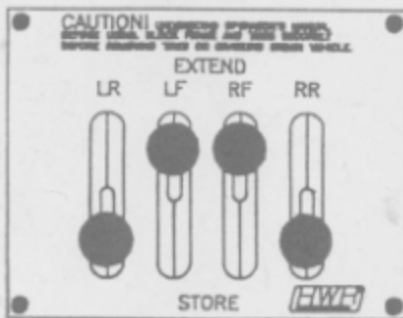
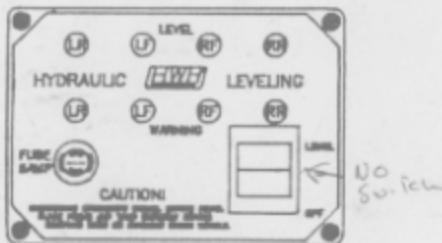


OPERATOR MANUAL

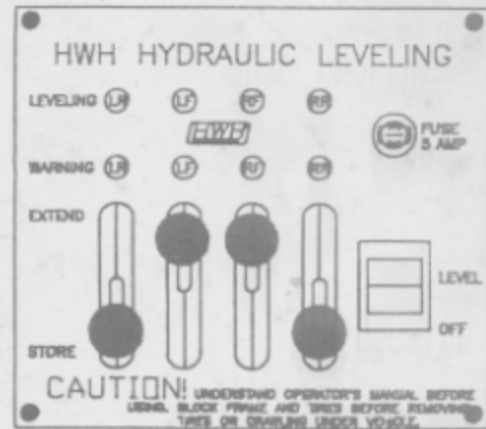
HWH LEVER CONTROLLED LEVELING SYSTEM

FEATURING;

FOUR LEVER MANUAL CONTROL
HYDRAULIC LEVELING
KICKDOWN LEVELING JACKS
WITHOUT AIR DUMP



SEPERATE CONTROLS



INTEGRATED CONTROLS

HWH CORPORATION
R.R.1
MOSCOW, IOWA 52760
800-321-3494
319-724-3396

Camping World
Rt 501

563
FAX 563 724-3408

ML7367 LH-S MANUAL 2-90

OPERATOR MANUAL

CAUTION !

READ THE ENTIRE OPERATOR MANUAL BEFORE OPERATING.

BLOCK FRAME AND TIRES SECURELY BEFORE CRAWLING UNDER VEHICLE. DO NOT USE LEVELING JACKS OR AIR SUSPENSION TO SUPPORT VEHICLE WHILE UNDER VEHICLE OR CHANGING TIRES. VEHICLE MAY DROP AND/OR MOVE FORWARD OR BACKWARD WITHOUT WARNING CAUSING INJURY OR DEATH.

KEEP ALL PEOPLE CLEAR OF VEHICLE WHILE LEVELING SYSTEM IS IN USE.

THE JACKS MAY ABRUPTLY SWING UP WHEN THE FOOT CLEARS THE GROUND OR WHEN JACK REACHES FULL EXTENSION.

NEVER PLACE HANDS OR OTHER PARTS OF THE BODY NEAR HYDRAULIC LEAKS. OIL MAY PENETRATE SKIN CAUSING INJURY OR DEATH.

WEAR SAFETY GLASSES WHEN INSPECTING OR SERVICING THE SYSTEM TO PROTECT EYES FROM DIRT, METAL CHIPS, OIL LEAKS, ETC. FOLLOW ALL OTHER APPLICABLE SHOP SAFETY PRACTICES.

DO NOT OVER EXTEND THE REAR JACKS. IF THE WEIGHT OF THE VEHICLE IS REMOVED FROM ONE OR BOTH REAR WHEELS, THE VEHICLE MAY ROLL FORWARD OR BACKWARD, OFF THE JACKS.

NOTE: KEEP FOUR LEVERS IN THE RETRACT OR STORE POSITION WHEN JACKS ARE NOT IN USE.

HOW TO OBTAIN WARRANTY SERVICE

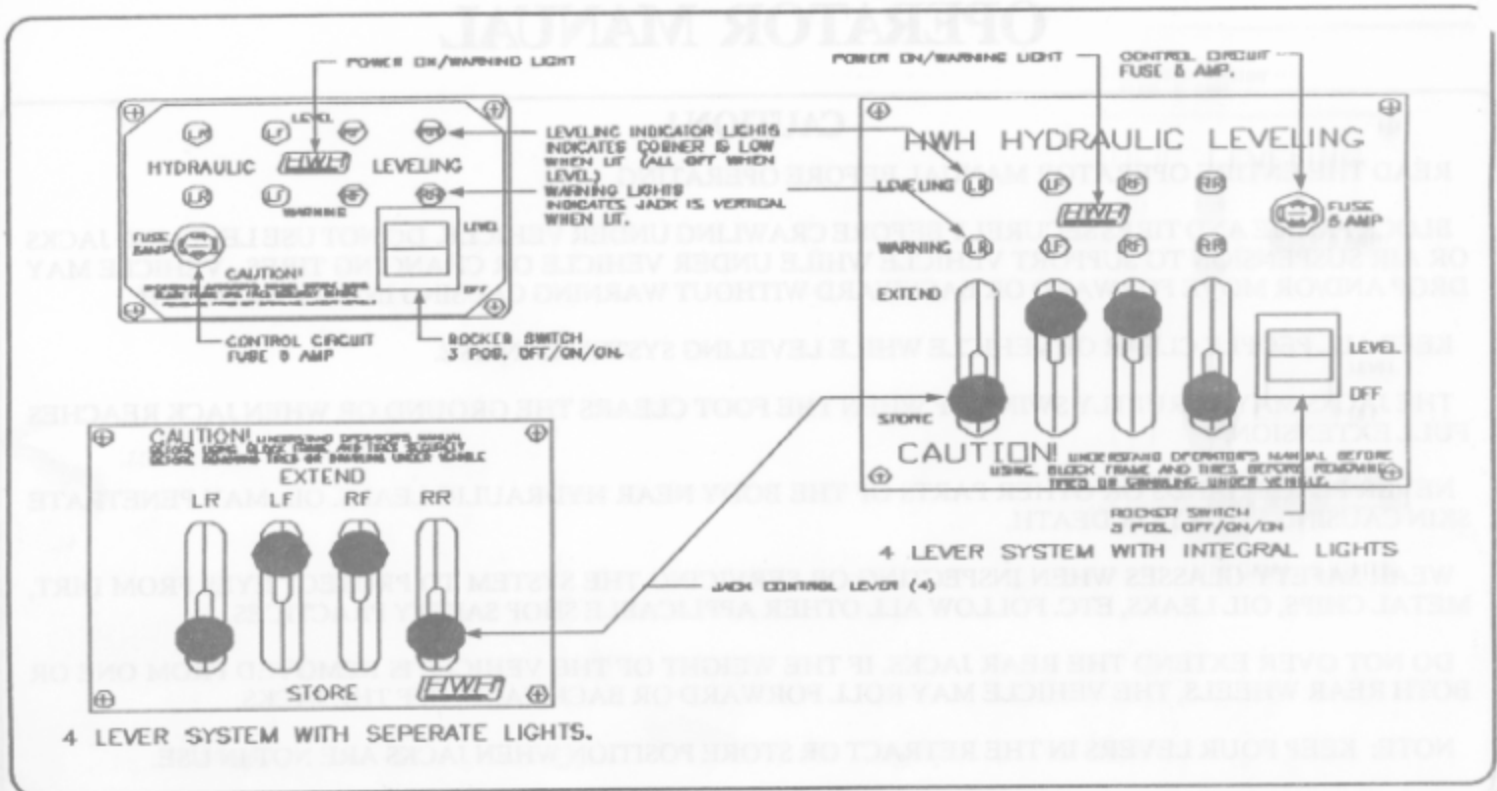
THIS IS NOT TO BE INTERPRETED AS A STATEMENT OF WARRANTY

HWH CORPORATION strives to maintain the highest level of customer satisfaction. Therefore, if you discover a defect or problem, please do the following:

FIRST: Notify the dealership where you purchased the vehicle or had the leveling system installed. Dealership management people are in the best position to resolve the problem quickly. If your dealer has difficulty solving the problem, he should immediately contact the Customer Service Department, HWH CORPORATION.

SECOND: If your dealer cannot or will not solve the problem, notify the Customer Service Department, HWH CORPORATION, R.R.1, MOSCOW, IOWA 52760, [319] 724-3396 OR 800-321-3494. Give your name and address, coach manufacturer and model year, date the coach was purchased, or the date of system installation, description of problem, and where you can be reached during business hours. [8:00a.m. till 5:00p.m. c.s.t.] HWH CORPORATION personnel will contact you to determine whether or not your claim is valid. If it is, HWH CORPORATION will authorize repair or replacement of the defective part, either by appointment at the factory or by authorization of an independent service facility, to be determined by HWH CORPORATION. All warranty repairs must be performed by an independent service facility authorized by HWH CORPORATION, or at HWH CORPORATION'S factory, OR unless prior written approval has been obtained from proper HWH CORPORATION personnel.

CONTROL IDENTIFICATION



CONTROL FUNCTIONS

ROCKER SWITCH:

This is the on/off switch for the leveling system. It provides control power to operate the electrical solenoid on the pump and the leveling lights. It does not control power to the red warning light. [Only the ignition switch controls the warning light power.]

POWER ON/WARNING LIGHT:

This light will be on when the rocker switch is on or any time a jack is vertical. [Provided the ignition is on.]

LEVELING INDICATOR LIGHTS:

If a yellow LEVELING light is on, that corner of the coach is low, thus that jack should be extended.

WARNING LIGHTS:

A red WARNING light will be "ON" whenever the corresponding jack is vertical, provided the ignition switch is in "ACCESSORY" or "ON" position. Some coaches are equipped with a dash mounted master warning or "JACKS DOWN" light which will be "ON" when one or more jacks are vertical, provided the ignition switch is "ON".

JACK CONTROL LEVERS:

Any jack is extended by pushing the appropriate control lever to the EXTEND position. This movement of the lever activates the pump and directs hydraulic fluid to the jack. When the lever is released it will return to the neutral [center] position, turning off the pump and stopping the jack in position. The jacks are retracted by pulling the levers toward STORE/OR RETRACT, the levers will detent in the STORE position and should be left in STORE until the jacks are used again.

SITE SELECTION

Park with the front of the vehicle facing downhill if possible. Care must be taken not to raise the rear of the vehicle too high or the vehicle may roll forward or backward off the jacks. If parking in soft ground or asphalt paving, wood blocks or pads must be placed under the jacks.

LEVELING PROCEDURE

1. Place gear selector in the parking position and apply brake. Block wheels securely.
2. Turn ignition switch to "ON" or "ACCESSORY". If vehicle has an air bag suspension, do not run the vehicle engine.
3. Turn the rocker switch in jack control plate to LEVEL.
4. Swing each jack to the vertical position by pushing each control lever to EXTEND. The respective red WARNING light will light as soon as the jack swings vertical. Check that all jacks have swung to the vertical position.

IMPORTANT: OVERHEATING AND EXCESSIVE CURRENT DRAW WILL RESULT IF CONTROL LEVERS ARE PARTIALLY OPERATED TOWARD "EXTEND" FOR AN EXTENDED PERIOD OF TIME.

5. A lit yellow LEVEL light indicates that corner of the coach is low. Extend jacks as needed to put out all the yellow lights. Two jacks may be operated at the same time. If desired, operation of both side jacks at the same time often provides a smoother lift while reducing stresses on the coach and jacks. If the ground is too uneven, the jacks may not have enough stroke to level the coach. The coach may have to be moved or blocks used under the jacks. Remember that if the rear of the vehicle is lifted too high, the coach may roll forward or backward off of the jacks.

6. After the coach is level the jacks not used for leveling may be extended until they touch the ground. This provides additional stability against wind and activity in the coach.

7. Turn off the rocker switch on the leveling system panel.

8. Turn off the ignition switch.

NOTE: The leveling system should be cycled at least once a month or whenever the vehicle is used, to keep the system in operating condition.

RETRACT PROCEDURE

1. If the vehicle has air suspension, the engine should be started and air pressure built up.
2. Move the control levers to the RETRACT position. Retracting the two rear levers followed by the two front will provide a smooth retraction. As soon as a jack foot clears the ground, the jack will swing horizontal and continue to retract.

CAUTION: THE CONTROL LEVERS SHOULD BE KEPT IN THE "RETRACT" or "STORE" POSITION WHILE TRAVELING TO KEEP THE JACKS IN THE HORIZONTAL POSITION.

3. With the ignition switch in "ON" or "ACCESSORY" check that the red WARNING lights and the master JACKS DOWN light are all out.

CAUTION: DO NOT RELY SOLELY UPON THE WARNING LIGHTS. IT IS THE OPERATOR'S RESPONSIBILITY TO CHECK THAT ALL JACKS ARE UP BEFORE MOVING THE VEHICLE.

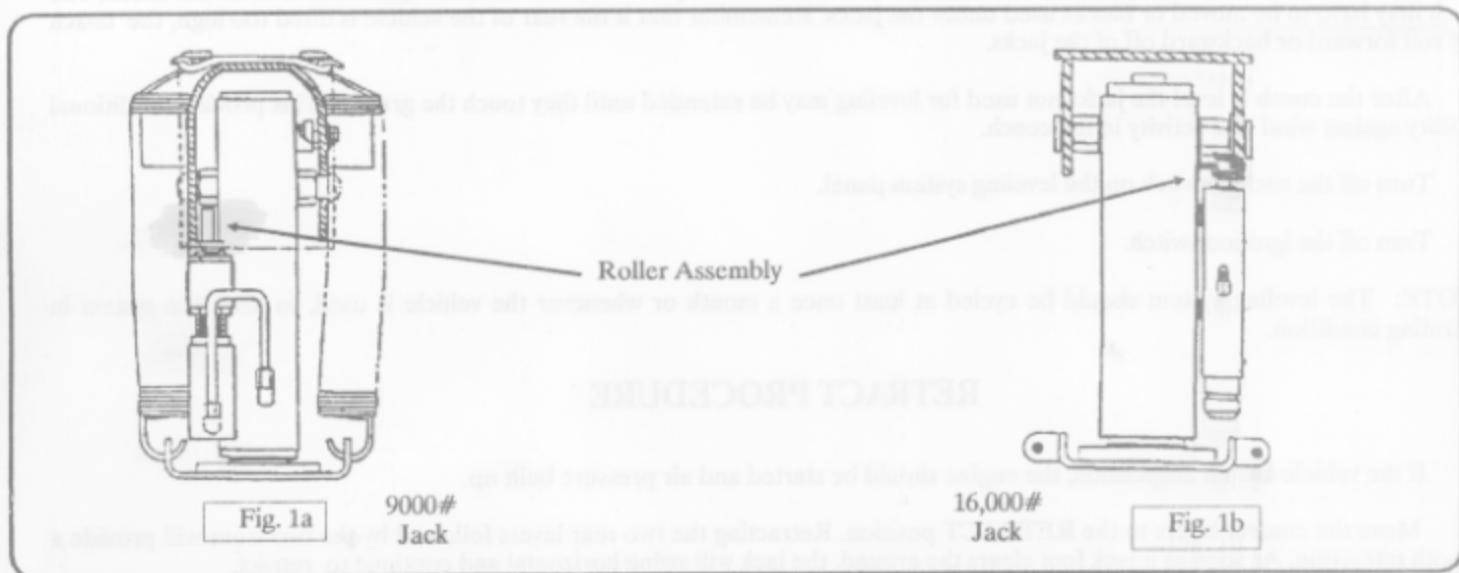
4. Turn rocker switch on the jack control plate to OFF. Turn ignition off.

MAINTENANCE

It is important that the four leveling units are in the retracted position before checking the hydraulic oil level. To check the oil supply, remove the breather plug from the top of the hydraulic oil reservoir. The oil level should be approximately one inch below the top of the reservoir when adequately filled.

NOTE: FLUIDS-Use Universal, Multipurpose or Dextron automatic transmission fluid. **DO NOT USE** brake fluid or hydraulic jack fluid. Use of these fluids can damage seals.

On the 9000# jacks and the 16000# jacks there are roller assemblies that need to rotate freely. [Fig. 1a & 1b] These rollers should be cleaned with a penetrating fluid, such as WD-40, and lubricated with a light oil as part of your regular maintenance schedule.



In general, to insure the smooth operation of the leveling system, it is a good idea to occasionally check the individual leveling units to prevent problems. This is especially true under the unusual conditions stated in the following:

UNUSUAL CONDITIONS

If driving conditions are unusually muddy, the units may become caked or clogged with mud. This condition may hamper the proper operation of the leveling system. This problem may be prevented or remedied by cleaning off each leveling unit if they become excessively muddy.

In wet, icy weather, leveling units may become encrusted with ice. This may cause the leveling system to function improperly. To eliminate this problem, periodically check the leveling units, and break loose any ice which may be causing improper operation.

Do not move the vehicle while the leveling units are still in contact with the ground. However, if this should accidentally happen, the leveling system was designed to protect itself from damage in most cases. Place the control levers in the retract position and then visually check to see if the leveling units have returned to the travel position.

NOTE: All major components of the system can be replaced with rebuilt units or can be sent to HWH CORPORATION to be rebuilt, when the system is out of warranty.

SYSTEM ADJUSTMENT

JACK ADJUSTMENT

There are two basic adjustments which are made at the time of installation. However, when adjustment of a leveling unit is needed, the following procedures are recommended.

1. 6000# JACKS: Always make the vertical adjustment first. If the vertical adjustment is changed at anytime, be sure to check

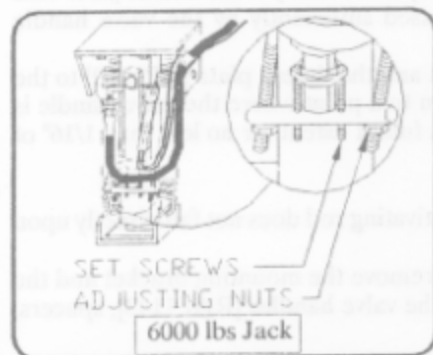


Fig. 2

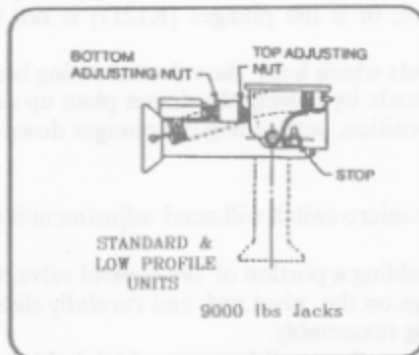


Fig. 3

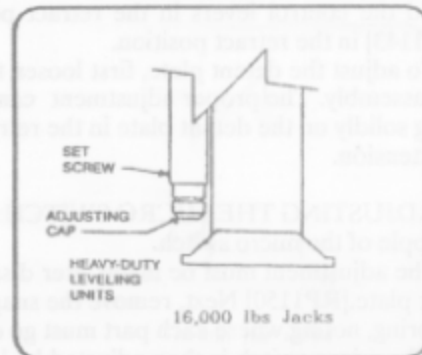


Fig. 4

the horizontal adjustment. Vertical position is changed by adjusting the lock nuts on the actuator cable.[Fig.2] If the jack stopped short of vertical, tighten the locknuts. If the jack goes past vertical, back the locknuts off. Be sure to adjust each nut the same number of turns.

Horizontal stop is adjusted by turning the set screws located just inside the cable locknuts. The jack can be adjusted down to provide clearance for objects which may interfere with the operation of the jacks. The horizontal stop must be adjusted to provide clearance between the hat bracket and mounting bolts; and the actuator and hose fittings, when the jack is in the stored position. The jack must be able to fully extend in the horizontal position without interfering with suspension components, tanks, etc.

2. 9000# JACKS: Each jack should be checked to be sure that it is vertical when it swings down. To do this, retract all jacks, then extend each jack until it is close to, but not touching the ground. If the jack stopped short of being vertical, it can be adjusted by loosening the upper adjusting nut and tighten the lower nut.[Fig.3]

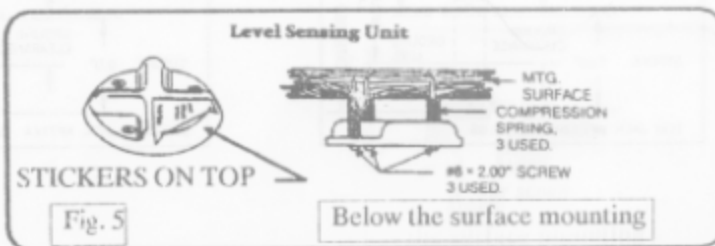
The horizontal stop can be adjusted up or down in the slot to provide clearance for objects which may interfere with the operation of the jack.[Fig.3] The stop must be adjusted so that the jack can be fully extended in the horizontal position without interfering with suspension components or tanks, etc.

3. 16000# JACKS: If the jack stopped short of being vertical, loosen the set screw and turn the adjusting cap clockwise. If the jack went beyond vertical, loosen the set screw and turn the adjusting cap counterclockwise. After each counterclockwise adjustment, the weight of the coach must be applied to the jack to make the adjustment effective. DO NOT adjust cap more than one turn without cycling the jack.[Fig.4]

The horizontal stop on the heavy-duty jack is adjusted by adding washers under the urethane stop.

LEVEL SENSING UNIT ADJUSTMENT

Level the coach by placing a circular bubble level in the center of the freezer floor or location within the coach that is to be level. With the coach level, adjust the sensing unit until all yellow lights are off. This is done by drawing up the corresponding screw if the sensing unit is mounted below the surface as shown in fig.5 or backing out the corresponding screw if the sensing unit is mounted above the surface. Bump the sensing unit to see that it has settled down in the level position.



ADJUSTING THE HYDRAULIC CONTROL VALVE

Two parts of the control valve are possible to adjust. The proper adjustments for these parts are made at the factory, so readjustments will rarely be necessary.

NOTE: These valve adjustments should only be made on a non-warranty basis. If the valve needs to be repaired or adjusted under warranty, the complete control valve unit should be replaced, but not the light panel.

The following procedures are recommended to adjust them if the need arises.

1. ADJUSTMENT OF THE DETENT PLATE: Adjustment of the detent plate [RP1150] is necessary if the detent plate fails to hold the control levers in the retract position, or if the plunger [R1217] is not depressed sufficiently by the valve handle [RAP1143] in the retract position.

To adjust the detent plate, first loosen the nuts which hold the valve mounting brackets and the detent plate [RP1150] to the valve assembly. The proper adjustment can be made by moving the detent plate up or down to a point where the valve handle is resting solidly on the detent plate in the retract position, yet holding the plunger down to its fullest extent or no less than 1/16" of this extension.

2. ADJUSTING THE MICRO SWITCH: The micro switch will need adjustment if the activating rod does not fall directly upon the nipple of the micro switch.

The adjustment must be made after disassembling a portion of the control valve. First, remove the mounting bracket and the detent plate [RP1150]. Next, remove the snap rings on the pivot rod, and carefully slide off the valve handles [RAP1143], spacers, and spring, noting where each part must go during reassembly.

The micro switch is then adjusted by loosening the small hex nuts which hold the micro switch to the pivot plate, and then making the proper correction.

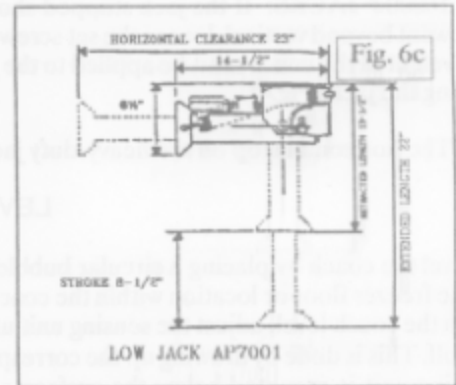
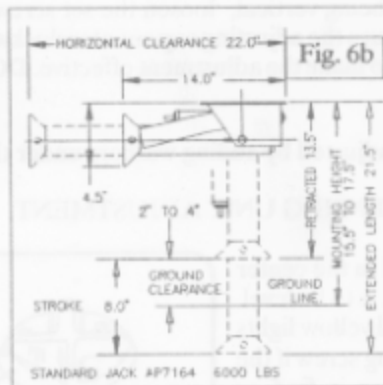
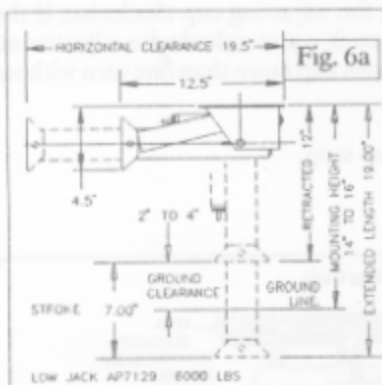
Finally, reassemble the control valve, remembering to properly adjust the detent plate as it is replaced.

COMPONENT IDENTIFICATION

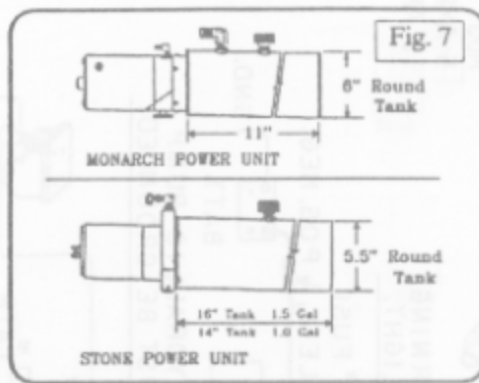
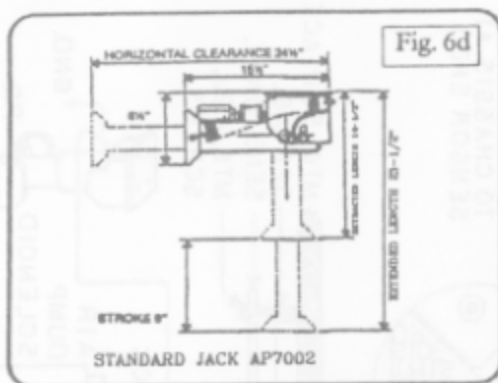
JACKS: The 6000# jacks and the 9000# jacks can be identified as LOW or STANDARD by measuring retracted lengths. Refer to figures 6a thru 6d.

The 16000# jack can be identified by measuring the foot [6&1/2" by 6"] or by measuring the spring diameter [2&3/4"]

CONTROL VALVES: Systems with the integrated light package use a RAP4973 valve. Systems with a separate light package use either a RAP1118 or a RAP5262 valve. [All handles tilted forward]



POWER UNITS: Power units can be identified by measuring the diameter and length of the fluid reservoir. Example: See figure. Also note that the unit is either side or bottom mounted.



TROUBLE SHOOTING

The following is a list of troubles, and possible solutions which might occur to the leveling system.

NOTE: Only qualified technicians should install or repair leveling systems on coaches. A knowledge of hydraulics, welding, the vehicle's suspension and electrical system, as well as an understanding of the leveling system's hydraulics and electronics is required.

1. JACK RETRACTS AFTER COACH IS LEVEL

- A. Hose or jack has external leak
B. Fluid is leaking back to reservoir thru control valve

2. LEVELING JACKS WILL NOT RETRACT COMPLETELY

- A. Actuator rod bent or scored [rod will not move freely]
- B. Unit clogged with mud or ice
- C. Main rod bent or scored
- D. Valve plunger not completely depressed by valve handle
- E. Springs weak or broken
- F. Hydraulic line pinched

3. UNIT IS EXTENDED BUT NOT VERTICAL

A. Move the control lever to the full retract position and wait two minutes. Be sure the jack is fully retracted, then try again.

- B. Roller assembly frozen or missing
- C. Actuator rod bent
- D. Actuator not functioning properly

4. IGNITION SWITCH ON, BUT NO POWER TO PUMP AND/OR LIGHT

- A. Bad micro switch
- B. Pump solenoid not functioning
- C. 12 volts from main power source not present
- D. Bad rocker switch
- E. Faulty wire or electrical connection
- F. Pump not grounded
- G. Blown fuse

5. LEVELING LIGHTS [YELLOW] NOT FUNCTIONING PROPERLY

- Yellow lights will not go out when coach is level: adjust sensing unit
- More than two yellow lights on: replace sensing unit
- Check PC board

6. WARNING LIGHTS [RED] NOT FUNCTIONING PROPERLY

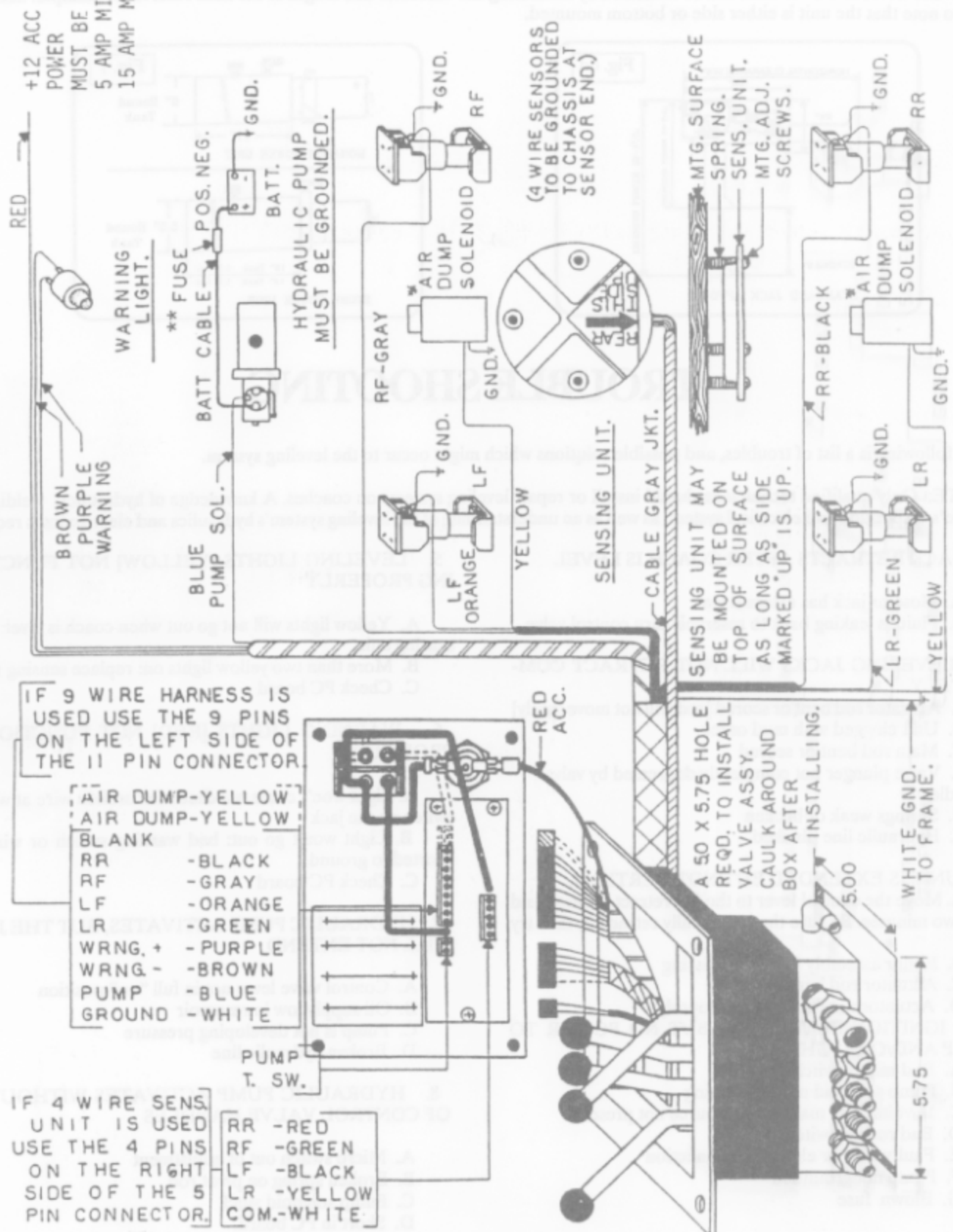
- A. Light won't come on: check for broken wire at warning switch on the jack
- B. Light won't go out: bad warning switch or wires are shorted to ground
- C. Check PC board

7. HYDRAULIC PUMP ACTIVATES, BUT THE JACKS WILL NOT EXTEND

- A. Control valve lever not in full "on" position
- B. Oil supply low in reservoir
- C. Pump is not developing pressure
- D. Broken hydraulic line

8. HYDRAULIC PUMP ACTIVATES WITHOUT USE OF CONTROL VALVE HANDLES

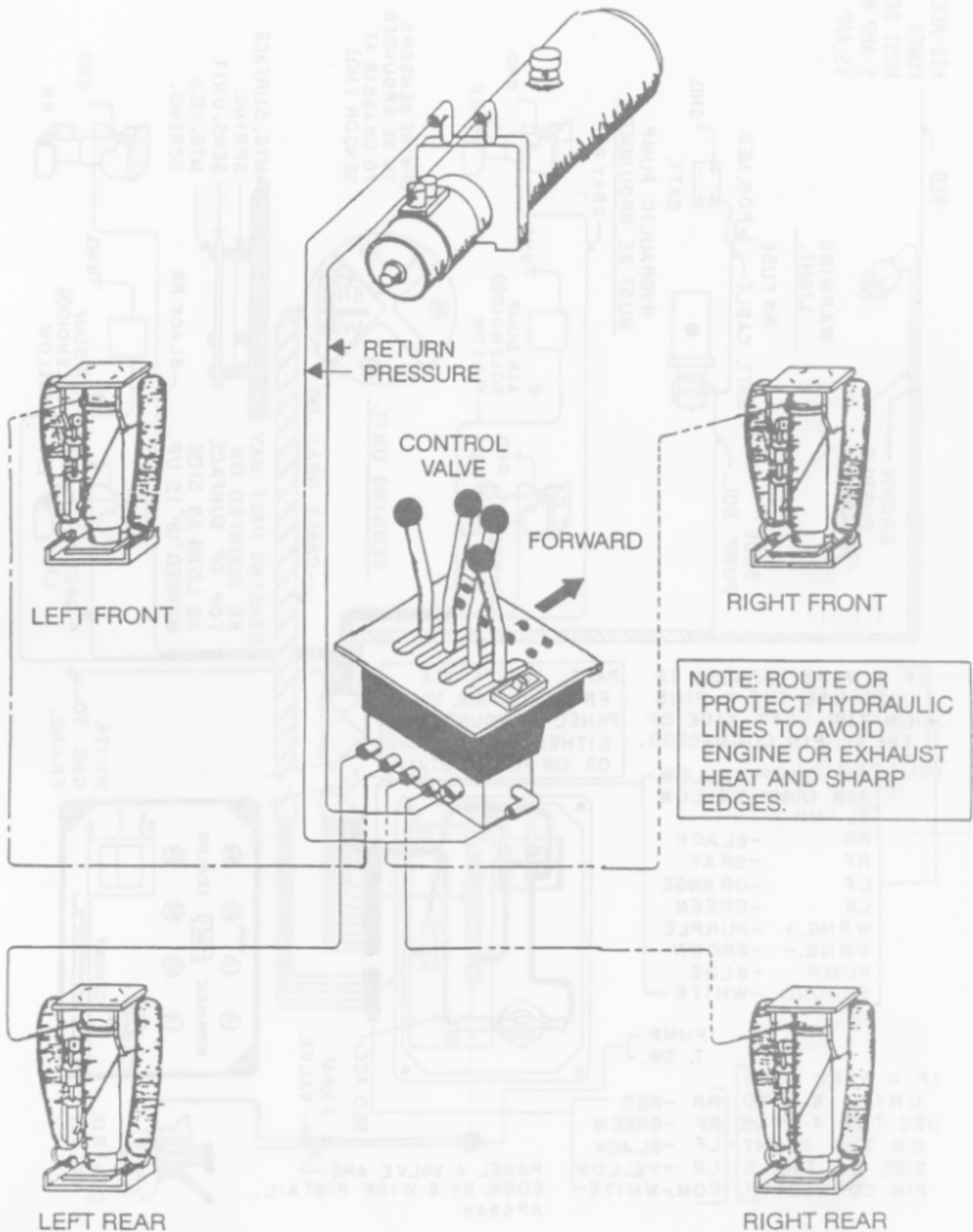
- A. Micro switch out of adjustment
- B. Broken spring on pivot rod
- C. Pump solenoid stuck
- D. Short in PC board.



* FOR SYSTEMS WITH AIR DUMP.

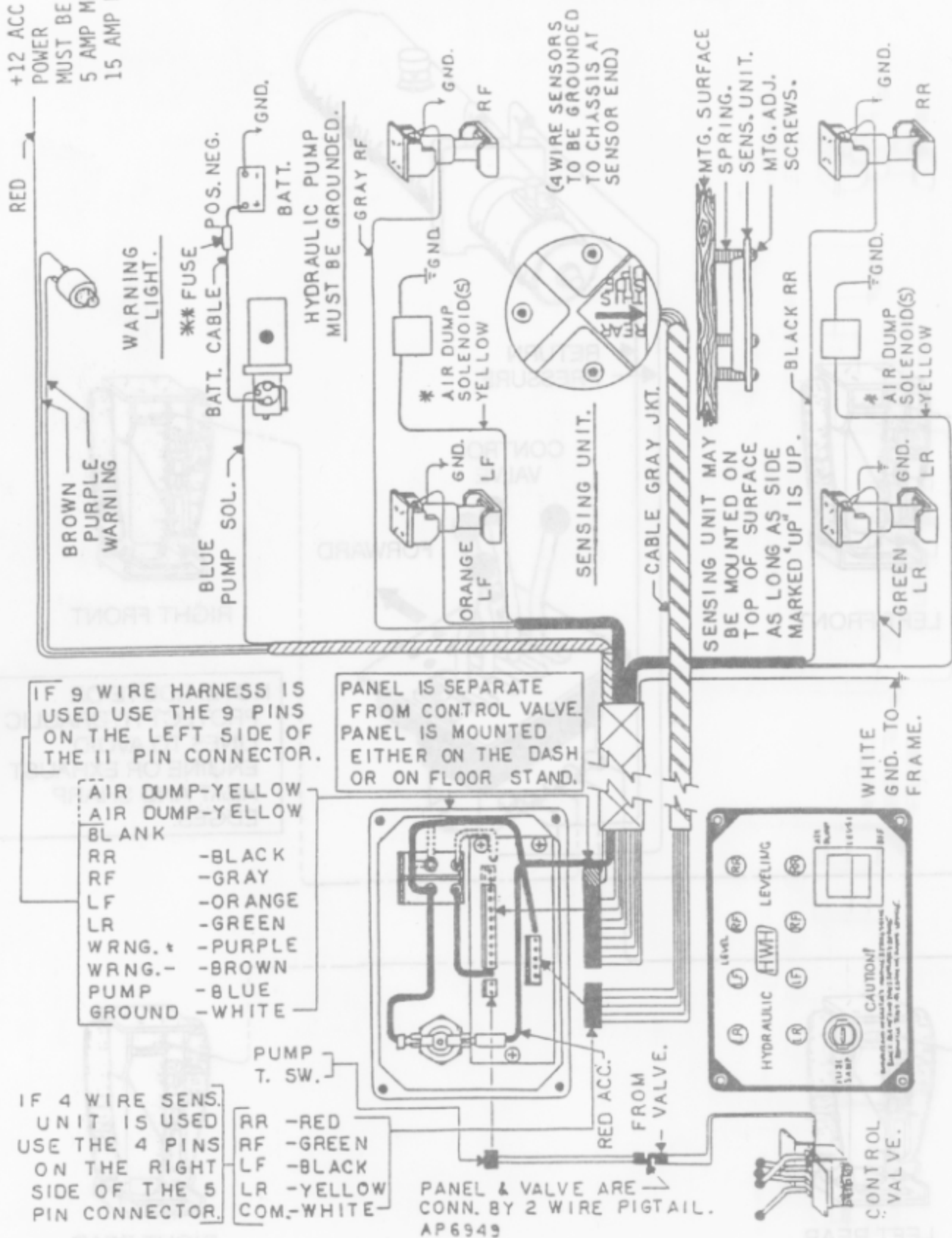
** FUSE MAYBE REQ'D CHECK APPLICABLE CODE

FOR FOUR LEVER INTEGRAL CONTROL SYSTEMS



ELECTRICAL CIRCUIT

SEPERATE LIGHT PLATE WITH ROCKER SWITCH



*FOR SYSTEMS WITH AIR DUMP.
** FUSE MAYBE REQ'D CHECK APPLICABLE CODE.

MP7456

02/16/90

IV.1

FOR FOUR LEVER SEPERATE CONTROL

