TO INDEX

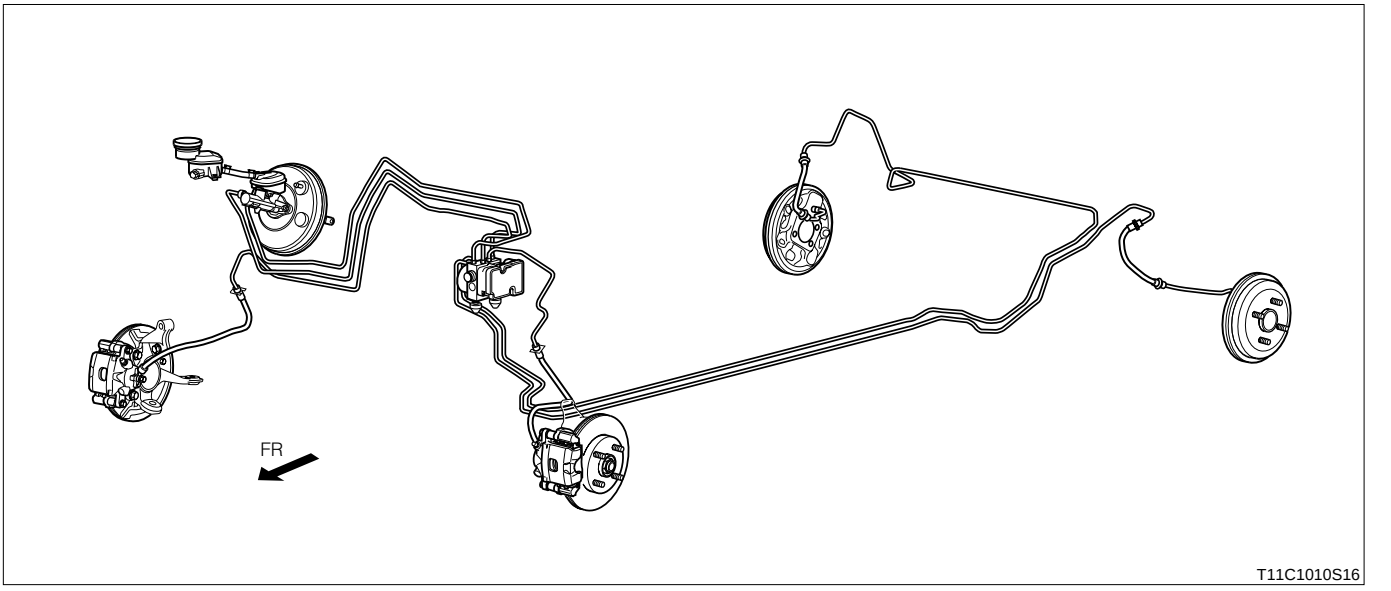
E1 BRAKE

1 OUTLINE

1-1 DESCRIPTION

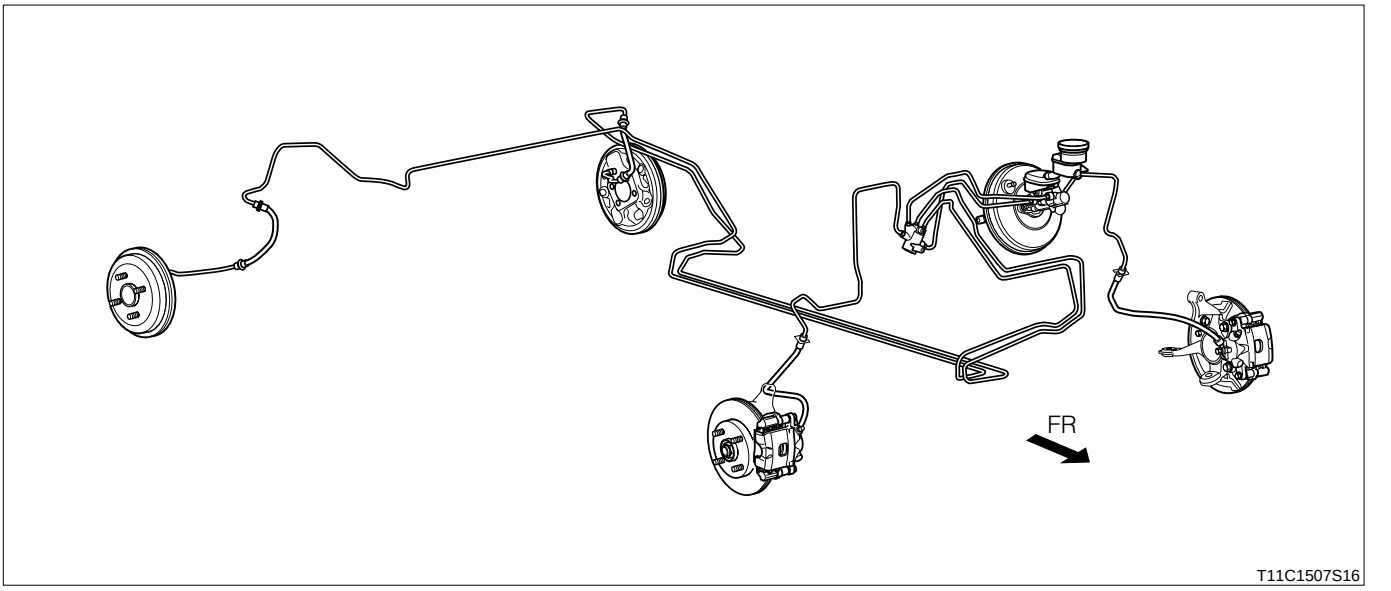
1.With regard to the brake mechanism, a disc brake has been employed at the front side, whereas a drum brake at the rear side.
2.On all models, the brake piping has employed a diagonal two-system piping (cross piping).
3.A separated-type brake reservoir tank is mounted.
4.The EBD control has been employed on ABS-equipped vehicles.

ABS-equipped vehicles



The illustration represents the RHD vehicle.

Vehicles not equipped with ABS



The illustration represents the LHD vehicle.

2 CONSTRUCTION AND OPERATION

2-1 BRAKE PIPING

2-1-1 DESCRIPTION

All vehicles have employed a diagonal dual brake piping (cross piping) so as to assure safety in the event that one brake system fails.

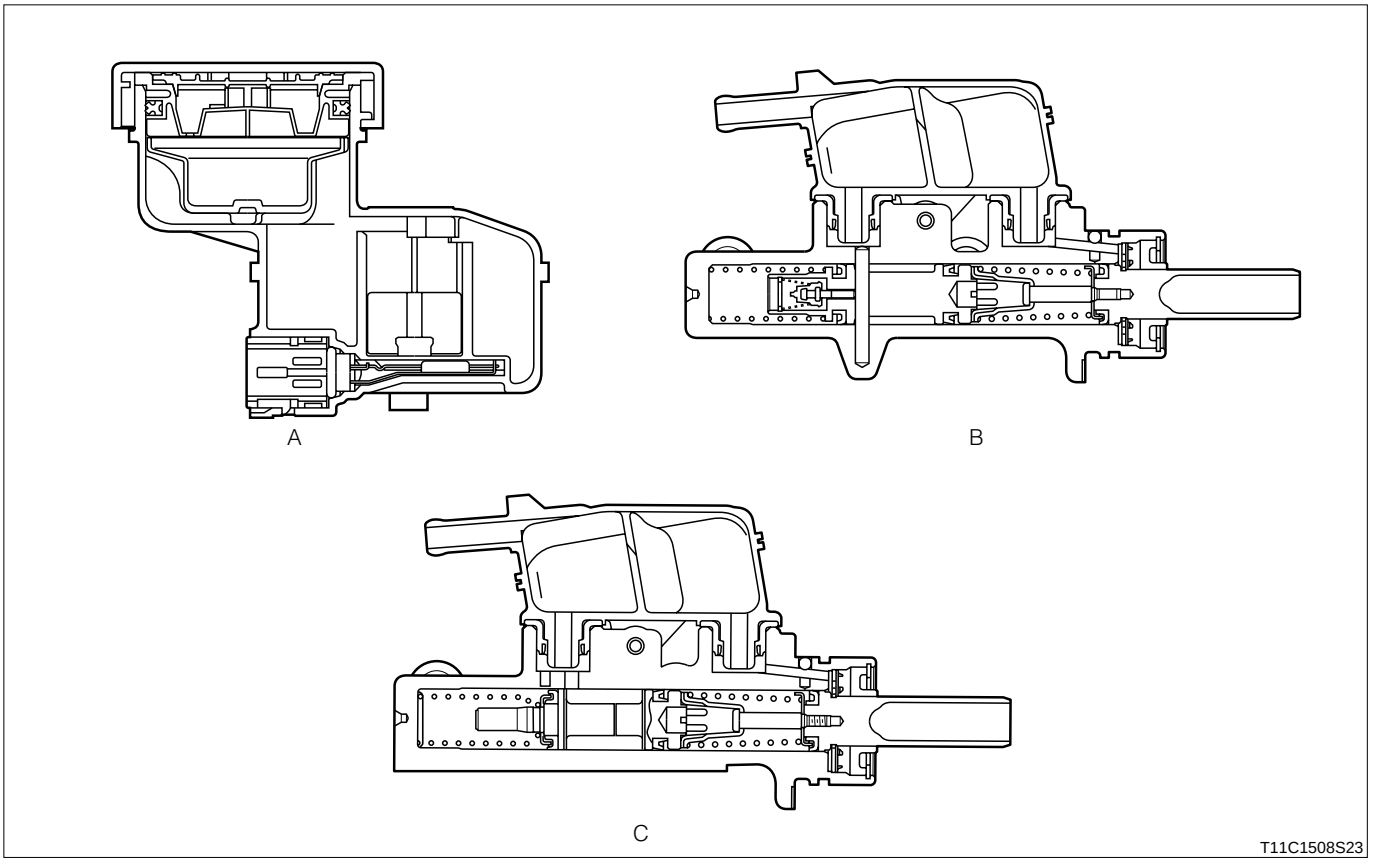
2-1-2 SPECIFICATIONS

	M300RS	M300LS	M301RS	M301LS
Operating system	Diagonal, dual circuit (cross piping)			

2-2 BRAKE MASTER CYLINDER

2-2-1 DESCRIPTION

1. On all models, the master cylinder has employed a tandem type. The master cylinder comes in the following three types, according to the port type and cylinder bore diameter.
   (1) Vehicles equipped with ABS: One-side center port type, cylinder bore diameter 19.0 mm
   (2) Vehicles equipped with ABS: One-side center port type, cylinder bore diameter 20.6 mm
   (3) Vehicles not equipped with ABS: Side port type, cylinder bore diameter 19.0 mm
2. All vehicles are equipped with the separated-type reservoir tank.



A in the figure: Reservoir tank
B in the figure: Master cylinder (Vehicles equipped with ABS)
C in the figure: Master cylinder (Vehicles not equipped with ABS)

2-2-2 SPECIFICATIONS

RHD vehicles

	M300RS	M301RS	M300RS	M301RS
	Vehicle equipped with ABS		Vehicle not equipped with ABS	
Type	Tandem center port (One side)		Tandem (Side port)	
Diameter [mm]	19.0			

LHD vehicles

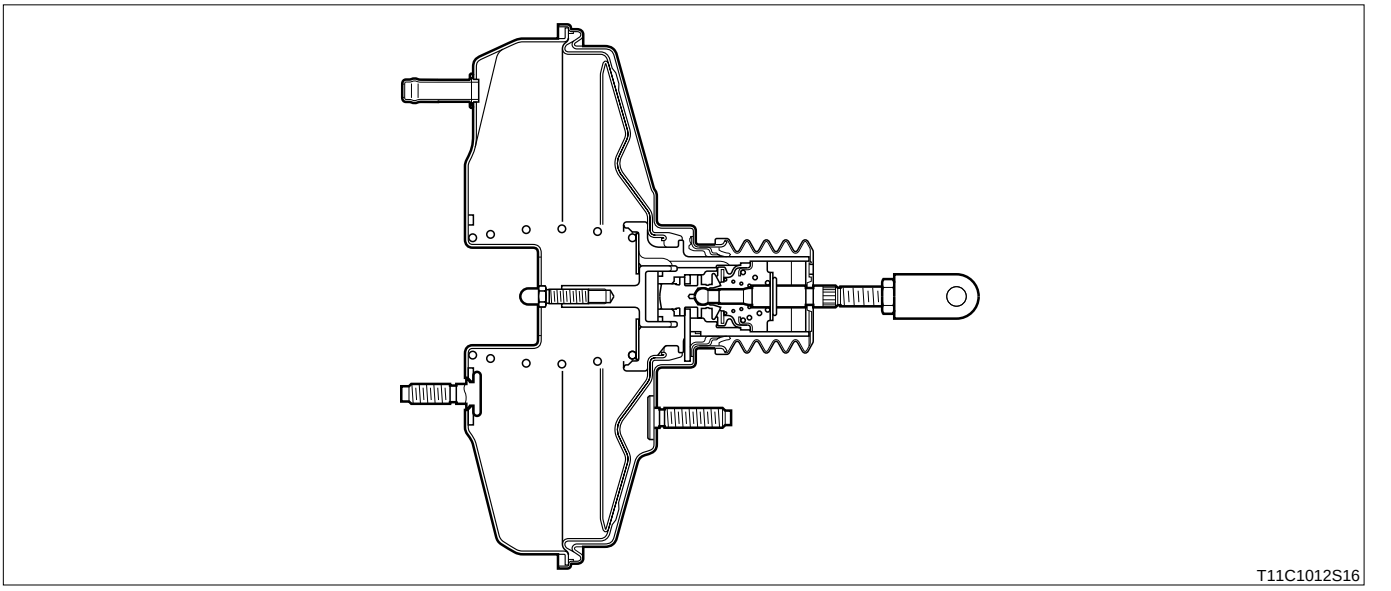
	M300LS			M301LS		
	GMNE GMNEW		GMNEW	GMGE GQGE GQGEW	GMGE GMGEW GQGE GQGEW	GMGEW GQGEW
	Vehicle equipped with ABS	Vehicle not equipped with ABS	Vehicle equipped with ABS	Vehicle equipped with ABS	Vehicle not equipped with ABS	Vehicle equipped with ABS
Type	Tandem center port (One side)	Tandem (Side port)	Tandem center port (One side)	←	Tandem (Side port)	Tandem center port (One side)
Diameter [mm]	19.0	←	20.6	19.0	←	20.6

2-3 BRAKE BOOSTER

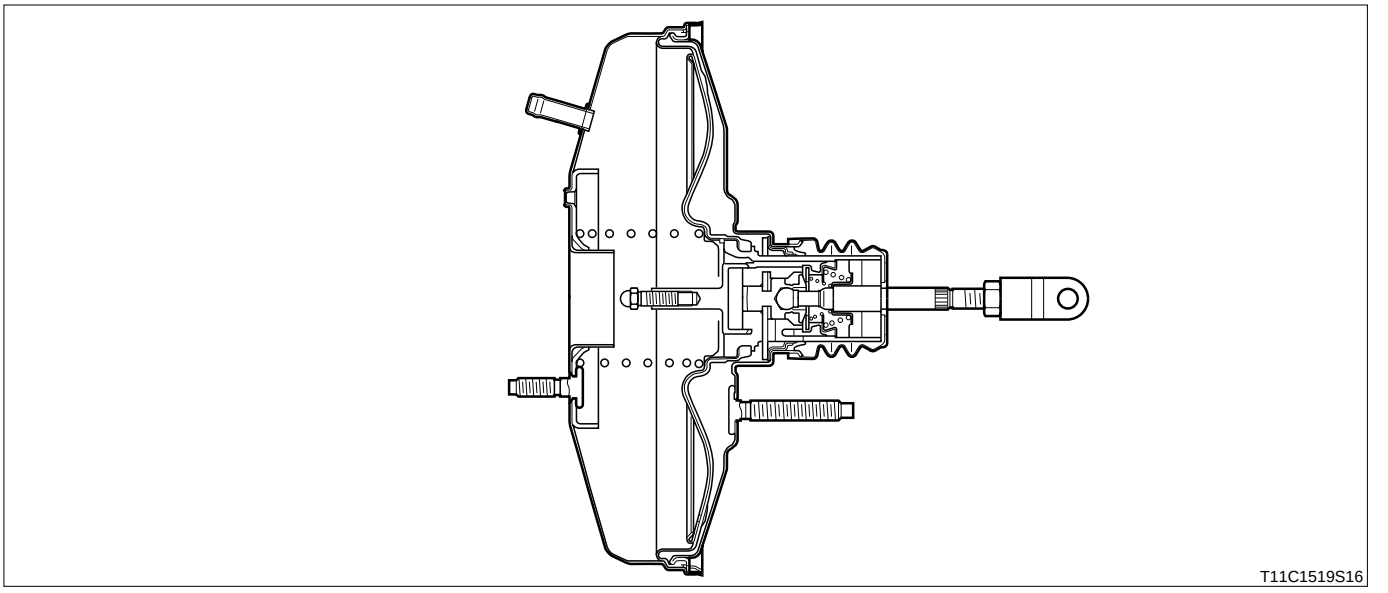
2-3-1 DESCRIPTION

1.The brake booster employs the vacuum boosting type on all models. The brake booster comes in two kinds according to the size.
  (1) 8-inch single type
  (2) 9-inch single type
2.For an enhanced brake performance at the time of emergency hard braking, a brake assist mechanism has been provided on vehicles equipped with ABS (except those equipped with a 9-inch brake booster).
3.A brake negative pressure switch has been installed on A/T vehicles (except those equipped with a 9-inch brake booster).

8-inch brake booster



9-inch brake booster



2-3-2 SPECIFICATIONS

RHD vehicles

	M300RS	M301RS	M300RS	M301RS
	Vehicle equipped with ABS		Vehicle not equipped with ABS	
Type	Vacuum boosting type (with the brake assist mechanism)		Vacuum boosting type	
Size [Inch]	8			

LHD vehicles

	M300LS			M301LS		
	GMNE GMNEW		GMNEW	GMGE GQGE GQGEW	GMGE GMGEW GQGE GQGEW	GMGEW GQGEW
	Vehicle equipped with ABS	Vehicle not equipped with ABS	Vehicle equipped with ABS	Vehicle equipped with ABS	Vehicle not equipped with ABS	Vehicle equipped with ABS
Type	Vacuum boosting type (with the brake assist mechanism)	Vacuum boosting type	←	Vacuum boosting type (with the brake assist mechanism)	Vacuum boosting type	←
Size [Inch]	8	←	9	8	←	9

2-3-3 BRAKE ASSIST MECHANISM

(1) Description

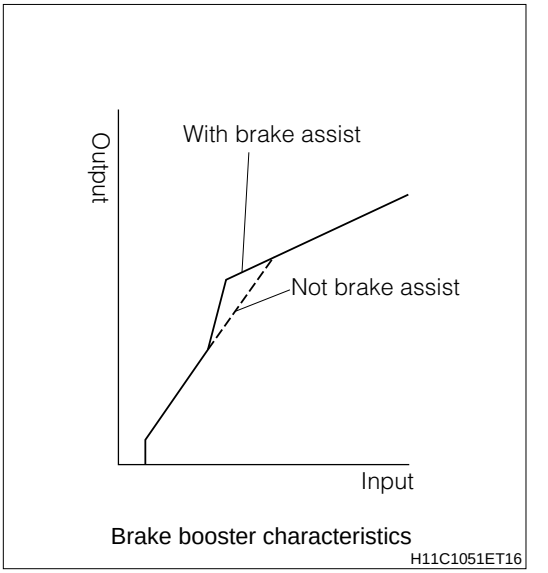
During emergency braking situations, a panicked driver will step on a brake pedal quickly; however the brake pedal may not be depressed hard enough. Or even if the brake pedal is depressed hard, it may be difficult for the driver to keep stepping hard on the brake.

In this case, the vehicle may not be allowed to exert its brake performance fully.

The brake booster equipped with a brake assist mechanism is a system that increases the assist to the braking force by the brake booster after the brake pedal depressing force exceeds a certain value, thereby enhancing brake performance, including ABS, at the time of emergency.

CAUTION

- The brake assist mechanism is not a mechanism which is capable of performing braking beyond the brake performance that the vehicle is designed to have or beyond the tire performance. Full attention should be paid during driving.
- The brake assist mechanism functions only when the brake pedal is depressed strongly during an emergency braking period. The driver will not feel any difference during the normal braking.



Brake booster characteristics

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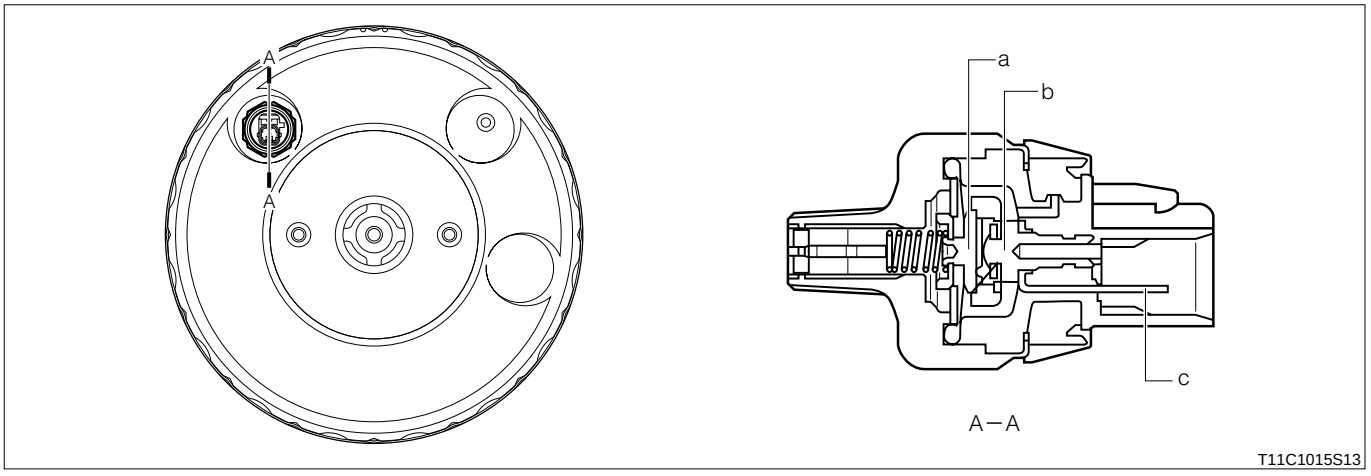
2-3-4 BRAKE VACUUM SWITCH

(1) Description

The brake vacuum switch reduces changes in negative pressure in the brake booster when the air-conditioner is ON to provide more stabilized performance of the brake servo.

(2) Operation



a	Contact point A
b	Contact point B
c	Terminal

1. When the pressure inside the brake booster is below the working pressure of the brake vacuum switch, the points of contact A and B are separated.
2. When the pressure in the brake booster increases (exceeding the working pressure of the brake vacuum switch), the point of contact A moves toward the point of contact B until it touches the point B, thereby providing body earth to the terminal.
3. The signal input is sent to the EFI ECU and the air-conditioner cutting is controlled on the EFI ECU side.

2-4 BRAKE PEDAL

2-4-1 DESCRIPTION

All vehicles are equipped with a backward movement preventing mechanism of the brake pedal in order to enhance passive safety.

2-4-2 BACKWARD MOVEMENT PREVENTING MECHANISM

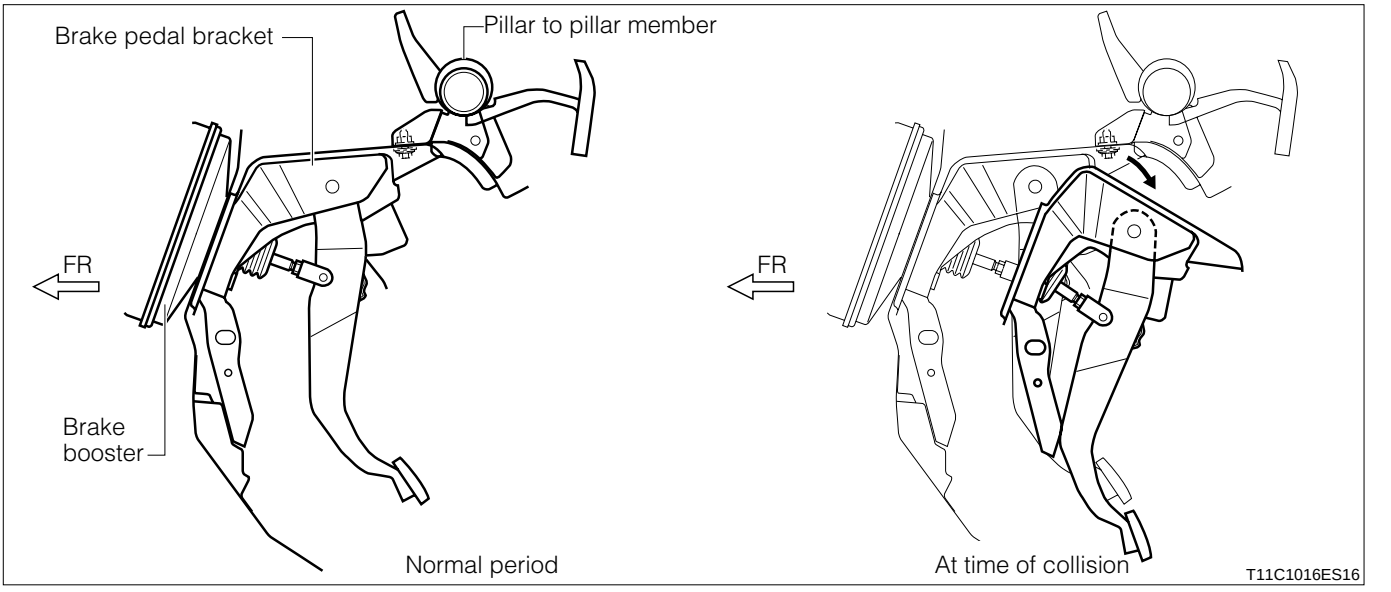
(1) Description

When an impact is applied from the front section of the vehicle body at the time of an accident, etc., and thus the brake master cylinder is pushed toward the vehicle interior, the brake pedal moves toward the rear side of the vehicle via the push rod of the brake booster. In this way, there is the possibility that the driver may be injured.

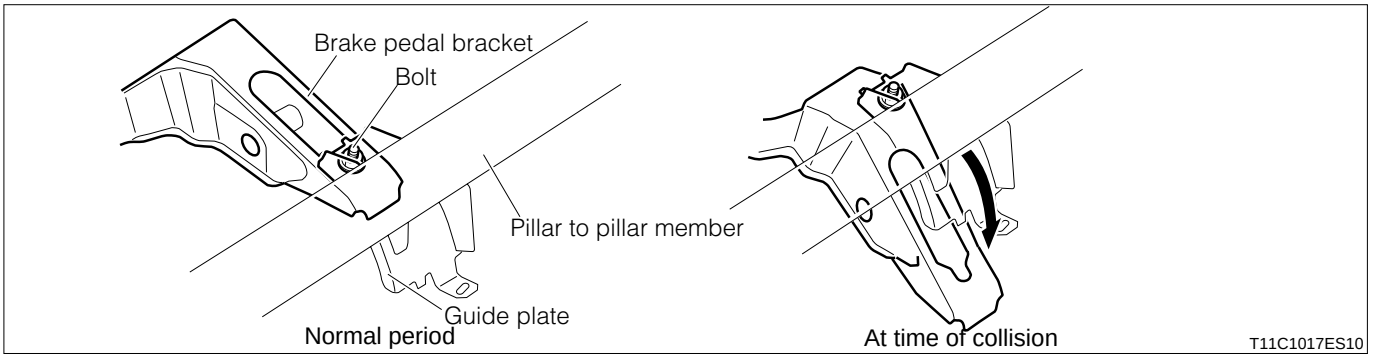
In order to prevent the brake pedal from moving backward, the backward movement preventing mechanism of the brake pedal has been employed on the brake pedal bracket and pillar-to-pillar member.

(2) Operation

1. When an impact is applied from the front section of the vehicle body at the time of an accident, etc., and thus the brake master cylinder is pushed toward the vehicle interior due to the backward movement of the engine itself, the brake booster pushes the brake pedal bracket.
2. The impact from the brake pedal bracket will disengage the pillar-to-pillar member, causing the brake pedal bracket to bend.



3. The brake pedal bracket moves by sliding toward the rear lower side of the vehicle over the guide plate on the pillar-to-pillar member.
4. This operation moves the brake pedal depressing surface toward the vehicle front lower side, thereby preventing the brake pedal from moving backward.



2-5 FRONT BRAKE

2-5-1 DESCRIPTION

1.The ventilated disc brake is employed on all models. The disc brake comes in two kinds according to the size.
(1) 13-inch ventilated disc brake (front disc 234mm dai)
(2) 14-inch ventilated disc brake (front disc 246mm dai)
2.The brake pad audible wear indicator is mounted on the brake pad inside the vehicle which provides an audible alarm if the pad remaining amount is reduced.

2-5-2 SPECIFICATIONS

	M300RS	M300LS	M301RS	M301LS	M301LS
	GMNE GMNEW	GMNE GMNEW	GMGE GMGEW GQGE GQGEW	GMGE GMGEW GQGE GQGEW	GMGEW GQGEW
Type	13 inch ventilated disk				14 inch ventilated disk
Cylinder diameter [mm]	51.1				51.1
Rotor outer diameter [mm]	234				246
Rotor thickness [mm]	16				17
Pad area [cm^2/piece]	30				35

2-6 REAR BRAKE

2-6-1 DESCRIPTION

1.All vehicles are equipped with the leading-trailing type drum brake.

2-6-2 SPECIFICATIONS

	M300RS	M300LS	M301RS	M301LS
Type	Drum (Leading trailing)			
Cylinder diameter [mm]	17.4			
Drum inner diameter [mm]	180			
Lining area [cm^2/piece]	43			

2-7 BRAKING FORCE CONTROL SYSTEM

2-7-1 DESCRIPTION

1.The EBD control has been employed on ABS-equipped vehicles. The braking force distribution between the front and rear wheels is electronically controlled ideally according to changes in the loading state and the load transfer due to deceleration, etc.
2.On vehicles not equipped with ABS, a mechanical type proportioning valve has been employed.

2-7-2 SPECIFICATIONS

	Vehicle equipped with ABS	Vehicle not equipped with ABS
Type	ABS with EBD control	Proportioning valve