# DRIVE-CONTROL COMPONENTS

## CONTENTS

# SUSPENSION

The suspension which has been adjusted to new body dimension with the optimal tuning has improved its cornering ability.

A McPherson strut-type suspension has been used at the front, and a multi-link suspension has been used at the rear.

## FEATURES

| | |
|---|---|
| High Steering Stability | 1. Suspension geometry optimized by linearisation of toe change, etc.<br>2. Wider tread<br>3. Optimized the roll center height<br>4. Increased the suspension stroke of the compressed side<br>5. Increased the lateral rigidity equipped with crossmember bars and flatted crossmember<br>6. Damping forces of front struts and rear shock absorbers as well as their coil springs' characteristics optimized<br>7. Optimized suspension bushings |
| Enhanced Riding Comfort | 1. Increased the suspension stroke of the compressed side<br>2. Damping forces of front struts and rear shock absorbers as well as their coil springs' characteristics optimized<br>3. Spring characteristics of bump rubber optimized<br>4. Characteristics of suspension bushings optimized |
| Reduced road noise | 1. Increased the volume of stabilizer bushings<br>2. Adoption of two mounting bolts to the stabilizer bracket |

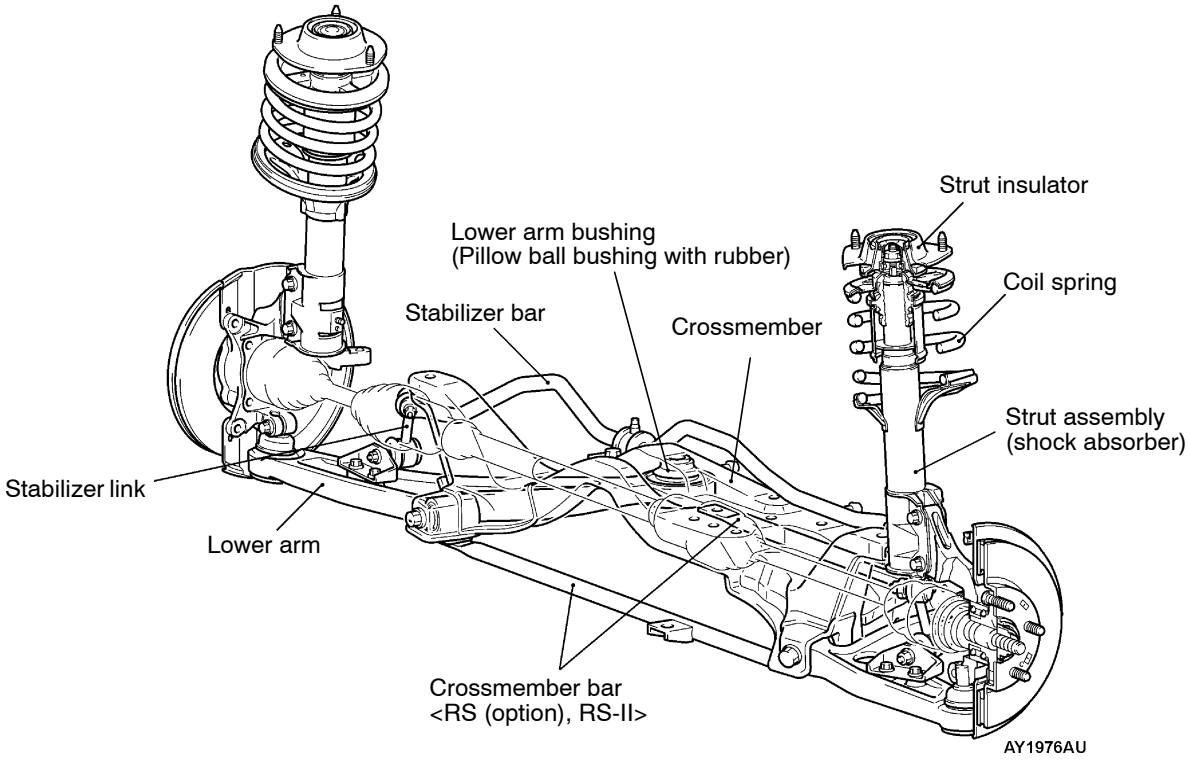
# FRONT SUSPENSION

## FEATURES

A McPherson strut independent suspension-type suspension has been adopted as the front suspension. It has improved its limitation of capacity as well as securing the sufficient lateral rigidity and rolling rigidity as a high performance vehicle.

- With widened tread and optimized roll center height, the cornering performance from initial responce to limited performance has been improved.
- Adopted the two-stage selectable structuare of camber angle according to driving mode like EVOLUTION-VI.
- Stabilized the vehicle behavior during cornering by lowering the installation position of the steering gear box with linear toe change.
- Increased the horizontal strength, improved the steering feeling and the rigidness at the time of cornering by making the cross member flat and connecting two reinforced bars (crossmember bar) at the installation part of the both right and left lower arms.
- Improved the cornering limitation with improved adhesion at the time of rolling by increasing bump strokes.
- Achieved the weight reduction being equipped with aluminium lower arm like EVOLUTION-VI.
- Improved reliability by making the size of mounting bolts larger at the front and rear bushing installation parts of lower arm.
- Improved the stroke feeling by replacing the rear bushings of the lower arm with the pillow ball bushing with rubber.
- Restricted the useless movement of lower arm equipped with stopper rubber at the front and rear bushing mounting parts of the lower arm.
- Improved the reliability and steering feeling by reducing friction as well as making the ball size of lower arm ball joint larger.
- Improved the camber rigidity by adopting an inverted strut like EVOLUTION-VI.
- Improved the steering stability by optimizing the damping force of shock absorbers and spring constants of coil springs.
- Adopted a strut insulaor with previous results like EVOLUTION-VI.
- Prevented the occurance of unusual noise by increasing the volume of stabilizer bushing.
- Prevented the occurance of unusual noise caused by lateral sliding of brackets with installation of two mounting bolts to the stabilizer bracket.

## CONSTRUCTION DIAGRAM




## SPECIFICATIONS

### SUSPENSION SYSTEM

| Items | Lancer EVOLUTION-VII | Lancer EVOLUTION-VI Tommi Makinen Edition |
|---|---|---|
| Suspension method | McPherson strut with coil springs | McPherson strut with coil springs |

### WHEEL ALIGNMENT

| Items | Lancer EVOLUTION-VII | Lancer EVOLUTION-VI Tommi Makinen Edition | |
|---|---|---|---|
| | | Tarmac suspension | Normal suspension |
| Camber (selectable from 2 options) | -1°00'* or -2°00' | -1°10'* or -2°10' | -1°00'* or -2°00' |
| Caster | 3°55' | 4°24' | 3°54' |
| Kingpin inclination | 13°45' | 14°48' | 14°18' |
| Toe-in | 0 | 0 | 0 |

NOTE
*: The factory shipped camber value is indicated.

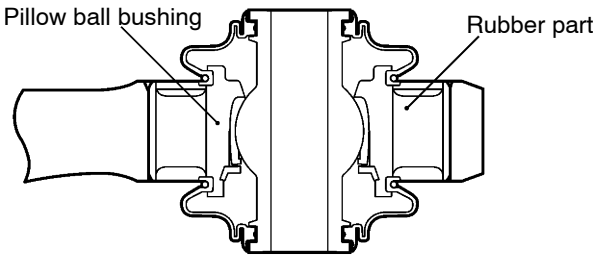
### COIL SPRING

| Item | Lancer EVOLUTION-**VII** | | Lancer EVOLUTION-**VI** Tommi Makinen Edition | |
|---|---|---|---|---|
| | RS (standard), RS-II | RS (option) | Tarmac suspension | Normal suspension |
| Wire diameter mm | 14 | 14 | 14 | 14 |
| Average diameter mm | 155 | 155 | 155 | 155 |
| Free length mm | 281 | 275 | 273 | 296 |

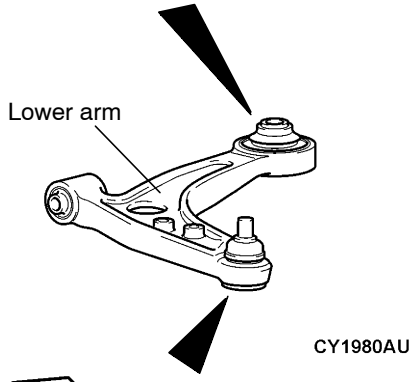
## LOWER ARM

Like Lancer EVOLUTION-VI Tommi Makinen Edition, an aluminium forged lower arm has been adopted and the followings are improved.

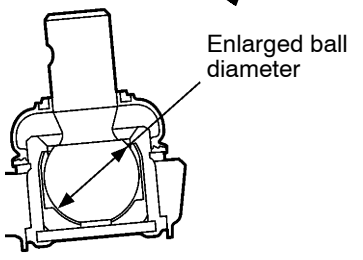
- Enlarging the size of mounting bolts at the front and rear sides of crossmember mounting section on lower arm has increased reliability.
- Improved the stroke feeling by installing a pillow ball bushing with rubber at the rear bushing.
- Improved the reliability and steering feeling by reducing friction as well as making the ball size of the ball joint larger.
- Restricted the useless movement of lower arm equipped with stopper rubber at the front bushing mounting parts of the lower arm.



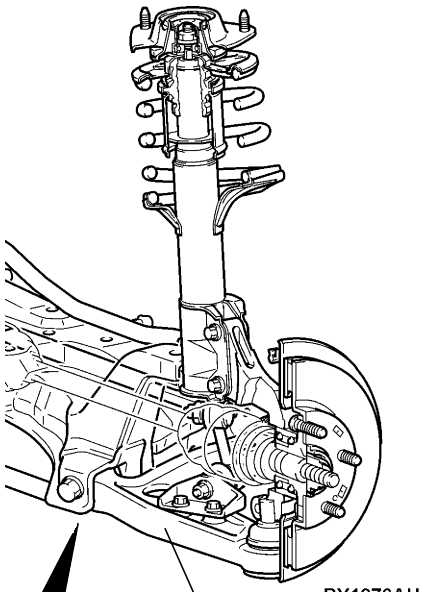
AY2335AU



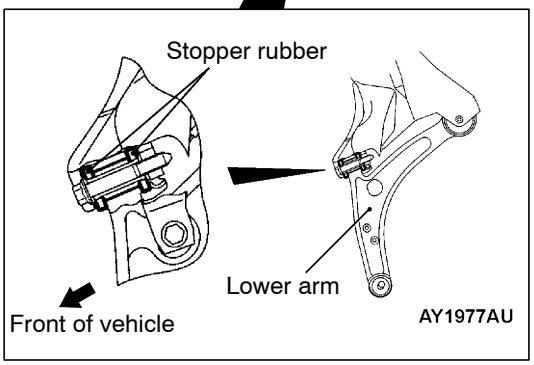
CY1980AU



BY1981AU



BY1976AU

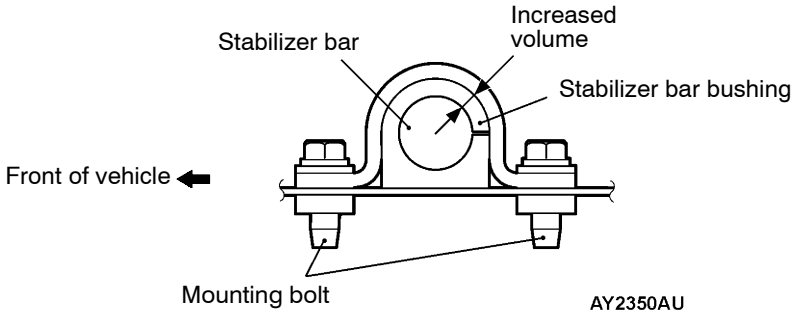


AY1977AU

## STABILIZER BAR

Following modifications have been made to Lancer EVOLUTION-VI Tommi Makinen Edition.

- Prevents the occurance of unusual noise by increasing the volume of stabilizer bushing.
- Prevents the occurance of unusual noise caused by lateral sliding of brackets with installation of two mounting bolts to the stabilizer bracket.



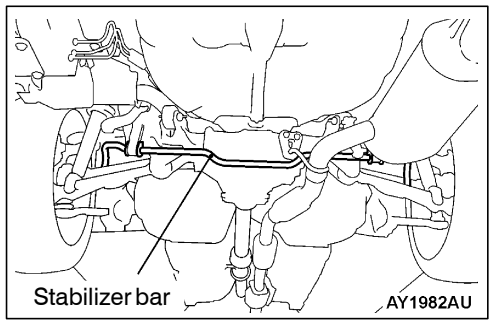

# REAR SUSPENSION

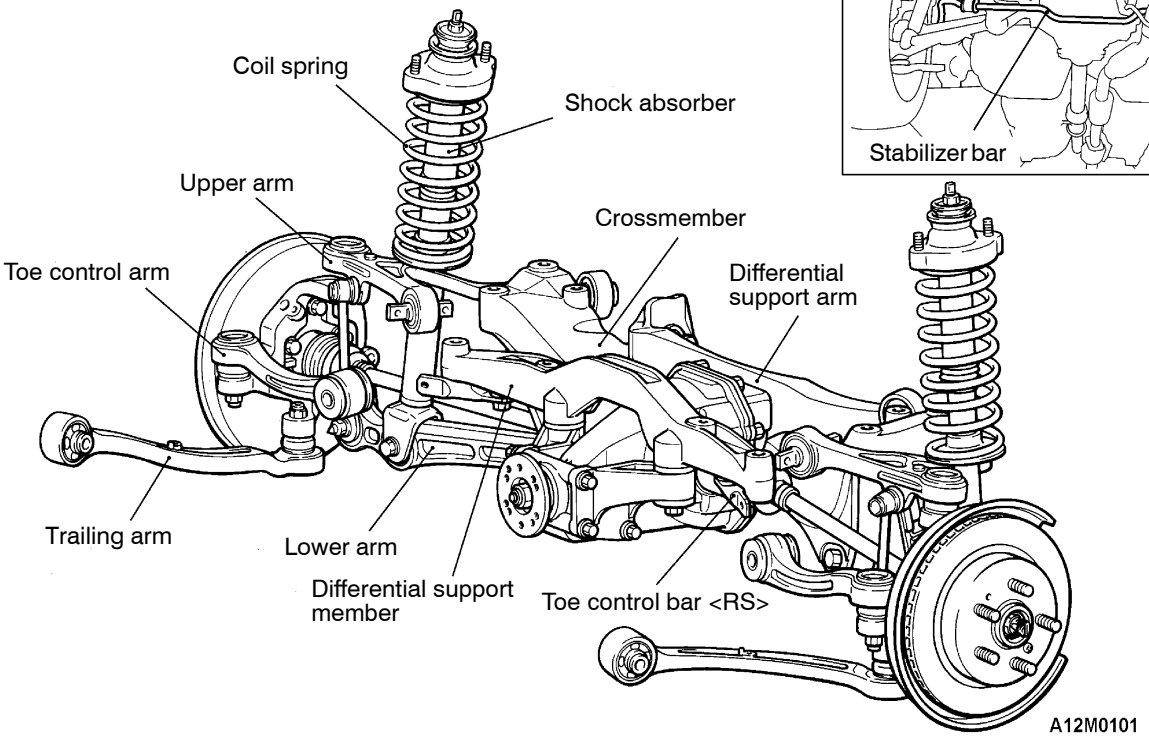
## FEATURES

A multi-link suspension which is developed with intention of performance improvement for racing use has been adopted. Yet this suspension is basically the same type as current Lancer EVOLUTION-VI Tommi Makinen Edition, but the following points have been improved.

- By widening tread (10 mm) and optimizing roll center height, the cornering performance from initial responce to limited performance has been improved.
- By increasing bump strokes (10 mm) adhesion at the time of rolling and cornering limitation has been improved.
- By optimizing the damping force of shock absorbers, spring constants of coil springs and bushing characteristics, the cornering performance from initial responce upto limited performance has been improved.

## CONSTRUCTION DIAGRAM



## SPECIFICATIONS

### SUSPENSION SYSTEM

| Item | Lancer EVOLUTION-**VII** | Lancer EVOLUTION-**VI** Tommi Makinen Edition |
|---|---|---|
| Suspension method | Multi-link | Multi-link |

### WHEEL ALIGNMENT

| Items | Lancer EVOLUTION-**VII** | Lancer EVOLUTION-**VI** Tommi Makinen Edition |
|---|---|---|
| Camber | - 1°00’ | - 1°00’ |
| Toe-in | 3 | 3 |

### COIL SPRING

| Items | Lancer EVOLUTION-**VII** | | | Lancer EVOLUTION-**VI** Tommi Makinen Edition | | |
|---|---|---|---|---|---|---|
| | Vehicles without AYC | Vehicles with AYC | | Vehicles without AYC | | Vehicles with AYC |
| | RS (standard) | RS (option) | RS-II | RS | RS-II (standard) | RS-II (option) |
| Wire diameter mm | 9 - 12 | 12 | 12 | 9 - 12 | 10 - 12 | 10 - 12 |
| Average diameter mm | 88 | 88 | 88 | 88 | 88 | 88 |
| Free length mm | 287 | 281 | 284 | 284 | 274 | 279 |

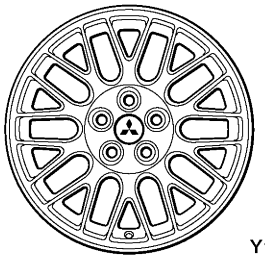
# WHEEL AND TYRE

## FEATURES

Following modifications have been made to Lancer EVOLUTION-VI Tommi Makinen Edition to improve the vehicle performance.

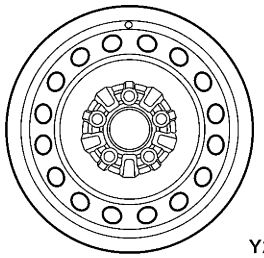
- Exclusively to EVOLUTION-VII 17-inch tyre has been newly developed by widening the tyre width from 225mm to 235mm and the limit performance has been improved by getting better grip at the time of high G cornering. <RS (option), RS-II>
- Equipped with 205/65R15 94H tyre <RS (standard)>
- Exclusively to EVOLUTION-VII 17-inch aluminium wheel has been newly deeveloped by widening rim width from 7 1/2JJ to 8JJ <RS (option), RS-II>
- Equipped with a strong type steel wheel with previous results <RS (standard)>

**17-inch Aluminium Wheel (17 × 8JJ) <RS (option), RS-II>**



Y1793AU

**Steel Wheel (15 × 6JJ) <RS (standard)>**



Y2355AU

## SPECIFICATIONS

| Items | | Lancer EVOLUTION-**VII** | | Lancer EVOLUTION-**VI** Tommi Makinen Edition | |
|---|---|---|---|---|---|
| | | RS (standard) | RS (option), RS-II | Standard | Option |
| Wheel | Type | Steel type | Aluminium type | Steel type | Aluminium type |
| | Size | 15 × 6JJ | 17 × 8JJ | 15 × 6JJ | 17 × 7 1/2JJ |
| | Amount of wheel offset mm | 46 | 38 | 46 | 38 |
| | Pitch circle diameter (P.C.D.) mm | 114.3 | 114.3 | 114.3 | 114.3 |
| Tyre | Size | 205/65R15 94H | 235/45ZR17 | 205/60R15 91H | 225/45ZR17 |
| Spare wheel | Type | Steel type | Steel type | Steel type | Steel type |
| | Size | 16 × 4T | 17 × 4T | 16 × 4T | 16 × 4T |
| | Amount of wheel offset mm | 40 | 30 | 40 | 40 |
| | Pitch circle diameter (P.C.D.) mm | 114.3 | 114.3 | 114.3 | 114.3 |
| Spare tyre (High pressure) | Size | T125/70D16 | T125/70D17 | T125/70D16 | T125/70D16 |

# POWER STEERING

## FEATURES

To improve steering feeling and response of the steering system, the following steering system has been adopted.

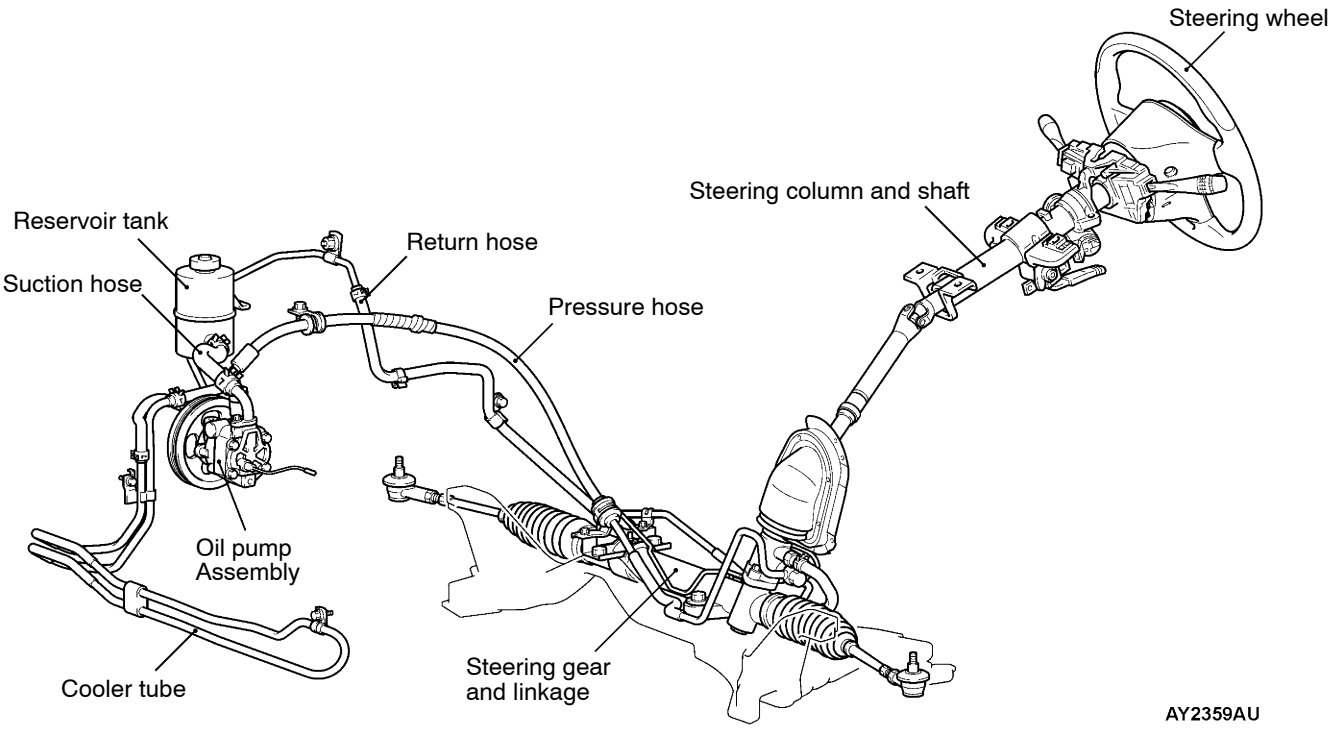
- The system has been equipped with the MOMO leather 3-spoke-type steering wheel with built-in SRS airbag.
- A steering column with a shock absorbing mechanism and a tilt steering mechanism has been adopted.
- Integral-type rack and pinion gear with high rigidity and excellent response has been adopted.
- A variable capacity pump has been adopted to reduce power losses and improve fuel consumption. When the engine speed increases, the pump chamber capacity is reduced proportionally so that only the necessary amount of power steering fluid is discharged.
- Improved the cooling efficiency of power steering fluid by adopting a cooler tube to the fluid line.

## SPECIFICATIONS

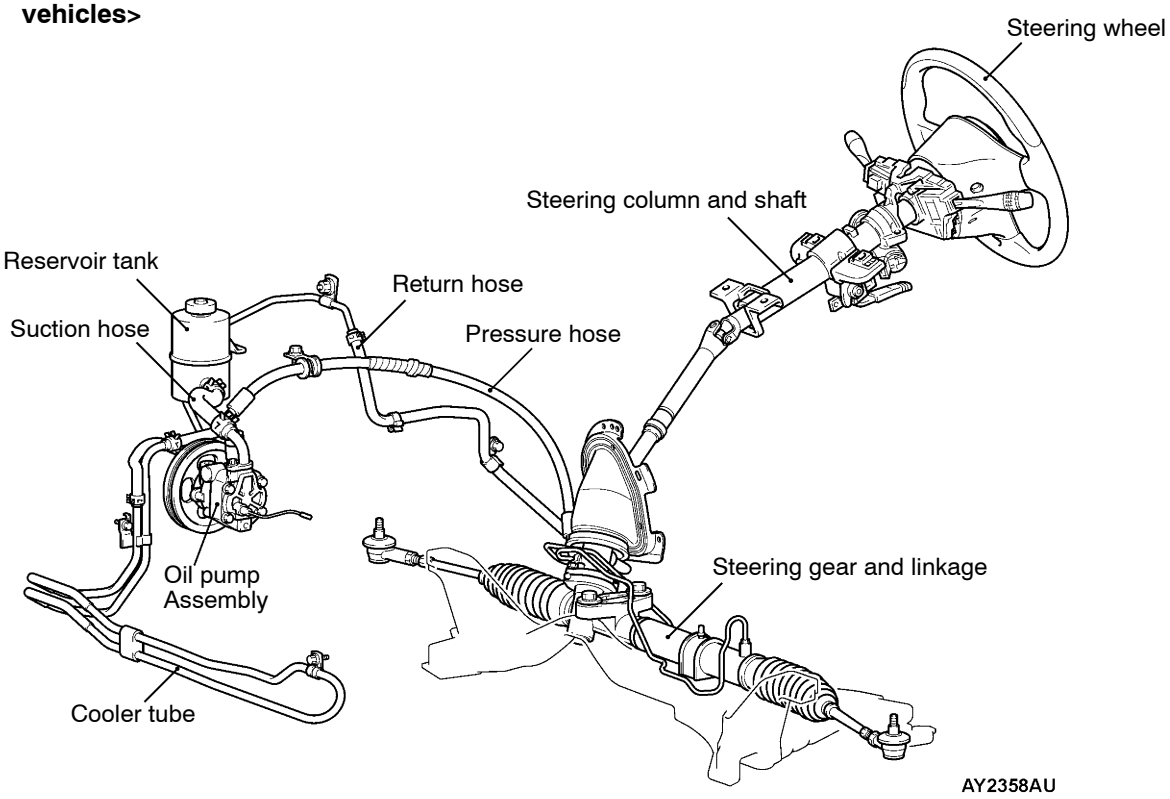
| Items | | Lancer EVOLUTION-**VII** | Lancer EVOLUTION-**VI** Tommi Makinen Edition |
|---|---|---|---|
| Steering wheel | Type | MOMO 3-spoke type | MOMO 3-spoke type |
| | Outside diameter mm | 380 <RS (standard)>, 365 <RS(option), RS-II> | 365 <RS>, 380 <RS-II> |
| | Maximum number of turns | 2.1 | 2.1 <RS>, 2.3 <RS-II> |
| Steering column | Column mechanism | Tilt steering | Tilt steering |
| Power steering type | | Integral type | Integral type |
| Oil pump | Type | Variable capacity type (vane pump) | Variable capacity type (vane pump) |
| | Basic discharge amount $cm^3$/rev. | 9.6 | 7.2 |
| | Relief pressure MPa | 8.3 - 9.0 | 8.3 - 9.0 |
| | Reservoir type | Separate type | Separate type |
| | Pressure switch | Equipped | Equipped |
| Steering gear and linkage | Type | Rack and pinion | Rack and pinion |
| | Stroke ratio (Rack stroke/ Steering wheel Maximum turning radius) | 68.61 | 62.89 |
| | Rack stroke mm | 146 | 136 |
| Steering angle | Inner wheel | 32° | 33° |
| | Outer wheel <for reference> | 27° | 28° |
| Power steering fluid | Specified lubricants | Automatic transmission fluid DEXRON II | Automatic transmission fluid DEXRON II |
| | Quantity $dm^3$ | Approximately 1.0 | Approximately 1.0 |

## CONSTRUCTION DIAGRAM

**<L.H. drive vehicles>**



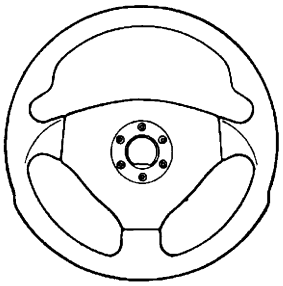

**<R.H. drive vehicles>**



## STEERING WHEEL

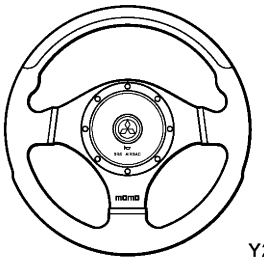
There are two types of MOMO leather 3-spoke-type steering wheels (built-in SRS air bag) with different desigins.

<RS (standard)>



13R0025

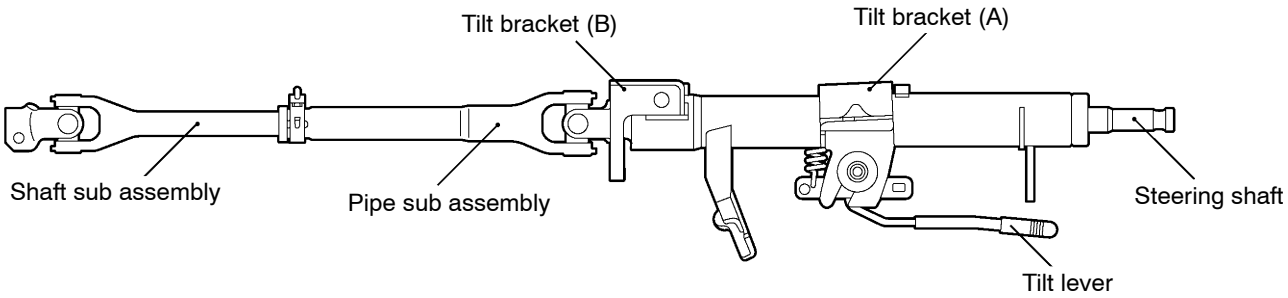
<RS(option), RS-II>



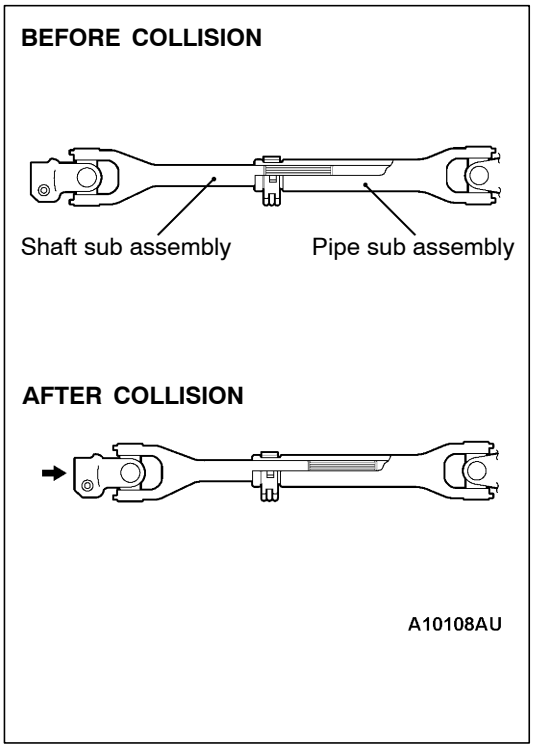
Y2058AU

## STEERING SHAFT AND COLUMN

For the steering column, an impact absorbing mechanism which absorbs impact energy in the event of a collision as well as a tilt steering mechanism which enables the driver to obtain an optimum driving position have been adopted.



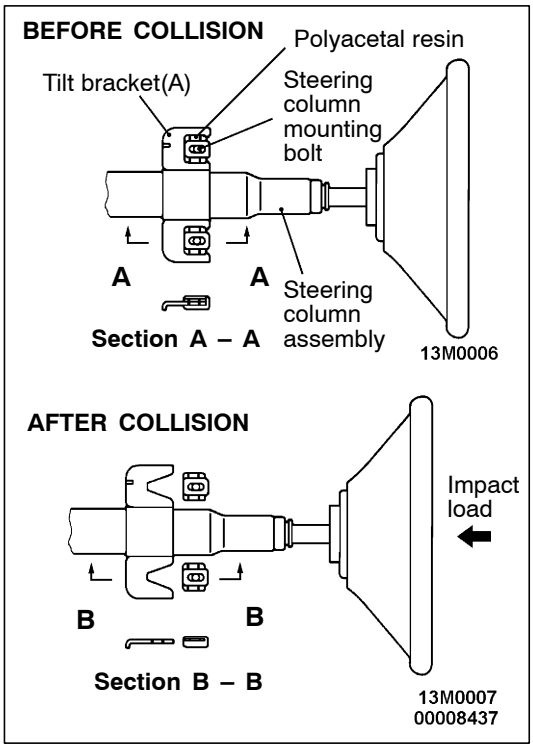

A10107AU




## SHOCK ABSORBING MECHANISM

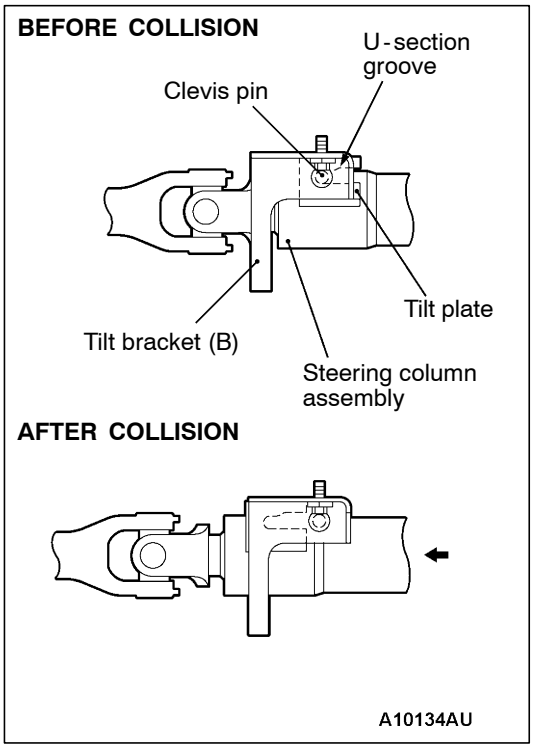
### 1. Primary impact

When the vehicle collides with something and there is a load added to the shaft sub assembly from the gearbox, the shaft sub assembly slides above the pipe sub assembly to absorb the shock load. This prevents the steering column from moving backwards during the impact.




### 2. Secondary impact

(1) When the driver falls against the developed air bag, the tilt bracket(A) moves forwards by shearing the polyacetal resin, causing the steering column assembly to move forward.

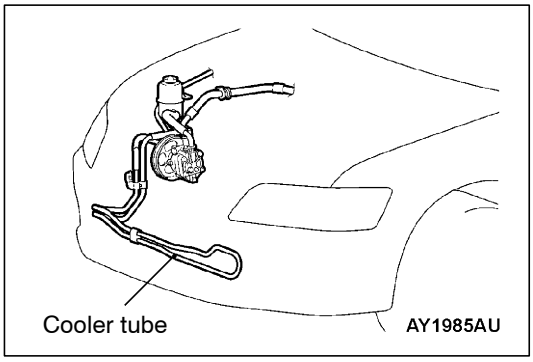



(2) At the same time that tilt bracket (A) separates, the clevis pin comes out of the U-section groove in the tilt plate, allowing the steering column assembly to move forward.

## OIL PUMP

The oil pump is a vane type with a fluid flow control system which functions so that the steering wheel turning effort will be reduced at low engine speeds and it will be appropriately increased at higher speeds.
The following modifications have been made to Lancer EVOLUTION-VI Tommi Makinen Edition.

- By increasing the basic discharge amount from 7.2 $cm^3$/rev. to 9.6 $cm^3$/rev., the assist shortage at idle has been improved.
- By increasing the diameter of the pully shaft bearing and the pump body rigidity , the pump noise has been relieved reducing vibration occurance.

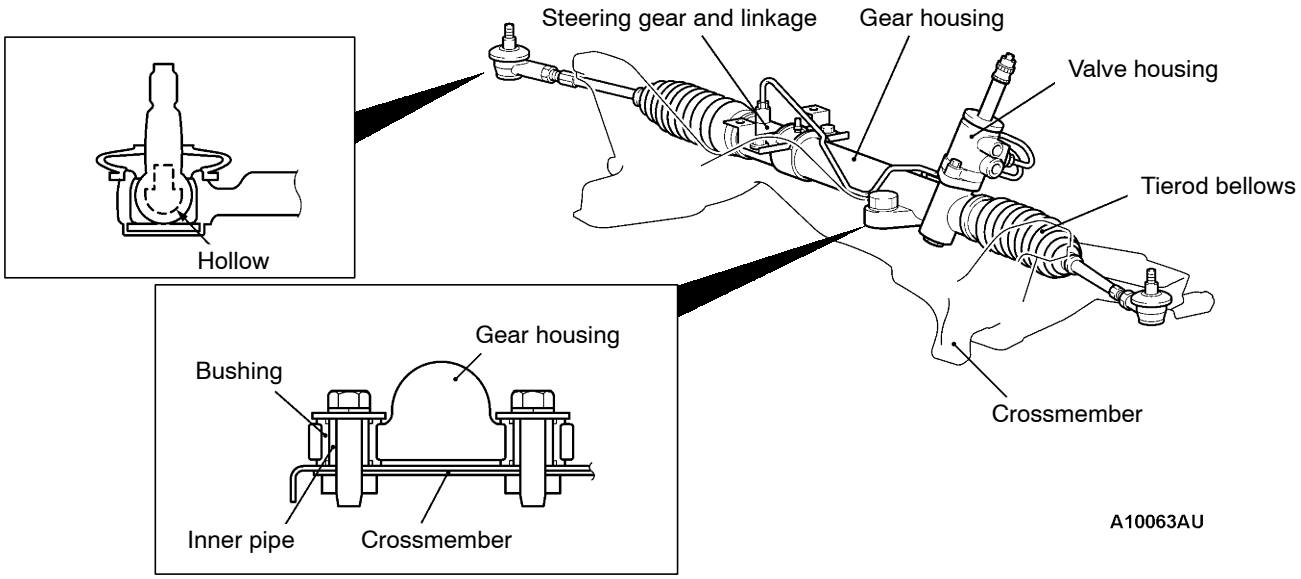



## POWER STEERING FLUID COOLER TUBE

The cooling efficiency of power steering fluid has been improved by adopting a cooler tube to the fluid line.

## STEERING GEAR

- Using the following parts have contributed to save weight; an aluminium steering gear and linkage valve housing, a plastic tie-rod bellows, and the hollow-type tie-rod stud.
- The installation accuracy, rigidity and steering stability have been improved by using an eye bushing, which secures the steering gear to the crossmember.



# BRAKES

The brake system has been designed to give greater reliability and durability and to provide excellent braking performance.

## FEATURES

**Improved braking performance**

1. A 8+9-inch brake booster has been adopted to provide large braking force with a small pedal depression force.
2. 15-inch ventilate disc brakes have been adopted to provide stable braking force and improved braking feel. <Vehicles without brembo braking system>
3. 17-inch front ventilate disc brakes have been adopted to provide stable braking force and improved braking feel. <Vehicles with brembo braking system>
4. 16-inch rear ventilate disc brakes have been adopted to provide stable braking force and improved braking feel. <Vehicles with brembo braking system>

**Improved stability**

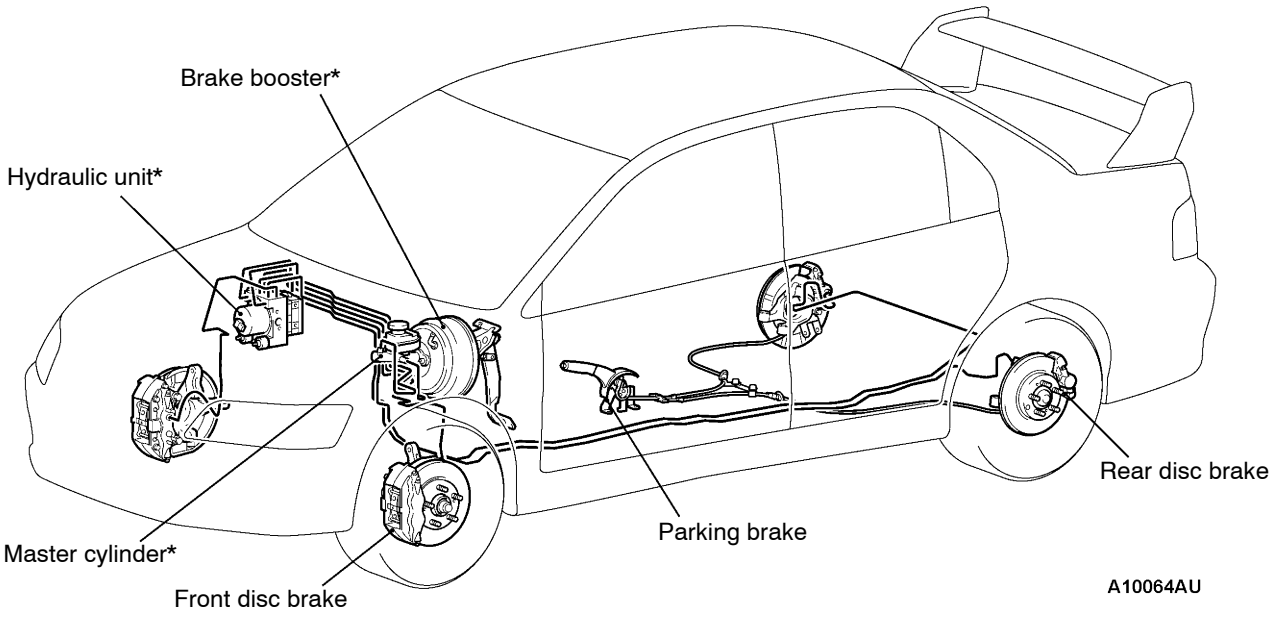
1. A 4-wheel anti-skid braking system (4ABS) has been adopted to prevent slipping caused by the vehicle wheels locking up in order to maintain an appropriate braking distance, and also to maintain a stable vehicle posture and steering performance. <Vehicles with ABS>
2. Adoption of an electronic brake-force distribution(EBD) which makes it possible to maintain the maximum amount of braking force even when the vehicle's load is unevenly distributed. <Vehicles with ABS>
3. A rear wheel early lock-prevention proportioning valve has been adopted. <Vehicles without ABS>
4. Front- and rear-wheel X-type brake line layout has been adopted.
5. Ventilated discs have been adopted in order to improve anti-fading performance.

**Improved serviceability**

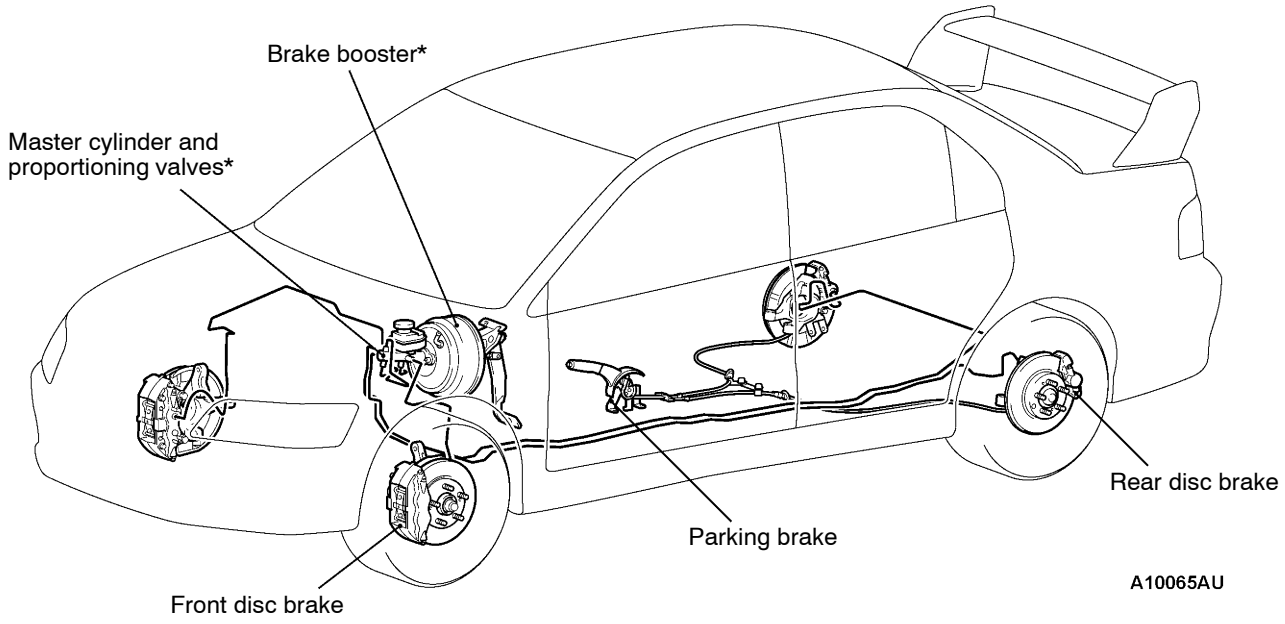
1. A diagnosis function has been adopted for the ABS system in order to make inspection easier. <Vehicles with ABS>
2. An outer disc method separated hub and rotor has been adopted to make removal and installation easier.
3. The master cylinder reservoir tank cap has been coloured white to make identification easier.
4. The ABS-ECU and hydraulic unit have been integrated to make them more compact and lightweight.

## CONSTRUCTION DIAGRAM

**<Vehicles with ABS>**




**<Vehicles without ABS>**



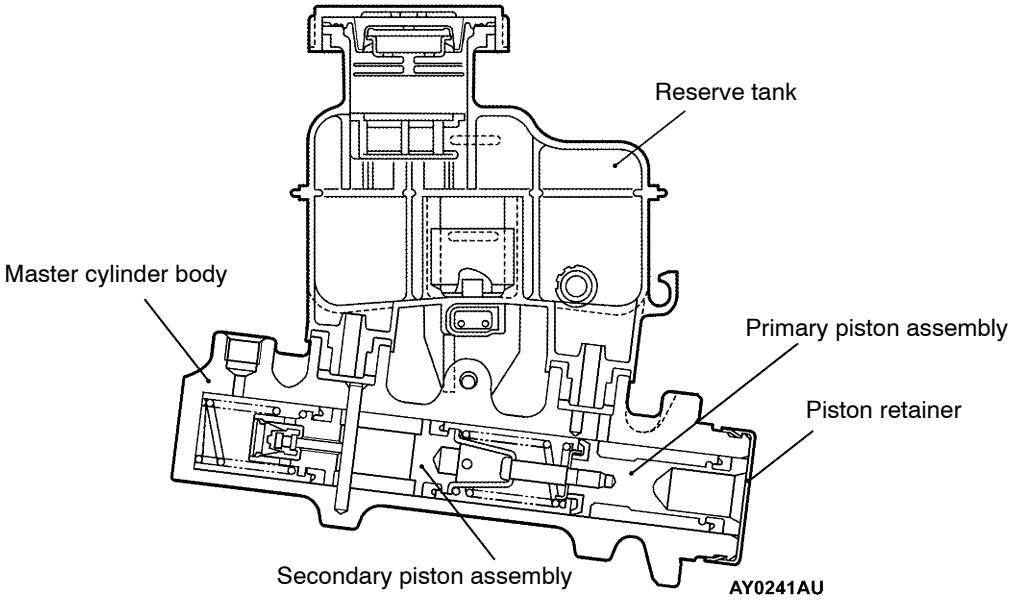

NOTE
For R.H. drive vehicles, only the position indicated by the * is symmetrical.

# SERVICE BRAKES
## SPECIFICATIONS

| Items | | Lancer EVOLUTION-VII | Lancer EVOLUTION-VI Tommi Makinen Edition |
|---|---|---|---|
| Master cylinder | Type | Tandem type | Tandem type |
| | I.D. mm | 26.9 | 26.9 |
| Brake booster | Type | Vacuum type, tandem | Vacuum type, tandem |
| | Effective dia. of power cylinder mm | 205 + 230 | 180 + 205 |
| | Boosting ratio | 4.5 (Pedal depressing force: 230 N) | 4.5 (Pedal depressing force: 230 N) |
| Rear wheel hydraulic control method | | Electronic brake-force distribution (EBD) <Vehicles with ABS (RS, RS-II)> or Proportioning valves <Vehicles without ABS (RS)> | Proportioning valves |
| Front brakes <RS (standard)> | Type | Floating caliper, 2 piston, ventilated disc | Floating caliper, 2 piston, ventilated disc |
| | Disc effective dia. × thickness mm | 227 × 24 | 227 × 24 |
| | Wheel cylinder I.D. mm | 42.9 (×2) | 42.9 (×2) |
| | Pad thickness mm | 10.0 | 10.0 |
| | Clearance adjustment | Automatic | Automatic |
| Front brakes <RS (option), RS-II> | Type | 4 opposed piston, ventilated disc <Brembo braking system> | 4 opposed piston, ventilated disc <Brembo braking system> |
| | Disc effective dia. × thickness mm | 263 × 32 | 263 × 32 |
| | Wheel cylinder I.D. mm | 40.0 (×2), 46.0 (×2) | 40.0 (×2), 46.0 (×2) |
| | Pad thickness mm | 10.0 | 10.0 |
| | Clearance adjustment | Automatic | Automatic |
| Rear brakes <RS (standard)> | Type | Floating caliper, 1 piston, ventilated disc | Floating caliper, 1 piston, ventilated disc |
| | Disc effective dia. × thickness mm | 237 × 20 | 237 × 20 |
| | Wheel cylinder I.D. mm | 34.9 | 34.9 |
| | Pad thickness mm | 10.0 | 10.0 |
| | Clearance adjustment | Automatic | Automatic |
| Rear brakes <RS (option), RS-II> | Type | 2 opposed piston, ventilated disc <Brembo braking system> | 2 opposed piston, ventilated disc <Brembo braking system> |
| | Disc effective dia. × thickness mm | 252 × 22 | 252 × 22 |
| | Wheel cylinder I.D. mm | 40.0 (×2) | 40.0 (×2) |
| | Pad thickness mm | 9.0 | 9.0 |
| | Clearance adjustment | Automatic | Automatic |
| Brake fluid | | DOT3 or DOT4 | DOT3 or DOT4 |

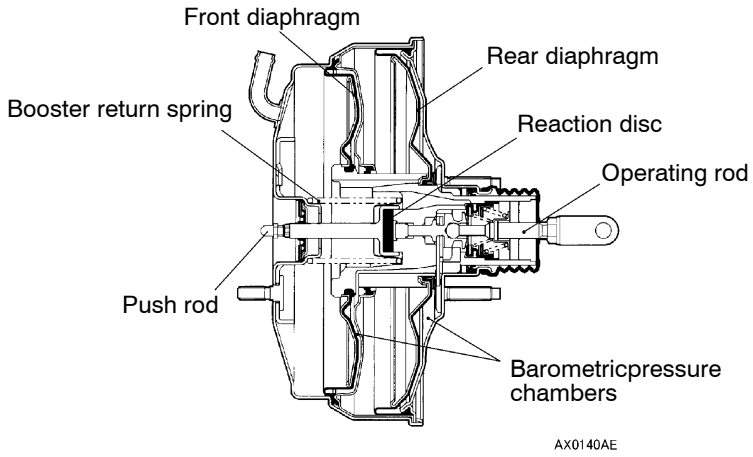
## MASTER CYLINDER

The master cylinder is a tandem-type, with a structure that emphasises safety.




## BRAKE BOOSTER

A 8+9-inch tandem-type brake booster has been adopted.



## DISC BRAKES

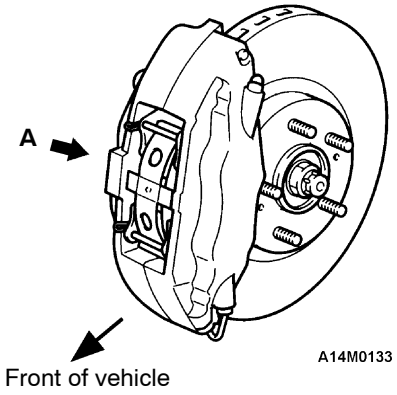
Brakes with the following specifications have been adopted.

- V5-W43 2-piston ventilate discs for front brakes <RS (standard)>
- V5-S35 1-piston ventilate discs for rear brakes <RS (standard)>
- Brembo V7-Z4046 4-opposed-piston ventilate discs for front brakes <RS (option), RS-II>
- Brembo V6-X40 2-opposed-piston ventilate discs for rear brakes <RS (option), RS-II>
- An outer disc method in which the wheels and discs are tightened together has been adopted to improve the ease of brake disc removal and installation.
- The brake pads are equipped with mechanical-type audible wear indicators to notify the driver when the usage limit (2 mm) has been reached.
- Split fins adopted as the disc fins to improve cooling performance

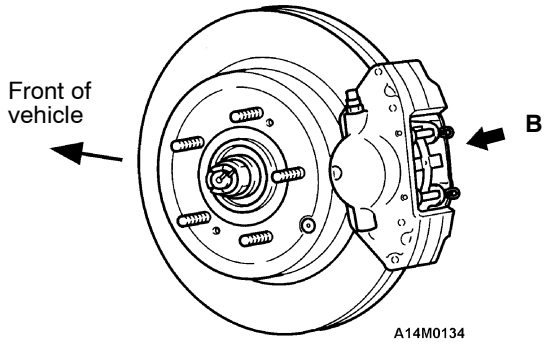
NOTE
Brembo is an italian component maker whose name and products are well known in the motorsports world.

**DISC BRAKES <Brembo braking system>**

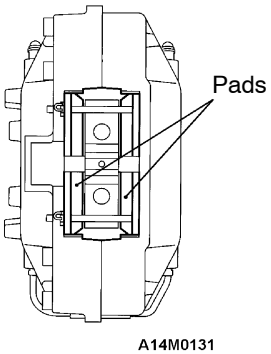
**<Front>**



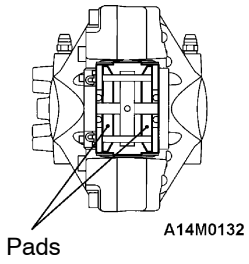

**<Rear>**




**View A**




**View B**



V 7 – Z 40 46
1 2 3 4

**DISC BRAKE NOMENCLATURE**

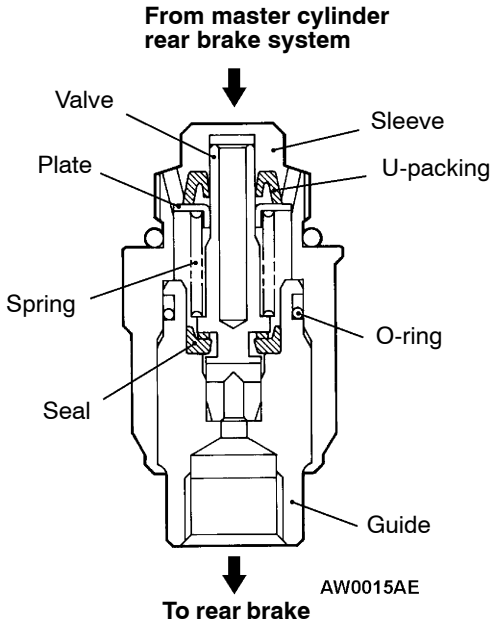
| No. | Item | Contents |
|---|---|---|
| 1 | Brake disc type | V: Ventilated |
| 2 | Brake size (Minimum applicable disc wheel) | 5: 15-inch<br>6: 16-inch<br>7: 17-inch |
| 3 | No. of pistons | S: 1 piston (floating type)<br>W: 2 piston (floating type)<br>X: 2 piston (opposed type)<br>Z: 4 piston (opposed type) |
| 4 | Piston size (rounded to nearest integer) | 35: ϕ35 mm<br>40: ϕ40 mm<br>43: ϕ43 mm<br>46: ϕ46 mm |

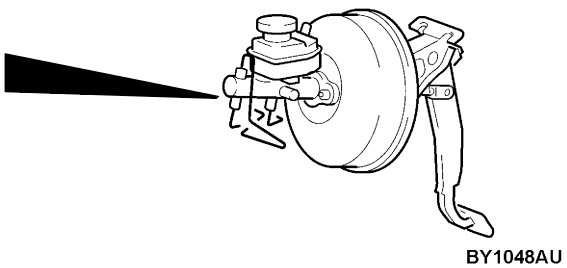
## BRAKE LINE

### PROPORTIONING VALVE <Vehicles without ABS (RS)>

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

NOTE
In terms of structure and operation, the proportioning valve is basically the same as that of the 1999 SPACE RUNNER/SPACE WAGON.



# 4-WHEEL ANTI-SKID BRAKING SYSTEM (4ABS)

## FEATURES

ABS has been adopted as optional equipment in RS-II to maintain directional stability and steering performance during sudden braking or braking on slippery road surfaces.
The ABS control method is a 4-sensor, 4-channel method which provides independent control for all wheels.
Following system for Lancer EVOLUTION-VII has been modified from Lancer EVOLUTION-VI Tommi Makinen Edition.

- By adding lateral G sensor, longitudinal G sensor and steering wheel sensor, optimized ABS control at the time of cornering.
- By inputting parking brake switch signal to ABS-ECU with pulling parking brake lever, ABS control has been optimized.
- ABS-ECU outputs ABS signal to 4WD-ECU.
- G sensor (lateral), steering wheel sensor and parking brake switch have been added to the diagnosis and service data.
- ABS-ECU connector has been changed.

### EBD CONTROL

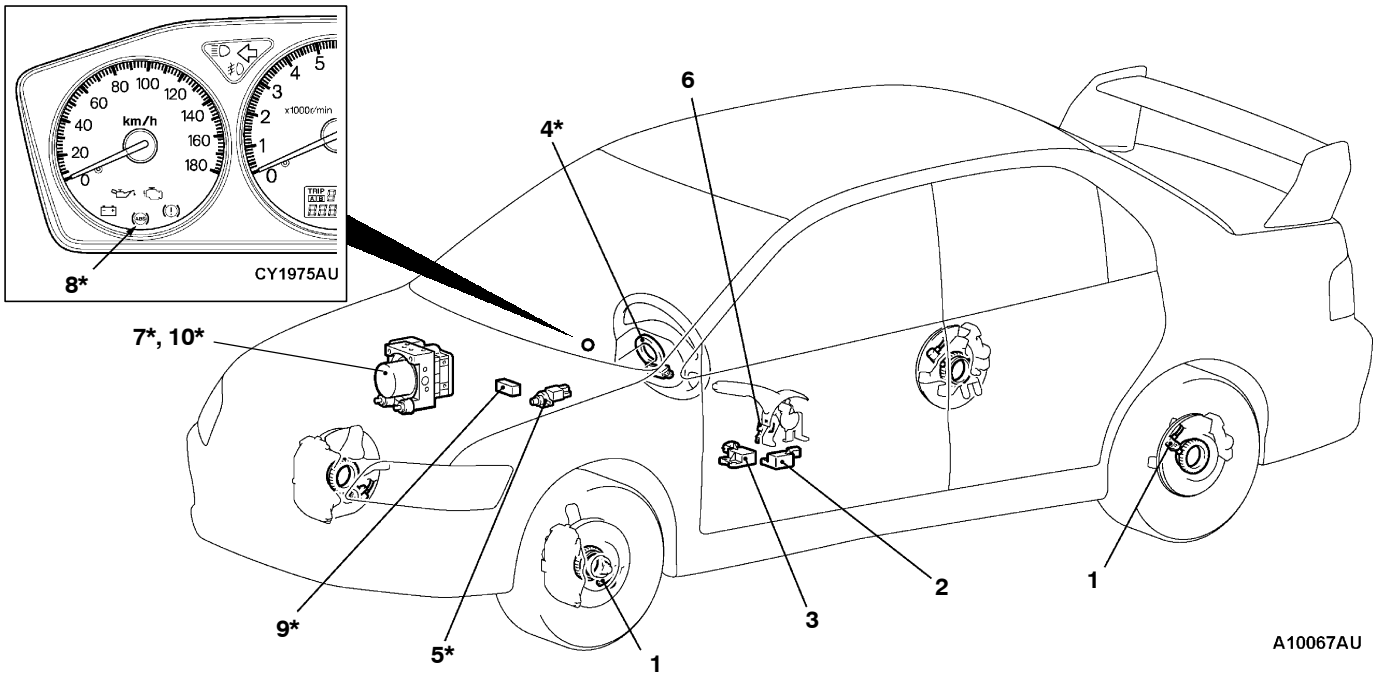
In ABS, electronic control method is used by which the rear wheel brake hydraulic pressure during braking is regulated by rear wheel control solenoid valves in accordance with the vehicle's rate of deceleration and the front and rear wheel slippage which are calculated from the each wheel speed sensor's signal. EBD control is a control system which provides a high level of control for both vehicle braking force and vehicle stability. The system has the following features:

- Because the system provides the optimum rear wheel braking force regardless of the vehicle laden condition and the condition of the road surface, the system reduces the required pedal depression force, particularly when the vehicle is heavily laden or driving on road surfaces with high frictional coefficients.
- Because the duty placed on the front brakes has been reduced, the increases in pad temperature can be controlled to improve the wear resistance characteristics of the pad, during front brakes applying.
- Control valves such as the proportioning valve are no longer required.

## SPECIFICATIONS

| Items | | Lancer EVOLUTION-VII | Lancer EVOLUTION-VI Tommi Makinen Edition |
|---|---|---|---|
| ABS control method | | 4-sensor, 4-channel | 4-sensor, 4-channel |
| No. of ABS rotor teeth | Front | 43 | 43 |
| | Rear | 43 | 43 |
| ABS speed sensor | Type | Magnet coil type | Magnet coil type |
| | Gap between sensor and rotor mm | 0.85 <front (non-adjustable type)><br>0.60 <rear (non-adjustable type)> | 0.9 <front (non-adjustable type)><br>0.9 <rear (non-adjustable type)> |

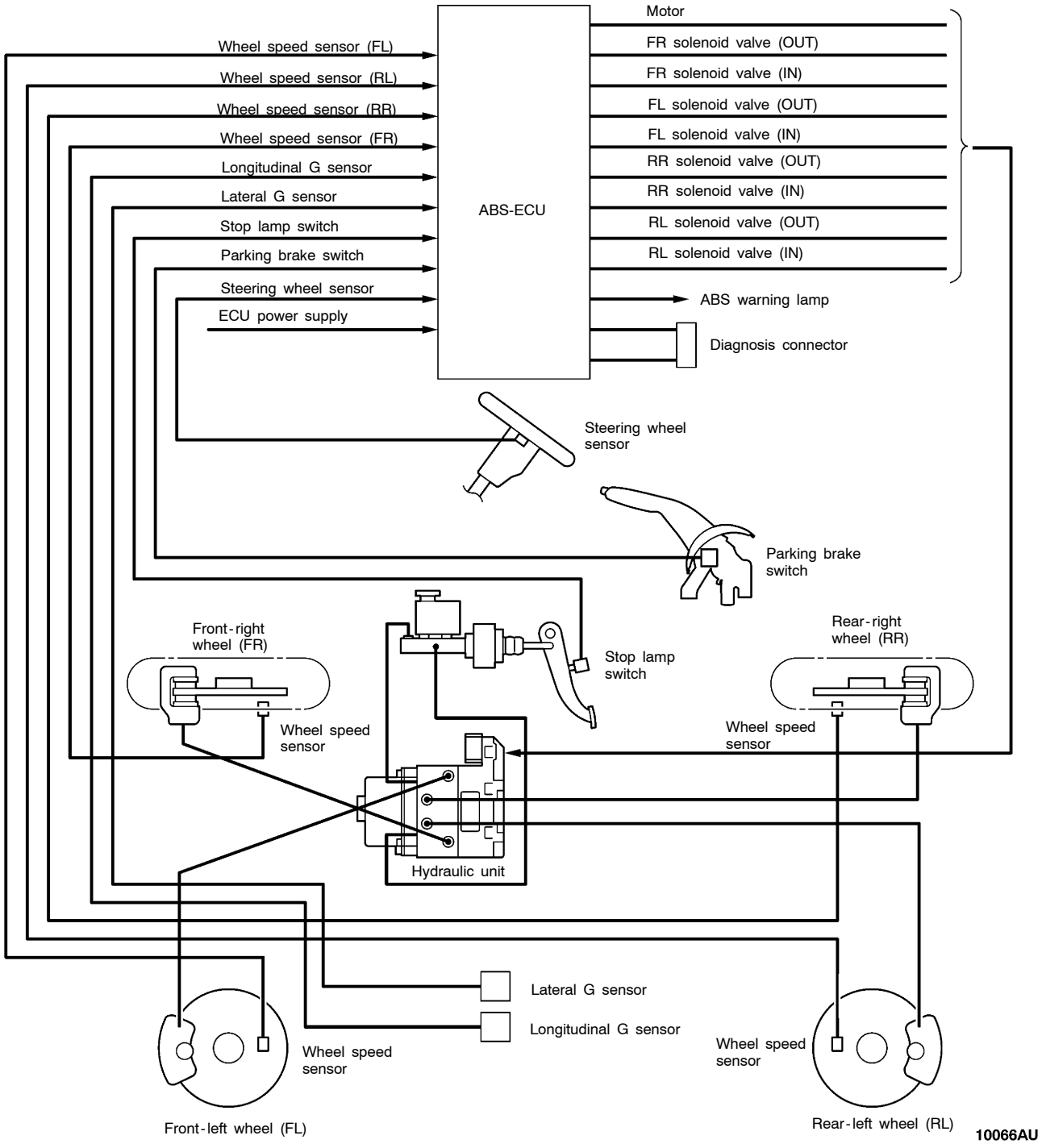
## CONSTRUCTION DIAGRAM



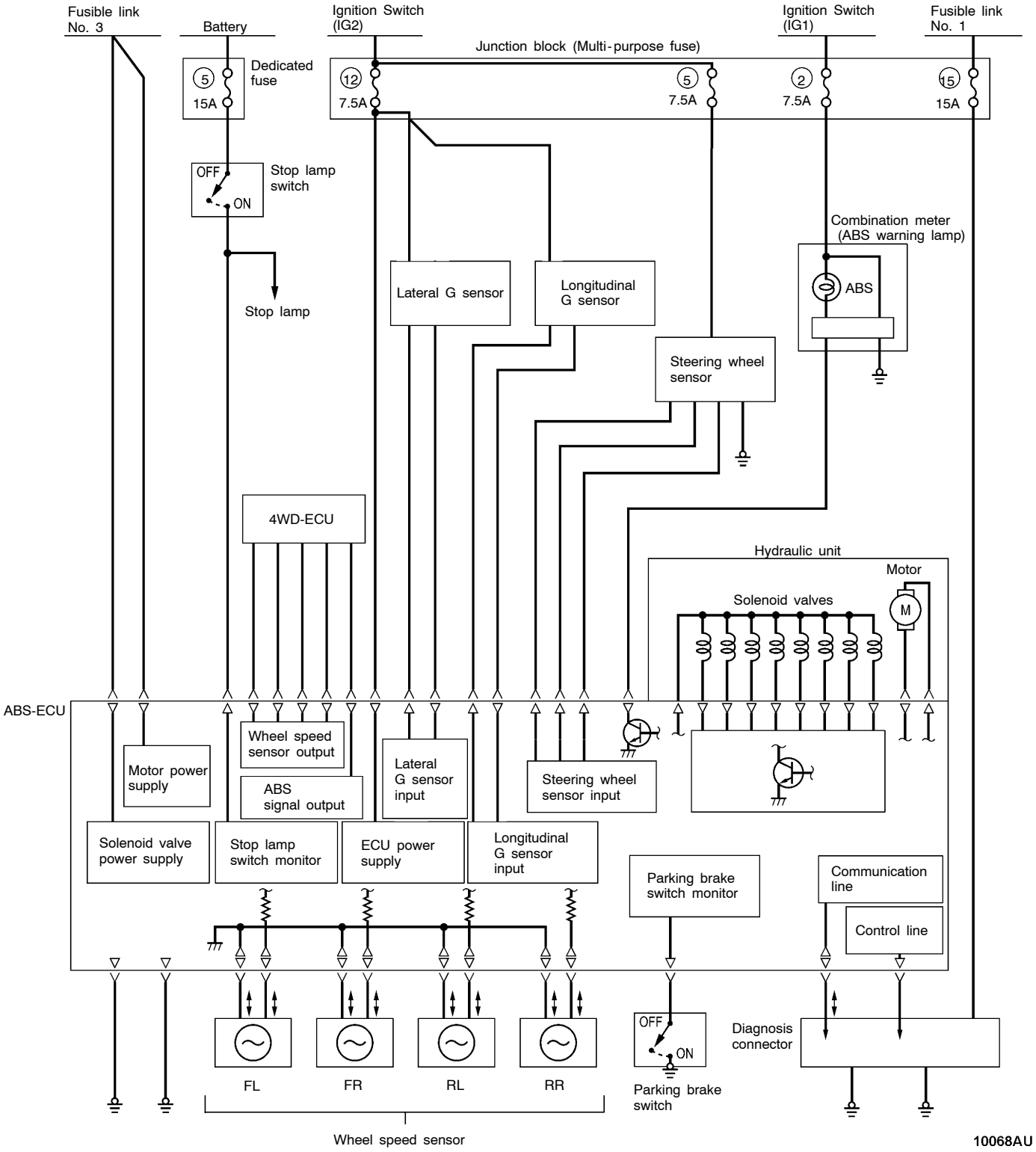

NOTE
For R.H. drive vehicles, only the position indicated by the * is symmetrical.

| Name of part | | Number | Outline of functions |
|---|---|---|---|
| Sensor | Wheel speed sensor | 1 | Send alternating current signals at frequencies which are proportional to the rotation speeds of each wheel to the ABS-ECU |
| | Lateral G sensor | 2 | Sends data on vehicle's rate of lateral acceleration to the ABS-ECU |
| | Longitudinal G sensor | 3 | Sends data on vehicle's rate of longitudinal acceleration to the ABS-ECU |
| | Steering wheel sensor | 4 | Sends data on steering wheel angle to the ABS-ECU |
| | | | Informs the ABS-ECU when steering wheel is in straight-ahead position |
| | Stop lamp switch | 5 | Sends a signal to the ABS-ECU to inform whether the brake pedal is depressed or not |
| | Parking brake switch | 6 | Sends a signal to the ABS-ECU to inform whether the parking brake lever is pulled or not |
| Actuator | Hydraulic unit | 7 | Drives the solenoid valves according to signals from the ABS-ECU in order to control the brake hydraulic pressure for each wheel |
| | ABS warning lamp | 8 | Illuminates in response to signals from the ABS-ECU when a problem happens in the system |
| Diagnosis connector | | 9 | Outputs the diagnosis codes and allows communication with the MUT-II |
| ABS control unit (ABS-ECU) | | 10 | Controls actuators (described above) based on the signals coming from each sensor |
| | | | Controls the self-diagnosis and fail-safe functions |
| | | | Controls the diagnosis function (MUT-II compatible) |

## SYSTEM CONFIGURATION DIAGRAM



## ABS ELECTRICAL CIRCUIT DIAGRAM



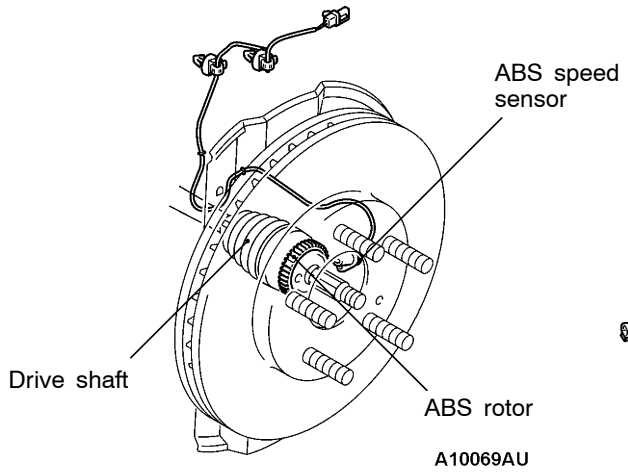
## SENSORS

### WHEEL SPEED SENSOR

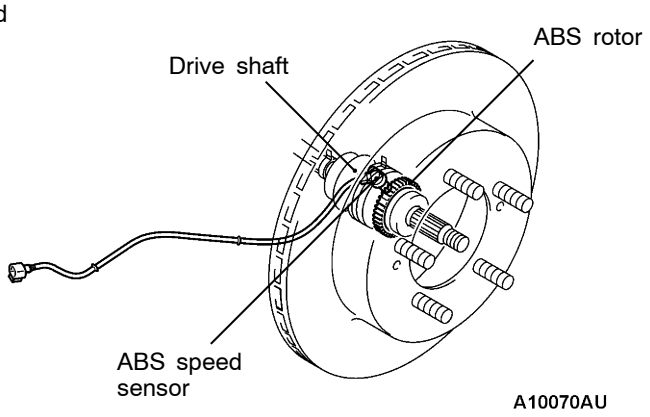
The wheel speed sensors consist of fixed ABS speed sensors and the ABS rotors that rotate at the same speed as the wheels, and output alternating current signals at frequencies which are proportional to the wheel speed.

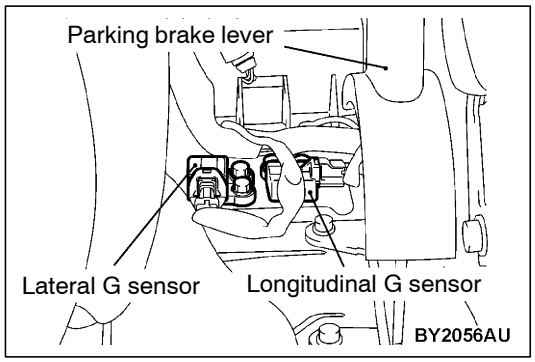
- The ABS rotors (43 teeth) are installed to the drive shafts, and the ABS speed sensors are installed to knuckles.
- The gap between the ABS rotors and the ABS speed sensors are non-adjustable at both the front and rear to improve serviceability.

**Front**



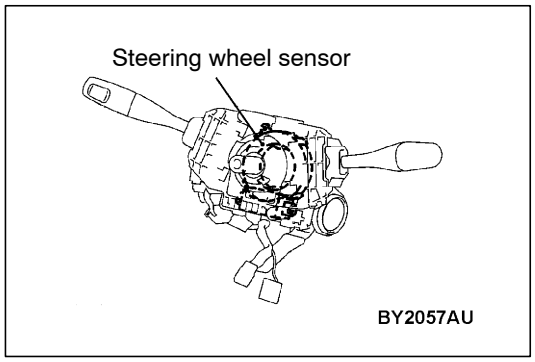

**Rear**




### LATERAL G SENSOR/LONGITUDINAL G SENSOR

Refer to GROUP 2 - ACD and AYC.




### STEERING WHEEL SENSOR

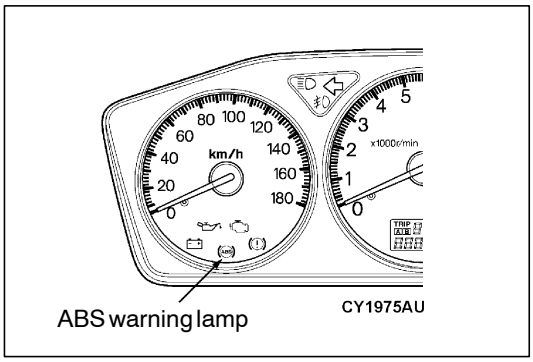
Refer to GROUP 2 - ACD and AYC.

### STOP LAMP SWITCH

This switch turns on when the brake pedal is depressed, and turns off when the brake pedal is released. The ABS-ECU detects whether the stop lamp switch is on or off by means of fluctuations in voltage (ON: system voltage; OFF: Approximately 0 V). This data is used for ABS control.

### PARKING BRAKE SWITCH

This switch turns on when the parking brake lever is pulled, and turns off when the parking brake lever is released. The ABS-ECU detects whether the parking brake switch is on or off by means of fluctuations in voltage (ON: less than 1V; OFF: system voltage). This data is used for ABS control.




## ACTUATORS

### ABS WARNING LAMP

The ABS-ECU controls the power transistor in ABS-ECU to turn on and causes the ABS warning lamp to illuminate in the following cases:

- During initial check when the ignition switch is at the "ON" position (for approximately 3 seconds)
- When a problem happens in the ABS/EBD system
- Poor ABS-ECU connector connection

### HYDRAULIC UNIT

The hydraulic unit is basically the same as that of the 1999 PAJERO io <General Export>/2000 PAJERO PININ <Europe>.

## ABS-ECU

The ABS-ECU is basically the same as that of the 1999 PAJERO io <General Export>/2000 PAJERO PININ <Europe> except for the followings:

### FAIL-SAFE FUNCTION

| Diagnosis code No. | Item |
|---|---|
| 11 | Open circuit or short-circuit in wheel speed sensor (FR) |
| 12 | Open circuit or short-circuit in wheel speed sensor (FL) |
| 13 | Open circuit or short-circuit in wheel speed sensor (RR) |
| 14 | Open circuit or short-circuit in wheel speed sensor (RL) |
| 16 | Abnormal drop or rise in ABS-ECU power supply voltage |
| 21 | Wheel speed sensor (FR) system |
| 22 | Wheel speed sensor (FL) system |
| 23 | Wheel speed sensor (RR) system |
| 24 | Wheel speed sensor (RL) system |
| 32 | Longitudinal G sensor system |
| 41 | Solenoid valve (FR) system |
| 42 | Solenoid valve (FL) system |
| 43 | Solenoid valve (RR) system |
| 44 | Solenoid valve (RL) system |
| 51 | Valve relay ON problem |
| 52 | Valve relay OFF problem |
| 53 | Motor relay OFF problem |
| 54 | Motor relay ON problem |
| 55 | Motor system |
| 63 | ABS-ECU abnormality |
| 71 | Lateral G sensor system |
| 81 | Steering wheel sensor (ST-1) system |
| 82 | Steering wheel sensor (ST-2) system |
| 83 | Steering wheel sensor (ST-N) system |

### DATA LIST REFERENCE TABLE

| Item No. | Check item | Display unit or words |
|---|---|---|
| 11 | Front-right wheel speed sensor | km/h |
| 12 | Front-left wheel speed sensor | |
| 13 | Rear-right wheel speed sensor | |
| 14 | Rear-left wheel speed sensor | |
| 21 | Power supply voltage | V |
| 29 | Parking brake switch | ON/OFF |
| 36 | Stop lamp switch | ON/OFF |
| 37 | Steering wheel sensor straight ahead position memory | ON/OFF |

| Item No. | Check item | Display unit or words |
|---|---|---|
| 71 | Lateral G sensor | V |
| 74 | Steering wheel sensor (ST-N) | ON/OFF |
| 75 | Steering wheel sensor (ST-1) | |
| 76 | Steering wheel sensor (ST-2) | |
| 86 | Steering angle | ° or OFF (When the steering angle is straight ahead position) |

### SYSTEM OPERATION

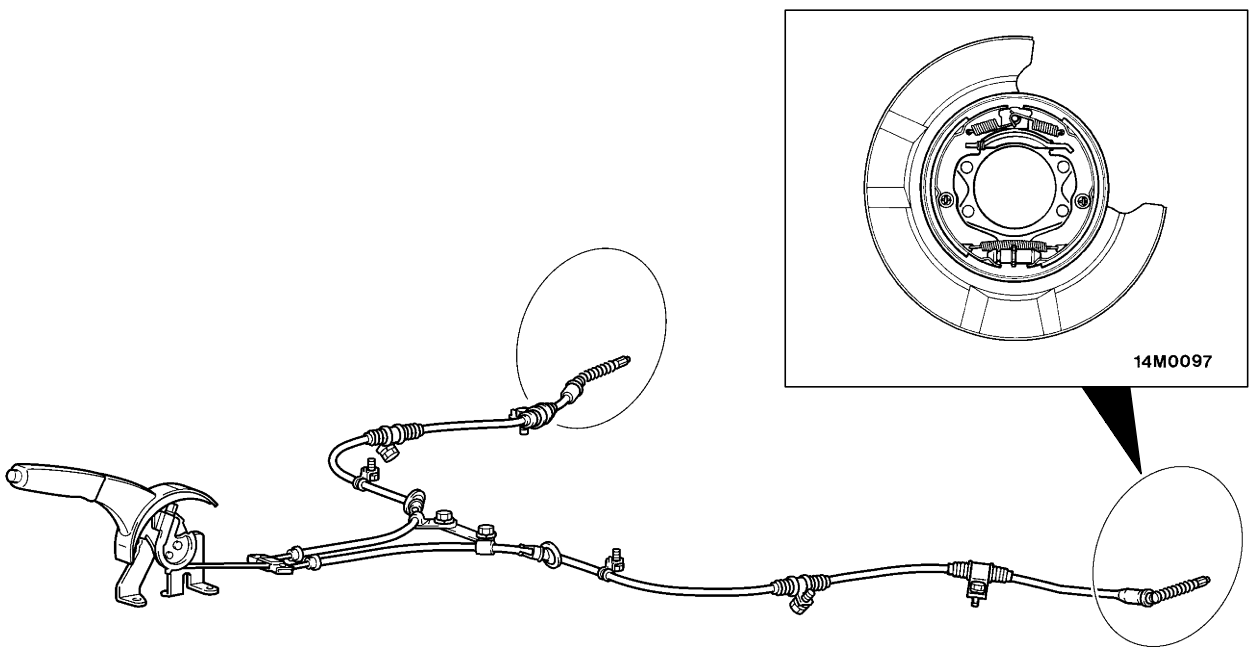
In terms of operation, the system is basically the same as that of the 1996 Colt/Lancer.

## PARKING BRAKE

### FEATURES

The parking brakes are a mechanical rear wheel brake design and controlled by a lever.

### CONSTRUCTION DIAGRAM




Y2351AU

**NOTES**