SECTION 12: BRAKE AND AIR SYSTEM

CONTENTS

LIST OF ILLUSTRATIONS

1. DESCRIPTION

1.1 Air System

The basic air system consists of an air compressor, reservoirs, valves, filters and interconnecting lines and hoses. It provides a means for breaking, operating controls and accessories, and suspension (refer to Section 16, *"Suspension"*, for complete information on suspension description and maintenance). An air system schematic diagram is annexed in the technical publications box provided with the vehicle for better understanding of the system.

1.2 Brakes

This vehicle uses both the service brake and emergency/parking brake. The service brake air system is divided into two independent circuits to isolate front brakes from rear brakes, thus providing safe breaking in the event that one circuit fails. Front axle brakes operate from the secondary air system, while brakes on both the drive axle and tag axle operate from the primary air system.

Note:** **The tag axle service brake operates only when the axle is in normal ride position (loaded and down).

Furthermore, the brake application sequence, which is increased by a pneumatic relay valve (R-12), will start with the rear axles and will be followed by the front axle, thus providing uniform braking on a slippery road. The vehicle may also be equipped with an Anti-Lock Braking System (ABS), which is detailed later in this section.

The drive and tag axles are provided with spring-applied emergency/parking brakes, which are applied automatically whenever the control valve supply pressure drops below 40 psi (275 kPa). The optional emergency/parking brake overrule system allows the driver to release spring brakes, and to move the vehicle to a safe parking place, such as in the case of a self-application of these brakes due to a drop in air pressure

2. AIR RESERVOIRS

2.1 Location and Function

The air coming from the air dryer is first forwarded to the wet air tank, then to the primary (for the primary brake system), secondary (for the secondary brake system), and accessory (for the pneumatic accessories) air tanks (Fig. 1).

Two additional air reservoirs may be installed on the vehicle: the kneeling air tank and emergency/parking brake overrule air tank.

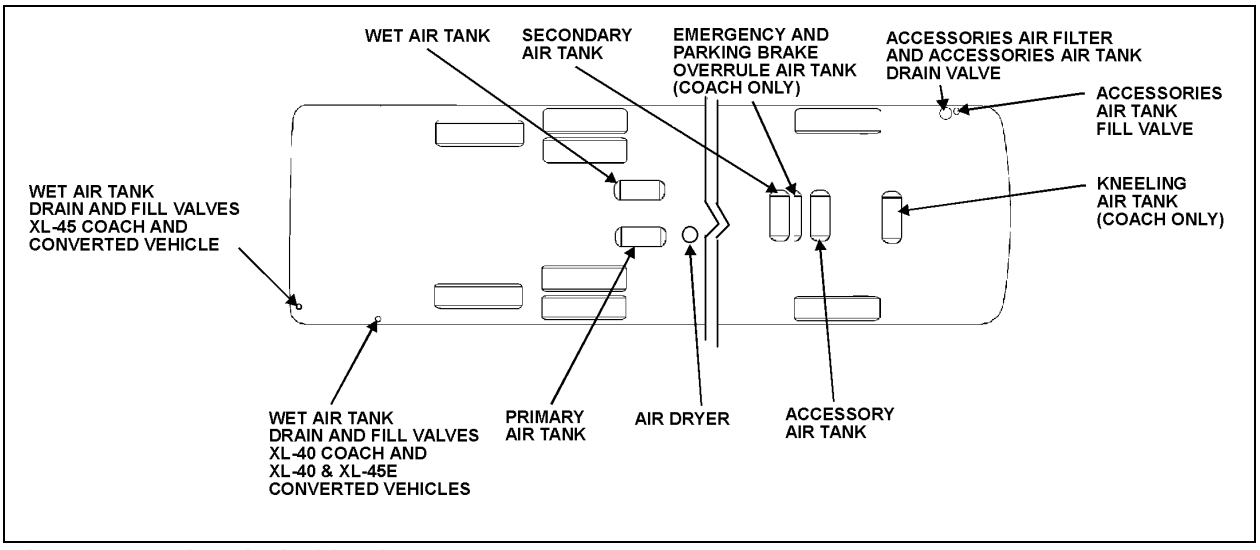

FIGURE 1: AIR RESERVOIRS LOCATION 12064

2.2 Maintenance

Ensure that the accessory air tank is purged during pre-starting inspection. A good practice is to purge this reservoir at the end of every working day by the remote air tank drain valve located in the steering compartment (Fig. 5).

Moreover, purge all reservoirs by their bottom drain valves at specified intervals.

2.2.1 Wet Air Tank

This reservoir is installed above L.H. wheel of drive axle, and is provided with bottom drain valve. It is recommended to **purge** the wet air tank by its bottom drain valve every 12,500 miles (20 000 km), or once a year, whichever comes first.

A remote valve located in engine compartment and accessible through engine R.H. side door is use to **drain** the air dryer. On XL-40 coach, the valve is positioned next to battery booster block, close to door hinge (Fig. 2). On XL-40 & XL-45E converted vehicles, the valve is positioned over battery assembly, close to door hinge (Fig. 3). On all XL-45 vehicles (coach and converted vehicle), the valve is positioned under back up alarm, close to L.H. side of door opening (Fig. 4).

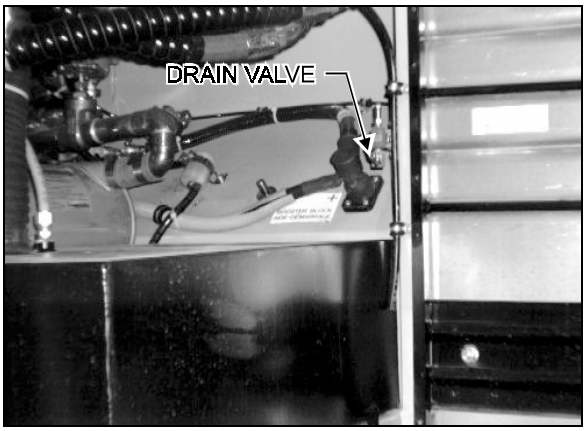

FIGURE 2: REAR VALVE LOCATION (XL-40 COACH) 12057

FIGURE 3: REAR VALVE LOCATION (XL-40 AND XL-45E CONVERTED VEHICLE) 12015

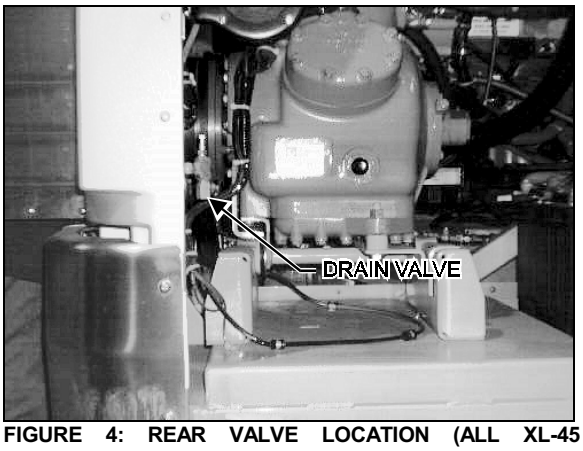

FIGURE 4: REAR VALVE LOCATION (ALL XL-45 VEHICLES) 12016

2.2.2 Primary Air Tank

This reservoir is located above R.H. wheel of drive axle, and is provided with a bottom drain valve (Fig. 1). It is recommended to purge the primary air tank by its bottom drain valve every 12,500 miles (20 000 km) or once a year, whichever comes first.

2.2.3 Secondary Air Tank

This reservoir is located in front wheelhousing, behind steering axle, and is provided with a bottom drain valve (Fig. 1).

It is recommended to purge the reservoir by its bottom drain valve, every 12,500 miles (20 000 km) or once a year, whichever comes first.

2.2.4 Accessory Air Tank

The accessory air tank is installed above front axle and is provided with a bottom drain valve (Fig. 1).

It is recommended to purge the reservoir by its bottom drain valve, every 12,500 miles (20 000 km) or once a year, whichever comes first.

A remote drain valve is located in steering compartment (Fig. 5). Refer to paragraph "4. Accessory Air Filter" of this section for daily purge procedure.

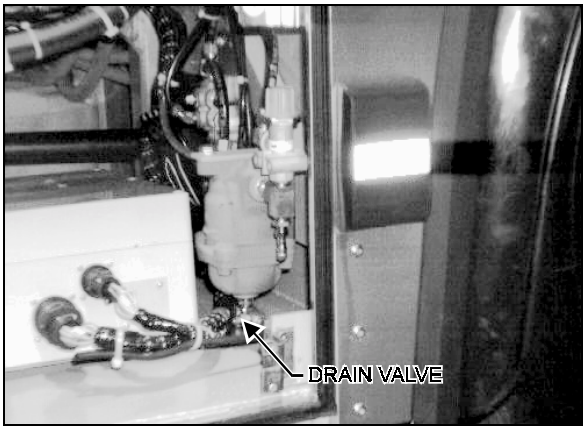

FIGURE 5: STEERING COMPARTMENT 12014

2.2.5 Kneeling Air Tank and Emergency/Parking Brake Overrule Air Tank (If Applicable)

These reservoirs are located in front wheelhousing. The emergency/parking brake overrule air tank is located behind steering axle. The kneeling air tank is located before steering axle. They are provided with a bottom drain valve.

It is recommended to purge them, with all other reservoirs, every 12,500 miles (20 000 km) or once a year, whichever comes first.

3. AIR SYSTEM EMERGENCY FILL VALVES

The vehicle is equipped with two air system emergency fill valves to supplement the air system when air pressure is low and engine cannot be operated.

The rear valve is located in engine compartment and accessible from engine R.H. side door. On XL-40 & XL-45E converted vehicles, the valve is positioned over battery assembly, close to door hinge (Fig. 6). On XL-40 coaches, the valve is positioned next to battery booster block, close to door hinge (Fig. 7). On all XL-45 vehicles, the valve is positioned under back up alarm, close to L.H. side of door opening (Fig. 8).

FIGURE 6: REAR VALVE LOCATION (XL-40 & XL-45E CONVERTED VEHICLES) 12010

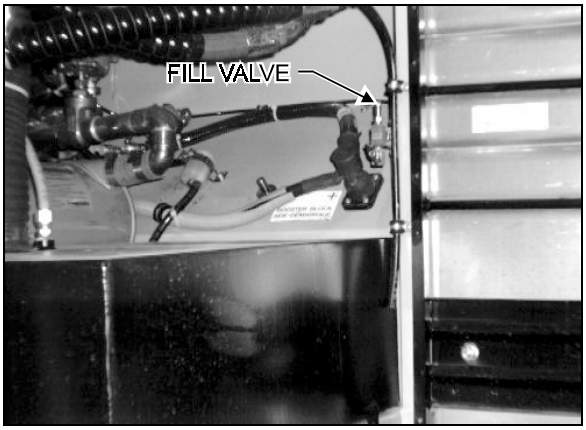

FIGURE 7: REAR VALVE LOCATION (XL-40 COACH) 12057

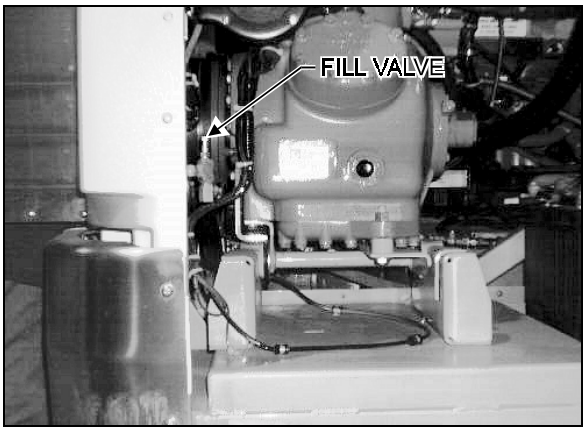

FIGURE 8: REAR VALVE LOCATION (ALL XL-45 VEHICLES) 12011

Caution: ***No other point should be used to supply air system. The maximum allowable air pressure is 125 psi (860 kPa).***

The front valve is located in the steering compartment close to R.H. side of door frame (Fig. 9).

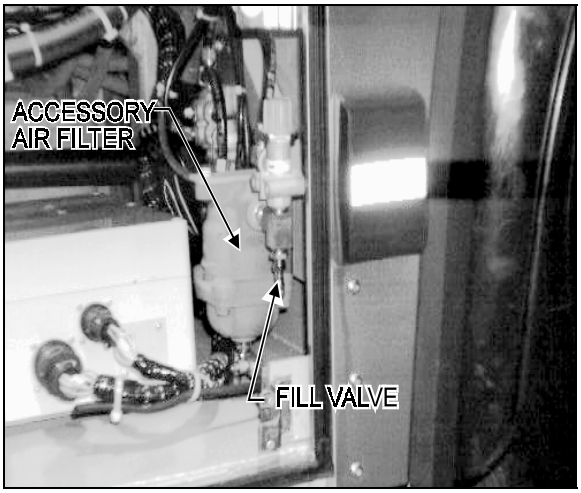

FIGURE 9: FRONT VALVE LOCATION 12012

These two air system emergency fill valves are fitted with the same valve stems as standard tires, and can be filled by any standard external air supply line.

The rear air system emergency fill valve will supply air for all systems (brakes, suspension and accessories) while the front fill valve will supply air for accessories only.

Caution: ***Air filled through these two points will pass through the standard air filtering system provided by Prevost. Do not fill air through any other points.***

4. ACCESSORY AIR FILTER

This filter is located inside the steering compartment (Fig. 9). Its first function consists in straining the air supply of the accessory air tank, when it is connected to an external supply line. Ensure filter is purged whenever supplying the system with an external air line. Its second function is to use the air filter drain valve for daily purge.

Purge the filter and accessory air tank as follows:

1. Take out from vehicle the flexible rubber hose.
2. Open the drain valve and let the moisture come out, then close the drain valve.

4.1 Element Replacement

Replace filter element and gasket every 100,000 miles (160 000 km) or two years, or whenever differential pressure exceeds 15 psi (105 kPa) between both filter inlet and outlet ports, whichever occurs first (Fig. 10).

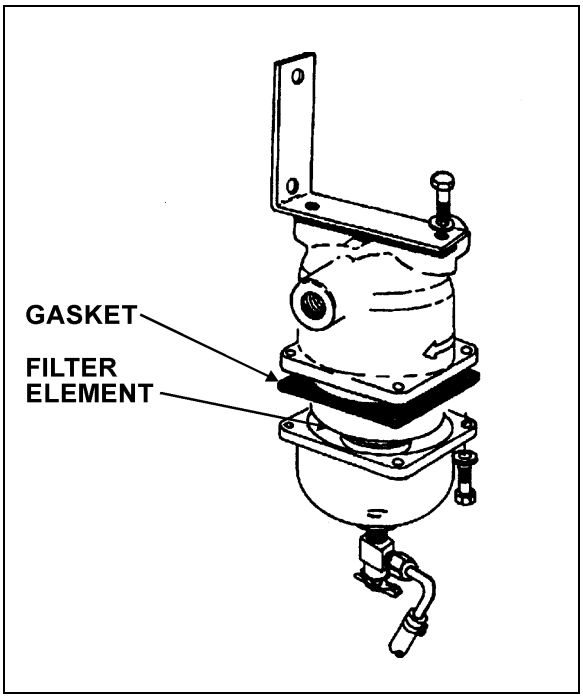

FIGURE 10: ACCESSORY AIR FILTER 12065

4.2 Cleaning

1. Clean filter body and bowl with a warm water and soap solution. Rinse thoroughly with clean water.
2. Blow dry with compressed air making sure the air stream is moisture free and clean. Pay particular attention to the internal passages.
3. Inspect all parts for damage and replace if necessary.

5. AIR GAUGES (PRIMARY AND SECONDARY)

The air pressure gauges, located on the central dashboard panel (see *"Operator's Manual"*), are connected to the DC-4 double check valve, which is located at ceiling of reclining bumper compartment. The latter is connected to the air lines running from the primary and secondary air

tanks, as shown on the pneumatic system diagram provided in the technical publications box.

The vehicle should never be set in motion until the buzzer alarm and warning lights turn off, i.e. when air pressure registers at least 66 psi (455 kPa). Moreover, if pressure drops below 66 psi (455 kPa), the *"Low air pressure"* warning lights will turn on, and the *"Low air pressure"* buzzer will sound. Stop the vehicle immediately, determine and correct the cause(s) of pressure loss. Check the gauges regularly with an accurate test gauge. Replace the gauge with a new unit if there is a variation of 4 psi (27 kPa) or more in the reading.

6. AIR DRYER (SYSTEM SAVER 1000)

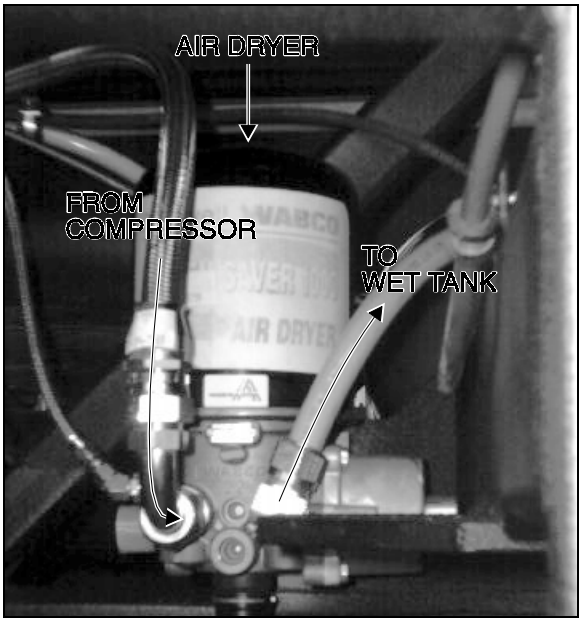

FIGURE 11: AIR DRYER 12035

Air dryer is located above R.H. wheel of drive axle (Fig. 11).The purpose of the air dryer is to remove moisture that could damage the air system before the air enters the system reservoir. The air dryer also filters the air to remove dirt, compressor oil, and other contaminants that can damage the system. Change cartridge every 100,000 miles (160 000 km) or once every two years, whichever comes first.

Maintenance and repair information on the air dryer are supplied in the applicable booklet annexed to this section under reference "Maintenance manual 4CC".

7. AIR LINES AND HOSES

Copper tubing, nylon-reinforced tubing, and flexible hoses are used to connect the units in the pressurized air system, including air brake system, suspension system, and accessory systems such as door, fresh air damper cylinder, air horns etc. Furthermore, the nylon tubing is color coded to ease identification. Refer to the following table for the complete color identification code. Service instructions for each type of air line are also provided under the applicable headings.

Color	Circuit
Red	Secondary
Green	Primary and Delivery
Yellow	Parking Brake
Blue	Suspension
Black	Accessory
White	Entrance Door

7.1 Tubing and Hoses

7.1.1 Copper Tubing

Annealed copper tubing with three-piece compression type fittings are used in the engine compartment where non-flexible hoses are required, but must be heat resistant. Connections should be checked for leakage at least every 6,250 miles (10 000 km) or twice a year, whichever comes first, and tightened or replaced if necessary. When replacing copper tubing, the tubing must be free of burrs, copper cuttings, and dirt. Blow out tubing with compressed air. Any of the above-mentioned particles will destroy sealing seats in air control units. New tubing must be the same size as the old one.

Always use new tubing ring when replacing tubing. When tightening tube connector nuts, tighten to the specified torque to ensure an airtight connection (refer to paragraph *"19. Fitting tightening torques"* at the end of this section). Overtightening will cause leakage. Apply SAE 10 oil or spray white grease (Prévost part No. 680343) to ball sleeves, tubes, and male threads, then torque to the minimum value and check for leaks. If leaking occurs, back off tube nut about 1/2 turn and retorque to a higher than minimum value.

7.1.2 Nylon Tubing

Nylon tubing is used for air lines in areas where usage of this material is suitable. Nylon tubing is flexible, durable, and weather resistant. When replacing an air line, use nylon tubing only where it has been used previously. Teflon-braided stainless steel hoses used in the engine compartment must be replaced only with similar hoses.

Caution: ***Nylon air lines should be used to replace existing nylon lines only, and must comply with the color identification code to ease pneumatic system troubleshooting.***

Nylon air lines must never be routed in areas where temperature could exceed 200 °F (93 °C).

7.1.3 Flexible Hoses

A flexible hose is used normally where it is impractical to use copper or nylon tubing due to constant flexing during operation, such as brake chamber hoses or belt tensioner air cylinder hoses. Hose connections should be tested for leakage at least every 6,250 miles (10 000 km) or twice a year, whichever comes first and tightened or replaced if necessary. Any hose which is chafed, worn or kinked should be replaced.

7.2 Air Line Serviceability Test

7.2.1 Operating Test

If any trouble symptom such as slow brake application or slow brake release indicates a restricted or clogged air line, disconnect the suspected tube or hose at both ends and blow through it to clear the passage. Inspect tubing and hose for partial restriction that may be caused by dents or kinks. If such a condition is found, the tubing or hose should be replaced.

7.2.2 Leakage Test

With air system fully charged and the brakes applied, coat all tubing and hose connections with a soapy solution to check for air leakage. No leakage is permitted. Leakage can sometimes be corrected by tightening the connection. If this fails to correct the leakage, new fittings, nylon tubing, copper tubing, teflon-braided stainless steel and flexible hoses must be installed as applicable.

7.3 Maintenance

Inspect all lines for cuts, swelling, kinks or other damage or deterioration. Check for lines being pinched by other components. Retaining clips and ties must be in place. Any support or bracket should be in good condition and mounted firmly in position. Hose spring guards should be in usable condition and not distorted. Particular attention should be given to long lines. Any supporting component (clips, ties, grommets, etc.) must be secured to prevent unnecessary vibrations and eventual loosening of connections. Any leak detected should be attended to. Be sure nylon lines are not near areas of intense heat. Check for any missing grommets or loom material where chafing or cutting may occur. Replace with new material as required. In general, lines should be securely located in position and free from any binding condition which would hinder air flow.

8. PRESSURE REGULATING VALVES

8.1 Description

There is one pressure regulating valve for the belt tensioners, and an optional one either for world transmission output retarder or for manual transmission servo-clutch.

The belt tensioner pressure regulating valve controls pressure in belt tensioner cylinders as these latter are parallel mounted. It is located in engine compartment above the door and is used to limit the air pressure in belt tensioners to 50 ± 2 psi (345 ± 15 kPa) for series 60 engines and 70 ± 2 psi (482 ± 15 kPa) for series 50 engines (Fig. 12).

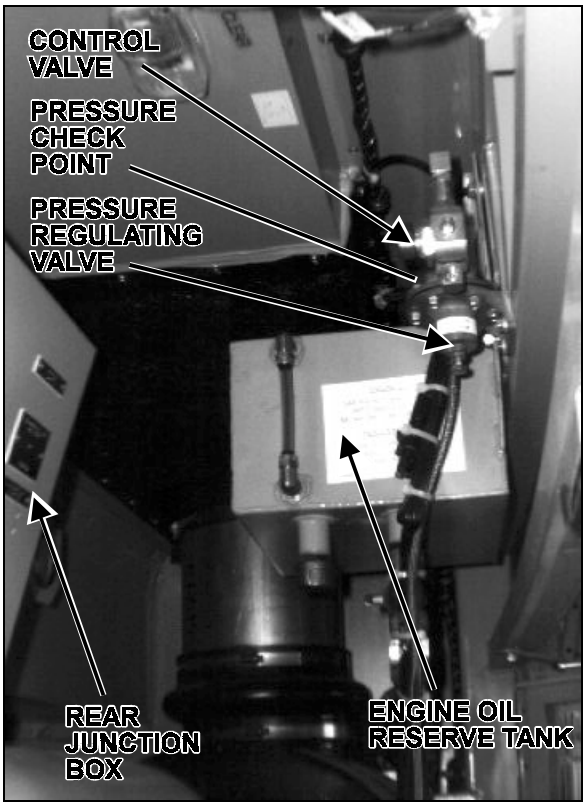

FIGURE 12: REAR ENGINE COMPARTMENT 12066

The optional one is located in engine compartment and is accessible by the service R.H. side door. It could be used for transmission retarder or for servo-clutch. When used with the transmission retarder, it should be adjusted to 80 ± 3 psi (550 ± 20 kPa), and when used with the manual transmission servo-clutch, it should be adjusted to 40 psi (275 kPa) (Fig. 13).

FIGURE 13: R.H. SIDE ENGINE COMPARTMENT (TYPICAL ILLUSTRATION) 12067

	Air Pressure (psi)	Air Pressure (kPa)
Belt Tensioner	**series 60** 50 ± 2 **series 50** 70 ± 2	**series 60** 345 ± 15 **series 50** 482 ± 15
Retarder	80 ± 3	550 ± 20
Servo-Clutch	40	275

8.2 Maintenance

Every 100,000 miles (160 000 km) or once every two years, whichever comes first, disassemble valve and wash all metal parts in a cleaning solvent (Fig. 14). Examine the diaphragm; if cracked, worn or damaged, replace with new diaphragm. If the valve is excessively grooved or pitted, it should be replaced. Replace any other parts that appear worn or damaged. After valve is assembled, adjust the valve to the specified pressure setting and check for air leakage.

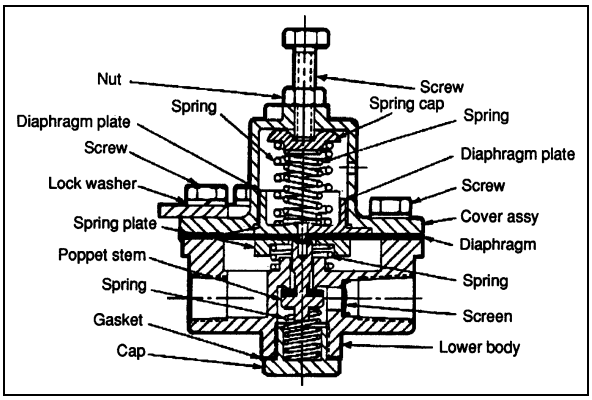

FIGURE 14: AIR PRESSURE REGULATING VALVE 12037

8.3 Pressure Setting Procedure

Remove the dust cap from the pressure check port (Fig. 15). Attach a pressure gauge at this port and check the pressure reading. If the pressure reading is not correct, it can be adjusted by means of the screw on top of the regulating valve as follows:

1. Loosen the lock nut, turn the adjusting screw counterclockwise to decrease pressure approximately 10 psi (70 kPa) below the required pressure.
2. Turn the adjusting screw clockwise to increase the pressure slowly until the required pressure setting is reached. Tighten the locknut.
3. Replace dust cap on the pressure check port.

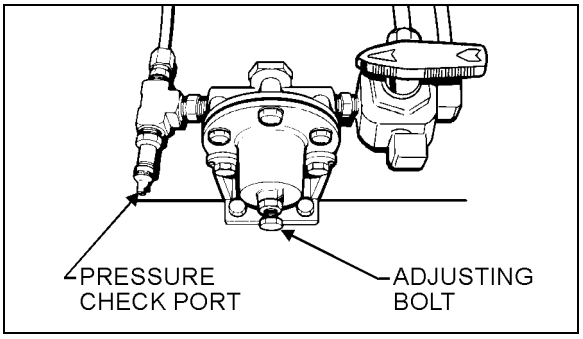

FIGURE 15: AIR PRESSURE REGULATING VALVE 12036

9. AIR SYSTEM COMPONENTS

9.1 Air Compressor (TU-FLO 750)

The air compressor is located on starter side of engine, on the rear of the engine gear case. The function of the compressor is to provide and maintain air under pressure to operate devices in brake and air systems.

This air compressor also drives the engine fuel pump which is bolted to the rear end of the compressor. The compressor crankshaft is designed to accept a drive coupling which is placed between the compressor and fuel pump.

The compressor is driven by the bull gear. The air compressor is water cooled. Engine coolant is fed to the compressor through a flexible hose tapped into the block water jacket and connected to the rear of the compressor. Coolant returns from the right of the compressor (governor side) through a flexible hose to the engine cylinder head. The compressor air inlet is taken from the air intake manifold and entered in the back of the compressor.

The compressed air is pushed in the discharge line located on top of the compressor, which is dispatching air to the air dryer. Lubricating oil is supplied to the compressor by a line from the cylinder block oil gallery that connects to the air compressor. Lubricating oil returns to the engine crankcase through the air compressor drive assembly.

Maintenance and repair information on the TU-FLO 750 air compressor is supplied in the applicable booklet annexed to this section under reference number SD-01-344.

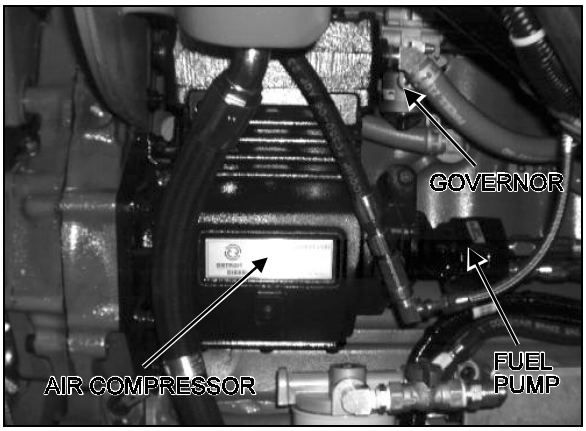

FIGURE 16: AIR COMPRESSOR AND GOVERNOR 12068

9.1.1 Removal and Installation

1. Exhaust compressed air from air system by opening the drain valve of each air tank.
2. Drain the engine cooling system. See Section 5: "*Cooling System*".
3. Identify and disconnect all air, coolant and oil lines from the compressor and governor assembly.
4. Gain access to the compressor by the engine R.H. side compartment. Remove the four compressor mounting bolts, and the two fuel pump support bracket bolts.
5. Slide air compressor rearward to disengage the hub from coupling. Remove the air compressor.

Reverse removal procedure for installation.

9.2 Governor (D-2)

The governor is mounted on the air compressor (Fig. 16), its function is to maintain the system pressure between a minimum and a maximum value. Maintenance and repair information on D-2 governor is supplied in the applicable booklet annexed to this section under reference number SD-01-16.

9.3 Push-Pull Control Valve

9.3.1 EMERGENCY/PARKING BRAKE CONTROL VALVE (PP-1)

A push-pull control valve mounted on the R.H. lateral console on coach and L.H. lateral console on converted vehicle is provided for parking brake application or release. The spring brakes are self-actuated whenever the control valve supply pressure drops below 40 psi (275 kPa). Maintenance and repair information on this valve is supplied in the applicable booklet annexed to this section under reference number SD-03-61.

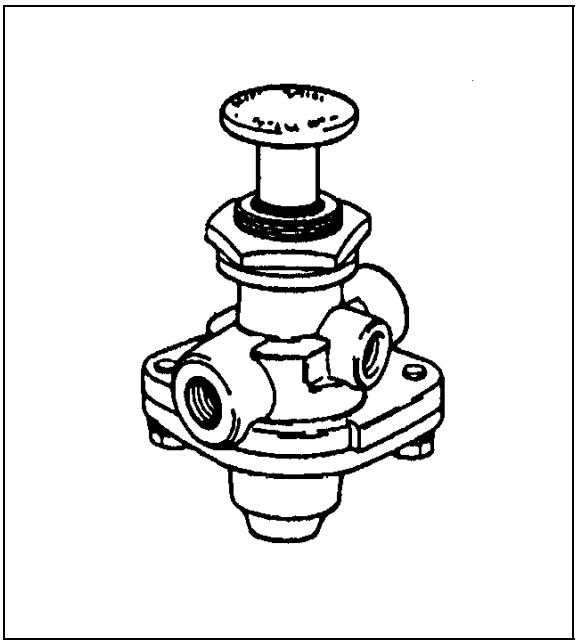

FIGURE 17: PP-1 12069

9.3.2 EMERGENCY/PARKING BRAKE OVERRULE CONTROL VALVE (RD-3) (if applicable)

A RD-3 control valve is used with the optional parking brake overrule system. This control valve is located on R.H. lateral console (coach only). In the case of self-application of spring brakes due to a pressure drop, the brakes can be released by holding down this control valve.

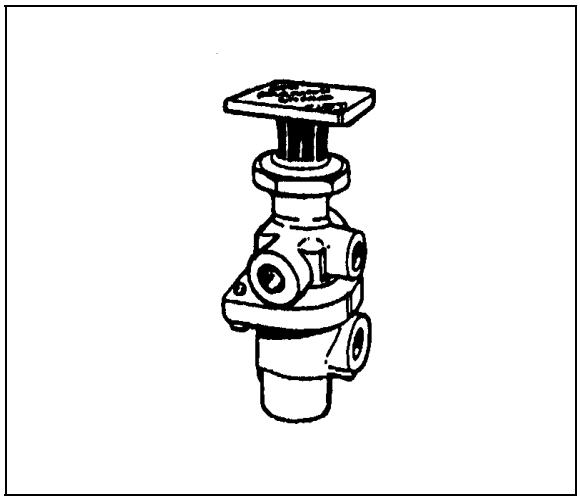

FIGURE 18: RD3 12070

9.4 Flip-flop Control Valve (TW-1)

A flip-flop control valve mounted on the R.H. lateral console on coach and L.H. lateral console on converted vehicle is provided to unload tag axle air springs (and to lift tag axle if vehicle is so equipped) and low-buoy system. It is a manually operated "on-off" valve. Maintenance and repair information on this valve is supplied in the applicable booklet annexed to this section under reference number SD-03-64.

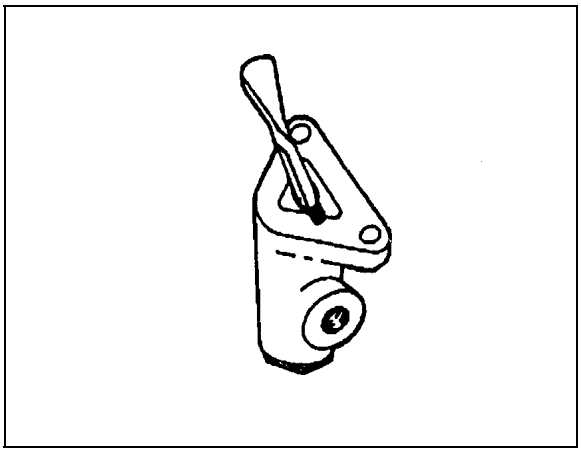

FIGURE 19: TW1 12071

9.5 Horn Valve (HV-3)

The horn valve is a simple "on-off" non-exhausting valve, designed specifically for controlling air horn. The horn valve is designed to return to the off position when application force is removed from it.

9.6 Dual Brake Application Valve (E-15)

The E-15 dual brake valve is floor mounted, treadle operated type brake valve with two separate supply and delivery circuits. This valve is located in steering compartment.

9.6.1 Brake Pedal Adjustment

After brake pedal replacement or repair, adjust the pedal to its proper position according to the following procedure:

Replace the linkage, loosen threaded rod lock nuts, and screw or unscrew the threaded adjustment rod in order to obtain a brake pedal inclination corresponding to 45° (Fig. 20). Tighten threaded rod lock nuts.

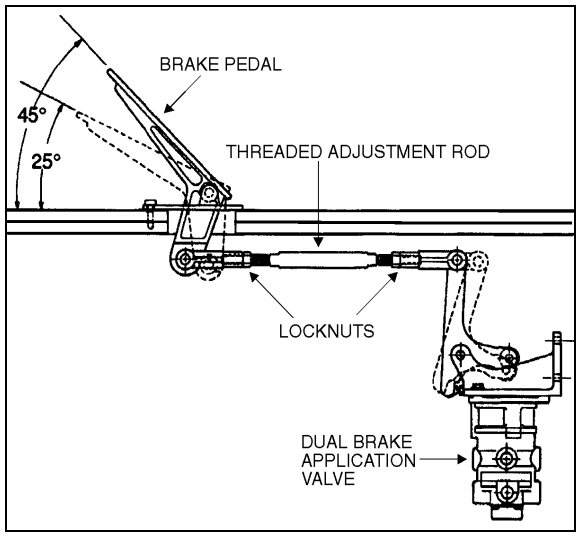

FIGURE 20: BRAKE PEDAL ADJUSTMENT 12040

9.6.2 Maintenance

Maintenance and repair information on the E-15 dual brake application valve is supplied in the applicable booklet annexed to this section under reference number SD-03-826.

9.7 Stoplight Switches

Two electro-pneumatic stoplight switches are mounted on the dual brake application valve (E-15). The upper one is used for the primary air circuit while the lower one is used for the secondary air circuit. Both switches are connected in parallel and have the same purpose, i.e. completing the electrical circuit and lighting the stoplights when a brake application is made. The upper switch (A.C. Delco) is designed to close its contact between 2 psi and 4 psi (14 kPa to 28 kPa) (Fig. 21), while the lower one (Bendix, SL-5) closes its contact at 4 psi (28 kPa) (Fig. 22). The switches are not a serviceable item; if found defective, the complete unit must be replaced.

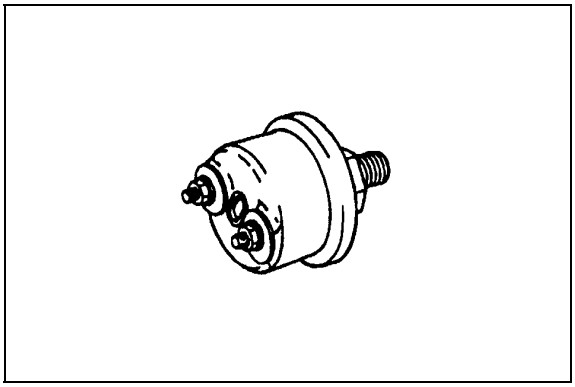

FIGURE 21: DELCO SWITCH 12072

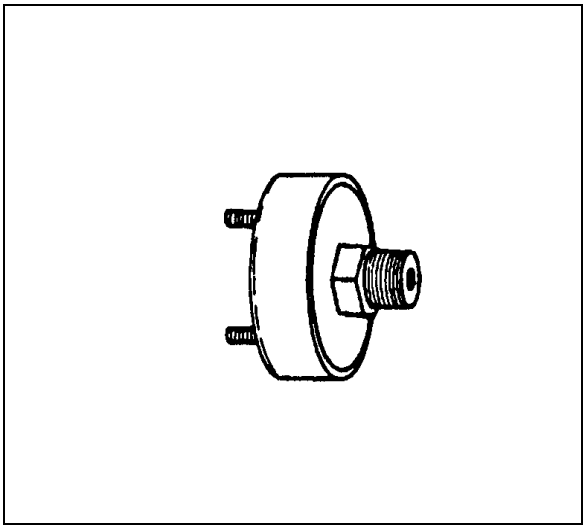

FIGURE 22: BENDIX SWITCH 12073

9.8 Parking Brake Alarm Switch (if applicable)

Refer to the appropriate annexed booklet (Bendix, SL-5 Stop Light Switch; reference no. SD-06-7).

The parking brake alarm uses the same switch as per the stoplights. It is mounted on the spring brake valve and operate in conjunction with a NC relay to sound a warning alarm by completing the electrical circuit when the ignition key is turned OFF with parking brake released.

9.9 Brake Relay Valve (R-12)

The primary air system includes three brakes being supplied by the dual brake valve, and which function is to speed up the application and release of the service brakes.

One valve supplies the drive axle service brake air line, while the other two valves supply independently both the tag axle right and left service brake air line and act as interlock valves. These valves are accessible from under the vehicle at the level of the tag axle. Maintenance and repair information on these valves is supplied in the applicable booklet annexed to this section under reference number SD-03-31.

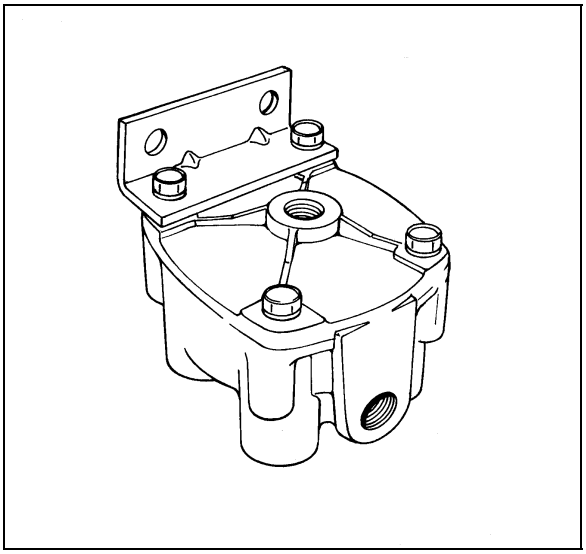

FIGURE 23: R-12 12074

9.10 Quick Release Valves (QR-1)

On XL-40 coach, two quick release valves are provided. One is mounted on the front axle service brake air line and located over the front axle. The other valve is mounted on the drive axle emergency brake air line. These valves are accessible from under the vehicle at the level of the drive axle.

On others XL vehicles, only one quick release valve is provided and located over the front axle. This valve is mounted on the front axle service brake air line.

They are responsible for the rapid exhaust of air pressure from brakes, thus decreasing the brake release time. Maintenance and repair information on these valves is supplied in the applicable booklet annexed to this section under reference number SD-03-69.

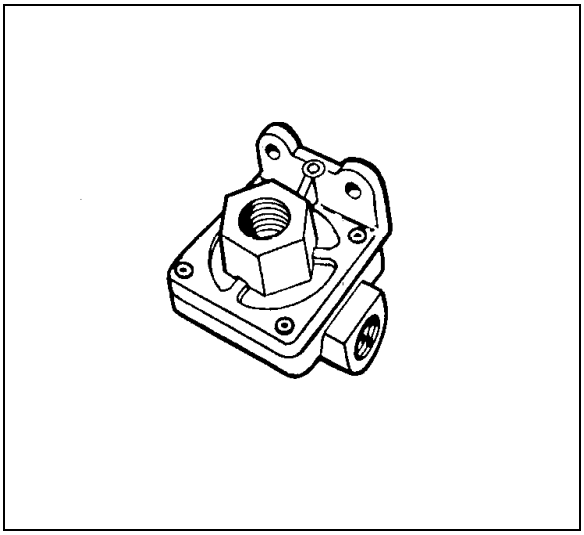

FIGURE 24: QR-1 12075

9.11 Spring Brake Valve (SR-1)

The spring brake valve is located at ceiling of front bumper compartment. The function of the SR-1 is to modulate the spring brake through application of the foot brake valve in the event of loss of service brake pressure. Maintenance and repair information on the spring brake valve is supplied in the applicable booklet annexed to this section under reference number SD-03-87.

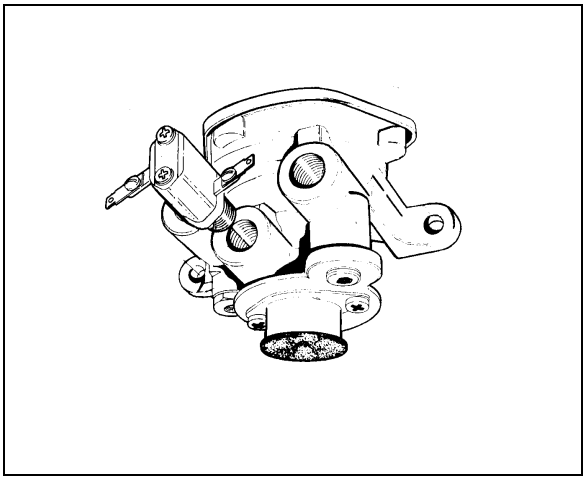

FIGURE 25: SR-1 12076

9.12 Pressure Protection Valve (PR-2)

Maintenance and repair information on the pressure protection valve is supplied in the applicable booklet annexed to this section under reference number SD-03-55.

The air system includes two pressure protection valves (Fig. 26). One valve is installed on the manifold block, and insures at all times a minimum pressure of 75 psi (517 kPa) in the suspension air system in the event that a pressure drop occurs in either the suspension air system or accessory air system. This valve is located in the steering compartment beside the air filter.

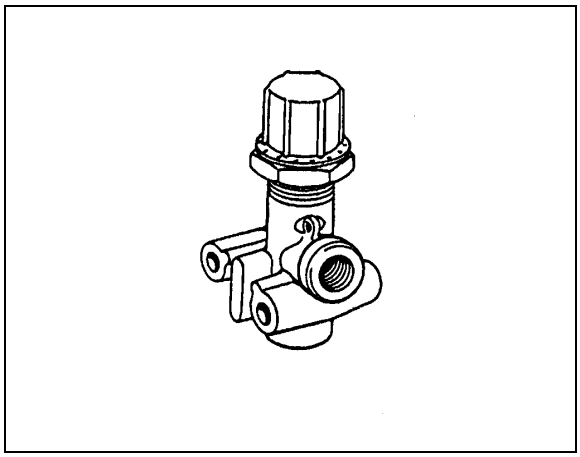

FIGURE 26: PR-2 12077

The other valve is installed on the accessory air tank, and insures a minimum pressure of 75 psi (517 kPa) in the accessory air system in the event that a pressure drop occurs in either the suspension air system or braking air system (Fig. 1 for accessory air tank location).

9.13 Low Pressure Indicators (LP-3)

Maintenance and repair information on the low pressure indicators is supplied in the applicable booklet annexed to this section under reference number SD-06-2.

The air system includes three low pressure switches, all located at ceiling of reclining bumper compartment. Two of them, one on each side of the double check valve, monitor both the primary and secondary air system warning lights along with a warning alarm (Fig. 28). Their pressure setting is switch is 66 ± 6 psi (455 ± 40 kPa). The remaining pressure switch is mounted on the spring brake valve, and monitors the parking brake pilot lamp. Its pressure setting is 30 psi (205 kPa).

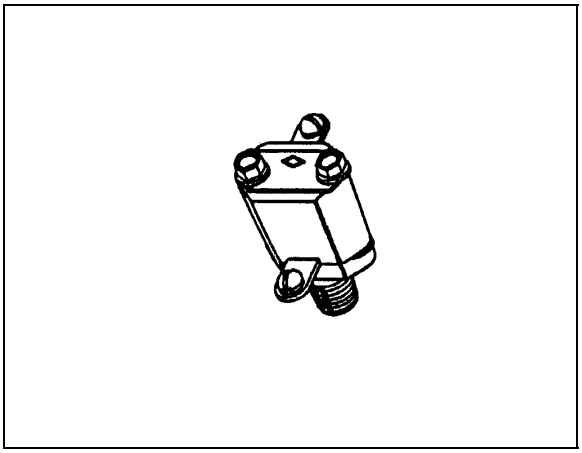

FIGURE 27: LP-3 12078

9.14 Shuttle-Type Double Check Valve (DC-4)

Maintenance and repair information on the shuttle-type double check valve is supplied in the applicable booklet annexed to this section under reference number SD-03-67.

The double check valve is located at ceiling of reclining bumper compartment. In the event of a pressure drop in either the primary or secondary systems, this unit will protect the emergency/parking brake control valve and the intact air system from pressure loss.

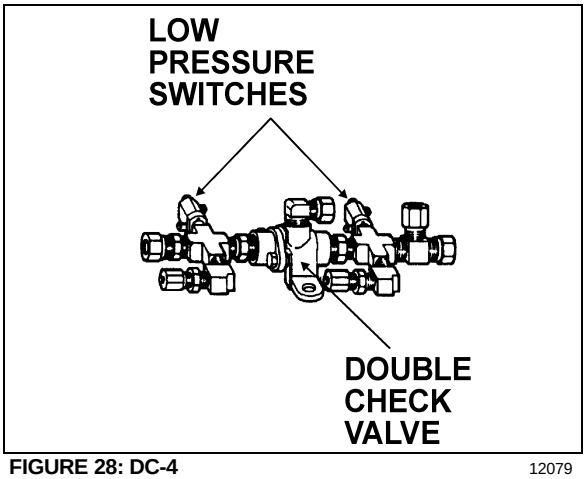

FIGURE 28: DC-4 12079

10. AIR SYSTEM TROUBLESHOOTING

The following list has been designed to help in troubleshooting some of the most common problems in the air system and their main causes. (For air brake troubleshooting, refer to paragraph "*15. Air Brake Troubleshooting"* later in this section. For other troubleshooting, refer to the manufacturer's brochures annexed to this section.)

1. **Air pressure doesn't rise to, or doesn't maintain, a normal setting**
   - Defective air gauge (registering incorrectly)
   - Excessive leaking in air system
   - Reservoir drain cock open
   - Governor poorly adjusted or defective
   - Defective compressor
   - Worn compressor or excessive wear on piston and/or ring
2. **Air pressure rises to normal setting too slowly**
   - Excessive leaking in air system
   - Clogged engine air cleaner
   - Worn compressor or excessive wear on piston and/or ring
   - Engine speed too low
3. **Air pressure rises above a normal setting**
   - Defective air gauge (registering incorrectly)
   - Governor poorly adjusted or defective
   - Restriction in line between governor and compressor unloading mechanism
4. **Air pressure drops quickly when engine is stopped**
   - Leaks in compressor discharge valve
   - Leaks in governor
   - Leaks in air lines
   - Leaks in air system valves

11. BRAKE OPERATION

The vehicle braking system uses both service and parking air-operated brakes. The air system is divided into two (2) independent circuits to isolate the front axle brakes and the rear axle brakes (drive and tag), thus providing safe brake operation in the event that one circuit of the system fails. The primary circuit is connected to the drive and tag axle brakes, while the secondary circuit is connected to the front axle brakes. The tag axle service brakes operate only when the axle is in the normal driving (loaded) position. The spring-type emergency brakes are mounted on the drive axle, and will apply automatically if primary system pressure falls below 40 psi (276 kPa). The optional parking brake override system can cancel the parking brakes, enabling the driver to move the vehicle to a safe parking place. To operate this system, push down and hold the control knob located on the R.H. lateral console (See *"Operator's Manual"* for more details).

Furthermore, the brake application sequence, which is increased by a pneumatic relay valve (R-12), will start with the rear axles and be followed by the front axle, thus providing uniform braking on a slippery surface. The vehicle may also be equipped with an Anti-lock Brake System (ABS), which is detailed later in this section. .

Brake and air system maintenance consist of periodic inspections. Check all parts for damage and brake adjustment (refer to subsequent headings in this section for more details). Ensure all fasteners are tight (refer to paragraph *"20. Specifications"* for recommended tightening torques).

12. AIR BRAKES

12.1 Disc Brakes

Rockwell duramaster air disc brakes are used on front and tag axles. The front axle discs are actuated by 30 square inch effective area air brake chamber. On tag axle, the brake chambers have a 16 square inch effective area for service brake and a 24 square inch effective area for emergency/parking brake.

12.1.1 Disc Brake Pads

Brake pads have to be checked on a regular basis depending on the vehicle operation. To check pad condition without removing the wheel, verify the position of the inboard bosses of the caliper on the slide pins (Fig. 29).

If the bosses are within ¼ inch (6.4 mm) of the ends of the pins, remove the wheels and tires and inspect the lining. If the bosses are within 1/8 inch (3.2 mm) of the ends of the pins, replace the linings. When replacing the brake pads, all four pads on an axle have to be changed at the same time. There is no inner or outer pad, since all pads are the same.

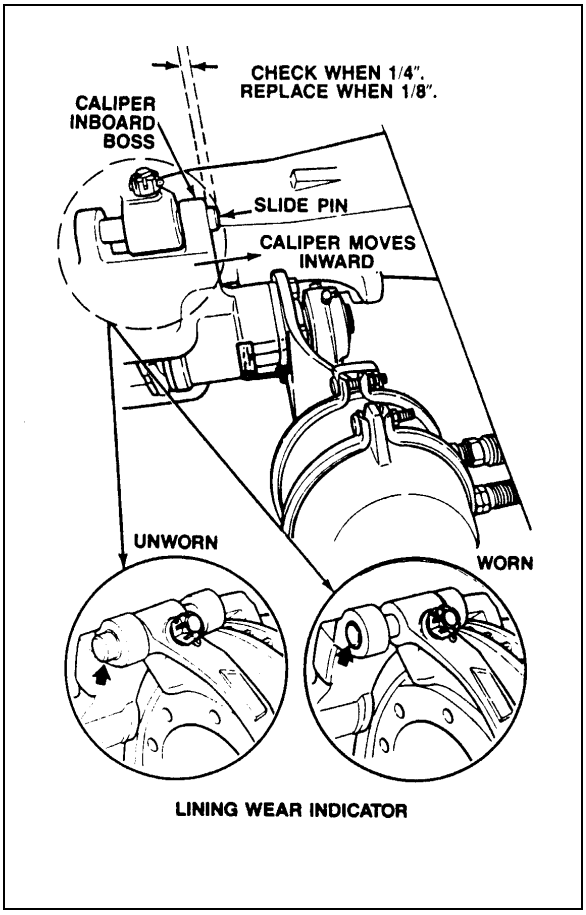

FIGURE 29: LINING WEAR INDICATOR 12080

For information on how to change the brake pads, refer to the manufacturer's brochure, annexed to this section.

Note: ***While breaking in new brake pads, avoid long brake applications as well as harsh braking.***

The Rockwell duramaster air disc brakes are supplied with automatic clearance (slack) adjusters from Rockwell or Haldex which may be installed with these air disc brakes. For information on installation and adjustment of Automatic slack adjusters, refer *to Rockwell or Haldex* brochures at the end of this section.

12.1.2 Lubrication

On front and tag axle, brake slack adjusters (one fitting on each slack adjuster) and disc brake calipers (two fittings on each of front and tag axles) should be serviced every 6,250 miles (10 000 km) or twice a year, whichever comes first. Use a good quality base grease NLGI No. 1 (suitable for extremely low temperature) and NLGI No. 2 (suitable for most temperature). Refer to Section 24, *"Lubrication"*.

12.2 Drum Brakes

The drive axle is equipped with Cam-Master, W-Series drum brakes from Rockwell. They're actuated by a 30 square inch effective diaphragm area for service brake, and a 36 square inch area for emergency/parking brake. Automatic slack adjusters from *Rockwell or Haldex* may be install with these brakes (Fig. 30). For information on installation and adjustment of Automatic slack adjusters, refer *to Rockwell or Haldex* brochures at the end of this section: *"Automatic Brake Adjusters, Installation and Maintenance".*

FIGURE 30: DRUM BRAKE ASSEMBLY 12044

12.2.1 Drum Brake Adjustment

Refer to *"Rockwell Maintenance Manual no.23B - Bus and Coach Brakes"* annexed to this section for drive axle.

12.2.2 Maintenance

Lubricate brake camshaft bushing every 100,000 miles (160 000 km) or once every two years whichever comes first. Grease one fitting on each drive axle drum brake, with good quality lithium-

base grease NLGI no.1 or NLGI no. 2. Lubricate brake slack adjuster every 6,250 miles (10 000 km) or twice a year, whichever comes first. Grease one fitting on each slack adjuster, with good quality lithium-base grease NLGI no.1 or NLGI no.2. Refer to figure 31 for localization of fitting. Lubricate brake spider, camshaft splines, anchor pins and shoe rollers when necessary.

Warning: ***Care must be taken when lubricating camshaft bushings, anchor pins and shoe rollers. Too much lubrication could cause lubrication saturation of brake linings and possible safety problems.***

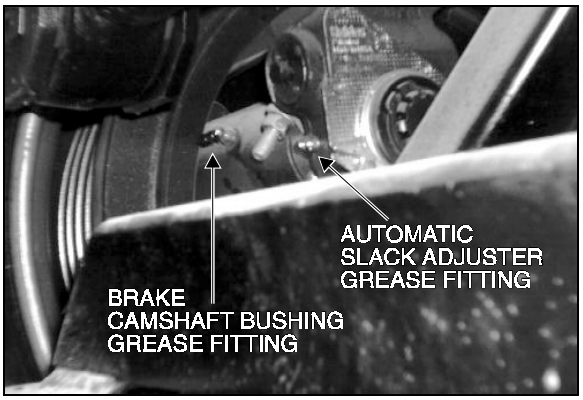

FIGURE 31: GREASE FITTINGS LOCATION 12045

Check brake drums periodically for cracks, severe heat checking, heat spotting, scoring, pitting and distortion. Replace damaged drums. Measure the inside diameter of the drum in several locations with a drum caliper or inside micrometer. Replace the drum if the diameter exceeds the specifications marked on the drum (Fig. 32). For more information on brake drums maintenance, refer to Rockwell's brochure *"Field Maintenance Manual Number 23B - Bus and Coach Brakes", annexed to this section*.

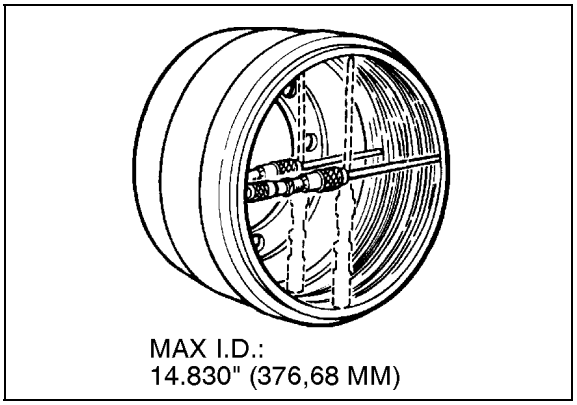

FIGURE 32: DRUM BRAKE INSIDE DIAMETER 12046

Caution: ***Prévost does not recommend the turning or reboring of the brake drums because it decreases the strength and heat capacity of the drum. However, if drums must be refaced, the new diameter MUST NOT exceed the maximum inside diameter marked on the drum.***

13. RECOMMENDED BRAKE SERVICE PROCEDURES TO REDUCE EXPOSURE TO NON-ASBESTOS FIBER DUST

Most recently manufactured brake linings no longer contain asbestos fibers. Instead of asbestos, these linings contain a variety of ingredients, including glass fibers, mineral wool, aramid fibers, ceramic fibers, and carbon fibers. At present, OSHA (Occupational Safety and Health Administration) does not specifically regulate these non-asbestos fibers, except as nuisance dust. Medical experts do not agree about the potential long-term risks from working with and inhaling non-asbestos fibers. Nonetheless some experts think that long-term exposure to some non-asbestos fibers could cause diseases of the lung, including pneumoconiosis, fibrosis, and cancer. Therefore, lining suppliers recommend that workers use caution to avoid creating and breathing dust when working on brakes that contain non-asbestos fibers.

Warning:

1. Whenever possible, work on brakes in a separate area away from other operations.

2. Always wear a respirator approved by NIOSH (National Institute of Occupational Safety and Health) or MSHA (Mine Safety and Health Administration) during all brake service procedures. Wear the respirator from removal of the wheels through assembly.

3. NEVER use compressed air or dry brushing to clean brake parts or assemblies. OSHA recommends that you use cylinders that enclose the brake. These cylinders have vacuums with high efficiency (HEPA (Health and Environment Protection Agency)) filters and workmans' arm sleeves. But, if such equipment is not available, carefully clean parts and assemblies in the open air.

4. Clean brake parts and assemblies in the open air. During disassembly, carefully place all parts on the floor to avoid getting dust into the air. Use an industrial vacuum cleaner with an HEPA filter system to clean dust from the brake drums, backing plates and other brake parts. After using the vacuum, remove any remaining dust with a rag soaked in water and wrung until nearly dry.

5. Grinding or machining brake linings. If you must grind or machine brake linings, take additional precautions because contact with fiber dust is higher during these operations. In addition to wearing an approved respirator, do such work in an area with exhaust ventilation.

6. Cleaning the work area. NEVER use compressed air or dry sweeping to clean the work area. Use an industrial vacuum with an HEPA filter and rags soaked in water and wrung until nearly dry. Dispose of used rags with care to avoid getting dust into the air. Use an approved respirator when emptying vacuum cleaners and handling used rags.

7. Worker clean-up. Wash your hands before eating, drinking or smoking. Do not wear your work clothes home. Vacuum your work clothes after use and then launder them separately, without shaking, to prevent fiber dust from getting into the air.

8. Material safety data sheets on this product, as required by OSHA, are available from Rockwell.

14. BRAKE BURNISHING

The following procedure should be followed whenever replacing a brake drum and/or brake linings.

Warning: ***Proceed with brake lining "burnishing" on a road where there is very light traffic, and only when no vehicle is following behind, to avoid possible accident.***

With the transmission in the highest gear, make 10 "snub" brake applications at exactly every ½ mile (0,8 km) regular interval while decelerating from 50 to 30 mph (80 to 50 km/h).

Check drum and rotor temperatures immediately after completing the above burnishing. Any drum or rotor that is significantly cooler than the other ones indicates a lack of braking effort on this wheel; in this case. repeat burnishing.

Allow all the wheel-end brakes to completely cool, thus having them return to the ambient temperature.

Repeat 10 more brake snubs as described above ½ mile (0,8 km) intervals while reducing speed from 50 to 30 mph (80 to 50 km/h).

Caution: ***A constant light brake application over a certain distance constitutes a light brake drag. This is not desirable. Depending upon the brake lining condition during the drum/lining contact, this dragging exacerbates pulsating forces which may develop due to the "slip-stick" phenomenon. This condition could "sprag" (violent high amplitude uncontrollable vibration), causing permanent damage to brake components such as spider, air chamber brackets, etc.***

Note: ***A brake lining glazing due to the underutilization of brakes (especially a converted coach equipped with a retarder) may be experienced during winter months when vehicle is in storage or is seldom used. To solve this problem, run the vehicle, observe the previous notices and repeatedly apply the brakes until they produce a light smoke.***

15. AIR BRAKE TROUBLESHOOTING

The following tests and check lists have been designed to identify the cause(s) of a sluggish performance and/or leaks in the system. These tests require very little time to perform, and give you a general idea of the system condition. Each test is provided with a corresponding check list, that will guide you to the most common causes of problems.

Prior to performing any test, check all air lines for kinks or dents, and hoses for signs of wear, drying out or overheating.

Warning: ***When working on or around brake system and its related components, the following precautions should be observed.***

1. Always block vehicle wheels. Stop engine when working under a vehicle. Keep hands away from chamber push rods and slack adjusters as they may apply when system pressure drops.

2. Never connect or disconnect a hose or line containing air pressure. It may whip as air escapes. Never remove a component or pipe plug unless you are sure all system pressure has been depleted.

3. Never exceed recommended air pressure and always wear safety glasses when working with air pressure. Never look into air jets or direct them at anyone.

4. Never attempt to disassemble a component until you have read and understood the recommended procedures. Some components contain powerful springs and injury can result if not properly disassembled. Use only proper tools and observe all precautions pertaining to the use of those tools.

5. Always clean connecting piping and/or fittings, and coat pipe threads with teflon pipe sealant before installing any air brake system component.

15.1 Pressure Build-up / Low Pressure Warning / Cutoff Point / Governor Cutout

CONDITION: Vehicle parked, wheels chocked

1. Completely drain air reservoirs.
2. Start engine and run at fast idle. Low pressure warning lights should be *"On"*.
3. Start checking pressure at 50 psi (344 kPa).
4. Low pressure warning lights and buzzer should go off at or above 60 psi (415 kPa).
5. At 85 psi (586 kPa), run engine at full rpm, then check that build up time to 100 psi (690 kPa) is 30 seconds or less.
6. Governor cutout. Cuts out at the correct pressure of 120-125 psi (826-861 kPa).
7. Governor cut-in. Reduce service air pressure to governor cut-in. The difference between cut-in and cut-out pressures should not exceed 25 psi (172 kPa).

For common corrections, refer to the following check list.

15.1.1 High or Low Warning Cutoff Point

1. Check dash gauge with an accurate test gauge.
2. Repair or replace the defective low pressure indicator switches.
3. Repair or replace buzzer or light bulb, and check wiring.

15.1.2 High or Low Governor Cutout Point

1. Check dash gauge with an accurate test gauge.
2. Adjust governor to desired cutout.

OR

3. Repair or replace governor as necessary after checking that compressor unloader mechanism is operating correctly.

15.1.3 More Than 30 Seconds to Build-up Pressure from 85 to 100 psi (585 - 690 kPa) at Full Engine RPM

1. Check air gauges on the dashboard with an accurate test gauge.
2. If compressor strainer or inlet line is restricted, clean or replace element or faulty line.
3. If compressor head or discharge line is carbonized or otherwise restricted, clean or replace.
4. If discharge valves are leaking, pull head and correct or replace cylinder head.
5. If drive is slipping, change gear as indicated.
6. If inlet valves are stuck, open or leaking severely, replace unloader kit, inlet valves and/or seats as necessary.
7. If drain cock is found open, close it.
8. If governor leaks when *"unloaded"*, clean or replace inlet valve or replace governor.
9. Listen for air leaks and repair.

Redo test to check all items repaired or replaced.

15.2 Air Supply Reservoir Leakage

CONDITION: Full pressure, engine stopped, parking brake applied

1. Allow at least 1 minute for pressure to stabilize.
2. Stop engine, then check air pressure gauge for 2 minutes, and note any pressure drop.
3. Pressure drop should not be more than 3 psi (20 kPa) per minute.

For common corrections, refer to the following check list.

15.2.1 Excessive Air Loss:

1. With the primary air system at normal operating pressure (95 - 125 psi (655 - 860 kPa)), coat all air line connections and pneumatic components with a water and soap solution. Bubbles will indicate an air leak, and none should be permissible. Repair or replace defective parts.
2. Listen for leaks and correct as required.

Redo test to check all items repaired or replaced.

15.3 Air Brake Leakage

CONDITION: Full pressure, engine stopped, parking brake released

1. Apply foot brake, allow at least 1 minute for pressure to stabilize.
2. Hold down foot valve for 2 minutes while observing air pressure gauge on the dashboard.
3. Pressure drop should not be more than 4 psi (27 kPa) per minute.

For common corrections, refer to the following check list.

15.3.1 Excessive Leakage on Brake Service Side:

1. With the primary air system at normal operating pressure (95 - 125 psi (655 - 860 kPa)) and foot brake applied, coat all air line connections and brake pneumatic components with a water and soap solution. Bubbles will indicate an air leak, and none should be permissible. Repair or replace defective parts.
2. Listen for leaks and correct as required.

Redo test to check all items repaired or replaced.

16. BRAKE AIR CHAMBER

16.1 Description

This vehicle is equipped with "Anchorlock" brake chambers on drive and tag axle, used as a service brake chamber, an emergency brake in case of air pressure loss and a spring-applied parking brake. It consists of two separate air chambers, each having its own diaphragm and push rod. Refer to figures 33 and 34.

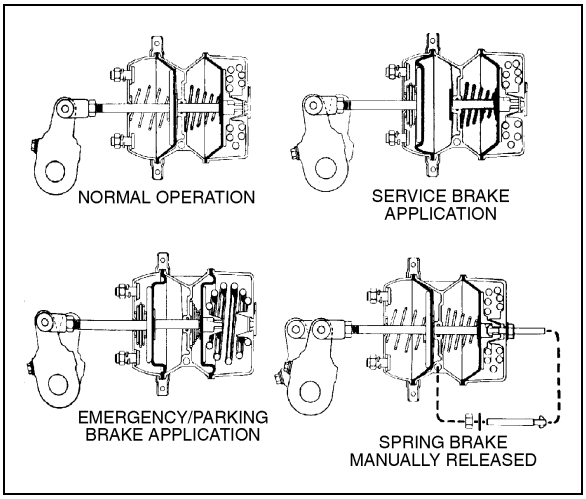

FIGURE 33: DRIVE AND TAG AXLES BRAKE AIR CHAMBERS OPERATION 12047

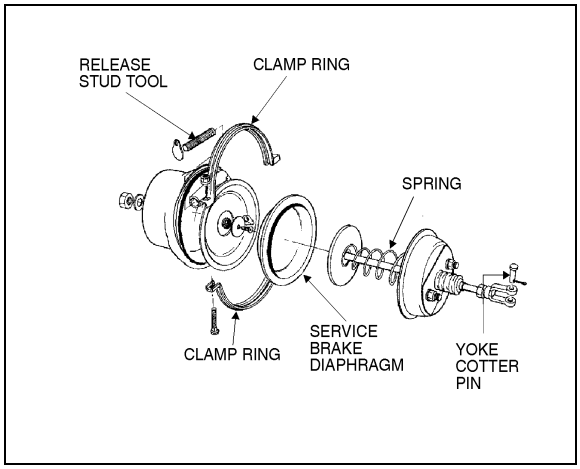

FIGURE 34: DRIVE AND TAG AXLES BRAKE AIR CHAMBERS ASSEMBLY 12081

The front axle is equipped with "Bendix" brake air chambers, used for service brake (Fig. 35).

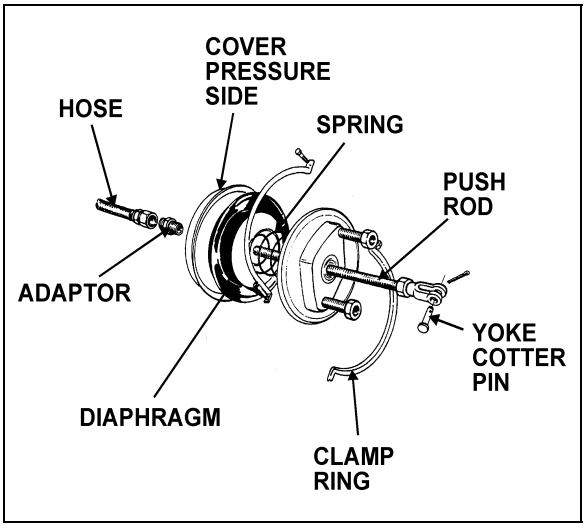

FIGURE 35: FRONT AXLE BRAKE AIR CHAMBER 12082

16.2 Maintenance

16.2.1 Every 6,250 Miles (10 000 km) or twice a year, whichever comes first Depending on Type of Operation

1. Apply brakes and observe that the push rods move out promptly without binding.
2. Release brakes, and observe that the push rods return promptly and without binding to the released position.
3. Check tightness of mounting nuts. Check that cotter pins are in place.
4. Check all hoses and lines. They should be secure and in good condition.

16.2.2 Every 100,000 Miles (160 000 km) or once a year, Whichever comes First Depending on Type of Operation

1. Disassemble and clean all parts.
2. Install new diaphragm or any other part if worn or deteriorated.

Note: ***When the diaphragm, spring, or both are replaced, they should be replaced with the corresponding chamber on the same axle.***

16.2.3 Airtightness Test

1. Make and hold a full brake application.
2. Coat clamping ring(s) with a soapy solution. If leakage is detected, tighten clamping ring only enough to stop leakage. ***Do not overtighten*** as this can distort sealing surface or clamping ring. Coat area around push rod hole (loosen boot if necessary). No leakage is permitted. If leakage is detected, the diaphragm must be replaced.

16.3 Emergency/Parking Brake Manual Release

Warning: ***Never stand in the axis line of the spring brake chambers, especially when caging the spring.***

1. Block the wheels to prevent the vehicle from moving.
2. Remove the release stud tool from its storage place on brake air chamber.
3. Remove the access plug from the end of the spring chamber, then insert the release stud through the opening. Turn the release stud 1/4 turn (clockwise) to anchor it into the spring plate. Install the flat washer and nut, then turn the nut clockwise to cage the spring. Repeat on the opposite side.

Warning: ***Make sure the release stud is properly anchored in spring plate receptacle prior to caging the spring.***

4. To manually reset the emergency/parking brake, turn the nut counterclockwise. Reinstall access plugs on the spring chambers, and release stud tools in their storage places.

16.4 Removal, Installation and Disassembly

16.4.1 Removal

Warning: ***To prevent personal injuries, brakes should be inoperative prior to working on any of their components.***

1. Block the wheels to prevent the vehicle from moving.

2. Safely support vehicle at the recommended body jacking points.

To gain access to a given brake air chamber, the corresponding wheel can be removed (refer to Section 13: *"Wheels, Hubs and Tires"*).

3. Exhaust compressed air from air system by opening the drain valve of each reservoir.
4. For the drive and tag axles (tag axle on some vehicles only) brake chambers, manually release spring brakes (refer to paragraph "*16.3 Emergency/Parking Brake Manual Release"* procedure).
5. Disconnect air line(s) from brake chamber.
6. Remove the cotter pin connecting brake chamber and slack adjuster.
7. Unbolt and remove the brake chamber from vehicle.

16.4.2 Installation

Reverse removal procedure, then check brake adjustment.

Caution: ***Always clean air lines and fittings, and coat pipe threads with teflon pipe sealant before reconnecting air lines.***

16.4.3 Disassembly

Warning: ***Spring brake chambers, on drive and tag axles (tag axle with service and Emergency/Parking brake, on some vehicles only) contain an extremely high compressive force spring, which can possibly cause serious injury if special precautions are not taken when working around this area. To avoid such injury, the following recommendations must be applied:***

1. Prévost recommends the installation of a new spring brake chamber if it is found to be defective.

2. Spring brake chamber maintenance and/or repair must be performed by trained and qualified personnel only.

3. Before manually releasing spring brakes, visually check spring brake for cracks and/or corrosion.

4. On "Anchorlock" brake chambers (drive and on some vehicles tag axles), make sure the release stud is properly anchored in spring plate receptacle prior to caging the spring.

5. Never stand in the axis line of the spring brake chambers, especially when caging the spring.

Warning: ***To prevent personal injury, brakes should be inoperative prior to working on any components.***

1. Block the wheels to prevent the vehicle from moving.
2. Safely support vehicle at the recommended body jacking points.

To gain access to a given brake air chamber, the corresponding wheel can be removed (refer to Section 13: *"Wheels, Hubs and Tires"*).

3. Exhaust compressed air from air system by opening the drain valve of each reservoir.
4. For "Anchorlock" brake chambers, manually release spring brakes (refer to paragraph "*16.3 Emergency/Parking Brake Manual Release"* procedure).
5. Remove clamp ring, and remove and discard the existing diaphragm. Install the new diaphragm squarely on body.
6. Reverse the procedure for assembly. Tap clamp ring to ensure proper seating. Check for proper operation before placing vehicle in service.

17. ANTI-LOCK BRAKING SYSTEM (ABS)

17.1 Description

This device has been designed to ensure stability and steerability of vehicle during braking, and to minimize its stopping distance whatever the road conditions are. On slippery roads and generally in emergency situations, overbraking frequently induces wheel locking. The anti-lock braking system provides maximum braking performance while maintaining adequate steerability on slippery roads.

The ABS continuously monitors the wheel behavior during braking. Sensors on each wheel of front and drive axles transmit data to a four channel electronic processor which senses when any wheel is about to lock. Modulator valves quickly adjust the brake pressure (up to 5 times per second) to prevent wheel locking. Each wheel is therefore controlled according to the grip available between its tire and the road.

With this device, the vehicle is brought to a halt in the shortest possible time, while remaining stable and under the driver's control.

Since the vehicle braking system has dual circuits, the ABS is also provided with a secondary system should a fault develop in the ABS. Anti-lock systems are fail safe. Should the system cut out due to a malfunction, the braking system reverts to normal non anti-lock controlled operation. But since ABS consists of two diagonally related circuits, only the half system which has sustained damage or other fault is switched off (i.e. wheels return to normal non-ABS braking). The other diagonal half remains under full ABS control.

Note: ***ABS is active on service brake, transmission retarder, Jake brake, but is inactive on emergency/parking brake.***

17.2 Troubleshooting and Testing

For troubleshooting and testing of the vehicle's anti-lock braking system, refer to *"Maintenance Manual No. 28: Anti-Lock Brake Systems For Trucks, Tractors and Buses"*, at the end of this section.

18. ABS COMPONENTS

The main components of the ABS system are listed hereafter. Refer to each component for its specific function in the system and its maintenance.

18.1 Electronic Control Unit

18.1.1 Description

This control unit is located in the steering compartment (refer to figure 36 for location of E.C.U. and blinker switch). According to the data transmitted by the sensors (number of pulses/sec is proportional to the speed of each wheel), the electronic control unit determines which wheel is accelerating or decelerating. It then establishes a reference speed (average speed) from each wheel data, and compares the speed of each wheel with this reference speed to determine which wheel is accelerating or decelerating.

As soon as wheel deceleration or wheel slip threshold values are exceeded, the electronic control unit signals a solenoid control valve to limit the excessive brake pressure produced by the driver in the brake chamber.

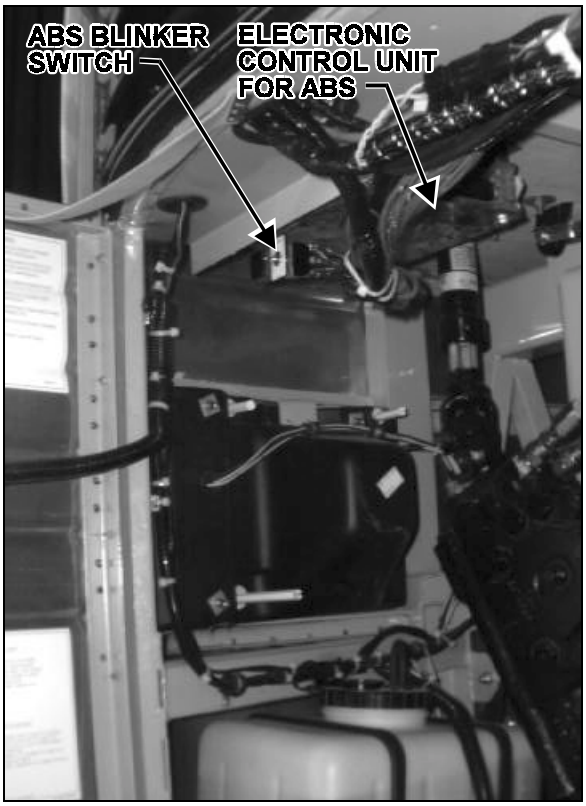

FIGURE 36: STEERING COMPARTMENT 12083

18.1.2 Maintenance

No specific maintenance is required for the electronic control unit. When it is found to be defective, replace it.

Caution: ***In order to protect the ABS electronic control unit from voltage surges, always disconnect its connector before performing any welding procedure on vehicle.***

18.2 ABS Modulator Valve

18.2.1 Description

This ABS system is equipped with four modulator valves, located between the brake chamber and the relay valve or quick release valve (Fig. 37). Note that there is only one solenoid valve controlling the drive and tag axle wheels on the same side.

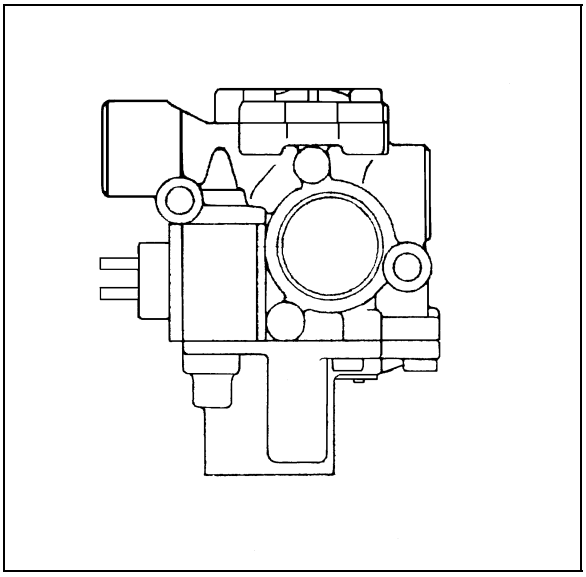

FIGURE 37: ABS MODULATOR VALVE 12084

This is an *"On/Off"* type valve, i.e., at brake application, the valve exhausts air from the brake chamber when the electronic unit senses that the corresponding wheel speed is decressing according to the other wheels.

18.2.2 Maintenance

Like the electronic control unit, no specific maintenance is required for the solenoid control valve.

18.3 Sensors

18.3.1 Description

The sensors are mounted on the front and drive axle wheel hubs (Fig. 38). The inductive sensors consist essentially of a permanent magnet with a round pole pin and a coil. The rotation of the toothed wheel alters the magnetic flux picked up by the coil, producing an alternating voltage, the frequency of which is proportional to the wheel speed. When wheel speed has a tendency to decrease due to the braking coefficient, the magnetic flux produced and sensed afterwards by the electronic control unit will be decreased. Consequently, the electronic control unit will command the solenoid control valve to decrease the pressure at the corresponding brake chamber.

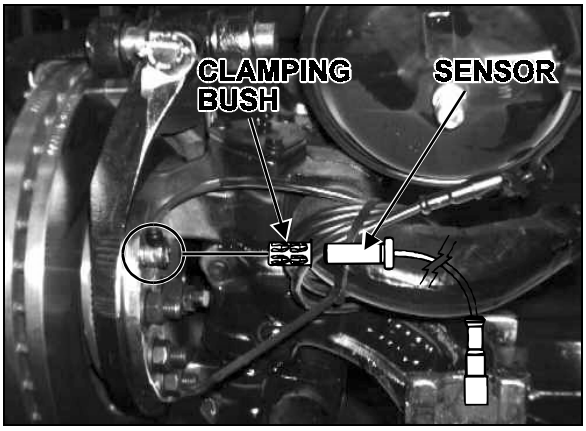

FIGURE 38: ABS SENSOR LOCATION 12085

18.3.2 Maintenance

No specific maintenance is required for sensors, except if the sensors have to be removed for axle servicing. In such a case, sensors should be lubricated with a special grease before their reinstallation. Refer to paragraph *"18.3.3 Installation"* for details.

Note: ***The resistance value, when sensors are checked as a unit, must be equal to 1,75 k ohms. To check the sensors for proper output voltage after the sensors and toothed wheels have been assembled to the axle, connect a suitable AC voltmeter across the output terminals. With the hubs rotating at 30 rpm, the output voltages should read from 50 to 1999 mV to be acceptable.***

18.3.3 Installation

The following procedure deals with sensor installation on the axle wheel hubs. Read procedure carefully before reinstalling a sensor, as its installation must comply with operational tolerances and specifications.

1. Dip clamping bush into the special grease (Prévost part number #680460), press clamping bush and insert in the bushing on hub.

Caution: ***Use only this type of grease on the sensors.***

2. Install sensor inside the clamping bush. Push on assembly to seat it on the pulse wheel. Ensure mounting is rigid, as it is an important criterion for an adequate sensor operation.

Note: ***This installation should be of the "press fit" type.***

18.4 Clamping Bush

18.4.1 Description

The clamping bush retains the sensor in its mounting bracket close to the toothed pulse wheel. The gap between the sensor end and teeth is set automatically by pushing the sensor in its bush hard up against the pole wheel, and the latter knocks back the sensor to its adjusted position (Fig. 39).

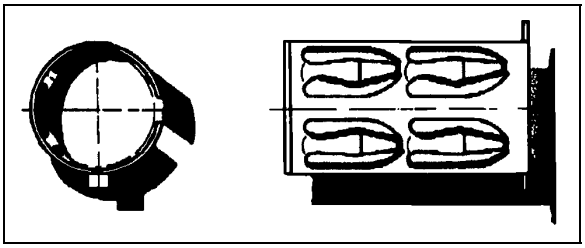

FIGURE 39: CLAMPING BUSH 12052

18.4.2 Maintenance

The clamping bush requires no specific maintenance.

19. FITTING TIGHTENING TORQUES

1. 45° Flare and Inverted Flare: Tighten assembly with a wrench until a solid feeling is encountered. From that point, tighten 1/6 turn (Fig. 40).

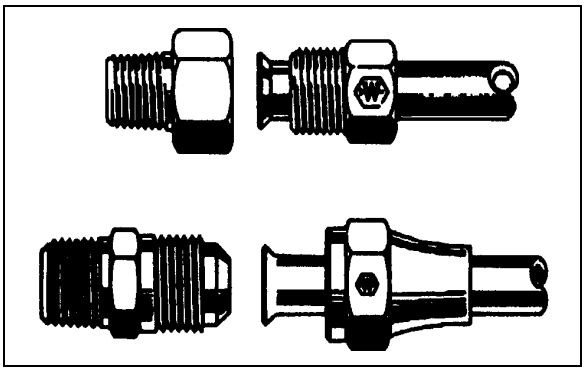

FIGURE 40: HOSE FITTINGS 12053

2. Compression: Tighten nut hand tight (Fig. 41). From that point, tighten with a wrench the number of turns indicated in the chart hereafter.

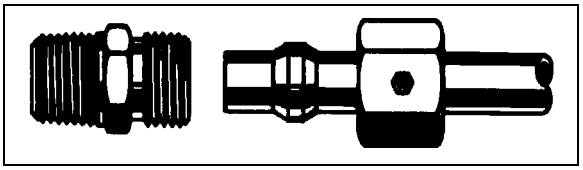

FIGURE 41: HOSE FITTING 12054

Fitting size	Pipe diameter (inch)	Number of additional turns required following manual tightening
2	1/8	1 1/4
3	3/16	1 1/4
4	1/4	1 1/4
5	5/16	1 3/4
6	3/8	2 1/4
8	1/2	2 1/4
10	5/8	2 1/4
12	3/4	2 1/4
16	1	2 1/4

3. NTA-type Plastic Tubing: Tighten nut hand tight (Fig. 42). From that point, tighten with a wrench the number of turns indicated in the chart hereafter.

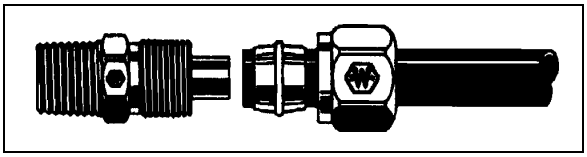

FIGURE 42: HOSE FITTING 12055

Tubing diameter (inch)	Number of additional turns required following manual tightening
1/4	3
3/8 to 1/2	4
5/8 to 3/4	3 1/2

4. AB-type Copper Piping: Tighten nut hand tight (Fig. 43). From that point, tighten with a wrench the number of turns indicated in the chart hereafter.

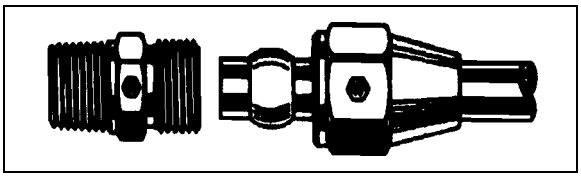

FIGURE 43: HOSE FITTING 12056

Piping diameter (inch)	Number of additional turns required following manual tightening
1/4, 3/8, 1/2	2
5/8, 3/4	3

5. Piping Tightening: All connections must be hand tightened. From that point, tighten a minimum of 2 1/2 additional turns.

Note: ***Use pipe sealant Loctite (Prévost number 680098) for sealed pipe thread.***

20. SPECIFICATIONS

AIR COMPRESSOR
Make.....Bendix Westinghouse
Model..... Tu-Flo 750
Capacity (at 1250 rpm) ....16.5 cfm (0,467 m^3/min.)
Supplier number.....107812
Prévost number.....641190

GOVERNOR
Make.....Bendix Westinghouse
Model..... D-2
Cut-in pressure .....95-105 psi (655-724 kPa)
Cutout pressure .....120-125 psi (827-861 kPa)
Supplier number.....284358
Prévost number.....640964

FLIP-FLOP CONTROL VALVE
Make ..... Bendix Westinghouse
Model TW-1
Type .....On-Off
Supplier number 229635
Prévost number 640136

EMERGENCY/PARKING BRAKE CONTROL VALVE
Make ..... Bendix Westinghouse
Model PP-1
Automatic release pressure
..... 40 psi (275 kPa) nominal
Supplier number 287325
Prévost number 641128

EMERGENCY/PARKING BRAKE OVERRULE CONTROL VALVE
Make ..... Bendix Westinghouse
Model RD-3
Supplier number 281481
Prévost number 640472

DUAL BRAKE APPLICATION VALVE
Make ..... Bendix Westinghouse
Model E-15
Supplier number 109174
Prévost number 641257

STOPLIGHT SWITCHES/PARKING BRAKE ALARM SWITCH
Make ..... Bendix Westinghouse
Model SL-5
Contact close (ascending pressure)
..... 4 psi and more (28 kPa)
Supplier number 286392
Prévost number 640852

STOPLIGHT SWITCHES
Make ..... A.C. Delco
Contact close (ascending pressure)
..... 2-4 psi (14-28 kPa)
Supplier number 1506713
Prévost number 562052

BRAKE RELAY VALVES
Make ..... Bendix Westinghouse
Model R-12
Supplier number 102852
Prévost number 641088

QUICK RELEASE VALVE
Make ..... Bendix Westinghouse
Model QR-1
Supplier number 229859

Prévost number.....641014

SPRING BRAKE VALVE
Make.....Bendix Westinghouse
Model.....SR-1
Supplier number.....286364
Prévost number.....640870

PRESSURE PROTECTION VALVE
Make.....Bendix Westinghouse
Model.....PR-2
Nominal closing pressure .....75 psi (517 kPa)
Supplier number.....277226
Prévost number.....640439

LOW PRESSURE INDICATORS
Make.....Bendix Westinghouse
Model..... LP-3
Contact close .....66 psi (455 kPa)
Supplier number.....277227
Prévost number.....640975

Make.....Bendix Westinghouse
Model..... LP-3
Contact close .....30 psi (207 kPa)
Supplier number.....276599
Prévost number.....641174

SHUTTLE-TYPE DOUBLE CHECK VALVE
Make.....Bendix Westinghouse
Model.....DC-4
Supplier number.....277988
Prévost number.....641015

AIR DRYER
Make.....Rockwell Wabco
Model..... System Saver 1000
Heater consumption.....100 watts
Supplier number..... RWABK-095
Prévost number.....641337
Desiccant cartridge kit supplier number
..... R950011
Desiccant cartridge kit Prévost number
.....641278

AIR PRESSURE REGULATOR
Make.....Williams Air Controls
Adjustable output range
.....0-80/85 psi (0-552/586 kPa)
Recommended pressure setting
.....75 psi (517 kPa)
Supplier number.....WM-279-1
Prévost number.....640938

AIR FILTER ELEMENT
Make ..... Bendix
Model .....Type E
Type .....with manual drain
Supplier number 221053
Prévost number 640073

FRONT AXLE BRAKE CHAMBERS
Make ..... Bendix Westinghouse
Type 30
Supplier number 288014
Prévost number 641253

DRIVE AXLE BRAKE CHAMBERS
Make ..... Anchorlock division
Type ..... 30 as service -36 as emergency
Supplier number 3036GC164318
Prévost number 641181

TAG AXLE BRAKE CHAMBERS
Make ..... Bendix Westinghouse
Type .....16 as service
Supplier number 109832
Prévost number 641320
Piggy Back
Make ..... Neway Anchorlock
Type ..... 24 as emergency
Supplier number 1624GP
Prévost number 641250

FRONT AXLE BRAKE LINING
Make .....Rockwell
Supplier number 15615PM
Prévost number 621371

DRIVE AXLE BRAKE LINING
Make .....Rockwell
STANDARD SIZE
Supplier number ..... EX4592 AD
Prévost number 641086
1-X
Supplier number .....EX4592 ADX
Prévost number 641087
2-X
Supplier number ..... EX4592 ADXX
Prévost number 641225
3-X
Supplier number .....EX4592 ADXXX
Prévost number 641226

TAG AXLE BRAKE LINING
Make .....Rockwell
Supplier number 15615PM
Prévost number 621371

FRONT AXLE AUTOMATIC SLACK ADJUSTER

Make.....Rockwell
Supplier number, R.H. side A43 3275A1145S
L.H. side A43 3275Z1144S
Prévost number, R.H. side 610880
L.H. side 610881

Make.....Haldex Corporation
Supplier number.....419-10586
Prévost number.....641266

DRIVE AXLE AUTOMATIC SLACK ADJUSTER
Make.....Rockwell
Supplier number, R.H. side A2-3275-P-1160S
L.H. side A2-3275-N-1158S
Prévost number, R.H. side 641273
L.H. side 641272

Make.....Haldex Corporation
Supplier number.....419-10585
Prévost number.....621523

TAG AXLE AUTOMATIC SLACK ADJUSTER
Make.....Rockwell
Supplier number.....A22-3275-H-1152S
Prévost number.....641314

Make.....Haldex Corporation
Supplier number.....419-10586
Prévost number.....641266

ABS ANTILOCK BRAKING SYSTEM (if applicable)

ABS MODULATOR VALVE
Make.....Rockwell Wabco
Voltage .....24 V
Supplier number.....472 195 006 0
Prévost number.....641097

SENSOR
Supplier number.....441 032 576 0
Prévost number.....641095