

DIESEL MECHANIC



MINING QUALIFICATIONS AUTHORITY

CODE: AAB

MAINTAIN AIR ASSISTED

BRAKES

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OBJECTIVE:

- Diagnose faults, replace faulty parts and maintain an air assisted brake system.

What you will be given

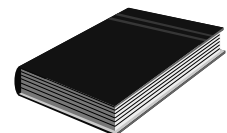
- A vehicle fitted with an air assisted brake system.
- All the necessary tools and equipment.
- A display board of an air assisted brake system.

What you must do

- State the functions of all the valves and related equipment in the brake system.
- Indicate the flow of air on a schematic diagram of the brake system when:
 - The foot brake pedal is depressed and the front brake boosters come into operation.
 - The foot brake pedal is depressed and the rear brake boosters come into operation.
 - The hand brake is applied.

How well you must do it

- The system must be connected up correctly.
- All faults must be correctly diagnosed.
- All faulty parts must be removed and replaced with parts that are in working order.
- The maintenance check list must be completed.
- The functions of the valves and related equipment must be correctly given.
- The flow of air must be correctly indicated for all the braking positions.



ADDITIONAL RESOURCES:

- A demonstration by a competent person e.g. your training officer.
- Workshop manual.
- Audio visual material, if available.

HAZARD IDENTIFICATION AND CONTROL (HIAC) FORM**AAB****MAINTAIN AIR ASSISTED BRAKES**

STEPS IN OPERATION / PROCESS	POTENTIAL ACCIDENT / INCIDENT	CONTROLS (BY RESPONSIBLE PERSON)
<ul style="list-style-type: none"> • Stored energy • Use hand tools • Work on vehicle • Jacking up vehicle 	<ul style="list-style-type: none"> • Compressed air • Spring loaded brake booster • Using damaged tools or wrong tools for the job can cause injury and damage to equipment. • Working on moving equipment can cause serious injury. • Improperly jacked up vehicle can fall and cause injury and damage to vehicle. 	<ul style="list-style-type: none"> • Release all air pressure • OEM requirements • Always use the correct tool for the job. • Ensure tools are in good condition. • Use tools correctly. • Wear appropriate PPE where necessary. • Always take good care of tools. Maintain, clean and store it properly. • Make sure that vehicle is stationary, switched off and locked out (if applicable). • Ensure vehicle stands level surface. • Install stop blocks behind and in front of wheels. • Ensure correct capacity jack is used. • In stall correct type and capacity stands under axles.

NOTE: Before doing the practical work contained in this module, the learner must study the content of the above HIAC form again and then sign the statement below.

The above risks, which will be encountered in this module, are fully understood and will be controlled during the practical work.

Signature of Learner: _____

Signature of Training Officer: _____

Date: _____

MAINTENANCE CHECK LIST		
	YES	NO
Compressor air filter clean		
Air inlet pipe cracked or damaged		
Flexible hose between compressor and un-loader valve cracked or damaged		
Un-loader valve set correctly (See workshop manual)		
Un-loader valve exhaust port shows signs of oil		
The air pressure gauge in the cab shows that both circuits are operating correctly		
The warning light/buzzer (if fitted) operates when the system is bled		
The air receivers mounted securely		
The water drains are at the lowest points on the receivers		
The air drained from the receivers free from contamination		
The foot brake pedal free play correct (See workshop manual)		
The foot brake valve registers full air pressure on the master pressure gauge when the foot brake pedal is fully depressed		
All pipes and fittings tight		
All valves secure		
All boosters secure		
Air leaks		
Air hoses routed correctly		

1. MAINTAIN AIR ASSISTED BRAKES

ITEM / TASK: Introduction

DESCRIPTION:

Because of their size, mass and the heavy loads they carry, earth moving vehicles, heavy trucks and trucks towing trailers must have some form of power assistance to improve their braking capability.

Air pressure or hydraulic pressure or a combination of both should be used on heavy vehicles to provide the power assistance needed. Most heavy duty vehicles however use air pressure.

The advantages of using a full air system rather than a hydraulic or combination system are that it is:

- a) Cleaner when leaks occur in the system, and
- b) Easier to connect and disconnect the power source between the horse and the trailer.

A system of valves ensure that air pressure is immediately available to apply brakes when a signal is given by the driver. The amount of the air pressure to the brakes will depend on the strength of the signal. The air pressures given in the text of this module will not necessarily apply to all air assisted brake systems and the workshop manual for a particular system will have to be consulted.

In order to simplify the circuit, it will be sub-divided into five basic pneumatic circuits, namely:

- a) Feed system
- b) Front service brakes
- c) Rear service brakes
- d) Hand brakes
- e) Trailer brake

2. THE FEED SYSTEM

ITEM / TASK: Feed System

DESCRIPTION:

The compressor draws air from the atmosphere. After the air is compressed it passes through the un-loader valve, which regulates the operating pressure in the braking system.

From the un-loader valve the air under compression goes to the four circuit protection valve, each of which leads to a receiver (storage tank).

These receivers supply air to different axles.

Each receiver is equipped with a drain valve, either manually or automatically operated to drain any condensed water that may accumulate in it.

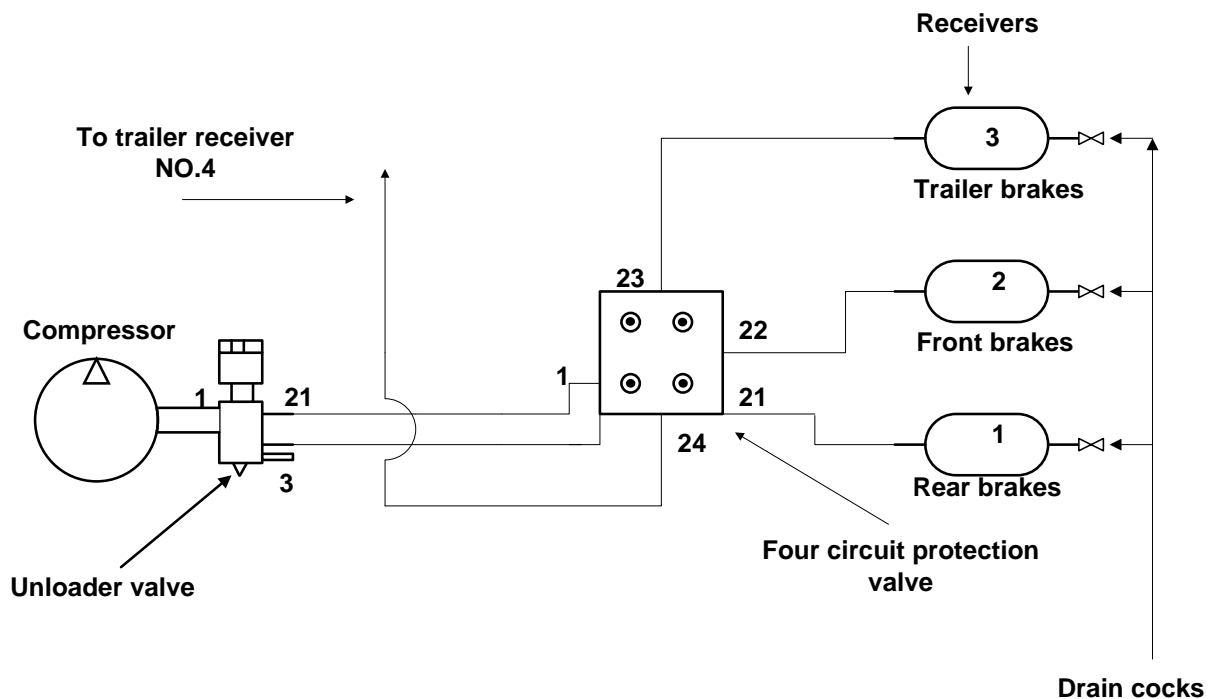


Fig. 1

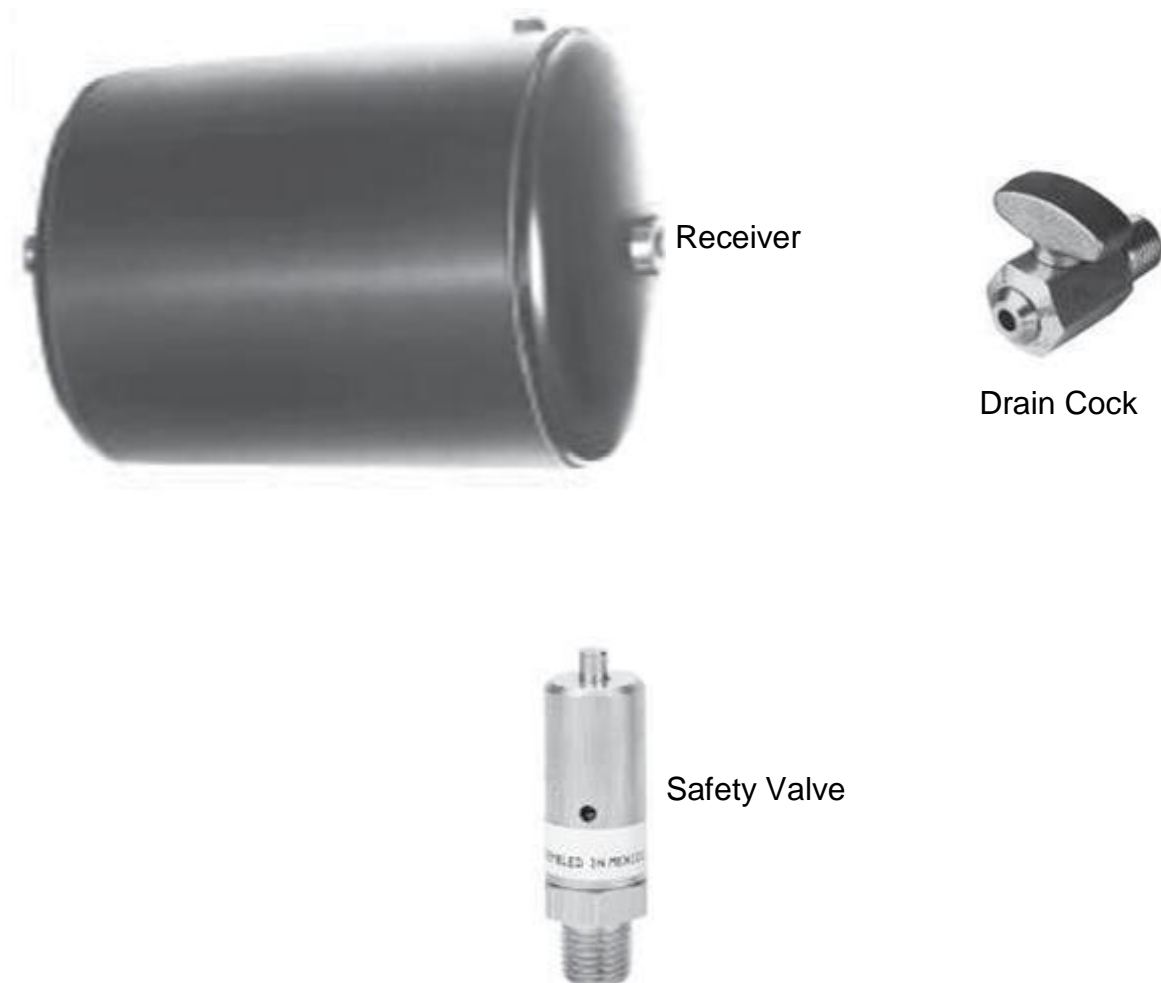


Fig. 2

3. THE COMPRESSOR

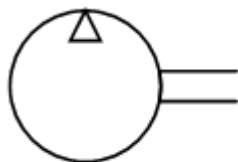
ITEM / TASK: The Compressor

DESCRIPTION:

The compressor used, as shown in Fig. 3, is a single stage reciprocating type and is driven directly by the vehicle engine.



Fig. 3



Drawing Symbol

Fig. 4

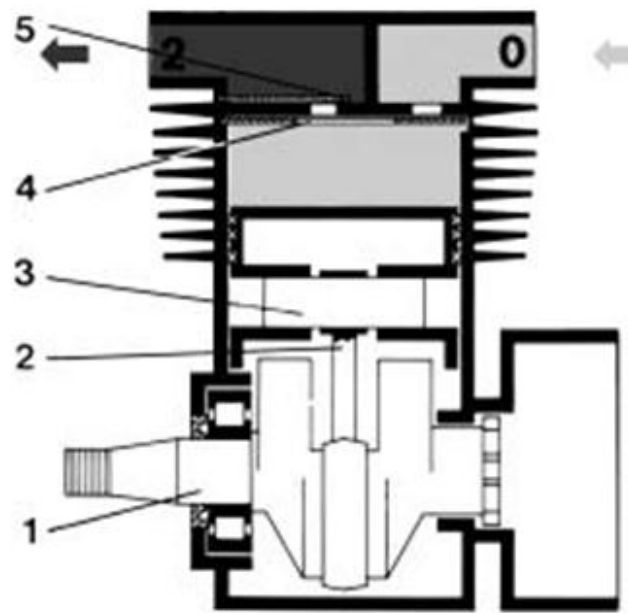


Fig. 5

The compressor is driven by the engine via a V-belt and a V-belt pulley or a toothed wheel. The crankshaft (1) connected with the piston (3) via the connecting rod (2) controls the piston (3) from the upper to the bottom dead centre (or vice versa). As the piston (3) moves downwards, valve (4) opens as a consequence of the ensuing suction. Through an upstream filter the compressor takes in air. When the bottom dead centre has been reached, the valve (4) closes. The air taken in is compressed by the subsequent upward motion of the piston (3). The compression pressure opens the valve (5) and the compressed air generated reaches the connected air reservoirs via the components of the air compression system.

4. THE UN-LOADER VALVE

ITEM / TASK: The Un-loader Valve

DESCRIPTION:

The un-loader valve is designed to protect the system against excessive pressure and also to clean the air supplied from the compressor by filtering out any oil and oil carbon particles that may be present. It also controls the pressure in the circuit at about 700 kPa.

- **Filling Function**

The air supplied by the compressor, enters the valve through the inlet port and flows through a filter where the oil and oil carbon particles are separated from the compressor air. From there the filtered air flows to a chamber below the filter where it forces open a valve cone to flow through the four circuit protection valve and into the receivers.



Air drier

Fig. 6

- **Unloading Function**

When the pre-set cut-out pressure is reached, the air pressure in the valve will overcome the tensions of the various springs in the valve. The outlet port to the four circuit protection valve will close and the passage to the discharge port will open to allow the excess compressed air from the compressor to escape to atmosphere.

Air from the compressor will continue discharging until the pressure in the system has dropped to below the pre-set cut-out pressure. When the pressure has dropped sufficiently, the spring tensions will overcome the pressure remaining in the valve, the discharge port will close, the outlet port to the for circuit protection valve will again be delivered to the receivers.

The un-loader valve shown in Fig. 7 is only one of the many types.

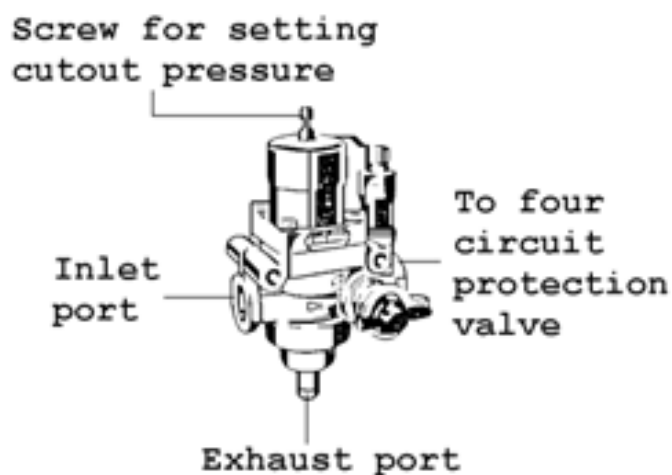


Fig. 7

The symbol for a un-loader valve is shown in Fig. 8.

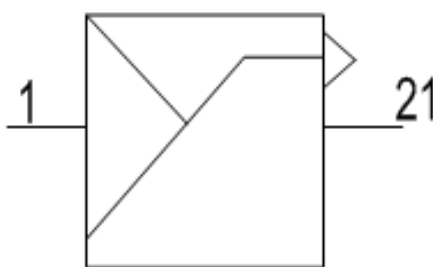


Fig. 8

Functional symbol Fig.9

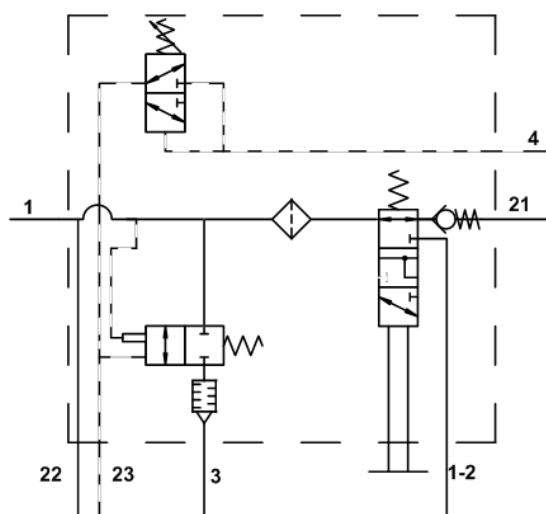


Fig.9

5. THE FOUR CIRCUIT PROTECTION VALVE

ITEM / TASK: The Four Circuit Protection Valve

DESCRIPTION:

Four circuit means four independent circuits on the same chassis. Each of these circuits operate on a separate axle. In the event of a failure the four circuit protection valve will protect the remaining circuits from the defective circuit. It will also supply air to the priority circuit first eg. the foot brakes (service brakes).

Fig. 10 shows a view of one type of four circuit protection valve.

The detailed symbol for the four circuit protection valve is shown in Fig. 10.

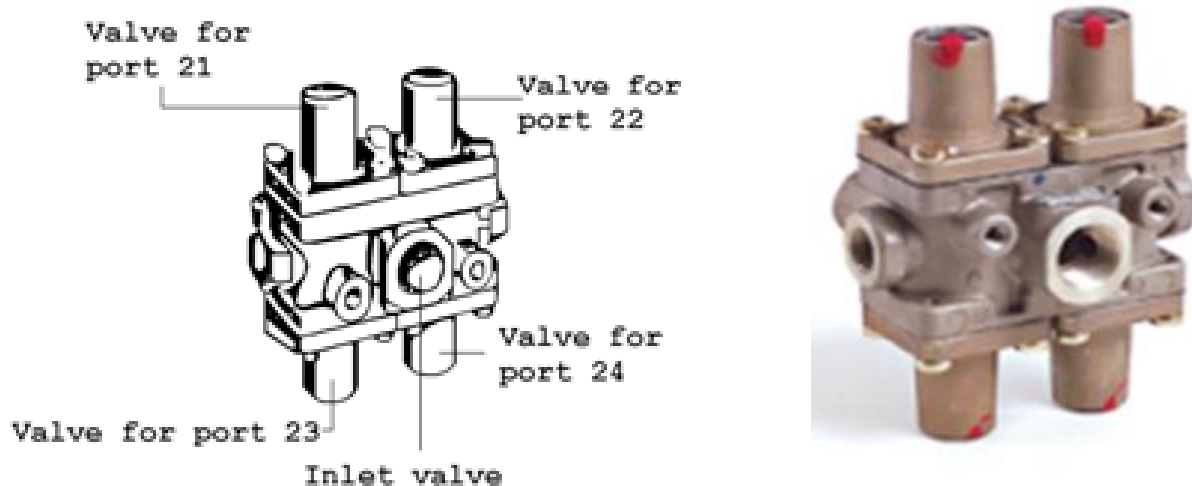


Fig. 10

The simplified symbol is shown in Fig.11.
See Figures 10, 11, 12.

Functional symbol

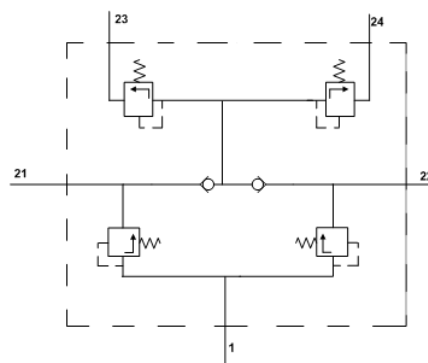


Fig.11

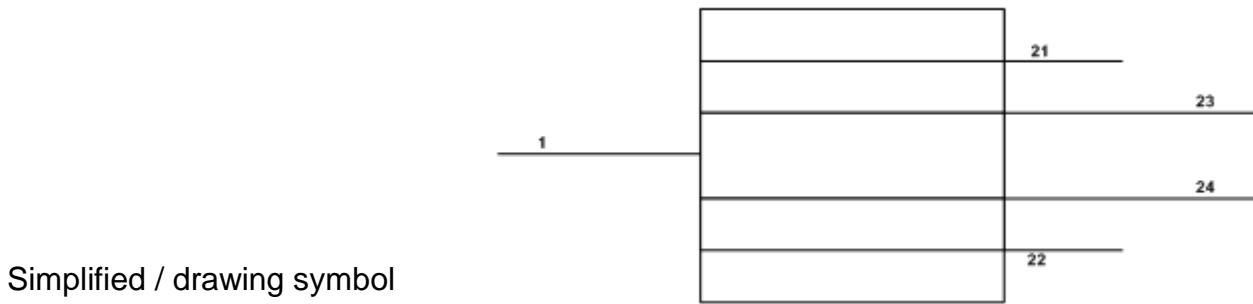


Fig. 12

- **Function**

The four circuit protection valve is really four separate valves in a single body. The valves are coupled in pairs, with one set feeding the receivers of the service brake circuits through ports 21 and 22, while the other set feeds the receivers of the hand brake and auxiliary circuits through ports 23 and 24. The supply air enters the valve through a common port, port No. 1.

- **Failure of a circuit**

Should there be a severe drop in pressure in any one of the circuits due to an air leak, the pressure sensing ability of the valve for that particular circuit will close off the port for that circuit and enable the continued safe operation of the vehicle.

6. VALVE PORT ABBREVIATIONS BY NUMBERS

ITEM / TASK: Valve Port Abbreviations by Numbers

DESCRIPTION:

All the ports of the valves used in the air brake system are identified by the numbers stamped on the port (Fig. 13).

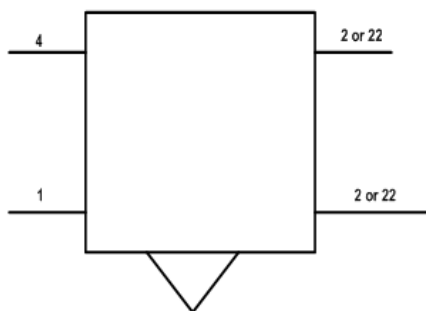


Fig. 13

The first number indicates the type of line:

- | | | |
|---|---|---------------------|
| 1 | - | Supply Line |
| 2 | - | Delivery Line |
| 3 | - | Vent Line |
| 4 | - | Control Signal Line |

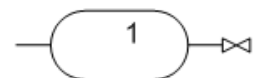
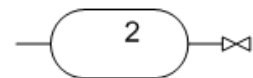
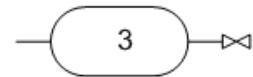
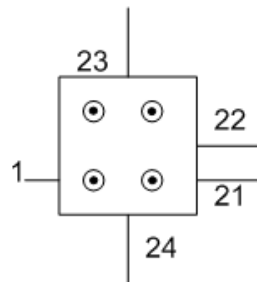
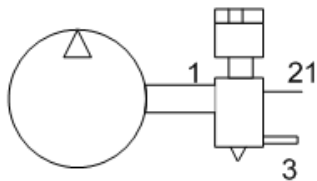
The second number indicates the circuit, egg 21 means delivery line for circuit No 1, 22 means delivery line for circuit No 2, etc.

GO ON TO THE NEXT PAGE FOR THE PRACTICE

SELF TEST 1



1. Name and complete the following circuit:



2. Describe the functions of the following:

i) Compressor

ii) Un-loader valve

iii) Four circuit protection valve

iv) Receiver

3) Identify the following on the vehicle or air brake trailer:

- i) Compressor,
- li) Un-Loader Valve, and
- lii) Four Circuit Protection Valve.
- Iv) Receiver

Call your training officer to check your work and ask him to sign you off when it is correct, before you go on to the next section.

LEARNER	TRAINING OFFICER
DATE :	DATE :
SIGNATURE :	SIGNATURE :

7. SERVICE BRAKES

ITEM / TASK: Front Service Brakes

DESCRIPTION:

The service brakes operate on both front and the rear axles of the vehicle. The brakes are applied by depressing the foot brake pedal to activate the dual-circuit foot valve. The braking force is dependant on the air pressure that passes through the foot valve. Full application of the foot brake pedal will allow full receiver pressure to reach the brake boosters. Partial foot brake pedal application will only allow a corresponding reduced pressure to be delivered to the boosters.

- Front service brakes (Fig. 14)

The front service brake circuit consists of

- Dual-circuit foot brake valve.
- Single chamber brake boosters.
- Brake drums and shoes.

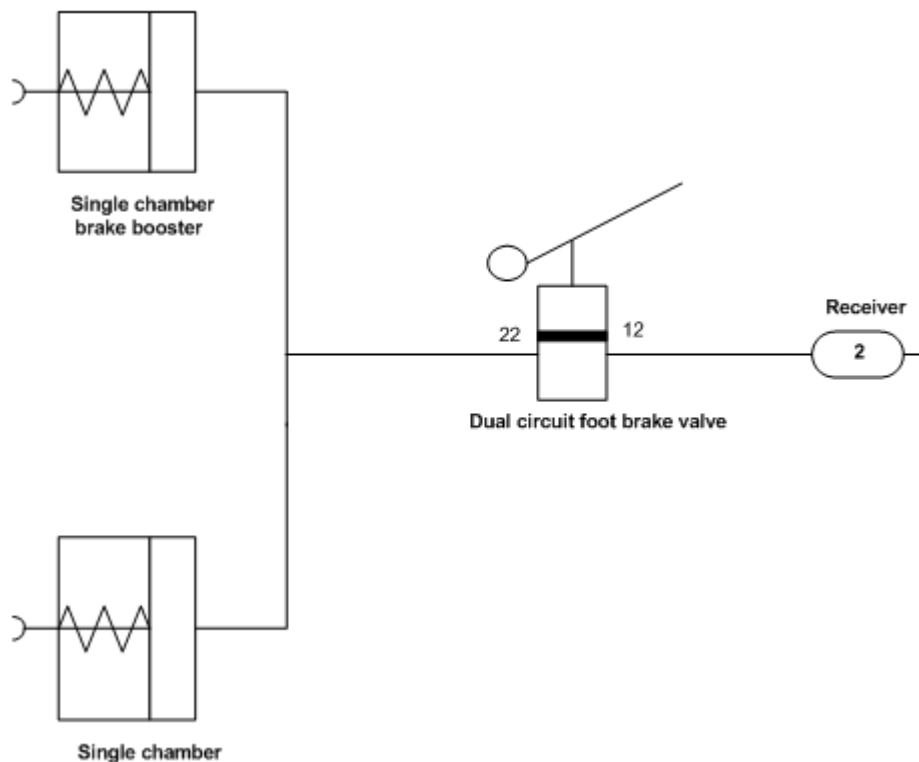


Fig. 14

- Dual-Circuit foot brake valve

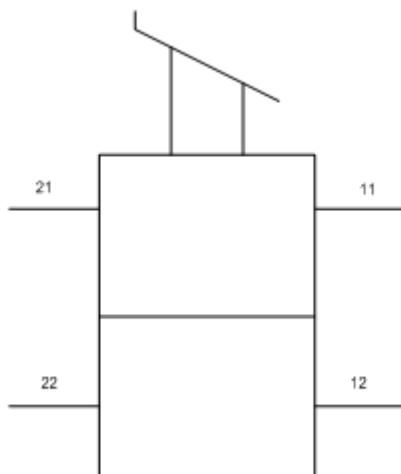
The dual-circuit foot valve allows for the gradual application of brakes on both the front and rear axles of the vehicle. This gradual pressure control is from zero to 700kPa.

If one of the valves in the dual-circuit foot valve should fail, it would not affect the other valve and the vehicle could still be brought to a safe stop.

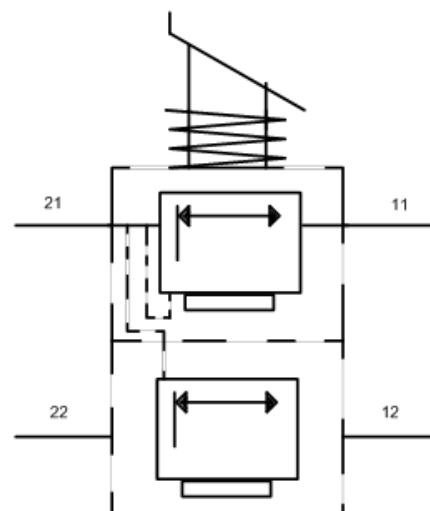
The symbol for a foot brake valve is shown in Fig.16.



Fig.15



Drawing Symbol



Functional symbol

Fig.16

- Single chamber brake booster (Fig.17)

The single chamber booster can only apply the brakes when the chamber is pressurised to enable the diaphragm to compress the spring in the booster. When the chamber is vented the spring in the booster will release the brakes.

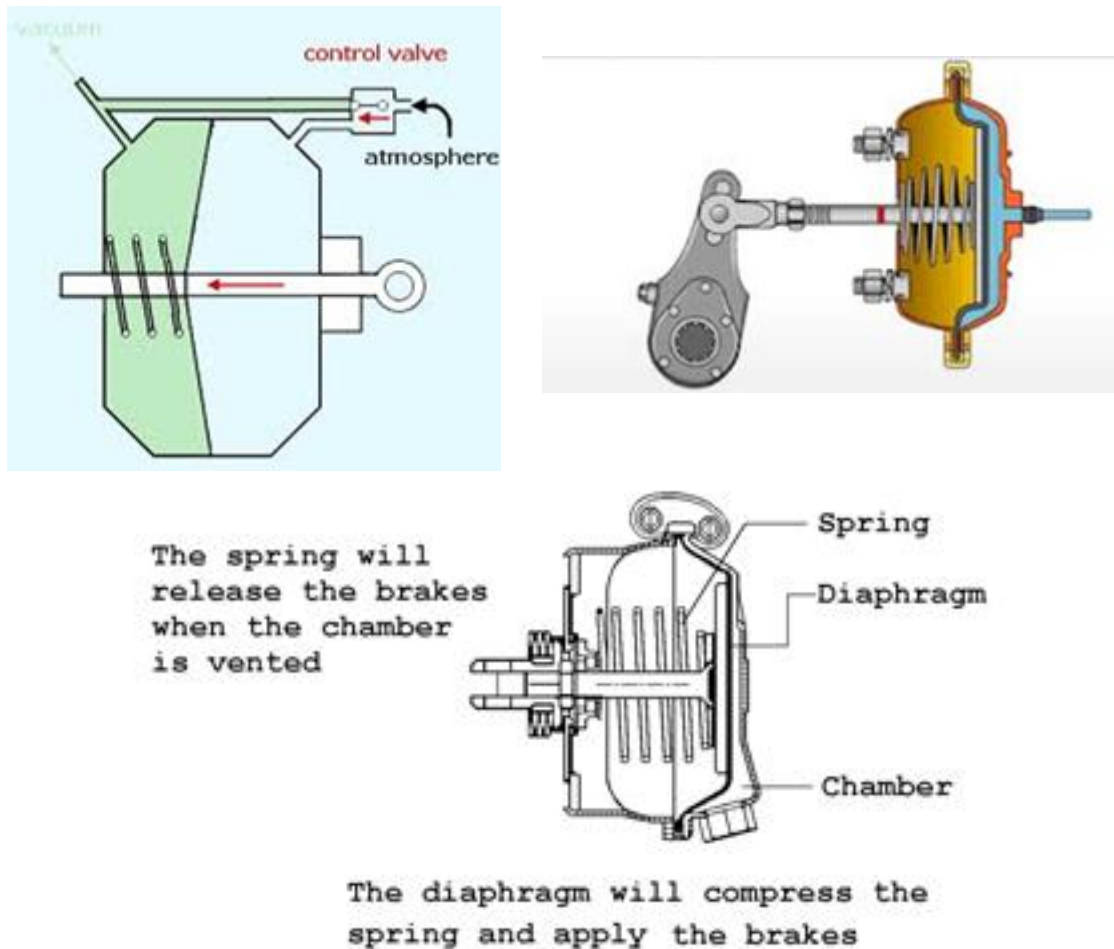


Fig.17

- Brake drums and shoes

The swivelling action of the "S" cams activated by the brake booster piston-rod, expands the brake shoes inside the brake drum to produce the friction that causes the braking of the vehicle. (Fig. 18) **ON THE NEXT PAGE.**

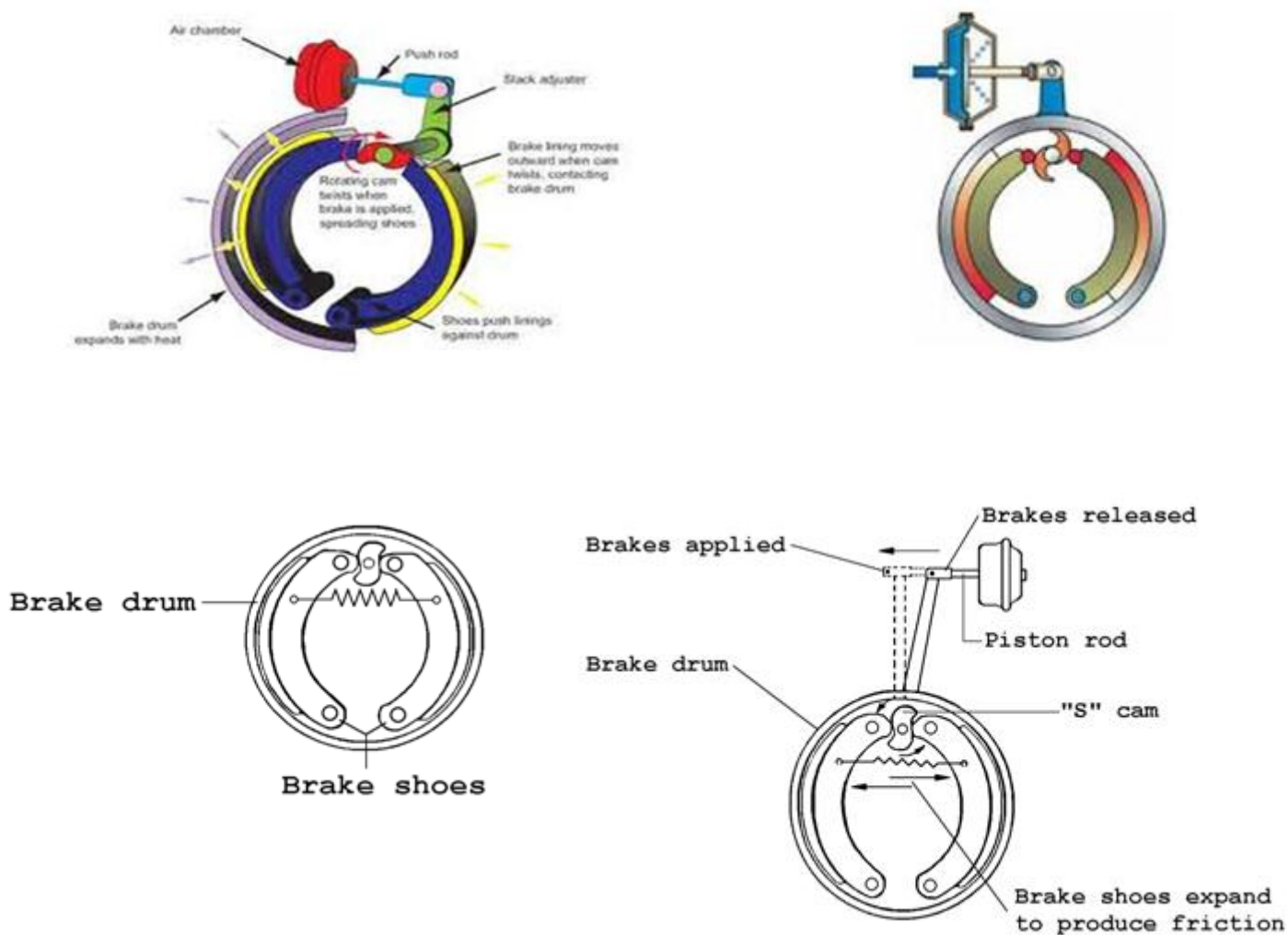


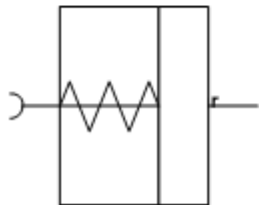
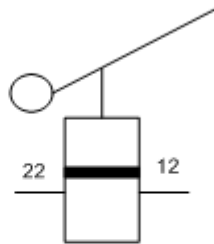
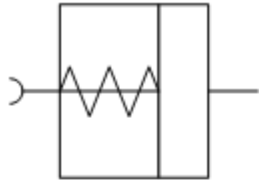
Fig. 18

GO TO THE NEXT PAGE AND DO THE SELF TEST

SELF TEST 2



1. Name and complete the diagram without referring to your notes.



2. Name the components of the front service brake system?

3. Describe the function of the single chamber brake booster.

4. Identify the foot brake valve and the front brake boosters on the air brake simulator/component.

Call your training officer to check your work and ask him to sign you off when it is correct, before you go on to the next section.

LEARNER	TRAINING OFFICER
DATE :	DATE :
SIGNATURE :	SIGNATURE :

8. REAR SERVICE BRAKES

ITEM / TASK: Rear Service Brakes

DESCRIPTION:

In the rear service brake circuit, the receiver is mounted as close as possible to the rear brake boosters. This is done to eliminate the drop in pressure and time delay that would occur in brake application, if the pipe line was very long.

The rear brake circuit consists of the following:

- Dual-circuit foot brake valve.
- Relay valve.
- Automatic load sensing valve.
- Double chamber brake boosters.
- Brake drums and shoes.

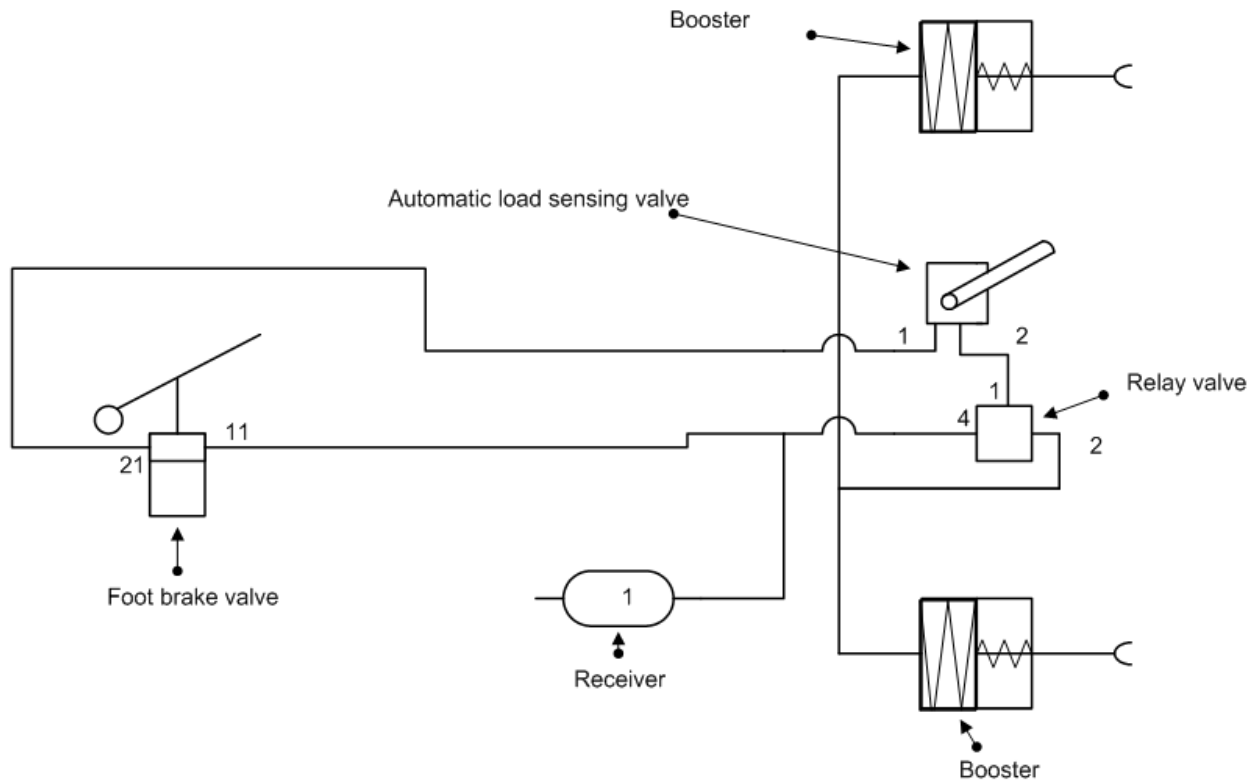


Fig. 19

- Dual-circuit foot brake valve.

The same as previously discussed

➤ Relay valve

The main functions of the relay valve are to speed-up brake application and the release of the large volume of air in the booster chambers.

The relay valve reacts to the signals received from the dual-circuit foot brake valve on when to open or close the port which supplies air flow to the booster.

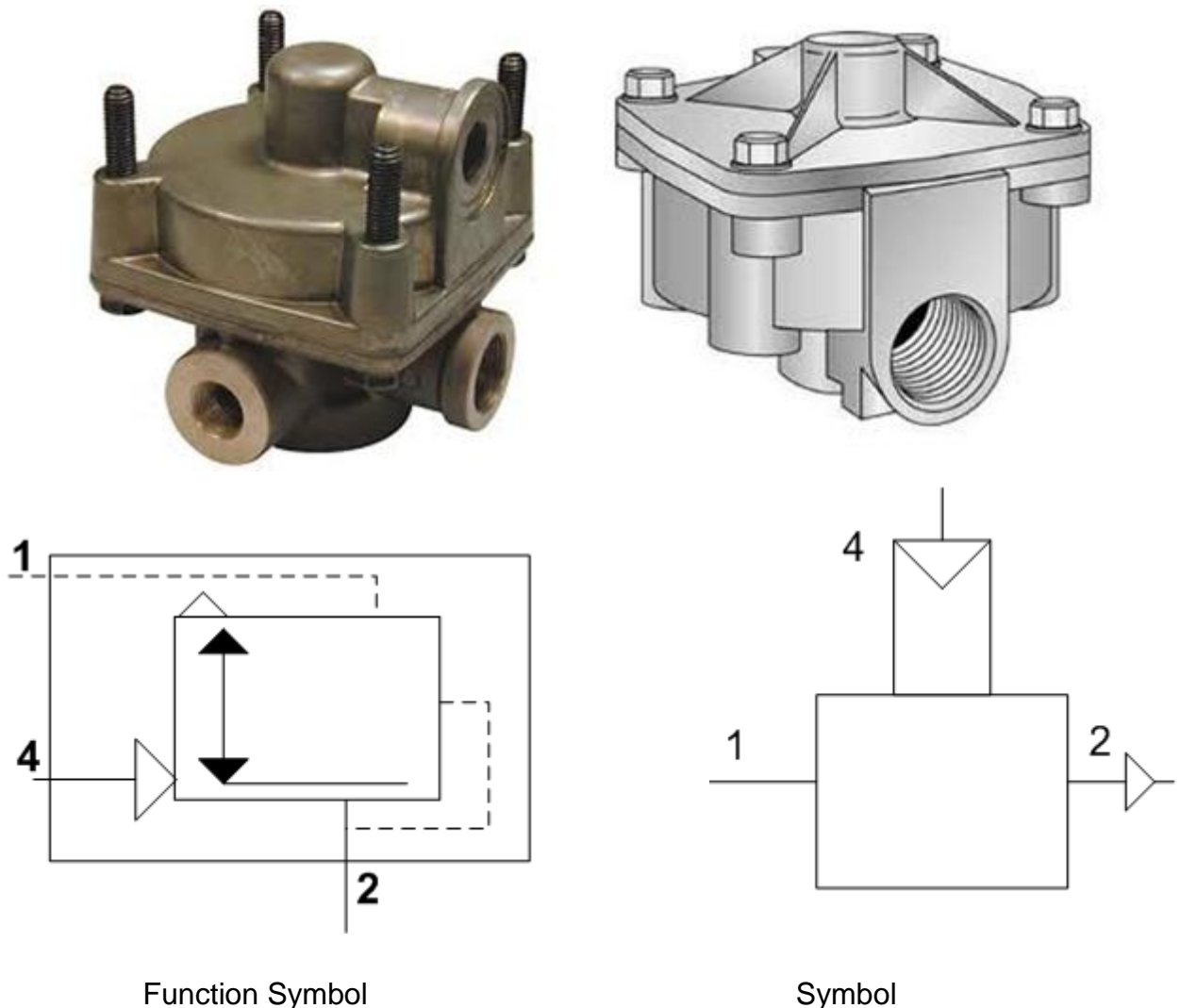


Fig .20

➤ Automatic load sensing valve

The signal sent out by the dual-circuit foot brake valve to the brakes, is received by the load sensing valve at the same time as the relay valve.

The main function of the load sensing valve is to automatically regulate the pressure released by the receiver to the boosters, according to the loaded condition of the vehicle.

If the connecting linkage between the load sensing valve and the axle should break, the valve will be adjusted to the full-load position by a tension spring. If the brakes were then applied, full or maximum pressure would be released from the receiver to the rear brake boosters.

Fig. 21 shows the symbol for a load sensing valve.

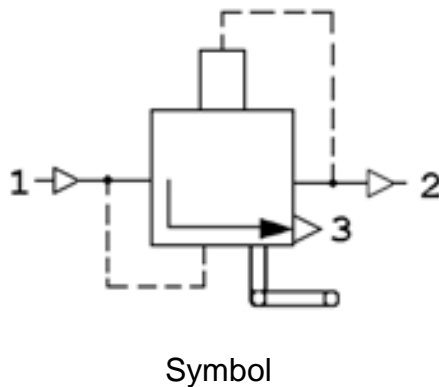
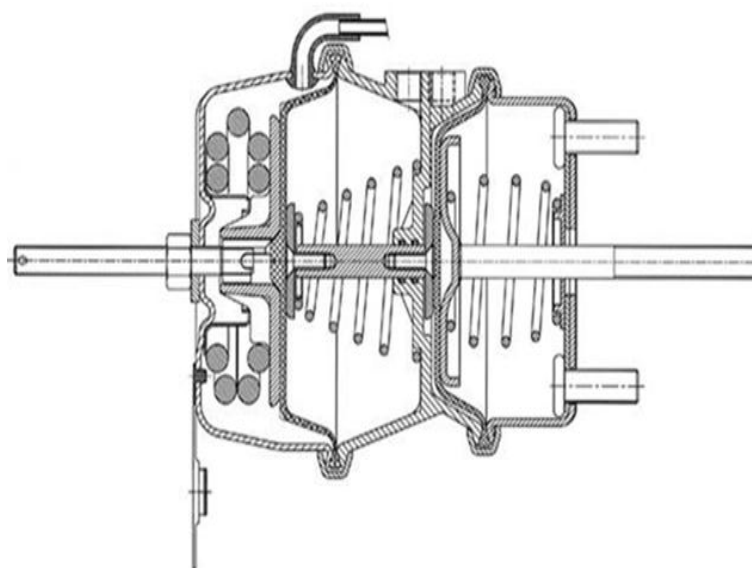


Fig. 21

➤ Double chamber brake booster (Fig 22).

As the name suggests, the double chamber brake booster consists of two chambers. Chamber "b" on the left applies the hand brake/emergency brake and will be explained in the section "Hand Brake".

Chamber "A" on the right applies the rear service brakes when it is pressurised at the same time that the front service brakes are applied. The chambers are in fact cylinders in this booster and pistons in the cylinders apply the brakes as opposed to the diaphragm in the single chamber booster.



Hand brakes released when
this chamber is pressurised

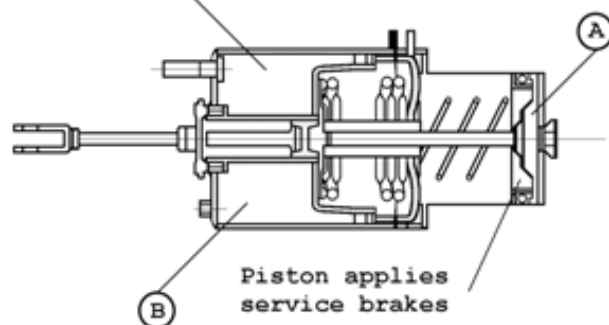


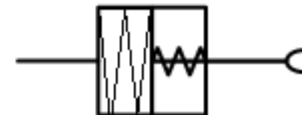
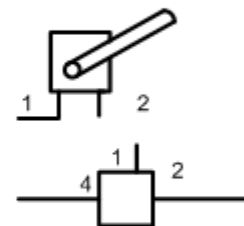
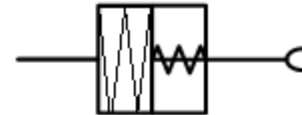
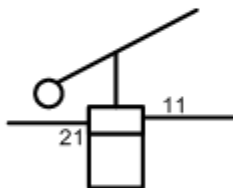
Fig 22

GO ON TO THE NEXT PAGE FOR THE SELF TEST.

SELF TEST 3



1. Without referring to your notes complete the circuit and name the components below.



2. Describe the function of:

i) Relay Valve

ii) Automatic Load Sensing Valve.

3. Identify the relay valve, the automatic load sensing valve and the double chamber brake boosters on the vehicle or air brake simulator.

Call your training officer to check your work and ask him to sign you off when it is correct, before you go on to the next section.

LEARNER	TRAINING OFFICER
DATE :	DATE :
SIGNATURE :	SIGNATURE :

9. HAND BRAKE

ITEM / TASK: Hand Brake

DESCRIPTION:

The hand brakes only operate on the rear axle of the vehicle and its operation is the opposite from the service brakes.

In the service brake circuit the brakes are applied when the air is applied to the boosters. In the hand brake circuit, the hand brakes are released when the spring brake chamber is pressurised and applied when it is vented.

This is also used as a parking brake, as the brakes are applied by the heavy coil springs in the chamber and will stay on for as long as the cylinder is vented (unpressurised).

The hand brake circuit consists of the following:

- Handbrake valve.
- Parking brake relay valve.
- Locking valve.
- Brake drums and shoes. (Not shown in schematic diagram).

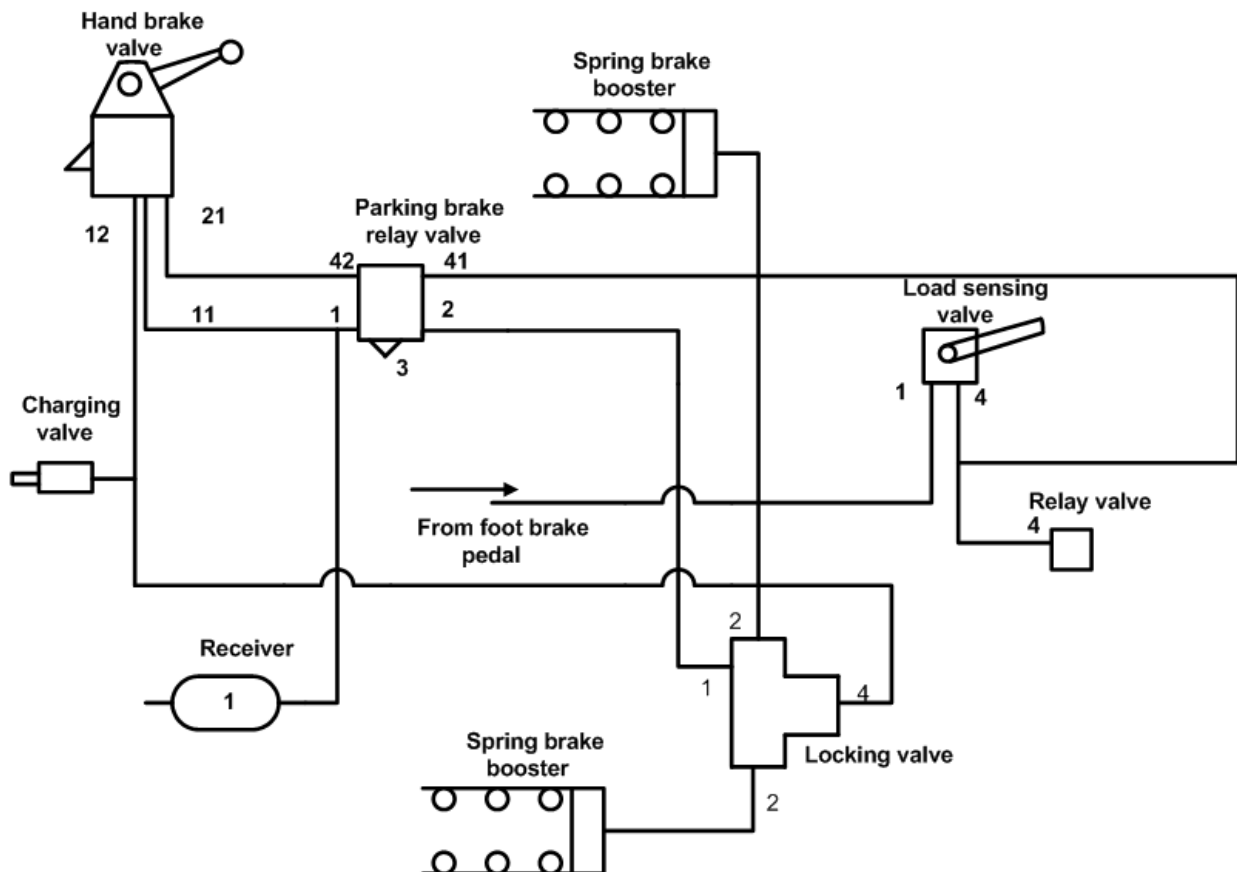


Fig. 23

- Hand Brake Valve

In the driving mode the rocker arm of the hand brake valve is at a stop in the hand brake released position. The compressed air from the receiver flows freely through the hand brake valve, the parking brake relay valve, the pressure pro-portioning valve and the locking valve to the spring brake chamber side of the double chamber brake boosters to keep the brake in a released position.

To apply the brakes the rocker arm is pushed downwards. Proportionally to the downward movement of the rocker arm, air will escape through the signal line from the parking brake relay valve and through the exhaust port of the hand brake valve to atmosphere. This action vents the spring brake chamber and applies the brakes proportionally to the pressure released. Refer to Fig. 24.

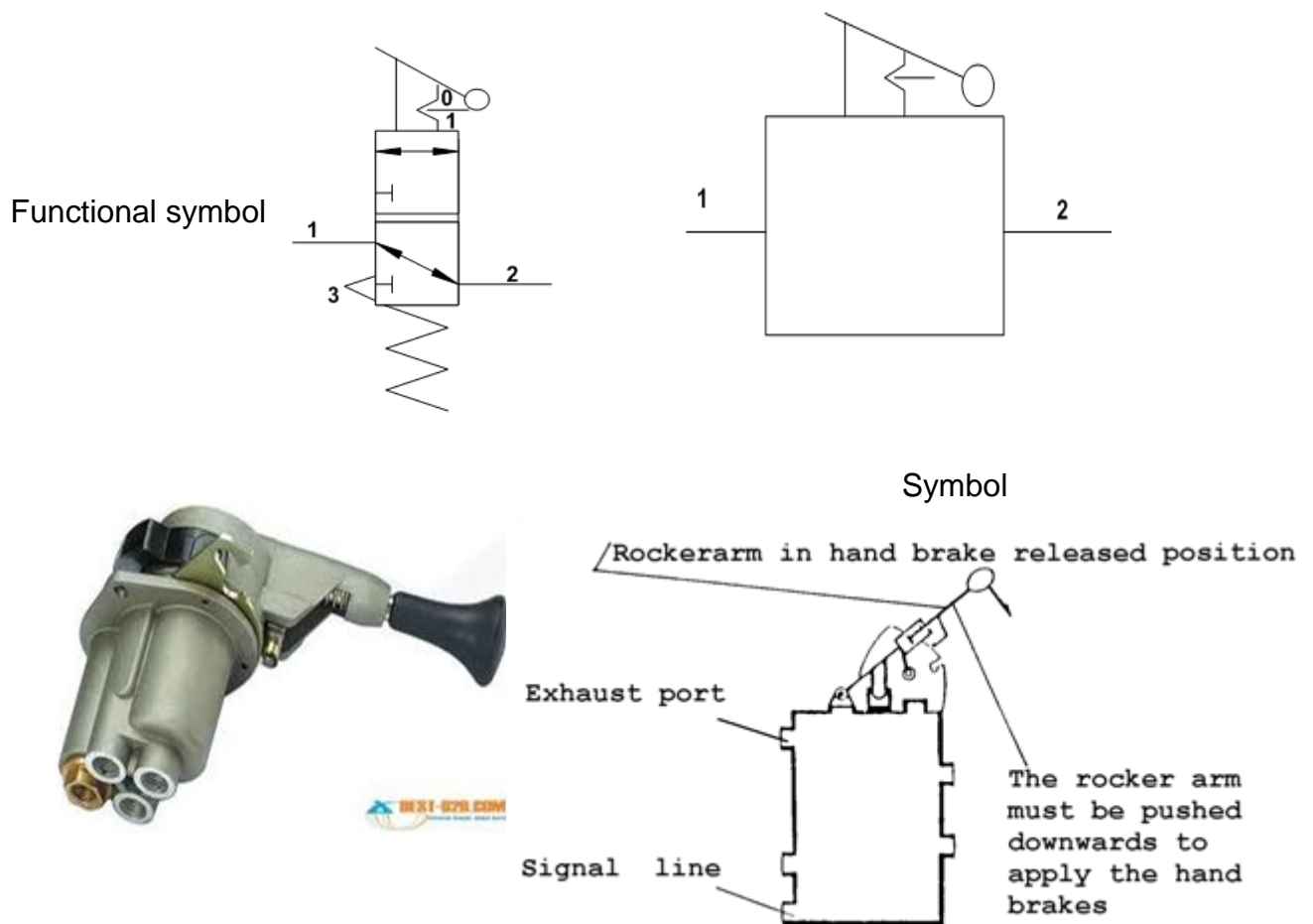


Fig. 24

- Parking Brake Relay Valve

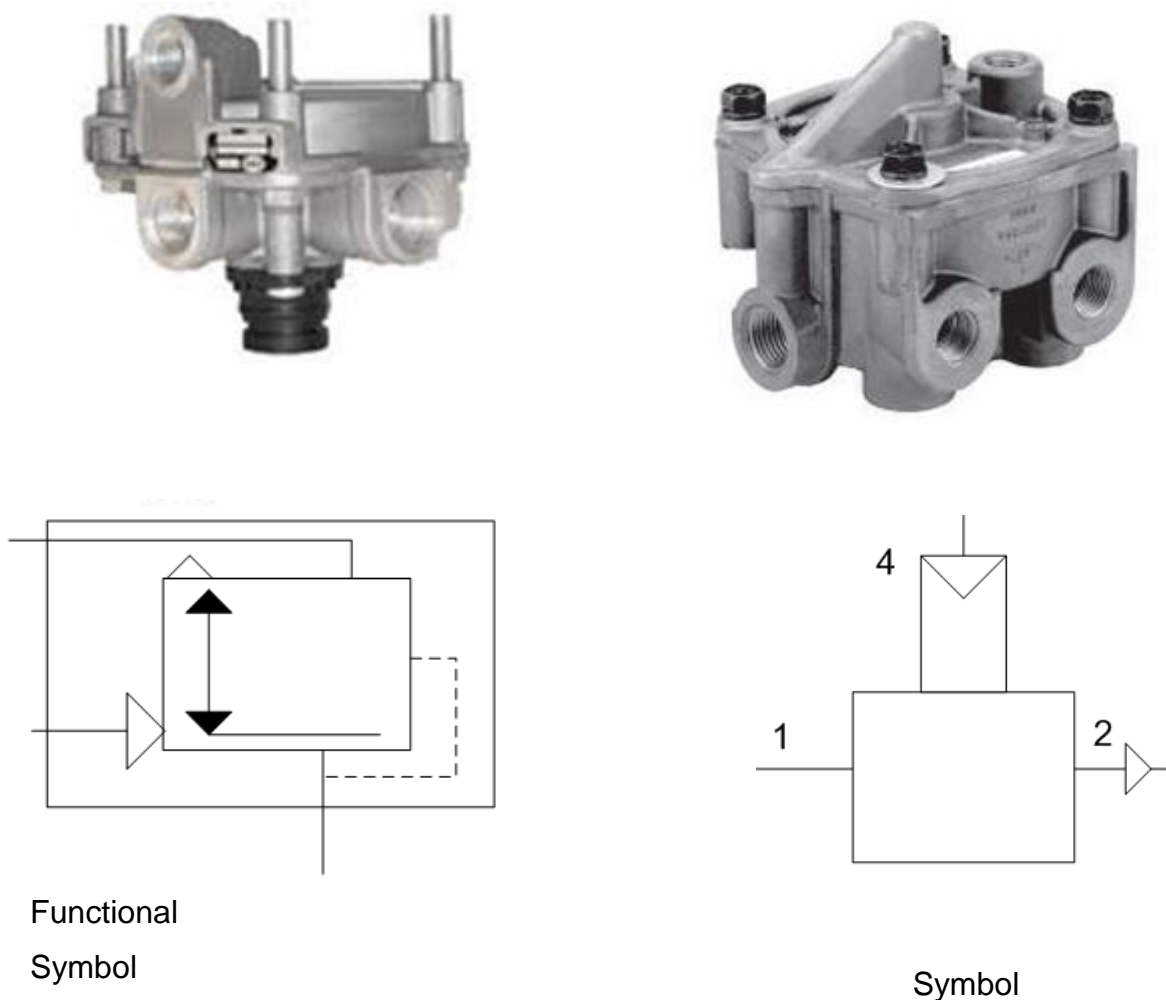


Fig. 25

The function of the parking brake relay valve is:

- To release the hand brake by pressurising the spring brake boosters when a signal is received from the hand brake valve.
- To produce the time taken to pressurise or vent the boosters in the same way that the relay valve pressurises and vents the boosters in the service brake circuits.
- To prevent the foot brakes (service brakes) from being applied while the hand brakes are applied.

When the foot brake pedal is depressed while the hand brakes are in the applied position and the system is pressurised, a signal will be sent to the hand brake relay valve to

pressurise the spring brake booster chambers. The pistons will be forced back against the coil springs and the hand brakes will be released.

The reason for preventing the simultaneous application of service and hand brakes is that there would be twice as much force exerted on the brake shoes and drums and they could be damaged.

The symbol for a parking brake relay valve is shown in Fig. 26

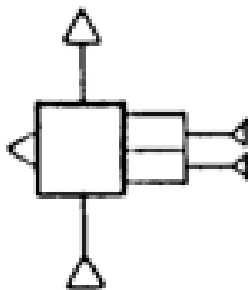


Fig. 26

- Locking Valve

The function of the locking valve is to prevent the sudden application of the hand brakes, while driving, should the air supply from the hand brake valve to the spring brake booster chambers suddenly be cut off.

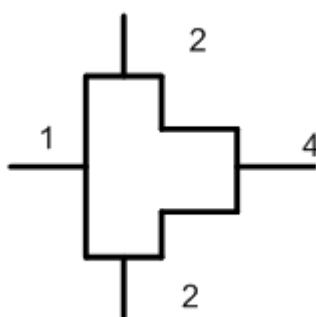


Fig. 27

- Double Chamber Brake Booster

This booster applies the hand brakes as well as the service brakes. Fig. 28 shows the booster in the "hand brake released" position. The chamber on the left is under pressure through port B, thus compressing springs 1 and 2. This chamber must be vented to apply the hand brake. After the chamber has been vented, coil springs 1 and 2 will act against the piston, the piston and sleeve will push the front piston rod out and apply the hand brakes.

If the hand brake is released and the chamber on the right hand side is pressurised through port A, the inner piston and piston rod will move forward to exert a force via the thrust piece onto the front piston rod, to apply the service brakes. Refer to Fig. 28

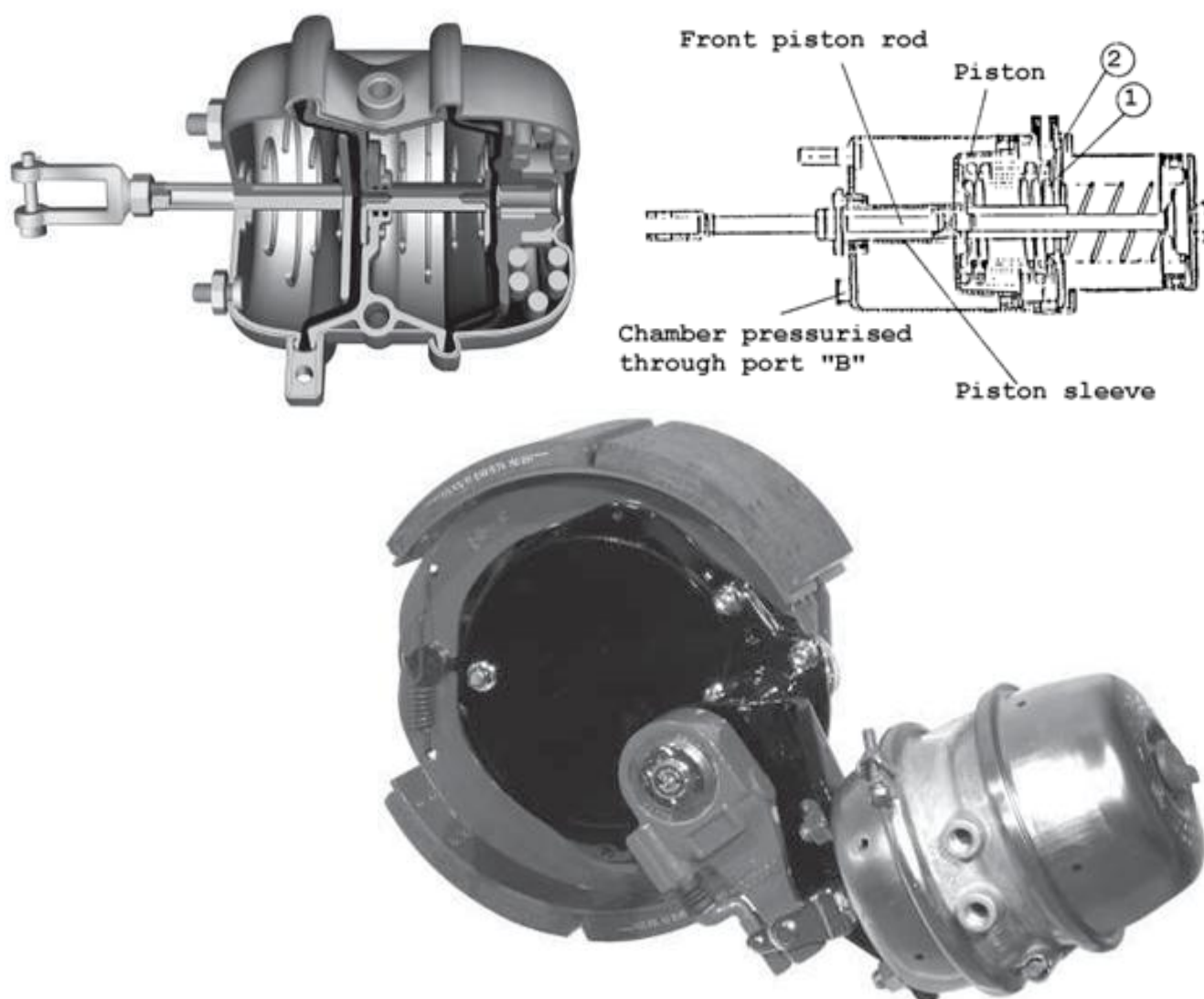
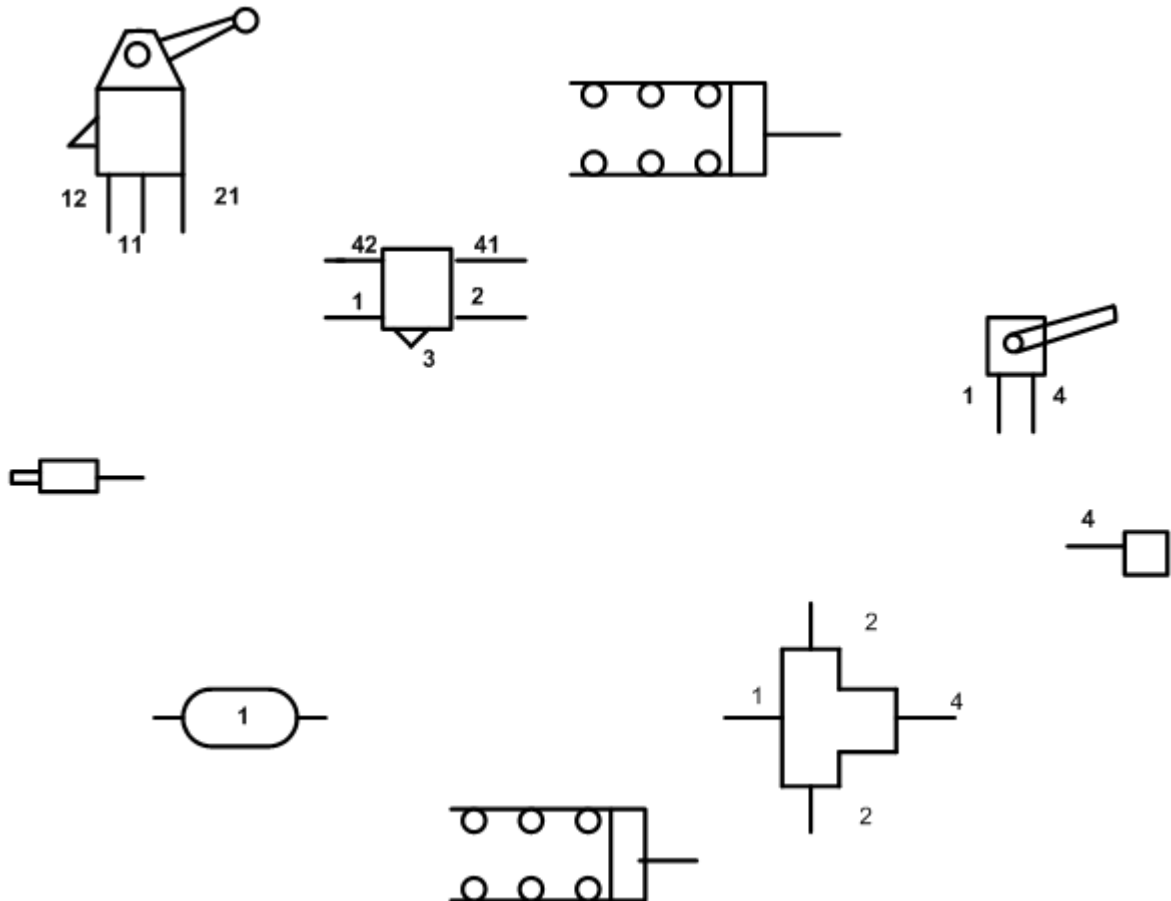


Fig. 28

SELF TEST 4



1. Without referring to your notes complete the diagram below.



2. Describe the functions of the:

i) Hand brake valve

ii) Parking brake relay valve

iii) Locking valve

3. Describe what will happen if the hand brake and service brakes were to be applied simultaneously.

4. Describe the two types of brake application that the double chamber brake booster can perform.

a)

b)

5. Identify the hand brake valve, parking brake relay valve, locking valve and double chamber brake boosters on the vehicle or air brake simulator/component.

Call your training officer to check your work and ask him to sign you off when it is correct, before you go on to the next section.

LEARNER	TRAINING OFFICER
DATE :	DATE :
SIGNATURE :	SIGNATURE :

10. TRAILER BRAKES

ITEM / TASK: Trailer Brake

DESCRIPTION:

The trailer brakes are activated in the same way as the rear service brakes and hand brakes of the towing vehicle with double drum brake boosters.

Air is supplied from the receiver through the differential switching valve to the trailer brake valve and via the red flexible hose on the trailer to the trailer control valve. Refer to Fig.29.

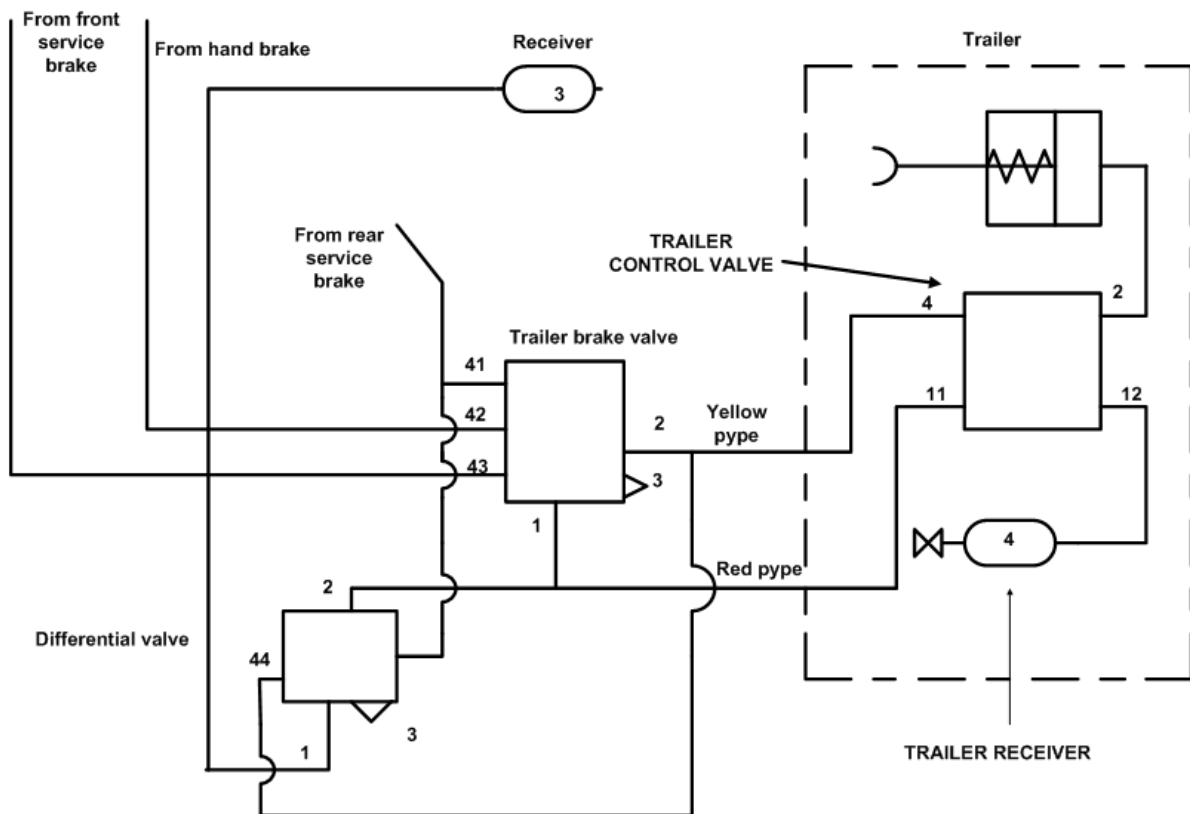


Fig.29

A signal line is connected from the hand brake valve to the trailer brake valve at port 43. Signal lines from the front service brake and the rear service brake are connected to port 42 and 41 respectively.

Air is supplied from the differential valve to the trailer brake valve via port 1. This opens the valve and sends a signal via port 2, through the yellow flexible hose to the trailer control valve to apply the trailer brakes.

When the hand brake valve is moved to the "hand brake released" position, a signal is received from the hand brake valve, which will vent the supply line 2 to atmosphere and will cause the trailer brakes to be released.

When a signal is received from the rear brakes, via port 41, or the front brakes via port 42, the trailer brake valve will open and signal through the yellow, flexible hose for the trailer control valve to open to apply the brakes. In the event of a failure of any of the front brake systems, the remaining circuit will still be able to operate the trailer brakes when the service brakes are applied. When either the yellow or the red flexible hose is not connected properly or broken, the trailer brakes will either stay on or come on automatically.

The yellow and red flexible hoses between the horse and trailer are connected by means of quick-couplers, it's a relatively easy to connect and disconnect.

The trailer brake circuit consists of the following:

- Trailer brake valve
- Trailer control valve
- Pressure differential switching valve
- Double chamber brake boosters
- Brake drums and shoes

Trailer brake valve

The trailer brake valve transmits hand brake and service brake signals from the towing vehicle to the trailer braking system when to apply or release the brakes. The symbol for the trailer brake valve is shown in Fig. 30.

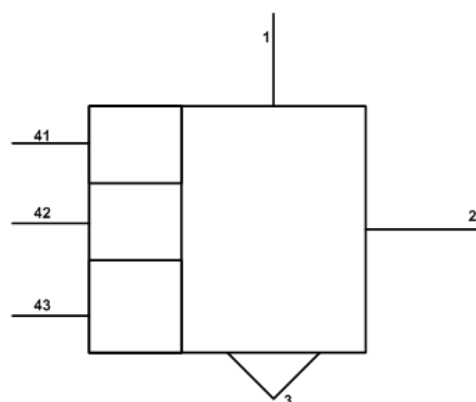


Fig. 30

Trailer control valve

Air is supplied from the receiver on the receiver on the horse or truck via the red flexible hose to the trailer control valve. When the pressure has reached 500 kPa, the pressure equalising valve inside the trailer control valve will open and the air will be supplied to the receiver on the trailer.

When a signal is received via the yellow flexible hose into the trailer control valve, it will open a port and allow the air to flow from the trailer receiver to the trailer service brake booster to apply the brakes. When the signal line is vented, the air from the brake boosters will be vented through the exhaust port of the trailer control valve.



In the event of the red flexible hose breaking or becoming defective, the pressure in the trailer circuit will drop to about 500 kPa. Because of the imbalance of pressure that will then exist in the trailer control valve, certain ports will close and others will open. This interaction of the valves inside the trailer control valve, will allow the air to flow freely from the receiver to the brake boosters when the trailer brakes are applied.

Pressure differential switching valve

The functions of the pressure differential switching valve are to cut off the air supply from the receiver on the truck or horse, and to vent the supply line connected to port 1 on the trailer brake valve and the red flexible hose to apply the trailer brake valve and the red flexible hose to apply the trailer brakes in the event of a defective yellow flexible hose.

Operation

Under normal working conditions the pressure in signal line 41 and 44 of the differential valve will be the same and the valve disc and piston will be in the position shown in Fig. 31 next page.

In the case where the yellow flexible hose is defective or not connected, there will be a pressure difference between ports 41 and 44 of the pressure differential valve when the service brakes are applied.

If the pressure difference is more than 300kPa, the piston will move downwards to close the inlet at port 1 with the valve disc and vent the supply line 2, via port 3, which will allow the trailer brakes to come on.

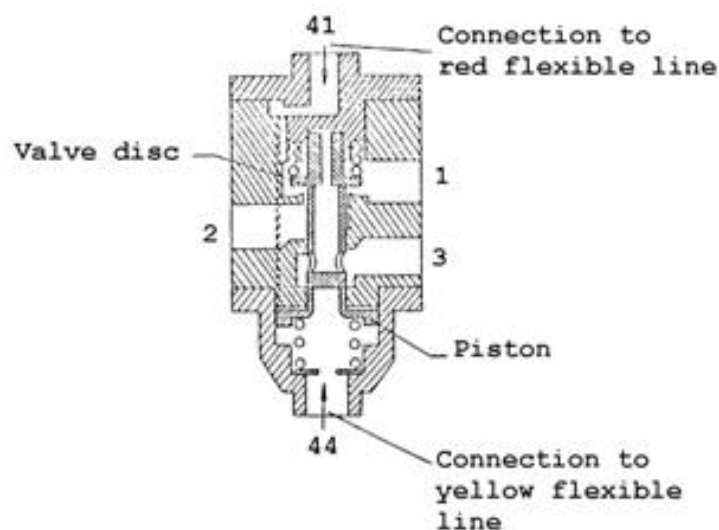


Fig. 31

The symbol for a pressure differential switching valve is shown in Fig. 32.

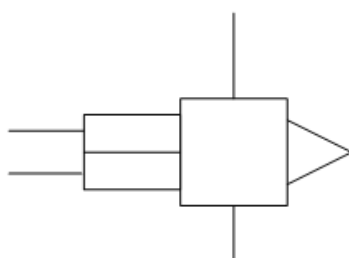


Fig. 32

Double chamber brake booster

The operating principals were discussed in a prior section of this module.

Brake drums and shoes

The operating principals were discussed in a prior section of this module.

GO ON TO THE NEXT PAGE TO DO THE SELF TEST.

SELF TEST 5



Without referring to your notes, answer the following questions:

1. Explain briefly what will happen if:

a) The flexible yellow hose becomes defective:

b) The flexible red hose becomes defective:

2. Identify the trailer brake valve and control valve on the trailer or air brake trailer.

Call your training officer to check your work and ask him to sign you off when it is correct

LEARNER	TRAINING OFFICER
DATE :	DATE :
SIGNATURE :	SIGNATURE :

11. FAULT FINDING

ITEM / TASK: Fault finding

DESCRIPTION:

➤ Receiver

- If there is oil present in the air when the drain cock of the receiver is opened, the compressor must be overhauled.
- Remove the compressor.
- Refit a new or reconditioned compressor.

➤ Air pressure build-up time incorrect

- Check for leaks.
- Check un-loader valve setting (see the workshop manual for correct setting) and adjust to correct setting.
- Replace the un-loader valve with a new or reconditioned one if it still unloads at below the recommended pressure.
- Check the condition of the compressor by doing a compression test. (Refer to modules PDC and DPA).

➤ Air leaks at the brake boosters

- Apply the service brakes (foot brakes).
- If there is an air leak at a booster, it indicates a damaged diaphragm.
- Remove the booster and replace it with a new or reconditioned one.
- Release the parking brake.
- If air leaks from the end cap at the service brake (spring brake) chamber side of the double chamber brake booster, it indicates a damaged piston seal.
- Remove the booster and replace it with a new or reconditioned one.

NB The spring brake chamber could also leak air back to the exhaust port of the first valve when the brakes are in the released position.

➤ Air leak at the foot brake valve.

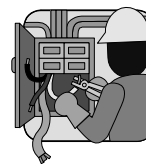
- Listen for audible air leaks.
- If an air leak is detected in the driver compartment do the following:
- Expose the dual-circuit foot brake valve and place your hand over the exhaust port.
- If air still escapes from the exhaust port with the parking brake applied, then the valve is faulty and must be replaced.
- If the air leak stops when the parking brake is applied, it means that air is bleeding back from a faulty spring brake booster.
- Release the parking brake.
- Trace the leak to the faulty spring brake booster.
- Replace the faulty spring brake booster.

NB. If a relay valve is fitted in the front service brake circuit, the air from a faulty brake booster will not reach the foot brake valve, but will escape from the exhaust port of the relay valve.

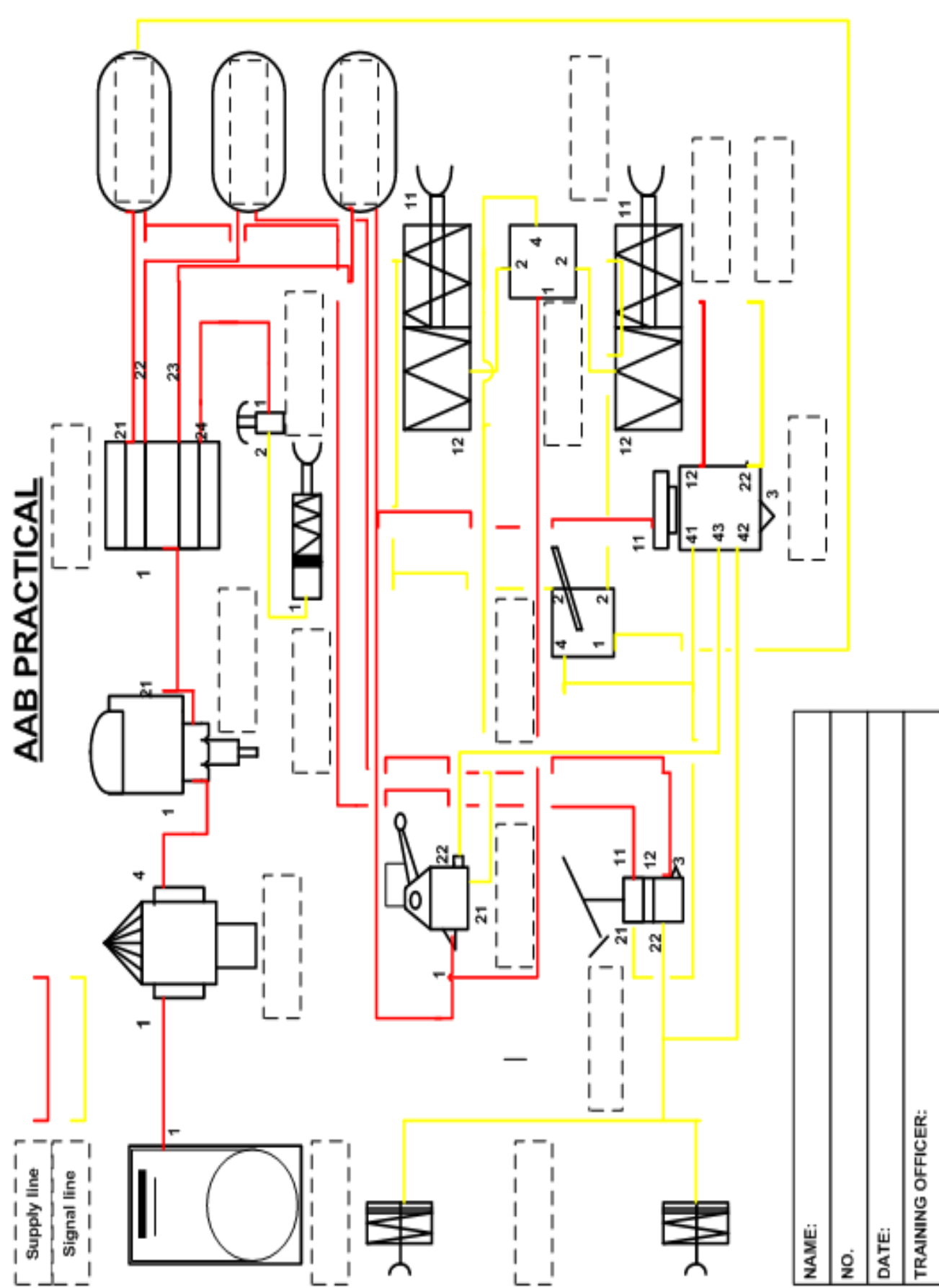
- Leak at the rear service brake relay valve
- Apply the parking brake.
- If air still leaks at the relay valve, it can only come from the receiver and indicates a faulty relay valve.
- Air leak at the parking brake valve.
- If air leaks from the exhaust port of the valve, it indicates a faulty valve.
- Replace the parking brake valve with a new or reconditioned one.

GO ON TO THE NEXT PAGE FOR THE PRACTICE.

PRACTICE



1. Connect the air brake system between the horse and the trailer.
2. Trouble shoot the system and replace defective parts.
3. Do a maintenance check on the complete air assisted brake system and complete the check list.
4. Name all the components in the schematic on the next page.



Call your training officer to check your work and ask him to sign you off when it is correct.

LEARNER	TRAINING OFFICER
DATE :	DATE :
SIGNATURE :	SIGNATURE :



REMEMBER ALWAYS WORK SAFE

Once you have passed all the self test and entire practices, you are now at liberty to request a Formative Assessment from your Assessor.