

## GROUP 35A

# BASIC BRAKE SYSTEM

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## GENERAL

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Brake systems with higher reliability and durability have achieved distinguished braking performance.

### FEATURES

#### IMPROVEMENT OF BRAKING PERFORMANCE

- A 10-inch single brake booster with the variable boost ratio mechanism has been used to assure maximum braking force with less pedal pressure in case of emergency. <Vehicles with ABS>
- In addition to the 10-inch single brake booster, a small and long stroke-type master cylinder has been adopted to achieve downsizing and secure assist force.
- 15-inch or 16-inch ventilated disc brakes have been adopted for the front.
- 8-inch leading trailing-type drum brake, 14-inch or 16-inch solid disc brake has been adopted for the rear.

#### IMPROVEMENT IN SAFETY

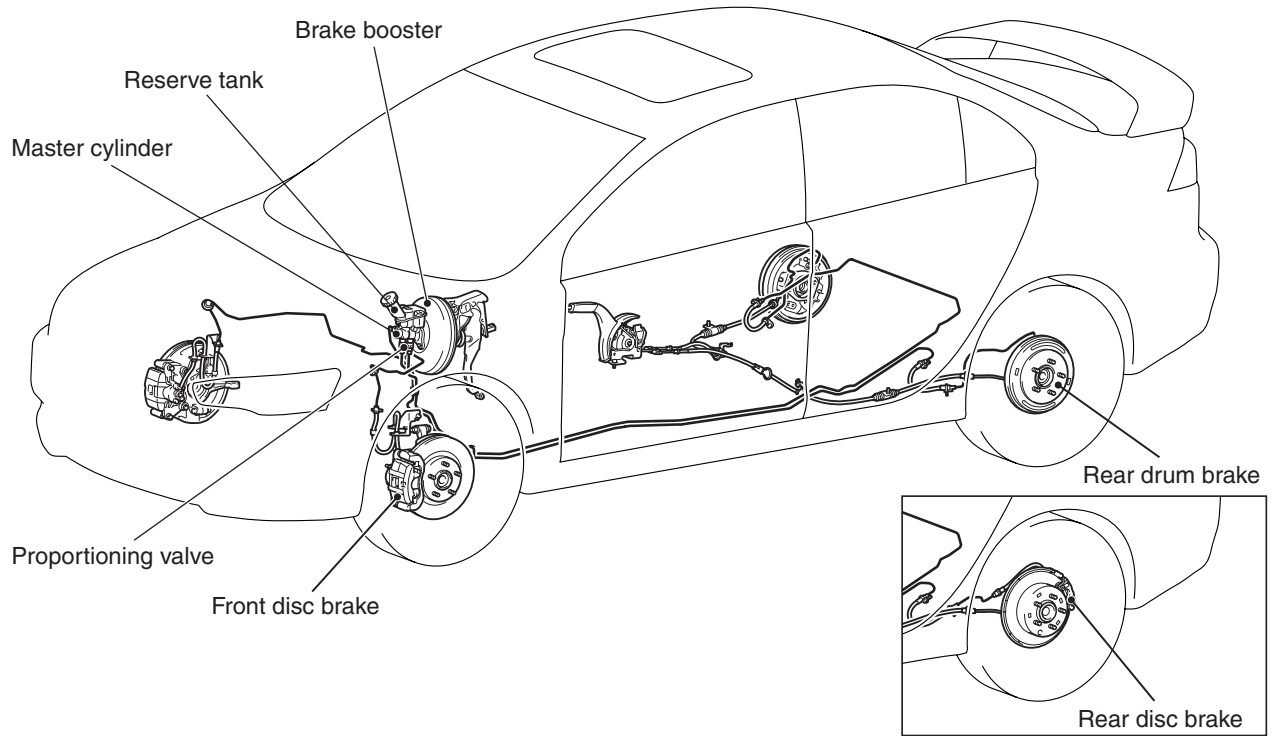
- The 4-wheel anti-lock brake system (4ABS) has been installed to prevent slippage resulting from the wheel lock and assure stable vehicle posture and driveability.<Vehicles with ABS>

- A rear wheel early lock-prevention proportioning valve has been used. <Vehicles without ABS>
- Electronic control braking force distribution system (EBD) has been adopted to assure the maximum braking force independently of the passenger's position in the vehicle. <Vehicles with ABS>
- X-type piping of brake lines have been adopted for the front and rear wheels.
- Audible wear indicators are used on the front and rear brake pads to warn the driver of wear limit.

#### SERVICE QUALITY IMPROVEMENTS

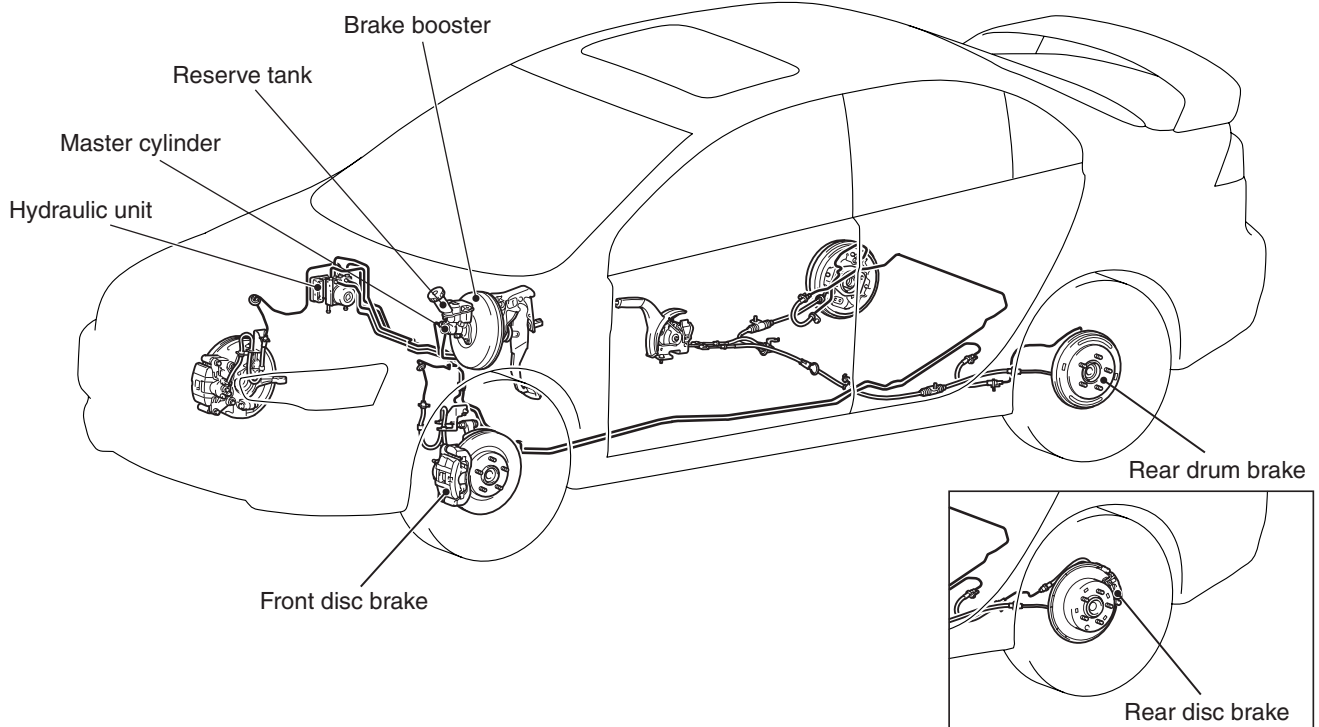
- Diagnostic function has been adopted to ABS for easier inspection. <Vehicles with ABS>
- Brake fluid reservoir, master cylinder, and brake booster have been integrated for downsizing and better serviceability.

<Vehicles without ABS>



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<Vehicles with ABS>



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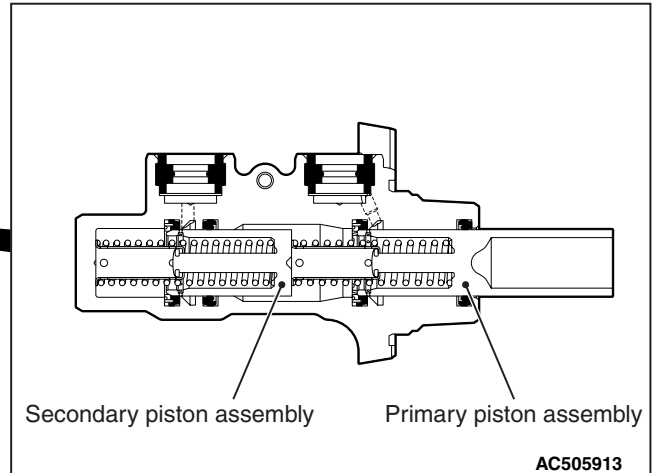
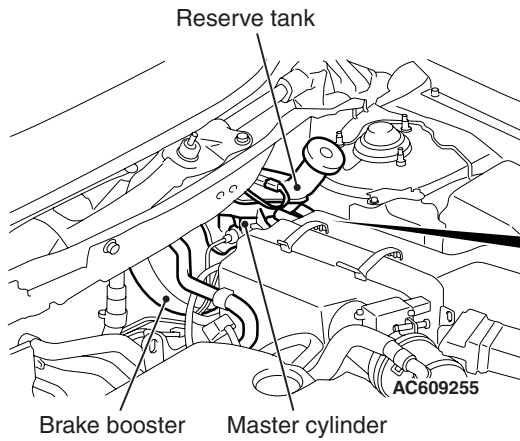
## SPECIFICATIONS

Item		Specifications	
Master cylinder	Type	Tandem type	
	I.D. mm (in)	20.6 (0.81)	
Brake booster	Type	Vacuum type, single	
	Effective dia. of power cylinder mm (in)	254 (10.0)	
	Boost ratio	Vehicles without ABS	6.5 (Pedal pressure: 188N)
Vehicles with ABS		6.5 (Pedal pressure: 92N) 8.5 (Pedal pressure: 156N)	
Rear wheel hydraulic control type	Vehicles without ABS	Proportioning valves	
	Vehicles with ABS	Electronic control braking force distribution system (EBD)	
Front disc brake	Type	Vehicles with 16-inch wheel	Floating caliper 1 piston ventilated disc (V5-S57)
		Vehicles with 18-inch wheel	Floating caliper 1 piston ventilated disc (V6-S57)
	Disc effective dia × thickness mm (in)	Vehicles with 16-inch wheel	222 × 26 (8.7 × 1.02)
		Vehicles with 18-inch wheel	241.6 × 26 (9.5 × 1.02)
	Cylinder I.D. mm (in)	57.1 (2.25)	
	Pad thickness mm (in)	10.0 (0.39)	
Clearance adjustment	Automatic adjustment		
Rear drum brake	Type	Leading trailing drum	
	Drum I.D. mm (in)	203 (8.0)	
	Wheel cylinder I.D. mm (in)	19.0 (0.75)	
	Lining thickness mm (in)	4 (0.157)	
	Clearance adjustment	Automatic	
Rear disc brake	Type	Vehicles with 16-inch wheel	Floating caliper 1 piston solid disc (S4-S35)
		Vehicles with 18-inch wheel	Floating caliper 1 piston solid disc (S6-S35)
	Disc effective dia × thickness mm (in)	Vehicles with 16-inch wheel	226 × 10 (8.9 × 0.39)
		Vehicles with 18-inch wheel	258 × 10 (10.2 × 0.39)
	Cylinder I.D. mm (in)	34.9 (1.37)	
	Pad thickness mm (in)	10.0 (0.39)	
Clearance adjustment	Automatic adjustment		

# CONSTRUCTION DESCRIPTION

## MASTER CYLINDER

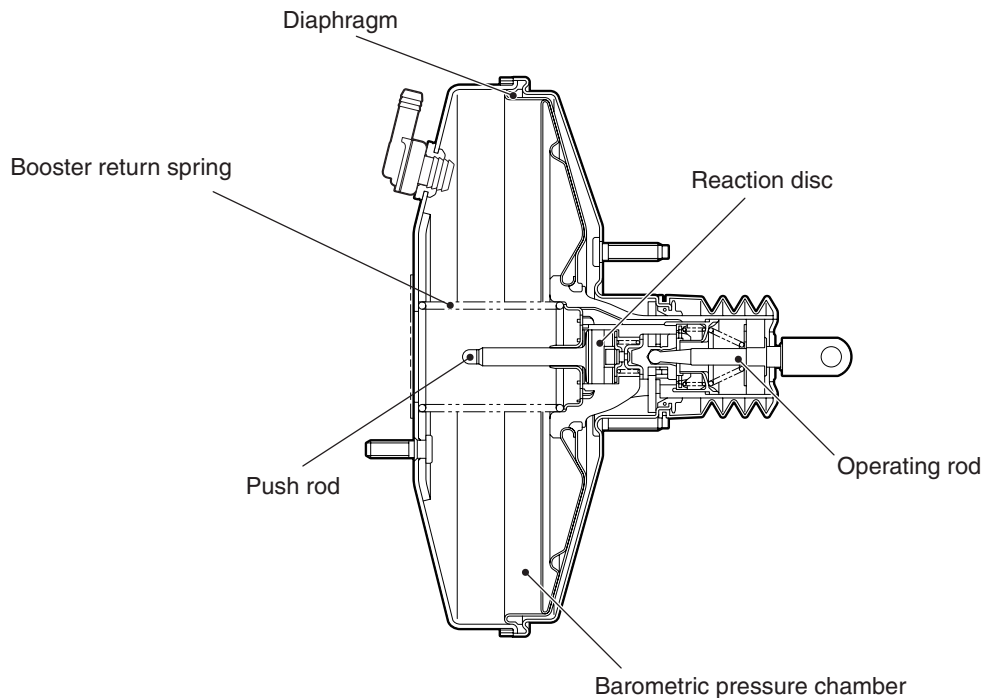
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The master cylinder is a tandem type and is integrated with the brake fluid reservoir with the level switch.

## BRAKE BOOSTER

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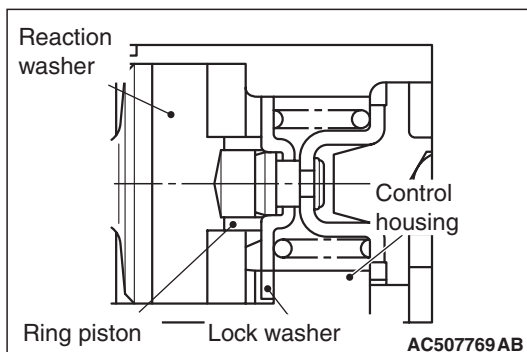
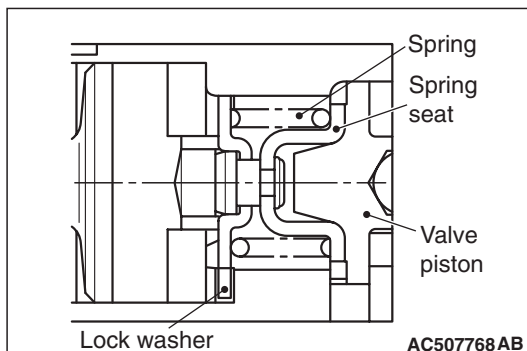
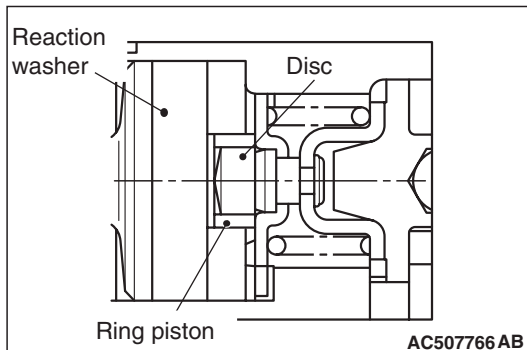
A 10-inch single brake booster has been installed. The variable boost ratio mechanism which increases the brake booster gain has been adopted.

**VARIABLE BOOST RATIO MECHANISM**

The variable boost ratio mechanism changes the input/output characteristics of the brake booster in two phases by changing the reaction force applied to the valve plunger during the assist phase.

**AT INITIAL ASSISTING**

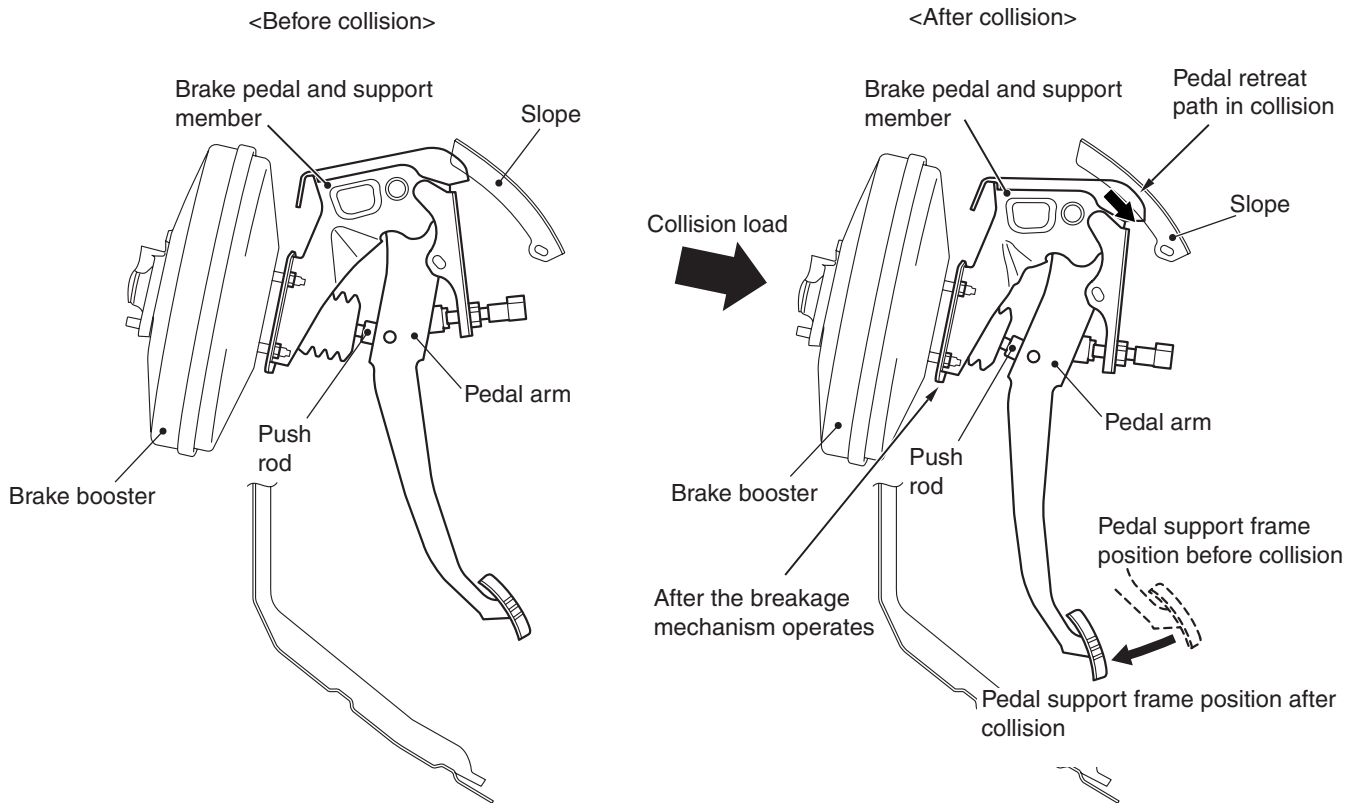
1. When the brake pedal is not depressed (no input load applied), the reaction washer is not deformed.
2. When the brake pedal is depressed, the reaction washer is deformed to reach the ring piston and disc, then the first input characteristics begin (Ratio 1).

**AT AN INCREMENT OF ASSIST RATIO**

1. The reaction washer is further deformed and pushes down the ring piston and lock washer, deflecting the spring. All the force pushing the ring piston and disc is transferred to the brake pedal via spring seat and disc as the reaction force.
2. The reaction washer is then further deformed, and when the lock washer makes contact with the control housing, the input characteristics change. All the force applied from the reaction washer to the ring piston is now transferred to the control housing via the lock washer, so no force is applied to the brake pedal. The second input characteristics (Ratio 2) begin.

BRAKE PEDAL

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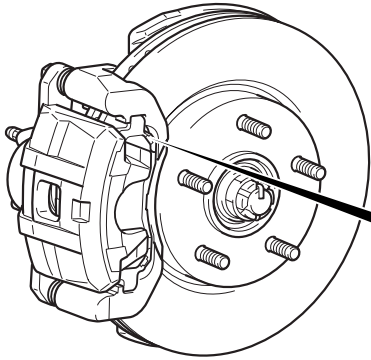
The brake pedal retreat suppression mechanism that restrains the retraction of the brake pedal surface during a frontal collision has been adopted in order to reduce the shock to the driver's feet.

When the brake booster is crushed rearward by the engine retreat during a frontal collision, the installation surface of the brake pedal is retreated. In this case, the end of the pedal support is forcibly slid down and back by the interference with the slope mounted on the front deck crossmember assembly. At the same time, the linkage comprised of the pedal support, pedal arm, and push rod moves the brake pedal pad surface forward.

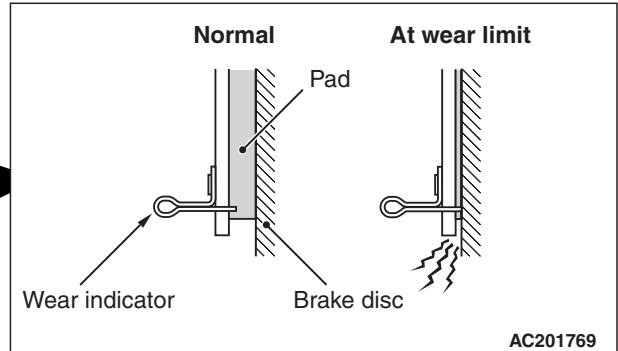
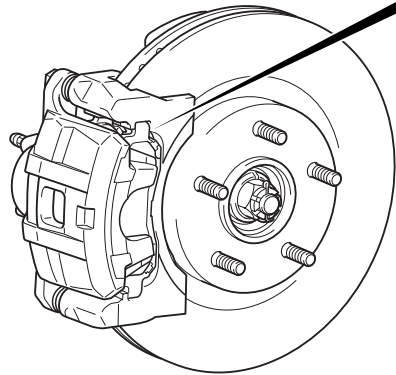
FRONT BRAKE

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<15-inch disc brake (V5-S57)>



<16-inch disc brake (V6-S57)>



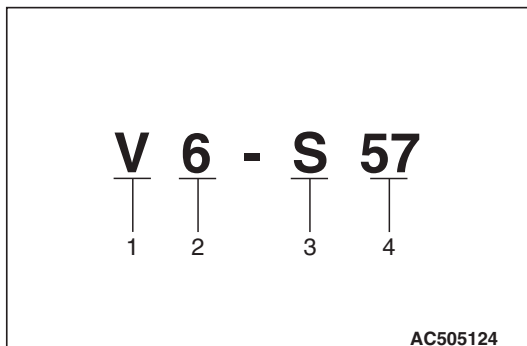
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Brakes with the following specifications have been adopted for the front brakes.

- The 1-piston ventilate disc brake (V5-S57 <Vehicles with 16-inch wheel> or V6-S57 <Vehicles with 18-inch wheel>) has been adopted.

- An audible wear indicator that informs the driver of application limit has been adopted onto the front brake LH pads.
- The outer disc type brake disc which can be tightened together with the wheel has been introduced for better serviceability.

DISC BRAKE DESIGNATION



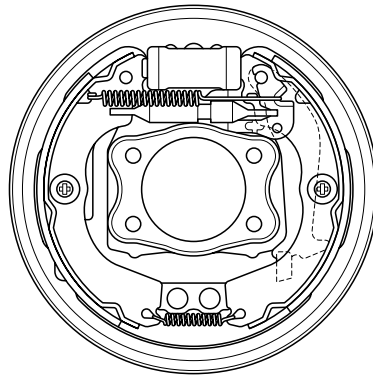
No.	Item	Contents
1	Brake disc type	V: Ventilated S: Solid
2	Brake size (Minimum applicable disc wheel)	4: 14" 5: 15" 6: 16"
3	Number of pistons	S: 1 (Floating type)
4	Piston size (Rounded integral value)	35: $\phi$ 34.9 mm 57: $\phi$ 57.1 mm



## REAR BRAKE

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### <Vehicles with rear drum brake>

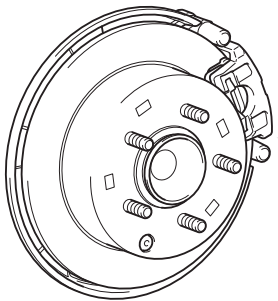


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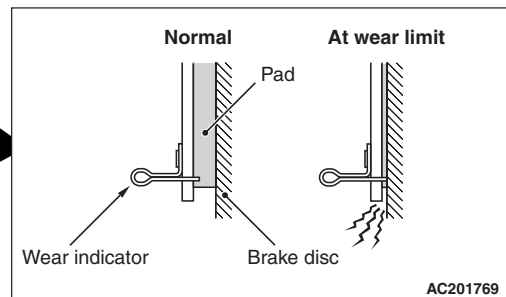
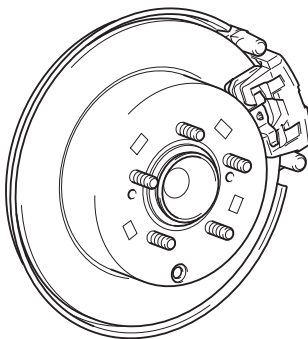
8-inch leading trailing-type drum brakes have been adopted for the rear brakes in order to provide stable braking force at all times both when moving forward and reverse.

### <Vehicles with rear disc brake>

<14-inch disc brake (S4-S35)>



<16-inch disc brake (S6-S35)>



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Brakes with the following specifications have been adopted for the rear.

- The 1-piston solid disc brake (S4-S35 <Vehicles with 16-inch wheel> or S6-S35 <Vehicles with 18-inch wheel>) has been adopted.\*
- An audible wear indicator that informs the driver of application limit has been adopted onto the brake pads.

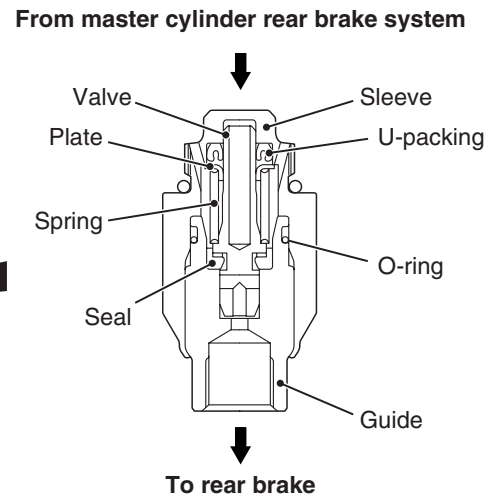
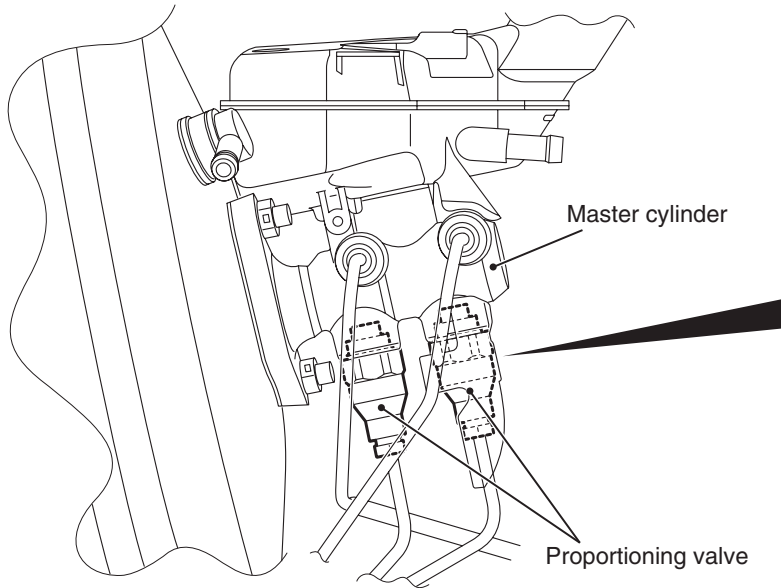
- The outer disc type brake disc which can be tightened together with the wheel has been introduced for better serviceability.

**NOTE:** \*For the brake disc name, refer to **FRONT BRAKE P.35A-8**.

### BRAKE LINE

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### PROPORTIONING VALVE <Vehicles without ABS>



A proportioning valve is used to prevent early locking of the rear wheels, in order to provide improved stability during braking.

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