

SECTION 6 — BRAKES

AUTOMATIC APPLY PARKING BRAKE 1994 (AND LATER) P3 MOTOR HOME (16,500# GVW AND GREATER)

The parking brake system on the 1994 16,500 pound GVW P3 motor home chassis incorporates a revised system from 1993. The Park position brake is spring applied and hydraulic released, the same as 1993. The 1991-94 system incorporates a manual parking brake pedal which applies the system when the shift indicator is in any position other than Park.

The electric/auto parking brake system controls the propeller shaft-mounted parking brake. It consists of a pressure maintenance switch, electric/hydraulic pump, reservoir, high pressure actuator, solenoid valve, light switch, parking brake relay, and a cam actuated switch.

BASIC KNOWLEDGE REQUIRED

Before attempting to diagnose the electric/auto park brake system, you must have a good understanding of electrical and hydraulic system basics. Without this basic knowledge you will find it difficult to diagnose this system.

SYSTEM OPERATION

To release the electric/auto park brake, move the shift lever on steering column from the park position. Movement is transferred from the transmission shift linkage to the cam actuated switch. The switch closes allowing current to flow to the solenoid valve. The solenoid valve closes and holds system pressure. The cam actuated switch also supplies current to the pressure maintenance switch. The pressure maintenance switch closes at pressures below 8,300 kPa (1200 psi) turning on the pump motor to supply fluid pressure to the actuator. The actuator has a large spring inside it that applies the parking brake. Fluid pressure overcomes spring tension and moves the piston in the actuator. This movement is transferred to the parking brake through the parking brake cable. When fluid pressure reaches approximately 11,000 kPa (1600 psi) the pressure maintenance switch opens and the pump shuts off. The pressure maintenance switch opens and closes depending on system pressure. If pressure drops too low, the pressure maintenance switch turns the pump back on to build system pressure back up to its working range.

Putting the shift lever back into the park position or turning the ignition off de-energizes the parking brake solenoid to dump the fluid back into the reservoir. As the pressure decreases, the spring in the actuator moves the piston and applies the parking brake through movement of the parking brake cable.

WARNING/INDICATOR LAMP OPERATION

"AUTO PARK" Warning Lamp

The "AUTO PARK" warning lamp turns on when the system pressure is less than 3,100 kPa (450 psi) or when

the electric/hydraulic pump motor is running due to the pressure maintenance switch being closed. The pressure maintenance switch and the light switch supply B+ to the circuit for lamp operation. Releasing the parking brake causes the switches to open the circuit and turn the lamp off. This lamp will flash at partial release pressures.

SYSTEM COMPONENTS

Parking Brake Pump Assembly (Figure 1)

The parking brake pump assembly (Figure 2) is located in a component box on the passenger's side of the vehicle. The component box is on the inside of the right frame rail behind the transmission. It consists of an electric pump and fluid reservoir. The pump provides fluid pressure to operate the system. A pressure relief valve in the pump limits system pressure to 12,400 kPa (1800 psi).

Pressure Maintenance Switch (Figure 1)

The pressure maintenance switch (Figure 2) mounts to the parking brake pump assembly housing. It is a hydraulic pressure switch that operates within a certain pressure range turning the pump motor on and off. The pressure maintenance switch closes when the system pressure is below 8,300 kPa (1200 psi) and opens when system pressure reaches approximately 11,000 kPa (1600 psi). The pressure maintenance switch applies B+ to the coil side (control side) of the relay switch.

Parking Brake Solenoid Valve (Figure 1)

The parking brake solenoid switch is a solenoid and valve assembly located in the component box on the underside of the vehicle. The solenoid controls when fluid can return to the pump reservoir. When the parking brake is released, the valve closes to hold pressure in the system. When the parking brake is applied, the valve opens to allow fluid to return to the pump reservoir.

Actuator (Figure 1)

CAUTION: DO NOT DISASSEMBLE THE ACTUATOR. ALWAYS SERVICE THE ACTUATOR AS A UNIT. THE ACTUATOR CONTAINS A LARGE SPRING UNDER TENSION. DISASSEMBLING THE ACTUATOR ALLOWS THE SPRING TO EXPAND WITH GREAT FORCE THAT CAN RESULT IN PERSONAL INJURY.

The actuator is located on the right framerrail underneath the body and chassis. It is a spring-loaded device that operates the parking brake cable. A large spring inside the actuator applies the parking brake. When fluid pressure against the piston is great enough, it overcomes spring tension and pushes the piston to release the parking brake.

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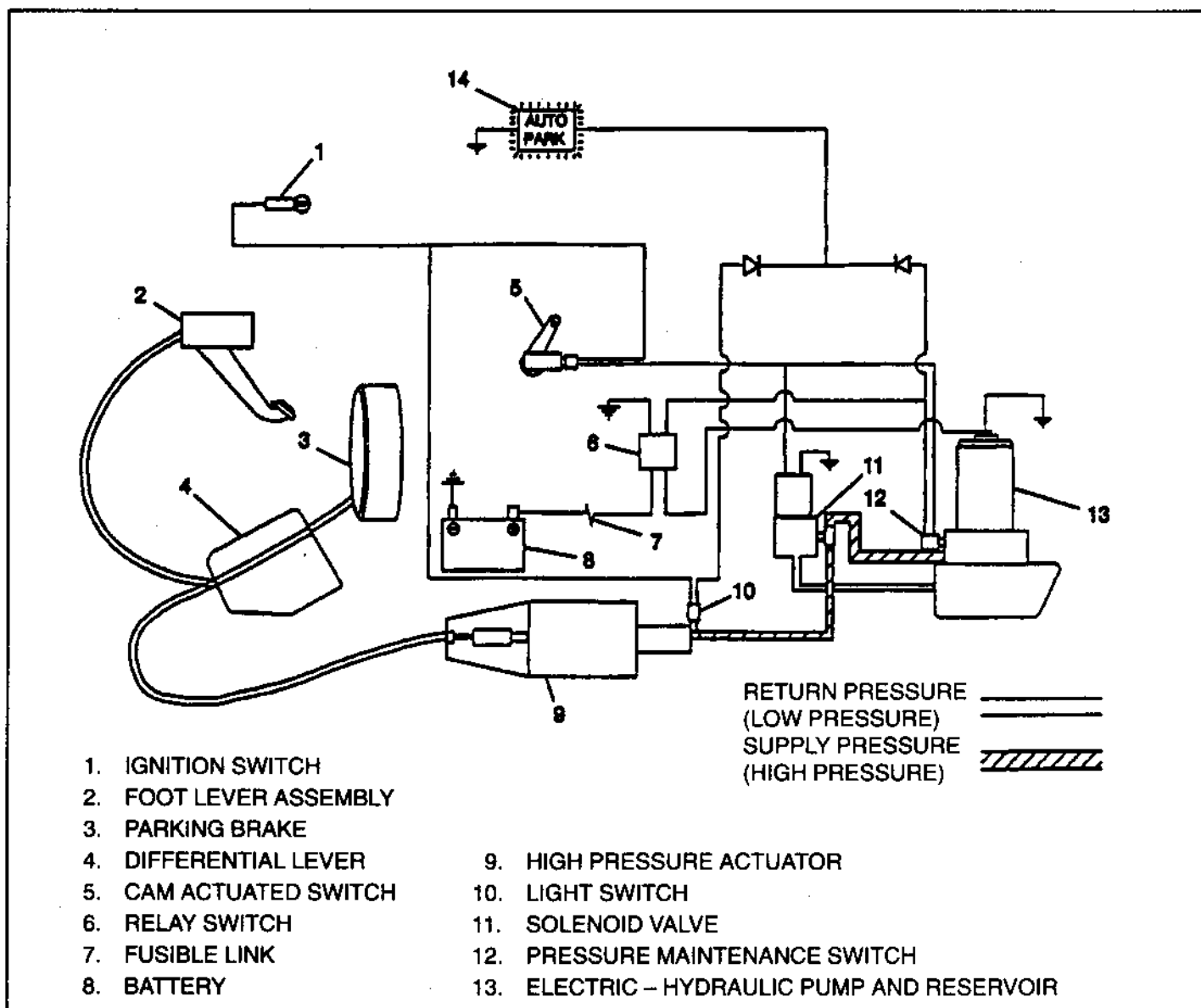


Figure 1 — Electric/Auto Park Brake

Cam Actuated Switch (Figure 1)

The cam actuated switch is located to the left of the steering column intermediate shaft. It is a normally open switch that closes when the column shifter is moved out of the park position. B+ is applied to the solenoid valve and to the pressure maintenance switch when the cam actuated switch is closed.

Parking Brake Relay Switch (Figure 1)

The parking brake relay switch is located in the component box underneath the vehicle. It receives B+ from the pressure maintenance switch and acts as the automatic control circuit for the high current required to run the pump motor. When the pressure maintenance switch supplies B+ to the relay switch, the contacts close to complete the feed circuit to the pump motor.

Parking Brake Light Switch (Figure 1)

The parking brake light switch is a hydraulic on/off switch located in the component box underneath the vehicle. The light switch is mounted with a fitting on the back of the actuator assembly. The light switch controls the ground side of the "AUTO PARK" lamp. The lamp switch closes when system pressure is below 3,100 kPa (450 psi) turning on the light when the ignition is "ON."

NOTE: The amount of time it takes for the parking brake to release will vary based on the temperature and battery voltage. In extremely cold weather, it can take up to 15 seconds to release the parking brake. This is normal system operation.

NOTE: Use care when probing terminals to measure voltage and resistance values. The DVM probe can damage the connector terminal and cause a poor connection. A damaged terminal condition is very hard to diagnose.

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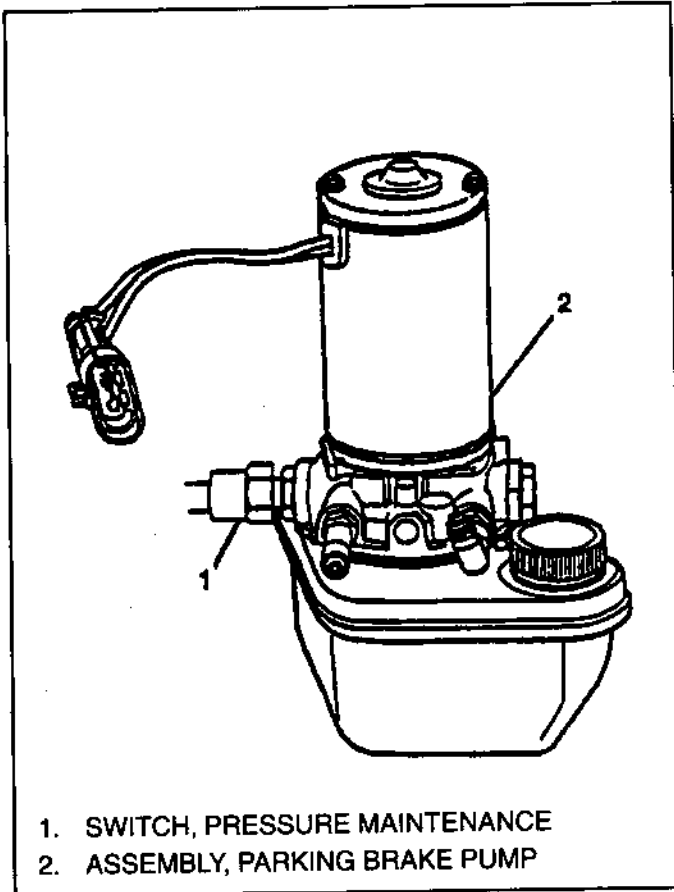


Figure 2 — Parking Brake Pump Assembly

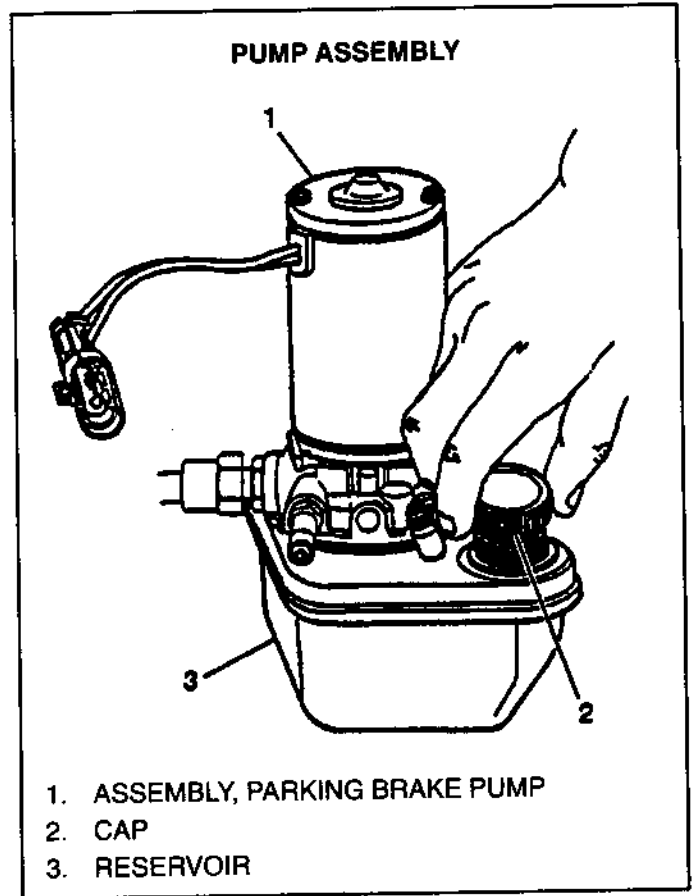
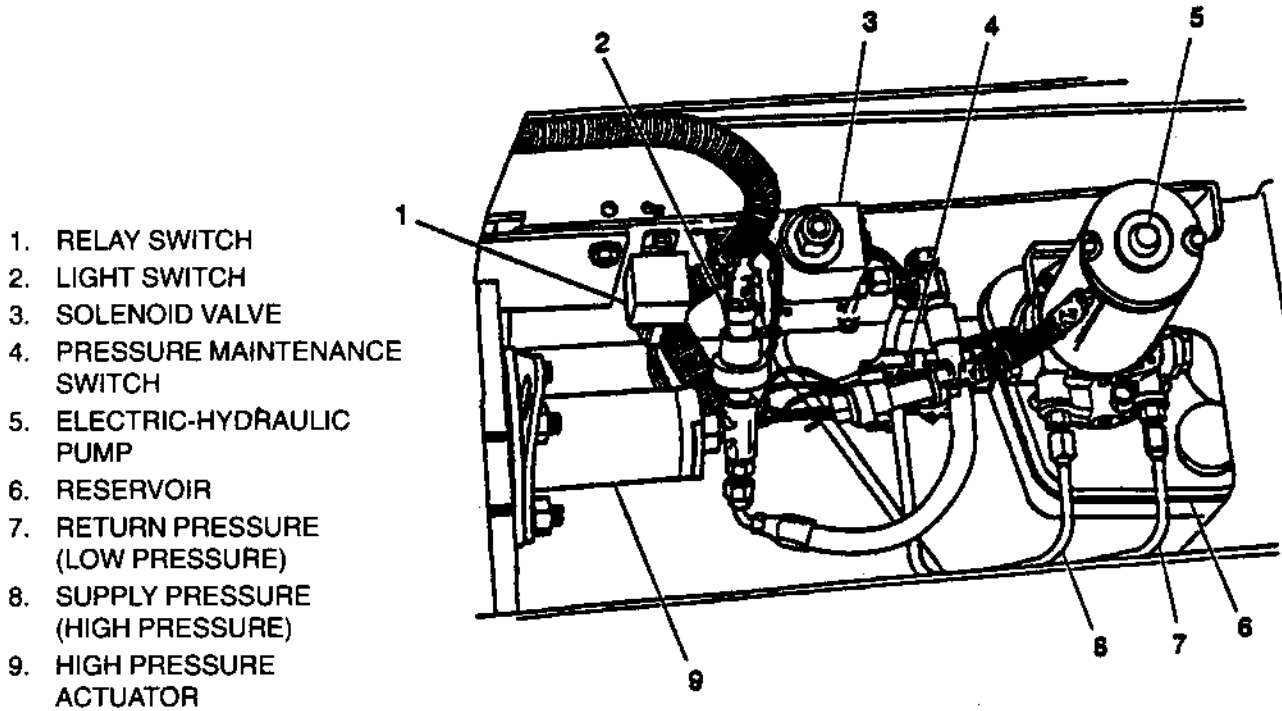


Figure 3 — Checking and Adding Fluid

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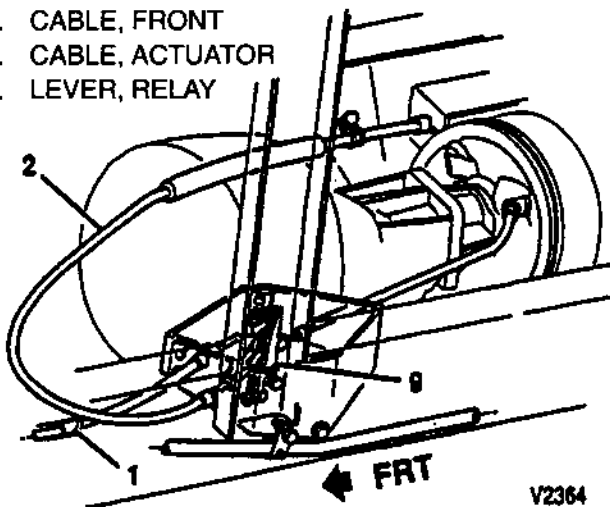
PARKING BRAKE COMPONENT BOX ASSEMBLY



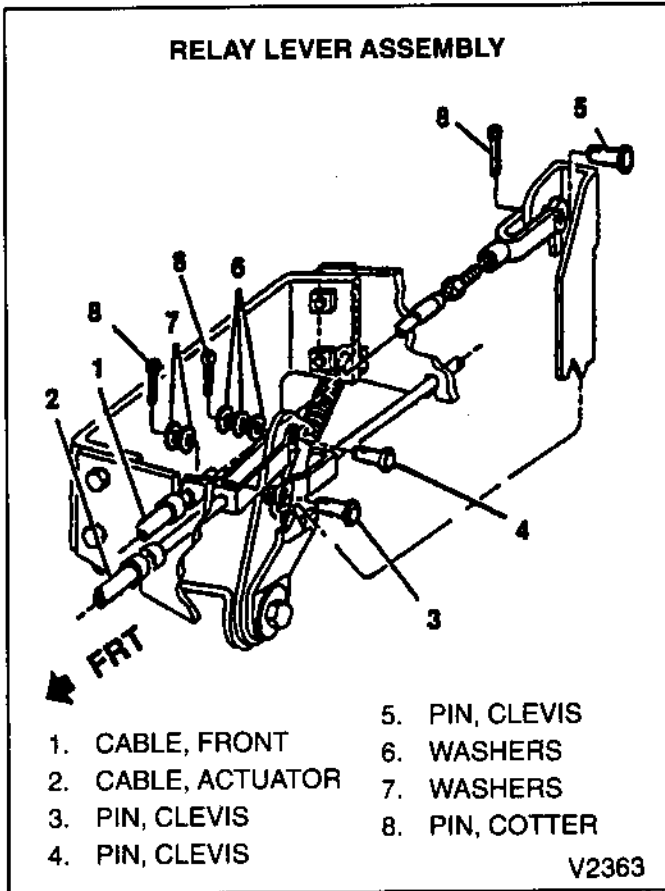
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ACTUATOR CABLE

1. CABLE, FRONT
2. CABLE, ACTUATOR
3. LEVER, RELAY

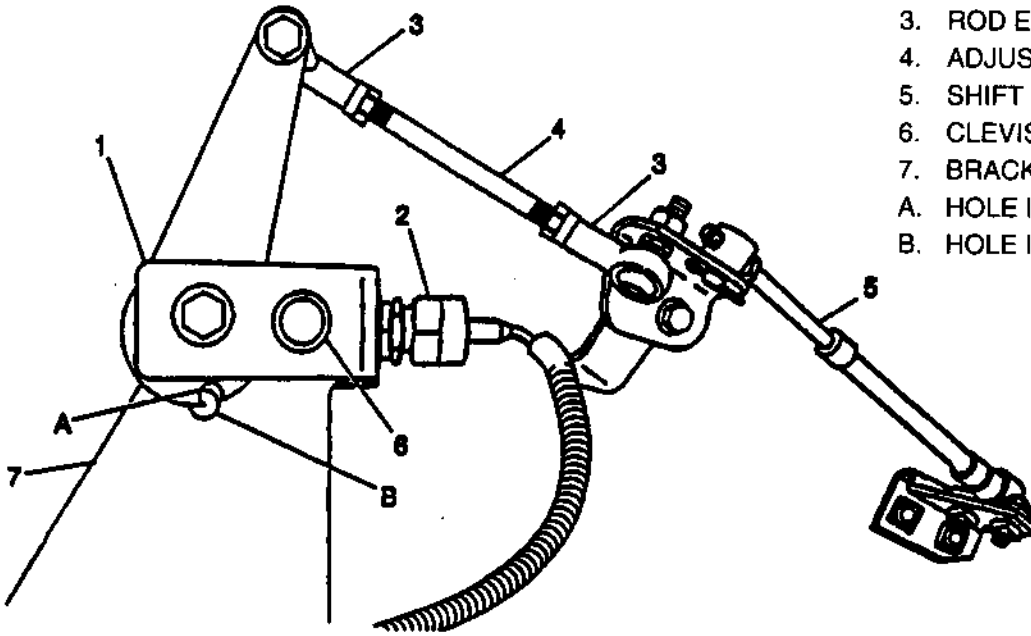


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CAM ACTUATOR SWITCH ASSEMBLY



1. CAM ASSEMBLY
 2. PARK BRAKE SWITCH
 3. ROD ENDS
 4. ADJUSTING ROD
 5. SHIFT LINK
 6. CLEVIS PIN
 7. BRACKET ASSEMBLY
- A. HOLE IN CAM ASSEMBLY
B. HOLE IN BRACKET ASSEMBLY