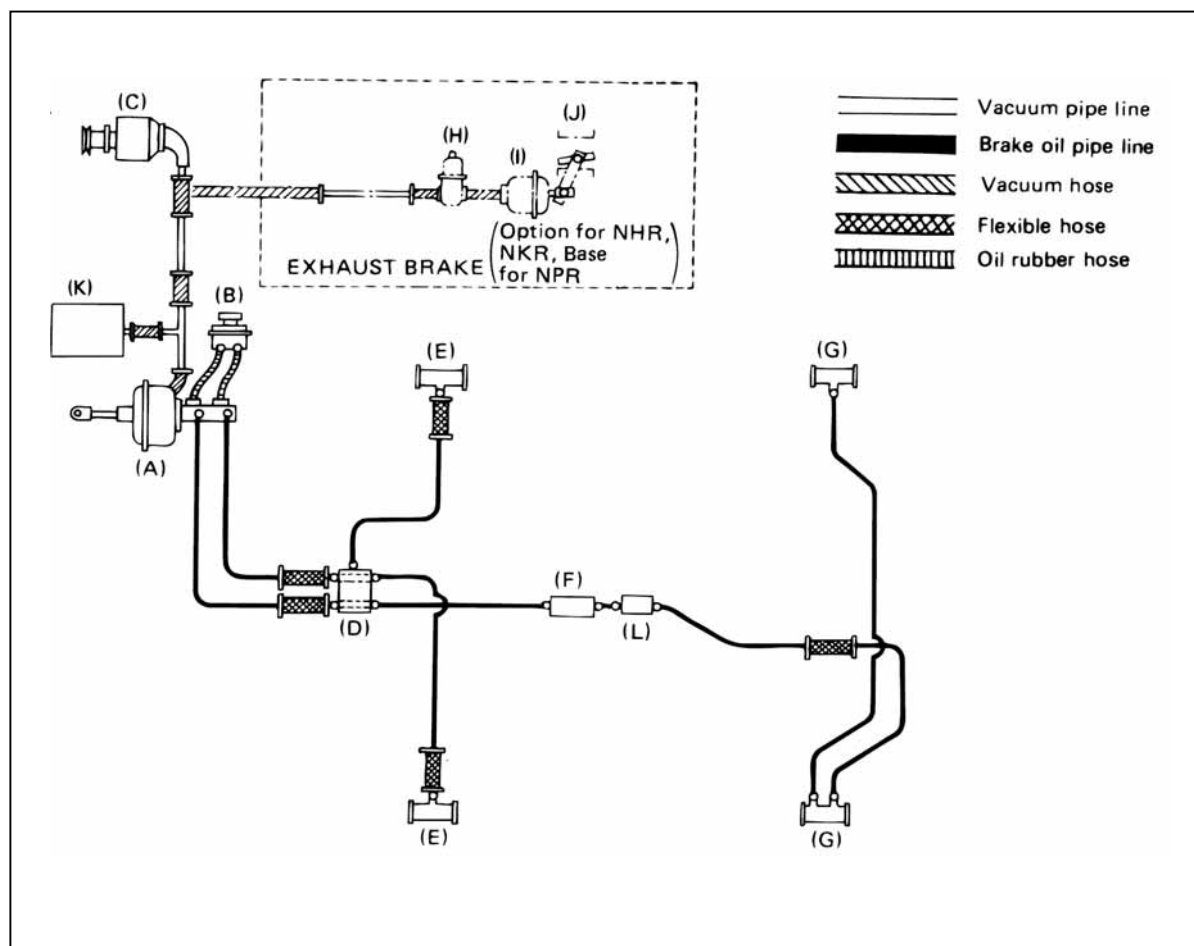


BRAKE



ISUZU
ISUZU MOTORS LIMITED

CONTENTS

	PAGE
SECTION 1. GENERAL DESCRIPTION	
Purpose and prerequisites of installing brake	1
Classification of brakes	1
Outline of service brake	2
Construction and operation of drum brake	4
Disc brake	9
Brake fluid	17
SECTION 2. MAIN DATA AND PIPING DIAGRAM	18
SECTION 3. CONSTRUCTION AND OPERATION	
Mastervac	32
Hydromaster	39
Airmaster	40~44
Master cylinder	45~46
Wheel cylinder	47~48
Dual brake valve	49~53
SECTION 4. BRAKE SAFETY DEVICE	
Outline of safety device	54
Dual brake system	54~56
Safety cylinder	56
[Antilock device]	
PCV	57~59
Blend valve	60~62
DSPV	63~65
LSPV	66~67

SECTION 1

GENERAL DESCRIPTION

Purposes and prerequisites of installing brake

The vehicle in motion has a great deal of drive energy from the engine or from natural environmental condition such as a slope, etc., and to retard or stop the vehicle in motion against the tremendous energy, means must be provided to absorb the inertial energy.

The brake mechanism specifically designed for this purpose must satisfy the following conditions as it is a vital component having a direct influence over the road performance of the vehicle.

(1) Shorter distance to stop

- Increase in brake system capacity
- Adequate distribution of brake force
- Adoption of power-assisted brake system

(2) Stable brake action

- Improvement in anti-fade characteristics
- Prevention of one-sided brake action through adoption of automatic adjusters

(3) Excellent directional stability

- Adoption of antilock devices

(4) Fail safe device

- Adoption of dual-circuit brake system
- Adoption of spring brake system

(5) Minor effort for brake control

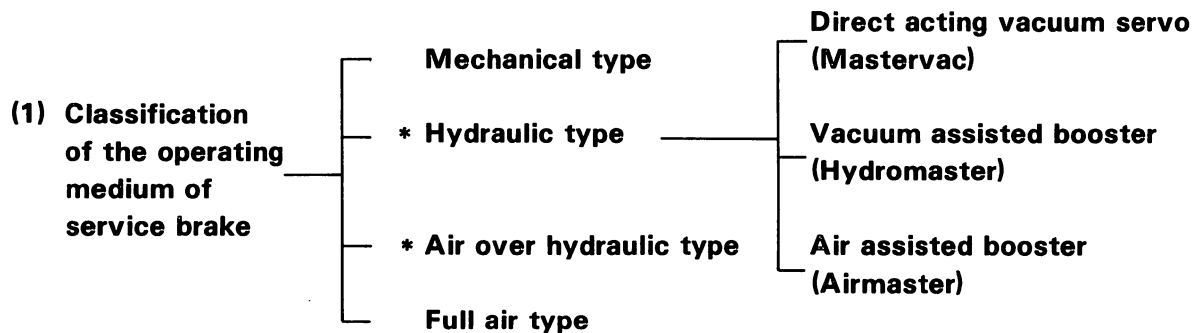
- Minimum foot pressure requirement
- Adequate setting of pedal stroke
- Appropriate pedal position

(6) Improvement in reliability and durability

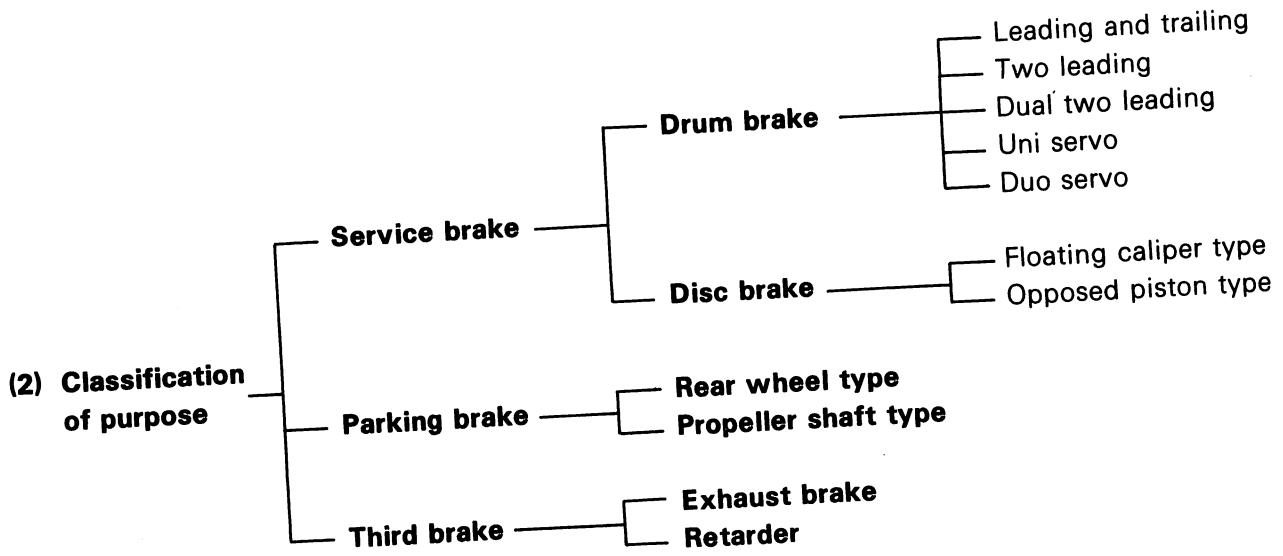
- Careful selection of brake materials
- Designing with full considerations given to severe operating conditions

Classification of brakes

For the vehicle applications, a wide variety of brake systems have been developed which can be classified broadly into service brakes and parking brake. The service brakes adopt dual circuit system or other safety device, so that the brake system on either front or rear side will continue to provide normal brake action even when a leakage is encountered in the brake hydraulic line. The brake safety device includes antilock devices, safety cylinders, independent dual circuit and emergency brake system, etc.



Remark: Types marked * are included in this book.



Outline of service brake

Hydraulic type

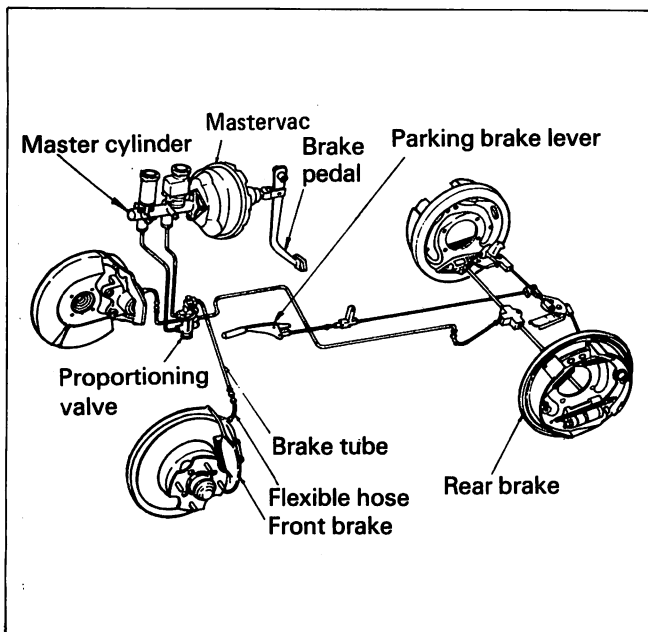
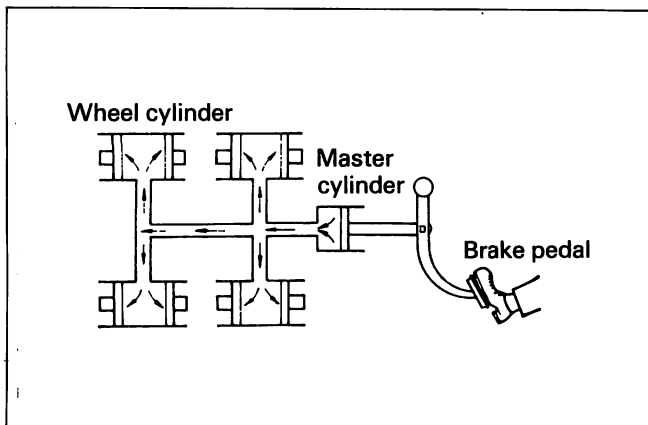
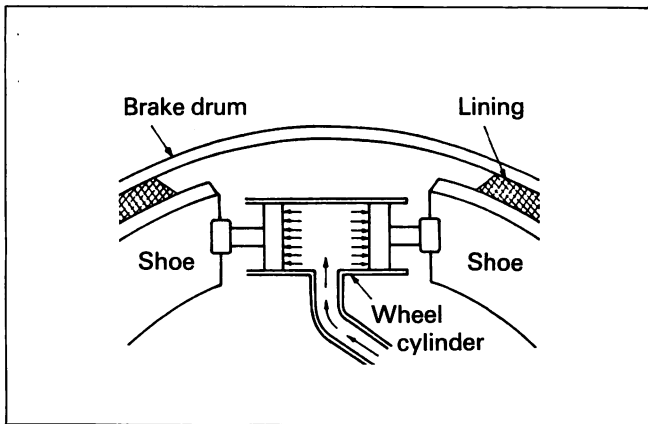
Hydraulic brake systems which employ a liquid for power transmission offer many advantage, that is, excellent response, simple construction, and a high degree of freedom in designing.

For this reason, a large percentage of the vehicles in use today employ a hydraulic brake system.

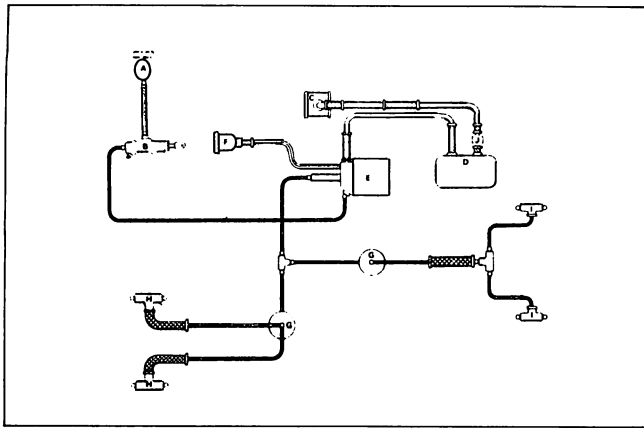
Basic system diagrams are shown at left.

The hydraulic brake consists of a master cylinder, wheel cylinders and piping parts.

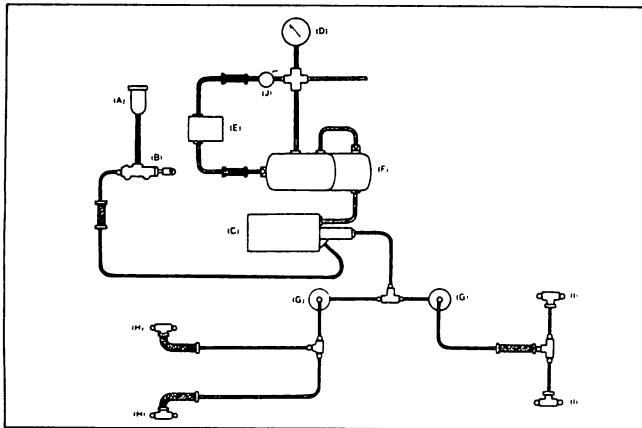
When the brake pedal is stepped on, the liquid pressure is raised by the master cylinder. The wheel cylinder operates according to this pressure, and the pressure of the shoe (lining) on the drum is applied as a brake input to brake the wheel. Because there are limits on the braking power that can be produced by stepping on the brake pedal, however, a booster is often incorporated. In addition, various control devices are employed for improving safety and brake power distribution.



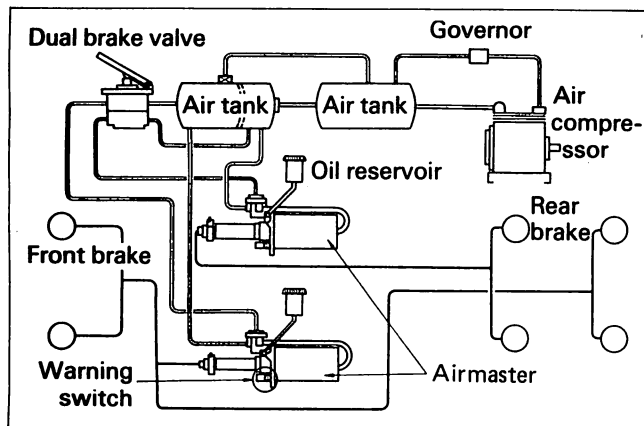
(1) Hydraulic type with Mastervac



(2) Hydraulic type with Hydromaster



(3) Hydraulic type with Airmaster



Air over hydraulic type

The air over hydraulic brake system features little pedal effort force, which is characteristic of a full air brakes, but a full air brake system has more braking delay. A piping example is shown at left.

This system uses a combination of brake valves, which is used in an air brake in place of the conventional master cylinder, and a pneumatic relay valve (air relay valve), which is operated by compressed air, to convert compressed air pressure to braking liquid pressure, which is sent to the wheel cylinders to brake the wheel.

Because the brake pedal needs to be depressed only to open or close the brake valve, this brake system requires merely a minimum depressing force and yet produces great braking power. Therefore, it is used for part of the heavy duty vehicles. The air booster used in this brake system is shown at left.

