

FRONT SUSPENSION

- The specification of the coil spring has been changed due to the addition of the 3000 mL engine models.
<3000 for Hong Kong>
- The specification of the coil spring has been changed.<3200 for South Africa>

SPECIFICATIONS

COIL SPRING

<3000 for Hong Kong>

Item	3000	3500 (for reference)
Wire diameter × average diameter × free length mm	17 × 110 × 317	17 × 110 × 321

<3200 for South Africa>

Item	New	Old
Wire diameter × average diameter × free length mm	17 × (90 – 110) × 326	17 × (90 – 110) × 321

REAR SUSPENSION

- The specification of the coil spring has been changed due to the addition of the 3000 mL engine models.
<3000 for Hong Kong>
- The specification of the coil spring has been changed. <3200 for General Export (except Brazil, Taiwan, Hong Kong, South Africa, Argentine), Brazil>, <3200-EXCEED, 3500-EXCEED for Australia>

SPECIFICATIONS

COIL SPRING

<3000 for Hong Kong>

Item	3000	3500 (for reference)
Wire diameter × average diameter × free length mm	19 × 134 × 331	19 × 134 × 337

<3200 for General Export (except Brazil, Taiwan, Hong Kong, South Africa, Argentine), Brazil>, <3200-EXCEED, 3500-EXCEED for Australia>

Item	New	Old
Wire diameter × average diameter × free length mm	(17 – 19) × (132 – 134) × 343	(18 – 19) × (133 – 134) × 337

HYDRAULIC BRAKE BOOSTER (HBB) <VEHICLES WITH M-ASTC, M-ATC>

Due to the adoption of M-ASTC*¹ and M-ATC*², accumulator, motor relay 1 and ECU have been changed.

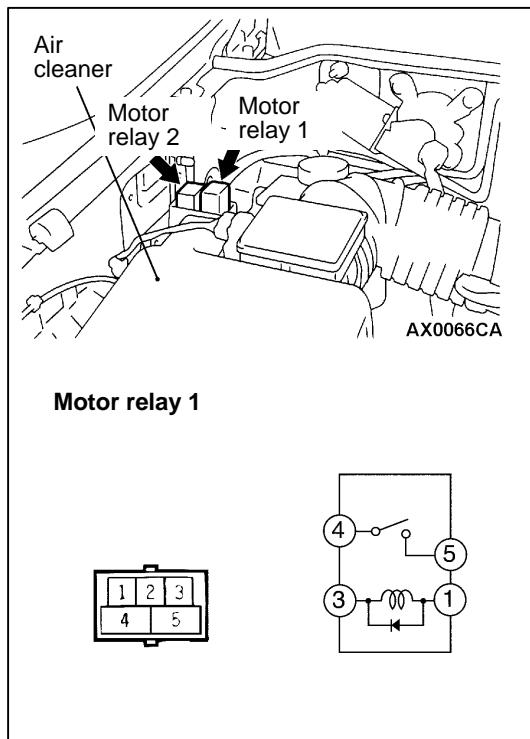
NOTE

- *¹: M-ASTC: Abbreviation for Mitsubishi Active Stability & Traction Control system. Refer to P.3-4 for construction and operations.
- *²: M-ATC: Abbreviation for Mitsubishi Active Traction Control system. Refer to P.3-4 for construction and operations.

ACCUMULATOR

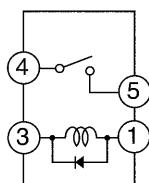
HBB accumulator specifications have been established as follows:

Item	Vehicles with M-ASTC, M-ATC	Vehicles without M-ASTC, M-ATC
Type	Piston type	Diaphragm type
Capacity cm ³	220	220
Sealed gas pressure MPa	7.4	7.4



MOTOR RELAY

In order to make a new type of motor relay 1, a diode has been added to motor relay 2 that makes quieter operation sound.



ECU

ECU specifications have been established as follows:

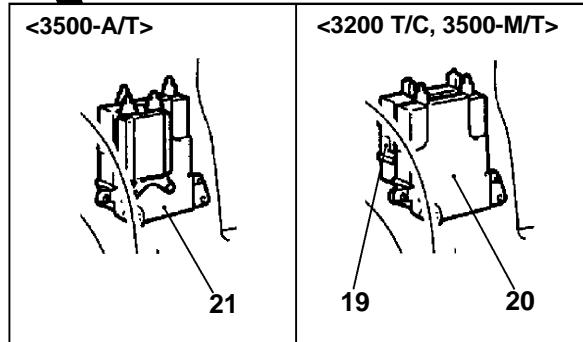
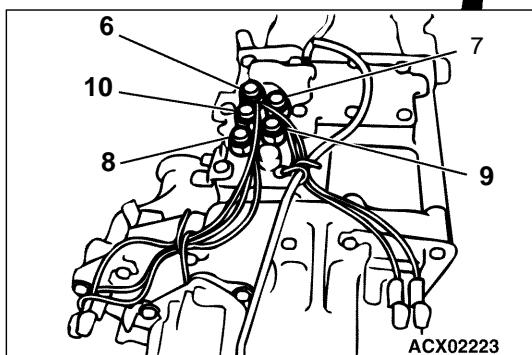
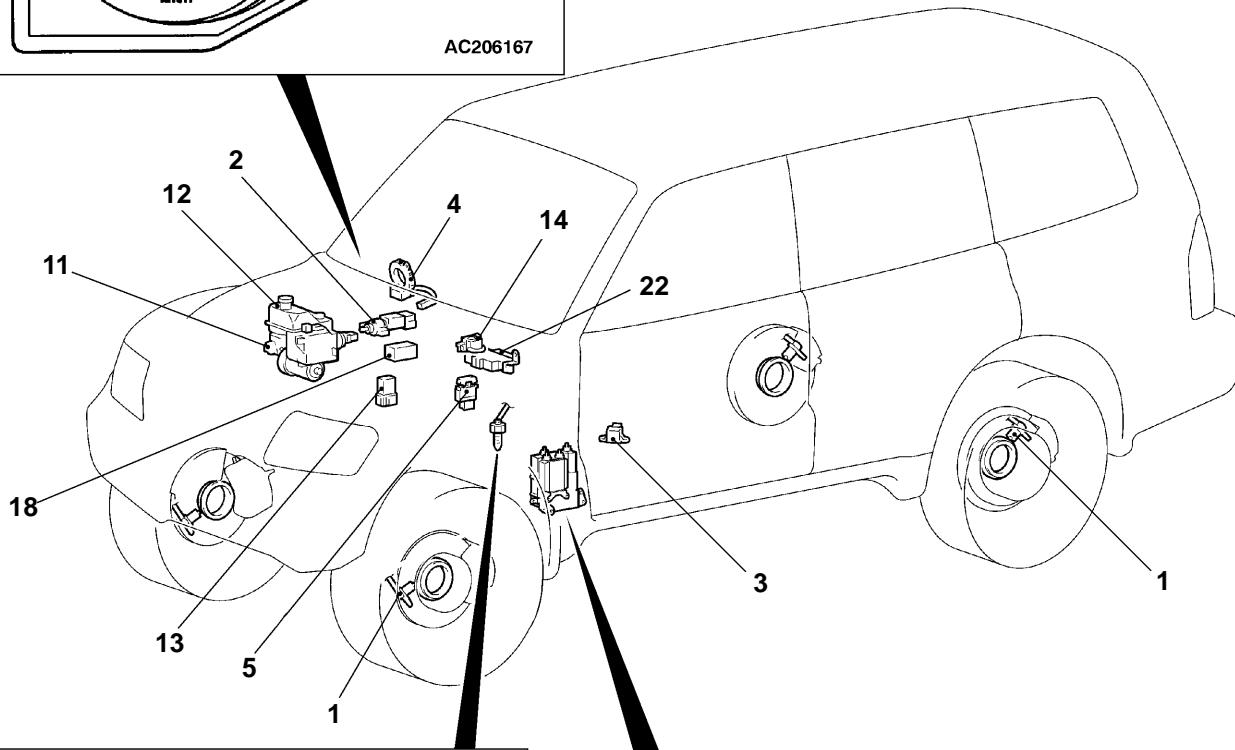
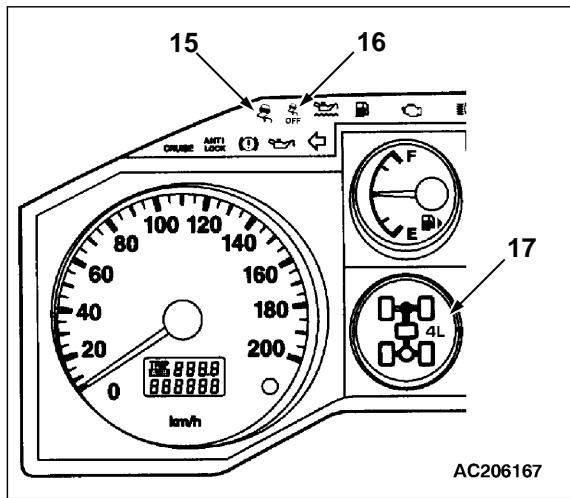
Item	Vehicles with M-ASTC	Vehicles with M-ATC	Vehicles without M-ASTC, M-ATC
ECU	M-ASTC-ECU	M-ATC-ECU	ABS-ECU
Control system	HBB, EBD, ABS, M-ASTC	HBB, EBD, ABS, M-ATC	HBB, EBD, ABS

IMITSUBISHI ACTIVE STABILITY AND TRACTION CONTROL SYSTEM (M-ASTC), MITSUBISHI ACTIVE TRACTION CONTROL SYSTEM (M-ATC)

MITSUBISHI Active Stability and Traction Control system (M-ASTC) has been installed as an option for 3200 for Australia, and MITSUBISHI Active Traction Control system (M-ATC) has been installed as an option for 3500 for GENERAL EXPORT (except TAIWAN) and Australia.

M-ATC is a system that automatically applies braking force to the freewheeling drive wheels caused by driving on the partially low-friction efficiency road surface and improper contact of wheel with the road so that loss of driving power by freewheeling drive wheels can be prevented and driving ability equivalent to differential lock can be provided. M-ASTC integrates functions of M-ATC and active stability control system to control critical behavior of a vehicle driving to the limit by suppressing the engine output as well as individually applying braking force to each wheel according to the driving condition into one.

CONSTRUCTION DIAGRAM

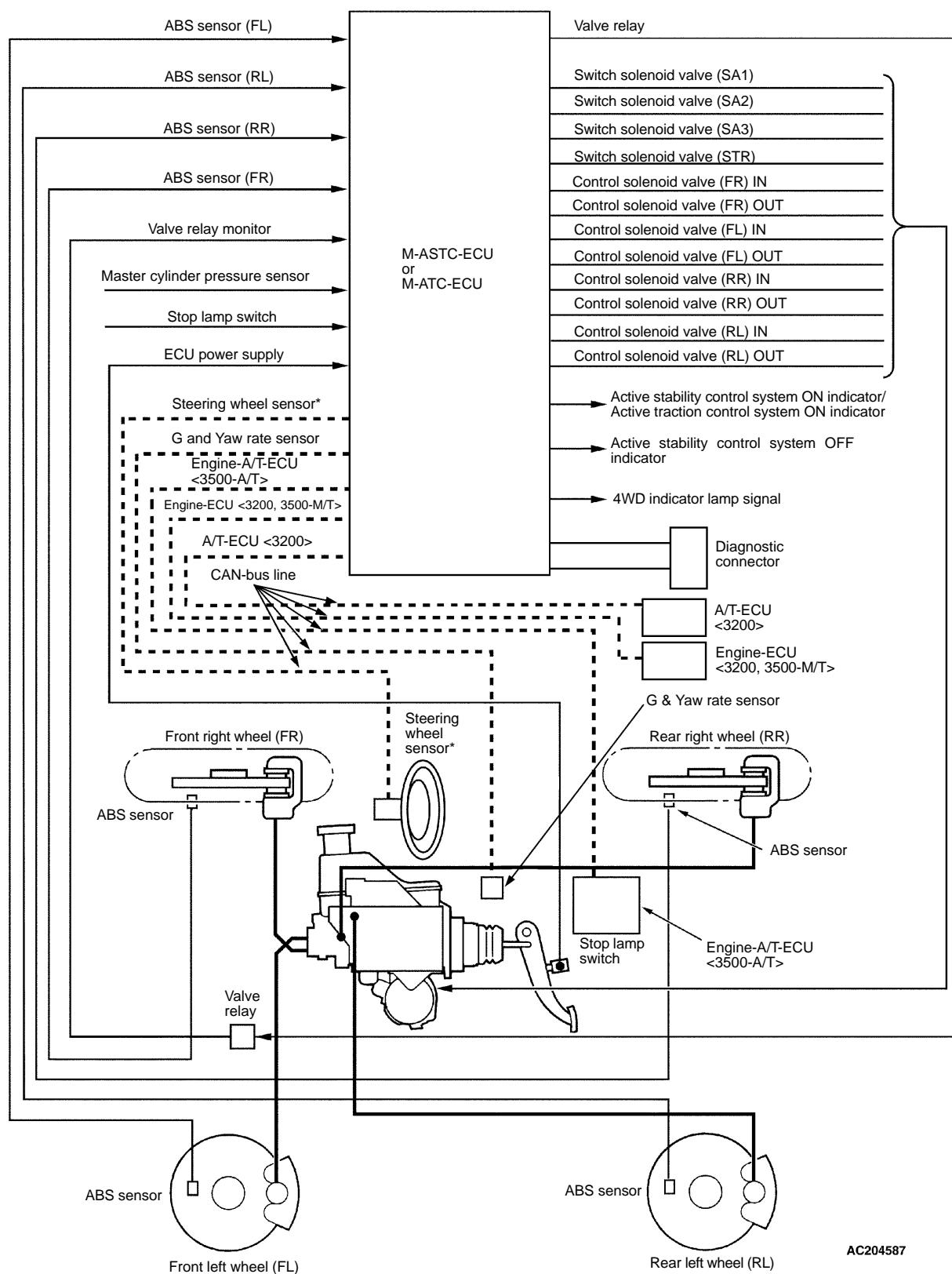


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Part name		Number	Outline of functions
Sensor	ABS sensor	1	Alternate current signals in proportion to the revolution speed of each wheel are sent to the M-ASTC-ECU or M-ATC-ECU.
	Stop lamp switch	2	Signals to indicate the application state of the brake pedal are sent to the M-ASTC-ECU or M-ATC-ECU.
	G and Yaw rate sensor	3	After the deceleration speed and cornering angular velocity of the vehicle in forward/rearward and lateral movement are detected, signals are converted into voltage value to be sent to the M-ASTC-ECU or M-ATC-ECU via CAN bus line.
	Steering wheel sensor <Vehicles with M-ASTC>	4	After the steering wheel angle is detected, signals are converted into the voltage value to be sent to the M-ASTC-ECU via CAN bus line.
	Active stability control switch <Vehicles with M-ASTC>	5	Instructions on active stability control system ON/OFF are given to M-ASTC-ECU.
	2WD/4WD switch	6	ON/OFF signals corresponding to the state of drive system are sent to the M-ASTC-ECU or M-ATC-ECU.
	4LLc switch	7	
	Center differential lock switch	8	
	2WD switch	9	
	4H switch	10	
	Master cylinder pressure sensor	11	Brake pedal application is notified to the M-ASTC-ECU or M-ATC-ECU.
Actuator	Hydraulic brake booster (HBB)	12	Signals received from the M-ASTC-ECU or M-ATC-ECU are used to operate switch solenoid valve and control solenoid valve so that brake fluid pressure of each wheel can be controlled.
	Valve relay	13	Signals received from M-ASTC-ECU or M-ATC-ECU are used to turn the system ON so that power can be supplied to the switch solenoid valve and the control solenoid valve in the HBB.
	HBB buzzer	14	Signals received from the M-ASTC-ECU or M-ATC-ECU are used to notify the driver of overheating in the solenoid valve caused by excessive operation of active traction control system.
	Active stability control system ON indicator/ Active traction control system ON indicator	15	Signals received from the M-ASTC-ECU or M-ATC-ECU are used to notify the driver of system in operation by flashing during control, system fault by illumination, and overheating in the solenoid valve caused by excessive operation.
	Active stability control system OFF indicator <Vehicles with M-ASTC>	16	Signals received from the M-ASTC-ECU are used to notify the driver of system NOT in operation by illumination or flash.
	4WD indicator lamp	17	As signals received from the M-ASTC-ECU or M-ATC-ECU are used to flash control wheels, a driver can learn that the system is in operation.

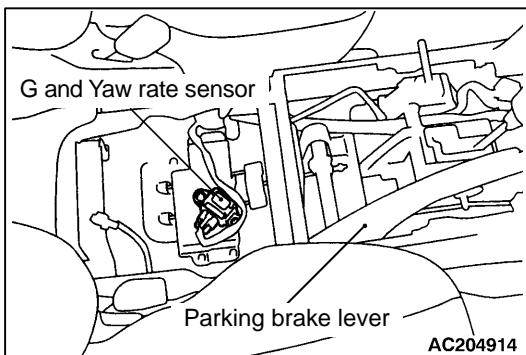
Part name	Number	Outline of functions
Diagnostic connector	18	Signals, including diagnosis code output are used to communicate with the MUT-II.
Engine ECU <3200, 3500-M/T>	19	Signals received from the M-ASTC-ECU or M-ATC-ECU are used to control the engine output.
A/T-ECU <3200>	20	
Engine-A/T-ECU <3500-A/T>	21	Signals are received from the M-ASTC-ECU or M-ATC-ECU to control the engine output.
MITSUBISHI Active Stability and Traction Control unit (M-ASTC-ECU), MITSUBISHI Active Traction Control unit (M-ATC-ECU)	22	<p>Use signals received from each sensor to control actuators , such as HBB.</p> <p>Controls self-diagnosis and fail safe function.</p> <p>Controls diagnostic function (MUT-II compatible).</p>

SYSTEM CONFIGURATION DIAGRAM



NOTE

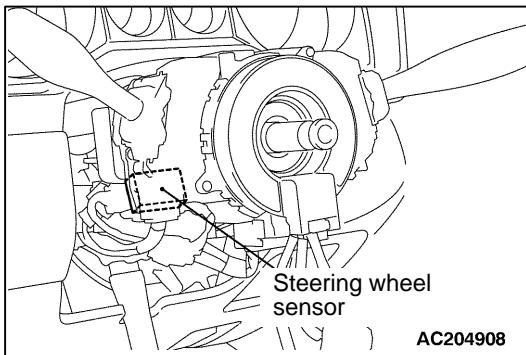
: Vehicles with M-ASTC



SENSOR

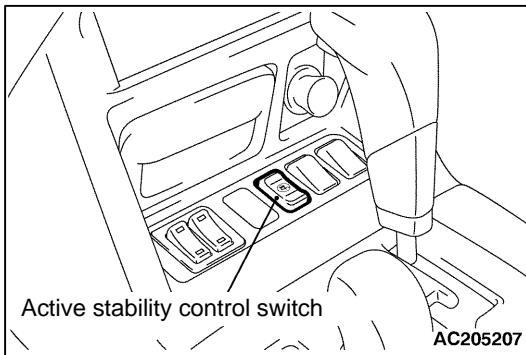
G AND YAW RATE SENSOR

The sensor is installed under the center console to detect deceleration speed and cornering angular velocity of the vehicle in forward/rearward and lateral movement.



STEERING WHEEL SENSOR <VEHICLES WITH M-ASTC>

The steering wheel sensor is installed at the column switch located near the front of the vehicle to detect angle of the steering wheel.



ACTIVE STABILITY CONTROL SWITCH <VEHICLES WITH M-ASTC>

The active stability control switch is installed at the center console to turn the system ON or OFF as shown in the table below.

SYSTEM CONTROL STATUS BY ACTIVE STABILITY CONTROL SWITCH <VEHICLE WITH M-ASTC>

Active stability control switch position	Transfer shift lever position	Active stability control system	Active traction control system	
			Brake control	Engine control
ON	2H	Control activated	Control activated	Control activated
	4H	Control activated	Control activated	Control activated
	4HLC	Control activated	Control activated	Control activated
	4LLC	Control deactivated	Control activated	Control deactivated
OFF	2H	Control deactivated	Control activated	Control deactivated
	4H	Control deactivated	Control activated	Control deactivated
	4HLC	Control deactivated	Control activated	Control deactivated
	4LLC	Control deactivated	Control activated	Control deactivated

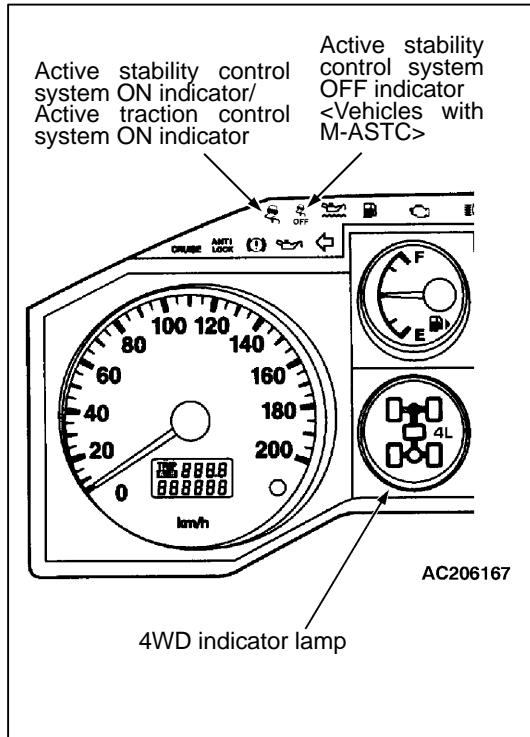
NOTE

- If MITSUBISHI Active Stability Control system is deactivated (OFF) by the active stability control switch, activation (ON) will be automatically resumed when the vehicle speed becomes 80 km/h or more.
- MITSUBISHI Active Stability Control system can be deactivated (OFF) when the vehicle speed becomes 40 km/h or less.

ACTUATOR

HYDRAULIC BRAKE BOOSTER

The switch solenoid valves (SA3, STR) have been added to control MITSUBISHI Active Stability and Traction Control system (M-ASTC) and MITSUBISHI Active Traction Control system (M-ATC). (Refer to P.3-21.)



ACTIVE STABILITY CONTROL SYSTEM ON INDICATOR/ACTIVE TRACTION CONTROL SYSTEM ON INDICATOR, ACTIVE STABILITY CONTROL OFF INDICATOR <VEHICLES WITH M-ASTC>, 4WD INDICATOR LAMP, HBB BUZZER

Active stability control system ON indicator/Active traction control system ON indicator, active stability control system OFF indicator, 4WD indicator lamp, and HBB buzzer are to notify a driver of the control state by illumination or flash as shown in the table.

Item	State	Active stability control system ON indicator/Active traction control system ON indicator	Active stability control system OFF indicator	4WD indicator lamp	HBB buzzer
Normal operation	Valve check	Illuminates for approximately 3 seconds after the ignition switch is turned ON	Illuminates for approximately 3 seconds after the ignition switch is turned ON	Illuminates for approximately 3 seconds after the ignition switch is turned ON	–
	Normal state	Turned OFF	Turned OFF	Illuminates the transfer gear position	–
	Deterioration in brake force (Example: accumulator pressure decreased)	–	–	–	Continuous sound
	Active stability control system control ON	Flashing (6 Hz)	Turned OFF	–	–
	Active traction control system control ON	Flashing (6 Hz)	–	Brake control: Controlled wheel flashing (6 Hz) Engine control: Fastest wheel flashing (6 Hz)	–
	Active stability control system control deactivated (4LLc position, active stability control switch: OFF)	Turned OFF	Illuminates	–	–
	Active traction control system control cancellation warning for solenoid valve protection	–	–	–	Intermittent sound
	Active traction control system control cancellation for solenoid valve protection	Illuminates	Illuminates	–	Continuous sound for 3 seconds

Item	State	Active stability control system ON indicator/Active traction control system ON indicator	Active stability control system OFF indicator	4WD indicator lamp	HBB buzzer
Defect	Active stability control system fault	Illuminates	Illuminates	–	–
	Active traction control system fault	Illuminates	Illuminates	–	–
	HBB defective	Illuminates	Illuminates	–	Continuous sound if accumulator pressure decreases
MUT-II being connected	Without driving forcibly	–	–	–	–
	Driving forcibly	Turned OFF	Illuminates	4 wheel extinguishes* Center differential flashing*	–
Battery removal	Steering wheel sensor initialisation incomplete	–	Illuminates	–	–

NOTE

*: The transfer-ECU controls according to the signals from the M-ASTC-ECU or M-ATC-ECU.

M-ASTC-ECU, M-ATC-ECU

ABS-ECU, active stability control system ECU, and active traction control system ECU are integrated into one in order to achieve integrated control over driving power and braking force in association of M-ASTC-ECU with ABS. Just like M-ASTC-ECU, ABS-ECU and active traction control system ECU are integrated into one in order to achieve integrated control over driving power and braking force in association of M-ATC-ECU with ABS.

SYSTEM COMPOSITION

MITSUBISHI Active Stability and Traction Control system is composed of yaw rate sensor, steering wheel sensor, switch solenoid valve, master cylinder pressure sensor in addition to ABS system. Moreover, MITSUBISHI Active Traction Control system is composed of yaw rate sensor, switch solenoid valve, master cylinder pressure sensor in addition to ABS system.

ACTIVE STABILITY CONTROL SYSTEM CONTROL <VEHICLES WITH M-ASTC>

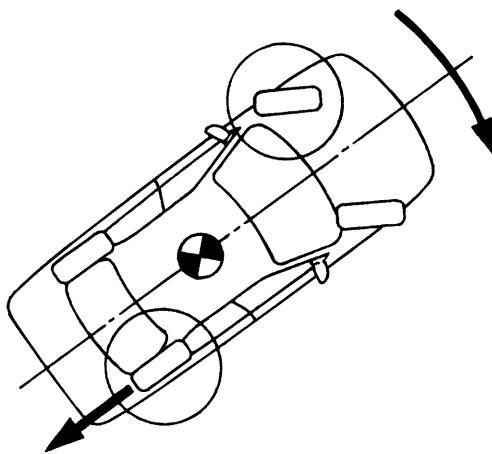
M-ASTC-ECU detects the vehicle movement based on the information received from each sensor and calculates ideal vehicle movement model. Based on the comparison of two results, yaw moment of the vehicle is generated by controlling braking force applied to certain wheels and understeer/oversteer is suppressed by controlling the engine output so that the vehicle movement can become similar to the calculated model.

EXAMPLE OF ACTIVE TRACTION CONTROL SYSTEM ON

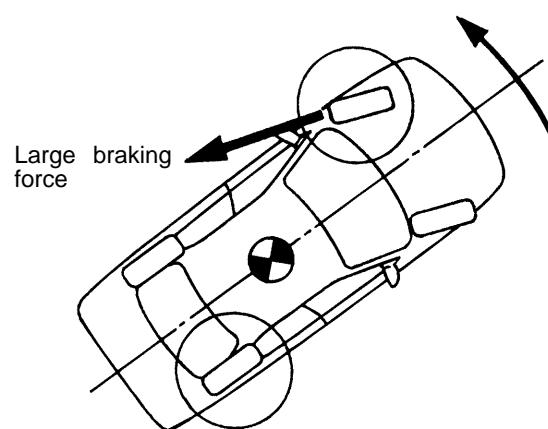
The active stability control system changes the balance of braking force and cornering force to generate yaw moment so that the vehicle balance can be controlled.

For example, if the vehicle tends to be understeer on the slippery road surface against the driver's intention, yaw moment towards suppression of understeer (rotating force) is generated by increasing braking force applied to the rear inner wheels. On the contrary, if the vehicle tends to be oversteer, yaw moment towards suppression of oversteer (counter-rotating force) is generated by increasing braking force applied to the front outer wheels. If the vehicle is determined as speeding, deceleration of the vehicle for stable and safe cornering can be achieved by reducing the engine output.

<Generation of rotating force>



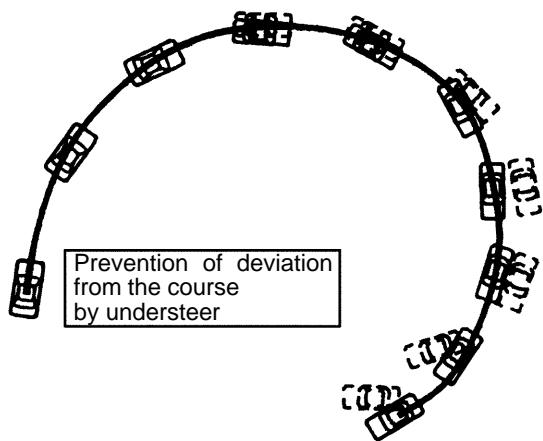
<Generation of counter-rotating force>



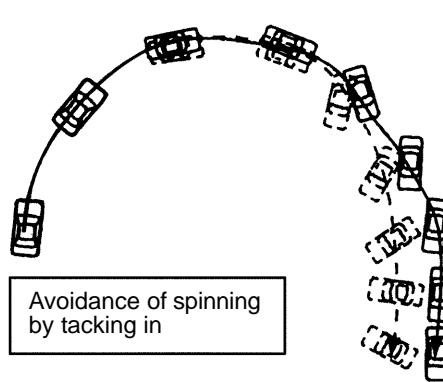
AC204610

EXAMPLES OF BRAKING EFFECT

Suppression of understeer



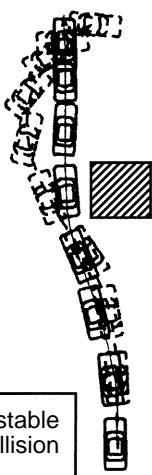
Suppression of oversteer



AC204506

AC204505

Improvement in ABS performance



Vehicle balance stable
after avoiding collision
with obstacles

AC204504

AC204507AB

COOPERATIVE CONTROL

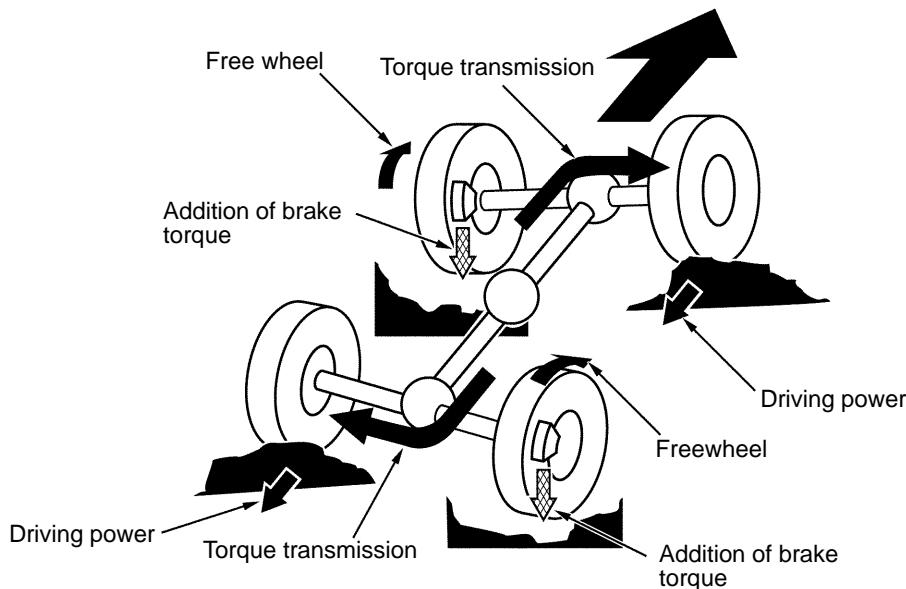
Active stability control system transmits and receives data required for controlling ABS and active traction control system so that cooperative control can be achieved.

Control system	Control features
ABS	The system cooperates with ABS control while the active stability control system is activated so that ABS performance can be improved.
Active traction control system	The system cooperates with the active traction control system to control the engine output when the accelerator pedal is depressed.

ACTIVE TRACTION CONTROL SYSTEM CONTROL

Active traction control system automatically applies braking force to the freewheeling drive wheels caused by driving on the partially low-friction efficiency road surface and improper contact of wheels with the road so that loss of driving power caused by the freewheeling drive wheels can be prevented.

For example, when the vehicle is driving off road, application of braking force to the freewheeling front left and rear right wheels can give driving power to not freewheeling front right and rear left wheels so that evacuation capability equivalent to differential lock can be provided.



AC204618 AB

FAIL-SAFE DIAGNOSTIC FUNCTION

M-ASTC-ECU and M-ATC-ECU monitor input and output signals any time and if any abnormality is detected in the system, fail signals are output to illuminate or flash respective indicator lamp and provide control according to trouble symptoms as shown in the following table. (When ABS is faulty, the active stability control system and the active traction control system functions are disabled, but the other functions are NOT disabled when the active stability control system and the active traction control system are faulty. It should be noted that a method of illumination depends on the micro computer for monitoring.)

In addition, M-ASTC-ECU and M-ATC-ECU are equipped with the following functions to facilitate system inspections:

- Diagnosis code output
- Service data output
- Actuator test

All of the above-mentioned items can be tested by the MUT-II.

FAIL-SAFE FUNCTION

Diagnos- sis code No.	Item	ABS control	EBD control	Active stability control system control		Active traction control system control	
				Engine control	Brake control	Engine control	Brake control
11	ABS sensor (FR) open circuit or short circuit	Deacti- vated	Activated (deacti- vated if defects are found in more than two wheels)	Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated
12	ABS sensor (FL) open circuit or short circuit			Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated
13	ABS sensor (RR) open circuit or short circuit			Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated
14	ABS sensor (RL) open circuit or short circuit			Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated
16	Excessive decrease or increase in the power supply voltage of the M-ASTC-ECU or M-ATC-ECU	Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated
17*	Active stability control switch system	–	–	Deacti- vated	Deacti- vated	–	–
21	ABS sensor (FR) system	Deacti- vated	Activated (deacti- vated if defects are found in more than two wheels)	Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated
22	ABS sensor (FL) system			Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated
23	ABS sensor (RR) system			Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated
24	ABS sensor (RL) system			Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated
25	Defective tyre with different diameter	Activated	Activated	Activated	Activated	Activated	Activated
31	Ignition switch (IG2) system	–	–	–	–	–	–
33	Stop light switch system	Deacti- vated	–	Deacti- vated	Deacti- vated	–	–
34	CAN communication error	Activated	–	Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated
35	Engine system fault	–	–	Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated
36	Engine-ECU communication error			Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated
37	A/T system fault	–	–	Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated
38	A/T-ECU communication error			Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated
41	Control solenoid valve (FR) system	Deacti- vated	Activated	Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated
42	Control solenoid valve (FL) system			Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated
43	Control solenoid valve (RR) system			Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated
44	Control solenoid valve (RL) system			Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated
45	Switch solenoid valve (SA1) system	Deacti- vated	–	Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated
46	Switch solenoid valve (SA2) system			Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated
47	Switch solenoid valve (SA3) system			Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated
48	Switch solenoid valve (STR) system			Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated

Diagnos- sis code No.	Item	ABS control	EBD control	Active stability control system control		Active traction control system control	
				Engine control	Brake control	Engine control	Brake control
51	Valve relay ON defective	Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated
52	Valve relay OFF defective	Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated
53	Motor system	Deacti- vated	Activated	Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated
54	Motor relay system	Open circuit defect	Deacti- vated	Activated	Deacti- vated	Deacti- vated	Deacti- vated
		Defects except for open circuit	Activated	Activated	Activated	Activated	Activated
55	Motor system	Deacti- vated	Activated	Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated
56	Pressure switch system	Deacti- vated	Activated	Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated
57	Accumulator pressure sensor system	Deacti- vated	Activated	Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated
58	Power supply drive circuit system	–	–	–	–	–	–
61	Master cylinder pressure sensor system	Activated	–	Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated
63	G sensor output error	Activated	–	Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated
64	G sensor clogging defect	Activated	–	Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated
65	G sensor self-diagnosis error	Activated	–	Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated
66*	Steering wheel sensor self-diagnosis error	–	–	Deacti- vated	Deacti- vated	–	–
67*	Steering wheel sensor communication line error	–	–	Deacti- vated	Deacti- vated	–	–
68*	Steering wheel sensor output error	–	–	Deacti- vated	Deacti- vated	–	–
71	Yaw rate sensor self-diagnosis error	–	–	Deacti- vated	Deacti- vated	–	–
72	Yaw rate sensor 0-point error	–	–	Deacti- vated	Deacti- vated	–	–
73	Yaw rate sensor output error	–	–	Deacti- vated	Deacti- vated	–	–

Diagnos- sis code No.	Item	ABS control	EBD control	Active stability control system control		Active traction control system control	
				Engine control	Brake control	Engine control	Brake control
74	G and Yaw rate sensor communication error	Activated	–	Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated
75	Transfer switch defect	–	–	Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated
76	G sensor error	Activated	–	Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated
77	Yaw rate sensor error	–	–	Deacti- vated	Deacti- vated	–	–
78	Engine ECU inappropriately installed	–	–	Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated
81	G sensor initialization incomplete	Deacti- vated	–	Deacti- vated	Deacti- vated	Deacti- vated	Deacti- vated
82	Yaw rate sensor initialization incomplete	–	–	Deacti- vated	Deacti- vated	–	–
83*	Steering wheel sensor initialization incomplete	–	–	Deacti- vated	Deacti- vated	–	–
84	Transfer switch initialization incomplete	–	–	Deacti- vated	Deacti- vated	–	–
85	Master cylinder pressure sensor initialization incomplete	–	–	Deacti- vated	Deacti- vated	–	–

NOTE

*: Only vehicles with M-ASTC

INDICATOR LAMP

Diagnos- sis code No.	Item	Brake warning lamp	ABS warning lamp	Active stability control system ON indicator/ Active traction control system ON indicator	Active stability control OFF indicator
11	ABS sensor (FR) open circuit or short circuit	Turned OFF (Illuminates if defects are found in more than two wheels)	Illuminates	Illuminates	Illuminates
12	ABS sensor (FL) open circuit or short circuit				
13	ABS sensor (RR) open circuit or short circuit				
14	ABS sensor (RL) open circuit or short circuit				
16	Excessive decrease or increase in the power supply voltage of the M-ASTC-ECU or M-ATC-ECU	Illuminates	Illuminates	Illuminates	Illuminates
17*	Active stability control switch system	Turned OFF	Turned OFF	Illuminates	Illuminates

Diagnosis code No.	Item	Brake warning lamp	ABS warning lamp	Active stability control system ON indicator/ Active traction control system ON indicator	Active stability control OFF indicator
21	ABS sensor (FR) system	Turned OFF (Illuminates if defects are found in more than two wheels)	Illuminates	Illuminates	Illuminates
22	ABS sensor (FL) system				
23	ABS sensor (RR) system				
24	ABS sensor (RL) system				
25	Defective tyre with different diameter	Turned OFF	Illuminates	Illuminates	Illuminates
31	Ignition switch (IG2) system	Illuminates	Turned OFF	Turned OFF	Turned OFF
33	Stop light switch system	Turned OFF	Illuminates	Illuminates	Illuminates
34	CAN communication error	Turned OFF	Illuminates	Illuminates	Illuminates
35	Engine system fault	Turned OFF	Turned OFF	Illuminates	Illuminates
36	Engine-ECU communication error				
37	A/T system fault	Turned OFF	Turned OFF	Illuminates	Illuminates
38	A/T-ECU communication error				
41	Control solenoid valve (FR) system	Turned OFF	Illuminates	Illuminates	Illuminates
42	Control solenoid valve (FL) system				
43	Control solenoid valve (RR) system				
44	Control solenoid valve (RL) system				
45	Switch solenoid valve (SA1) system	Turned OFF	Illuminates	Illuminates	Illuminates
46	Switch solenoid valve (SA2) system				
47	Switch solenoid valve (SA3) system				
48	Switch solenoid valve (STR) system				
51	Valve relay ON fault	Illuminates	Illuminates	Illuminates	Illuminates
52	Valve relay OFF fault	Illuminates	Illuminates	Illuminates	Illuminates
53	Motor system	Illuminates	Illuminates	Illuminates	Illuminates
54	Motor relay system	Open circuit defect	Illuminates	Illuminates	Illuminates
		Defects except for open circuit	Illuminates	Turned OFF	Turned OFF
55	Motor system	Illuminates	Illuminates	Illuminates	Illuminates
56	Pressure switch system	Illuminates	Illuminates	Illuminates	Illuminates
57	Accumulator pressure sensor system	Illuminates	Illuminates	Illuminates	Illuminates
58	Power supply drive circuit system	Illuminates	Turned OFF	Turned OFF	Turned OFF
61	Master cylinder pressure sensor system	Turned OFF	Illuminates	Illuminates	Illuminates

Diagnos- sis code No.	Item	Brake warning lamp	ABS warning lamp	Active stability control system ON indicator/ Active traction control system ON indicator	Active stability control OFF indicator
63	G sensor output error	Turned OFF	Illuminates	Illuminates	Illuminates
64	G sensor clogging defect	Turned OFF	Illuminates	Illuminates	Illuminates
65	G sensor self-diagnosis error	Turned OFF	Illuminates	Illuminates	Illuminates
66*	Steering wheel sensor self-diagnosis error	Turned OFF	Turned OFF	Illuminates	Illuminates
67*	Steering wheel sensor communication line error	Turned OFF	Turned OFF	Illuminates	Illuminates
68*	Steering wheel sensor output error	Turned OFF	Turned OFF	Illuminates	Illuminates
71	Yaw rate sensor self-diagnosis error	Turned OFF	Turned OFF	Illuminates	Illuminates
72	Yaw rate sensor 0-point error	Turned OFF	Turned OFF	Illuminates	Illuminates
73	Yaw rate sensor output error	Turned OFF	Turned OFF	Illuminates	Illuminates
74	G and Yaw rate sensor communication error	Turned OFF	Illuminates	Illuminates	Illuminates
75	Transfer switch defect	Turned OFF	Turned OFF	Illuminates	Illuminates
76	G sensor error	Turned OFF	Illuminates	Illuminates	Illuminates
77	Yaw rate sensor error	Turned OFF	Turned OFF	Illuminates	Illuminates
78	Engine ECU inappropriately installed	Turned OFF	Turned OFF	Illuminates	Illuminates
81	G sensor initialization incomplete	–	–	Flashing	Illuminates
82	Yaw rate sensor initialization incomplete	–	–	Flashing	Illuminates
83*	Steering wheel sensor initialization incomplete	–	–	Turned OFF	Illuminates
84	Transfer switch initialization incomplete	–	–	Turned OFF	Illuminates
85	Master cylinder pressure sensor initialization incomplete	–	–	Turned OFF	Illuminates

NOTE

*: Only vehicles with M-ASTC

DIAGNOSIS CODE OUTPUT

Due to the adoption of non-volatile memory (EEPROM*), the results of 54 diagnostic items are memorized even after battery terminals are disconnected.

NOTE

1. Refer to P.3-16 for diagnostic items.
2. *: EEPROM=Electrical Erasable Programmable ROM (ROM, into which information to be memorized can be written and be erasable electrically.)

HOW TO READ DIAGNOSIS CODE

The diagnosis code can be checked by the MUT-II.

HOW TO ERASE DIAGNOSIS CODE MEMORY

Diagnosis code memory can be erased by the MUT-II.

NOTE

If the ASTC-ECU is deactivated by fail safe function, diagnosis code cannot be erased.

SYSTEM OPERATION

ACTIVE STABILITY CONTROL SYSTEM ON (EXAMPLE: TURNING TO RIGHT, OVERSTEER SUPPRESSED)

If M-ASTC-ECU determines that the vehicle tends to be oversteer, the signals indicated in the table shown below are output to each solenoid valve of ABS and active stability control system in order to regulate pressurization of outward front wheels.

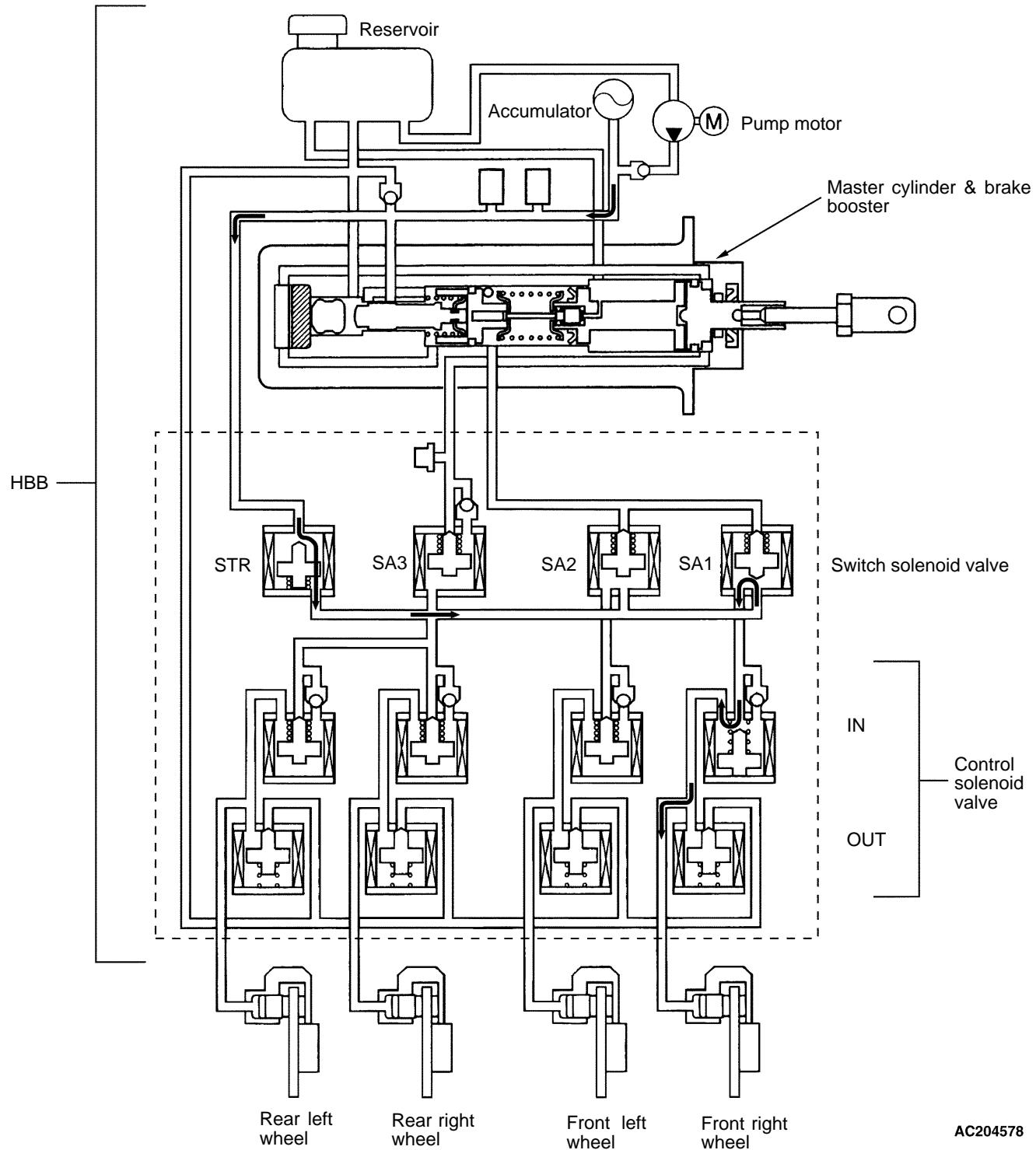
To be specific, oil pressurized by pump makes the switch solenoid valve (STR) and the switch solenoid valve (SA1) open and goes through them to pressurize the front left wheel. At the moment, the control solenoid valve at the front right wheel (IN) is closed to block supply of fluid pressure.

SWITCH SOLENOID VALVE

Item	Continuity
SA1, SA2, SA3, STR	ON

CONTROL SOLENOID VALVE

Item		Continuity	Opening state
Front right wheel	IN	OFF	Open
	OUT	OFF	Closed
Front left wheel	IN	ON	Closed
	OUT	OFF	Closed
Rear right wheel	IN	ON	Closed
	OUT	OFF	Closed
Rear left wheel	IN	ON	Closed
	OUT	OFF	Closed



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ACTIVE STABILITY CONTROL SYSTEM ON (EXAMPLE: TURNING TO LEFT, UNDERSTEER SUPPRESSED)

If M-ASTC-ECU determines that the vehicle tends to be understeer, the signals indicated in the table shown below are output to each solenoid valve of ABS and active stability control system in order to regulate pressurization of rear inside wheels.

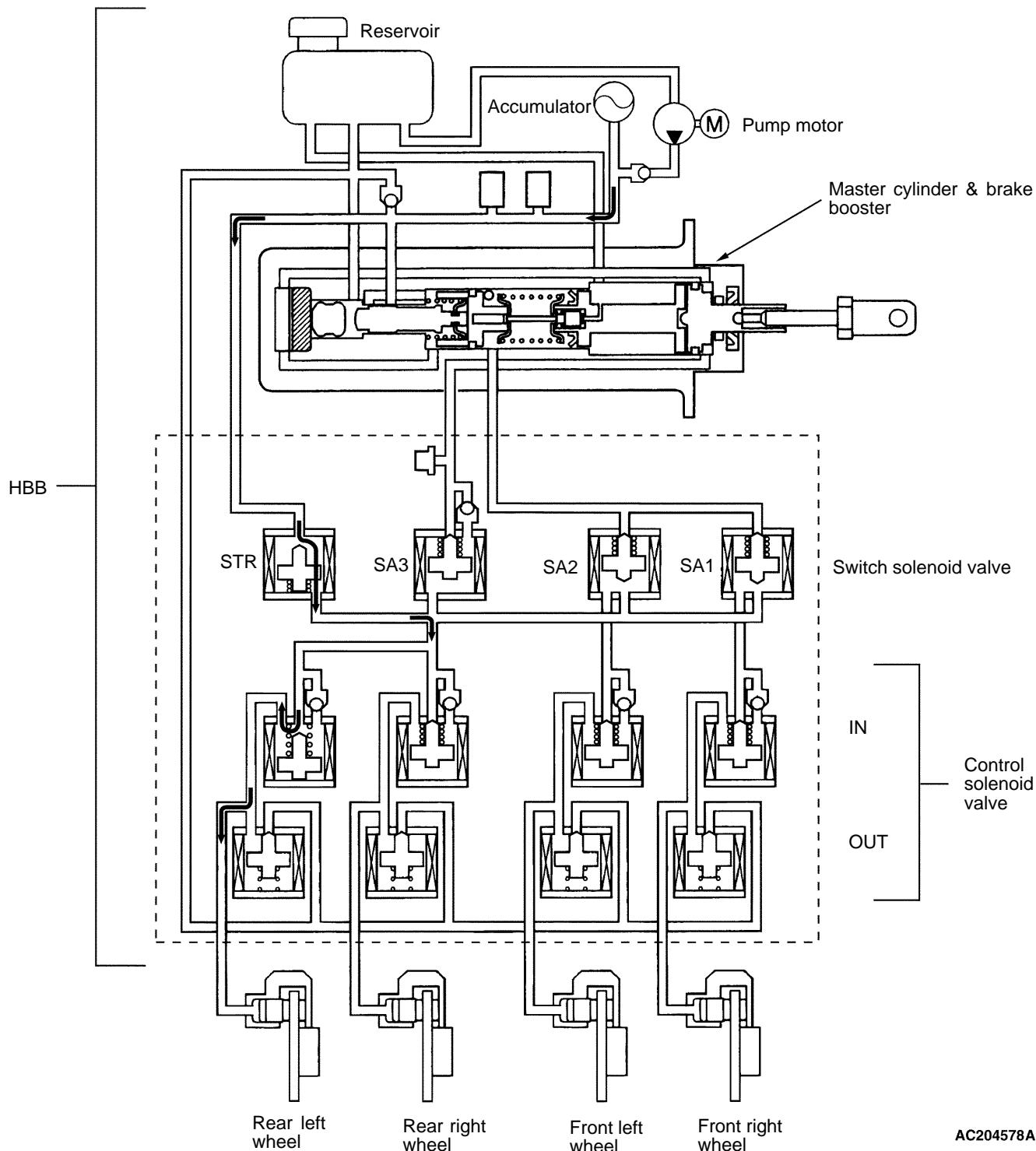
To be specific, oil pressurized by pump goes through the switch solenoid valve (STR) and the switch solenoid valve (SA3) to pressurize the cylinder at the front rear wheel. At the moment, the control solenoid valve at the front right wheel (IN) is closed to block supply of fluid pressure.

SWITCH SOLENOID VALVE

Item	Continuity
SA1, SA2, SA3, STR	ON

CONTROL SOLENOID VALVE

Item	Continuity	Opening state
Front right wheel	IN	ON
	OUT	OFF
Front left wheel	IN	ON
	OUT	OFF
Rear right wheel	IN	ON
	OUT	OFF
Rear left wheel	IN	OFF
	OUT	OFF



ACTIVE TRACTION CONTROL SYSTEM ON

If freewheel is determined by the M-ASTC-ECU, pressurization is controlled over freewheeling wheels so that torque can be transmitted to wheels that are not subject to freewheel. Drive of each solenoid valve is in the same way as active stability control system operation.

CAN

CAN stands for Controller Area Network and is a multiple communication protocol for automobiles. CAN is consisted of the following components:

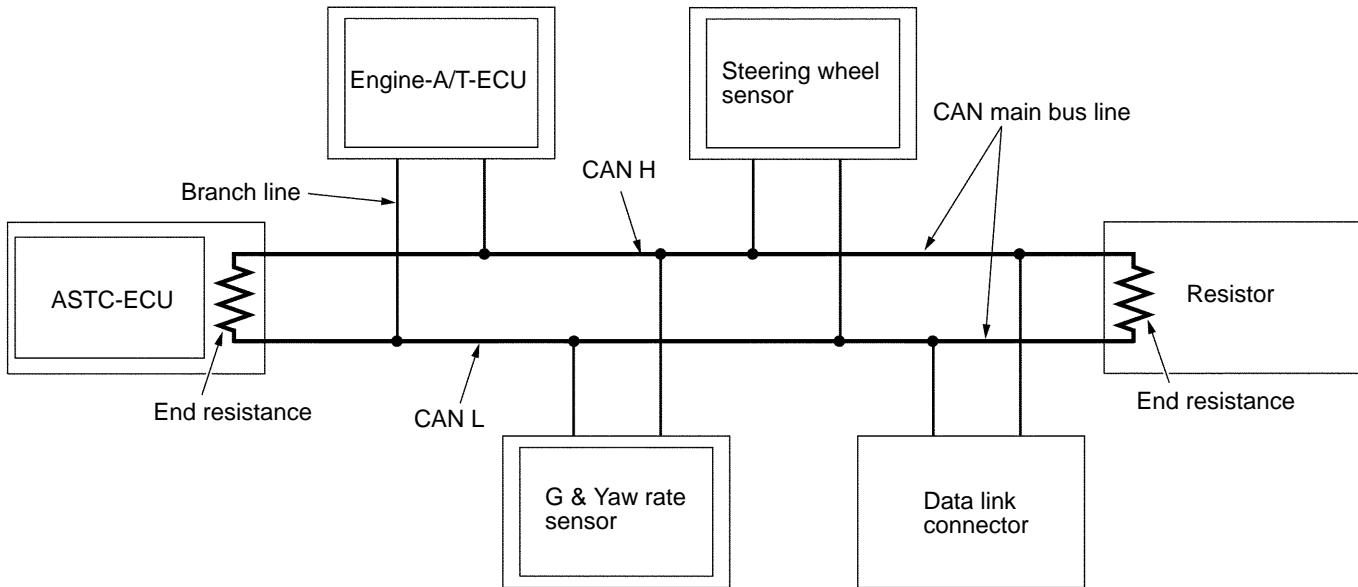
- Two communication lines called CAN L (can low) and CAN H (can high)
- End resistance connecting the both ends of CAN L and CAN H
- Each ECU and sensor related to CAN communication

The communication line connecting end resistance is called main bus line, from which a line diverges is called a branch line. A branch line always diverges from a main bus line. If a branch line diverges from another branch line, it cannot be recognized as a component of CAN.

The following ECUs and sensors take care of CAN communication in Pajero:

- Engine-A/T-ECU <3500-A/T>
- Engine ECU <3200, 3500-M/T>
- A/T-ECU <3200>
- G and yaw rate sensor
- Steering wheel sensor
- ASTC-ECU

End resistance, each ECU, and sensors are connected through communication lines as follows.



surrounded by resistors indicate that CAN communication is conducted.

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OPERATION DESCRIPTION

The basic characteristics of CAN are described as follows:

- Communication data can be sorted by priority. Each ECU and sensor transmits data according to priority. If data transmission is conducted at the same timing, transmission of data with higher priority is given priority to that of data with lower priority. On that occasion, transmission of data with lower priority is suspended for a moment. It will automatically resume as soon as the transmission of data with higher priority is completed.
- Reliability of communication data has been improved by using two main bus lines of CAN L and CAN H for communication because a failure attributed to transmission data error can be easily prevented even if a main bus line is open circuit.
- Communication can be done at a higher speed compared with the previous transmission protocols.
- If communication errors occur at any ECU or sensor more than a certain number of times, the responsible ECU or sensor stops communication for a while. Subsequently if further communication errors occur at any ECU or sensor more than a certain number of times, the responsible ECU or sensor completely stops communication. In this way, erroneous system operation can be prevented due to communication data error.