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**GROUP 22A****MANUAL  
TRANSAXLE****CONTENTS**

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**MANUAL TRANSAXLE****GENERAL INFORMATION**

For the manual transaxle, newly developed W5M6A has been adopted. The transaxle offers the following features.

- The width of each gear tooth is increased to achieve the high torque capacity suitable for 4B11 engine. At the same time, the increase of transaxle length is kept minimum, securing the same length as the conventional 6-speed transaxle.

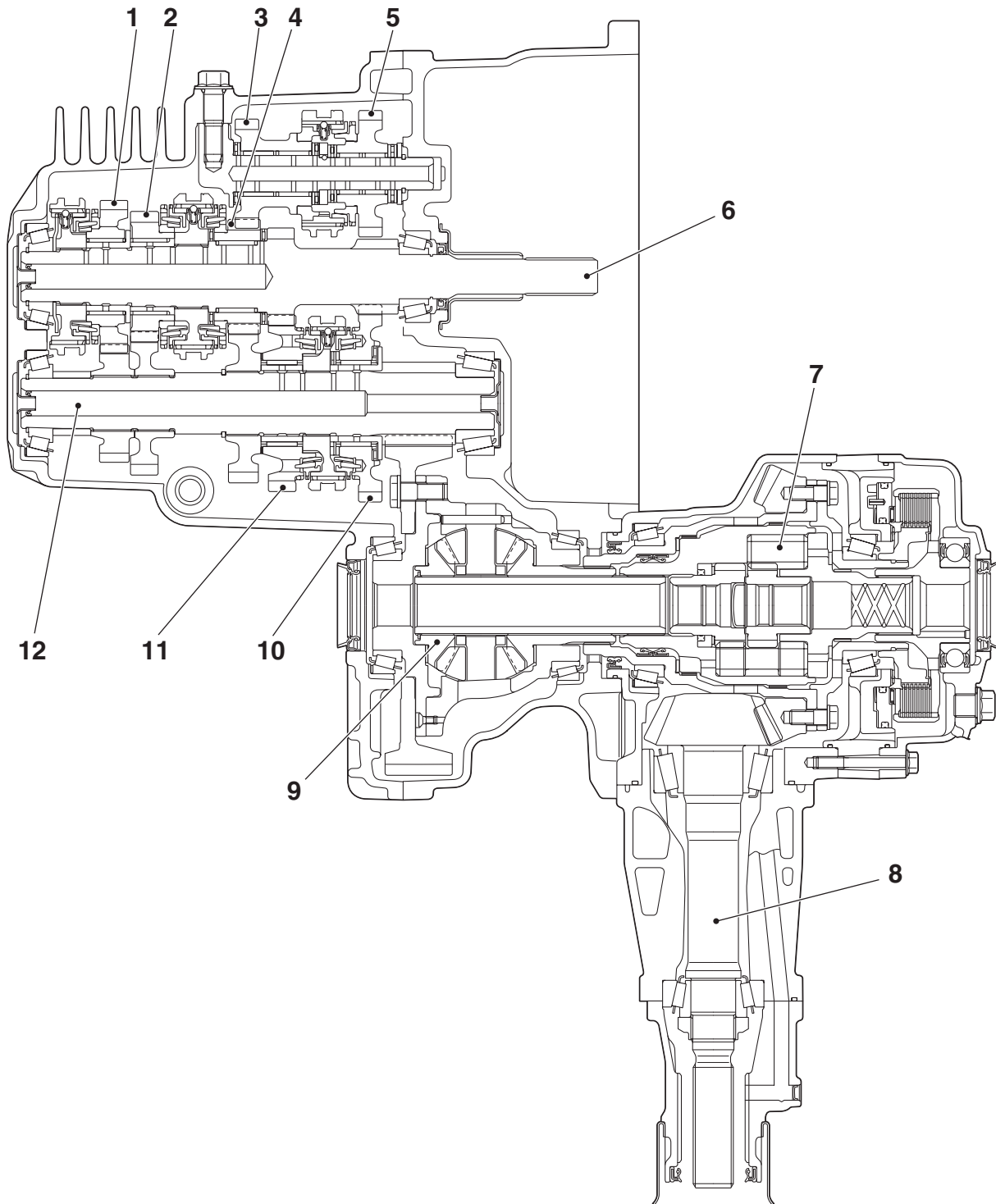
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- The synchronization mechanism from 1st to 5th gear has been multi-synchronized to improve the durability.

**SPECIFICATION**

Item		Specification
Transaxle model		W5M6A
Transaxle type		5-speed forward, 1-speed reverse constant mesh
Gear ratio	1st	2.857
	2nd	1.950
	3rd	1.444
	4th	1.096
	5th	0.761
	Reverse	2.892
Final gear ratio		4.687
Helical gear LSD (front differential)		Present
Transfer	Reduction ratio	0.302
	Differential gear unit	Hydraulic pressure multiplate clutch (ACD)
Transmission oil	Brand	Mitsubishi genuine Dia-Queen new multi gear oil SAE 75W-80 (GL-3)
	Capacity dm <sup>3</sup>	2.5
Transfer oil	Brand	Mitsubishi genuine Dia-Queen LSD Gear Oil
	Capacity dm <sup>3</sup>	0.8
AWC control fluid	Brand	Mitsubishi genuine Dia-Queen ATF SPIII
	Capacity dm <sup>3</sup>	1.0 (Hydraulic pipe section)

SECTIONAL VIEW



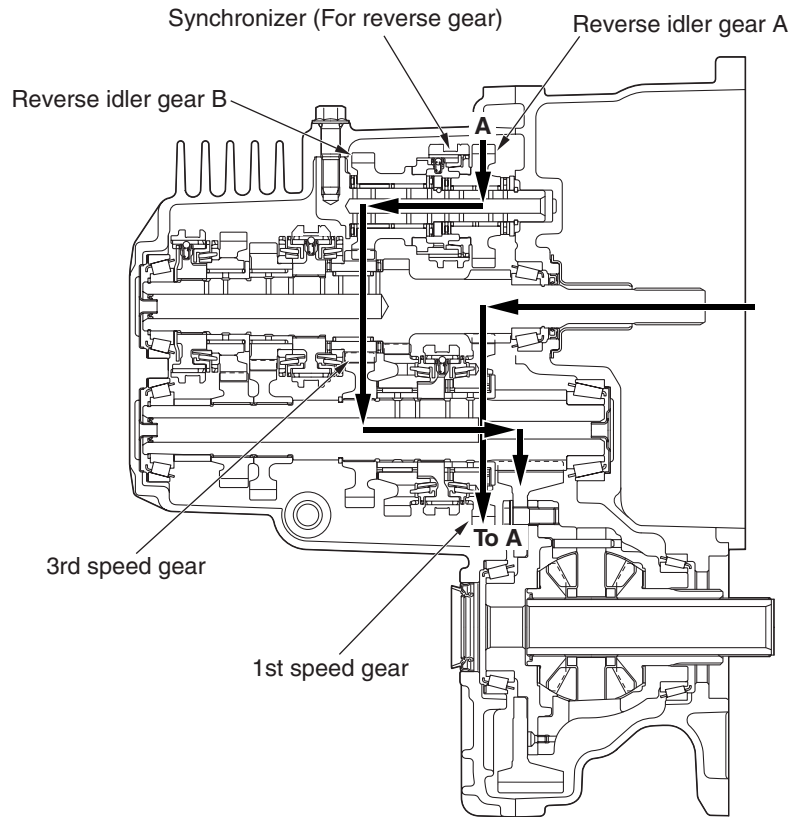
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- |                     |   |
|---------------------|---|
| 1. 5th speed gear   | 7. Front differential (Helical gear type) |
| 2. 4th speed gear   | 8. Hypoid pinion                          |
| 3. Rev idler gear B | 9. Center differential                    |
| 4. 3rd speed gear   | 10. 1st speed gear                        |
| 5. Rev idler gear A | 11. 2nd speed gear                        |
| 6. Input shaft      | 12. Output shaft                          |

## INFORMATION OF CONSTRUCTION AND OPERATION

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The width of each gear tooth is increased, and the 1st and 3rd gears are shared with the reverse gear, keeping the increase of transaxle length to a minimum.



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When the vehicle is driven backward, two idler gears engaged with 1st and 3rd gears are synchronized to transfer the torque.

## TRANSAXLE CONTROL

### GENERAL INFORMATION

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With the transaxle control, a cable type is adopted with which the gear is shifted through a cable between the transaxle and shift lever. The shift lever and control cable offer the following advantages.

#### Shift lever

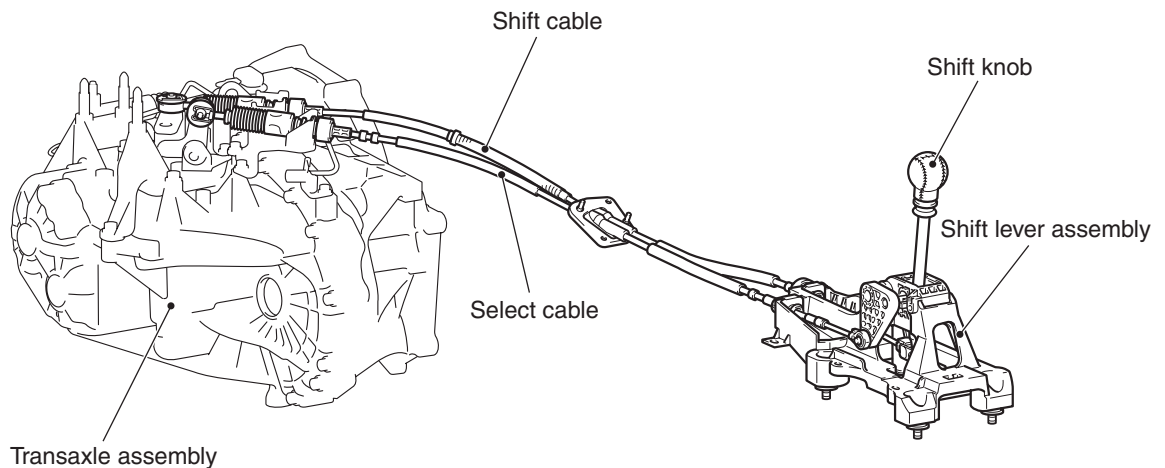
- The spherical rotation fulcrum type, which does not have much looseness, has been adopted to the rotating shaft.
- The base bracket is made of resin to reduce weight.
- The lever has been made to have a shorter stroke for improved operability.

#### Control cable

- The one-touch assembly of cable ends at the transaxle side and the shift lever side has been made available to improve serviceability. (Except for the transaxle side end of shift cable)
- A socket with elastic body has been adopted to the cable (transaxle side) joint to reduce sticking or tightness.

#### Shift knob

- Spherical shift knob is adopted for easier operation.
- The size is designed to allow the operation with racing gloves put on.
- Soft material and leather are used with the knob to reduce damage to hand during sport driving.



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## SUPER ALL WHEEL CONTROL (S-AWC)

### GENERAL INFORMATION

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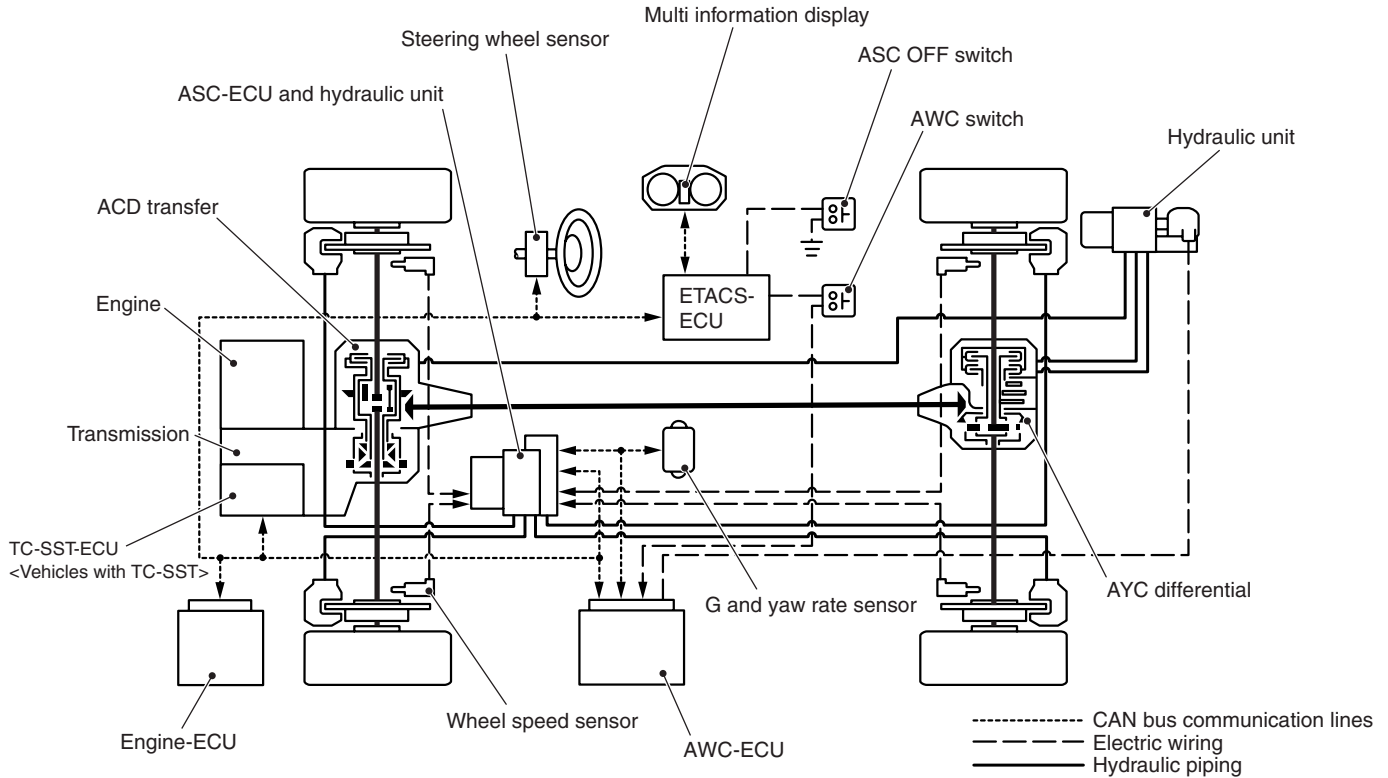
S-AWC (Super All Wheel Control) performs an integrated control of ACD (Active Center Differential), AYC (Active Yaw Control), ASC (Active Skid Control), and ABS (Anti-lock Brake System) under the newly developed, 4-wheel controlling ideal AWC (All Wheel Control). This vehicle movement integrated control system offers the "superior drivability at driver's will" and "excellent stability".

#### NOTE:

- For more information on ABS, refer to GROUP 35B.
- For more information on ASC, refer to GROUP 35C.

INFORMATION OF CONSTRUCTION AND OPERATION

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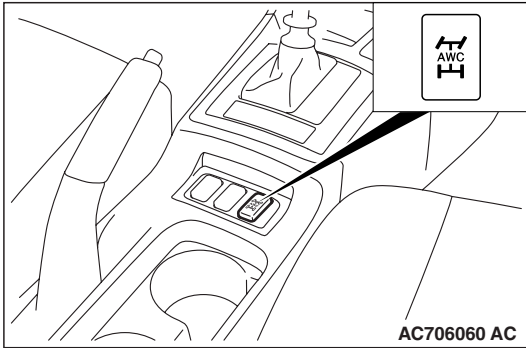
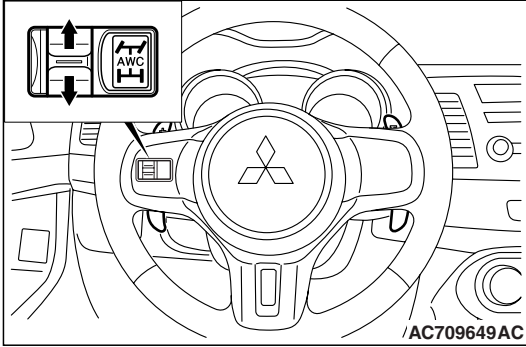
AWC-ECU performs a calculation based on the information from ECU, sensors, and switches. Then, based on the calculation value, it appropriately operates the hydraulic units (for ACD, AYC, ASC, ABS) to control in response to the driver's operations and vehicle behaviors.

Item	Control content
ACD transfer	The basic structure and operation are the same with EVOLUTION IX, but the strength of each part has been enhanced to support the high-powered engine.
AYC differential	The basic structure and operation are the same with EVOLUTION IX, but the strength of each part has been enhanced to support the high-powered engine.
Hydraulic unit (For ACD/AYC)	The basic structure and operation are the same with EVOLUTION IX, but the shape has been changed to accommodate the change of on-vehicle layout.
Hydraulic unit (for ASC/ABS)	In addition to the brake control of ASC and ABS, it also performs the AYC brake control.
AWC-ECU	Based on the information obtained via CAN communication and others, it appropriately controls ACD, AYC, ASC, and ABS.
Sensors	Adding to the sensors (throttle position sensor, G sensor, steering sensor, wheel speed sensor) that provided information to EVOLUTION IX, the following sensors have been equipped: Engine torque sensor, engine speed sensor, yaw rate sensor, and wheel cylinder brake fluid pressure sensor.

### AWC SWITCH

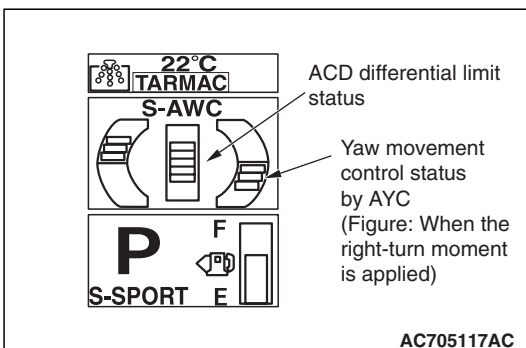
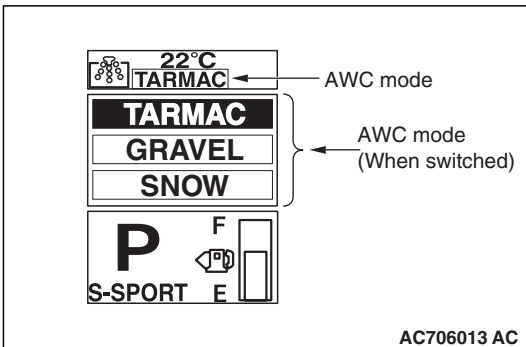
With the operation of AWC switch, the driving mode can be switched among TARMAC, GRAVEL, and SNOW. Depending on the mounting position, the mode switching differs with the AWC switch.

- Steering wheel  
(TARMAC ⇔ GRAVEL ⇔ SNOW)
- Floor console <Vehicles with steering wheel audio remote control>  
(TARMAC → GRAVEL → SNOW → TARMAC)



### MULTI INFORMATION DISPLAY

The current driving mode is displayed at all times to the upper center of multi information display. When the mode is switched, the mode switching status is displayed automatically to the information screen at the middle, and then the screen returns to the previous screen after the completion of setting.



Also, by the operation of multi information meter switch, an exclusively designated screen for displaying the AWC operation status can be set to the information screen at the middle. This exclusively designated screen displays the ACD differential limit status to the screen center, and the yaw movement control status by AYC to the screen left and right.

**CONTROL OVERVIEW**

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**AWC CONTROL MODE**

The AWC control is the same as with EVOLUTION IX, and the control mode can be switched among TARMAC, GRAVEL, and SNOW in response to road conditions.

<b>AWC control mode</b>	<b>Control content</b>
TARMAC	Mainly for a dry paved road surface. A slight control is performed with ACD, and a focused control is performed with AYC (lateral torque movement control, brake control).
GRAVEL	Mainly for a wet road surface and dirt road. A slightly strong control is performed with ACD, and a mid-range control is performed with AYC (lateral torque movement control, brake control).
SNOW	Mainly for snowy roads. A focused control is performed with ACD, and a slight control is performed with AYC (lateral torque movement control, brake control).

**SENSOR INFORMATION**

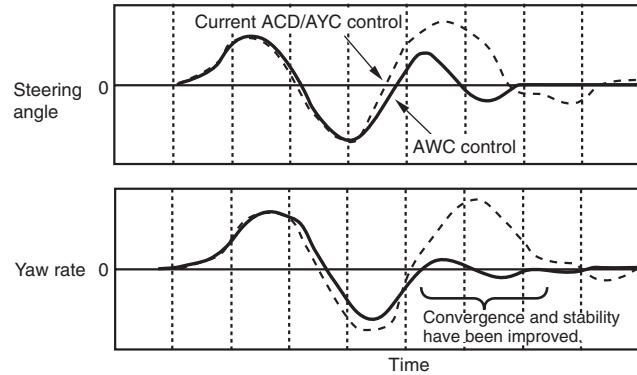
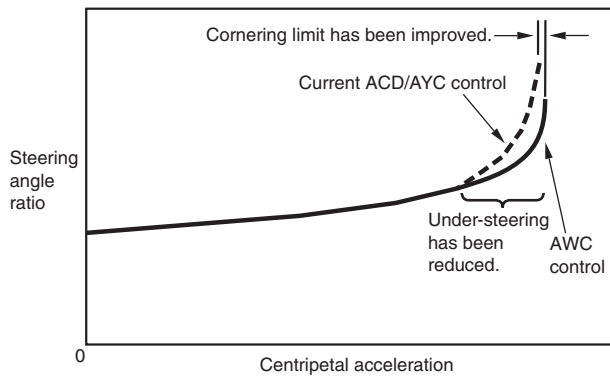
Together with the sensor information used with EVOLUTION IX, information on engine torque, engine speed, and brake pressure yaw rate have been added to enable more substantial control, thus improving the responses to vehicle driving conditions.

**YAW RATE FEEDBACK CONTROL****INTRODUCTION OF YAW RATE  
FEEDBACK CONTROL**

Using the yaw rate sensor information, the vehicle cornering status is accurately determined, and the vehicle cornering motion that is faithful to the driver's steering operation has been achieved.



## EFFECTS OF YAW RATE FEEDBACK CONTROL



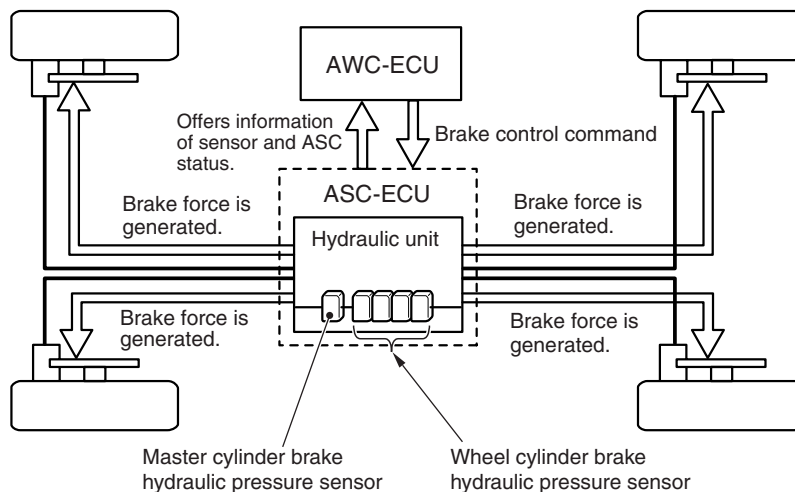
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With the cornering performance of when vehicle is steered to trace a turning circle of certain radius while the speed is gradually increased, the under-steer is further suppressed compared to the ACD/AYC control adopted with EVOLUTION IX,

resulting in a further improvement to cornering performance. For the quick steering lane change on a slippery road surface, the stability and convergence of vehicle behavior at the completion of lane change have also been improved.

## BRAKE CONTROL

### ADDITION OF BRAKE CONTROL



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In addition to the conventional lateral torque movement control, a new brake control has been added to AYC. It is activated near the driving limit range to assist the yaw motion control.

Brake force is applied to the inside wheels while the vehicle behavior is understeer during cornering, and to the outside wheels when oversteer, achieving the vehicle cornering performance that corresponds to the driver's operation. Also, the spinning of front wheels at vehicle start is suppressed by the brake force, improving the traction performance. This brake control can be deactivated with the ASC OFF switch.

**EFFECTS OF BRAKE CONTROL**

The understeer behavior and oversteer behavior near the driving limit range are further suppressed.

**INTEGRATED CONTROL OF  
ACD/AYC/ASC/ABS**

ASC has been added to ACD, AYC, and ABS that are equipped with LANCER EVOLUTION IX, and an integrated control is performed to enhance the driving performance, cornering performance, and stability in any driving condition during acceleration, deceleration, and cornering.

**ADDITION OF TC-SST CONTROL****<VEHICLES WITH TC-SST>**

For vehicles with TC-SST, AWC-ECU communicates with TC-SST-ECU via CAN line to suppress unnecessary gear shifts during cornering which hamper the sport driving.

## DIAGNOSTIC FUNCTION

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### DIAGNOSTIC TROUBLE CODE

If a trouble is present to the AWC system, a corresponding trouble spot is stored in AWC-ECU as the diagnostic trouble code below, and a warning is displayed to the multi information display.

#### DIAGNOSTIC TROUBLE CODE TABLE

Code No.	Diagnostic item	Main trouble cause
C1000	Stoplight switch	Stoplight switch seizure
C100A	FL wheel speed sensor	Abnormality in circuit
C1011		Abnormality in signal
C1014		Abnormality in characteristics
C1015	FR wheel speed sensor	Abnormality in circuit
C101C		Abnormality in signal
C101F		Abnormality in characteristics
C1020	RL wheel speed sensor	Abnormality in circuit
C1027		Abnormality in signal
C102A		Abnormality in characteristics
C102B	RR wheel speed sensor	Abnormality in circuit
C1032		Abnormality in signal
C1035		Abnormality in characteristics
C1078	Tire speed	Abnormality in tire speed
C1219	Steering wheel sensor	Abnormality in signal
C121A	Steering wheel sensor	Neutral learning abnormality
C123C	G and yaw rate sensor	Abnormality in signal
C1242	G and yaw rate sensor	Abnormality in longitudinal G sensor output signal
C1610	AWC power supply electronic relay	Abnormality in AWC power supply electronic relay
C1611	AWC pressure sensor	AWC pressure sensor low voltage
C1612		AWC pressure sensor high voltage
C1613	AWC switch	AWC switch seizure
C1614	Parking brake switch	Parking brake switch ON seizure
C1615	Brake control	Prohibition request of brake control
C1616	Cranking signal	Cranking signal seizure
C1617	AWC CAN (main)	AWC CAN main data not received
C1618	AWC CAN (local)	AWC CAN local data not received
C1619	AYC current value	AYC current value abnormality
C161A	AYC direction valve (right)	Abnormality of AYC direction valve (right) output
C161B	AYC direction valve (left)	Abnormality of AYC direction valve (left) output
C161C	ACD current value	ACD current value abnormality
C161D	AWC pump relay	Abnormality in AWC pump relay circuit

<b>Code No.</b>	<b>Diagnostic item</b>	<b>Main trouble cause</b>
C161E	AWC pump	AWC pump trouble
C161F	AWC actuator	AWC actuator protection 1
C1620	AYC control	AYC control abnormality
C1621	AWC actuator	AWC actuator protection 2
C1622	ACD control	ACD control abnormality
C1623	Brake control	Brake control abnormality
C1624	AWC-ECU	AWC-ECU internal error
C1625	AWC pressure sensor power supply voltage	Abnormality in AWC pressure sensor power supply voltage
C2100	Battery positive voltage	Abnormal battery voltage (too low)
C2101		Abnormal battery voltage (too high)
C2114	Power supply source to G and yaw rate sensor	Power supply source to G and yaw rate sensor (Low voltage)
C2115		Power supply source to G and yaw rate sensor (High voltage)
C2203	Chassis number	Chassis number not written
C2204	G and yaw rate sensor	Internal error in G and yaw rate sensor
C2205	Steering wheel sensor	Internal error in steering wheel sensor
U0001	Bus off	Bus off
U0100	Engine time-out error	Engine time-out error
U0101	TC-SST time-out error	TC-SST time-out error
U0121	ASC time-out error	ASC time-out error
U0126	Steering wheel sensor time-out error	Steering wheel sensor time-out error
U0141	ETACS time-out error	ETACS time-out error
U0401	Engine data	Engine data error
U0428	Steering wheel sensor data	Abnormality in steering wheel sensor data
U0431	ETACS data	ETACS data error
U1003	Bus off (Local CAN)	Bus off (Local CAN)
U1415	Variant coding	Variant coding not implemented
U1417	Variant coding	Abnormality in variant coding
U1425	TC-SST data	TC-SST data error
U1426	ASC data	ASC data error
U1427	Wheel speed sensor data	Wheel speed sensor data error
U1428	G and yaw rate sensor data	Abnormality in G and yaw rate sensor data