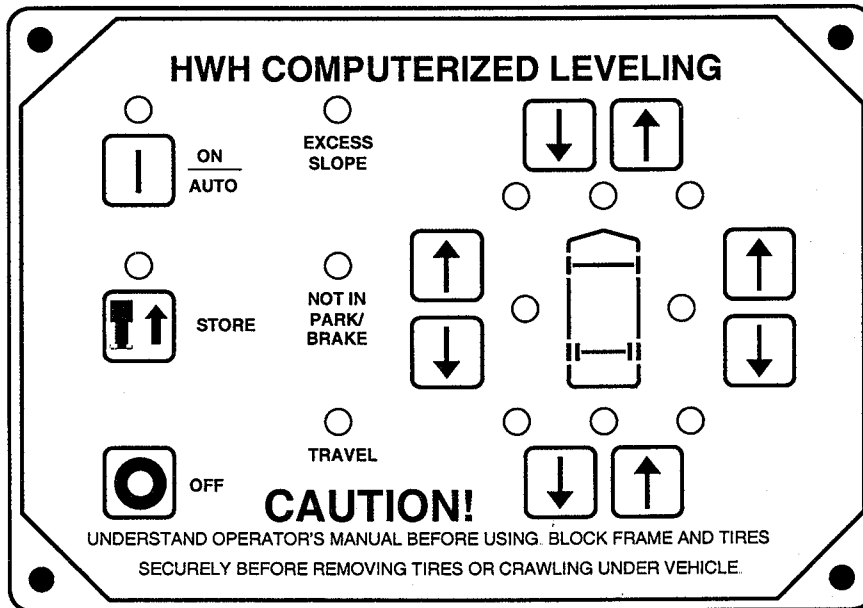




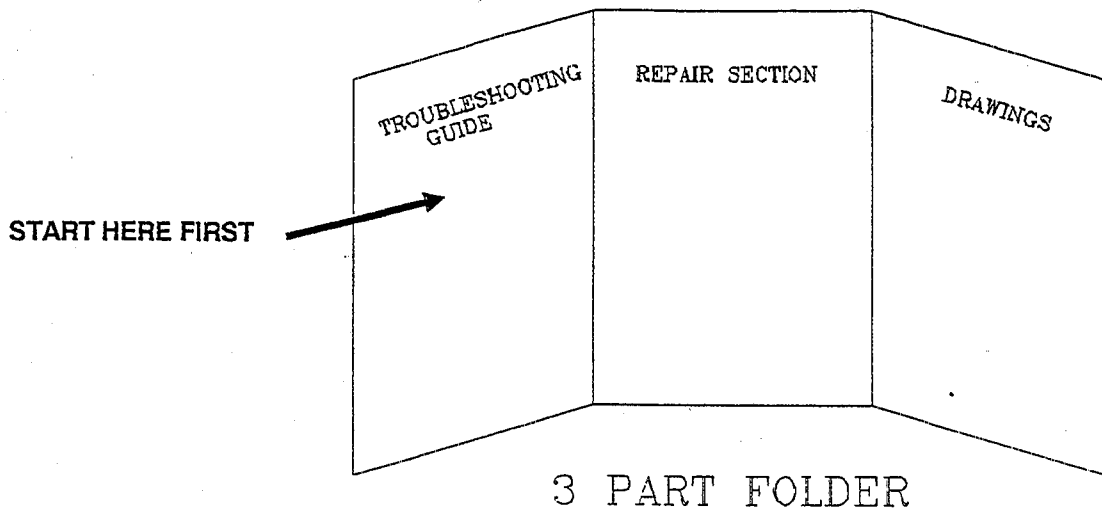
# REPAIR MANUAL

## HWH COMPUTER-CONTROLLED HYDRAULIC LEVELING SYSTEM 510 SERIES

FEATURING:  
**TOUCH PANEL CONTROL**



**HWH CORPORATION**  
**(ON I-80, EXIT 267 SOUTH)**  
**2096 MOSCOW ROAD**  
**MOSCOW, IOWA 52760**  
**(800) 321-3494 / (563) 724-3396**  
**INTERNET: <http://www.hwhcorp.com>**



1. Start with the Trouble Shooting Guide, the guide will refer you to the Repair Section.
2. The Repair Section will explain what has to be done, referring you to the Drawings when needed.

The following repair and trouble shooting manual is offered as a guide only. It is impossible to anticipate every problem or combination of problems. This manual is written in sequential order of the proper operation of the system. The trouble shooting steps must be followed in order to give correct diagnoses of the problem(s).

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.

**NOTE: HWH CORPORATION ASSUMES NO LIABILITY FOR DAMAGES OR INJURIES RESULTING FROM THE INSTALLATION OR REPAIR OF THIS PRODUCT.**

**CAUTION!**

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.

**SAFETY REQUIREMENTS:**

When routing or rerouting hydraulic hoses and wires, be sure they are not exposed to engine exhaust or any high temperature components of the vehicle.

The jacks may abruptly swing up when the foot clears the ground or when the jack reaches full extension.

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

Safety glasses are to be worn 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.

## NOTES AND CHECKS - Read and check before proceeding with Trouble Shooting Guide

1. Most Coaches have more than one battery; one for the engine and the other(s) for the coach. The electronics within the control box receives its power from the "ACC" line which comes from the engine battery and the power to operate the pump and the control valves comes from the coach battery. The two battery operation is recommended, but there are installations where only one battery is used. Batteries should read at least 12 - 6 volts. Batteries must be in good condition with no weak cells. An alternator, converter or battery charger will not supply enough power for the system to operate properly.

2. The control box automatically monitors these batteries during the "AUTOMATIC LEVELING, RETRACT, and MANUAL" modes of operation. The system will stop its operation and the "battery" symbol on the touch panel will light when either of the batteries' voltages drops below (8.5 - 9.0 Volts). Have the batteries properly charged to their full capacity.

3. Check that the oil reservoir is full with the jacks in the fully retracted position.

4. Proper ground of all components is critical. See the electrical circuit for specific grounds required. Faulty grounds, especially for the control box, solenoid manifold or the pump assembly, may cause control box component damage, and / or erratic operation.

5. Do not replace the control box unless the trouble shooting guide says to replace it. Otherwise the malfunctions may damage the new control box.

6. If the jacks can't be retracted see step 19 below for temporary measures.

7. The trouble shooting guide must be followed in order. Problems checked for in one step are assumed correct and not rechecked in the following steps.

8. Begin with the trouble shooting guide on the following page.

This manual is intended for use by experienced mechanics, with knowledge of hydraulics and automotive electrical systems. People with little or no experience with HWH leveling systems should contact HWH technical service (800-321-3494) before beginning. Special attention should be given to all cautions, wiring, and hydraulic diagrams.

SUGGESTED TOOLS FOR TROUBLE SHOOTING THE HWH LEVELING SYSTEMS: JUMPER WIRES (UP TO 10 GA.)  
PRESSURE GAUGE 3500 PSI MIN.)  
MULTI - METER  
12 VOLT TEST LIGHT

**NOTE: SOME 510 SYSTEMS USE A MODULAR CABLE TO CONNECT THE TOUCH PANEL TO THE 7" CONTROL BOX, OTHER SYSTEMS USE A RIBBON CABLE. DIAGRAMS ARE SUPPLIED FOR BOTH SYSTEMS. TROUBLE SHOOTING AND REPAIR ARE THE SAME FOR BOTH SYSTEMS.**

**SPECIAL NOTE: WHEN INSTALLING A NEW CONTROL BOX, MAKE SURE THE BOX IS PROPERLY GROUNDED BEFORE APPLYING POWER TO THE SYSTEM.**

# TROUBLE SHOOTING GUIDE

(MUST FOLLOW IN SEQUENTIAL ORDER)

1. Turn the ignition switch 'OFF'. Nothing should be lit on the touch panel nor anything operational, etc.

**If this is not so:**

1A. Check to see that power is not present on the brown wire to the three (3) pin UML. (MP7481) If power is present, is this with the ignition switch 'OFF'? Trace this wire to its source.

1B. Check to see that power is not present on the 10 ga. black wire to the six (6) pin UML. (MP7481) If power is present, is the contacts of solenoid A shorted? (MP7480) Trace this wire to its source.

2. Turn the ignition switch to the 'ACCESSORY' position (ignition on some coaches), and press the [I] 'ON' button on the touch panel. The red indicator above the [I] 'ON' button should light and stay lit when the button is released. If the pump starts at this time, see Section E. If the red indicator light does not come on and stay lit then:

2A. If the 'NOT IN PARK BRAKE' light is 'ON' while you are pressing the 'ON' button, this indicates that the park brake is not set. Apply the park brake and retry. If the 'NOT IN PARK BRAKE' light still comes on, check the blue wire voltage on the six (6) pin UML. Note: Some coaches use a +12 volt signal for the park brake switch and others a grounding voltage. Check the coach's manual to see which signal is used. Then check the control box to see that it is wired properly for the correct signal. If the blue wire does not have the proper signal, trace out this wire and check the park brake switch for proper function. If the blue wire does have the proper signal and the panel is still not operating, the control box is at fault and needs to be replaced.

2B. Check that power is present on the brown wire to the three (3) pin UML, +12v power should be present. If power is not present, trace this wire to its source. Check for blown fuses between the accessory hook up and the control box. If power is present, check that the interconnect cable is connected to the touch panel and to the control box. Check that the 'ACC FUSE', plugged into the back of the control box, is good. If the interconnect cable is connected properly and the fuse is not blown, then the problem is with the control box, interconnect cable, or the touch panel itself.

3. Press the [I](on) button again. The control box should start the pump and activate the horizontal/vertical solenoid. The jacks should go vertical and the pump should then shut off.

A. If the jacks go vertical and the pump remains 'ON' for more than 5 seconds, the control box is not sensing the pressure switch, see Section Z.

B. If the pump motor doesn't run, see Section B.

C. If the jacks don't swing vertical and nothing else occurs, but the pump is running, see Section F.

D. If nothing happens but the pump is free wheeling and shuts off within 2 to 5 seconds, check the stabilize solenoid valve, see Section G.

E. If the jacks don't swing vertical but one or more jacks extend, see Section G.

F. If the jacks swing vertical but return to the horizontal position as soon as the pump stops, cycle the jacks two more times and if the problem persists, see Section H.

G. For coaches with 16,000# jacks, see Section AA.

4. If during any automatic function of the system, except during retract, the pump runs for two(2) seconds and shuts down, see Section I.

5. With the jacks in their vertical position, the operator can manually operate the jacks with the eight buttons on the right half of the touch panel. The up arrows will lift the coach by extending the jacks; whereas, the down arrows will lower the coach by retracting the jacks. The jacks operate in pairs; left side, right side, front and rear pairs. Press the up arrow button for each of the jack pairs, checking to see that those jacks only begin to extend.

5A. If more than two jacks are extending, check the solenoid for the jack(s) that should not be extending. see Section G.

5B. If a jack retracts when its button is released, check the solenoid for that jack. see Section G.

5C. If a jack will not extend when the proper button is pushed, check the solenoid for that jack. see Section J.

6. Press the down arrow buttons for each of the jack pairs, checking that each of the jack pairs retract. (if the jack will extend in manual operation, they should also retract.) If the jacks extend when the down arrow button is pressed, the pump is running when it should not. Recheck Section E, lastly replace the control box.

7. With the jacks in the vertical position, and the ignition switch in the accessory or 'ON' position, there should be four warning lights 'ON', one in each of the four corners on the touch panel within the up-down arrows. Each led light represents the down or vertical position of the jacks themselves. if not see Section K.

8. With the jacks in the horizontal position, and the ignition switch in the accessory or 'ON' position, the red warning leds should be off. if not see Section N.

9. The yellow level indicator leds located around the coach on the touch panel, when lit, indicates that that side 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 or in a storage compartment. The sensing unit supplies the signal for the lights; as well as signals to the control box for leveling. If opposing level indicator leds are 'ON' together, the sensor is either incorrectly mounted or faulty. If more than two (2) yellow indicator lights are 'ON' at the same time the sensing unit is faulty.

10. Extend each jack pair 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 retracting it's jack pair and/or extending the opposing jack pair. If the ground is sloping or uneven the coach may need to be moved to complete the above test. If one or more lights will not come on, see Section Q.

10A. If one or more yellow lights will not go out, unplug the 5 pin MTA connector from the control box.(MP7481) If the lights go out, replace the sensing unit. If the lights remain on the control box, interconnect cable, or touch panel is faulty.

11. With the jacks in the vertical position, make all the yellow level indicator lights go out by extending the respective jacks pairs. the coach should now be nearly level. If not in the position desired, see Section R.

12. Completely retract all jacks and swing the jacks to the horizontal position. To do this, press the [O] 'OFF' button , the [I] 'ON' button and the 'STORE' button in that sequence. The 'STORE' indicator above the button will be flashing showing that the control box is retracting the jacks to their horizontal position. The horizontal/vertical solenoid will be energized for approximately 30 minutes after which the control box will automatically shut itself off. The operator can override this by manually pressing the [O] 'OFF' button, but only when the jacks have been fully retracted.

**From this point on it is assumed the system is fully functional in the manual mode. when ever a malfunction occurs revert to the manual operation and check for correct functioning. If a malfunction is found in manual operation, trouble shoot that problem using the preceding steps. remember, low volts will cause erratic performance and damage components.**

13. Turn the ignition switch to the 'ON' or accessory position. For coaches with automatic air dump, the engine must be off during leveling. If the control box is 'ON', press the [O] 'OFF' button. This resets the microprocessor. press the [I] 'ON' button. The red indicator light above the [I] button should be on. Any time the control box is turned off, either with the [O] 'OFF' button or the ignition switch off, the microprocessor within the control box is reset and any automatic procedure in progress must be restarted.

14. Press the [I] 'ON' button the second time. this places the control box in the automatic leveling mode where the following should occur:

A. The red indicator above the [I] 'ON' button should be flashing.

B. The pump should start.

C. All jacks swing vertical.

D. The four red warning leds on the touch panel and the dash warning light should light as the jacks swing VERTICAL.

E. The pump should stop approximately 3 seconds after all jacks are vertical.

F. The red led indicator above the [I] 'ON' button now glows a steady red.

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

15. For the third time press the [I] 'ON' button. the following should automatically occur.

A. The red led indicator above the [I] 'ON' button should start to flash.

B. For automatic air dump systems, the air will dump at this time with 25 seconds allowed for dumping before any jacks extend.

C. One, two, or three jacks at a time will extend corresponding to any yellow light(s) which is/are lit. This should continue until all yellow led indicators are out or until one or two jacks have reached full extension.

D. The pump and stabilize solenoid will come on and run until all remaining jacks not touching the ground do so. The control box automatically, via a flow switch, senses when all jacks are extended firmly on the ground under low hydraulic pressure. There exists a background timer of 90 seconds that shuts down the system if no signal is ever received from the flow switch.

E. The red led indicator above the [I] 'ON' button will go out. If any of the above does not occur as described, see Section U.

#### CONTINUE FOR RETRACT PROCEDURES

16. Systems with air dump, start coach engine, build up air pressure and leave running.

17. Turn the ignition switch to the on or accessory position. The control box must be 'OFF' press the [O] 'OFF' button before pressing the [I] 'ON' button, this resets the microprocessor. The red led indicator above the [I] 'ON' button will come on steady. If the pump starts at this time, see Section E.

18. Press the 'STORE' button. the following should automatically occur:

A. The red led indicator above the 'STORE' button should be flashing.

B. The jacks should start to retract, as each jack clears the ground, it should swing horizontal and continue to retract.

C. As each jack swings horizontal, it's respective red led indicator should go out. when all jacks are horizontal, the dash mounted warning light should go out and the green 'TRAVEL' led should be lit.

D. The red 'STORE' indicator will continue to flash for approximately six (6) minutes after the travel light is lit, after which the control box automatically shuts itself off.

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

19. Emergency jack retraction. some systems are equipped with drain valves. (SEE HYDRAULIC CIRCUIT. MP7458) 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 solenoid comes on. The pump may be disabled by disconnecting the cable from terminal #6 on solenoid b. (MP7480) This will disconnect all power to the pump motor. Then the system may be run through a normal retract procedure.

20. If a jack retracts slowly after the coach is level and stabilized, the solenoid valve for that jack is leaking and should be replaced.

21. If when leveling or stabilizing the coach drops slightly before continuing, the inner check valve for the jack that is dropping is leaking and should be replaced. This problem may also be caused by a sticky shuttle valve.

## REPAIR SECTION

(START WITH TROUBLE SHOOTING STEPS)

Section A. Check the pump pressure. The pressure gauge should be hooked to the pressure outlet at the pump. The pump relief valve should be set at 3500 psi. If the pressure is low, the relief valve can be adjusted in to increase the pressure. If the proper pressure cannot be reached, replace the pump.

Section B. Check for +12 volts between terminal 2 (MP7480) and the vehicle ground. If no voltage, check battery cable leading from battery.

NEXT: With control box on, check for +12 volts between terminal 1 (MP7480) and the frame of the vehicle. If no voltage, see Section C.

NEXT: Check for +12 volts at terminal 3 or 4 (MP7480) and the vehicle ground. If no voltage is present, change solenoid A. Disconnect battery ground before changing solenoid.

NEXT: Attach an insulated wire to terminal 2 (MP7480) and touch the other end to terminal 5. The pump motor should now run. If the pump does not run, see Section D. If the pump runs with the jumper wire attached, check the gray wire on the six (6) pin UML on the back of the control box for +12 volts. (MP7481) If voltage is present, check for a broken gray wire between the control box and the pump. If voltage is not present on the gray wire on the six (6) pin UML, then check the pump fuse. (5amp) If the fuse is not blown, the control box is faulty.

Section C. If no voltage is present on terminal 1, (MP7480) check the voltage on the red wire at the control box on the six (6) pin UML. If voltage is present, then the red wire is broke between the control box and the master solenoid. If voltage is not present, check the ACC fuse on the control box. If the fuse is not blown, the control box is faulty.

Section D. Check for +12 volts between terminal 6 (MP7480) and the vehicle ground. If +12 volts is not present, replace solenoid B.

Disconnect battery ground before changing solenoid. If +12 volts is read, replace the pump motor. (always be sure cable connections are clean and tight.)

NOTE: Solenoid A is activated by applying +12 volts to terminal 1.

Solenoid B is activated by applying +12 volts to terminal 5.

Section E. Disconnect the gray wire from terminal 5. (MP7480) If the pump continues to run with the system on, solenoid B is stuck close and needs to be replaced. If the pump does not run, check the pin corresponding to the gray wire on the six (6) pin UML (MP7481) on the back of the control box for +12 volts. If voltage is present, the control box is faulty, and should be replaced.

Section F. If the pump is running under heavy load and lugging down, check for +12 volts on the yellow wire on the nine (9) pin UML on the back of the control box. (MP7481) If voltage is not present, check the h/v fuse (15amp) and if the fuse is not blown the control box is faulty. If voltage is present on the yellow wire on the nine (9) pin UML, then check the voltage at the horizontal/vertical solenoid. (MP7487) If voltage is not present, check for a broken yellow wire between the control box and the solenoid. If voltage is present, change the horizontal/vertical solenoid. If the pump is free wheeling or running under no load, check the return line for oil flow to the pump reservoir. If there is oil flowing to the reservoir, then the pressure/ return shuttle valve should be replaced. (MP7487) This valve is located on the solenoid manifold, next to the stabilize valve. the stabilize valve is the grooved solenoid valve. The main pressure line from the pump attaches to the end of the shuttle valve.

Section G. Check for correct connection of hydraulic lines through out the system. The actuator lines and the main cylinder lines might be switched. (MP7458) Check electrical connectors at the solenoid manifold. (MP7487) Locate the correct solenoid valve. (MP7487) Unplug the solenoid valve. If the problem persists, change the valve. (NOTE: The stabilize valve is different from the other five valves.) If the problem stops, check the wire from the control box for +12 volts. If +12 volts is present, remove the correct fuse for that valve from the control box. If +12 volts is not present change the control box. If +12 volts is still present, the wiring harness is shorted out. Trace the correct wire back to the control box.

Section H. With the system on, unplug the horizontal/vertical valve. Check the wire from the control box for +12 volts. If +12 volts is not present, its either the bleed valve cartridge or the horizontal/vertical valve. Replace the bleed valve cartridge first, since this is the easier of the two. If +12 volts is present remove the H/V fuse from the control box. Then if +12 volts is not present, replace the control box. If +12 volts is still present, the wire is probably shorted to +12 volts. Trace the wire back to the control box.

Section I. The control box is reading a signal from either the pressure switch or the flow switch. Unplug one at a time to determine which is the problem. If the problem persists, trace the black wire back to the nine (9) pin UML. (MP7481) Unplug the connector and check for continuity between the black wire and ground. If the wire is not shorted to ground, replace the control box.

Section J. Check all connections. Unplug the correct solenoid valve for the jack that won't extend. Check the wire from the control box, +12 volts should be present. If it is,

replace the valve. If +12 volts is not, trace the wire back to the nine (9) pin UML on the control box. If +12 volts is not present at the control box, check the proper fuse. If the fuse is not blown, replace the control box.

Section K. If the individual warning lights on the touch panel are lit, but not the master warning light on the dash, see Section L.

Warning switches are mounted on the barrel of each 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, and the other is connected to the control box via a four (4) pin MTA connector. (MP7481 & MP7488) The warning switches provide the ground for the warning lights (red led's) to light.

Check for physical damage or loose wires, especially the grounds and crimp connectors on the warning switches. Disconnect the wire harness from the control box. (MP7481 & MP7488) With the jacks vertical, check for continuity to ground on each wire for which the red light was not lit. If continuity is not found, see Section M.

Using a jumper, ground the pins on the control box where the warning connector is plugged in. (MP7481) As the pin is grounded, it's red indicator led should light on the touch panel. If not, either the touch panel, interconnect cable, or control box is faulty, contract HWH technical service for further assistance.

Section L. The master warning light is connected to the control box by a two (2) pin MTA connector. When the external warning is to be lit, +12 volts should appear across these two pins at the control box, If not the box is faulty. If voltage does appear next check the warning light and it's wiring.

Section M. Reconnect the wire harness to the control box. using a needle probe or other method, go close to the jack and ground the wire coming to the warning switch. If the warning light does not come on, the wire running to the control box is faulty. If the warning light does come on then check the ground wire of the warning switch. If the light still does not come on (with the jack vertical and with the needle probe disconnected) replace the warning switch.

Section N. Disconnect the ground wire of the warning switch on the jack which has the red led light lit. If the red warning light goes out, replace the warning switch. If the red warning light does not go out check for a short in the wire running from the warning switch to the control box. Unplug the four (4) pin MTA connector. (MP7488) If a light remains on, the control box, ribbon cable, or touch panel is at fault. contact HWH service dept. for further help.

Section Q. Unplug the sensing unit cable from the control box. Using a jumper wire, ground the terminal pins (MP7481)

that the cable was plugged into. If the yellow lights on the touch panel do not come on when grounding their respective terminal, the control box is faulty. If the lights come on respectively, then replace the sensing unit.

Section R. Disregard the yellow indicator lights. Using a bubble level, level the coach or refrigerator as desired by extending the jacks manually. The sensing unit is adjusted by turning the mounting screw in or out. Raise the side of the sensing unit corresponding to the lit yellow light on the touch panel until all yellow lights are out.

Section S. Providing the control box is on and neither 14a or 14b occur, the control box should be replaced. If 14a does occur, but 14b, 14c, and 14d do not occur, recheck in manual operation. If the pump does not stop as described in 14e, see Section T.

Section T. First recheck operation of pump manually. correct any malfunctions found. then return to step 13. If 14e again fails then advance to Section Z.

Section U. If the jacks do not extend to level the coach in 15c, check for malfunctions in manual operation, then replace the control box. If the pump does not stop, see Section X. If 15d does not occur as described, see Section V. If the air does not dump as described in 15b, see Section Y.

Section V. If the pump runs for approximately 2 seconds and shuts off, without extending the remaining jacks, the flow switch is faulty and should be replaced. A test would be to remove the wire from the flow switch and start the automatic leveling over again. The flow switch is on the manifold (MP7487). The stabilize solenoid may be faulty if the remaining jacks extend and lift the coach. During 15d, the stabilize solenoid should be energized; this is the purple wire on the nine (9) pin UML on the back of the control box. Check to make sure the stabilize fuse (15amp) is not blown. If voltage is present at the control box and not at the solenoid, the wiring between the control box and solenoid is faulty; otherwise, the stabilize solenoid needs to be replaced. If one or more jacks do not reach the ground before the pump shuts off, replace the flow switch.

Section W. All functions of step 18 are used in the manual mode except the blinking red light in 18a and 18d. If 18b or 18c do not occur as described, check its manual operation, then replace the control box. If the light does not blink but other functions occur as described, the touch panel may be faulty.

Section X. Check for correct operation in the manual mode. (trouble shooting steps 1-6) 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 15d, see Section Z.



Section Y. **NOTE: FOR AUTOMATIC AIR DUMP ONLY.** A +12 volt signal (gray wire) is sent from the control box to the air solenoids. This is the gray wire in the nine (9) pin UML connector. Check the dump fuse (5amp) on the back of the control box. (MP7481) If this voltage is present, the fault is with the wiring to the solenoids and/or the solenoids themselves. If during the dump cycle, the voltage on the gray wire on the back of the control box is not present, the control box is faulty. Air dump solenoid valves are tee'd into the air line running from the mechanical air valves to the air bags. The air dump solenoid valves may be disabled by going to each air dump valve and closing the manual valve which is attached to the solenoid valve. To close the valve, turn the handle perpendicular to the body of the valve.

Section Z. The control box is not receiving the signal from the pressure switch (See MP7487) 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 control box. 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 2500psi or 3000psi. The pump should be set 400 or 500 psi higher than the pressure switch. (see operators manual)

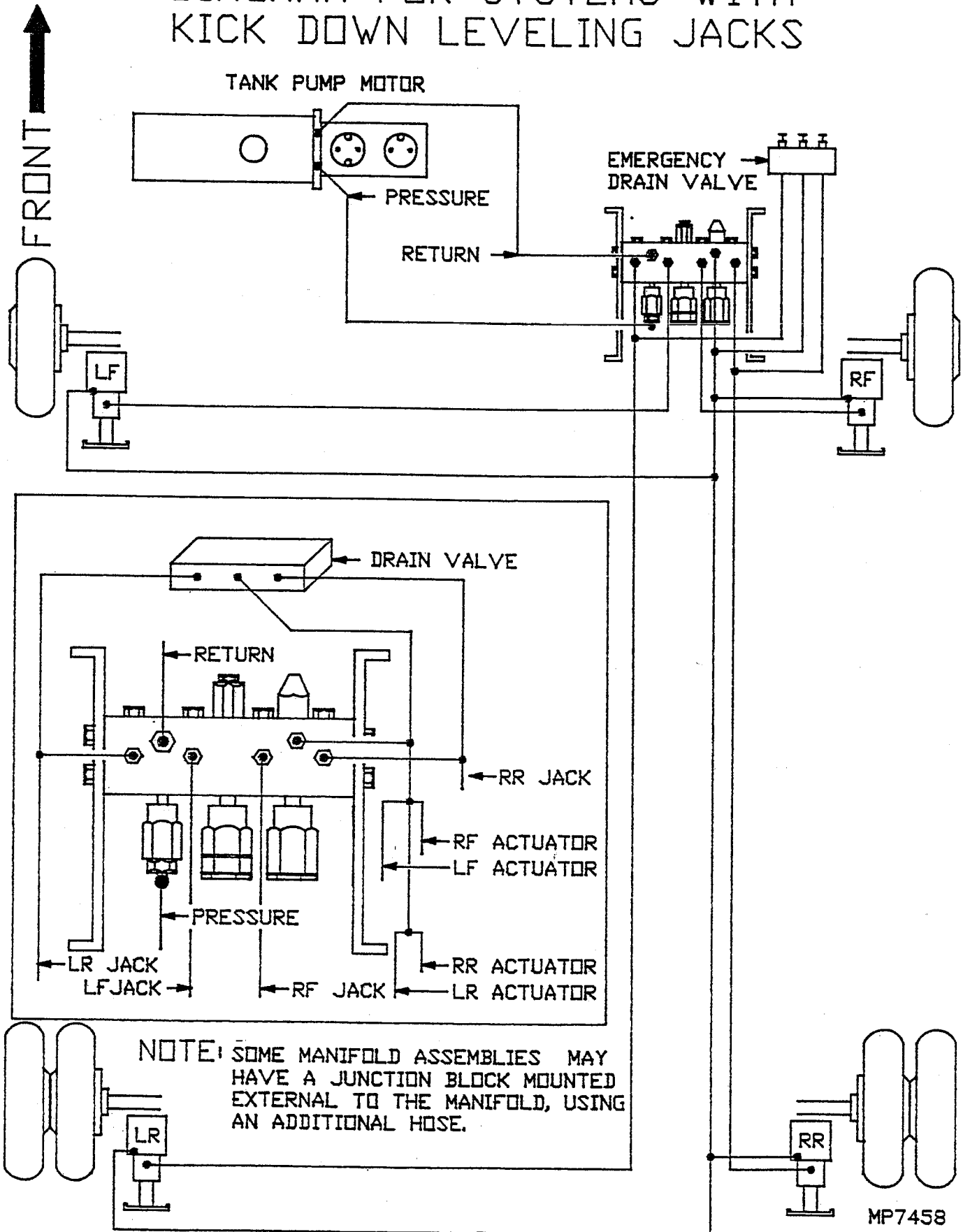
The pressure switch closes when the pressure exceeds the switch setting. Thus one may simulate closing the pressure switch by unplugging the 2-way plug coming from the main harness to the pressure switch, and placing a jumper into the plug. If the pump stops, then the wiring and the control box are functioning 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. see Section A. If the system has been operating properly for an extended time, then the problem may be a weak pump or a faulty pressure switch.

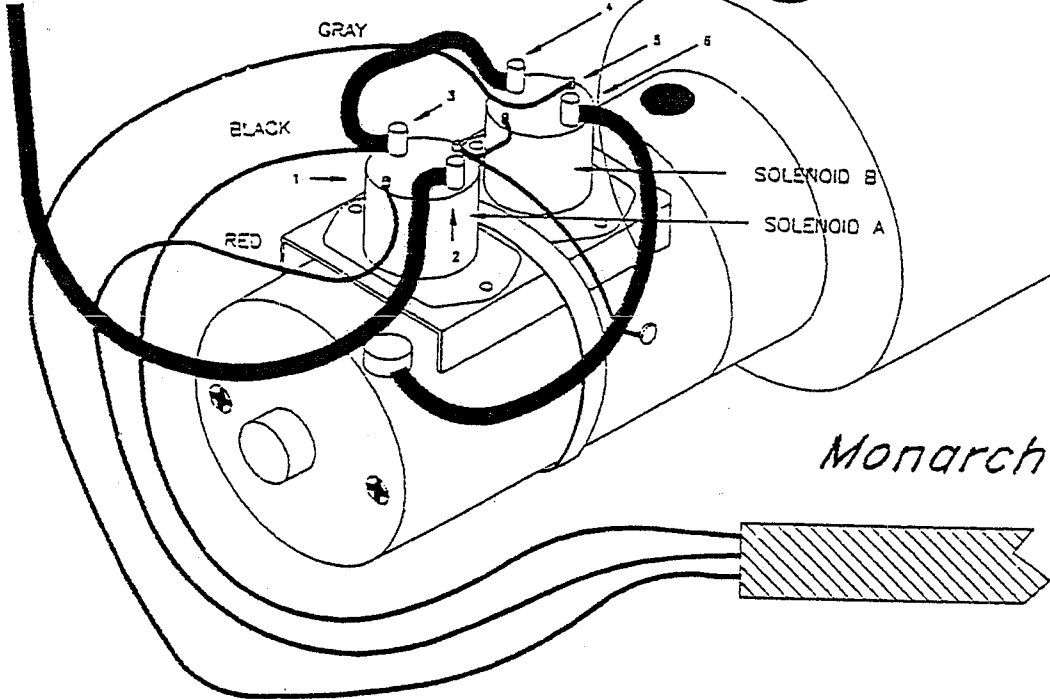
Section AA. A 16,000# jack can extend in the horizontal position before going vertical. This can be caused by an actuator with an internal leak. If the solenoid and control box are ok, replace the actuator.

# HYDRAULIC LINE CONNECTION DIAGRAM FOR SYSTEMS WITH KICK DOWN LEVELING JACKS

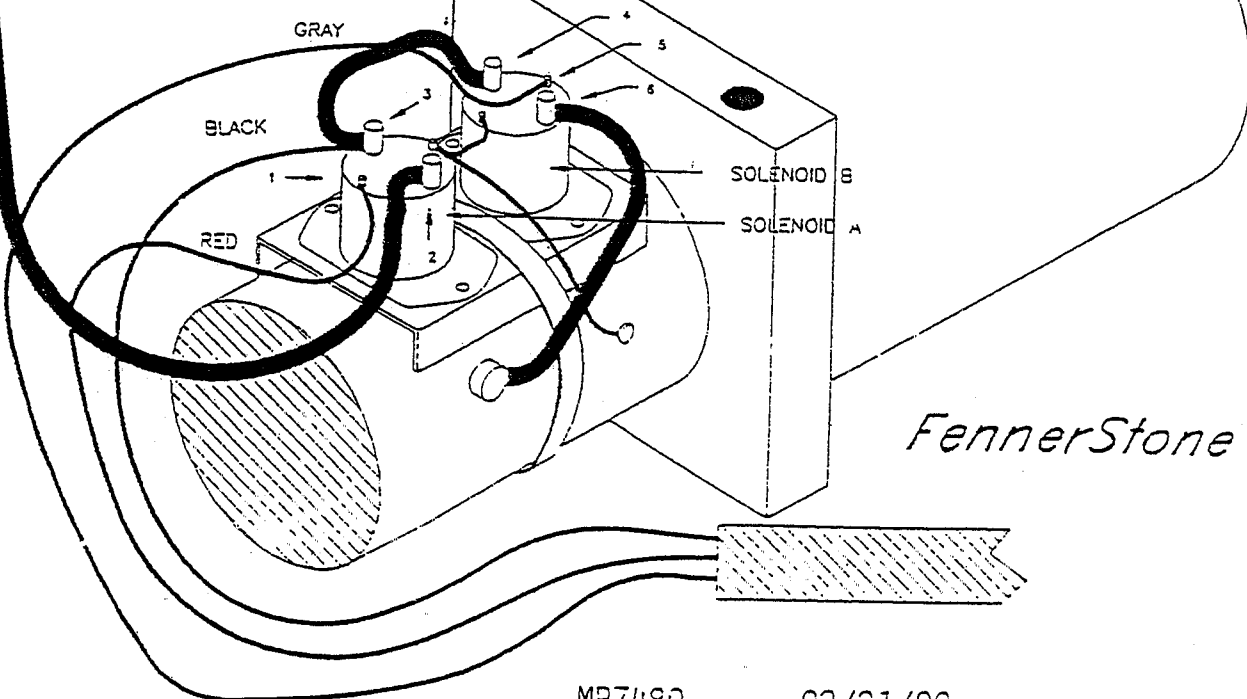


# PUMP WIRING DIAGRAM FOR TOUCH PANEL SYSTEMS

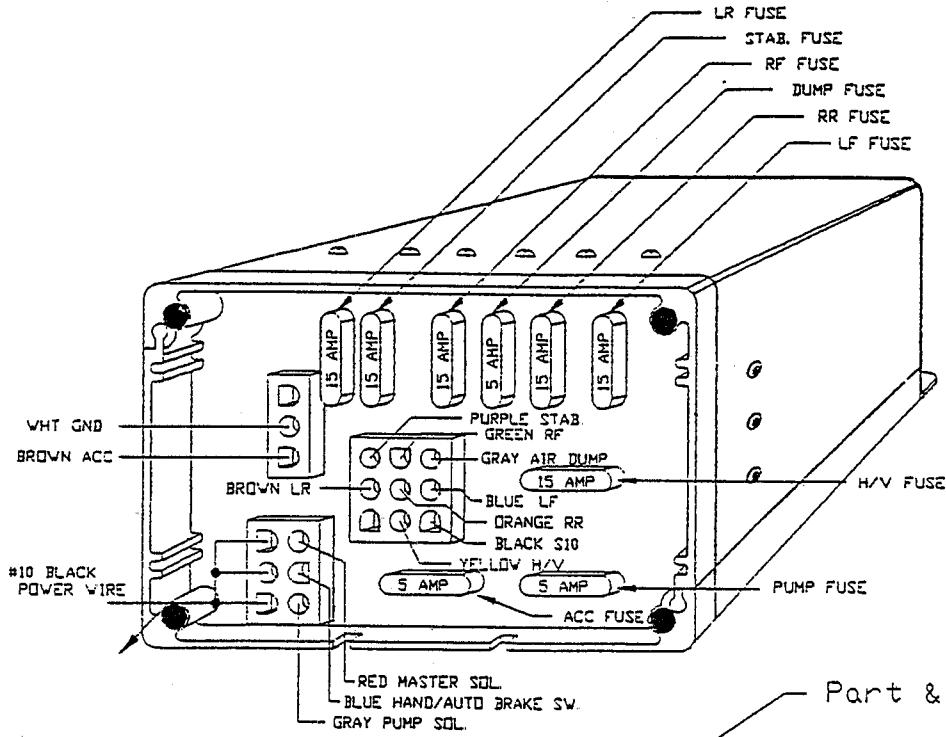
BATTERY CABLE



BATTERY CABLE



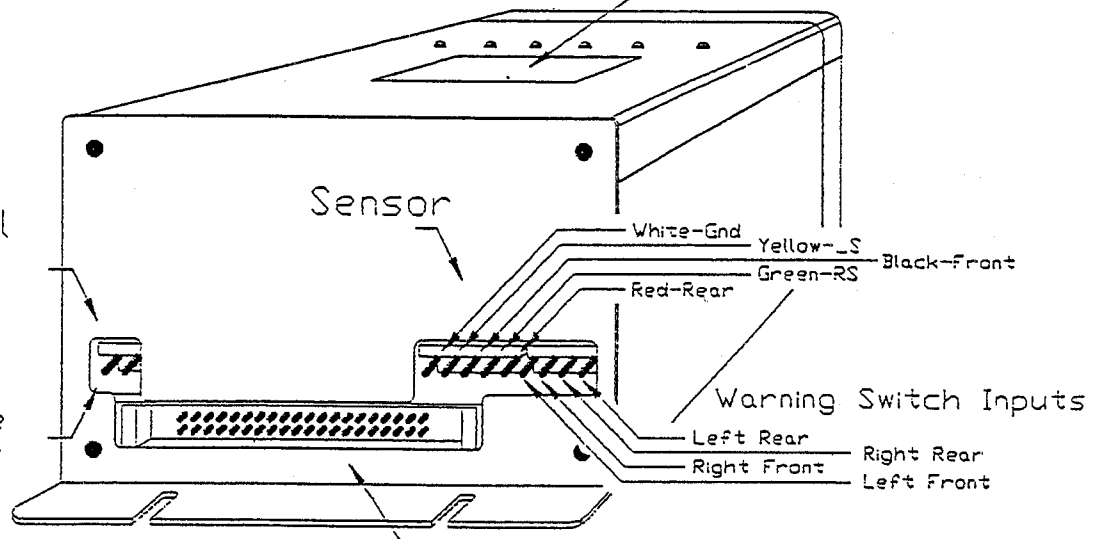
CONNECTION INFORMATION  
 S10 CONTROL BOX  
 WITH RIBBON CABLE



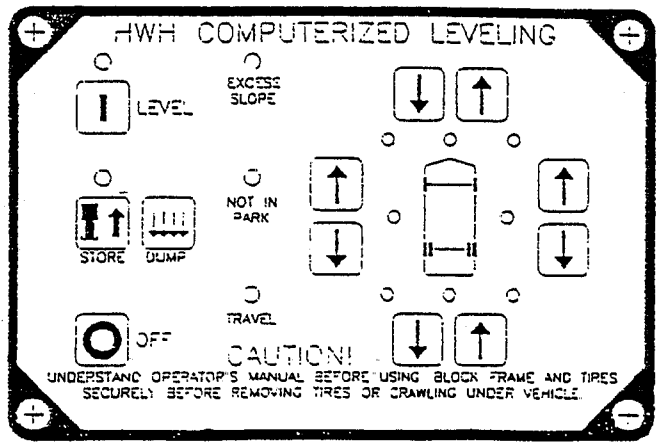
Part & Serial No.'s

External Warning Light

Positive voltage

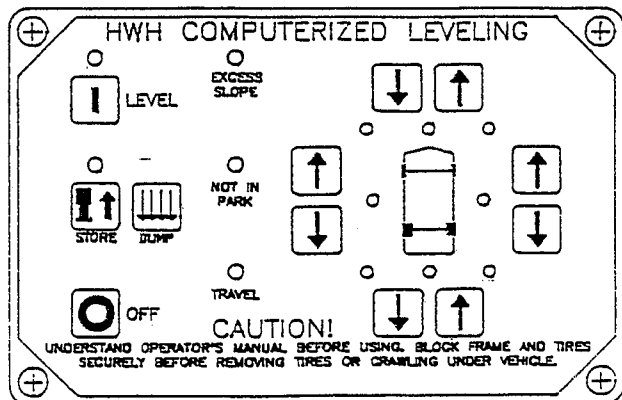
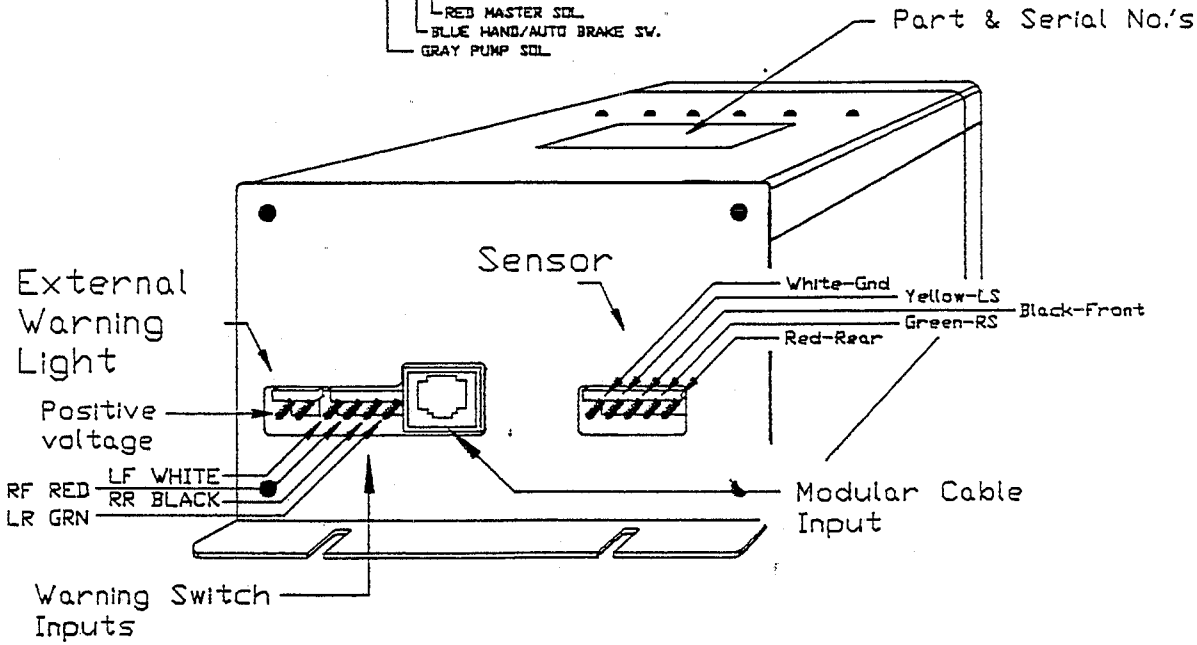
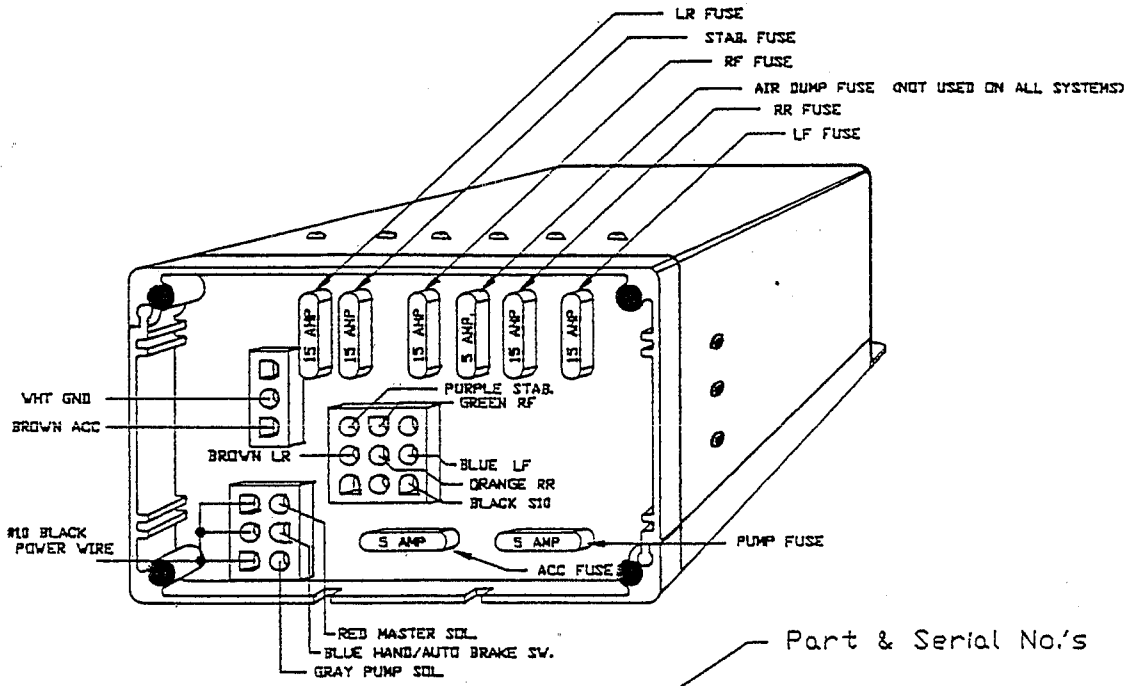


Ribbon Cable Connection to TouchPanel



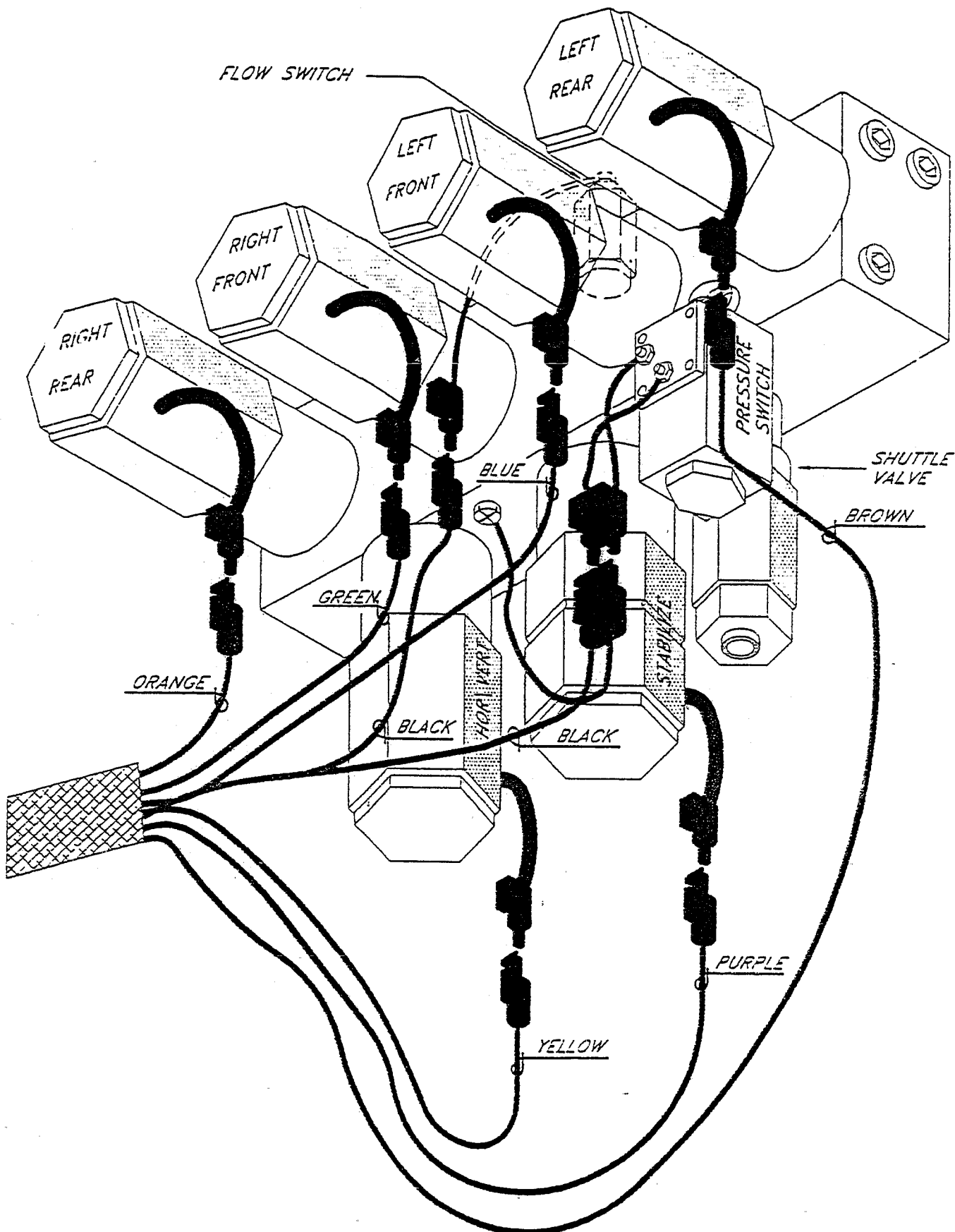
TouchPanel

# CONNECTION INFORMATION 510 CONTROL BOX

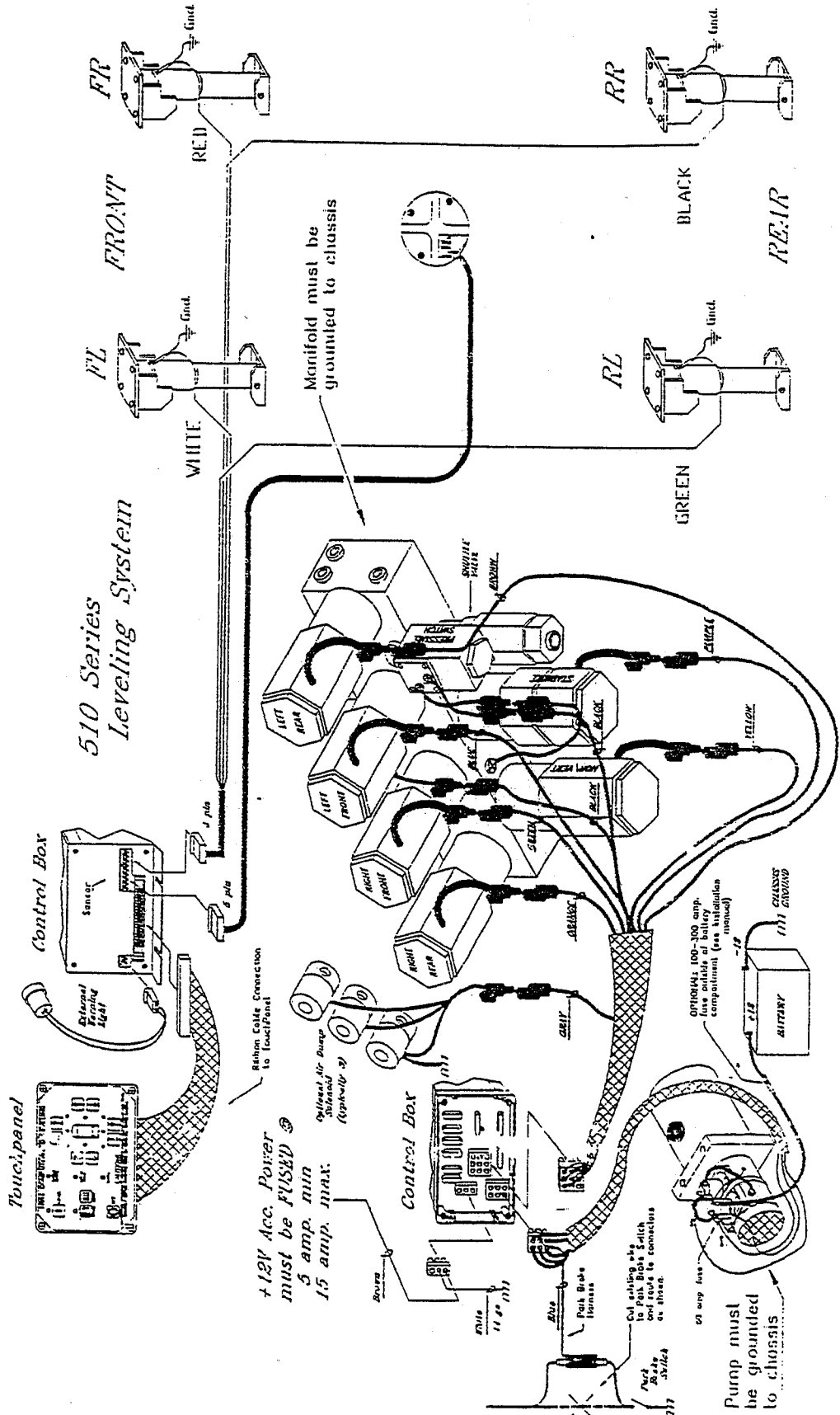


← TouchPanel

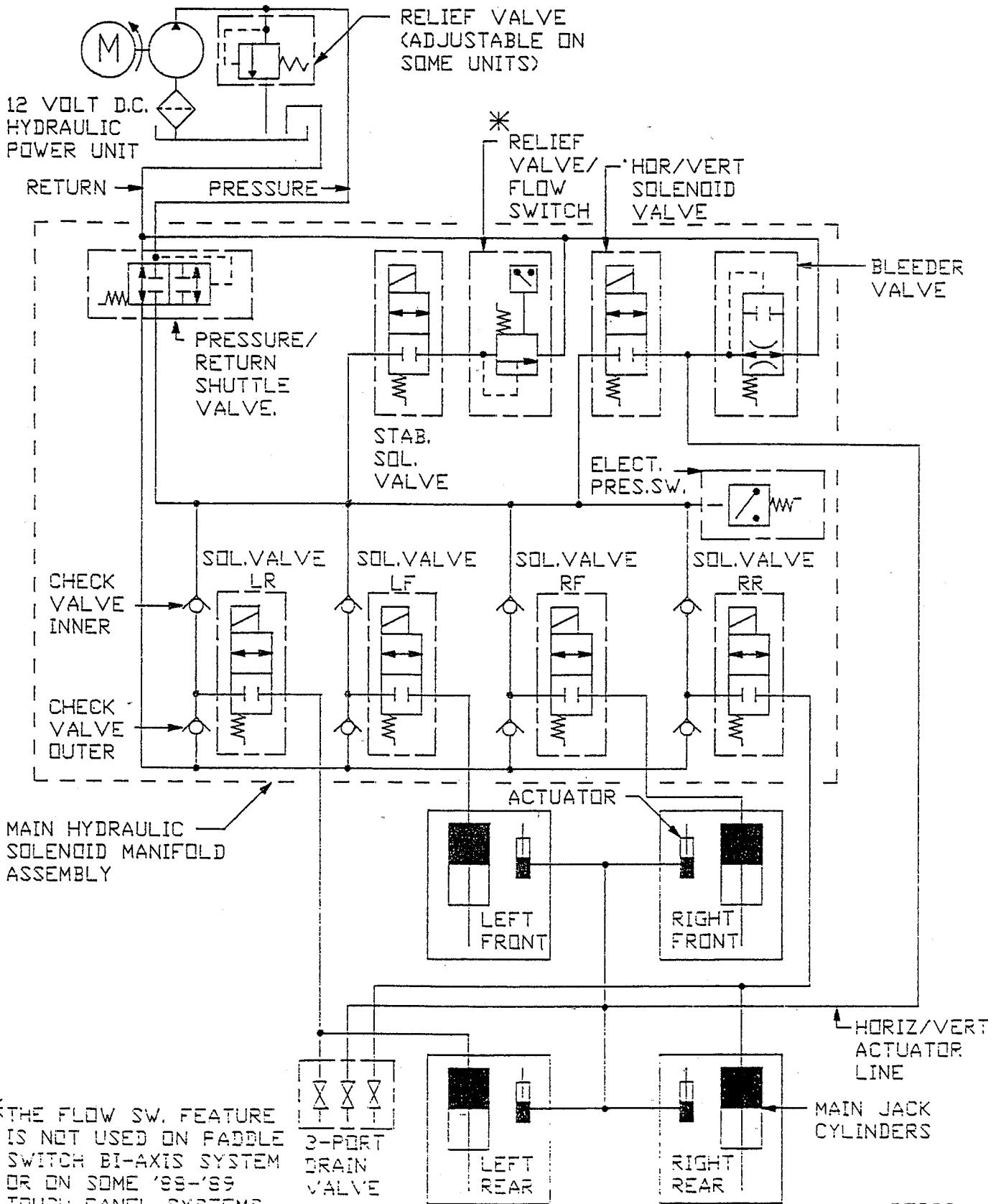
BI-AXIS MANIFOLD CONNECTION DIAGRAM  
SINGLE WIRE CONTROL



# WIRING DIAGRAM 510 SERIES TOUCHPANEL



# HYDRAULIC SCHEMATIC BI-AXIS WITH KICK DOWN JACKS



\*THE FLOW SW. FEATURE IS NOT USED ON PADDLE SWITCH BI-AXIS SYSTEM OR ON SOME '88-'89 TOUCH PANEL SYSTEMS.