

## REPAIR MANUAL

READ AND UNDERSTAND ENTIRE OPERATORS MANUAL BEFORE OPERATION.

**CAUTION:** Block frame and tires securely before changing tires or crawling under vehicle. Do not use leveling jacks or air suspension to support vehicle while under vehicle or changing tires. VEHICLE MAY DROP OR RAISE AND/OR MOVE FORWARD OR BACKWARD WITHOUT WARNING CAUSING INJURY OR DEATH.

The front jacks may ABRUPTLY SWING UP anytime the foot clears the ground.

Never place hands or other parts of body near hydraulic leaks. Oil may cut and penetrate the skin causing injury or death.

Keep all people clear of vehicle while leveling system is in use.

### NOTE AND CHECK

1. Battery should read at least 13 volts. Battery must be in good condition with no weak cells. The system can draw up to 300 amps. An alternator, converter or battery charger will not supply enough power for the system to operate properly.
2. The "LOW VOLTS" light on the OFF side of the Master Switch will light when battery power drops too low for proper system operation. The leveling system will automatically stop if it is operating in automatic level or retract. Turn off the Master Switch and correct the battery problem. (This feature is not on all systems.)
3. Check that the oil reservoir is full with the jacks in retract.
4. Proper ground of all components is critical. See the Electrical Circuit for specific grounds required. Faulty grounds, especially for the computer panel, solenoid manifold or sensing unit, will cause improper or erratic operation.
5. Do not replace the computerized panel unless the Trouble Shooting Steps say to replace it. Otherwise the malfunctions may damage the new panel.
6. If the jacks cannot be retracted see Step 25 below for temporary measures.
7. The following trouble shooting steps must be followed in order. Problems checked for in one step are assumed correct and not re-checked in following steps.
8. Begin Trouble Shooting Steps next page. ↓

TROUBLE SHOOTING STEPS  
(MUST FOLLOW IN ORDER)

1. Turn on Leveling System switch on dash.
2. Turn off Master Switch on Computerized Leveling Panel.
3. Turn on Master Switch on Computerized Panel. If pump starts at this time, see Section E.
4. Red Light on "ON" side of Master Switch should be lit. If not, see Section A.
5. Press the Vertical/Horizontal switch toward Vertical. If the pump motor does not run, see Section B. If the pump motor runs but does not stop, see Section E.
6. Press and hold the Horizontal/Vertical switch toward Vertical. The pump should run, the front jacks should swing vertical within 5 seconds at which time the switch should be released. If the jacks swing vertical and nothing else occurs, go to step 7.
  - a. If jacks do not swing vertical and nothing else occurs, see Section F.
  - b. If the jacks do not swing vertical but one jack extends, see Section G.
  - c. If the jacks do not swing vertical but all jacks extend, see Section H.
  - d. If jacks swing vertical but return to horizontal as soon as the vertical switch is released, cycle the jacks two more times and if the problem persists, replace the horizontal/vertical solenoid valve.
7. Press the Horizontal/Vertical switch toward Horizontal. All jacks should swing horizontal providing they are not in contact with the ground. (The pump should not run during this step.) If the jacks do not swing horizontal revert to step 4. (If the Horizontal/Vertical Solenoid valve will open to swing the jacks vertical, it should open to swing jacks horizontal.)
8. Swing the jacks vertical by pressing the Horizontal/Vertical switch to Vertical.
9. Press and hold the switch for each jack toward Extend, checking to see that that jack only begins to extend. If not, see Section J. If a jack starts to retract when it's switch is released, replace the solenoid valve for that jack.
10. Press and hold the switch for each of the four jacks toward Retract, checking that each jack retracts. (If the jack will extend in manual operation, they should also retract.) If jacks extend when switch is pressed toward Retract, the pump is running when it should not. See Section E.
11. Recheck the operation of the Horizontal/Vertical switch and the four individual jack switches.
12. The four red jack warning lights on the dash should be on when the dash Leveling System switch is on and the front jacks are in the vertical position and the rear jacks are extended at least 4 inches. If not, see Section K.

13. The red warning lights on the dash should be out when the rear jacks are retracted and the front are horizontal. Also the Bluebird computerized audio warning should not be commenting about the leveling system. If either warning is active see Section L. If the audio warning comes on while traveling and the rear jacks have extended one inch or more see Section M.

14. The Yellow Level Indicator Lights are on the Retract side of the four jack switches. When a light is lit it indicates that corner of the coach is low. The Sensing Unit (a 4 inch diameter disk) is usually mounted on the under side of the coach, but sometimes inside the coach. The Sensing Unit supplies the signal for the Yellow Indicator lights and also for the automatic leveling.

Turn the Master Switch on the computer panel to On. Either none, one, or two yellow lights should be on. If at any time more than two lights come on and stay on the Sensing Unit should be replaced.

15. Swing jacks vertical. Extend each jack noting that if it's yellow light is lit it can be made to go out. Check also that all lights can be made to come on (at different times) by extending the opposing jack or jacks. (If the ground is sloping or uneven the coach may need to be moved to complete the above test.) If none of the yellow level indicator lights can be made to come on see Section P. If one or two lights will not come on see Section Q.

16. With the jacks in the vertical position, make all the Yellow Level Indicator lights go out by extending the respective jack. The refrigerator should now be nearly level. If not see Section R.

17. Completely retract all jacks and swing the jacks to the horizontal position.

From this point on it is assumed the system is fully functional in the manual mode. Whenever a malfunction occurs revert to manual operation and check for correct functioning. If a malfunction is found in manual operation, trouble shoot that problem using the preceeding steps. Remember low voltage will cause erratic performance and may damage components. See Notes 1 and 2 on the first page.

18. The engine must be off during leveling. Turn the Master Switch on. (If the Master Switch is on, turn off and then on. This resets the microprocessor.) The Red Light on the Master Switch should be lit.

Any time the Master Switch is turned off or the Ignition Switch is turned to another position, the microprocessor is reset. Any automatic procedure in progress must be restarted.

19. Momentarily press the Automatic Level/Automatic Retract switch toward Automatic Level. The following should now occur automatically.

a. The red light on the Automatic Leveling side of the switch should start to blink.

- b. The pump should start.
- c. The front jacks should swing vertical.
- d. The red dash warning lights should light as jacks go vertical.
- e. The pump should stop approximately 3 seconds after the jacks are vertical.
- f. The red light on Automatic Leveling side of the Auto Level/Retract switch now glow a steady red.

If any of the above does not occur as described, see Section S.

20. Dump the air suspension allowing adequate time for bags to bleed off, then, for the second time, momentarily press the Auto Level/Retract switch toward Auto Level. The following should automatically occur:
- a. The red light on the Automatic Leveling side of the switch should start to blink.
  - b. Jacks will extend corresponding to any yellow lights which are on. Both front jacks will extend if either front yellow light is on. There is a 5 second pause between the operation of the jacks. The pump will cycle on and off as required for extending the jacks. This should continue until all yellow lights are out or until one or two jacks have reached full stroke. If a jack reaches full stroke before it's yellow light goes out the processor will ignore that yellow light and continue to level as much as possible with the remaining jacks.
  - c. The pump will come on and run approximately 45 seconds. During this time any jacks not already touching the ground will be extended to touch the ground.
  - d. The red light on the Automatic Leveling side of the Auto Level/Retract switch will go out.

If any of the above does not occur as described, see Section U.

21. Start coach and build up air pressure. Leave coach running during steps 22 & 23.
22. Turn the Master Switch on. (If the Master Switch is on turn off, and then on. This resets the microprocessor.) The Red Light on the Master Switch should be lit.
23. Momentarily press the Auto/Level Retract Switch toward Automatic Retract. The pump should not run at this time. If it does the jacks will extend instead of retracting. See Section E. The following should automatically occur when Auto Retract is pressed:
- a. The red light on the Automatic Retract side of the switch will start to blink.
  - b. The jacks should start to retract, as the front jacks clear the ground they will swing horizontal and continue to retract.

- c. When the front jacks swing horizontal and the rear jacks are nearly retracted, the respective red warning lights will go out. (The system must still be left in retract 1 to 2 minutes longer to allow jacks to fully retract.)
- d. The red light (a. above) will blink for 6 minutes from when retracting was initiated and then go out. During this time the 4 individual jack solenoid valves and the Horizontal/Vertical solenoid valve will be energized (open).

If any of the above does not occur as described, see Section W. In cold weather, it may be necessary to cycle the retract a second time to allow the jacks to retract fully.

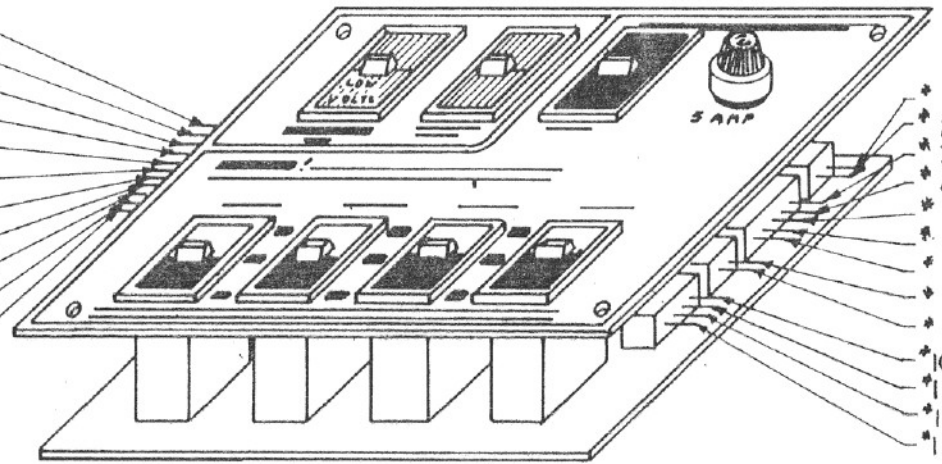
24.

25. Emergency Retracting for jack.

Some systems are equipped with drain valves. (See hydraulic circuit.) Systems with automatic air dump would have the 3 port drain valve. Place a container under the drain valve. Slowly open the drain valve by turning each T handle counter clockwise 3 turns. Drive the coach forward, off the jacks.

A second method to retract jacks will work if the jacks will not retract due to the pump coming on when the Master Switch is turned on. The pump may be disabled by disconnecting the cable from terminal #6 on solenoid B (Fig. IIA or IIB). This will disconnect all power to the pump motor. Then the system may be run through a normal retract procedure.

MASTER SOL. RED \*14  
 SHIELD CABLE ——— \*15  
 SHIELD CABLE ——— \*16  
 DUMP VALVE BLACK \*17  
 STABILIZER PURPLE \*18  
 LR BROWN \*19  
 LF BLUE \*20  
 RF GREEN \*21  
 RR ORANGE \*22  
 HOR-VER YELLOW \*23  
 PUMP GRAY \*24



\*1: #2 FROM ACC. TER.  
 \*2: BATTERY GROUND  
 \*3: COMMON  
 \*4: LR WHITE  
 \*5: LF GREEN  
 \*6: RF RED  
 \*7: RR BLACK  
 \*8: NEGATIVE SIDE  
 \*9: POSITIVE SIDE  
 \*10: LR  
 \*11: LF  
 \*12: RF  
 \*13: RR

LEVEL SENSOR  
 MAST WRN.  
 JACK WRN.  
 NOT USED ON BB COACHES

FIG. I

COMPUTERIZED PANEL BLUEBIRD

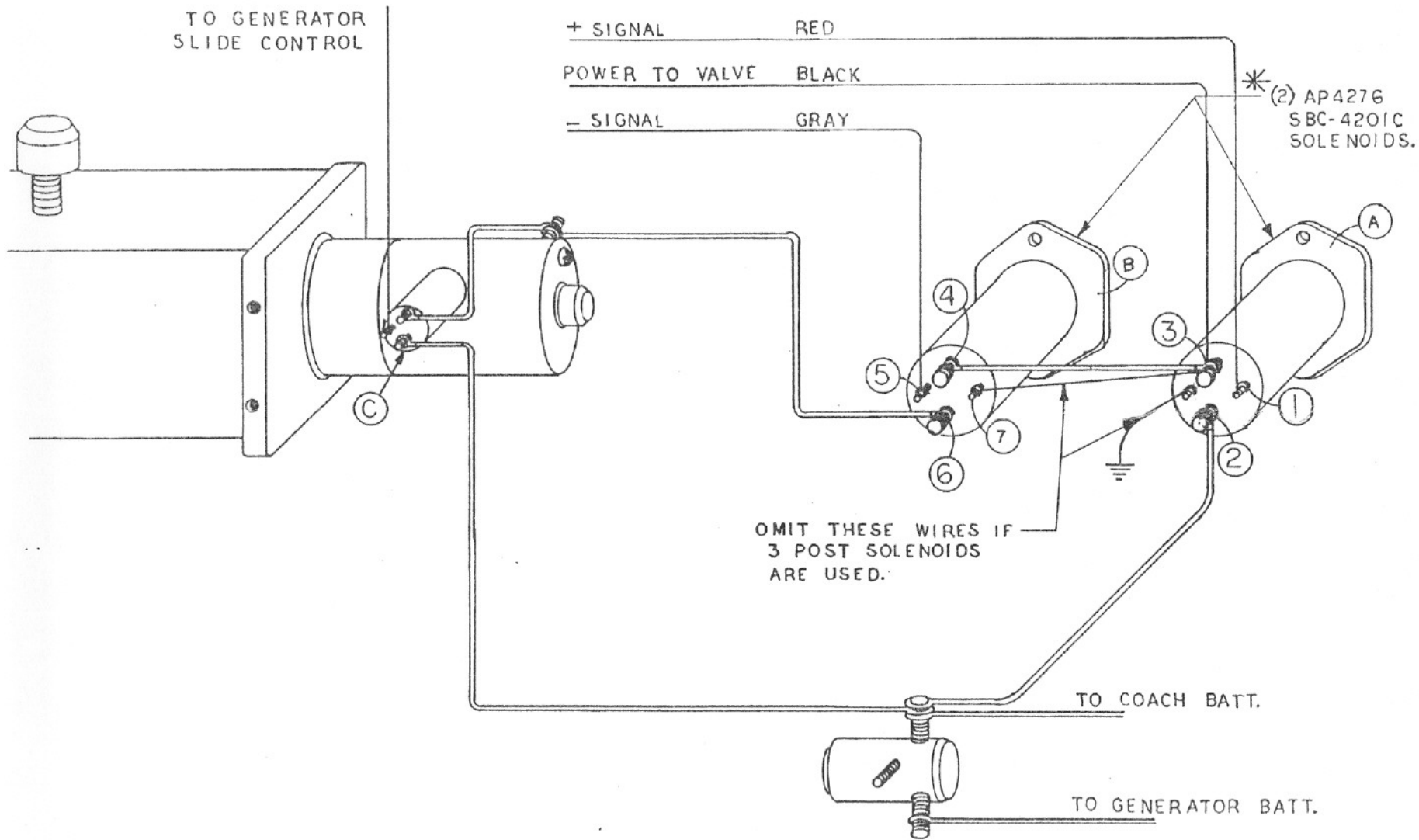


FIG II

\*If solenoids other than Prestolite SBC-4201C are used, Solenoid A must be positive activated continuous duty, Solenoid B must be negative activated.

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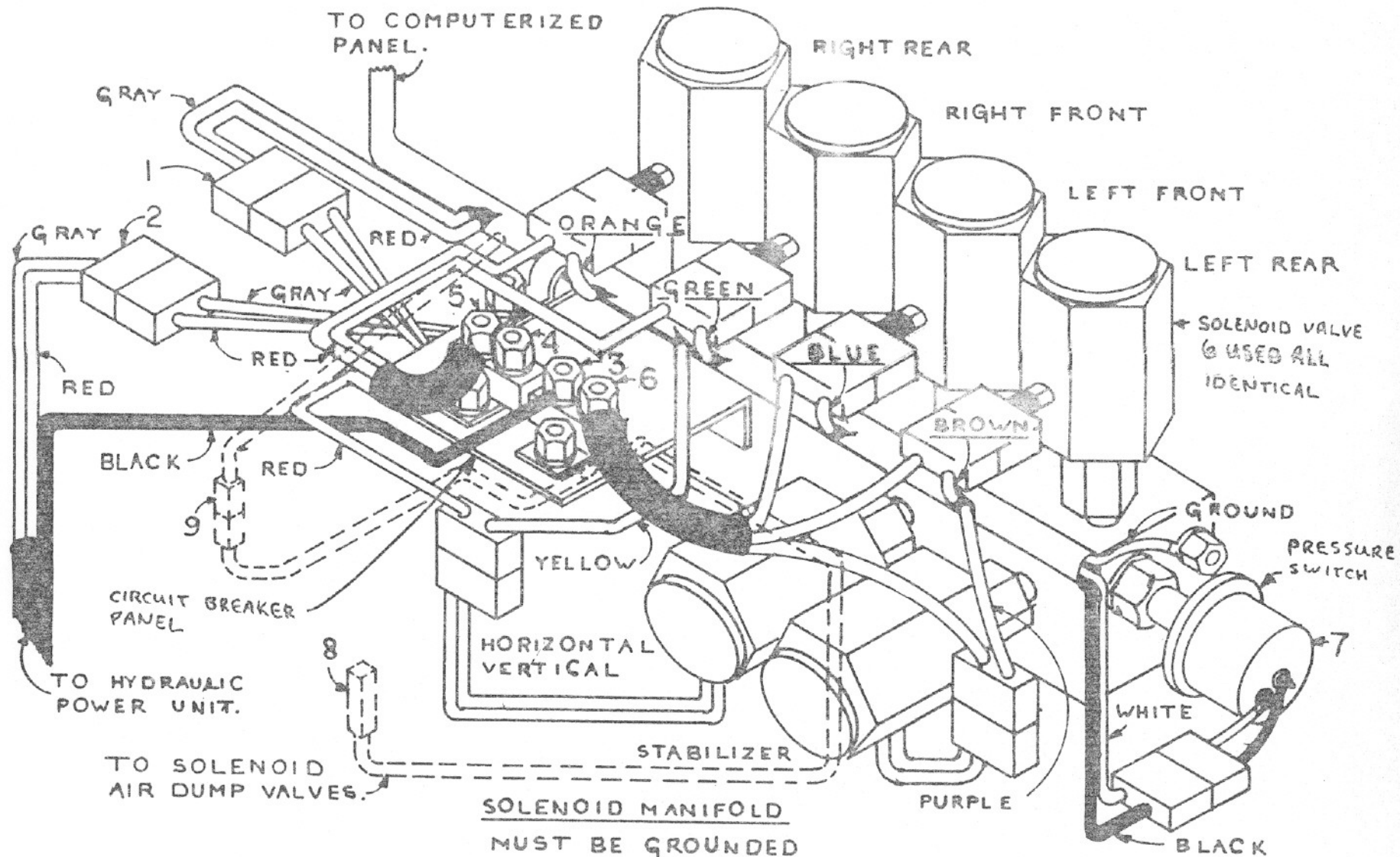


FIG III A

NOTE: Circuit Breaker panel as 2 breakers  
See Fig. IIIB for 3 breaker panel.



TO COMPUTERIZED  
PANEL.

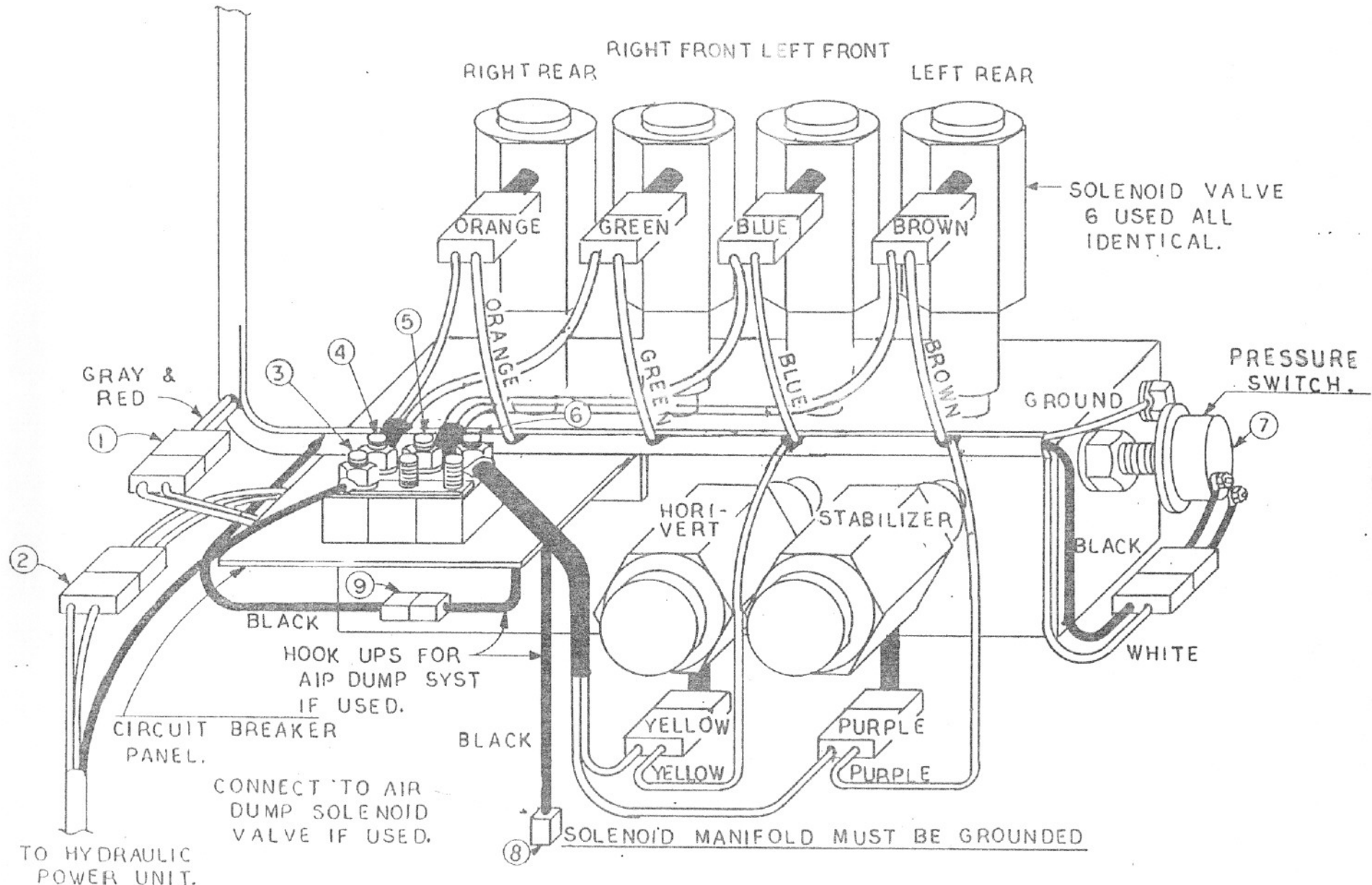


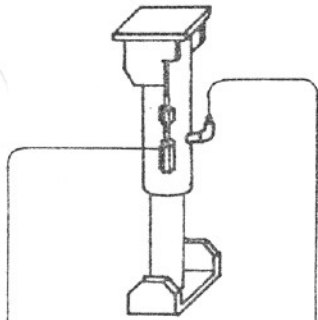
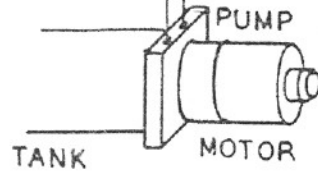
FIG III B

Circuit Breaker Panel has 3 breakers  
See Fig. IIIA for 2 breaker panel

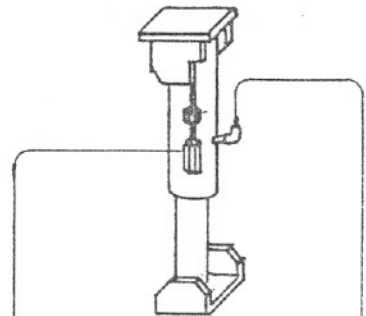
XP  
S-86

TO GENERATOR  
SLIDE SOLENOID VALVE

PRESSURE RETURN



LEFT FRONT

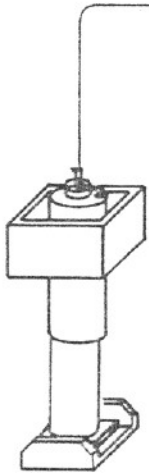
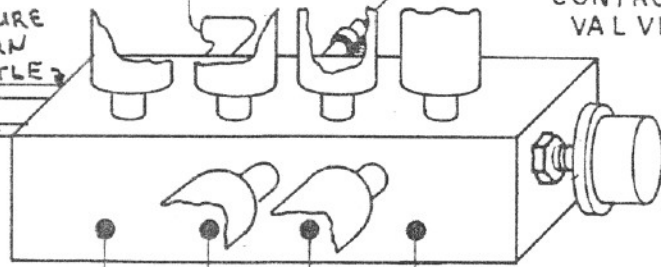


RIGHT FRONT

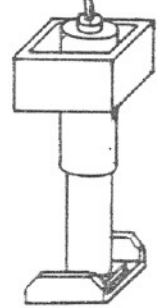
ACTUATOR

PRESSURE  
RETURN  
SHUTTLE

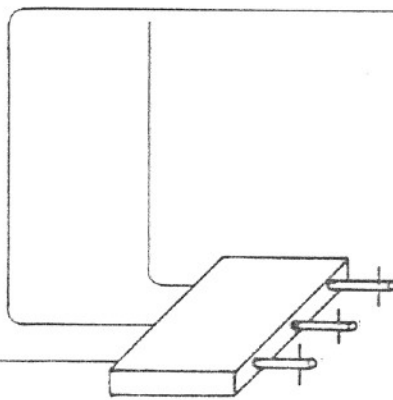
CONTROL  
VALVE



LEFT REAR



RIGHT REAR

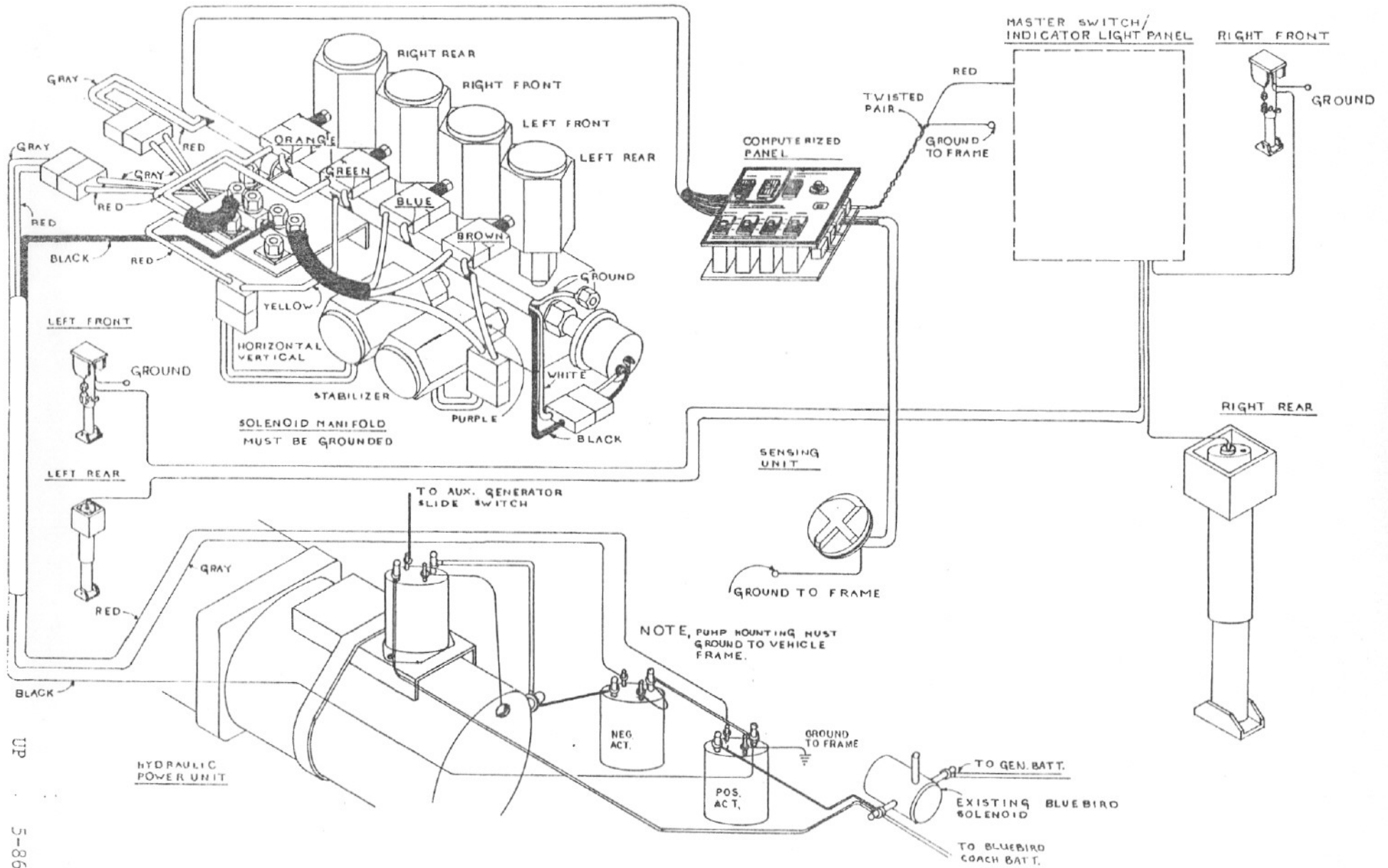


DRAIN VALVE

HYDRAULIC CIRCUIT  
BLUEBIRD PUSHER

UN

5-86



BLUEBIRD ELECTRICAL DIAGRAM

UP  
5-86

## REPAIR SECTIONS

← (START ON OPPOSITE SIDE WITH THE TROUBLE SHOOTING STEPS)

- A. Push Vertical/Horizontal switch toward Vertical. If pump motor runs replace light bulb in the Master Switch. If pump does not run proceed as follows:

Check fuse in computerized panel. (5 Amp required.)  
Disconnect the two wire lead to terminal 1 and 2 (Figure I).  
Check for 12 volt in the leads with the wire to terminal 1 being (+) and wire to terminal 2 being (-). If 12 volts is present replace computerized panel, if not check these wires.  
NOTE: If the system is wired through the accessory fuse of the vehicle be sure this fuse is not blown.

- B. With the Master Switch on check for +12 volts between the terminal 1 (See Fig. II) and frame of the vehicle. If no voltage, see Section C. Next check for +12 volts between terminal 2 (Figure II) and the vehicle ground. If no voltage check battery cable leading from battery. Next check for +12 volts at terminal 3 or 4 (Figure II) and the vehicle ground. If no voltage, change solenoid A. Disconnect battery ground before changing solenoid. Next attach an insulated wire to the vehicle frame and touch the other end to terminal 5 (Figure II). Pump motor should now run. If the pump does not run see Section D. If the pump runs with the jumper wire attached, disconnect wire and change circuit breaker panel on the solenoid manifold assembly (Fig. III). Now if the motor does not run, replace computerized panel.
- C. If no voltage on terminal 1 (Figure II) unplug the eleven wire lead to the computerized panel and check for 12 volts on terminal 14 (the top left terminal) (Figure I). If no voltage is read replace computerized panel. If voltage is read, check wiring between terminal 14 (Fig. I) and terminal 1 (Fig. II). Note this is the red wire passing directly through the circuit breaker panel via the two-way connectors 1 and 2 (Fig. III).
- D. If not check for 12 volts between terminal 6 (Fig. II) and the vehicle ground. If 12 volts are not read replace solenoid B (Fig. II). Disconnect battery ground before changing solenoid. If 12 volts is read replace pump motor. Before replacing motor try operating the generator slide. If it operates, the pump is functional. Review above steps and check especially for poor electrical connections.

NOTE: Solenoid A is activated by applying 12 volts to terminal 1. Solenoid B is activated by grounding terminal 5. Solenoid C is for operating the generator slide and is activated with a +12 volts.

- E. Disconnect the gray wire from terminal 5 (Fig. II). If pump continues to run (when Master Switch is on), solenoid B (Fig. II) is stuck closed and should be replaced. If pump does not run, the circuit breaker panel on the solenoid manifold is probably the cause and should be replaced. However, solenoid B (Fig. II) may be at fault since a stuck solenoid may open when rattled or when power is interrupted.

- F. If the pump is running under heavy load and lugging down, check for 12 volts on terminal 3 (Fig. III). If no voltage, go to the 3rd. sentence of Section B. Check for 12 volts on terminals 5 and 6 (Fig. IIIA) or terminals 4, 5, and 6 (Fig. IIIB). If no voltage, replace the circuit breaker panel. If voltage is read, replace the Horizontal/Vertical solenoid valve. If the pump is free wheeling or running under no load, then the pressure/return shuttle valve AP3623, should be replaced. This valve is located on the hydraulic solenoid manifold on the end opposite the electrical pressure switch, is approximately 3 inches long and has the pump pressure line coming into it. See the Hydraulic Circuit.
- G. Check for correct connection of hydraulic lines throughout the system and of electrical connectors at the solenoid manifold. If problems persist, replace the solenoid valve of the jack which is extending.
- H. Check that hydraulic lines are connected correctly. The actuator lines and main cylinder lines may be switched. Next replace the Stabilizer solenoid valve.
- J. If one jack does not extend when it's switch is pushed, check for correct connections, then replace the solenoid valve for that jack. If two jacks extend when one switch is pressed toward extend, replace the solenoid valve of the jack which should not have been extended. If all jacks extend when one particular switch is pressed, but not when one of the other three switches are pressed, replace the check valve for the jack whose switch will activate all four jacks. There are four check valves (one for each jack), on the side of the manifold block opposite the circuit breaker panel. They appear as a 7/8" hex.

CAUTION: Retract all jacks before removing a check valve.

- K. Warning switches are mounted on the barrel of each front jack with a hose clamp. With the jack vertical the warning switch should be on the rear side of the jack and the wires should come out of the lower end of the switch. One wire from each warning switch should be grounded, the other should run to the Bluebird warning system and dash lights. The rear jacks have warning switches mounted in the top of the jack. The wire from each rear warning switch should run to the Bluebird warning system and dash lights. Thus the warning switch provides the ground for the warning lights to light.

Check for physical damage, loose wires or poor grounds. Ground the wire coming to the warning switch whose light did not light. If the light comes on now, replace the warning switch. If the light does not come on the warning light may be burned out or there may be a loose or broken wire going to the light.

- L. Go to the warning switch corresponding to the light which is on and disconnect the wire to that warning switch. If the light goes out, replace the warning switch, if not there is a short in the wire coming to the warning switch. Moisture, salt, dirt or corrosion may cause a low grade short to ground especially on the terminal on top of the rear warning switch. This will cause the audio warning to sound. The terminal should be cleaned and coated with a sealant.
- M. On automatic leveling systems the rear jacks may extend due to thermal expansion and activate the warning system. However, when retracting the jacks it is critical that the system be kept in retract for 1 minute after all the warning lights are out. This allows for full retraction of all jacks. Otherwise slight thermal expansion may trigger the warning system. The warning switch on the rear jacks on some coaches are approximately 3/4" tall. If thermal expansion is a problem these should be replaced by a warning system which is approximately 3" tall. The HWH part number is AP4707.
- P. Check that the sensing unit is grounded. Check the shielded cable to the sensing unit for damage. If yellow lights still do not work, replace the sensing unit.
- Q. Unplug the sensing unit cable from the computerized panel. Using a jumper, ground the respective terminal 4, 5, 6, or 7, (Fig. I) of the yellow light which will not light. If the light does not come on, replace the light bulb. If the light does come on replace the sensing unit.
- R. Disregard the yellow indicator lights. Using a bubble level, level the refrigerator by extending jacks as required. The sensing unit is adjusted by turning the mounting screws in or out. Raise the side of the sensing unit corresponding to the lit yellow lights until all yellow lights are out.
- S. Providing the Master Switch light is on and neither 19a or 19b occur, the computerized panel should be replaced. If 19a does occur, but 19b, 19c and 19d do not occur, recheck in manual operation. Check also that connectors 1 and 2 (Fig. III) are plugged into the circuit breaker panel, not each other. Check that the circuit breaker panel is grounded to solenoid manifold. If 19b does not occur, first replace the circuit breaker panel, then replace the computerized panel. If 19b does occur and 19c does not, and nothing else occurs, replace the Horizontal/Vertical solenoid valve, then the computerized panel. If 19b does occur and 19c does not, but all the jacks start to extend, replace the pressure switch #7 (Fig. III). 19d is not connected to the computerized panel. See step 12 if 19d does not occur. If the pump does not stop as described in 19e, see Section T.
- T. First check operation of pump solenoid B (Fig. II) in manual mode, by reviewing steps 3, 4 and 5. Correct any malfunctions. If the pump does not stop in step 19e, see Section Z.
- U. If the jacks do not extend to level the coach in 20b, check for malfunctions in manual operation, then replace the computerized panel. If the pump does not stop, see Section X. If 20c does not occur as described, see Section V.

- V. If the pump does not come on, recheck step 19b then replace the computerized panel. If the pump runs, but the jacks do not extend, proceed as follows:

Plug the stabilized solenoid valve lead into the two wire lead coming to the Horizontal/Vertical solenoid valve. Turn the Master switch off, then on. Push Horizontal/Vertical switch toward Vertical. If the jacks do not extend, replace the stabilized solenoid valve. If the jacks do extend, replace the computerized panel. Return the solenoid valve leads to their correct positions.

- W. All functions of Step 23 are used in the manual mode except the blinking red light in 23a, and 23d. If 23b, or 23c do not occur as described, check in manual operation, then replace the computerized panel. If the light does not blink but other functions occur as described replace the light bulb.
- X. Check for correct operation in manual mode (Trouble Shooting Steps 1 through 6). If a jack is fully extended and it's yellow light is still on, and the pump continues to run rather than progressing to the stabilizing function 20c, see Section Z.
- Z. The computerized panel is not receiving the signal from the pressure switch 7 (Fig. III) to stop the pump. This may be due to a defective pressure switch, inadequate pump pressure to trip the switch, the wrong pressure switch/pump setting combination, a bad connection or possibly a bad computerized panel. The symptoms of above problems are all the same. The numbers 2500 or 3000 are incorporated into the model number on the end of the pressure switch indicating a switch setting of 2500 psi or 3000 psi. The pump should be set 400 or 500 psi higher than the pressure switch. (See Operator's Manual)

The pressure switch closes when the pressure exceeds the switch setting. Thus one may simulate closing the pressure switch by unplugging the 2-way plug to the pressure switch and placing a jumper into the plug coming from the main harness. If the pump stops, then the wiring and the computerized panel are functioning correctly.

If the system is new and a 2500 psi switch is used, we would suggest replacing the switch.

If the system is new and a 3000 psi switch is used we suggest checking the pump pressure setting before replacing the pressure switch. If the system has been operating properly for an extended time, then the problem may be a weak pump or faulty pressure switch.