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# WORKSHOP MANUAL

## **LANCER EVOLUTION-IV EVOLUTION-V**



Pub. No. S9806CNC9

**RALLI  ART**



# LANCER EVOLUTION-IV EVOLUTION-V

## WORKSHOP MANUAL

### FOREWORD

This Workshop Manual contains procedures for service mechanics, including removal, disassembly, inspection, adjustment, reassembly and installation. Figures taken from registration documents are given in metric units only. All other figures are given in SI units with metric units in brackets. Use the following manuals in combination with this manual as required.

TECHNICAL INFORMATION MANUAL  
N9806CNCP9

All information, illustrations and product descriptions contained in this manual are current as at the time of publication. We, however, reserve the right to make changes at any time without prior notice or obligation.

July 1998

## RALLIART INC.

General .....	<b>00</b>
Engine .....	<b>11</b>
Engine Lubrication .....	<b>12</b>
Fuel .....	<b>13</b>
Engine Cooling .....	<b>14</b>
Intake and Exhaust .....	<b>15</b>
Engine Electrical .....	<b>16</b>
Engine and Emission Control ....	<b>17</b>
Clutch .....	<b>21</b>
<b>Manual Transmission</b> .....	<b>22</b>
<b>Front Axle</b> .....	<b>26</b>
<b>Rear Axle</b> .....	<b>27</b>
<b>Power Plant Mount</b> .....	<b>32</b>
<b>Front Suspension</b> .....	<b>33</b>
<b>Rear Suspension</b> .....	<b>34</b>
<b>Service Brakes</b> .....	<b>35</b>
<b>Parking Brakes</b> .....	<b>36</b>
<b>Steering</b> .....	<b>37</b>
<b>Body</b> .....	<b>42</b>
<b>Exterior</b> .....	<b>51</b>
<b>Chassis Electrical</b> .....	<b>54</b>
<b>Electrical Wiring</b> .....	

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# GENERAL



## CONTENTS

MODELS ..... 2

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**MODELS****<LANCER EVOLUTION-IV>**

Model code	Class code	Model year	Grade	Engine model	Transmission model	Fuel supply system
E-CN9A	SNDF	'97	RS	4G63 (2,000-DOHC – 16 valves-intercooler turbo)	W5M51 (4WD-5M/T)	Electronically controlled fuel injection (MPI)
	SRGF	'97	GSR			

**<LANCER EVOLUTION-V>**

Model code	Class code	Model year	Grade	Engine model	Transmission model	Fuel supply system
GF-CP9A	SNDF	'98	EVOLUTION-V RS	4G63 (2,000-DOHC – 16 valves-intercooler turbo)	W5M51 (4WD-5M/T)	MPI
	SNGF	'98	EVOLUTION-V GSR			

**Applicable serial numbers**

E-CN9A: CN9A – 0000001 ~

GF-CP9A: CP9A – 0000001 ~



# ENGINE

## CONTENTS

<b>SERVICE SPECIFICATIONS</b> .....	<b>2</b>	<b>CRANKSHAFT PULLEY</b> .....	<b>9</b>
<b>SEALANTS</b> .....	<b>2</b>	<b>CAMSHAFT AND CAMSHAFT</b>	
<b>SPECIAL TOOLS</b> .....	<b>2</b>	<b>OIL SEAL</b> .....	<b>10</b>
<b>ENGINE ADJUSTMENTS</b> .....	<b>4</b>	<b>OIL PAN</b> .....	<b>13</b>
1. Drive Belt Tension Check .....	4	<b>CRANKSHAFT OIL SEAL</b> .....	<b>15</b>
2. Auto Tensioner Check .....	5	<b>CYLINDER HEAD GASKET</b> .....	<b>17</b>
3. Lash Adjuster Check .....	5	<b>TIMING BELT</b> .....	<b>21</b>
4. Lash Adjuster Replacement .....	7	<b>ENGINE ASSEMBLY</b> .....	<b>32</b>
5. Ignition Timing Check .....	7		
6. Idle Speed Check and Idle Mixture Check	7		
7. Compression Pressure Check .....	7		
8. Manifold Vacuum Check .....	8		

## SERVICE SPECIFICATIONS

Items	Standard value	Limit
Basic ignition timing	5° BTDC ± 3°	–
Ignition timing (at idle)	Approx. 5° BTDC	–
Idle speed rpm	850 ± 50	–
CO contents %	0.6 or less	–
HC contents ppm	300 or less	–
Compression pressure kg/cm <sup>2</sup> – rpm	11.5 – 250	Min. 9.7 – 250
Compression pressure difference of all cylinders kg/cm <sup>2</sup>	–	Max. 1.0
Intake manifold vacuum kPa {mmHg}	–	Min. 55 {410}
Cylinder head bolt shank length mm	–	99.4

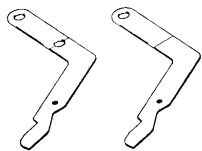
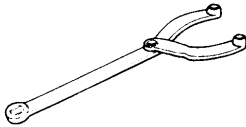
## SEALANTS

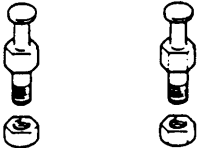
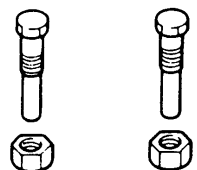
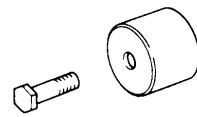
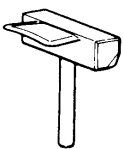
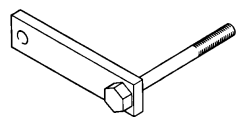

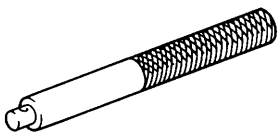
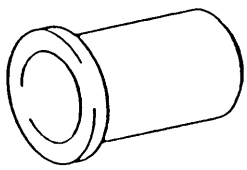
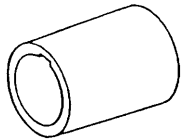
Items	Specified sealants
Rocker cover	Semi-drying sealant: THREEBOND 1207D [MZ 100168] (containing 150 g)
Oil pan	Semi-drying sealant: THREEBOND 1207F [MZ 100191] (containing 150 g)

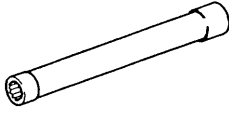
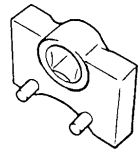
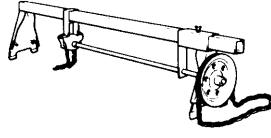
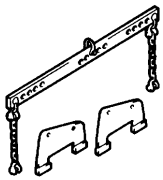
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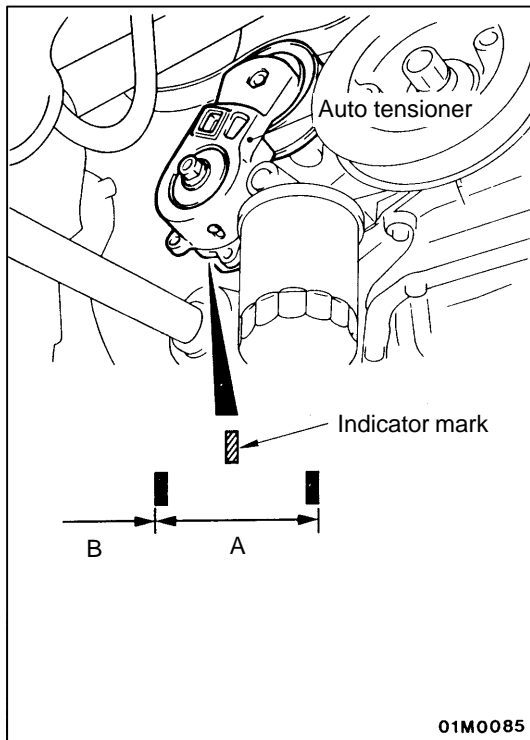
Given in [ ] are MITSUBISHI GENUINE PART numbers.

## SPECIAL TOOLS

Tool	Number	Name	Use
	MD998782	Valve lifter set	Replacing the lash adjuster
	MB990767	End yoke holder	<ul style="list-style-type: none"> <li>● Holding the crankshaft pulley</li> <li>● Holding the camshaft sprocket</li> </ul>

Tool	Number	Name	Use
	MD998719	Crankshaft pulley holder pin	<ul style="list-style-type: none"> <li>● Holding the crankshaft pulley</li> <li>● Holding the camshaft sprocket</li> </ul>
	MD998715	Pulley holder pin	
	MD998713	Camshaft oil seal installer	Pressfitting the camshaft oil seal
	MD998727	Oil pan remover	Removing the oil pan
	MD998781	Flywheel stopper	Securing the flywheel or drive plate
	MD998776	Crankshaft rear oil seal installer	Pressfitting the crankshaft rear oil seal
	MB990938	Handle	
	MD998382	Crankshaft front oil seal installer	Installing the crankshaft front oil seal
	MD998285	Crankshaft front oil seal guide	

Tool	Number	Name	Use
	MB991654	Cylinder head bolt wrench	Removing and reinstalling the cylinder head bolt
	MD998767	Tensioner pulley socket wrench	Timing belt tension adjustment
	Recommended tool MZ203826 by Anzen Jidosha or MZ203827 by Banzai	Engine lifter	Supporting the engine assembly during removal and installation of the transmission
	MD991453	Engine hanger assembly	



## ENGINE ADJUSTMENTS

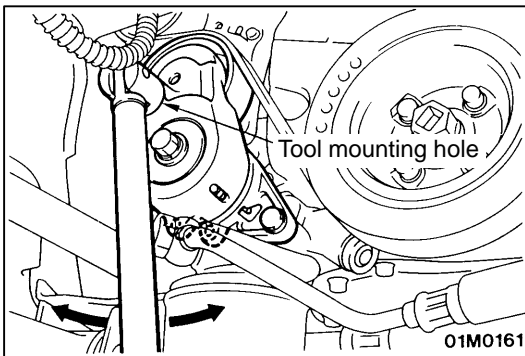
### 1. DRIVE BELT TENSION CHECK

**NOTE**

Use of the auto tensioner eliminates the need for belt tension adjustment. Check that the indicator mark on the auto tensioner is in the range of A shown.

If it is outside the specified range (i.e., in range of B shown), replace the drive belt.

(For the removal and installation of the drive belt, refer to P.11-9.)



## 2. AUTO TENSIONER CHECK

- (1) Stop the engine from the idle speed and check that the belt rests within the auto tensioner pulley width.
- (2) Remove the drive belt.  
(For the removal of the drive belt, refer to P.11-9.)
- (3) Fit a spinner handle or similar tool into the tool mounting hole of the auto tensioner and turn the tensioner clockwise and counterclockwise to ensure that it does not bind.
- (4) If step (1) or (3), or both, have been checked abnormally, replace the auto tensioner.
- (5) Reinstall the drive belt.

## 3. LASH ADJUSTER CHECK

### NOTE

If an unusual knocking noise can be heard immediately after the engine has started or while it is running and if that is probably attributable to the lash adjuster, make the following checks.

- (1) Check the engine oil and add or change oil as necessary.

### NOTE

- (1) If the engine oil level is low, air is taken in through the oil screen, entering the oil passage.
- (2) If the oil level is too high, the cranks agitate oil causing oil to trap a large amount of air.
- (3) Air does not easily separate from a deteriorated oil that can contain an increased amount of air.

When air trapped in oil for these reasons gets into the high-pressure chamber of the lash adjuster, the air in the high-pressure chamber is compressed to shrink the lash adjuster excessively while the valve is opening, resulting in an unusual noise occurring. This is the same symptom developing when the valve clearance is adjusted to an excessive value.

The problem in this case is gone when air is released from the lash adjuster.

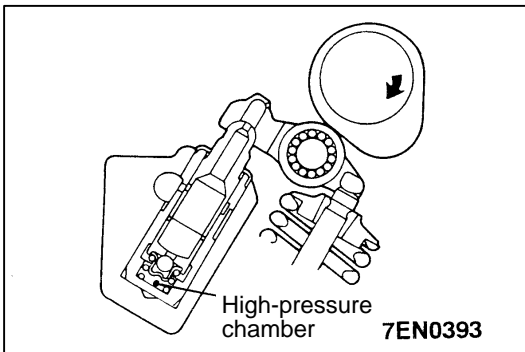
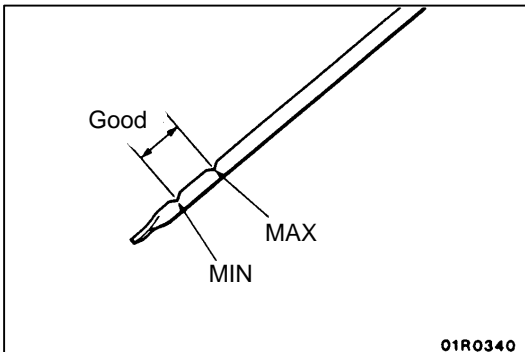
- (2) Start the engine and carry out several cycles (10 or less) of mild racing\*.

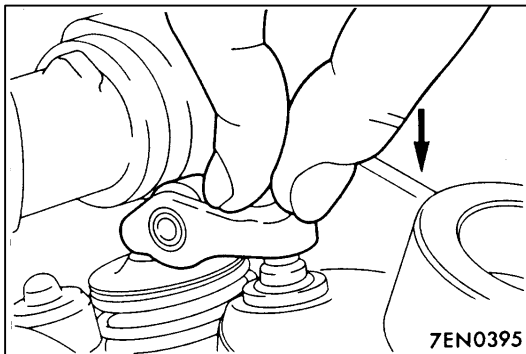
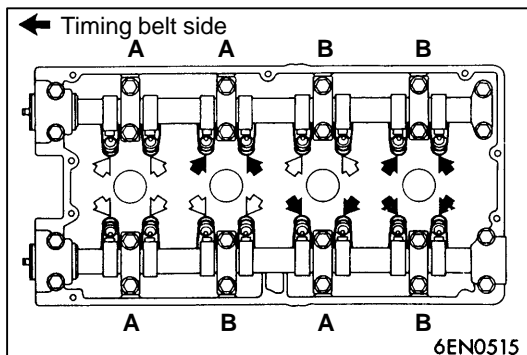
If the noise is gone after racing, it indicates that air has been released from the high-pressure chamber of the lash adjuster, restoring the lash adjuster to normal operating conditions.

\*: Gradually (extending over a 30-sec. period) increase the engine speed from idle speed to 3,000 r/min and then reduce it down to the idle speed gradually (extending over a 30-sec. period).

### NOTE

- (1) If the vehicle is parked on a slope for a long time, the amount of oil in the lash adjuster will decrease, causing air to get into the high-pressure chamber when the engine is started.
- (2) After the vehicle has been parked for a long time, oil drains out of the oil passage and it takes a long time for the oil to reach the lash adjuster. This can cause air to get into the high-pressure chamber.



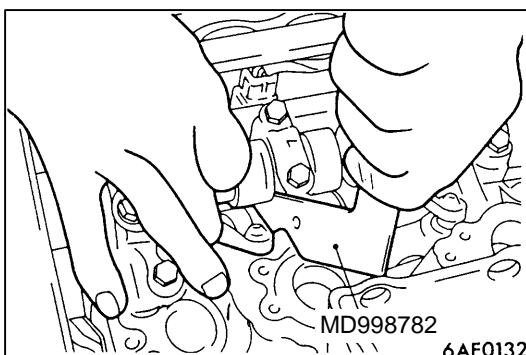
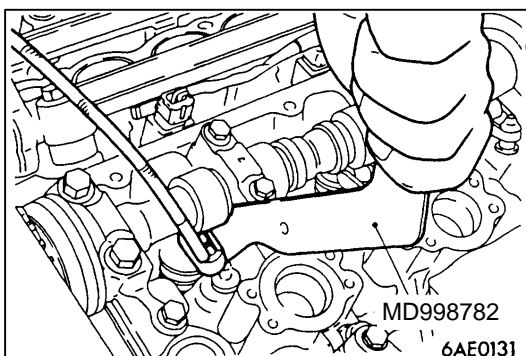


- (3) If the noise is not eliminated by racing, follow these steps to check the lash adjuster.
- Stop the engine.
  - Bring no. 1 cylinder to TDC on the compression stroke.
  - Push the rocker arms indicated by arrow A on the left to see if they go down.
  - Slowly turn the crankshaft clockwise 360°.
  - Perform the same step as step c for rocker arms indicated by arrow B.

- Push the part of the rocker arm which contacts the top of the lash adjuster. If the rocker arm can be easily moved down to the bottom, the lash adjuster is defective, requiring replacement. When the lash adjuster is replaced, be sure first to bleed the lash adjuster of air before installation. Then, perform steps a through e to ensure that no abnormal symptoms are noted.

#### NOTE

- The leak-down test is an effective means to accurately determine if the lash adjuster is operational or not.
- For the leak-down test and bleeding procedures, refer to ENGINE WORKSHOP MANUAL. If the rocker arm is felt binding and cannot be pushed downward as you push it, the lash adjuster is operational. Check for other possible causes for the noise.



- (4) Lash adjuster replacement

#### Caution

From the cylinder from which the lash adjuster is to be removed, turn the crankshaft to lower the piston, as the valve contacts the piston when pushed down. A rocker arm cannot be removed if it is lifted by the cam. If this is the case, turn the crankshaft so that the arm is not lifted.

- Using the special tool, push the valve downward to remove the roller rocker arm.
- Remove the lash adjuster from the cylinder head.
- Mount a brandnew lash adjuster which has been bled of air in the cylinder head.
- Using the special tool, lower the valve and install the roller rocker arm.

#### NOTE

To mount the roller rocker arm, first place the pivot side of the rocker arm on the lash adjuster, then push down the valve; next, place the slipper side of the rocker arm on the valve system side.

#### 4. LASH ADJUSTER REPLACEMENT

Refer to (4) of the preceding paragraph.

#### 5. IGNITION TIMING CHECK

Check that ignition timing is at the standard value.

**Standard value: approx. 5° BTDC**

**NOTE**

Ignition timing is variable within about  $\pm 7^\circ$ , even under normal operating.

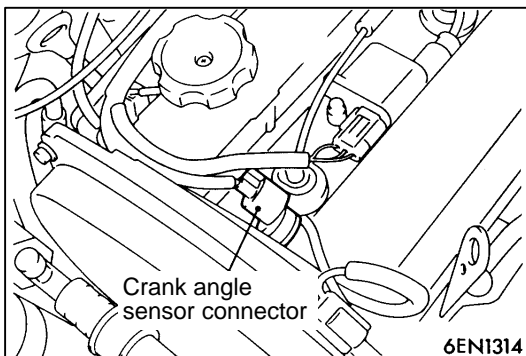
#### 6. IDLE SPEED CHECK AND IDLE MIXTURE CHECK

- (1) Run the engine at 2,000 to 3,000 r/min for 2 minutes.
- (2) Check the CO and HC contents at idle.

**Standard value**

**CO contents: 0.6% or less**

**HC contents: 300 ppm or less**



#### 7. COMPRESSION PRESSURE CHECK

- (1) Before inspection, check that the engine oil, starter and battery are normal. In addition, set the vehicle to the pre-inspection condition.
- (2) Remove all of the spark plugs.
- (3) Disconnect the crank angle sensor connector.

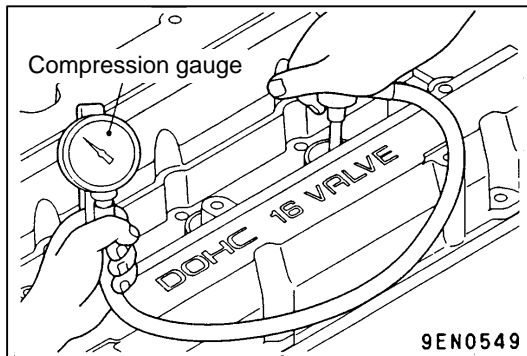
**NOTE**

Doing this will prevent the engine-ECU from carrying out ignition and fuel injection.

- (4) Cover the spark plug hole with a shop towel etc., and after the engine has been cranked, check that no foreign material is adhering to the shop towel.

**Caution**

- (1) Keep away from the spark plug hole when cranking.
- (2) If compression is measured with water, oil, fuel, etc., that has come from cracks inside the cylinder, these materials will become heated and will gush out from the spark plug hole, which is dangerous.



- (5) Set compression gauge to one of the spark plug holes.
- (6) Crank the engine with the throttle valve fully open and measure the compression pressure.

**Standard value**

(at engine speed of 250 r/min): 11.5 kg/cm<sup>2</sup>

**Limit (at engine speed of 250 r/min): 9.7 kg/cm<sup>2</sup>**

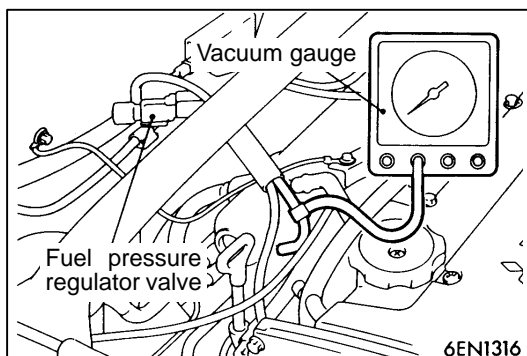
- (7) Measure the compression pressure for all the cylinders, and check that the pressure differences of the cylinders are below the limit.

**Limit: Max. 1.0 kg/cm<sup>2</sup>**

- (8) If there is a cylinder with compression or a compression difference that is outside the limit, pour a small amount of engine oil through the spark plug hole, and repeat the operations in steps (5) through (7).
  - a. If the compression increases after oil is added, the cause of the malfunction is a worn or damaged piston ring and/or cylinder inner surface.
  - b. If the compression does not rise after oil is added, the cause is a burnt or defective valve seat, or pressure is leaking from the gasket.
- (9) Connect the crank angle sensor connector.
- (10) Install the spark plugs.
- (11) Install the ignition coil and connect the ignition coil connector.
- (12) Erase the diagnosis codes by keeping the battery minus (-) cable disconnected for more than 10 seconds.

**NOTE**

This will erase the diagnosis code resulting from the crank angle sensor connector being disconnected.



## 8. MANIFOLD VACUUM CHECK

- (1) Before inspection, set the vehicle to the pre-inspection condition.
- (2) Connect a tachometer connector.
- (3) Attach a three-way union to the vacuum hose between the fuel pressure regulator valve and the intake manifold, and connect a vacuum gauge.
- (4) Start the engine and check that idle speed is within standard value.

**Standard value: 850 ± 50 r/min**

5. Check the manifold vacuum at idling.

**Limit: Min. 55 kPa {410 mmHg}**



# CRANKSHAFT PULLEY

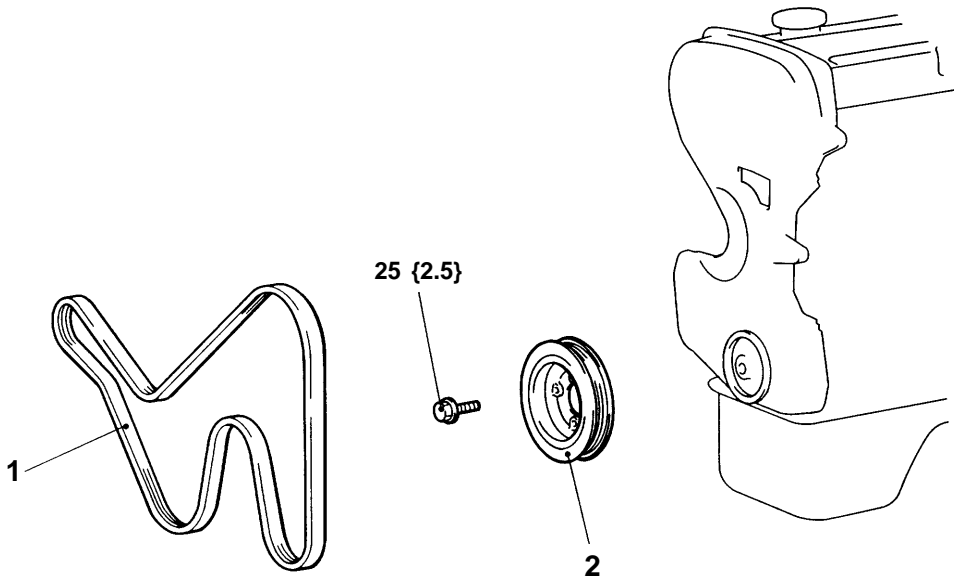
## REMOVAL AND INSTALLATION

**Pre-removal Operation**

- Under Cover Removal

**Post-installation Operation**

- Drive Belt Tension Adjustment (Refer to P.11-4.)
- Under Cover Installation



01M0165

Unit: Nm {kgf · m}

**Removal steps**

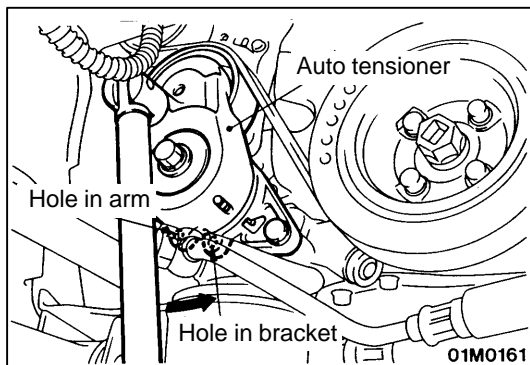


1. Drive belt
2. Crankshaft pulley

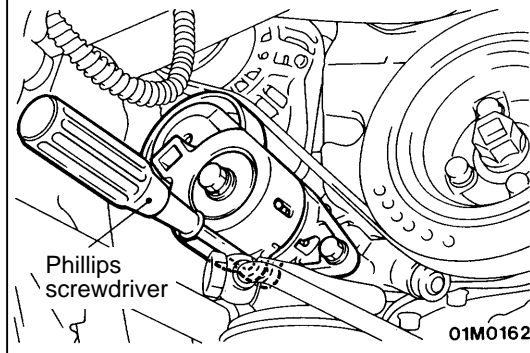
### REMOVAL SERVICE POINT

**◀▶ DRIVE BELT REMOVAL**

- (1) Align the hole in the auto tensioner bracket with that in the arm and insert a screwdriver into the holes.
- (2) Remove the drive belt.



01M0161



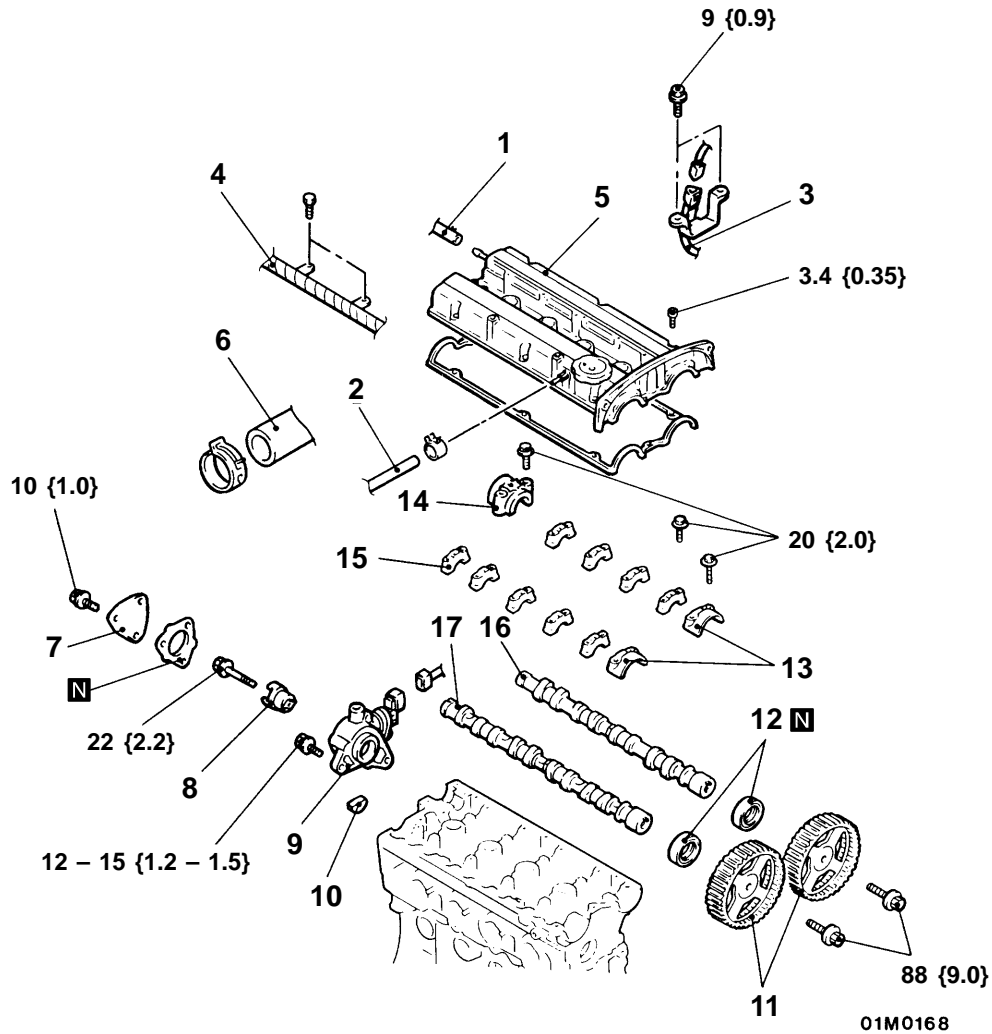
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# CAMSHAFT AND CAMSHAFT OIL SEAL

## REMOVAL AND INSTALLATION

**Pre-removal and Post-installation Operation**

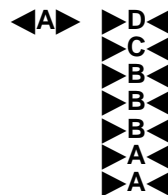
- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>(1) Engine Coolant Draining and Refilling</li> <li>(2) Air Hose C Removal and Installation<br/>(Refer to GROUP 15 – Intercooler.)</li> <li>(3) Spark Plug Cable and Ignition Coil Assembly Removal and Installation</li> </ul> | <ul style="list-style-type: none"> <li>(4) Air Pipe Removal and Installation<br/>(Refer to GROUP 15 – Air Control Valve.)</li> <li>(5) Timing Belt Removal and Installation<br/>(Refer to P.11-21.)</li> </ul> |
|---|--|



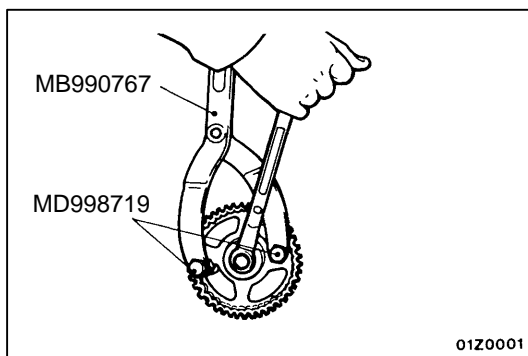
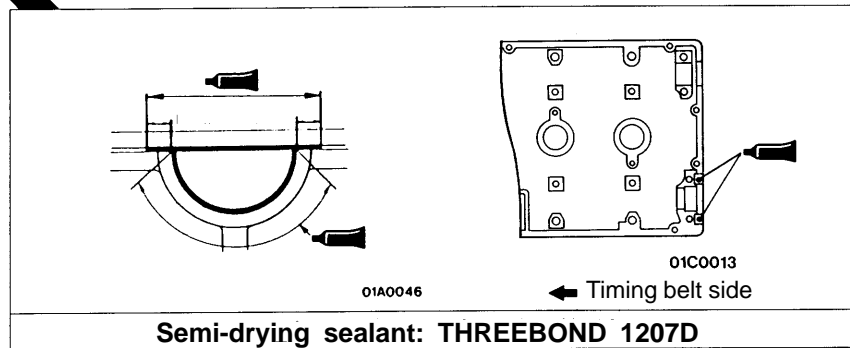
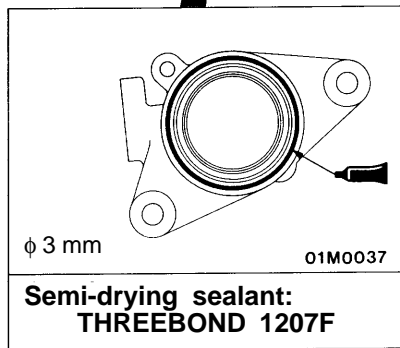
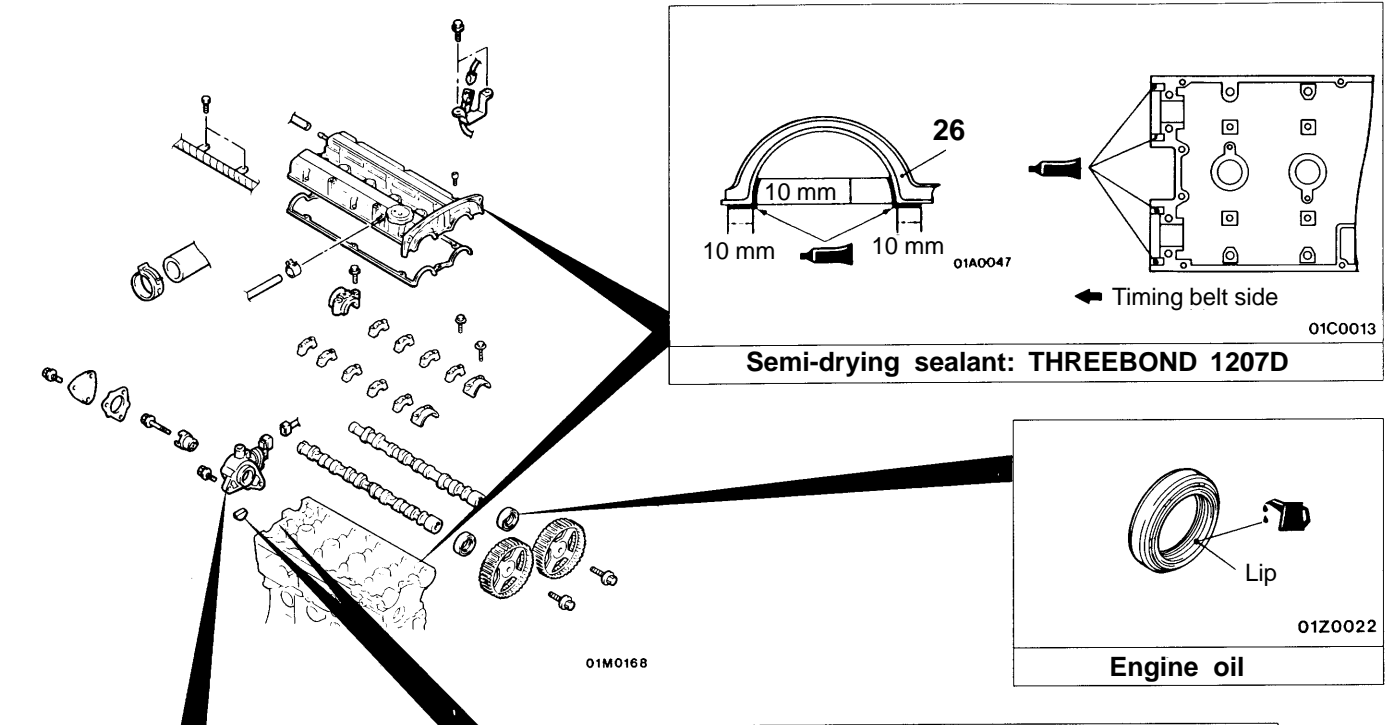
Unit: Nm {kgf·m}

**Removal steps**

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>1. Breather hose connection</li> <li>2. PCV hose connection</li> <li>3. Crank angle sensor bracket connection</li> <li>4. Control harness connection</li> <li>5. Rocker cover</li> <li>6. Radiator upper hose connection</li> <li>7. Cover</li> <li>8. Cam position sensing cylinder</li> </ul> | <ul style="list-style-type: none"> <li>9. Cam position sensor support</li> <li>10. Semi-circular packing</li> <li>11. Camshaft sprocket</li> <li>12. Camshaft oil seal</li> <li>13. Front cam cap</li> <li>14. Rear cam cap</li> <li>15. Cam cap</li> <li>16. Camshaft (exhaust side)</li> <li>17. Camshaft (intake side)</li> </ul> |
|--|--|

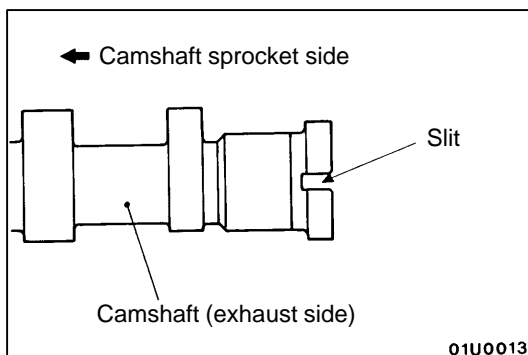


Grease and adhesive application points



**REMOVAL SERVICE POINT**

◀A▶ **CAMSHAFT SPROCKET REMOVAL**



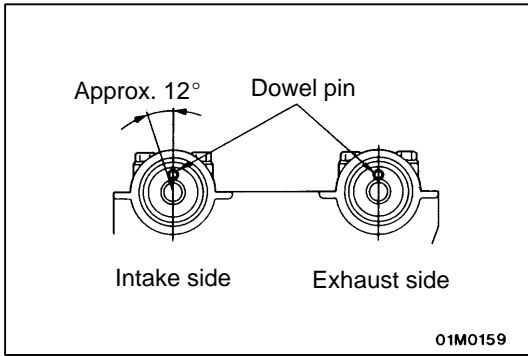
**INSTALLATION SERVICE POINTS**

▶A◀ **CAMSHAFT INSTALLATION**

- (1) Apply engine oil to the cams and journals of the camshaft.
- (2) Mount the camshaft on the cylinder head.

**Caution**

Make sure that the camshaft has a unique orientation for installation, the intake side and exhaust side. The exhaust camshaft has a slit in the rear end face.

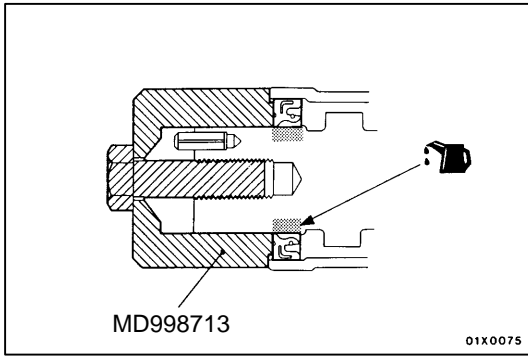


**►B◄ CAM CAP / REAR CAP / FRONT CAM CAP INSTALLATION**

(1) Locate the camshaft dowel pins as illustrated.

(2) Temporarily tighten cam cap in two to three steps, then torque it to specification.

**Tightening torque: 20 Nm {2.0 kgf·m}**



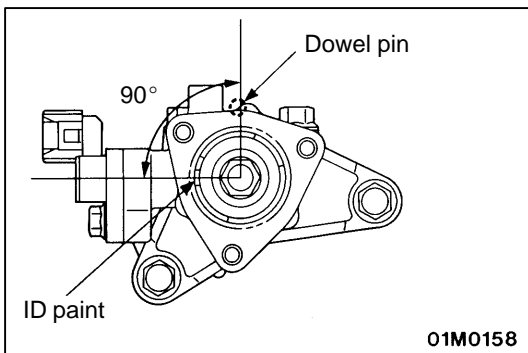
**►C◄ CAMSHAFT OIL SEAL INSTALLATION**

- (1) Apply engine oil to the entire periphery of the oil seal lip.
- (2) Pressfit the oil seal as shown.

**►D◄ CAMSHAFT SPROCKET INSTALLATION**

As you did during removal, secure the camshaft sprocket with the special tool and tighten bolt to specification.

**Tightening torque: 88 Nm {9.0 kgf·m}**



**►E◄ CAM POSITION SENSING CYLINDER**

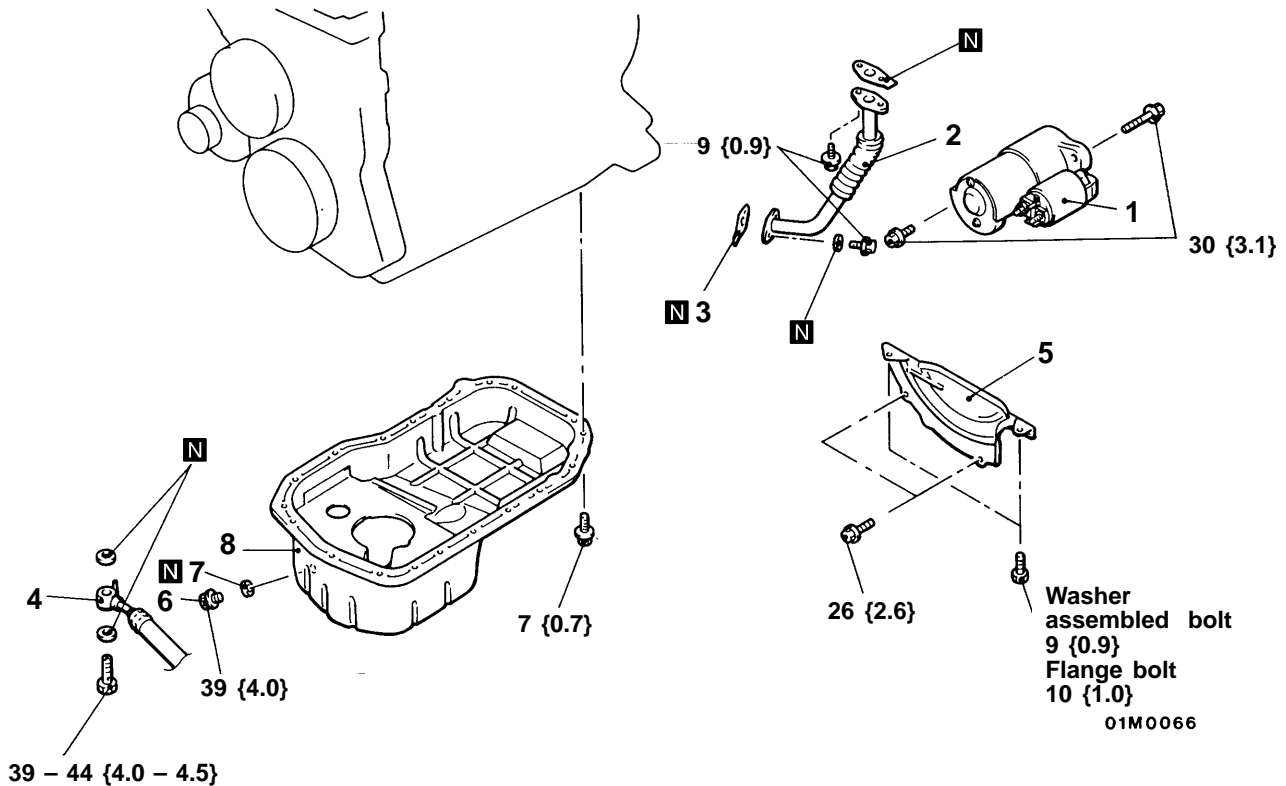
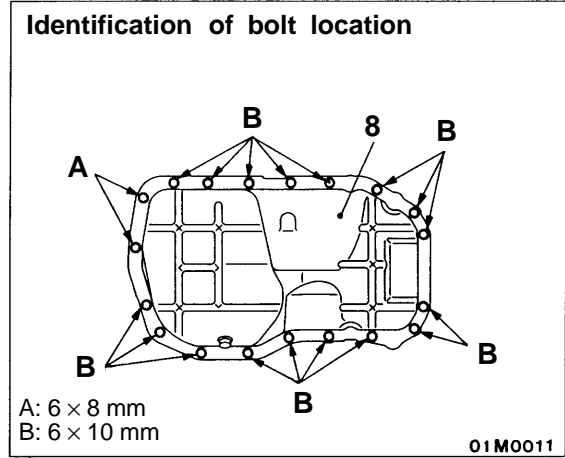
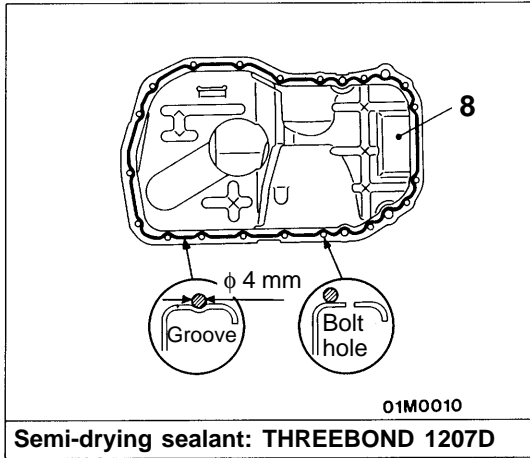
Install the cam position sensing cylinder so that the ID paint on the cam position sensing cylinder is 90° with respect to the camshaft dowel pin as shown.

# OIL PAN

## REMOVAL AND INSTALLATION

### Pre-removal and Post-installation Operation

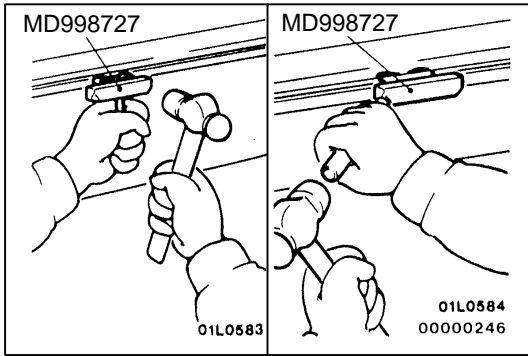
- (1) Under Cover Removal and Installation
- (2) Front Exhaust Pipe Removal and Installation
- (3) Oil Level Gauge Removal and Installation
- (4) Engine Oil Draining and Supplying (Refer to GROUP 15.)



Unit: Nm {kgf · m}

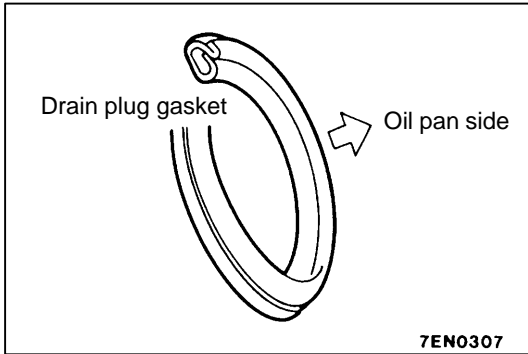
### Removal steps

- 1. Starter
- 2. Oil return pipe
- 3. Oil return pipe gasket
- 4. Engine oil cooler return pipe
- 5. Bell housing cover
- 6. Drain plug
- 7. Drain plug gasket
- 8. Oil pan



**REMOVAL SERVICE POINT**

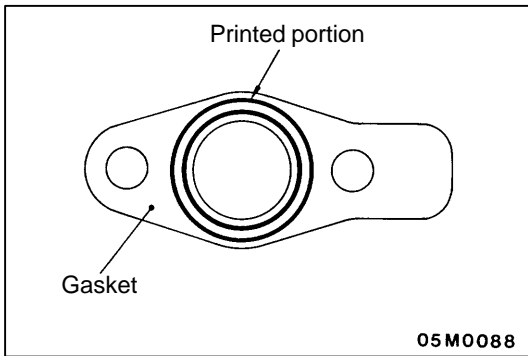
**◀A▶ OIL PAN REMOVAL**



**INSTALLATION SERVICE POINTS**

**▶A◀ DRAIN PLUG GASKET INSTALLATION**

Install the drain plug gasket in the direction so that it faces as shown in the illustration.

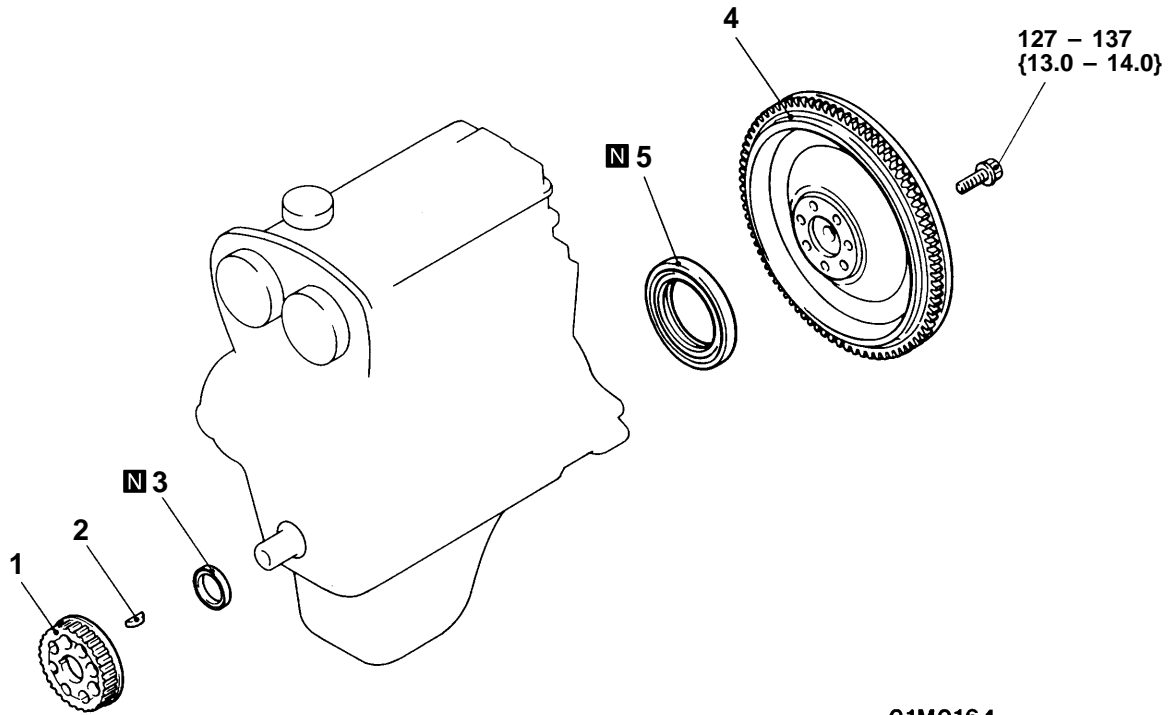


**▶B◀ OIL RETURN PIPE GASKET INSTALLATION**

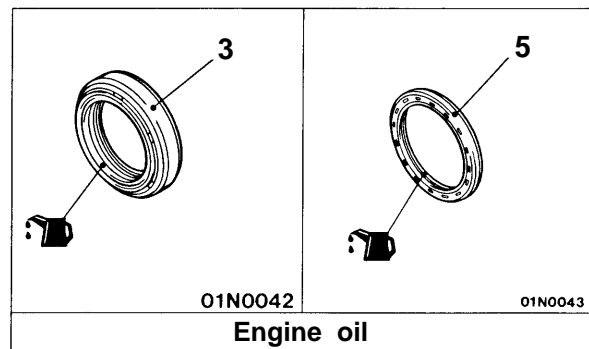
Install the gasket with the printed portion toward the oil pan.

# CRANKSHAFT OIL SEAL

## REMOVAL AND INSTALLATION



01M0164



Engine oil

Unit: Nm {kgf·m}

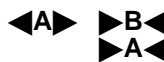
### Crankshaft front oil seal removal steps

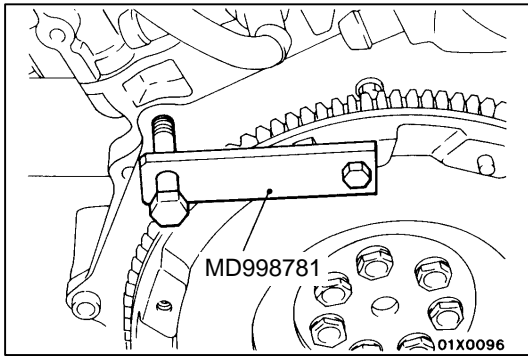
- Timing belt and timing belt B (Refer to P.11-21.)
  - Crank angle sensor (Refer to GROUP 16.)
1. Crankshaft sprocket B
  2. Key
  3. Crankshaft front oil seal



### Crankshaft rear oil seal removal steps

- Transmission assembly
  - Clutch cover and disc
4. Flywheel
  5. Crankshaft rear oil seal

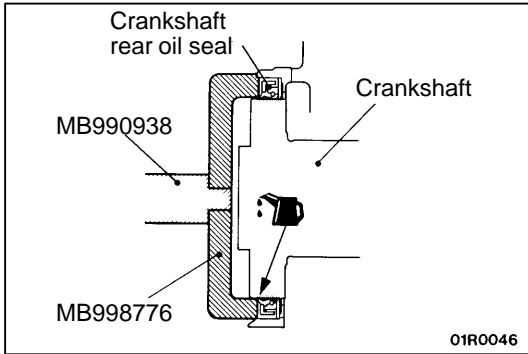




**REMOVAL SERVICE POINT**

**◀A▶ FLYWHEEL ASSEMBLY REMOVAL**

Use the special tool to secure the flywheel assembly and remove the bolts.



**INSTALLATION SERVICE POINTS**

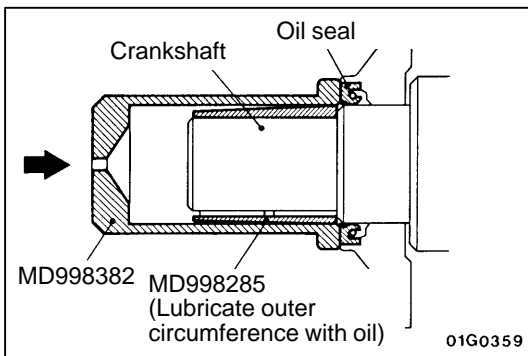
**▶A◀ CRANKSHAFT REAR OIL SEAL INSTALLATION**

- (1) Apply a small amount of engine oil to the entire circumference of the oil seal lip.
- (2) Install the oil seal with the special tool as far as the chamfered position of the oil seal case as shown in the illustration.

**▶B◀ FLYWHEEL ASSEMBLY INSTALLATION**

Use the special tool to hold the flywheel in the same manner as removal, and install the bolt. Tighten the bolts to the specification.

**Tightening torque: 127 – 137 Nm {13.0 – 14.0 kgf·m}**



**▶C◀ CRANKSHAFT FRONT OIL SEAL INSTALLATION**

Apply a small amount of engine oil to the entire circumference of the oil seal lip. Pressfit the oil seal until it is flush with the chamfered end of the oil pump case.

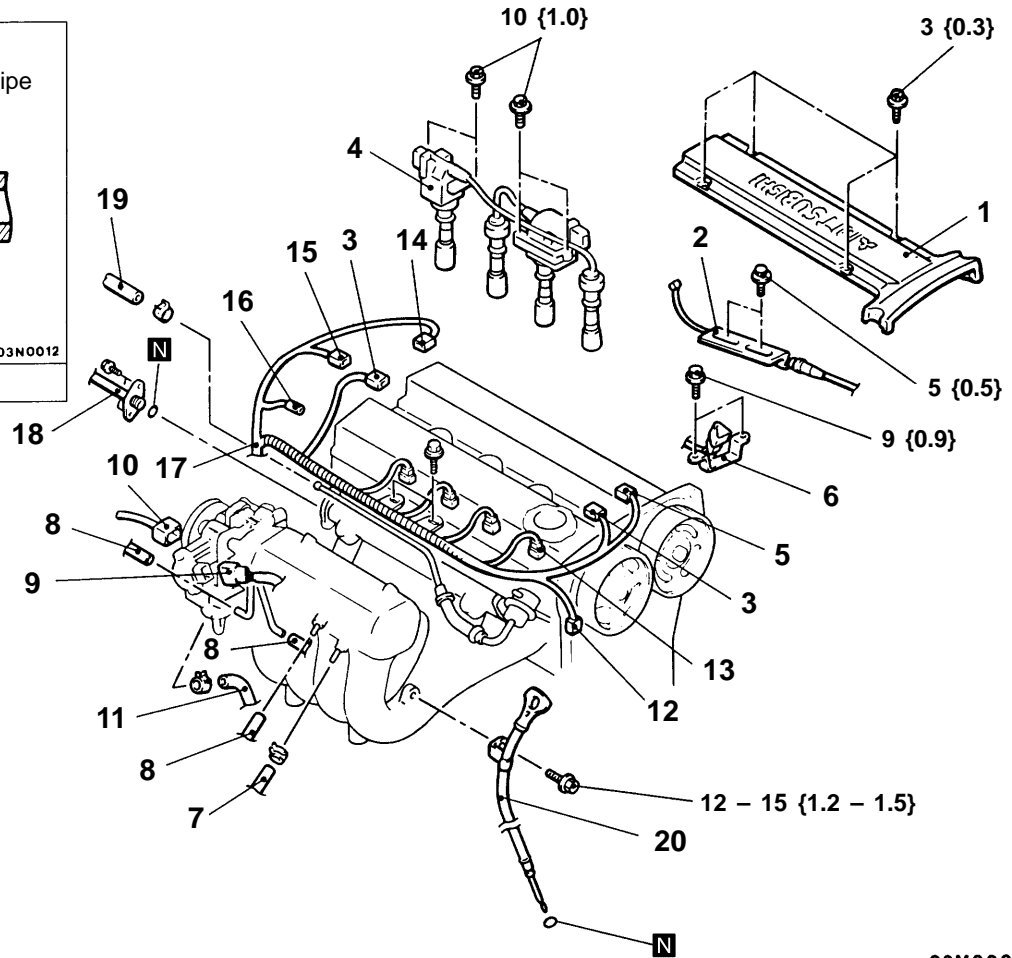
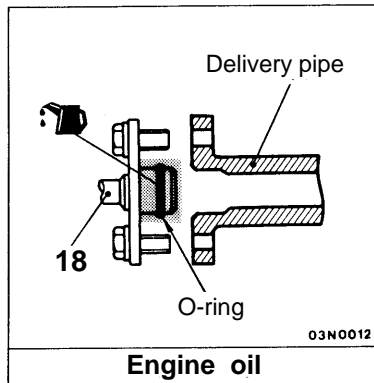


**CYLINDER HEAD GASKET****REMOVAL AND INSTALLATION****Pre-removal Operation**

- (1) Fuel Discharge Prevention
- (2) Engine Oil Removal
- (3) Strut Tower Bar Removal
- (4) Timing Belt Removal (Refer to P.11-21.)
- (5) Thermostat Case Assembly Removal  
(Refer to GROUP 14 – Water Hose Pipe.)
- (6) Front Exhaust Pipe Removal (Refer to GROUP 15.)

**Post-installation Operation**

- (1) Front Exhaust Pipe Installation  
(Refer to GROUP 15.)
- (2) Thermostat Case Assembly Installation  
(Refer to GROUP 14 – Water Hose Pipe.)
- (3) Engine Oil Filling
- (4) Timing Belt Installation (Refer to P.11-21.)
- (5) Strut Tower Bar Installation
- (6) Accelerator Cable Adjustment



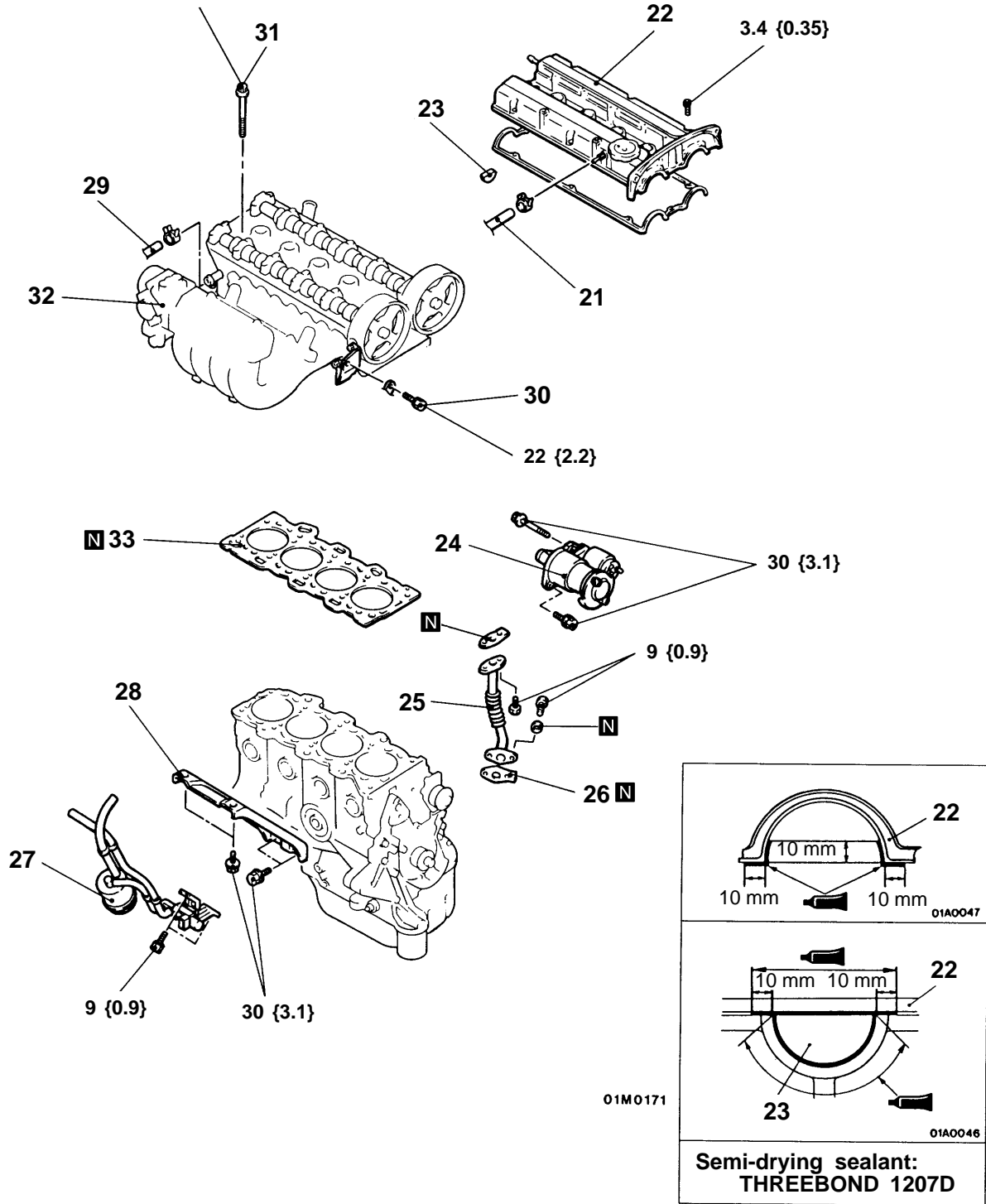
02M0009

Unit: Nm {kgf · m}

**Removal steps**

- |  |   |
|--|---|
| <ol style="list-style-type: none"> <li>1. Center cover</li> <li>2. Accelerator cable connection</li> <li>3. Ignition coil connector</li> <li>4. Ignition coil</li> <li>5. Crank angle sensor connector</li> <li>6. Crank angle sensor bracket connection</li> <li>7. Brake booster vacuum hose connection</li> <li>8. Vacuum hose connection</li> <li>9. TPS connector</li> <li>10. ISC motor connector</li> </ol> | <ol style="list-style-type: none"> <li>11. Water hose connection</li> <li>12. Oxygen sensor connector</li> <li>13. Injector connector</li> <li>14. Cam position sensor connector</li> <li>15. Coolant temperature sensor connector</li> <li>16. Water temperature gauge unit connector</li> <li>17. Control harness</li> <li>18. Fuel pipe pressure hose connection</li> <li>19. Fuel return hose connection</li> <li>20. Oil level gauge guide assembly</li> </ol> |
|--|---|

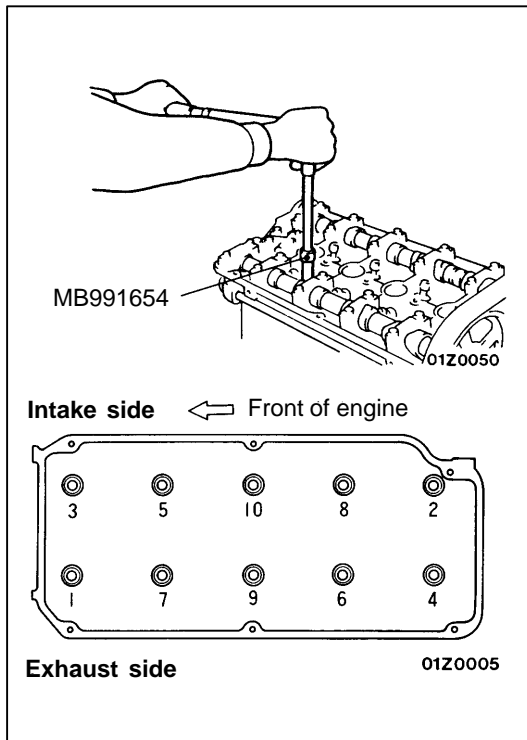
78 → 0 → 20 → +90° → +90°  
 {8.0 → 0 → 2.0 → +90° → +90°}



Unit: Nm {kgf·m}

**Removal steps**

- 21. PCV hose connection
- 22. Rocker cover
- 23. Semi-circular packing
- 24. Starter
- 25. Oil return pipe
- ▶C◀ 26. Oil return pipe gasket
- 27. Vacuum tank/solenoid valve/vacuum hose assembly
- 28. Intake manifold stay
- 29. Heater hose connection
- 30. Alternator brace stay mounting bolt
- ▶A▶▶B◀ 31. Cylinder head bolt
- ▶A◀ 32. Cylinder head assembly
- ▶A◀ 33. Cylinder head gasket



## REMOVAL SERVICE POINT

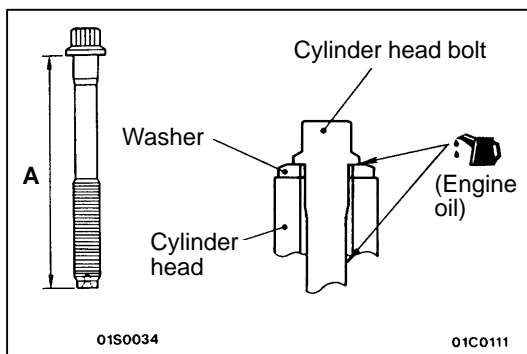
### ◀A▶ CYLINDER HEAD BOLT REMOVAL

Loosen the bolts in 2 or 3 steps in order of the numbers shown in the illustration, and remove the cylinder head assembly.

## INSTALLATION SERVICE POINTS

### ▶A▶ CYLINDER HEAD GASKET INSTALLATION

- (1) Wipe off all oil and grease from the gasket mounting surface.
- (2) Install so that the shapes of the cylinder head holes match the shapes of the respective cylinder head gasket holes.

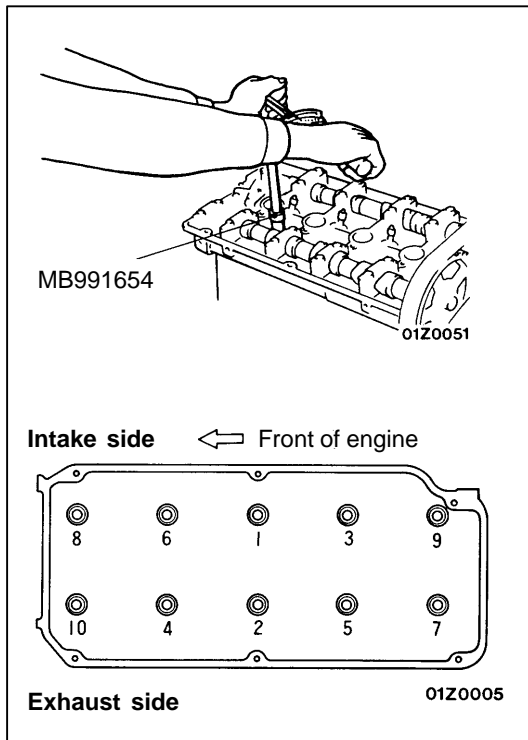


### ▶B▶ CYLINDER HEAD BOLT INSTALLATION

- (1) When installing the cylinder head bolts, the length below the head of the bolts should be within the limit. If it is outside the limit, replace the bolts.

**Limit (A): 99.4 mm**

- (2) Apply a small amount of engine oil to the thread section and the washer of the cylinder head bolt.

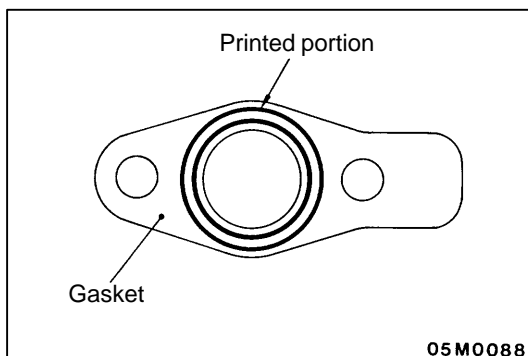
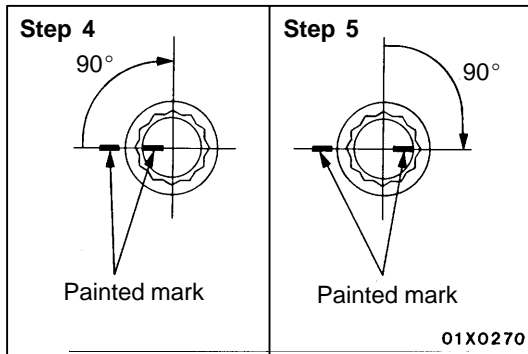


(3) Tighten the bolts by the following procedure.

Step	Operation
1	Tighten to 78 Nm {8.0 kgf·m} in the order shown in the illustration.
2	Fully loosen in the reverse order of that shown in the illustration.
3	Tighten to 20 Nm {2.0 kgf·m} in the order shown in the illustration.
4	Mark the head of the cylinder head bolt and cylinder head by paint, then tighten 90° of a turn in the order shown in the illustration.
5	Tighten 90° of a turn in the order shown in the illustration. Check that the painted mark of the head bolt is lined up with that of the cylinder head.

**Caution**

- (1) Always make a tightening angle just 90°. If it is less than 90°, the head bolt will be loosened.
- (2) If it is more than 90°, remove the head bolt and repeat the procedure from step 1.



**▶◀ OIL RETURN PIPE GASKET INSTALLATION**

Install the gasket with the printed portion toward the oil pan.

**▶◀ HIGH-PRESSURE FUEL HOSE INSTALLATION**

- (1) Apply a small amount of new engine oil to the O-ring, then fit the O-ring in the delivery pipe.

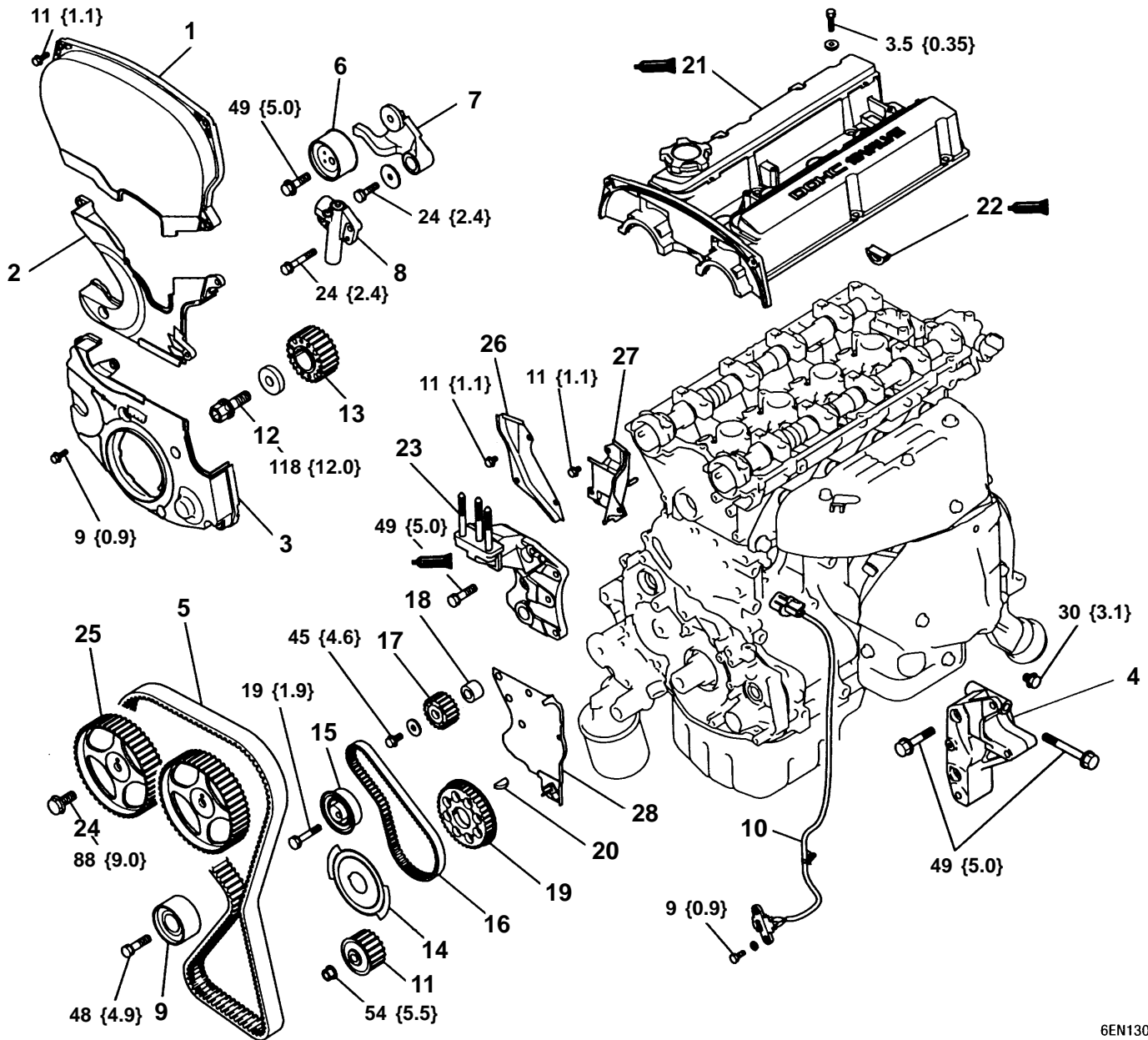
**Caution**

**Do not let any engine oil get into the delivery pipe.**

- (2) Check that the high pressure hose turns smoothly. If the hose does not turn smoothly, the O-ring is probably being clamped. Disconnect the high-pressure fuel hose and check the O-ring for damage. After this, re-install the hose to the delivery pipe and check that the hose turns smoothly.
- (3) Tighten the mounting bolts to the specification.

# TIMING BELT

## REMOVAL AND INSTALLATION

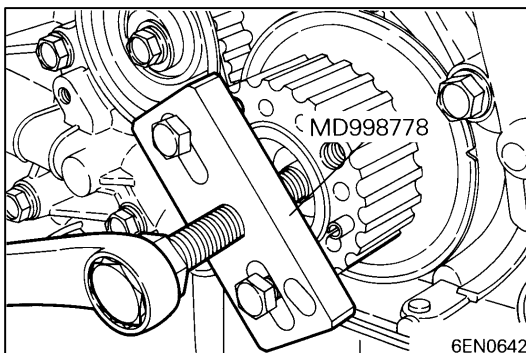
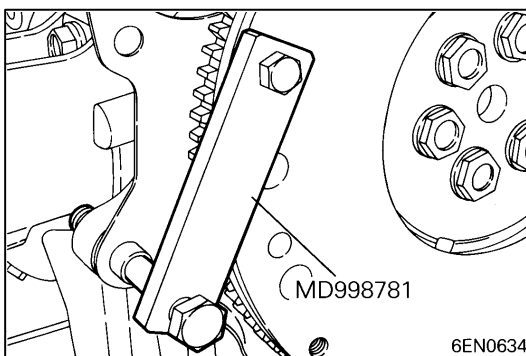
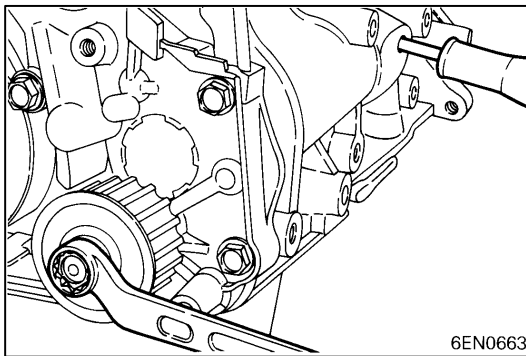
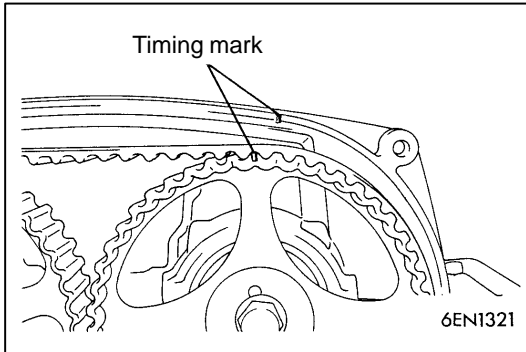
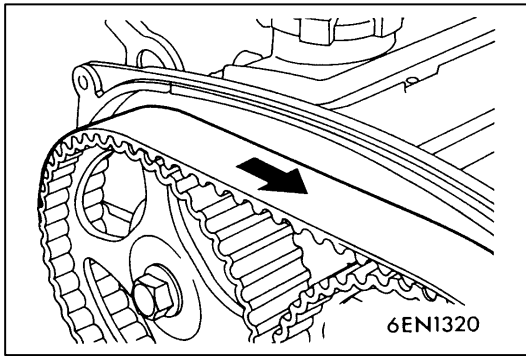


6EN1301

Unit: Nm {kgf·m}

### Removal steps

- |                                |                                       |
|--------------------------------|---------------------------------------|
| 1. Front upper cover           | 15. Tensioner B                       |
| 2. Front center cover          | 16. Timing belt B                     |
| 3. Front lower cover           | 17. Counterbalance shaft sprocket     |
| 4. Bracket                     | 18. Spacer                            |
| 5. Timing belt                 | 19. Crankshaft sprocket B             |
| 6. Tensioner pulley            | 20. Crankshaft key                    |
| 7. Tensioner arm               | 21. Rocker cover                      |
| 8. Auto tensioner              | 22. Semi-circular packing             |
| 9. Idle pulley                 | 23. Engine support bracket            |
| 10. Crankshaft position sensor | 24. Camshaft sprocket bolt            |
| 11. Oil pump sprocket          | 25. Camshaft sprocket                 |
| 12. Crankshaft bolt            | 26. Timing belt rear right cover      |
| 13. Crankshaft sprocket        | 27. Timing belt rear left upper cover |
| 14. Sensing blade              | 28. Timing belt rear left lower cover |



## REMOVAL SERVICE POINTS

### ◀A▶ TIMING BELT REMOVAL

- (1) If the timing belt is to be reused, chalk an arrow mark on the back surface of the belt so that the belt can be reinstalled in the same direction.
- (2) Place the exhaust camshaft sprocket in a position where the timing mark for No. 1 cylinder is positioned about one tooth before the top dead center of the compression stroke.

#### Caution

The camshaft sprocket on the exhaust side can turn very easily because of the valve spring tension. Use care not to allow your fingers to get caught by the sprocket.

- (3) Loosen the lock nut of the tensioner pulley, then remove the timing belt.

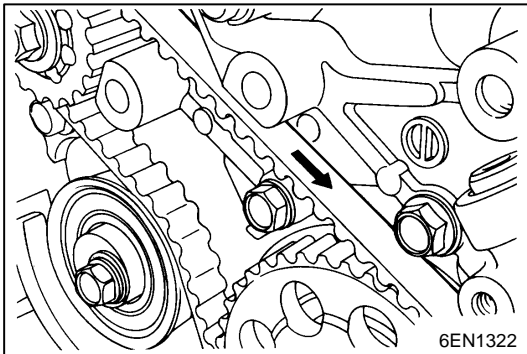
### ◀B▶ OIL PUMP SPROCKET REMOVAL

- (1) Remove the plug on the left side of cylinder block.
- (2) Insert a screwdriver (shank diameter 8 mm) to block the counterbalance shaft.
- (3) Loosen the flange bolt.
- (4) Remove the oil pump sprocket.

### ◀C▶ CRANKSHAFT BOLT LOOSENING

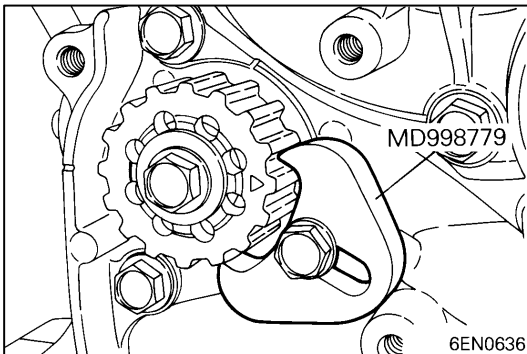
### ◀D▶ CRANKSHAFT SPROCKET REMOVAL

If it is difficult to remove the sprocket, use the special tool.

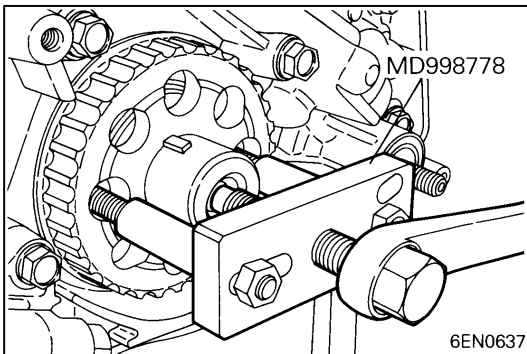


### ◀E▶ TIMING BELT “B” REMOVAL

Make an arrow mark on the back of the timing belt indicating the direction of rotation so it may be reassembled in the same direction if it is to be reused.

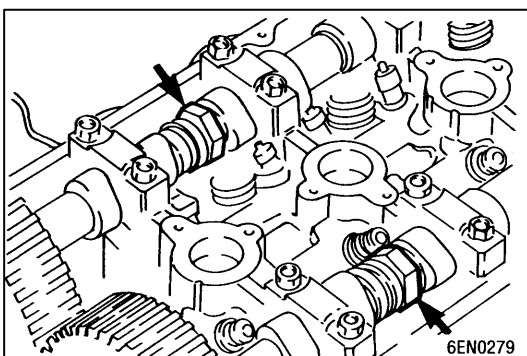


### ◀F▶ COUNTERBALANCE SHAFT SPROCKET REMOVAL



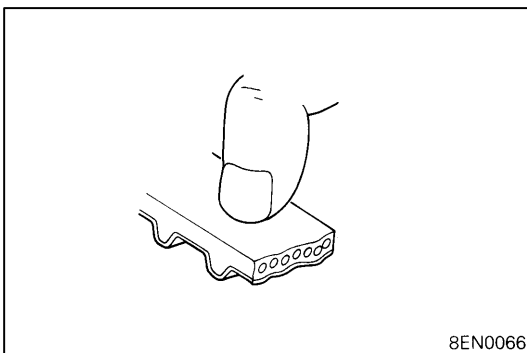
### ◀G▶ CRANKSHAFT SPROCKET “B” REMOVAL

If it is difficult to remove the sprocket, use the special tool.



### ◀H▶ CAMSHAFT SPROCKET BOLT LOOSENING

Use a wrench to hold the hexagonal part of the camshaft, and then remove the camshaft sprocket mounting bolt.

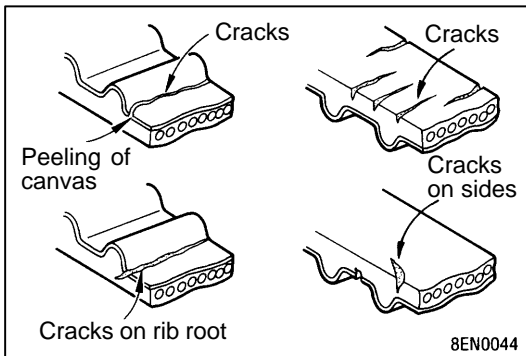


## INSPECTION

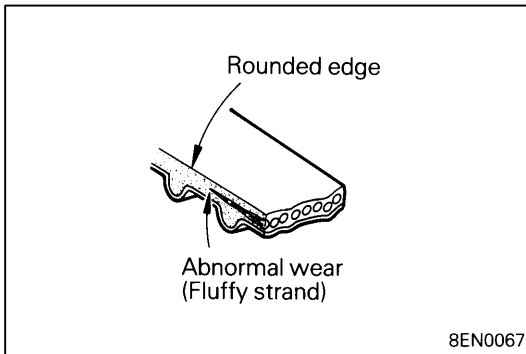
### TIMING BELT

Replace belt if any of the following conditions exist.

- (1) Hardening of back rubber.  
Back side is glossy without resilience and leaves no indent when pressed with fingernail.



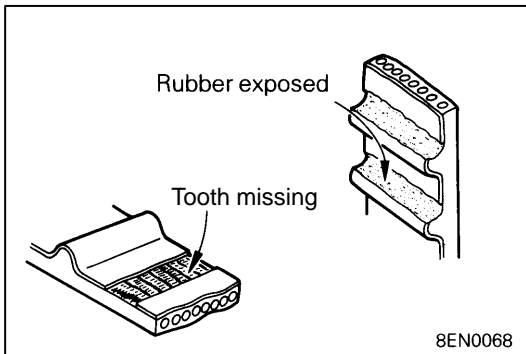
- (2) Cracks on rubber back.
- (3) Cracks of canvas.
- (4) Cracks on rib root.
- (5) Cracks on belt sides.



- (6) Abnormal wear of belt sides.

**NOTE**

The sides are normal if they are sharp as if cut by a knife.



- (7) Abnormal wear on teeth.

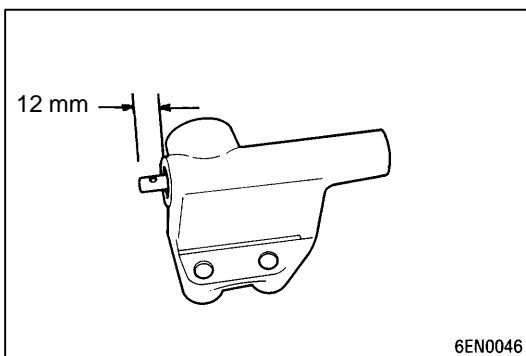
Initial stage:

Canvas on load side tooth flank worn (Fluffy canvas fibers, rubber gone and color changed to white, and unclear canvas texture)

Final stage:

Canvas on load side tooth flank worn down and rubber exposed (tooth width reduced)

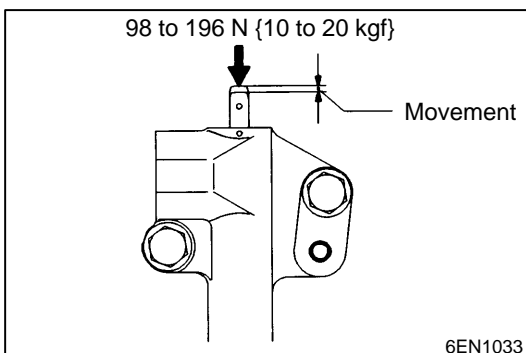
- (8) Missing tooth.



**AUTO TENSIONER**

- (1) Check the auto tensioner for possible leaks and replace as necessary.
- (2) Check the rod end for wear or damage and replace as necessary.
- (3) Measure the rod protrusion. If it is out of specification, replace the auto tensioner.

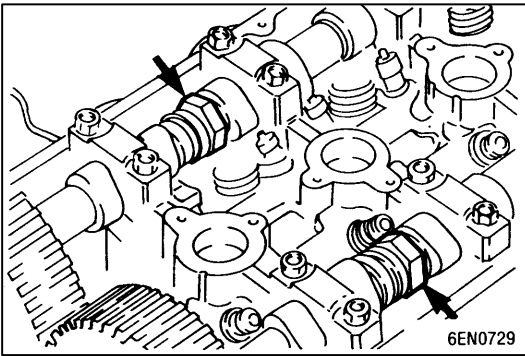
**Standard value: 12 mm**



- (4) Press the rod with a force of 98 – 196 N {10 – 20 kgf} and measure its protrusion. If it is out of specification, replace the auto tensioner.

**Standard value: 1 mm or less**

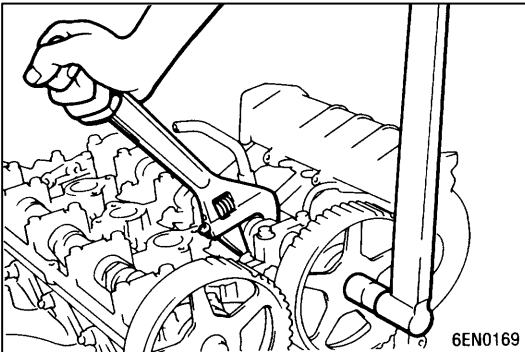


**INSTALLATION SERVICE POINTS****▶A◀ CAMSHAFT SPROCKET BOLT TIGHTENING**

Using a wrench, hold the camshaft at its hexagon and tighten the bolt to the specification.

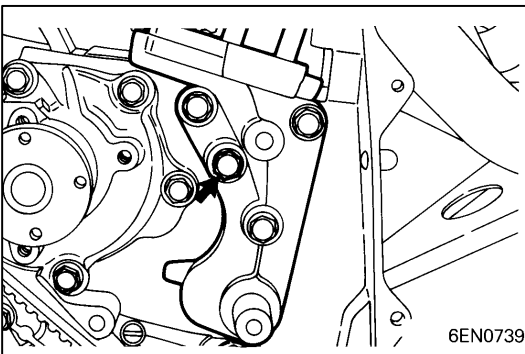
**Caution**

Locking the camshaft sprocket with a tool damages the sprocket.

**▶B◀ ENGINE SUPPORT BRACKET LEFT INSTALLATION**

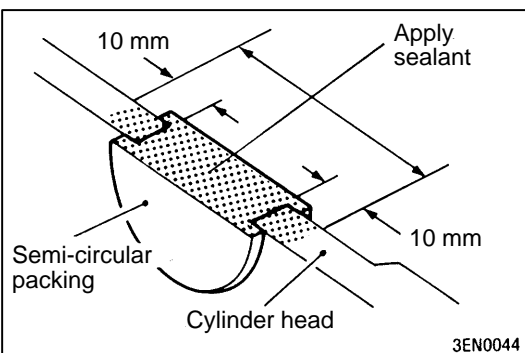
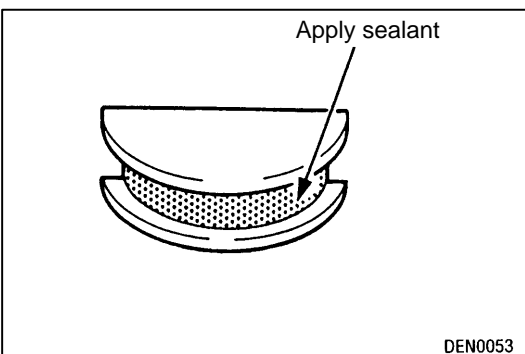
Coat the bolts illustrated with sealant before tightening.

**Specified sealant: THREEBOND 1207F or equivalent**

**▶C◀ SEALANT APPLICATION ON SEMI-CIRCULAR PACKING**

Apply sealant to the areas indicated in the illustration.

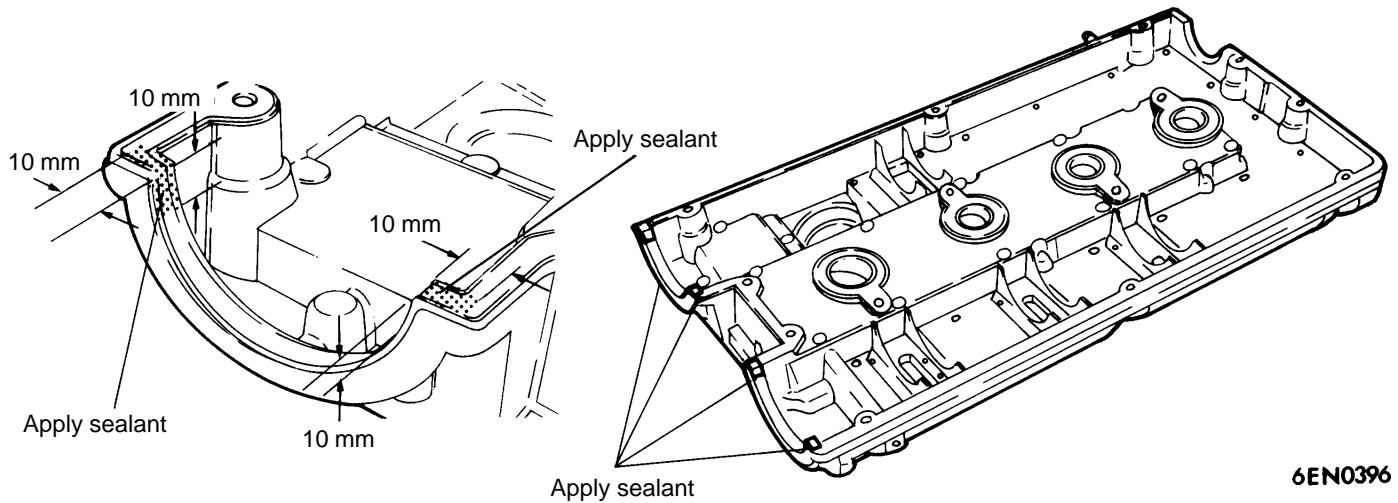
**Specified sealant: THREEBOND 1212D or equivalent**



**►D◄ SEALANT APPLICATION ON ROCKER COVER**

Apply sealant to the areas indicated in the illustration.

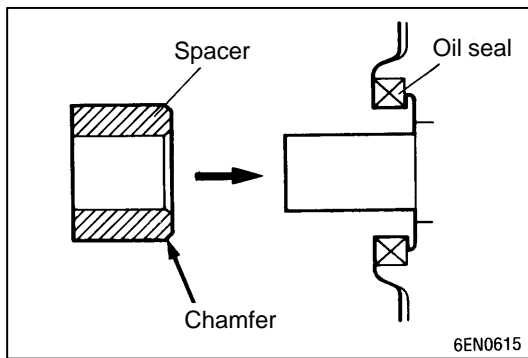
**Specified sealant: THREEBOND 1212D or equivalent**



6EN0396

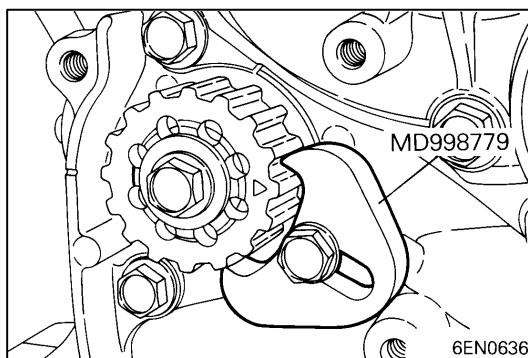
**►E◄ SPACER INSTALLATION**

- (1) Apply very thin coat of oil to the outer periphery of the spacer (oil seal contacting surface).
- (2) Install the spacer with the chamfered end toward the oil seal. Mounting in the reverse direction can damage the oil seal lip.



6EN0615

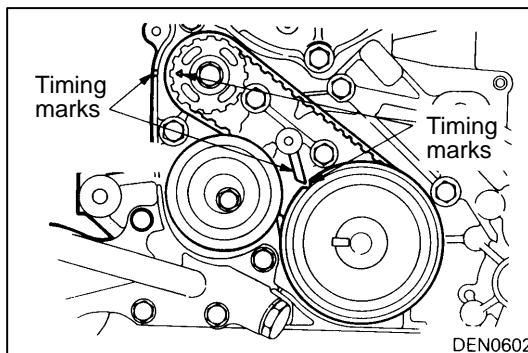
**►F◄ COUNTERBALANCE SHAFT SPROCKET INSTALLATION**



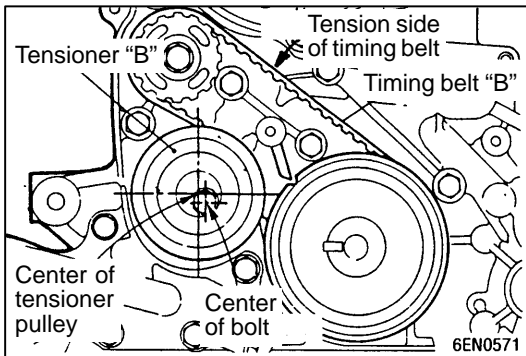
6EN0636

**►G◄ TIMING BELT “B” INSTALLATION**

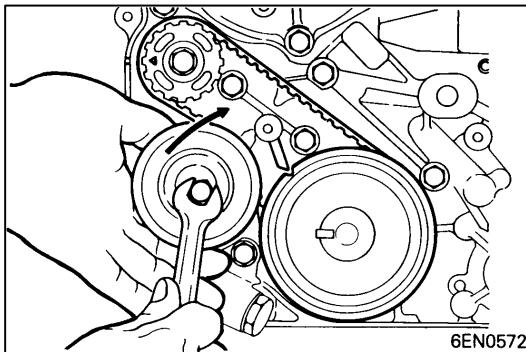
- (1) Align timing marks on the crankshaft sprocket “B” and counterbalance shaft sprocket with the marks on the front case respectively.
- (2) Install the timing belt “B” on the crankshaft sprocket “B” and counterbalance shaft sprocket. There should be no slack on the tension side.



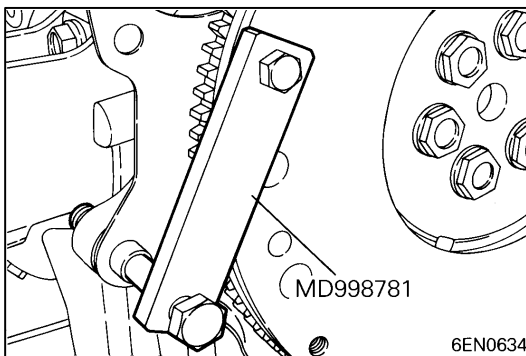
DEN0602



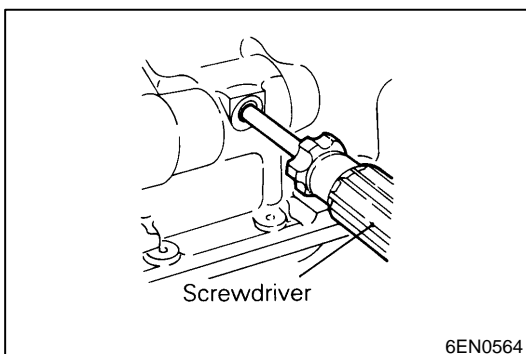
- (3) Make sure that the relationship between the tensioner pulley center and the bolt center is as shown in the illustration.



- (4) Move the tensioner "B" in the direction of arrow while lifting with a finger to give a sufficient tension to the tension side of timing belt. In this condition, tighten bolt to secure tensioner "B". When the bolt is tightened, use care to prevent shaft from turning together. If shaft is turned together, belt will be overtensioned.

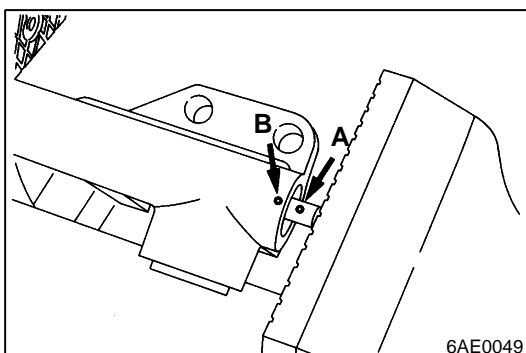


#### ►H◄ CRANKSHAFT BOLT TIGHTENING



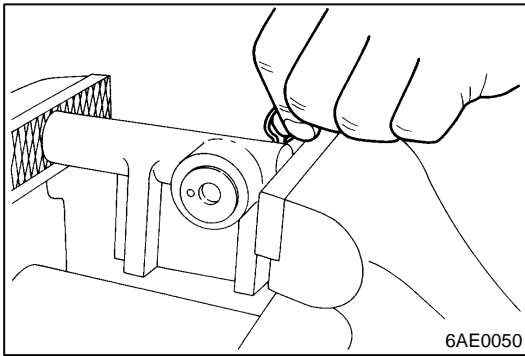
#### ►I◄ OIL PUMP SPROCKET INSTALLATION

- (1) Block the counterbalance shaft in the same way as at the disassembly to prevent it from turning.
- (2) Install the oil pump sprocket.
- (3) Apply a proper amount of engine oil to the bearing surfaces of the flange nuts.
- (4) Tighten the flange nuts to the specified torque.

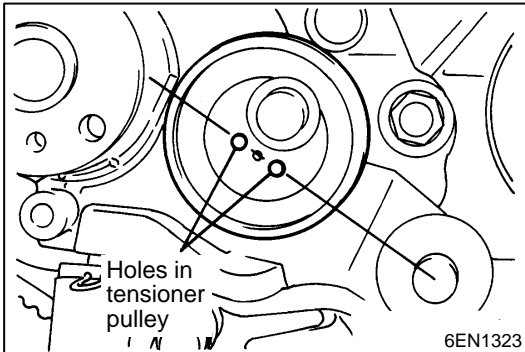


#### ►J◄ AUTO TENSIONER INSTALLATION

- (1) If the auto tensioner rod is in its fully extended position, reset it as follows.
  - a. Clamp the auto-tensioner in the vise with soft jaws.
  - b. Push in the rod little by little with the vise until the set hole A in the rod is aligned with the hole B in the cylinder.

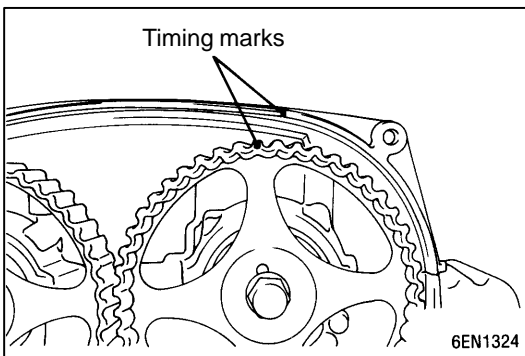


- c. Insert a wire (1.4 mm in diameter) into the set holes.
  - d. Unclamp the auto tensioner from the vise.
- (2) Install the auto tensioner. Leave the wire installed in the auto tensioner until the timing belt is installed.



### ►K◄ TENSIONER PULLEY INSTALLATION

Install the tensioner pulley as shown in the illustration.

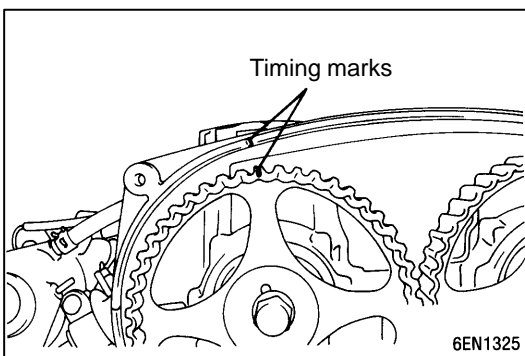


### ►L◄ TIMING BELT INSTALLATION

- (1) Place the exhaust side camshaft sprocket in a position where its timing mark is one tooth offset from the timing mark on the rocker cover in the counterclockwise direction.

#### NOTE

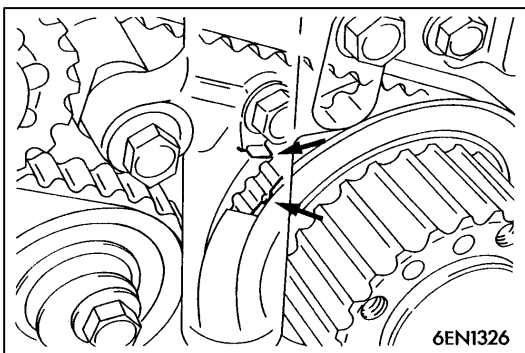
Even if the timing marks on the sprocket and the rocker cover are brought into alignment, the exhaust camshaft is forced back by the valve spring tension. It is stabilized at a position one tooth before the timing mark.



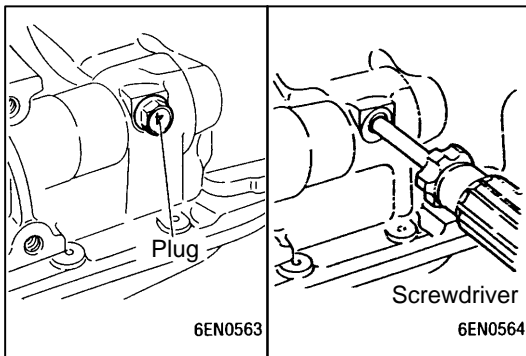
- (2) Align the timing mark on the intake side camshaft sprocket with that on the rocker cover.

#### NOTE

Even if the timing marks on the sprocket and the cover are brought into alignment, the intake camshaft is forced to turn one tooth in the clockwise direction by the valve spring tension and stabilized there.

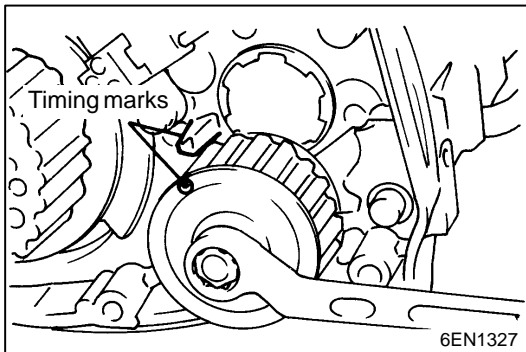


- (3) Place the timing mark on the crankshaft sprocket one tooth this side from the mated timing mark as in the case of the camshaft sprocket.

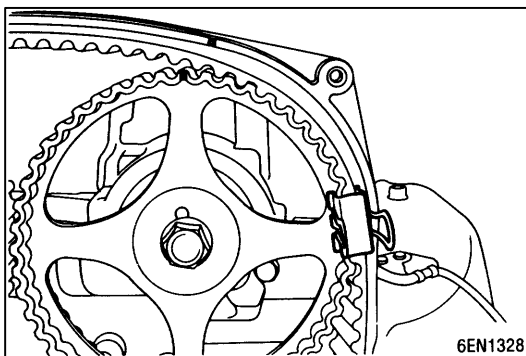


- (4) Align the timing mark on the oil pump sprocket with its mating mark.
- (5) Remove the plug on the left side of the cylinder block and insert a Phillips screwdriver (shank diameter 8 mm) through the hole.

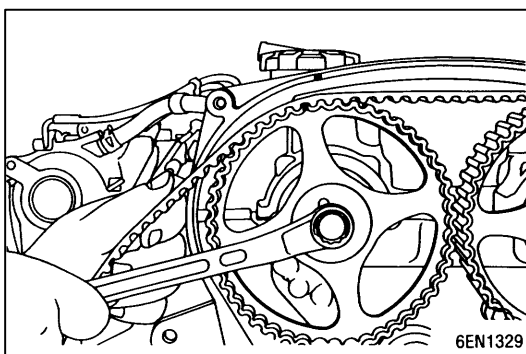
If it can be inserted as deep as 60 mm or more, the timing marks are correctly aligned. If the inserted depth is only 20 – 25 mm, turn the oil pump sprocket one turn and realign timing marks. Then check to ensure that the screwdriver can be inserted 60 mm or more.



- (6) Remove the Phillips screwdriver. Place the oil pump sprocket in a position where its timing mark is one tooth offset from the mated timing mark in the counterclockwise direction.



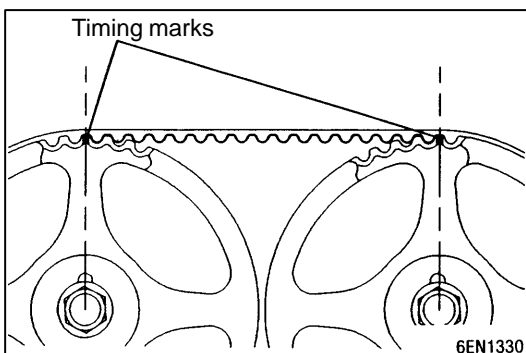
- (7) Fit the timing belt over the exhaust side camshaft sprocket, and secure it at the illustrated position using a paper clip.



- (8) Turn the intake side camshaft sprocket as shown to a position where its timing mark is one tooth offset from the mated timing mark in the counterclockwise direction. Then, fit the timing belt over the sprocket and secure it with a paper clip.

#### NOTE

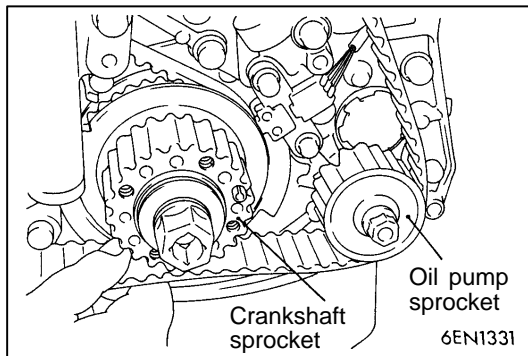
The intake camshaft will be turned a little clockwise by the valve spring tension and stabilized in position even if the belt is clipped at one tooth offset position.



- (9) Check to ensure that the timing marks on the intake camshaft sprocket side are in alignment when the exhaust camshaft sprocket is turned clockwise to align the timing marks.

#### NOTE

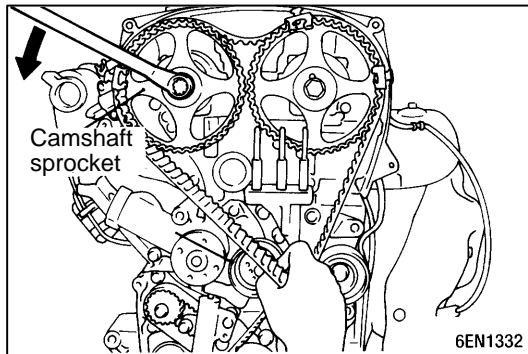
The timing belt span between the intake and exhaust sprockets will have 17 cogs.



- (10) Fit the timing belt over the idler pulley, oil pump sprocket and crankshaft sprocket in this order.

## NOTE

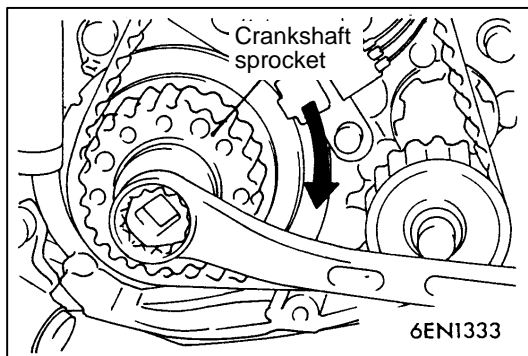
Be careful that the belt does not become slack.



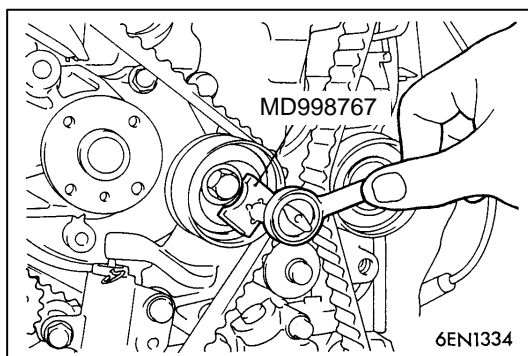
- (11) Fit the timing belt over the tensioner pulley.

## NOTE

When fitting the timing belt over the tensioner pulley, turn the intake side camshaft sprocket a little counterclockwise, as this will facilitate the work.



- (12) Turn the crankshaft pulley a little in the illustrated direction to pull up the timing belt at the idler pulley side.
- (13) Check to ensure that the timing marks on the crankshaft sprocket, oil pump sprocket and exhaust camshaft sprocket are all offset one tooth from the corresponding timing marks in the counterclockwise direction.

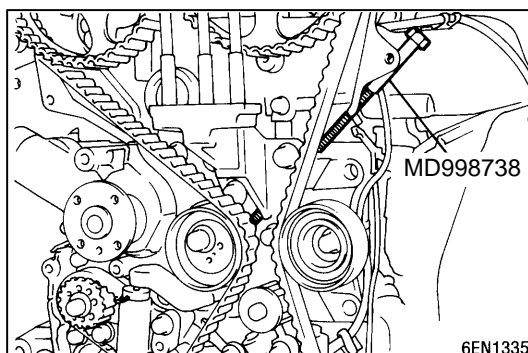


- (14) Using the special tool, turn the tensioner pulley in the illustrated direction to strain the timing belt. Then, secure the tensioner temporarily by tightening the retaining bolt lightly.

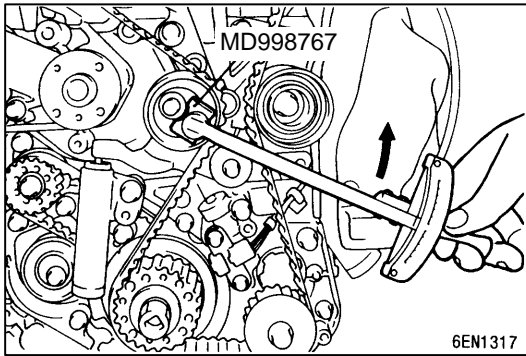
## NOTE

There must be no slack in the timing belt between the intake and exhaust camshafts.

- (15) Turn the crankshaft to align the timing mark with the mark for No. 1 cylinder top dead center in the compression stroke.



- (16) Set the special tool as shown and screw it in up to the position where the wire inserted in the auto-tensioner when installing it can be moved lightly.



(17) Loosen the retaining bolt of the tensioner pulley.

**Caution**

**Loosening the retaining bolt can cause the intake and exhaust camshafts to turn, resulting in slackened timing belt. Use care that the timing belt does not come off the sprockets at this time.**

(18) Pull up the slack of the timing belt by turning the tensioner in illustrated direction using the special tool and a torque wrench (0 – 5 Nm {0 – 0.5 kgf·m}).

(19) From this position, turn back the tensioner until the torque wrench reading becomes 3.5 Nm {0.36 kgf·m}, then secure it by tightening the retaining bolt.

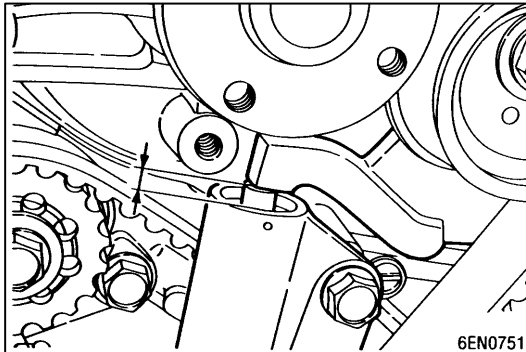
(20) Remove the special tool attached in step (16).

(21) Rotate the crankshaft clockwise 2 turns. Then, leave it intact 15 minutes.

(22) Check to see that the wire inserted when installing the auto-tensioner can be pulled out lightly. If it can be pulled out lightly, the timing belt is being tensioned properly. If so, remove the wire. In addition, check that the rod protrusion from the auto-tensioner meets the standard value, which is also an indication of properly tensioned timing belt.

**Standard value: 3.8 – 4.5 mm**

(23) If the wire cannot be removed with a light force, repeat steps (16) through (21) until the proper belt tensioner is obtained.



## ENGINE ASSEMBLY

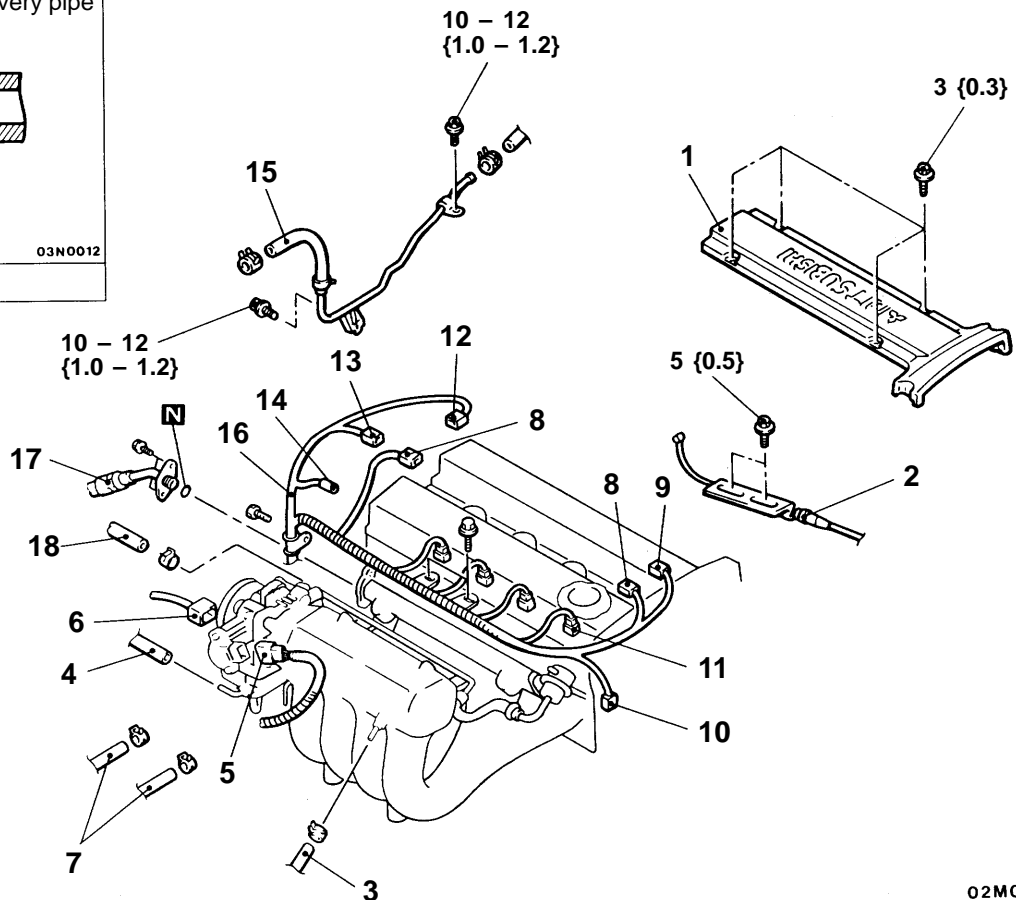
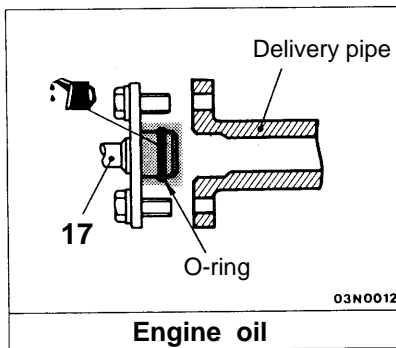
## REMOVAL AND INSTALLATION

**Pre-removal Operation**

- (1) Fuel Discharge Prevention
- (2) Hood Removal
- (3) Strut Tower Bar Removal
- (4) Air Hose C Removal  
(Refer to GROUP 15 – Intercooler.)
- (5) Radiator Assembly Removal (Refer to GROUP 14.)
- (6) Under Cover Removal
- (7) Front Exhaust Pipe Removal (Refer to GROUP 15.)

**Post-installation Operation**

- (1) Front Exhaust Pipe Installation  
(Refer to GROUP 15.)
- (2) Under Cover Installation
- (3) Radiator Assembly Installation  
(Refer to GROUP 14.)
- (4) Accelerator Cable Adjustment
- (5) Air Hose C Installation  
(Refer to GROUP 15 – Intercooler.)
- (6) Strut Tower Bar Installation
- (7) Hood Installation



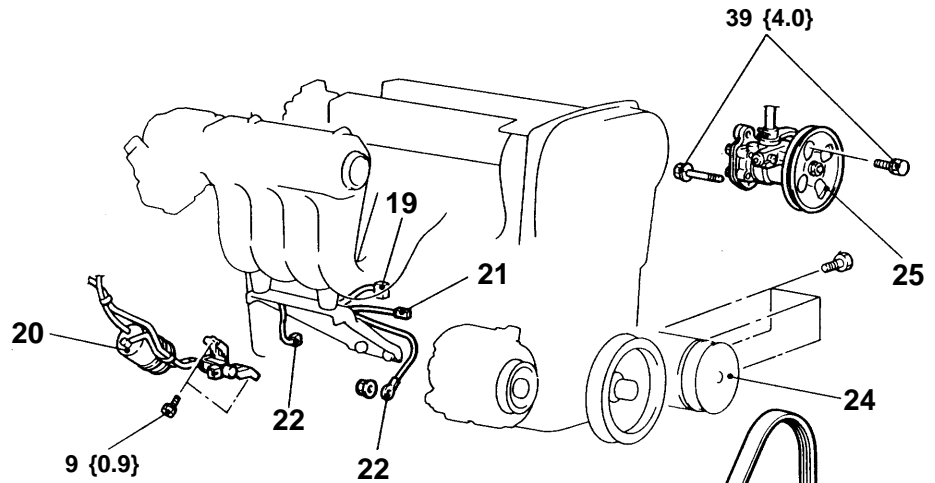
Unit: Nm {kgf·m}

**Removal steps**

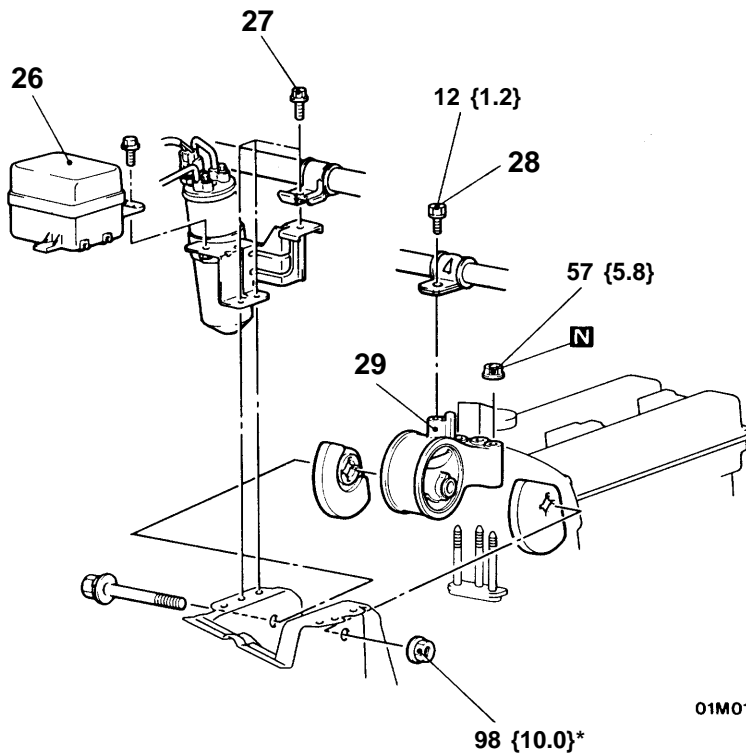
- |   |  |
|---|--|
| 1. Center cover                         | 11. Injector connector                       |
| 2. Accelerator cable                    | 12. Cam position sensor connector            |
| 3. Brake booster vacuum hose connection | 13. Coolant temperature sensor connector     |
| 4. Vacuum hose connection               | 14. Coolant temperature gauge unit connector |
| 5. Throttle position sensor connector   | 15. Vacuum pipe/hose assembly                |
| 6. Idle speed control motor connector   | 16. Control harness                          |
| 7. Heater hose connection               | 17. High-pressure fuel hose connection       |
| 8. Ignition coil connector              | 18. Fuel return hose connection              |
| 9. Crank angle sensor connector         |  |
| 10. Oxygen sensor connector             |  |







01M0167



01M0175

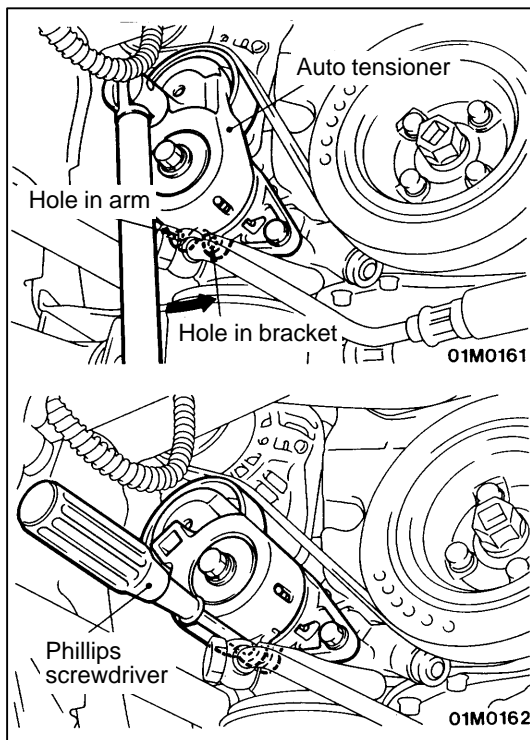
Unit: Nm {kgf · m}

- 19. Solenoid valve connector
- 20. Vacuum tank/solenoid valve/vacuum hose assembly
- 21. Oil pressure switch connector
- 22. Alternator connector
  - Drive belt tension inspection (Refer to P.11-4.)
- 23. Drive belt
- 24. A/C compressor
- 25. Power steering oil pump
  - Transmission assembly

- 26. A/C relay box
- 27. A/C receiver bracket mounting bolt
- 28. Oil pressure hose mounting bolt
- 29. Engine mount bracket
- 30. Engine assembly



**Caution**  
 Mounting locations marked by \* should be provisionally tightened, and then fully tightened after placing the vehicle horizontally and loading the full weight of the engine on the vehicle body.

**REMOVAL SERVICE POINTS****◀A▶ DRIVE BELT REMOVAL**

- (1) Align the hole in the auto tensioner bracket with that in the arm and insert a screwdriver into the holes.
- (2) Remove the drive belt.

**◀B▶ POWER STEERING OIL PUMP REMOVAL**

Remove the power steering oil pump from the bracket with the hose attached.

**NOTE**

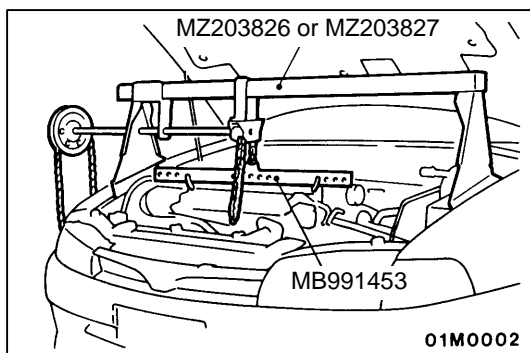
Place the removed power steering oil pump in a place where it will not be a hindrance when removing and installing the engine assembly, and tie it with a cord.

**◀C▶ A/C COMPRESSOR REMOVAL**

Disconnect the A/C compressor connector and remove the compressor from the compressor bracket with the hose still attached.

**NOTE**

Place the removed A/C compressor where it will not be a hindrance when removing and installing the engine assembly, and tie it with a cord.

**◀D▶ ENGINE MOUNT BRACKET REMOVAL**

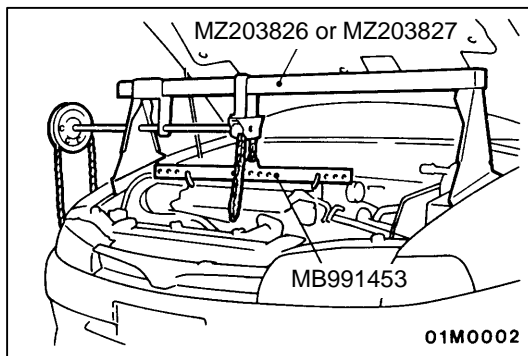
- (1) Support the engine with a garage jack.
- (2) Remove the special tools which was attached when the transmission assembly was removed.
- (3) Hold the engine assembly with a chain block or similar tool.
- (4) Place a garage jack against the engine oil pan with a piece of wood in between, jack up the engine so that the weight of the engine is no longer being applied to the engine mount bracket, and then remove the engine mount bracket.

**◀E▶ ENGINE ASSEMBLY REMOVAL**

After checking that all cables, hoses and harness connectors, etc., are disconnected from the engine, lift the chain block slowly to remove the engine assembly upward from the engine compartment.

**INSTALLATION SERVICE POINTS****▶A▶ ENGINE ASSEMBLY INSTALLATION**

Install the engine assembly, checking that the cables, hoses, and harness connectors are not clamped.

**▶B▶ ENGINE MOUNT BRACKET INSTALLATION**

- (1) Place a garage jack against the engine oil pan with a piece of wood in between, and install the engine mount bracket while adjusting the position of the engine.
- (2) Support the engine with the garage jack.
- (3) Remove the chain block and support the engine assembly with the special tools.

**▶C▶ HIGH-PRESSURE FUEL HOSE INSTALLATION**

- (1) Apply a small amount of new engine oil to the O-ring, then fit the O-ring in the delivery pipe.

**Caution**

**Do not let any engine oil get into the delivery pipe.**

- (2) Check that the high pressure hose turns smoothly. If the hose does not turn smoothly, the O-ring is probably being clamped. Disconnect the high-pressure fuel hose and check the O-ring for damage. After this, re-install the hose to the delivery pipe and check that the hose turns smoothly.
- (3) Tighten the mounting bolt to the specification.

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# ENGINE LUBRICATION

## CONTENTS

LUBRICANTS ..... 2

ENGINE OIL COOLER ..... 2



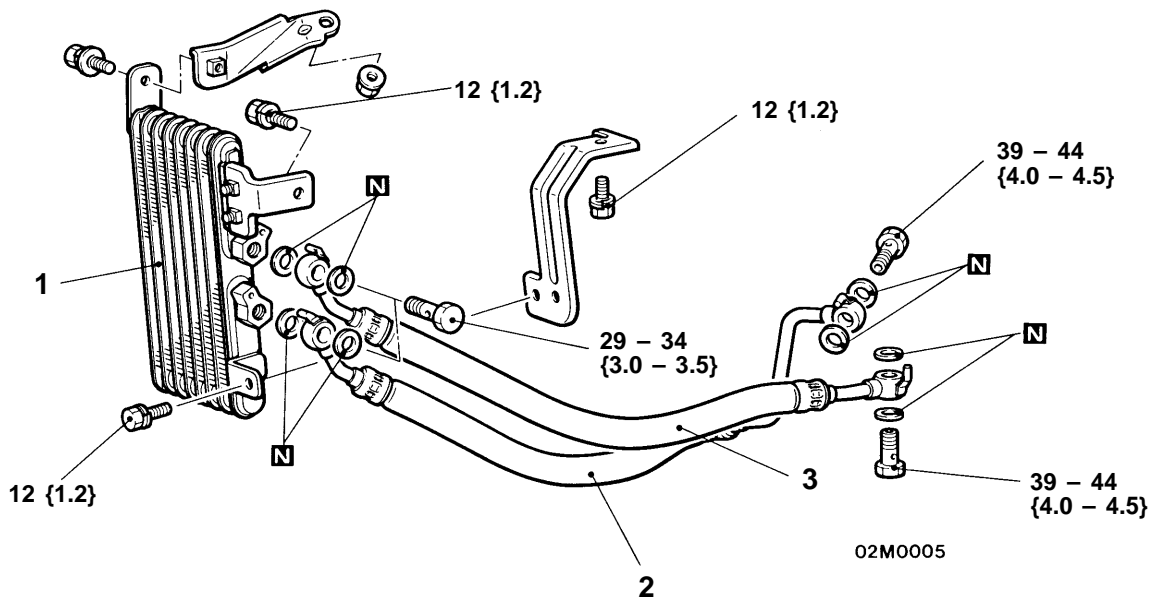
# LUBRICANTS

Items		Capacity dm <sup>3</sup> {ℓ}
Engine oil	Quantity in oil filter	0.3 {0.3}
	Quantity in oil cooler	0.16 {0.16}
	Total quantity	5.1 {5.1}
	Brand	DIA QUEEN MOTOR OIL (Grade SG or higher); or engine oil in a can marked with ILSAC certification.

## ENGINE OIL COOLER

### REMOVAL AND INSTALLATION

**Pre-removal and Post-installation Operation**  
 (1) Engine Oil Removal and Refilling  
 (2) Front Bumper Removal and Installation  
 (Refer to GROUP 51.)



Unit: Nm {kgf·m}

**Removal steps**

- 1. Engine oil cooler
- ▶◀ 2. Feed hose assembly
- ▶◀ 3. Return hose assembly

**INSTALLATION SERVICE POINT**

▶◀ **FEED HOSE ASSEMBLY / RETURN HOSE ASSEMBLY INSTALLATION**

Fit the hose joint positioning tab into the hole in oil cooler to secure the hose assembly in position.

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# FUEL

## CONTENTS

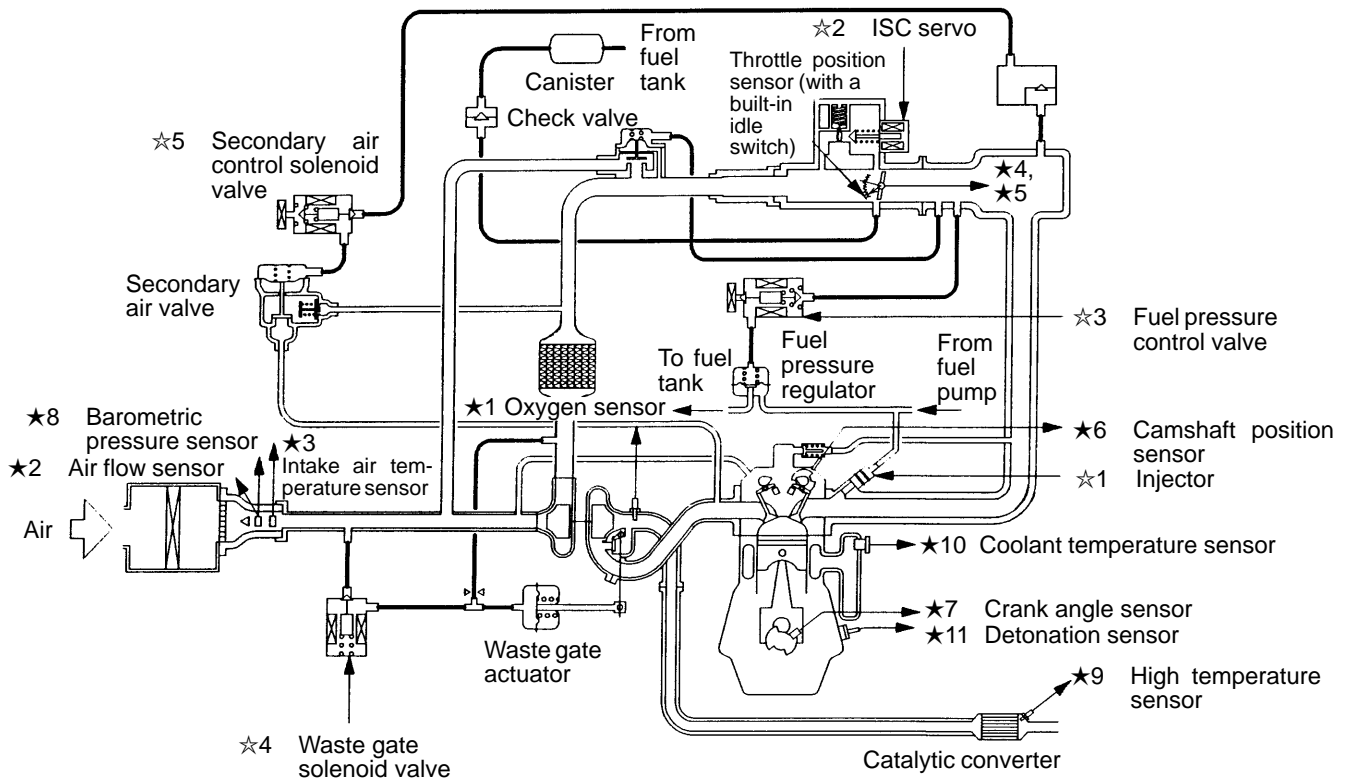
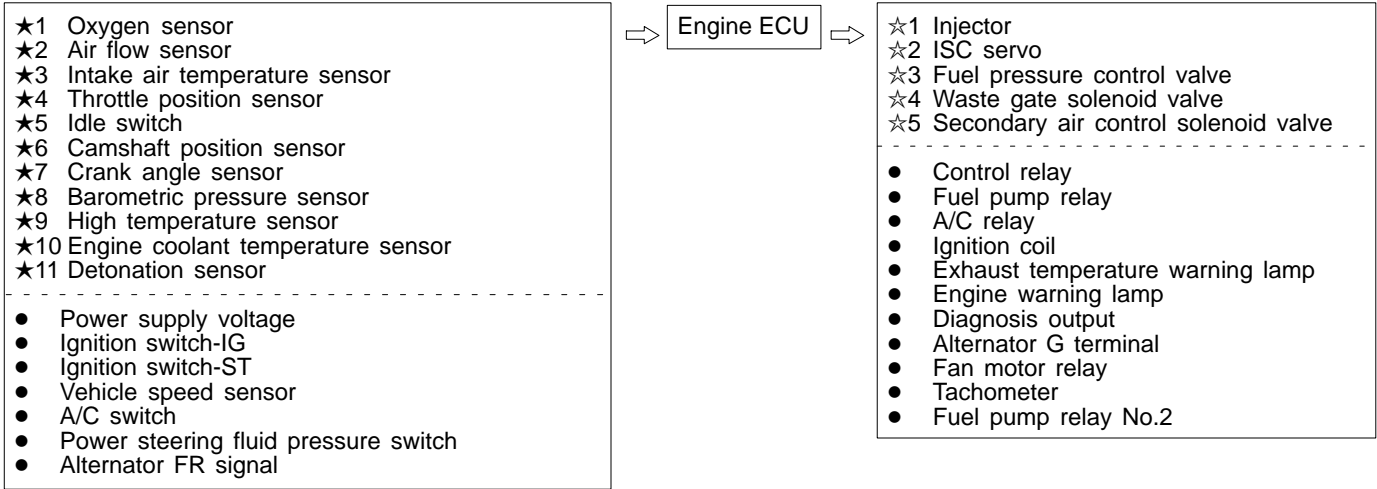
<b>MULTIPOINT INJECTION (MPI) .....</b>	<b>2</b>	4. Fuel Pressure Measurement .....	30
<b>GENERAL INFORMATION .....</b>	<b>2</b>	5. MPI System Components Layout .....	31
<b>SERVICE SPECIFICATIONS .....</b>	<b>3</b>	6. Intake Air Temperature Sensor Check ..	32
<b>SEALANT .....</b>	<b>3</b>	7. Engine Coolant Temperature Sensor Check .....	32
<b>SPECIAL TOOLS .....</b>	<b>4</b>	8. Oxygen Sensor Check .....	32
<b>TROUBLESHOOTING .....</b>	<b>6</b>	9. Injector Check .....	34
<b>ON-VEHICLE SERVICE .....</b>	<b>30</b>	10. Resistor Check .....	34
1. Idle Position Switch and Throttle Position Sensor (TPS) Adjustment .....	30	11. Fuel Pump Relay No.2 Check .....	35
2. Fixed SAS Adjustment .....	30	12. Fuel Pump Resistor Check .....	35
3. Basic Idle Speed Adjustment .....	30	<b>INJECTOR .....</b>	<b>36</b>
		<b>THROTTLE BODY .....</b>	<b>37</b>

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# MULTIPOINT INJECTION (MPI)

## GENERAL INFORMATION

### OMPI System Diagram



6FU2656

Given above is the MPI system diagram for EVOLUTION-IV. The MPI system for EVOLUTION-V is different from this in the following point;

- Oxygen sensor with a heater is adopted.
- The diagnosis connector power supply circuit is different.
- The high temperature sensor is no longer used.

**SERVICE SPECIFICATIONS**

Items		Specifications
Basic ignition timing °BTDC		5 ± 3
Basic idle speed rpm		850 ± 50
Throttle position sensor adjusting voltage mV		400 – 1,000
Throttle position sensor resistance kΩ		3.5 – 6.5
ISC servo coil resistance (at 20°C) Ω		28 – 33
Intake air temperature sensor resistance kΩ	At 20°C	2.3 – 3.0
	At 80°C	0.30 – 0.42
Coolant temperature sensor resistance kΩ	At 20°C	2.1 – 2.7
	At 80°C	0.26 – 0.36
Fuel pressure kPa {kgf/cm <sup>2</sup> }	When vacuum hose is connected	230 {2.35}
	When vacuum hose is disconnected	289 – 309 {2.95 – 3.15}
Injector coil resistance Ω		2 – 3
Amount of injector fuel leak drop/min		1 or less
Oxygen sensor output voltage		0.6 – 1.0
Fuel pressure control valve coil resistance (at 20°C) Ω		28 – 36

**SEALANT**

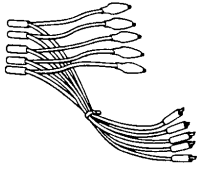

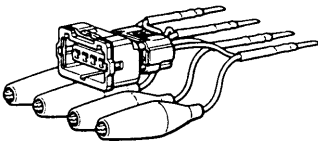
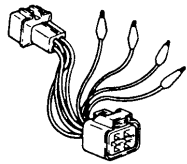
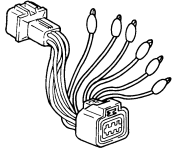
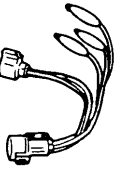
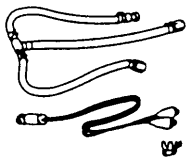
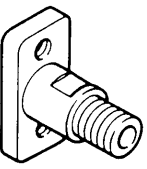
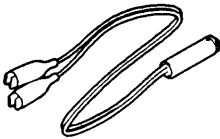
Item	Specified sealant
Coolant temperature sensor	Drying sealant: HELMESEAL H-1M [0110513]

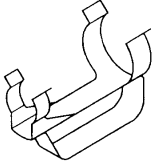
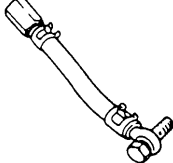

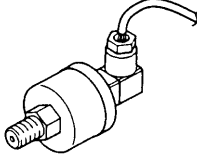
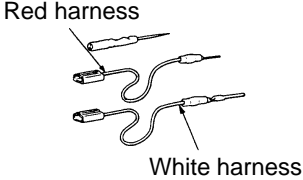
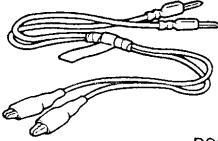
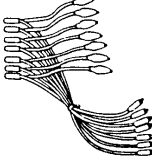
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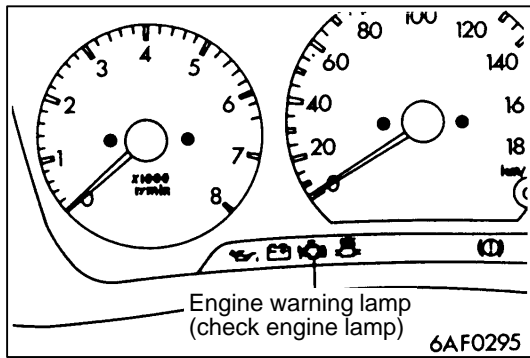
Given in [ ] are MITSUBISHI GENUINE PART numbers.



## SPECIAL TOOLS

Tool	Number	Name	Use
	MB991348	Test harness set	<ul style="list-style-type: none"> <li>• Measurement of voltage during troubleshooting</li> <li>• Inspection using an oscilloscope</li> </ul>
	MB991519	Alternator harness connector	Measurement of voltage during troubleshooting
	MB991536	TPS check harness	Adjustment of idle switch and throttle position sensor (TPS)
	MD998464	Test harness (4-pin, square)	Inspection of oxygen sensor
	MD998463	Test harness (6-pin, square)	<ul style="list-style-type: none"> <li>• Inspection of idle speed control servo</li> <li>• Inspection using an oscilloscope</li> </ul>
	MD998478	Test harness (3-pin, triangle)	<ul style="list-style-type: none"> <li>• Measurement of voltage during troubleshooting</li> <li>• Inspection using an oscilloscope</li> </ul>
	MD998706	Injector test set	Checking the spray condition of injectors
	MD998741	Injector test adaptor	
	MB991607	Injector test harness	

Tool	Number	Name	Use
	MD998746	Clip	Checking the spray condition of injectors
	MD998709	Adaptor hose	Measurement of fuel pressure
	MD998742	Hose adaptor	
	MB991637	Fuel pressure gauge set	
 <p>Red harness</p> <p>White harness</p>	MB991223	Inspection test harness set <ul style="list-style-type: none"> <li>● Pin contact pressure inspection harness</li> <li>● Market tester contact probe (for general connectors)</li> </ul>	Measurement of terminal voltage
 <p>B991529</p>	MB991529	Diagnostic trouble code check harness	Reading of diagnosis codes
	MB991709	Test harness	<ul style="list-style-type: none"> <li>● Measurement of voltage during troubleshooting</li> <li>● Inspection using an oscilloscope</li> </ul>



## TROUBLESHOOTING

### 1. DIAGNOSIS FUNCTION

#### 1-1 ENGINE WARNING LAMP (CHECK ENGINE LAMP)

If an abnormality occurs in any of the following items related to the Multipoint Fuel Injection (MPI) system, the engine warning lamp will illuminate.

If the lamp remains illuminated or if the lamp illuminates while the engine is running, check the diagnosis code output.

#### Engine warning lamp inspection items

Engine-ECU
Air flow sensor (AFS)
Intake air temperature sensor
Throttle position sensor (TPS)
Engine coolant temperature sensor
Crank angle sensor
Camshaft position sensor
Barometric pressure sensor
Detonation sensor
Injector
Ignition coil, power transistor
Misfire <Evolution-V only>

#### 1-2 METHOD OF READING AND ERASING DIAGNOSIS CODES

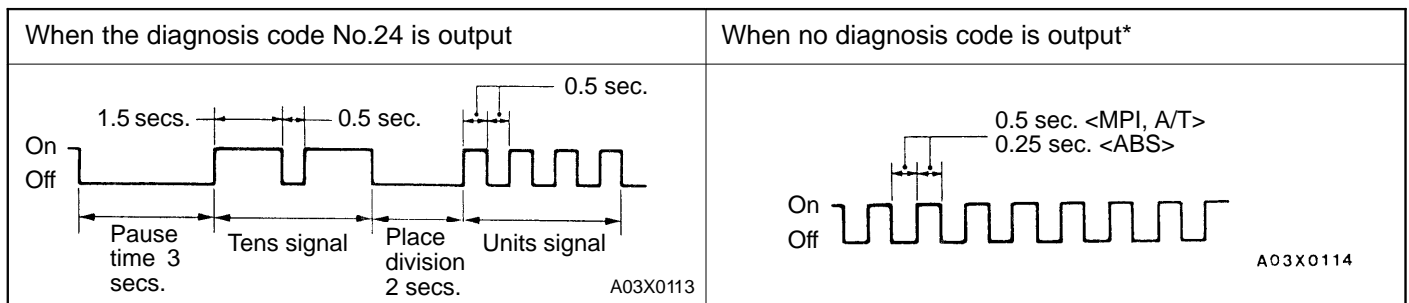
- (1) Use the special tool to earth No.1 terminal (diagnosis control terminal) of the diagnosis connector.
- (2) To check ABS system, remove the valve relay.

**NOTE**

That is because the valve relay is off and the warning lamp remains illuminated if there is a fault in the ABS system.

- (3) Turn off the ignition switch.
- (4) Read out a diagnosis code by observing how the warning lamp flashes.

#### Indication of diagnosis code by warning lamp



**NOTE**

\*: Even if the ABS system is normal, removing the valve relay causes the diagnosis code No.52 to be output.

**1-3 ERASING DIAGNOSIS CODES**

- (1) Turn the ignition switch to OFF.
- (2) After disconnecting the battery cable from the battery (-) terminal for 10 seconds or more, reconnect the cable.
- (3) After the engine has warmed up, run it at idle for about 15 minutes.

**1-4 FAIL-SAFE FUNCTION REFERENCE TABLE**

When the main sensor malfunctions are detected by the diagnosis function, the vehicle is controlled by means of the pre-set control logic to maintain safe conditions for driving.

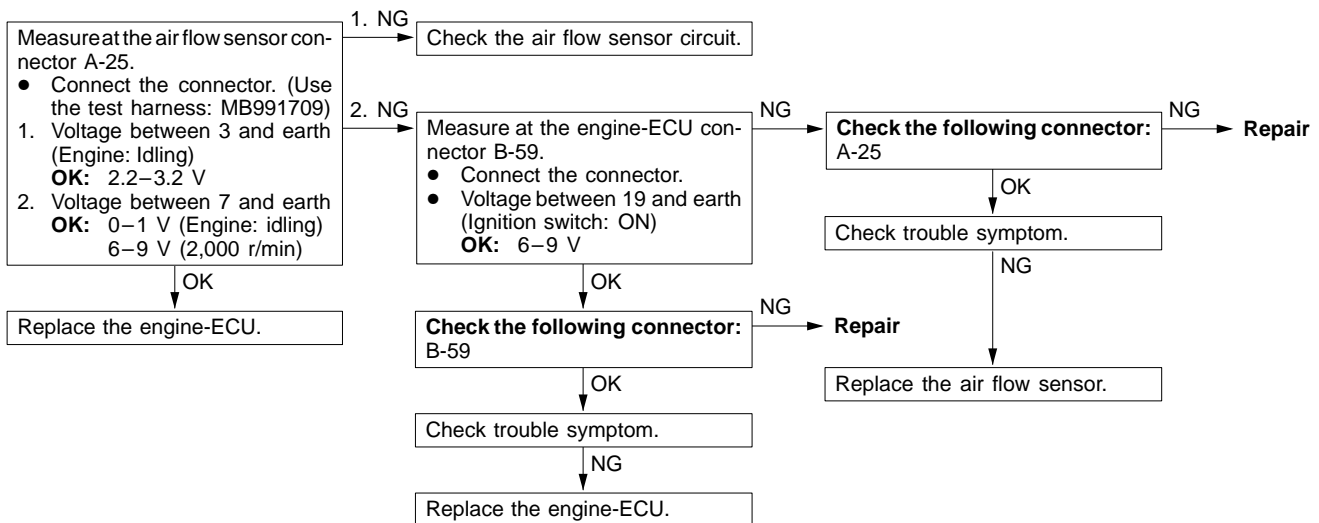
Malfunctioning item	Control contents during malfunction
Air flow sensor (AFS)	<ol style="list-style-type: none"> <li>(1) Uses the throttle position sensor signal and engine speed signal (crank angle sensor signal) to take reading of the basic injector drive time and basic ignition timing from the pre-set mapping.</li> <li>(2) Fixes the ISC servo in the appointed position so idle control is not performed.</li> </ol>
Intake air temperature sensor	Controls as if the intake air temperature is 25°C.
Throttle position sensor (TPS)	No increase in fuel injection amount during acceleration due to the throttle position sensor signal.
Engine coolant temperature sensor	Controls as if the engine coolant temperature is 80°C. (This condition is maintained until the ignition switch is turned off even when the sensor signal returns normal.)
Camshaft position sensor	<ol style="list-style-type: none"> <li>(1) Injects fuel to all cylinders simultaneously for 4 seconds. (However, after the ignition switch is turned to ON, the No. 1 cylinder top dead centre is not detected at all.)</li> <li>(2) Lets the fan motor (radiator and condensor) run at high speed.</li> </ol>
Barometric pressure sensor	Controls as if the barometric pressure is 101 kPa (760 mmHg).
Detonation sensor	Switches the ignition timing from ignition timing for super petrol to ignition timing for standard petrol.
Ignition coil, power transistor	Cuts off the fuel supply to cylinders with an abnormal ignition.
Alternator FR terminal	Does not control the output of the alternator according to an electrical load. (works as a normal alternator)
Misfire (Evolution-V only)	Cuts off the fuel to the misfiring cylinder if a misfire that could damage the catalyst is detected.

2. INSPECTION CHART FOR DIAGNOSIS CODES

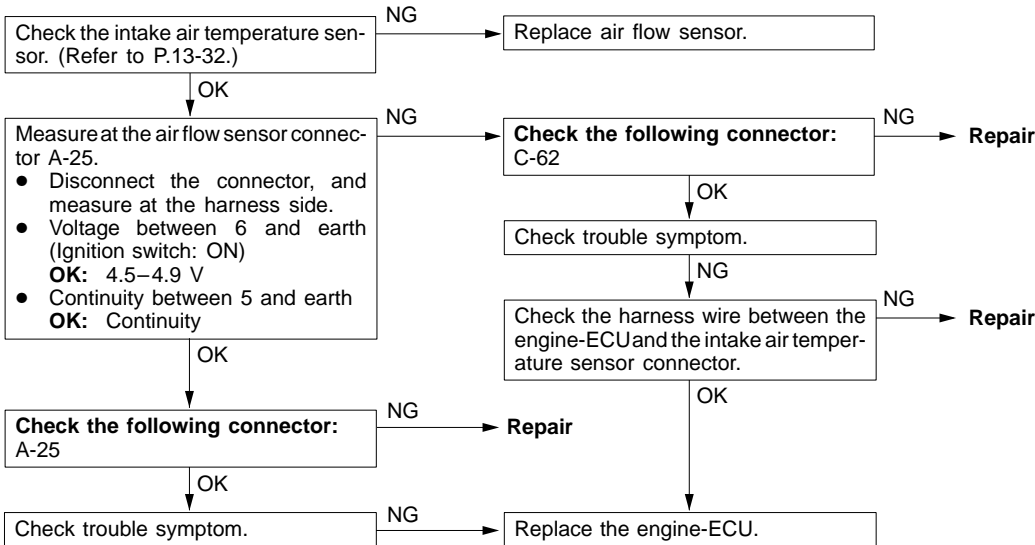
Code No.	Diagnosis item	Reference page
12	Air flow sensor (AFS) system	13-8
13	Intake air temperature sensor system	13-9
14	Throttle position sensor (TPS) system	13-9
21	Engine coolant temperature sensor system	13-10
22	Crank angle sensor system	13-11
23	Camshaft position sensor system	13-11
24	Vehicle speed sensor system	13-12
25	Barometric pressure sensor system	13-13
31	Detonation sensor system	13-14
41	Injector system	13-14
44	Ignition coil and power transistor unit system	13-15
64	Alternator FR terminal system	13-16

3. INSPECTION PROCEDURE FOR DIAGNOSIS CODES

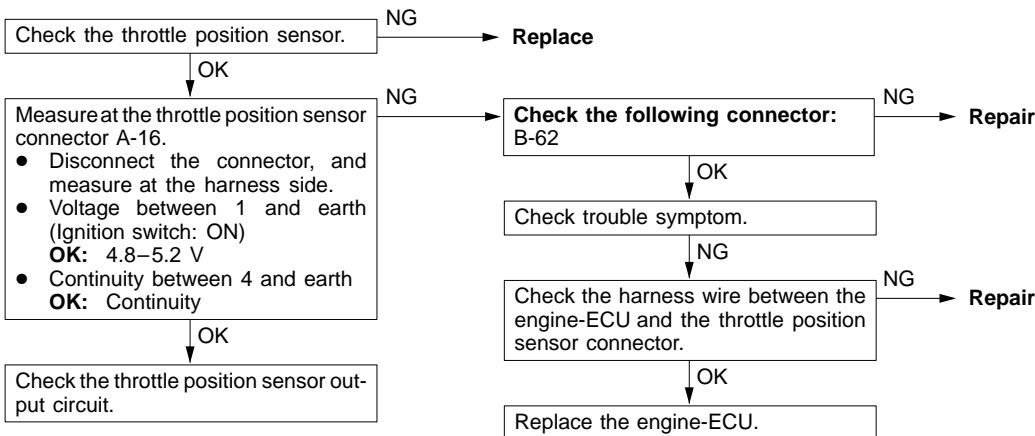
Code No. 12 Air flow sensor (AFS) system	Probable cause
<p>Range of Check</p> <ul style="list-style-type: none"> <li>Engine speed is 500 r/min or more.</li> </ul> <p>Set conditions</p> <ul style="list-style-type: none"> <li>Sensor output frequency is 3 Hz or less for 4 seconds.</li> </ul>	<ul style="list-style-type: none"> <li>Malfunction of the air flow sensor</li> <li>Improper connector contact, open circuit or short-circuited harness wire of the air flow sensor</li> <li>Malfunction of the engine-ECU</li> </ul>



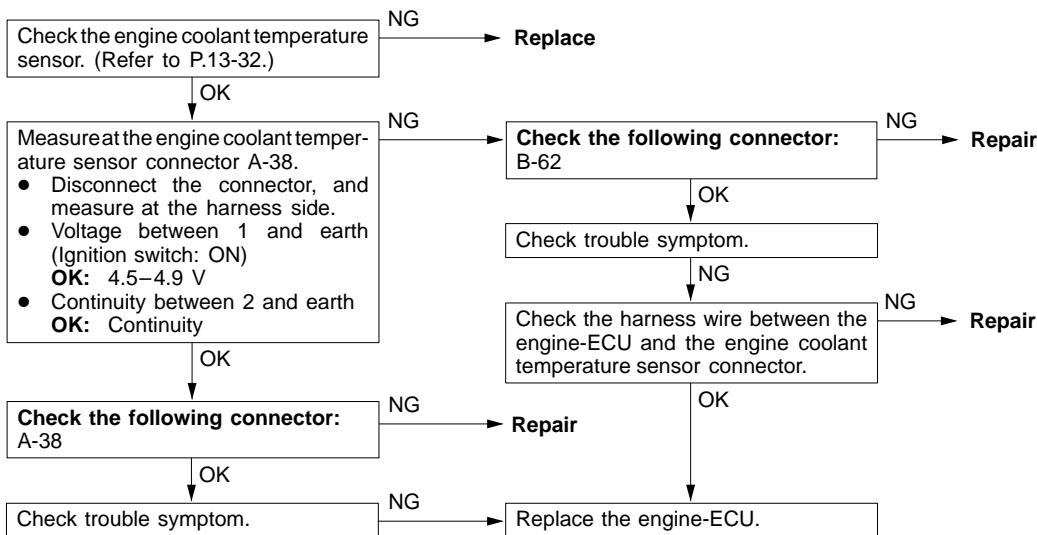
Code No. 13 Intake air temperature sensor system	Probable cause
<p>Range of Check</p> <ul style="list-style-type: none"> <li>Ignition switch: ON</li> <li>Excluding 60 seconds after the ignition switch is turned to ON or immediately after the engine starts.</li> </ul> <p>Set conditions</p> <ul style="list-style-type: none"> <li>Sensor output voltage is 4.6 V or more (corresponding to an intake air temperature of -45°C or less) for 4 seconds.</li> </ul> <p>or</p> <ul style="list-style-type: none"> <li>Sensor output voltage is 0.2V or less (corresponding to an intake air temperature of 125°C or more) for 4 seconds.</li> </ul>	<ul style="list-style-type: none"> <li>Malfunction of the intake air temperature sensor</li> <li>Improper connector contact, open circuit or short-circuited harness wire of the intake air temperature sensor circuit</li> <li>Malfunction of the engine-ECU</li> </ul>



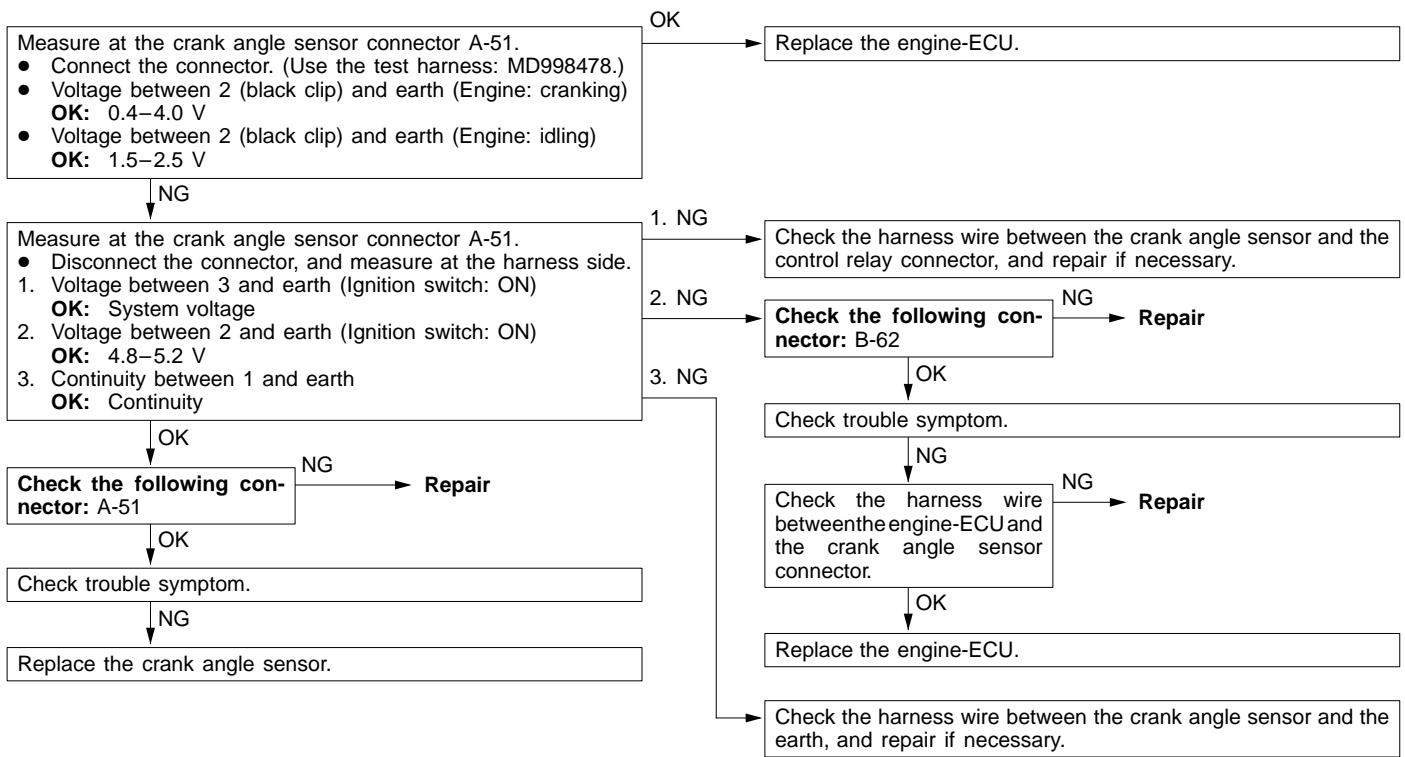
Code No. 14 Throttle position sensor (TPS) system	Probable cause
<p>Range of Check</p> <ul style="list-style-type: none"> <li>Ignition switch: ON</li> <li>Excluding 60 seconds after the ignition switch is turned to ON or immediately after the engine starts.</li> </ul> <p>Set conditions</p> <ul style="list-style-type: none"> <li>The sensor output voltage is 0.2 V or less for 4 seconds.</li> </ul>	<ul style="list-style-type: none"> <li>Malfunction of the throttle position sensor</li> <li>Improper connector contact, open circuit or short-circuited harness wire of the throttle position sensor circuit</li> <li>Improper "ON" state of idle position switch</li> <li>Short circuit of the idle position switch signal line</li> <li>Malfunction of the engine-ECU</li> </ul>



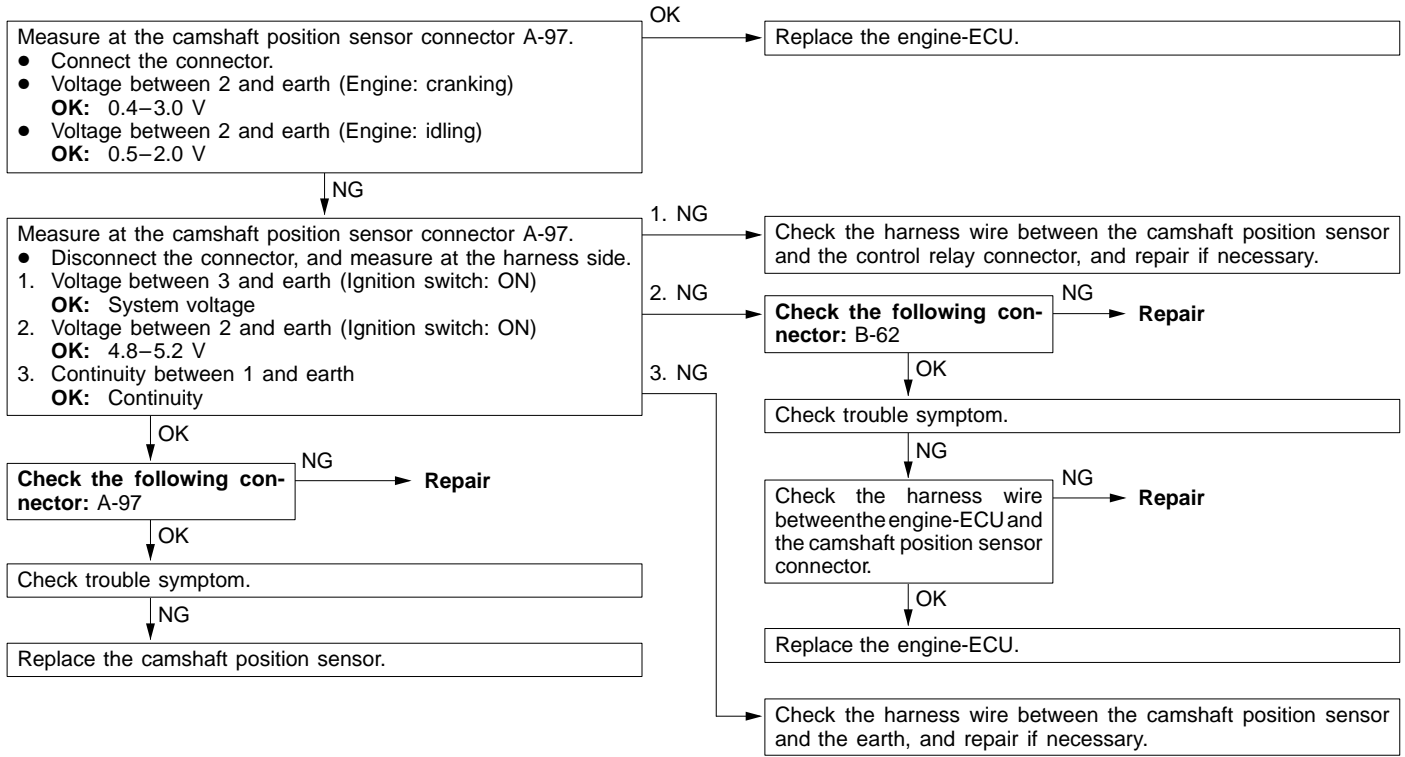
Code No. 21 Engine coolant temperature sensor system	Probable cause
<p>Range of Check</p> <ul style="list-style-type: none"> <li>Ignition switch: ON</li> <li>Excluding 60 seconds after the ignition switch is turned to ON or immediately after the engine starts.</li> </ul> <p>Set conditions</p> <ul style="list-style-type: none"> <li>Sensor output voltage is 4.6 V or more (corresponding to an engine coolant temperature of -45°C or less) for 4 seconds.</li> </ul> <p>or</p> <ul style="list-style-type: none"> <li>Sensor output voltage is 0.1 V or less (corresponding to an engine coolant temperature of 140°C or more) for 4 seconds.</li> </ul>	<ul style="list-style-type: none"> <li>Malfunction of the engine coolant temperature sensor</li> <li>Improper connector contact, open circuit or short-circuited harness wire of the engine coolant temperature sensor circuit</li> <li>Malfunction of the engine-ECU</li> </ul>
<p>Range of Check</p> <ul style="list-style-type: none"> <li>Ignition switch: ON</li> <li>Engine speed is approx. 50 r/min or more</li> </ul> <p>Set conditions</p> <ul style="list-style-type: none"> <li>The sensor output voltage increases from 1.6 V or less (corresponding to an engine coolant temperature of 40°C or more) to 1.6 V or more (corresponding to an engine coolant temperature of 40°C or less).</li> <li>After this, the sensor output voltage is 1.6 V or more for 5 minutes.</li> </ul>	



Code No. 22 Crank angle sensor system	Probable cause
Range of Check ● Engine is cranking. Set conditions ● Sensor output voltage does not change for 4 seconds (no pulse signal input.)	● Malfunction of the crank angle sensor ● Improper connector contact, open circuit or short-circuited harness wire of the crank angle sensor ● Malfunction of the engine-ECU

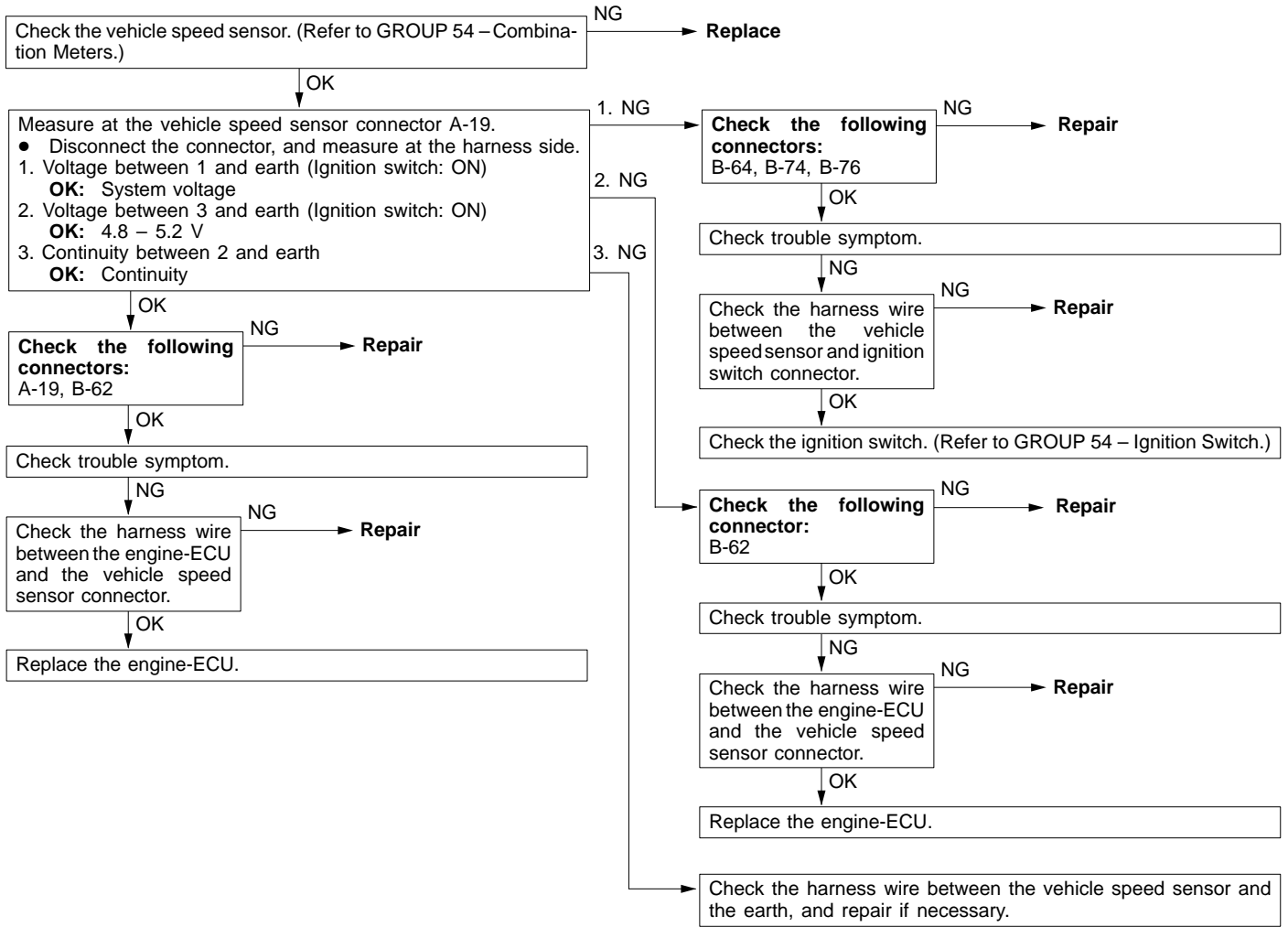


Code No. 23 Camshaft position sensor system	Probable cause
Range of Check ● Ignition switch: ON ● Engine speed is approx. 50 r/min or more. Set conditions ● Sensor output voltage does not change for 4 seconds (no pulse signal input.)	● Malfunction of the camshaft position sensor ● Improper connector contact, open circuit or short-circuited harness wire of the camshaft position sensor circuit ● Malfunction of the engine-ECU

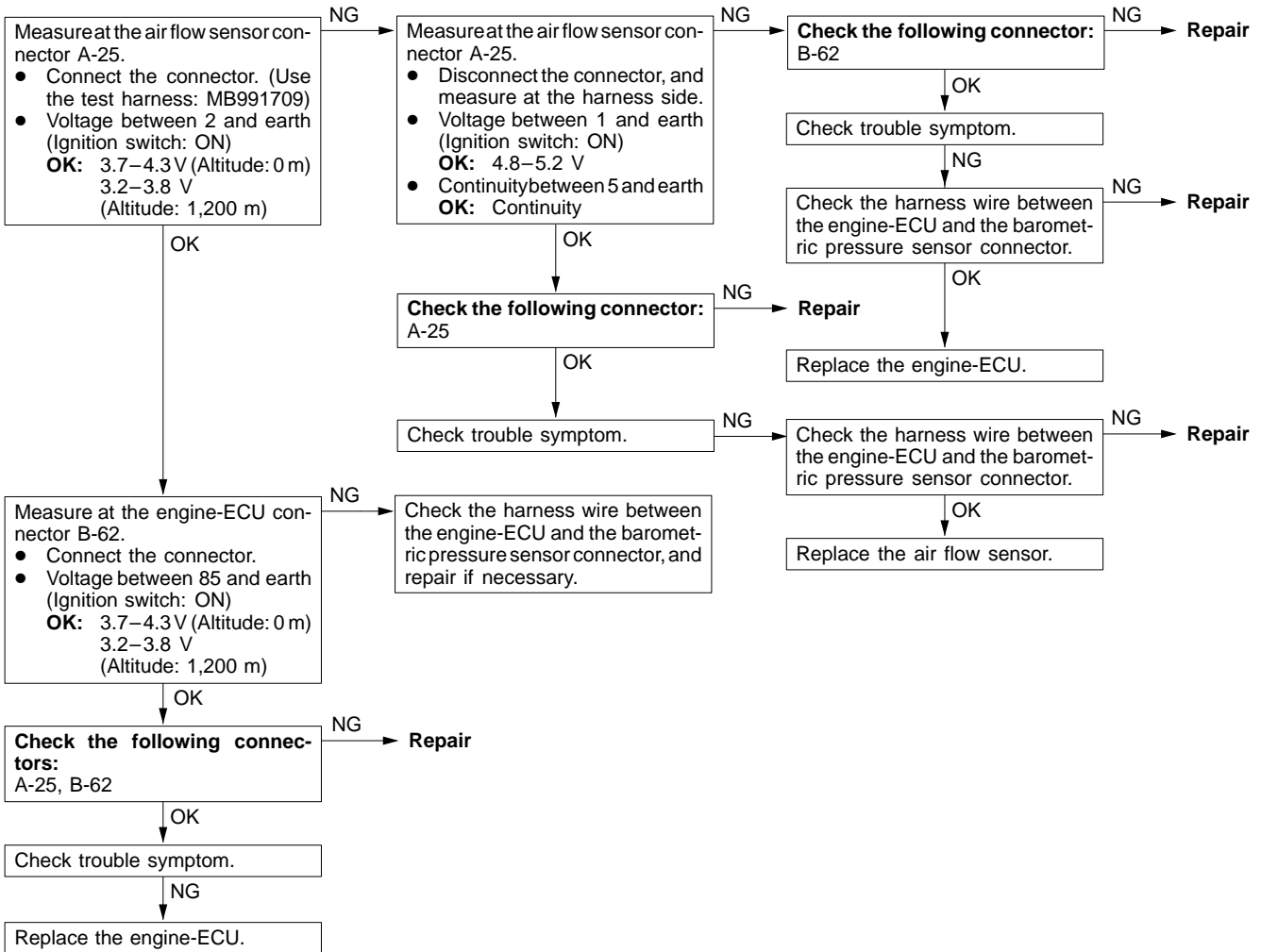




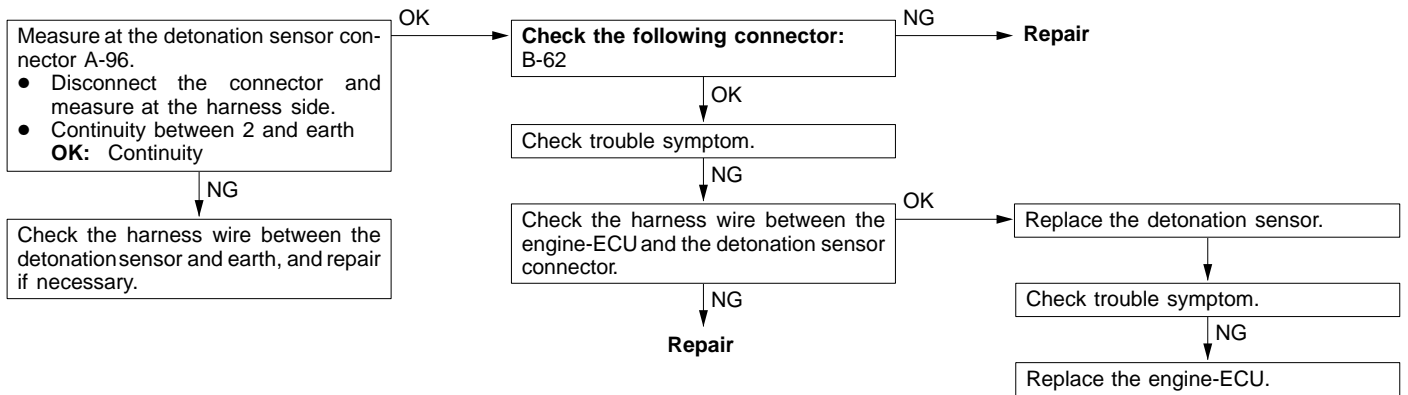
Code No. 24 Vehicles speed sensor system	Probable cause
<p>Range of check</p> <ul style="list-style-type: none"> <li>● Ignition switch: ON</li> <li>● Excluding 60 seconds after the ignition switch is turned to ON or immediately after the engine starts.</li> <li>● Idle position switch: OFF</li> <li>● Engine speed is 3,000 r/min or more.</li> <li>● Driving under high engine load conditions.</li> </ul> <p>Set conditions</p> <ul style="list-style-type: none"> <li>● Sensor output voltage does not change for 4 seconds (no pulse signal input).</li> </ul>	<ul style="list-style-type: none"> <li>● Malfunction of the vehicle speed sensor</li> <li>● Improper connector contact, open circuit or short-circuited harness wire of the vehicle speed sensor circuit</li> <li>● Malfunction of the engine-ECU</li> </ul>



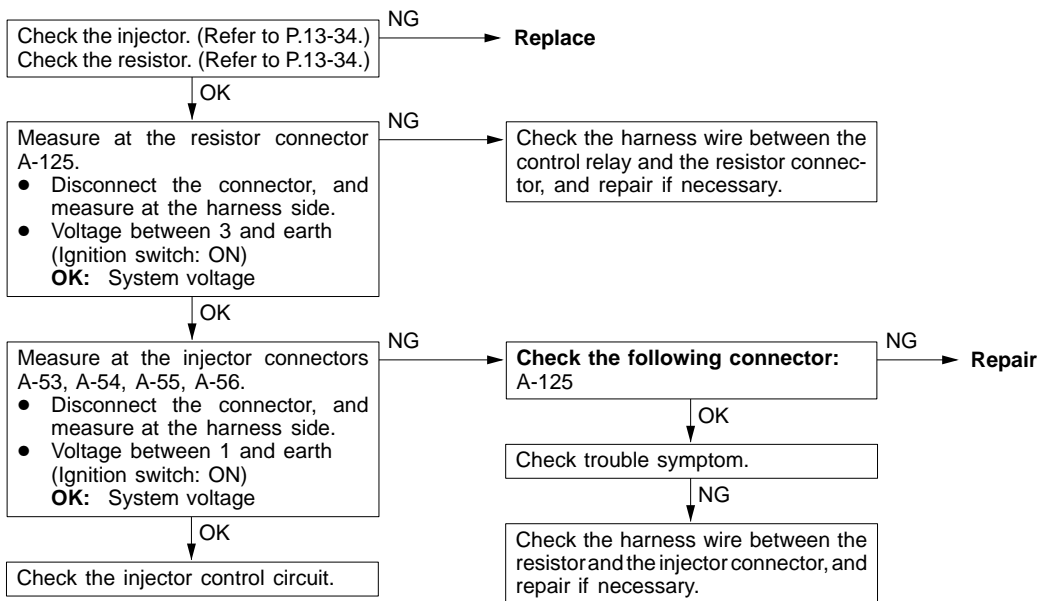
Code No. 25 Barometric pressure sensor system	Probable cause
<p>Range of Check</p> <ul style="list-style-type: none"> <li>Ignition switch: ON</li> <li>Excluding 60 seconds after the ignition switch is turned to ON or immediately after the engine starts.</li> </ul> <p>Set conditions</p> <ul style="list-style-type: none"> <li>Sensor output voltage is 4.5 V or more (corresponding to a barometric pressure of 114 kPa {855 mmHg} or more) for 4 seconds.</li> </ul> <p>or</p> <ul style="list-style-type: none"> <li>Sensor output voltage is 0.2 V or less (corresponding to a barometric pressure of 53 kPa {40 mmHg} or less) for 4 seconds.</li> </ul>	<ul style="list-style-type: none"> <li>Malfunction of the barometric pressure sensor</li> <li>Improper connector contact, open circuit or short-circuited harness wire of the barometric pressure sensor circuit</li> <li>Malfunction of the engine-ECU</li> </ul>



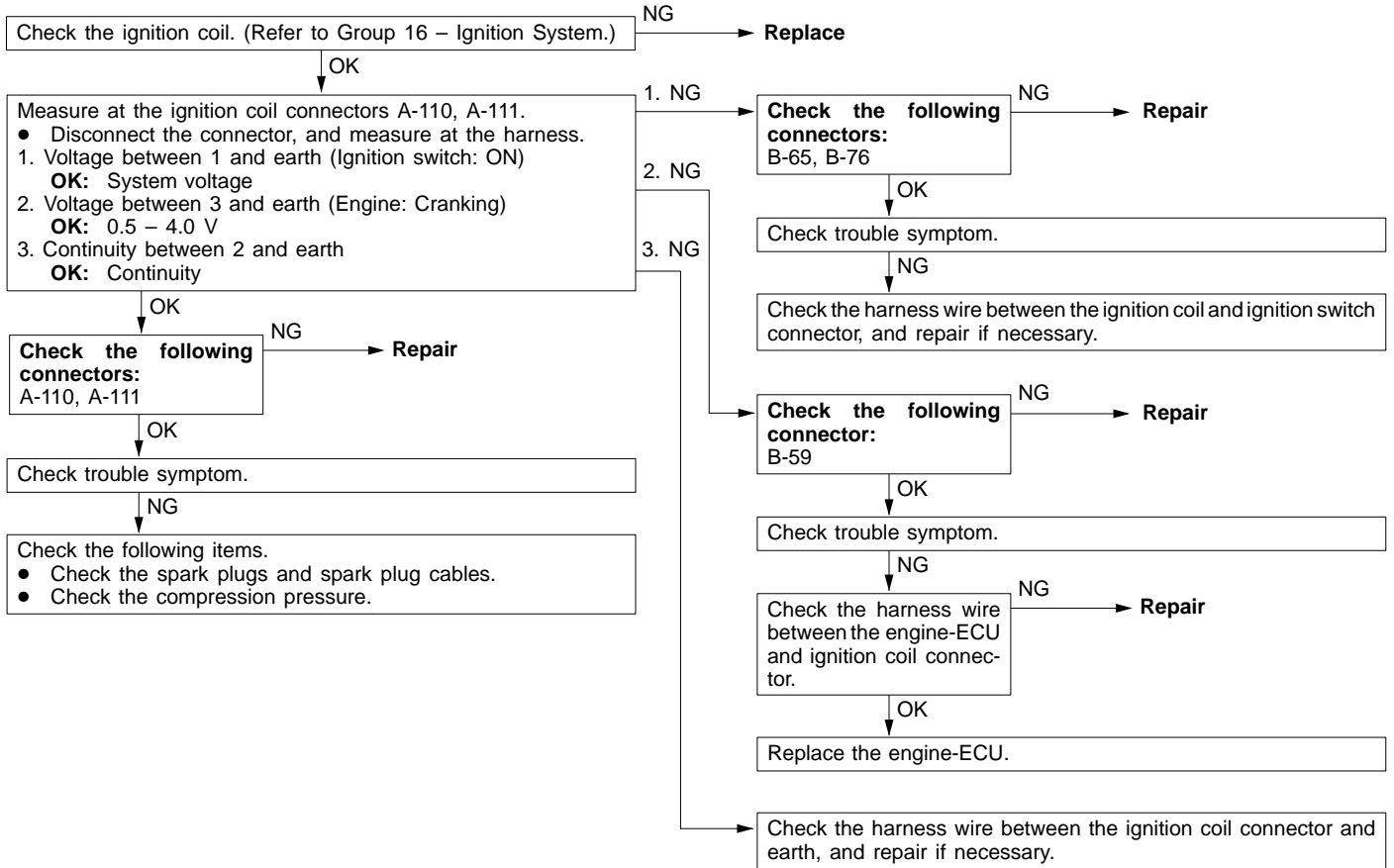
Code No.31 Detonation sensor system	Probable cause
<p>Range of Check</p> <ul style="list-style-type: none"> <li>• Ignition switch: ON</li> <li>• Excluding 60 seconds after the ignition switch is turned to ON or immediately after the engine starts.</li> <li>• Engine speed is approx. 5,000 r/min or more</li> </ul> <p>Set conditions</p> <p>The change in the detonation sensor output voltage (detonation sensor peak voltage at each 1/2 revolution of the crankshaft) is less than 0.06 V for 200 times in succession.</p>	<ul style="list-style-type: none"> <li>• Malfunction of the detonation sensor</li> <li>• Improper connector contact, open circuit or short-circuited harness wire of the detonation sensor circuit</li> <li>• Malfunction of the engine-ECU</li> </ul>



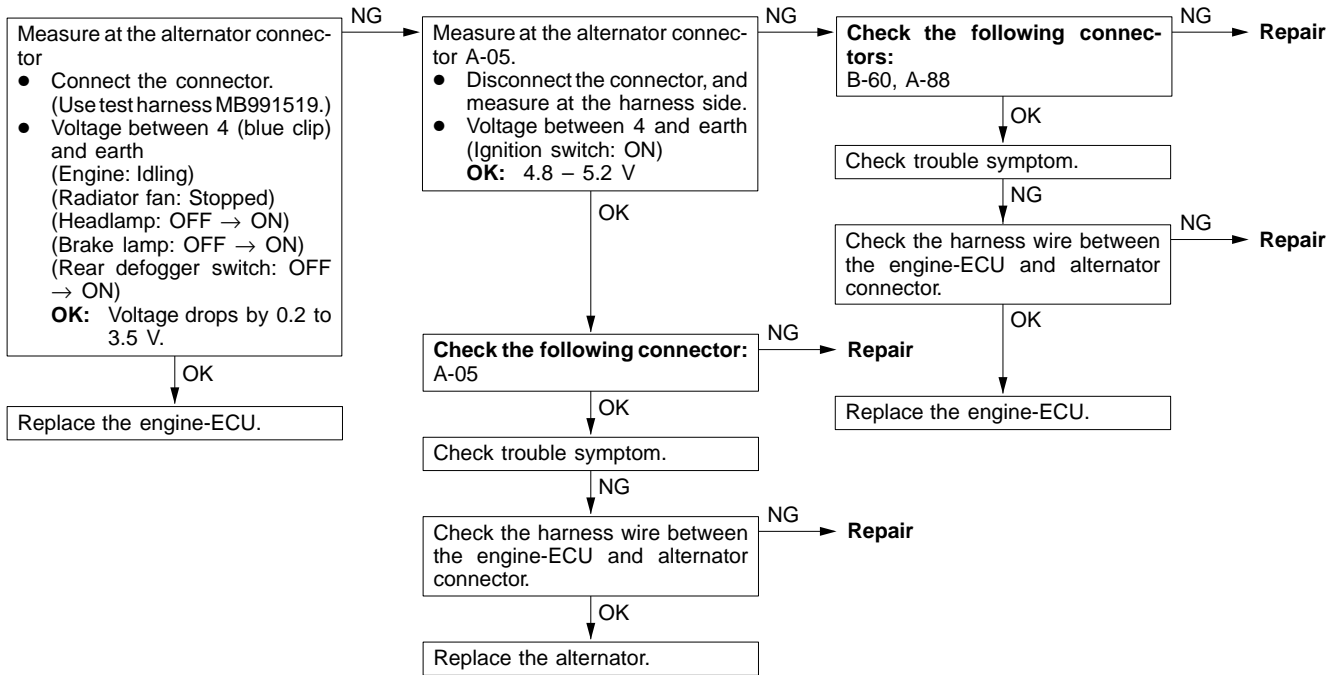
Code No. 41 Injector system	Probable cause
<p>Range of Check</p> <ul style="list-style-type: none"> <li>• Engine speed is approx. 50–1,000 r/min</li> <li>• The throttle position sensor output voltage is 1.15 V or less.</li> </ul> <p>Set conditions</p> <ul style="list-style-type: none"> <li>• Surge voltage of injector coil is not detected for 4 seconds.</li> </ul>	<ul style="list-style-type: none"> <li>• Malfunction of the injector</li> <li>• Improper connector contact, open circuit or short-circuited harness wire of the injector circuit</li> <li>• Malfunction of the engine-ECU</li> </ul>



Code No. 44 Ignition coil and power transistor unit system	Probable cause
<p>Range of Check</p> <ul style="list-style-type: none"> <li>● Engine speed is approx. 50 – 4,000 r/min.</li> <li>● Engine is not being cranked.</li> </ul> <p>Set conditions</p> <ul style="list-style-type: none"> <li>● Abnormal engine speed is detected due to misfiring by crank angle sensor. (One of two coils fails.)</li> </ul>	<ul style="list-style-type: none"> <li>● Malfunction of the ignition coil</li> <li>● Improper connector contact, open circuit or short-circuited harness wire of the ignition primary circuit</li> <li>● Malfunction of the engine-ECU.</li> </ul>

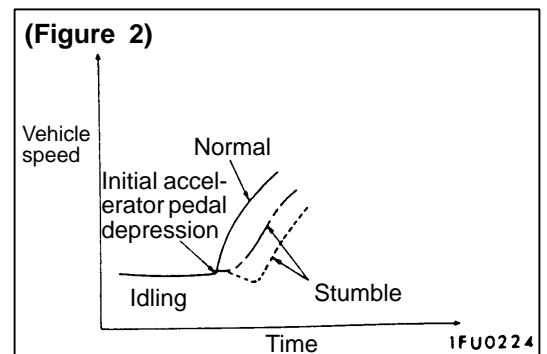
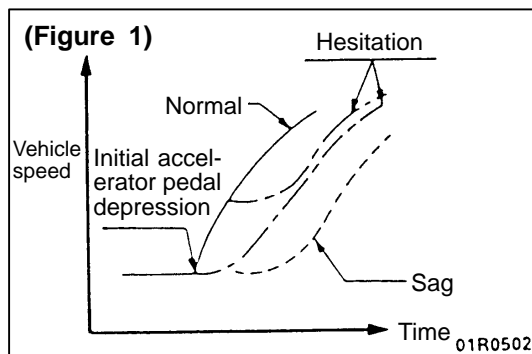


Code No. 64 Alternator FR Terminal System	Probable cause
Range of Check ● Engine speed is approximately 50 r/min or more. Set conditions ● Input voltage at the alternator FR terminal is 4.5 V or more for 20 seconds.	● Open circuit in alternator FR terminal circuit ● Malfunction of the engine-ECU.



4. PROBLEM SYMPTOMS TABLE

Items		Symptom
Starting	Won't start	The starter is used to crank the engine, but there is no combustion within the cylinders, and the engine won't start.
	Fires up and dies	There is combustion within the cylinders, but then the engine soon stalls.
	Hard starting	Engine starts after cranking a while.
Idling stability	Rough idle Hunting	Engine speed doesn't remain constant and changes at idle. Usually, a judgement can be based upon the movement of the tachometer pointer, and the vibration transmitted to the steering wheel, shift lever, body, etc. This is called rough idle or hunting.
	Incorrect idle speed	The engine doesn't idle at the usual correct speed.
	Engine stall (Die out)	The engine stalls when the accelerator pedal is released, regardless of whether the vehicles is moving or not.
	Engine stall (Pass out)	The engine stalls when the accelerator pedal is depressed or while it is being used.
Driving	Hesitation, Sag	"Hesitation" is the delay in response of the vehicle speed (engine speed) that occurs when the accelerator is depressed in order to accelerate from the speed at which the vehicle is now traveling, or a temporary drop in vehicle speed (engine speed) during such acceleration. Serious hesitation is called "sag". (Refer to Figure 1.)
	Poor acceleration	Poor acceleration is inability to obtain an acceleration corresponding to the degree of throttle opening, even though acceleration is smooth, or the inability to reach maximum speed.
	Stumble	Engine speed increase is delayed when the accelerator pedal is initially depressed for acceleration. (Refer to Figure 2.)
	Shock	The feeling of a comparatively large impact or vibration when the engine is accelerated or decelerated.
	Surge	This is repeated forward or rearward surging during constant speed travel or during variable speed travel.
	Knocking	A sharp sound like a hammer striking the cylinder walls during driving and which adversely affects driving.
Stopping	Run on ("Dieseling")	The condition in which the engine continues to run after the ignition switch is turned to OFF. Also called "Dieseling".



## 5. SERVICE DATA LIST

## &lt;EVOLUTION-IV&gt;

Item No.	Inspection item	Inspection contents	Normal condition	
11	Oxygen sensor	Engine: After having been warmed up Air/fuel mixture is made leaner when decelerating, and is made richer when racing.	When at 4,000 r/min, engine is suddenly decelerated	200 mV or less
			When engine is suddenly raced	600 – 1,000 mV
		Engine: After having been warmed up The oxygen sensor signal is used to check the air/fuel mixture ratio, and control condition is also checked by the ECU.	Engine is idling	400 mV or less (Changes)
			2,500 r/min	600 – 1,000 mV
12	Air flow sensor*	<ul style="list-style-type: none"> <li>• Engine coolant temperature: 80 – 95°C</li> <li>• Lamps, electric cooling fan and all accessories: OFF</li> <li>• Transmission: Neutral</li> </ul>	Engine is idling	17 – 43 Hz
			2,500 r/min	46 – 86 Hz
			Engine is raced	Frequency increases in response to racing
13	Intake air temperature sensor	Ignition switch: ON or with engine running	When intake air temperature is –20°C	–20°C
			When intake air temperature is 0°C	0°C
			When intake air temperature is 20°C	20°C
			When intake air temperature is 40°C	40°C
			When intake air temperature is 80°C	80°C
14	Throttle position sensor	Ignition switch: ON	Set to idle position	300 – 1,000 mV
			Gradually open	Increases in proportion to throttle opening angle
			Open fully	4,500 – 5,500 mV
16	Power supply voltage	Ignition switch: ON		System voltage
18	Cranking signal (ignition switch-ST)	Ignition switch: ON	Engine: Stopped	OFF
			Engine: Cranking	ON

## NOTE

\*: When the car is new (distance it travelled is less than 500 km), output frequency of the air flow sensor may become about 10% higher.

Item No.	Inspection item	Inspection contents	Normal condition	
21	Engine coolant temperature sensor	Ignition switch: ON or with engine running	When engine coolant temperature is $-20^{\circ}\text{C}$	$-20^{\circ}\text{C}$
			When engine coolant temperature is $0^{\circ}\text{C}$	$0^{\circ}\text{C}$
			When engine coolant temperature is $20^{\circ}\text{C}$	$20^{\circ}\text{C}$
			When engine coolant temperature is $40^{\circ}\text{C}$	$40^{\circ}\text{C}$
			When engine coolant temperature is $80^{\circ}\text{C}$	$80^{\circ}\text{C}$
22	Crank angle sensor	<ul style="list-style-type: none"> <li>● Engine: Idling</li> <li>● Idle position switch: ON</li> </ul>	When engine coolant temperature is $-20^{\circ}\text{C}$	1,300 – 1,500 rpm
			When engine coolant temperature is $0^{\circ}\text{C}$	1,300 – 1,500 rpm
			When engine coolant temperature is $20^{\circ}\text{C}$	1,300 – 1,500 rpm
			When engine coolant temperature is $40^{\circ}\text{C}$	1,150 – 1,350 rpm
			When engine coolant temperature is $80^{\circ}\text{C}$	750 – 950 rpm
25	Barometric pressure sensor	Ignition switch: ON	At altitude of 0 m	101 kPa
			At altitude of 600 m	95 kPa
			At altitude of 1,200 m	88 kPa
			At altitude of 1,800 m	81 kPa
26	Idle position switch	Ignition switch: ON (Check by operating accelerator pedal repeatedly.)	Throttle valve: Set to idle position	ON
			Throttle valve: Slightly open	OFF* <sup>1</sup>
27	Power steering fluid pressure switch	Engine: Idling	Steering wheel stationary	OFF
			Steering wheel turning	ON
28	A/C switch	Engine: Idling (when A/C switch is ON, A/C compressor should be operating.)	A/C switch: OFF	OFF
			A/C switch: ON	ON



Item No.	Inspection item	Inspection contents	Normal condition	
41	Injector drive time*2	Engine: Cranking	When engine coolant temperature is 0°C (injection is carried out for all cylinders simultaneously)	27 – 41 ms
			When engine coolant temperature is 20°C	14 – 22 ms
			When engine coolant temperature is 80°C	3.9 – 5.9 ms
	Injector drive time*3	<ul style="list-style-type: none"> <li>● Engine coolant temperature: 80 – 95°C</li> <li>● Lamps, electric cooling fan and all accessories: OFF</li> <li>● Transmission: Neutral</li> </ul>	Engine is idling	1.2 – 2.4 ms
			2,500 r/min	1.0 – 2.2 ms
			When engine is suddenly raced	Increases
44	Ignition advance	<ul style="list-style-type: none"> <li>● Engine: After having been warmed up</li> <li>● Timing lamp is set. (The timing lamp is set in order to check actual ignition timing.)</li> </ul>	Engine is idling	3 – 13° BTDC
			2,500 r/min	24 – 44° BTDC
45	ISC (stepper) motor position *4	<ul style="list-style-type: none"> <li>● Engine coolant temperature: 80 – 90°C</li> <li>● Lamps, electric cooling fan and all accessories: OFF</li> <li>● Transmission: Neutral</li> <li>● Idle position switch: ON</li> <li>● Engine: Idling (When A/C switch is ON, A/C compressor should be operating.)</li> </ul>	A/C switch: OFF	2 – 25 steps
			A/C switch: OFF → ON	Increases by 10 – 70 steps
			A/C switch: OFF	Increases by 5 – 50 steps
49	A/C relay	Engine: After having been warmed up/Engine is idling	A/C switch: OFF	OFF (Compressor clutch is not operating)
			A/C switch: ON	ON (Compressor clutch is operating)

## NOTE

- \*1: The idle position switch normally turns off when the voltage of the throttle position sensor is 50 – 100 mV higher than the voltage at the idle position. If the idle position switch turns back on after the throttle valve is opened, the idle position switch and the throttle position sensor need to be adjusted.
- \*2: The injector drive time represents the time when the cranking speed is at 250 r/min or below when the power supply voltage is 11 V.
- \*3: In a new vehicle [driven approximately 500 km or less], the injector drive time is sometimes 10% longer than the standard time.
- \*4: In a new vehicle [driven approximately 500 km or less], the step of the stepper motor is sometimes 30 steps greater than the standard value.

## &lt;EVOLUTION-V&gt;

Descriptions other than those given below are the same as for the EVOLUTION-IV.

Item No.	Inspection item	Inspection contents	Normal condition	
12	Air flow sensor*1	<ul style="list-style-type: none"> <li>● Engine coolant temperature: 80 – 95°C</li> <li>● Lamps, electric cooling fan and all accessories: OFF</li> <li>● Transmission: Neutral</li> </ul>	Engine is idling	12 – 38 Hz
			2,500 r/min	36 – 76 Hz
			Engine is raced	Frequency increases in response to racing
41	Injector drive time*2	Engine: Cranking*2	When engine coolant temperature is 0°C	27 – 40 ms
			When engine coolant temperature is 20°C	14.5 – 21.7 ms
			When engine coolant temperature is 80°C	3.8 – 5.6 ms
	Injector drive time *3	<ul style="list-style-type: none"> <li>● Engine coolant temperature: 80 – 95°C</li> <li>● Lamps, electric cooling fan and all accessories: OFF</li> <li>● Transmission: Neutral</li> </ul>	Engine is idling	0.9 – 2.1 ms
			2,500 r/min	0.7 – 1.9 ms
			When engine is suddenly raced	Increases
44	Ignition advance	<ul style="list-style-type: none"> <li>● Engine: After having been warmed up</li> <li>● Timing lamp is set.</li> </ul>	Engine is idling	0 – 13° BTDC
			2,500 r/min	24 – 44° BTDC

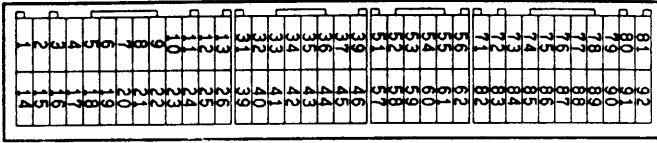
## NOTE

- \*1: In a new vehicle (driven approximately 500 km or less), the air flow sensor output frequency is sometimes 10 % higher than the standard frequency.
- \*2: The injector drive time represents the time when the cranking speed is at 250 r/min or below when the power supply voltage is 11 V.
- \*3: In a new vehicle (driven approximately 500 km or less), the injector drive time is sometimes 10 % longer than the standard time.

## 6. ENGINE-ECU INSPECTION

### 6-1 TERMINAL VOLTAGES

#### Engine ECU connector



9FU0393

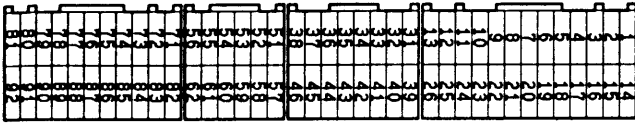
Terminal No.	Check item	Check condition (Engine condition)	Normal condition
1	No.1 injector	While engine is idling after having been warmed up, suddenly depress the accelerator pedal.	Momentarily drops slightly from 11 – 14 V.
14	No.2 injector		
2	No.3 injector		
15	No.4 injector		
3	Fuel pressure control valve	Ignition switch: ON	Battery voltage
		Engine: Cranking to idling (within about two minutes)	0 – 3 V to battery voltage
4	Stepper motor coil (A1)	Engine: Immediately after engine has been started for warming up	Changes repeatedly from battery voltage to 0 – 6 V and from 0 – 6 V to battery voltage.
17	Stepper motor coil (A2)		
5	Stepper motor coil (B1)		
18	Stepper motor coil (B2)		
6	Secondary air control solenoid valve	Ignition switch: ON	Battery voltage
8	Fuel pump relay	Ignition switch: ON	Battery voltage
		Engine: Idling	0 – 3 V
10	Power transistor unit (A)	Engine speed: 3,000 r/min	0.3 – 3.0 V
23	Power transistor unit (B)		
11	Wastegate solenoid valve	Ignition switch: ON	Battery voltage
		Engine: At idle after having been warmed up (when premium gasoline is used)	0 – 3 V
12	Power supply	Ignition switch: ON	Battery voltage
25			
19	Air flow sensor reset signal	Engine: Idling	0 – 1 V
		Engine speed: 3,000 r/min	6 – 9 V
20	Fan motor relay (HI)	Fan not operating (coolant temperature: 90°C or below)	Battery voltage
		Fan at high speed (coolant temperature: 105°C or above)	0 – 3 V

Terminal No.	Check item	Check condition (Engine condition)		Normal condition
21	Fan motor relay (LOW)	Fan not operating (coolant temperature: 90°C or below)		Battery voltage
		Fan at low speed (coolant temperature: 90 – 100°C)		0 – 3 V
22	A/C relay	<ul style="list-style-type: none"> <li>● Engine: Idling</li> <li>● A/C switch: OFF to ON (Compressor is being driven.)</li> </ul>		Battery voltage, or 6 V or more instantaneously to 0 – 3 V
33	Alternator G terminal	<ul style="list-style-type: none"> <li>● Engine: Warm, idle (radiator fan: OFF)</li> <li>● Headlamp: OFF to ON</li> <li>● Brake lamp: OFF to ON</li> <li>● Rear defogger switch: OFF to ON</li> </ul>		Voltage rises by 0.2 – 3.5 V.
36	Engine warning lamp	Ignition switch: OFF → ON		0 – 3 V → Battery voltage (After several seconds have elapsed)
37	Power steering fluid pressure switch	Engine: Idling after warming up	When steering wheel is stationary	Battery voltage
			When steering wheel is turned	0 – 3 V
38	Control relay	Ignition switch: OFF		Battery voltage
		Ignition switch: ON		0 – 3 V
39	Fuel pump relay No.2	While engine is idling, suddenly depress the accelerator pedal.		Momentarily rises slightly from 0 to 3 V.
40	Exhaust temperature warning lamp	Ignition switch: OFF to ON		0 – 3 V to battery voltage (After several seconds have elapsed)
41	Alternator FR terminal	<ul style="list-style-type: none"> <li>● Engine: Warm, idle (radiator fan: OFF)</li> <li>● Headlamp: OFF to ON</li> <li>● Brake lamp: OFF to ON</li> <li>● Rear defogger switch: OFF to ON</li> </ul>		Voltage drops by 0.2 – 3.5 V.
45	A/C switch	Engine: Idle speed	Turn the A/C switch OFF	0 – 3 V
			Turn the A/C switch ON (A/C compressor is operating)	Battery voltage
60	Oxygen sensor heater (Evolution-V only)	Engine: Idling		0 – 3 V
		Engine speed: 5,000 r/min		Battery voltage
71	Ignition switch-ST	Engine: Cranking		8 V or more

Terminal No.	Check item	Check condition (Engine condition)		Normal condition
72	Intake air temperature sensor	Ignition switch: ON	When intake air temperature is 0°C	3.2 – 3.8 V
			When intake air temperature is 20°C	2.3 – 2.9 V
			When intake air temperature is 40°C	1.5 – 2.1 V
			When intake air temperature is 80°C	0.4 – 1.0 V
76	Oxygen sensor	Engine: Running at 2,000 r/min after having been warmed up (Check using a digital type voltmeter)		0 ↔ 0.8 V (Changes repeatedly)
80	Backup power supply	Ignition switch: OFF		Battery voltage
81	Sensor impressed voltage	Ignition switch: ON		4.5 – 5.5 V
82	Ignition switch-IG	Ignition switch: ON		Battery voltage
83	Engine coolant temperature sensor	Ignition switch: ON	When engine coolant temperature is 0°C	3.2 – 3.8 V
			When engine coolant temperature is 20°C	2.3 – 2.9 V
			When engine coolant temperature is 40°C	1.3 – 1.9 V
			When engine coolant temperature is 80°C	0.3 – 0.9 V
84	Throttle position sensor	Ignition switch: ON	Set throttle valve to idle position	0.3 – 1.0 V
			Fully open throttle valve	4.5 – 5.5 V
85	Barometric pressure sensor	Ignition switch: ON	When altitude is 0 m	3.7 – 4.3 V
			When altitude is 1,200 m	3.2 – 3.8 V
86	Vehicle speed sensor	<ul style="list-style-type: none"> <li>● Ignition switch: ON</li> <li>● Move the vehicle slowly forward</li> </ul>		0 ↔ 5 V (Changes repeatedly)
87	Idle position switch	Ignition switch: ON	Set throttle valve to idle position	0 – 1 V
			Slightly open throttle valve	4 V or more
88	Camshaft position sensor	Engine: Cranking		0.4 – 3.0 V
		Engine: Idle speed		0.5 – 2.0 V
89	Crank angle sensor	Engine: Cranking		0.4 – 4.0 V
		Engine: Idle speed		1.5 – 2.5 V
90	Air flow sensor	Engine: Idle speed		2.2 – 3.2 V
		Engine speed: 2,500 r/min		

## 6-2 RESISTANCE AND CONTINUITY BETWEEN HARNESS SIDE CONNECTORS AND TERMINALS

### Engine-ECU Harness Side Connector Terminal Arrangement



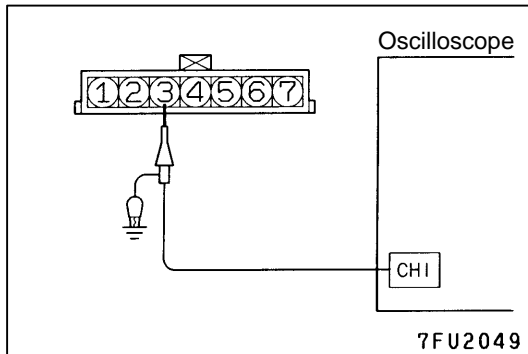
9FU0392

Terminal No.	Inspection item	Normal condition (Check condition)
1 – 12	No.1 injector	2 – 3 $\Omega$ (At 20°C)
14 – 12	No.2 injector	
2 – 12	No.3 injector	
15 – 12	No.4 injector	
3 – 12	Fuel pressure control valve	28 – 36 $\Omega$ (At 20°C)
4 – 12	Stepper motor coil (A1)	28 – 33 $\Omega$ (At 20°C)
17 – 12	Stepper motor coil (A2)	
5 – 12	Stepper motor coil (B1)	
18 – 12	Stepper motor coil (B2)	
6 – 12	Secondary air control solenoid valve	28 – 36 $\Omega$ (At 20°C)
11 – 12	Wastegate solenoid valve	62 – 74 $\Omega$ (At 20°C)
13 – Body earth	Engine-ECU earth	Continuity established (0 $\Omega$ )
26 – Body earth		
60 – 12	Oxygen sensor heater (EVOLUTION-V only)	11 – 18 $\Omega$ (at 20°C)
72 – 92	Intake air temperature sensor	5.3 – 6.7 k $\Omega$ (When intake air temperature is 0°C)
		2.3 – 3.0 k $\Omega$ (When intake air temperature is 20°C)
		1.0 – 1.5 k $\Omega$ (When intake air temperature is 40°C)
		0.30 – 0.42 k $\Omega$ (When intake air temperature is 80°C)
74 – 77	High temperature sensor	3 $\Omega$ or less
83 – 92	Engine coolant temperature sensor	5.1 – 6.5 k $\Omega$ (When coolant temperature is 0°C)
		2.1 – 2.7 k $\Omega$ (When coolant temperature is 20°C)
		0.9 – 1.3 k $\Omega$ (When coolant temperature is 40°C)
		0.26 – 0.36 k $\Omega$ (When coolant temperature is 80°C)
87 – 92	Idle position switch	Continuity established (when throttle valve is at idle position)
		No continuity (when throttle valve is slightly open)
91 – Body earth	–	Continuity established

## 7. INSPECTION PROCEDURE USING OSCILLOSCOPE

### 7-1 AIR FLOW SENSOR (AFS)

Observing waveforms displayed on the oscilloscope allows you to visually identify possible unusual disturbances in waveform that could temporarily occur in the air flow sensor output.



#### <Measurement procedure>

- (1) Disconnect the air flow sensor connector and connect the special tool (Test Harness: MB991709) to it. (Ensure that all terminals are connected.)
- (2) Connect the oscilloscope probe to terminal no. 3 of air flow sensor connector.

#### NOTE

If the engine ECU connector is used, connect the oscilloscope probe to terminal no. 90.

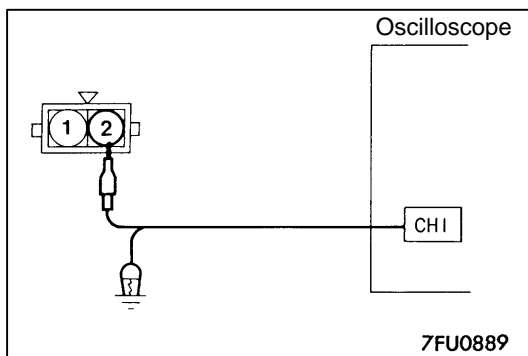
- (3) Perform the same steps from here on as with the 4G9 engine.

### 7-2 CAMSHAFT POSITION SENSOR AND CRANK ANGLE SENSOR

Perform the same steps as with the conventional 4G9 engine for the inspection.

### 7-3 INJECTOR

Observing waveforms displayed on the oscilloscope allows you to visually check the conditions of injector drive signals actually output from the engine ECU.



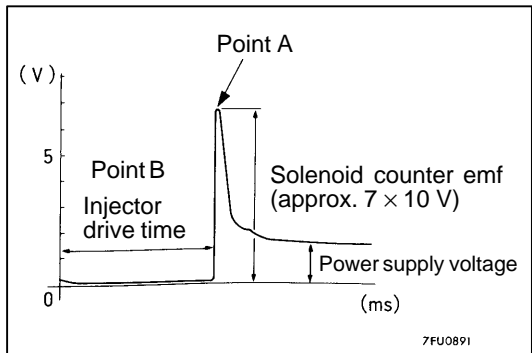
#### Injector Control Signal (Oscilloscope 1)

#### <Measurement procedure>

- (1) Disconnect the injector connector and connect the special tool (Test Harness: MB991348) to the circuit. (Ensure that the terminals on both the power supply and engine ECU sides are connected.)
- (2) Connect the oscilloscope probe to terminal no. 2 of injector connector.

#### NOTE

If the engine ECU connector is used for the measurement, take measurements at each of the following terminals. Connect the oscilloscope probe to terminal no. 1 when the waveform is observed with no. 1 cylinder, to terminal no. 14 when the waveform is observed with no. 2 cylinder, to terminal no. 2 when the waveform is observed with no. 3 cylinder, and to terminal no. 15 when the waveform is observed with no. 4 cylinder.



<Standard waveform>

Observation conditions

Probe selector switch	× 10
AC-GND-DC	DC
VOLTS/DIV.	1 V
TIME/DIV.	0.5 ms
Misc.	–
Engine speed	Idle

<Explanation on waveform>

The power supply voltage is being normally applied and, when a signal is received from the engine ECU, the voltage drops to around 0 V for the period of time equivalent to its drive signal. When the signal from the engine ECU turns OFF, the counter emf of the coil causes a voltage peak to develop, thus resuming the power supply voltage.

Injector drive time:

The fuel injection time as determined by the engine ECU according to the output values of sensors including AFS. Injector drive time = effective injection time + invalid injection time (Invalid injection time: corrects operation time lag caused by a power supply voltage drop)

Solenoid coil counter emf:

When the signal from the engine ECU turns OFF, counter emf occurs in the injector coil (approx. 65 to 75 V).

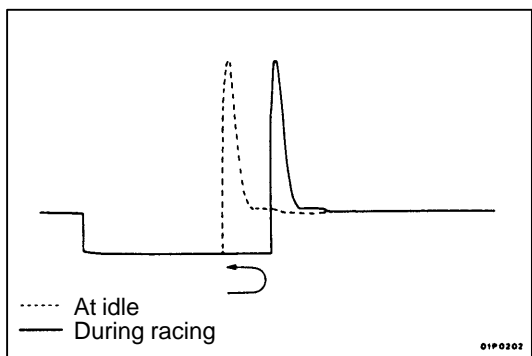
Power supply voltage:

The power supply voltage is being applied in the absence of a signal from the engine ECU. If this voltage is low, it extends the invalid injection time and, thus, the drive time.

<Waveform observation points>

**Point A:** Strength of solenoid coil counter emf

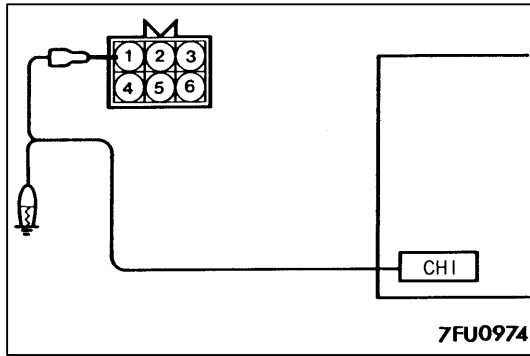
Solenoid coil counter emf is low or zero.	Injector solenoid shorting
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**Point B:** Injector drive time

When the engine is suddenly raced, the drive time temporarily extends by a wide margin and soon returns to the normal drive time corresponding to the engine speed.





**Injector Power Supply Voltage (Oscilloscope 2)**

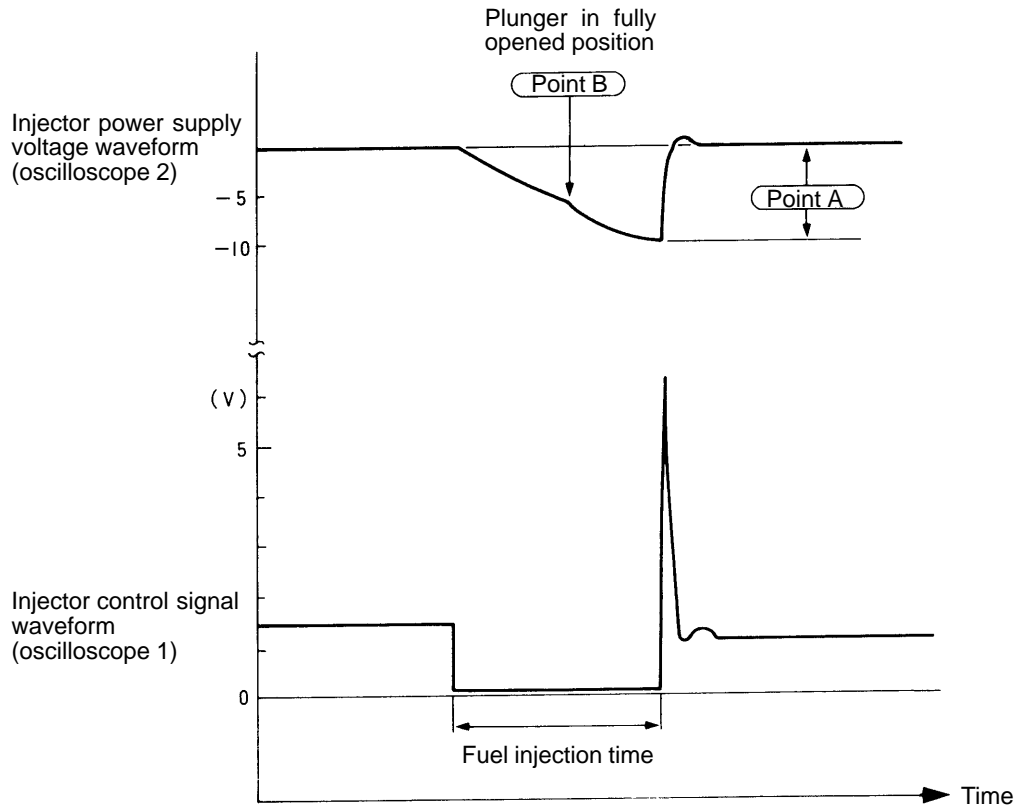
**<Measurement procedure>**

- (1) Disconnect the resistor connector and connect the special tool (Harness Connector: MD998463) to the circuit.
- (2) Connect the oscilloscope probe to resistor connector terminal (1) (special tool red clip) when the waveform is observed with no. 1 cylinder, to terminal (4) (black clip) when the waveform is observed with no. 2 cylinder, to terminal (5) (green clip) when the waveform is observed with no. 3 cylinder, and to terminal (6) (yellow clip) when the waveform is observed with no. 4 cylinder.
- (3) For the power supply voltage, observe the waveform of the injector control signal at the same time. (Refer to P.13-26 for the injector control signal measurement procedure.)

**<Standard waveform>**

**Observation conditions**

	Injector power supply voltage waveform	Injector control signal
Probe selector switch	× 1	× 10
AC-GND-DC	AC	DC
VOLTS/DIV.	5 V	1 V
TIME/DIV.	0.5 ms	
Misc.	To be timed with injector control signal	
Engine speed	Idle (850 rpm)	



**<Explanation of waveform>**

The injector power supply voltage waveform shows a voltage drop caused by resistance of the resistor. As the amount of current increases, voltage gradually decreases and a spike occurs at the plunger fully opened position due to counter emf.

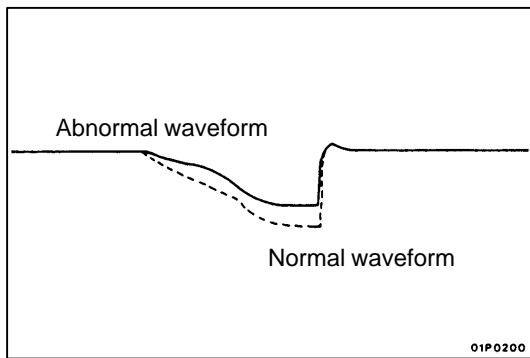
**<Waveform observation points>**

**Point A:** Voltage drop during fuel injection time (Refer to abnormal waveform example 1.)

Difference from standard waveform	Possible cause
Voltage drop during fuel injection time is small (there should normally be a voltage drop of about 10 V).	Resistance of resistor is too small. Resistance of injector is too large.

**Point B:** Spike when plunger is fully open (Refer to abnormal waveform example 2.)

Difference from standard waveform	Possible cause
No spike when plunger is fully open	Plunger inoperative



**<Abnormal waveform examples>**

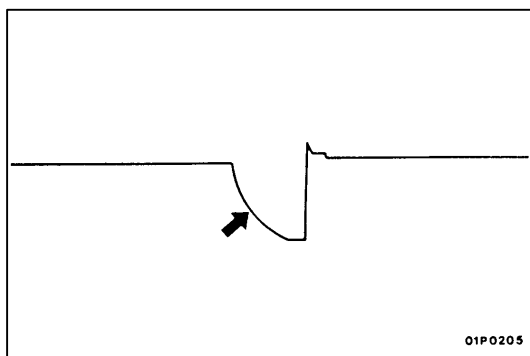
- Example 1

**[Cause of problem]**

Resistance of the resistor is too small.

**[Waveform characteristics]**

Small voltage drop



- Example 2

**[Cause of problem]**

Plunger is inoperative.

**[Waveform characteristics]**

No spike when plunger is fully open.

**7-4 IGNITION COIL**

Perform the same steps as with the conventional 4G9 engine for the inspection.

## ON-VEHICLE SERVICE

### 1. IDLE POSITION SWITCH AND THROTTLE POSITION SENSOR (TPS) ADJUSTMENT

The thickness of the feeler gauge inserted between the fixed SAS and throttle lever should be 0.45 mm.

### 2. FIXED SAS ADJUSTMENT

#### <EVOLUTION-IV>

Turn down one turn after the fixed SAS has touched the throttle lever.

#### <EVOLUTION-V>

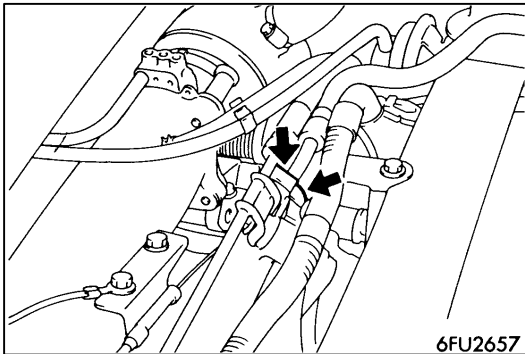
Turn down 1-1/4 turns after the fixed SAS has touched the throttle lever.

### 3. BASIC IDLE SPEED ADJUSTMENT

The basic idle speed should be  $850 \pm 50$  rpm.

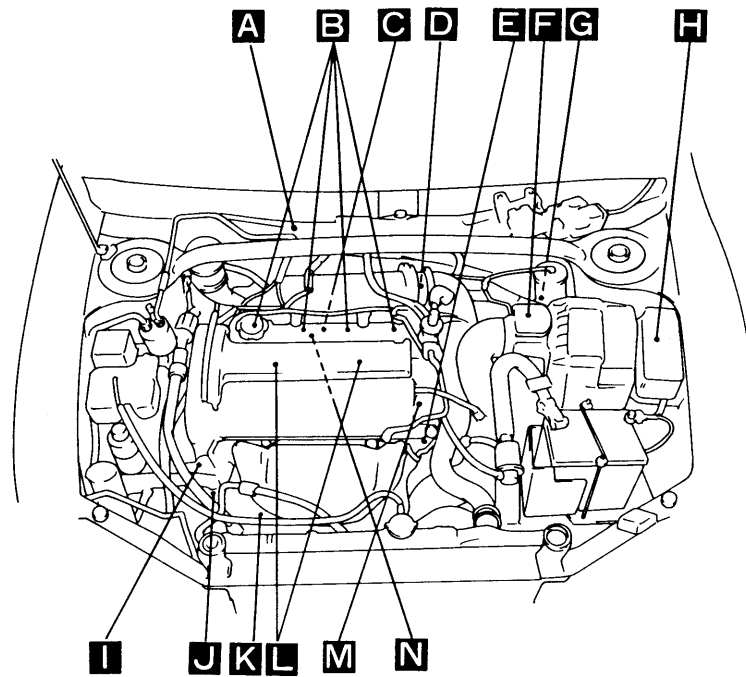
### 4. FUEL PRESSURE MEASUREMENT

The fuel pressure gauge should be installed at the location shown on the left.

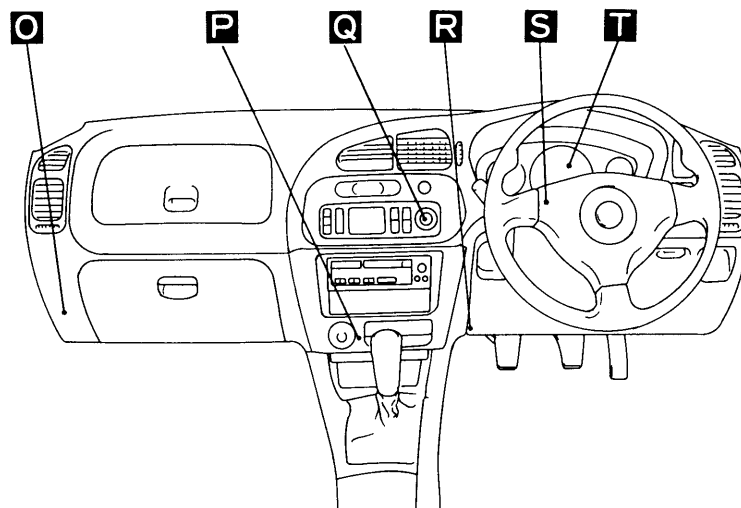


5. MPI SYSTEM COMPONENTS LAYOUT

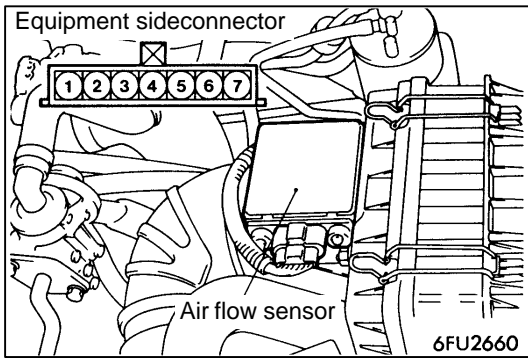
Name	Symbol	Name	Symbol
A/C switch	Q	Exhaust temperature warning lamp	S
A/C relay	H	Fuel pressure control valve	A
Air flow sensor (with a built-in intake air temperature sensor and barometric pressure sensor)	F	Ignition coil and power transistor unit	L
		Injector	B
Camshaft position sensor	M	ISC servo	D
Control relay and fuel pump relay	P	Oxygen sensor	K
Coolant temperature sensor	E	Power steering fluid pressure switch	I
Crank angle sensor	J	Secondary air control solenoid valve	N
Detonation sensor	C	Throttle position sensor (with a built-in idle switch)	D
Diagnosis connector	R		
Engine ECU	O	Vehicle speed sensor	T
Engine warning lamp	S	Wastegate solenoid valve	G



6FU2658



6FU2659

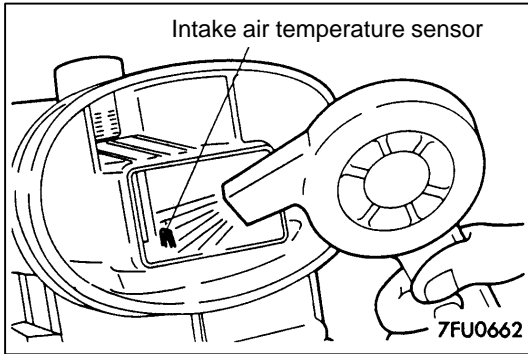


### 6. INTAKE AIR TEMPERATURE SENSOR CHECK

1. Disconnect the air flow sensor connector.
2. Measure resistance between terminals 5 and 6.

**Standard value:**

2.3 – 3.0 kΩ (at 20°C)  
0.30 – 0.42 kΩ (at 80°C)

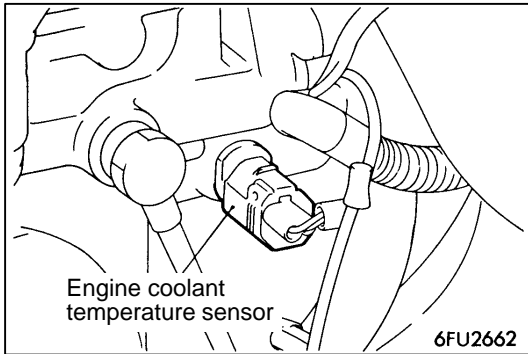


3. Measure resistance while heating the sensor using a hair drier.

**Normal condition:**

Temperature (°C)	Resistance (kΩ)
Higher	Smaller

4. If the value deviates from the standard value or the resistance remains unchanged, replace the air flow sensor assembly.

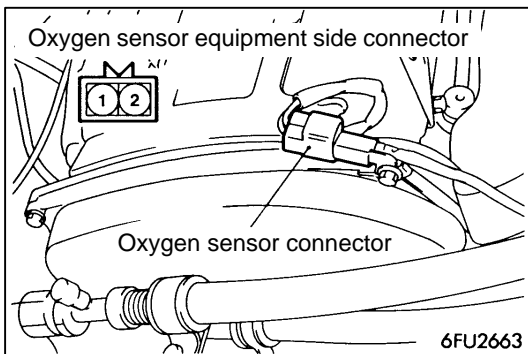


### 7. ENGINE COOLANT TEMPERATURE SENSOR CHECK

The engine coolant temperature sensor is located as shown on the left.

**Standard value:**

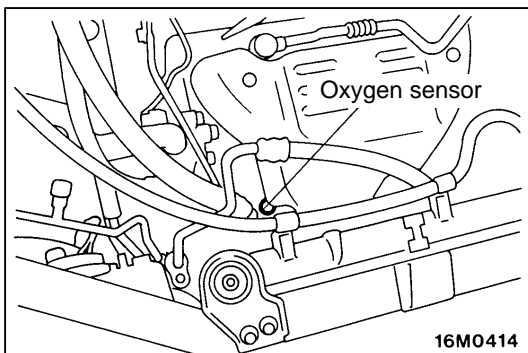
2.1 – 2.7 kΩ (at 20°C)  
0.26 – 0.36 kΩ (at 80°C)



### 8. OXYGEN SENSOR CHECK

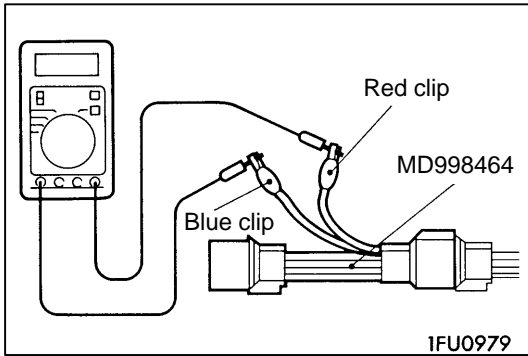
<EVOLUTION-IV>

The sensor connector is located as shown on the left.

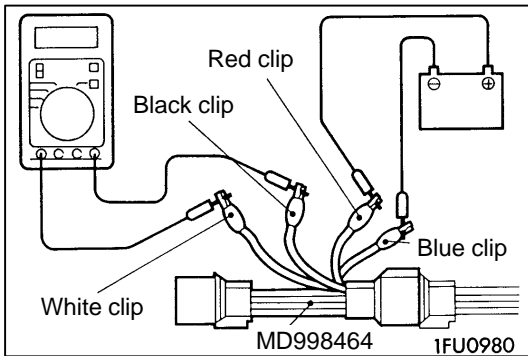


<EVOLUTION-V>

- (1) Disconnect the oxygen sensor connector and connect the special tool (Test Harness: MD998464) to the oxygen sensor connector.



- (2) Check that there is continuity (11 to 18  $\Omega$  at 20°C) across terminal no. 1 (special tool red clip) and terminal no. 3 (special tool blue clip) of the oxygen sensor connector.
- (3) If there is no continuity, replace the oxygen sensor.



- (4) Run the engine until the engine coolant temperature exceeds 80°C.
- (5) Using jumper wires, connect oxygen sensor terminal no. 1 (special tool red clip) and terminal no. 3 (special tool blue clip) to battery (+) and (-) terminal, respectively.

**Caution**

**Make sure of the correct connections: if a wrong connection is made, a broken oxygen sensor results.**

- (6) Connect a digital voltmeter between terminal no. 2 (special tool black clip) and terminal no. 4 (special tool white clip).
- (7) Race the engine repeatedly to measure the oxygen sensor output voltage.

**Standard value:**

Engine	Oxygen sensor output voltage	NOTE
When engine is raced	0.6 – 1.0 V	When engine racing is repeated to enrich air-fuel ratio, an operational oxygen sensor should output a voltage of 0.6 to 1.0 V.

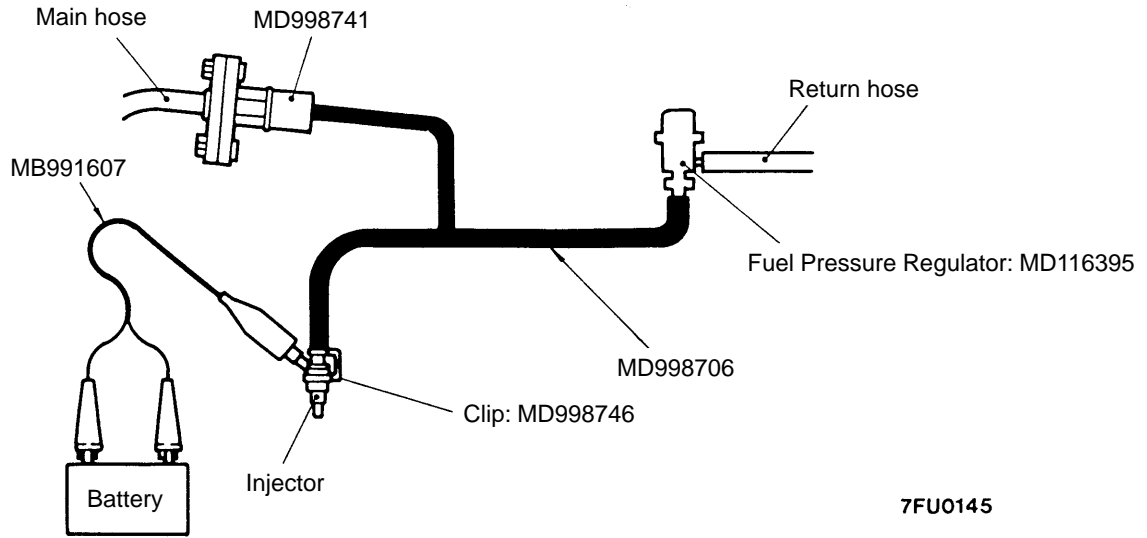
**NOTE**

Use the same procedures to remove and install the oxygen sensor.

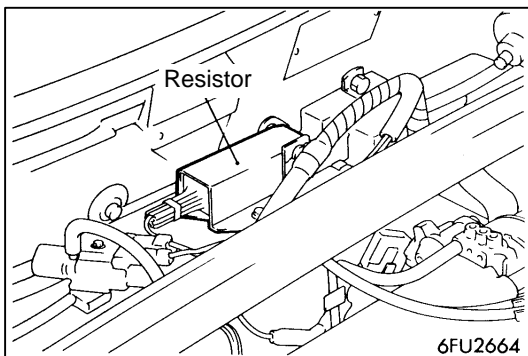
### 9. INJECTOR CHECK

#### Injection Condition Check

- (1) Release the residual pressure from the fuel pipe line to prevent fuel from flowing out.
- (2) Remove the injector.
- (3) Set up the special tools (Injector Test Set, Adapter, Fuel Pressure Regulator, and Clip) as illustrated below.
- (4) From here on, use the same procedure as with the conventional 4G9 engine for the check.



7FU0145

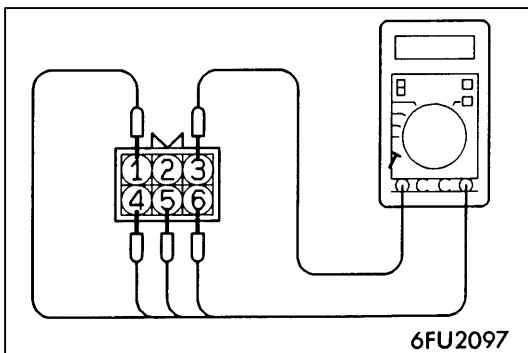


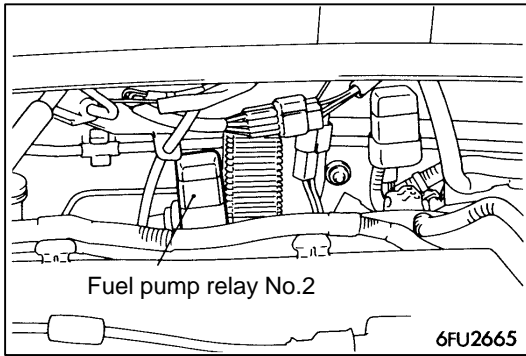
### 10. RESISTOR CHECK

- (1) Disconnect the resistor connector.
- (2) Measure resistance across terminals as detailed below.

#### Standard value

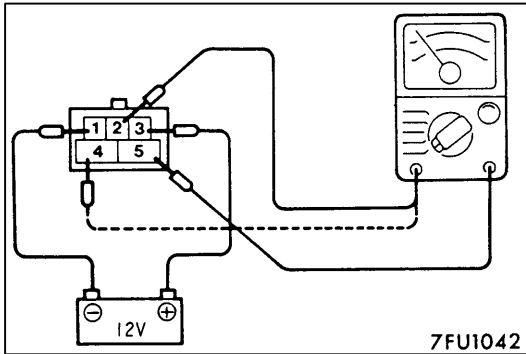
Measurement terminals	Resistance ( $\Omega$ )
1 – 3	5.5 to 6.5 (at 20°C)
4 – 3	
5 – 3	
6 – 3	





### 11. FUEL PUMP RELAY NO.2 CHECK

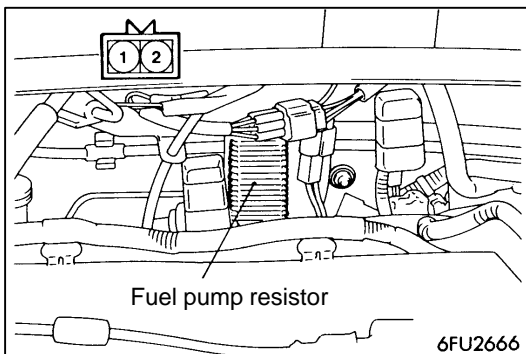
- (1) Remove fuel pump relay No.2.



- (2) Using jumper wires, connect fuel pump relay No.2 terminal (3) to battery (+) terminal, and terminal (1) to battery (-) terminal, respectively.
- (3) Connecting and disconnecting the jumper wire on the battery (-) terminal end, check for continuity across terminal (2) and terminal (5), and across terminal (4) and terminal (5), of fuel pump relay No.2.

Jumper wire	Continuity across terminals (2) and (5)	Continuity across terminals (4) and (5)
Connected	No	Yes
Disconnected	Yes	No

- (4) If the continuity is checked abnormally, replace fuel pump relay No.2.



### 12. FUEL PUMP RESISTOR CHECK

- (1) Disconnect the fuel pump resistor connector.

- (2) Measure resistance across the terminals.

**Standard value: 0.6 – 0.9 Ω**

- (3) If the measurement falls outside the specified range, replace the fuel pump resistor.



# INJECTOR

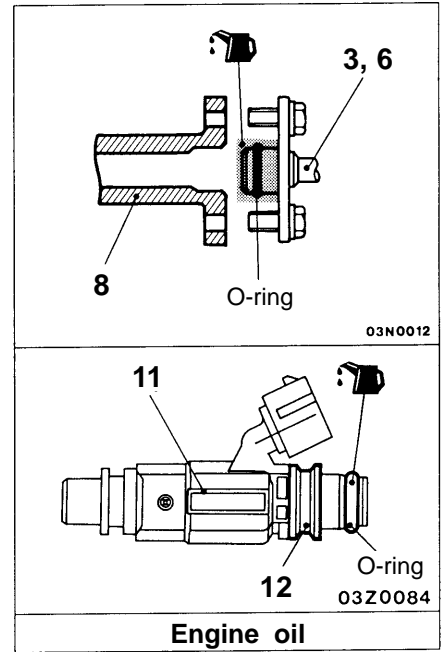
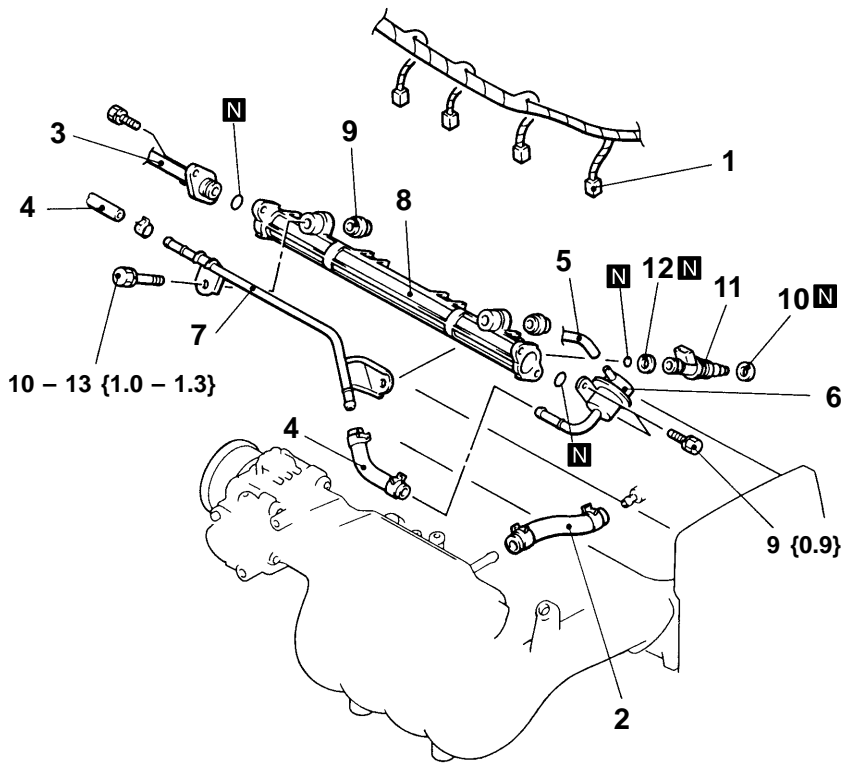
## REMOVAL AND INSTALLATION

### Pre-removal Operation

- (1) Fuel Discharge Prevention
- (2) Air Hose D Removal  
(Refer to GROUP15 – Intercooler.)

### Post-installation Operation

- (1) Air Hose D Installation  
(Refer to GROUP15 – Intercooler.)
- (2) Fuel Leakage Check



03M0069

Unit: Nm {kgf·m}

### Removal steps

- ◀A▶ 1. Injector connector
- ◀A▶ 2. PCV hose connection
- ◀A▶ 3. High-pressure fuel hose connection
- ◀A▶ 4. Fuel return hose connection
- ◀A▶ 5. Vacuum hose connector
- ◀A▶ 6. Fuel pressure regulator

- ◀A▶ 7. Fuel return pipe
- ◀A▶ 8. Delivery pipe
- ◀A▶ 9. Insulator
- ◀A▶ ▶A◀ 10. Insulator
- ◀A▶ ▶A◀ 11. Injector
- ◀A▶ ▶A◀ 12. Grommet

# THROTTLE BODY

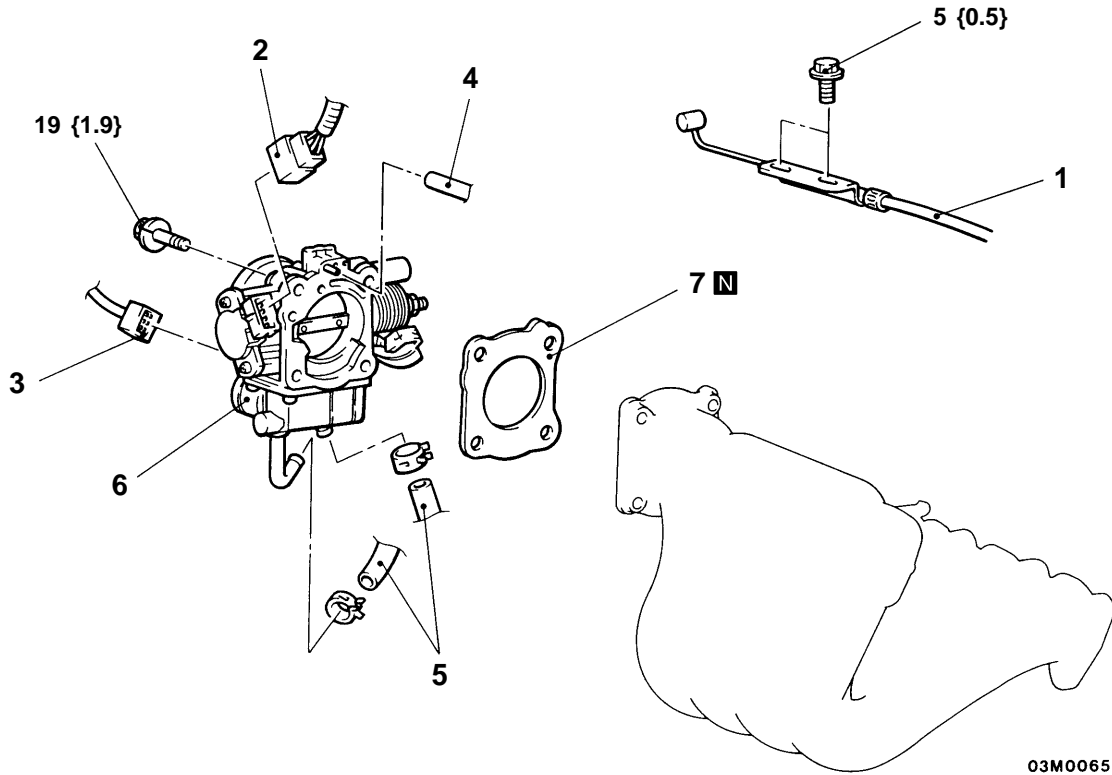
## REMOVAL AND INSTALLATION

**Pre-removal Operation**

- (1) Engine Coolant Draining
- (2) Air Hose D Removal
- (Refer to GROUP 15 – Intercooler.)
- (3) Strut Tower Bar Removal

**Post-installation Operation**

- (1) Strut Tower Bar Installation
- (2) Air Hose D Installation
- (Refer to GROUP 15 – Intercooler.)
- (3) Engine Coolant Supplying
- (4) Accelerator Cable Adjustment



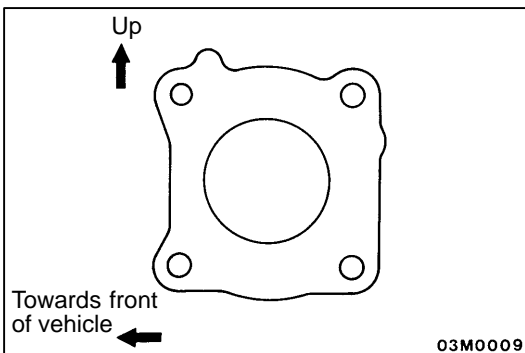
03M0065

Unit: Nm {kgf·m}

**Removal steps**

- 1. Accelerator cable connection
- 2. Throttle position sensor connector
- 3. Idle speed control servo connector
- 4. Vacuum hose connection

- 5. Water hose connection
- 6. Throttle body
- 7. Throttle body gasket



03M0009

**INSTALLATION SERVICE POINT**

**▶A◀ THROTTLE BODY GASKET INSTALLATION**

Place the gasket so that the projecting part is positioned as shown in the illustration, and then install it between the intake manifold and the throttle body.

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# ENGINE COOLING

## CONTENTS



<b>SERVICE SPECIFICATIONS</b> .....	<b>2</b>	<b>THERMOSTAT</b> .....	<b>3</b>
<b>LUBRICANT</b> .....	<b>2</b>	<b>WATER PUMP</b> .....	<b>5</b>
<b>ON-VEHICLE SERVICE</b> .....	<b>2</b>	<b>WATER HOSE AND WATER PIPE</b> .....	<b>6</b>
Coolant Replacement .....	2	<b>RADIATOR</b> .....	<b>7</b>



## SERVICE SPECIFICATIONS

Items		Standard value
Thermostat valve opening temperature °C	When open	76.5 ± 1.5
	When fully open	90
Thermostat lift mm		8.5 or more

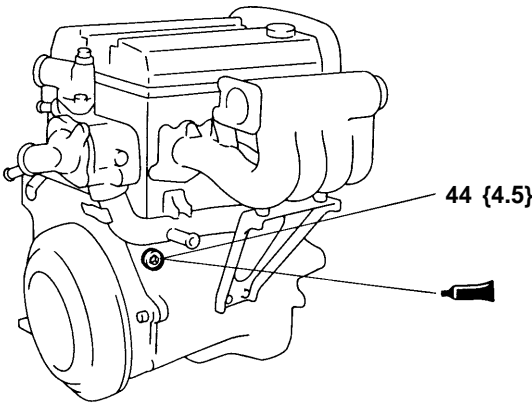
## LUBRICANT

Items	Brand	Quantity dm <sup>3</sup> {ℓ}
Coolant capacity (in condenser tank)	mitsubishi_genuine_dia_queen_super_long_life_coolant	6 {6}

## ON-VEHICLE SERVICE

### COOLANT REPLACEMENT

#### CYLINDER BLOCK DRAIN PLUG



04M0052

Unit: Nm {kgf · m}

**Drying sealant: HELMESEAL H-1M**

### RADIATOR CAP VALVE OPENING PRESSURE CHECK

On EVOLUTION-V, the radiator cap valve opening pressure must be as shown below.

**Standard value: 93 – 123 kPa {0.95 – 1.25 kgf/cm<sup>2</sup>}**

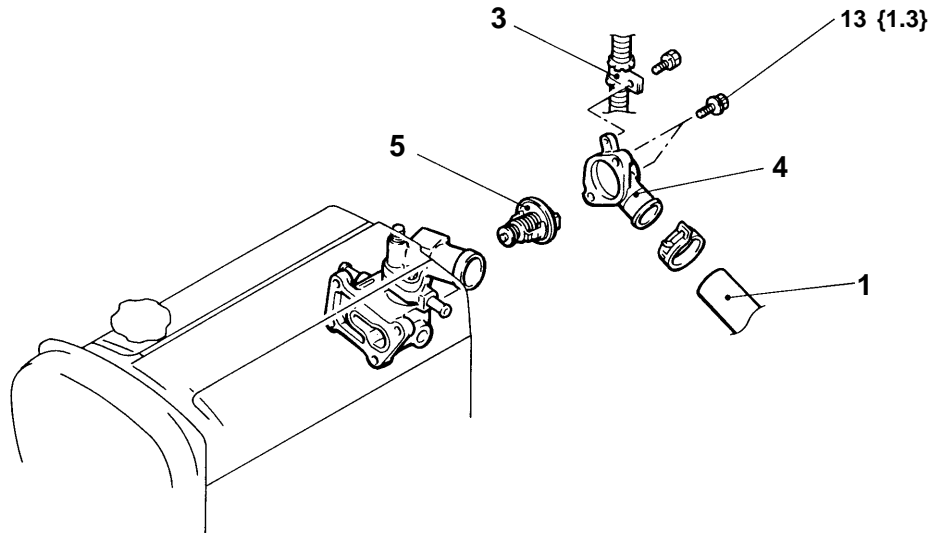
**Limit: 83 kPa {0.85 kgf/cm<sup>2</sup>}**

# THERMOSTAT

## REMOVAL AND INSTALLATION

### Pre-removal and Post-installation Operation

- Engine Coolant Draining and Supplying  
(Refer to P.14-2.)
- Air Intake Hose Assembly Removal and Installation  
(Refer to GROUP 15 – Intercooler.)



04M0051

Unit: Nm {kgf·m}

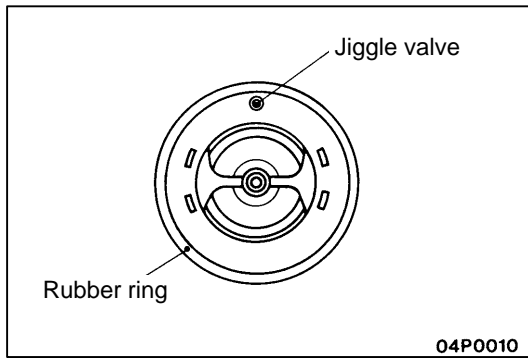
### Removal steps

- ◀A▶ ▶B▶ 1. Radiator lower hose connection  
 ▶A▶ ▶B▶ 2. Control wiring harness connection  
 ▶A▶ ▶B▶ 3. Water inlet fitting  
 ▶A▶ ▶B▶ 4. Thermostat

### REMOVAL SERVICE POINT

#### ◀A▶ RADIATOR LOWER HOSE DISCONNECTION

After making mating marks on the radiator hose and the hose clamp, disconnect the radiator hose.



## INSTALLATION SERVICE POINTS

### ►A◄ THERMOSTAT INSTALLATION

- (1) Install the thermostat so that the jiggle valve is facing straight up.

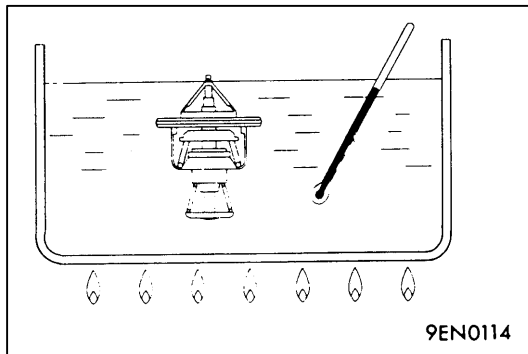
#### Caution

**Make absolutely sure that no oil is adhering to the rubber ring of the thermostat. If the rubber ring is damaged, replace the thermostat.**

- (2) When assembling the thermostat, be careful not to fold over or scratch the rubber ring.

### ►B◄ RADIATOR LOWER HOSE CONNECTION

- (1) Insert each hose as far as the projection of the water inlet fitting.
- (2) Align the mating marks on the radiator hose and hose clamp, and then connect the radiator hose.



## INSPECTION

### THERMOSTAT CHECK

- (1) Immerse the thermostat in water, and heat the water while stirring. Check the thermostat valve opening temperature.

**Standard value:  $76.5 \pm 1.5^{\circ}\text{C}$**

- (2) Check that the amount of valve lift is at the standard value when the water is at the full-opening temperature.

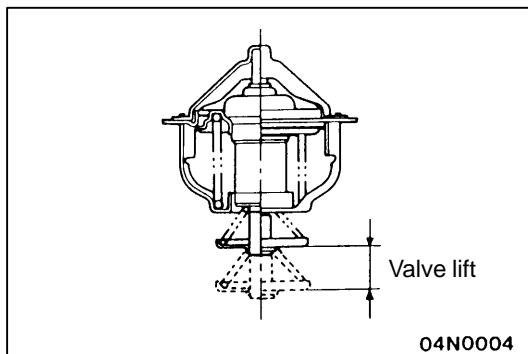
**Standard value:**

**Full-opening temperature:  $90^{\circ}\text{C}$**

**Amount of valve lift: 8.5 mm or more**

#### NOTE

Measure the valve height when the thermostat is fully closed, calculate the valve lift by subtracting this measurement from the valve height when the thermostat is fully open.

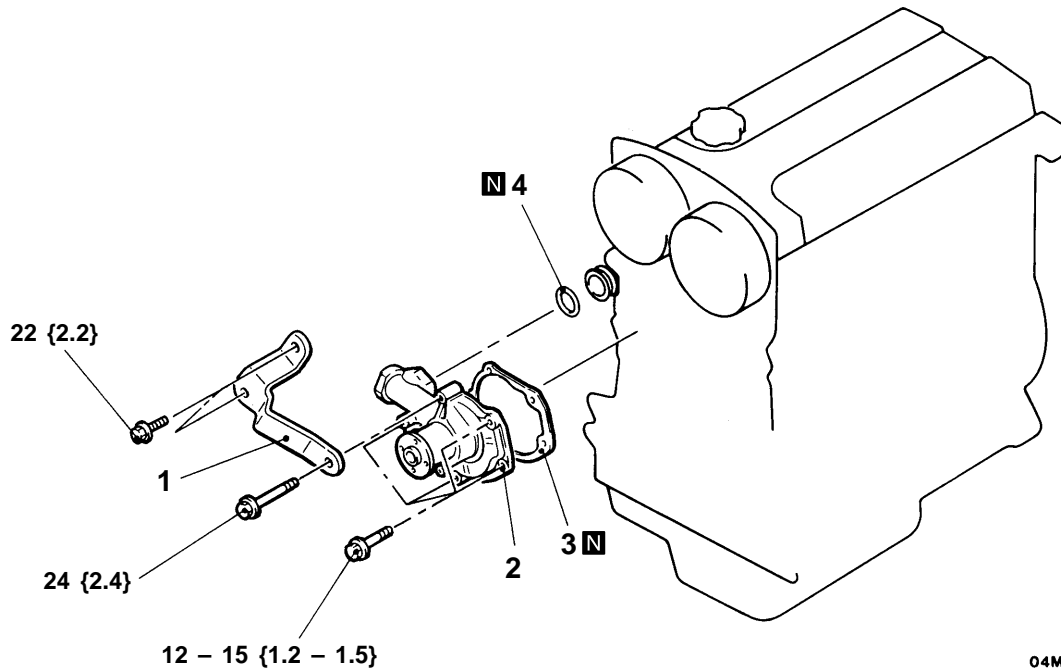


# WATER PUMP

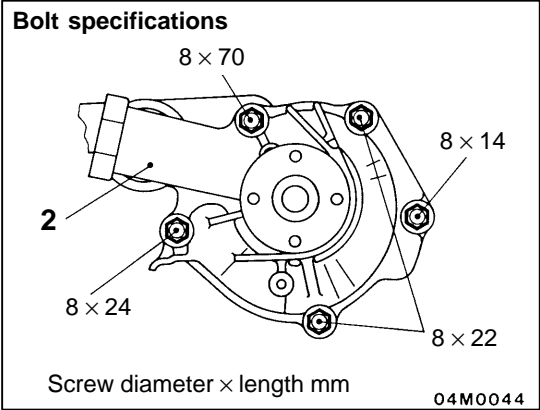
## REMOVAL AND INSTALLATION

**Pre-removal and Post-installation Operation**

- Engine Coolant Draining and Supplying (Refer to P.14-2.)
- Timing Belt and Timing Belt B Removal and Installation (Refer to GROUP 11.)

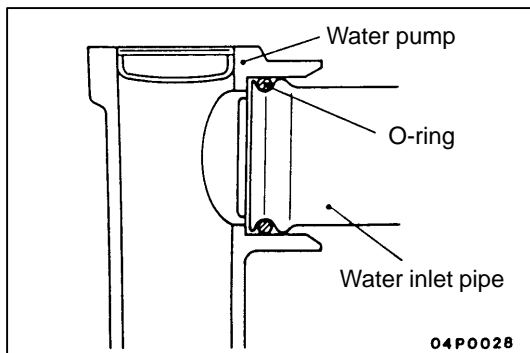


04M0047 Unit: Nm {kgf·m}



**Removal steps**

1. Alternator brace
2. Water pump
3. Water pump gasket
4. O-ring



### INSTALLATION SERVICE POINT

**▶A◀ O-RING INSTALLATION**

Fit the O-ring in the O-ring groove in the water inlet pipe, and coat the outer circumference of the O-ring or the inside surface of the water pump with water before inserting the pipe.



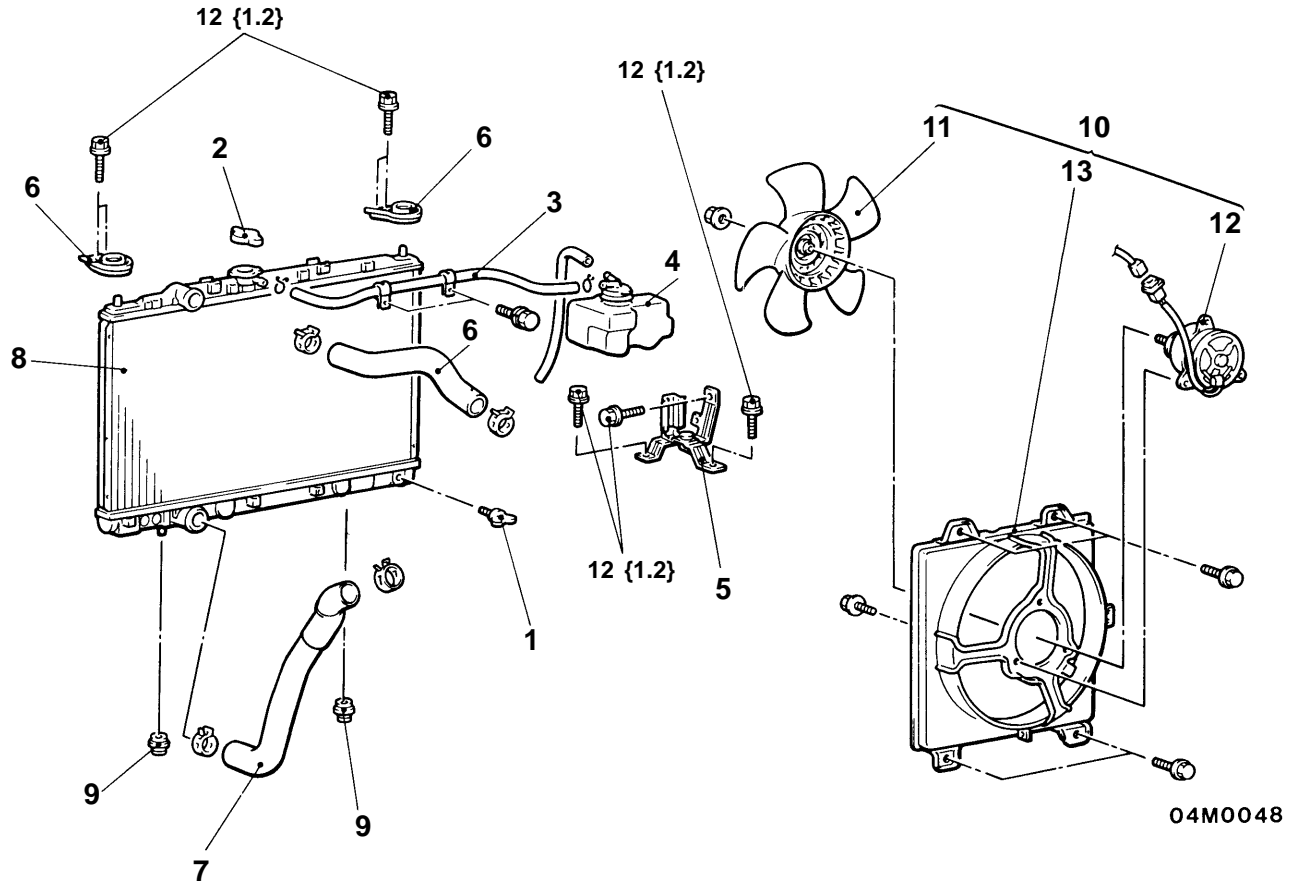


# RADIATOR

## REMOVAL AND INSTALLATION

**Pre-removal and Post-installation Operation**

- Engine Coolant Draining and Supplying (Refer to P.14-2.)



Unit: Nm {kgf·m}

**Radiator removal steps**

1. Drain plug
2. Radiator cap
3. Overflow hose
4. Reserve tank
5. Reserve tank bracket
6. Radiator upper hose
7. Radiator lower hose
8. Radiator assembly
9. Lower insulator
10. Radiator fan motor assembly



**Radiator fan motor removal steps**

1. Drain plug
2. Radiator cap
6. Radiator upper hose
- Air intake hose  
(Refer to GROUP15 – Intercooler.)
10. Radiator fan motor assembly
11. Fan
12. Radiator fan motor
13. Shroud



**REMOVAL SERVICE POINTS**

**◀A▶ RADIATOR UPPER HOSE / RADIATOR LOWER HOSE DISCONNECTION**

After making mating marks on the radiator hose and the hose clamp, disconnect the radiator hose.

**INSTALLATION SERVICE POINT**

**▶A◀ RADIATOR LOWER HOSE / RADIATOR UPPER HOSE CONNECTION**

- (1) Insert each hose as far as the projection of the water inlet or outlet fitting.
- (2) Align the mating marks on the radiator hose and hose clamp, and then connect the radiator hose.

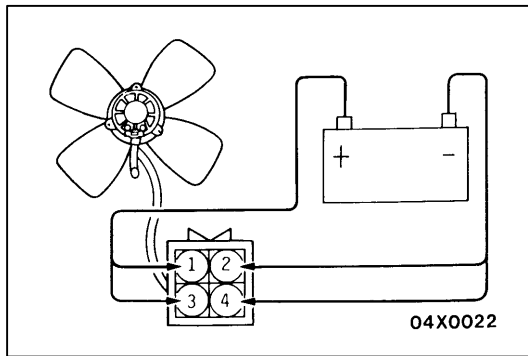
**Caution**

**Fit the clamp on the hose at the same position as before.**

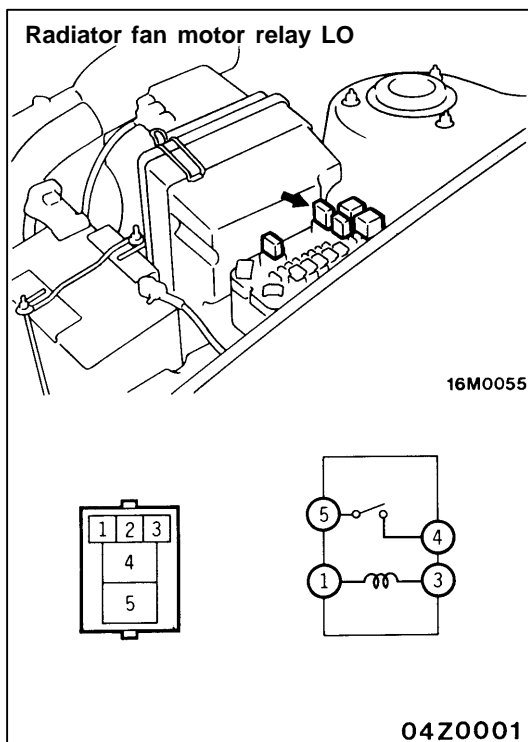
**INSPECTION**

**1. RADIATOR FAN MOTOR CHECK**

Apply the battery voltage across connector terminals 1 and 2, and terminals 3 and 4, of the radiator fan motor and check, at that time, that the radiator fan turns.

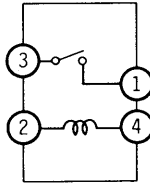
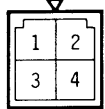
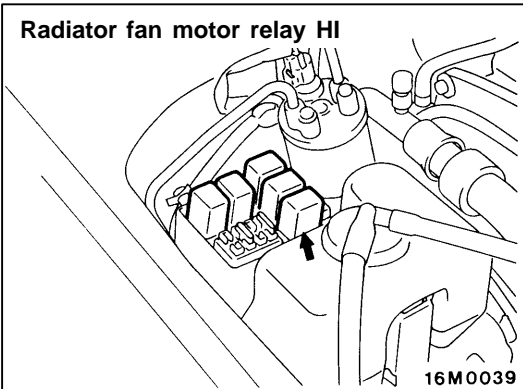


**2. POWER RELAY CONTINUITY CHECK**



Battery voltage	Terminal number			
	1	3	4	5
When deenergized	○	○		
When energized	⊕	⊖	○	○

Radiator fan motor relay HI



20Z0001

Battery voltage	Terminal number			
	1	2	3	4
When deenergized		○	—	○
When energized	○	⊕	—	○

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# INTAKE AND EXHAUST

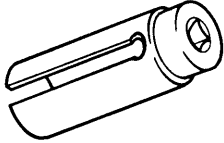
## CONTENTS

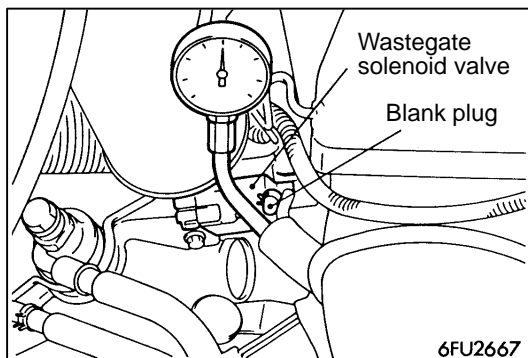
<b>SERVICE SPECIFICATIONS</b> .....	2	8. Secondary Air Valve Check .....	6
<b>SPECIAL TOOL</b> .....	2	9. Vacuum Tank Check .....	6
<b>ON-VEHICLE SERVICE</b> .....	2	<b>INTERCOOLER</b> .....	7
1. Turbocharger Boost Pressure Check ....	2	<b>AIR CONTROL VALVE</b> .....	8
2. Boost Pressure Control System Check ..	3	<b>INTAKE MANIFOLD</b> .....	9
3. Wastegate Actuator Check .....	4	<b>EXHAUST MANIFOLD AND</b>	
4. Wastegate Solenoid Valve Check .....	4	<b>TURBOCHARGER</b> .....	11
5. Air Bypass Valve Check .....	4	<b>EXHAUST PIPE AND MUFFLER</b> .....	14
6. Secondary Air Control System Check ...	5		
7. Secondary Air Control Solenoid Valve			
Check .....	5		

## SERVICE SPECIFICATIONS

Items	Standard value	Limit
Turbocharger boost pressure kPa {kg/cm <sup>2</sup> }	53 – 87 {0.54 – 0.89}	–
Wastegate actuator activation pressure kPa {kg/cm <sup>2</sup> }	Approx. 100 {1.02}	–
Wastegate solenoid valve coil resistance (at 20°C) Ω	62 – 74	–
Air bypass valve activation pressure kPa {mmHg}	Approx. 53 {400}	–
Secondary air control solenoid valve coil resistance (at 20°C) Ω	28 – 36	–
Intake manifold and exhaust manifold mounting surface distortion mm	Within 0.15	0.20

## SPECIAL TOOL

Tool	Number	Name	Application
	MB998770	Oxygen sensor wrench	Removal and installation of oxygen sensor



## ON-VEHICLE SERVICE

### 1. TURBOCHARGER BOOST PRESSURE CHECK

#### Caution

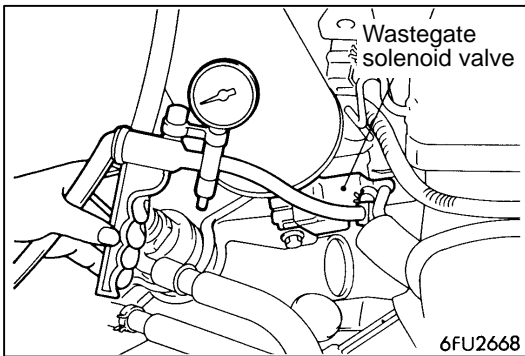
Carry out driving tests in a location where full-throttle acceleration is possible with utmost safety. Two persons should be in the vehicle during the test, the assistant in the front passenger seat reading the pressure gauge.

- (1) Disconnect the hose (black) from the boost pressure control solenoid valve and fit the pressure gauge to this hose.  
After the hose (black) has been disconnected, fit a blank plug to the solenoid valve nipple.
- (2) Drive at full-throttle acceleration in second gear and measure the boost pressure when the engine speed exceeds about 3,000 r/min.

#### Standard value:

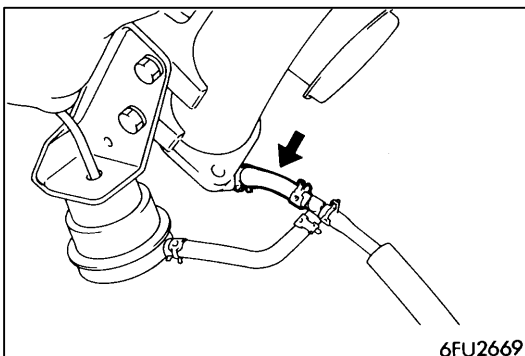
53 – 87 kPa {0.54 – 0.89 kg/cm<sup>2</sup>} <EVOLUTION-IV>  
59 – 84 kPa {0.61 – 0.86 kg/cm<sup>2</sup>} <EVOLUTION-V>

- (3) If the boost pressure is lower than the standard value, check for following which are probably the cause:
  - Wastegate actuator inoperative
  - Boost pressure leak
  - Turbocharger defective
- (4) If the boost pressure is higher than the standard value, boost pressure control is probably faulty. Make the following checks:
  - Wastegate actuator inoperative
  - Wastegate valve inoperative
  - Wastegate actuator rubber hose disconnected or cracked



**2. BOOST PRESSURE CONTROL SYSTEM CHECK**

- (1) Disconnect the hose (black) from the wastegate solenoid valve and connect a three-way joint between the hose and solenoid valve.
- (2) Connect a hand vacuum pump to the three-way joint.

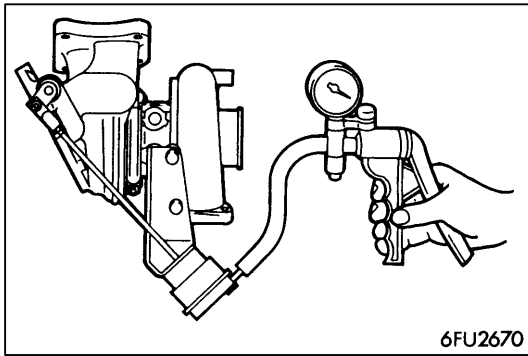


- (3) Disconnect the hose (black) from the intake pipe nipple connected to the turbocharger compressor housing and fit a blank plug to this nipple.
- (4) Disconnect the negative cable from the battery, keep it disconnected for 10 sec. or more, and then reconnect it back again.
- (5) Block and unblock the end of the vacuum hose (black) with a finger to apply vacuum and check for the vacuum condition.

Engine condition	Hose (black) end	Normally
Stationary (ignition switch: ON)	Unblocked	Vacuum leaks.
	Blocked	Vacuum retained.
Idling after warmup		Vacuum leaks.

**NOTE**

If the vacuum condition is faulty, the wastegate actuator, wastegate solenoid valve, or hose is probably defective.



### 3. WASTEGATE ACTUATOR CHECK

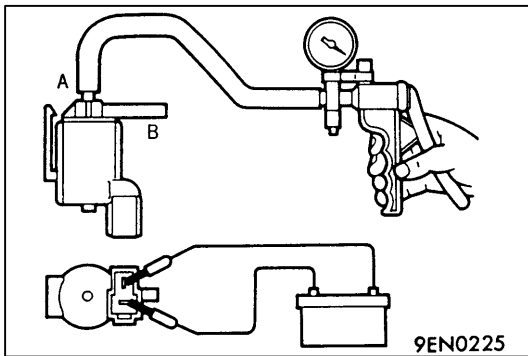
- (1) Connect a hand pump (pressure type) to the nipple.
- (2) Gradually increase the pressure being applied to check for the pressure at which the wastegate actuator rod starts moving (approx. 1 mm stroke).

**Standard value: Approx. 100 kPa {1.02 kg/cm<sup>2</sup>}**

**Caution**

**Do not apply a pressure more than 120 kPa {1.23 kg/cm<sup>2</sup>}** to prevent the diaphragm from being damaged.

- (3) If the pressure drastically deviates from the standard value, check the actuator or wastegate valve and, if necessary, replace the actuator or turbocharger assembly.

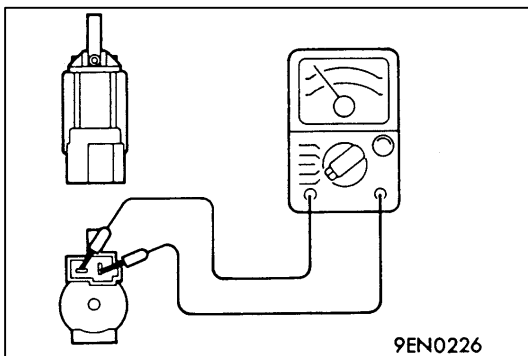


### 4. WASTEGATE SOLENOID VALVE CHECK

#### 4-1 OPERATION CHECK

- (1) Connect a hand vacuum pump to nipple A of the solenoid valve.
- (2) Using jumper wires, connect the solenoid valve terminal to battery terminals.
- (3) Disconnecting and reconnecting the jumper wire on the (-) terminal side, apply vacuum to check for airtightness.

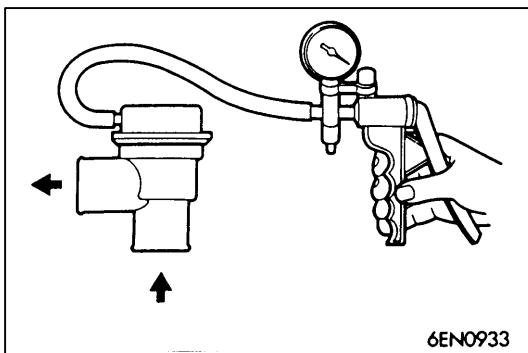
Jumper wire	Nipple B condition	Normally
Connected	Open	Vacuum leaks.
	Plugged	Vacuum retained.
Disconnected	Open	Vacuum retained.



#### 4-2 COIL RESISTANCE CHECK

Measure the resistance across solenoid valve terminals.

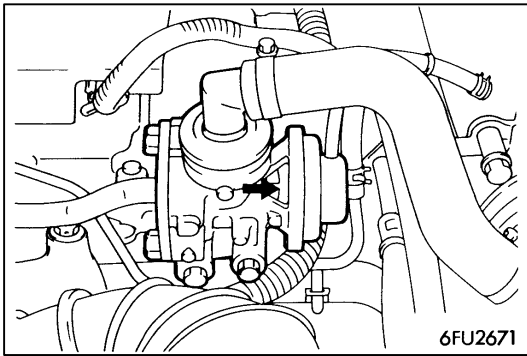
**Standard value: 62 – 74 Ω (at 20°C)**



### 5. AIR BYPASS VALVE CHECK

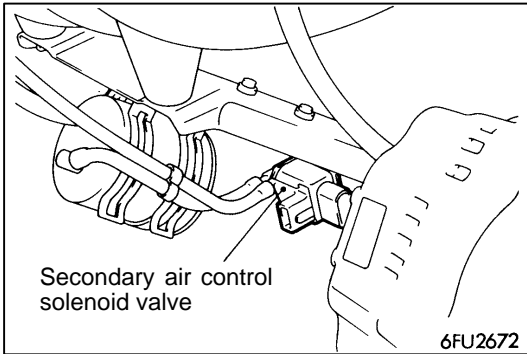
- (1) Remove the air bypass valve.
- (2) Connect a hand vacuum pump to the air bypass valve nipple.
- (3) Apply a vacuum of approx. 45 kPa {340 mmHg} and check that the valve is airtight.
- (4) Increase the vacuum and check for valve operation.

Vacuum	Valve operation
Approx. 53 kPa {400 mmHg}	Starts moving



**6. SECONDARY AIR CONTROL SYSTEM CHECK**

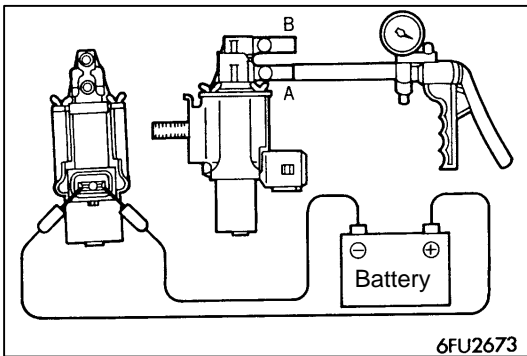
- (1) Start the engine and let it run at idle speed.
- (2) Short-circuit the no. 6 terminal of the engine ECU connector using a jumper wire and check at this time that the secondary air valve lifts.  
At this time, the engine ECU connector should be connected.



**7. SECONDARY AIR CONTROL SOLENOID VALVE CHECK**

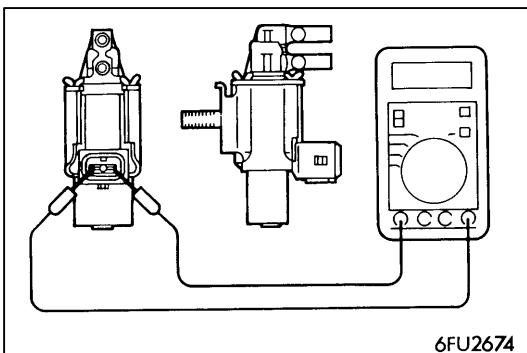
**7-1 OPERATION CHECK**

- (1) Disconnect the vacuum hose (white stripe, yellow stripe) from the solenoid valve.
- (2) Disconnect the harness connector.



- (3) Connect a hand vacuum pump to nipple A of the solenoid valve.
- (4) Using jumper wires, connect the solenoid valve terminal to battery terminals.
- (5) Disconnecting and reconnecting the jumper wire on the (-) terminal side, apply vacuum to check for airtightness.

Jumper wire	Nipple B condition	Normally
Connected	Open	Vacuum leaks.
	Plugged	Vacuum retained.
Disconnected	Open	Vacuum leaks.

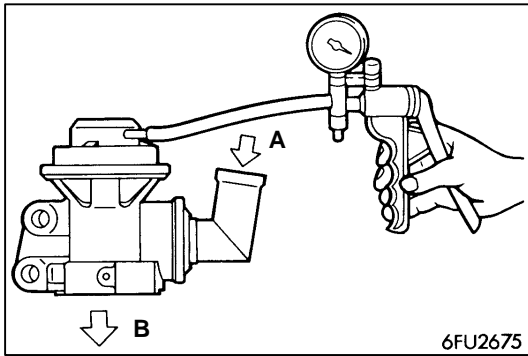


**7-2 COIL RESISTANCE CHECK**

Measure the resistance across solenoid valve terminals.

**Standard value: 28 – 36 Ω (at 20°C)**

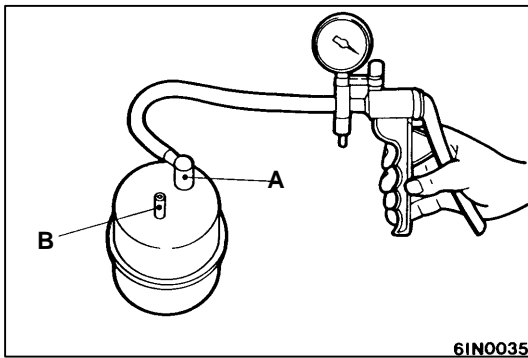




**8. SECONDARY AIR VALVE CHECK**

- (1) Remove the secondary air valve.
- (2) Connect a hand vacuum pump to the secondary air valve nipple.
- (3) Apply a vacuum of 67 kPa {500 mmHg} and check that the vacuum is retained.
- (4) Blow air from side (A) and side (B) of the secondary air valve to check for air passage.

Vacuum	Air blowing direction	Air passage
0 kPa (vacuum not applied)	(A) → (B)	No
40 kPa {300 mmHg} or more	(A) → (B)	Yes
	(B) → (A)	No



**9. VACUUM TANK CHECK**

- (1) Connect a hand vacuum pump to nipple A of the vacuum tank. Applying a vacuum of 67 kPa {500 mmHg}, check that the vacuum is retained.
- (2) Connect a hand vacuum pump to nipple B of the vacuum tank.
- (3) Apply a vacuum of 67 kPa {500 mmHg] with nipple A plugged with a finger. Check that the vacuum leaks when the finger is then released.

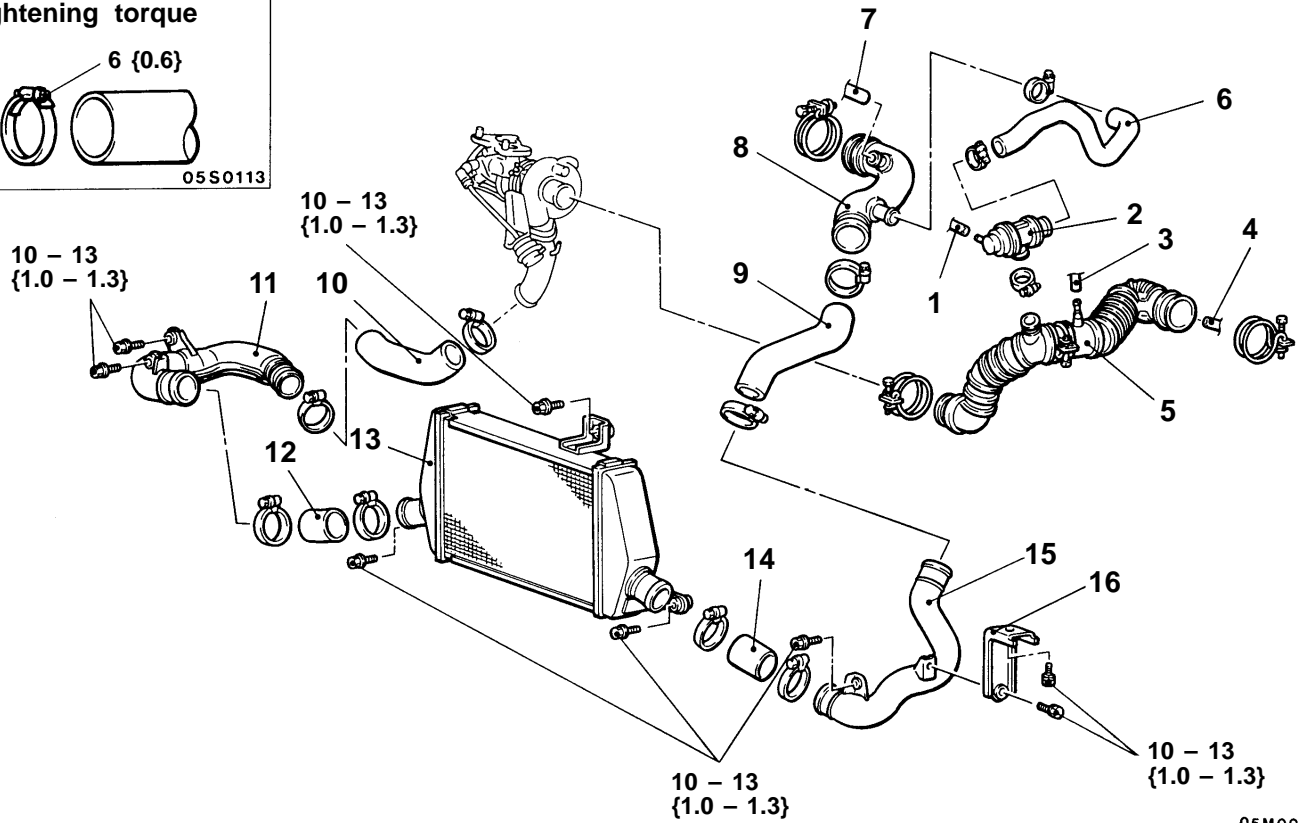
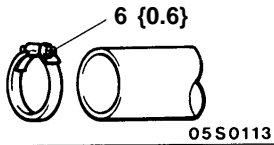
# INTERCOOLER

## REMOVAL AND INSTALLATION

**Pre-removal and Post-installation Operation**

- Front Bumper Removal and Installation  
(Refer to GROUP 51.)

**Hose clamp tightening torque**



05M0090

Unit: Nm {kgf·m}

**Removal steps**

- |     |                              |     |                          |
|-----|------------------------------|-----|--------------------------|
| ▶A◀ | 1. Vacuum hose connection    | ▶A◀ | 9. Air hose C            |
| ▶A◀ | 2. Air bypass valve assembly | ▶A◀ | 10. Air hose A           |
| ▶A◀ | 3. Breather hose connection  | ▶A◀ | 11. Air pipe A           |
| ▶A◀ | 4. Vacuum hose connection    | ▶A◀ | 12. Air hose B           |
| ▶A◀ | 5. Air intake hose assembly  | ▶A◀ | 13. Intercooler assembly |
| ▶A◀ | 6. Air bypass hose           | ▶A◀ | 14. Air hose B           |
| ▶A◀ | 7. Air hose connection       | ▶A◀ | 15. Air pipe B           |
| ▶A◀ | 8. Air hose D                | ▶A◀ | 16. Air pipe bracket     |

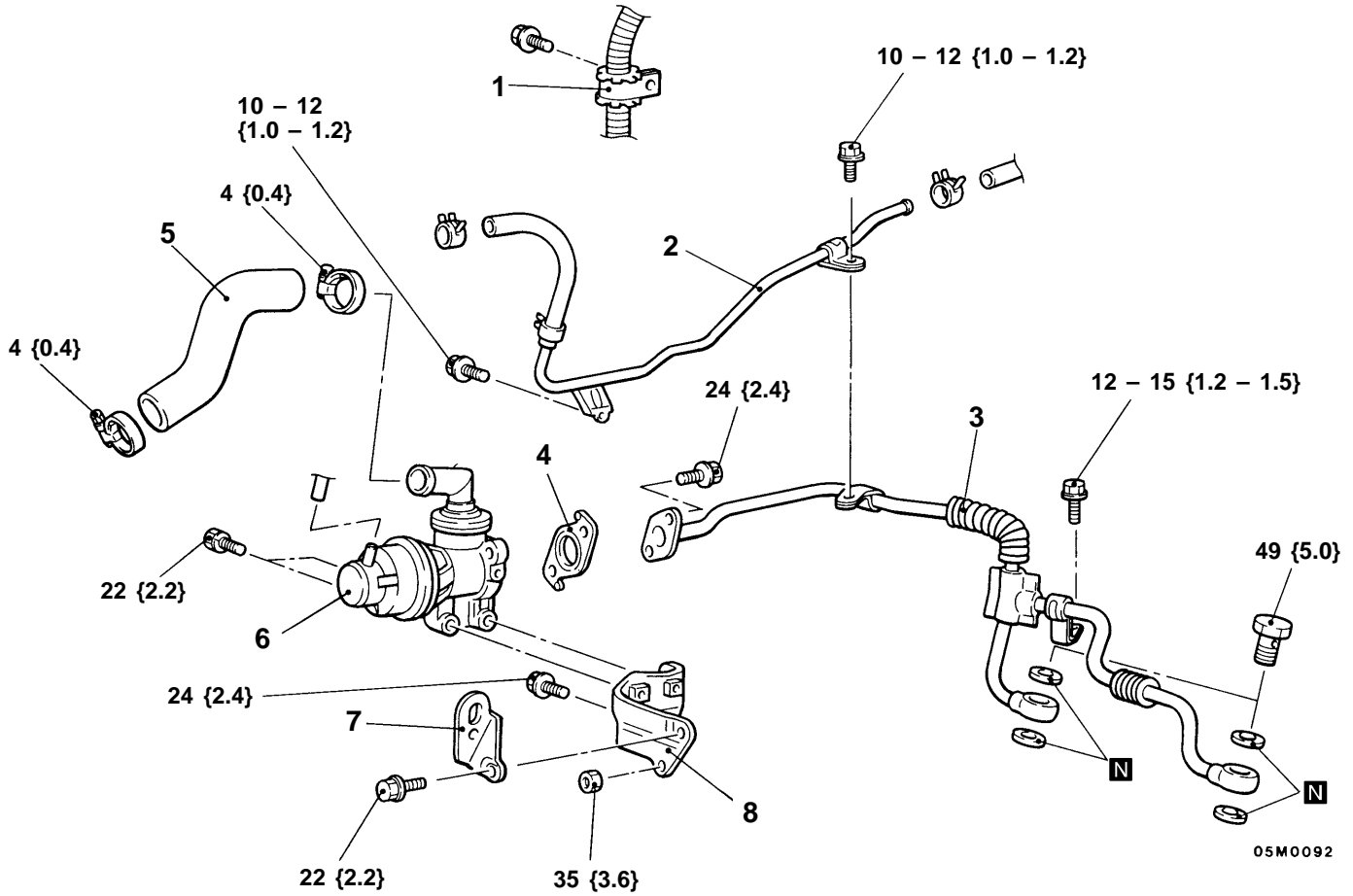
**INSTALLATION SERVICE POINT**

**▶A◀ AIR HOSE B / AIR HOSE A / AIR HOSE C / AIR HOSE D / AIR BYPASS HOSE INSTALLATION**

Align the alignment mark (white paint) on each hose with the protrusion on each pipe.

# AIR CONTROL VALVE

## REMOVAL AND INSTALLATION

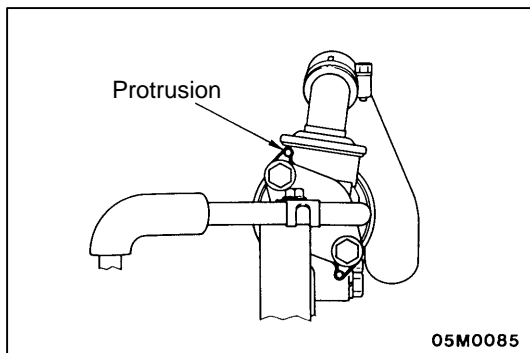


Unit: Nm {kgf·m}

### Removal steps

1. Control harness connection
2. Vacuum pipe hose assembly
3. Air pipe assembly
4. Gasket

5. Air hose
6. Air control valve
7. Engine hanger
8. Air control valve bracket



### INSTALLATION SERVICE POINT

#### ▶◀ GASKET INSTALLATION

Install the gasket so that its protrusion is located as shown.

# INTAKE MANIFOLD

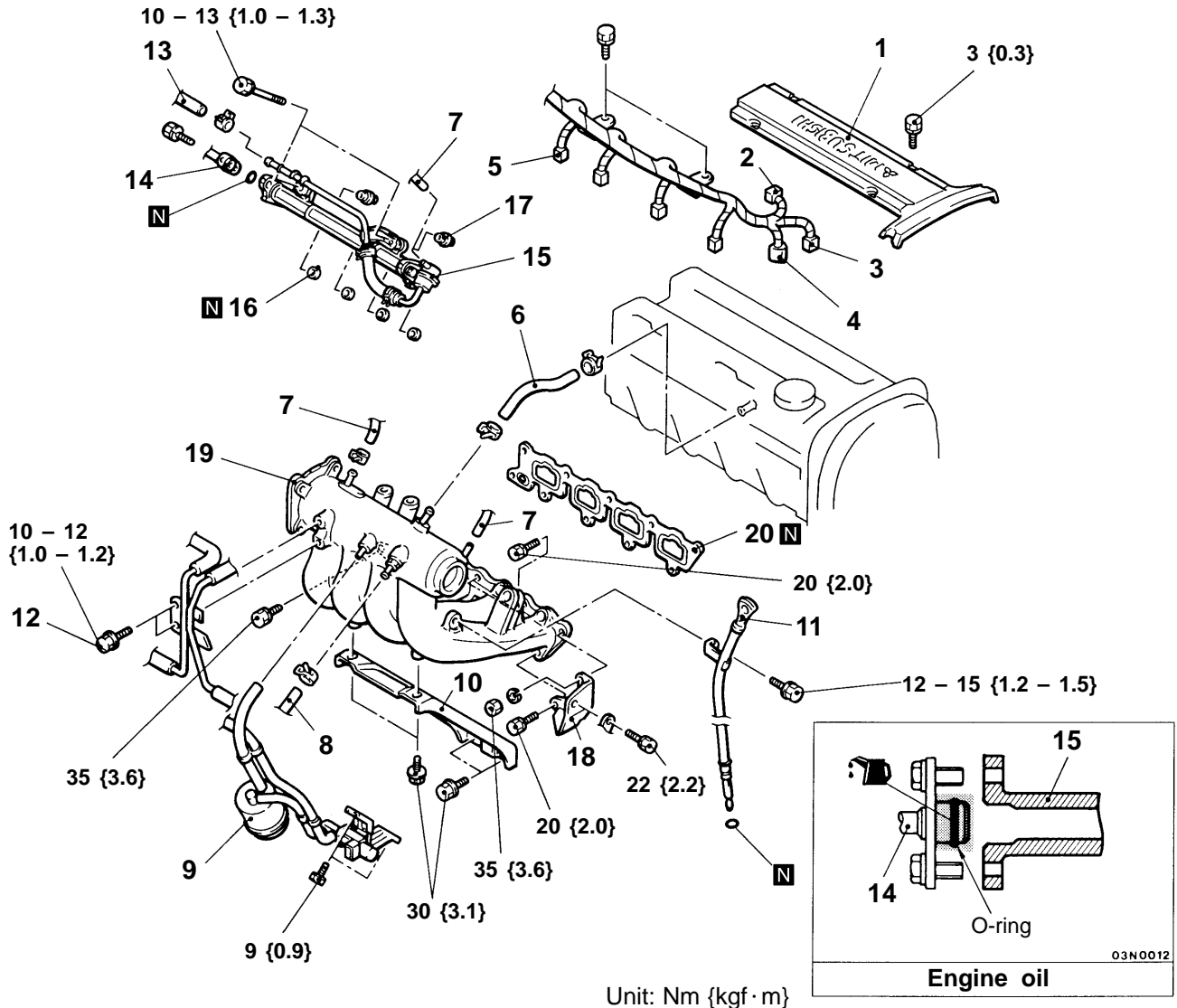
## REMOVAL AND INSTALLATION

### Pre-removal Operation

- (1) Fuel Discharge Prevention
- (2) Throttle Body Removal (Refer to GROUP 13.)
- (3) Front Exhaust Pipe Removal (Refer to P.15-14.)
- (4) Air Control Valve Bracket Removal (Refer to P.15-8.)
- (5) Strut Tower Bar Removal

### Post-installation Operation

- (1) Strut Tower Bar Installation
- (2) Air Control Valve Bracket Installation (Refer to P.15-8.)
- (3) Front Exhaust Pipe Installation (Refer to P.15-14.)
- (4) Throttle Body Installation (Refer to GROUP 13.)



### Removal steps

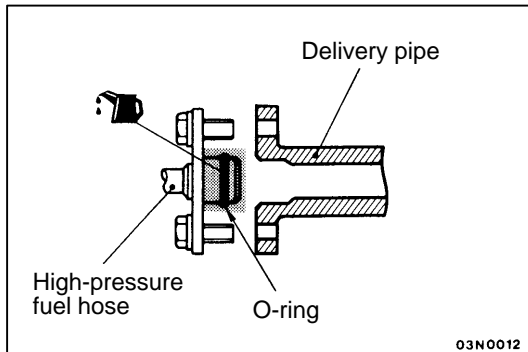
- |  |   |
|--|---|
| <ol style="list-style-type: none"> <li>1. Center cover</li> <li>2. Ignition coil connector connection</li> <li>3. Oxygen sensor connector connection</li> <li>4. Crank angle sensor connector connection</li> <li>5. Injector connector connection</li> <li>6. PCV hose</li> <li>7. Vacuum hose connection</li> <li>8. Brake booster vacuum hose connection</li> <li>9. Vacuum tank, solenoid valve, and vacuum hose assembly</li> </ol> | <ol style="list-style-type: none"> <li>10. Intake manifold stay</li> <li>11. Oil level gauge guide assembly</li> <li>12. Vacuum hose and pipe mounting bolt</li> <li>13. Fuel return hose connection</li> <li>14. Fuel high pressure hose connection</li> <li>15. Delivery pipe, injector, and pressure regulator assembly</li> <li>16. Insulator</li> <li>17. Insulator</li> <li>18. Alternator brace stay</li> <li>19. Intake manifold</li> <li>20. Intake manifold gasket</li> </ol> |
|--|---|

**REMOVAL SERVICE POINT****◀A▶ DELIVERY PIPE, INJECTOR AND PRESSURE REGULATOR REMOVAL**

Remove the delivery pipe with the injectors and pressure regulator attached to it.

**Caution**

**Care must be taken, when removing the delivery pipe, not to drop the injector.**

**INSTALLATION SERVICE POINT****▶A◀ HIGH-PRESSURE FUEL HOSE INSTALLATION**

- (1) When connecting the high-pressure fuel hose to the delivery pipe, apply a small amount of new engine oil to the O-ring and then insert the high-pressure fuel hose, being careful not to damage the O-ring.

**Caution**

**Be careful not to let any engine oil get into the delivery pipe.**

- (2) Check to be sure that the high pressure hose turns smoothly.  
If it does not turn smoothly, the O-ring may be trapped. Remove the high-pressure fuel hose to check for damaged O-ring and then re-insert it into the delivery pipe and check once again.
- (3) Tighten the mounting bolts to the specification.

**INSPECTION****INTAKE MANIFOLD CHECK**

- (1) Check the intake manifold for damage or cracking and replace it if defective.
- (2) Using a straight edge and feeler gauge, check for distortion of the cylinder head installation surface.

**Standard value: 0.15 mm or less**

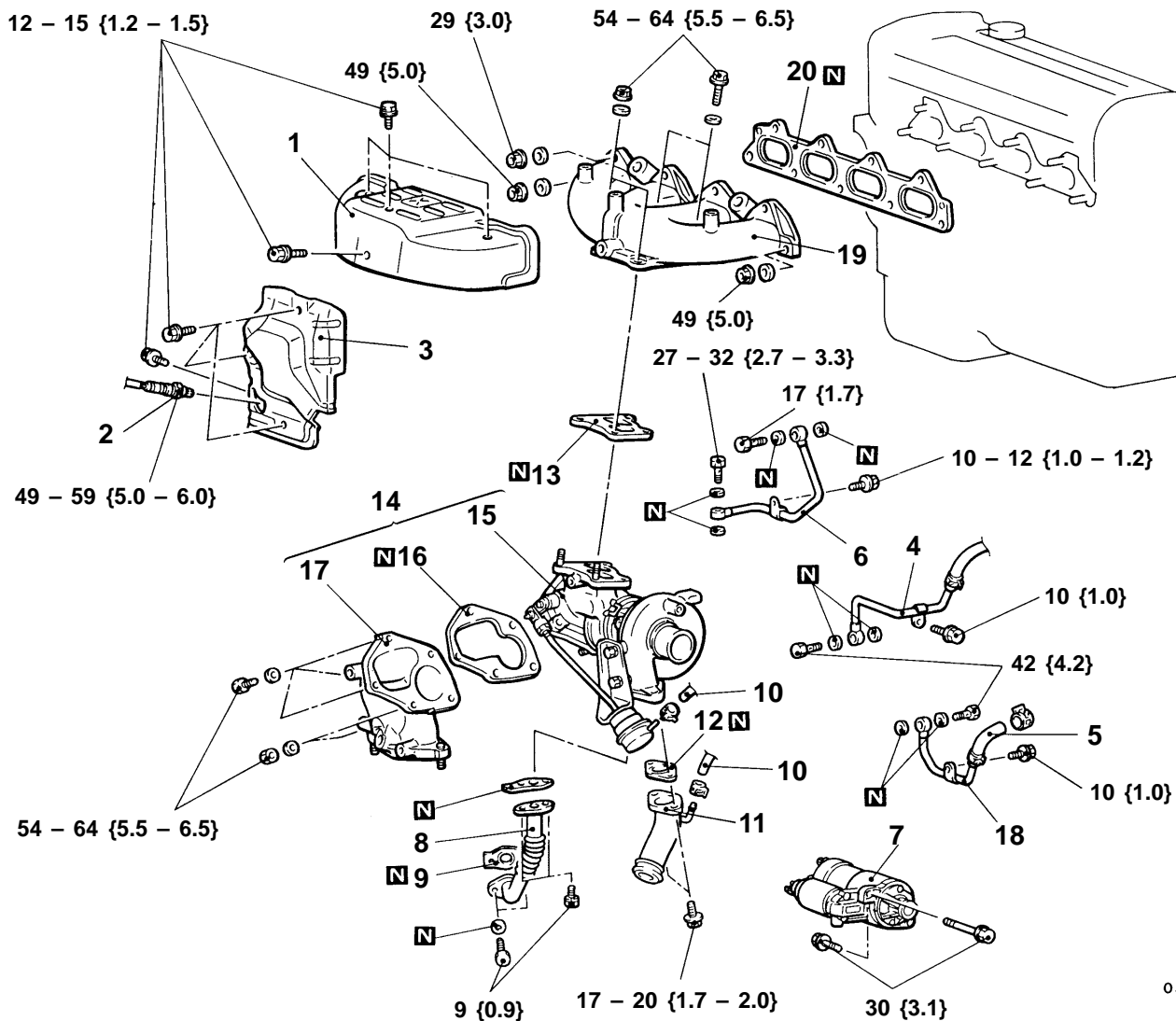
**Limit: 0.2 mm**

# EXHAUST MANIFOLD AND TURBOCHARGER

## REMOVAL AND INSTALLATION

### Pre-removal and Post-installation Operation

- |  |  |
|--|--|
| (1) Radiator Removal and Installation<br>(Refer to GROUP 14.)                  | (4) Air Pipe Assembly Removal and Installation<br>(Refer to P.15-8.) |
| (2) Air Intake Hose and Air Hose A Removal and Installation (Refer to P.15-7.) | (5) Engine Oil Removal and Refilling                                 |
| (3) Front Exhaust Pipe Removal and Installation<br>(Refer to P.15-14.)         |  |

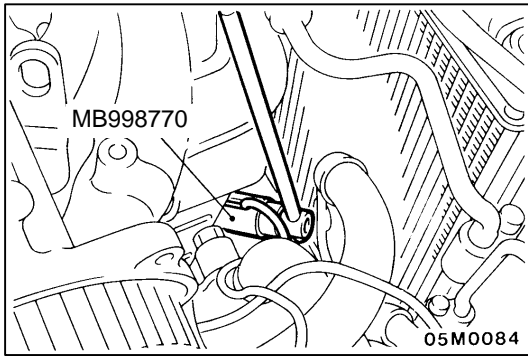


05M0091

Unit: Nm {kgf·m}

### Removal steps

- |     |                                     |     |                               |
|-----|-------------------------------------|-----|-------------------------------|
| ◀A▶ | 1. Exhaust manifold heat protector  | ▶B◀ | 11. Air outlet fitting        |
|     | 2. Oxygen sensor                    |     | 12. Air outlet fitting gasket |
|     | 3. Turbocharger heat protector      |     | 13. Turbocharger gasket       |
|     | 4. Water pipe assembly A connection | ▶A◀ | 14. Turbocharger assembly     |
| ◀B▶ | 5. Water hose connection            |     | 15. Turbocharger              |
|     | 6. Oil pipe                         |     | 16. Exhaust fitting gasket    |
|     | 7. Starter                          |     | 17. Exhaust fitting           |
|     | 8. Oil return pipe                  |     | 18. Water pipe hose assembly  |
| ▶C◀ | 9. Oil return pipe gasket           |     | 19. Exhaust manifold          |
|     | 10. Vacuum hose connection          |     | 20. Exhaust manifold gasket   |



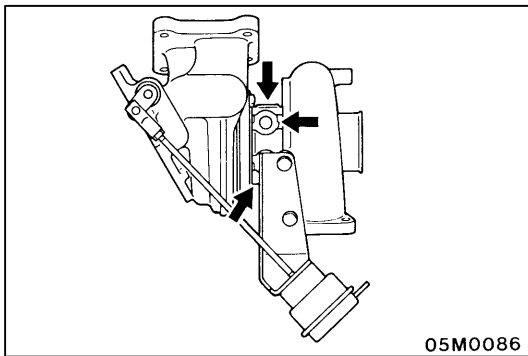
**REMOVAL SERVICE POINTS**

**◀A▶ OXYGEN SENSOR REMOVAL**

**◀B▶ OIL PIPE REMOVAL**

**Caution**

After the oil pipe has been removed, ensure that no foreign matter will get into the oil passage holes in turbocharger.



**INSTALLATION SERVICE POINTS**

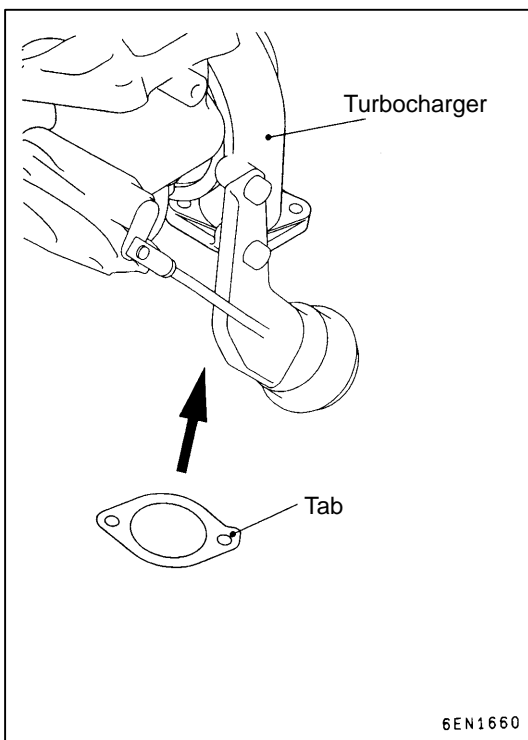
**▶A◀ TURBOCHARGER INSTALLATION**

- (1) Clean the connections between oil pipe, oil return pipe, and water pipe.

**Caution**

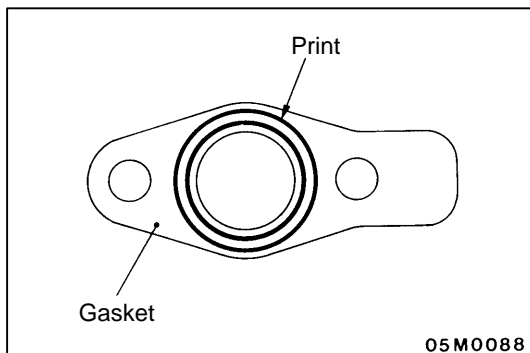
Ensure that no foreign matter will get into the turbocharger.

- (2) Through the oil pipe mounting hole in the turbocharger, add fresh engine oil.



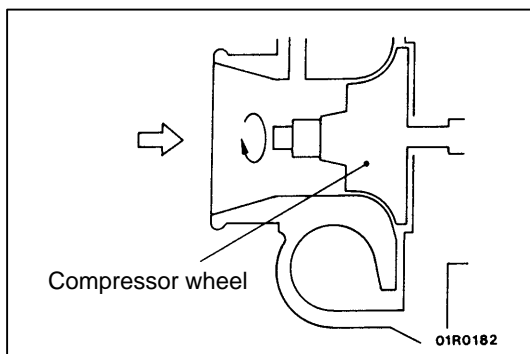
**▶B◀ AIR OUTLET FITTING GASKET INSTALLATION**

Install the gasket so that its tab is located as shown.



**▶◀ OIL RETURN PIPE GASKET INSTALLATION**

Install the gasket so that its print part is on the oil pan side.



**INSPECTION**

**1. TURBOCHARGER CHECK**

- (1) Visually check the turbine wheel and compressor wheel for damage and cracking.
- (2) Check that the turbine wheel and compressor wheel can be turned manually with a light force.
- (3) Check that there is no oil leak from the turbocharger.
- (4) Check to see if the wastegate valve remains open. If any of these faulty symptoms is evident, disassemble the turbocharger and replace the defective part.

**NOTE**

For the disassembly procedure, refer to ENGINE WORKSHOP MANUAL.

**2. EXHAUST MANIFOLD CHECK**

- (1) Check the exhaust manifold for damage and cracking and replace it as necessary.
- (2) Using a straightedge and feeler gauge, check the cylinder head mounting surface for distortion and replace as necessary.

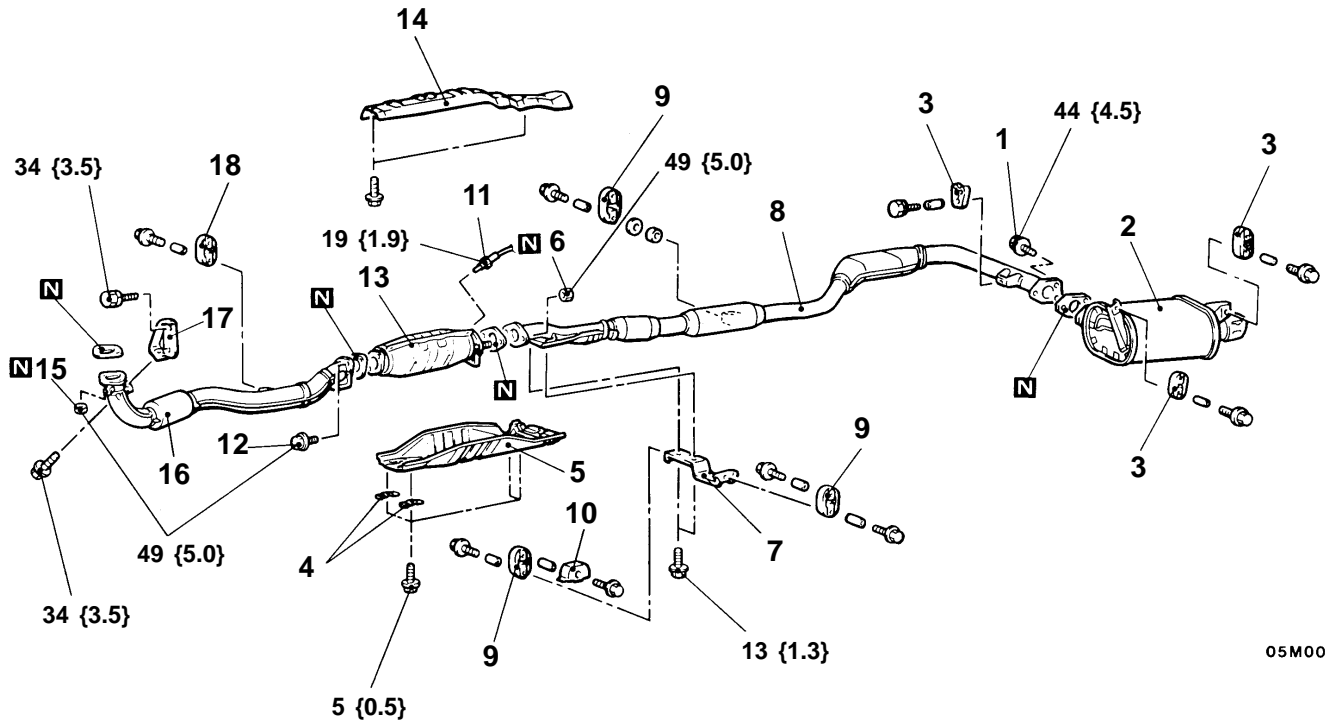
**Standard value: Within 0.15 mm**

**Limit: 0.2 mm**



# EXHAUST PIPE AND MUFFLER

## REMOVAL AND INSTALLATION



05M0093

**Hanger mounting bolt tightening torque**

3, 9, 18  
13 {1.3}

05M0037

Unit: Nm {kgf·m}

**Main muffler removal steps**

- 1. Bolt
- 2. Main muffler
- 3. Hanger

**Center exhaust pipe removal steps**

- 1. Bolt
- 4. Spring
- 5. Heat protector
- 6. Self-locking nut
- 7. Hanger bracket
- 8. Center exhaust pipe
- 9. Hanger
- 10. Protector

11. High-temperature sensor

- 12. Bolt
- 13. Catalytic converter
- 14. Front floor heat protector panel

**Front exhaust pipe removal steps**

- 4. Spring
- 5. Heat protector
- 12. Bolt
- 15. Self-locking nut
- 16. Front exhaust pipe
- 17. Front exhaust pipe bracket
- 18. Hanger

---

# ENGINE ELECTRICAL

## CONTENTS

<b>CHARGING SYSTEM</b> .....	<b>2</b>	<b>IGNITION SYSTEM</b> .....	<b>4</b>
<b>ALTERNATOR</b> .....	<b>2</b>	<b>ON-VEHICLE SERVICE</b> .....	<b>4</b>
		1. Ignition Coil with Built-in Power Transistor Check .....	4
		2. Spark Plug Check, Cleaning, and Replacement .....	4
		<b>CAMSHAFT POSITION SENSOR AND CRANK ANGLE SENSOR</b> .....	<b>5</b>



# CHARGING SYSTEM

## ALTERNATOR

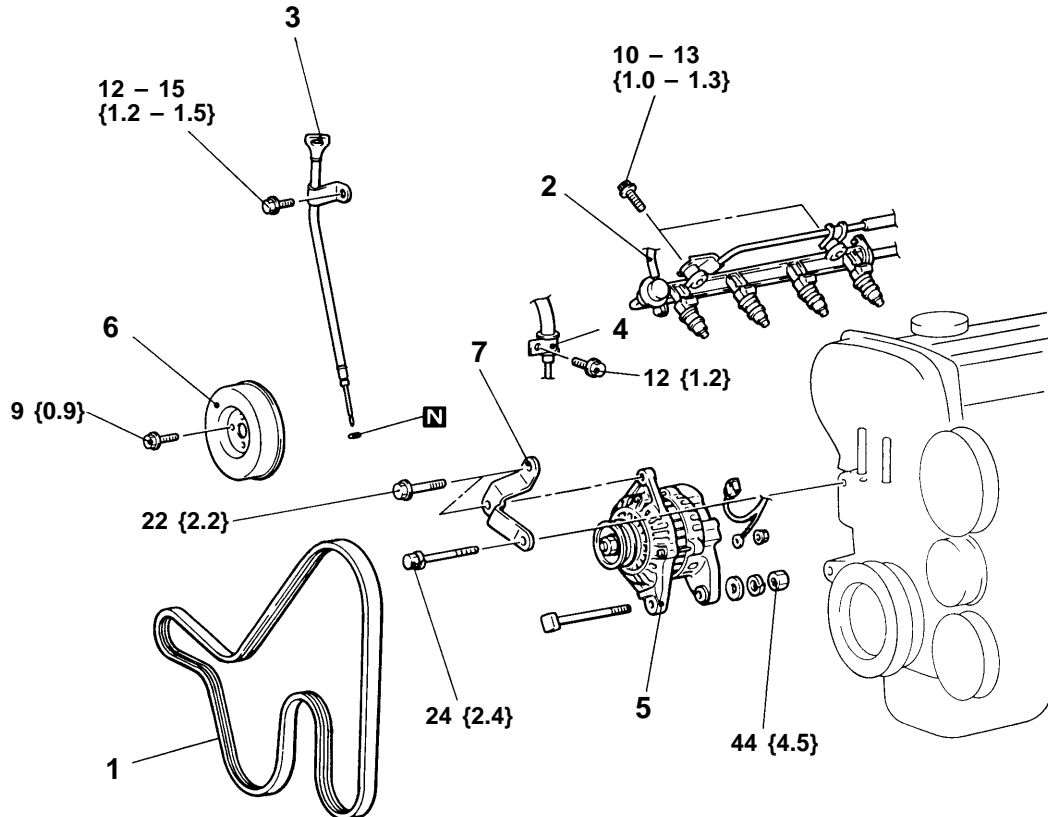
### REMOVAL AND INSTALLATION

**Pre-removal Operation**

- (1) Under Cover Removal
- (2) Engine Mount Removal
- (3) Strut Tower Bar Removal

**Post-installation Operation**

- (1) Strut Tower Bar Installation
- (2) Engine Mount Installation
- (3) Under Cover Installation
- (4) Drive Belt Tension Adjustment  
(Refer to GROUP 11 – On-vehicle Service.)



16M0438

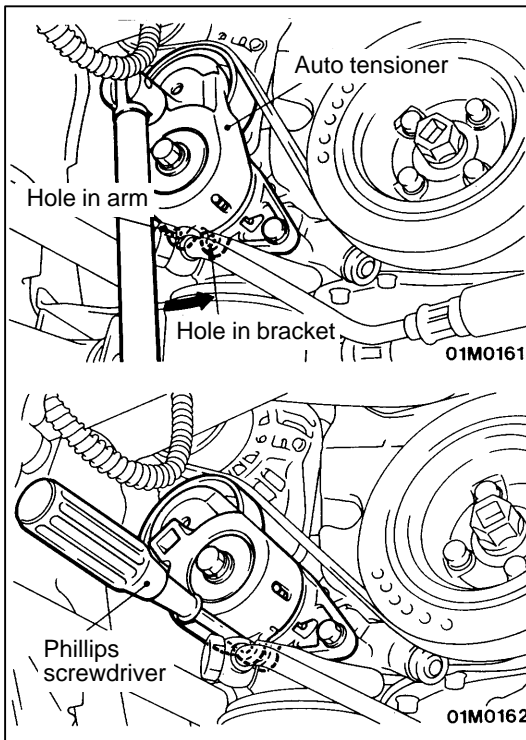
Unit: Nm {kgf · m}

**Removal steps**

- 1. Drive belt (Power steering, A/C)
- 2. Delivery pipe, injector and pressure regulator assembly
- 3. Oil level gauge guide

- 4. Pressure hose connection
- 5. Alternator
- 6. Water pump pulley
- 7. Alternator brace



**REMOVAL SERVICE POINTS****◀A▶ POWER STEERING, A/C COMPRESSOR, AND ALTERNATOR DRIVE BELT REMOVAL**

- (1) Align the hole in the auto tensioner bracket with that in the arm and insert a screwdriver into the holes.
- (2) Remove the drive belt.

**◀B▶ DELIVERY PIPE, INJECTOR, AND PRESSURE REGULATOR ASSEMBLY REMOVAL**

After the mounting points have been loosened, slightly move the corresponding part to allow for a space for removal of the alternator.

**◀C▶ ALTERNATOR REMOVAL**

Push the engine all the way up with a garage jack and remove the alternator upward the engine compartment.

# IGNITION SYSTEM

## ON-VEHICLE SERVICE

### 1. IGNITION COIL WITH BUILT-IN POWER TRANSISTOR CHECK

Secondary coil resistance measurement

Standard value: 15 – 21 k $\Omega$

### 2. SPARK PLUG CHECK, CLEANING, AND REPLACEMENT

Check the plug gap and replace if the limit is exceeded.

#### Caution

- (1) Do not attempt to adjust the gap of the platinum plug.
- (2) Cleaning the platinum plug can damage platinum tips. If a cleaning is needed, use a plug cleaner and finish cleaning within 20 seconds to protect the electrodes. Never use wire brushes.

Standard values and limits:

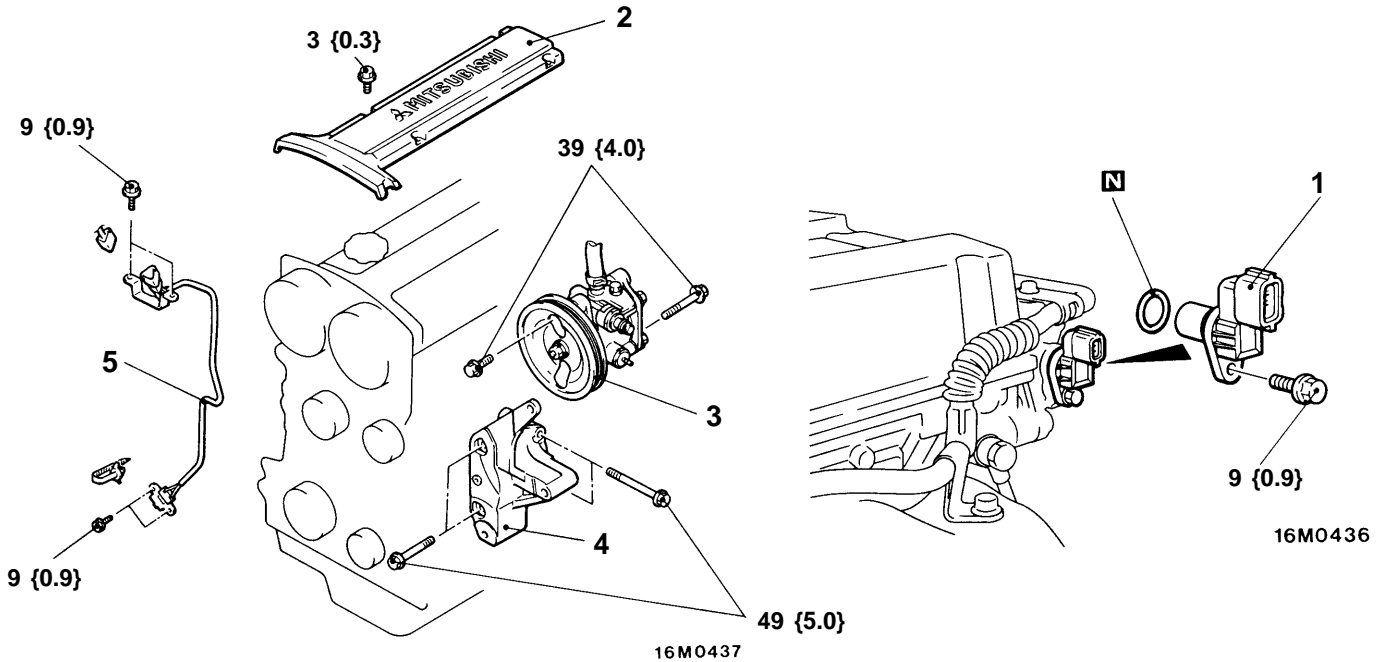
Manufacturer	Model	Standard value (mm)	Limit (mm)
NGK	PGR7A	0.7 – 0.8	0.95
DENSO	P22PR8	0.7 – 0.8	0.95

# CAMSHAFT POSITION SENSOR AND CRANK ANGLE SENSOR

## REMOVAL AND INSTALLATION

**Pre-removal and Post-installation Operation**

- Timing Belt Removal and Installation  
(Refer to GROUP 11.)



Unit: Nm {kgf·m}

**Removal steps**

1. Camshaft position sensor
2. Center cover
3. Power steering oil pump

4. Power steering oil pump bracket
5. Crank angle sensor



**REMOVAL SERVICE POINT**

**◀▶ POWER STEERING OIL PUMP REMOVAL**

Remove the power steering oil pump with hose from the power steering oil pump bracket.

**NOTE**

String up the oil pump which has been removed onto a location that does not hamper removal and installation of the power steering oil pump bracket.

---

# ENGINE AND EMISSION CONTROL

## CONTENTS

<b>ENGINE CONTROL SYSTEM</b> .....	<b>2</b>	<b>EMISSION CONTROL SYSTEM</b> .....	<b>2</b>
<b>SERVICE SPECIFICATIONS</b> .....	<b>2</b>	<b>ON-VEHICLE SERVICE</b> .....	<b>2</b>
		System Configuration Diagram .....	2
		Vacuum Hose Piping Circuit Diagram .....	3
		<b>CANISTER</b> .....	<b>3</b>
		<b>CATALYTIC CONVERTER</b> .....	<b>4</b>



# ENGINE CONTROL SYSTEM

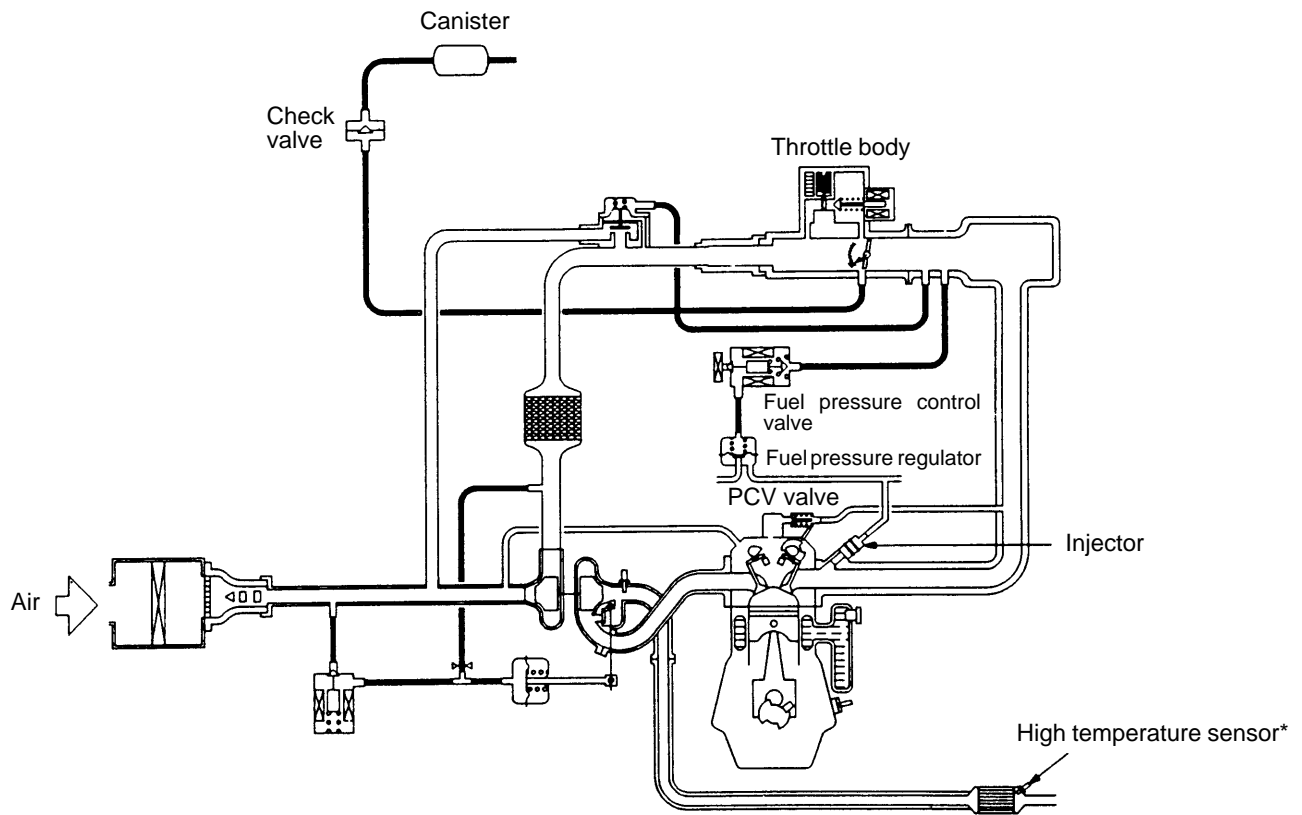
## SERVICE SPECIFICATIONS

Items	Standard value
Idle speed rpm	850 ± 50

# EMISSION CONTROL SYSTEM <MPI>

## ON-VEHICLE SERVICE

### SYSTEM CONFIGURATION DIAGRAM

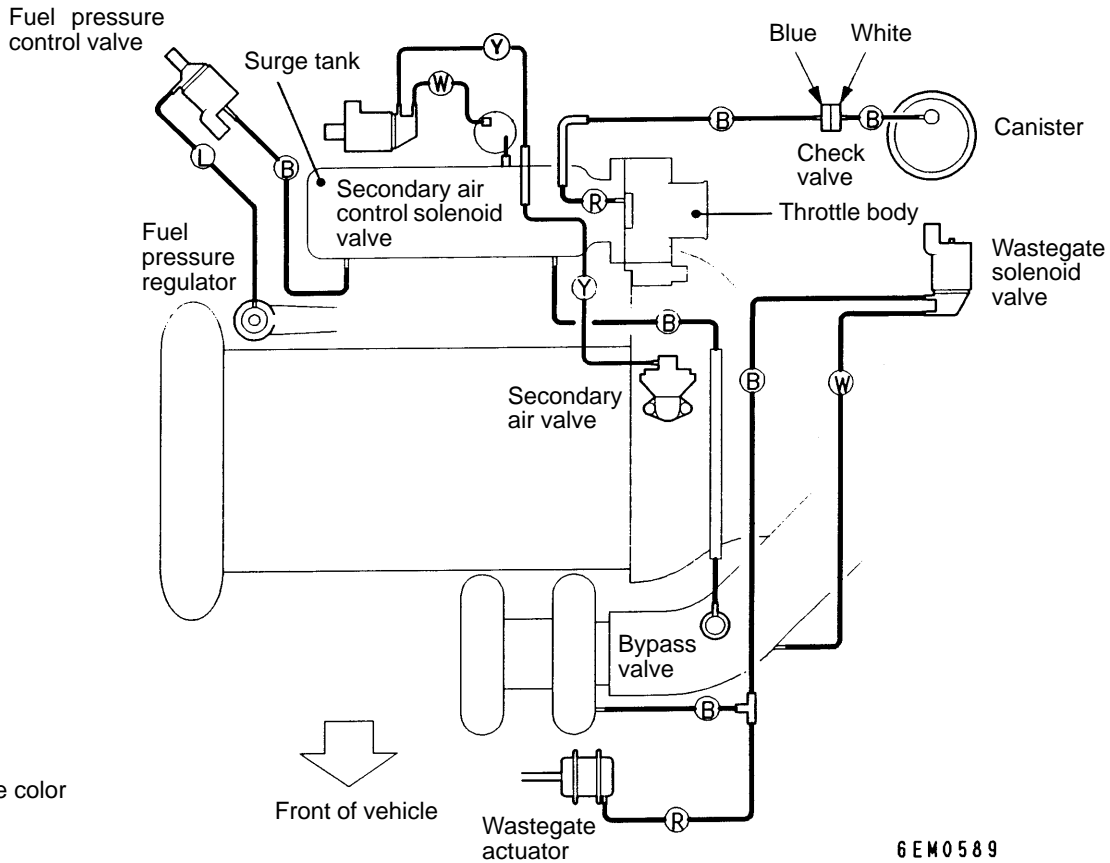


9FU0640

\*: EVOLUTION-IV only



VACUUM HOSE PIPING CIRCUIT DIAGRAM

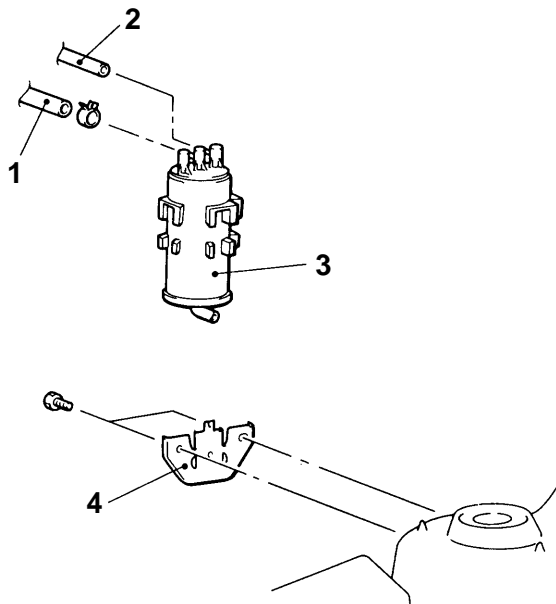


CANISTER

REMOVAL AND INSTALLATION

**Pre-removal and Post-installation Operation**

- Air Cleaner Removal and Installation

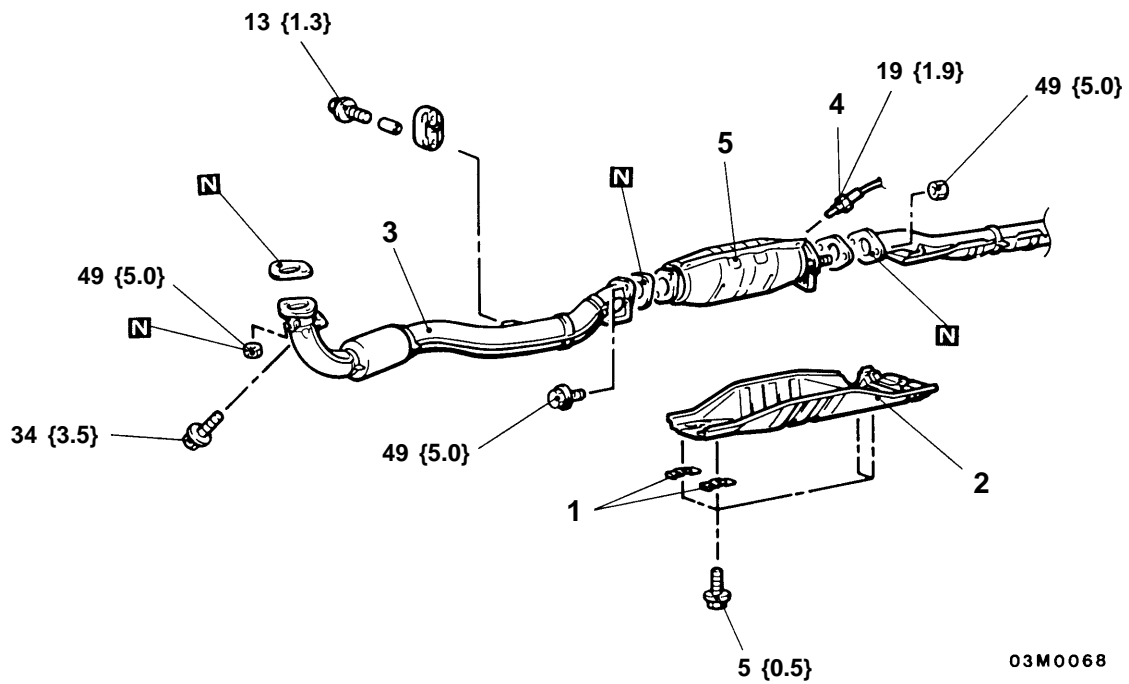


**Removal steps**

1. Vapor hose
2. Purge hose
3. Canister
4. Canister bracket

## CATALYTIC CONVERTER

### REMOVAL AND INSTALLATION



03M0068

Unit: Nm {kgf·m}

#### Removal steps

1. Spring
2. Heat protector
3. Front exhaust pipe
4. High temperature sensor  
<EVOLUTION-IV only>
5. Catalytic converter

---

# CLUTCH

## CONTENTS

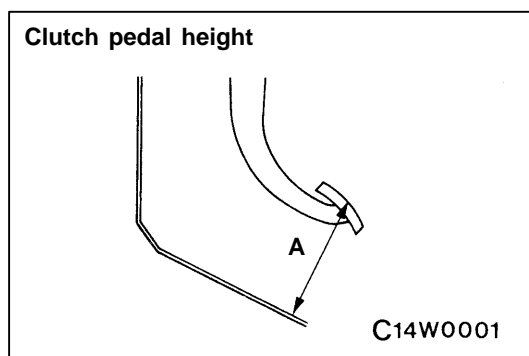
<b>SERVICE SPECIFICATIONS</b> .....	<b>2</b>	<b>CLUTCH PEDAL</b> .....	<b>4</b>
<b>LUBRICANTS</b> .....	<b>2</b>	<b>CLUTCH CONTROL</b> .....	<b>5</b>
<b>ON-VEHICLE SERVICE</b> .....	<b>2</b>	Clutch Master Cylinder .....	6
1. Clutch Pedal Inspection and Adjustment ..	2		
2. Bleeding .....	3		

## SERVICE SPECIFICATIONS

Items	Standard value
Clutch pedal height mm	162.5 – 165.5
Clutch pedal clevis pin play mm	1 – 3
Clutch pedal free play mm	6 – 13
Distance between the clutch pedal and the toeboard when the clutch is disengaged mm	70 or more

## LUBRICANTS

Items	Specified lubricants	Quantity
Clutch fluid	MITSUBISHI genuine brake fluid "DIA-QUEEN BRAKE FLUID SUPER 4"	As required
Push rod assembly	Rubber grease	
Boot		
Release cylinder push rod	MOLYKOT BR-2 PUS	

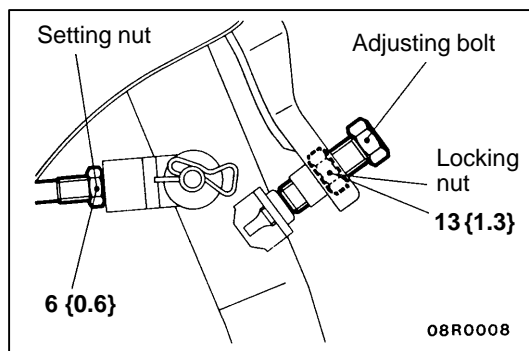


## ON-VEHICLE SERVICE

### 1. CLUTCH PEDAL INSPECTION AND ADJUSTMENT

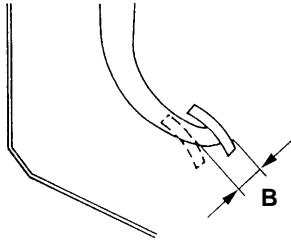
- (1) Turn up the carpet, etc. under the clutch pedal.
- (2) Measure the clutch pedal height.

**Standard value (A): 162.5 – 165.5 mm**



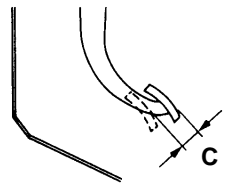
- (3) If the height of the clutch pedal is outside the standard value, loosen the lock nut and adjust the pedal height to the standard value using the adjusting bolt.

Clutch pedal clevis pin play



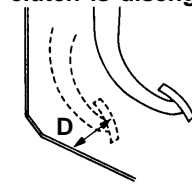
A14W0002

Clutch pedal free play



14W0002

Distance between the clutch pedal and the toeboard when the clutch is disengaged



14W0003

- (4) Measure the clutch pedal play.  
**Standard value (B): 1 – 3 mm**
- (5) If the clutch pedal play is not within the standard value, loosen the setting nut and move the push rod to adjust.

**Caution**

**Do not push in the master cylinder push rod at this time.**

- (6) After completing the adjustments, confirm that the clutch pedal free play (measured at the face of the pedal pad) and the distance between the clutch pedal (the face of the pedal pad) and the toeboard when the clutch is disengaged are within the standard value ranges.

**Standard value (C): 6 – 13 mm**

**Standard value (D): 70 mm or more**

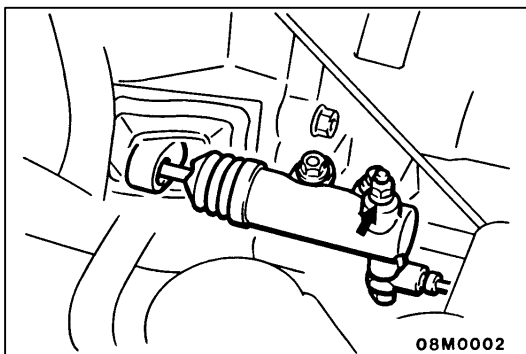
- (7) If the clutch pedal free play and the distance between the clutch pedal and the toeboard when the clutch is disengaged do not agree with the standard values, it is probably the result of either air in the hydraulic system or a faulty master cylinder or clutch. Bleed the air, or disassemble and inspect the master cylinder, release cylinder or clutch.
- (8) Turn back the carpet, etc.

**2. BLEEDING****Specified fluid:**

**MAZDA genuine brake fluid “DIA-QUEEN BRAKE FLUID SUPER 4”**

**Caution**

**Use the specified brake fluid. Avoid using a mixture of the specified fluid and other fluid.**



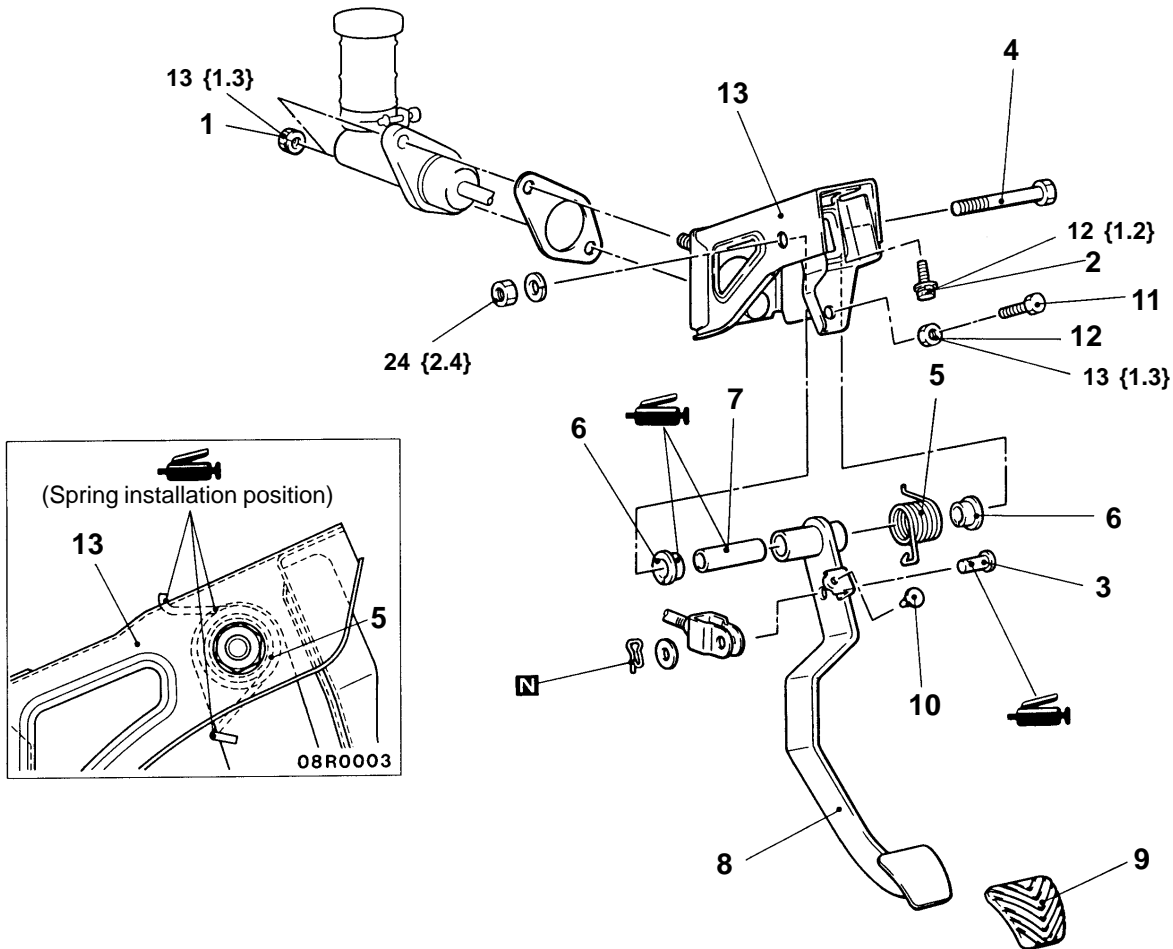
08M0002

# CLUTCH PEDAL

## REMOVAL AND INSTALLATION

### Post-installation Operation

- Clutch Pedal Adjustment (Refer to P.21-2.)



08M0001

Unit: Nm {kgf·m}

### Removal steps

1. Clutch master cylinder installation nut
2. Master cylinder member bracket installation bolt
3. Clevis pin
4. Bolt
5. Return spring
6. Bushing
7. Pipe
8. Clutch pedal
9. Pedal pad
10. Stopper
11. Adjusting bolt
12. Locking nut
13. Pedal and master cylinder support member

# CLUTCH CONTROL

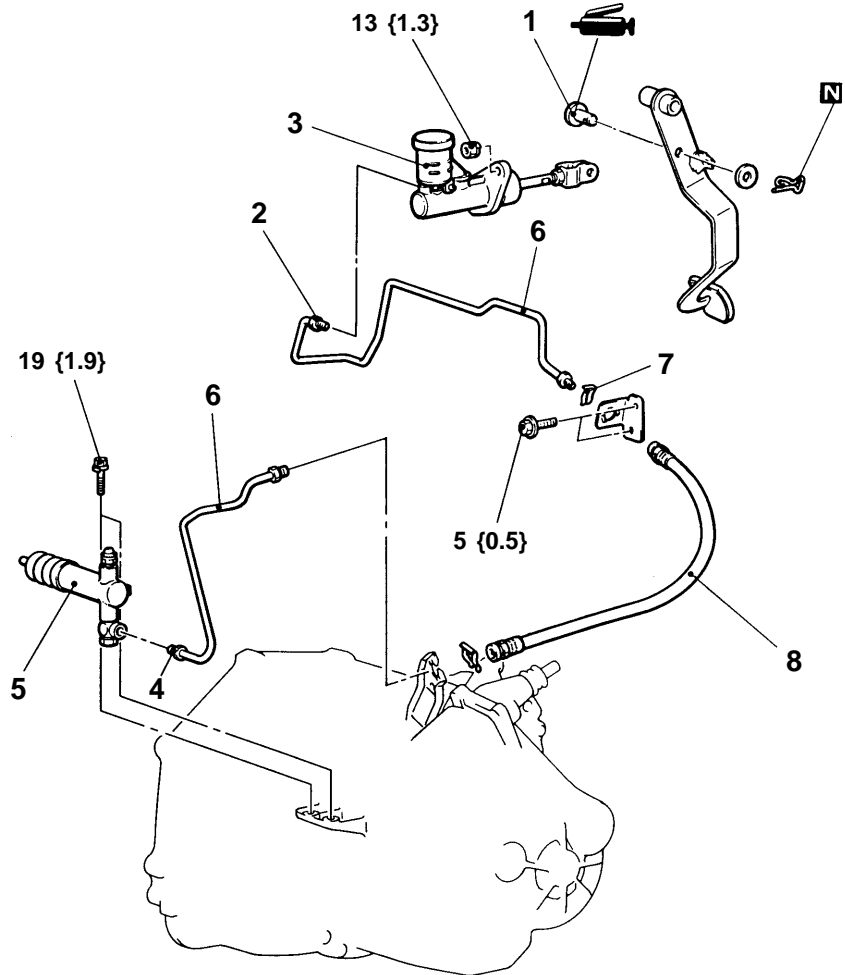
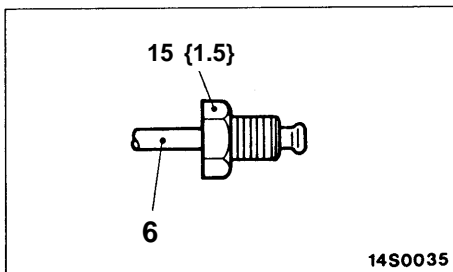
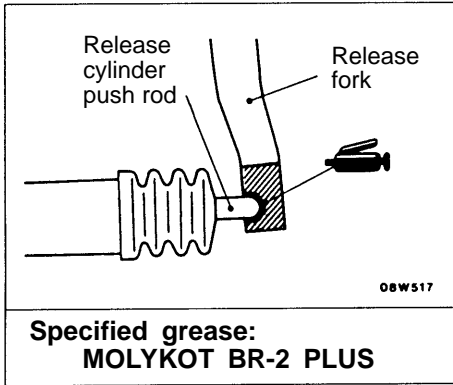
## REMOVAL AND INSTALLATION

**Pre-removal Operation**

- Clutch Fluid Draining

**Post-installation Operation**

- (1) Clutch Fluid Supplying
- (2) Clutch Line Bleeding (Refer to P.21-3.)
- (3) Clutch Pedal Adjustment (Refer to P.21-2.)



08M0004

Unit: Nm {kgf·m}

**Clutch master cylinder removal steps**

1. Clevis pin
2. Clutch pipe connection
3. Clutch master cylinder

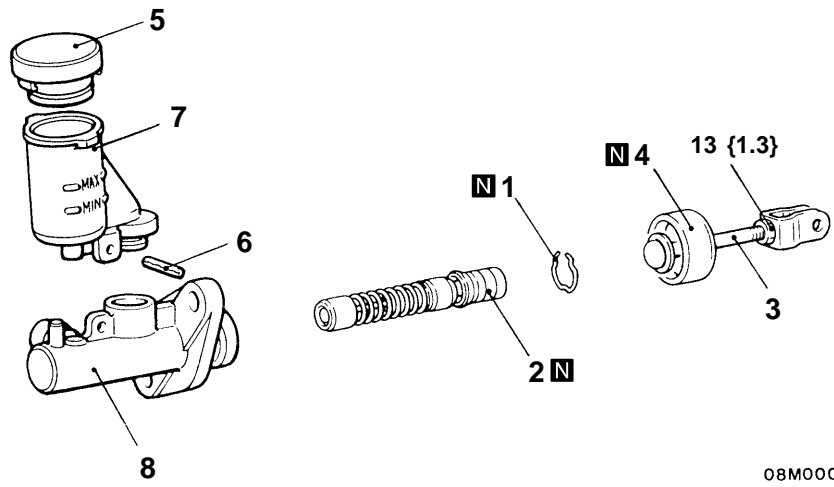
**Clutch release cylinder removal steps**

4. Clutch pipe connection
5. Clutch release cylinder

**Clutch line removal steps**

6. Clutch pipe
7. Hose clip
8. Clutch hose

**CLUTCH MASTER CYLINDER  
DISASSEMBLY AND REASSEMBLY**



08M0003

Unit: Nm {kgf · m}

00004610

08U0047

**Piston repair kit**

08R0011

**Clutch fluid: DIA-QUEEN BRAKE  
FLUID SUPER 4**

08R0007

**Grease: Rubber grease**

**Disassembly steps**

1. Piston stopper ring
2. Piston assembly
3. Push rod assembly
4. Boot
5. Reservoir cap
6. Spring pin
7. Reservoir tank
8. Clutch master cylinder body

**Caution**

**Do not disassemble piston assembly.**



# MANUAL TRANSMISSION

## CONTENTS

MANUAL TRANSMISSION ..... 22A

MANUAL TRANSMISSION OVERHAUL ..... 22B





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# MANUAL TRANSMISSION

## CONTENTS

<b>LUBRICANTS</b> .....	<b>2</b>	<b>TRANSMISSION CONTROL*</b> .....	<b>4</b>
<b>SPECIAL TOOLS</b> .....	<b>2</b>	Shift Lever Assembly .....	6
<b>ON-VEHICLE SERVICE</b> .....	<b>3</b>	<b>TRANSMISSION ASSEMBLY</b> .....	<b>7</b>
1. Transmission Oil Check .....	3	<b>TRANSFER ASSEMBLY</b> .....	<b>10</b>
2. Transmission Oil Replacement .....	3		
3. Transfer Oil Check .....	3		
4. Transfer Oil Replacement .....	3		

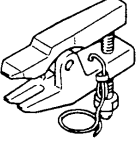
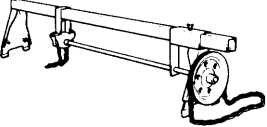
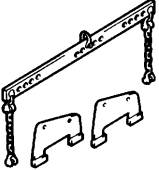
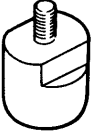
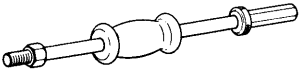
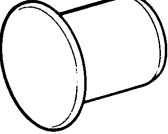
**WARNING REGARDING SERVICING OF SUPPLEMENTAL RESTRAINT SYSTEM (SRS) EQUIPPED VEHICLES**

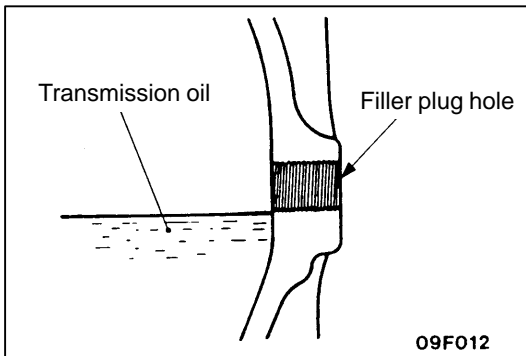
- (1) Thoroughly review this manual, especially GROUP 52B – Supplemental Restraint System (SRS) before beginning any service or maintenance of any component of the SRS or any SRS-related component.
- (2) When removing or installing the components indicated in the table of contents by an asterisk (\*), use special care not to apply shocks to SRS-related components.
-

## LUBRICANT

Item	Specified lubricant	Quantity dm <sup>3</sup> (ℓ)
Transmission oil	MITSUBISHI genuine “Dia-Queen” multi gear oil <75W/85W>	2.8 (2.8)
Transfer oil	MITSUBISHI genuine “Dia-Queen Super” hypoid gear oil (GL-5)	0.62 (0.62)

## SPECIAL TOOLS

Tool	Number	Name	Use
 B991113	MB990635 or MB991113	Steering linkage puller	Tie rod end and lower arm disconnection
	Recommended tool MZ203826 by Anzen Jidosha or MZ203827 by Banzai	Engine lifter	Supporting the engine assembly during removal and installation of the transmission
	MB991453	Engine hanger	
	MB991612	Adapter	Removing output shaft
	MB990211	Slide hammer	
	MB991193	Plug	Preventing oil flowing out from and foreign matter entry into transfer.

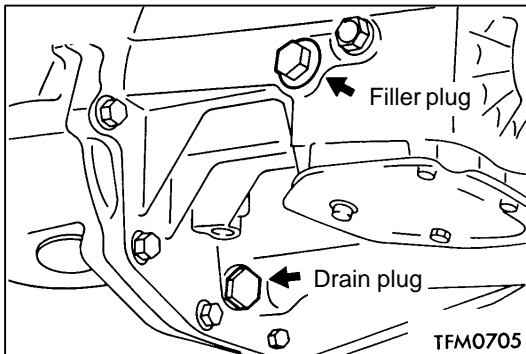


## ON-VEHICLE SERVICE

### 1. TRANSMISSION OIL CHECK

- (1) Remove the oil filler plug.
- (2) Oil level should be at the lower portion of the filler plug hole.
- (3) Check that the transmission oil is not noticeably dirty, and that it has a suitable viscosity.
- (4) Tighten the filler plug to the specified torque.

**Tightening torque: 32 Nm {3.3 kgf·m}**



### 2. TRANSMISSION OIL REPLACEMENT

- (1) Remove the drain plug to drain oil.
- (2) Tighten the drain plug to the specified torque.
- (3) Remove the filler plug and fill with specified oil till the level comes to the lower portion of filler plug hole.

**Transmission oil**

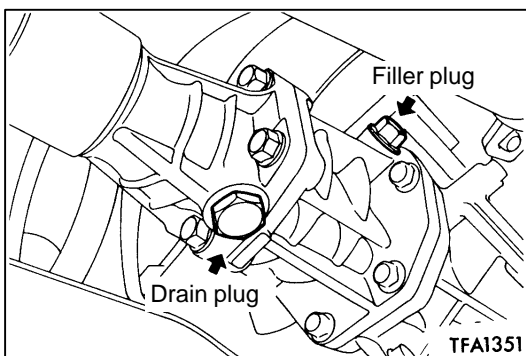
**Specified oil:**

**MITSUBISHI genuine “Dia-Queen” multi gear oil <75W/85W>**

**Quantity: 2.8 dm<sup>3</sup> (2.8 ℓ)**

- (4) Tighten the filler plug to the specified torque.

**Tightening torque: 32 Nm {3.3 kgf·m}**



### 3. TRANSFER OIL CHECK

- (1) Remove the oil filler plug.
- (2) Oil level should be at the lower portion of the filler plug hole.
- (3) Check that the transmission oil is not noticeably dirty, and that it has a suitable viscosity.
- (4) Tighten the filler plug to the specified torque.

**Tightening torque: 32 Nm {3.3 kgf·m}**

### 4. TRANSFER OIL REPLACEMENT

- (1) Remove the drain plug to drain oil.
- (2) Tighten the drain plug to the specified torque.
- (3) Remove the filler plug and fill with specified oil till the level comes to the lower portion of filler plug hole.

**Transfer oil**

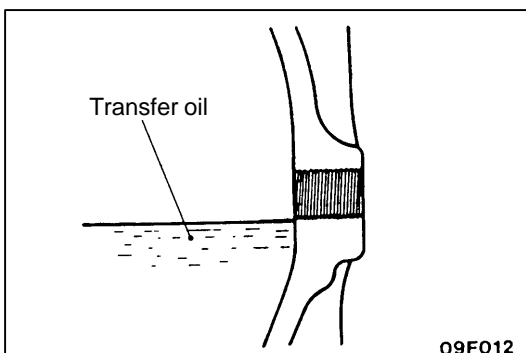
**Specified oil:**

**MITSUBISHI genuine “Dia-Queen Super” hypoid gear oil (GL-5)**

**Quantity: 0.62 dm<sup>3</sup> (0.62 ℓ)**

- (4) Tighten the filler plug to the specified torque.

**Tightening torque: 32 Nm {3.3 kgf·m}**



# TRANSMISSION CONTROL

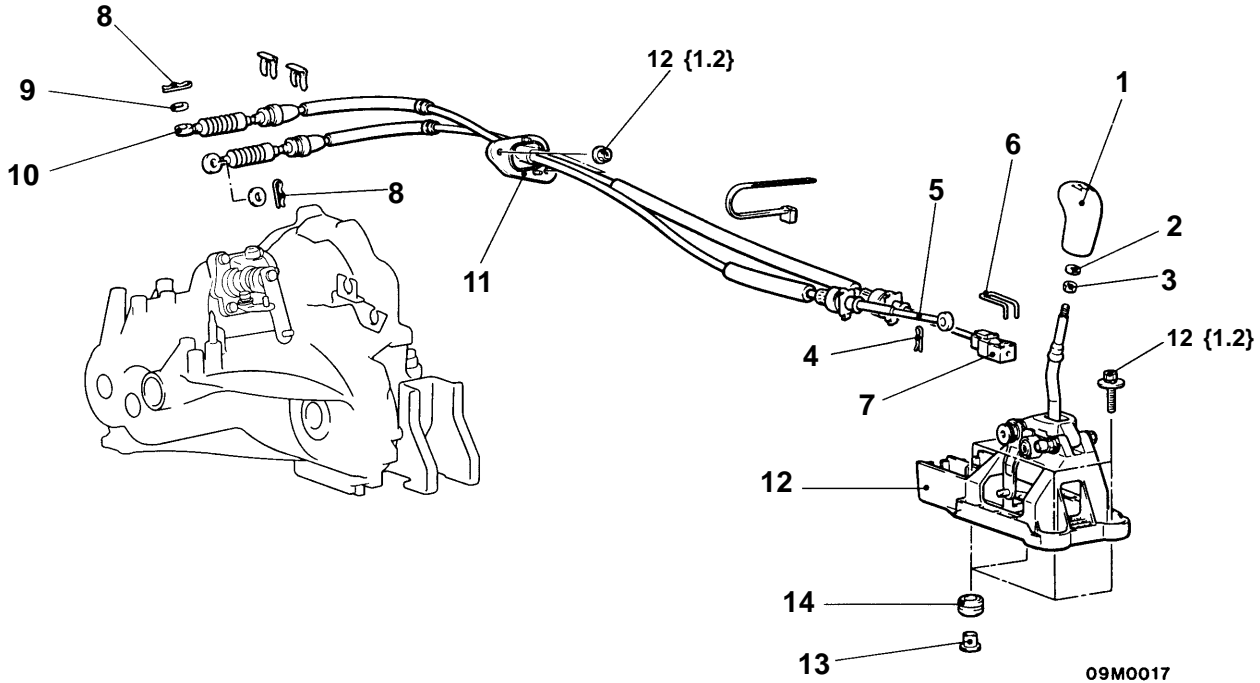
## REMOVAL AND INSTALLATION

**Pre-removal and Post-installation Operation**

- Air Cleaner Assembly Removal and Installation

**Caution: SRS**

Be careful not to subject the SRS-ECU to any shocks during removal and installation of the shift cable and select cable assembly.



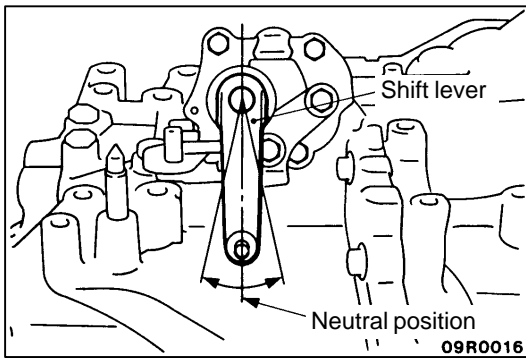
Unit: Nm {kgf·m}

**Shift cable and select cable assembly removal steps**

- ▶B◀ 1. Shift knob
- ▶B◀ 2. Spring washer
- ▶B◀ 3. Nut
  - Front floor console (Refer to GROUP 52.)
- 4. Snap pin
- 5. Select cable connection (Shift lever side)
- 6. Clip
- 7. Shift cable connection (Shift lever side)
- 8. Snap pin
- ▶A◀ 9. Select cable connection (Transmission side)
- ▶A◀ 10. Shift cable connection (Transmission side)
- ▶A◀ 11. Shift cable and select cable assembly

**Shift lever assembly removal steps**

- ▶B◀ 1. Shift knob
- ▶B◀ 2. Spring washer
- ▶B◀ 3. Nut
  - Front floor console (Refer to GROUP 52.)
- 4. Snap pin
- 5. Select cable connection (Shift lever side)
- 6. Clip
- 7. Shift cable connection (Shift lever side)
- 12. Shift lever assembly
- 13. Distance piece
- 14. Bushing



## INSTALLATION SERVICE POINTS

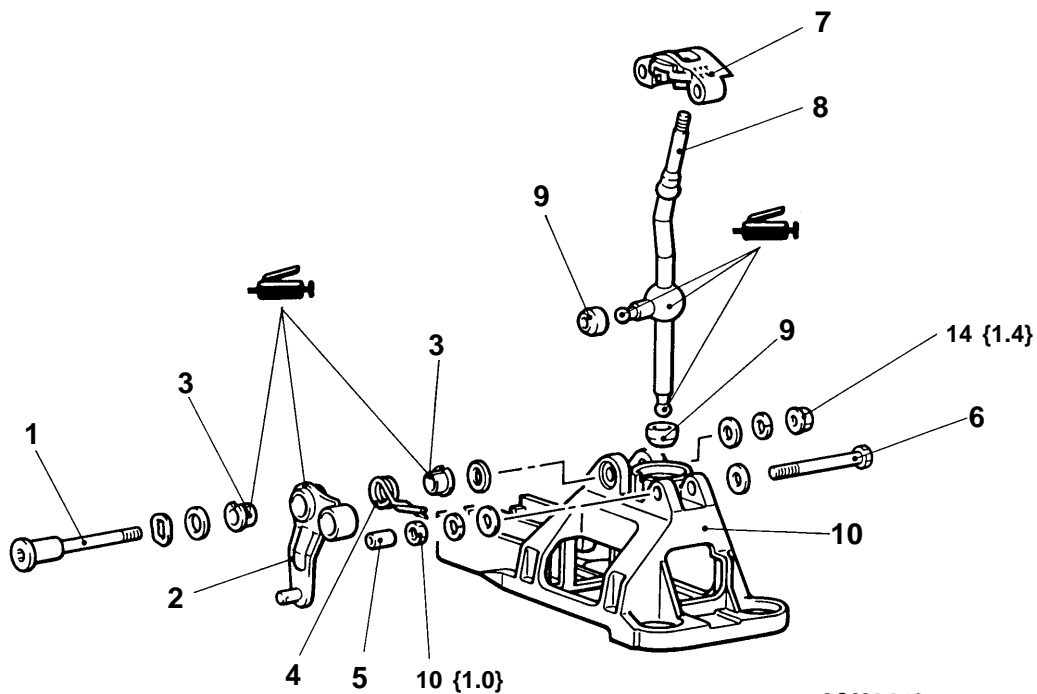
### ▶A◀ SHIFT CABLE AND SELECT CABLE ASSEMBLY / SHIFT CABLE CONNECTION / SELECT CABLE CONNECTION

- (1) Set the transmission side shift lever and the passenger compartment side shift lever to the neutral position.
- (2) For the transmission side, the white and yellow paint marks on the shift and select cable ends should face the snap pins.
- (3) Move the shift lever to all positions and check that the operation is smooth.

### ▶B◀ NUT / SPRING WASHER / SHIFT KNOB INSTALLATION

- (1) Screw in the nut all the way by hand, turn back half a turn, and then insert the spring washer.
- (2) Screw in the shift knob until it touches the spring washer, and make one more turn. Then turn more to adjust the shift pattern on the shift knob.
- (3) If the above steps are impossible, you can turn back the shift knob by one turn at most after screwing in all the way to adjust the shift pattern.

## SHIFT LEVER ASSEMBLY DISASSEMBLY AND REASSEMBLY



09M0013

Unit: Nm {kgf · m}

### Disassembly steps

- |                  |                        |
|------------------|------------------------|
| 1. Bolt          | 6. Bolt                |
| 2. Select lever  | 7. Cap                 |
| 3. Bushing       | 8. Shift lever         |
| 4. Return spring | 9. Shift lever bushing |
| 5. Collar        | 10. Base block         |



# TRANSMISSION ASSEMBLY

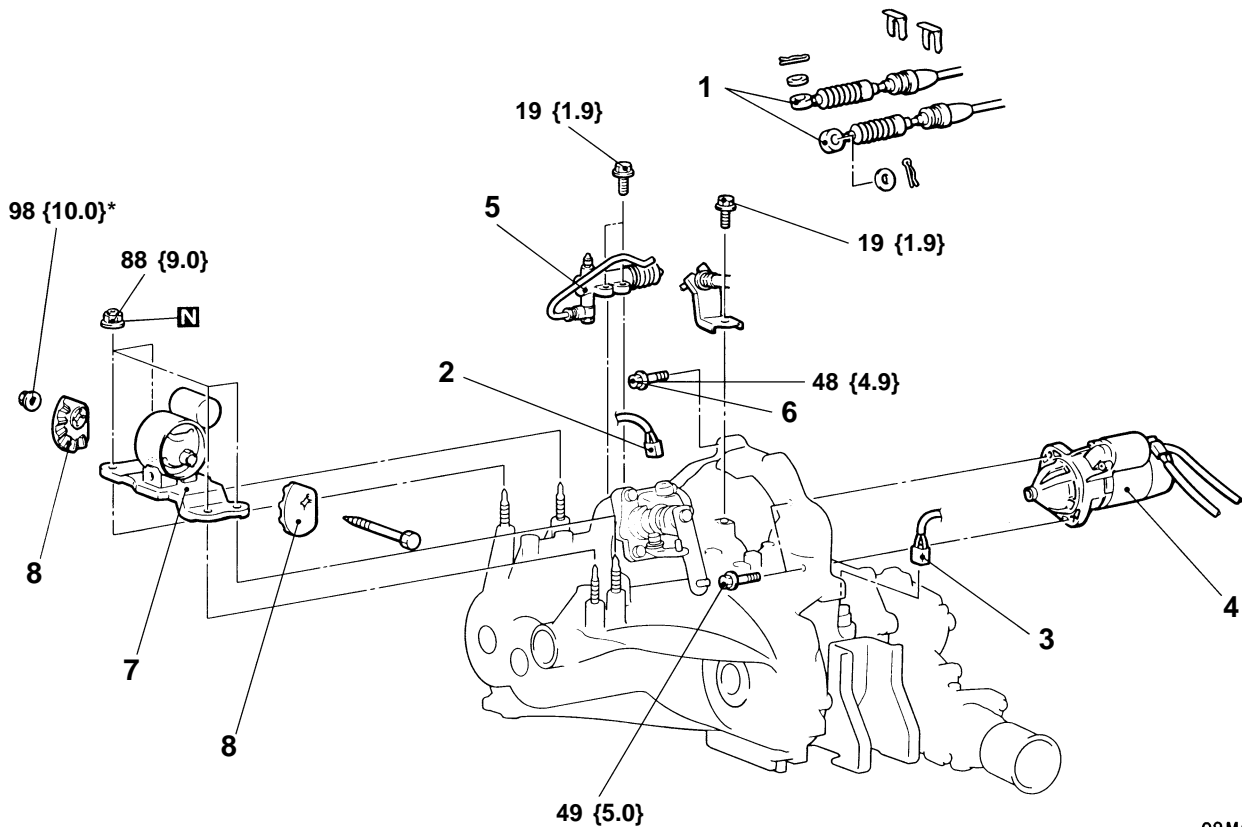
## REMOVAL AND INSTALLATION

### Pre-removal Operation

- (1) Transmission Oil Draining (Refer to P.22A-3.)
- (2) Transfer Oil Draining (Refer to P.22A-3.)
- (3) Under Cover Removal
- (4) Front Exhaust Pipe Removal (Refer to GROUP 15.)
- (5) Battery and Battery Tray Removal
- (6) Air Cleaner Assembly Removal

### Post-installation Operation

- (1) Air Cleaner Assembly Installation
- (2) Battery and Battery Tray Installation
- (3) Front Exhaust Pipe Installation (Refer to GROUP 15.)
- (4) Under Cover Installation
- (5) Transfer Oil Supplying (Refer to P.22A-3.)
- (6) Transmission Oil Supplying (Refer to P.22A-3.)
- (7) Shift Lever Operation Check
- (8) Speedometer Operation Check



09M0016

Unit: Nm {kgf · m}

### Removal steps

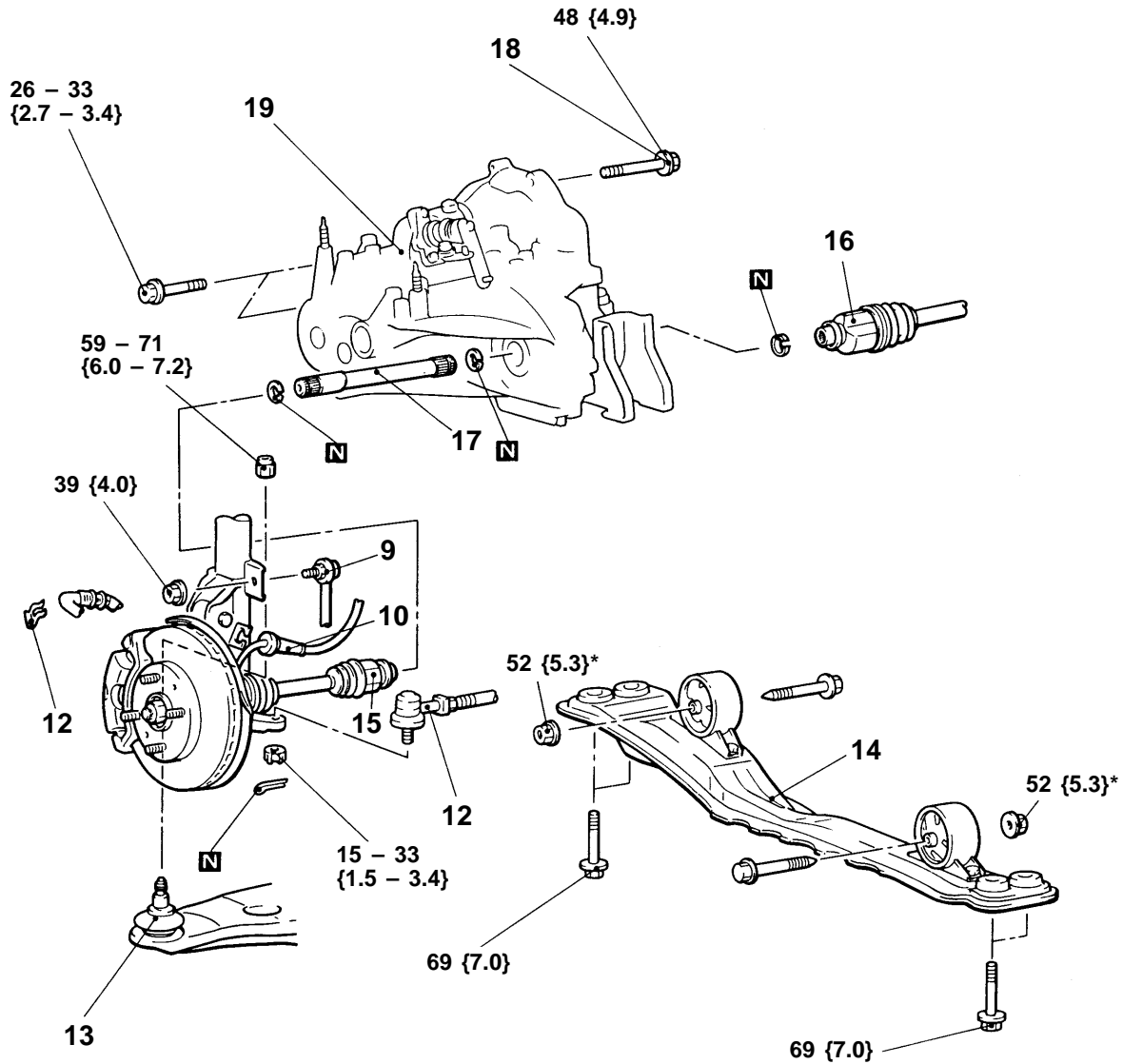
1. Shift cable and select cable connection
2. Backup lamp switch connector
3. Vehicle speed sensor connector
4. Starter motor
5. Clutch release cylinder connection
6. Transmission assembly upper part coupling bolts

7. Transmission mount bracket
8. Transmission mount stopper
- Engine assembly supporting



### Caution

Mounting locations marked by \* should be provisionally tightened, and then fully tightened when the body is supporting the full weight of the engine.

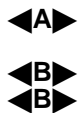


09M0010

Unit: Nm {kgf·m}

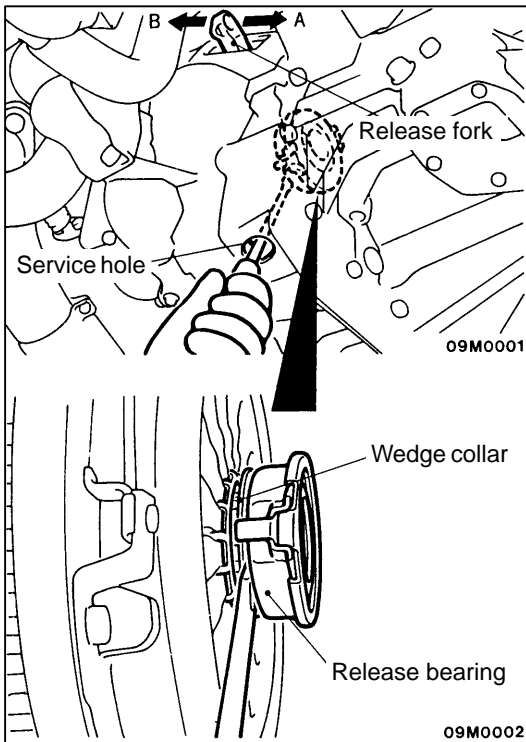
**Lifting up of the vehicle**

- 9. Stabilizer bar connection
- 10. Wheel speed sensor cable connection <Vehicles with ABS>
- 11. Brake hose clamp
- 12. Tie rod end connection
- 13. Lower arm ball joint connection
  - Clutch release bearing connection
- 14. Centermember assembly
- 15. Drive shaft <LH> connection
- 16. Drive shaft <RH> connection
  - Strut assembly <LH> (Refer to GROUP 33A.)



- 17. Output shaft
  - Air hose A (Refer to GROUP 15 – Intercooler.)
- 18. Transmission assembly lower part coupling bolts
- 19. Transmission assembly

**Caution**  
 Mounting locations marked by \* should be provisionally tightened, and then fully tightened when the body is supporting the full weight of the engine.



**REMOVAL SERVICE POINTS**

**◀A▶ CLUTCH RELEASE BEARING SEPARATION**

- (1) Remove the cover from the service hole in the clutch housing.
- (2) While pushing the release fork by hand in the direction A, insert a flap-tip screwdriver between the release bearing and the wedge collar.

**Caution**

**Be sure to push the release fork in the direction A before inserting a screwdriver.**

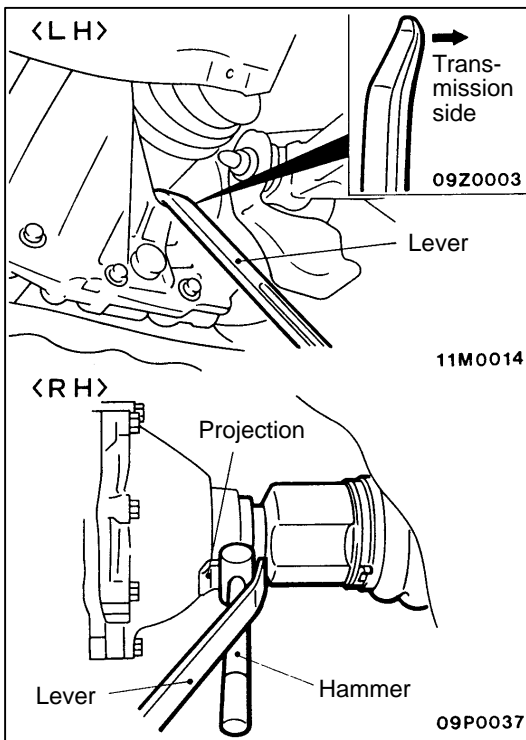
- (3) Separate the release bearing from the wedge collar by prying with the screwdriver (turning the screwdriver grip 90°).

**NOTE**

The release fork is forced to move fully in the direction B by the return spring as soon as it is separated from the wedge collar.

**Caution**

**If it is hard to turn the screwdriver (to pry off the release bearing), remove the screwdriver once and repeat the above procedure after pushing the release fork fully in the direction A two to three times. Forcibly prying can cause the release bearing to be damaged.**



**◀B▶ DRIVE SHAFT <LH> / DRIVE SHAFT <RH> DISCONNECTION**

- (1) To disconnect the left-hand drive shaft, insert a lever as shown and pry out the shaft from the transmission. To disconnect the right-hand drive shaft, apply a lever and a hammer as shown and lever out the shaft from the transfer assembly using the hammer as a fulcrum.

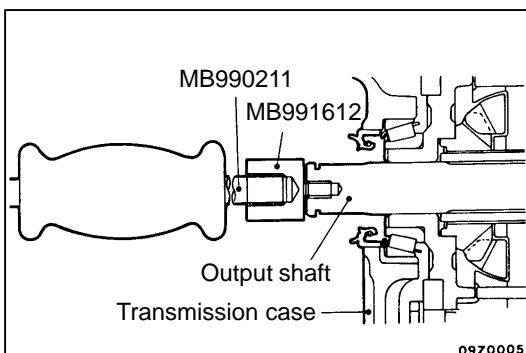
**NOTE**

Remove the drive shafts with the hub and knuckle attached.

**Caution**

**Do not attempt to pull out the drive shaft from the BJ in this stage since it can cause the TJ to be damaged. Be sure to remove the drive shaft first from the transmission side using a lever.**

- (2) Suspend the removed drive shaft with a wire so that there are no sharp bends in any of the joints.



**◀C▶ OUTPUT SHAFT REMOVAL**

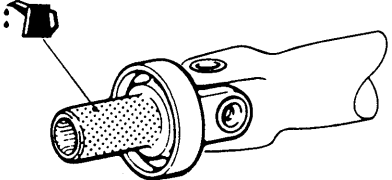
- (1) Use the special tools (MB991612, MB990211) to remove the output shaft.
- (2) Use a shop towel to cover the transmission case not to let foreign material get into it.

# TRANSFER ASSEMBLY

## REMOVAL AND INSTALLATION

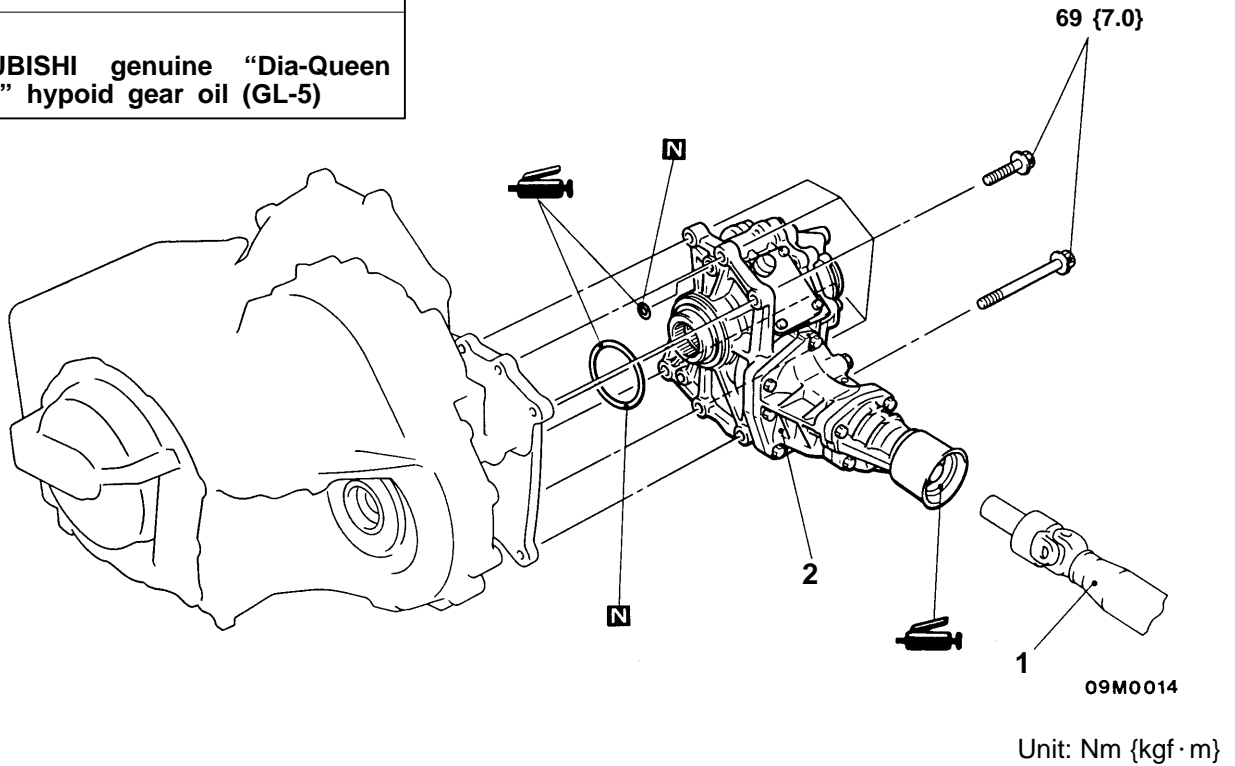
**Pre-removal and Post-installation Operation**

- Transmission Oil Draining and Supplying (Refer to P.22A-3.)
- Transfer Oil Draining and Supplying (Refer to P.22A-3.)
- Front Exhaust Pipe Removal and Installation (Refer to GROUP 15.)



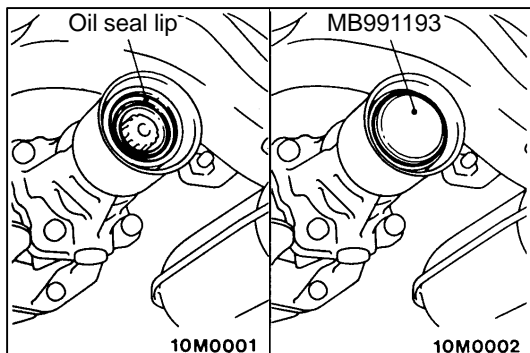
10G0001

**Gear oil:**  
**MITSUBISHI** genuine “Dia-Queen Super” hypoid gear oil (GL-5)



**Removal steps**

- Drive shaft (Refer to P.22A-9.)
- Output shaft (Refer to P.22A-9.)
- 1. Front propeller shaft (Refer to GROUP 25)
- 2. Transfer assembly



**REMOVAL SERVICE POINT**

◀▶ **TRANSFER ASSEMBLY REMOVAL**

**Caution**

- (1) Use care not to damage the lip of the oil seal in the transfer case.
- (2) Use the special tool to cover the opening in the transfer case to prevent oil from flowing out or foreign materials from entering the case.

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# MANUAL TRANSMISSION OVERHAUL

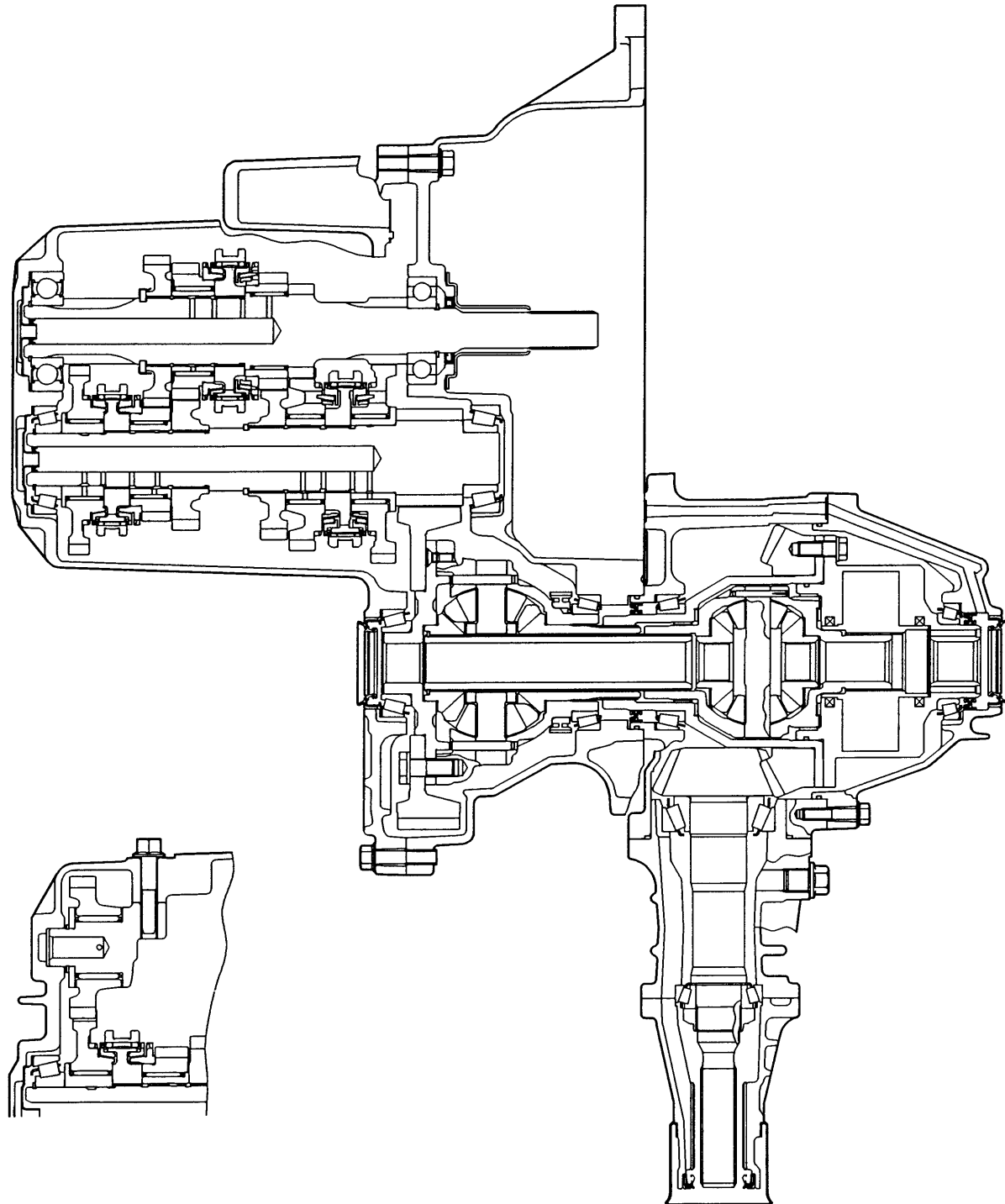
## CONTENTS

GENERAL INFORMATION .....	2	OUTPUT SHAFT .....	27
SPECIFICATIONS .....	4	REVERSE IDLER GEAR .....	35
SERVICE SPECIFICATIONS .....	4	SPEEDOMETER GEAR .....	36
SEALANTS AND ADHESIVES .....	5	SELECT LEVER .....	37
LUBRICANTS .....	6	CONTROL HOUSING .....	38
SNAP RINGS, SPACERS AND THRUST PLATES FOR ADJUSTMENT .....	6	CLUTCH HOUSING .....	41
TORQUE SPECIFICATIONS .....	9	TRANSMISSION CASE .....	44
SPECIAL TOOLS .....	10	CENTER DIFFERENTIAL .....	46
TRANSMISSION .....	13	TRANSFER .....	49
INPUT SHAFT .....	20		

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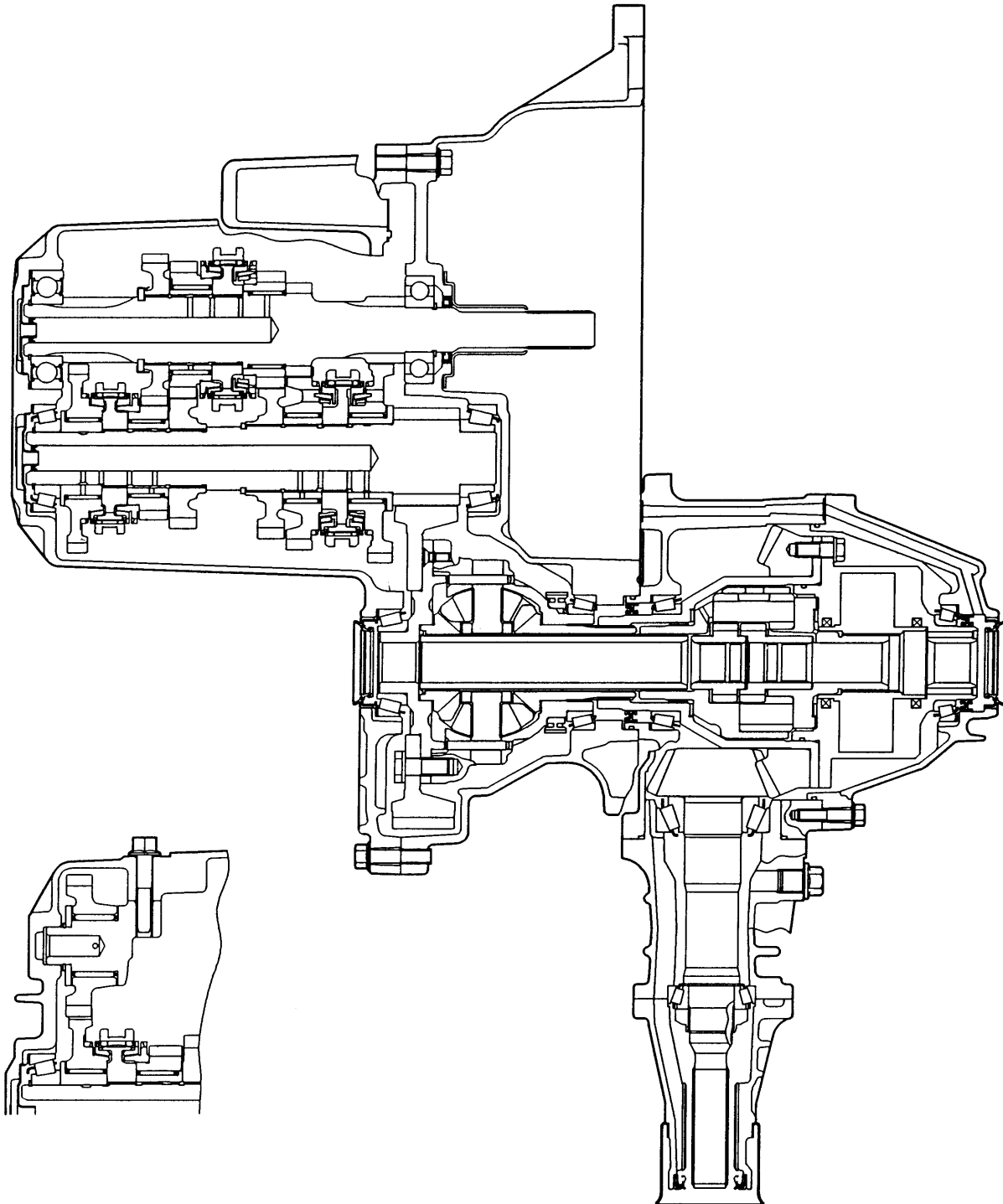
## GENERAL INFORMATION

### SECTIONAL VIEW – Without Front Limited Slip Differential (Front LSD)



TFM0706

SECTIONAL VIEW – With Front Limited Slip Differential (Front LSD)



TFM0707

**SPECIFICATIONS****TRANSMISSION MODEL TABLE**

Transmission model	Gear ratio	Speedometer gear ratio	Final gear ratio	Front LSD
W5M51-1-X6A	A	29/36	4.529	Not available
W5M51-1-X6A1	A	29/36	4.529	Available
W5M51-1-X7A	A	30/36	4.529	Not available
W5M51-1-X7A1	A	30/36	4.529	Available
W5M51-1-Z6A	B	29/36	4.875	Not available
W5M51-1-Z6A1	B	29/36	4.875	Available
W5M51-1-Z7A	B	30/36	4.875	Not available
W5M51-1-Z7A1	B	30/36	4.875	Available

**GEAR RATIO TABLE**

	A	B
1st	2.785	←
2nd	1.950	←
3rd	1.407	1.444
4th	1.031	1.096
5th	0.761	0.825
Reverse	3.416	←
Transfer gear ratio	0.3018	←

**SERVICE SPECIFICATIONS**

Items	Allowable range	Limit
Input shaft end play mm	0.05 – 0.17	–
Input shaft front bearing clearance mm	0 – 0.12	–
Input shaft rear bearing clearance mm	0 – 0.12	–
Input shaft 5th speed gear clearance mm	0 – 0.09	–
Output shaft preload mm	0.13 – 0.18	–
Output shaft bearing clearance mm	0 – 0.09	–
Output shaft 3rd speed gear clearance mm	0 – 0.09	–
Center differential case preload mm	0.05 – 0.11	–
Center differential case pinion backlash mm	0.025 – 0.150	–
Synchronizer ring back surface to gear clearance mm	–	0.5



## **SEALANTS AND ADHESIVES**

### **TRANSMISSION**

Items	Specified sealants and adhesives
Clutch housing-transmission case mating surface	THREEBOND 1216
Control housing-transmission case mating surface	
Under cover-transmission case mating surface	
Air breather	THREEBOND 1501
Center differential drive gear bolt	THREEBOND 1303 or LOKTITE 648

### **TRANSFER**

Items	Specified sealants and adhesives
Air breather	THREEBOND 1501

### **FORM-IN-PLACE GASKET**

The transmission has several areas where the form-in-place gasket (FIPG) is in use. To ensure that the gasket fully serves its purpose, it is necessary to observe some precautions when applying the gasket. Bead size, continuity and location are of paramount importance. Too thin a bead could cause leaks. Too thick a bead, on the other hand, could be squeezed out of location, causing blocking or narrowing of the fluid feed line. To eliminate the possibility of leaks from a joint, therefore, it is absolutely necessary to apply the gasket evenly without a break, while observing the correct bead size.

### **DISASSEMBLY**

The parts assembled with the FIPG can be easily disassembled without use of a special method. In some cases, however, the sealant between the joined surfaces may have to be broken by lightly striking with a mallet or similar tool. A flat and thin gasket scraper may be lightly hammered in between the joined surfaces. In this case, however, care must be taken to prevent damage to the joined surfaces.

### **SURFACE PREPARATION**

Thoroughly remove all substances deposited on the gasket application surfaces, using a gasket scraper or wire brush. Check to ensure that the surfaces to which the FIPG is to be applied is flat. Make sure that there are no oils, greases and foreign substances deposited on the application surfaces. Do not forget to remove the old sealant remaining in the bolt holes.

### **FORM-IN-PLACE GASKET APPLICATION**

Applied FIPG bead should be of the specified size and without breaks. Also be sure to encircle the bolt hole circumference with a completely continuous bead. The FIPG can be wiped away unless it is hardened. While the FIPG is still moist (in less than 10 minutes), mount the parts in position. When the parts are mounted, make sure that the gasket is applied to the required area only. In addition, do not apply any oil or water to the sealing locations or start the engine until a sufficient amount of time (about one hour) has passed after installation is completed.

The FIPG application procedure may vary on different areas. Observe the procedure described in the text when applying the FIPG.

**LUBRICANTS****TRANSMISSION**

Items	Specified lubricants
Drive shaft oil seal lip area	DIA QUEEN MULTI-GEAR OIL 75W/85W (Transmission oil)
Input shaft oil seal lip area	
Control shaft oil seal lip area	
Select lever shoe	MOLYWHITE TA No.1 or No.2

**TRANSFER**

Items	Specified lubricants
Drive shaft oil seal lip area	DIA QUEEN MULTI-GEAR OIL 75W/85W (Transmission oil)
Front differential oil seal lip area	
O-rings	

**SNAP RINGS, SPACERS AND THRUST PLATES FOR  
ADJUSTMENT**

Part name	Thickness mm	Identification symbol	Part No.
Spacer (For adjustment of input shaft end play)	1.34	34	MD723600
	1.43	43	MD723603
	1.52	52	MD723606
	1.61	61	MD723609
	1.70	70	MD756760
	1.79	79	MD756763
Snap ring (For adjustment of input shaft front bearing clearance)	1.43	Green (2)	MD746708
	1.51	White (2)	MD746709
	1.59	Yellow (2)	MD746710
Snap ring (For adjustment of input shaft rear bearing clearance)	1.44	None	MD746602
	1.51	Blue	MD746603
	1.58	Brown	MD746604

Part name	Thickness mm	Identification symbol	Part No.
Thrust plate (For adjustment of input shaft 5th speed gear clearance)	3.82	0	MD748465
	3.86	2	MD748466
	3.90	3	MD748467
	3.94	5	MD748468
	3.98	6	MD748469
	4.02	7	MD748470
	4.06	8	MD748471
	4.10	9	MD748472
Spacer (For adjustment of output shaft preload)	0.86	86	MD720938
	0.89	89	MD720939
	0.92	92	MD720940
	0.95	95	MD720941
	0.98	98	MD720942
	1.01	01	MD720943
	1.04	04	MD720944
	1.07	07	MD720945
	1.10	J	MD710454
	1.13	D	MD700270
	1.16	K	MD710455
	1.19	L	MD710456
	1.22	G	MD700271
	1.25	M	MD710457
	1.28	N	MD710458
	1.31	E	MD706574
	1.34	O	MD710459
	1.37	P	MD710460
1.40	None	MD706573	
1.43	Q	MD710461	
1.46	R	MD710462	

Part name	Thickness mm	Identification symbol	Part No.
Snap ring (For adjustment of output shaft bearing clearance)	1.36	Yellow	MD748449
	1.40	Green	MD748450
	1.44	None	MD746602
	1.48	Black	MD748451
	1.51	Blue	MD746603
	1.55	White	MD748452
	1.58	Brown	MD746604
	1.63	Orange	MD748453
	1.68	Blue	MD748454
Snap ring (For adjustment of output shaft 3rd speed gear clearance)	2.81	None	MD746594
	2.85	Blue	MD746595
	2.89	Brown	MD746596
	2.93	Yellow	MD746597
	2.97	Green	MD746598
	3.01	Black	MD746599
	3.05	White	MD746600
	3.09	Orange	MD746601
Spacer (For adjustment of center differential case preload)	0.74	74	MD727660
	0.77	77	MD754476
	0.80	80	MD727661
	0.83	83	MD720937
	0.86	86	MD720938
	0.89	89	MD720939
	0.92	92	MD720940
	0.95	95	MD720941
	0.98	98	MD720942
	1.01	01	MD720943
	1.04	04	MD720944
	1.07	07	MD720945
	1.10	J	MD710454
	1.13	D	MD700270
1.16	K	MD710455	

Part name	Thickness mm	Identification symbol	Part No.
Spacer (For adjustment of center differential case preload)	1.19	L	MD710456
	1.22	G	MD700271
	1.25	M	MD710457
	1.28	N	MD710458
	1.31	E	MD706574
Spacer (For adjustment of center differential case pinion backlash)	0.6	–	MD748362
	0.7	–	MD748363
	0.8	–	MD748364
	0.9	–	MD748365
	1.0	–	MD748366
	1.1	–	MD748367

## TORQUE SPECIFICATIONS

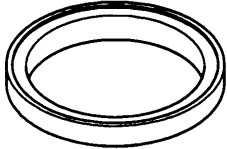
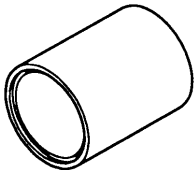
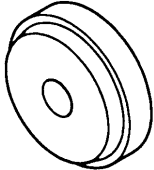
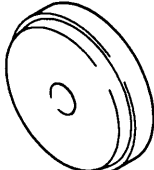
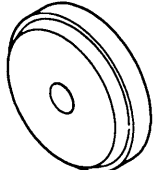
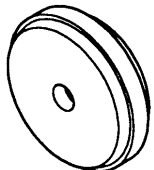
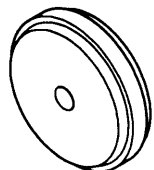
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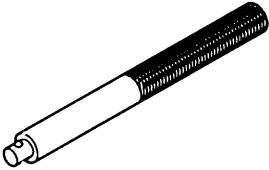
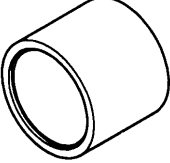
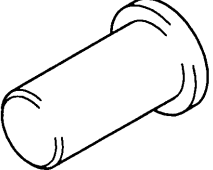

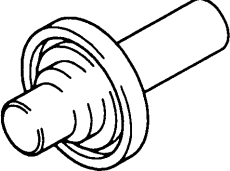
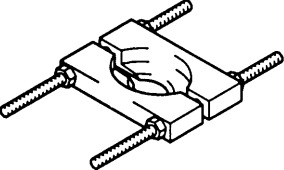
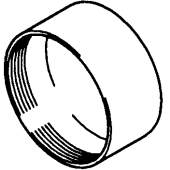
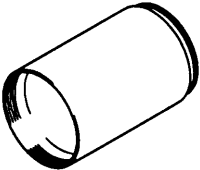
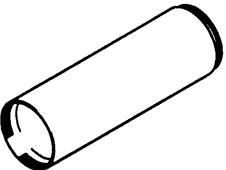
Items	Nm {kgf · m}
Under cover mounting bolt	6.9 {0.7}
Interlock plate bolt	30 {3.1}
Clutch housing-transmission case mounting bolt	44 {4.5}
Clutch release bearing retainer mounting bolt	9.8 {1.0}
Control housing mounting bolt	18 {1.9}
Shift cable bracket mounting bolt	18 {1.9}
Speedometer gear mounting bolt	3.9 {0.4}
Stopper bracket mounting bolt	18 {1.9}
Select lever mounting bolt	18 {1.9}
Select lever mounting nut	11 {1.2}
Center differential drive gear mounting bolt	132 {13.5}
Back-up lamp switch	32 {3.3}
Poppet spring plug	32 {3.3}
Reverse idler gear shaft mounting bolt	48 {4.9}
Roll stopper bracket mounting bolt	69 {7.0}

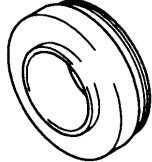

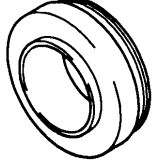
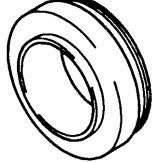
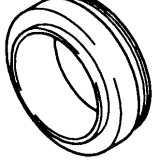
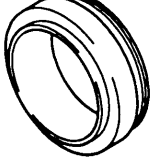
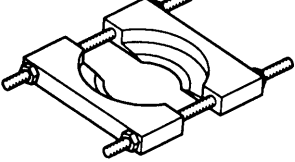
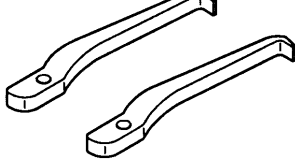
**TRANSFER**

Items	Nm {kgf · m}
Transfer cover mounting bolt	23 {2.4}
Transmission-transfer mounting bolt	69 {7.0}

**SPECIAL TOOLS**

Tool	Number	Name	Use
	MB990887	Arm bushing remover & installer ring	Installation of transfer oil seal
	MB990891	Bushing remover & installer base	Installation of transfer oil seal
	MB990928	Installer adapter	Installation of input shaft oil seal
	MB990932	Installer adapter	Removal of differential case taper roller bearing
	MB990933	Installer adapter	Installation of transfer oil seal
	MB990935	Installer adapter	Installation of output shaft front taper roller bearing outer race
	MB990937	Installer adapter	Installation of differential case taper roller bearing

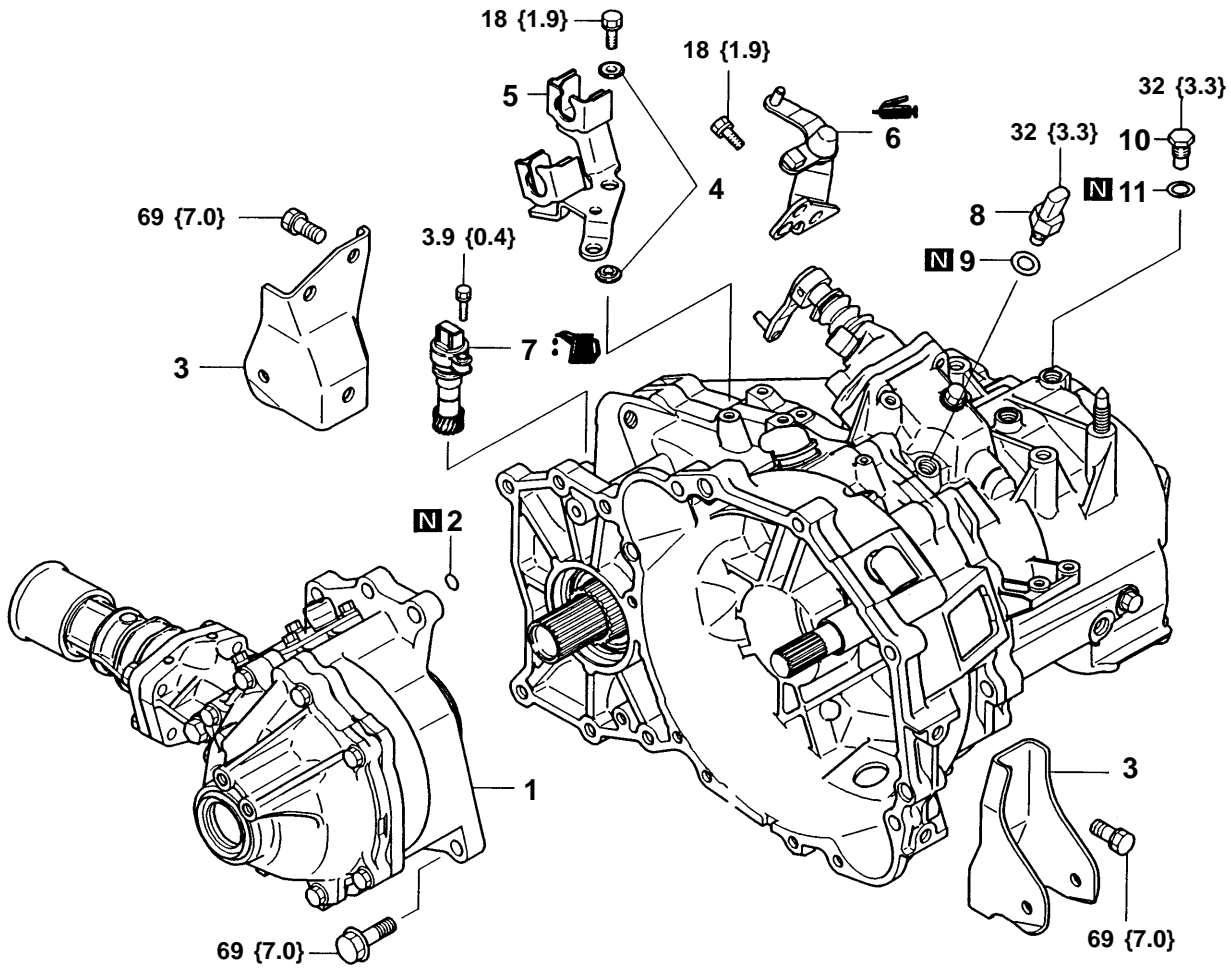
Tool	Number	Name	Use
	MB990938	Handle	Use with Installer adapter
	MB991445	Bushing remover and installer base	Installation of differential case taper roller bearing outer race
	MD998304	Oil seal installer	Installation of transfer extension housing oil seal
	MD998364	Camshaft oil seal installer	Installation of gear, bearing and sleeve
	MD998800	Oil seal installer	Installation of differential oil seal and transfer cover oil seal
	MD998801	Bearing remover	Installation and removal of gear, bearing and sleeve
	MD998812	Installer cap	Use with Installer and installer adapter
	MD998813	Installer-100	Use with Installer cap and installer adapter
	MD998814	Installer-200	Use with Installer cap and installer adapter

Tool	Number	Name	Use
	MD998818	Installer adapter (38)	Installation of input shaft front bearing
	MD998819	Installer adapter (40)	Installation of input shaft rear bearing and output shaft taper roller bearing
	MD998820	Installer adapter (42)	Installation of reverse gear bearing sleeve
	MD998821	Installer adapter (44)	Installation of 4th speed gear, 5th speed gear sleeve and 5th-reverse speed synchronizer hub
	MD998824	Installer adapter (50)	Installation of 1st-2nd speed synchronizer hub, 2nd speed gear sleeve and 3rd speed gear
	MD998825	Installer adapter (52)	Installation of 1st speed gear sleeve, 3rd-4th speed synchronizer hub, 4th speed gear sleeve, 5th speed gear and thrust plate stopper
	MD998917	Bearing remover	Removal and installation of gear, bearing and sleeve
	MD999566	Claw	Removal of taper roller bearing outer race



# TRANSMISSION

## DISASSEMBLY AND REASSEMBLY



TFM0881

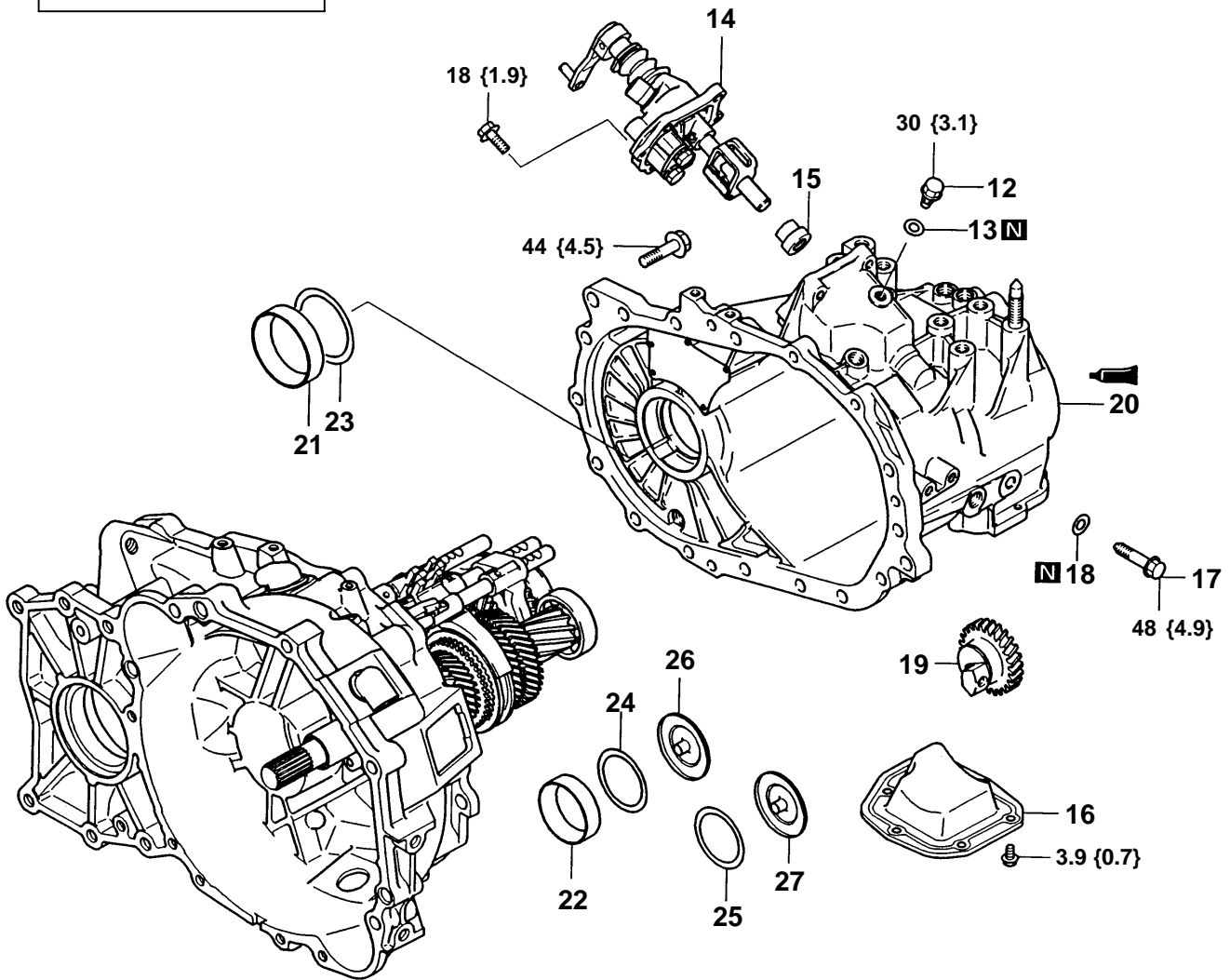
Unit: Nm {kgf·m}

### Disassembly steps

- ▶J◀ 1. Transfer
- ▶J◀ 2. O-ring
- ▶J◀ 3. Roll stopper bracket
- ▶J◀ 4. Insulator washer
- ▶J◀ 5. Shift cable bracket
- ▶J◀ 6. Select lever

- ▶H◀ 7. Speedometer gear
- ▶H◀ 8. Back-up lamp switch
- ▶H◀ 9. Gasket
- ▶H◀ 10. Plug
- ▶H◀ 11. Gasket

Apply gear oil to all moving parts before installation.



TFM0762

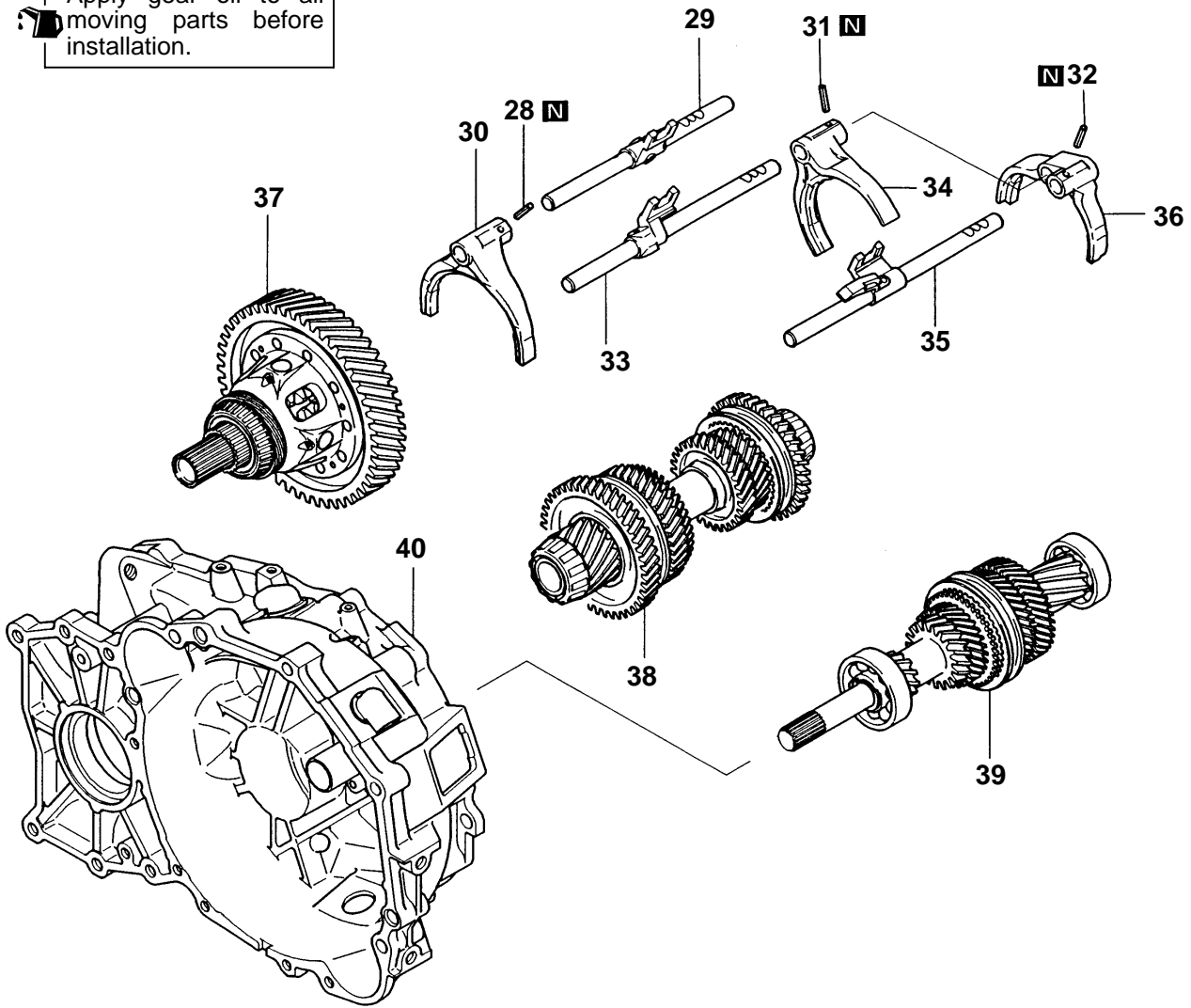
Unit: Nm {kgf · m}

**Disassembly steps**

- 12. Interlock plate bolt
- 13. Gasket
- ▶G◀ 14. Control housing
- ▶F◀ 15. Neutral return spring
- 16. Under cover
- 17. Reverse idler gear shaft bolt
- 18. Gasket
- 19. Reverse idler gear

- ▶E◀ 20. Transmission case
- 21. Outer race
- 22. Outer race
- ▶D◀ 23. Spacer
- ▶D◀ 24. Spacer
- ▶D◀ 25. Spacer
- 26. Oil guide
- 27. Oil guide

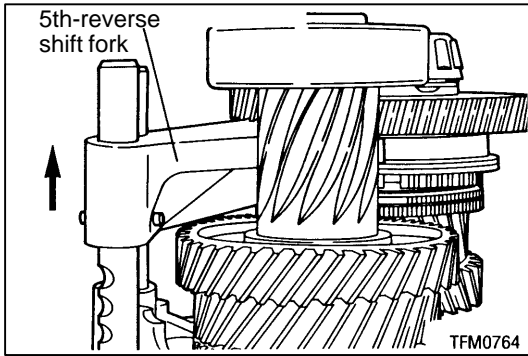
Apply gear oil to all moving parts before installation.



TFM0882

**Disassembly steps**

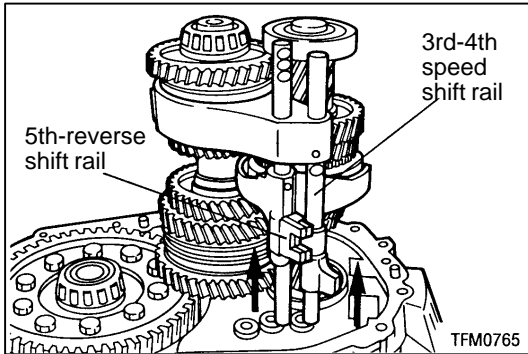
- |           |                              |        |                                  |
|-----------|------------------------------|--------|----------------------------------|
| ▶C◀       | 28. Spring pin               | ▶B▶▶B▶ | 35. 5th-reverse speed shift rail |
|           | 29. 1st-2nd speed shift rail | ▶B▶▶B▶ | 36. 5th-reverse speed shift fork |
|           | 30. 1st-2nd speed shift fork | ▶C▶▶A▶ | 37. Center differential          |
| ▶C▶       | 31. Spring pin               | ▶C▶▶A▶ | 38. Output shaft                 |
| ▶A▶▶B▶▶B▶ | 32. Spring pin               | ▶C▶▶A▶ | 39. Input shaft                  |
|           | 33. 3rd-4th speed shift rail |        | 40. Clutch housing               |
|           | 34. 3rd-4th speed shift fork |        |                                  |



**DISASSEMBLY SERVICE POINTS**

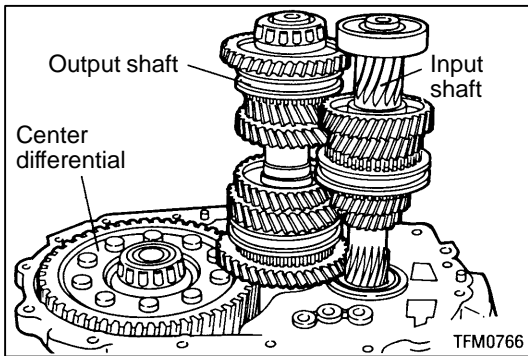
**◀A▶ SPRING PIN REMOVAL**

Shift the 5th-reverse shift fork in the direction shown in the illustration.



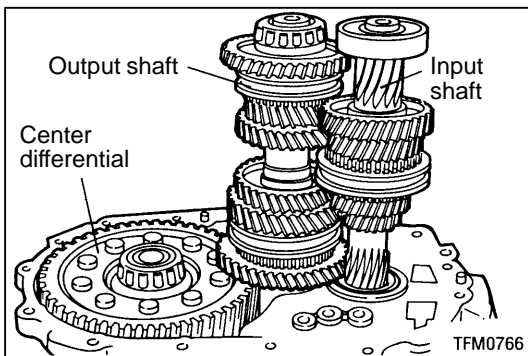
**◀B▶ 3RD-4TH SPEED SHIFT RAIL / 3RD-4TH SPEED SHIFT FORK / 5TH-REVERSE SPEED SHIFT RAIL / 5TH-REVERSE SPEED SHIFT FORK REMOVAL**

Pull out the shift rails from the shift rail holes in the clutch housing.



**◀C▶ CENTER DIFFERENTIAL / OUTPUT SHAFT / INPUT SHAFT REMOVAL**

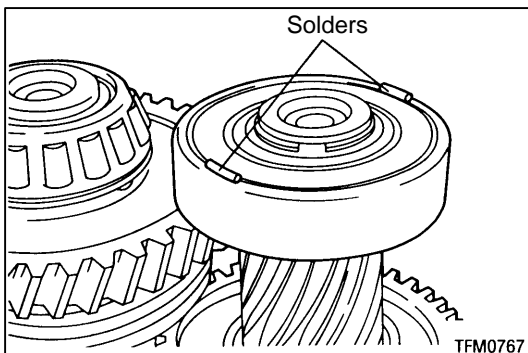
Remove the input shaft, output shaft and center differential together.



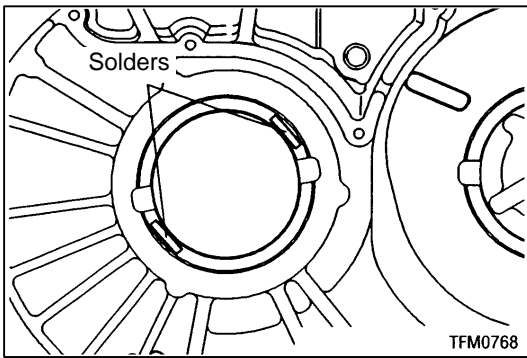
**ADJUSTMENT BEFORE REASSEMBLY**

**SPACER SELECTION FOR ADJUSTING INPUT SHAFT END PLAY / OUTPUT SHAFT PRELOAD / DIFFERENTIAL PRELOAD**

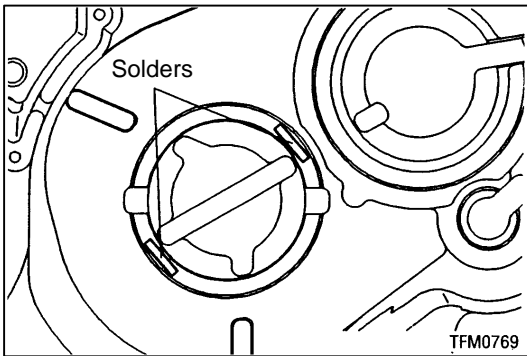
(1) Install the input shaft, output shaft and center differential as a set to the clutch housing.



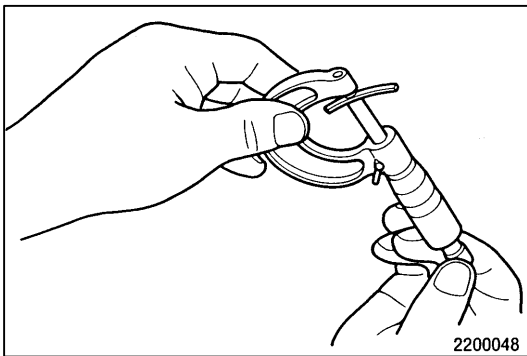
(2) Place two pieces of solder (1.6 mm in diameter and approx. 10 mm in length) on the input shaft rear bearing at the positions shown in the illustration.



- (3) Place two pieces of solder (1.6 mm in diameter and approx. 10 mm in length) on the transmission case at the positions shown in the illustration.
- (4) Install the bearing outer race.
- (5) Install the transmission case and tighten the bolts to the specified torque.



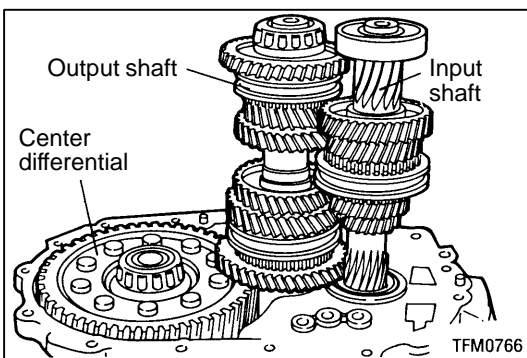
- (6) Remove the transmission case. If the solder is not crushed, repeat the steps (2) through (5) using the solder with larger diameter.



- (7) Measure the thickness of the crushed solder with a micrometer and select spacers that will provide the standard end play/preload value.

**Standard value:**

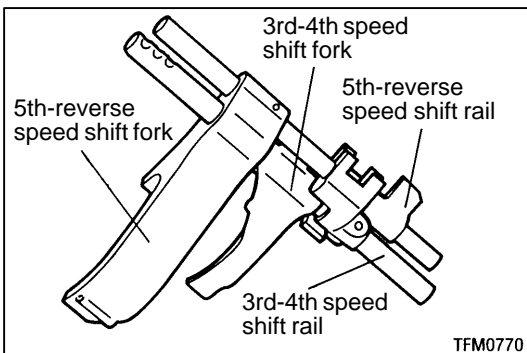
- Input shaft end play ..... 0 – 0.17 mm
- Output shaft end play ..... 0.13 – 0.18 mm
- Center differential preload .... 0.05 – 0.11 mm



**REASSEMBLY SERVICE POINTS**

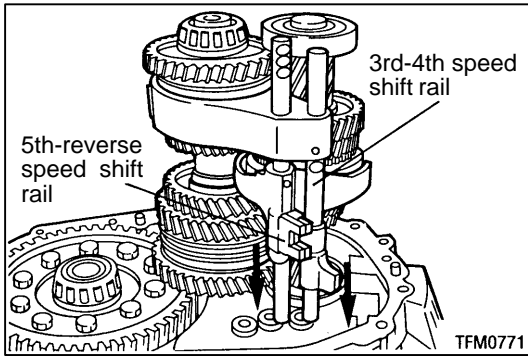
**▶A◀ INPUT SHAFT / OUTPUT SHAFT / CENTER DIFFERENTIAL INSTALLATION**

Install the input shaft, output shaft and differential as a unit.

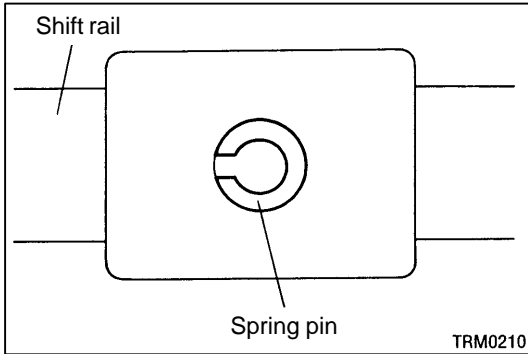


**▶B◀ 5TH-REVERSE SPEED SHIFT FORK / 5TH-REVERSE SPEED SHIFT RAIL / 3RD-4TH SPEED SHIFT RAIL INSTALLATION**

- (1) Install the 3rd-4th speed shift rails and fork, and 5th-reverse speed shift rail and fork.



(2) Slide the shift rails into the shift rail holes in the clutch housing.

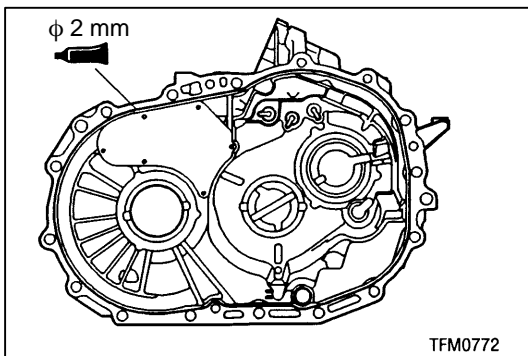


►C◄ SPRING PIN INSTALLATION

Install the spring pin with its slit directed as shown in the illustration.

►D◄ SPACER INSTALLATION

Install the spacer selected in the section “ADJUSTMENT BEFORE REASSEMBLY”.



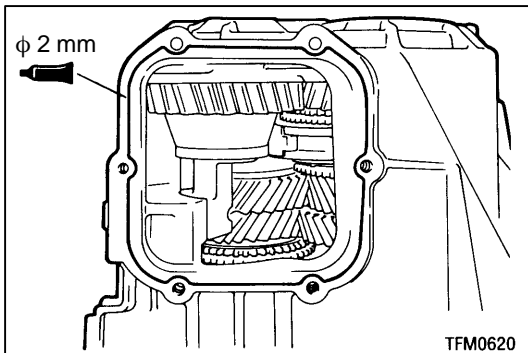
►E◄ TRANSMISSION CASE INSTALLATION

Apply sealant to the illustrated position of the transmission case.

**Specified sealant: THREEBOND 1216**

**Caution**

**Squeeze out the sealant uniformly, while making sure that it is not broken or excessively applied.**



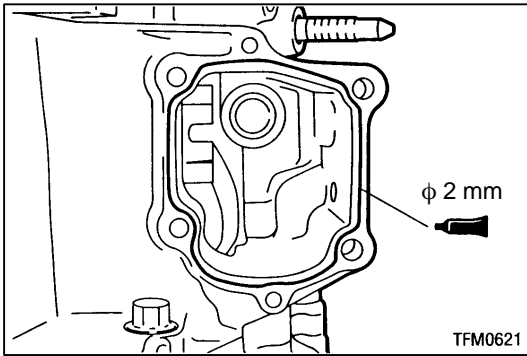
►F◄ UNDER COVER INSTALLATION

Apply sealant to the illustrated position of the transmission case.

**Specified sealant: THREEBOND 1216**

**Caution**

**Squeeze out the sealant uniformly, while making sure that it is not broken or excessively applied.**



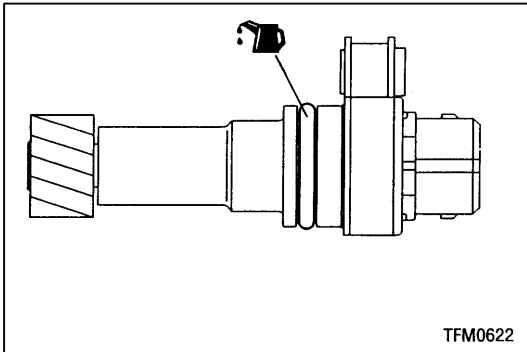
**▶G◀ CONTROL HOUSING INSTALLATION**

Apply sealant to the illustrated position of the transmission case.

**Specified sealant: THREEBOND 1216**

**Caution**

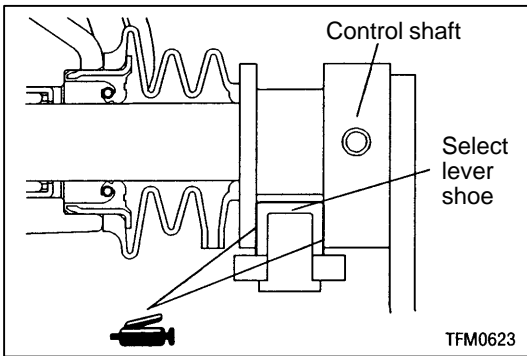
**Squeeze out the sealant uniformly, while making sure that it is not broken or excessively applied.**



**▶H◀ SPEEDOMETER GEAR INSTALLATION**

Apply transmission oil to the O-ring of the speedometer gear.

**Transmission oil: DIA QUEEN MULTI-GEAR OIL 75W/85W**



**▶I◀ SELECT LEVER INSTALLATION**

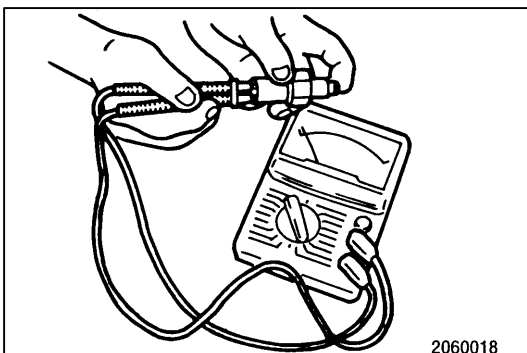
Apply grease to the control shaft sliding portion of the select lever shoe.

**Specified grease: MOLYWHITE TA No.1 or No.2**

**▶J◀ O-RING INSTALLATION**

Lubricate O-ring with transmission oil.

**Transmission oil: DIA QUEEN MULTI-GEAR OIL 75W/85W**



**INSPECTION**

**BACK-UP LAMP SWITCH**

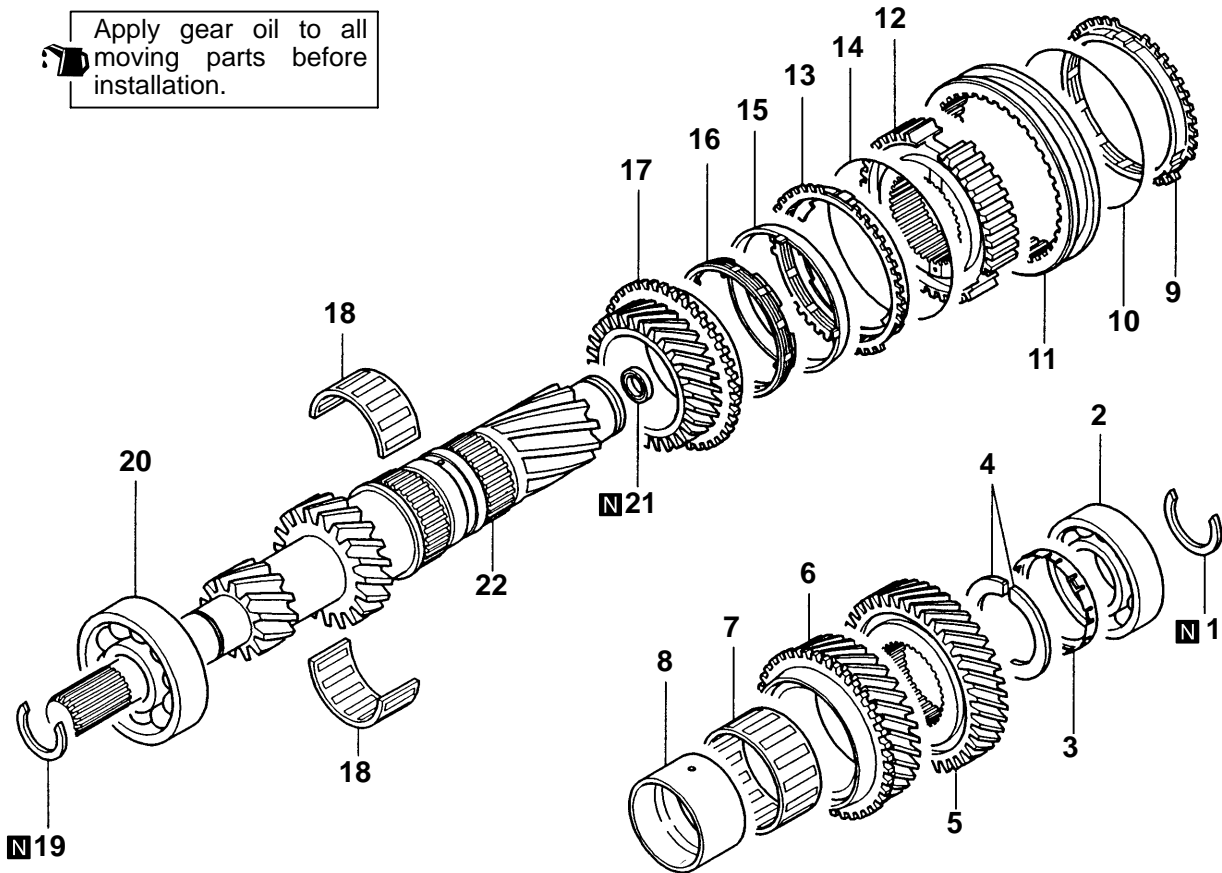
Check for continuity between terminals.

Switch condition	Continuity
Pressed	Not exist
Released	Exists

# INPUT SHAFT

## DISASSEMBLY AND REASSEMBLY

Apply gear oil to all moving parts before installation.



TFM0716

### Disassembly steps

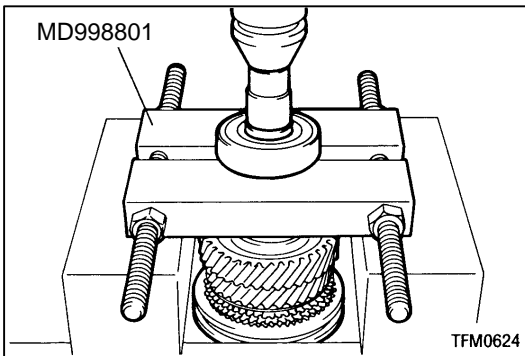
- ◀A▶ ▶M▶ 1. Snap ring
- ◀B▶ ▶L▶ 2. Ball bearing
- ◀C▶ ▶K▶ 3. Thrust plate stopper
- ▶J▶ 4. Thust plate
- ▶I▶ 5. 5th speed gear
- ▶H▶ 6. 4th speed gear
- ▶G▶ 7. Needle roller bearing
- ▶F▶ 8. 4th speed gear sleeve
- ▶E▶ 9. Synchronizer ring
- ▶D▶ 10. Synchronizer spring
- ▶C▶ 11. Synchronizer sleeve

- ▶E▶ 12. 3rd-4th speed synchronizer hub
- ▶D▶ 13. Outer synchronizer ring
- ▶C▶ 14. Synchronizer spring
- ▶B▶ 15. Synchronizer cone
- ▶A▶ 16. Inner synchronizer ring
- ▶M▶ 17. 3rd speed gear
- ▶L▶ 18. Needle roller bearing
- ▶K▶ 19. Snap ring
- ▶J▶ 20. Ball bearing
- ▶I▶ 21. Oil seal
- ▶H▶ 22. Input shaft



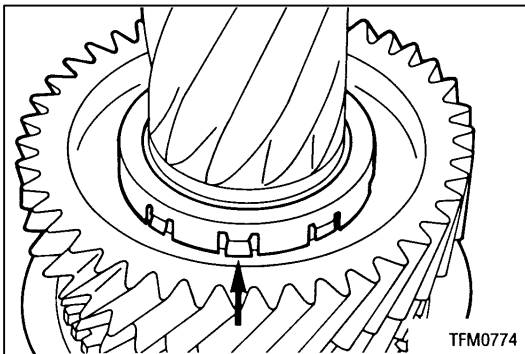
**DISASSEMBLY SERVICE POINTS**

**◀A▶ BALL BEARING REMOVAL**

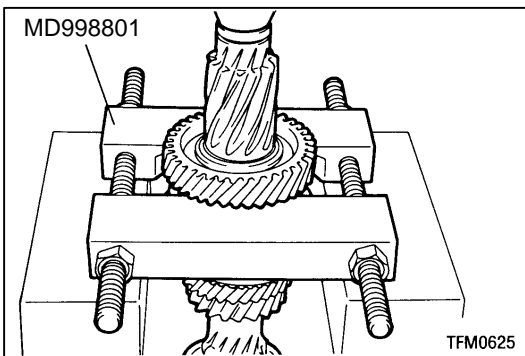


**◀B▶ THRUST PLATE STOPPER REMOVAL**

Using a screwdriver, pry up the position shown in the illustration and remove the thrust plate stopper.

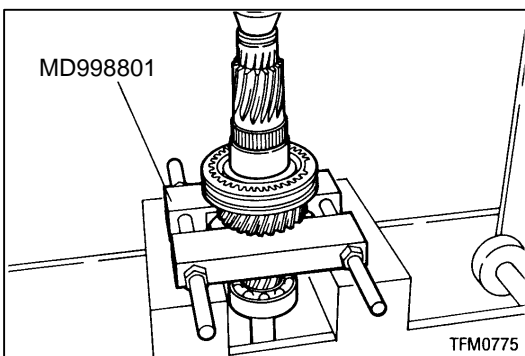


**◀C▶ 5TH SPEED GEAR REMOVAL**

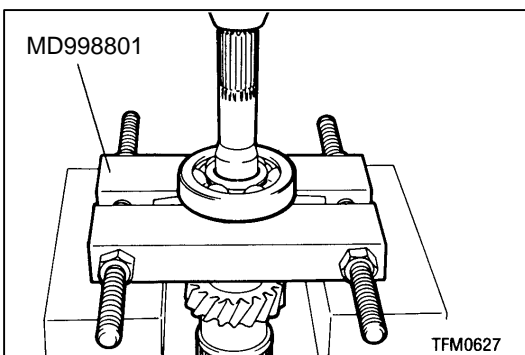


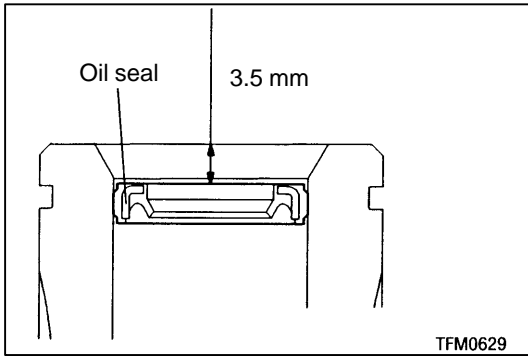
**◀D▶ 4TH SPEED GEAR SLEEVE REMOVAL**

Install the special tool to the 3rd speed gear and remove the 4th speed gear sleeve.



**◀E▶ BALL BEARING REMOVAL**

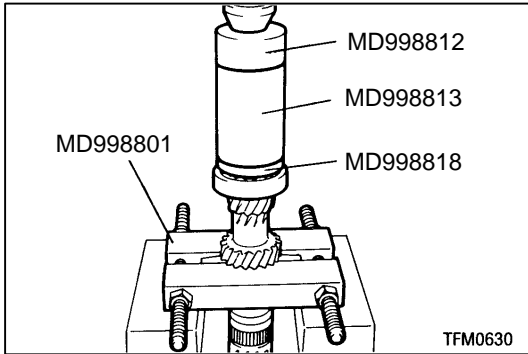




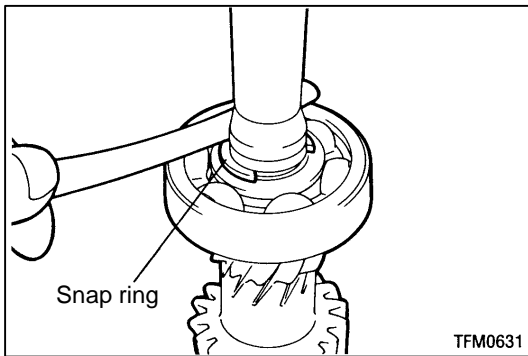
**REASSEMBLY SERVICE POINTS**

**▶A◀ OIL SEAL INSTALLATION**

Make sure that the oil seal is pressed into the position shown in the illustration.



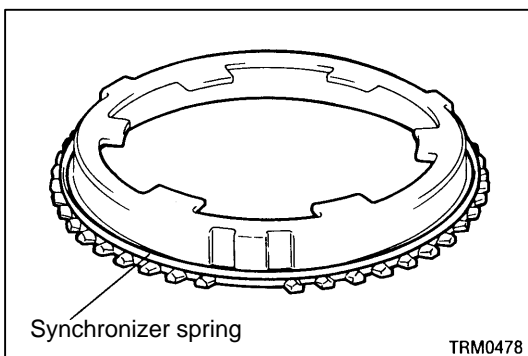
**▶B◀ BALL BEARING INSTALLATION**



**▶C◀ SNAP RING INSTALLATION**

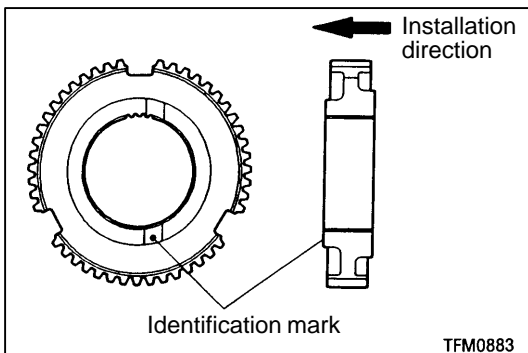
Select and install a snap ring so that the input shaft front bearing end play will have the standard value.

**Standard value: 0 – 0.12 mm**



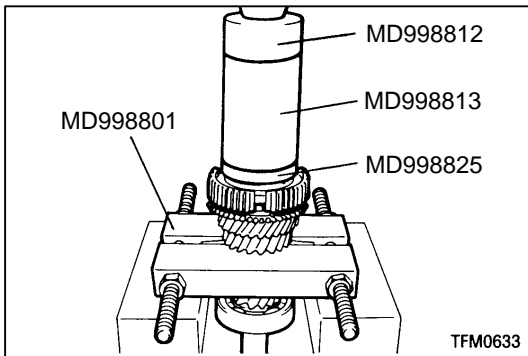
**▶D◀ SYNCHRONIZER SPRING INSTALLATION**

Install the synchronizer spring securely to the illustrated position of the outer synchronizer ring.



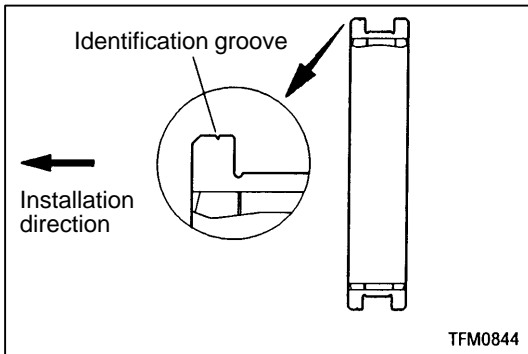
**▶E◀ 3RD-4TH SPEED SYNCHRONIZER HUB INSTALLATION**

Install the synchronizer hub in such a way that it will be oriented in the direction shown.



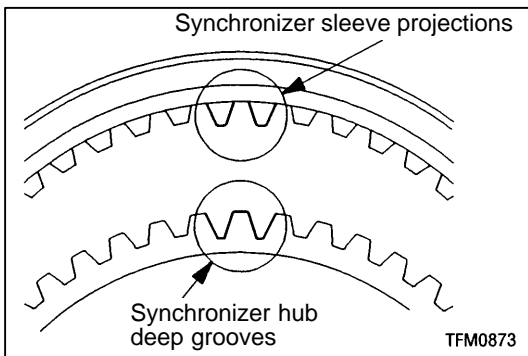
**Caution**

When the hub is installed, make sure that the synchronizer ring is not caught.

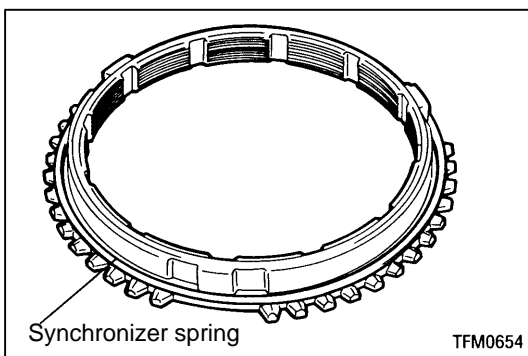


**►F◄ SYNCHRONIZER SLEEVE INSTALLATION**

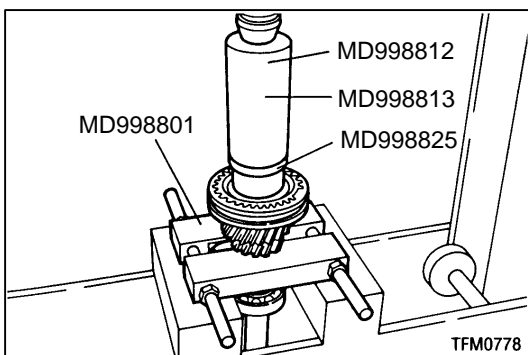
- (1) Install the synchronizer sleeve in such a way that it will be oriented in the direction shown.



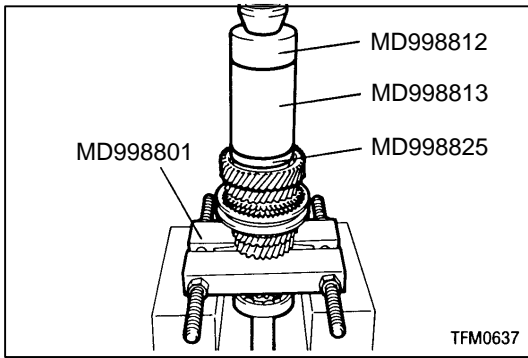
- (2) When the synchronizer sleeve is installed, make sure that the deep groove portion of the synchronizer hub is aligned with the projecting portion of the sleeve.



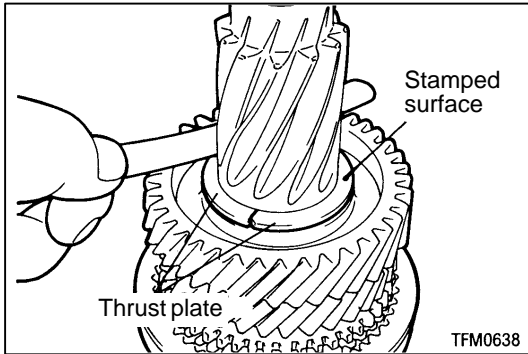
**►G◄ SYNCHRONIZER SPRING INSTALLATION**



**►H◄ 4TH SPEED GEAR SLEEVE INSTALLATION**



►◄ 5TH SPEED GEAR INSTALLATION



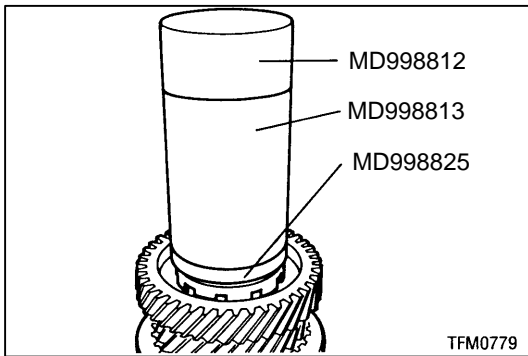
►◄ THRUST PLATE INSTALLATION

Select and install a thrust plate so that the input shaft 5th speed gear clearance will have the standard value.

**Standard value: 0 – 0.09 mm**

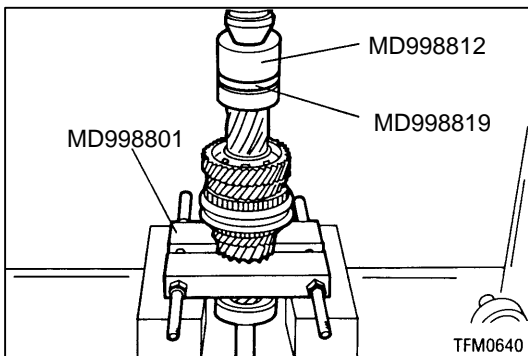
**Caution**

Install the plate with its identification stamped surface faced against the thrust plate stopper.

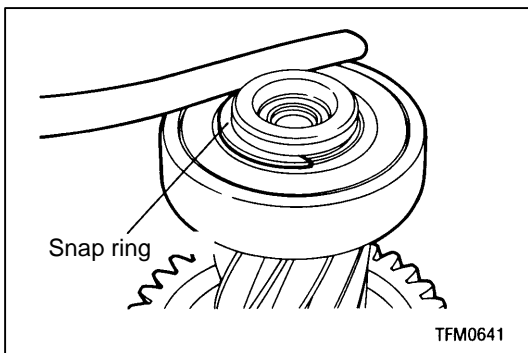


►◄ THRUST PLATE STOPPER INSTALLATION

Install the thrust plate stopper by pressing the special tools with hand. Make sure that the stopper is not installed aslant.



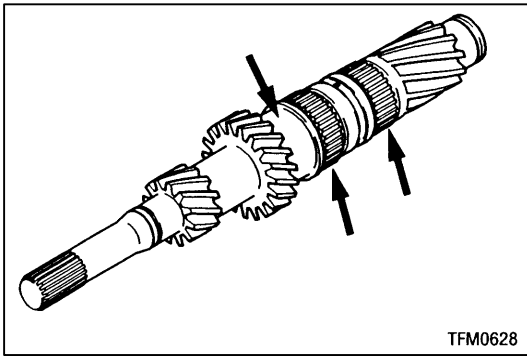
►◄ BALL BEARING INSTALLATION



►◄ SNAP RING INSTALLATION

Select and install a snap ring so that the input shaft rear bearing clearance will have the standard value.

**Standard value: 0 – 0.12 mm**



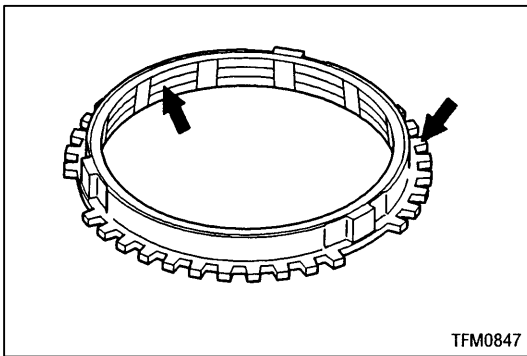
**INSPECTION**

**INPUT SHAFT**

- (1) Check the outside diameter of the needle bearing mounting portion for damage, abnormal wear and seizure.
- (2) Check the splines for damage and wear.

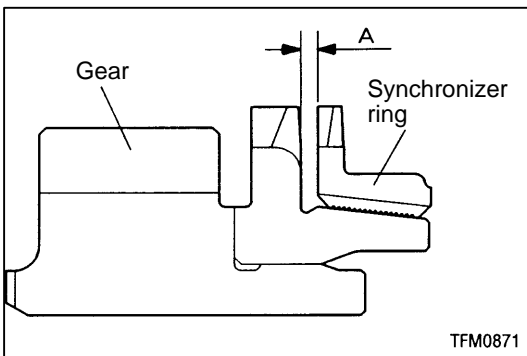
**NEEDLE ROLLER BEARING**

- (1) Check to ensure that when the input shaft and gear are combined and made to rotate, they rotate smoothly without looseness and noise.
- (2) Check to ensure that the cage is not deformed.



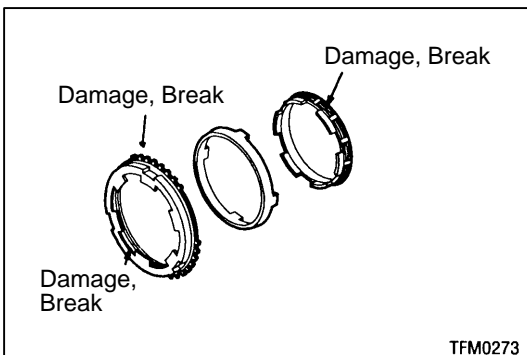
**SYNCHRONIZER RING**

- (1) Check to ensure that the clutch gear tooth surfaces are not damaged and broken.
- (2) Check to ensure that the cone inside surface is not damaged or worn and that the threads are not crushed.



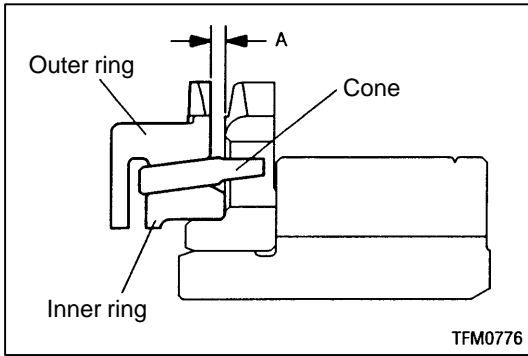
- (3) Press the synchronizer ring against the gear and check clearance "A". If "A" is less than the limit, replace.

**Limit: 0.5 mm**



**OUTER SYNCHRONIZER RING / INNER SYNCHRONIZER RING / SYNCHRONIZER CONE**

- (1) Check to ensure that the clutch gear tooth surface and cone surface are not damaged and broken.

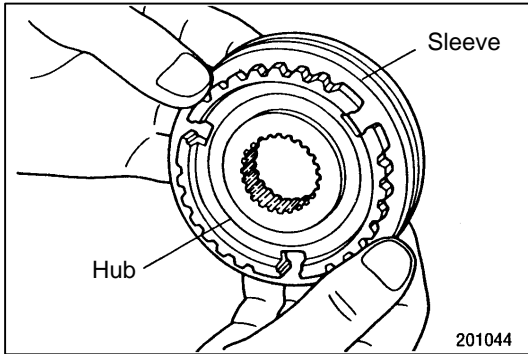


- (2) Install the outer ring, inner ring and cone, press them against the gear, and check clearance "A". If "A" is less than the limit, replace.

**Limit: 0.5 mm**

**Caution**

**When any of the outer ring, inner ring or cone has to be replaced, replace them as a set.**



**SYNCHRONIZER SLEEVE AND HUB**

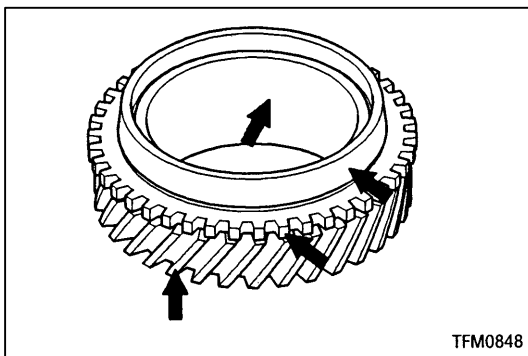
- (1) Check to ensure that when the synchronizer sleeve and hub are combined and made to slide, they slide smoothly without binding.
- (2) Check to ensure that the front and rear ends of the sleeve inside surface are not damaged.

**Caution**

**When replacement of either the synchronizer sleeve or hub is necessary, make sure that the synchronizer sleeve and hub are replaced as a set.**

**SYNCHRONIZER SPRING**

Check to ensure that the spring is not sagging, deformed or broken.



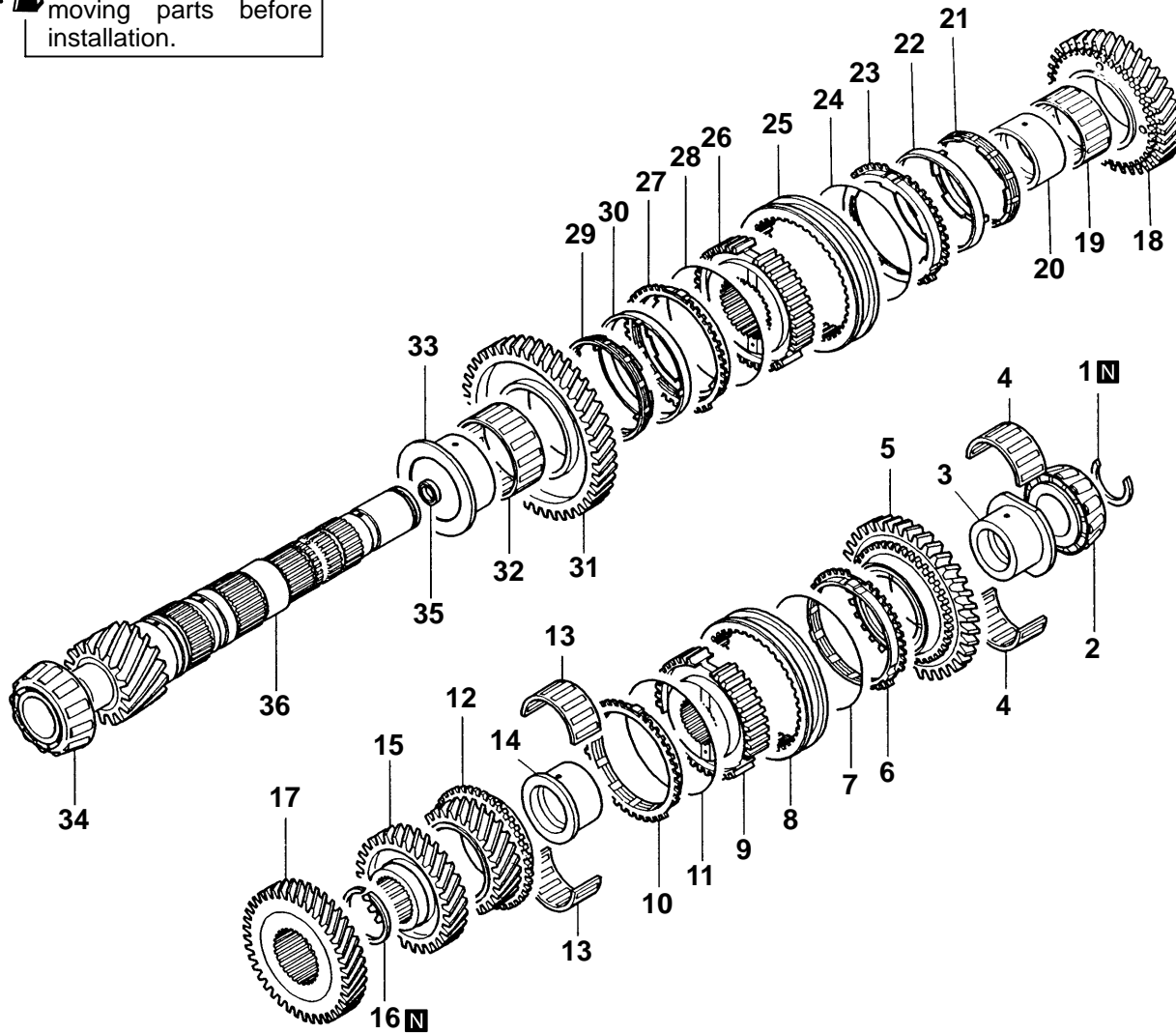
**SPEED GEARS**

- (1) Check to ensure that the helical and clutch gear tooth surfaces are not damaged or worn.
- (2) Check to ensure that the synchronizer cone surfaces are not roughened, damaged or worn.
- (3) Check to ensure that the gear inside diameter and front and rear surfaces are not damaged and worn.

# OUTPUT SHAFT

## DISASSEMBLY AND REASSEMBLY

Apply gear oil to all moving parts before installation.

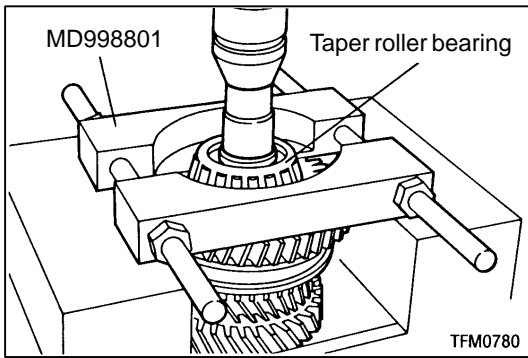


TFM0884

### Disassembly steps

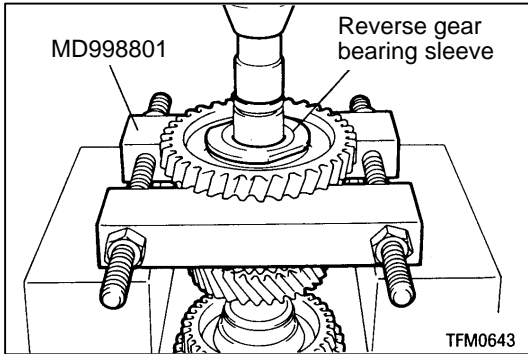
- ▶P◀ 1. Snap ring
- ▶O◀ 2. Taper roller bearing
- ▶N◀ 3. Reverse gear bearing sleeve
- ▶N◀ 4. Needle roller bearing
- ▶N◀ 5. Reverse gear
- ▶L◀ 6. Synchronizer ring
- ▶F◀ 7. Synchronizer spring
- ▶M◀ 8. Synchronizer sleeve
- ▶C◀ ▶M◀ 9. 5th-reverse speed synchronizer hub
- ▶L◀ 10. Synchronizer ring
- ▶L◀ 11. Synchronizer spring
- ▶L◀ 12. 5th speed gear
- ▶K◀ 13. Needle roller bearing
- ▶K◀ 14. 5th speed gear sleeve
- ▶J◀ 15. 4th speed gear
- ▶I◀ 16. Snap ring
- ▶D◀ ▶H◀ 17. 3rd speed gear
- ▶D◀ 18. 2nd speed gear

- ▶E◀ ▶G◀ 19. Needle roller bearing
- ▶E◀ ▶G◀ 20. 2nd speed gear sleeve
- ▶E◀ ▶G◀ 21. Inner synchronizer ring
- ▶E◀ ▶G◀ 22. Synchronizer cone
- ▶E◀ ▶G◀ 23. Outer synchronizer ring
- ▶D◀ ▶G◀ 24. Synchronizer spring
- ▶F◀ ▶G◀ 25. Synchronizer sleeve
- ▶E◀ ▶G◀ 26. 1st-2nd speed synchronizer hub
- ▶E◀ ▶G◀ 27. Outer synchronizer ring
- ▶D◀ ▶G◀ 28. Synchronizer spring
- ▶D◀ ▶G◀ 29. Inner synchronizer ring
- ▶D◀ ▶G◀ 30. Synchronizer cone
- ▶D◀ ▶G◀ 31. 1st speed gear
- ▶F◀ ▶G◀ 32. Needle roller bearing
- ▶F◀ ▶G◀ 33. 1st speed gear sleeve
- ▶F◀ ▶G◀ 34. Taper roller bearing
- ▶G◀ ▶A◀ 35. Oil seal
- ▶G◀ ▶A◀ 36. Output shaft



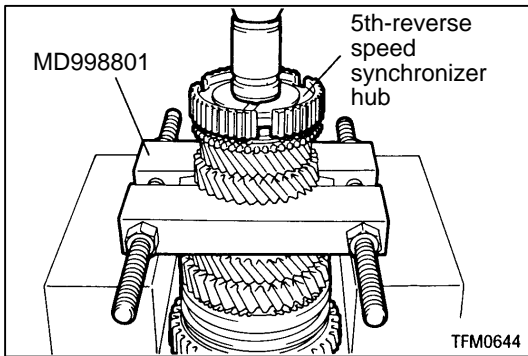
**DISASSEMBLY SERVICE POINTS**

**◀A▶ TAPER ROLLER BEARING REMOVAL**



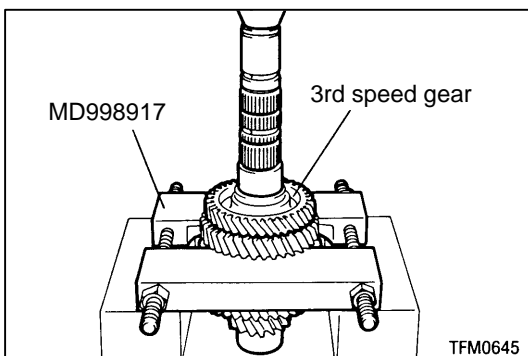
**◀B▶ REVERSE GEAR BEARING SLEEVE REMOVAL**

Mount a special tool on the reverse gear and remove the reverse gear bearing sleeve.



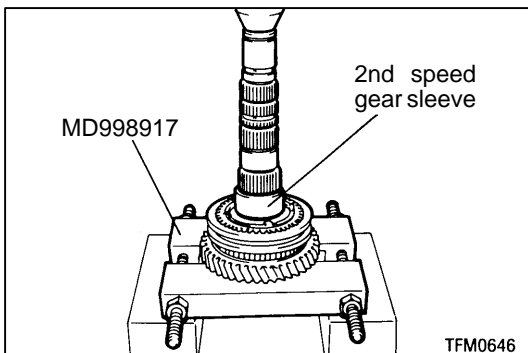
**◀C▶ 5TH-REVERSE SPEED SYNCHRONIZER HUB REMOVAL**

Mount a special tool on the 4th speed gear and remove the 5th-reverse speed synchronizer hub.



**◀D▶ 3RD SPEED GEAR REMOVAL**

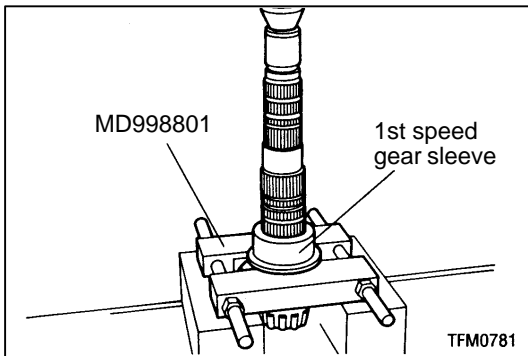
Mount a special tool on the 2nd speed gear and remove the 3rd speed gear.



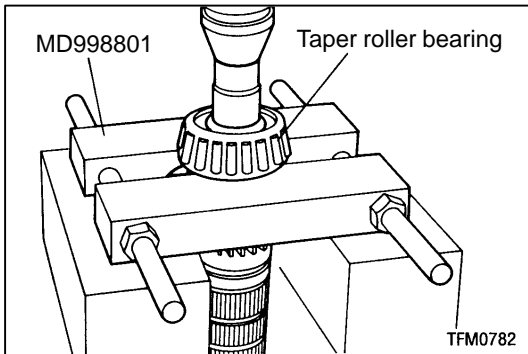
**◀E▶ 2ND SPEED GEAR SLEEVE REMOVAL**

Mount a special tool on the 1st speed gear and remove the 2nd speed gear sleeve.

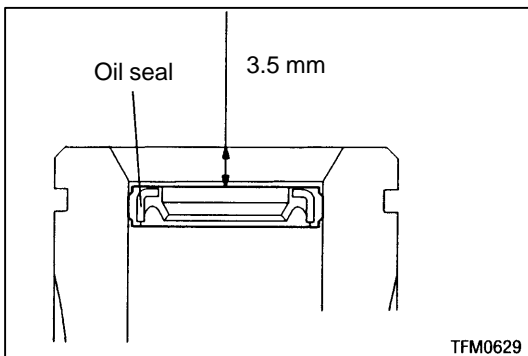




◀F▶ 1ST SPEED GEAR SLEEVE REMOVAL



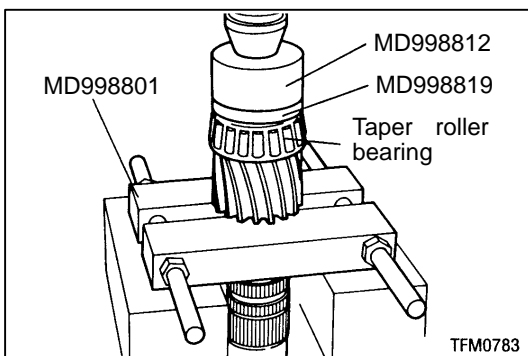
◀G▶ TAPER ROLLER BEARING REMOVAL



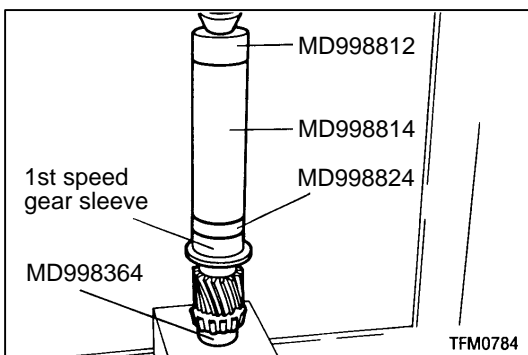
REASSEMBLY SERVICE POINTS

▶A▶ OIL SEAL INSTALLATION

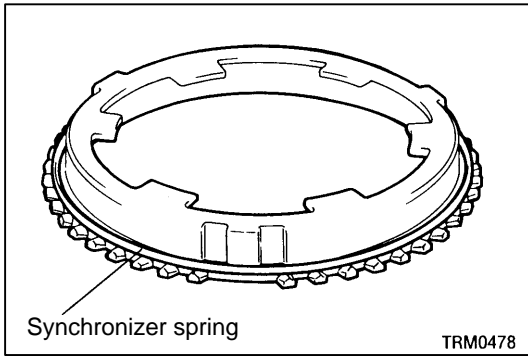
Make sure that the oil seal is pressed into the position shown in the illustration.



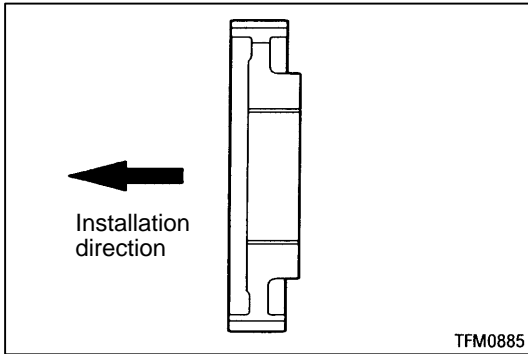
▶B▶ TAPER ROLLER BEARING INSTALLATION



▶C▶ 1ST SPEED GEAR SLEEVE INSTALLATION

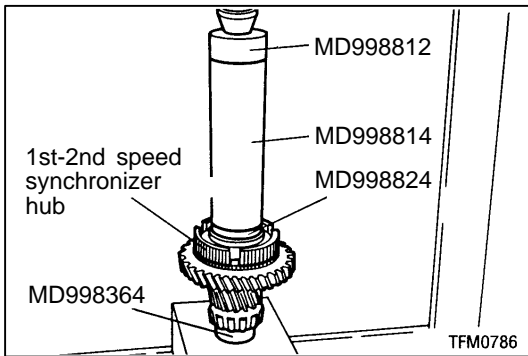


►D◄ SYNCHRONIZER SPRING INSTALLATION



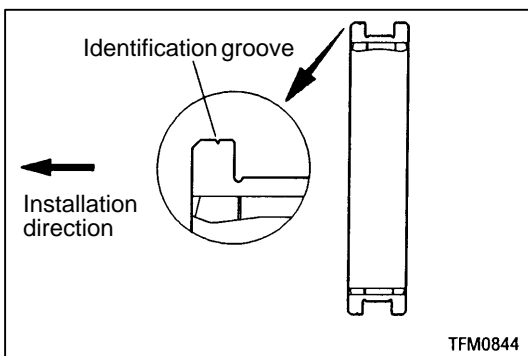
►E◄ 1ST-2ND SPEED SYNCHRONIZER HUB INSTALLATION

Install the 1st-2nd speed synchronizer hub in such a way that it will be oriented in the direction shown.



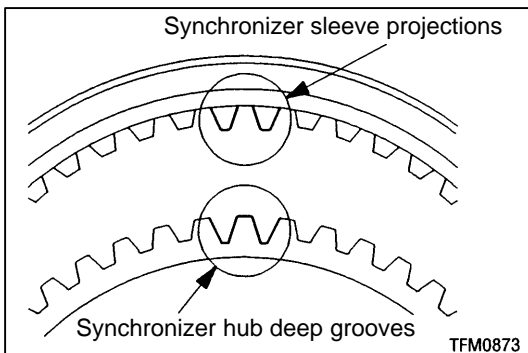
**Caution**

When the hub is installed, make sure that the synchronizer ring is not caught.

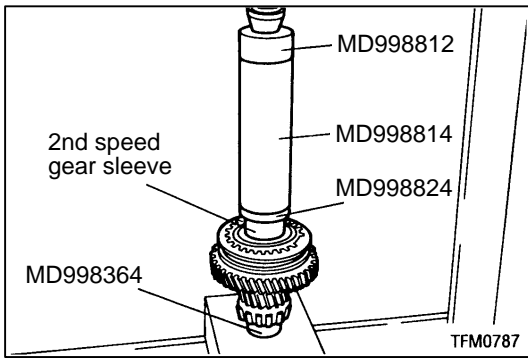


►F◄ SYNCHRONIZER SLEEVE INSTALLATION

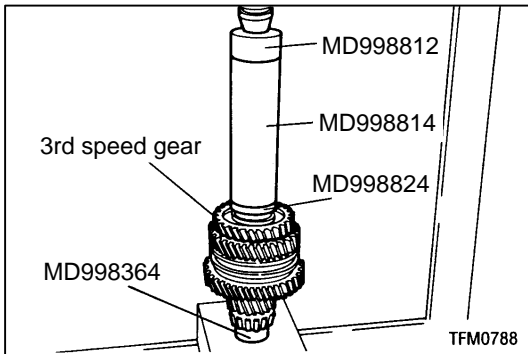
(1) Install the synchronizer sleeve in such a way that it will be oriented in the direction shown.



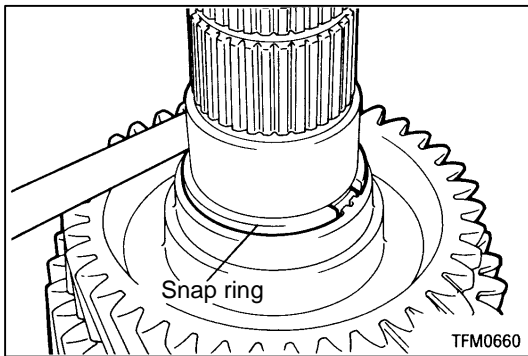
(2) When the synchronizer sleeve is installed, make sure that the deep groove portion of the synchronizer hub is aligned with the projecting portion of the sleeve.



►G◄ 2ND SPEED GEAR SLEEVE INSTALLATION



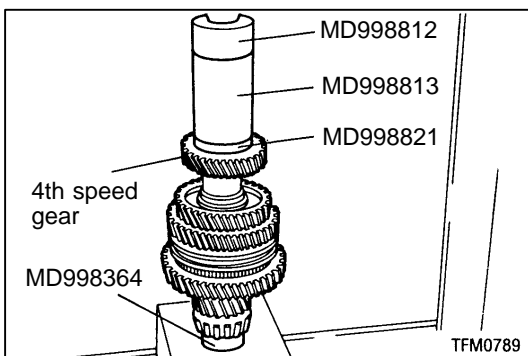
►H◄ 3RD SPEED GEAR INSTALLATION



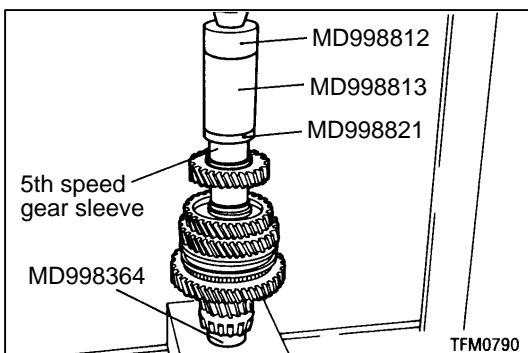
►I◄ SNAP RING INSTALLATION

Select and install a snap ring so that the output shaft 3rd speed gear clearance will have the standard value.

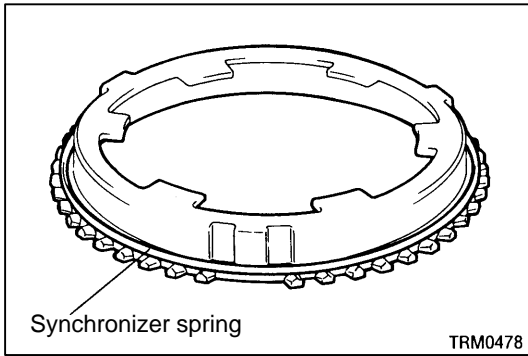
Standard value: 0 – 0.09 mm



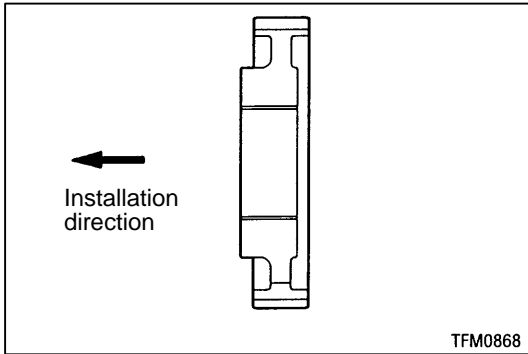
►J◄ 4TH SPEED GEAR INSTALLATION



►K◄ 5TH SPEED GEAR SLEEVE INSTALLATION

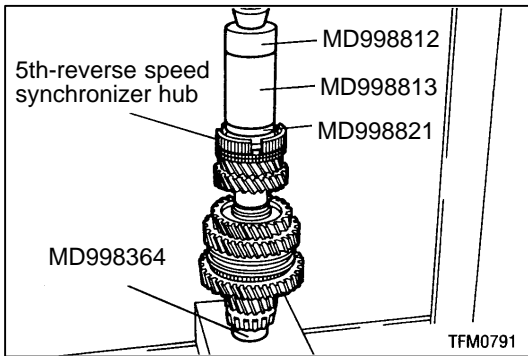


►L◄ SYNCHRONIZER SPRING INSTALLATION



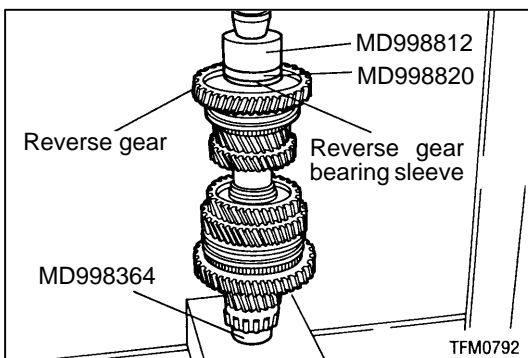
►M◄ 5TH-REVERSE SPEED SYNCHRONIZER HUB INSTALLATION

Install the 5th-reverse speed synchronizer hub in such a way that it will be oriented in the direction shown.

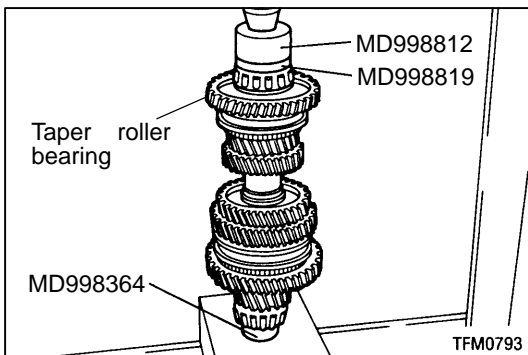


**Caution**

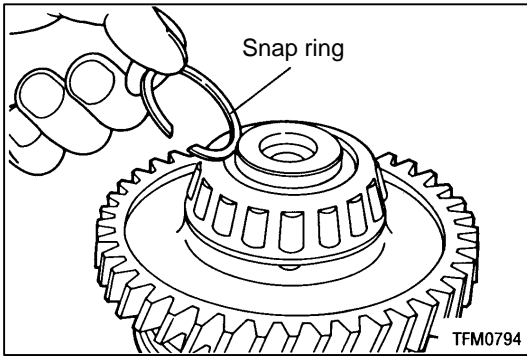
When the hub is installed, make sure that the synchronizer ring is not caught.



►N◄ REVERSE GEAR / NEEDLE ROLLER BEARING / REVERSE GEAR BEARING SLEEVE INSTALLATION



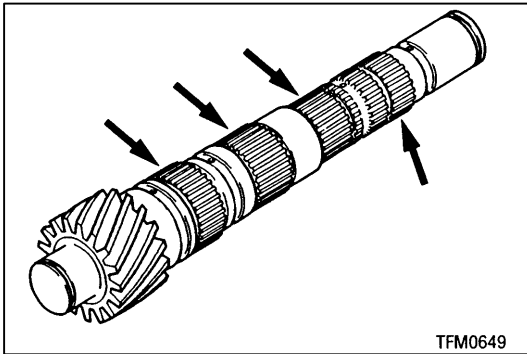
►O◄ TAPER ROLLER BEARING INSTALLATION



**▶P◀ SNAP RING INSTALLATION**

Select and install a snap ring so that the output shaft rear bearing clearance will have the standard value.

**Standard value: 0 – 0.09 mm**



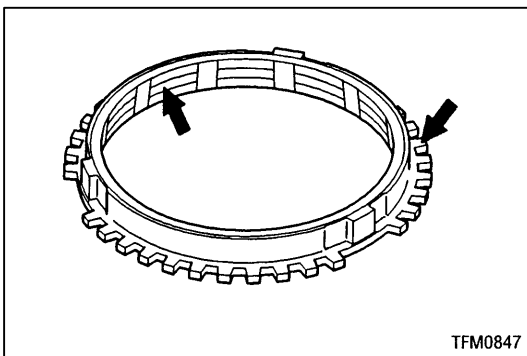
**INSPECTION**

**OUTPUT SHAFT**

Check the splines for damage and wear.

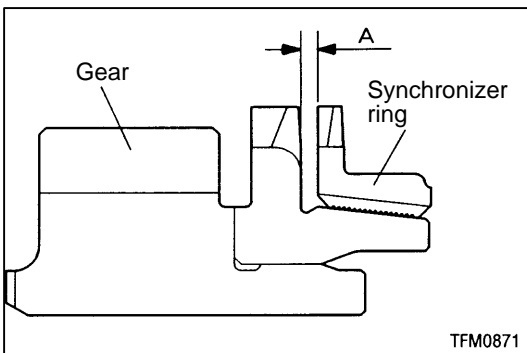
**NEEDLE ROLLER BEARING**

- (1) Check to ensure that when the bearing sleeve and gear are combined and made to rotate, they rotate smoothly without looseness and noise.
- (2) Check the cage for deformation.



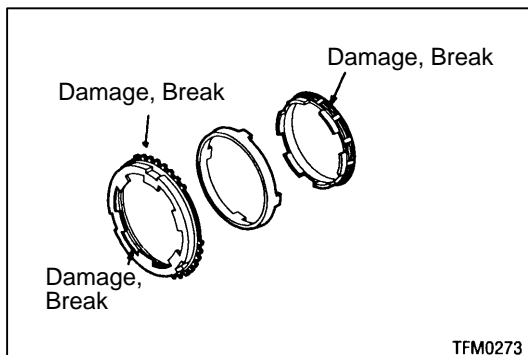
**SYNCHRONIZER RING**

- (1) Check to ensure that the clutch gear tooth surfaces are not damaged and broken.
- (2) Check to ensure that the cone inside diameter is not damaged or worn and that the threads are not crushed.



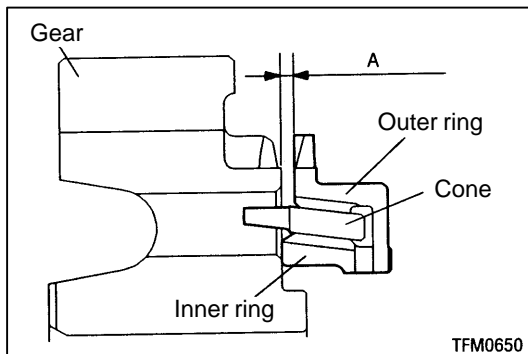
- (3) Press the synchronizer ring against the gear and check clearance "A". If "A" is less than the limit, replace.

**Limit: 0.5 mm**



### OUTER SYNCHRONIZER RING / INNER SYNCHRONIZER RING / SYNCHRONIZER CONE

- (1) Check to ensure that the clutch gear tooth surfaces and cone surfaces are not damaged and broken.

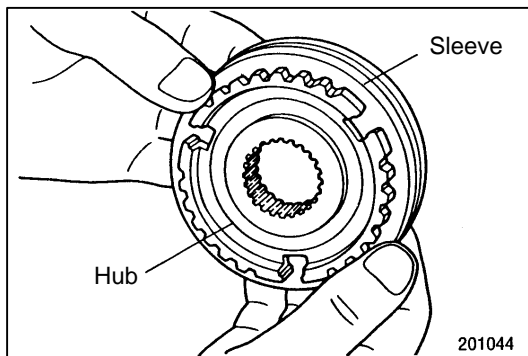


- (2) Install the outer ring, inner ring and cone, press them against the gear, and check clearance "A". If "A" is less than the limit, replace.

**Limit: 0.5 mm**

#### Caution

**When any of the outer ring, inner ring or cone has to be replaced, replace them as a set.**



### SYNCHRONIZER SLEEVE AND HUB

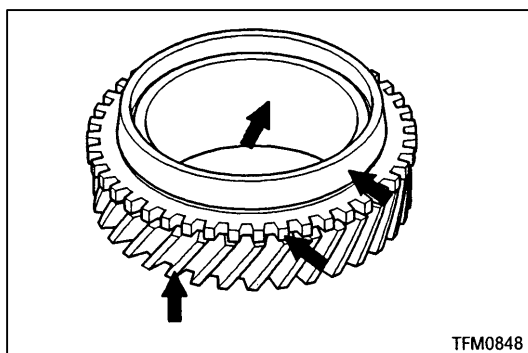
- (1) Check to ensure that when the synchronizer sleeve and hub are combined and made to slide, they slide smoothly without binding.
- (2) Check to ensure that the front and rear ends of the sleeve inside surface are not damaged.

#### Caution

**When replacement of either the synchronizer sleeve or hub is necessary, make sure that the synchronizer sleeve and hub are replaced as a set.**

### SYNCHRONIZER SPRING

Check to ensure that the spring is not sagging, deformed or broken.




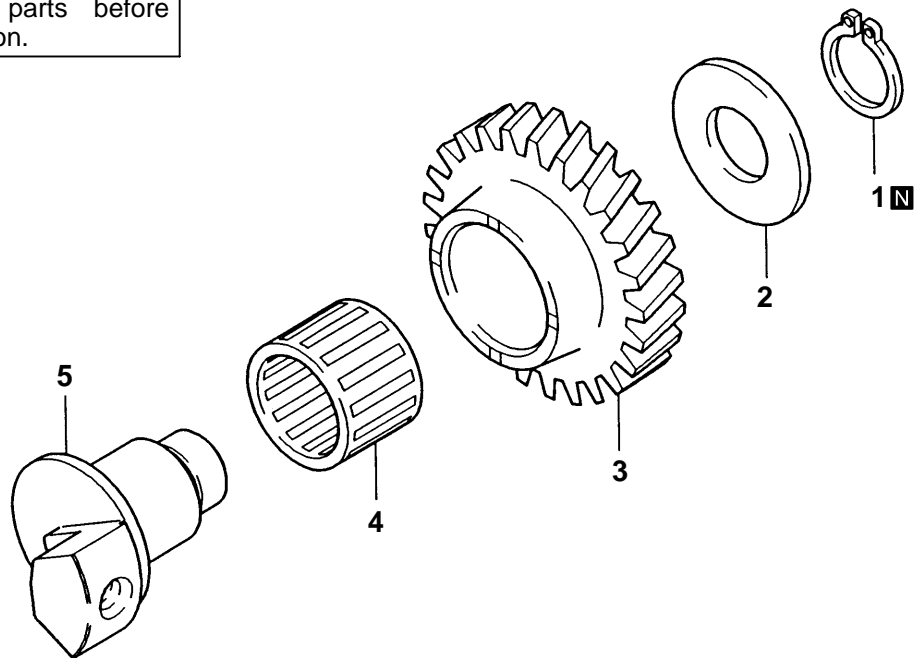
### SPEED GEARS

- (1) Check to ensure that the helical and clutch gear tooth surfaces are not damaged or worn.
- (2) Check to ensure that the synchronizer cone surfaces are not roughened, damaged or worn.
- (3) Check to ensure that the gear inside diameter and front and rear surfaces are not damaged and worn.

## REVERSE IDLER GEAR

### DISASSEMBLY AND REASSEMBLY

 Apply gear oil to all moving parts before installation.



TFM0807

#### Disassembly steps

1. Snap ring
2. Thrust washer
3. Reverse idler gear
4. Needle roller bearing
5. Reverse idler gear shaft


## INSPECTION

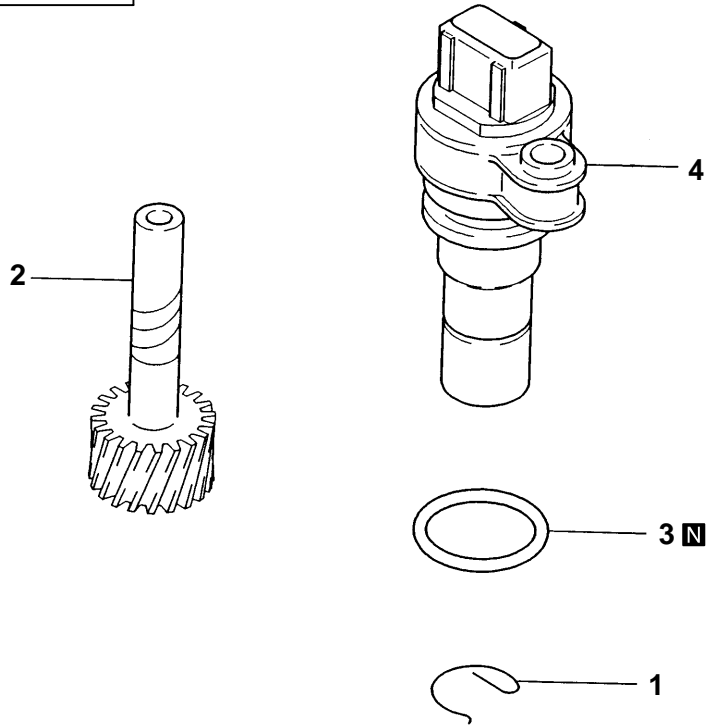
### NEEDLE ROLLER BEARING

- (1) Check to ensure that when the shaft and gear are combined and made to rotate, they rotate smoothly without looseness and noise.
- (2) Check to ensure that the cage is not deformed.

## SPEEDOMETER GEAR

### DISASSEMBLY AND REASSEMBLY

 Apply gear oil to all moving parts before installation.



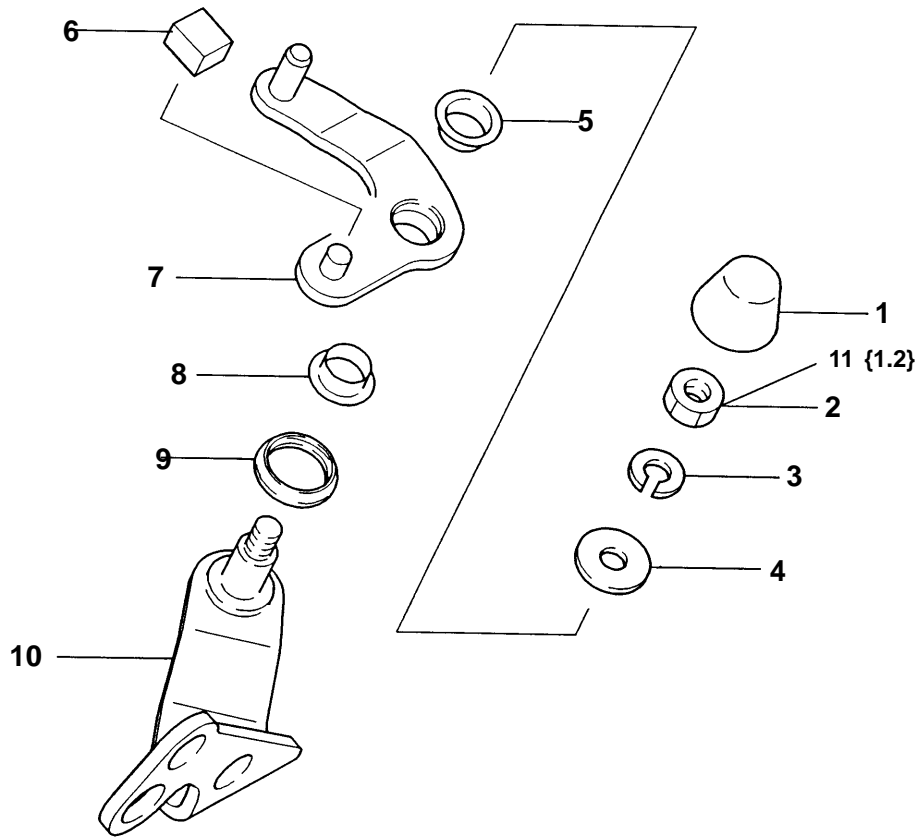
#### Disassembly steps

1. e-clip
2. Speedometer driven gear
3. O-ring
4. Sleeve



# SELECT LEVER

## DISASSEMBLY AND REASSEMBLY



TFM0589

Unit: Nm {kgf · m}

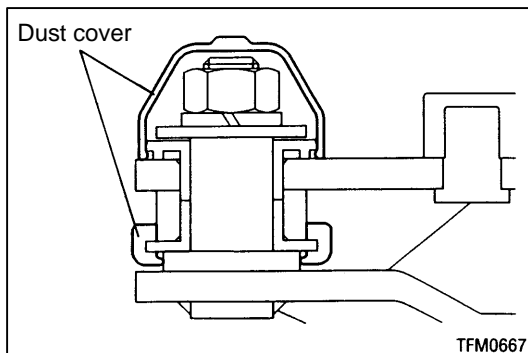
### Disassembly steps



1. Dust cover
2. Nut
3. Spring washer
4. Washer
5. Select lever bushing



6. Select lever shoe
7. Select lever
8. Select lever bushing
9. Dust cover
10. Select lever shaft



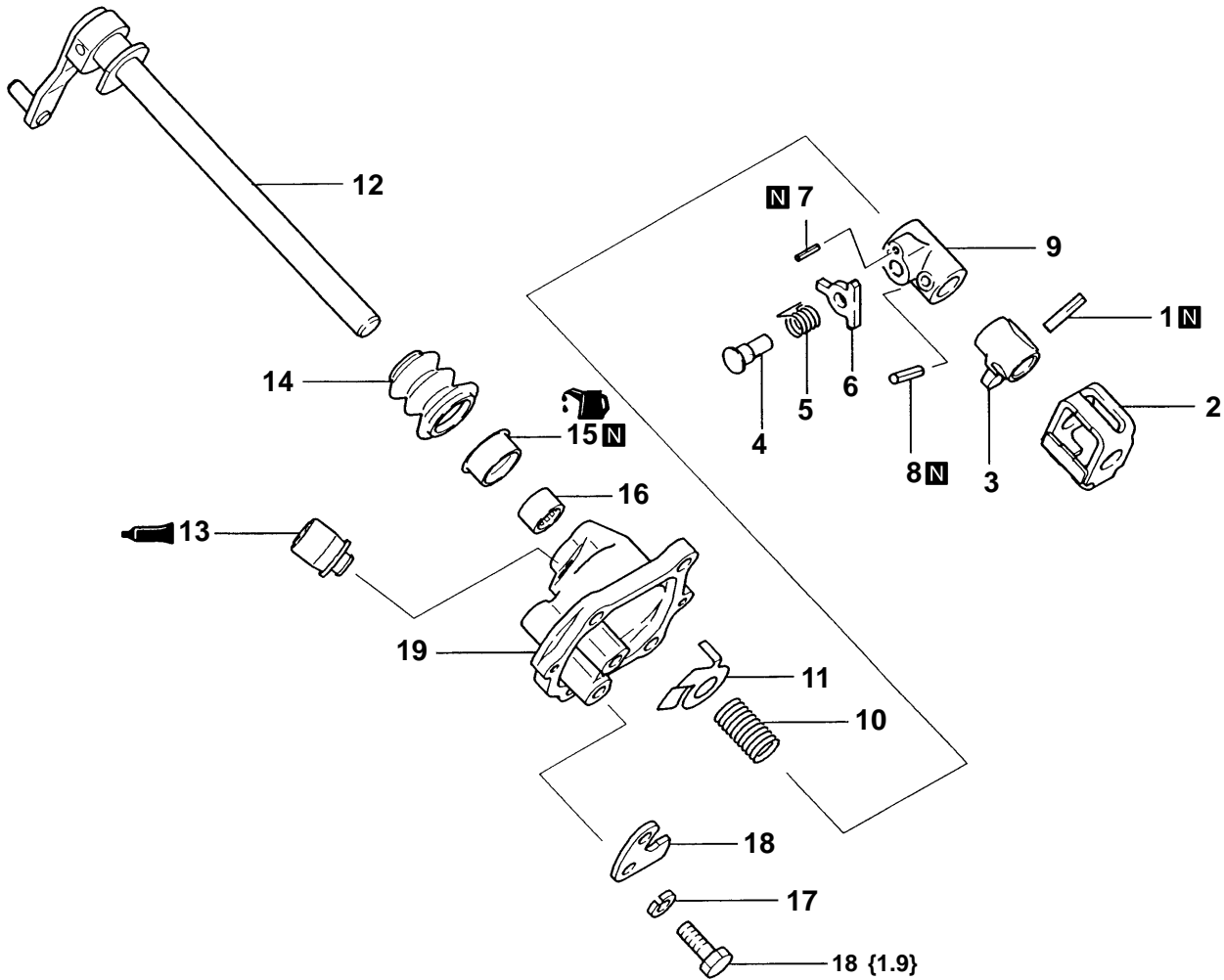
TFM0667

### REASSEMBLY SERVICE POINT

#### ▶A◀ DUST COVER INSTALLATION

# CONTROL HOUSING

## DISASSEMBLY AND REASSEMBLY



TFM0588

Unit: Nm {kgf·m}

### Disassembly steps

◀A▶ ▶F▶

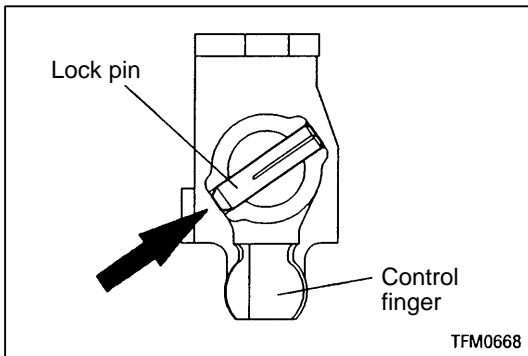
- 1. Lock pin
- 2. Interlock plate
- 3. Control finger
- 4. Pin
- 5. Return spring
- 6. Stopper plate
- 7. Spring pin
- 8. Spring pin
- 9. Stopper body
- 10. Neutral return spring

▶E▶  
▶D▶

▶C▶

▶B▶  
▶A▶

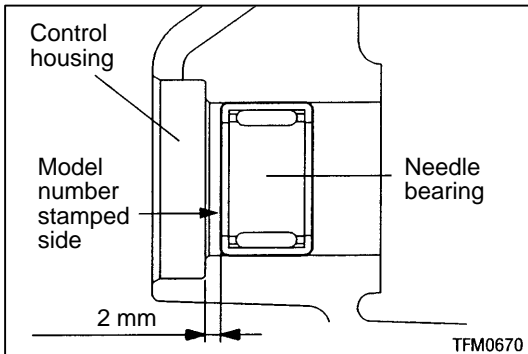
- 11. Spacer
- 12. Control shaft
- 13. Air breather
- 14. Control shaft boot
- 15. Oil seal
- 16. Needle bearing
- 17. Spring washer
- 18. Stopper bracket
- 19. Control housing



**DISASSEMBLY SERVICE POINT**

**◀A▶ LOCK PIN REMOVAL**

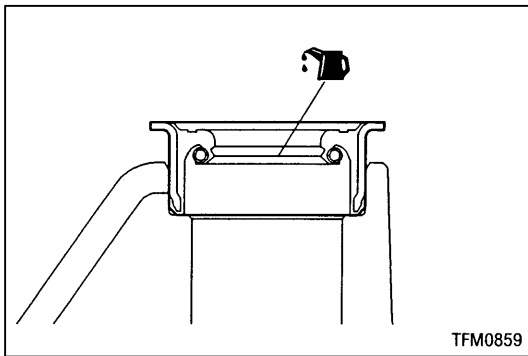
Drive the lock pin out of position from the direction shown.



**REASSEMBLY SERVICE POINTS**

**▶A◀ NEEDLE BEARING INSTALLATION**

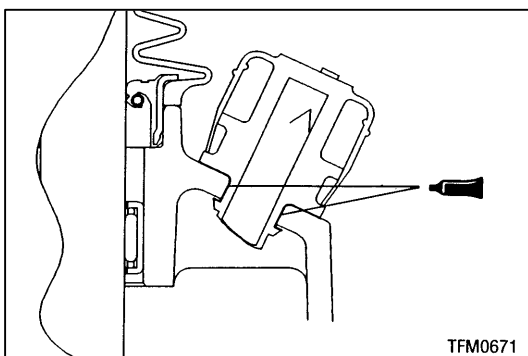
Press fit the needle bearing to the position shown in the illustration, while making sure that the model number stamped side is oriented in the direction shown.



**▶B◀ OIL SEAL INSTALLATION**

Apply transmission oil to the oil seal lip area.

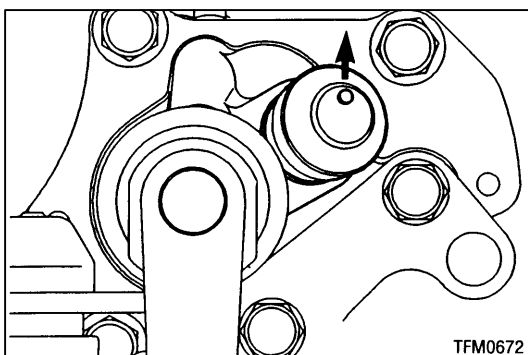
**Transmission oil: DIA QUEEN MULTI-GEAR OIL 75W/85W**



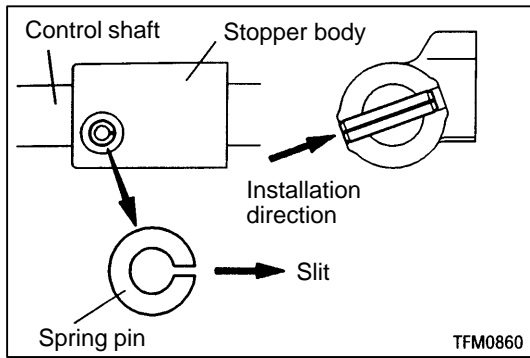
**▶C◀ AIR BREATHER INSTALLATION**

(1) Apply a sealant to the outside circumference of the inserting portion.

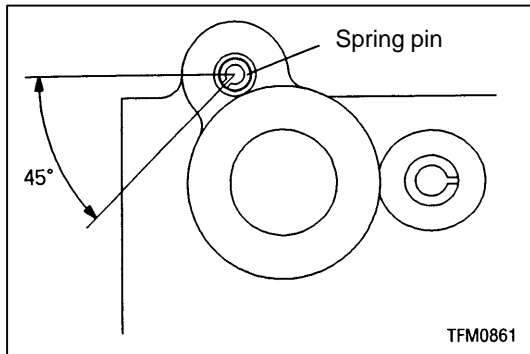
**Specified sealant: THREEBOND 1501**



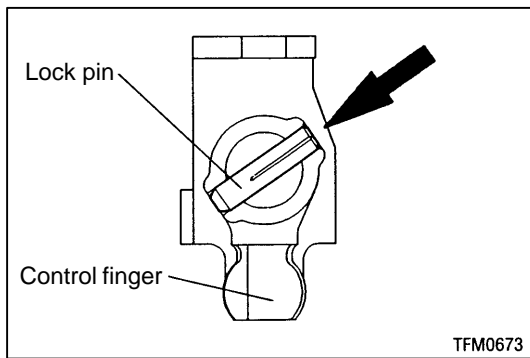
(2) Make sure that the projecting portion is oriented in the direction shown.



►D◄ SPRING PIN INSTALLATION



►E◄ SPRING PIN INSTALLATION

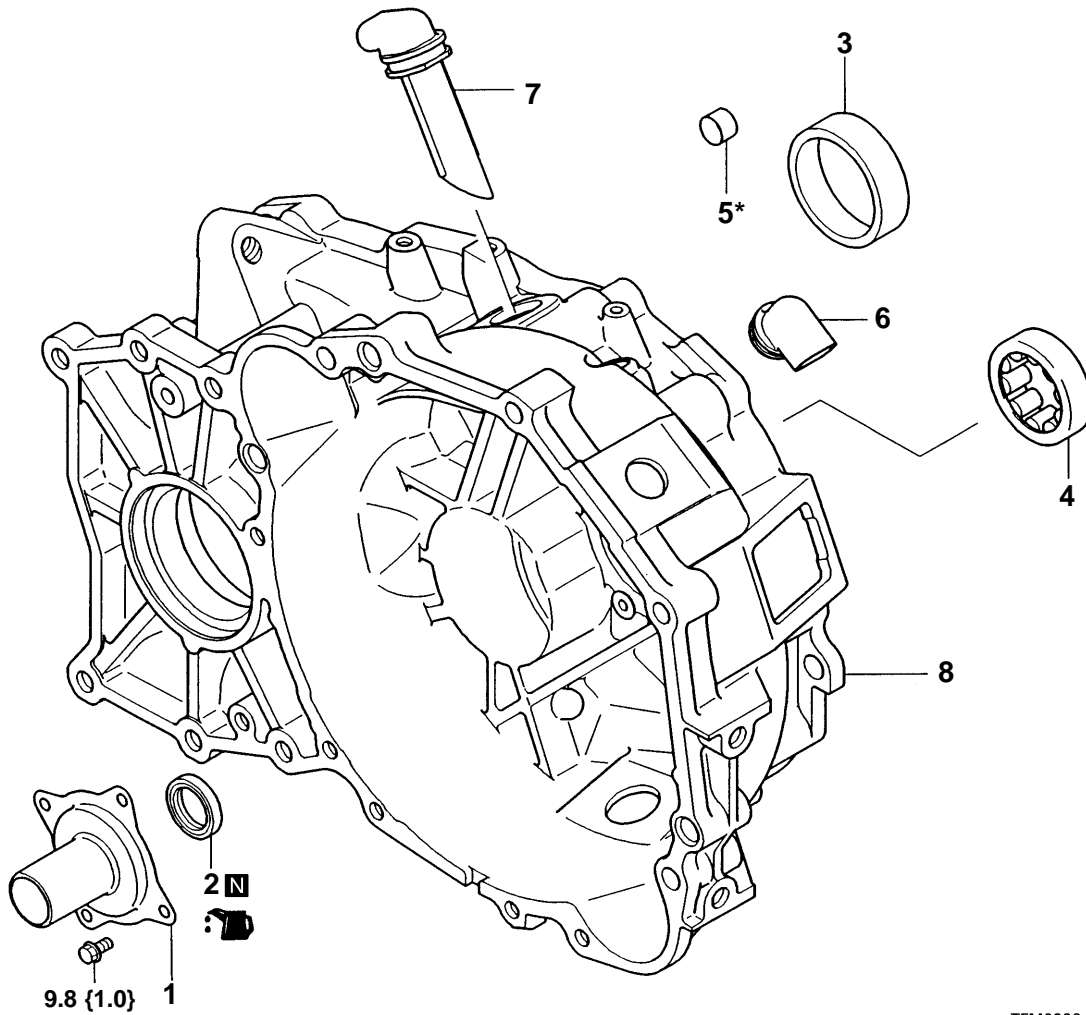


►F◄ LOCK PIN INSTALLATION

Drive in the lock pin in the direction shown in the illustration.

# CLUTCH HOUSING

## DISASSEMBLY AND REASSEMBLY



TFM0886

Unit: Nm {kgf · m}

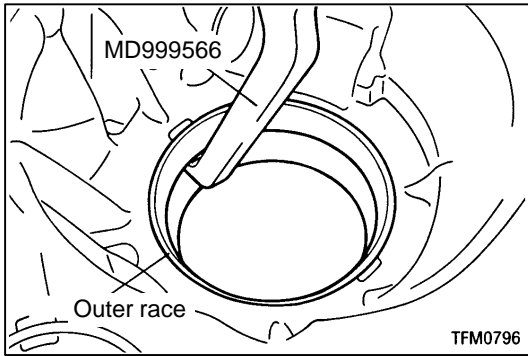
### Disassembly steps

- |     |     |                                    |
|-----|-----|------------------------------------|
| ▶A◀ | ▶E◀ | 1. Clutch release bearing retainer |
| ▶B◀ | ▶D◀ | 2. Oil seal                        |
|     | ▶C◀ | 3. Outer race                      |
|     |     | 4. Outer race                      |

- |     |                   |
|-----|-------------------|
| ▶B◀ | 5. Bushing*       |
| ▶A◀ | 6. Cover-A        |
| ▶A◀ | 7. Cover-B        |
|     | 8. Clutch housing |

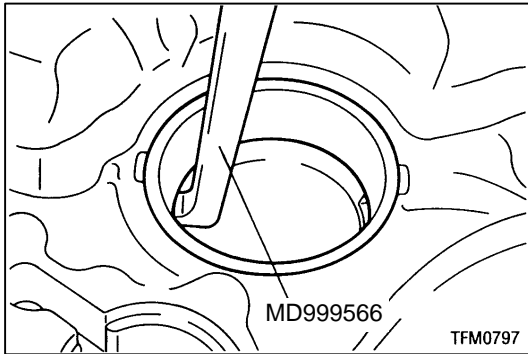
### NOTE:

\*: Never remove the bushings from the clutch housing.  
 Only the case when installing new bushings into a new clutch housing, refer to ▶B◀.

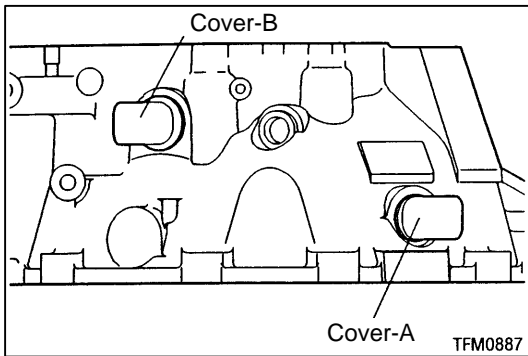


**DISASSEMBLY SERVICE POINTS**

◀A▶ OUTER RACE REMOVAL



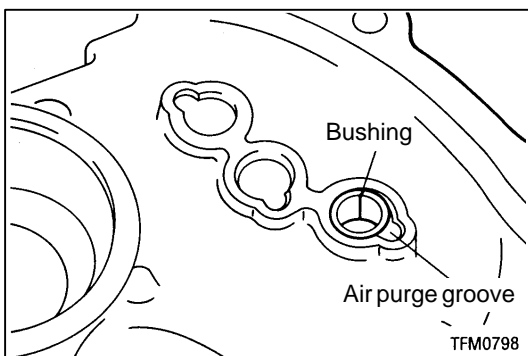
◀B▶ OUTER RACE REMOVAL



**REASSEMBLY SERVICE POINTS**

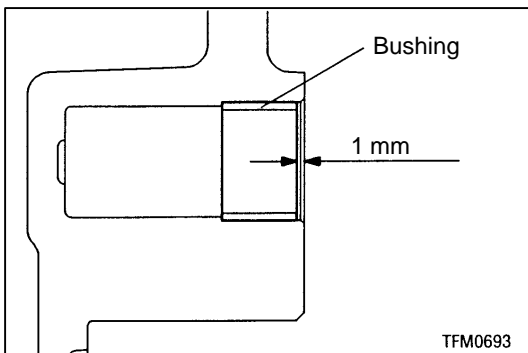
▶A◀ COVER-A / COVER-B INSTALLATION

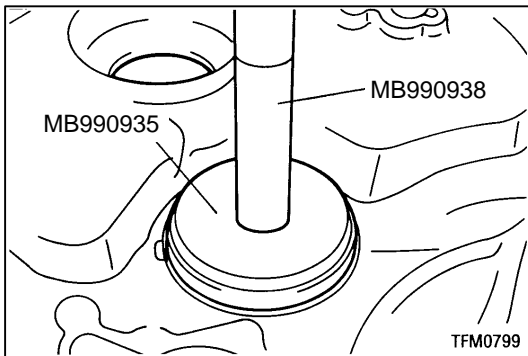
Install the covers directed as shown in the illustration



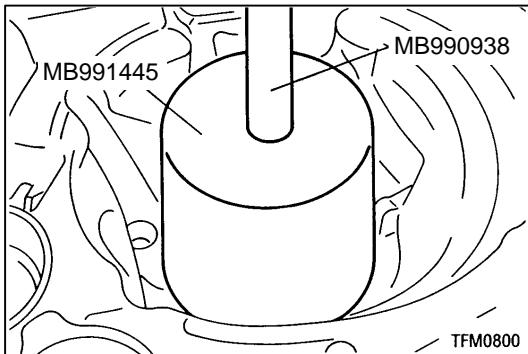
▶B◀ BUSHING INSTALLATION

Press fit the bushing to the illustrated position, while making sure that the split ends of the bushing do not coincide with the air purge groove.

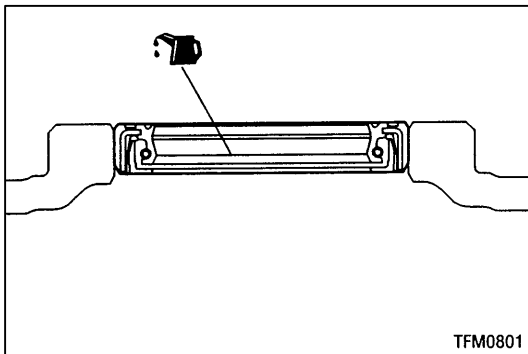




▶C◀ OUTER RACE INSTALLATION



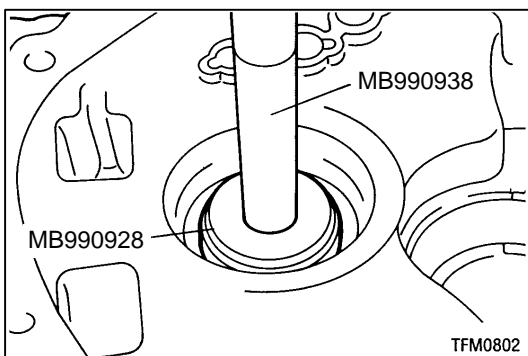
▶D◀ OUTER RACE INSTALLATION



▶E◀ OIL SEAL INSTALLATION

Apply transmission oil to the oil seal lip area.

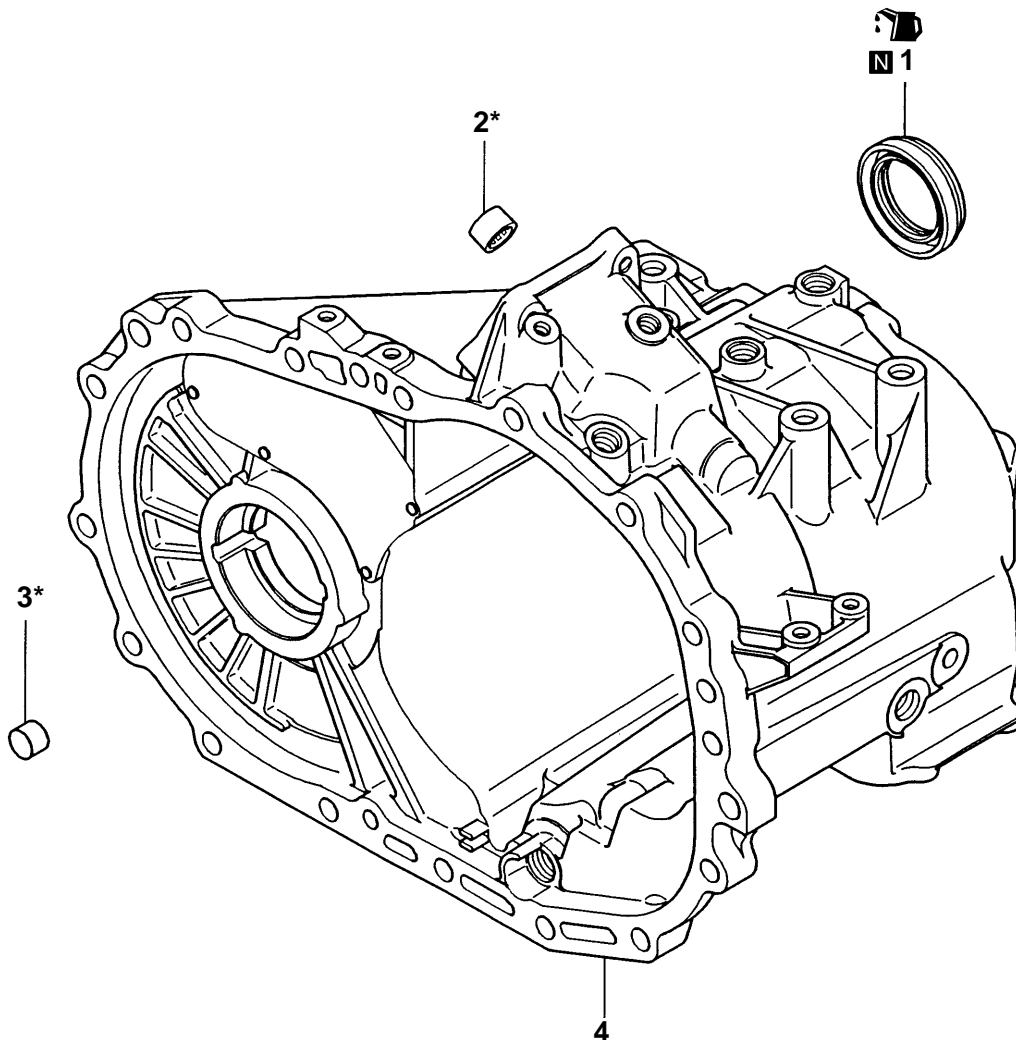
**Transmission oil: DIA QUEEN MULTI-GEAR OIL 75W/85W**



TFM0802

## TRANSMISSION CASE

### DISASSEMBLY AND REASSEMBLY



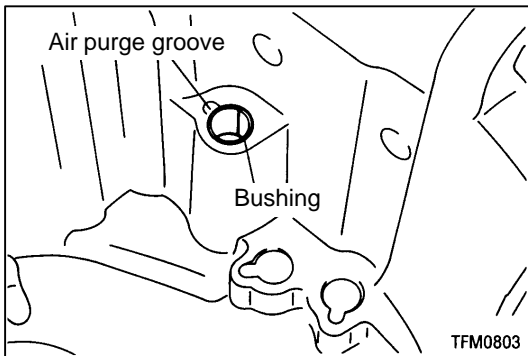
#### Disassembly steps

- ▶C◀ 1. Oil seal
- ▶B◀ 2. Needle bearing\*
- ▶A◀ 3. Bushing\*
- 4. Transmission case

#### NOTE:

\*: Never remove the bearing and bushing from the transmission case.  
Only the case when installing new bearing and bushing into a new transmission case, refer to ▶A◀ and ▶B◀.

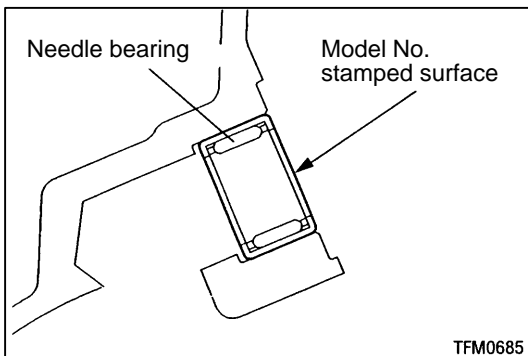
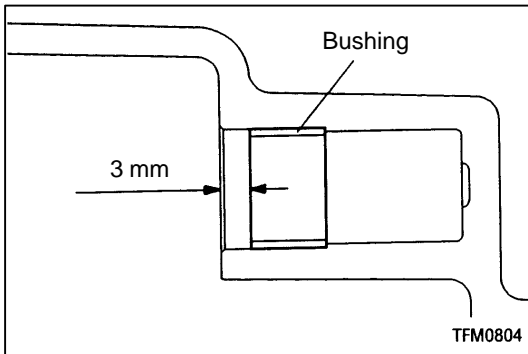




**REASSEMBLY SERVICE POINTS**

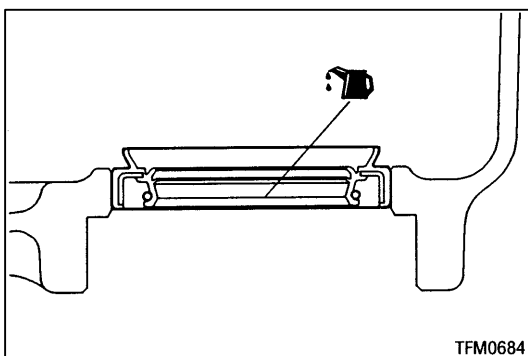
**▶A◀ BUSHING INSTALLATION**

Press fit the bushing to the illustrated position, while making sure that the split ends of the bushing do not coincide with the air purge groove.



**▶B◀ NEEDLE BEARING INSTALLATION**

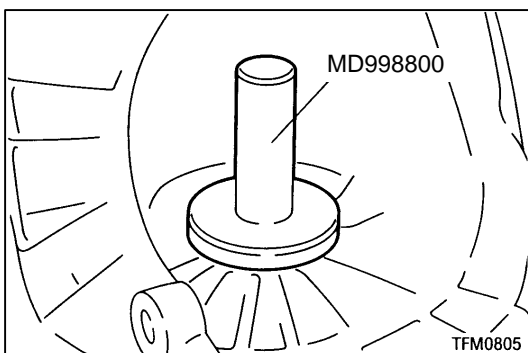
Press fit the needle bearing until it is flush with the case, while making sure that the model number stamped side is oriented in the direction shown.



**▶C◀ OIL SEAL INSTALLATION**

Apply transmission oil to the oil seal lip area.

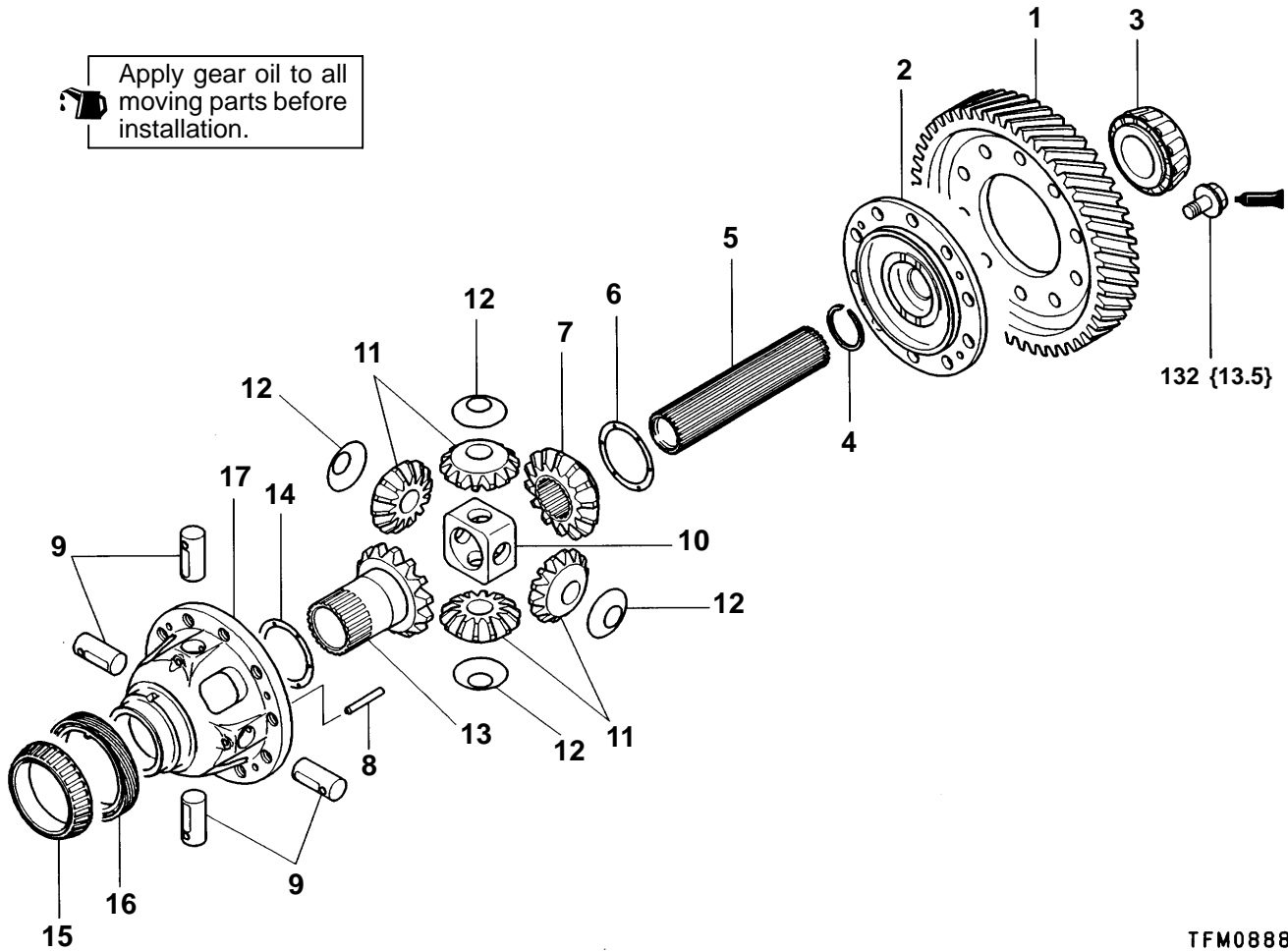
**Transmission oil: DIA QUEEN MULTI-GEAR OIL 75W/85W**



# CENTER DIFFERENTIAL

## DISASSEMBLY AND REASSEMBLY

Apply gear oil to all moving parts before installation.



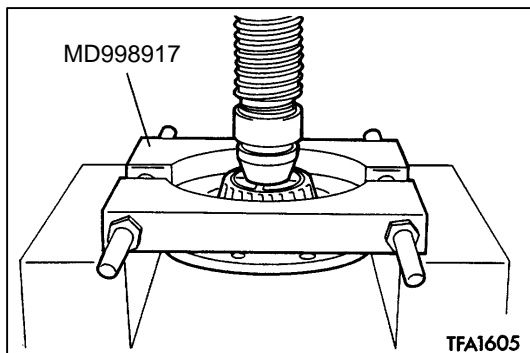
TFM0888

Unit: Nm {kgf·m}

### Disassembly steps

- ◀A▶ D 1. Center differential drive gear
- ▶C▶ C 2. Center differential flange
- ▶B▶ B 3. Taper roller bearing
- ▶C▶ C 4. Snap ring
- ▶C▶ C 5. Front output shaft
- ▶C▶ C 6. Spacer
- ▶C▶ C 7. Side gear
- ▶C▶ C 8. Lock pin
- ▶C▶ C 9. Pinion shaft

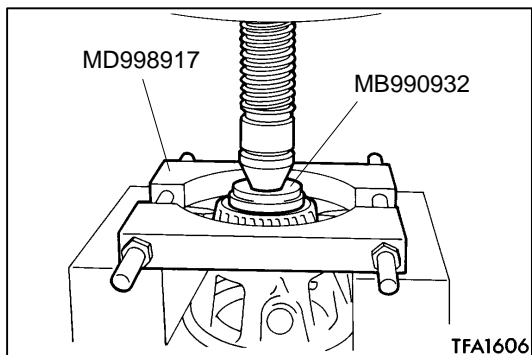
- ▶C▶ C 10. Pinion shaft holder
- ▶C▶ C 11. Pinion
- ▶C▶ C 12. Washer
- ▶C▶ C 13. Side gear
- ▶C▶ C 14. Spacer
- ▶B▶ A 15. Taper roller bearing
- ▶C▶ C 16. Speedometer drive gear
- ▶C▶ C 17. Differential case



### DISASSEMBLY SERVICE POINTS

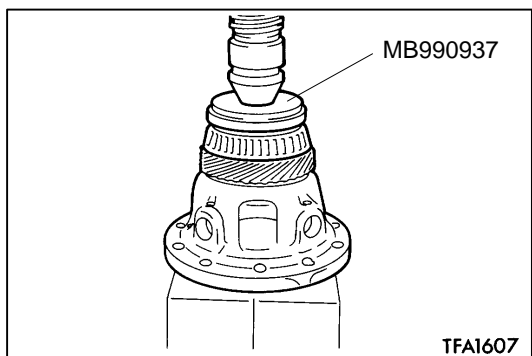
#### ◀A▶ TAPER ROLLER BEARING REMOVAL

Use the special tool to remove the taper roller bearing.



**◀B▶ TAPER ROLLER BEARING REMOVAL**

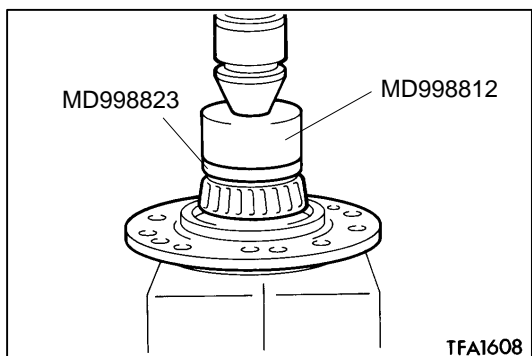
Use the special tools to remove the taper roller bearing.



**REASSEMBLY SERVICE POINTS**

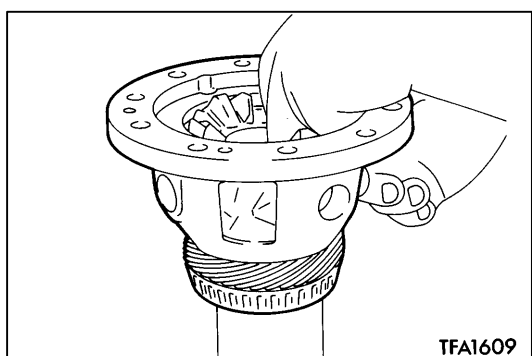
**▶A▶ TAPER ROLLER BEARING INSTALLATION**

Use the special tool to install the taper roller bearing.



**▶B▶ TAPER ROLLER BEARING INSTALLATION**

Use the special tools to install the taper roller bearing.

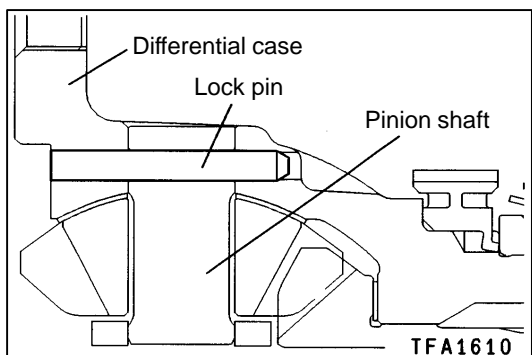


**▶C▶ SPACER / SIDE GEAR / WASHER / PINION/PINION HOLDER / PINION SHAFT / LOCK PIN / FRONT OUTPUT SHAFT / SNAP RING / CENTER DIFFERENTIAL FLANGE INSTALLATION**

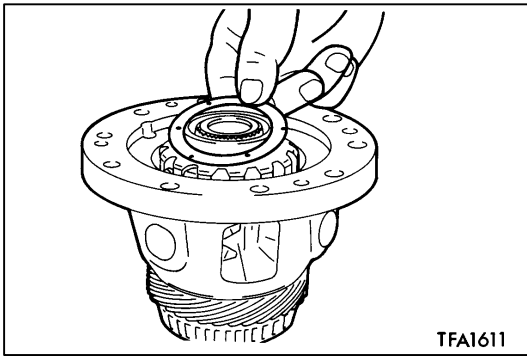
- (1) Install the side gear in the center differential case with the spacer attached.

**NOTE**

If a new side gear is to be installed, select a spacer with medium thickness (0.8 – 0.9 mm).



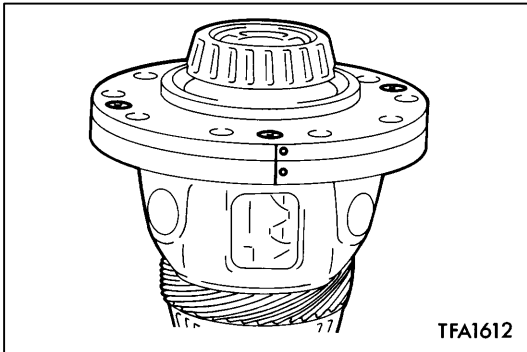
- (2) Fit the washer on the back of each pinion. Engage the 4 pinions simultaneously in the side gear. Rotate the gears to place them in position, then install the pinion shaft holder.
- (3) Insert the pinion shafts.
- (4) Install the lock pins in the illustrated direction.



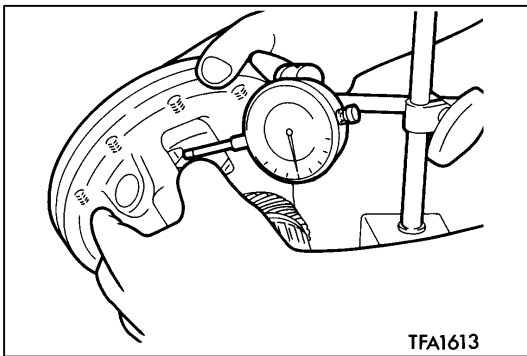
- (5) Install the front output shaft to the side gear and fit the snap ring.
- (6) Attach the spacer on the other side gear, then install the side gear in the center differential case.

**NOTE**

If a new side gear is to be installed, select a spacer with medium thickness (0.8 – 0.9 mm).



- (7) Install the center differential flange on the case while aligning the mating marks, then secure it temporarily with machine screw.



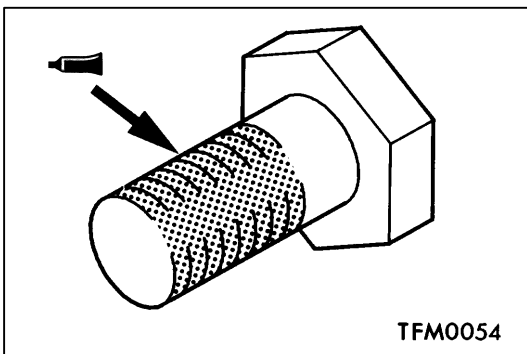
- (8) Measure the backlash between the side gear and the pinion.

**Standard value: 0.025 – 0.150 mm**

- (9) If the measurement deviates from the standard value, correct the backlash using a spacer of different thickness and check it again.

**NOTE**

The backlash must be the same on both sides.

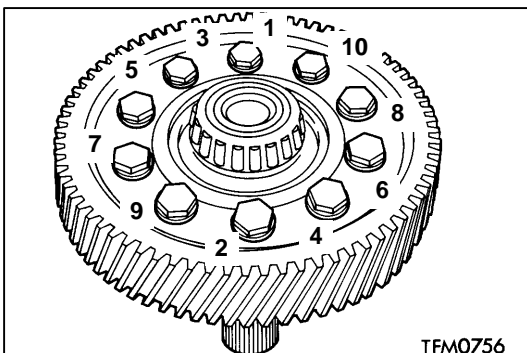


**►D◄ CENTER DIFFERENTIAL DRIVE GEAR INSTALLATION**

- (1) Apply sealant to the entire threaded portion of the bolt.

**Specified sealant:**

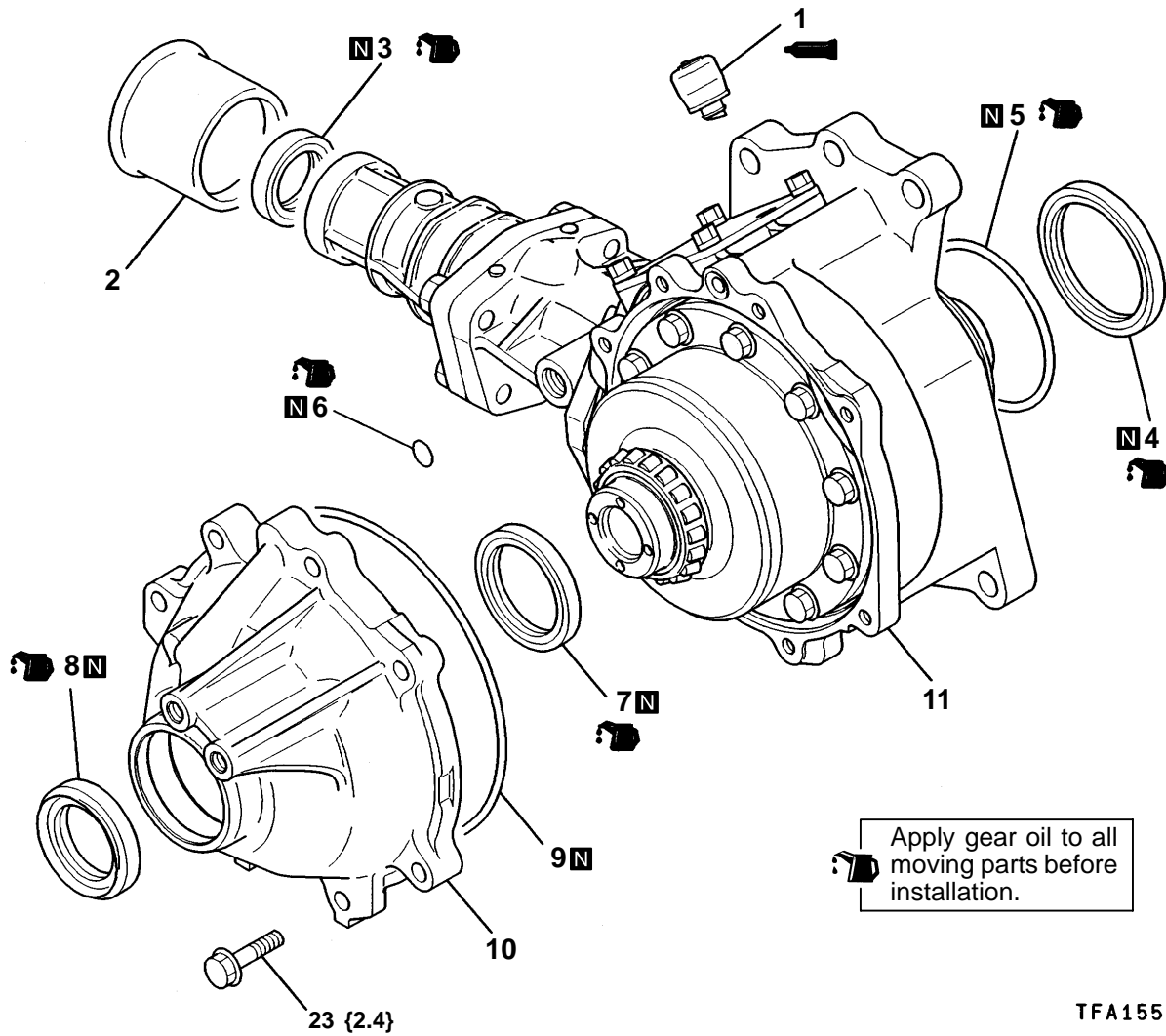
**THREEBOND 1303 or LOKTITE 648**



- (2) Tighten the bolts to the specified torque in the illustrated sequence.

**TRANSFER**

**DISASSEMBLY AND REASSEMBLY**



TFA1558

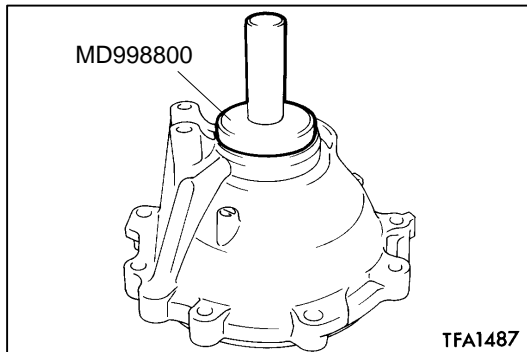
Unit: Nm {kgf·m}

- Disassembly steps**
- ▶F◀ 1. Air breather
  - ▶E◀ 2. Dust seal guard
  - ▶D◀ 3. Oil seal
  - ▶A◀ 4. Oil seal
  - ▶A◀ 5. O-ring
  - ▶A◀ 6. O-ring
  - ▶C◀ 7. Oil seal
  - ▶B◀ 8. Oil seal
  - ▶A◀ 9. O-ring
  - 10. Transfer cover
  - 11. Transfer

**REASSEMBLY SERVICE POINTS****▶A◀ O-RING INSTALLATION**

Apply transmission oil to the O-ring.

**Transmission oil: DIA QUEEN MULTI-GEAR OIL 75W/85W**

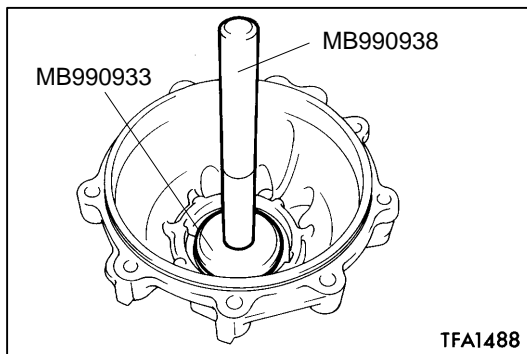
**▶B◀ OIL SEAL INSTALLATION**

(1) Apply transmission oil to the oil seal lip area.

**Transmission oil:**

**DIA QUEEN MULTI-GEAR OIL 75W/85W**

(2) By using the special tool, install the oil seal.

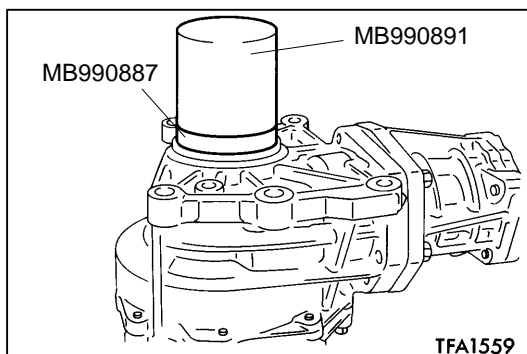
**▶C◀ OIL SEAL INSTALLATION**

(1) Apply transmission oil to the oil seal lip area.

**Transmission oil:**

**DIA QUEEN MULTI-GEAR OIL 75W/85W**

(2) By using the special tool, install the oil seal.

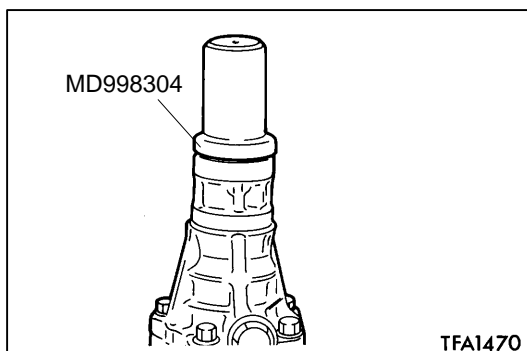
**▶D◀ OIL SEAL INSTALLATION**

(1) Apply transmission oil to the oil seal lip area.

**Transmission oil:**

**DIA QUEEN MULTI-GEAR OIL 75W/85W**

(2) By using the special tool, install the oil seal.

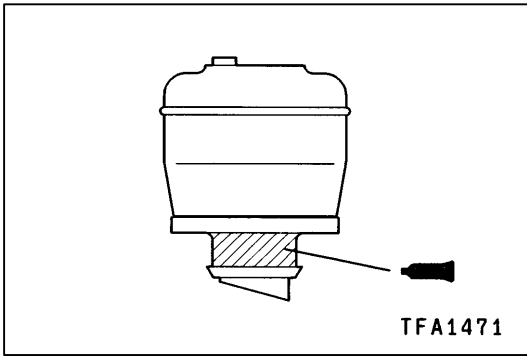
**▶E◀ OIL SEAL INSTALLATION**

(1) Apply transmission oil to the oil seal lip area.

**Transmission oil:**

**DIA QUEEN MULTI-GEAR OIL 75W/85W**

(2) By using the special tool, install the oil seal.



►F◄ AIR BREATHER INSTALLATION

Apply sealant to the air breather.

Specified sealant: **THREEBOND 1501**

# FRONT AXLE

## CONTENTS

SERVICE SPECIFICATIONS .....	2	AXLE HUB AND KNUCKLE .....	3
SPECIAL TOOLS .....	2		

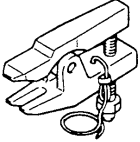
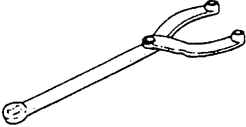
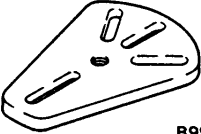
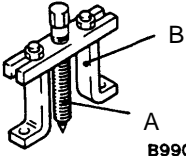
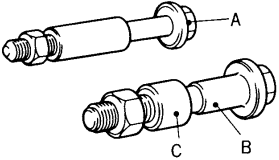
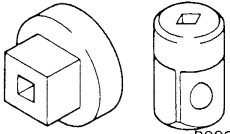




## SERVICE SPECIFICATIONS

Items	Limit
Hub axial play mm	0.05
Hub rotation starting torque Nm {kgf · m}	1.8 {1.8}

## SPECIAL TOOLS

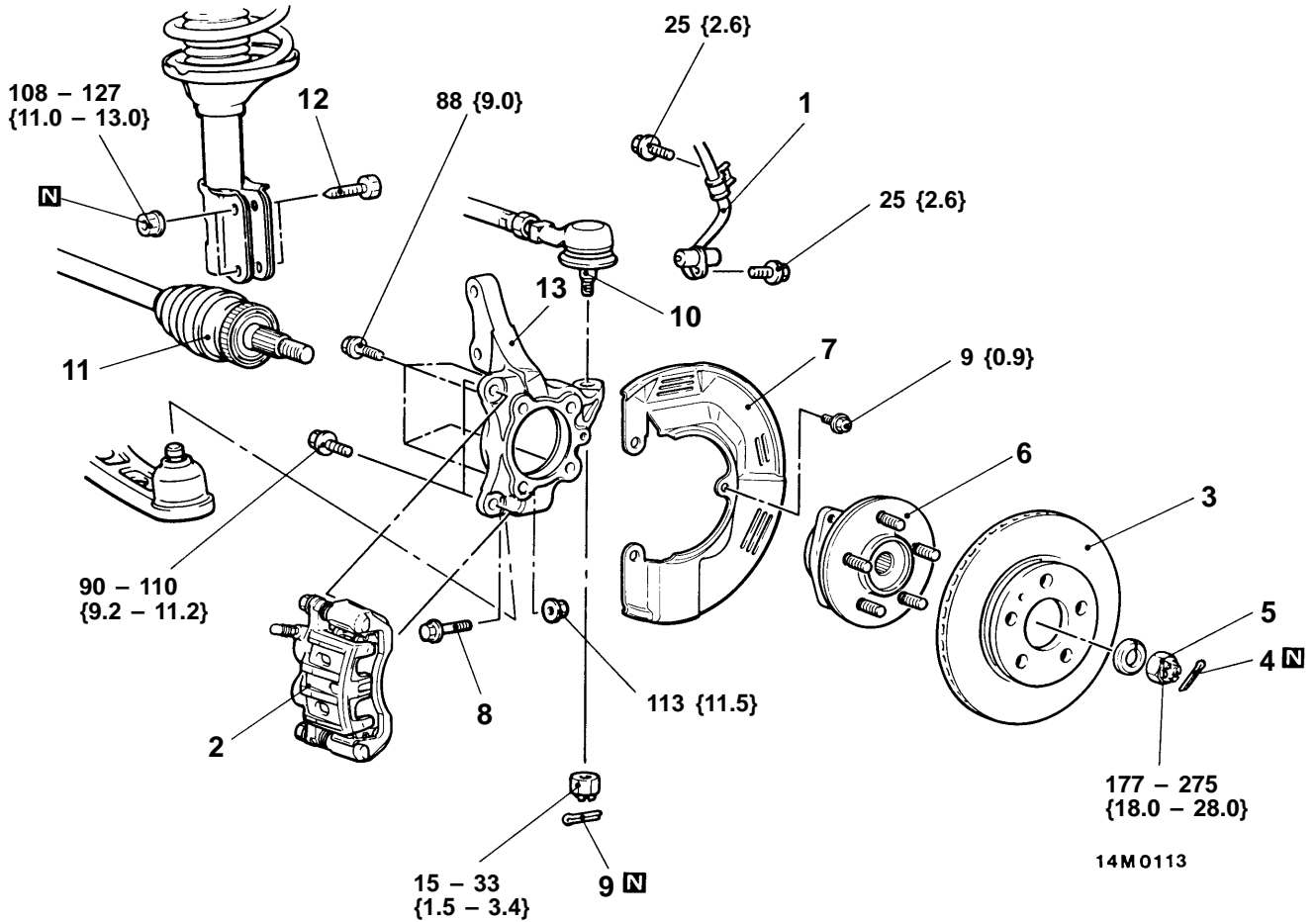
Tool	Number	Name	Use
 B991113	MB990635 or MB991113	Steering linkage puller	Ball joint disconnection
 B990767	MB990767	End holder	Fixing of hub
 B991354	MB991354	Puller body	Removal of drive shaft
 B990241	MB990241 A: MB990242 B: MB990244	Axle shaft puller A: Puller shaft B: Puller bar	
	A: MB991017 B: MB990998 C: MB991000	A, B: Front hub remover & installer C: Spacer	<ul style="list-style-type: none"> <li>• Temporary fixing of unit bearing</li> <li>• Measurement of hub rotation starting torque</li> <li>• Measurement of hub axial play Use MB991000 (component of MB990998) for the spacer.</li> </ul>
 B990326	MB990326	Preload socket	Measurement of hub rotation starting torque

# AXLE HUB AND KNUCKLE

## REMOVAL AND INSTALLATION

**Post-installation Operation**

- Check the Dust Cover for Cracks or Damage by Pushing it with Finger.



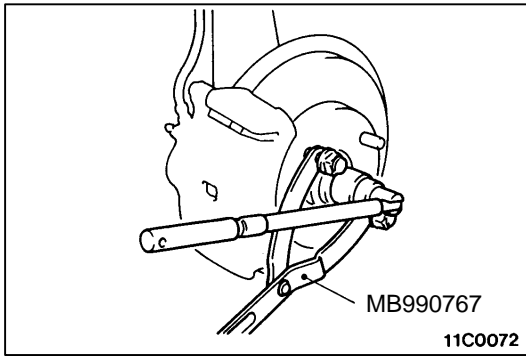
Unit: Nm {kgf·m}

**Removal steps**

- ◀A▶ 1. Front speed sensor  
<Vehicles with AYC>
- ◀B▶ ▶A▶ 2. Caliper assembly
- 3. Brake disc
- 4. Split pin
- 5. Drive shaft nut
- 6. Front hub assembly
- 7. Dust shield
- 8. Connection for lower arm ball joint
- 9. Split pin
- ◀C▶ ▶D▶ 10. Connection for tie rod end
- 11. Front drive shaft
- 12. Front strut mounting bolt
- 13. Knuckle

**Caution**

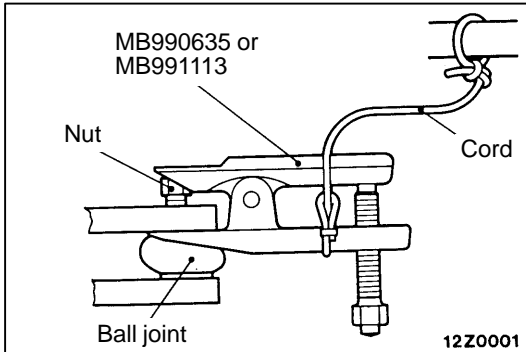
- (1) For vehicles with AYC, be careful when handling the pole piece at the tip of the speed sensor so as not to damage it by striking against other parts.
- (2) For vehicles with AYC, be careful not to damage the rotors installed to B.J. outer race during removal and installation of the drive shaft.

**REMOVAL SERVICE POINTS****◀A▶ CALIPER ASSEMBLY REMOVAL**

Secure the removed caliper assembly with wire, so that it does not fall.

**◀B▶ DRIVE SHAFT NUT REMOVAL****Caution**

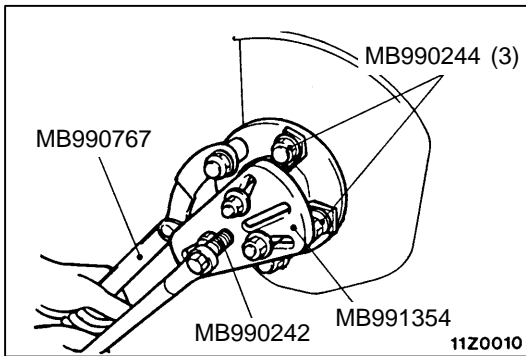
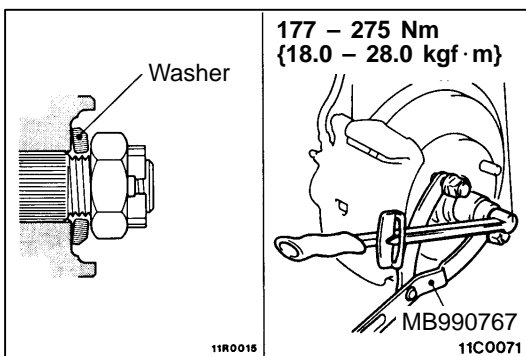
Do not apply the vehicle weight to the wheel bearing while loosening the drive shaft nut.

**◀C▶ TIE ROD END DISCONNECTION**

Use the special tool to disconnect the ball joint.

**Caution**

- (1) Use the special tool to loosen the nut only; do not remove it from the ball joint.
- (2) Tie the special tool with a cord not to let it fall off.

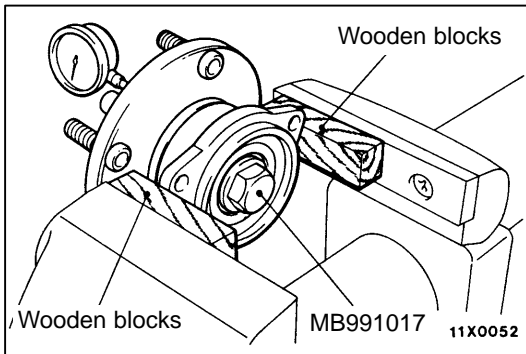
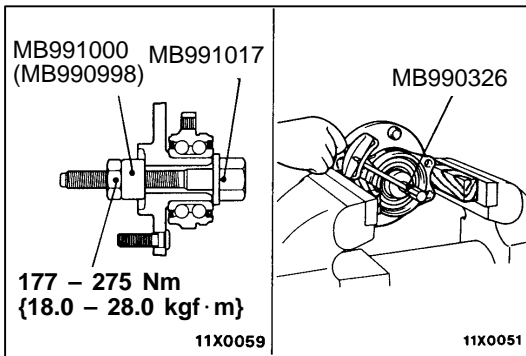
**◀D▶ DRIVE SHAFT REMOVAL****INSTALLATION SERVICE POINT****▶A◀ DRIVE SHAFT NUT INSTALLATION**

- (1) Install the drive shaft washer in the specified direction.
- (2) Using the special tool, tighten the drive shaft nut.

**Caution**

Before securely tightening the drive shaft nuts, make sure there is no load on the wheel bearings.

- (3) If the position of the split pin holes does not match, tighten the nut up to the first matching holes. Install the split pin and bend it securely.



## INSPECTION

### 1. HUB ROTATION STARTING TORQUE CHECK

- (1) Install the special tool to the front hub assembly and tighten the nut to the specified torque.
- (2) Use the special tool to measure the hub rotation starting torque.

**Limit: 1.8 Nm {18.0 kgf·cm}**

- (3) The hub rotation starting torque should be within the limit value range, and there should be no engagement or feeling of roughness.

### 2. HUB AXIAL PLAY CHECK

- (1) Measure the hub play in the axial direction.

**Limit: 0.05 mm**

#### NOTE

Measure the hub play while clamping the hub in a vice with wooden blocks against the bearing section.

- (2) If the limit value of hub axial play cannot be obtained with the nut tightened to the specified torque (177 to 275 Nm {18.0 to 28.0 kgf·m}), replace the front hub assembly.

# REAR AXLE

## CONTENTS

<b>SERVICE SPECIFICATIONS</b> .....	<b>2</b>	<b>REAR HUB ASSEMBLY</b> .....	<b>33</b>
<b>LUBRICANT</b> .....	<b>2</b>	<b>KNUCKLE</b> .....	<b>35</b>
<b>SEALANT</b> .....	<b>2</b>	<b>DRIVE SHAFT</b> .....	<b>36</b>
<b>SPECIAL TOOLS</b> .....	<b>3</b>	<b>DIFFERENTIAL CARRIER</b> <b>&lt;EVOLUTION-IV, EVOLUTION-V GSR&gt;</b> .	<b>39</b>
<b>TROUBLESHOOTING &lt;AYC&gt;</b> .....	<b>5</b>	<b>DIFFERENTIAL CARRIER</b> <b>&lt;EVOLUTION-V RS&gt;</b> .....	<b>41</b>
<b>ON-VEHICLE SERVICE</b> <b>&lt;VEHICLES WITH AYC&gt;</b> .....	<b>27</b>	<b>TORQUE TRANSFER DIFFERENTIAL</b> <b>&lt;VEHICLES WITH AYC&gt;</b> .....	<b>43</b>
1. Rear Axle Total Backlash Check .....	27	<b>LSD CASE ASSEMBLY</b> <b>&lt;VEHICLES WITHOUT AYC&gt;</b> .....	<b>46</b>
2. Gear Oil Level Check .....	27	<b>HYDRAULIC UNIT</b> <b>&lt;VEHICLES WITH AYC&gt;</b> .....	<b>50</b>
3. Gear Oil Change .....	28	<b>SENSOR RELAY</b> <b>&lt;VEHICLES WITH AYC&gt;</b> .....	<b>52</b>
4. Fluid Level Check .....	29	<b>AYC-ECU</b> .....	<b>53</b>
5. Bleeding .....	29		
6. Differential Carrier Oil Seal Replacement .....	30		
7. Speed Sensor Output Voltage Measurement <Vehicles without ABS> .	31		
8. Action When Battery Runs Out .....	32		

## SERVICE SPECIFICATIONS

### <Vehicles with AYC>

Items	Standard value	Limit
Rear axle total backlash mm	–	5
Pressure generated by hydraulic unit MPa {kgf/cm <sup>2</sup> }	0 – 1.6 {10.0 – 16.0}	–
Wheel bearing axial play mm	–	0.05
Wheel bearing rotation starting torque Nm {kgf·cm}	–	1.0 {10.5} or less

### <Vehicles without AYC>

Items	Standard value	Limit
Right-to-left difference in combined thickness of friction plate and friction disc mm	0 – 0.05	–
Clearance between spring plate and differential case mm	0.06 – 0.25	–
LSD differential torque Nm {kgf·m}	When new clutch plate is installed	5 – 19 {0.5 – 1.9}
	When existing clutch plate is installed	2 – 19 {0.2 – 1.9}
Distortion of friction plate and friction disc mm	–	0.08
Difference in thickness between friction plate, friction disc, and spring plate mm	–	0.1

## LUBRICANT

### <Vehicles with AYC>

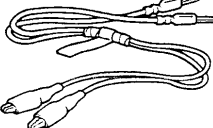
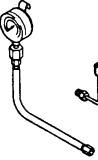
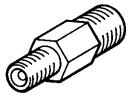
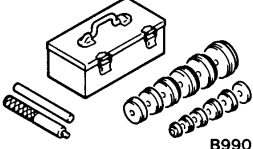
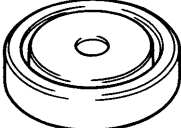
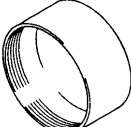
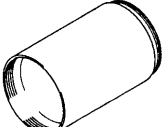

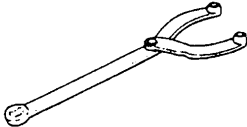
Items			Specified lubricant	Capacity
Gear oil	Torque transfer differential	Differential	mitsubishi GENUINE DIA QUEEN SUPER HYPOID GEAR OIL (GL-5)	0.41 ± 0.02 dm <sup>3</sup> {0.41 ± 0.02 ℓ}
		Torque transfer mechanism	mitsubishi GENUINE DIA QUEEN AYC FLUID	0.70 <sup>+0</sup> / <sub>-0.05</sub> dm <sup>3</sup> {0.70 <sup>+0</sup> / <sub>-0.05</sub> ℓ}
Hydraulic piping fluid			mitsubishi GENUINE DIA QUEEN ATF-SPII	1 dm <sup>3</sup> {1 ℓ}
Torque transfer mechanism oil seal lips			Vaseline	As required

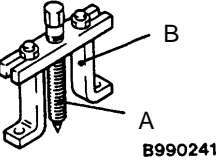

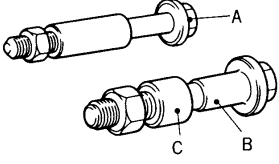
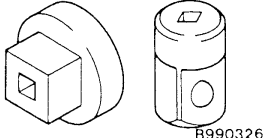
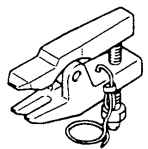
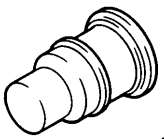
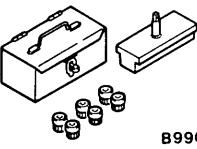
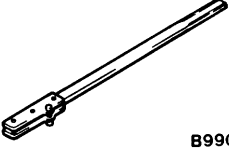
## SEALANT

### <Vehicles with AYC>

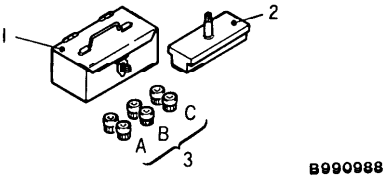
Items	Specified sealant
Torque transfer differential vent plug	Semi-drying sealant: THREEBOND 1281B (460 g)
Torque transfer mechanism cover	

**SPECIAL TOOLS**

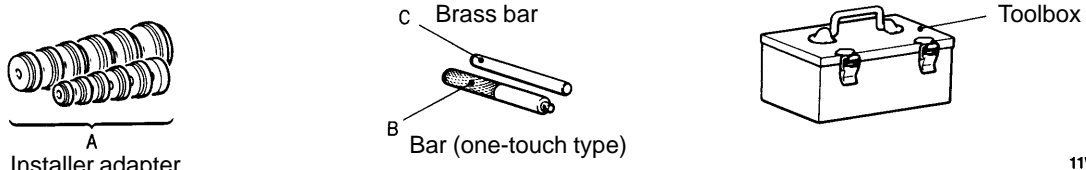
Tool	Number	Name	Use
 <p>B991529</p>	MB991529	Diagnosis code check harness	Inspection of AYC (diagnosis display by AYC warning lamp)
	MD998330 (MD998331)	Oil pressure gauge (2,942 kPa {30 kgf/cm <sup>2</sup> })	Hydraulic pressure measurement <vehicles with AYC>
 <p>B991705</p>	MB991705	Hose adapter	
 <p>B990925</p>	MB990925	Bearing & oil seal installer set	Pressfitting of oil seal <differential>
 <p>B991115</p>	MB991115	Oil seal installer	Pressfitting of oil seal <differential> (used in combination with MB990938)
	MD998812	Installer cap	Pressfitting of oil seal <torque transfer mechanism of vehicles with AYC>
	MD998813	Installer 100	
	MD998829	Installer adapter (60)	
 <p>B990767</p>	MB990767	End yoke holder	Fixing of hub

Tool	Number	Name	Use
 <p>B990241</p>	MB990241 A: MB990242 B: MB990244	Rear axle shaft puller A: Puller shaft B: Puller bar	<ul style="list-style-type: none"> <li>Removal of drive shaft</li> <li>Removal of rear hub assembly</li> </ul>
 <p>B991354</p>	MB991354	Puller body	
	A: MB991017 B: MB990998 C: MB991000	A, B: Front hub remover & installer C: Spacer	<ul style="list-style-type: none"> <li>Temporary fixing of unit bearing</li> <li>Measurement of wheel bearing rotation starting torque</li> <li>Measurement of wheel bearing axial play Use MB991000 (component of MB990998) for the spacer.</li> </ul>
 <p>B990326</p>	MB990326	Preload socket	<ul style="list-style-type: none"> <li>Measurement of wheel bearing rotation starting torque</li> <li>Measurement of drive pinion preload</li> </ul>
 <p>B991113</p>	MB991406, MB990635, or MB991113	Steering linkage puller	<ul style="list-style-type: none"> <li>Disconnection of ball joint</li> <li>Removal of hub bolt</li> </ul>
 <p>B991460</p>	MB991460	Plug	Prevention of differential oil from being discharged and entry of foreign matter <differential>
 <p>B990988</p>	MB990988	Side gear holding tool set	Measurement of clutch plate preload <vehicles without AYC>
 <p>B990850</p>	MB990850	End yoke holder	Removal and installation of companion flange



MB990988 	Number		Name	O.D. mm
	1	MB990551	Box	–
	2	MB990989	Base	–
	3	(MB990990)	Tool A	25
		(MB990991)	Tool B	28
		(MB990992)	Tool C	31

MB990925



Installer adapter (A), Brass bar (C), Bar (one-touch type) (B), Toolbox

11W0113

	Tool number (MB990925)	O.D. mm		Tool number (MB990925)	O.D. mm
A	MB990926	39.0	A	MB990933	63.5
	MB990927	45.0		MB990934	67.5
	MB990928	49.5		MB990935	71.5
	MB990929	51.0		MB990936	75.5
	MB990930	54.0		MB990937	79.0
	MB990931	57.0	B	MB990938	–
	MB990932	61.0	C	MB990939	–

## TROUBLESHOOTING <AYC>

### 1. BASIC TROUBLESHOOTING CONDITIONS

Before starting the troubleshooting procedure, make sure that the following items have been checked okay.

- The correct steering wheel has been properly installed in the neutral position of the steering column shaft.
- Tire and wheel sizes are correct with correct specifications. Inflation pressure, balance, and wear conditions are okay.
- Wheel alignment is correct.
- The engine, suspension, and other parts have not been remodeled so as to affect the AYC system.

### 2. DIAGNOSIS FUNCTION

#### READING THE DIAGNOSIS CODE

Read the diagnosis code using AYC warning lamp.

## 3. INSPECTION CHART FOR DIAGNOSIS CODE

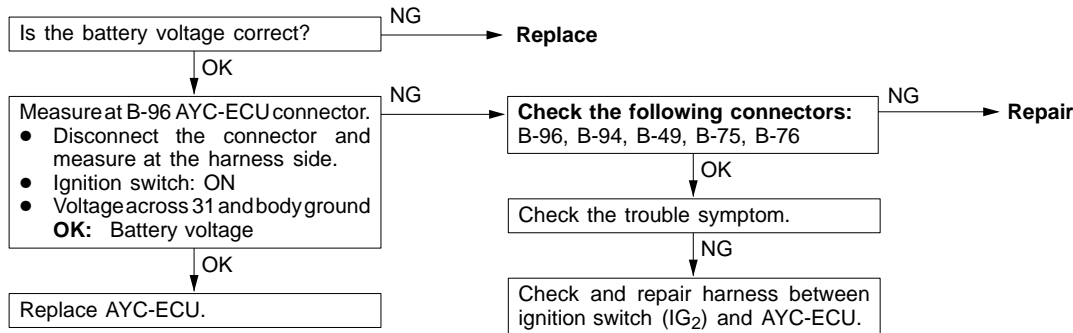
Diagnosis code No.	Diagnosis items	Ref. page
12	Power supply voltage (valve power supply) system (open- or short-circuit)	27-7
21	FR wheel speed sensor system (open- or short-circuit)	27-7
22	FL wheel speed sensor system (open- or short-circuit)	27-7
23	RR wheel speed sensor system (open- or short-circuit)	27-7
24	RL wheel speed sensor system (open- or short-circuit)	27-7
25	Wrong-diameter tire	27-9
26	Faulty wheel speed sensor	27-10
31	Steer sensor (ST-1, ST-2, ST-N) system (open-circuit)	27-11
32	Steer sensor (ST-N) system (short-circuit)	27-11
33	Steer sensor (ST-N) system	27-12
34	Steer sensor (ST-1, ST-2) system (short-circuit)	27-12
41	TPS system (open- or short-circuit)	27-13
51	Longitudinal acceleration sensor system (open- or short-circuit)	27-13
52	Longitudinal acceleration sensor	27-14
56	Lateral acceleration sensor system (open- or short-circuit)	27-13
61	Stop lamp switch system (open-circuit)	27-14
65	ABS monitor system (open-circuit or defective ABS)	27-15
71	Proportioning valve system (open- or short-circuit)	27-15
72	Directional control valve (right) system (open- or short-circuit)	27-16
73	Directional control valve (left) system (open- or short-circuit)	27-17
81	AYC relay system (open- or short-circuit)	27-18
82	Electric pump system	27-19
83	Electric pump system	27-20

4. INSPECTION PROCEDURES FOR DIAGNOSIS CODES

Code No. 12: Power supply voltage (valve power supply) system	Probable cause
This code is output when the AYC-ECU power supply voltage drops below, goes beyond, a specified level.	<ul style="list-style-type: none"> <li>● Defective harness or connector</li> <li>● Defective battery</li> <li>● Defective AYC-ECU</li> </ul>

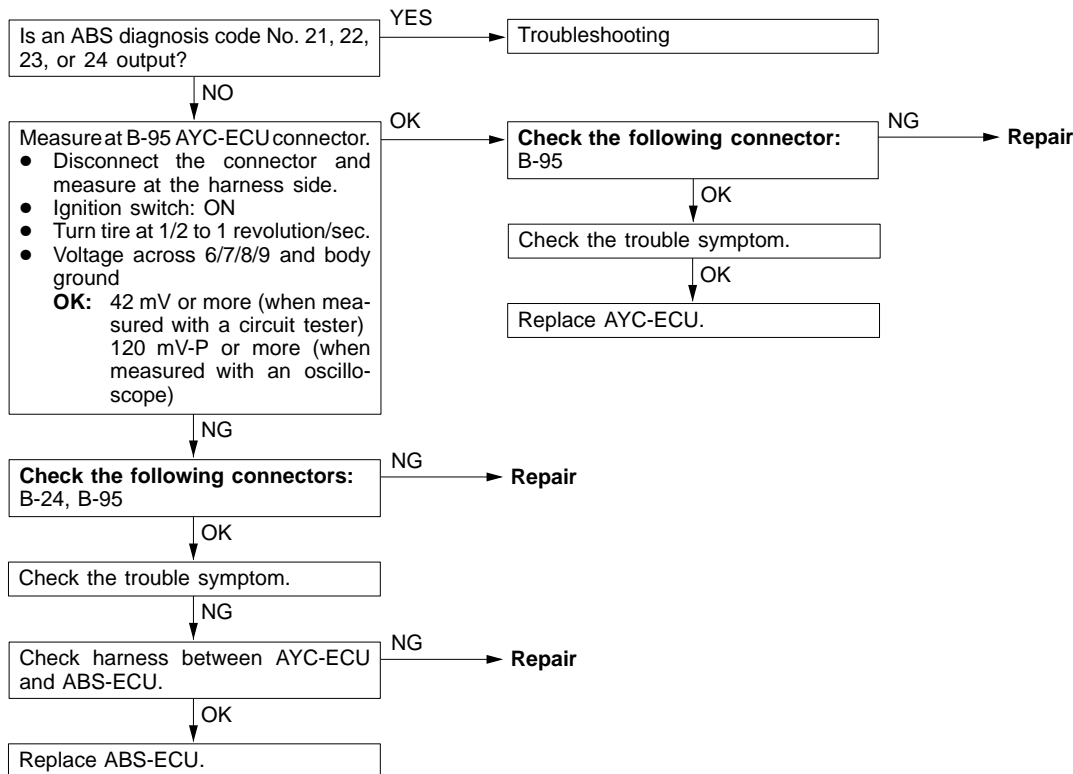
NOTE

Refer to the corresponding item if any other diagnosis code is being output.

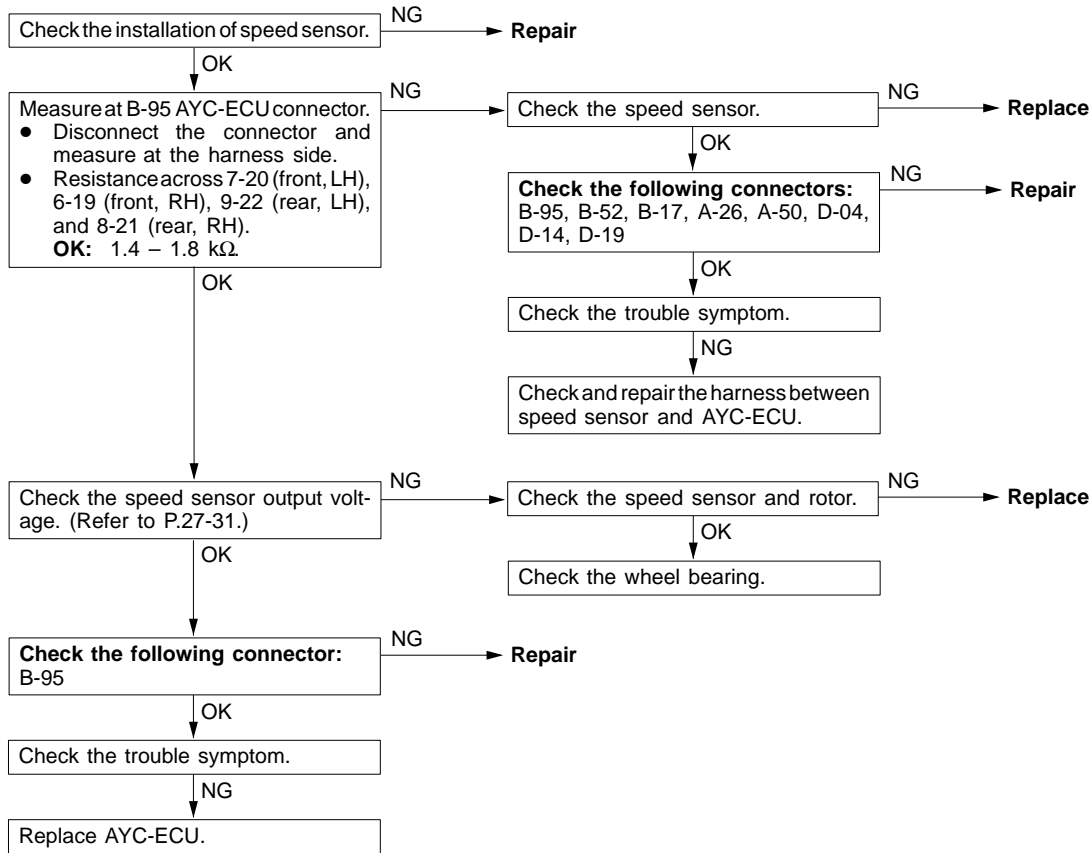


Code No. 21, 22, 23, 24: Wheel speed sensor system	Probable cause
This code is output if any one of three wheel speed sensors fails to provide an input even after the other wheel exceeded 8 km/h.	<ul style="list-style-type: none"> <li>● Defective harness or connector</li> <li>● Defective ABS-ECU</li> <li>● Defective AYC-ECU</li> </ul>

<Vehicles with ABS>

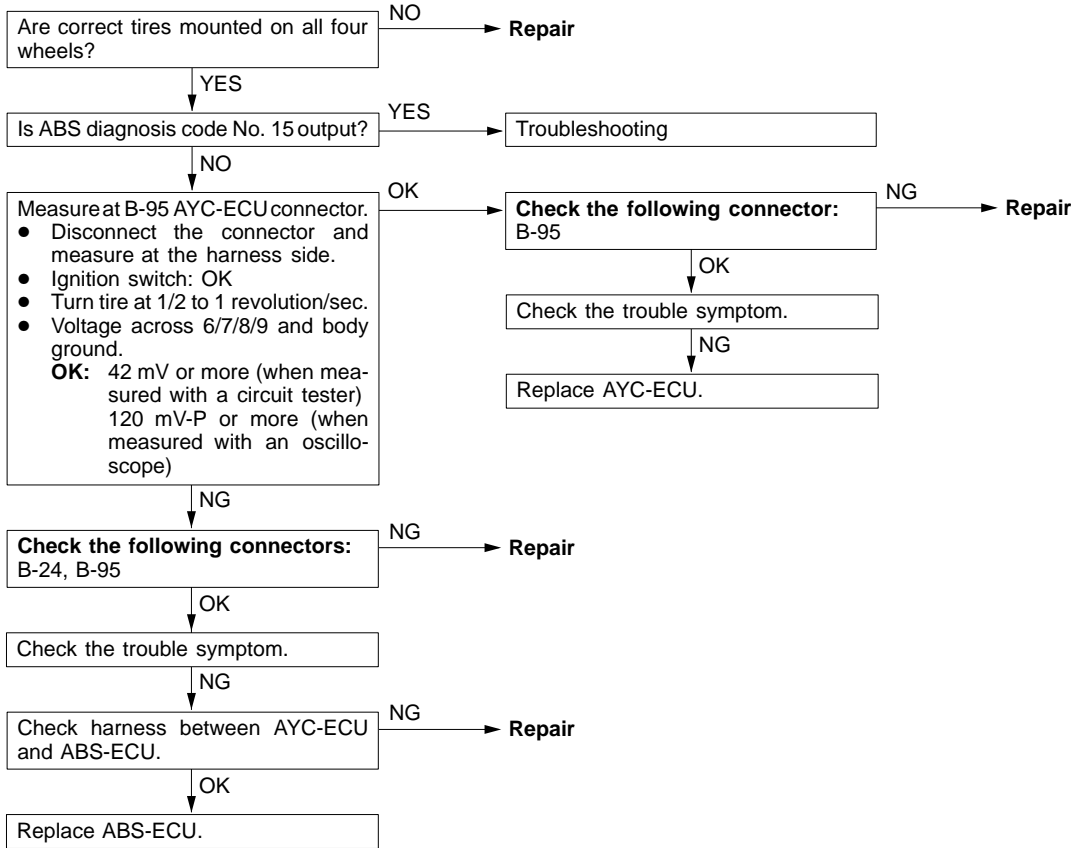


<Vehicles without ABS>

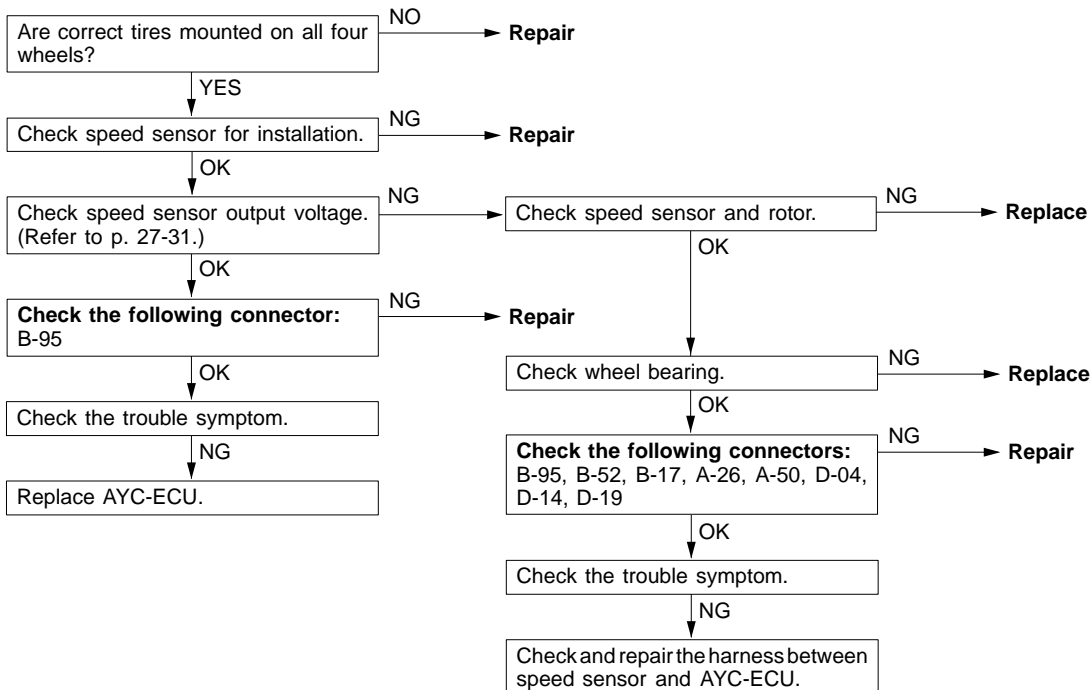


Code No. 25: Wrong-diameter tire	Probable cause
This code is output if the speed of any one of the four wheels exceeds a specified level with respect to the average of the four wheel speed sensor outputs when the steering wheel is in the straight-ahead position and the vehicle speed exceeds 20 km/h. At this time, the warning lamp does not light up.	<ul style="list-style-type: none"> <li>● Defective harness or connector</li> <li>● Defective AYC-ECU</li> <li>● Defective ABS-ECU</li> </ul>

<Vehicles with ABS>

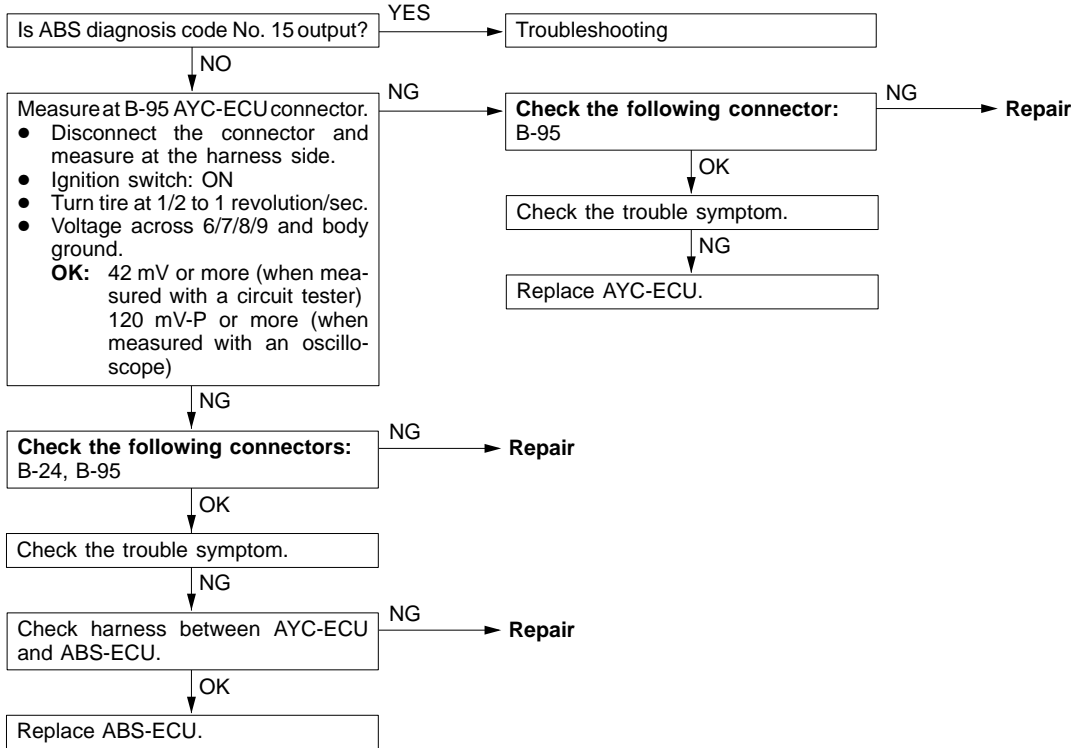


<Vehicles without ABS>

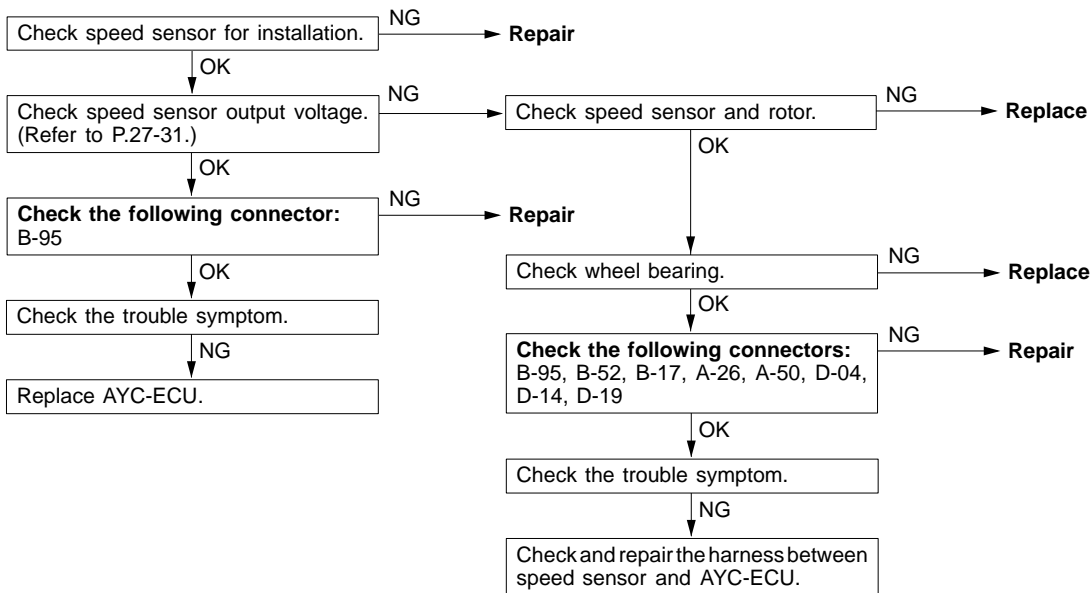


Code No. 26: Wheel speed sensor system (faulty output signal)	Probable cause
This code is output if the speed of one of the four wheels exceeds a specified level when the vehicle speed is 20 km/h or more. At this time, the warning lamp is turned on.	<ul style="list-style-type: none"> <li>● Defective harness or connector</li> <li>● Defective AYC-ECU</li> <li>● Defective ABS-ECU</li> </ul>

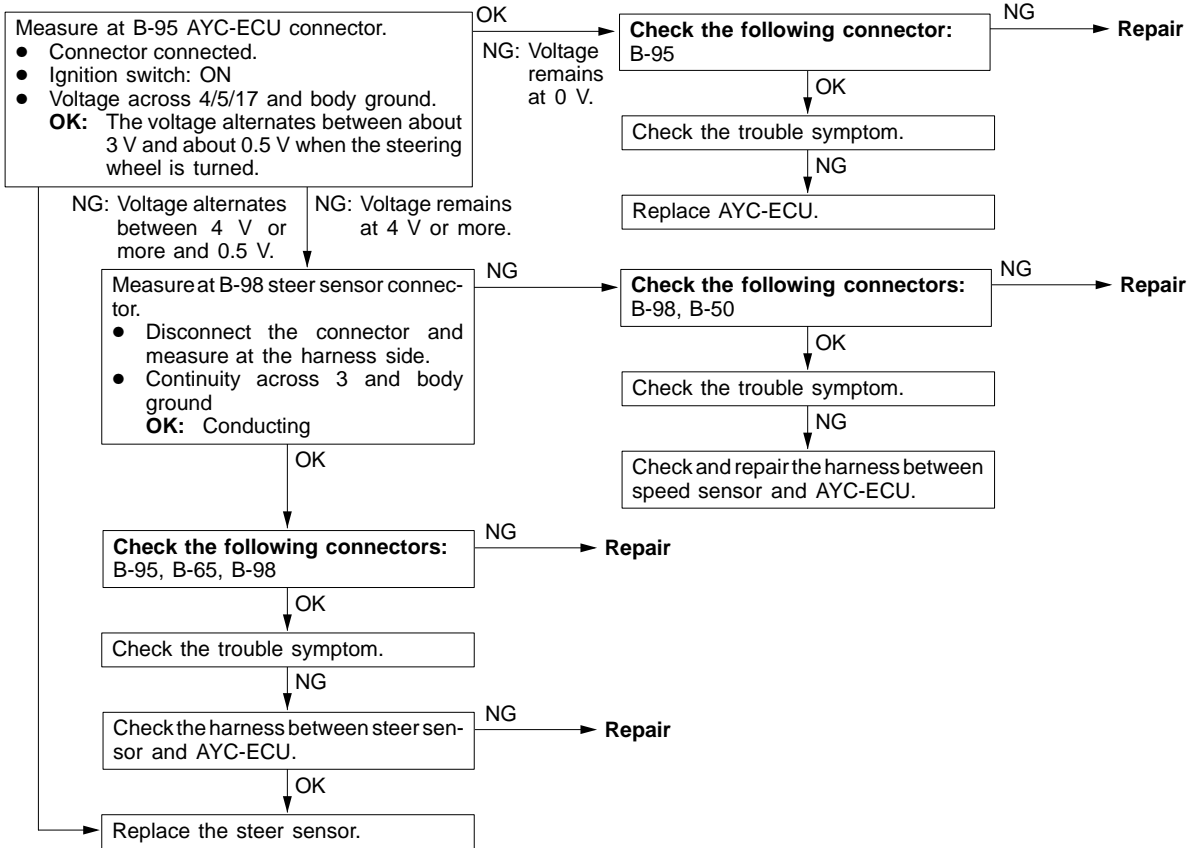
<Vehicles with ABS>



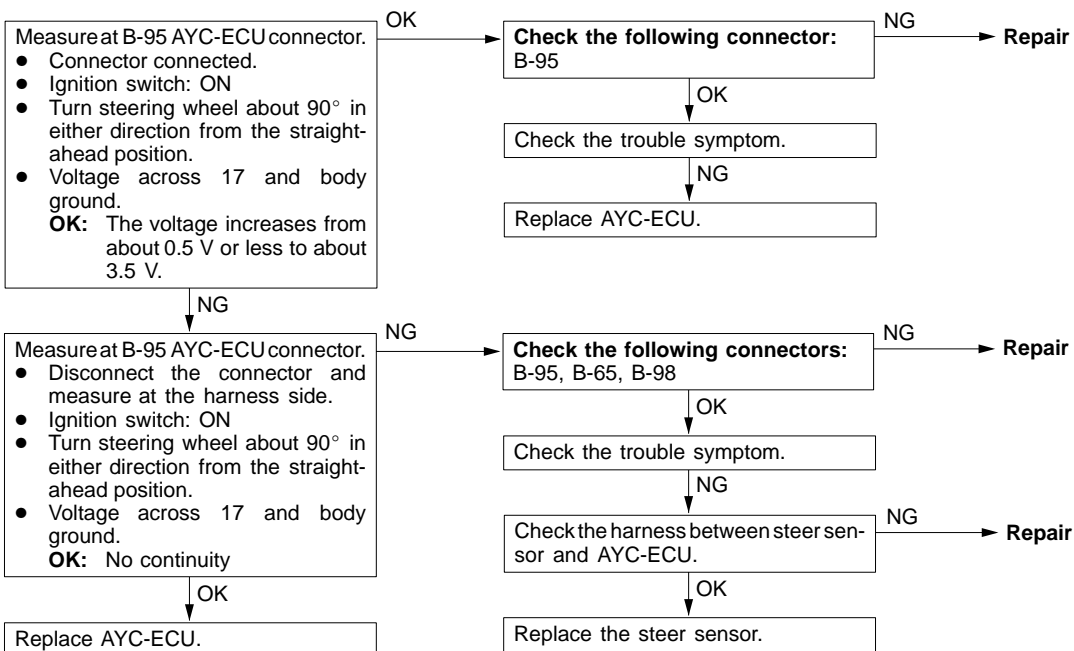
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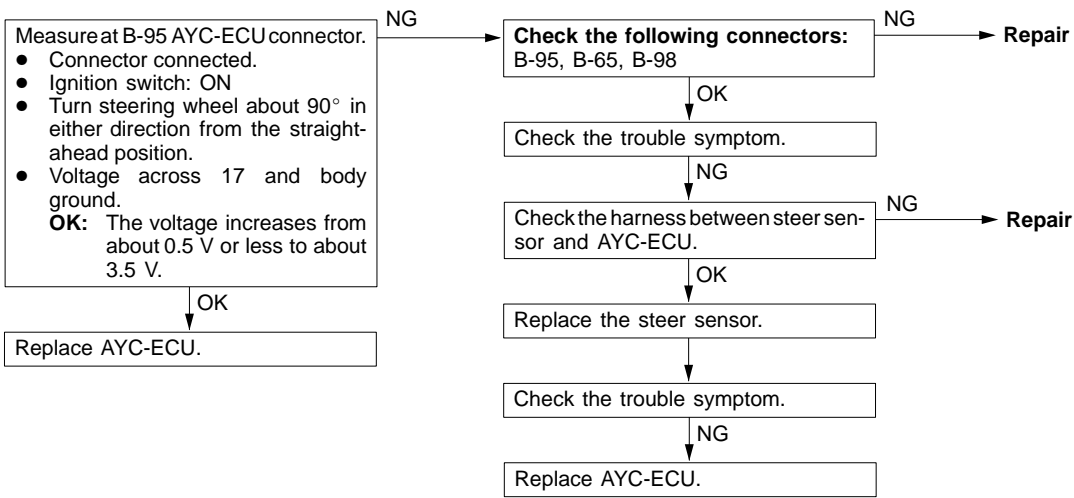
Code No. 31: Steer sensor (ST-1, ST-2, ST-N) system	Probable cause
This code is output when any of the steer sensors ST-1, ST-2, and ST-N is open-circuited or the steer sensor ground wire is open-circuited.	<ul style="list-style-type: none"> <li>● Defective steer sensor</li> <li>● Defective harness or connector</li> <li>● Defective AYC-ECU</li> </ul>



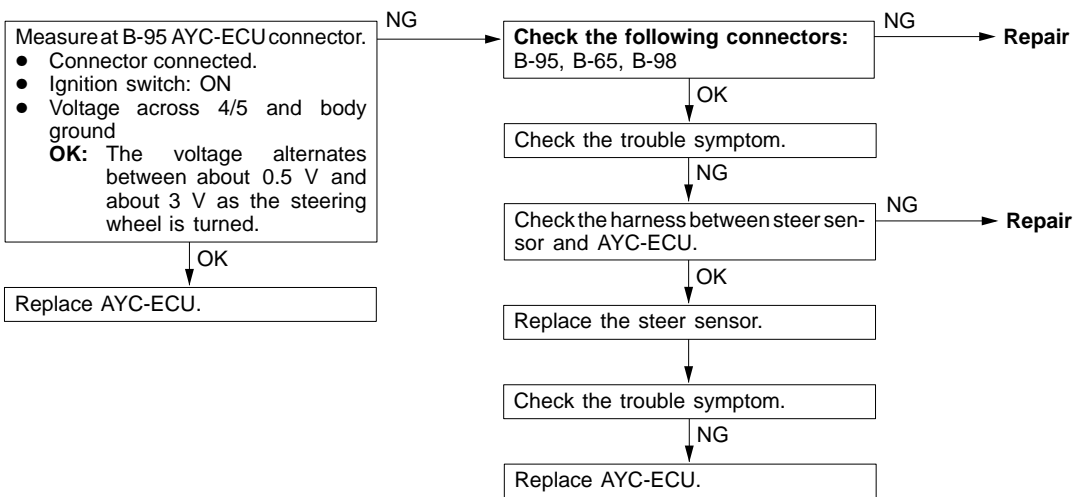
Code No. 32: Steer sensor (ST-N) system	Probable cause
This code is output when the steering wheel is considered to be turned 40° or more as determined with ST-1 and ST-2 with ST-N ON (LOW voltage).	<ul style="list-style-type: none"> <li>● Defective steer sensor</li> <li>● Defective harness or connector</li> <li>● Defective AYC-ECU</li> </ul>



Code No. 33: Steer sensor (ST-N) system	Probable cause
This code is output when the steering wheel is turned 400° or more in the same direction with ST-N OFF (HIGH voltage).	<ul style="list-style-type: none"> <li>● Defective steer sensor</li> <li>● Defective harness or connector</li> <li>● Defective AYC-ECU</li> </ul>

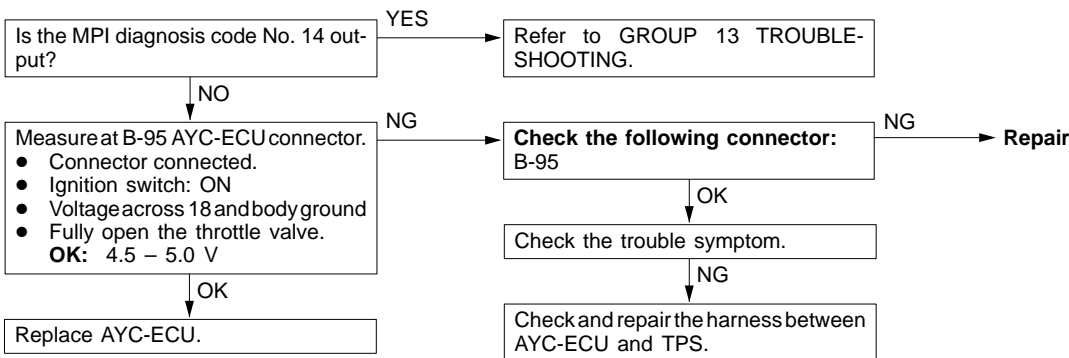


Code No. 34: Steer sensor (ST-1, ST-2) system	Probable cause
This code is output if a turning condition is detected for a cumulative period of time of 15 min. or more, during which there is no change in the steer sensor (ST-1, ST-2) signals with the wheel speed 15 km/h or more.	<ul style="list-style-type: none"> <li>● Defective steer sensor</li> <li>● Defective harness or connector</li> <li>● Defective AYC-ECU</li> </ul>

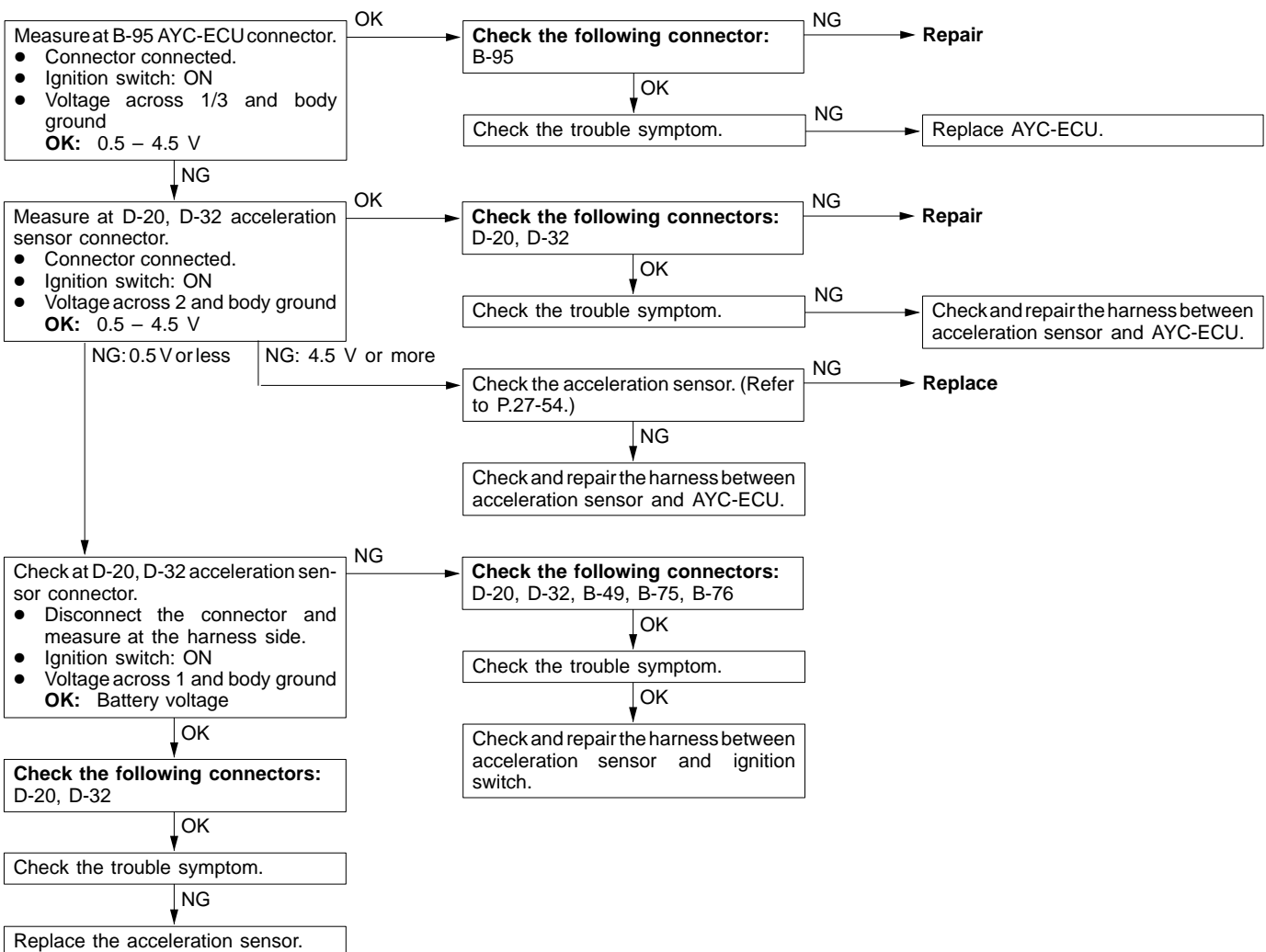




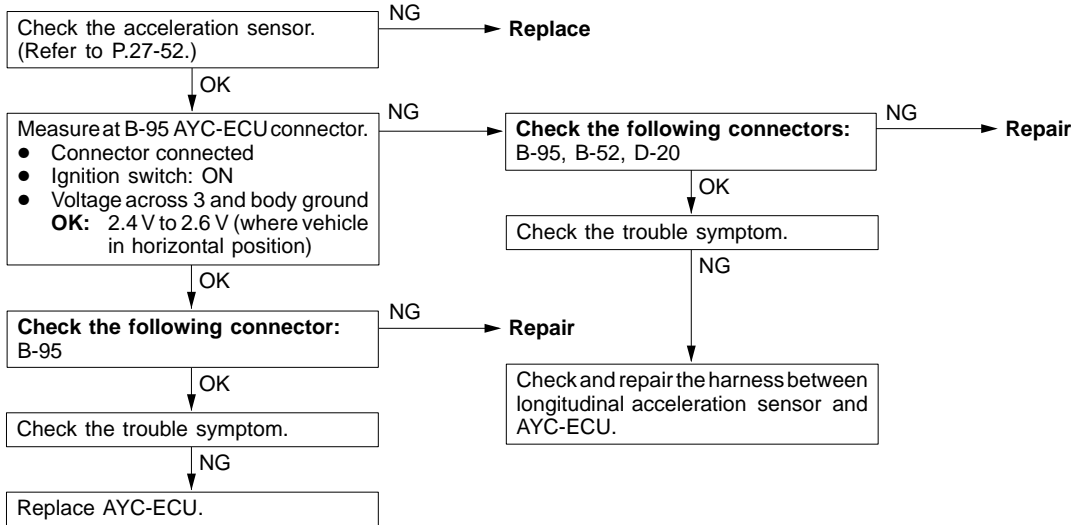
Code No. 41: TPS system	Probable cause
This code is output when the input from the throttle position sensor falls short of 0.2 V.	<ul style="list-style-type: none"> <li>● Defective TPS</li> <li>● Defective harness or connector</li> <li>● Defective AYC-ECU</li> </ul>



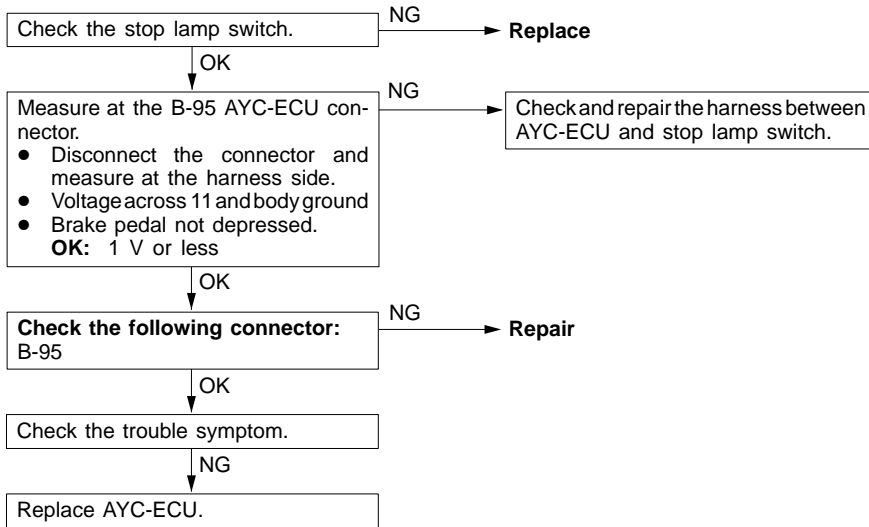
Code No. 51: Longitudinal acceleration sensor system	Probable cause
<b>Code No. 56: Lateral acceleration sensor system</b>  This code is output when the output from the acceleration sensor becomes 0.5 V or less or 4.5 V or more.	<ul style="list-style-type: none"> <li>● Defective longitudinal acceleration sensor</li> <li>● Defective lateral acceleration sensor</li> <li>● Defective harness or connector</li> <li>● Defective AYC-ECU</li> </ul>



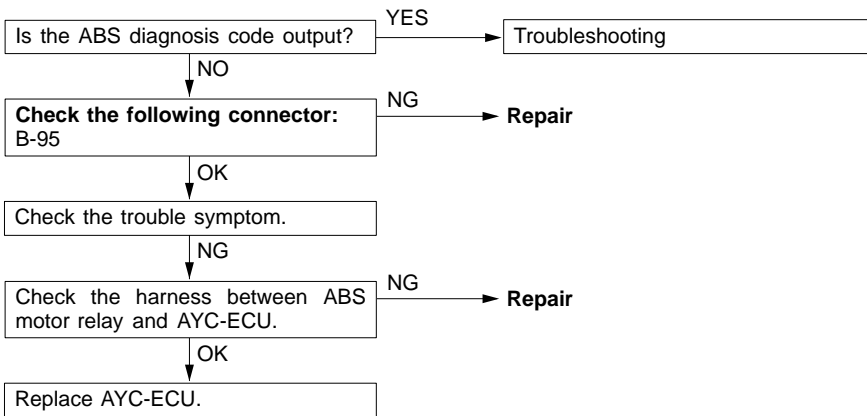
Code No. 52: Longitudinal acceleration sensor system	Probable cause
This code is output when the longitudinal acceleration exceeds a predetermined value while the vehicle is running with both ABS and brakes being inactive.	<ul style="list-style-type: none"> <li>● Defective longitudinal acceleration sensor</li> <li>● Defective harness or connector</li> <li>● Defective AYC-ECU</li> </ul>



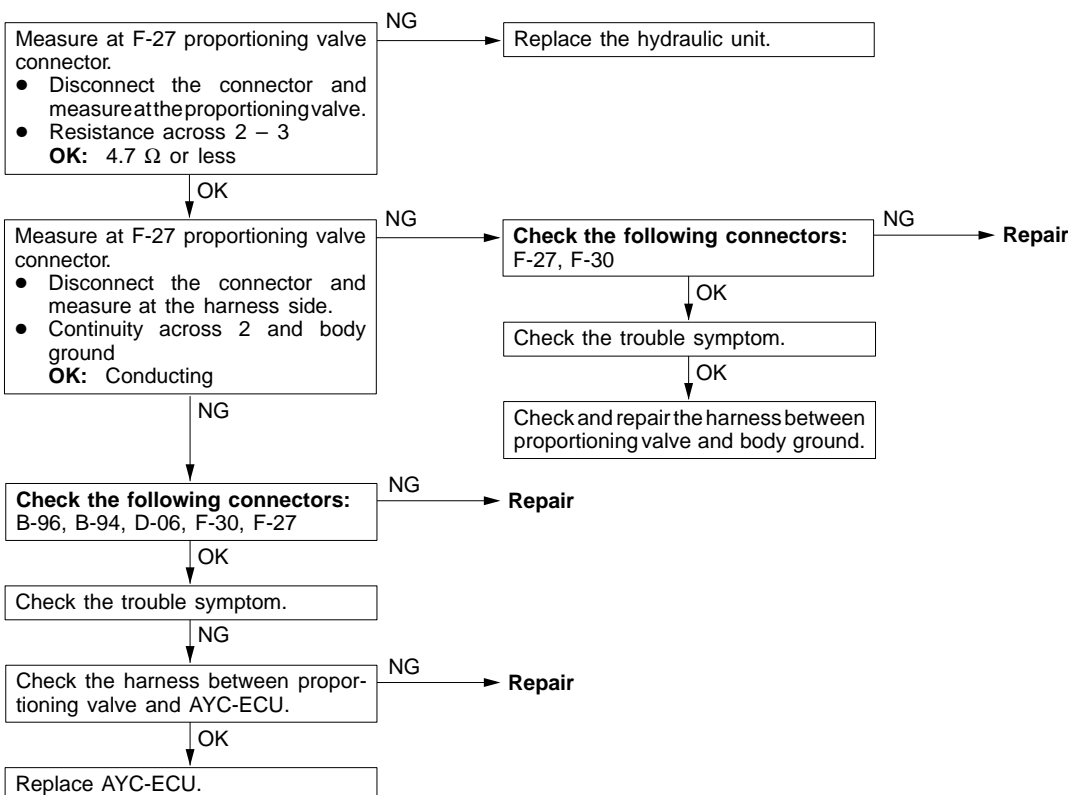
Code No. 61: Stop lamp switch system	Probable cause
This code is output under either of the following conditions: <ul style="list-style-type: none"> <li>● Stop lamp switch remains ON for 15 min. or more.</li> <li>● There is an open-circuit in the harness between AYC-ECU and stop lamp switch.</li> </ul>	<ul style="list-style-type: none"> <li>● Defective stop lamp switch</li> <li>● Defective harness or connector</li> <li>● Defective AYC-ECU</li> </ul>



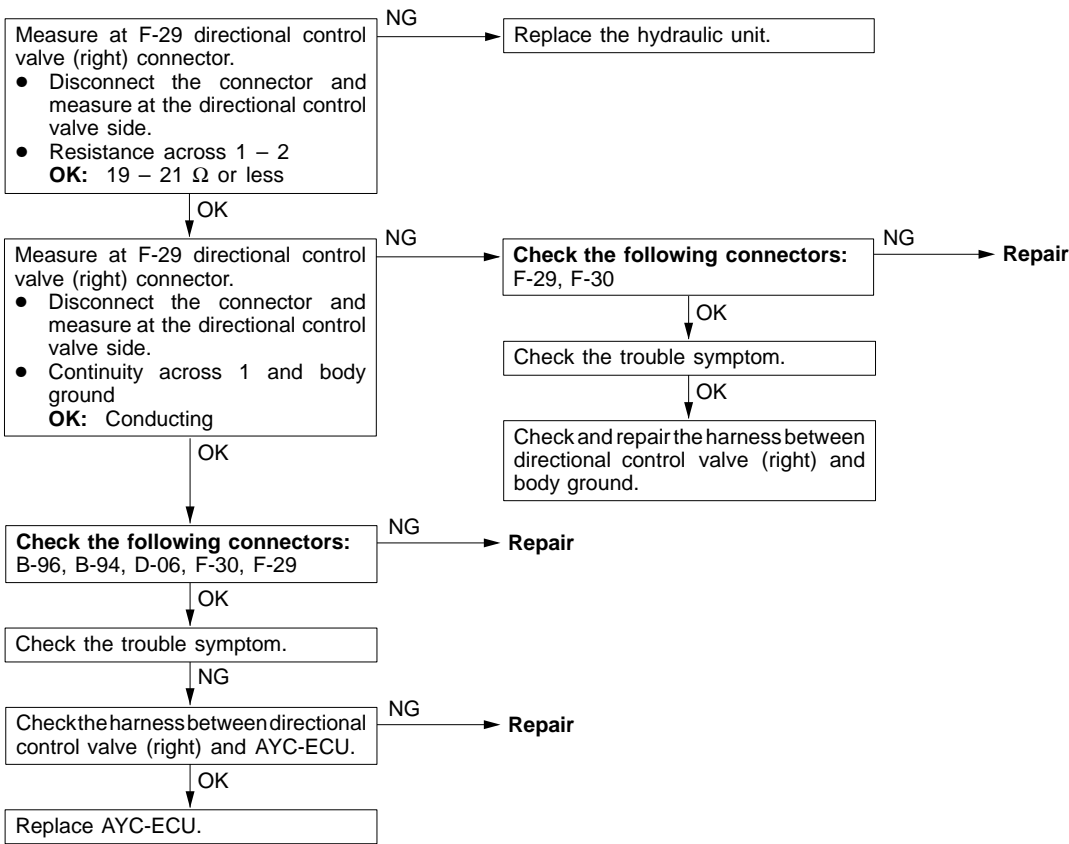
Code No. 65: ABS monitor system	Probable cause
This code is output when ABS is considered to remain activated (motor relay remains ON) for a continuous 1-min.-or-more period. It is output also when there is an open-circuit in the harness between ABS motor relay and AYC-ECU.	<ul style="list-style-type: none"> <li>● Defective harness or connector</li> <li>● Defective AYC-ECU</li> </ul>



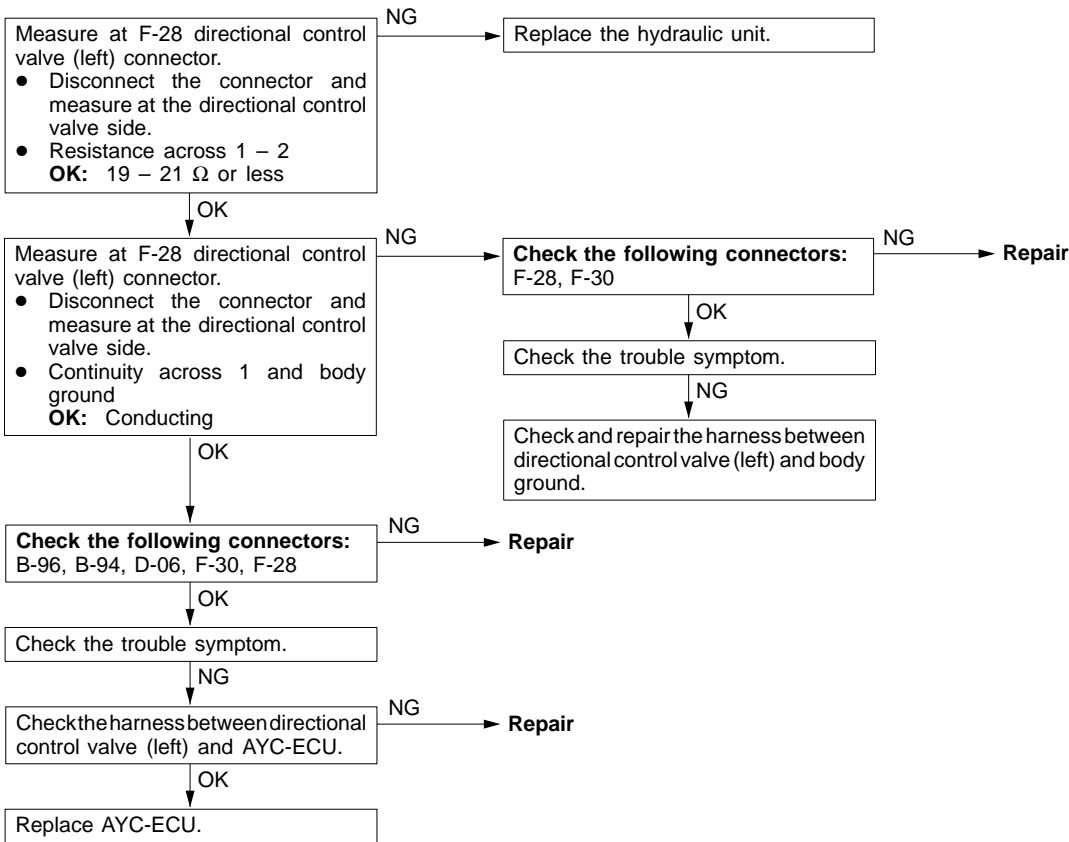
Code No. 71: Proportioning valve system	Probable cause
This code is output when the proportioning valve control circuit is open- or short-circuited.	<ul style="list-style-type: none"> <li>● Defective proportioning valve</li> <li>● Defective harness or connector</li> <li>● Defective AYC-ECU</li> </ul>



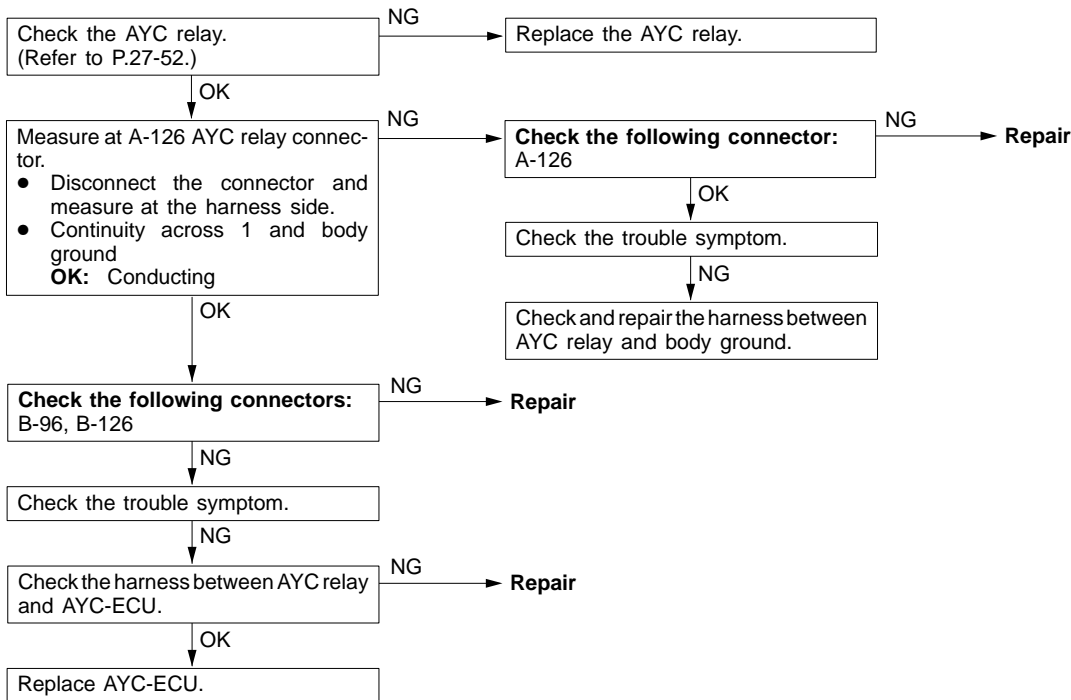
Code No. 72: Directional control valve (right) system	Probable cause
This code is output when the directional control valve (right) control circuit is open- or short-circuited.	<ul style="list-style-type: none"> <li>● Defective directional control valve (right)</li> <li>● Defective harness or connector</li> <li>● Defective AYC-ECU</li> </ul>



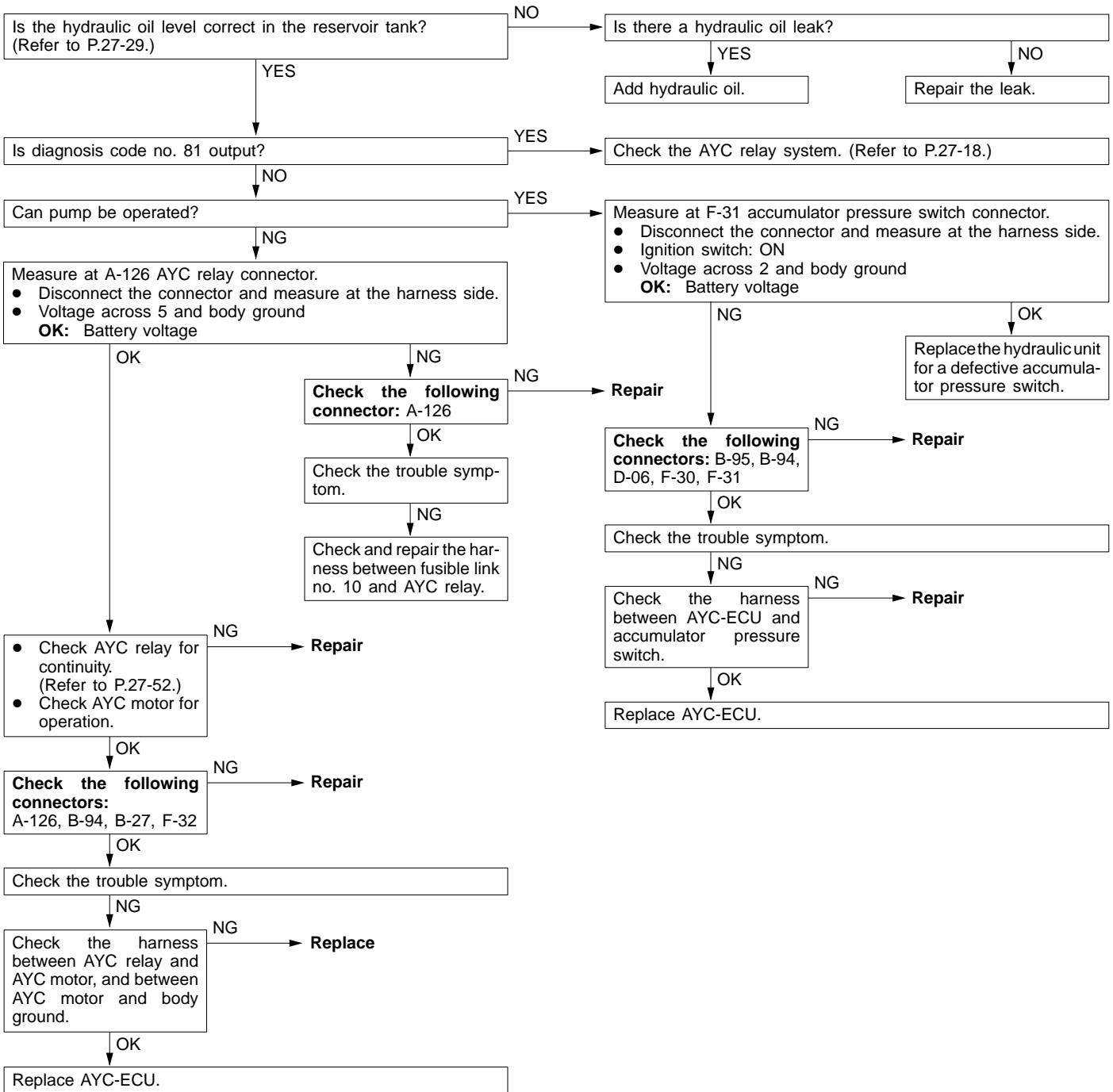
Code No. 73: Directional control valve (left) system	Probable cause
This code is output when the directional control valve (left) control circuit is open- or short-circuited.	<ul style="list-style-type: none"> <li>● Defective directional control valve (left)</li> <li>● Defective harness or connector</li> <li>● Defective AYC-ECU</li> </ul>



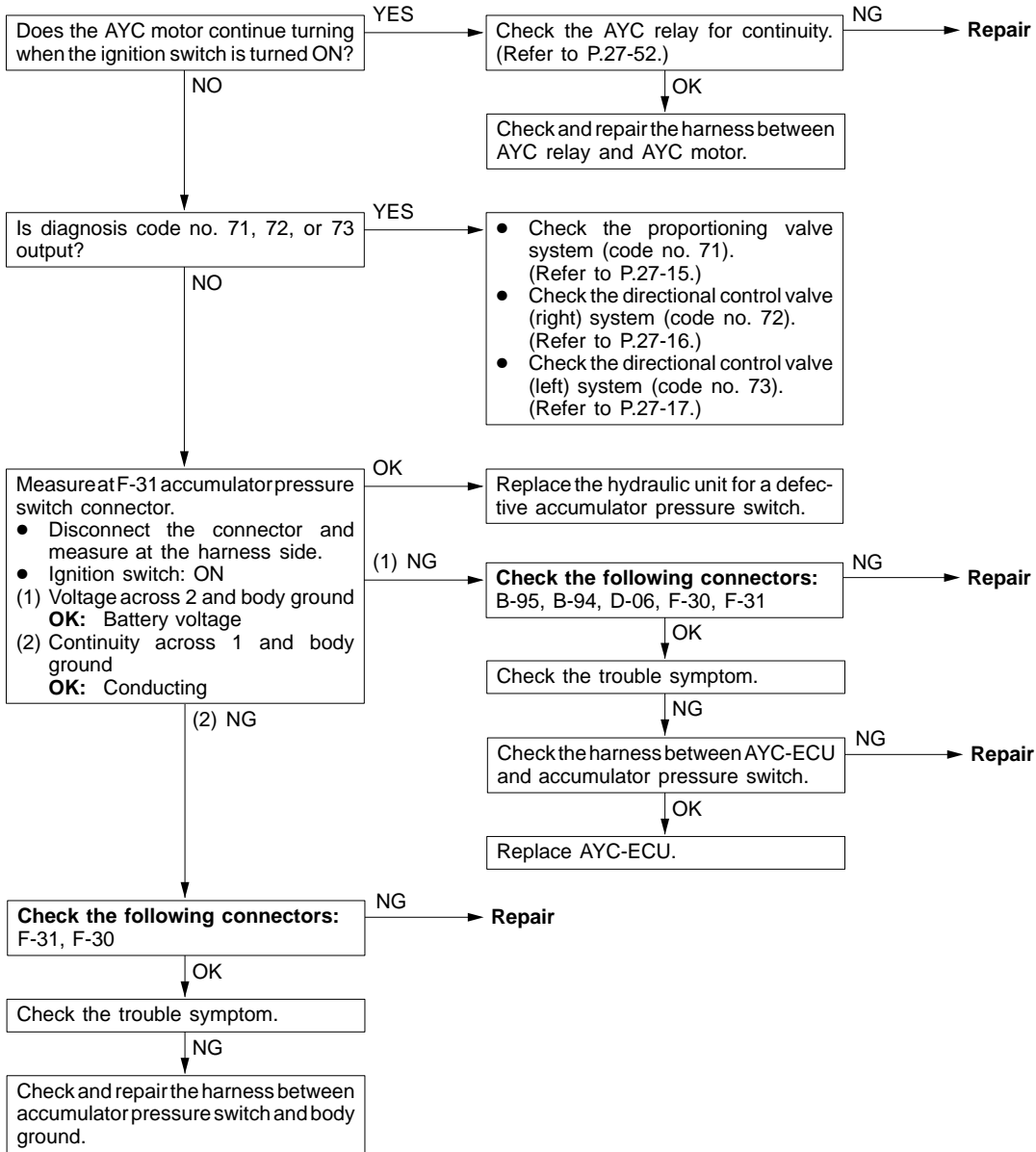
Code No. 81: AYC relay system	Probable cause
This code is output when the coil circuit of the AYC relay is open- or short-circuited.	<ul style="list-style-type: none"> <li>● Defective AYC relay</li> <li>● Defective harness or connector</li> <li>● Defective AYC-ECU</li> </ul>



Code No. 82: Electric pump system	Probable cause
<p>This code is output if the pressure switch is not set to high-pressure position despite the AYC-ECU's command to drive the AYC relay for a given period of time.</p>	<ul style="list-style-type: none"> <li>● Low hydraulic oil level</li> <li>● Oil leak</li> <li>● Defective fusible link</li> <li>● Defective AYC relay</li> <li>● Defective harness or connector</li> <li>● Defective AYC motor</li> <li>● Defective accumulator pressure switch</li> <li>● Defective AYC-ECU</li> </ul>



Code No. 83: Electric pump system	Probable cause
This code is output if the pressure switch is not set to low-pressure position despite the AYC-ECU's command to change the driving force.	<ul style="list-style-type: none"> <li>• Defective accumulator pressure switch</li> <li>• Defective harness or connector</li> </ul>





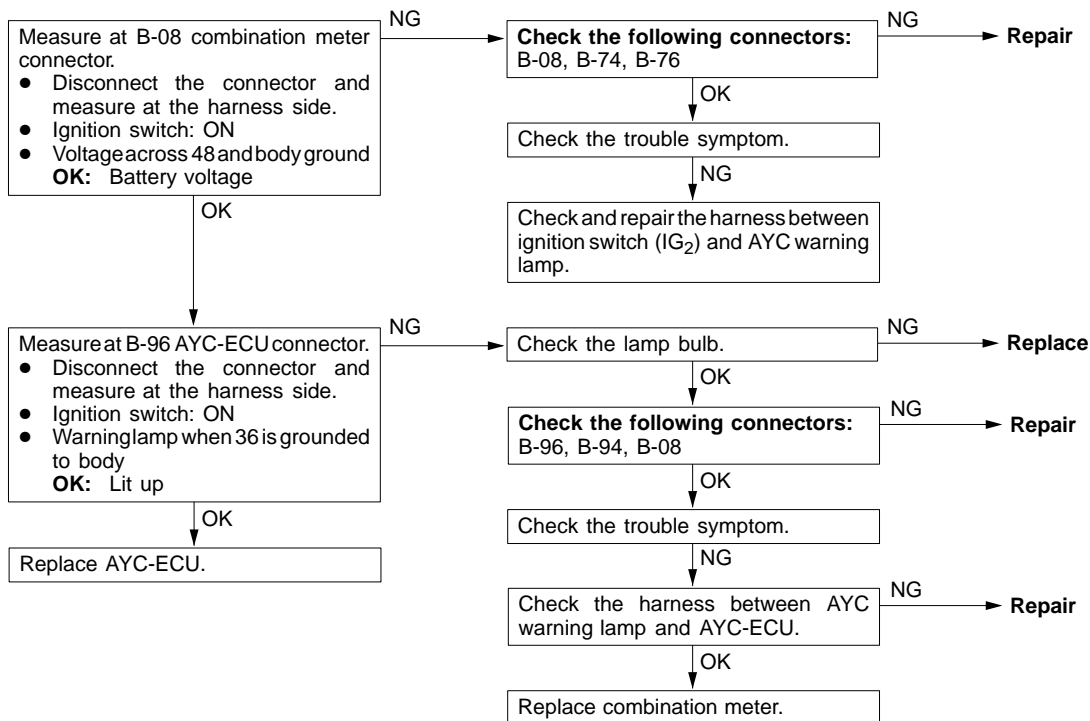
### 5. INSPECTION CHART FOR TROUBLE SYMPTOMS

Trouble symptom	Inspection procedure No.	Ref. page
AYC warning lamp does not light up when the ignition key is turned to “ON” (engine stationary).	1	27-21
AYC warning lamp remains lit up after the engine has started.	2	27-22
AYC is inoperative. Unable to start or accelerate on slippery road surfaces.	3	27-22
Rear tires are noisy during low-speed cornering. Vehicle skews.	4	27-23

### 6. INSPECTION PROCEDURE FOR TROUBLE SYMPTOMS

#### INSPECTION PROCEDURE 1

AYC warning lamp does not light up when the ignition key is turned to “ON” (engine stationary).	Probable cause
The lamp power supply circuit is probably open-circuited, lamp bulb is out, or the circuit between AYC warning lamp and AYC-ECU or AYC-ECU itself is defective.	<ul style="list-style-type: none"> <li>• Blown fuse</li> <li>• AYC warning lamp out</li> <li>• Defective harness or connector</li> <li>• Defective AYC-ECU</li> </ul>

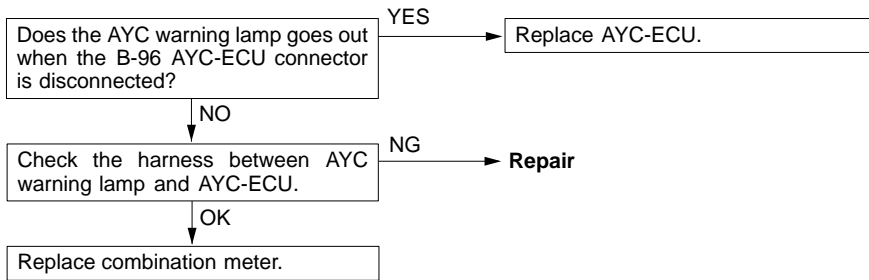


**INSPECTION PROCEDURE 2**

AYC warning lamp remains lit up after the engine has started.	Probable cause
The AYC warning lamp ON circuit is probably short-circuited.	<ul style="list-style-type: none"> <li>● Defective combination meter</li> <li>● Defective harness (short-circuit)</li> <li>● Defective AYC-ECU</li> </ul>

**NOTE**

This symptom is limited only when AYC-ECU power supply is in normal condition and the diagnosis code is correct.

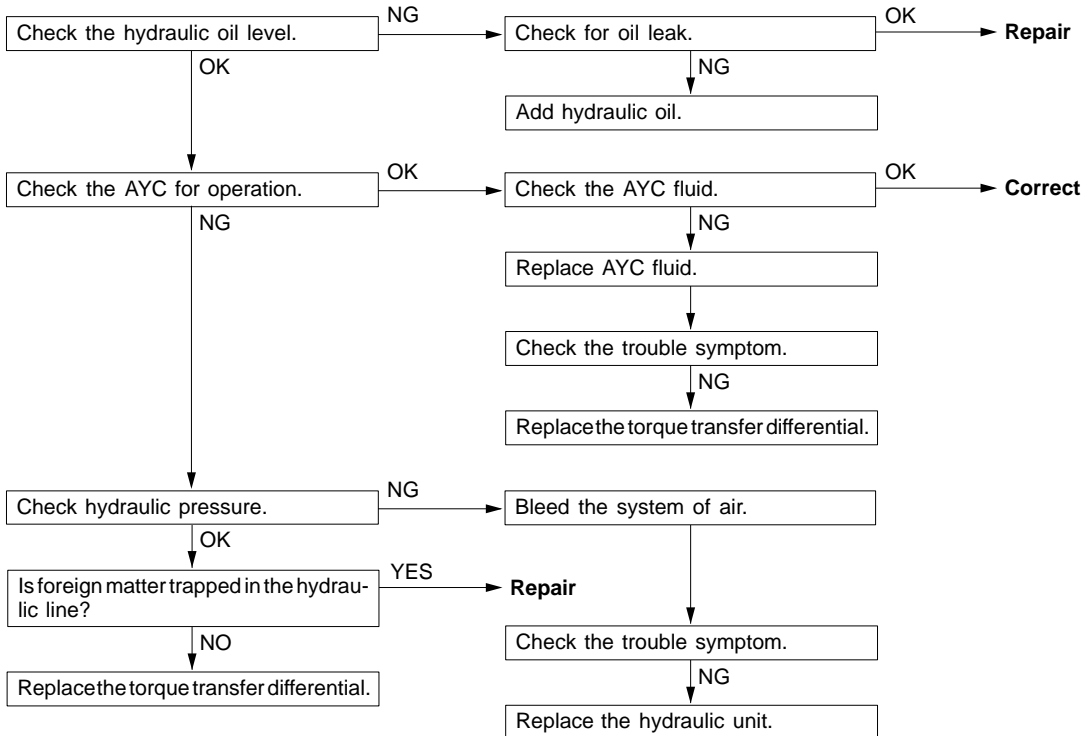


**INSPECTION PROCEDURE 3**

AYC is inoperative. Unable to start or accelerate on slippery road surfaces.	Probable cause
The hydraulic oil level is probably low, there is an oil leak, the hydraulic unit is defective, or the torque transfer differential is defective.	<ul style="list-style-type: none"> <li>● Low hydraulic oil level</li> <li>● Oil leak</li> <li>● Defective hydraulic unit</li> <li>● Defective torque transfer differential</li> </ul>

**NOTE**

This symptom is limited only when the diagnosis code is correct.

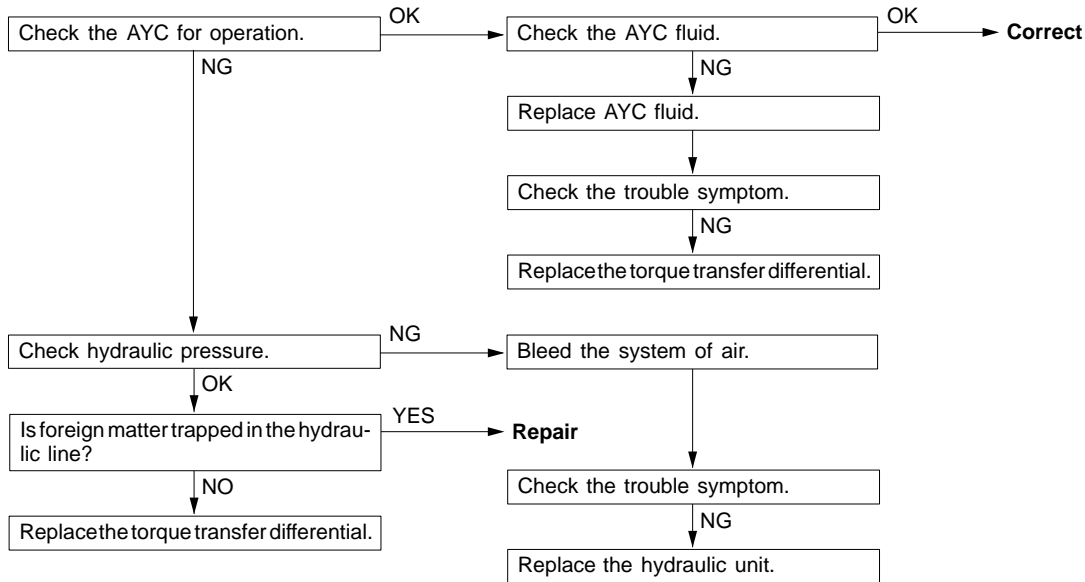


**INSPECTION PROCEDURE 4**

Rear tires are noisy during low-speed cornering.	Probable cause
The hydraulic unit or torque transfer differential is probably defective.	<ul style="list-style-type: none"> <li>• Defective hydraulic unit</li> <li>• Defective torque transfer differential</li> </ul>

**NOTE**

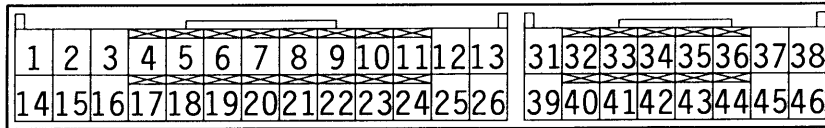
This symptom is limited only when the diagnosis code is correct.



## 7. CHECK AT AYC-ECU TERMINALS

### 7-1 TERMINAL VOLTAGE LISTING

- (1) The voltage is to be measured across each terminal and ground terminal.  
 (2) Fig. below shows the arrangement of the terminals.



1110060

Terminal No.	Check item	Check requirement	Normally	
1	Lateral acceleration sensor	Ignition switch: ON	2.4 – 2.6 V (horizontal position)	
2	Longitudinal acceleration sensor ground Lateral acceleration sensor ground	At all times	0 V	
3	Longitudinal acceleration sensor	Ignition switch: ON	2.4 – 2.6 V (horizontal position)	
4	Steer sensor (ST-2)	Engine: Idle speed Turn steering wheel slowly.	0 V ↔ approx. 3 V flashing	
5	Steer sensor (ST-1)	Engine: Idle speed Turn steering wheel slowly.	0 V ↔ approx. 3 V flashing	
6*1	FR wheel speed	Vehicle stationary	1 V or less	
		Forward vehicle slowly.	0 – 5 V	
7*1	FL wheel speed	Vehicle stationary	1 V or less	
		Forward vehicle slowly.	0 – 5 V	
8*1	RR wheel speed	Vehicle stationary	1 V or less	
		Forward vehicle slowly.	0 – 5 V	
9*1	FL wheel speed	Vehicle stationary	1 V or less	
		Forward vehicle slowly.	0 – 5 V	
10	Diagnosis selection input		Battery voltage	
11	Stop lamp switch	Ignition switch: ON	Stop lamp switch: ON	Battery voltage
			Stop lamp switch: OFF	1 V or less
12*1	ABS monitor	When ABS monitor is activated	Battery voltage	
		When ABS monitor is deactivated	1 V or less	
17	Steer sensor (ST-N)	Engine: Idle speed	Steering wheel: Neutral position	0.5 V or less
			Steering wheel: Turned 90° from neutral position	2.5 – 3.5 V

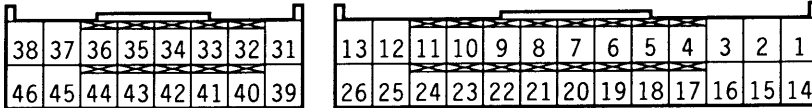
Terminal No.	Check item	Check requirement	Normally	
18	TPS	Ignition switch: ON	Accelerator pedal: Fully closed	0.3 – 1.0 V
			Accelerator pedal: Fully open	4.5 – 5.0 V
23	Diagnosis data input/output		1 V or less	
24	Idle position switch	Ignition switch: ON	Accelerator pedal: Fully closed	2 V or less
			Accelerator pedal: Fully open	4.5 – 5.0 V
25	Accumulator pressure switch	Ignition switch: ON	Accumulator internal pressure: Low	2 V or less
			Accumulator internal pressure: High	Battery voltage
26	ECU ground	At all times	0 V	
31	AYC-ECU power supply	Ignition switch: ON	Battery voltage	
		Ignition switch: OFF	0 V	
35	AYC motor relay	Ignition switch: ON	When motor is energized	Battery voltage
			When motor is deenergized	2 V or less
36	AYC warning lamp	Ignition switch: ON	When lamp is OFF	Battery voltage
			When lamp is ON	2 V or less
37	Directional control valve (right)	Ignition switch: ON	Right clutch: ON	Battery voltage
			Right clutch: OFF	0 V
38	Proportioning valve	Ignition switch: ON	AYC-ON	0 V to battery voltage
			AYC-OFF	0 V
39	ECU backup power supply	At all times	Battery voltage	
45	Directional control valve (left)	Ignition switch: ON	Left clutch: ON	Battery voltage
			Left clutch: OFF	0 V
46	ECU ground	At all times	0 V	

NOTE

\*1: Indicates the vehicles with ABS.

### 7-2 LISTING OF RESISTANCE AND CONTINUITY ACROSS CONNECTOR TERMINALS ON HARNESS SIDE

- (1) Measure the resistance and check for continuity with the ignition switch in the “OFF” position and AYC-ECU connector disconnected.
- (2) Measure the resistance and check for continuity across terminals listed below.
- (3) Fig. below shows the arrangement of terminals.



1110061

Terminal No.	Signal name	Normally
2 – body ground	Longitudinal acceleration sensor ground, lateral acceleration sensor ground	Conducting
26 – body ground	ECU ground	Conducting
35 – body ground	AYC motor relay	Conducting
37 – body ground	Directional control valve (right)	15.4 – 16.4 Ω
38 – body ground	Proportioning valve	3.4 – 4.0 Ω
45 – body ground	Directional control valve (left)	15.4 – 16.4 Ω
46 – body ground	ECU ground	Conducting
6 – 19*2	Speed sensor (front, RH)	1.4 – 1.8 Ω
7 – 20*2	Speed sensor (front, LH)	1.4 – 1.8 Ω
8 – 21*2	Speed sensor (rear, RH)	1.4 – 1.8 Ω
9 – 22*2	Speed sensor (rear, LH)	1.4 – 1.8 Ω

#### NOTE

\*2: Indicates the vehicles without ABS.

## ON-VEHICLE SERVICE <VEHICLES WITH AYC>

### 1. REAR AXLE TOTAL BACKLASH CHECK

If the drive system roars or the vehicle vibrates, use the following procedure to measure total backlash in the rear axle. Based on the measurement taken, determine whether the differential carrier assembly needs to be removed or not.

- (1) Place the shift lever in the neutral position and operate the parking brake.
- (2) Turn the propeller shaft fully clockwise and make an alignment mark on the companion flange dust cover and gear carrier.
- (3) Turn the propeller shaft fully counterclockwise and measure the deviation between the alignment marks.

**Limit: 5 mm**

- (4) If the backlash exceeds the limit, replace the differential carrier assembly.

### 2. GEAR OIL LEVEL CHECK

#### 2-1 DIFFERENTIAL

- (1) Remove the filler plug.
- (2) Check that the gear oil level is within the specified range from the bottom end of the filler plug hole.

**Standard value (A): 6 mm**

- (3) If the gear oil level exceeds the standard value, add the specified gear oil up to the bottom end of the filler plug hole.

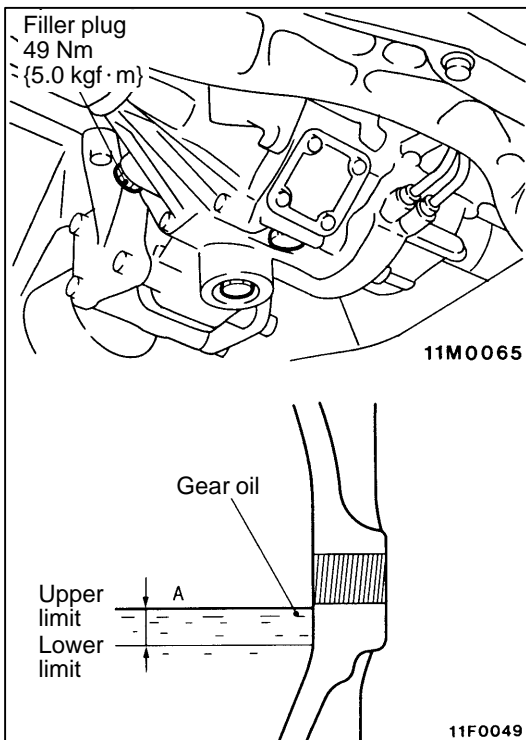
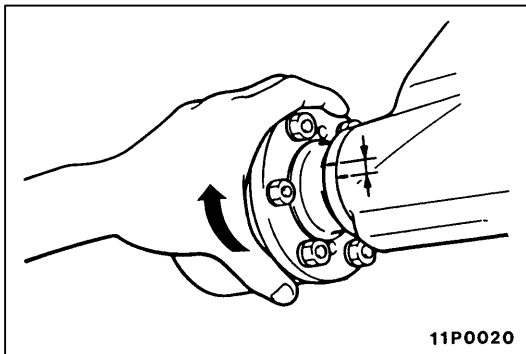
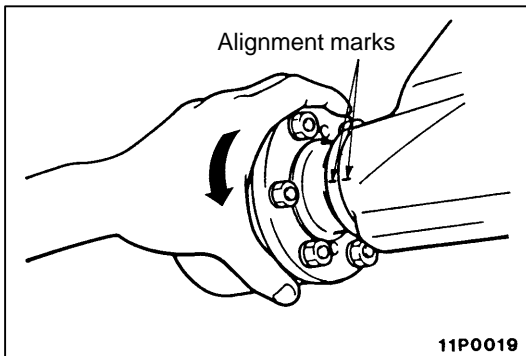
**Specified gear oil:**

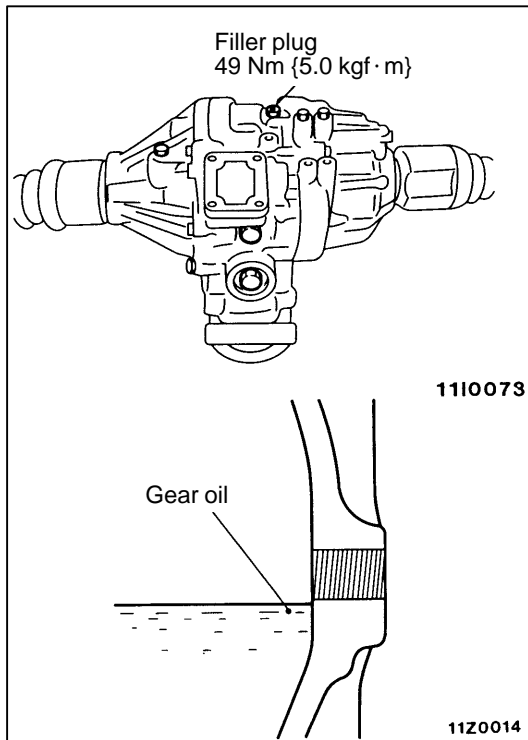
**MITSUBISHI GENUINE DIA QUEEN SUPER  
HYPOID GEAR OIL (GL-5)**

**NOTE**

10°C or more: #90, less than 10°C: #80

- (4) Fit the filler plug and tighten it to the specified torque.





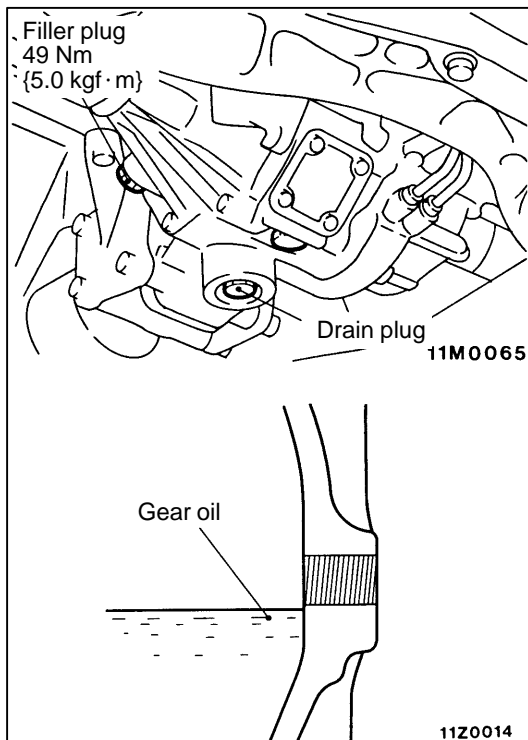
## 2-2 TORQUE TRANSFER MECHANISM

- (1) Remove the filler plug.
- (2) Check that the gear oil level is up to the bottom end of the filler plug hole.
- (3) If the gear oil level is lower than the bottom end of the filler plug hole, add the specified gear oil up to the bottom end of the filler plug hole.

**Specified gear oil:**

**MITSUBISHI GENUINE DIA QUEEN SUPER AYC FLUID**

- (4) Fit the filler plug and tighten it to the specified torque.



## 3. GEAR OIL CHANGE

### 3-1 DIFFERENTIAL

- (1) Remove the drain plug to discharge the gear oil.
- (2) Fit the drain plug and tighten it to the specified torque.

**Tightening torque: 49 Nm {5.0 kgf·m}**

- (3) Remove the filler plug and add the specified gear oil up to the bottom end of the filler plug hole.

**Specified gear oil:**

**MITSUBISHI GENUINE DIA QUEEN SUPER HYPOID GEAR OIL (GL-5)**

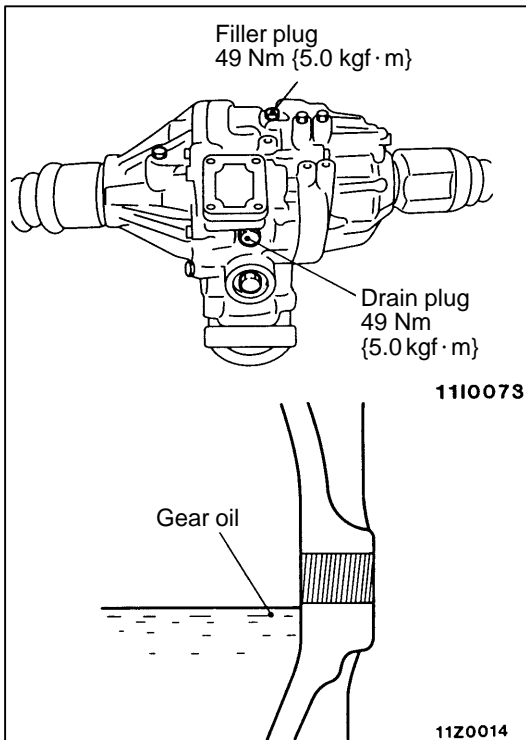
**Quantity used:  $0.41 \pm 0.02 \text{ dm}^3$  { $0.41 \pm 0.02 \text{ ℓ}$ }**

**NOTE**

10°C or more: #90, less than 10°C: #80

- (4) Fit the filler plug and tighten it to the specified torque.





**3-2 TORQUE TRANSFER MECHANISM**

- (1) Remove the drain plug to discharge the gear oil.
- (2) Fit the drain plug and tighten it to the specified torque.
- (3) Remove the filler plug and add the specified gear oil up to the bottom end of the filler plug hole.

**Specified gear oil:**

**MITSUBISHI GENUINE DIA QUEEN SUPER AYC FLUID**

**Quantity used:  $0.70^{+0}_{-0.05}$  dm<sup>3</sup> { $0.70^{+0}_{-0.05}$  ℓ}**

- (4) Fit the filler plug and tighten it to the specified torque.

**4. FLUID LEVEL CHECK**

- (1) Remove the maintenance lid located in the luggage compartment.
- (2) If the vehicle has been run, leave it for 5 min. or more in an ordinary temperature (10°C to 30°C) to allow the accumulator internal pressure to drop.

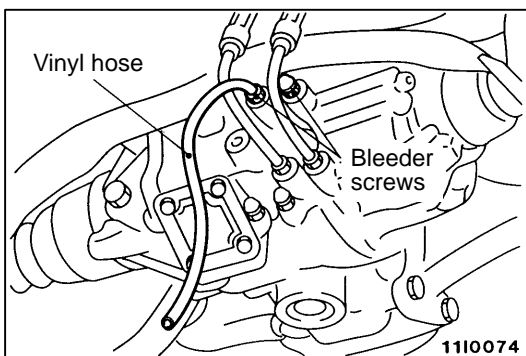
**NOTE**

If the ambient temperature is less than 10°C or less, allow more time to leave the vehicle to stand idle.

- (3) Check that the fluid level in the oil reservoir is in the range between MAX and MIN.
- (4) If the fluid level is lower than MIN, add the specified fluid.

**Specified fluid: MITSUBISHI DIA QUEEN ATF-SPII**

- (5) Reinstall the maintenance lid.



**5. BLEEDING**

- (1) Lift up the vehicle.
- (2) Remove the cap of the left bleeder screw on the torque transfer differential and connect a vinyl hose.
- (3) Gradually turn the steering wheel clockwise from the straight-ahead position. At this time, loosen the left bleeder screw and check that fluid is discharged with air.
- (4) After air has been completely discharged, tighten the bleeder screw.

**Caution**

**While the system is being bled of air, add fluid as necessary to ensure that it is left in the oil reservoir during the entire procedure.**

- (5) Repeat steps (3) and (4) two to three times until no air bubbles are recognized in the fluid that comes out. Then, tighten the bleeder screw to the specified torque.

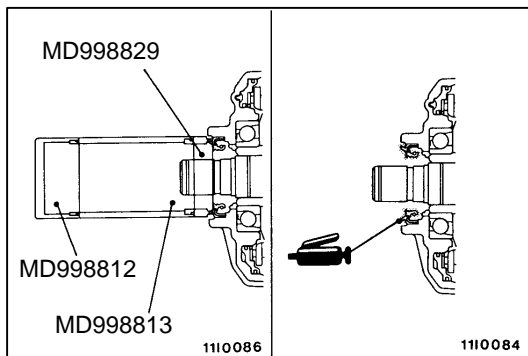
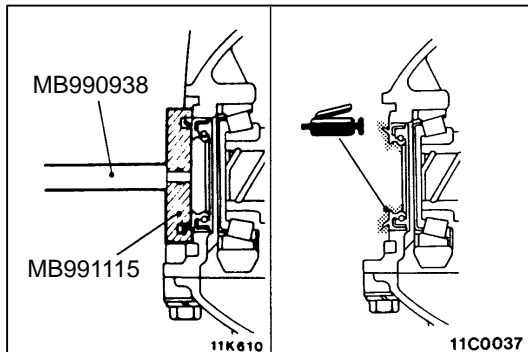
**Tightening torque: 9 Nm {0.9 kgf·m}**

- (6) Perform steps (2) through (5) for the right bleeder screw. Note, however, that the steering wheel should be turned counterclockwise.

- (7) After the system has been completely bled of air, check for the fluid level.

**Caution**

If the system is not completely bled of air, the hydraulic unit could generate noise, degrading pump durability.



## 6. DIFFERENTIAL CARRIER OIL SEAL REPLACEMENT

### 6-1 DIFFERENTIAL

- (1) Remove the drive shaft. (Refer to p. 27-36.)
- (2) Remove the oil seal from the differential carrier.
- (3) Using the special tool, drive a new oil seal all the way into position.
- (4) Coat the oil seal lips and the drive shaft surface in contact with the oil seal with multi-purpose grease.
- (5) Replace the drive shaft circlip with a new one and mount the drive shaft to the differential carrier. (Refer to P.27-36.)
- (6) Check for correct wheel alignment. (Refer to GROUP 34 – On-vehicle Service.)

### 6-2 TORQUE TRANSFER MECHANISM

- (1) Remove the drive shaft. (Refer to p. 27-36.)
- (2) Remove the oil seal from the differential carrier.
- (3) Using the special tool, drive a new oil seal all the way into position.
- (4) Coat the oil seal lips and the drive shaft surface in contact with the oil seal with the specified grease.

**Specified grease: Vaseline**

- (5) Replace the drive shaft circlip with a new one and mount the drive shaft to the differential carrier. (Refer to P.27-36.)
- (6) Check for correct wheel alignment. (Refer to GROUP 34 – On-vehicle Service.)

**7. SPEED SENSOR OUTPUT VOLTAGE MEASUREMENT <VEHICLES WITHOUT ABS>**

- (1) Lift up the vehicle and release the parking brake.
- (2) Disconnect the AYC-ECU harness connector and take measurements on the harness side connector.

**Caution**

Insert the probe from the harness side with the double lock of the connector unlocked. Inserting it to the terminal side could result in poor contact.

- (3) Turn the wheel to be tested at about 1/2 to one revolution/sec. and check for the output voltage using a circuit tester (AC mV range) or oscilloscope.

**Terminal nos.**

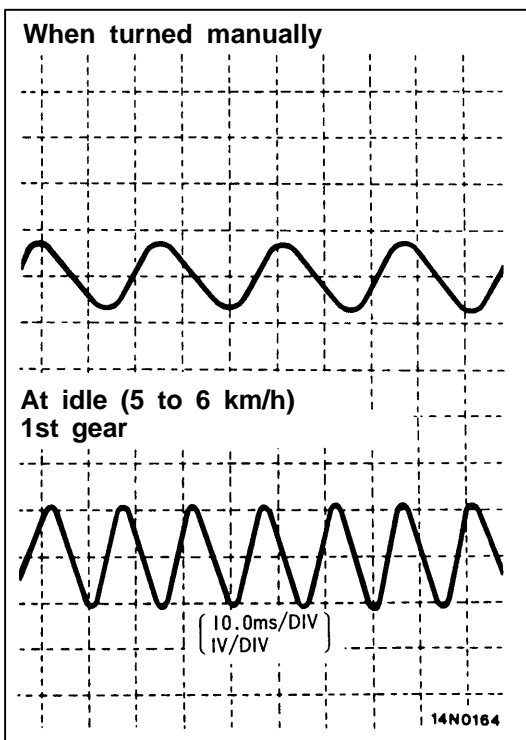
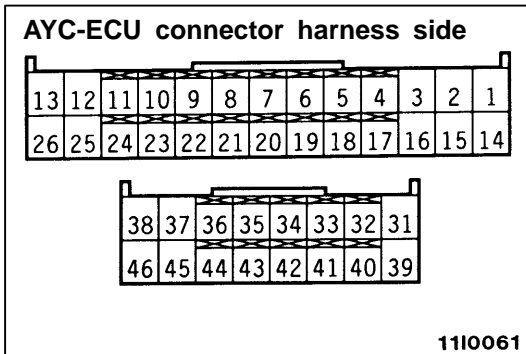
Front LH	Front RH	Rear LH	Rear RH
7	6	9	8
20	19	22	21

**Output voltage:**

**When circuit tester is used: 70 mV or more**

**When oscilloscope is used: 200 mVp-p or more**

- (4) If the output voltage is lower than the above value, it is probably attributable to the following faults. Check or replace the speed sensor as necessary.
  - Excessive clearance between the pole piece and rotor of the speed sensor
  - Defective speed sensor



**Waveform Check Using Oscilloscope**

Check the harness and connector of the speed sensor for connection. Then, use an oscilloscope to check for output voltage waveform of each speed sensor as follows. Start the engine and monitor the sensor by turning the wheel; for a driving wheel, let it turn by shifting into the 1st gear and for a driven wheel turn it manually at a constant speed.

**NOTE**

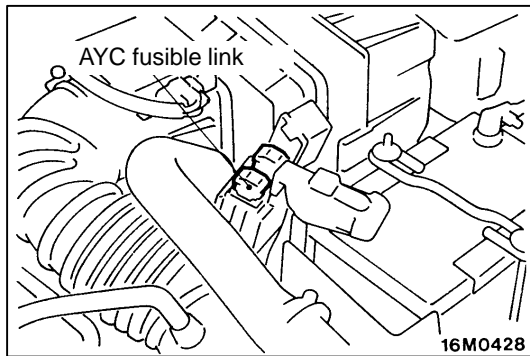
- (1) Waveform may be observed by actually running the vehicle.
- (2) The output voltage is low when the wheel speed remains low and builds up as the wheel speed increases.

**Waveform Observation Points**

Symptom	Probable cause	Action
Waveform amplitude is too small, or no waveform.	Defective speed sensor	Replace sensor.
Waveform amplitude varies greatly. (No problem if the smallest amplitude is 100 mV or more)	Excessive axle hub lateral and radial runout	Replace hub.
	Poor AYC-ECU grounding	Repair.
Noise on waveform or disturbed waveform	Open-circuited sensor	Replace sensor.
	Open-circuited harness	Repair harness.
	Improperly mounted speed sensor	Correct sensor installation.
	Missing or collapsed rotor tooth	Replace rotor.

**Caution**

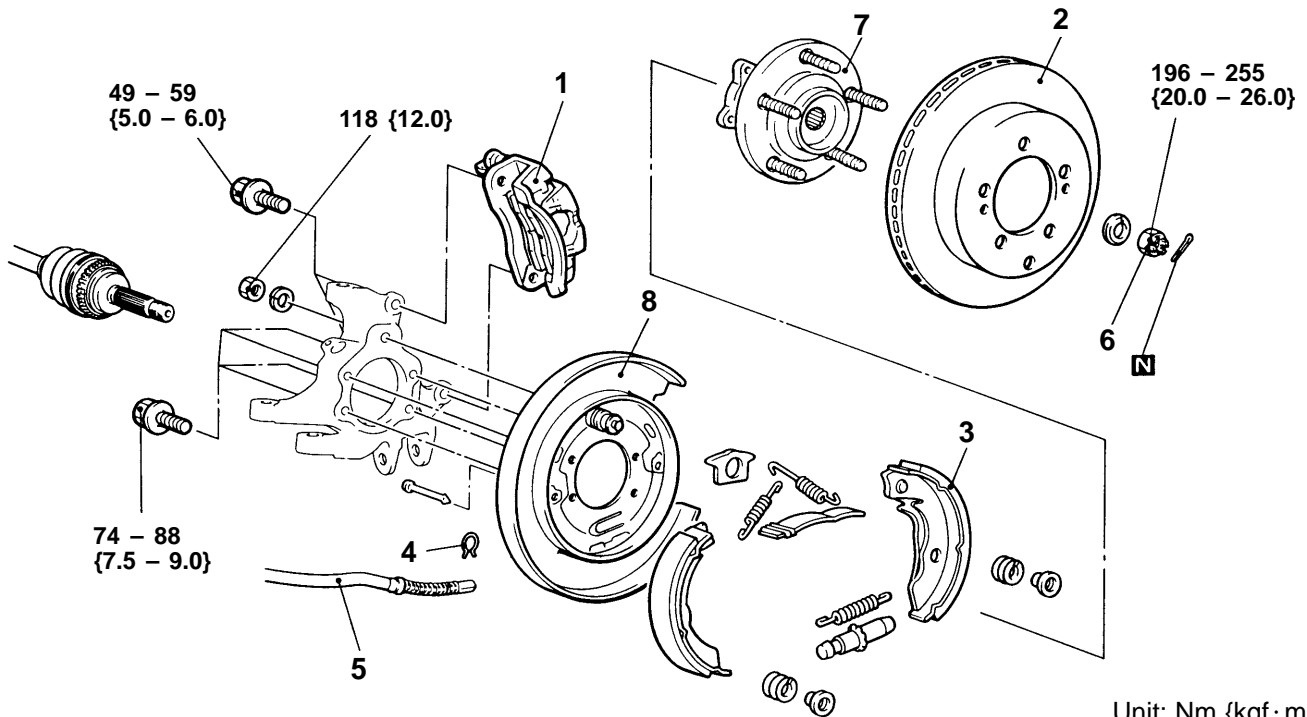
Since the speed sensor cable follows the movement of the front or rear suspension, it may be open-circuited only when the vehicle is run on rough roads and not on ordinary road. The speed sensor output voltage waveform should therefore be checked also by rocking the sensor harness so that driving on rough roads may be simulated.



**8. ACTION WHEN BATTERY RUNS OUT**

When the engine is started using a booster cable where the battery has completely run down and you attempt to start the vehicle without waiting for the battery to recover a certain charge, the engine can misfire and you just cannot start to move it. In such cases, charge the battery sufficiently; or, remove the AYC fusible link from the engine compartment relay box to make AYC inactive before attempting to start the vehicle. When the fusible link is removed, the AYC warning lamp lights up. After the battery has been recharged, fit the fusible link back again and start the engine to ensure that the AYC warning lamp is off.

**REAR HUB ASSEMBLY  
REMOVAL AND INSTALLATION**



14M0117

**Removal steps**



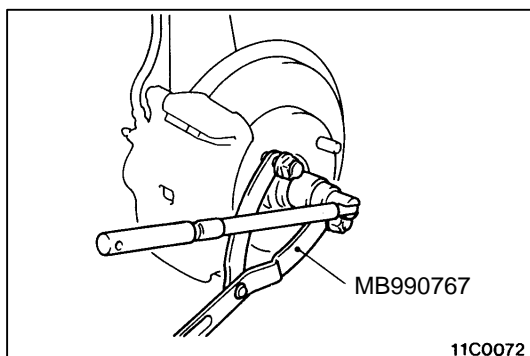
1. Caliper assembly
2. Brake disc
3. Shoe & lining assembly  
(Refer to GROUP 36 – Parking Brake.)
4. Clip
5. Parking brake cable connection



6. Drive shaft nut
7. Rear hub assembly
8. Backing plate

**Caution**

**Do not disassemble the rear hub assembly.**

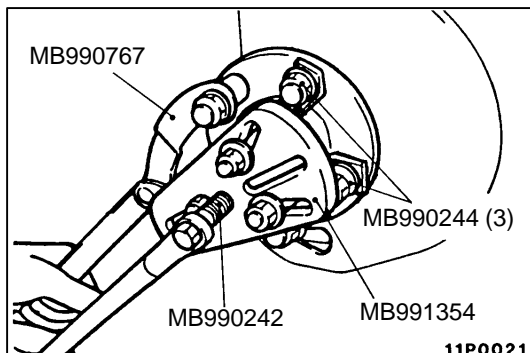


**REMOVAL SERVICE POINTS**

**◀A▶ CALIPER ASSEMBLY REMOVAL**

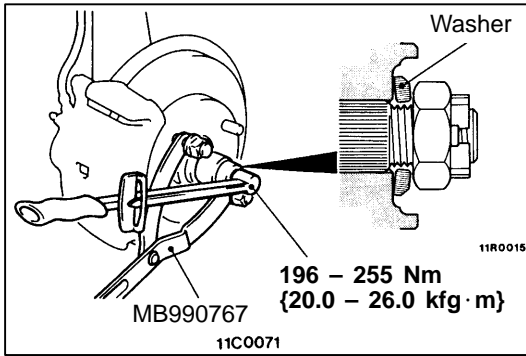
Secure the removed caliper assembly with a wire so that it will not fall.

**◀B▶ DRIVE SHAFT NUT REMOVAL**



**◀C▶ REAR HUB ASSEMBLY REMOVAL**

- (1) Using the special tool, remove the drive shaft from the rear hub assembly.
- (2) Remove the mounting bolts and remove the rear hub assembly from the knuckle.



**INSTALLATION SERVICE POINT**

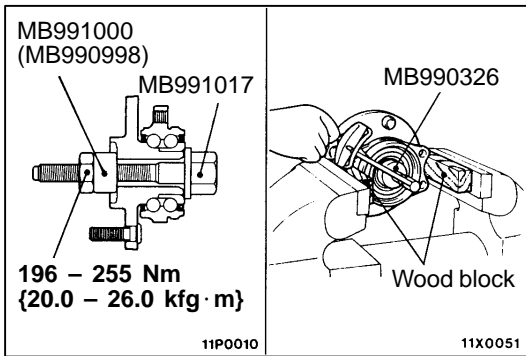
**▶A◀ DRIVE SHAFT NUT INSTALLATION**

- (1) Install the washer on the drive shaft in the direction shown on the left.
- (2) Using the special tool, tighten the drive shaft nut to the specified torque.

**Caution**

**Before torquing the drive shaft nut to specification, do not apply vehicle weight to the wheel bearing.**

- (3) If, at this time, the split pin holes are not aligned, tighten the nut further (within 255 Nm {26.0 kgf·m}), insert the split pin in the first matching holes, and bend it securely.



**INSPECTION**

**1. REAR WHEEL BEARING ROTATION STARTING TORQUE**

- (1) Install the special tool to the rear hub assembly and tighten it to the specified torque.
- (2) Using the special tool, measure the wheel bearing rotation starting torque.

**Limit: 1.0 Nm {10.5 kgf·cm}**

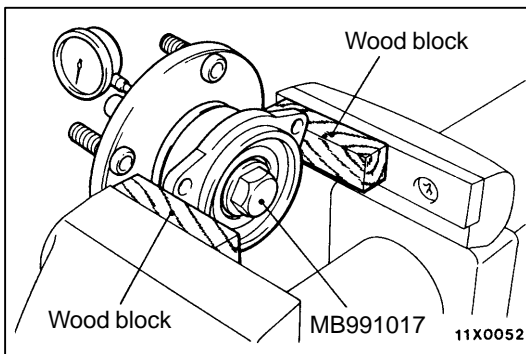
- (3) The wheel bearing starting torque should be within the limit and the hub should be free of binding or rough motion when turned.

**2. WHEEL BEARING AXIAL PLAY CHECK**

- (1) Check the wheel bearing for axial play.

**Limit: 0.05 mm**

- (2) If the specified torquing range (196 to 255 Nm {20.0 to 26.0 kgf·m}) does not bring the wheel bearing axial play into the limit, replace the rear hub assembly.



# KNUCKLE

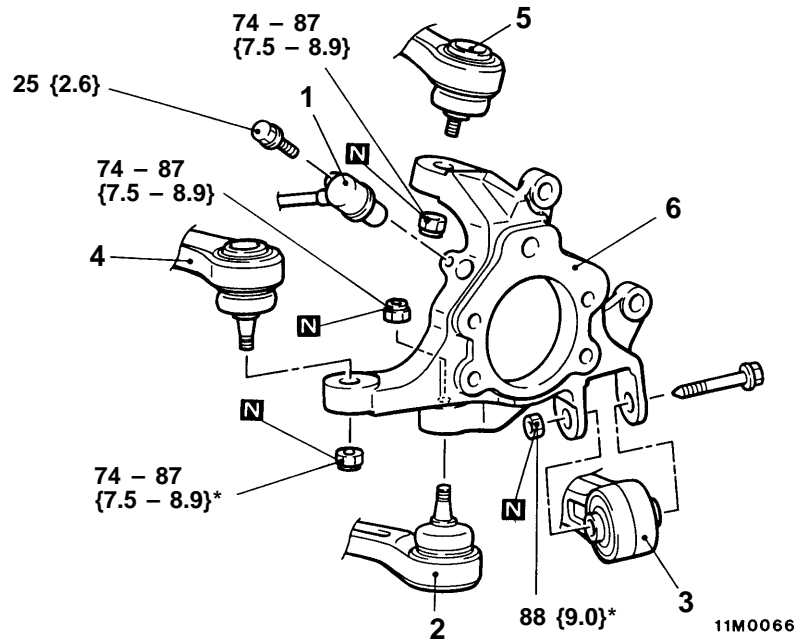
## REMOVAL AND INSTALLATION

### Pre-removal Operation

- Rear Hub Assembly and Backing Plate Removal (Refer to P.27-33.)

### Post-installation Operation

- (1) Check Each Ball Joint Dust Cover for Cracks or Damage by Pushing It with Finger.
- (2) Rear Hub Assembly and Backing Plate Installation (Refer to P.27-33.)



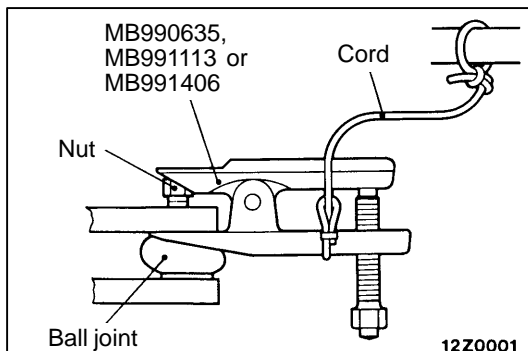
Unit: Nm {kgf·m}

### Removal steps

1. Rear speed sensor connection <Vehicles with AYC>
2. Trailing arm connection
3. Lower arm connection
4. Toe control arm connection
5. Upper arm connection
6. Knuckle

### Caution

\*: Indicates parts which should be temporarily tightened, and then fully tightened with the vehicle on the ground in the unladen condition.



### REMOVAL SERVICE POINT

◀A▶ TRAILING ARM / TOE CONTROL ARM / UPPER ARM DISCONNECTION

### Caution

- (1) Use the special tool to loosen the nut only; do not remove it from the ball joint.
- (2) Tie the special tool with a cord not to let it fall off.

# DRIVE SHAFT

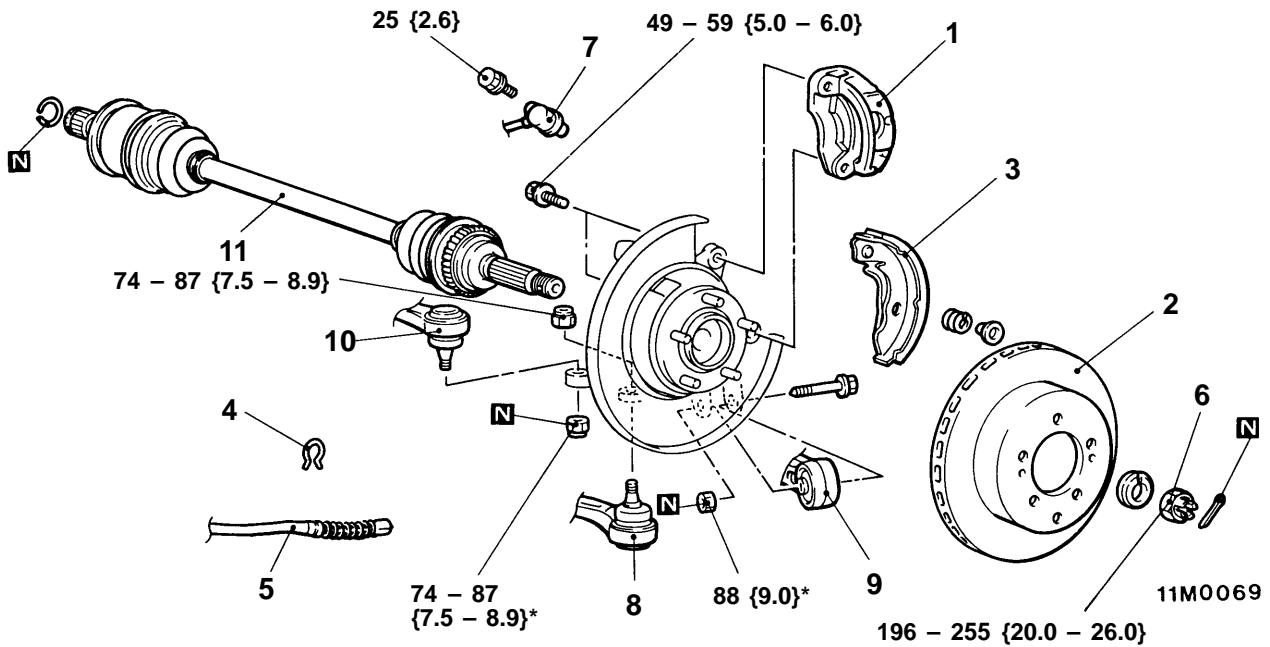
## REMOVAL AND INSTALLATION

**Pre-removal Operation**

- (1) Gear Oil Draining (Refer to P.27-28.)
- (2) Center Exhaust Pipe Removal (Refer to GROUP 15.)

**Post-installation Operation**

- (1) Checking Each Ball Joint Dust Cover for Cracks and Damages by Pressing Dust Cover with Finger
- (2) Center Exhaust Pipe Installation (Refer to GROUP 15.)
- (3) Gear Oil Filling (Refer to P.27-28.)
- (4) Parking Brake Lever Stroke Check and Adjustment (Refer to GROUP 36 – On-vehicle Service.)
- (5) Wheel Alignment Check and Adjustment (Refer to GROUP 34 – On-vehicle Service.)



Unit: Nm {kgf·m}

**Removal steps**

- 1. Caliper assembly (Refer to P.27-33.)
- 2. Brake disc
- 3. Shoe & lining assembly (Refer to GROUP 36 – Parking Brake.)
- 4. Clip
- 5. Parking brake cable connection
- 6. Drive shaft nut
- 7. Rear speed sensor coupling <vehicles with AYC>
- 8. Trailing arm coupling
- 9. Lower arm coupling
- 10. Toe control arm coupling
- 11. Drive shaft

◀A▶ ▶B◀

◀B▶ ▶A◀

**Caution**

- (1) With the part marked with \*, first temporarily tighten it, then ground the vehicle and tighten it to specification in unloaded condition.
- (2) When removing the drive shaft from, and reinstalling it to, a vehicle with AYC, use care not to damage the rotor mounted on the BJ outer race.

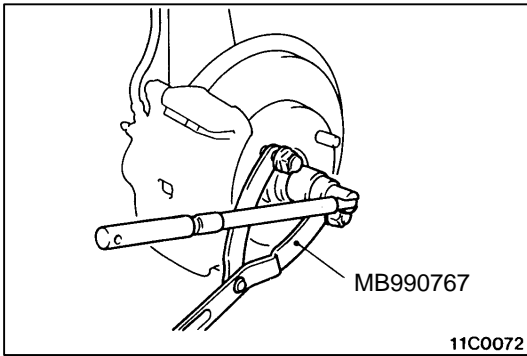


**REMOVAL SERVICE POINTS**

**◀A▶ DRIVE SHAFT NUT REMOVAL**

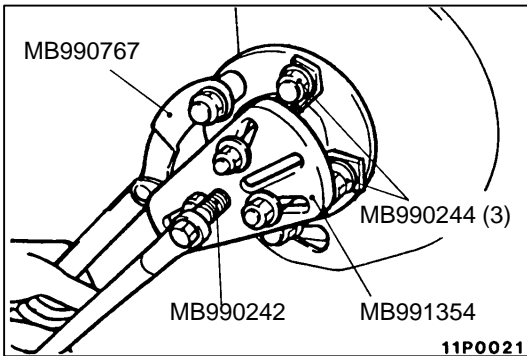
**Caution**

Do not apply the vehicle weight to the wheel bearing with the drive shaft nut loosened.



**◀B▶ DRIVE SHAFT REMOVAL**

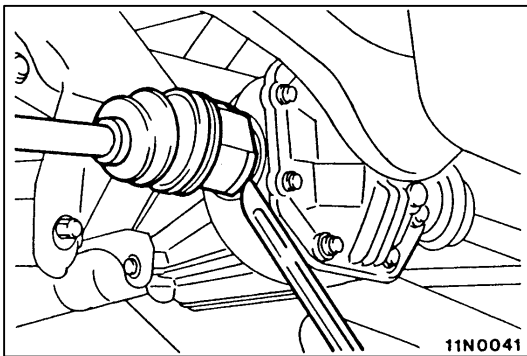
(1) Using the special tool, drive the drive shaft out of the hub.



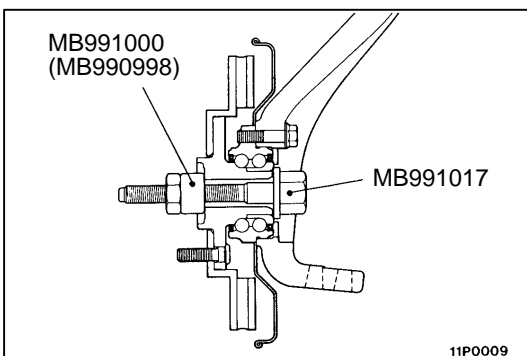
(2) Apply a lever to the protrusion of the drive shaft and remove the drive shaft from the differential carrier.

**Caution**

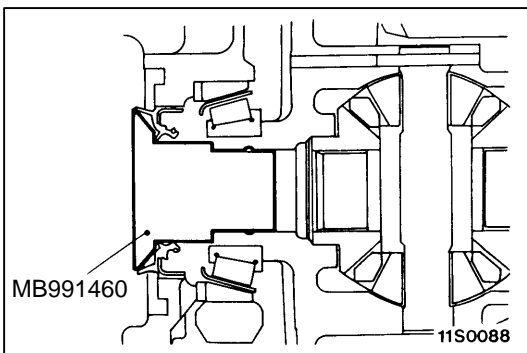
(1) Be sure to remove the drive shaft from the differential side using a lever. Removing it from the BJ side could damage the parts.



(2) Do not apply the vehicle weight to the wheel bearing with the drive shaft removed. If it is unavoidable to apply the weight for reasons of moving the vehicle, use the special tool to temporarily secure it in position.

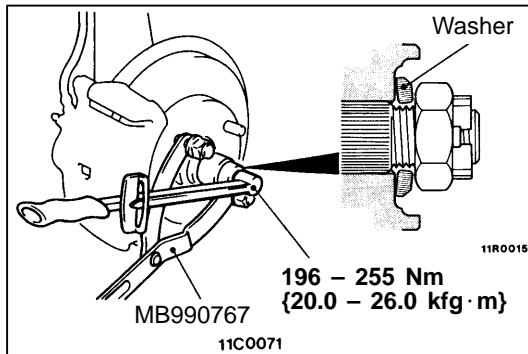


(3) To prevent entry of foreign matter into the differential carrier, use the special tool as a cover. <Except vehicles with AYC (RH)>



**INSTALLATION SERVICE POINTS****►A◄ DRIVE SHAFT INSTALLATION****Caution**

Use care not to allow the drive shaft splines to damage the oil seal of the differential carrier.

**►B◄ DRIVE SHAFT NUT INSTALLATION**

- (1) Install the washer on the drive shaft in the direction shown on the left.
- (2) Using the special tool, tighten the drive shaft nut to the specified torque.

**Caution**

**Before torquing the drive shaft nut to specification, do not apply vehicle weight to the wheel bearing.**

- (3) If, at this time, the split pin holes are not aligned, tighten the nut further (within 255 Nm {26.0 kgf·m}), insert the split pin in the first matching holes, and bend it securely.

# DIFFERENTIAL CARRIER <EVOLUTION-IV, EVOLUTION-V GSR>

## REMOVAL AND INSTALLATION

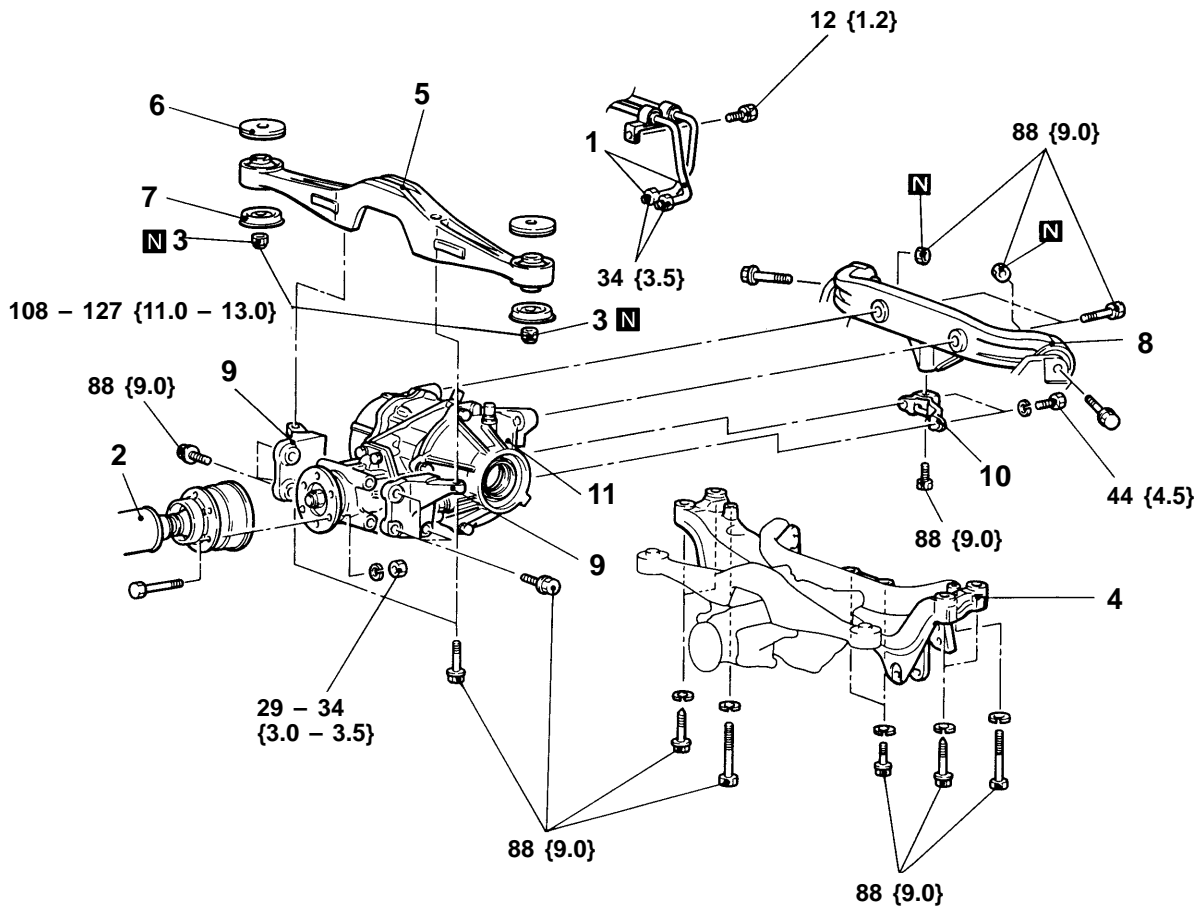
<Vehicles with AYC>

### Pre-removal Operation

- (1) Hydraulic Piping Fluid Draining
- (2) Gear Oil Draining (Refer to P.27-28.)
- (3) Lower Arm Assembly Removal (Refer to GROUP 34.)
- (4) Rear Stabilizer Removal (Refer to GROUP 34.)
- (5) Drive Shaft Removal (Refer to P.27-36.)

### Post-installation Operation

- (1) Drive Shaft Installation (Refer to P.27-36.)
- (2) Rear Stabilizer Installation (Refer to GROUP 34.)
- (3) Lower Arm Assembly Installation (Refer to GROUP 35.)
- (4) Gear Oil Filling (Refer to P.27-28.)
- (5) Hydraulic Piping Fluid Filling and Bleeding (Refer to P.27-29.)



11M0068

Unit: Nm {kgf·m}

### Removal steps

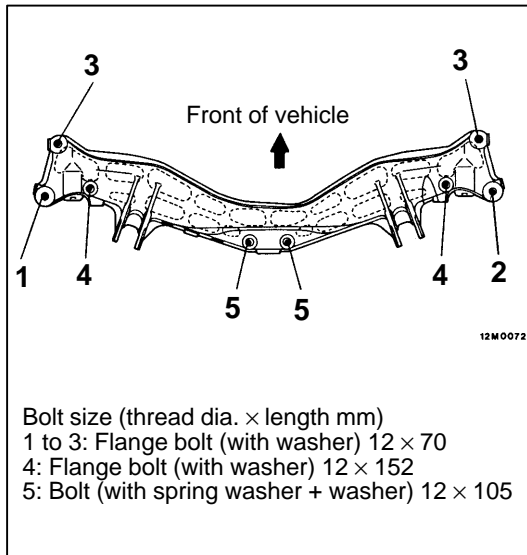
1. Hydraulic unit hose assembly connection
- ▶B◀ 2. Propeller shaft connection
3. Differential support member mounting bolt
- ◀A▶ ▶A◀ 4. Rear crossmember and differential carrier assembly

5. Differential support member
6. Upper stopper
7. Lower stopper
8. Differential support arm
9. Differential mount bracket
10. Differential mount bracket
11. Differential carrier

## REMOVAL SERVICE POINT

### ◀A▶ REAR CROSSMEMBER AND DIFFERENTIAL CARRIER ASSEMBLY REMOVAL

- (1) Using a jack, support the differential carrier from its underside.
- (2) Remove the rear crossmember mounting bolts and remove the differential carrier, where it is attached to the rear crossmember, from the vehicle.



## INSTALLATION SERVICE POINTS

### ▶A▶ REAR CROSSMEMBER AND DIFFERENTIAL CARRIER ASSEMBLY

Tighten the rear crossmember mounting bolts in the numerical order shown.

#### NOTE

To ensure both good installation accuracy and ease of installation, the rear crossmember mounting holes have different diameters between front and rear. This is the reason for specifying the tightening sequence of the mounting bolts.

### ▶B▶ PROPELLER SHAFT CONNECTION

Align the alignment mark on the differential carrier with that of the propeller shaft at installation.

#### Caution

**Oil or grease on the threads of the mounting bolt or nut can allow the bolt or nut to come loose. Be sure to degrease the threads before installation.**

# DIFFERENTIAL CARRIER <EVOLUTION-V RS>

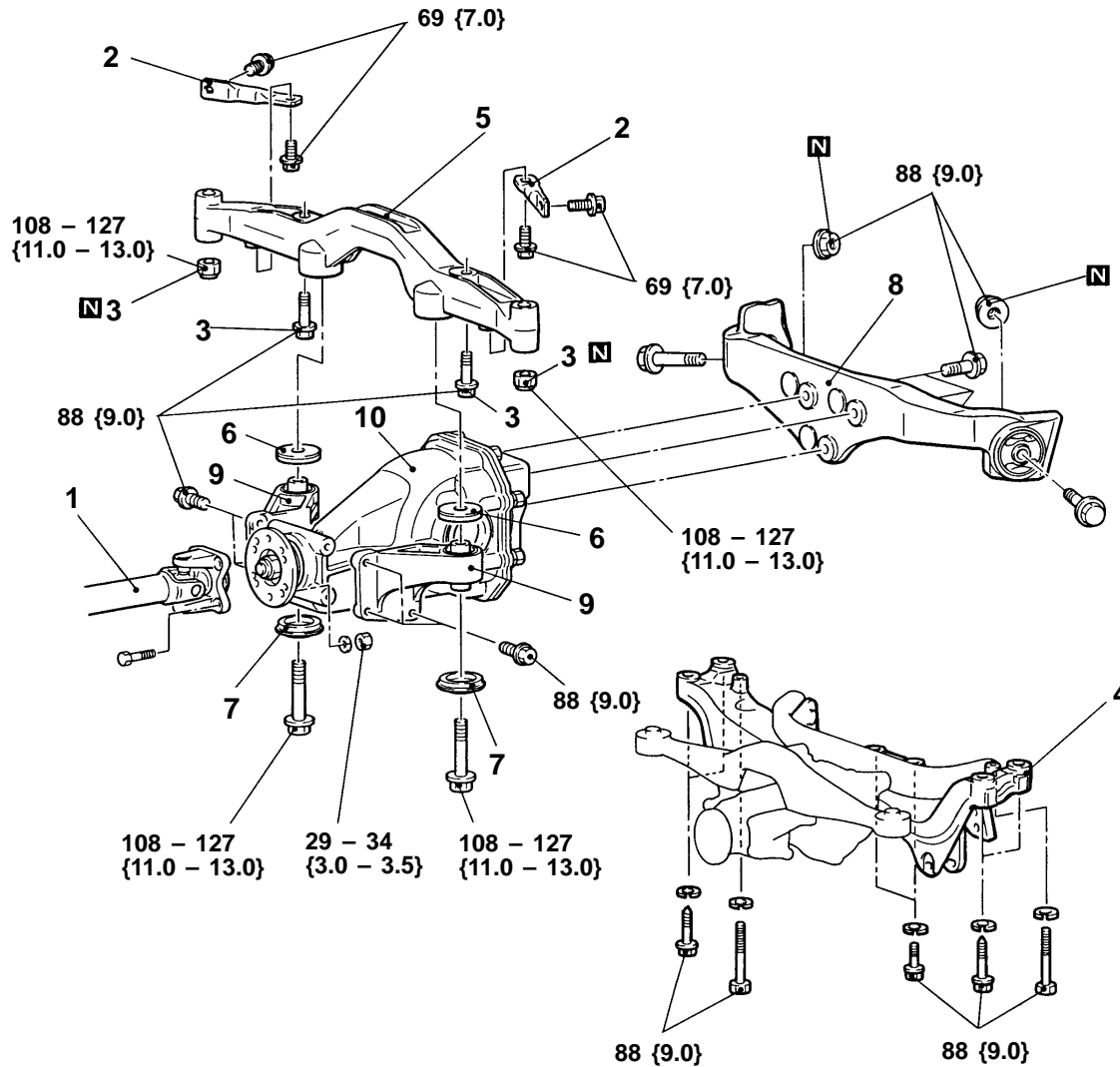
## REMOVAL AND INSTALLATION

### Pre-removal Operation

- (1) Differential Gear Oil Draining
- (2) Lower Arm Assembly Removal
- (3) Rear Stabilizer Removal
- (4) Drive Shaft Removal

### Post-installation Operation

- (1) Drive Shaft Installation
- (2) Rear Stabilizer Installation
- (3) Lower Arm Assembly Installation
- (4) Differential Gear Oil Filling



Unit: Nm {kgf·m}

### Removal steps



1. Propeller shaft connection
2. Toe control bar
3. Differential support member mounting bolt and nut



4. Rear crossmember and differential carrier assembly

5. Differential support member
6. Upper stopper
7. Lower stopper
8. Differential support arm
9. Differential mount bracket
10. Differential carrier

**REMOVAL SERVICE POINTS****◀A▶ PROPELLER SHAFT DISCONNECTION**

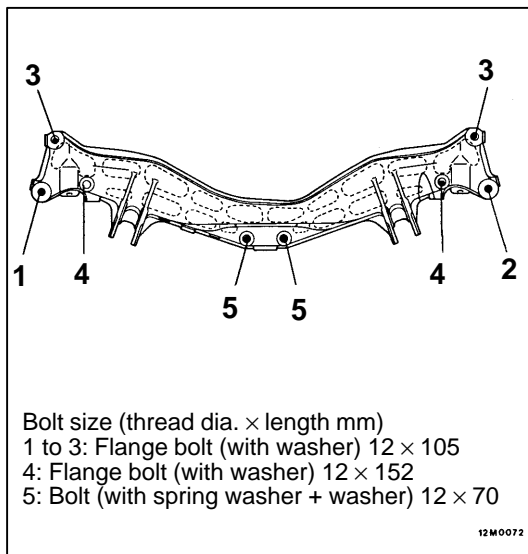
Make an alignment mark on the companion flange and flange yoke, then disconnect the propeller shaft from the companion flange.

**Caution**

**Suspend the propeller shaft from the body with a wire to prevent the bend at the joint from catching and damaging the joint boot.**

**◀B▶ REAR CROSSMEMBER AND DIFFERENTIAL CARRIER ASSEMBLY REMOVAL**

- (1) Using a jack, support the differential carrier from its underside.
- (2) Remove the rear crossmember mounting bolts and remove the differential carrier, where it is attached to the rear crossmember, from the vehicle.

**INSTALLATION SERVICE POINTS****▶A◀ REAR CROSSMEMBER AND DIFFERENTIAL CARRIER ASSEMBLY INSTALLATION**

Tighten the rear crossmember mounting bolts in the numerical order shown.

**NOTE**

To ensure both good installation accuracy and ease of installation, the rear crossmember mounting holes have different diameters between front and rear. This is the reason for specifying the tightening sequence of the mounting bolts.

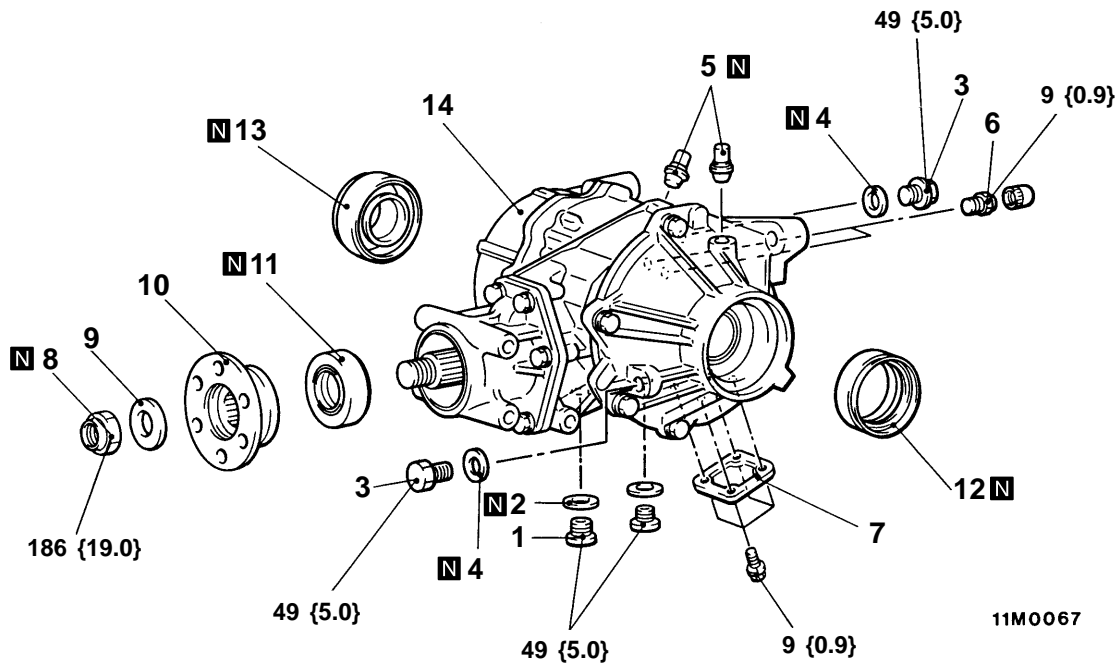
**▶B◀ PROPELLER SHAFT CONNECTION**

Align the alignment mark on the companion flange with that of the flange yoke at installation.

**Caution**

**Oil or grease on the threads of the mounting bolt or nut can allow the bolt or nut to come loose. Be sure to degrease the threads before installation.**

**TORQUE TRANSFER DIFFERENTIAL <VEHICLES WITH AYC>  
DISASSEMBLY AND REASSEMBLY**



Unit: Nm {kgf · m}

**Disassembly steps**

1. Drain plug
2. Packing
3. Filler plug
4. Gasket
5. Vent plug
6. Bleeder screw
7. Cover
8. Self-locking nut
9. Washer
10. Companion flange

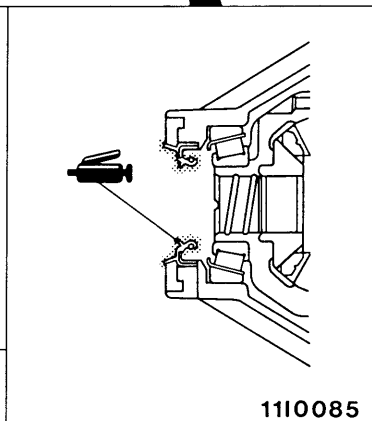
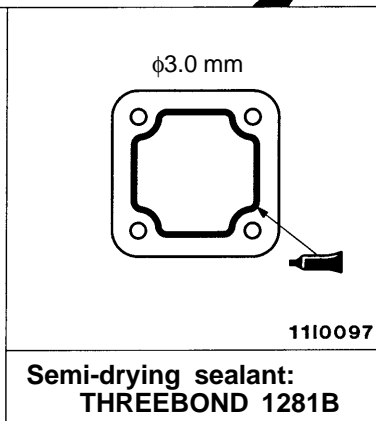
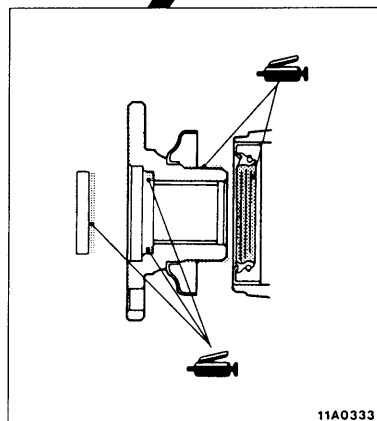
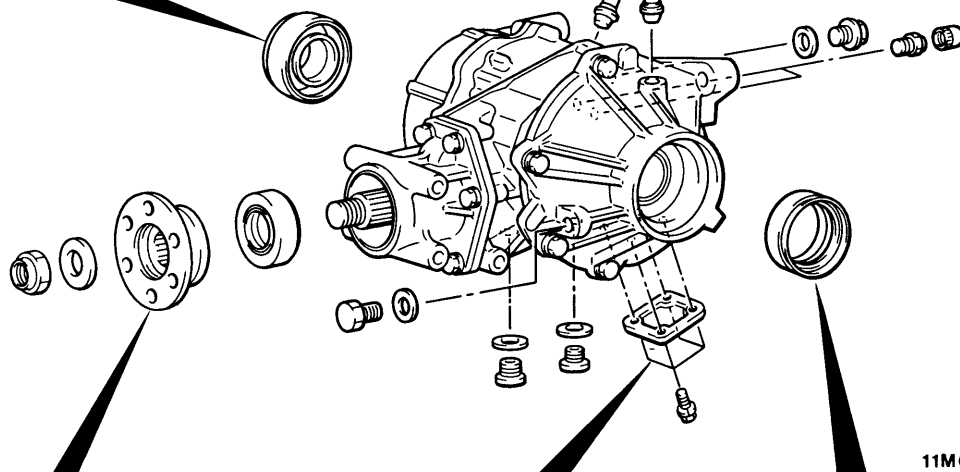
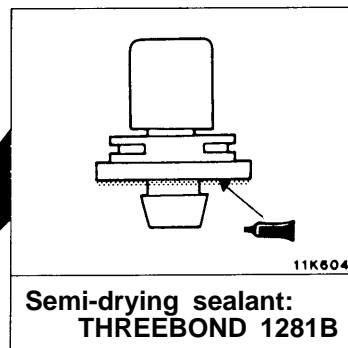
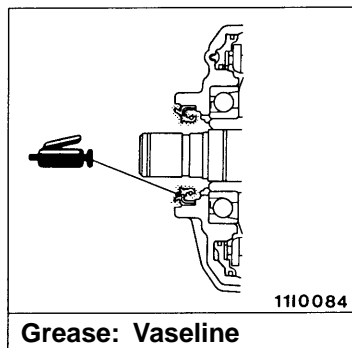
- ▶B◀ 11. Oil seal
- ▶A◀ 12. Oil seal
- ▶A◀ 13. Oil seal
- ▶A◀ 14. Differential carrier assembly

**Caution**

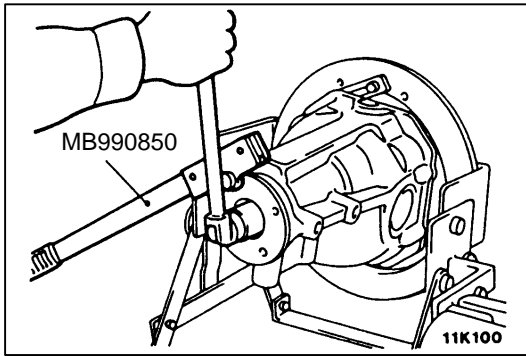
- (1) The differential carrier assembly is non-maintainable.
- (2) No foreign matter should be allowed inside and at the joints of the differential carrier assembly.



GREASE AND SEALANT APPLICATION POINTS

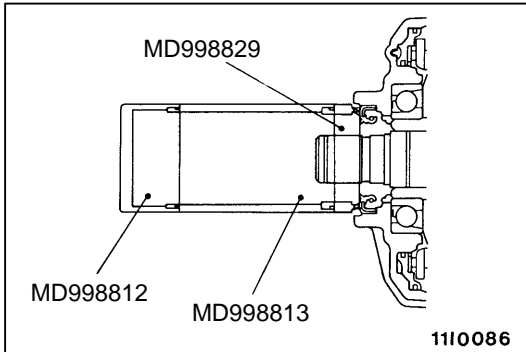






**DISASSEMBLY SERVICE POINT**

**◀A▶ SELF-LOCKING NUT REMOVAL**

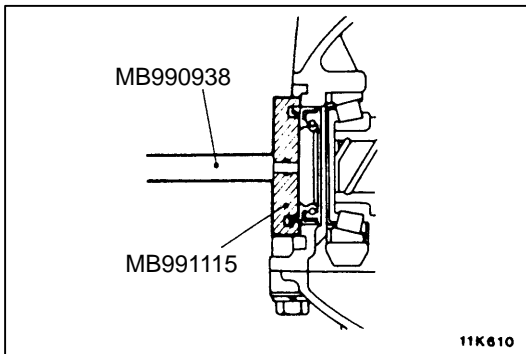


**ASSEMBLY SERVICE POINTS**

**▶A◀ OIL SEAL INSTALLATION**

- (1) Using the special tool, pressfit the oil seal as far as it will go.
- (2) Apply the specified grease to the oil seal lip.

**Specified grease: Vaseline**

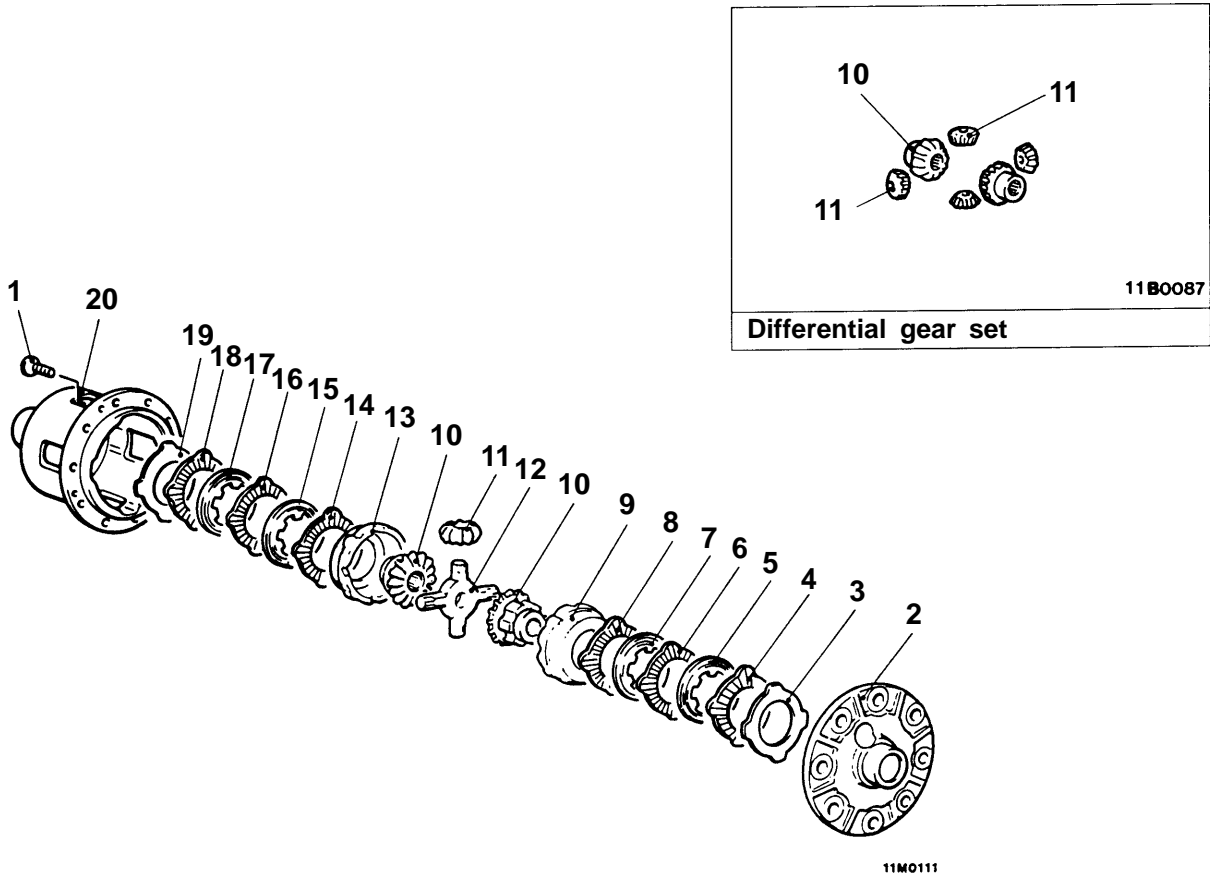


**▶B◀ OIL SEAL INSTALLATION**

- (1) Using the special tool, pressfit the oil seal as far as it will go.
- (2) Apply the multi-purpose grease to the oil seal lip.

**LSD CASE ASSEMBLY <VEHICLES WITHOUT AYC>**

**DISASSEMBLY AND REASSEMBLY**



**Disassembly steps**



• LSD differential torque check

- 1. Screw
- 2. Differential case A
- 3. Spring plate
- 4. Friction plate
- 5. Friction disc
- 6. Friction plate
- 7. Friction disc
- 8. Friction plate
- 9. Pressure ring
- 10. Side gear

- 11. Pinion gear
- 12. Pinion shaft
- 13. Pressure ring
- 14. Friction plate
- 15. Friction disc
- 16. Friction plate
- 17. Friction disc
- 18. Friction plate
- 19. Spring plate

- >A< 20. Differential case B

**DISASSEMBLY SERVICE POINT**

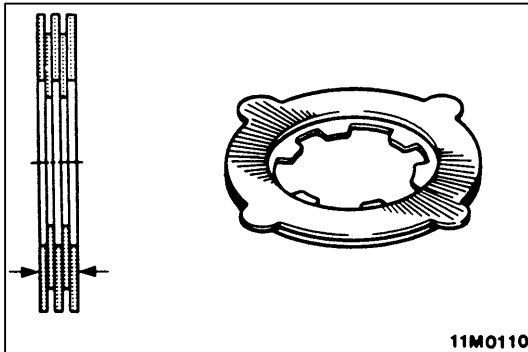
**<A> SCREW REMOVAL**

- (1) Check out the alignment marks.
- (2) Loosen a uniform amount little by little the screws securing differential case A to B.
- (3) Separate differential case B from differential case A and remove their components.  
Keep the removed spring plates, friction plates, and friction discs organized in the order of removal and for right and left use.

**ASSEMBLY SERVICE POINTS**

**▶A◀ INSTALLATION TO DIFFERENTIAL CASE B**

Before starting the assembly procedure, perform the following steps to adjust dimensional differences (clutch plate friction force) in the axial direction of the components inside the differential case and axial clearance of the differential side gear.

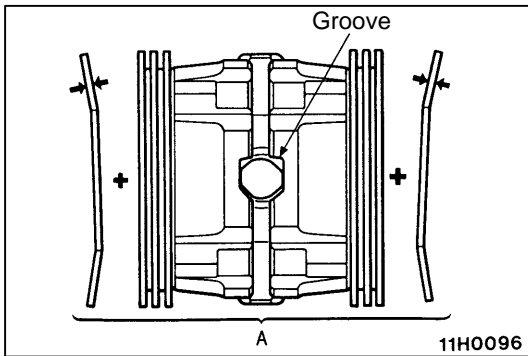


- (1) Place friction discs (two each) and friction plates (three each) one on top of another as illustrated and, using a micrometer, measure the thickness of each of the right and left assemblies. Select different discs and plates so that the difference between the right and left assemblies falls within the specified range.

**Standard value: 0 – 0.05 mm**

**NOTE**

If a new part is used, note that the friction disc comes in two thicknesses: 1.6 mm and 1.7 mm.

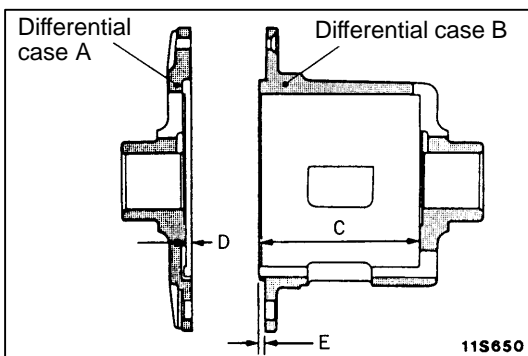


- (2) Measure the thickness of each of the right and left spring plates.
- (3) Assemble the pressure ring internal parts (pinion shaft and pressure ring), friction plates, and friction discs and, using a micrometer, measure the overall width.

**NOTE**

When taking measurements, press the assembly from both sides so that the pinion shaft makes a positive contact with the groove in the pressure ring.

- (4) Find value (A) which is the thickness measured in step (3) added to the thickness of two spring plates.

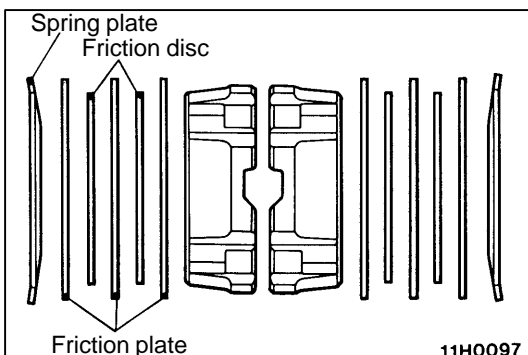


- (5) Find dimension (B) between the spring plate faying surfaces when differential case A and B are assembled together.

$$B = C + D - E$$

- (6) If the clearance between the spring plate and differential case (B – A) is outside the specified range, change the friction discs and make adjustments.

**Standard value: 0.06 – 0.25 mm**



- (7) Coat each part with the specified gear oil and mount it in the specified direction and order into differential case B.

**Gear oil: DIA QUEEN LSD GEAR OIL**

**NOTE**

Apply a careful coat of gear oil to the contacting and sliding surfaces.

**►B◄ SCREW TIGHTENING**

- (1) Align the alignment mark on differential case A with that on differential case B.
- (2) Tighten the screws connecting differential case A and B a uniform amount little by little in the diagonal order.

**NOTE**

If tightening the screws does not bring the two cases properly together, spring plates are not probably assembled properly. Reassemble from the start.

**►C◄ LSD DIFFERENTIAL TORQUE CHECK**

- (1) Using the special tool, check for differential torque.

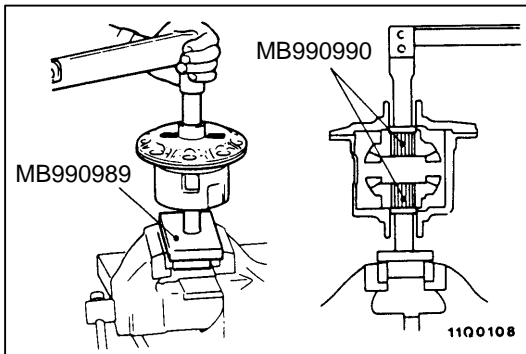
**Standard value:**

When new clutch plate is installed Nm {kgf·m}	When existing clutch plate is reused Nm {kgf·m}
5 – 19 {0.5 – 1.9}	2 – 19 {0.2 – 1.9}

**NOTE**

Before measuring the differential torque, first turn the gears so they snug each other, then take measurements during rotation.

- (2) If the measurement falls outside the specified range, disassemble the differential case assembly and repair or replace defective parts.



**INSPECTION**

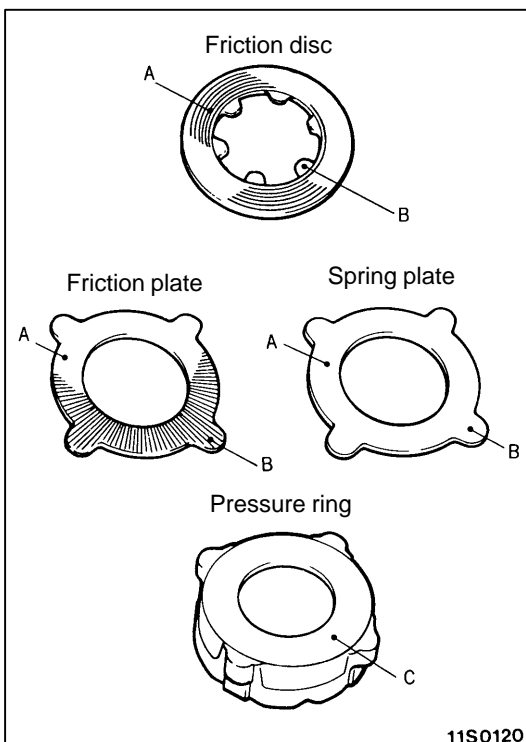
**1. DIFFERENTIAL CASE INTERNAL PARTS CONTACT/SLIDING SURFACE CHECK**

- (1) Clean the disassembled parts with cleaning oil and dry them with compressed air.
- (2) Check each plate, disc, and pressure ring for the following:
  - A. Friction and sliding surfaces of friction discs, friction plates, and spring plates. Replace a defective part with heat discoloration and excessive wear with a new one, as it degrades locking performance.

**NOTE**

If the inner periphery of the friction face shows traces of harsh contact, it is because of the spring tension of each plate, disc and other part. Do not confuse this with abnormal wear.

- B. Inner periphery and outer periphery protrusions of friction discs, friction plates, and spring plates. Replace a cracked or damaged part with a new one.
- C. Friction and sliding surfaces between pressure rings and friction discs.



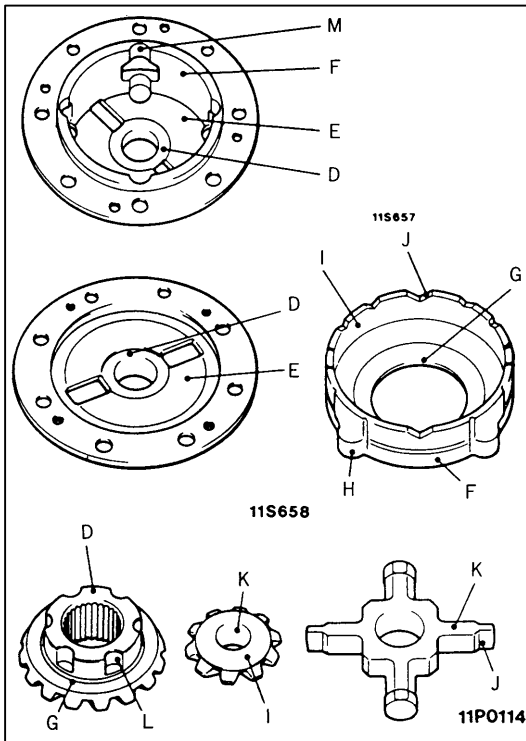
Grind a dented or scratched part with oil stone and then lap and correct with a compound on a surface plate.

**NOTE**

If the inner periphery of the friction face shows traces of harsh contact, it is because of the spring tension of each plate, disc and other part. Do not confuse this with abnormal wear.

- (3) Check the following parts for contact and sliding surfaces (D to M) and correct burrs and dents with oil stone.

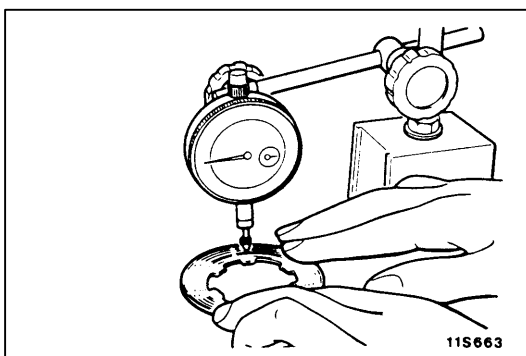
- D: Sliding surfaces of side gear and case
- E: Contacting surfaces of differential case and spring plate
- F: Contacting surfaces of pressure ring and differential case inner face
- G: Sliding surfaces of pressure ring hole and side gear
- H: Protrusions on outer periphery of pressure ring
- I: Pressure ring inner surface and differential pinion gear spherical surface
- J: Pressure ring V-groove and pinion shaft V
- K: Sliding surfaces of pinion shaft and differential pinion gear hole
- L: Side gear grooves on outer periphery
- M: Slits in inner periphery of differential



**2. FRICTION PLATE AND FRICTION DISC DISTORTION CHECK**

Apply a dial indicator to the friction plate or disc on a surface plate and, turning the friction plate or disc, measure the distortion (flatness).

**Limit: 0.08 mm (total runout)**

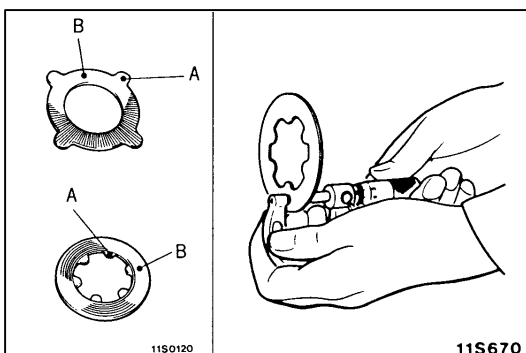


**3. FRICTION PLATE, FRICTION DISC, AND SPRING PLATE WEAR CHECK**

- (1) For the purpose of determining wear, measure thickness (A, B) of the friction surface and protrusion at several places and find the difference between the two.

**Limit: 0.1 mm**

- (2) If the wear exceeds the limit, replace the part with a new one.



HYDRAULIC UNIT <VEHICLES WITH AYC>

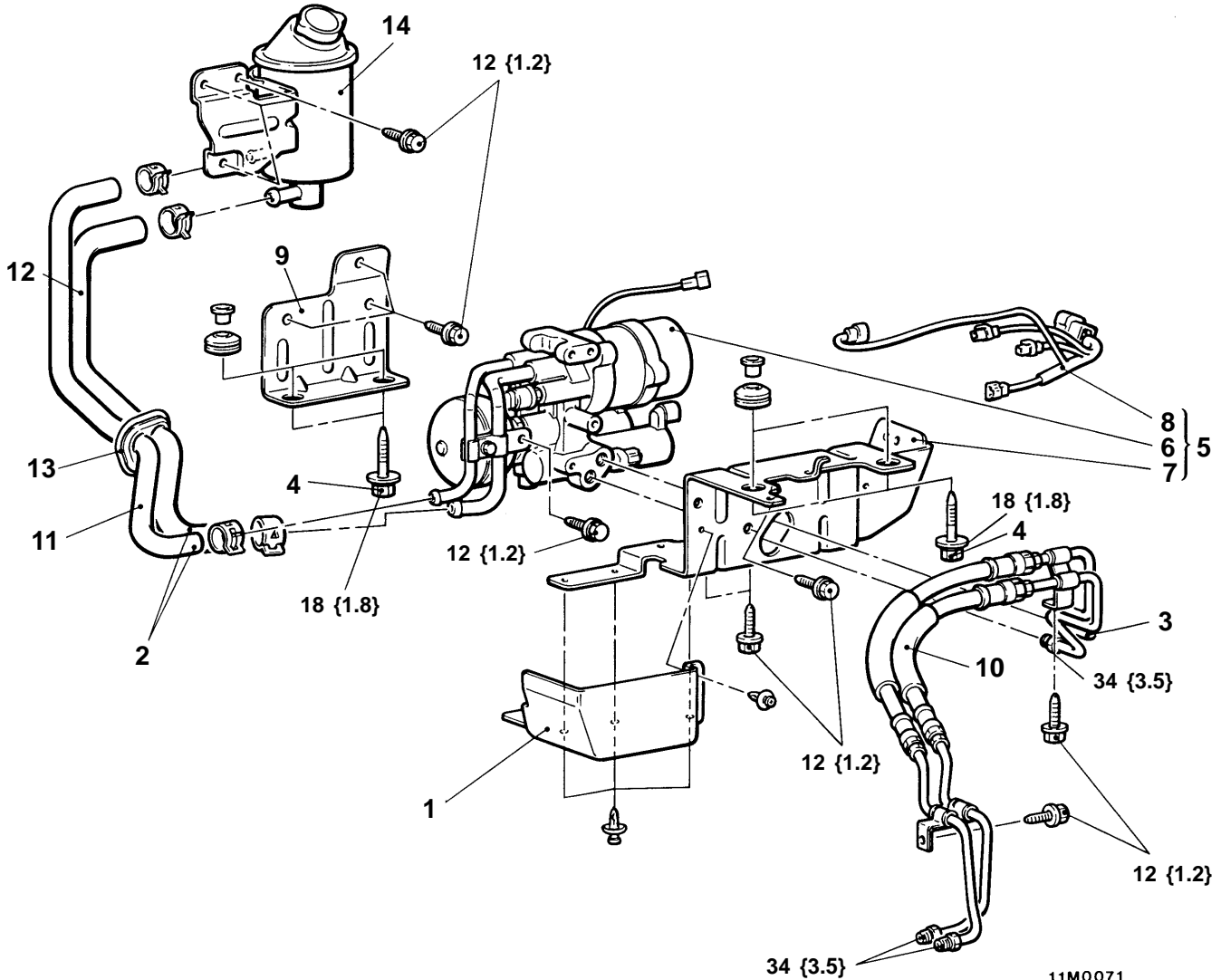
REMOVAL AND INSTALLATION

**Pre-removal Operation**

- (1) Trunk Side Trim Removal
- (2) Hydraulic Piping Fluid Draining

**Post-installation Operation**

- (1) Hydraulic Piping Fluid Filling and Bleeding (Refer to P.27-29.)
- (2) Trunk Side Trim Installation



11M0071

Unit: Nm {kgf·m}

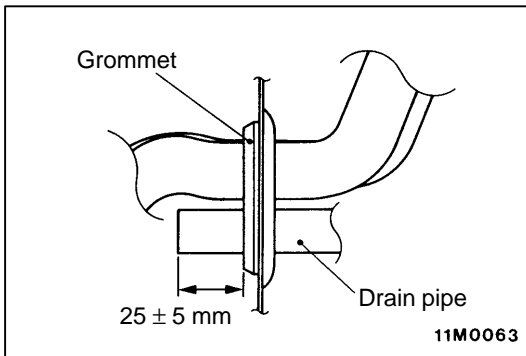
**Removal steps**

- 1. Dust guard
- 2. Suction hose and return hose connection
- 3. Hydraulic unit hose assembly connection
- 4. Hydraulic unit and bracket assembly mounting bolt
- ▶C◀ 5. Hydraulic unit and bracket assembly
- 6. Hydraulic unit
- 7. Hydraulic unit bracket
- 8. AYC harness

- 9. Hydraulic unit bracket
- 10. Hydraulic unit hose assembly
- ▶B◀ 11. Return hose
- ▶B◀ 12. Suction hose
- ▶A◀ 13. Grommet
- 14. Oil reservoir

**Caution**

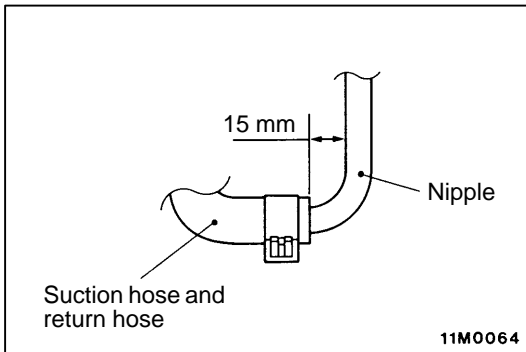
- (1) When connecting the return hose and suction hose, do not apply lubricant.
- (2) No foreign matter should be allowed in the hydraulic piping and joints.



## INSTALLATION SERVICE POINTS

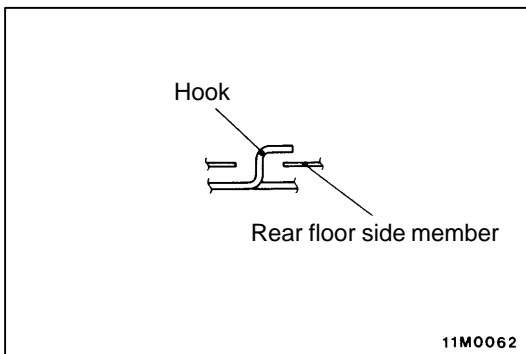
### ▶A◀ GROMMET INSTALLATION

On the vehicle mounted with a sun roof, mount the drain pipe to the grommet as illustrated.



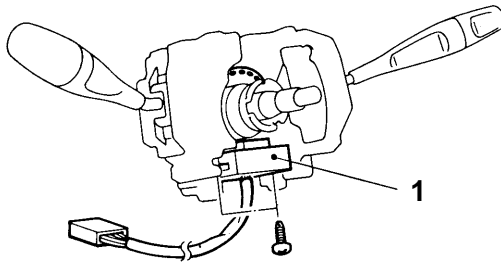
### ▶B◀ SUCTION HOSE / RETURN HOSE INSTALLATION

Fit the suction hose and return hose to the nipple of hydraulic unit as illustrated.

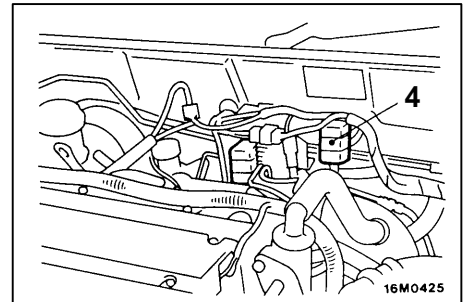
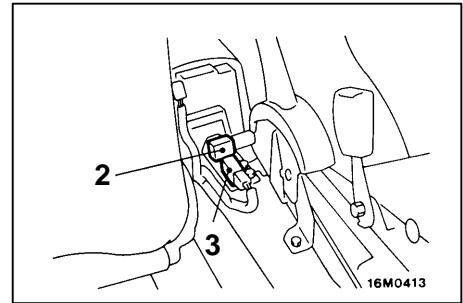


### ▶C◀ HYDRAULIC UNIT AND BRACKET ASSEMBLY INSTALLATION

Hook the hydraulic unit bracket hook to the rear floor side member and install the hydraulic unit and bracket assembly mounting bolt.

**SENSOR RELAY <VEHICLES WITH AYC>****REMOVAL AND INSTALLATION**

14W0057

**Steer sensor removal steps**

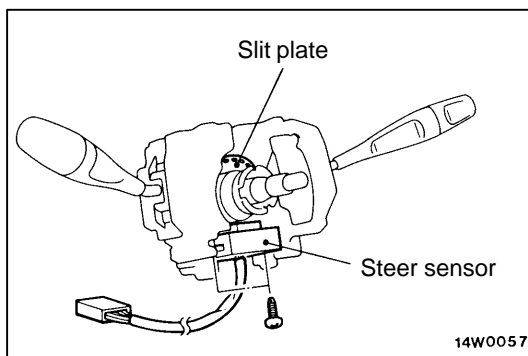
- Steering wheel and column cover (Refer to GROUP 37 – Steering Wheel and Shaft.)
1. Steer sensor

**Acceleration sensor and AYC relay removal**

2. Longitudinal acceleration sensor
3. Lateral acceleration sensor
4. AYC relay

**NOTE**

For the wheel speed sensor, refer to GROUP 35B.



14W0057

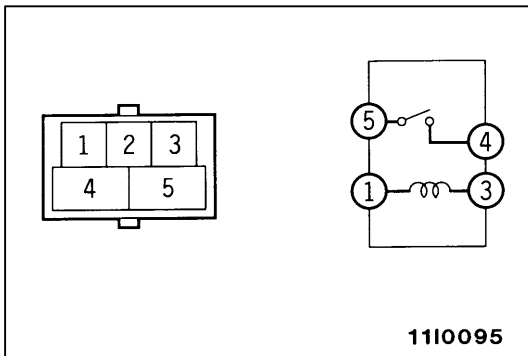
**REMOVAL SERVICE POINT****◀A▶ STEER SENSOR REMOVAL**

Remove the steer sensor from the column switch.

**Caution**

- (1) A photocoupler is used as the steer sensor. Use care not to allow dust or grease to be on the sensor.
- (2) Do not bend or dirty with grease the slit plate on the column switch side.





**INSPECTION**

**1. LONGITUDINAL AND LATERAL ACCELERATION SENSOR CHECK**

Refer to GROUP 35B – Acceleration Sensor.

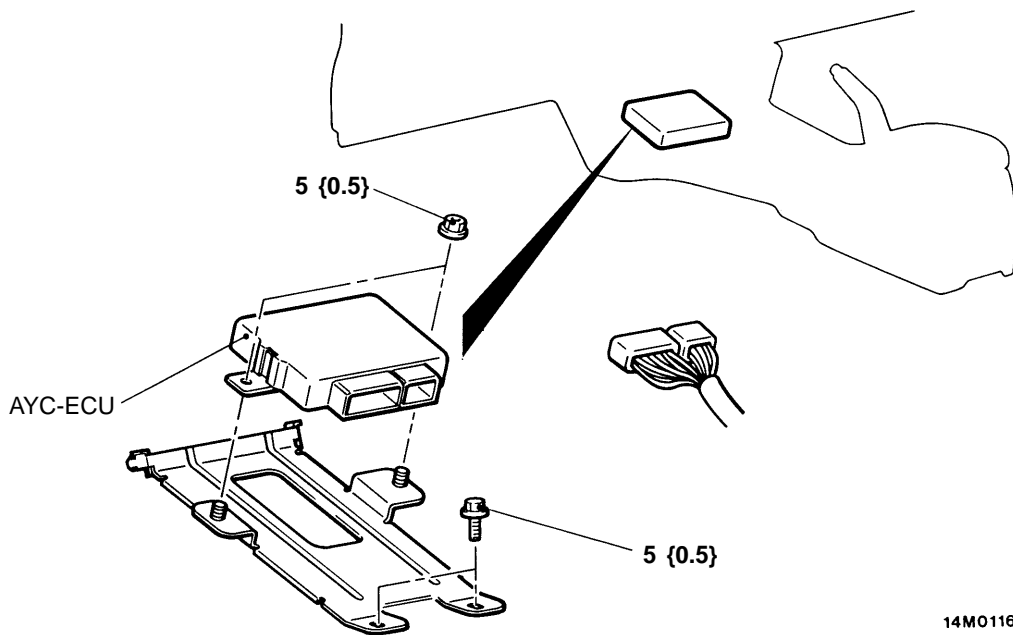
**2. AYC RELAY CONTINUITY CHECK**

Battery voltage	Terminal No.			
	1	3	4	5
When not energized	○—○			
When energized	⊖—⊕		○—○	

**AYC-ECU**

**REMOVAL AND INSTALLATION**

- Pre-removal and Post-installation Operation**
- Front Floor Console Removal and Installation



14M0116

Unit: Nm {kgf·m}

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# POWER PLANT MOUNT

## CONTENTS

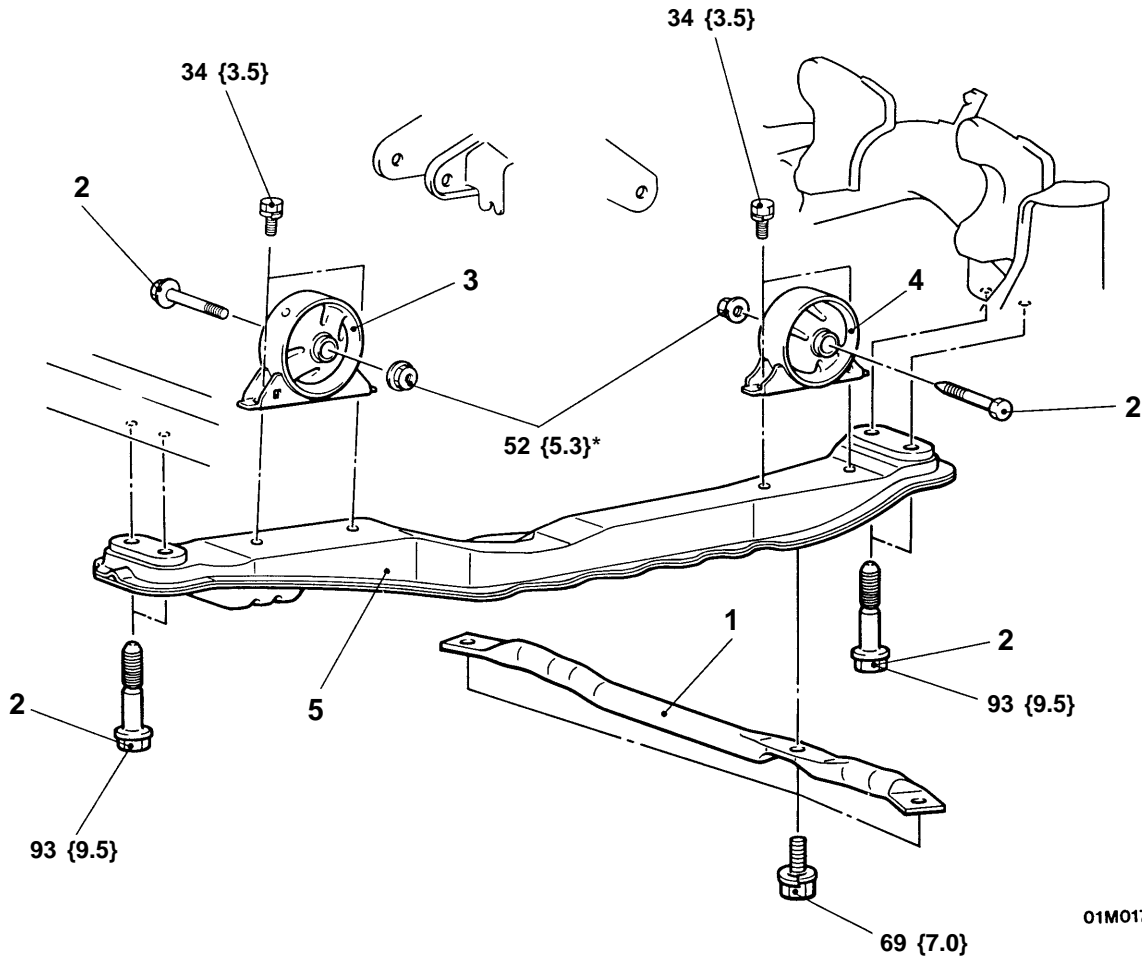
ROLL STOPPER AND CENTERMEMBER ..... 2



# ROLL STOPPER AND CENTERMEMBER

## REMOVAL AND INSTALLATION

**Caution**  
 When tightening the portion marked with \*, first temporarily tighten it, then torque to specification with the engine weight applied to the body.



01M0176

Unit: Nm {kgf · m}

### Removal steps



1. Front crossmember bar <vehicles with 17' wheels>
2. Bolt
3. Front roll stopper bracket assembly
4. Rear roll stopper bracket assembly
5. Centermember

### NOTE

The conventional service procedures apply for the installation service points.

---

# FRONT SUSPENSION

## CONTENTS

<b>SERVICE SPECIFICATIONS</b> .....	2	<b>STRUT ASSEMBLY</b> .....	4
<b>SPECIAL TOOLS</b> .....	2	<b>LOWER ARM &lt;EVOLUTION-IV&gt;</b> .....	5
<b>ON-VEHICLE SERVICE</b> .....	3	<b>LOWER ARM &lt;EVOLUTION-V&gt;</b> .....	7
Wheel Alignment Check and Adjustment <EVOLUTION-V> .....	3	<b>STABILIZER BAR</b> .....	9



## SERVICE SPECIFICATIONS

### <EVOLUTION-IV>

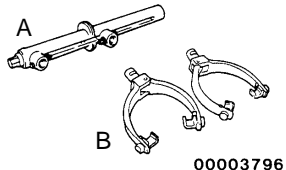
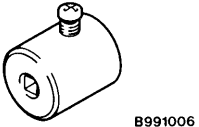
Items	Standard value
Toe-in mm	-3 ~ 3
Camber	-1°00' ± 30' (difference between right and left wheel: less than 30')
Caster	3°50' ± 30' (difference between right and left wheel: less than 30')
Kingpin inclination	13°25'
Lower arm ball joint rotation starting torque Nm {kgf · cm}	2.0 – 8.8 {20 – 90}

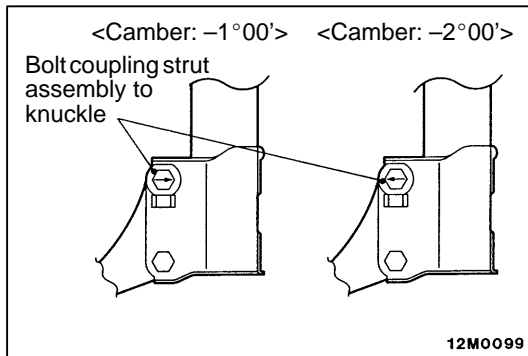
### <EVOLUTION-V>

Same as EVOLUTION-IV except for following.

Items	Standard value
Camber (selectable from 2 options)	-1°00' ± 30' or -2°00' ± 30' (difference between right and left wheel: less than 30')
Caster	3°54' ± 30' (difference between right and left wheel: less than 30')
Kingpin inclination	14°18'

## SPECIAL TOOLS

Tool	Number	Name	Use
	A: MB991237 B: MB991238	A: Spring compressor body B: Arm set	Coil spring compression
	MB991006	Preload socket	Lower arm ball joint rotation starting torque measurement



## ON-VEHICLE SERVICE

### WHEEL ALIGNMENT CHECK AND ADJUSTMENT <EVOLUTION-V>

Use the conventional procedures to measure wheel alignment.

#### 1. CAMBER

**Standard value:**

$-1^{\circ}00' \pm 30'$  (difference between right and left wheel: less than  $30'$ ) or

$-2^{\circ}00' \pm 30'$  (difference between right and left wheel: less than  $30'$ )

Select the camber angle as follows.

If the arrow on the bolt that couples the strut assembly to knuckle faces inboard  $\rightarrow -1^{\circ}00' \pm 30'$ .

If the arrow on the bolt that couples the strut assembly to knuckle faces outboard  $\rightarrow -2^{\circ}00' \pm 30'$ .

#### 2. CASTER

**Standard value:  $3^{\circ}54' \pm 30'$  (difference between right and left wheel: less than  $30'$ )**

NOTE

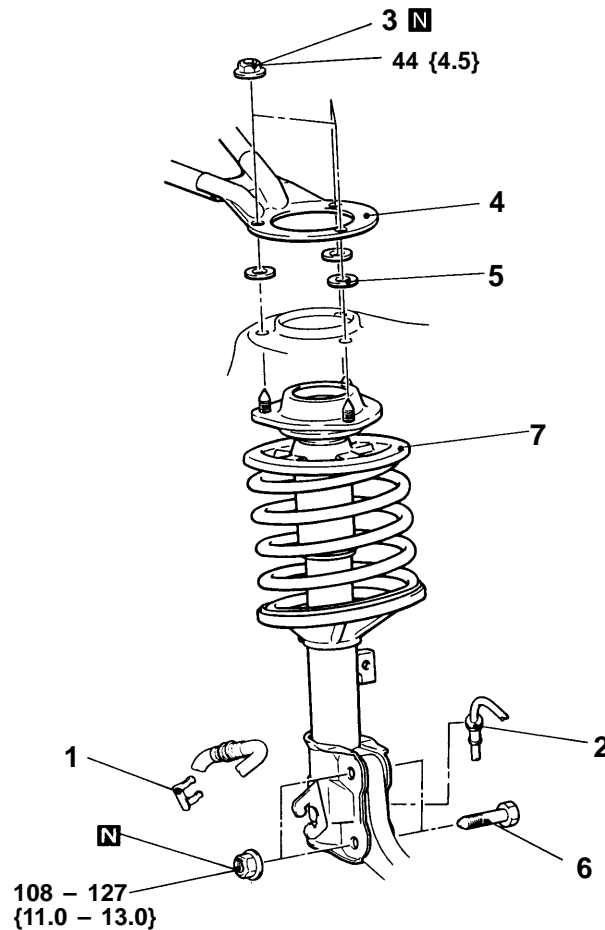
The suspension system is designed so as to retain the preset caster value, requiring no adjustment for caster.

## STRUT ASSEMBLY

### REMOVAL AND INSTALLATION

#### Post-installation Operation

- Front Wheel Alignment Adjustment  
(Refer to P.33A-3.)



12M0084

Unit: Nm {kgf·m}

#### Removal steps

1. Brake hose clamp
2. Front speed sensor bracket  
<Vehicles with ABS>
3. Flange nut

4. Strut tower bar
5. Plain washer
6. Bolts
7. Strut assembly



### REMOVAL SERVICE POINT

#### ◀A▶ BOLTS REMOVAL

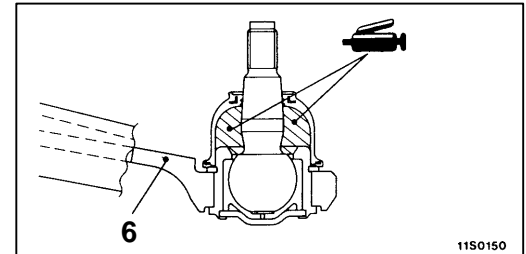
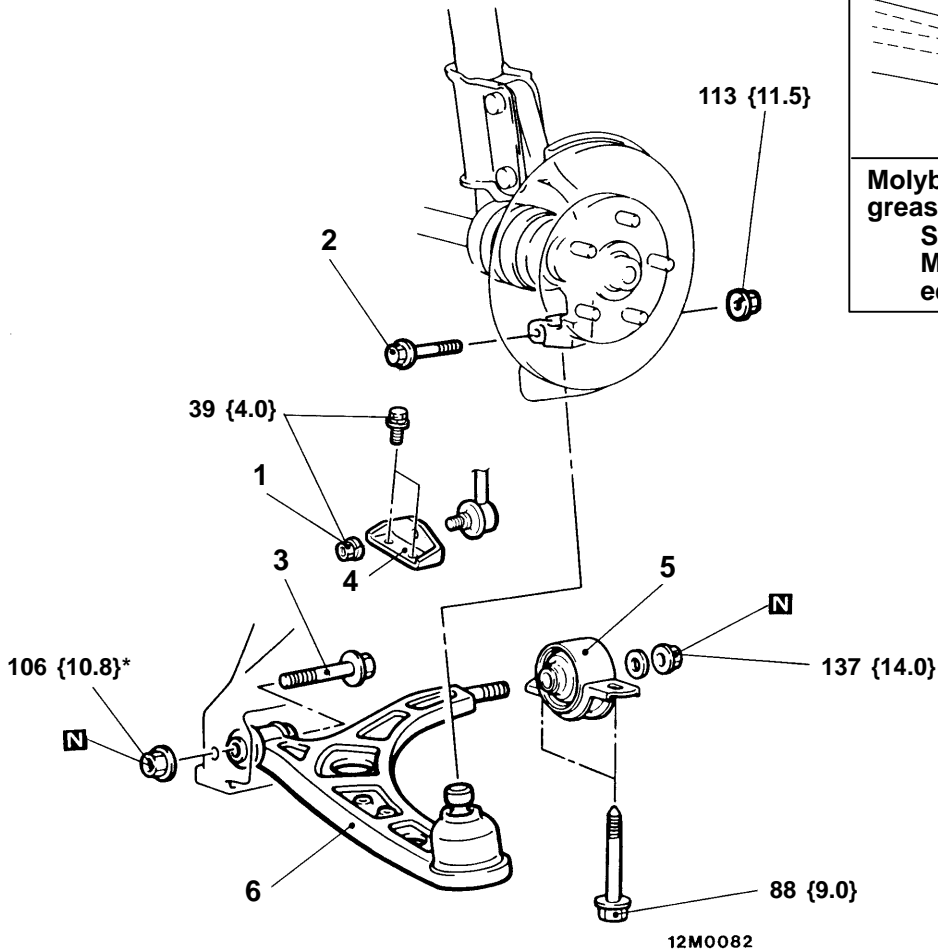
- (1) Suspend the lower arm from the vehicle with wire.
- (2) Remove the strut and knuckle connection.

# LOWER ARM <EVOLUTION-IV>

## REMOVAL AND INSTALLATION

**Post-installation Operation**

- (1) Push the Dust Cover of the Lower Arm and Stabilizer Link Ball Joint with a Finger to Check for Possible Cracks or Damage.
- (2) Wheel Alignment Check and Adjustment



**Molybdenum disulfide-base chassis grease:**  
**SHOWA SHELL SEKIYU SUNLITE MB2, NISSEKI CLACKNOCK FL, or equivalent**

Unit: Nm {kgf·m}

**Removal steps**



1. Stabilizer link mounting nut
2. Lower arm to knuckle coupling bolt
3. Bolt
4. Stabilizer bracket



5. Bushing assembly
6. Lower arm assembly

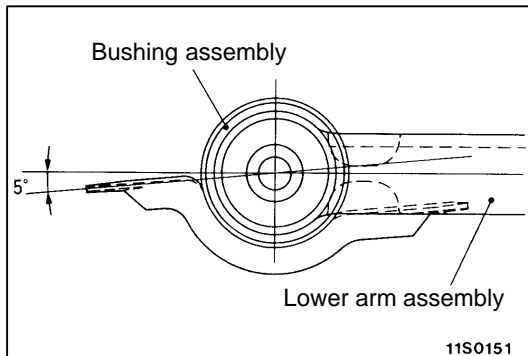
**Caution**

The part marked with \* should be first temporarily tightened, then torqued to specification with the vehicle on the ground in unloaded condition.

**NOTE**

Follow the conventional procedures for removal service points.



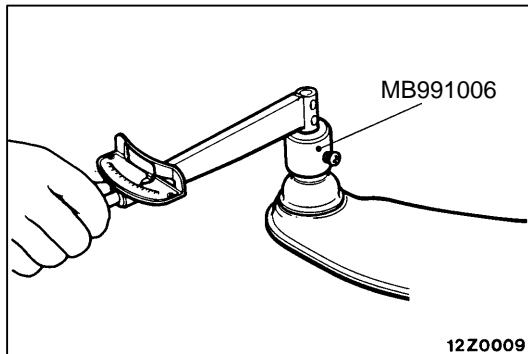


## INSTALLATION SERVICE POINT

### ►A◄ BUSHING ASSEMBLY INSTALLATION

Install the bushing assembly to the lower arm assembly with a relative angle as shown and tighten the self-locking nut to the specified torque.

**Tightening torque: 137 Nm {14.0 kgf·m}**



## INSPECTION

### BALL JOINT ROTATION STARTING TORQUE

Use the conventional procedures except the special tool used and the standard value as given below.

**Standard value: 2.0 – 8.8 Nm {20 – 90 kgf·cm}**

## LOWER ARM BALL JOINT DUST COVER REPLACEMENT

Replace the dust cover by using the conventional procedure only if it has been inadvertently damaged during servicing. After the dust cover has been replaced with a new one, push it with a finger to check for possible cracks or damage.

# LOWER ARM <EVOLUTION-V>

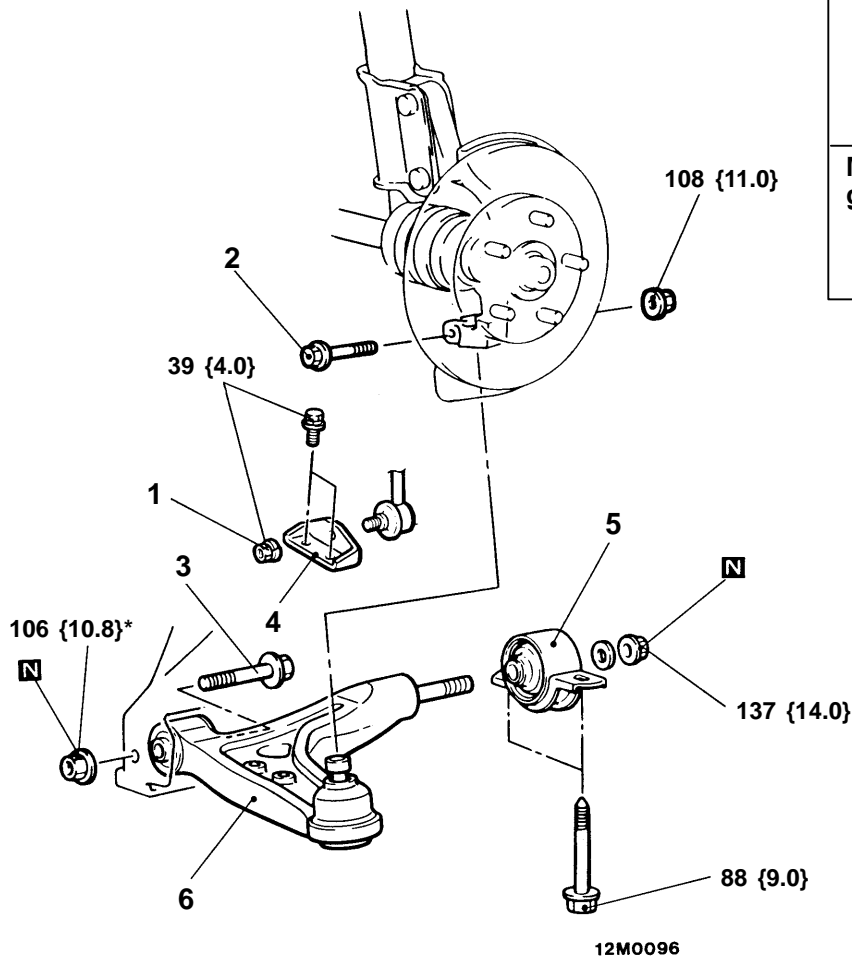
## REMOVAL AND INSTALLATION

**Caution**

To prevent bushing from being galled, the part marked with \* should be first temporarily tightened, then torqued to specification with the vehicle on the ground in unloaded condition.

**Post-installation Operation**

- (1) Push the Dust Cover of the Lower Arm and Stabilizer Link Ball Joint with a Finger to Check for Possible Cracks or Damage.
- (2) Wheel Alignment Check and Adjustment (Refer to P.33A-3.)



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**Molybdenum disulfide-base chassis grease:**  
SHOWA SHELL SEKIYU SUNLITE MB2, NISSEKI CLACKNOCK FL, or equivalent

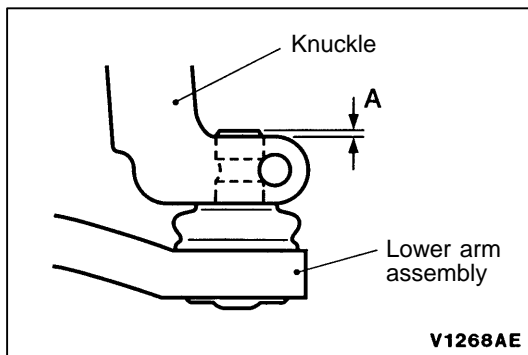
Unit: Nm {kgf·m}

**Removal steps**

- ◀A▶ ▶B◀ 1. Stabilizer link mounting nut
- ▶A◀ 2. Lower arm to knuckle coupling bolt
- 3. Bolt
- 4. Stabilizer bracket
- 5. Bushing assembly
- 6. Lower arm assembly

**NOTE**

Follow the conventional procedures for removal service points.



## INSTALLATION SERVICE POINTS

### ►A◄ BUSHING ASSEMBLY INSTALLATION

Follow the conventional procedure.

### ►B◄ LOWER ARM TO KNUCKLE COUPLING BOLT INSTALLATION

- (1) Install the lower arm assembly to the knuckle.

#### Caution

To prevent the dust cover lip from being recessed and grease from flowing out, ensure that protrusion A of the ball joint stud from knuckle measures 4 mm or less during installation of the lower arm assembly.

- (2) Should the knuckle be pushed in excessively and grease flow out from the dust cover, replace the dust cover with a new one.
- (3) Check that there is no clearance between the knuckle and dust cover.

## INSPECTION

### BALL JOINT ROTATION STARTING TORQUE

Use the conventional procedures.

### LOWER ARM BALL JOINT DUST COVER REPLACEMENT

Replace the dust cover by using the conventional procedure if it has been inadvertently damaged or grease flown out during servicing.

After the dust cover has been replaced with a new one, push it with a finger to check for possible cracks or damage.

# STABILIZER BAR

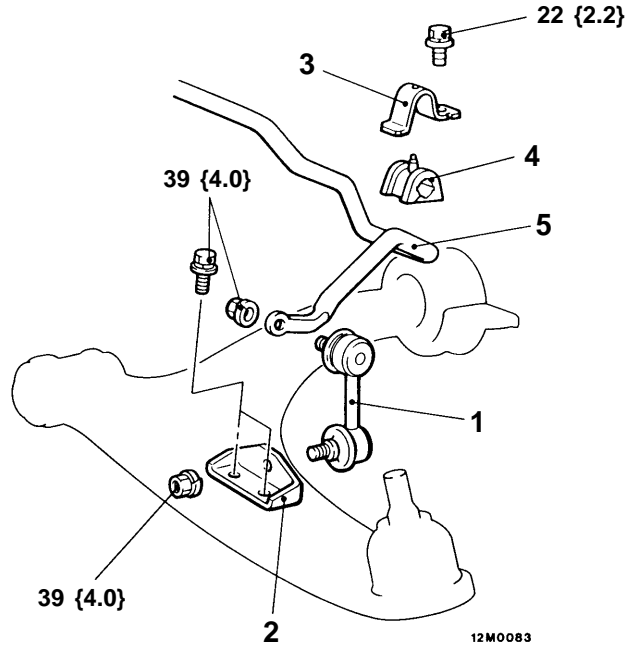
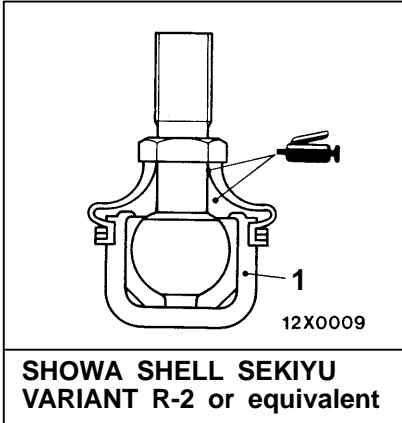
## REMOVAL AND INSTALLATION

**Pre-removal Operation**

- Crossmember Removal

**Post-installation Operation**

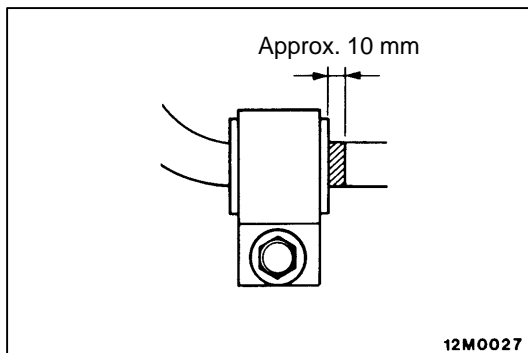
- (1) Crossmember Installation
- (2) Check the Stabilizer Link Ball Joint Dust Cover for Cracks or Damage by Pushing it with Finger.



Unit: Nm {kgf · m}

**Removal steps**

1. Stabilizer link
2. Stabilizer bar bracket
3. Fixture
4. Bushing
5. Stabilizer bar



### INSTALLATION SERVICE POINT

▶◀ **FIXTURE / BUSHING INSTALLATION**

Install the stabilizer bar so that the identification mark is positioned at left. Fit the bushing so that the mark may protrude about 10 mm from the inner end of the bushing, then secure it with the fixture.

**INSPECTION****STABILIZER LINK BALL JOINT ROTATION STARTING TORQUE**

Follow the conventional procedures.

**STABILIZER LINK DUST COVER REPLACEMENT**

Replace the dust cover by using the conventional procedure only if it has been inadvertently damaged during servicing. After the dust cover has been replaced with a new one, push it with a finger to check for possible cracks or damage.

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# REAR SUSPENSION

## CONTENTS

<b>SERVICE SPECIFICATIONS</b> .....	<b>2</b>	<b>UPPER ARM ASSEMBLY</b> .....	<b>6</b>
<b>LUBRICANT</b> .....	<b>2</b>	<b>TRAILING ARM ASSEMBLY</b> .....	<b>8</b>
<b>SPECIAL TOOLS</b> .....	<b>2</b>	<b>LOWER ARM AND TOE CONTROL ARM ASSEMBLIES</b> .....	<b>10</b>
<b>ON-VEHICLE SERVICE</b> .....	<b>3</b>	<b>SHOCK ABSORBER ASSEMBLY</b> .....	<b>13</b>
1. Rear Wheel Alignment Check and Adjustment .....	3	<b>STABILIZER BAR</b> .....	<b>14</b>
2. Ball Joint Dust Cover Check .....	3		
<b>REAR SUSPENSION ASSEMBLY</b> .....	<b>4</b>		



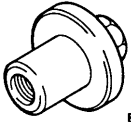
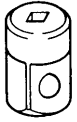
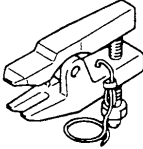

## SERVICE SPECIFICATIONS

Items	Standard value
Toe-in mm	3 ± 2
Camber	-1°00 ± 30'
Rear thrust angle	0°00 ± 9'
Upper arm ball joint turning torque Nm {kgf · cm}	0.5 – 2.5 {5 – 25}
Trailing arm ball joint turning torque Nm {kgf · cm}	0.5 – 2.5 {5 – 25}
Toe control arm ball joint turning torque Nm {kgf · cm}	0.5 – 2.5 {5 – 25}
Toe control arm slide bushing operating torque Nm {kgf · cm}	0.2 – 1.5 {2 – 15}
Stabilizer link ball joint turning torque Nm {kgf · cm}	1.7 – 3.1 {17 – 32}

## LUBRICANT

Items	Specified lubricant	Quantity
Inside and lips of upper arm ball joint dust cover	Molybdenum disulfide-base chassis grease: SHOWA SHELL SEKIYU SUNLITE MB2, NISSEKI CLAKNOCK FL, or equivalent	As required
Inside and lips of trailing arm ball joint dust cover		
Inside and lips of control arm ball joint dust cover		
Inside and lips of stabilizer link ball joint dust cover	SHOWA SHELL SEKIYU VARIANT R-2 or equivalent	

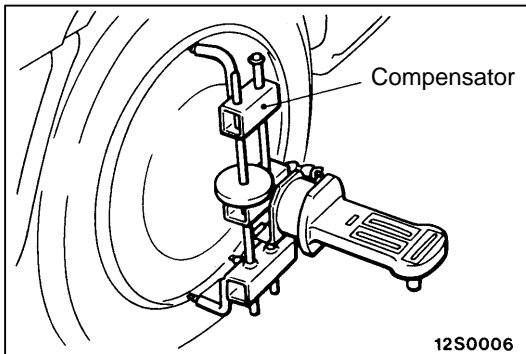
## SPECIAL TOOLS

Tool	Number	Name	Use
 B991004	MB991004	Wheel alignment gauge attachment	Measurement of wheel alignment <vehicles with aluminum wheels>
 B990326	MB990326	Preload socket	Measurement of ball joint turning torque
 B991113	MB990635, MB991113, or MB991406	Steering linkage puller	Disconnection of ball joint from knuckle
	MB990800	Ball joint remover & installer	Pressfitting of ball joint dust cover

## ON-VEHICLE SERVICE

### 1. REAR WHEEL ALIGNMENT CHECK AND ADJUSTMENT

- (1) The rear suspension and wheels should be serviced to the normal condition prior to measurement of wheel alignment.
- (2) Measure the wheel alignment with the vehicle parked on level ground.



#### 1-1 CAMBER

**Standard value:  $-1^{\circ}00' \pm 30'$**

**(The difference between the left and right wheels should be 30' or less.)**

#### NOTE

For vehicles equipped with aluminium wheels, measure the camber using a compensator. If no compensator is available, measure the camber after tightening the special tool (MB991004) to the specified torque 196 – 255 Nm {20.0 – 26.0 kgf·m}.

#### Caution

**Never subject the wheel bearings to the full vehicle load when the flange nuts/drive shaft nuts are loosened.**

If outside the standard value, adjust by the following procedure.

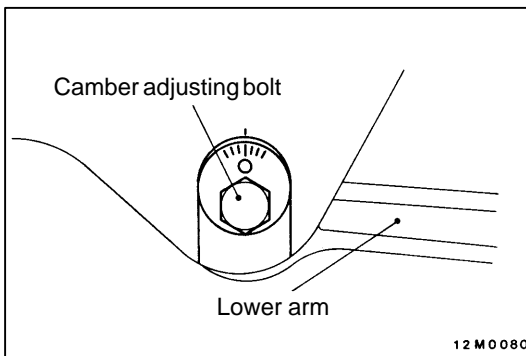
- (1) Adjust by turning the camber adjusting bolt (mounting bolt for the lower arm and rear crossmember).

Left wheel: clockwise + camber

Right wheel: clockwise – camber

The scale has gradations of approximately 14'.

- (2) After adjusting the camber, be sure to adjust the toe-in.



#### 1-2 TOE-IN

**Standard value:**

**At the centre of tyre tread  $3 \pm 2$  mm**

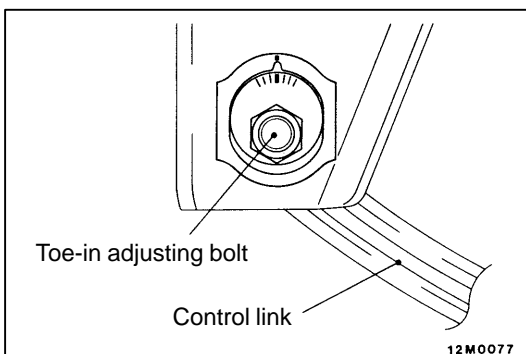
If outside the standard value, adjust by the following procedure.

- (1) Be sure to adjust the camber before adjusting the toe-in.
- (2) Adjust by turning the toe adjusting bolt (inner mounting bolt toe control arm).

LH: Turning clockwise → toe-in direction

RH: Turning clockwise → toe-out direction

The scale has gradations of approximately 3.3 mm (single side toe angle equivalent to 19').



### 2. BALL JOINT DUST COVER CHECK

- (1) Check the dust cover for cracks or damage by pushing it with finger.
- (2) If the dust cover is cracked or damaged, replace the appropriate suspension arm assembly or stabilizer link.

#### NOTE

Cracks or damage of the dust cover may cause damage of the ball joint.



# REAR SUSPENSION ASSEMBLY

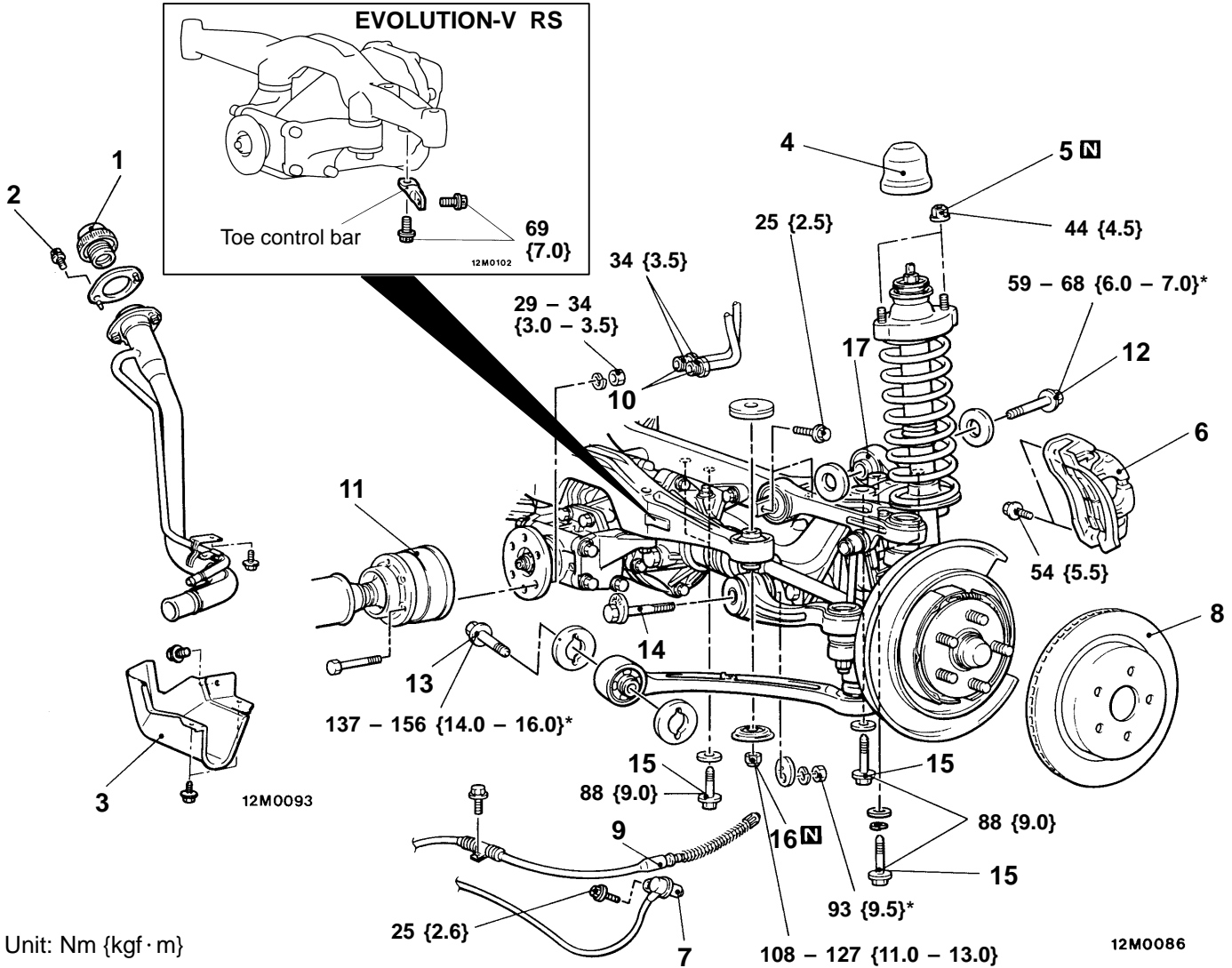
## REMOVAL AND INSTALLATION

### Pre-removal Operation

- (1) Center Exhaust Pipe Removal  
(Refer to GROUP 15.)
- (2) Trunk Room Side Trim Removal <GSR>
- (3) AYC Fluid Draining  
(Refer to GROUP 27 – On-vehicle Service.)

### Post-installation Operation

- (1) AYC Fluid Refilling and Bleeding  
(Refer to GROUP 27 – On-vehicle Service.)
- (2) Center Exhaust Pipe Installation  
(Refer to GROUP 15.)
- (3) AYC Operation Check
- (4) Parking Brake Cable Stroke Check  
(Refer to GROUP 36 – On-vehicle Service.)
- (5) Wheel Alignment Check and Adjustment  
(Refer to P.34-3.)



Unit: Nm {kgf · m}

### Removal steps

1. Fuel filler cap
2. Bolt
3. Filler neck protector
4. Cap
5. Shock absorber mounting nut
6. Brake caliper assembly
7. Rear speed sensor <vehicles with AYC>
8. Brake disc
9. Parking brake cable end (Refer to GROUP 36.)
10. AYC fluid line connection <vehicles with AYC>

- ◀B▶ ▶B▶ 11. Propeller shaft connection
- ▶C▶ ▶A▶ 12. Upper arm mounting bolt
13. Trailing arm mounting bolt
14. Toe control arm mounting bolt
15. Crossmember mounting bolt
16. Differential support assembly mounting bolt
17. Rear suspension assembly

### Caution

The parts marked with \* should be first temporarily tightened, then torqued to specification with the vehicle on the ground in unloaded condition.

**REMOVAL SERVICE POINTS**

**◀A▶ BRAKE CALIPER ASSEMBLY REMOVAL**

Remove the brake caliper assembly and secure it with a wire.

**◀B▶ PROPELLER SHAFT DISCONNECTION**

- (1) Make an alignment mark on the differential carrier companion flange and propeller shaft flange yoke.
- (2) Remove the mounting bolts and nuts of the differential carrier and propeller shaft.

**◀C▶ CROSSMEMBER MOUNTING BOLT REMOVAL**

Support the differential case with a garage jack or transmission jack and then remove the crossmember mounting bolt.

**INSTALLATION SERVICE POINTS**

**▶A◀ CROSSMEMBER MOUNTING BOLT INSTALLATION**

Tighten the mounting bolts in the numerical order shown.

**NOTE**

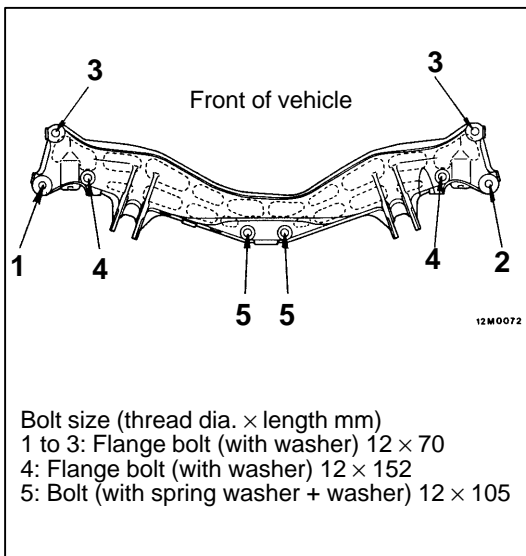
To ensure both good installation accuracy and ease of installation, the crossmember mounting holes have different diameters between front and rear. This is the reason for specifying the tightening sequence of the mounting bolts.

**▶B◀ PROPELLER SHAFT CONNECTION**

Align the alignment mark on the differential carrier with that of the propeller shaft at installation.

**Caution**

**Oil or grease on the threads of the mounting bolt or nut can allow the bolt or nut to come loose. Be sure to degrease the threads before installation.**

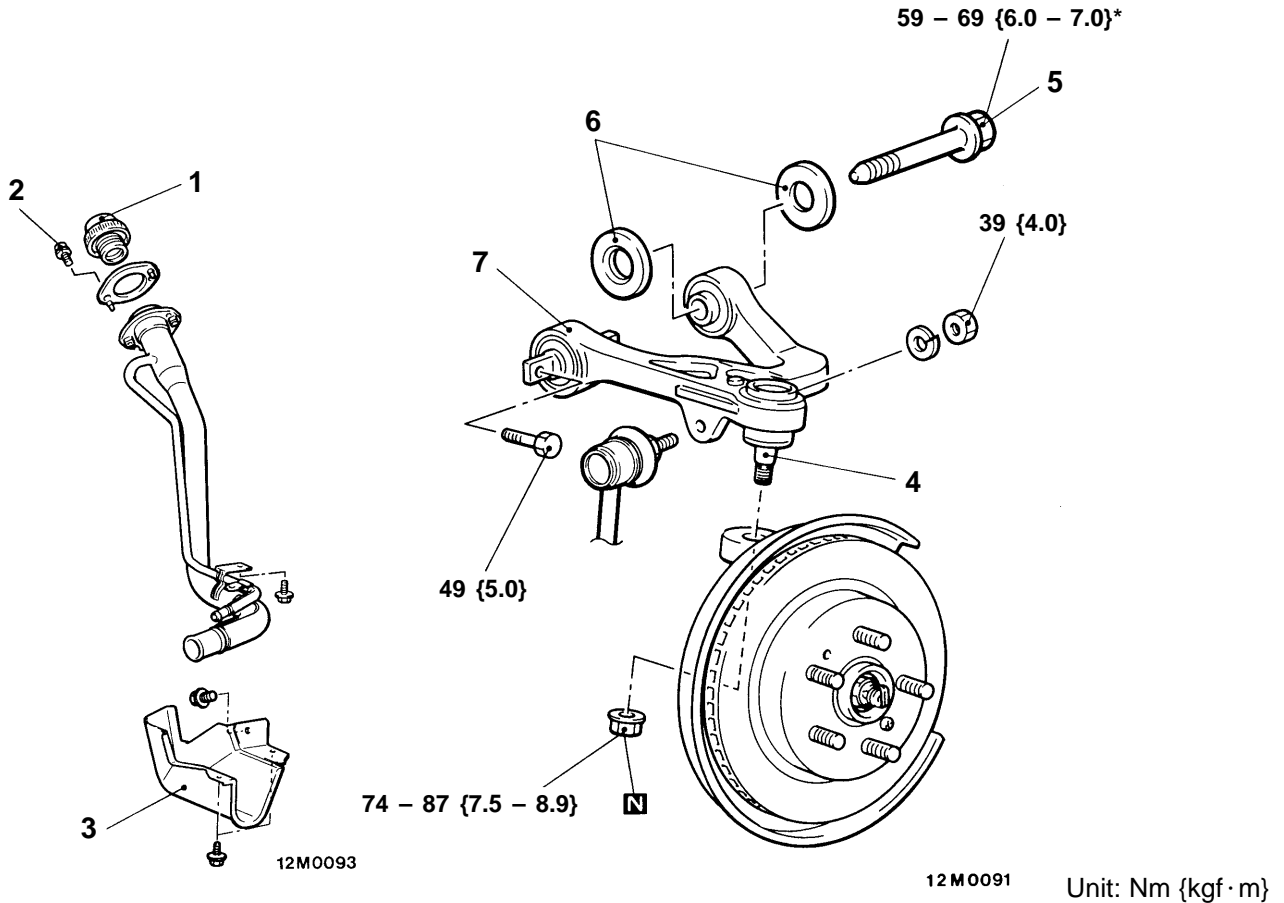


# UPPER ARM ASSEMBLY

## REMOVAL AND INSTALLATION

**Post-installation Operation**

- (1) Push the Dust Cover of the Upper Arm Ball Joint with a Finger to Check for Possible Cracks or Damage.
- (2) Wheel Alignment Check and Adjustment (Refer to P.34-3.)



**Removal steps**

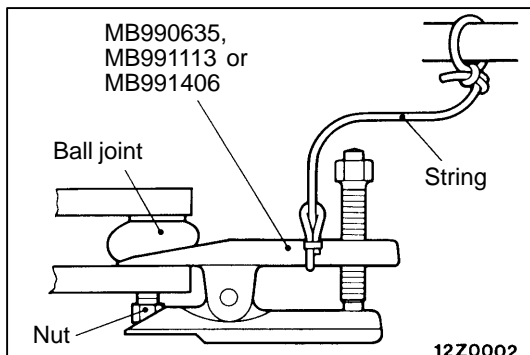
1. Fuel filler cap\*
2. Bolt\*
3. Filler neck protector\*
4. Upper arm assembly to knuckle coupling
5. Upper arm assembly mounting bolt
6. Stopper
7. Upper arm assembly

**NOTE**

Parts marked with \* apply only when RH side is removed and installed.

**Caution**

The part marked with \* should be first temporarily tightened, then torqued to specification with the vehicle on the ground in unloaded condition.

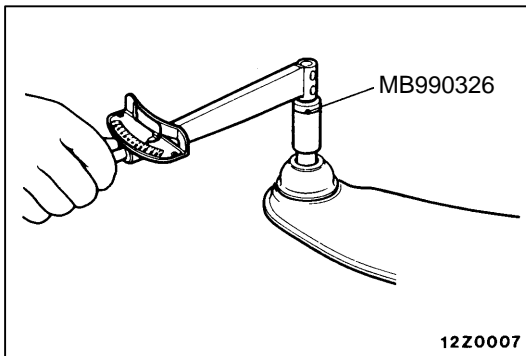


**REMOVAL SERVICE POINT**

**◀▶ UPPER ARM ASSEMBLY DISCONNECTION FROM KNUCKLE**

**Caution**

- (1) Only loosen the nut, and not remove it from the ball joint, and use the special tool.
- (2) Hang the special tool with a string to prevent the parts including the tool from falling apart.



**INSPECTION**

**1. UPPER ARM BALL JOINT TURNING TORQUE CHECK**

- (1) Rock the upper arm ball joint stud several times; then, mount a nut to the stud and, using the special tool, measure the turning torque of the upper arm ball joint.

**Standard value: 0.5 – 2.5 Nm {5 – 25 kgf·cm}**

- (2) If the measurement exceeds the standard value, replace the upper arm assembly.
- (3) If the measurement falls short of the standard value, check that the ball joint turns smoothly without excessive play. If so, the ball joint should still be in good condition for continued use.

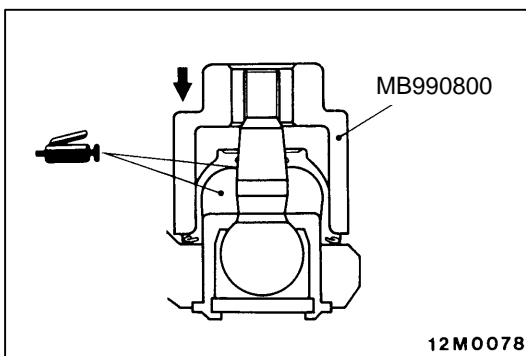
**2. UPPER ARM BALL JOINT DUST COVER CHECK**

- (1) Check the dust cover for cracks or damage by pushing it with a finger.
- (2) If the dust cover is cracked or damaged, replace the upper arm assembly.

**NOTE**

A cracked or damaged dust cover can lead to a damaged ball joint.

If the dust cover is damaged during servicing, replace it with a new one.



**UPPER ARM BALL JOINT DUST COVER REPLACEMENT**

Only when the dust cover is damaged accidentally during service work, follow these steps to replace it with a new one.

- (1) Remove the dust cover.
- (2) Pack and apply the specified grease to the inside and lips of the dust cover.

**Molybdenum disulfide-base chassis grease:**

**SHOWA SHELL SEKIYU SUNLITE MB2, NISSEKI CLAKNOCK FL, or equivalent**

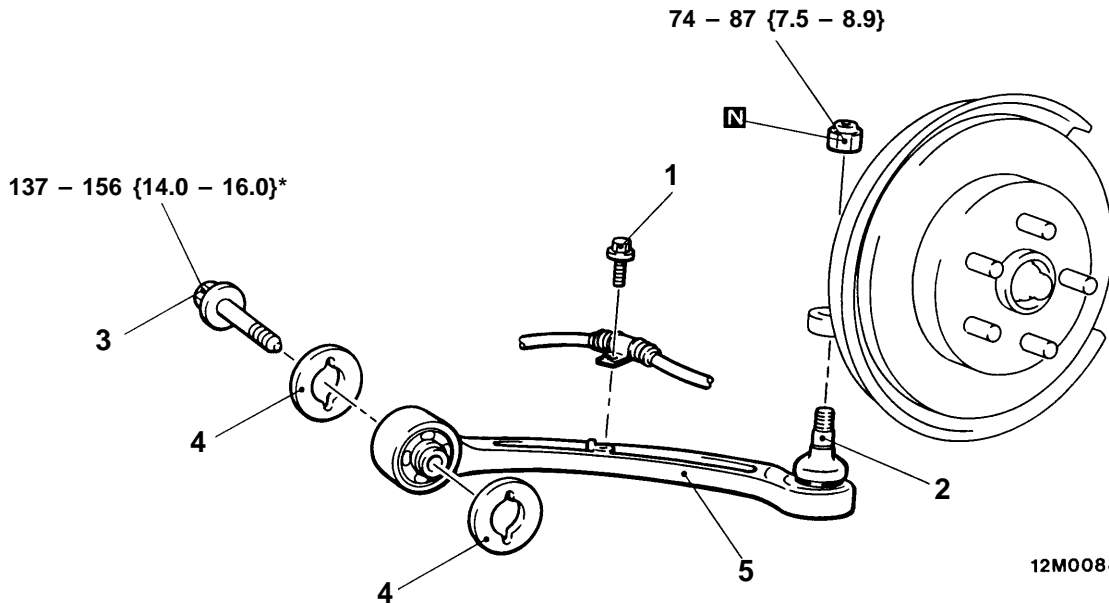
- (3) Using the special tool, press the dust cover until it contacts the snap ring.
- (4) Push the dust cover with a finger to ensure that it is free from cracks or damage.

# TRAILING ARM ASSEMBLY

## REMOVAL AND INSTALLATION

**Post-installation Operation**

- (1) Push the Dust Cover of the Trailing Arm Ball Joint with a Finger to Check for Possible Cracks or Damage.
- (2) Wheel Alignment Check and Adjustment (Refer to P.34-3.)



12M0088

Unit: Nm {kgf·m}

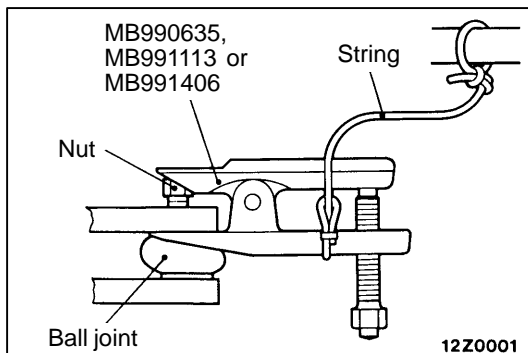
**Removal steps**



- 1. Parking brake cable bolt
- 2. Trailing arm assembly to knuckle coupling
- 3. Trailing arm assembly mounting bolt
- 4. Stopper
- 5. Trailing arm assembly

**Caution**

The part marked with \* should be first temporarily tightened, then torqued to specification with the vehicle on the ground in unloaded condition.

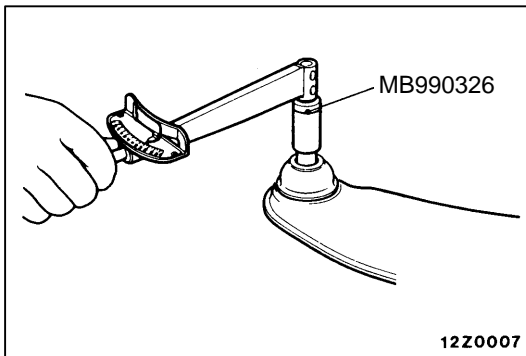


**REMOVAL SERVICE POINT**

**◀A▶ TRAILING ARM ASSEMBLY DISCONNECTION FROM KNUCKLE**

**Caution**

- (1) Only loosen the nut, and not remove it from the ball joint, and use the special tool.
- (2) Hang the special tool with a string to prevent the parts including the tool from falling apart.



**INSPECTION**

**1. TRAILING ARM BALL JOINT TURNING TORQUE CHECK**

- (1) Rock the trailing arm ball joint stud several times; then, mount a nut to the stud and, using the special tool, measure the turning torque of the ball joint.

**Standard value: 0.5 – 2.5 Nm {5 – 25 kgf·cm}**

- (2) If the measurement exceeds the standard value, replace the trailing arm assembly.
- (3) If the measurement falls short of the standard value, check that the ball joint turns smoothly without excessive play. If so, the ball joint should still be in good condition for continued use.

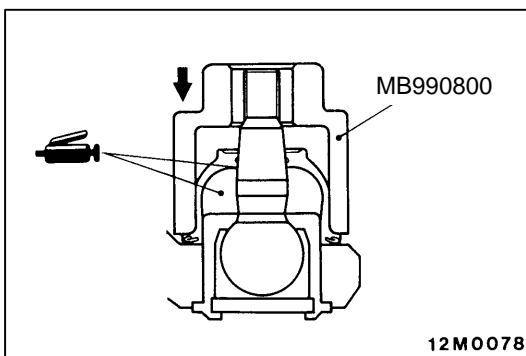
**2. TRAILING ARM BALL JOINT DUST COVER CHECK**

- (1) Check the dust cover for cracks or damage by pushing it with a finger.
- (2) If the dust cover is cracked or damaged, replace the trailing arm assembly.

**NOTE**

A cracked or damaged dust cover can lead to a damaged ball joint.

If the dust cover is damaged during servicing, replace it with a new one.



**TRAILING ARM BALL JOINT DUST COVER REPLACEMENT**

Only when the dust cover is damaged accidentally during service work, follow these steps to replace it with a new one.

- (1) Remove the dust cover.
- (2) Pack and apply the specified grease to the inside and lips of the dust cover.

**Molybdenum disulfide-base chassis grease:**

**SHOWA SHELL SEKIYU SUNLITE MB2, NISSEKI CLAKNOCK FL, or equivalent**

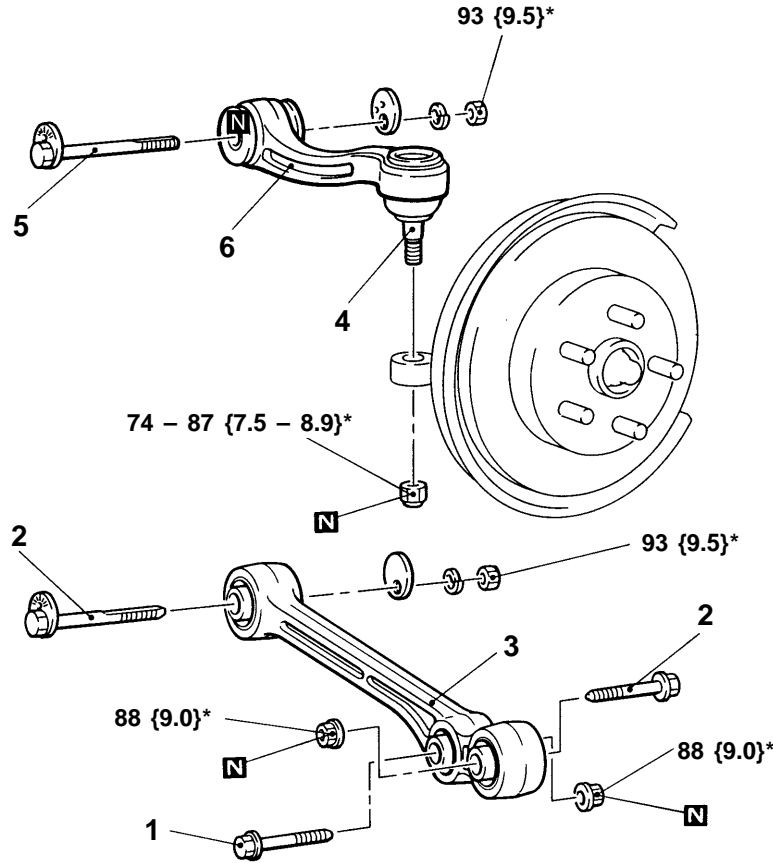
- (3) Using the special tool, press the dust cover until it contacts the snap ring.
- (4) Push the dust cover with a finger to ensure that it is free from cracks or damage.

# LOWER ARM AND TOE CONTROL ARM ASSEMBLIES

## REMOVAL AND INSTALLATION

**Post-installation Operation**

- (1) Check the Toe Control Arm Ball Joint Dust Cover for Cracks or Damage by Pushing it with Finger
- (2) Wheel Alignment Check and Adjustment (Refer to P.34-3.)



12M0089

Unit: Nm {kgf·m}

**Lower arm assembly removal steps**

1. Lower arm assembly and shock absorber connecting bolt
2. Lower arm assembly mounting bolt
3. Lower arm assembly



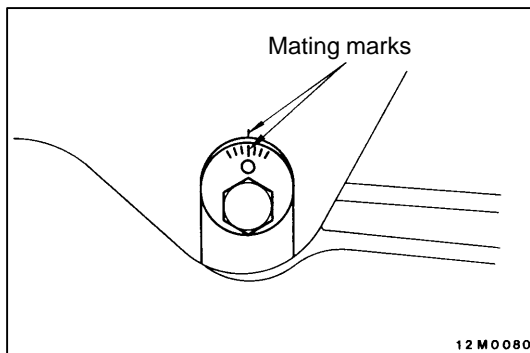
**Toe control arm assembly removal steps**

4. Toe control arm and knuckle connection
5. Toe control arm assembly mounting bolt
6. Toe control arm assembly



**Caution**

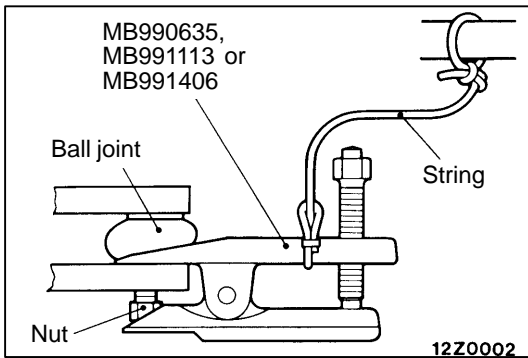
The part marked with \* should be first temporarily tightened, then torqued to specification with the vehicle on the ground in unloaded condition.



**REMOVAL SERVICE POINTS**

**LOWER ARM ASSEMBLY MOUNTING BOLT REMOVAL**

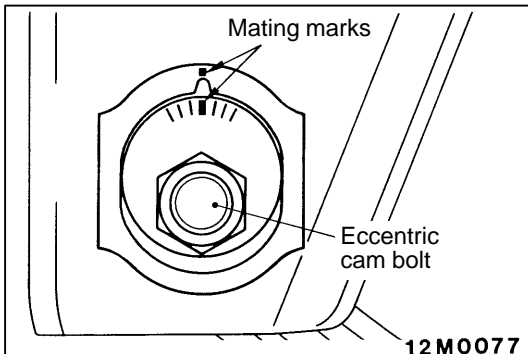
Place mating marks on the lower arm and the eccentric cam bolt before removal.



**◀B▶ TOE CONTROL ARM AND KNUCKLE DISCONNECTION**

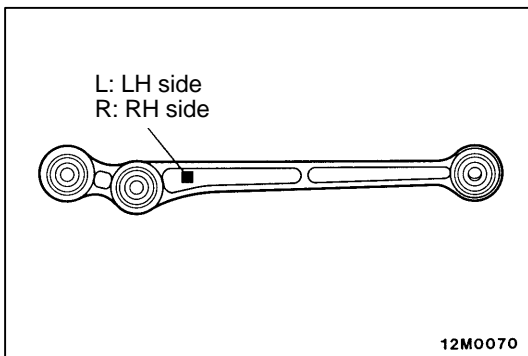
**Caution**

- (1) Use the special tool to loosen the nut only; do not removal it from the ball joint.
- (2) Tie the special tool with a cord not to let it fall off.



**◀C▶ TOE CONTROL ARM ASSEMBLY MOUNTING BOLT REMOVAL**

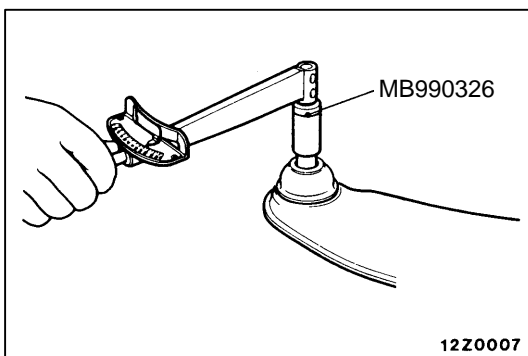
Place mating marks on the toe control arm and the eccentric cam bolt before removal.



**INSTALLATION SERVICE POINT**

**▶A◀ LOWER ARM ASSEMBLY INSTALLATION**

Install the lower arm assemblies according to the identification mark stamped in the illustrated position.



**INSPECTION**

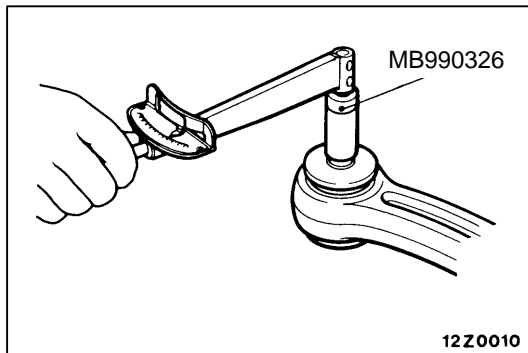
**1. TOE CONTROL ARM BALL JOINT TURNING TORQUE CHECK**

- (1) After shaking the ball joint stud several times, install the nut to the stud and use the special tool to measure the turning torque of the ball joint.

**Standard value: 0.5 – 2.5 Nm {5 – 25 kgf·cm}**

- (2) When the measured value exceeds the standard value, replace the toe control arm assembly.
- (3) When the measured value is lower than the standard value, check that the ball joint turns smoothly without excessive play. If so, it is possible to use that ball joint.





### 2. TOE CONTROL ARM SLIDE BUSHING OPERATING TORQUE CHECK

- (1) Insert a bolt into the slide bushing of the toe control arm. Fit a washer onto the bolt from the opposite end and screw a nut onto it. Turn the inner cylinder (together with the washer) several turns, then measure the toe control arm slide bushing operating torque using the special tool.

**Standard value: 0.2 – 1.5 Nm {2 – 15 kgf·cm}**

- (2) If the measurement exceeds the standard value, replace the toe control arm assembly.
- (3) If the measurement falls short of the standard value, check that the slide bushing turns smoothly without excessive play. If so, the slide bushing should still be in good condition for continued use.

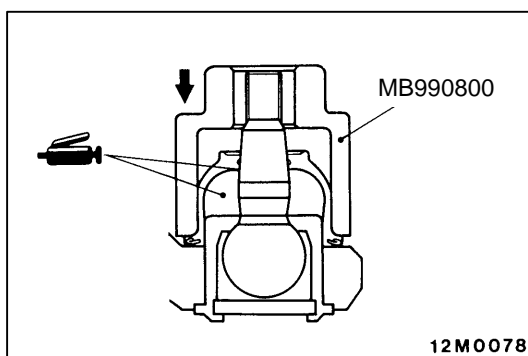
### 3. TOE CONTROL ARM BALL JOINT DUST COVER CHECK

- (1) Check the dust cover for cracks or damage by pushing it with a finger.
- (2) If the dust cover is cracked or damaged, replace the toe control arm assembly.

#### NOTE

A cracked or damaged dust cover can lead to a damaged ball joint.

If the dust cover is damaged during servicing, replace it with a new one.



### TOE CONTROL ARM BALL JOINT DUST COVER REPLACEMENT

Only when the dust cover is damaged accidentally during service work, follow these steps to replace it with a new one.

- (1) Remove the dust cover.
- (2) Pack and apply the specified grease to the inside and lips of the dust cover.

#### Molybdenum disulfide-base chassis grease:

**SHOWA SHELL SEKIYU SUNLITE MB2, NISSEKI CLAKNOCK FL, or equivalent**

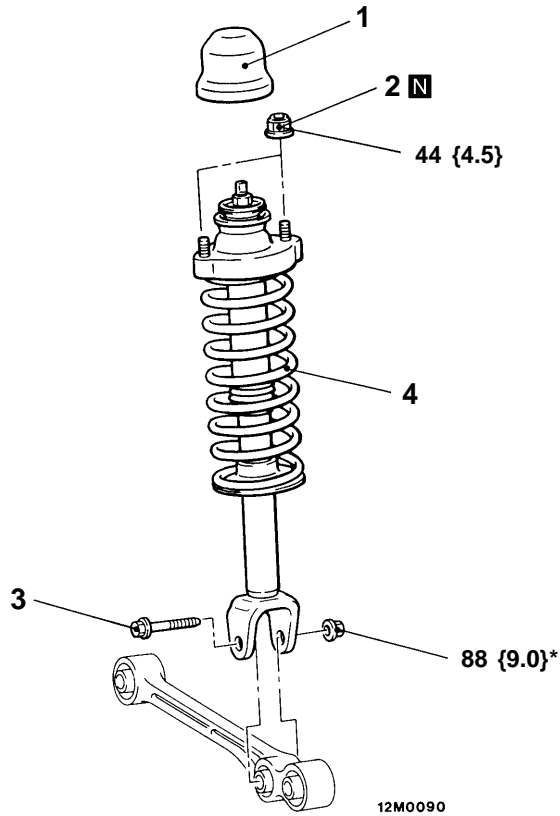
- (3) Using the special tool, press the dust cover until it contacts the snap ring.
- (4) Push the dust cover with a finger to ensure that it is free from cracks or damage.

# SHOCK ABSORBER ASSEMBLY

## REMOVAL AND INSTALLATION

**Pre-removal and Post-installation Operation**

- Trunk Room Side Trim Removal and Installation <GSR>



Unit: Nm {kgf·m}

**Removal steps**

1. Cap
2. Shock absorber mounting nuts
3. Bolt
4. Shock absorber assembly

**Caution**

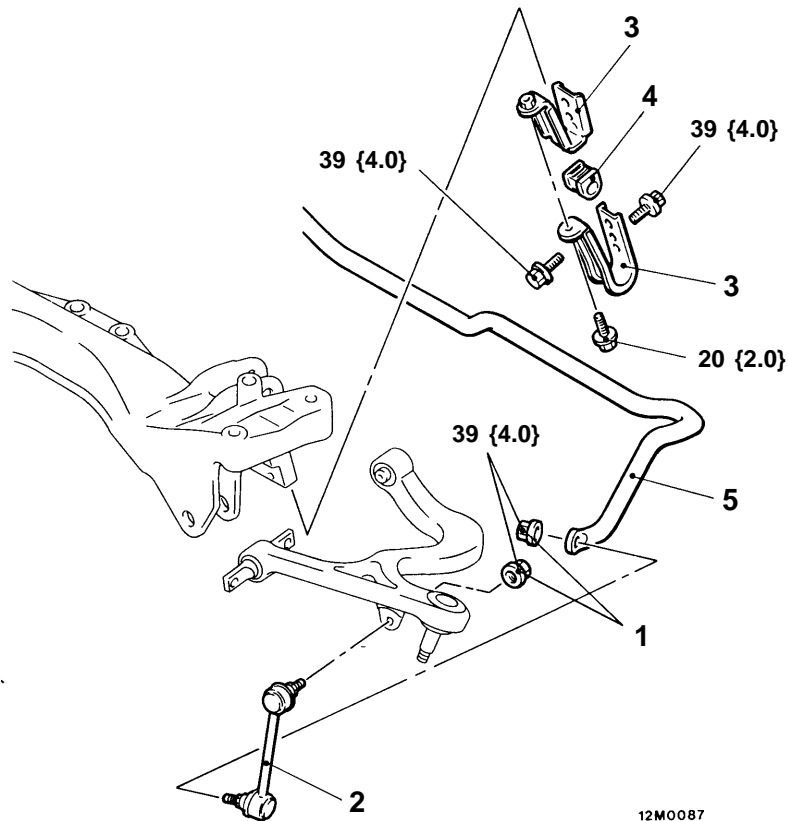
The part marked with \* should be first temporarily tightened, then torqued to specification with the vehicle on the ground in unloaded condition.

## STABILIZER BAR

### REMOVAL AND INSTALLATION

#### Post-installation Operation

- Check the Stabilizer Link Ball Joint Dust Cover for Cracks or Damage by Pushing it with Finger.

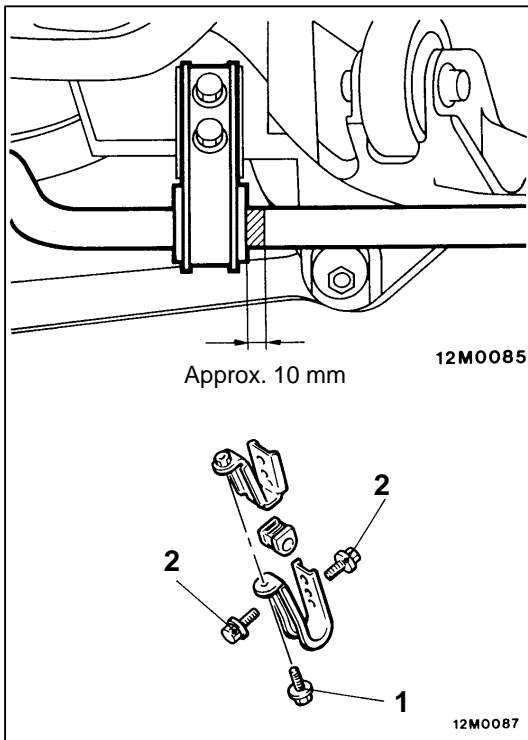


Unit: Nm {kgf · m}

#### Removal steps

1. Stabilizer link mounting nuts
2. Stabilizer link
3. Stabilizer bar bracket
4. Bushing
5. Stabilizer bar

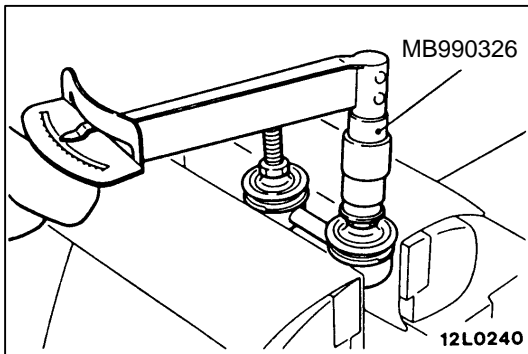




**INSTALLATION SERVICE POINT**

**▶◀ STABILIZER BAR / BUSHING / STABILIZER BAR BRACKET INSTALLATION**

Position the stabilizer bar such that the identification mark may protrude toward the vehicle center as shown in the figure, and tighten first the stabilizer bar bracket mounting bolt 1 then the mounting bolt 2.



**INSPECTION**

**1. STABILIZER LINK BALL JOINT TURNING TORQUE CHECK**

- (1) After shaking the ball joint stud several times, install the nut to the stud and use the special tool to measure the turning torque of the ball joint.

**Standard value: 1.7 – 3.1 Nm {17 – 32 kgf·cm}**

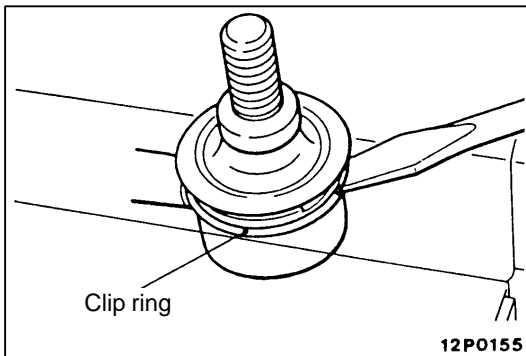
- (2) When the measured value exceeds the standard value, replace the stabilizer link.
- (3) When the measured value is lower than the standard value, check that the ball joint turns smoothly without excessive play. If so, it is possible to use that ball joint.

**2. STABILIZER LINK BALL JOINT DUST COVER CHECK**

- (1) Check the dust cover for cracks or damage by pushing it with finger.
- (2) If the dust cover is cracked or damaged, replace the stabilizer link.

**NOTE**

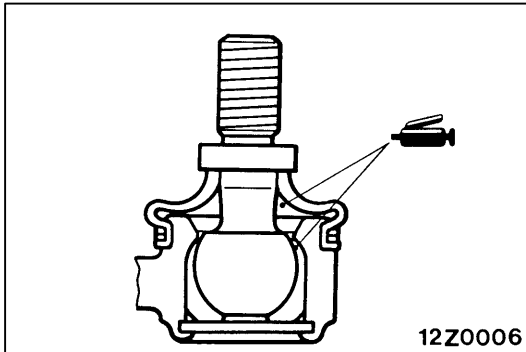
Cracks or damage of the dust cover may cause damage of the ball joint. When it is damaged during service work, replace the dust cover.



### STABILIZER LINK BALL JOINT DUST COVER REPLACEMENT

Only when the dust cover is damaged accidentally during service work, replace the dust cover as follows:

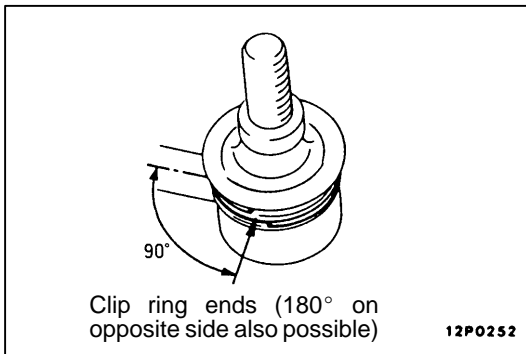
- (1) Remove the clip ring and the dust cover.



- (2) Apply the specified grease to the lip and inside of the dust cover.

**Specified grease:**

**SHOWA SHELL SEKIYU VARIANT R-2 or equivalent**



- (3) Wrap plastic tape on the stabilizer link threads as shown in the illustration, and then install the dust cover to the stabilizer link.
- (4) Secure the dust cover with the clip ring. When installing the clip ring, align the ends at a 90° angle from the axis of the stabilizer link.
- (5) Check the dust cover for cracks or damage by pushing it with finger.

# SERVICE BRAKES

## CONTENTS

BASIC BRAKE SYSTEM .....	35A
ANTI-LOCK BRAKING SYSTEM (ABS) .....	35B





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# BASIC BRAKE SYSTEM

## CONTENTS

<b>SERVICE SPECIFICATIONS</b> .....	2	4. Disc Brake Pad Check and Replacement <EVOLUTION-IV> .....	4
<b>LUBRICANTS</b> .....	2	5. Disc Brake Pad Check and Replacement <EVOLUTION-V> .....	4
<b>SEALANT</b> .....	3	6. Brake Disc Thickness Check .....	6
<b>SPECIAL TOOLS</b> .....	3	7. Brake Drum I.D. Check .....	6
<b>ON-VEHICLE SERVICE</b> .....	3	8. Lining to Brake Drum Contact Check ...	6
1. Brake Booster Operation Check .....	3	<b>FRONT BRAKE</b> .....	<b>7</b>
2. Proportioning Valve Function Test .....	3	<b>REAR BRAKE</b> .....	<b>8</b>
3. Bleeding <EVOLUTION-V> .....	4		





## SERVICE SPECIFICATIONS

### <EVOLUTION-IV>

Items		Standard value	Limit
Brake booster nonboosting action test generated fluid pressure kPa {kgf/cm <sup>2</sup> }	Pedal force 98 N {10 kgf}	49 {0.5} or more	–
	Pedal force 294 N {30 kgf}	1,177 {12} or more	–
Brake booster boosting action test generated fluid pressure kPa {kgf/cm <sup>2</sup> }	Pedal force 98 N {10 kgf}	2,354 – 3,334 {24 – 34}	–
	Pedal force 294 N {30 kgf}	6,963 – 9,414 {71 – 96}	–
Proportioning valve	Split point kPa {kgf/cm <sup>2</sup> }	2,697 – 3,187 {27.5 – 32.5}	–
	Output fluid pressure kPa {kgf/cm <sup>2</sup> } (input fluid pressure kPa {kgf/cm <sup>2</sup> })	4,658 {47.5} (9,807 {100})	–
Front disc brake drag force N {kgf}		51 {5.2}	–
Rear disc brake	Brake pad thickness mm	10.0	2.0
	Brake disc thickness mm	20.0	18.4
	Brake drag force N {kgf}	69 {7.0}	–
	Brake drum I.D. mm	168.0	169.0

### <EVOLUTION-V>

Same as EVOLUTION-IV except for followings.

Items		Standard value	Limit
Front disc brake	Brake pad thickness mm	10.0	2.0
	Brake drag force N {kgf}	69 {7.0}	–
Rear disc brake	Brake pad thickness mm	10.0	2.0
	Brake drag force N {kgf}	69 {7.0}	–

## LUBRICANTS

Items	Specified lubricant	Quantity
Brake fluid	MITSUBISHI GENUINE DIA QUEEN BRAKE FLUID SUPER	As required
Piston boot, piston seal	Repair kit grease	
Guide pin, lock pin		
Pin boot, guide pin sleeve		
Piston, wheel cylinder body		
Packing plate	CHUO YUKA AKB100	
Shoe & lining assembly		
Auto adjuster assembly		

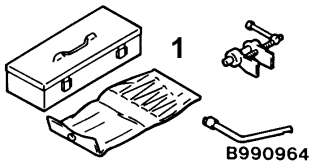
## SEALANT

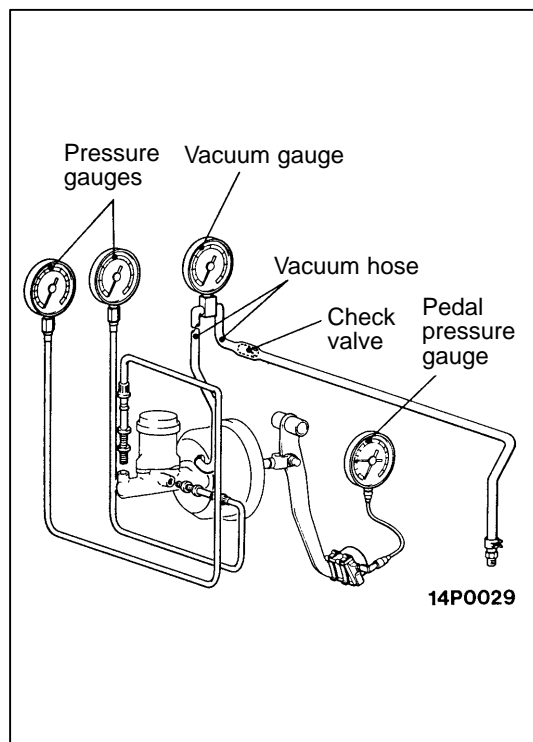
Items	Specified sealant
Fitting	Semi-drying sealant: THREEBOND 1104 [0110207]
Vacuum switch	HELMESEAL 101Y [MZ100022 (containing 100 g)], [MZ100023 (containing 500 g)] HELMESEAL 201-52B [0110511 (containing 100 g)], [0110512 (containing 500 g)]

### NOTE

Given in [ ] are the genuine part numbers.

## SPECIAL TOOLS

Tool	Number	Name	Use
	MB990964 1: MB991008 (F)	Brake tool set	Installation of rear drum brake piston cup



## ON-VEHICLE SERVICE

### 1. BRAKE BOOSTER OPERATION CHECK

The conventional procedures apply except for the following standard value.

#### Nonboosting action test

Standard value:

Fluid pressure generated kPa {kgf/cm<sup>2</sup>}

Pedal force 98 N {10 kgf}: 49 {0.5} or more

Pedal force 294 N {30 kgf}: 1,177 {12} or more

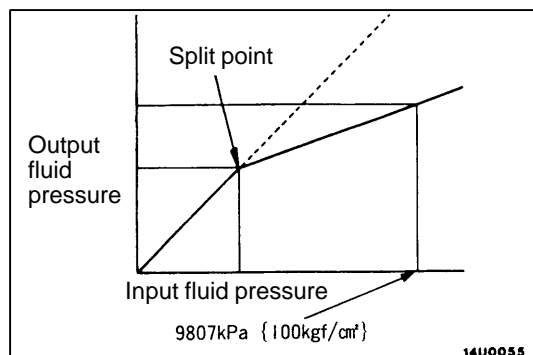
#### Boosting action test

Standard value:

Fluid pressure generated kPa {kgf/cm<sup>2</sup>}

Pedal force 98 N {10 kgf}: 2,354 – 3,334 {24 – 34}

Pedal force 294 N {30 kgf}: 6,963 – 9,414 {71 – 96}

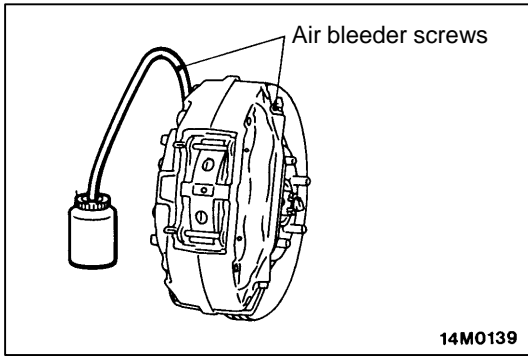


### 2. PROPORTIONING VALVE FUNCTION TEST

The conventional procedures apply except for the following standard value.

Standard value:

Input fluid pressure kPa {kgf/cm <sup>2</sup> }	Output fluid pressure kPa {kgf/cm <sup>2</sup> }
Split point	2,697 – 3,187 {27.5 – 32.5}
9,807 {100}	4,658 {47.5}



### 3. BLEEDING <EVOLUTION-V>

Connect a vinyl tube to the outer end of the air bleeder screw to bleed the circuit of air. Then, connect the vinyl tube to the inner end and bleed the circuit of air. Except for these, the conventional procedures shall be followed. After the circuit has been bled of air, tighten both air bleeder screws to the specified torque.

### 4. DISC BRAKE PAD CHECK AND REPLACEMENT <EVOLUTION-IV>

#### 4-1 FRONT BRAKE

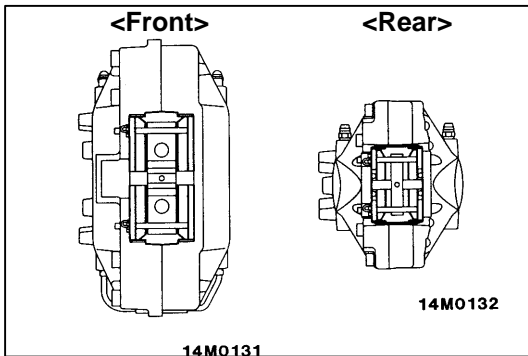
Use the same procedure as that for the 2-pot type disc brake.

#### 4-2 REAR BRAKE

The conventional procedures apply except for the following standard value for the brake pad thickness.

**Standard value (brake pad thickness): 10.0 mm**

**Limit: 2.0 mm**



### 5. DISC BRAKE PAD CHECK AND REPLACEMENT <EVOLUTION-V>

#### NOTE

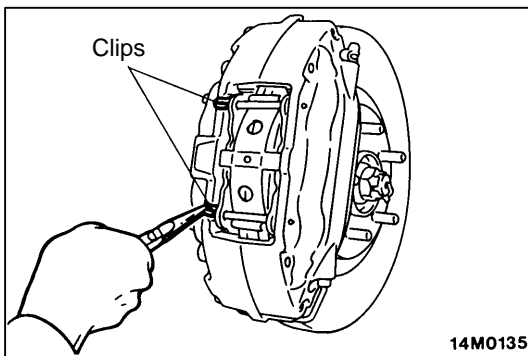
The wear indicator contacts the brake disc to squeak when the pad thickness becomes about 2 mm, warning the driver that the pad needs replacement.

- (1) Visually check for the brake pad thickness through the inspection hole in the caliper body.

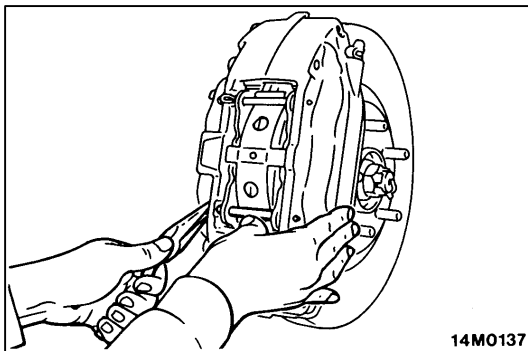
**Standard value: 10.0 mm**

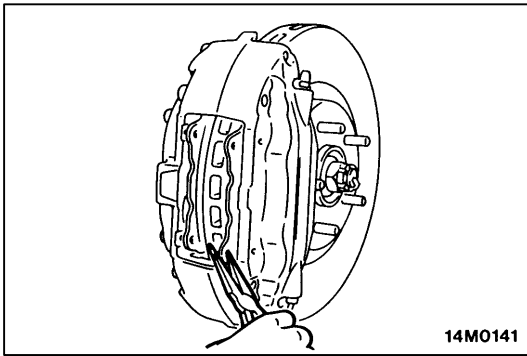
**Limit: 2.0 mm**

- (2) If the brake pad thickness is less than the limit, follow steps (3) and onward to replace the brake pads on both sides with new ones as a set.
- (3) Remove clips from the pins.

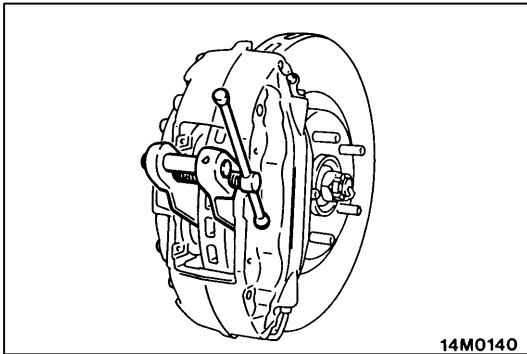


- (4) Holding the cross spring with one hand, pull the pin out of the caliper.

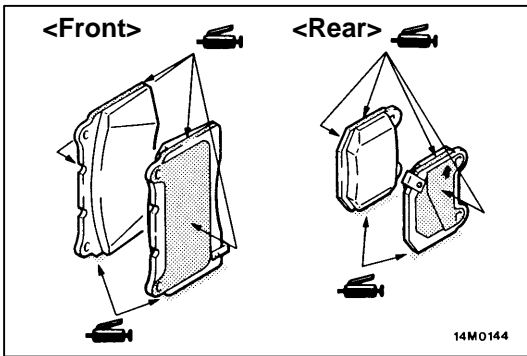




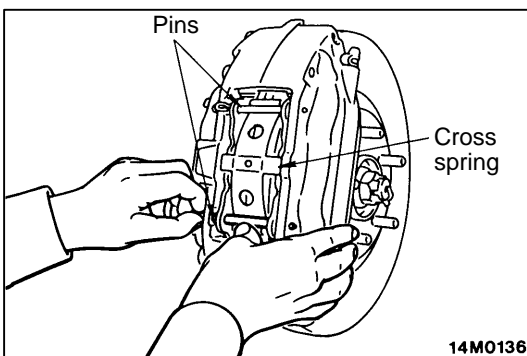
- (5) Remove the pad from the caliper.
- (6) To measure brake drag force after new pads have been installed, use a spring balance to measure the turning sliding resistance of the hub with the pads removed.



- (7) Clean the piston and, using the special tool, push the piston into the cylinder.

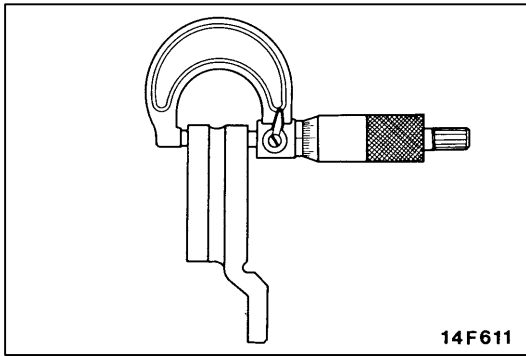


- (8) Apply repair kit grease to the portions of the pads indicated on the left. At this time, make sure that the grease will not be applied to any other surfaces.
- (9) Mount the pad to the caliper so that its side with the wear indicator is on the outside of the vehicle. With the rear pad, ensure that the arrow on the pad faces in the same direction as the brake disc turns when the vehicle moves forward.



- (10) Holding the cross spring with one hand, fit pins in the caliper.
- (11) Mount clips to the pins.
- (12) Using a spring balance, measure the turning sliding resistance of the hub in the forward direction.
- (13) Find the brake disc drag force [the difference in measurements taken in step (6) and in step (12)].

**Standard value: 69 N {7.0 kgf}**



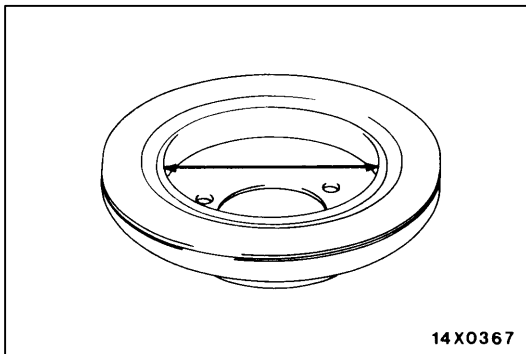
## 6. BRAKE DISC THICKNESS CHECK

- (1) Remove dirt and rust from the surface of the brake disc.
- (2) Measure the thickness of the disc, over which the pad slides, at 4 places or more.

**Standard value:** <Front> 24.0 mm  
<Rear> 20.0 mm

**Limit:** <Front> 22.4 mm  
<Rear> 18.4 mm

- (3) If any of the brake disc thickness measurements exceeds the limit, replace the brake discs and brake pads on both sides as a set.



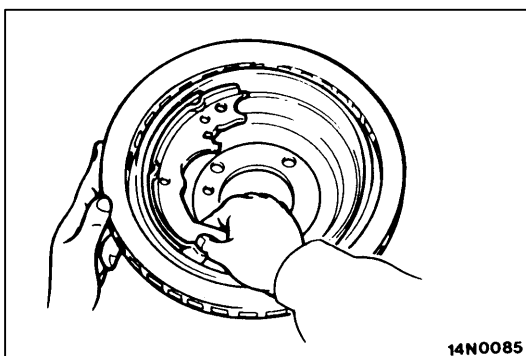
## 7. BRAKE DRUM I.D. CHECK

- (1) Remove the rear brake assembly and support it with a wire.
- (2) Remove the brake disc.
- (3) Measure the I.D. of the brake drum at 2 places or more.

**Standard value: 168.0 mm**

**Limit: 169.0 mm**

- (4) If the brake drum I.D. has worn to exceed the limit, or if an excessive eccentric wear is evident, replace the brake disc with a new one.



## 8. LINING TO BRAKE DRUM CONTACT CHECK

- (1) Remove the rear brake assembly and support it with a wire.
- (2) Remove the brake disc.
- (3) Remove the shoe & lining assembly. (Refer to GROUP 36.)
- (4) Apply chalk to the brake disc inner surface (brake drum) and rub the shoe & lining assembly against it.
- (5) If any irregular contact is evident, replace the shoe & lining assembly or brake disc.

### NOTE

Wipe the surfaces clean of chalk after the check has been completed.

## FRONT BRAKE

### REMOVAL AND INSTALLATION

Except for the followings, use the same procedure as that for conventional disc brake.

### INSTALLATION SERVICE POINT

#### ▶◀DISC BRAKE ASSEMBLY INSTALLATION

Follow the conventional procedures except the standard value for the disc brake drag force.

**Standard value (disc brake drag force):**

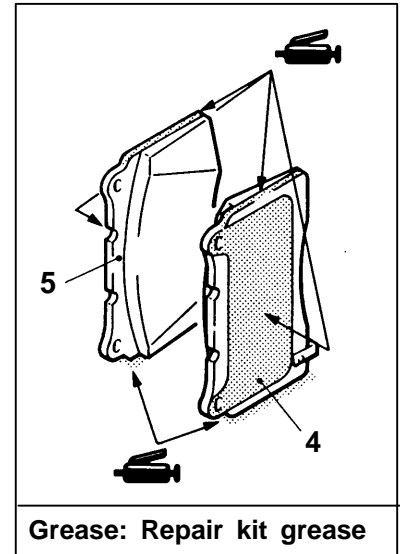
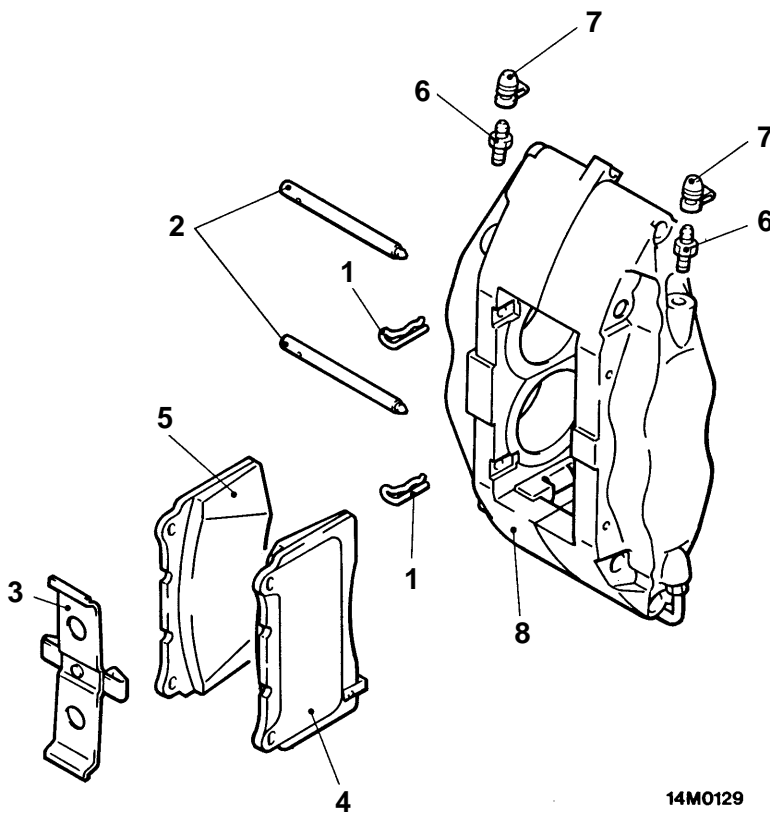
51 N {5.2 kgf} <EVOLUTION-IV>

69 N {7.0 kgf} <EVOLUTION-V>

### DISASSEMBLY AND REASSEMBLY

#### NOTE

On EVOLUTION-IV, follow the same procedure as conventional.  
On EVOLUTION-V, disassemble in the order shown.



#### Disassembly steps

1. Clip
2. Pin
3. Cross spring
4. Pad & wear indicator assembly

5. Pad assembly
6. Air bleeder screw
7. Cap
8. Disc brake caliper assembly

14M0129

## REAR BRAKE

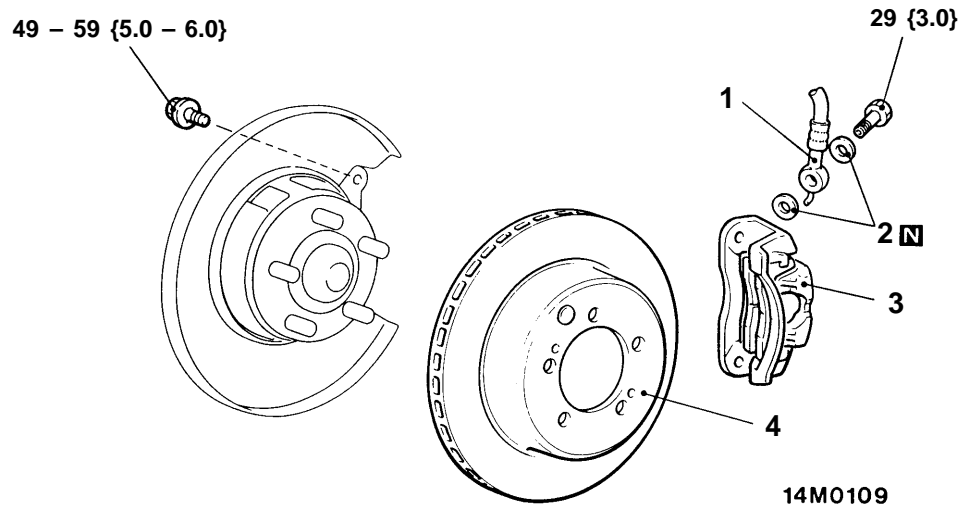
### REMOVAL AND INSTALLATION

#### Pre-removal Operation

- Brake Fluid Draining

#### Post-installation Operation

- Brake Fluid Refilling and Bleeding



Unit: Nm {kgf·m}

#### Removal steps

1. Brake hose connection
2. Gasket
- ▶A◀ 3. Rear brake assembly
4. Brake disc

#### NOTE

Shown here is the illustration of rear brake for EVOLUTION-IV.

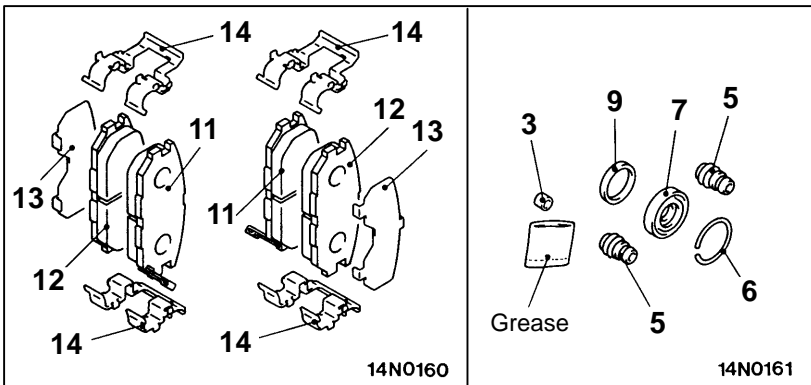
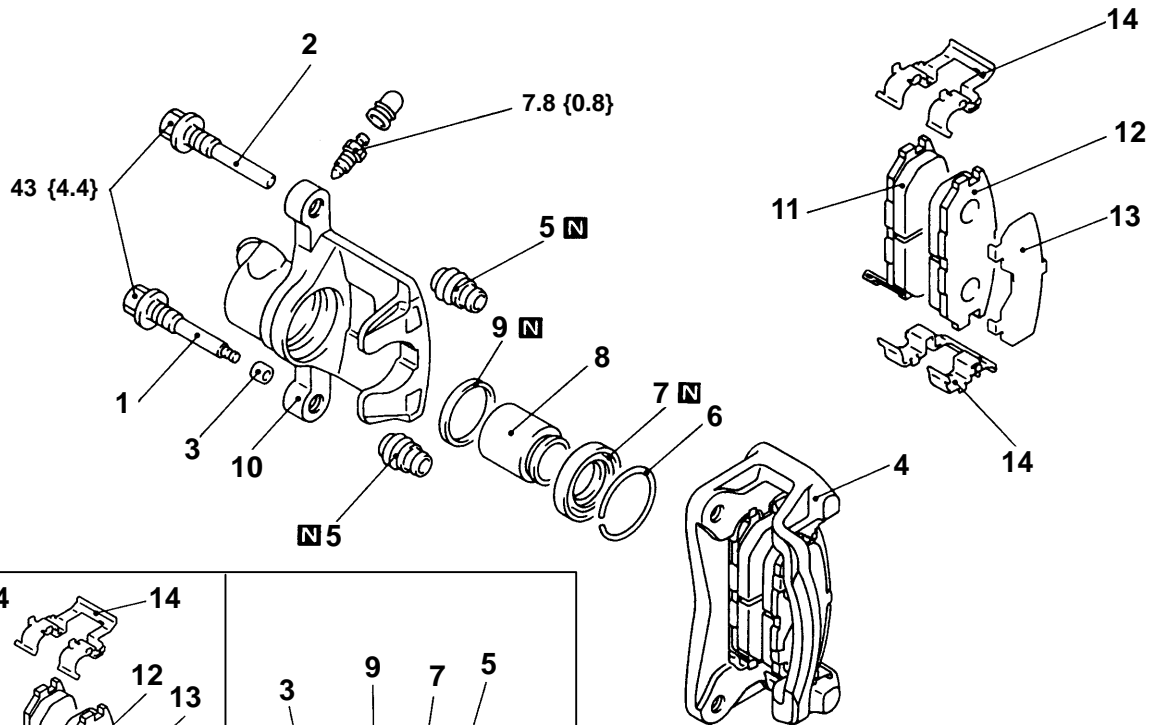
### INSTALLATION SERVICE POINT

#### ▶A◀ DISC BRAKE ASSEMBLY INSTALLATION

Follow the conventional procedures except the standard value for the disc brake drag force.

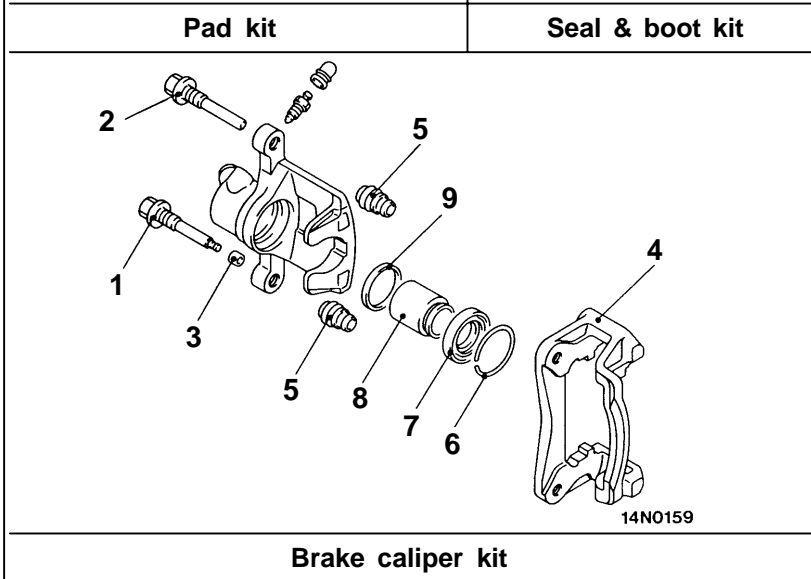
**Standard value (disc brake drag force): 69 N {7.0 kgf}**

DISASSEMBLY AND REASSEMBLY  
<EVOLUTION-IV>



14N0158

Unit: Nm {kgf·m}



Disassembly steps



1. Lock pin
2. Guide pin
3. Bushing
4. Caliper support (pad, clip, shim)
5. Pin boot
6. Boot ring
7. Piston boot

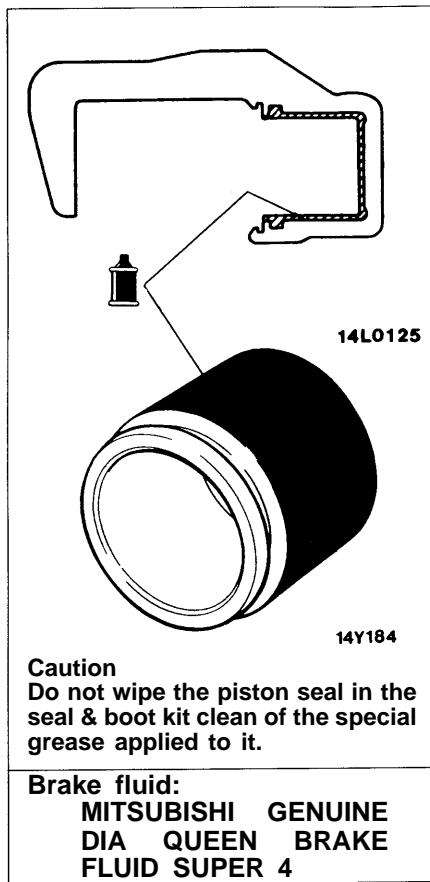


8. Piston
9. Piston seal
10. Caliper body
11. Pad & wear indicator assembly
12. Pad assembly
13. Outer shim
14. Clip





LUBRICANT APPLICATION POINTS

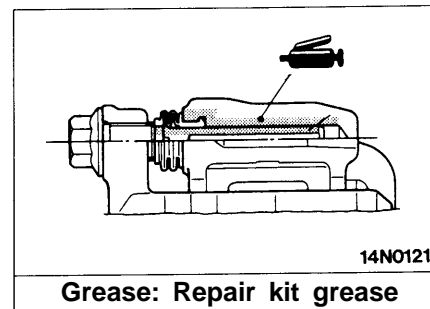


14L0125

14Y184

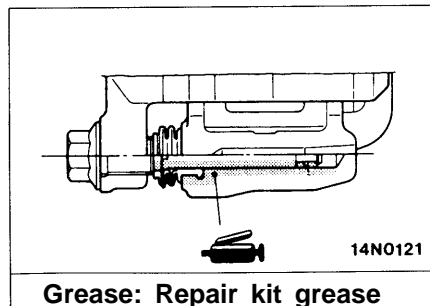
**Caution**  
Do not wipe the piston seal in the seal & boot kit clean of the special grease applied to it.

**Brake fluid:**  
MITSUBISHI GENUINE  
DIA QUEEN BRAKE  
FLUID SUPER 4



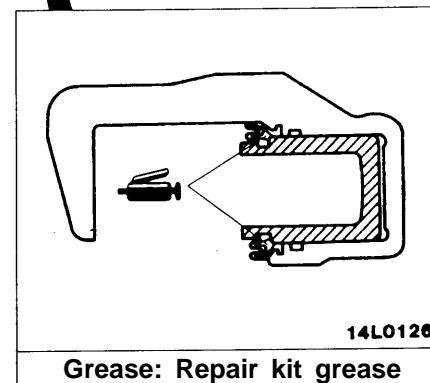
14N0121

**Grease: Repair kit grease**



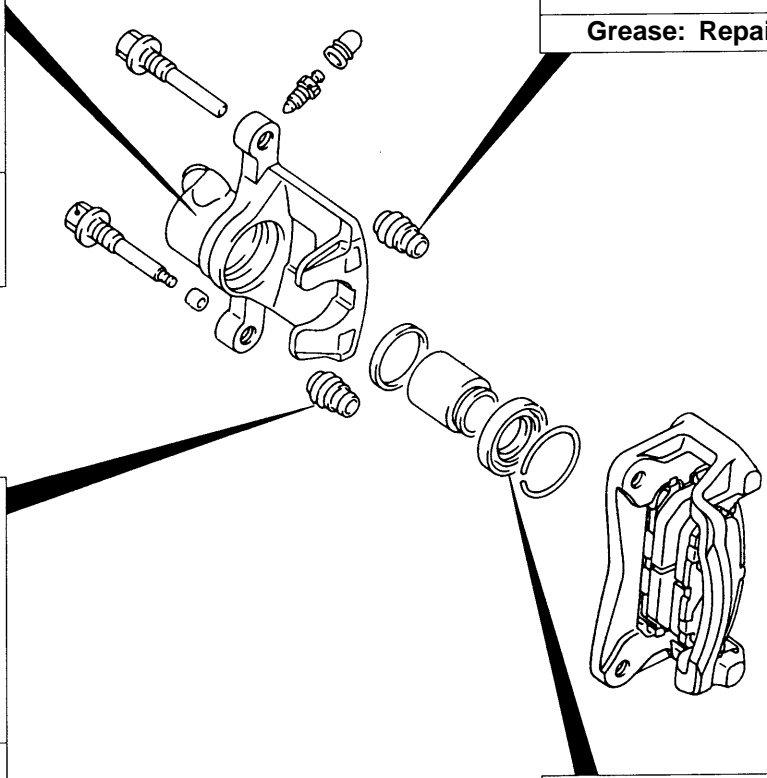
14N0121

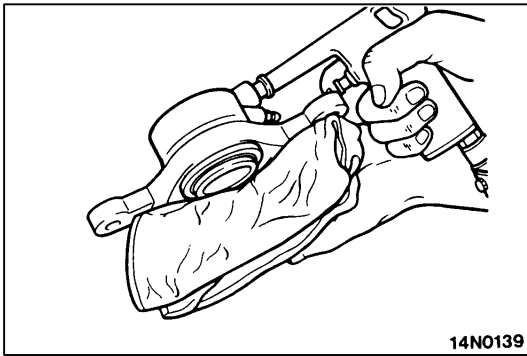
**Grease: Repair kit grease**



14L0126

**Grease: Repair kit grease**





**DISASSEMBLY SERVICE POINTS**

**◀A▶ PISTON BOOT / PISTON REMOVAL**

Cover the outer end of the caliper body with a cloth. Blow compressed air through the brake hose connection to remove the piston and piston boot.

**Caution**

Do not send a sudden blast of air, as it causes the piston to rush out. Send a gentle, gradual blow of compressed air.

**◀B▶ PISTON SEAL REMOVAL**

(1) Remove the piston seal with a finger tip.

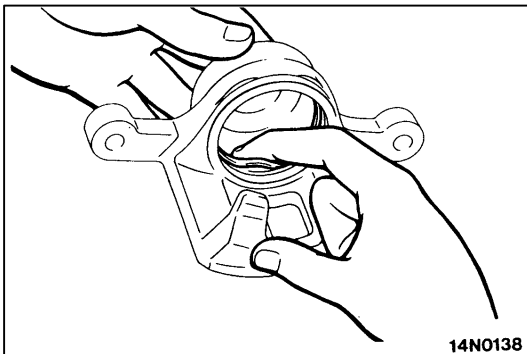
**Caution**

Do not use a flat-blade screwdriver or similar tool to prevent the cylinder inner surface from being damaged.

(2) Clean the piston surface and cylinder inner surface with trichloroethylene, alcohol, or the specified brake fluid.

**Brake fluid:**

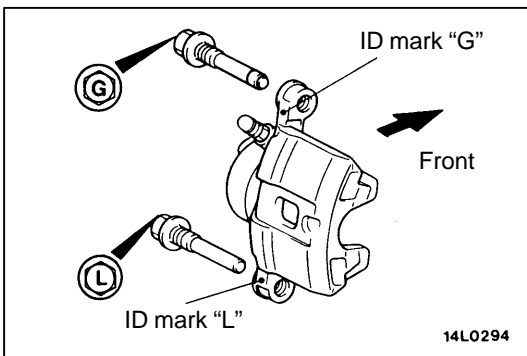
**MITSUBISHI GENUINE DIA QUEEN BRAKE FLUID SUPER 4**



**INSTALLATION SERVICE POINT**

**▶A◀ LOCK PIN / GUIDE PIN INSTALLATION**

Install the guide pin and lock pin so that each head mark matches the ID mark indicated on the caliper body as illustrated on the left.



**INSPECTION**

**PAD WEAR CHECK**

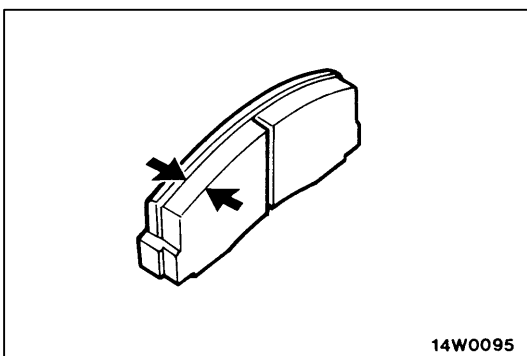
Measure the thickness at a location that wears most of the pad. If the thickness is less than the limit, replace the pad assembly.

**Standard value: 10.0 mm**

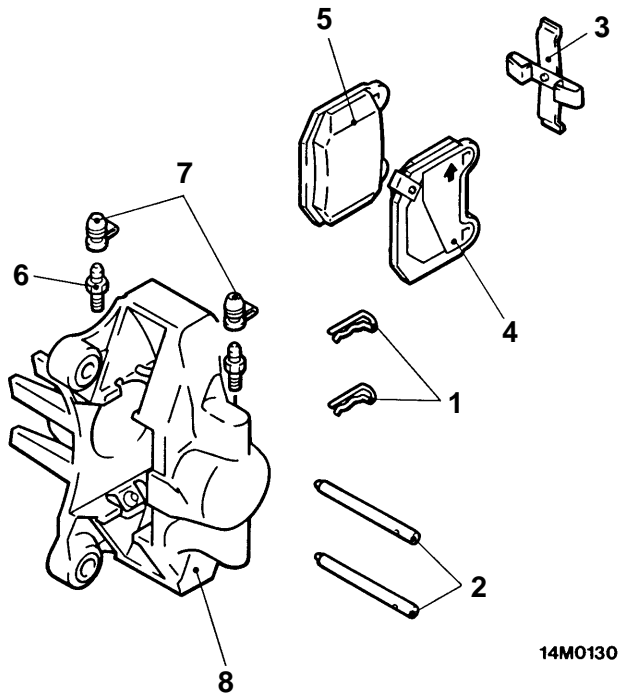
**Limit: 2.0 mm**

**Caution**

- (1) Whenever a pad is to be replaced with a new one, be sure to replace both right and left sides as a set.
- (2) If there is an excessive difference in pad thickness noted between the right and left ones, check the sliding mechanism.



DISASSEMBLY AND REASSEMBLY  
<EVOLUTION-V>



14M0130



**Disassembly steps**

1. Clip
2. Pin
3. Cross spring
4. Pad & wear indicator assembly

5. Pad assembly
6. Air bleeder screw
7. Cap
8. Disc brake caliper assembly

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# ANTI-LOCK BRAKING SYSTEM (ABS)

## CONTENTS

<b>TROUBLESHOOTING</b> .....	<b>2</b>	<b>ON-VEHICLE SERVICE</b> .....	<b>17</b>
1. Inspection Chart for Diagnosis Codes ...	2	Wheel Speed Sensor Output Voltage Measurement <EVOLUTION-V> .....	17
2. Inspection Procedure for Diagnostic Trouble Codes .....	3	<b>LATERAL ACCELERATION SENSOR</b> ...	<b>17</b>
3. Inspection Chart for Trouble Symptoms	11	<b>WHEEL SPEED SENSOR</b> .....	<b>18</b>
4. Inspection Procedure for Trouble Symptoms .....	12		
5. Check at ABS-ECU Terminals .....	15		



The EVOLUTION-V is provided with a lateral acceleration sensor in addition to the longitudinal acceleration sensor, and the ABS-ECU connector is changed in terminal arrangement. When servicing EVOLUTION-V, therefore, use the following service procedures.

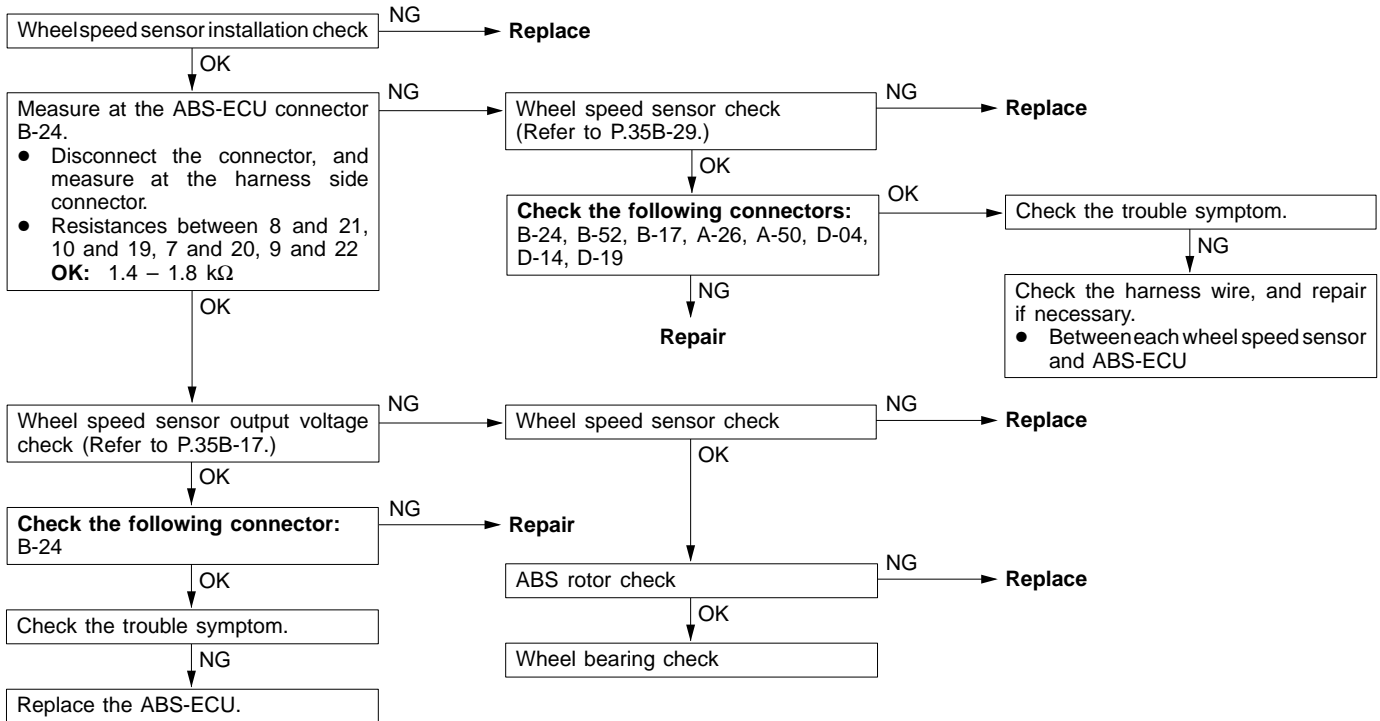
## TROUBLESHOOTING

### 1. INSPECTION CHART FOR DIAGNOSIS CODES

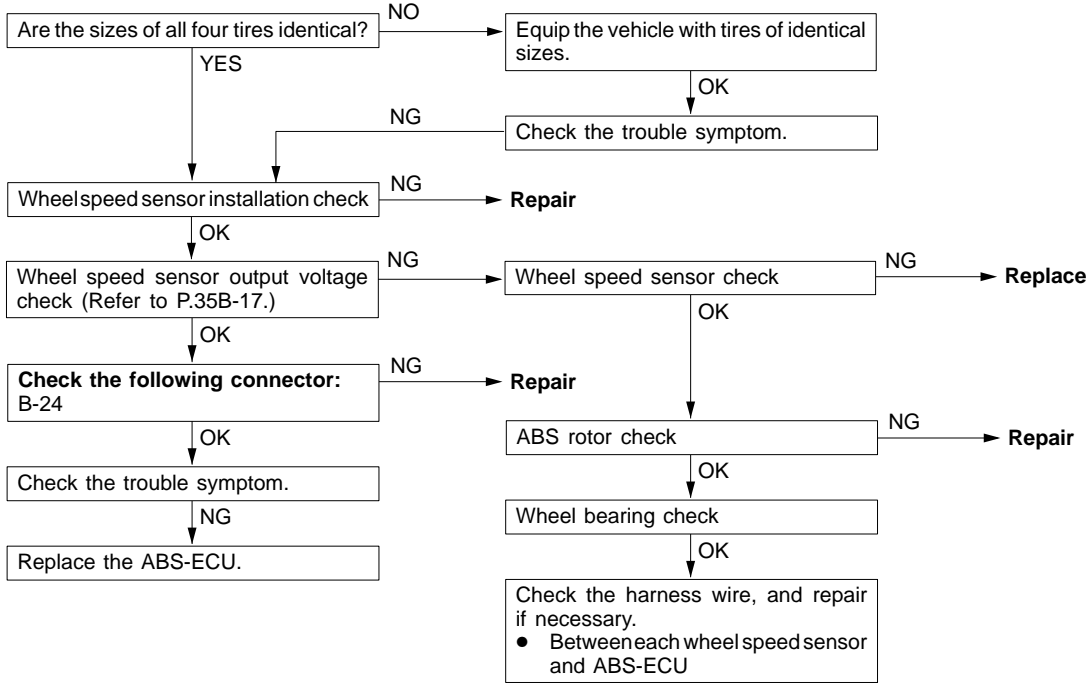
Diagnosis code No.	Diagnosis items	Reference Page
11	Wheel speed sensor (FR) system (open- or short-circuit)	35B-3
12	Wheel speed sensor (FL) system (open- or short-circuit)	35B-3
13	Wheel speed sensor (RR) system (open- or short-circuit)	35B-3
14	Wheel speed sensor (RL) system (open- or short-circuit)	35B-3
15	Wheel speed sensor system (abnormal output signal)	35B-4
16	ABS-ECU power supply voltage system (abnormal voltage drop or rise)	35B-5
21	Wheel speed sensor (FR) system	35B-2
22	Wheel speed sensor (FL) system	35B-2
23	Wheel speed sensor (RR) system	35B-2
24	Wheel speed sensor (RL) system	35B-2
27	AYC monitor system (detective AYC)	35B-6
32	Longitudinal acceleration sensor circuit system	35B-6
33	Stop lamp switch system	35B-7
41	Solenoid valve (FR) system	35B-7
42	Solenoid valve (FL) system	35B-7
43	Solenoid valve (RR) system	35B-7
44	Solenoid valve (RL) system	35B-7
51	Valve relay system	35B-8
53	Motor relay system	35B-9
63	ABS-ECU failure	Replace ABS-ECU.
71	Lateral acceleration sensor system	35B-10

**2. INSPECTION PROCEDURE FOR DIAGNOSTIC TROUBLE CODES**

<p><b>Code Nos.11, 12, 13 and 14: Wheel speed sensor (open circuit or short circuit)</b></p>	<p><b>Probable cause</b></p>
<p><b>Code Nos.21, 22, 23 and 24: Wheel speed sensor</b></p>	
<p>Code Nos 11, 12, 13 and 14 are output if the ABS-ECU detects an open circuit or short-circuit in the (+) wire or (-) wire in any one of the four wheel speed sensors.</p>	<ul style="list-style-type: none"> <li>● Malfunction of wheel speed sensor</li> <li>● Malfunction of wiring harness or connector</li> <li>● Malfunction of ABS-ECU</li> </ul>
<p>Code Nos.21, 22, 23 and 24 are output in the following cases.</p> <ul style="list-style-type: none"> <li>● When there is no input from any one of the four wheel speed sensors when travelling at 8 km/h or more, even though open circuit can not be verified.</li> <li>● When a chipped or blocked-up ABS rotor is detected and if the anti-lock system operates continuously because a malfunctioning sensor or a warped ABS rotor is causing sensor output to drop.</li> </ul>	<ul style="list-style-type: none"> <li>● Malfunction of wheel speed sensor</li> <li>● Malfunction of wiring harness or connector</li> <li>● Too much gap between the sensor and the rotor</li> <li>● Malfunction of ABS-ECU</li> <li>● Malfunction of wheel bearing</li> </ul>



Code No.15: Wheel speed sensor (abnormal output signal)	Probable cause
This code is output when there is an abnormality in the output signal from any one of the four wheel speed sensors while driving (except for an open circuit or short circuit).	<ul style="list-style-type: none"> <li>● The four vehicle tires are of different sizes</li> <li>● Malfunction of wheel speed sensor</li> <li>● Malfunction of wiring harness or connector</li> <li>● Malfunction of ABS-ECU</li> <li>● Malfunction of wheel bearing</li> </ul>

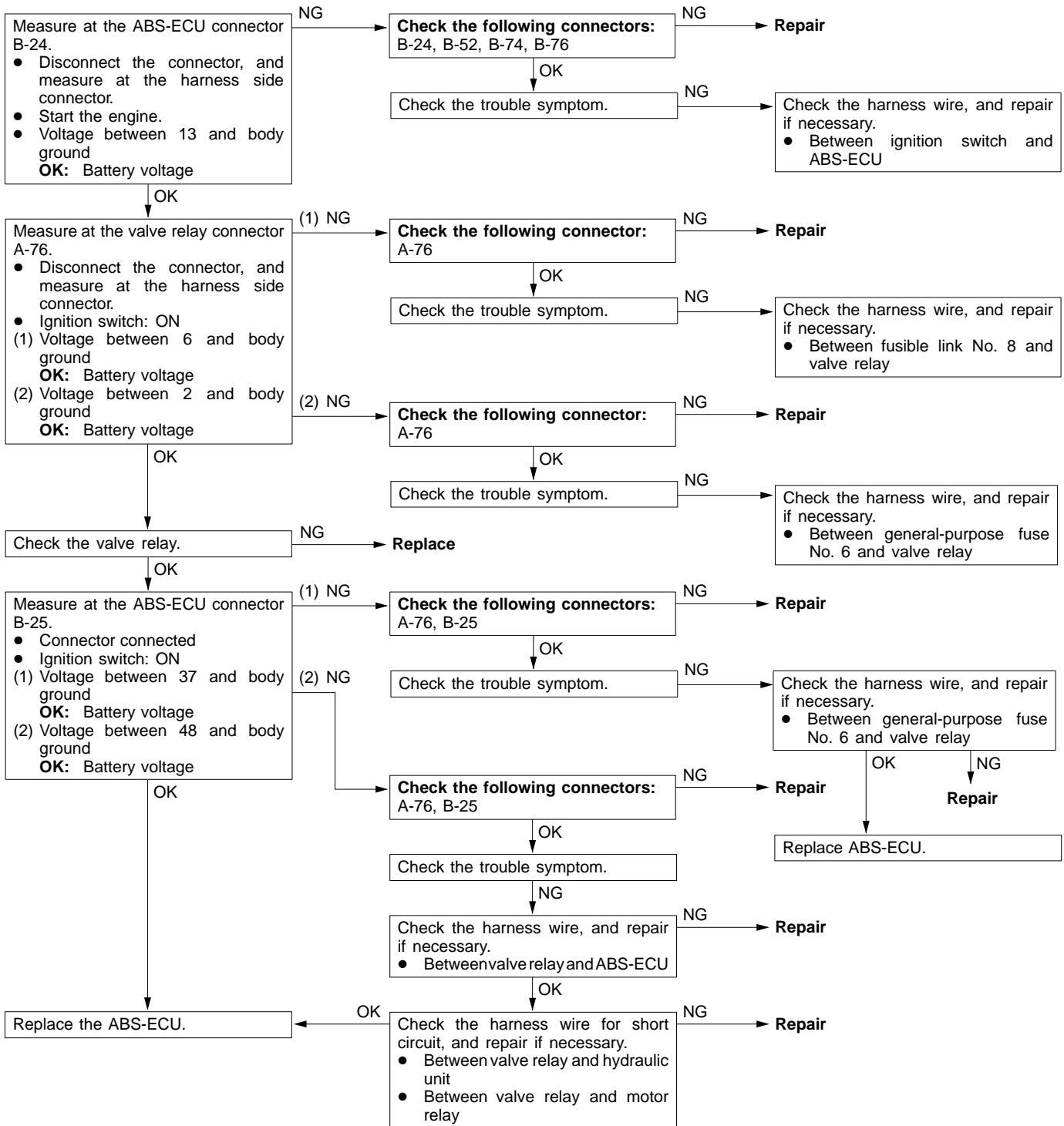


Code No.16: ABS-ECU power supply system (abnormal voltage drop or rise)	Probable cause
This code is output if the ABS-ECU or valve relay power supply voltage drops below or rises above the rated values. The valve relay power supply voltage is detected based on the voltage in the valve relay monitor line.	<ul style="list-style-type: none"> <li>● Malfunction of battery</li> <li>● Malfunction of wiring harness or connector</li> <li>● Malfunction of valve relay</li> <li>● Malfunction of ABS-ECU</li> </ul>

**Caution**

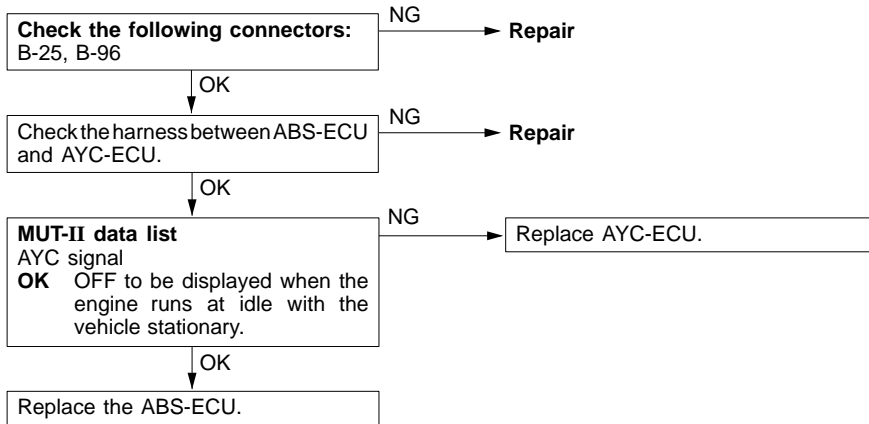
If battery voltage drops or rises during inspection, this code will be output as well, making it impossible to obtain correct diagnostic results.

Before carrying out the following inspection, check the battery level, and refill it if necessary.

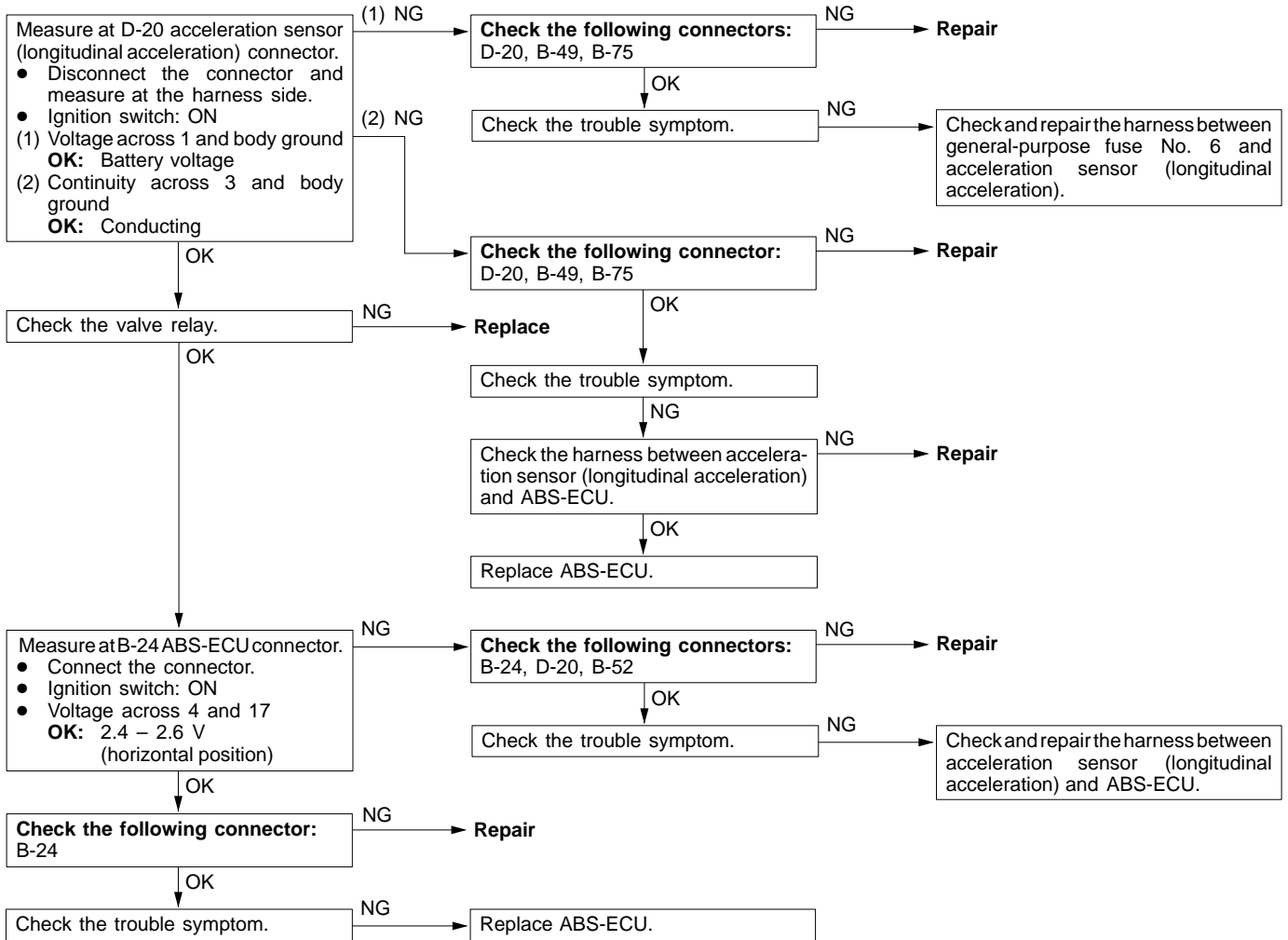




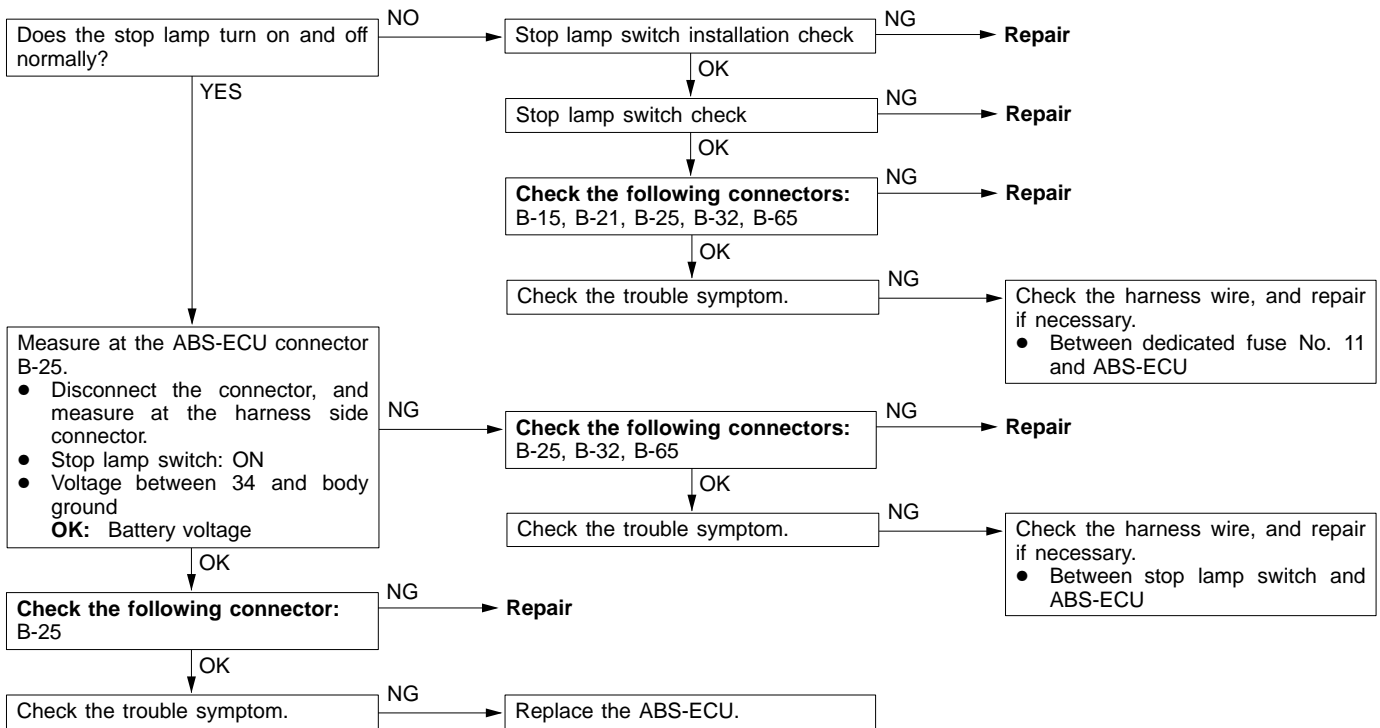
Code No. 27: AYC monitor system (defective AYC)	Probable cause
This code is output when the AYC monitor signal becomes faulty.	<ul style="list-style-type: none"> <li>Defective AYC-ECU</li> <li>Defective ABS-ECU</li> <li>Defective harness or connector</li> </ul>



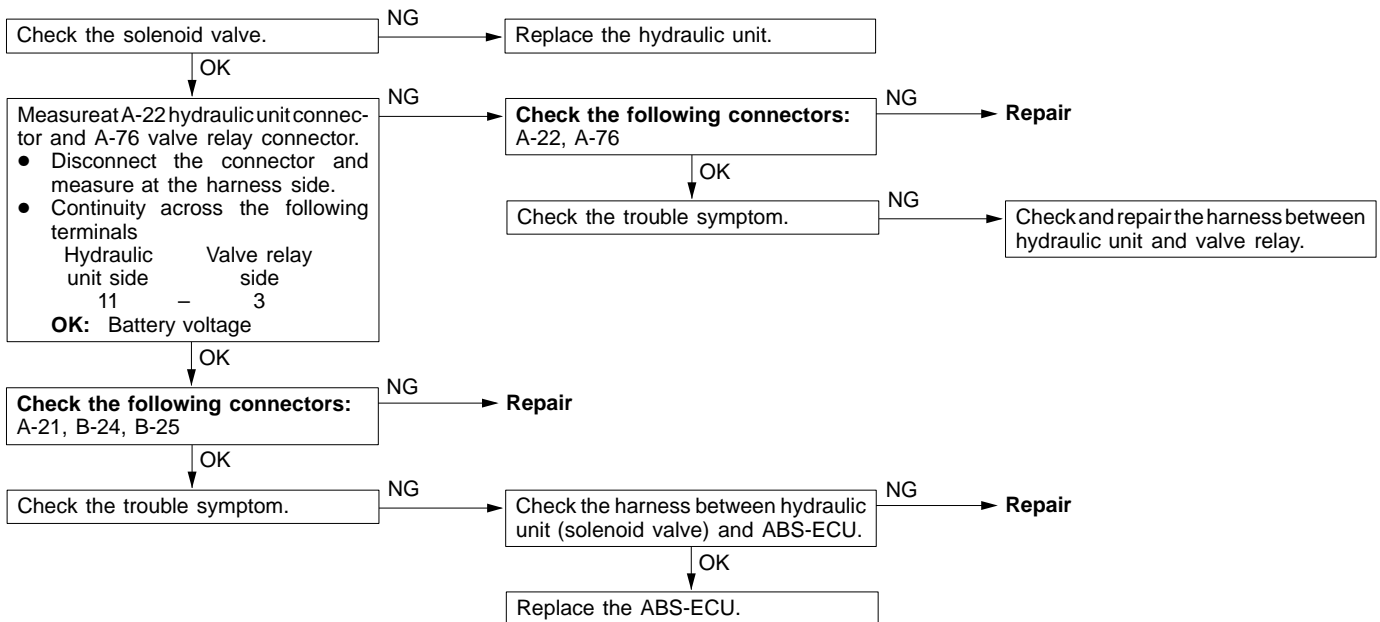
Code No. 32: Acceleration sensor (longitudinal acceleration) circuit system	Probable cause
This code is output under either of the following conditions: <ul style="list-style-type: none"> <li>The output from the acceleration sensor (longitudinal acceleration) becomes 0.5 V or less, or 4.5 V or more.</li> <li>The acceleration sensor (longitudinal acceleration) harness is open- or short-circuited.</li> </ul>	<ul style="list-style-type: none"> <li>Defective acceleration sensor (longitudinal acceleration)</li> <li>Defective harness or connector</li> <li>Defective ABS-ECU</li> </ul>



Code No.33: Stop lamp switch system (open circuit or stop lamp stays ON)	Probable cause
This code is output, if the stop lamp switch is continuously on for 15 minutes or more.	<ul style="list-style-type: none"> <li>● Malfunction of stop lamp switch</li> <li>● Malfunction of wiring harness or connector</li> <li>● Malfunction of ABS-ECU</li> </ul>



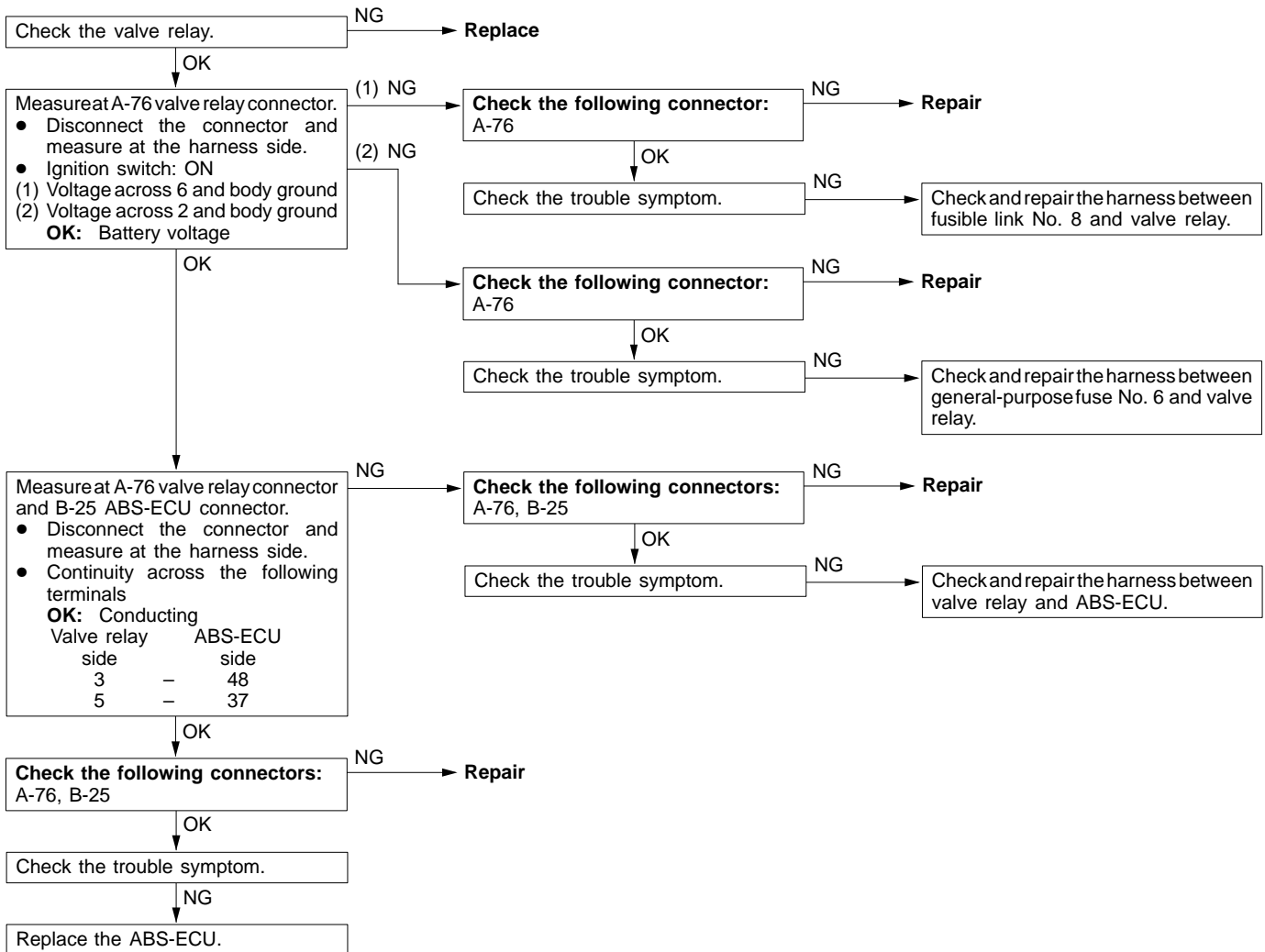
Code No. 41, 42, 43, 44: Solenoid valve system	Probable cause
ABS-ECU monitors the solenoid valve energization circuit at all times. This code is output when no current flows through the solenoid even when ABS-ECU energizes it or when current continues flowing through the solenoid even when ABS-ECU deenergizes it, which is considered to be attributable to an open- or short-circuited solenoid coil or open- or short-circuited harness.	<ul style="list-style-type: none"> <li>● Defective hydraulic unit</li> <li>● Defective harness or connector</li> <li>● Defective ABS-ECU</li> </ul>



Code No. 51: Valve relay system	Probable cause
This code is output under any of the following conditions: <ul style="list-style-type: none"> <li>• The solenoid valve power is not supplied when ABS-ECU attempts to turn ON the valve relay as part of the initial check when the ignition switch is turned ON.</li> <li>• The solenoid valve power remains supplied when ABS-ECU attempts to turn OFF the valve relay as part of the initial check when the ignition switch is turned ON.</li> <li>• The solenoid valve power is not supplied while the valve relay remains ON under normal conditions.</li> </ul>	<ul style="list-style-type: none"> <li>• Defective ABS valve relay</li> <li>• Defective harness or connector</li> <li>• Defective ABS-ECU</li> </ul>

**NOTE**

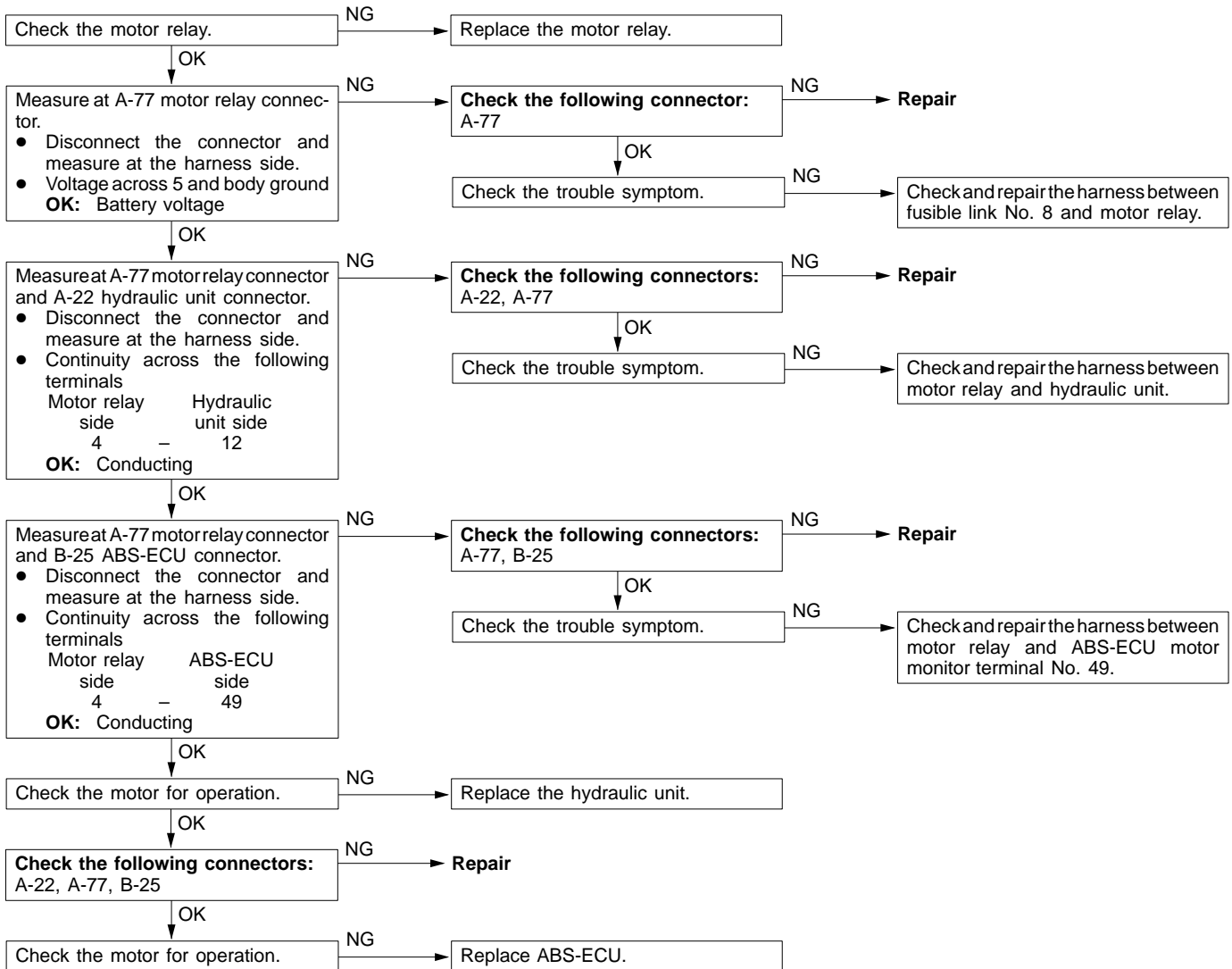
In the diagnosis code reading by means of the ABS warning lamp, this code is output in addition to the actual diagnosis code since the valve relay connector is disconnected. If the ABS warning lamp turns ON even when the spot represented by the diagnosis code output in addition to this code has been repaired, and if no diagnosis code other than No. 51 is output, then the valve relay system is probably defective. Make the following checks.



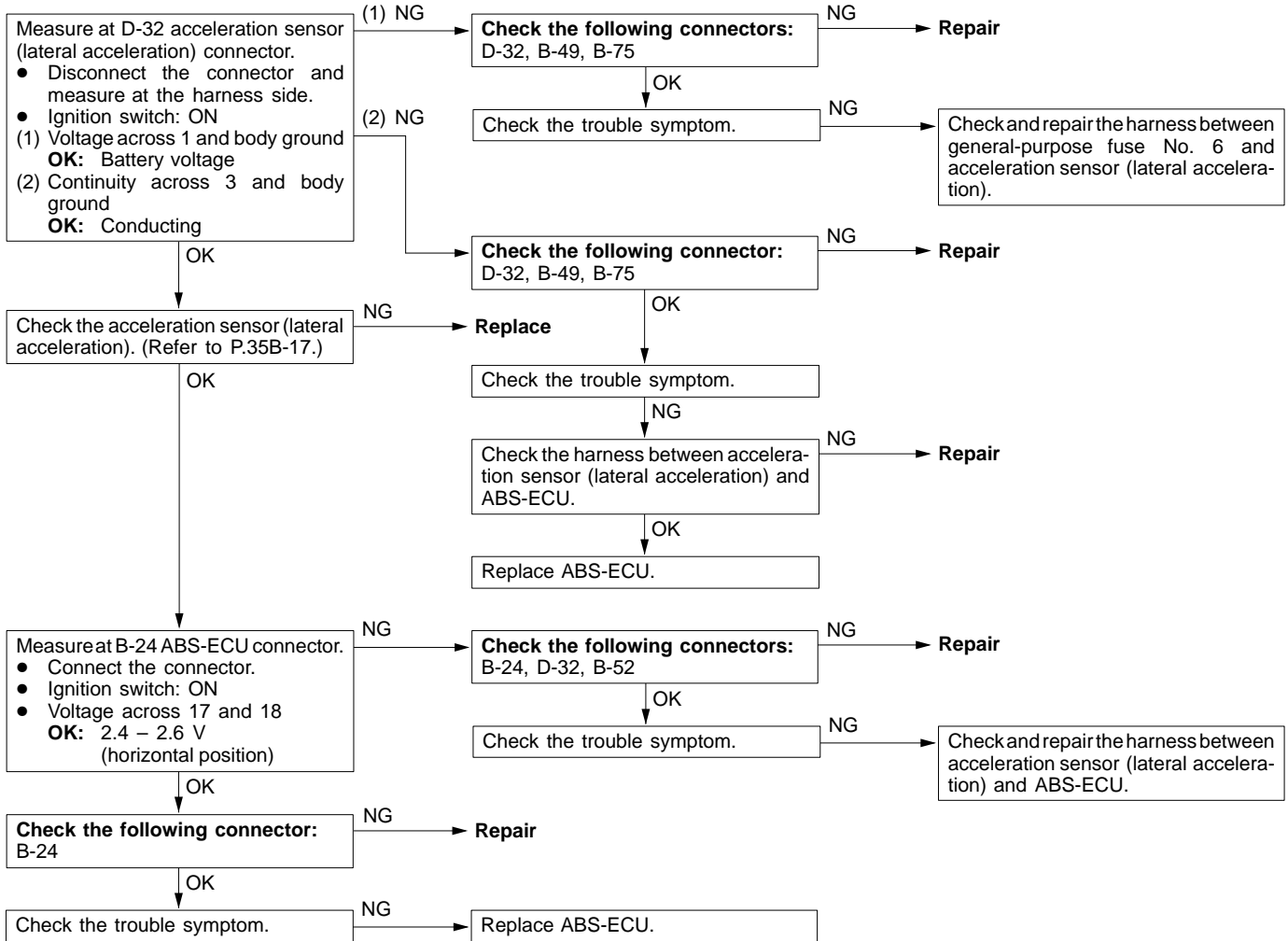
Code No. 53: Motor relay system	Probable cause
<p>This code is output under any of the following conditions:</p> <ul style="list-style-type: none"> <li>• No signals are input to the motor monitor when the motor relay is ON (motor does not run, etc.).</li> <li>• A signal is being input to the motor monitor for 3 sec. or more when the motor relay is OFF (motor continues running, etc.).</li> <li>• The motor relay is inoperative.</li> </ul>	<ul style="list-style-type: none"> <li>• Defective motor relay</li> <li>• Defective harness or connector</li> <li>• Defective hydraulic unit</li> <li>• Defective ABS-ECU</li> </ul>

**Caution**

- (1) If the motor relay contacts fuse, the motor continues running even when the ignition switch is turned OFF. In this case, immediately remove fusible link No. 8 (60 A) or disconnect the A-22 connector or A-77 motor relay connector of the hydraulic unit. Overloading the motor results in a rundown battery.**
- (2) Driving the motor through actuator test runs down the battery. After the test, run the engine for some while.**



Code No. 71: Acceleration sensor (lateral acceleration) system	Probable cause
This code is output under either of the following conditions: <ul style="list-style-type: none"> <li>• The output from the acceleration sensor (lateral acceleration) becomes 0.5 V or less, or 4.5 V or more.</li> <li>• The acceleration sensor (lateral acceleration) harness is open- or short-circuited.</li> </ul>	<ul style="list-style-type: none"> <li>• Defective acceleration sensor (lateral acceleration)</li> <li>• Defective harness or connector</li> <li>• Defective ABS-ECU</li> </ul>



### 3. INSPECTION CHART FOR TROUBLE SYMPTOMS

Get an understanding of the trouble symptoms and check according to the inspection procedure chart.

Trouble symptoms	Inspection procedure No.	Reference page
When the ignition key is turned to "ON" (engine stopped), the ABS warning lamp does not illuminate.	1	35B-12
Even after the engine is started, the ABS warning lamp remains illuminated.	2	35B-13
After the ignition key is turned to "ON", the ABS warning lamp blinks twice, and when turned to "START", it illuminates. When returned to "ON", the lamp flashes once, and then switches off.	3	35B-13
When the ignition key is turned to "START", the ABS warning lamp does not illuminate.	4	35B-14
Brake operation is abnormal	5	35B-14

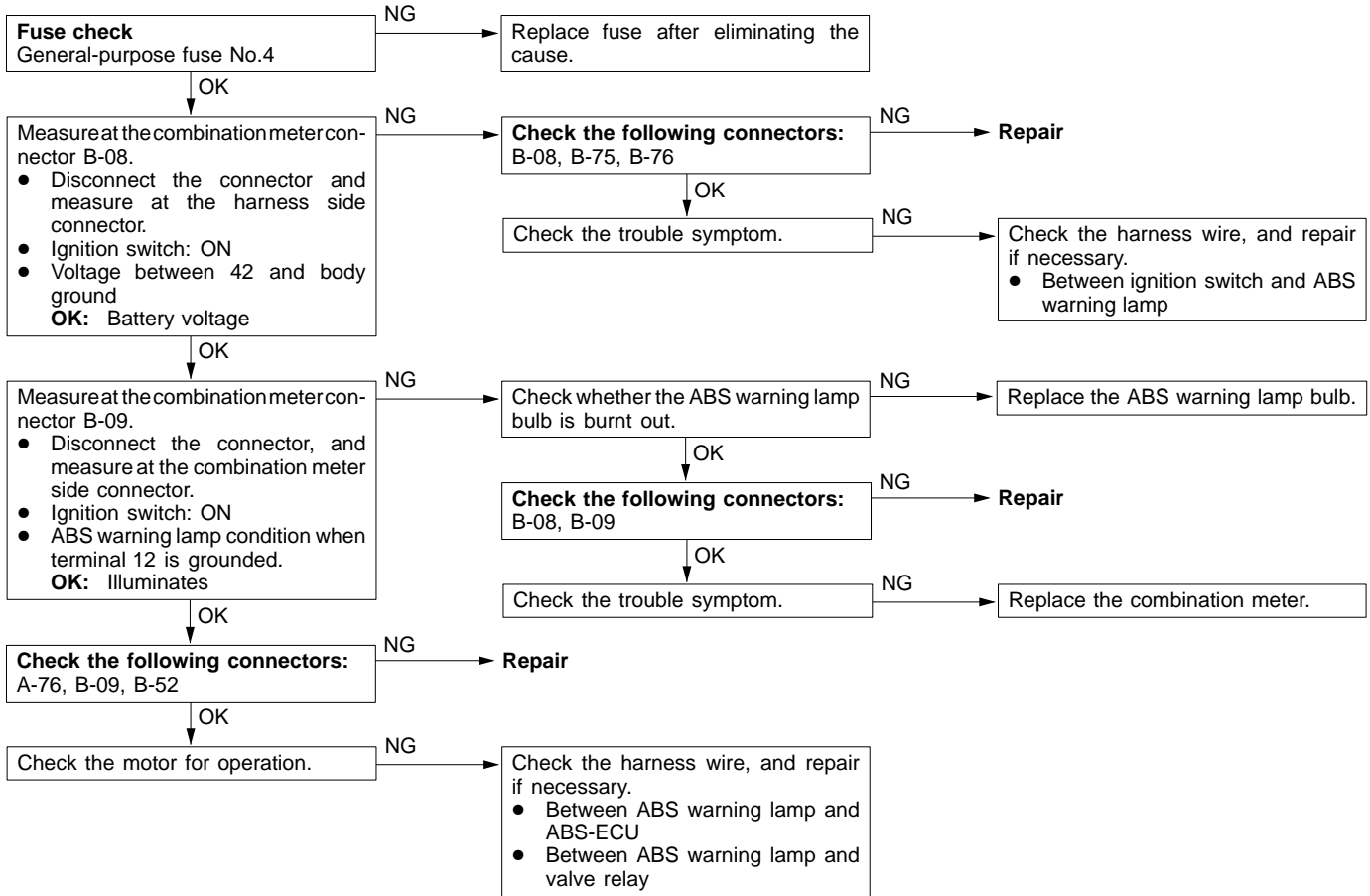
#### Caution

- (1) If steering movements are made when driving at high speed, or when driving on road surfaces with low frictional resistance, or when passing over bumps, the ABS may operate even though sudden braking is not being applied. Because of this, when getting information from the customer, check if the problem occurred while driving under such conditions as these.
- (2) During ABS operation, the brake pedal may vibrate or may not be able to be depressed. Such phenomena are due to intermittent changes in hydraulic pressure inside the brake line to prevent the wheels from locking and is not an abnormality.

4. INSPECTION PROCEDURE FOR TROUBLE SYMPTOMS

INSPECTION PROCEDURE 1

When the ignition key is turned to “ON” (engine stopped), the ABS warning lamp does not illuminate.	Probable cause
<p>The ABS-ECU turns the valve relay ON → OFF → ON for initial checking when it is powered ON. Accordingly, the ABS warning lamp illuminates twice even if the circuit between the ABS warning lamp and ABS-ECU is faulty.</p> <p>The cause may be an open circuit in the lamp power supply circuit, a blown lamp, an open circuit between the ABS warning lamp and ABS-ECU or between the ABS warning lamp and the valve relay.</p>	<ul style="list-style-type: none"> <li>● Blown fuse</li> <li>● Burn out ABS warning lamp bulb</li> <li>● Malfunction of wiring harness or connector</li> </ul>

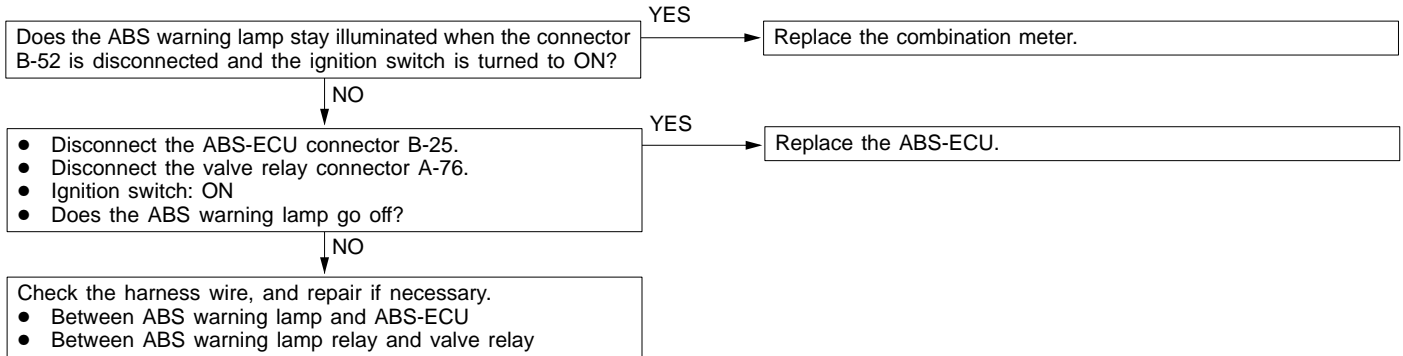


**INSPECTION PROCEDURE 2**

Even after the engine is started, the ABS warning lamp remains illuminated.	Probable cause
The cause is probably a short-circuit in the ABS warning lamp illumination circuit.	<ul style="list-style-type: none"> <li>● Malfunction of combination meter</li> <li>● Malfunction of ABS-ECU</li> <li>● Malfunction of wiring harness (short circuit)</li> </ul>

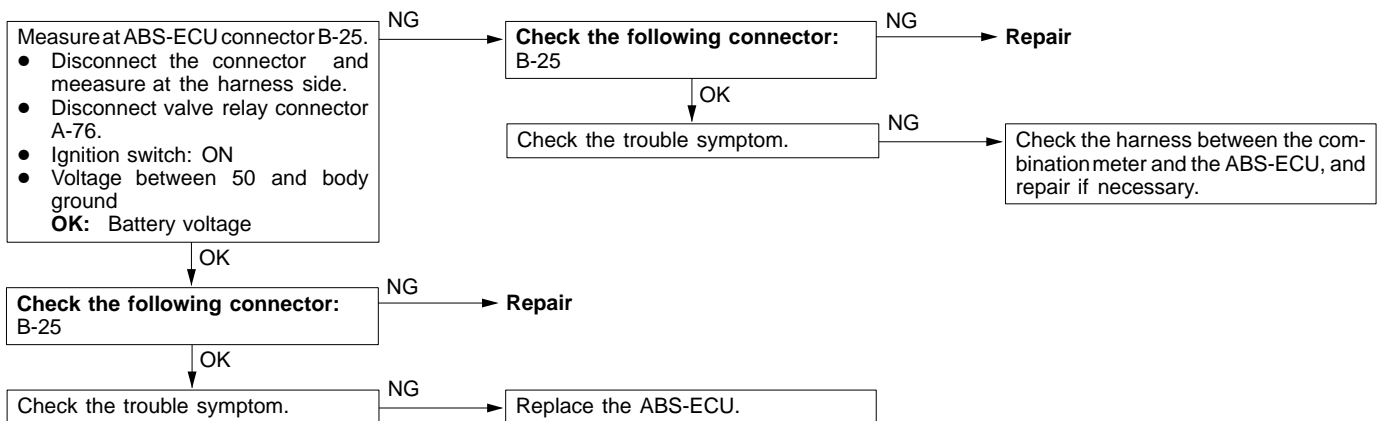
**NOTE**

This trouble symptom is limited to cases where ABS-ECU power supply is normal and the diagnosis code is a normal diagnosis code.



**INSPECTION PROCEDURE 3**

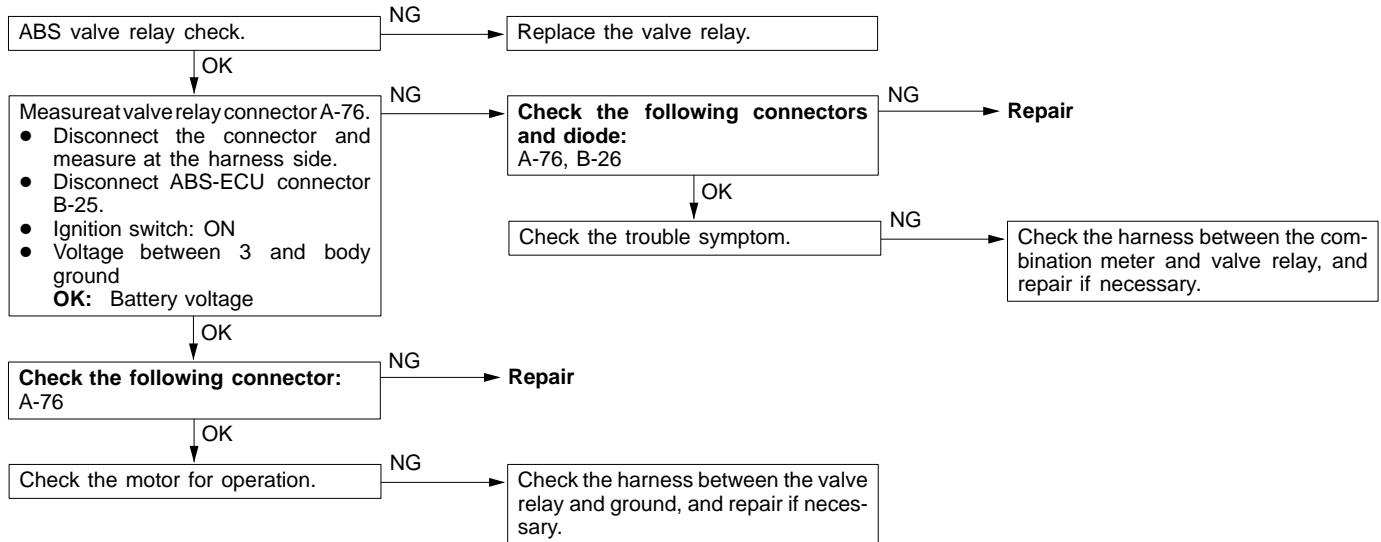
After the ignition key is turned to “ON”, the ABS warning lamp blinks once, and when turned to “START”, it illuminates. When returned to “ON”, the lamp flashes once, and then switches off.	Probable cause
The ABS-ECU causes the ABS warning lamp to illuminate during the initial check. During the initial check, the valve relay turns from off to on, off and back to on again. If there is an open circuit in the harness between the ABS-ECU and the ABS warning lamp, the lamp will illuminate only when the valve relay is OFF during valve relay test, etc.	<ul style="list-style-type: none"> <li>● Malfunction of wiring harness or connector</li> <li>● Malfunction of ABS-ECU</li> </ul>





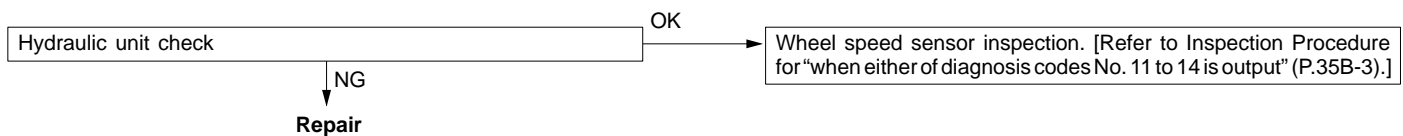
**INSPECTION PROCEDURE 4**

When the ignition key is turned to “START”, the ABS warning lamp does not illuminate.	Probable cause
The ABS-ECU is powered through IG2 which is turned off when the ignition key is in START position. The ABS warning lamp is powered through IG1 which is not turned off even when the ignition key is in START position. So the cause must be a defective circuit on valve relay side.	<ul style="list-style-type: none"> <li>● Malfunction of wiring harness or connector</li> <li>● Malfunction of valve relay</li> </ul>



**INSPECTION PROCEDURE 5**

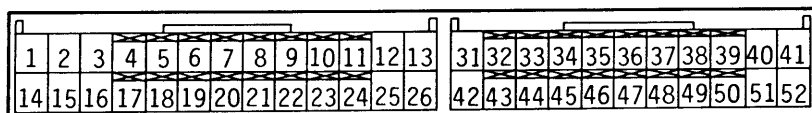
Brake operation is abnormal	Probable cause
The varies depending on the driving conditions and the road surface conditions, so problem diagnosis is difficult. However, if a normal diagnosis code is displayed, carry out the following inspection.	<ul style="list-style-type: none"> <li>● Improper installation of wheel speed sensor</li> <li>● Incorrect sensor harness contact</li> <li>● Foreign material adhering to wheel speed sensor</li> <li>● Malfunction of wheel speed sensor</li> <li>● Malfunction of wheel bearing</li> <li>● Malfunction of hydraulic unit</li> <li>● Malfunction of ABS-ECU</li> </ul>



## 5. CHECK AT ABS-ECU TERMINALS

### 5-1 TERMINAL VOLTAGE LISTING

- (1) The voltage is to be measured across each terminal and ground terminal.
- (2) Fig. below shows the arrangement of the terminals.



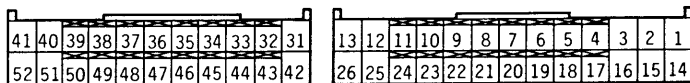
14M0128

Terminal No.	Check item	Check requirement	Normally	
1	Solenoid valve OUT (FL) output	Ignition switch: ON (after initial check)	Battery voltage	
2	Solenoid valve OUT (RR) output	Ignition switch: ON (after initial check)	Battery voltage	
3	Solenoid valve IN (RR) output	Ignition switch: ON (after initial check)	Battery voltage	
4	Acceleration sensor (longitudinal acceleration) input	Ignition switch: ON	2.4 – 2.6 V (horizontal position)	
11	Wheel speed (FL) output	Vehicle stationary	1 V or less	
		Moving forward slowly	0 – 5 V	
13	ABS-ECU power supply	Ignition switch: ON	Battery voltage	
14	Solenoid valve IN (FL) output	Ignition switch: ON (after initial check)	Battery voltage	
15	Ground	At all times	0 V	
17	Acceleration sensor ground	At all times	0 V	
18	Acceleration sensor (lateral acceleration) input	Ignition switch: ON	2.4 – 2.6 V (horizontal position)	
24	Wheel speed (RL) output	Vehicle stationary	1 V or less	
		Moving forward slowly	0 – 5 V	
25	Ground	At all times	0 V	
32	ABS-ECU backup power supply	At all times	Battery voltage	
33	Wheel speed (FR) output	Vehicle stationary	1 V or less	
		Moving forward slowly	0 – 5 V	
34	Stop lamp switch input	Stop lamp switch: ON	Battery voltage	
		Stop lamp switch: OFF	0 V	
37	Valve relay output	Ignition switch: ON	When relay is ON	0 V
			When relay is OFF	Battery voltage
38	Motor relay output	Ignition switch: ON	When motor is energized	0 V
			When motor is deenergized	Battery voltage
40	Solenoid valve OUT (RL) output	Ignition switch: ON (after initial check)	Battery voltage	
41	Solenoid valve OUT (FR) output	Ignition switch: ON (after initial check)	Battery voltage	
42	Ground	At all times	0 V	

Terminal No.	Check item	Check requirement	Normally	
44	Wheel speed (RR) output	Vehicle stationary	1 V or less	
		Moving forward slowly	0 – 5 V	
48	Valve relay monitor input	Ignition switch: ON (after initial check)	Battery voltage	
49	Motor relay monitor output	Ignition switch: ON	When motor is energized	0 V
			When motor is deenergized	Battery voltage
50	ABS warning lamp output	Ignition switch: ON	When lamp is off	Battery voltage
			When lamp is on	0 V
51	Solenoid valve IN (RL) output	Ignition switch: ON (after initial check)	Battery voltage	
52	Solenoid valve IN (FR) output	Ignition switch: ON (after initial check)	Battery voltage	

## 5-2 LISTING OF RESISTANCE AND CONTINUITY ACROSS CONNECTOR TERMINALS ON HARNESS SIDE

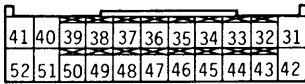
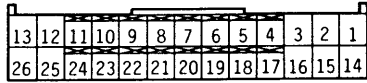
- (1) Measure the resistance and check for continuity with the ignition switch in the "OFF" position and ABS-ECU connector disconnected.
- (2) Measure the resistance and check for continuity across terminals listed below.
- (3) Fig. below shows the arrangement of terminals.



14M0127

Terminal No.	Signal name	Normally
1 – body ground	Solenoid valve OUT (FL) output	4.04 – 4.54 $\Omega$
2 – body ground	Solenoid valve OUT (RR) output	4.04 – 4.54 $\Omega$
3 – body ground	Solenoid valve IN (RR) output	8.04 – 9.04 $\Omega$
7 – 20	Wheel speed sensor (FL) input	1.4 – 1.8 k $\Omega$
8 – 21	Wheel speed sensor (RR) input	1.4 – 1.8 k $\Omega$
9 – 22	Wheel speed sensor (RL) input	1.4 – 1.8 k $\Omega$
10 – 23	Wheel speed sensor (FR) input	1.4 – 1.8 k $\Omega$
14 – body ground	Solenoid valve IN (FL) output	8.04 – 9.04 $\Omega$
15 – body ground	Ground	Conducting
25 – body ground	Ground	Conducting
40 – body ground	Solenoid valve OUT (RL) output	4.04 – 4.54 $\Omega$
41 – body ground	Solenoid valve OUT (FR) output	4.04 – 4.54 $\Omega$
42 – body ground	Ground	Conducting
48 – body ground	Valve relay monitor input	Conducting
49 – body ground	Motor relay monitor input	Conducting
51 – body ground	Solenoid valve IN (RL) output	8.04 – 9.04 $\Omega$
52 – body ground	Solenoid valve IN (FR) output	8.04 – 9.04 $\Omega$

ABS-ECU connector harness side



14M0127

**ON-VEHICLE SERVICE**

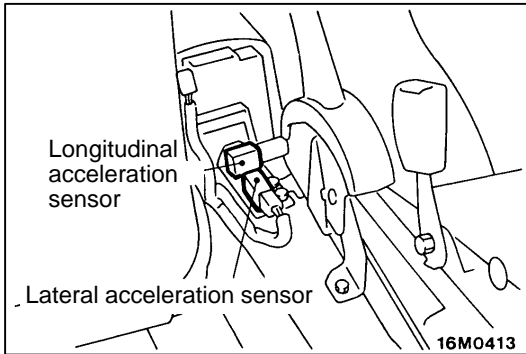
**WHEEL SPEED SENSOR OUTPUT VOLTAGE MEASUREMENT <EVOLUTION-V>**

The EVOLUTION-V has the ABS-ECU connector terminal arranged as shown at left. Accordingly, the terminals to measure the output voltage of the wheel speed sensors are different from EVOLUTION-V.

Follow the conventional procedures except these pick-out terminals.

**Measurement terminals:**

Front LH	Front RH	Rear LH	Rear RH
7	10	9	8
20	23	22	21



**LATERAL ACCELERATION SENSOR**

**INSPECTION**

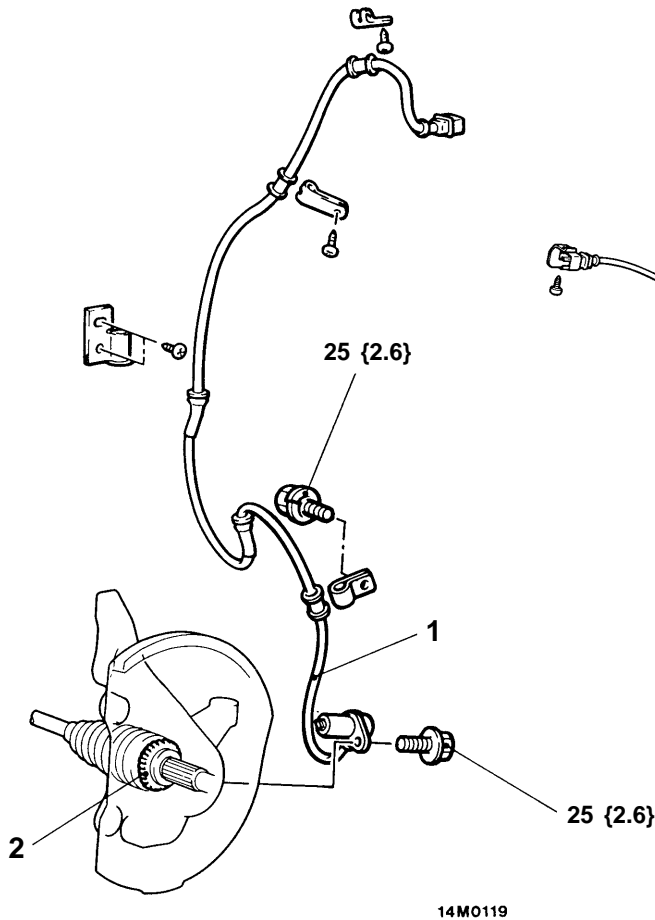
Use the same procedures as those for the conventional longitudinal acceleration sensor.

# WHEEL SPEED SENSOR

## REMOVAL AND INSTALLATION

### Post-installation Operation

- Wheel Speed Sensor Output Voltage Measurement

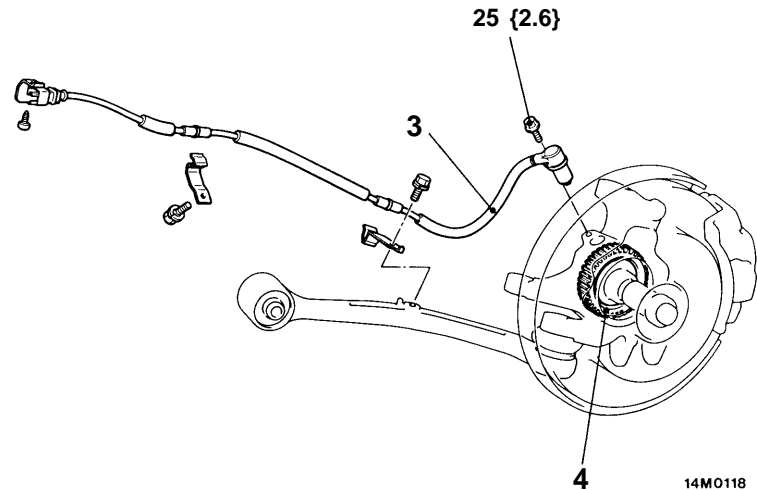


### Front speed sensor removal steps

- Splash shield
- 1. Front speed sensor
- 2. Front rotor (Refer to GROUP 26 DRIVE SHAFT.)

### Rear speed sensor removal steps

- 3. Rear speed sensor
- 4. Rear rotor (Refer to GROUP 27 REAR AXLE HUB.)



Unit: Nm {kgf·m}

### NOTE

The front rotor and rear rotor are integrated with the drive shaft and thus nonmaintainable.

### Caution

When removing and installing the speed sensor and rotor, use care not to allow the surfaces of the ball piece and rotor at the end of the speed sensor to be hit against a metal or other object, damaging it.

---

# PARKING BRAKES

## CONTENTS

<b>SERVICE SPECIFICATIONS .....</b>	<b>2</b>	<b>ON-VEHICLE SERVICE .....</b>	<b>3</b>
<b>LUBRICANTS .....</b>	<b>2</b>	1. Parking Brake Lever Stroke Check and Adjustment .....	3
<b>SPECIAL TOOLS .....</b>	<b>2</b>	2. Lining Running-in .....	4
		<b>PARKING BRAKE CABLE .....</b>	<b>5</b>
		<b>PARKING BRAKE DRUM .....</b>	<b>7</b>



## 36-2 PARKING BRAKE – Service Specifications / Lubricants / Special Tools

The parking brake is designed as a drum-in-disc brake acting on the rear wheel. This brake is a little different in construction between EVOLUTION-IV and EVOLUTION-V but much alike in the service procedure of the parking brake section. In this group, therefore, the description is made only for EVOLUTION-IV.

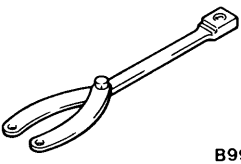
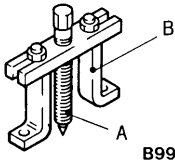
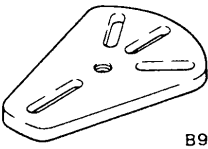
### SERVICE SPECIFICATIONS

Items	Standard value	Limit
Parking brake lever stroke (operating force approx. 196 N {20 kgf})	5 – 7 notches	–
Brake lining thickness mm	2.8	1.0
Brake drum I.D. mm	168	169

### LUBRICANTS

Items	Specified lubricant	Quantity
Backing plate	CHUO YUKA AKB100	As required
Shoe & lining assembly		
Adjuster		

### SPECIAL TOOLS

Tool	Number	Name	Use
 <p>B991367</p>	MB990767	End yoke holder	Fixing of hub
 <p>B990241</p>	MB990241 A: MB990242 B: MB990244	Axle shaft puller A: Puller shaft B: Puller bar	Removal of drive shaft
 <p>B991354</p>	MB991354	Puller body	

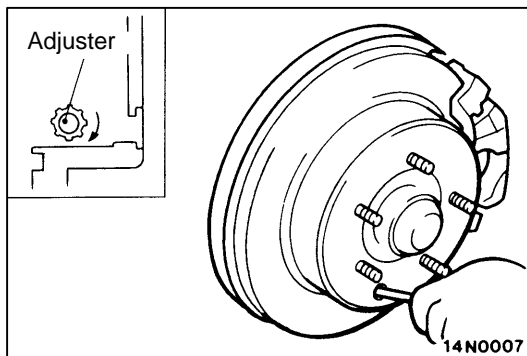
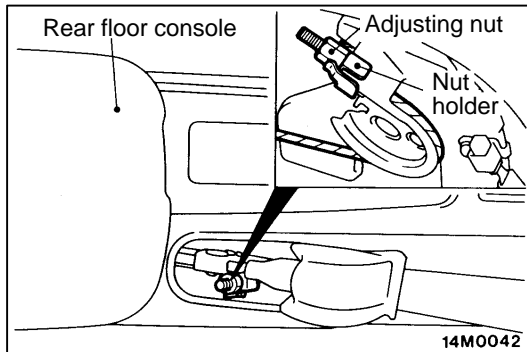
## ON-VEHICLE SERVICE

### 1. PARKING BRAKE LEVER STROKE CHECK AND ADJUSTMENT

#### 1-1 STROKE CHECK

Standard value: 5 – 7 notches

[Operating force of approx. 196 N {20 kgf}]



#### 1-2 STROKE ADJUSTMENT

If the parking brake lever stroke is not the standard value, adjust as described below.

- (1) Loosen the adjusting nut at the floor console to release the cable.

- (2) Remove the adjustment hole plug, and then use a flat-tip (-) screwdriver to turn the adjuster in the direction of the arrow (the direction which expands the shoe) until the disc cannot be rotated by both hands.

Return the adjuster five notches in the direction opposite to the direction of the arrow. (Reference: shoe clearance on one side 0.19 mm)

- (3) Turn the adjusting nut to adjust the parking brake lever stroke to the standard value. After adjusting, check that there is no space between the adjusting nut and the parking brake lever.

Check also that the adjusting nut is firmly held by the nut holder.

#### Caution

**If the parking brake lever stroke is below the standard value and the braking is too firm, the rear brakes may drag.**

- (4) After adjusting the parking brake lever stroke, jack up the rear of the vehicle. Release the parking brake and turn the rear wheels to check that the rear brakes are not dragging.



## 2. LINING RUNNING-IN

Carry out running-in by the following procedure when replacing the parking brake linings or the rear brake disc rotors, or when brake performance is insufficient.

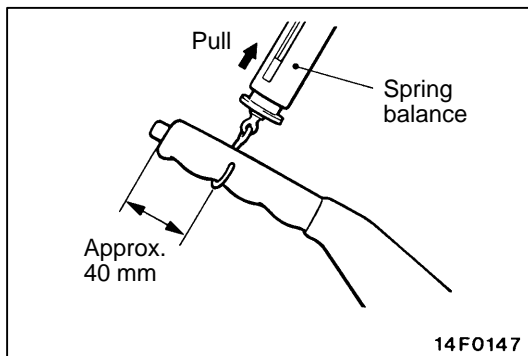
### Caution

Carry out running-in in a place with good visibility, and pay careful attention to safety.

- (1) Adjust the parking brake stroke to the specified value.

**Standard value: 5 – 7 notches**

**[Operating force of approx. 196 N {20 kgf}]**



- (2) Hook a spring balance onto the center of the parking brake lever grip and pull it with a force of 98 – 147 N {10 – 15 kgf} in a direction perpendicular to the handle.
- (3) Drive the vehicle at a constant speed of 35 – 50 km/h for 100 metres.
- (4) Release the parking brake and let the brakes cool for 5 – 10 minutes.
- (5) Repeat the procedure in steps (2) to (4) 4 – 5 times.

# PARKING BRAKE CABLE

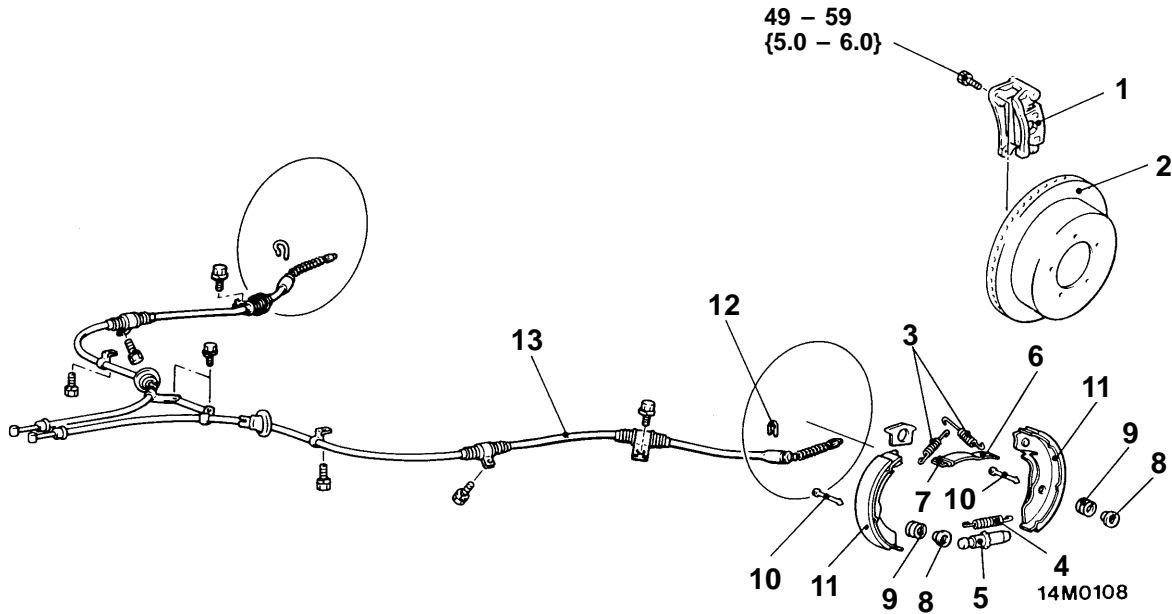
## REMOVAL AND INSTALLATION

**Pre-removal Operation**

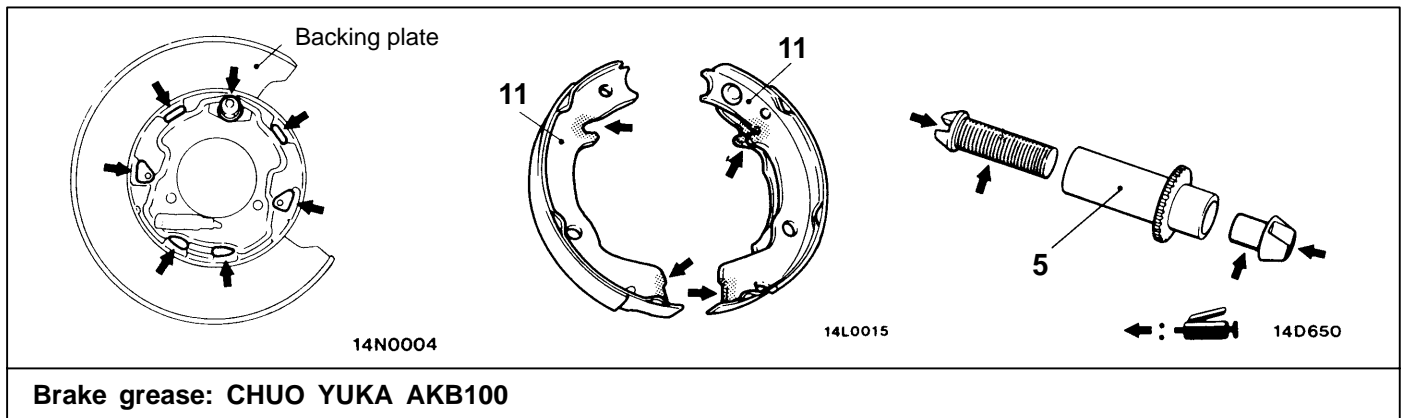
- Floor Console and Rear Seat Removal

**Post-installation Operation**

- (1) Parking Brake Lever Stroke Check and Adjustment (Refer to P.36-3.)
- (2) Floor Console and Rear Seat Installation



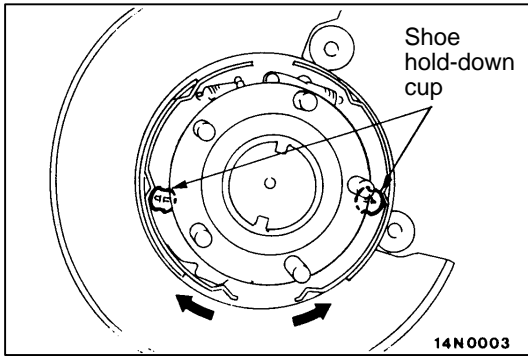
Unit: Nm {kgf·m}



**Removal steps**

- ◀A▶ 1. Rear brake caliper assembly
- ▶B▶ 2. Rear brake disc
- ▶B▶ 3. Shoe-to-anchor spring
- ▶A▶ 4. Adjusting screw spring
- ▶A▶ 5. Adjuster
- 6. Strut
- 7. Strut return spring

- ◀B▶ 8. Shoe hold-down cup
- 9. Shoe hold-down spring
- 10. Shoe hold-down pin
- 11. Shoe and lining assembly
- 12. Clip
- 13. Parking brake cable



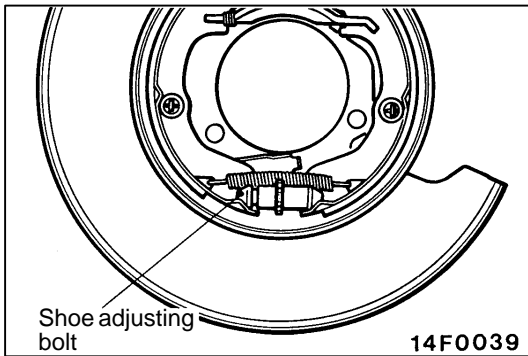
**REMOVAL SERVICE POINTS**

**◀A▶ REAR BRAKE CALIPER ASSEMBLY REMOVAL**

Remove the rear brake caliper assembly and support it with wire or similar.

**◀B▶ SHOE HOLD-DOWN CUP REMOVAL**

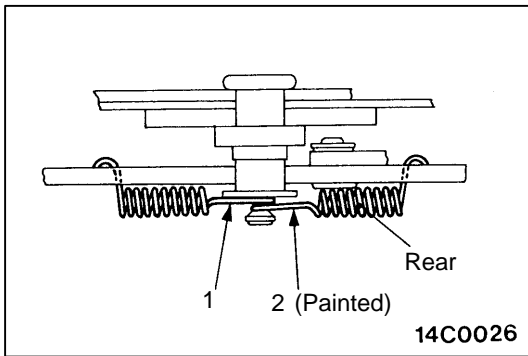
Extend the shoe and lining assembly, and remove the shoe hold-down cup.



**INSTALLATION SERVICE POINTS**

**▶A◀ ADJUSTER INSTALLATION**

Install the adjuster so that the shoe adjusting bolt of left hand wheel is attached towards the front of the vehicle, and the shoe adjusting bolt of right hand wheel is towards the rear of the vehicle.



**▶B◀ SHOE-TO-ANCHOR SPRING INSTALLATION**

Install the shoe-to-anchor springs in the order shown in the illustration.

**Caution**

The load on the respective shoe-to-anchor springs is different, so the spring in the figure has been painted.

**NOTE**

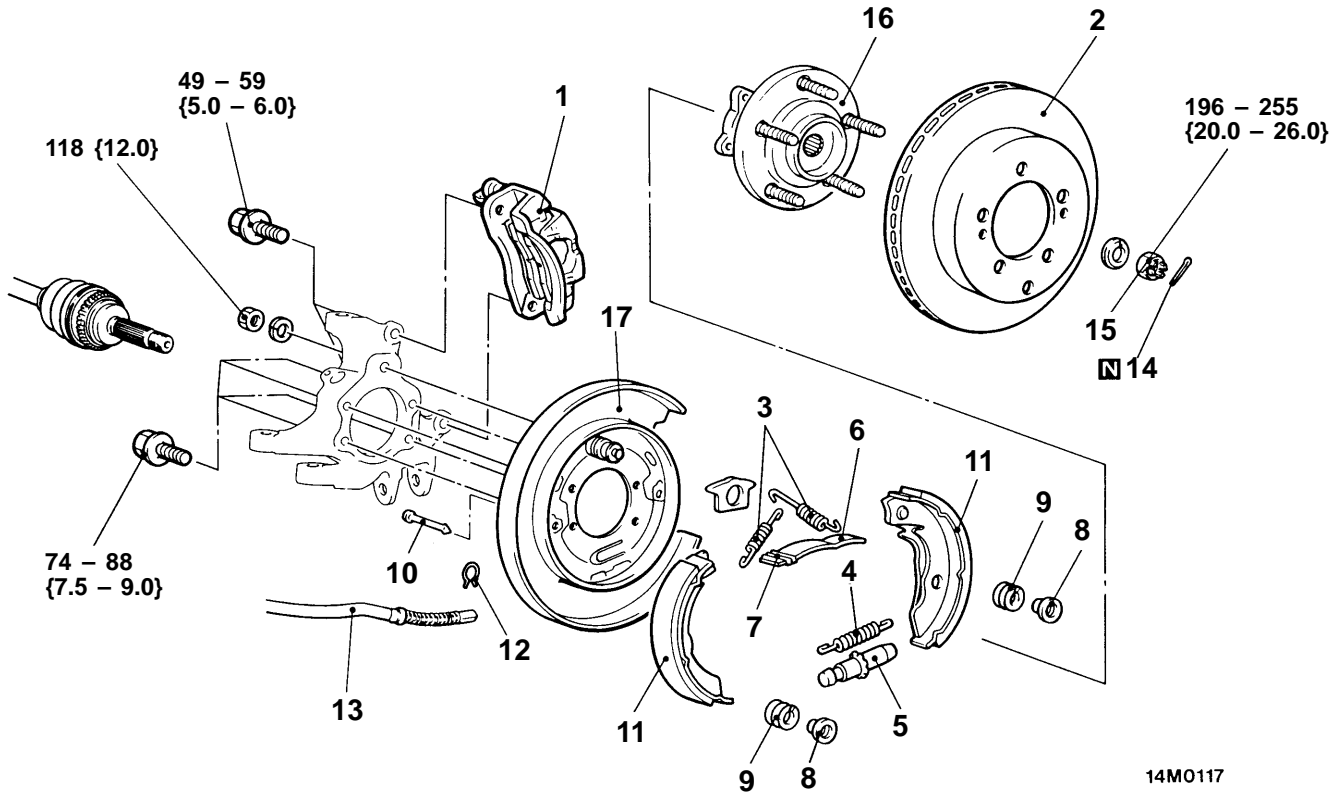
The figure shows the left wheel; for the right wheel, the position is symmetrical.

# PARKING BRAKE DRUM

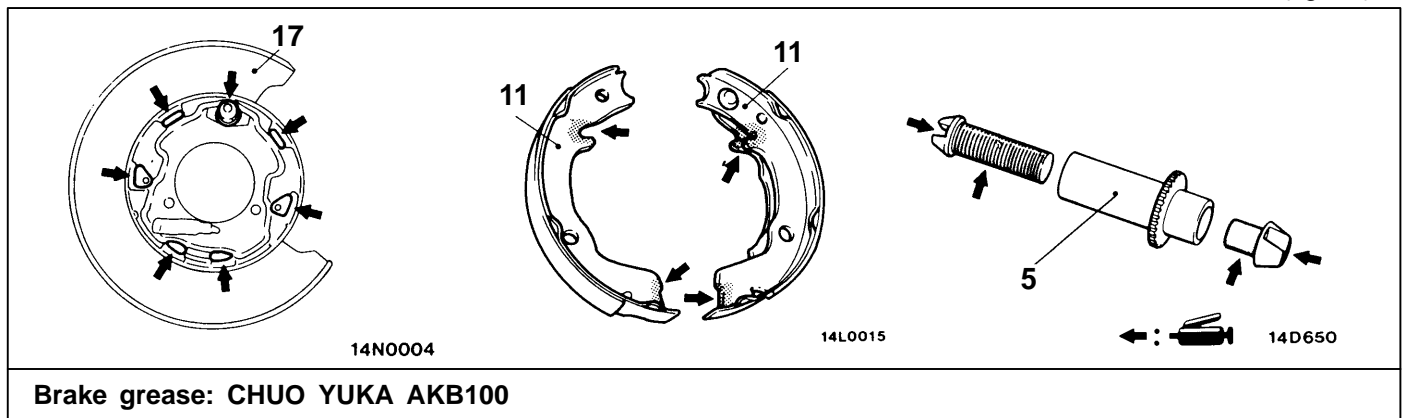
## REMOVAL AND INSTALLATION

**Post-installation Operation**

- Parking Brake Lever Stroke Check and Adjustment (Refer to P.36-3.)



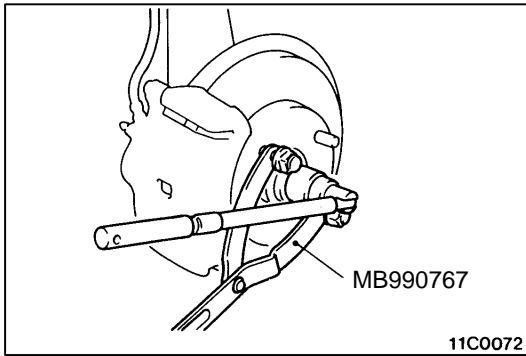
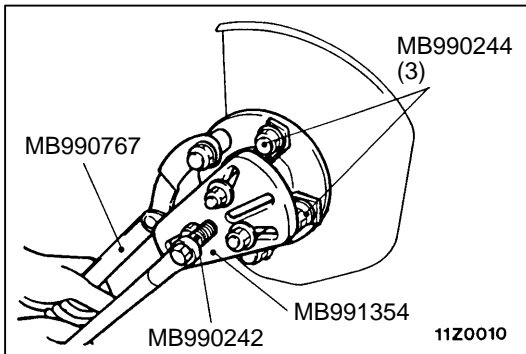
14M0117  
Unit: Nm {kgf·m}



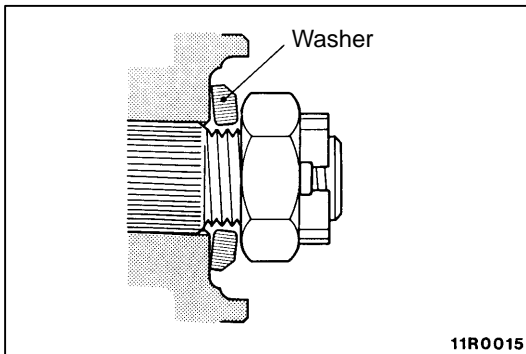
**Removal steps**

- |   |   |
|---|---|
| <ol style="list-style-type: none"> <li>1. Rear brake caliper (Refer to P.36-6.)</li> <li>2. Rear brake disc</li> <li>3. Shoe-to-anchor spring (Refer to P.36-6.)</li> <li>4. Adjusting screw spring</li> <li>5. Adjuster</li> <li>6. Strut</li> <li>7. Strut return spring</li> <li>8. Shoe hold-down cup (Refer to P.36-6.)</li> </ol> | <ol style="list-style-type: none"> <li>9. Shoe hold-down spring</li> <li>10. Shoe hold-down pin</li> <li>11. Shoe and lining assembly</li> <li>12. Clip</li> <li>13. Parking brake cable</li> <li>14. Split pin</li> <li>15. Drive shaft nut</li> <li>16. Rear hub assembly</li> <li>17. Backing plate</li> </ol> |
|---|---|



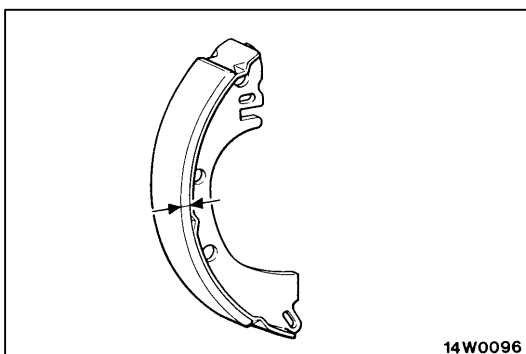
**REMOVAL SERVICE POINTS****◀A▶ DRIVE SHAFT NUT REMOVAL****◀B▶ REAR HUB ASSEMBLY REMOVAL**

- (1) Using the special tool, remove the drive shaft from the rear hub assembly.
- (2) Remove the mounting bolts and remove the rear hub assembly from the knuckle.

**INSTALLATION SERVICE POINT****▶A◀ DRIVE SHAFT NUT INSTALLATION**

- (1) Install the drive shaft washer in the direction shown.
- (2) Use the special tool as you did during removal and tighten the drive shaft nut to the specified torque.

**Tightening torque: 196 – 255 Nm {20.0 – 26.0 kgf · m}**

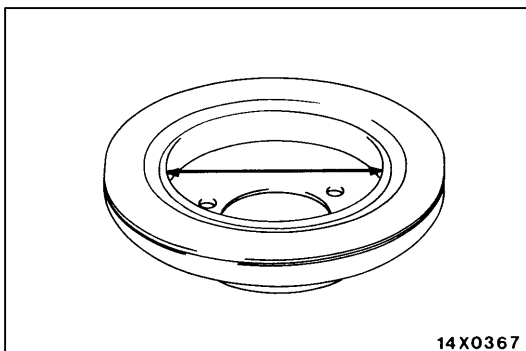
**INSPECTION****BRAKE LINING AND BRAKE DRUM WEAR CHECK**

- (1) Measure the thickness of the brake lining at a location that wears most.

**Standard value: 2.8 mm**

**Limit: 1.0 mm**

- (2) If the measurement exceeds the limit, replace the shoe & lining assembly of both sides as a set.



- (3) Measure I.D. of the brake disc at two or more places.

**Standard value: 168.0 mm**

**Limit: 169.0 mm**

- (4) If the measurement exceeds the limit or there is an excessive eccentric wear evident, replace the brake disc.

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# STEERING

## CONTENTS

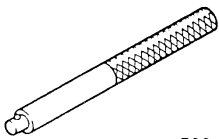

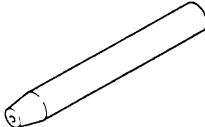
<b>SERVICE SPECIFICATIONS</b> .....	2	<b>STEERING WHEEL</b>	
<b>SPECIAL TOOLS</b> .....	2	<b>&lt;EVOLUTION-IV RS&gt;</b> .....	3
<b>ON-VEHICLE SERVICE</b> .....	2	<b>POWER STEERING GEAR &amp; LINKAGE</b> ...	3
1. Steering Angle Check .....	2	<b>POWER STEERING OIL PUMP</b> .....	7
2. Oil Pump Belt Tension Check and Adjustment .....	2	<b>POWER STEERING FLUID COOLER</b> .....	9

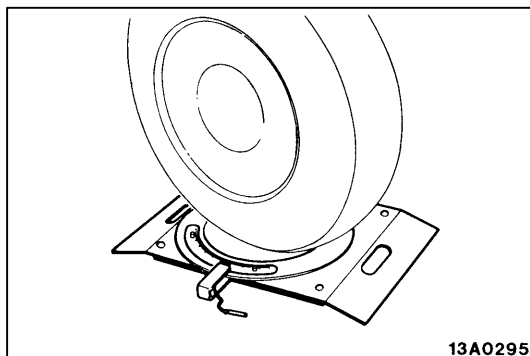


## SERVICE SPECIFICATIONS

Items			Standard value
Steering angle	EVOLUTION-IV	Inner wheel	33°30' ± 2°
		Outer wheel	28°20'
	EVOLUTION-V	Inner wheel	33°10' ± 2°
		Outer wheel	28°10'
Steering gear	Pinion total turning torque Nm {kgf·cm}	Total turning torque	0.9 – 1.7 {9 – 17}
		Torque fluctuations	0.4 {4} or less

## SPECIAL TOOLS

Tool	Number	Name	Use
 B991197	MB991197	Installer bar	Pressfitting of gear housing oil seal
	MB991199	Oil seal installer	
 B991214	MB991214	Oil seal protector	Installation of rack assembly



## ON-VEHICLE SERVICE

### 1. STEERING ANGLE CHECK

Locate front wheels on turning radius gauge and measure steering angle.

**Standard value:**

**Inner wheel**

33°30' ± 2° <EVOLUTION-IV>

33°10' ± 2° <EVOLUTION-V>

**Outer wheel**

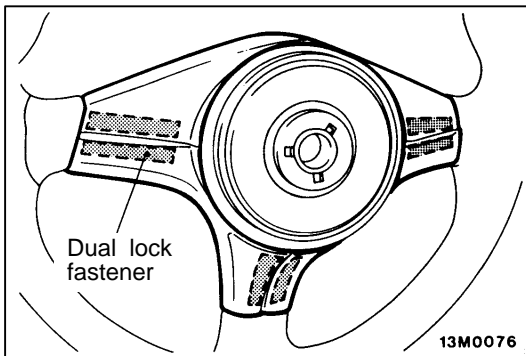
28°20' <EVOLUTION-IV>

28°10' <EVOLUTION-V>

When the angle is not within the standard value, the toe is probably incorrect. Adjust toe (Refer to GROUP 33A – On-vehicle Service) and recheck steering angle.

### 2. OIL PUMP BELT TENSION CHECK AND ADJUSTMENT

Refer to GROUP 11 – Engine Adjustments.

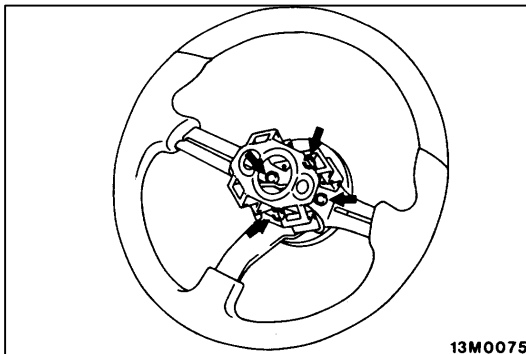


## STEERING WHEEL <EVOLUTION-IV RS>

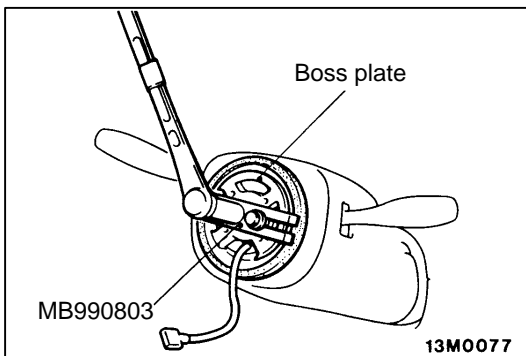
### REMOVAL SERVICE POINT

#### STEERING WHEEL REMOVAL

- (1) Peel off the dual lock fasteners from the steering wheel spokes and remove the horn pad.



- (2) Remove the bolts indicated by arrows in the illustration and remove the steering wheel from the boss plate.



- (3) Using the special tool, remove the boss plate from the steering column.

## POWER STEERING GEAR & LINKAGE

For removal, installation and inspection procedure, follow the conventional procedures except the following.

### INSPECTION

#### PINION TOTAL TURNING TORQUE

The conventional procedures apply except for the standard value.

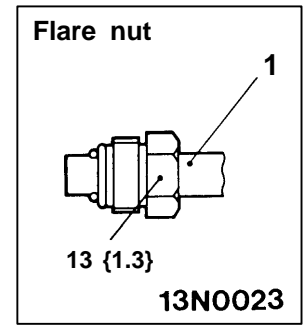
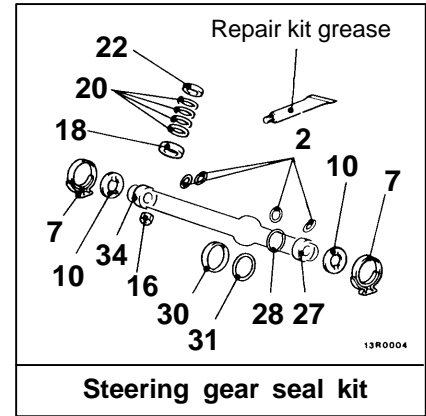
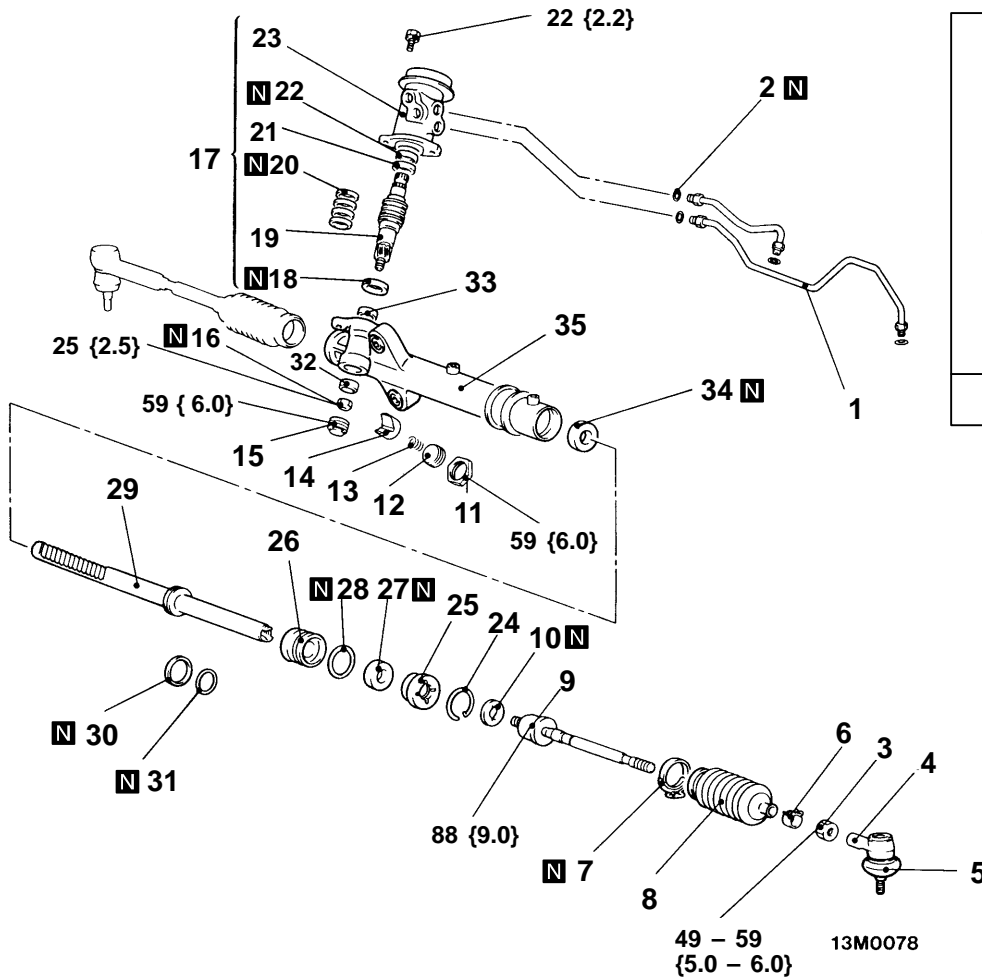
**Standard value:**

**Total turning torque 0.9 to 1.7 Nm {9 to 17 kgf·cm}**

**Torque fluctuations 0.4 Nm {4 kgf·cm} or less**



DISASSEMBLY AND REASSEMBLY



Unit: Nm {kgf·m}

Disassembly steps

- 1. Feed pipe
- 2. O-ring
- ▶N◀ 3. Lock nut
- ▶N◀ 4. Tie rod end
- ▶M◀ 5. Dust cover
- 6. Clip
- ▶L◀ 7. Band
- 8. Bellows
- ▶K◀ 9. Tie rod
- ▶K◀ 10. Tab washer
- ▶J◀ • Pinion total turning torque adjustment
- 11. Lock nut
- ◀A▶ 12. Rack support cover
- 13. Support spring
- ▶I◀ 14. Rack support
- 15. End plug
- 16. Lock nut
- 17. Valve housing assembly

- ◀B▶ ▶H◀ 18. Lower oil seal
- ◀B▶ ▶G◀ 19. Pinion & valve assembly
- ◀C▶ ▶F◀ 20. Seal ring
- ◀D▶ ▶F◀ 21. Upper bearing
- ◀D▶ ▶F◀ 22. Upper oil seal
- 23. Valve housing
- ◀E▶ ▶E◀ 24. Circlip
- ◀F▶ ▶D◀ 25. Rack stopper
- ◀F▶ ▶D◀ 26. Rack bushing
- ◀G▶ ▶D◀ 27. Oil seal
- 28. O-ring
- ◀F▶ ▶C◀ 29. Rack assembly
- ◀C▶ ▶C◀ 30. Seal ring
- 31. O-ring
- ◀H▶ ▶B◀ 32. Lower bearing
- ◀I▶ ▶B◀ 33. Needle bearing
- ◀J▶ ▶A◀ 34. Oil seal
- 35. Gear housing

49 - 59 {5.0 - 6.0} 13M0078

**LUBRICANT AND SEALANT APPLICATION POINTS**

Same as before.

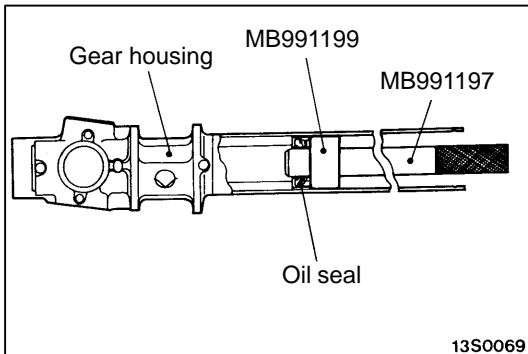
**DISASSEMBLY SERVICE POINT**

Follow the conventional procedures.

**REASSEMBLY SERVICE POINTS**

Follow the conventional procedures except followings.

**▶A◀ OIL SEAL INSTALLATION**

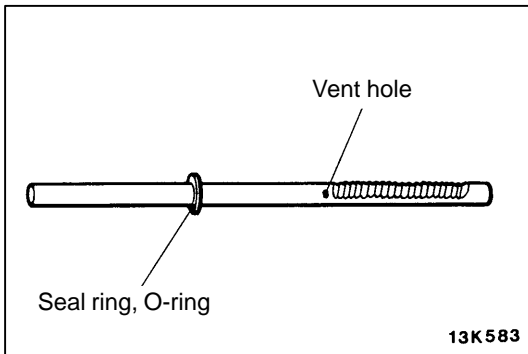


**▶C◀ RACK ASSEMBLY INSTALLATION**

- (1) Apply a coating of repair kit grease to the rack tooth face.

**Caution**

**Do not close the vent hole in the rack with grease.**



- (2) Cover rack serrations with special tool.
- (3) Apply the specified fluid on the special tool, seal ring and O-ring surfaces.

**Specified fluid:**

**MITSUBISHI GENUINE ATF II**

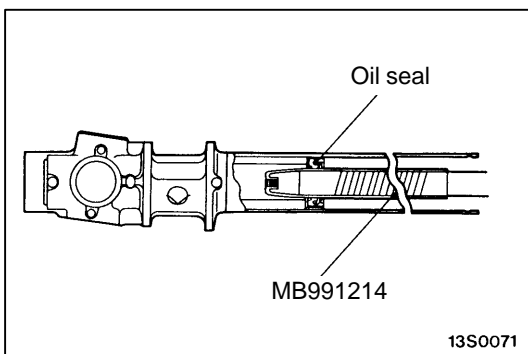
**Caution**

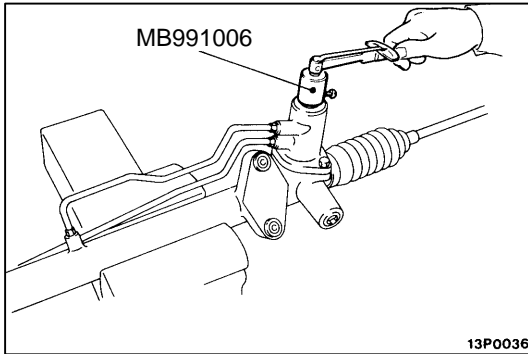
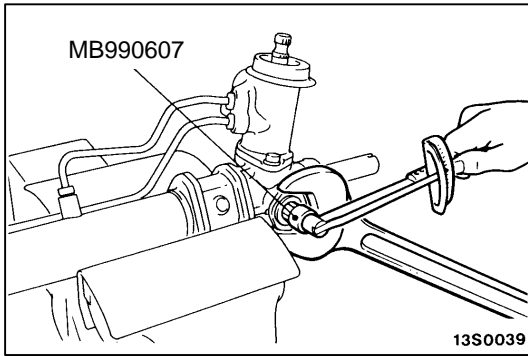
**Do not use ATF-SP II.**

- (4) Slowly insert the special tool-covered rack into the gear housing from power cylinder side.

**Caution**

**When inserting the rack, align the oil seal center with the tip of the special tool to prevent the retainer spring from slipping.**





**▶J◀ ADJUSTMENT OF PINION TOTAL TURNING TORQUE**

- (1) With special tool, tighten rack support cover to 15 Nm {1.5 kgf·m}.
- (2) Return rack support cover approx. 30°.

- (3) Using the special tools, rotate the pinion shaft at the rate of one rotation in approximately 4 to 6 seconds to check that the turning torque and the torque fluctuation confirm to the standard values.

**Standard value:**

**Pinion total turning torque**

**0.9 – 1.7 Nm {9 – 17 kgf·cm}**

**Torque fluctuation 0.4 Nm {4 kgf·cm} or less**

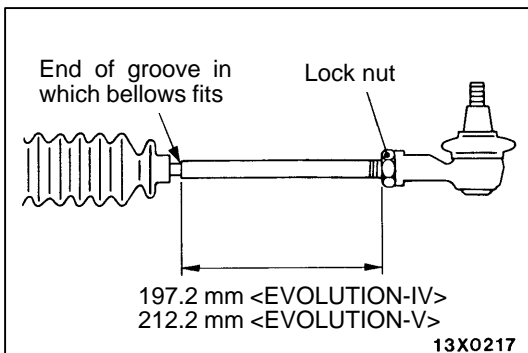
- (4) If either the turning torque or the torque fluctuation deviates from the standard value, turn back the rack support cover within the range of 0 to 30° to adjust it for the standard value.

**Caution**

1. When adjusting, set the standard value at its highest value.
2. Assure no ratcheting or catching when operating rack towards the axial direction.
3. Be sure to measure the turning torque through the whole stroke of the rack.

**NOTE**

If the standard value cannot be obtained by turning back the rack support cover within the specified angle range, check rack support cover components and replace as required.



**▶N◀ TIE ROD END / LOCK NUT INSTALLATION**

Turn down the tie rod until the dimension shown in the illustration is reached; then, temporarily tighten the lock nut.

**NOTE**

The lock nut is to be tightened to the specified torque after toe-in has been adjusted with the steering gear & linkage mounted in the vehicle.

# POWER STEERING OIL PUMP

<EVOLUTION-IV>

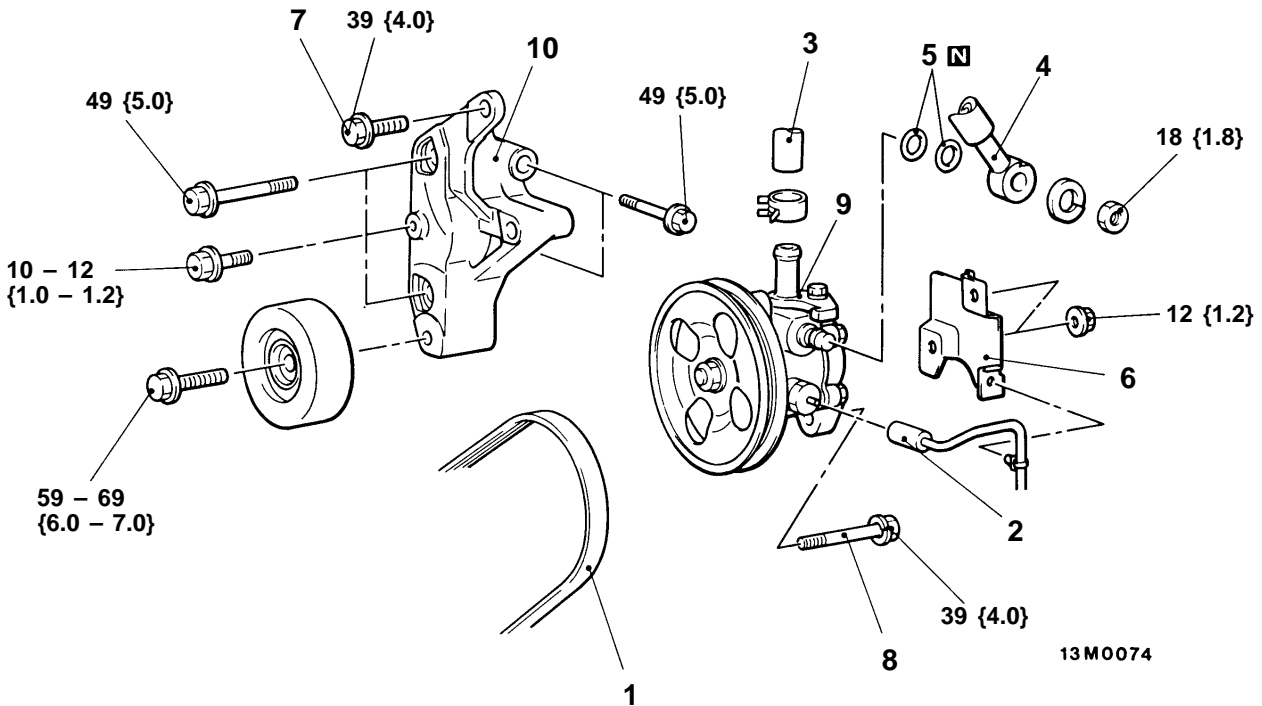
## REMOVAL AND INSTALLATION

**Pre-removal Operation**

- Power Steering Fluid Draining

**Post-installation Operation**

- (1) Power Steering Fluid Supplying
- (2) Drive Belt Tension Adjusting  
(Refer to GROUP 11 – On-vehicle Service.)



Unit: Nm {kgf · m}

**Removal steps**

1. Drive belt
2. Pressure switch connector
3. Suction hose
4. Pressure hose
5. O-ring
6. Heat protector
7. Bolt
8. Bolt
9. Oil pump assembly
10. Oil pump bracket

<EVOLUTION-V>

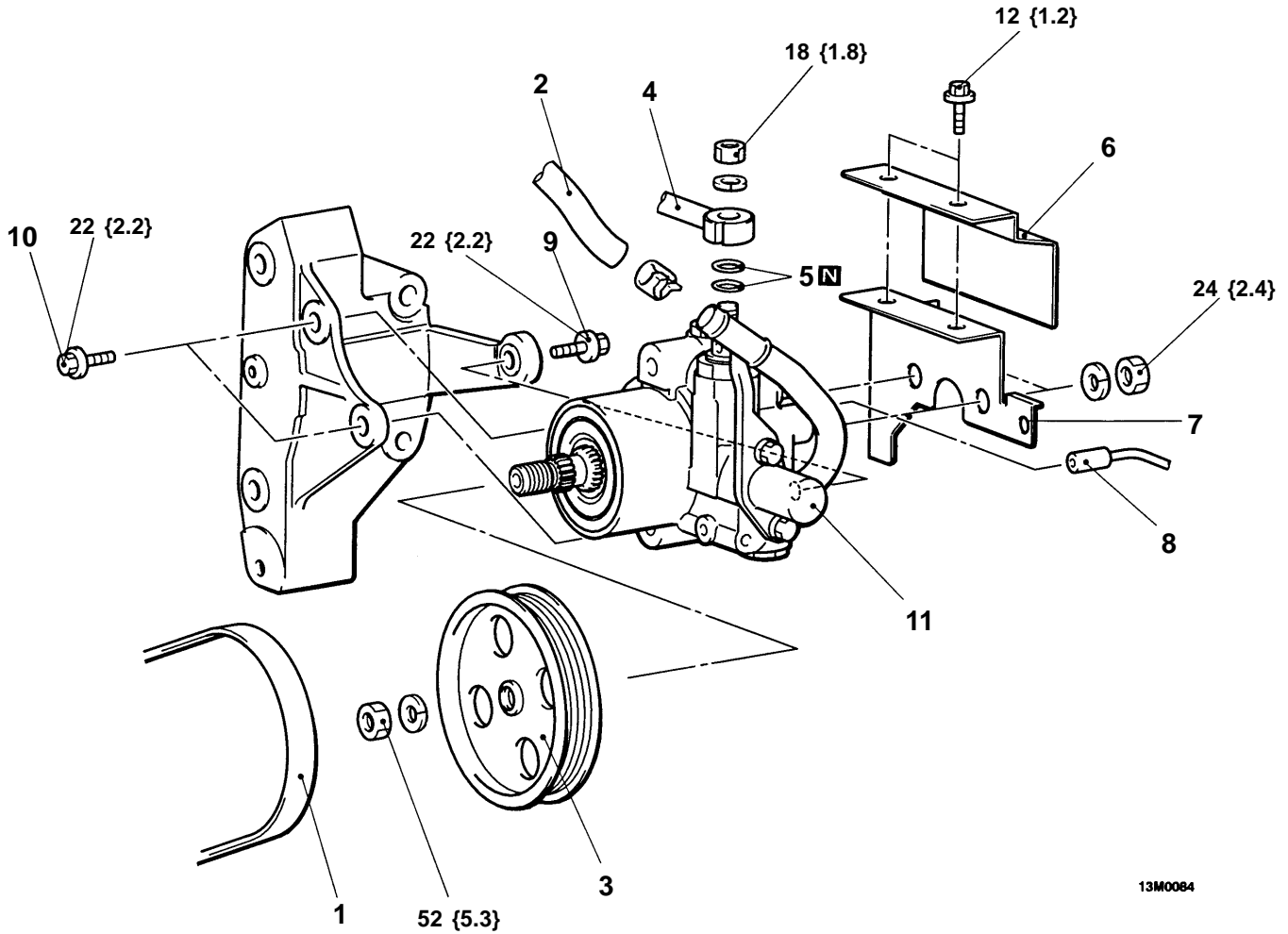
REMOVAL AND INSTALLATION

**Pre-removal Operation**

- Power Steering Fluid Draining

**Post-installation Operation**

- (1) Power Steering Fluid Supplying
- (2) Drive Belt Tension Adjusting
- (3) Power Steering Fluid Line Bleeding



13M0084

Unit: Nm {kgf·m}

**Removal steps**

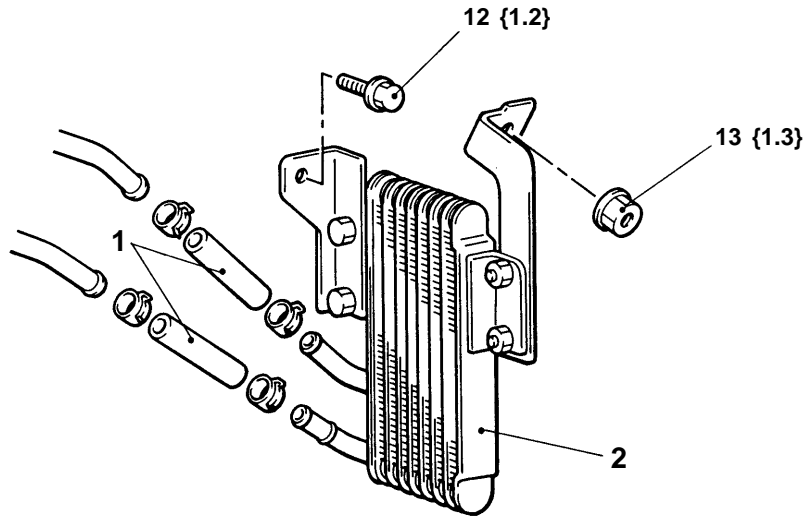
- |   |   |
|---|---|
| <ol style="list-style-type: none"> <li>1. Drive belt</li> <li>2. Suction hose</li> <li>3. Pulley</li> <li>4. Pressure hose</li> <li>5. O-ring</li> <li>6. Heat protector A</li> </ol> | <ol style="list-style-type: none"> <li>7. Heat protector B</li> <li>8. Pressure switch connector</li> <li>9. Bolt</li> <li>10. Bolt</li> <li>11. Oil pump assembly</li> </ol> |
|---|---|

# POWER STEERING FLUID COOLER

## REMOVAL AND INSTALLATION

**Pre-removal and Post-installation Operation**

- (1) Power Steering Fluid Draining and Refilling
- (2) Front Bumper Removal and Installation  
(Refer to GROUP 51.)



13M0073

Unit: Nm {kgf·m}

**Removal steps**

1. Cooler hose
2. Power steering fluid cooler

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# BODY

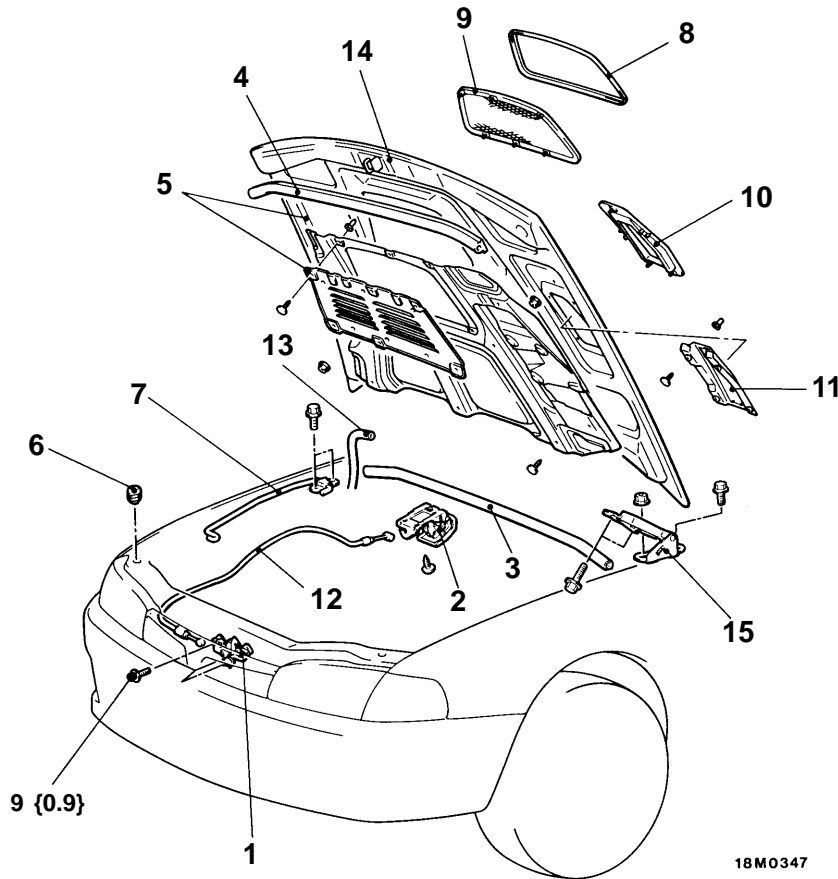
## CONTENTS

HOOD .....	2	TYPE A (PROJECTED DIMENSIONS) .....	7
FENDER .....	3	TYPE B (ACTUAL-MEASUREMENT DIMENSIONS) .....	11
TRUNK LID <EVOLUTION-V> .....	4		
BODY CONSTRUCTION (Difference between EVOLUTION-IV and V) .....	5		



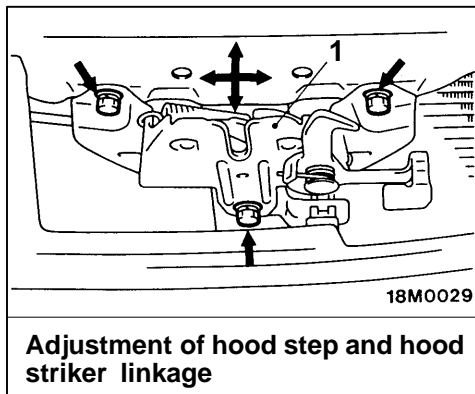
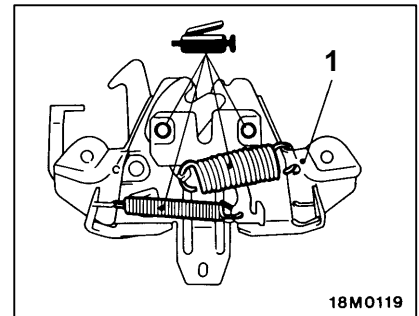
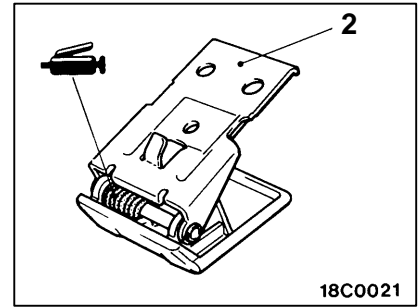
HOOD

REMOVAL AND INSTALLATION

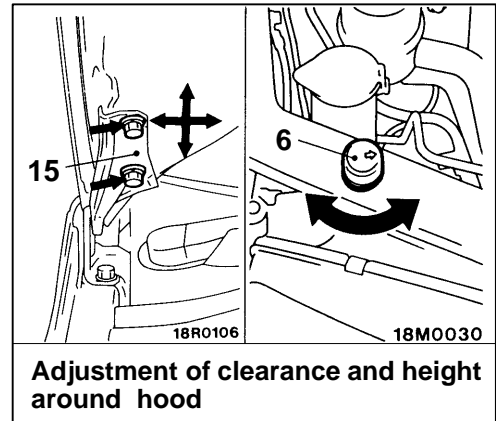


18M0347

Unit: Nm {kgf · m}



Adjustment of hood step and hood striker linkage



Adjustment of clearance and height around hood

- 1. Hood latch
- 2. Hood lock release handle
- 3. Hood weatherstrip
- 4. Hood weatherstrip
- 5. Hood insulator
- 6. Bumper
- 7. Hood support rod
- 8. Hood outlet garnish weatherstrip
- 9. Hood outlet garnish
- 10. Hood inlet garnish, upper
- 11. Hood inlet garnish, lower

**Hood lock release cable removal steps**

- Splash shield <Driver's side>
- 12. Hood lock release cable

**Hood and hood hinge removal steps**

- 13. Washer hose connection
- 14. Hood
- 15. Hood hinge

**Caution**  
For hood hinge and hood mounting, use only specially surface-treated bolts.



# FENDER

<EVOLUTION-V>

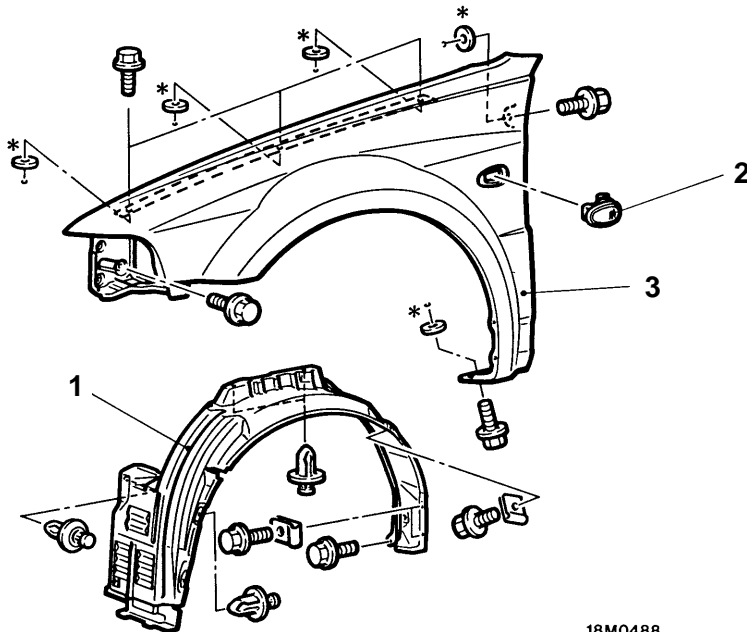
## REMOVAL AND INSTALLATION

**Caution**

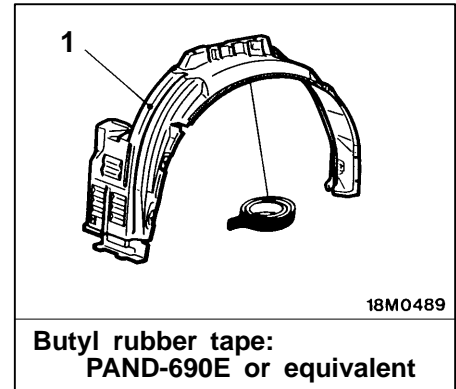
A rust preventive treatment has been applied to the washers marked with \* to prevent contact corrosion between aluminum and metal of different kind. Be sure to use these special washers.

**Pre-removal and Post-installation Operation**

- (1) Front Bumper Removal and Installation (Refer to GROUP 51.)
- (2) Front Turn Signal Lamp Removal and Installation
- (3) Side Air Dam Removal and Installation (Refer to GROUP 51 – Aero Parts.)



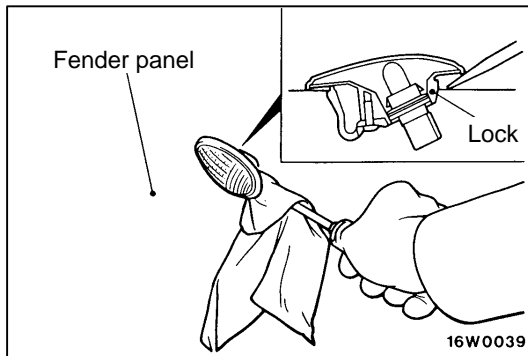
18M0488



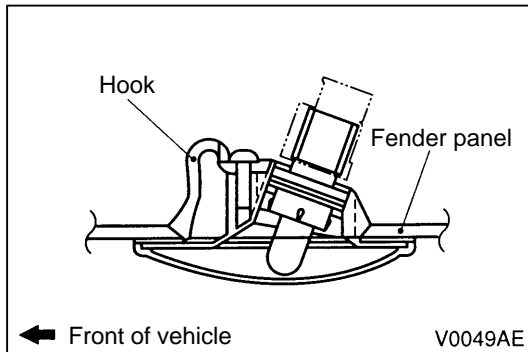
18M0489

**Removal steps**

- ◀A▶ ▶A◀
- 1. Splash shield
  - 2. Side turn signal lamp
  - 3. Overfender

**REMOVAL SERVICE POINT****◀A▶ SIDE TURN SIGNAL LAMP REMOVAL**

Using a flat-tip screwdriver or similar tool, release the lock from the fender panel and remove the side turn signal lamp.

**INSTALLATION SERVICE POINT****▶A◀ SIDE TURN SIGNAL LAMP INSTALLATION**

Fit the hook into the fender panel to secure the side turn signal lamp into position.

**TRUNK LID <EVOLUTION-V>**

The conventional procedures shall be used except for followings.

**INSTALLATION SERVICE POINT****TRUNK LID TORSION BAR INSTALLATION**

- (1) Torsion bars are color-coded, as indicated at their center.

Torsion bar <LH> ID color	Torsion bar <RH> ID color
White green	Orange

- (2) Fit the end of the torsion bar into the mounting hole.  
 (3) As you did during removal, mount the special tool to the torsion bar and twist the torsion bar to hook it onto the link; then, hook it onto the holder.

**Caution**

**Make sure that the special tool is positively mounted to the torsion bar. If the torsion bar comes off the special tool, it can damage the body and other parts.**

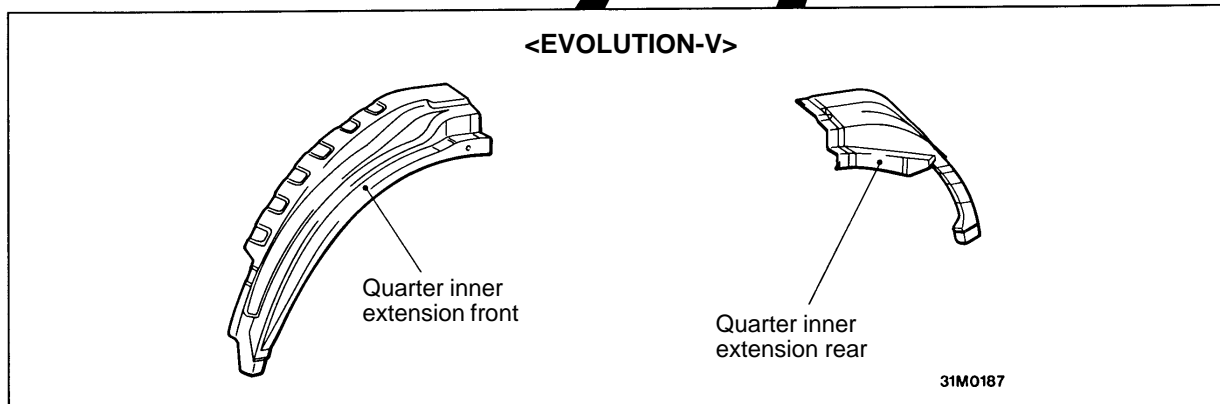
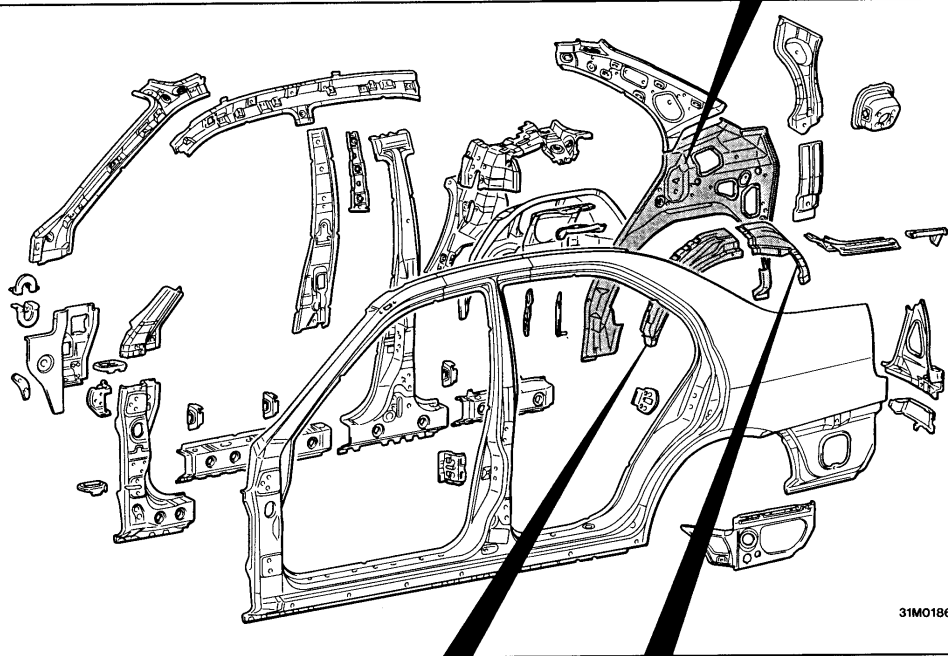
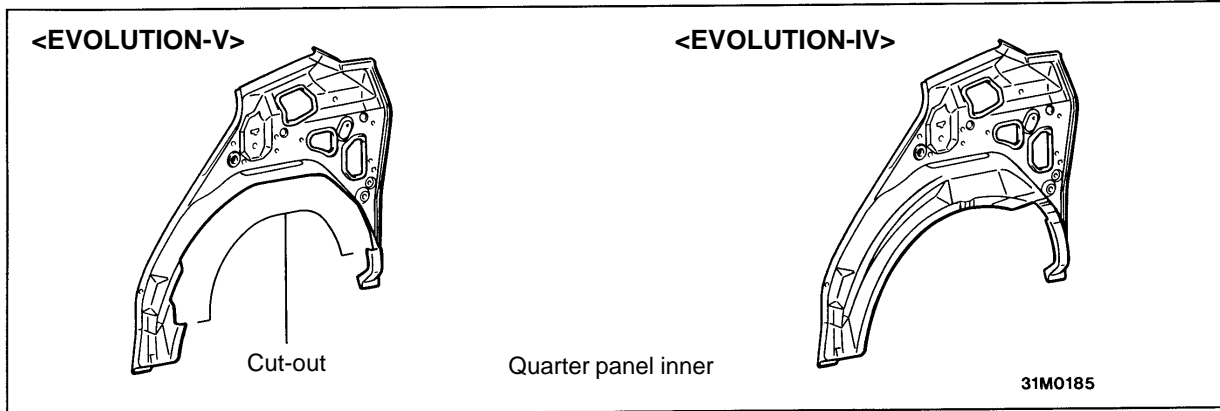
# BODY CONSTRUCTION (Difference between EVOLUTION-IV and V)

EVOLUTION-V has a different rear suspension configuration from that of EVOLUTION-IV because of adoption of reinforced suspension elements and wide tread tyres. For this reason, the configuration and the dimensions of the following body sections are also different.

## SIDE BODY

### Side Structure

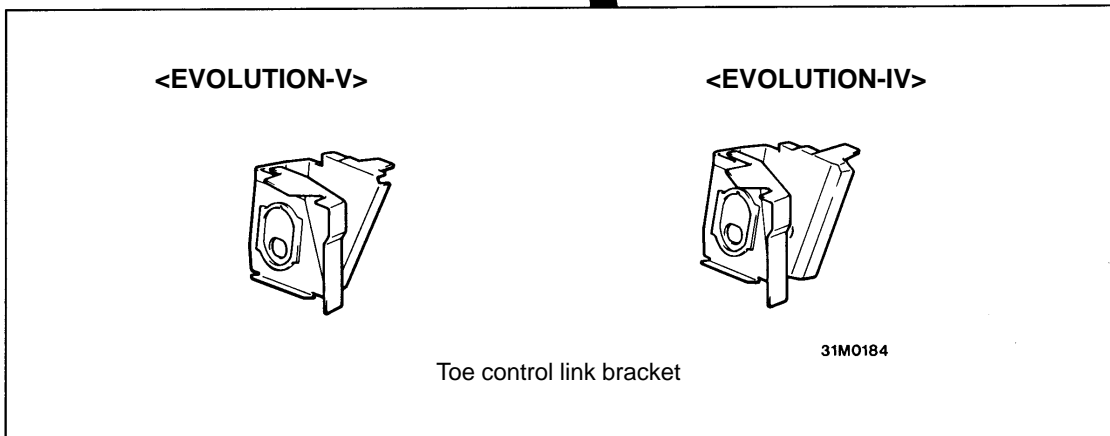
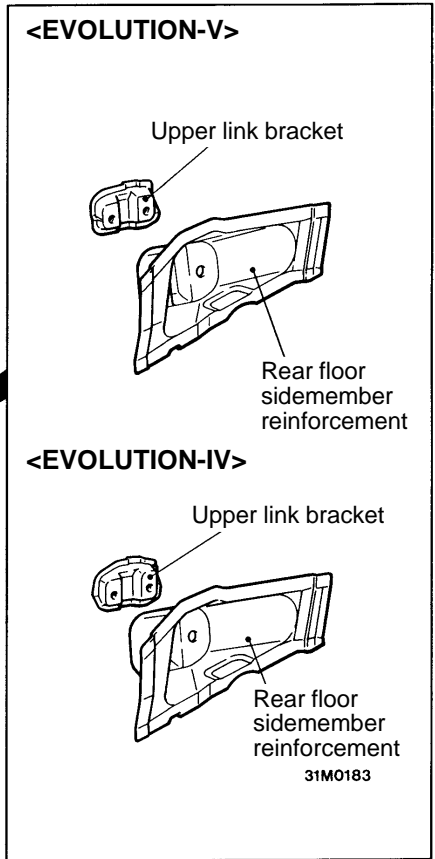
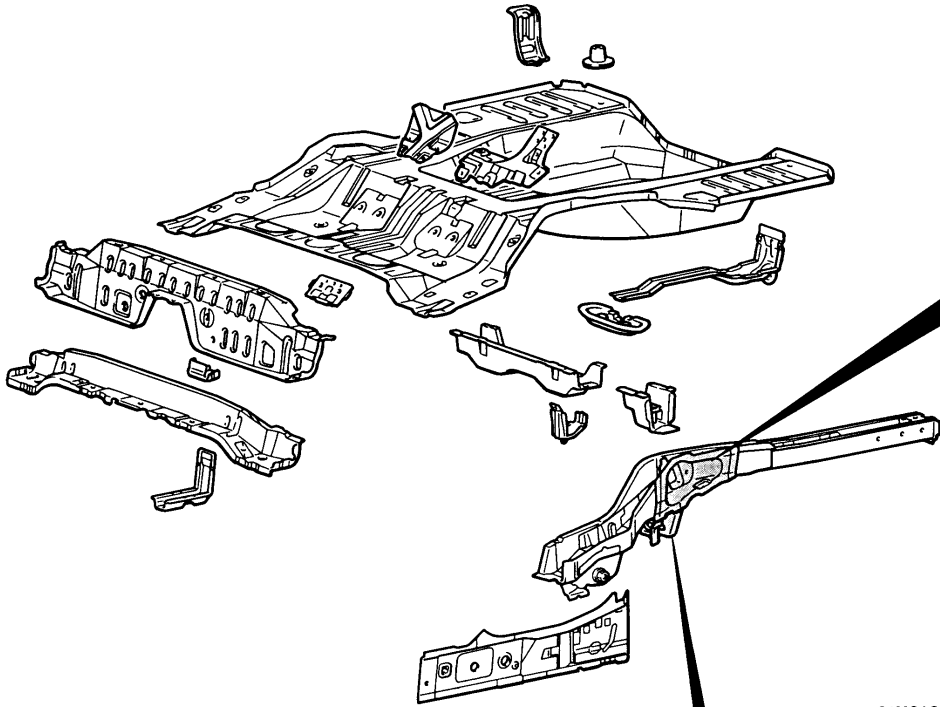
- (1) The quarter panel has a cut-out provided at the inner section.
- (2) The quarter inner extension front and the quarter inner extension rear is provided in the quarter panel inner cut-out section.



### UNDER BODY

#### Rear Floor

The upper link bracket, rear floor sidemember reinforcement and toe control link bracket have been changed in configuration.



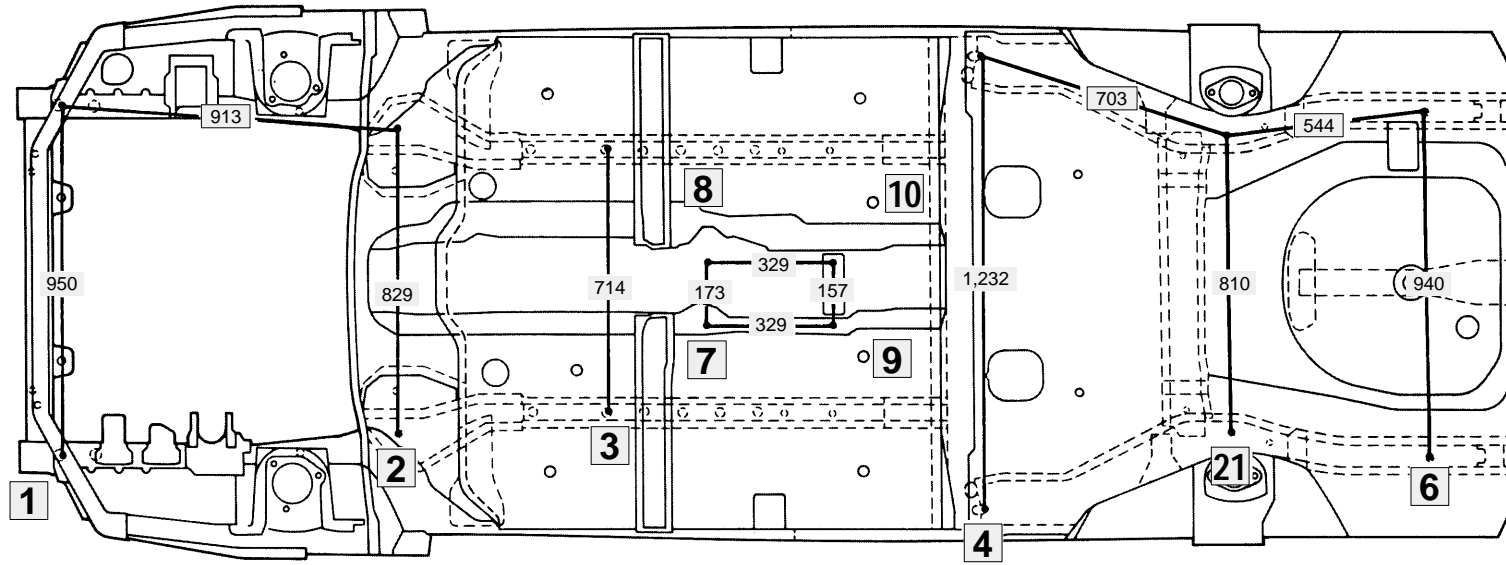
# BODY DIMENSION

## TYPE A (PROJECTED DIMENSIONS) <EVOLUTION-V>

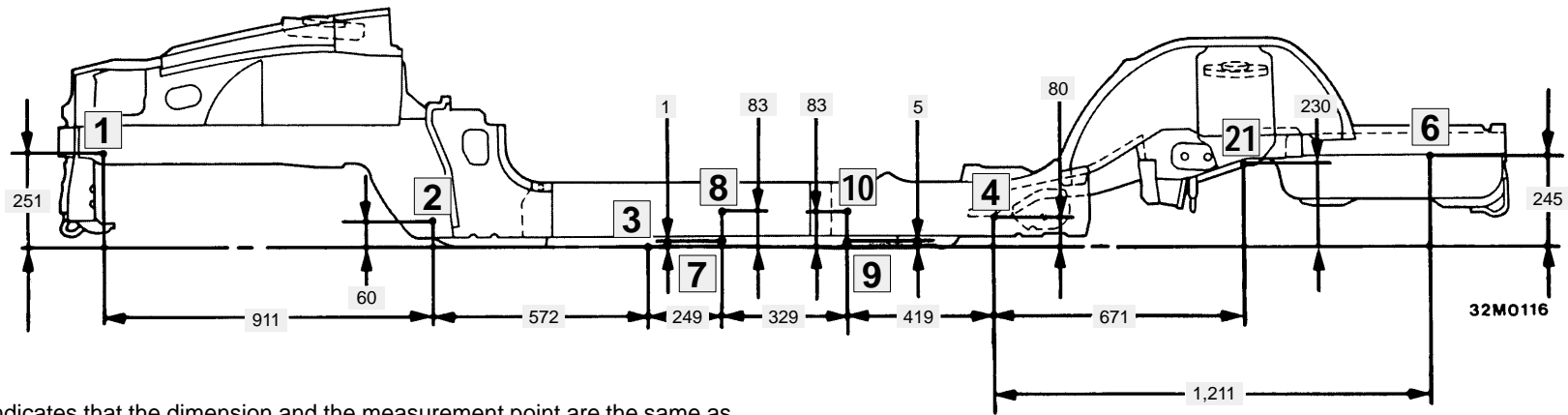
The reference dimensions of the under body have been changed as follow. Those of the other body sections remain unchanged.

### UNDER BODY

Unit: mm



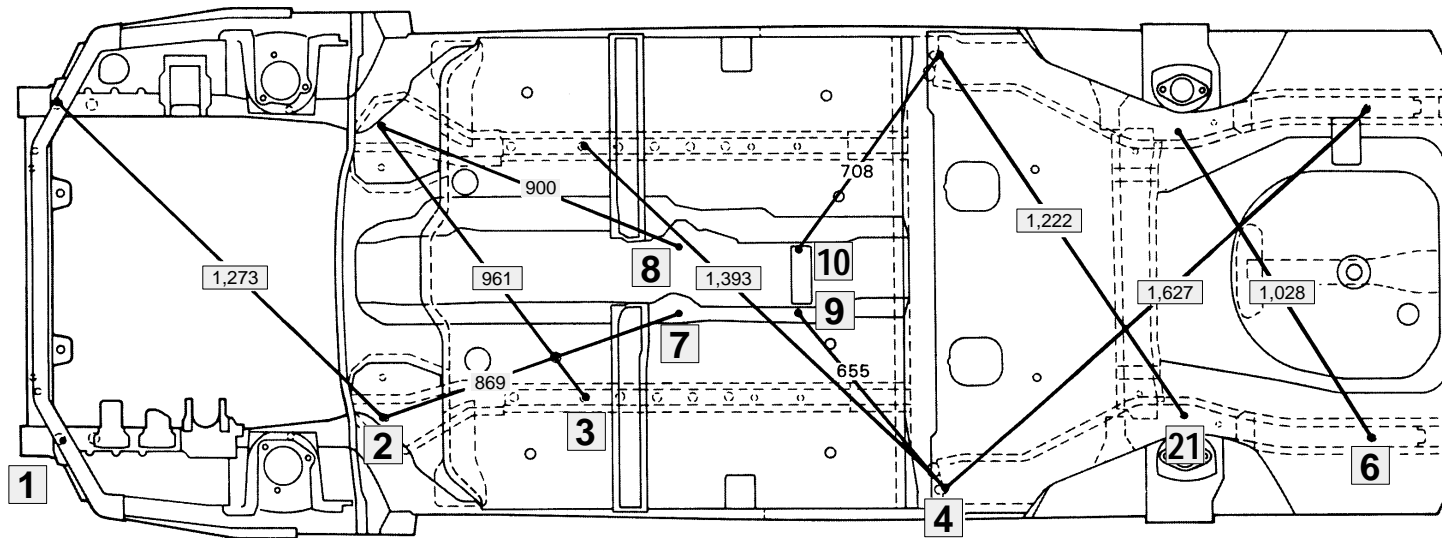
32M0115



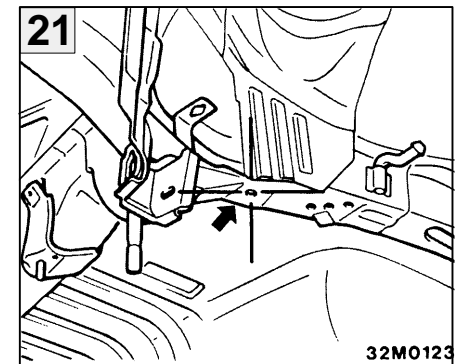
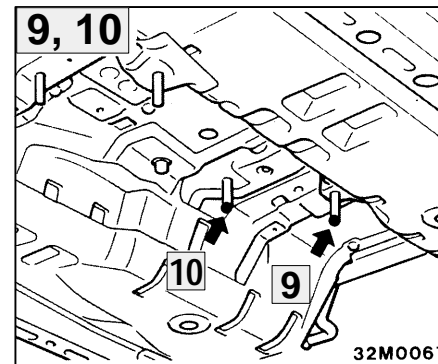
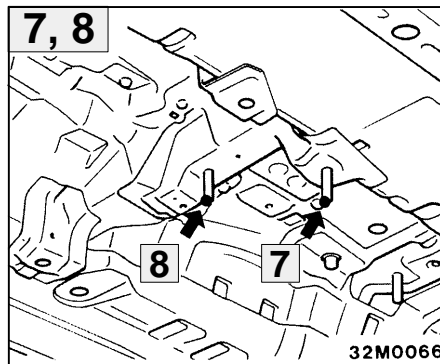
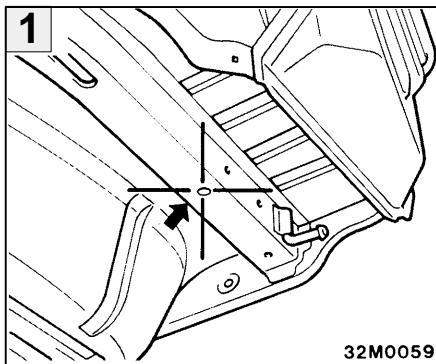
32M0116

■ indicates that the dimension and the measurement point are the same as those for EVOLUTION-IV.

Unit: mm



■ indicates that the dimension and the measurement point are the same as those for EVOLUTION-IV.

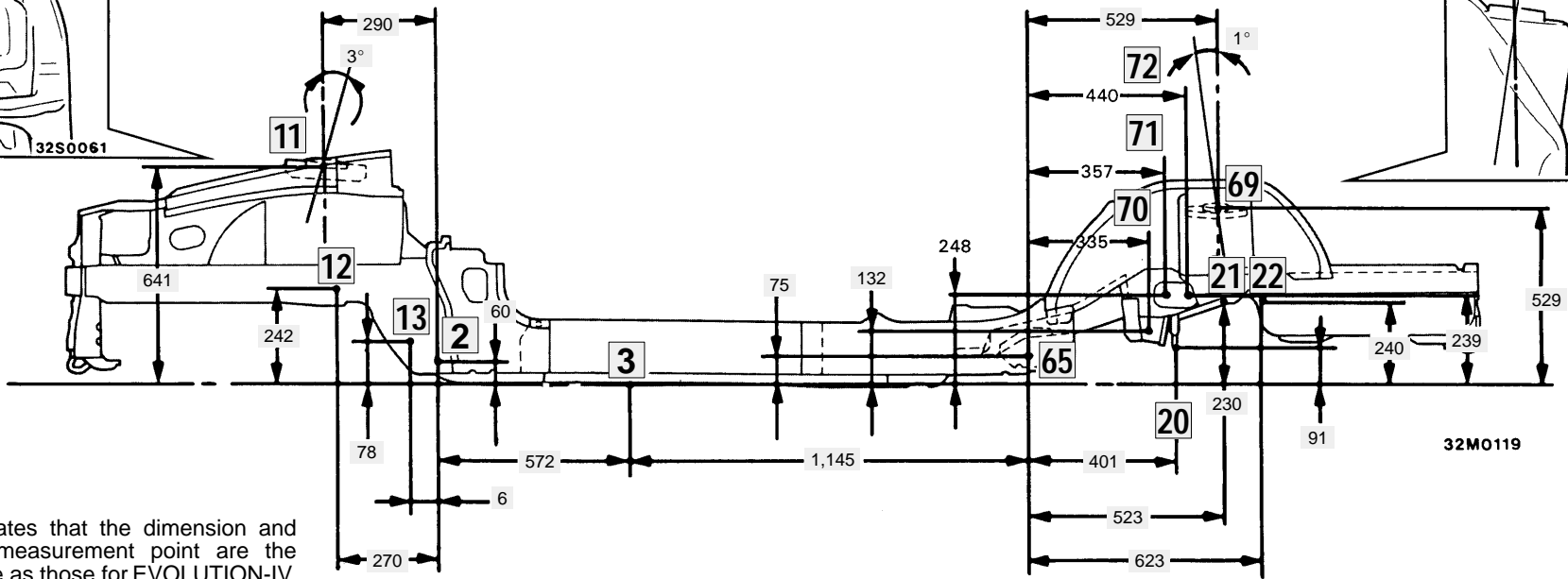
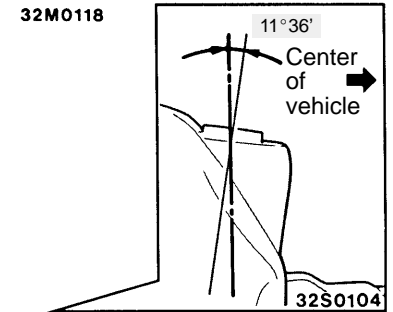
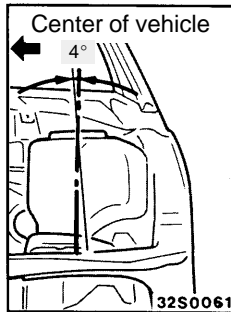
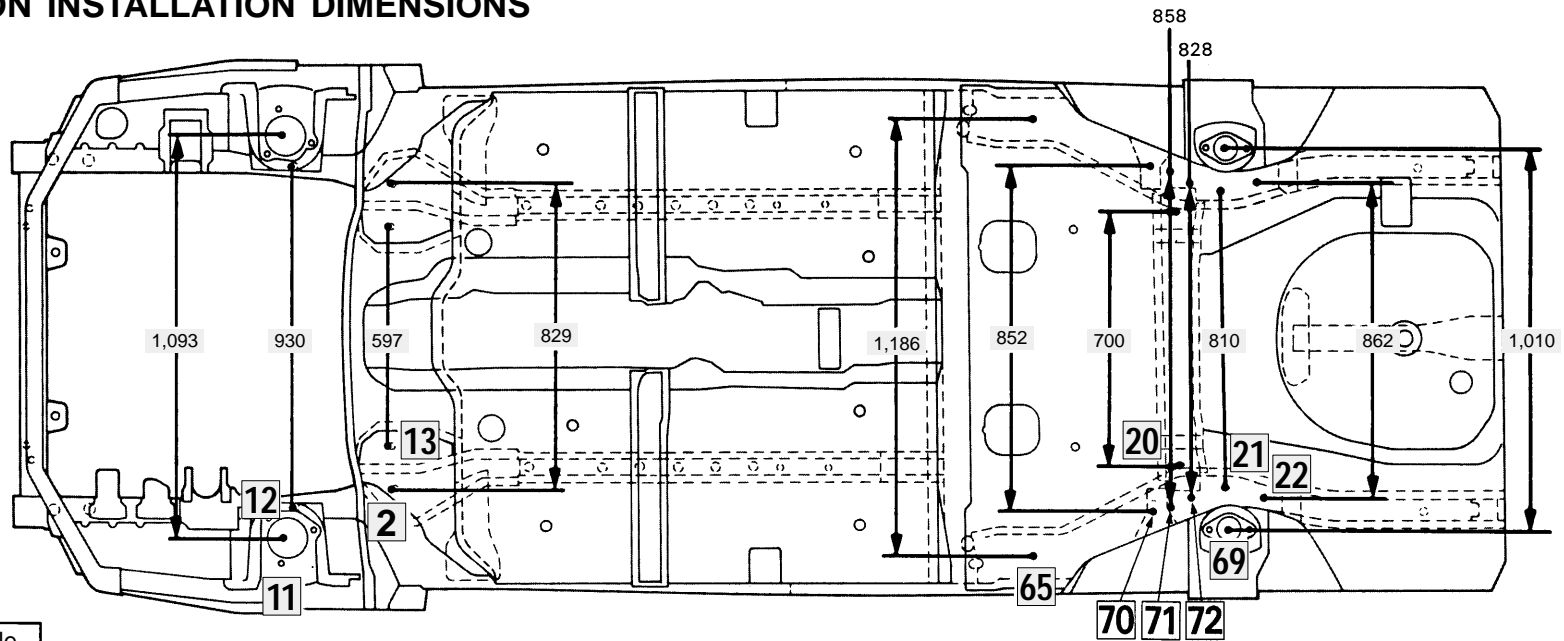


No.	Standard measurement point	Hole shape	Size mm	No.	Standard measurement point	Hole shape	Size mm
1*	Rear portion of front bumper stay mounting hole	○	– 30	7	Center bearing mounting bolt end	–	–
2*	Center of suspension crossmember mounting hole	Left: ○ Right: ○	– 14 – 16	8	Center bearing mounting bolt end	–	–
3*	Rear portion of front floor sidemember positioning hole	○	– 25	9	Center bearing mounting bolt end	–	–
4*	Rear portion of rear seat crossmember positioning hole	○	– 22 × 38	10	Center bearing mounting bolt end	–	–
6*	Center of rear floor sidemember extension drain hole	○	– 20	21	Center of suspension crossmember mounting hole	○	– 14

NOTE: The \* mark indicates the mounting position for the frame centering gauge.

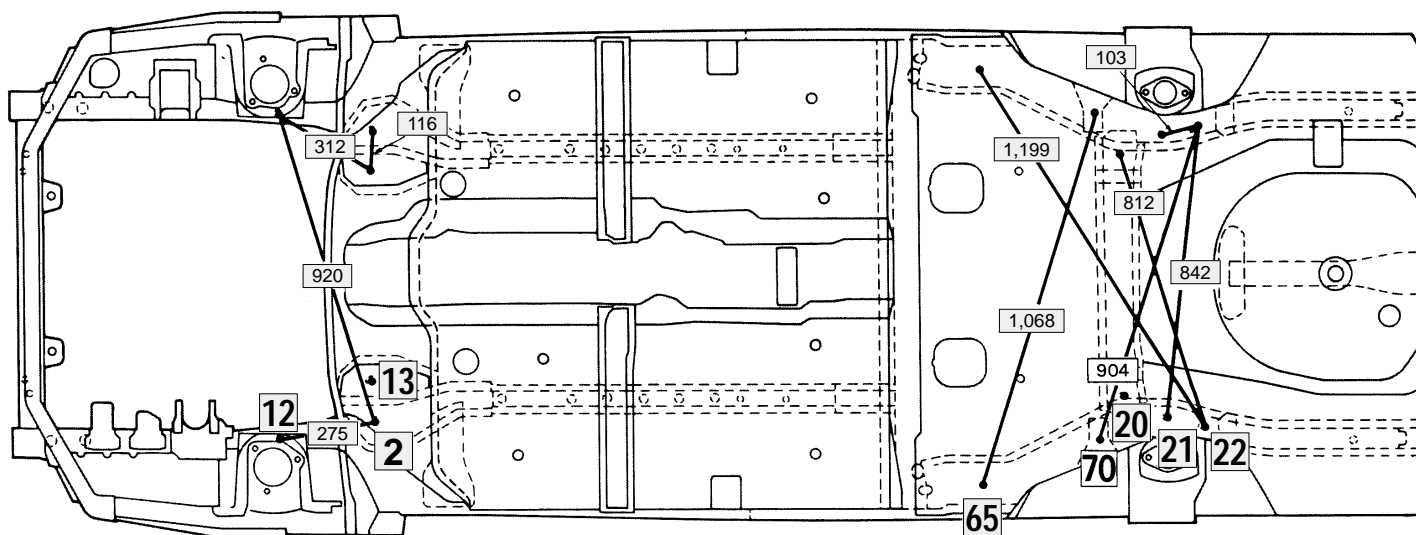
# SUSPENSION INSTALLATION DIMENSIONS

Unit: mm



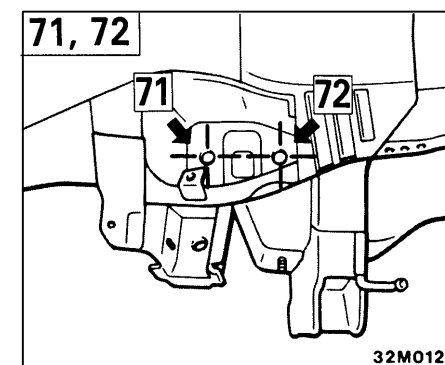
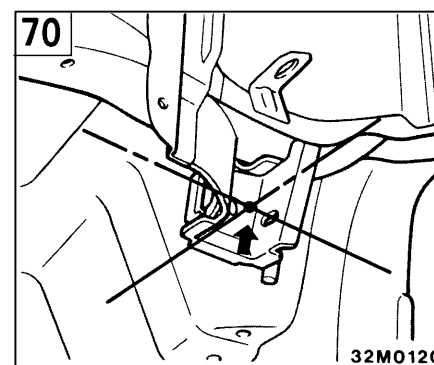
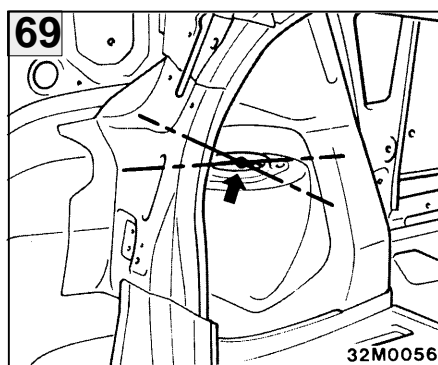
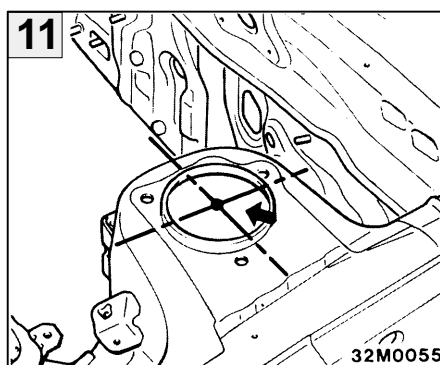
■ indicates that the dimension and the measurement point are the same as those for EVOLUTION-IV.

Unit: mm



■ indicates that the dimension and the measurement point are the same as those for EVOLUTION-IV.

32M0124

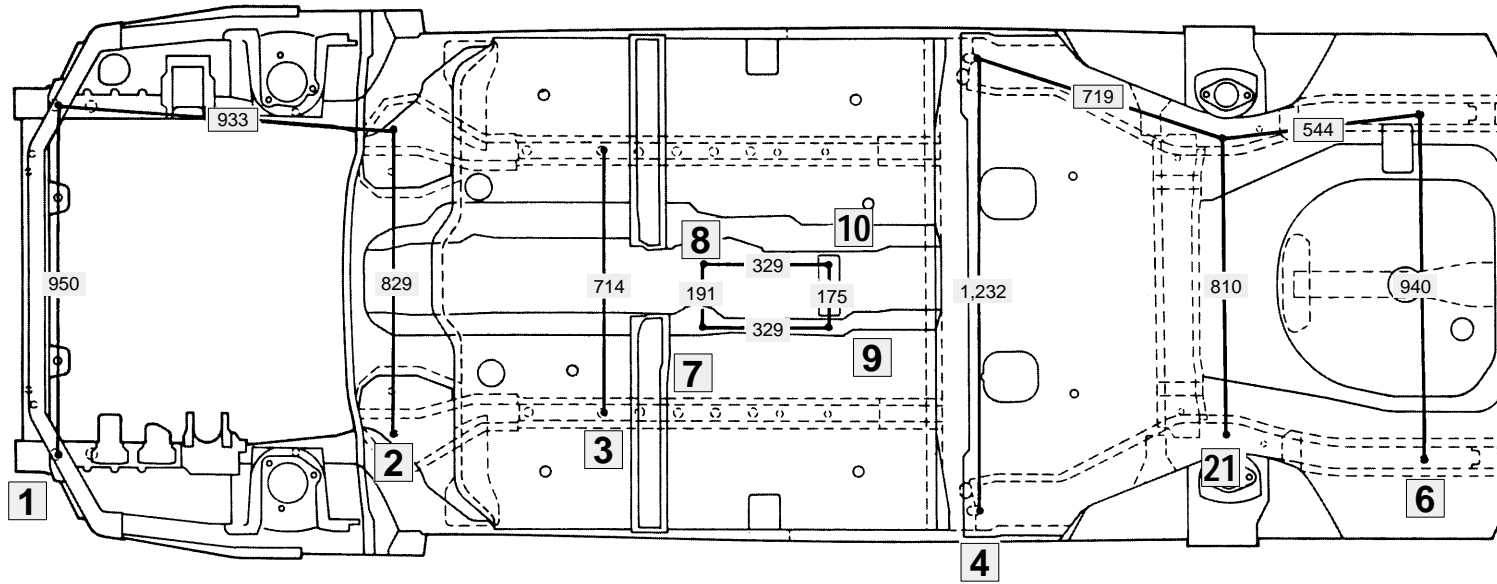


No.	Standard measurement point	Hole shape – Size mm	No.	Standard measurement point	Hole shape – Size mm
11	Center of strut insulator	○ – 110	65	Trailing arm mounting position	–
12	Center of suspension crossmember mounting hole	○ – 15	69	Center of rear shock absorber mounting hole	○ – 68
13	Center of suspension crossmember mounting hole	○ – 16	70	Control link mounting position	–
20	Differential mounting bolt end	–	71	Center of upper link mounting hole	○ – 14
21	Center of suspension crossmember mounting hole	○ – 14	72	Center of upper link mounting hole	○ – 14
22	Center of suspension crossmember mounting hole	Left: ○ – 13.5 Right: ○ – 12.2 × 14			

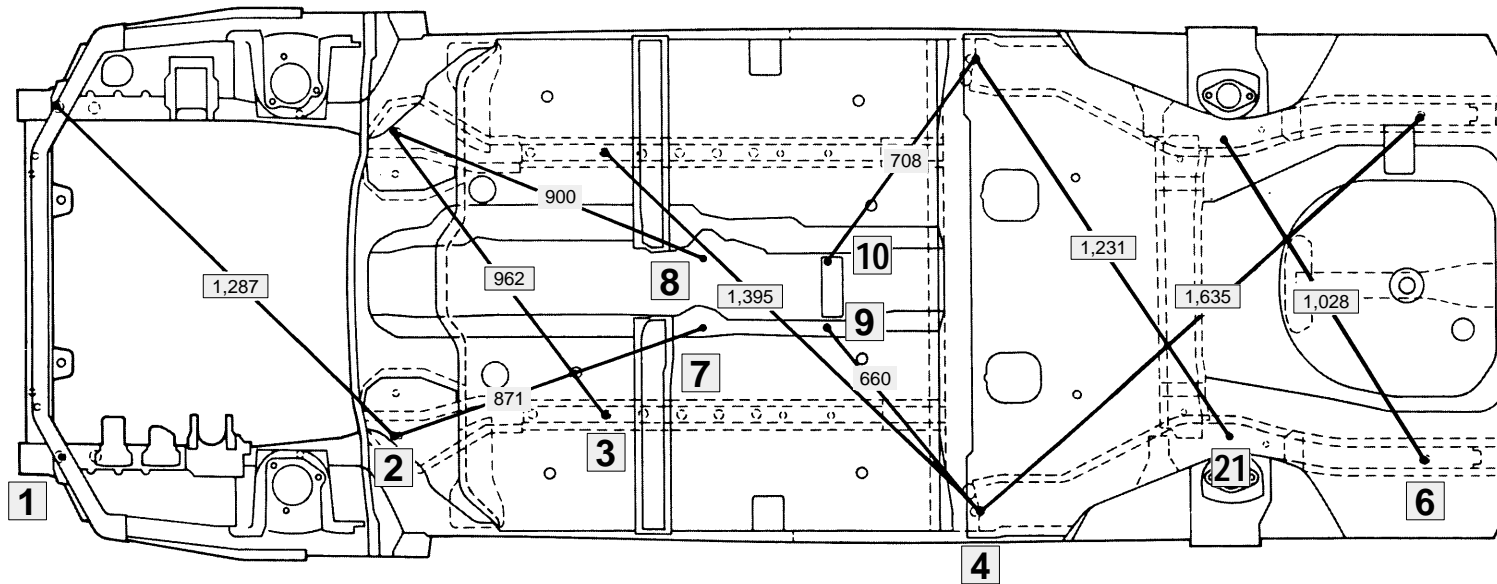



**TYPE B (ACTUAL-MEASUREMENT DIMENSIONS)  
UNDER BODY**

Unit: mm



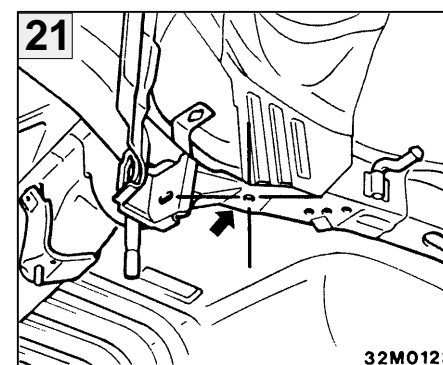
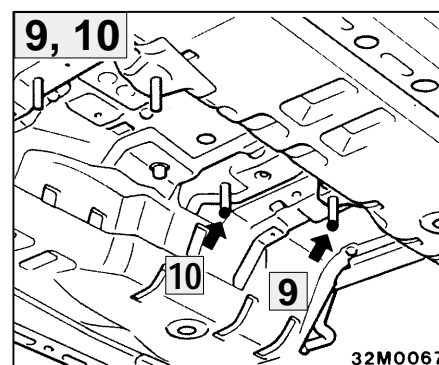
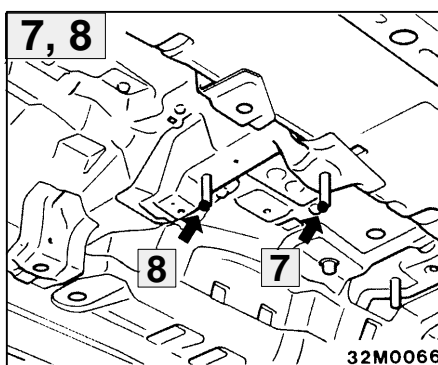
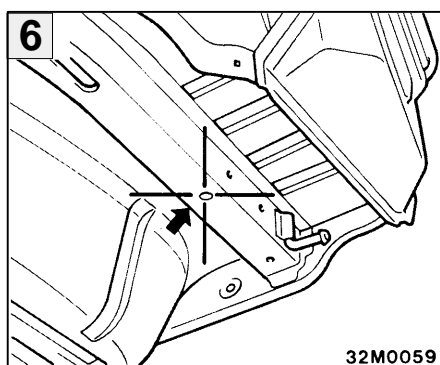
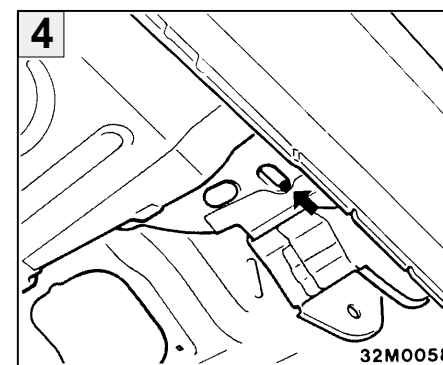
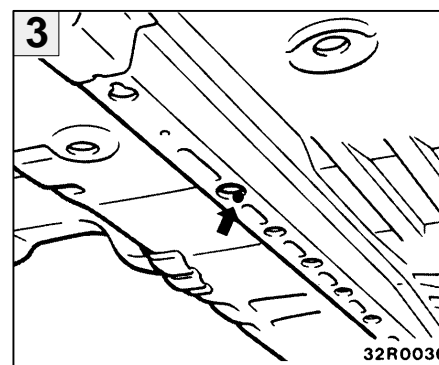
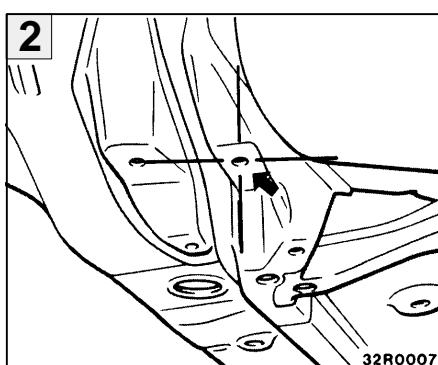
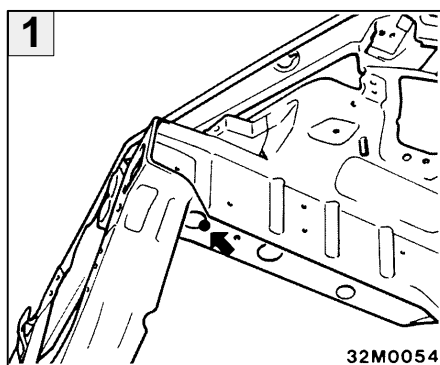
32M0115



 indicates that the dimension and the measurement point are the same as those for EVOLUTION-IV.

32M0117

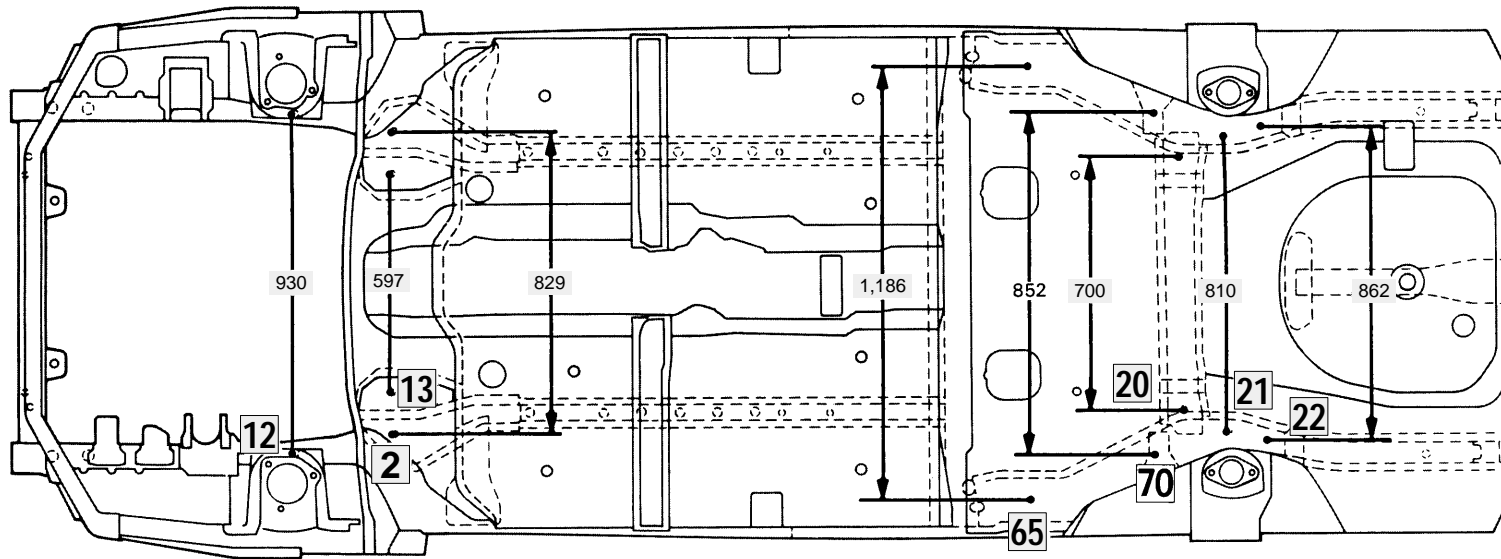
indicates that the dimension and the measurement point are the same as those for EVOLUTION-IV.



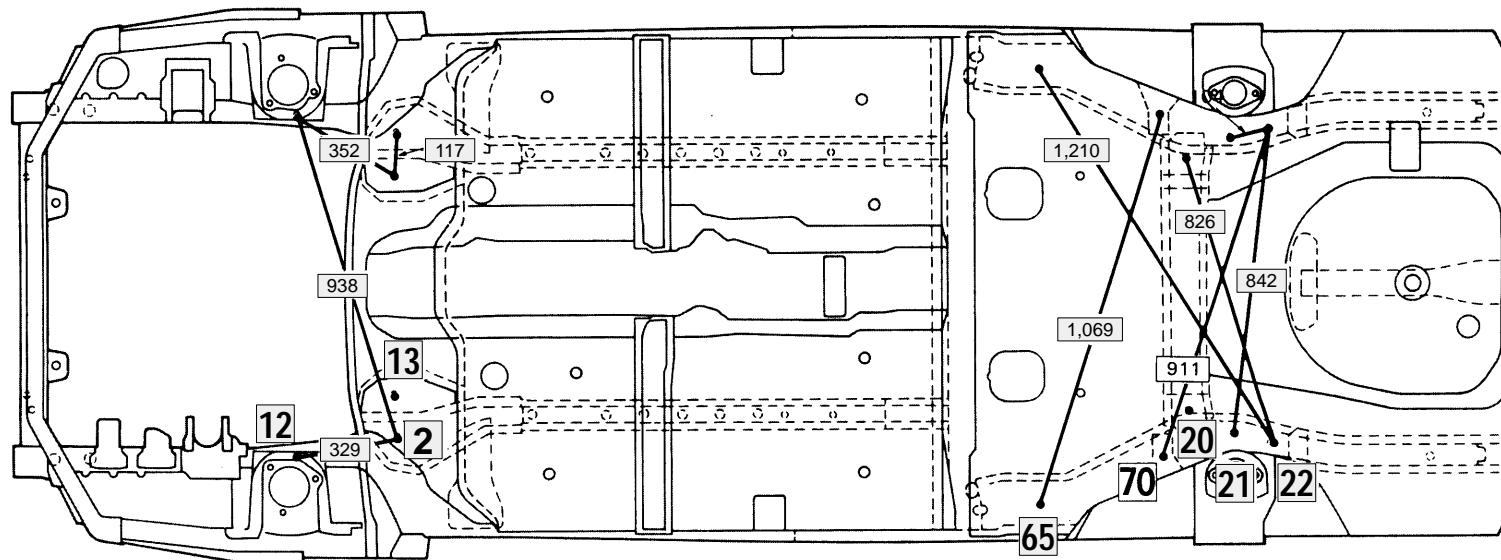
No.	Standard measurement point	Hole shape	Size mm	No.	Standard measurement point	Hole shape	Size mm
1	Rear portion of front bumper stay mounting hole	○	– 30	7	Center bearing mounting bolt end	–	–
2	Center of suspension crossmember mounting hole	Left: ○ Right: ○	– 14 – 16	8	Center bearing mounting bolt end	–	–
3	Rear portion of front floor sidemember positioning hole	○	– 25	9	Center bearing mounting bolt end	–	–
4	Rear portion of rear seat crossmember positioning hole	◻	– 22 × 38	10	Center bearing mounting bolt end	–	–
6	Center of rear floor sidemember extension drain hole	○	– 20	21	Center of suspension crossmember mounting hole	○	– 14

# SUSPENSION INSTALLATION DIMENSIONS

Unit : mm



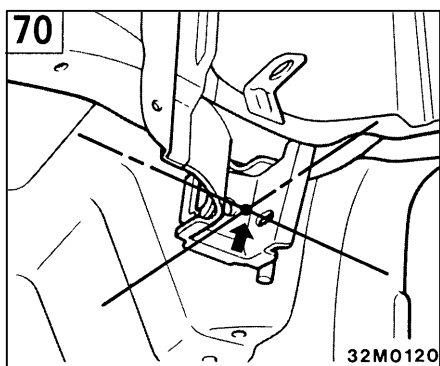
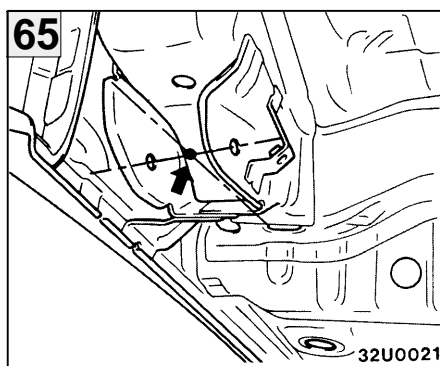
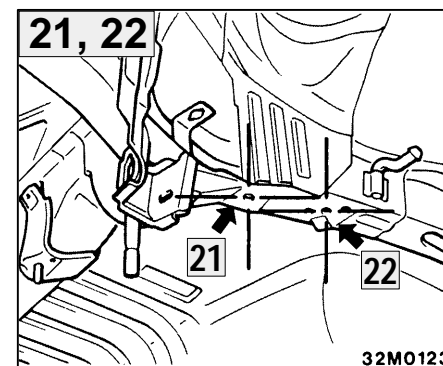
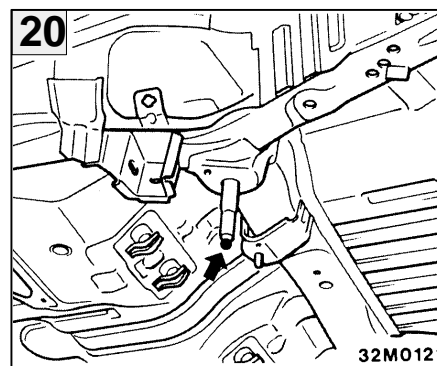
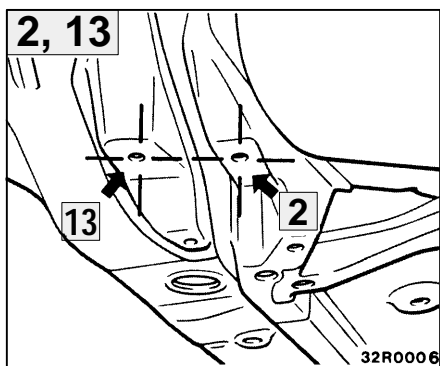
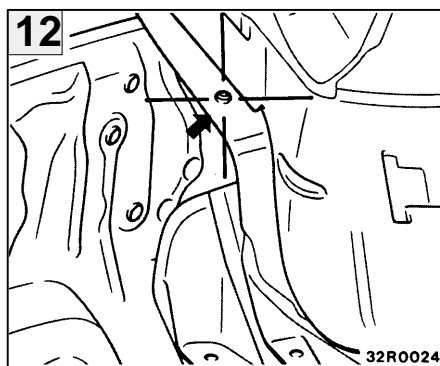
32M0125



32M0124

■ indicates that the dimension and the measurement point are the same as those for EVOLUTION-IV.

indicates that the dimension and the measurement point are the same as those for EVOLUTION-IV.



No.	Standard measurement point	Hole shape – Size mm	No.	Standard measurement point	Hole shape – Size mm
<b>2</b>	Center of suspension crossmember mounting hole	Left: ○ – 14 Right: ○ – 16	<b>21</b>	Center of suspension crossmember mounting hole	○ – 14
<b>12</b>	Center of suspension crossmember mounting hole	○ – 15	<b>22</b>	Center of suspension crossmember mounting hole	Left: ○ – 13.5 Right: ○ – 12.2 × 14
<b>13</b>	Center of suspension crossmember mounting hole	○ – 16	<b>65</b>	Trailing arm mounting position	–
<b>20</b>	Differential mounting bolt end	–	<b>70</b>	Control link mounting position	–

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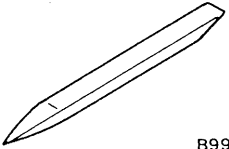
# EXTERIOR

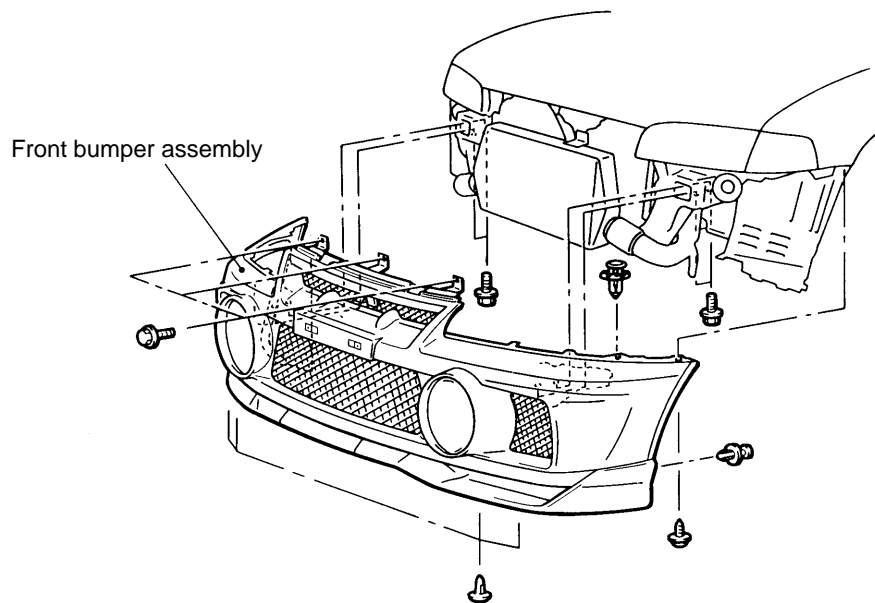
## CONTENTS

SPECIAL TOOLS .....	2	REAR FENDER GARNISH <EVOLUTION-V> .....	11
FRONT BUMPER <EVOLUTION-IV> .....	2	WATER SPRAY <EVOLUTION-IV> .....	12
FRONT BUMPER <EVOLUTION-V> .....	4	INTERCOOLER & RADIATOR WATER SPRAY SYSTEM <EVOLUTION-V> .....	13
REAR BUMPER <EVOLUTION-V> .....	6	MARK <EVOLUTION-V> .....	15
AERO PARTS <EVOLUTION-IV> .....	7		
AERO PARTS <EVOLUTION-V> .....	8		



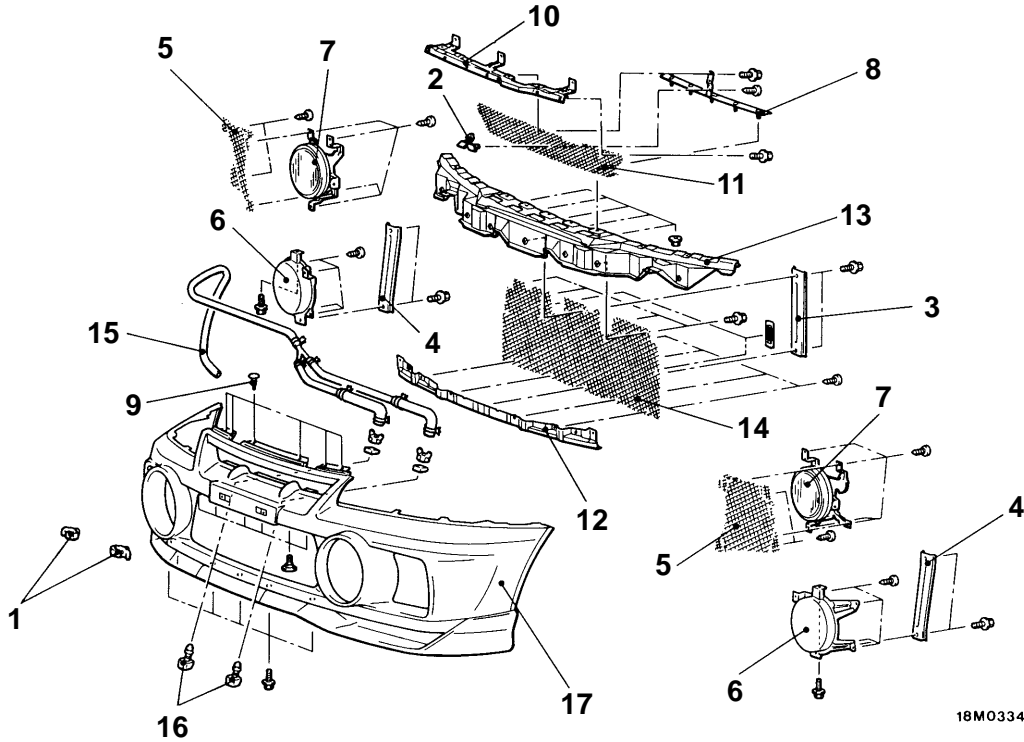
**SPECIAL TOOLS**

Tool	Number	Name	Use
 B990784	MB990784	Ornament remover	Removal of front bumper and rear bumper


**FRONT BUMPER <EVOLUTION-IV>****REMOVAL AND INSTALLATION**

18M0335

DISASSEMBLY AND REASSEMBLY

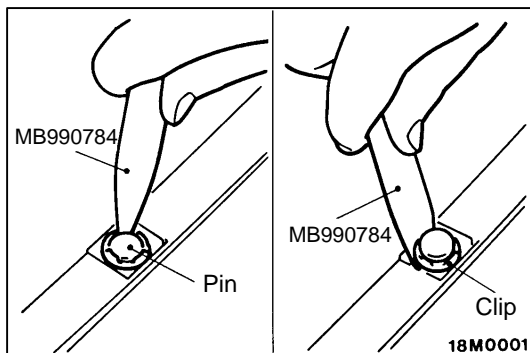


**Disassembly steps**

- Front air dam (Refer to P.51-7.)
- Brake duct (Refer to P.51-7.)
- 1. License plate bracket
- 2.  mark
- 3. Bumper center stay
- 4. Bumper center stay  
<vehicles without fog lamps>
- 5. Bumper net (side)
- 6. Fog lamp cover  
<vehicles without fog lamps>
- 7. Fog lamp



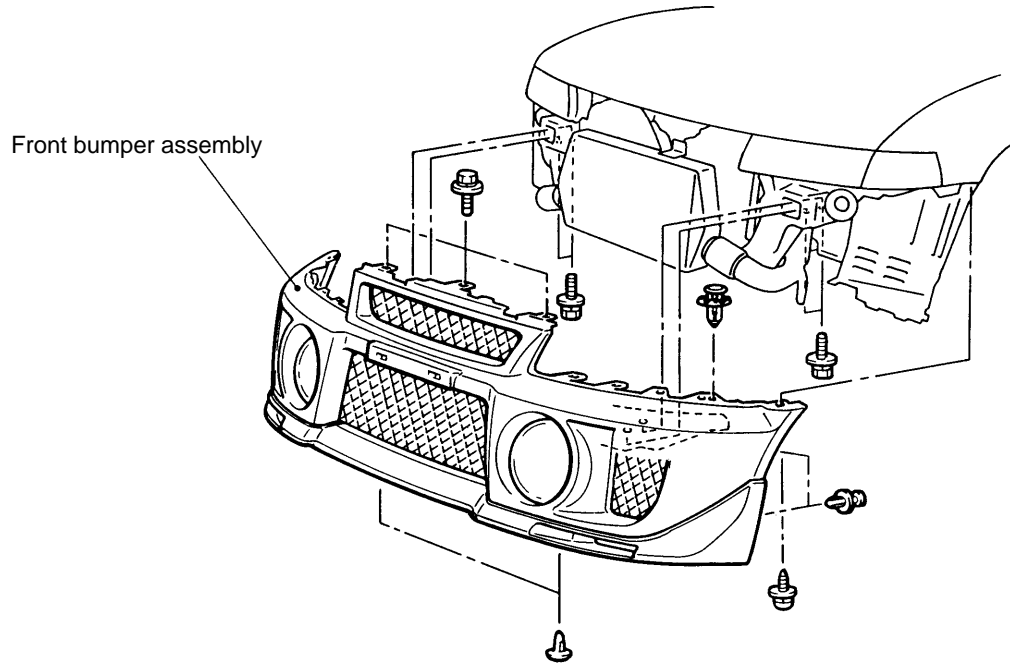
- 8. Bumper bolt plate
- 9. Clip
- 10. Bumper upper reinforcement
- 11. Grille net
- 12. Bumper lower reinforcement
- 13. Bumper reinforcement
- 14. Bumper center net
- 15. Water spray hose assembly
- 16. Water spray nozzle
- 17. Bumper face



**DISASSEMBLY SERVICE POINT**

**◀A▶ CLIP REMOVAL**

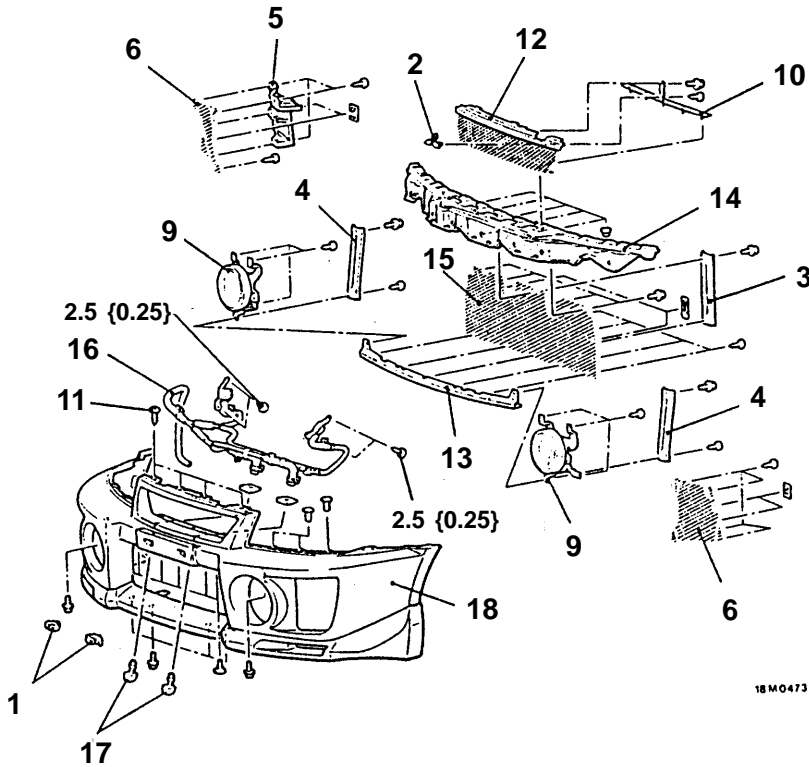
- (1) Using the special tool, raise the pin at the center of the clip.
- (2) Remove the clip.

**FRONT BUMPER <EVOLUTION-V>****REMOVAL AND INSTALLATION**

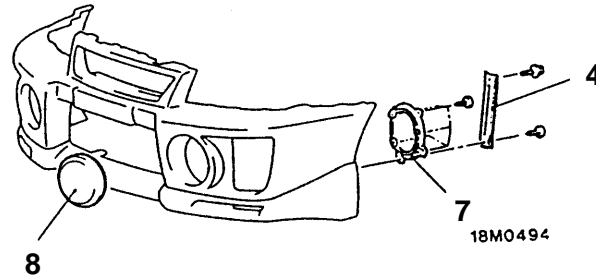
18M0464



DISASSEMBLY AND REASSEMBLY




18M0473



18M0494

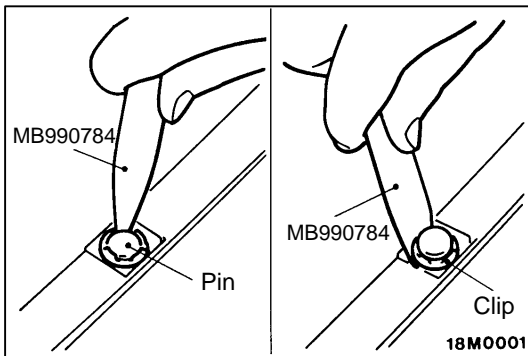
Unit: Nm {kgf · m}

**Disassembly steps**

- Front air dam (Refer to P.51-9.)
- Brake duct (Refer to P.51-9.)
- 1. License plate bracket
- 2.  mark
- 3. Bumper center stay
- 4. Bumper center stay  
<vehicles without fog lamps>
- 5. Air guide panel (on driver's seat side)
- 6. Bumper net (side)
- 7. Fog lamp plate  
<vehicles without fog lamps>
- 8. Fog lamp cover  
<vehicles without fog lamps>



- 9. Fog lamp
- 10. Bumper bolt plate
- 11. Clip
- 12. Bumper upper reinforcement assembly
- 13. Bumper lower reinforcement
- 14. Bumper reinforcement
- 15. Bumper center net
- 16. Water spray hose assembly
- 17. Water spray nozzle
- 18. Bumper face



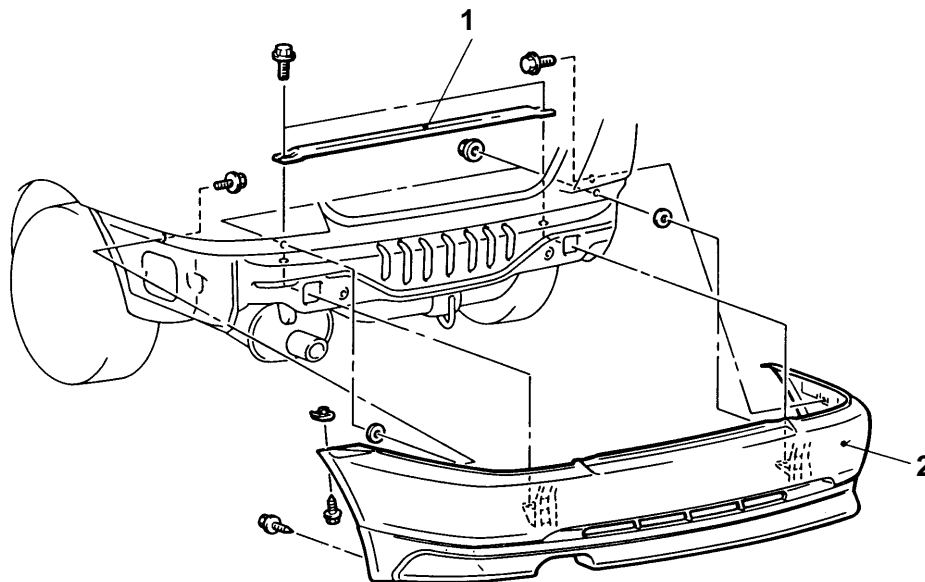
### DISASSEMBLY SERVICE POINT

#### ◀A▶ CLIP REMOVAL

- (1) Using the special tool, raise the pin at the center of the clip.
- (2) Remove the clip.

## REAR BUMPER <EVOLUTION-V>

### REMOVAL AND INSTALLATION



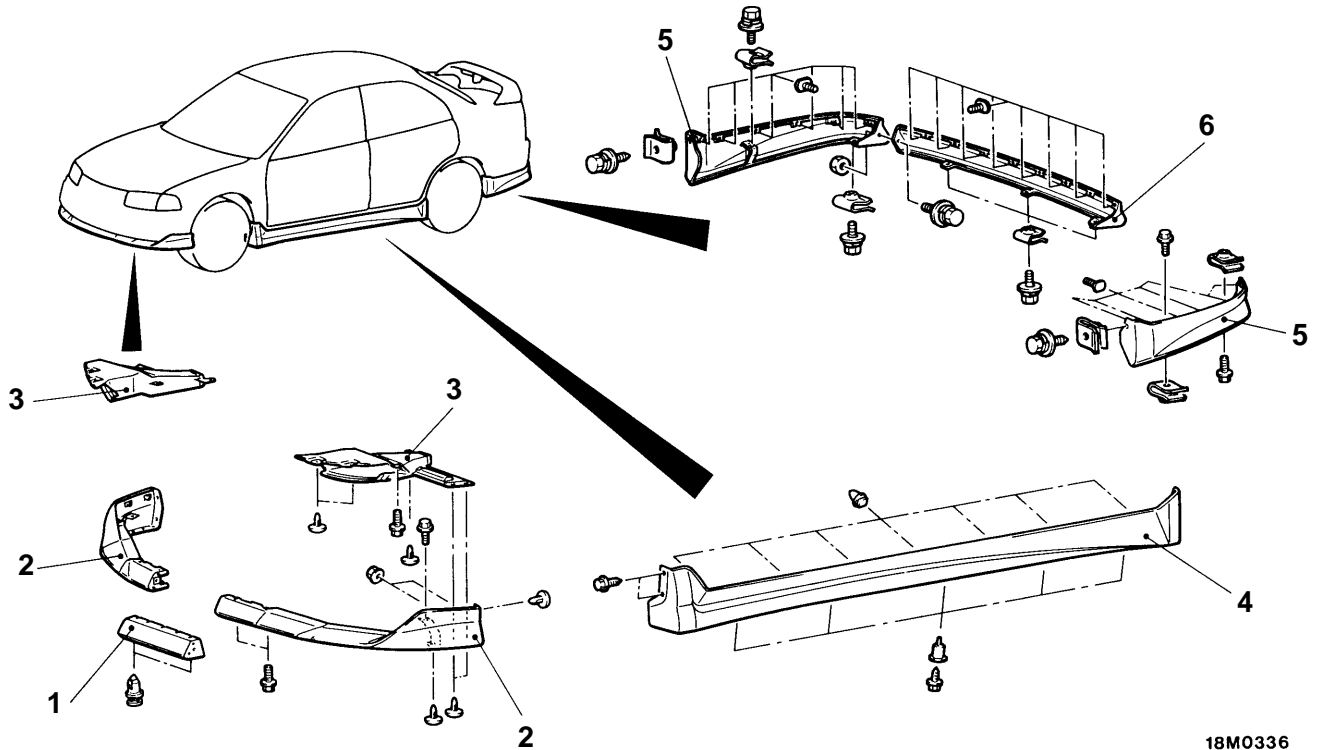
18M0468

#### Rear bumper removal

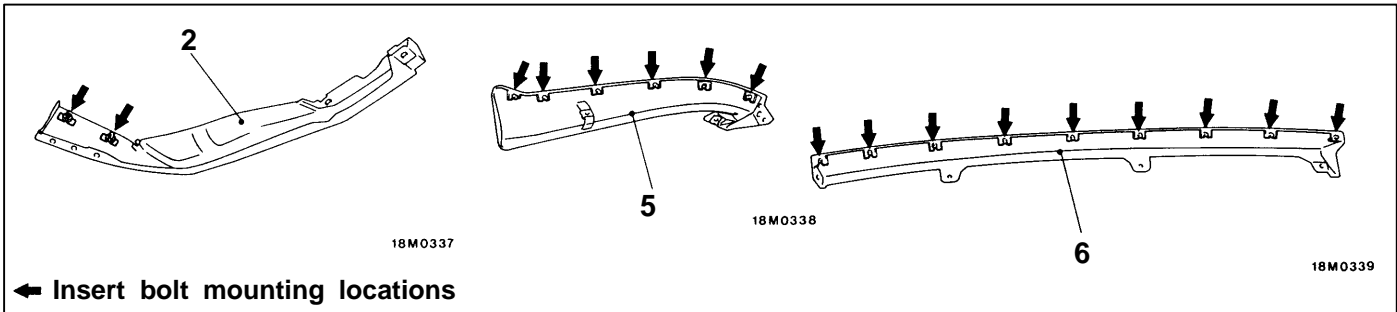
1. Rear end crossbar
2. Rear bumper assembly

**AERO PARTS <EVOLUTION-IV>**

**REMOVAL AND INSTALLATION**



18M0336

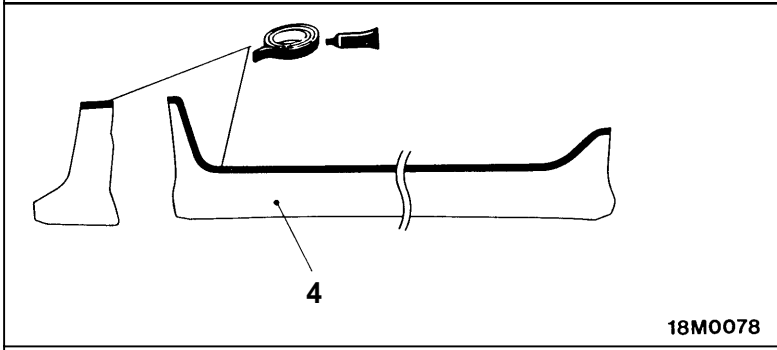


18M0337

18M0338

18M0339

← Insert bolt mounting locations



18M0078

**Double-sided adhesive tape:**  
**SUMITOMO 3M 4211 or equivalent (width: 5 mm)**  
**Primer: SUMITOMO 3M C100 or equivalent**

**Front air dam removal steps**

1. Front air dam center
2. Front air dam
3. Brake duct

**Side air dam removal**

4. Side air dam

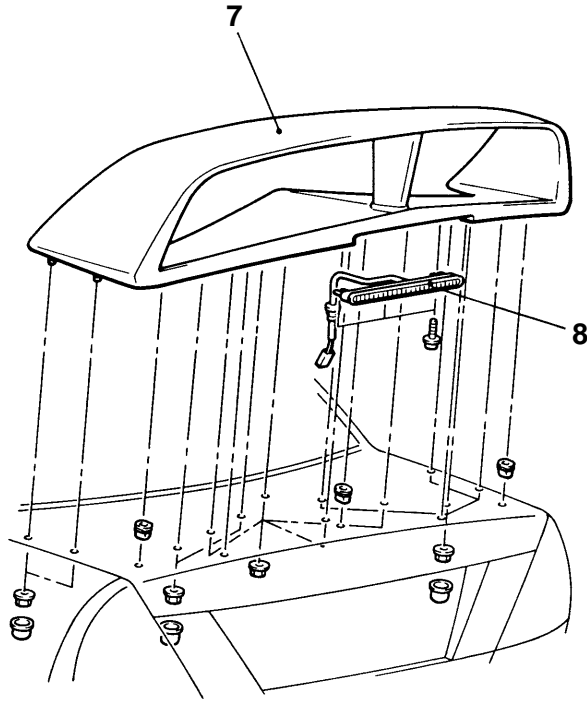
**Rear air dam removal steps**

5. Rear air dam
6. Rear air dam center

**NOTE**

The conventional service points apply for removal and installation.





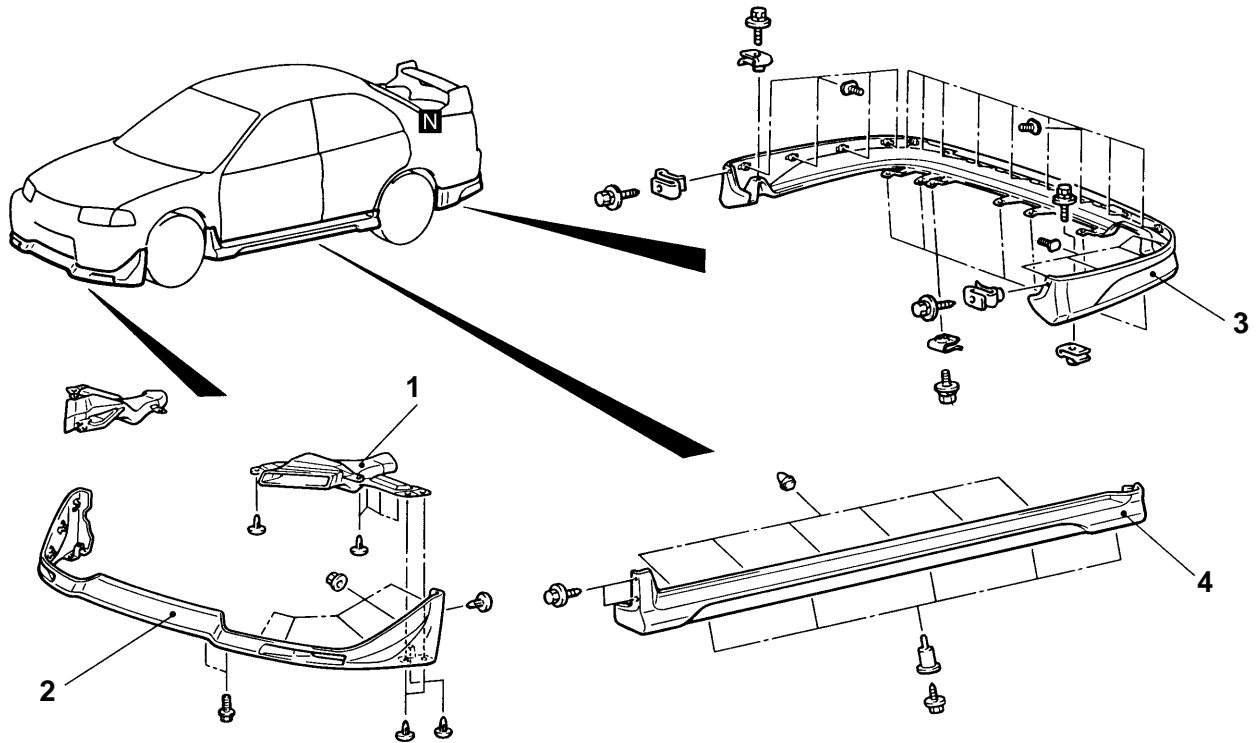
18M0340

**Rear spoiler removal steps**

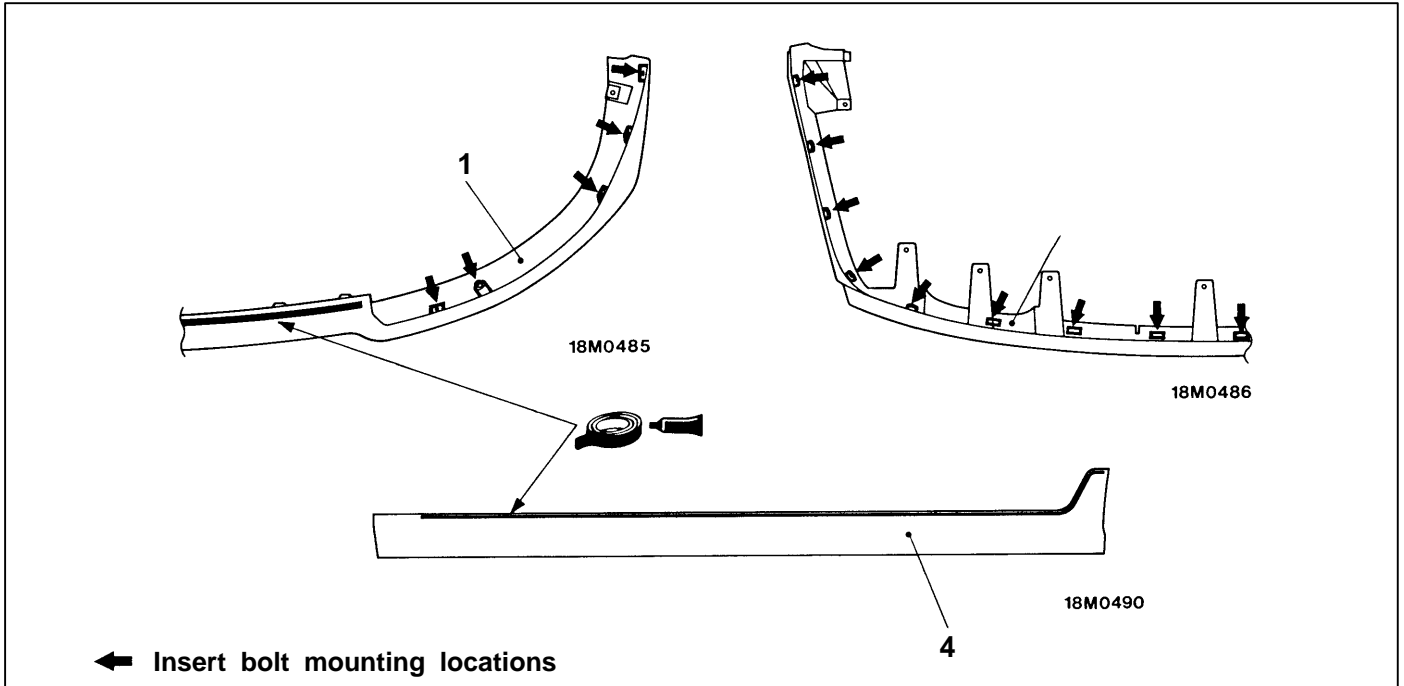
7. Rear spoiler
8. High-mount stop lamp

# AERO PARTS <EVOLUTION-V>

## REMOVAL AND INSTALLATION



18M0475



Double-sided adhesive tape: SUMITOMO 3M 4211 or equivalent (thickness: 1.2 mm)  
 Primer: SUMITOMO 3M 8107 PP parts primer

**Front air dam removal steps**



1. Brake duct
2. Front air dam

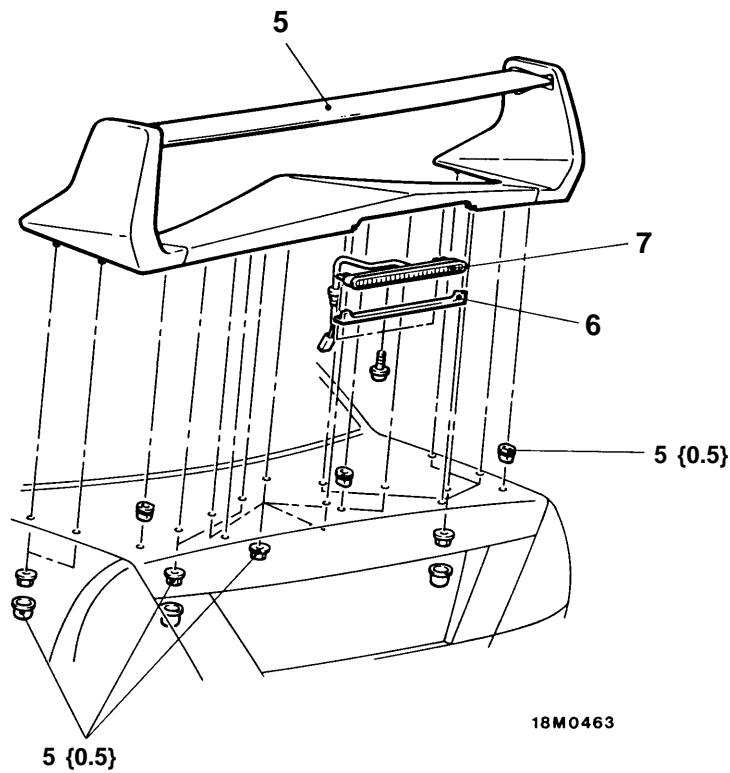
**Side air dam removal**



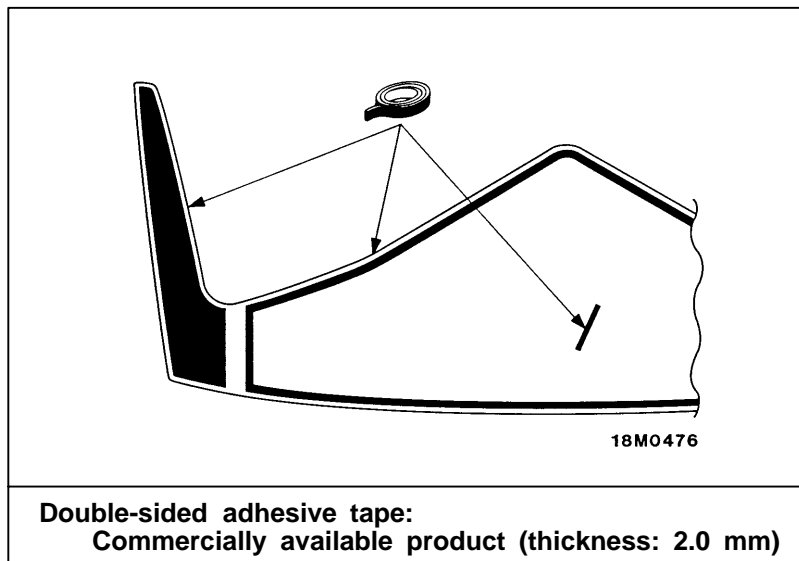
4. Side air dam

**Rear air dam removal steps**

3. Rear air dam



Unit: Nm {kgf·m}



**Rear spoiler removal steps**



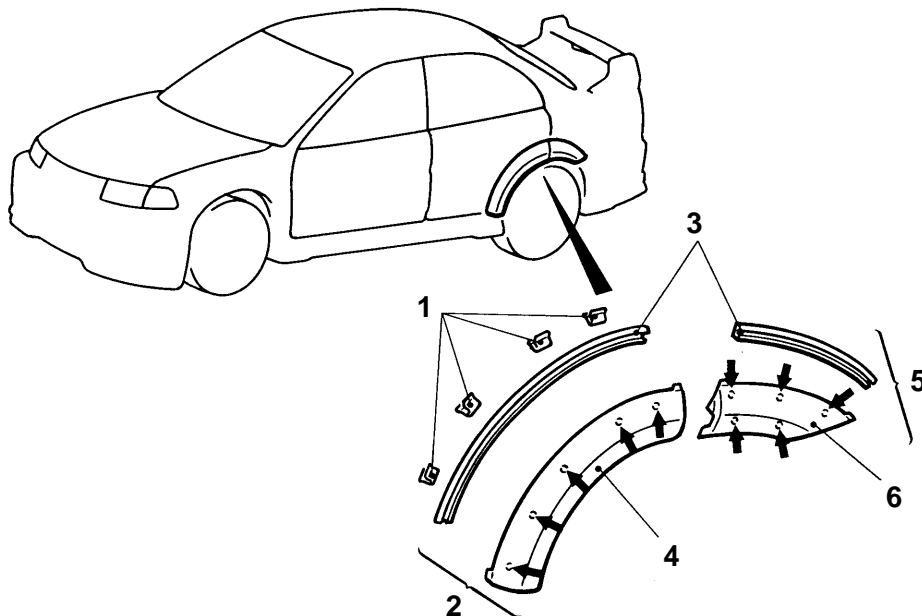
- 5. Rear spoiler
- 6. High-mount stop lamp undercover
- 7. High-mount stop lamp

**NOTE**

The conventional service points apply for removal and installation.

# REAR FENDER GARNISH <EVOLUTION-V>

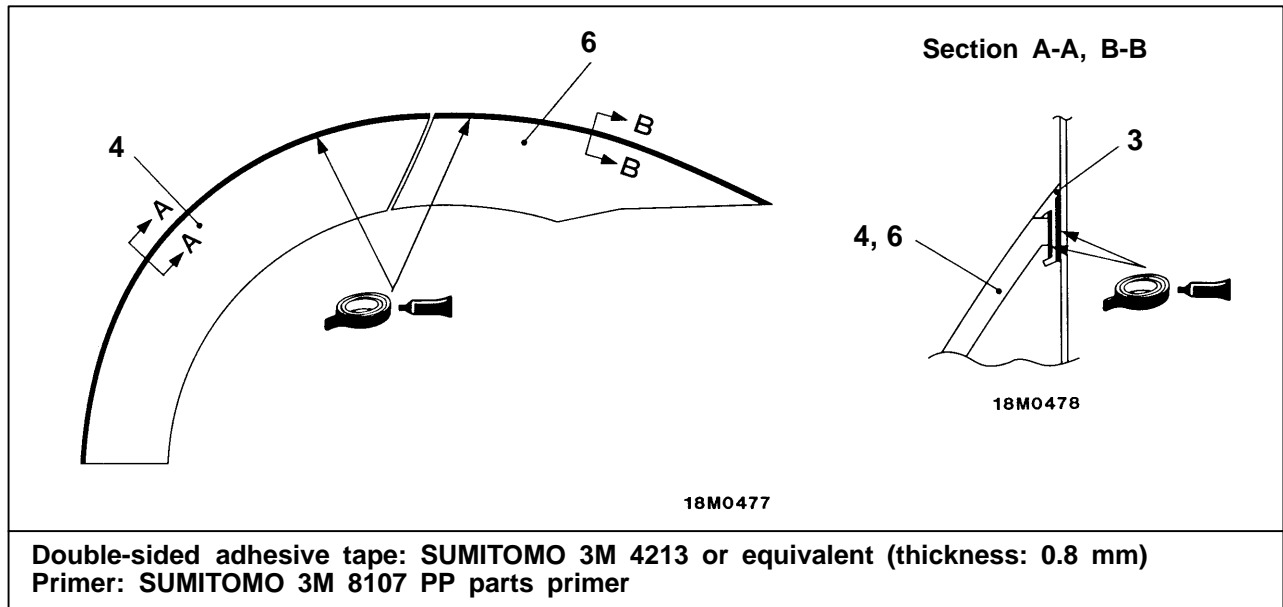
## REMOVAL AND INSTALLATION



**NOTE**

The parts marked with are plastic clips.

18M0491



Double-sided adhesive tape: SUMITOMO 3M 4213 or equivalent (thickness: 0.8 mm)  
 Primer: SUMITOMO 3M 8107 PP parts primer

**Rear door garnish removal steps**



1. Clip
2. Rear door garnish assembly
3. Protector
4. Rear door garnish

**Quarter garnish removal steps**



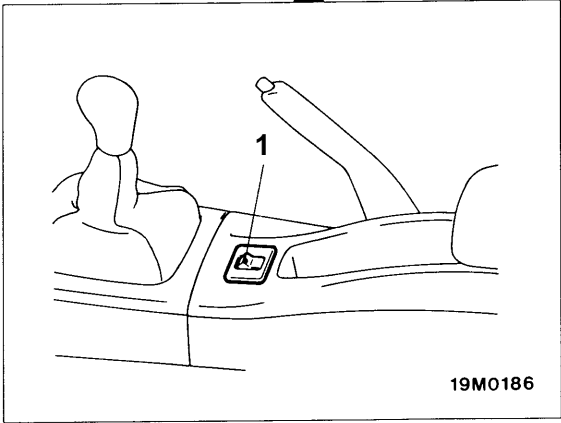
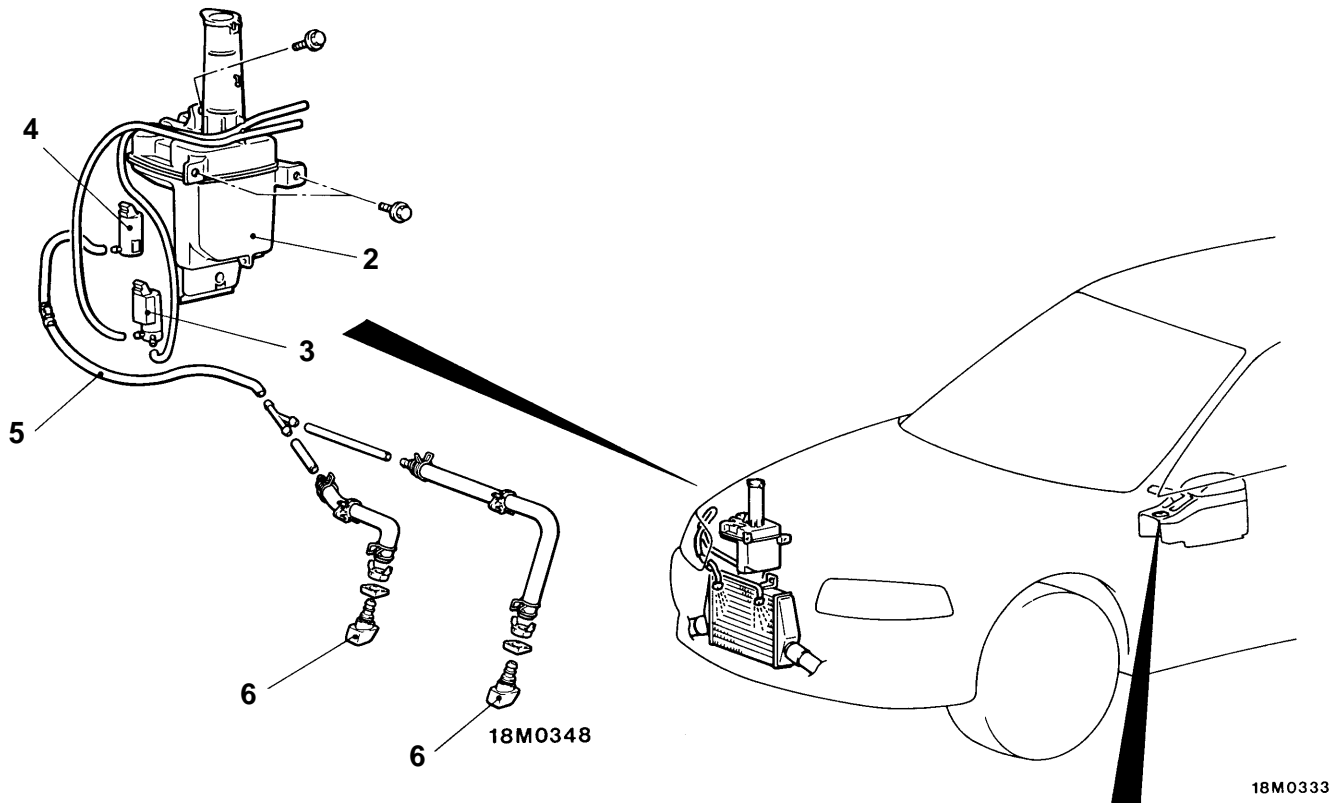
5. Quarter garnish assembly
3. Protector
6. Quarter garnish

**NOTE**

The same service points as those for aero parts apply for removal and installation.

# WATER SPRAY <EVOLUTION-IV>

## REMOVAL AND INSTALLATION

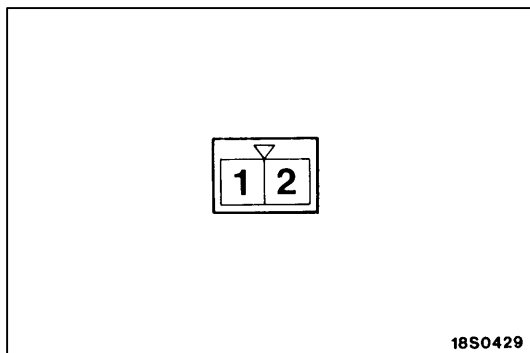


1. Water spray switch

**Removal steps**

- Front bumper (Refer to P.51-3.)
- 2. Washer tank

- 3. Washer motor
- 4. Water spray motor
- 5. Water spray hose
- 6. Water spray nozzle



**INSPECTION**

**WATER SPRAY SWITCH CONTINUITY CHECK**

Switch position	Terminal No.	
	1	2
ON	○	○
OFF		

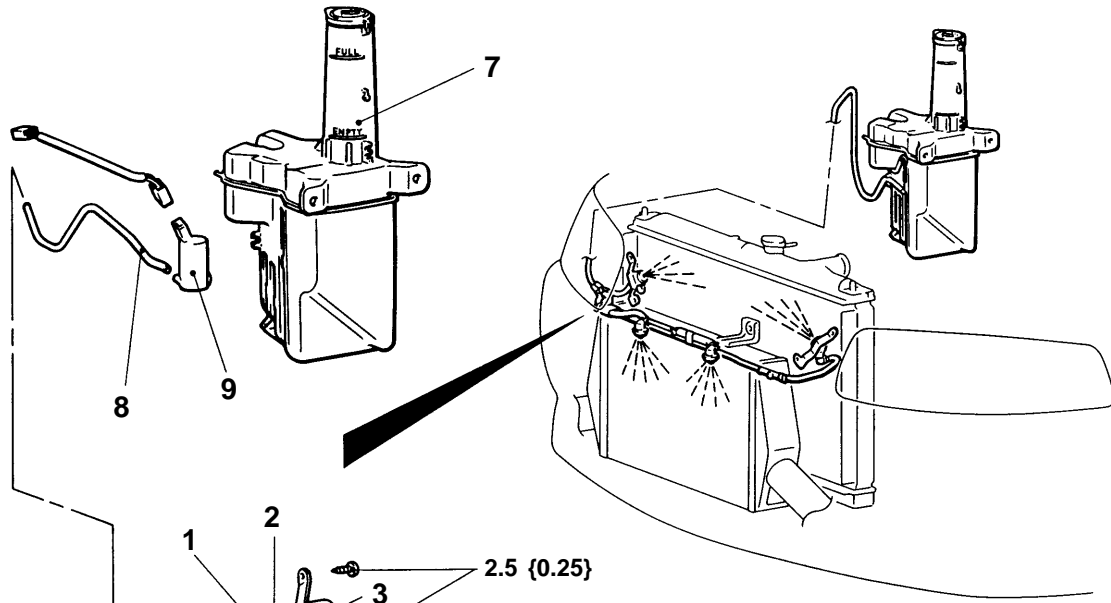


# INTERCOOLER & RADIATOR WATER SPRAY SYSTEM <EVOLUTION-V>

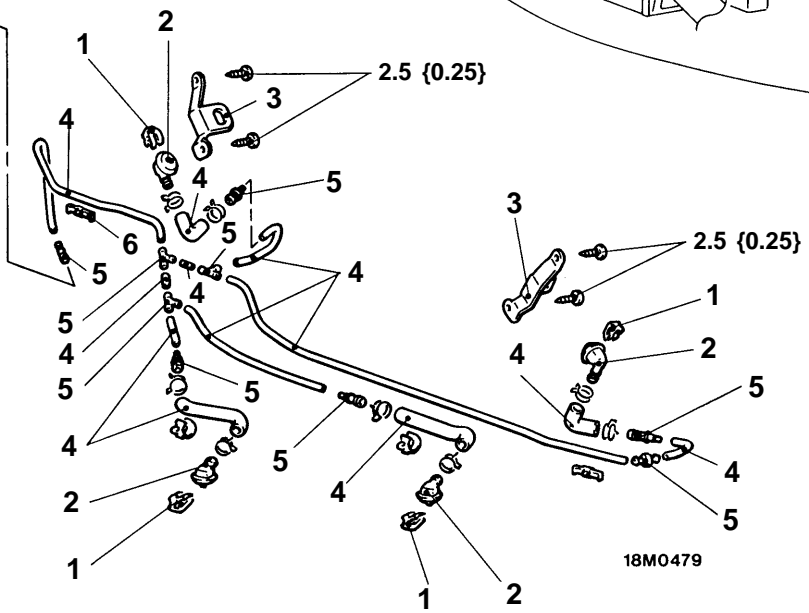
## REMOVAL AND INSTALLATION

**Pre-removal and Post-installation Operation**

- Front Bumper Removal and Installation (Refer to P.51-4.)



18M0484



18M0479

Unit: Nm {kgf·m}

- ▶◀ 1. Clamp
- ▶◀ 2. Water spray nozzle
- ▶◀ 3. Water spray nozzle bracket
- ▶◀ 4. Water spray hose
- ▶◀ 5. Joint
- ▶◀ 6. Clip

**Water spray motor removal steps**

- 7. Washer tank
- 8. Water spray hose
- 9. Water spray motor

**NOTE**  
The conventional service procedures apply for the water spray switch.

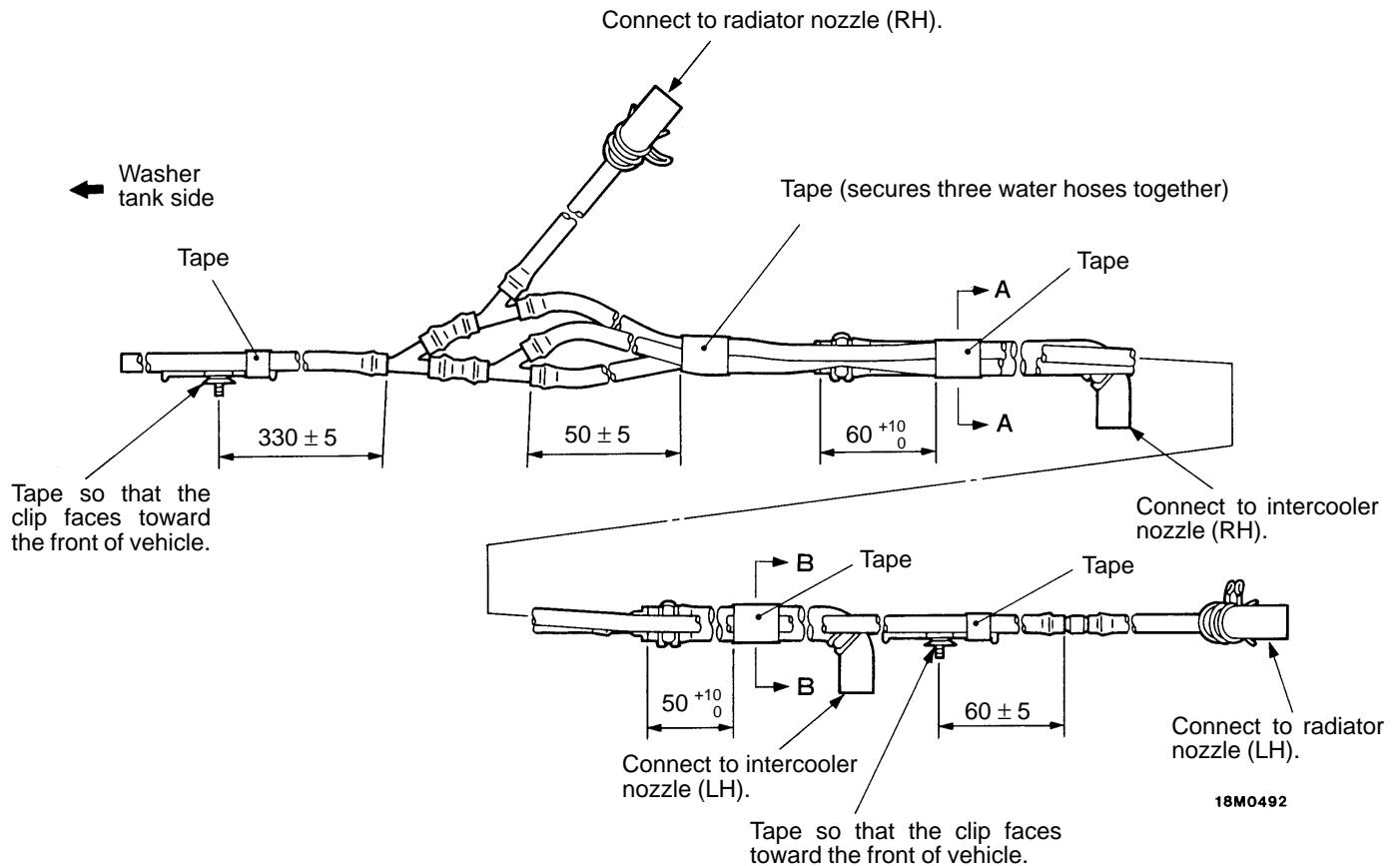
**INSTALLATION SERVICE POINT**

**▶A◀ CLIP / WATER SPRAY HOSE INSTALLATION**

- (1) Tape clips as illustrated.
- (2) Tape the water spray hose as illustrated.
- (3) Insert the clips positively into the mounting holes.

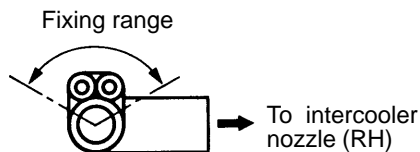
<Top view>

Unit: mm



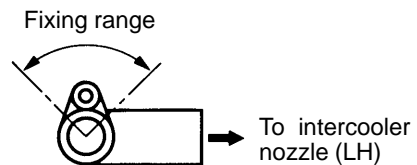
**Section A – A**

Tape and secure so that the two thin water spray hoses are located above the thick water spray hose.



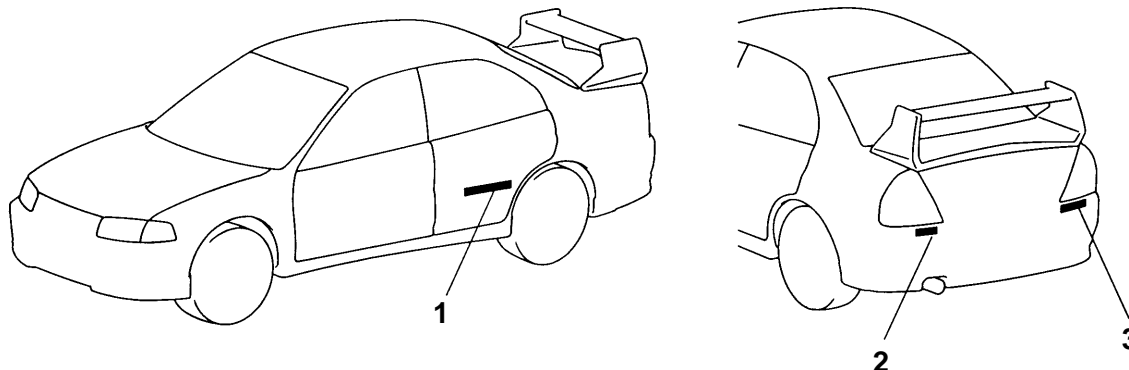
**Section B – B**

Tape and secure so that the thin water spray hose is located above the thick water spray hose.



# MARK <EVOLUTION-V>

## REMOVAL AND INSTALLATION



18M0469

- ▶A◀ 1. EVOLUTION-V mark (side)
- ▶A◀ 2. Brembo mark
- ▶A◀ 3. EVOLUTION-V mark (rear)

**NOTE**  
The mark “Brembo” represents an Italian disc brake maker, whose disc brakes are used both in front and rear on EVOLUTION-V.

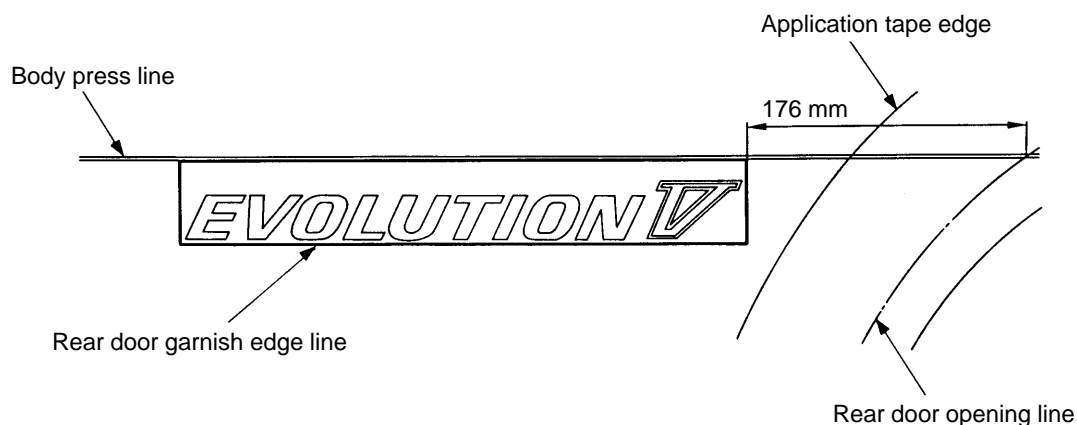
## INSTALLATION SERVICE POINT

### ▶A◀ MARK INSTALLATION

#### Installation positions

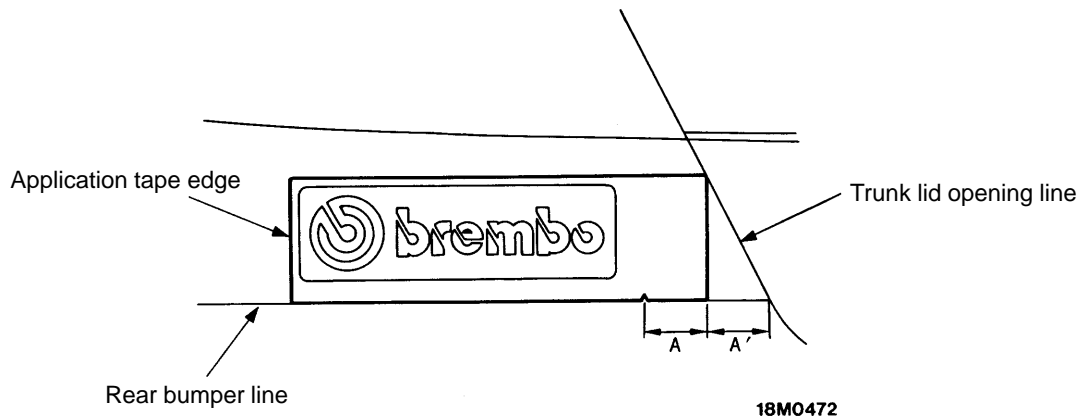
The dimension up to the cutout in decal (A in fig.) is the same as the dimension from the mounting reference line (A' in fig.). Use this dimension as a guideline to determine the mounting position. (A = A')

#### 1. EVOLUTION-V MARK (SIDE)

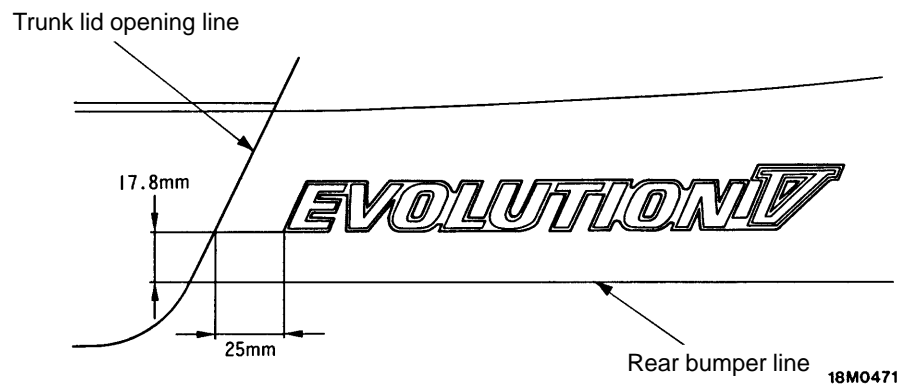


18M0470

## 2. brembo MARK



## 3. EVOLUTION-V MARK (REAR)



## (2) Installation procedure

1. Using unleaded gasoline, degrease the surface of the body on which the marks are mounted.
2. Peel off the release paper from the back side of the mark and affix the mark, ensuring the specified dimensions are met.

**Caution**

- (1) Perform the procedure in a dust-free place with an ambient temperature ranging from 20 to 38°C.
- (2) If the ambient temperature is below 20°C, heat the mark and mounting position to 20 to 30°C.
- (3) Be sure to press each mark positively, as a low pressure results in the mark being separated easily.

# CHASSIS ELECTRICAL

## CONTENTS

GENERAL .....	3	SPECIAL TOOL .....	13
BATTERY .....	3	TROUBLESHOOTING .....	13
SERVICE SPECIFICATION .....	3	IGNITION SWITCH AND IMMOBILIZER SYSTEM .....	19
ON-VEHICLE SERVICE .....	3	COMBINATION METERS .....	22
IGNITION SWITCH <EXCEPT EVOLUTION-VI WITH IMMOBILIZER SYSTEM> .....	6	SERVICE SPECIFICATIONS .....	22
SPECIAL TOOL .....	6	SEALANT .....	23
TROUBLESHOOTING .....	6	SPECIAL TOOLS .....	23
IGNITION SWITCH .....	11	TROUBLESHOOTING .....	24
IGNITION SWITCH AND IMMOBILIZER SYSTEM <EVOLUTION-VI WITH IMMOBILIZER SYSTEM> .....	13		

CONTINUED ON NEXT PAGE

### WARNINGS REGARDING SERVICING OF SUPPLEMENTAL RESTRAINT SYSTEM (SRS) EQUIPPED VEHICLES

#### WARNING!

- (1) The service personnel must thoroughly review this manual, and especially its GROUP 52B – Supplemental Restraint System (SRS) before beginning any service or maintenance of any component of the SRS or any SRS-related component.
- (2) When removing or installing the components indicated in the table of contents by an asterisk (\*), use utmost care so as not to apply any strong shock to SRS components.

#### NOTE

The SRS includes the following components: SRS-ECU, SRS warning lamp, air bag module, clock spring and interconnecting wiring. Other SRS-related components (that may have to be removed/installed in connection with SRS service or maintenance) are indicated in the table of contents by an asterisk (\*).

---

ON-VEHICLE SERVICE .....	27	SIDE TURN-SIGNAL LAMP .....	43
COMBINATION METERS .....	30	HAZARD WARNING LAMP SWITCH, CLOCK .....	44
HEADLAMP .....	32	SPECIAL TOOL .....	44
SERVICE SPECIFICATIONS .....	32	HAZARD WARNING LAMP SWITCH ....	44
SPECIAL TOOLS .....	32	RADIO AND TAPE PLAYER .....	45
TROUBLESHOOTING .....	33	TROUBLESHOOTING .....	45
ON-VEHICLE SERVICE .....	34	RADIO AND TAPE PLAYER .....	47
HEADLAMP AND FRONT TURN-SIGNAL LAMP* .....	36	SPEAKER .....	47
FRONT FOG LAMP .....	39	ANTENNA .....	48
SERVICE SPECIFICATIONS .....	39	POLE ANTENNA .....	48
ON-VEHICLE SERVICE .....	39	REAR WINDOW ANTENNA AND GLASS DIVERSITY ANTENNA .....	49
FOG LAMP .....	41	REAR WINDOW DEFOGGER .....	50
REAR COMBINATION LAMP* .....	42	TROUBLESHOOTING <VEHICLES WITH AUTOMATIC A/C> .....	50
TROUBLESHOOTING .....	42	ON-VEHICLE SERVICE .....	50
REAR COMBINATION LAMP* .....	42	REAR WINDOW DEFOGGER SWITCH <VEHICLES WITH AUTOMATIC A/C> ...	51
SIDE TURN-SIGNAL LAMP .....	43		
SPECIAL TOOL .....	43		

# GENERAL

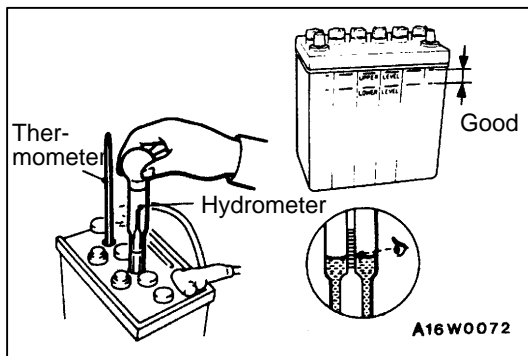
## Outline of Change

- The following service procedures have been incorporated.

# BATTERY

## SERVICE SPECIFICATION

Item	Specification
Specific gravity of the battery fluid	1.220–1.290 [20°C]



## ON-VEHICLE SERVICE

### FLUID LEVEL AND SPECIFIC GRAVITY CHECK

- Inspect whether or not the battery fluid is between the UPPER LEVEL and LOWER LEVEL marks.
- Use a hydrometer and thermometer to check the specific gravity of the battery fluid.

**Standard value: 1.220–1.290 [20°C]**

The specific gravity of the battery fluid varies with the temperature, so use the following formula to calculate the specific gravity for 20°C. Use the calculated value to determine whether or not the specific gravity is satisfactory.

$$D_{20} = Dt + 0.0007 (t - 20)$$

**$D_{20}$ :** Specific gravity of the battery fluid calculated for 20°C.

**Dt:** Actually measured specific gravity

**t:** Actually measured temperature

**CHARGING**

1. When charging a battery while still installed in the vehicle, disconnect the battery cables to prevent damage to electrical parts.
2. The current normally used for charging a battery should be approximately 1/10th of the battery capacity.
3. When performing a quick-charging due to lack of time, etc., the charging current should never exceed the battery capacity as indicated in amperes.
4. Determining if charging is completed.
  - (1) If the specific gravity of the battery fluid reaches 1.250–1.290 and remains constant for at least one hour.
  - (2) If the voltage of each cell reaches 2.5–2.8 V and remains constant for at least one hour.

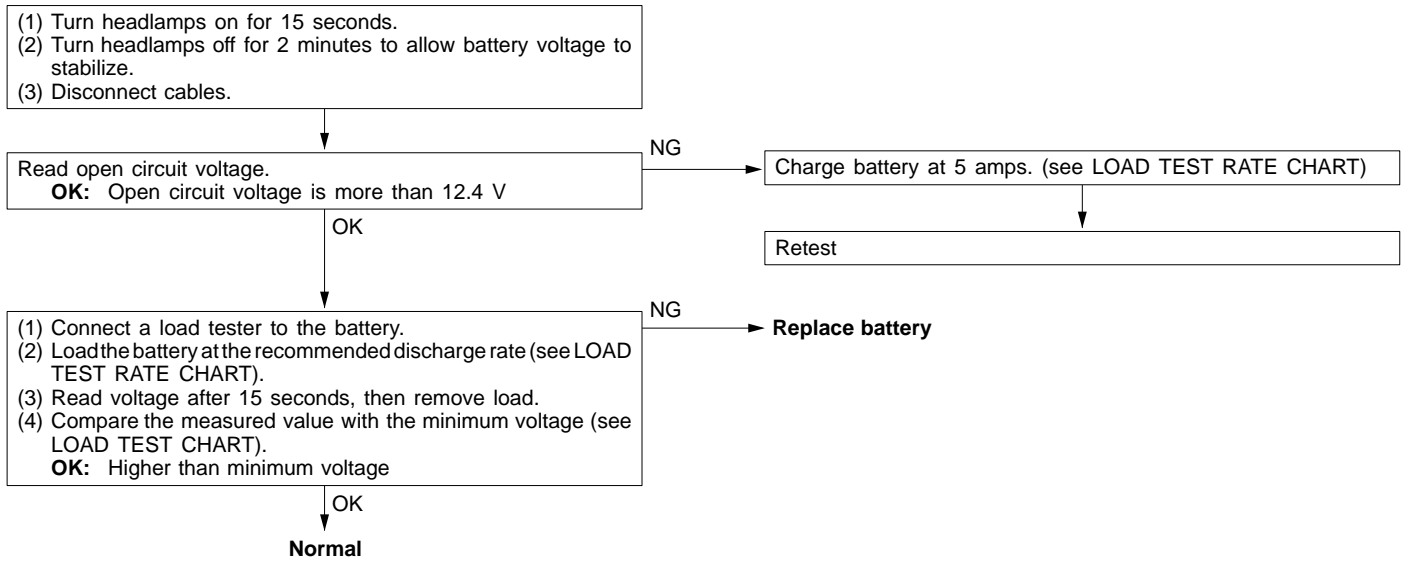
**Caution**

1. **Be careful since the battery fluid level may rise during charging.**
2. **Keep all sources of fire away while charging because there is a danger of explosion.**
3. **Be careful not to do anything that could generate sparks while charging.**
4. **When charging is completed, replace the battery caps, pour clean water over the battery to remove any sulfuric acid and dry.**



**BATTERY TESTING PROCEDURE**

**TEST STEP**



**LOAD TEST RATE CHART**

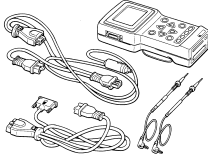
Battery type	28B19L	34B19L	44B20L	95D31L	55D23L	55B24L
Charging time when fully discharged h [5-amp rated current charging]	5	6	7	13	10	8
Load test (Amps)	120	130	160	310	170	170

**LOAD TEST CHART**

Temperature °C	21 and above	16 to 20	10 to 15	4 to 9	-1 to 3	-7 to -2	-12 to -8	-18 to -13
Minimum voltage V	9.6	9.5	9.4	9.3	9.1	8.9	8.7	8.5

# IGNITION SWITCH <EXCEPT EVOLUTION-VI WITH IMMOBILIZER SYSTEM>

## SPECIAL TOOL

Tool	Number	Name	Use
	MB991502	MUT-II sub assembly	ETACS-ECU input signal checking

## TROUBLESHOOTING

### DIAGNOSIS FUNCTION

#### INPUT SIGNAL INSPECTION POINTS <VEHICLES WITH ETACS-ECU>

Refer to Group 00 – How to Use Troubleshooting / Inspection Service Points.

## INSPECTION CHART FOR TROUBLE SYMPTOMS

Trouble symptoms	Inspection procedure	Reference page
Communication with MUT-II is impossible.	Key hole illumination lamp remains illuminated.	1 54-7
	Even if driver's side door is opened, key hole illumination lamp does not illuminate.	2 54-7
	While key hole illumination lamp is illuminated, ignition key is turned to the ON position but key hole illumination lamp does not switch off. (However, it switch off after 10 seconds.)	3 54-8
Key reminder warning buzzer system	While the key reminder warning buzzer is sounding, the ignition key is turned to the ON position but the sound dose not stop. (However, it stops when the driver's side door is closed.)	3 54-8
	The key reminder warning buzzer dose not stop sounding even if the key is removed. (However, it stops when the driver's side door is closed.)	4 54-9
	The key reminder warning buzzer does not sound ever if the driver's side door is opened while the key is still inserted. (However, the ignition key should be in the OFF position.)	5 54-10

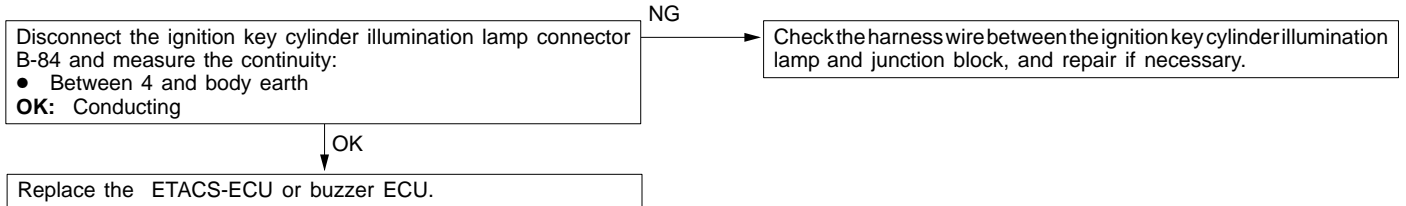
### NOTE

If every input signal can not be checked with the MUT-II, a diagnosis circuit system failure is probably the cause. <Vehicles with ETACS-ECU>

**INSPECTION PROCEDURE FOR TROUBLE SYMPTOMS**

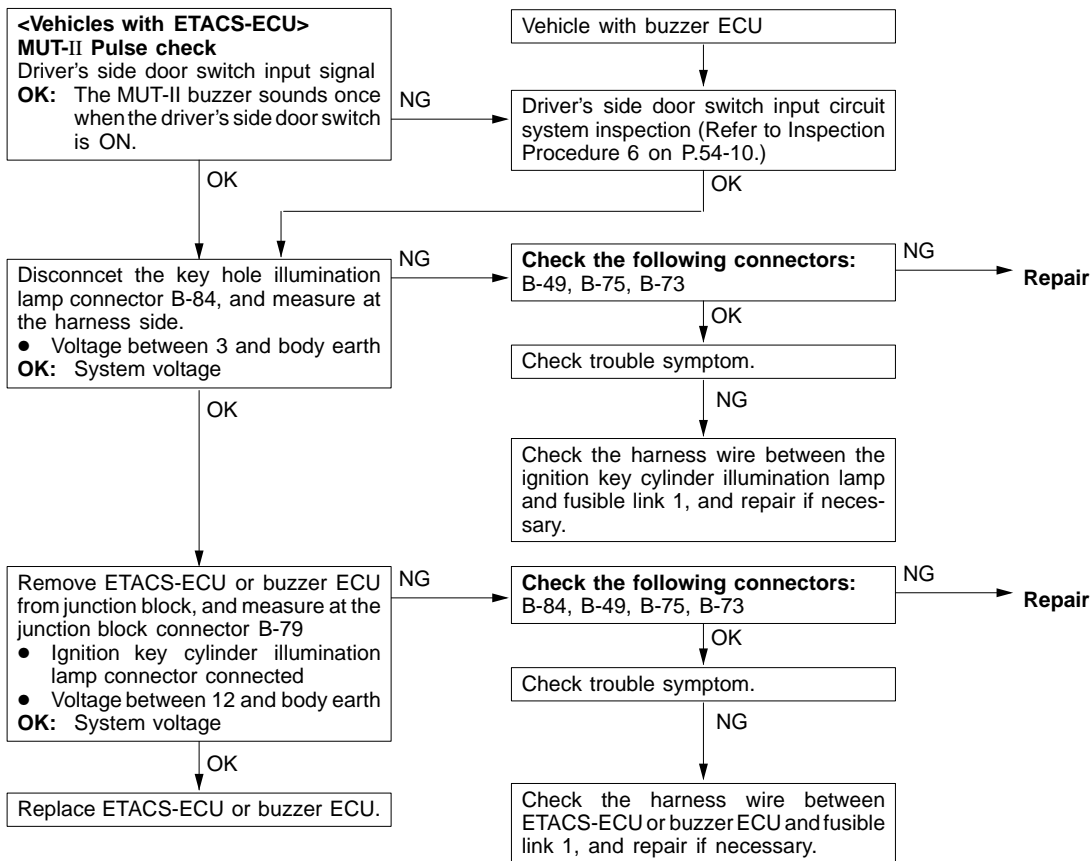
**Inspection Procedure 1**

Key hole illumination lamp remains illuminated.	Probable cause
The cause is probably a harness short or a defective ETACS-ECU or buzzer ECU.	<ul style="list-style-type: none"> <li>• Malfunction of harness wire</li> <li>• Malfunction of ETACS-ECU</li> <li>• Malfunction of buzzer ECU</li> </ul>



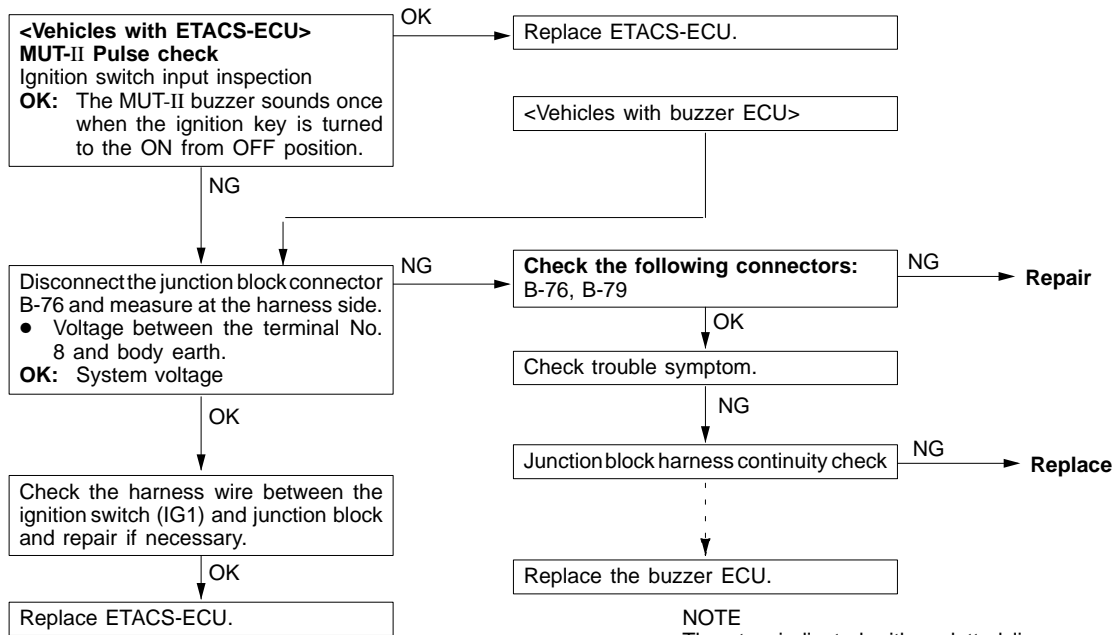
**Inspection Procedure 2**

Even if driver's side door is opened, key hole illumination lamp does not illuminate.	Probable cause
The cause is probably a defective key hole illumination lamp circuit system, or a defective driver's side door switch input circuit system if the ignition key reminder warning buzzer is also faulty.	<ul style="list-style-type: none"> <li>• Malfunction of driver's side door switch</li> <li>• Malfunction of bulb</li> <li>• Malfunction of connector</li> <li>• Malfunction of harness wire</li> <li>• Malfunction of ETACS-ECU</li> <li>• Malfunction of buzzer ECU</li> </ul>



Inspection Procedure 3

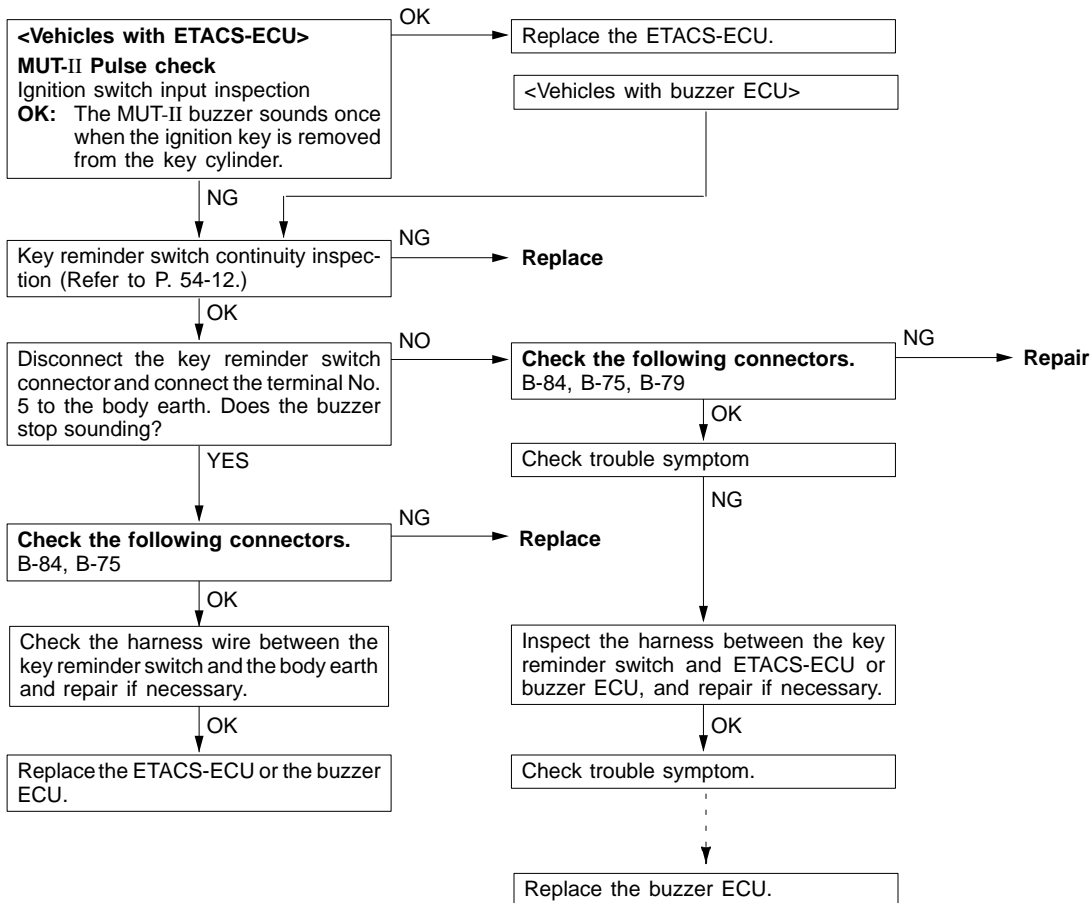
<p><b>While key hole illumination lamp is illuminated, ignition key is turned to the ON position but key hole illumination lamp does not switch off. (However, it switch off after 15 seconds.)</b></p>	<p><b>Probable cause</b></p>
<p><b>While the key reminder warning buzzer is sounding, the ignition key is turned to the ON position but the sound dose not stop. (However, it stops when the driver’s side door is closed.)</b></p>	
<p>The cause is probably a malfunction of the ignition switch input circuit, ETACS-ECU or buzzer ECU. Furthermore, if there is a malfunction of a multipurpose fuse, the cause may also be a short circuit in a harness.</p>	<ul style="list-style-type: none"> <li>● Malfunction of fuse</li> <li>● Malfunction of connector</li> <li>● Malfunction of harness</li> <li>● Malfunction of ETACS-ECU</li> <li>● Malfunction of buzzer ECU</li> </ul>



NOTE  
The stop indicated with a dotted line applies only to vehicles with buzzer ECU.

Inspection Procedure 4

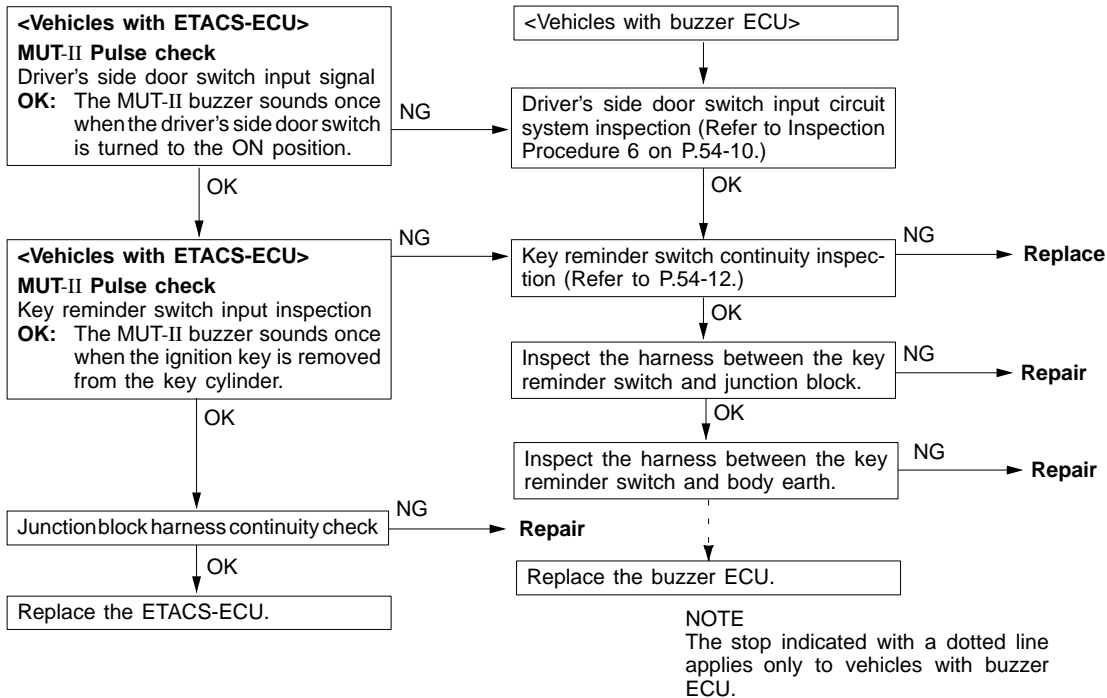
The key reminder warning buzzer dose not stop sounding even if the key is removed. (However, it stops when the driver’s side door is closed.)	Probable cause
The cause is probably a malfunction of the key reminder switch input circuit system, or a malfunction of ETACS-ECU, or a malfunction of buzzer ECU.	<ul style="list-style-type: none"> <li>● Malfunction of key reminder switch</li> <li>● Malfunction of connector</li> <li>● Malfunction of harness</li> <li>● Malfunction of ETACS-ECU</li> <li>● Malfunction of buzzer ECU</li> </ul>



NOTE  
The stop indicated with a dotted line applies only to vehicles with buzzer ECU.

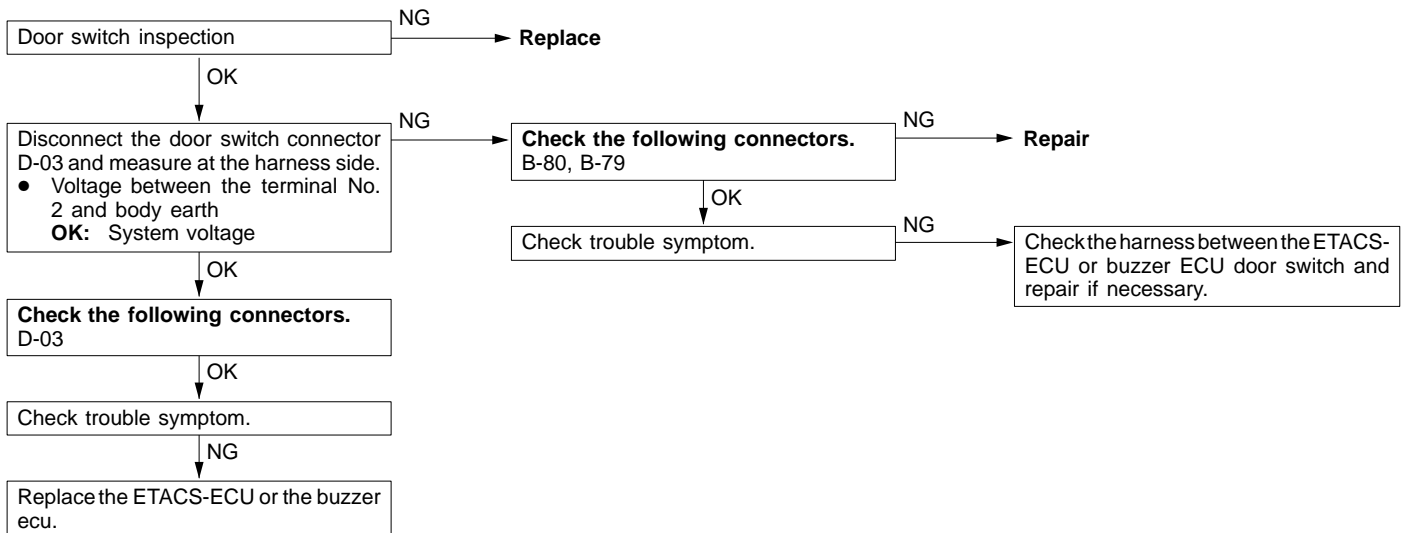
Inspection Procedure 5

<p>The key reminder warning buzzer dose not sound even if the driver’s side door is opened while the key is still inserted. (However, the ignition key should be in the OFF position.)</p>	<p>Probable cause</p>
<p>The cause is probably a malfunction of the door switch input circuit system, if the key hole illumination lamp is also faulty. A malfunction of the key reminder switch input circuit system is also suspected.</p>	<ul style="list-style-type: none"> <li>● Malfunction of door switch</li> <li>● Malfunction of key reminder switch</li> <li>● Malfunction of connector</li> <li>● Malfunction of harness</li> <li>● Malfunction of ETACS-ECU</li> <li>● Malfunction of buzzer ECU</li> </ul>



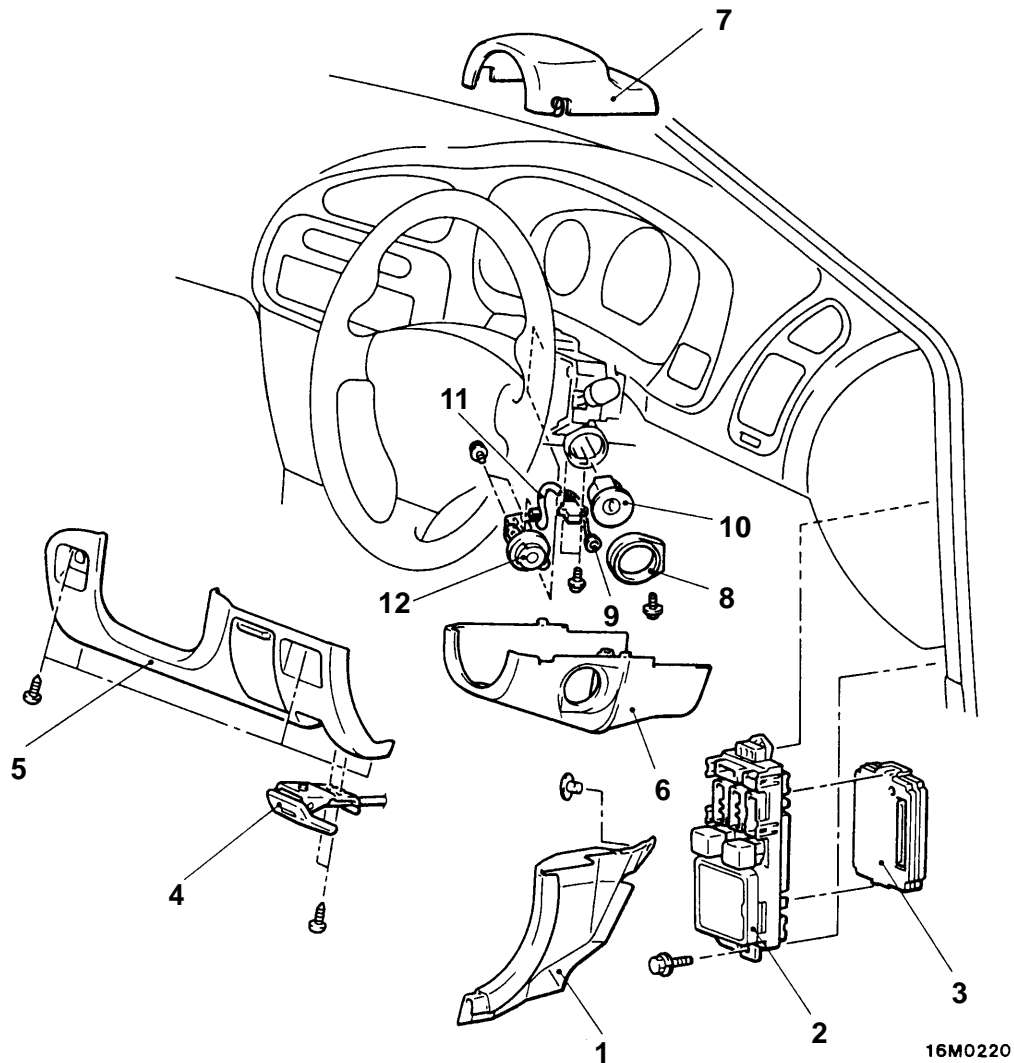
Inspection Procedure 6

Driver’s side door switch input circuit system inspection



# IGNITION SWITCH

## REMOVAL AND INSTALLATION



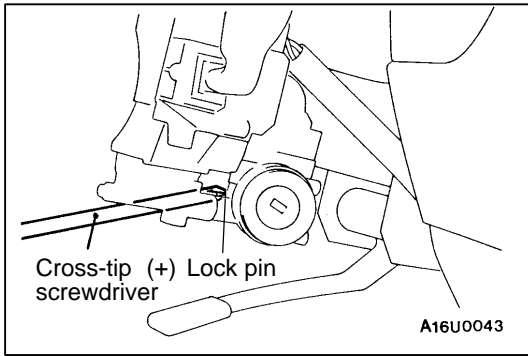
### ETACS-ECU or buzzer ECU removal steps

1. Cowl side trim (R.H.)
2. Junction block
3. Buzzer control unit ETACS-ECU

### Ignition switch removal steps

4. Hood lock release handle
5. Driver side lower panel
6. Column cover, lower
7. Column cover, upper
8. Illumination ring or ring cover
9. Key hole illumination lamp bulb
10. Steering lock cylinder
11. Key reminder switch
12. Ignition switch

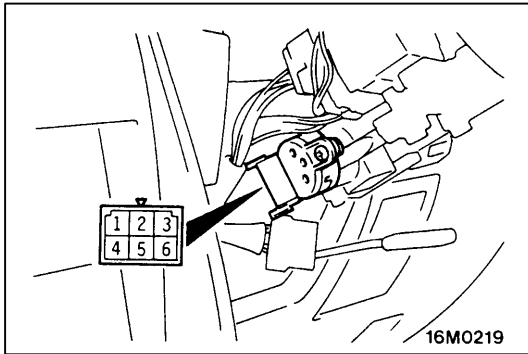




**REMOVAL SERVICE POINT**

**◀A▶ STEERING LOCK CYLINDER REMOVAL**

1. Insert the key in the steering lock cylinder and turn it to the “ACC” position.
2. Using a cross-tip (+) screwdriver (small) or a similar tool, push the lock pin of the steering lock cylinder inward and then remove the steering lock cylinder.

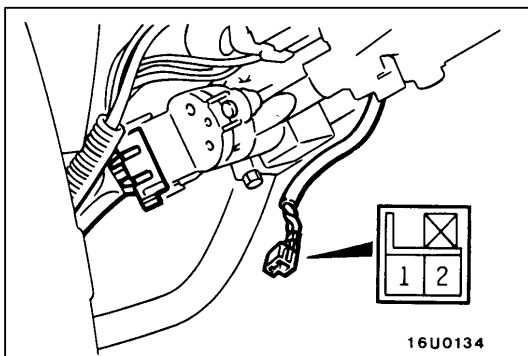


**INSPECTION**

**IGNITION SWITCH CONTINUITY CHECK**

Disconnect the ignition switch connector without removing the ignition switch from the vehicle. Then, check the continuity between the following terminals.

Ignition key position	Terminal No.					
	1	2	3	4	5	6
LOCK						
ACC	○					○
ON	○	○		○		○
START	○	○	○		○	



**KEY REMINDER SWITCH CONTINUITY CHECK**


Disconnect the key reminder switch connector with the switch installed on the vehicle, and then check continuity.

Ignition key	Terminal No.	
	1	2
Removed	○	○
Inserted		



# IGNITION SWITCH AND IMMOBILIZER SYSTEM <EVOLUTION-VI WITH IMMOBILIZER SYSTEM>

## SPECIAL TOOL

Tool	Number	Name	Use
	MB991502	MUT-II sub assembly	<ul style="list-style-type: none"> <li>• Immobilizer system check (Diagnosis display using the MUT-II)</li> <li>• Registration of the ID code</li> </ul>

## TROUBLESHOOTING

### Caution

The ID code should always be re-registered when replacing the immobilizer-ECU.

### STANDARD FLOW OF DIAGNOSIS TROUBLESHOOTING

Refer to GROUP 00 – How To Use Troubleshooting/Inspection Service Points.

### DIAGNOSIS FUNCTION

#### DIAGNOSIS CODES CHECK

Refer to GROUP 00 – How To Use Troubleshooting/Inspection Service Points.

#### ERASING DIAGNOSIS CODES

Refer to GROUP 00 – How To Use Troubleshooting/Inspection Service Points.

### Caution

The diagnosis codes which result from disconnecting the battery cables cannot be erased.

### INSPECTION CHART FOR DIAGNOSIS CODES

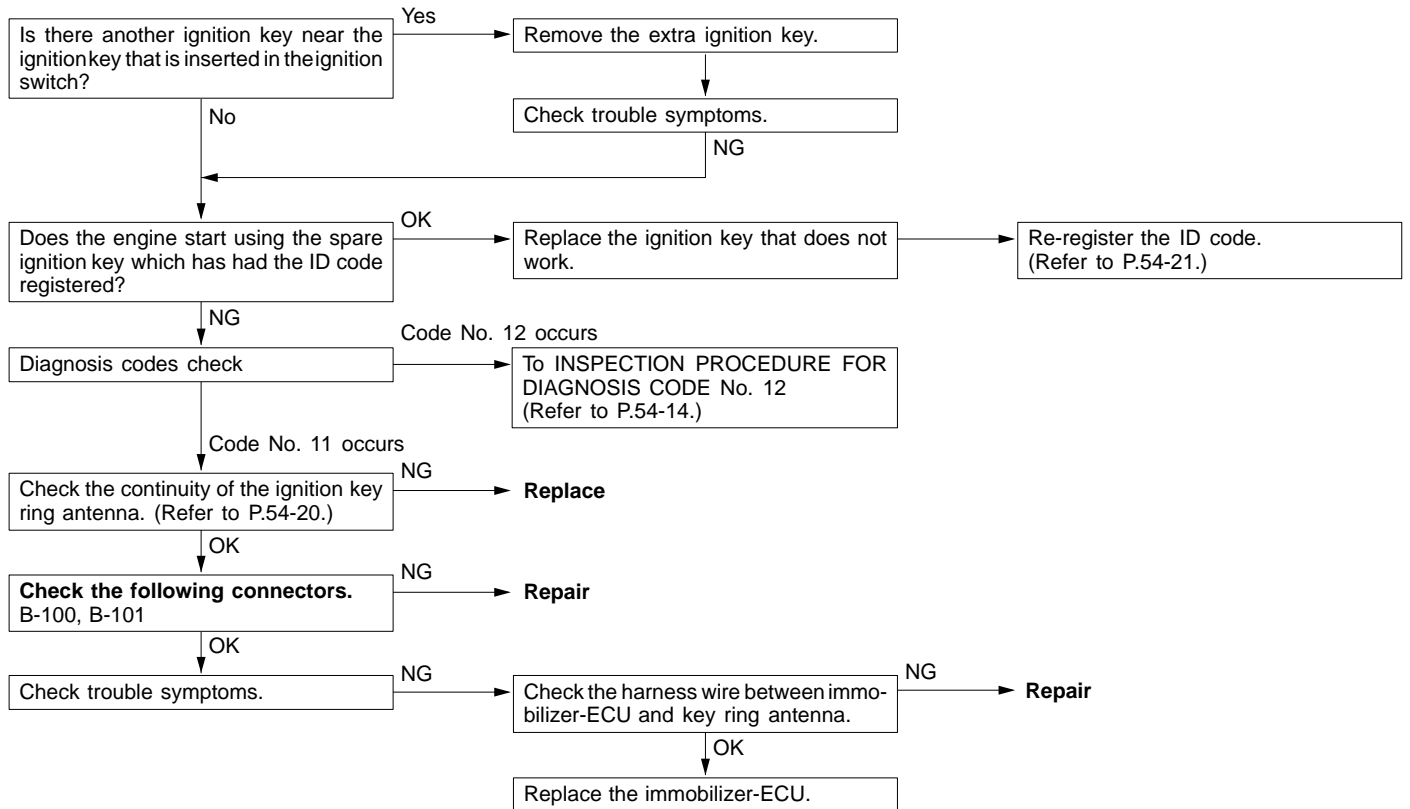
Diagnosis code No.	Inspection items	Reference page
11	Transponder communication system	54-14
12*	ID code are not the same or are not registered	54-14
21	Communication system between MUT-II and engine-ECU	54-15
31	EEPROM abnormality inside immobilizer-ECU	54-15

### NOTE

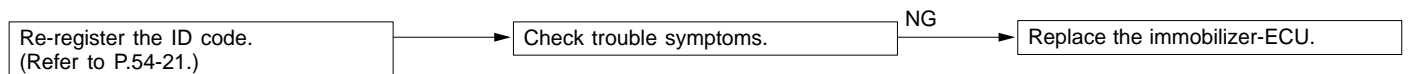
\*: Diagnosis code No. 12 is not recorded.

## INSPECTION PROCEDURE FOR DIAGNOSIS CODES

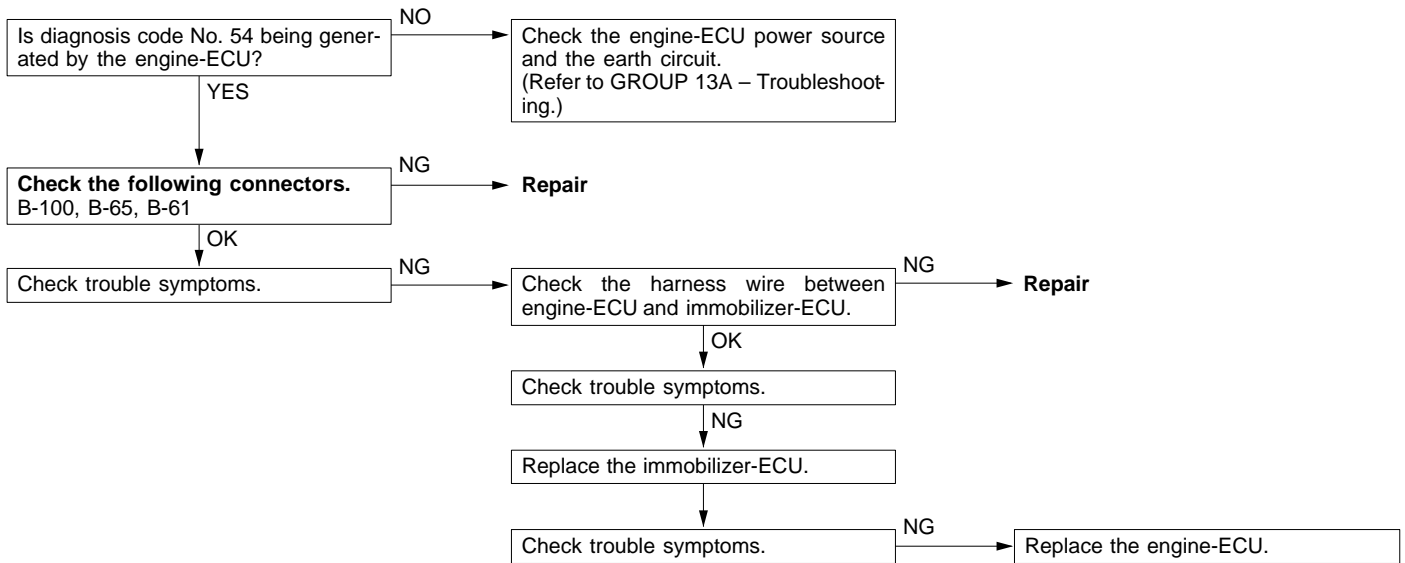
Code No. 11 Transponder communication system	Probable cause
<ul style="list-style-type: none"> <li>The ID code of the transponder is not sent to the immobilizer-ECU immediately after the ignition switch is turned to the ON position.</li> <li>When starting the engine, one ignition key's ID code interferes with another ignition key's code.</li> </ul>	<ul style="list-style-type: none"> <li>Radio interference of ID codes</li> <li>Malfunction of the transponder</li> <li>Malfunction of the ignition key ring antenna</li> <li>Malfunction of harness or connector</li> <li>Malfunction of the immobilizer-ECU</li> </ul>



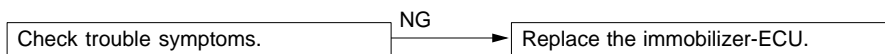
Code No. 12 ID code are not the same or are not registered	Probable cause
The ID code which is sent from the transponder is not the same as the ID code which is registered in the immobilizer-ECU.	<ul style="list-style-type: none"> <li>The ID code in the ignition key being used has not been properly registered.</li> <li>Malfunction of the immobilizer-ECU</li> </ul>



Code No. 21 Communication system between MUT-II and engine-ECU	Probable cause
After the ignition switch is turned to the ON position, the confirmation code is not received from the engine-ECU within the allowable time, or an abnormal code is received.	<ul style="list-style-type: none"> <li>• Malfunction of harness or connector</li> <li>• Malfunction of the engine-ECU</li> <li>• Malfunction of the immobilizer-ECU</li> </ul>



Code No. 31 EEPROM abnormality inside immobilizer-ECU	Probable cause
No data has been written to the EEPROM inside the immobilizer-ECU.	<ul style="list-style-type: none"> <li>• Malfunction of the immobilizer-ECU</li> </ul>



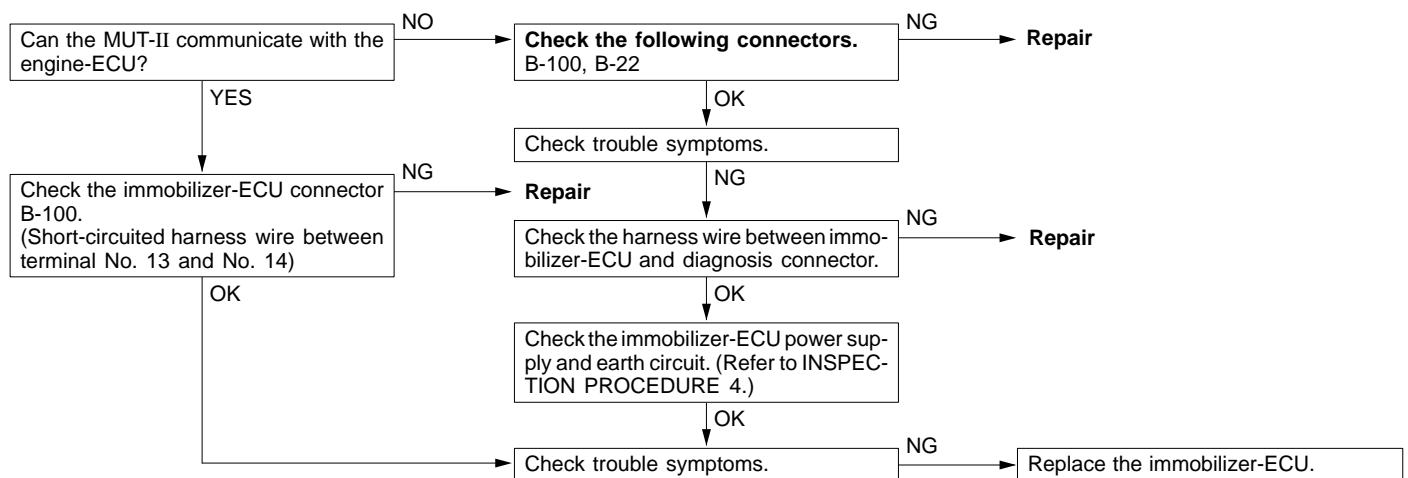
## INSPECTION CHART FOR TROUBLE SYMPTOMS

Trouble symptom	Inspection procedure No.	Reference page
Communication with MUT-II is impossible.	1	54-16
ID code cannot be registered using the MUT-II.	2	54-17
Engine does not start (Cranking but no initial combustion).	3	54-17
Malfunction of the immobilizer-ECU power source and earth circuit	4	54-18

## INSPECTION PROCEDURE FOR TROUBLE SYMPTOMS

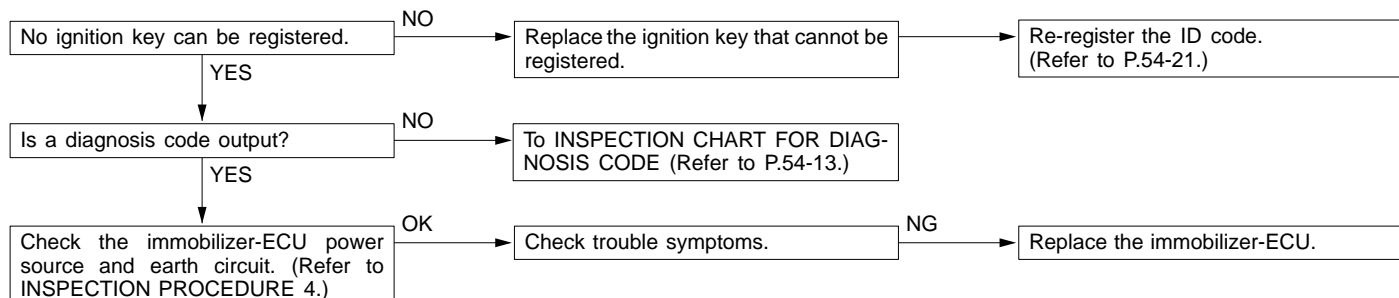
### Inspection Procedure 1

Communication with MUT-II is impossible.	Probable cause
The cause is probably that a malfunction of the diagnosis line or the immobilizer-ECU is not functioning.	<ul style="list-style-type: none"> <li>• Malfunction of the diagnosis line</li> <li>• Malfunction of harness or connector</li> <li>• Malfunction of the immobilizer-ECU</li> </ul>



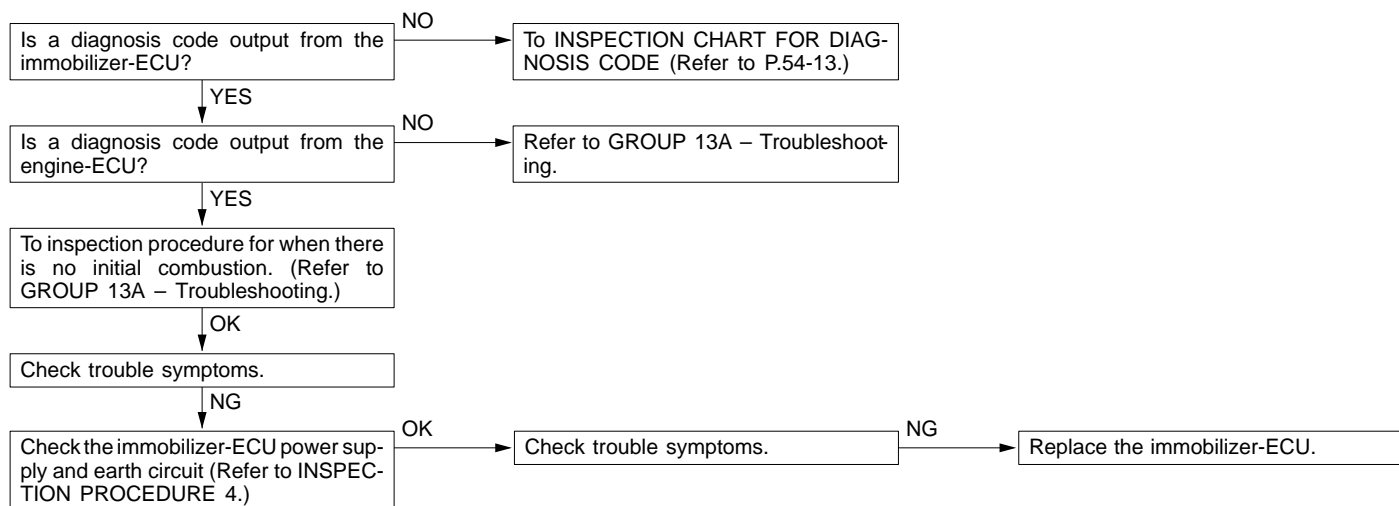
**Inspection Procedure 2**

ID code cannot be registered using the MUT-II.	Probable cause
The cause is probably that there is no ID code registered in the immobilizer-ECU, or there is a malfunction of the immobilizer-ECU.	<ul style="list-style-type: none"> <li>● Malfunction of the transponder</li> <li>● Malfunction of the ignition key ring antenna</li> <li>● Malfunction of harness or connector</li> <li>● Malfunction of the immobilizer-ECU</li> </ul>



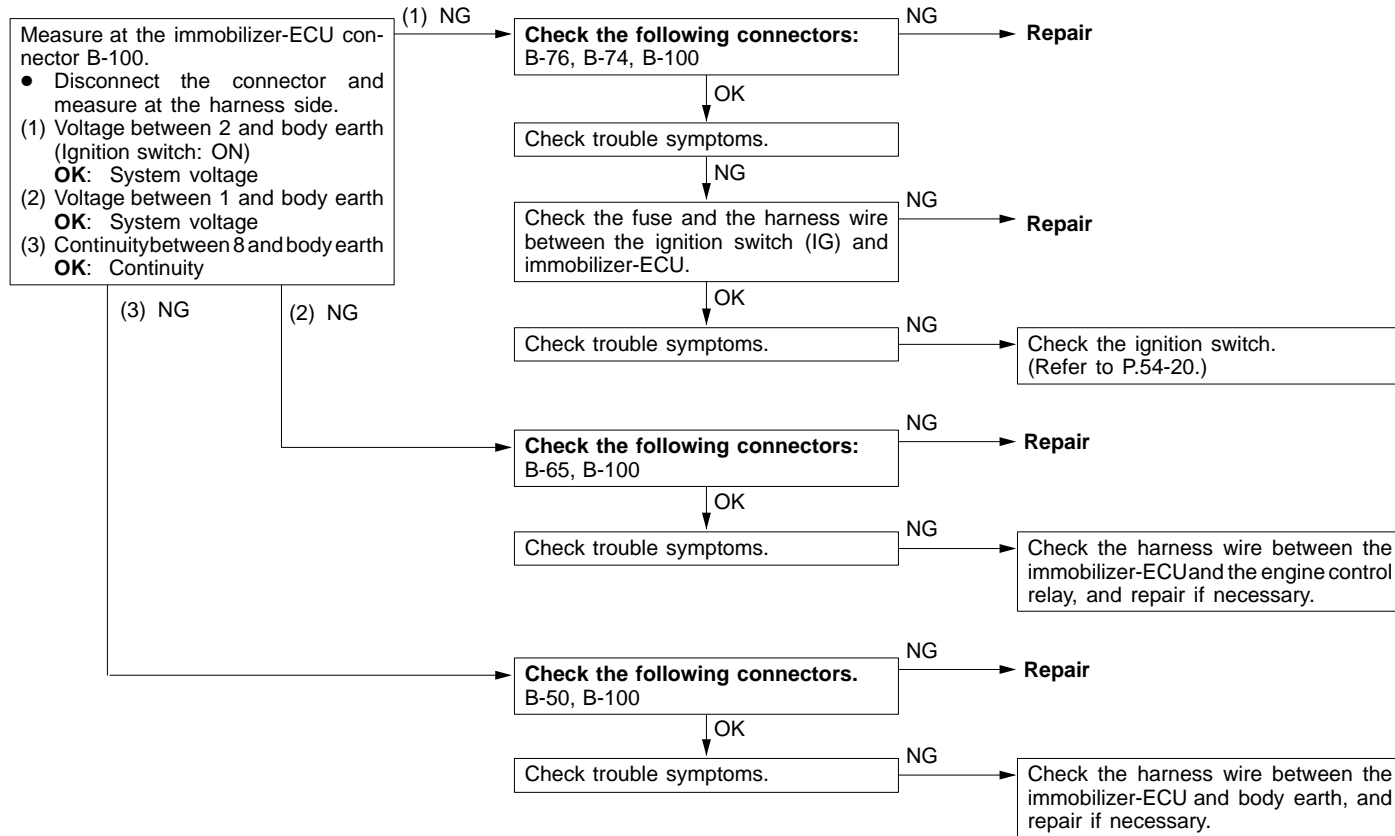
**Inspection Procedure 3**

Engine does not start (cranking but no initial combustion).	Probable cause
If the fuel injectors are not operating, there might be a problem with the MPI system in addition to a malfunction of the immobilizer system. It is normal for this to occur if an attempt is made to start the engine using a key that has not been properly registered.	<ul style="list-style-type: none"> <li>● Malfunction of the MPI system</li> <li>● Malfunction of the immobilizer-ECU</li> </ul>

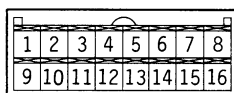


## Inspection Procedure 4

### Malfunction of the immobilizer-ECU power supply and earth circuit



## CHECK AT IMMOBILIZER-ECU TERMINAL VOLTAGE CHECK CHART



16W0390

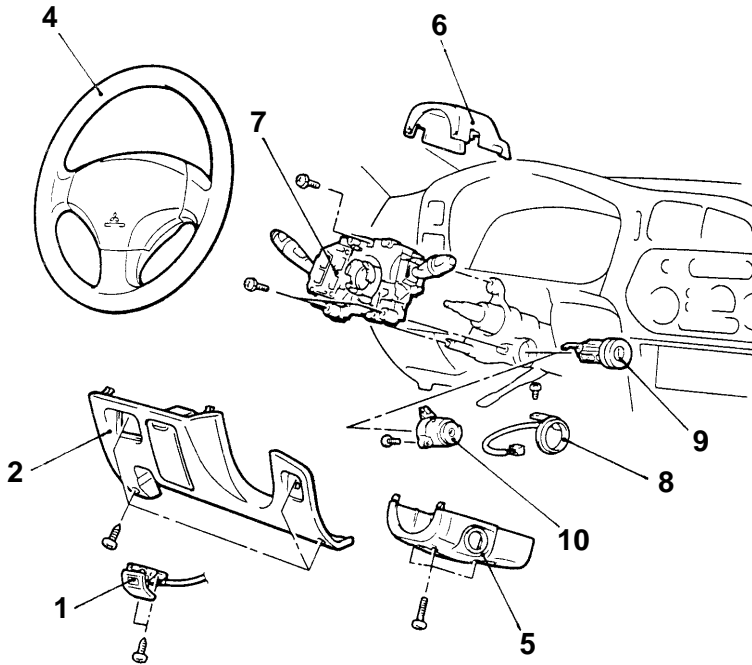
Terminal No.	Signal	Checking requirements	Terminal voltage
1	Immobilizer-ECU power supply	Ignition switch: ON	System voltage
2	Ignition switch-IG	Ignition switch: OFF	0V
		Ignition switch: ON	System voltage
8	Immobilizer-ECU earth	Always	0V

## IGNITION SWITCH AND IMMOBILIZER SYSTEM

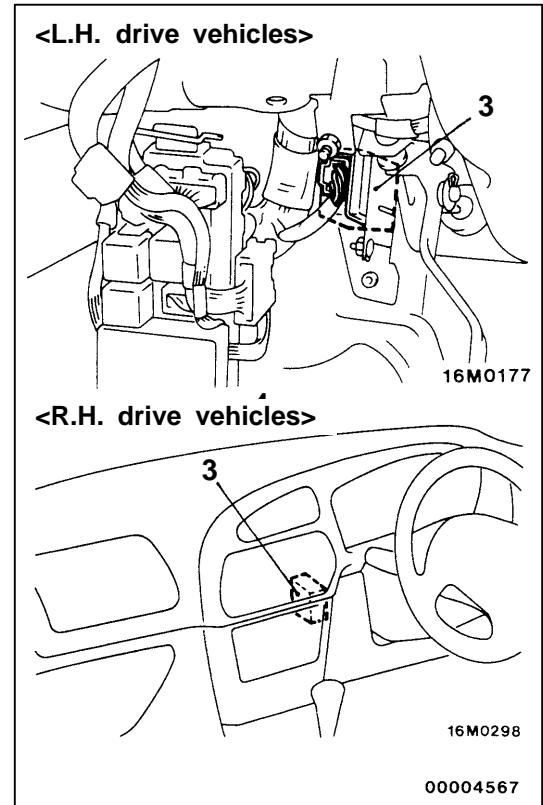
**Caution: SRS**

Before removal of air bag module and clock spring, refer to GROUP 52B – SRS Service Precautions and Air Bag Module and Clock Spring.

### REMOVAL AND INSTALLATION



16M0283



16M0177

16M0298

00004567

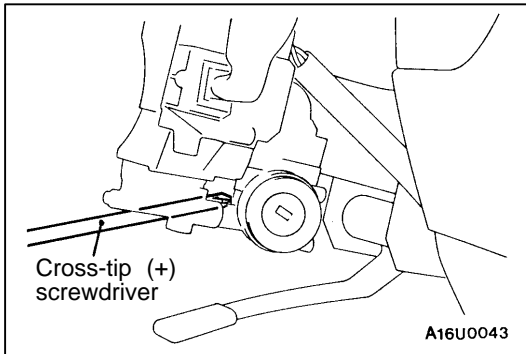
#### Immobilizer-ECU removal steps

1. Hood lock release handle
2. Driver's side lower cover
  - Radio and tape player <R.H drive vehicles>
  - Heater control assembly <R.H. drive vehicles>
3. Immobilizer-ECU



#### Ignition switch and ignition key ring antenna removal steps

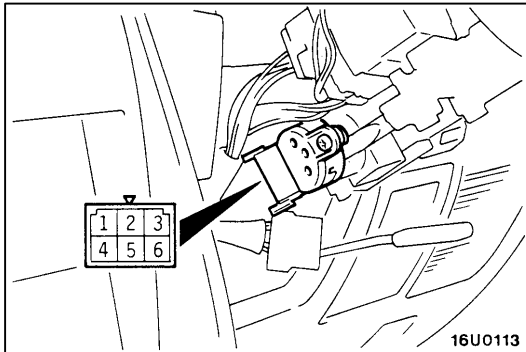
1. Hood lock release handle
2. Driver's side lower cover
4. Steering wheel
5. Column cover, lower
6. Column cover, upper
7. Column switch
8. Ignition key ring antenna
9. Steering lock cylinder
10. Ignition switch



## REMOVAL SERVICE POINTS

### ◀A▶ STEERING LOCK CYLINDER REMOVAL

1. Insert the key in the steering lock cylinder and turn it to the “ACC” position.
2. Using a cross-tip (+) screwdriver (small) or a similar tool, push the lock pin of the steering lock cylinder inward and then pull the steering lock cylinder toward you.

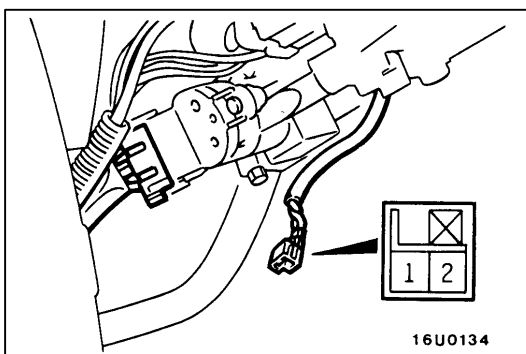


## INSPECTION

### IGNITION SWITCH CONTINUITY CHECK

1. Remove the column cover lower and upper.
2. Disconnect the wiring connector from the ignition switch.
3. Operate the switch, and check the continuity between the terminals.

Ignition key position	Terminal No.				
	1	2	3	5	6
LOCK					
ACC		○	—	○	
ON	○	○	○	○	
START		○	○	—	○



### IGNITION KEY RING ANTENNA CONTINUITY CHECK

Use a circuit tester to check the continuity between the terminals.



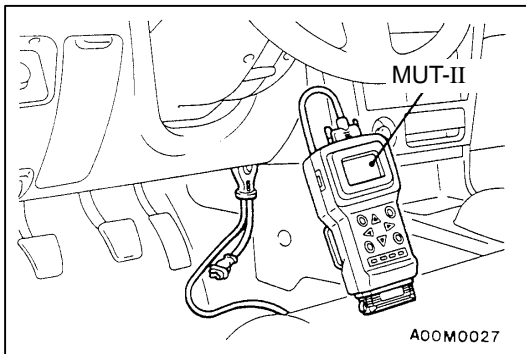
## ID CODE REGISTRATION METHOD

If using an ignition key that has just been newly purchased, or if the immobilizer-ECU has been replaced, you will need to register the ID codes for each ignition key being used into the immobilizer-ECU. (A maximum of eight different ID codes can be registered.)

Moreover, when the immobilizer-ECU has been replaced, you will need to use the MUT-II to register the password that the user specifies into the immobilizer-ECU. (Refer to the MUT-II instruction manual for instructions on using the MUT-II.)

### Caution

**If registering of the ID codes is carried out all previously-registered codes will be erased. Accordingly, you should have ready all of the ignition keys that have already been registered.**



1. Connect the MUT-II to the diagnosis connector.

### Caution

**Turn the ignition switch off before connecting or disconnecting the MUT-II.**

2. Check that the diagnosis code No.54 is not displayed for MPI system. If the code is displayed, carry out troubleshooting before proceeding to the next step. (Refer to GROUP 13A – Troubleshooting).
3. Use the ignition key that is to be registered to turn the ignition switch to the ON position.
4. Use the MUT-II to register the ID code. If you are registering two or more codes, use the next key to be registered to turn the ignition switch to the ON position without disconnecting the MUT-II.
5. Disconnect the MUT-II. This completes the registration operation.
6. Check that the engine can be started by each one of the ignition keys.
7. Check that the diagnosis code No.54 is not displayed for MPI system. If the code is displayed, erase it. (Refer to GROUP 13A – Troubleshooting).

# COMBINATION METERS

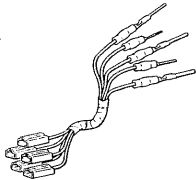
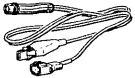


## SERVICE SPECIFICATIONS

Items			Standard value	Limit
Speedometer	Allowable indication range km/h (Speedometer indication error to be with -6% to +10%)	40	37 – 45	–
		80	75 – 88	–
		120	113 – 132	–
		160	150 – 176	–
	Pointer fluctuation km/h (at vehicle speeds of higher than 35 km/h)		–	±3
Tachometer indication error r/min	700	All types of tachometer	± 100	–
	3,000	Meters measurable up to 6,000 rpm and meters measurable up to 8,000 rpm	+ 150	–
		Meters measurable up to 9,000 rpm and meters measurable up to 10,000 rpm	+ 225 – 100	–
	4,750	Meters measurable up to 6,000 rpm	± 160	–
	5,000	Meters measurable up to 8,000 rpm	± 250	–
		Meters measurable up to 9,000 rpm and meters measurable up to 10,000 rpm	+ 325 – 125	–
	6,000	Meters measurable up to 8,000 rpm	± 300	–
	7,000	Meters measurable up to 9,000 rpm and meters measurable up to 10,000 rpm	+ 400 – 100	–
	8,000	Meters measurable up to 10,000 rpm	+ 400 – 0	–
Fuel gauge unit resistance $\Omega$	Main tank	Float point F	$1.8 \pm 1.2$	–
		Float point E	$65.2 \pm 4$	–
	Sub tank	Float point F	$1.2 \pm 0.8$	–
		Float point E	$44.8 \pm 3$	–
Fuel gauge unit float height mm	Main tank	Float point F	16.4	–
		Float point E	122.6	–
	Sub tank	Float point F	17.5	–
		Float point E	134.6	–
Engine coolant temperature gauge unit resistance (at 70 °C) $\Omega$			$104 \pm 13.5$	–
Fuel gauge resistance $\Omega$	Power supply and earth		$192 \pm 19.2$	–
	Power supply and fuel gauge		$89 \pm 8.9$	–
	Fuel gauge and earth		$103 \pm 10.3$	–
Engine coolant temperature gauge resistance $\Omega$	Power supply and earth		$187 \pm 18.7$	–
	Power supply and engine coolant temperature gauge		$90 \pm 4.5$	–
	Engine coolant temperature gauge and earth		$247 \pm 24.7$	–

## SEALANT

Items	Specified sealant	Remark
Engine coolant temperature gauge unit threaded portion	3M Adhesive nut locking No. 4171 or equivalent	Drying sealant

## SPECIAL TOOLS

Tool	Number	Name	Use
<p><b>A</b></p>  <p><b>B</b></p>  <p><b>C</b></p>  <p><b>D</b></p> 	<p>MB991223</p> <p>A: MB991219</p> <p>B: MB991220</p> <p>C: MB991221</p> <p>D: MB991222</p>	<p>Harness set</p> <p>A: Test harness</p> <p>B: LED harness</p> <p>C: LED harness adapter</p> <p>D: Probe</p>	<p>Fuel gauge simple check</p> <p>A: Connector pin contact pressure check</p> <p>B, C: Power circuit check</p> <p>D: Commercial tester connection</p>

# TROUBLESHOOTING

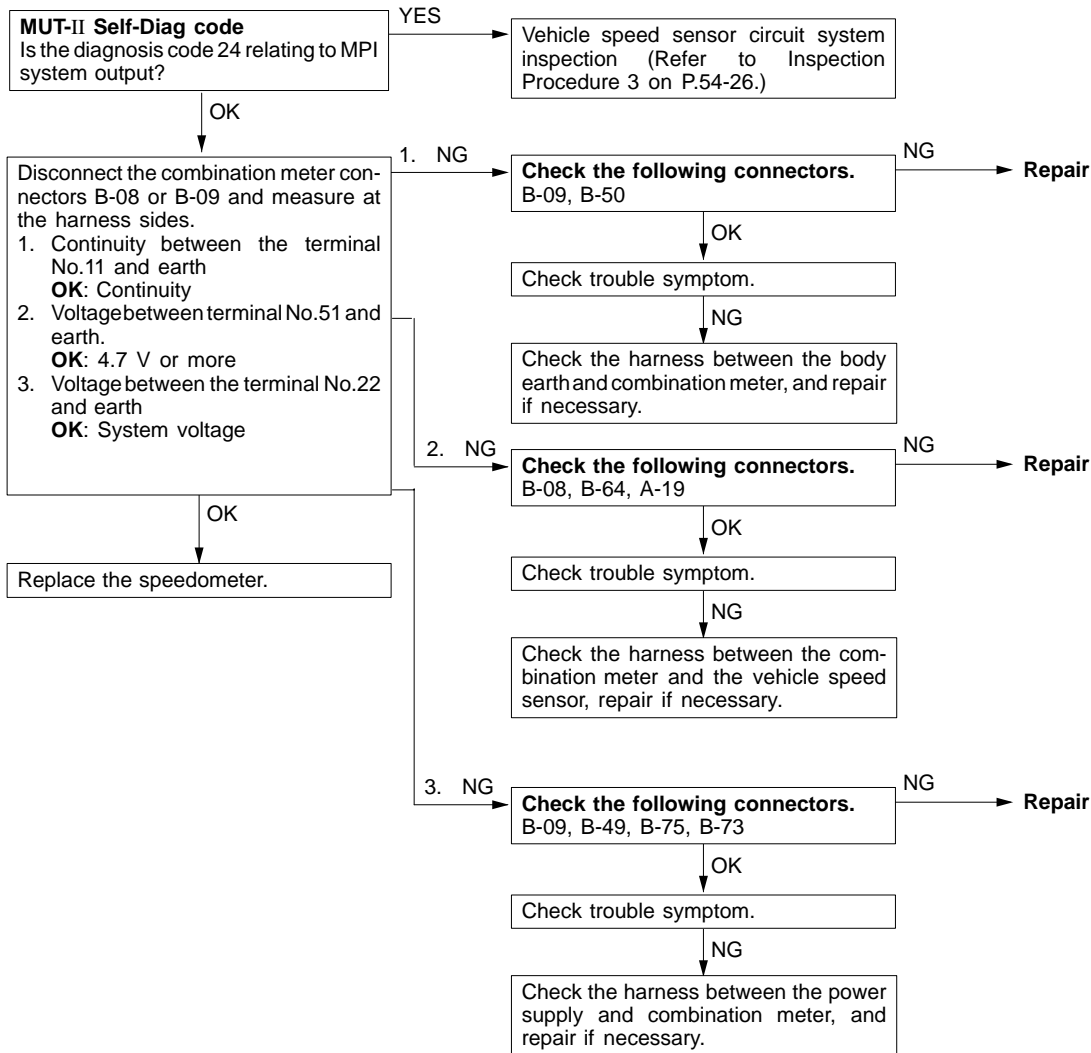
## INSPECTION CHART FOR TROUBLE SYMPTOMS

Trouble symptom	Inspection procedure	Reference page
Speedometer does not work.	1	54-24
Tachometer does not work.	2	54-25

## INSPECTION PROCEDURE FOR TROUBLE SYMPTOMS

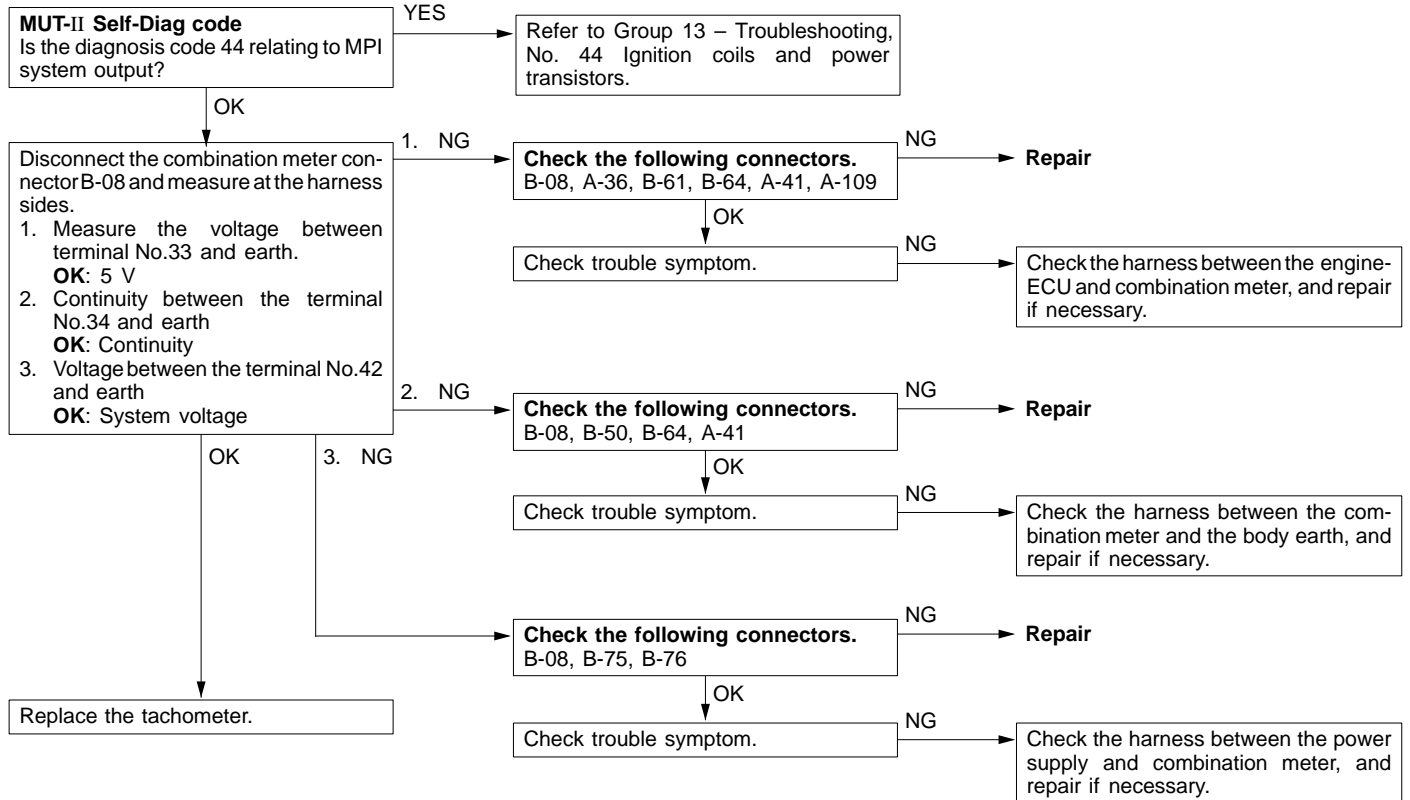
### Inspection Procedure 1

Speedometer does not work.	Probable cause
Examine the diagnosis codes registered in the engine-ECU. If no wheel speed sensor-relating diagnosis code has been output, the wheel speed sensors are in order.	<ul style="list-style-type: none"> <li>• Malfunction of vehicle speed sensor</li> <li>• Malfunction of speedometer</li> <li>• Malfunction of harness or connector</li> <li>• Malfunction of relevant ECU</li> </ul>



Inspection Procedure 2

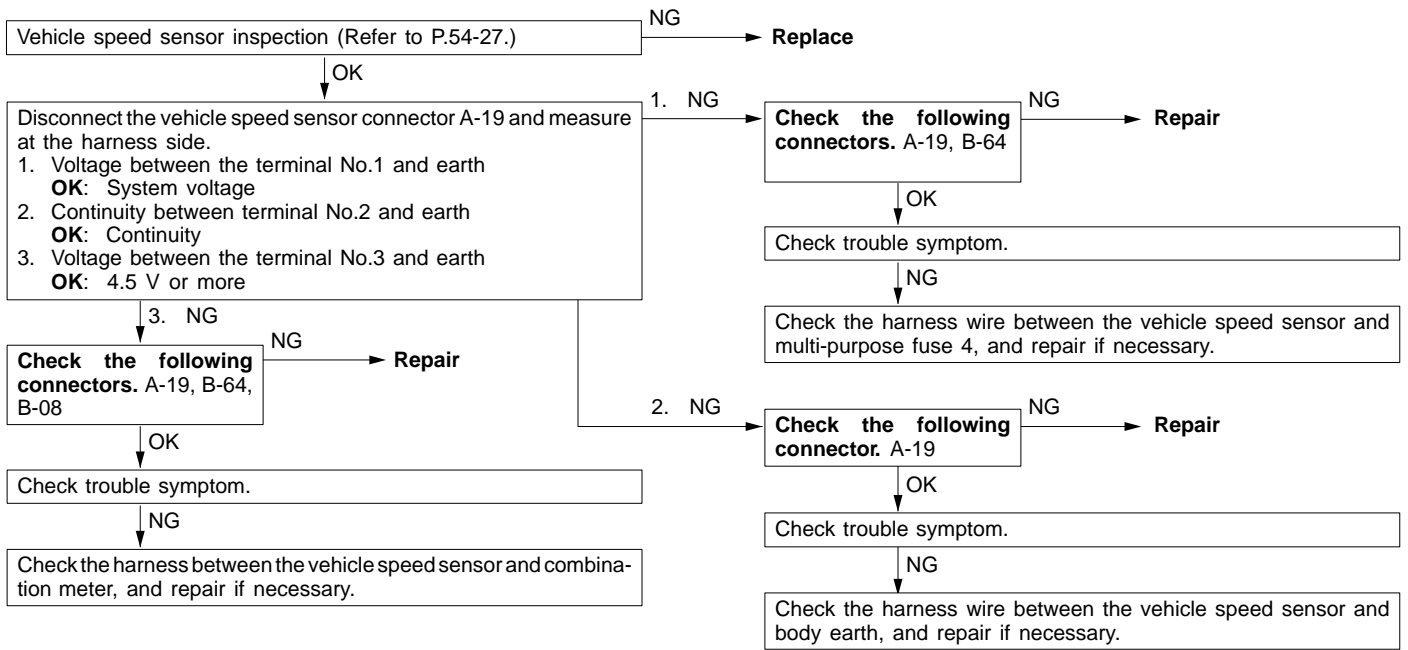
Tachometer does not work.	Probable cause
The ignition signal may not be input from the engine, or there may be a malfunction in the power supply or earth circuit.	<ul style="list-style-type: none"> <li>● Malfunction of tachometer</li> <li>● Malfunction of harness or connector</li> </ul>



Inspection Procedure 3

**Vehicle speed sensor circuit system inspection**

Signals from the vehicle speed sensor are utilized both in the speedometer and the engine-ECU.



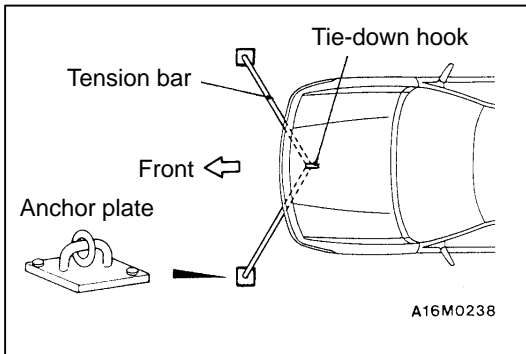
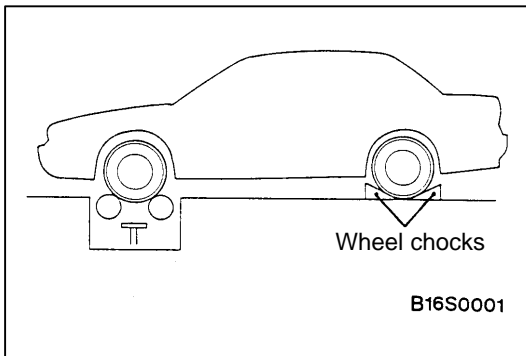
**NOTE**

If the trouble symptom still persists even after the above procedures are performed, check the vehicle speed sensor output signal side circuit (harness, speedometer and engine ECU) for short-circuit.

## ON-VEHICLE SERVICE

### SPEEDOMETER CHECK

1. Adjust the pressure of the tyres to the specified level.
2. Set the vehicle onto a speedometer tester and use wheel chocks to hold the rear wheels.
3. Pull the parking brake lever firmly.



4. To prevent the front wheel from moving from side to side, attach tension bars to the tie-down hook, and secure both ends to anchor plates.
5. To prevent the vehicles from starting, attach a chain or wire to the rear towing hook, and secure the other end of the chain or wire firmly to an unmovable body.
6. Check if the speedometer indication range is within the standard values and if the pointer fluctuation is within the limits.

#### Caution

**Do not operate the clutch suddenly. Do not increase/decrease speed rapidly while testing.**

#### Standard values:

Vehicle speed km/h	Speedometer indication allowable errors km/h
40	37 – 45
80	75 – 88
120	113 – 132
160	150 – 176

#### Limit: Pointer fluctuation

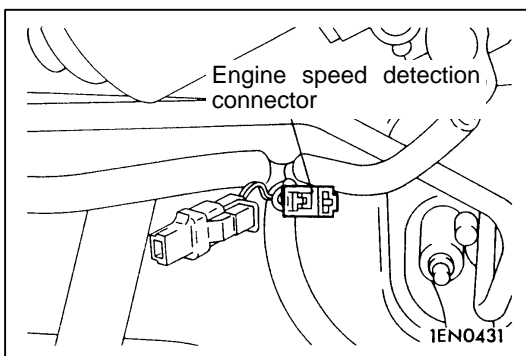
(at vehicle speeds of higher than 35 km/h)  $\pm 3$  km/h

### TACHOMETER CHECK

1. Insert a paper clip in the engine speed detection connector from the harness side, and attach the engine speedometer.
2. Compare the readings of the engine speedometer and the tachometer at every engine speed, and check if the variations are within the standard values.

#### Standard values:

- 700 r/min :  $\pm 100$  r/min
- 3,000<sup>\*1</sup> r/min :  $\pm 150$  r/min
- 3,000<sup>\*2</sup> r/min : +225 to -100 r/min
- 5,000<sup>\*1</sup> r/min :  $\pm 250$  r/min
- 5,000<sup>\*2</sup> r/min : +325 to -125 r/min
- 6,000<sup>\*1</sup> r/min :  $\pm 300$  r/min
- 7,000<sup>\*2</sup> r/min : +400 to -100 r/min
- 8,000<sup>\*3</sup> r/min : +400 to 0 r/min



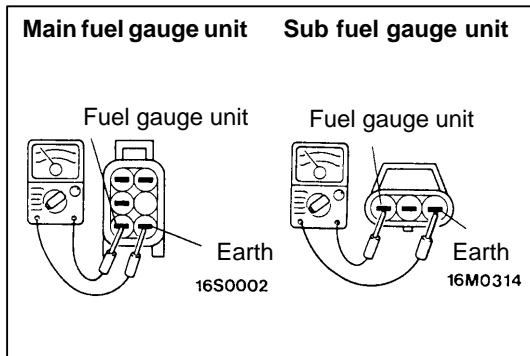
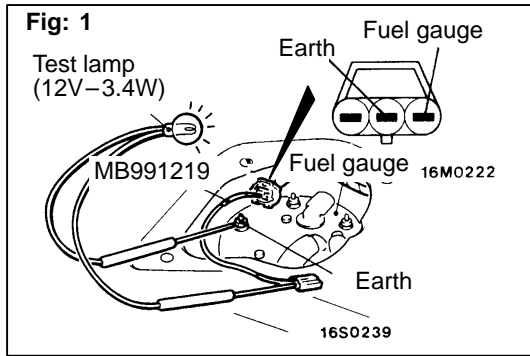
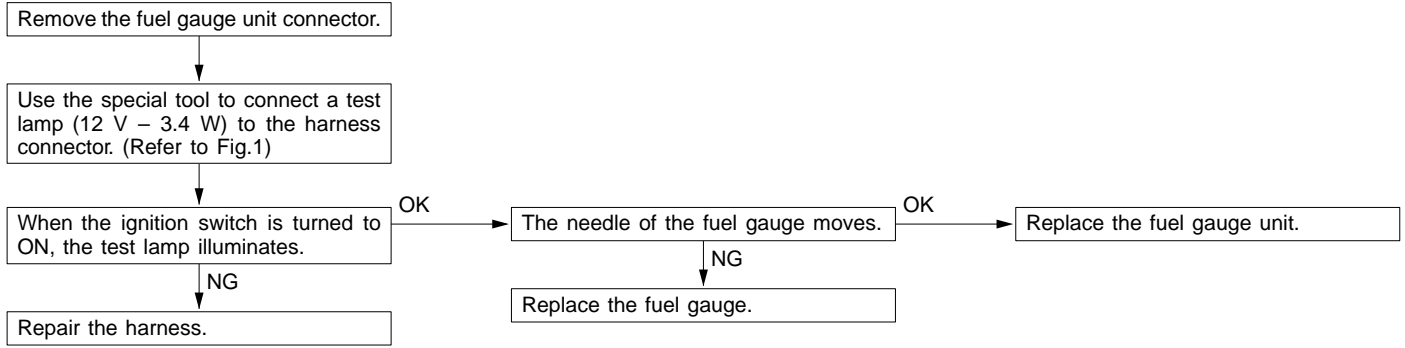
#### NOTE

\*1: Tachometer measurable up to 8,000 r/min

\*2: Tachometer measurable up to 9,000 r/min and one measurable up to 10,000 r/min

\*3: Tachometer measurable up to 10,000 r/min

**FUEL GAUGE SIMPLE CHECK**



**FUEL GAUGE UNIT CHECK**

Remove the fuel gauge unit from the fuel tank.

**FUEL GAUGE UNIT RESISTANCE**

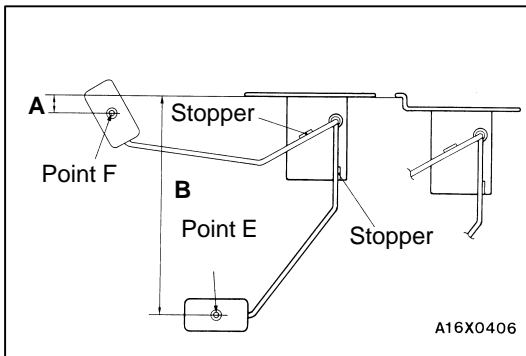
1. Check that resistance value between the fuel gauge unit terminal and earth terminal is at standard value when fuel gauge unit float is at point F and point E.

**Standard value:**

Float position	Main	Sub
Point F	1.8 ± 1.2 Ω	1.2 ± 0.8 Ω
Point E	65.2 ± 4 Ω	44.8 ± 8 Ω

2. Check that resistance value changes smoothly when float moves slowly between point F and point E.



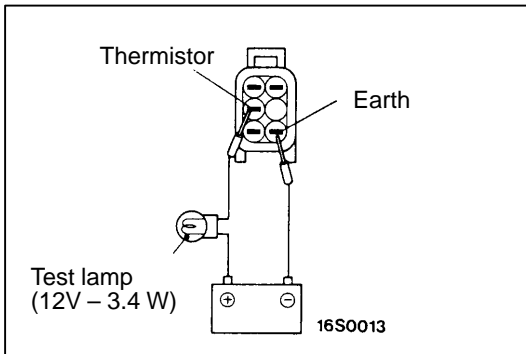


**FUEL GAUGE UNIT FLOAT HEIGHT**

Move float and measure the height at point F (A) and at point E (B) with float arm touching stopper.

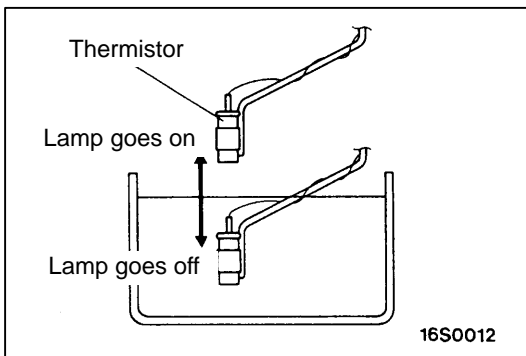
Standard value:

Float position	Main	Sub
Point F	16.4	17.5
Point E	122.6	134.6



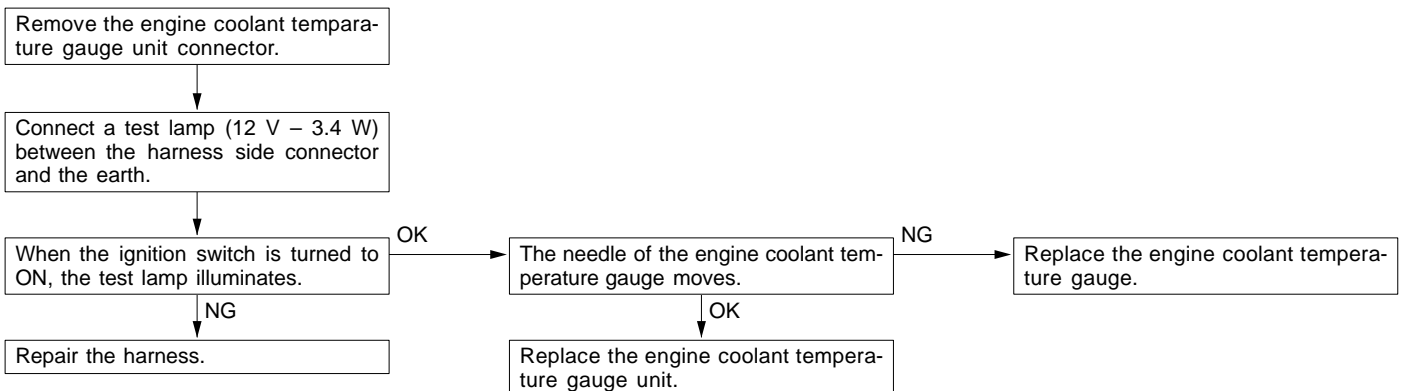
**FUEL LEVEL SENSOR (THERMISTOR)**

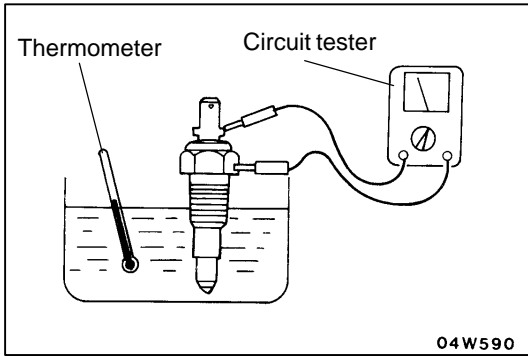
1. Connect a test lamp (12V – 3.4W) to the fuel gauge unit connector terminal and apply the battery voltage.



2. Condition is good if lamp goes off when the thermistor is immersed in water and goes on when it is taken out of water.

**ENGINE COOLANT TEMPERATURE GAUGE SIMPLE CHECK**

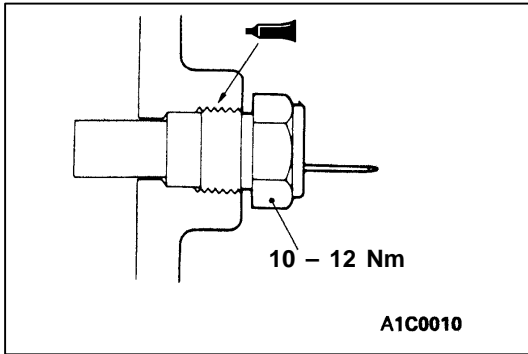




**ENGINE COOLANT TEMPERATURE GAUGE UNIT CHECK**

1. Bleed the engine coolant.
2. Remove the engine coolant temperature gauge unit.
3. Immerse the unit in 70°C water to measure the resistance.

**Standard value: 104 ± 13.5 Ω**

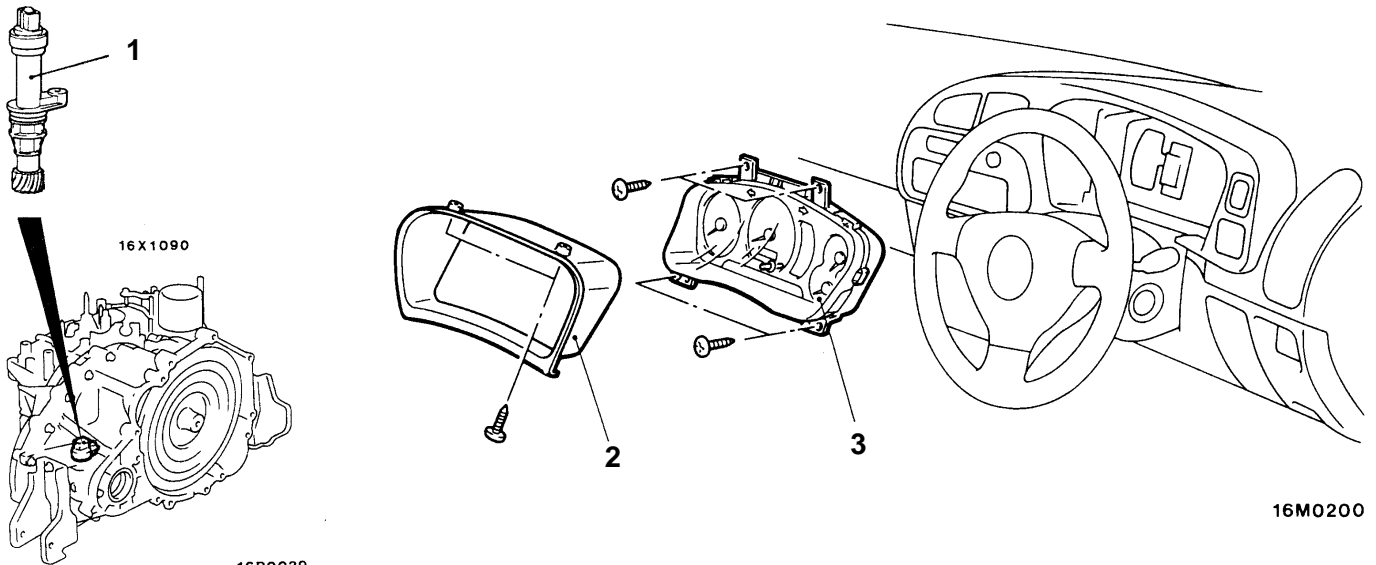


4. After checking, apply the specified adhesive around the thread of engine coolant temperature gauge unit. Then, tighten the unit to the specified torque.

**Specified sealant:**  
**3M Adhesive Nut Locking No. 4171 or equivalent**

5. Add engine coolant.

**COMBINATION METERS  
 REMOVAL AND INSTALLATION**

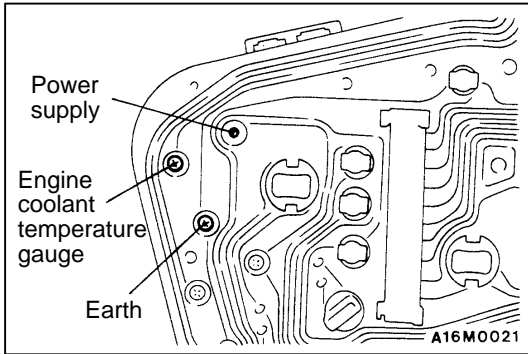
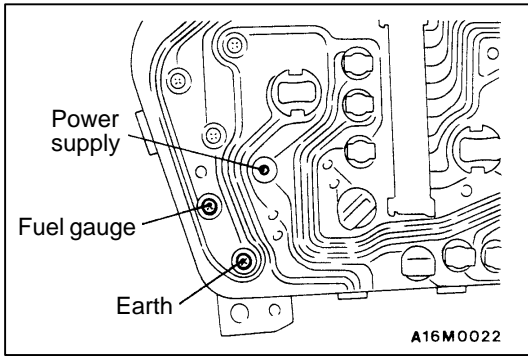


**Vehicle speed sensor removal steps**

- Battery and battery tray
- Air cleaner assembly
- 1. Vehicle speed sensor

**Combination meter removal steps**

2. Meter bezel
3. Combination meter



**INSPECTION**

**FUEL GAUGE RESISTANCE CHECK**

1. Remove the power supply tightening screw.
2. Use a circuit tester to measure the resistance value between the terminals.

**Standard value:**

**Unit:** Ω

Measurement terminal	Resistance value
Power supply – Earth	192±19.2
Power supply – Fuel gauge	89±8.9
Fuel gauge – Earth	103±10.3

**Caution**

When inserting the testing probe into the power supply terminal, be careful not to touch the printed board.

**ENGINE COOLANT TEMPERATURE GAUGE RESISTANCE CHECK**

1. Remove the power supply tightening screw.
2. Use a circuit tester to measure the resistance value between the terminals.

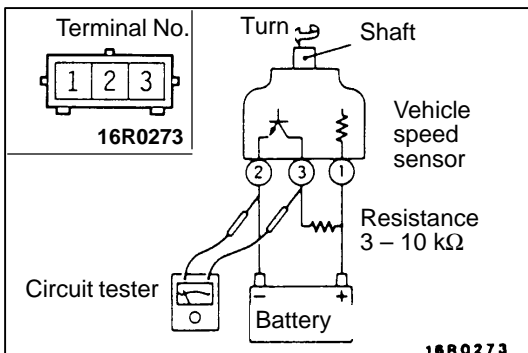
**Standard value:**

**Unit:** Ω

Measurement terminal	Resistance value
Power supply – Earth	187±18.7
Power supply – Engine coolant temperature gauge	90±4.5
Engine coolant temperature gauge – Earth	247±24.7

**Caution**

When inserting the testing probe into the power supply terminal, be careful not to touch the printed board.



**VEHICLE SPEED SENSOR CHECK**

1. Connect a 3 – 10 kΩ resistance as shown in the illustration.
2. Turn the shaft of the vehicle speed sensor one turn and check that voltage changes are caused when measured between terminals 2 and 3 using a circuit tester. (1 turn = 4 pulses)

# HEADLAMP

## SERVICE SPECIFICATIONS


Items			Standard value	Limit	
Headlamp aiming [Parenthesized are allowable beam axis deviations 3 m ahead of headlamp.]	High beam	Vertical direction	25' (22 mm) below horizontal line	–	
		Horizontal direction	Left head-lamp	Parallel to direction of vehicle travel	–
			Right head-lamp	15' (13 mm) leftward from vertical line (V)	–
	Low beam	Vertical direction	25' (22 mm) below horizontal line	–	
		Horizontal direction	Position where 15* rising section intersects vertical line (V)	–	
Headlamp intensity cd (Center of high-beam high intensity zone)			–	15,000 or more per light	

### Cautions in Handling Headlamp Assembly

Each headlamp assembly has a plastic outer lens on. Observe the do's and don'ts below when handling the headlamps.

- Do not leave the headlamps lit for longer than 3 minutes with a protective cover on.
- Do not mask the outer lens surface by taping or in any other way.
- Do not scrub the outer lens surface with a pointed tool.
- Use the designated wax remover for cleaning the outer lens surface. Rinse it thoroughly.
- Use the designated genuine bulbs.

### SPECIAL TOOLS

Tool	Number	Name	Use
	MB991502	MUT-II sub assembly	ETACS-ECU input signal checking

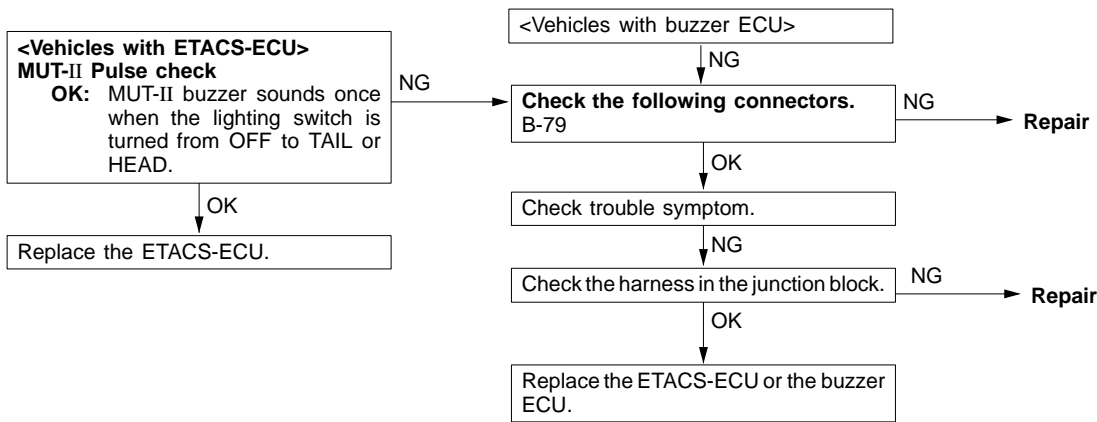
# TROUBLESHOOTING

## DIAGNOSIS FUNCTION

### INPUT SIGNAL INSPECTION POINTS <VEHICLES WITH ETACS-ECU>

Refer to Group 00 – How to Use Troubleshooting / Inspection Service Points.

<p><b>The lighting monitor buzzer does not sound even when the ignition key is removed with the tail lamps or headlamps ON and the driver’s side door open. [However, the key reminder warning buzzer sounds when inserting the key into the ignition key cylinder.</b></p>	<p><b>Probable cause</b></p>
<p>The cause is probably a malfunction of the lighting switch input circuit system or a malfunction of ETACS-ECU or buzzer ECU. When the key reminder warning buzzer is sounding, the lighting monitor warning buzzer does not sound even if the tail lamps or headlamps are lit.</p>	<ul style="list-style-type: none"> <li>● Malfunction of harness or connector</li> <li>● Malfunction of ETACS-ECU</li> <li>● Malfunction of buzzer ECU</li> </ul>



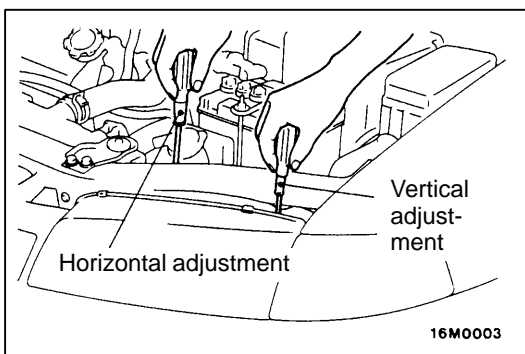
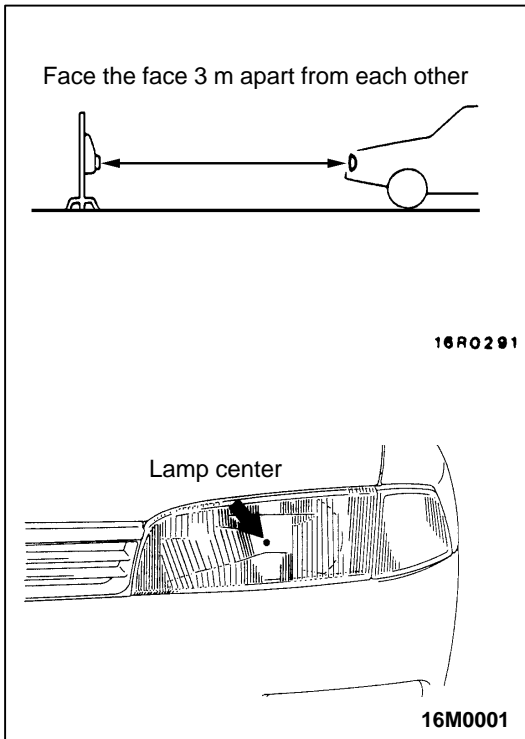
## ON-VEHICLE SERVICE

### HEADLAMP AIMING

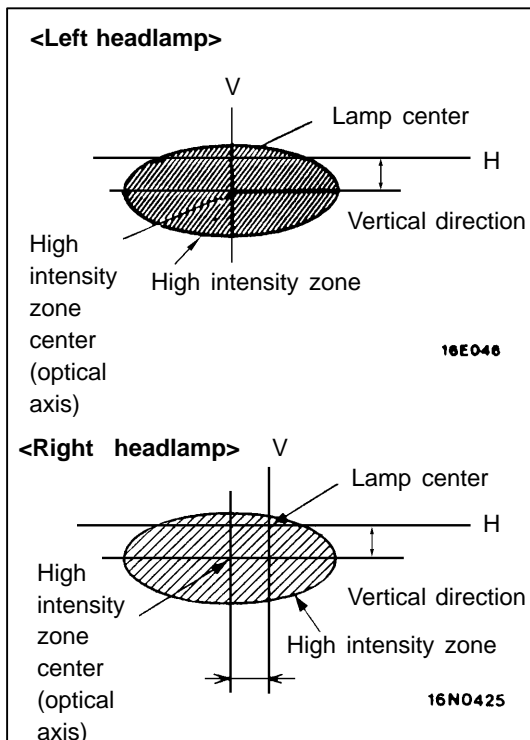
Bring the vehicle in the following conditions before aiming the headlamp.

- Check the tires for inflation pressure. Pump them up if necessary to the labeled pressure level.
- Set the vehicle unladen on a level floor.
- Place one person (approximately 55 kg) on the driver's seat.

1. Position the tester so that its converging lens faces the high-beam lamp (○ marked) center to center at a distance of 3 m from each other.



2. Aim the headlamps to appropriate standard values using the aiming adjustment screw.

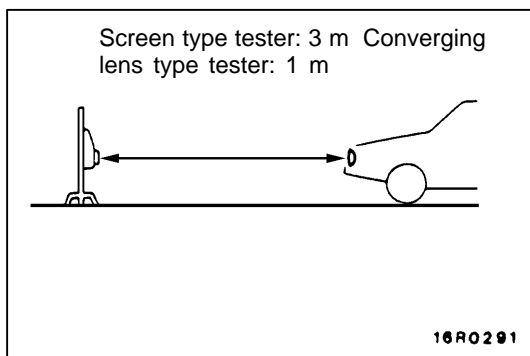


**Standard values:**

Vertical direction		25' (22 mm) below horizontal line (H)
Horizontal direction	Left headlamp	Parallel to direction of vehicle travel
	Right headlamp	15' (13 mm) leftward from vertical line (V)

**Caution:**

- (1) Perform aiming adjustments, one light at a time, with the other headlamp disconnected so as not to be lit unless circumstances compel otherwise. When reconnecting the headlamps, be careful not to upset their aim. Do not leave the headlamps on for any longer than 3 minutes if their outer lenses are covered with a surface covering impervious to light.
- (2) Do not mask the outer lenses by taping or in any other way.
- (3) Aiming adjustment must be completed with the aiming adjustment screws turned in the tightening direction.



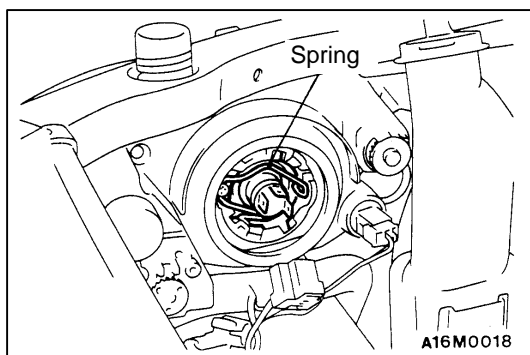
**INTENSITY MEASUREMENT**

1. Position the tester so that its light sensor faces each headlamp center to center at the appropriate distance shown.
2. Maintain an engine speed of 2,000 r/m into keep the battery in the charged condition.
3. Check that the high-beam headlamp intensity at the center of the high intensity zone satisfies the limit value.

**Limit: 15,000 cd or more per headlamp**

**Caution**

- (1) Perform intensity measurement, one headlamp at a time, with the low-beam lamp and the other headlamp disconnected from the battery unless circumstances compel otherwise. Do not leave the headlamps on for any longer than 3 minutes if their outer lenses are covered with a surface covering impervious to light.
- (2) Do not mask the outer lens surfaces by taping or in any other way.

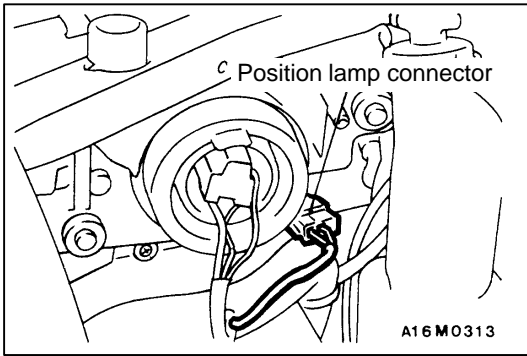


**HEADLAMP BULB REPLACEMENT**

1. Disconnect the connector.
2. Remove the socket cover.
3. Unhook the spring which secures the bulb, and then remove the bulb.

**Caution**

Do not touch the surface of the bulb with hands or dirty gloves. If the surface does become dirty, clean it with alcohol or thinner, and let it dry thoroughly before installing.



- After the bulb is replaced, reinstall the socket cover with the TOP mark facing upward.

**NOTE**

To prevent the clouding of lens and ingress of water into the lamp unit, install the socket cover correctly.

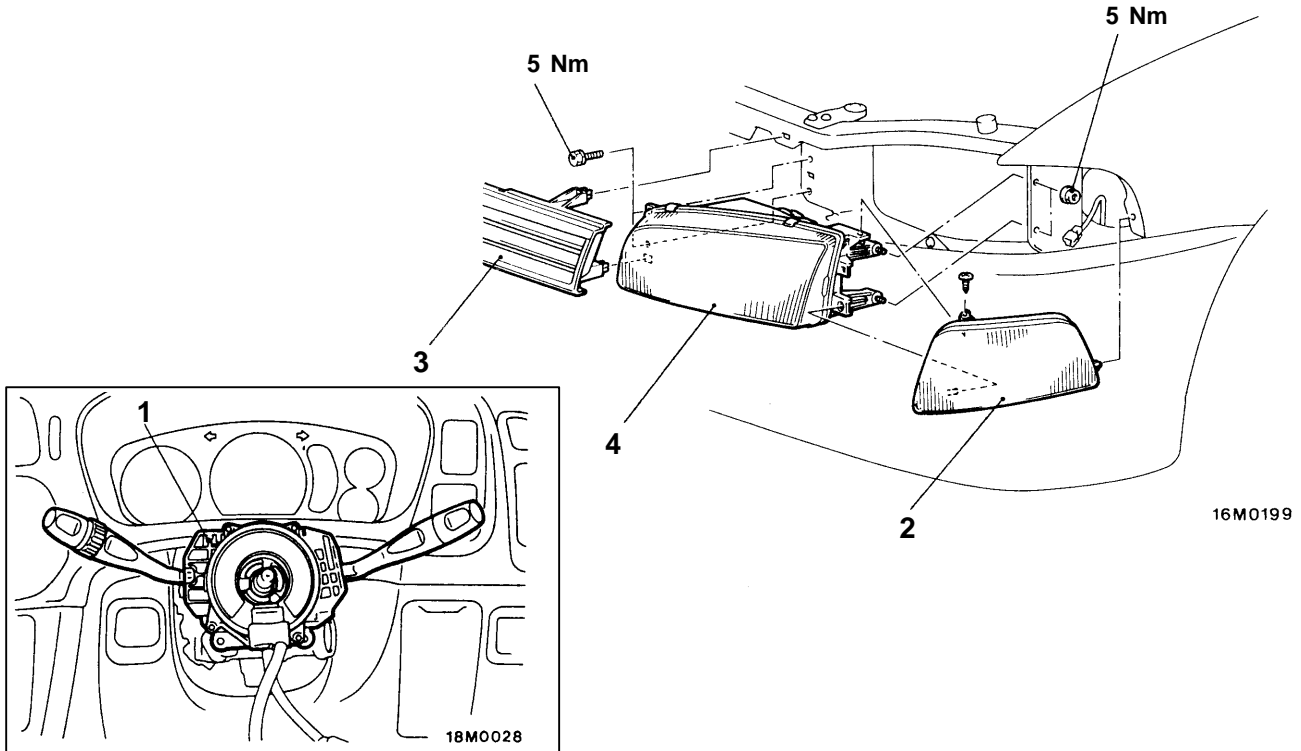
**POSITION LAMP BULB REPLACEMENT**

Remove the position lamp by turning it together with the lamp socket, then replace its bulb.

**HEADLAMP AND FRONT TURN-SIGNAL LAMP**

**REMOVAL AND INSTALLATION**

**CAUTION: SRS**  
 Before removal of air bag module and clock spring, refer to GROUP 52B – SRS Service Precautions and Air Bag Module and Clock Spring.

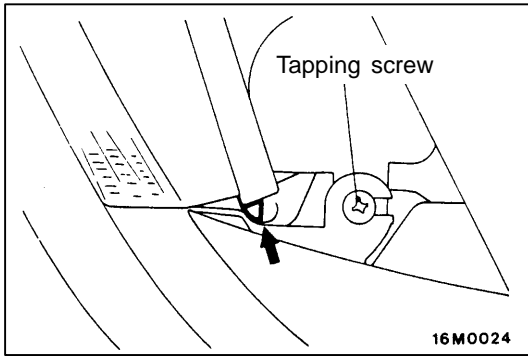


1. Column switch

**Removal steps**

- ◀A▶ 2. Front turn-signal lamp
- ▶A◀ 3. Radiator grille
- ▶A◀ 4. Headlamp

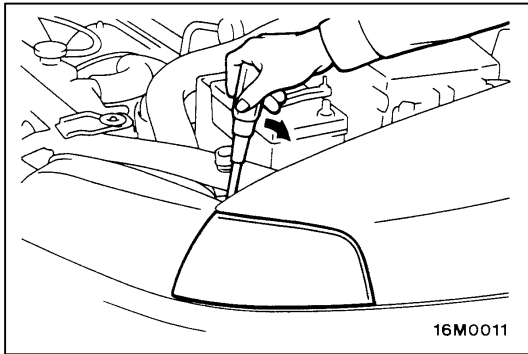




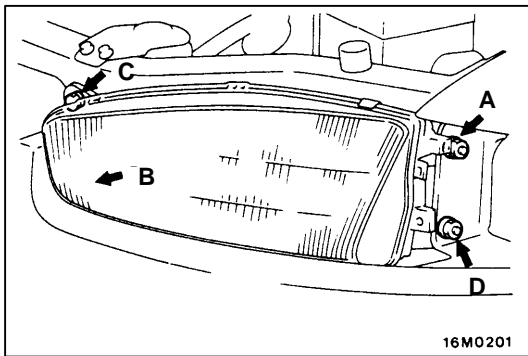
**REMOVAL SERVICE POINT**

**◀▶ FRONT TURN-SIGNAL LAMP REMOVAL**

1. Loosen the tapping screw connecting the headlamp to the front turn-signal lamp. Put a screwdriver in the space produced between the headmap and the front turn-signal lamp.



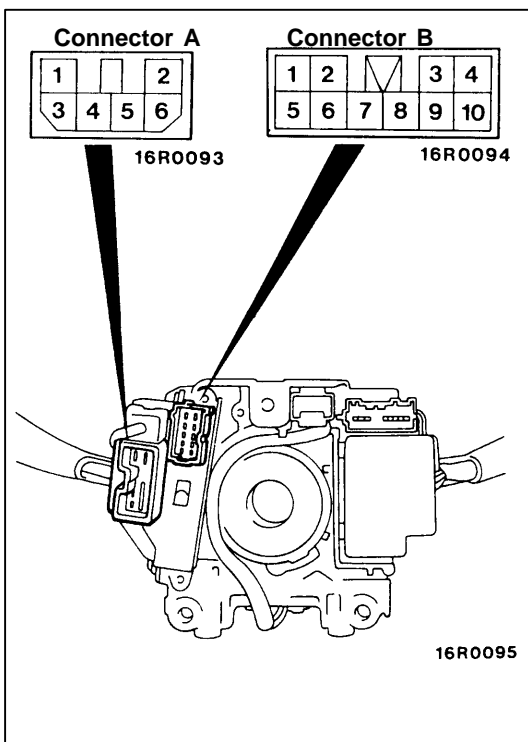
2. Prying the screwdriver in the direction shown, thrust the front turn-signal lamp in the direction of the vehicle.
3. Unplug the connector and remove the front turn-signal lamp.



**INSTALLATION SERVICE POINT**

**▶◀ HEADLAMP INSTALLATION**

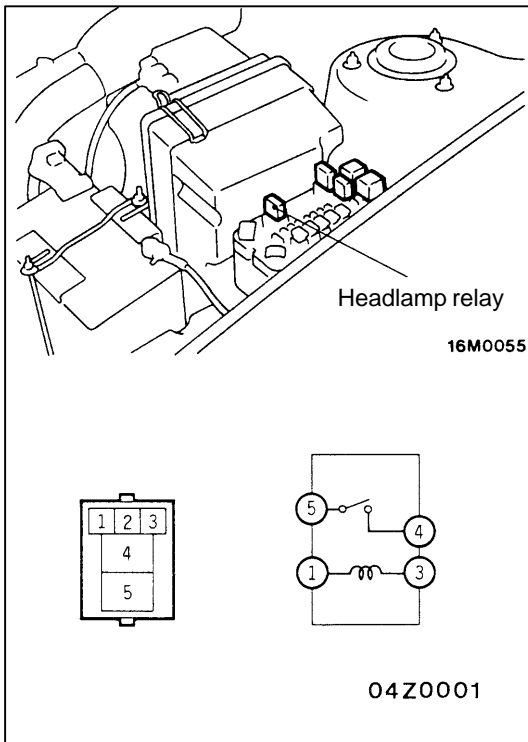
Tighten attaching bolts and nuts in the order of A, B, C and D.



**INSPECTION**

**LIGHTING SWITCH, DIMMER/PASSING SWITCH CONTINUITY CHECK**

Switch position		Terminal No.												
		Connector A			Connector B									
		5	6	7	1	2	3	4	6					
LIGHTING SWITCH	OFF													
	TAIL	○	—	○										
	HEAD	○		○										
DIMMER/PASSING SWITCH	LOWER								○	—	○			
	UPPER											○	—	○
	PASSING				○	—	○						○	



**HEADLAMP RELAY CONTINUITYCHECK**

Battery voltage	Terminal No.			
	1	3	4	5
Not supplied	○	○		
Supplied	⊕	⊖	○	○

# FRONT FOG LAMP

## SERVICE SPECIFICATIONS

Items		Standard value
Headlamp aiming [Parenthesized are allowable beam axis deviations 10 m ahead of headlamp.]	Vertical direction	2° (349 mm) below horizontal line (H)
	Horizontal direction	3° (524 mm) leftward from vertical line (V)

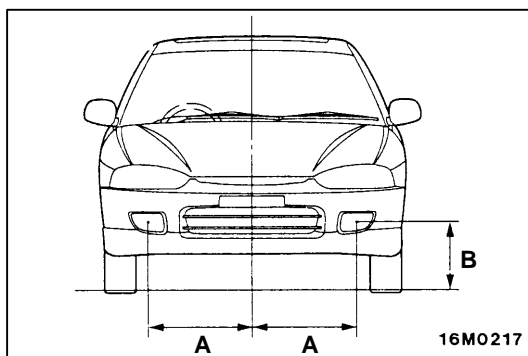
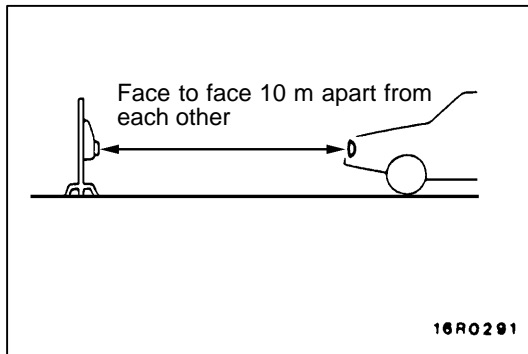
## ON-VEHICLE SERVICE

### HEADLAMP AIMING

Bring the vehicle in the following conditions before aiming the headlamp.

- Check the tires for inflation pressure. Pump them up if necessary to the labeled pressure level.
- Set the vehicle unladen on a level floor.
- Place one person (approximately 55 kg) on the driver's seat.
- Maintain an engine speed of 2,000 r/min to keep the battery in the charged condition.

1. Position the tester so that its converging lens faces the fog lamp center to center at a distance of 10 m.

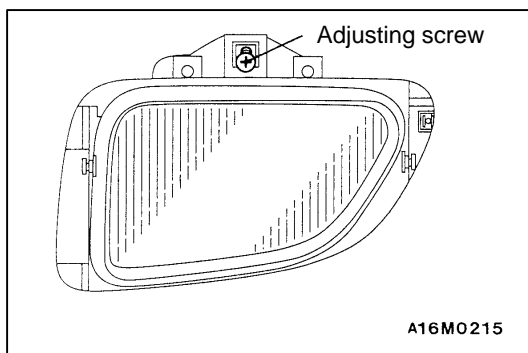


#### NOTE

Measure the center of the fog lamp as shown.

A: 572.5 mm (from the center of the vehicle body)

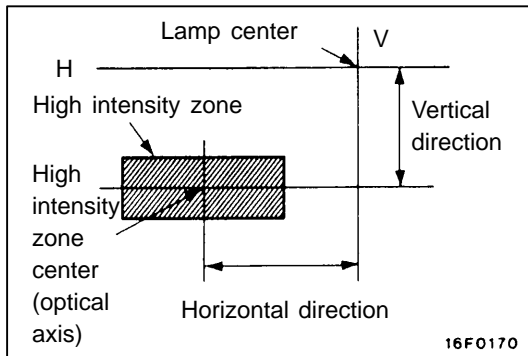
B: 360 mm



2. Remove the fog lamp bezel, and using the aiming adjustment screw, aim the fog lamp to the standard value.

#### NOTE

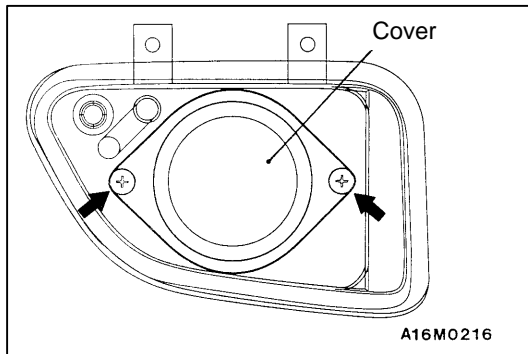
The horizontal direction is non-adjustable. If the beam axis deviation exceeds the standard value, check the fog lamp to determine if it is installed out of position and correct if necessary.

**Standard values:**

Vertical direction	2° (349 mm) below horizontal line (H)
Horizontal direction	3° (524 mm) leftward from vertical line (V)

**Caution:**

- (1) Perform aiming adjustments, one light at a time, with the other headlamp disconnected so as not to be lit unless circumstances compel otherwise. When reconnecting the headlamps, be careful not to upset their aim. Do not leave the headlamps on for any longer than 3 minutes if their outer lenses are covered with a surface covering impervious to light.
- (2) Do not mask the outer lenses by taping or in any other way.
- (3) Aiming adjustment must be completed with the aiming adjustment screws turned in the tightening direction.

**FOG LAMP BULB REPLACEMENT**

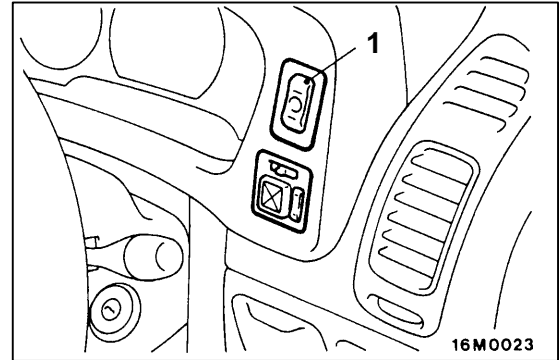
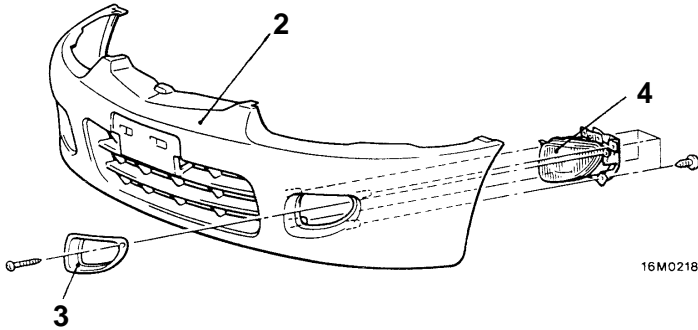
1. Remove the fog lamp.
2. Remove the cover.
3. Unhook the spring which secures the bulb and then replace the bulb.

**Caution**

- (1) Do not touch the surface of the bulb with hands or dirty gloves. If the surface does become dirty, clean it with alcohol or thinner, and let it dry thoroughly before installing.
- (2) To prevent the clouding of lens and ingress of water into the lamp unit, install the socket cover correctly.

# FOG LAMP

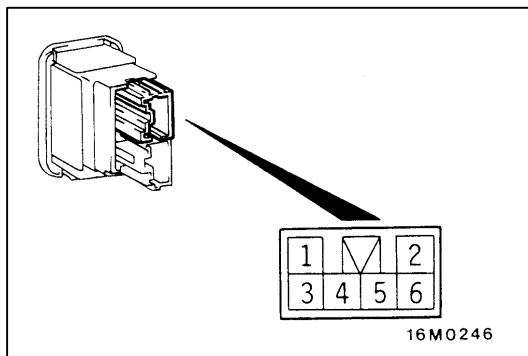
## REMOVAL AND INSTALLATION



1. Front fog lamp switch

### Fog lamp removal steps

2. Front bumper
3. Fog lamp bezel
4. Fog lamp assembly



## INSPECTION

### FOG LAMP SWITCH CONTINUITY CHECK

Switch position	Terminal No.						
	1	2	3	4	-	5	6
OFF				○	ILL ↑	○	
ON	○	○		○	ILL ↓	○	○

# REAR COMBINATION LAMP

## TROUBLESHOOTING

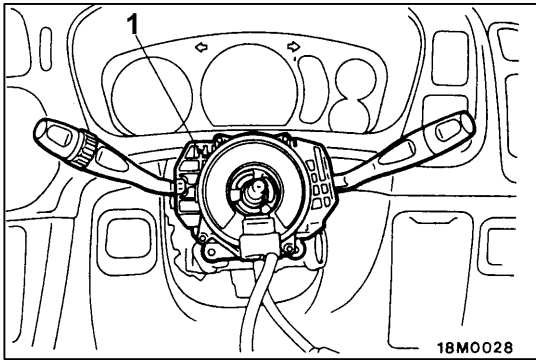
For the troubleshooting of the lighting monitor warning buzzer, refer to P.54-33.

## REAR COMBINATION LAMP

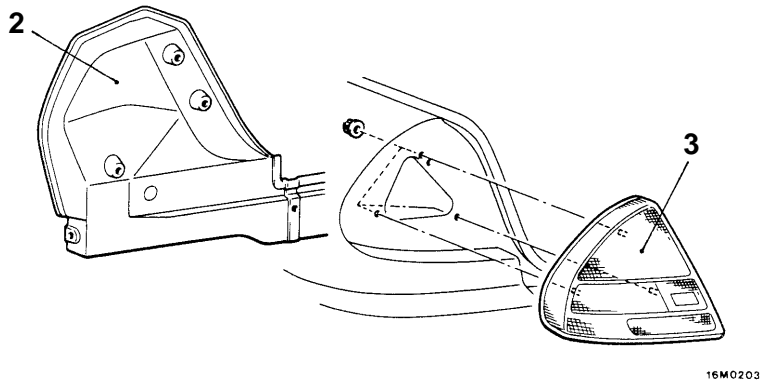
### REMOVAL AND INSTALLATION

**Caution: SRS**

Before removal of air bag module and clock spring, refer to GROUP 52B – SRS Service Precautions and Air Bag Module and Clock Spring.

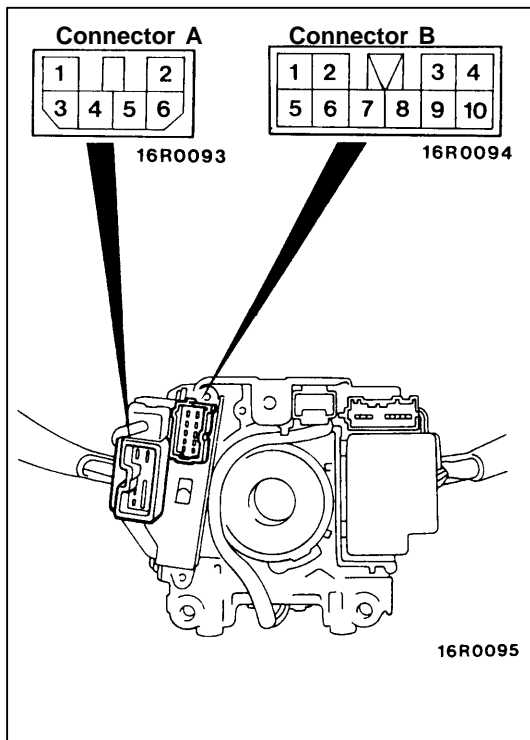


1. Column switch



**Rear combination lamp removal steps**

- 2. Rear end trim
- 3. Rear combination lamp




## INSPECTION

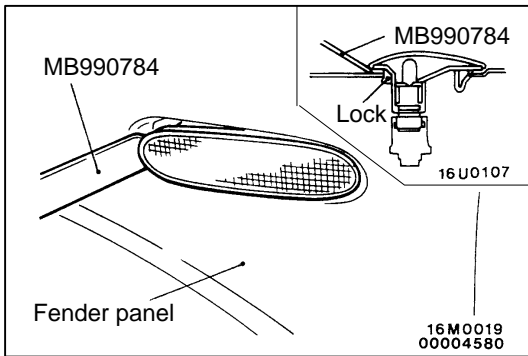
### LIGHTING SWITCH CONTINUITY CHECK

Switch position		Terminal No.			
		Connector B			Connector A
		5	6	7	1
LIGHTING SWITCH	OFF				
	TAIL	○	—	○	
	HEAD	○	○	○	○

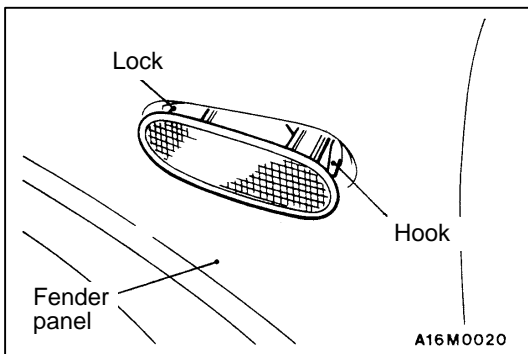
# SIDE TURN-SIGNAL LAMP

## SPECIAL TOOL

Tool	Number	Name	Use
	MB990784	Ornament remover	Removal of side turn-signal lamp



## SIDE TURN-SIGNAL LAMP REMOVAL

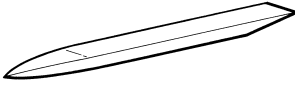


## INSTALLATION

Fit the hook side rearward.

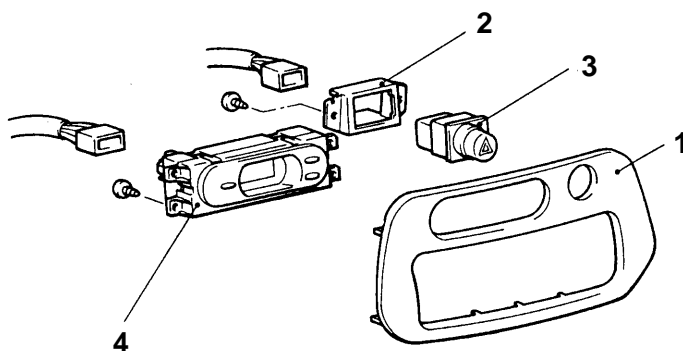
# HAZARD WARNING LAMP SWITCH, CLOCK

## SPECIAL TOOL

Tool	Number	Name	Use
	MB990784	Ornament remover	Air conditioner panel removal

## HAZARD WARNING LAMP SWITCH

### REMOVAL AND INSTALLATION



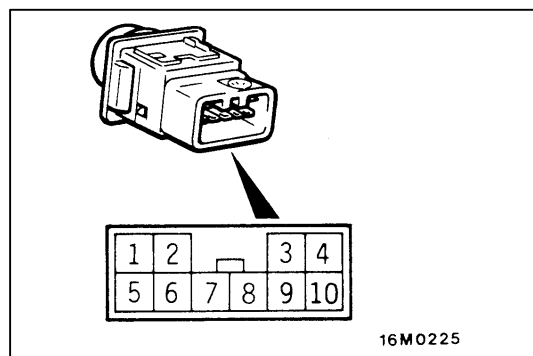
#### Hazard warning lamp switch removal steps

1. Air conditioner panel
2. Switch holder
3. Hazard warning lamp switch

16M0210

#### Clock removal steps

1. Air conditioner panel
4. Clock



## INSPECTION

### HAZARD WARNING LAMP SWITCH CONTINUITY CHECK

Switch position	Terminal No.									
	1	2	4	5	6	7	9	-	10	
OFF				○	—	○	○	ILL	○	
ON	○	○	○	○	○		○	ILL	○	



# RADIO AND TAPE PLAYER

## TROUBLESHOOTING

There is noise when the engine is running.

Kind of Noise (Parenthesized is how noise sounds.)	Symptom	Cause	Remedy
AM, FM: Ignition noise (Popping, snapping, crackling, buzzing)	<ul style="list-style-type: none"> <li>• Popping sound becomes faster with the increase of engine speed.</li> <li>• The noise is lost with ignition switch turned to ACC.</li> </ul>	<ul style="list-style-type: none"> <li>• Mainly due to the spark plugs.</li> <li>• Due to noise circulation from elsewhere</li> <li>• Noise from the engine</li> </ul>	Check the noise capacitor and earth cable and replace if necessary. (See Fig. 1 and Fig. 2.)
AM, FM: Defogger noise (1) (Murmuring)	Occurs when the defogger switch is turned to ON and OFF.	Noise produced by sparking when the defogger switch is turned to ON/OFF enters the glass antenna.	Check the noise capacitor and replace if necessary. (See Fig. 1.)
AM, FM: Defogger noise (2) (Snapping noise)	Occurs when the defogger switch is turned to ON.	Noise produced by current flowing in the defogger enters the glass antenna.	Check the choke coil and replace if necessary. (See Fig. 3.)
AM, FM: Defogger noise (3) (Scratching, gagging)	Occurs when the defogger switch is turned to ON with print heater wire broken.	Noise produced by sparking where print heater is broken enters the glass antenna.	Repair the print heater.
AM, FM: Wiper motor noise (Humming, wheezing)	Sound becomes faster with the increase of wiper speed and is lost when the wiper is stopped.	Caused by sparking in wiper motor brush.	Replace the wiper motor.
FM: Mirror motor noise (Humming, wheezing)	Occurs when electric mirror operates.	Caused by sparking in mirror motor brush.	Replace the electric motor.
Other electrical components	–	Noise is emitted by some electrical components in long use.	Repair or replace electrical components.
Static electricity (Crackling, crinkling)	<ul style="list-style-type: none"> <li>• Noise is stopped when the vehicle comes to a complete stop.</li> <li>• Noise becomes louder when the clutch is released.</li> </ul>	Occurs when parts or wiring move for some reason and contact metal parts of the body.	Put parts or wiring into position.
	Various noises are produced by body parts.	Due to electrical detachment of the hood, exhaust pipe and muffler, suspension, etc. from the body.	Tighten mounting bolts securely. In many cases, remedy of one part does not eliminate the problem due to incomplete earthing elsewhere.

### Caution

- (1) Never let the noise filter contact a high tension cable. The noise filter could break down.
- (2) Check that there is no external noise. This check is necessary to prevent misidentification of noise sources.
- (3) Noise prevention should be performed by eliminating noise sources in the descending order of loudness.

## NOTE

## 1. Noise Suppressing Capacitor

The capacitor does not allow the passage of DC current but AC current. It decreases in impedance (resistance to AC) as the number of waves increases, making the AC flow easier. A noise suppressing capacitor relying on this property to function is inserted between a noise generating power line and earthing line to suppress noise by earthing noise components (in AC or pulse signal) to the vehicle body.

## 2. Noise Filter

The coil allows the passage of DC current and increases in impedance (resistance to AC) as the number of waves increases. A noise suppressing coil relying on this property to function is inserted somewhere in a noise generating power line, preventing noise components from flowing or radiating from the line.

Fig: 1

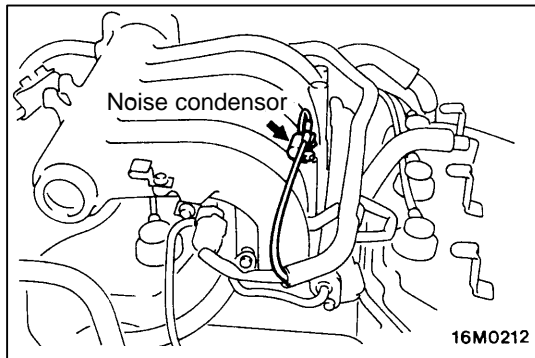


Fig: 3

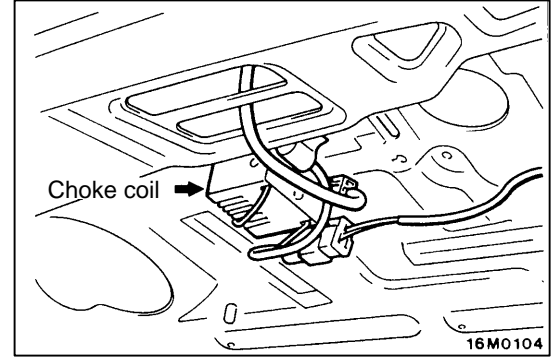
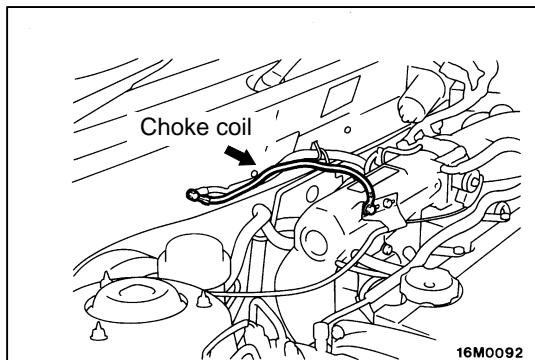
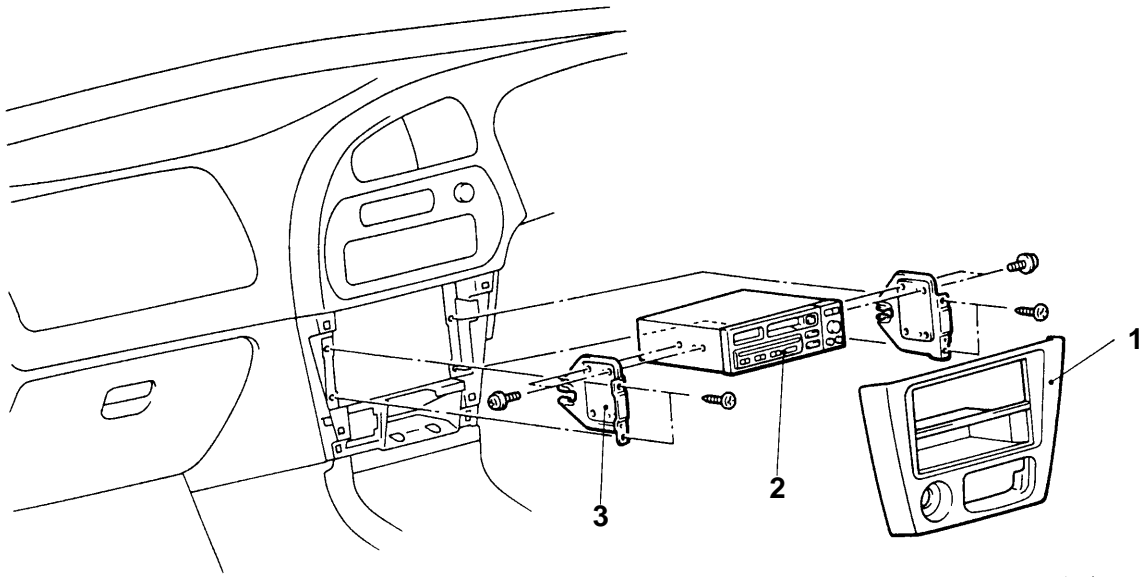


Fig: 2



## RADIO AND TAPE PLAYER

### REMOVAL AND INSTALLATION



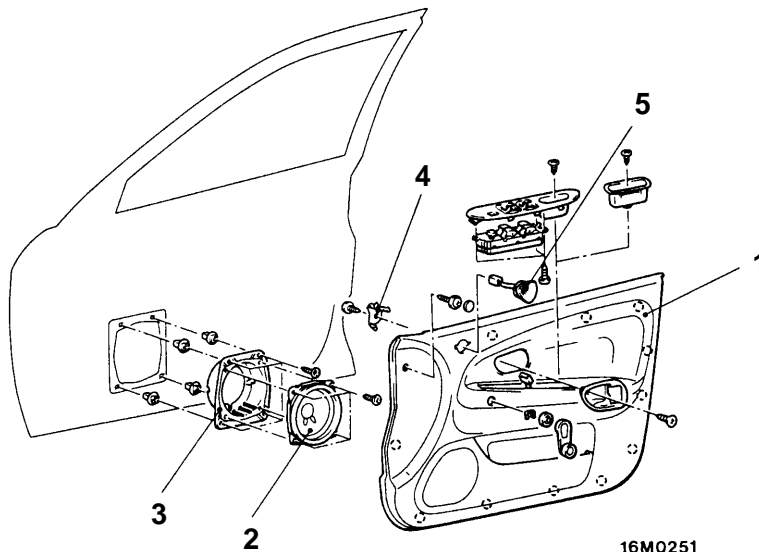
16M0254

#### Removal steps

1. Radio panel
2. Radio and tape player
3. Radio bracket

## SPEAKER

### REMOVAL AND INSTALLATION

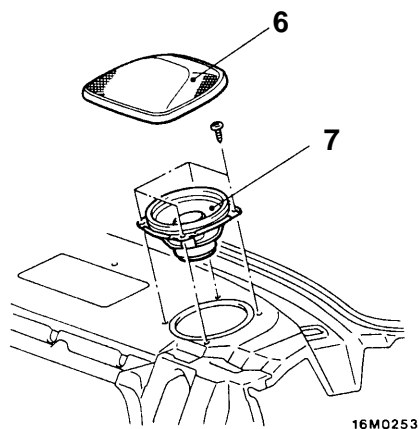


16M0251

#### Removal steps

- |  |  |
|--|--|
| <ol style="list-style-type: none"> <li>1. Door trim</li> <li>2. Speaker</li> <li>3. Speaker cover</li> </ol> | <ol style="list-style-type: none"> <li>4. Speaker brakcet</li> <li>5. Tweeter speaker</li> </ol> |
|--|--|

<REAR SPEAKER>



16M0253

Rear shelf speaker removal steps

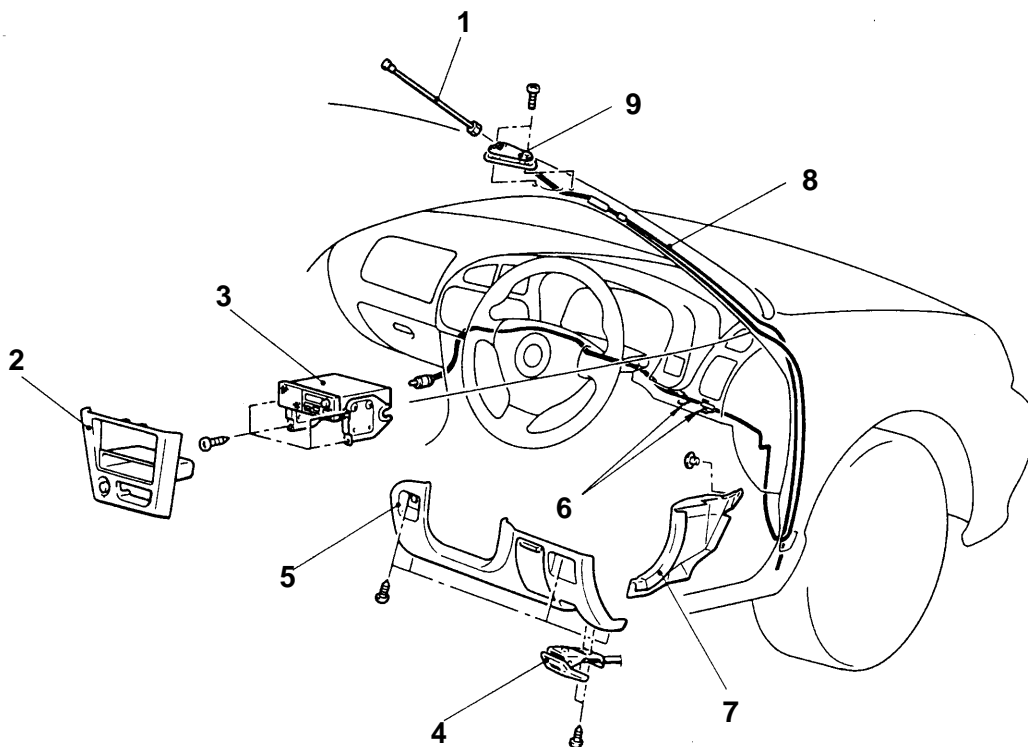
6. Speaker garnish

7. Speaker

# ANTENNA

## POLE ANTENNA

### REMOVAL AND INSTALLATION



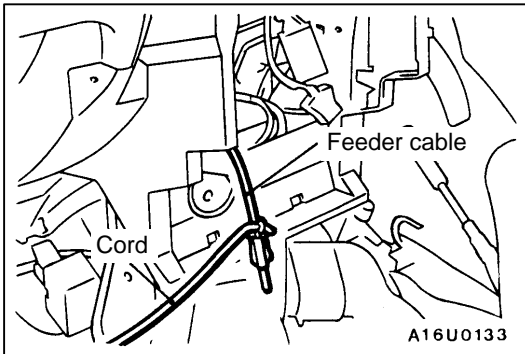
16M0221

Removal steps

- 1. Pole
- 2. Radio panel
- 3. Radio and tape player
- 4. Hood lock release handle



- 5. Driver side lower cover
- 6. Clip
- 7. Cowl side trim
- 8. Antenna assembly
- 9. Antenna base gasket



**REMOVAL SERVICE POINT**

**◀A▶ ANTENNA ASSEMBLY REMOVAL**

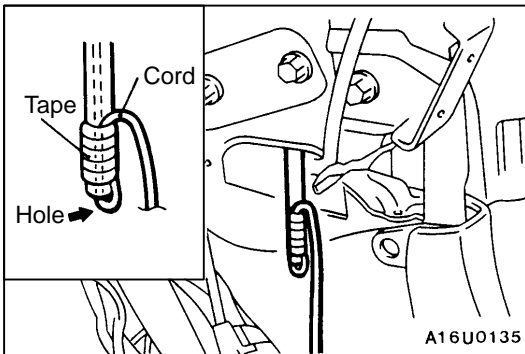
To facilitate the installation work of the antenna assembly, perform the following before removing the feeder cable:

1. Tie a cord to the end of the feeder cable.
2. Pull out the antenna assembly until the end of the drain pipe can be seen.
3. Pass the cord through the hole in the end of the drain pipe and wrap it with vinyl tape.

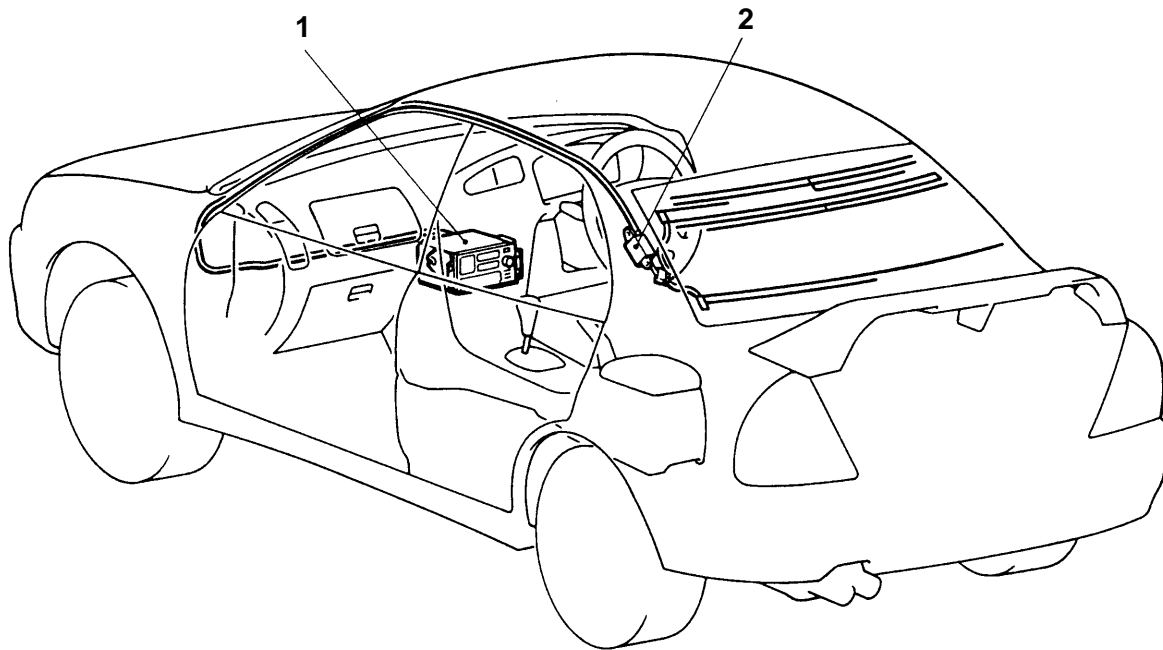
**Caution**

**Wrap it securely so that the cord will not come off.**

4. Pull out the antenna assembly little by little to remove it.



**REAR WINDOW ANTENNA AND GLASS DIVERSITY ANTENNA  
REMOVAL AND INSTALLATION**



**Removal steps**

- Glove box
- Front pillar trim (LH), center pillar trim (LH), rear pillar trim (LH)

- Assist grip
- 1. Radio and tape player
- 2. Antenna assembly



**REMOVAL SERVICE POINT**

**◀A▶ ANTENNA AMPLIFIER ASSEMBLY REMOVAL**

Take off the left-hand edge of the hand lining and undo the clips of the antenna amplifier assembly.

**REAR WINDOW DEFOGGER**

**TROUBLESHOOTING <VEHICLES WITH AUTOMATIC A/C>**

Refer to GROUP 55.

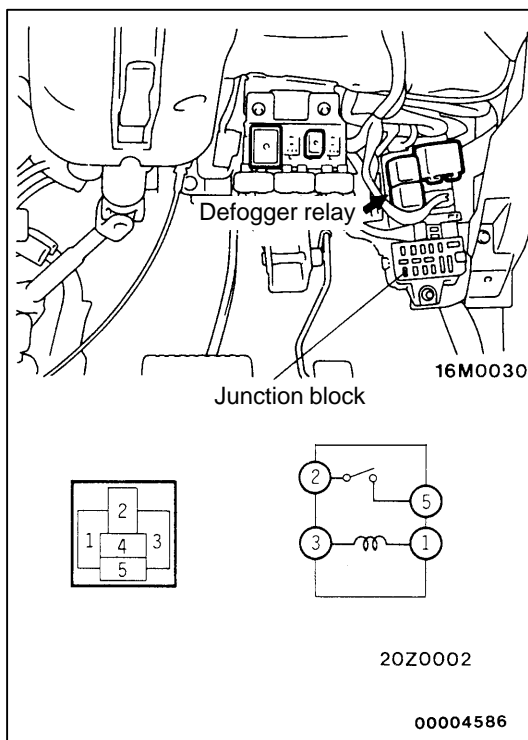
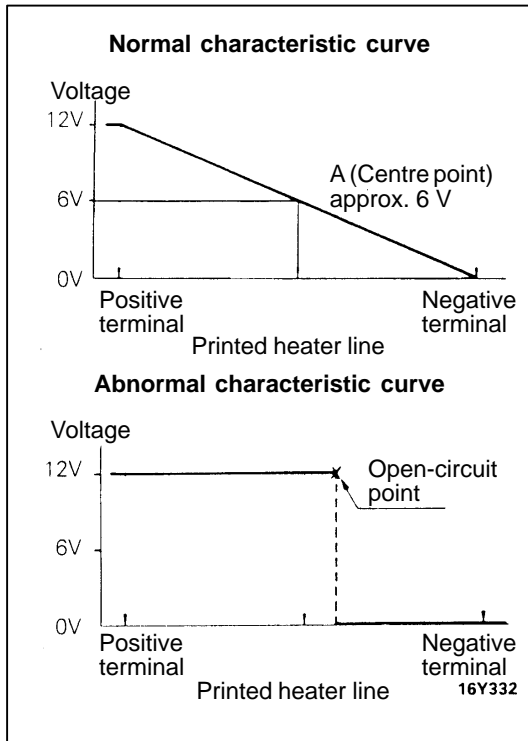
**ON-VEHICLE SERVICE**

**PRINTED-HEATER CHECK**

1. Run engine at 2,000 r/min. Check heater element with battery at full.
2. Turn ON rear window defogger switch. Measure heater element voltage with circuit tester at rear window glass centre A.
3. If 12 V is indicated at A, there is a break in the negative terminals from A. Move test bar slowly to negative terminal to detect where voltage changes suddenly (0V).
4. If 0 V is indicated at A, there is a break in the positive terminals from A. Defect where the voltage changes suddenly (12 V) in the same method described above.

**DEFOGGER RELAY CONTINUITY CHECK**

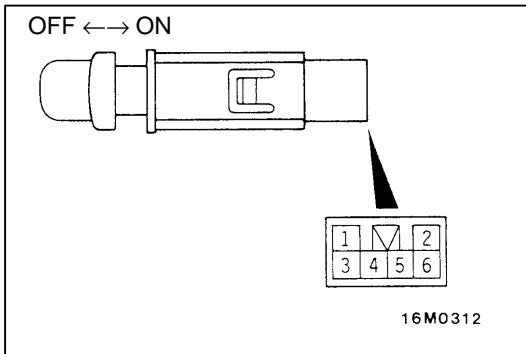
Battery voltage	Terminal No.			
	1	3	2	5
Power is not supplied	○ — ○			
Power is supplied	⊖ — ⊕		○ — ○	



# REAR WINDOW DEFOGGER SWITCH <VEHICLES WITH AUTOMATIC A/C>

## REMOVAL AND INSTALLATION

Refer to GROUP – Heater Control Assembly.



## INSPECTION

### DEFOGGER SWITCH CONTINUITY CHECK

Switch position	Terminal No.						
	1	2	-	3	4	-	6
OFF	○		ILL ⊕	○			
ON	○		ILL ⊕	○		IND ⊕	○

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## NOTES



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# ELECTRICAL WIRING

## CONTENTS

HOW TO READ THE WIRING DIAGRAMS .....	A
ELECTRICAL WIRING (EVOLUTION-IV) .....	B
ELECTRICAL WIRING (EVOLUTION-V) .....	C



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## NOTES

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# HOW TO READ THE WIRING DIAGRAMS

## CONTENTS

HOW TO READ CIRCUIT DIAGRAMS ..... 2



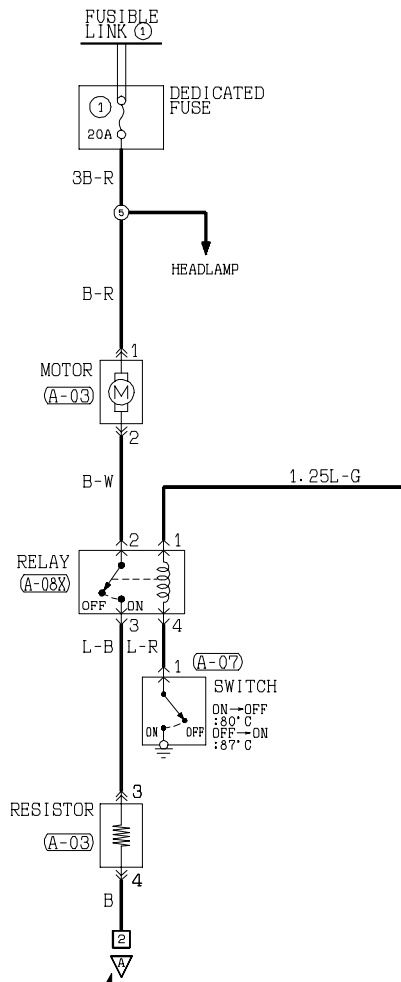
**HOW TO READ CIRCUIT DIAGRAMS**

The circuit of each system from fuse (or fusible link) to earth is shown. The power supply is shown at the top and the earth at the bottom to facilitate understanding of how the current flows.

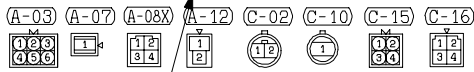
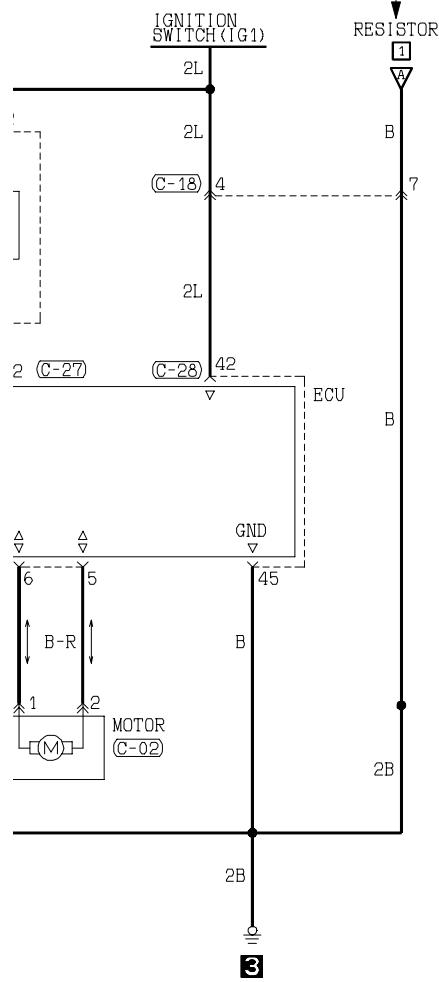
Each circuit diagram consists of block(s). The blocks are divided by page number.

Indicates that the diagram comes from **1** which belongs to the **1** block in the same circuit.

**1**



**2**



Indicates that the diagram continues at **2** which belongs to the **2** block in the same circuit.

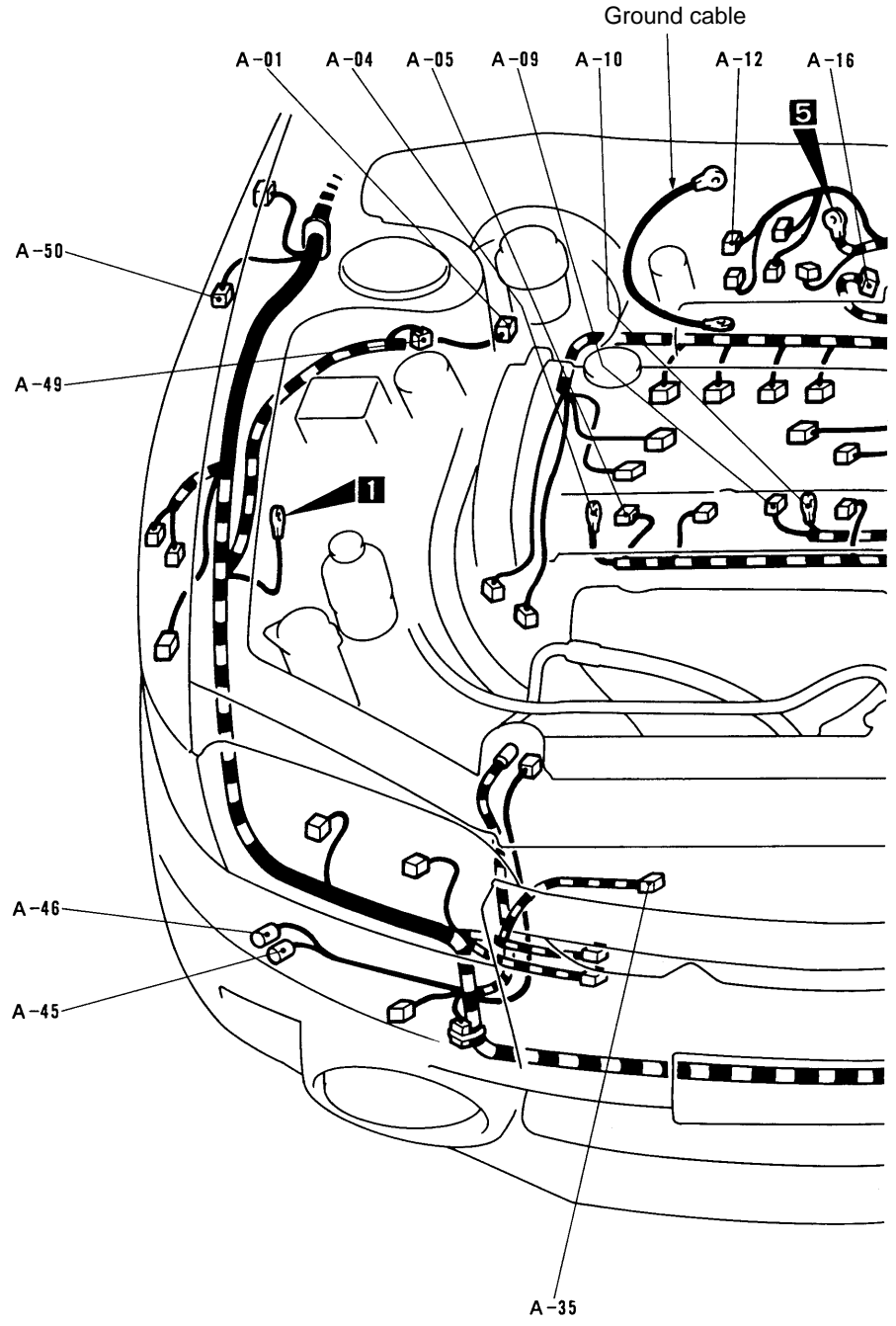
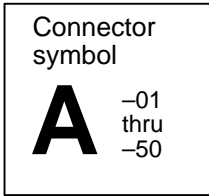
# ELECTRICAL WIRING (EVOLUTION-IV)

## CONTENTS

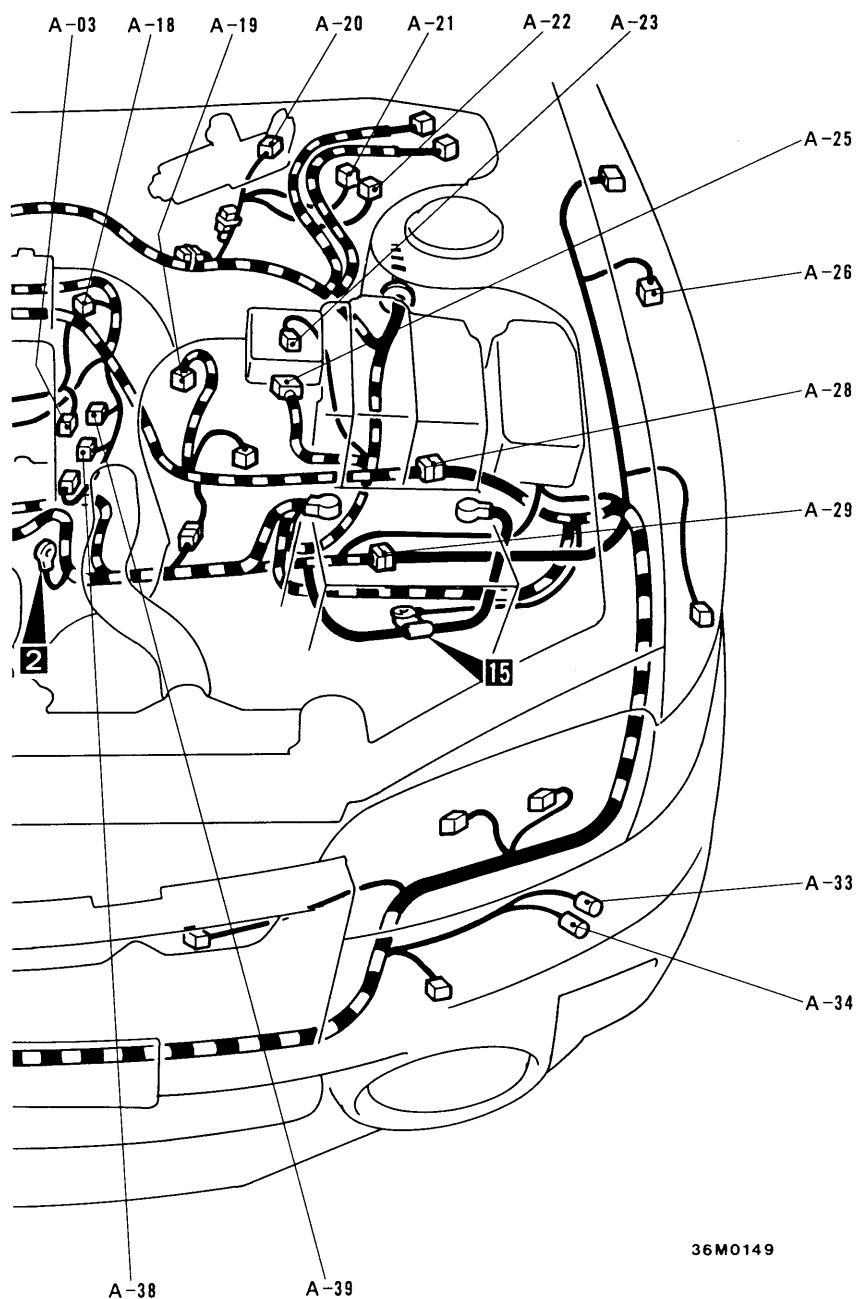
<b>WIRING HARNESS CONFIGURATION DIAGRAMS</b> .....	2	<b>FOG LAMP</b> .....	42
ENGINE COMPARTMENT .....	2	<b>ROOM LAMP AND LUGGAGE COMPARTMENT LAMP</b> .....	43
DASH PANEL .....	6	<b>TURN-SIGNAL LAMP AND HAZARD LAMP</b> .....	44
FLOOR, ROOF, AND SEAT .....	12	<b>STOP LAMP</b> .....	47
LUGGAGE COMPARTMENT .....	14	<b>BACK-UP LAMP</b> .....	48
<b>SINGLE PART INSTALLATION POSITION</b> .....	16	<b>HORN</b> <VEHICLES WITHOUT SRS AIR BAG> .	49
RELAY .....	16	<b>OIL PRESSURE WARNING LAMP</b> .....	50
ECU .....	17	<b>CENTRAL DOOR LOCKING SYSTEM &lt;VEHICLES WITH KEYLESS ENTRY SYSTEM&gt;</b> .....	52
SENSOR .....	18	<b>HEATER AND MANUAL AIR CONDITIONER</b> .....	56
SOLENOID VALVE .....	20	<b>FULLY AUTOMATIC AIR CONDITIONER</b>	62
CHECK CONNECTOR AND SPARE CONNECTOR .....	21	<b>WINDSHIELD WIPER AND WASHER &lt;INTERMITTENT WIPER&gt;</b> .....	70
FUSIBLE LINK AND FUSE .....	22	<b>REAR WIPER AND WASHER</b> .....	71
GROUND CABLE .....	22	<b>DEFOGGER AND DOOR MIRROR HEATER &lt;VEHICLES WITHOUT FULLY AUTOMATIC AIR CONDITIONER&gt;</b> .....	72
GROUND .....	22	<b>DEFROGGER AND DOOR MIRROR HEATER &lt;VEHICLES WITH FULLY AUTOMATIC AIR CONDITIONER&gt;</b> .....	74
<b>CIRCUIT DIAGRAM</b> .....	23	<b>SPARE CONNECTOR FOR RADIO</b> .....	76
CENTRALIZED JUNCTION .....	23	<b>RADIO &lt;4-SPEAKER, 6-SPEAKER&gt;</b> ....	78
POWER DISTRIBUTION SYSTEM .....	24	<b>ANTI-LOCK BRAKE SYSTEM (ABS)</b> ....	80
STARTING SYSTEM .....	29	<b>ACTIVE YAW CONTROL SYSTEM (AYC)</b>	86
IGNITION SYSTEM .....	30	<b>INTERCOOLER WATER SPRAY SYSTEM</b>	92
CHARGING SYSTEM .....	31		
ENGINE CONTROL SYSTEM .....	32		
COOLING SYSTEM .....	38		
TAIL LAMP, POSITION LAMP, LICENSE PLATE LAMP AND LIGHTING MONITOR ALARM BUZZER .....	40		

# WIRING HARNESS CONFIGURATION DIAGRAMS

## ENGINE COMPARTMENT

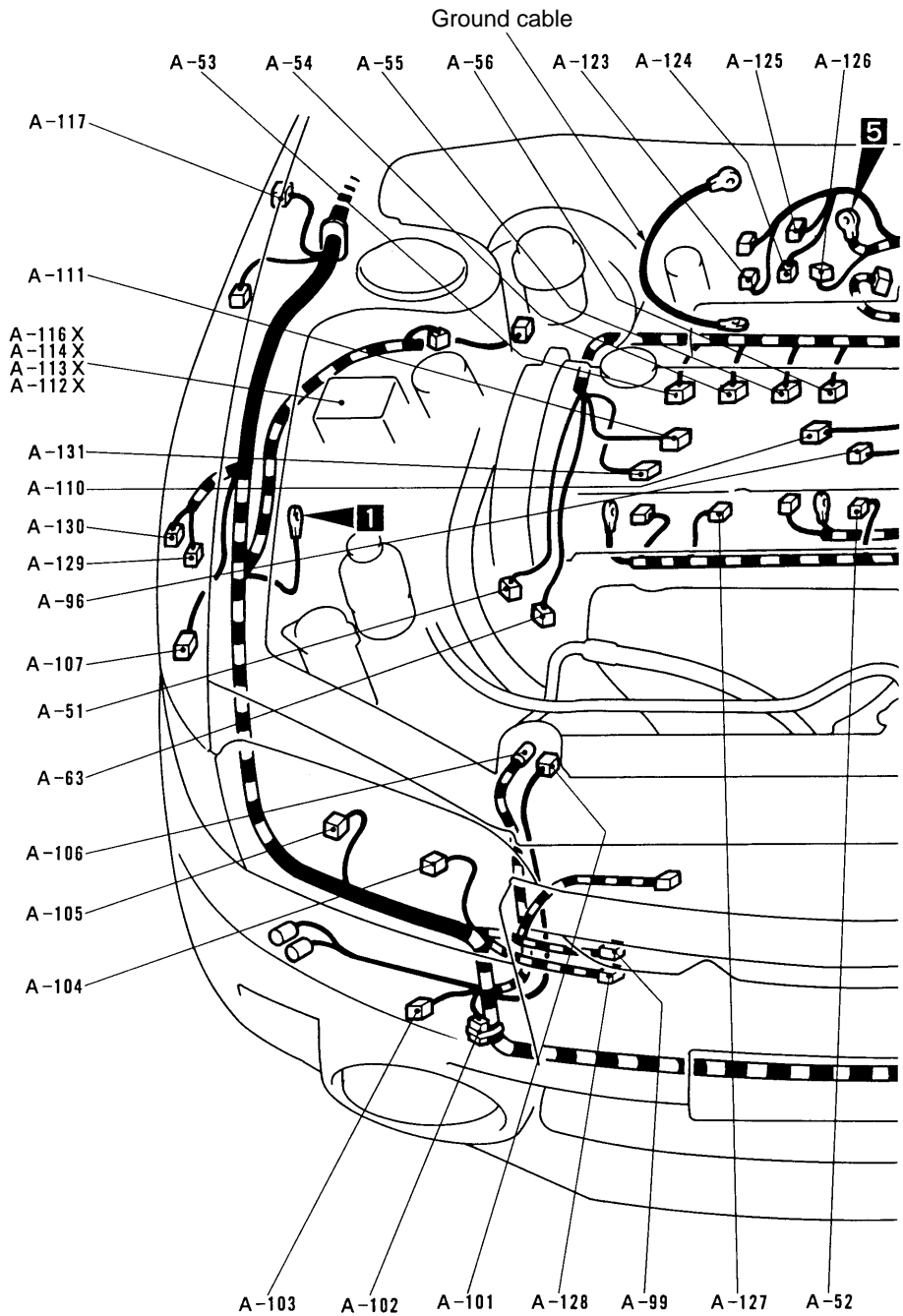
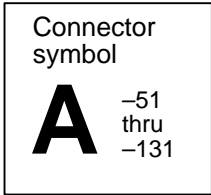


- |             |                              |            |  |
|-------------|------------------------------|------------|--|
| A-01 (2-B)  | Brake fluid level switch     | A-20 (4-B) | Windshield wiper motor                           |
| A-03 (1-B)  | Noise condenser              | A-21 (8-B) | Hydraulic unit <vehicles with ABS>               |
| A-04 (1)    | Alternator                   | A-22 (2-B) | Hydraulic unit <vehicles with ABS>               |
| A-05 (4-GR) | Alternator                   | A-23 (2-B) | Waste gate solenoid valve                        |
| A-09 (1-B)  | Starter                      | A-25 (7-B) | Air flow sensor                                  |
| A-10 (1)    | Starter                      | A-26 (2-B) | Front speed sensor (LH)<br><vehicles with ABS>   |
| A-12 (2-B)  | Fuel pressure solenoid valve | A-28 (8-B) | Control harness and front harness<br>combination |
| A-16 (4-B)  | Throttle position sensor     |            |  |
| A-18 (6-B)  | Idle speed control servo     |            |  |
| A-19 (3-B)  | Vehicle speed sensor         |            |  |



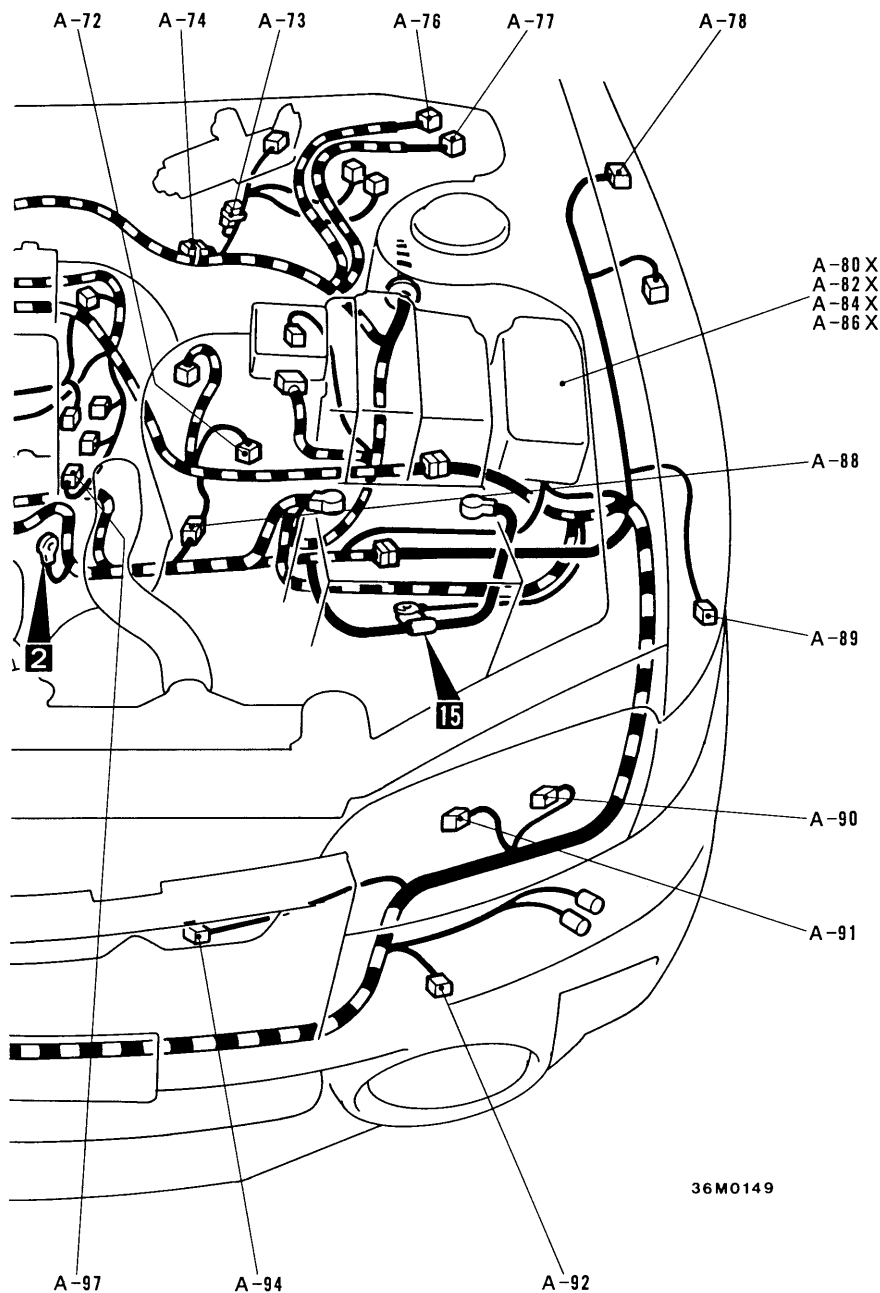
36M0149

A-29 (2-B)	Front harness and battery harness combination	A-39 (1-B)	Engine coolant temperature gauge unit
A-33 (1)	Horn (LH)	A-45 (1)	Horn (RH)
A-34 (1)	Horn (LH)	A-46 (1)	Horn (RH)
A-35 (2-BR)	Outside air temperature sensor <vehicles with fully automatic air conditioner>	A-49 (2-BR)	Dual pressure switch
A-38 (2-B)	Engine coolant temperature sensor	A-50 (2-B)	Front speed sensor (RH) <vehicles with ABS>



- |             |                                  |             |   |
|-------------|----------------------------------|-------------|---|
| A-51 (3-B)  | Crank angle sensor               | A-80X (5)   | Horn relay <vehicles with SRS air bag>          |
| A-52 (1-B)  | Oil pressure switch              | A-82X (5)   | Radiator fan relay (LO)                         |
| A-53 (2-B)  | Injector (No.1)                  | A-84X (5)   | Headlamp relay                                  |
| A-54 (2-B)  | Injector (No.2)                  | A-86X (4)   | Alternator relay                                |
| A-55 (2-B)  | Injector (No.3)                  | A-88 (6-B)  | Control harness and battery harness combination |
| A-56 (2-B)  | Injector (No.4)                  | A-89 (2-BR) | Front turn signal lamp (LH)                     |
| A-63 (2-B)  | O <sub>2</sub> sensor            | A-90 (3-B)  | Headlamp (LH)                                   |
| A-72 (2-B)  | Back-up lamp switch              | A-91 (2)    | Position lamp (LH)                              |
| A-73 (1-L)  | Engine speed detection connector | A-92 (2-B)  | Fog lamp (LH)                                   |
| A-74 (1-B)  | Fuel pump check connector        | A-94 (4-GR) | Radiator fan motor                              |
| A-76 (6)    | Valve relay <vehicles with ABS>  | A-96 (2-GR) | Knock sensor                                    |
| A-77 (5)    | Motor relay <vehicles with ABS>  |             |   |
| A-78 (2-GR) | Side turn signal lamp (LH)       |             |   |

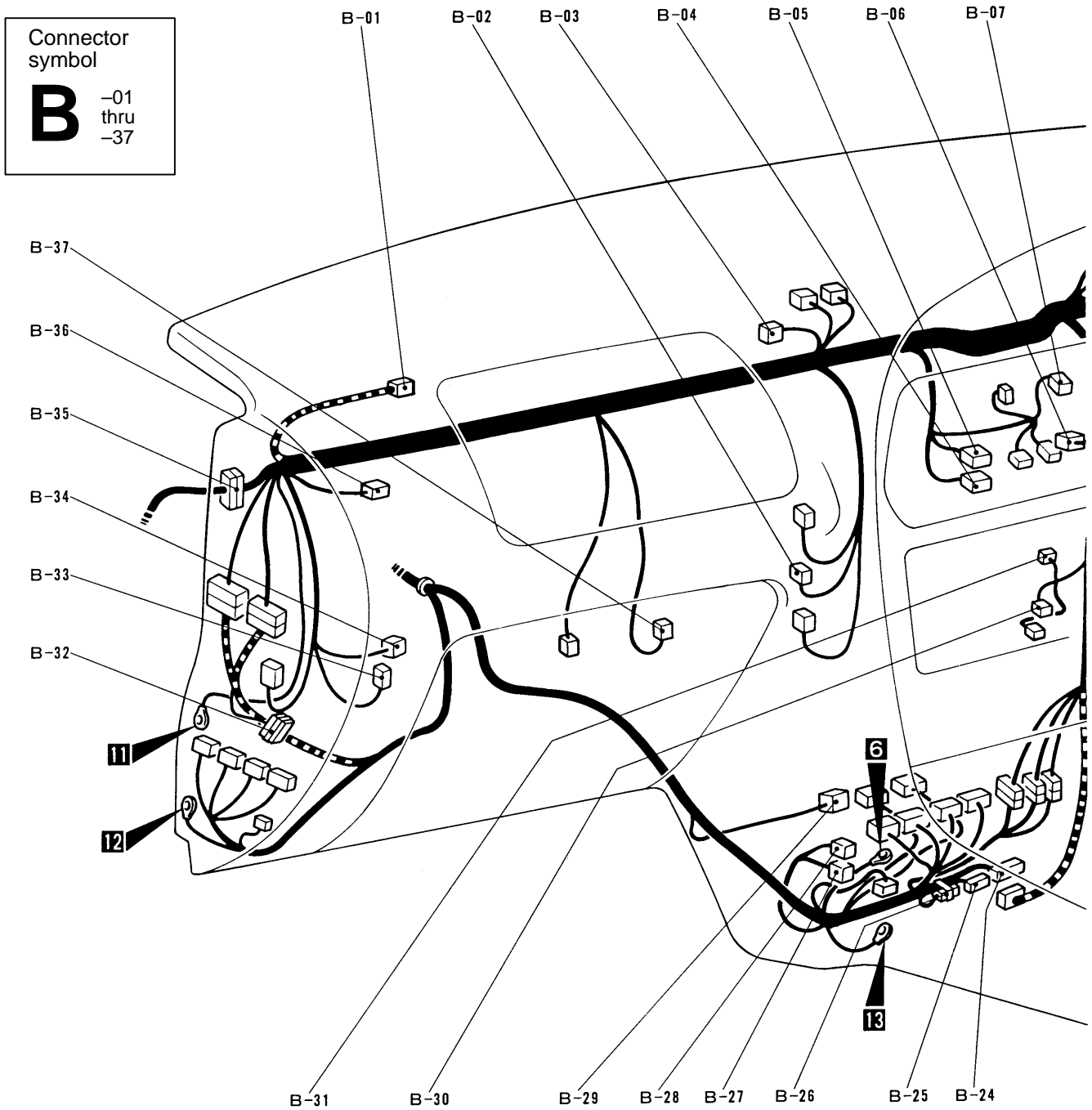




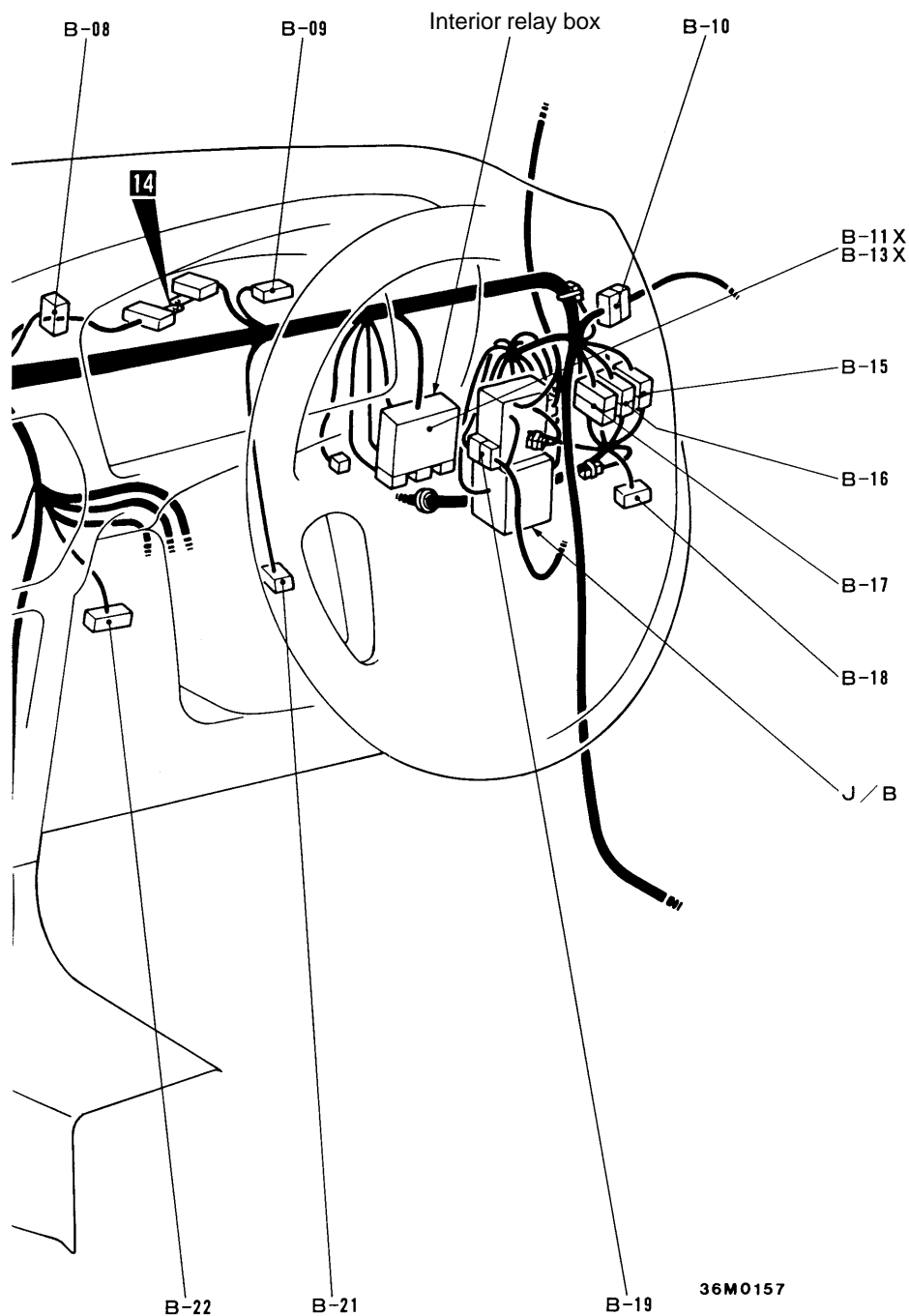
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- |              |                                    |              |                                      |
|--------------|------------------------------------|--------------|--------------------------------------|
| A-97 (3-B)   | Camshaft position sensor           | A-114X (4)   | Condenser fan relay (HI)             |
| A-99 (2-B)   | Condenser fan motor                | A-116X (4)   | A/C compressor relay                 |
| A-101 (1)    | Power steering oil pressure switch | A-117 (2-GR) | Side turn signal lamp (RH)           |
| A-102 (1)    | Spare connector for fog lamp       | A-123 (5-B)  | Fuel pump relay No.2                 |
| A-103 (2-B)  | Fog lamp (RH)                      | A-124 (6-B)  | Fuel pump resistor                   |
| A-104 (2)    | Position lamp (RH)                 | A-125 (2-B)  | Resistor (for injector)              |
| A-105 (3-B)  | Headlamp (RH)                      | A-126 (5-B)  | AYC relay                            |
| A-106 (1-B)  | A/C compressor assembly            | A-127 (2-B)  | Secondary air control solenoid valve |
| A-107 (2-BR) | Front turn signal lamp (RH)        | A-128 (2-GR) | Condenser fan motor                  |
| A-110 (3-GR) | Ignition coil 1                    | A-129 (2-B)  | Water spray motor                    |
| A-111 (3-GR) | Ignition coil 2                    | A-130 (3-B)  | Water motor                          |
| A-112X (4)   | Radiator fan relay (HI)            | A-131 (1-B)  | Noise condenser                      |
| A-113X (4)   | Condenser fan relay (LO)           |              |                                      |

DASH PANEL

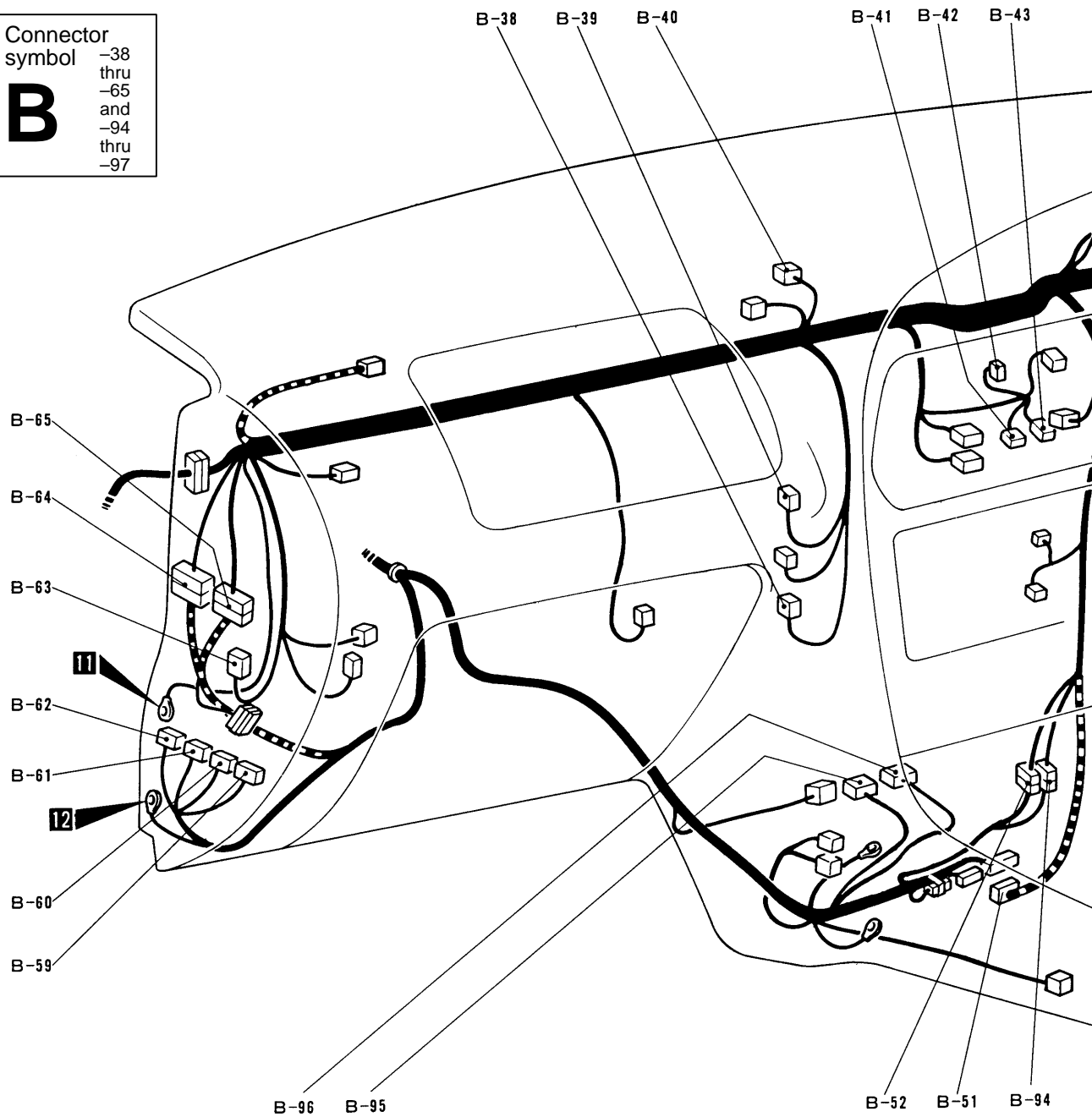


- |             |   |           |   |
|-------------|---|-----------|---|
| B-01 (2-R)  | Passenger seat air bag module (squib)   | B-07 (8)  | Blower switch   |
| B-02 (2)    | Heater water temperature sensor   |           | <vehicles with manual air conditioner>                |
| B-03 (2-B)  | Air thermo sensor <vehicles with fully automatic air conditioner>                                     | B-08 (25) | Meter and gauge                                       |
| B-04 (20-B) | A/C-ECU <vehicles with fully automatic air conditioner>   | B-09 (25) | Meter and gauge                                       |
| B-05 (16-B) | A/C-ECU <vehicles with fully automatic air conditioner>   | B-10 (22) | Body harness and front door harness (RH) combination  |
| B-06 (6)    | Air outlet change-over damper motor and potentiometer <vehicles with fully automatic air conditioner> | B-11X (8) | Rear intermittent wiper relay                         |
|             |   | B-13X (5) | Power window relay                                    |
|             |   | B-15 (20) | Front harness and body harness combination            |
|             |   | B-16 (6)  | Front harness and body harness combination            |
|             |   | B-17 (14) | Front harness and body harness combination <ABS, AYC> |
|             |   | B-18 (19) | Jumper connector (1)                                  |

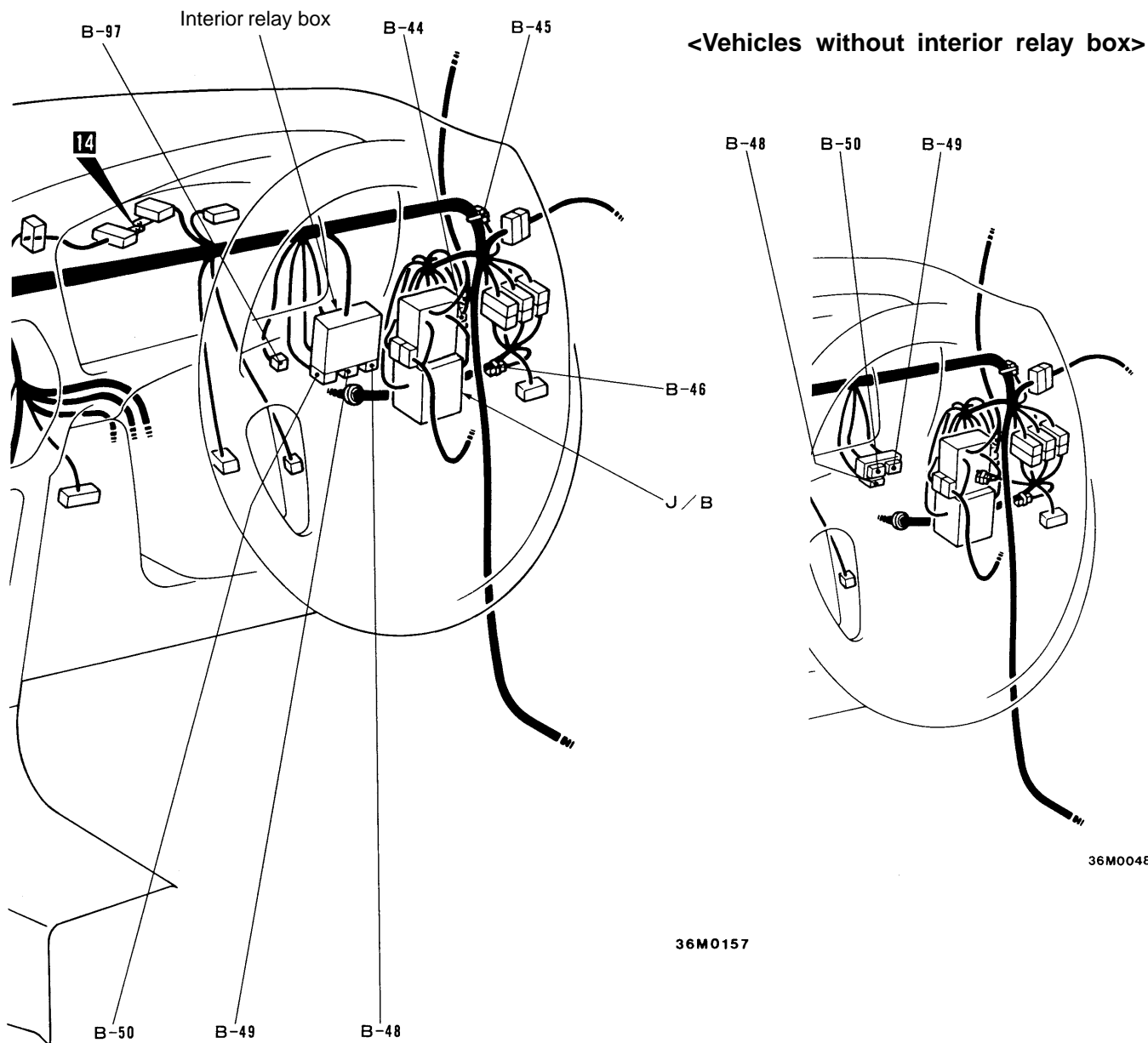


- |             |   |           |   |
|-------------|---|-----------|---|
| B-19 (22)   | Body harness and instrument panel harness combination | B-33 (2)  | Blower motor<br><vehicles with fully automatic air conditioner>   |
| B-21 (2)    | Stop lamp switch (driver side)                        | B-34 (4)  | Blower high speed relay <vehicles with fully automatic air conditioner>   |
| B-22 (16-B) | Diagnosis connector                                   | B-35 (22) | Body harness and front door harness (LH) combination  |
| B-24 (26-Y) | ABS-ECU   | B-36 (2)  | Inside and outside air change-over damper motor <vehicles with fully automatic air conditioner>                               |
| B-25 (16)   | ABS-ECU   | B-37 (4)  | Power transistor <vehicles with fully automatic air conditioner> or resistor <vehicles with heater or manual air conditioner> |
| B-26 (2-B)  | Diode (for ABS circuit)                               |           |   |
| B-27 (4)    | Engine control relay                                  |           |   |
| B-28 (4)    | Fuel pump relay                                       |           |   |
| B-29 (4-B)  | A/T relay   |           |   |
| B-30 (14)   | Radio or spare connector for radio                    |           |   |
| B-31 (1)    | Glass antenna amplifier                               |           |   |
| B-32 (19-B) | Jumper connector (5)                                  |           |   |

Connector  
symbol  
**B**  
-38  
thru  
-65  
and  
-94  
thru  
-97

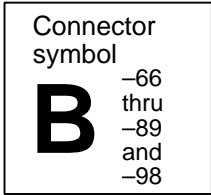


- |          |  |             |   |
|----------|--|-------------|---|
| B-38 (2) | Sunlight sensor <vehicles with fully automatic air conditioner>                        | B-43 (6-B)  | Defogger switch <vehicles with heater or manual air conditioner>  |
| B-39 (6) | Air mix damper motor and potentiometer <vehicles with fully automatic air conditioner> | B-44 (6)    | Body harness and roof harness combination <vehicles with sunroof> |
| B-40 (3) | Automatic compressor ECU <vehicles with manual air conditioner>                        | B-45 (2-B)  | Diode (for keyless entry system circuit)                          |
| B-41 (8) | A/C switch <vehicles with manual air conditioner>                                      | B-46 (2)    | Spare connector for fog lamp switch <vehicles without fog lamp>   |
| B-42 (2) | Blower switch illumination lamp <vehicles with heater or manual air conditioner>       | B-48 (14)   | Jumper connector (2)  |
|          |  | B-49 (14)   | Jumper connector (3)  |
|          |  | B-50 (14-L) | Jumper connector (4)  |
|          |  | B-51 (21-Y) | SRS-ECU   |

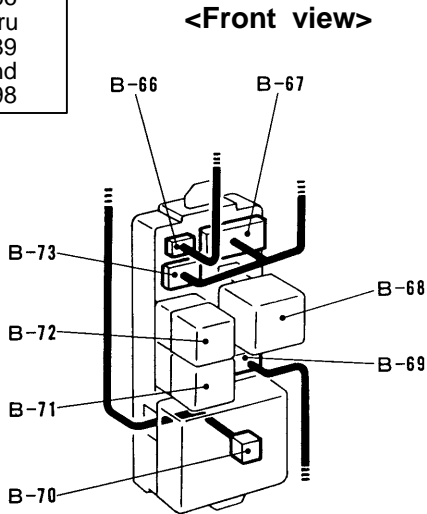


- B-52 (16-B) Control harness and body harness combination <vehicles with ABS>
- B-59 (26-Y) Engine-ECU
- B-60 (16-Y) Engine-ECU
- B-61 (12-Y) Engine-ECU
- B-62 (22-Y) Engine-ECU
- B-63 (2) Blower motor <vehicles with heater or manual air conditioner>
- B-64 (13) Control harness and body harness combination

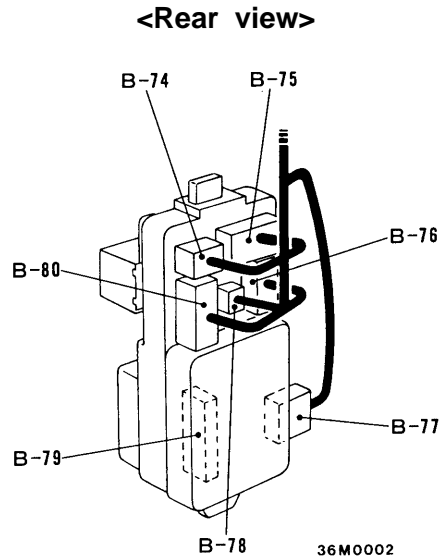
- B-65 (16-B) Control harness and body harness combination
- B-94 (13) Control harness and body harness combination <vehicles with AYC>
- B-95 (26-Y) AYC-ECU
- B-96 (16) AYC-ECU
- B-97 (2) Foot lamp



<Junction block>

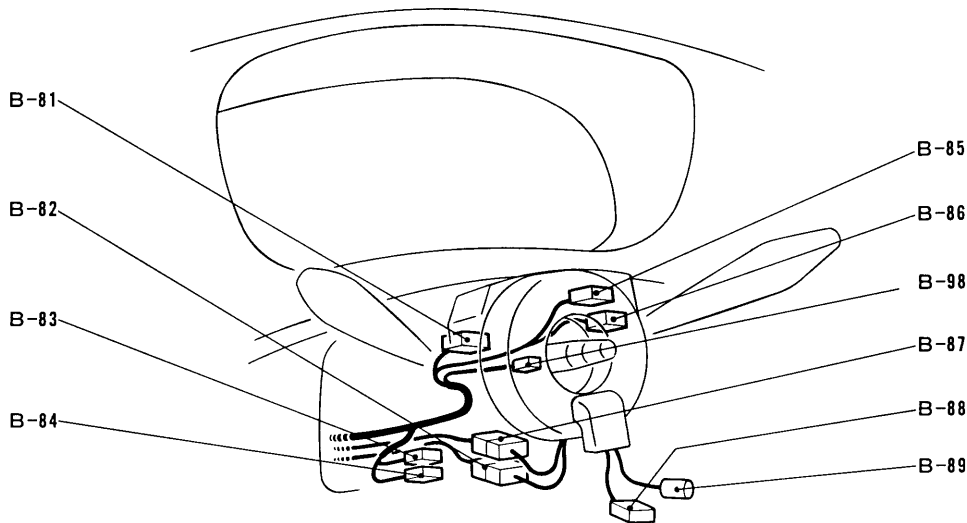


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36M0002

<Steering column>

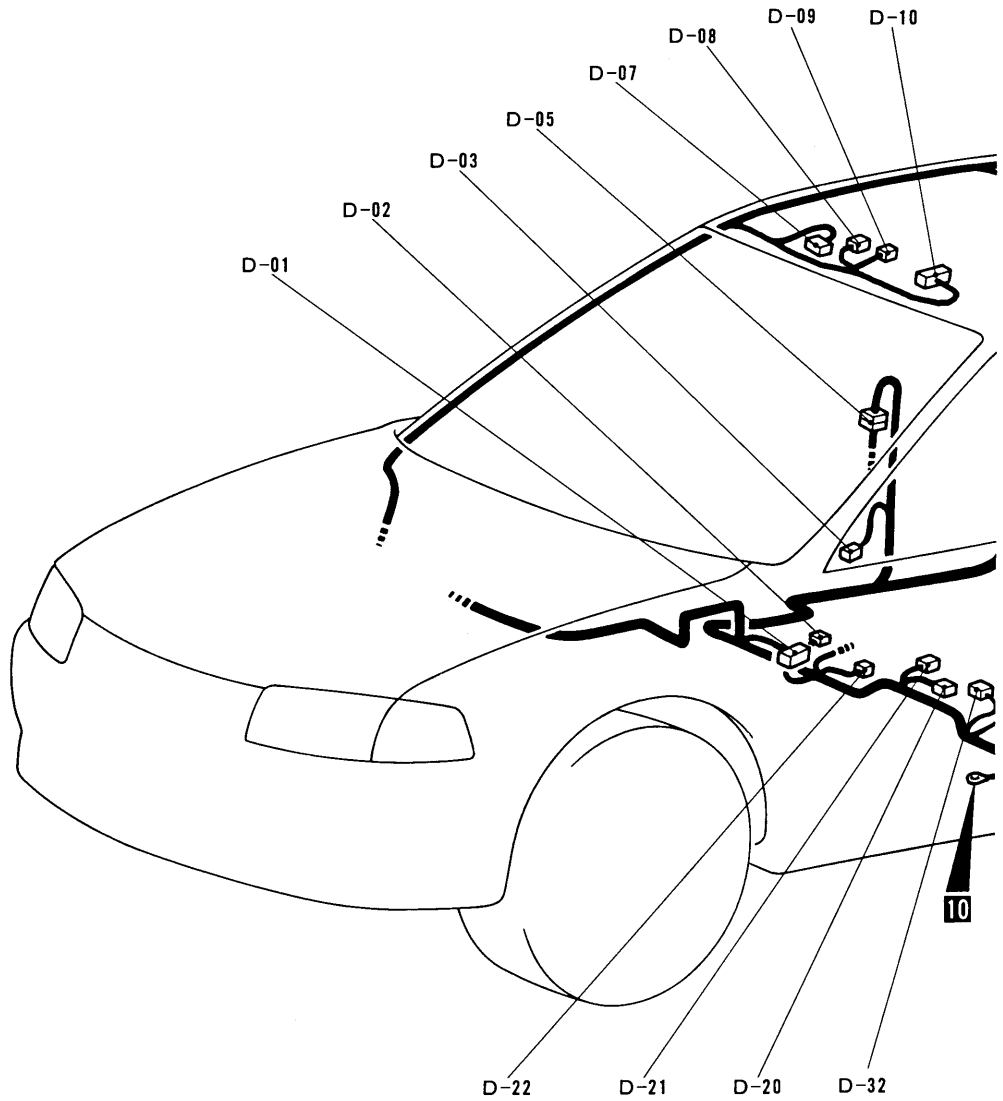
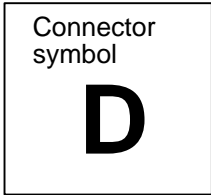


36M0156

- |             |   |            |   |
|-------------|---|------------|---|
| B-66 (2)    | Junction block and roof harness combination             | B-79 (12)  | Junction block and ETACS-ECU combination, or junction block and ECU combination |
| B-67 (11)   | Junction block and front harness combination            | B-80 (13)  | Junction block and body harness combination                                     |
| B-68 (3)    | Turn signal / hazard flasher unit                       | B-81 (12)  | Column switch   |
| B-69 (14)   | Junction block and instrument panel harness combination | B-82 (2-R) | Clock spring <vehicles with SRS air bag>  |
| B-70 (4)    | Dedicated fuse (for sunroof circuit)                    | B-83 (6)   | Ignition switch   |
| B-71 (5)    | Defogger relay  | B-84 (5)   | Key reminder switch   |
| B-72 (5)    | Blower relay  | B-85 (6)   | Column switch   |
| B-73 (1)    | Junction block and front harness combination            | B-86 (10)  | Column switch   |
| B-74 (10)   | Junction block and body harness combination             | B-87 (3)   | Clock spring (SRS) <vehicles with dual horn>                                    |
| B-75 (10-B) | Junction block and body harness combination             | B-88 (2)   | Driver seat air bag module (squib)  |
| B-76 (8)    | Junction block and body harness combination             | B-89 (1)   | Horn switch <vehicles with SRS air bag>   |
| B-77 (8)    | ETACS-ECU   | B-98 (5)   | Steer sensor <vehicles with AYC>  |
| B-78 (4)    | Junction block and body harness combination             |            |   |

NOTES

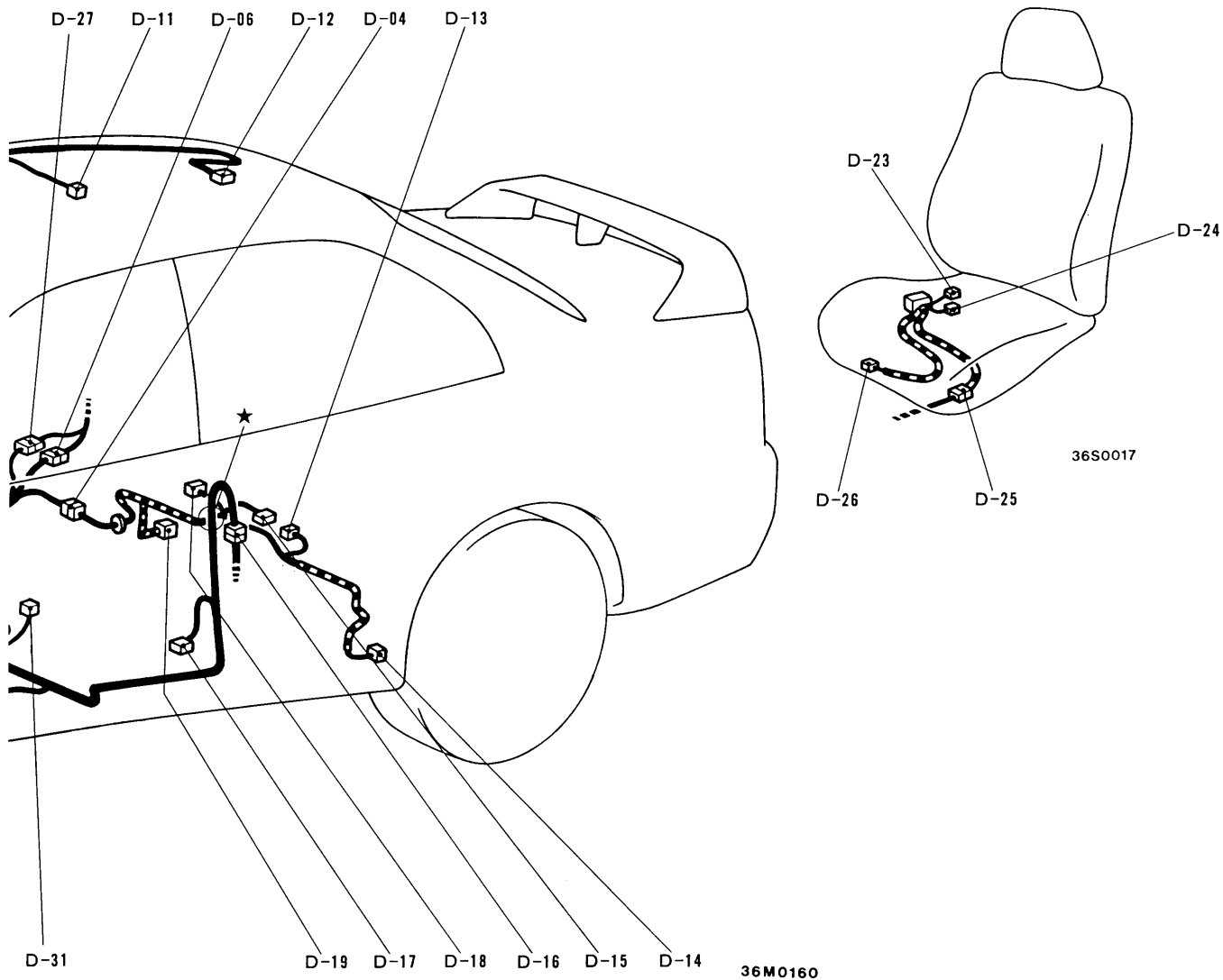
FLOOR, ROOF, AND SEAT



- |           |   |             |   |
|-----------|---|-------------|---|
| D-01 (20) | Receiver<br><vehicles with keyless entry system>    | D-09 (1)    | Map lamp  |
| D-02 (2)  | Seat belt switch                                    | D-10 (18)   | Sunroof ECU   |
| D-03 (2)  | Front door switch (RH)                              | D-11 (2-GR) | Room lamp <vehicles without sunroof>                |
| D-04 (10) | Body harness and fuel harness combination           | D-12 (8)    | Sunroof motor                                       |
| D-05 (6)  | Body harness and rear door harness (RH) combination | D-13 (3-B)  | Fuel gauge unit (sub)                               |
| D-06 (22) | Body harness and rear harness combination           | D-14 (2-B)  | Rear speed sensor (LH)<br><vehicles with ABS>       |
| D-07 (6)  | Sunroof switch                                      | D-16 (6)    | Body harness and rear door harness (LH) combination |
| D-08 (8)  | Room lamp <vehicles with sunroof>                   | D-17 (2)    | Front door switch (LH)                              |
|           |   | D-18 (6)    | Fuel gauge unit (main)                              |

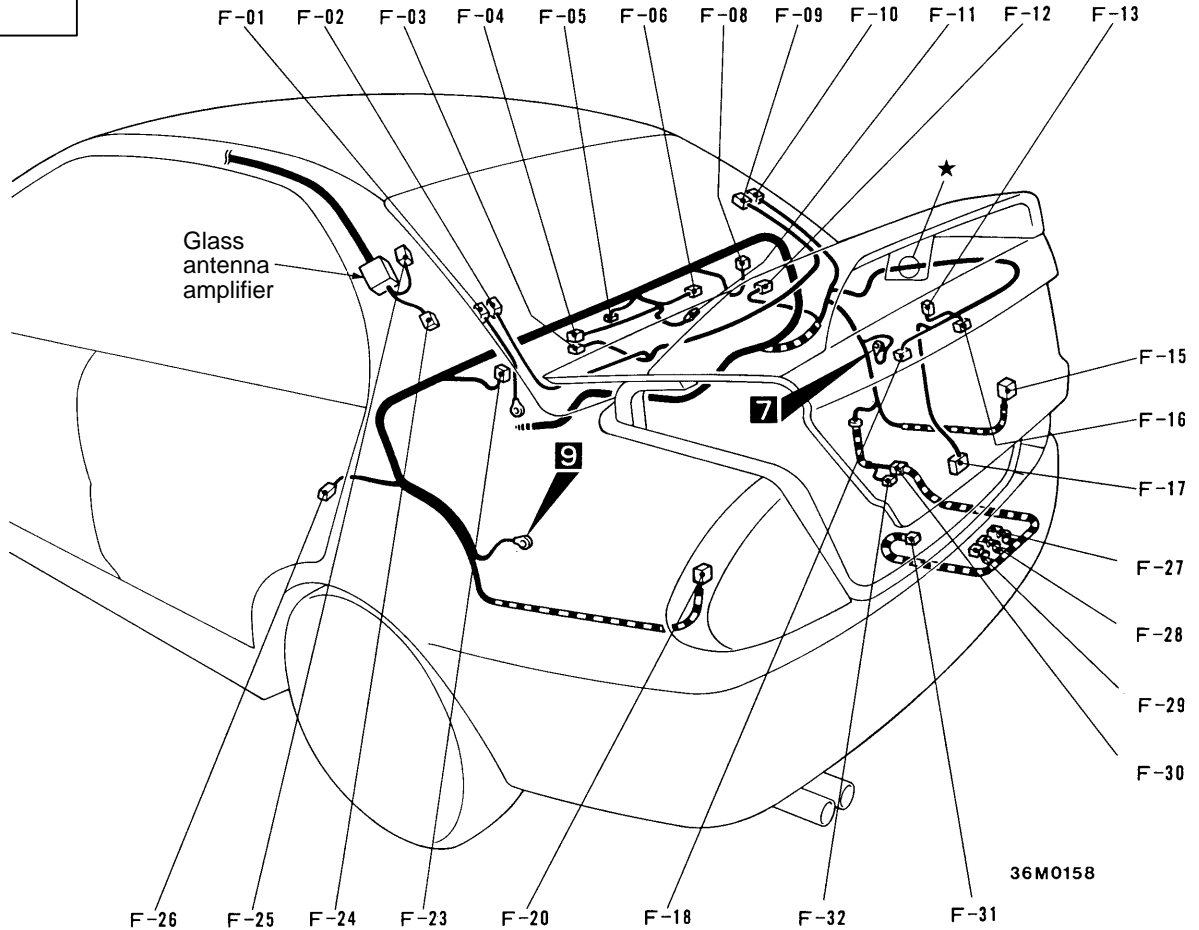
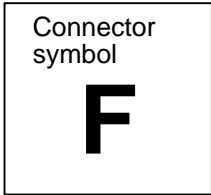


<Power seat>



- |            |  |            |   |
|------------|--|------------|---|
| D-19 (2-B) | Rear speed sensor (RH)<br><vehicles with ABS>                    | D-25 (2)   | Body harness and power seat harness combination and power seat switch |
| D-20 (3-B) | Acceleration sensor (longitudinal)<br><vehicles with ABS or AYC> | D-26       | Slide motor   |
| D-21 (1-B) | Parking brake switch   | D-27 (2)   | Body harness and rear harness combination <vehicles with AYC>         |
| D-22 (2-B) | High temperature sensor  | D-31 (2)   | Water spray switch  |
| D-23       | Reclining motor  | D-32 (3-B) | Acceleration sensor (lateral)<br><vehicles with AYC>                  |
| D-24       | Slide limit switch   |            |   |

LUGGAGE COMPARTMENT



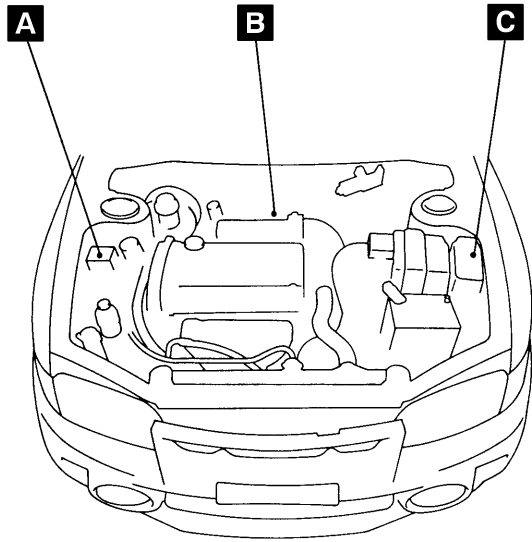
- |             |  |             |  |
|-------------|--|-------------|--|
| F-01 (1-B)  | Defogger (-) <vehicles without choke coil>         | F-17 (1-B)  | Luggage compartment lamp switch                          |
| F-02 (1-B)  | Defogger (-) <vehicles with choke coil>            | F-18 (2-GR) | Licence plate lamp (LH)                                  |
| F-03 (2)    | Choke coil   | F-20 (6)    | Rear combination lamp (LH)                               |
| F-04 (3)    | Choke coil   | F-23 (2-B)  | Rear speaker (LH)  |
| F-05 (2)    | Luggage compartment lamp                           | F-24 (1)    | Glass antenna <vehicles without diversity glass antenna> |
| F-06 (2)    | High mounted stop lamp (installed on rear shelf)   | F-25 (1)    | Glass antenna  |
| F-08 (2-B)  | Rear speaker (RH)                                  | F-26 (1-B)  | Rear door switch (LH)                                    |
| F-09 (1-B)  | Defogger (+) <vehicles with choke coil>            | F-27 (3-B)  | Proportioning valve <vehicles with AYC>                  |
| F-10 (1-B)  | Defogger (+) <vehicles without choke coil>         | F-28 (2-B)  | Direction valve (LH) <vehicles with AYC>                 |
| F-11 (3)    | Rear wiper motor                                   | F-29 (2-B)  | Direction valve (RH) <vehicles with AYC>                 |
| F-12 (1-B)  | Rear door switch (RH)                              | F-30 (8-B)  | Rear harness and AYC harness combination                 |
| F-13 (2)    | High mounted stop lamp (installed on rear spoiler) | F-31 (2-B)  | Accumulator pressure switch <vehicles with AYC>          |
| F-15 (6)    | Rear combination lamp (RH)                         | F-32 (2-B)  | AYC motor  |
| F-16 (2-GR) | Licence plate lamp (RH)                            |             |  |

NOTES

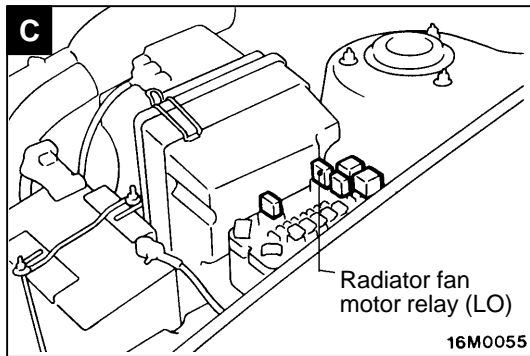
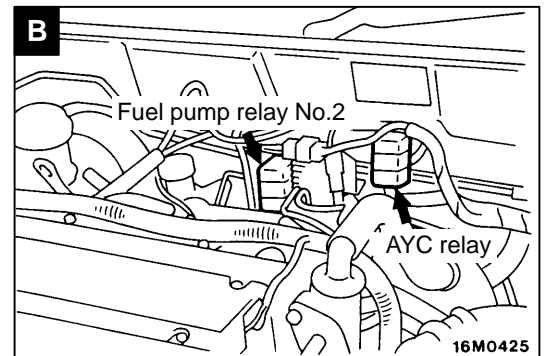
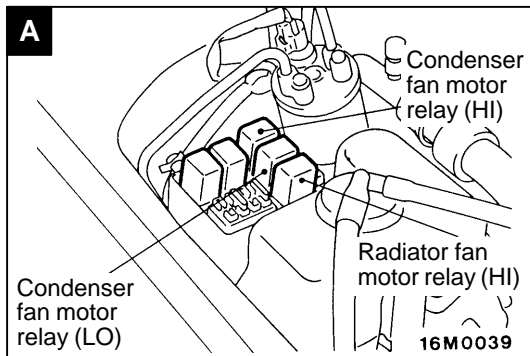
# SINGLE PART INSTALLATION POSITION

## RELAY

Name	Symbol	Name	Symbol
AYC relay	B	Fuel pump relay No.2	B
Condenser fan motor relay (HI)	A	Radiator fan motor relay (HI)	A
Condenser fan motor relay (LO)	A	Radiator fan motor relay (LO)	C

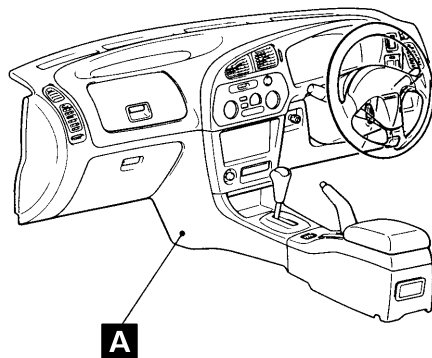


16M0429

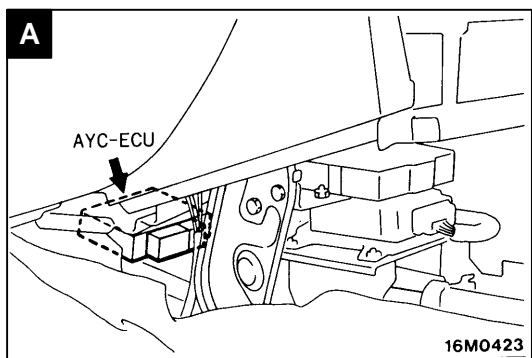


**ECU**

Name	Symbol
AYC-ECU	A



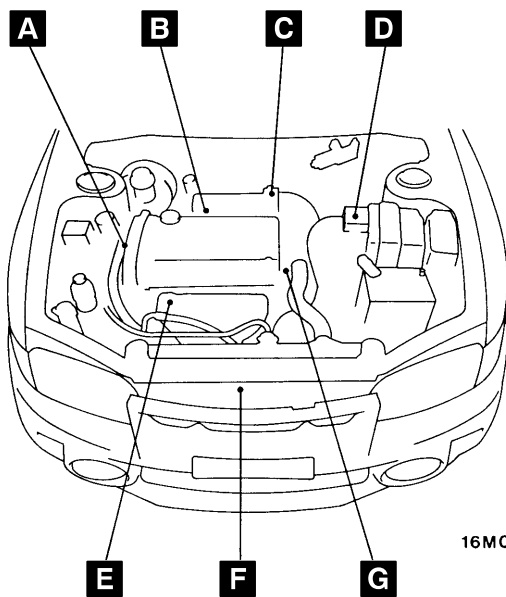
B21A066



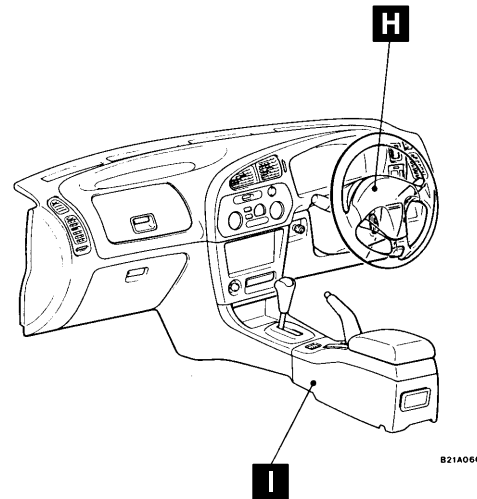
16M0423

**SENSOR**

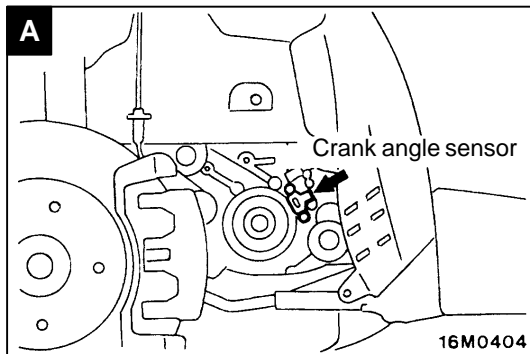
Name	Symbol	Name	Symbol
Acceleration sensor (lateral) <vehicles with AYC>	I	Knock sensor	B
Acceleration sensor (longitudinal) <vehicles with ABS and AYC>	I	Outside air temperature sensor <vehicles with fully automatic air conditioner>	F
Air flow sensor	D	O <sub>2</sub> sensor	E
Camshaft position sensor	G	Steering angle sensor <vehicles with AYC>	H
Crank angle sensor	A	Throttle position sensor	C
Engine coolant temperature sensor	G		



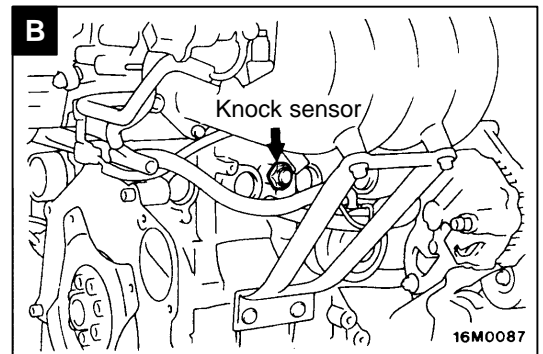
16M0429



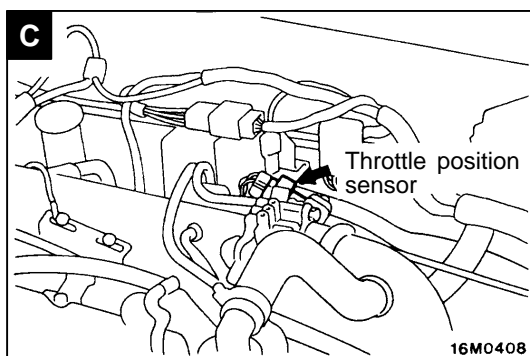
B21A066



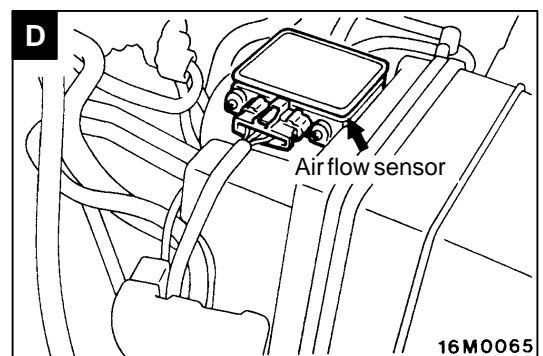
16M0404



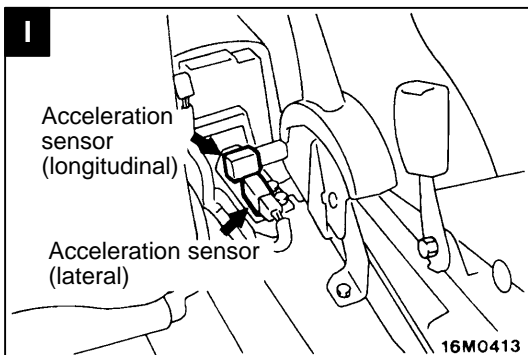
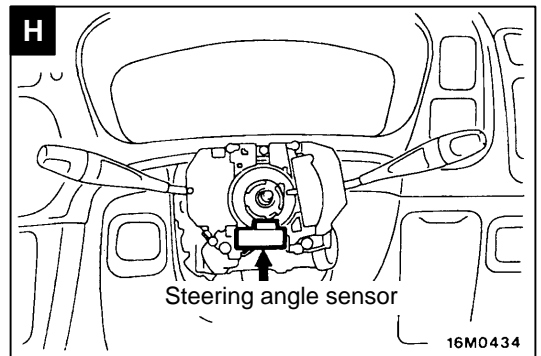
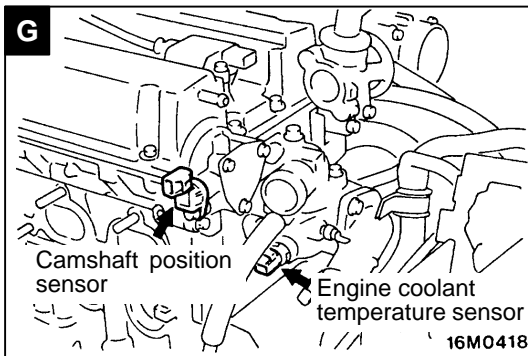
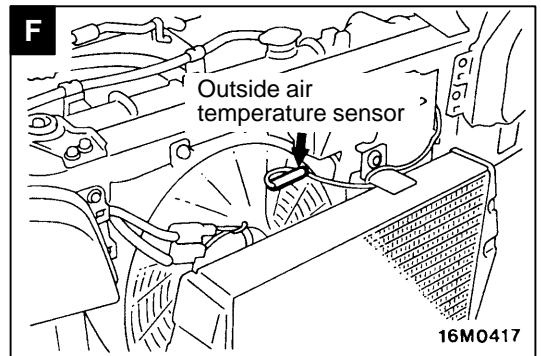
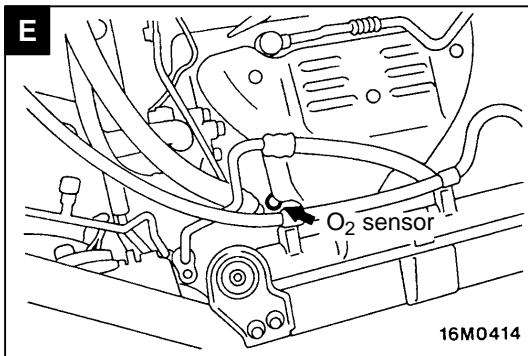
16M0087



16M0408

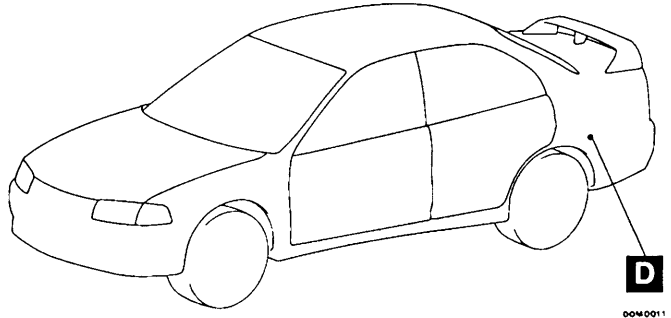
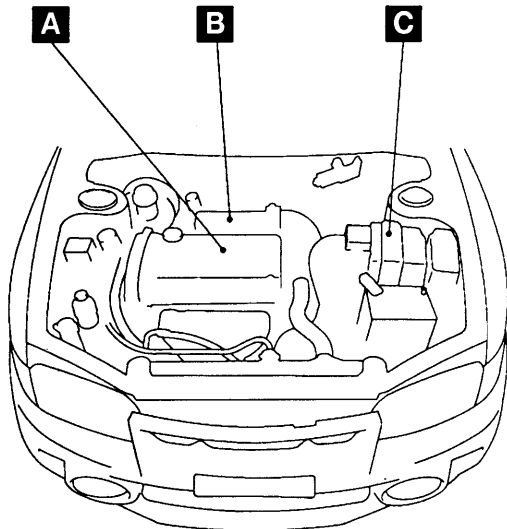


16M0065



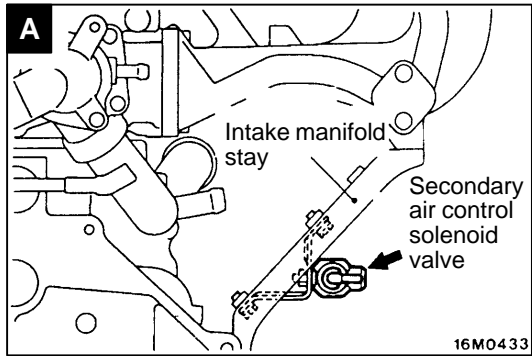
**SOLENOID VALVE**

Name	Symbol	Name	Symbol
Direction valve <vehicles with AYC>	D	Secondary air control solenoid valve	A
Fuel pressure solenoid valve	B	Waste gate solenoid valve	C
Proportioning valve <vehicles with AYC>	D		

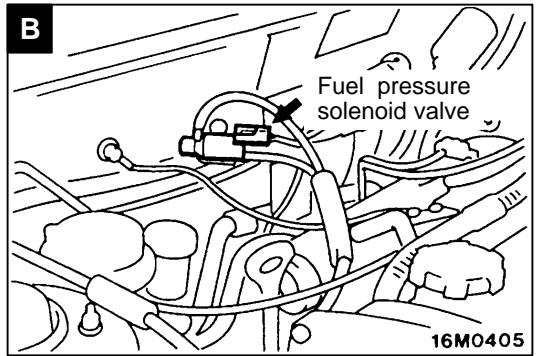


0040011

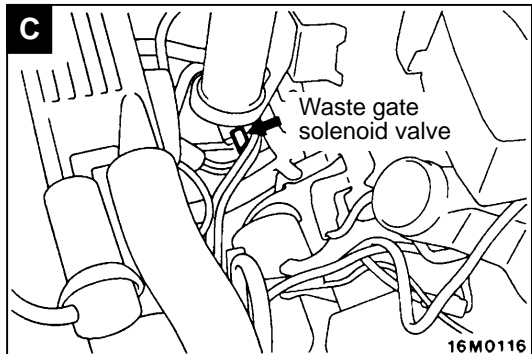
16M0429



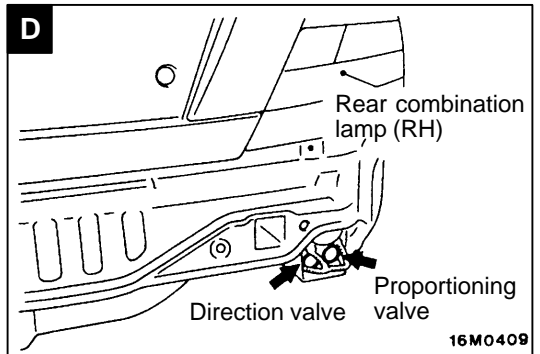
16M0433



16M0405



16M0116

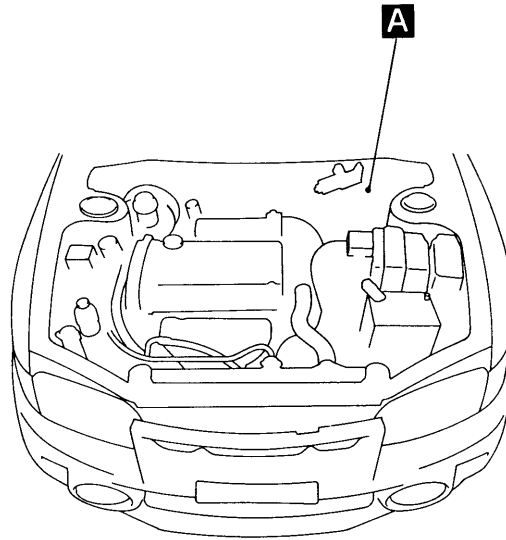


16M0409

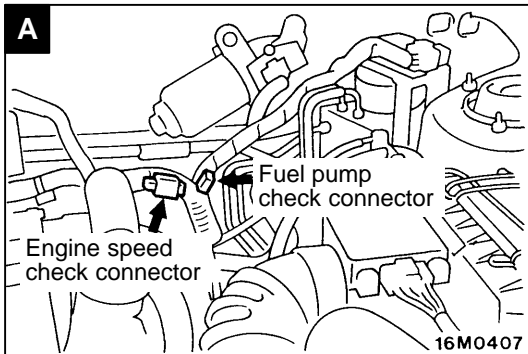


# CHECK CONNECTOR AND SPARE CONNECTOR

Name	Symbol	Name	Symbol
Engine speed check connector	A	Fuel pump check connector	A

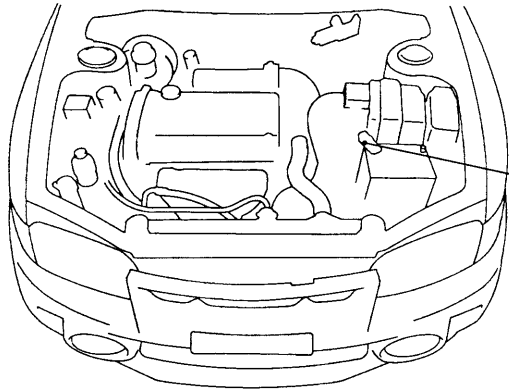


16M0429

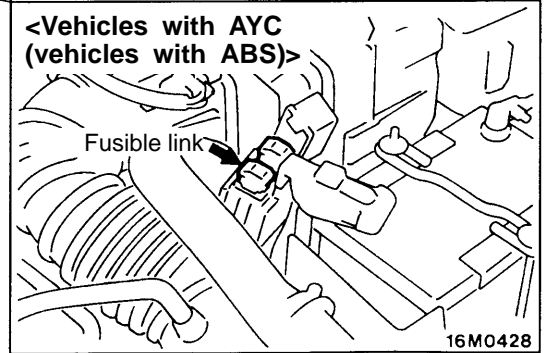
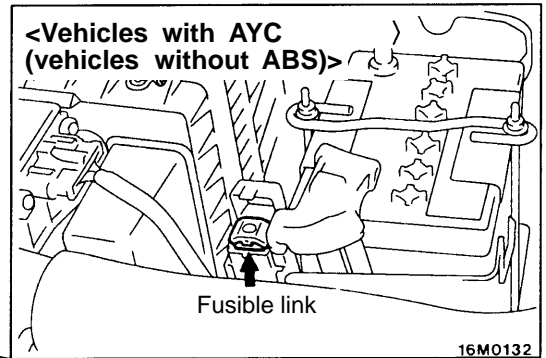


16M0407

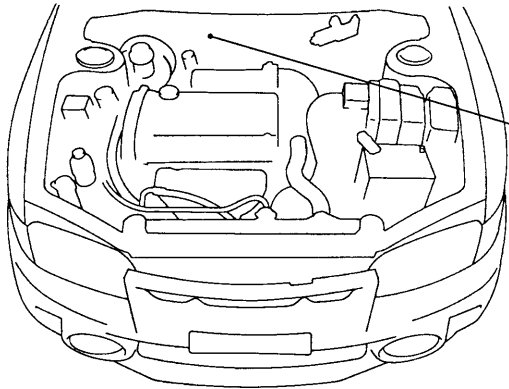
# FUSIBLE LINK AND FUSE



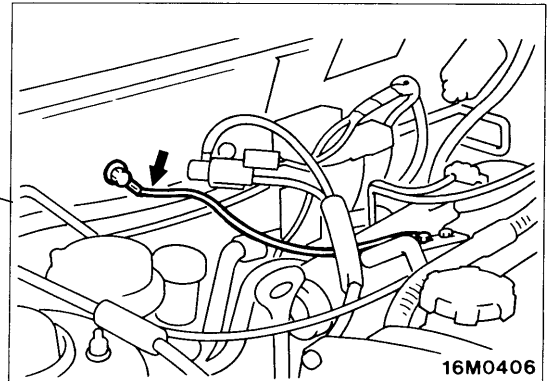
16M0429



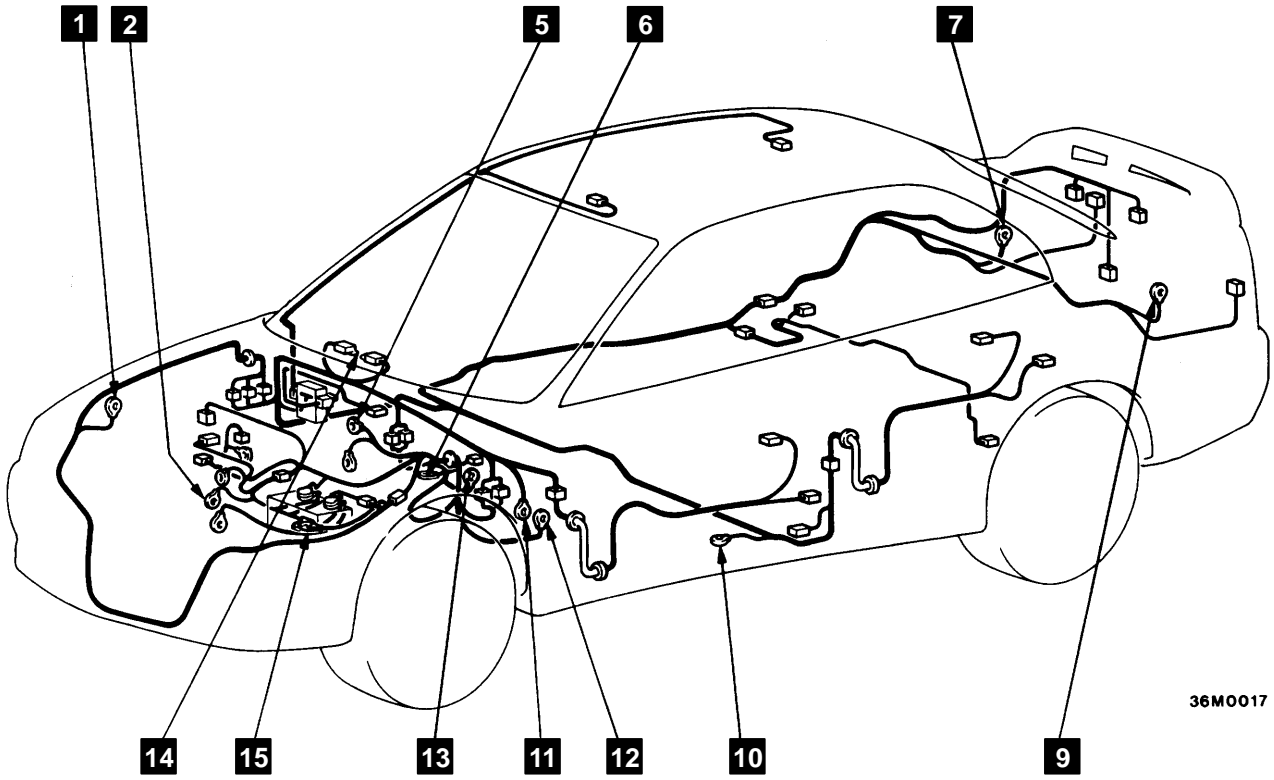
# GROUND CABLE



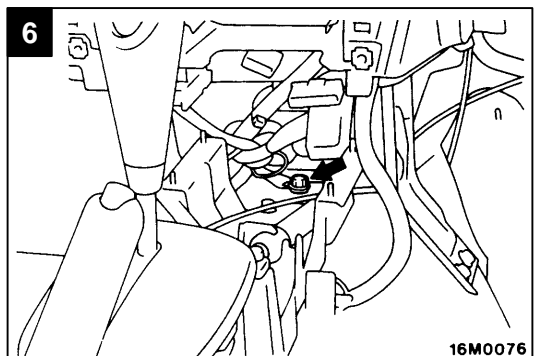
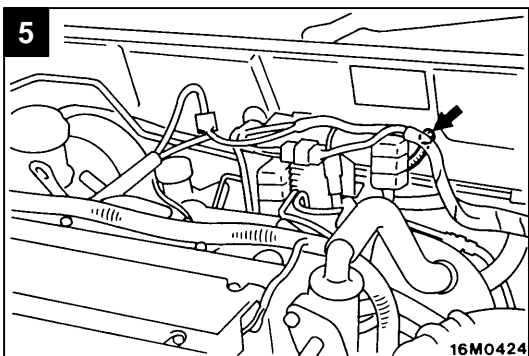
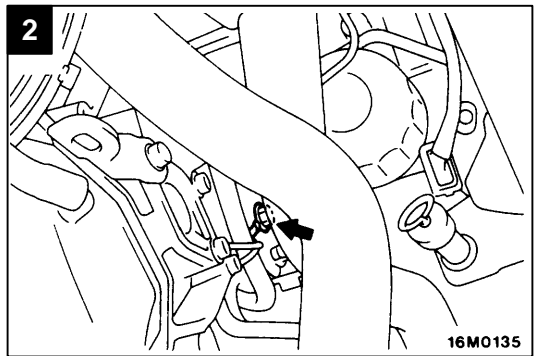
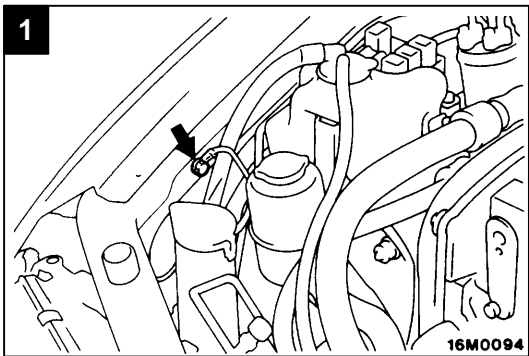
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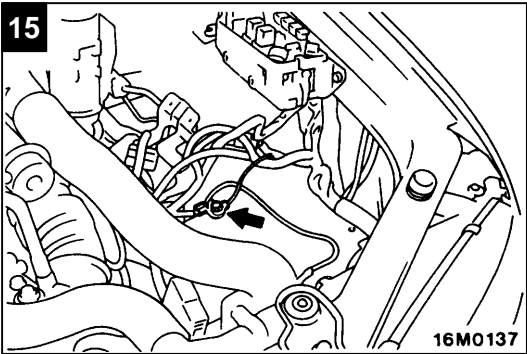
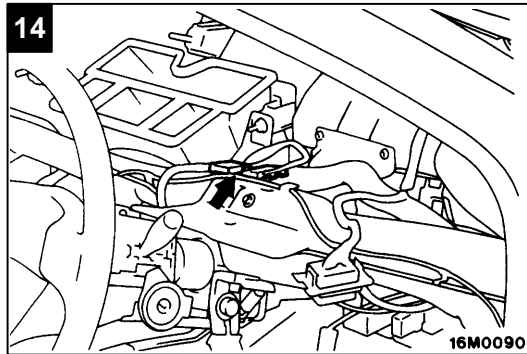
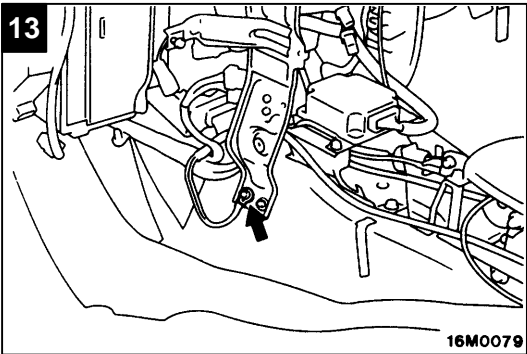
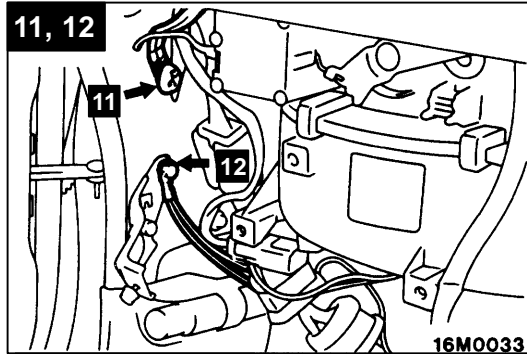
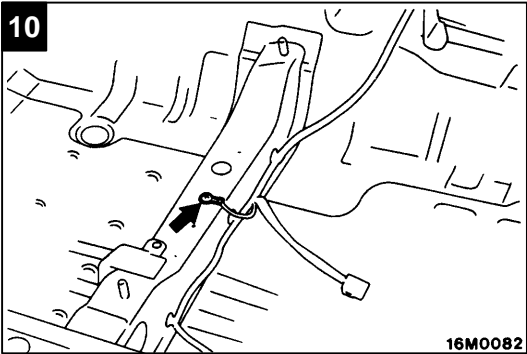
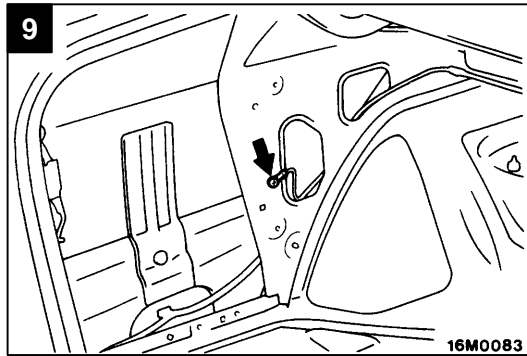
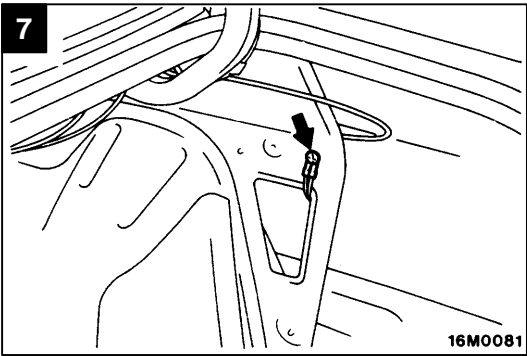


GROUND



36M0017





# CIRCUIT DIAGRAM

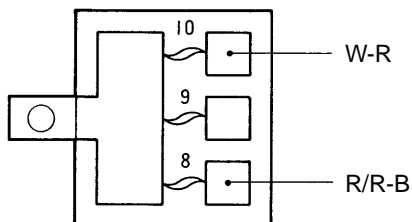
## CENTRALIZED JUNCTION

### FUSIBLE LINK

No.	Circuit protected	Type	Housing color	Rated capacity (A)
10	Active yaw control system	Screw-in type	Yellow	60

Fuse box directly attached on battery

<Vehicles with AYC>

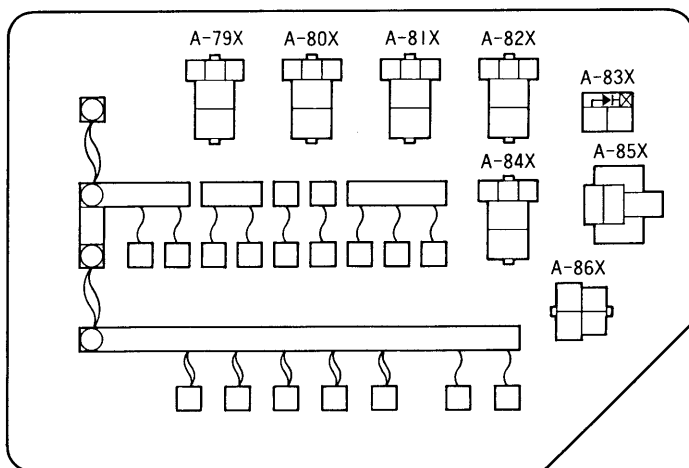


16M0144

### CENTRALIZED RELAY

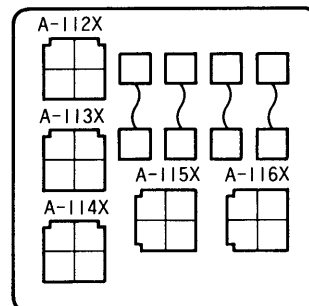
Connector No.	Name	Connector No.	Name
A-82X	Radiator fan motor relay (LO)	A-113X	Condenser fan motor relay (LO)
A-112X	Radiator fan motor relay (HI)	A-114X	Condenser fan motor relay (HI)

Relay box in engine compartment



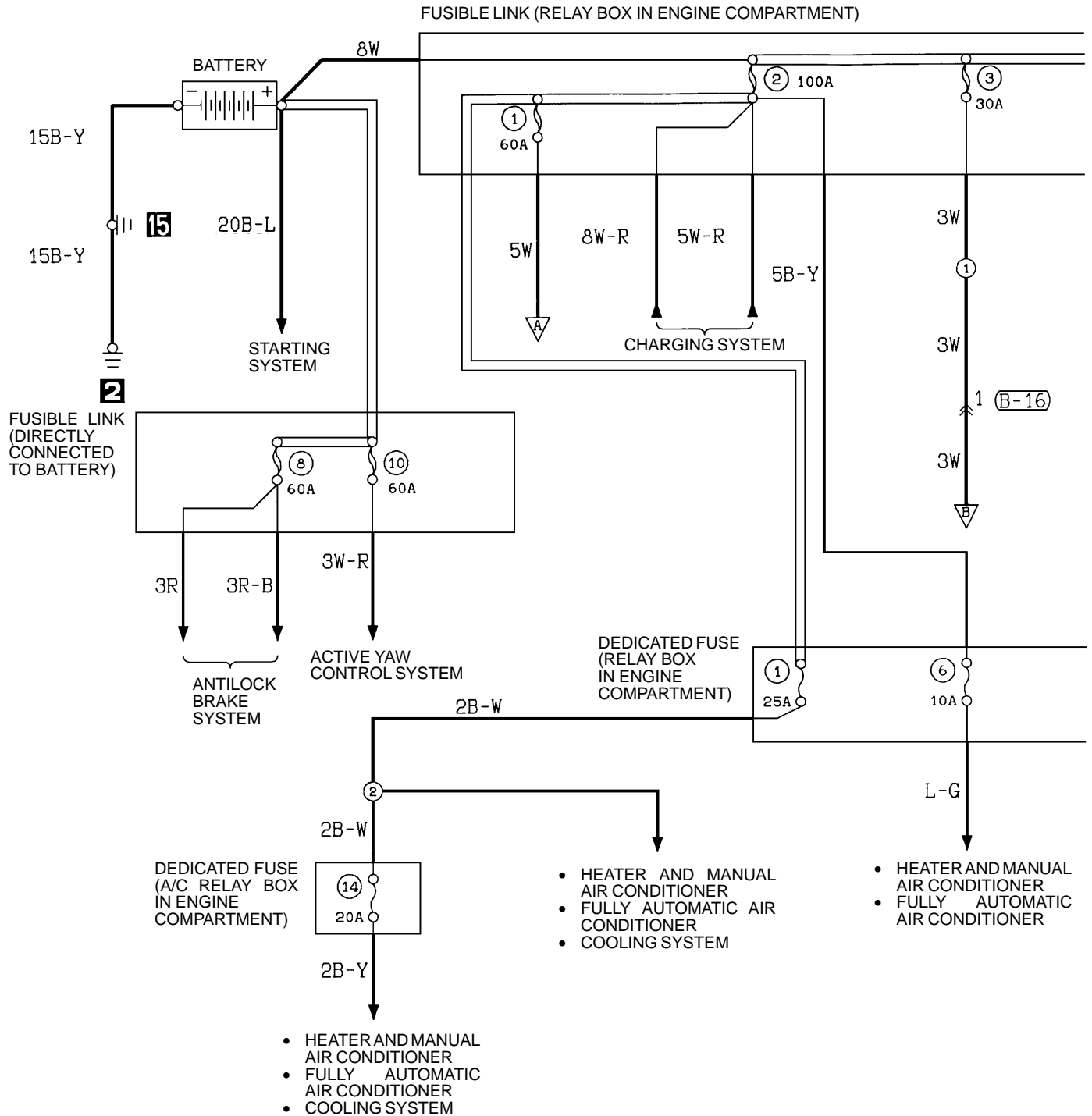
16M0141

(A/C relay box)



16M0142

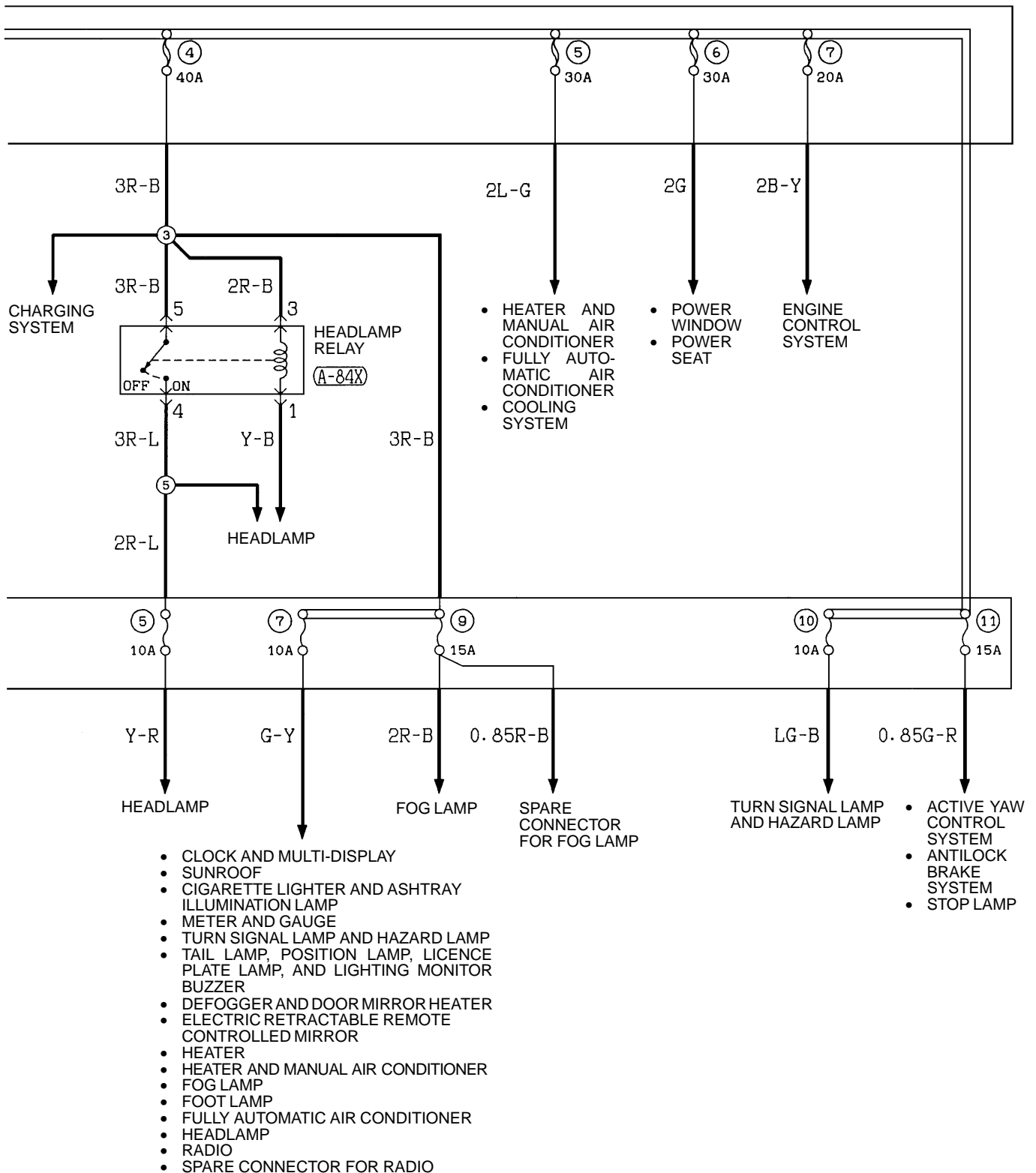
POWER DISTRIBUTION SYSTEM



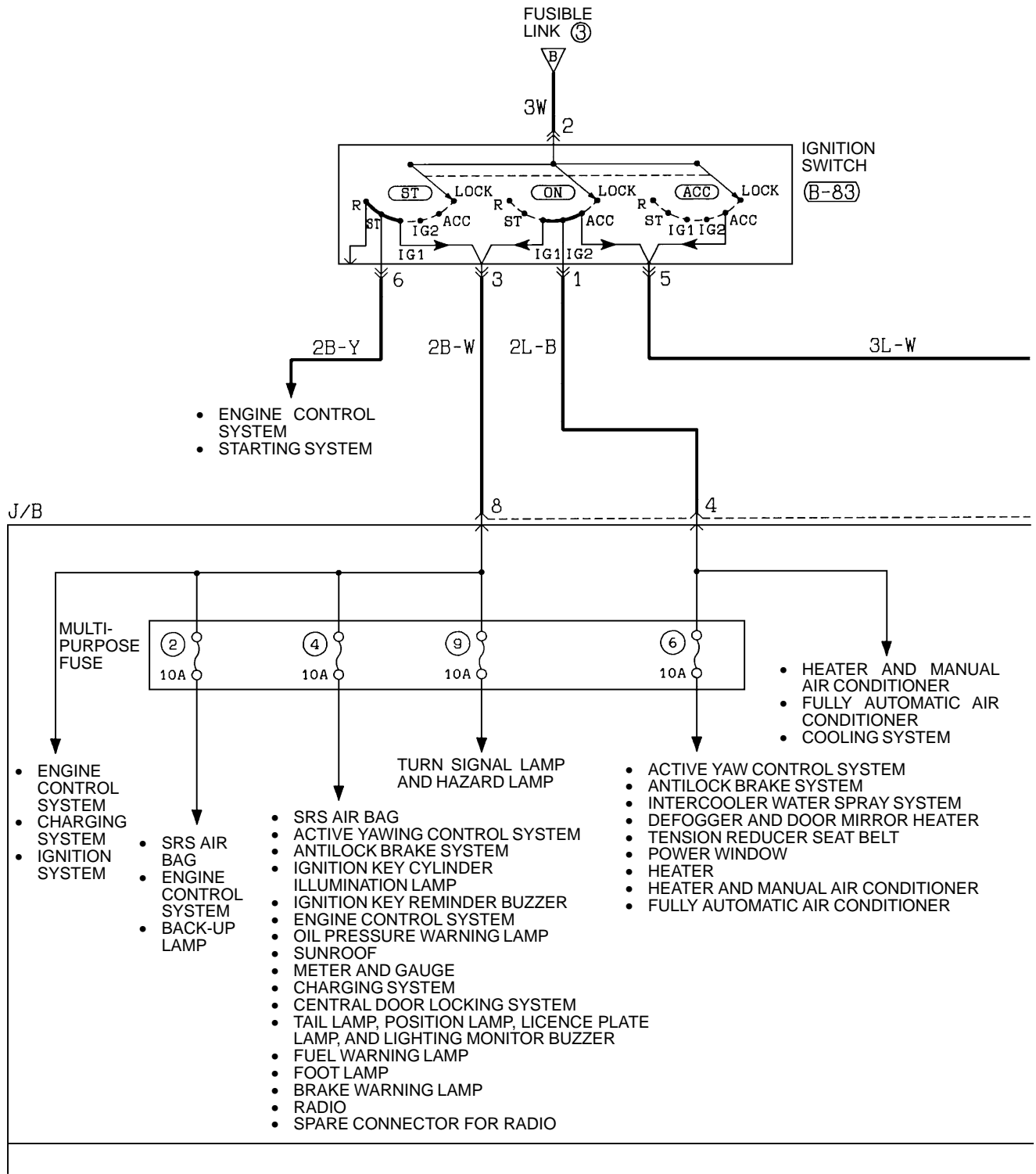
(A-84X)

(B-16)

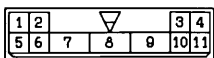




POWER DISTRIBUTION SYSTEM (CONTINUED)



(B-67)



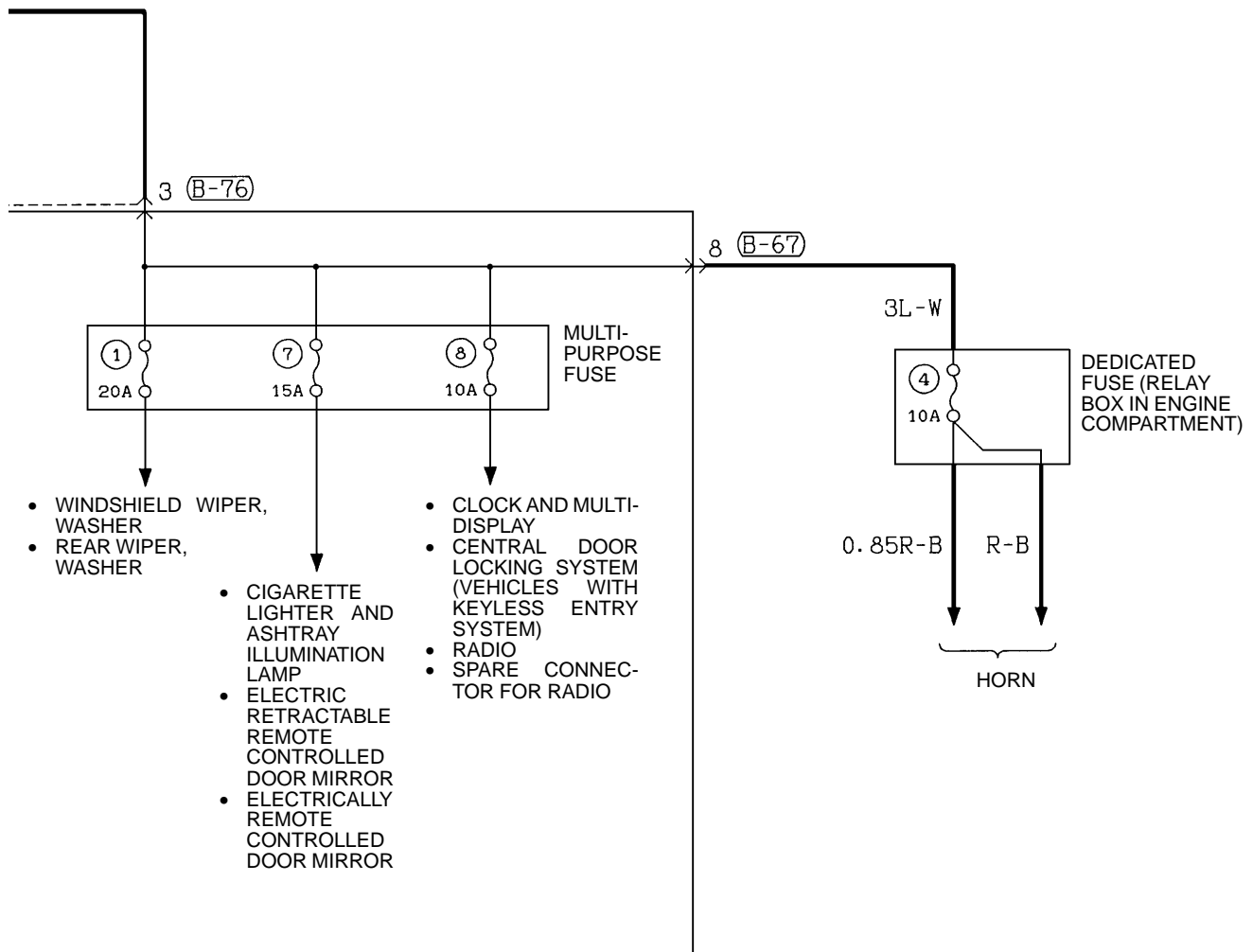
(B-76)



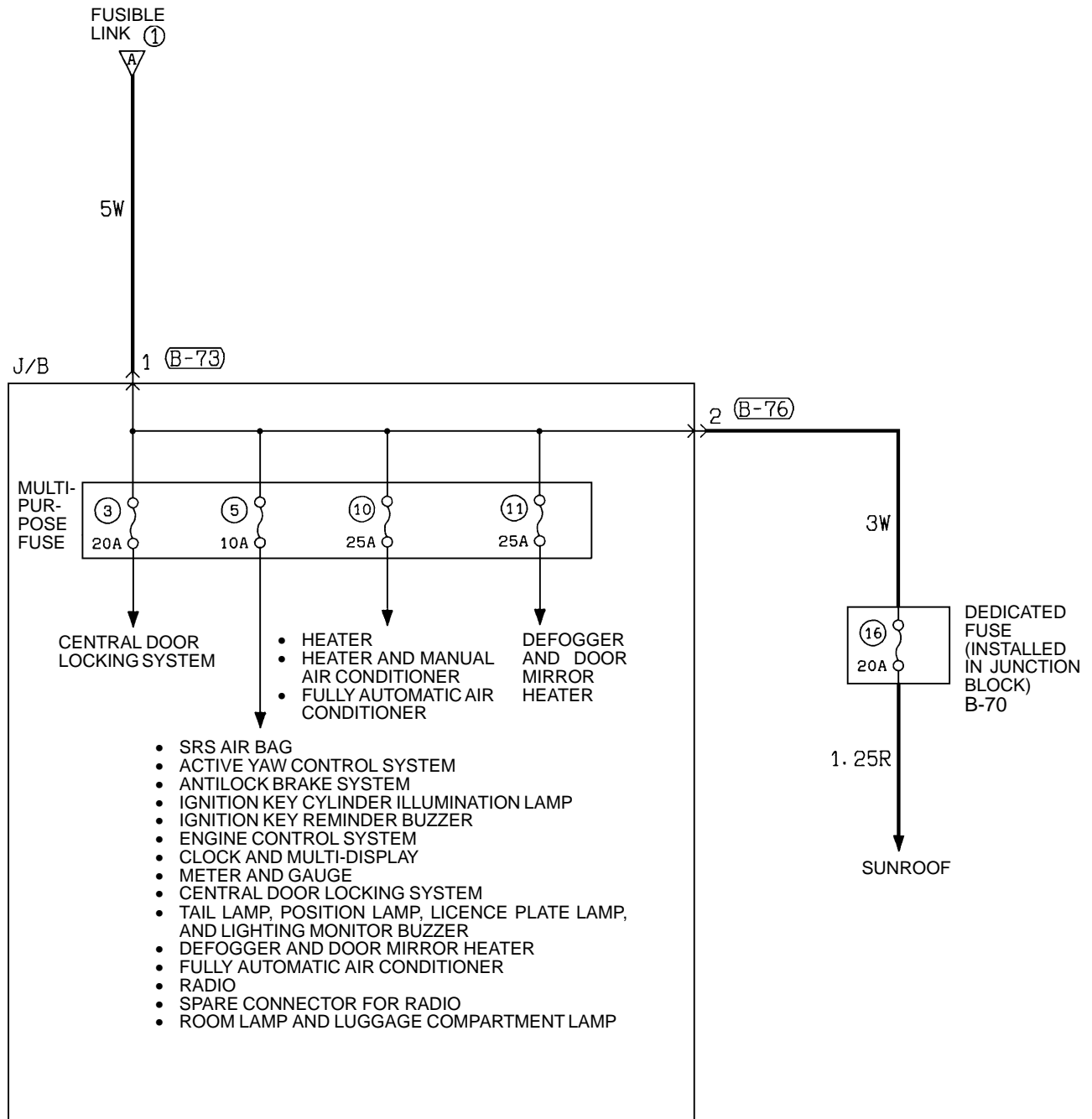
(B-83)







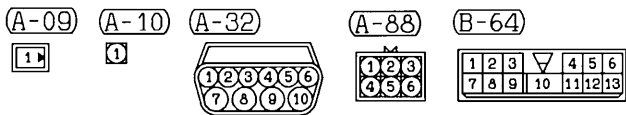
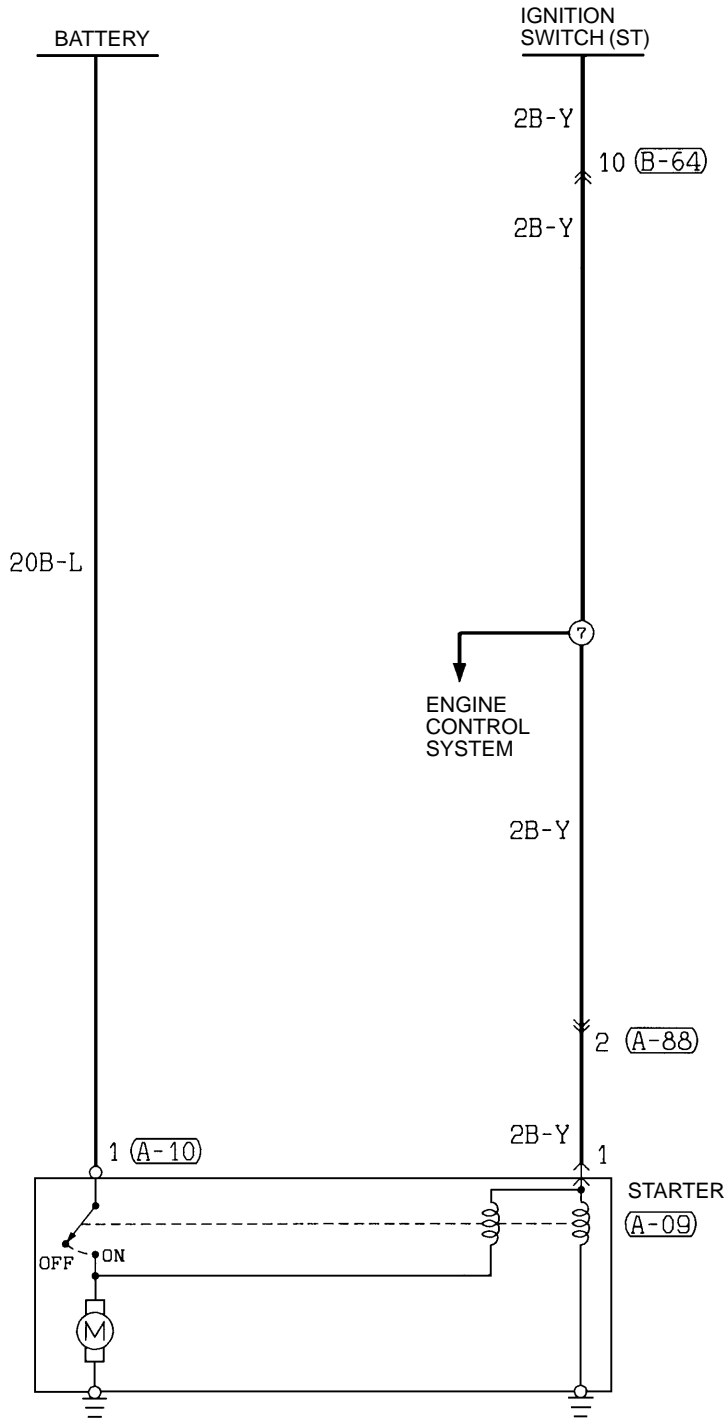
POWER DISTRIBUTION SYSTEM (CONTINUED)



(B-73) (B-76)

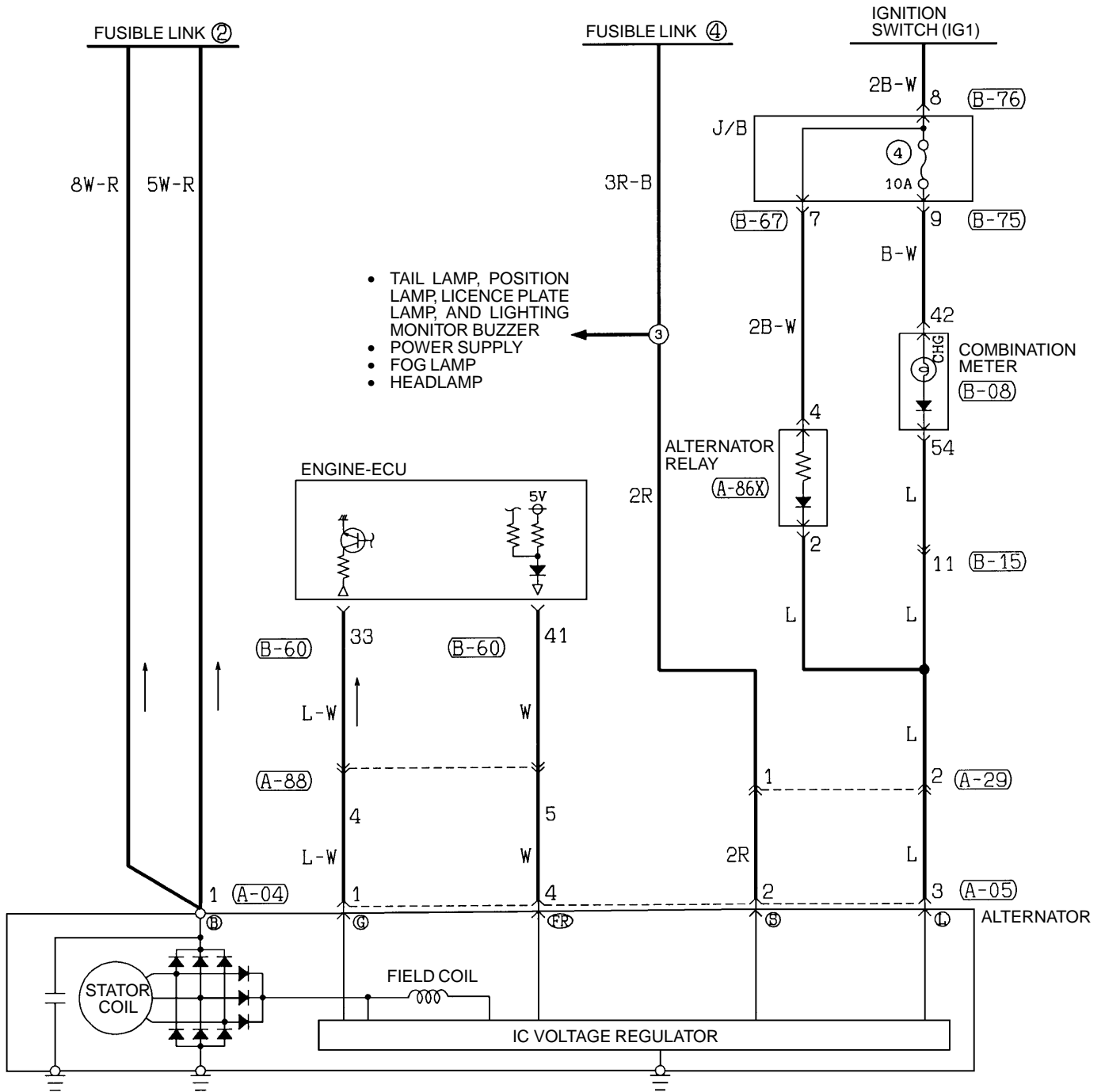


STARTING SYSTEM

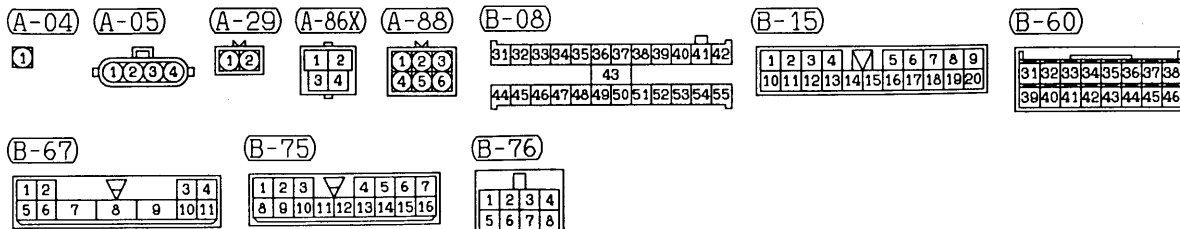




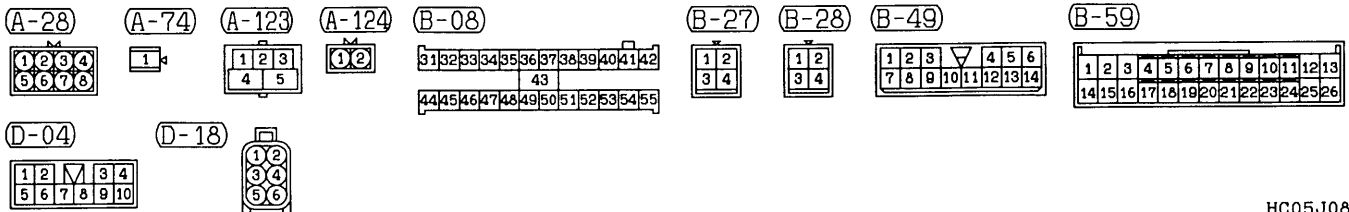
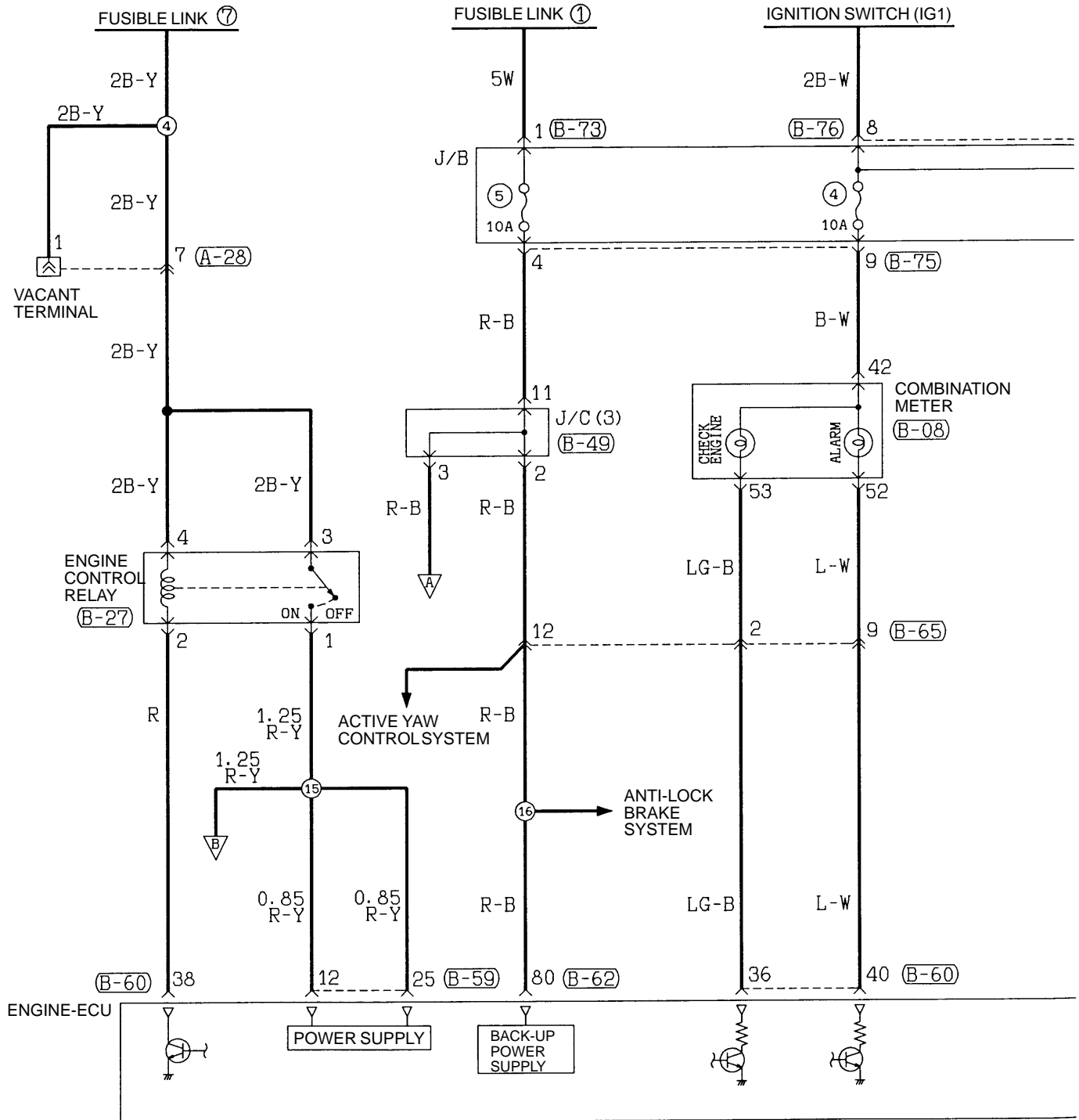
CHARGING SYSTEM

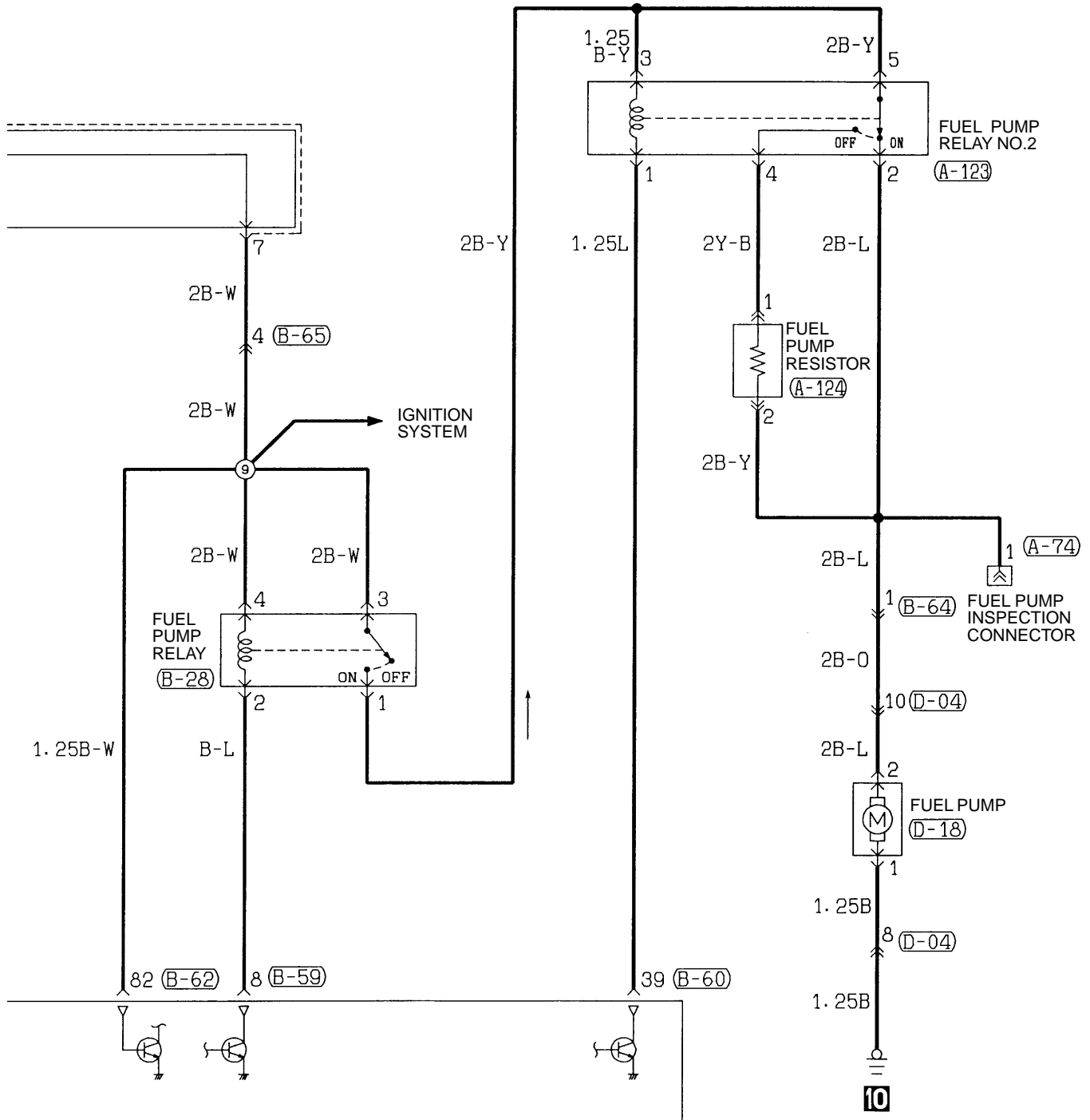


- TAIL LAMP, POSITION LAMP, LICENCE PLATE LAMP, AND LIGHTING MONITOR BUZZER
- POWER SUPPLY
- FOG LAMP
- HEADLAMP



# ENGINE CONTROL SYSTEM





(B-60)

31	32	33	34	35	36	37	38
39	40	41	42	43	44	45	46

(B-62)

71	72	73	74	75	76	77	78	79	80	81
82	83	84	85	86	87	88	89	90	91	92

(B-64)

1	2	3	▽	4	5	6
7	8	9	10	11	12	13

(B-65)

1	2	3	▽	4	5	6	7	
8	9	10	11	12	13	14	15	16

(B-73)

1
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(B-75)

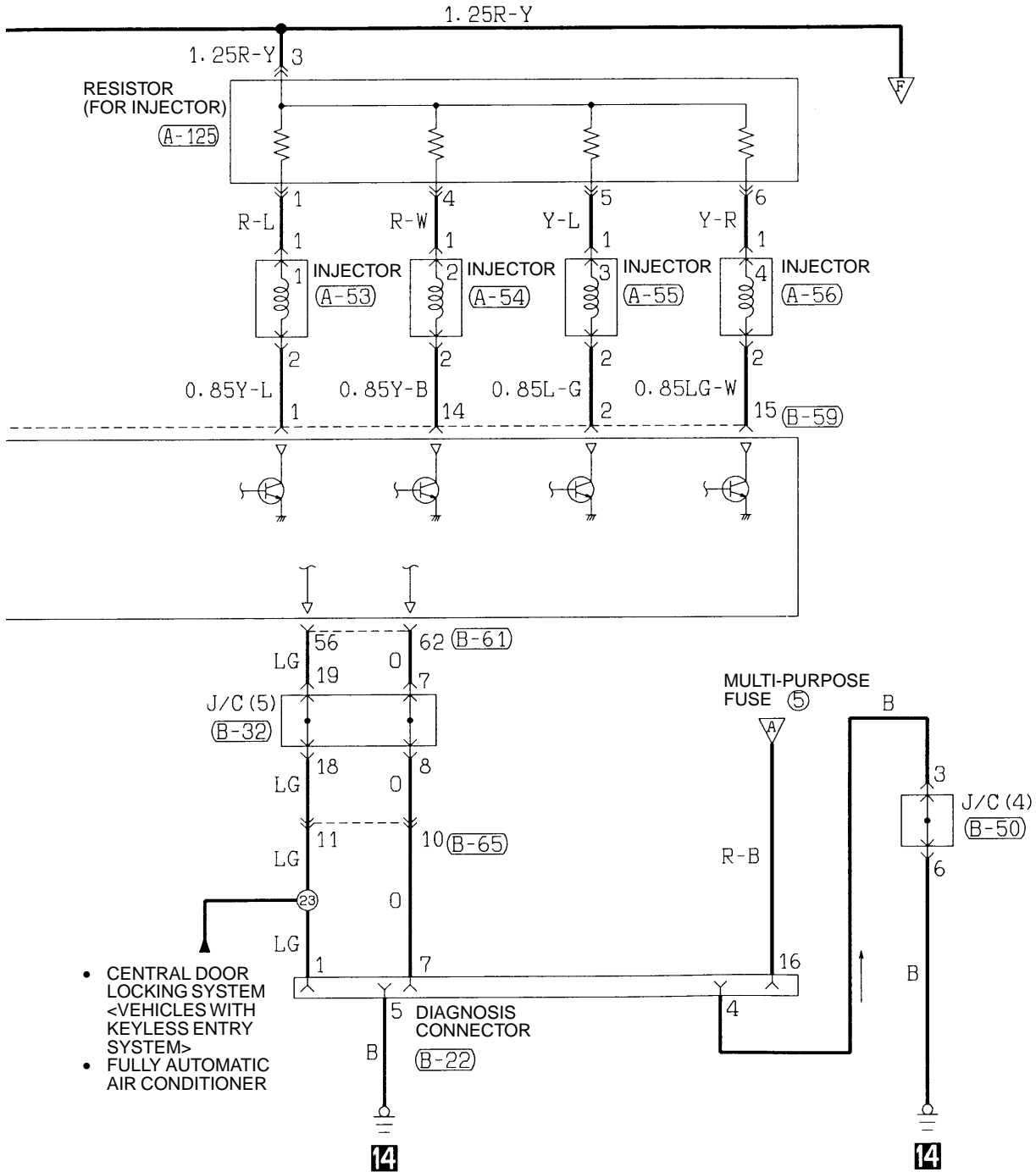
1	2	3	▽	4	5	6	7	
8	9	10	11	12	13	14	15	16

(B-76)

1	2	3	4
5	6	7	8







- CENTRAL DOOR LOCKING SYSTEM <VEHICLES WITH KEYLESS ENTRY SYSTEM>
- FULLY AUTOMATIC AIR CONDITIONER

(B-32)

1	2	3	4	5	6
7	8	9	10	11	12
13	14				

(B-50)

1	2	3	4	5	6	7	8	9	10	11	12	13
14	15	16	17	18	19	20	21	22	23	24	25	26

(B-61)

51	52	53	54	55	56
57	58	59	60	61	62

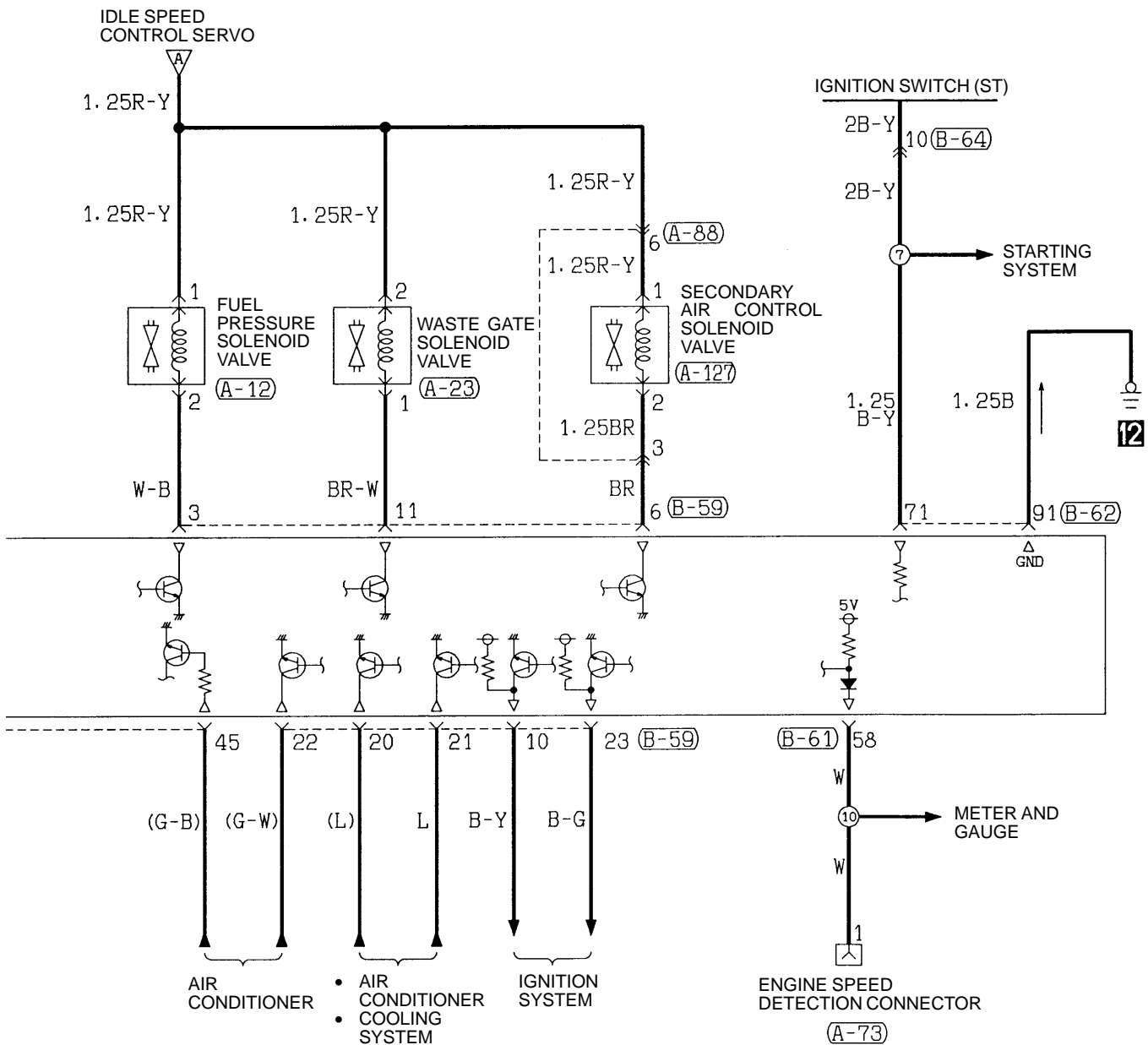
(B-62)

71	72	73	74	75	76	77	78	79	80	81
82	83	84	85	86	87	88	89	90	91	92

(B-65)

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16					





(B-59)

1	2	3	4	5	6	7	8	9	10	11	12	13
14	15	16	17	18	19	20	21	22	23	24	25	26

(B-60)

31	32	33	34	35	36	37	38
39	40	41	42	43	44	45	46

(B-61)

51	52	53	54	55	56
57	58	59	60	61	62

(B-62)

71	72	73	74	75	76	77	78	79	80	81
82	83	84	85	86	87	88	89	90	91	92

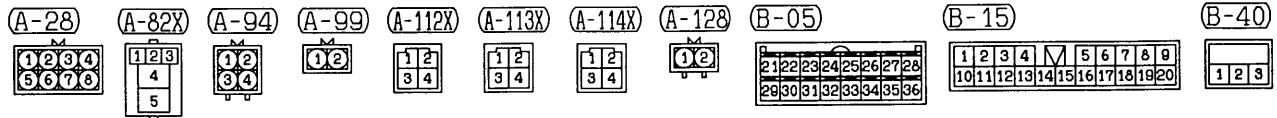
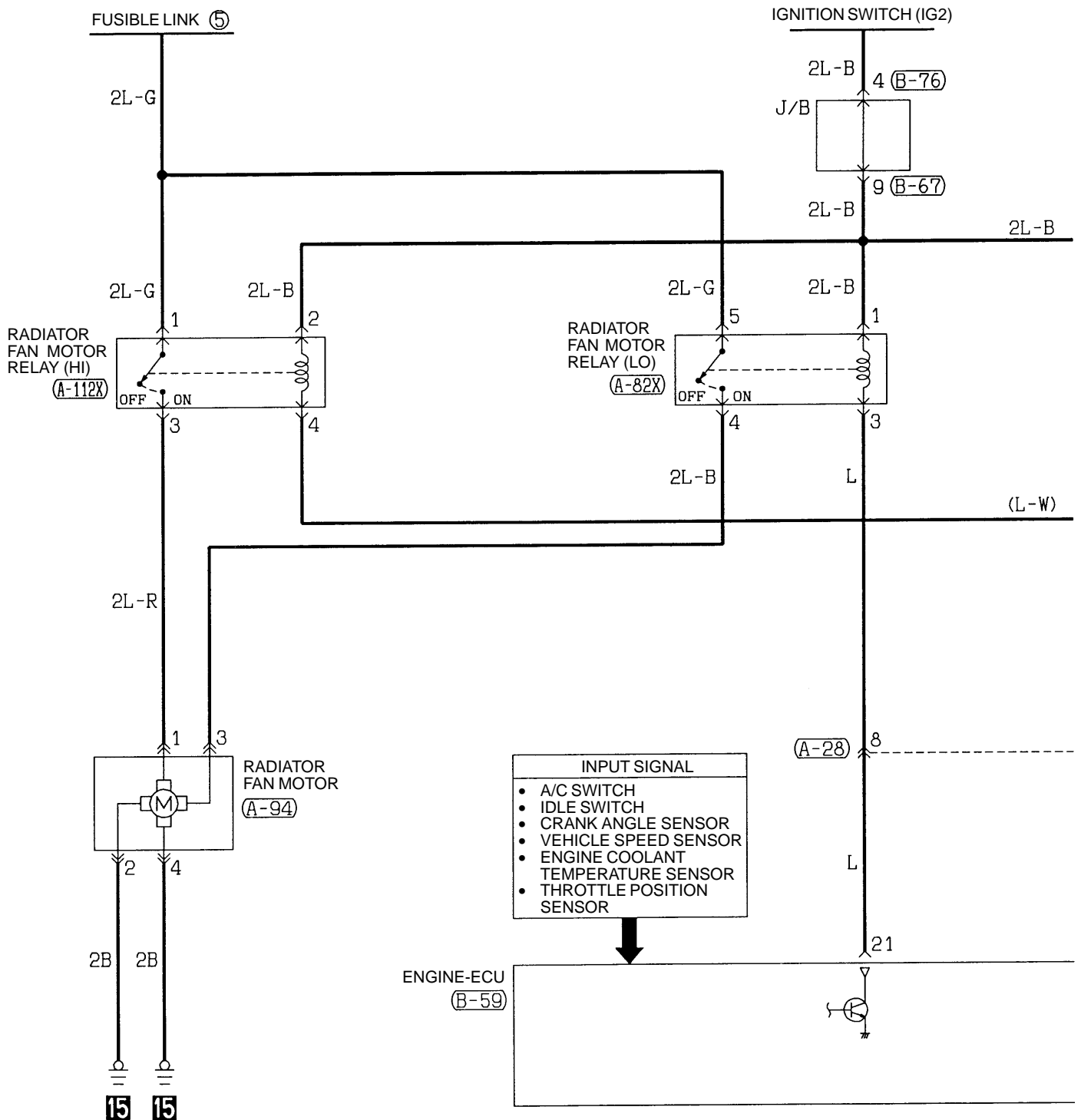
(B-64)

1	2	3	▽	4	5	6
7	8	9	10	11	12	13

(B-65)

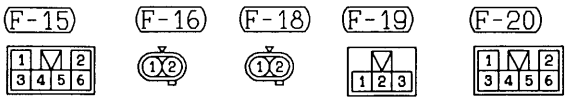
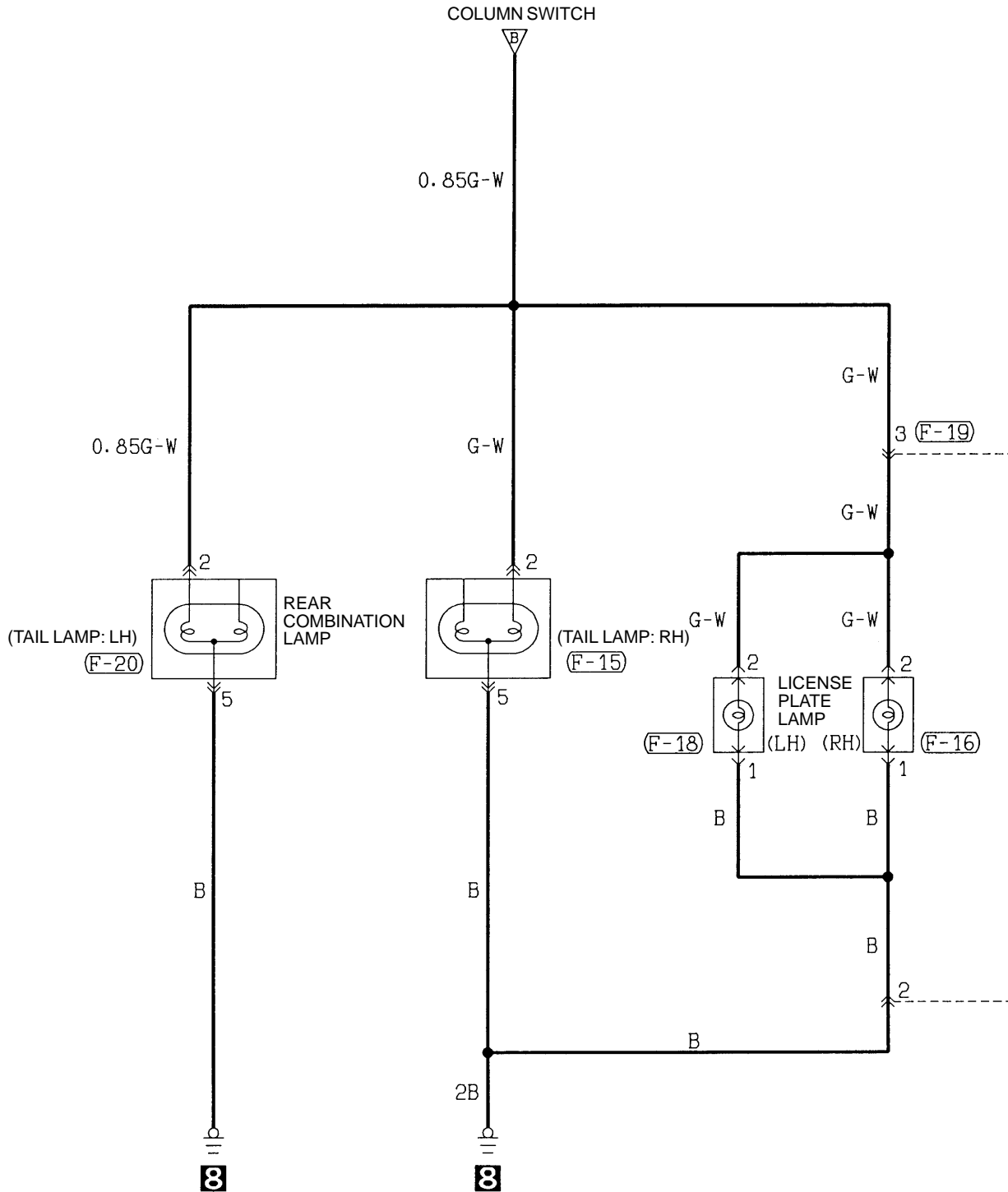
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8	9	10	11	12	13	14	15	16

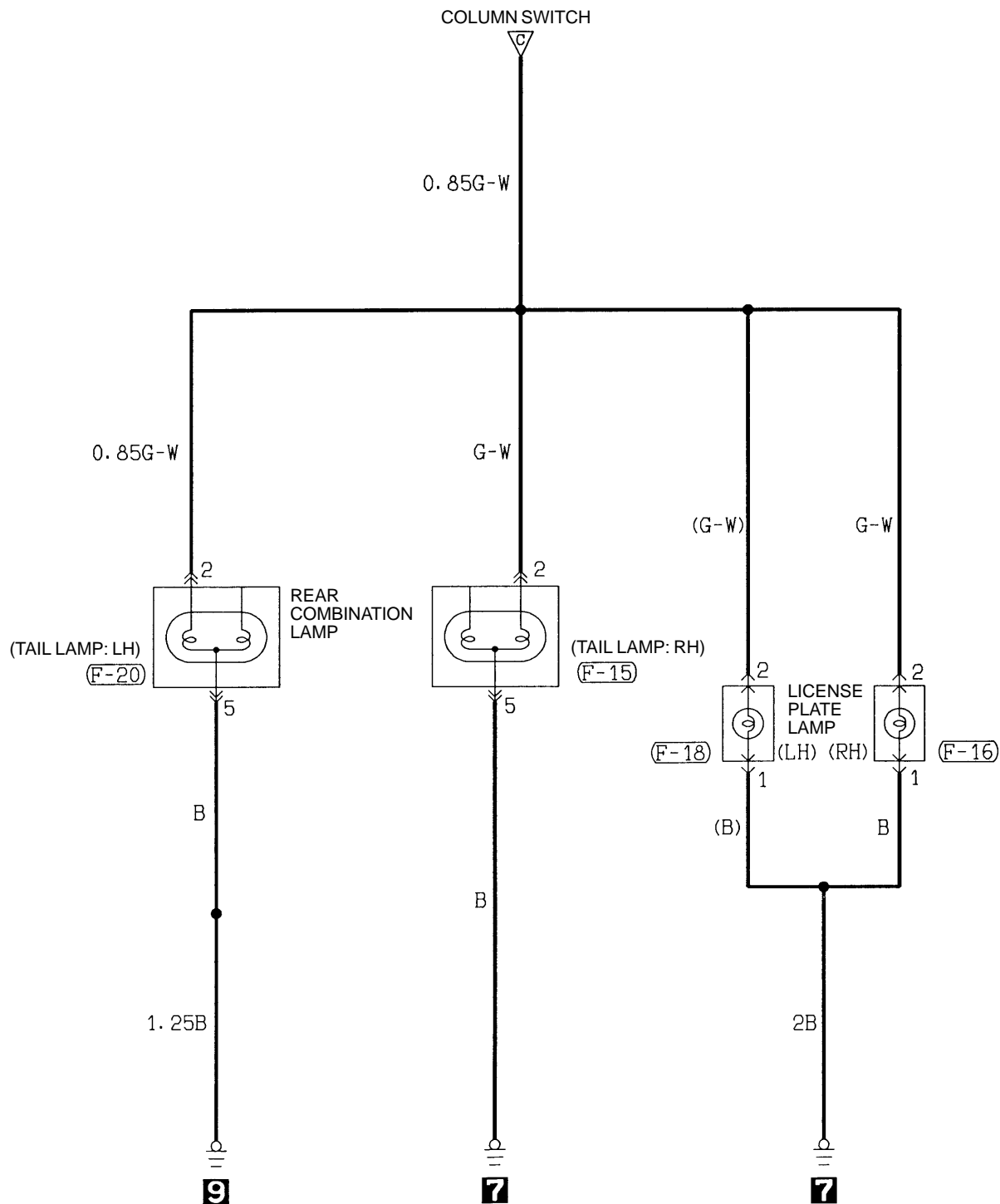
COOLING SYSTEM



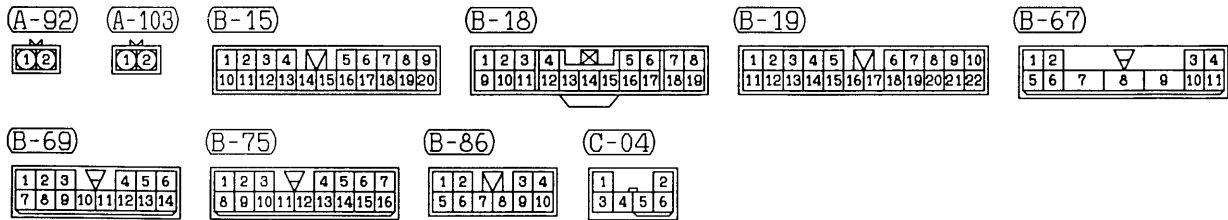
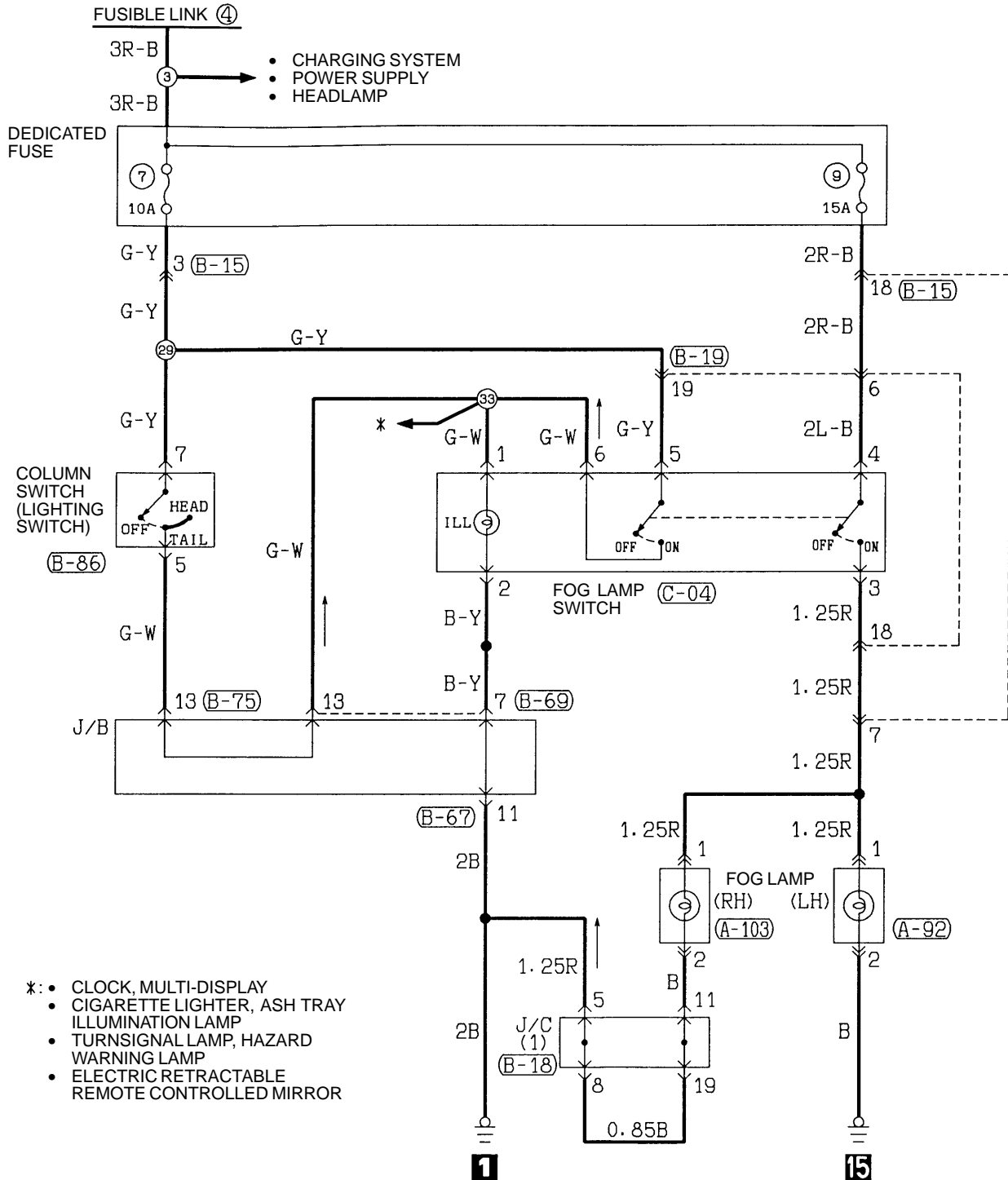


# TAIL LAMP, POSITION LAMP, LICENSE PLATE LAMP AND LIGHTING MONITOR ALARM BUZZER





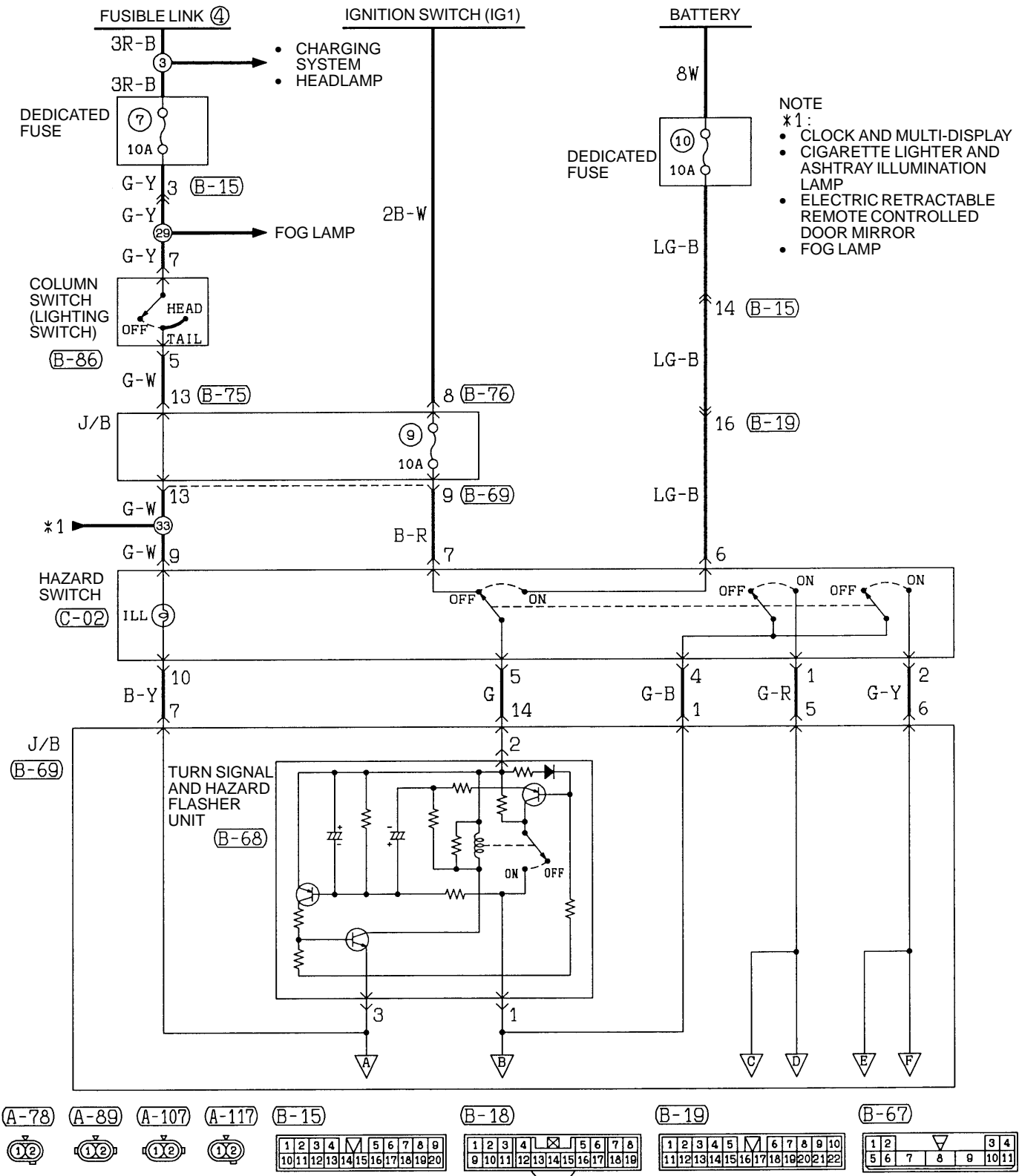
FOG LAMP

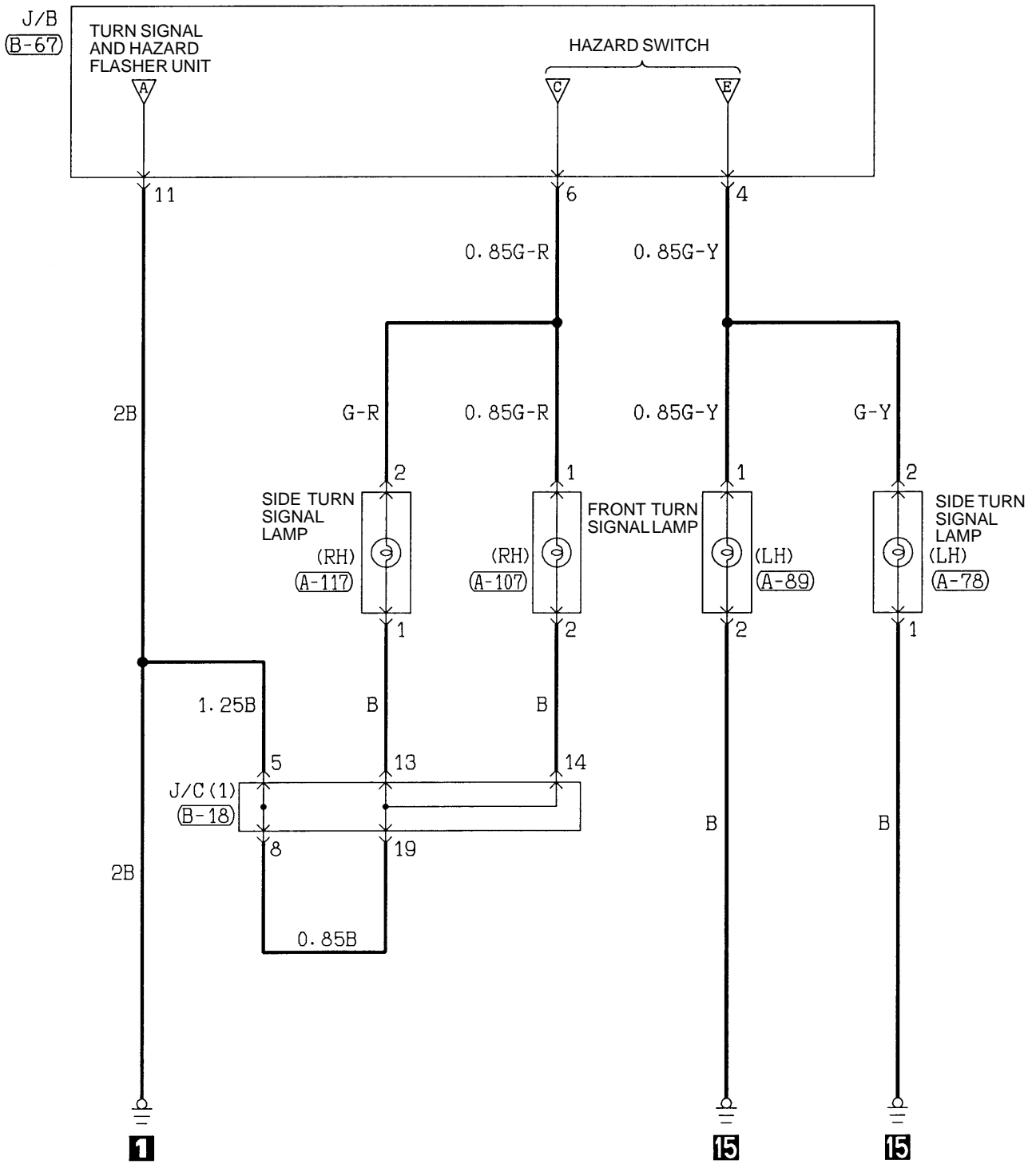






TURN-SIGNAL LAMP AND HAZARD LAMP





(B-68)

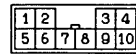
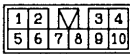
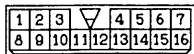
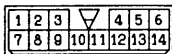
(B-69)

(B-75)

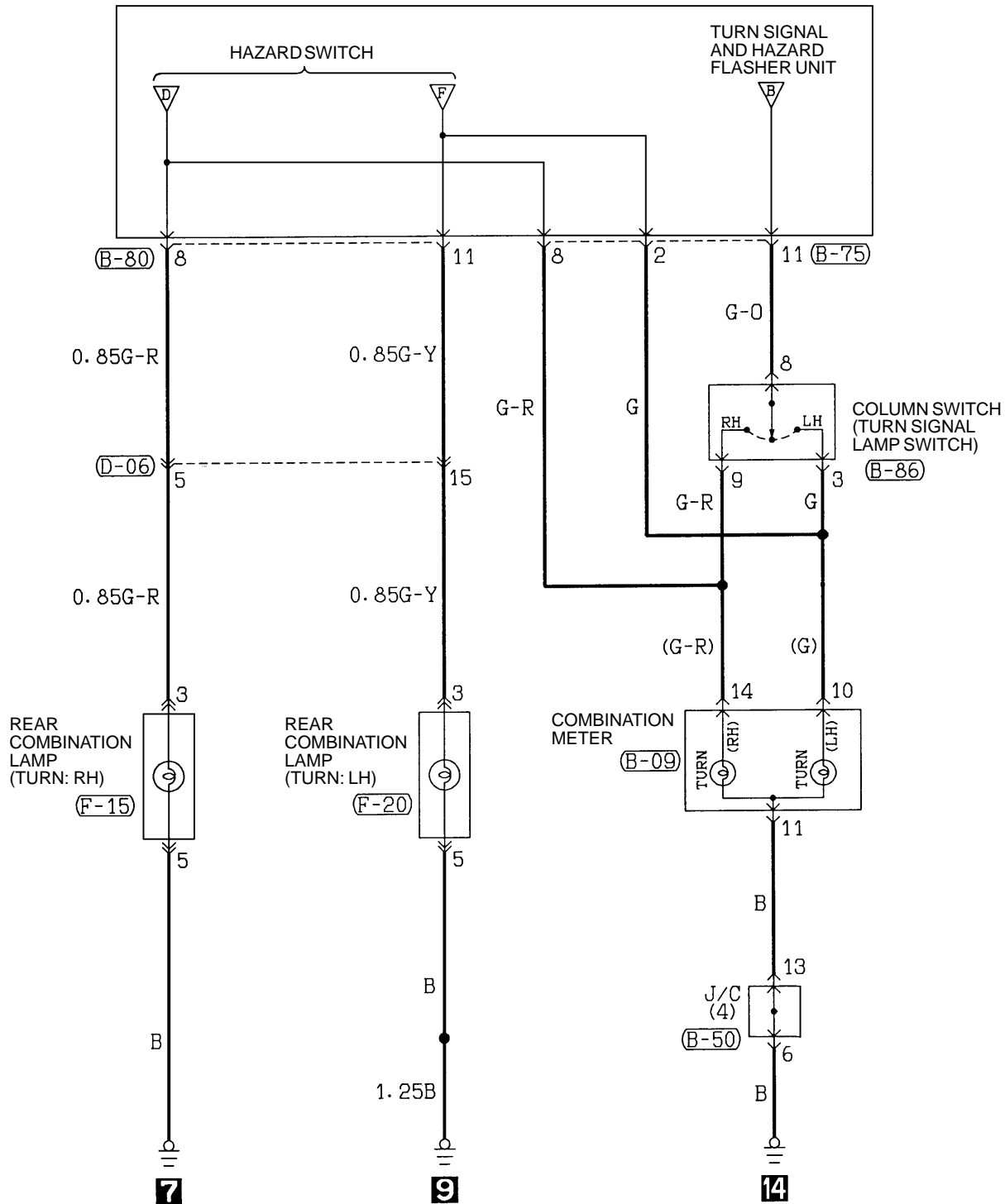
(B-76)

(B-86)

(C-02)



TURN-SIGNAL LAMP AND HAZARD LAMP (CONTINUED)



(B-09)

1	2	3	4	5	6	7	8	9	10	11	12
									13		
14	15	16	17	18	19	20	21	22	23	24	25

(B-50)

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18

(B-75)

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21

(B-80)

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18

(B-86)

1	2	3	4
5	6	7	8
9	10	11	12

(D-06)

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30

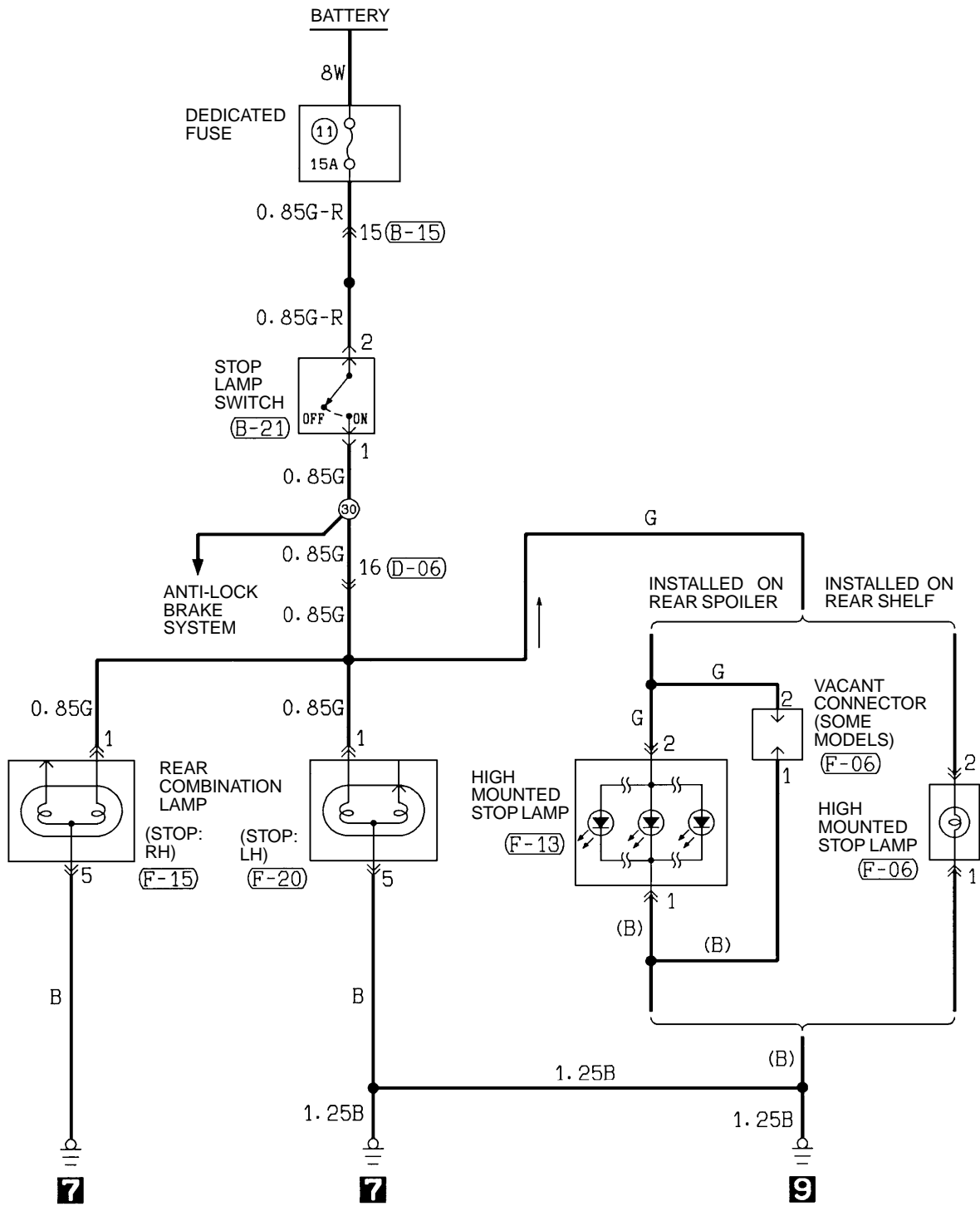
(F-15)

1	2
3	4
5	6

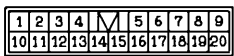
(F-20)

1	2
3	4
5	6

STOP LAMP



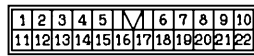
(B-15)



(B-21)



(D-06)



(F-06)



(F-13)



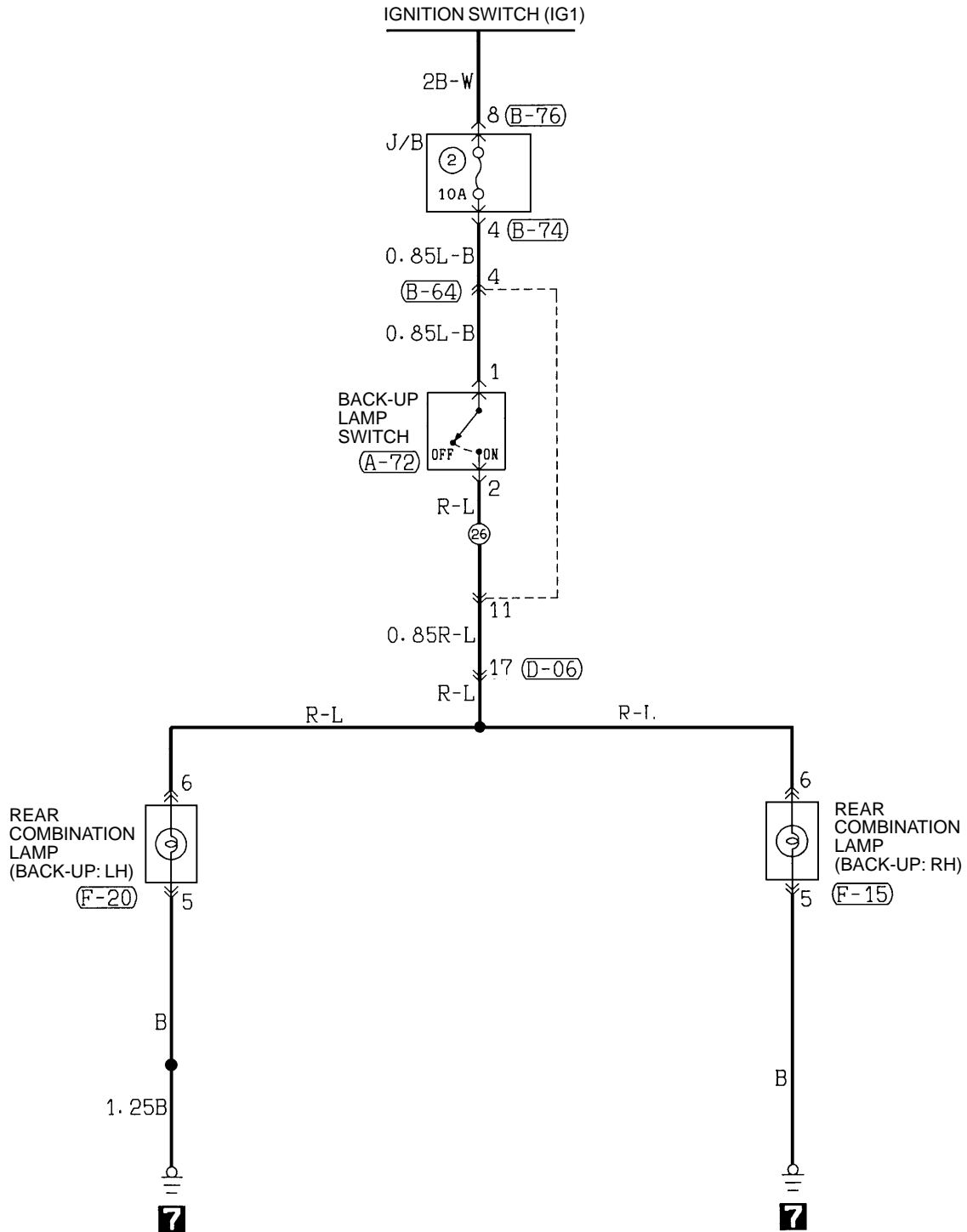
(F-15)



(F-20)



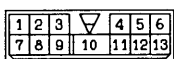
# BACK-UP LAMP



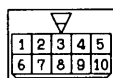
(A-72)



(B-64)



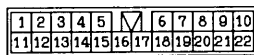
(B-74)



(B-76)



(D-06)



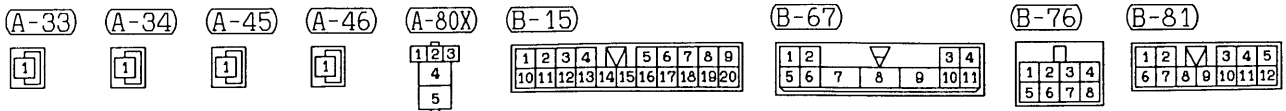
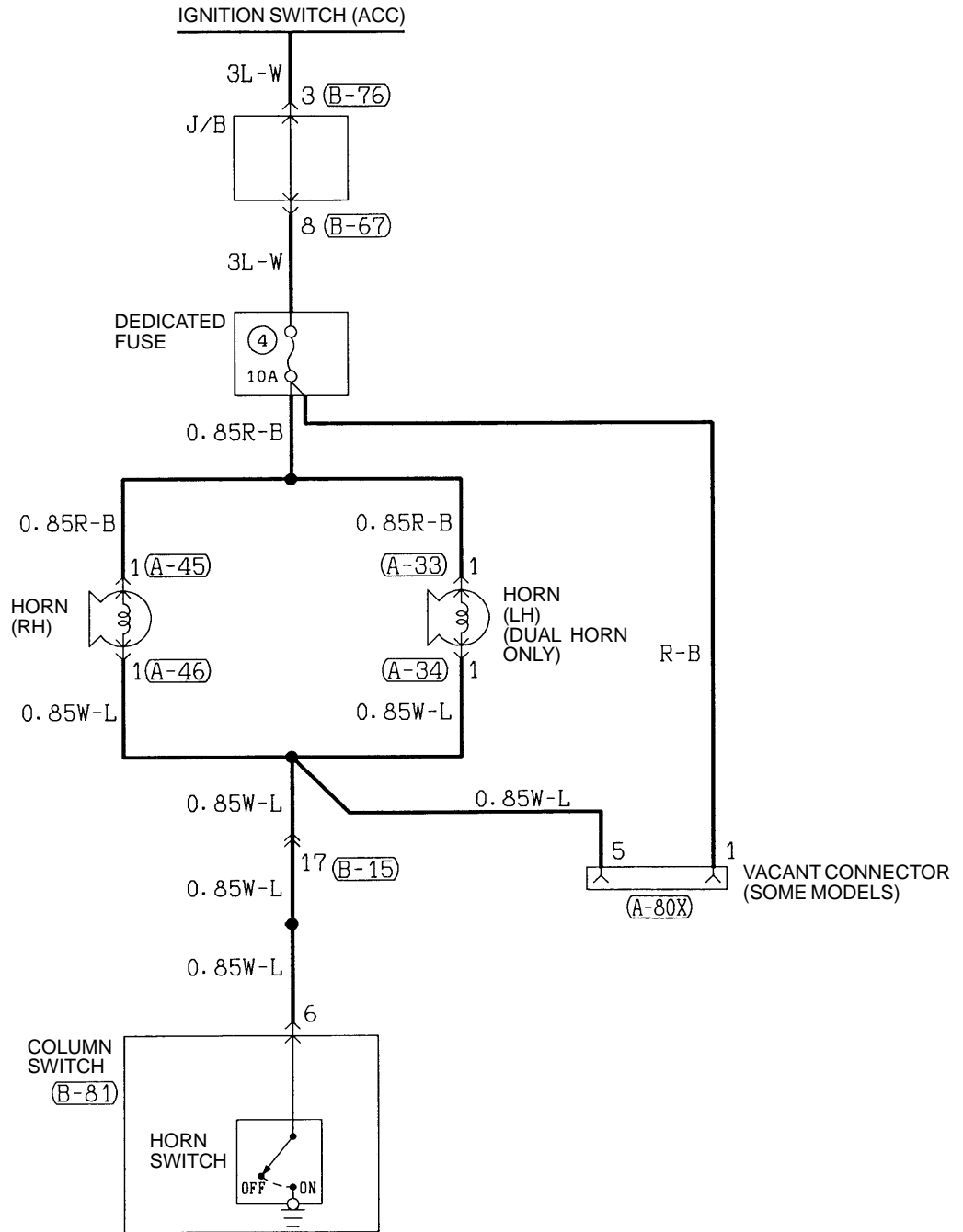
(F-15)



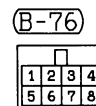
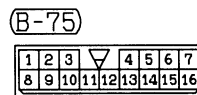
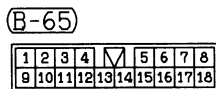
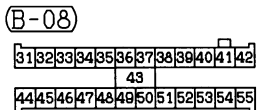
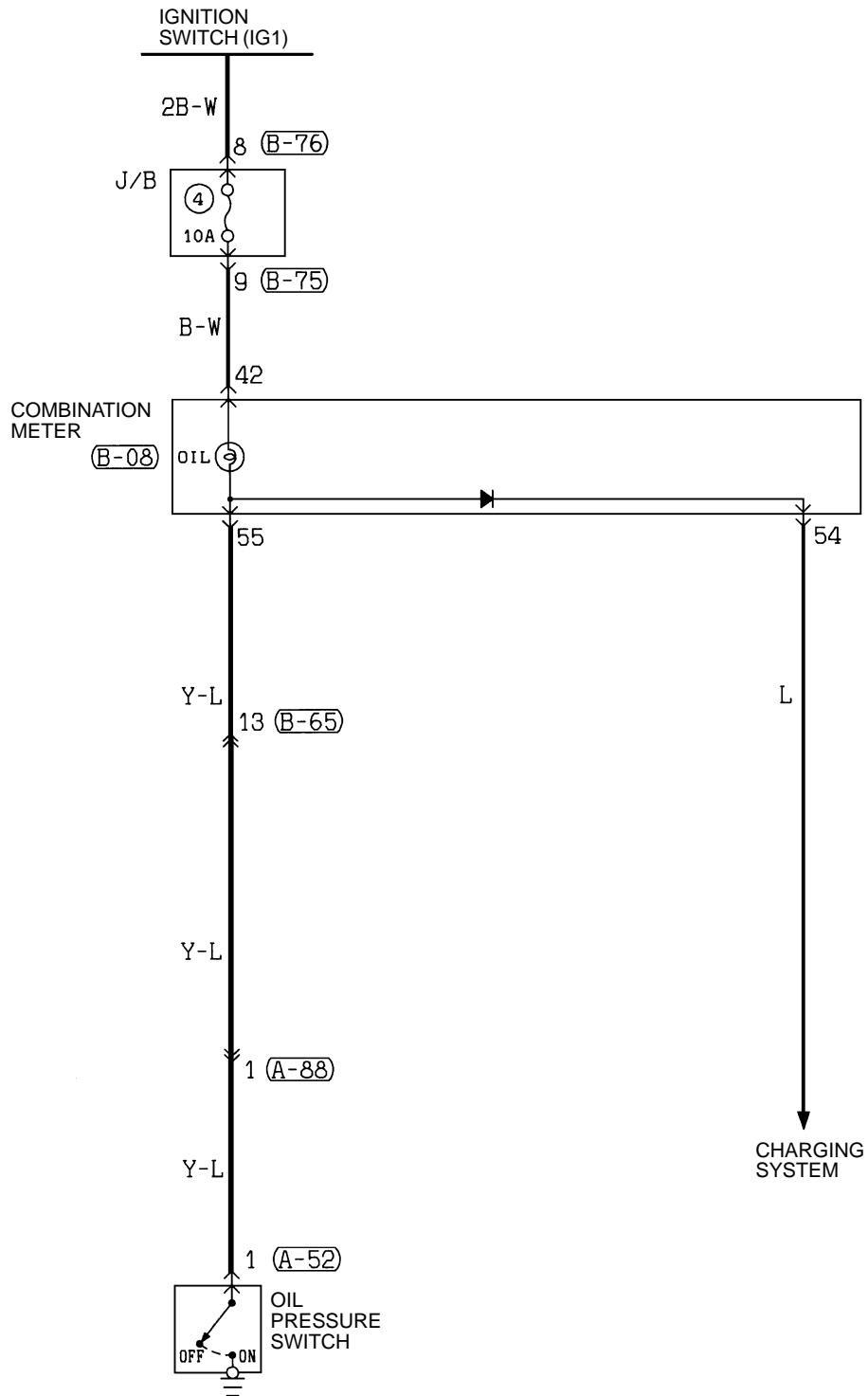
(F-20)



**HORN <VEHICLES WITHOUT SRS AIR BAG>**



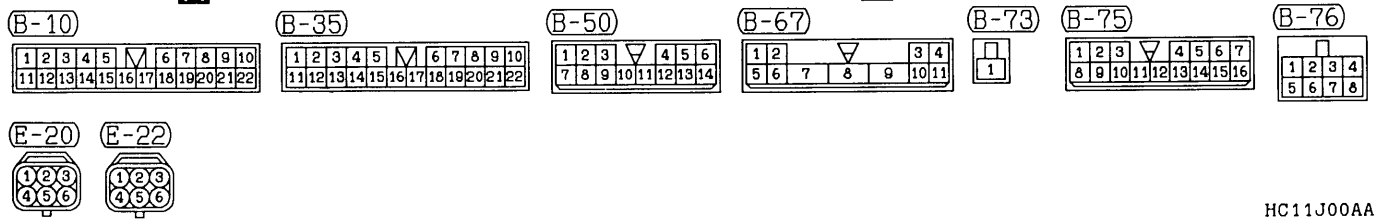
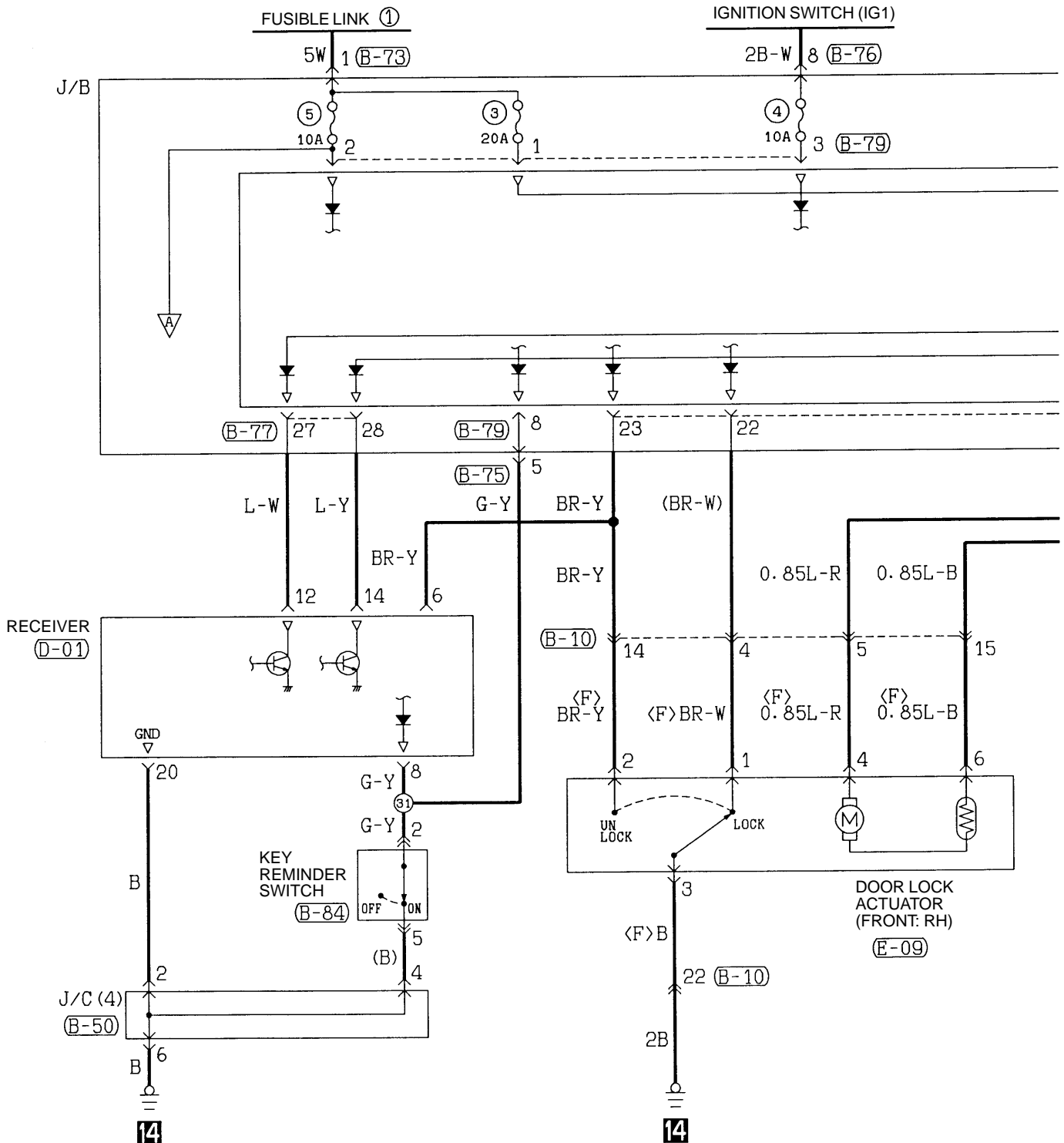
OIL PRESSURE WARNING LAMP

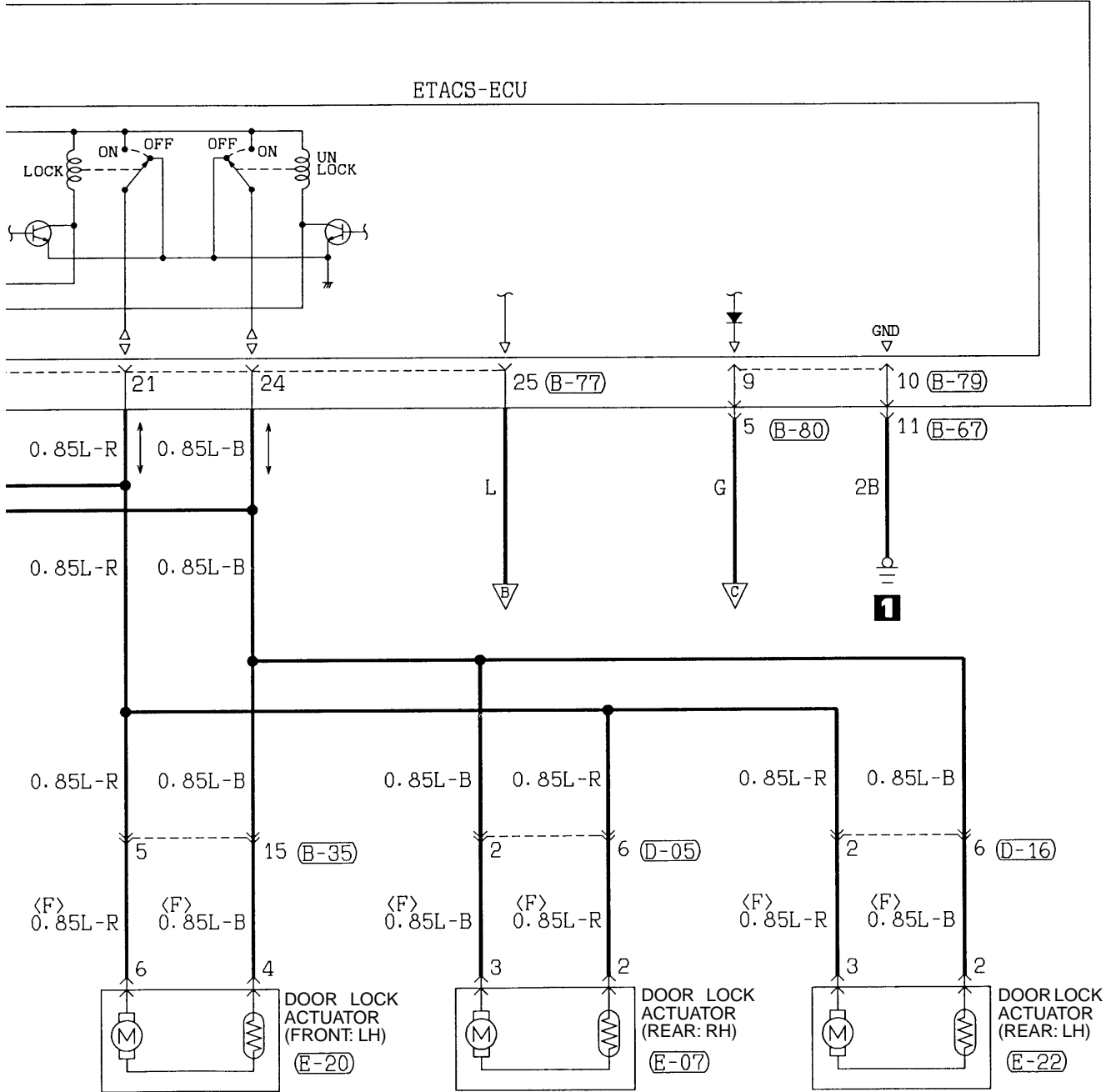




NOTES

**CENTRAL DOOR LOCKING SYSTEM <VEHICLES WITH KEYLESS ENTRY SYSTEM>**





(B-77)

21	22	23
24	25	26
27	28	

(B-79)

1	2	3	4	5	6	7	8	9	10	11	12
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(B-80)

1	2	3	4	5	6
7	8	9	10	11	12
13					

(B-84)

1	2	3	4	5
6	7	8	9	10

(D-01)

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20

(D-05)

1	M	2
3	4	5
6		

(D-16)

1	M	2
3	4	5
6		

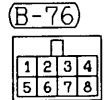
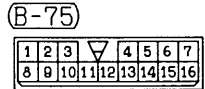
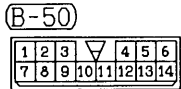
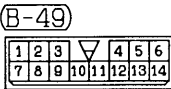
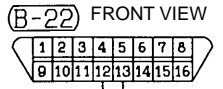
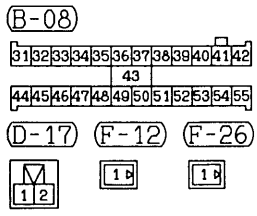
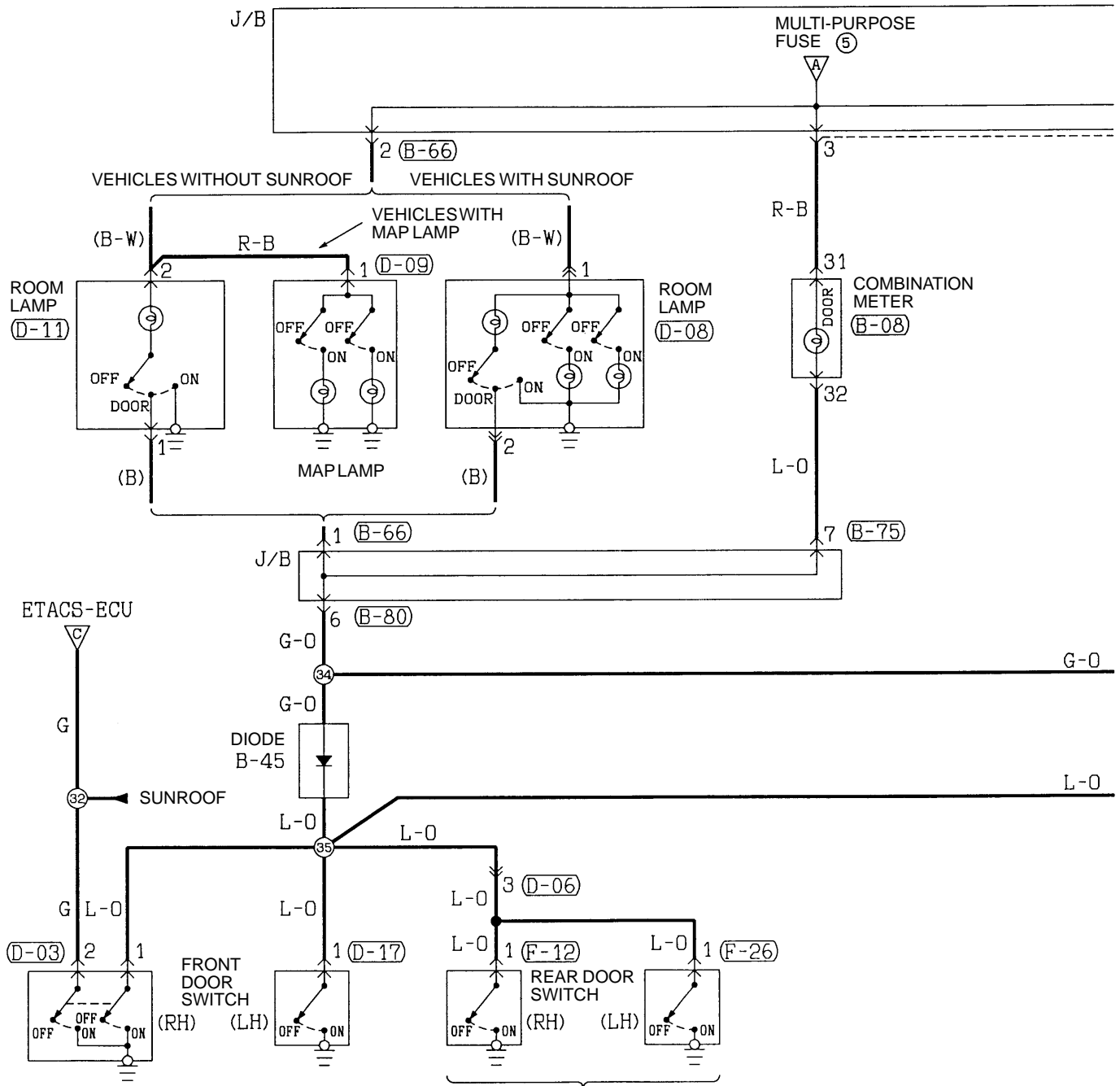
(E-07)

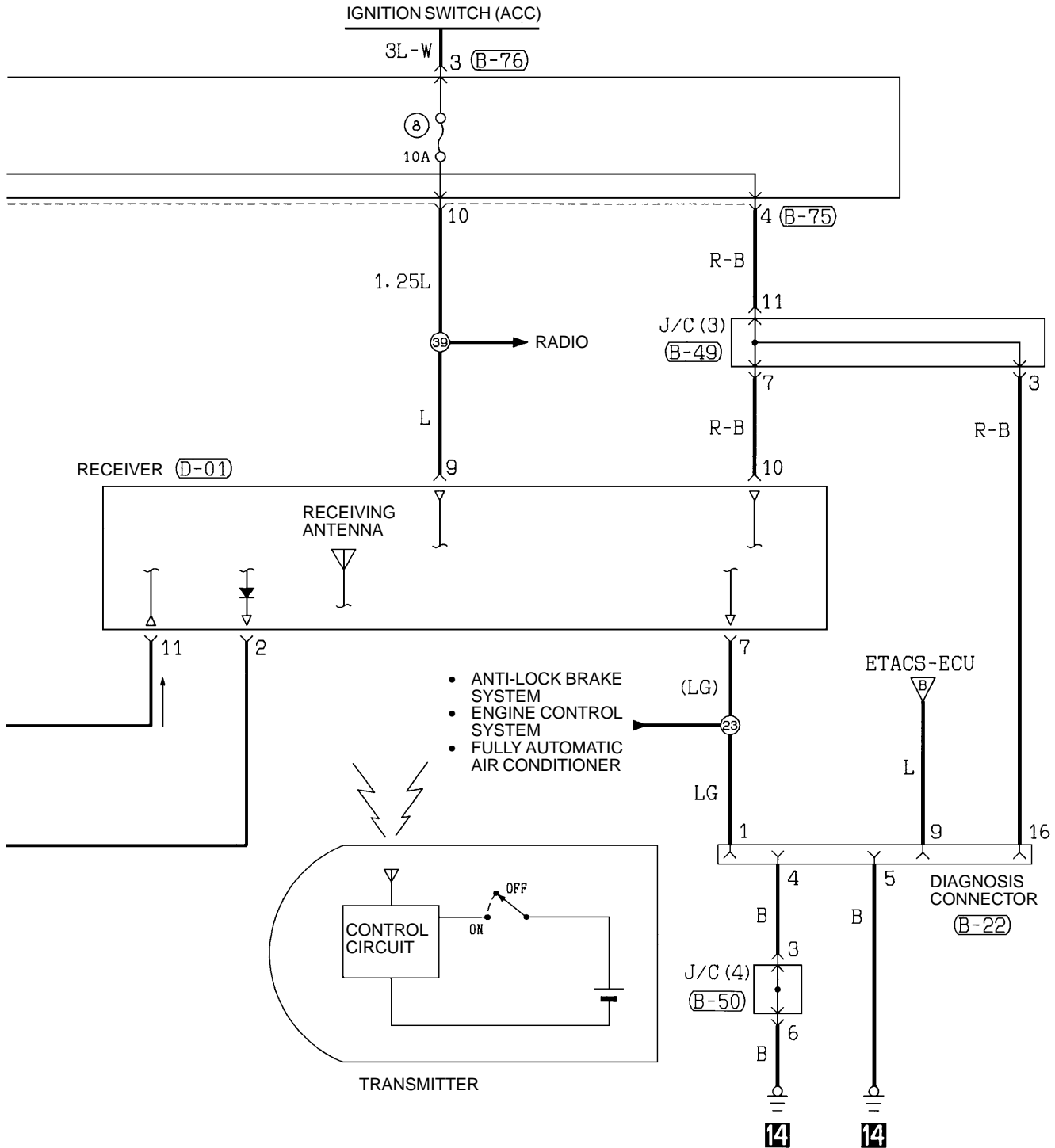
1	2	3
4	5	6

(E-09)

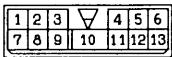
1	2	3
4	5	6

CENTRAL DOOR LOCKING SYSTEM <VEHICLES WITH KEYLESS ENTRY SYSTEM> (CONTINUED)

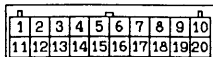




(B-80)



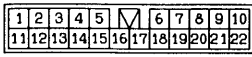
(D-01)



(D-03)



(D-06)



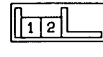
(D-08)



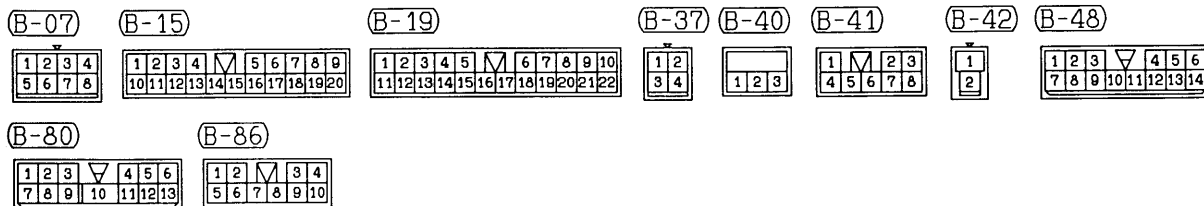
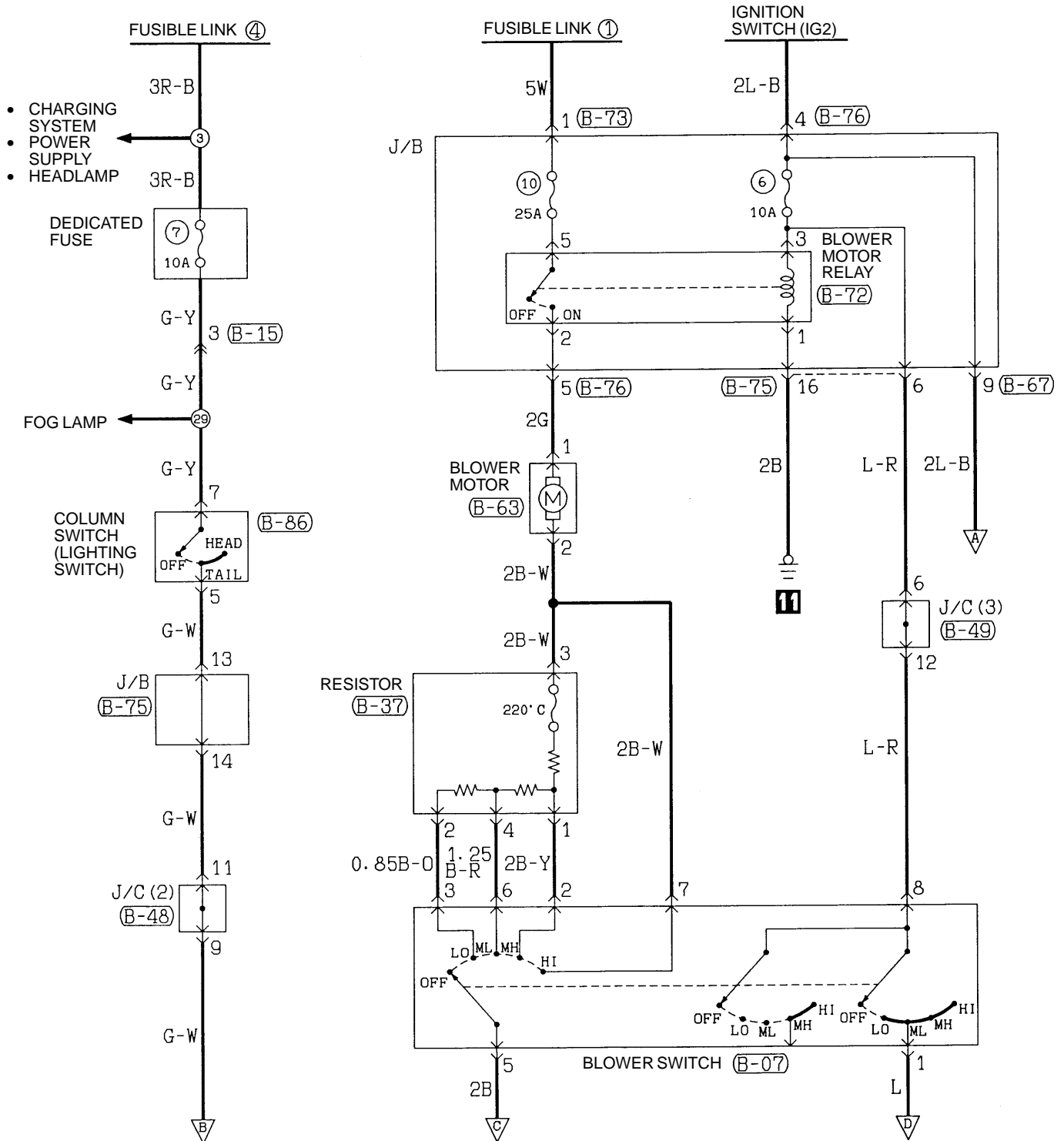
(D-09)

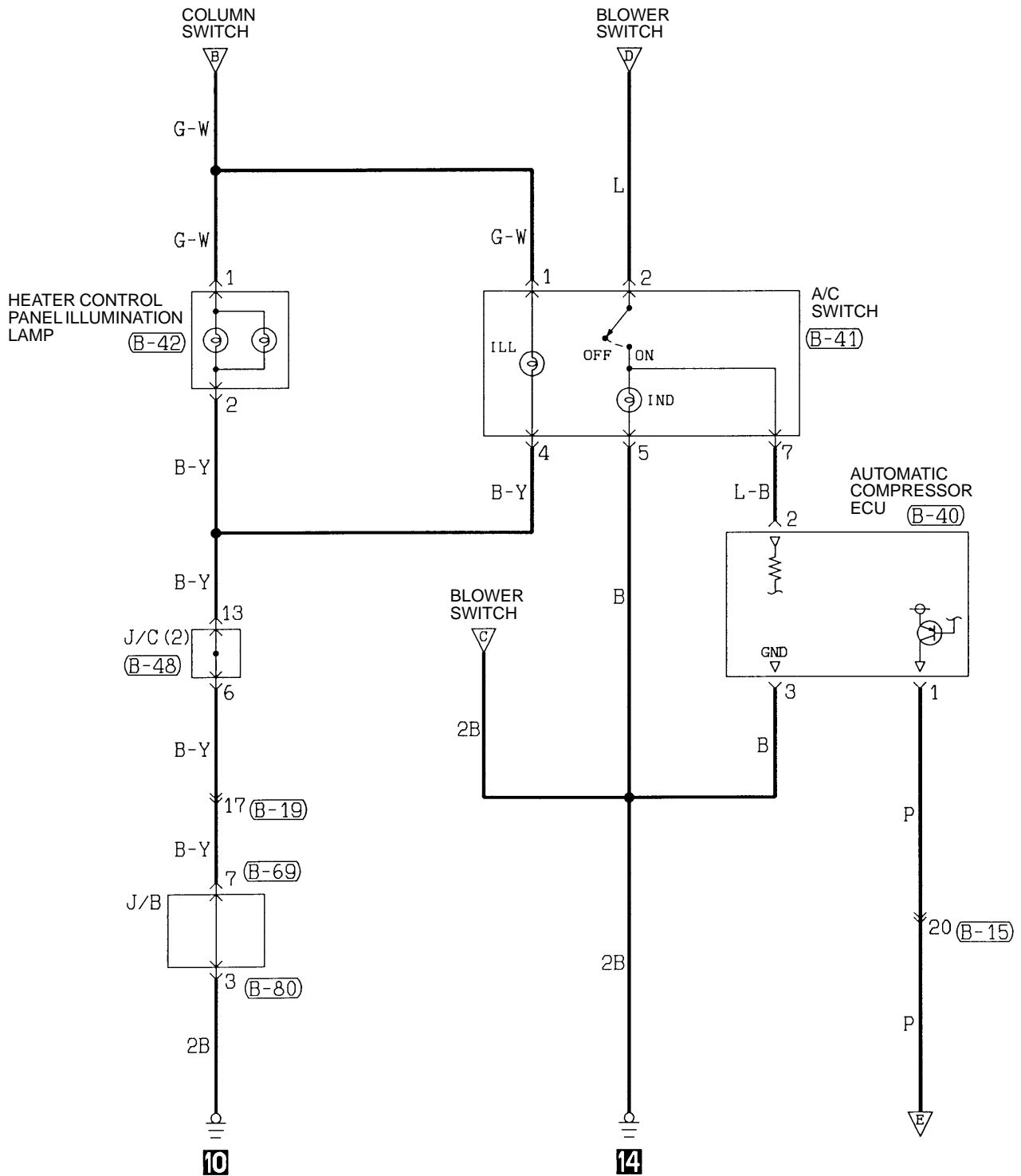


(D-11)

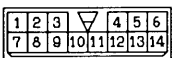


HEATER AND MANUAL AIR CONDITIONER





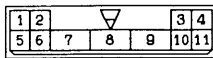
(B-49)



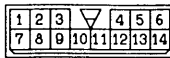
(B-63)



(B-67)



(B-69)



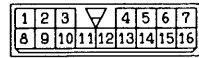
(B-72)



(B-73)



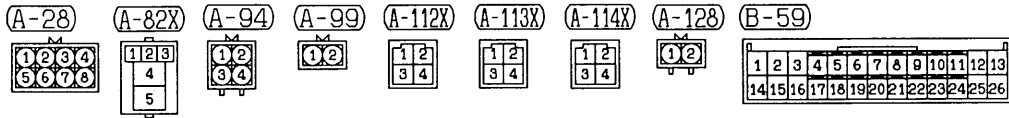
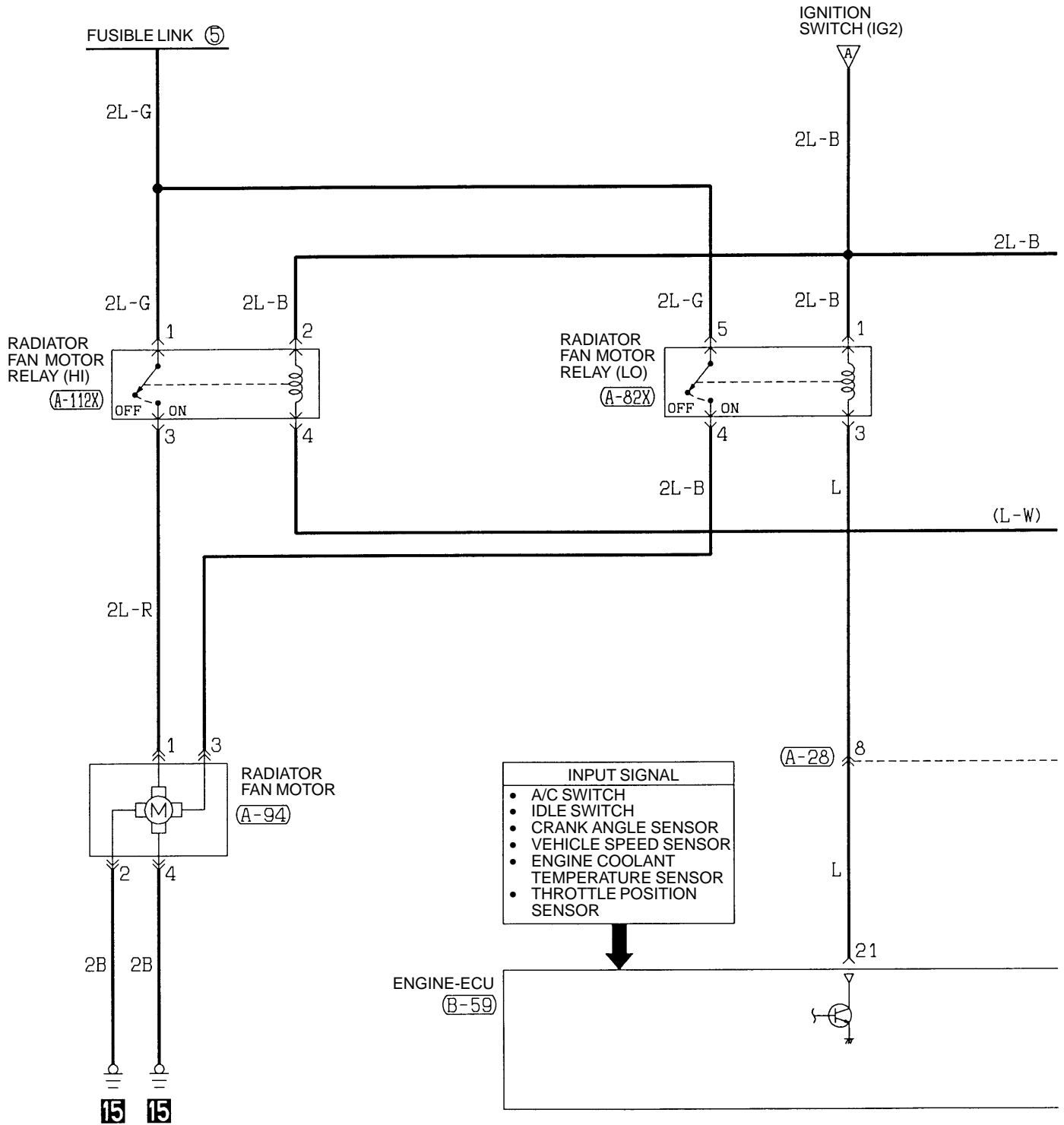
(B-75)



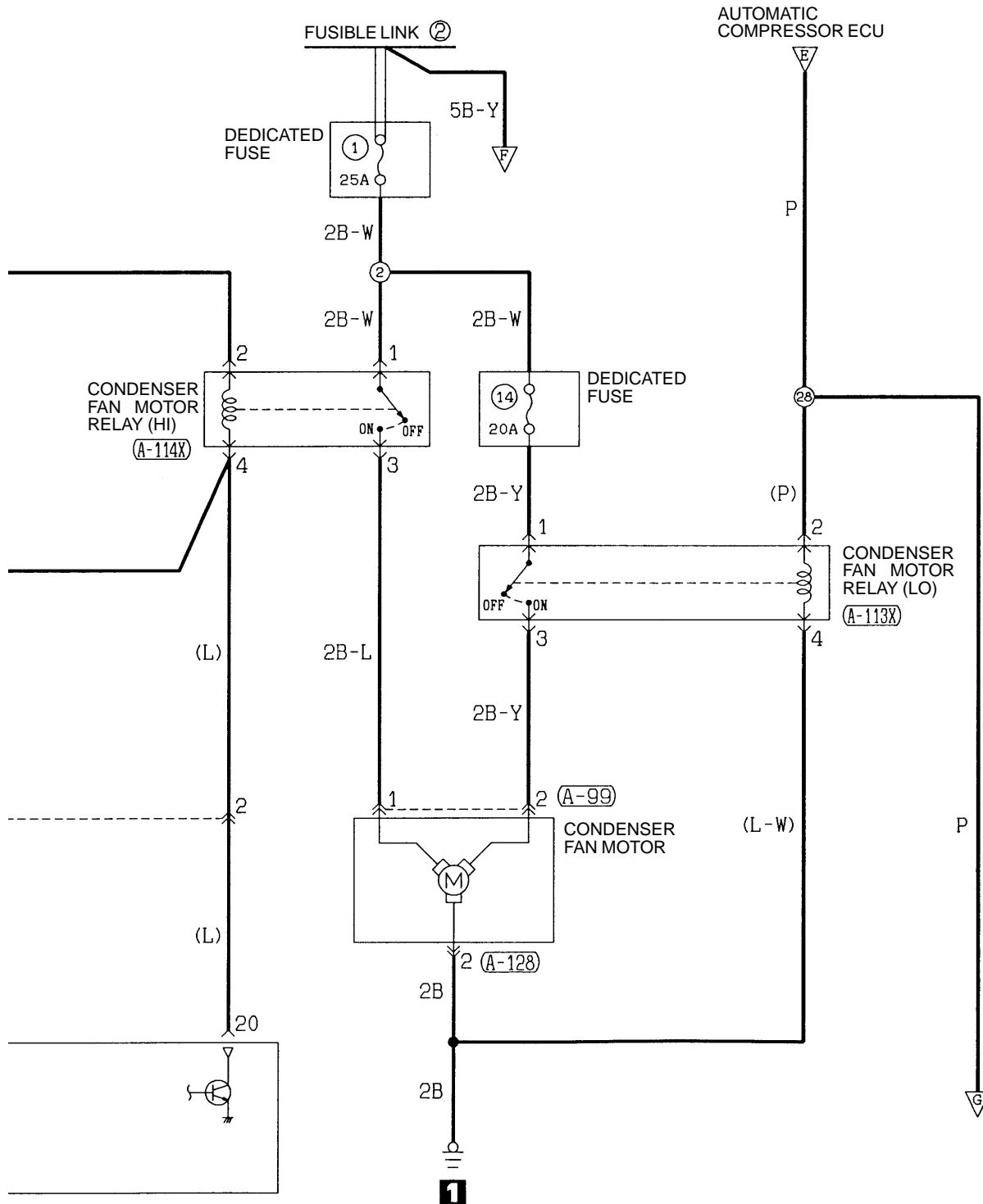
(B-76)



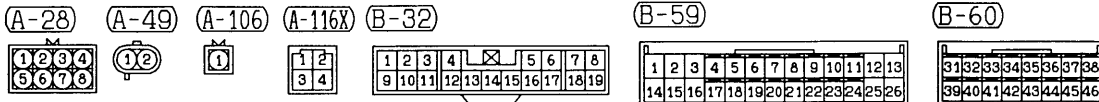
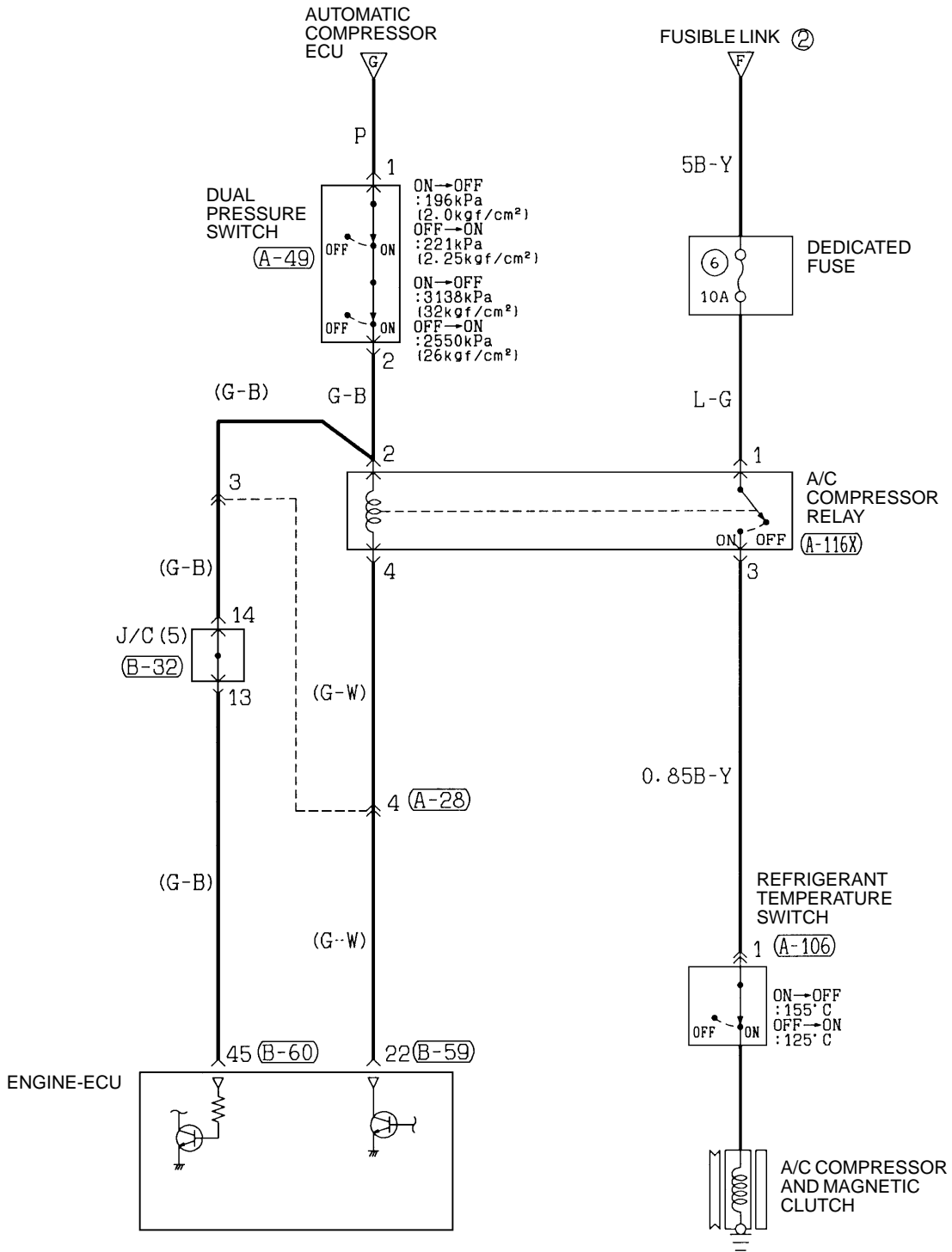
HEATER AND MANUAL AIR CONDITIONER (CONTINUED)





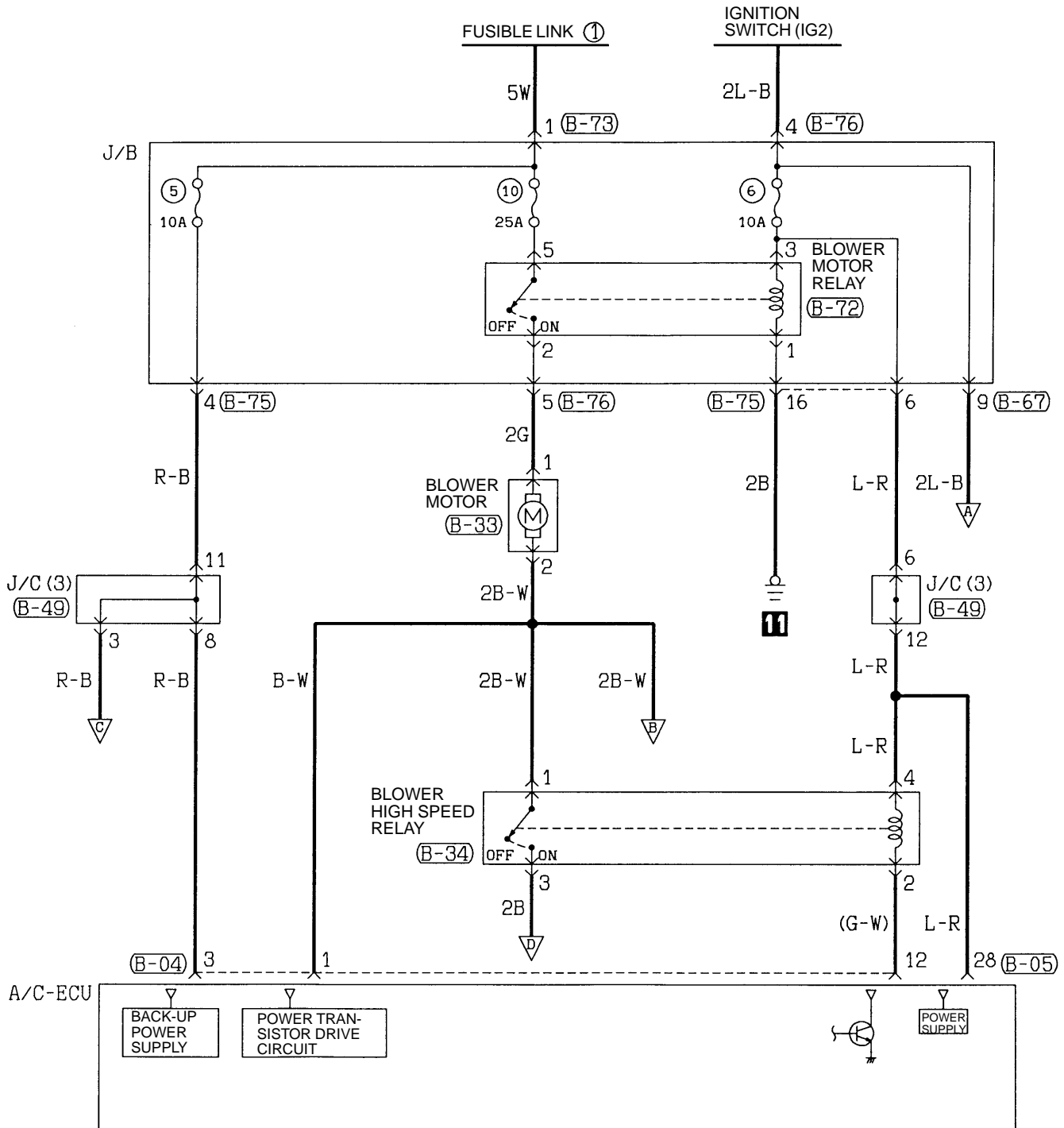


HEATER AND MANUAL AIR CONDITIONER (CONTINUED)

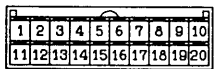


NOTES

FULLY AUTOMATIC AIR CONDITIONER



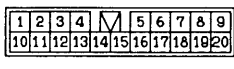
(B-04)



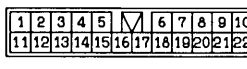
(B-05)



(B-15)



(B-19)



(B-33)



(B-34)



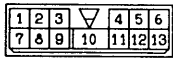
(B-37)



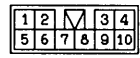
(B-39)

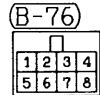
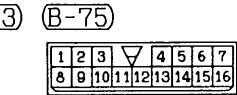
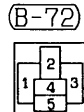
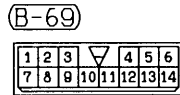
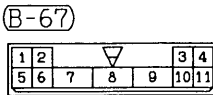
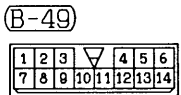
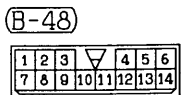
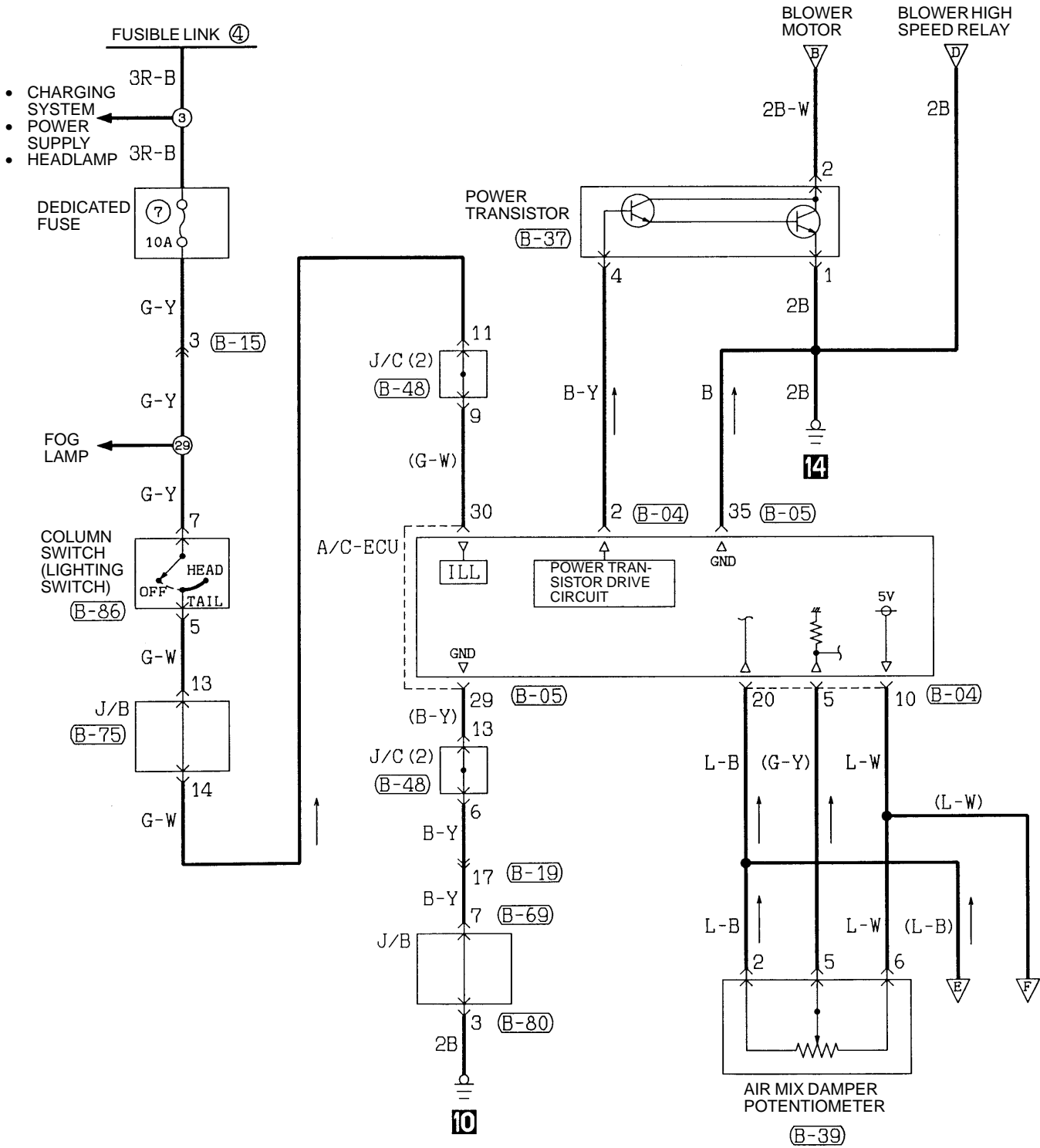


(B-80)

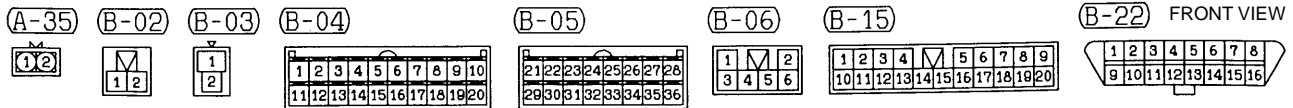
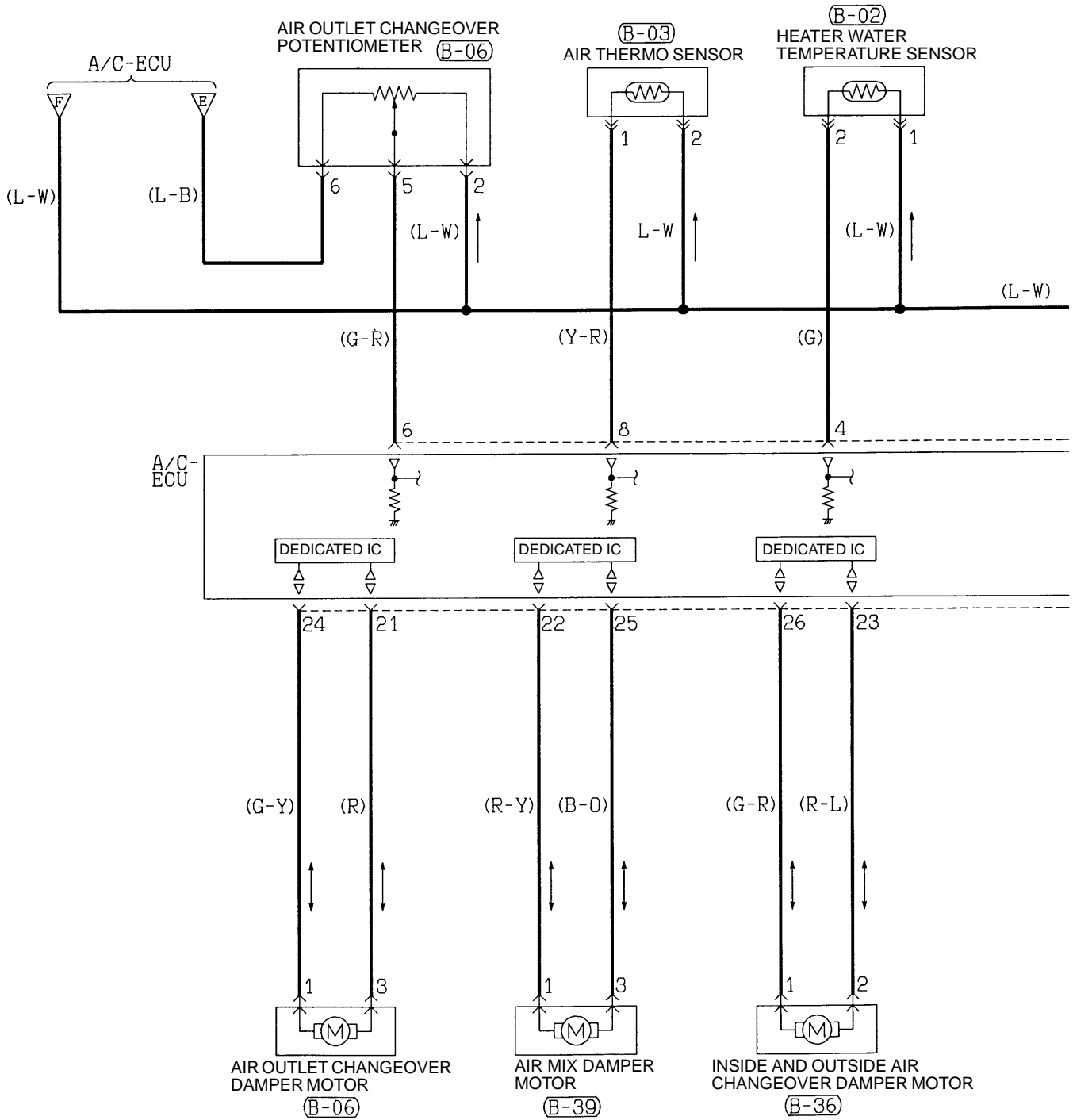


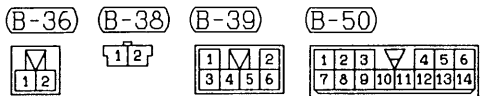
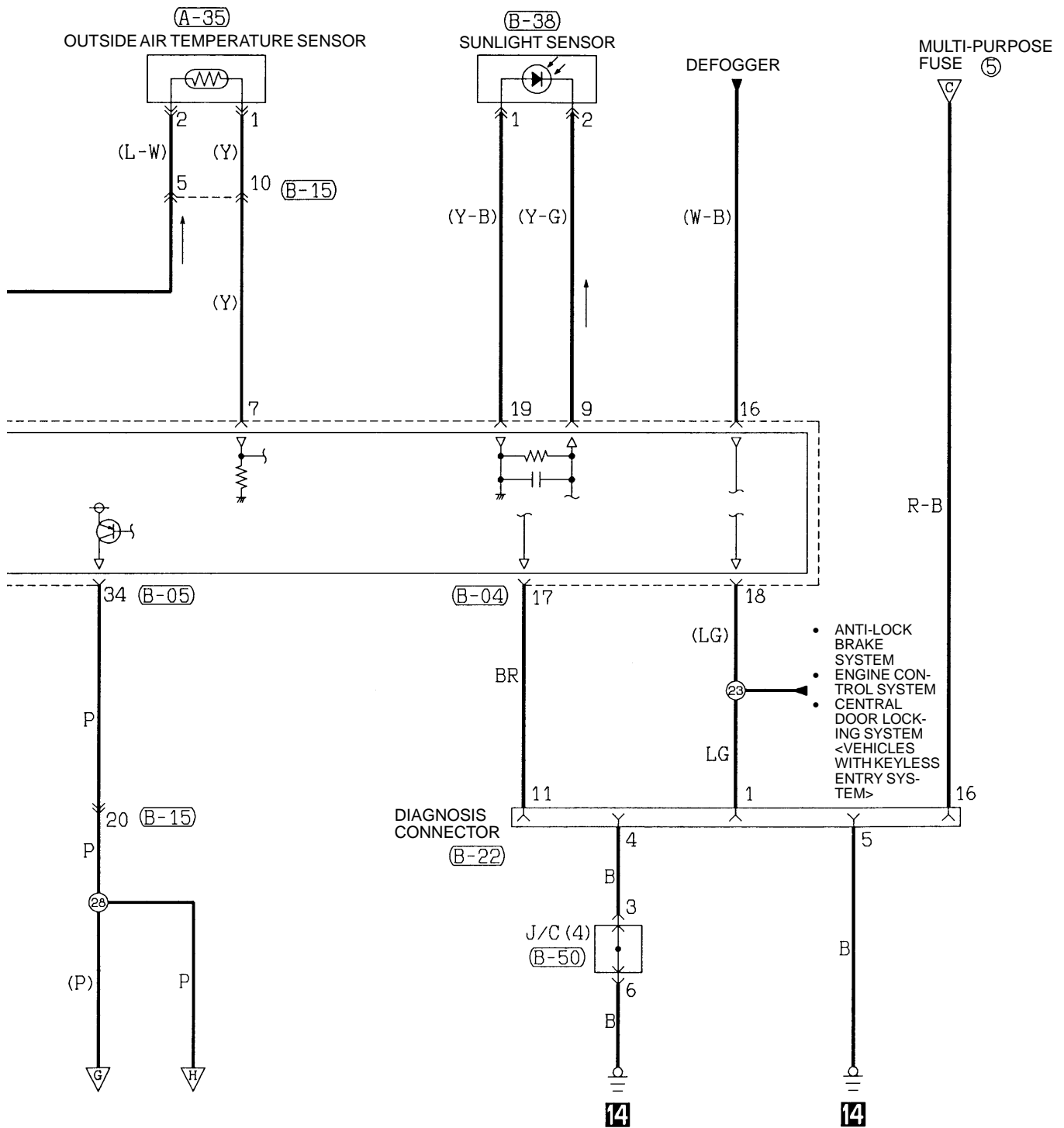
(B-86)



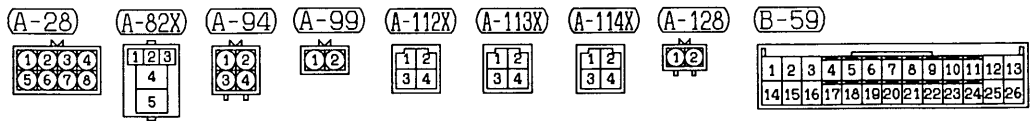
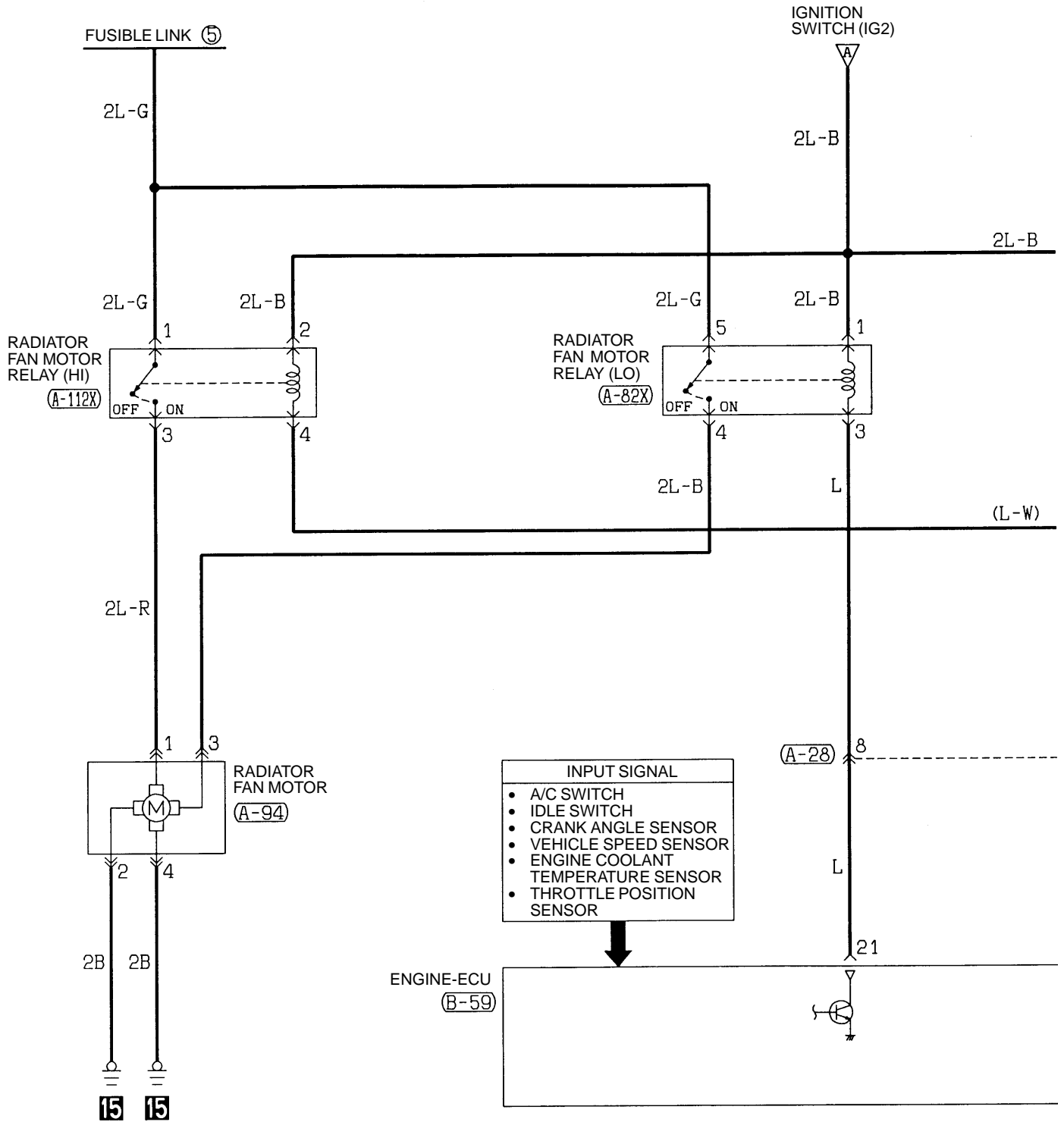


FULLY AUTOMATIC AIR CONDITIONER (CONTINUED)

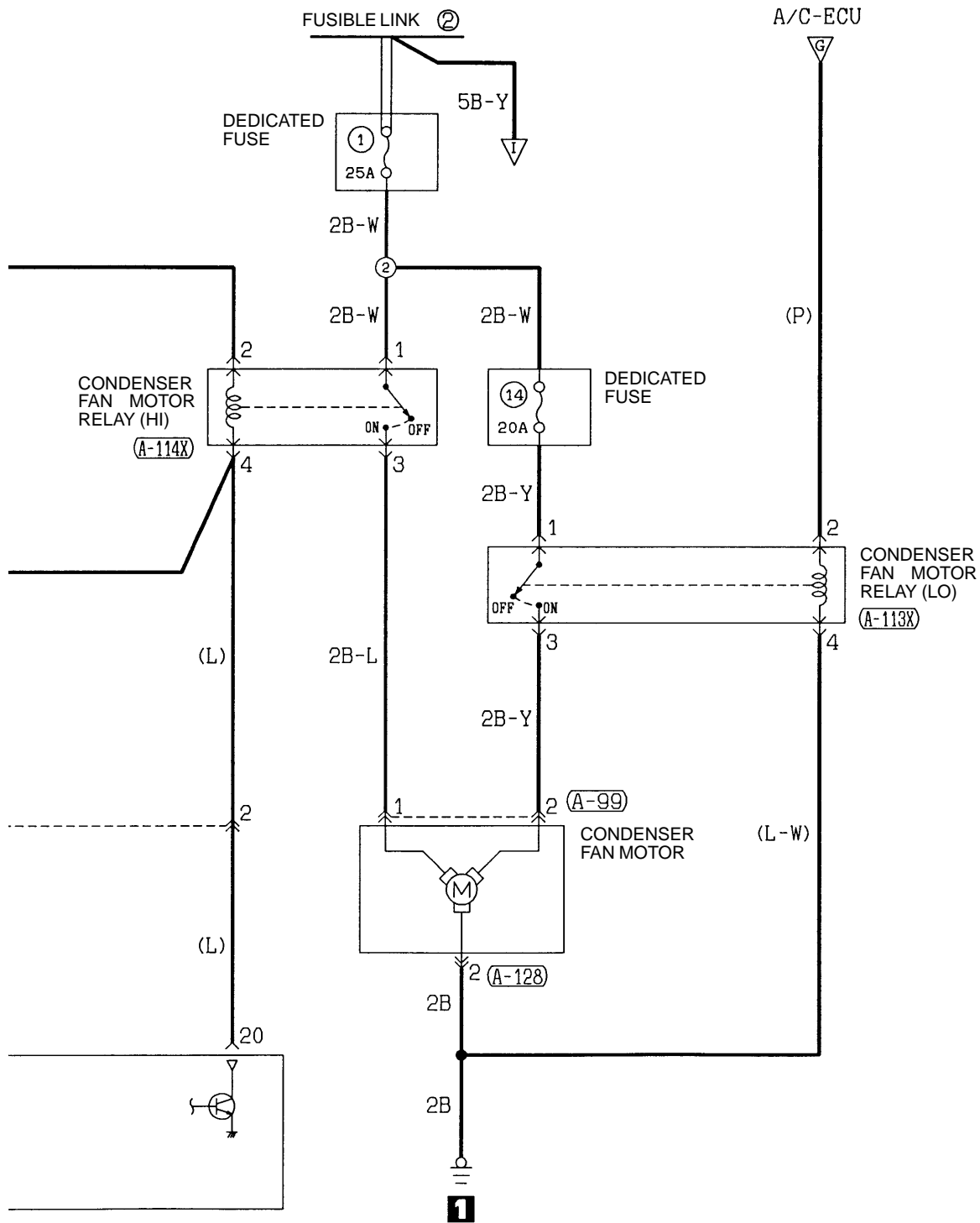




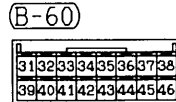
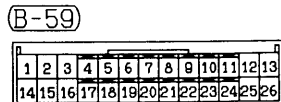
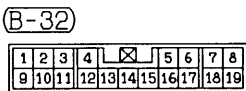
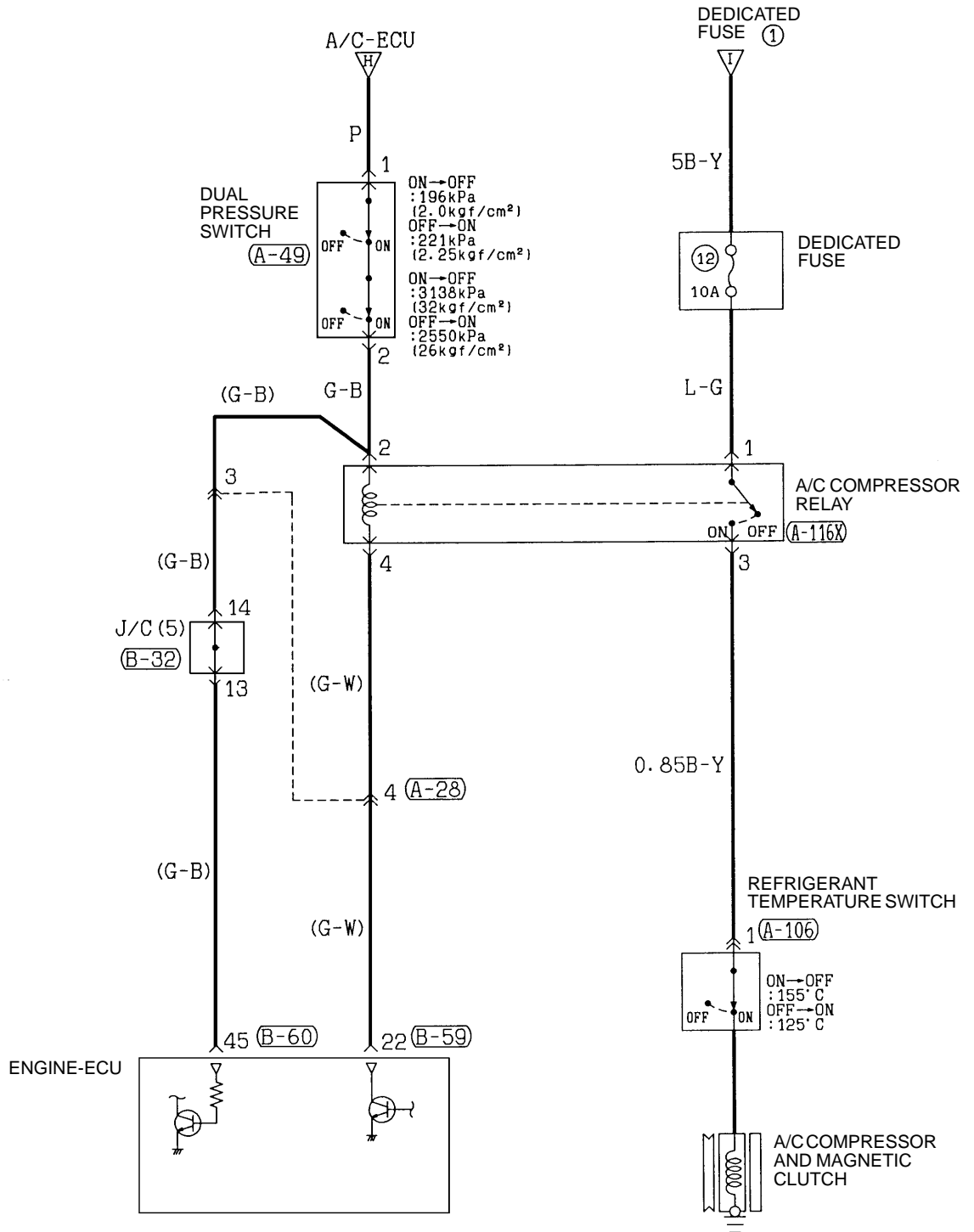
FULLY AUTOMATIC AIR CONDITIONER (CONTINUED)





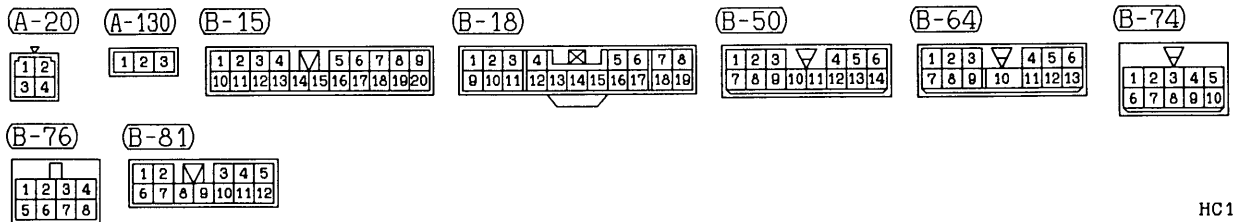
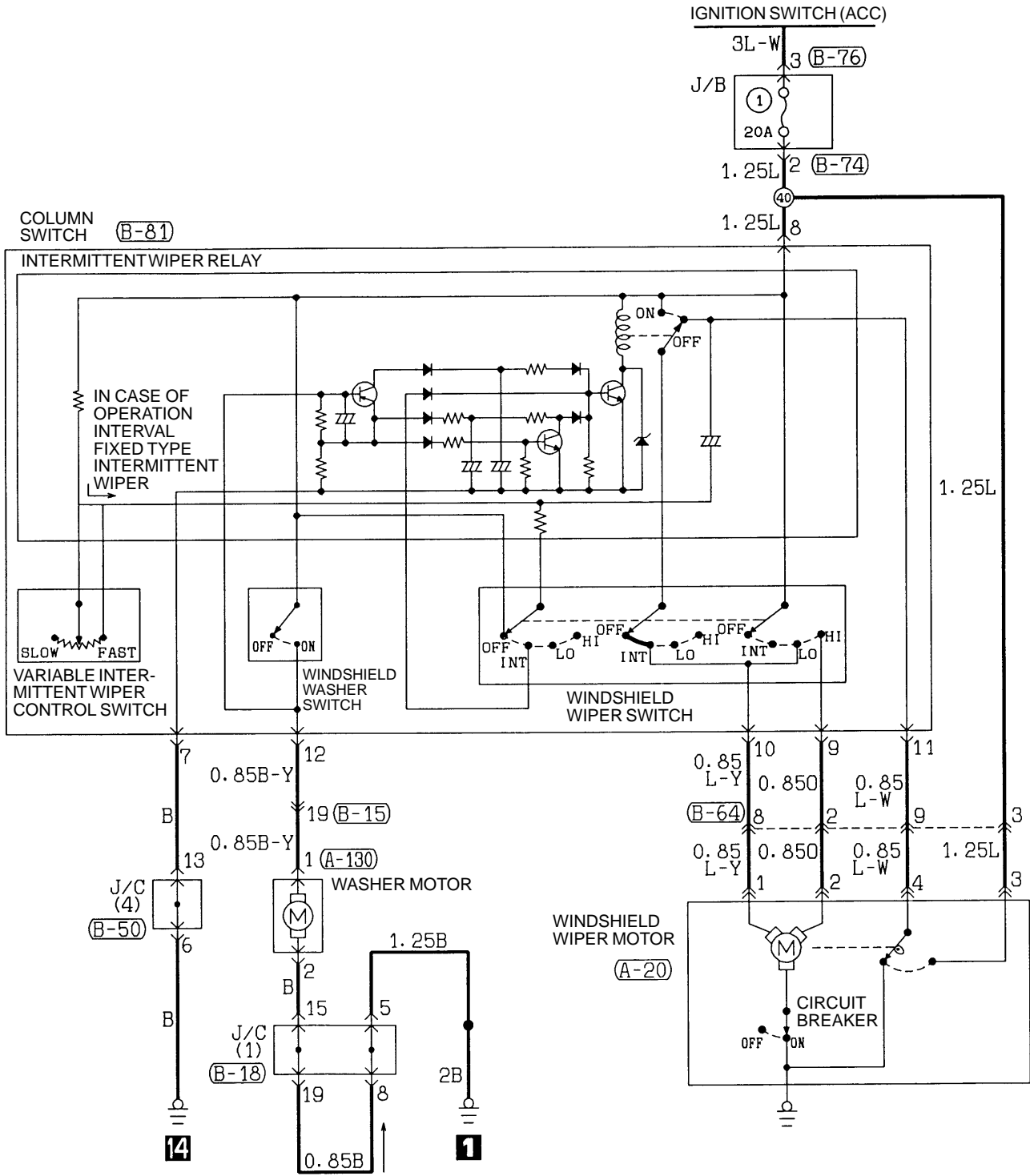


FULLY AUTOMATIC AIR CONDITIONER (CONTINUED)

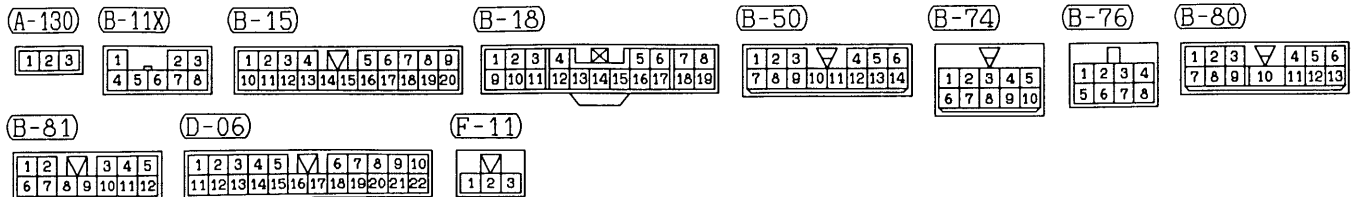
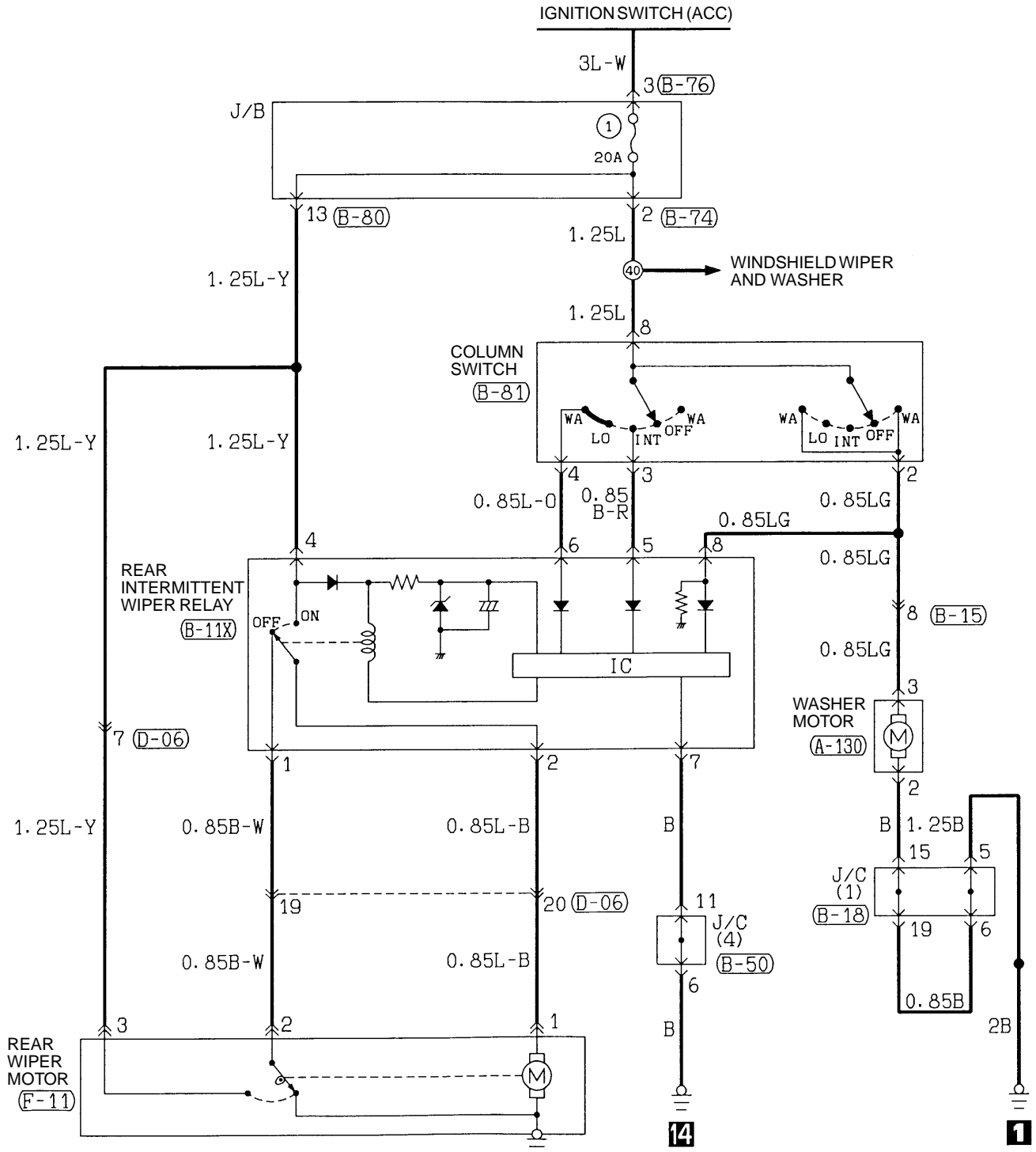


NOTES

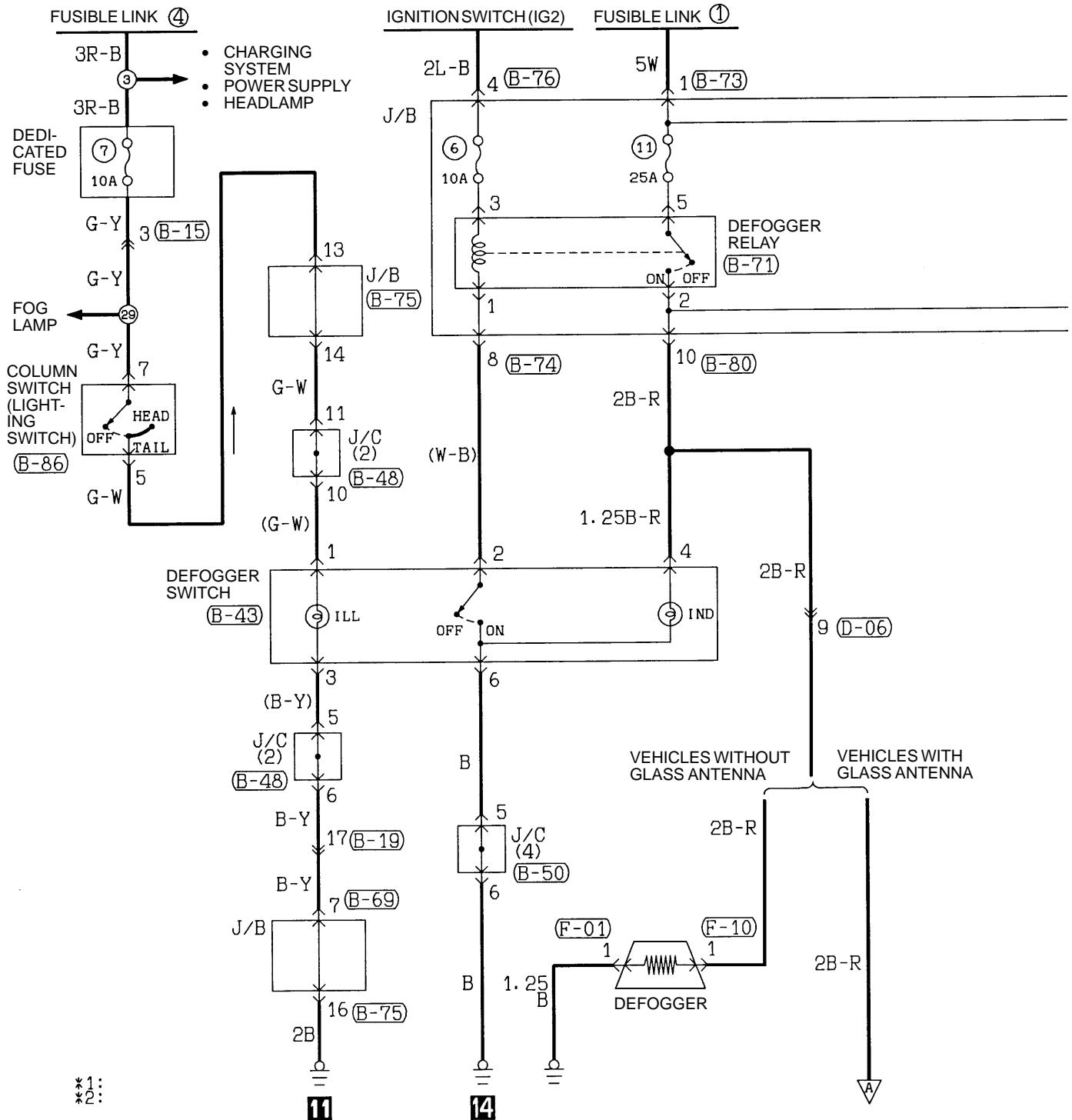
**WINDSHIELD WIPER AND WASHER <INTERMITTENT WIPER>**



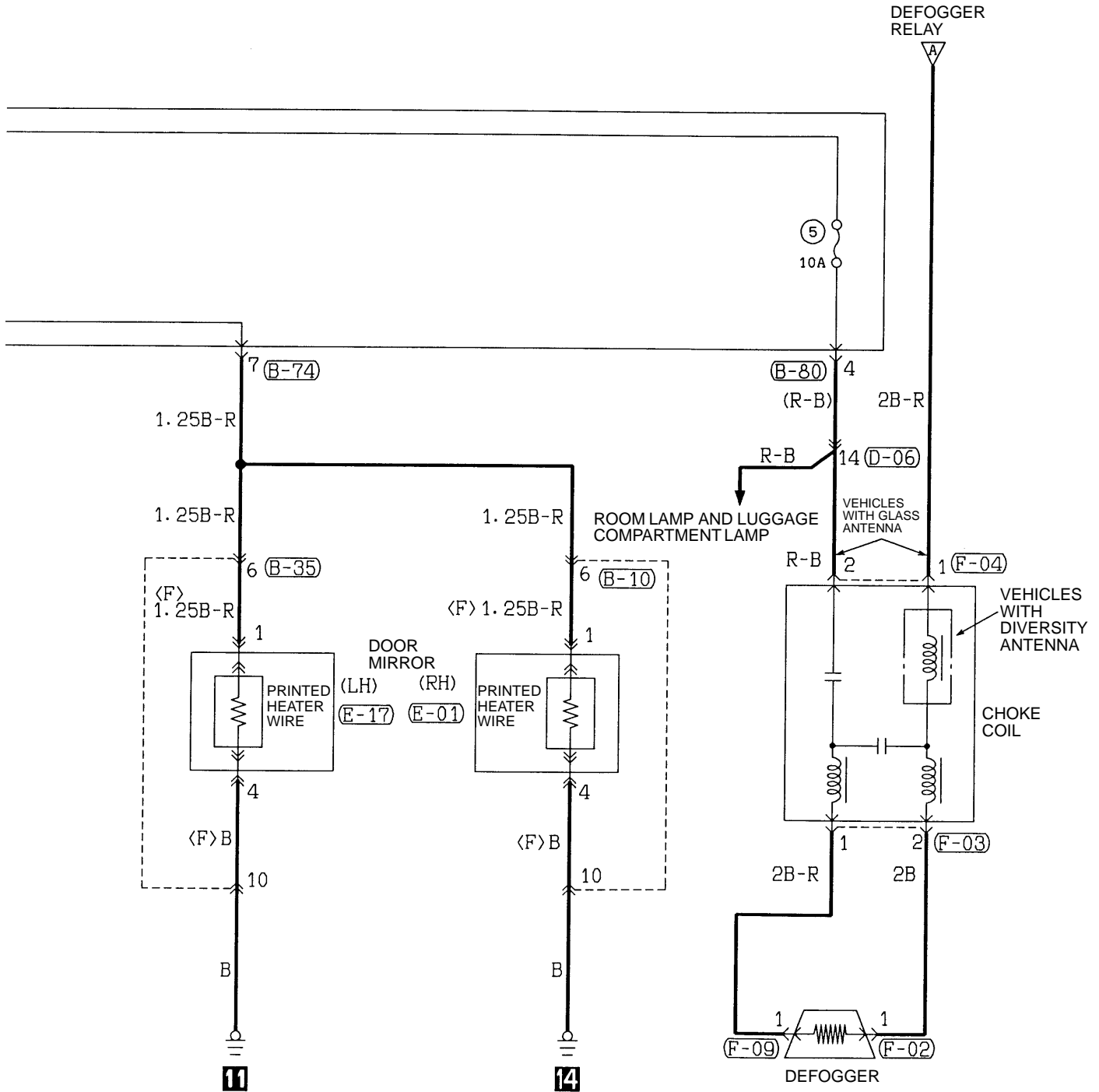
REAR WIPER AND WASHER



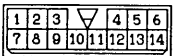
# DEFOGGER AND DOOR MIRROR HEATER <VEHICLES WITHOUT FULLY AUTOMATIC AIR CONDITIONER>



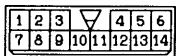
<b>(B-10)</b>	<b>(B-15)</b>	<b>(B-19)</b>	<b>(B-35)</b>	<b>(B-43)</b>	<b>(B-48)</b>		
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22	1 2 3 4 5 6	1 2 3 4 5 6 7 8 9 10 11 12 13 14		
<b>(D-06)</b>	<b>(E-01)</b>	<b>(E-17)</b>	<b>(F-01)</b>	<b>(F-02)</b>	<b>(F-03)</b>	<b>(F-04)</b>	<b>(F-09)</b>
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22	1 2 3 4 5 6 7	1 2 3 4 5 6 7	1	1	1 2	1 2 3	1



(B-50)



(B-69)



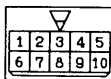
(B-71)



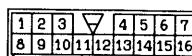
(B-73)



(B-74)



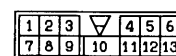
(B-75)



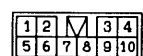
(B-76)



(B-80)



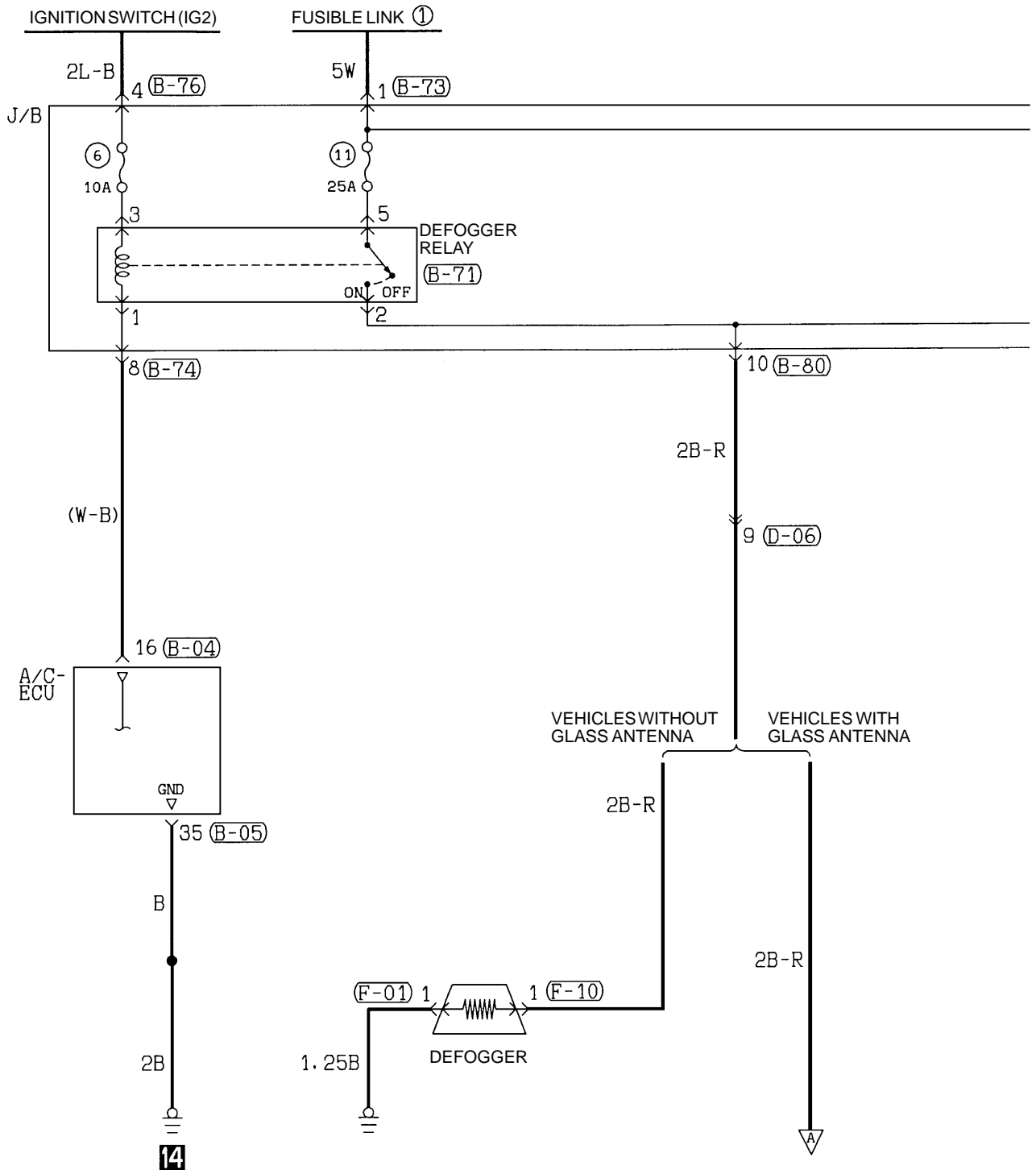
(B-86)



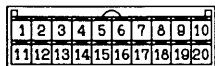
(F-10)



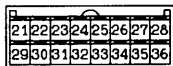
**DEFOGGER AND DOOR MIRROR HEATER**  
**<VEHICLES WITH FULLY AUTOMATIC AIR CONDITIONER>**



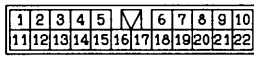
(B-04)



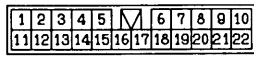
(B-05)



(B-10)



(B-35)



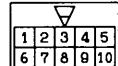
(B-71)



(B-73)



(B-74)



(F-04)



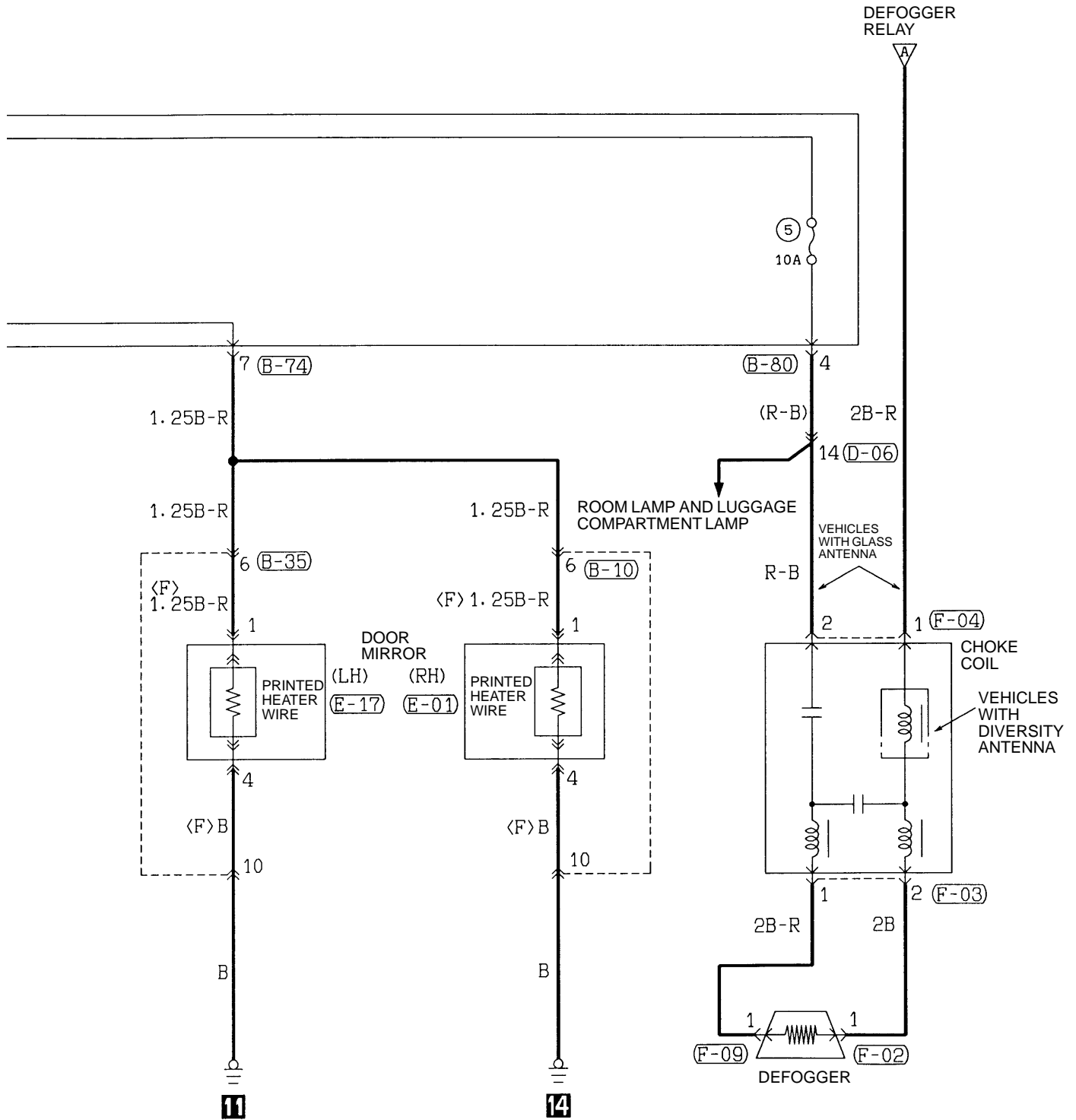
(F-09)



(F-10)







(B-76)

1	2	3	4
5	6	7	8

(B-80)

1	2	3	4	5	6	
7	8	9	10	11	12	13

(D-06)

1	2	3	4	5	6	7	8	9	10		
11	12	13	14	15	16	17	18	19	20	21	22

(E-01)

1	2	3	
4	5	6	7

(E-17)

1	2	3	
4	5	6	7

(F-01)

1
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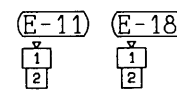
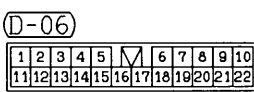
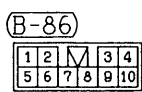
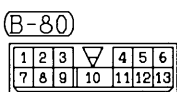
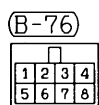
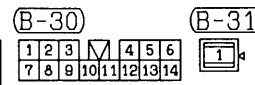
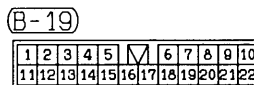
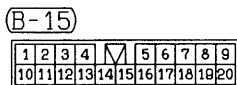
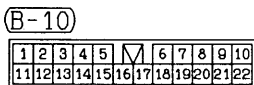
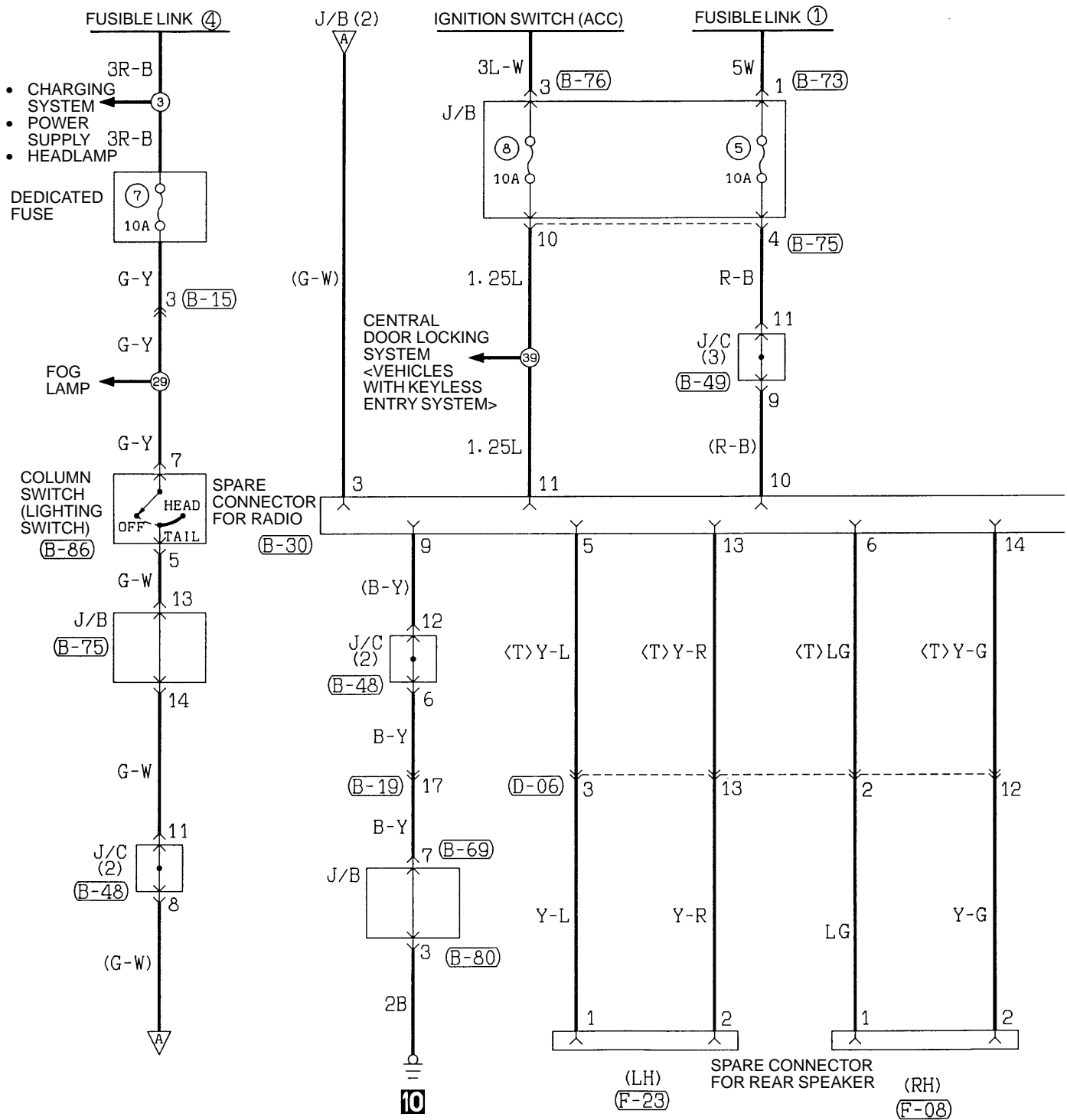
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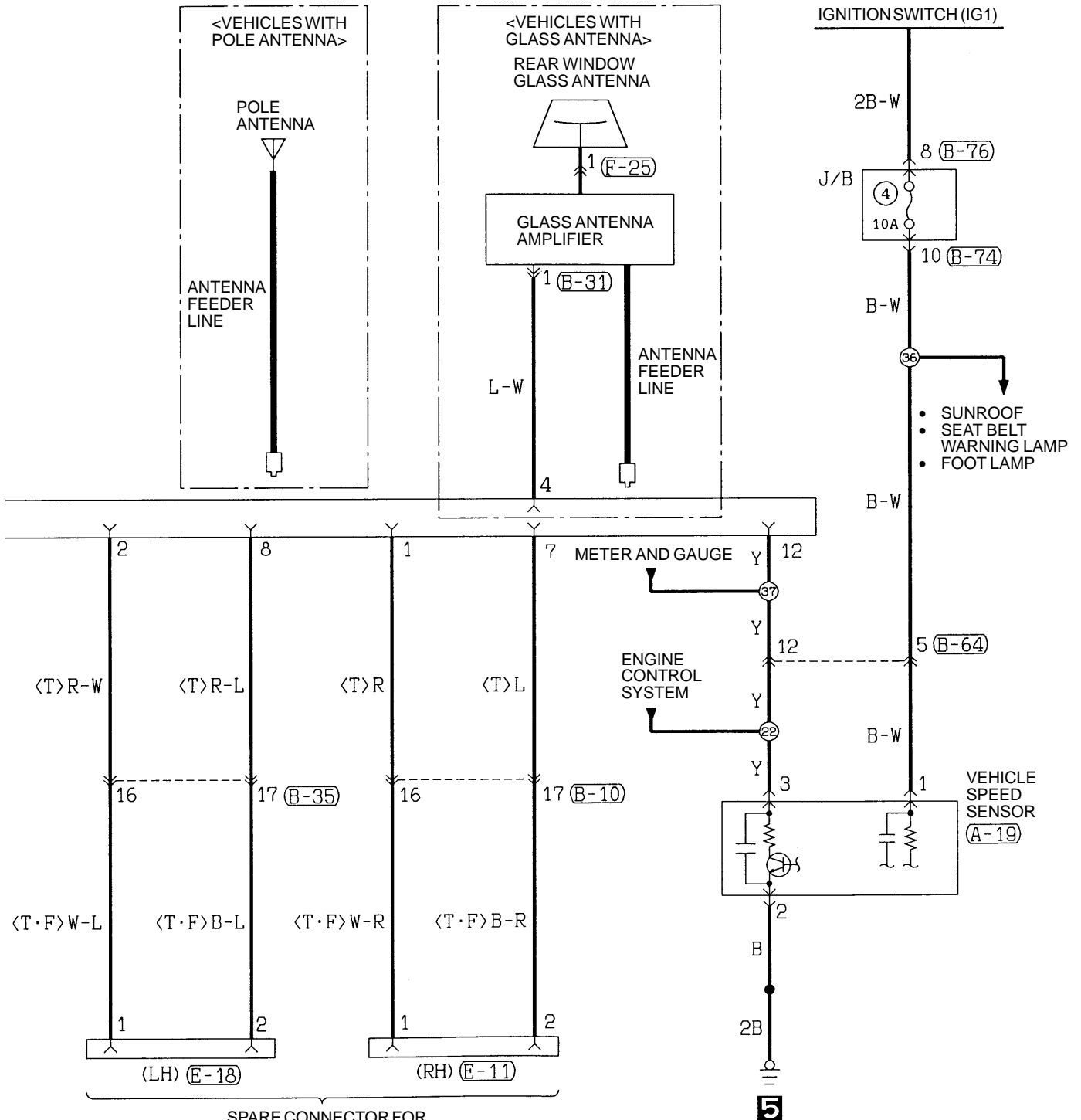
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(F-03)

1	2
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SPARE CONNECTOR FOR RADIO





(B-35)

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22								

(B-48)

1	2	3	4	5	6
7	8	9	10	11	12
13	14				

(B-49)

1	2	3	4	5	6
7	8	9	10	11	12
13	14				

(B-64)

1	2	3	4	5	6
7	8	9	10	11	12
13	14				

(B-69)

1	2	3	4	5	6
7	8	9	10	11	12
13	14				

(B-73)

1
---

(B-74)

1	2	3	4	5
6	7	8	9	10

(F-08)

1
2

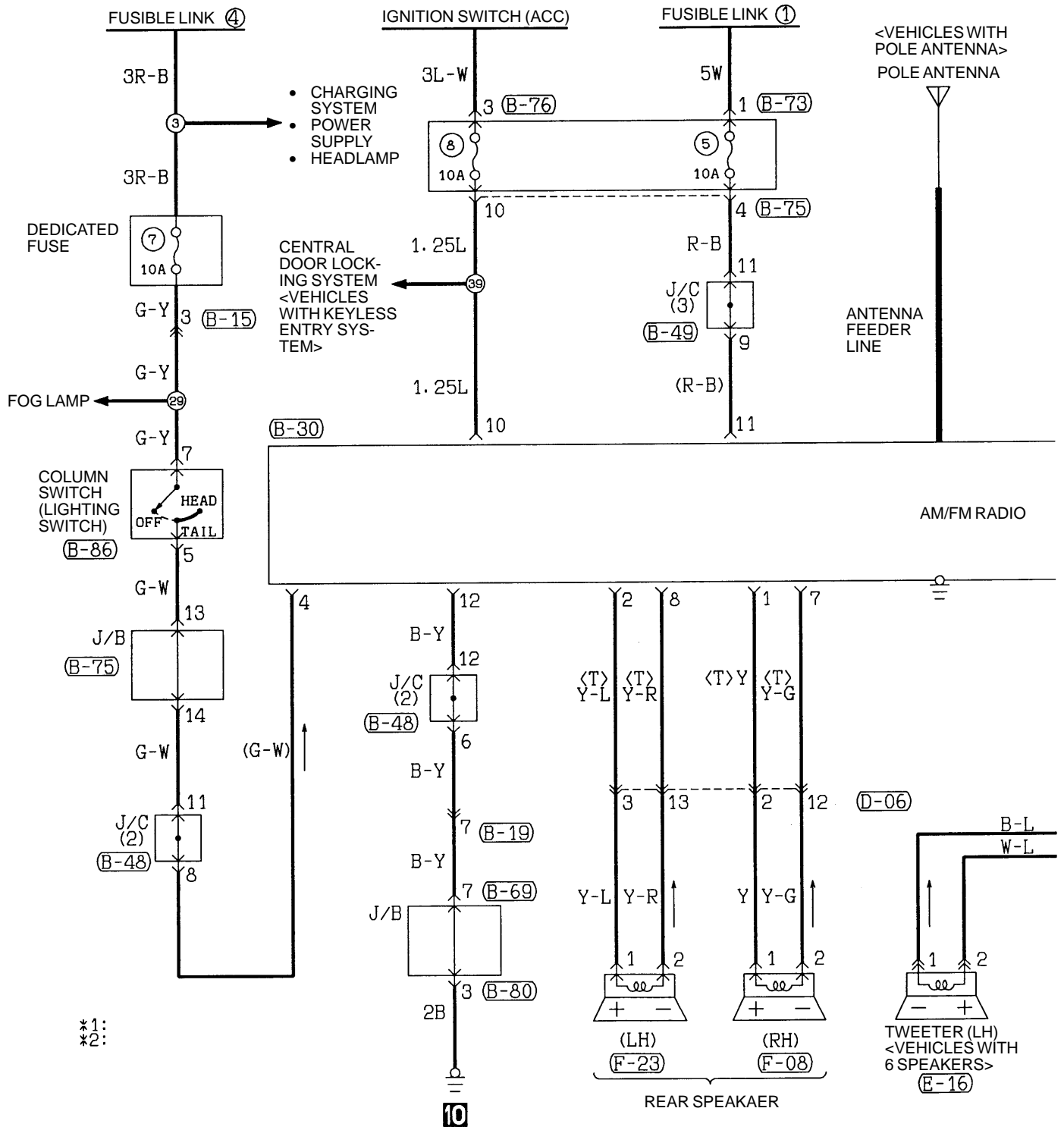
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1
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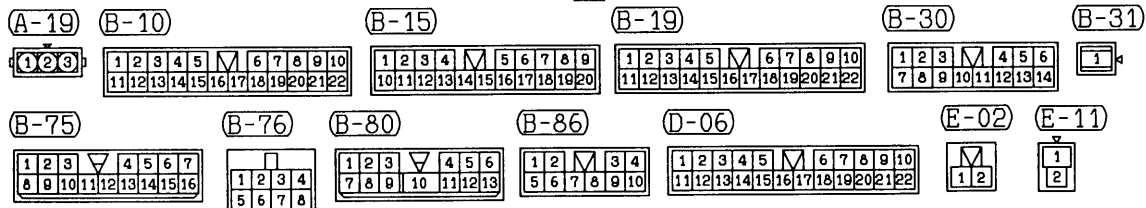
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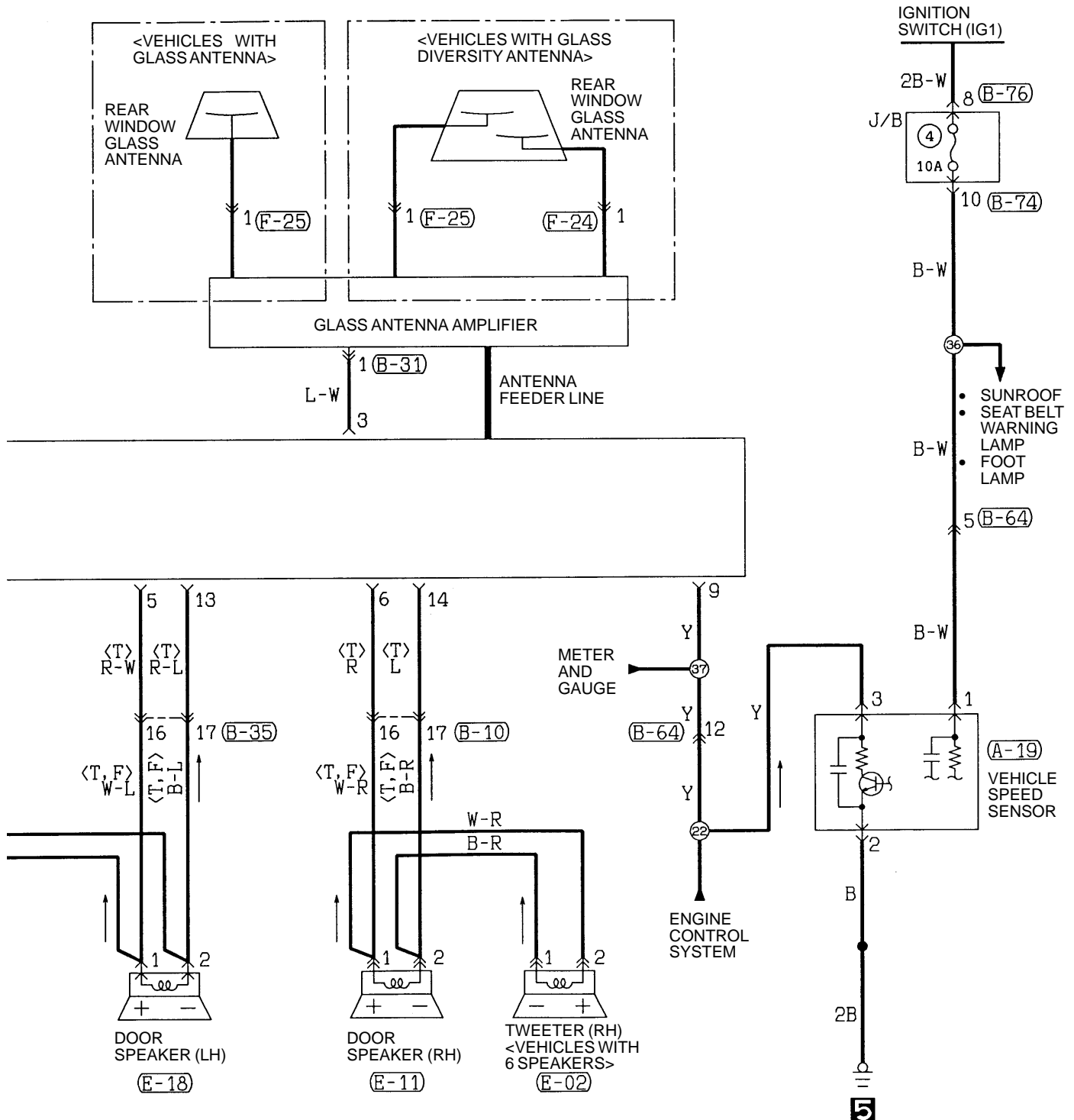
1
2

RADIO <4-SPEAKER, 6-SPEAKER>



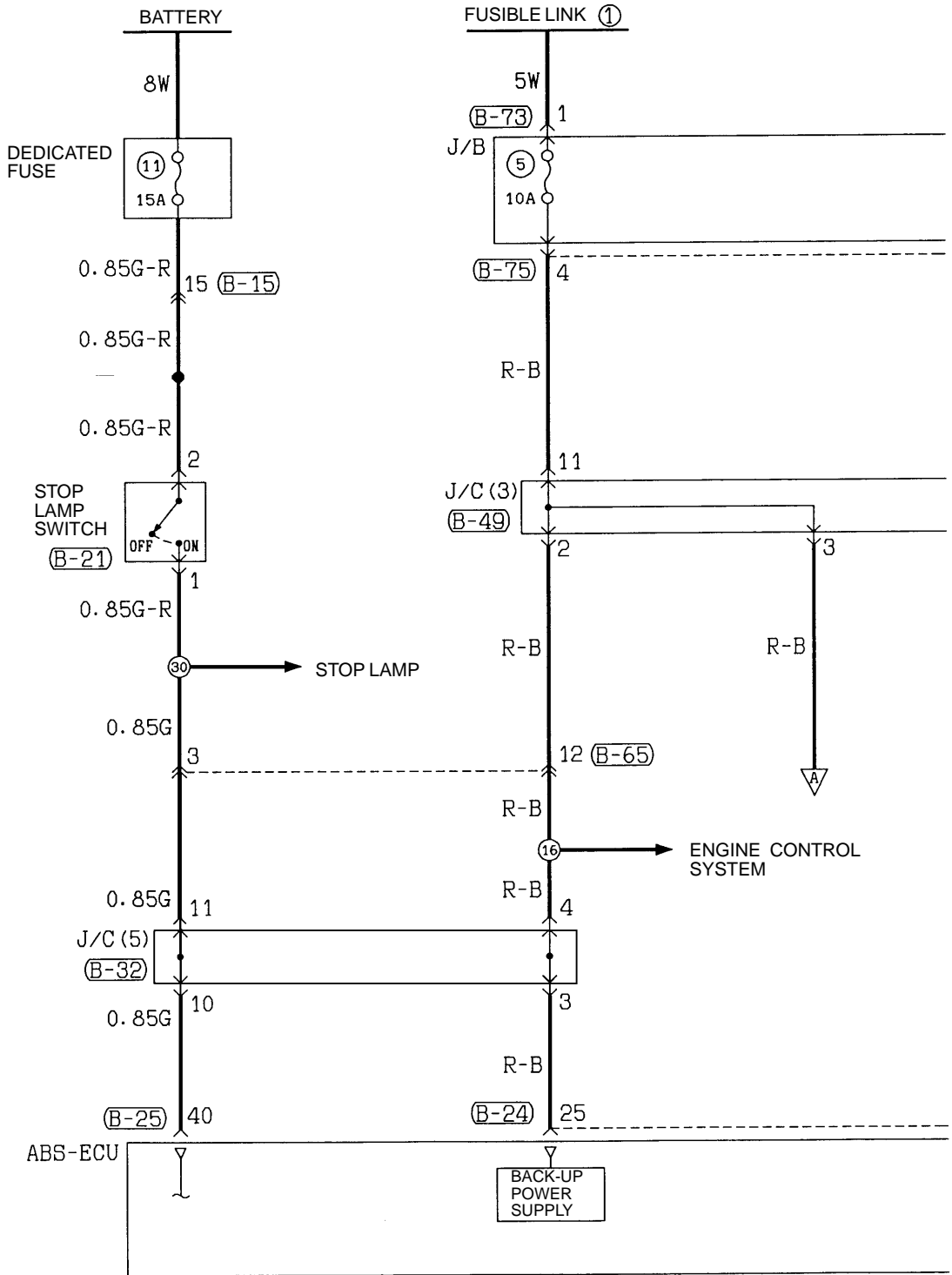
\*1:  
\*2:





<b>(B-35)</b> 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22	<b>(B-48)</b> 1 2 3 4 5 6 7 8 9 10 11 12 13 14	<b>(B-49)</b> 1 2 3 4 5 6 7 8 9 10 11 12 13 14	<b>(B-64)</b> 1 2 3 4 5 6 7 8 9 10 11 12 13	<b>(B-69)</b> 1 2 3 4 5 6 7 8 9 10 11 12 13 14	<b>(B-73)</b> 1	<b>(B-74)</b> 1 2 3 4 5 6 7 8 9 10
<b>(E-16)</b> 1 2	<b>(E-18)</b> 1 2	<b>(F-08)</b> 1 2	<b>(F-23)</b> 1 2	<b>(F-24)</b> 1 2	<b>(F-25)</b> 1 2	

ANTI-LOCK BRAKE SYSTEM (ABS)



(B-15)

1	2	3	4	5	6	7	8	9		
10	11	12	13	14	15	16	17	18	19	20

(B-21)

1
2

(B-24)

1	2	3	4	5	6	7	8	9	10	11	12	13
14	15	16	17	18	19	20	21	22	23	24	25	26

(B-25)

31	32	33	34	35	36	37	38
39	40	41	42	43	44	45	46

(B-32)

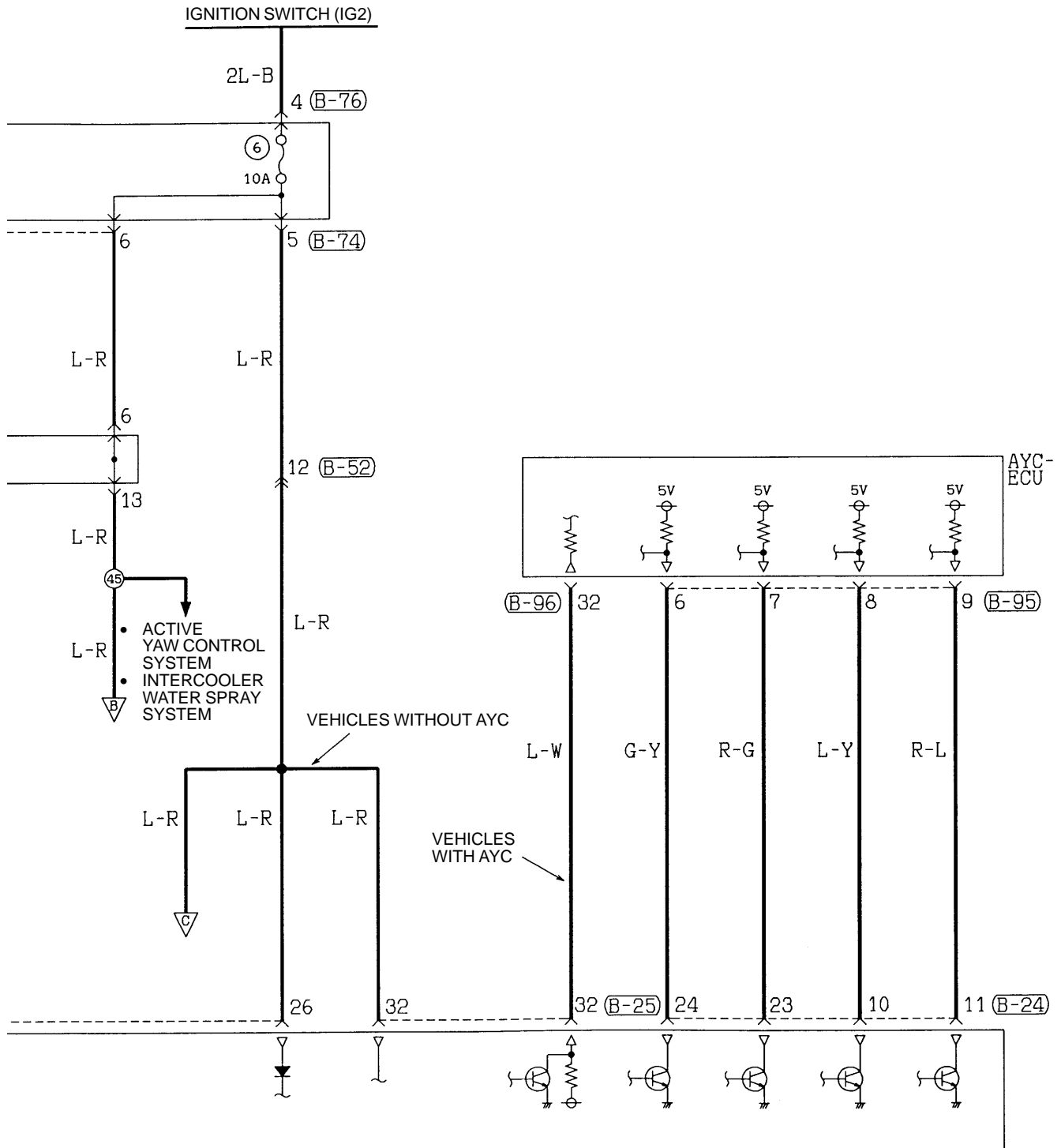
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9	10	11	12	13	14	15	16	17	18	19

(B-49)

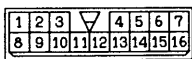
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7	8	9	10	11	12	13	14

(B-96)

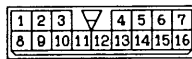
31	32	33	34	35	36	37	38
39	40	41	42	43	44	45	46



(B-52)



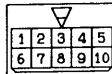
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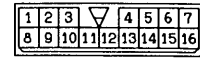
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(B-74)



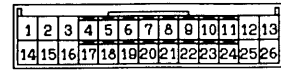
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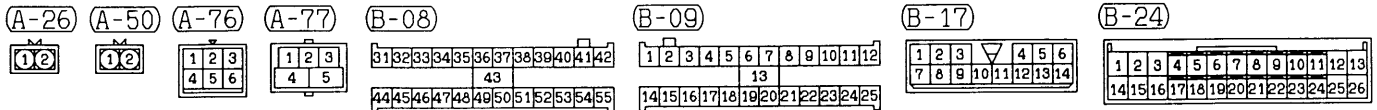
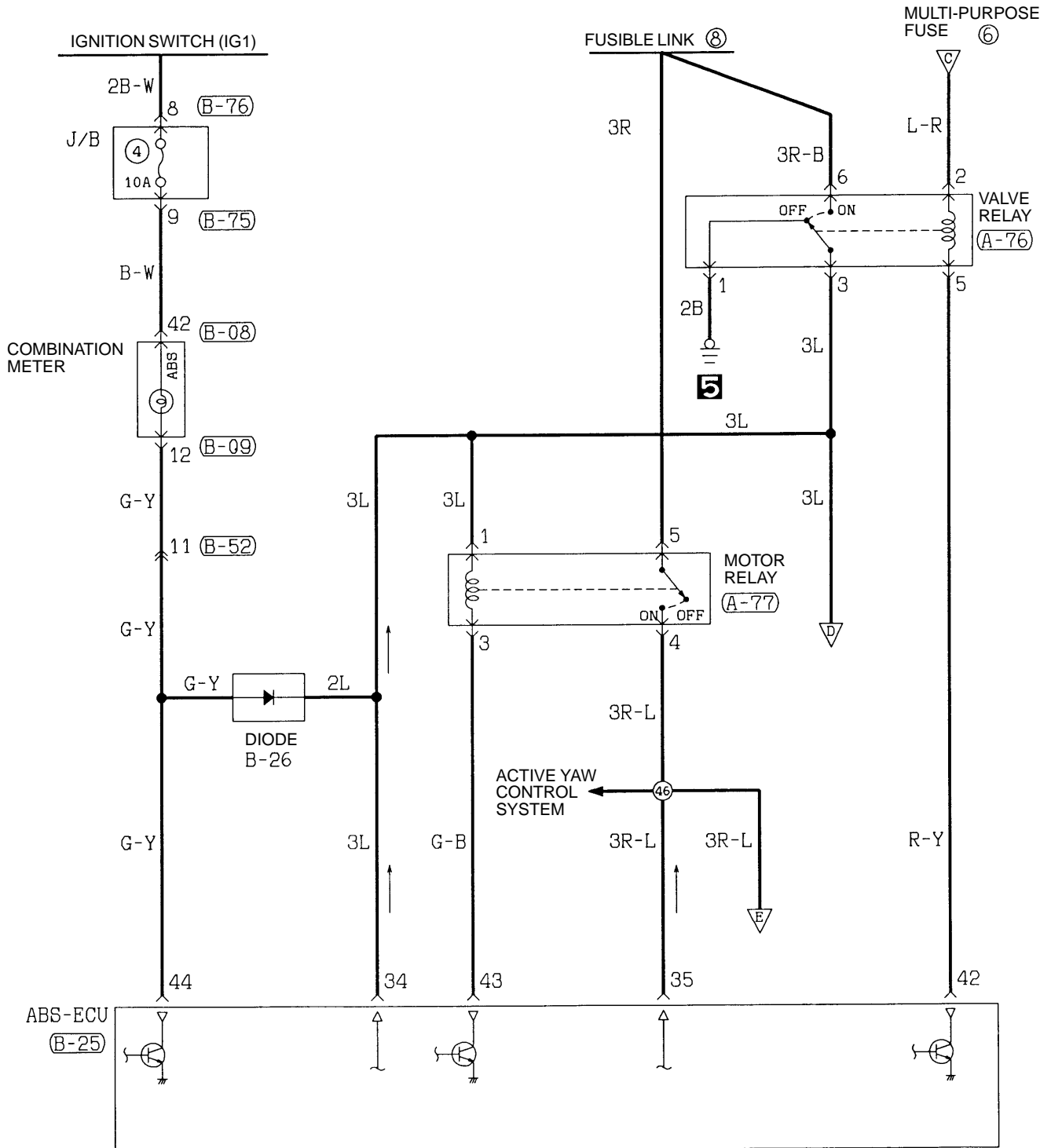
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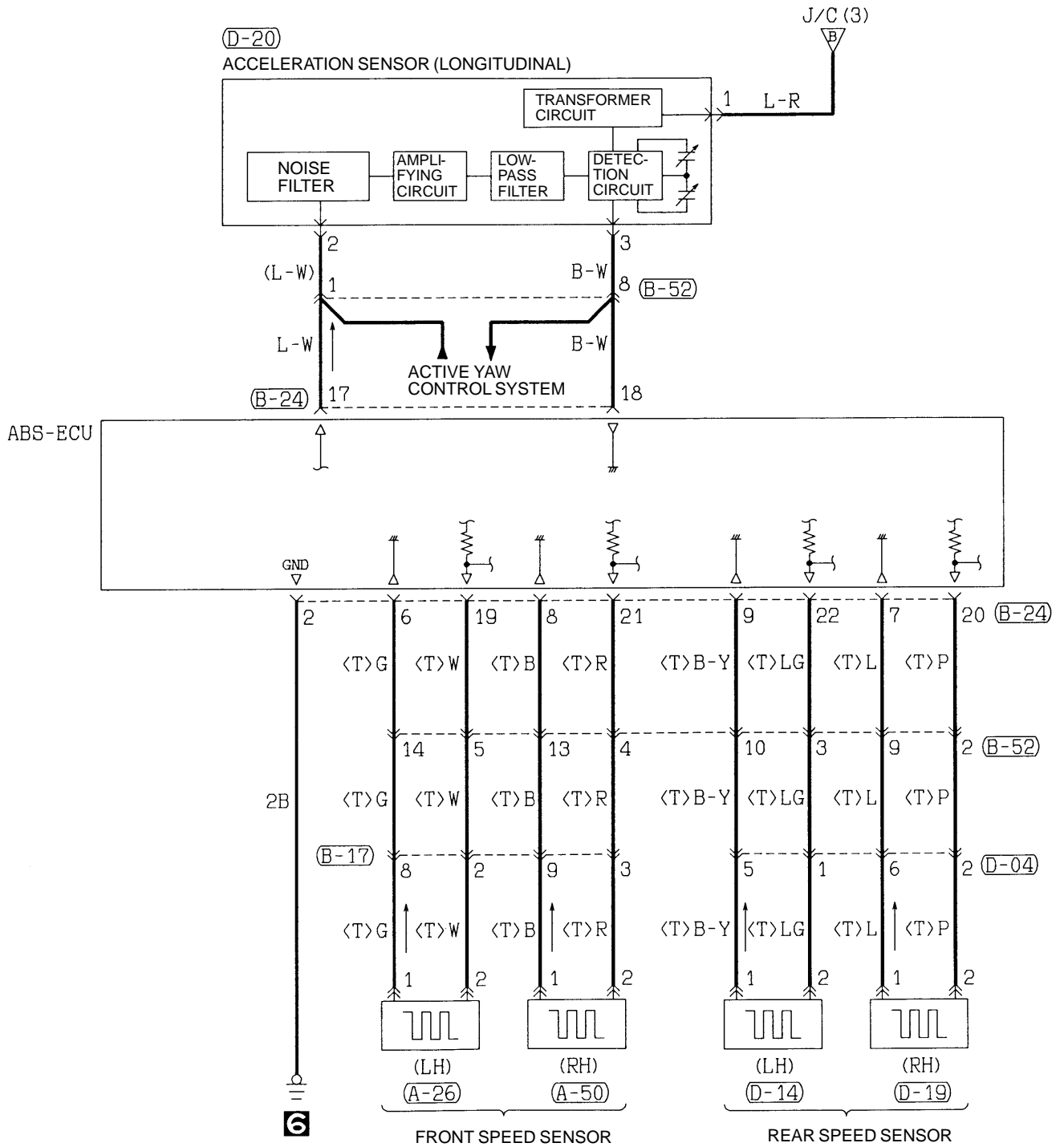
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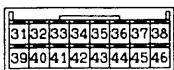
ANTI-LOCK BRAKE SYSTEM (ABS) (CONTINUED)



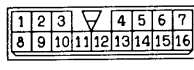




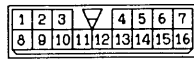
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(B-52)



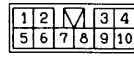
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(B-76)



(D-04)



(D-14)



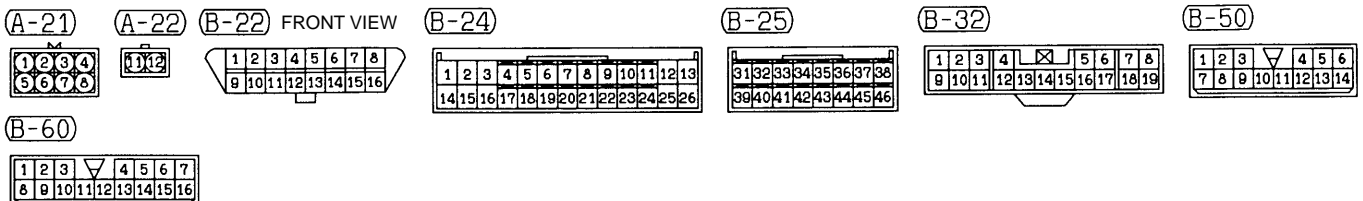
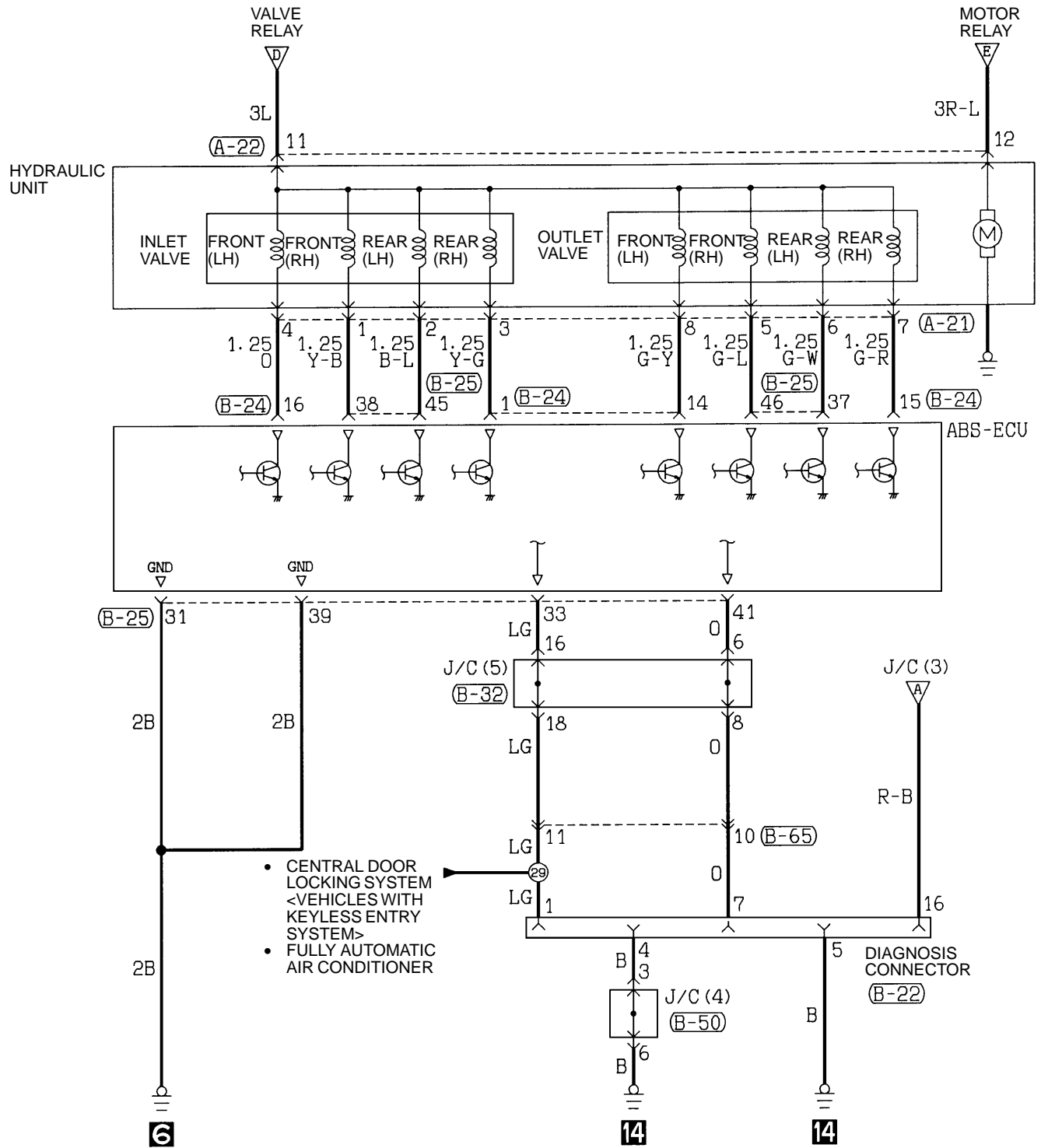
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(D-20)

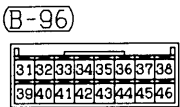
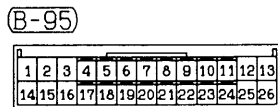
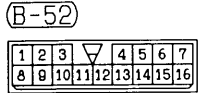
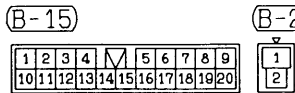
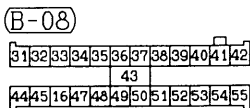
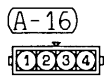
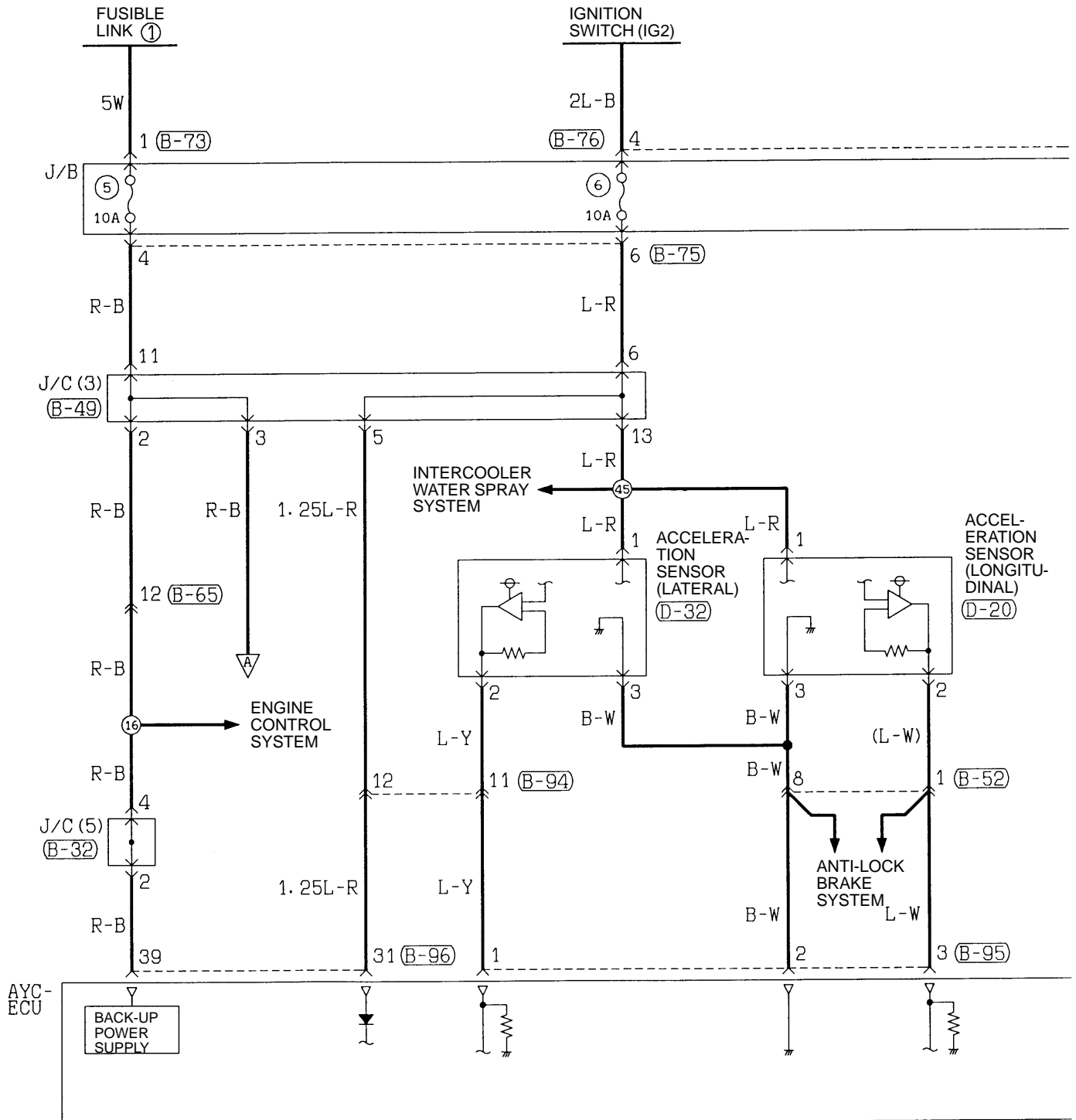


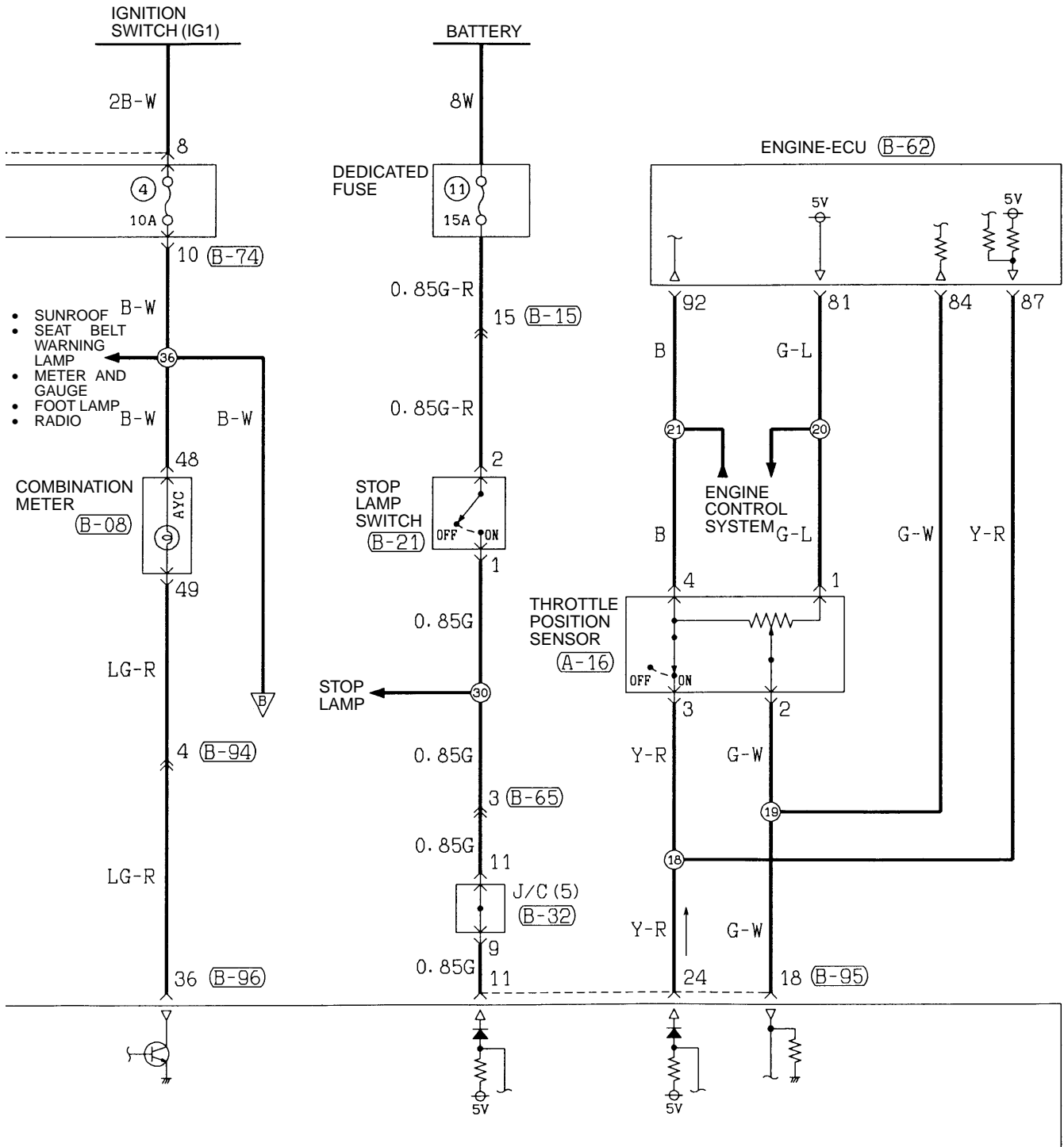
ANTI-LOCK BRAKE SYSTEM (ABS) (CONTINUED)



NOTES

ACTIVE YAW CONTROL SYSTEM (AYC)





(B-62)

7	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	

(B-65)

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16					

(B-73)

1
---

(B-74)

1	2	3	4	5
6	7	8	9	10

(B-75)

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16					

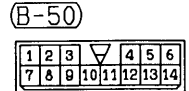
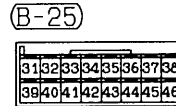
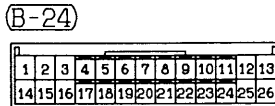
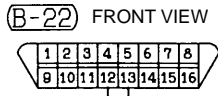
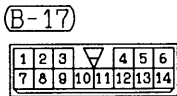
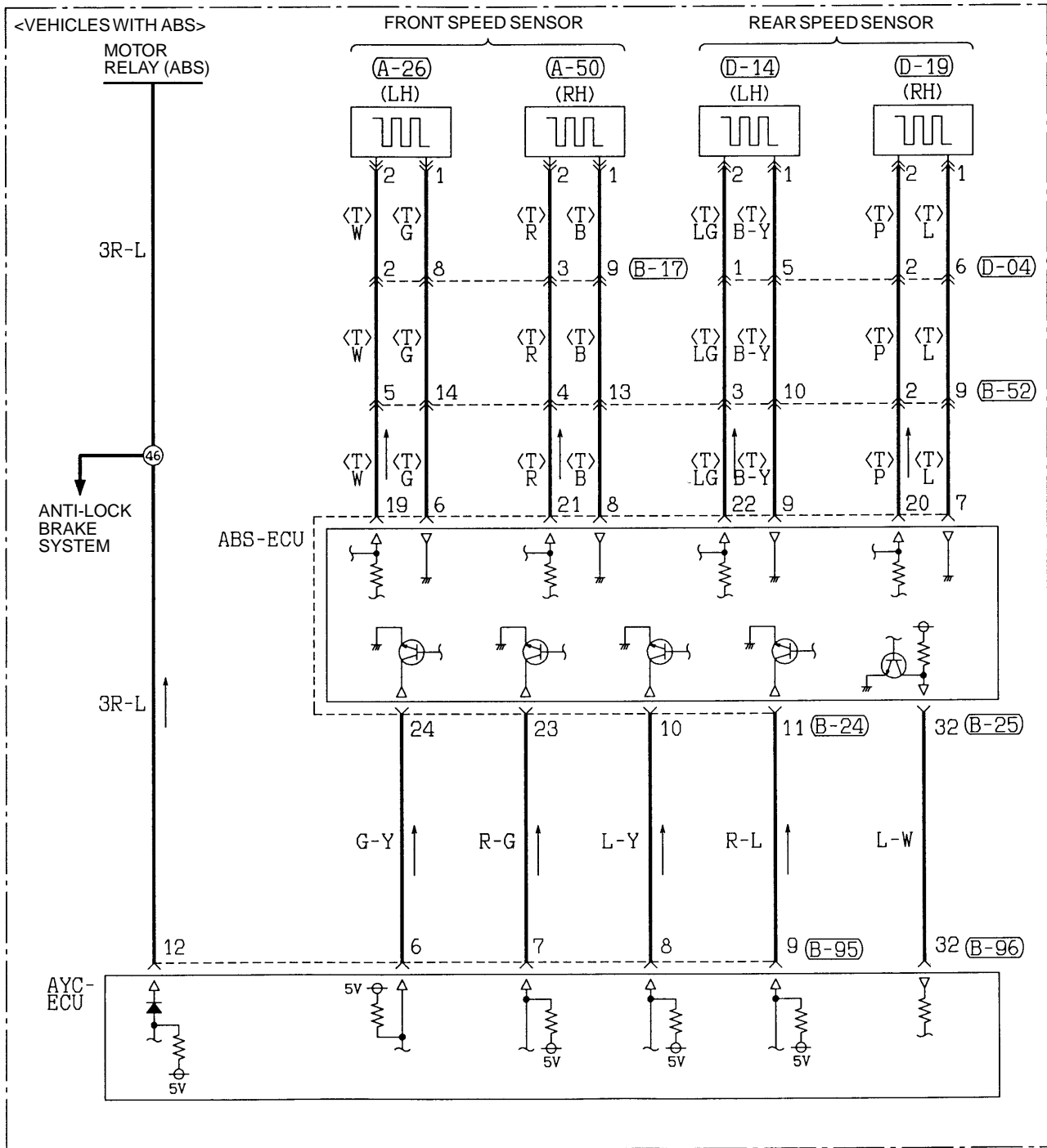
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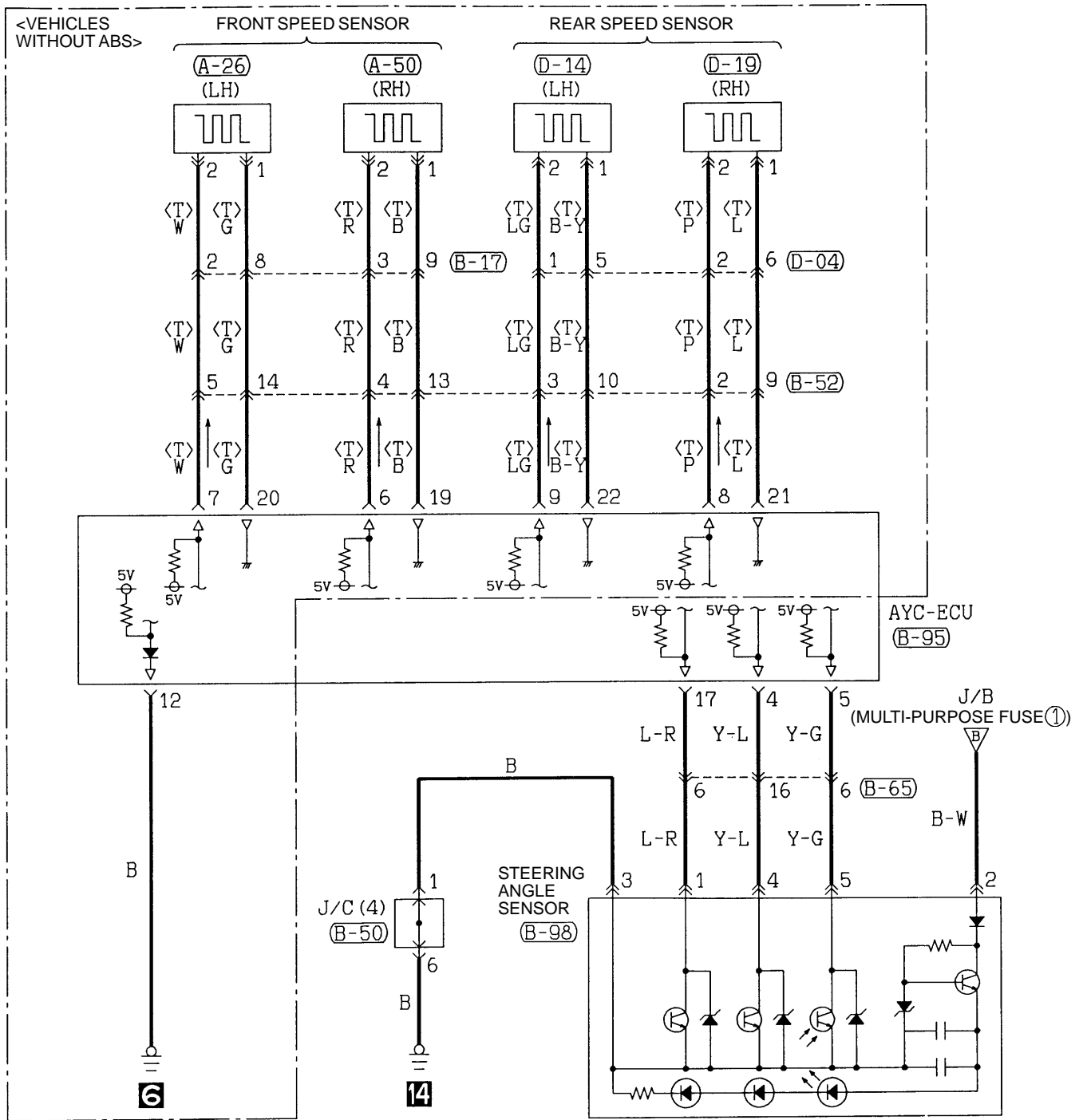
1	2	3	4
5	6	7	8

(B-94)

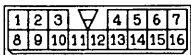
1	2	3	4	5	6
7	8	9	10	11	12
13					

ACTIVE YAW CONTROL SYSTEM (AYC) (CONTINUED)

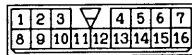




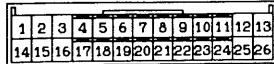
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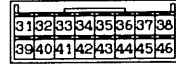
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(B-95)



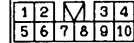
(B-96)



(B-98)



(D-04)



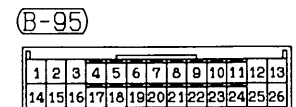
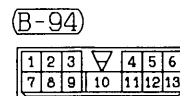
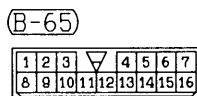
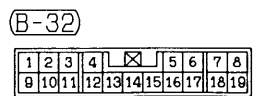
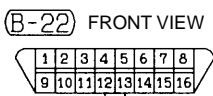
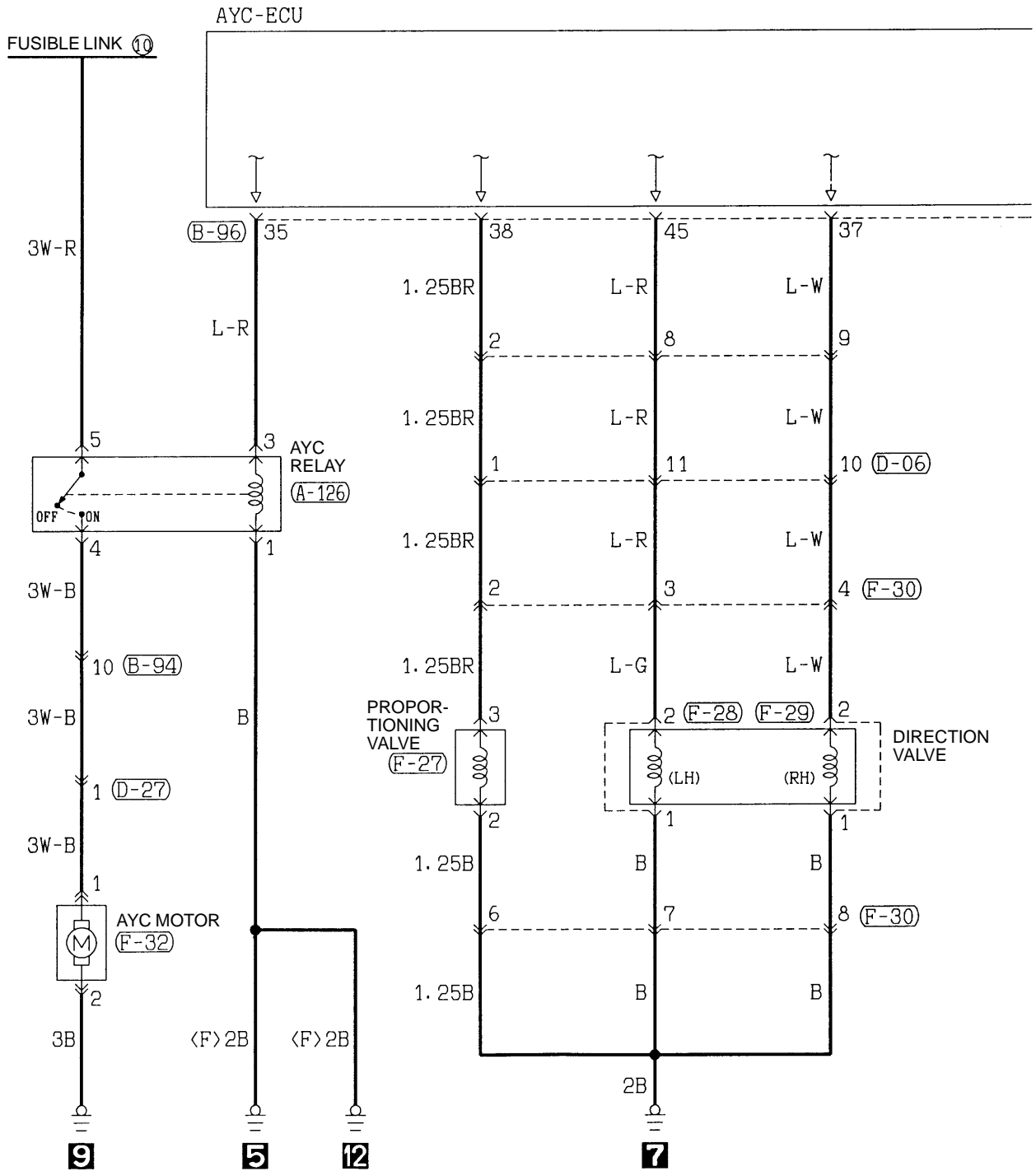
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(D-19)



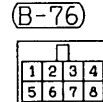
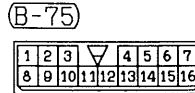
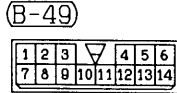
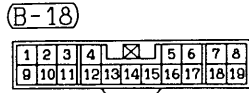
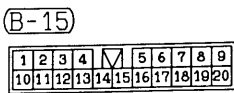
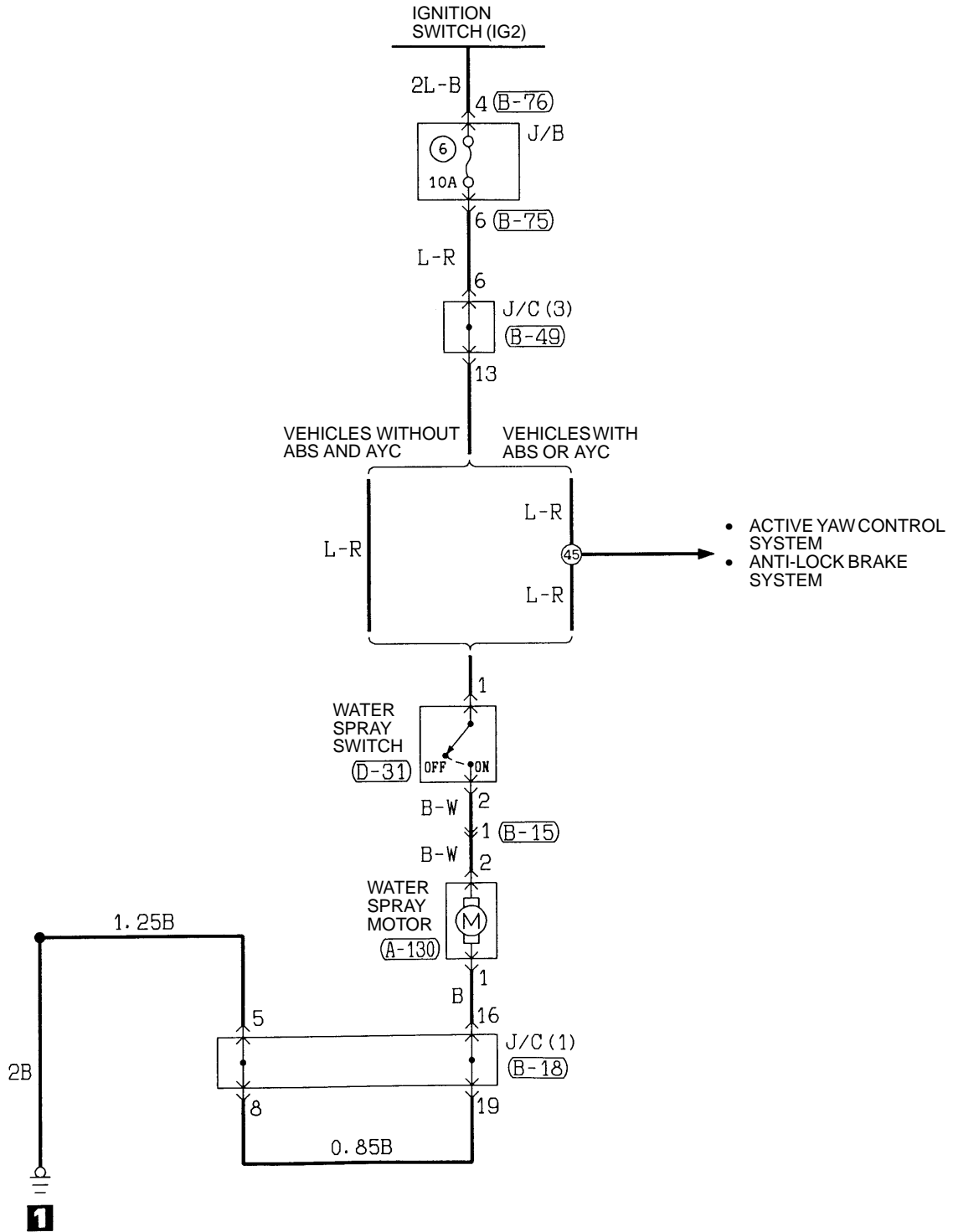
ACTIVE YAW CONTROL SYSTEM (AYC) (CONTINUED)







INTERCOOLER WATER SPRAY SYSTEM



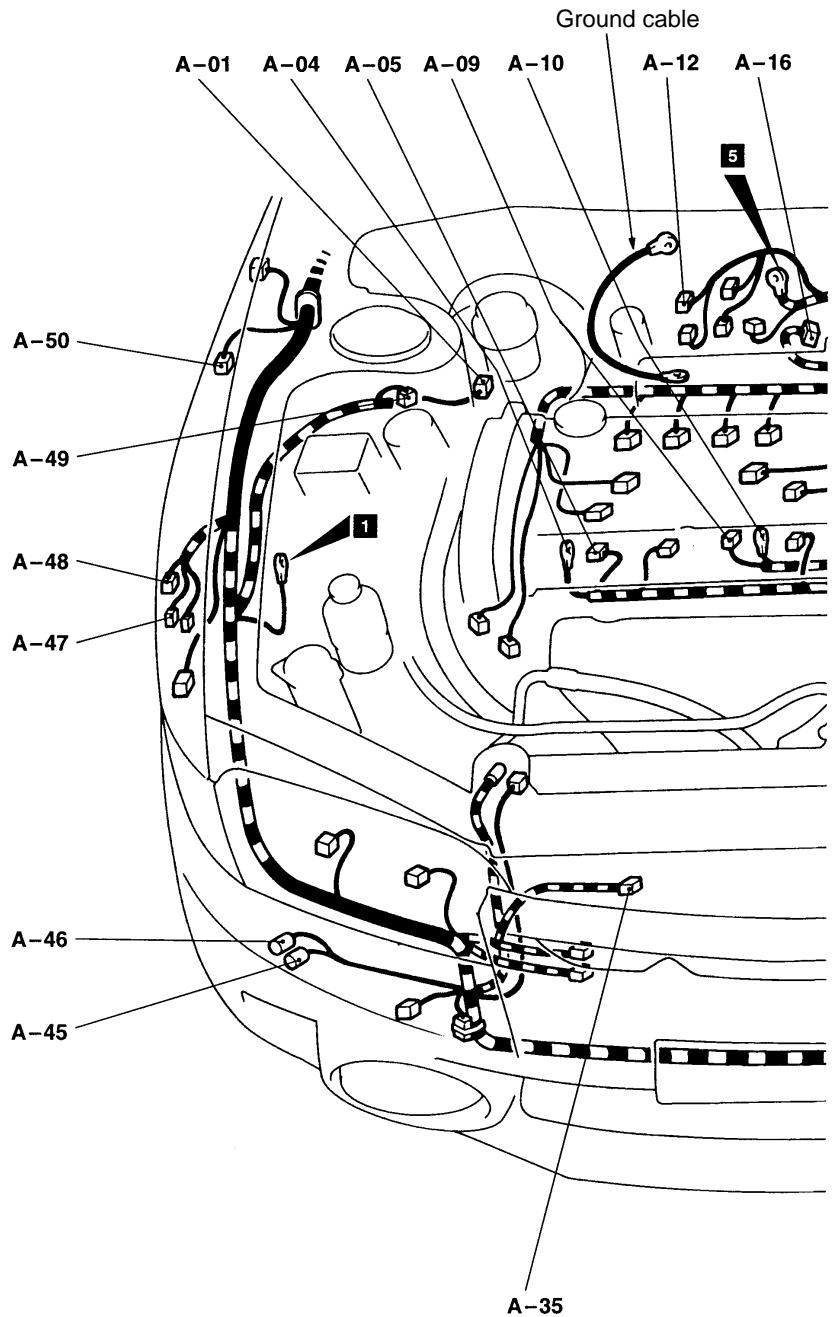
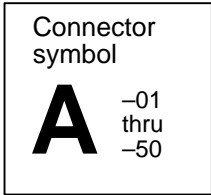
# ELECTRICAL WIRING (EVOLUTION-V)

## CONTENTS

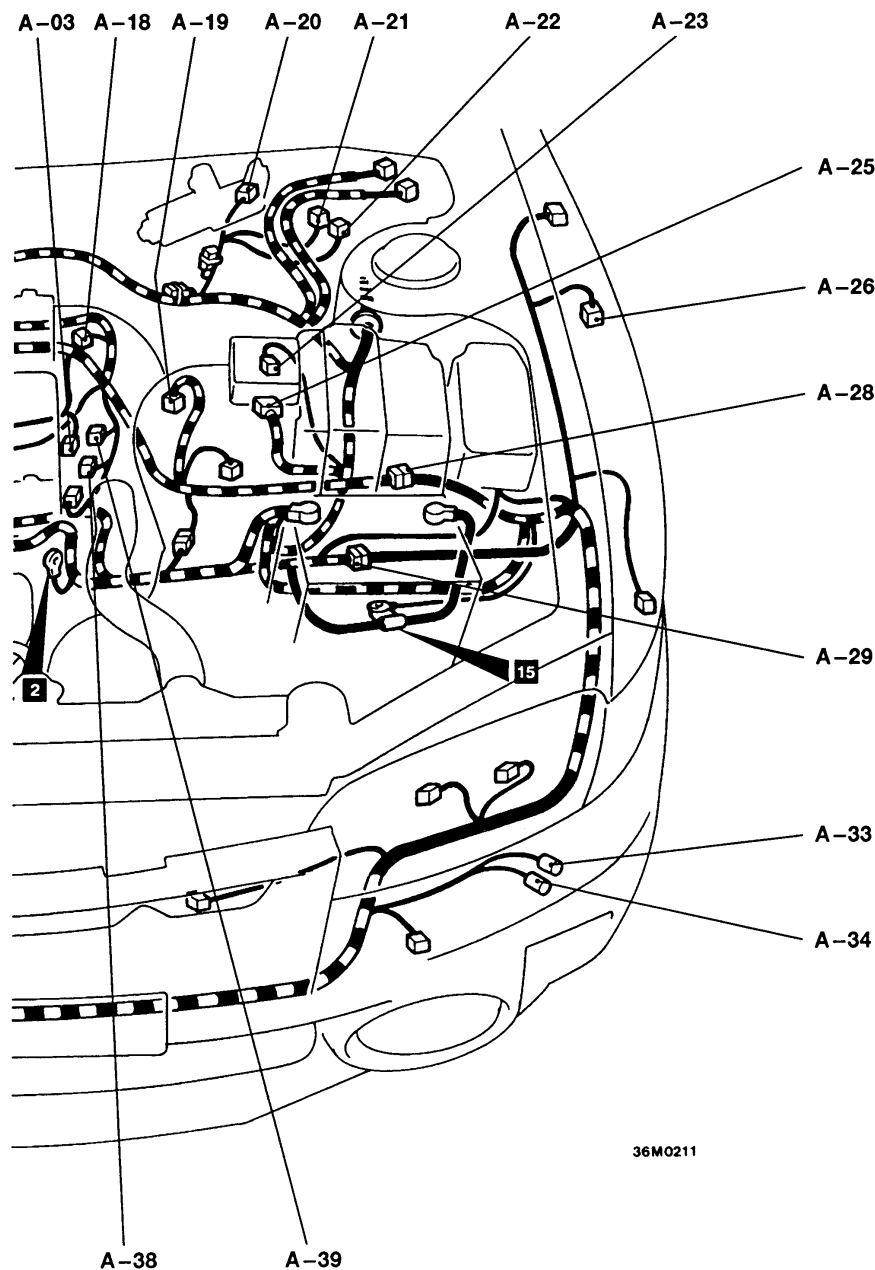
<b>WIRING HARNESS CONFIGURATION DIAGRAMS</b> .....	2	<b>ROOM LAMP AND LUGGAGE COMPARTMENT LAMP</b> .....	36
ENGINE COMPARTMENT .....	2	<b>TURN-SIGNAL LAMP AND HAZARD LAMP</b> .....	38
DASH PANEL .....	6	<b>STOP LAMP</b> .....	41
FLOOR, ROOF, AND SEAT .....	10	<b>BACK-UP LAMP</b> .....	42
LUGGAGE COMPARTMENT .....	12	<b>OIL PRESSURE WARNING LAMP</b> .....	43
<b>SINGLE PART INSTALLATION POSITION</b> .....	13	<b>CENTRAL DOOR LOCKING SYSTEM &lt;VEHICLES WITH KEYLESS ENTRY SYSTEM&gt;</b> .....	44
RELAY .....	13	<b>HEATER AND MANUAL AIR CONDITIONER</b> .....	48
ECU .....	14	<b>FULLY AUTOMATIC AIR CONDITIONER</b> .....	54
SENSOR .....	14	<b>WINDSHIELD WIPER AND WASHER &lt;INTERMITTENT WIPER&gt;</b> .....	61
SOLENOID VALVE .....	16	<b>REAR WIPER AND WASHER</b> .....	62
CHECK CONNECTOR AND SPARE CONNECTOR .....	17	<b>DEFOGGER AND DOOR MIRROR HEATER &lt;VEHICLES WITHOUT FULLY AUTOMATIC AIR CONDITIONER&gt;</b> .....	64
FUSIBLE LINK AND FUSE .....	17	<b>DEFOGGER AND DOOR MIRROR HEATER &lt;VEHICLES WITH FULLY AUTOMATIC AIR CONDITIONER&gt;</b> .....	66
GROUND CABLE .....	18	<b>SPARE CONNECTOR FOR RADIO</b> .....	68
GROUND .....	18	<b>RADIO &lt;4-SPEAKER, 6-SPEAKER&gt;</b> ....	70
<b>CIRCUIT DIAGRAM</b> .....	19	<b>ANTI-LOCK BRAKE SYSTEM (ABS)</b> ....	74
CENTRALIZED JUNCTION .....	19	<b>ACTIVE YAW CONTROL SYSTEM (AYC)</b> .....	80
POWER DISTRIBUTION SYSTEM .....	20	<b>INTERCOOLER WATER SPRAY SYSTEM</b> .....	86
STARTING SYSTEM .....	25		
IGNITION SYSTEM .....	26		
CHARGING SYSTEM .....	27		
ENGINE CONTROL SYSTEM .....	28		
COOLING SYSTEM .....	34		

# WIRING HARNESS CONFIGURATION DIAGRAMS

## ENGINE COMPARTMENT

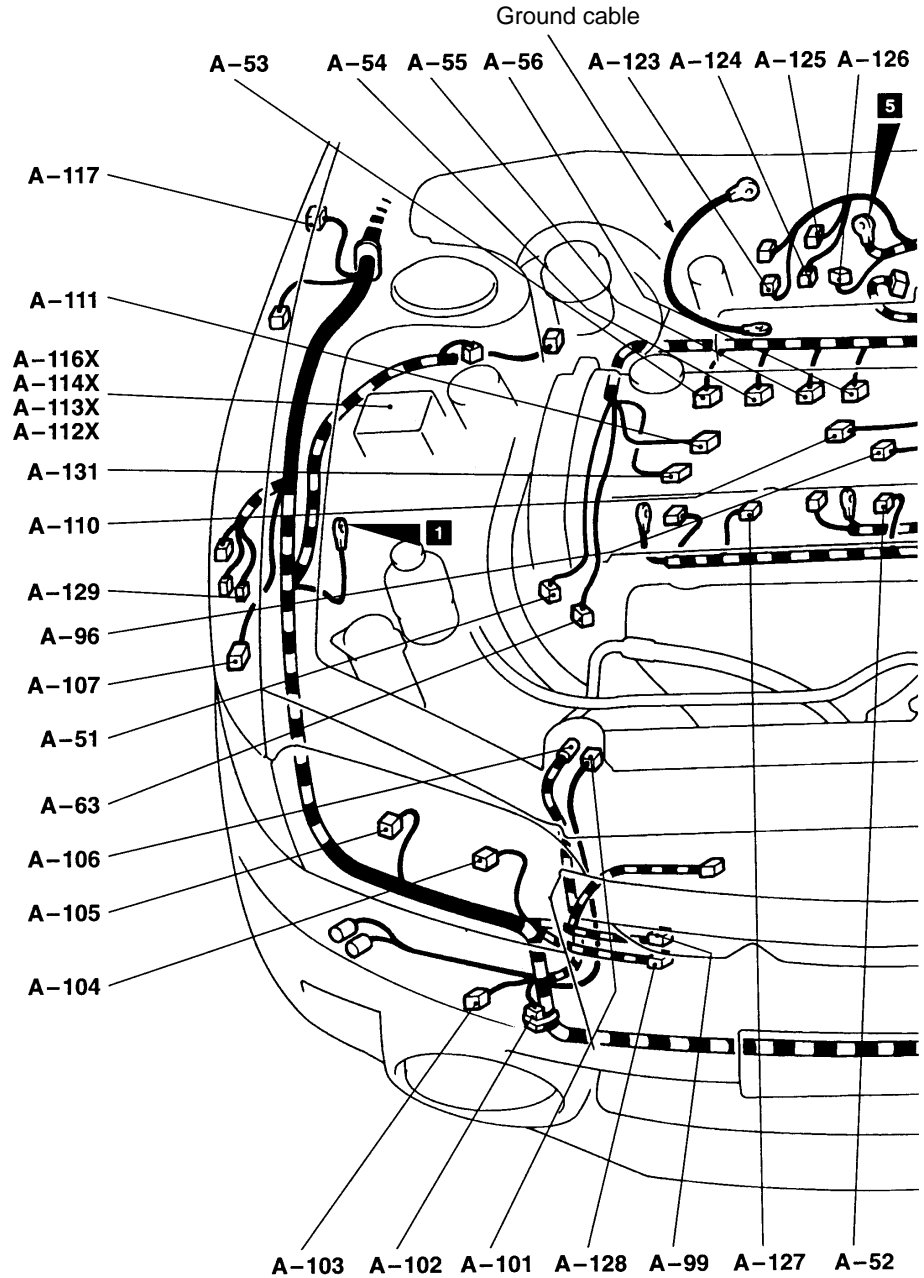
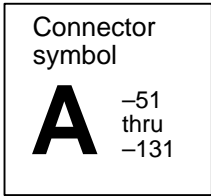


- |             |                              |            |   |
|-------------|------------------------------|------------|---|
| A-01 (2-B)  | Brake fluid level switch     | A-20 (4-B) | Windshield wiper motor                        |
| A-03 (1-B)  | Noise condenser              | A-21 (8-B) | Hydraulic unit <vehicles with ABS>            |
| A-04 (1)    | Alternator                   | A-22 (2-B) | Hydraulic unit <vehicles with ABS>            |
| A-05 (4-GR) | Alternator                   | A-23 (2-B) | Waste gate solenoid valve                     |
| A-09 (1-B)  | Starter                      | A-25 (7-B) | Air flow sensor                               |
| A-10 (1)    | Starter                      | A-26 (2-B) | Front speed sensor (LH) <vehicles with ABS>   |
| A-12 (2-B)  | Fuel pressure solenoid valve | A-28 (8-B) | Control harness and front harness combination |
| A-16 (4-B)  | Throttle position sensor     |            |   |
| A-18 (6-B)  | Idle speed control servo     |            |   |
| A-19 (3-B)  | Vehicle speed sensor         |            |   |



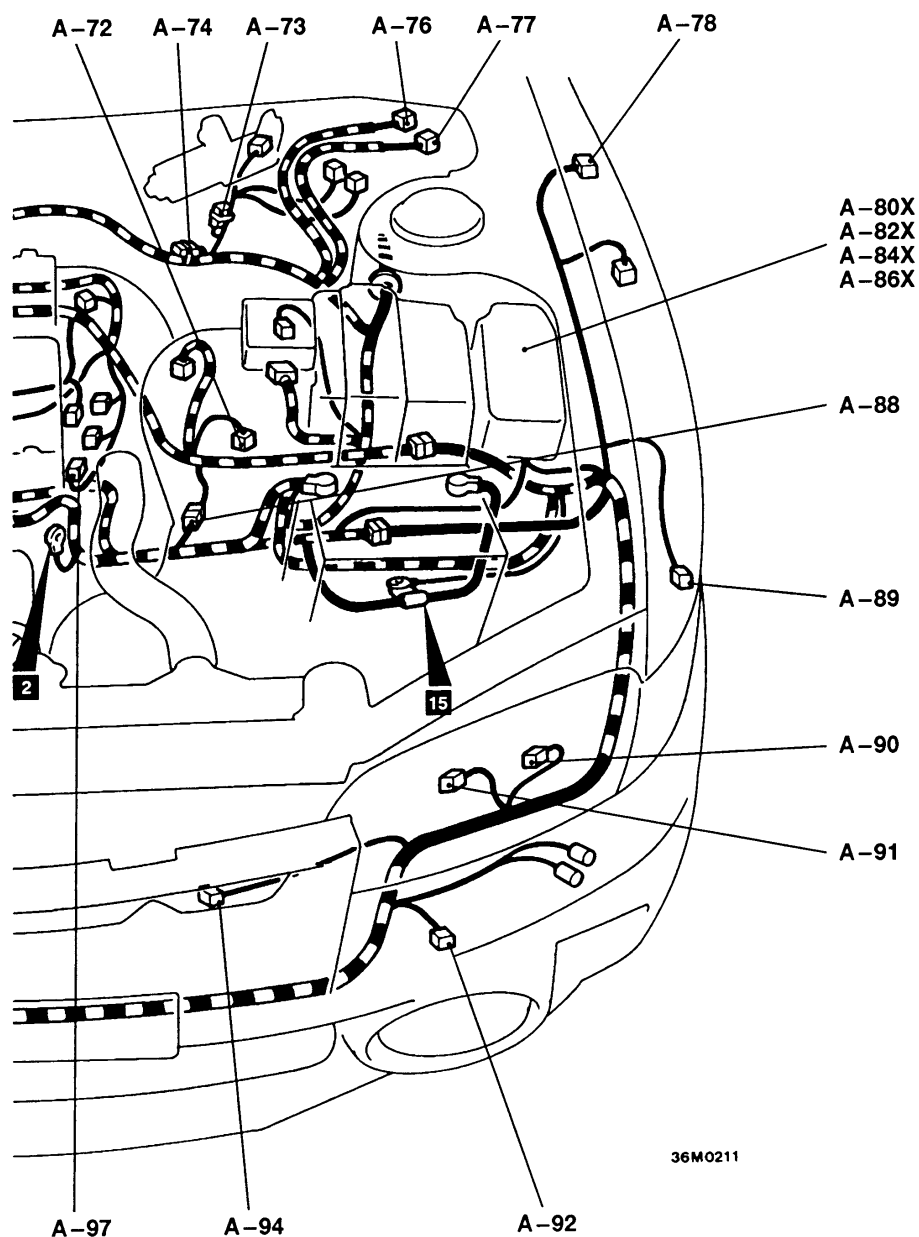
36M0211

A-29 (2-B)	Front harness and battery harness combination	A-45 (1)	Horn (RH)
A-33 (1)	Horn (LH)	A-46 (1)	Horn (RH)
A-34 (1)	Horn (LH)	A-47 (2-G)	Rear washer motor
A-35 (2-BR)	Outside air temperature sensor <vehicles with fully automatic air conditioner>	A-48 (2)	Windshield washer motor
A-38 (2-B)	Engine coolant temperature sensor	A-49 (2-BR)	Dual pressure switch
A-39 (1-B)	Engine coolant temperature gauge unit	A-50 (2-B)	Front speed sensor (RH) <vehicles with ABS>



- A-51 (3-B) Crank angle sensor
- A-52 (1-B) Oil pressure switch
- A-53 (2-B) Injector (No.1)
- A-54 (2-B) Injector (No.2)
- A-55 (2-B) Injector (No.3)
- A-56 (2-B) Injector (No.4)
- A-63 (4-B) O<sub>2</sub> sensor
- A-72 (2-B) Back-up lamp switch
- A-73 (1-L) Engine speed detection connector
- A-74 (1-B) Fuel pump check connector
- A-76 (6) Valve relay <vehicles with ABS>
- A-77 (5) Motor relay <vehicles with ABS>

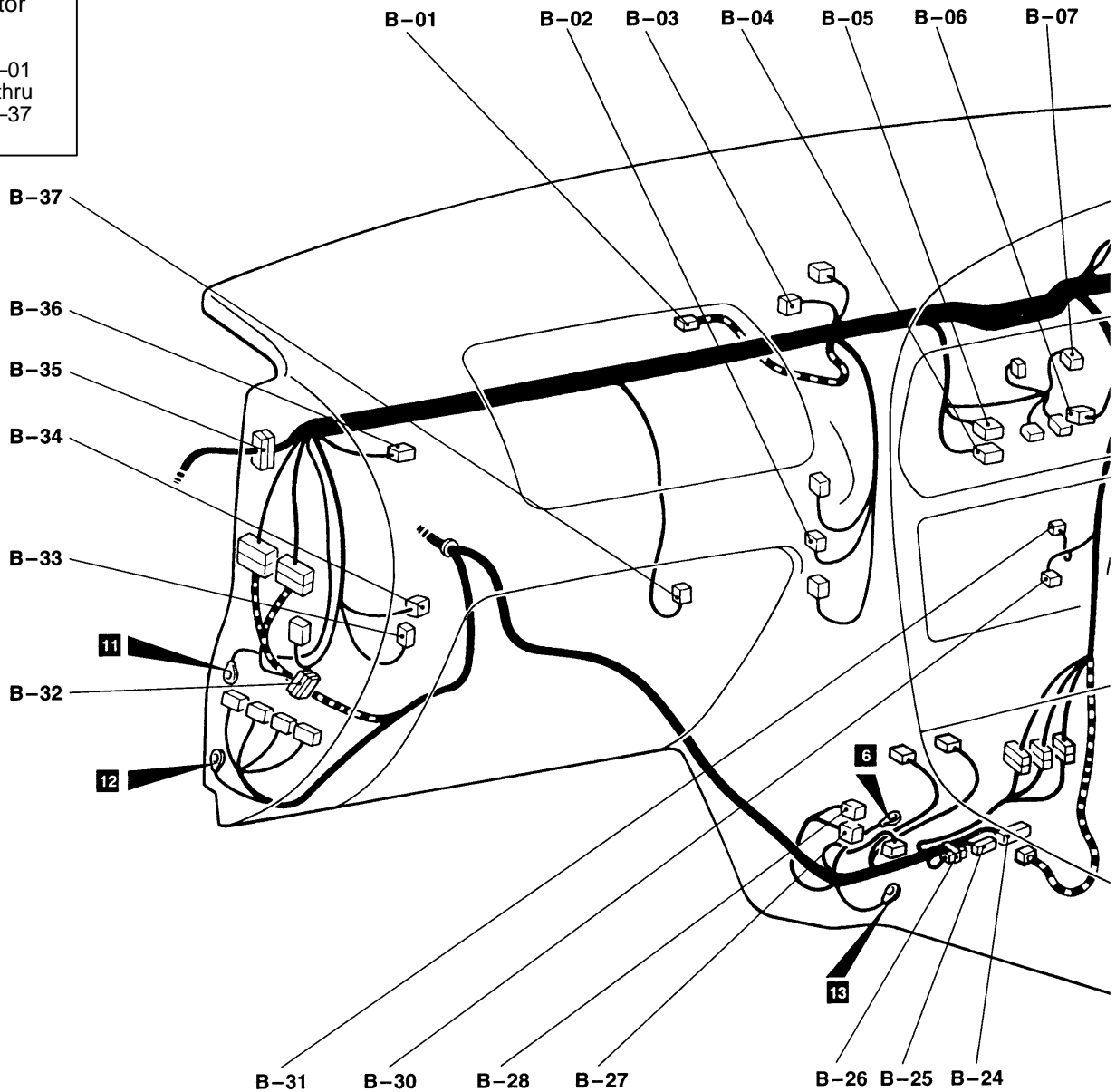
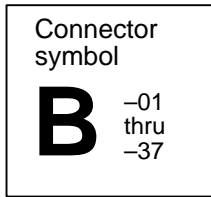
- A-78 (2-GR) Side turn signal lamp (LH)
- A-80X (5) Horn relay <vehicles with SRS air bag>
- A-82X (5) Radiator fan relay (LO)
- A-84X (5) Headlamp relay
- A-86X (4) Alternator relay
- A-88 (6-B) Control harness and battery harness combination
- A-89 (2-BR) Front turn signal lamp (LH)
- A-90 (3-B) Headlamp (LH)
- A-91 (2) Position lamp (LH)
- A-92 (2-B) Fog lamp (LH)



- A-94 (4-GR) Radiator fan motor
- A-96 (2-GR) Knock sensor
- A-97 (3-B) Camshaft position sensor
- A-99 (2-B) Condenser fan motor
- A-101 (1) Power steering oil pressure switch
- A-102 (1) Spare connector for fog lamp
- A-103 (2-B) Fog lamp (RH)
- A-104 (2) Position lamp (RH)
- A-105 (3-B) Headlamp (RH)
- A-106 (1-B) A/C compressor assembly
- A-107 (2-BR) Front turn signal lamp (RH)
- A-110 (3-GR) Ignition coil 1
- A-111 (3-GR) Ignition coil 2

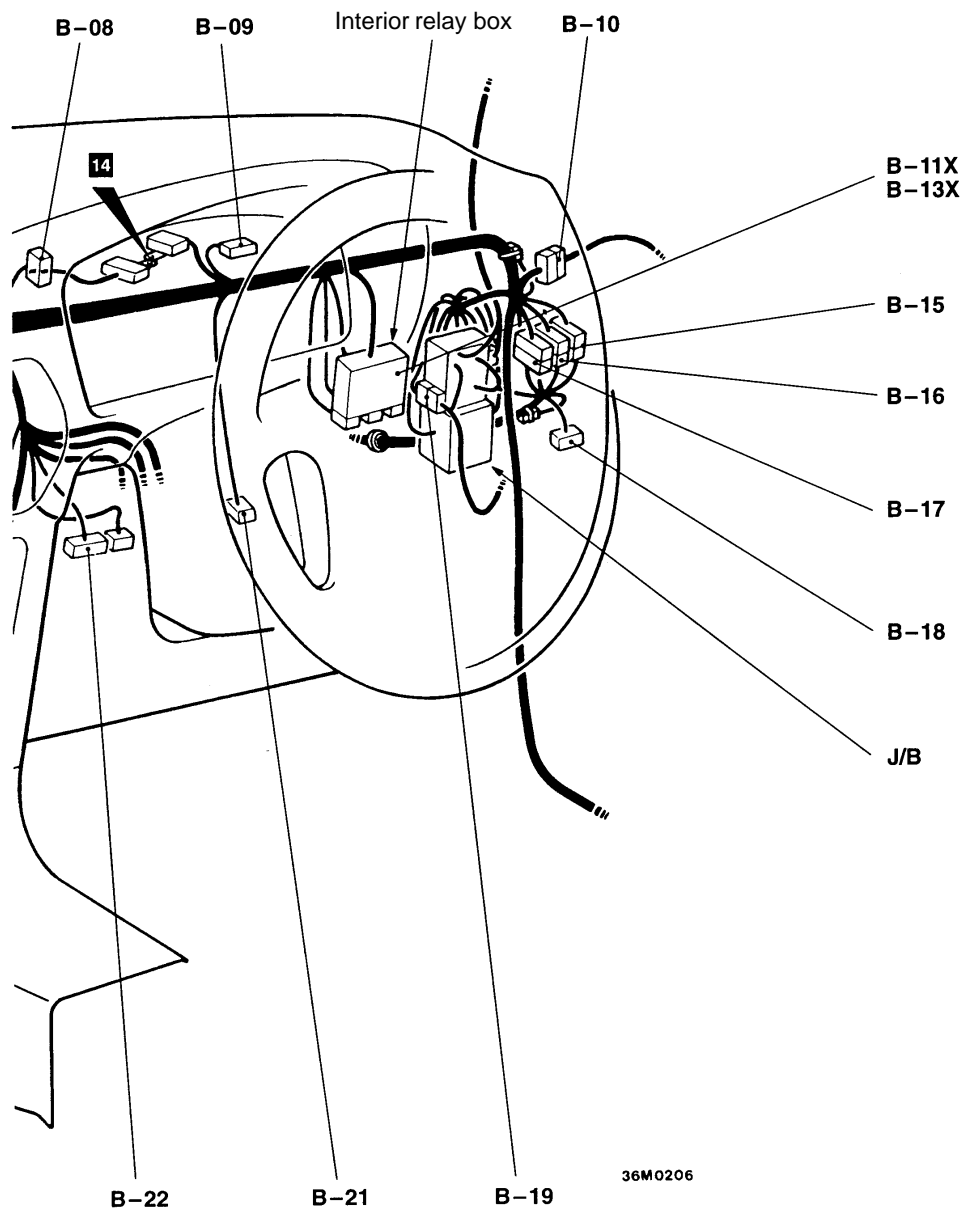
- A-112X (4) Radiator fan relay (HI)
- A-113X (4) Condenser fan relay (LO)
- A-114X (4) Condenser fan relay (HI)
- A-116X (4) A/C compressor relay
- A-117 (2-GR) Side turn signal lamp (RH)
- A-123 (5-B) Fuel pump relay No.2
- A-124 (6-B) Fuel pump resistor
- A-125 (2-B) Resistor (for injector)
- A-126 (5-B) AYC relay
- A-127 (2-B) Secondary air control solenoid valve
- A-128 (2-GR) Condenser fan motor
- A-129 (2-B) Water spray motor
- A-131 (1-B) Noise condenser

DASH PANEL



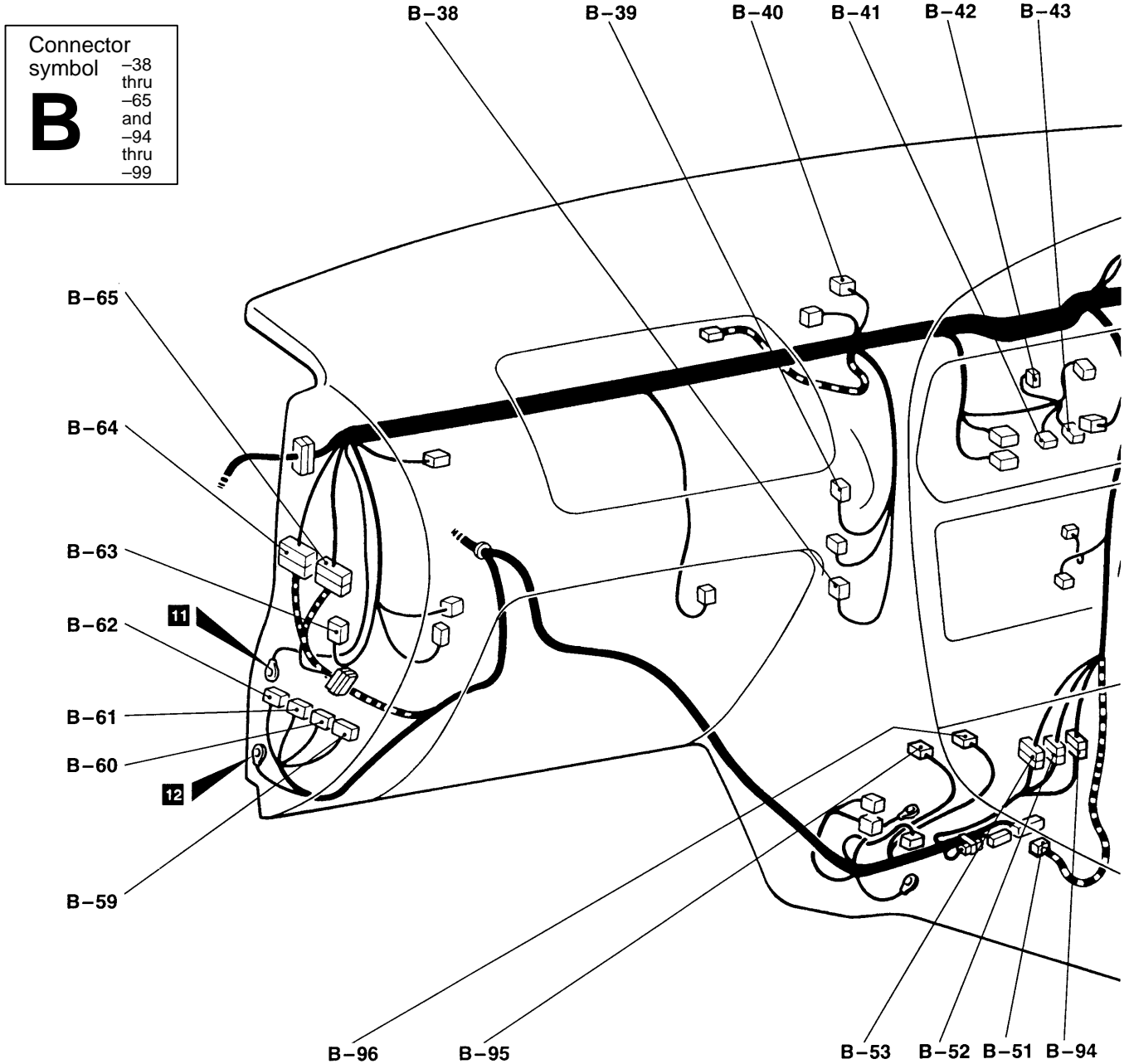
- |             |   |           |   |
|-------------|---|-----------|---|
| B-01 (2-R)  | Passenger seat air bag module (squib)   | B-09 (25) | Meter and gauge                                       |
| B-02 (2)    | Heater water temperature sensor <vehicles with fully automatic air conditioner>                       | B-10 (22) | Body harness and front door harness (RH) combination  |
| B-03 (2-B)  | Air thermo sensor <vehicles with fully automatic air conditioner>                                     | B-11X (8) | Rear intermittent wiper relay                         |
| B-04 (20-B) | A/C-ECU <vehicles with fully automatic air conditioner>   | B-13X (5) | Power window relay                                    |
| B-05 (16-B) | A/C-ECU <vehicles with fully automatic air conditioner>   | B-15 (20) | Front harness and body harness combination            |
| B-06 (6)    | Air outlet change-over damper motor and potentiometer <vehicles with fully automatic air conditioner> | B-16 (6)  | Front harness and body harness combination            |
| B-07 (8)    | Blower switch <vehicles with manual air conditioner>  | B-17 (14) | Front harness and body harness combination <ABS>      |
| B-08 (25)   | Meter and gauge   | B-18 (19) | Jumper connector (1)                                  |
|             |   | B-19 (22) | Body harness and instrument panel harness combination |



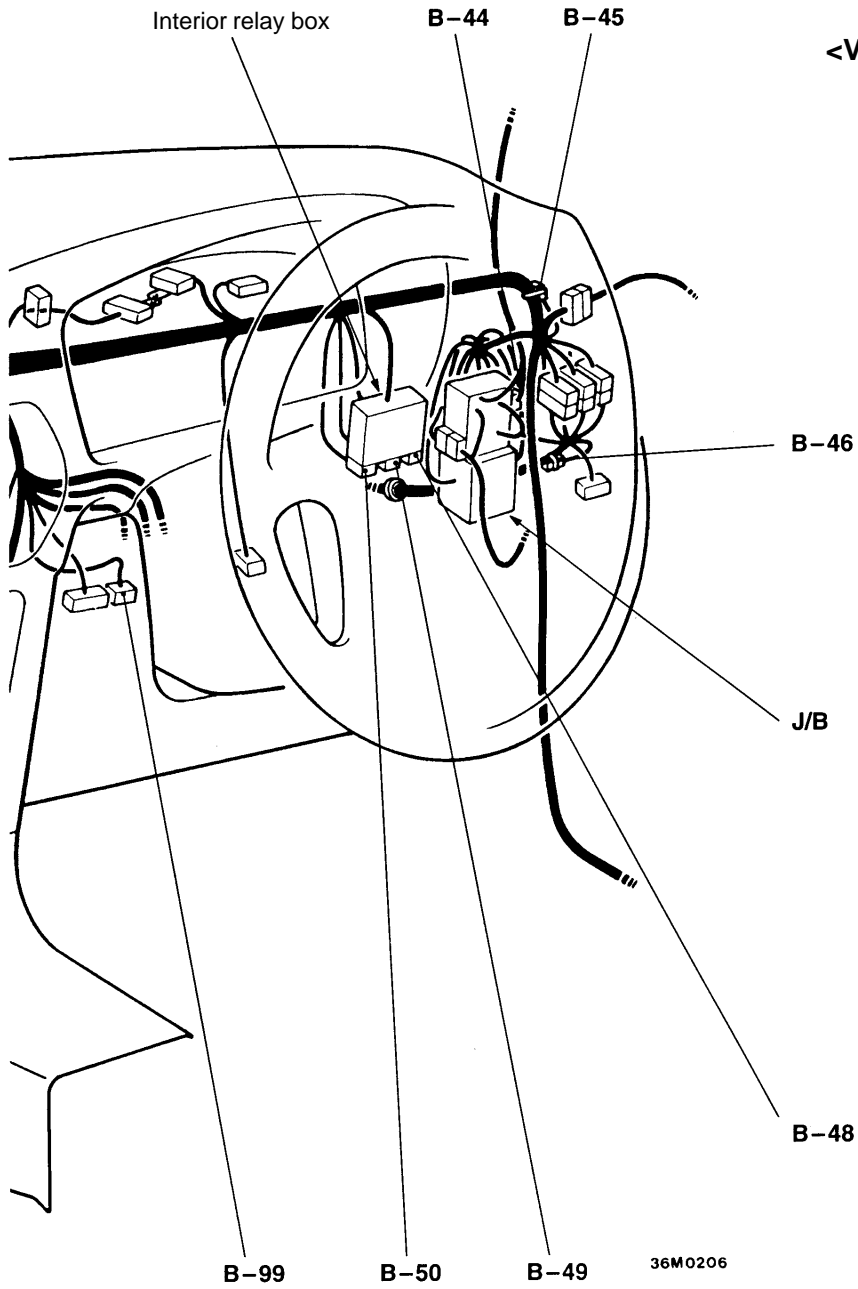


36M0206

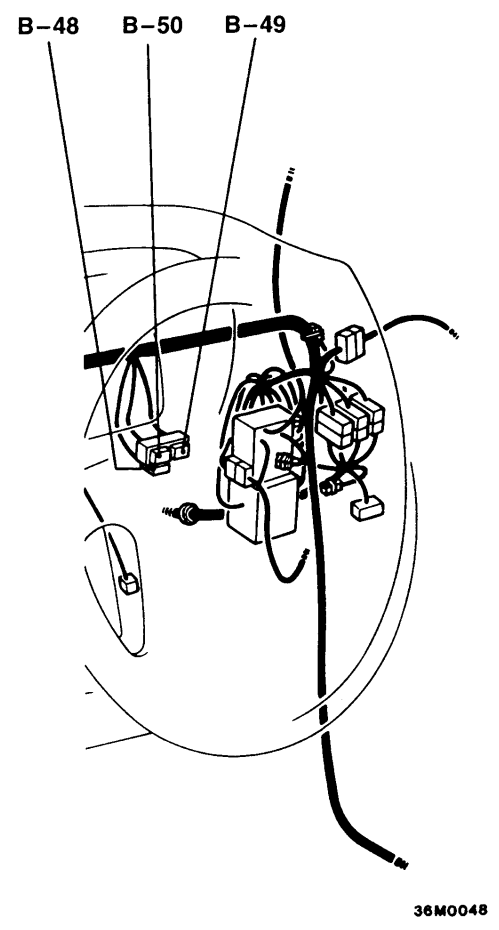
B-21 (2)	Stop lamp switch	B-34 (4)	Blower high speed relay <vehicles with fully automatic air conditioner>
B-22 (16-B)	Diagnosis connector	B-35 (22)	Body harness and front door harness (LH) combination
B-24 (26-Y)	ABS-ECU	B-36 (2)	Inside and outside air change-over damper motor <vehicles with fully automatic air conditioner>
B-25 (22-Y)	ABS-ECU	B-37 (4)	Power transistor <vehicles with fully automatic air conditioner> or resistor <vehicles with heater or manual air conditioner>
B-26 (2-B)	Diode (for ABS circuit)		
B-27 (4)	Engine control relay		
B-28 (4)	Fuel pump relay		
B-30 (14)	Radio or spare connector for radio		
B-31 (1)	Glass antenna amplifier		
B-32 (19-B)	Jumper connector (5)		
B-33 (2)	Blower motor <vehicles with fully automatic air conditioner>		



- |            |  |             |   |
|------------|--|-------------|---|
| B-38 (2)   | Sunlight sensor <vehicles with fully automatic air conditioner>                        | B-44 (6)    | Body harness and roof harness combination <vehicles with sunroof> |
| B-39 (6)   | Air mix damper motor and potentiometer <vehicles with fully automatic air conditioner> | B-45 (2-B)  | Diode (for keyless entry system circuit)                          |
| B-40 (3)   | Automatic compressor ECU <vehicles with manual air conditioner>                        | B-46 (2)    | Spare connector for fog lamp switch <vehicles without fog lamp>   |
| B-41 (8)   | A/C switch <vehicles with manual air conditioner>                                      | B-48 (14)   | Jumper connector (2)  |
| B-42 (2)   | Blower switch illumination lamp <vehicles with heater or manual air conditioner>       | B-49 (14)   | Jumper connector (3)  |
| B-43 (6-B) | Defogger switch <vehicles with heater or manual air conditioner>                       | B-50 (14-L) | Jumper connector (4)  |
|            |  | B-51 (21-Y) | SRS-ECU   |
|            |  | B-52 (16-B) | Control harness and body harness combination <vehicles with ABS>  |

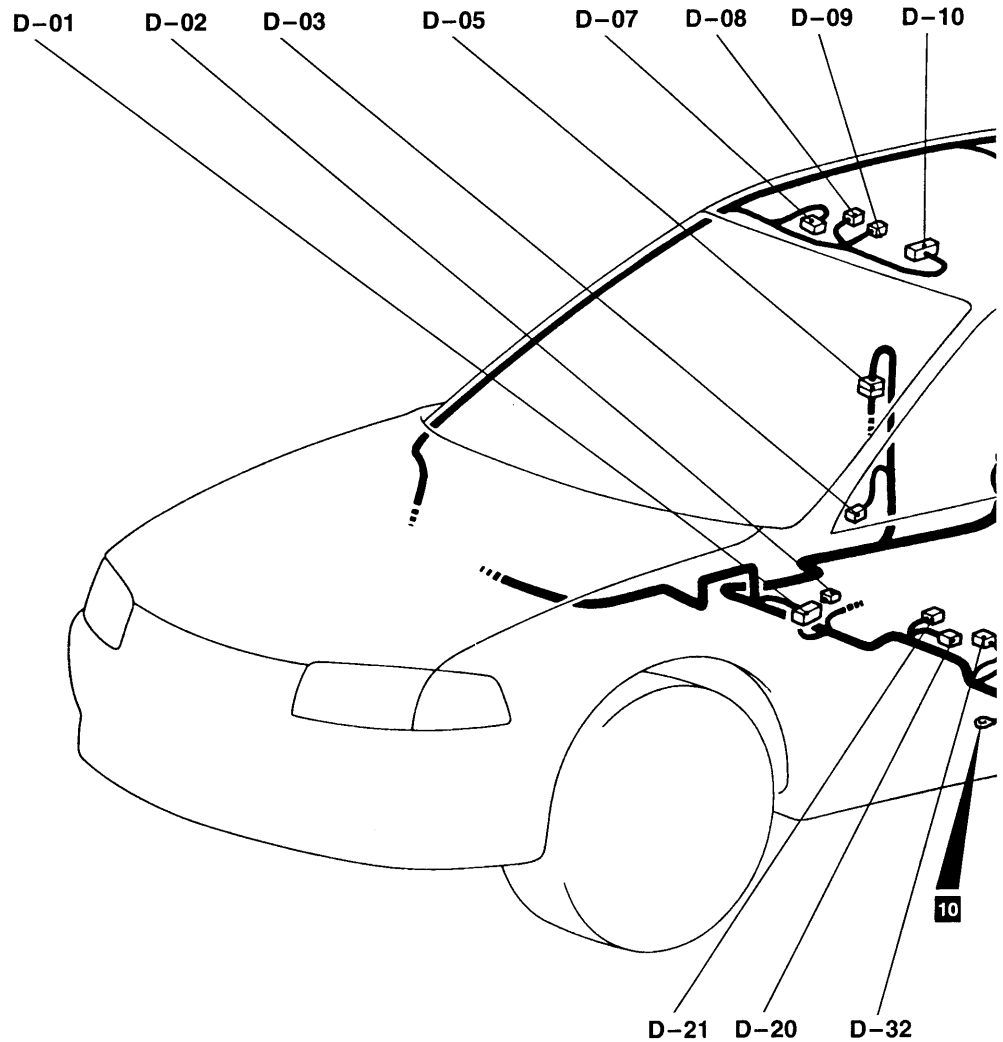
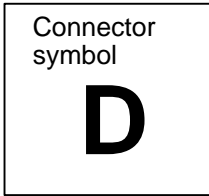


<Vehicles without interior relay box>

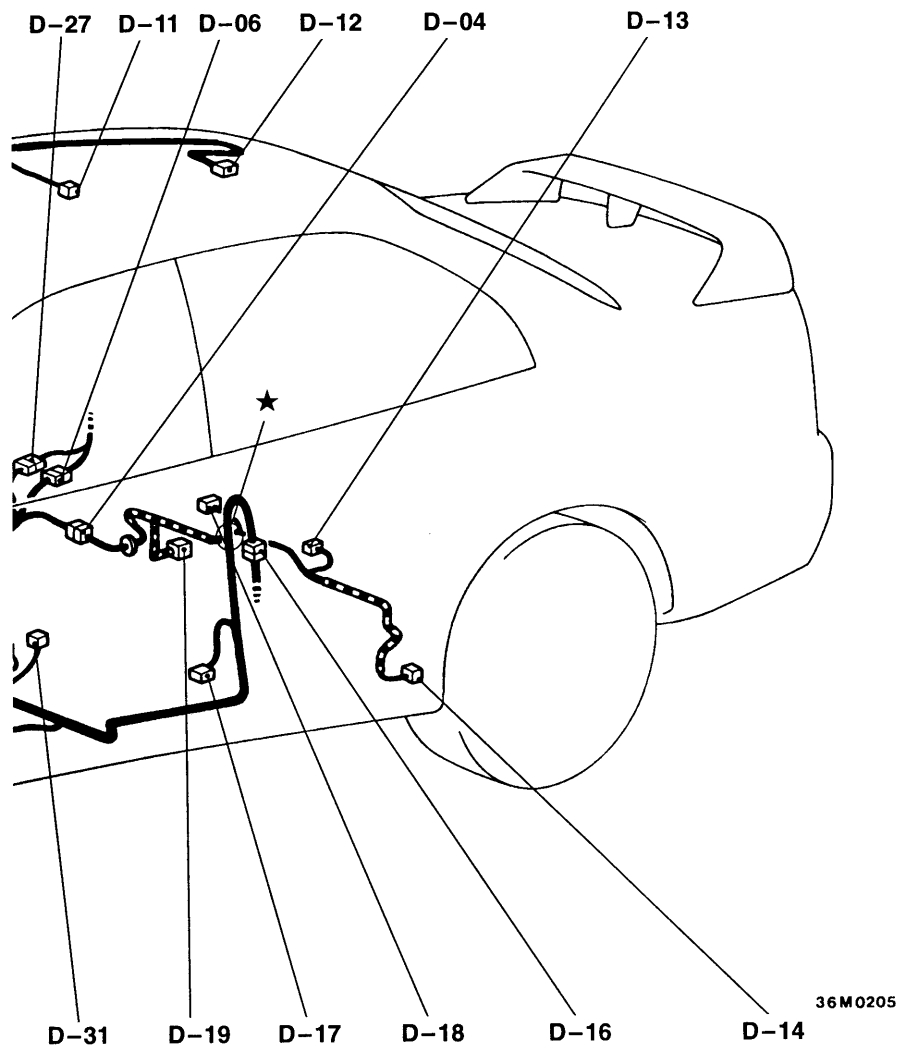


B-59 (26-Y)	Engine-ECU	B-65 (16-B)	Control harness and body harness combination
B-60 (16-Y)	Engine-ECU	B-94 (13)	Control harness and body harness combination <vehicles with AYC>
B-61 (12-Y)	Engine-ECU	B-95 (26)	AYC-ECU
B-62 (22-Y)	Engine-ECU	B-96 (16)	AYC-ECU
B-63 (2)	Blower motor <vehicles with heater or manual air conditioner>	B-99 (12)	Diagnosis connector
B-64 (13)	Control harness and body harness combination		

FLOOR, ROOF, AND SEAT



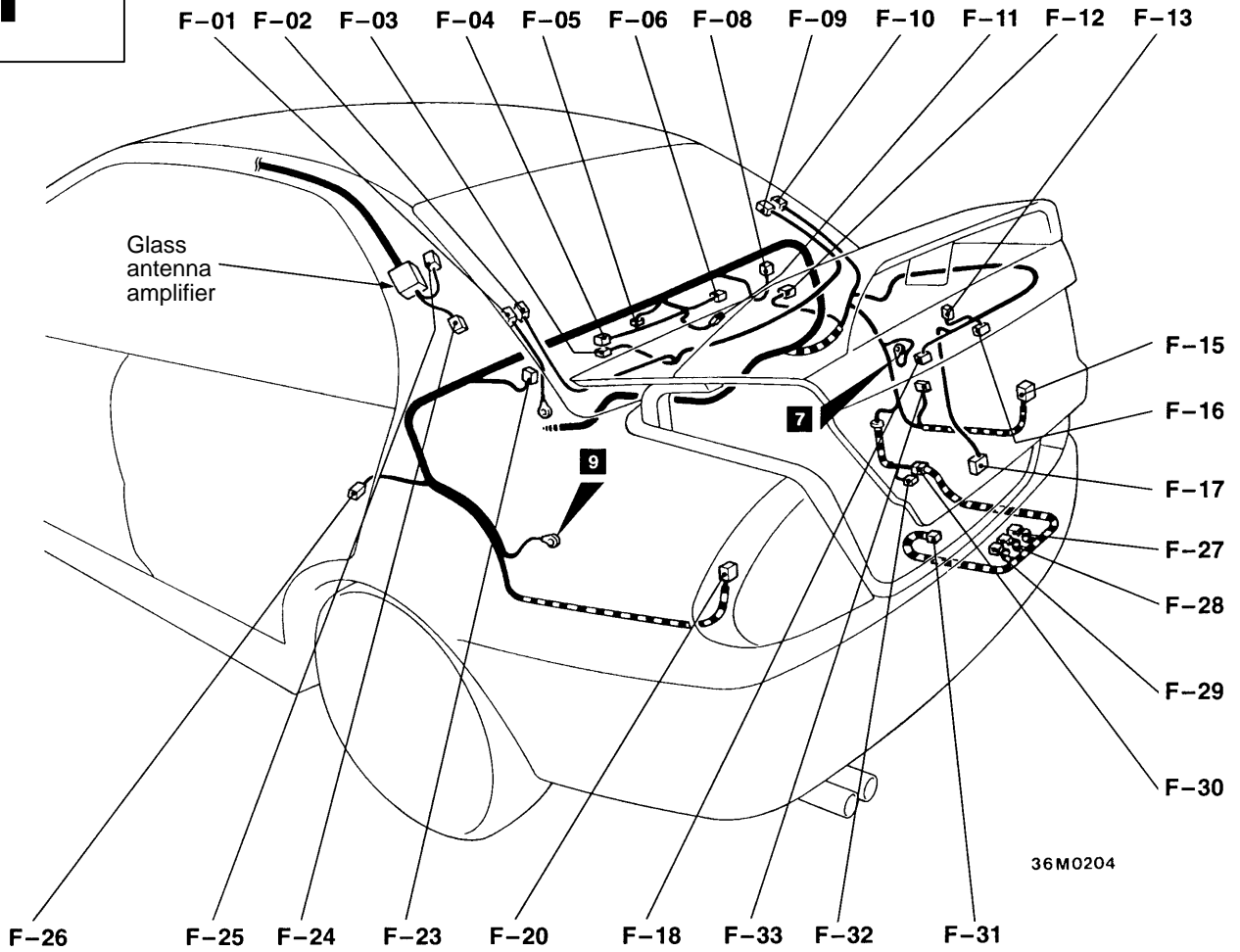
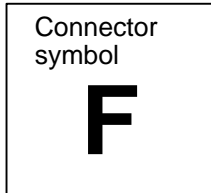
- |           |   |             |   |
|-----------|---|-------------|---|
| D-01 (20) | Receiver<br><vehicles with keyless entry system>    | D-09 (1)    | Map lamp  |
| D-02 (2)  | Seat belt switch                                    | D-10 (18)   | Sunroof ECU   |
| D-03 (2)  | Front door switch (RH)                              | D-11 (2-GR) | Room lamp <vehicles without sunroof>                |
| D-04 (10) | Body harness and fuel harness combination           | D-12 (8)    | Sunroof motor                                       |
| D-05 (6)  | Body harness and rear door harness (RH) combination | D-13 (3-B)  | Fuel gauge unit (sub)                               |
| D-06 (22) | Body harness and rear harness combination           | D-14 (2-B)  | Rear speed sensor (LH)<br><vehicles with ABS>       |
| D-07 (6)  | Sunroof switch                                      | D-16 (6)    | Body harness and rear door harness (LH) combination |
| D-08 (8)  | Room lamp <vehicles with sunroof>                   | D-17 (2)    | Front door switch (LH)                              |
|           |   | D-18 (6)    | Fuel gauge unit (main)                              |



- D-19 (2-B) Rear speed sensor (RH)  
<vehicles with ABS>
- D-20 (3-B) Acceleration sensor <vehicles with ABS>
- D-21 (1-B) Parking brake switch
- D-27 (2) Body harness and rear harness combina-  
tion <vehicles with AYC>

- D-31 (2) Water spray switch
- D-32 (3-B) Acceleration sensor (lateral)  
<vehicles with AYC>

LUGGAGE COMPARTMENT



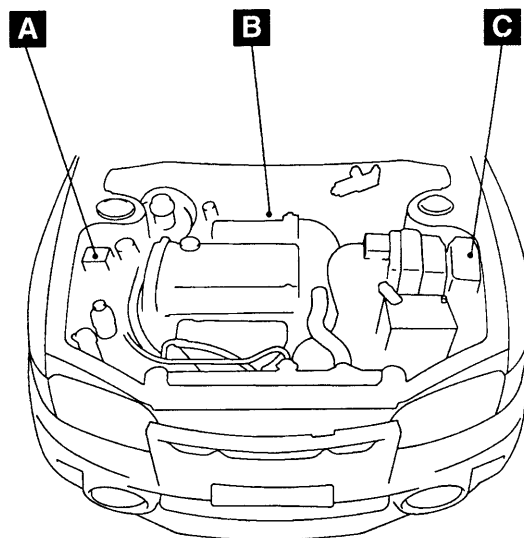
36M0204

- |             |  |             |  |
|-------------|--|-------------|--|
| F-01 (1-B)  | Defogger (-) <vehicles without choke coil>                           | F-18 (2-GR) | Licence plate lamp (LH)                  |
| F-02 (1-B)  | Defogger (-) <vehicles with choke coil>                              | F-20 (6)    | Rear combination lamp (LH)               |
| F-03 (2)    | Choke coil   | F-23 (2-B)  | Rear speaker (LH)                        |
| F-04 (3)    | Choke coil   | F-24 (1)    | Glass antenna                            |
| F-05 (2)    | Luggage compartment lamp   |             | <vehicles with diversity glass antenna>  |
| F-06 (2)    | Vacant connector or high mounted stop lamp (installed on rear shelf) | F-25 (1)    | Glass antenna                            |
|             |  | F-26 (1-B)  | Rear door switch (LH)                    |
| F-08 (2-B)  | Rear speaker (RH)  | F-27 (3-B)  | Proportioning valve <vehicles with AYC>  |
| F-09 (1-B)  | Defogger (+) <vehicles with choke coil>                              | F-28 (2-B)  | Direction valve (LH) <vehicles with AYC> |
| F-10 (1-B)  | Defogger (+) <vehicles without choke coil>                           | F-29 (2-B)  | Direction valve (RH) <vehicles with AYC> |
| F-11 (3)    | Rear wiper motor   | F-30 (8-B)  | Rear harness and AYC harness combination |
| F-12 (1-B)  | Rear door switch (RH)  |             |  |
| F-13 (2)    | High mounted stop lamp (installed on rear spoiler)                   | F-31 (2-B)  | Accumulator pressure switch              |
|             |  |             | <vehicles with AYC>                      |
| F-15 (6)    | Rear combination lamp (RH)   | F-32 (2-B)  | AYC motor                                |
| F-16 (2-GR) | Licence plate lamp (RH)  | F-33 (6)    | CD changer                               |
| F-17 (1-B)  | Luggage compartment lamp switch                                      |             |  |

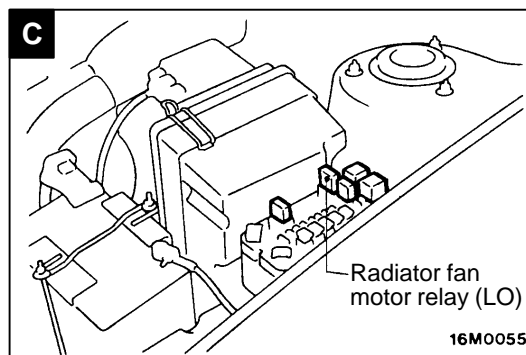
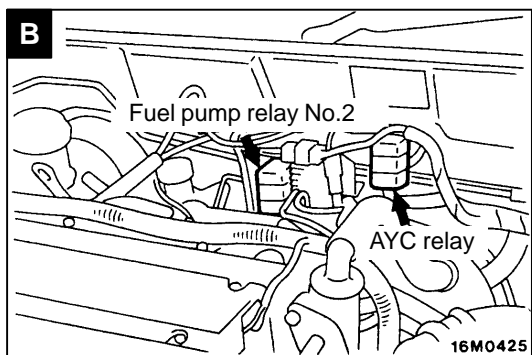
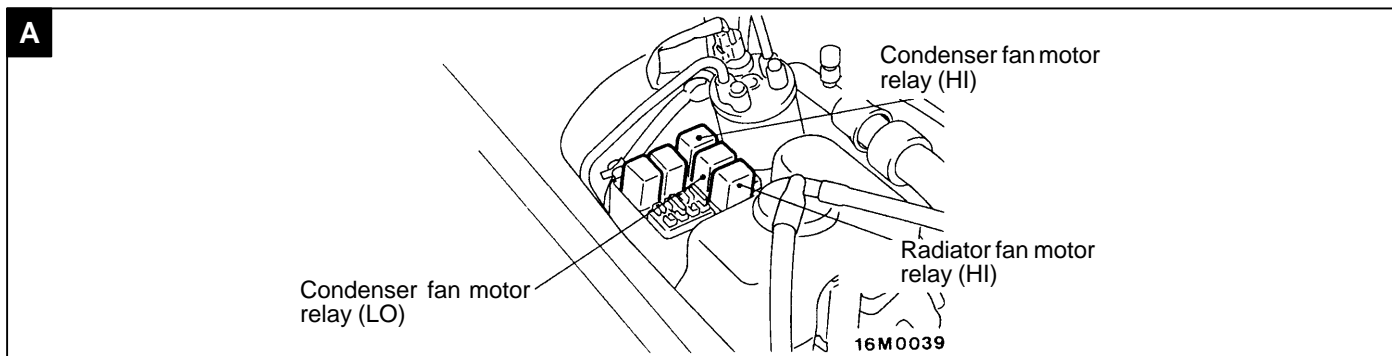
# SINGLE PART INSTALLATION POSITION

## RELAY

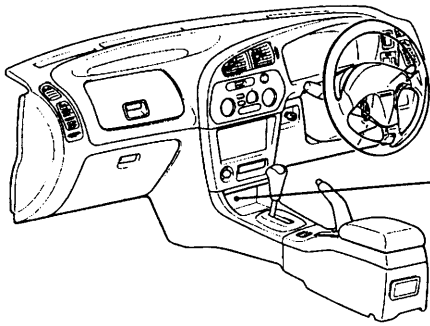
Name	Symbol	Name	Symbol
AYC relay	B	Fuel pump relay No.2	B
Condenser fan motor relay (HI)	A	Radiator fan motor relay (HI)	A
Condenser fan motor relay (LO)	A	Radiator fan motor relay (LO)	C



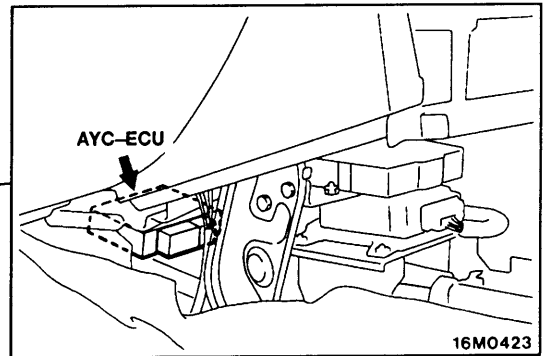
16M0429



**ECU**



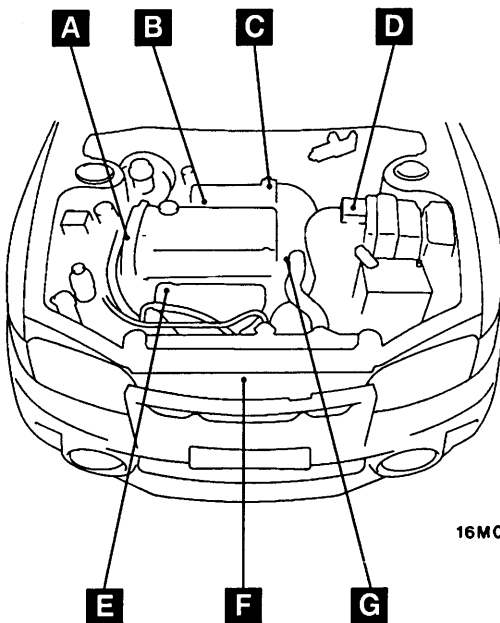
B21A086



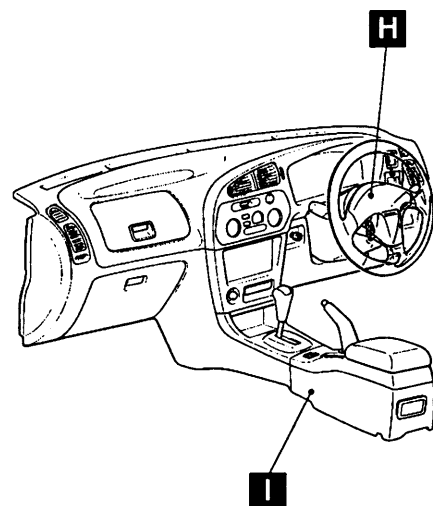
16M0423

**SENSOR**

Name	Symbol	Name	Symbol
Acceleration sensor (lateral) <vehicles with AYC>	I	Knock sensor	B
Acceleration sensor (longitudinal) <vehicles with ABS and AYC>	I	Outside air temperature sensor <vehicles with fully automatic air conditioner>	F
Air flow sensor	D	O <sub>2</sub> sensor	E
Camshaft position sensor	G	Steering angle sensor (lateral) <vehicles with AYC>	H
Crank angle sensor	A	Throttle position sensor	C
Engine coolant temperature sensor	G		

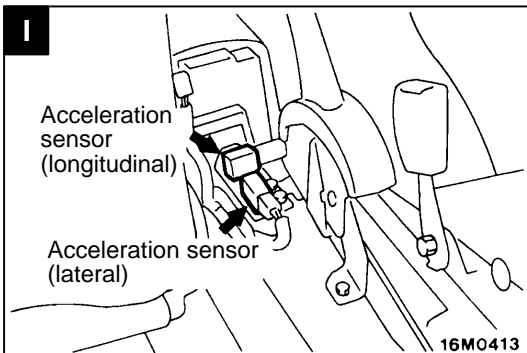
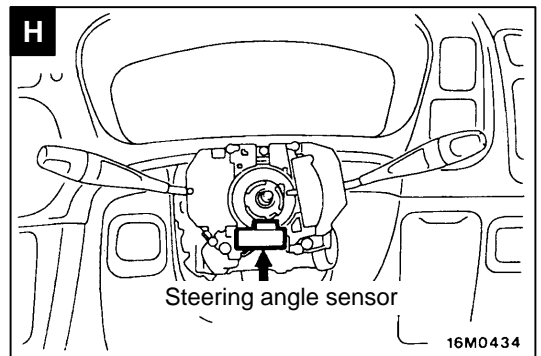
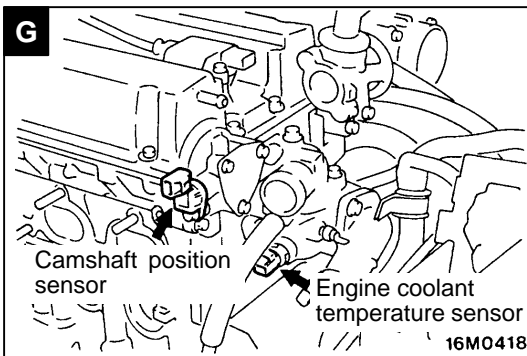
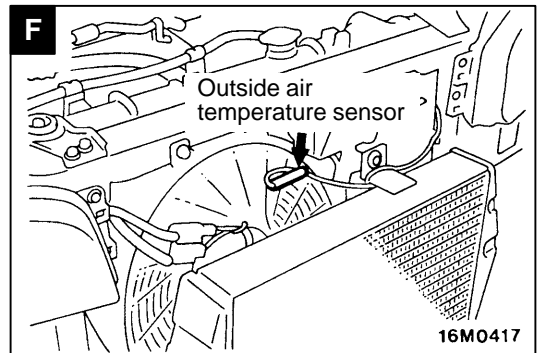
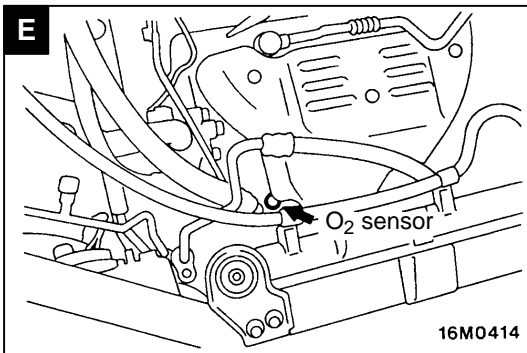
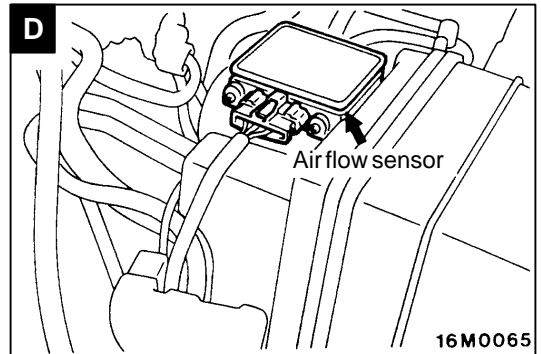
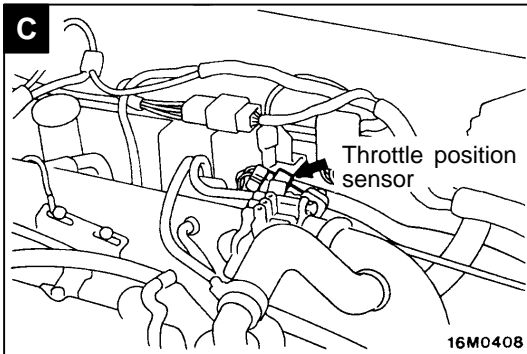
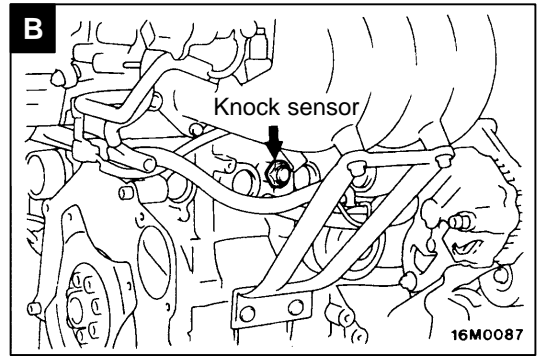
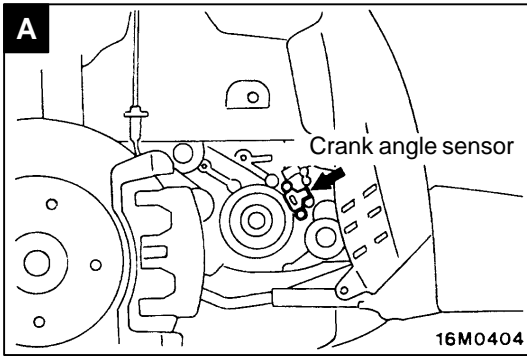


16M0429



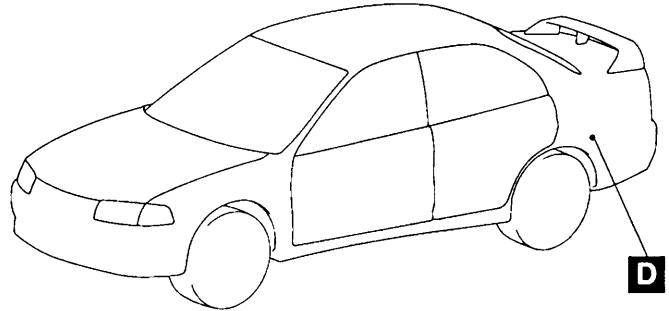
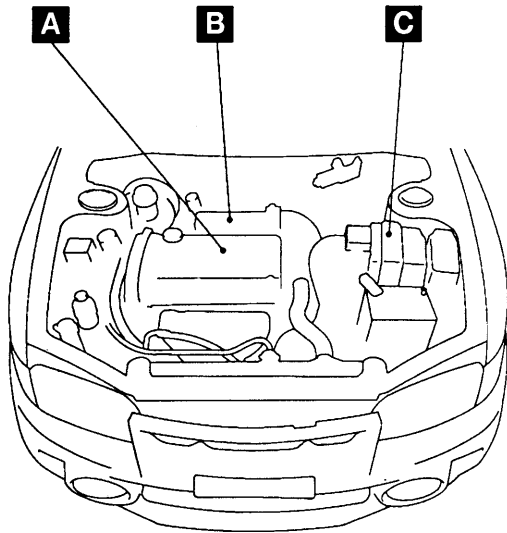
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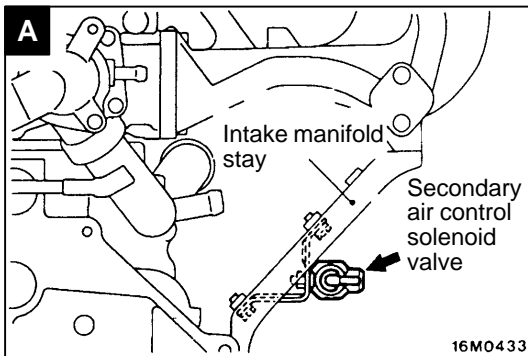
**SOLENOID VALVE**

Name	Symbol	Name	Symbol
Direction valve <vehicles with AYC>	D	Secondary air control solenoid valve	A
Fuel pressure solenoid valve	B	Waste gate solenoid valve	C
Proportioning valve <vehicles with AYC>	D		

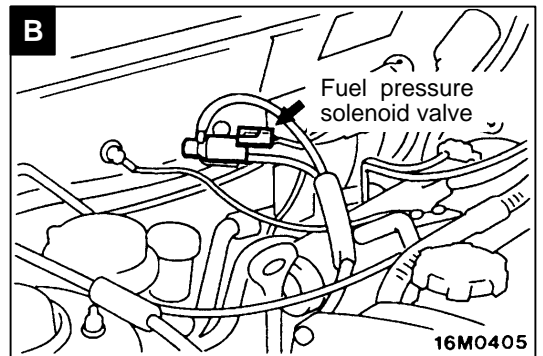


0040011

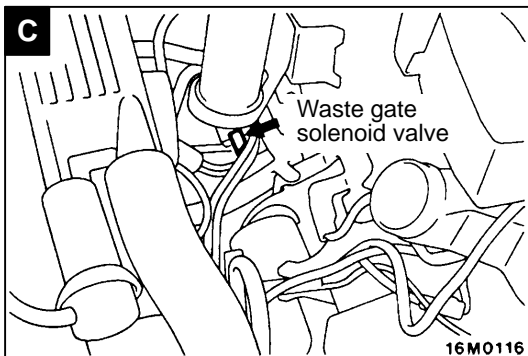
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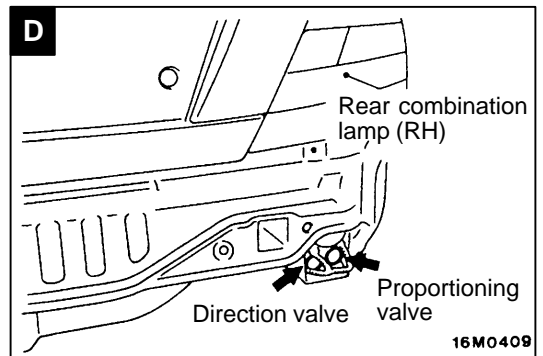
16M0433



16M0405

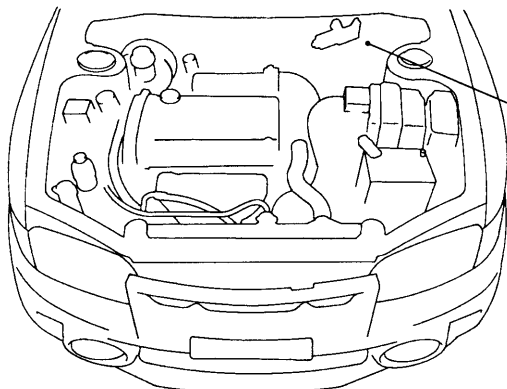


16M0116

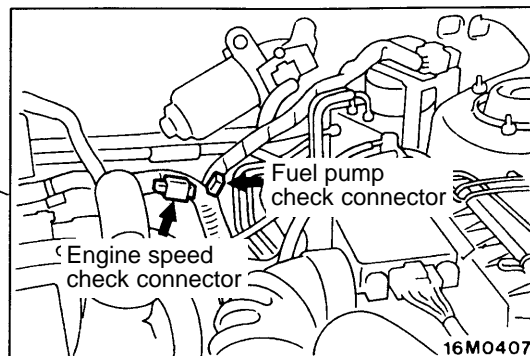


16M0409

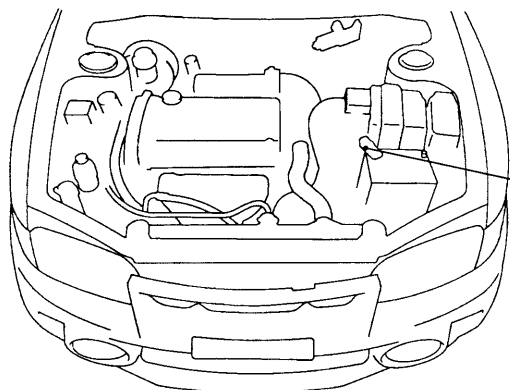
## CHECK CONNECTOR AND SPARE CONNECTOR



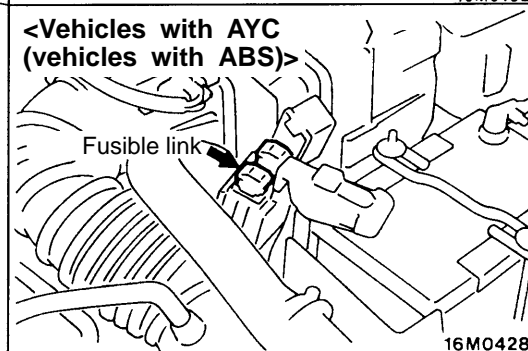
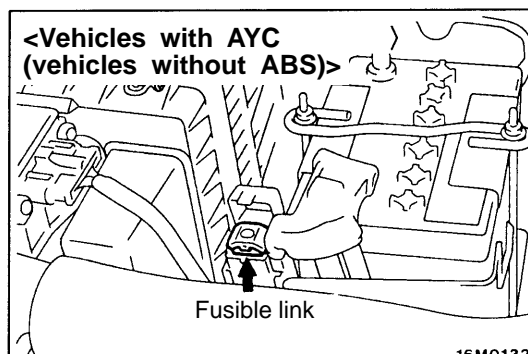
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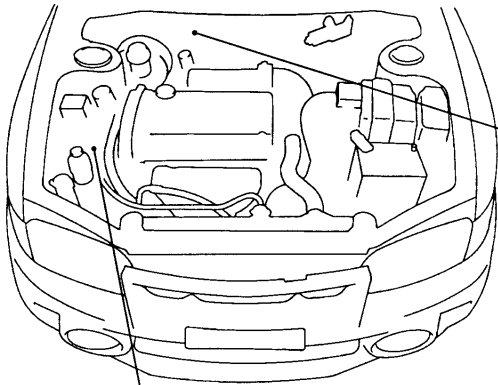
## FUSIBLE LINK AND FUSE



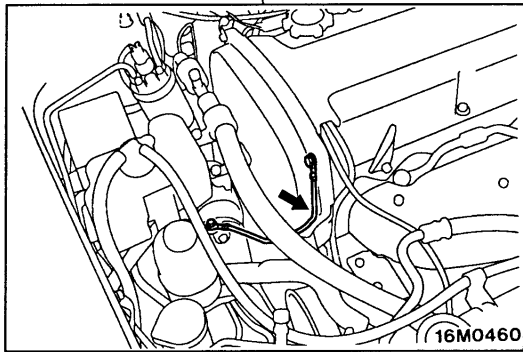
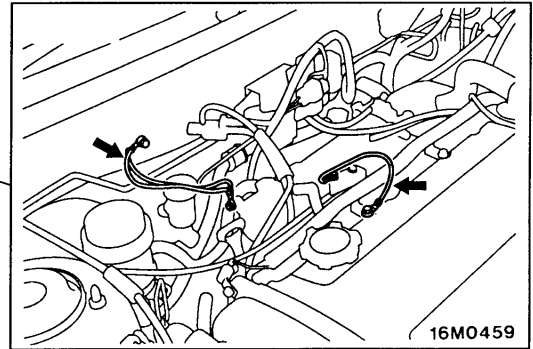
16M0429



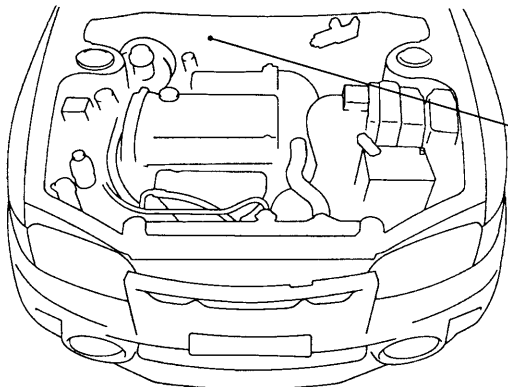
## GROUND CABLE



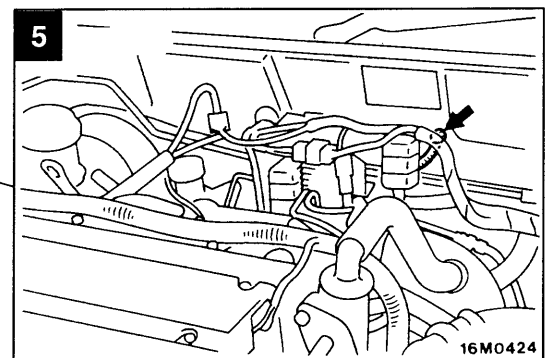
16M0429



## GROUND



16M0429



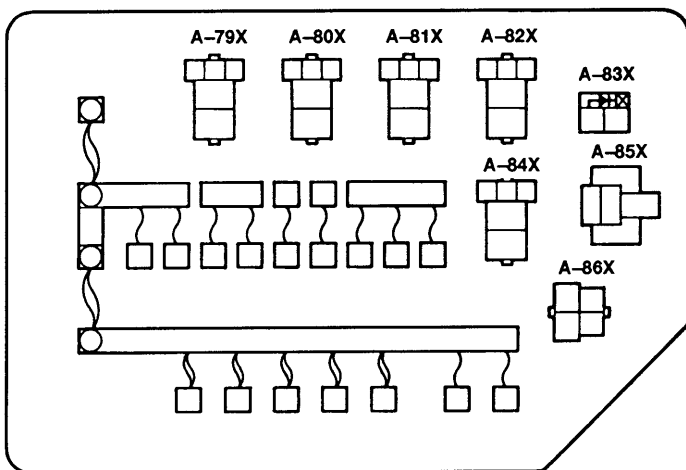
# CIRCUIT DIAGRAM

## CENTRALIZED JUNCTION

### CENTRALIZED RELAY

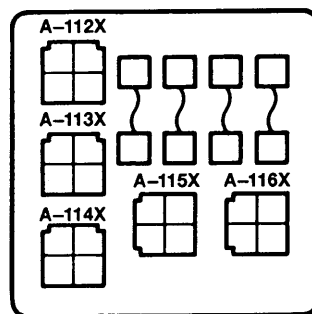
Connector No.	Name	Connector No.	Name
A-82X	Radiator fan motor relay (LO)	A-113X	Condenser fan motor relay (LO)
A-112X	Radiator fan motor relay (HI)	A-114X	Condenser fan motor relay (HI)

Relay box in engine compartment



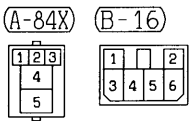
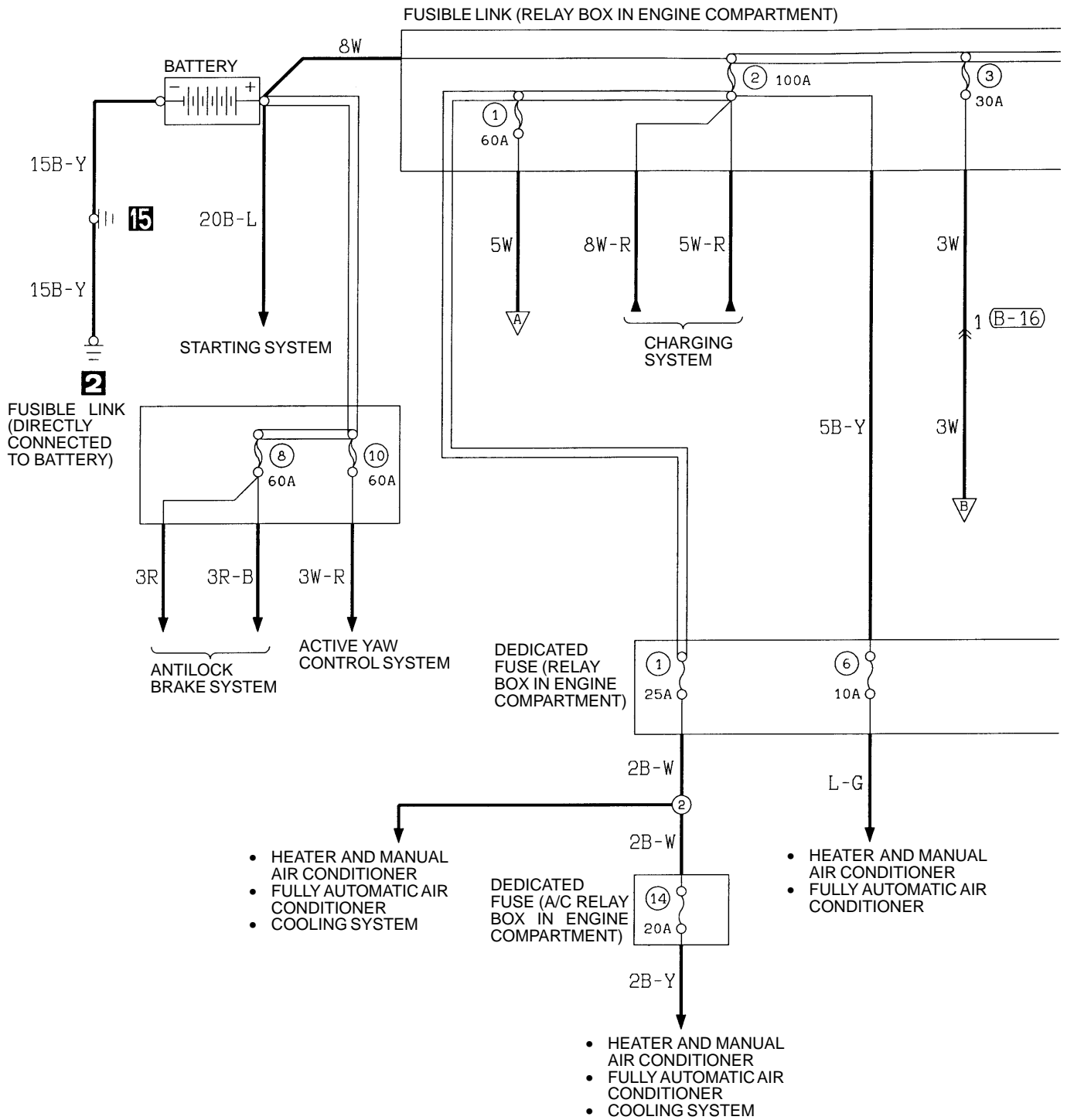
16M0141

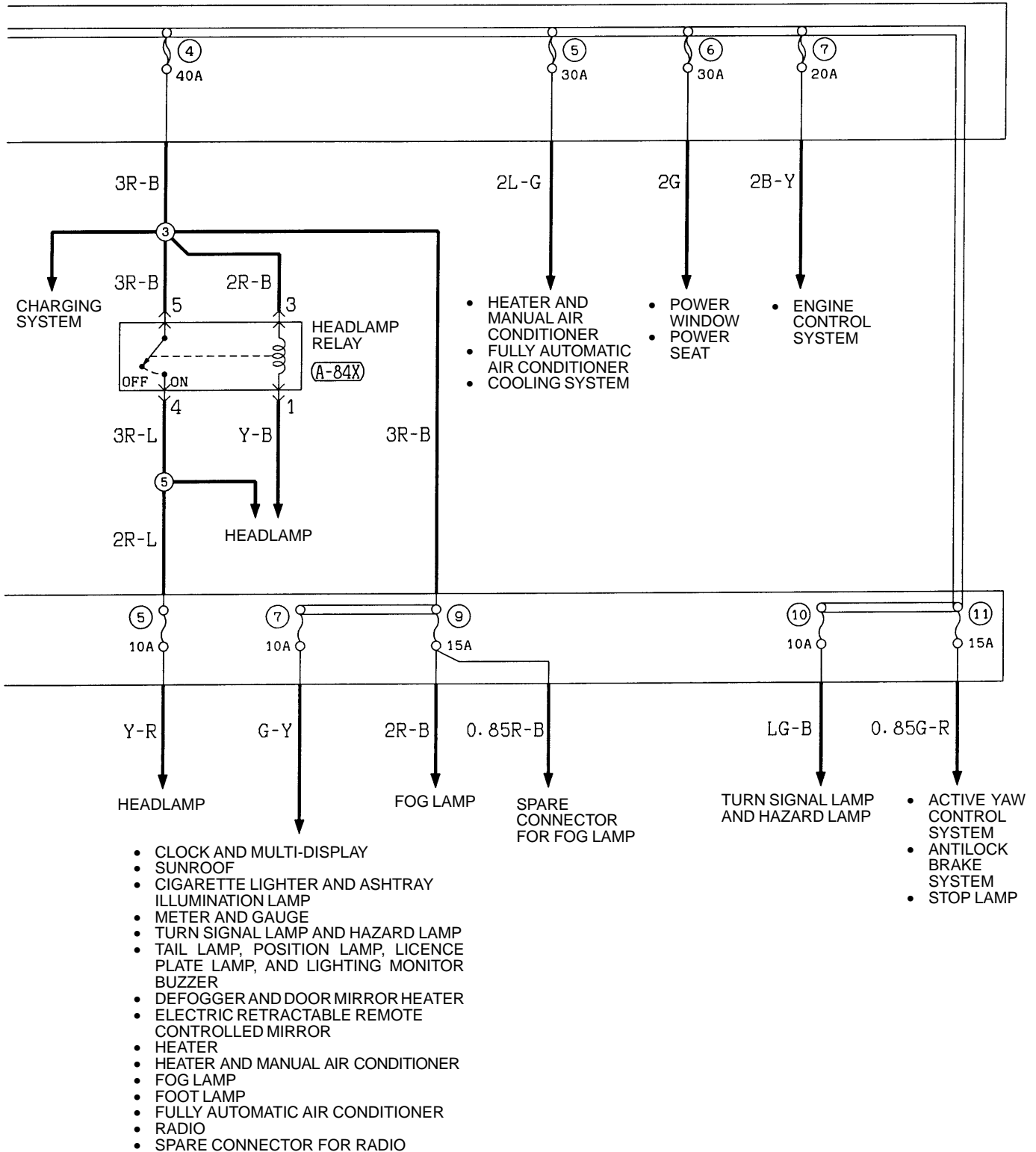
(A/C relay box)



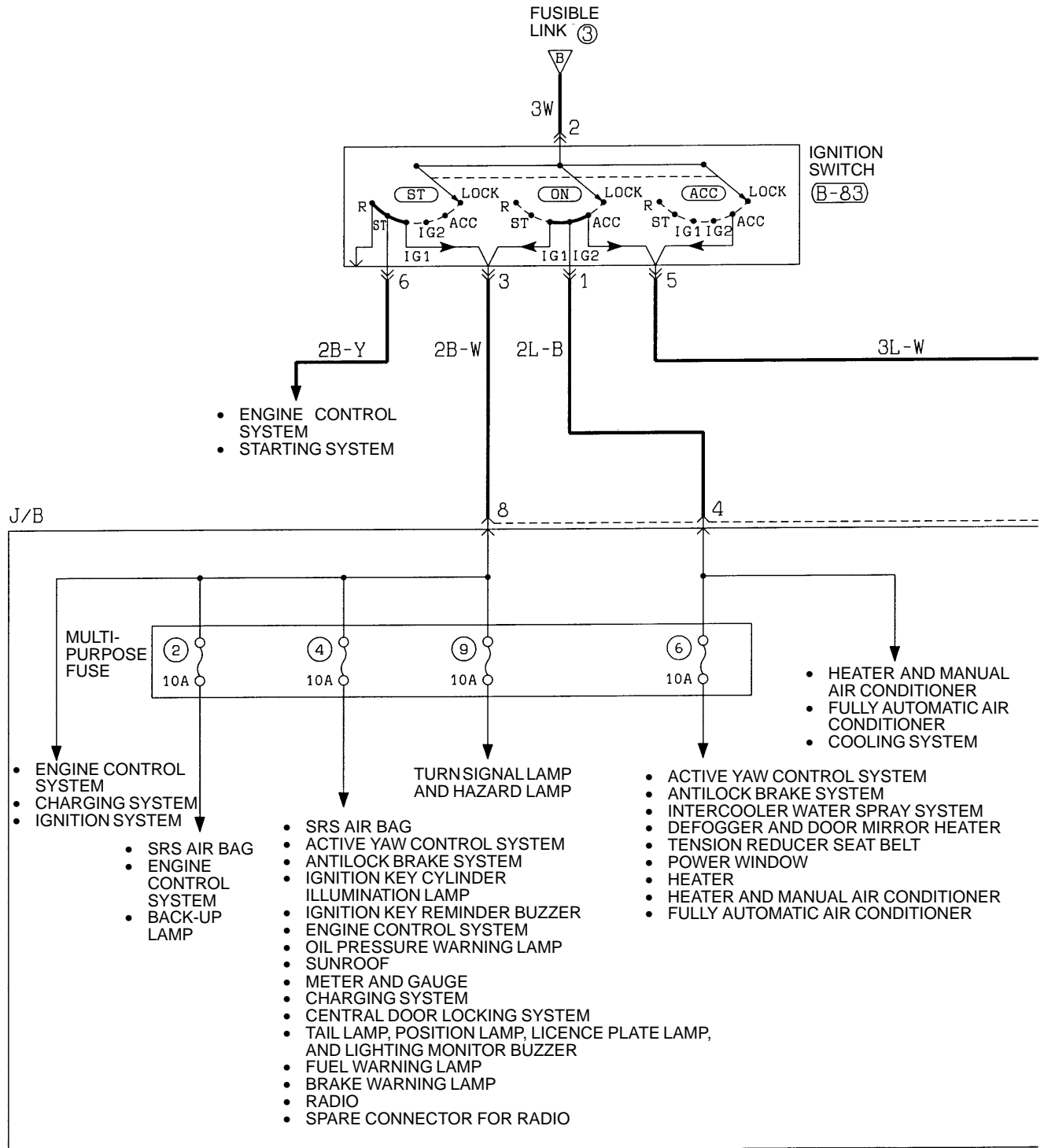
16M0142

POWER DISTRIBUTION SYSTEM

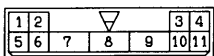




POWER DISTRIBUTION SYSTEM (CONTINUED)



(B-67)



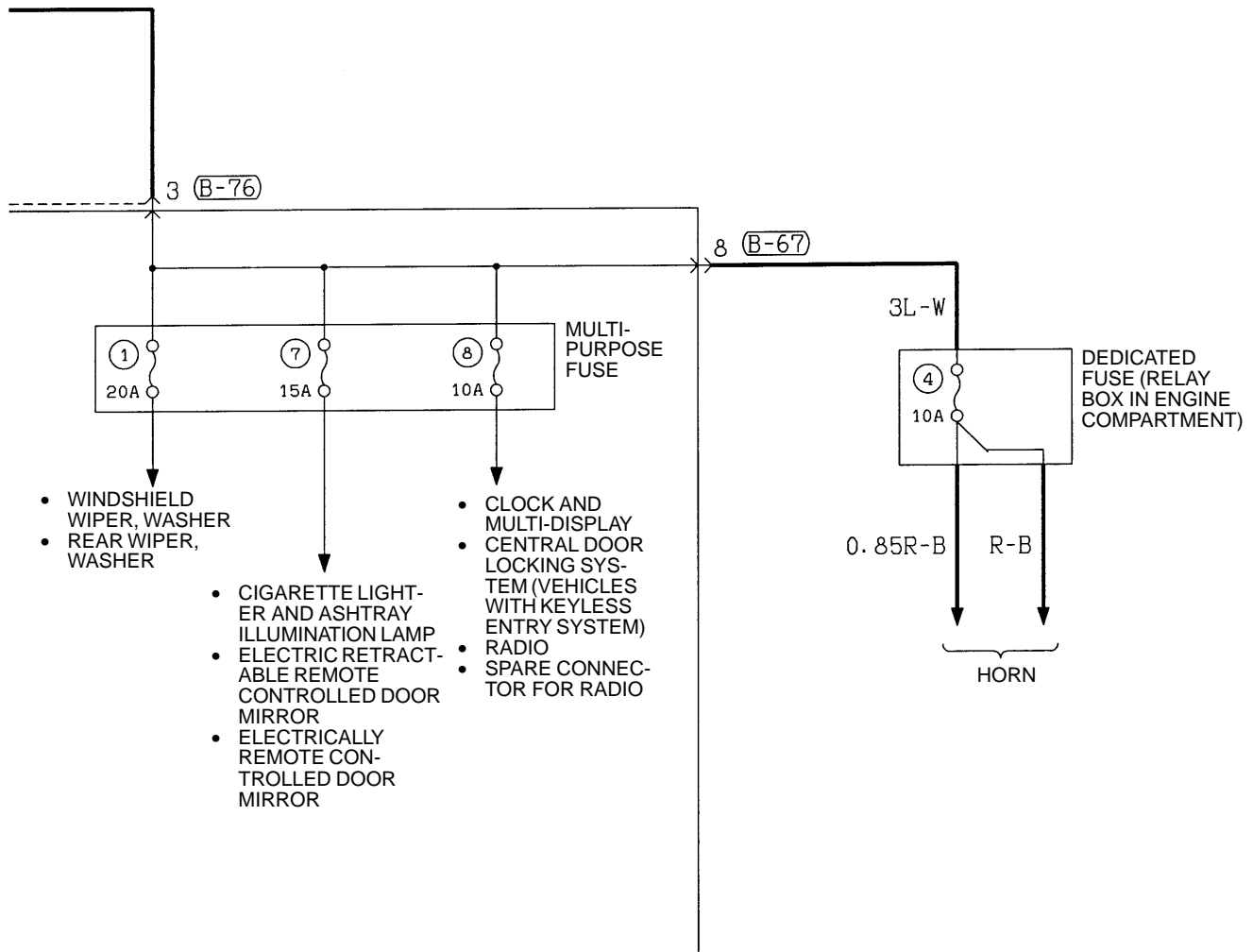
(B-76)



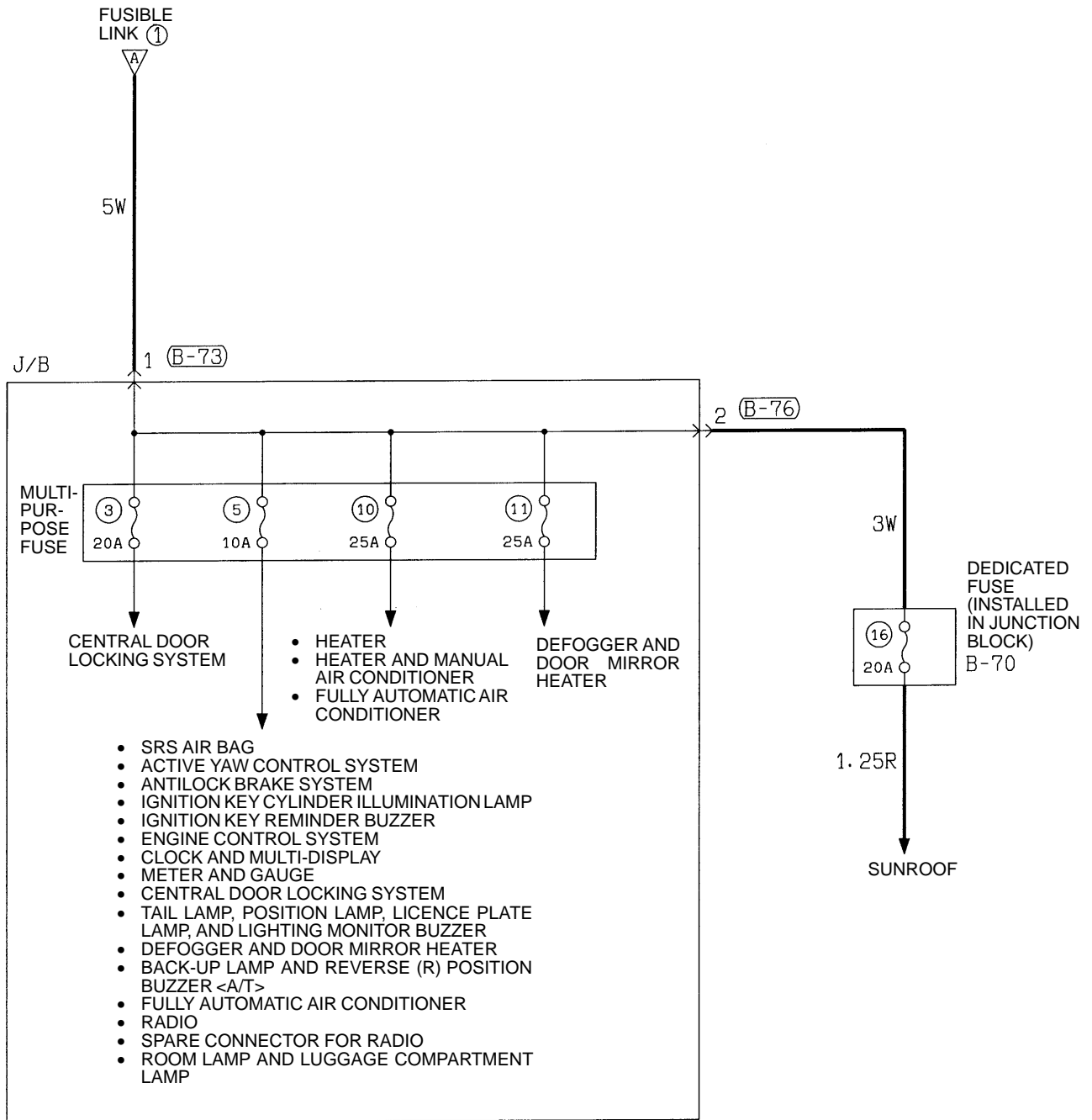
(B-83)



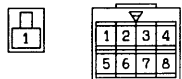




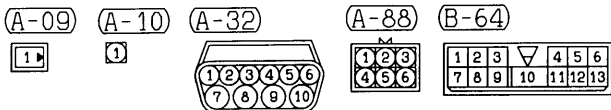
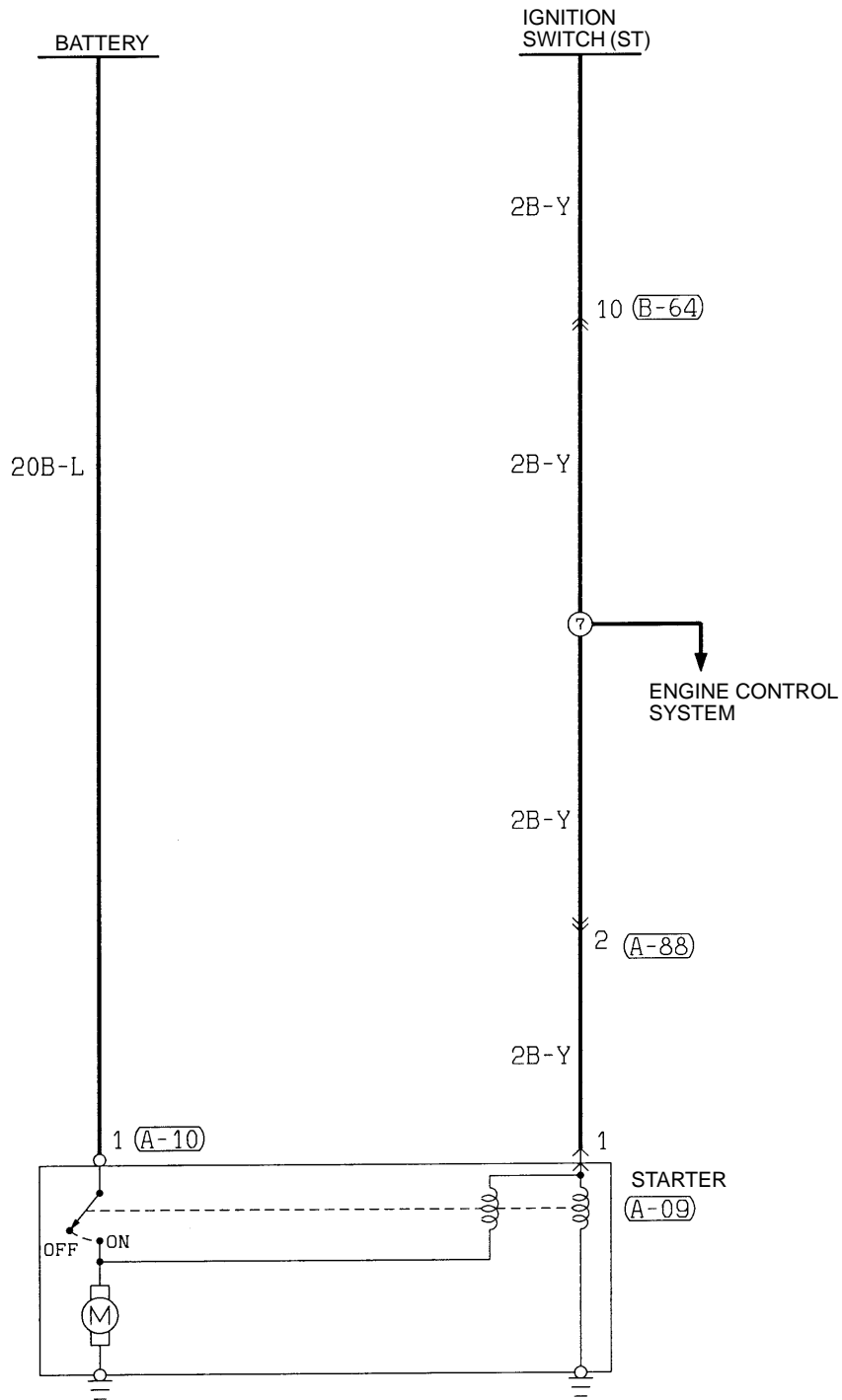
POWER DISTRIBUTION SYSTEM (CONTINUED)



(B-73) (B-76)

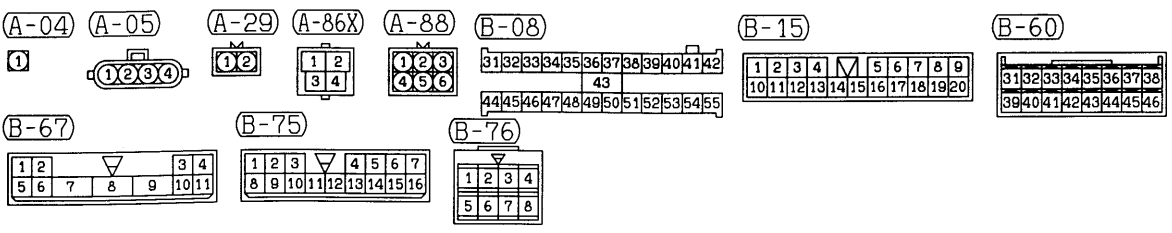
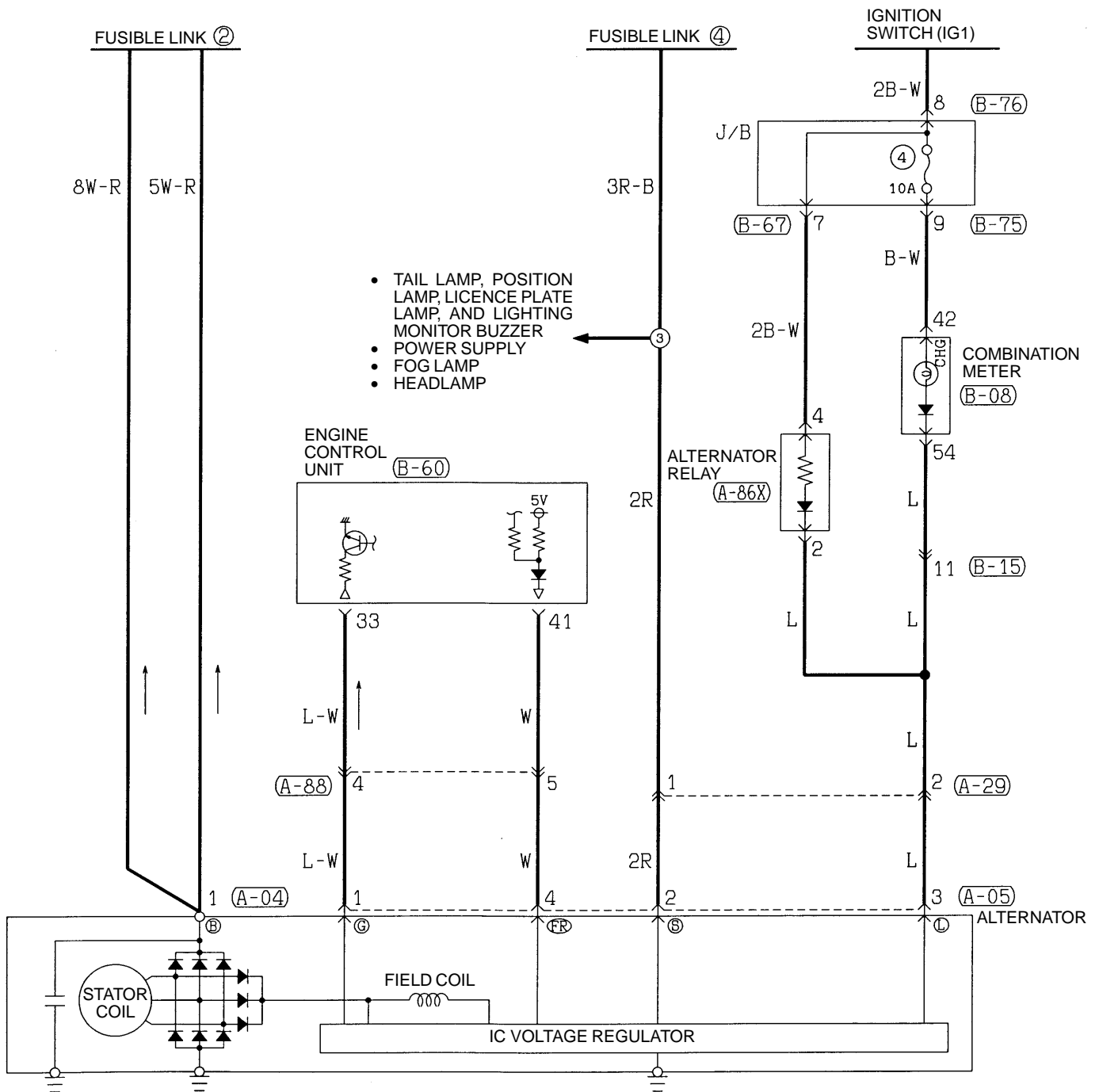


STARTING SYSTEM

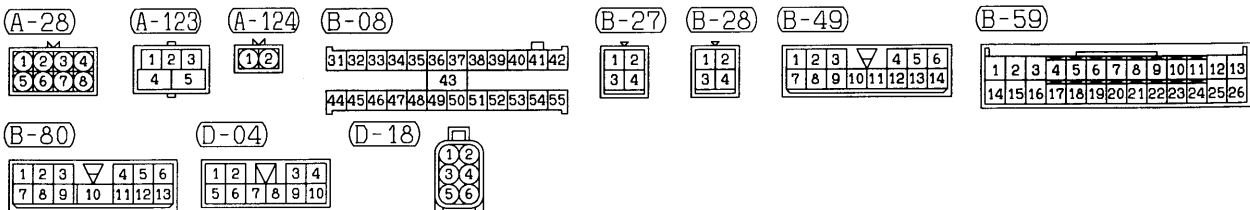
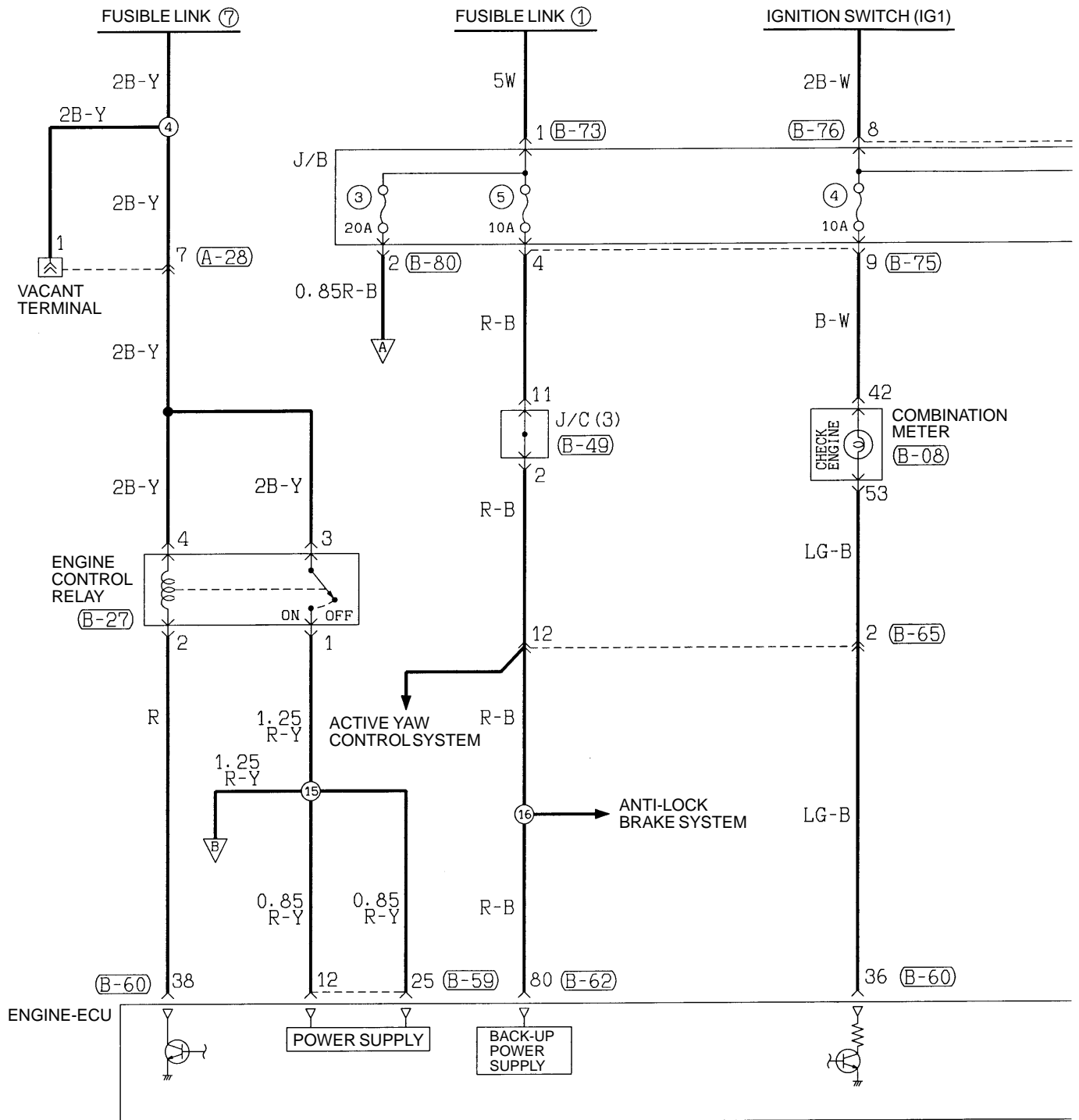


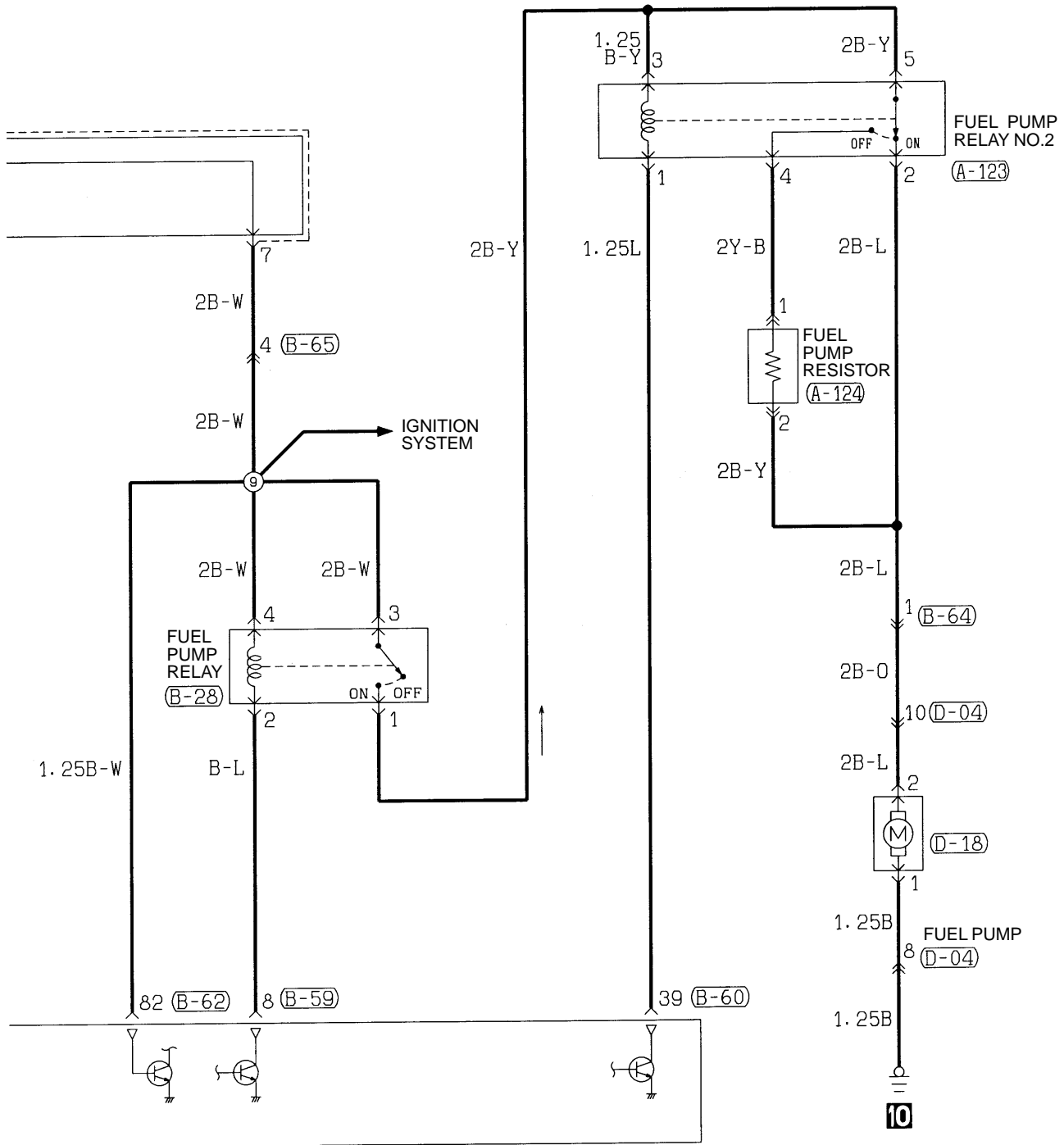


CHARGING SYSTEM



ENGINE CONTROL SYSTEM





(B-60)

31	32	33	34	35	36	37	38
39	40	41	42	43	44	45	46

(B-62)

71	72	73	74	75	76	77	78	79	80	81
82	83	84	85	86	87	88	89	90	91	92

(B-64)

1	2	3	▽	4	5	6
7	8	9	10	11	12	13

(B-65)

1	2	3	▽	4	5	6	7	
8	9	10	11	12	13	14	15	16

(B-73)

1
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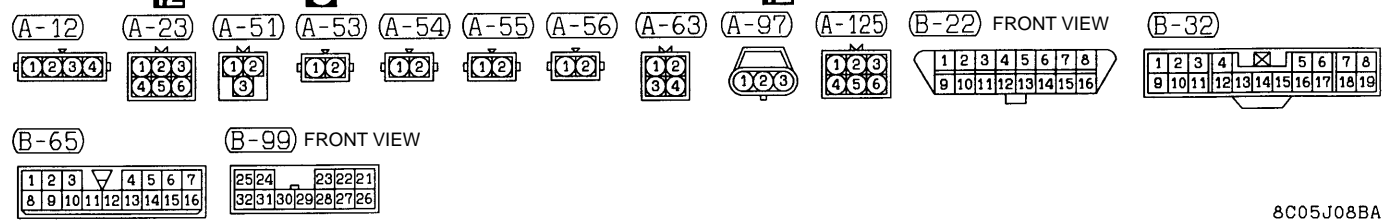
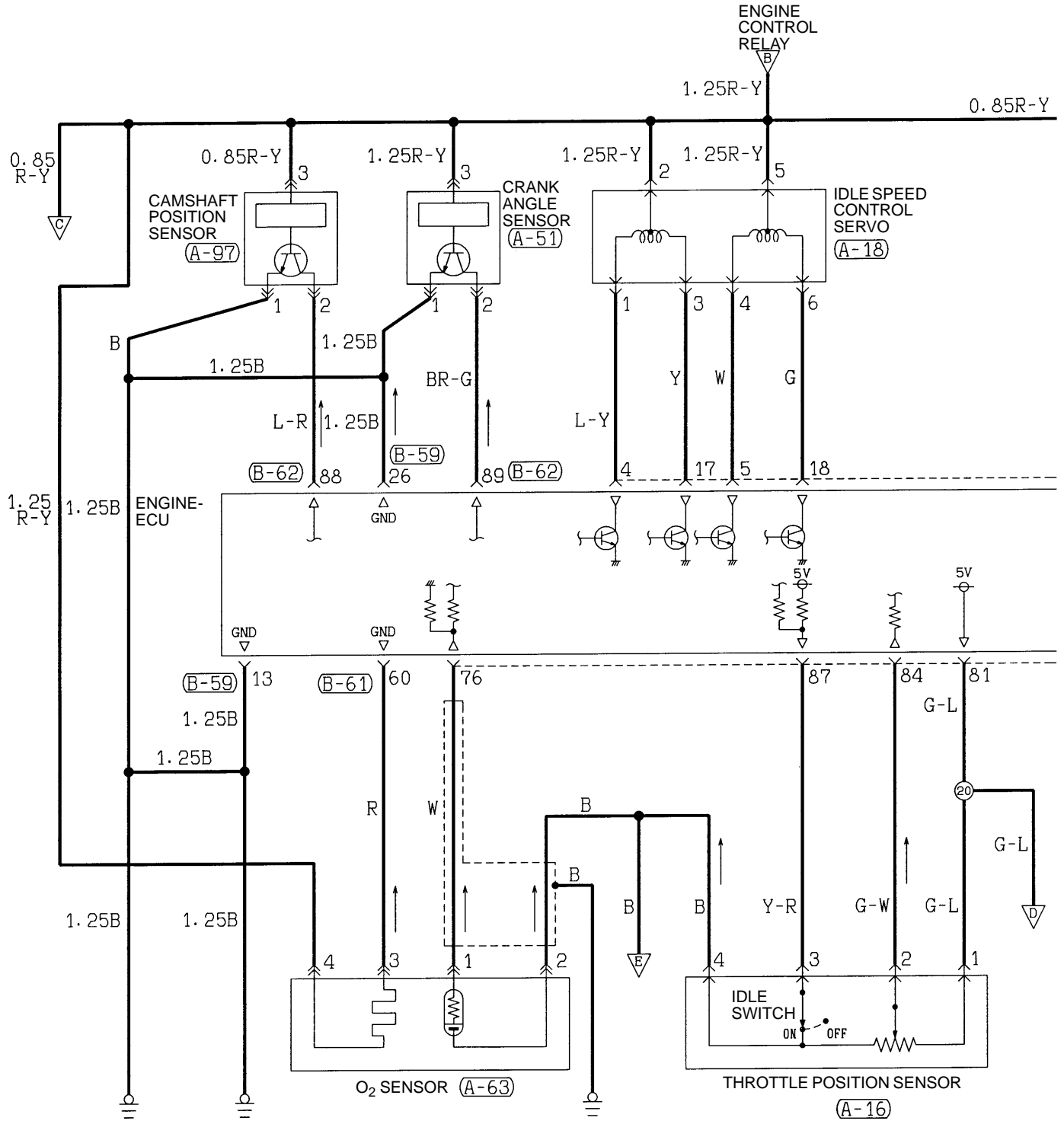
(B-75)

1	2	3	▽	4	5	6	7	
8	9	10	11	12	13	14	15	16

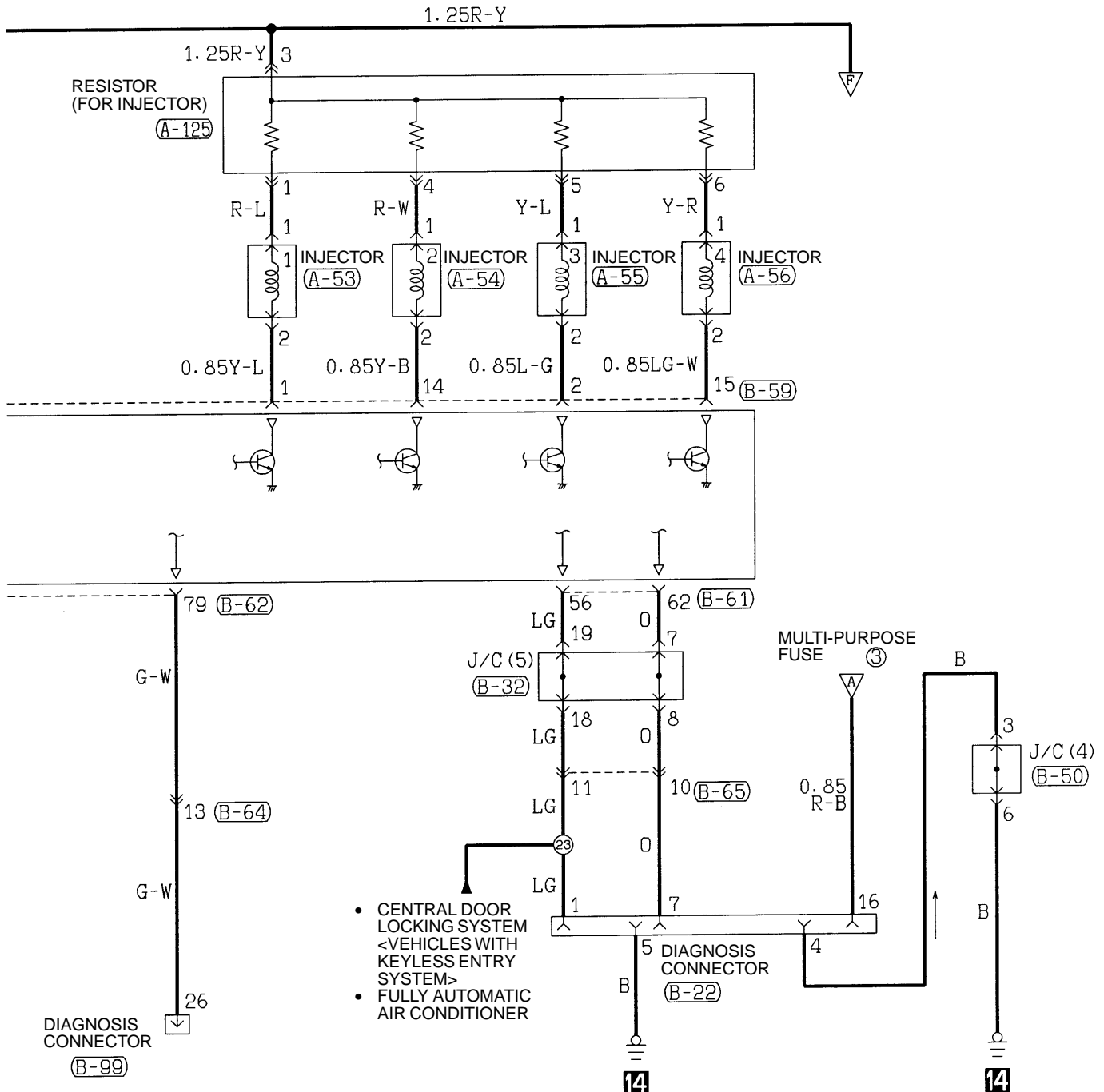
(B-76)

1	2	3	4
5	6	7	8

ENGINE CONTROL SYSTEM (CONTINUED)







- CENTRAL DOOR LOCKING SYSTEM <VEHICLES WITH KEYLESS ENTRY SYSTEM>
- FULLY AUTOMATIC AIR CONDITIONER

(B-50)

1	2	3	4	5	6	7	8	9	10	11	12	13
14	15	16	17	18	19	20	21	22	23	24	25	26

(B-59)

1	2	3	4	5	6	7	8	9	10	11	12	13
14	15	16	17	18	19	20	21	22	23	24	25	26

(B-61)

51	52	53	54	55	56
57	58	59	60	61	62

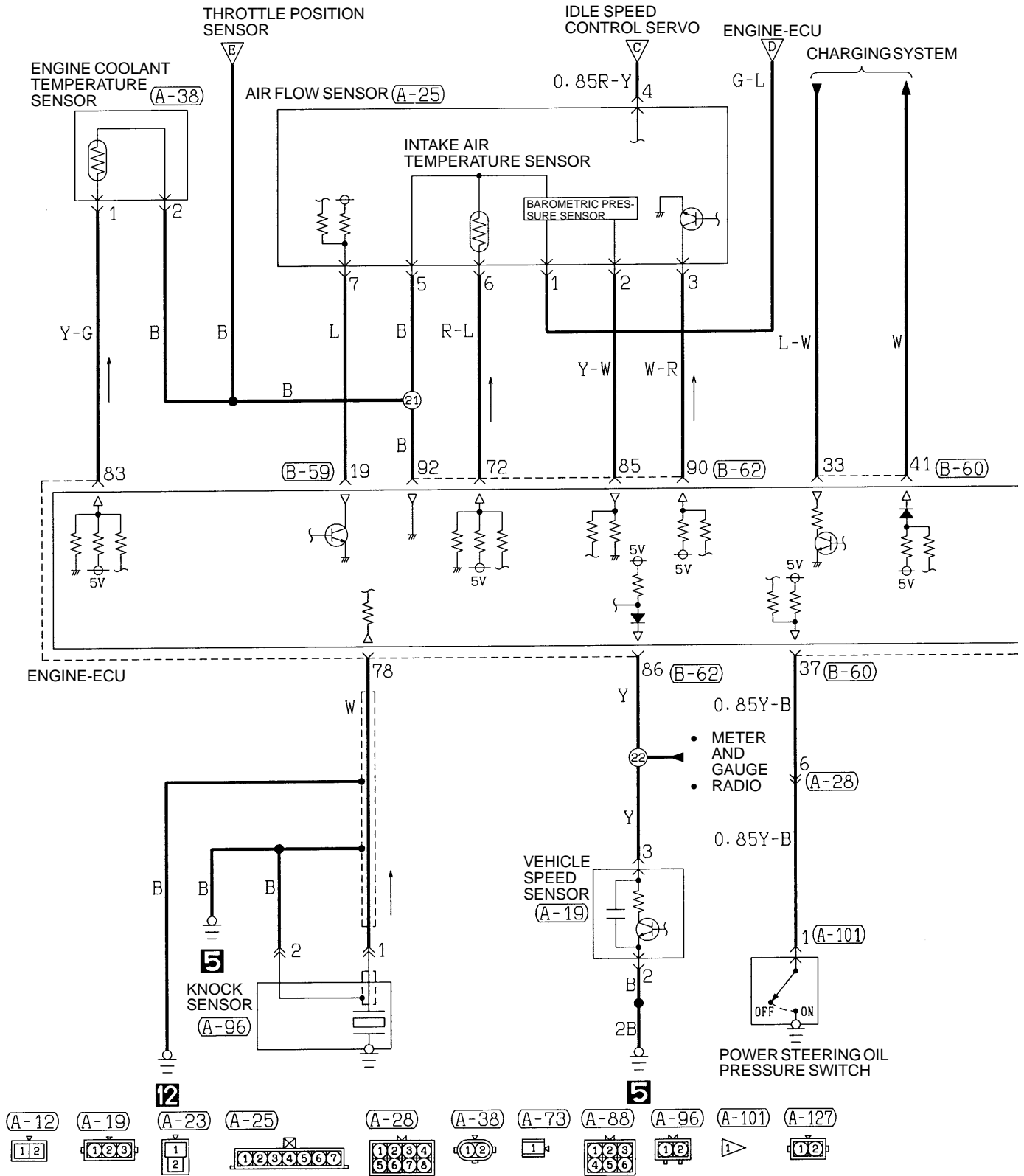
(B-62)

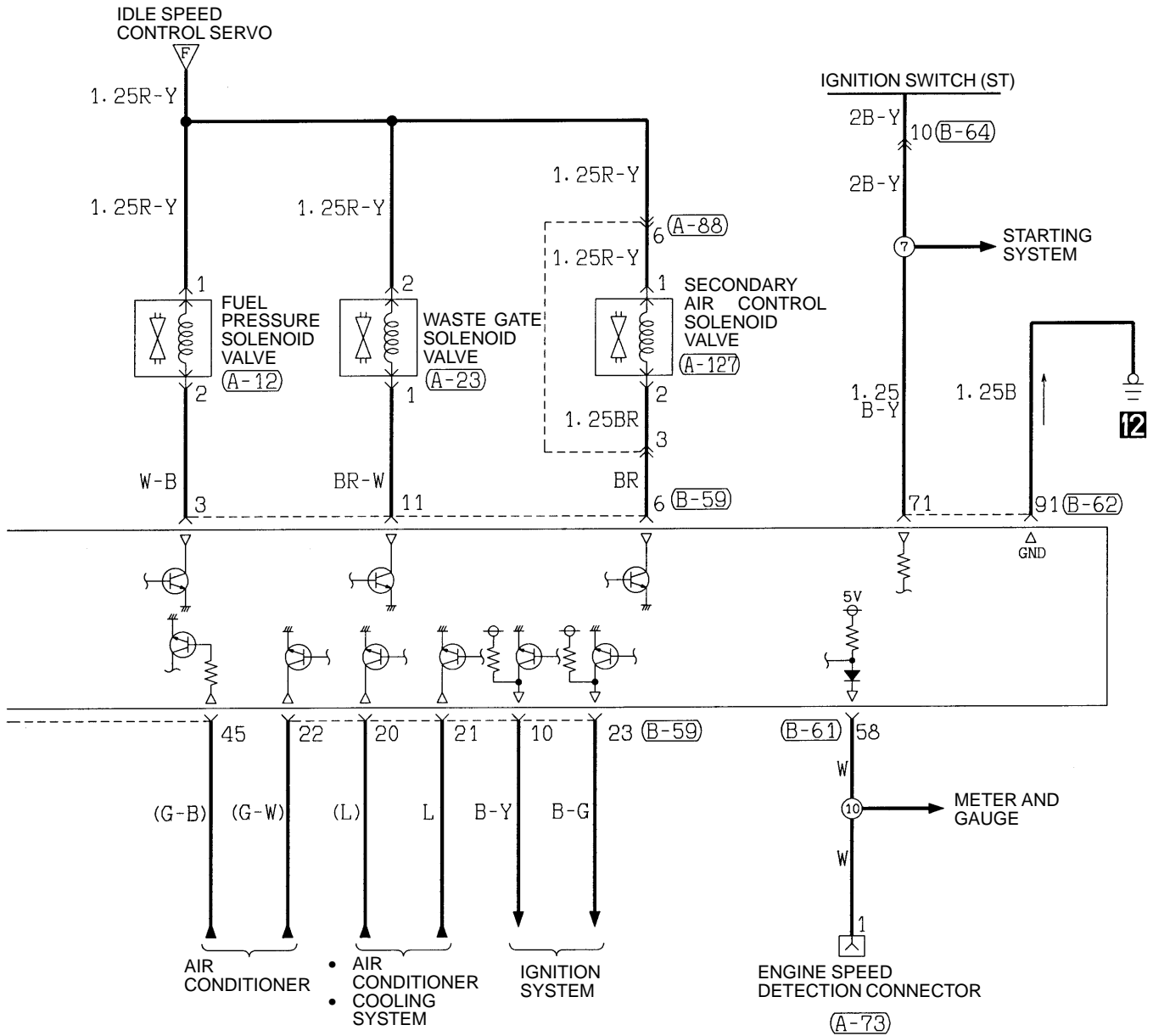
71	72	73	74	75	76	77	78	79	80	81
82	83	84	85	86	87	88	89	90	91	92

(B-64)

1	2	3	▽	4	5	6
7	8	9	10	11	12	13

ENGINE CONTROL SYSTEM (CONTINUED)





(B-59)

1	2	3	4	5	6	7	8	9	10	11	12	13
14	15	16	17	18	19	20	21	22	23	24	25	26

(B-60)

31	32	33	34	35	36	37	38
39	40	41	42	43	44	45	46

(B-61)

51	52	53	54	55	56
57	58	59	60	61	62

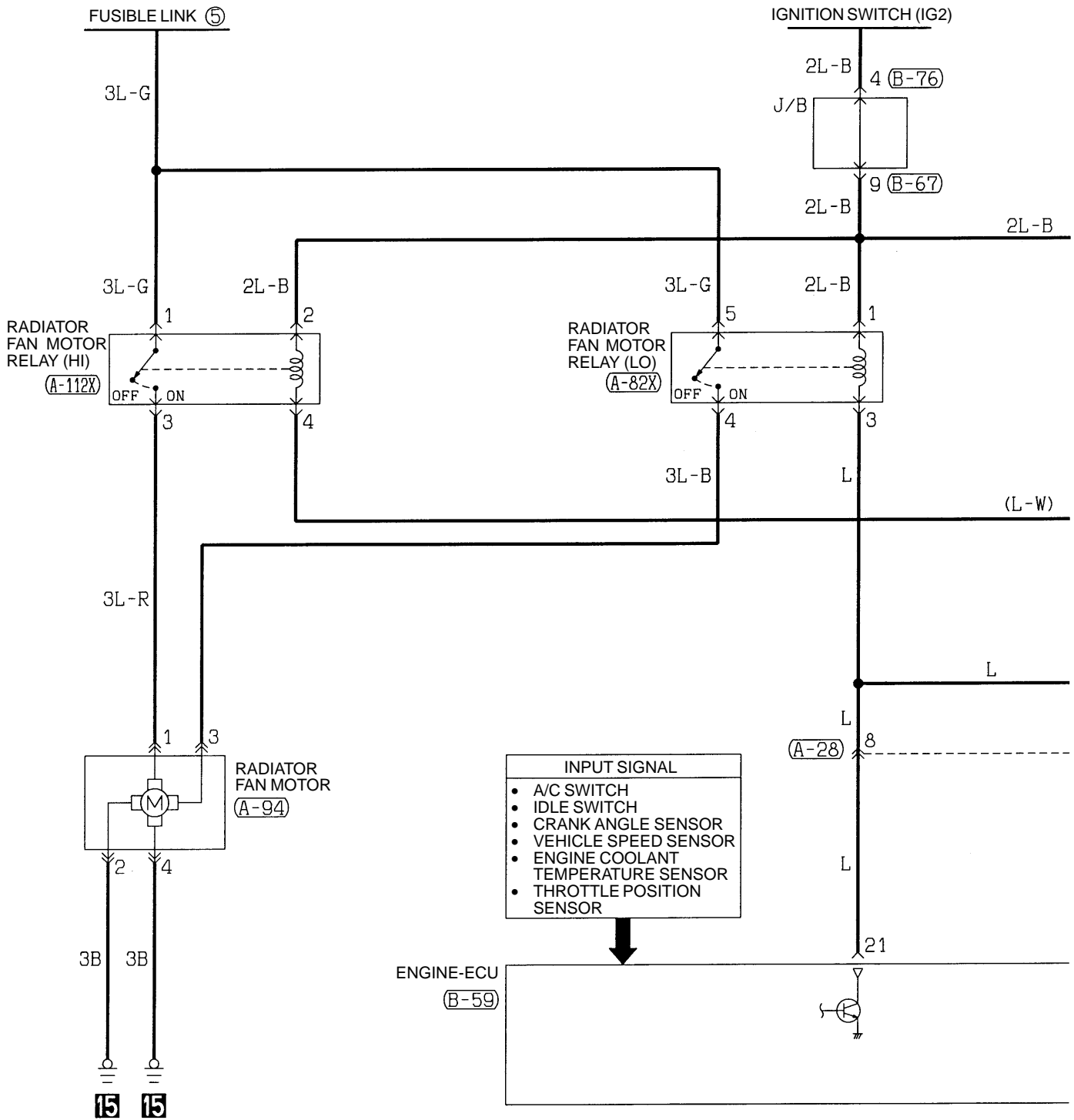
(B-62)

71	72	73	74	75	76	77	78	79	80	81
82	83	84	85	86	87	88	89	90	91	92

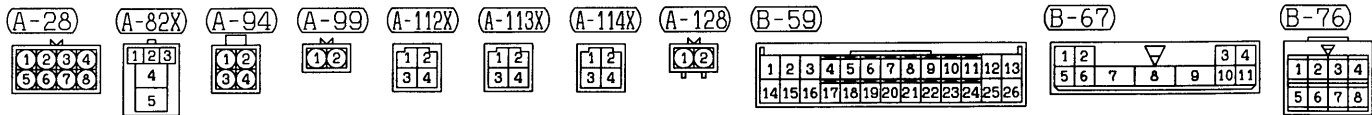
(B-64)

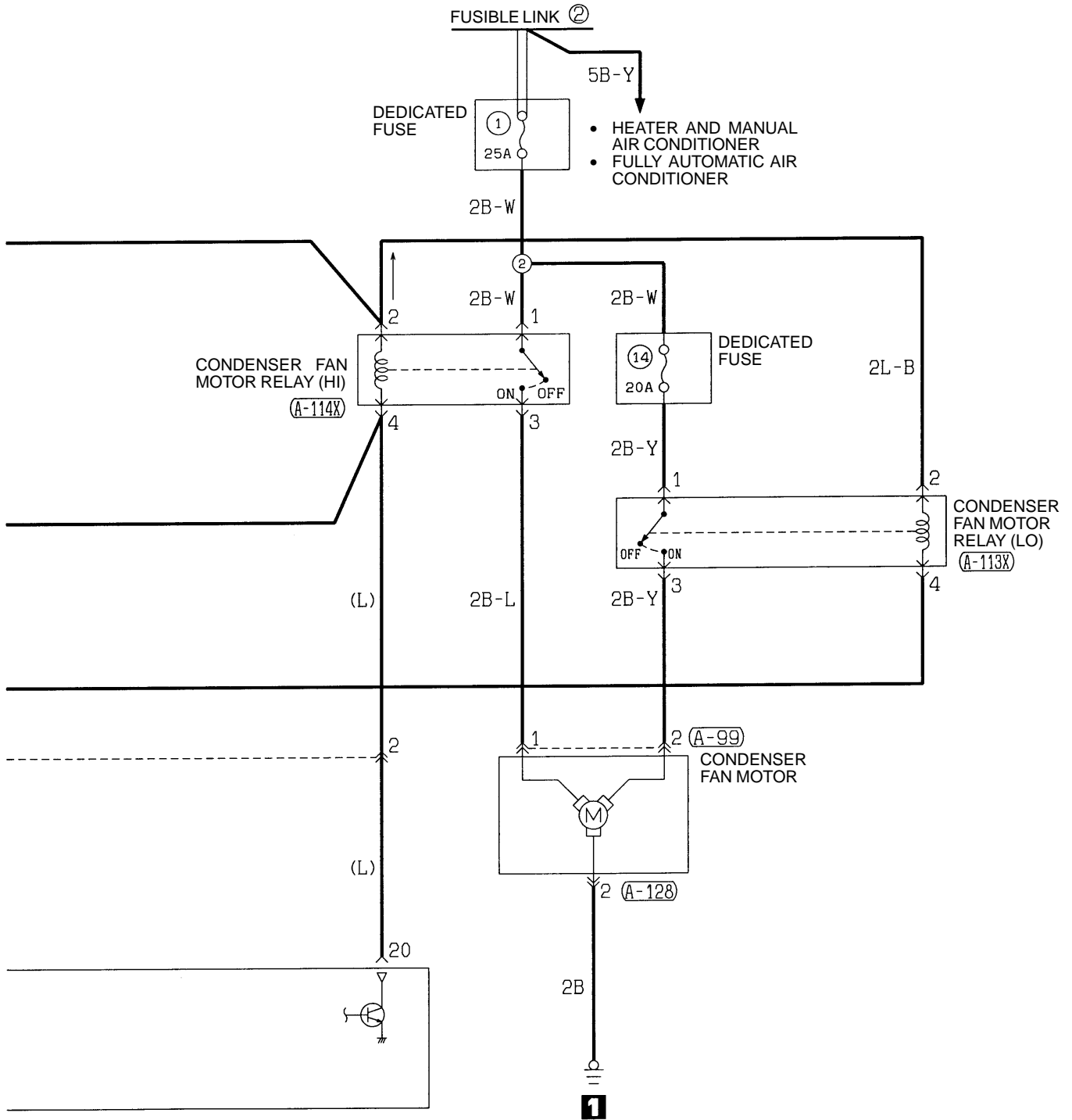
1	2	3	4	5	6
7	8	9	10	11	13

COOLING SYSTEM

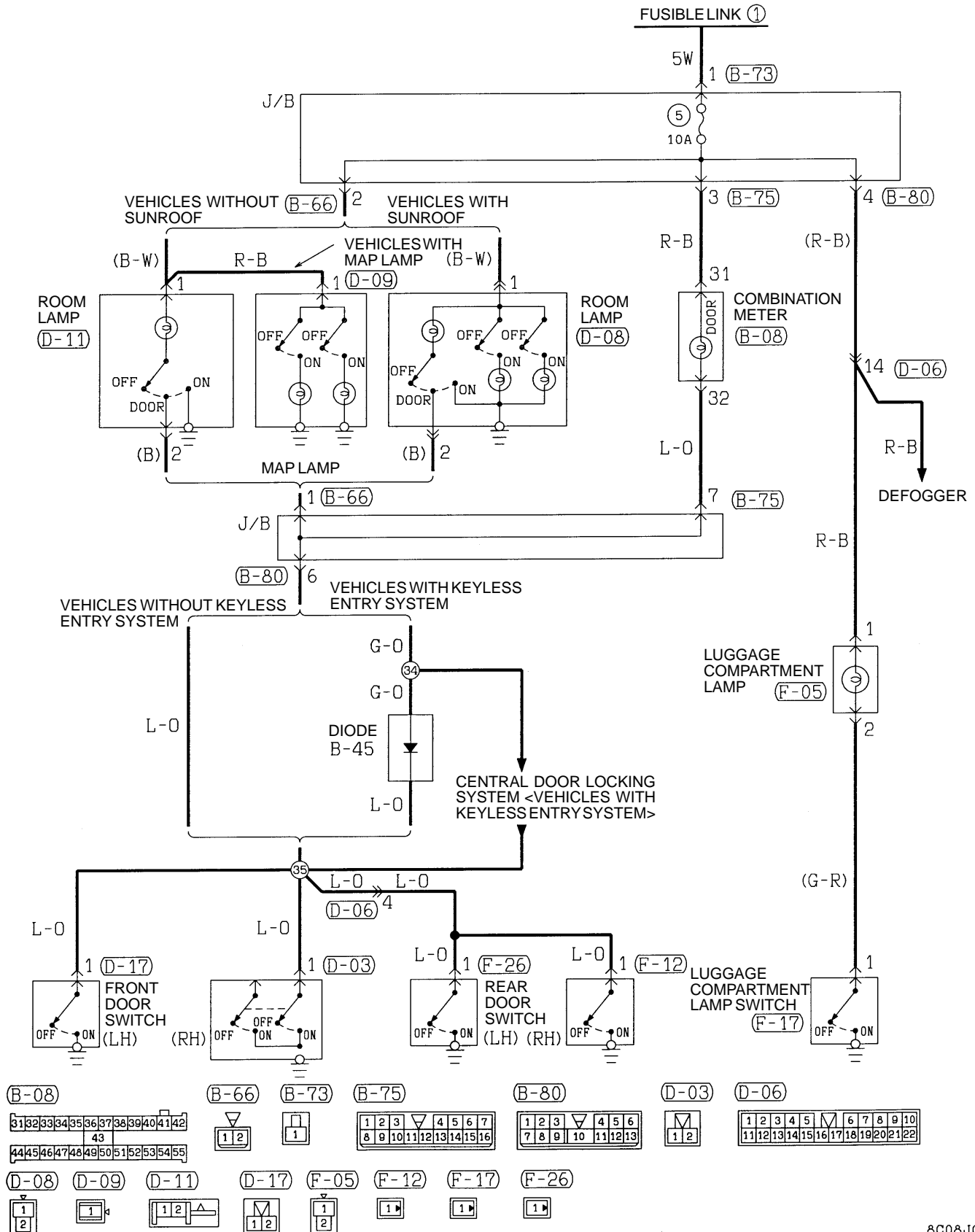


- INPUT SIGNAL
- A/C SWITCH
  - IDLE SWITCH
  - CRANK ANGLE SENSOR
  - VEHICLE SPEED SENSOR
  - ENGINE COOLANT TEMPERATURE SENSOR
  - THROTTLE POSITION SENSOR





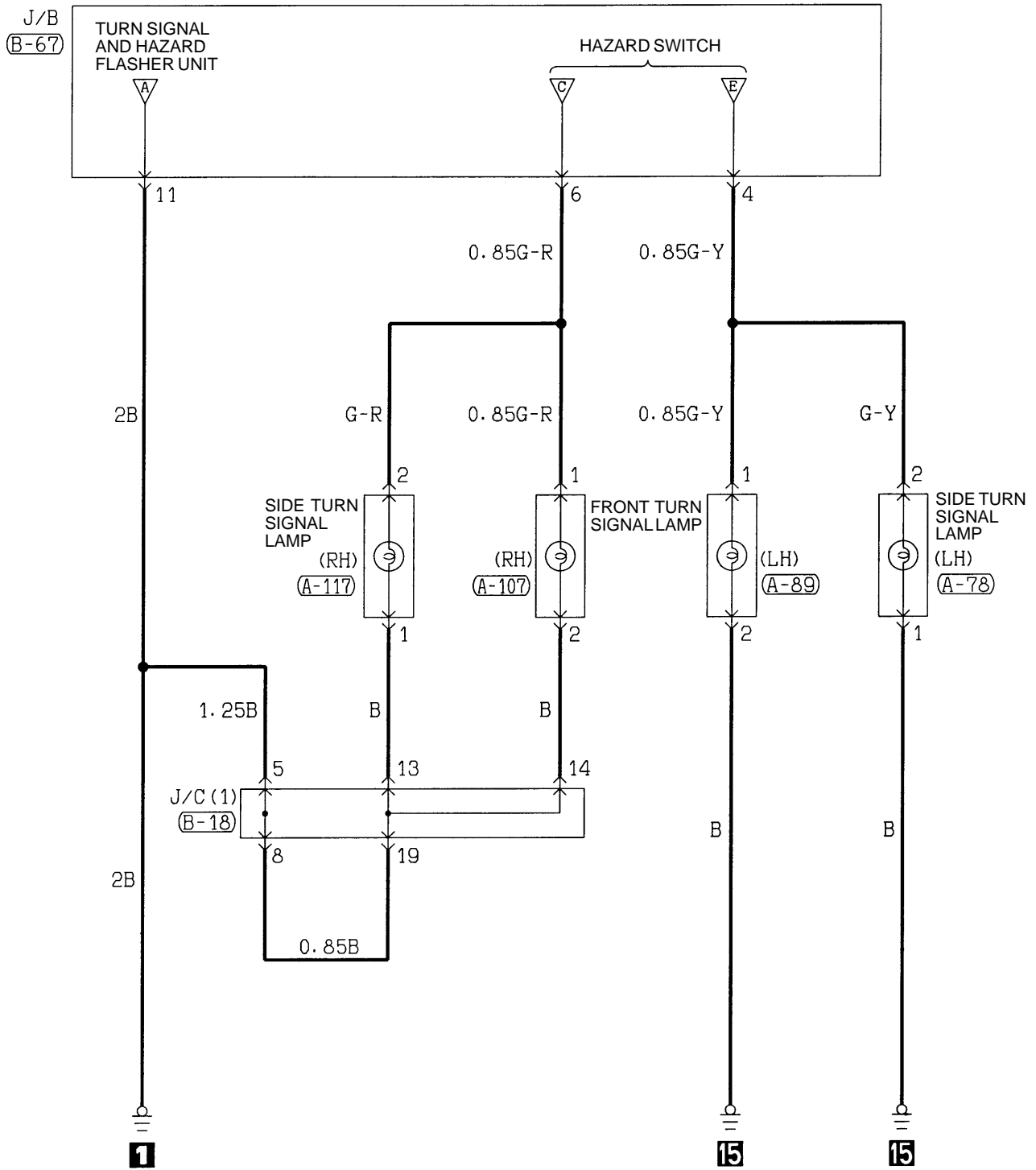
# ROOM LAMP AND LUGGAGE COMPARTMENT LAMP



NOTES







(B-68)

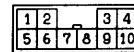
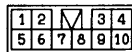
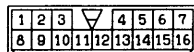
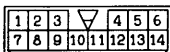
(B-69)

(B-75)

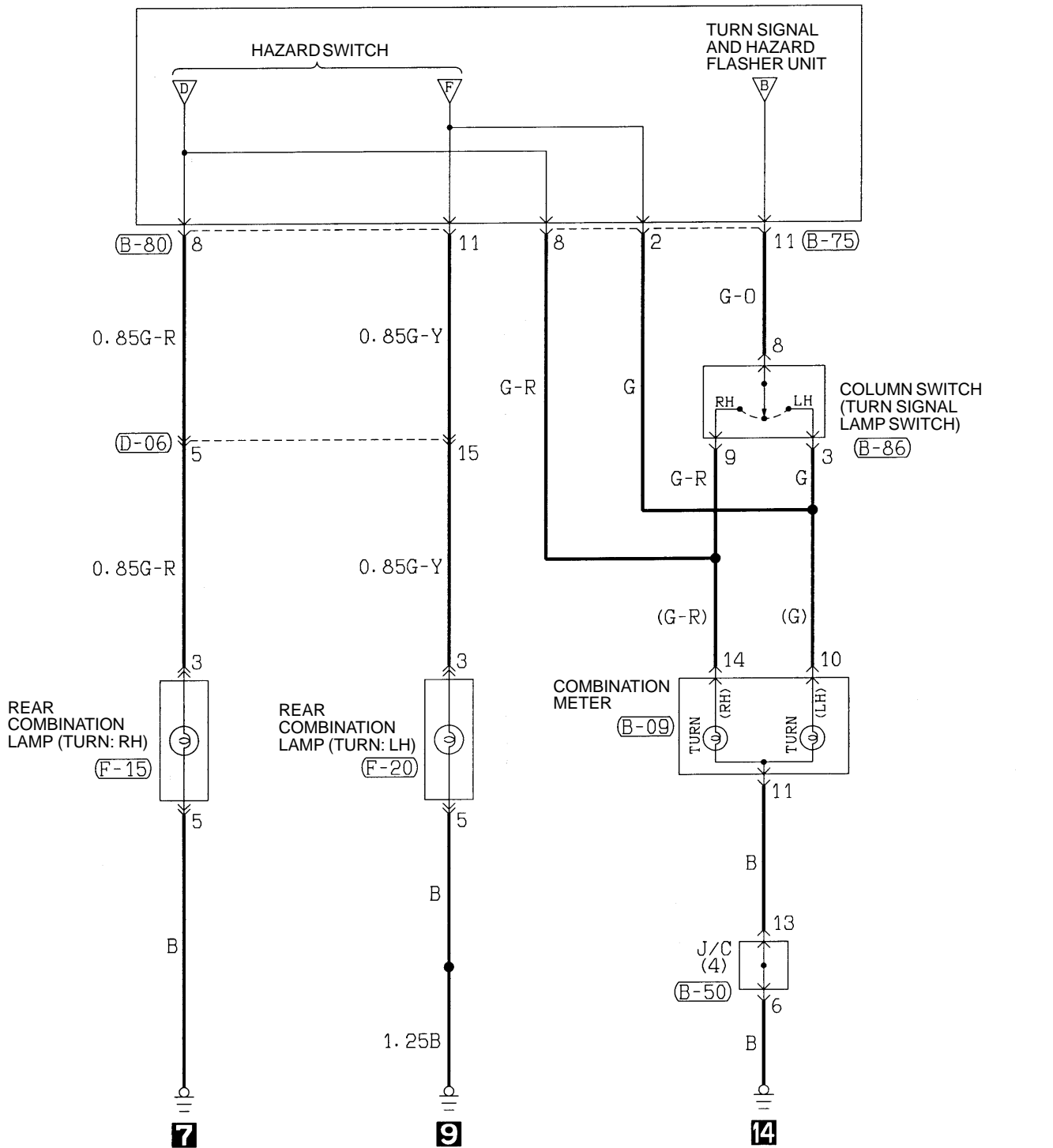
(B-76)

(B-86)

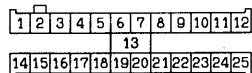
(C-02)



TURN-SIGNAL LAMP AND HAZARD LAMP (CONTINUED)



(B-09)



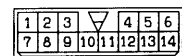
(F-15)



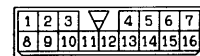
(F-20)



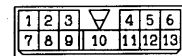
(B-50)



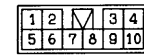
(B-75)



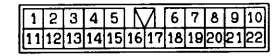
(B-80)



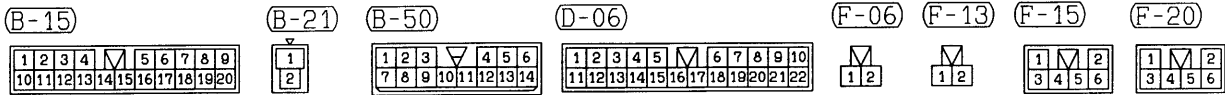
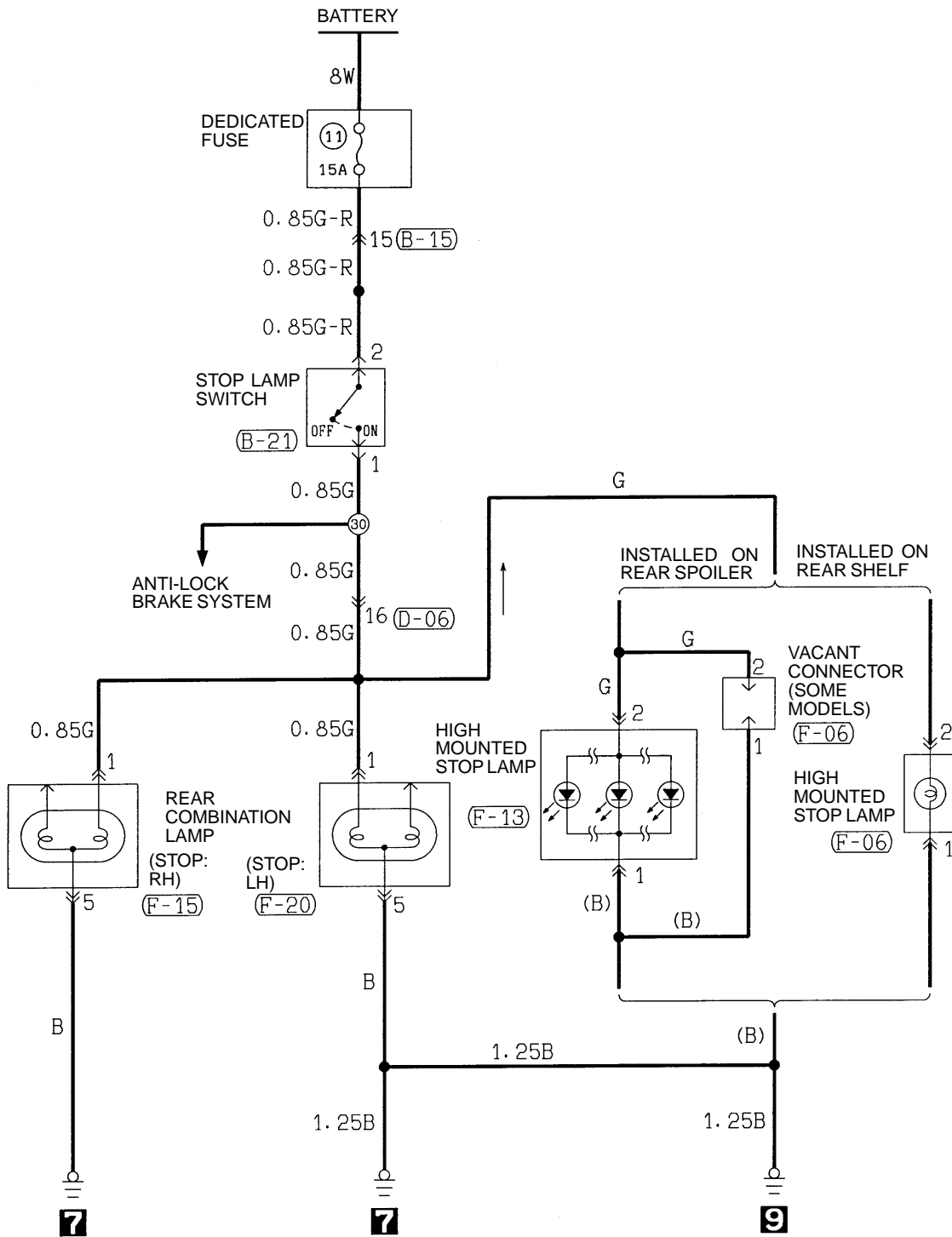
(B-86)



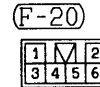
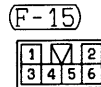
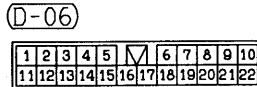
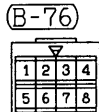
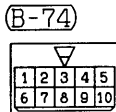
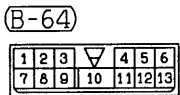
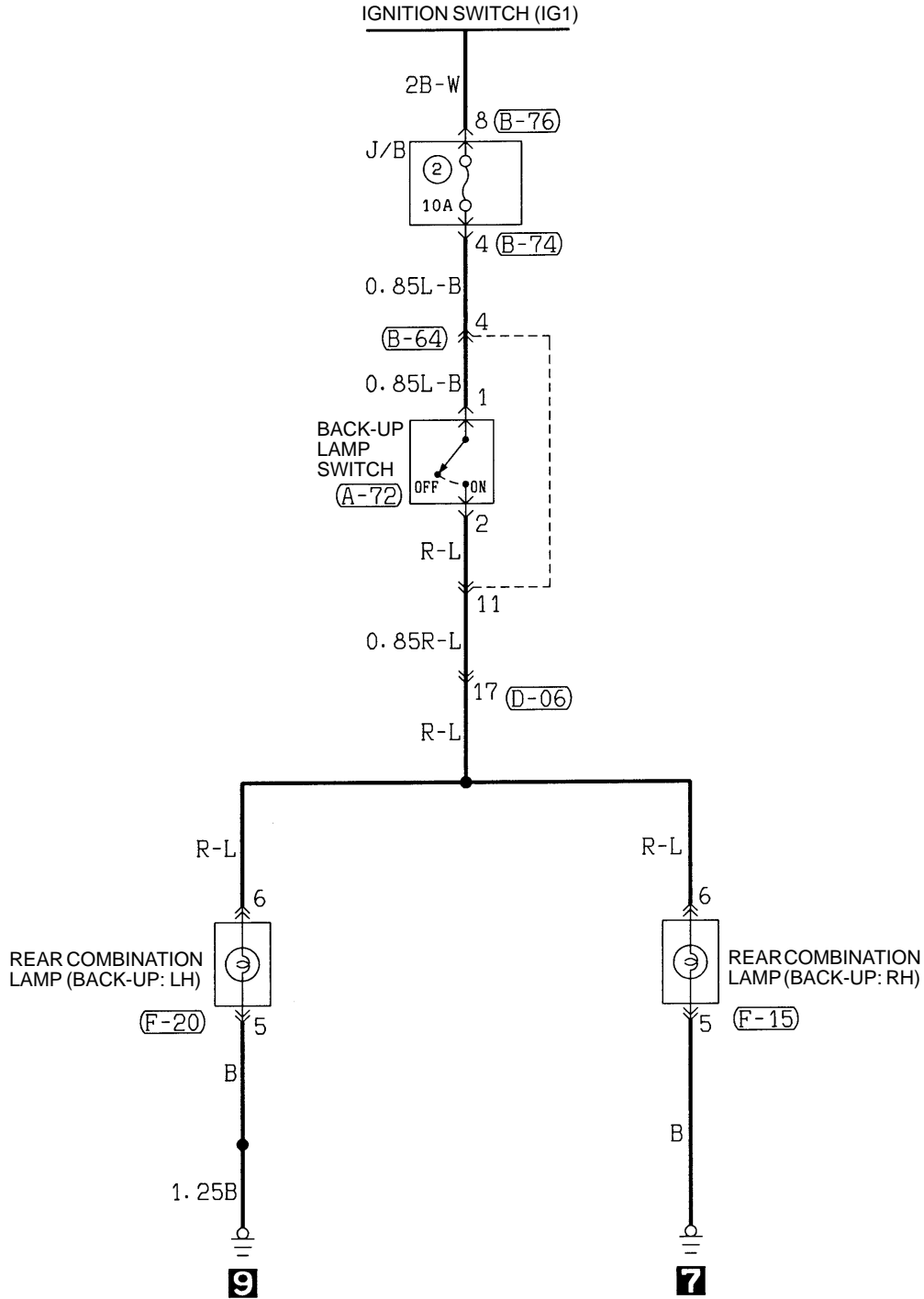
(D-06)



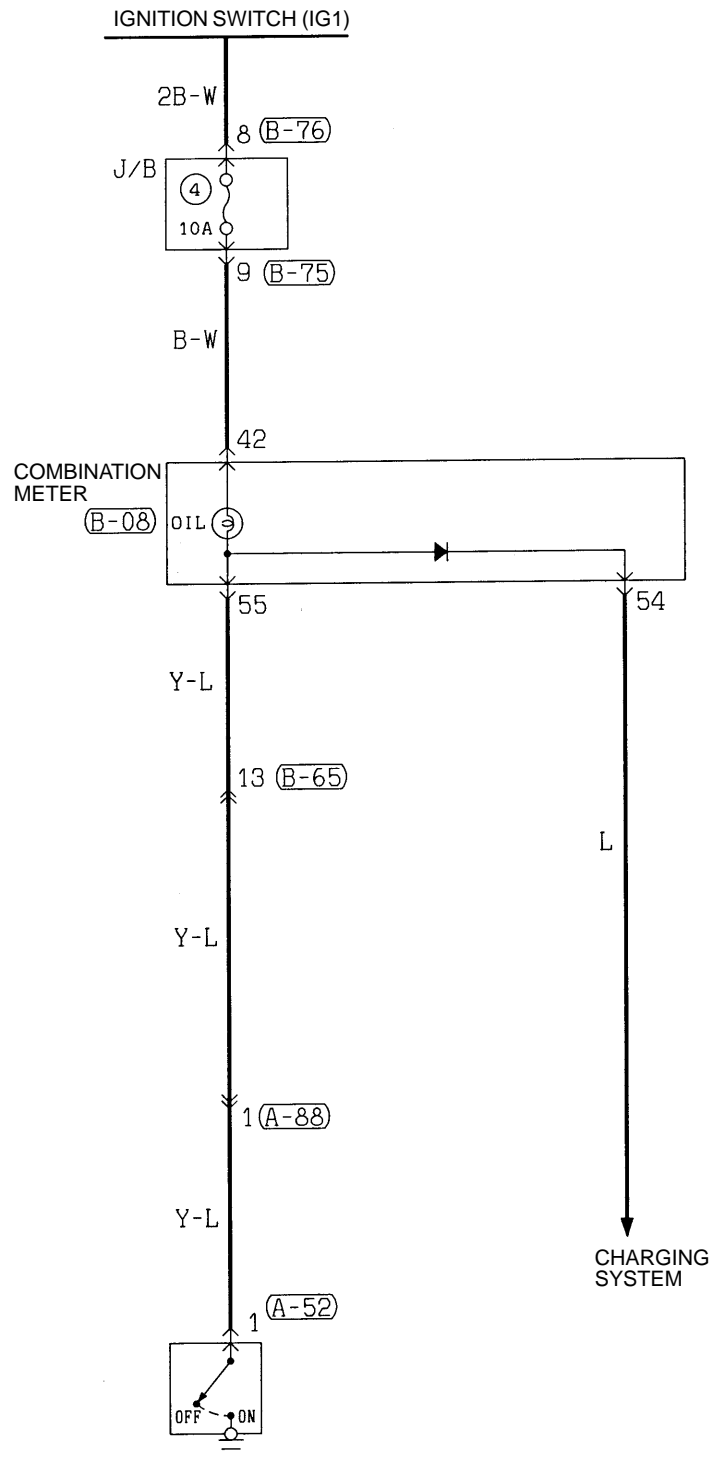
STOP LAMP



BACK-UP LAMP



OIL PRESSURE WARNING LAMP



(A-52)

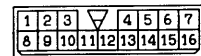
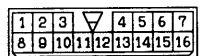
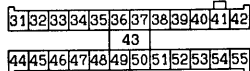
(A-88)

(B-08)

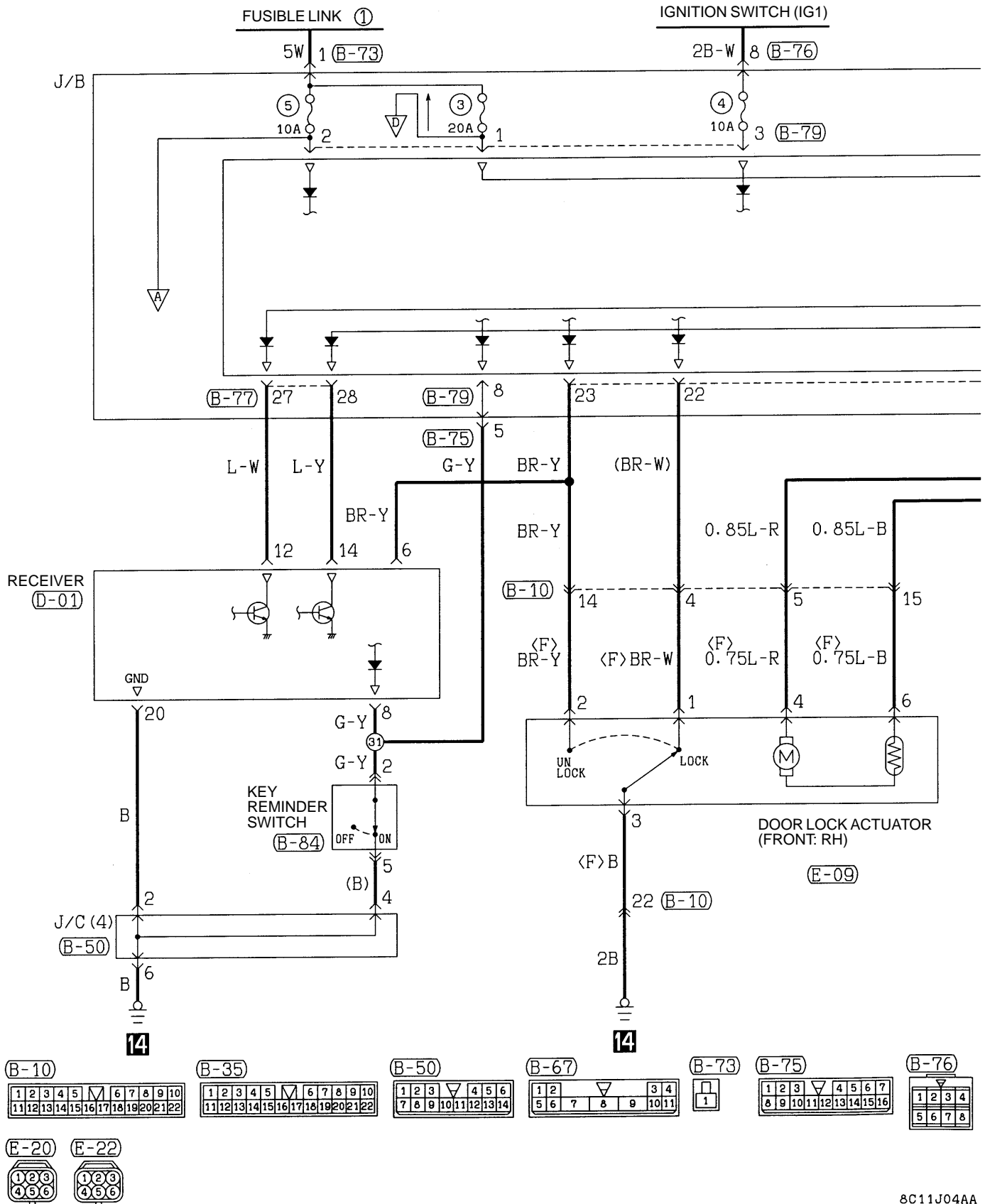
(B-65)

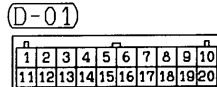
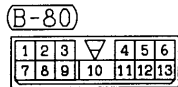
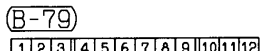
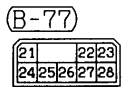
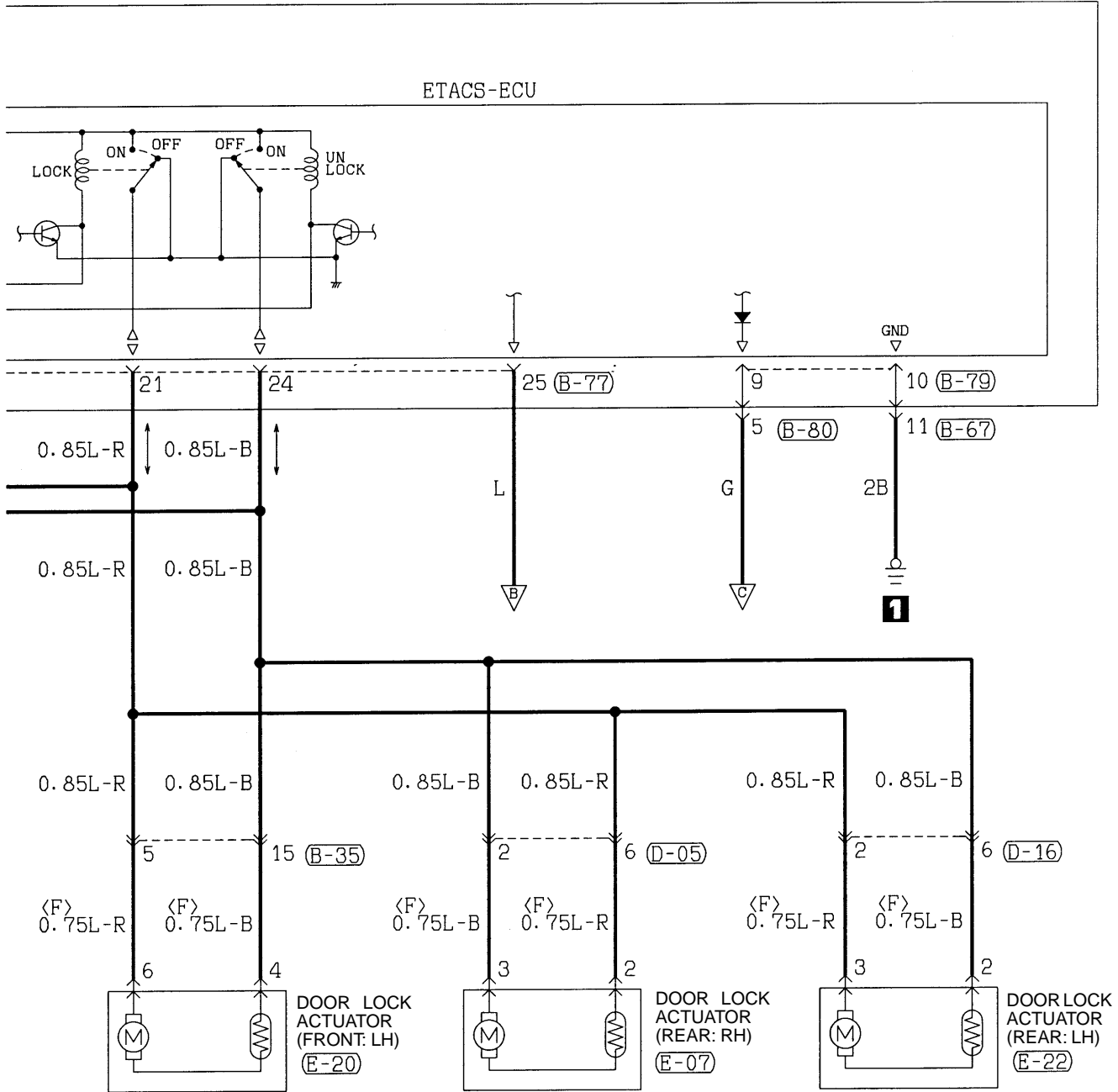
(B-75)

(B-76)

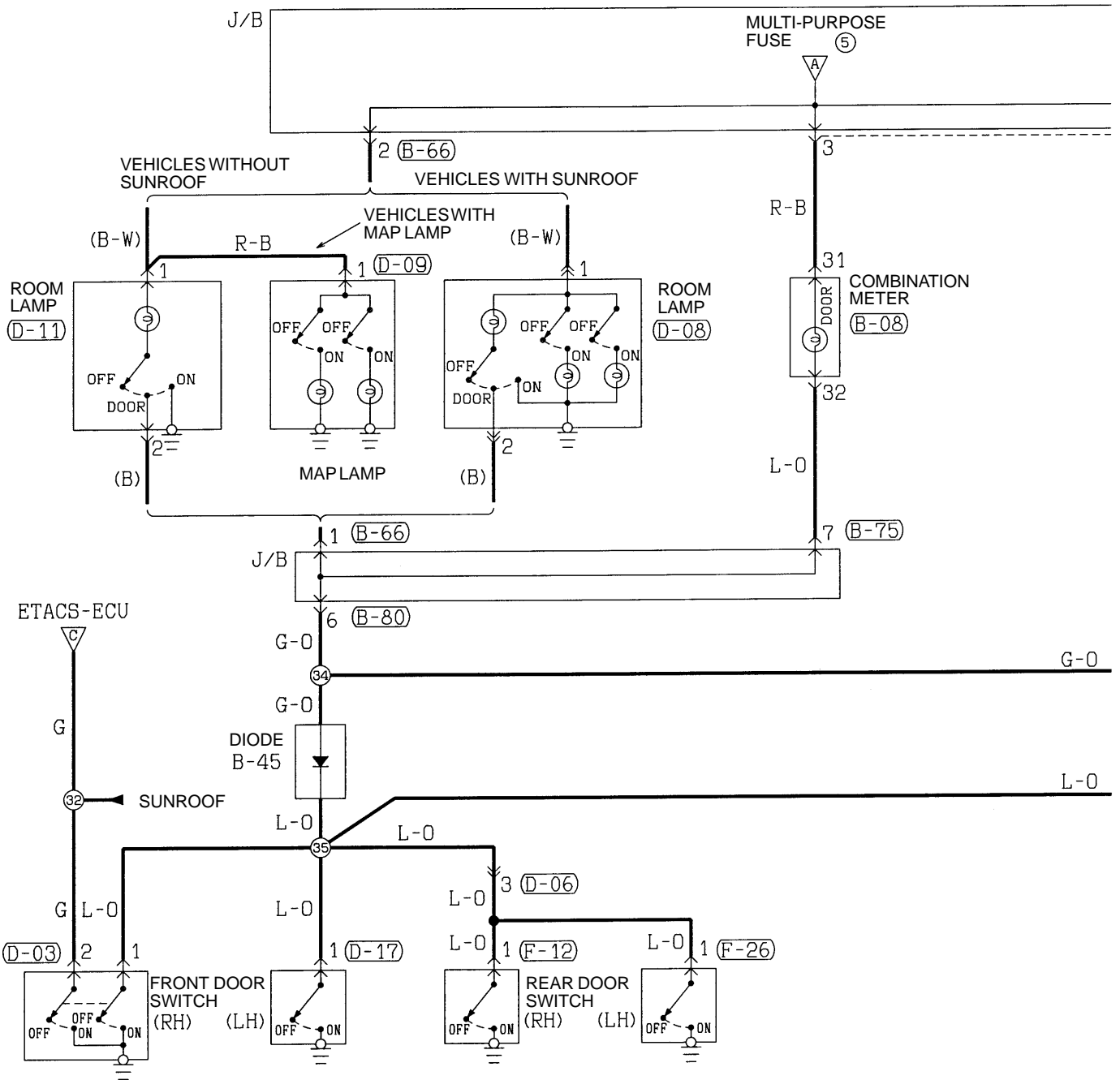


**CENTRAL DOOR LOCKING SYSTEM <VEHICLES WITH KEYLESS ENTRY SYSTEM>**





CENTRAL DOOR LOCKING SYSTEM <VEHICLES WITH KEYLESS ENTRY SYSTEM> (CONTINUED)



(B-08)

31	32	33	34	35	36	37	38	39	40	41	42
				43							
44	45	46	47	48	49	50	51	52	53	54	55

(B-22) FRONT VIEW

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16

(B-49)

1	2	3	4	5	6
7	8	9	10	11	12
13	14				

(B-50)

1	2	3	4	5	6
7	8	9	10	11	12
13	14				

(B-66)

1	2
---	---

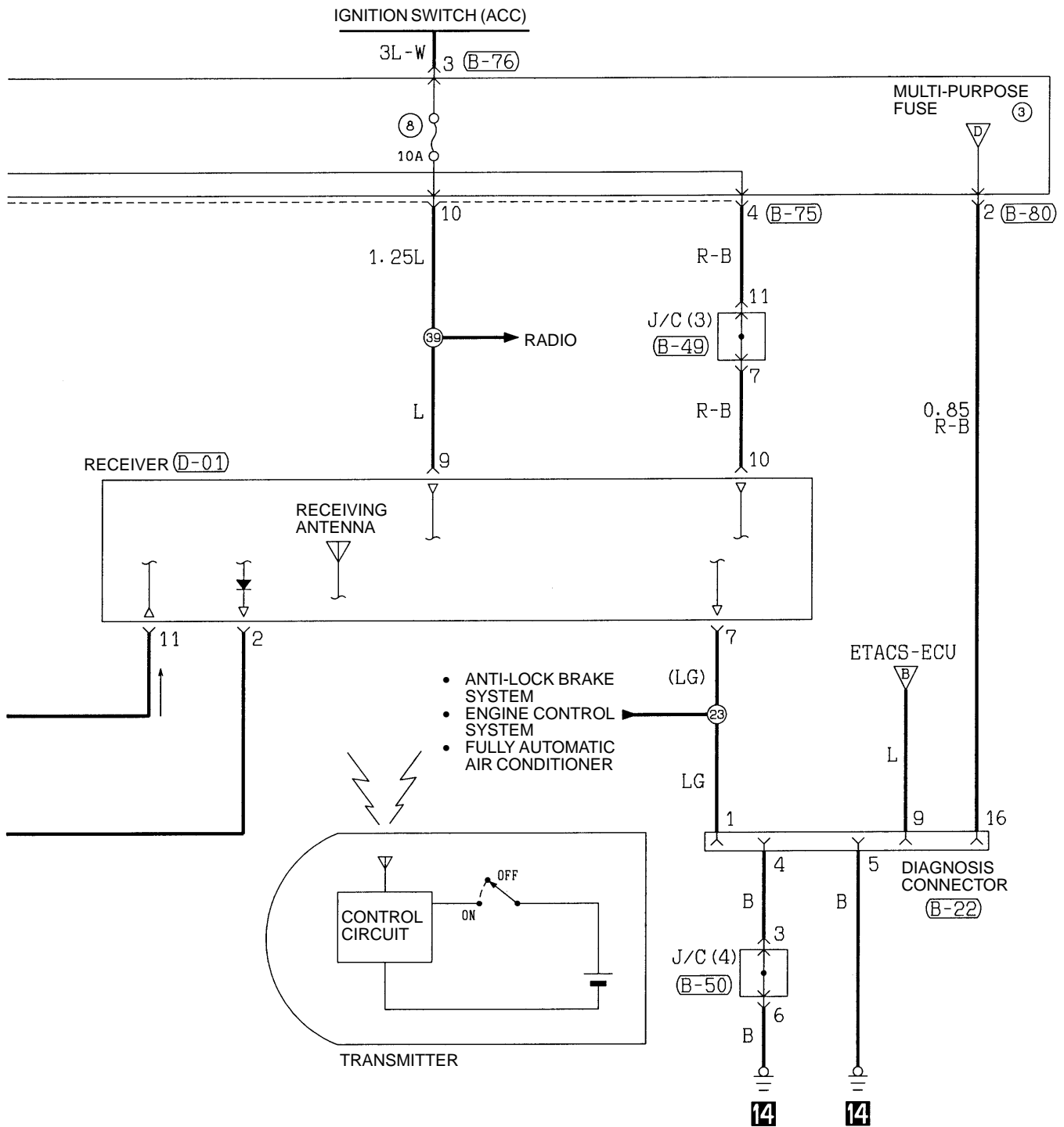
(B-75)

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16					

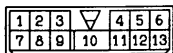
(B-76)

1	2	3	4
5	6	7	8

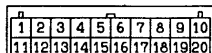




(B-80)



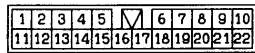
(D-01)



(D-03)



(D-06)



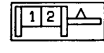
(D-08)



(D-09)



(D-11)



(D-17)



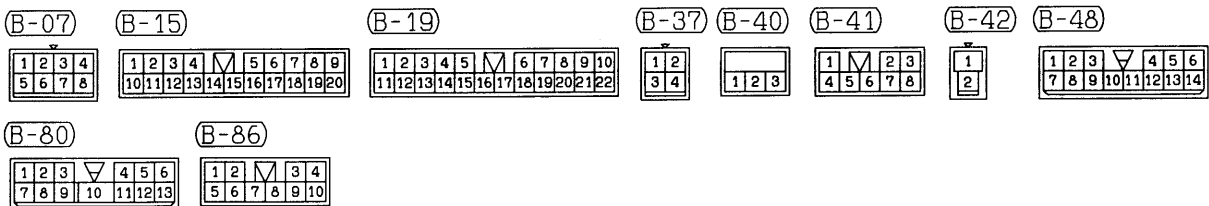
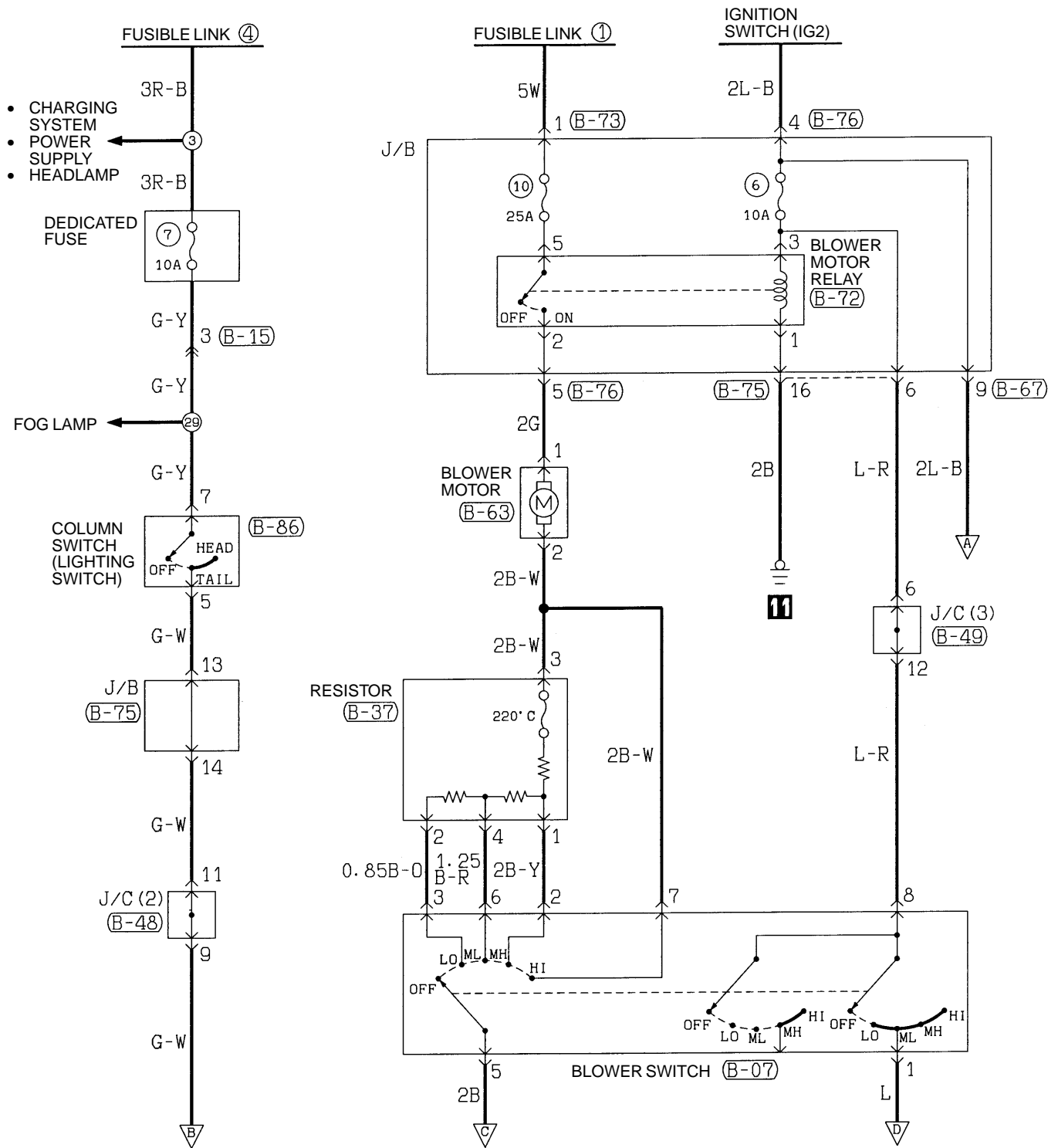
(F-12)



(F-26)

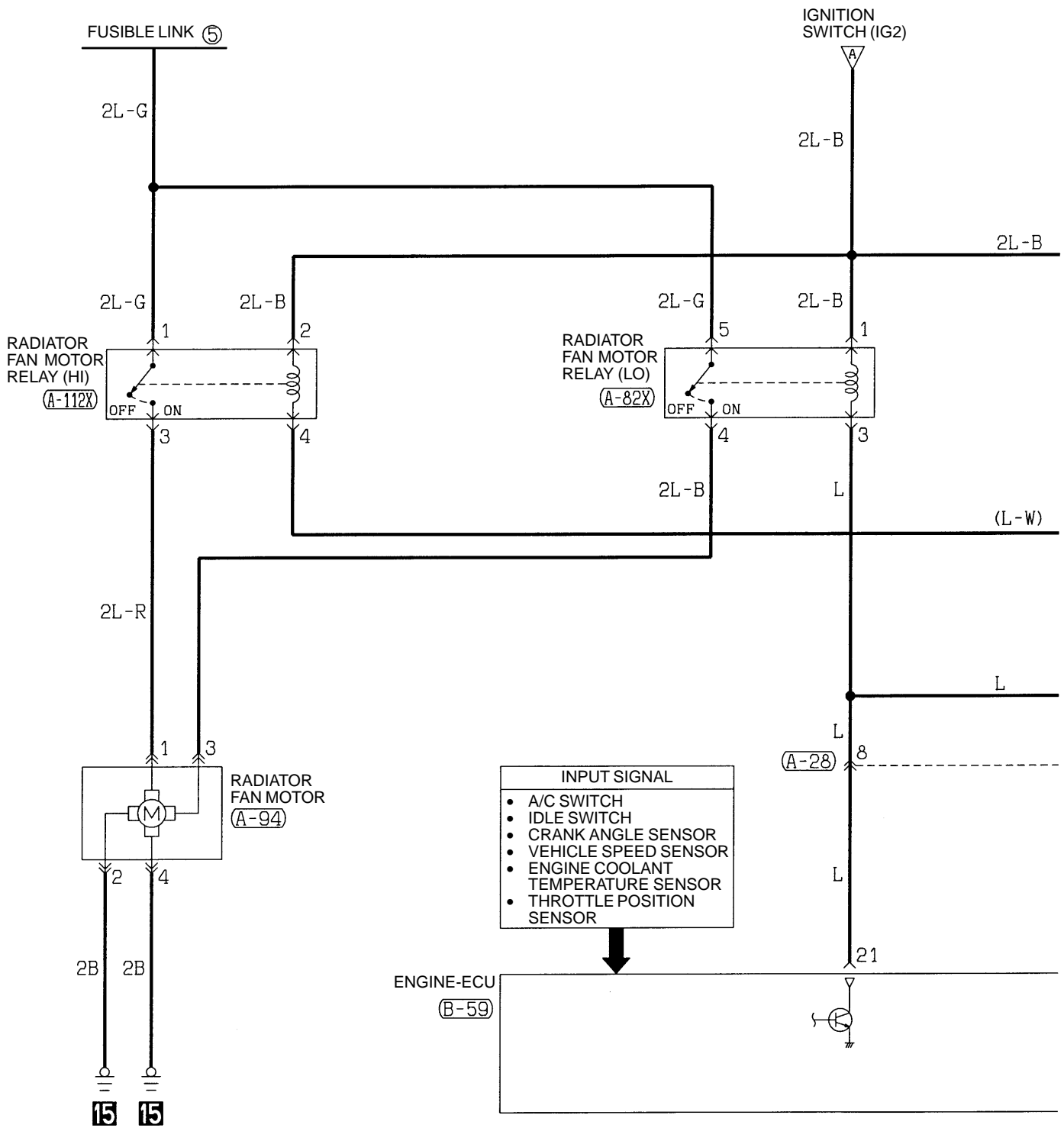


HEATER AND MANUAL AIR CONDITIONER

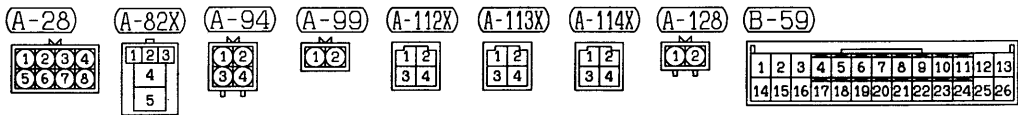


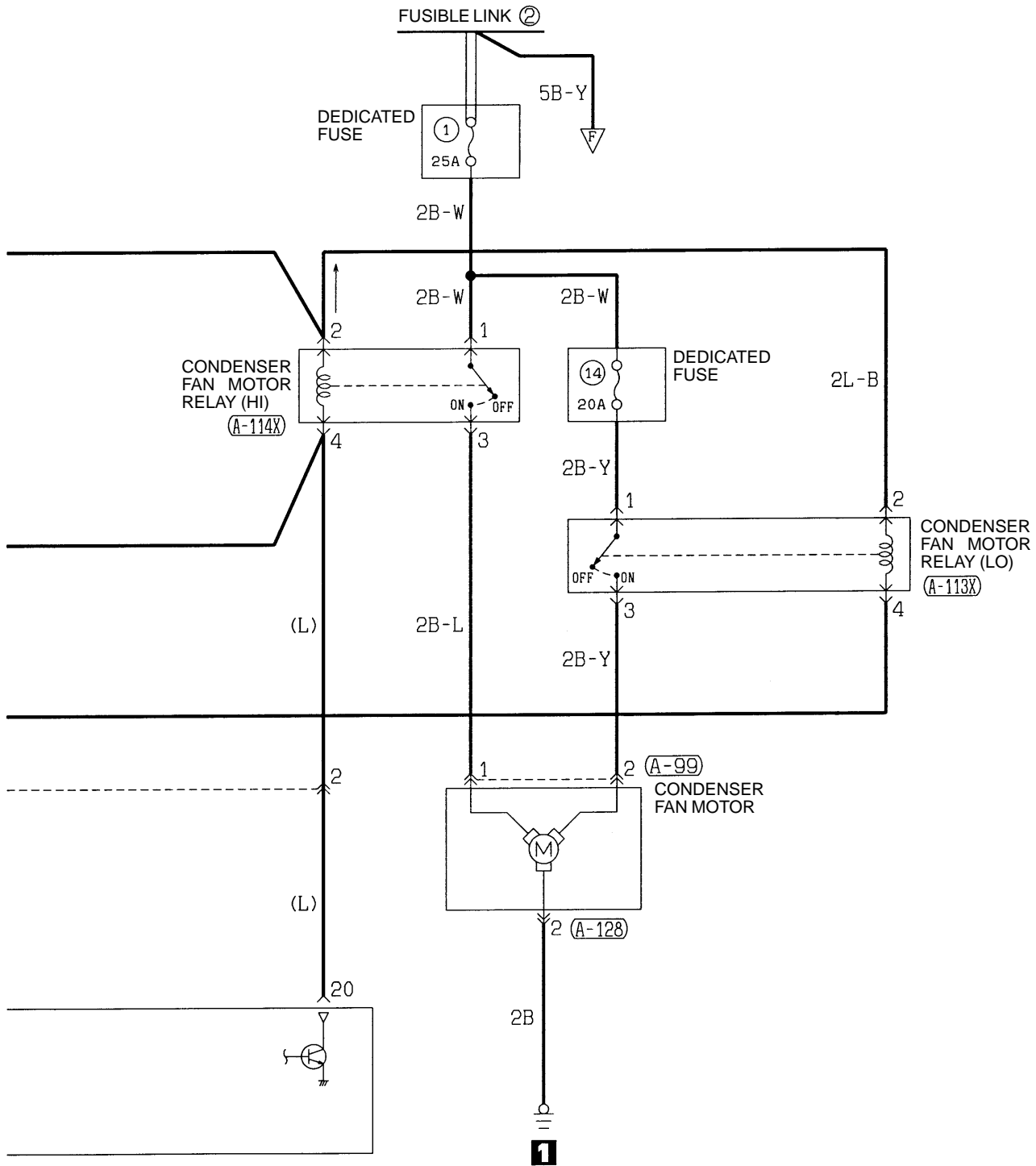


HEATER AND MANUAL AIR CONDITIONER (CONTINUED)

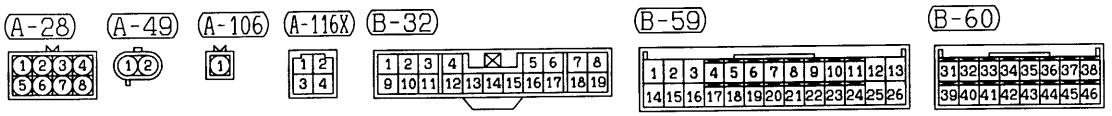
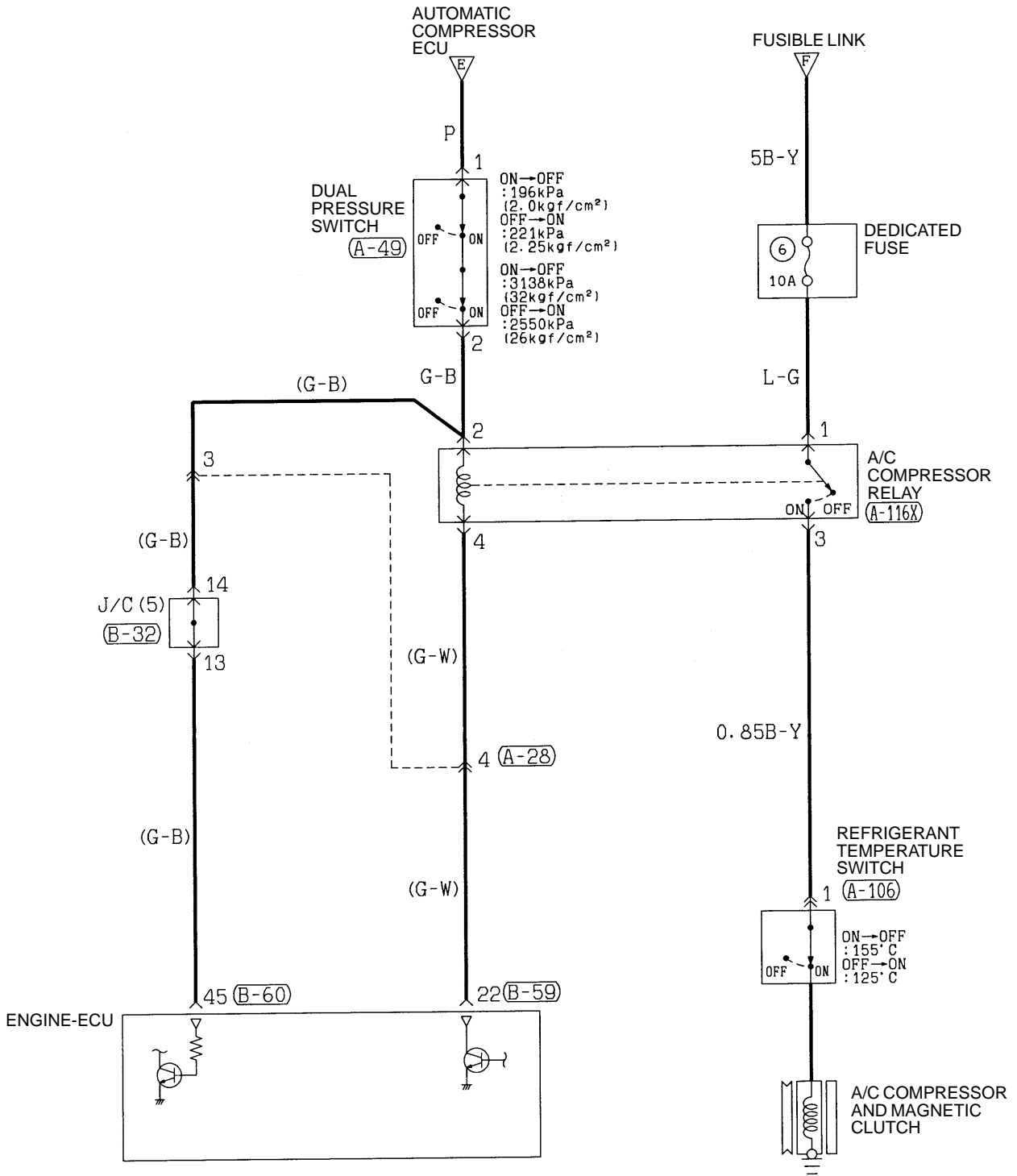


- INPUT SIGNAL
- A/C SWITCH
  - IDLE SWITCH
  - CRANK ANGLE SENSOR
  - VEHICLE SPEED SENSOR
  - ENGINE COOLANT TEMPERATURE SENSOR
  - THROTTLE POSITION SENSOR



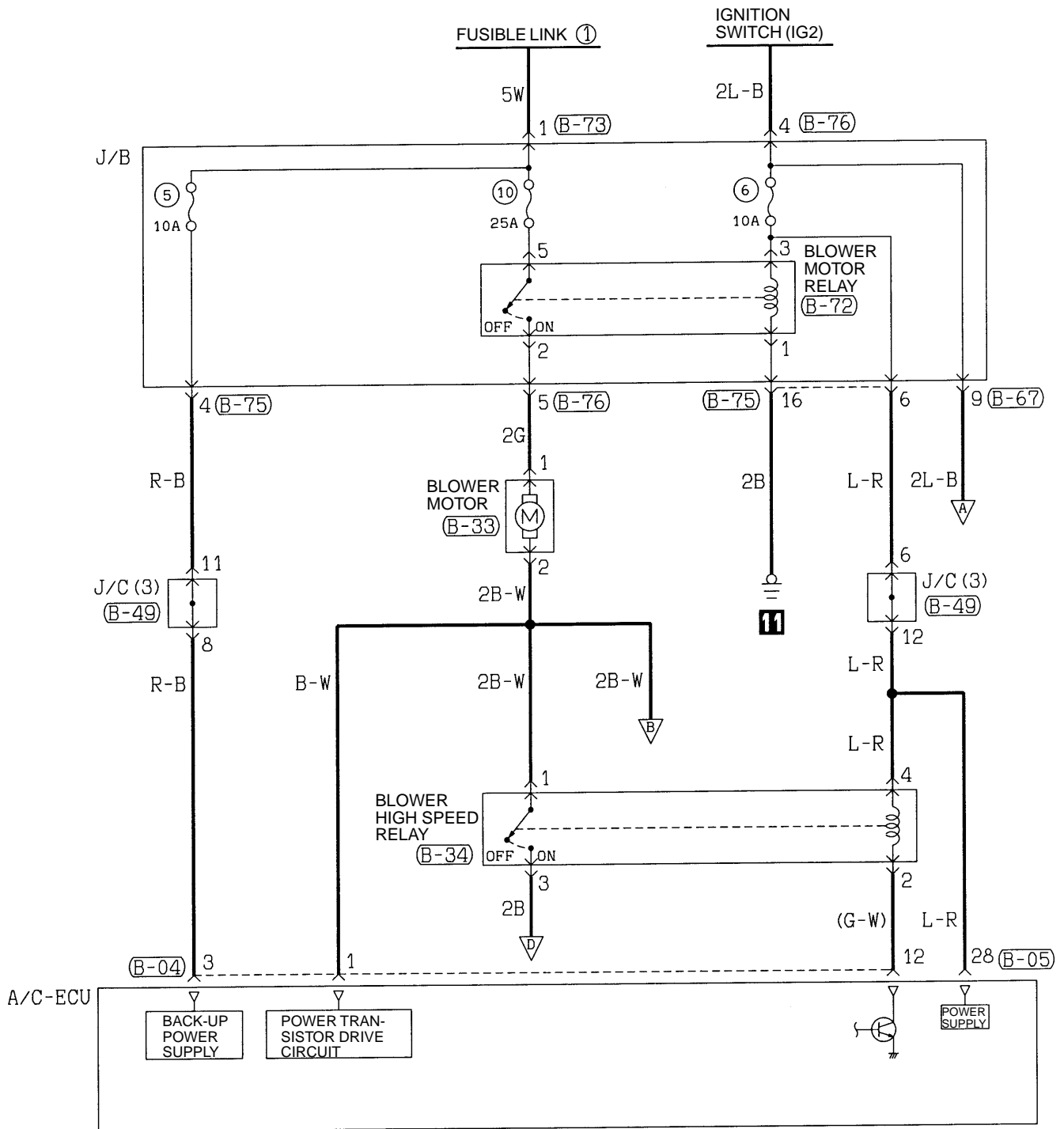


HEATER AND MANUAL AIR CONDITIONER (CONTINUED)



NOTES

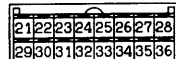
FULLY AUTOMATIC AIR CONDITIONER



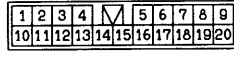
(B-04)



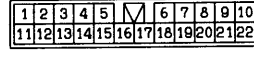
(B-05)



(B-15)



(B-19)



(B-33)



(B-34)



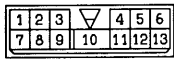
(B-37)



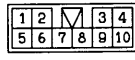
(B-39)



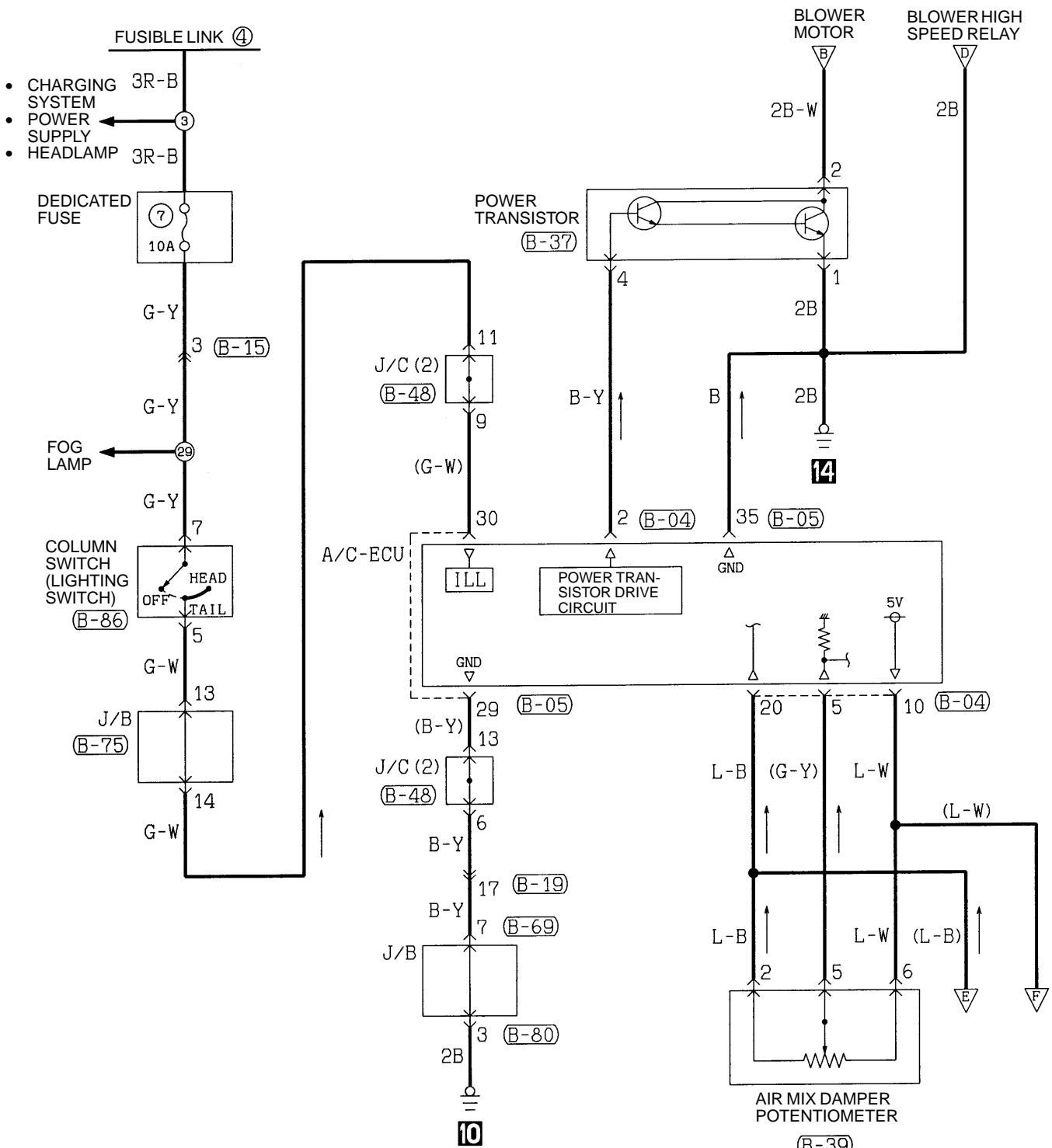
(B-80)



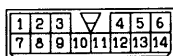
(B-86)



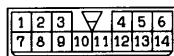




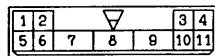
(B-48)



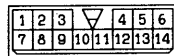
(B-49)



(B-67)



(B-69)



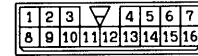
(B-72)



(B-73)



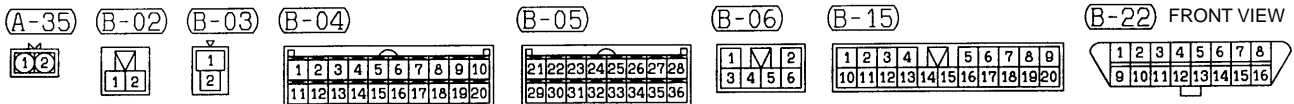
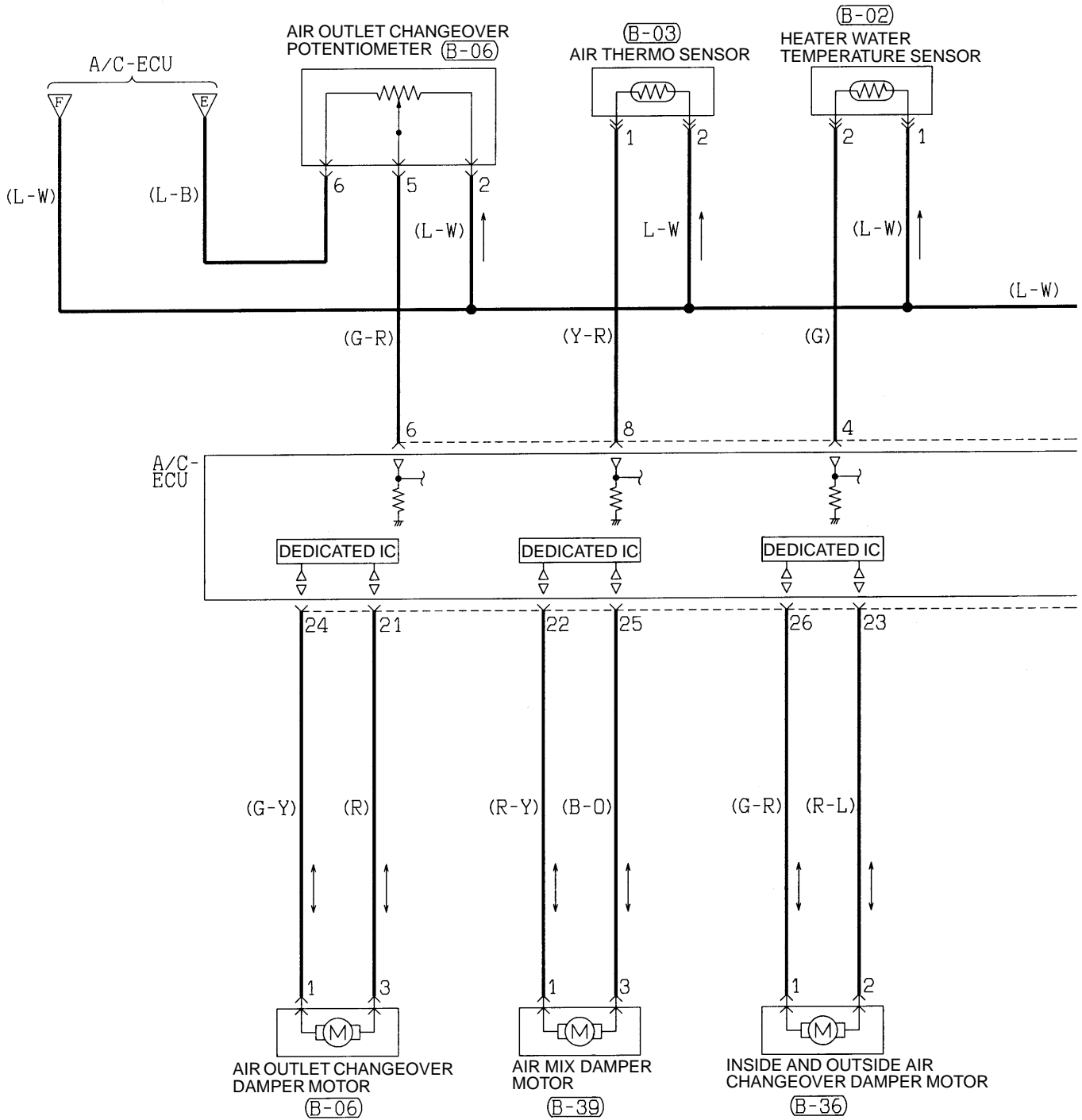
(B-75)

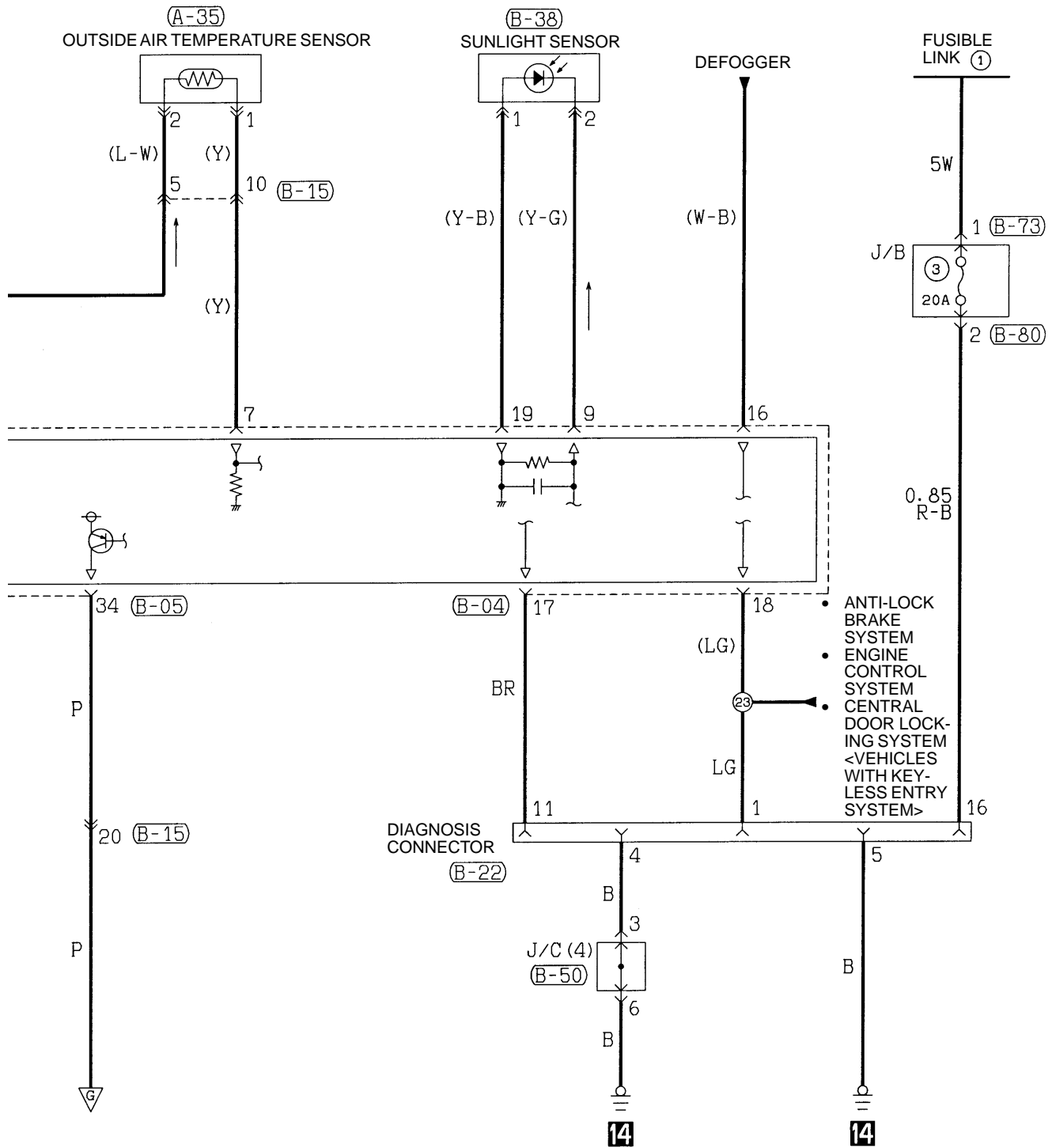


(B-76)



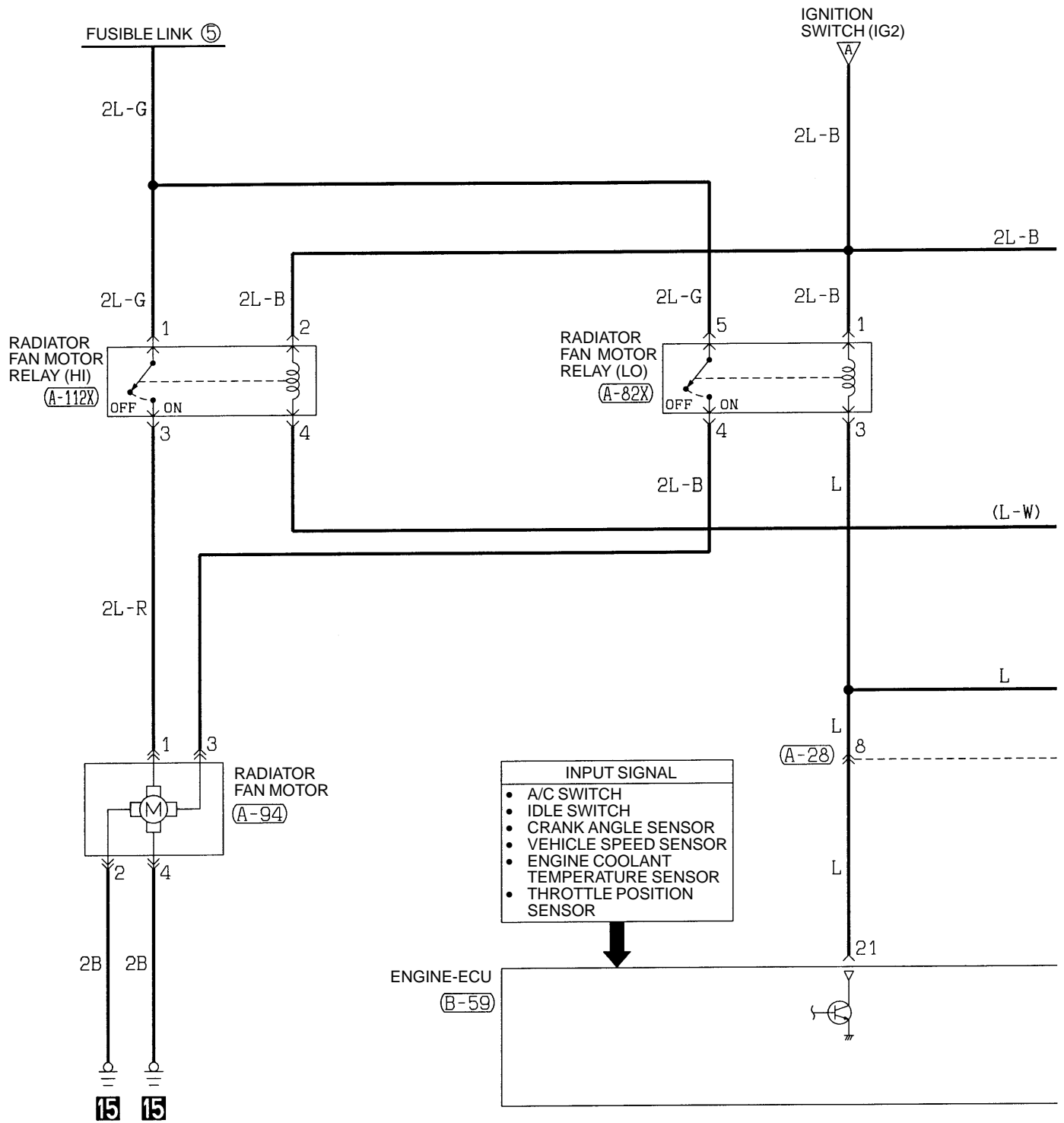
FULLY AUTOMATIC AIR CONDITIONER (CONTINUED)





(B-36)	(B-38)	(B-39)	(B-50)	(B-73)	(B-80)

FULLY AUTOMATIC AIR CONDITIONER (CONTINUED)



(A-28)



(A-82X)



(A-94)



(A-99)



(A-112X)



(A-113X)



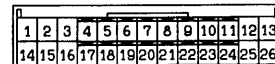
(A-114X)

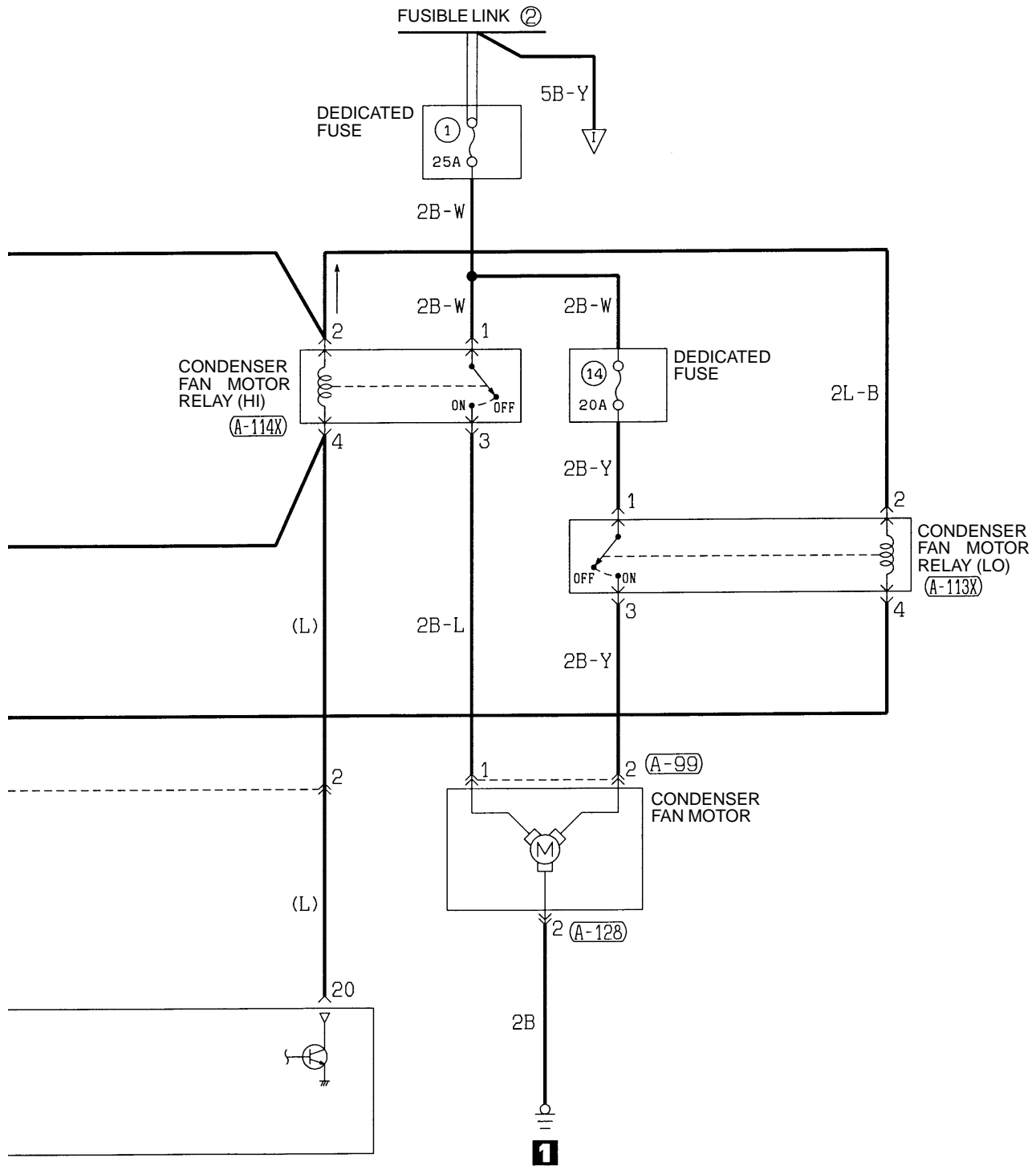


(A-128)

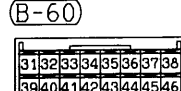
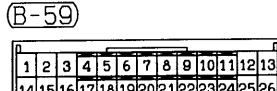
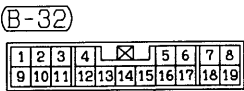
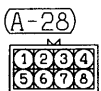
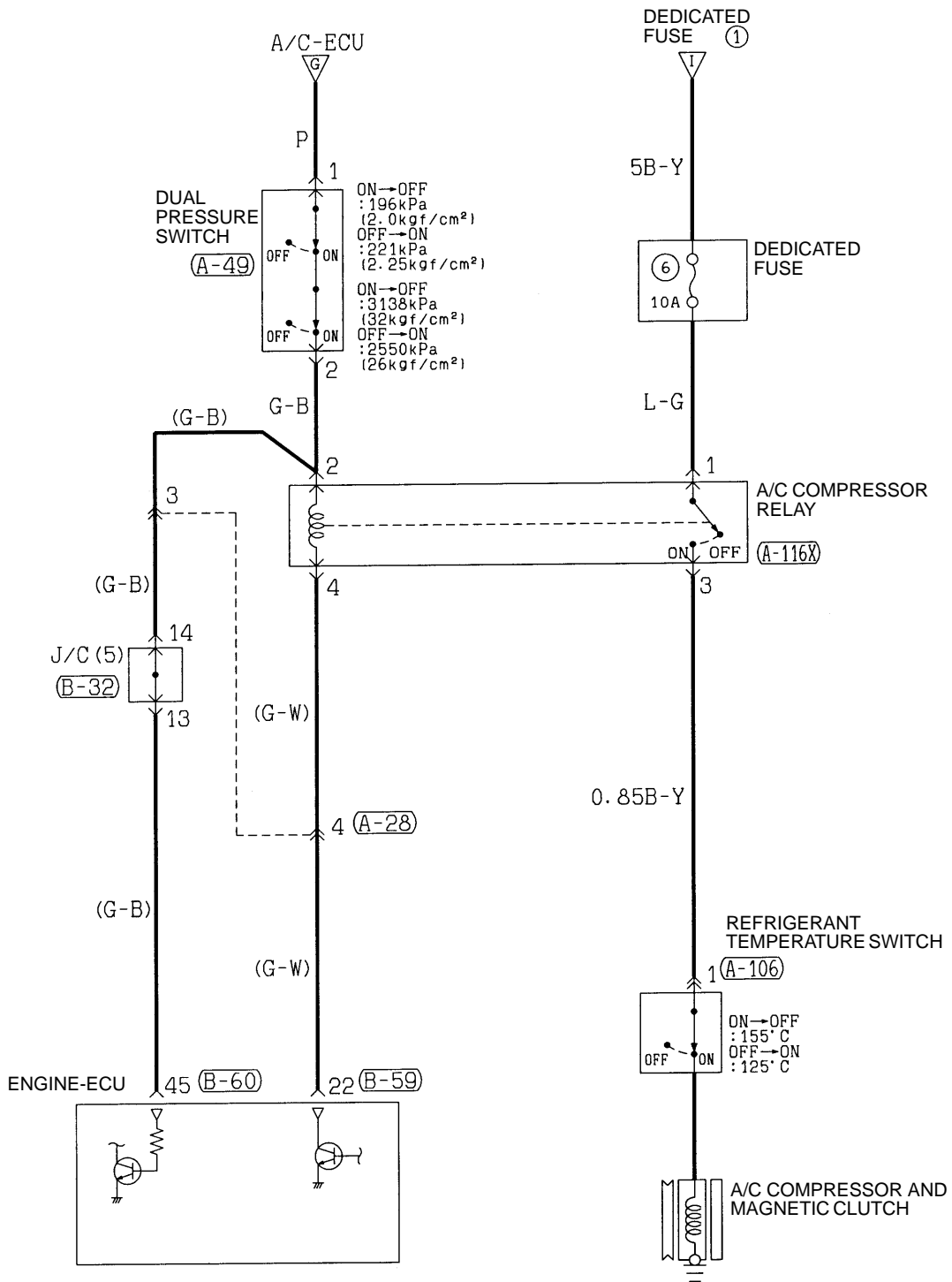


(B-59)

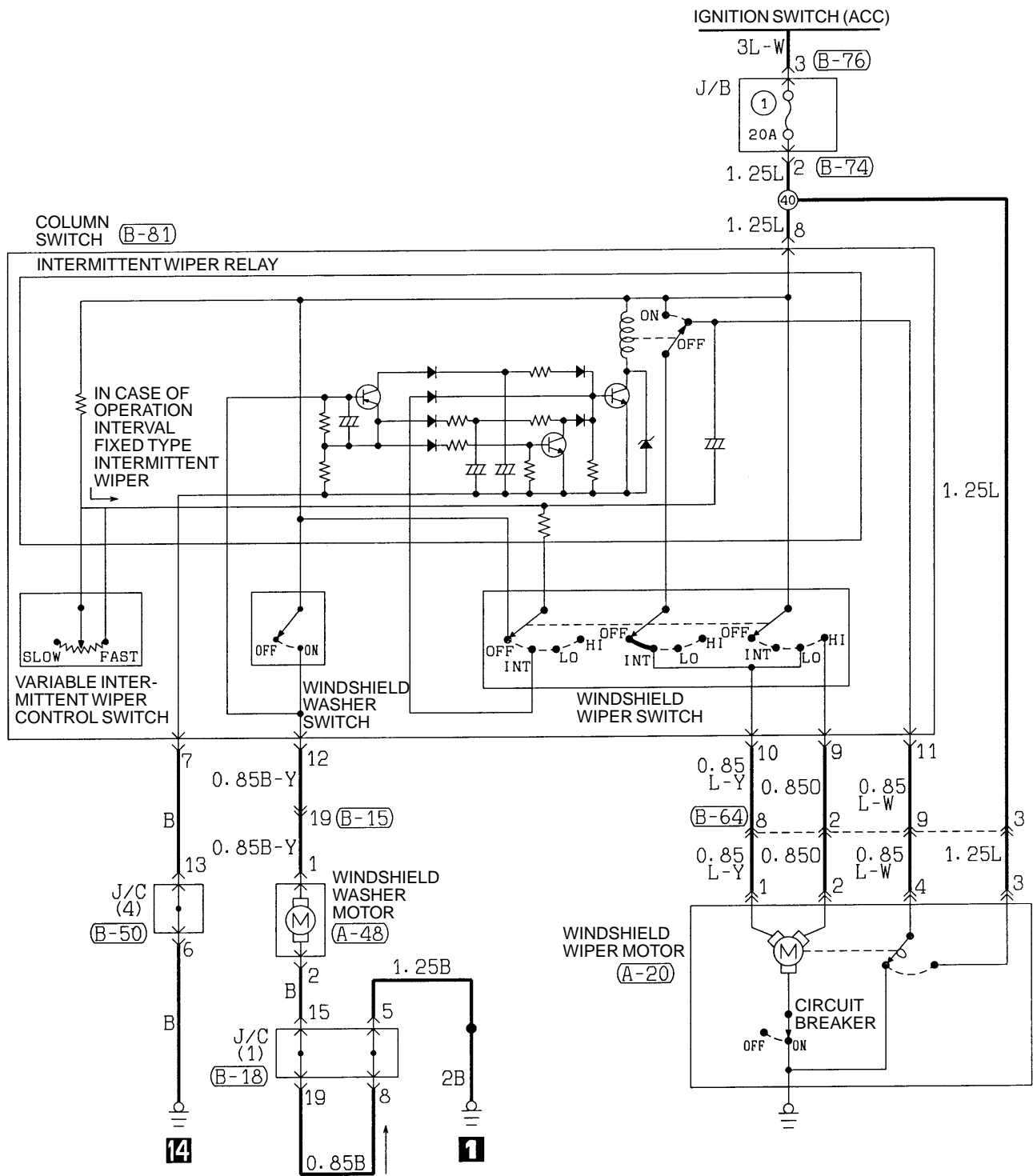




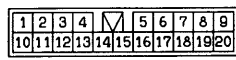
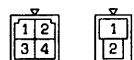
FULLY AUTOMATIC AIR CONDITIONER (CONTINUED)



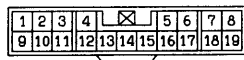
WINDSHIELD WIPER AND WASHER <INTERMITTENT WIPER>



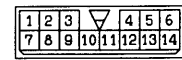
(A-20) (A-48) (B-15)



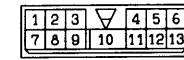
(B-18)



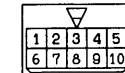
(B-50)



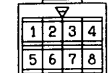
(B-64)



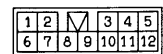
(B-74)



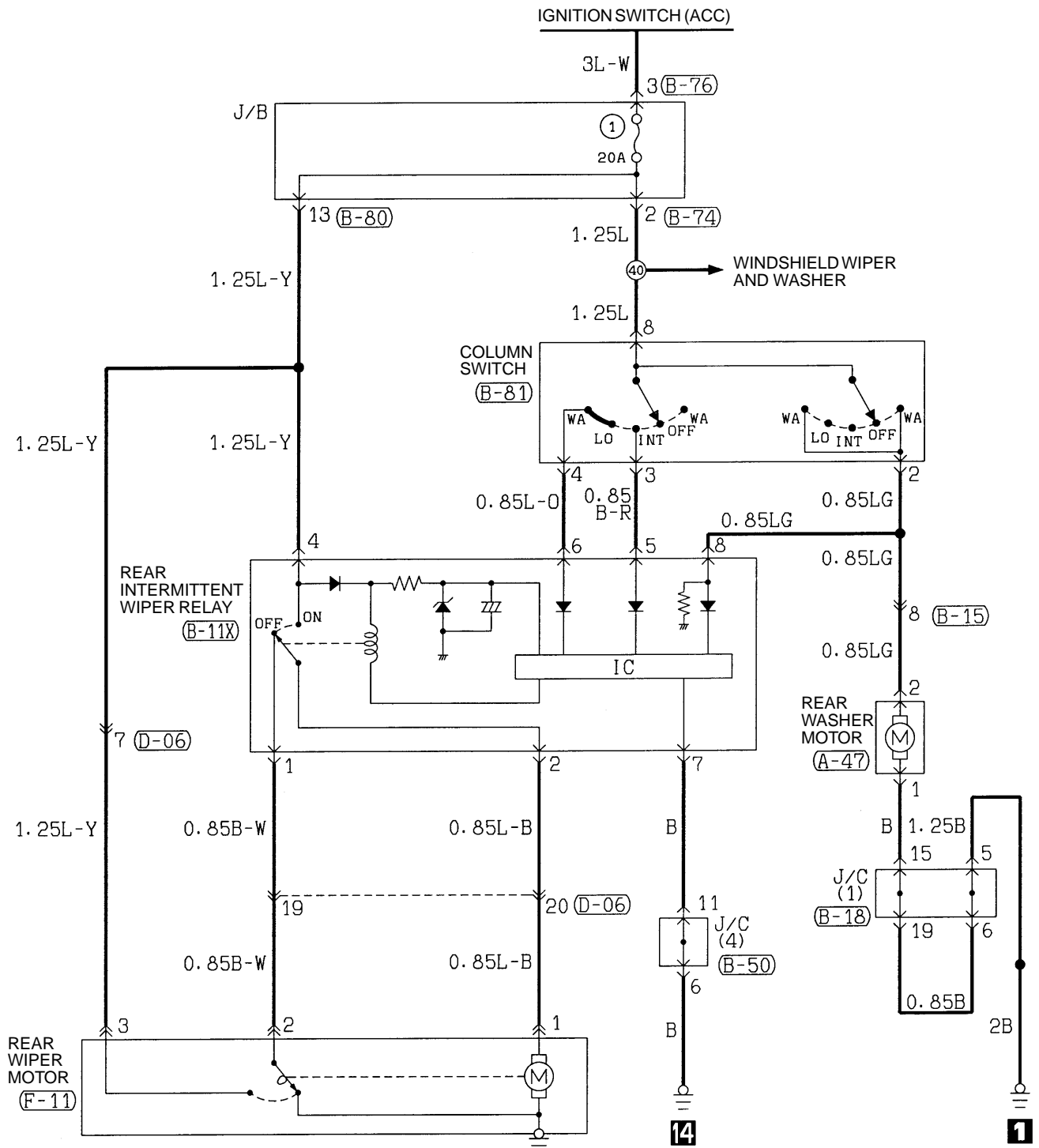
(B-76)



(B-81)



REAR WIPER AND WASHER



- (A-47) 

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
- (B-11X) 

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
- (B-15) 

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
- (B-18) 

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
- (B-50) 

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
- (B-74) 

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
- (B-76) 

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
- (B-80) 

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
- (B-81) 

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
- (D-06) 

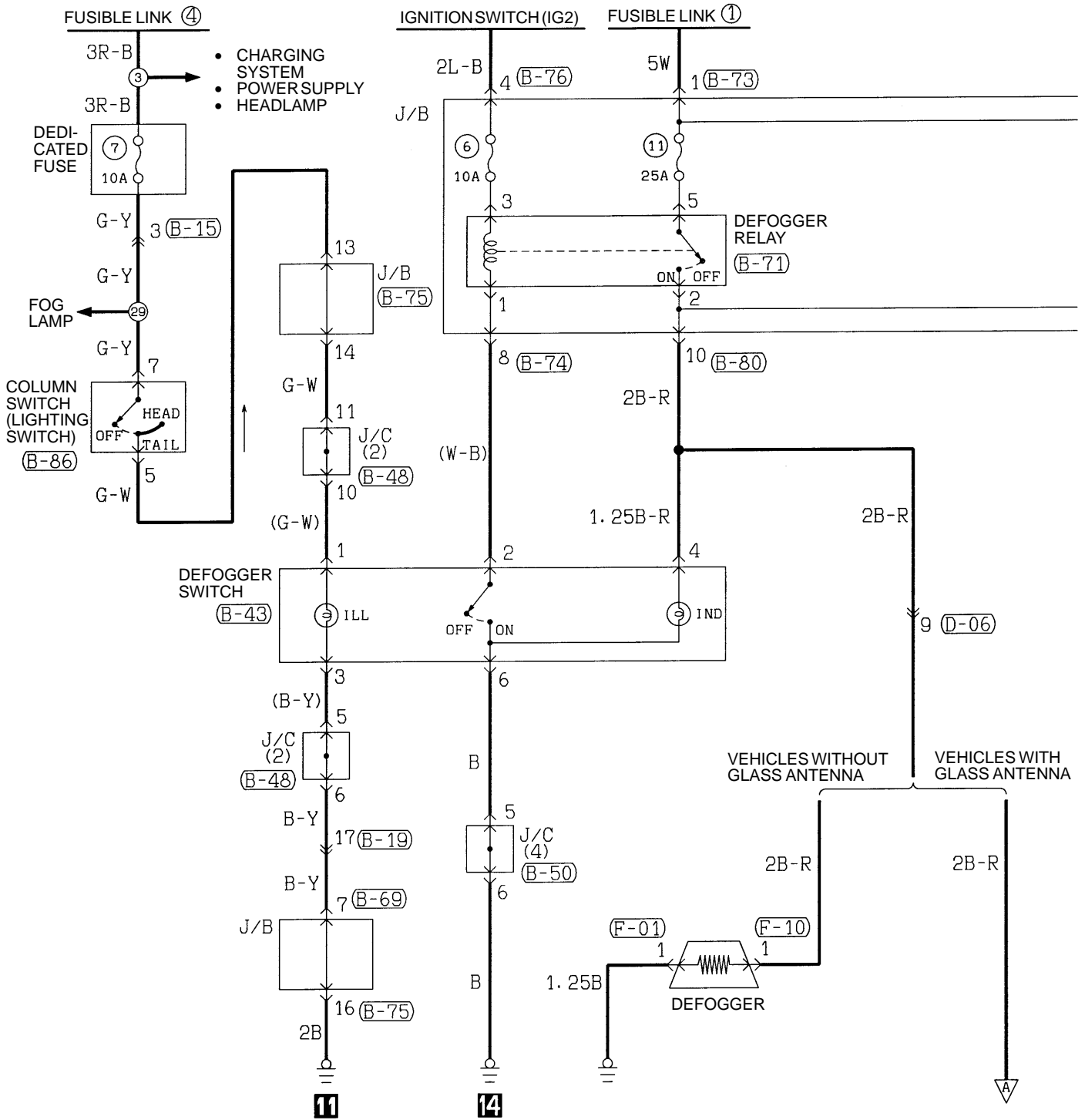
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
- (F-11) 

1	2	3
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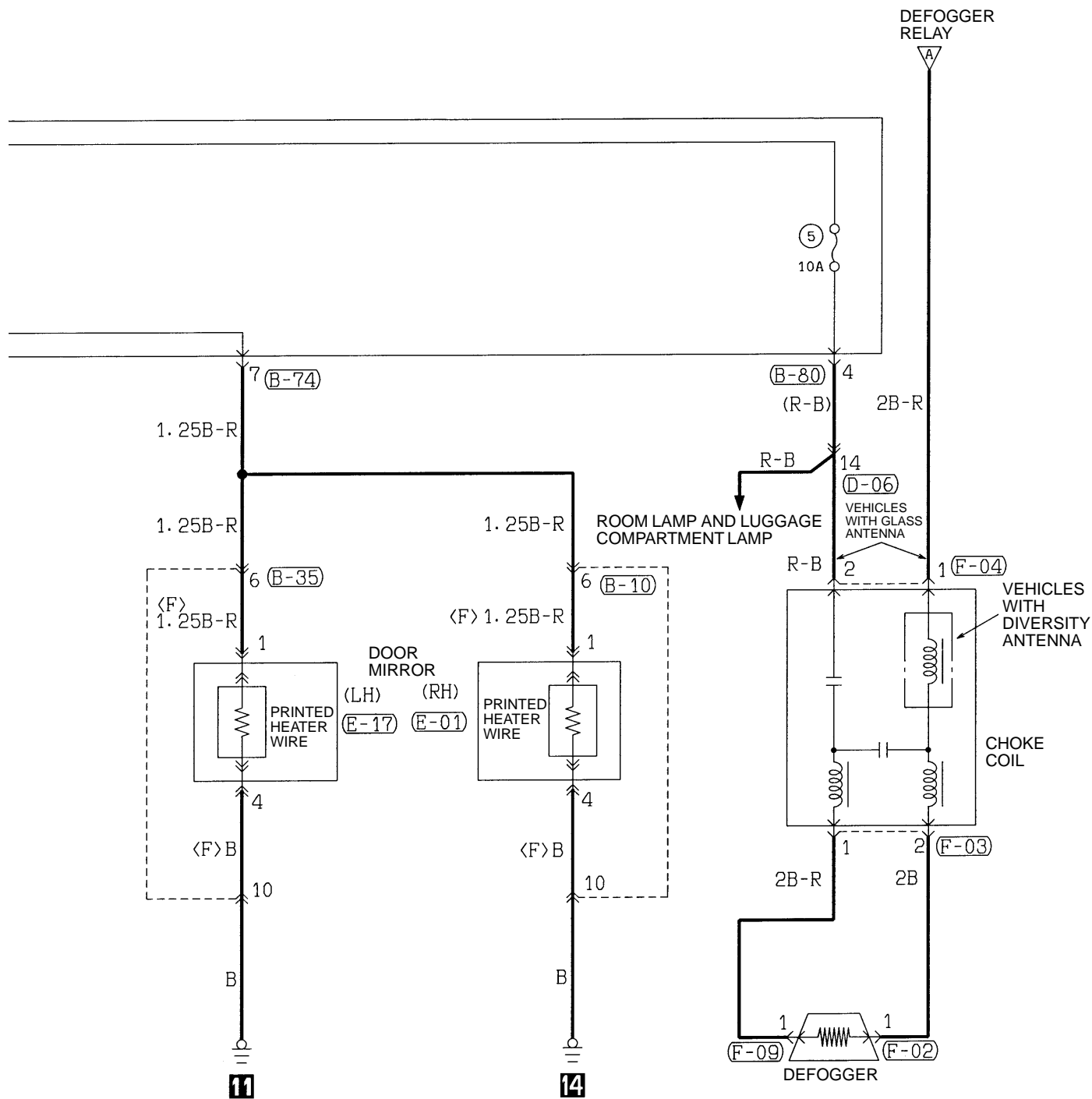


NOTES

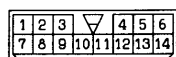
# DEFOGGER AND DOOR MIRROR HEATER <VEHICLES WITHOUT FULLY AUTOMATIC AIR CONDITIONER>



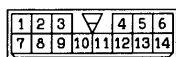
<b>(B-10)</b>	<b>(B-15)</b>	<b>(B-19)</b>	<b>(B-35)</b>	<b>(B-43)</b>	<b>(B-48)</b>			
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22	1 2 3 4 5 6	1 2 3 4 5 6 7 8 9 10 11 12 13 14			
<b>(D-06)</b>	<b>(E-01)</b>	<b>(E-17)</b>	<b>(F-01)</b>	<b>(F-02)</b>	<b>(F-03)</b>	<b>(F-04)</b>	<b>(F-09)</b>	<b>(F-10)</b>
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22	1 2 3 4 5 6 7	1 2 3 4 5 6 7	1	1	1 2	1 2 3	1	1



(B-50)



(B-69)



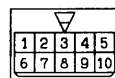
(B-71)



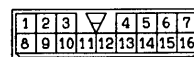
(B-73)



(B-74)



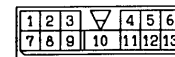
(B-75)



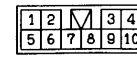
(B-76)



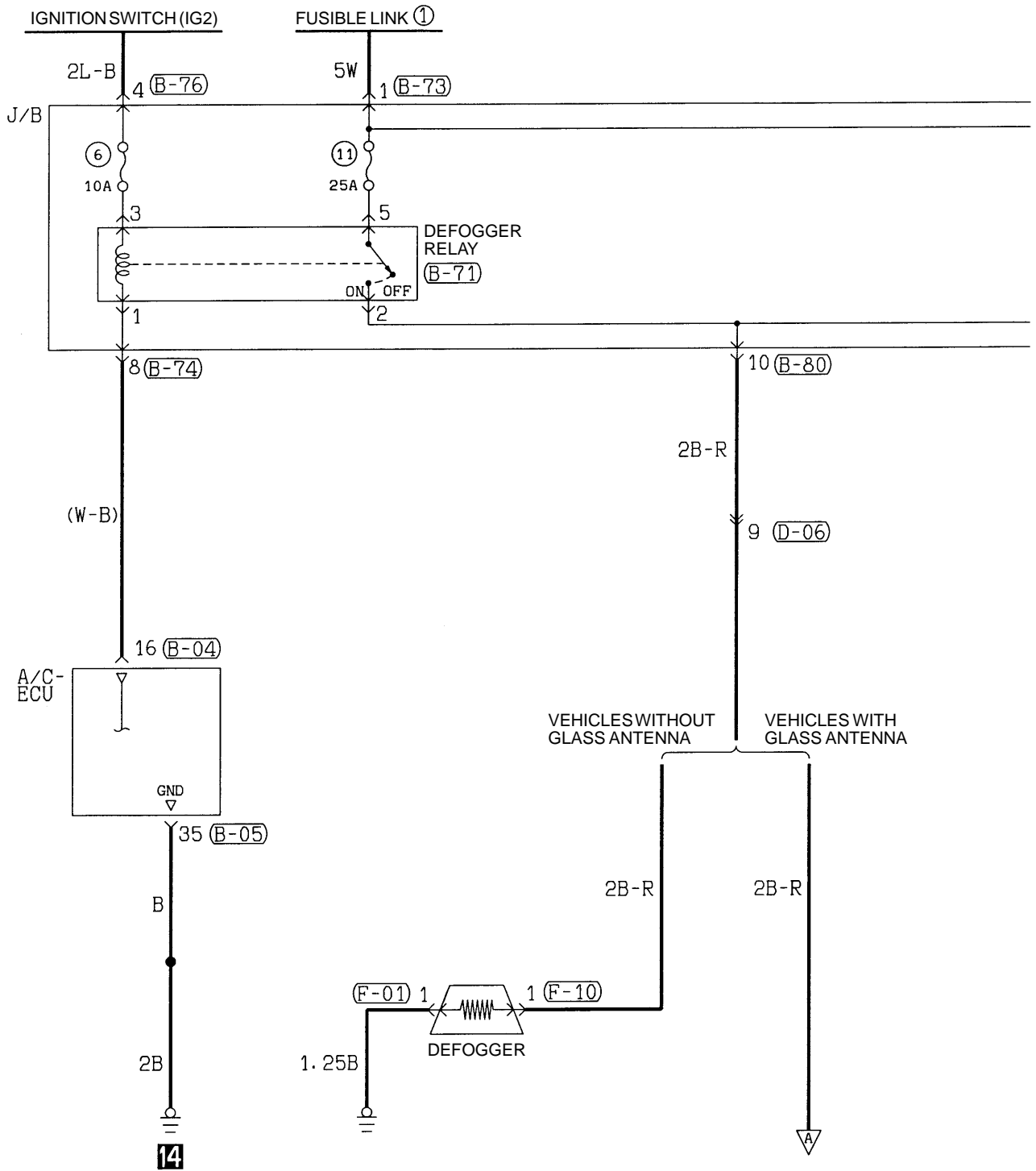
(B-80)



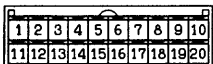
(B-86)



**DEFOGGER AND DOOR MIRROR HEATER  
 <VEHICLES WITH FULLY AUTOMATIC AIR CONDITIONER>**



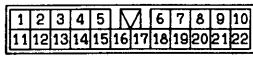
(B-04)



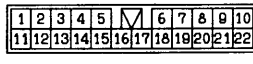
(B-05)



(B-10)



(B-35)



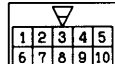
(B-71)

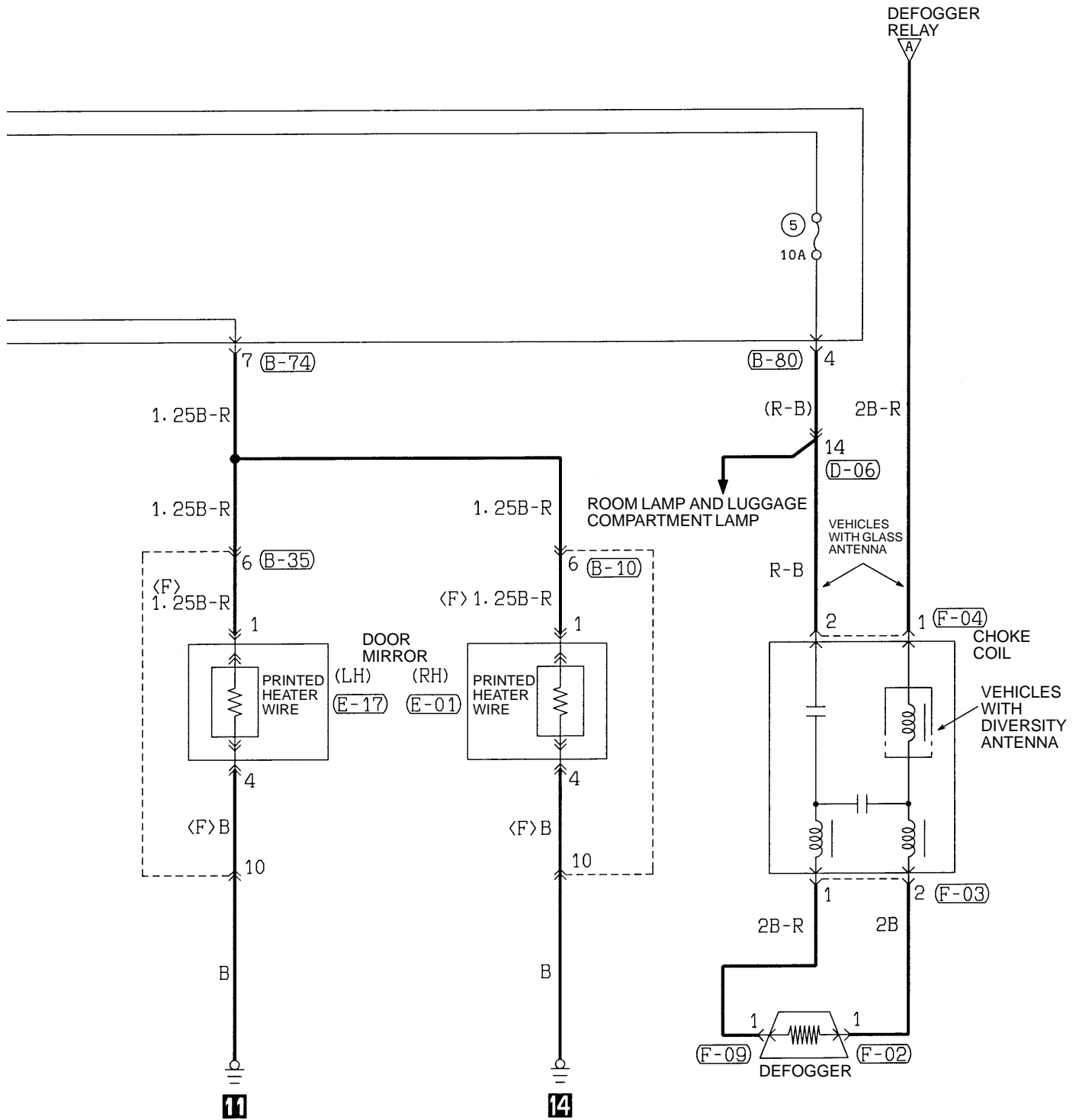


(B-73)



(B-74)





(B-76)

1	2	3	4
5	6	7	8

(B-80)

1	2	3	4	5	6	
7	8	9	10	11	12	13

(D-06)

1	2	3	4	5	6	7	8	9	10		
11	12	13	14	15	16	17	18	19	20	21	22

(E-01)

1	2	3	
4	5	6	7

(E-17)

1	2	3	
4	5	6	7

(F-01)

1
---

(F-02)

1
---

(F-03)

1
2

(F-04)

1	
2	3

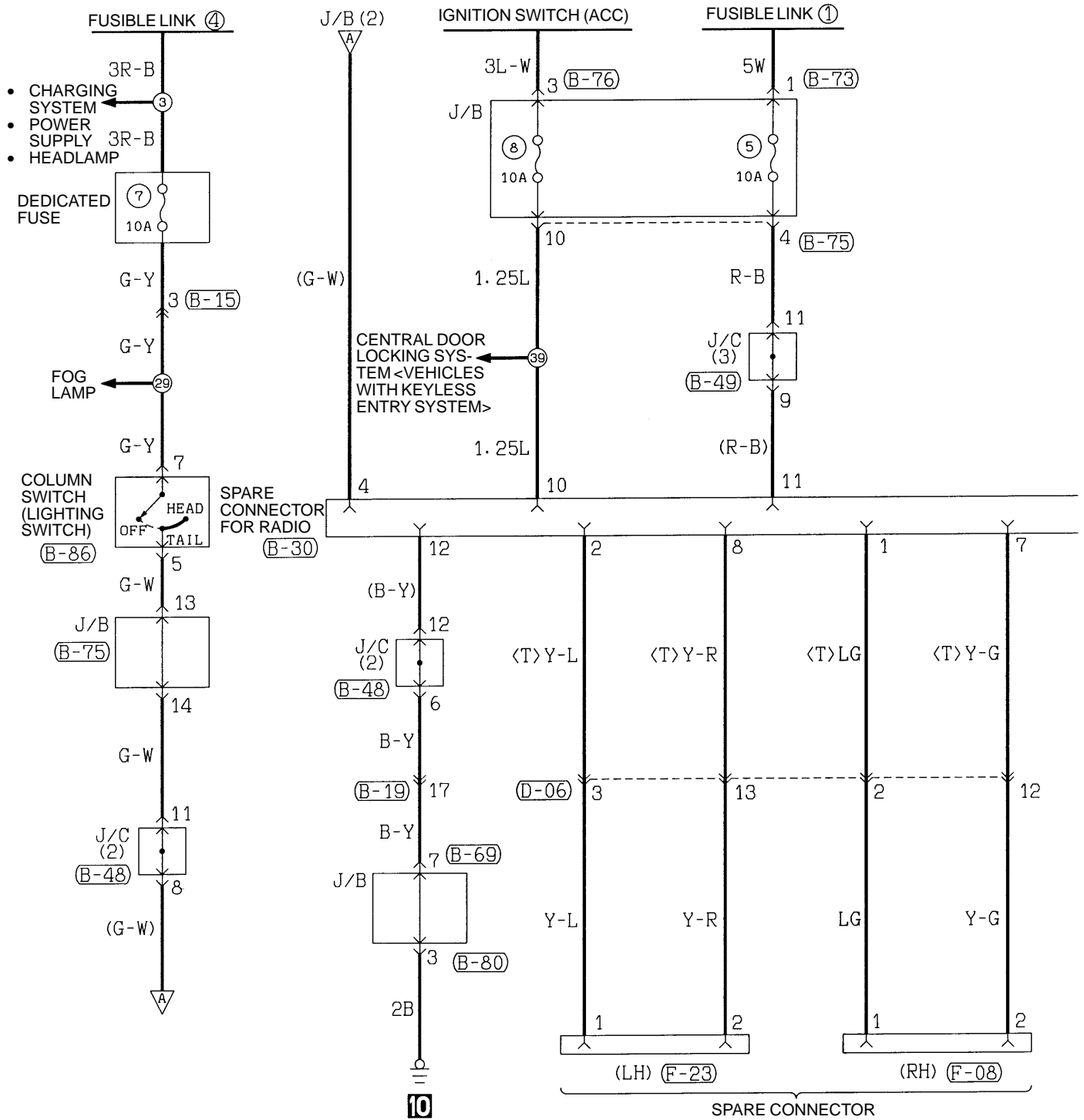
(F-09)

1
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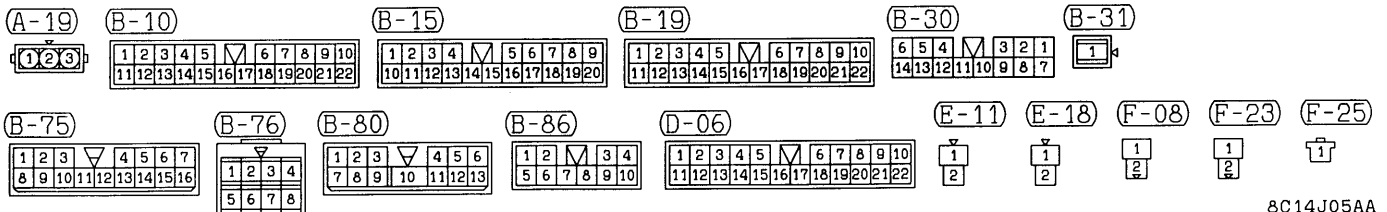
(F-10)

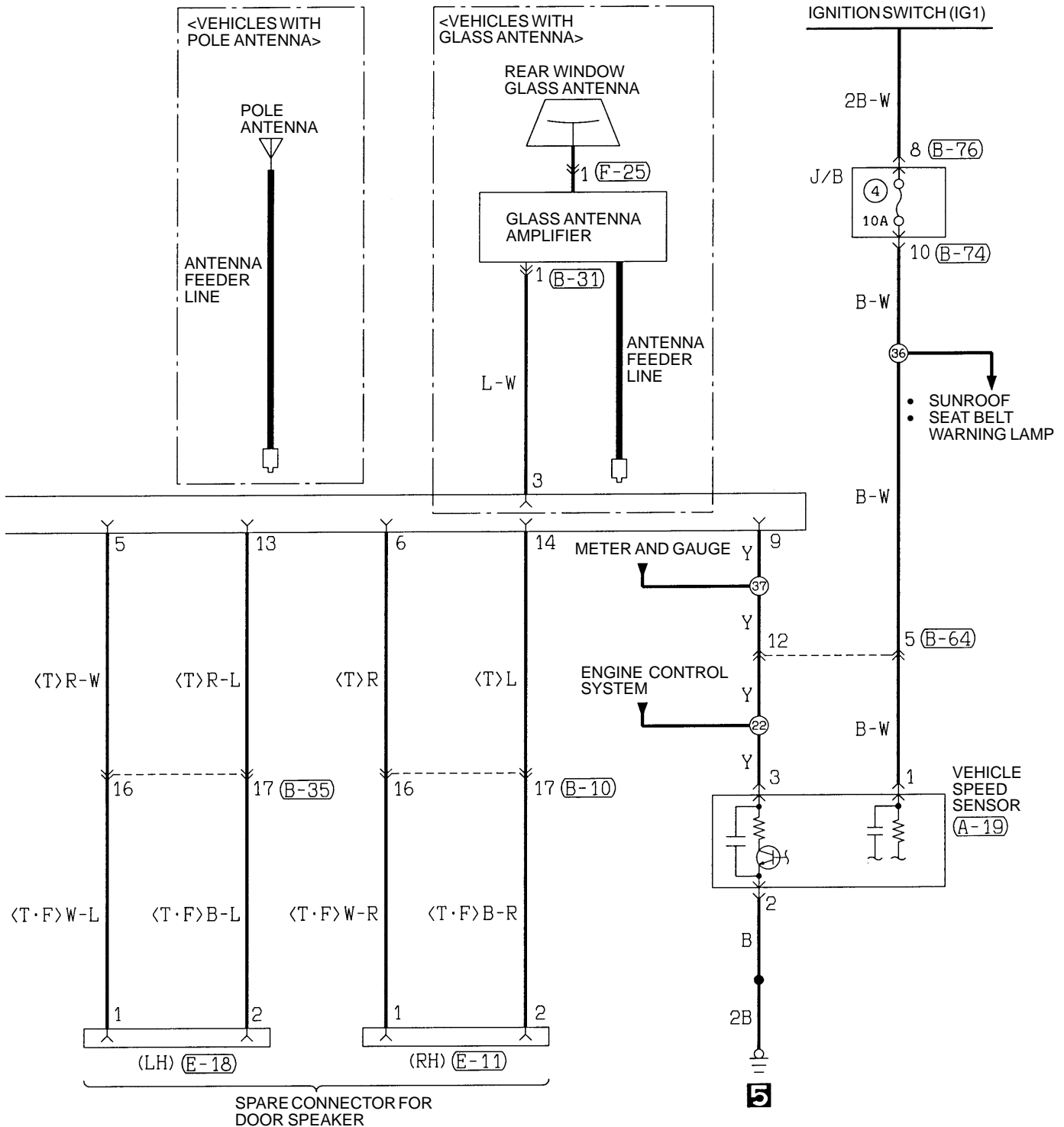
1
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SPARE CONNECTOR FOR RADIO



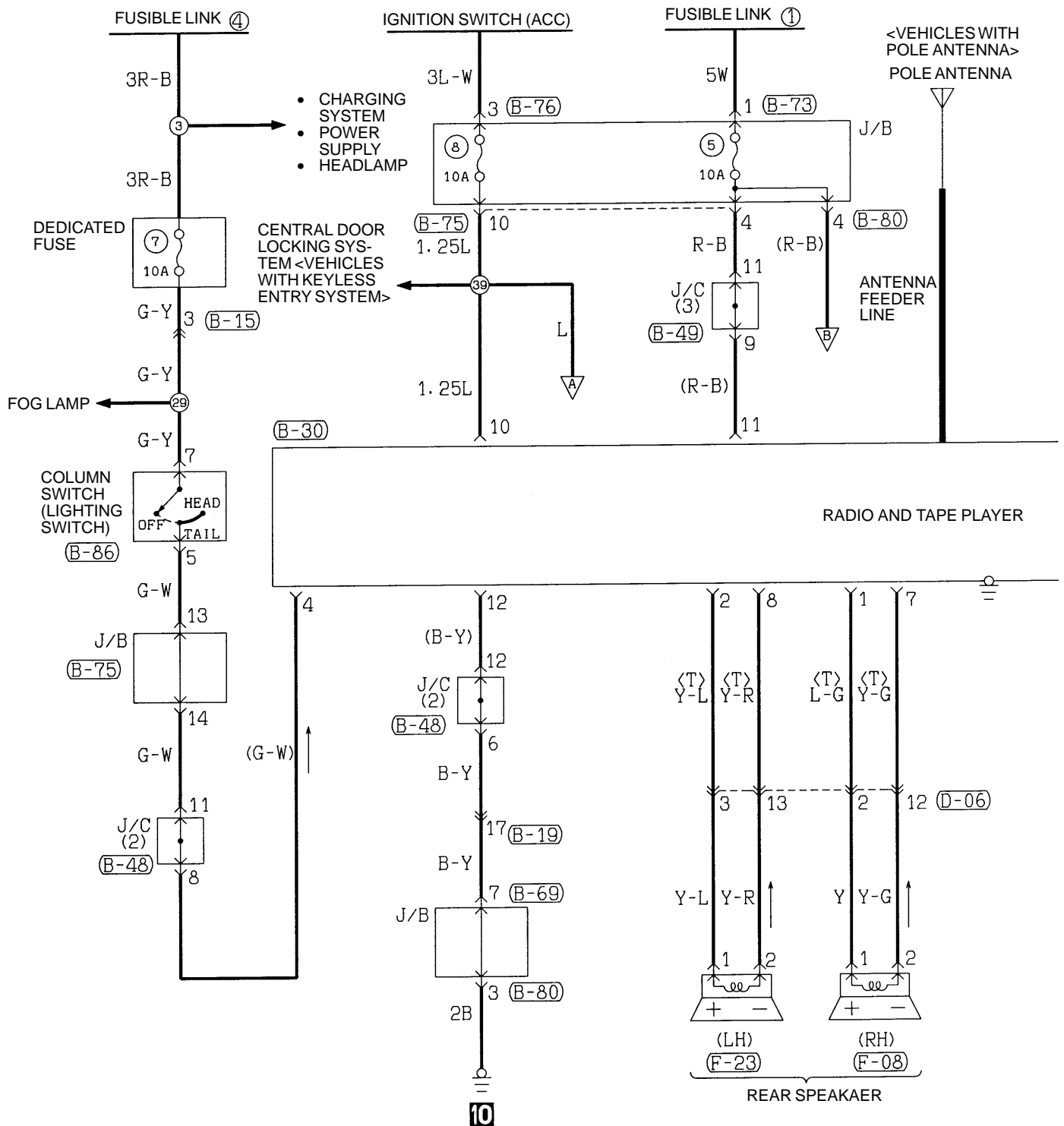
SPARE CONNECTOR FOR REAR SPEAKER





<b>(B-35)</b>	<b>(B-48)</b>	<b>(B-49)</b>	<b>(B-64)</b>	<b>(B-69)</b>	<b>(B-73)</b>	<b>(B-74)</b>
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22	1 2 3 4 5 6 7 8 9 10 11 12 13 14	1 2 3 4 5 6 7 8 9 10 11 12 13 14	1 2 3 4 5 6 7 8 9 10 11 12 13	1 2 3 4 5 6 7 8 9 10 11 12 13 14	1	1 2 3 4 5 6 7 8 9 10

RADIO <4-SPEAKER, 6-SPEAKER>



(B-10)

1	2	3	4	5	M	6	7	8	9	10	
11	12	13	14	15	16	17	18	19	20	21	22

(B-15)

1	2	3	4	M	5	6	7	8	9	
10	11	12	13	14	15	16	17	18	19	20

(B-19)

1	2	3	4	5	M	6	7	8	9	10	
11	12	13	14	15	16	17	18	19	20	21	22

(B-30)

1	2	3	M	4	5	6	
7	8	9	10	11	12	13	14

(B-31)

1
---

(B-35)

1	2	3	4	5	M	6	7	8	9	10	
11	12	13	14	15	16	17	18	19	20	21	22

(D-06)

1	2	3	4	5	M	6	7	8	9	10	
11	12	13	14	15	16	17	18	19	20	21	22

(E-02)

M
1 2

(E-11)

1
2

(E-16)

M
1 2

(E-18)

1
2

(F-08)

1
2

(F-23)

1
2

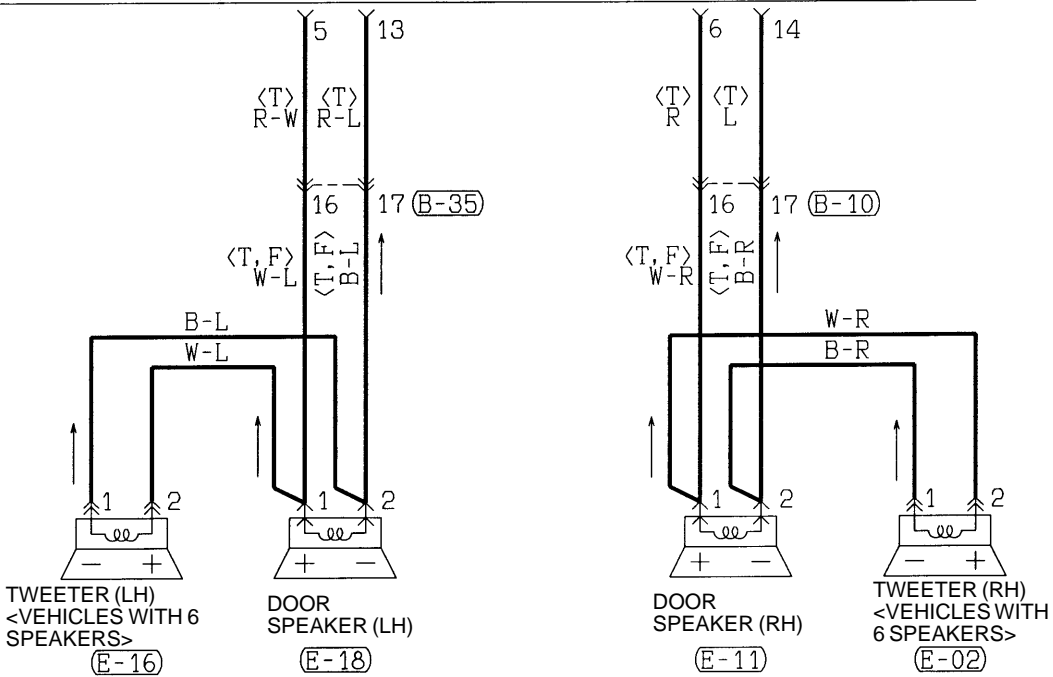
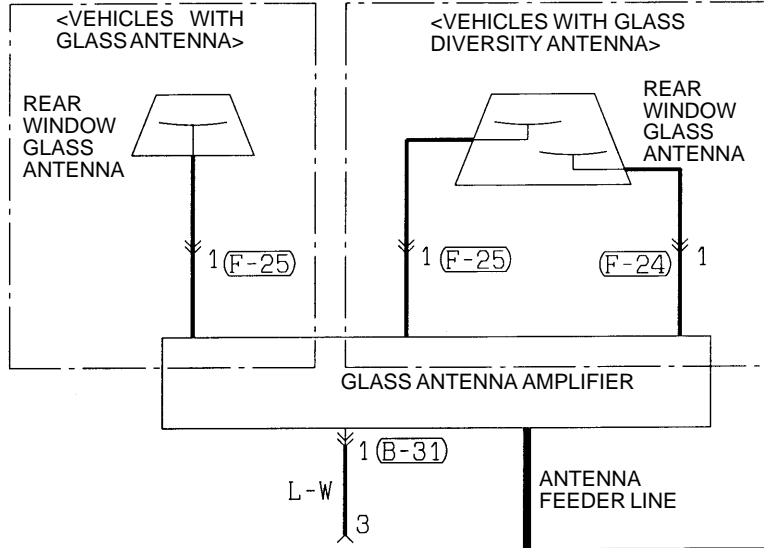
(F-24)

1
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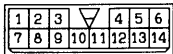
(F-25)

1
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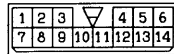




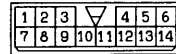
(B-48)



(B-49)



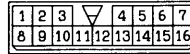
(B-69)



(B-73)



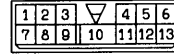
(B-75)



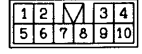
(B-76)



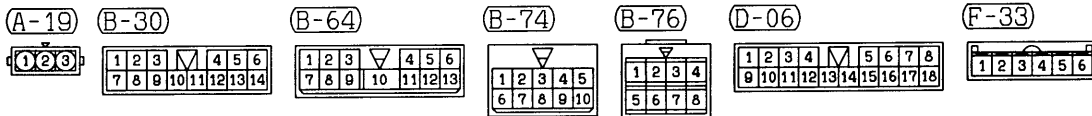
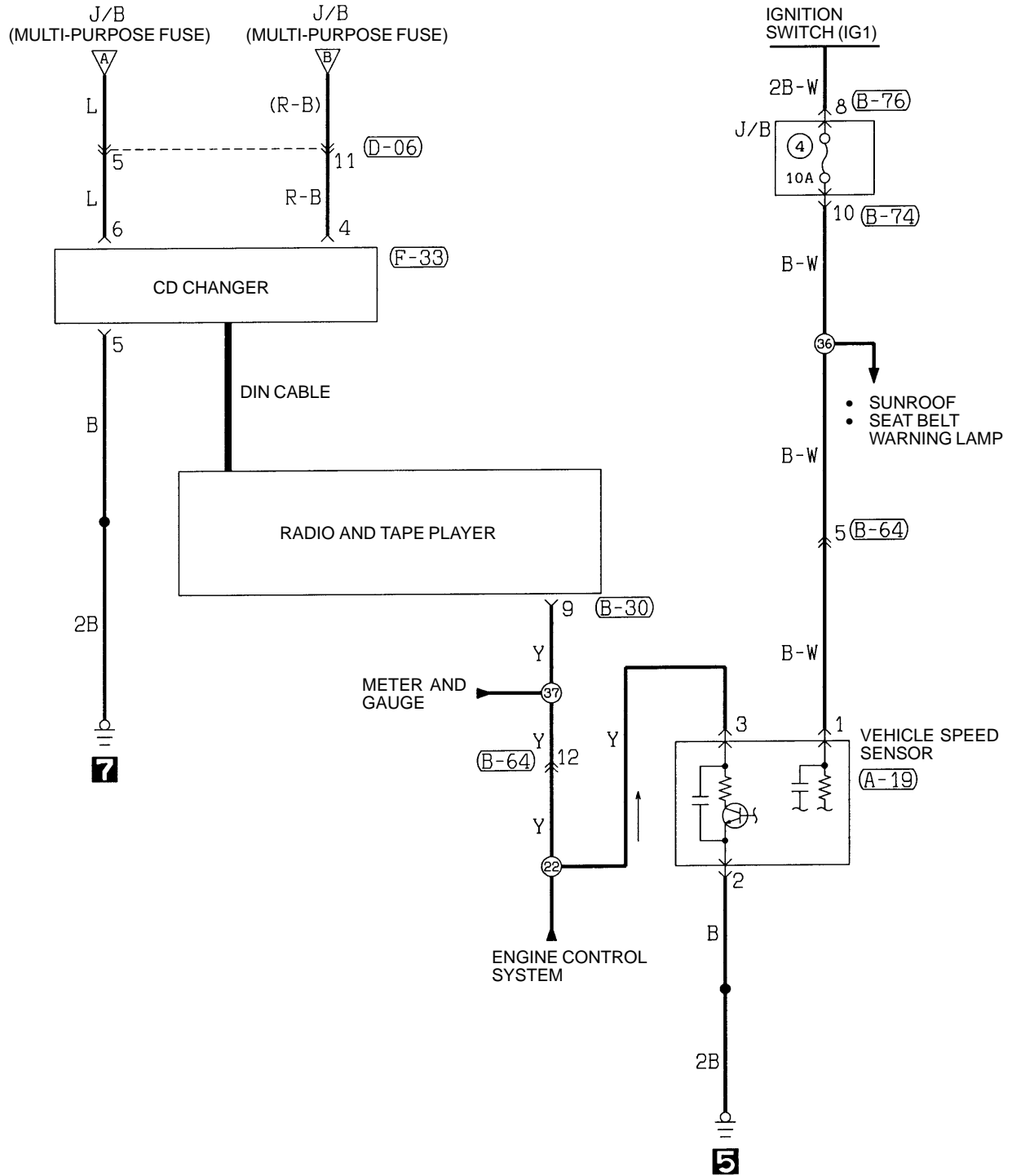
(B-80)



(B-86)

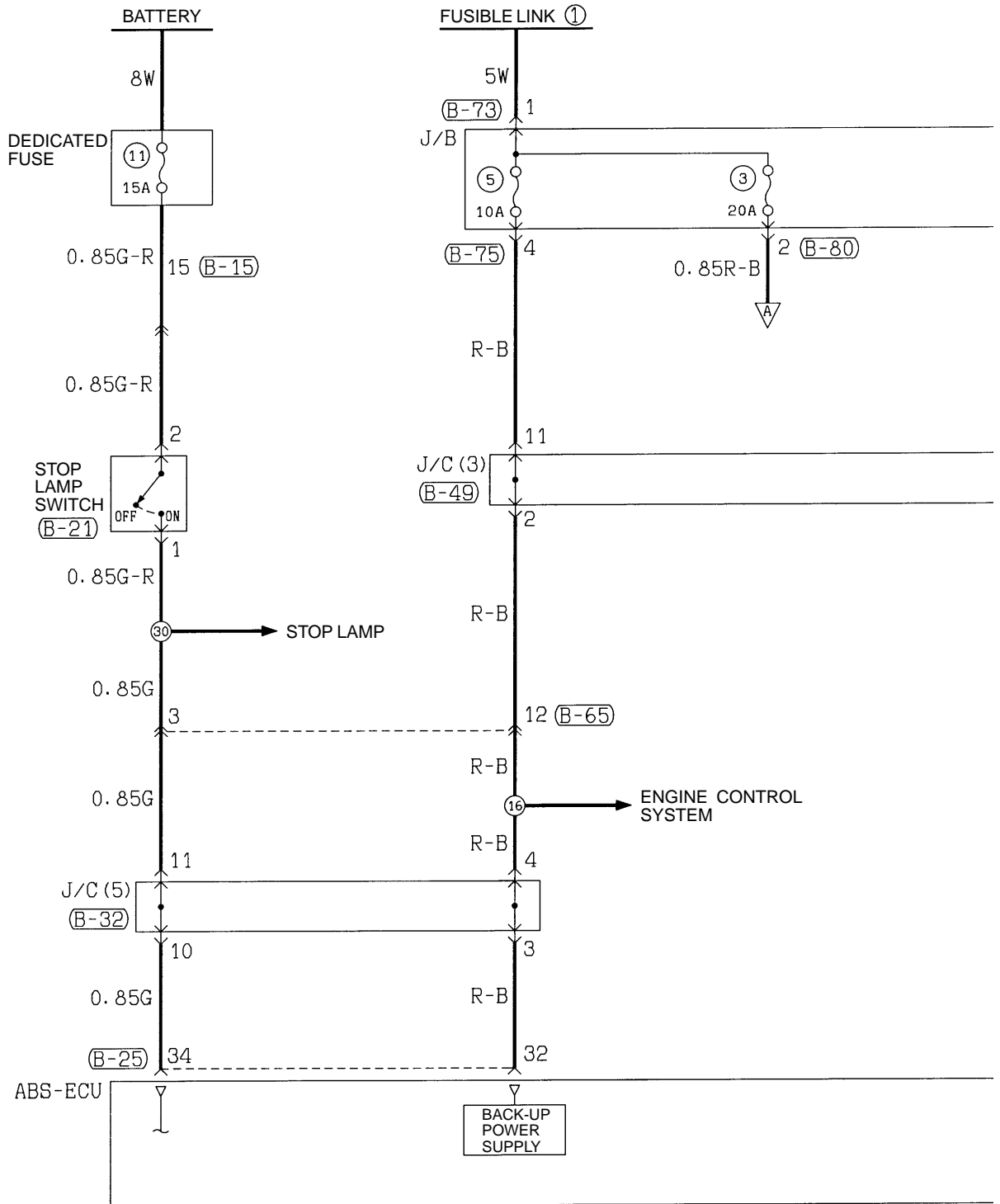


RADIO <4-SPEAKER, 6-SPEAKER> (CONTINUED)

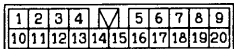


NOTES

ANTI-LOCK BRAKE SYSTEM (ABS)



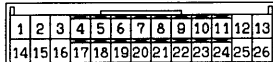
(B-15)



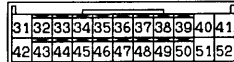
(B-21)



(B-24)



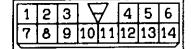
(B-25)



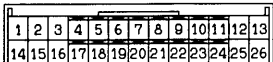
(B-32)

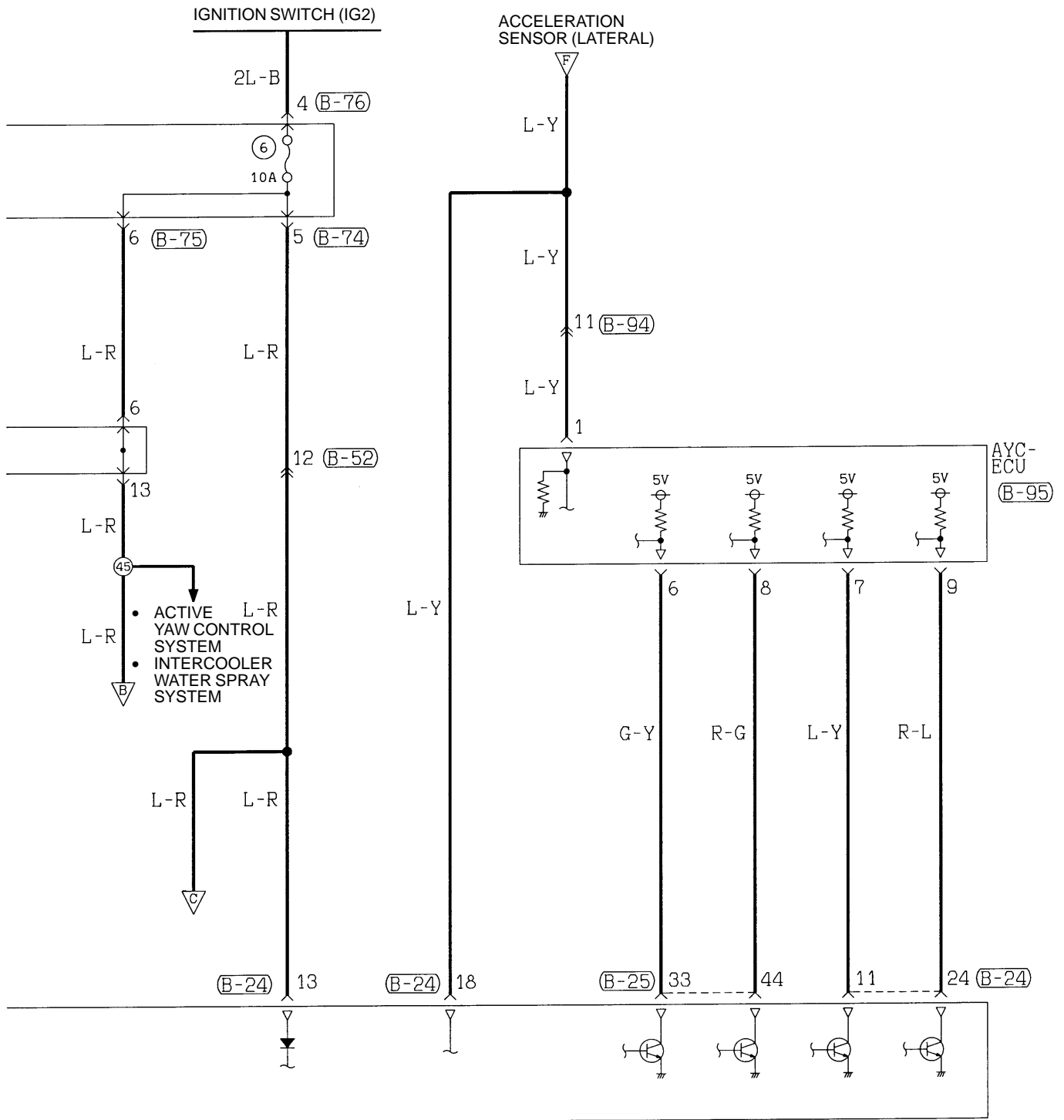


(B-49)



(B-95)





(B-52)

(B-65)

(B-73)

(B-74)

(B-75)

(B-76)

(B-80)

(B-94)

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16					

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16					

1
---

1	2	3	4	5
6	7	8	9	10

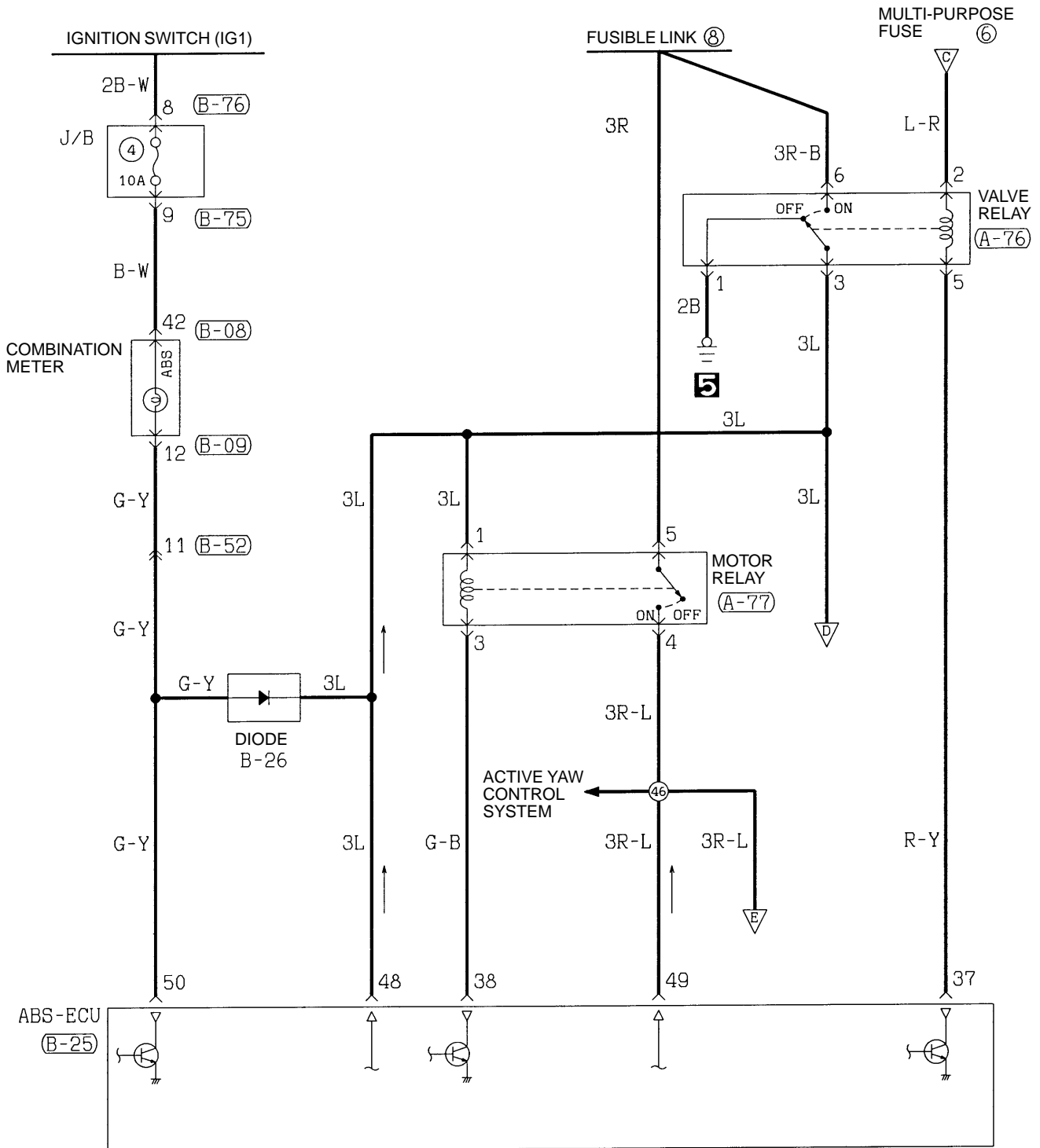
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16					

1	2	3	4
5	6	7	8

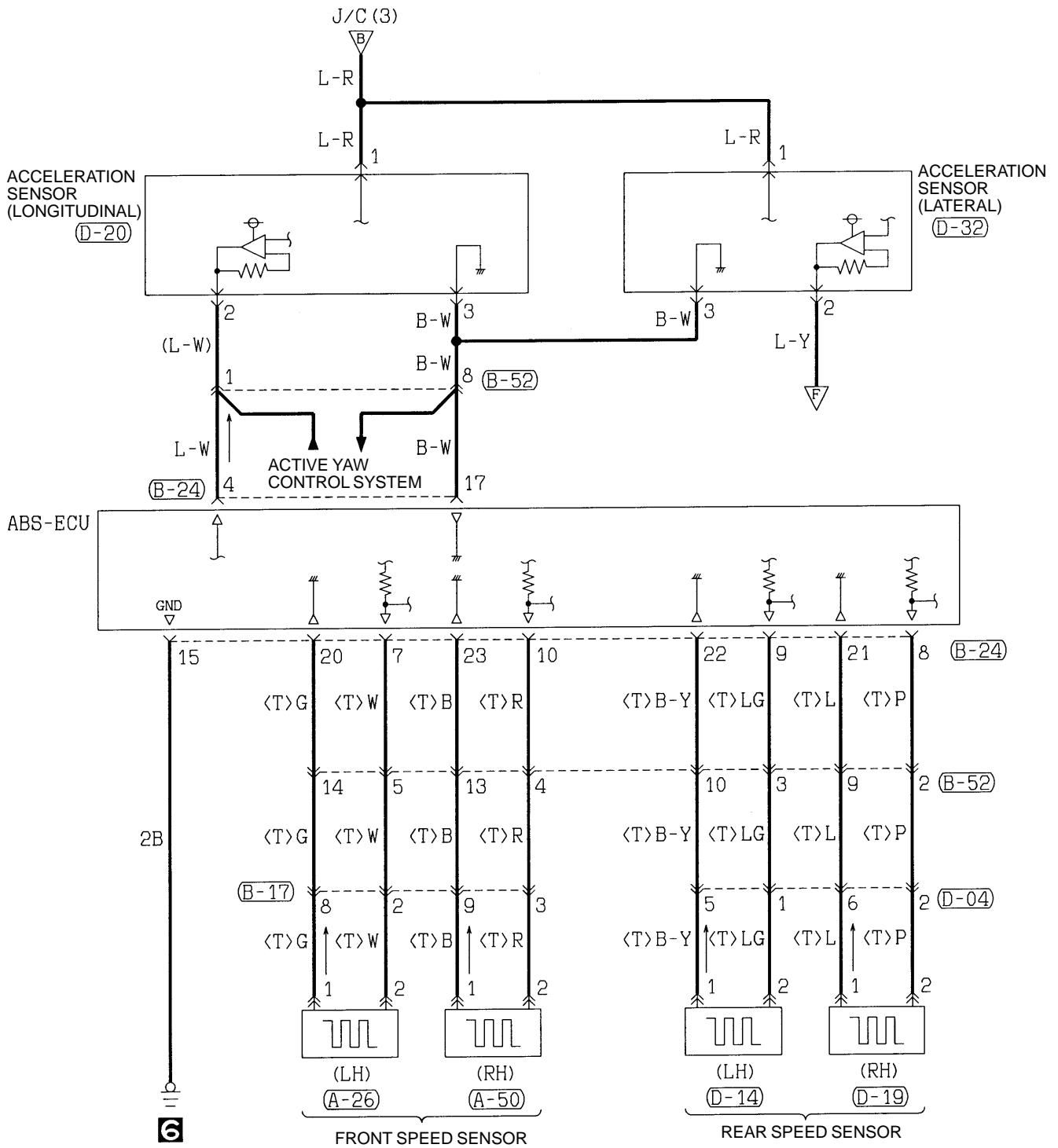
1	2	3	4	5	6
7	8	9	10	11	12
13					

1	2	3	4	5	6
7	8	9	10	11	12
13					

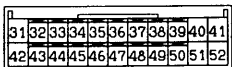
ANTI-LOCK BRAKE SYSTEM (ABS) (CONTINUED)



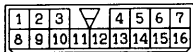
(A-26)	(A-50)	(A-76)	(A-77)	(B-08)	(B-09)	(B-17)	(B-24)
1 2	1 2	1 2 3 4 5 6	1 2 3 4 5	31 32 33 34 35 36 37 38 39 40 41 42 43	1 2 3 4 5 6 7 8 9 10 11 12 13	1 2 3 4 5 6 7 8 9 10 11 12 13 14	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26
44 45 46 47 48 49 50	51 52 53 54 55	14 15 16 17 18 19 20 21 22 23 24 25					



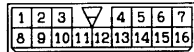
(B-25)



(B-52)



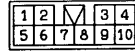
(B-75)



(B-76)



(D-04)



(D-14)



(D-19)



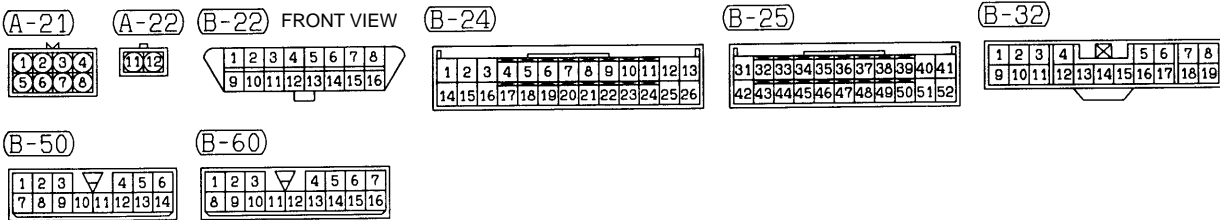
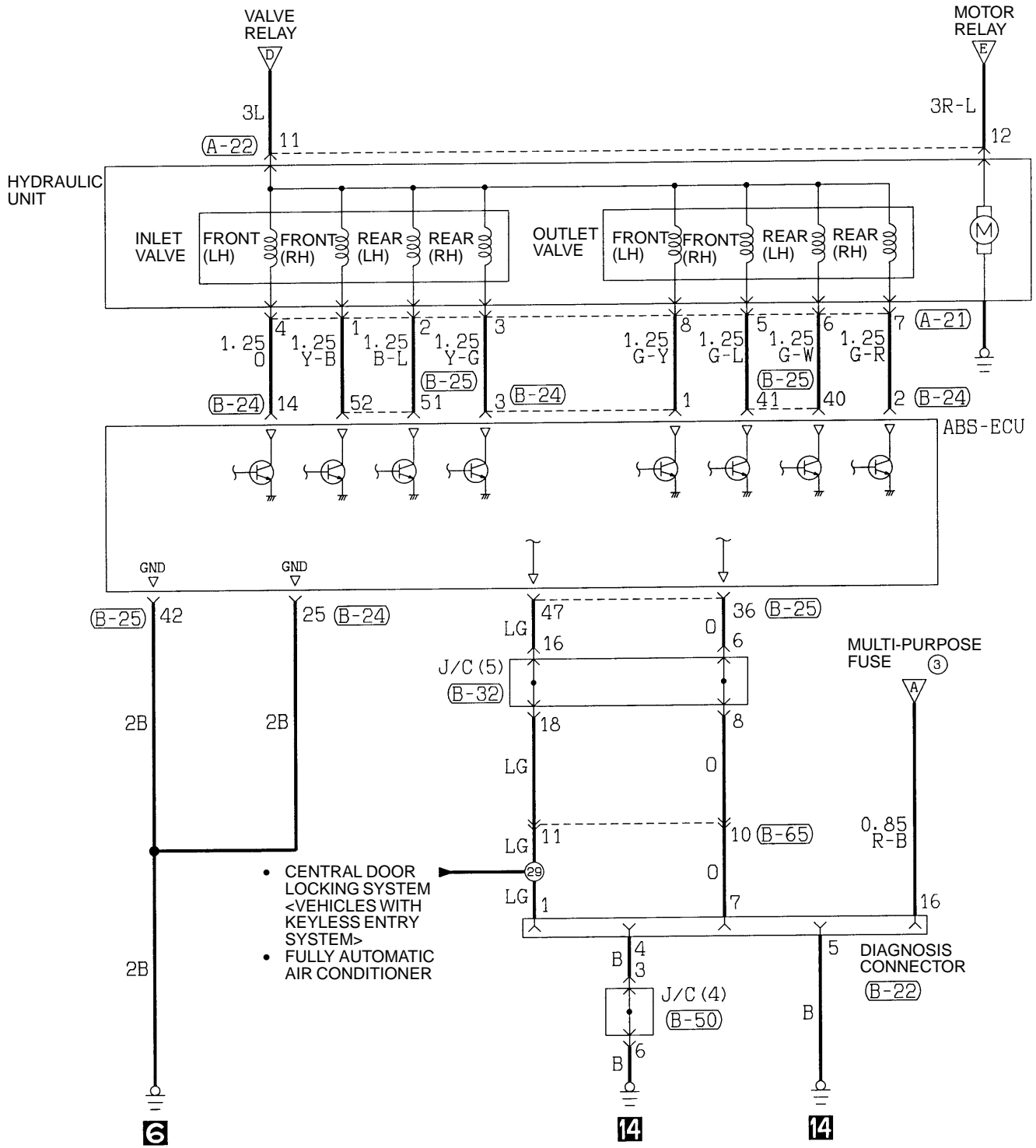
(D-20)



(D-32)



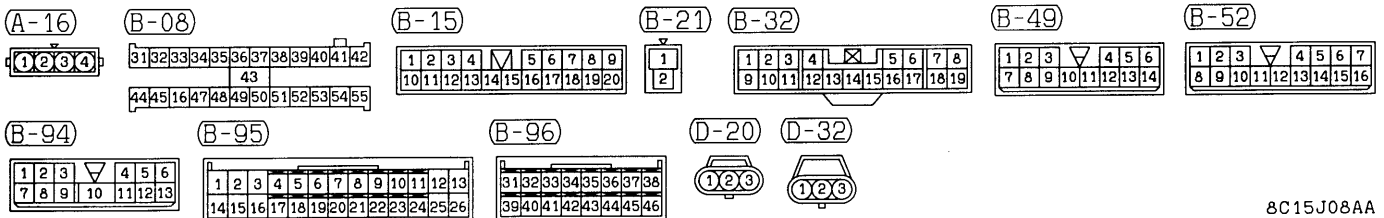
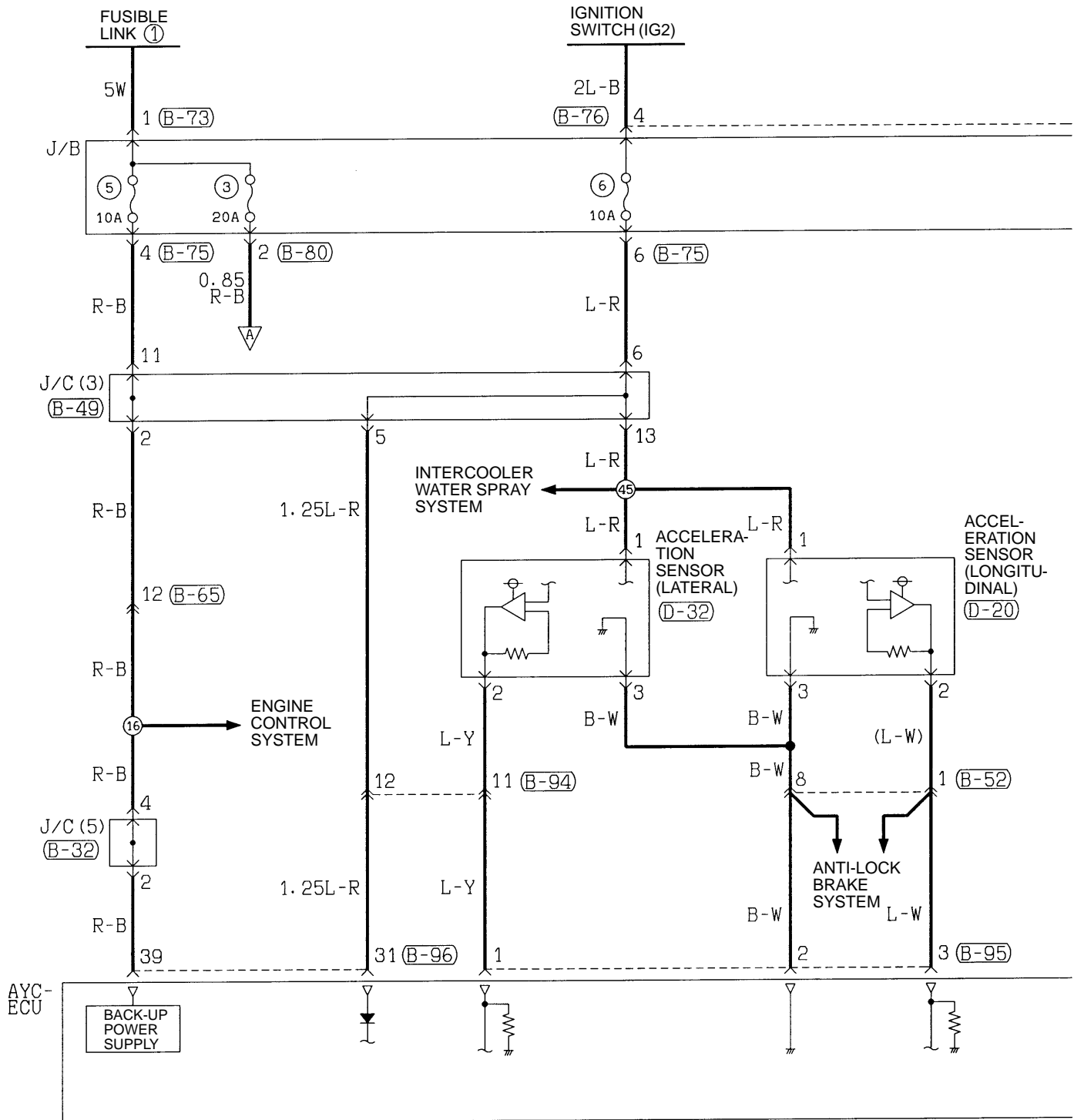
ANTI-LOCK BRAKE SYSTEM (ABS) (CONTINUED)





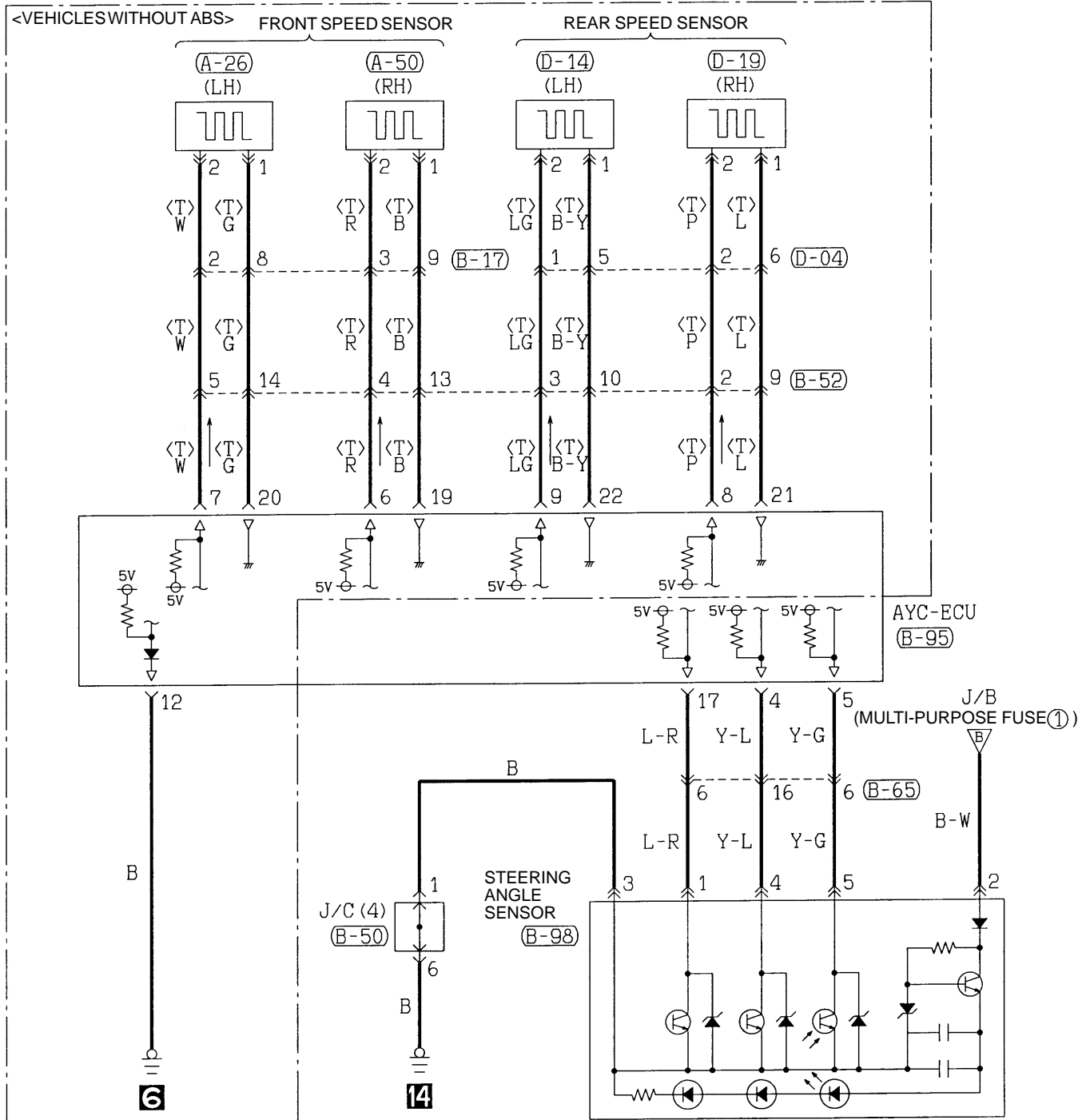
NOTES

ACTIVE YAW CONTROL SYSTEM (AYC)

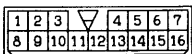




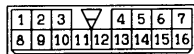




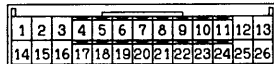
(B-52)



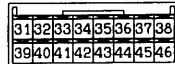
(B-65)



(B-95)



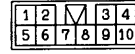
(B-96)



(B-98)



(D-04)



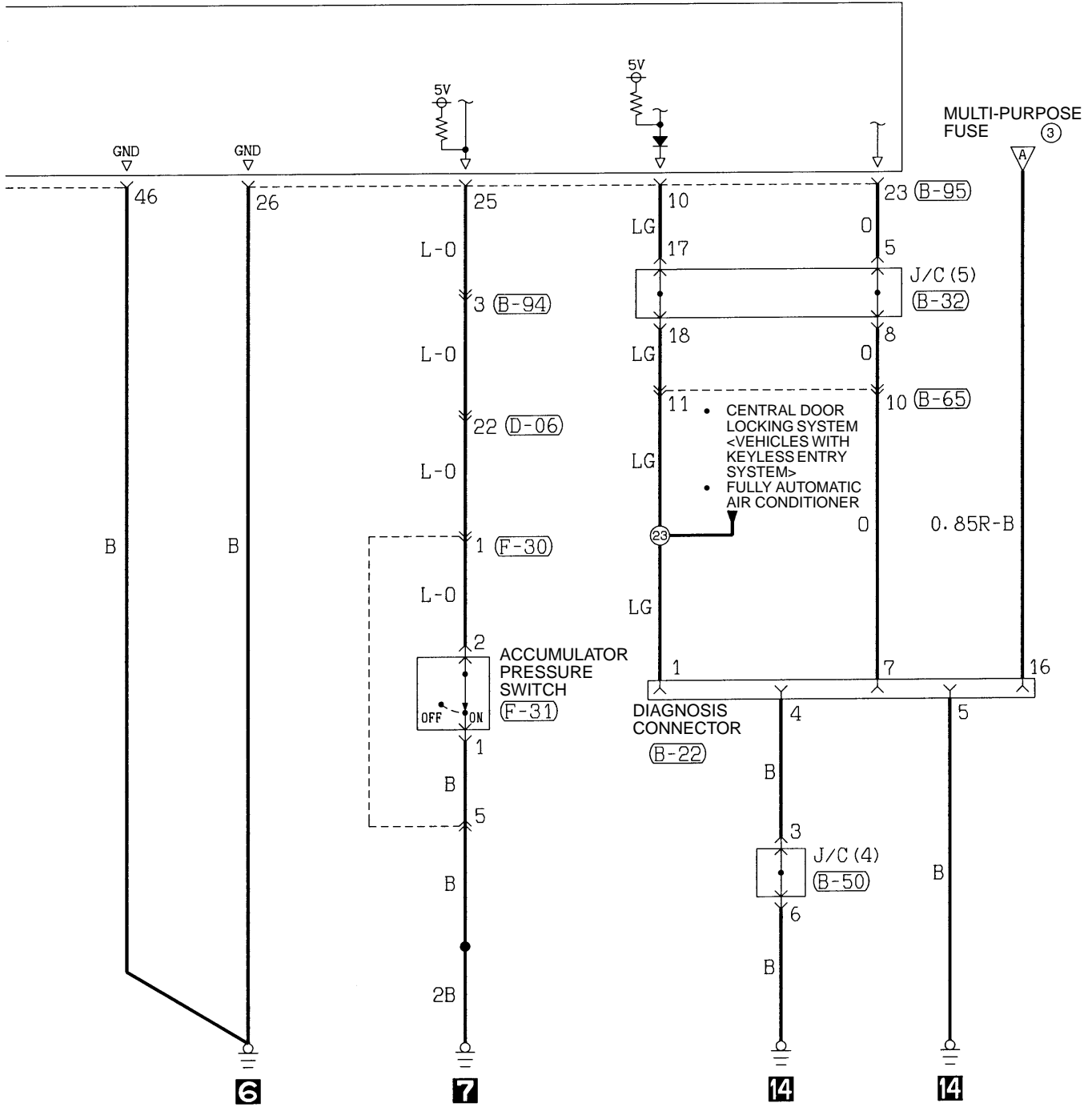
(D-14)



(D-19)



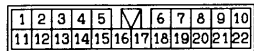




B-96



D-06



D-27



F-27



F-28



F-29



F-30



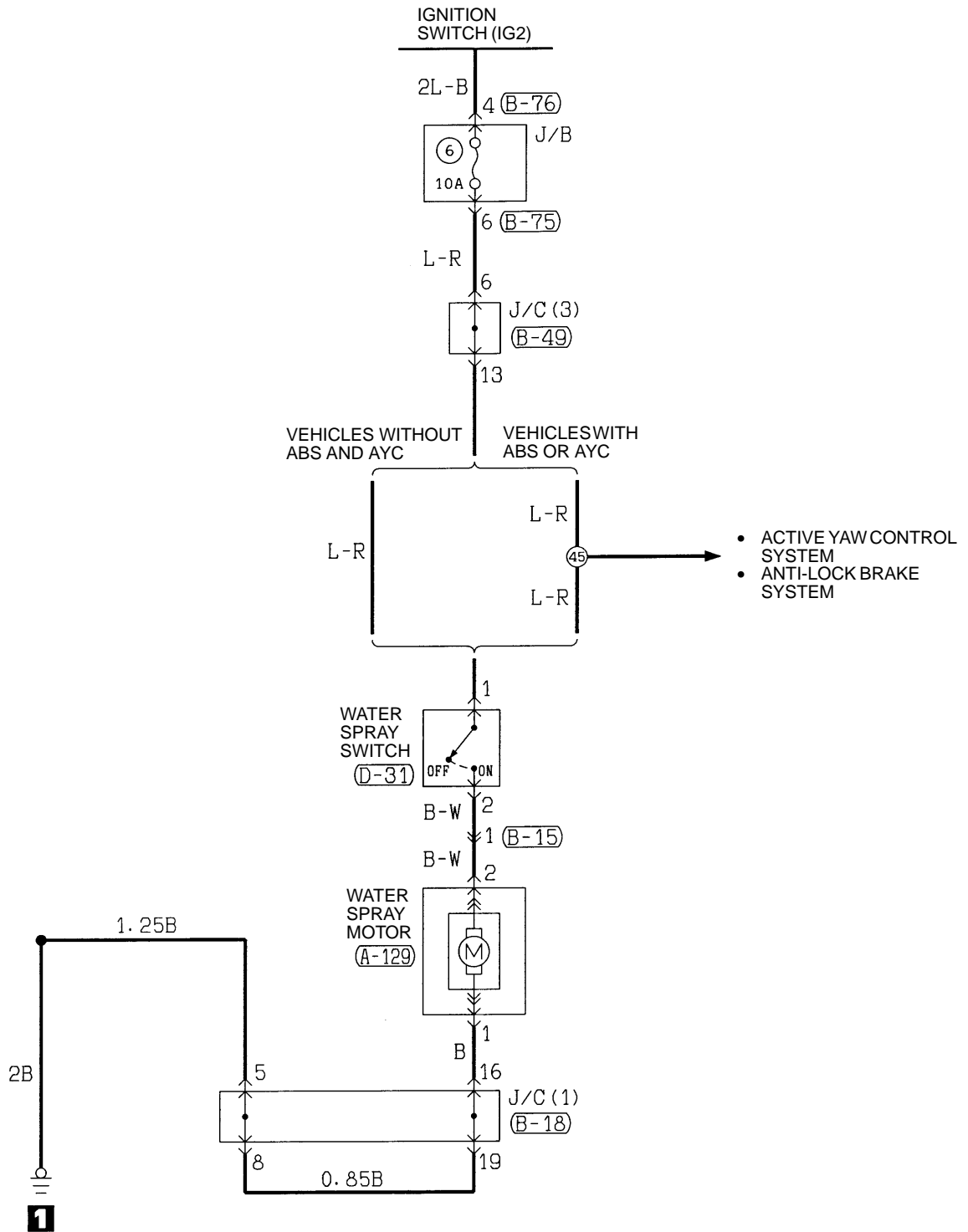
F-31



F-32



# INTERCOOLER WATER SPRAY SYSTEM



- ACTIVE YAW CONTROL SYSTEM
- ANTI-LOCK BRAKE SYSTEM

