |          | 2    |
| B        | 3/8" - 16 Hex Head Self Locking Nut |          | 2    |
| C        | 3/8" Flat Washer                    |          | 4    |
| D        | 1/4" - 20 X 1" Hex Head Bolt        |          | 4    |
| E        | 1/4" - 20 Hex Head Self Locking Nut |          | 4    |



**Figure 10**

# HYDRAULIC SYSTEM GENERAL SCHEMATIC (RAPID-TACH II, V-PLOW)

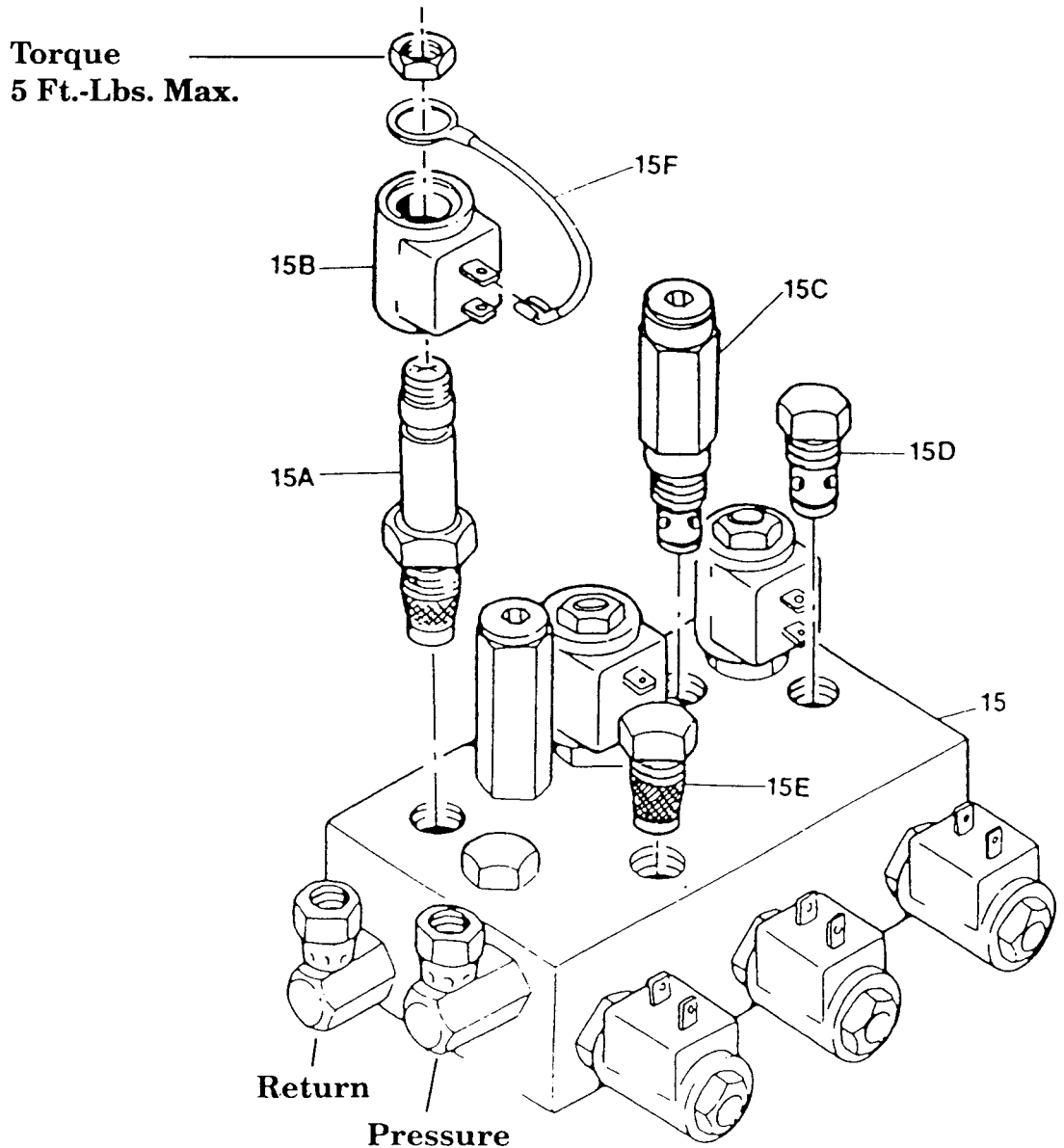
| REF. NO. | DESCRIPTION                             | PART NO. | QTY. |
|----------|---|----------|------|
| 14       | Hydraulic Powe Unit                     | HYD1710  | 1    |
| 15       | Hydraulic Valve Assembly                | HYD1602  | 1    |
| 17       | Hydraulic Cylinder, Angle (V)           | HYD1603  | 2    |
| 18       | Hydraulic Hose (1/4" X 18")             | HYD1606  | 2    |
| 18A      | Hydraulic Hose (1/4" X 12")             | HYD1696  | 1    |
| 18B      | Hydraulic Hose (1/4" X 15 1/2")         | HYD1695  | 2    |
| 22       | Hydraulic Hose (3/8" X 48")             | HYD1707  | 2    |
| 25       | Hydraulic Cylinder, Lift                | HYD1680  | 2    |
| 25A      | Hydraulic Fitting (Tee)                 | HYD1682  | 1    |
| 29       | Straight Swivel, 3/8" Male, 3/8" Female | HYD1711  | 2    |
| 32       | 90 Degree Swivel "O" Ring               | HYD1620  | 4    |
| 52       | Flow Control Valve                      | HYD1624  | 1    |



**Figure 11**

# HYDRAULIC VALVE ASSEMBLY PARTS LIST

| REF. NO. | DESCRIPTION                  | PART NO. | QTY. |
|----------|------------------------------|----------|------|
| 15       | Hydraulic Valve Assembly (V) | HYD1602  | 1    |
| 15A      | Valve                        | HYD1637  | 6    |
| 15B      | Coil                         | HYD1638  | 6    |
| 15C      | Relief Valve (V) 2800 PSI    | HYD1639  | 2    |
| 15D      | Check Valve                  | HYD1640  | 3    |
| 15E      | Screen Cartridge             | HYD1641  | 1    |
| 15F      | Ground Strap                 | HYD1647  | 6    |

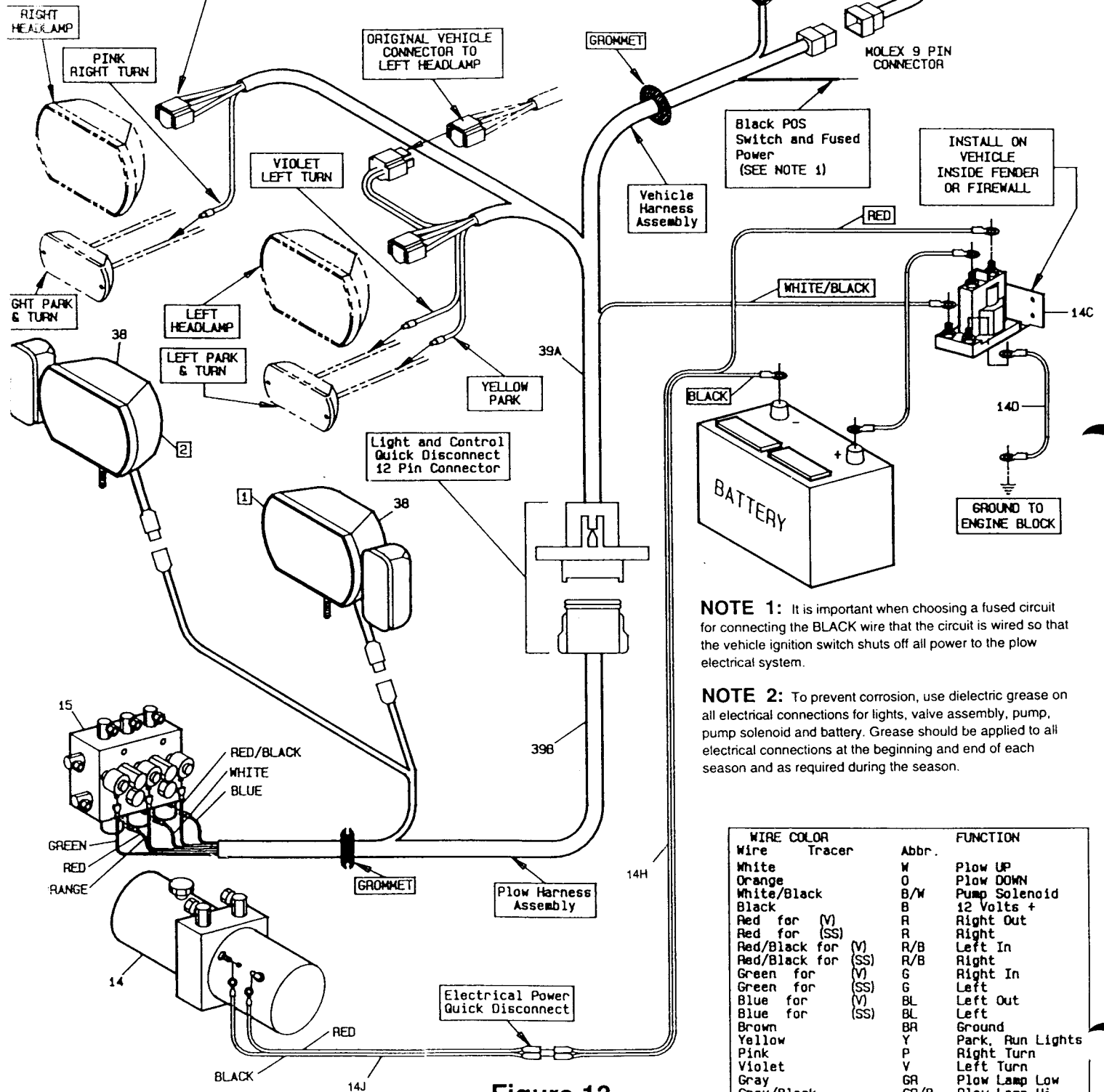


**Figure 12**

# RAPID-TACH II

PLUG-IN HARNESS FOR LIGHTS AND CONTROL  
Installation and Parts Diagram

Adapter Kits Available For:  
Four Headlamp Vehicles  
Four Halogen Headlamps  
Composite Halogen Headlamps  
UF/LF Headlamps



**NOTE 1:** It is important when choosing a fused circuit for connecting the BLACK wire that the circuit is wired so that the vehicle ignition switch shuts off all power to the plow electrical system.

**NOTE 2:** To prevent corrosion, use dielectric grease on all electrical connections for lights, valve assembly, pump, pump solenoid and battery. Grease should be applied to all electrical connections at the beginning and end of each season and as required during the season.

| WIRE COLOR         | Tracer | Abbr. | FUNCTION         |
|--------------------|--------|-------|------------------|
| White              |        | W     | Plow UP          |
| Orange             |        | O     | Plow DOWN        |
| White/Black        |        | B/W   | Pump Solenoid    |
| Black              |        | B     | 12 Volts +       |
| Red for (V)        |        | R     | Right Out        |
| Red for (SS)       |        | R     | Right            |
| Red/Black for (V)  |        | R/B   | Left In          |
| Red/Black for (SS) |        | R/B   | Right            |
| Green for (V)      |        | G     | Right In         |
| Green for (SS)     |        | G     | Left             |
| Blue for (V)       |        | BL    | Left Out         |
| Blue for (SS)      |        | BL    | Left             |
| Brown              |        | BR    | Ground           |
| Yellow             |        | Y     | Park, Run Lights |
| Pink               |        | P     | Right Turn       |
| Violet             |        | V     | Left Turn        |
| Gray               |        | GR    | Plow Lamp Low    |
| Gray/Black         |        | GR/B  | Plow Lamp Hi     |
| LT Green           |        | LG    | Vehicle Lamp Lo  |
| LT Green/Black     |        | LG/B  | Vehicle Lamp Hi  |
| LT Blue            |        | LBL   | Lo Headlamp IN   |
| LT Blue/Black      |        | LBL/B | Hi Headlamp IN   |

Figure 13

# POWER-V HYDRAULIC PUMP SWITCH ASSEMBLY WIRING DIAGRAM

| COLOR       | FUNCTION      | PIN |
|-------------|---------------|-----|
| BLACK       | 12 VOLTS +    | 1   |
| ORANGE      | PLOW DOWN     | 2   |
| WHITE       | PLOW UP       | 3   |
| RED         | RIGHT OUT     | 4   |
| GREEN       | RIGHT IN      | 5   |
| BLUE        | LEFT OUT      | 6   |
| RED/BLACK   | LEFT IN       | 7   |
| WHITE/BLACK | PUMP SOLENOID | 8   |

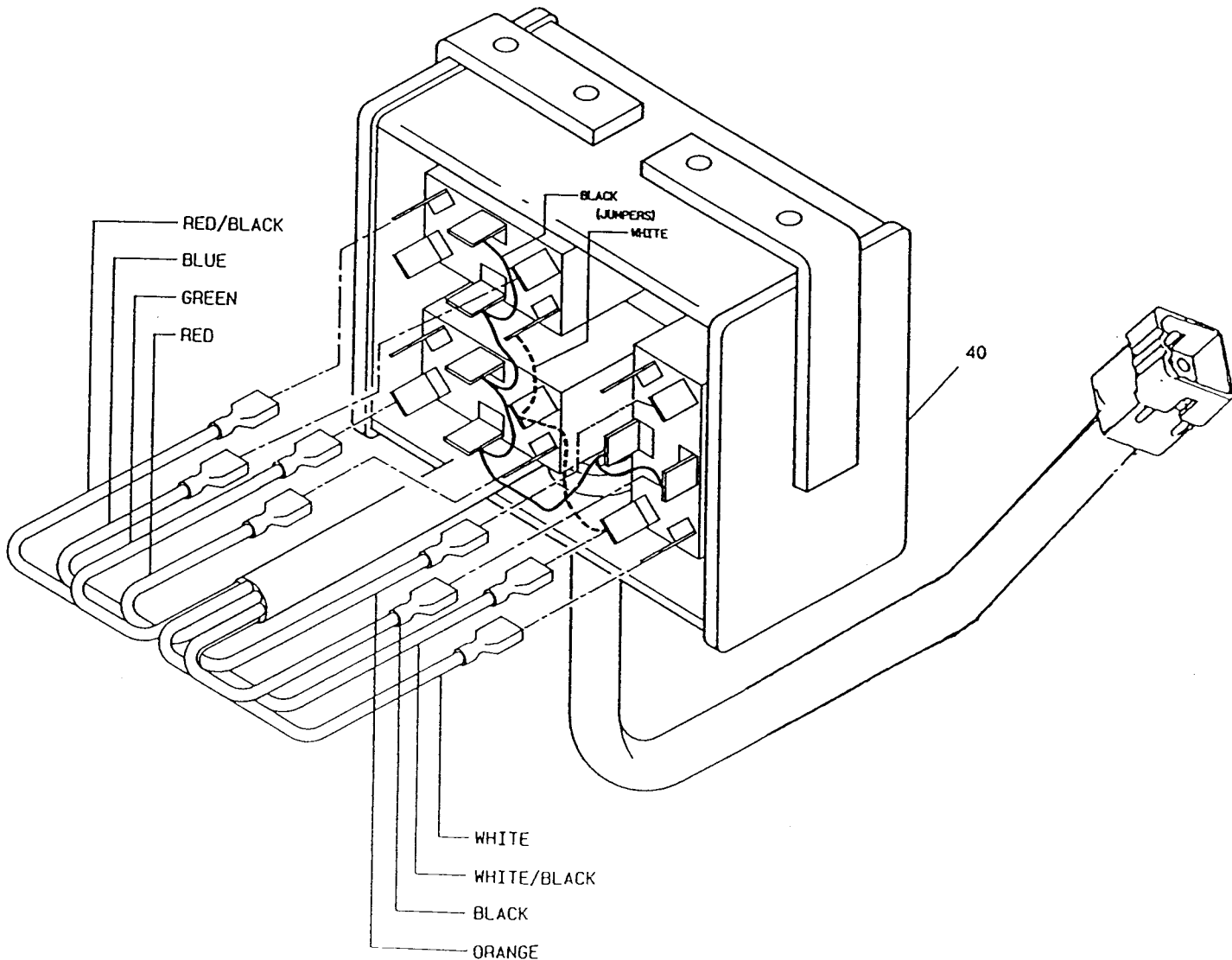


Figure 14

# RAPID-TACH II WIRING SCHEMATIC

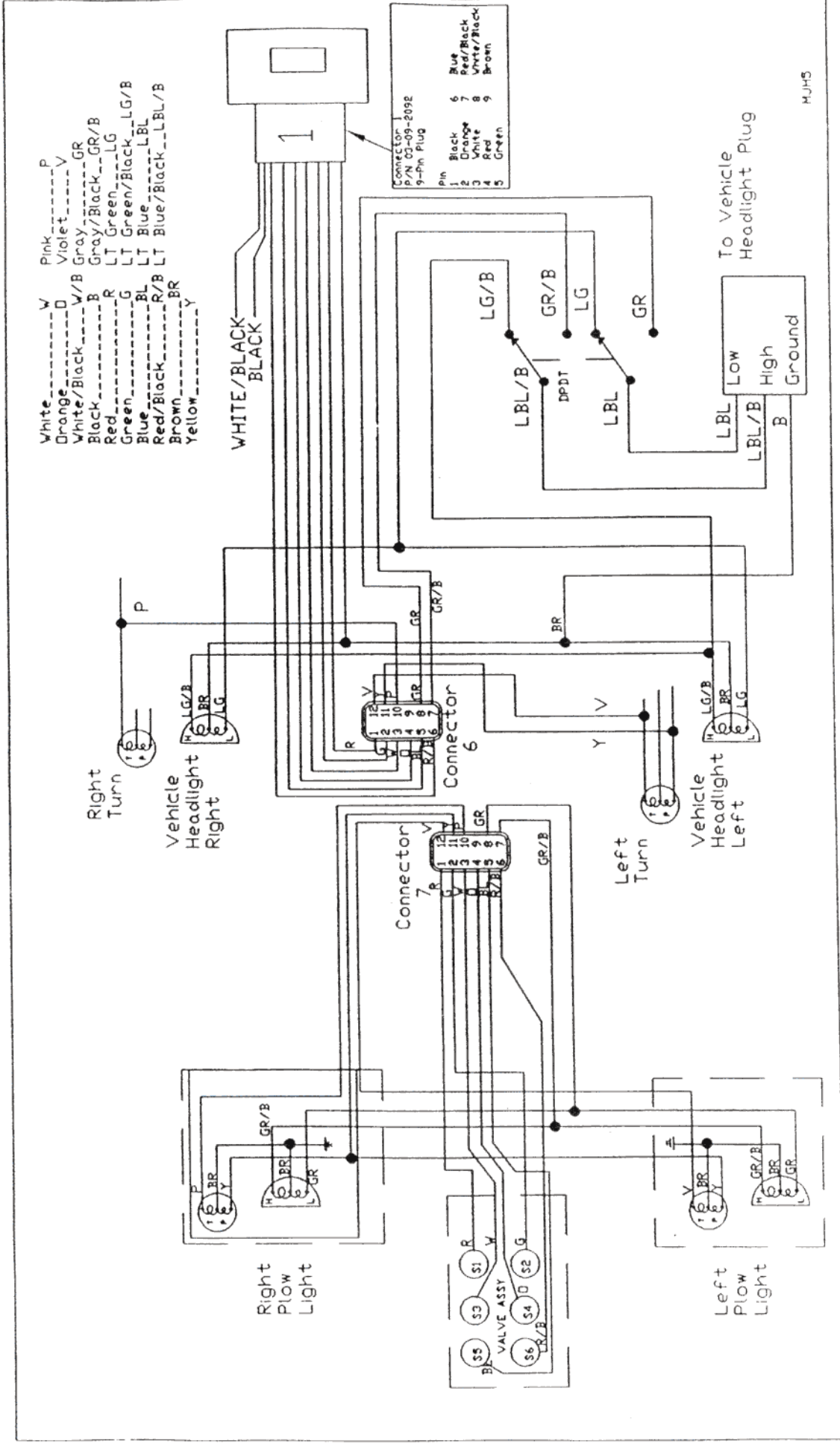


Figure 15

HJHS



# POWER-V WITH (RAPID-TACH II™) GENERAL DRAWING

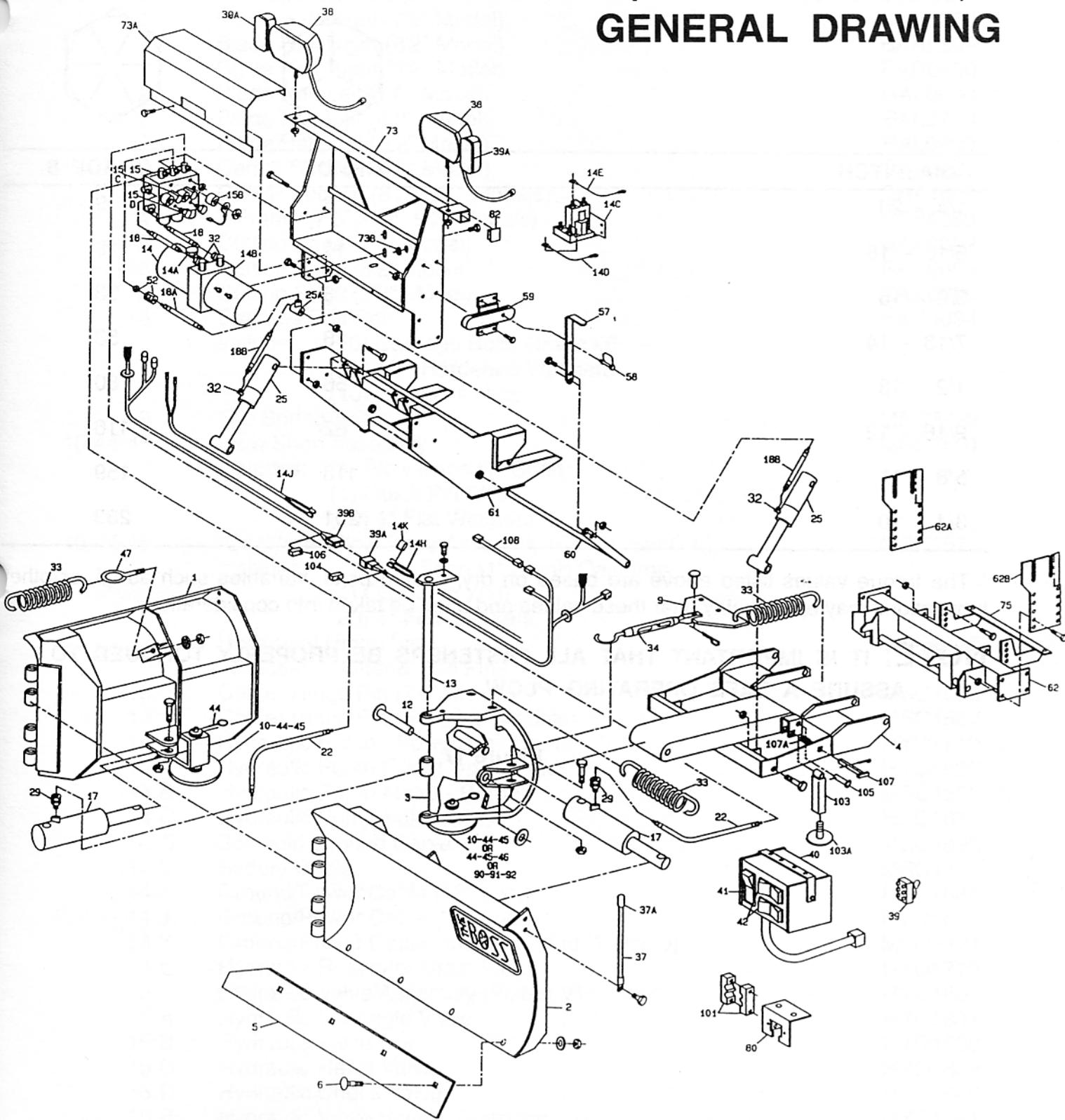
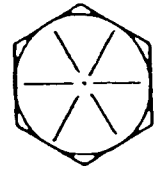


Figure 16

# GUIDE TO RECOMMENDED ASSEMBLY TORQUE

All Torque Values Are In Foot-Pounds (Ft.-Lb.)



| DIA./PITCH | GRADE 5 | GRADE 8 |
|------------|---------|---------|
| 1/4 - 20   | 6       | 9       |
| 5/16 - 18  | 14      | 19      |
| 3/8 - 16   | 23      | 33      |
| 7/16 - 14  | 38      | 53      |
| 1/2 - 13   | 56      | 80      |
| 9/16 - 12  | 82      | 116     |
| 5/8 - 11   | 113     | 159     |
| 3/4 - 10   | 201     | 283     |

\* The torque values listed above are based on dry, coated bolts, variables such as oil, or other lubrications may appreciably alter these values and must be taken into consideration.

**NOTE: IT IS IMPORTANT THAT ALL FASTENERS BE PROPERLY TORQUED TO ASSURE A SAFE OPERATING PLOW.**

Figure 17

# POWER-V WITH RAPID-TACH II™

## PARTS LIST

| REF. NO. | DESCRIPTION                                     | PART NUMBER |
|----------|---|-------------|
| 1        | Blade Half Right (7'6" Model)                   | BAR0200     |
| 1        | Blade Half Right (8'2" Model)                   | BAR0300     |
| 1        | Blade Half Right (9'2" Model)                   | BAR0400     |
| 2        | Blade Half Left (7'6" Model)                    | BAL0600     |
| 2        | Blade Half Left (8'2" Model)                    | BAL0700     |
| 2        | Blade Half Left (9'2" Model)                    | BAL0800     |
| 3        | Center Section (7'6" Model)                     | CHA1200     |
| 3        | Center Section (8'2", 9'2" Models)              | CHA1000     |
| 4        | T-Frame (7'6", 8'2", 9'2" Models)               | TFR4350     |
| 5        | Cutting Edge (7'6" Model)                       | BAX0002     |
| 5        | Cutting Edge (8'2" Model)                       | BAX0003     |
| 5        | Cutting Edge (9'2" Model)                       | BAX0004     |
| 6        | Carriage Bolt Set                               | BAX0034     |
|          | Includes: (10) Carriage Bolts Grade #8          |             |
|          | (10) 1/2" Hardened Washers                      |             |
|          | (10) 1/2" Lock Nuts                             |             |
| 9        | Trip Spring Yoke                                | MSC3422     |
| 10-44-45 | Plow Shoe Assembly                              | MSC1501     |
|          | Includes: (1) Plow Shoe (1" Shaft)              |             |
|          | (1) Quick Pin 7/16"                             |             |
|          | (20) 1" Flat Washers                            |             |
| 10-44-45 | "Cast Iron" Plow Shoe Assembly (Center Section) | MSC1570     |
|          | Includes: (1) Plow Shoe (1" Shaft) Cast Iron    |             |
|          | (1) Quick Pin 7/16"                             |             |
|          | (20) 1" Flat Washers                            |             |
| 12       | Horizontal Hinge Pin                            | MSC1508     |
|          | Includes: Cotter & Roll Pins                    |             |
| 13       | Center Hinge Pin (7'6" Model)                   | MSC1550     |
| 13       | Center Hinge Pin (8'2", 9'2" Models)            | MSC1507     |
| 14       | Hydraulic Pump - Power Unit Barnes              | HYD1710     |
| 14 A     | Hydraulic Pump Filler Cap - Barnes              | HYD1636     |
| 14 B     | Hydraulic Pump Motor - Barnes                   | MSC1563     |
| 14 C     | Hydraulic Pump Solenoid                         | HYD1633     |
| 14 D     | Solenoid Ground Cable                           | MSC1595     |
| 14 E     | Battery Cable                                   | MSC1515     |
| 14 H     | Ground/Power Cable (78" Long)                   | HYD1684     |
| 14 J     | Ground/Power Cable (36" Long)                   | HYD1690     |
| 14 K     | Ground/Power Cable Dust Cap/Plug (1-Req'd)      | MSC3721     |
| 14 L     | Hydraulic Reservoir Drain Plug                  | HYD1712     |
| 15       | Hydraulic Valve Assembly (Power V)              | HYD1602     |
| 15 A     | Hydraulic Lift/Angle Valve                      | HYD1637     |
| 15 B     | Hydraulic Valve Coil                            | HYD1638     |
| 15 C     | Hydraulic Relief Valve                          | HYD1639     |
| 15 D     | Hydraulic Check Valve                           | HYD1640     |
| 15 E     | Hydraulic Valve Screen Cartridge                | HYD1641     |
| 15 F     | Hydraulic Valve Ground Strap                    | HYD1647     |
| 17       | Hydraulic Cylinder (Angle)                      | HYD1603     |
| 18 A     | Hydraulic Hose 1/4" x 12"                       | HYD1696     |
| 18 B     | Hydraulic Hose 1/4" x 15-1/2"                   | HYD1695     |

# POWER-V WITH RAPID-TACH II™

## PARTS LIST

|       |   |         |
|-------|---|---------|
| 18    | Hydraulic Hose (1/4" X 18")                                 | HYD1606 |
| 22    | Hydraulic Hose (3/8" X 48")                                 | HYD1707 |
| 25    | Hydraulic Cylinder (Lift)                                   | HYD1680 |
| 25 A  | Hydraulic - Tee (Lift)                                      | HYD1682 |
| 29    | Straight Swivel 3/8 Female - 3/8 Male                       | HYD1711 |
| 32    | 90 Degree Swivel - "O" Ring                                 | HYD1620 |
| 33    | Trip/Return Spring  | MSC1509 |
| 34    | Turnbuckle  | MSC1510 |
| 37    | Blade Guide Set   | BAX0005 |
| 37 A  | Blade Guide Tip   | MSC1562 |
| 38    | Auxiliary Headlight Set                                     | MSC3410 |
| 38 A  | Turn Signal Lense with Gasket                               | MSC1555 |
| 39    | Auxiliary Light Harness Assembly (RT II)                    | MSC1514 |
|       | Includes: Toggle Switch                                     |         |
|       | Connectors  |         |
| 39 A  | Light and Control Harness (Vehicle Only) 116" Long          | MSC3742 |
| 39 B  | Light and Control Harness (Plow) 48" Long                   | MSC3741 |
| 40    | Hydraulic Pump Switch Assembly - Control Box Only (Power-V) | HYD1691 |
| 40 E  | Pump Switch Cable Dust Cap                                  | MSC3489 |
| 41    | Rocker Switch - Lift  | HYD1622 |
| 42    | Rocker Switch - Angle                                       | HYD1623 |
| 44    | Quick Pin - 7/16"   | MSC1503 |
| 47    | Eye Bolt  | HDW1744 |
| 52    | Flow Control Valve With Adapter                             | HYD1624 |
| 57    | Latch Handle  | LTA3555 |
| 58    | Latch Handle Safety Pin                                     | HDW5509 |
| 59    | Latch Handle Guide  | LTA3566 |
| 60    | Coupler Latch Pin   | LTA3573 |
| 61    | Coupler Assembly  | CPA4340 |
| 62    | Push Beam Assembly  |         |
| 62 A  | Push Beam Support Plate (RH) Passenger Side                 |         |
| 62 B  | Push Beam Support Plate (LH) Driver Side                    |         |
| 73    | Light Bracket Assembly                                      | LBA4360 |
| 73 A  | Light Bracket Hydraulic Cover                               | LBA4712 |
| 73 B  | 1-1/8" Rubber Grommet                                       | MSC3456 |
| 75 A  | Angle Bracket (RH) Passenger Side                           |         |
| 75 B  | Angle Bracket (LH) Passenger Side                           |         |
| 80    | Control Harness Mounting Bracket                            | MSC3813 |
| 81    | Dielectric Grease (2 Oz. Tube)                              | MSC3423 |
| 82    | Plastic End Cap   | MSC3481 |
| 101   | Power/Ground Cable Mounting Bracket                         | MSC3491 |
| 102   | Split Rubber Grommet  | MSC3761 |
| 103   | Kickstand   | TFR3691 |
| 103 A | Kickstand Adjustment Pad                                    | TFR3633 |
| 104   | Weather Cap for Light and Control Harness (Vehicle Only)    | MSC3743 |
| 105   | Kickstand Mounting Pin                                      | TFR3697 |
| 106   | Weather Cap for Light and Control Harness (Plow Side)       | MSC3744 |
| 107   | Kickstand Handle  | TFR3693 |
| 107 A | Kickstand Spring  | CPA4430 |
| 108   | Light Adapter   |         |

# Troubleshooting Guide

## Glossary of Problems:

1. Pump motor does not run.
2. Pump continues to run with switch in neutral.
3. Plow will not lower.
4. Plow will not raise or raises slowly, motor runs.
5. While trying to raise the plow, wing(s) extend prior to raising plow and will not retract.
6. Wing(s) drift back when extended.
7. Plow lowers too fast.
8. Wing(s) will not extend, motor runs.
9. Wing(s) extend, but will not retract or retract slowly.
10. Wing(s) retract too easily while plowing.
11. Oil leaks from cylinders.
12. Battery goes dead with all switches in neutral.
13. Plow lights are dim, will not come on or flicker.
14. Turn signals flash at a rapid rate.
15. No high beam indicator when using plow lights.
16. Blade digs into the ground in the vee position.
17. Blade does not lay flat against the ground in the carry position.
18. Blade trips too easily.
19. Plow does not clean-up snow from low areas.
20. In extremely cold temperatures, the oil in the hydraulic system is thickened, causing slow functioning of the plow.
21. Vehicle overheats with the plow on.
22. Oil running out of fill cap on hydraulic pump.
23. Pump chatters when raising plow or extending wing(s).

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|----|--|---|--|
| 1. | <b>PROBLEM</b>                               | <b>CAUSE</b>  | <b>REMEDY</b>  |
|    | Pump Motor Does Not Run                      | A. Defective Solenoid<br>B. Defective Pump Motor<br>C. Weak Or Defective Battery<br>D. Bad Electrical Connections<br>E. Defective Up/Down Switch  | A. Replace Solenoid<br>B. Replace Pump Motor<br>C. Charge Or Replace Battery<br>D. Tighten Nuts At Connections<br>E. Replace Switch  |
| 2. | <b>PROBLEM</b>                               | <b>CAUSE</b>  | <b>REMEDY</b>  |
|    | Pump Continues To Run With Switch In Neutral | A. Defective Solenoid<br>B. Defective Switch<br>C. Wiring Short   | A. Replace Solenoid<br>B. Replace Switch<br>C. Locate And Repair   |
| 3. | <b>PROBLEM</b>                               | <b>CAUSE</b>  | <b>REMEDY</b>  |
|    | Plow Will Not Lower                          | A. Flow Control Valve Closed<br>B. Flow Control Valve Not Installed Properly<br>C. Check Wiring On Valve Block<br>D. Check Wiring On Up/Down Switch<br>E. Defective Up/Down Switch<br>F. Defective Lift Return Valve<br>G. Defective Lift Return Coil | A. Open Flow Control Valve<br>B. Arrow On Flow Control Valve Must Point Toward Valve Block<br>C. Wires May Be Reversed<br>D. Wire(s) May Have Come Loose<br>E. Replace Switch<br>F. Replace Valve<br>G. Replace Coil |

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| 4.  | <b>PROBLEM</b>  | <b>CAUSE</b>  | <b>REMEDY</b>  |
|     | Plow Will Not Raise Or Raises Slowly, Motor Runs                                      | A. Weak Or Defective Battery<br>B. Oil Level Low<br>C. Flow Control Valve Not Installed Properly<br>D. Hydraulic Connection Leak<br>E. Lift Valve Not Opening Properly<br>F. Defective Lift Valve Coil<br>G. Screen Cartridge On Valve Body Plugged   | A. Charge Or Replace Battery<br>B. Add Oil (Do Not Overfill)<br>C. Arrow On Flow Control Valve Must Point Toward Valve Block<br>D. Tighten Or Redo Connection<br>E. Replace Valve<br>F. Replace Coil<br>G. Clean Or Replace Screen Cartridge |
| 5.  | <b>PROBLEM</b>  | <b>CAUSE</b>  | <b>REMEDY</b>  |
|     | While Trying To Raise Plow, Wing(s) Extend Prior To Raising Plow And Will Not Retract | A. The Pressure And Return Lines From The Valve Block To The Pump Are Reversed.   | A. Install Lines Properly  |
| 6.  | <b>PROBLEM</b>  | <b>CAUSE</b>  | <b>REMEDY</b>  |
|     | Wing(s) Drift Back When Extended  | A. Defective Relief Valve<br>B. Defective Wing(s) Return Valve<br>C. Hydraulic Connection Leak  | A. Replace Relief Valve<br>B. Replace Valve<br>C. Tighten Or Redo Connection   |
| 7.  | <b>PROBLEM</b>  | <b>CAUSE</b>  | <b>REMEDY</b>  |
|     | Plow Lowers Too Fast  | A. Flow Control Valve Not Installed<br>B. Flow Control Valve Fully Open   | A. Install Flow Control Valve<br>B. Close Valve To Desired Drop Speed  |
| 8.  | <b>PROBLEM</b>  | <b>CAUSE</b>  | <b>REMEDY</b>  |
|     | Wing(s) Will Not Extend, Motor Runs   | A. Weak or Defective Battery<br>B. Oil Level Low<br>C. Hydraulic Connection Leak<br>D. Defective Quick Coupler<br>E. Defective Wing(s) Power Valve<br>F. Defective Wing(s) Check Valve<br>G. Defective Wing(s) Power Coil<br>H. Defective Wing(s) Switch<br>I. Defective Hydraulic Angle Cylinder | A. Charge Or Replace Battery<br>B. Add Oil (Do Not Overfill)<br>C. Tighten Or Redo Connection<br>D. Replace Quick Coupler<br>E. Replace Valve<br>F. Replace Valve<br>G. Replace Coil<br>H. Replace Switch<br>I. Rebuild Or Replace Cylinder  |
| 9.  | <b>PROBLEM</b>  | <b>CAUSE</b>  | <b>REMEDY</b>  |
|     | Wing(s) Extend, But Will Not Retract Or Retract Slowly                                | A. Defective Wing(s) Return Valve<br>B. Defective Wing(s) Return Valve Coil<br>C. Defective Wing(s) Switch  | A. Replace Valve<br>B. Replace Coil<br>C. Replace Switch   |
| 10. | <b>PROBLEM</b>  | <b>CAUSE</b>  | <b>REMEDY</b>  |
|     | Wing(s) Retract Too Easily While Plowing  | A. Relief Valve Pressure Set Too Low  | A. See Your Boss Dealer For Any Pressure Adjustments Required  |
| 11. | <b>PROBLEM</b>  | <b>CAUSE</b>  | <b>REMEDY</b>  |
|     | Oil Leaks From Cylinder(s)  | A. Loose Packing<br>B. Defective Cylinder   | A. Tighten Packing 1/5 Turn<br>B. Repack Or Replace Cylinder   |
| 12. | <b>PROBLEM</b>  | <b>CAUSE</b>  | <b>REMEDY</b>  |
|     | Battery Goes Dead With All Switches In Neutral  | A. Possible Short In Switch(es)<br>B. Possible Short In Wiring<br>C. Possible Short In Valve Coil(s)  | A. Replace Switch(es)<br>B. Repair Damaged Wire<br>C. Replace Coil(s)  |

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| 13. | <b>PROBLEM</b>  | <b>CAUSE</b>   | <b>REMEDY</b>  |
|     | Plow Lights Are Dim, Will Not Come On Or Flicker  | A. Bad Connection(s)<br>B. Lights Not Properly Grounded  | A. Repair Connection<br>B. Properly Ground   |
|     | <b>PROBLEM</b>  | <b>CAUSE</b>   | <b>REMEDY</b>  |
|     | Turn Signals Flash At A Rapid Rate  | A. Improper Flasher  | A. Replace Original Vehicle Flasher With The Heavy Duty Six Lamp Flasher Provided                                      |
| 15. | <b>PROBLEM</b>  | <b>CAUSE</b>   | <b>REMEDY</b>  |
|     | No High Beam Indicator When Using Plow Lights   | A. Light Connections Have Been Made Under The Dashboard  | A. Light Connections Should Be Made In The Engine Compartment  |
| 16. | <b>PROBLEM</b>  | <b>CAUSE</b>   | <b>REMEDY</b>  |
|     | Blade Digs Into The Ground In The Vee Position  | A. Center Shoe Not Adjust Properly<br>B. Push Beam Installed Too High  | A. Lower Center Shoe<br>B. Lower Push Beam   |
| 17. | <b>PROBLEM</b>  | <b>CAUSE</b>   | <b>REMEDY</b>  |
|     | Blade Does Not Lay Flat Against The Ground In The Scoop Position  | A. Push Beam Installed Too Low   | A. Raise Push Beam   |
| 18. | <b>PROBLEM</b>  | <b>CAUSE</b>   | <b>REMEDY</b>  |
|     | Blade Trips Too Easily  | A. Not Enough Tension On Trip Springs  | A. Add Tension To Trip Springs By Adjusting The Turnbuckle   |
| 19. | <b>PROBLEM</b>  | <b>CAUSE</b>   | <b>REMEDY</b>  |
|     | Plow Does Not Clean-Up Snow From Low Areas  | A. Up/Down Switch Not In Neutral   | A. Up/Down Switch Should Be In The Down Position (Float)   |
| 20. | <b>PROBLEM</b>  | <b>CAUSE</b>   | <b>REMEDY</b>  |
|     | In Extremely Cold Temperatures The Oil In The Hydraulic System Is Thickened, Causing Slow Functioning Of The Plow | A. Cold Temperatures<br><br><b>NOTE:</b> For Extreme Cold Weather Applications, An Aircraft Hydraulic Oil, Mil. Spec. No. 5606 Is Recommended. Do Not Use Synthetic Oils. They Are Not Compatible With The Seals In the Cylinders, Pump Or Valves. | A. As The System Warms, The Oil Will Thin Out  |
| 21. | <b>PROBLEM</b>  | <b>CAUSE</b>   | <b>REMEDY</b>  |
|     | Vehicle Overheats With The Plow On  | A. Vehicle Coolant Level Low<br>B. Ice And Snow Buildup In Grille<br>C. Defective Radiator Hose(s)<br>D. Insufficient Cooling Fan  | A. Add Coolant<br>B. Remove Ice And Snow<br>C. Replace Defective Hose(s)<br>D. Install Heavy Duty, Non-Clutch Type Fan |
| 22. | <b>PROBLEM</b>  | <b>CAUSE</b>   | <b>REMEDY</b>  |
|     | Oil Running Out Of Fill Cap On Hydraulic Pump   | A. Plowing On Steeply Inclined Terrain<br>B. Too Much Oil<br>C. Hydraulic Pump Not Level   | A. Avoid Excessive Inclines Or Change Direction Of Plowing<br>B. Remove Excess Oil<br>C. Level Hydraulic Pump          |
| 23. | <b>PROBLEM</b>  | <b>CAUSE</b>   | <b>REMEDY</b>  |
|     | Pump Chatters When Raising Plow Or Extending Wing(s)  | A. Hydraulic Oil Low   | A. Add Hydraulic Oil Until Chattering Stops. Caution: Only Add Enough Oil To Stop The Chattering - Do Not Overfill     |