

**ELECTRO-LEVEL AIR SUSPENSION SYSTEM
GMC MOTORHOMES**

GMC



**MOTORHOMES
INTERNATIONAL**

ELECTRO-LEVEL AIR SUSPENSION SYSTEM

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The optional Electro-Level System provides the ability to level the vehicle at campsite or parking area where the surface is not level. This system can raise or lower the rear of the vehicle approximately four inches from normal ride height.

NORMAL OPERATION:

The controls consist of three rocker switches that function to automatically or manually level the vehicle. The center rocker switch (TRAVEL) is used for an automatic or hold mode, and the two outer rocker switches (RAISE-LOWER) are used to raise or lower the vehicle.

DRIVING:

A reminder light in the dash panel is designed to light momentarily any time the engine is running and the transmission selector lever is moved to "D" (Drive Range). The normal position for the RAISE-LOWER switches should be placed in the middle position "OFF". The TRAVEL switch should be moved to "AUTO"

CAMPSITE OR PARKING AREA:

The two RAISE-LOWER switches may be used as necessary to raise or lower the vehicle. When using Electro-Level at a campsite, the vehicle engine need not be running to operate the system; however, the ignition switch must be in the "ON" or "ACCESSORY" position.

"RAISE" - With a rocker switch in this position, the appropriate side of the vehicle will raise to any desired position, up to a maximum of approximately four inches above normal ride height. When desired height is reached, return rocker switch to "OFF" position.

"LOWER" - With a rocker switch in this position, the appropriate side of the vehicle will lower a maximum of approximately four inches below the normal ride height. In order to maintain a desired height, return rocker switch to "OFF" position.

NOTE: It is possible that the air compressor may operate for a short period when a rocker switch is in "LOWER" position.

IMPORTANT: When both sides of the vehicle have been leveled, be sure the TRAVEL switch is moved to "HOLD" and turn ignition switch to "OFF".

COMPONENTS AND THEIR OPERATION: (See Attached Electro-Level Air System Schematic)

The hardware for the system is basically the same as the former system with the addition of six electrically actuated air solenoids. These solenoids give positive air flow or stoppage; whichever is called for. Four of the solenoids (two per side) are three-way and two (one per side) are two-way.

All components except the control panel, air bellows and height control valves, (located as before) are located in the lower cabinet of the closet module. The assembly consisting of the air compressor, pressure switch, check valve, wet tank connecting fittings, and solenoids is referred to as the air control module.

AIR FLOW:

The main function of this system is to provide air to the bellows, and maintain a proper height with a minimum possibility of a leak-down. This is accomplished by the two-way solenoids, "E" and "F". The purpose of these solenoids in a normal operating condition; i.e. while the vehicle is operating and the "TRAVEL" switch is in "HOLD" with the "RAISE-LOWER" switches in the center "OFF" position is to remain closed, trapping air in the bellows and isolating the bellows from the rest of the system. This means the only possible areas of leakage will be the bellows themselves, the fitting on the bellows, the fittings at the solenoids or the air line running between. The rest of the system is not in any way functional. This same air flow situation exists when the vehicle is parked and the key is off.

When the vehicle is operating with the "TRAVEL" switch in "AUTO", solenoids "E" and "F" are open. This allows air to flow from the compressor through the height control valve and further through solenoids "A", "C" and "E" on the left side. On the right side, it will flow through solenoids "B", "D" and "F" to the bellows. Height of the vehicle in the "AUTO" mode will simply be regulated by the height control valves. The three-way solenoids will allow air to pass from the No. 3 port to the No. 2 port. This is the normal air flow of these valves when they are not energized.

If a vehicle is put in the "RAISE" position by use of the "RAISE-LOWER" switch, air flow is a little different. System pressure air no longer goes through valves "A" or "B" from the No. 3 port to the No. 2 port. Instead, this passage is closed and air flows from the No. 1 port to the No. 2 port. This means the height control valve is now taken out of the system and air going through solenoids "A" or "B" is regulated only by the rocker switch on the dash panel. Air will continue through solenoids "C" and "E" to the left side or "D" and "F" on the right side.

To lower the system, the "RAISE-LOWER" switches on the dash will be set in the "LOWER" position energizing solenoids "C" or "D" which causes the normal passage of air between the No. 3 port to the No. 2 port to be altered. Instead, the solenoid opens the passage between the No. 2 and No. 1 ports which goes to the atmosphere allowing the vehicle to lower by expelling air.

OFF-ROAD OPERATION:

In order to gain maximum ground clearance both "RAISE-LOWER" switches should be placed in the "RAISE" position. It is recommended that a speed of 15 mph should not be exceeded since the air suspension in this position has maximum pressure supplied.

EMERGENCY OPERATION:

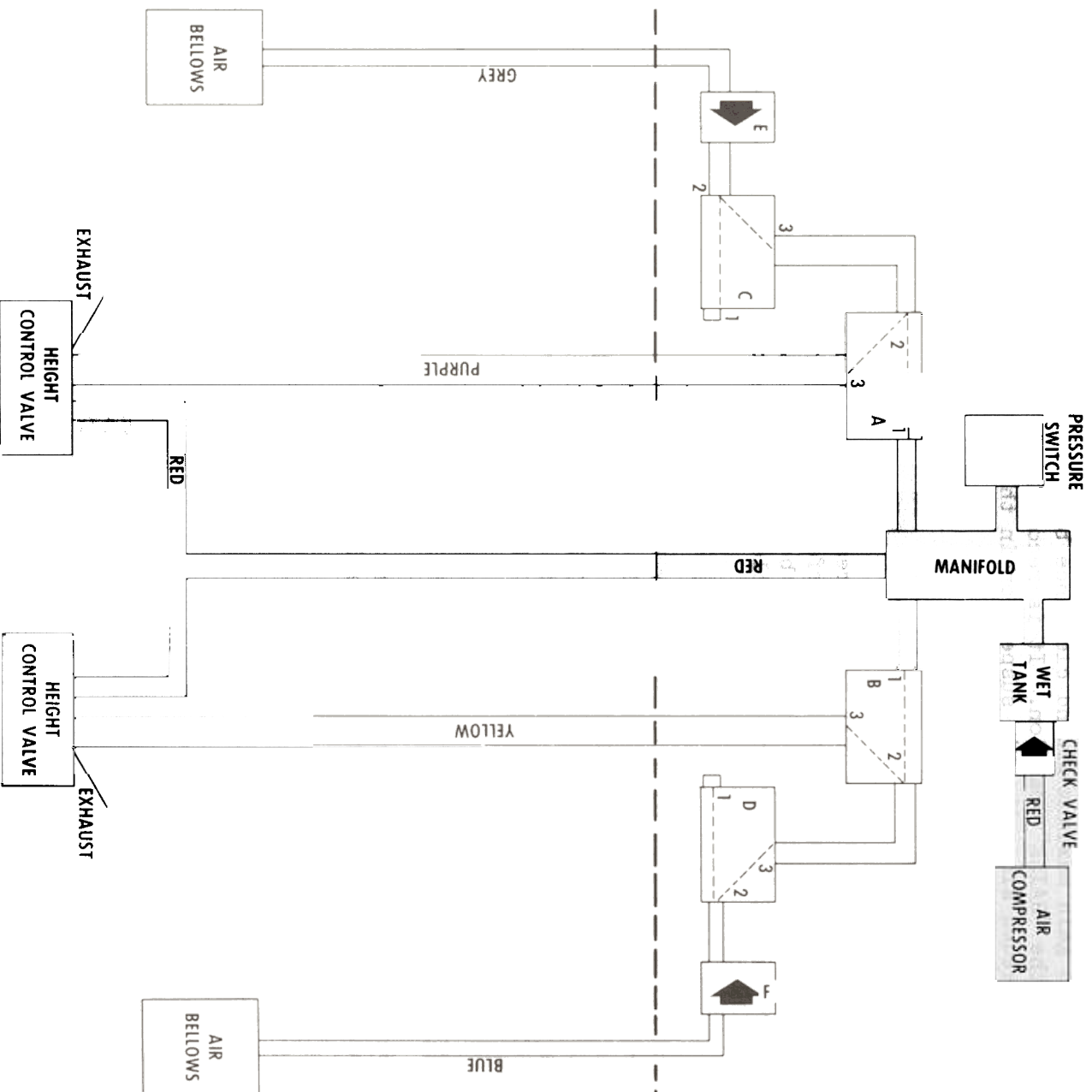
In the event of total air loss for any reason, the vehicle may be driven at a speed of 5-15 mph (depending on road surface) with the rear of the vehicle in the fully "DOWN" position. Care should be exercised since ground clearance at the rear will be at a minimum. Vehicle should be taken to nearest dealer.

Depending on the type of failure, it may be possible to add air to the rear suspension at the wet tank (shop air fill valve located on tank) at a local gas station. (DO NOT EXCEED 120 PSI). Be sure the engine is running or the ignition switch is turned to "ON" or "ACCESSORY" position, and the outer rocker switches in "RAISE" position until vehicle is leveled. Then move "RAISE-LOWER" switches to "OFF" and "TRAVEL" switch to "HOLD".

MAINTENANCE:

No routine maintenance is required on the Electro-Level System other than draining moisture in the wet tank. Expell moisture into cup or rag.

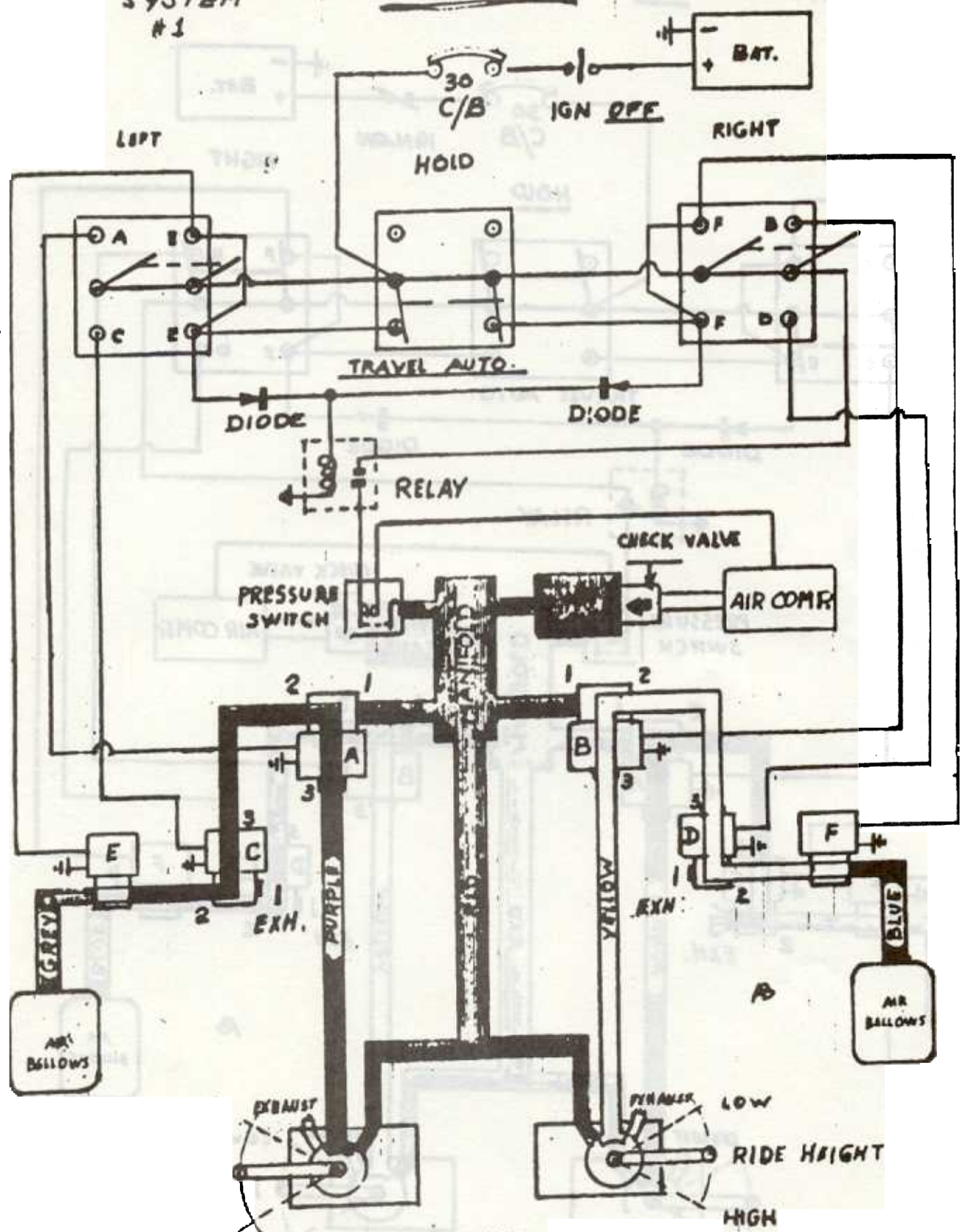
ELECTRO - LEVEL AIR SYSTEM



ELCTRO LEVEL SYSTEM IN TRAVEL AUTO CENTER SW DOWN #1

RAISE
OFF
LOWER

RAISE
OFF
LOWER

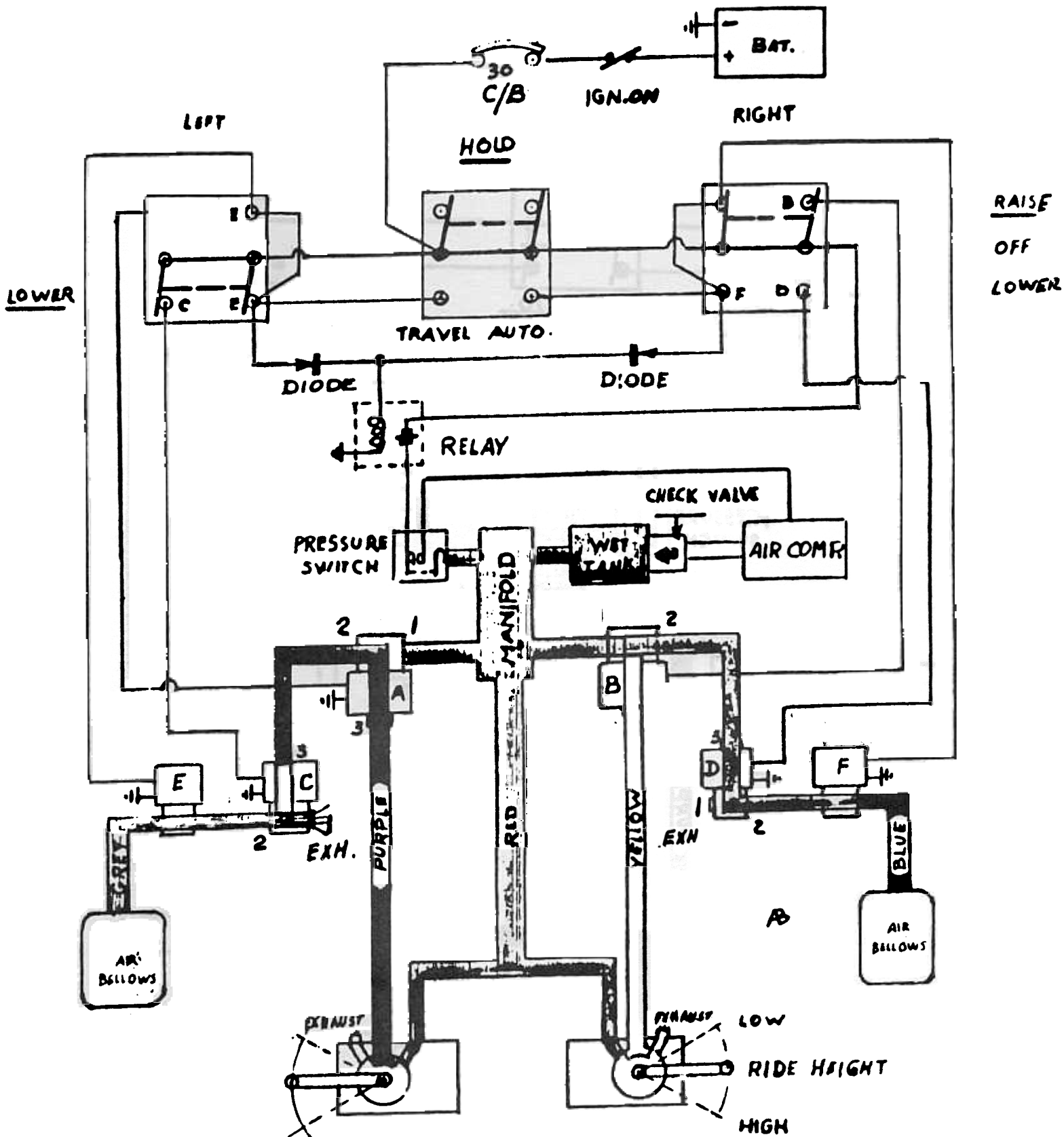


NOTE → HEIGHT CONTROL VALVES 7 SEC. DELAY

Above Diagrams Per

Alex Birch F-18104

ELECTRO LEVEL SYSTEM IN HOLD - TO LOWER OR RAISE CENTER SW UP #1

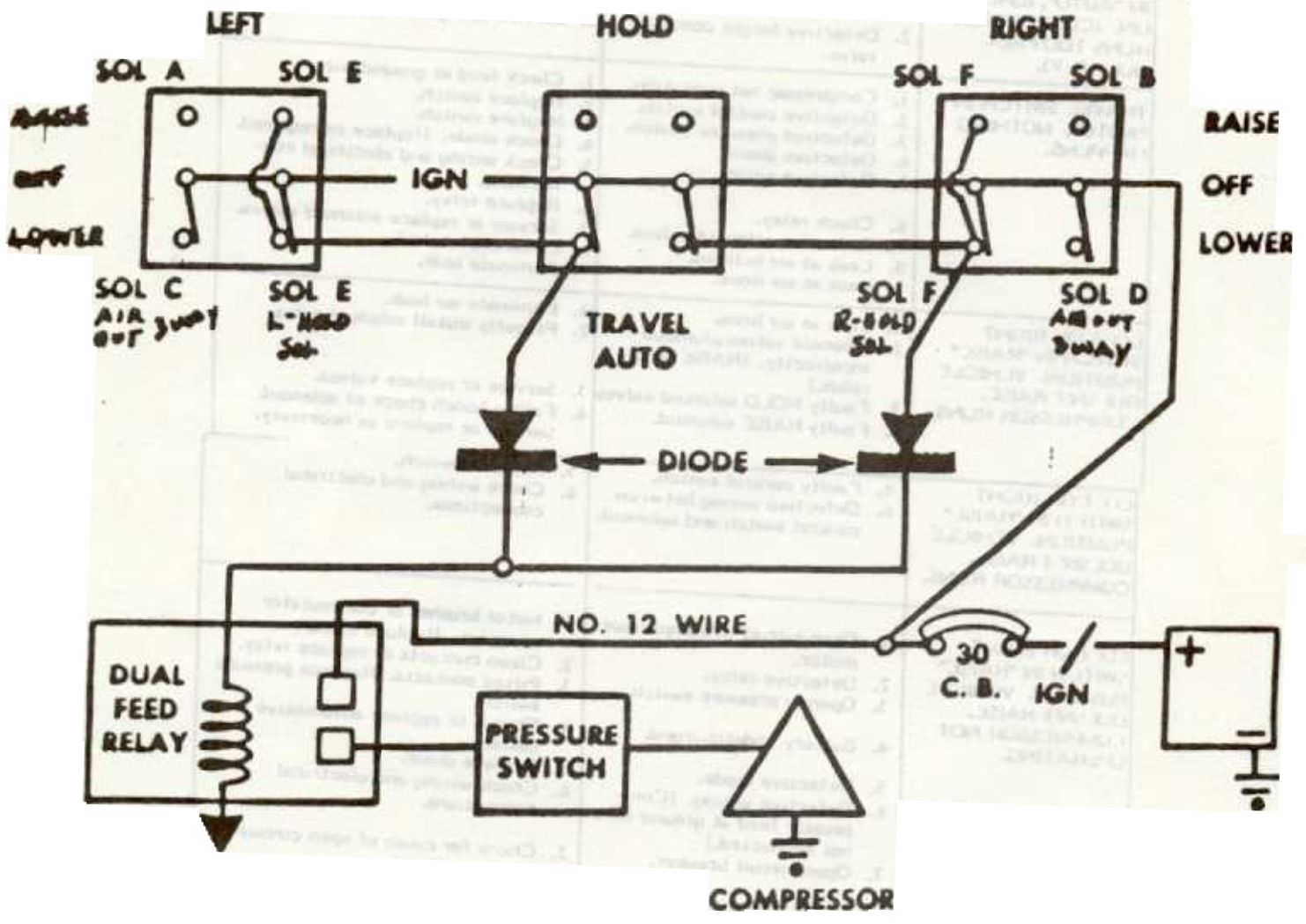
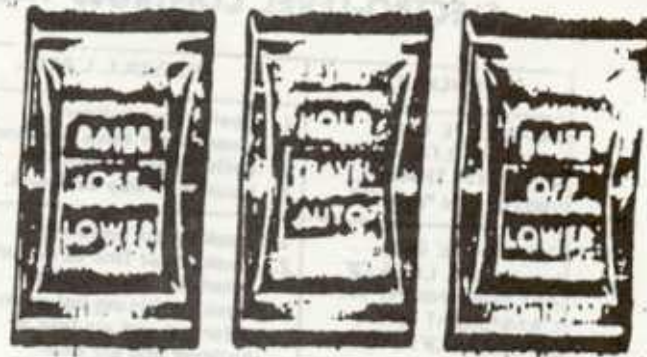


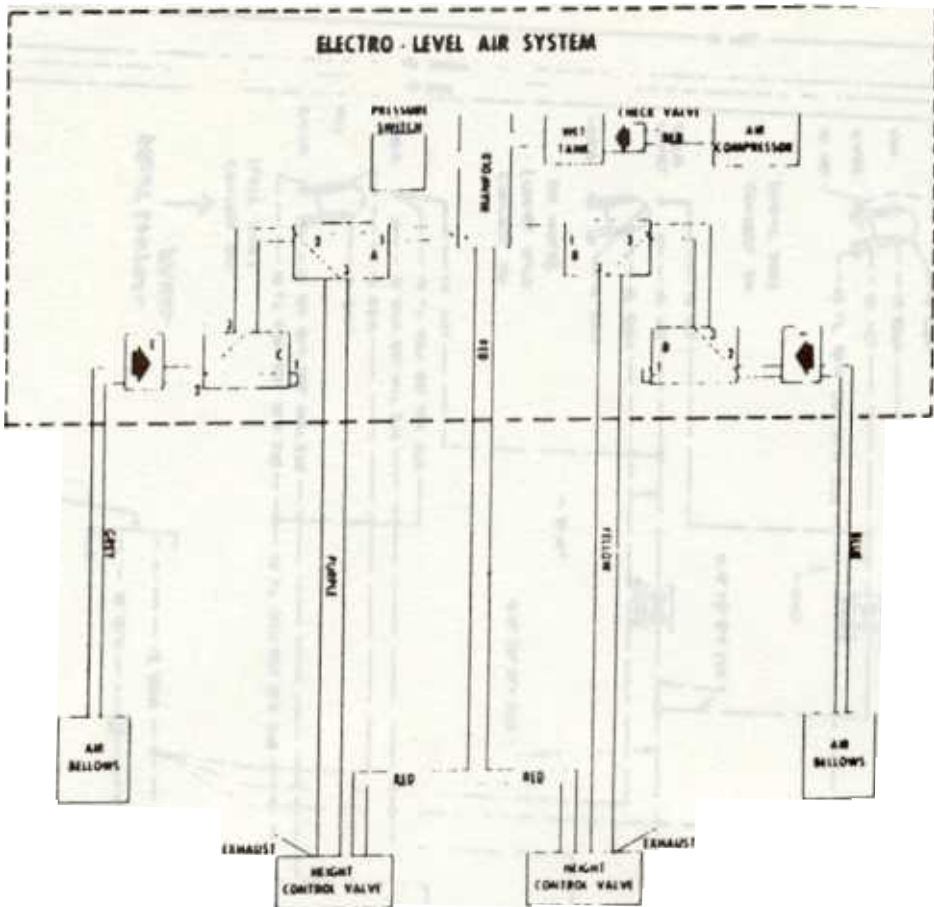
HEIGHT CONTROL VALVES
7 SEC. DELAY

Above Diagrams Per
Alex Birch F-18104

ELECTRO-LEVEL CONTROLS TROUBLE DIAGNOSIS CHART

PROBLEM	POSSIBLE CAUSE	CORRECTION
COMPLETE OR PARTIAL LOSS OF AIR WITH TRAVEL SWITCH IN "HOLD".	<ol style="list-style-type: none"> 1. Leak in air bellows. 2. Leak at air lines between bellows and solenoid. 3. Leak in 2-way solenoid. 	<ol style="list-style-type: none"> 1. Eliminate air leak. 2. Eliminate air leak. 3. Service or replace solenoid.
COMPLETE OR GRADUAL LOSS OF AIR OVERNIGHT AT CAMP/SIGHT WITH IGNITION OFF.	<ol style="list-style-type: none"> 1. Leak at air bellows. 2. Leak in air line between solenoid and bellows. 3. Leak at fitting between solenoid and air line or bellows and air line. 4. Defective 2-way solenoid valve. 	<ol style="list-style-type: none"> 1. Eliminate air leak. 2. Eliminate air leak. 3. Eliminate air leak. 4. Service or replace solenoid.
COMPLETE OR PARTIAL LOSS OF AIR WITH TRAVEL SWITCH IN "AUTO", IGNITION ON. (COMPRESSOR RUNS TOO FREQUENTLY).	<ol style="list-style-type: none"> 1. Air leak in system. 2. Defective height control valve. 	<ol style="list-style-type: none"> 1. Eliminate air leak. Note: Vehicle should be operated with travel switch in 2. Service or replace valve.
TRAVEL SWITCH IN "AUTO". NOTHING HAPPENS.	<ol style="list-style-type: none"> 1. Compressor not operating. 2. Defective control switch. 3. Defective pressure switch. 4. Defective diode. 5. Defective wiring. 6. Check relay. 7. Defective solenoid valves. 8. Leak at air bellows. 9. Leak in air lines. 	<ol style="list-style-type: none"> 1. Check feed at ground wire. 2. Replace switch. 3. Replace switch. 4. Check diode. Replace as required. 5. Check wiring and electrical connections. 6. Replace relay. 7. Service or replace solenoid valves. 8. Eliminate air leak. 9. Eliminate leak.
LEFT OR RIGHT SWITCH IN "RAISE" POSITION. VEHICLE DOESN'T RAISE. COMPRESSOR RUNS.	<ol style="list-style-type: none"> 1. Leak in air lines. 2. Solenoid valves plumbed incorrectly. (RAISE solenoids.) 3. Faulty HOLD solenoid valves 4. Faulty RAISE solenoid. 	<ol style="list-style-type: none"> 1. Eliminate air leak. 2. Properly install solenoid valve. 3. Service or replace valves. 4. Follow bench check of solenoid. Service or replace as necessary.
LEFT OR RIGHT SWITCH IN "RAISE" POSITION. VEHICLE DOESN'T RAISE. COMPRESSOR RUNS.	<ol style="list-style-type: none"> 5. Faulty control switch. 6. Defective wiring between control switch and solenoid. 	<ol style="list-style-type: none"> 5. Replace switch. 6. Check wiring and electrical connections.
LEFT OR RIGHT SWITCH IN "RAISE" POSITION. VEHICLE DOESN'T RAISE. COMPRESSOR NOT OPERATING.	<ol style="list-style-type: none"> 1. Open circuit in compressor motor. 2. Defective relay. 3. Open in pressure switch. 4. Battery undercharged. 5. Defective diode. 6. Defective wiring. (Compressor feed at ground wire not connected.) 7. Open circuit breaker. 8. Faulty control switch. 	<ol style="list-style-type: none"> 1. Motor brushes or commutator worn out. Replace motor. 2. Clean contacts or replace relay. 3. Pitted contacts. Replace pressure switch. 4. Charge or replace automotive battery. 5. Replace diode. 6. Check wiring and electrical connections. 7. Check for cause of open circuit breaker. Reset. 8. Replace switch.
LEFT OR RIGHT SWITCH IN "LOWER" POSITION. VEHICLE DOESN'T LOWER.	<ol style="list-style-type: none"> 1. LOWER solenoid valves incorrectly plumbed. 2. Undercharged battery. 3. Defective wiring. 4. Open circuit breaker. 5. Defective solenoid valves. 6. Defective control switch. 	<ol style="list-style-type: none"> Correctly install solenoid valves. 2. Charge or replace battery. 3. Check wiring and electrical connections. 4. Find cause for open circuit breaker. Reset. 5. Service or replace solenoid valves. 6. Replace switch.





From the desk of

BASIL BICKEL

GMC MOTORHOMES INTERNATIONAL

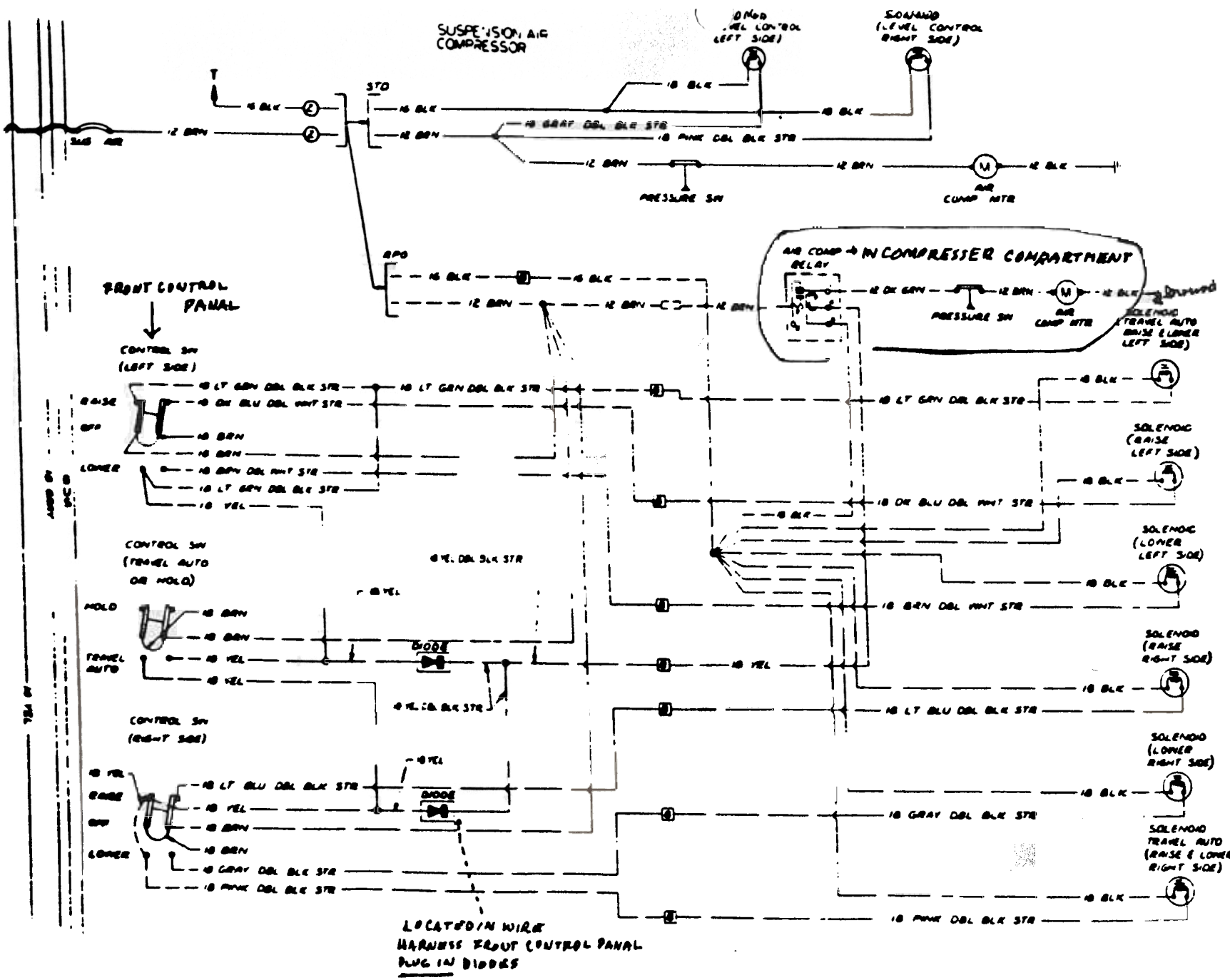


ELECTRO-LEVEL 1 HINTS

1. Raise or lower position in HOLD puts 12 Volts + thru either Diode into Relay to supply 12*DC to Pressure Switch, in Pressure regulator, for Compressor to Run. Thus Compressor will not run if one or both DIODES are open or reversed. Voltage only goes one way thru DIODE so be sure when repacing DIODE they are installed in the proper direction.
2. Be sure that voltage at relay (in compressor compartment) is 12v+ under load as Air solenoids will not open under 12V+. Check Voltage at Solenoid connector With Volt-Meter it must be 12V+ with Solenoid engaged. Compressor must be running with this test to load 12V+ supply. Also check Voltage at the center contacts of the Raise or Lower Switches.

Disconnect leads at C or D Solenoids and test Coil to find that if is not open. C is Solenoid with Grey hose to left Bag, D is Solenoid with Blue hose to right Bag. These are to Hold the Air in the Bags when Power is off.

4. In TRAVEL Relay will close (thru either DIODE) to Run Compressor.



ELECTRO LEVEL 1
WIRING DIA