



MITSUBISHI
MOTORS

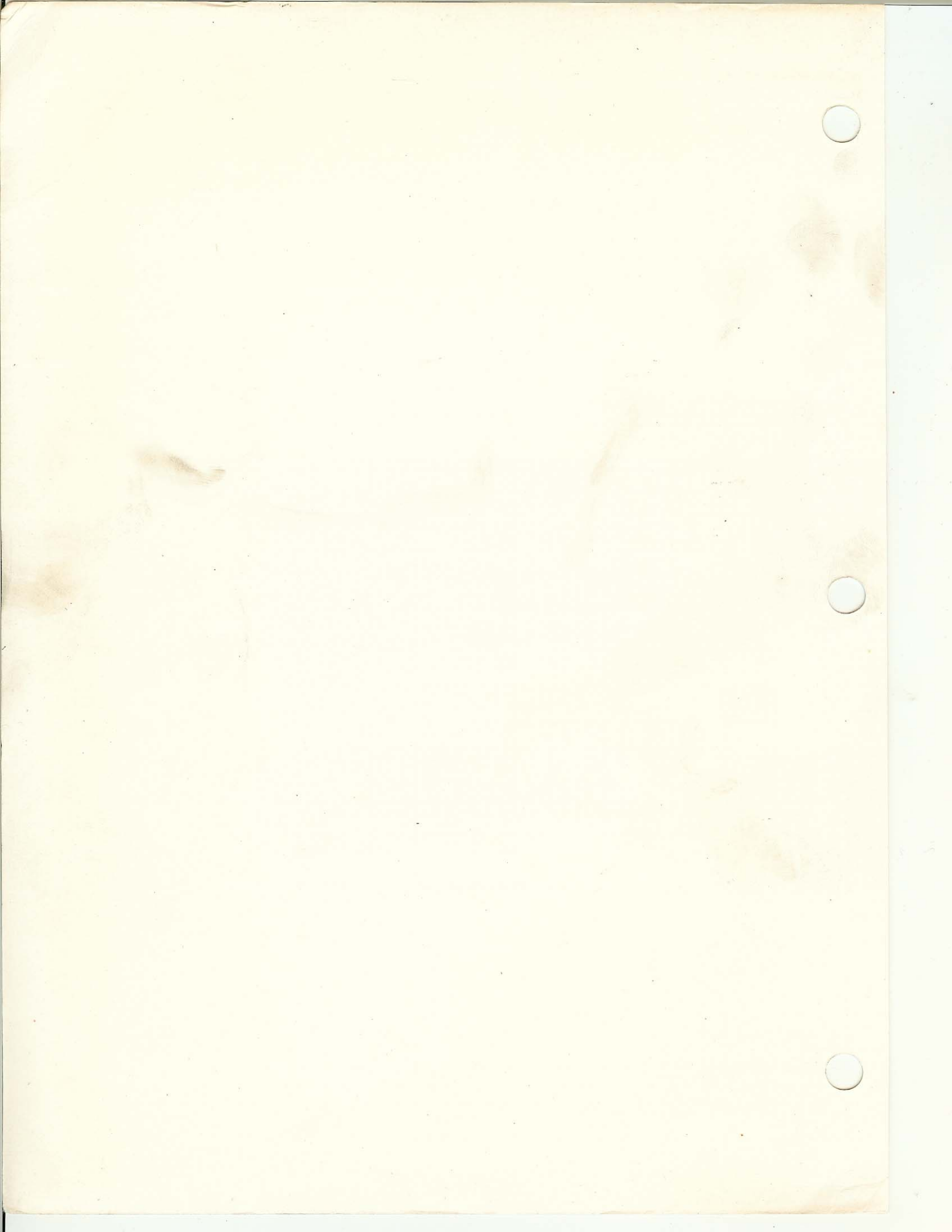
1998

MONTERO



SERVICE MANUAL

VOLUME 2



Service Manual

MONTERO

1998
Volume 2

FOREWORD

This Service Manual has been prepared with the latest service information available at the time of publication. It is subdivided into various group categories and each section contains diagnosis, disassembly, repair, and installation procedures along with complete specifications and tightening references. Use of this manual will aid in properly performing any servicing necessary to maintain or restore the high levels of performance and reliability designed into these outstanding vehicles.



Mitsubishi Motors Corporation reserves the right to make changes in design or to make additions to or improvements in its products without incurring any obligations upon itself to install them on its products as manufactured.

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NOTE:
For information on all service manual groups not listed above, please refer to Volume 1.

WARNINGS REGARDING SERVICING OF SUPPLEMENTAL RESTRAINT SYSTEM (SRS) EQUIPPED VEHICLES

WARNING!

- (1) Improper service or maintenance of any component of the SRS, or any SRS-related component, can lead to personal injury or death to service personnel (from inadvertent firing of the air bag) or to the driver and passenger (from rendering the SRS inoperative).
- (2) If it is possible that the SRS components are subjected to heat over 93°C (200°F) in baking or in drying after painting, remove the SRS components (air bag module, SRS diagnosis unit, front impact sensors) beforehand.
- (3) Service or maintenance of any SRS component or SRS-related component must be performed only at an authorized MITSUBISHI dealer.
- (4) MITSUBISHI dealer 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.

NOTE

Section titles with the asterisks (*) in the table of contents in each group indicate operations requiring warnings.

PROPELLER SHAFT

CONTENTS

2510900020

GENERAL SPECIFICATIONS	2	SERVICE SPECIFICATIONS	2
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CIRCUIT DIAGRAMS

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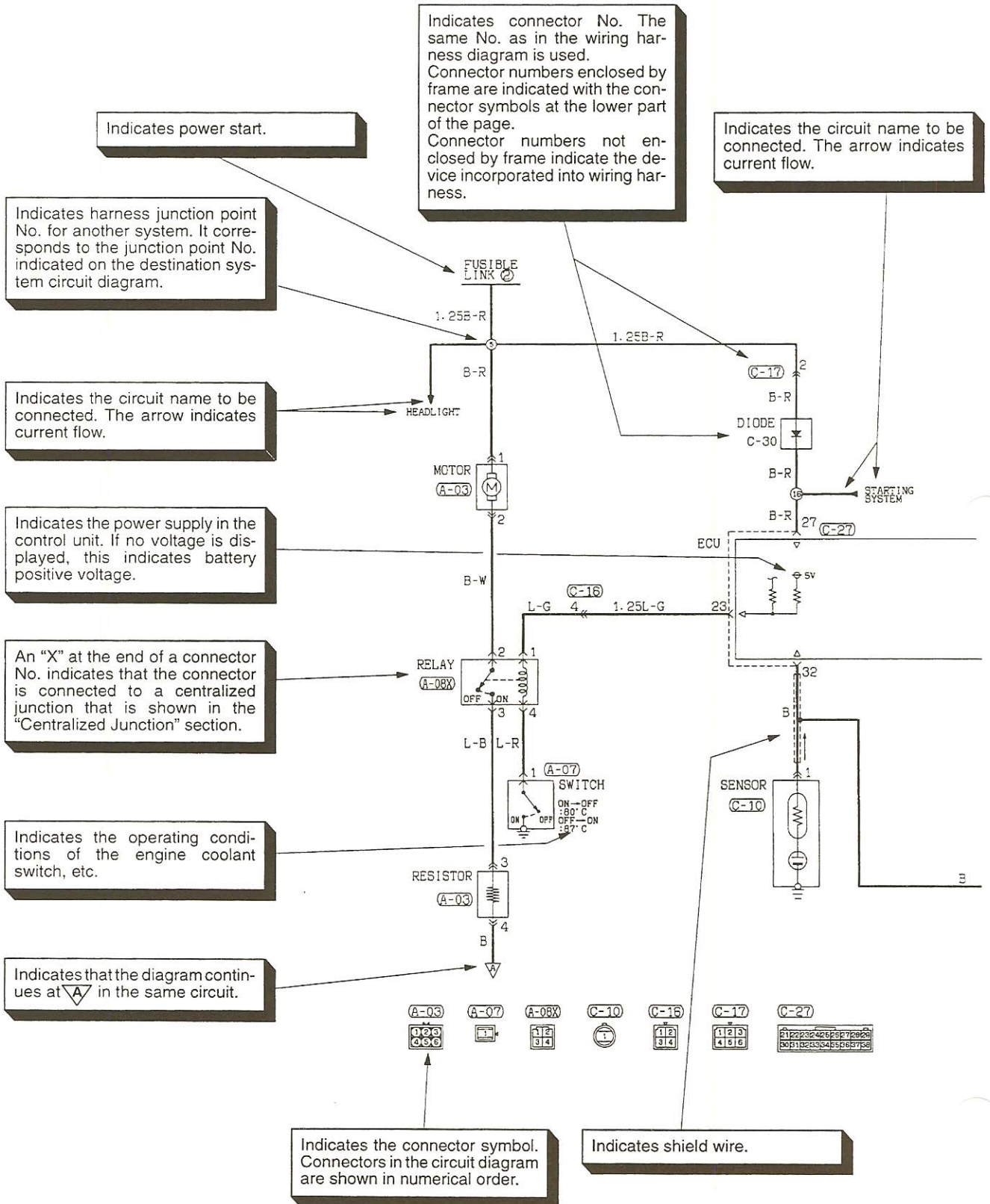
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Remote Controlled Variable Shock Absorber System	118	Turn-signal Light and Hazard Light	66
Seat Belt Warning Light	74	Vanity Mirror Light	62
Starting System	24	Windshield Wiper and Washer	95
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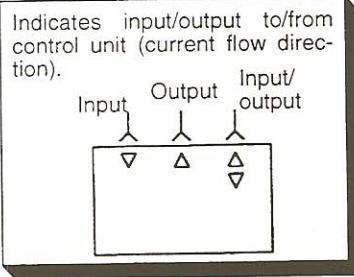
NOTES

HOW TO READ CIRCUIT DIAGRAMS

The circuit of each system is shown from the fuse (or fusible link) to ground. The power supply is shown at the top and the ground at the bottom to help understand of how the current flows.



- (A-03)
1 2 3 4
- (A-07)
1
- (A-08X)
1 2 3 4
- (C-10)
1
- (C-15)
1 2 3 4
- (C-17)
1 2 3 4 5 6
- (C-27)
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



A broken line indicates that these connectors are the same intermediate connectors.

Indicates that the diagram comes from ∇ in the same circuit.

Indicates terminal No.

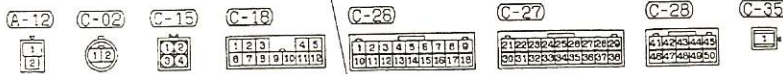
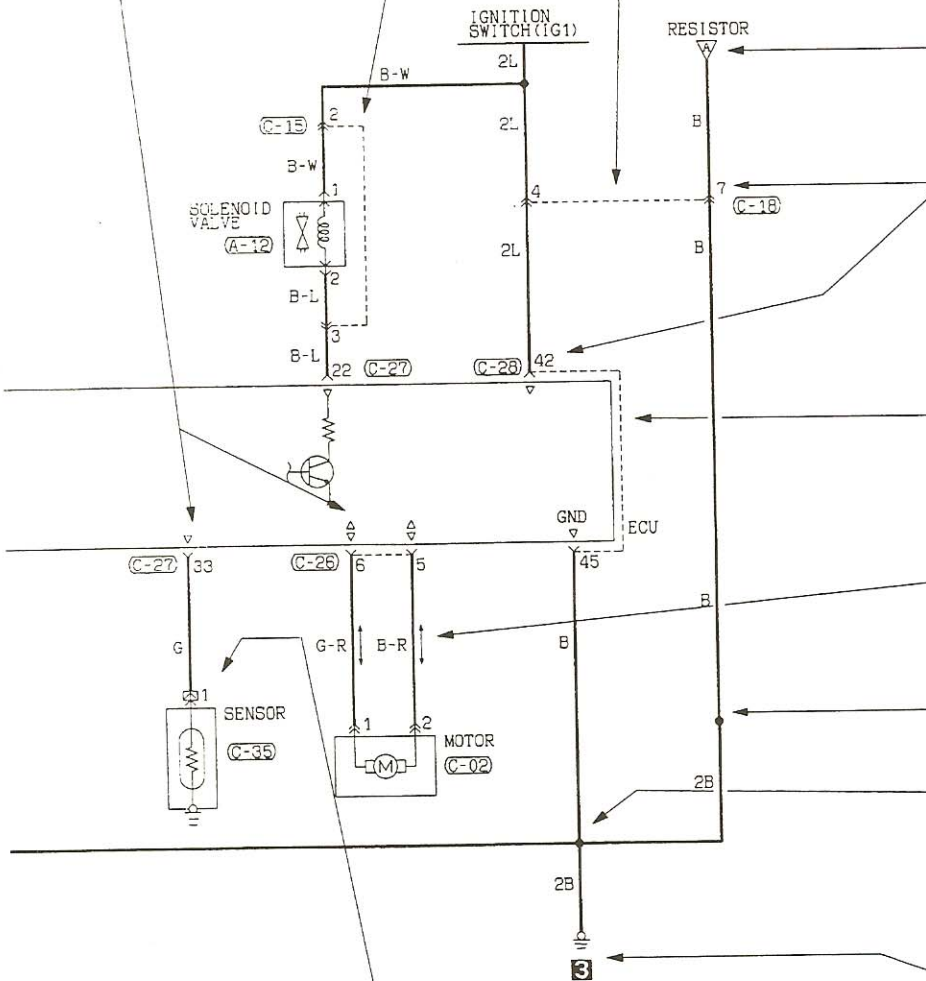
In case two or more connectors are connected to the same device, markings indicating the same connector are connected by a broken line.

Indicates current flow downward or upward as controlled by the control unit.

Indicates harness junction where wire diameter or color changes.

Indicates intersections at which the lead wires are not connected.
 Indicates intersections at which the lead wires are connected.

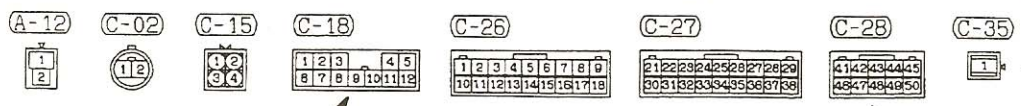
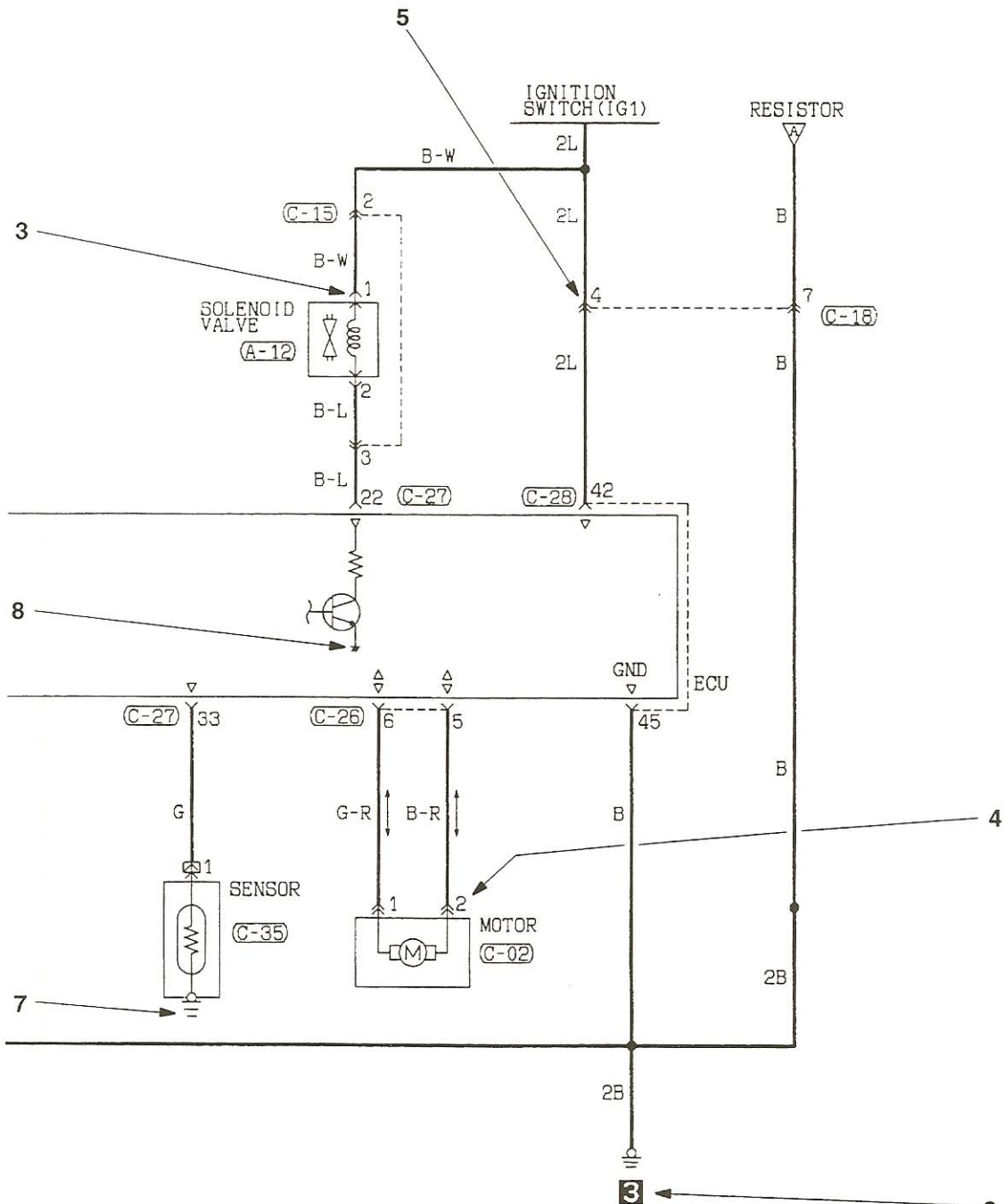
Indicates vehicle body ground point. (Same No. as that of ground point in Grounding location).



Indicates that the terminal is a spare one if the device (sensor in this case) is not provided.

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CONNECTOR/GROUNDING INDICATIONS

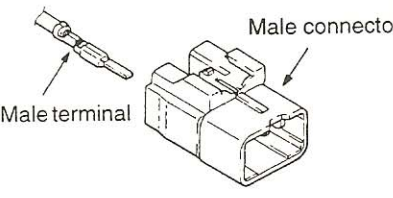

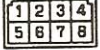
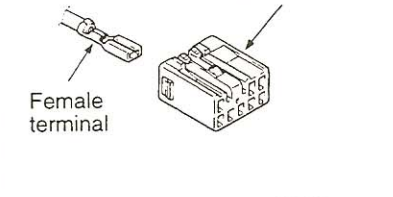

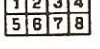
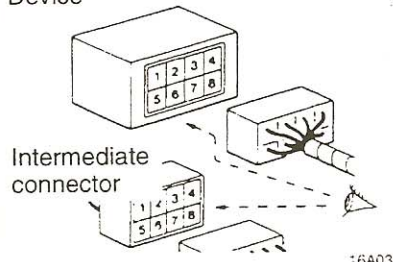

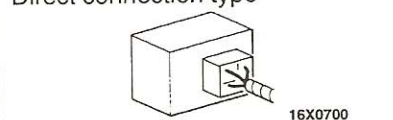
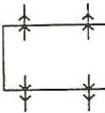
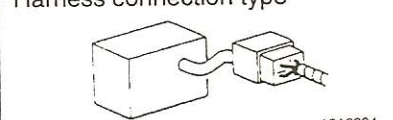
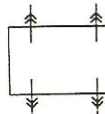
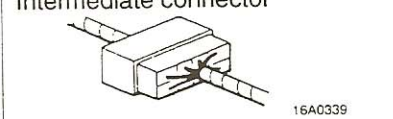



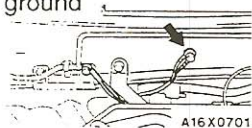

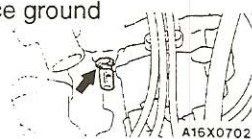



1

2

HF00M0C

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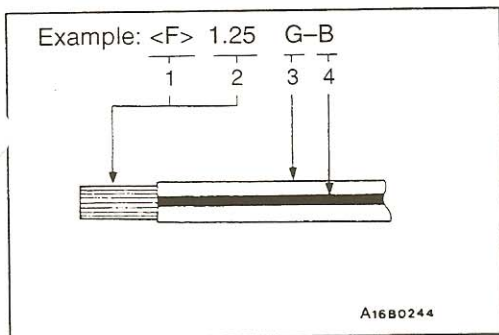
Item	NO.	Connector/Grounding	Symbol	Contents
Connector and terminal marking	1		Male terminal  WH-3 Male connector  WH-1	The male and female terminals are indicated as shown. The connector with male terminal(s) is called as male connector and indicated by two connector contour lines. The connector with female terminal(s) is called as female connector and indicated by single connector contour line.
	-		Female terminal  WH-4 Female connector  WH-2	
Connector symbol marking	2	Device 	 WH-1	The symbol indicates the connector is viewed as shown. At a device connection, the connector symbol on the device side is shown. For an intermediate connector, the male connector symbol is shown. For the data link connector, its contents differ from the previous description. Refer to "Scan tool operation instruction" in detail.
Connector connection marking	3	Direct connection type 	 WH-5	Connection between a device and the harness is either by direct insertion in the device (direct connection type) or by connection with a harness connector furnished on the device side (harness connection type). The two types are indicated as illustrated.
	4	Harness connection type 	 WH-6	
	5	Intermediate connector 	 WH-7	

Item	NO.	Connector/Grounding	Symbol	Contents
Grounding markings	6	Body ground  A16X0701	 WH-8	Grounding is either by body ground, device ground or control unit interior ground. These are indicated as illustrated.
	7	Device ground  A16X0702	 WH-9	
	8	Ground in control unit  A16X0703	 WH-10	

WIRE COLOR CODES

Wire colors are identified by the following color codes.

Code	Wire color	Code	Wire color
B	Black	P	Pink
BR	Brown	R	Red
G	Green	SB	Sky blue
GR	Gray	V	Violet
L	Blue	W	White
LG	Light green	Y	Yellow
O	Orange	-	-



If a cable has two colors, the first of the two color code characters indicates the basic color (color of the cable coating) and the second indicates the marking color.

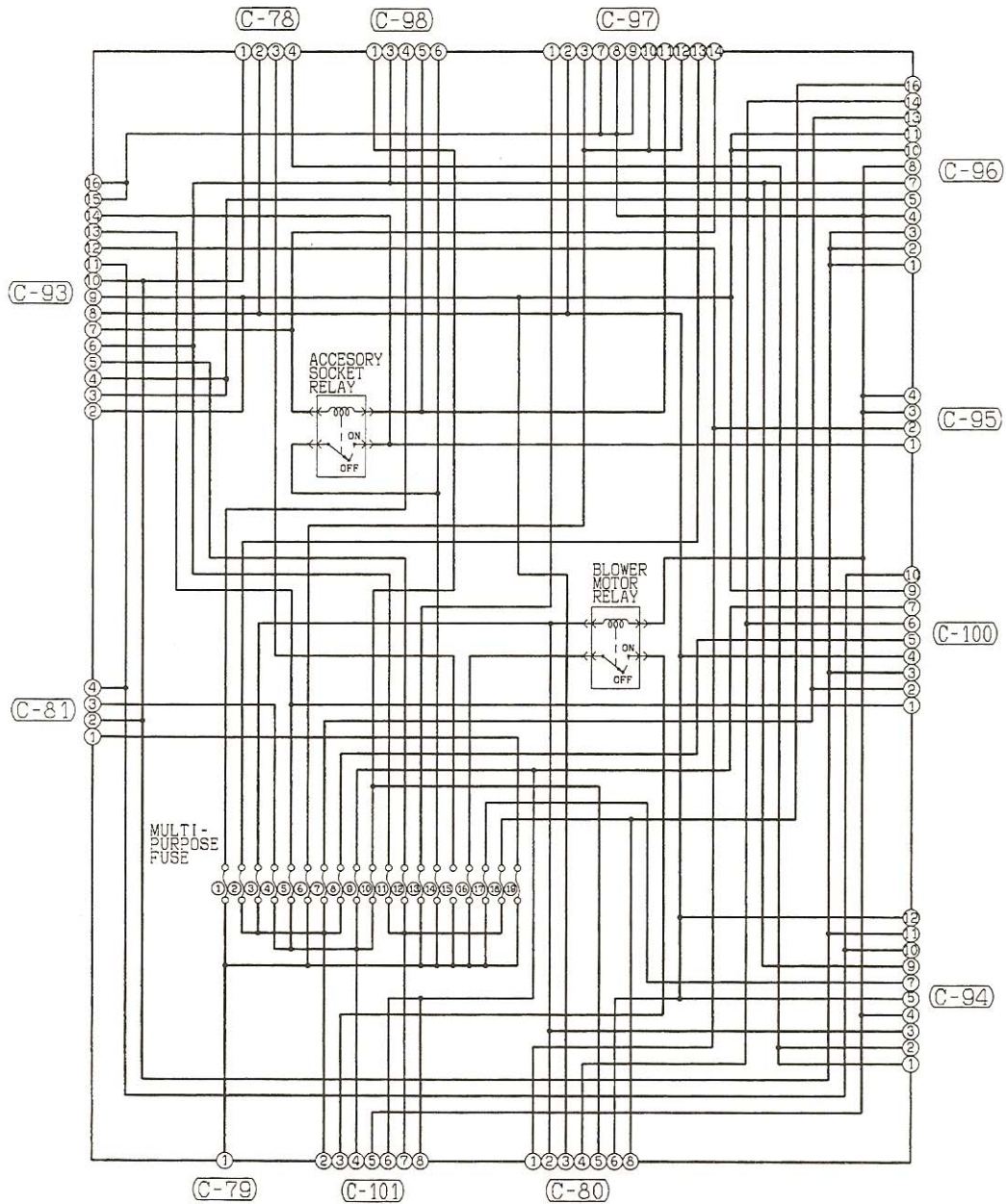
No.	Meaning
1	<F>: Flexible wire
	<T>: Twisted wire
2	Wire size (mm ²)*
3	Basic color (color of the cable coating)
4	Marking color

NOTE

*: No code indicates 0.5 mm² (.0008 in.²).
 Cable color code in parentheses indicates 0.3 mm² (.0005 in.²).

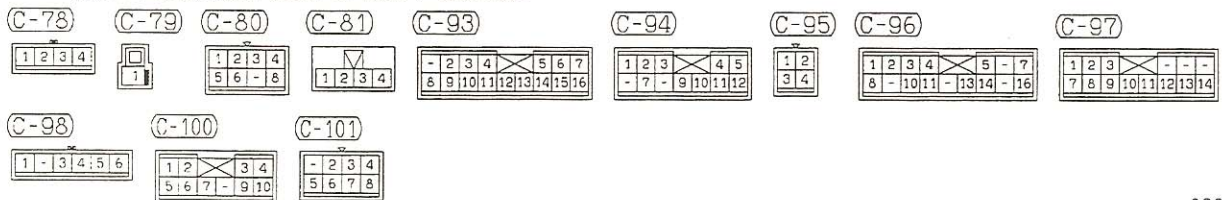
JUNCTION BLOCK (J/B)

90100020100



Remark

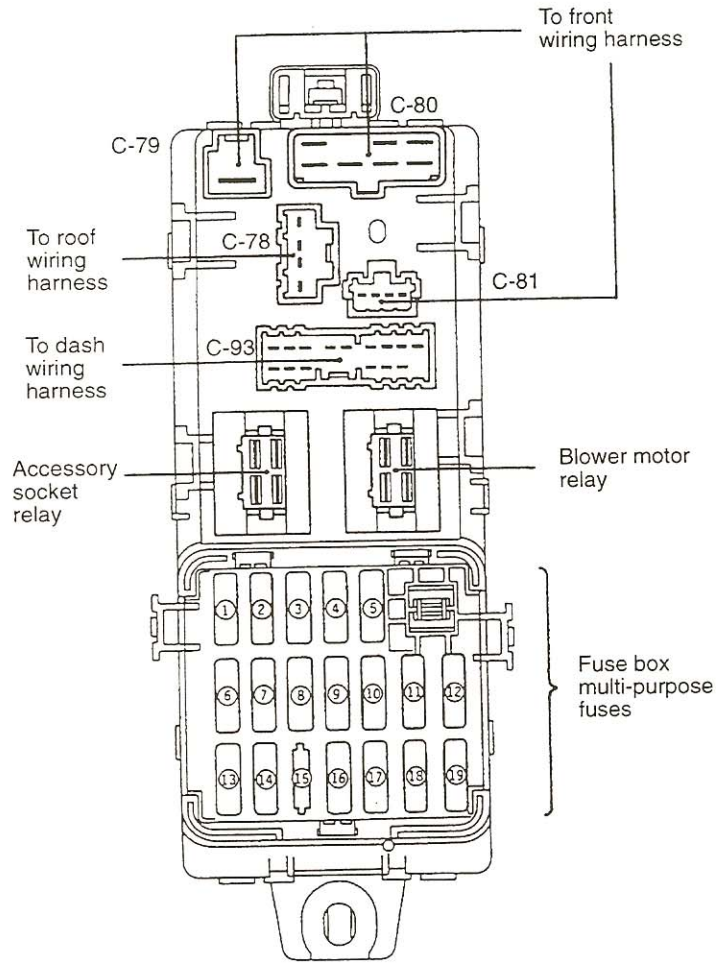
Connector numbers are keyed to the configuration diagram (dash panel) and each circuit diagram.



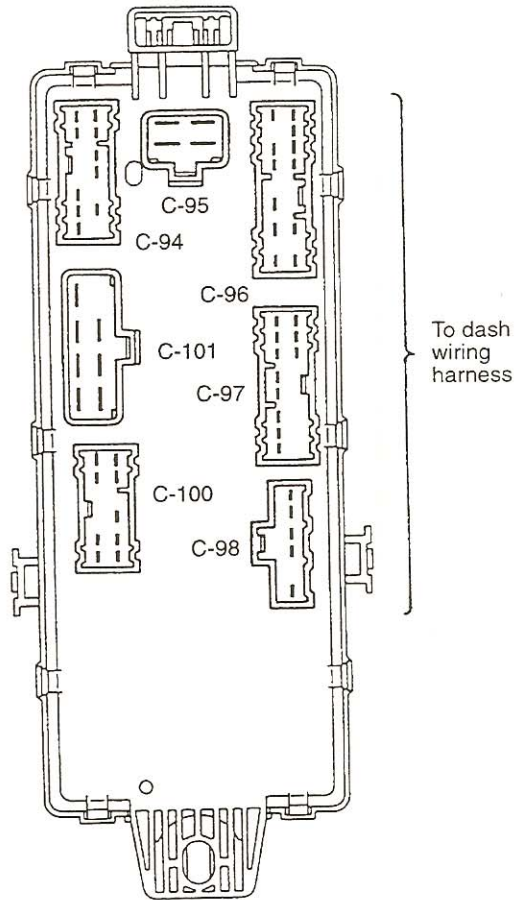
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Front side

Rear side



16E1368



16F0058
00004182

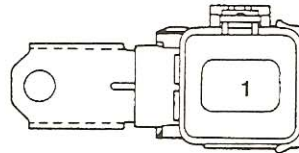
CENTRALIZED JUNCTION

90100030501

FUSIBLE LINK

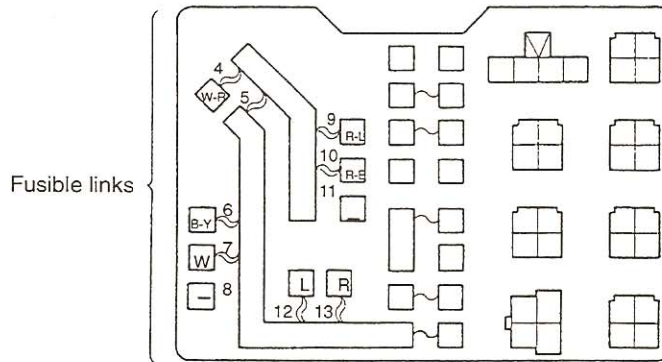
No.	Circuit	Housing color	Rated capacity (A)
1	ABS circuit (hydraulic unit power source)	Yellow	60
2	–	–	–
3	–	–	–
4	Junction block (Multi-purpose fuse No. 1, 6, 14, 16, 17 and 19) and A/C circuit	Yellow	60
5	Generator circuit	Blue	100
6	MFI circuit	Light blue	20
7	Ignition switch circuit	Green	40
8	–	–	–
9	Defogger circuit	Pink	30
10	Power window circuit, Power seat circuit	Pink	30
11	–	–	–
12	Condenser fan motor circuit	Pink	30
13	Generator, headlight and tail light circuit	Green	40

(Connected directly to battery positive terminal)
<Vehicles with ABS>



16A0335

(Relay box in engine compartment)



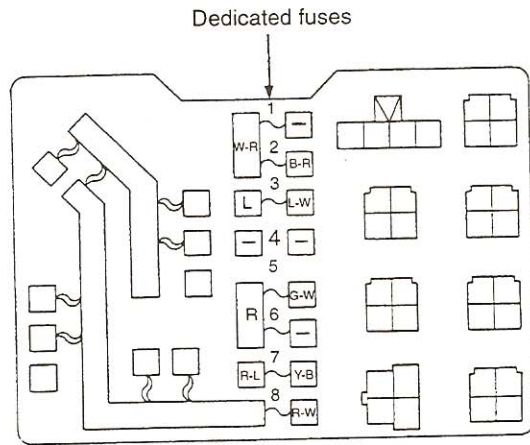
16E0410
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DEDICATED FUSE

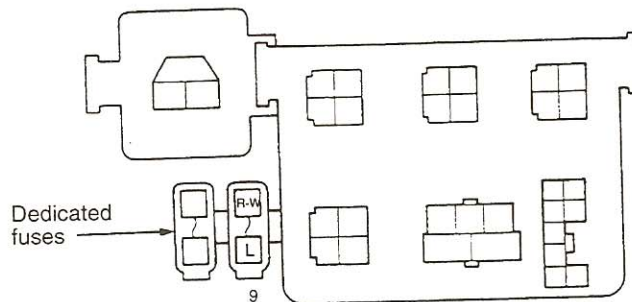
Power supply circuit	No.	Rated capacity (A)	Housing color	Circuit
–	1	–	–	–
Battery	2	10	Red	A/C compressor circuit
Battery	3	25	Transparent	Condenser fan motor circuit
–	4	–	–	–
Tail light relay (battery)	5	10	Red	Tail light circuit
–	6	–	–	–
Headlight relay (battery)	7	10	Red	Upper beam indicator circuit
Battery	8	10	Red	Hazard light circuit
Ignition switch (ACC)	9	15	Blue	Sunroof circuit
Tail light relay (battery)	10	15	Blue	Fog light circuit

(Relay box in engine compartment)



16E0550

(Relay box in passenger compartment)



16E1641

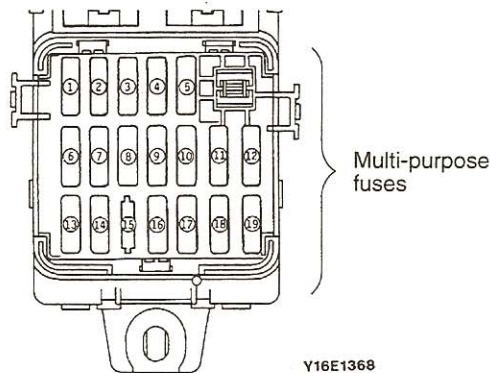
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MULTI-PURPOSE FUSES

Power supply circuit		No.	Rated capacity (A)	Load circuit
Battery		1	20	–
Ignition switch	(IG2)	2	10	ELC-4 A/T control module, Auto-cruise control-ECU
		3	10	Blower motor relay, Headlight washer relay, Defogger relay
	(ACC)	4	10	Radio, Clock, Accessory socket relay, Auto-cruise control-ECU, Data link connector
		5	15	Remote controlled mirror, Cigarette lighter
Battery		6	15	Door lock relay, Door lock control unit
Ignition switch	(IG2)	7	10	Overdrive relay, Variable shock absorber control unit, 4WD indicator control unit, ABS control unit, Combination meter
		8	10	Power window relay
	(ACC)	9	15	Wiper, Washer, Sunroof
		10	10	Horn
	(IG1)	11	10	Combination meter, Multi-meter, Antenna motor-ECU, Buzzer assembly
		12	10	Turn-signal light, Hazard light, SRS diagnosis unit
Battery		13	10	–
		14	15	Accessory socket
		15	–	–
		16	25	Blower motor
		17	15	Stop light
Ignition switch	(IG1)	18	15	Back-up light, SRS air bag control unit
Battery		19	10	Engine control module, Dome light, Reading light, Cargo space light, Vanity mirror light, Clock, Door lock relay, Radio, Auto-cruise control-ECU, ELC-4A/T control module, Ignition key hole illumination light timer.

(In junction block)



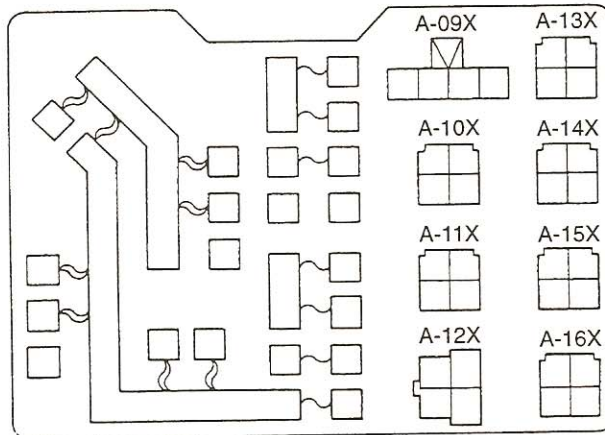
Y16E1368

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CENTRALIZED RELAY

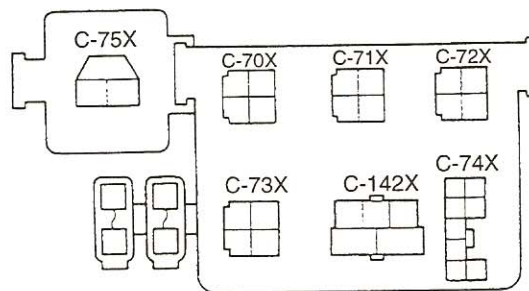
Classification		Name	Classification		Name
Relay box in engine compartment	A-09X	IOD or storage connector	Relay box in passenger compartment	C-70X	–
	A-10X	Headlight relay		C-71X	–
	A-11X	–		C-72X	Power window relay
	A-12X	Generator relay		C-73X	–
	A-13X	–		C-142X	Defogger relay
	A-14X	Tail light relay		C-74X	Rear intermittent wiper relay
	A-15X	Condenser fan motor relay		C-75X	Turn and hazard flasher unit
	A-16X	A/C compressor clutch relay			

(Relay box in engine compartment)



16E0550

(Relay box in passenger compartment)



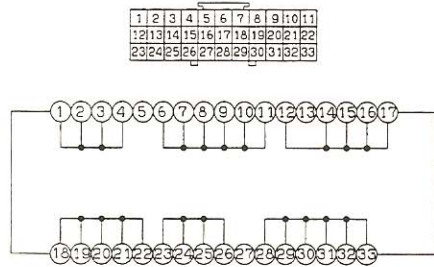
16E1641

00007149

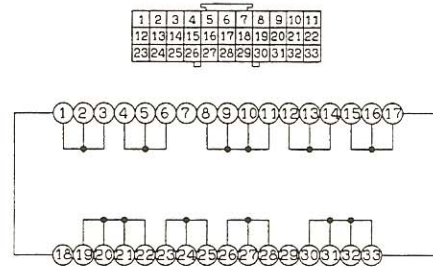
JOINT CONNECTOR (J/C)

90101420012

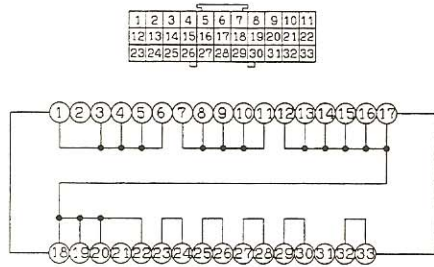
J/C (1) C-130



J/C (2) C-131



J/C (3) C-132



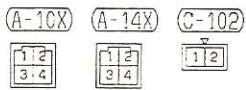
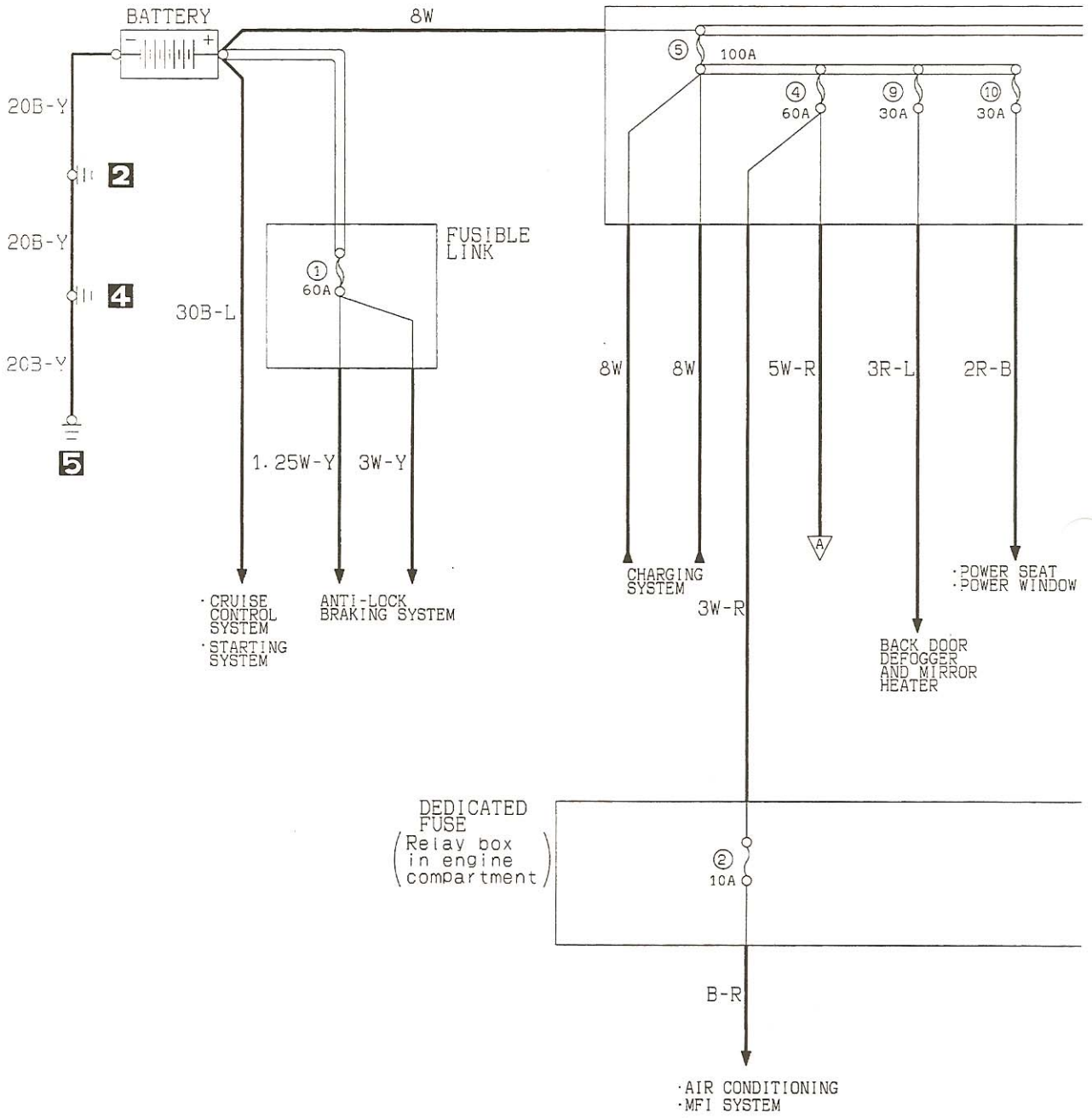
Remark
 · in actual vehicles, any of the terminals connected in J/C are used.
 The terminals described in the circuit diagram may not be identical to those of the vehicles.

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NOTES

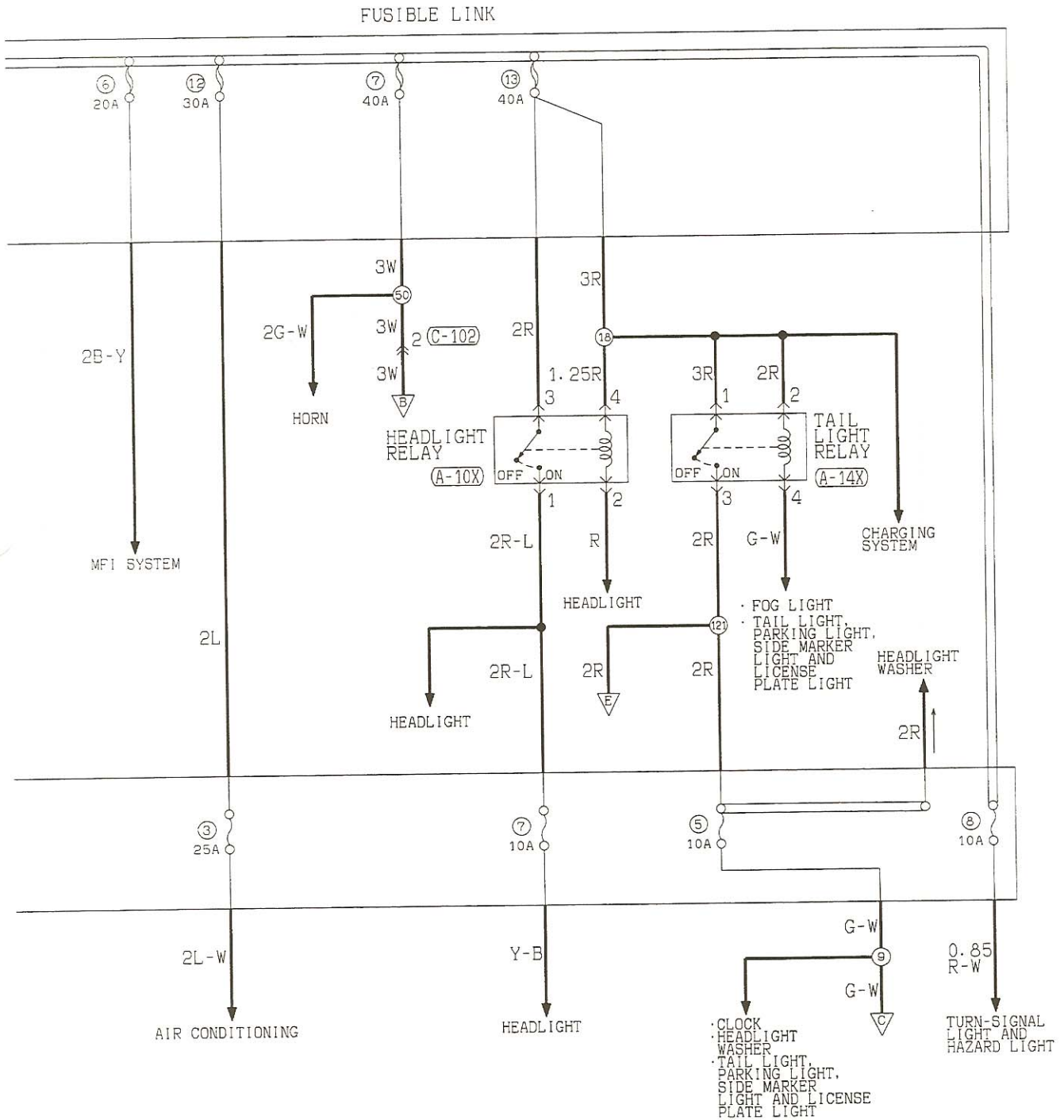
POWER DISTRIBUTION

90100040654



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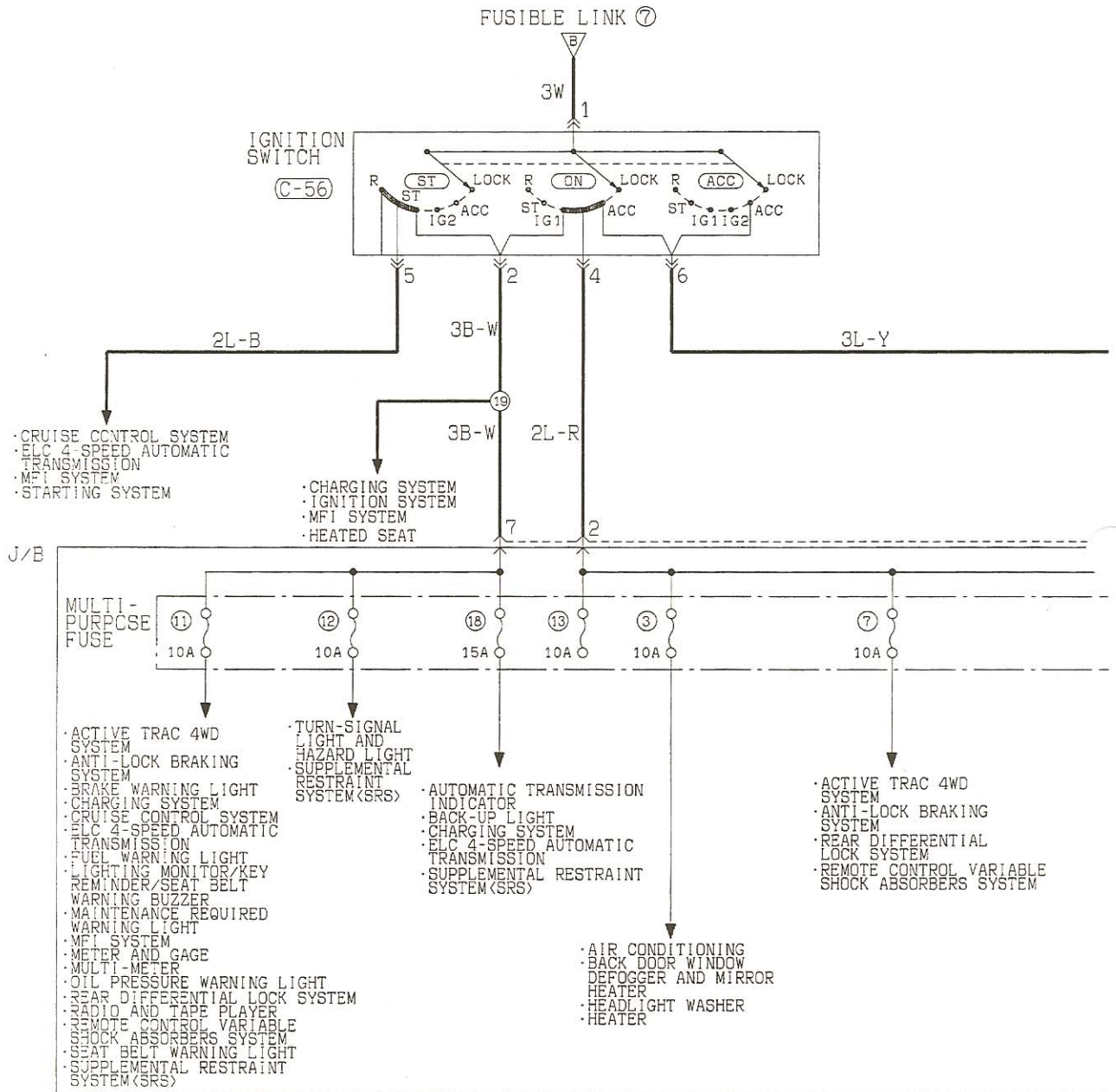


Wire color code
 B:Black LG:Light green G:Green L:Blue W:White Y:Yellow SB:Sky blue
 BR:Brown O:Orange GR:Gray R:Red P:Pink V:Violet

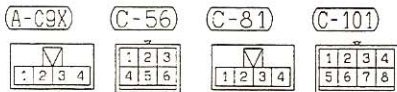
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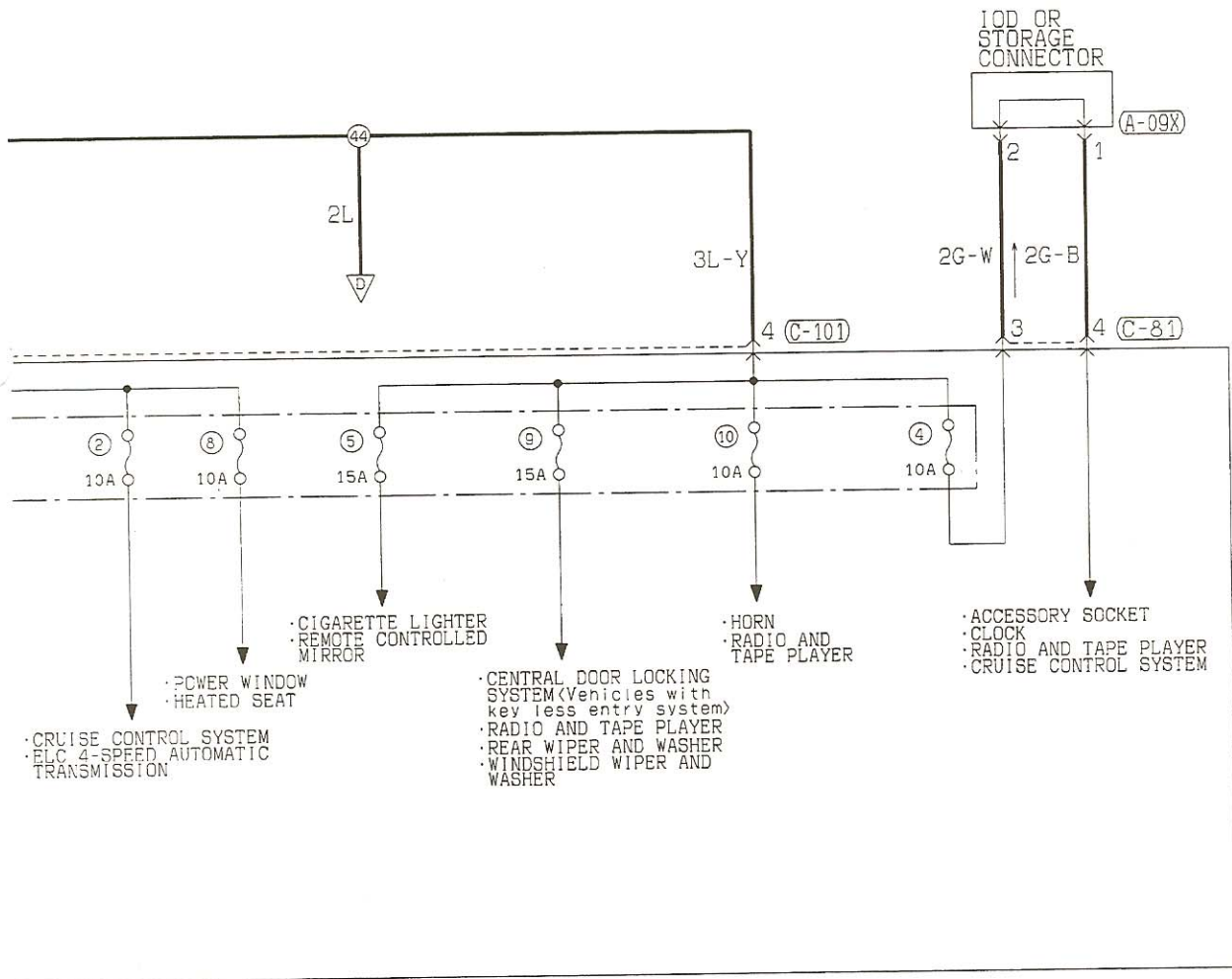
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POWER DISTRIBUTION (CONTINUED)



Remark
 · The above circuit diagram shows the current flow at the ignition key position "ACC", "ON" and "ST" combined. Be sure trace the appropriate circuit depending on the ignition key position.



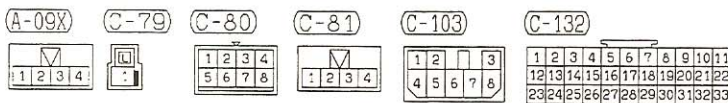
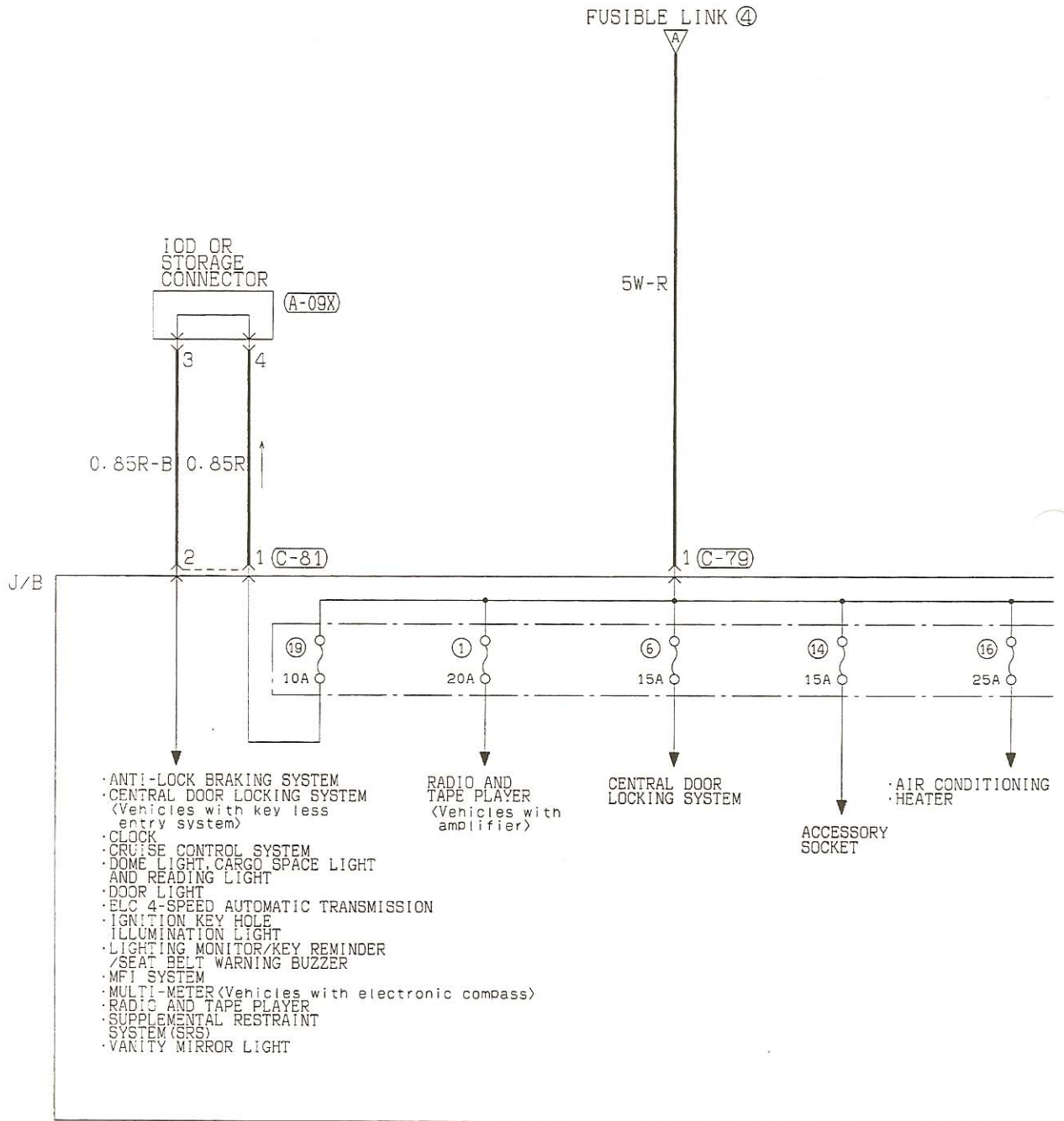


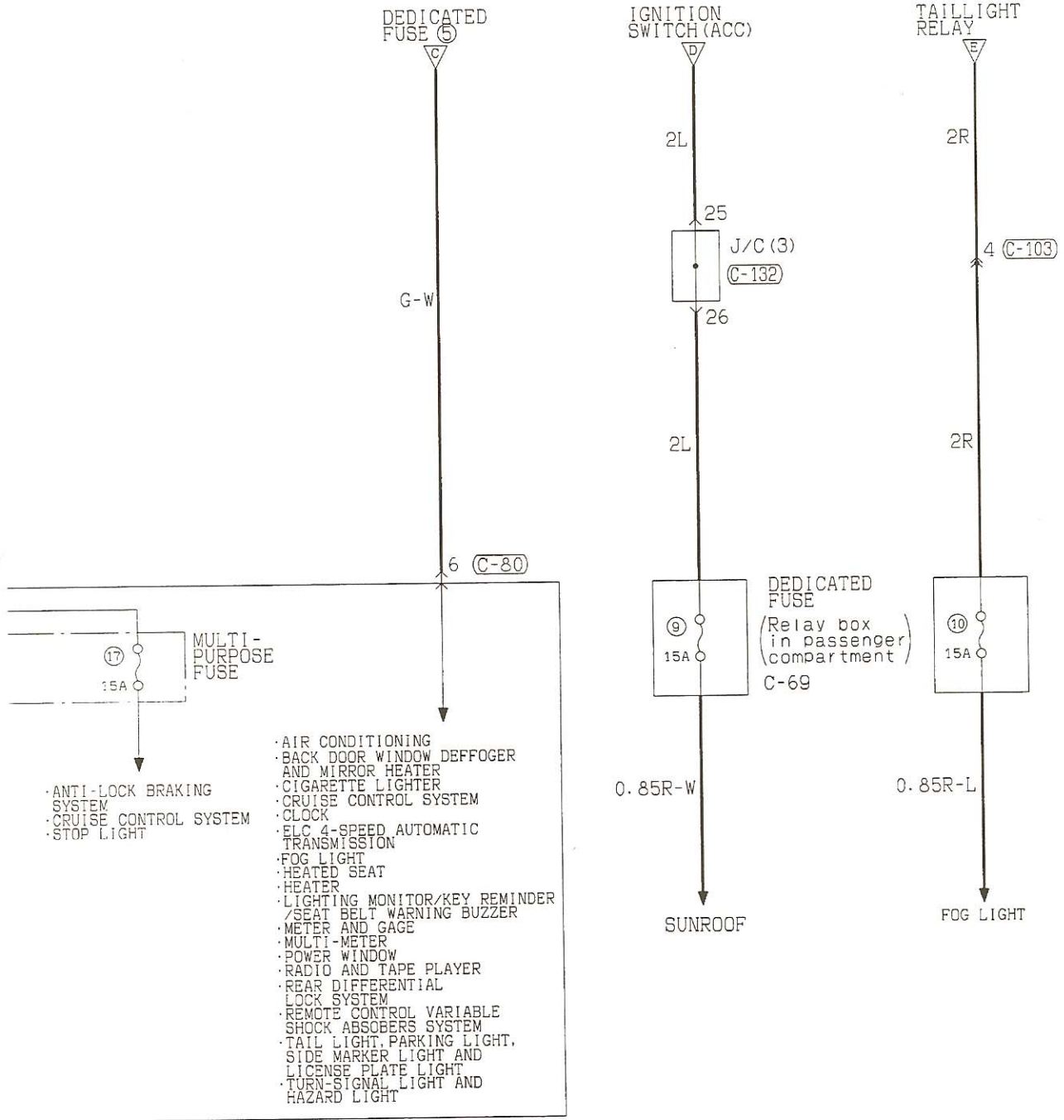
Wire color code
 BB:Black LG:Light green G:Green L:Blue W:White Y:Yellow SB:Sky blue
 BR:Brown O:Orange GR:Gray R:Red P:Pink V:Violet

8000M01BB

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POWER DISTRIBUTION (CONTINUED)





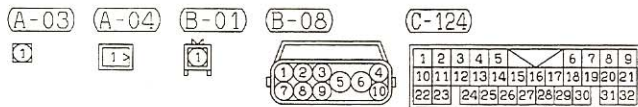
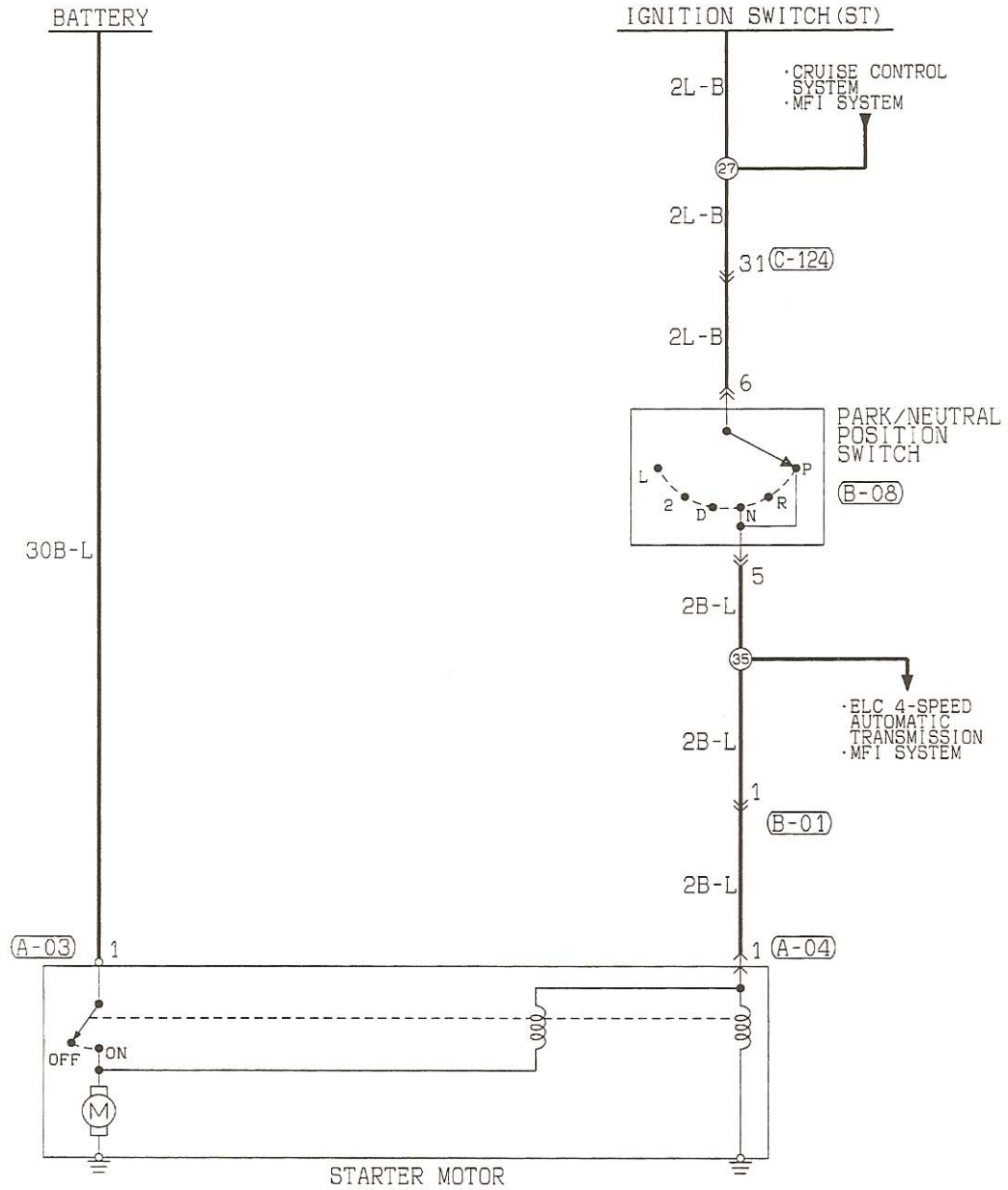
Wire color code
 B:Black LG:Light green G:Green L:Blue W:White Y:Yellow SB:Sky blue
 BR:Brown O:Orange GR:Gray R:Red P:Pink V:Violet

8G00M01CB

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STARTING SYSTEM

90100050R79



Wire color code
 B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
 BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

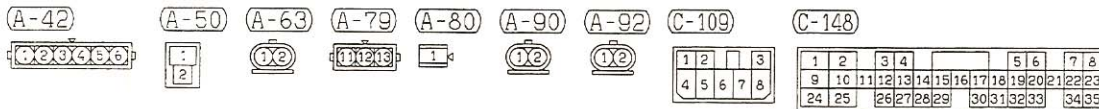
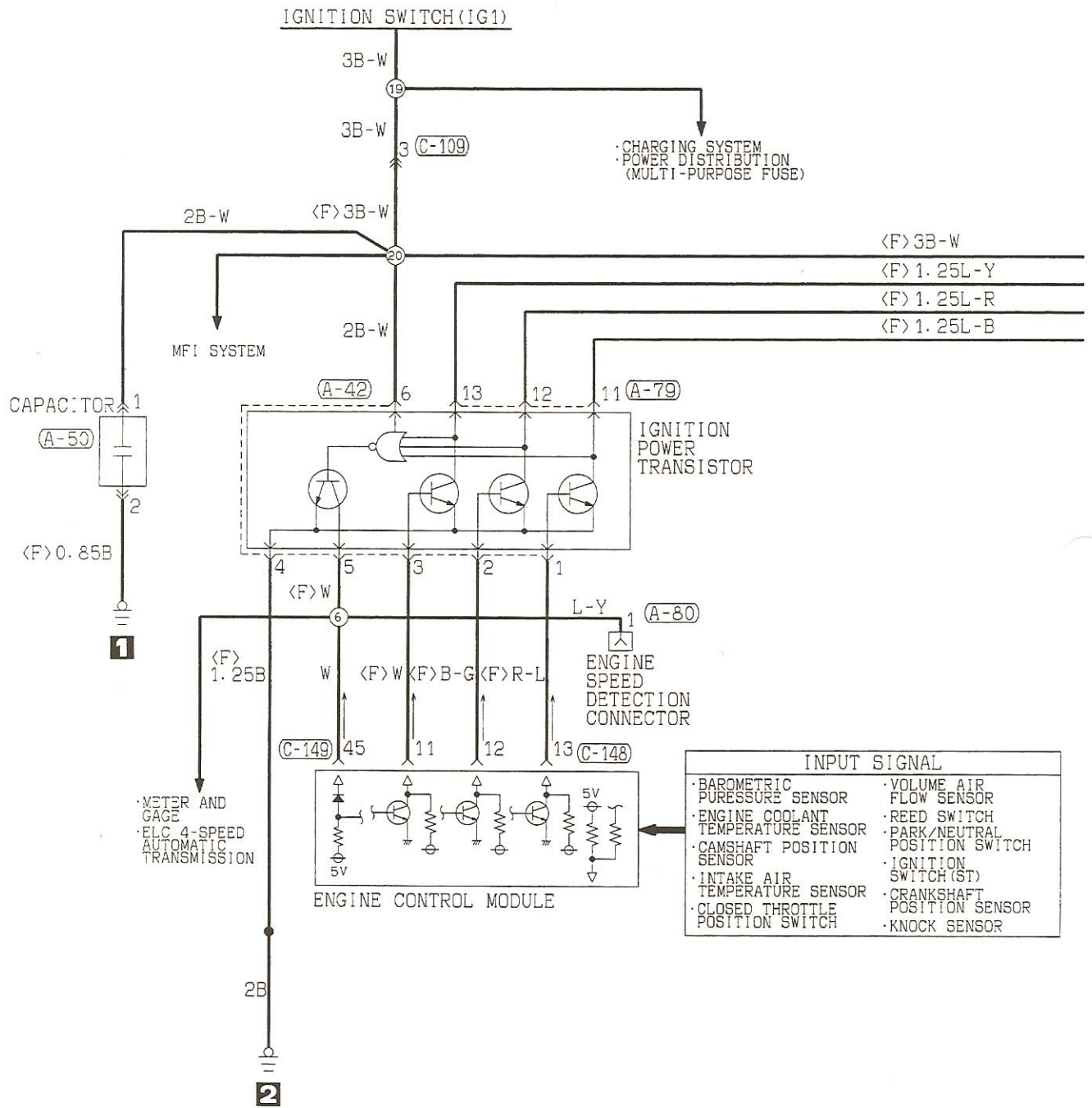
8Q02M00AA

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NOTES

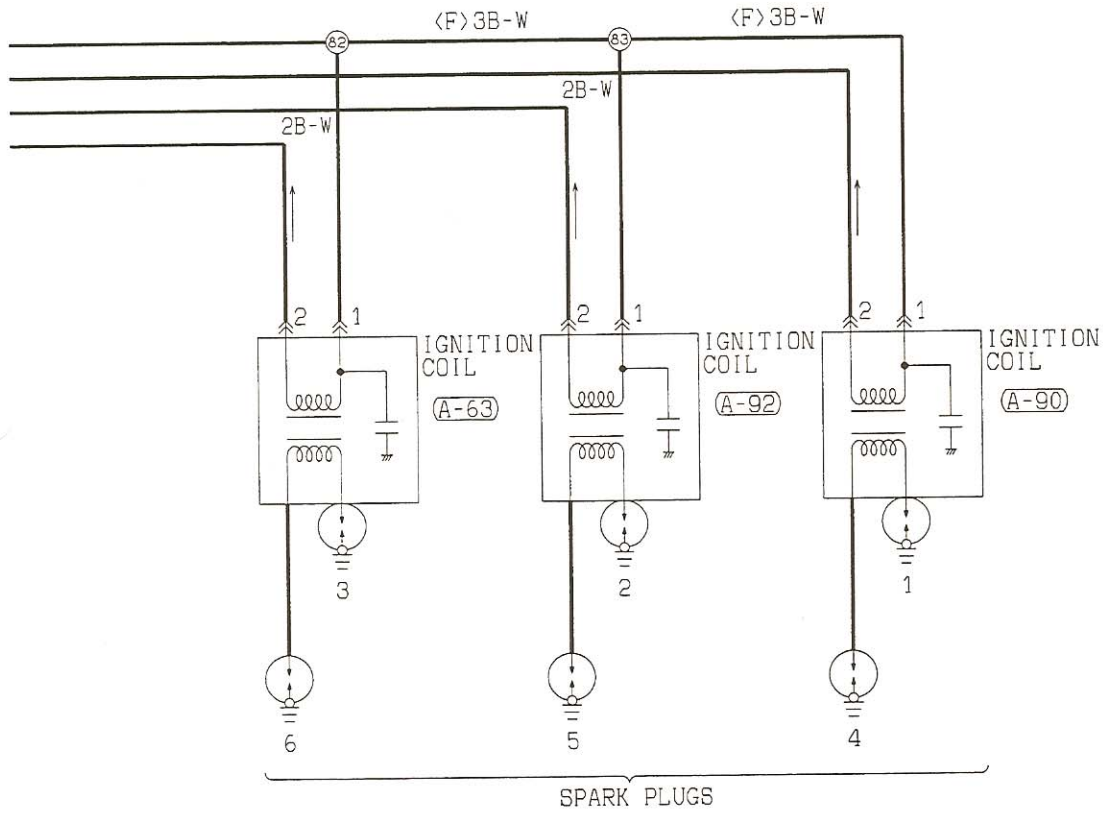
IGNITION SYSTEM

90100060



8003M00AA

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C-149

41	42	43	44			45	46	47			
48	49	50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68			

Wire color code
 B : Black LG:Light green G :Green L :Blue W :White Y :Yellow SB:Sky blue
 BR:Brown C :Orange GR:Gray R :Red P :Pink V :Violet

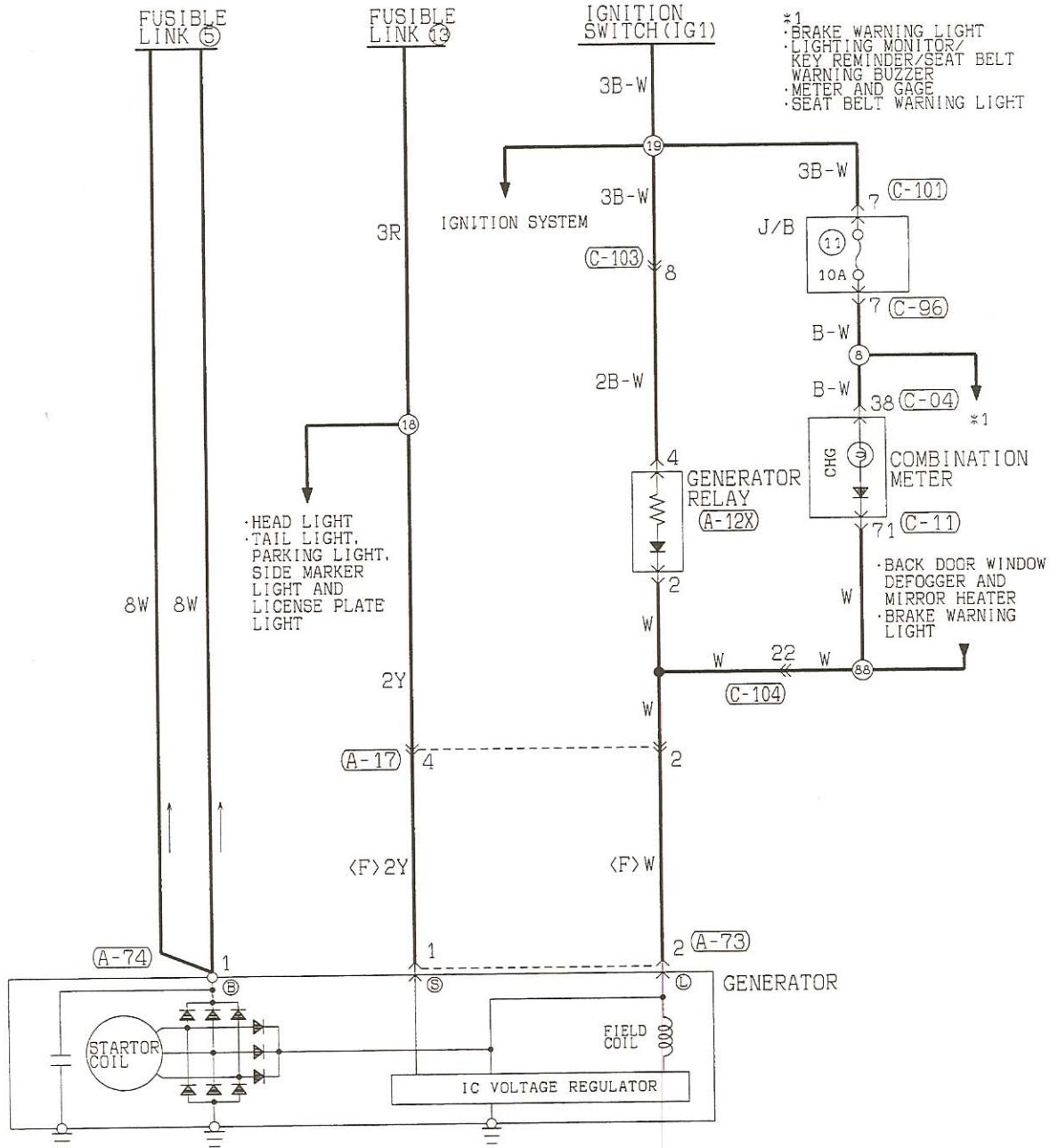
8003M00AB

TSB Revision

NOTES

CHARGING SYSTEM

90100070721



- *1 BRAKE WARNING LIGHT
- LIGHTING MONITOR/
- KEY REMINDER/SEAT BELT
- WARNING BUZZER
- METER AND GAGE
- SEAT BELT WARNING LIGHT

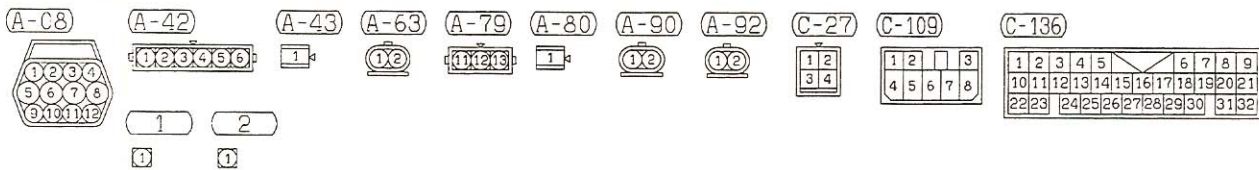
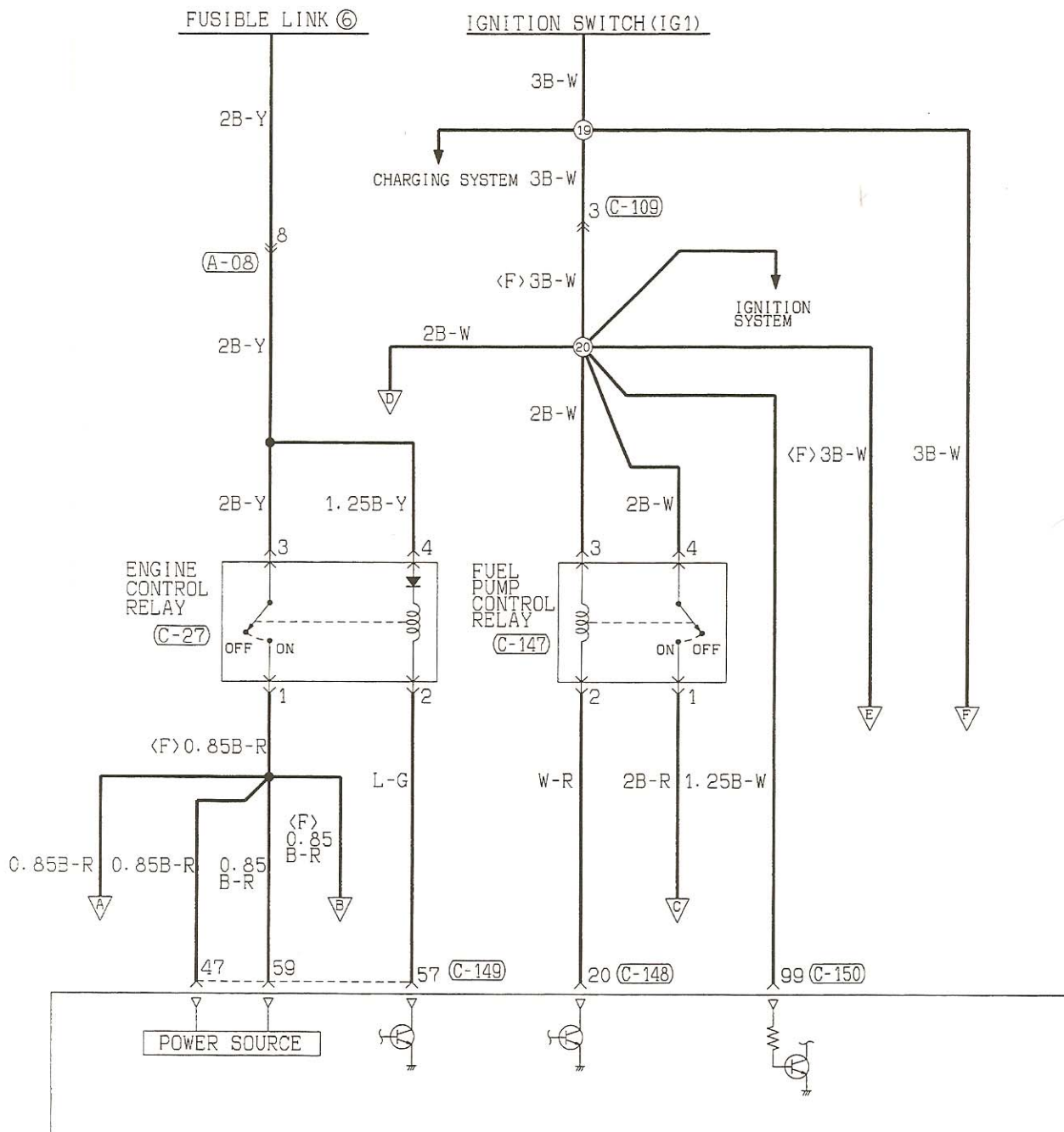
A-12X 1 2 3 4	A-17 1 2 3 4	A-73 1 2	A-74 1	C-04 31 32 33 34 35 36 37 38 39 40 41 42 43 44	C-11 71 72 73 74 75 76 77 78 79 80 81 82 83 84	C-96 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	C-101 1 2 3 4 5 6 7 8
C-103 1 2 3 4 5 6 7 8	C-104 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22	Wire color code B : Black LG : Light green G : Green L : Blue BR : Brown O : Orange GR : Gray R : Red W : White SB : Sky blue P : Pink Y : Yellow V : Violet					

8G04M00AA

TSB Revision

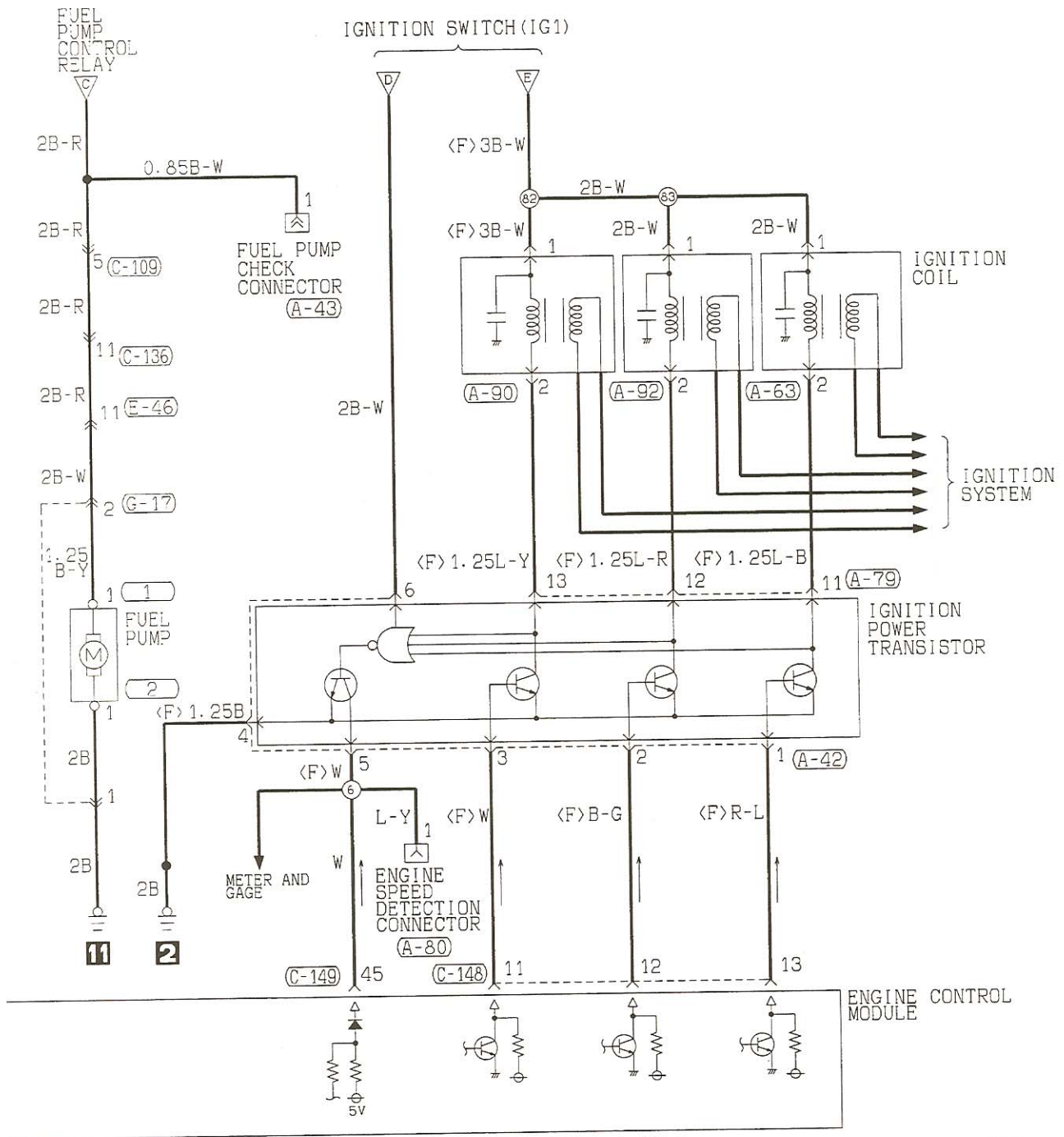
MFI SYSTEM <Vehicles for Federal>

90100081A50



8905M00AA

TSB Revision



C-147 C-148

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25	26	27	28	29	30	31	32
33	34	35					

C-149

41	42	43	44	45	46	47
48	49	50	51	52	53	54
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62	63	64	65	66	67	68

C-150

71	72	73	74	75	76	77
78	79	80	81	82	83	84
85	86	87	88	89	90	91
92	93	94	95	96	97	98
99	100					

E-46

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13	14				

G-17

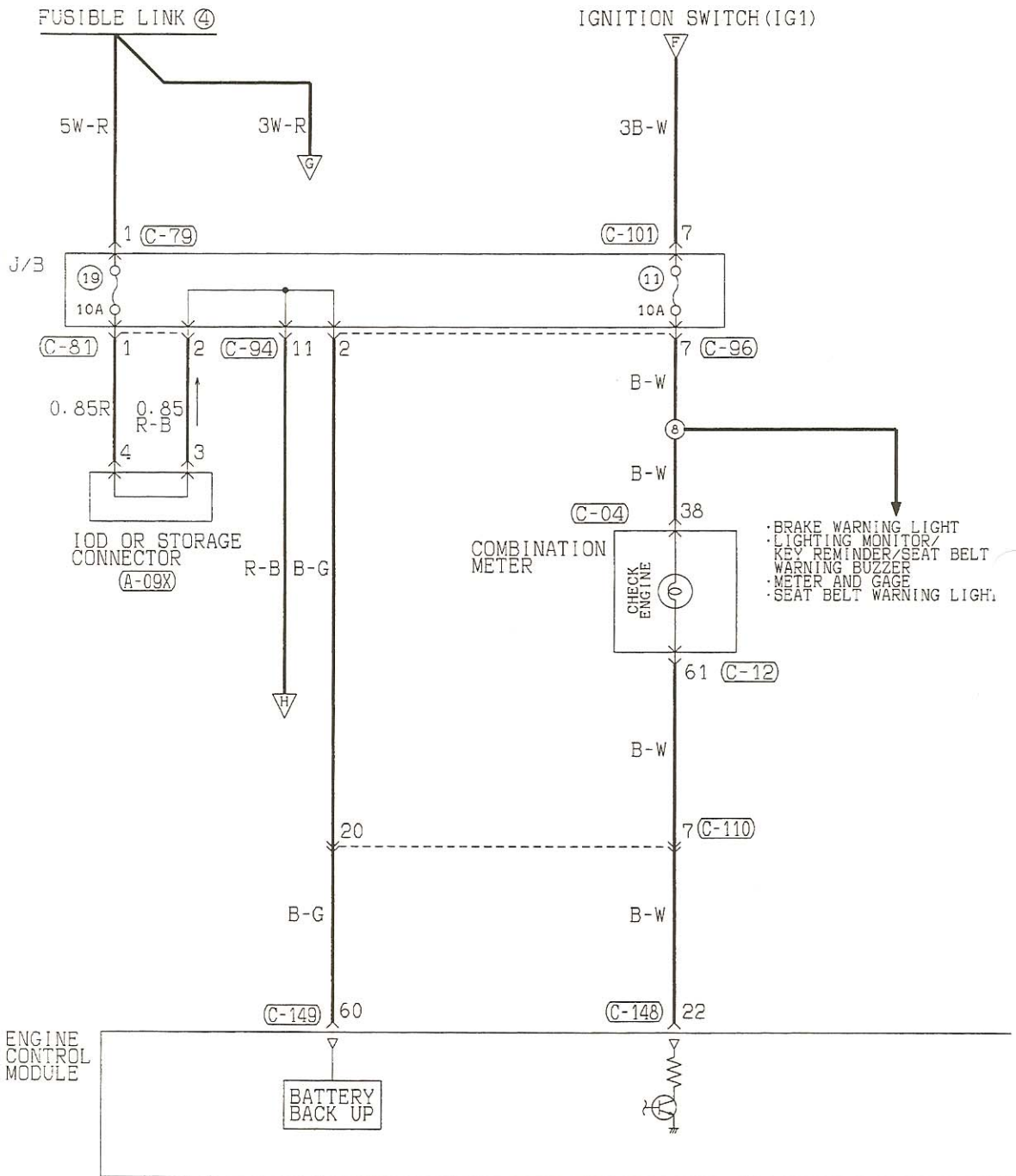
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Wire color code
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8Q05M00AB

TSB Revision

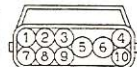
MFI SYSTEM <Vehicles for Federal> (CONTINUED)



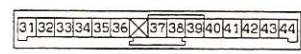
(A-09X)



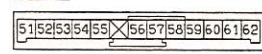
(C-08)



(C-04)



(C-12)



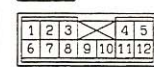
(C-79)



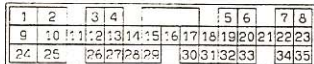
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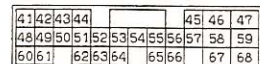
(C-94)



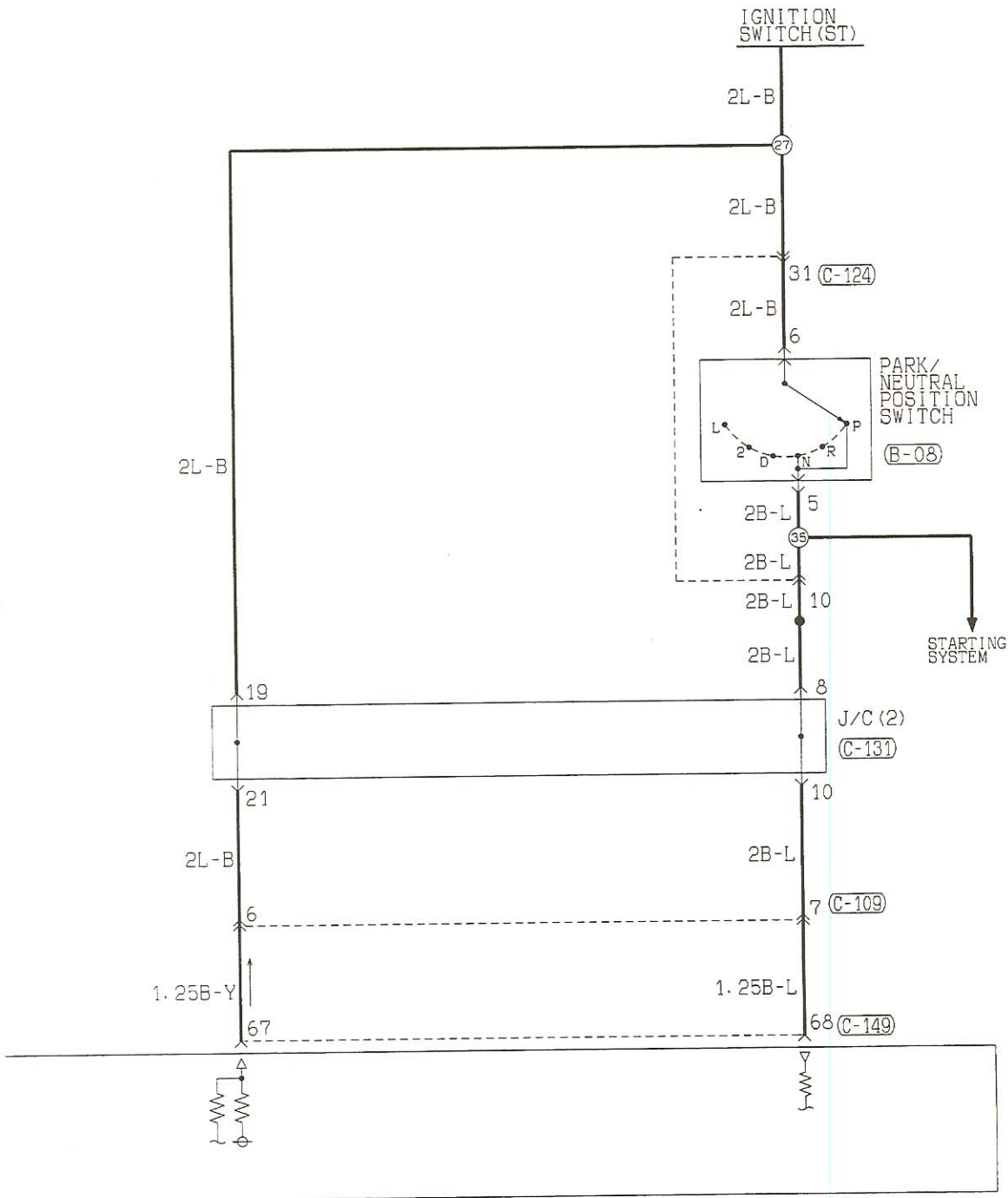
(C-148)



(C-149)



TSB Revision



C-96

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22	23	24	25	26	27	28
29	30	31	32	33	34	35

C-101

1	2	3	4
5	6	7	8

C-109

1	2	3
4	5	6
7	8	9

C-110

1	2	3	4	5	M	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20	21
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C-124

1	2	3	4	5	6	7	8	9
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C-131

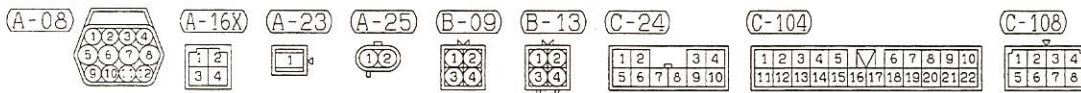
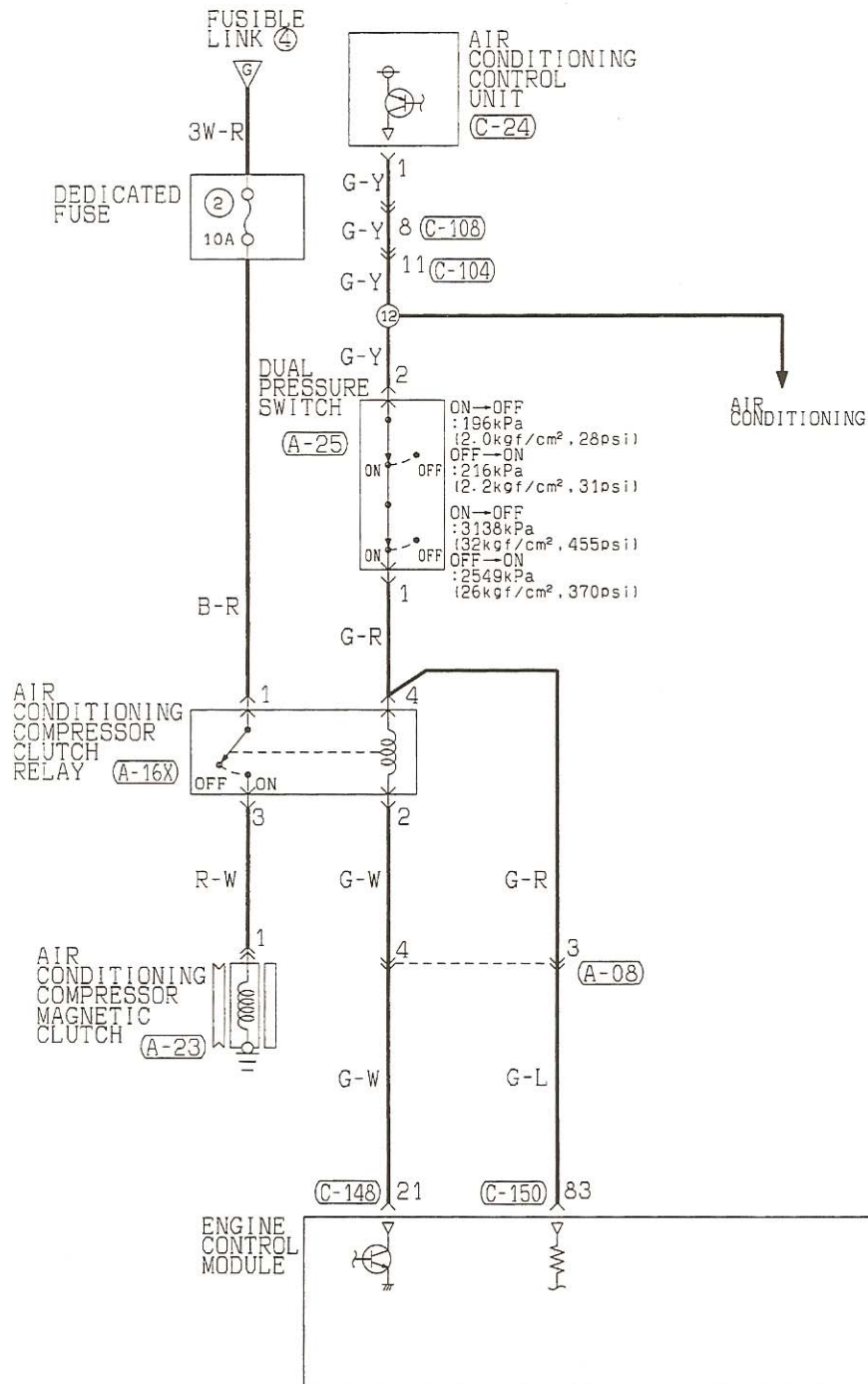
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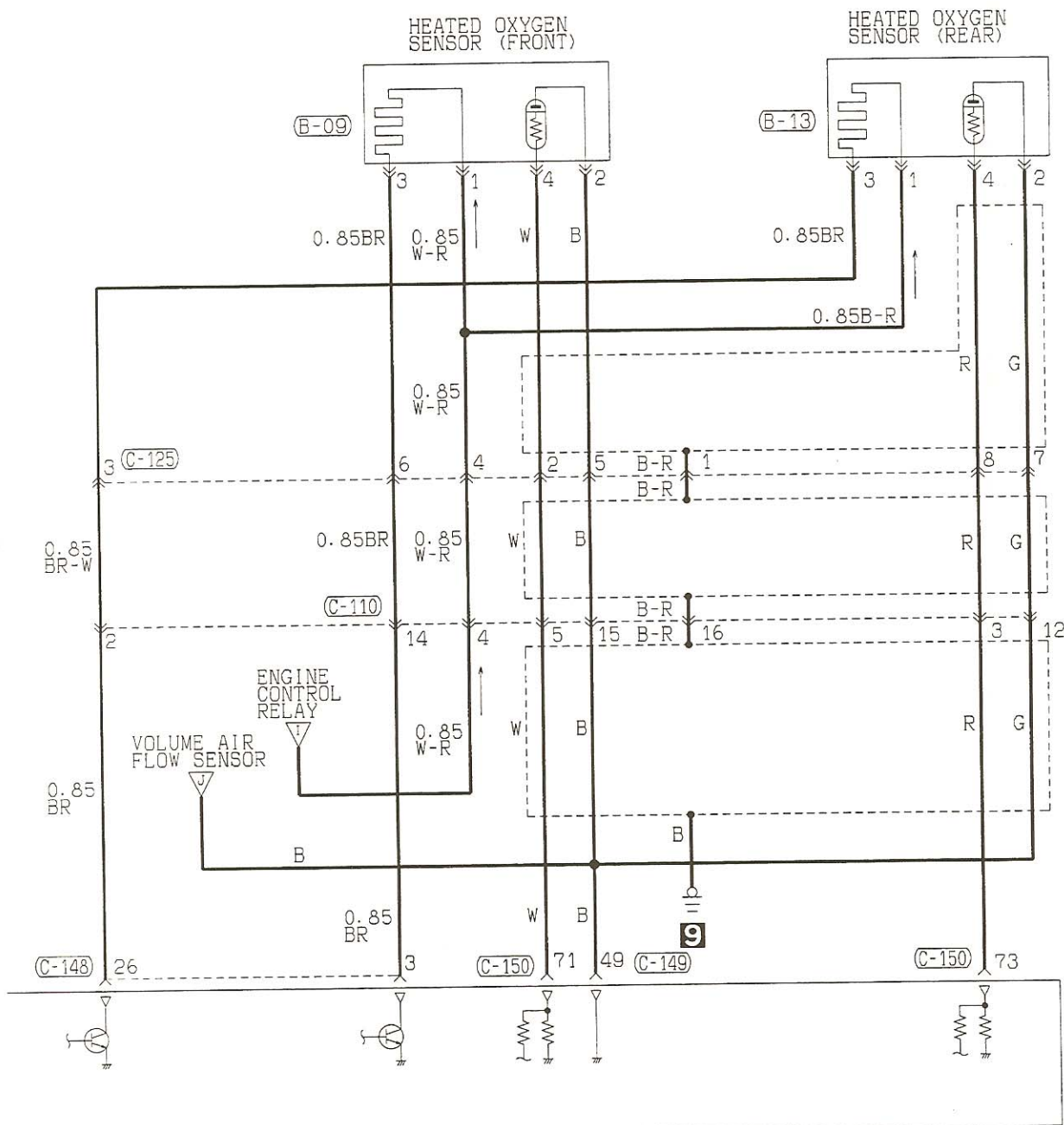
Wire color code
 B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
 BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

8005M00BB

TSB Revision

MFI SYSTEM <Vehicles for Federal> (CONTINUED)





C-110

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22								

C-125

1	2	3
4	5	6
7	8	

C-148

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					

C-149

41	42	43	44	45	46	47
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55	56	57	58	59	60	61
62	63	64	65	66	67	68

C-150

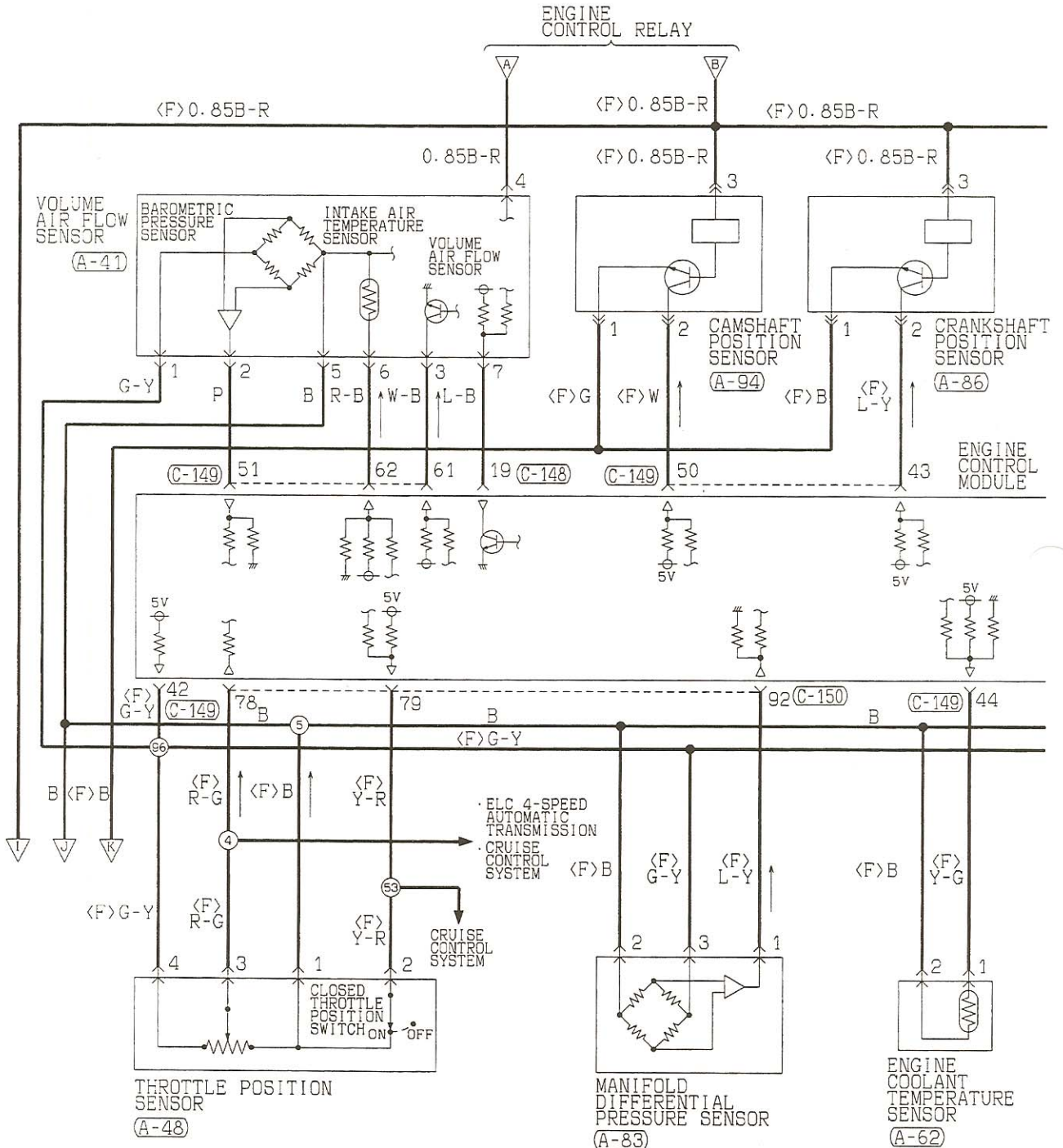
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92	93	94	95	96	97	98
99	100					

Wire color code
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8005M00CB

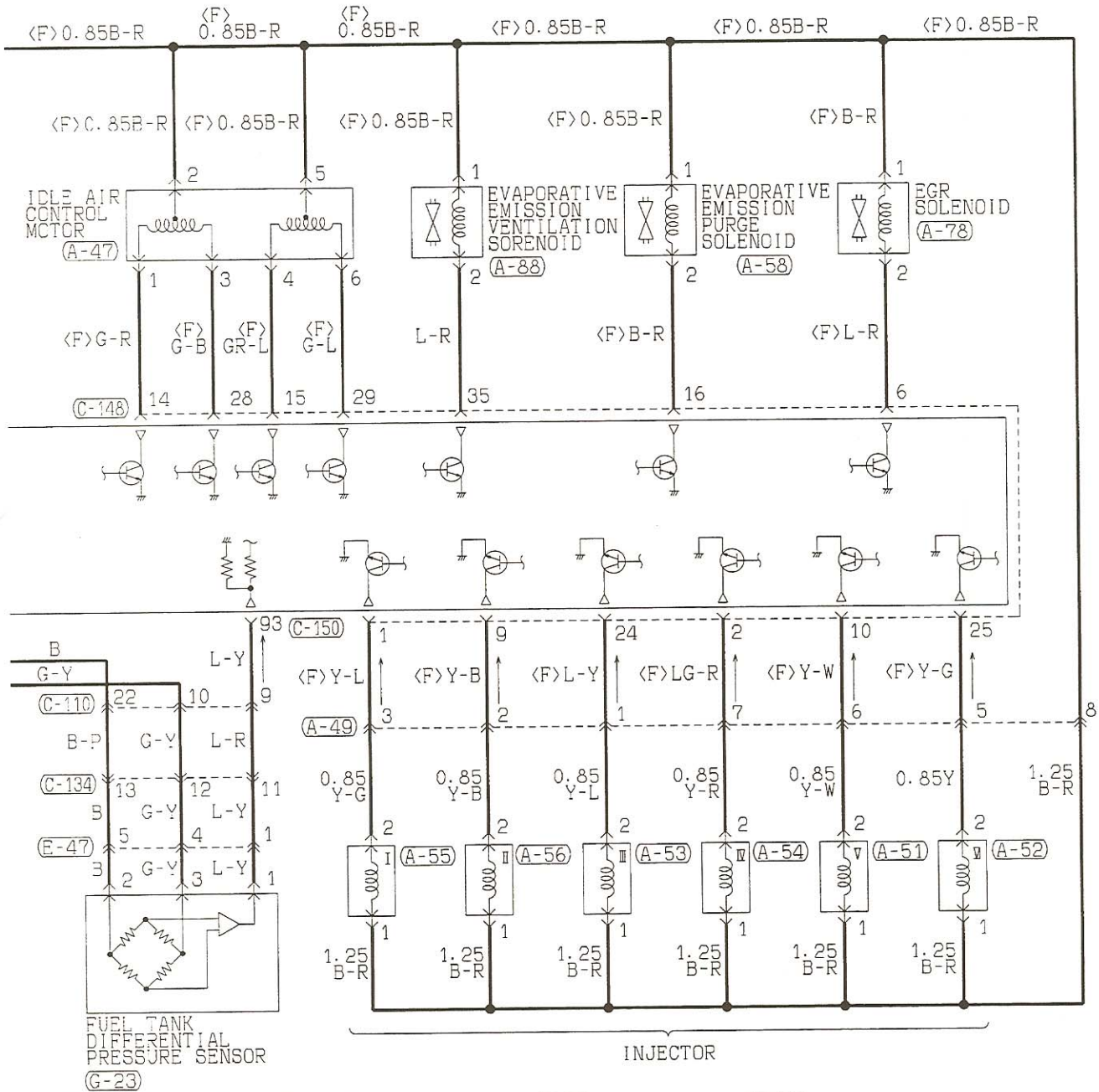
TSB Revision

MFI SYSTEM <Vehicles for Federal> (CONTINUED)



A-41 1 2 3 4 5 6 7 8	A-47 1 2 3 4 5 6	A-48 1 2 3 4	A-49 1 2 3 4 5 6 7 8	A-51 1 2	A-52 1 2	A-53 1 2	A-54 1 2	A-55 1 2	A-56 1 2	A-58 1 2	A-62 1 2	A-78 1 2
C-149 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68	C-150 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100	E-47 1 2 3 4 5 6 7 8	G-23 1 2 3									

TSB Revision



(A-83) (A-86) (A-88) (A-94) (C-110)

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11	12	13	14	15	16	17	18	19	20
21	22								

(C-134)

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22								

(C-148)

1	2	3	4	5	6	7	8
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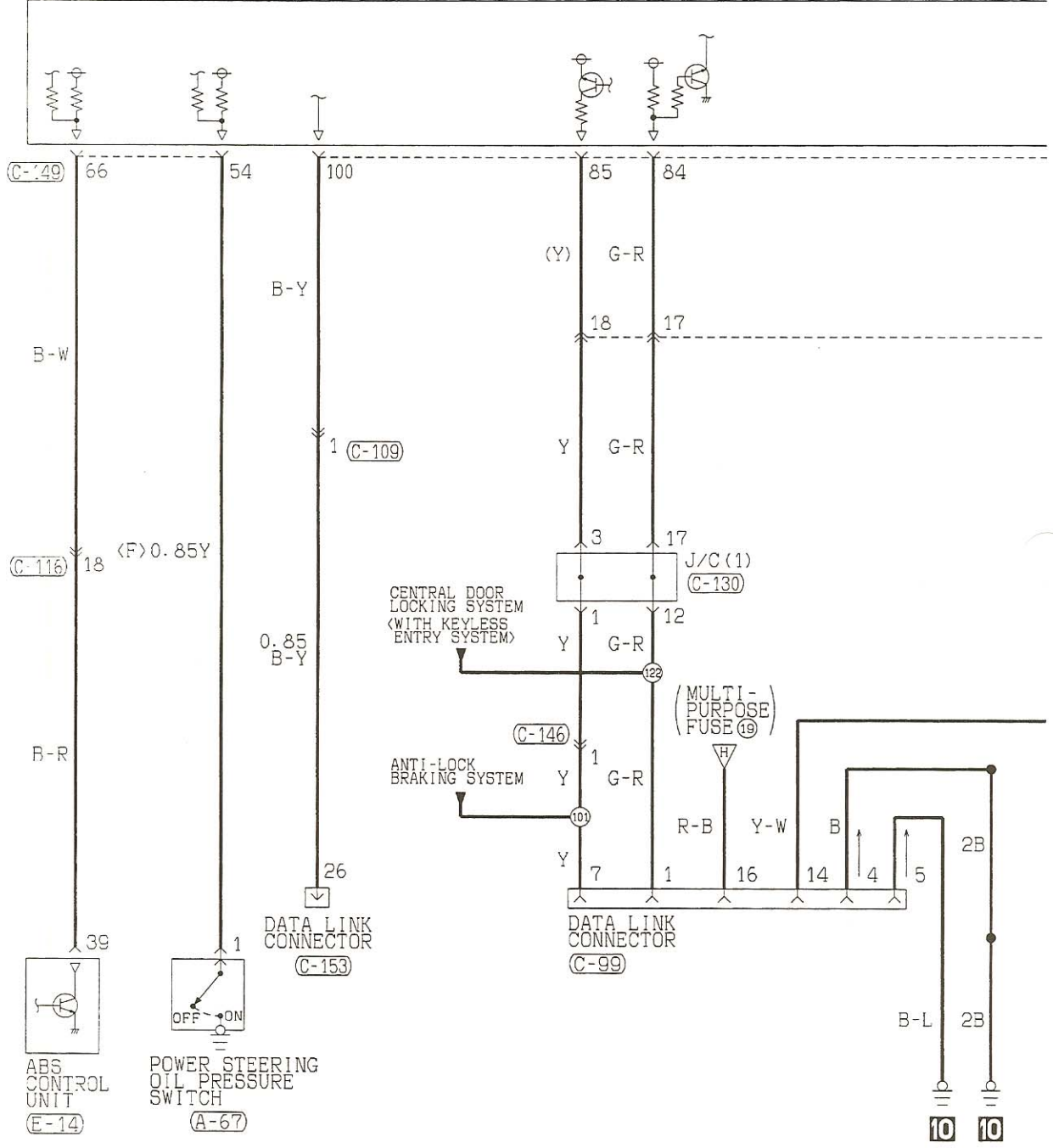
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 BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

8905M00DB

TSB Revision

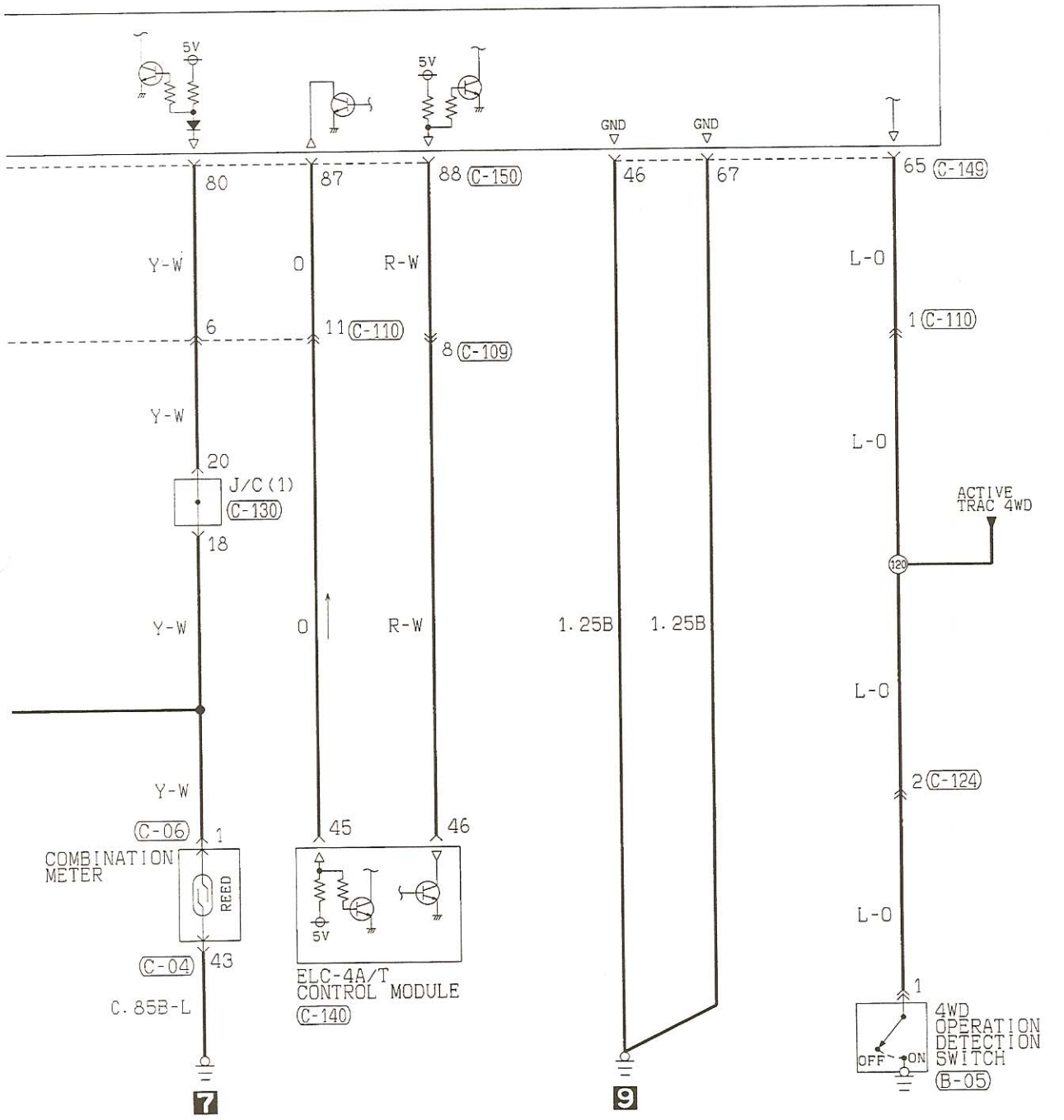
MFI SYSTEM <Vehicles for Federal> (CONTINUED)

ENGINE CONTROL MODULE



(A-67)	(B-C5)	(C-04)	(C-06)	(C-99) FRONT SIDE	(C-109)	(C-110)
1	1	31 32 33 34 35 36 37 38 39 40 41 42 43 44	1	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 14 15 16 17 18 19 20 21 22
(C-153)	(C-153) FRONT SIDE	(E-14)				
71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100	21 22 23 24 25 26 27 28 29 30 31 32	31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52				

TSB Revision



(C-116)

1	2	3	4	5	6	7	8		
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(C-124)

1	2	3	4	5	6	7	8	9			
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22	23	24	25	26	27	28	29	30	31	32	

(C-130)

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12	13	14	15	16	17	18	19	20	21	22
23	24	25	26	27	28	29	30	31	32	33

(C-140)

31	32	33	34	35	36	37	38
39	40	41	42	43	44	45	46

(C-146)

1	2	3
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(C-149)

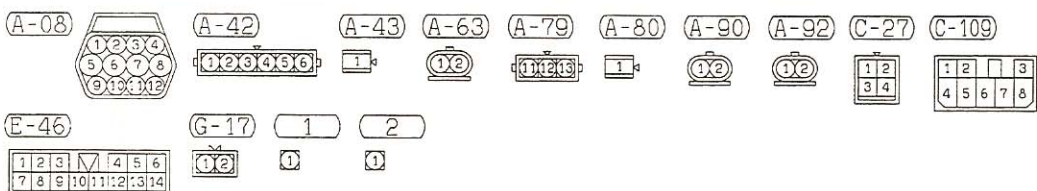
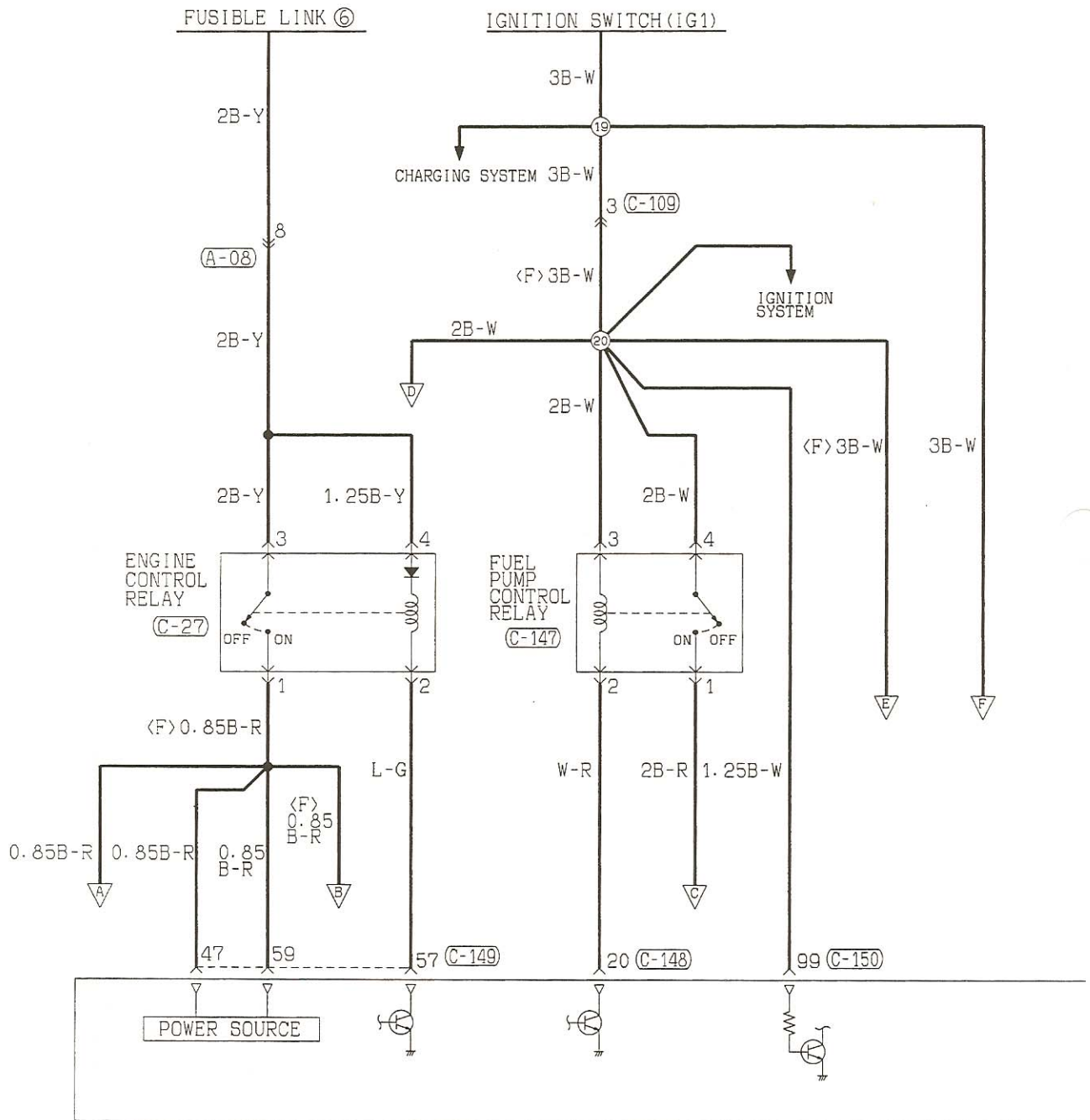
41	42	43	44	45	46	47					
48	49	50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68			

Wire color code
 B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
 BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

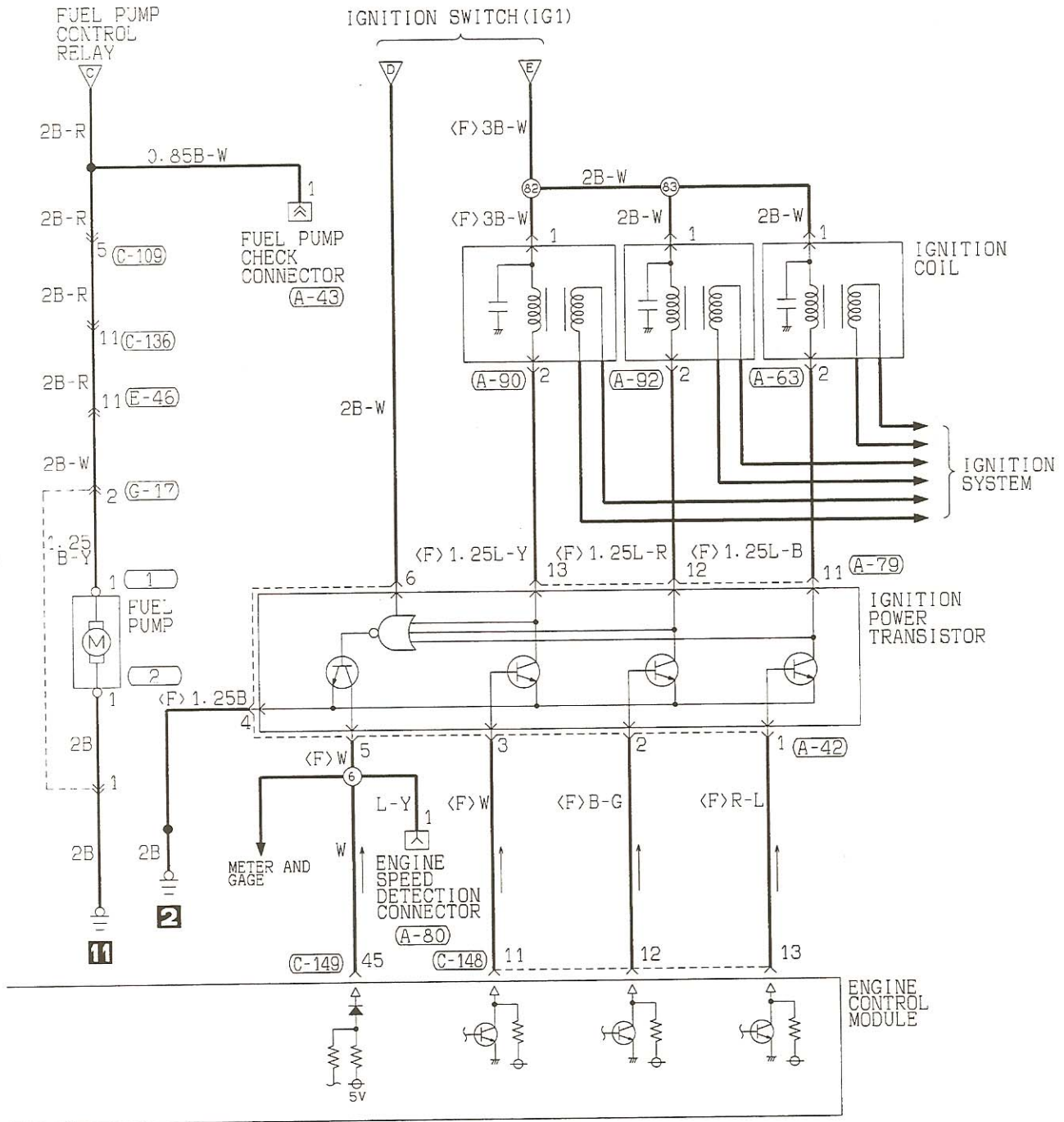
8Q05M00EB

TSB Revision

MFI SYSTEM <Vehicles for California>



TSB Revision



C-136

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C-147

1	2
3	4

C-148

1	2	3	4	5	6	7	8
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33	34	35					

C-149

41	42	43	44	45	46	47
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C-150

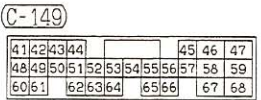
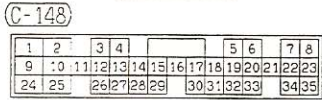
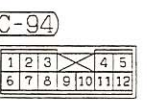
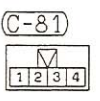
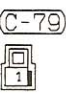
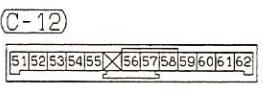
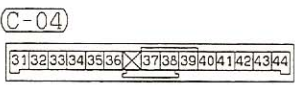
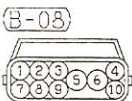
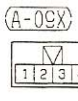
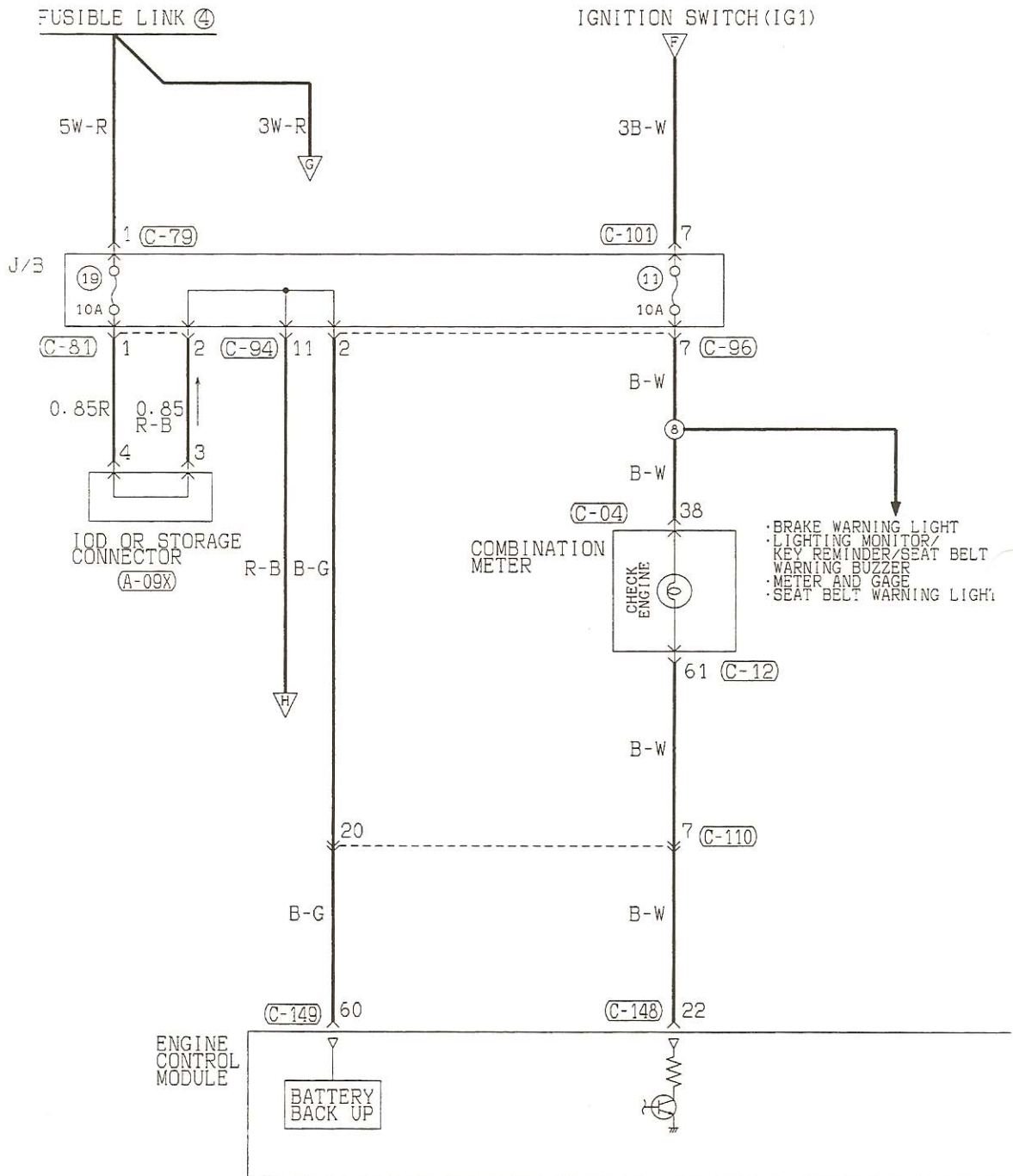
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Wire color code
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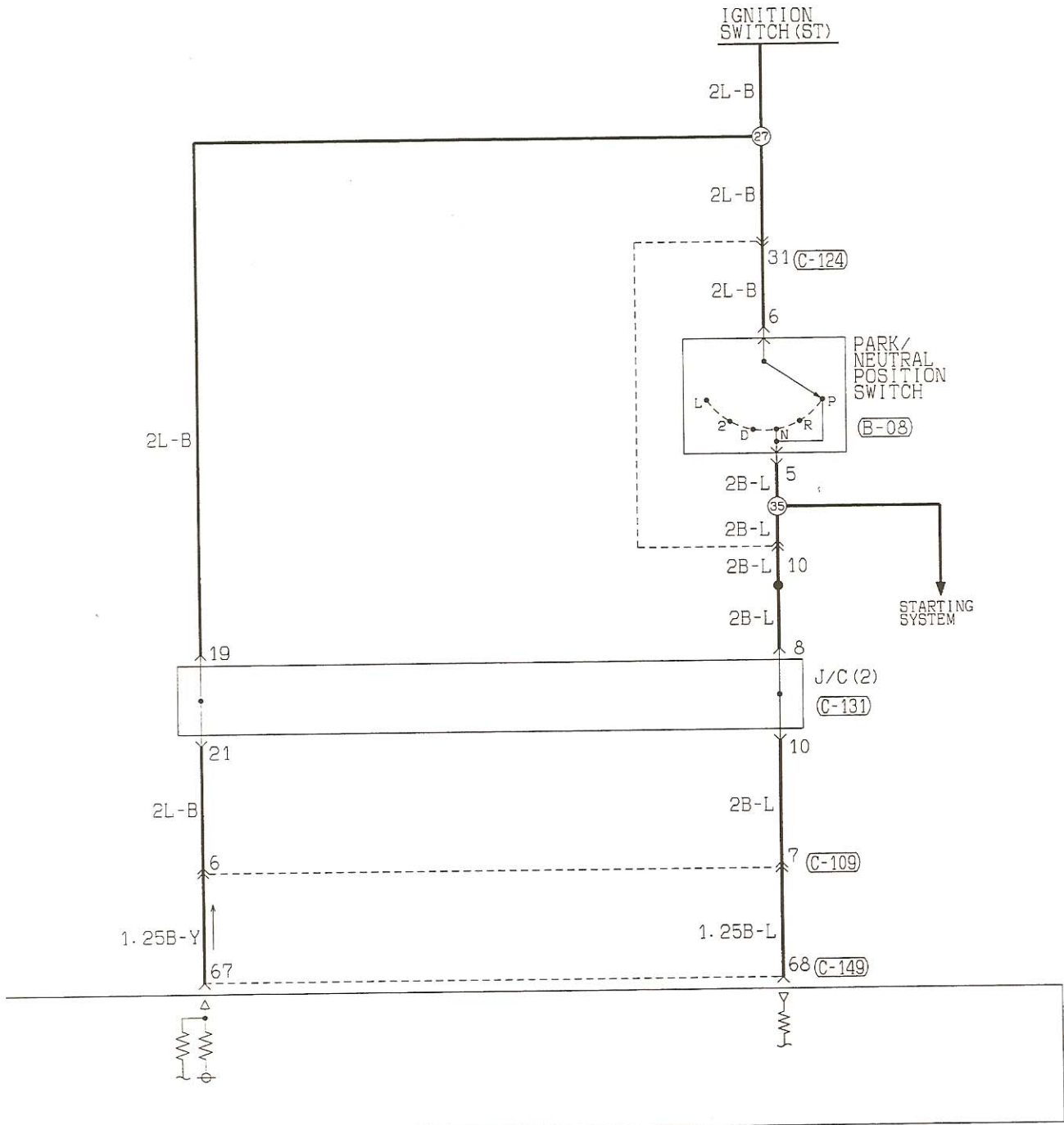
8Q05M01AB

TSB Revision

MFI SYSTEM <Vehicles for California> (CONTINUED)



TSB Revision



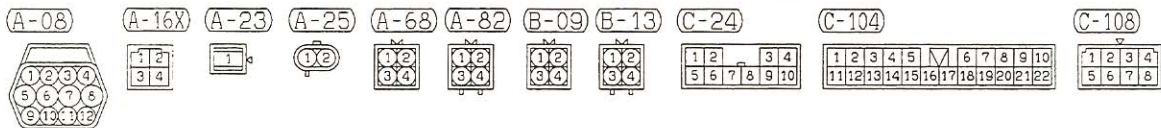
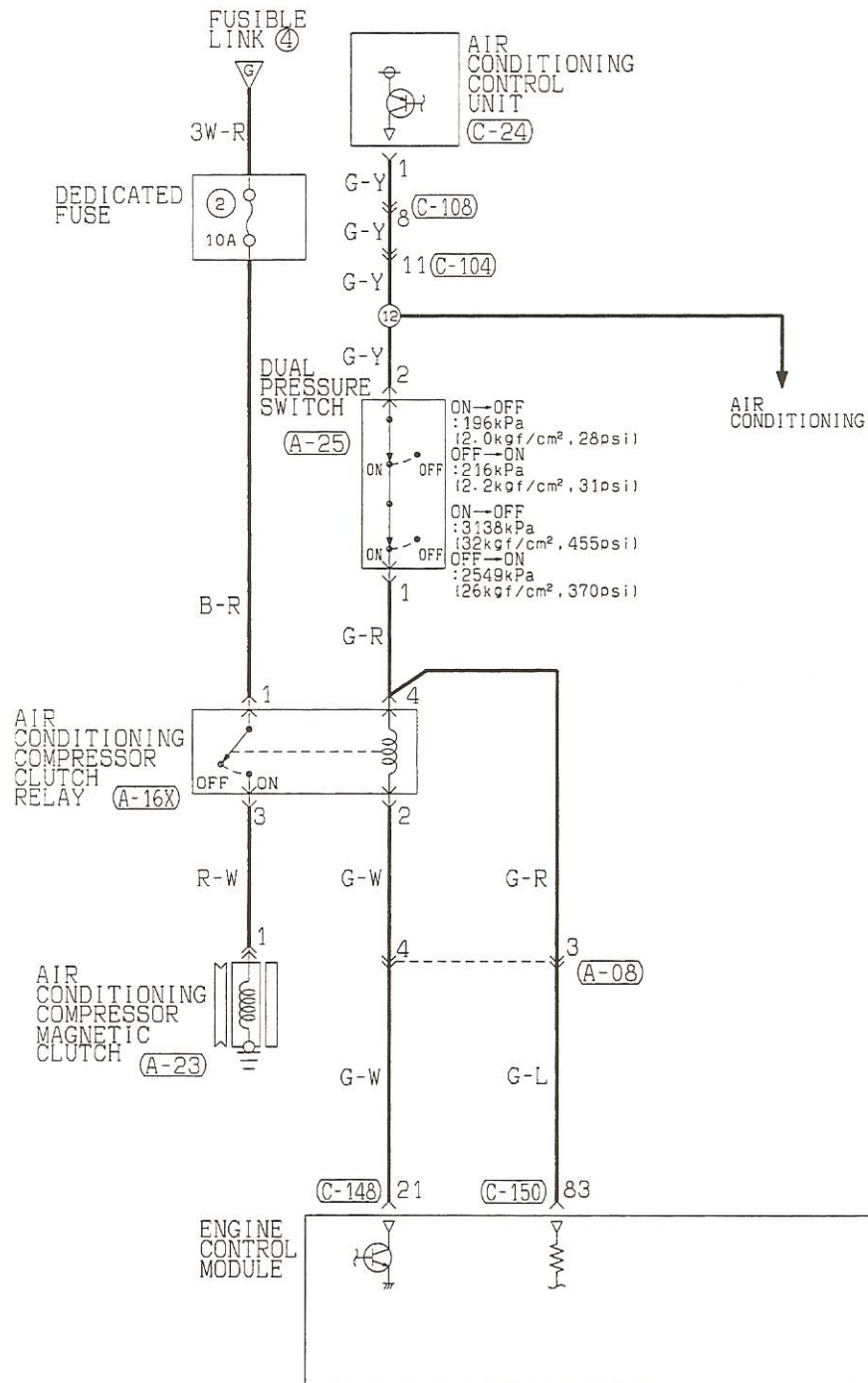
C-96	C-101	C-109	C-110	C-124	C-131																																																																																																																																									
<table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr> <tr><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td></tr> <tr><td>15</td><td>16</td><td></td><td></td><td></td><td></td><td></td></tr> </table>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16						<table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>5</td><td>6</td><td>7</td><td>8</td></tr> </table>	1	2	3	4	5	6	7	8	<table border="1"> <tr><td>1</td><td>2</td><td>3</td></tr> <tr><td>4</td><td>5</td><td>6</td></tr> <tr><td>7</td><td>8</td><td></td></tr> </table>	1	2	3	4	5	6	7	8		<table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> <tr><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td></tr> <tr><td>21</td><td>22</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22									<table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td></tr> <tr><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td></tr> <tr><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td></tr> <tr><td>28</td><td>29</td><td>30</td><td>31</td><td>32</td><td></td><td></td><td></td><td></td></tr> </table>	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					<table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td></tr> <tr><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td></tr> <tr><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td><td>31</td><td>32</td><td>33</td></tr> </table>	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
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21	22																																																																																																																																													
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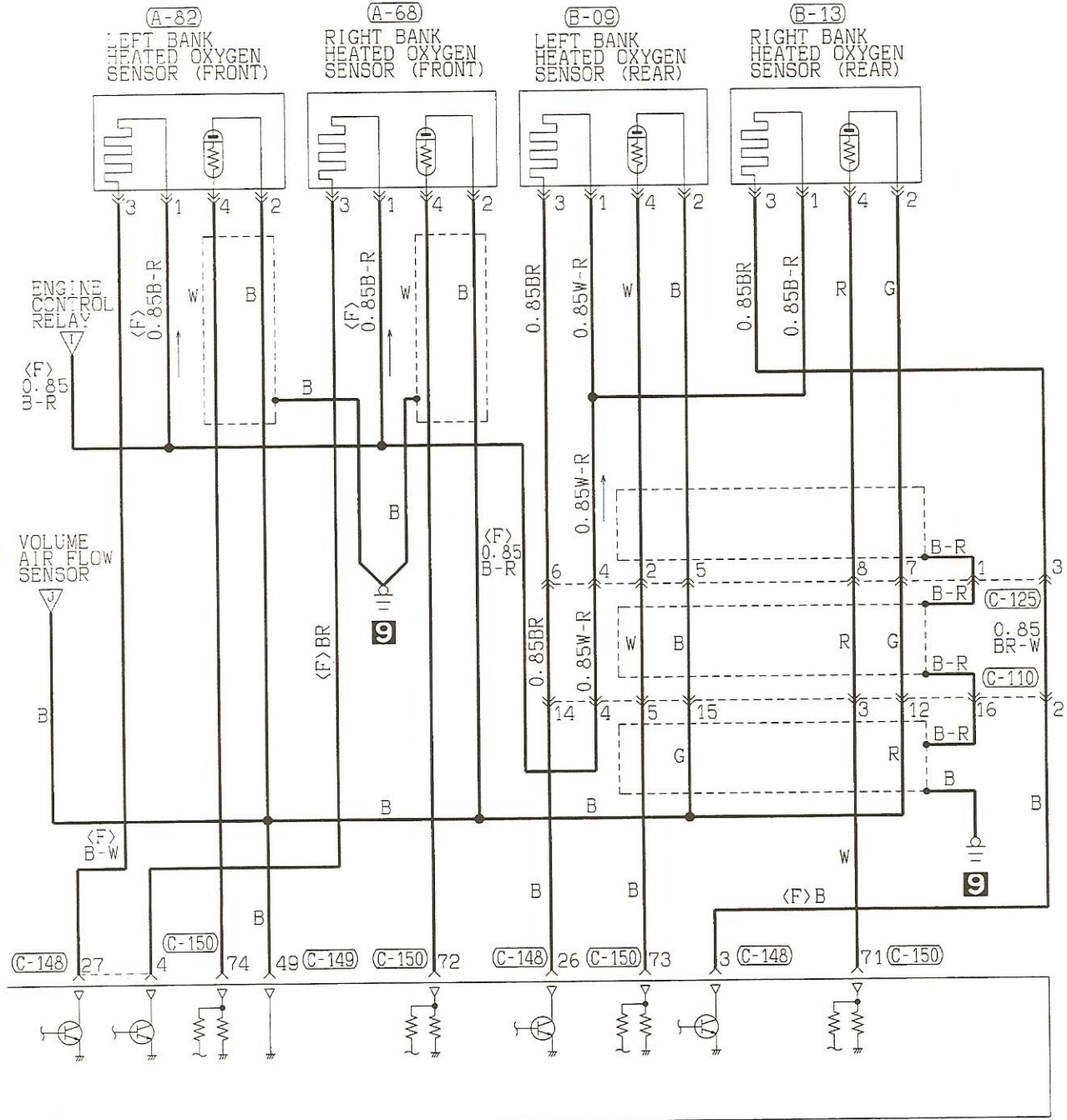
Wire color code
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8Q05M01BB

TSB Revision

MFI SYSTEM <Vehicles for California> (CONTINUED)



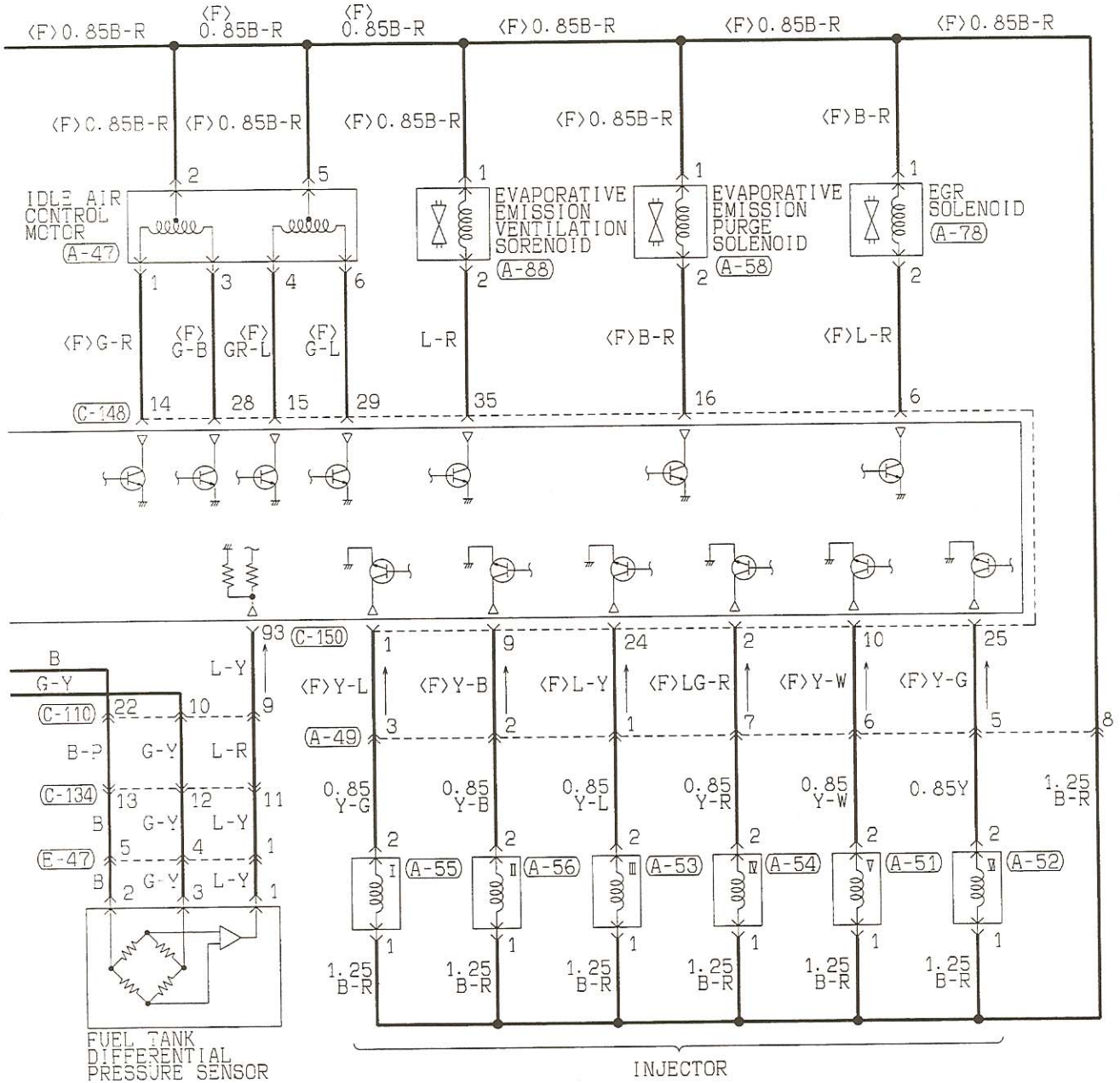


C-110	C-125	C-148	C-149	C-150
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22	1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35	41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68	71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

Wire color code
 W : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
 BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

8005M01CB

TSB Revision



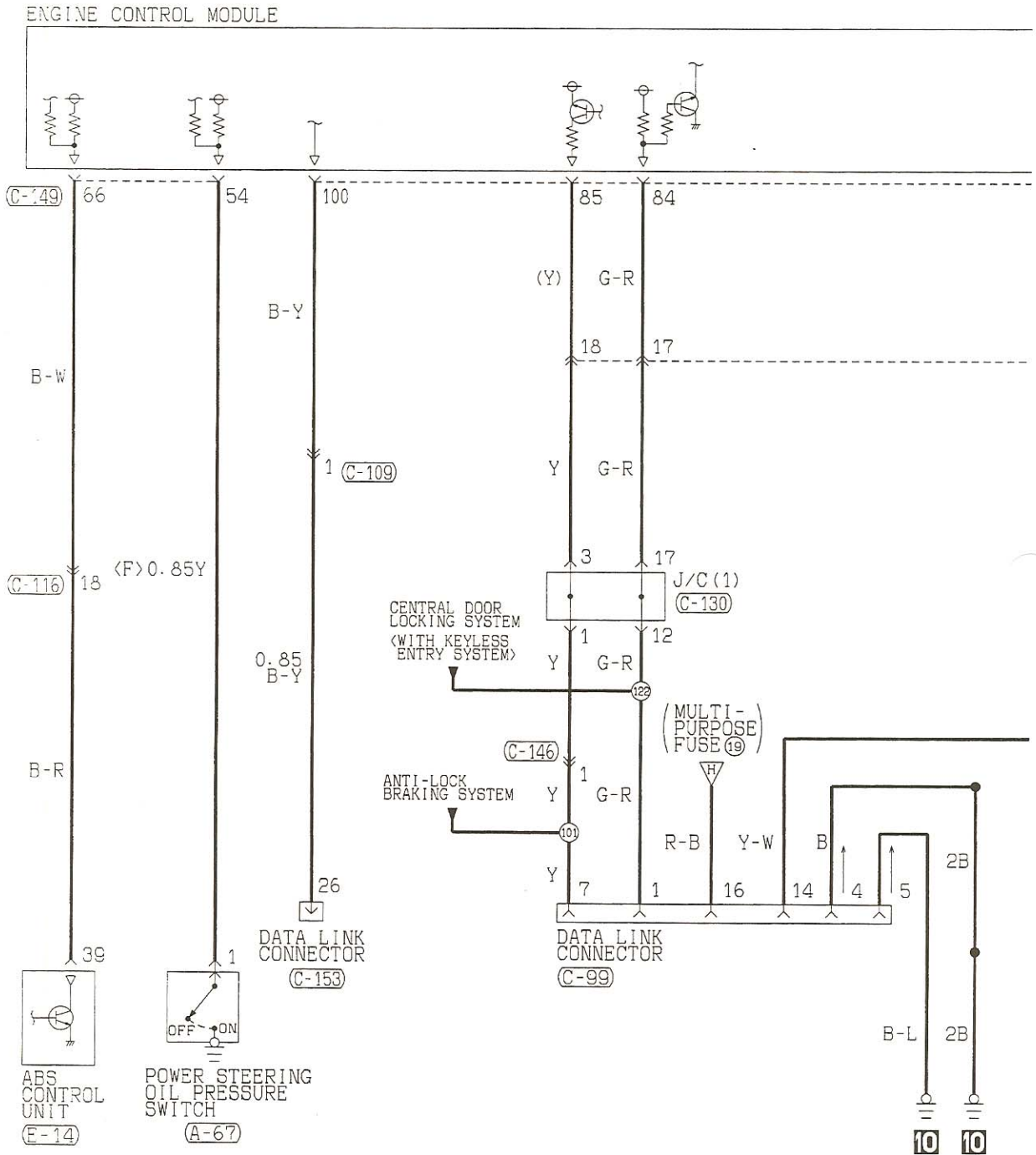
(A-83)	(A-86)	(A-88)	(A-94)	(C-110)	(C-134)	(C-148)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22	1 2 3 4 5 6 7 8 9 10 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 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

Wire color code
 B:Black LG:Light green G:Green L:Blue W:White Y:Yellow SB:Sky blue
 BR:Brown O:Orange GR:Gray R:Red P:Pink V:Violet

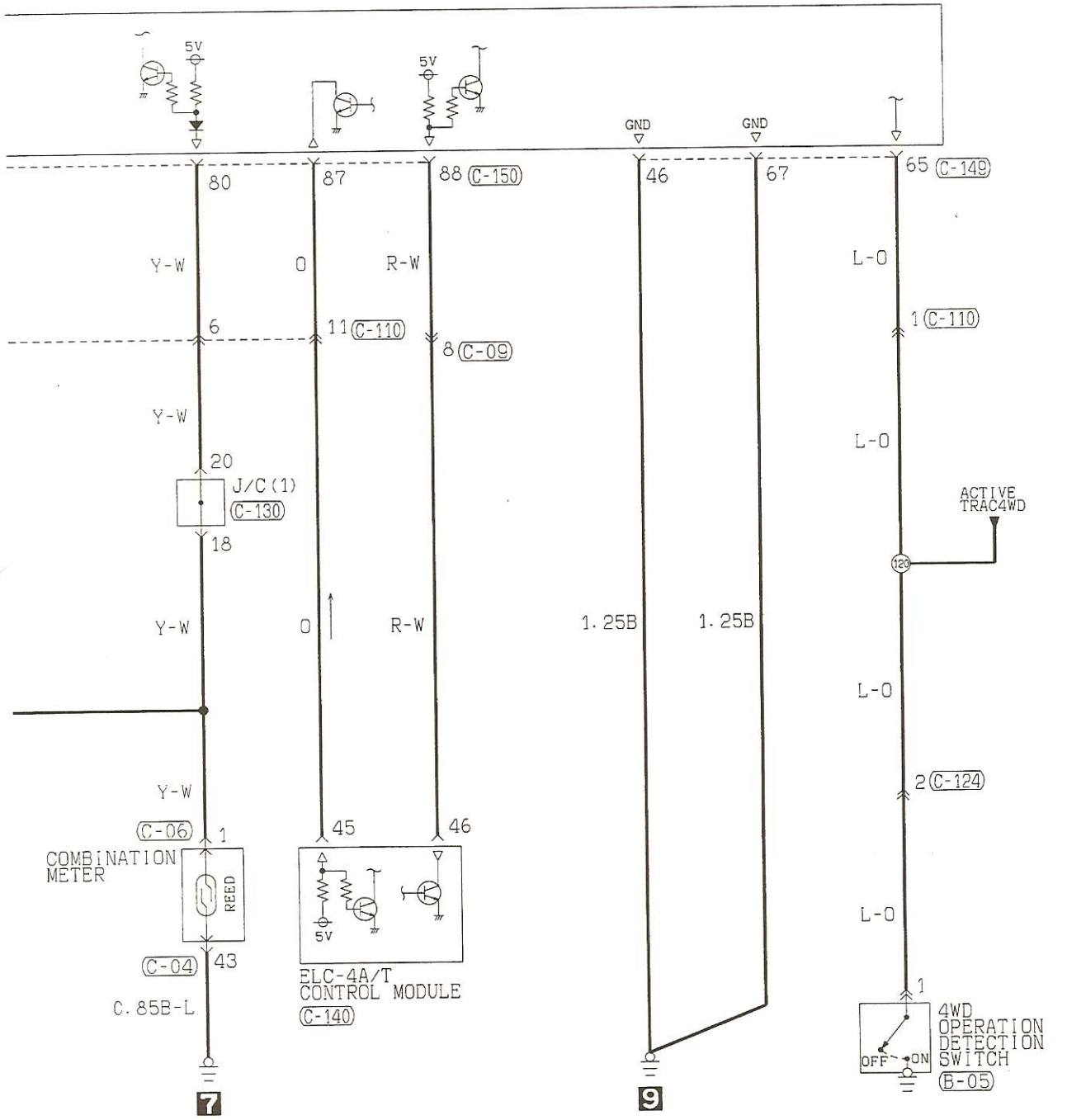
8005M01DB

TSB Revision

MFI SYSTEM <Vehicles for California> (CONTINUED)



A-67	B-05	C-04	C-06	C-99 FRONT SIDE	C-109	C-110
1	1	31 32 33 34 35 36 37 38 39 40 41 42 43 44	1	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 14 15 16 17 18 19 20 21 22
C-150	C-153 FRONT SIDE	E-14				
71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100	21 22 23 24 25 26 27 28 29 30 31 32	31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52				



C-116

1	2	3	4	5	6	7	8		
9	10	11	12	13	14	15	16	17	18

C-124

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	

C-130

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

C-140

31	32	33	34	35	36	37	38
39	40	41	42	43	44	45	46

C-146

1	2	3
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C-149

41	42	43	44	45	46	47					
48	49	50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68			

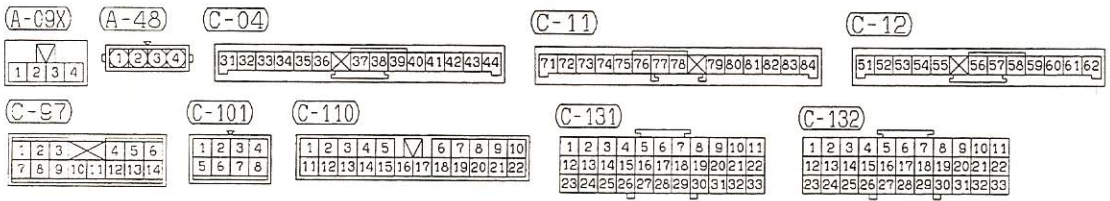
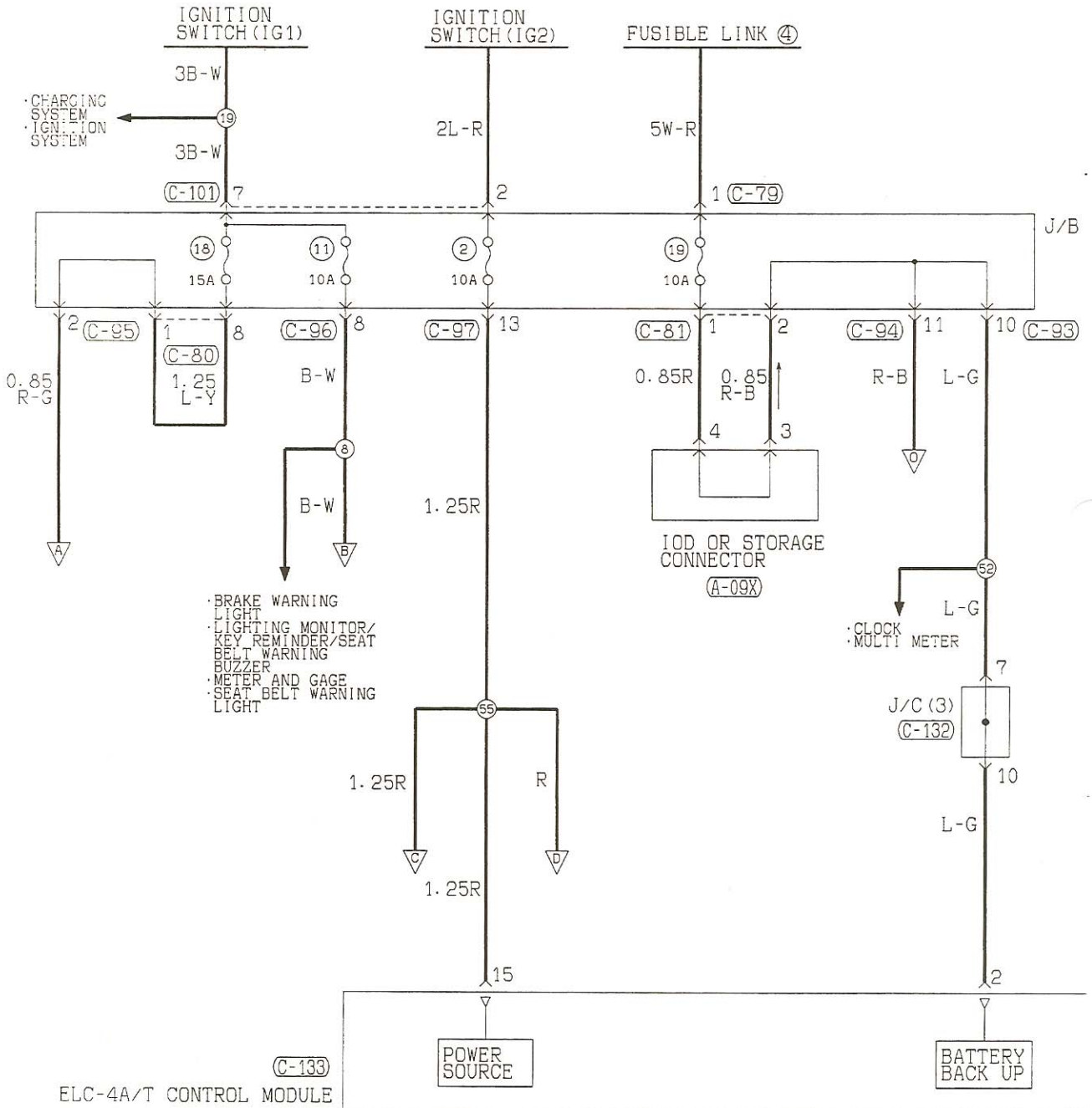
Wire color code
 B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
 BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

8005M01EB

TSB Revision

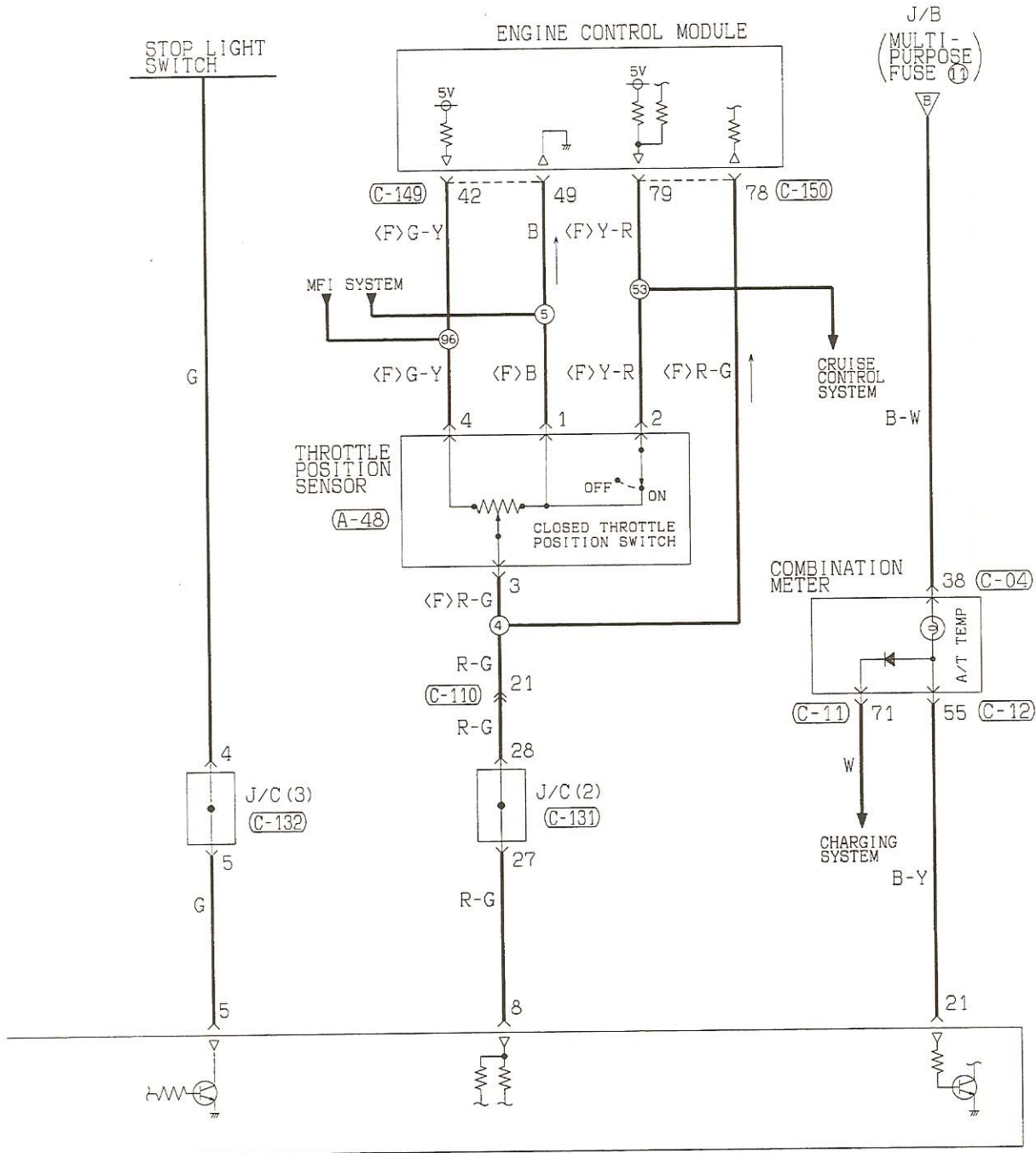
ELC 4-SPEED AUTOMATIC TRANSMISSION

90100120F00



8Q07M00AA

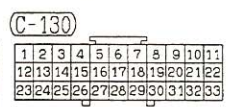
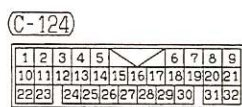
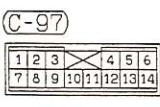
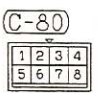
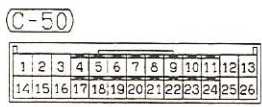
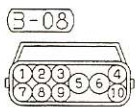
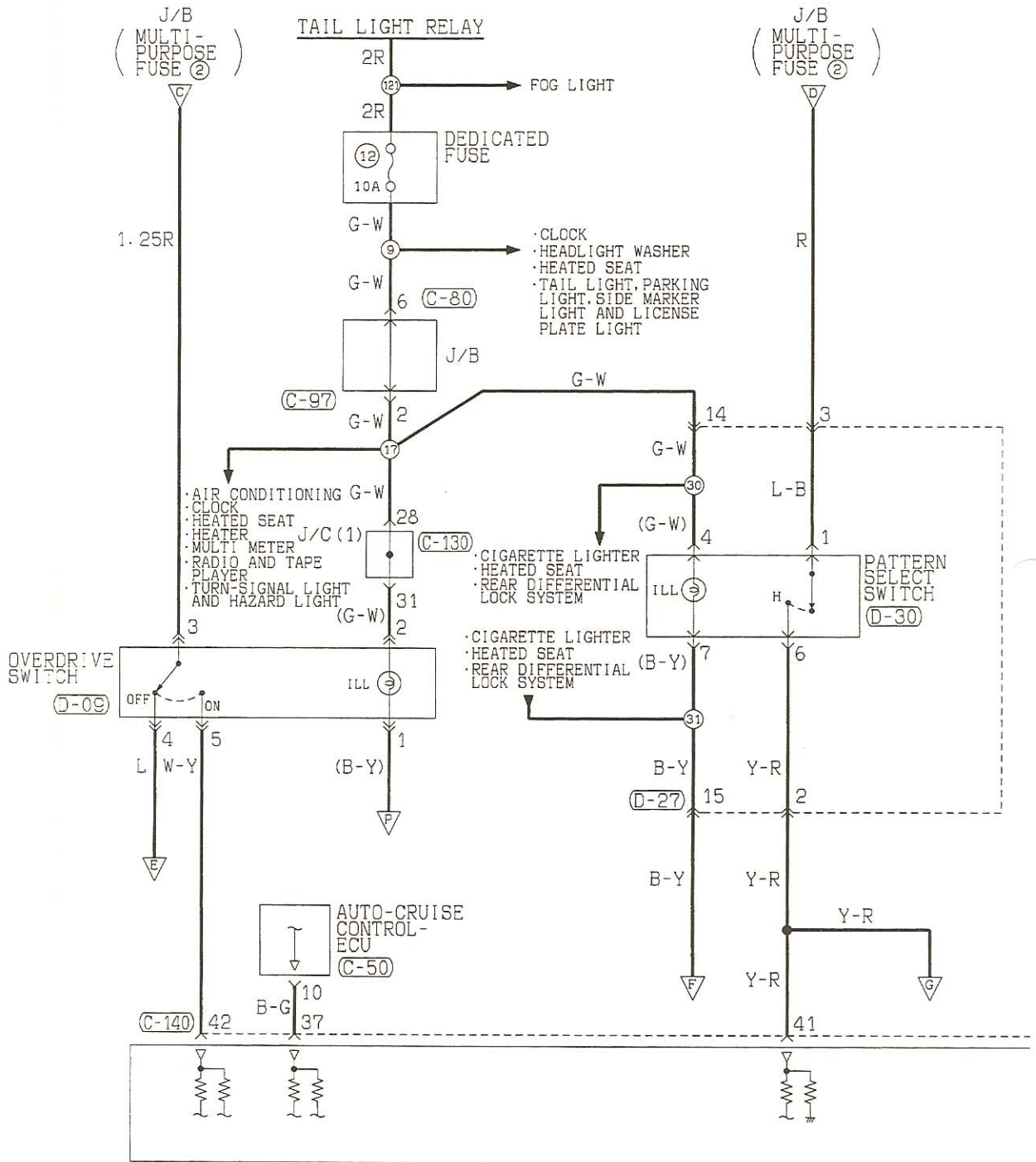
TSB Revision



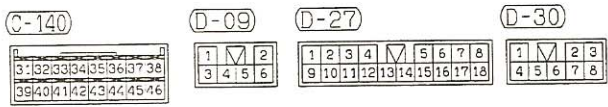
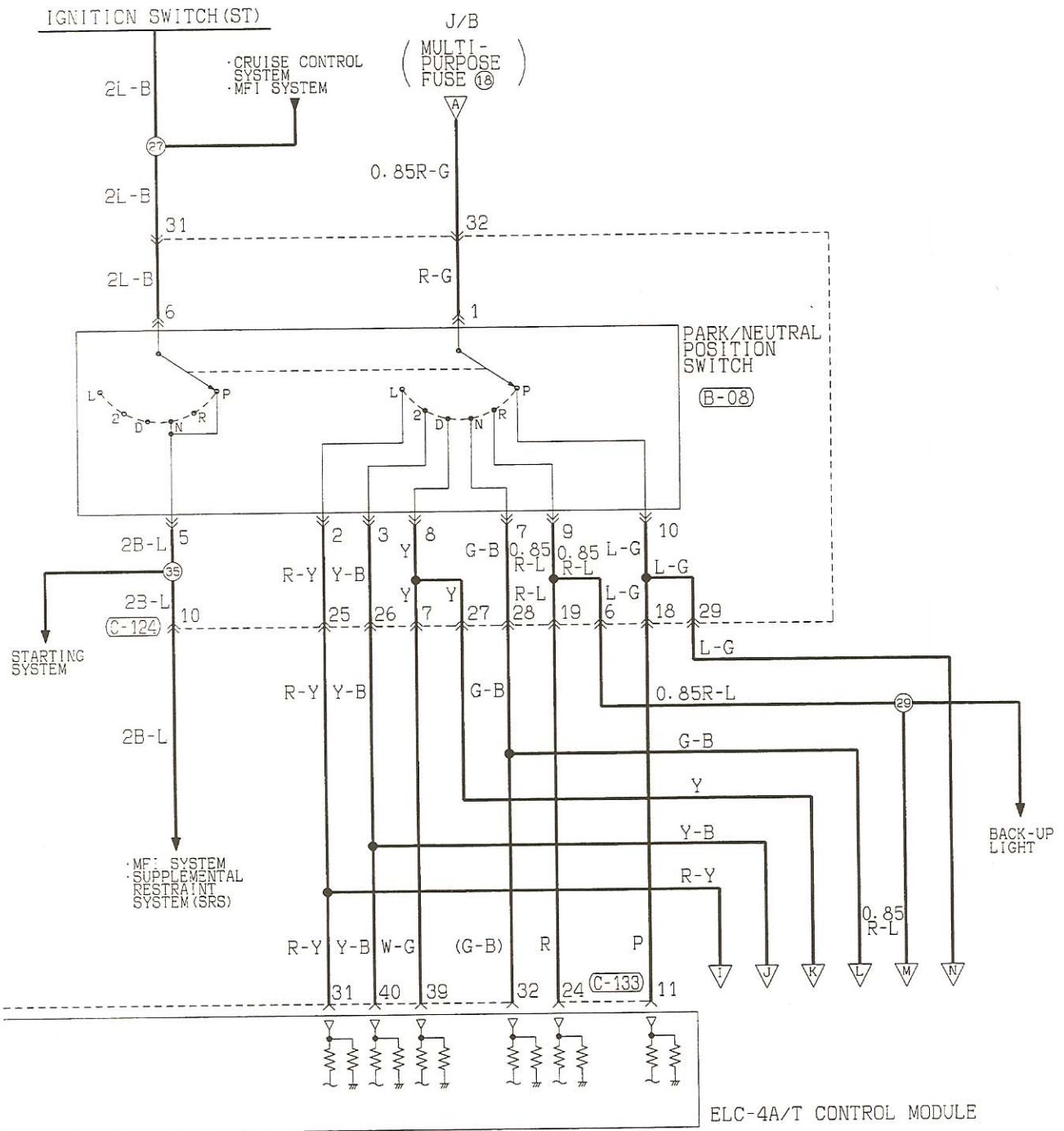
C-38 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92	C-79 1 1	C-80 1 2 3 4 5 6 7 8	C-81 1 2 3 4	C-93 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	C-94 1 2 3 4 5 6 7 8 9 10 11 12	C-95 1 2 3 4	C-96 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
C-133 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26	C-149 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68	C-150 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100					

TSB Revision

ELC 4-SPEED AUTOMATIC TRANSMISSION (CONTINUED)



TSB Revision

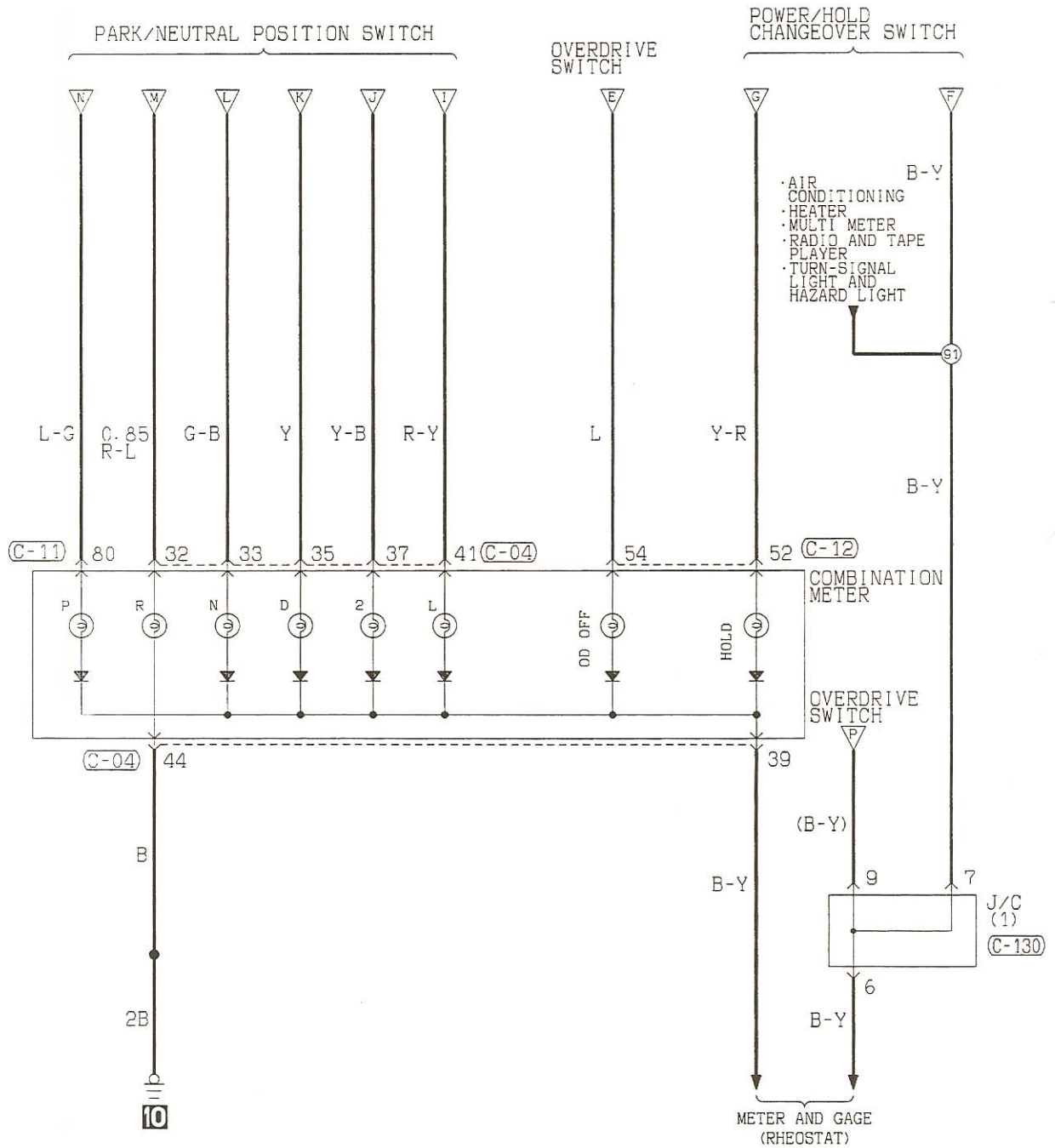


Wire color code
 B : Black LG: Light green G : Green L : Blue W : White Y : Yellow SB: Sky blue
 BR: Brown O : Orange GR: Gray R : Red P : Pink V : Violet

8Q07M00BB

TSB Revision

ELC 4-SPEED AUTOMATIC TRANSMISSION (CONTINUED)



B-10

1	2	3	4	5
6	7	8	9	10

C-04

31	32	33	34	35	36	37	38	39	40	41	42	43	44
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C-11

71	72	73	74	75	76	77	78	79	80	81	82	83	84
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C-12

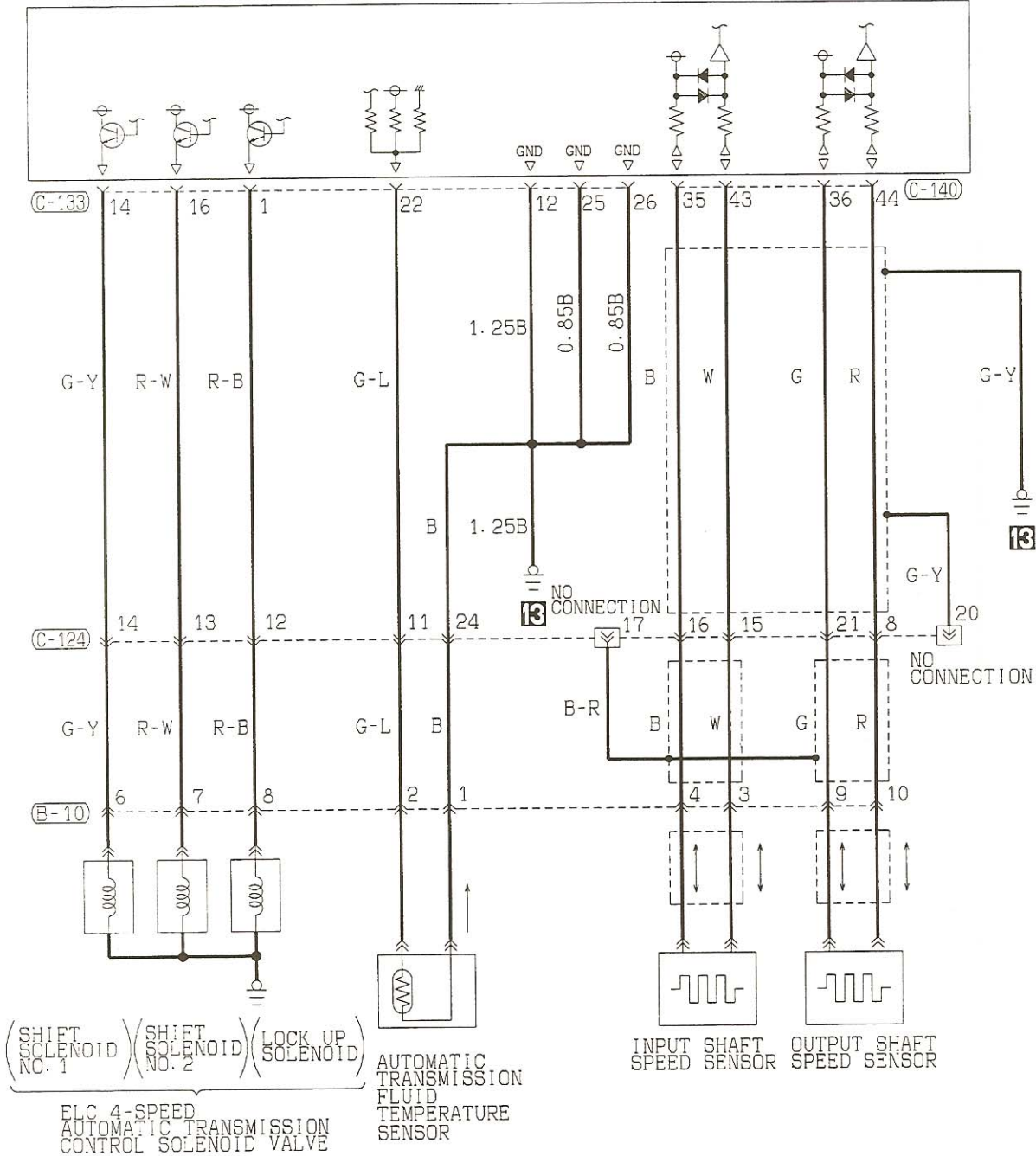
51	52	53	54	55	56	57	58	59	60	61	62
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C-124

1	2	3	4	5	6	7	8	9		
10	11	12	13	14	15	16	17	18	19	20
22	23	24	25	26	27	28	29	30	31	32

TSB Revision

ELC-4A/T CONTROL MODULE



(SHIFT SOLENOID NO. 1) (SHIFT SOLENOID NO. 2) (LOCK UP SOLENOID)
 AUTOMATIC TRANSMISSION FLUID TEMPERATURE SENSOR
 INPUT SHAFT SPEED SENSOR
 OUTPUT SHAFT SPEED SENSOR

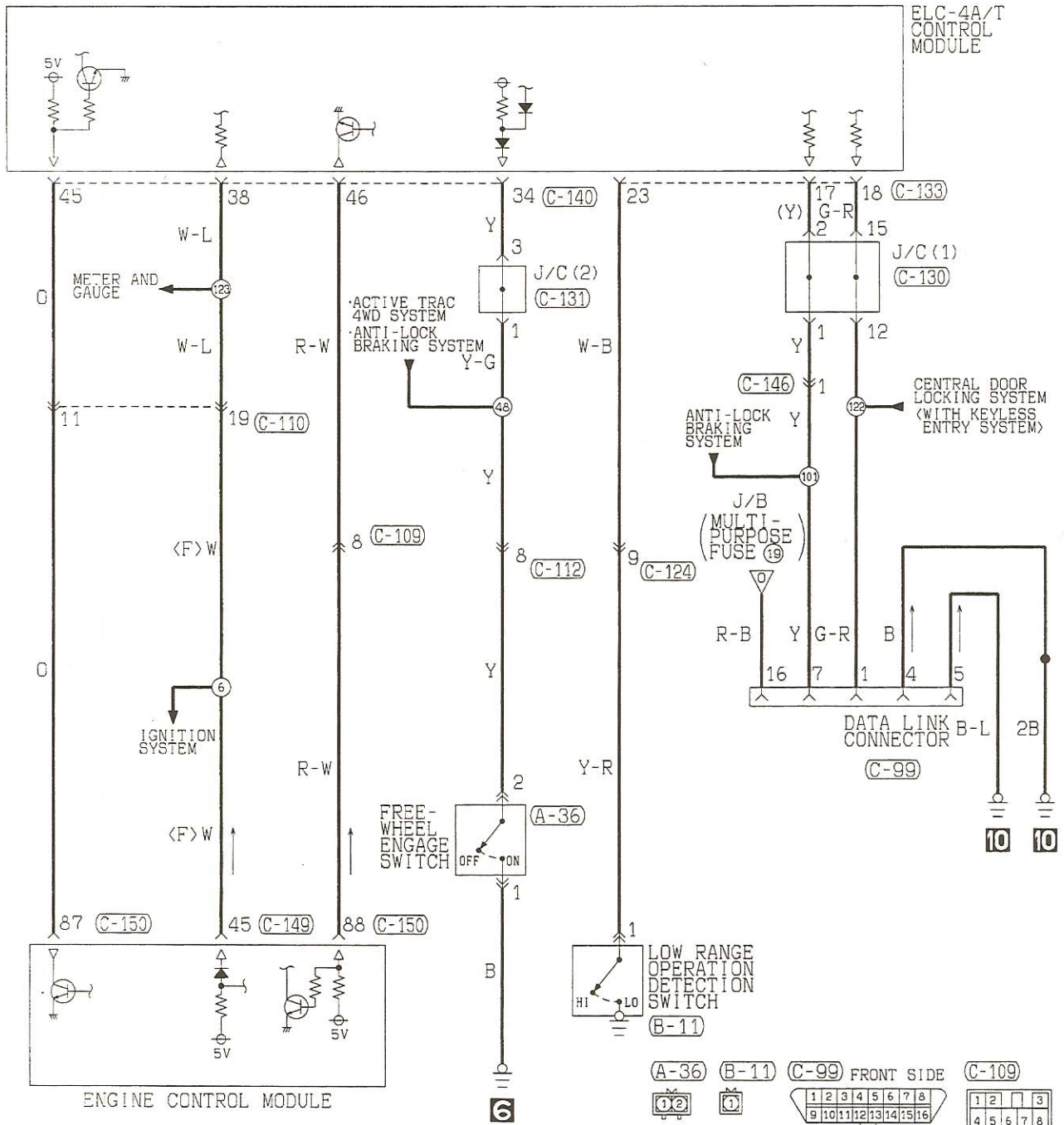
C-130											C-133											C-140														
1	2	3	4	5	6	7	8	9	10	11	1	2	3	4	5	6	7	8	9	10	11	12	13	1	2	3	4	5	6	7	8	9	10	11	12	13
12	13	14	15	16	17	18	19	20	21	22	14	15	16	17	18	19	20	21	22	23	24	25	26	31	32	33	34	35	36	37	38					
23	24	25	26	27	28	29	30	31	32	33														39	40	41	42	43	44	45	46					

Wire color code
 B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
 BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

8907M00CB

TSB Revision

ELC 4-SPEED AUTOMATIC TRANSMISSION (CONTINUED)



C-110

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22								

C-112

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18						

C-124

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			

C-130

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

C-131

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

C-133

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

C-140

31	32	33	34	35	36	37	38
39	40	41	42	43	44	45	46

C-146

1	2	3
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C-149

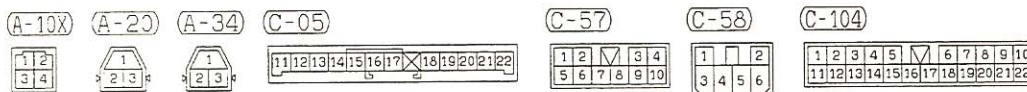
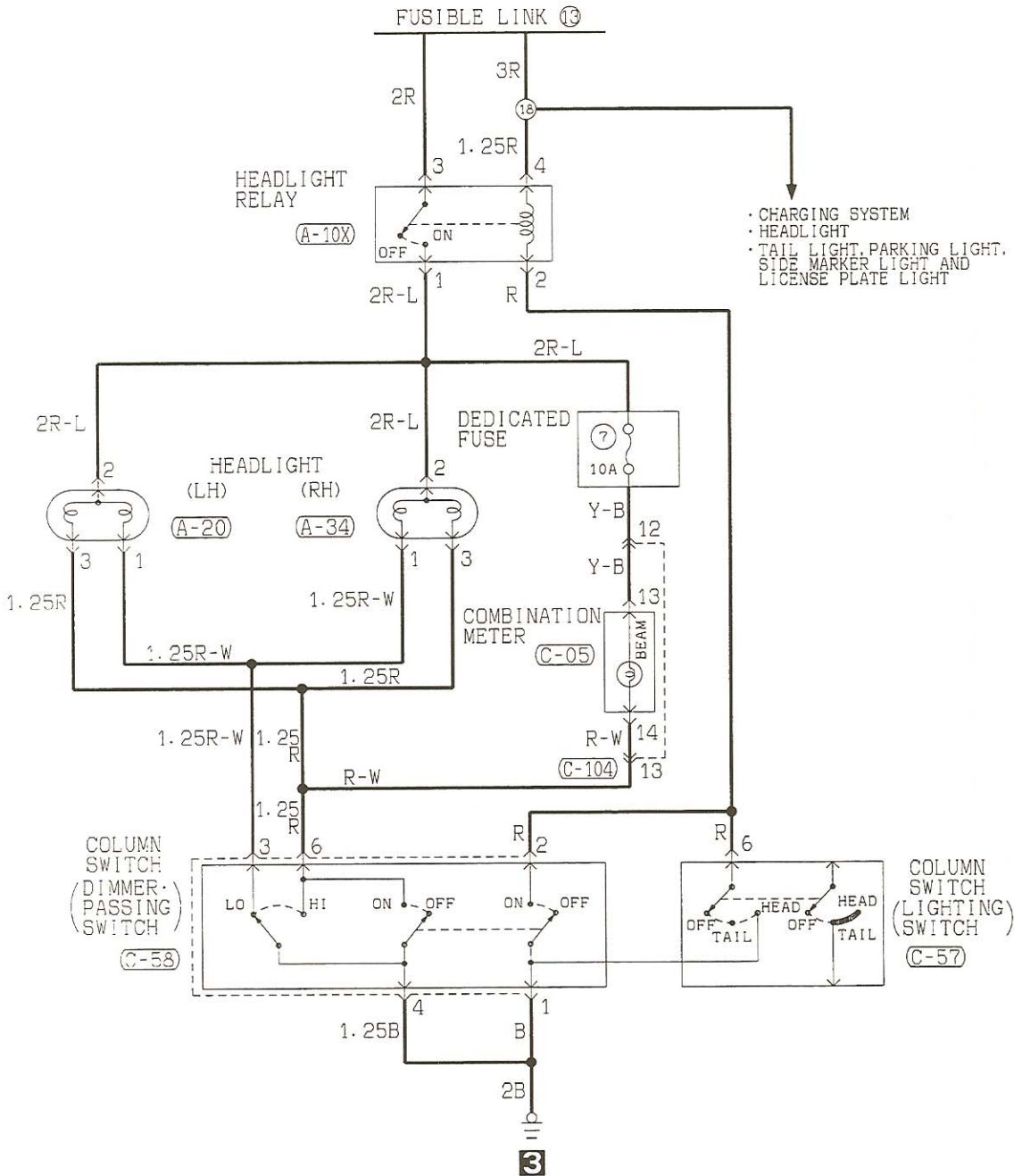
41	42	43	44	45	46	47
48	49	50	51	52	53	54
55	56	57	58	59	60	61
62	63	64	65	66	67	68

C-150

71	72	73	74	75	76	77
78	79	80	81	82	83	84
85	86	87	88	89	90	91
92	93	94	95	96	97	98
99	100					

HEADLIGHT

90100150708



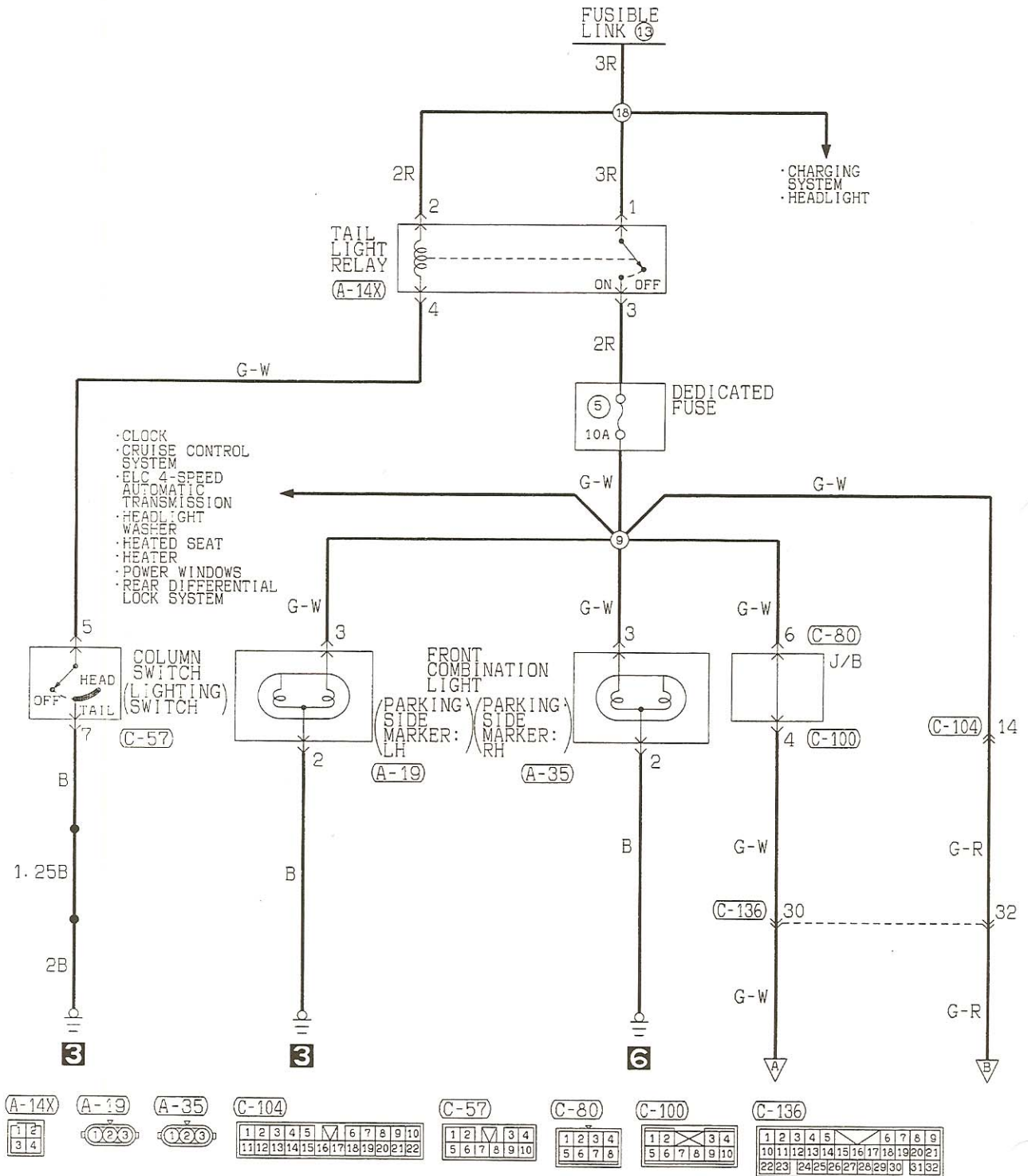
Wire color code
 B : Black LG: Light green G : Green L : Blue W : White Y : Yellow SB: Sky blue
 BR: Brown O : Orange GR: Gray R : Red P : Pink V : Violet

8Q08M00AA

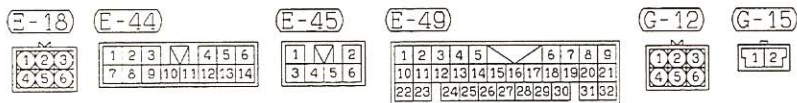
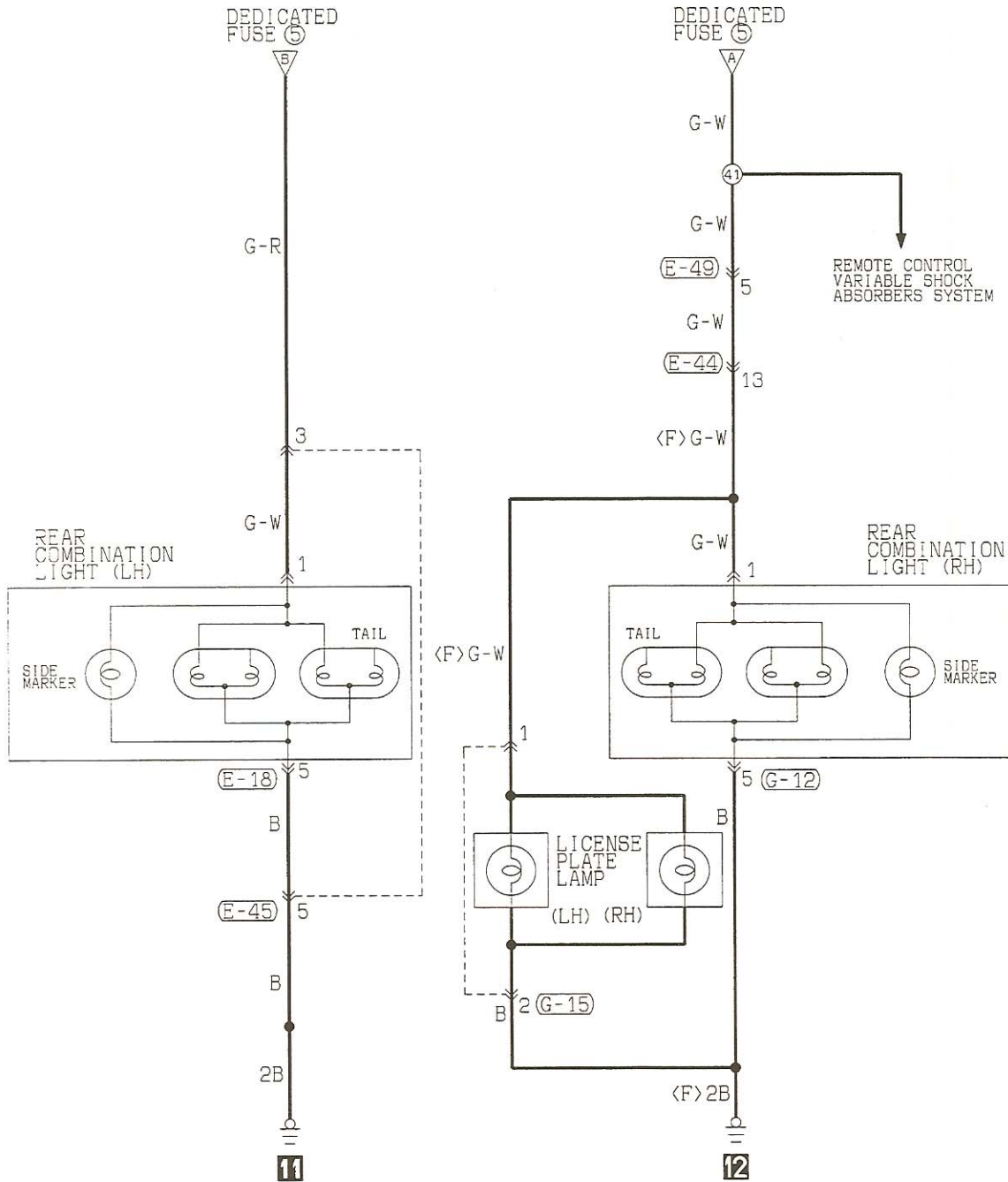
TSB Revision

**TAIL LIGHT, PARKING LIGHT, SIDE MARKER LIGHT AND
LICENSE PLATE LIGHT**

901013



TSB Revision



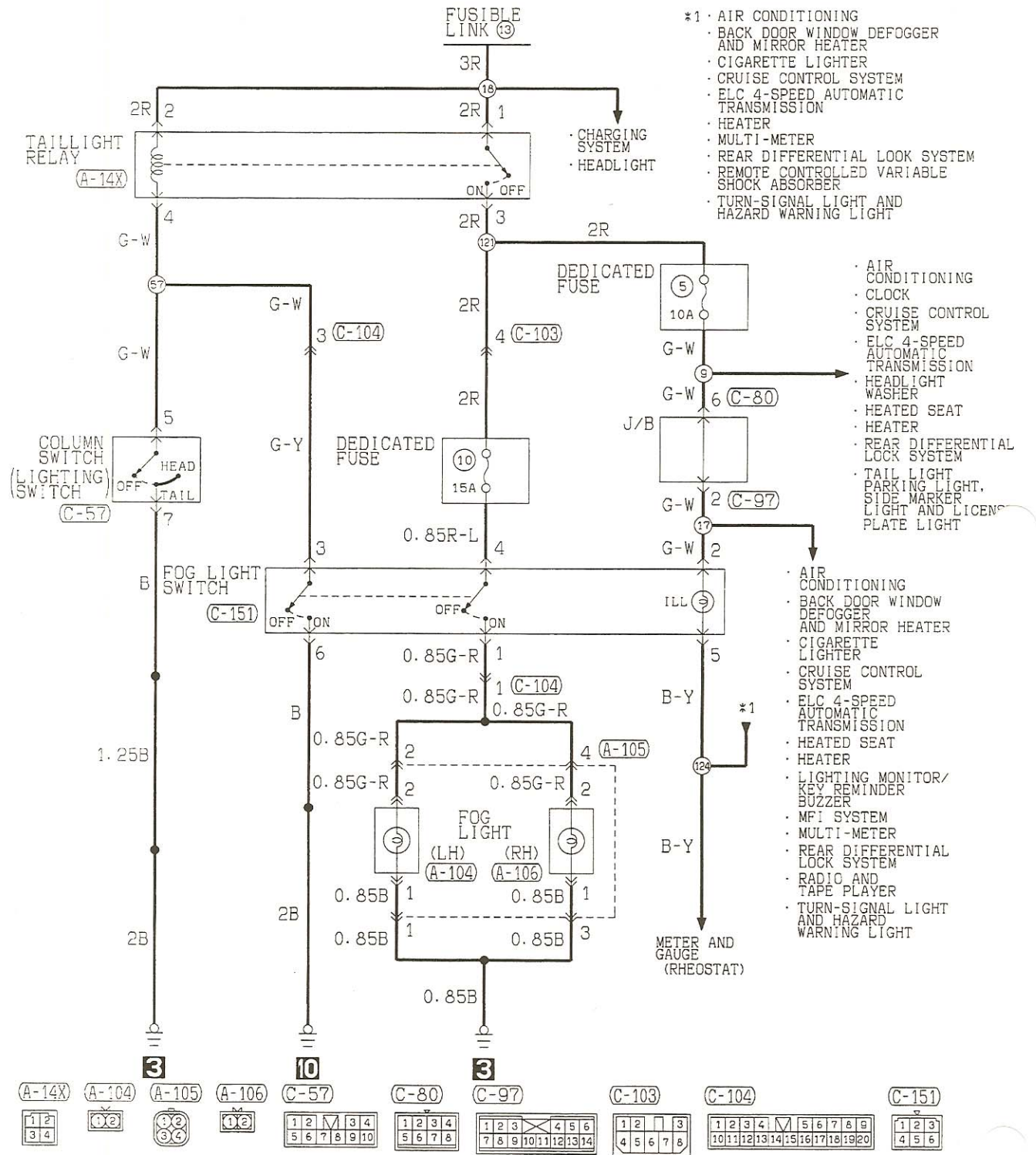
Wire color code
 B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
 BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

8Q08M01AB

TSB Revision

FOG LIGHT

90100180006



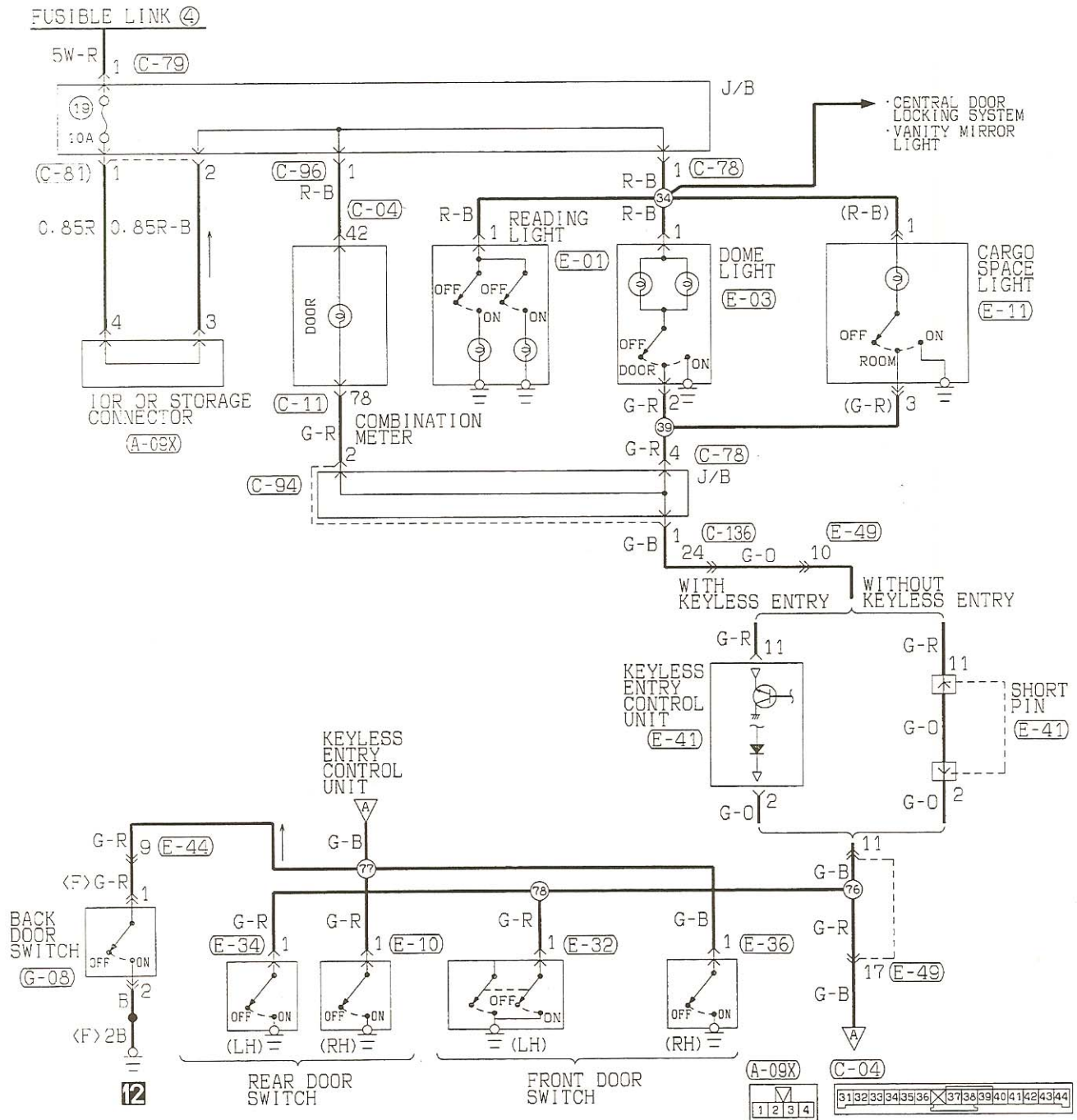
Wire color code
 B : black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
 BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

8Q08M02AA

TSB Revision

DOME LIGHT, CARGO SPACE LIGHT AND READING LIGHT

90101380106



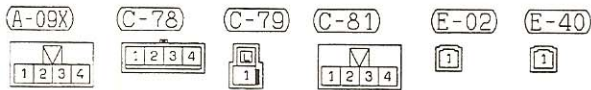
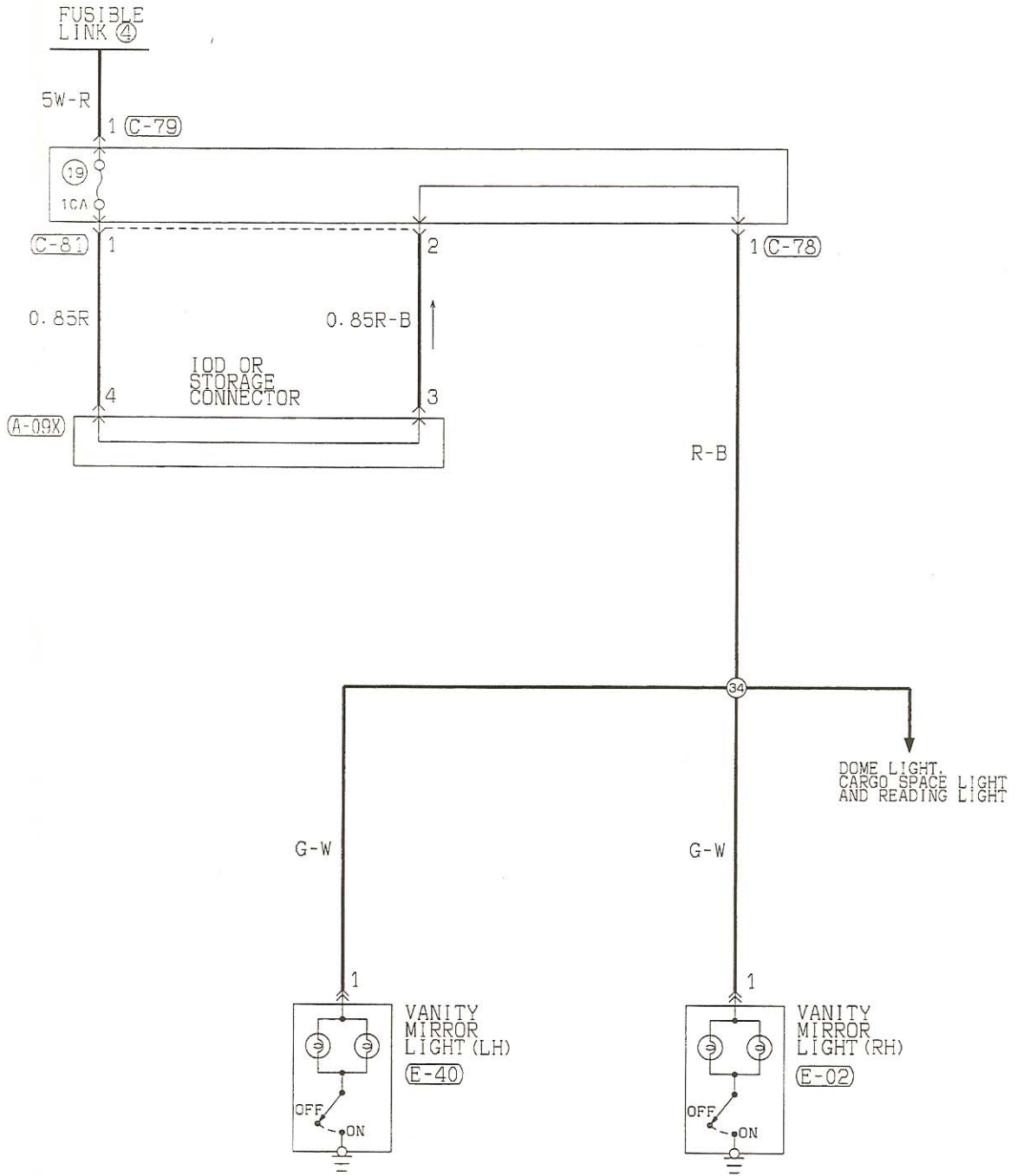
C-11	C-78	C-79	C-81	C-94	C-96	C-136	E-01
17 17 2 73 74 75 76 77 78 X 79 80 81 82 83 84	1 1 2 3 4	1	1 2 3 4	1 2 3 X 4 5 6 7 8 9 10 11 12	1 2 3 4 X 5 6 7 8 9 10 11 12 13 14 15 16	1 2 3 4 5 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32	1 4
E-03	E-10	E-11	E-32	E-34	E-36	E-41	E-44
1 1 2	1 1 2	1 1 2 3	1 1 2	1 1 2	1 1 2	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
							E-49
							1 2 3 4 5 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
							G-08
							1 2

8Q08MC3AA

TSB Revision

VANITY MIRROR LIGHT

90100240005



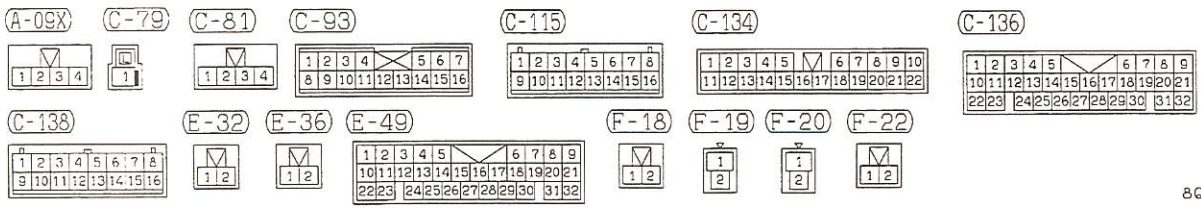
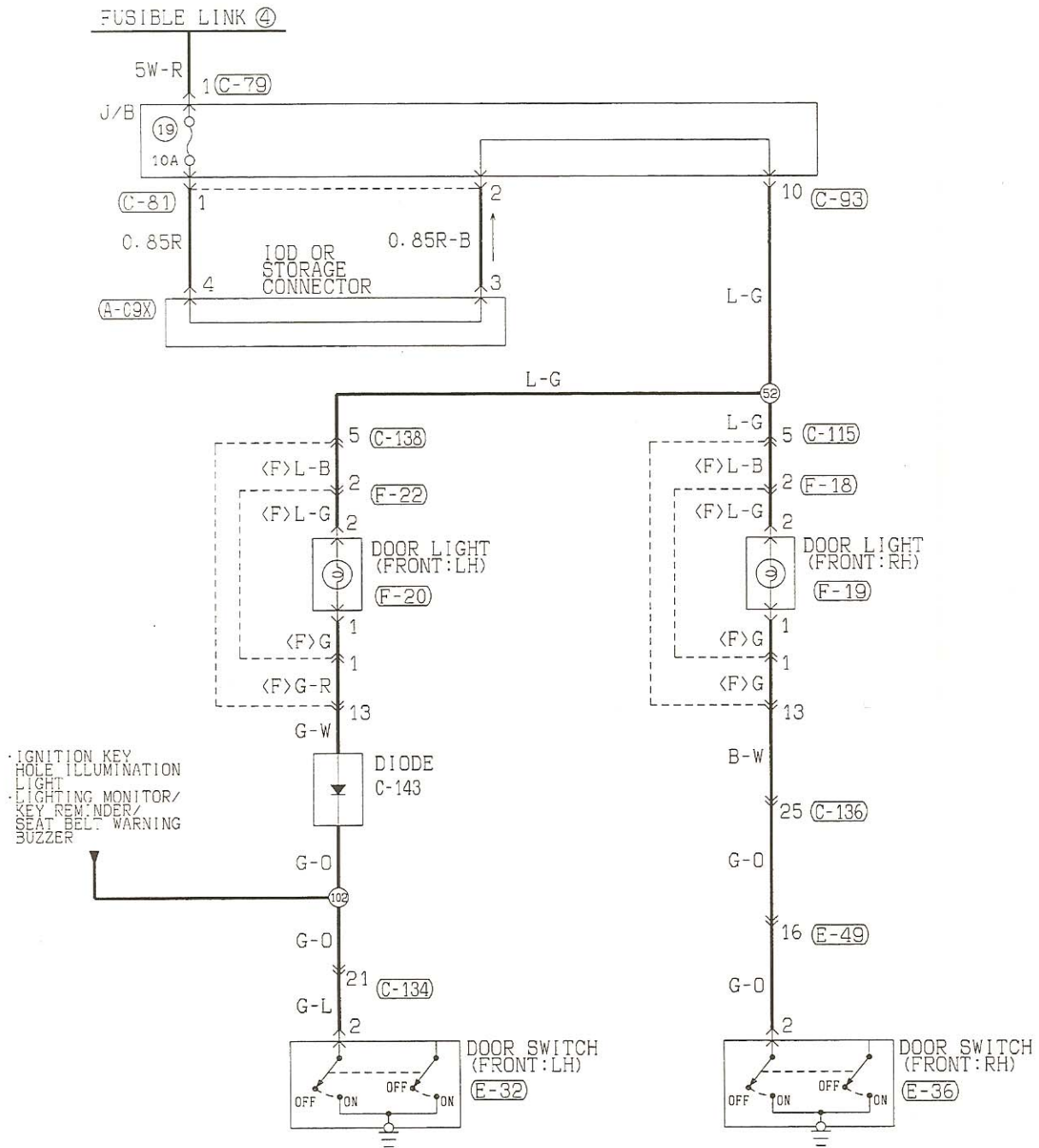
Wire color code
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 BR: Brown O: Orange GR: Gray R: Red P: Pink V: Violet

8Q08M04AA

TSB Revision

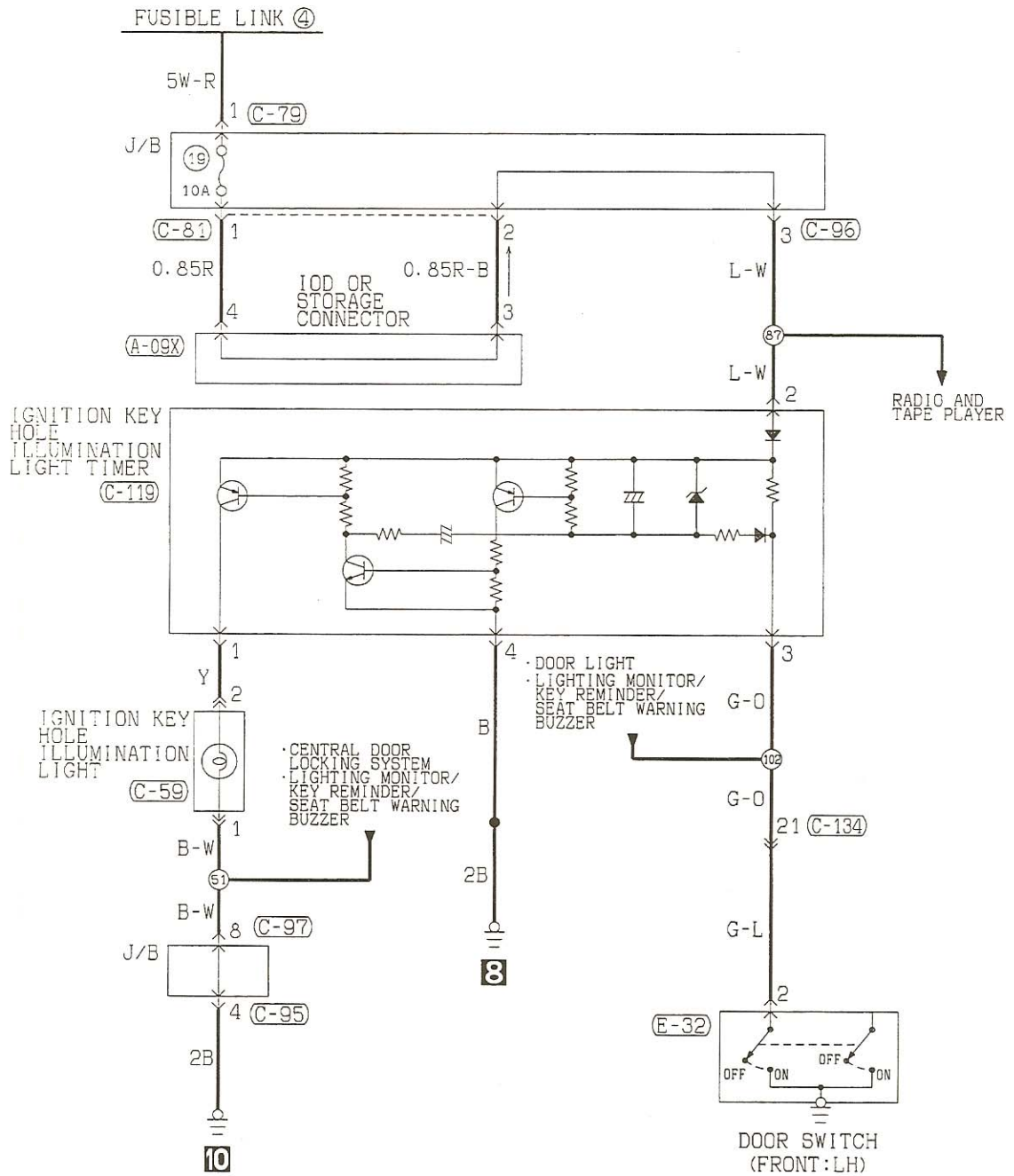
DOOR LIGHT

90100250231



TSB Revision

IGNITION KEY HOLE ILLUMINATION LIGHT



(A-09X)	(C-59)	(C-79)	(C-81)	(C-95)	(C-96)	(C-97)	(C-119)	(C-134)

(E-32)

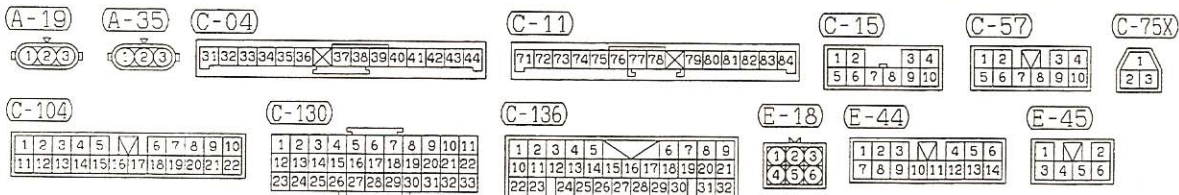
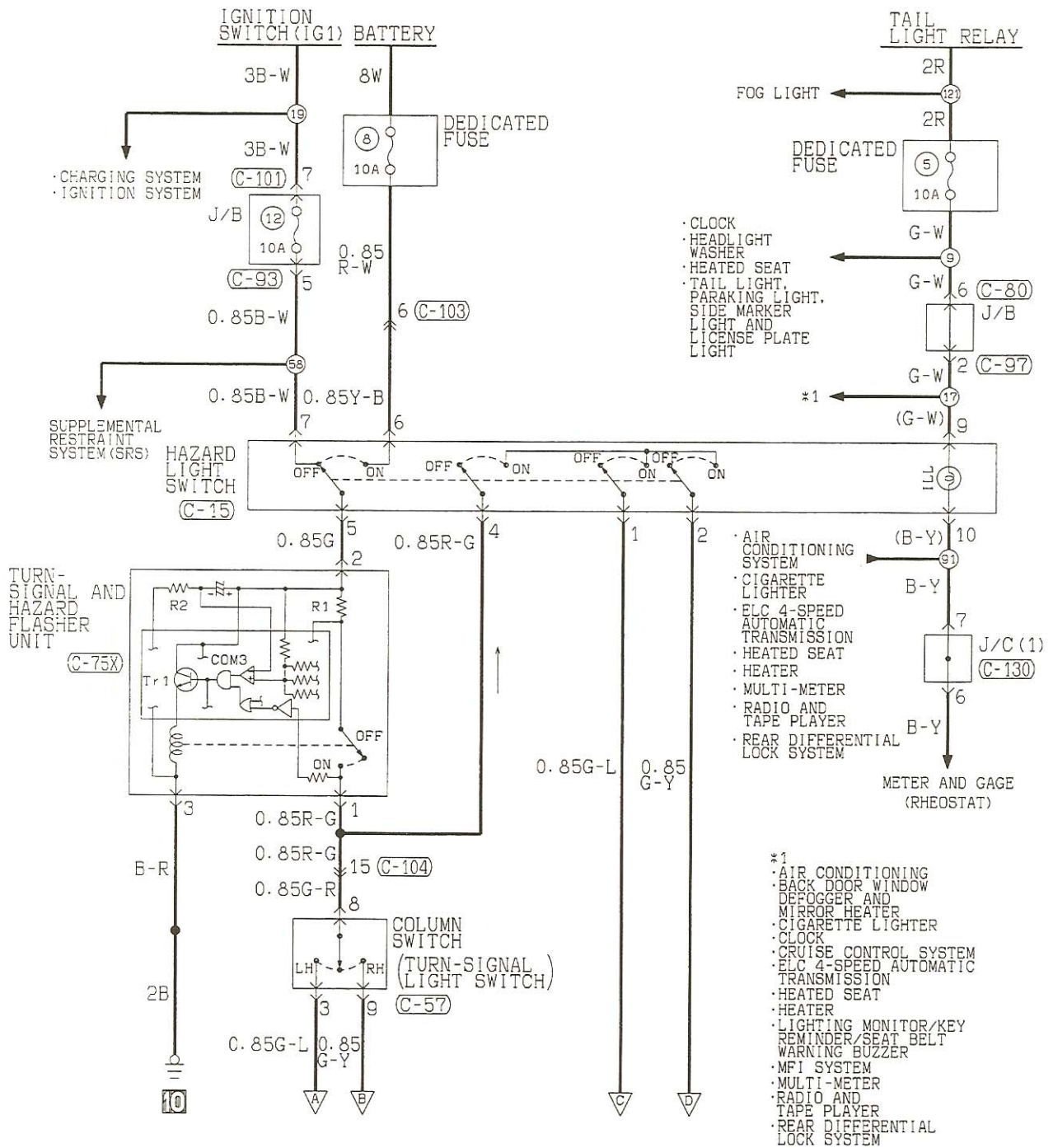
Wire color code
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 BR: Brown O : Orange GR: Gray R : Red P : Pink V : Violet

TSB Revision

NOTES

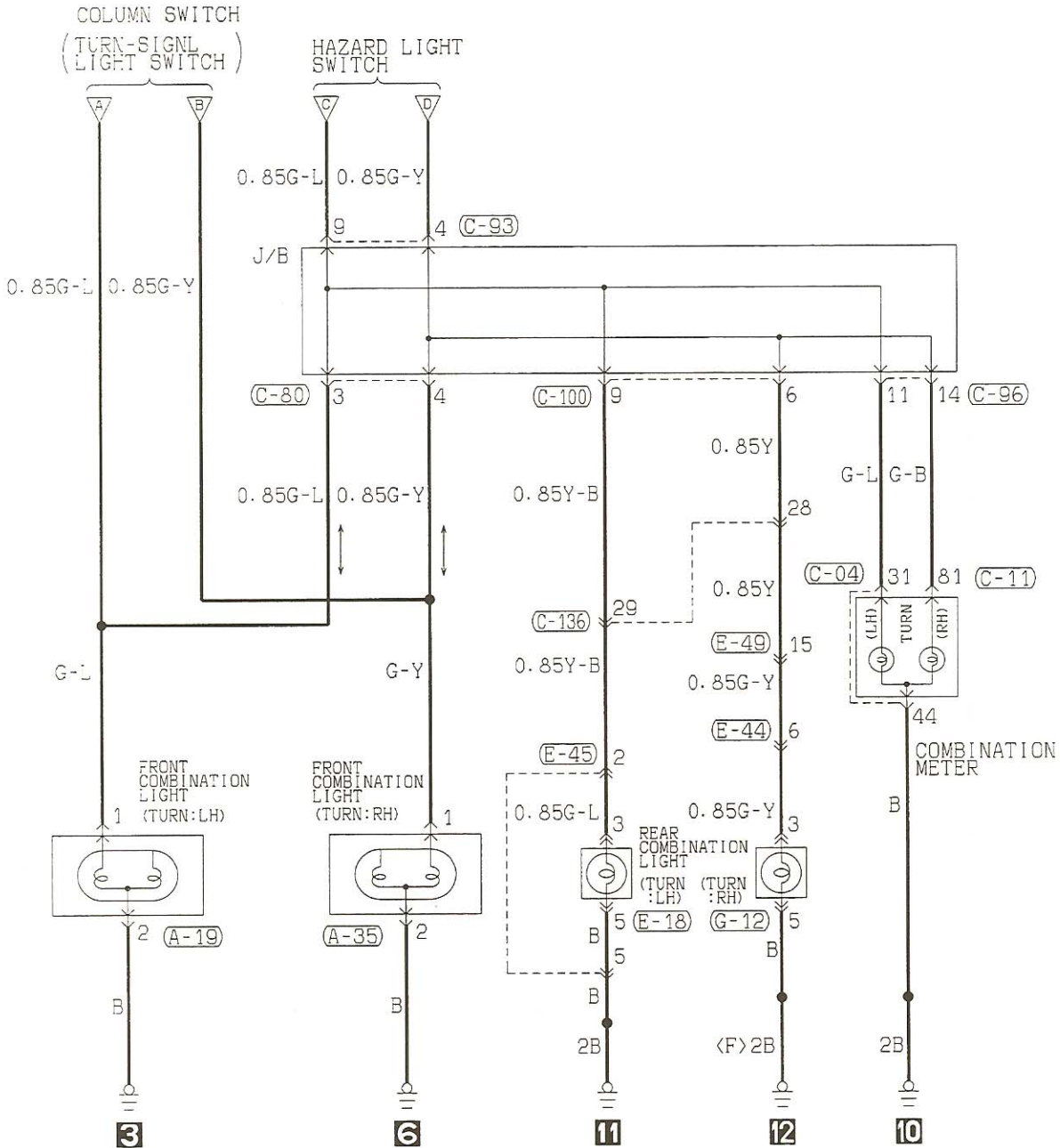
TURN-SIGNAL LIGHT AND HAZARD LIGHT

90100290



8Q09M00AA

TSB Revision



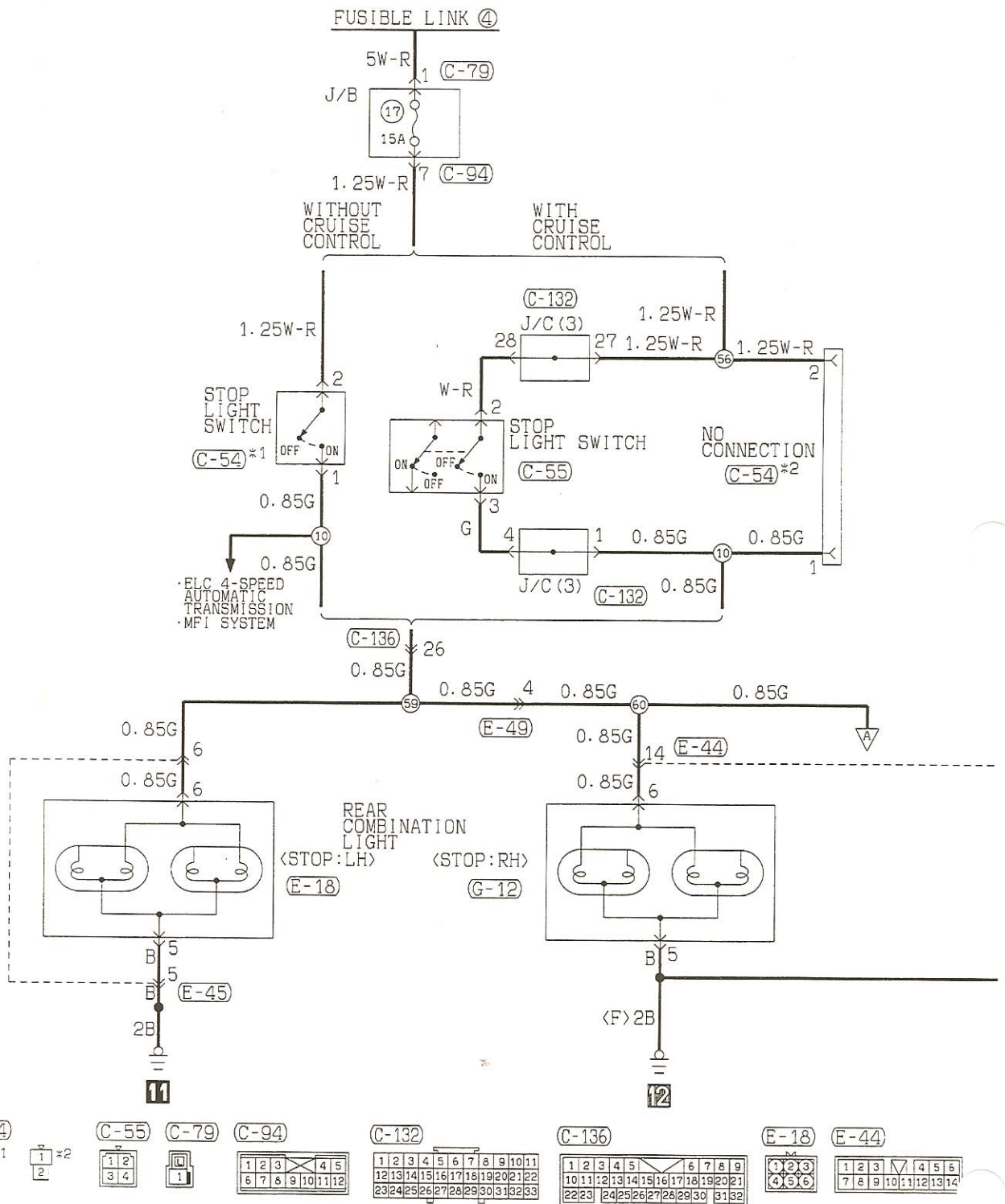
C-80	C-93	C-96	C-97	C-100	C-101	C-103
1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	1 2 3 4 5 6 7 8 9 10 11 12 13 14	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8
E-49	G-12	Wire color code		G : Green	L : Blue	
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32	1 2 3 4 5 6	B : Black	LG : Light green	GR : Gray	RD : Red	
		BR : Brown	O : Orange	P : Pink	Y : Yellow	
		W : White	SB : Sky blue			
		V : Violet				

8Q09MCOAB

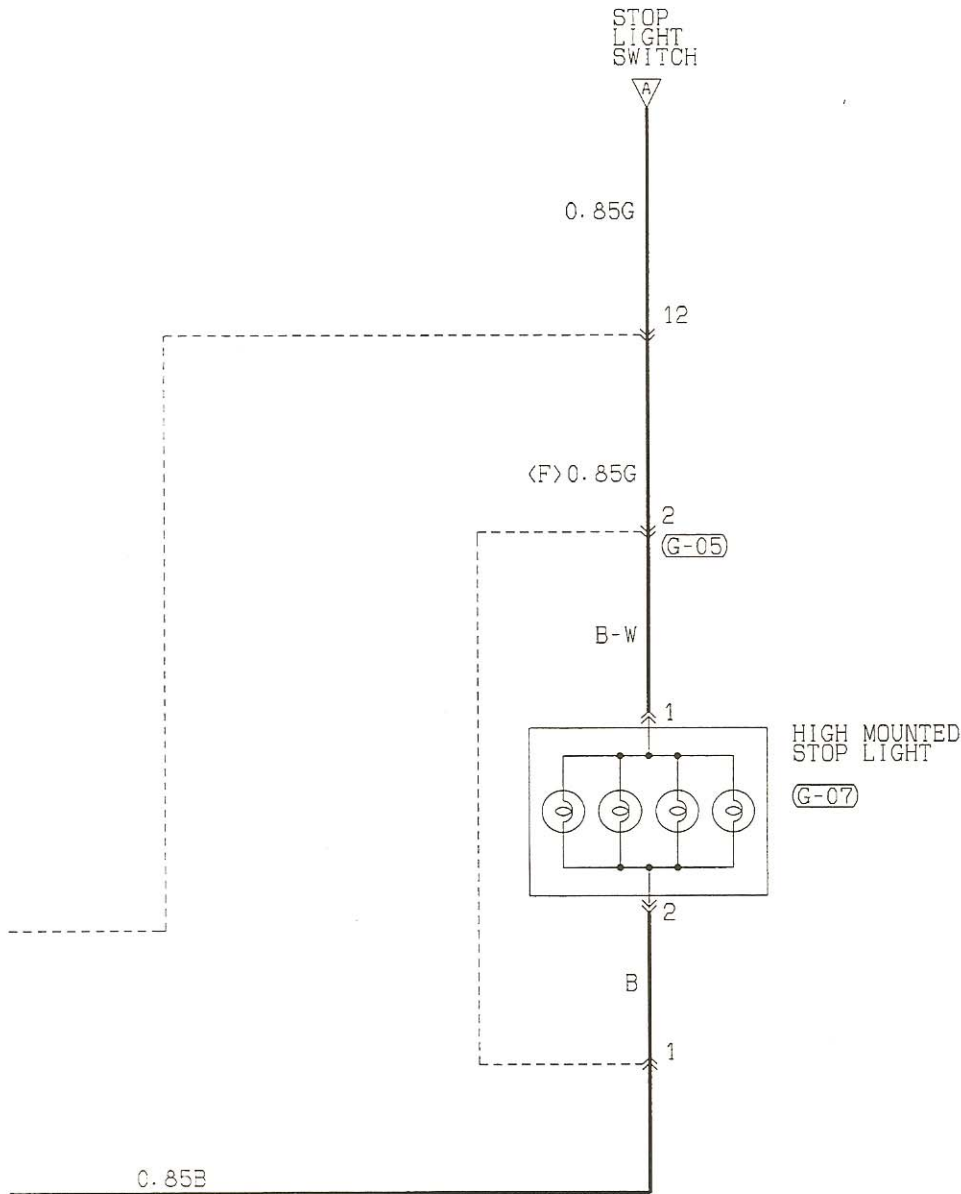
TSB Revision

STOP LIGHT

9010030047



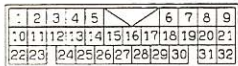
TSB Revision



(E-45)



(E-49)



(G-05)



(G-07)



(G-12)



Wire color code

B :Black LG:Light green
BR:Brown O :Orange

G :Green GR:Gray

L :Blue R :Red

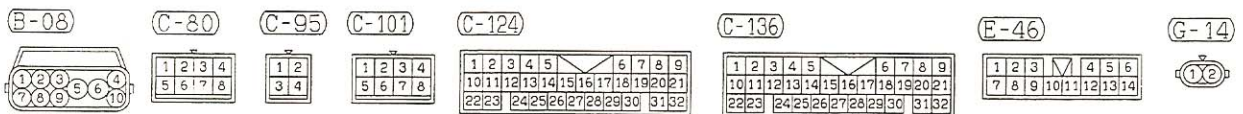
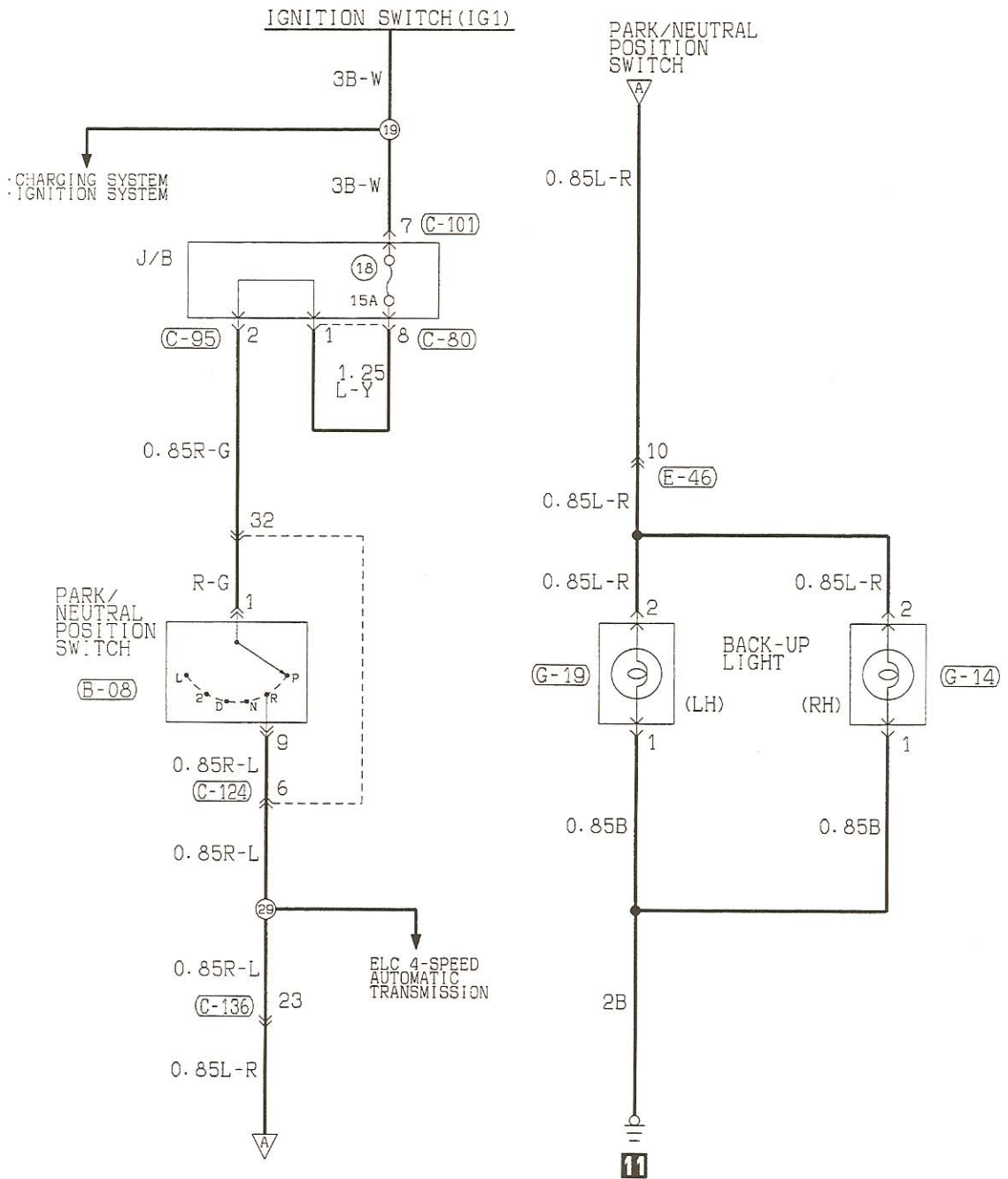
W :White P :Pink

Y :Yellow V :Violet

SB:Sky blue

BACK-UP LIGHT

90100310508



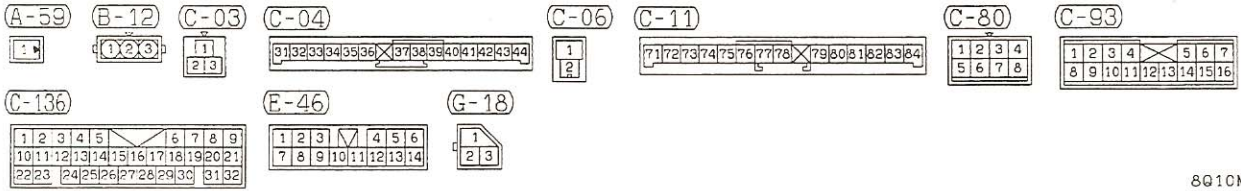
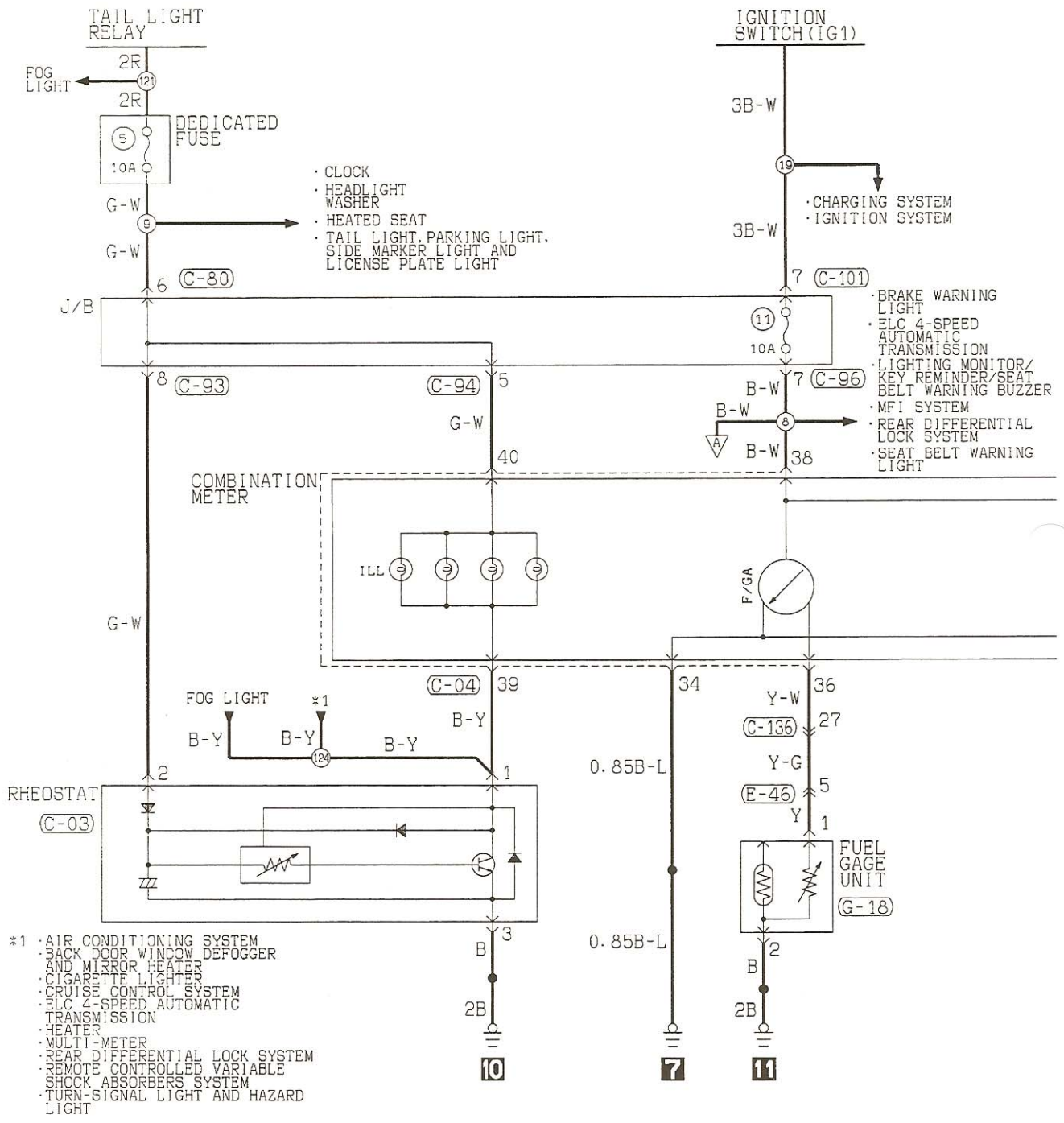
Wire color code
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 BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

8009M03AA

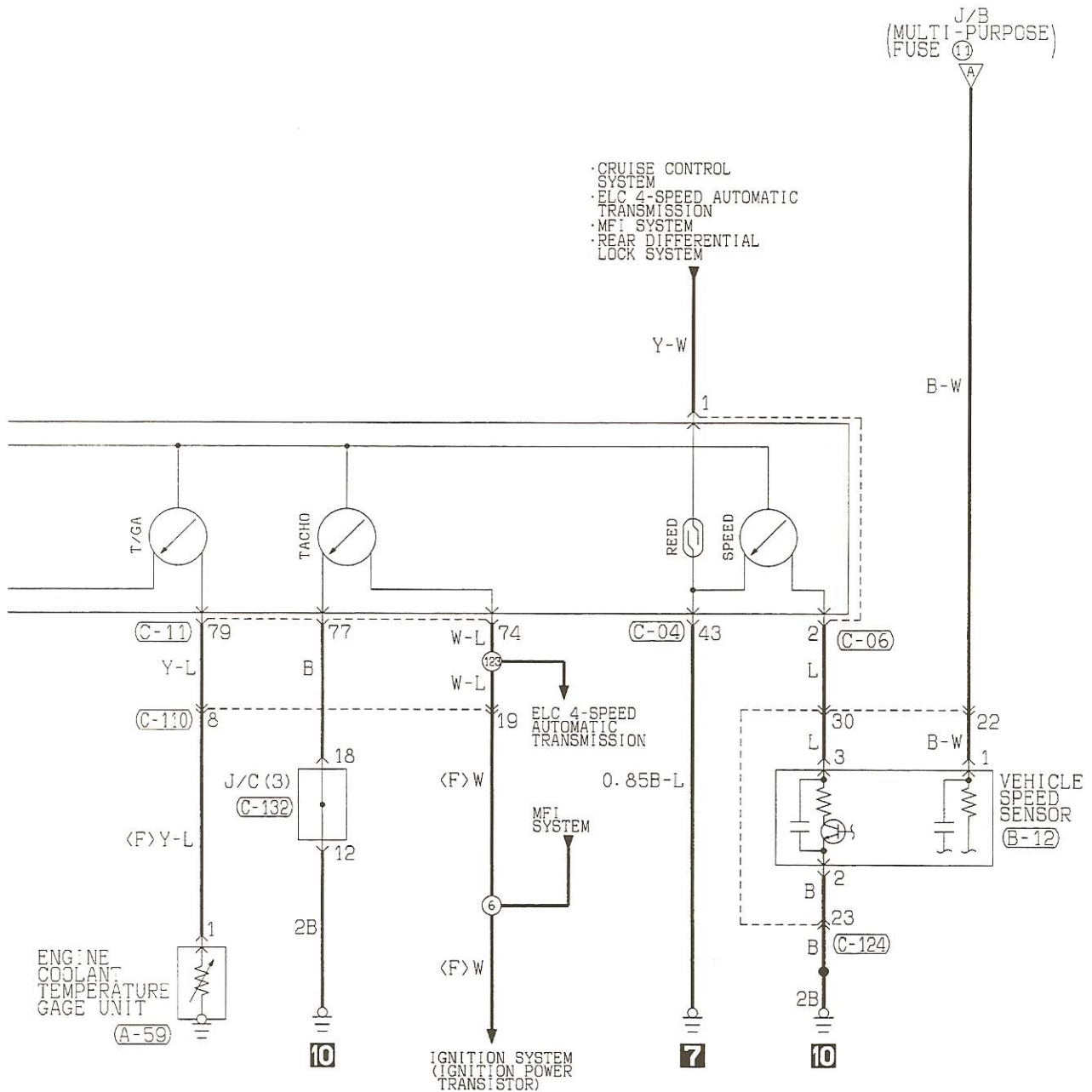
TSB Revision

METER AND GAGE

90100350007



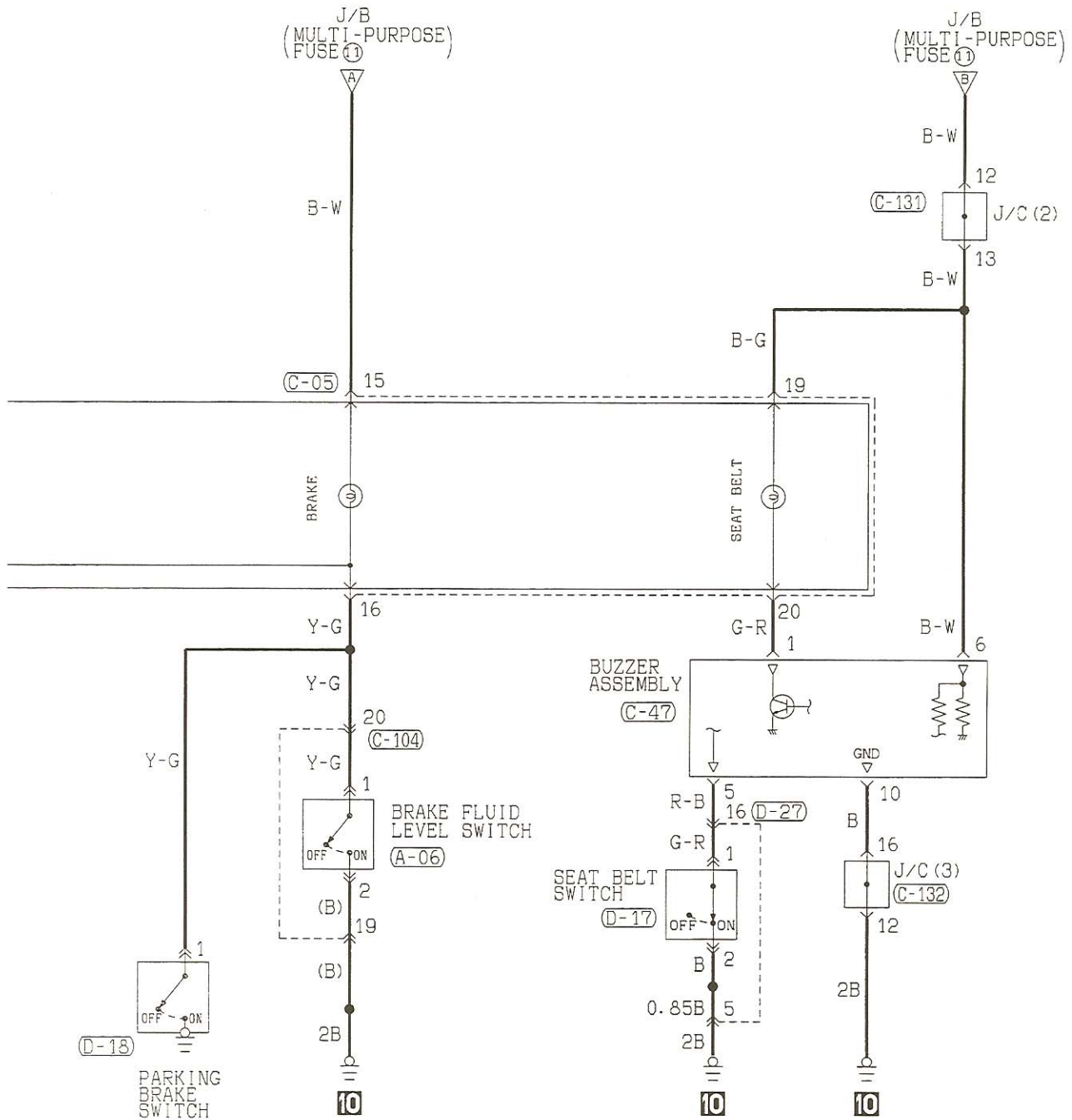
TSB Revision



C-94	C-96	C-101	C-110	C-124	C-132
1 2 3 4 5 6 7 8 9 10 11 12	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 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 23 24 25 26 27 28 29 30 31 32	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

Wire color code
 B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
 BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

TSB Revision



(C-12)

5	15	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
---	----	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

(C-47)

1	2	3	4	5	6	7	8	9	10
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(C-96)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
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(C-101)

1	2	3	4	5	6	7	8
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(C-104)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
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(C-131)

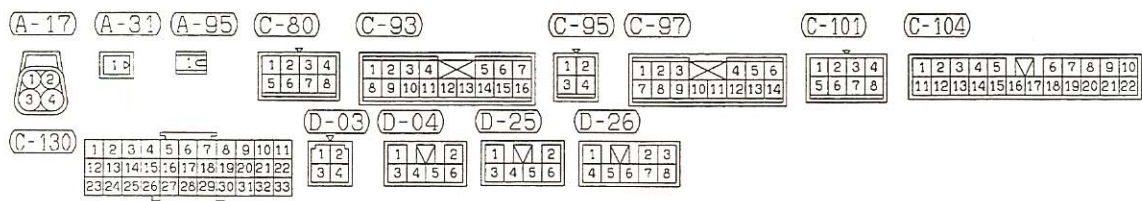
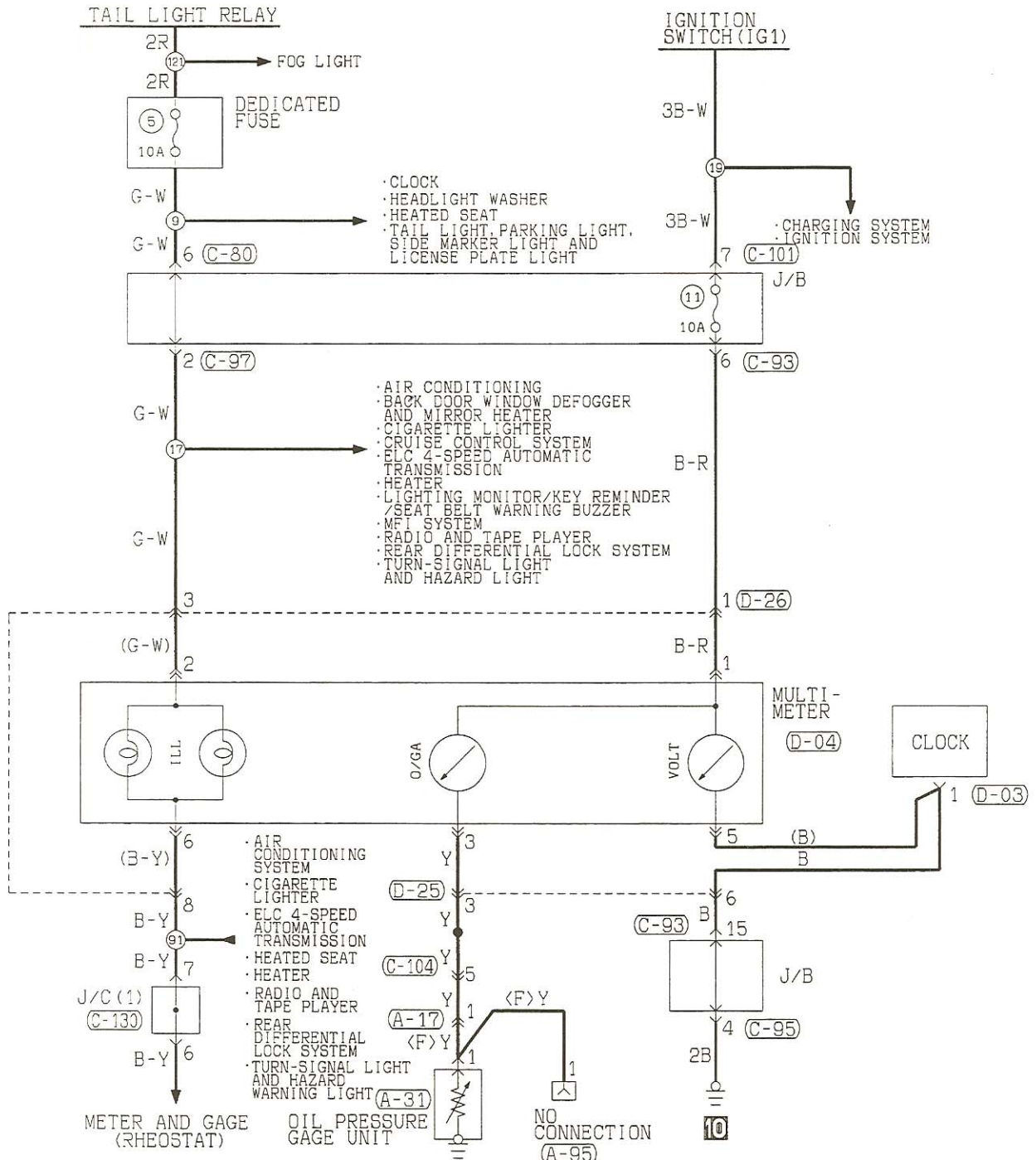
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Wire color code
 B : Black LG: Light green G : Green L : Blue W : White Y : Yellow SB: Sky blue
 BR: Brown O : Orange GR: Gray R : Red P : Pink V : Violet

TSB Revision

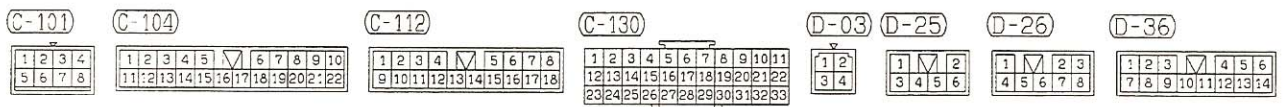
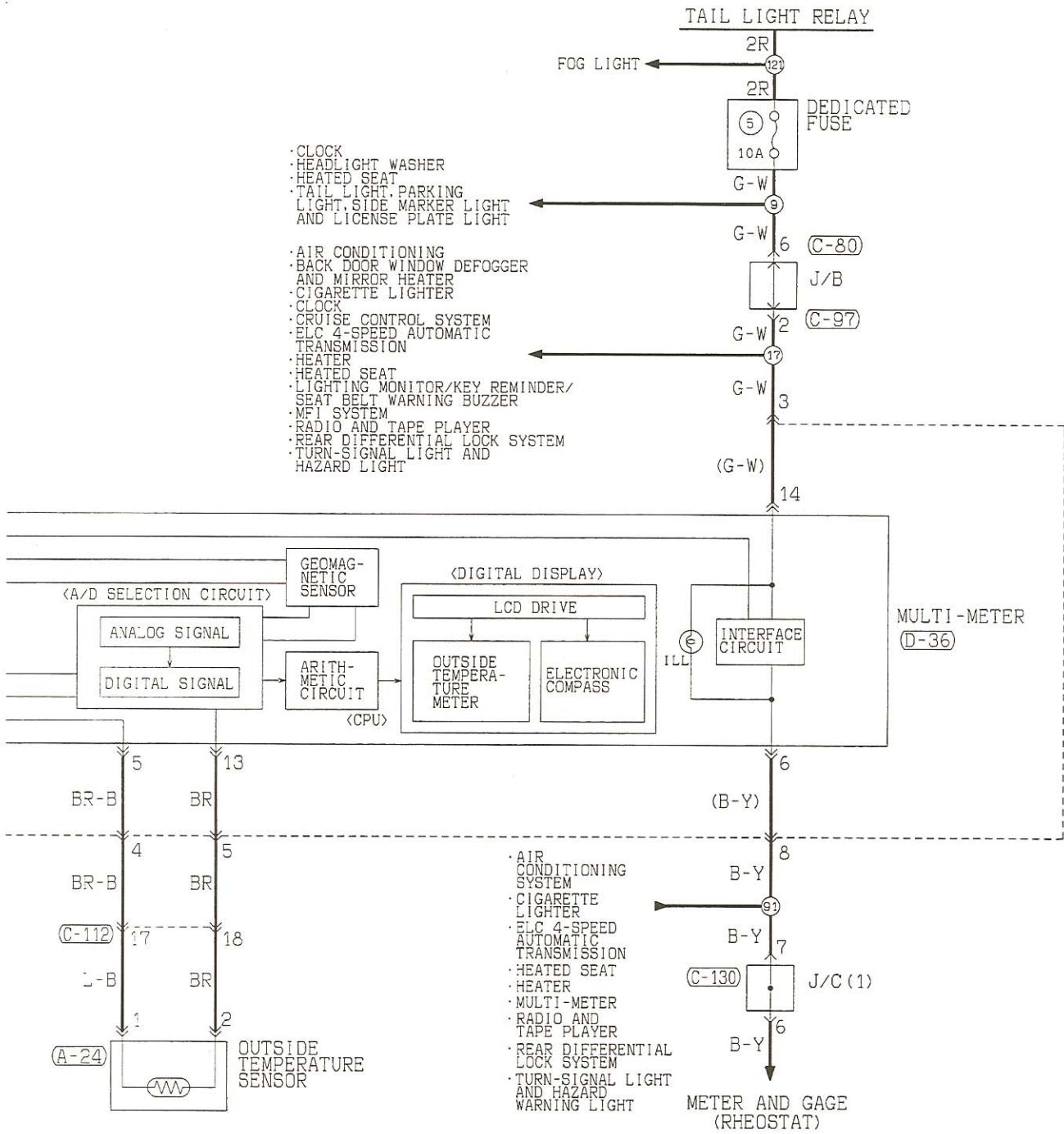
MULTI METER <Vehicles without electronic compass>

9010043000



TSB Revision

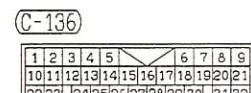
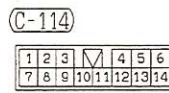
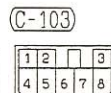
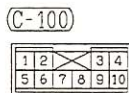
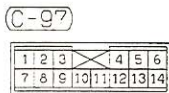
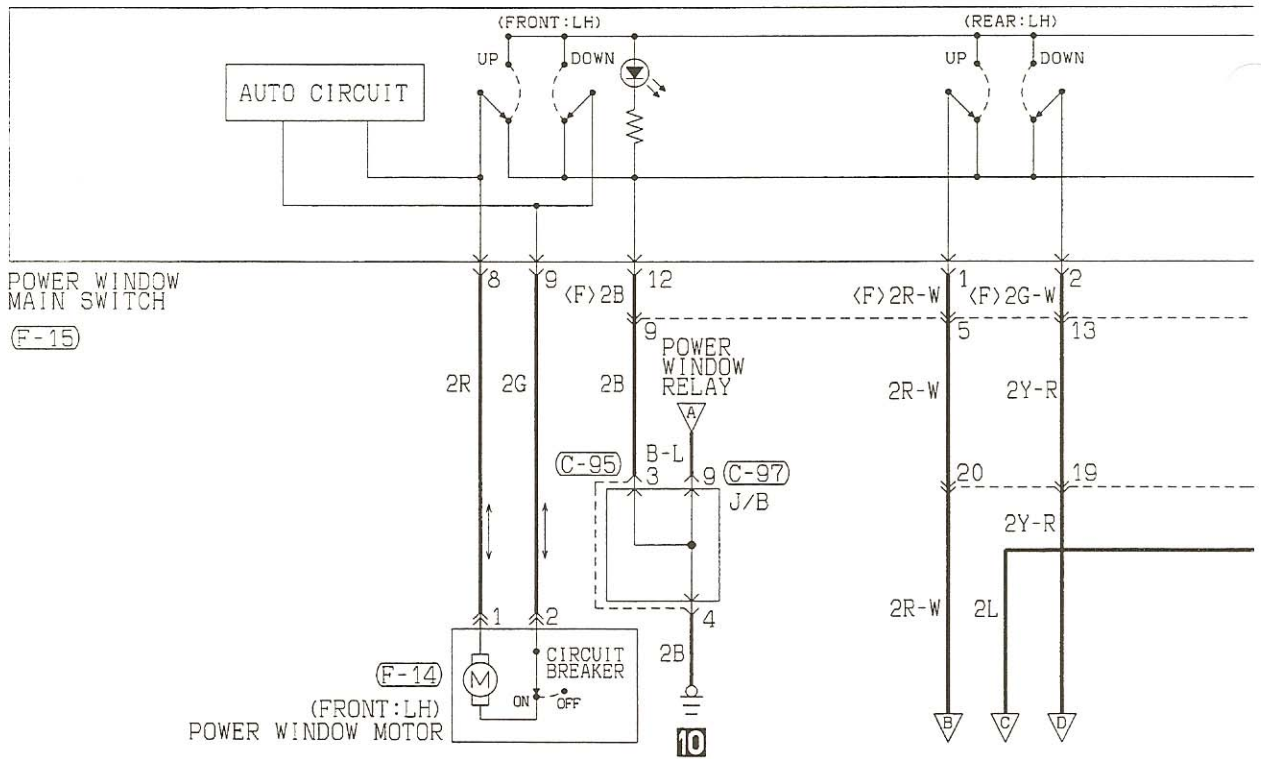
NOTES



Wire color code
 B :Black LG:Light green G :Green L :Blue W :White Y :Yellow SB:Sky blue
 BR:Brown O :Orange GR:Gray R :Red P :Pink V :Violet

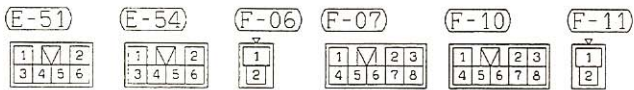
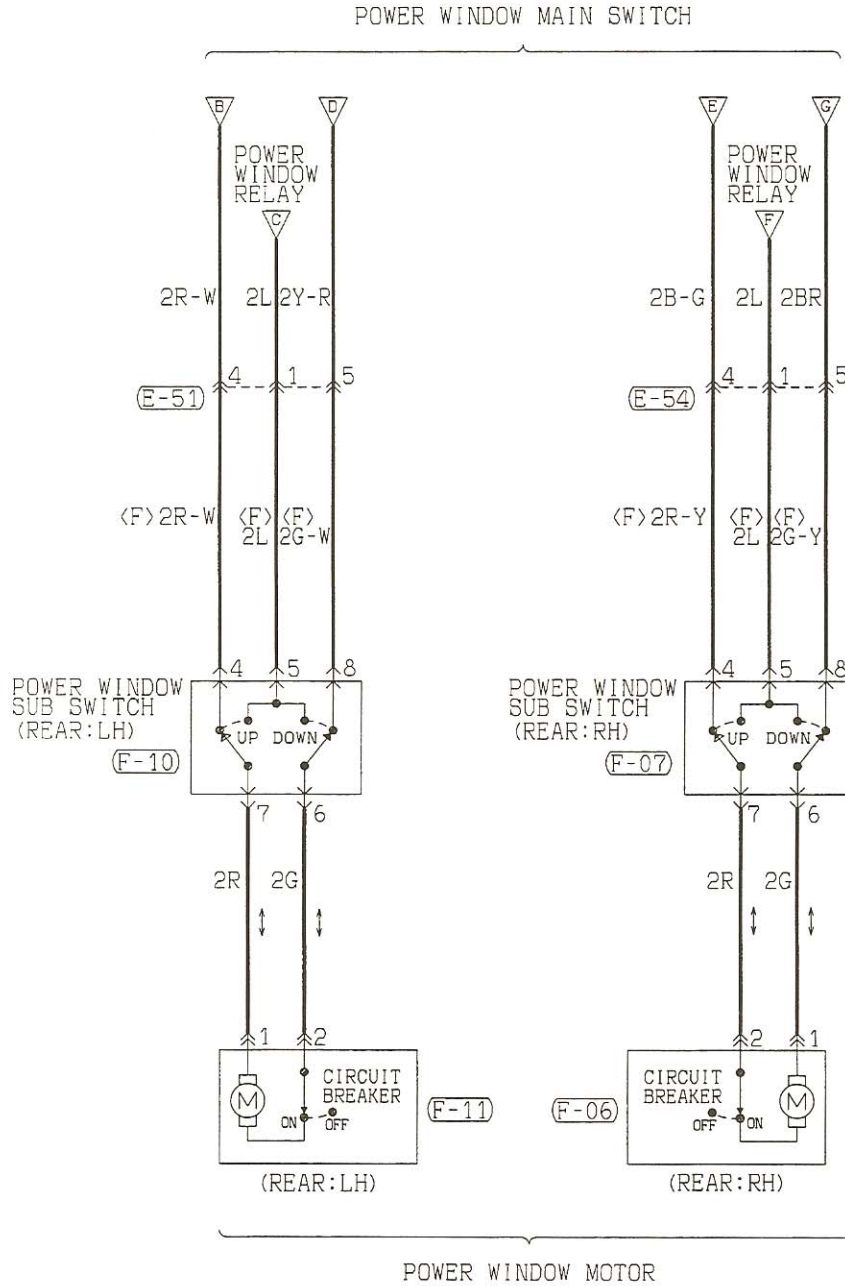
TSB Revision

POWER WINDOWS



TSB Revision

POWER WINDOWS (CONTINUED)



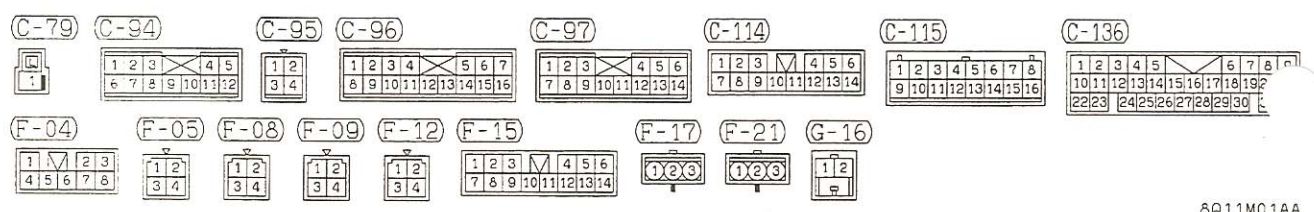
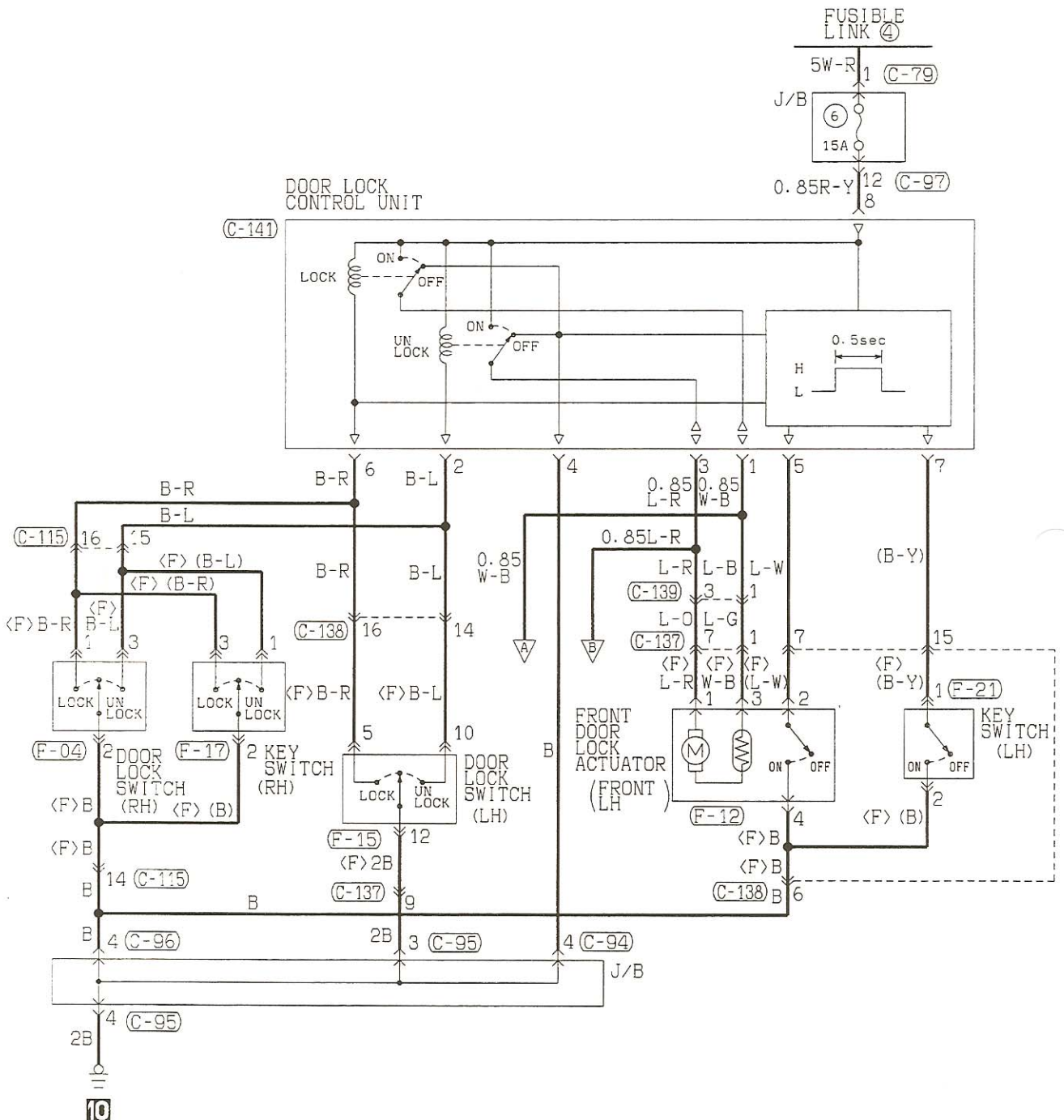
Wire color code
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 BR:Brown O:Orange GR:Gray R:Red P:Pink V:Violet

TSB Revision

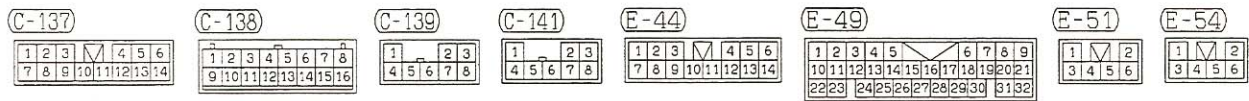
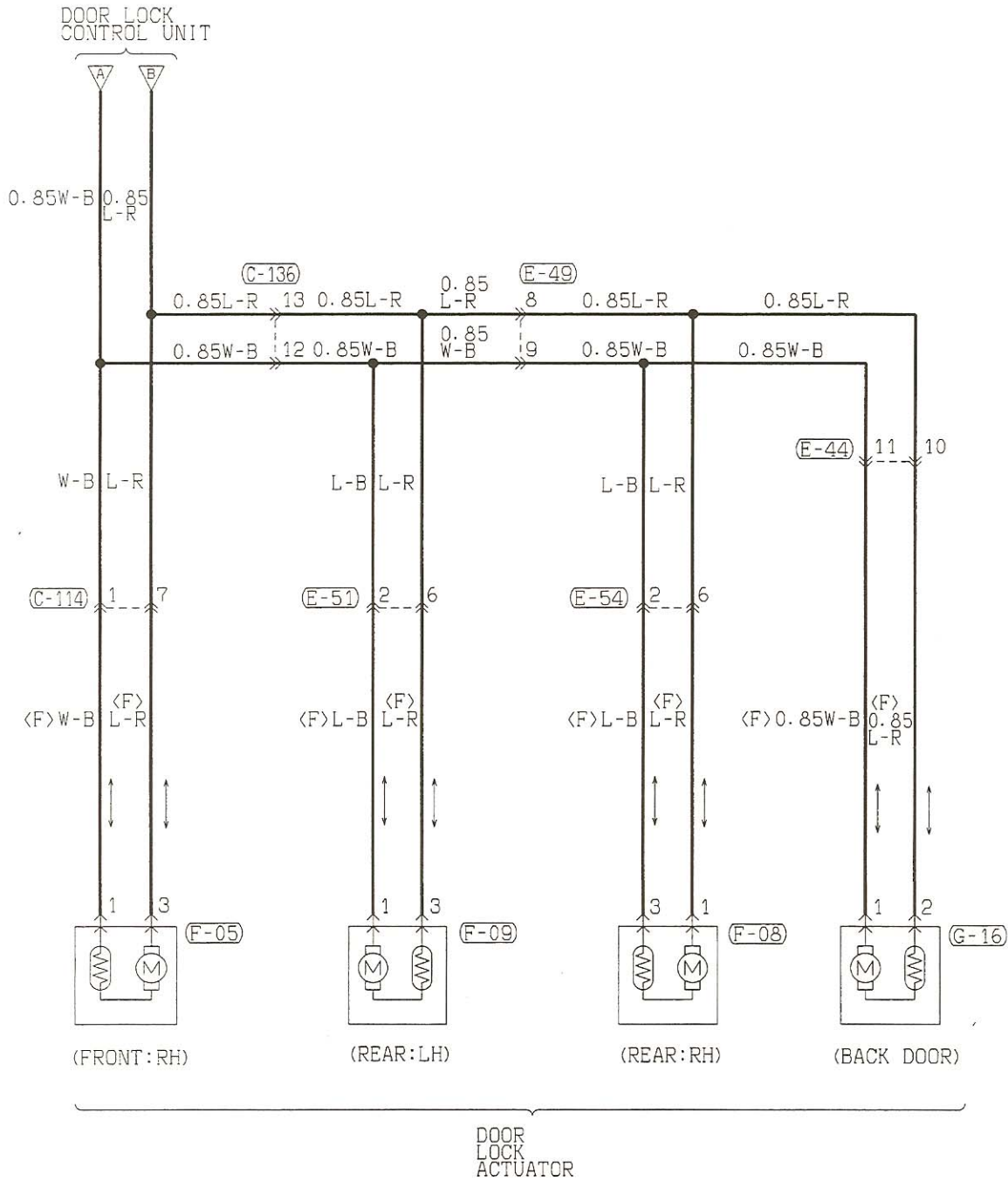
NOTES

CENTRAL DOOR LOCKING SYSTEM <Vehicles without keyless entry system>

901004



TSB Revision



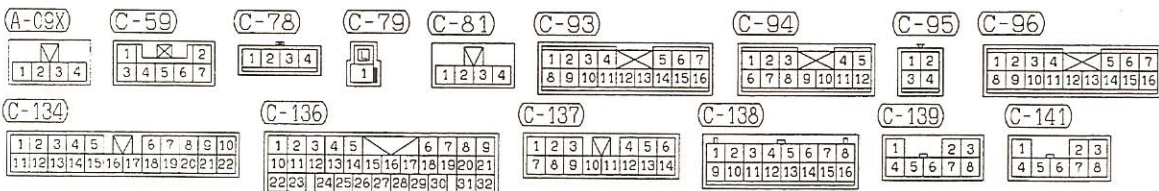
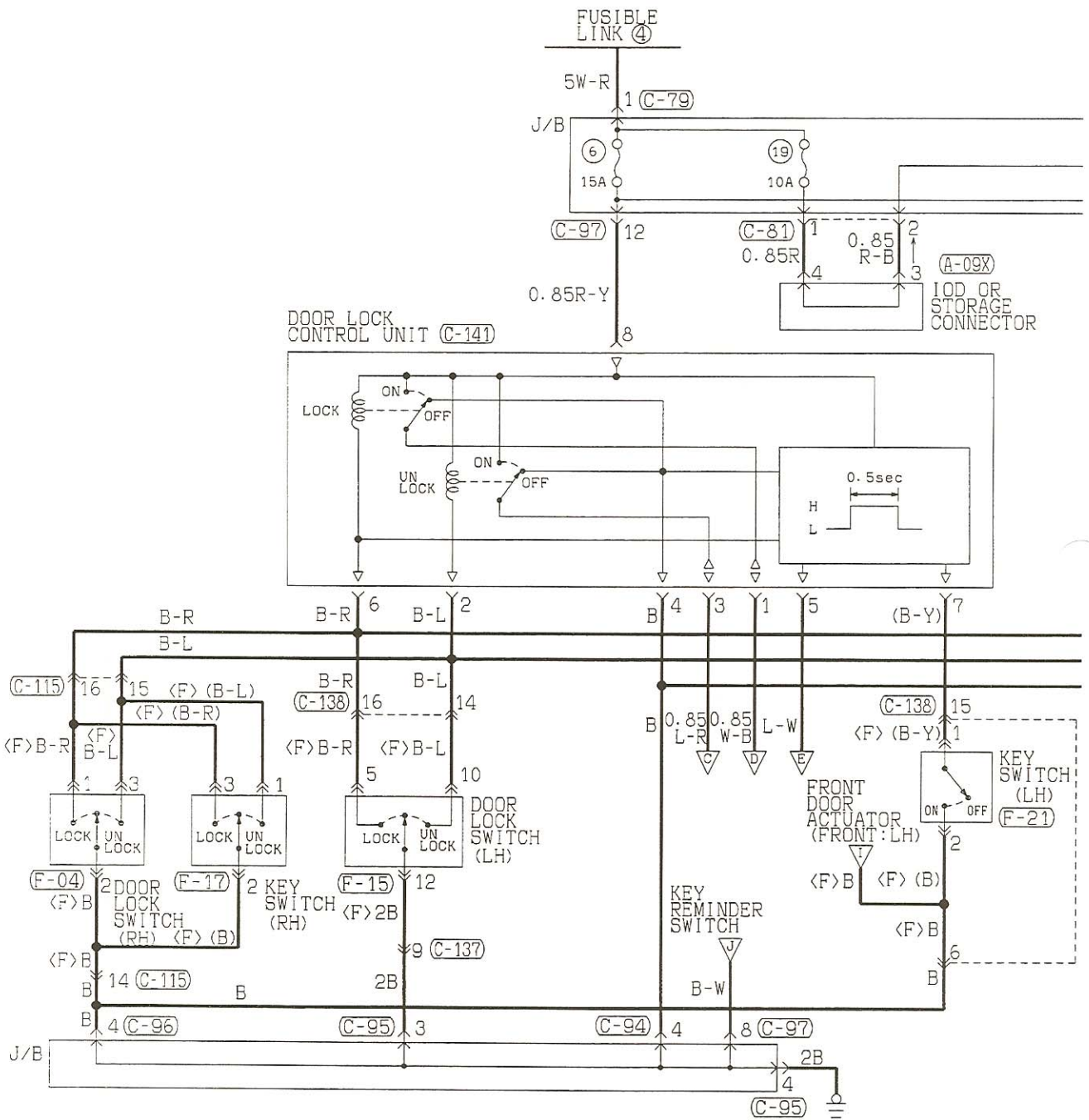
Wire color code
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 BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

8011M01AB

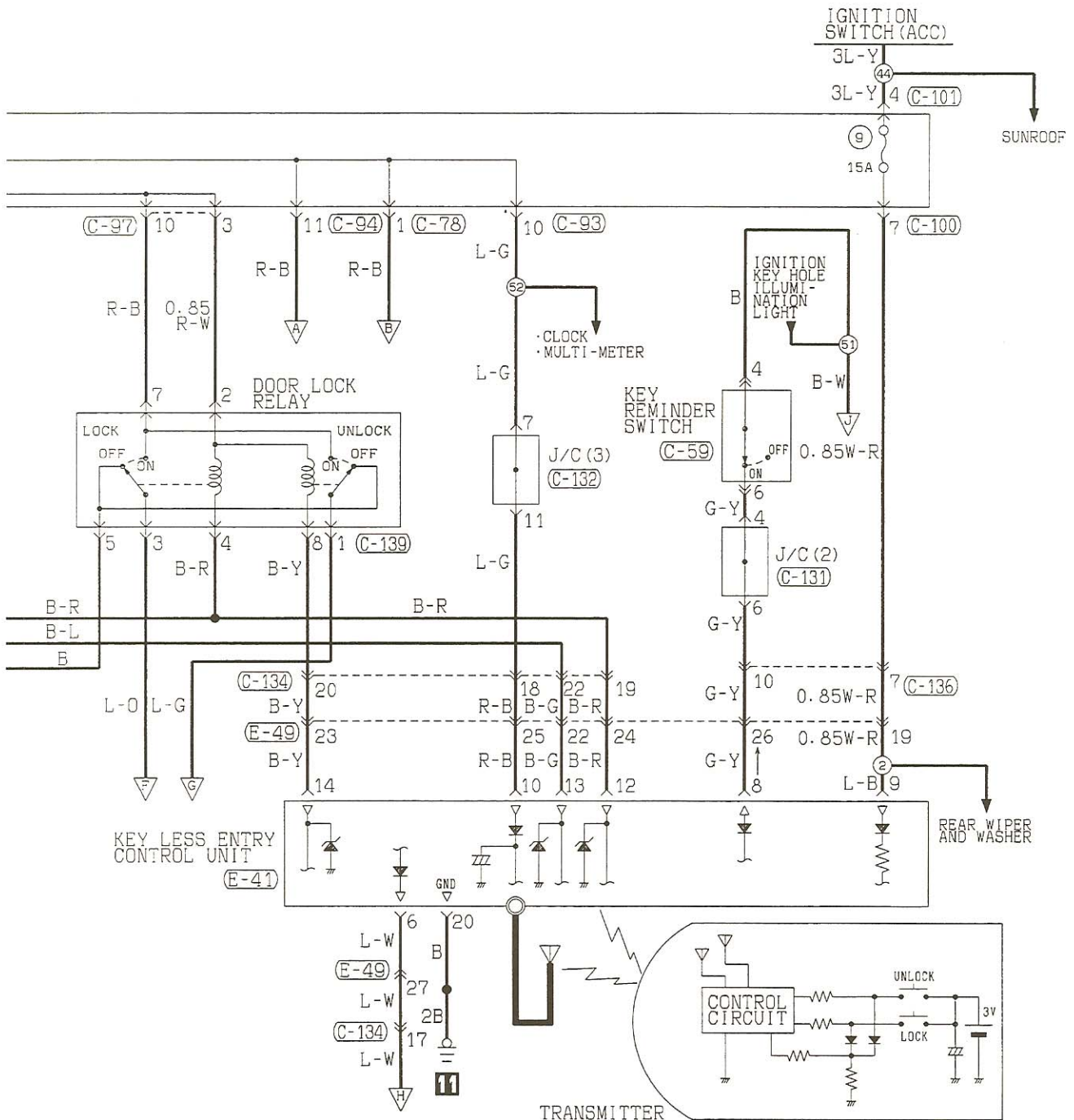
TSB Revision

CENTRAL DOOR LOCKING SYSTEM <Vehicles with keyless entry system>

901004.



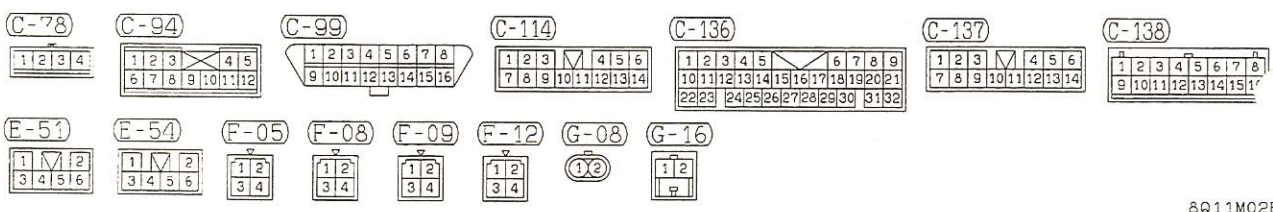
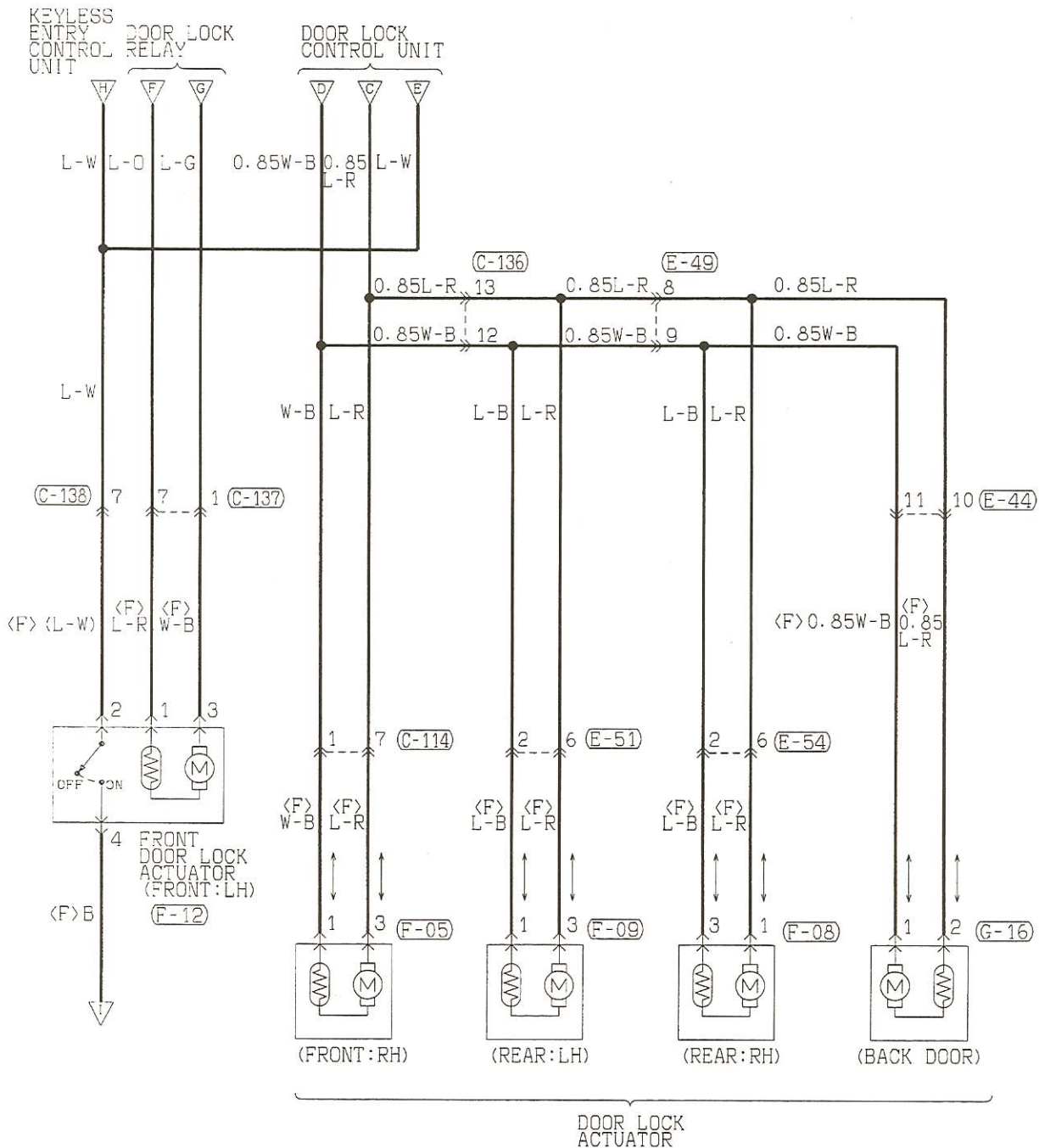
TSB Revision



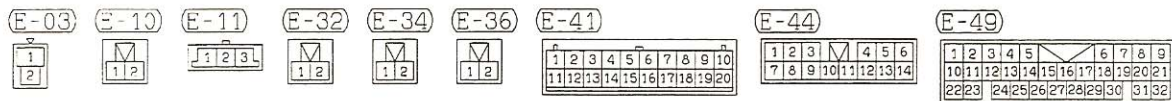
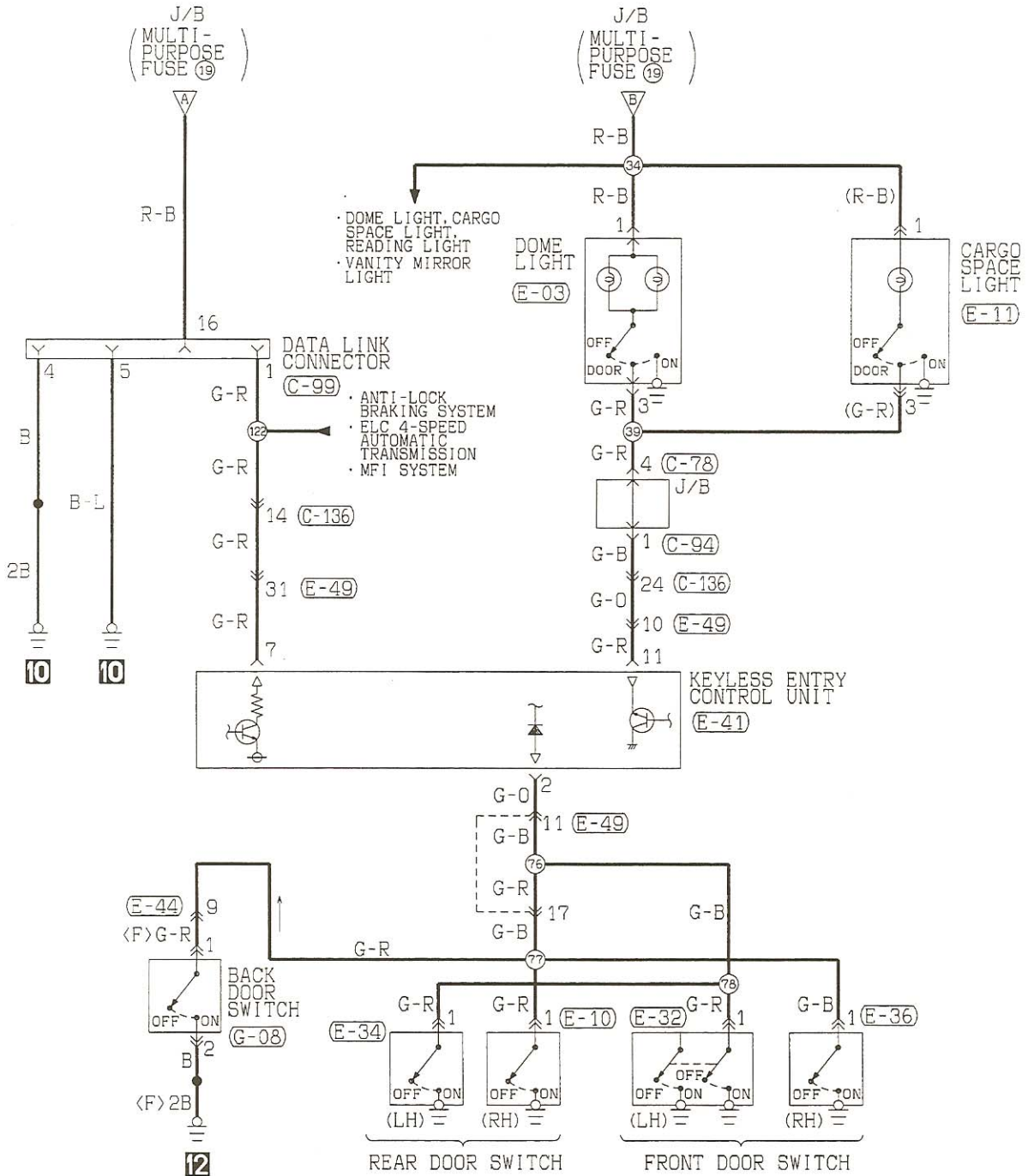
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E-41 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20	E-49 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32	F-04 1 2 3 4 5 6 7 8	F-15 1 2 3 4 5 6 7 8 9 10 11 12 13 14	F-17 1 2 3	F-21 1 2 3

TSB Revision

CENTRAL DOOR LOCKING SYSTEM <Vehicles with keyless entry system> (CONTINUED)



TSB Revision

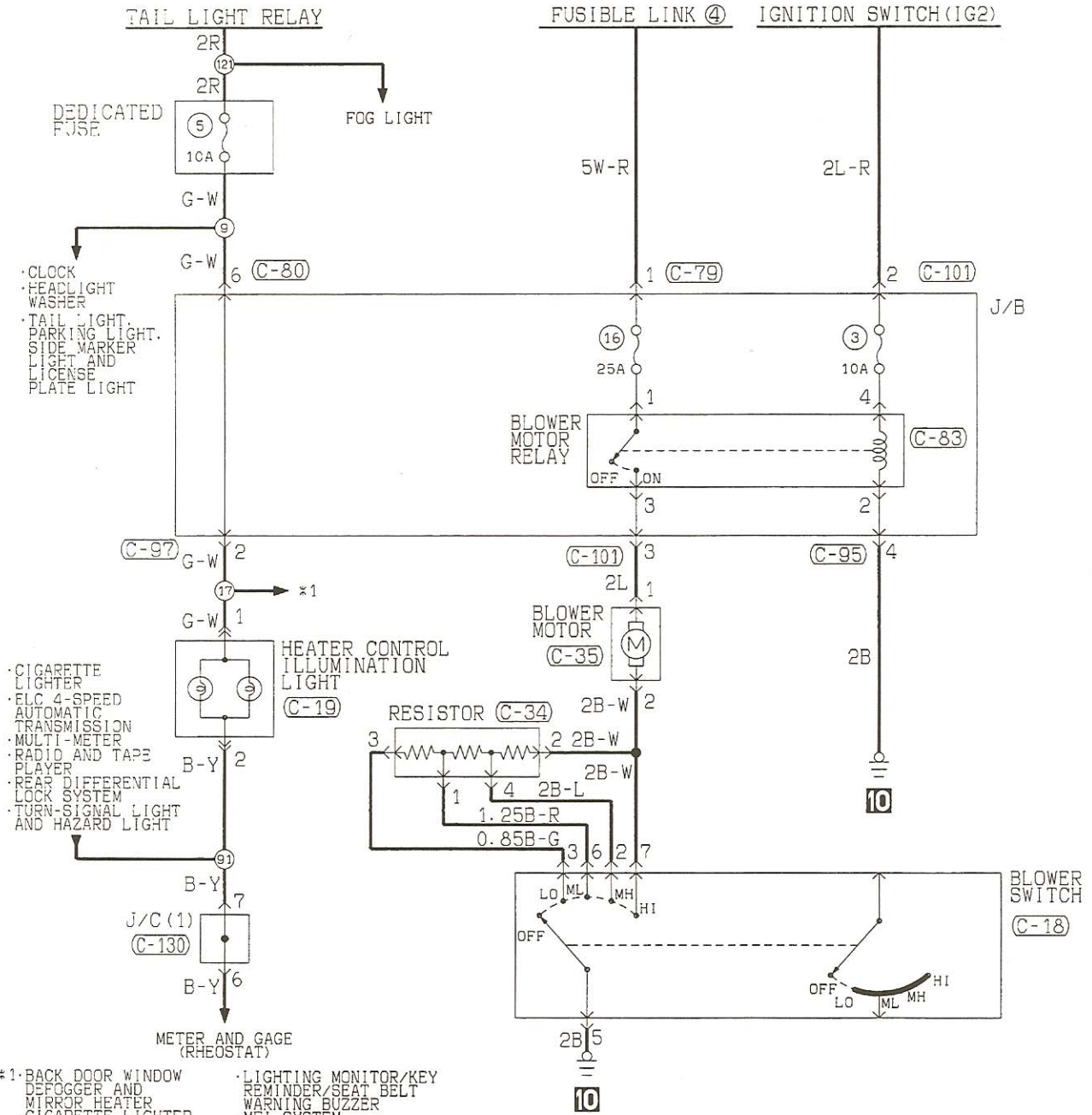


Wire color code
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 BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

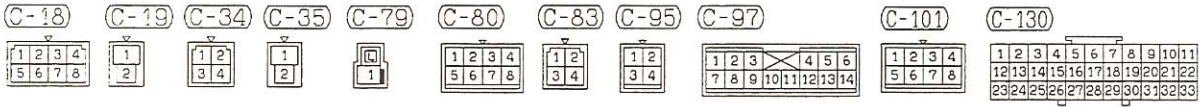
TSB Revision

HEATER

90101330009



- *1 BACK DOOR WINDOW DEFOGGER AND MIRROR HEATER
- CIGARETTE LIGHTER
- CLOCK
- CRUISE CONTROL SYSTEM
- ELC 4-SPEED AUTOMATIC TRANSMISSION
- HEATED SEAT
- LIGHTING MONITOR/KEY REMINDER/SEAT BELT WARNING BUZZER
- MFI SYSTEM
- MULTI-METER
- RADIO AND TAPE PLAYER
- REAR DIFFERENTIAL LOCK SYSTEM
- TURN-SIGNAL LIGHT AND HAZARD LIGHT



Wire color code
 B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
 BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

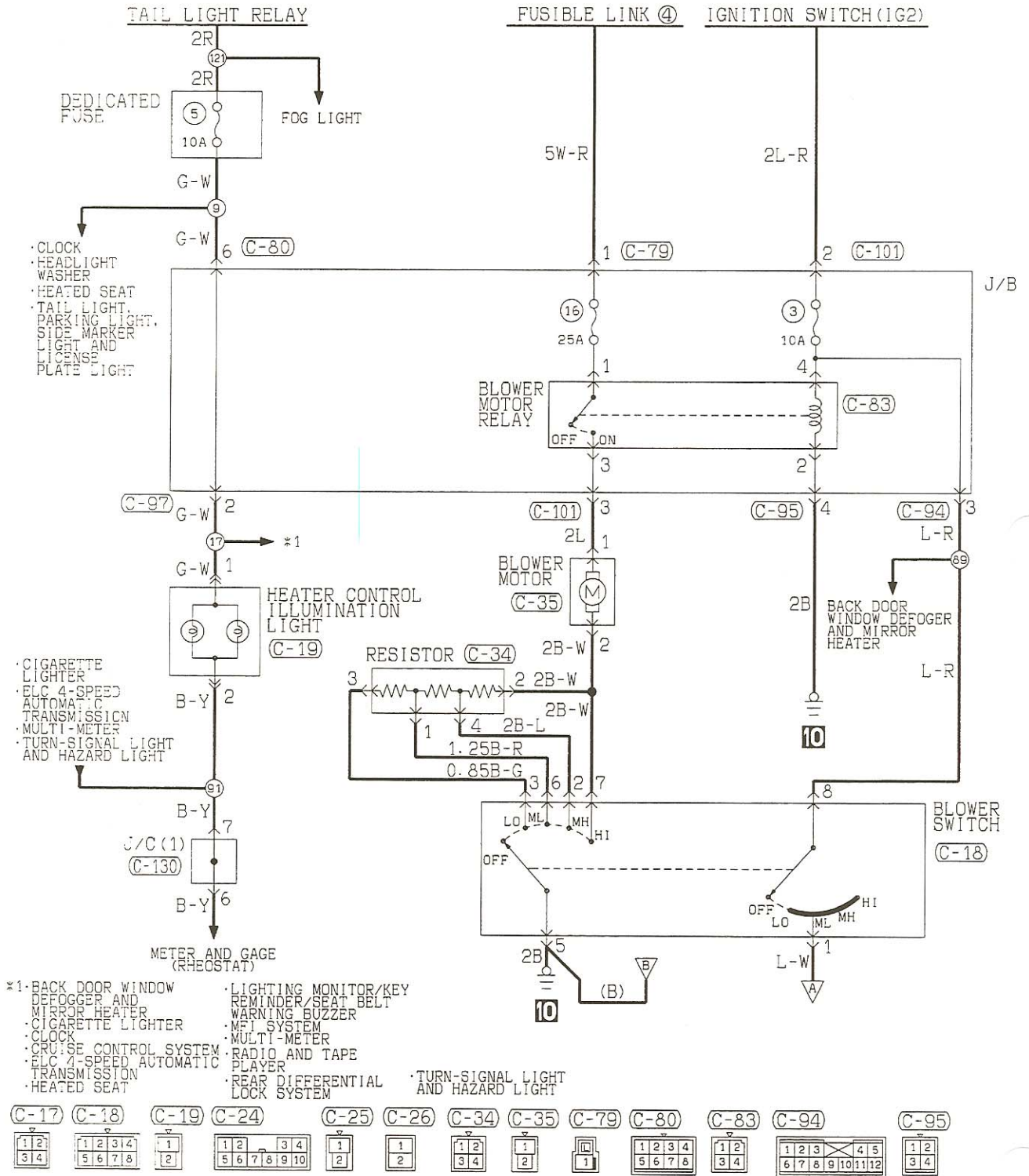
8Q12M00AA

TSB Revision

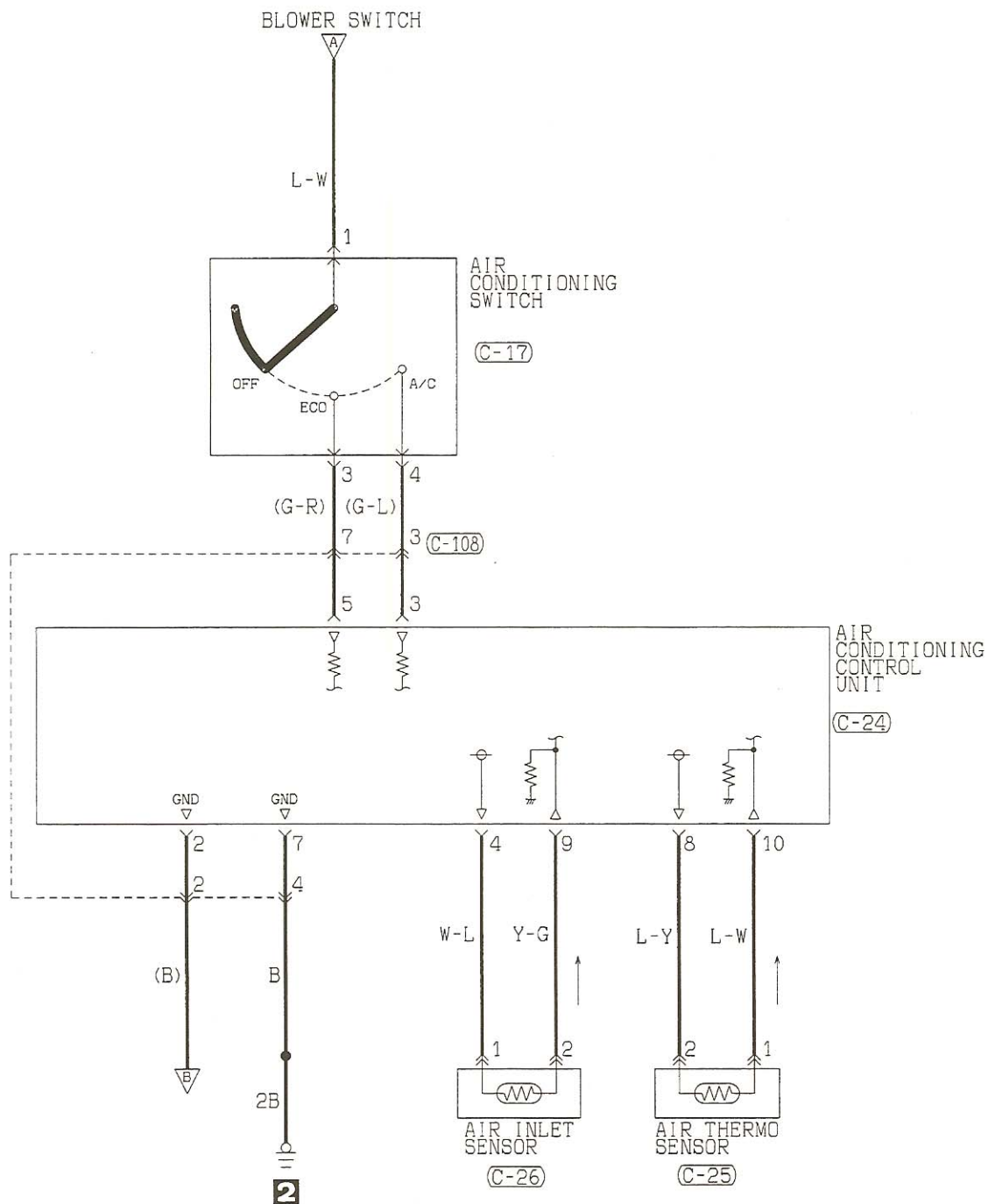
NOTES

AIR CONDITIONING

9010055



TSB Revision



C-97

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18

C-101

1	2	3	4
5	6	7	8

C-108

1	2	3	4
5	6	7	8

C-130

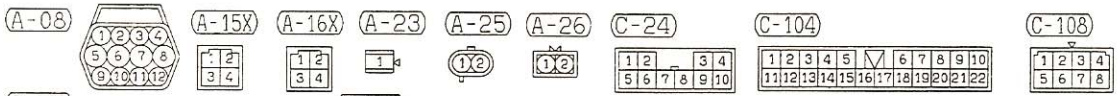
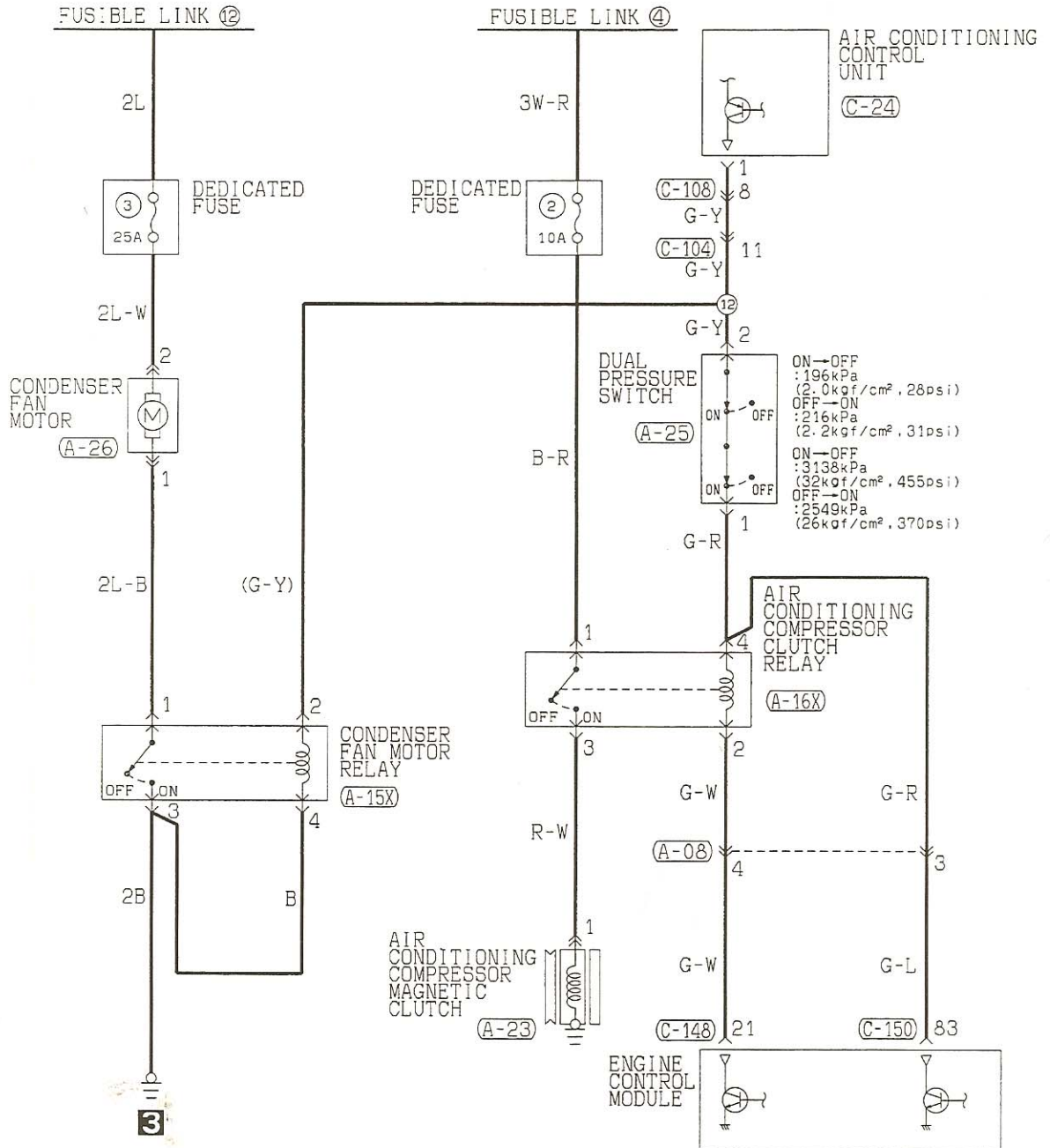
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12	13	14	15	16	17	18	19	20	21	22
23	24	25	26	27	28	29	30	31	32	33

Wire color code
 B : Black LG: Light green G : Green L : Blue W : White Y : Yellow SB: Sky blue
 BR: Brown O : Orange GR: Gray R : Red P : Pink V : Violet

8012M01AB

TSB Revision

AIR CONDITIONING (CONTINUED)



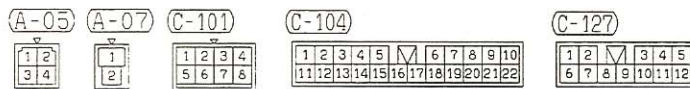
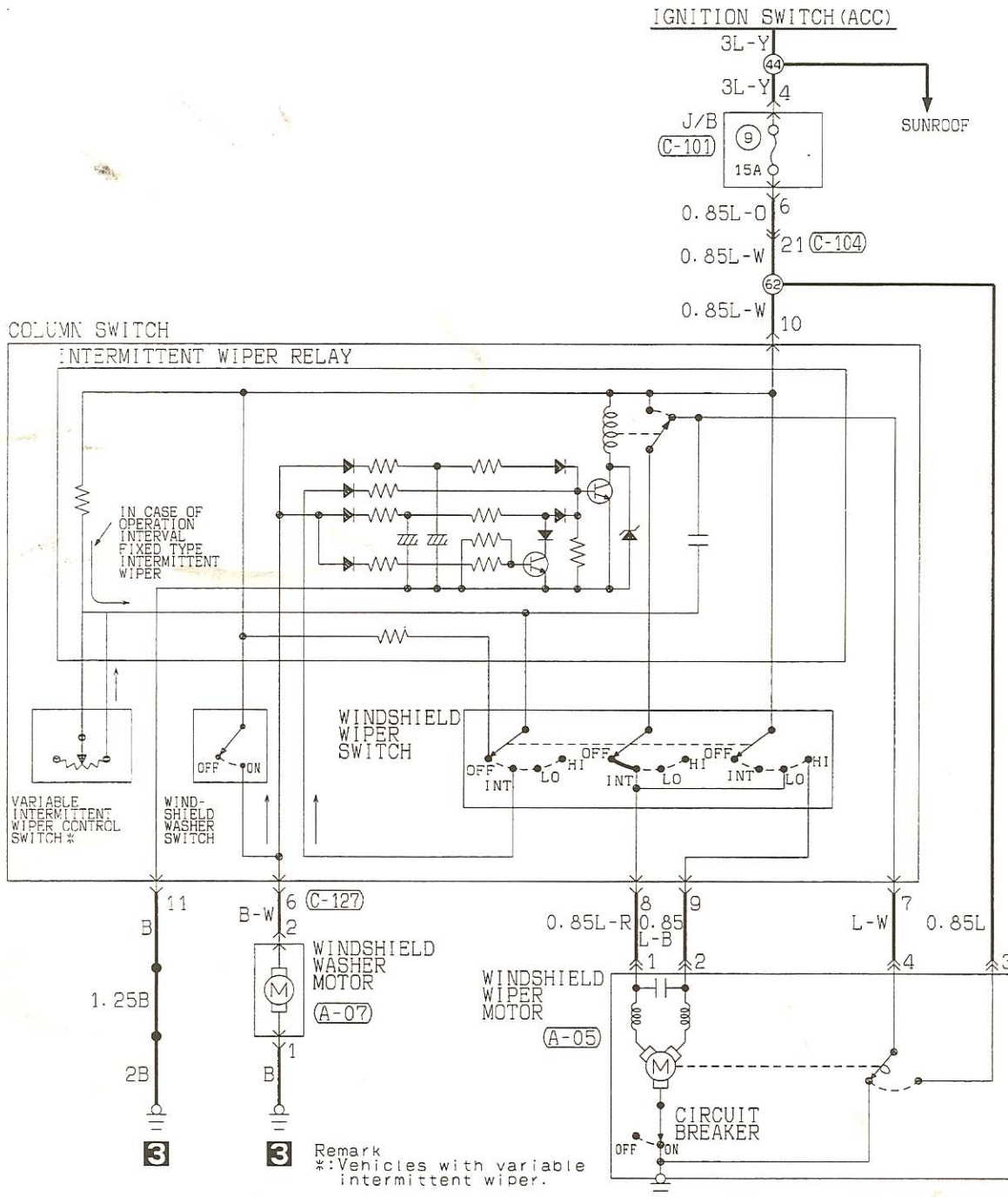
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9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	78	79	80	81	82	83	84	85	86	87	88	89	90	11	12	13	14	15	16	17	18	19	20	21	22	5	6	7	8
24	25	26	27	28	29	30	31	32	33	34	35	91	92	93	94	95	96	97	98	99	100																						

Wire color code
 B : Black LG : Light green G : Green L : Blue
 BR : Brown O : Orange GR : Gray R : Red
 W : White SB : Sky blue P : Pink Y : Yellow
 V : Violet

TSB Revision

WINDSHIELD WIPER AND WASHER

90100610534



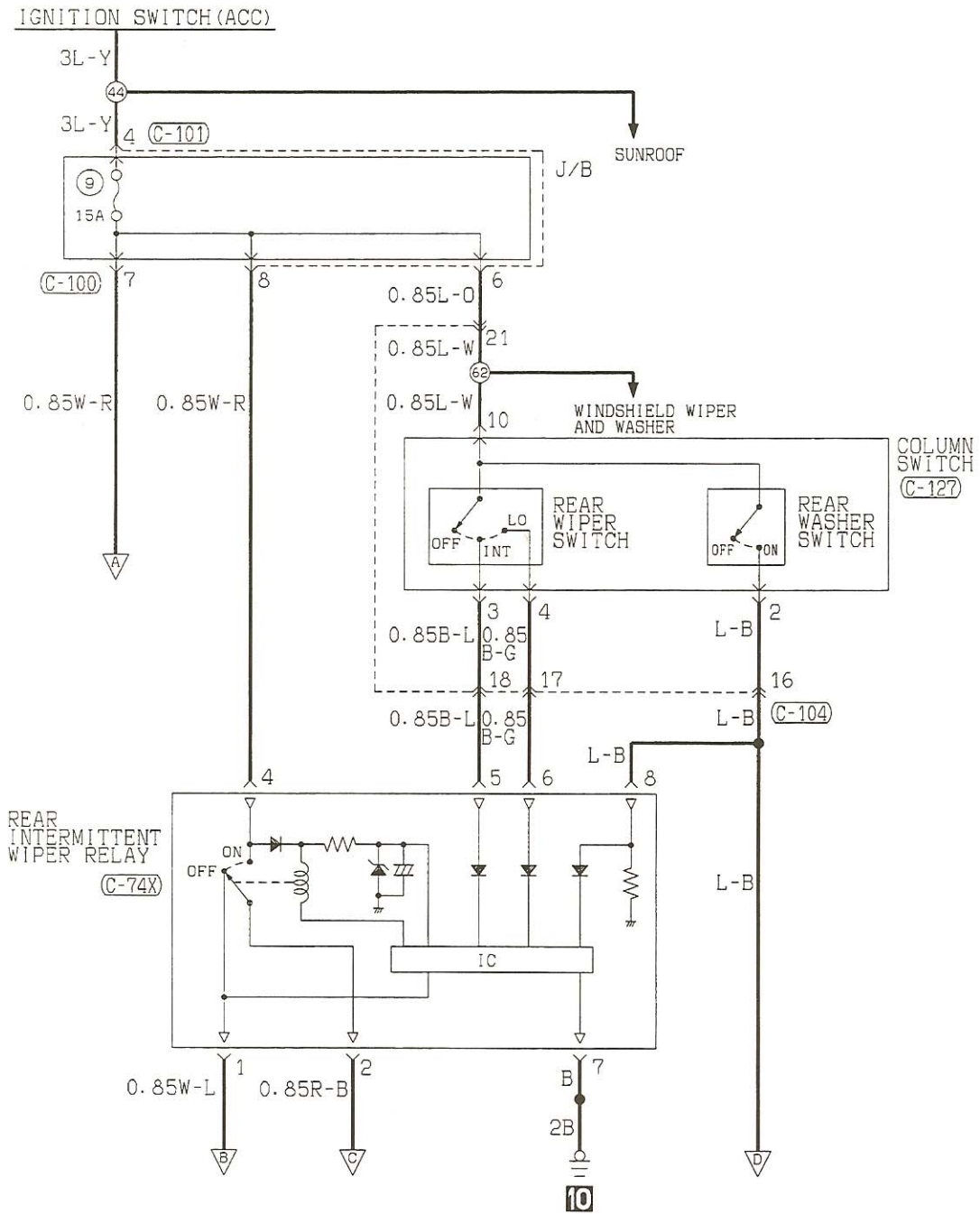
Wire color code
B : Black LG: Light green G : Green L : Blue W : White Y : Yellow SB: Sky blue
BR: Brown O : Orange GR: Gray R : Red P : Pink V : Violet

8Q13M00AA

TSB Revision

REAR WIPER AND WASHER

901006



C-74X

1	2	3
4	5	6
7	8	

C-100

1	2	3	4
5	6	7	8
9	10		

C-101

1	2	3	4
5	6	7	8

C-104

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21	22								

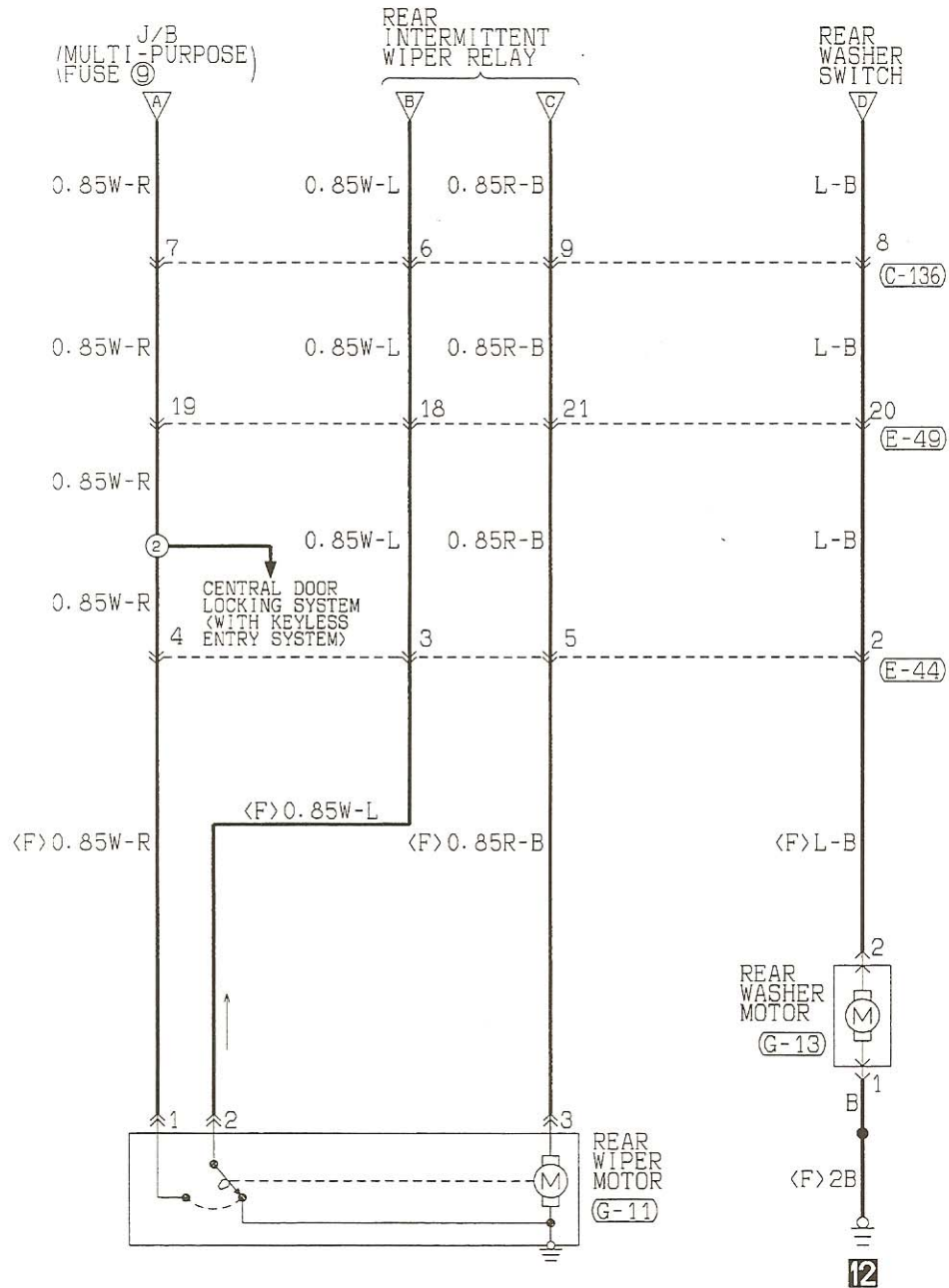
C-127

1	2	3	4	5
6	7	8	9	10
11	12			

C-136

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				

TSB Revision



E-44

1	2	3	M	4	5	6	
7	8	9	10	11	12	13	14

E-49

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	

G-11

1	2	3
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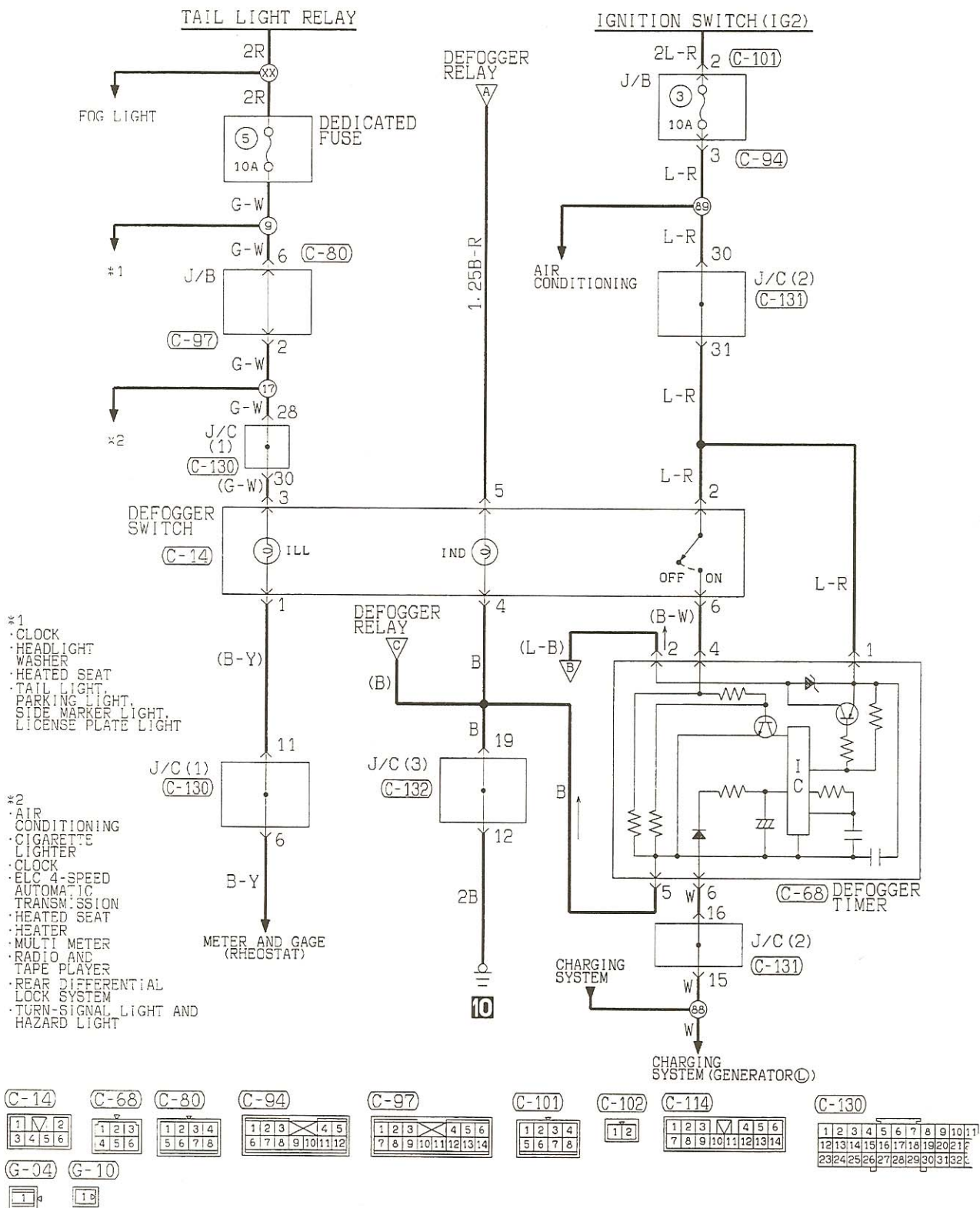
G-13

1	2
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Wire color code
 B:Black LG:Light green G:Green L:Blue W:White Y:Yellow SB:Sky blue
 BR:Brown O:Orange GR:Gray R:Red P:Pink V:Violet

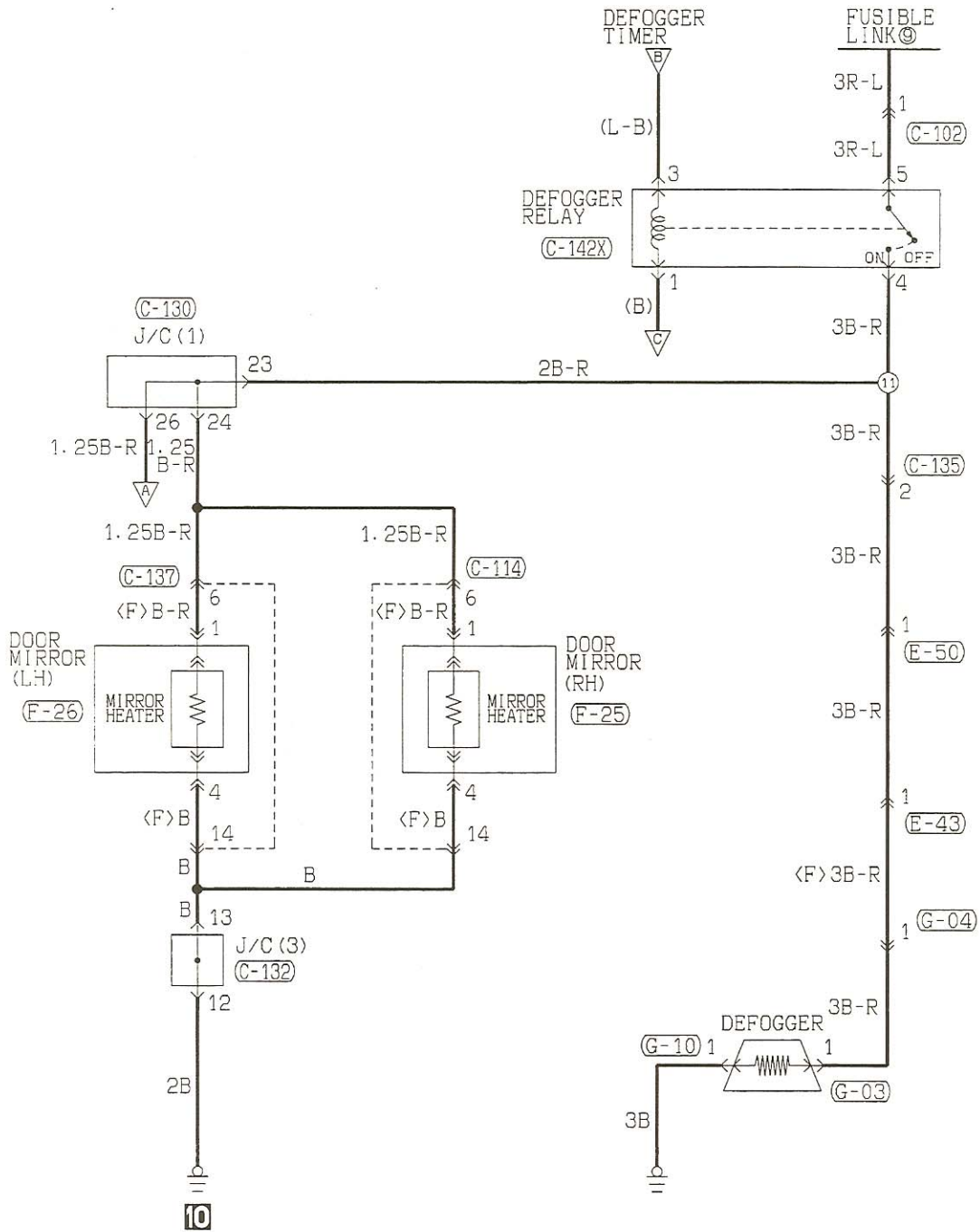
BACK DOOR WINDOW DEFOGGER AND MIRROR HEATER

901006A



TSB Revision

CIRCUIT DIAGRAMS – Back Door Window Defogger and Mirror Heater 90-99



C-131	C-132	C-135	C-137	C-142X	E-43	E-50	F-25	F-26	G-03
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	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	1 2	1 2 3 4 5 6 7 8 9 10 11 12 13 14	1 2 3 4 5	1	1	1 2 3 4 5 6 7	1 2 3 4 5 6 7	1 2

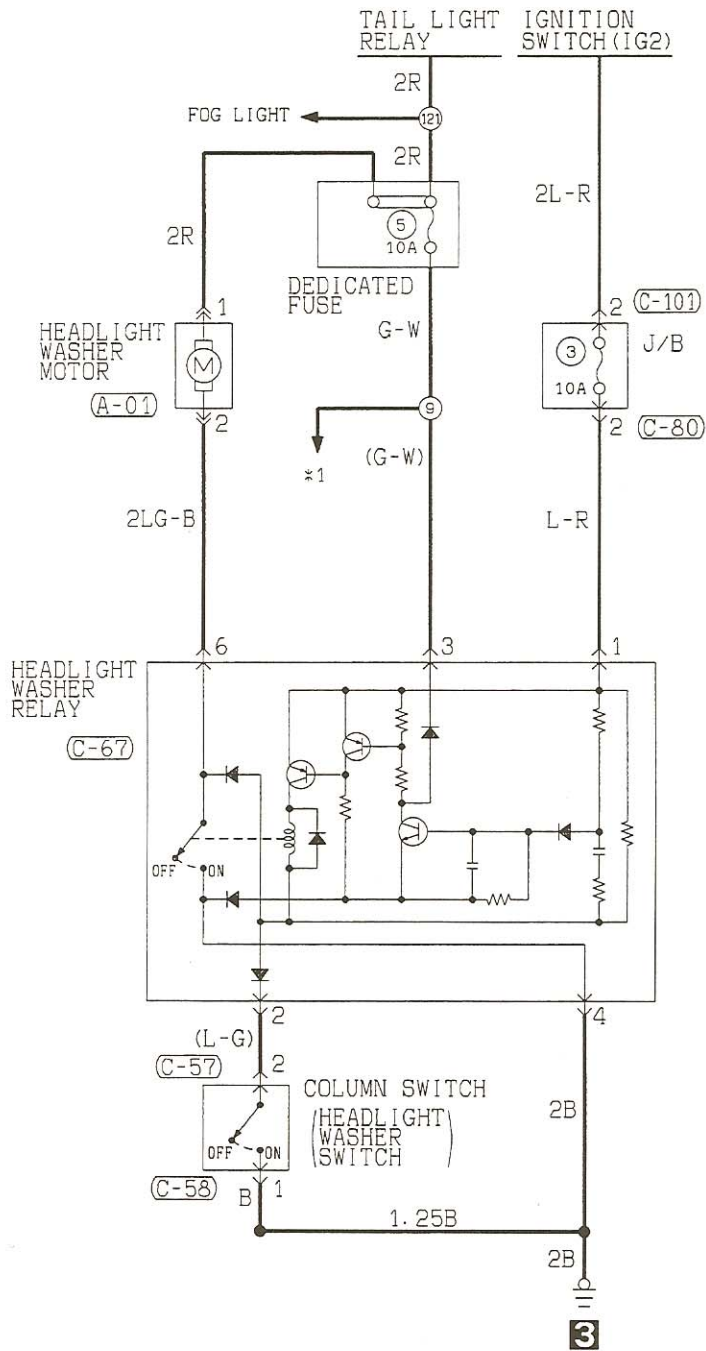
Wire color code
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 BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

8Q13M02AB

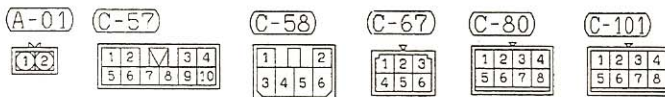
TSB Revision

HEADLIGHT WASHER

90100630005



- *1 - CLOCK
 - CRUISE CONTROL SYSTEM
 - ELC 4-SPEED AUTOMATIC TRANSMISSION
 - HEATED SEAT
 - HEATER
 - POWER DISTRIBUTION (MULTI-PURPOSE FUSE)
 - POWER WINDOWS
 - REAR DIFFERENTIAL LOCK SYSTEM
 - TAIL LIGHT, PARKING LIGHT, SIDE MARKER LIGHT AND LICENSE PLATE LIGHT



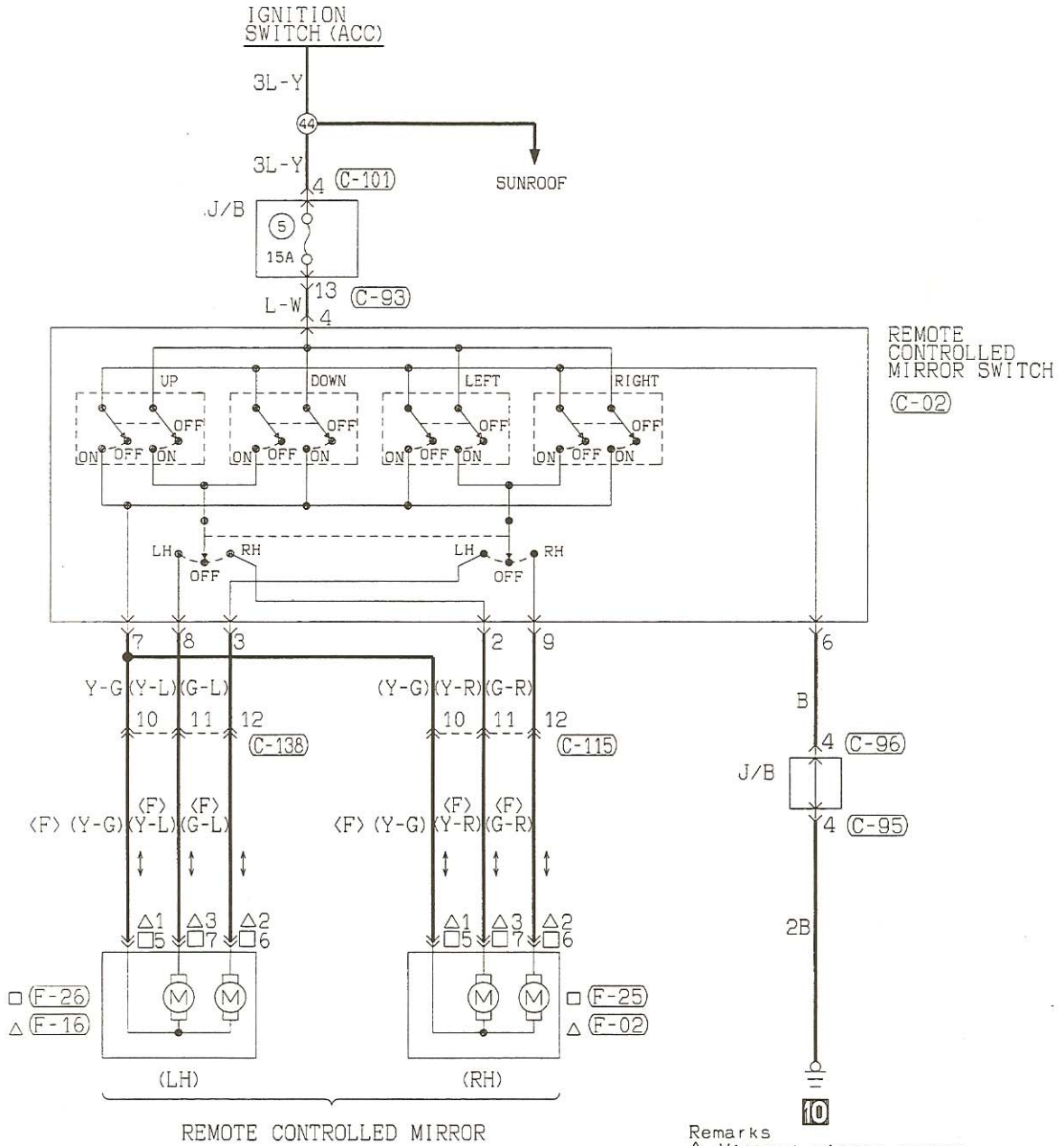
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 BR: Brown O: Orange GR: Gray RL: Red P: Pink V: Violet

8Q13M03AA

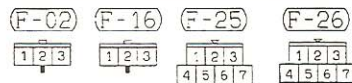
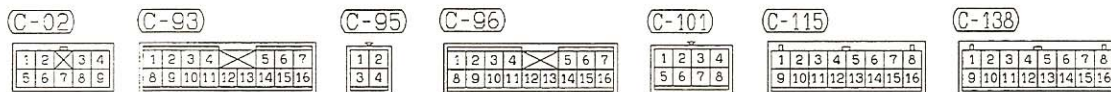
TSB Revision

REMOTE CONTROLLED MIRROR

90100650451



Remarks
 △: Without mirror heater
 □: With mirror heater



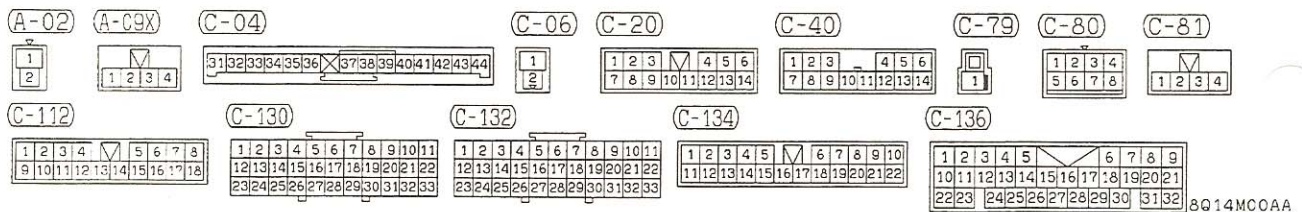
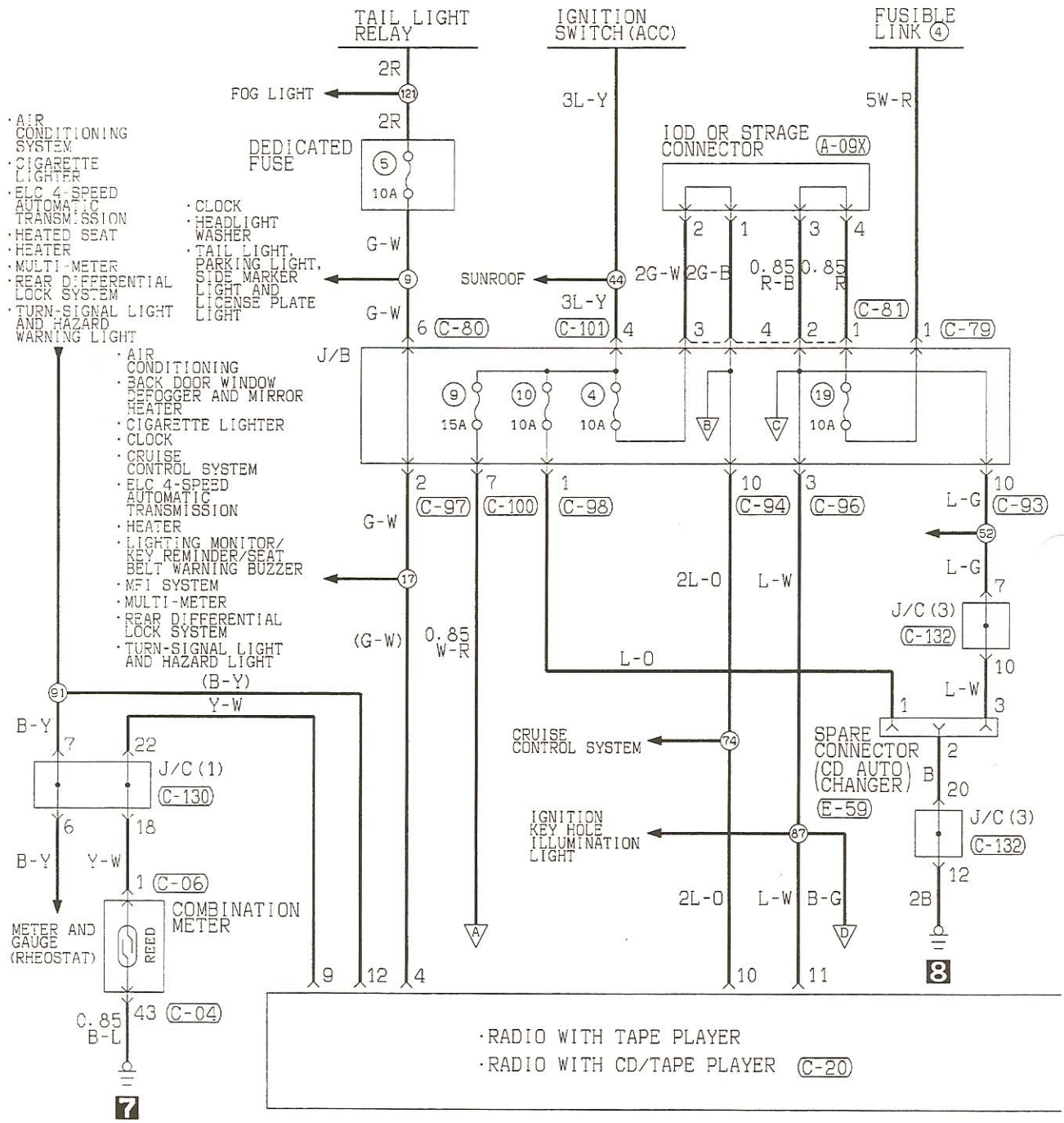
Wire color code
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 BR : Brown O : Orange GR : Gray R : Red
 W : White SB : Sky blue P : Pink Y : Yellow
 V : Violet

8Q13M04AA

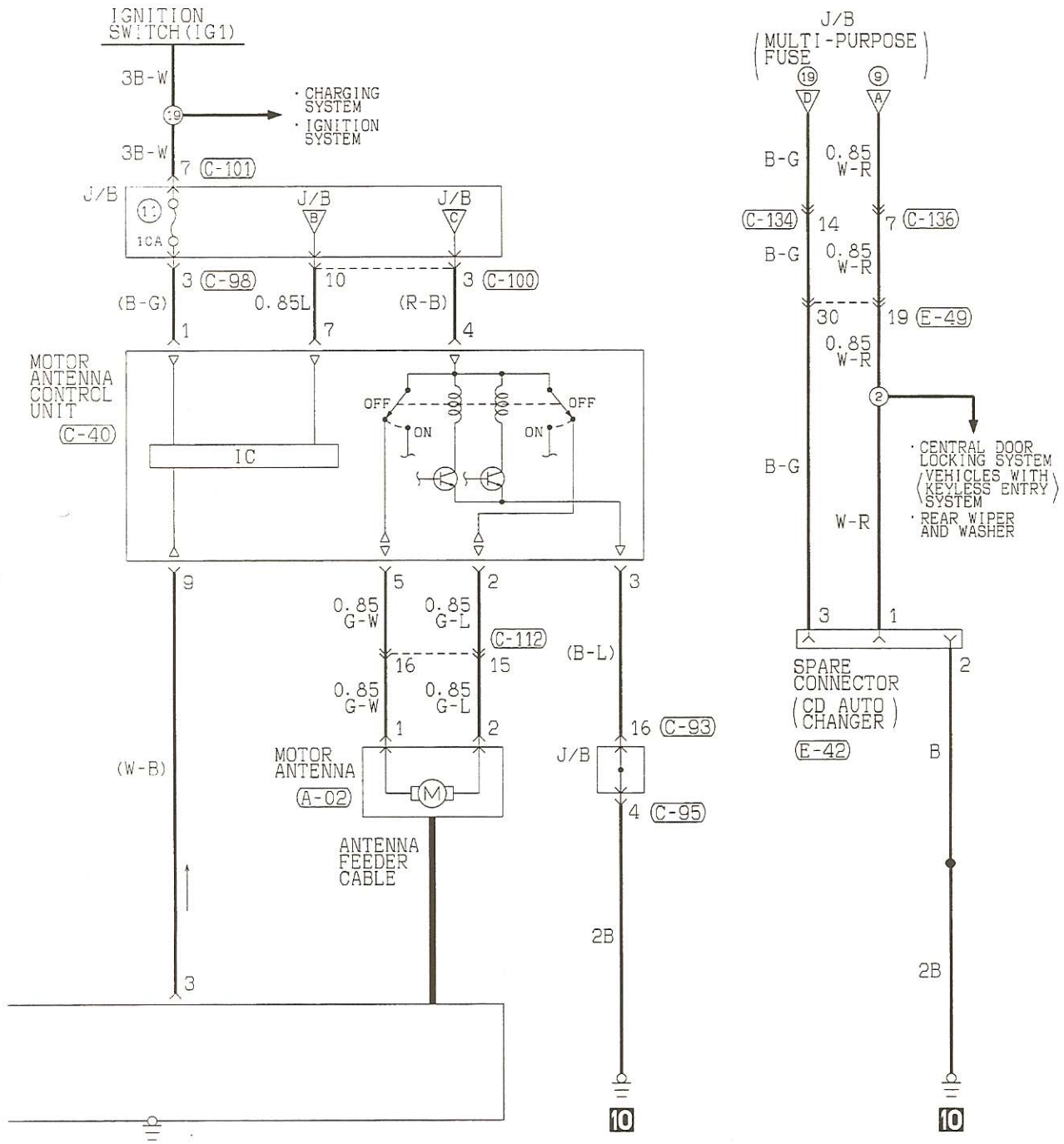
TSB Revision

RADIO AND TAPE PLAYER <Vehicles without amplifier>

90100721000



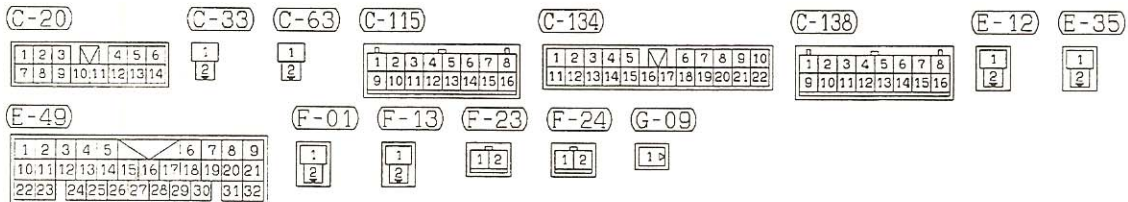
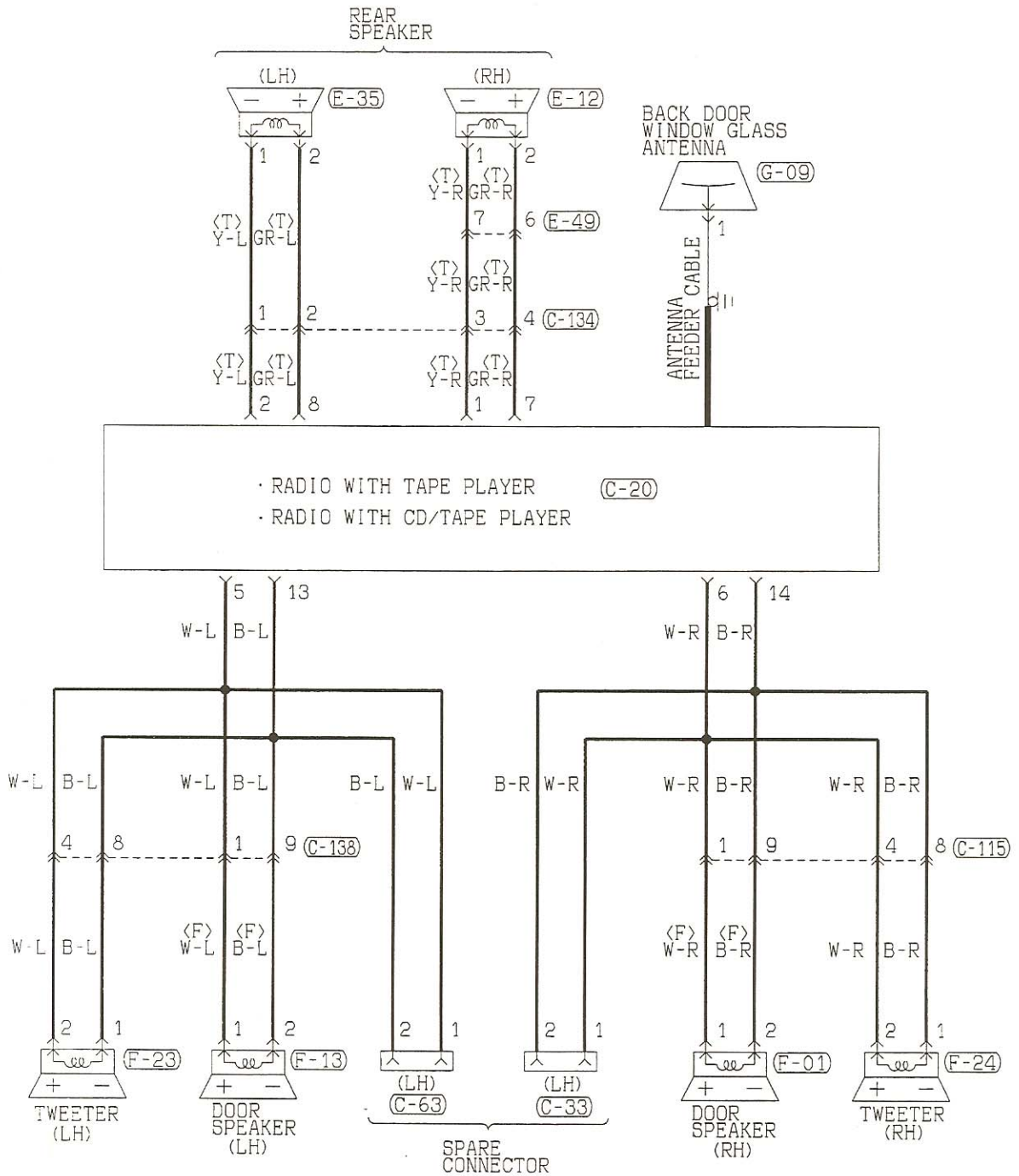
TSB Revision



C-93	C-94	C-95	C-96	C-97	C-98	C-100	C-101
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	1 2 3 4	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	1 2 3 4 5 6	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8
E-42	E-49	E-59	Wire color code				
1 2 3 4 5 6	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	1 2 3 4 5 6	B : Black	LG : Light green	G : Green	L : Blue	
			BR : Brown	O : Orange	GR : Gray	R : Red	
			W : White	SB : Sky blue	P : Pink	Y : Yellow	
			V : Violet				

TSB Revision

**RADIO AND TAPE PLAYER <Vehicles without amplifier>
(CONTINUED)**



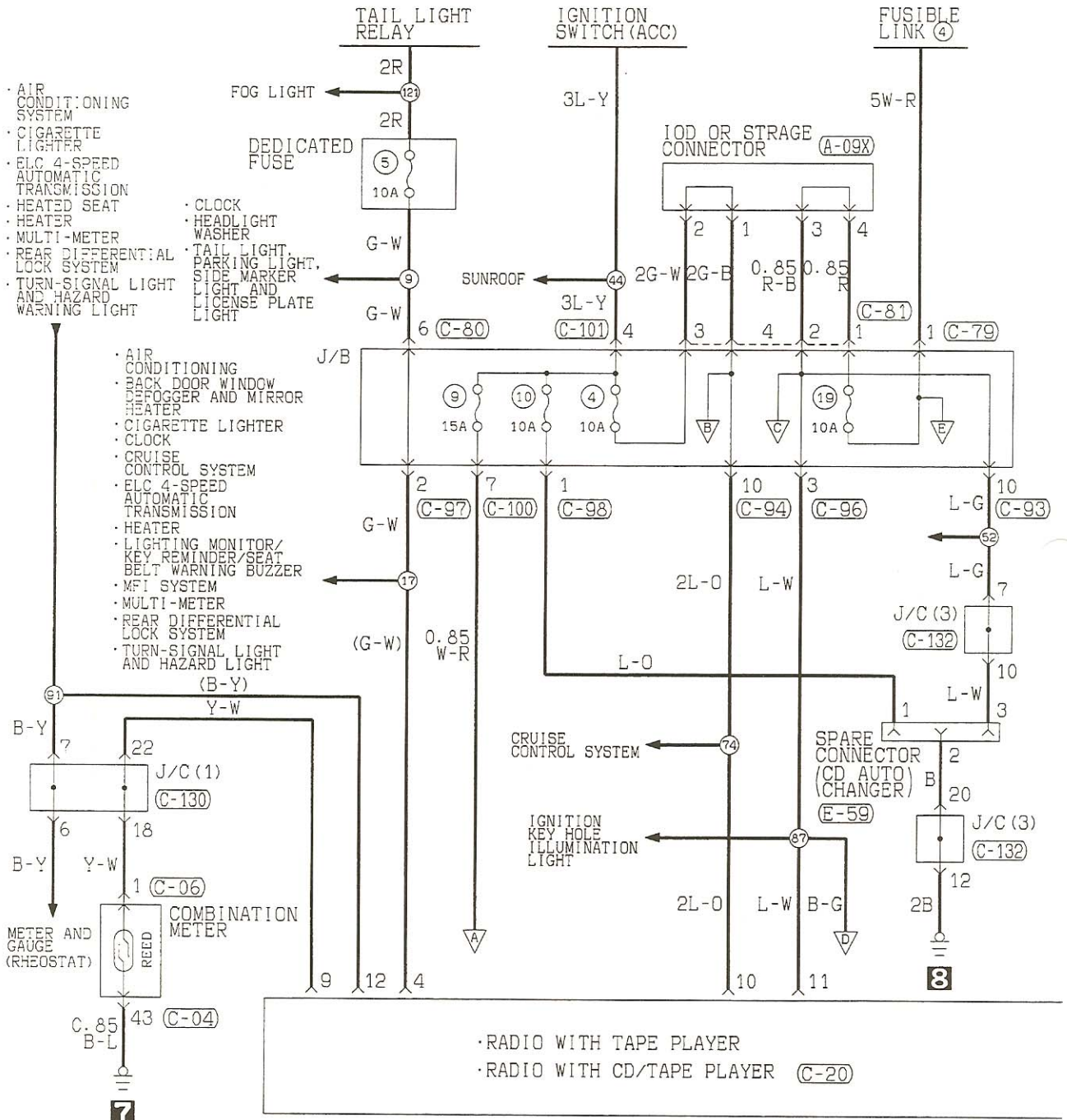
TSB Revision

NOTES



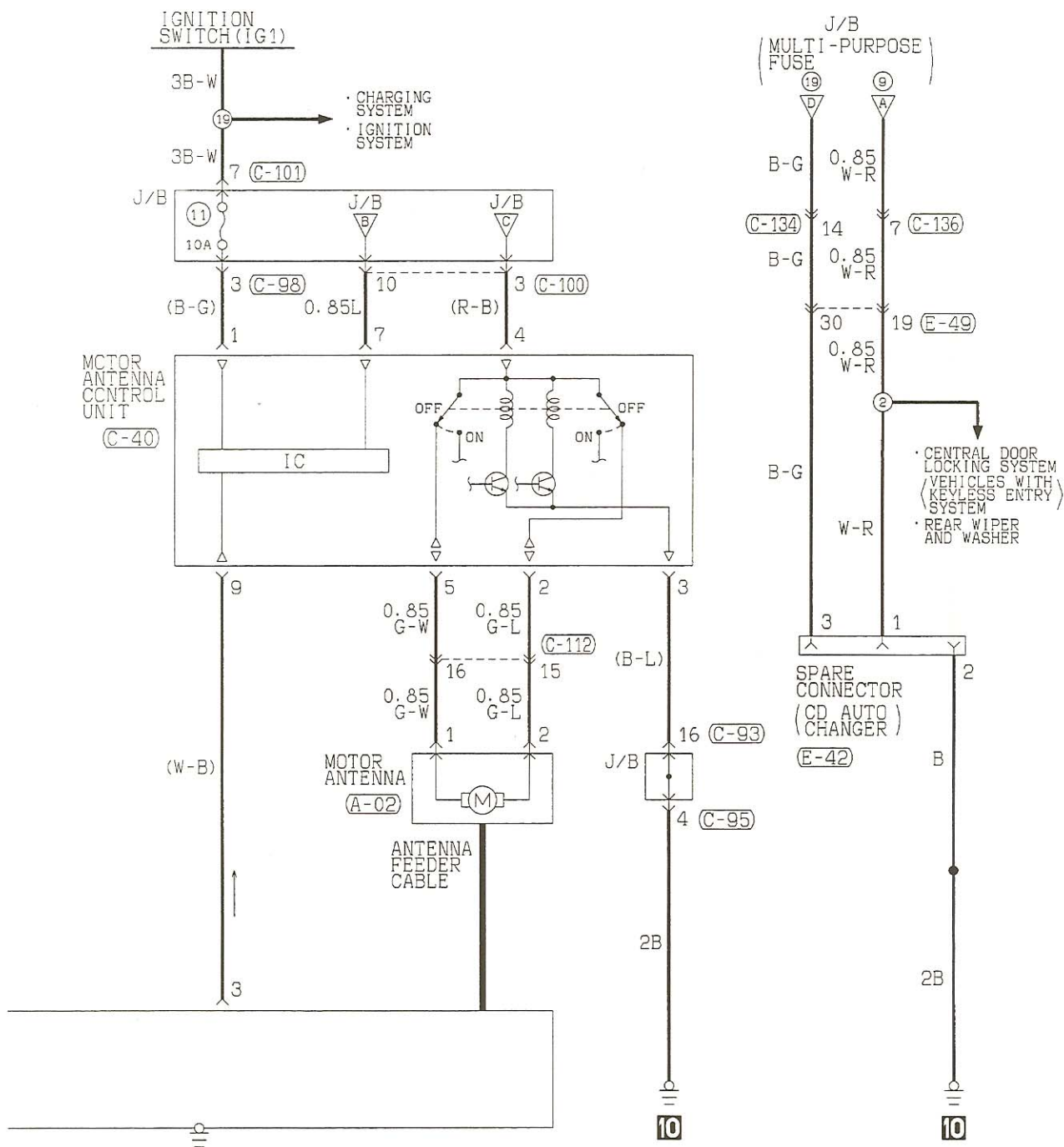
RADIO AND TAPE PLAYER <Vehicles with amplifier>

90100721017



A-02 1 2	A-09X 1 2 3 4	C-04 3 13 23 33 34 35 36 37 38 39 40 41 42 43 44	C-06 1 2	C-20 1 2 3 4 5 6 7 8 9 10 11 12 13 14	C-40 1 2 3 4 5 6 7 8 9 10 11 12 13 14	C-79 1	C-80 1 2 3 4 5 6 7 8	C-81 1 2 3 4
C-112 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18	C-130 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	C-132 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	C-134 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22	C-136 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				

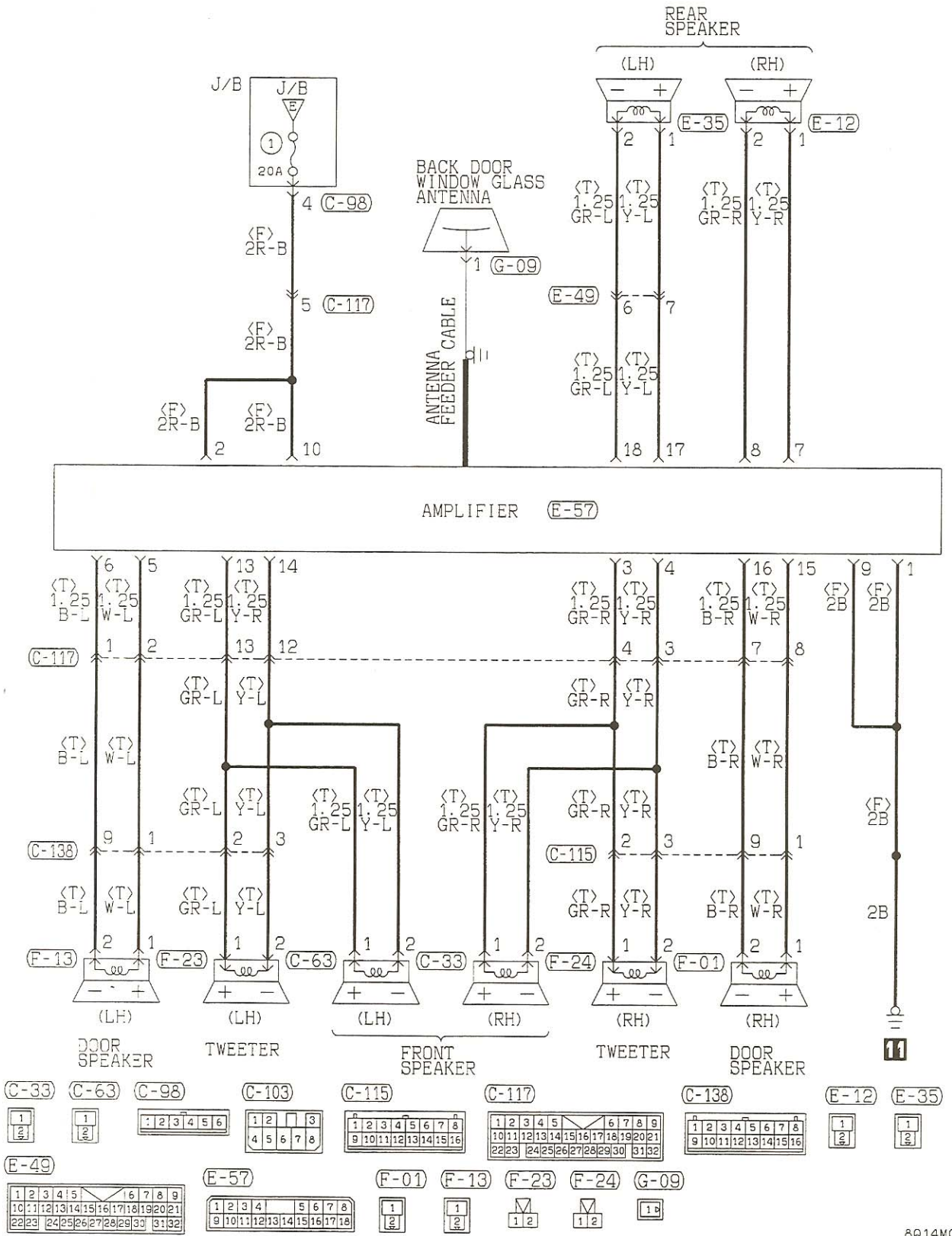
TSB Revision



(C-93)	(C-94)	(C-95)	(C-96)	(C-97)	(C-98)	(C-100)	(C-101)
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	1 2 3 4	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	1 2 3 4 5 6	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8
(E-42)	(E-49)	(E-59)	Wire color code				
1 2 3 4 5 6	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	1 2 3 4 5 6	B: Black	LG: Light green	G: Green	L: Blue	
			BR: Brown	O: Orange	GR: Gray	R: Red	
			W: White	SB: Sky blue	P: Pink	Y: Yellow	
			V: Violet				

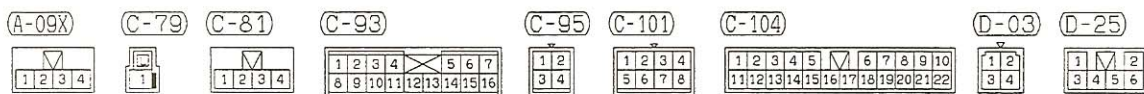
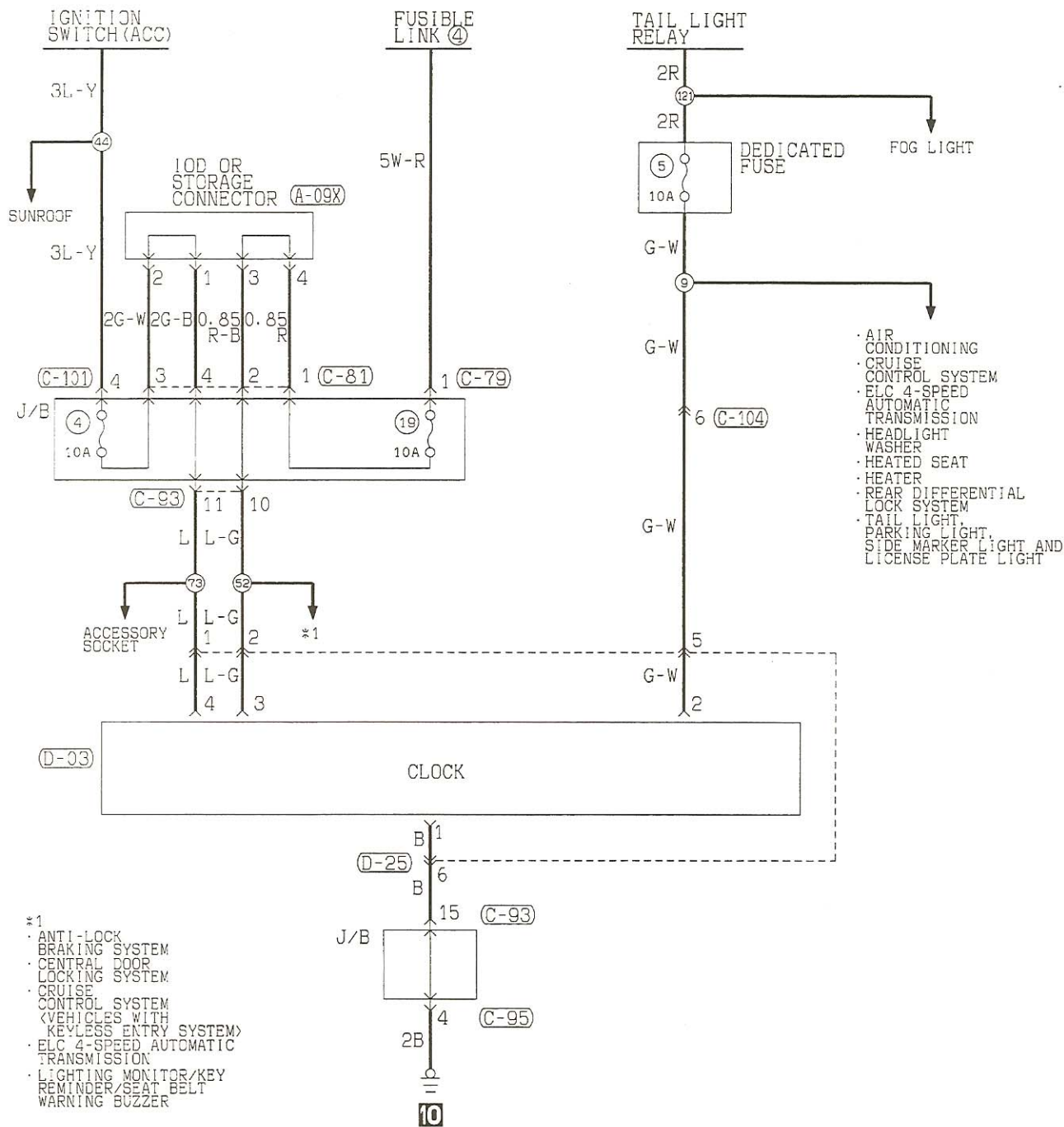
TSB Revision

**RADIO AND TAPE PLAYER <Vehicles with amplifier>
(CONTINUED)**



CLOCK

90100770379



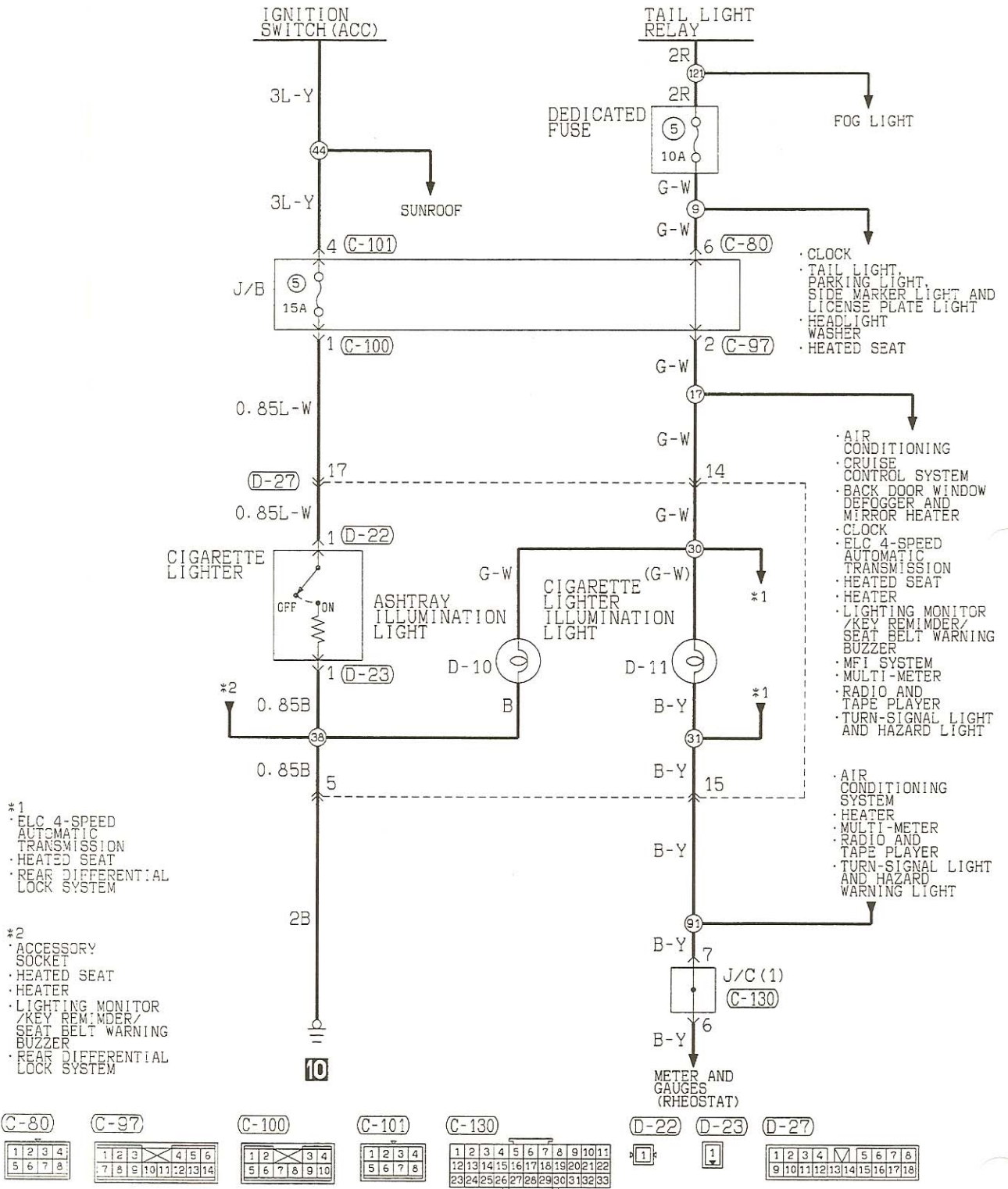
Wire color code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown C : Orange GR : Gray R : Red P : Pink V : Violet

8Q14M02AA

TSB Revision

CIGARETTE LIGHTER

90100780119



Wire color code
 B : Black LG: Light green G: Green L : Blue W : White Y : Yellow SB: Sky blue
 BR: Brown O : Orange GR: Gray R : Red P : Pink V : Violet

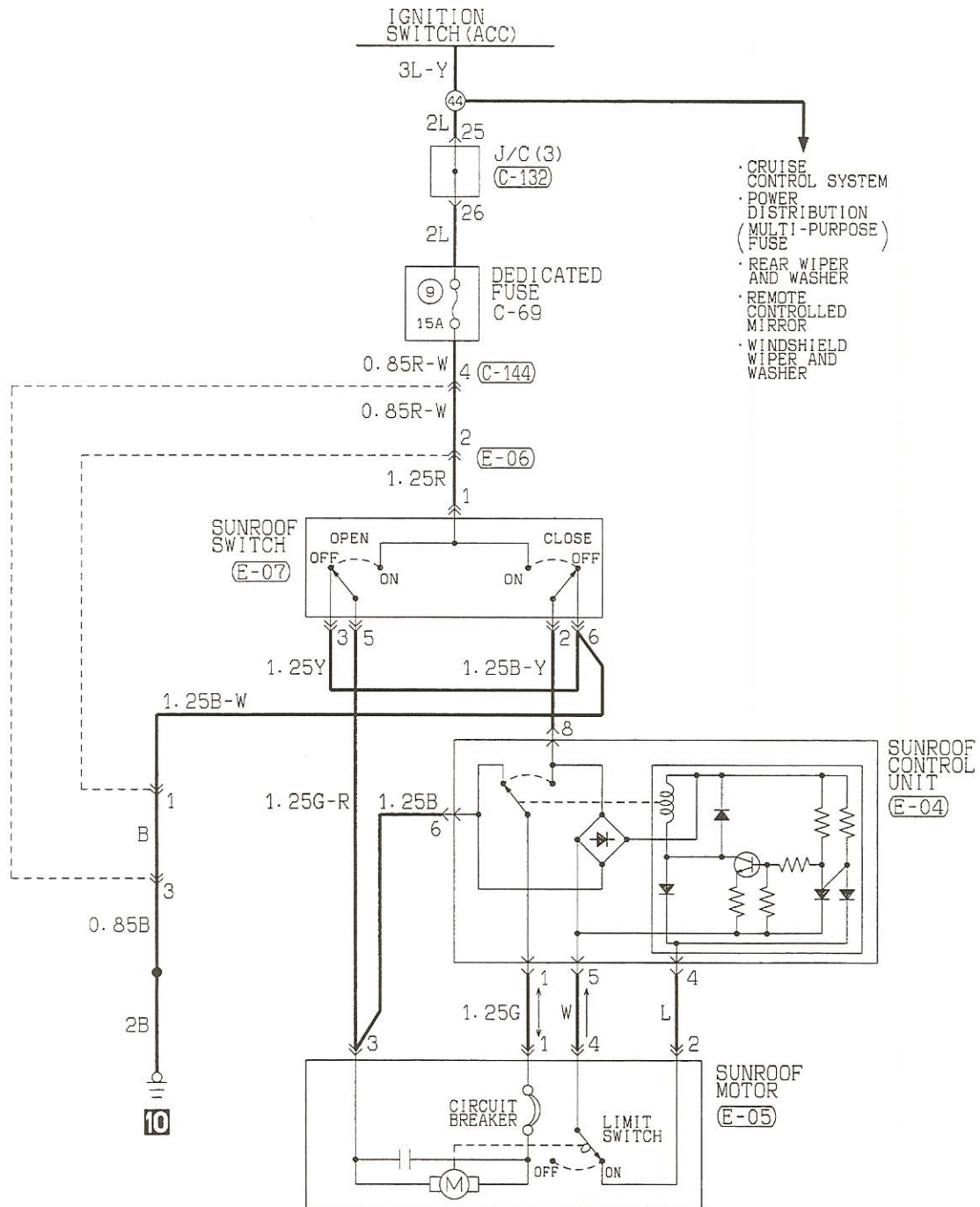
8Q14M03AA

TSB Revision

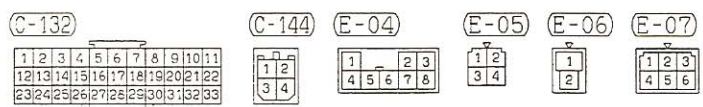
NOTES

SUNROOF

9010090355



- CRUISE CONTROL SYSTEM
- POWER DISTRIBUTION (MULTI-PURPOSE) FUSE
- REAR WIPER AND WASHER
- REMOTE CONTROLLED MIRROR
- WINDSHIELD WIPER AND WASHER



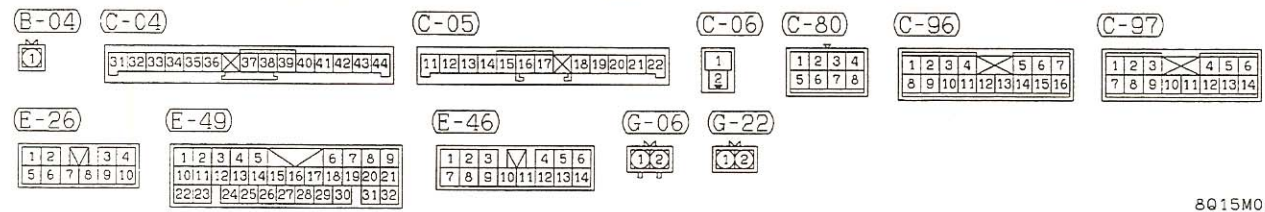
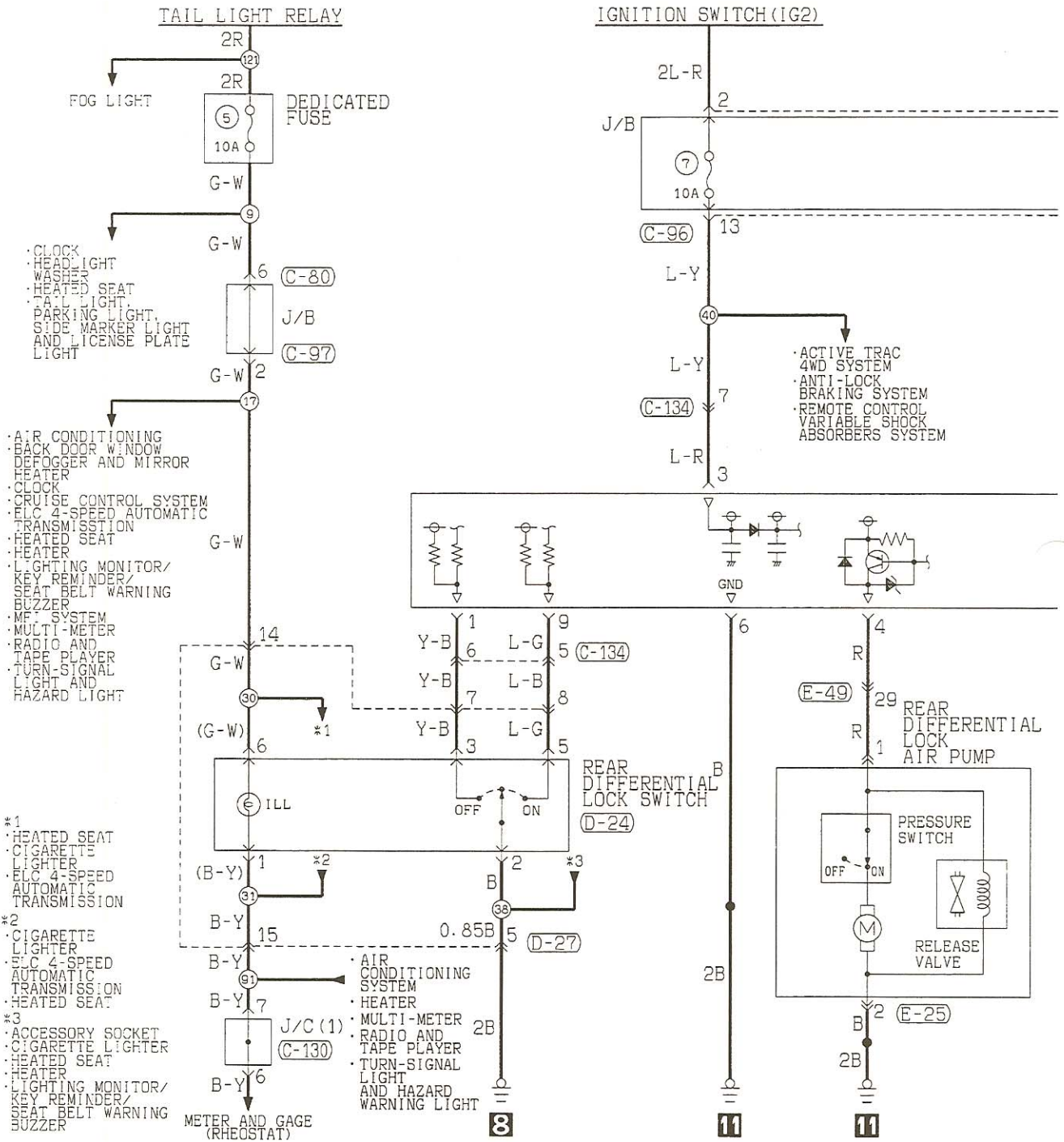
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 BR: Brown O: Orange GR: Gray R: Red P: Pink V: Violet

8Q14M05AA

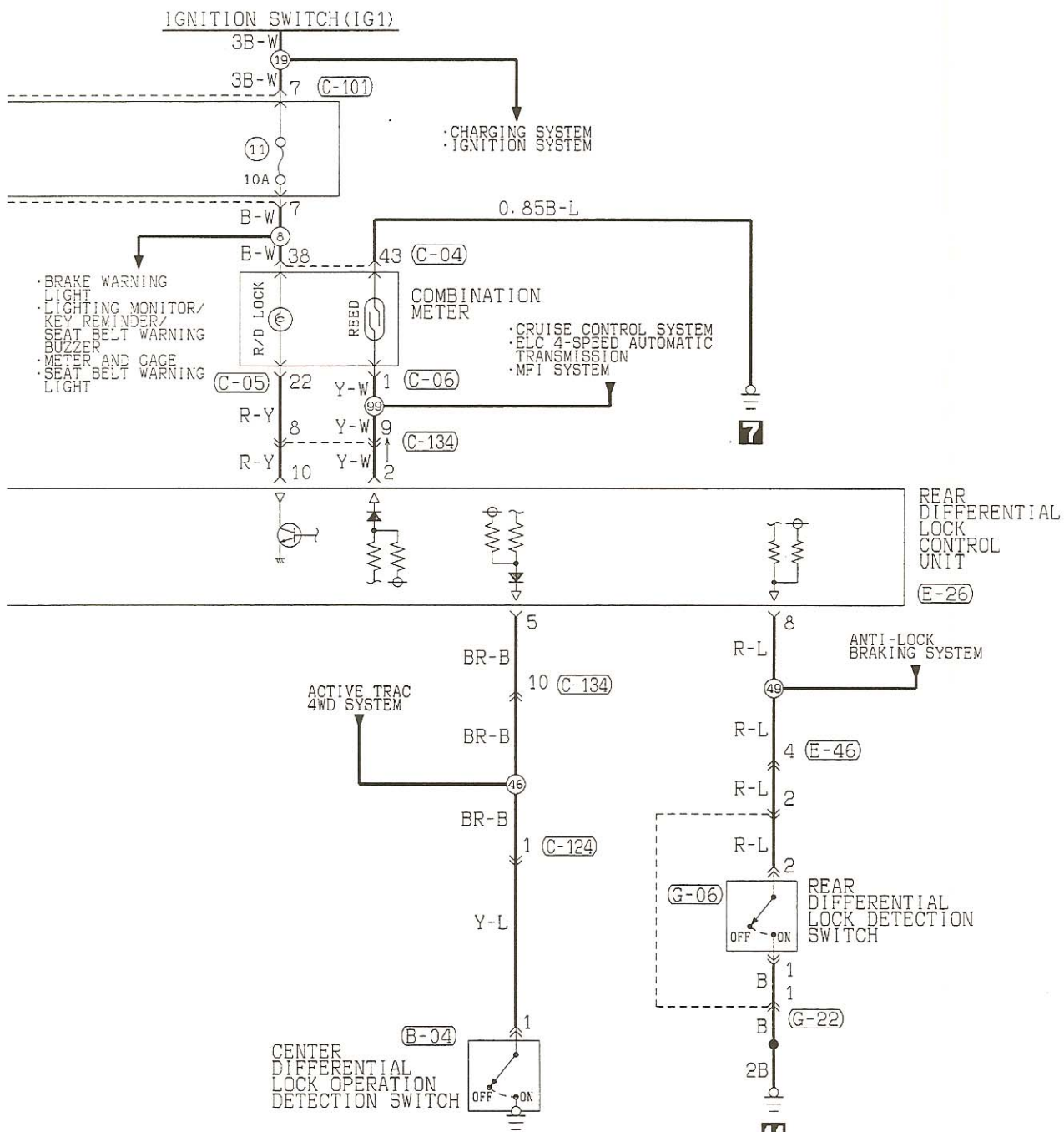
TSB Revision

REAR DIFFERENTIAL LOCK SYSTEM

90101430005



TSB Revision



(C-101)	(C-124)	(C-130)	(C-134)	(D-24)	(D-27)	(E-25)
1 2 3 4 5 6 7 8	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	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	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 15 16 17 18	1 2

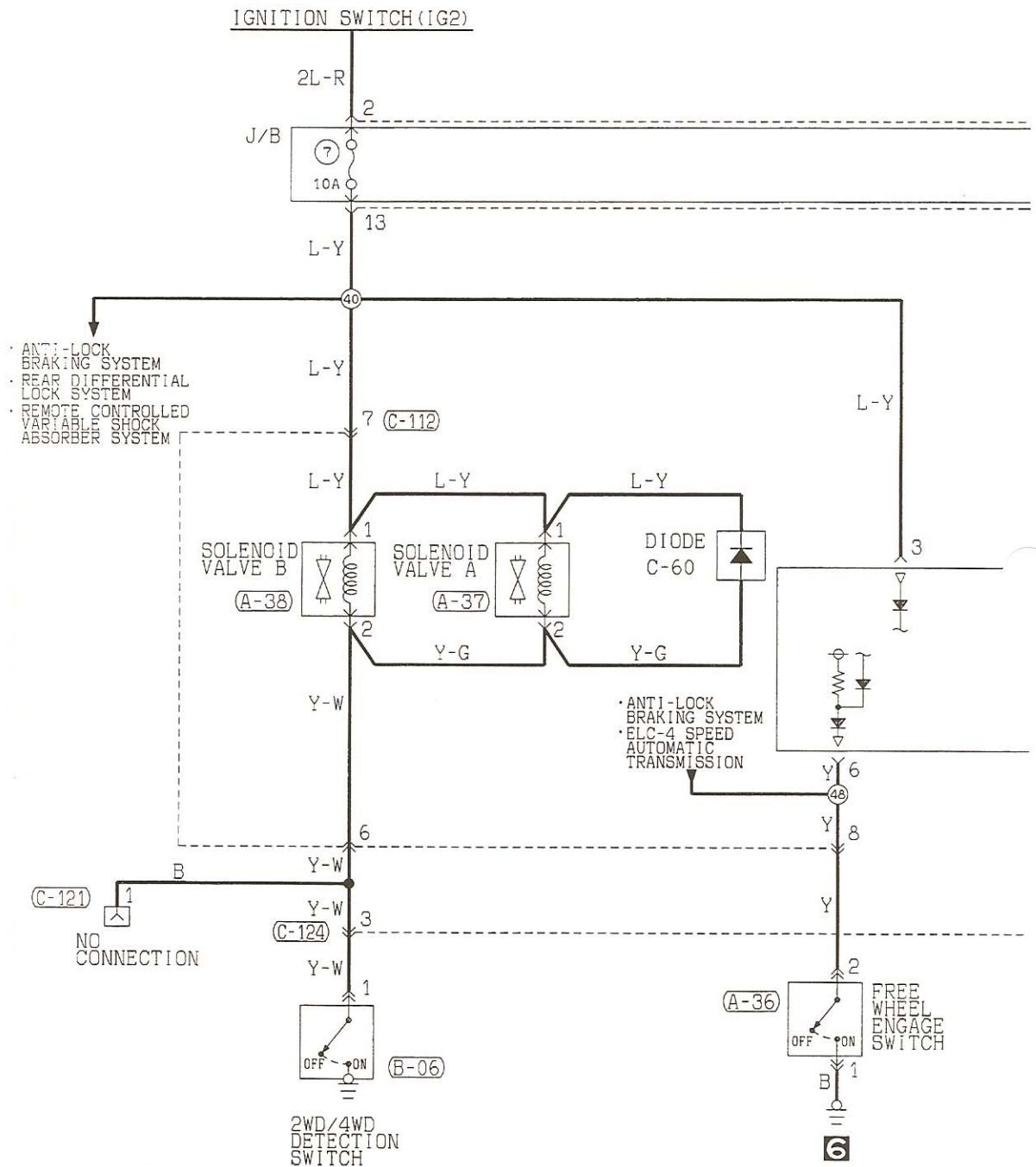
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8Q15M00AB

TSB Revision

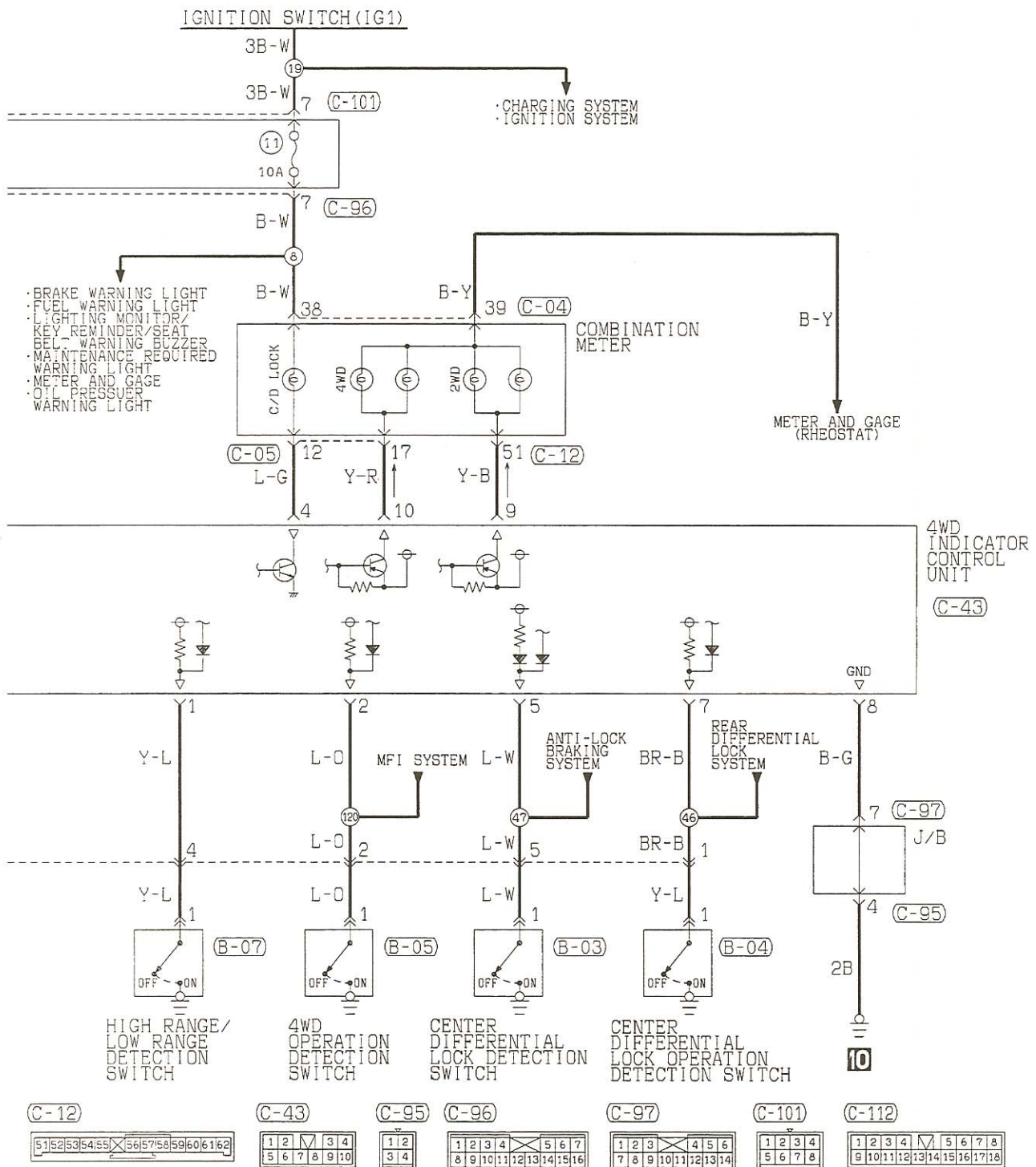
ACTIVE TRAC 4WD SYSTEM

90100920057



A-36	A-37	A-38	B-03	B-04	B-05	B-06	B-07	C-04	C-05
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C-121	C-124								
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TSB Revision



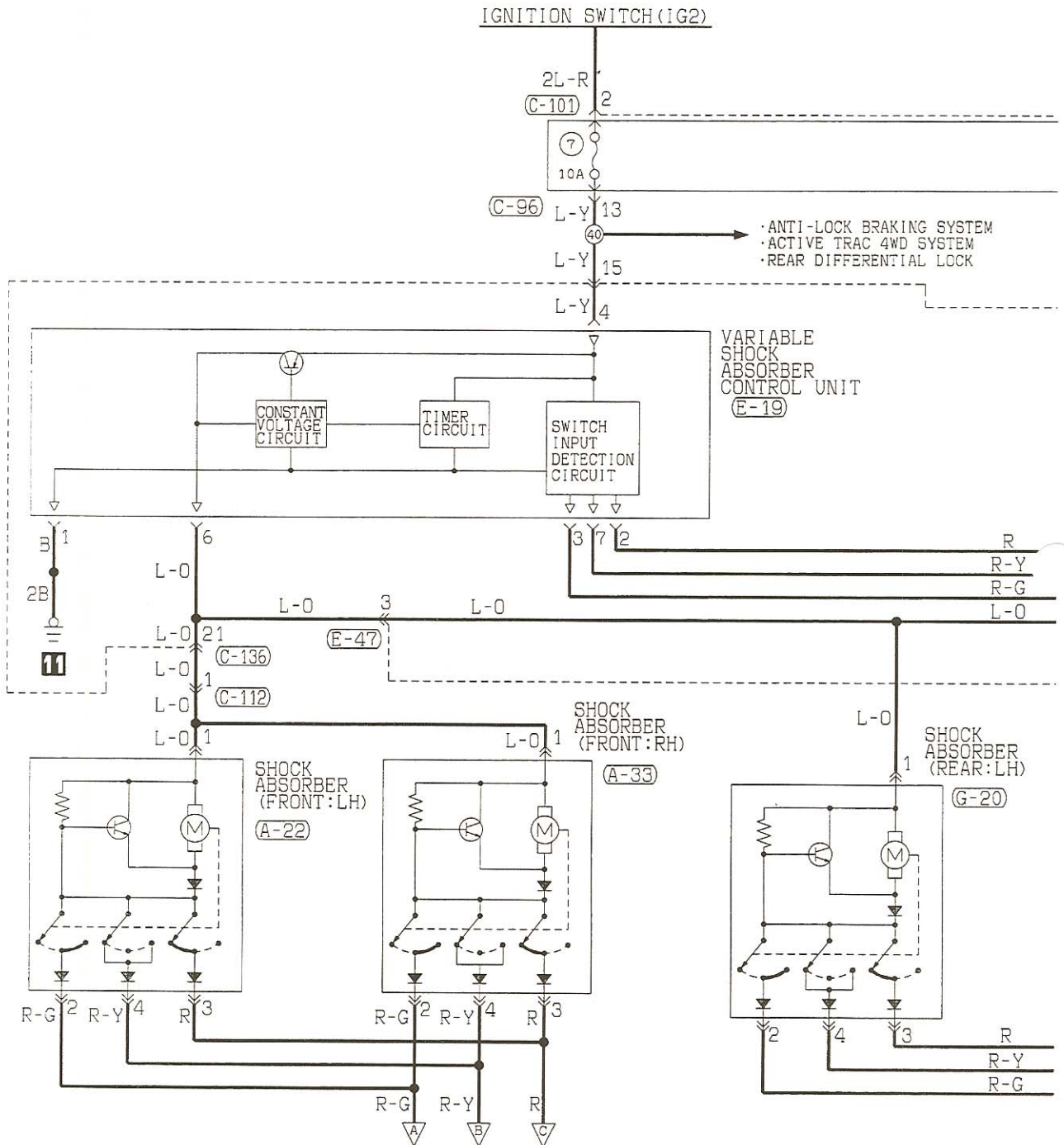
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8015M01AB

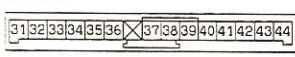
TSB Revision

REMOTE CONTROLLED VARIABLE SHOCK ABSORBER SYSTEM

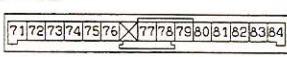
901014.



(A-22) (A-33) (C-04)



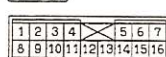
(C-11)



(C-80)



(C-96)

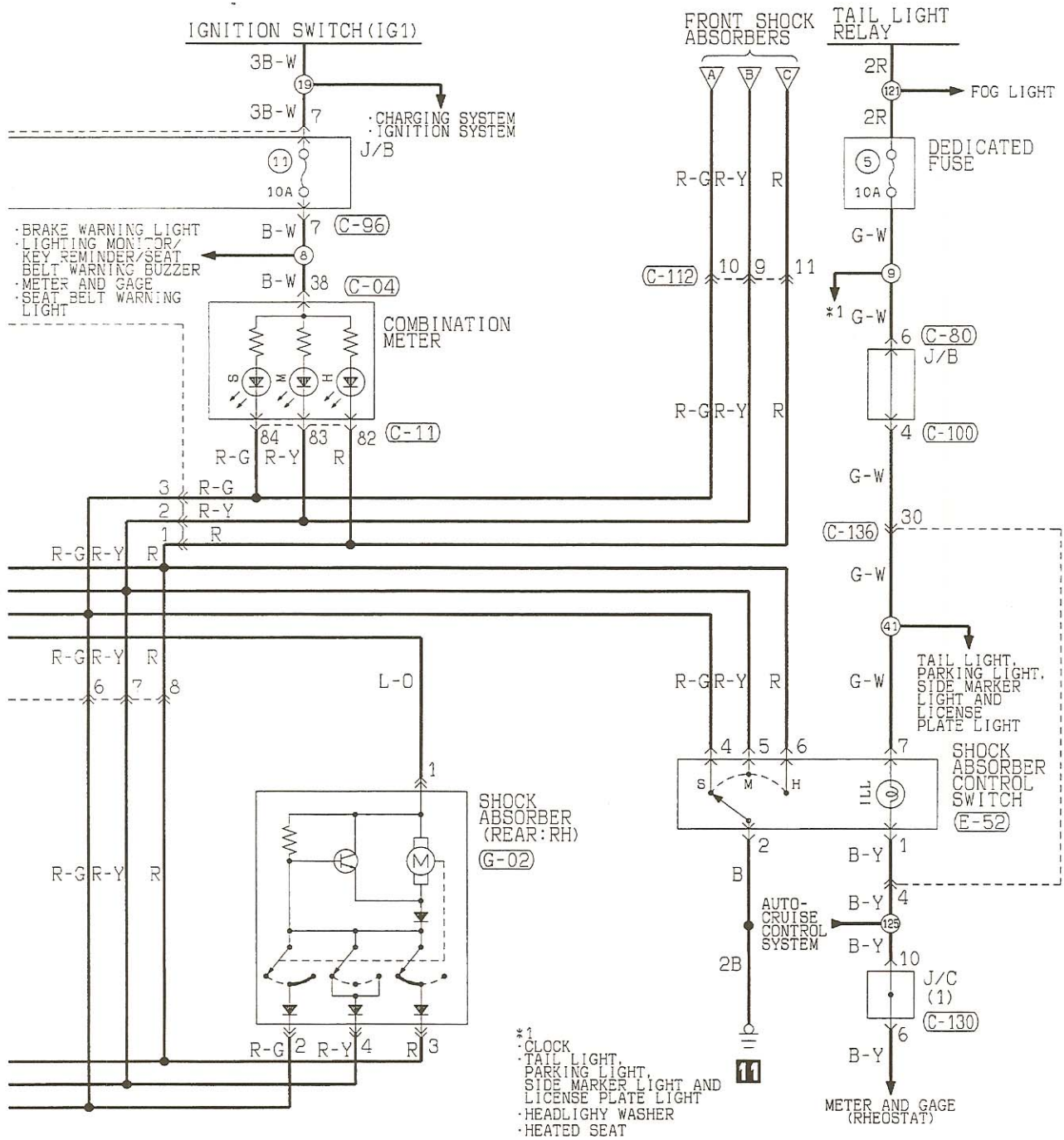


(C-100)



8Q15M02AA

TSB Revision



C-101	C-112	C-130	C-136	E-19	E-47	E-52	G-02	G-20
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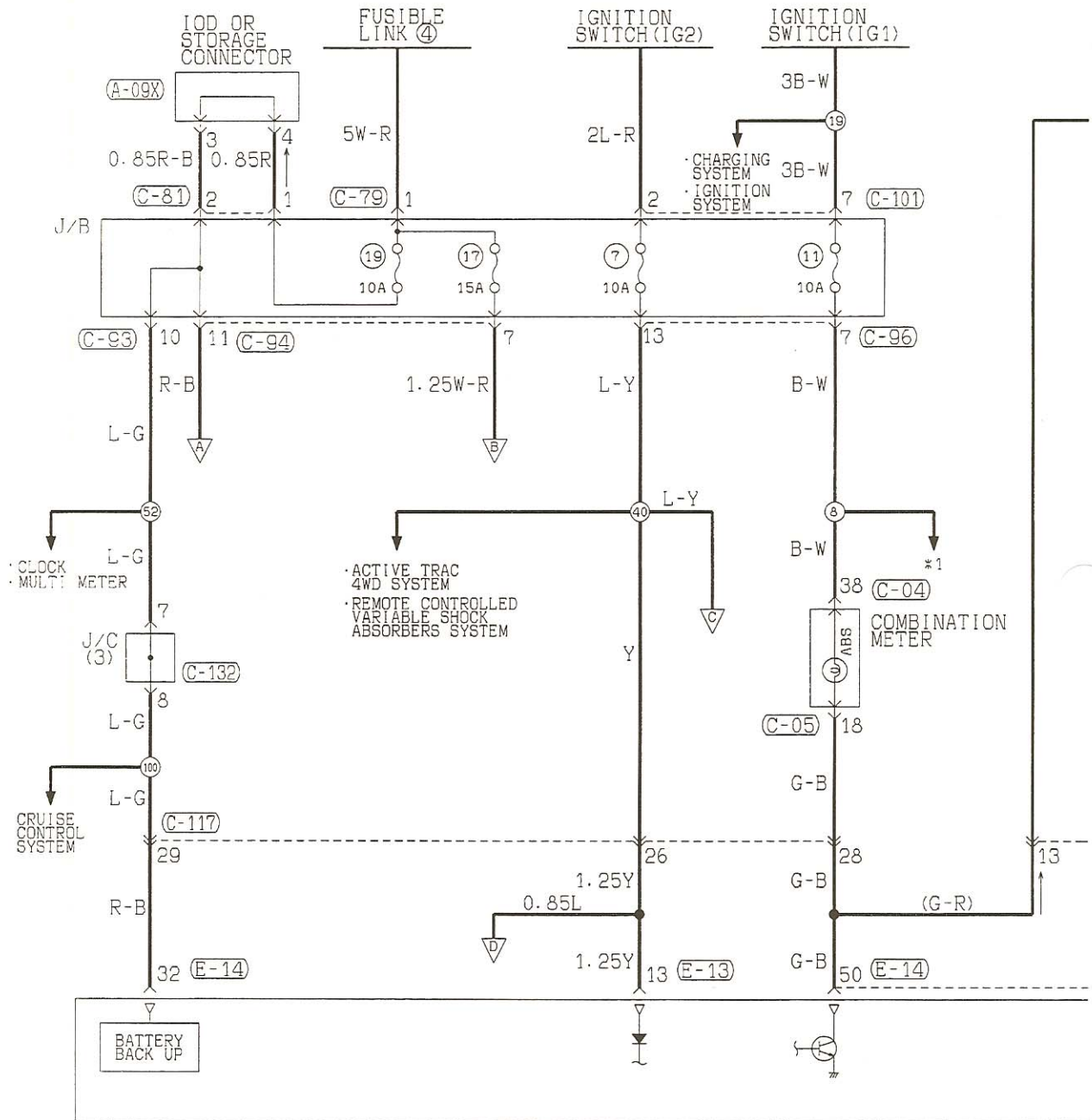
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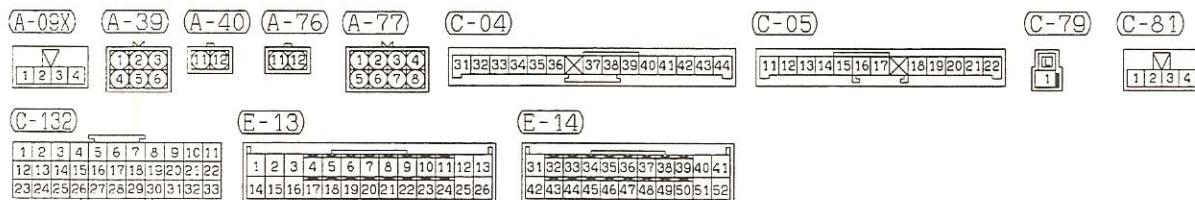
TSB Revision

ANTI-LOCK BRAKING SYSTEM

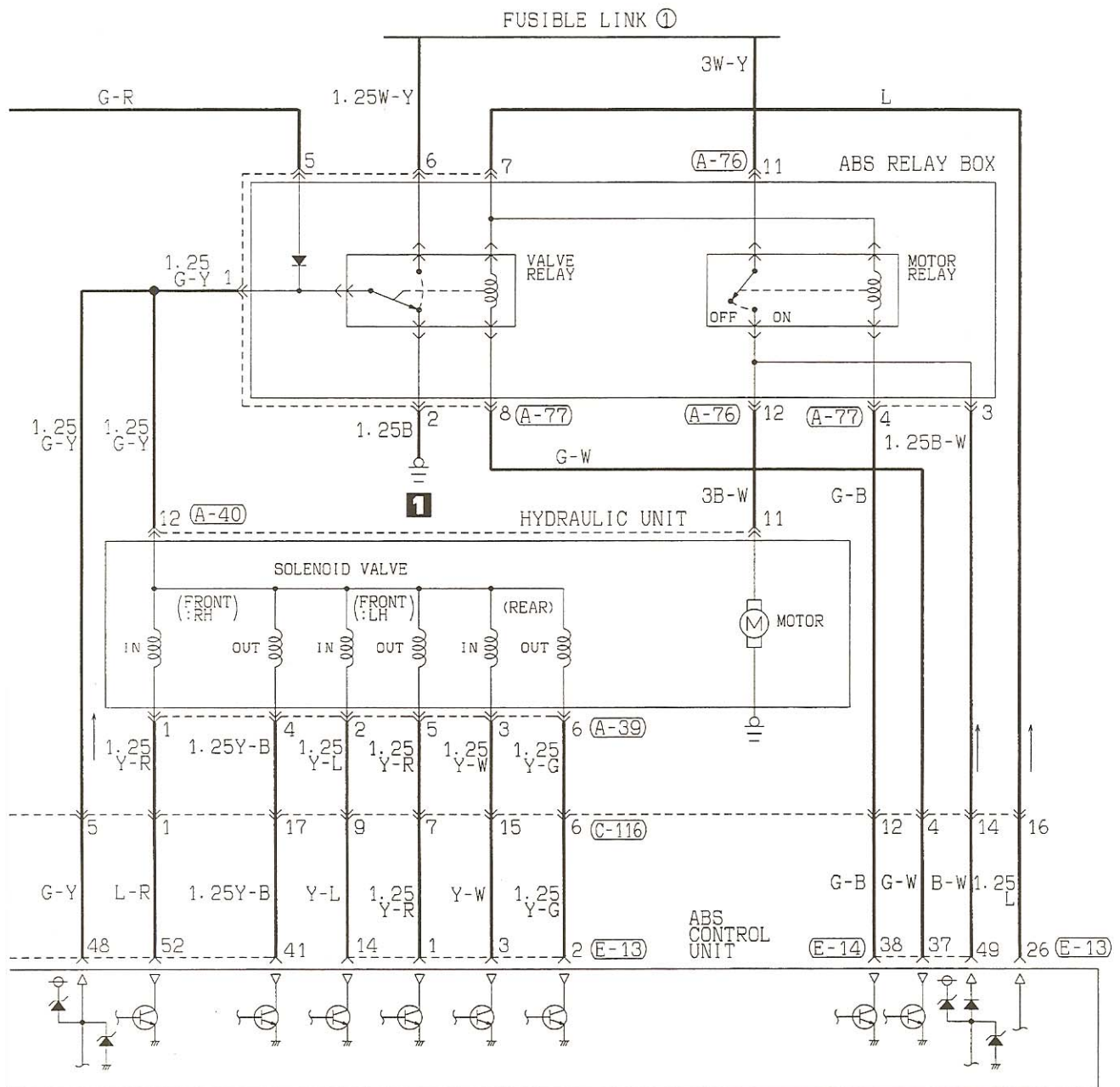
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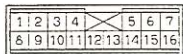
- *1
- BRAKE WARNING LIGHT
- LIGHTING MONITOR/KEY REMINDER/SEAT BELT WARNING BUZZER
- METER AND GAGE
- SEAT BELT WARNING LIGHT



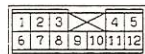
TSB Revision



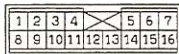
(C-93)



(C-94)



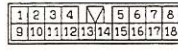
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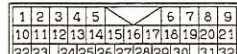
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(C-116)



(C-117)

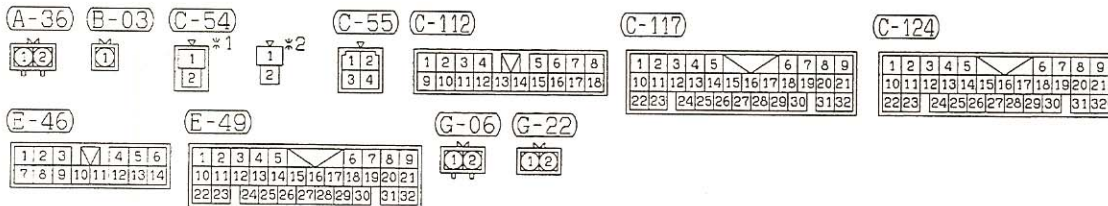
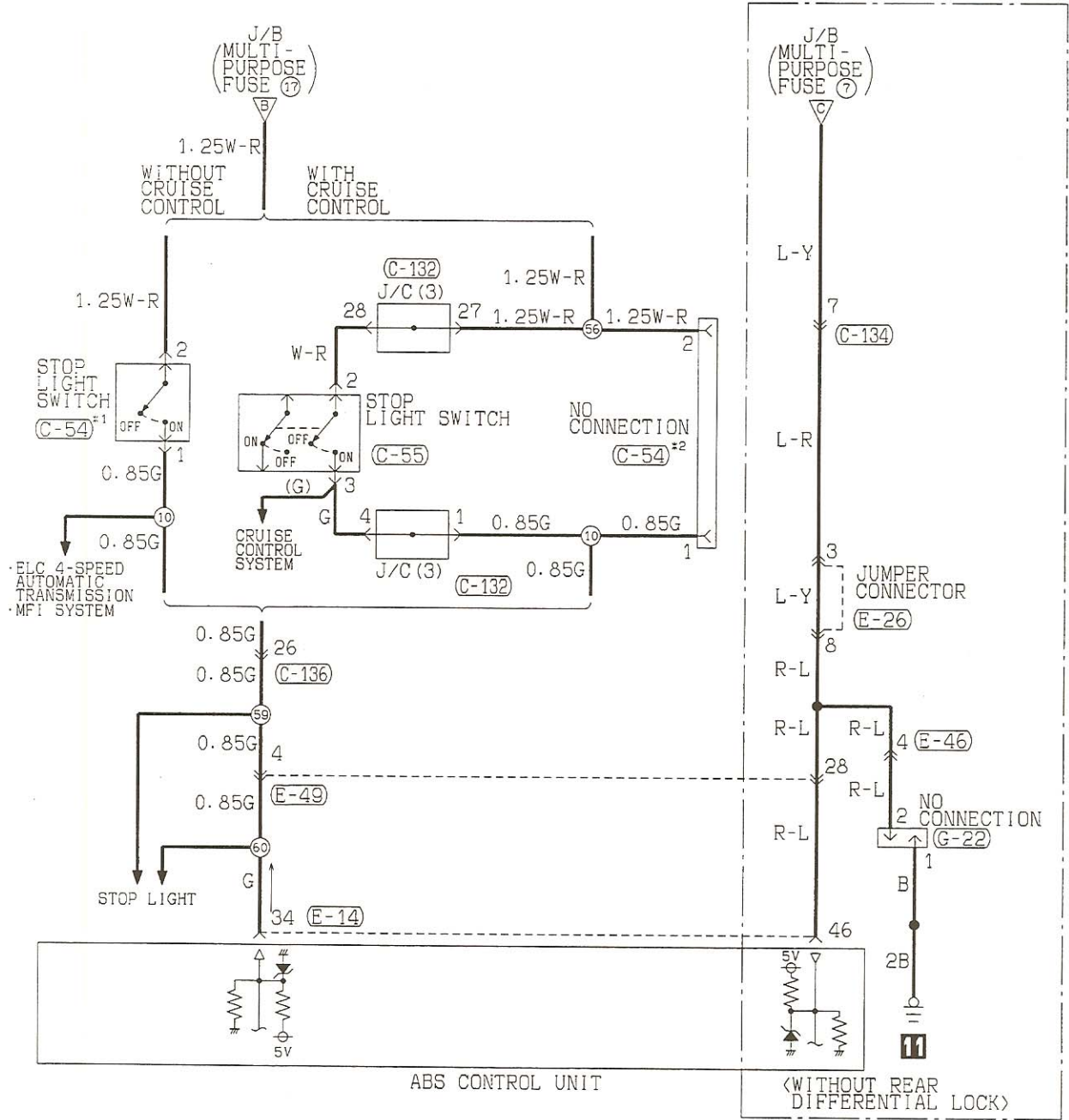


Wire color code
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 BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

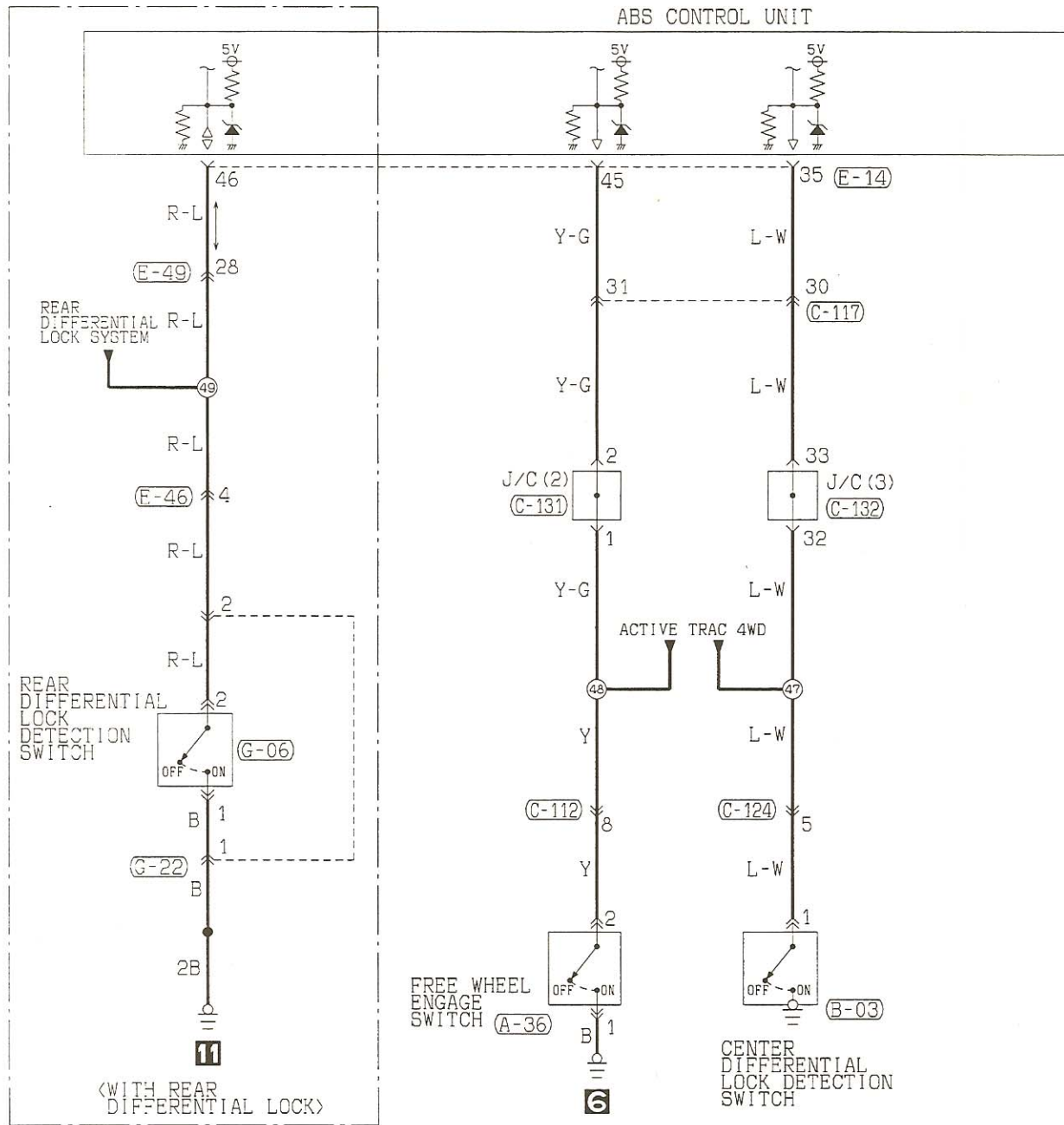
8Q15M03AB

TSB Revision

ANTI-LOCK BRAKING SYSTEM (CONTINUED)



TSB Revision



(C-131)

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23	24	25	26	27	28	29	30	31	32	33

(C-132)

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23	24	25	26	27	28	29	30	31	32	33

(C-134)

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21	22								

(C-136)

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19	20	21	22	23	24	25	26	27
28	29	30	31	32				

(E-14)

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(E-26)

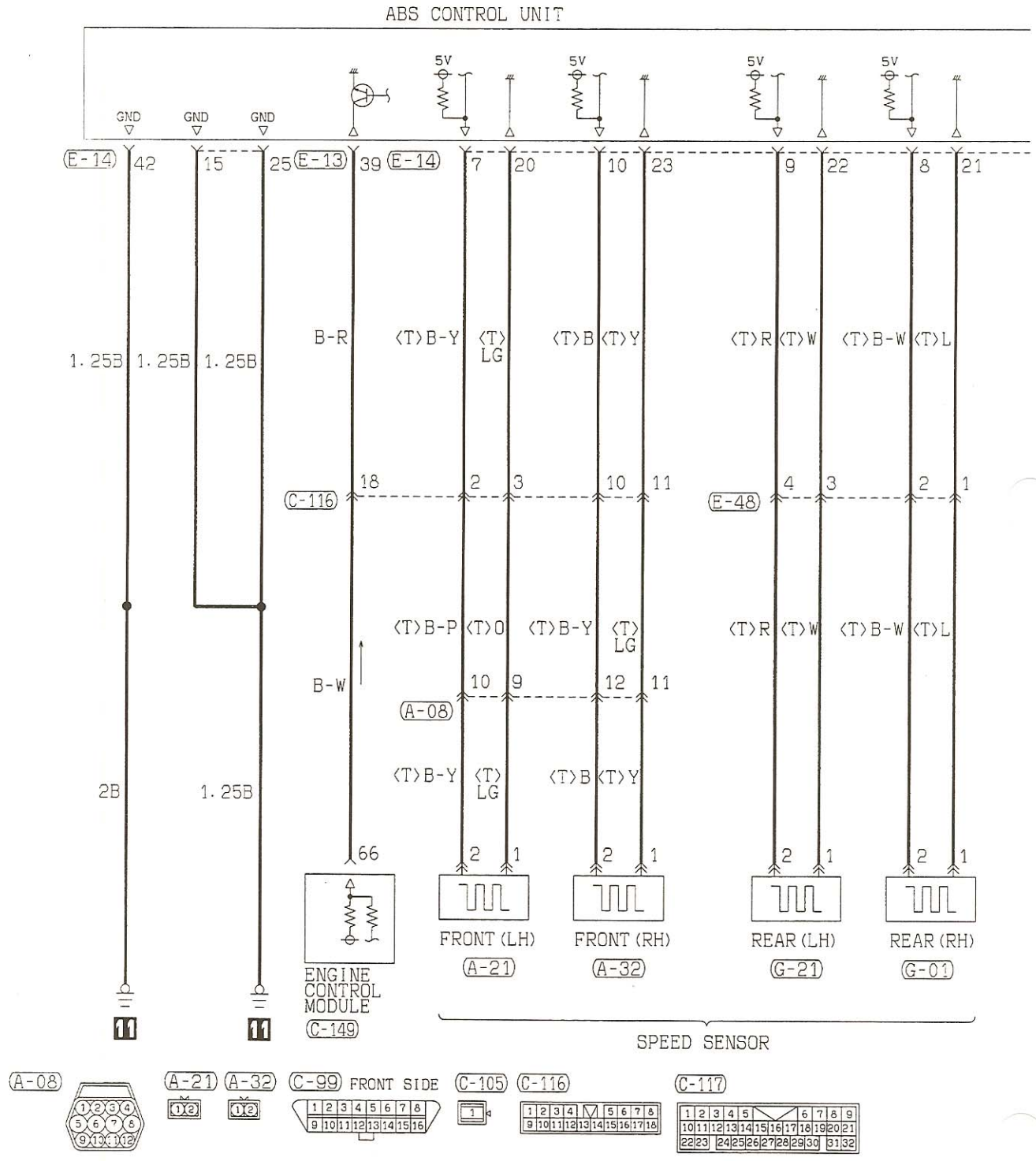
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9	10		

Wire color code
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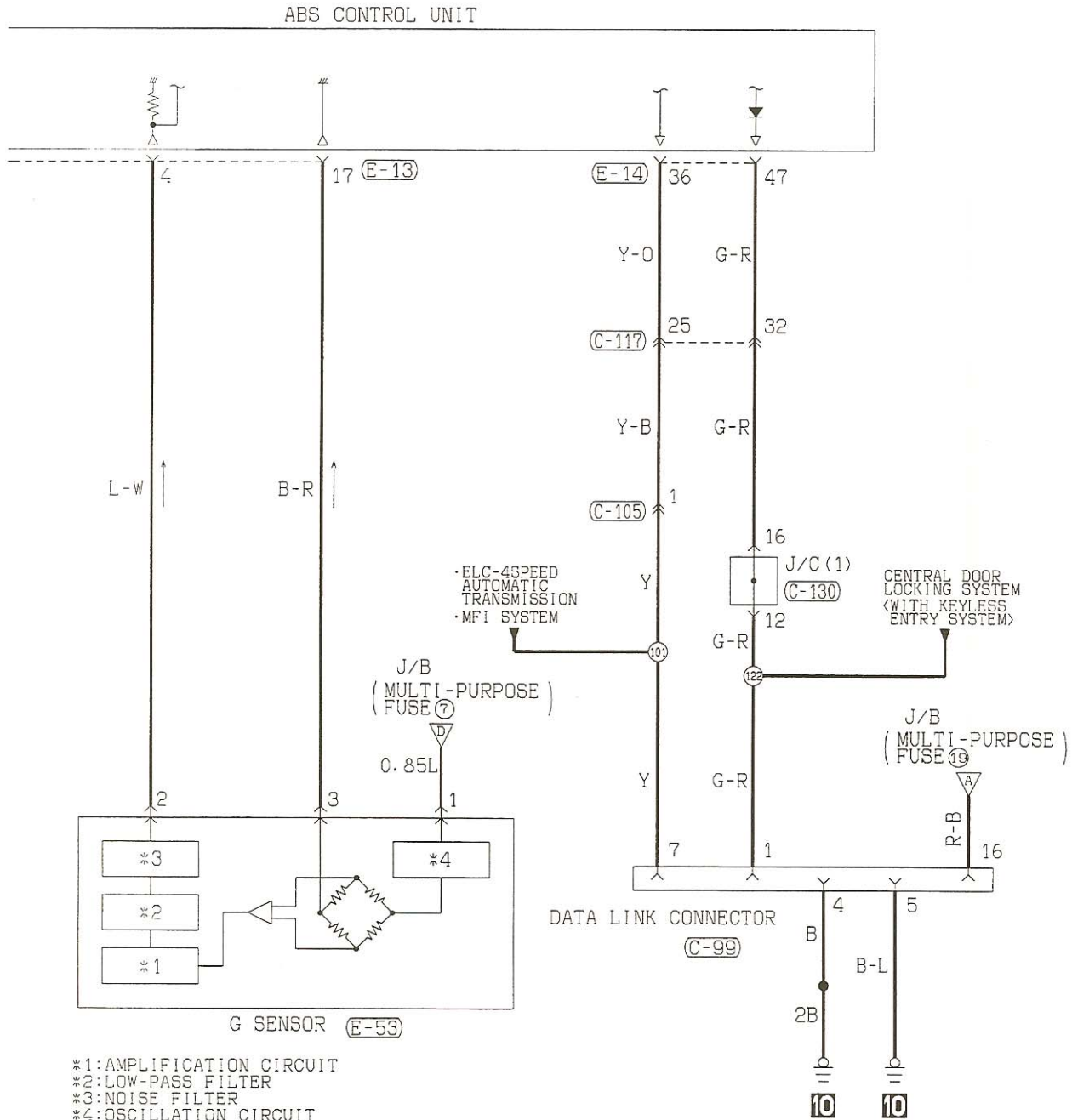
8Q15M03BB

TSB Revision

ANTI-LOCK BRAKING SYSTEM (CONTINUED)



TSB Revision



*1: AMPLIFICATION CIRCUIT
 *2: LOW-PASS FILTER
 *3: NOISE FILTER
 *4: OSCILLATION CIRCUIT

(C-130)

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(C-149)

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(E-13)

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(E-14)

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(E-48)

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(E-53)

1	2	3
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(G-01)

1	2
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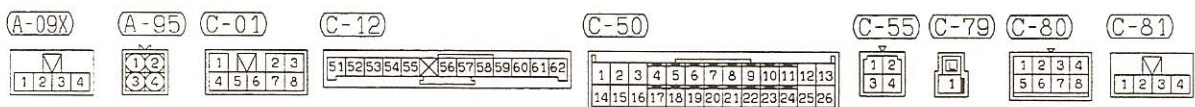
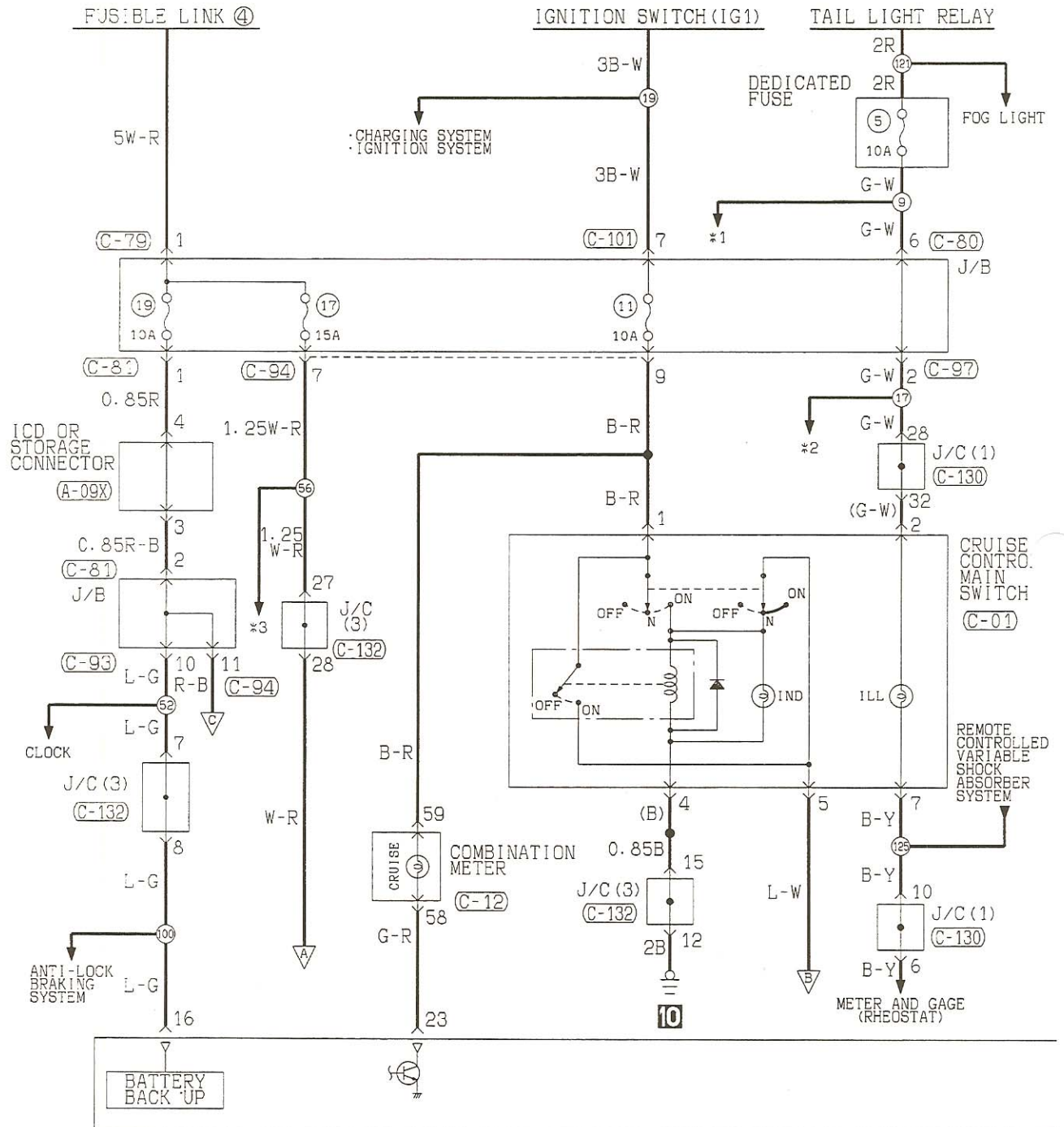
(G-21)

1	2
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Wire color code
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CRUISE CONTROL SYSTEM

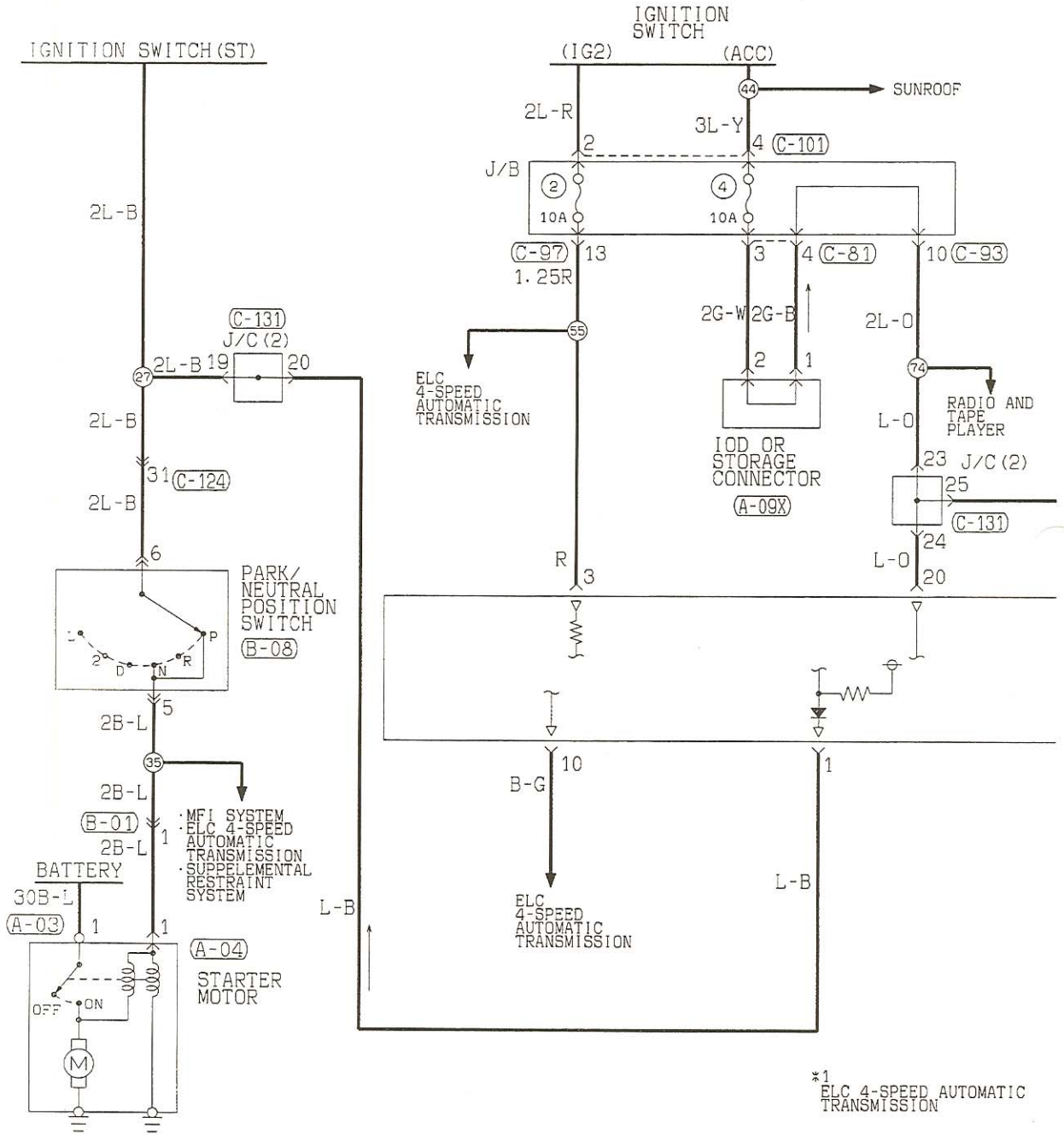
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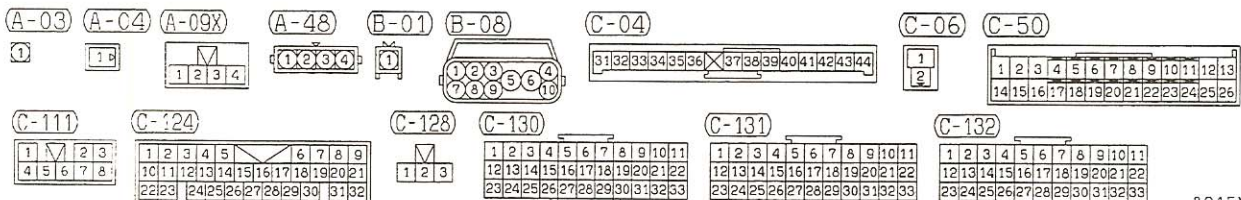
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TSB Revision

CRUISE CONTROL SYSTEM (CONTINUED)



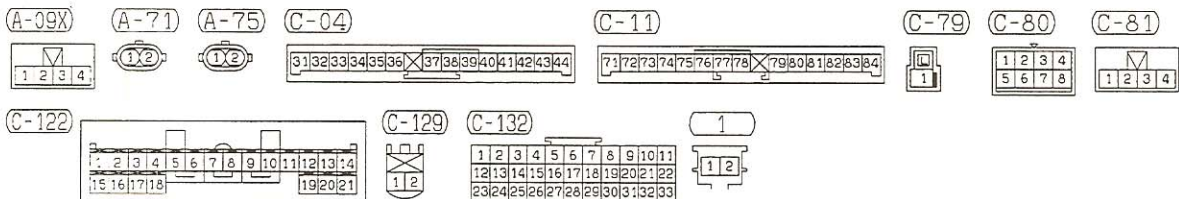
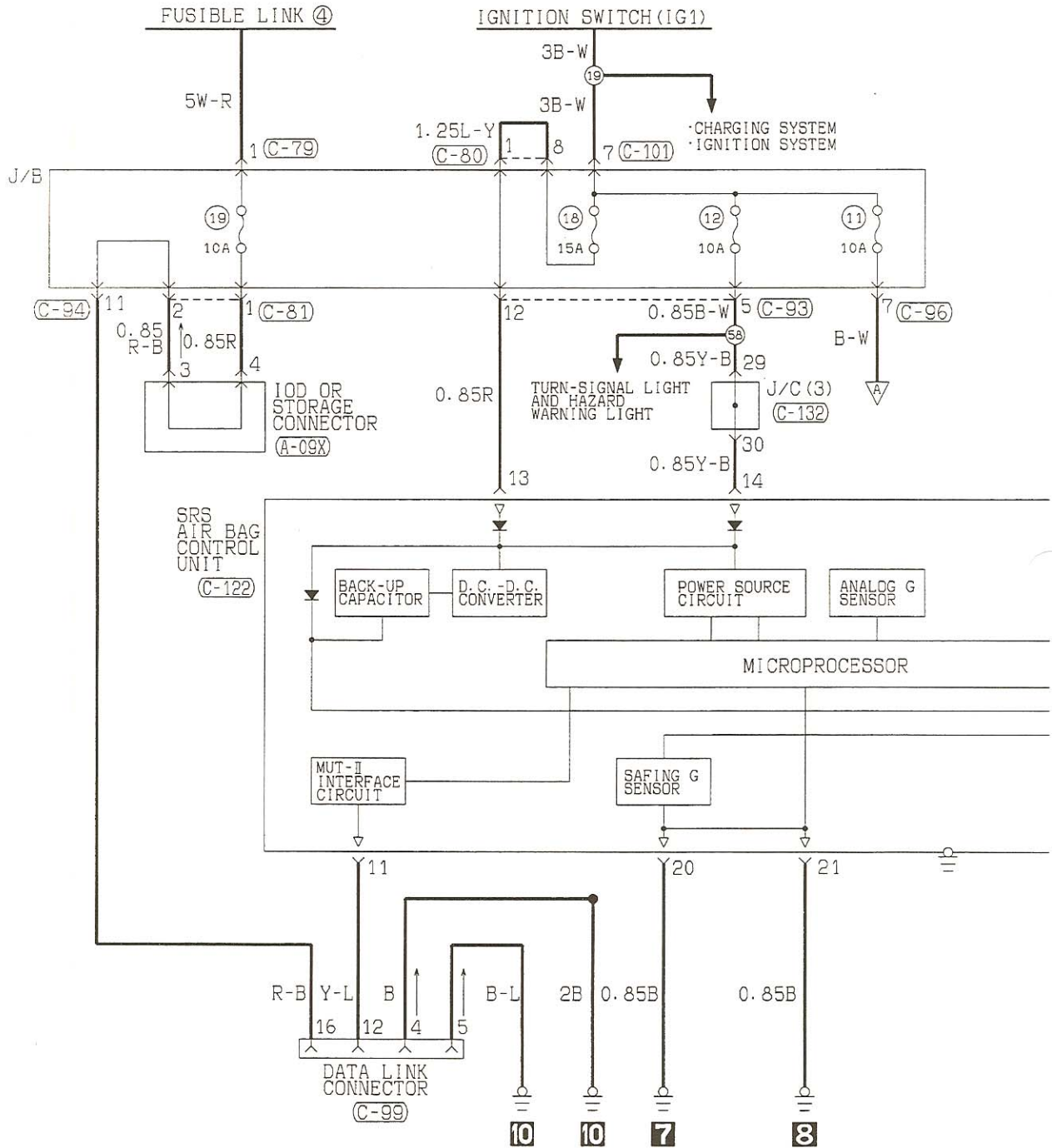
*1 ELC 4-SPEED AUTOMATIC TRANSMISSION



TSB Revision

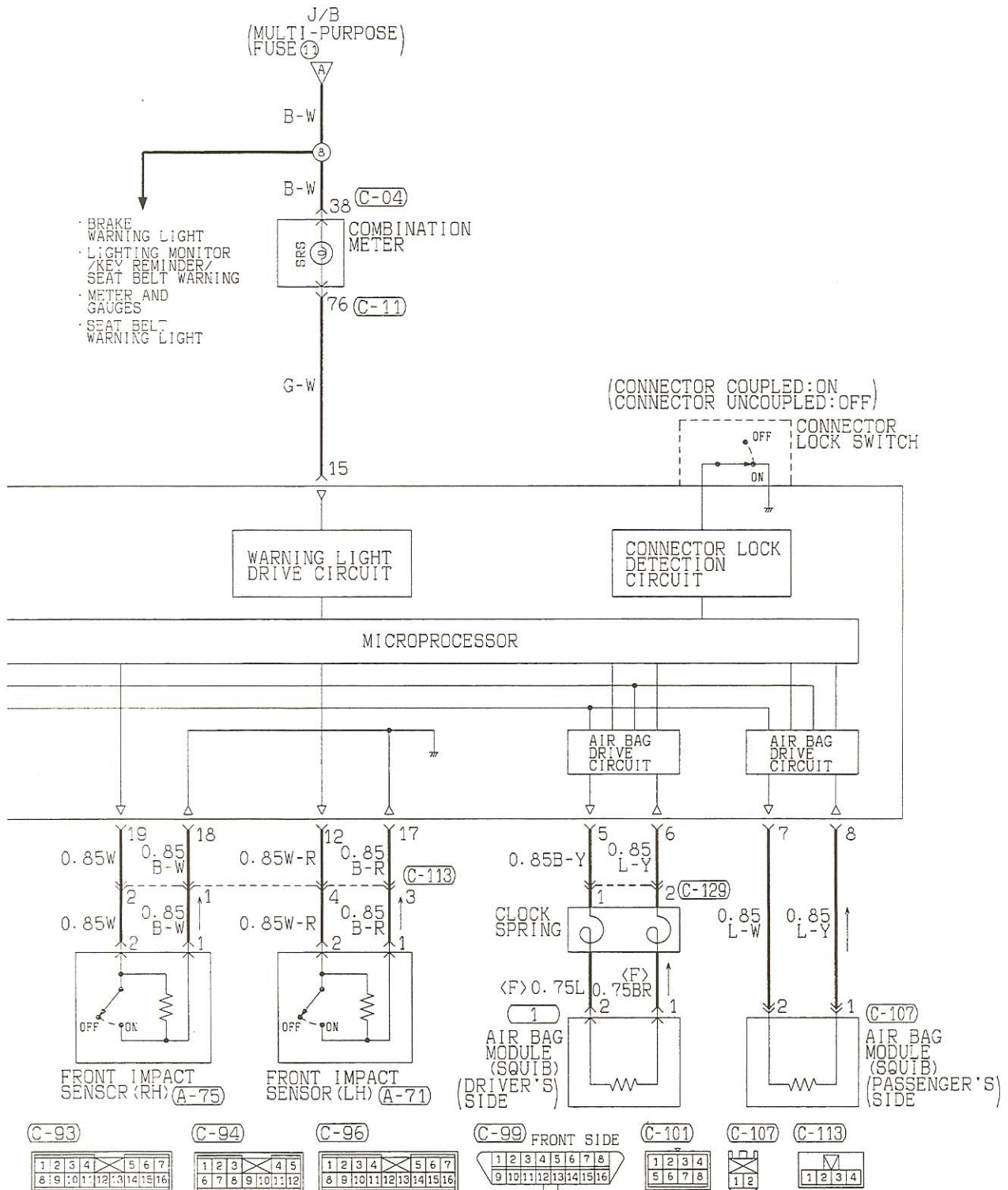
SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

90100970571



TSB Revision

8Q15M05AA



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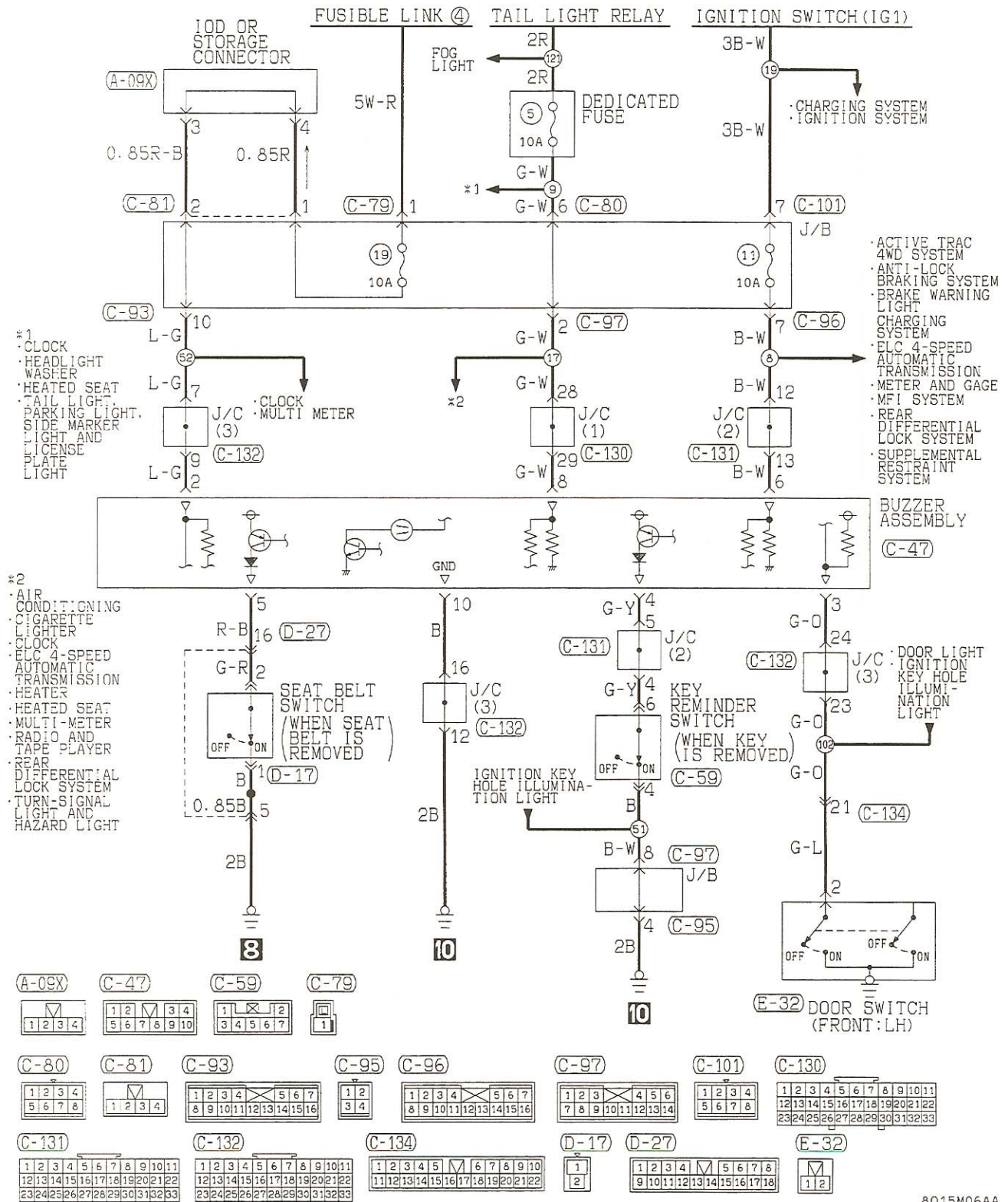
8Q15M05AB

TSB Revision

NOTES

LIGHTING MONITOR/KEY REMINDER/SEAT BELT WARNING BUZZER

90101450081

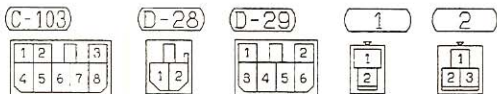
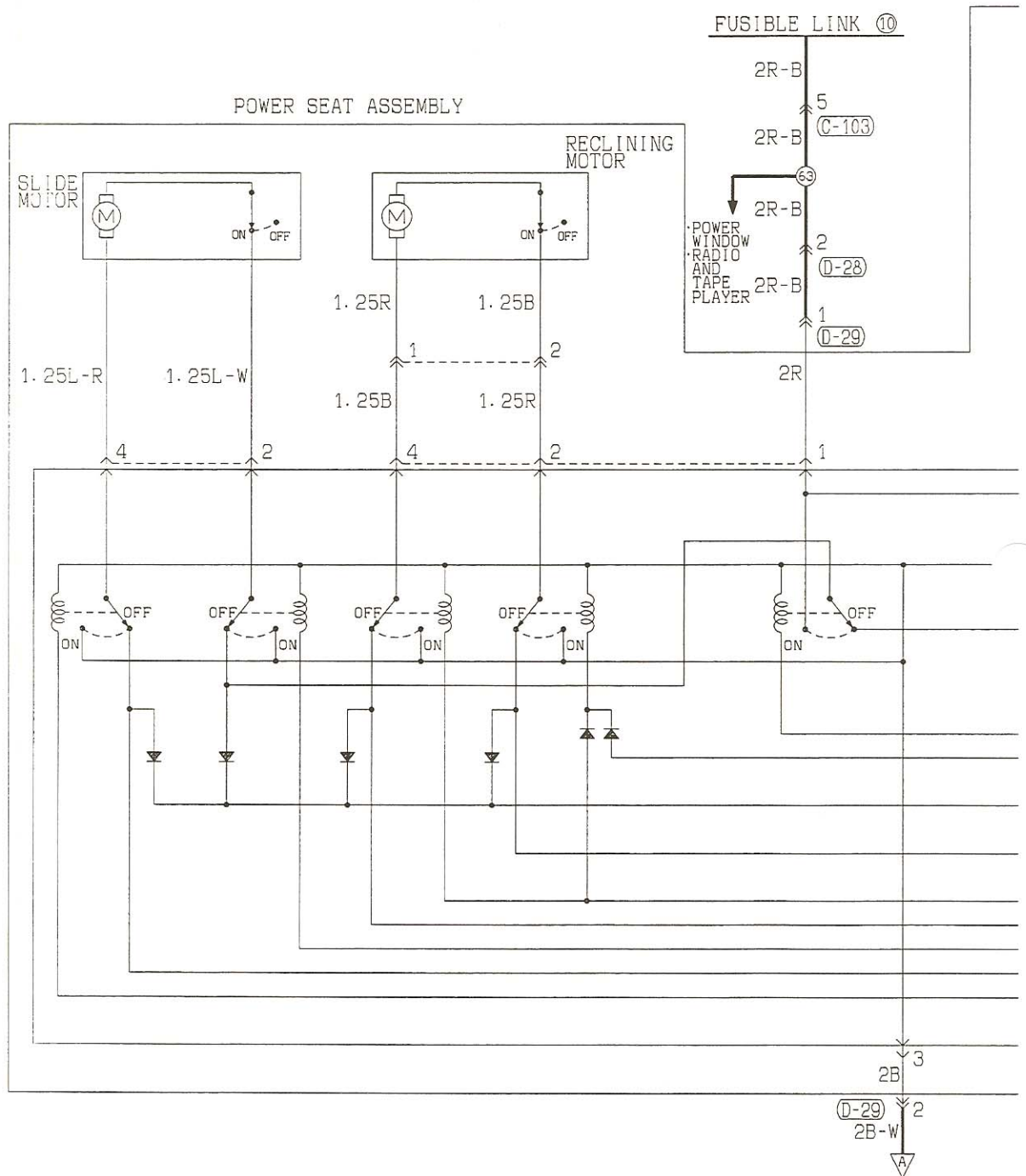


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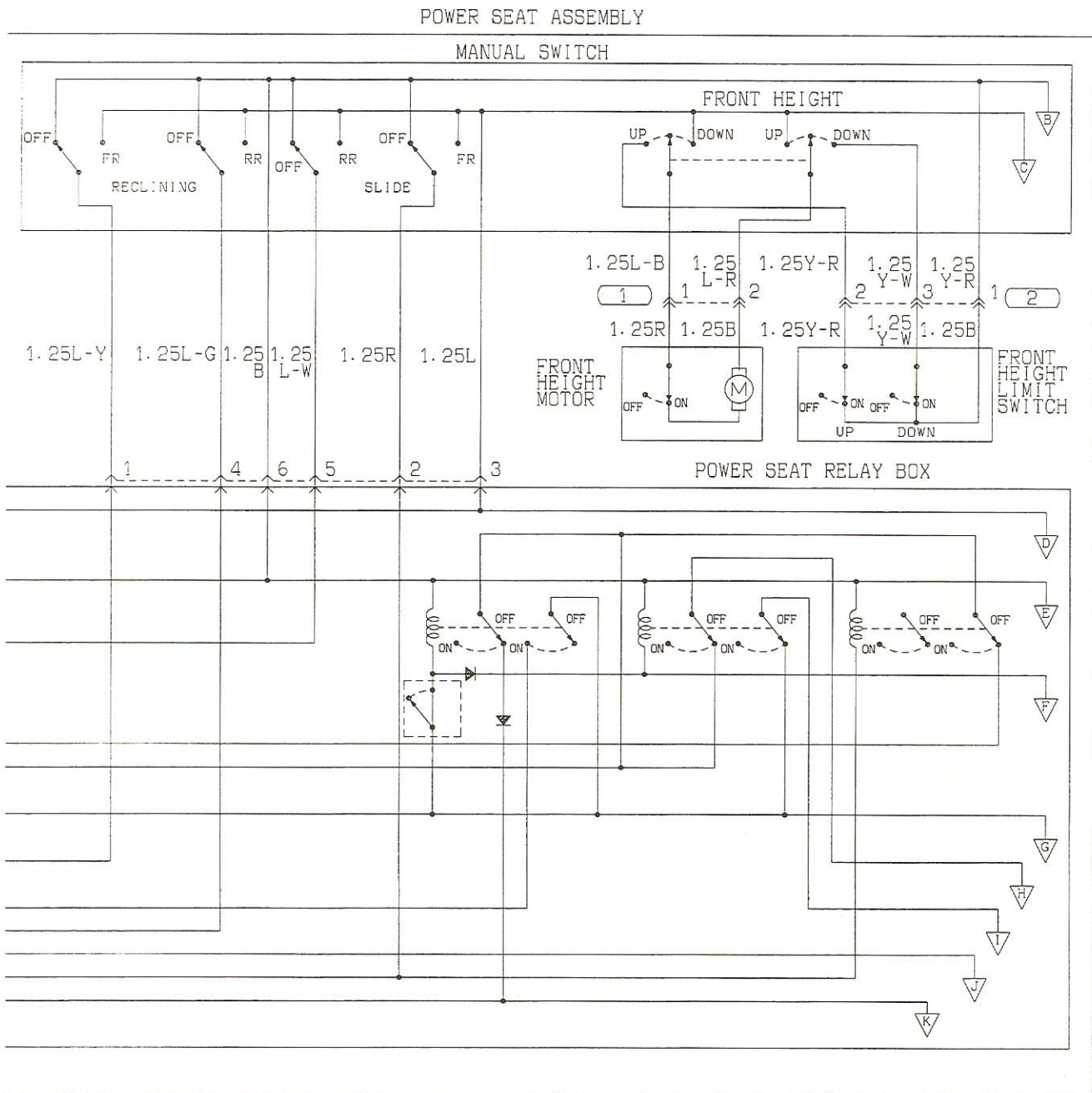
TSB Revision

POWER SEAT

90101040106



TSB Revision

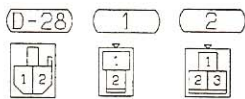
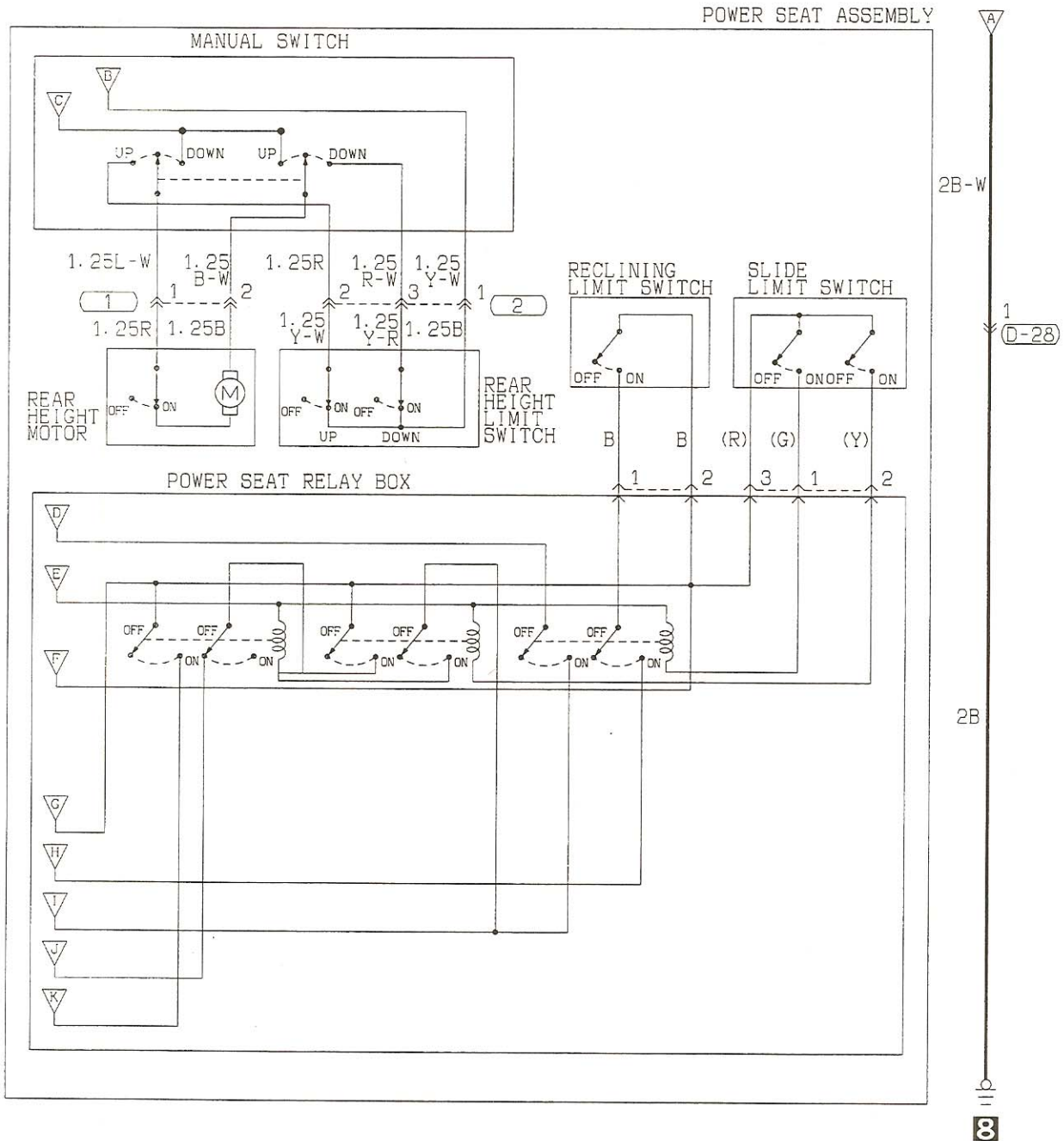


Wire color code
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8Q15M07AB

TSB Revision

POWER SEAT (CONTINUED)



Wire color code
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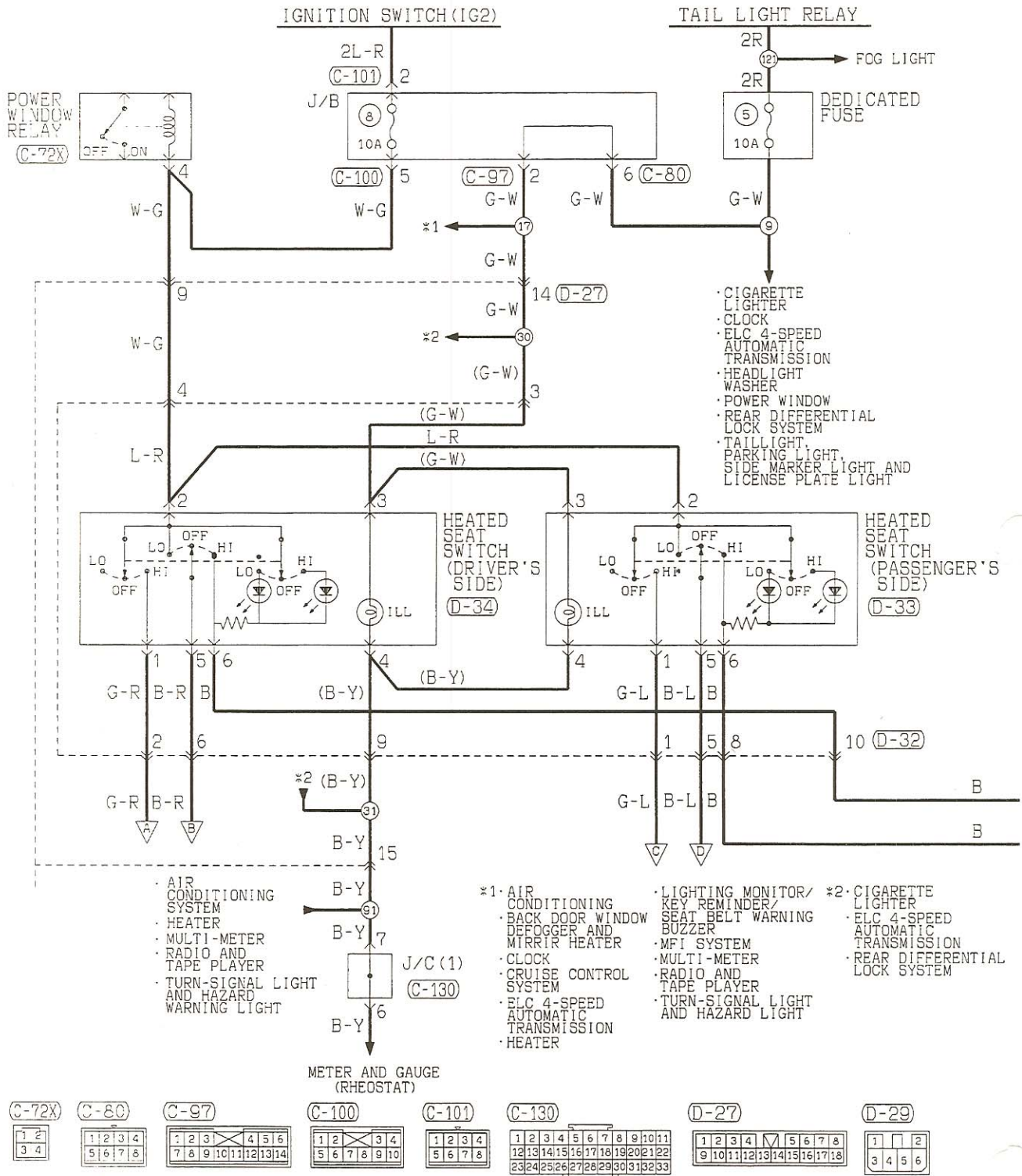
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TSB Revision

NOTES

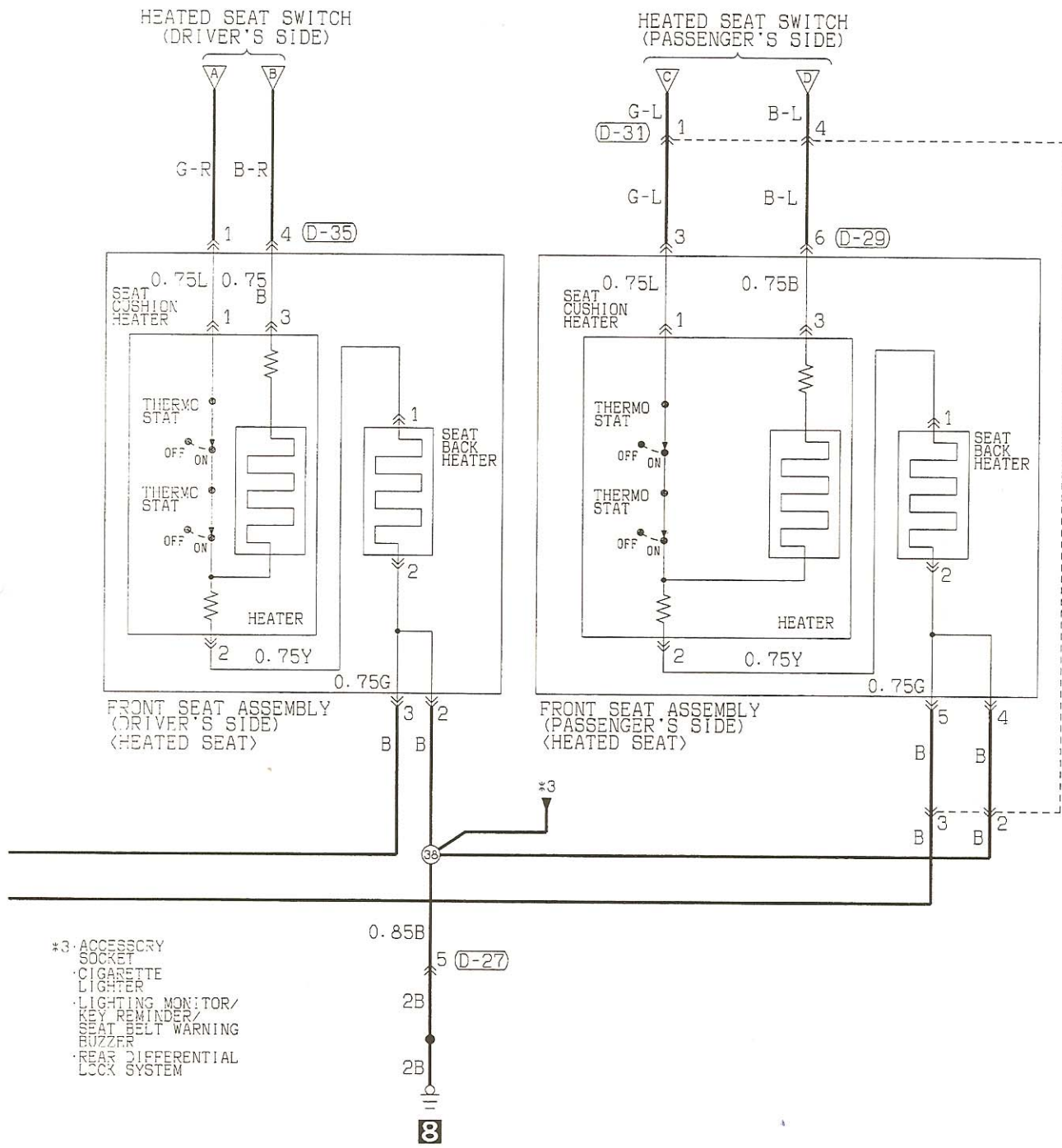
HEATED SEAT

90101070-57

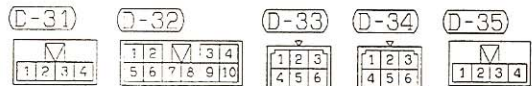


8Q15M08AA

TSB Revision



- *3- ACCESSORY SOCKET
- CIGARETTE LIGHTER
- LIGHTING MONITOR/KEY REMINDER/SEAT BELT WARNING BUZZER
- REAR DIFFERENTIAL LOCK SYSTEM



Wire color code
 B: Black LG: Light green G: Green L: Blue W: White Y: Yellow SB: Sky blue
 BR: Brown O: Orange GR: Gray R: Red P: Pink V: Violet

TSB Revision

NOTES

GENERAL SPECIFICATIONS

2510003

PROPELLER SHAFT

Items		Specifications
Type		2-joint type
Length (joint to joint) × O.D. mm (in.)	Front propeller shaft	713 × 50.8 (28.1 × 2.00)
	Rear propeller shaft	736.5 × 75 (29.0 × 2.95)

UNIVERSAL JOINT

Items		Specifications
Type		Cross type
Lubrication Method		Nipple type
Journal O.D. mm (in.)	Front propeller shaft	14.689 (.5783)
	Rear propeller shaft	18.300 (.7205)

SERVICE SPECIFICATIONS

25100030028

Items	Standard value	Limit
Clearance between snap ring and groove wall of yoke mm (in.)	0.06 (.0024) or less	–
Propeller shaft runout mm (in.)	–	0.6 (.024)

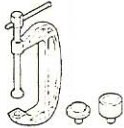

LUBRICANTS

25100040021

Item	Specified lubricants
Sleeve yoke	Hypoid Gear Oil API classification GL-4 or higher SAE viscosity 80W, 75W–85W

SPECIAL TOOLS

25100060027

Tool	Tool number and name	Supersession	Application
	MB990840 Universal joint remover/ installer	MB990840-01	Disassembly and reassembly of universal joint
	MB991410 Collar	–	

TROUBLESHOOTING

25100070013

Trouble Symptom	Probable Cause	Remedy
Noise at start	Worn journal bearing	Replace
	Worn sleeve yoke spline	
	Loose propeller shaft installation	Retighten
Noise and vibration at high speed	Unbalanced propeller shaft	Replace
	Incorrect snap ring selection	Adjust the clearance
	Worn journal bearing	Replace

PROPELLER SHAFT

25100100125

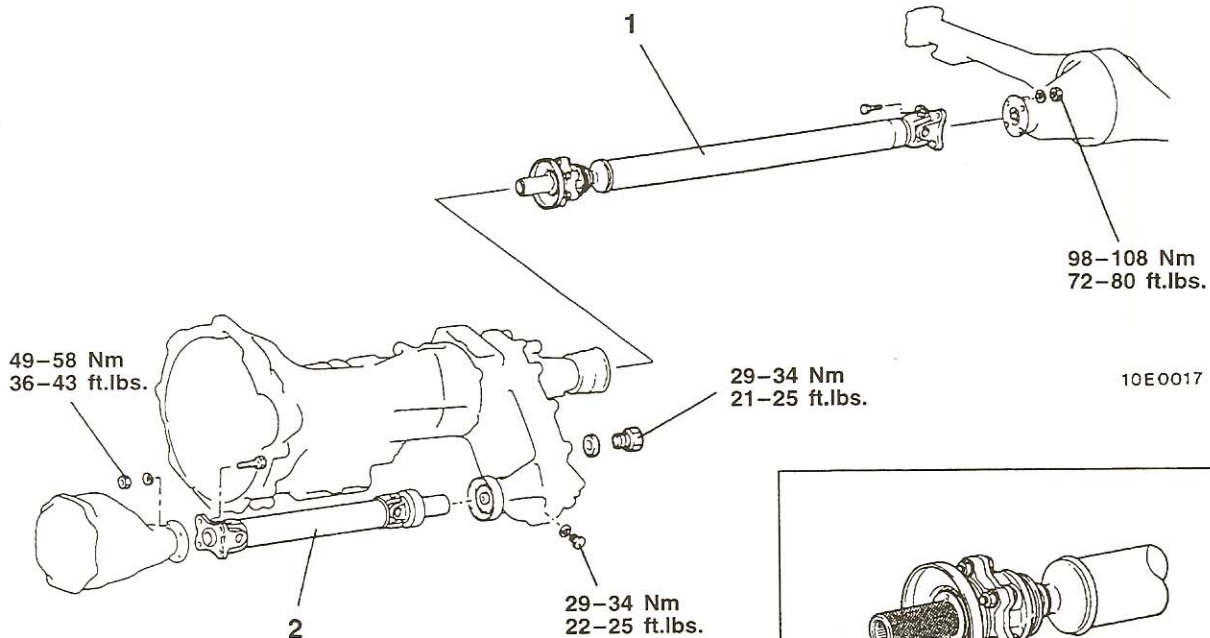
REMOVAL AND INSTALLATION

Pre-removal Operation

- Set the Transfer Shift Lever to "2H".
- Transfer Gear Oil Draining (Refer to GROUP 00 – Maintenance Service.)

Post-installation Operation

- Transfer Gear Oil Supplying (Refer to GROUP 00 – Maintenance Service.)



10E0015

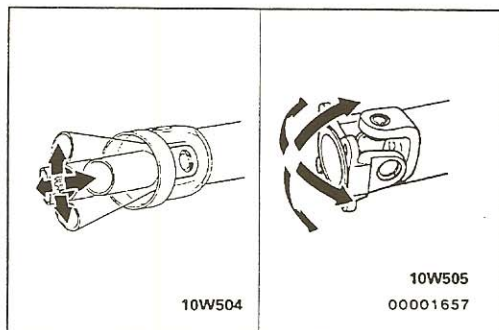
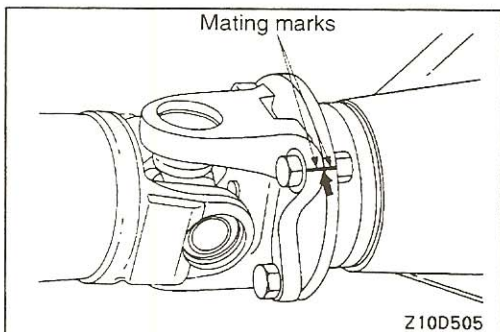
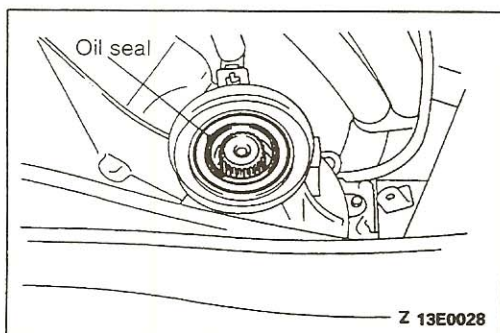
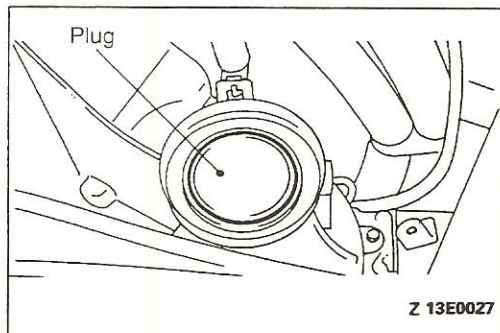
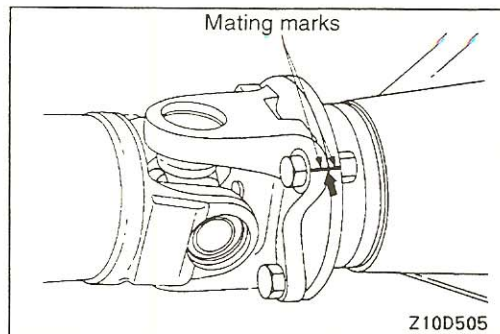
Gear oil:
Hypoid gear oil API classification GL-4 or higher/SAE viscosity 80W, 75W-85W

00005430

Removal steps

- ◀A▶ ▶A◀ 1. Rear propeller shaft
- ◀A▶ ▶A◀ 2. Front propeller shaft

TSB Revision



REMOVAL SERVICE POINT

◀A▶ REAR PROPELLER SHAFT/FRONT PROPELLER SHAFT REMOVAL

- (1) Make mating marks on the flange yoke and the differential companion flange.

- (2) Use the plug as a cover so that no foreign material gets into the transmission or transfer.

INSTALLATION SERVICE POINT

▶A◀ FRONT PROPELLER SHAFT/REAR PROPELLER SHAFT INSTALLATION

Caution

Be careful not to damage the oil seal lip of the transmission and transfer.

Install the propeller shaft to the companion flange so that the mating marks are aligned.

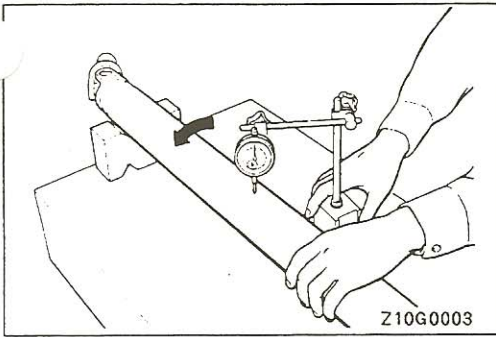
Caution

If the threads of the bolts and nuts are stained with oil or grease, they can become loose. Completely remove oil or grease from the threads before tightening the bolts and nuts.

INSPECTION

25100110029

- Check the universal joints for smooth operation in all directions.
- Check the sleeve yoke and flange yoke for wear, damage or cracks.
- Check the propeller shaft yokes for wear, damage or cracks.
- Check the propeller shaft for bends, twisting or damage.



PROPELLER SHAFT RUNOUT

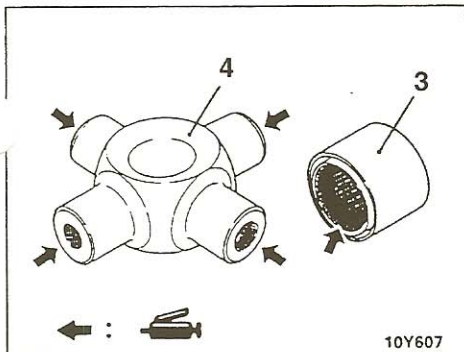
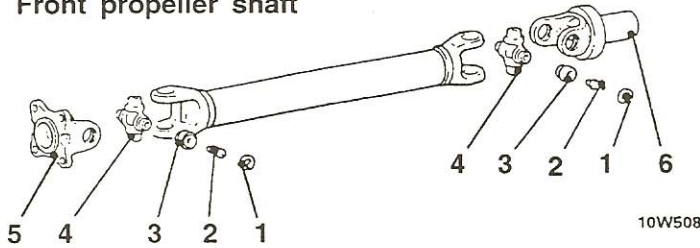
Measure the propeller shaft runout with a dial indicator.

Limit: 0.6 mm (.024 in.)

DISASSEMBLY AND REASSEMBLY

25100120077

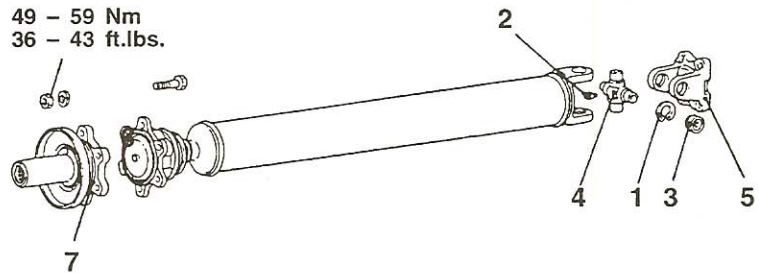
Front propeller shaft



Caution
Do not apply grease excessively. Otherwise, faulty fitting of bearing caps and errors in the selection of snap rings may result.

Rear propeller shaft

49 – 59 Nm
36 – 43 ft.lbs.



10E0018

00005431

Disassembly steps

- ◀A▶ ▶B▶ 1. Snap ring
- ▶B▶ ▶A▶ 2. Grease fitting
- ▶B▶ ▶A▶ 3. Journal bearing
- ▶A▶ ▶A▶ 4. Journal
- ▶A▶ ▶A▶ 5. Flange yoke

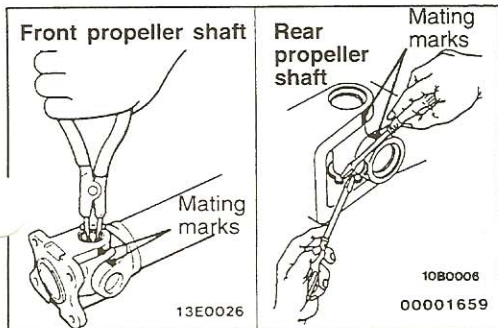
- 6. Sleeve yoke
- 7. Sleeve flange

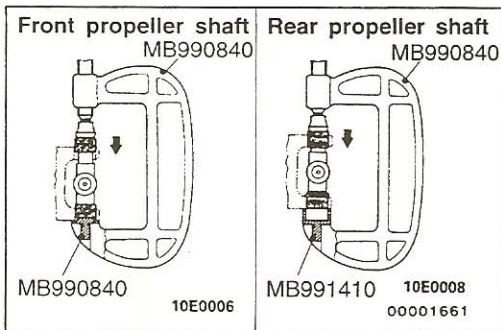
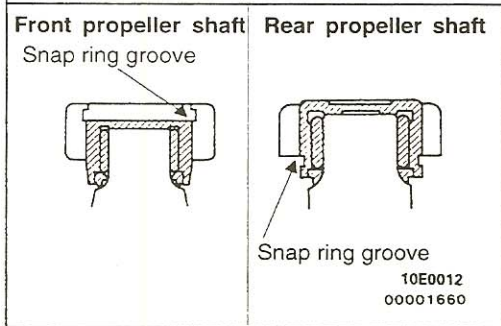
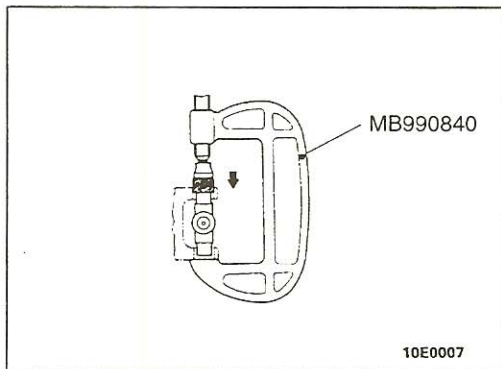
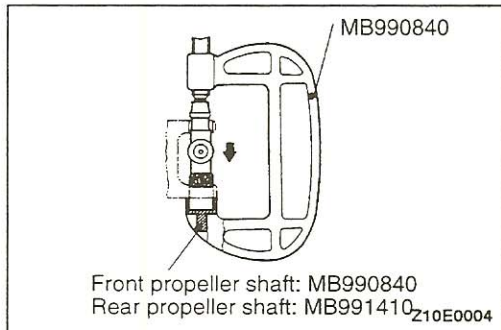
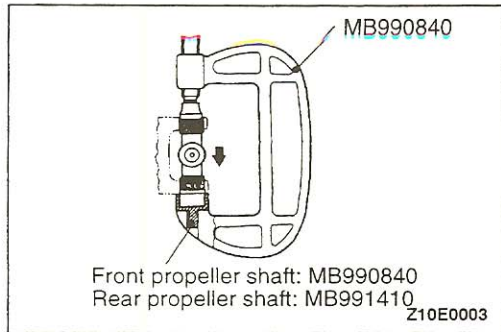
NOTE
Do not disassemble the BJ joint assembly.

DISASSEMBLY SERVICE POINTS

◀A▶ SNAP RING REMOVAL

Make mating marks on the yokes of the universal joint that is to be disassembled.





◀B▶ JOURNAL BEARING REMOVAL

- (1) Use the special tool to press in the journal bearing one side, and take out the journal bearing on the opposite side.

- (2) Insert the special tool in the other side and press the journal to remove the first journal bearing that was pushed.

Caution

Do not tap the journal bearings to remove them, as this will upset the balance of the propeller shaft.

REASSEMBLY SERVICE POINTS

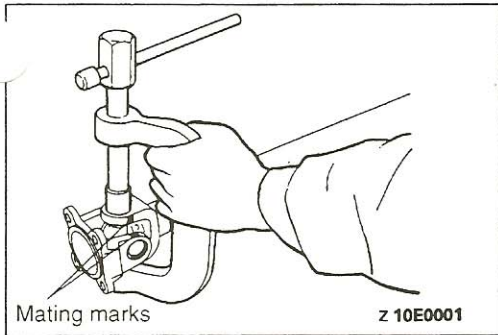
▶A▶ JOURNAL/JOURNAL BEARING INSTALLATION

- (1) Fit the journal onto the yoke.
- (2) Use the special tool to press the journal bearing the yoke until the snap ring groove is fully visible.

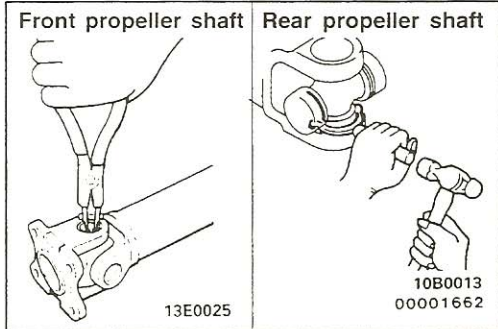
- (3) Use the special tool to press the opposite side journal bearing into the yoke.

Caution

Be careful when pressing the journal bearings, as if they are pressed at an angle, the inside of the journal bearings will be damaged by the journal.

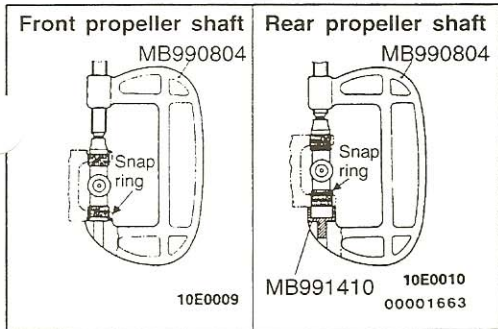


- (4) Align the mating marks on the yoke and propeller shaft, and install the propeller shaft journal bearings in the method described in steps (2) and (3) above.

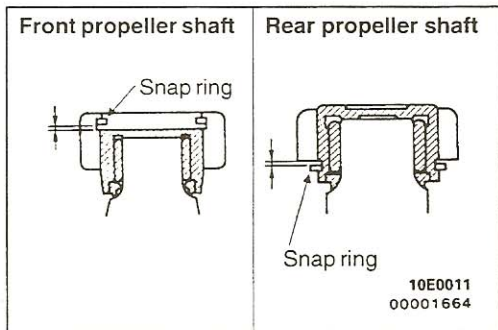


►B◄ SNAP RING INSTALLATION

- (1) Install a snap ring to one side of the journal.



- (2) Use the special tool at the opposite side of the installed snap ring to press in the journal bearing toward the snap ring.



- (3) Install the snap ring on the opposite side, and measure the clearance of the snap ring groove with a thickness gage.

Standard value: 0.06 mm (.0024 in.) or less

Caution

Always use snap rings of equal thicknesses on both sides.

- (4) If the clearance exceeds the standard value, adjust by changing the thickness of the snap ring.

Snap ring thickness mm (in.)		Identification color
Front propeller shaft	1.28 (.050)	–
	1.31 (.052)	Yellow
	1.34 (.053)	Blue
	1.37 (.054)	Purple
Rear propeller shaft	1.50 (.059)	–
	1.55 (.061)	Yellow
	1.60 (.063)	Blue
	1.65 (.065)	Purple

FRONT AXLE

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2610900058

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GENERAL SPECIFICATIONS

26100020039

Items		Specifications	
Front axle hub bearing	Type	Taper roller bearing	
Drive shaft	Joint type	Outer	Birfield joint
		Inner	Double-offset joint
Differential	Final drive gear type	Hypoid gear	
	Reduction ratio	4.272	
	Pinion gear type	2 pinion	

SERVICE SPECIFICATIONS

26100030056

Items		Standard value	Limit	
Front axle total backlash mm (in.)		–	11 (.43)	
Drive shaft end play mm (in.)		0.4–0.7 (.016–.028)	–	
Solenoid valve resistance [at 20°C (68°F)] Ω		36–46	–	
Front hub play in the axial direction mm (in.)		0.05 (.0020) or less	–	
Front hub turning resistance Nm (in.lbs.) [Spring scale reading N (lbs.)]		0.3–1.3 (2.6–11.3) [5–18 (1.1–4.0)]	–	
Opening dimension of the special tool (MB991561) mm (in.)	When the B.J. boot band (small) is crimped	2.9 (.114)	–	
	When the B.J. boot band (big) is crimped	3.2 (.126)	–	
Crimped width of the B.J. boot band mm (in.)		2.4–2.8 (.094–.110)	–	
Clearance between the B.J. boot (larger diameter side) and the stepped phase of the B.J. housing mm (in.)		0.05–1.55 (.0020–.0610)	–	
Setting of D.O.J. boot length mm (in.)		77–83 (3.03–3.27)	–	
Clutch gear play (bearing end play) mm (in.)		0.05–0.30 (.0020–.0120)	–	
Final drive gear backlash mm (in.)		0.11–0.16 (.0043–.0063)	–	
Drive gear runout mm (in.)		–	0.05 (.0020)	
Differential gear backlash mm (in.)		0–0.076 (0–.0030)	0.2 (.0079)	
Drive pinion rotation torque Nm (in.lbs.)	Without oil seal	With anti-rust agent	0.3–0.5 (2.6–4.3)	–
		with gear oil applies	0.15–0.25 (1.3–2.2)	–
	With oil seal	with anti-rust agent	0.5–0.7 (4.3–6.1)	–
		with gear oil applies	0.35–0.45 (3.1–3.9)	–

TSB Revision

LUBRICANTS

26100040165

Items	Specified lubricants	Quantity
Front axle gear oil (Front differential)	Hypoid gear oil API classification GL-5 or higher SAE viscosity No. 90, 80W	1.15 dm ³ (1.22 qts.)
D.O.J. boot grease	Repair kit grease	100 g (3.5 oz.)
B.J. boot grease	Repair kit grease	130 g (4.6 oz.)

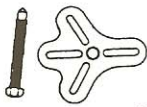

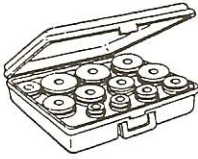
SEALANTS AND ADHESIVES


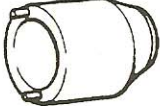


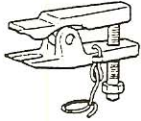


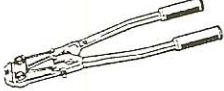
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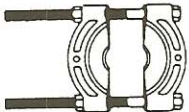


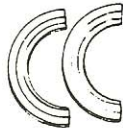





Items	Specified sealants and adhesives
Contact surface of drive flange and front axle hub	3M ATD Part No. 8663 or equivalent
Contact surface of hub cap and drive flange	
Contact surface of differential cover and differential carrier	
Free-wheeling clutch assembly	
Drive gear threaded hole	3M Stud Locking Part No. 4170 or equivalent

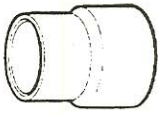
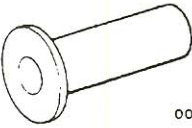
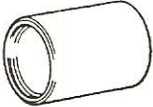
SPECIAL TOOLS


26100060062

Tool	Tool number and name	Supersession	Application
 00004349	MB990241 Drive shaft attachment	MB990241-01 or General service tool	Insertion of inner shaft assembly (use with MB990211-01)
	MB990211 Sliding hammer	MB990211-01	Removal of housing tube oil seal Insertion of inner shaft assembly (use with MB990241-01)
 00004350	MB990925 Bearing and oil seal installer set	MB990925-01	Press-fitting of front axle hub bearing outer race MB990935-01 Press-fitting of drive pinion bearing outer race MB990933-01, MB990934-01, MB990936-01 Press-fitting of differential carrier oil seal MB990934-01 Press-fitting of free wheel clutch oil seal MB990926-01 Press-fitting of free wheel clutch needle bearing MB990927-01

Tool	Tool number and name	Supersession	Application
	MB990938 Handle	MB990938-01	Press-fitting of front axle bearing outer race Press-fitting of front axle hub oil seal Press-fitting of knuckle needle bearing Press-fitting of knuckle oil seal Press-fitting of housing tube oil seal Press-fitting of differential carrier oil seal Press-fitting of drive pinion bearing outer race Press-fitting of free wheel clutch oil seal Press-fitting of free wheel clutch needle bearing
	MB990954 Lock nut wrench	MB990954-01	Removal and adjustment of lock nut
 <small>00004353</small>	MB990955 Oil seal installer	MB990955-01	Press-fitting of front axle hub oil seal Press-fitting of housing tube oil seal
 <small>00004351</small>	MB990811 Side bearing cup remover step plate	MB990811-01	Removal of side bearing inner race
	MB991113, MB990635, MB991406 Steering linkage puller	MB991113-01	Removal of knuckle Disconnecting the lower ball joint and upper ball joint Removal of knuckle Disconnecting the tie rod
 <small>00004352</small>	MB990956 Needle bearing installer	MB990956-01	Press-fitting of knuckle needle bearing (use with MB990938-01)
 <small>00004353</small>	MB990985 Oil seal installer	MB990985-01	Press-fitting of knuckle oil seal (use with MB990938-01)
	MB991561 Boot band crimping tool	-	Installation of B.J. boot band (resin boot band)

Tool	Tool number and name	Supersession	Application
 <p>00004354</p>	<p>MD998348 Bearing separator</p>	<p>MD998348-01</p>	<p>Removal and press-fitting of inner shaft bearing</p>
 <p>00004355</p>	<p>MB990339 Pinion carrier bearing puller</p>	<p>MB990339-01</p>	<p>Removal of side bearing inner race (use with MB990811-01) Removal of drive pinion front bearing inner race</p>
 <p>00004294</p>	<p>MIT303173 Insert</p>	<p>MIT303173</p>	<p>Removal of side bearing inner race (use with MB990811-01) Removal of drive pinion front bearing inner race</p>
	<p>MIT44801 Collet set</p>	<p>MIT44801</p>	<p>Removal of side bearing inner race (use with MB990811-01) Removal of drive pinion front bearing inner race</p>
 <p>00004356</p>	<p>MB990767 End yoke holder</p>	<p>MB990767-01</p>	<p>Holding of end yoke</p>
 <p>00004357</p>	<p>MB990901 Pinion height gage set</p>	<p>MB990901-01</p>	<p>Adjustment of pinion height</p>
	<p>MB990802 Bearing installer</p>	<p>MB990802-01</p>	<p>Press-fitting of drive pinion front bearing inner race Press-fitting of side bearing inner race</p>
 <p>00004358</p>	<p>MB990031 Drive pinion oil seal installer</p>	<p>MB990031-01</p>	<p>Press-fitting of drive pinion oil seal</p>
 <p>00004295</p>	<p>MIT304180 Handle</p>	<p>MIT304180</p>	<p>Press-fitting of drive pinion oil seal</p>

Tool	Tool number and name	Supersession	Application
	MB990799 Ball joint dust shield installer	MB990799-01	Press-fitting of free wheel cl. bearing
 00004296	MIT310424 Drive pinion oil seal installer	MIT310424	Press-fitting of free wheel clutch oil seal
	MB990890 Rear suspension bushing base	MB990890-01	Press-fitting of free wheel clutch bearing

MB990925-01  00004350	Tool number	Installer disc O.D. mm (in.)
	MB990926-01	39.0 (1.54)
	MB990927-01	45.0 (1.77)
	MB990928-01	49.5 (1.95)
	MB990929-01	51.0 (2.01)
	MB990930-01	54.0 (2.13)
	MB990931-01	57.0 (2.24)
	MB990932-01	61.0 (2.40)
	MB990933-01	63.5 (2.50)
	MB990934-01	67.5 (2.66)
	MB990935-01	71.5 (2.81)
	MB990936-01	75.5 (2.97)
	MB990937-01	79.0 (3.11)

TROUBLESHOOTING

FREE-WHEELING CLUTCH

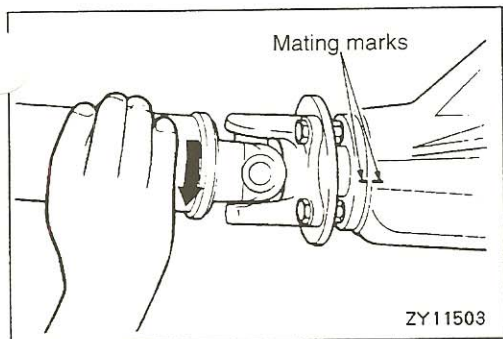
Symptom	Probable cause	Remedy
Does not lock	Negative pressure leakage	Correct or replace vacuum hose
	Vacuum tank damaged	Replace
	Check valve damaged	
	Actuator assembly damaged	
	Shift fork damaged	
	Clutch gear damaged	
	Main shaft damaged	
	Thrust bushing damaged	Retighten attaching bolts
Actuator assembly attaching bolt loose		
Locks but does not become free	Foreign substances on tooth surfaces of main shaft and clutch sleeve	Clean tooth surfaces or replace
	Foreign substances on tooth surfaces of clutch sleeve and clutch gear	

DRIVE SHAFT, INNER SHAFT

Symptom	Probable cause	Remedy
Noise during wheel rotation	Housing tube bent	Replace
	Inner shaft bent	
	Inner shaft bearing worn, pounding	Replace
	Drive shaft assembly worn damaged, bent	Check or replace
Noise due to excessive play of wheel in turning direction	Inner shaft and side gear serration play	Replace
	Drive shaft and side gear serration play	

DIFFERENTIAL

Symptom	Probable Cause	Remedy
Constant noise	Incorrect adjustment of drive gear and drive pinion (poor meshing)	Correct or replace
	Loose, worn or damaged side bearing	Correct or replace
	Loose, worn or damaged drive pinion bearing	Correct or replace
	Worn drive gear or drive pinion	Correct or replace
	Worn side gear thrust washer or pinion shaft	Replace
	Deformed drive gear or differential case	Replace
	Damaged gear	Replace
	Foreign material	Remove the foreign material and check, and replace if necessary.
	No oil	Fill or change
Gear noise while driving	Poor gear engagement	Correct or replace
	Incorrect gear adjustment	Correct or replace
	Incorrect drive pinion preload adjustment	Correct or replace
	Damaged gear	Replace
	Foreign material	Remove the foreign material and check, and replace if necessary.
	Insufficient oil	Fill or change
Gear noise while coasting	Incorrect drive pinion rotation torque adjustment	Correct or replace
	Damaged differential gear	Replace
Bearing noise while driving or coasting	Cracked or damaged drive pinion rear bearing	Replace
Noise while turning	Loose side bearing	Replace
	Damaged side gear, pinion gear or pinion shaft	Replace
Heat	Incorrect differential gear backlash Excessive preload	Adjust
	Insufficient oil	Fill or change
Oil leakage	Clogged vent plug	Clean or replace
	Cover is not tightened Malfunction of seal	Re-tighten, apply sealant or replace the gasket.
	Worn or damaged oil seal	Replace
	Excessive oil	Adjust the oil level.

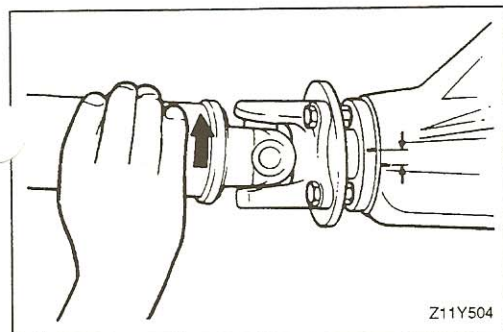


ON-VEHICLE SERVICE

26100130015

FRONT AXLE TOTAL BACKLASH CHECK

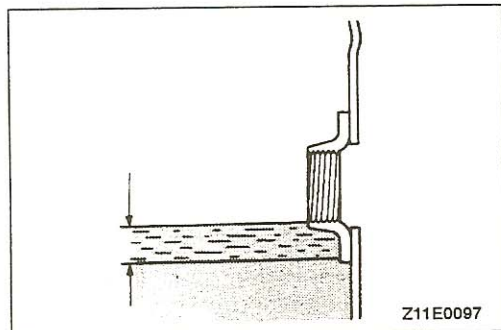
1. If the vehicle vibrates and produces a booming sound due to an imbalance in the drive system, measure the front axle total backlash by the following procedure to see if the differential carrier assembly requires removal.
 - (1) Place the transfer control lever in the "4H" position and drive the vehicle until the 4WD indicator changes from flashing to illuminated.
 - (2) Hold the wheels and place the transfer control lever in the "2H" position.
 - (3) Turn the companion flange clockwise until all play is eliminated, and then align the mating mark on the dust cover with the mating mark on the differential carrier.



- (4) Turn the companion flange anti-clockwise until all play is eliminated and measure the distance through which the mating marks moved.

Limit: 11 mm (.43 in.)

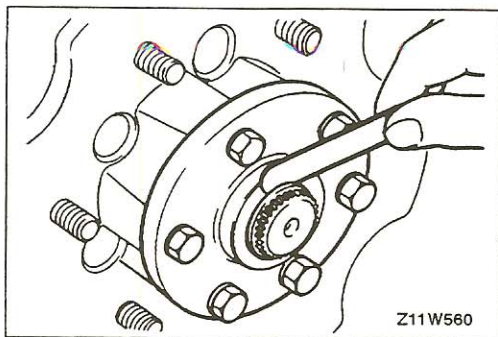
2. If the backlash exceeds the limit, remove the differential carrier assembly and final drive gear. Then check the differential gear meshing condition and the looseness of the drive shaft or inner shaft splines.

FRONT AXLE GEAR OIL LEVEL CHECK²⁶²⁰⁰⁰⁹⁰⁰¹⁹

Remove the filler plug and check the gear oil level. Check that the gear oil level is not more than 8 mm (.31 in.) below the bottom of the filler plug hole.

Specified gear oil:

Hypoid gear oil API classification GL-5 or higher, SAE viscosity No. 90, 80W [1.15 dm³ (1.22 qts.)]

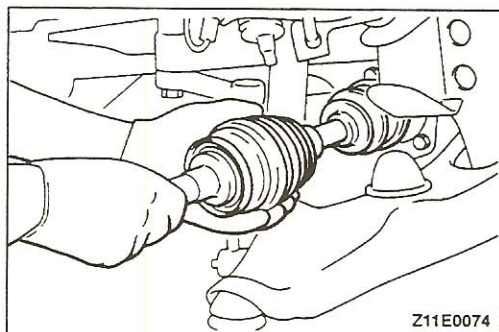
**DRIVE SHAFT END PLAY CHECK**

26100140018

1. Jack up the vehicle and remove the front wheels.
2. Remove the hub cap.
3. Manually push the drive shaft in the direction in which it will closely contact the knuckle.
4. Use a feeler gauge to measure the clearance between the drive flange and the snap ring as shown in the illustration.

Standard value: 0.4–0.7 mm (.016–.028 in.)

5. If the play is outside the standard value, adjust by adding or removing shims.

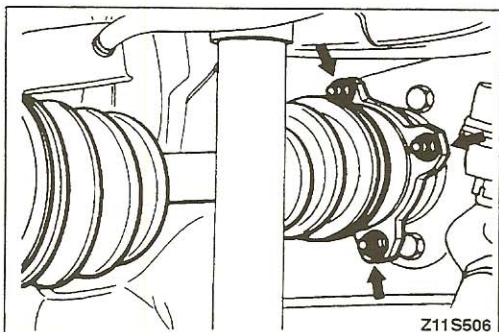
**DIFFERENTIAL CARRIER OIL SEAL REPLACEMENT**

26200100019

1. Remove the under cover.
2. Remove the front hub and knuckle assembly.
3. Remove the left drive shaft.

Caution

When pulling the left drive shaft from the differential carrier assembly, be careful that the drive shaft spline does not damage the oil seal.

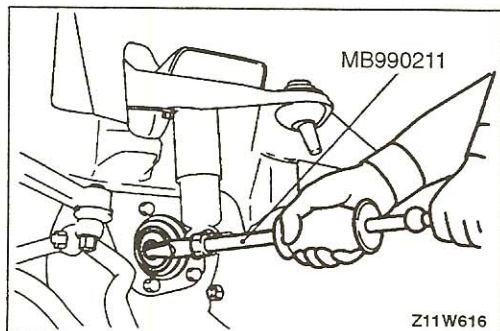


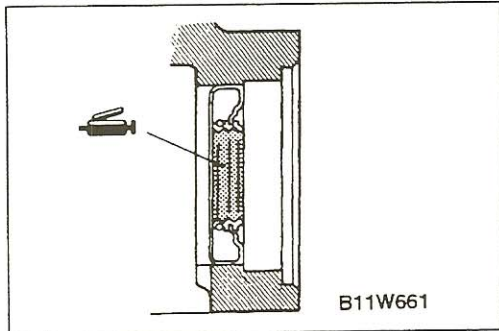
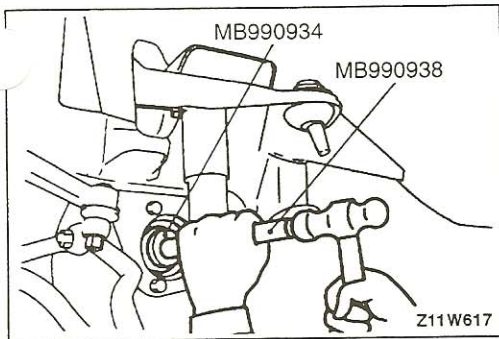
4. Remove the right drive shaft from the inner shaft assembly.
5. After removing the shock absorber (R.H.) lower mounting bolt, remove the inner shaft.

Caution

When pulling the inner shaft out from the differential carrier, be careful that the spline of the inner shaft does not damage the oil seal.

6. Remove the actuator mounting bolt from the housing tube, and then remove the harness from the clamp.
7. Remove the differential mounting bracket (R.H.) and housing tube.
8. Use the special tool to remove the oil seal.





9. Press-fit the oil seal firmly by using the special tools.

10. Apply multi-purpose grease to the lip of the oil seal and install it to the drive shaft (L.H.).
For the right side, apply multi-purpose grease to the lip of the oil seal and install to the housing tube and differential mounting bracket (R.H.).

11. Install the inner shaft and drive shaft (R.H.).

Caution

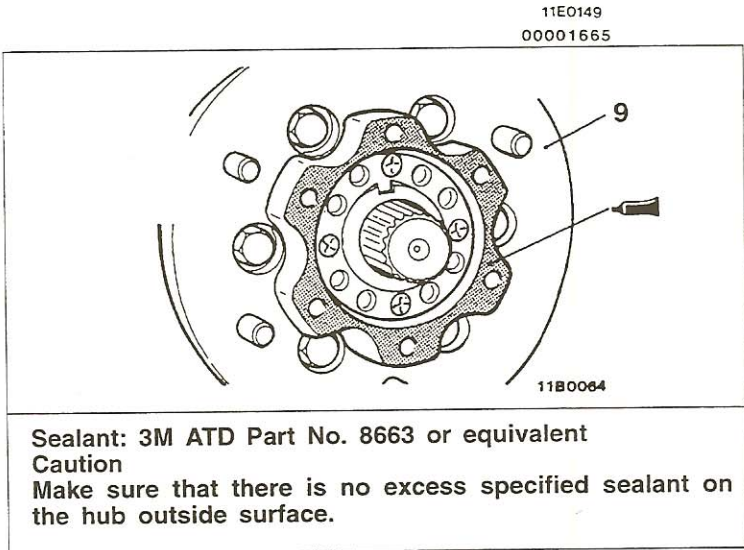
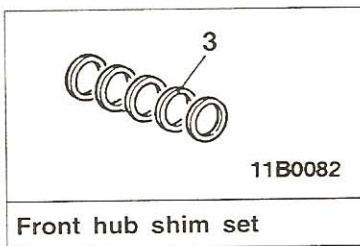
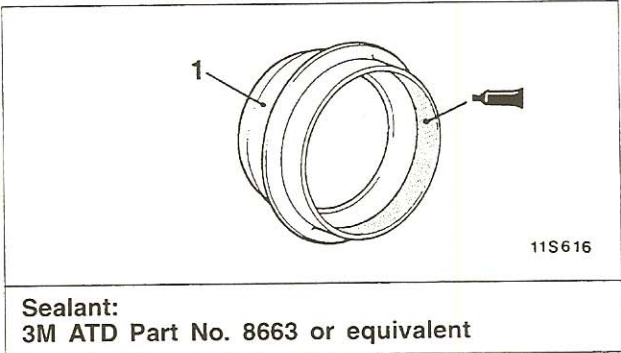
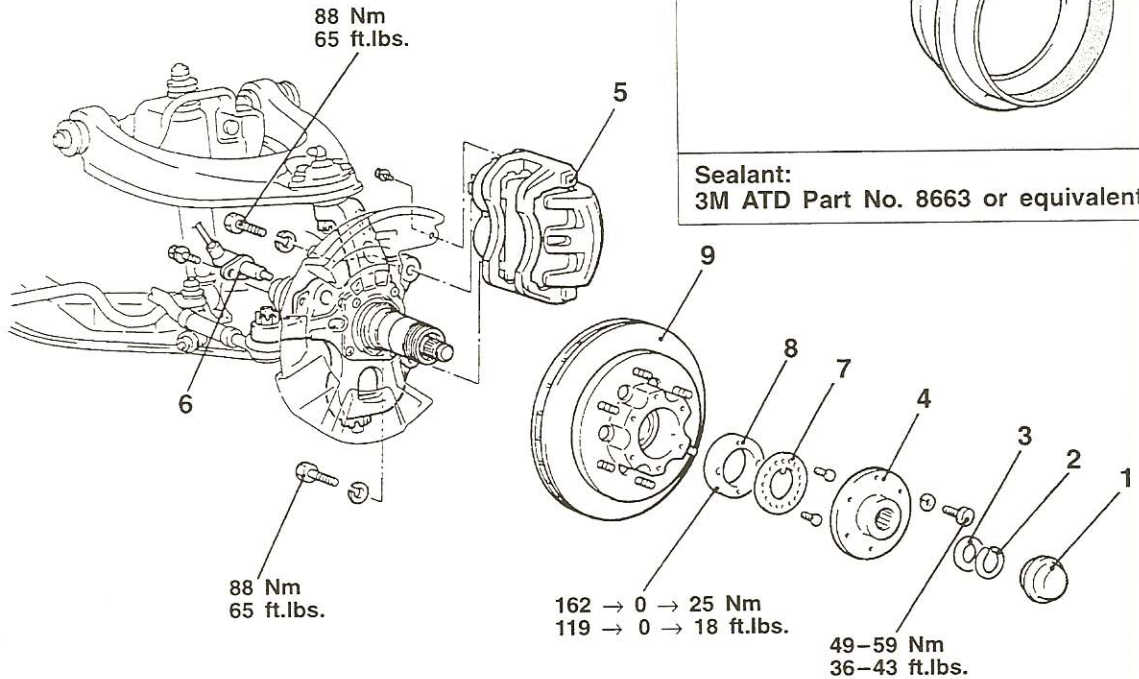
1. Do not damage the lip of the oil seal.
2. The circlip attached to the B.J. side spline of the drive shaft should be replaced with a new clip.

12. Install the actuator and secure the harness with the clamp.
13. Install the shock absorber.
14. Install the hub and knuckle assembly.
15. Install the under cover.

26100170185

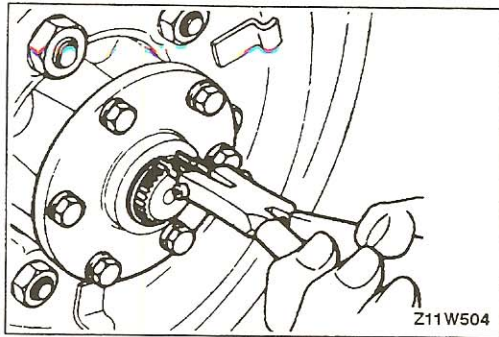
AXLE HUB

REMOVAL AND INSTALLATION



Removal steps

- 1. Hub cap
- 2. Snap ring
- 3. Shim
- 4. Drive flange
- 5. Front brake assembly
- 6. Speed sensor <Vehicles with ABS> (Refer to GROUP 35C – Wheel Speed Sensor.)
- 7. Lock washer
- 8. Lock nut
- 9. Front hub assembly



REMOVAL SERVICE POINTS

◀A▶ SNAP RING REMOVAL

Use snap ring pliers to remove the snap ring from the drive shaft.

Caution

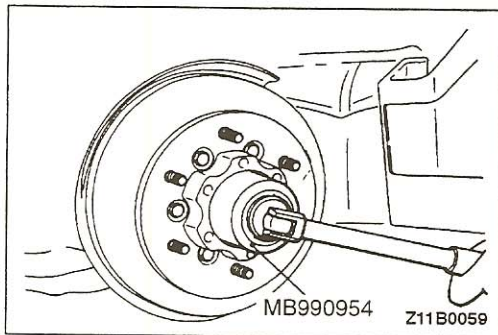
The proper tool for removing and installing the snap ring is a pair of snap ring pliers. Using a screwdriver or other tool can deform or spread the snap ring beyond its yield point. Be sure to use only snap ring pliers for removing and installing this snap ring.

◀B▶ FRONT BRAKE ASSEMBLY REMOVAL

- (1) Remove the front brake assembly with the brake hose connected.
- (2) Use wire to suspend the front brake assembly from the upper arm so that the front brake assembly won't fall.

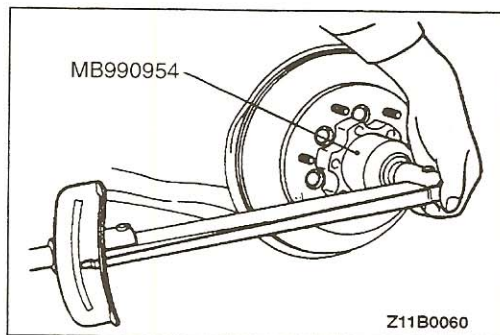
Caution

Do not twist the brake hose.



◀C▶ LOCK NUT/FRONT HUB ASSEMBLY REMOVAL

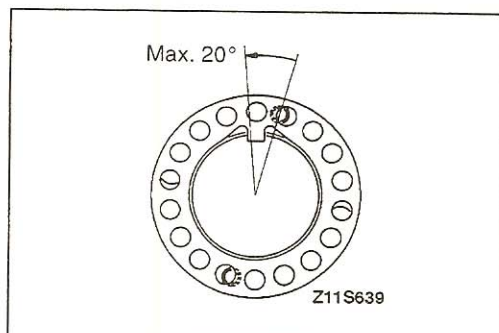
- (1) After removing the lock washer, remove the lock nut with the special tool.
- (2) Remove the front hub assembly from the knuckle together with the inner and outer bearings.

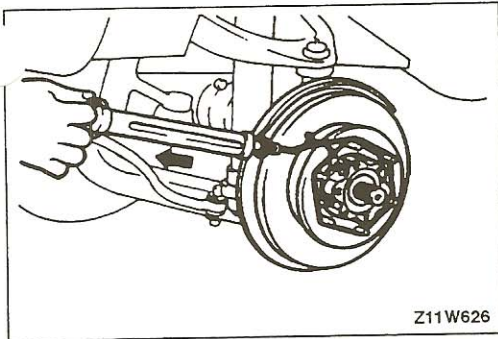


INSTALLATION SERVICE POINTS

▶A◀ WHEEL BEARING PRELOAD ADJUSTMENT

- (1) Use the special tool to tighten the lock nut by the following procedure.
 1. Tighten to 162 Nm (119 ft.lbs.).
 2. Loosen to 0 Nm (0 ft.lbs.).
 3. Re-tighten to 25 Nm (18 ft.lbs.) and then loosen 30–40°.
- (2) Install the lock washer. If the lock washer holes are not aligned with the lock nut holes, move the lock nut within a range of not more than 20° until the holes are aligned.





- (3) Loosen the lock nut approximately 30 to 40 degrees to adjust the front hub's turning resistance and play in the axial direction so that they are at the standard values.

Standard value:

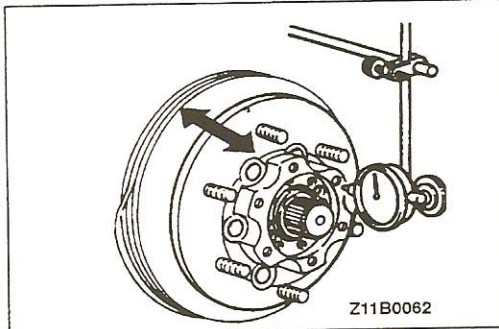
0.3–1.3 Nm (2.6–11.3 in.lbs.)

[Spring scale reading 5–18 N (1.1–4.0 lbs.)]

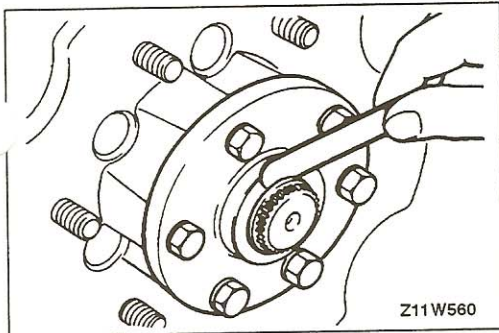
Standard value: 0.05 mm (.0020 in.) or less

NOTE

If adjustment is not possible, the bearing may be incorrectly installed; check and repair if necessary. The lubrication condition should also be checked.



- (4) Install the lock washer. If the lock washer holes are not aligned with the lock nut holes, loosen the lock nut to align them.



►B◄ DRIVE SHAFT END PLAY ADJUSTMENT

After installing the shim and snap ring, check the drive shaft end play by the following procedure.

- (1) Install the shim and snap ring to the drive shaft.
- (2) Push the drive shaft in by hand toward the knuckle until they touch.
- (3) Measure the clearance between the drive flange and the shim with a feeler gage as shown in the illustration.

Standard value: 0.4–0.7 mm (.016–.028 in.)

- (4) If the amount of play is outside the standard value, adjust by selecting a shim that will bring the play to the standard value.

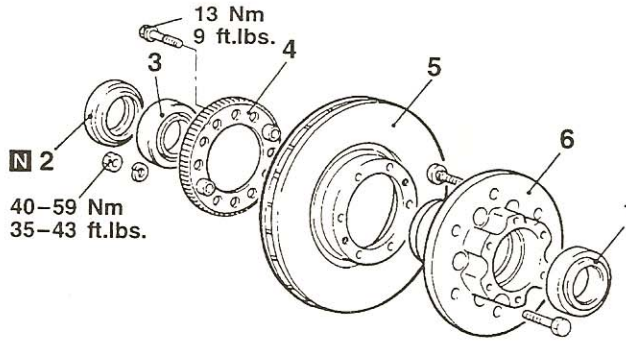
INSPECTION

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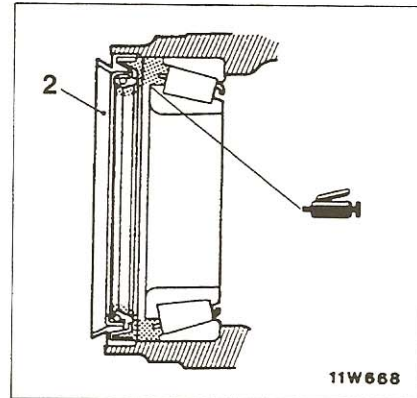
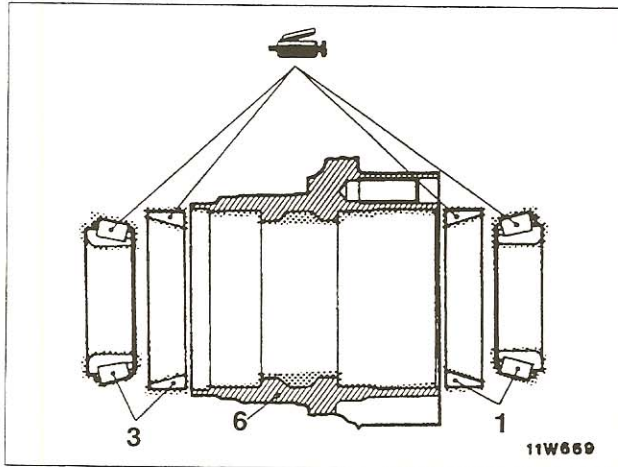
- Check the wheel bearing for seizure, discoloration and rough raceway surface.
- Check the front hub for cracks.
- Check the oil seals for cracks or damage.

DISASSEMBLY AND REASSEMBLY

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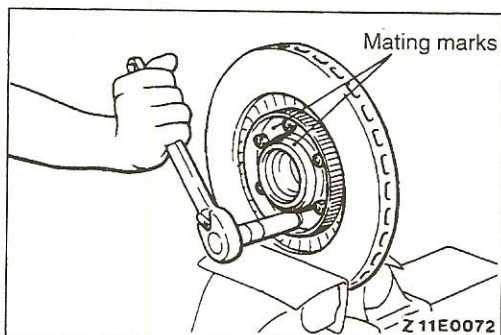


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Disassembly steps

- ▶A◀
1. Outer bearing
 2. Oil seal
 3. Inner bearing

- ◀A▶
4. Rotor
 5. Brake disc
 6. Front hub



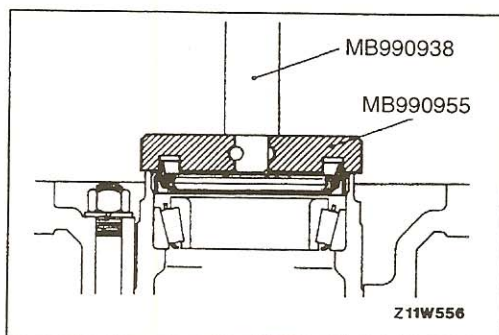
DISASSEMBLY SERVICE POINT

◀A▶ BRAKE DISC REMOVAL

Make mating marks on the brake disc and front hub, and then separate the front hub and brake disc, if necessary.

Caution

Lock the disc in a vise and grip it with a copper or aluminum board.

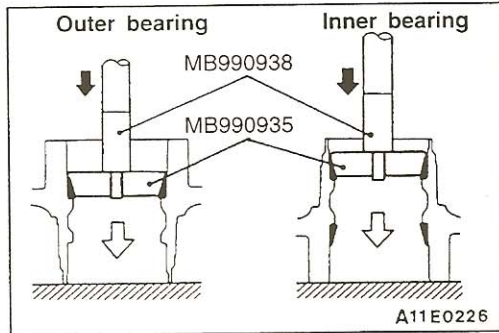
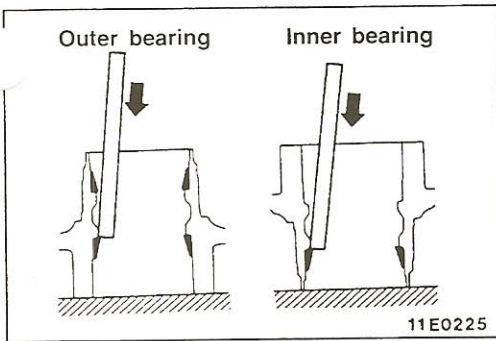


REASSEMBLY SERVICE POINT

▶A◀ OIL SEAL INSTALLATION

- (1) Apply multi-purpose grease to the lip of the oil seal and to the inside surface of the front hub.
- (2) Apply multi-purpose grease to the inner bearing inner race, and then install the inner race to the front hub.
- (3) Use the special tools to press-fit the new oil seal to front hub until the oil seal is flush with the front hub end face.

TSB Revision

**BEARING REPLACEMENT**

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- (1) Wipe off any grease on the inside surface of the front hub.
- (2) Drive out the inner and outer bearing outer races by tapping them uniformly.
- (3) Apply multi-purpose grease to the outside surfaces of the new inner and outer bearing outer races.
- (4) Use the special tools to press-fit the inner and outer bearing outer races.

NOTE

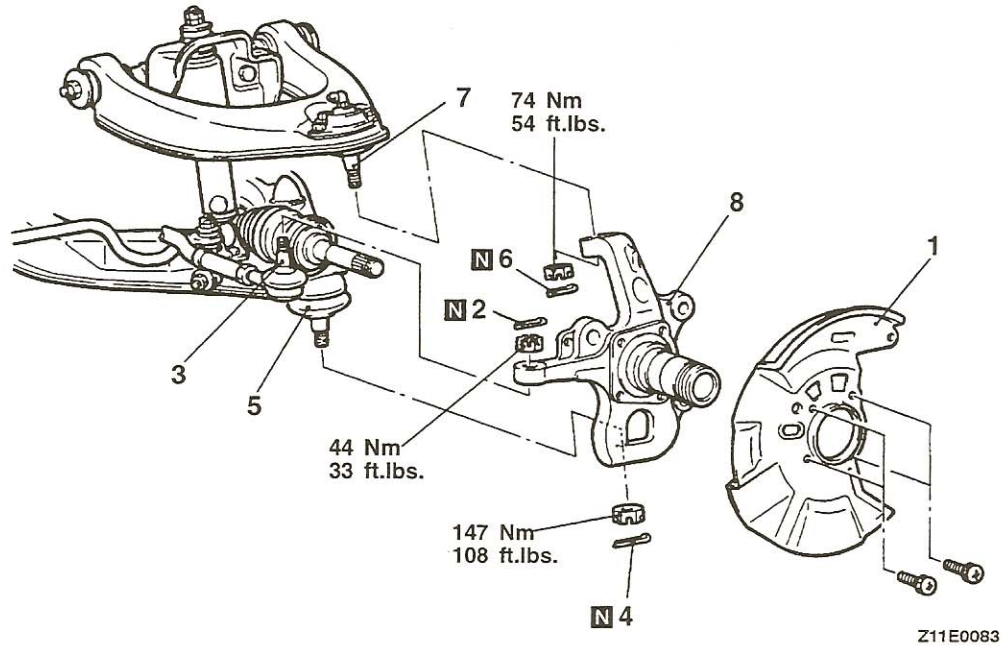
The bearing inner race and bearing outer race should be replaced as an assembly.

KNUCKLE

REMOVAL AND INSTALLATION

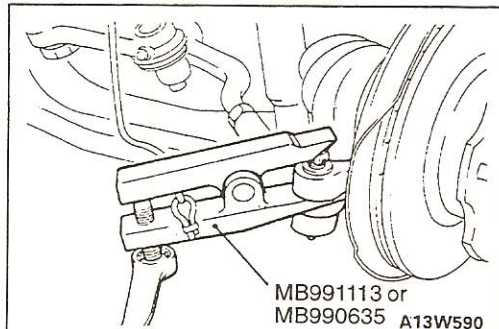
Pre-removal and post-installation Operation

- Press the dust cover with a finger to check whether the dust cover is cracked or damaged.
- Front Hub Removal and Installation (Refer to P.26-13.)



Removal steps

- | | | |
|--|---|---|
| <p>◀A▶</p> <p>1. Dust cover</p> <p>2. Cotter pin</p> <p>3. Tie rod assembly and knuckle connection</p> | <p>◀B▶</p> <p>4. Cotter pin</p> <p>5. Lower ball joint and knuckle connection</p> | <p>◀B▶</p> <p>6. Cotter pin</p> <p>7. Upper ball joint and knuckle connection</p> <p>8. Knuckle</p> |
|--|---|---|



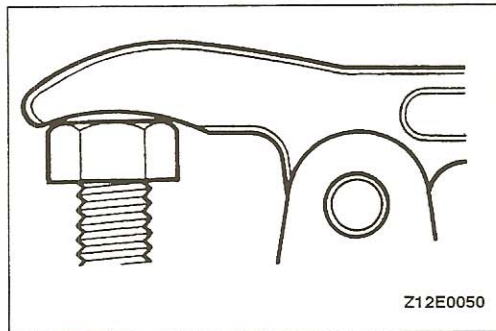
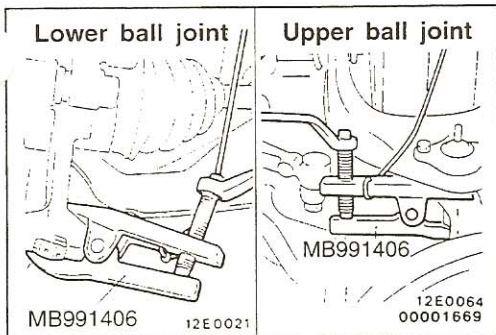
REMOVAL SERVICE POINTS

◀A▶ TIE ROD ASSEMBLY AND KNUCKLE DISCONNECTION

Use the special tool to disconnect the tie rod from the knuckle.

Caution

1. Use a cord to bind the special tool closely so it will not become separated.
2. The nut should only be loosened, not removed.



◀B▶ LOWER BALL JOINT AND KNUCKLE/UPPER BALL JOINT AND KNUCKLE DISCONNECTION

Caution

1. Support the lower arm with a jack when removing the knuckle from the lower ball joint or the upper ball joint.
2. After the knuckle has been removed, lower the jack slowly.
3. Use a cord to bind the special tool closely so that it will not become separated.
4. The nut should only be loosened, not removed.
5. Insert the special tool securely.

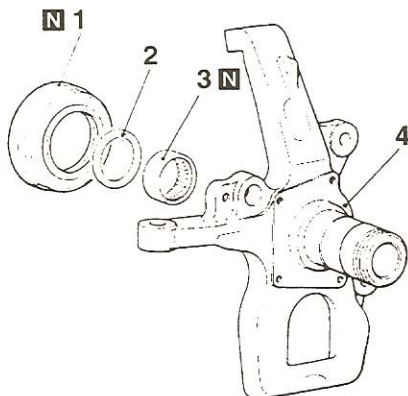
INSPECTION

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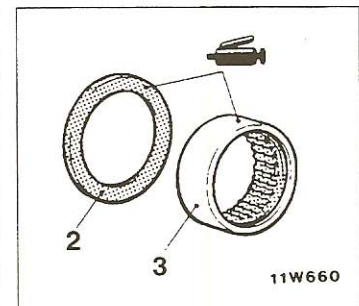
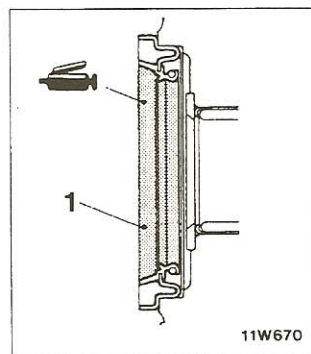
- Check the needle bearing for wear or damage.
- Check the knuckle for cracks or bends.
- Check the knuckle spindle for wear or pounding.

DISASSEMBLY AND REASSEMBLY

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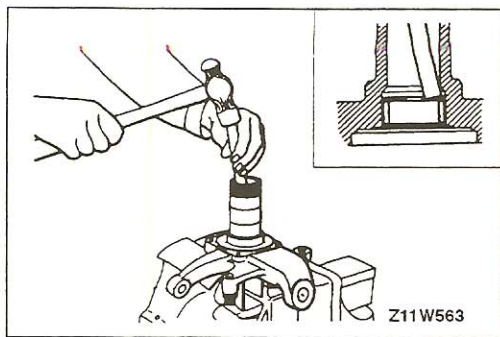


00001670

Disassembly steps

- ◀C▶ 1. Oil seal
- ◀B▶ 2. Spacer
- ◀A▶ 3. Needle bearing
- 4. Knuckle

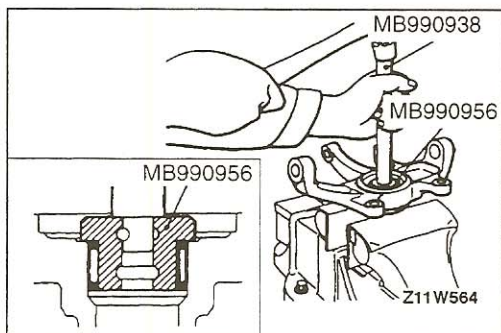
TSB Revision

**DISASSEMBLY SERVICE POINT****◀A▶ NEEDLE BEARING REMOVAL**

- (1) Remove the oil seal and take out the spacer.
- (2) Drive out the needle bearing by tapping the needles uniformly.

Caution

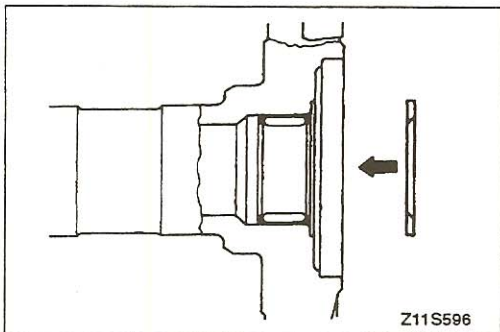
Once removed, the needle bearing must not be reused.

**REASSEMBLY SERVICE POINTS****▶A◀ NEEDLE BEARING INSTALLATION**

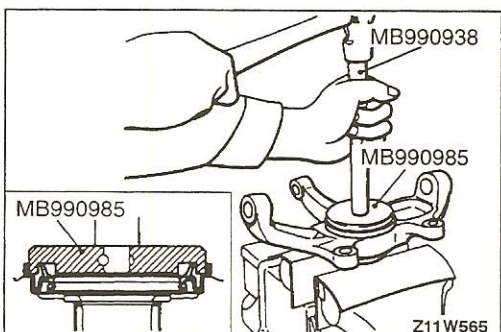
- (1) Apply multi-purpose grease to the roller surface of the new needle bearing.
- (2) Use the special tools to press-fit the needle bearing until it is flush with the knuckle end face.

Caution

Use care to prevent driving the needle bearing too far in.

**▶B◀ SPACER INSTALLATION**

- (1) Apply multi-purpose grease to the knuckle attachment surface of the spacer.
- (2) Install the spacer to the knuckle with the chamfered end toward the center of the vehicle.

**▶C◀ OIL SEAL INSTALLATION**

- (1) Use the special tools to press-fit the new oil seal until it is flush with the knuckle end face.
- (2) Apply multi-purpose grease to the inside and lip of the oil seal.

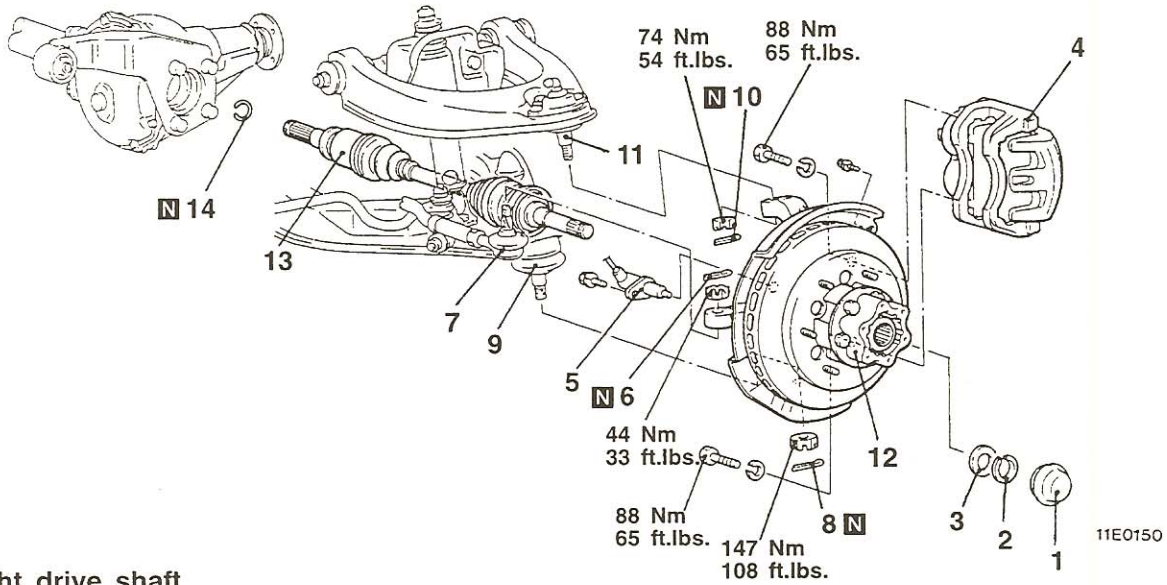
DRIVE SHAFT

REMOVAL AND INSTALLATION

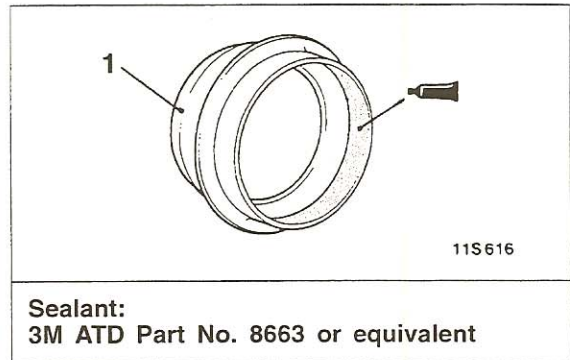
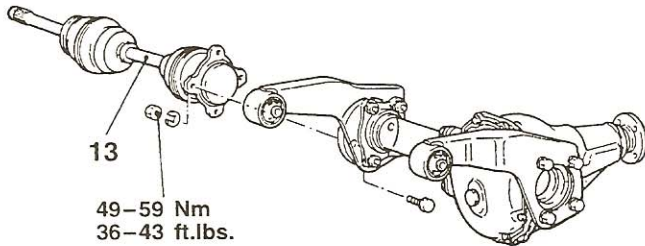
Pre-removal and Post-installation Operation

- Press the dust cover with a finger to check whether the dust cover is cracked or damaged.
- Under Cover Removal and Installation

Left drive shaft

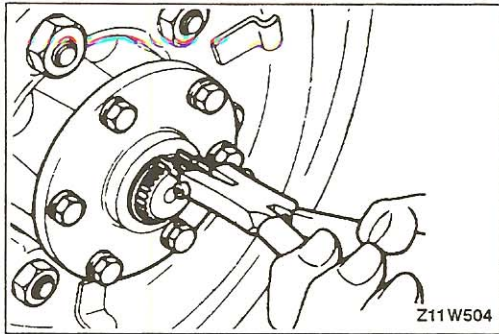


Right drive shaft



Removal steps

- | | | | |
|----------------------------------|--|--------------------------------------|---|
| <p>◀A▶</p> <p>◀B▶</p> <p>◀C▶</p> | <p>1. Hub cap</p> <p>2. Snap ring</p> <p>3. Shim</p> <p>4. Front brake assembly</p> <p>5. Speed sensor <Vehicles with ABS> (Refer to GROUP 35C – Wheel Speed Sensor.)</p> <p>6. Cotter pin</p> <p>7. Tie rod assembly and knuckle connection</p> | <p>◀D▶</p> <p>◀D▶</p> <p>◀E▶ ▶A▶</p> | <p>8. Cotter pin</p> <p>9. Lower ball joint and knuckle connection</p> <p>10. Cotter pin</p> <p>11. Upper ball joint knuckle connection</p> <p>12. Front hub and knuckle assembly</p> <p>13. Drive shaft</p> <p>14. Circlip</p> |
|----------------------------------|--|--------------------------------------|---|



REMOVAL SERVICE POINTS

◀A▶ SNAP RING REMOVAL

Use snap ring pliers to remove the snap ring from the drive shaft.

Caution

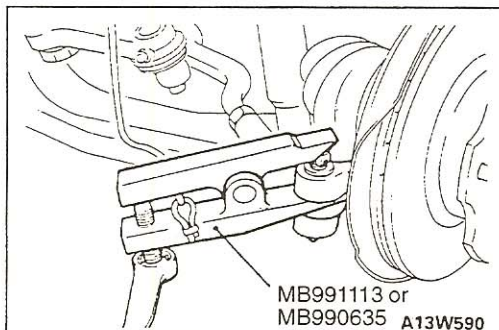
The proper tool for removing and installing the snap ring is a pair of snap ring pliers. Using a screwdriver or other tool can deform or spread the snap ring beyond its yield point. Be sure to use only snap ring pliers for removing and installing this snap ring.

◀B▶ FRONT BRAKE ASSEMBLY REMOVAL

- (1) Remove the front brake assembly with the brake hose connected.
- (2) Use wire to suspend the front brake assembly from the upper arm so that the front brake assembly won't fall.

Caution

Do not twist the brake hose.

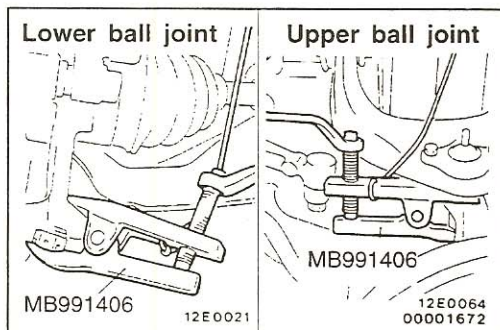


◀C▶ TIE ROD ASSEMBLY AND KNUCKLE DISCONNECTION

Use the special tool to disconnect the tie rod from the knuckle.

Caution

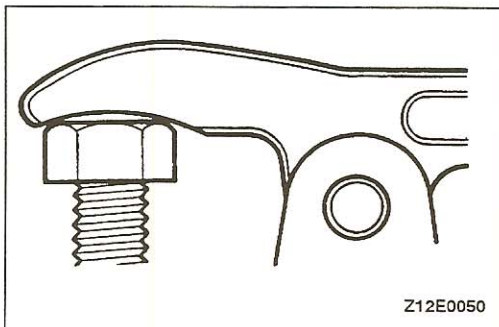
1. Use a cord to bind the special tool closely so that it will not become separated.
2. The nut should only be loosened, not removed.

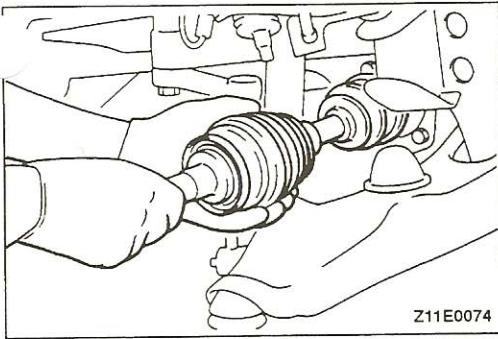


◀D▶ LOWER BALL JOINT AND KNUCKLE/UPPER BALL JOINT AND KNUCKLE DISCONNECTION

Caution

1. Support the lower arm with a jack when removing the knuckle from the lower ball joint or the upper ball joint.
2. After the knuckle has been removed, lower the jack slowly.
3. Use a cord to bind the special tool closely so that it will not become separated.
4. The nut should only be loosened, not removed.
5. Insert the special tool securely.





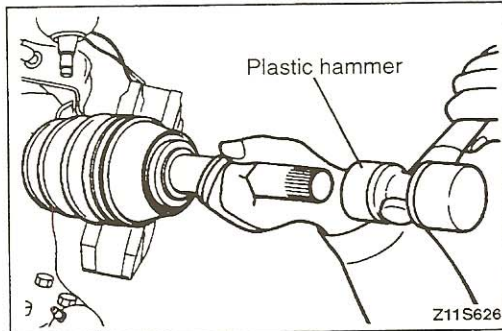
◀E▶ DRIVE SHAFT REMOVAL

FOR LEFT DRIVE SHAFT

Pull the drive shaft out from the differential carrier.

Caution

When pulling the drive shaft out from the differential carrier, be careful that the spline part of the drive shaft does not damage the oil seal.



INSTALLATION SERVICE POINT

▶A◀ DRIVE SHAFT INSTALLATION

FOR LEFT DRIVE SHAFT

Drive the drive shaft into the differential carrier with a plastic hammer.

Caution

1. Be careful not to damage the lip of the oil seal.
2. The circlip attached to the B.J. side spline of the drive shaft should be replaced with a new clip.

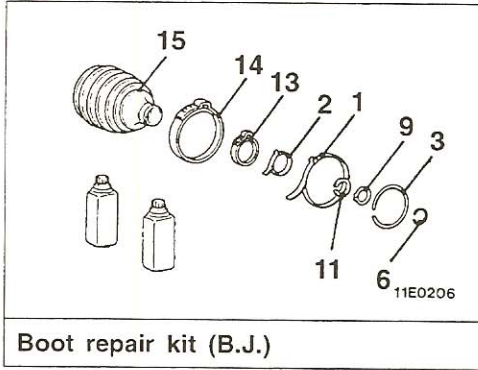
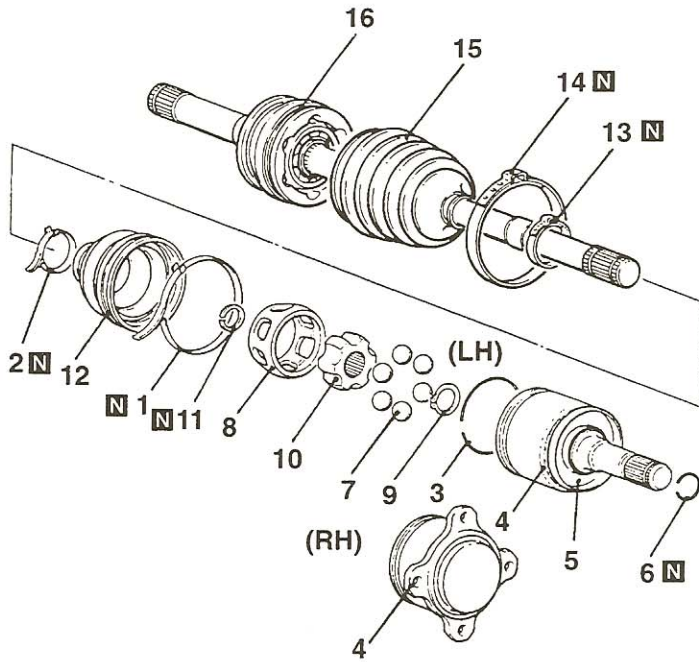
INSPECTION

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- Check the operation of the ball joint and check for excessive looseness.
- Check the boot for wear or damage.
- Check the splines for wear or damage.

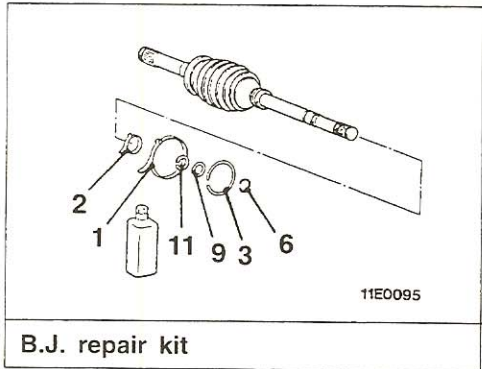
DISASSEMBLY AND REASSEMBLY

261003-06

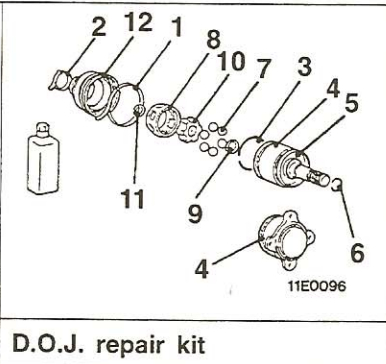


Boot repair kit (B.J.)

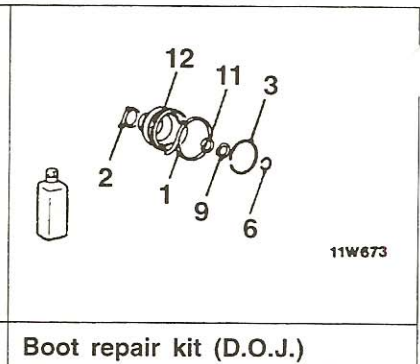
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B.J. repair kit



D.O.J. repair kit



Boot repair kit (D.O.J.)

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Disassembly steps

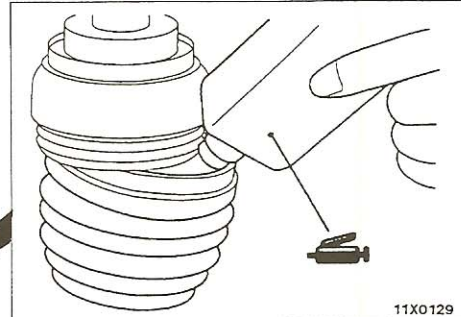
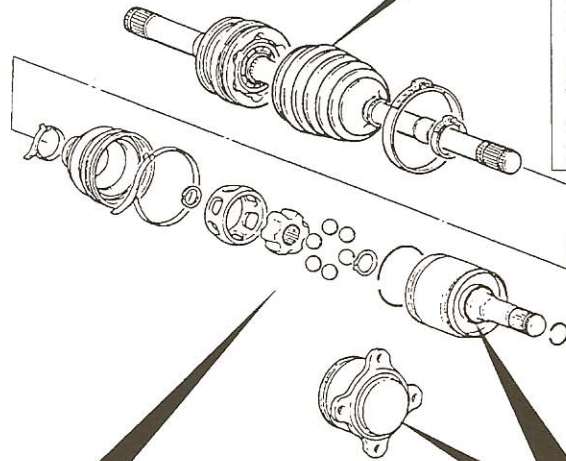
1. D.O.J. boot band (large)
2. D.O.J. boot band (small)
3. Circlip
4. D.O.J. outer race
5. Dust cover
6. Circlip
7. Ball
8. D.O.J. cage
9. Snap ring
10. D.O.J. inner race
11. Circlip
12. D.O.J. boot
13. B.J. boot band (small)
14. B.J. boot band (large)
15. B.J. boot
16. B.J. assembly



Reassembly steps

16. B.J. assembly
- ▶A◀ 15. B.J. boot
- ▶A◀ 14. B.J. boot band (large)
- ▶A◀ 13. B.J. boot band (small)
2. D.O.J. boot band (small)
12. D.O.J. boot
- ▶B◀ 8. D.O.J. cage
11. Circlip
- ▶B◀ 10. D.O.J. inner race
- ▶B◀ 9. Snap ring
- ▶B◀ 7. Ball
- ▶C◀ 4. D.O.J. outer race
5. Dust cover
3. Circlip
1. D.O.J. boot band (large)
6. Circlip

LUBRICATION POINTS



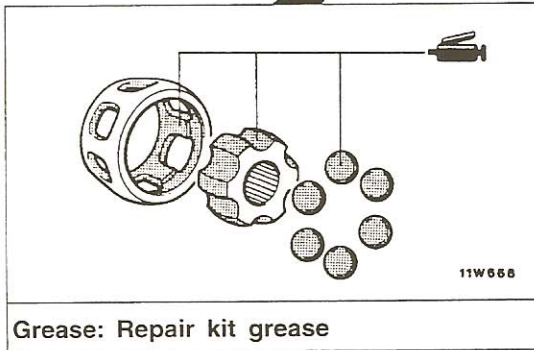
11X0129

Grease:
Repair kit grease 130 g (4.6 oz.)

NOTE
The grease in the repair kit should be divided in half for use, respectively, at the joint and inside the boot.

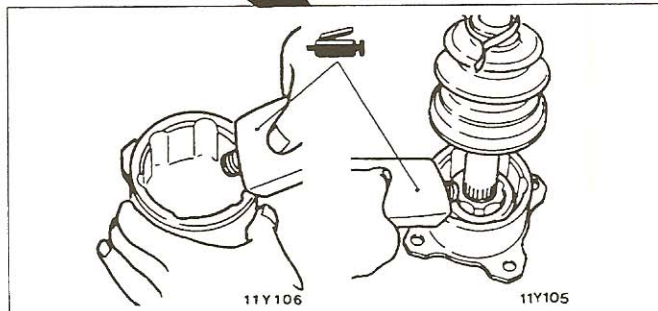
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11W666

Grease: Repair kit grease

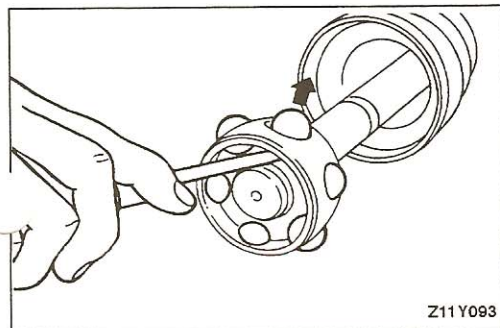


11Y106

11Y105

Grease:
Repair kit grease 100 g (3.5 oz.)

NOTE
The grease in the repair kit should be divided in half for use, respectively, at the joint and inside the boot.



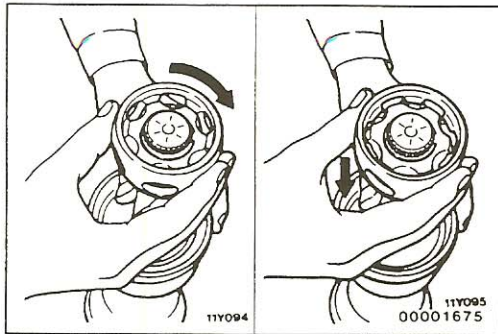
Z11Y093

DISASSEMBLY SERVICE POINTS

◀A▶ BALLS REMOVAL

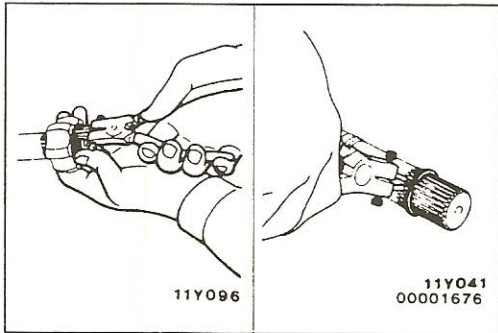
Remove the balls from the D.O.J. cage.

TSB Revision



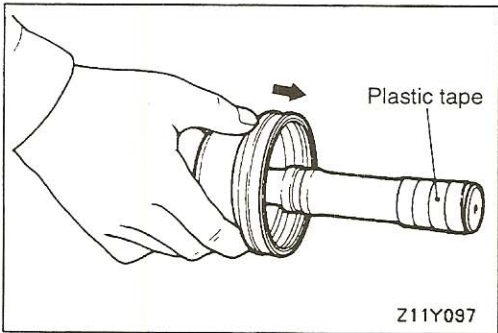
◀B▶ D.O.J. CAGE REMOVAL

Remove the D.O.J. cage from the D.O.J. inner race in direction shown in the illustration.



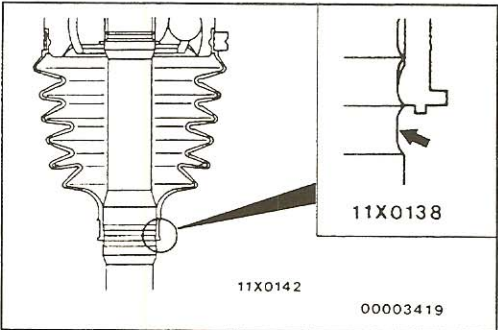
◀C▶ SNAP RING/CIRCLIP REMOVAL

- (1) Use snap ring pliers to remove the snap ring from the drive shaft, and then withdraw the D.O.J. inner race and D.O.J. cage from the drive shaft.
- (2) Use snap ring pliers to remove the circlip from the drive shaft.



◀D▶ D.O.J. BOOT REMOVAL

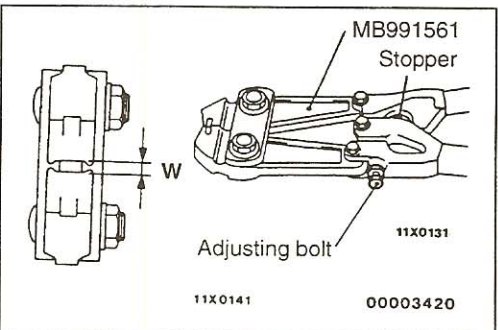
- (1) Wrap plastic tape around the spline part on the D.O.J. side of the drive shaft so that the D.O.J. boot will not be damaged when removed.
- (2) With draw the D.O.J. boot from the drive shaft.



REASSEMBLY SERVICE POINTS

▶A◀ B.J. BOOT/B.J. BOOT BAND (LARGE)/B.J. BOOT BAND (SMALL) INSTALLATION

- (1) Wrap plastic tape around the spline part on the drive shaft, and then install the B.J. boot band (small) and B.J. boot.
- (2) Install the smaller side of the B.J. boot band so that one shaft groove can be seen.

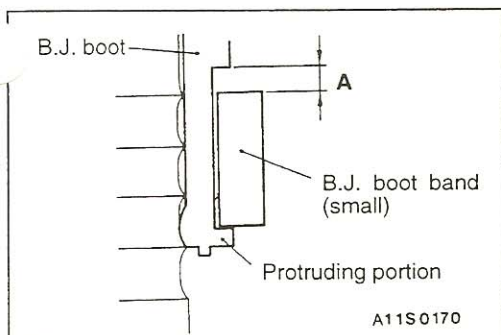


- (3) Turn the adjusting bolt of the special tool to adjust the opening dimension (W) to the standard value.

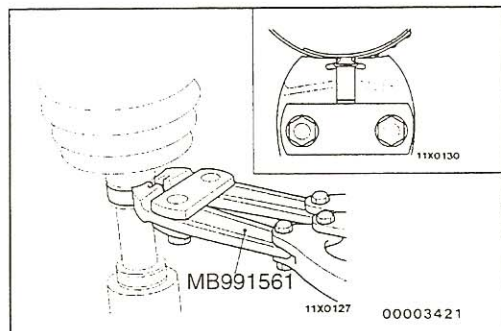
Standard value (W): 2.9 mm (.114 in.)
<When more than 2.9 mm (.114 in.)>
Screw in the adjusting bolt.
<When less than 2.9 mm (.114 in.)>
Loosen the adjusting bolt.

NOTE

- (1) The dimension (W) is adjusted by approx. 0.7 mm (.028 in.) per one turn.
- (2) Do not turn the adjusting bolt more than one turn.



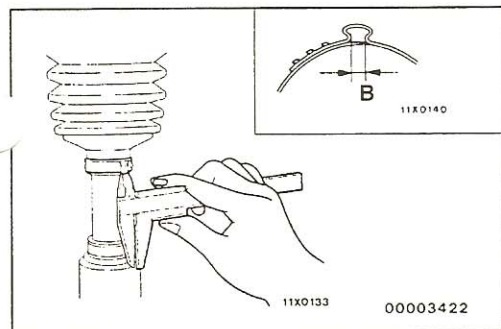
- (4) Place the boot band (small) along the protruding portion, and install it so that there is some clearance (A) along the other side.



- (5) Use the special tool to crimp the B.J. boot band (small.)

Caution

- (1) Hold the drive shaft perpendicularly, and use the special tool to crimp the B.J. boot band securely.
- (2) Crimp the B.J. boot band until the special tool touches the stopper.



- (6) Check that the crimped width (B) is within the standard value.

Standard value (B): 2.4 – 2.8 mm (.094 – .110 in.)

<When more than 2.8 mm (.110 in.)>

Readjust the dimension (W) of step (3) to the value calculated by the following equation, and repeat step (5).

$$W = 5.5 \text{ mm (.217 in.)} - B$$

Example: If (B) is 2.9 mm (.114 in.), (W) is 2.6 mm (.102 in.)

<When less than 2.4 mm (.094 in.)>

Remove the B.J. boot band, readjust the dimension (W) of step (3) to the value calculated by the following equation, and use a new B.J. boot band to repeat steps (4) to (5).

$$W = 5.5 \text{ mm (.217 in.)} - B$$

Example: If (B) is 2.3 mm (.091 in.), (W) is 3.2 mm (.126 in.)

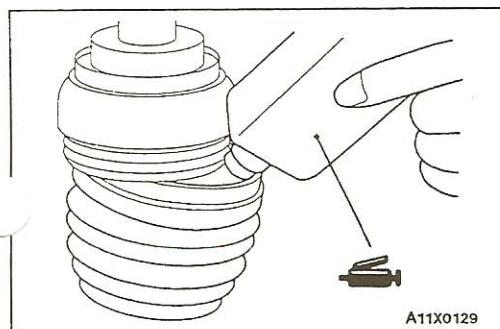
- (7) Check that the B.J. boot band is secured correctly. If the band is secured incorrectly, repeat steps (4) to (6) to replace it.

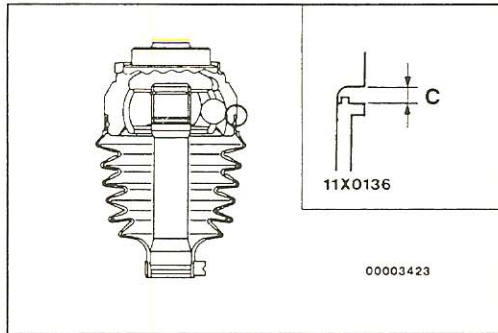
- (8) Fill the inside of the B.J. boot with specified grease.

Specified grease: Repair kit grease 130 g (4.6 oz.)

Caution

The drive shaft joint uses special grease. Do not mix old and new grease or different types of grease.



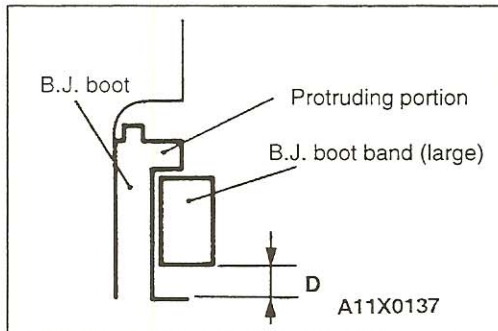


- (9) Install the B.J. boot to adjust the clearance (C) between the B.J. boot end and the stepped phase of the housing is within the standard value.

Standard value (C): 0.05 – 1.55 mm (.0020 – .061 in.)

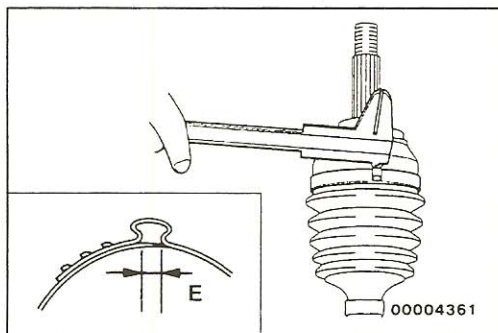
- (10) Adjust the opening dimension (W) to the standard value as mentioned at the step (3).

Standard value (W): 3.2 mm (.126 in.)



- (11) Place the B.J. boot band (large) along the protruding portion, and install it so that there is some clearance (D) along the other side.

- (12) Use the special tool to crimp the B.J. boot band (large) in the same way as the step (5).



- (13) Check that the crimped width (E) is within the standard value.

Standard value (E): 2.4 – 2.8 mm (.094 – .110 in.)

<When more than 2.8 mm (.110 in.)>

Readjust the dimension (W) of step (10) to the value calculated by the following equation, and repeat step (12).

$$W = 5.8 \text{ mm (.228 in.)} - E$$

Example: If (E) is 2.9 mm (.114 in.), (W) is 2.9 mm (.114 in.).

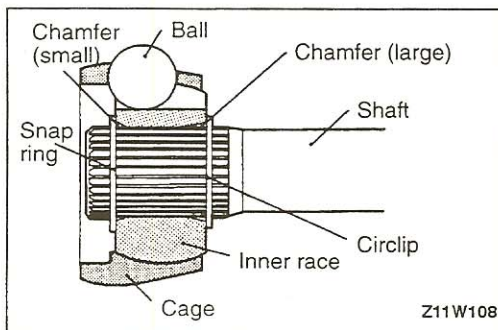
<When less than 2.4 mm (.094 in.)>

Remove the B.J. boot band, readjust the dimension (W) of step (10) to the value calculated by the following equation, and use a new B.J. boot band to repeat steps (11) to (12).

$$W = 5.8 \text{ mm (.228 in.)} - E$$

Example: If (E) is 2.3 mm (.091 in.), (W) is 3.5 mm (.138 in.).

- (14) Check that the boot band is secured correctly. If the band is secured incorrectly, repeat steps (11) to (13) to replace it.

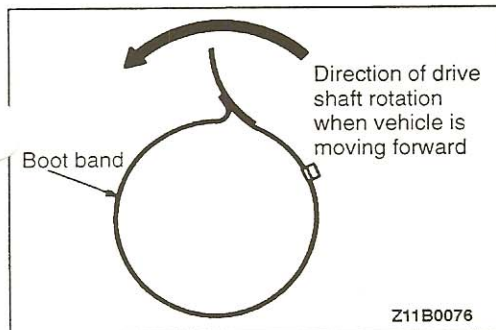
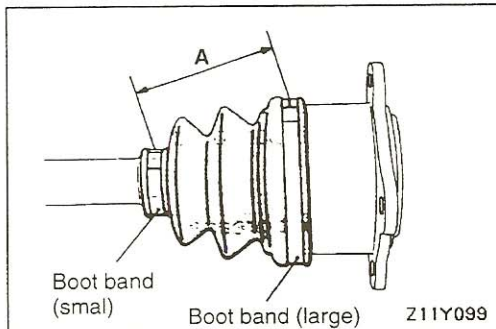
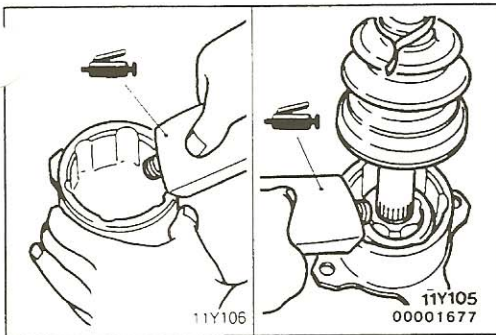


►◄ D.O.J. CAGE/D.O.J. INNER RACE/SNAP RING/BALLS INSTALLATION

Install the cage, balls and inner race to the drive shaft, and fit the snap ring securely into the groove in the drive shaft.

Caution

The inner race should be installed so that the chamfer on the spline section is on the drive shaft s



►C◄ D.O.J. OUTER RACE INSTALLATION

- (1) Fill the inside of the D.O.J. outer race and D.O.J. boot with specified grease.

Specified grease: Repair kit grease 100 g (3.5 oz.)

Caution

The drive shaft joint uses special grease. Do not mix old and new grease or different types of grease.

- (2) Install the circlip onto the D.O.J. outer race. Place the D.O.J. boot over the D.O.J. outer race, and then use a boot band (small) to secure the boot.

Caution

Do not secure the boot band (large).

- (3) Secure the drive shaft, and then move the D.O.J. outer race until it is at the position where the D.O.J. boot assembly dimension is at the standard value.

Standard value (A): 77–83 mm (3.03–3.27 in.)

- (4) Remove part of the D.O.J. boot from the D.O.J. outer race to release the air within the boot.
- (5) Secure the boot band (large) on the D.O.J. boot.

Caution

Check that the installation directions of the boot bands are correct.

INSPECTION

26100380052

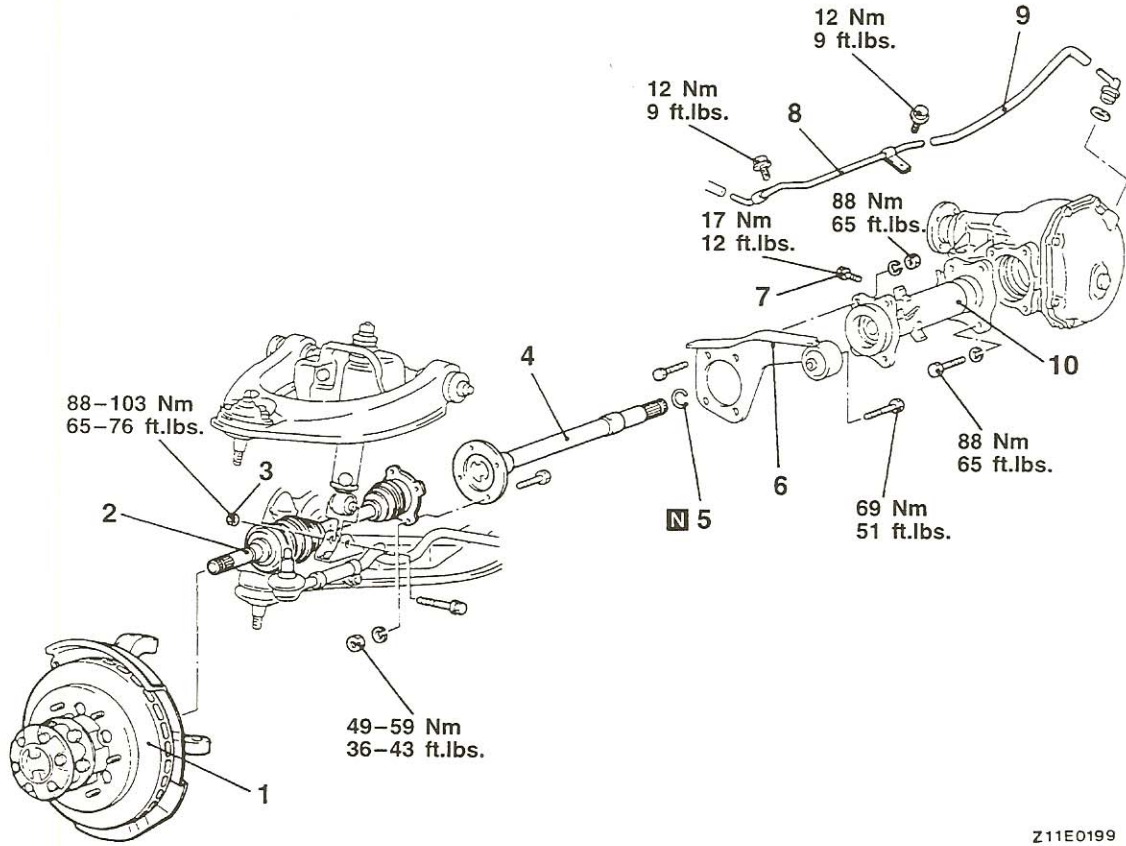
- Check the drive shaft for bending or wear.
- Check the B.J. for entry of water, foreign materials or rust.
- Check the D.O.J. cage, D.O.J. inner race and balls for rust, wear or damage.
- Check the circlip for damage or deformation.
- Check the D.O.J. outer race for wear or damage.

INNER SHAFT

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation

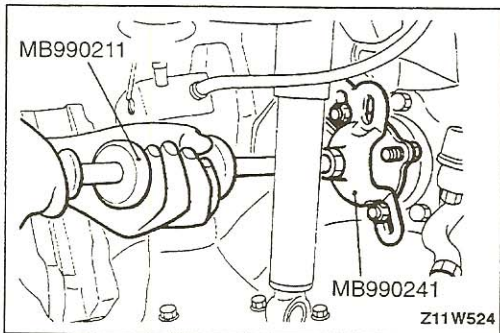
- Press the dust cover with a finger to check whether the dust cover is cracked or damaged.
- Under Cover Removal and Installation



Z11E0199

Removal steps

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Front hub and knuckle assembly (Refer to P.26-18.) 2. Drive shaft assembly (R.H.) (Refer to P.26-21.) 3. Shock absorber lower mounting bolt and nut 4. Inner shaft 5. Circlip | <ol style="list-style-type: none"> 6. Differential mounting bracket (R.H.) 7. Actuator mounting bolt 8. Breather pipe 9. Breather hose 10. Housing tube |
|--|--|



REMOVAL SERVICE POINT

◀A▶ INNER SHAFT REMOVAL

Attach the special tools to the flange of the shaft, and pull the inner shaft out from the front differential carrier.

Caution

When pulling the inner shaft out from the front differential carrier, be careful that the spline part of the inner shaft does not damage the oil seal.

TSB Revision

INSTALLATION SERVICE POINT

▶A◀ INNER SHAFT INSTALLATION

Drive the inner shaft into the front differential carrier by using the special tools (MB990241 and MB990211).

Caution

Be careful not to damage the lip of the dust seal and oil seal.

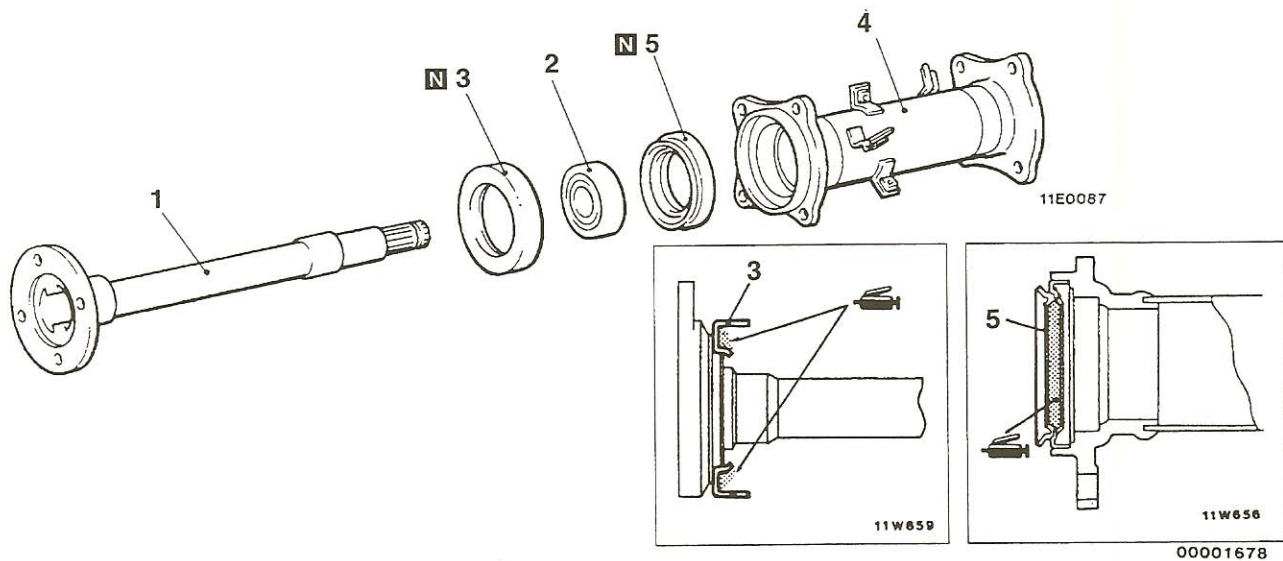
INSPECTION

26100410010

- Check the inner shaft for bend.
- Check the bearing for wear or discoloration.
- Check the housing tube for cracks.
- Check the dust seal for cracks or damage.

DISASSEMBLY AND REASSEMBLY

26100420013



Disassembly steps

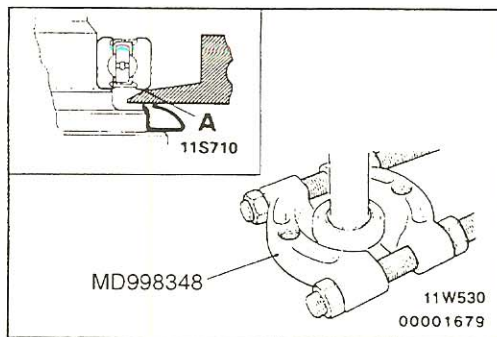
- ◀A▶ ▶C▶
 1. Inner shaft
 2. Bearing

- ▶B▶ 3. Dust cover
 4. Housing tube
 ▶A▶ 5. Dust seal

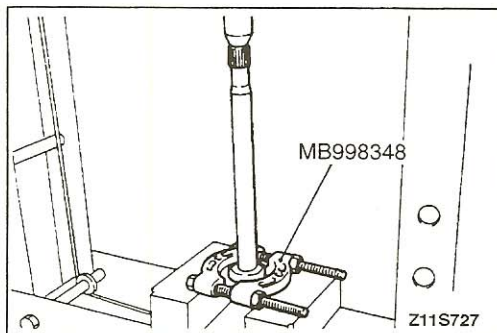
DISASSEMBLY SERVICE POINT

◀A▶ BEARING REMOVAL

(1) Bend the outside edge of dust cover inward with a hammer.



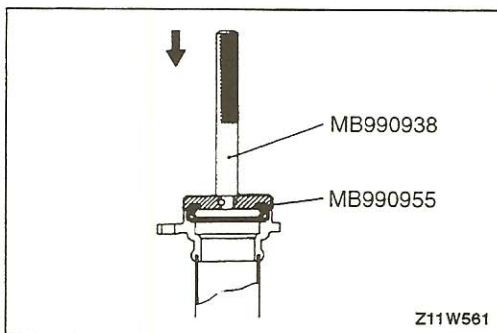
- (2) After the special tool has been installed as shown, tighten the nut of the special tool until section "A" of the special tool touches the bearing outer race.



- (3) Press out the inner shaft from the bearing.

Caution

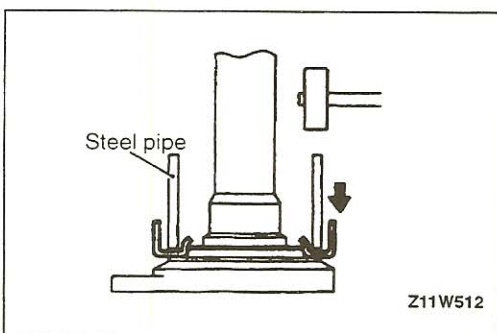
Do not allow the inner shaft to drop.



REASSEMBLY SERVICE POINTS

►A◄ **DUST SEAL INSTALLATION**

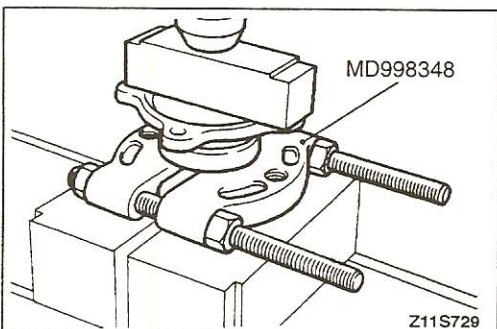
Use the special tools to press-fit the new dust seal into the housing tube until it is flush with the housing tube end face.



►B◄ **DUST COVER INSTALLATION**

Use a steel pipe to press-fit a new dust cover onto the inner shaft.

Steel pipe	mm (in.)
Overall length	50 (1.7)
Outer diameter	75 (3.0)
Wall thickness	4 (.2)

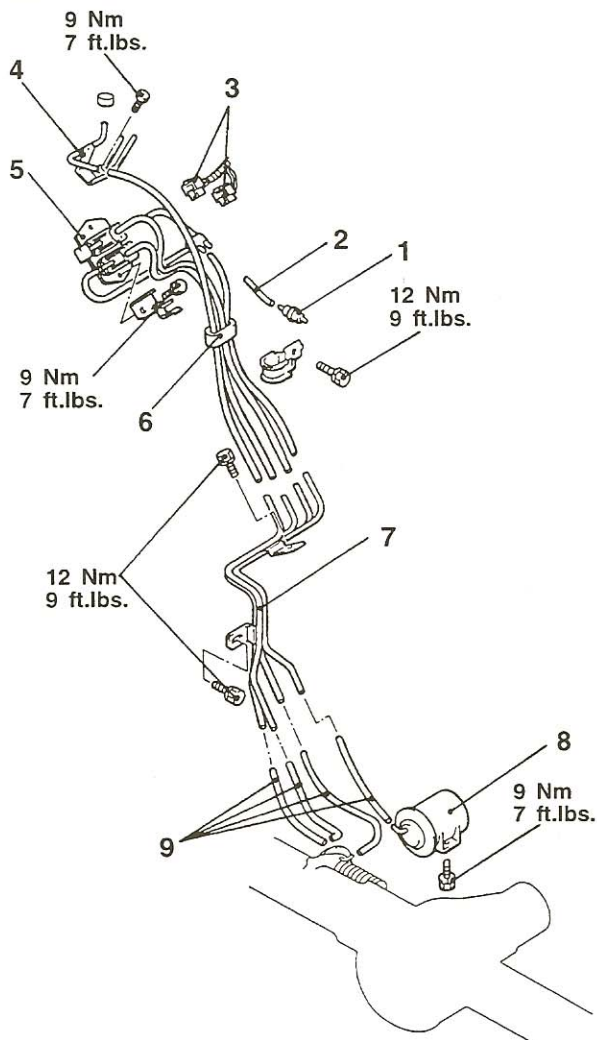


►C◄ **BEARING INSTALLATION**

Use the special tool to press-fit the bearing onto the inner shaft.

SOLENOID VALVE AND VACUUM HOSE

REMOVAL AND INSTALLATION

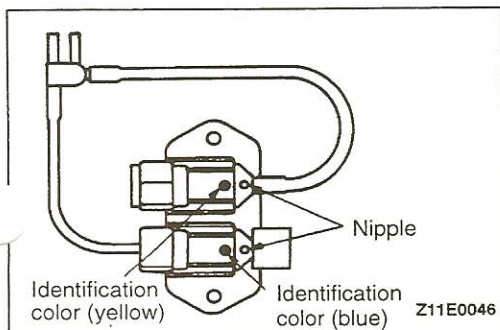


A11E0183

Removal steps

1. Check valve
 2. Vacuum hose
 3. Solenoid valve connector
 4. Vacuum pipe
 5. Solenoid valve assembly
- ▶B◀

6. Vacuum hose
 7. Vacuum pipe assembly
 8. Vacuum tank
 9. Vacuum hose
- ▶A◀



INSTALLATION SERVICE POINTS

▶A◀ VACUUM HOSE INSTALLATION

Install the vacuum hoses so that the identification colors match those of the pipe assembly and the actuator. Furthermore, there are no identification colors on the vacuum hose at the vacuum tank connection.

▶B◀ VACUUM HOSE/SOLENOID VALVE ASSEMBLY INSTALLATION

Install the vacuum hose and solenoid valve assembly so that the colors of the identification marks are matched.

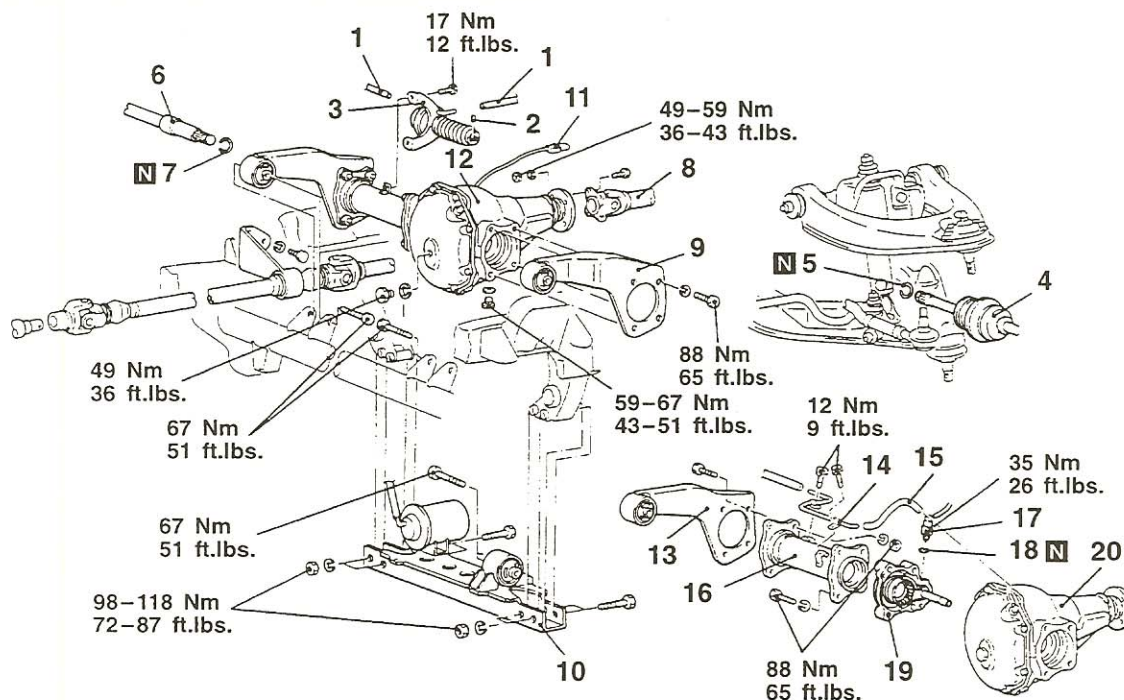
DIFFERENTIAL CARRIER AND FREE-WHEELING CLUTCH

26200180037

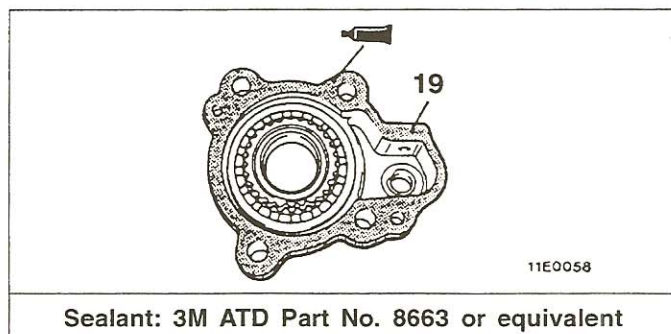
REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operations

- Press the dust cover with a finger to check whether the dust cover is cracked or damaged.
- Under Cover Removal and Installation
- Gear Oil Draining and Supplying (Refer to P.26-9.)



11E0200



11E0058

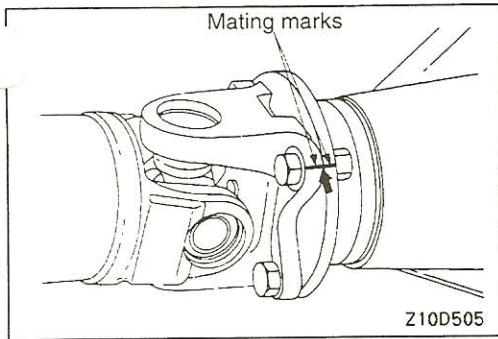
Sealant: 3M ATD Part No. 8663 or equivalent

00007088

Removal steps

- | | |
|---|---|
| <p>▶C◀</p> <ol style="list-style-type: none"> 1. Vacuum hose 2. Pin 3. Actuator assembly 4. Drive shaft (Refer to P.26-21.) 5. Circlip 6. Inner shaft (Refer to P.26-30.) 7. Circlip <p>◀A▶ ▶B◀</p> <ol style="list-style-type: none"> 8. Front propeller shaft <ul style="list-style-type: none"> • Support the front differential with transmission jack. 9. Differential mounting bracket (L.H.) 10. Front suspension crossmember 11. Free-wheeling engage switch connector | <ol style="list-style-type: none"> 12. Front differential carrier assembly, housing tube and differential mounting bracket (R.H.) 13. Differential mounting bracket (R.H.) 14. Breather pipe 15. Breather hose 16. Housing tube 17. Free-wheeling engage switch 18. Gasket ▶A◀ 19. Free-wheeling clutch assembly 20. Front differential carrier assembly |
|---|---|

TSB Revision



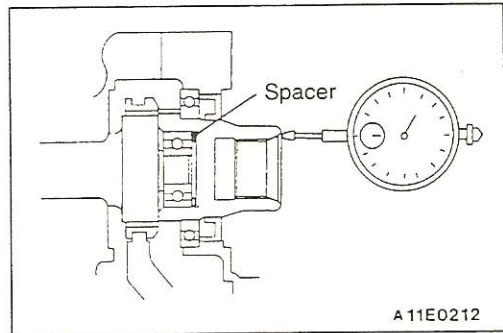
REMOVAL SERVICE POINT

◀A▶ FRONT PROPELLER SHAFT REMOVAL

Make mating marks on the flange yoke of the rear propeller shaft and on the companion flange of the differential case.

Caution

Suspend the propeller shaft from the body with wire, etc. to avoid spilling transmission fluid and to avoid injury from falling propeller shaft when not secured.



INSTALLATION SERVICE POINTS

▶A◀ FREE-WHEELING CLUTCH ASSEMBLY INSTALLATION

After installing the free-wheeling clutch assembly, select a spacer so that the clutch gear play (bearing looseness) is within the standard value.

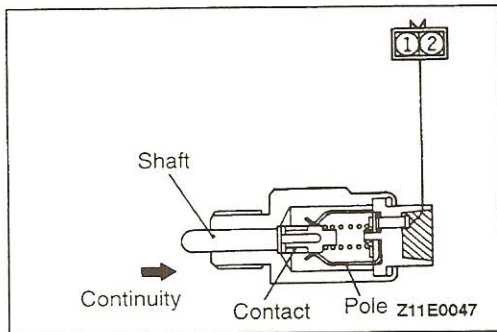
Standard value: 0.05–0.30 mm (.0020–.0120 in.)

▶B◀ FRONT PROPELLER SHAFT INSTALLATION

Install the front propeller shaft so that the mating marks on the flange yoke and differential carrier companion flange are aligned.

▶C◀ VACUUM HOSE INSTALLATION

Install the vacuum hoses so that the identification colors match those of the actuator assembly nipples.



INSPECTION

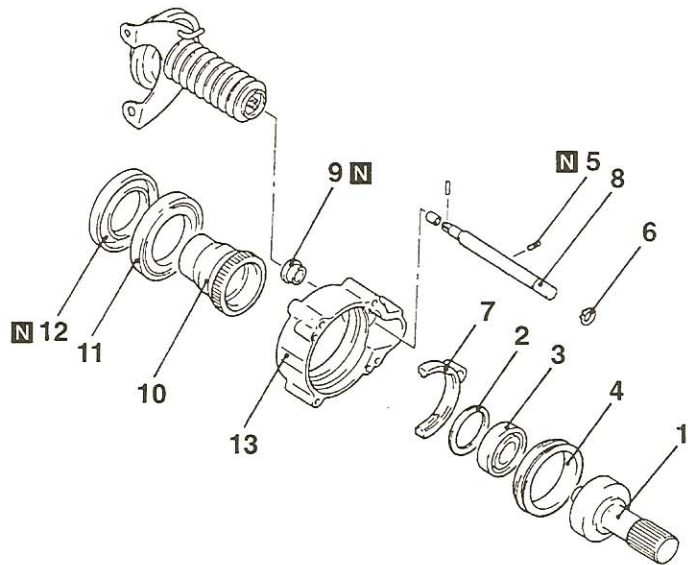
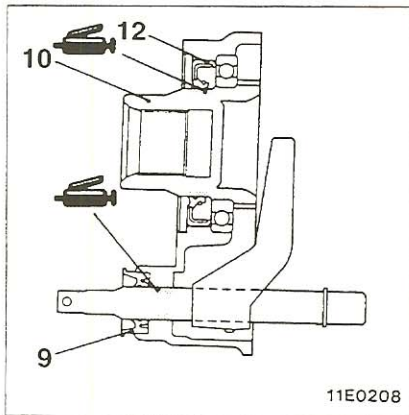
26200190016

FREE-WHEEL ENGAGE SWITCH

The switch is normal if there is continuity when the shaft is pushed in and no continuity when the shaft is released.

FREE-WHEELING CLUTCH

DISASSEMBLY AND REASSEMBLY

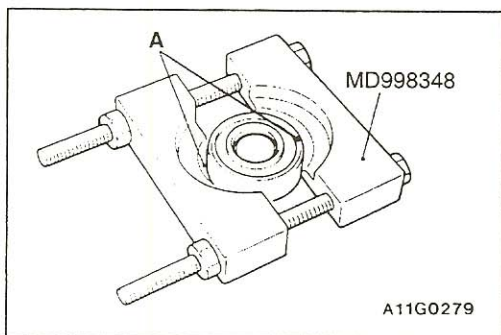


00003993

Removal steps

- ◀A▶ 1. Main shaft
- ◀A▶ ▶F▶ 2. Spacer
- ◀A▶ ▶E▶ 3. Bearing
- ▶D▶ 4. Clutch sleeve
- ▶D▶ 5. Spring pin
- ▶D▶ 6. Snap ring
- ▶D▶ 7. Shift fork

- ▶B▶ ▶C▶ 8. Shift rod
- ▶B▶ ▶B▶ 9. Oil seal
- ▶B▶ ▶B▶ 10. Clutch gear
- ▶B▶ ▶B▶ 11. Bearing
- ▶A▶ ▶A▶ 12. Oil seal
- ▶A▶ ▶A▶ 13. Clutch housing

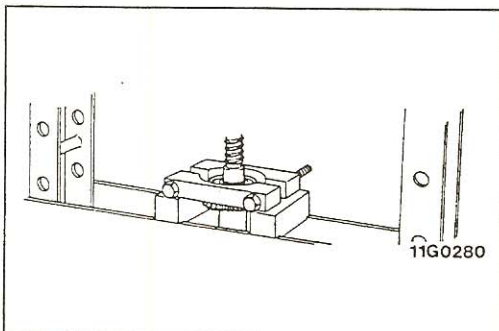


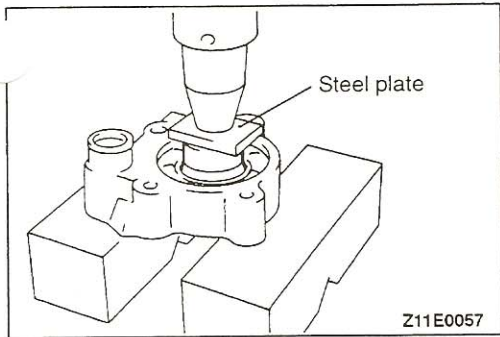
DISASSEMBLY SERVICE POINTS

◀A▶ MAIN SHAFT/BEARING REMOVAL

(1) After assembling the special tool as shown in the illustration, tighten the nut of the special tool so that A section of the special tool contacts the bearing outer race.

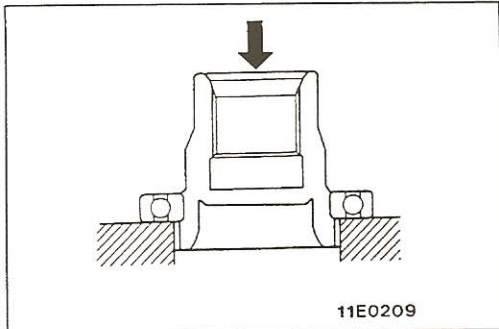
(2) Use a press and pull the bearing off the main shaft.



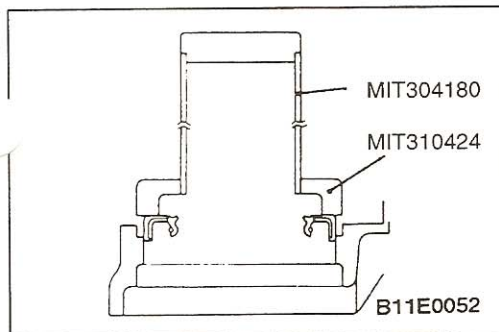


◀B▶ CLUTCH GEAR/BEARING REMOVAL

- (1) Use a press and a steel plate to remove the clutch gear and bearing together.



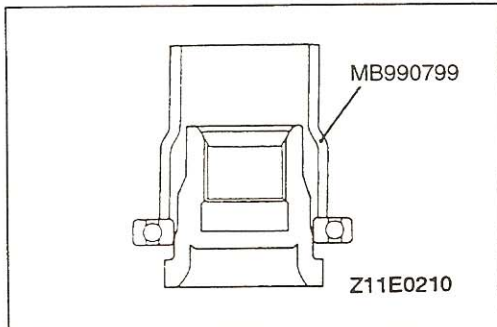
- (2) Use a press to hold the supports against the bearing inner race, and then separate the clutch gear and bearing.



REASSEMBLY SERVICE POINTS

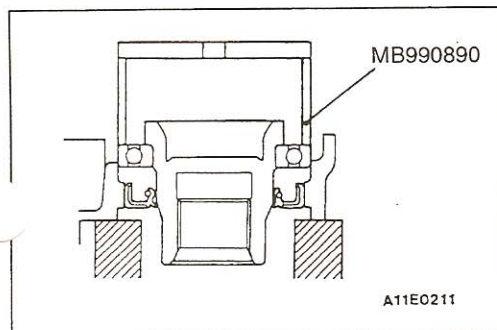
▶A◀ OIL SEAL INSTALLATION

Use the special tool to tap the oil seal until it is flush with the clutch housing.



▶B◀ BEARING/CLUTCH GEAR INSTALLATION

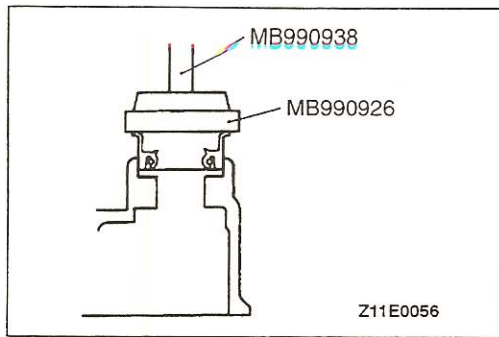
- (1) Use the special tool to press-fit the bearing onto the shoulder of the clutch gear.



- (2) Use the special tool to press-fit the bearing into the side of the clutch housing.

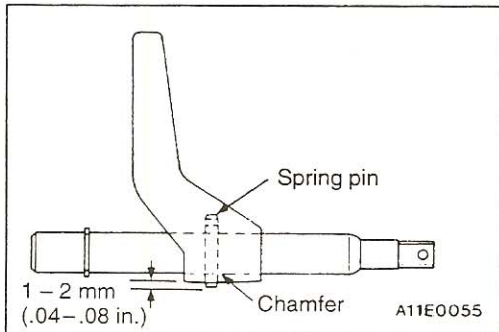
Caution

Place the special tool against the outer race of the bearing.



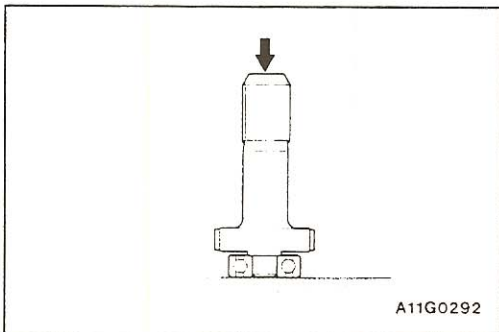
►C◄ OIL SEAL INSTALLATION

Use the special tool to tap the oil seal.



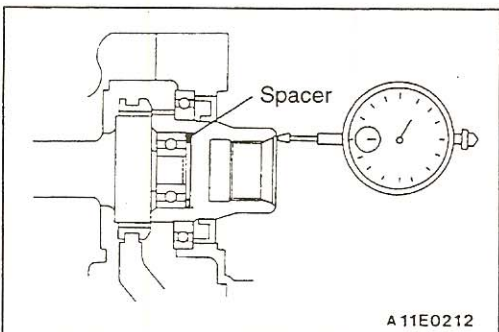
►D◄ SPRING PIN INSTALLATION

Tap the spring pin from the chamfered side of the shift rod until the projection length is 1–2 mm (.04–.08 in.).



►E◄ BEARING INSTALLATION

Press-fit the bearing as far as the shoulder of the main shaft.



►F◄ SPACER INSTALLATION

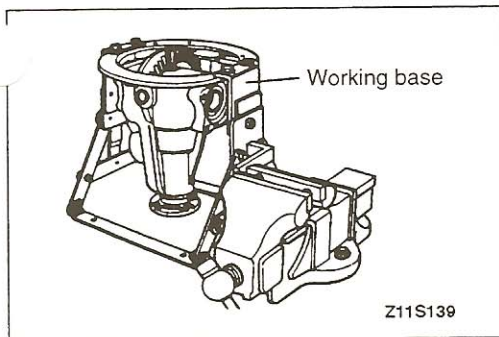
- (1) After installing the free-wheeling clutch assembly, select a spacer so that the clutch gear axial play (bearing looseness) is within the standard value.

Standard value: 0.05 – 0.30 mm (.0020 – .0120 in.)

- (2) If it is outside the standard value, disassemble and select the appropriate again.

NOTE

The thickness of the spacer is different 0.25 mm (.10 in.) each.



DIFFERENTIAL CARRIER

26200430019

INSPECTION BEFORE DISASSEMBLY

Remove the cover and gasket. Hold the working base in a vise, and install the differential carrier assembly to it.

FINAL DRIVE GEAR BACKLASH

Check the final drive gear backlash by the following procedure.

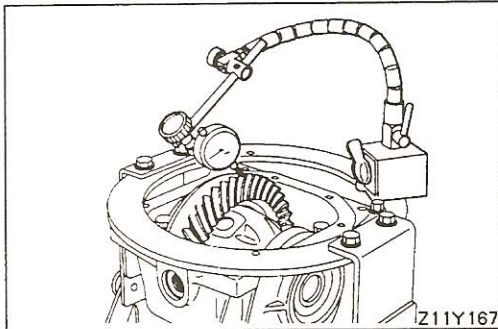
- (1) With the drive pinion locked in place, use a dial indicator to measure the final drive gear backlash on the drive gear.

NOTE

Measure at four points or more on the circumference of the drive gear.

Standard value: 0.11–0.16 mm (.0043–.0063 in.)

- (2) If the backlash is outside the standard value, adjust it by using the side bearing adjustment spacers.



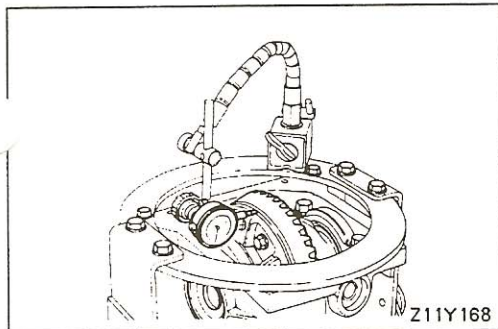
DRIVE GEAR RUNOUT

Check the drive gear runout by the following procedure.

- (1) Measure the drive gear runout at the shoulder on the reverse side of the drive gear.

Limit: 0.05 mm (.0020 in.)

- (2) If the runout exceeds the limit, check for incorrect tightening of the drive gear and differential case.



DIFFERENTIAL GEAR BACKLASH

Check the differential gear backlash by the following procedure.

- (1) While locking the side gear with a wedge, use a dial indicator to measure the differential gear backlash on the pinion gear.

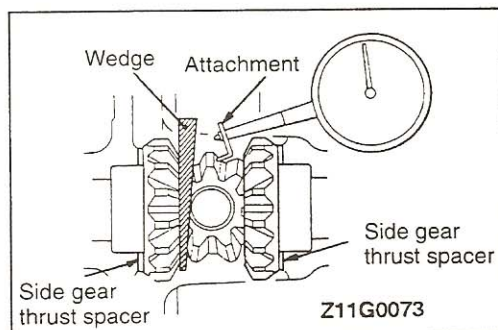
NOTE

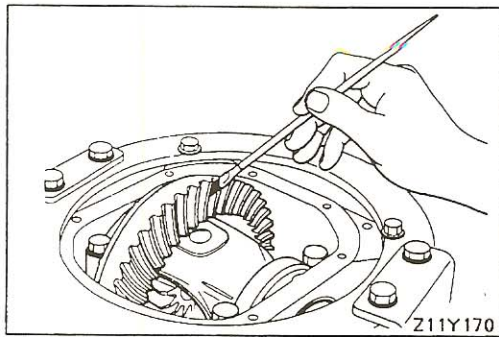
The measurement should be made for both pinion gears individually.

Standard value: 0.076 mm (.0030 in.) or less

Limit: 0.2 mm (.0079 in.)

- (2) If the backlash exceeds the limit, adjust by using the side gear thrust spacers.

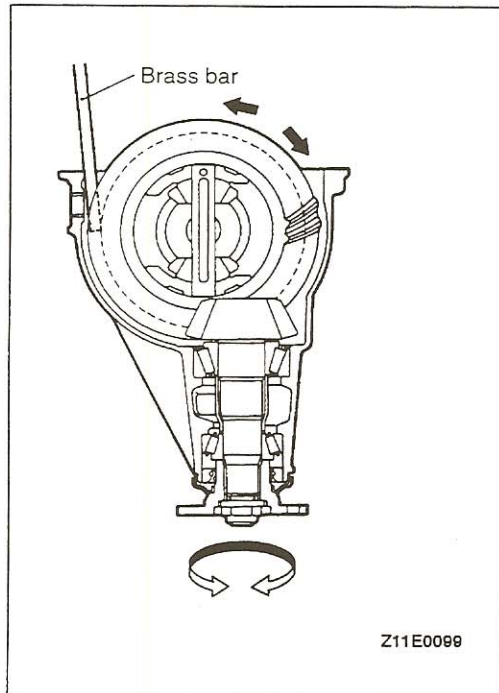




FINAL DRIVE GEAR TOOTH CONTACT

Check the final drive gear tooth contact by the following procedure.

- (1) Apply a thin, uniform coat of machine blue to both surfaces of the drive gear teeth.



- (2) Insert a brass rod between the differential carrier and the differential case, and then rotate the companion flange by hand (once in the forward direction, and then once in the reverse direction) while applying a load to the drive gear, so that the rotation torque [2.5–3.0 Nm (28–33 in.lbs.)] is applied to the drive pinion.

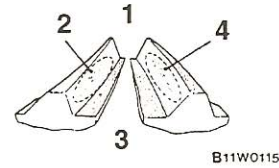
Caution

If the drive gear is rotated too much, the tooth contact pattern will become unclear and difficult to check.

- (3) Check the tooth contact of the drive gear and drive pinion.

Standard tooth contact pattern

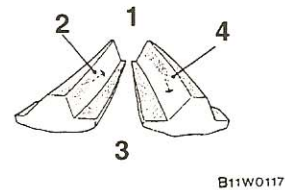
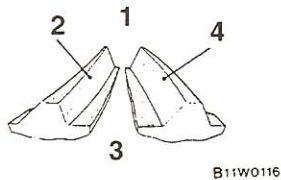
- 1 Narrow tooth side
- 2 Drive-side tooth surface (the side applying power during forward movement)
- 3 Wide tooth side
- 4 Coast-side tooth surface (the side applying power during reverse movement)



Problem

Solution

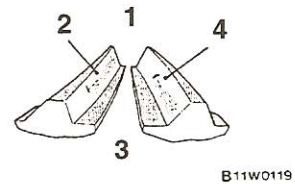
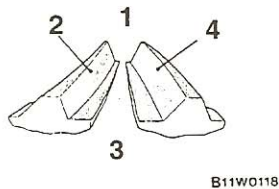
Tooth contact pattern resulting from excessive pinion height



The drive pinion is positioned too far from the center of the drive gear.

Increase the thickness of the pinion height adjusting shim, and position the drive pinion closer to the center of the drive gear. Also, for backlash adjustment, position the drive gear farther from the drive pinion.

Tooth contact pattern resulting from insufficient pinion height



The drive pinion is positioned too far from the center of the drive gear.

Decrease the thickness of the pinion height adjusting shim, and position the drive pinion farther from the center of the drive gear. Also, for backlash adjustment, position the drive gear closer to the drive pinion.

NOTE

Confirm that the pinion height and backlash adjustments have been done properly by inspecting the tooth contact pattern. Continue to adjust the pinion height and backlash until the tooth contact pattern resembles the standard pattern.

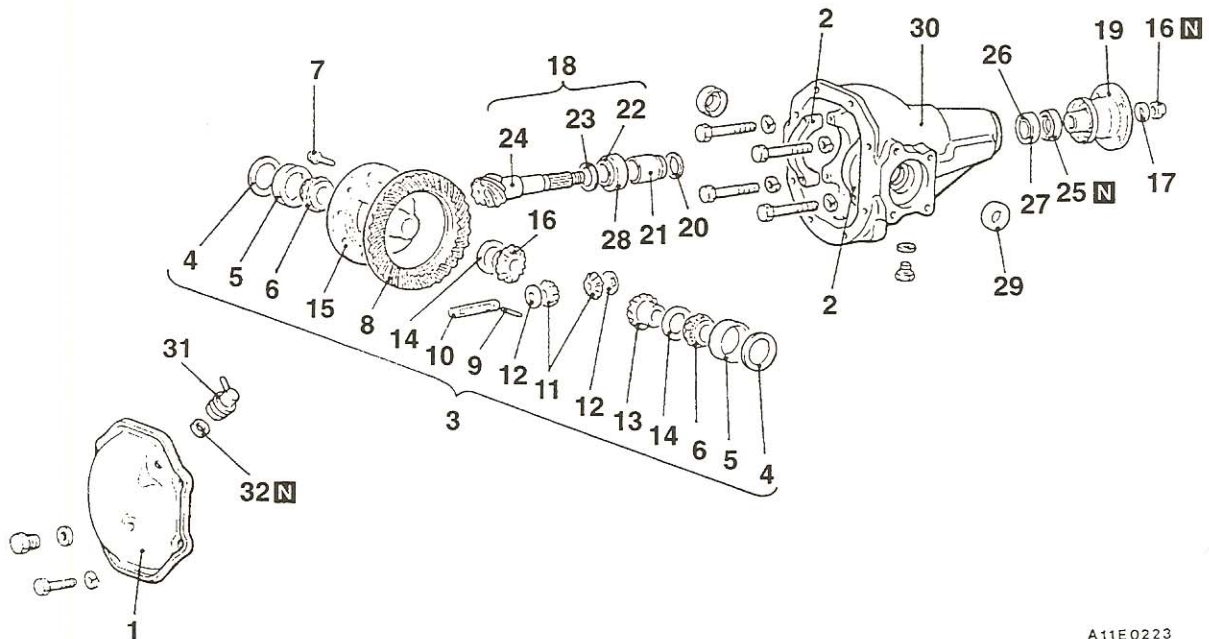
If the correct tooth contact pattern cannot be obtained even after adjustments, the drive gear and the drive pinion must be worn beyond the allowable limit. Replace the gear set.

DISASSEMBLY

26200230015

Inspection before Disassembly

- Final Drive Gear Backlash (Refer to P.26-39.)
- Drive Gear Runout (Refer to P.26-39.)
- Differential Gear Backlash (Refer to P.26-39.)
- Final Drive Gear Tooth Contact (Refer to P.26-40.)

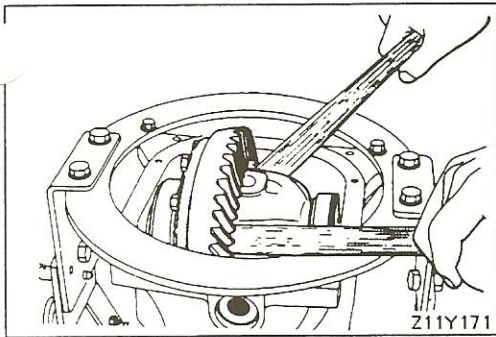


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Disassembly steps

- | | | | |
|---|---|----------------------------------|---|
| <p>◀A▶</p> <p>◀B▶</p> <p>◀C▶</p> <p>◀D▶</p> <p>◀E▶</p> <p>◀F▶</p> | <p>1. Cover</p> <p>2. Bearing cap</p> <p>3. Differential case assembly</p> <p>4. Side bearing adjusting spacer</p> <p>5. Side bearing outer race</p> <p>6. Side bearing inner race</p> <p>7. Bolt (10)</p> <p>8. Drive gear</p> <p>9. Lock pin</p> <p>10. Pinion shaft</p> <p>11. Pinion gear</p> <p>12. Pinion washer</p> <p>13. Side gear</p> <p>14. Side gear thrust spacer</p> <p>15. Differential case</p> <p>16. Companion flange self-locking nut</p> <p>17. Washer</p> <p>18. Drive pinion assembly</p> | <p>◀G▶</p> <p>◀H▶</p> <p>◀H▶</p> | <p>19. Companion flange</p> <p>20. Drive pinion rear shim (for preload adjustment)</p> <p>21. Drive pinion spacer</p> <p>22. Drive pinion front bearing inner race</p> <p>23. Drive pinion front shim (for pinion height adjustment)</p> <p>24. Drive pinion</p> <p>25. Oil seal</p> <p>26. Drive pinion rear bearing inner race</p> <p>27. Drive pinion rear bearing outer race</p> <p>28. Drive pinion front bearing outer race</p> <p>29. Oil seal</p> <p>30. Gear carrier</p> <p>31. Vent plug</p> <p>32. Packing</p> |
|---|---|----------------------------------|---|

TSB Revision

**DISASSEMBLY SERVICE POINTS****◀A▶ DIFFERENTIAL CASE ASSEMBLY REMOVAL**

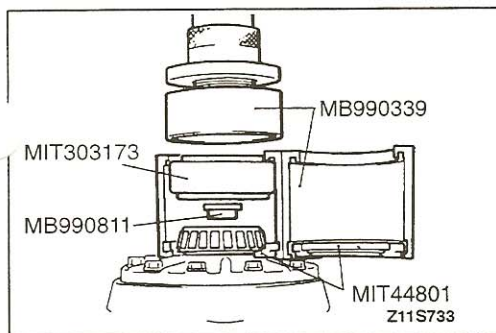
Use a hammer handle to take out the differential case assembly.

Caution

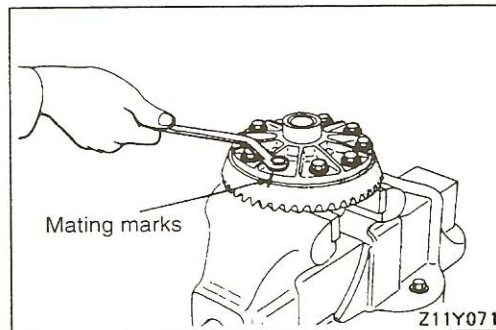
When taking out the differential case assembly, be careful not to drop and damage the side bearing outer races.

NOTE

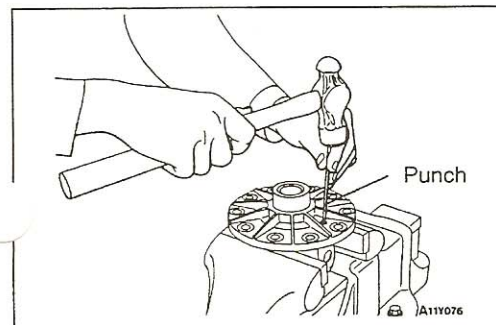
Keep the right and left side bearings and side bearing adjusting spacers separate in order to be able to distinguish them for reassembly.

**◀B▶ SIDE BEARING INNER RACE REMOVAL**

Use the special tools to pull out the side bearing inner races.

**◀C▶ DRIVE GEAR REMOVAL**

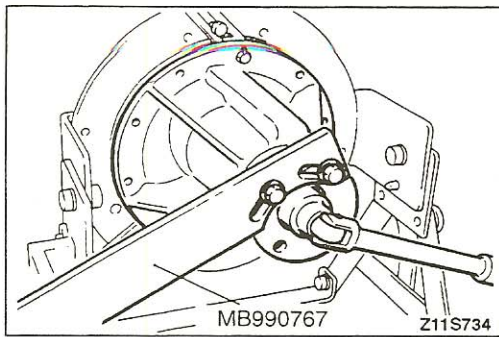
- (1) Make mating marks on the differential case and drive gear.
- (2) Loosen the drive gear mounting bolts in diagonal sequence to remove the drive gear.

**◀D▶ LOCK PIN REMOVAL**

Drive out the lock pin with a punch.

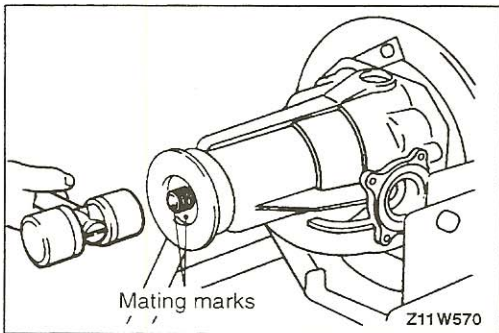
NOTE

The removed side gears and the left and right side gear thrust spacers should be retained for reassembly.



◀E▶ COMPANION FLANGE SELF-LOCKING NUT REMOVAL

Use the special tool to hold the companion flange, and then remove the companion flange self-locking nut.



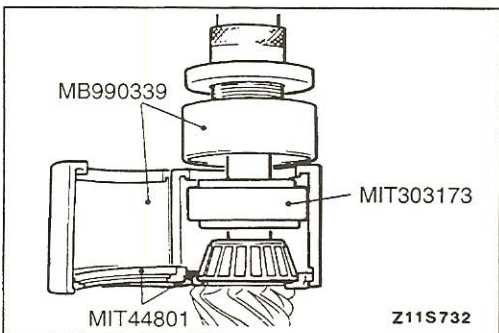
◀F▶ DRIVE PINION ASSEMBLY REMOVAL

- (1) Make mating marks on the drive pinion and companion flange.

Caution

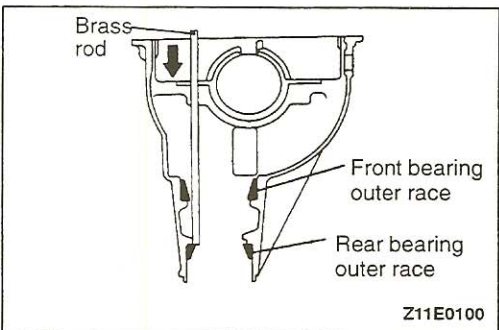
The mating mark made on the companion flange must not be on the coupling surface of the flange yoke and the front propeller shaft.

- (2) Drive out the drive pinion together with the drive pinion spacer and the drive pinion shims.



◀G▶ DRIVE PINION FRONT BEARING INNER RACE REMOVAL

Use the special tools to pull out the front bearing inner race.



◀H▶ DRIVE PINION REAR BEARING OUTER RACE/ DRIVE PINION FRONT BEARING OUTER RACE REMOVAL

- (1) Use the brass rod to drive out the drive pinion rear bearing outer race from the gear carrier.
- (2) Drive out the front bearing outer race in the same manner.

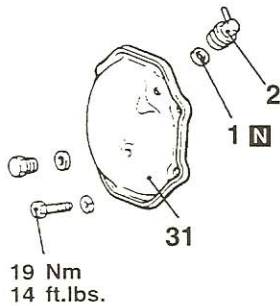
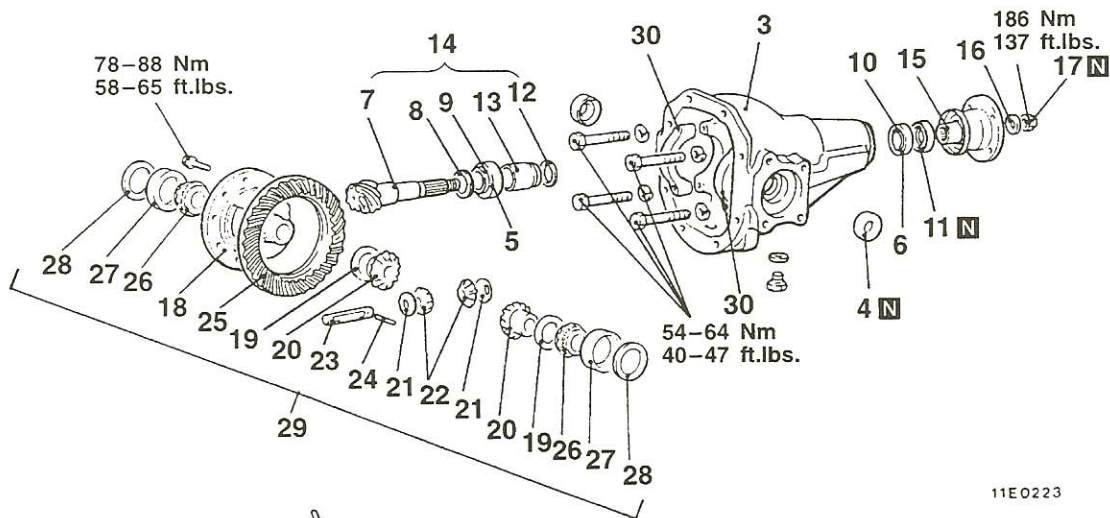
INSPECTION

26200240018

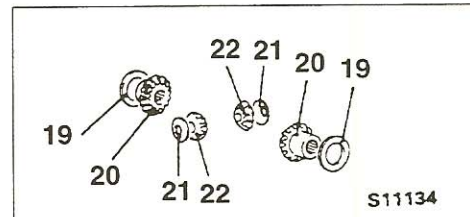
- Check the companion flange for wear or damage.
- Check the oil seal for wear or deterioration.
- Check the bearings for wear or discoloration.
- Check the gear carrier for cracks.
- Check the drive pinion and drive gear for wear or cracks.
- Check the side gears, pinion gears and pinion shaft wear or damage.
- Check the side gear spline for wear or damage.

REASSEMBLY

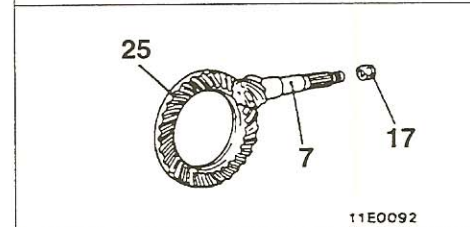
26200250073



11E0223



Differential gear set



Final drive gear set

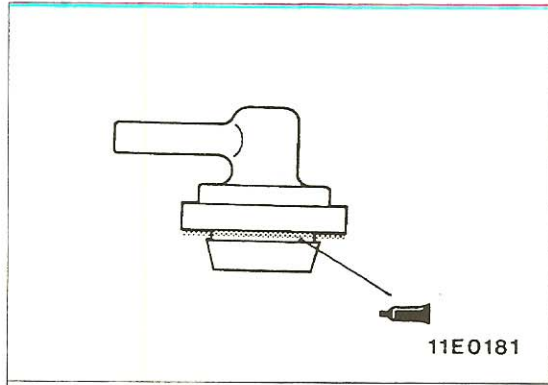
00007089

Reassembly steps

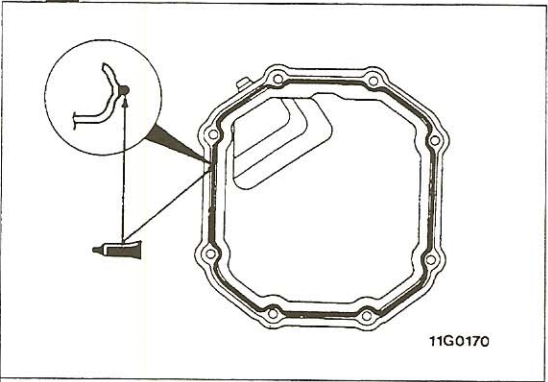
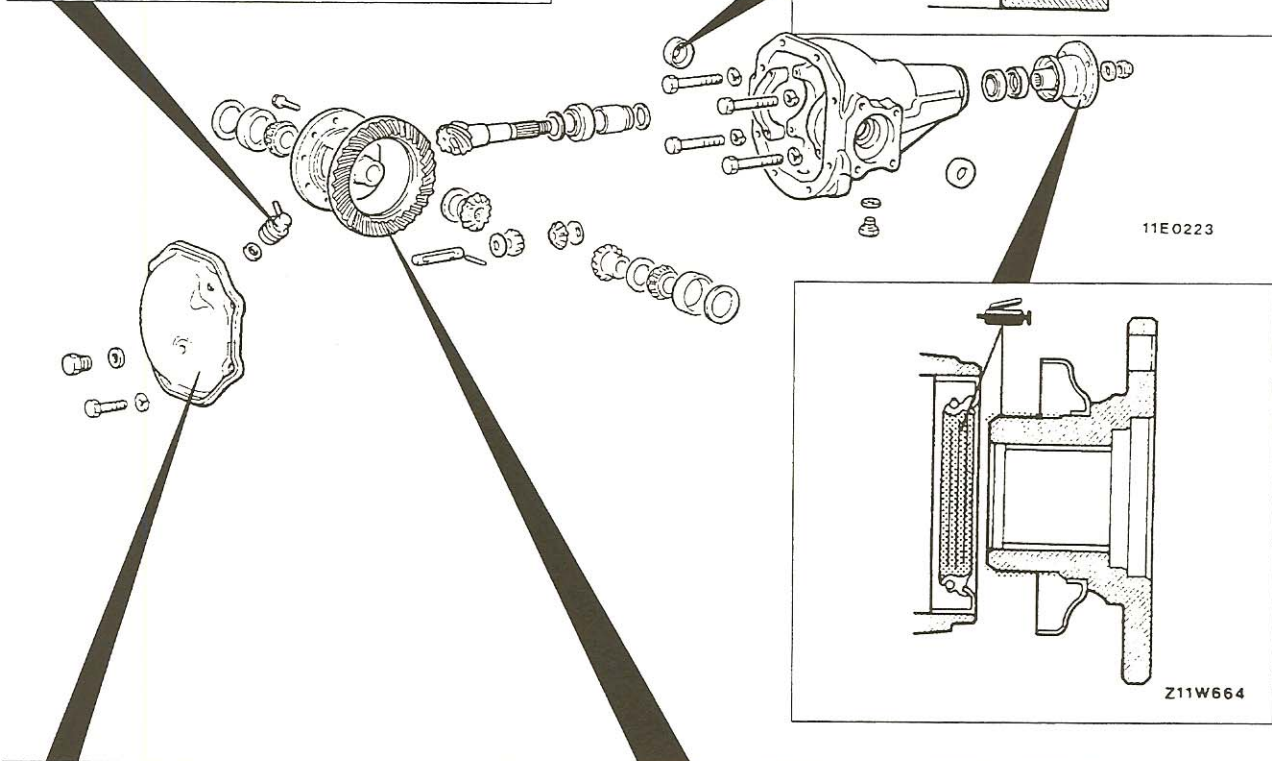
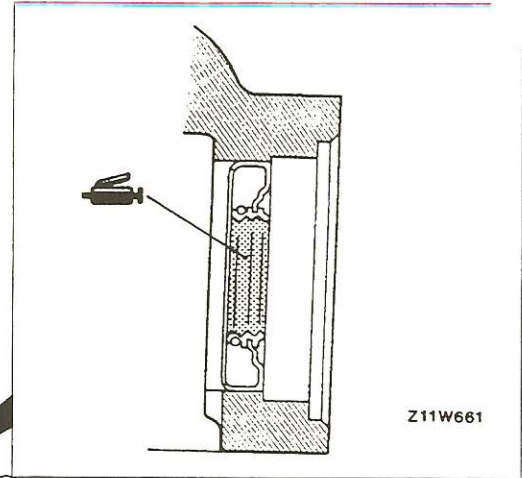
1. Packing
2. Vent plug
3. Gear carrier
- ▶A◀ 4. Oil seal
- ▶B◀ 5. Drive pinion front bearing outer race
- ▶B◀ 6. Drive pinion rear bearing outer race
- ▶C◀ • Pinion height adjustment
7. Drive pinion
8. Drive pinion front shim (for pinion height adjustment)
9. Drive pinion front bearing inner race
- ▶D◀ • Drive pinion rotation torque adjustment
10. Drive pinion rear bearing inner race
11. Oil seal
12. Drive pinion rear shim (for turning torque adjustment)
13. Drive pinion spacer
14. Drive pinion assembly
15. Companion flange
16. Washer
17. Companion flange self-locking nut
18. Differential case
19. Side gear thrust spacer
20. Side gear
21. Pinion washer
22. Pinion gear
- ▶E◀ • Differential gear backlash adjustment
23. Pinion shaft
- ▶F◀ 24. Lock pin
- ▶G◀ 25. Drive gear
- ▶H◀ 26. Side bearing inner race
27. Side bearing outer race
- ▶I◀ • Final drive gear backlash adjustment
28. Side bearing adjusting spacer
29. Differential case assembly
30. Bearing cap
31. Cover

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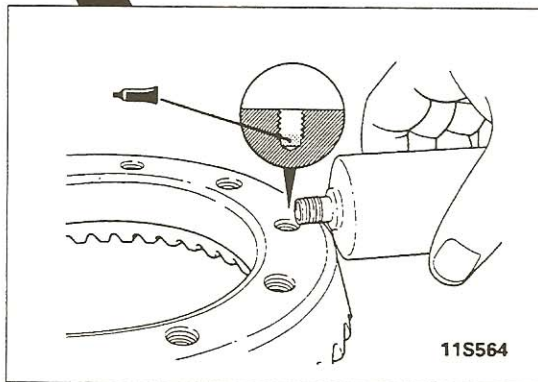
LUBRICATION, SEALING AND ADHESION POINTS



Sealant:
3M ATD Part No. 8663 or equivalent



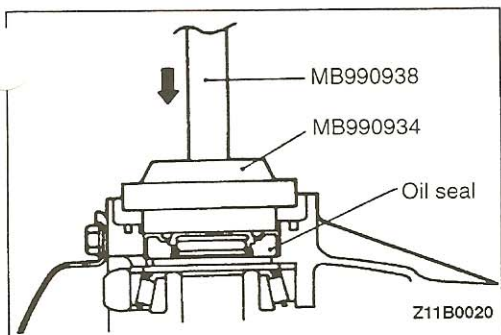
Sealant:
3M ATD Part No. 8663 or equivalent



Adhesive
3M Stud Locking 4170 or equivalent

00003997

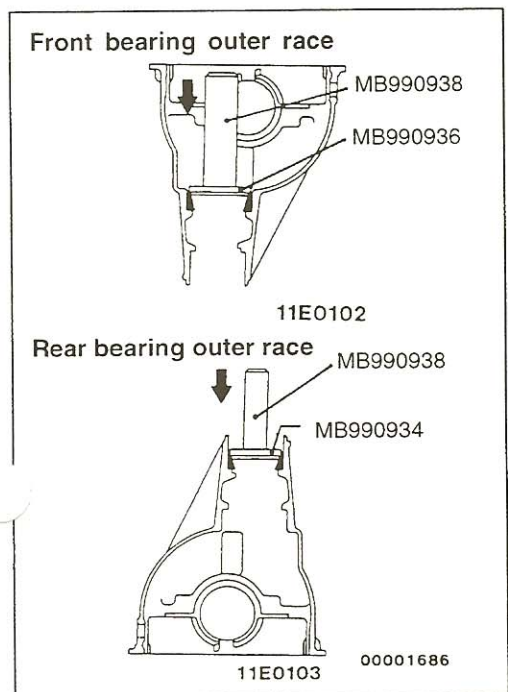
TSB Revision



REASSEMBLY SERVICE POINTS

▶A◀ OIL SEAL INSTALLATION

Use the special tool to insert the oil seal, and then apply a thin coat of multi-purpose grease to the lip of the oil seal.

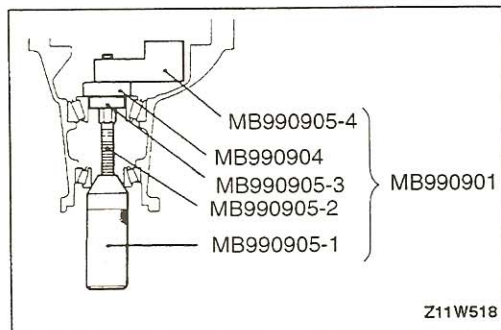


**▶B◀ DRIVE PINION FRONT BEARING OUTER RACE/
DRIVE PINION REAR BEARING OUTER RACE
INSTALLATION**

Use the special tools to press-fit the drive pinion front bearing outer races into the gear carrier.

NOTE

Carry out press-fitting carefully so as not to tilt the outer race.

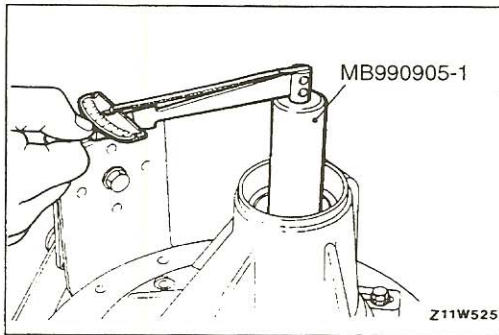


▶C◀ PINION HEIGHT ADJUSTMENT

Adjust the drive pinion height as follows:

(1) Install the special tools and the drive pinion front and rear bearing inner races into the gear carrier in the order shown in the illustration.

(2) Tighten the handle of the special tool until the standard value for the drive pinion rotation torque is obtained.



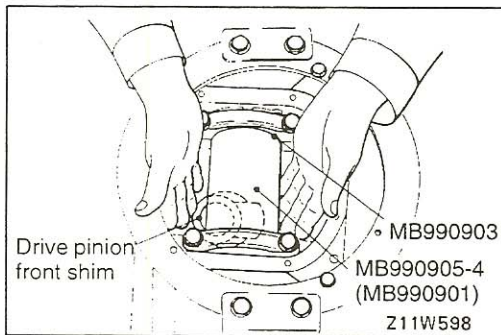
- (3) Use the special tools to measure the drive pinion rotation torque (without the oil seal).

Standard value:

Bearing type	Bearing lubrication	Rotation torque
New	None (With anti-rust agent)	0.3–0.5 Nm 2.6–4.3 in.lbs.
New or reuse	Gear oil applied	0.15–0.25 Nm 1.3–2.2 in.lbs.

NOTE

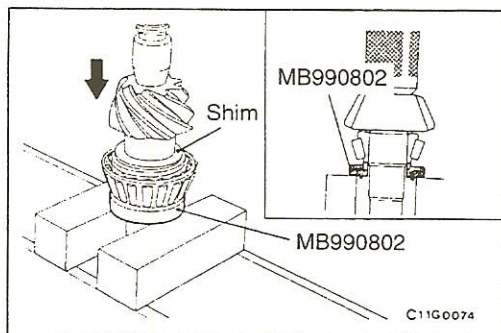
1. Gradually tighten the handle of the special tool while checking the drive pinion preload.
2. Because one rotation cannot be made when the special tool is in contact with the gear carrier, move it a few times and, after seating the bearing, measure the rotation torque.



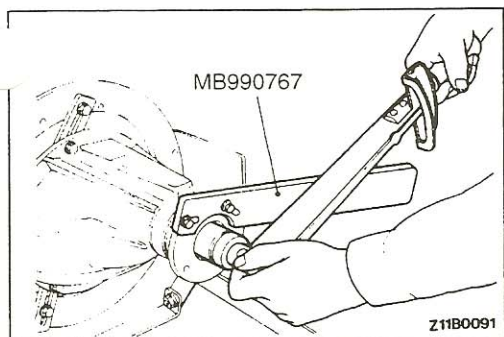
- (4) Position the special tool in the side bearing seat of the gear carrier, and then select a drive pinion front shim of a thickness which corresponds to the gap between the special tools.

NOTE

1. Be sure to clean the side bearing seat thoroughly. When positioning the special tool, check that the cut-out sections of the special tool are in the position shown in the illustration, and check that the special tool is in close contact with the side bearing seat.
2. When selecting the drive pinion front shims, keep the number of shims to a minimum.



- (5) Fit the selected drive pinion front shim(s) to the drive pinion, and then use the special tool to press-fit the drive pinion front bearing inner race.



►D◄ DRIVE PINION ROTATION TORQUE ADJUSTMENT

Adjust the drive pinion rotation torque by the following procedure.

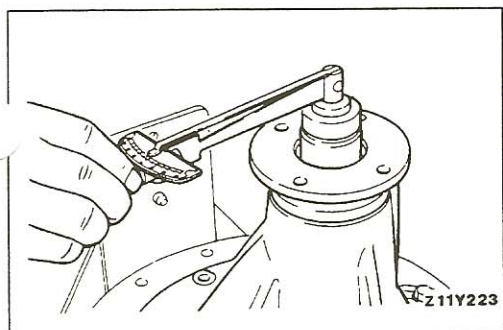
Without oil seal

- (1) Insert the drive pinion into the gear carrier, and then install the drive pinion spacer, drive pinion rear shim, drive pinion rear bearing inner race and companion flange in that order from the front of the carrier.

NOTE

Do not install the oil seal.

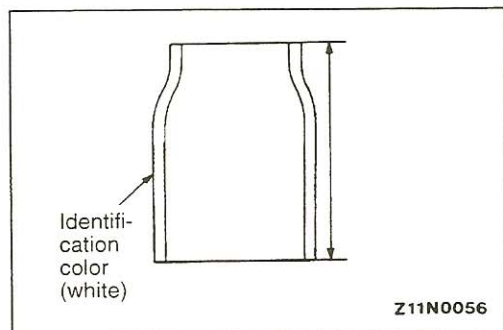
- (2) Use the special tool to tighten the companion flange to the specified torque.



- (3) Use the special tools to measure the drive pinion rotation torque (without the oil seal).

Standard value:

Bearing type	Bearing lubrication	Rotation torque
New	None (With anti-rust agent)	0.3–0.5 Nm 2.6–4.3 in.lbs.
New or reuse	Gear oil applied	0.15–0.25 Nm 1.3–2.2 in.lbs.

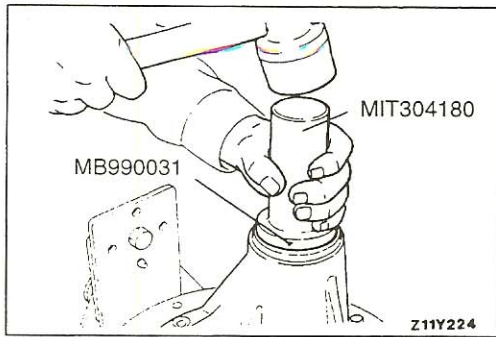


- (4) If the drive pinion rotation torque is not within the standard value range, adjust the preload by replacing the drive pinion front shim(s) or the drive pinion spacer.

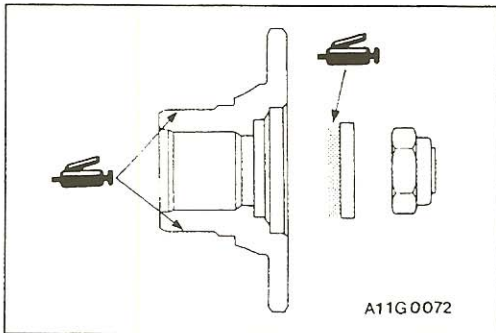
NOTE

When selecting the drive pinion rear shims, if the number of shims is large, reduce the number of shims to a minimum by selecting the appropriate drive pinion spacers. Also, select the drive pinion spacer from the following two types.

Item	Types
Height of drive pinion spacer mm (in.)	56.67 (2.231) With identification color
	57.01 (2.244) No identification color

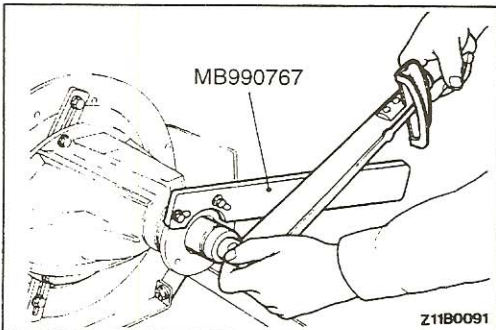


- (5) Remove the companion flange and drive pinion again.

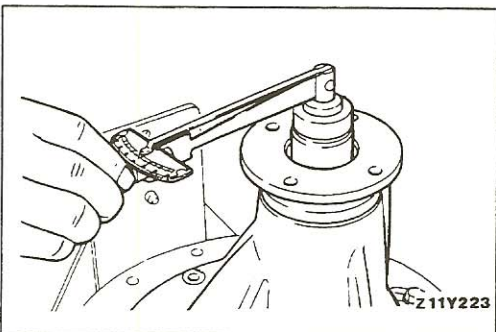


With oil seal

- (1) After setting the drive pinion rear bearing inner race, use special tool to drive the oil seal into the front lip of the gear carrier.
 (2) Apply multi-purpose grease to the contact surfaces of the companion flange oil seal and the washer companion flange.



- (3) Install the drive pinion assembly and companion flange with the mating marks properly aligned. Using the special tools, tighten the companion flange self-locking nut to the specified torque.

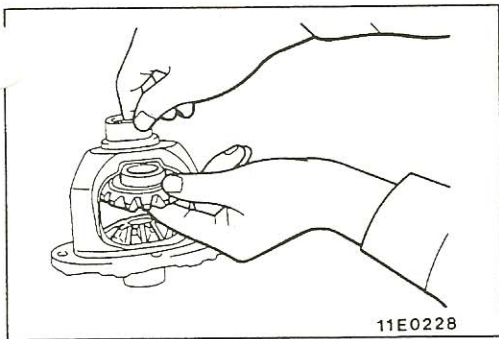


- (4) Use the special tools to measure the drive pinion rotation torque (with the oil seal) to confirm that the drive pinion preload is at the standard value.

Standard value:

Bearing type	Bearing lubrication	Rotation torque
New	None (With anti-rust agent)	0.5–0.7 Nm 4.3–6.1 in.lbs.
New or reuse	Gear oil applied	0.35–0.45 Nm 3.1–3.9 in.lbs.

- (5) If the measured value is not within the standard value range, check for incorrect installation of the oil seal or incorrect tightening of the self-locking nut.

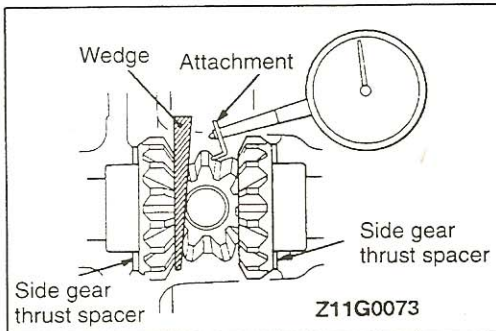


►E◄ DIFFERENTIAL GEAR BACKLASH ADJUSTMENT

- (1) Assemble the side gears, side gear thrust spacers, pinion gears and pinion washers into the differential case.
- (2) Provisionally install the pinion shaft.

NOTE

Do not drive in the lock pin yet.



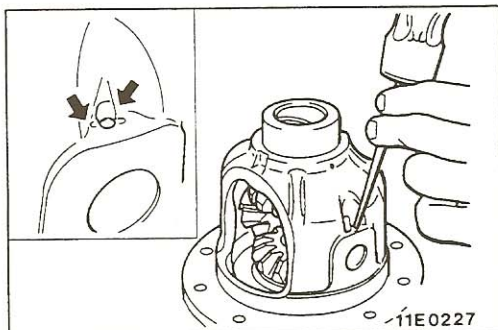
- (3) Insert a wedge between the side gear and the pinion shaft to lock the side gear.
- (4) Use a dial indicator to measure the differential gear backlash on the pinion gear.

Standard value: 0.076 mm (.0030 in.) or less

Limit: 0.2 mm (.0079 in.)

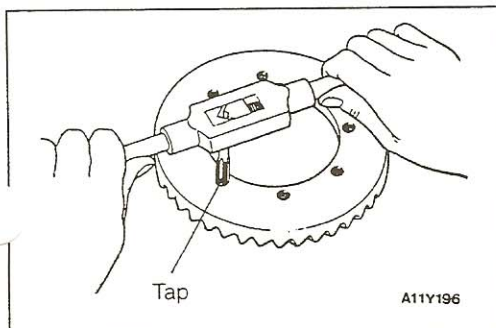
- (5) If the differential gear backlash exceeds the limit, adjust the backlash by installing thicker side gear thrust spacers.
- (6) Measure the differential gear backlash again, and check that it is within the limit.

If adjustment is not possible, replace the side gears and pinion gears as a set.



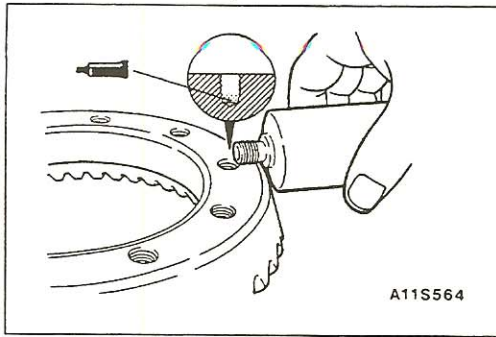
►F◄ LOCK PIN INSTALLATION

- (1) Align the pinion shaft lock pin hole with the differential case lock pin hole, and then drive in the lock pin.
- (2) Stake the lock pin with a punch on both sides.



►G◄ DRIVE GEAR INSTALLATION

- (1) Clean the drive gear mounting bolts.
- (2) Remove the adhesive which is adhering to the threaded holes of the drive gear by turning the tap tool (tap M10×1.25), and then clean the threaded holes by applying compressed air.

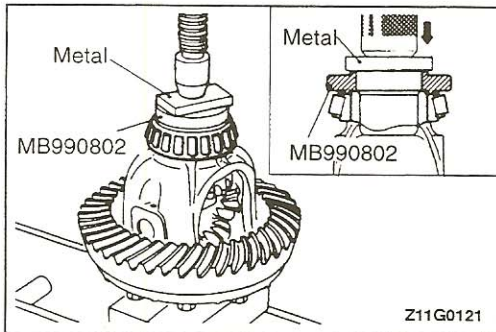


- (3) Apply specified adhesive to the threaded holes of the drive gear.

Specified adhesive:

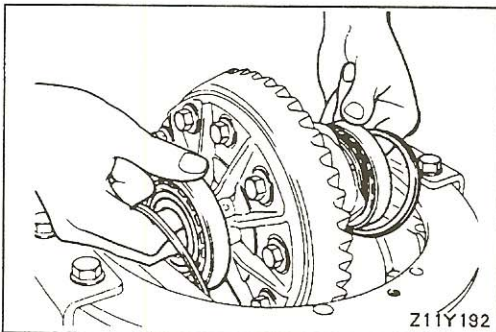
3M Stud Locking Part No. 4170 or equivalent

- (4) Install the drive gear to the differential case so that the mating marks are properly aligned. Tighten the bolts to the specified torque in a diagonal sequence.



►H◄ SIDE BEARING INNER RACE INSTALLATION

Use the special tool to press-fit the side bearing inner races into the differential case.



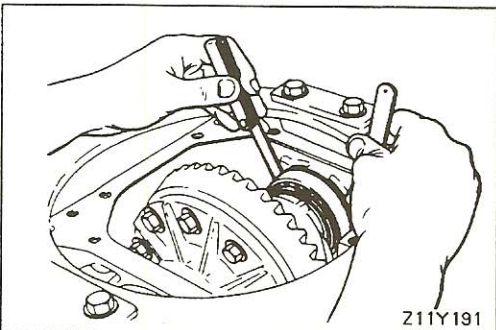
►I◄ FINAL DRIVE GEAR BACKLASH ADJUSTMENT

Adjust the final drive gear backlash by the following procedure.

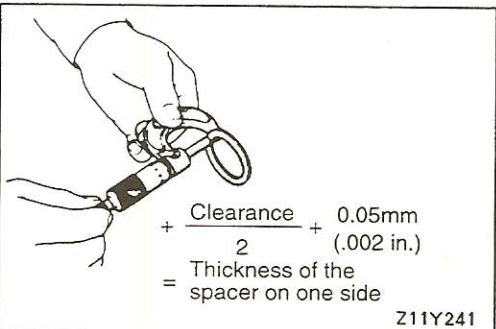
- (1) Install side bearing spacers which are thinner than those removed to the side bearing outer races, and then in the differential case assembly to the gear carrier.

NOTE

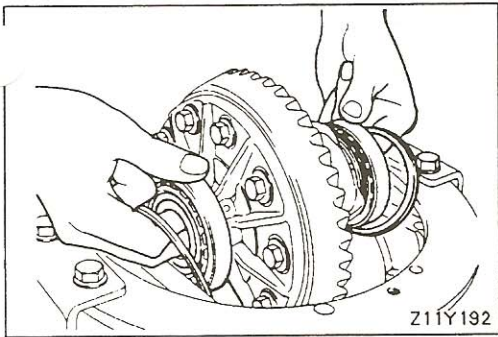
Select side bearing spacers with the same thickness for both the drive pinion side and the drive gear side.



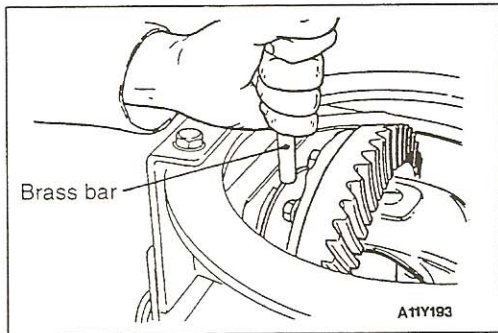
- (2) Push the differential case assembly to one side, and then measure the clearance between the gear carrier and the side bearing adjusting spacer with a feeler gage.



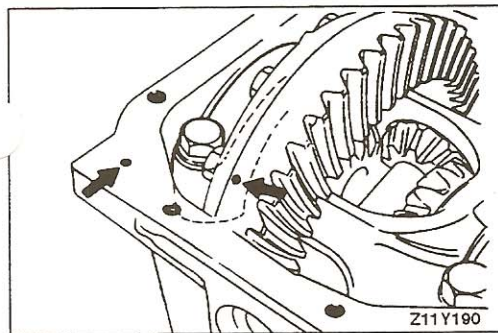
- (3) Measure the thickness of the side bearing adjusting spacers on one side, select two pairs of spacers which correspond to that thickness plus one half of the thickness plus 0.05 mm (.002 in.), and then install one pair each to the drive pinion side and the drive gear side.



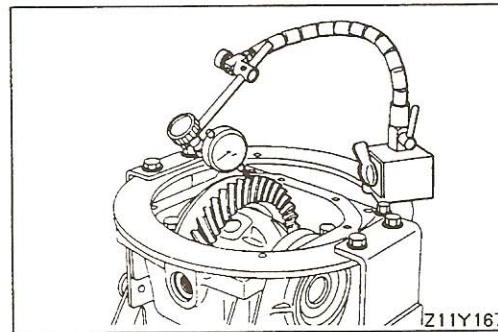
- (4) Install the side bearing adjusting spacers and differential case assembly to the gear carrier as shown in the illustration.



- (5) Tap the side bearing adjusting spacers with a brass bar to press-fit them to the side bearing outer race.



- (6) Align the mating marks on the gear carrier and the bearing cap, and then tighten the bearing cap.

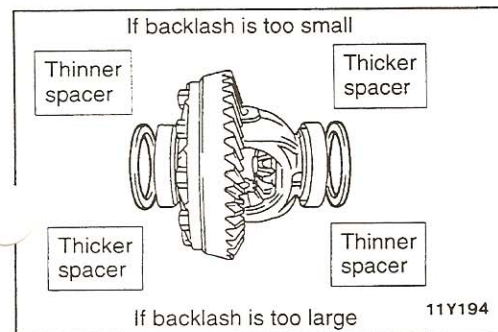


- (7) With the drive pinion locked in place, use a dial indicator to measure the final drive gear backlash on the drive gear.

NOTE

Measure at four points or more on the circumference of the drive gear.

Standard value: 0.11–0.16 mm (.0043–.0063 in.)

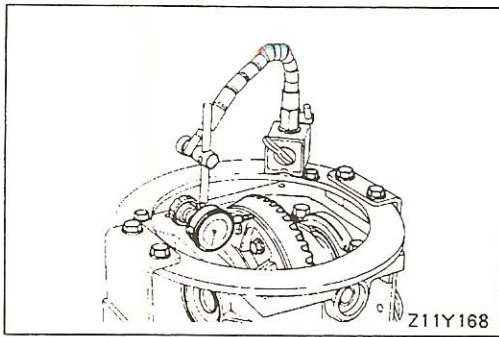


- (8) Change the side bearing adjusting spacers as shown in the illustration, and then adjust the final drive gear backlash between the drive gear and the drive pinion.

NOTE

When increasing the number of side bearing adjusting spacers, use the same number for each side, and use as few spacers as possible.

- (9) Check the tooth contact of the drive gear and drive pinion. If poor contact is evident, carry out adjustment. (Refer to P.26-39.)



(10) Measure the drive gear runout at the shoulder on the reverse side of the drive gear.

Limit: 0.05 mm (.0020 in.)

(11) If the drive gear runout exceeds the limit, remove the differential case and the drive gears, move them to different positions and then reinstall them.

REAR AXLE



CONTENTS

27109000215

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AXLE SHAFT	16	Rear Axle Total Backlash Check	10
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ON-VEHICLE SERVICE	10	SERVICE SPECIFICATIONS	2
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Axle Shaft End Play Check	11	TROUBLESHOOTING	7
Gear Oil Level Check	11		

GENERAL SPECIFICATIONS

27100020074

Items		Specifications
Axle housing type		Banjo type
Axle shaft	Supporting type	Semi-floating type
Differential	Differential size	No. 7.5
	Reduction gear type	Hypoid gear
	Reduction ratio	4.272
	Pinion gear type	2 pinion* or 4 pinion

NOTE

*: Without rear differential lock

SERVICE SPECIFICATIONS

27100030244

<Conventional differential>

Items		Standard value	Limit	
Rear axle total backlash mm (in.)		–	5 (.20)	
Axle shaft end play mm (in.)		0.25 (.0098)	–	
Protruding length of stabilizer bar mounting bolt mm (in.)		15–17 (.59–.67)	–	
Press-fitting force of retainer N (lbs.)	Initial press-force	49,000 (11,016)	–	
	Final press-fitting force	98,000–108,000 (22,031–24,279)	–	
Clearance of snap ring and retainer mm (in.)		0.166 (.0065) or less	–	
Final drive gear backlash mm (in.)		0.13–0.18 (.0051–.0071)	–	
Drive gear runout mm (in.)		–	0.05 (.002)	
Differential gear backlash mm (in.)		0.10–0.25 (.004–.01)	–	
Drive pinion rotation torque Nm (in.lbs.)	Without oil seal	With anti-rust agent (new)	0.6–0.9 (5.2–7.8)	–
		With gear oil applied (new or used)	0.4–0.5 (3.5–4.3)	–
	With oil seal	With anti-rust agent (new)	0.85–1.15 (7.4–10.0)	–
		With gear oil applied (new or used)	0.65–0.75 (5.6–6.5)	–

REAR AXLE – Service Specifications/Lubricants/Sealants and Adhesives 27-3

<Differential with rear differential lock>

Items		Standard value	Limit
Rear axle total backlash mm (in.)		–	5 (.20)
Axle shaft end play mm (in.)		0.25 (.0098)	–
Protruding length of stabilizer bar mounting bolt mm (in.)		15–17 (.59–.67)	–
Press-fitting force of retainer N (lbs.)	Initial press-force	49,000 (11,016)	–
	Final press-fitting force	98,000–108,000 (22,031–24,279)	–
Clearance of snap ring and retainer mm (in.)		0.166 (.0065) or less	–
Rear differential lock air pump pressure kPa (psi)		25–40 (4–6)	–
Final drive gear backlash mm (in.)		0.12–0.18 (.0047–.0071)	–
Drive gear runout mm (in.)		–	0.05 (.002)
Differential gear backlash mm (in.)		0.15–0.20 (.005–.008)	–
Drive pinion rotation torque Nm (in.lbs.)	Without oil seal	With anti-rust agent (new)	0.6–0.9 (5.2–7.8)
		With gear oil applied (new or used)	0.4–0.5 (3.5–4.3)
	With oil seal	With anti-rust agent (new)	0.85–1.15 (7.4–10.0)
		With gear oil applied (new or used)	0.65–0.75 (5.6–6.5)

LUBRICANTS

27100040100

Items	Specified lubricant	Quantity dm ³ (qts.)
Rear axle gear oil	Hypoid gear oil API classification GL-5 or higher SAE viscosity No. 90, 80W	3.2 (3.3)

SEALANTS AND ADHESIVES



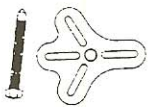

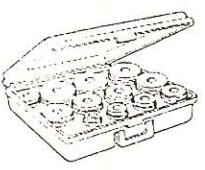

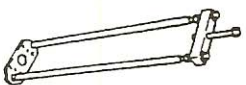
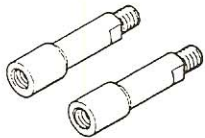
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Items	Specified sealants and adhesives
Bearing case	3M ATD Part No. 8663 or equivalent
Differential carrier mounting surface of axle housing	
Drive gear threaded hole	3M Stud Locking Part No. 4170 or equivalent

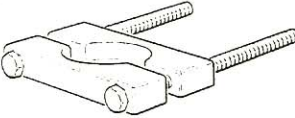
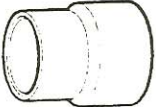
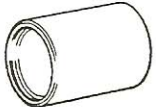

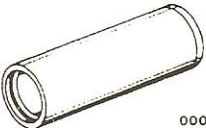



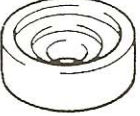
TSB Revision

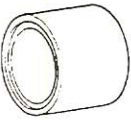

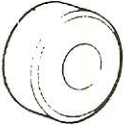
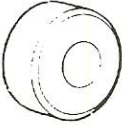
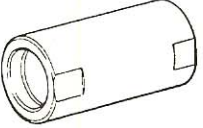



SPECIAL TOOLS

271000F0009

Tool	Tool number and name	Supersession	Application
 11H0072	MB991618 Hub bolt remover	–	Removal of hub bolt
 00004356	MB990767 End yoke holder	MB990767-01	Holding of axle shaft Holding of companion flange
 00004349	MB990241 Axle puller	MB990241-01 or General service tool	Removal of axle shaft (use with MB990211-01)
	MB990211 Sliding hammer	MB990211-01	Removal of axle shaft (use with MB990241-01) Removal of axle housing oil seal
 00004350	MB990925 Bearing and oil seal installer set (Refer to GROUP 26.)	MB990925-01	Pressing of axle housing oil s MB990932-01 Pressing of axle shaft oil seal MB990936-01 Pressing of drive pinion front bearing outer race MB990934-01
	MB990938 Handle	MB990938-01	Pressing of axle housing oil seal Pressing of axle shaft oil seal Pressing of drive pinion rear bearing outer race Pressing of drive pinion front bearing outer race
	MB991552 Rear axle bearing case remover	–	Removal of axle shaft bearing and bearing case
	MB991601 Extension bar	–	Removal of axle shaft bearing and bearing case

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Tool	Tool number and name	Supersession	Application
	MD998801 Rear axle bearing remover	MD998348-01	Removal of axle shaft bearing Removal of drive pinion rear bearing inner race
	MB990799 Axle bearing remover and installer	MB990799-01	Pressing of axle shaft bearing inner race Pressing of axle shaft retainer
	MB990890 Rear suspension bushing race	MB990890-01	Pressing of axle shaft bearing outer race
	MB991535 Side gear holding tool	–	Confirmation of rear differential lock
 <p>00004297</p>	MIT304180 Handle	MIT304180	Pressing of drive pinion oil seal
 <p>00004290</p>	MIT991168 Drive pinion oil seal installer	MIT991168	Pressing of drive pinion oil seal
 <p>00004364</p>	MB990201 Adjustable wrench	MB990201-01	Removal and adjustment of side bearing nut
	MB990810 Side bearing puller	MB990810-01	Removal of side bearing inner race
	MB991407 Differential rear support arbor	–	Removal of side bearing inner race

Tool	Tool number and name	Supersession	Application
	MB991445 Bush remover and Installer base	-	Pressing of drive pinion bearing outer race
 00004357	MB990901 Pinion height gage set	MB990901-01	Measuring the pinion height
 00004299	MIT215838 Aligning adapter	MIT215838	Measuring the pinion height
 00004300	MIT215839 Gage disc	MIT215839	Measuring the pinion height
	MB991534 Cylinder gauge	-	Measuring the pinion height
	MB990802 Bearing installer	MB990802-01	Pressing of drive pinion rear bearing inner race Pressing of side bearing inner race
	MB998812 Installer cap	-	Pressing of side bearing inner race
	MB998829 Installer adaptor	-	Pressing of side bearing inner race

TROUBLESHOOTING

27100070109

AXLE SHAFT, AXLE HOUSING

Symptom	Probable cause	Remedy
Noise while wheels are rotating	Brake drag	Replace
	Bent axle shaft	
	Worn or scarred axle shaft bearing	
Grease leakage	Worn or damaged oil seal	Replace
	Malfunction of bearing seal	

DIFFERENTIAL (CONVENTIONAL DIFFERENTIAL)

Symptom	Probable cause	Remedy
Constant noise	Improper final drive gear tooth contact adjustment	Correct or replace
	Loose, worn or damaged side bearing	
	Loose, worn or damaged drive pinion bearing	
	Worn drive gear, drive pinion	Replace
	Worn side gear thrust washer or pinion shaft	
	Deformed drive gear or differential case	
	Damaged gear	
	Foreign material	Eliminate the foreign material and check; replace if necessary
No oil	Fill or change	
Gear noise while driving	Poor gear engagement	Correct or replace
	Improper gear adjustment	
	Improper drive pinion preload adjustment	
	Damaged gear	Replace
	Foreign material	Eliminate the foreign material and check; replace the parts if necessary
	Insufficient oil	Fill or change
Gear noise while coasting	Improper drive pinion preload adjustment	Correct or replace
	Damaged gear	Replace
Bearing noise while driving or coasting	Cracked or damaged drive pinion rear bearing	Replace
Noise while turning	Loose side bearing	Replace
	Damaged side gear, pinion gear or pinion shaft	
Heat	Improper gear backlash	Adjust
	Excessive preload	
	Insufficient oil	Fill or change

Symptom	Probable cause	Remedy
Oil leakage	Clogged breather hose	Clean or replace
	Cover not tightened	Retighten, apply sealant, or replace the gasket
	Seal malfunction	
	Worn or damaged oil seal	Replace
	Excessive oil	Adjust the oil level

DIFFERENTIAL (DIFFERENTIAL WITH REAR DIFFERENTIAL LOCK)

Symptom	Probable cause	Remedy
Abnormal noise during driving or shifting (*1)	Excessive final drive gear backlash	Adjust
	Insufficient drive pinion preload	
	Excessive differential gear backlash	Adjust or replace
	Worn side gear spline	Replace
	Loose spline coupling self-locking nut	Retighten or replace
Abnormal noise when cornering	Damaged differential gears	Replace
	Damaged pinion shaft	
	Nicked and/or abnormal wear of inner and outer clutch plates	
	Poor gear oil	
	Abnormally worn or damaged thrust washer	
Gear noise (*2)	Improper final drive gear tooth contact adjustment	Refill or replace
Gear noise (*2)	Incorrect final drive gear backlash	Adjust
	Improper drive pinion preload adjustment	
	Damaged, broken, and/or seized tooth surfaces of the drive gear and drive pinion	Replace
	Damaged, broken, and/or seized drive pinion bearings	
	Damaged broken, and/or seized side bearings	
	Damaged differential case	
	Poor gear oil	
	Improper gear oil quantity	

NOTE

*1: In addition to a malfunction of the differential carrier components, abnormal noise can also be caused by the universal joint of the propeller shaft, the axle shafts, the wheel bearings, etc. Before disassembling any parts, take all possibilities into consideration and confirm the source of the noise.

*2: Noise from the engine, muffler vibration, transmission, propeller shaft, wheel bearings, tires, body, etc., is easily mistaken as being caused by malfunction in the differential carrier components. Be extremely careful and attend when test driving, etc.

Test methods to confirm the source of the abnormal noise include: coasting, acceleration, constant speed driving, raising the rear wheels on a jack, etc. Use the method most appropriate to the circumstances.

Symptom	Probable cause	Remedy
Gear oil leakage	Worn or damaged front oil seal, or an improperly installed oil seal	Replace
	Damaged gasket	
	Loose spline coupling self-locking nut	Retighten or replace
	Loose filler or drain plug	Retighten or apply adhesive
	Clogged or damaged breather hose	Clean or replace
Seizure (*3)	Improper final drive gear backlash	Adjust
Seizure (*3)	Excessive drive pinion preload	
	Excessive side bearing preload	
	Improper differential gear backlash	
	Excessive clutch plate preload	
	Improper gear oil	
Improper gear oil quantity	Refill or replace	
Breakdown (*4)	Incorrect final drive gear backlash	Adjust
	Incorrect drive pinion preload	
	Incorrect side bearing preload	
	Excessive differential gear backlash	
	Incorrect clutch plate preload	
	Loose drive gear clamping bolts	Retighten
	Operational malfunction due to overloaded clutch	Avoid excessively rough operation

NOTE

*3: In the event of seizure, disassemble and replace the parts involved. Be sure to check all components for any irregularities and repair or replace as necessary.

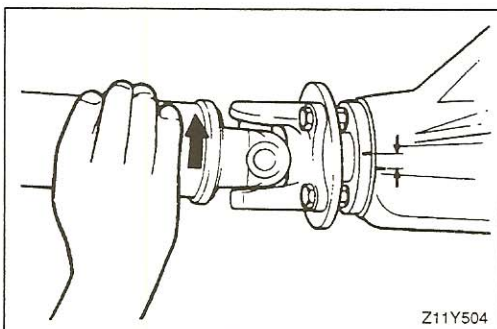
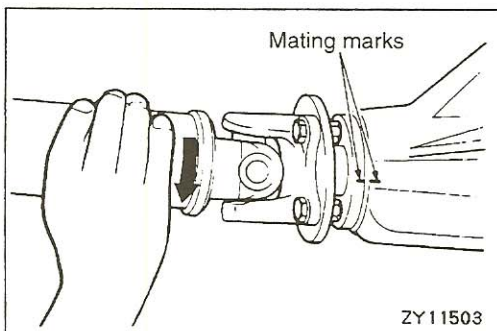
*4: In addition to disassembling and replacing the failed parts, be sure to check all components for irregularities and repair or replace as necessary.

REAR DIFFERENTIAL LOCK

1. Troubleshooting procedures
 - (1) Check that there are no cracks or damage in the air hose.
 - (2) Check that the connectors for all parts are securely connected and that no fuses are blown.
 - (3) Make sure you understand the check contents and the order for troubleshooting in the quick reference table, and check according to the order given.
2. Troubleshooting quick-reference table
 - (1) If the result of checking according to the order in the table below shows that there is no abnormality, the cause is probably a malfunction of the control unit.

Order	Check location	Check points	Normal condition	Probable Cause	Remedy
1	Air hose	Check visually	Air doesn't leak.	Air leaking from hose connection	Repair or replace the air hose
2	Rear differential lock switch	Refer to P.27-24.		Switch is defective	Replace the switch
3	Center differential lock operation detection switch	Move the transfer lever to the "4HLc" or "4LLc" position and check the continuity.	Continuity	Switch is defective	Replace the switch
4	Rear differential lock detection switch	Refer to P.27-13.	Continuity	Switch is defective	Replace the switch
5	Air pump	Refer to P.27-23.		Air pump is defective	Replace the air pump
6	Actuator	Refer to P.27-27.		Actuator is defective	Replace the actuator

- (2) Control unit output voltage check
Refer to P.27-23.



ON-VEHICLE SERVICE

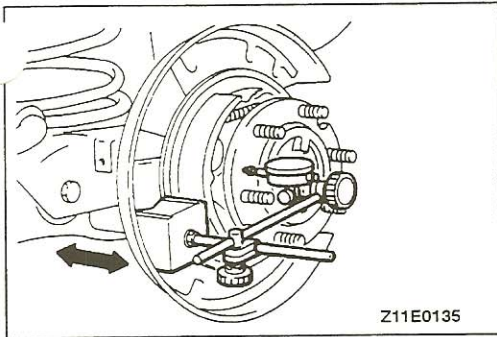
27100120026

REAR AXLE TOTAL BACKLASH CHECK

If the vehicle vibrates and produces a booming sound due to the an imbalance in the drive system, measure the rear axle total backlash by the following procedure to see if the differential carrier assembly requires removal.

- (1) Park the vehicle on a flat, level surface.
- (2) Place the transmission control lever to the neutral position.
Place the transfer control lever to the neutral position.
Apply the parking brake. Raise the vehicle on a jack.
- (3) Turn the companion flange clockwise as far as it will go.
Make mating mark on the dust cover of the companion flange and on the differential carrier.
- (4) Turn the companion flange anti-clockwise as far as it will go, and measure the distance the mating marks moved. If the backlash exceeds the limit, remove the differential carrier assembly and adjust the backlash.

Limit: 5 mm (.20 in.)



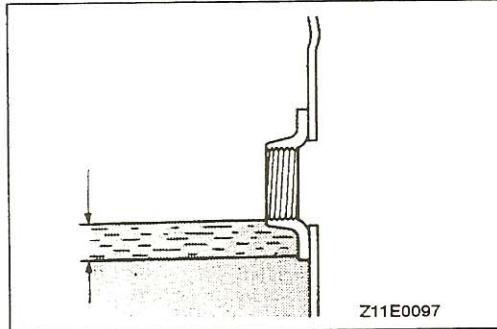
AXLE SHAFT END PLAY CHECK

27100130012

Use a dial indicator to measure the axle shaft end play.

Standard value: 0.25 mm (.0098 in.)

If the axle shaft end play exceeds the standard value, replace the bearing with a new one.



GEAR OIL LEVEL CHECK

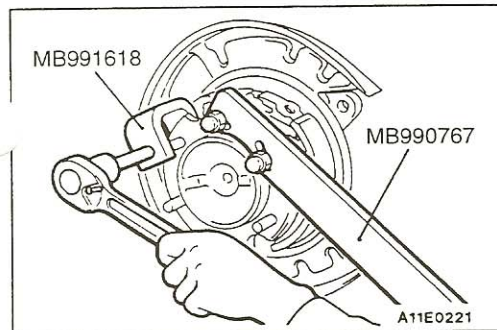
27200120111

Remove the filler plug and check the oil level.

Check that the gear oil level is not more than 8 mm (.3 in.) below the bottom of the filler plug hole.

Specified gear oil:

**Hypoid gear oil API classification GL-5 or higher SAE viscosity No. 90, 80W
3.2 dm³ (3.3 qts.)**



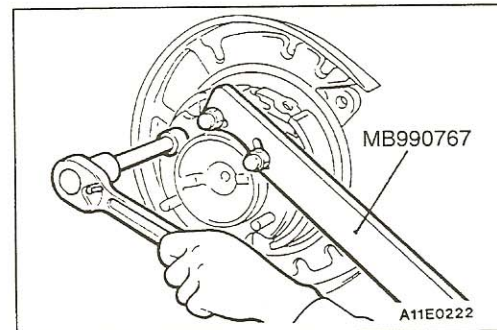
HUB BOLT REPLACEMENT

27100100044

- (1) Remove the caliper assembly and secure it with wire so that it does not fall.
- (2) Remove the brake disc.
- (3) Use the special tool to remove the hub bolt.

Caution

Insert the spacer of thickness of approx. 3 mm between the special tool (MB991618) and the dust cover to protect the dust cover.

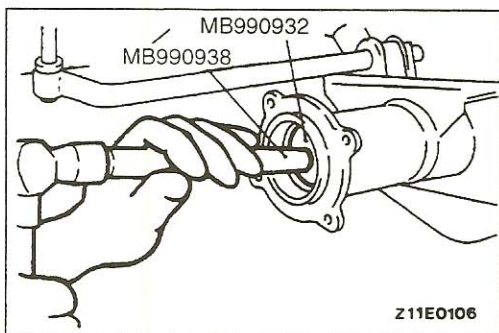
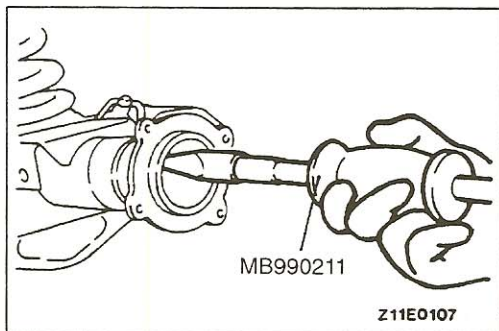
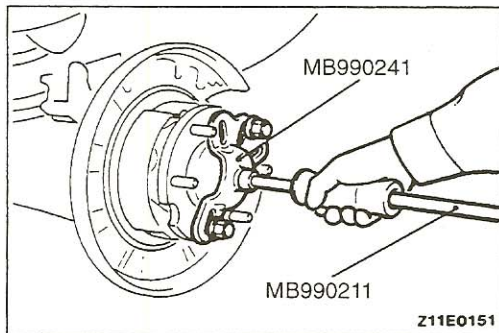


- (4) Using the hub nut, tighten the hub bolt to install it.

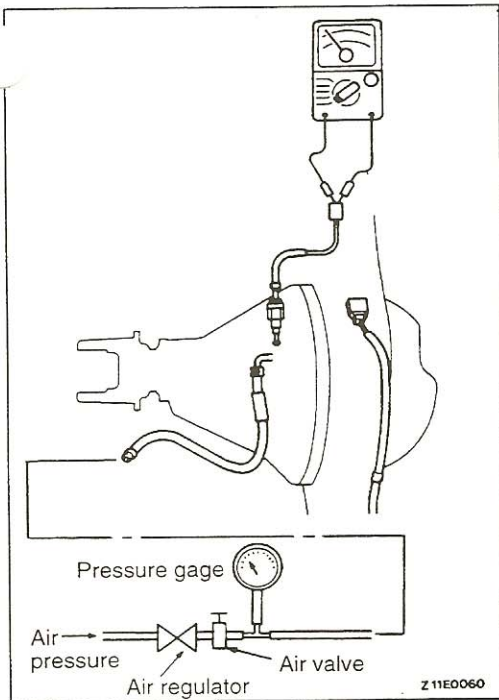
AXLE HOUSING OIL SEAL REPLACEMENT

27100

1. Release coupling between parking brake cable and the backing plate.
2. Before disconnecting the brake pipe, drain the brake fluid from the bleeder screw.
3. Remove the nuts securing the backing plate to the axle housing.
4. Pull the rear axle shaft from axle housing. If the rear axle shaft is hard to remove, use the special tools.



5. Use special tools with hook attached to remove the oil seal.
6. Apply multipurpose grease to the oil seal fitting area of the rear axle housing.
7. Drive the new oil seal into the rear axle housing end by using the special tool.
8. Apply multipurpose grease to the oil seal lip.
9. Install the rear axle shaft.
10. Install the brake tube and perform air bleeding of the brake system from the air bleeder. (Vehicle without ABS: Refer to GROUP 35A – On-vehicle Service, Vehicles with ABS: Refer to GROUP 35C – On-vehicle Service.)
11. Install the parking brake cable and adjust the parking brake lever stroke. (Refer to GROUP 36 – On-vehicle Service.)



REAR DIFFERENTIAL LOCK DETECTION SWITCH CHECK

27200100016

1. Raise up the vehicle.
2. Remove the air pipe and air hose connections.
3. Connect a pressure gauge and air regulator, for adjusting the compressed air pressure, to the air hose.
4. Adjust the compressed air pressure with the air regulator until the pressure gage shows a pressure of approx. 25 kPa (4 psi.).

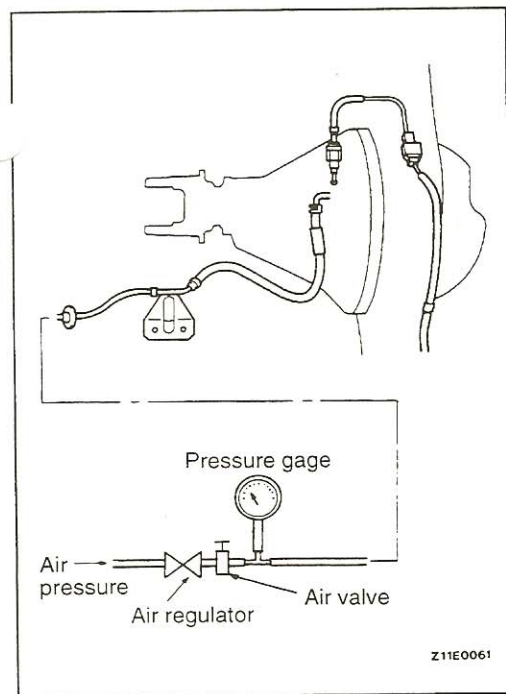
Caution

Do not apply a higher pressure.

5. Hold the wheel on one side of the vehicle stationary, and slowly turn the wheel on the other side.
6. Check for continuity in the rear differential lock detection switch.

When air is supplied	Continuity
When air is released	No continuity

7. If the detection switch is defective, first remove the differential carrier, then remove the detection switch.



REAR DIFFERENTIAL LOCK SYSTEM AIR LEAKAGE CHECK

27200110057

1. Remove the rear differential lock air pump and remove the air hose from the air pump. (Refer to P.27-22.)
2. Connect a pressure gage and air regulator, for adjusting the compressed air pressure to the air hose.
3. Adjust the compressed air pressure with the air regulator until the pressure gage shows a pressure of approx. 35 kPa (5 psi.).

Caution

Do not apply a higher pressure.

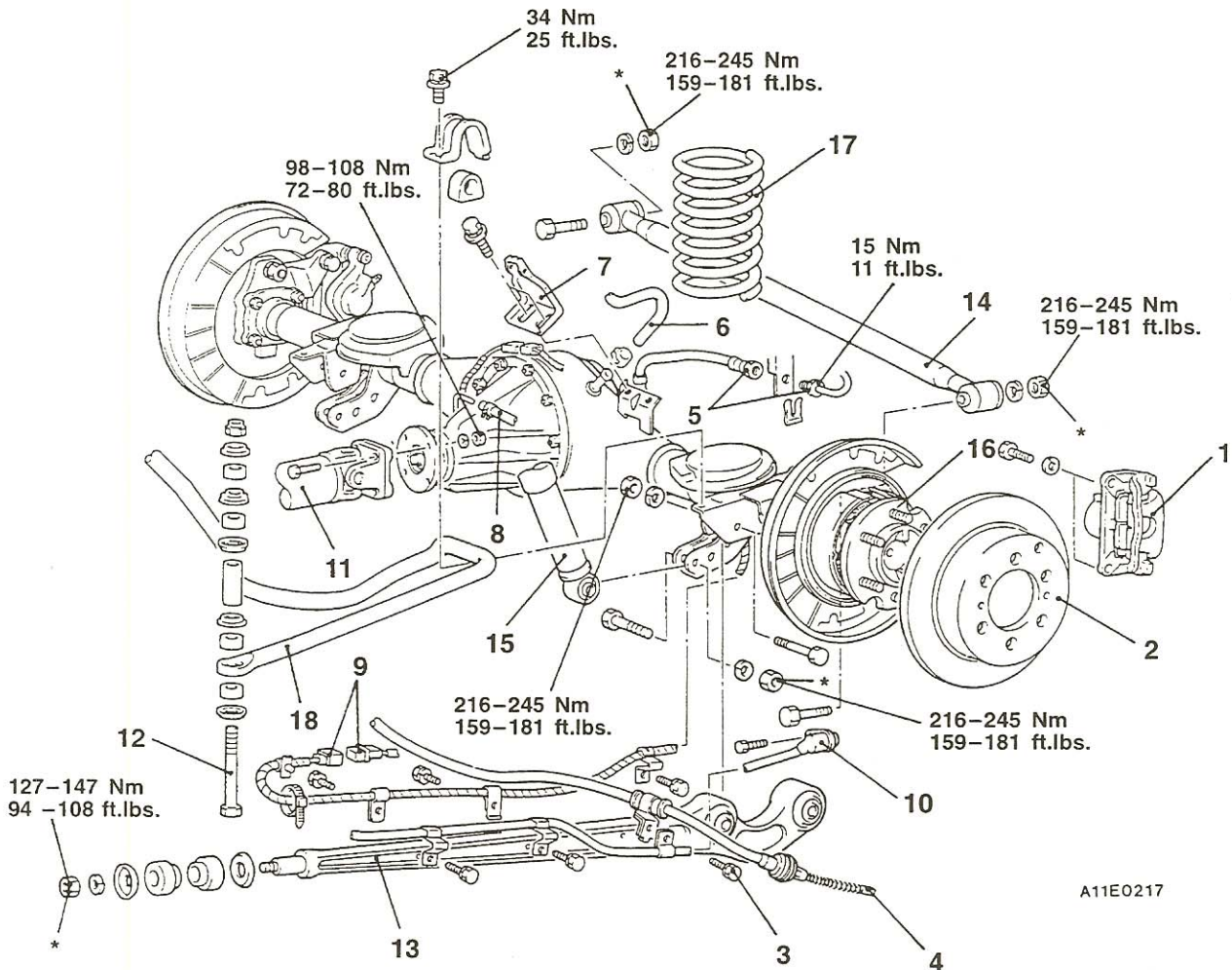
4. Shut off the air valve.
5. If after approximately 10 minutes have passed, the pressure has dropped, it can be concluded that there is no leaking of air from the air hose, etc.

AXLE ASSEMBLY

REMOVAL AND INSTALLATION

Post-installation Operation

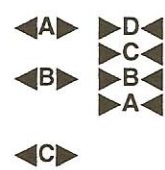
- Air Bleeding from Brake Lines
(Vehicles without ABS: Refer to GROUP 35A – On-vehicle Service.)
(Vehicles with ABS: Refer to GROUP 35C – On-vehicle Service.)
- Load Sensing Spring Length Checking and Adjustment
(Refer to GROUP 35A – On-vehicle Service.)
- Parking Brake Lever Stroke Adjustment
(Refer to GROUP 36 – On-vehicle Service.)



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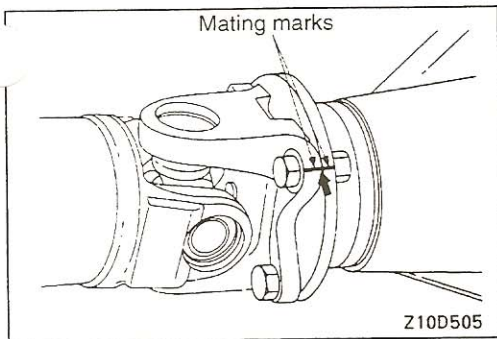
Removal steps

1. Rear brake assembly
2. Brake disc
3. Parking brake cable or speed sensor attaching bolt
4. Parking brake cable end
5. Brake hose
6. Breather hose
7. Spring support for load sensing proportioning valve
8. Hose <Vehicles with rear differential lock>
9. Rear differential lock position harness connector <Vehicles with rear differential lock>
10. Speed sensor <Vehicles with ABS> (Refer to GROUP 35C – Wheel Speed Sensor.)
11. Rear propeller shaft
12. Stabilizer bar mounting bolt
13. Lower arm
14. Lateral rod
15. Shock absorber (lower part only)
16. Axle assembly
17. Coil spring
18. Stabilizer bar



NOTE
The part with * must be tightened with the vehicle lowered to the ground.

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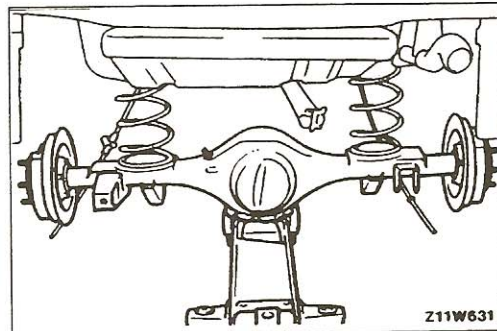
REMOVAL SERVICE POINTS

◀A▶ REAR PROPELLER SHAFT REMOVAL

Make mating marks on the flange yoke of the rear propeller shaft and on the companion flange of the differential case.

Caution

Suspend the propeller shaft from the body with wire, etc. to avoid spilling transmission fluid and to avoid injury from falling propeller shaft when not secured.



◀B▶ LOWER ARM REMOVAL

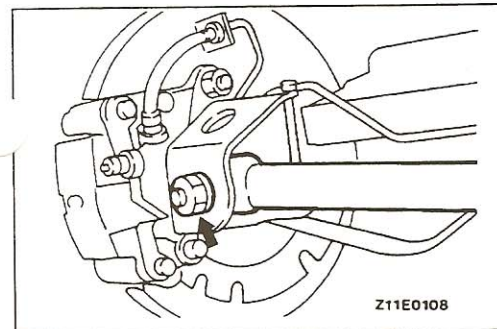
After supporting the axle assembly by floor jacks, remove the lower arm.

◀C▶ AXLE ASSEMBLY REMOVAL

Draw out the axle assembly toward the rear of the vehicle.

Caution

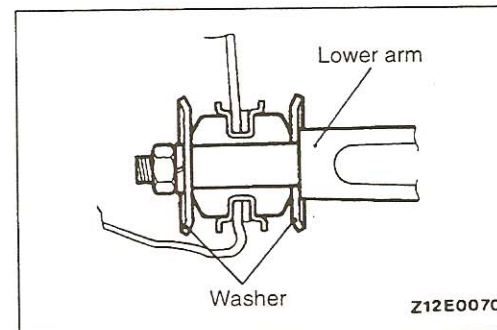
Secure the axle assembly to the jack or equivalent. The axle assembly is heavy and unstable and may fall causing damage to the assembly, surrounding equipment, or injuring the installer.



INSTALLATION SERVICE POINTS

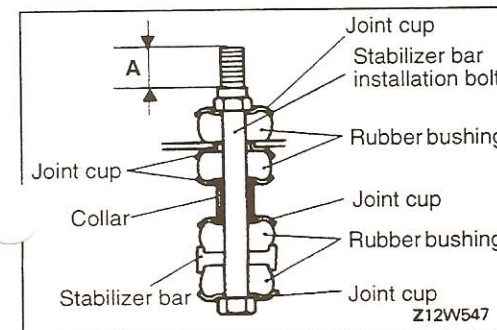
▶A◀ LATERAL ROD INSTALLATION

Install the lateral rod from the axle housing side.



▶B◀ LOWER ARM INSTALLATION

Install the washers (facing as shown in the figure) to the lower arm.



▶C◀ STABILIZER BAR MOUNTING BOLT INSTALLATION

When installing the stabilizer bar to the stabilizer bar bracket, check that the amount of projection of the stabilizer bar installation bolt is within the standard value range.

Standard value (A): 15–17 mm (.59–.67 in.)

▶D◀ REAR PROPELLER SHAFT INSTALLATION

Align the mating marks on the flange yoke and the companion flange to install the rear propeller shaft.

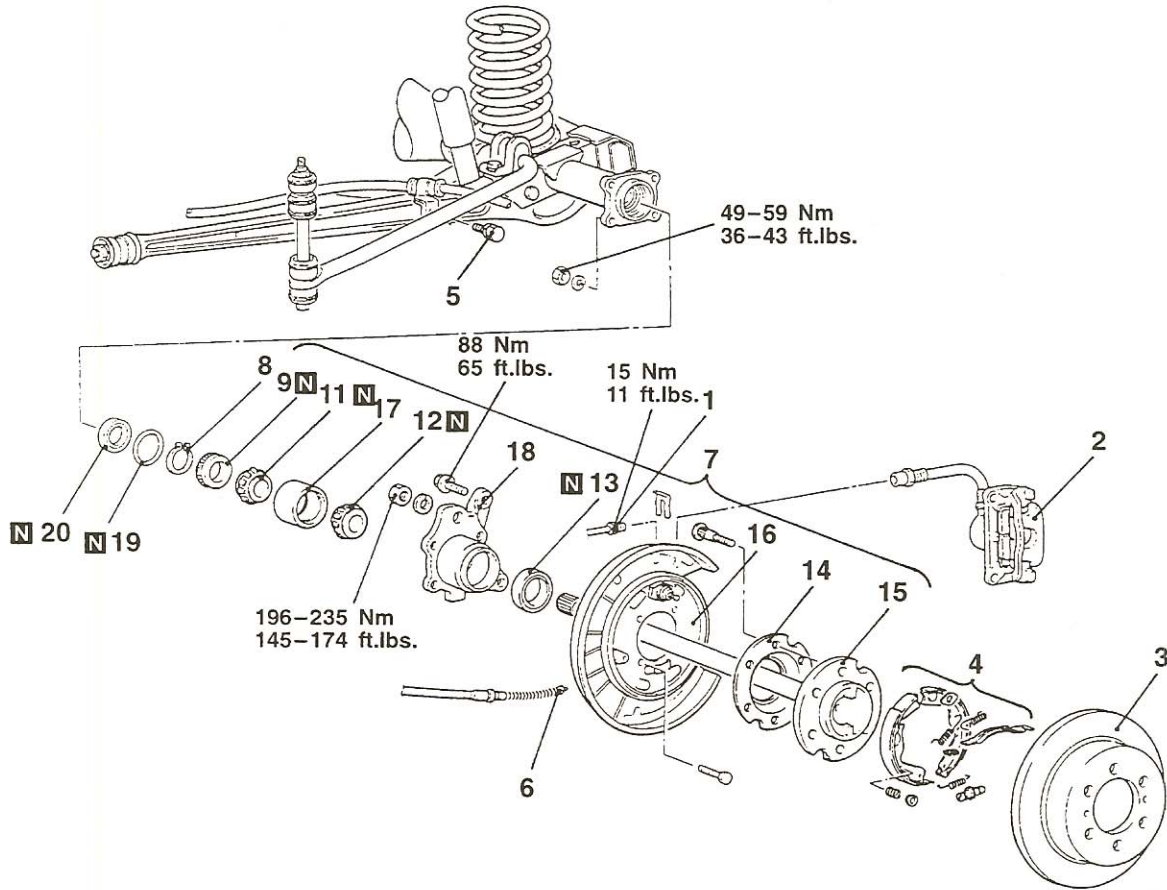
AXLE SHAFT

27100250015

REMOVAL AND INSTALLATION

Post-installation Operation

- Air Bleeding from Brake Lines
(Vehicles without ABS: Refer to GROUP 35A – On-vehicle Service.)
(Vehicles with ABS: Refer to GROUP 35C – On-vehicle Service.)
- Parking Brake Lever Stroke Adjustment
(Refer to GROUP 36 – On-vehicle Service.)



A11E0218

Removal steps

1. Brake tube
2. Rear brake assembly
3. Brake disc
4. Parking brake assembly
5. Parking brake cable attaching bolt
6. Parking brake cable end
7. Axle shaft assembly
8. Snap ring
9. Retainer
10. Axle shaft sub assembly
(Parts from step 12 to step 15)
11. Bearing inner race (inner)
12. Bearing inner race (outer)
13. Oil seal
14. Dust cover
15. Axle shaft
16. Backing plate
17. Bearing outer race
18. Bearing case
19. O-ring
20. Oil seal

◀A▶

◀B▶

◀C▶

◀D▶

◀E▶

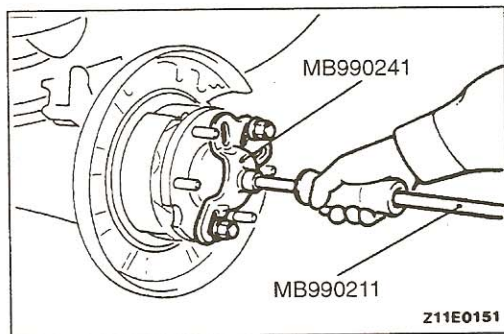
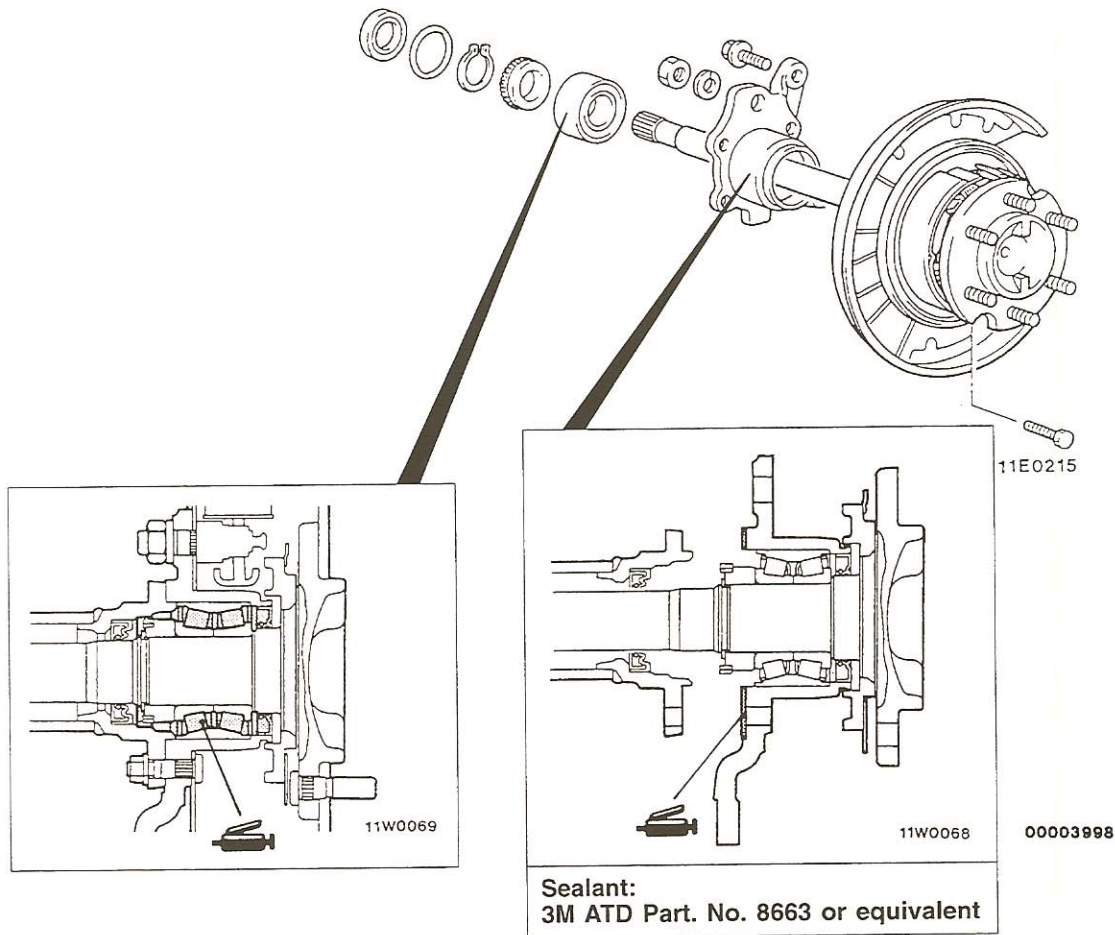
◀F▶

Installation steps

- ▶A◀ 20. Oil seal
- ▶A◀ 19. O-ring
- ▶A◀ 18. Bearing case
- ▶B◀ 17. Bearing outer race
- ▶B◀ 16. Backing plate
- ▶B◀ 15. Axle shaft
- ▶B◀ 14. Dust cover
- ▶C◀ 12. Bearing inner race (outer)
- ▶D◀ 13. Oil seal
- ▶D◀ 11. Bearing inner race (inner)
- ▶E◀ 9. Retainer
- ▶E◀ 8. Snap ring
- ▶F◀ 7. Axle shaft assembly
- ▶F◀ 6. Parking brake cable end
- ▶F◀ 5. Parking brake cable attaching bolt
- ▶F◀ 4. Parking brake assembly
- ▶F◀ 3. Brake disc
- ▶F◀ 2. Rear brake assembly
- ▶F◀ 1. Brake tube

TSB Revision

LUBRICATION AND SEALING POINTS



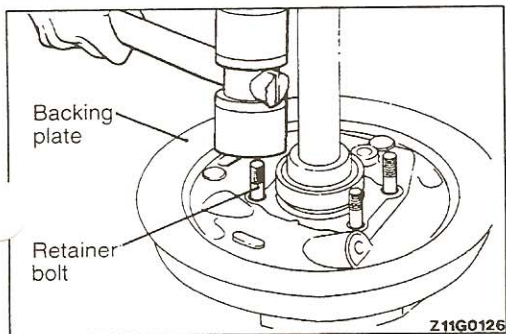
REMOVAL SERVICE POINTS

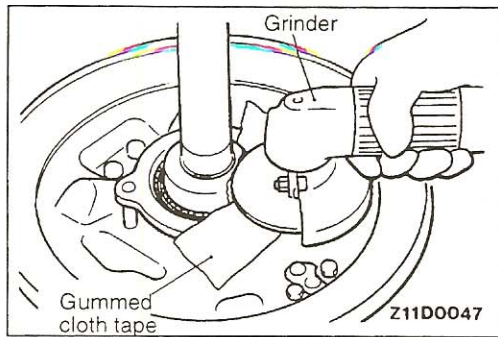
◀A▶ AXLE SHAFT ASSEMBLY REMOVAL

Pull the rear axle shaft with rear brake assembly attached. If the rear axle shaft is difficult to remove, use special tools.

◀B▶ RETAINER REMOVAL

(1) Remove one retainer bolt from the backing plate.

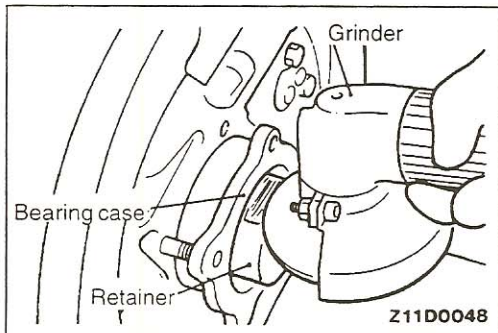




- (2) Apply gummed cloth tape around the edge of the bearing case for protection.
- (3) As shown in the figure, hold the axle shaft. Using a grinder, shave off a point of its circumference locally until the wall thickness become as follows:
 - 1.0–2.0 mm (.04–.08 in.) for axle shaft side
 - 2.0 mm (.08 in.) for bearing side

Caution

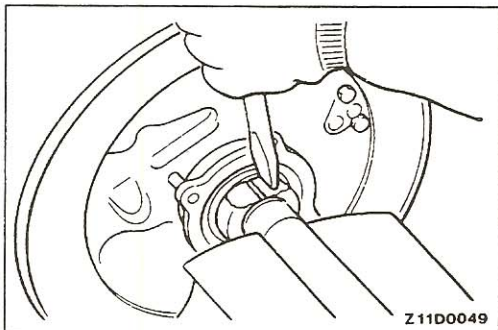
Be careful not to damage the bearing case and the axle shaft.



- (4) Fix the axle shaft and shave off the remaining 2.0 mm (.08 in.) on the side of the bearing of the retainer.

Caution

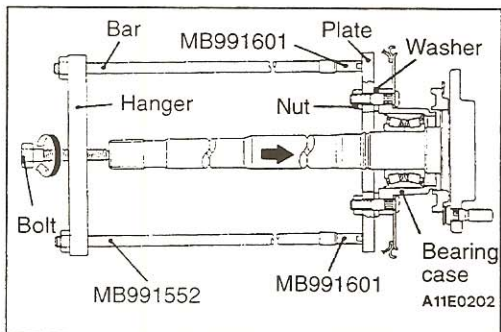
Be careful not to damage the bearing case and the axle shaft.



- (5) Cut in with a chisel the place where the retainer ring has been shaved and remove the retainer.

Caution

Be careful not to damage the axle shaft.

**◀C▶ AXLE SHAFT SUB ASSEMBLY REMOVAL**

- (1) Adjust the height of the hanger. Then install the washers, plate and nuts in that order as shown in the figure.

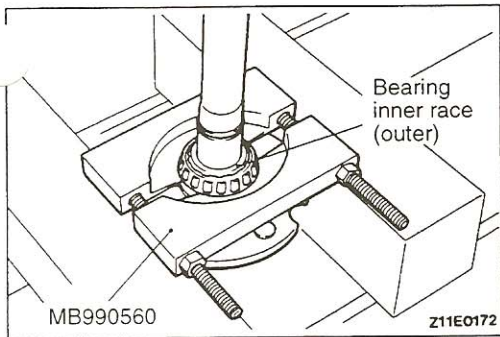
NOTE

If the bar of special tool (MB991552) is short, connect the extension bar (MB991601) to adjust the height of the hanger.

- (2) Place the end of the bolt against the center of the axle shaft, and then tighten the nuts to remove the axle shaft from the bearing case assembly.

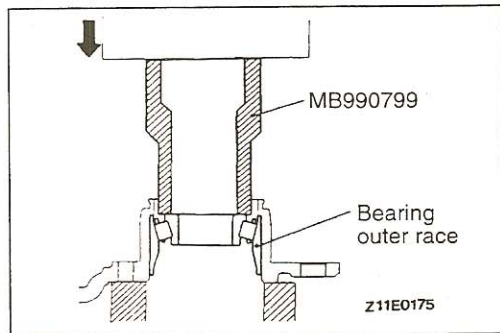
Caution

The hanger and plate must be placed so that they are parallel.



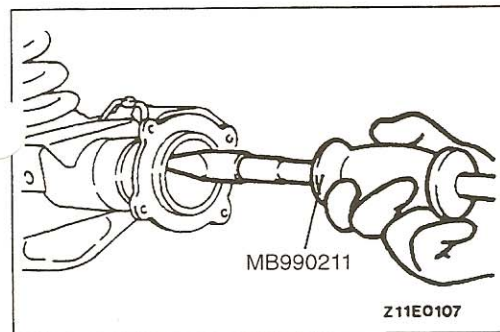
◀D▶ BEARING INNER RACE (OUTER) REMOVAL

Install special tool as shown in the illustration, and then use a press to remove the bearing inner race (outer) from the axle shaft.



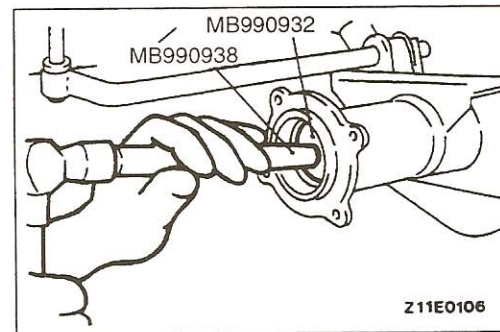
◀E▶ BEARING OUTER RACE REMOVAL

Reinstall the bearing inner race that was removed previously. Use special tool and press to remove the bearing outer race.



◀F▶ OIL SEAL REMOVAL

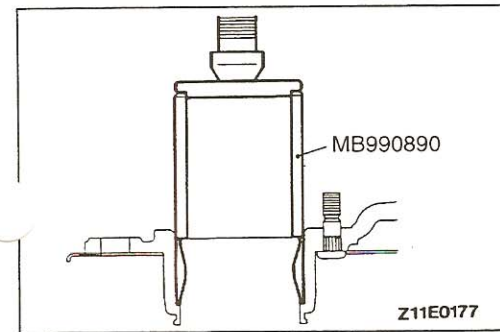
Remove the oil seal from the end of rear axle housing using special tool, if necessary.



INSTALLATION SERVICE POINTS

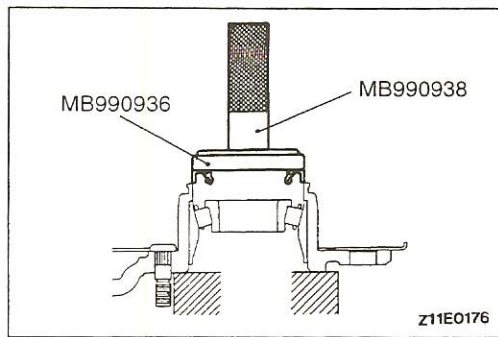
▶A◀ OIL SEAL INSTALLATION

Drive the new oil seal into the rear axle housing end by using special tools.



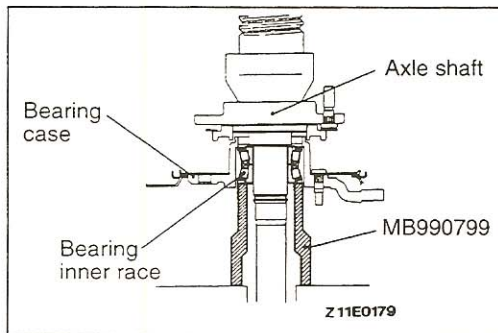
▶B◀ BEARING OUTER RACE INSTALLATION

- (1) Apply the multi-purpose grease to the external surface of the bearing outer race.
- (2) Press-fit the bearing outer race into the bearing case by using special tools.



►C◄ OIL SEAL INSTALLATION

- (1) Apply multi-purpose grease to the outside of the oil seal.
- (2) Using special tools, press-fit the oil seal until it is flush with the end of the bearing case.
- (3) Apply multi-purpose grease to the lip of the oil seal.

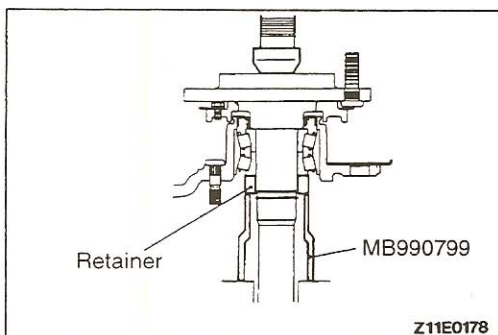


►D◄ BEARING INNER RACE (INNER) INSTALLATION

- (1) Pass the axle shaft through the bearing inner race, the bearing case and the second bearing inner race in that order.
- (2) Using special tool, press-fit the bearing inner race to the axle shaft.

Caution

1. Both bearing inner race sets should be press-fitted together.
2. The left and right lengths of the axle shaft are different [approx. 7 mm (.28 in.)] in vehicles with rear differential lock. The right side is longer, so be careful when installing.

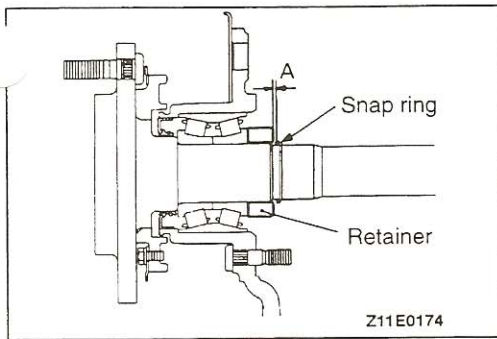


►E◄ RETAINER PRESS-FITTING

Using special tool, press-fit the retainer onto the axle shaft. Check that the press-fitting force is at the standard value. If the initial press-fitting force is less than the standard value, replace the axle shaft.

Standard value:

- Initial press-fitting force
49,000 N (11,016 lbs.) or more
- Final press-fitting force
98,000 – 108,000 N (22,031 – 24,279 lbs.)



▶F◀ SNAP RING INSTALLATION

- (1) After installing the snap ring, measure the clearance (A) between the snap ring and the retainer with a thickness gage. Check that it is within the standard values.

Standard value (A): 0.166 mm (.0065 in.) or less

- (2) If the clearance exceeds the standard value, change the snap ring so that the clearance is at the standard value.

Thickness of snap ring mm (in.)	Identification color
2.17 (.0854)	–
2.01 (.0791)	Yellow
1.85 (.0728)	Blue
1.69 (.0665)	Purple
1.53 (.0602)	Red

Example:

Clearance 2.0 mm (.08 in.)

Standard value 0 – 0.166 mm (0 – .0065 in.)

Thickness of snap ring 2.01 mm (.0791 in.)

INSPECTION

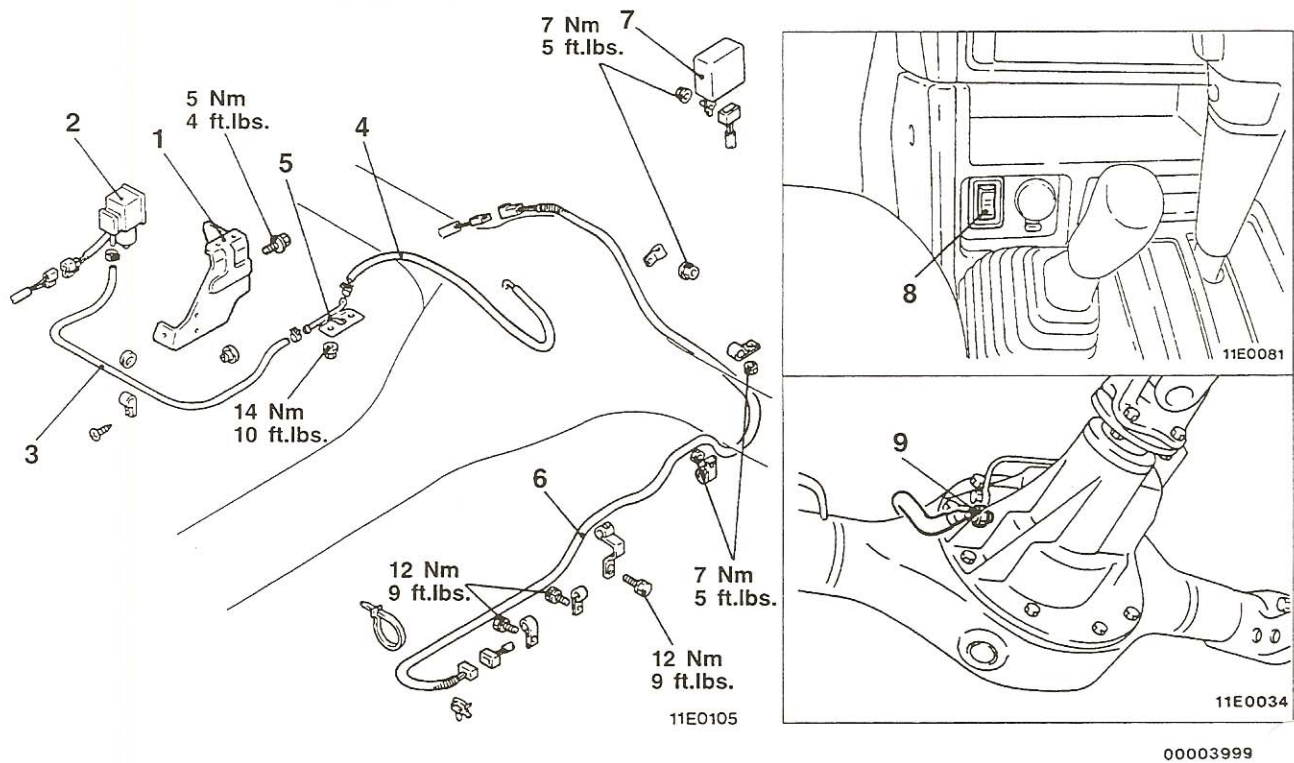
27100260018

- Check the dust cover for deformation or damage.
- Check the oil seal for damage.
- Check the inner and outer bearings for seizure, discoloration and rough raceway surface.
- Check the axle shaft for cracks, wear and damage.

REAR DIFFERENTIAL LOCK

27200270069

REMOVAL AND INSTALLATION

**Rear differential lock air pump and hose removal steps**

- Second Seat (Refer to GROUP 52A – Second Seat.)
- 1. Bracket
- 2. Rear differential lock air pump
- 3. Air hose
- 4. Air hose
- 5. Hose bracket
- 6. Position harness

Rear differential lock control unit removal steps

- Quarter trim lower <LH side> (Refer to GROUP 52A – Trims.)
- 7. Rear differential lock control unit

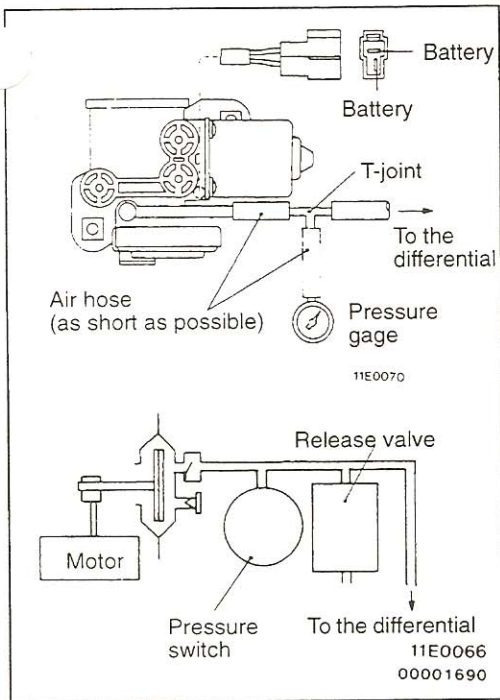
Rear differential lock switch removal

- 8. Rear differential lock switch

Rear differential lock detection switch removal

- 9. Rear differential lock detection switch (Refer to P.27-29.)

27200310013



INSPECTION

REAR DIFFERENTIAL LOCK AIR PUMP

1. Connect the pressure gage to the air pump discharge outlet nozzle, via the air hose and T-joint.
2. Install air hose to the differential.
3. Apply battery positive voltage to the air pump connector.
4. Measure the time between when the pump starts and stops operating, and if it stops within 5 seconds, the pressure switch inside the pump is normal.
5. Measure the pressure 10–20 seconds after the pump has stopped.

Standard value: 25–40 kPa (4–6 psi.)

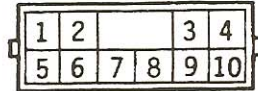
If the pressure is within the standard value, the release valve inside the pump is normal.

6. Check that the pump does not begin operating for 5 minutes after it has stopped.
7. If the inspection for 4–6 is normal, then the pump is fully operational.

REAR DIFFERENTIAL LOCK CONTROL UNIT

27200320016

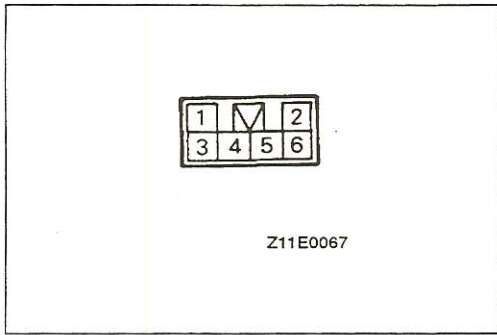
1. Measure the terminal voltages under each condition.
2. With the control unit connected to the harness and the probe inserted into the rear of the harness connector, carry out the voltage measurements between terminal (6) (ground terminal) and each other terminal.



Z11E0068

Terminal No.	Inspection Item	Inspection Condition	Terminal Voltage
3	Ignition switch (IG1)	Ignition switch (IG1) OFF	0 V
		ON	Battery positive voltage
9	Rear differential lock switch	Ignition switch: ON	0 V
1		ON side / OFF side / When in neutral	Battery positive voltage
10	Rear differential lock indicator light	Ignition switch: ON	0 V
		Rear differential is locked / Rear differential is free	Battery positive voltage
2	Vehicle speed reed switch	Select "D" or "1" (1st gear) and drive forward slowly.	5 V
8	Rear differential lock detection switch	Ignition switch: ON	0 V
		Rear differential is locked / Rear differential is free	Battery positive voltage
4	Rear differential lock air pump	Ignition switch: ON	Battery positive voltage
		When filing or holding / When releasing	0 V
5	Center differential lock operation detection switch	Ignition switch: ON	Battery positive voltage
		Center differential is free / Center differential is locked	0 V

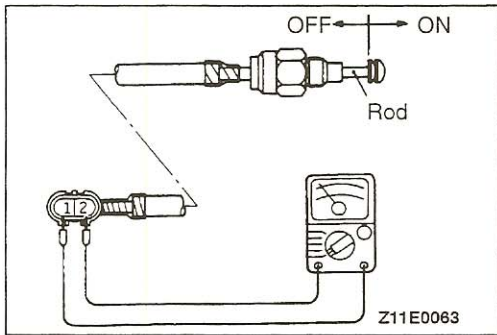
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REAR DIFFERENTIAL LOCK SWITCH CONTINUITY

272002

Switch position	Terminal					
Switch position	5	3	2	6	1	
ON	○				○	○
OFF		○	○			



REAR DIFFERENTIAL LOCK DETECTION SWITCH

27200100085

1. Connect an ohmmeter to the detection switch connector.
2. The rear differential lock detection switch is in good condition when the rod of the detection switch is pulled, there should be continuity, and when it is returned to its normal position, no continuity.

NOTE

Remove the differential carrier in order to replace the rear differential lock detection switch. (Refer to P.27-29.)

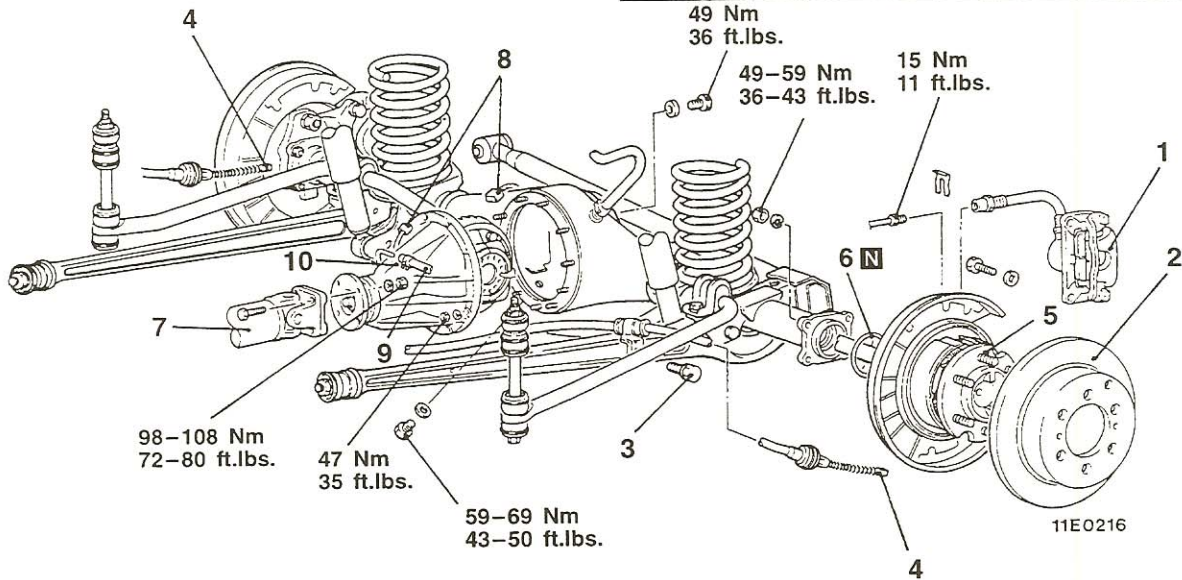
DIFFERENTIAL CARRIER REMOVAL AND INSTALLATION

Pre-removal Operation

- Differential Gear Oil Draining

Post-installation Operation

- Air Bleeding from Brake Lines (Vehicles without ABS: Refer to GROUP 35A – On-vehicle Service.) (Vehicles with ABS: Refer to GROUP 35C – On-vehicle Service.)
- Parking Brake Lever Stroke Adjustment (Refer to GROUP 36 – On-vehicle Service.)
- Differential Gear Oil Filling (Refer to P.27-11.)



00004000

Sealant:
3M ATD Part No. 8663 or equivalent

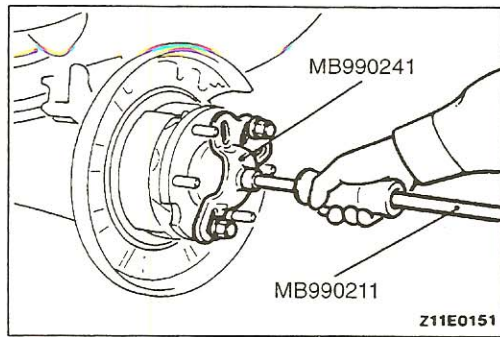
NOTE
Apply the specified sealant to the differential carrier mounting surface of the axle housing as shown in the illustrations.

11B0051

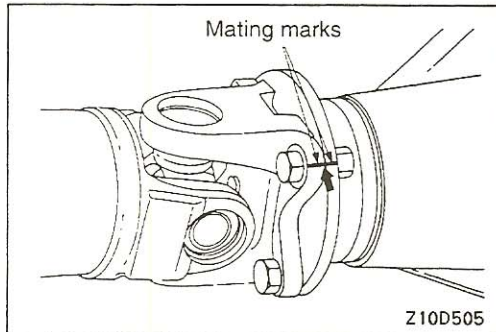
Removal steps

1. Rear brake assembly
2. Brake disc
3. Parking brake cable attaching bolt
4. Parking brake cable end
5. Rear axle shaft assembly
6. O-ring

7. Rear propeller shaft
8. Rear differential lock position harness connector
9. Hose <Vehicles with rear differential lock>
10. Differential carrier

**REMOVAL SERVICE POINTS****◀A▶ REAR AXLE SHAFT ASSEMBLY REMOVAL**

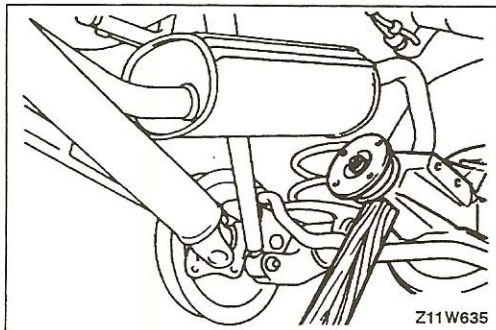
Pull out the right and left axle shafts by about 70 mm (3 in.). If it is difficult to pull out, use the special tools.

**◀B▶ REAR PROPELLER SHAFT REMOVAL**

Make mating marks on the flange yoke of the rear propeller shaft and the companion flange of the differential case.

Caution

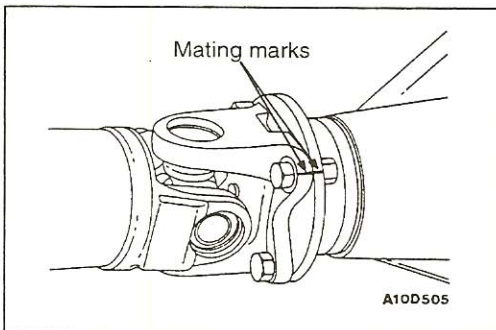
Suspend the propeller shaft from the body with wire, etc. to avoid spilling transmission fluid and to avoid injury from falling propeller shaft when not secured.

**◀C▶ DIFFERENTIAL CARRIER REMOVAL**

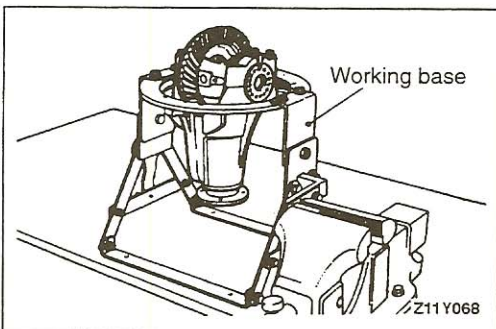
Remove the mounting nuts. Strike the lower part of differential carrier assembly with a piece of wood several times to loosen the assembly. Remove the assembly.

Caution

1. Do not remove the uppermost nut but keep it loosened all the way to the stud bolt end.
2. Use care not to strike the companion flange.

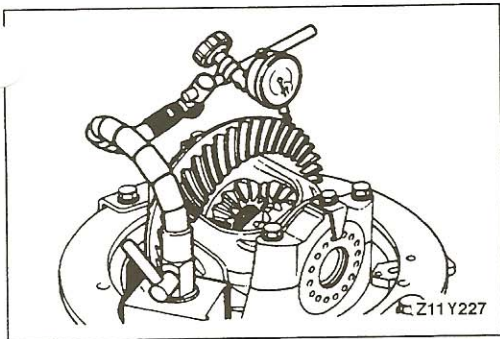
**INSTALLATION SERVICE POINT****▶A◀ REAR PROPELLER SHAFT INSTALLATION**

Align the mating marks on the flange yoke and the companion flange to install the rear propeller shaft.

**INSPECTION BEFORE DISASSEMBLY**

27200290065

Hold the working base in a vice, and install the differential carrier to the special tool.



FINAL DRIVE GEAR BACKLASH

With the drive pinion locked in place, measure the final drive gear backlash with a dial indicator on the drive gear.

NOTE

Measure at four points or more on the circumference of the drive gear.

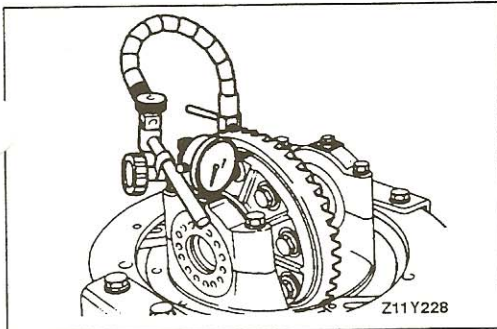
Standard value:

Vehicles without rear differential lock

0.13–0.18 mm (.0051–.0071 in.)

Vehicles with rear differential lock

0.12–0.18 mm (.0047–.0071 in.)



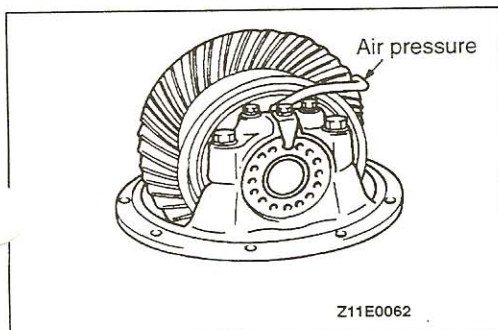
DRIVE GEAR RUNOUT

Measure the drive gear runout at the shoulder on the reverse side of the drive gear.

Limit: 0.05 mm (.002 in.)

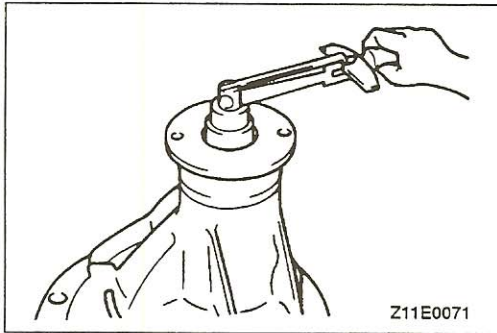
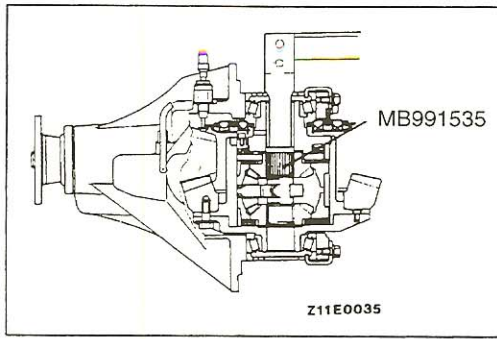
FINAL DRIVE GEAR TOOTH CONTACT

Refer to GROUP 26–Differential Carrier.



REAR DIFFERENTIAL LOCK

1. Connect an air hose, pressure gage and air regulator, for adjusting the compressed air pressure, to the actuator pipe.
2. Adjust the compressed air pressure with the air regulator until the pressure gage shows a pressure of approximately 25 kPa (4 psi.).



3. Use the special tool to gently turn only the side gear of one side of the axle 1/4–1/2 turns.

NOTE

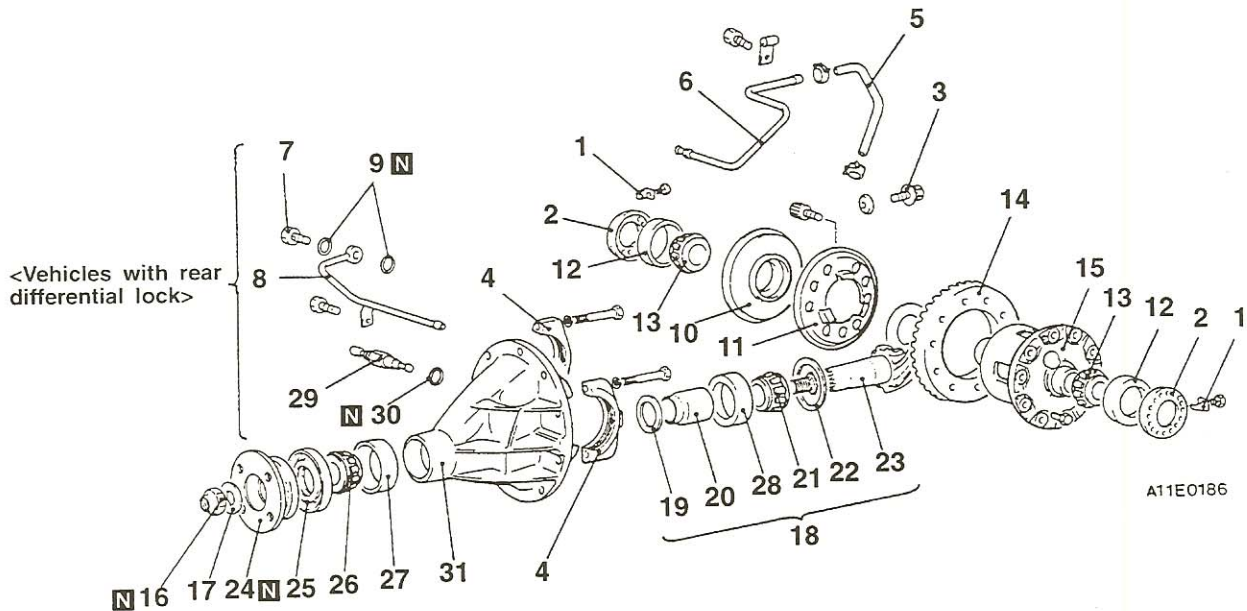
1. The lock will not operate when both side gears turn together, even when air pressure is supplied. The side gear on one side of the axle must be turned so that the clutch will mesh (lock).
 2. To unlock, shut supply of air pressure, and gently turn the side gear on one side of the axle 1/4–1/2 turns.
4. Measure the rotation torque of the companion flange, and check the lock condition and free condition of the rear differential.

Rear differential operation	Companion flange Nm (ft.lbs.) [N (lbs.)]
Locked	Doesn't turn at 49 (36) [1,111 (248)]
Free	Turns at less than 49 (36) [1,111 (248)]

DISASSEMBLY

Inspection Before Disassembly

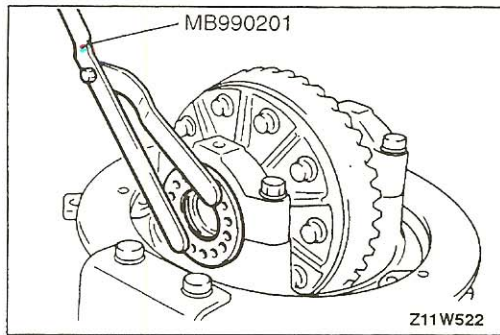
- | | |
|---|---|
| (1) Final Drive Gear Inspection (Refer to P.27-27.) | (4) Final Drive Gear Tooth Contact Inspection (Refer to P.27-27.) |
| (2) Drive Gear Run-out Inspection (Refer to P.27-27.) | |
| (3) Differential Gear Backlash Inspection (Refer to P.27-27.) | |



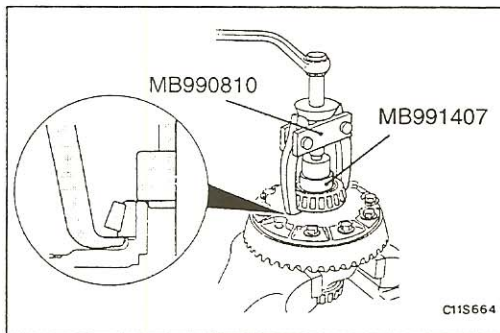
Disassembly steps

- | | |
|--|---|
| <p>◀A▶</p> <p>1. Lock plate</p> <p>2. Side bearing nut</p> <p>3. Bolt</p> <p>4. Bearing cap</p> <p>5. Hose*</p> <p>6. Air pipe assembly (A)*</p> <p>7. Eye bolt*</p> <p>8. Air pipe assembly (B)*</p> <p>9. Gasket*</p> <p>10. Actuator assembly*</p> <p>11. Pressure plate*</p> <p>12. Side bearing outer race</p> <p>13. Side bearing inner race</p> <p>◀B▶</p> <p>◀C▶</p> <p>14. Drive gear</p> <p>15. Differential case (Refer to P.27-49.)</p> <p>◀D▶</p> <p>◀E▶</p> <p>16. Self-locking nut</p> <p>17. Washer</p> <p>18. Drive pinion assembly</p> | <p>◀F▶</p> <p>19. Drive pinion front shim (For adjusting of drive pinion bearing preload)</p> <p>20. Drive pinion spacer</p> <p>21. Drive pinion rear bearing inner race</p> <p>22. Drive pinion rear shim (For adjusting drive pinion height)</p> <p>23. Drive pinion</p> <p>24. Companion flange</p> <p>◀G▶</p> <p>◀G▶</p> <p>◀G▶</p> <p>◀G▶</p> <p>25. Oil seal</p> <p>26. Drive pinion front bearing inner race</p> <p>27. Drive pinion front bearing outer race</p> <p>28. Drive pinion rear bearing outer race</p> <p>29. Rear differential lock detection switch*</p> <p>30. Gasket*</p> <p>31. Differential carrier</p> |
|--|---|

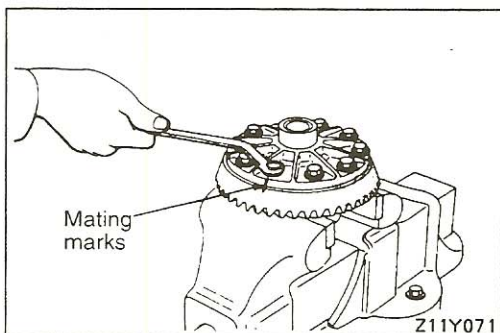
NOTE
*: Vehicles with rear differential lock

**DISASSEMBLY SERVICE POINTS****◀A▶ SIDE BEARING NUT REMOVAL**

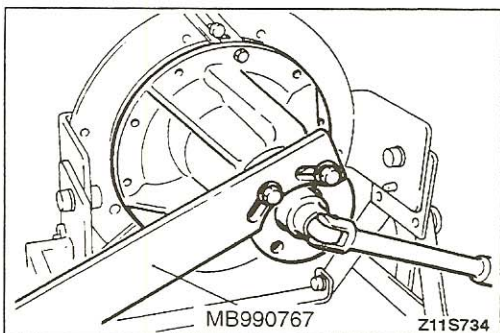
Use the special tool to remove the side bearing nut.

**◀B▶ SIDE BEARING INNER RACE REMOVAL**

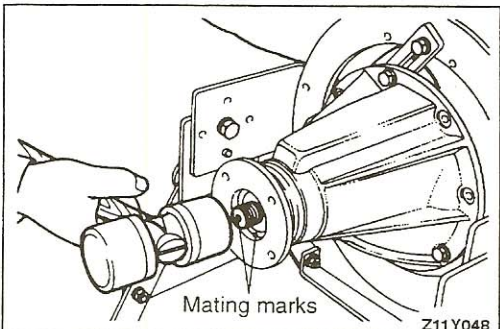
Use the special tools to pull out the side bearing inner races.

**◀C▶ DRIVE GEAR REMOVAL**

- (1) Make mating marks on the differential case and drive gear.
- (2) Loosen the drive gear mounting bolts in diagram sequence to remove the drive gear.

**◀D▶ SELF-LOCKING NUT REMOVAL**

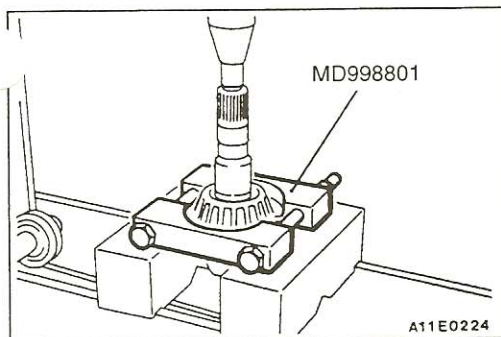
Use the special tool to hold the companion flange, and then remove the companion flange self-locking nut.

**◀E▶ DRIVE PINION ASSEMBLY REMOVAL**

- (1) Make mating marks on the drive pinion and companion flange.
- (2) Drive out the drive pinion together with the drive pinion spacer and the drive pinion front shims.

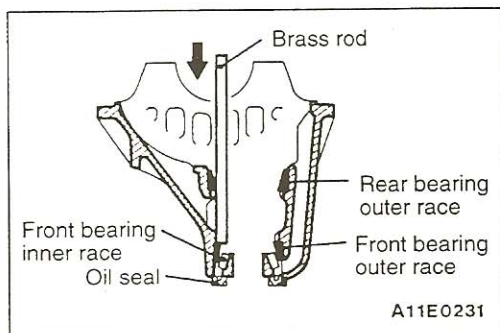
Caution

Do not make mating marks on the contact surface of the companion flange and propeller shaft.



◀F▶ **DRIVE PINION REAR BEARING INNER RACE REMOVAL**

Use the special tools to pull out the drive pinion rear bearing inner race.



◀G▶ **OIL SEAL/DRIVE PINION FRONT BEARING INNER RACE/DRIVE PINION FRONT BEARING OUTER RACE/DRIVE PINION REAR BEARING OUTER RACE REMOVAL**

- (1) Use a brass rod to drive out the drive pinion front bearing outer race from the gear carrier together with the drive pinion front bearing inner race and the oil seal.
- (2) Drive out the drive pinion rear bearing outer race in the same manner.

INSPECTION

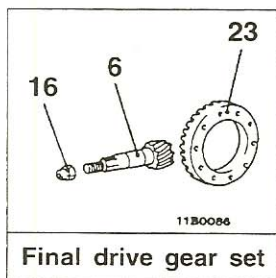
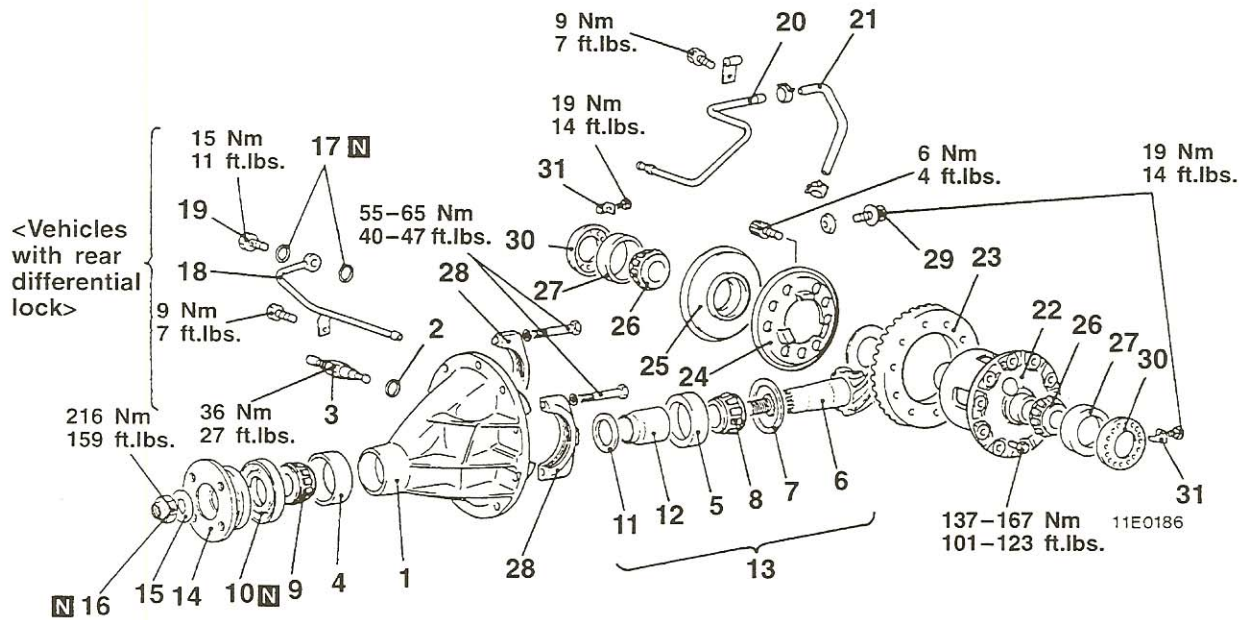
27200300034

Wash the disassembled parts in cleaning solvent, dry them using compressed air, and then check the following areas.

- Check the companion flange for wear or damage.
- Check the oil seal for wear or deterioration.
- Check the bearings for wear or discoloration.
- Check the differential case for cracks.
- Check the drive pinion and drive gear for wear or cracks.
- Check the side gears, pinion gears and pinion shaft for wear or damage. <Vehicles with conventional type>
- Check the side gear spline for wear or damage. <Vehicles with conventional type>

REASSEMBLY

27200230074



00005432

Reassembly steps

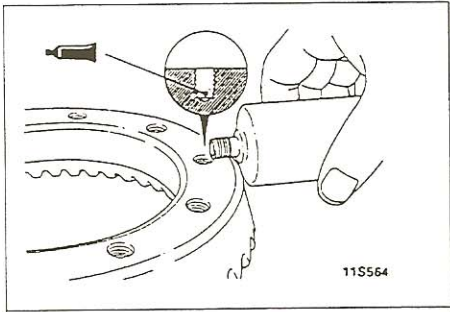
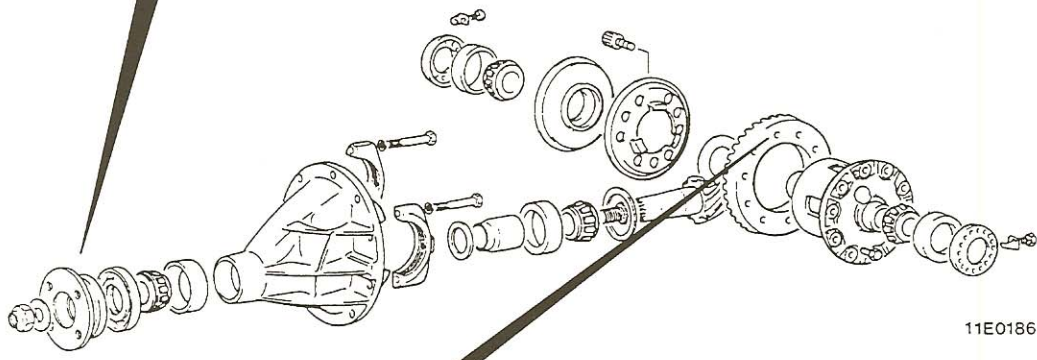
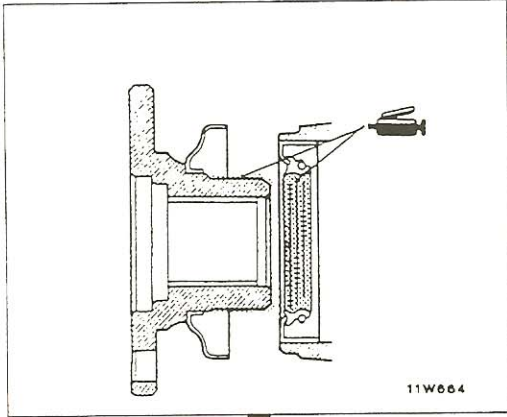
1. Differential carrier
2. Gasket
3. Rear differential lock detection switch
- ▶A◀ 4. Drive pinion front bearing outer race
- ▶B◀ 5. Drive pinion rear bearing outer race
- ▶C◀ 6. Drive pinion height adjustment
7. Drive pinion rear shim (For adjusting drive pinion height)
8. Drive pinion rear bearing inner race
9. Drive pinion front bearing inner race
10. Oil seal
11. Drive pinion front shim (For adjusting drive pinion bearing preload)
- ▶D◀ 12. Drive pinion spacer
- ▶E◀ 13. Drive pinion assembly
14. Companion flange
15. Washer
16. Self-locking nut
17. Gasket
18. Air pipe assembly (B)
19. Eye bolt
20. Air pipe assembly (A)*
21. Hose*
22. Differential case
- ▶F◀ 23. Drive gear
24. Pressure plate*
- ▶G◀ 25. Actuator assembly*
- ▶F◀ 26. Side bearing inner race
- ▶G◀ 27. Side bearing outer race
- ▶H◀ 28. Bearing cap
- ▶H◀ 29. Bolt
- ▶H◀ 30. Side bearing nut
- ▶H◀ 31. Lock plate

NOTE

*: Vehicles with rear differential lock.

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LUBRICATION, SEALING AND ADHESION POINTS



Adhesive:
3M Stud Locking 4170 or equivalent

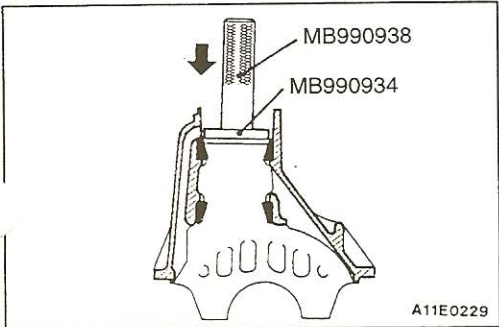
REASSEMBLY SERVICE POINTS

▶◀ DRIVE PINION FRONT BEARING OUTER RACE INSTALLATION

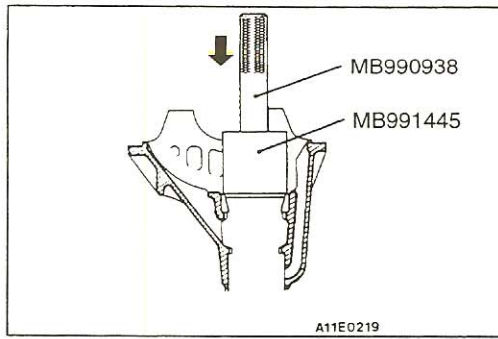
Use the special tools to press-fit the drive pinion front bearing outer race into the gear carrier.

Caution

The bearing outer race must be fitted using a press to avoid tilt and distortion.



TSB Revision

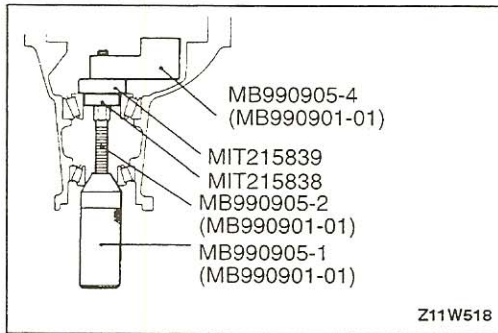


►B◄ DRIVE PINION REAR BEARING OUTER RACE INSTALLATION

Using special tools, press-fit the drive pinion rear bearing outer race into the gear carrier.

Caution

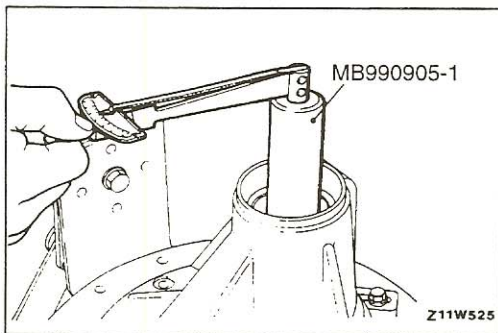
The bearing outer race must be fitted using a press to avoid tilt and distortion.



►C◄ DRIVE PINION HEIGHT ADJUSTMENT

Adjust the drive pinion height as follows:

- (1) Install special tools and the drive pinion front and rear bearing inner races into the gear carrier in the order shown in the illustration.
- (2) Tighten the handle of the special tool until the standard value for the drive pinion rotation torque is obtained.



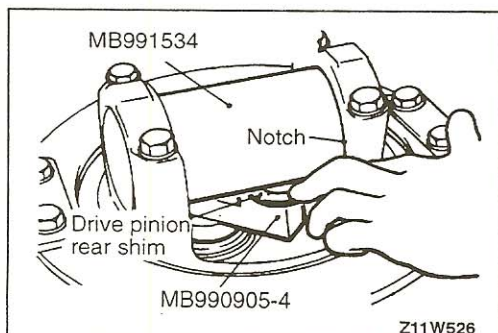
- (3) Measure the drive pinion rotation torque (without oil seal).

Standard value:

Bearing type	Bearing lubrication	Rotation torque
New	None (With anti-rust agent)	0.6–0.9 Nm 5.2–7.8 in.lbs.
New or reuse	Gear oil applied	0.4–0.5 Nm 3.5–4.3 in.lbs.

NOTE

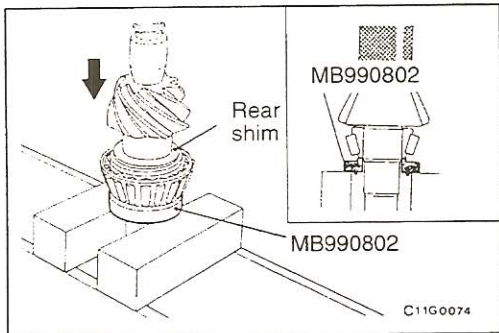
1. Gradually tighten the handle of the special tool while checking the drive pinion rotation torque.
2. The one rotation cannot be made when the special tool is in contact with the gear carrier. So move it a few times and, after seating the bearing, measure the rotation torque.



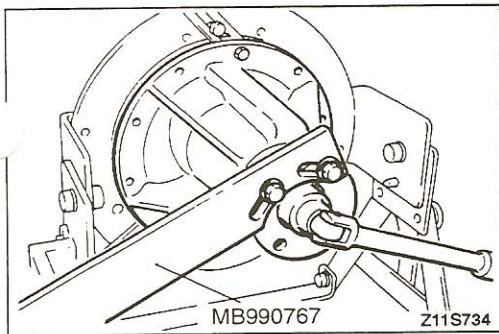
- (4) Position the special tool in the side bearing seat of the gear carrier, and then select a drive pinion rear shim of a thickness which corresponds to the gap between the special tools.

NOTE

1. Be sure to clean the side bearing seat thoroughly. When positioning the special tool, check that the cut-out sections of the special tool are in the position shown in the illustration, and also check that the special tool is in close contact with the side bearing seat.
2. When selecting the drive pinion front shims, keep the number of shims to a minimum.



- (5) Fit the selected drive pinion rear shim(s) to the drive pinion, and then use the special tool to press-fit the drive pinion rear bearing inner race.



►D◄ DRIVE PINION BEARING PRELOAD ADJUSTMENT

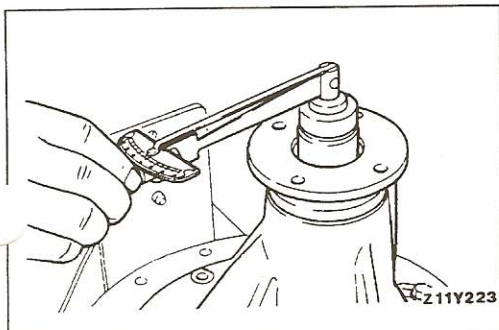
Adjust the drive pinion rotation torque by using the following procedure:

Without oil seal

- (1) Insert the drive pinion front shim(s) between the drive pinion spacer and the drive pinion rear bearing inner race.
- (2) Using special tools, tighten the companion flange to the specified torque.

NOTE

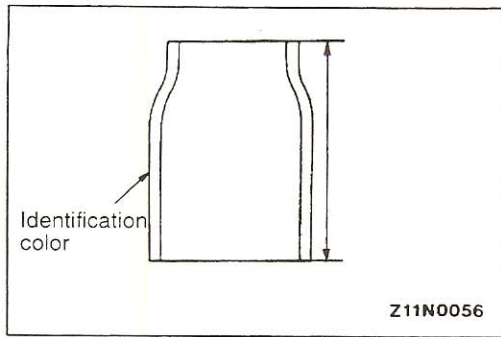
Do not install the oil seal.



- (3) Measure the drive pinion rotation torque (without the oil seal).

Standard value:

Bearing type	Bearing lubrication	Rotation torque
New	None (With anti-rust agent)	0.6–0.9 Nm 5.2–7.8 in.lbs.
New or reuse	Gear oil applied	0.4–0.5 Nm 3.5–4.3 in.lbs.



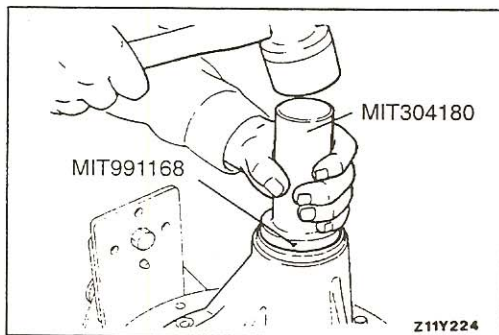
- (4) If the drive pinion rotation torque is not within the standard value range, adjust the rotation torque by replacing drive pinion front shim(s) or the drive pinion spacer.

NOTE

When selecting the drive pinion front shims, if the number of shims is large, reduce the number of shims to a minimum by selecting the appropriate drive pinion spacers. Also, select the drive pinion spacer from the following two types.

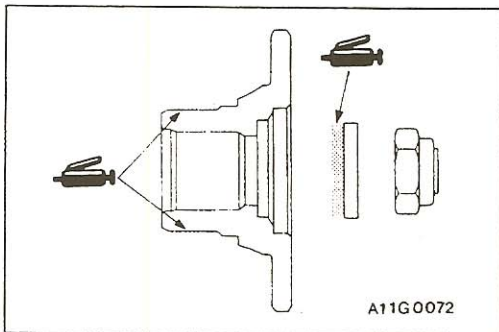
Height of drive pinion spacer mm (in.)	Identification color
52.50 (2.067)	Yellow
52.84 (2.080)	Red

- (5) Remove the companion flange and drive pinion again.

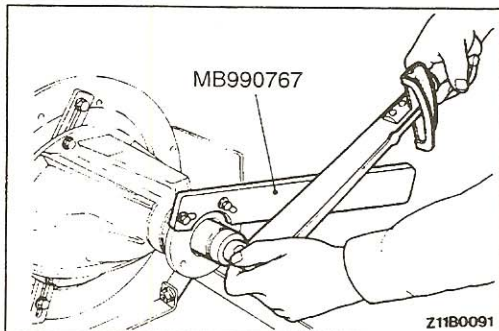


With oil seal

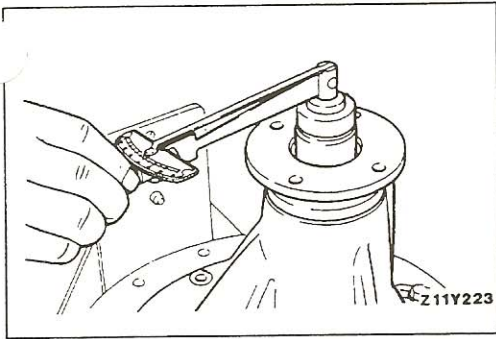
- (1) After setting the drive pinion front bearing inner race, use the special tool to drive the oil seal into the front lip of the gear carrier.



- (2) Apply a thin coat of clean multi-purpose grease to the companion flange contact surfaces of the washer and the oil seal contacting surface before installing the drive pinion assembly.



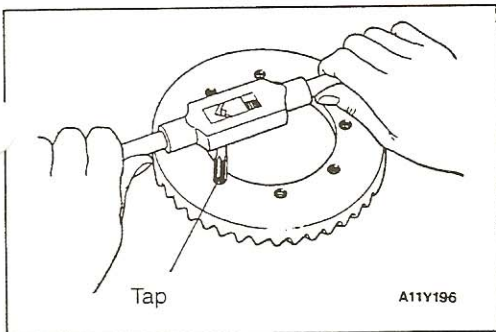
- (3) Install the drive pinion assembly and companion flange with the mating marks properly aligned. Using the special tools, tighten the companion flange self-locking nut to the specified torque.



- (4) If the drive pinion rotation torque is not within the range of the standard value, adjust the rotation torque by replacing the drive pinion front shim(s) or the drive pinion spacer.

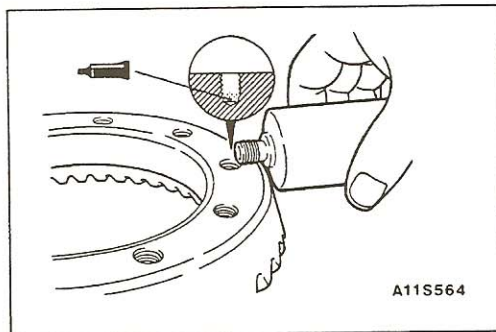
Standard value:

Bearing type	Bearing lubrication	Rotation torque
New	None (With anti-rust agent)	0.85–1.15 Nm 7.4–10.0 in.lbs.
New or reuse	Gear oil applied	0.65–0.75 Nm 5.6–6.5 in.lbs.



►E◄ DRIVE GEAR INSTALLATION

- (1) Clean the drive gear mounting bolts.
- (2) Remove the adhesive which is adhering to the threaded holes of the drive gear by turning the tap tool (M12 × 1.25), and then clean the threaded holes by applying compressed air.

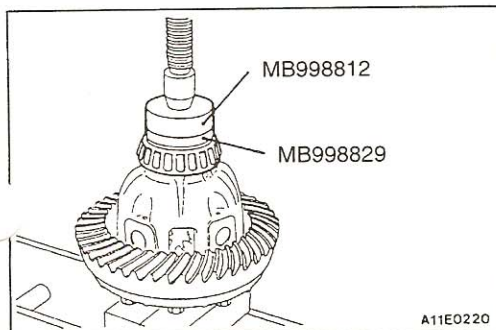


- (3) Apply specified adhesive to the threaded holes of the drive gear.

Specified adhesive:

3M Stud Locking Part No. 4170 or equivalent

- (4) Install the drive gear to the differential case so that the mating marks are properly aligned. Tighten the bolts to the specified torque in a diagonal sequence.

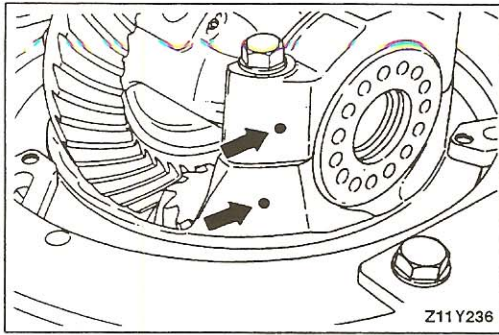


►F◄ SIDE BEARING INNER RACE INSTALLATION

Using special tool, press-fit the side bearing inner races into the differential case.

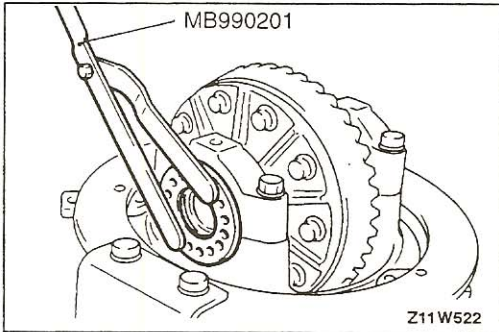
Caution

When only one side bearing inner race is installed, place a load on the differential case only.



►G◄ BEARING CAP INSTALLATION

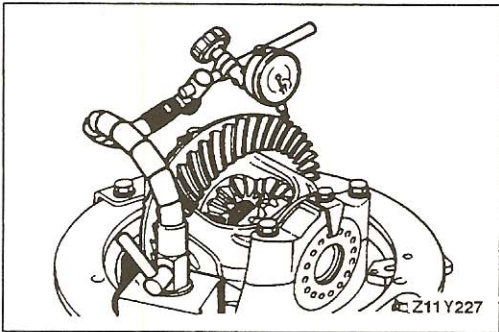
Align the mating marks on the gear carrier and the bearing cap, and then tighten the bearing cap.



►H◄ FINAL DRIVE GEAR BACKLASH ADJUSTMENT

Adjust the final drive gear backlash as follows:

- (1) Using special tool, provisionally tighten the side bearing nut to just before preloading of the side bearing.



- (2) Measure the final drive gear backlash.

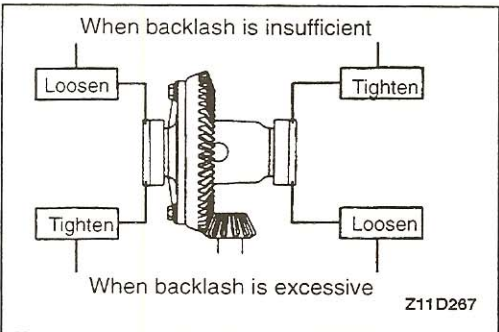
Standard value:

Vehicles without rear differential lock
0.13–0.18 mm (.0051–.0071 in)

Vehicle with rear differential lock
0.12–0.18 mm (.0047–.0071 in)

NOTE

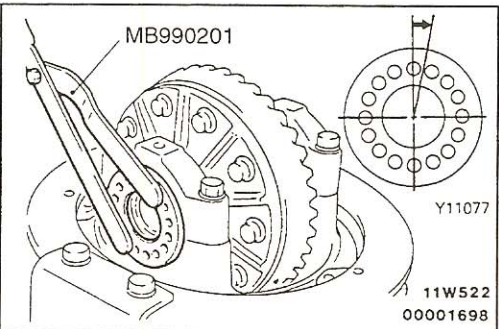
Measure at four points or more on the circumference of the drive gear.



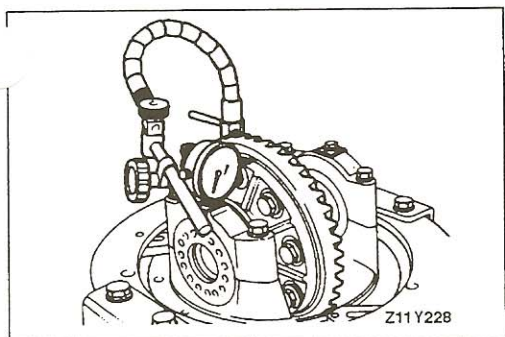
- (3) Using special tool (MB990201), adjust the backlash to the standard value by moving the side bearing nut as shown.

NOTE

First loosen the side bearing nut then tighten turn the side bearing nut the same amount as when it was loosened.



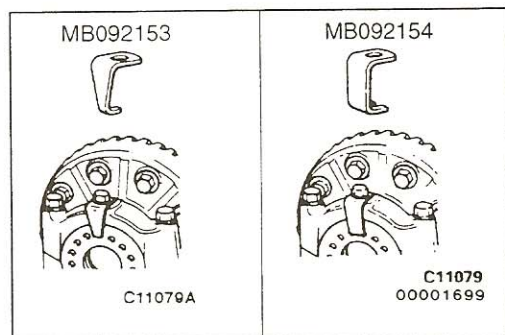
- (4) Using special tool, turn both right and left side bearing nuts one half the distance between the centers of two neighboring holes to apply the preload.



(5) Measure the drive gear runout.

Limit: 0.05 mm (.0020 in.)

(6) If the drive gear runout exceeds the limit, remove the differential case and the drive gears, move them to different positions and then reinstall them.



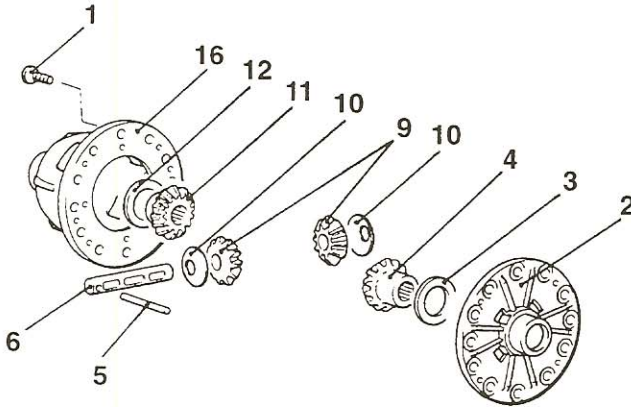
(7) Choose and install the lock plates (two types).

(8) Check the final drive gear tooth contact. If poor contact is evident, carry out adjustment. (Refer to GROUP 26–Differential Carrier.)

DIFFERENTIAL CASE

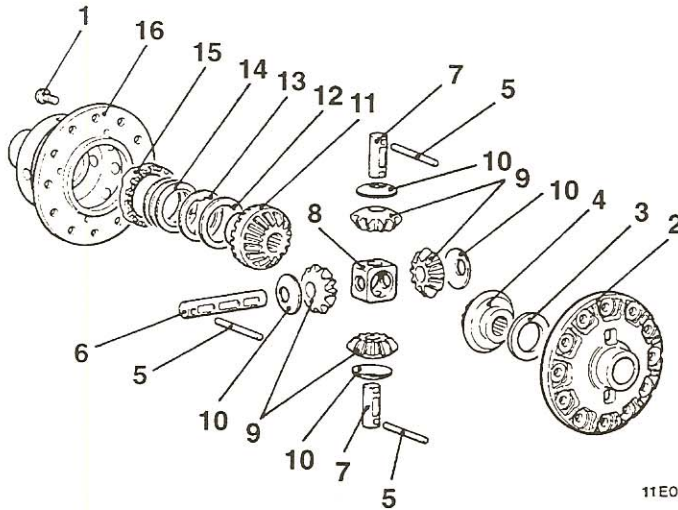
DISASSEMBLY AND REASSEMBLY

<Conventional differential>



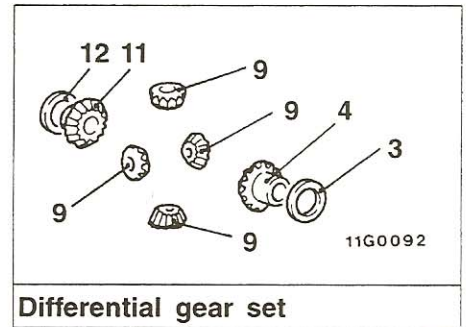
<Rear differential lock>

11E0198



11E0189

00001825



Differential gear set

Disassembly steps

◀A▶

1. Screw
2. Case A
3. Side gear spacer (RH)
4. Side gear (RH)

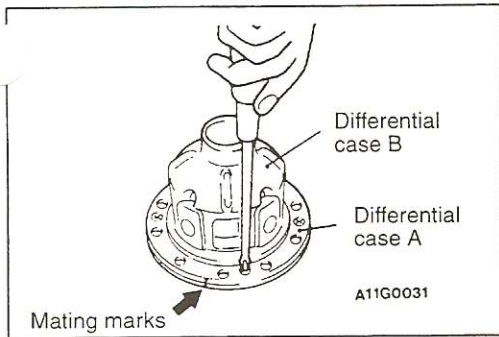
▶B◀

- Backlash adjustment on differential gear case A side
 - Differential gear backlash check
5. Lock pin
 6. Pinion shaft-A
 7. Pinion shaft-B
 8. Pinion shaft holder

◀B▶

▶A◀

9. Pinion gear
10. Washer
11. Side gear (LH)
12. Side gear spacer (LH)
13. Spring washer
14. Spring
15. Drive cam
- Backlash adjustment on differential gear case B side
16. Case B



DISASSEMBLY SERVICE POINTS

◀A▶ SCREW REMOVAL

- (1) Make mating marks.

NOTE

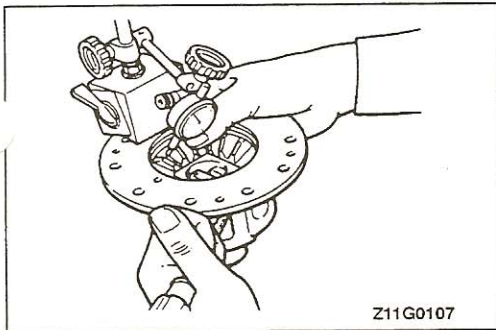
The mating marks are represented by one of the following methods.

- Engraving by a punch or electric pen.
- Identical Arabic numerals.

- (2) Evenly loosen 4 screws on case A and B to remove.
- (3) Set case B downward and remove case A, side gear spacer (RH) and side gear (RH).

NOTE

Check differential gear backlash to determine necessity of disassembling side (RH) and onward.



◀B▶ DIFFERENTIAL GEAR BACKLASH CHECK

Check differential gear backlash as follows.

- (1) Insert cloth wrapped screwdriver through side of case B and lock side gear (LH) and pinion gear. (one piece).
- (2) Contact dial gauge on pinion gear facing the locked pinion gear and measure backlash within the standard value.

NOTE

Measure 2 pinion gears.

Standard value:

Conventional differential

0.10–0.25 mm (.004–.01 in.)

Rear differential lock

0.15–0.20 mm (.005–.008 in.)

- (3) When backlash exceeds the standard value, adjust side gear spacer (LH).

NOTE

If backlash is within the standard value, assure appropriate gear spacer (RH) thickness and assemble differential case assembly.

REASSEMBLY SERVICE POINTS

▶A◀ BACKLASH ADJUSTMENT ON DIFFERENTIAL GEAR CASE B SIDE

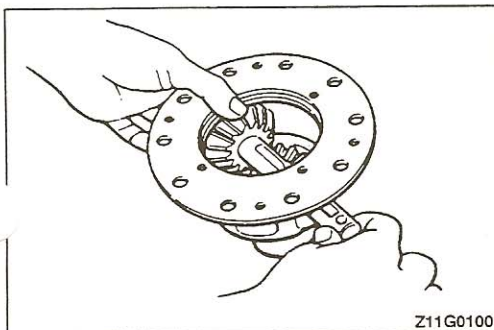
Adjust backlash on differential gear case B side as follows.

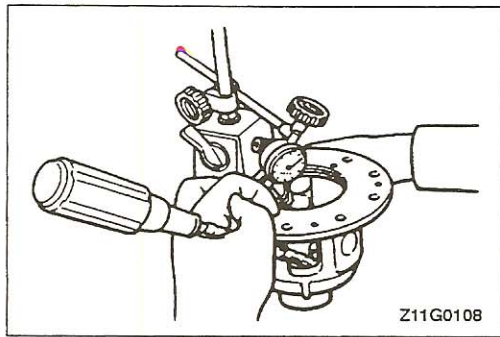
- (1) Temporarily install side gear spacer (LH), side gear (LH), washers, 2 pinion gears and pinion shaft A on case B.

NOTE

Do not assemble pinion shaft holder, pinion shaft-B or the remaining pinion gears (2).

- (2) Insert wrapped screwdriver through side of case B to lock one side of pinion gear and side gear (LH).





- (3) Place dial gauge on unlocked pinion gear and measure differential gear backlash within the standard value

Standard value:

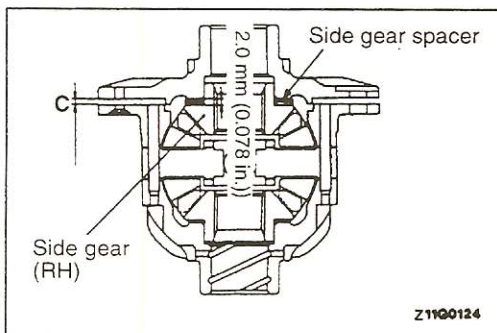
Conventional differential

0.10–0.25 mm (.004–.01 in)

Rear differential lock

0.15–0.20 mm (.005–.008 in)

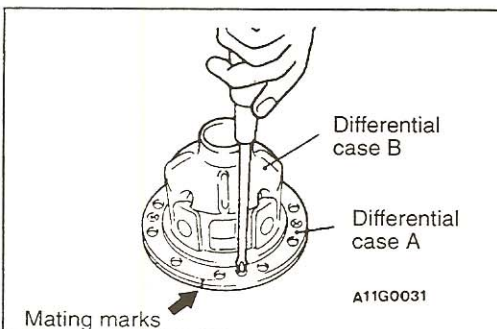
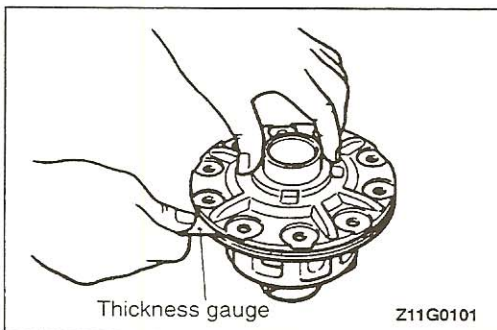
- (4) When backlash exceeds the standard value, adjust with selected side gear spacer (LH).
 (5) Install washers, pinion gears, pinion shaft holder and pinion shaft-A and B. Lock with lock pin through case B.



▶B◀ BACKLASH ADJUSTMENT ON DIFFERENTIAL GEAR CASE A SIDE

Adjust backlash as follows.

- (1) Install side gear (RH) and 2 side gear spacers [1.0 (0.039 in.) thick]. Press differential case A to differential case B.
 (2) Measure flange space (C) between differential case A and B with thickness gauge.
 (3) Calculate side gear spacer (RH) thickness (D) as follows:
 $D = 2.0 \text{ mm (.078 in.)} - [C + 0.2 \text{ mm (.008 in.)}]$
 (4) Choose spacer with a thickness nearest D in (3) and adjust differential gear backlash on the right side.



- (5) Match the match marks and assemble cases A and B.
 (6) Assure smooth rotation of inner shaft.

INSPECTION

27200250032

Wash the disassembled parts in cleaning solvent, dry them using compressed air, and then check the following areas:

- Check the side gears, pinion gears and pinion shaft for wear or damage.
- Check the side gear spline for wear or damage.

NOTES

WHEEL AND TIRE



CONTENTS

3110900052

GENERAL SPECIFICATIONS	2	SERVICE SPECIFICATIONS	2
ON-VEHICLE SERVICE	4	TROUBLESHOOTING	3
Tire Inflation Pressure Check	4		
Tire Wear Check	4		
Wheel Runout Check	4		



31-2 WHEEL AND TIRE – General Specifications/Service Specifications

GENERAL SPECIFICATIONS

31100020071

Items	Vehicles with wide fender	Vehicles without wide fender
Tire size	265/70R15 110H	265/70R16 112S
Wheel type	Aluminum type	Aluminum type
Wheel size	15×7JJ	16×7JJ
Amount of wheel offset mm (in.)	10 (.39)	10 (.39)
P.C.D. mm (in.)	139.7 (5.5)	139.7 (5.5)
Tire inflation pressure kPa (psi)	Front	180 (26)
	Rear	220 (32)

NOTE

P.C.D. (Pitch Circle Diameter) indicates the pitch circle diameter of the wheel installation holes.

SERVICE SPECIFICATIONS

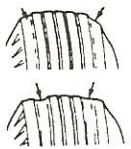

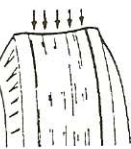
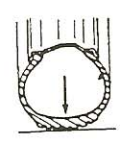


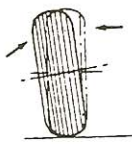

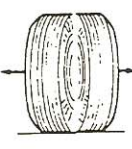



31100030166

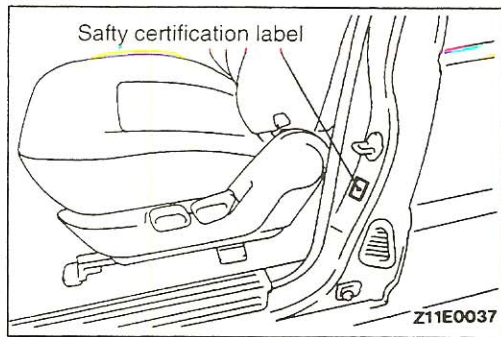
Items	Standard value	Limit
Wheel nut tightening torque Nm (ft.lbs.)	98–118 (72–87)	–
Wheel runout mm (in.)	Radial	–
	Lateral	–
Tread depth of tire mm (in.)	–	1.0 (.039)
		1.6 (.06)

TSB Revision

TROUBLESHOOTING

31100070052

Trouble Symptom		Probable Cause		Remedy
Rapid wear at shoulders	 11X0109	Under-inflation or lack of rotation	 11X0116	Adjust the tire pressure.
Rapid wear at center	 11X0110	Over-inflation or lack of rotation	 11X0117	
Cracked treads	 11X0111	Under-inflation		Adjust the tire pressure.
Wear on one side	 11X0112	Excessive camber	 11X0118	Check the camber.
Feathered edge	 11X0113	Incorrect toe-in	 11X0119	Adjust the toe-in.
Bald spots	 11X0114	Unbalanced wheel	 11X0120	Adjust the unbalanced wheels.
Scalloped wear	 11X0115	Lack of rotation of tires or worn or out-of-alignment suspension		Rotate the tires. Check the front suspension alignment.

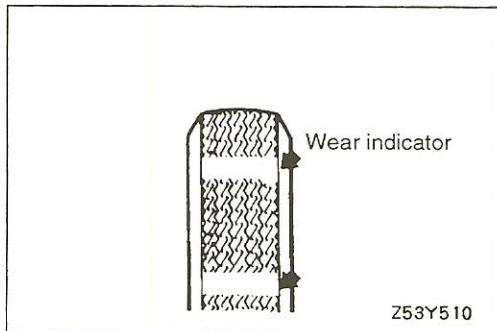


ON-VEHICLE SERVICE

3110090126

TIRE INFLATION PRESSURE CHECK

Check the inflation pressure of the tires. If it is not within the standard value, adjust it.



TIRE WEAR CHECK

3110010041

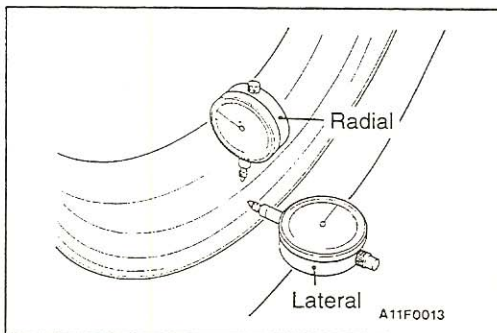
Measure the tread depth of the tires.

Limit: 1.6 mm (.06 in.)

If the remaining tread depth is less than the limit, replace the tire.

NOTE

When the tread depth of the tire is reduced to 1.6 mm (.06 in.) or less, the wear indicator will appear.



WHEEL RUNOUT CHECK

31100110136

Jack up the vehicle so that the wheels are clear of the floor. While slowly turning the wheel, use a dial indicator to measure the wheel runout.

Limit:

Radial 1.0 mm (.039 in.)

Lateral 1.0 mm (.039 in.)

If the wheel runout exceeds the limit, replace the wheel.

POWER PLANT MOUNT

CONTENTS

32109000127

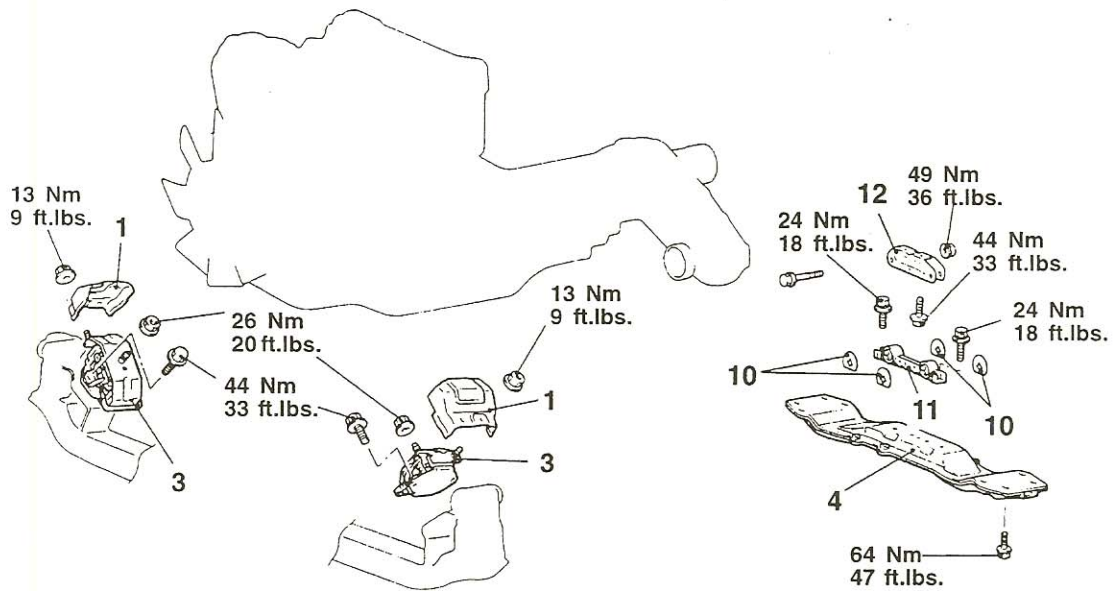
ENGINE MOUNTING	2	FRONT DIFFERENTIAL MOUNTING	3
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ENGINE MOUNTING

32100110231

REMOVAL AND INSTALLATION



A01E0150

Front engine mount removal steps

- Engine Assembly Removal (Refer to GROUP 11A – Engine Assembly.)
- 1. Heat protector
- 3. Engine support front insulator

Rear engine mount removal step:

- 4. No. 2 crossmember
- 10. Stopper
- 11. Engine support rear insulator
- 12. Engine support rear bracket

INSPECTION

32100120105

- Check the insulators for cracks, separation or deformation.
- Check the front insulator stoppers for deformation.
- Check the No. 2 crossmember for deformation or corrosion.

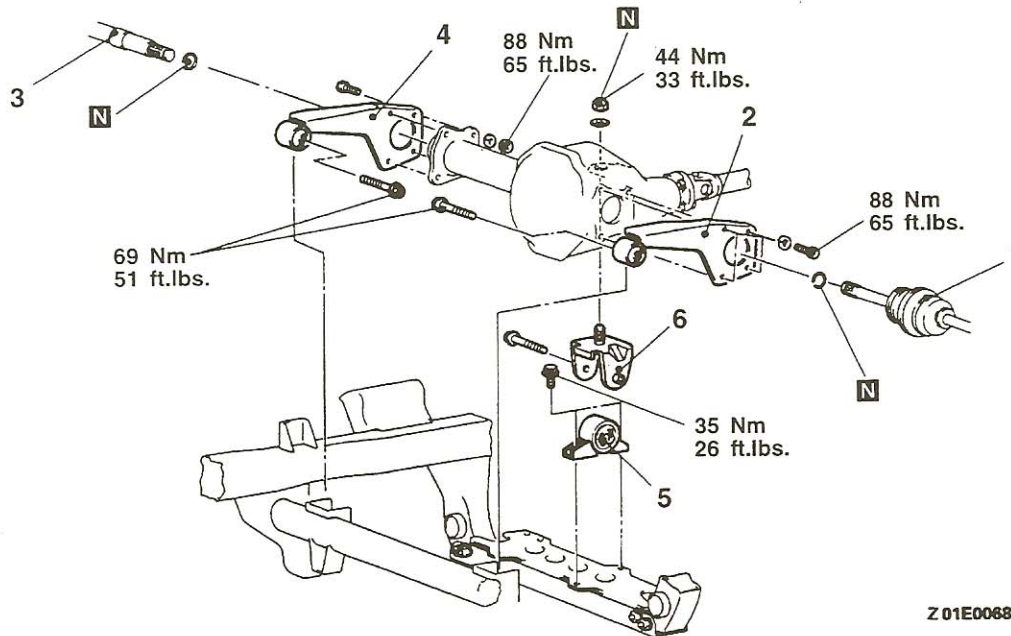
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FRONT DIFFERENTIAL MOUNTING

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation

- Under Cover and Under Skid Plate Removal and Installation



Removal steps

1. Knuckle and drive shaft assembly (Refer to GROUP 26 – Drive Shaft.)
2. Differential mounting bracket (L.H.)
3. Inner shaft (Refer to GROUP 26 – Inner Shaft.)



4. Differential mounting bracket (R.H.)
5. Differential mounting bracket
6. Differential support bracket



REMOVAL SERVICE POINT

- ◀A▶ DIFFERENTIAL MOUNTING BRACKET (L.H.)/
DIFFERENTIAL MOUNTING BRACKET (R.H.)/
DIFFERENTIAL MOUNTING BRACKET REMOVAL

While supporting the differential carrier with a jack, remove the differential mounting bracket.

NOTE

Support the differential carrier with a jack until the differential mounting bracket is installed.

INSPECTION

32100180011

- Check the differential mounting brackets for deformation or damage.
- Check the differential support bracket for deformation or damage.
- Check insulators for cracks, separation or deformation.

NOTES

FRONT SUSPENSION

CONTENTS

3310900025 

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ELECTRONICALLY-CONTROLLED SUSPENSION (ECS)	33B
ELECTRONICALLY-CONTROLLED SUSPENSION (ACTIVE PREVIEW ECS)	33C

NOTE

The tinted sections are not included in this manual.

NOTES

FRONT SUSPENSION

CONTENTS

3310900032

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CONTROL UNIT	22	SERVICE SPECIFICATIONS	2
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Front Lower Arm Bushing Replacement	16	Replacement	13
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ON-VEHICLE SERVICE	9	Replacement	21
Ball Joint Dust Cover Check	10	TORSION BAR	17
Front Wheel Alignment Check and		TROUBLESHOOTING	4
Adjustment	9	Stabilizer Link Ball Joint Dust Cover	
		Replacement	21

33A-2 FRONT SUSPENSION – General Specifications/Service Specifications

GENERAL SPECIFICATIONS

3310000014

SUSPENSION TYPE

Items	Specification
Suspension system	Independent, double wishbone with torsion bar and telescopic shock absorber

TORSION BAR <Normal Type>

Items	Specifications
Length×O.D. mm (in.)	1307.5×26.4 (51.476×1.039)
Spring constant (wheel position) N/mm (lbs./in.)	29 (162)

TORSION BAR <Sport Type>

Items	Specifications
Length×O.D. mm (in.)	1307.5×27.2 (51.476×1.071)
Spring constant (wheel position) N/mm (lbs./in.)	33 (185)

SHOCK ABSORBER

Items	Vehicles without remote-controlled variable shock absorbers	Vehicles with remote-controlled variable shock absorbers
Type	Hydraulic, cylindrical, double-acting type	Hydraulic, cylindrical, double-acting type with low-pressure nitrogen gas
Max. length mm (in.)	345 (13.6)	345 (13.6)
Min. length mm (in.)	225 (8.9)	230 (9.1)
Stroke mm (in.)	120 (4.7)	115 (4.5)
Damping force [at 0.3 m/sec (0.9 ft./sec.)] N (lbs.)	Expansion	2,530 (569)
	Contraction	1,079 (243)
		Hard: 3,236 (728) Medium: 2,550 (573) Soft: 1,746 (392)
		Hard: 1,285 (289) Medium: 1,030 (232) Soft: 628 (141)

SERVICE SPECIFICATIONS

33100030023

Items		Standard value	Limit
Toe-in	At the center of tire tread mm (in.)	3.5±3.5 (.14±.14)	—
	At the rim of disc wheel mm (in.)	1.8±1.8 (.07±.07)	—
	Toe-in angle (per wheel)	0°–0°17'	—
	Toe-out angle on turn (inner wheel when outer wheel is at 20°)	21°56'	—
Camber		0°40'±30'	—
Caster		3°00'±1°00'	—

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Items		Standard value	Limit
Kingpin inclination		14°52'	–
Side slip mm (in.)		0±3 (0±.12)	–
Upper ball joint breakaway torque Nm (in.lbs.)		0.8–3.5 (7–30)	–
Shock absorber attaching dimension mm (in.)	Normal shock absorber	1–2 (.04–.08)	–
	Remote-controlled variable shock absorber	1.5– 2.5 (.06–.10)	–
Lower ball joint end play mm (in.)		–	0.3 (.012)
Clearance between bump stopper and bump stopper bracket mm (in.)		21–23 (.83–.91)	–
Stabilizer link ball joint breakaway torque Nm (in.lbs.)		1.7–3.1 (15–27)	–

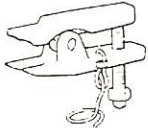

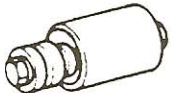

SEALANTS AND ADHESIVES

33100050012

Items	Specified sealant
Upper ball joint dust cover to upper ball joint groove	3M ATD Part No. 8661 or equivalent

SPECIAL TOOLS

33100060022

Tool	Tool number and name	Supersession	Application
	MB991406 Steering linkage puller	–	Removal of ball joints and knuckle
	MB990883 Arbor	MB990883-01	Removal and press-fitting of lower arm bushing
	MB991522 Torsion bar bushing remover and installer	–	Removal and press-fitting of the bushing
	MB990326 Preload socket	General service tool	Measurement of the stabilizer link starting torque

TROUBLESHOOTING <Remote controlled variable shock absorbers>

THE TROUBLESHOOTING CHART SELECTION

Check the malfunction symptoms according to the following flow chart, and inspect according to the inspection chart.

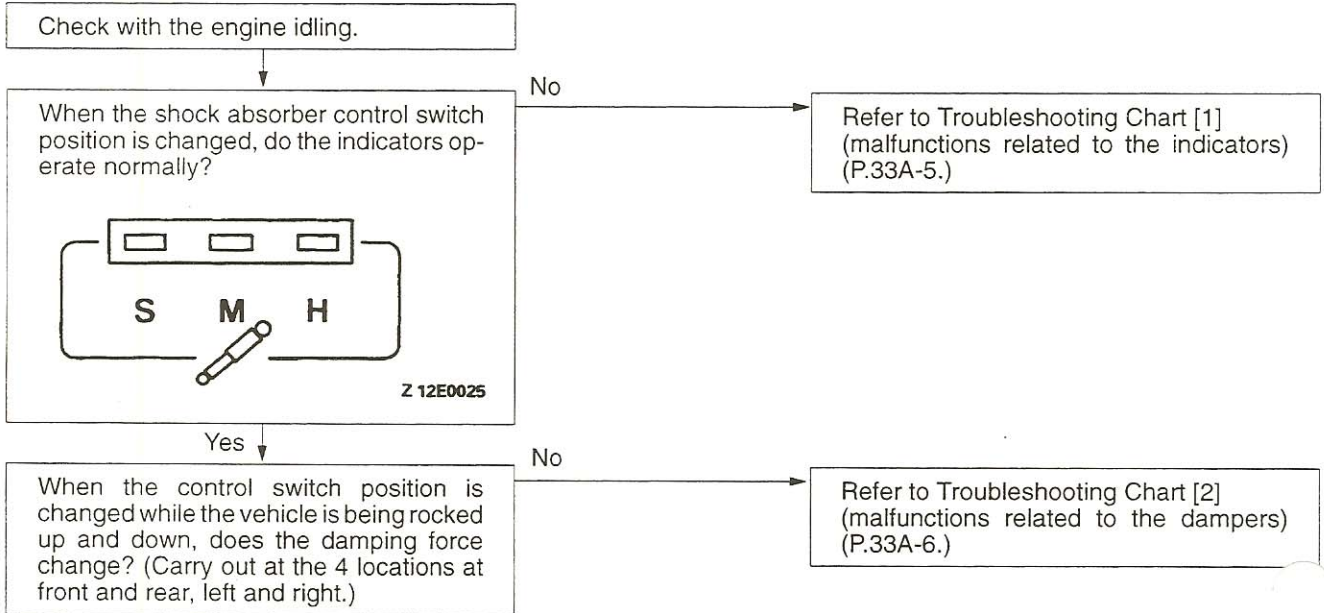


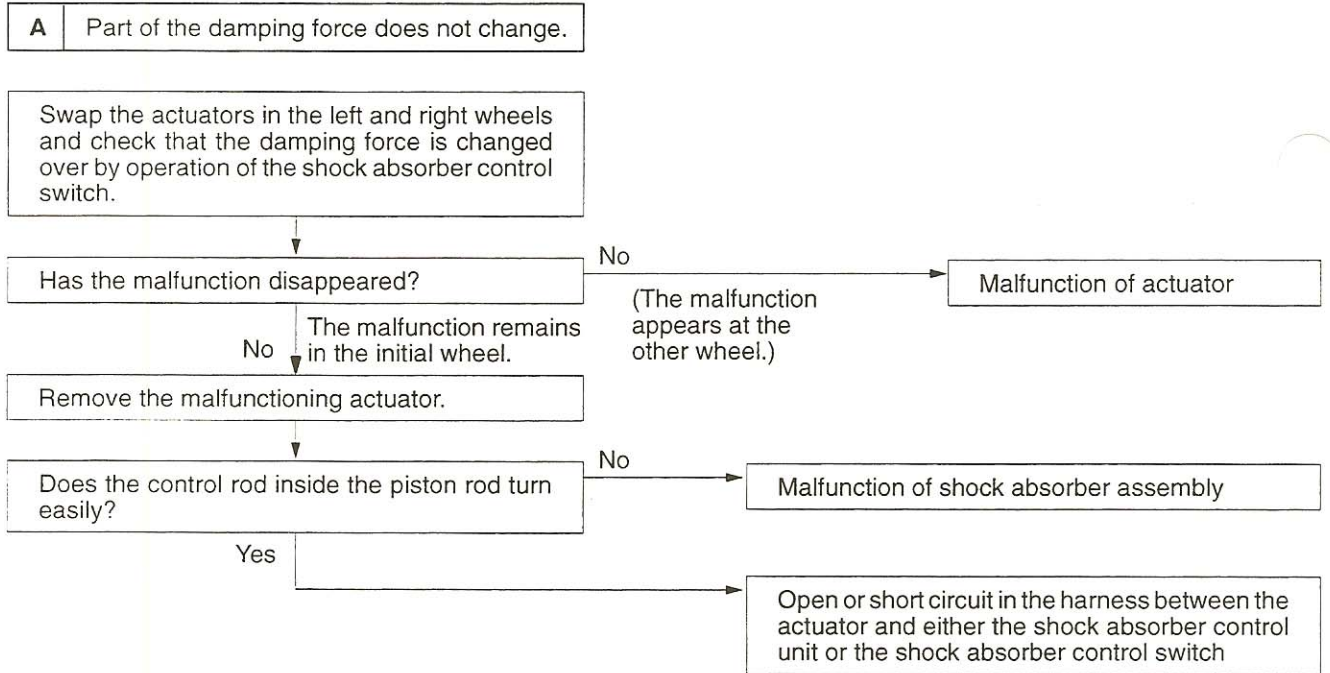
CHART CLASSIFIED BY TROUBLE SYMPTOM

TROUBLESHOOTING CHART [1] (MALFUNCTIONS RELATED TO THE INDICATORS)

Trouble Symptom	Inspection	Normal condition	Probable Cause
Even when switched to S (Soft) mode, the indicator does not illuminate.	(1) Disconnect the shock absorber control switch connector and ground harness connector terminal (4).	The indicator illuminates.	<ul style="list-style-type: none"> ● Open circuit in fuse No. 11 in the junction block ● Malfunction of light-emitting diode ● Open circuit in the harness between the combination meter and either the junction block or the shock absorber control switch
	(2) Disconnect the shock absorber control switch connector and check for continuity between switch connector terminals (4) – (2) when the switch is set to S (Soft).	Continuity	<ul style="list-style-type: none"> ● Malfunction of shock absorber control switch
	(3) When the results of inspection items (1) and (2) are normal	–	<ul style="list-style-type: none"> ● Open circuit in the harness between the control switch and the ground ● Incorrect ground connection
Even when switched to M (Medium) mode, the indicator does not illuminate.	(1) Disconnect the shock absorber control switch connector and ground harness connector terminal (5).	The indicator illuminates.	<ul style="list-style-type: none"> ● Open circuit in fuse No. 11 in the junction block ● Malfunction of light-emitting diode ● Open circuit in the harness between the combination meter and either the junction block or the shock absorber control switch
	(2) Disconnect the shock absorber control switch connector and check for continuity between switch connector terminals (5) – (2) when the switch is set to M (Medium).	Continuity	<ul style="list-style-type: none"> ● Malfunction of shock absorber control switch
	(3) When the results of inspection items (1) and (2) are normal	–	<ul style="list-style-type: none"> ● Open circuit in the harness between the shock absorber control switch and the ground ● Incorrect ground connection

Trouble Symptom	Inspection	Normal condition	Probable Cause
Even when switched to H (Hard) mode, the indicator does not illuminate.	(1) Disconnect the shock absorber control switch connector and ground harness connector terminal (6).	The indicator illuminates.	<ul style="list-style-type: none"> • Open circuit in fuse No. 11 in the junction block • Malfunction of light-emitting diode • Open circuit in the harness between the combination meter and either the junction block or the shock absorber control switch
	(2) Disconnect the shock absorber control switch connector and check for continuity between switch connector terminals (6) – (2) when the switch is set to H (Hard).	Continuity	<ul style="list-style-type: none"> • Malfunction of shock absorber control switch
	(3) When the results of inspection items (1) and (2) are normal	–	<ul style="list-style-type: none"> • Open circuit in the harness between the shock absorber control switch and the ground • Incorrect ground connection

TROUBLESHOOTING CHART [2] (MALFUNCTIONS RELATED TO THE DAMPERS)



NOTE

When the mutual damping forces do not change, the problem is probably an open circuit in the harness between the actuator and either the shock absorber control unit or the shock absorber control switch, so the harness should be checked first.

B Damping force for all wheels does not change over.

Disconnect the shock absorber control unit connector.

When the ignition switch is turned to ON, does a voltage of approximately 12 V show between harness connector terminal (4) of the shock absorber control unit and the ground?

No

Open circuit in the harness between the shock absorber control unit and the junction block

Yes

Is there continuity between harness connector terminal (1) of the shock absorber control unit and the ground?

No

Open circuit in the harness between the shock absorber control unit and the ground

Yes

Is there normal continuity between shock absorber control unit harness connector terminal (3) and the ground, terminal (7) and the ground and terminal (2) and the ground?

No

Open circuit in the harness between the shock absorber control unit and the shock absorber control switch

<When normal>

Terminal	Mode		
	S (Soft)	M (Medium)	H (Hard)
No. 3	Continuity	No continuity	No continuity
No. 7	No continuity	Continuity	No continuity
No. 2	No continuity	No continuity	Continuity

Yes

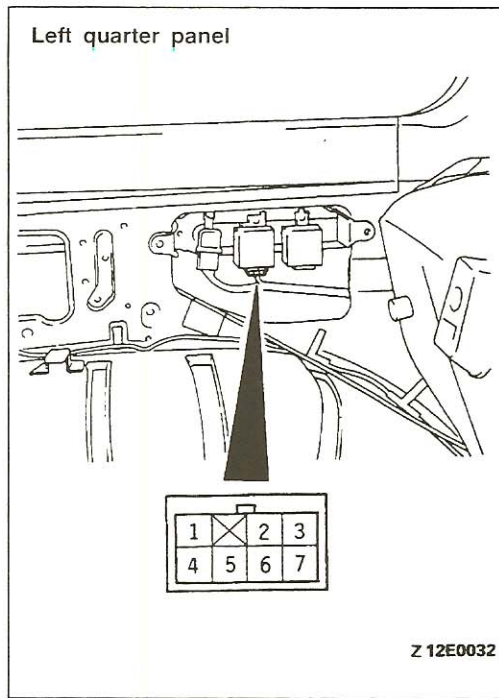
When 12 V is applied to harness connector terminal (6) of the shock absorber control unit, does the damping force change over?

No

Open or short circuit in the harness between the actuator and either the shock absorber control unit or the shock absorber control switch

Yes

Incorrect shock absorber control unit connection, or malfunction of shock absorber control unit



SHOCK ABSORBER CONTROL UNIT SIGNAL CIRCUIT INSPECTION

- (1) Disconnect the shock absorber control unit connector, and inspect the connector at the harness side.

B+: Battery Positive Voltage

Terminal No.	Connection destination	Measurement	Tester connection	Check condition	Standard	
1	Ground	Continuity	(1)– Ground	Constantly	Continuity	
2	Shock absorber control switch (Hard)	Continuity	(2)– Ground	Shock absorber control switch condition	S (Soft mode)	No continuity
					M (Medium mode)	No continuity
					H (Hard mode)	Continuity
7	Shock absorber control switch (Medium)	Continuity	(7)– Ground	Shock absorber control switch condition	S (Soft mode)	No continuity
					M (Medium mode)	Continuity
					H (Hard mode)	No continuity
3	Shock absorber control switch (Soft)	Continuity	(3)– Ground	Shock absorber control switch condition	S (Soft mode)	Continuity
					M (Medium mode)	No continuity
					H (Hard mode)	No continuity
4	Power supply	Voltage	(4)– Ground	Ignition switch	OFF	0 V
					ON	B+

- (2) Connect the shock absorber control unit and inspect.

Terminal No.	Connection destination	Measurement	Tester connection	Check condition	Standard
6	Shock absorber actuator	Voltage	(6)– Ground	5 seconds after operating the shock absorber control switch	Approx. 12
				Conditions except above	0 V

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ON-VEHICLE SERVICE

33100090052

FRONT WHEEL ALIGNMENT CHECK AND ADJUSTMENT

TOE-IN

1. Measure the toe-in.

Standard value:

At the center of tire tread

3.5 ± 3.5 mm (.14 \pm .14 in.)

At the rim of disc wheel

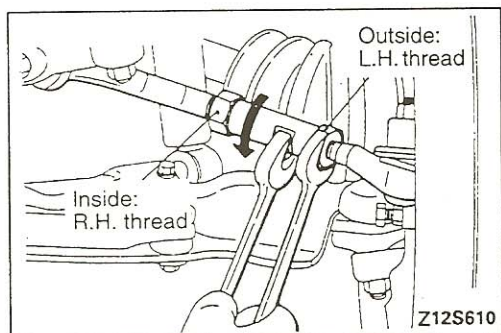
1.8 ± 1.8 mm (.07 \pm .07 in.)

Toe angle (per wheel) $0^\circ - 0^\circ 17'$

2. If the toe-in is not within the standard value, adjust the toe-in by turning the left and right tie rod turnbuckles by the same amount (in opposite directions).

Caution

The difference between the left and right tie rods should not exceed 5 mm (.2 in.).



3. After adjusting, use a turning radius gage to confirm that the steering wheel turning angle is within the standard value range. (Refer to GROUP 37A.)

TOE-OUT ANGLE ON TURNS

To check the steering linkage, especially after the vehicle has been involved in an accident or if an accident is presumed, it is advisable to check the tow-out angle on turns in addition to the wheel alignment.

Conduct this test on the left turn as well as on the right turn.

Standard value:

$21^\circ 56'$ (inner wheel when outer wheel at 20°)

CAMBER

Standard value:

$0^\circ 40' \pm 30'$ (Left/right deviation within $30'$)

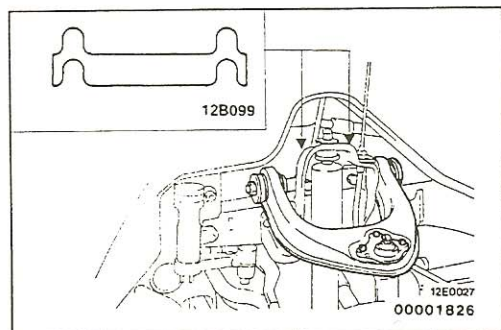
1. Adjust the camber by increasing or decreasing the thickness of the adjusting shim provided between the upper arm shaft and the crossmember.

NOTE

- Standard thickness of the shim is 4 mm (.16 in.).
- The number of shims is three or less.

Camber adjustment shim (yellow plating)

Part number	Thickness mm (in.)
MB176288	1.0 (.039)
MB176289	2.0 (.079)



CASTER**Standard value: 3°00'±1° (Left/right deviation within****NOTE**

1. Caster is pre-set at the factory and cannot be adjusted.
2. If the caster is not within the standard value, replace bent or damaged parts.

KINGPIN INCLINATION**Standard value: 14°52'****SIDE SLIP**

Measure the side slip with a side slip tester.

Standard value: 0±3 mm (0±.12 in.)**BALL JOINT DUST COVER CHECK**

33200860069

1. Check the dust cover for cracks or damage by pushing it with finger.
2. If the dust cover is cracked or damaged, replace upper arm, lower arm, or stabilizer link assembly.

NOTE

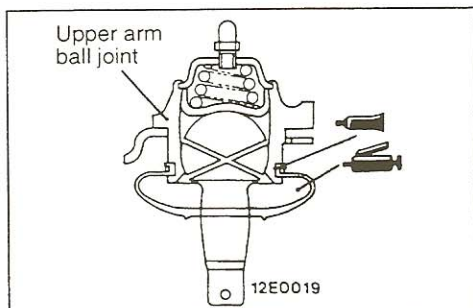
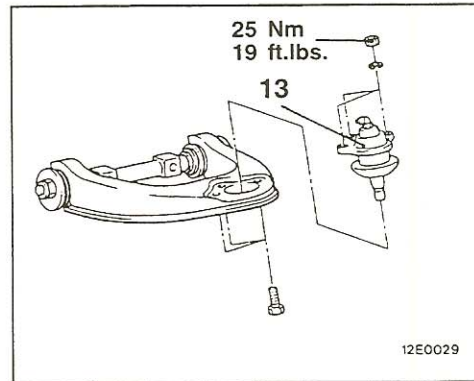
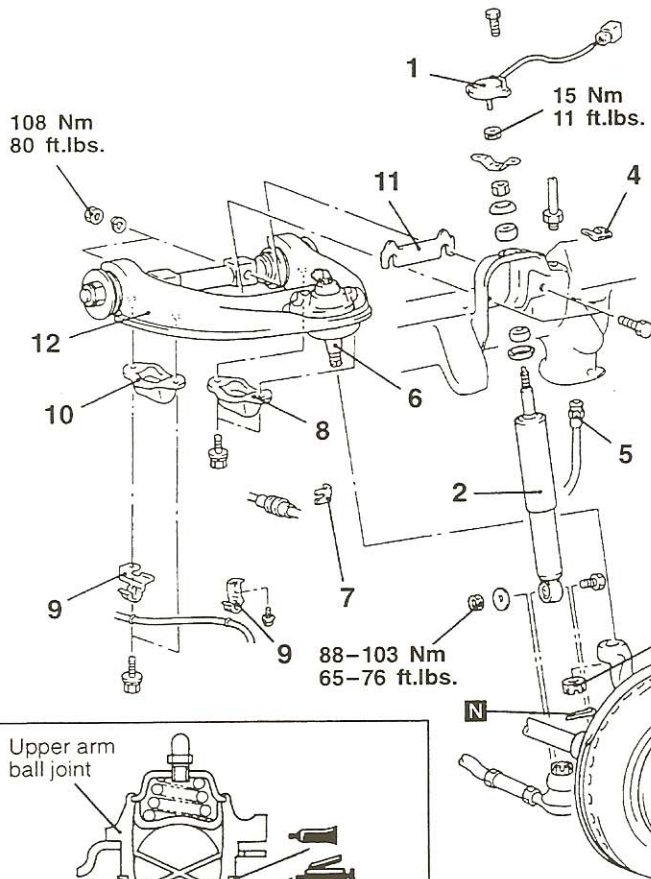
Cracks or damage of the dust cover may cause damage of the ball joint.

SHOCK ABSORBER AND UPPER ARM

REMOVAL AND INSTALLATION

Post-installation Operation

- Press the dust cover with a finger to check whether the dust cover is cracked or damaged.
- Wheel Alignment Inspection and Adjustment (Refer to P.33A-9.)
- Brake line bleeding (Vehicles without ABS: Refer to GROUP 35A – On-vehicle Service.)(Vehicles with ABS: Refer to GROUP 35C – On-vehicle Service.)



Sealant: 3M ATD Part No. 8661 or equivalent

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Shock absorber removal steps

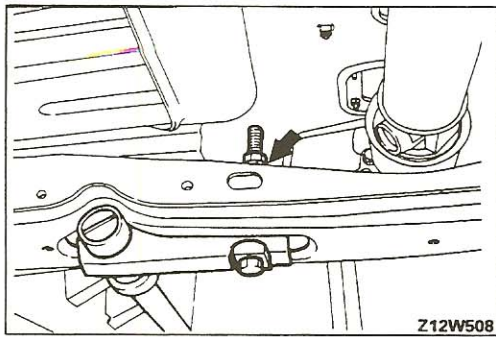
- ▶B◀ 1. Actuator (Vehicles with remote controlled variable shock absorbers)
- ▶B◀ 2. Shock absorbers

Upper arm removal steps

- Bump stopper and bump stopper bracket clearance adjustment (Refer to P.33A-18.)
- ▶A◀ 3. Anchor arm assembly adjusting nut
- 4. Hose clip

- 5. Brake hose connection
- 6. Upper ball joint and knuckle connection
- 7. Brake hose clip
- 8. Rebound stopper
- 9. Speed sensor bracket (Vehicles with ABS)
- 10. Rebound stopper
- 11. Shim
- ▶A◀ 12. Upper arm
- 13. Upper ball joint

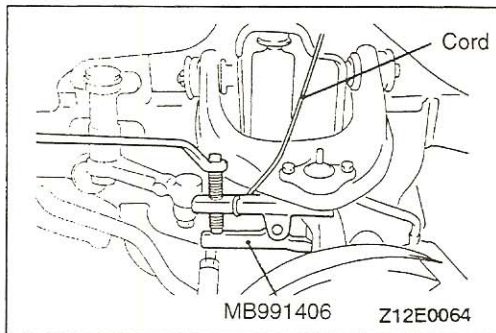
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**REMOVAL SERVICE POINTS****◀A▶ ANCHOR ARM ASSEMBLY ADJUSTING NUT LOOSENING**

Loosen the anchor bolt of the torsion bar all the way.

NOTE

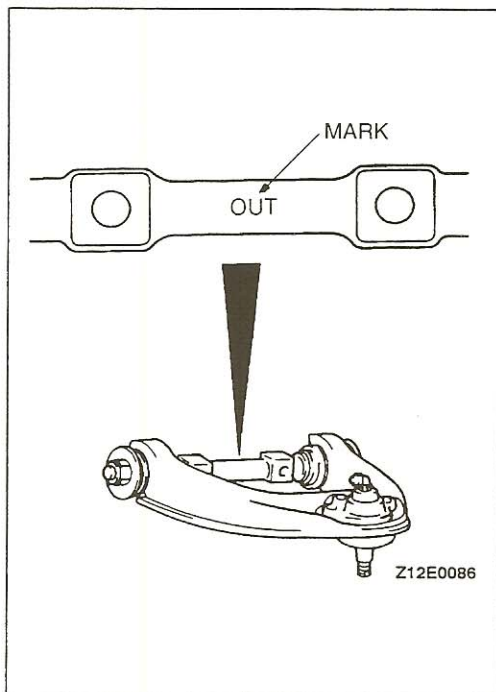
When the anchor arm assembly adjusting nut is loosened, use a jack to support the lower arm of the side to be loosened to make the work easier.

**◀B▶ UPPER BALL JOINT AND KNUCKLE DISCONNECTION**

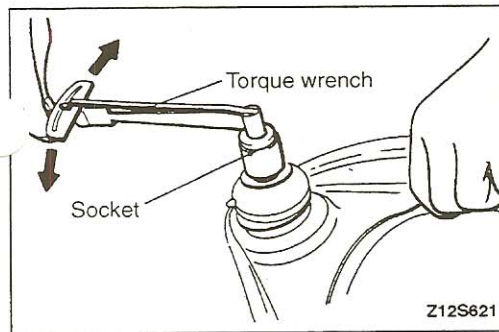
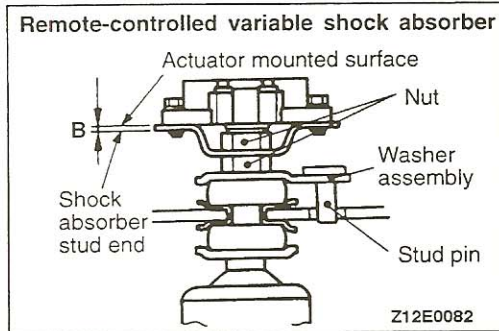
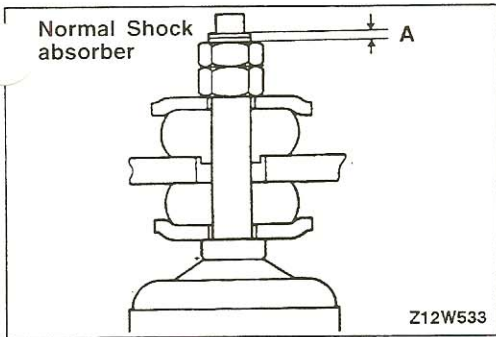
Use the special tool to disconnect the upper arm ball joint from the knuckle.

Caution

1. Be sure to tie the cord of the special tool to the nearby part.
2. The nut should only be loosened, not removed.

**INSTALLATION SERVICE POINTS****▶A◀ UPPER ARM INSTALLATION**

Install the upper arm so that the "OUT" mark on the upper arm shaft is facing toward the outside of the vehicle.



►B◄ SHOCK ABSORBER/ACTUATOR (VEHICLES WITH REMOTE CONTROLLED VARIABLE SHOCK ABSORBER) INSTALLATION

Tighten the shock absorber installation nut so that the dimensions shown in the illustration (A and B) are at the standard values.

Standard value

A: 1–2 mm (.04–.08 in.)

B: 1.5–2.5 mm (.06–.10 in.)

Caution

When tightening the nut, be careful not to bend the stud pin of the washer assembly.

INSPECTION

33200260050

BALL JOINT BREAKAWAY 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 breakaway torque of the ball joint.

Standard value: 0.8–3.5 Nm (7–30 in.lbs.)

2. When the measured value exceeds the standard value, replace the ball joint.
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.

UPPER ARM 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 upper arm. (Refer to P.33A-11.)

NOTE

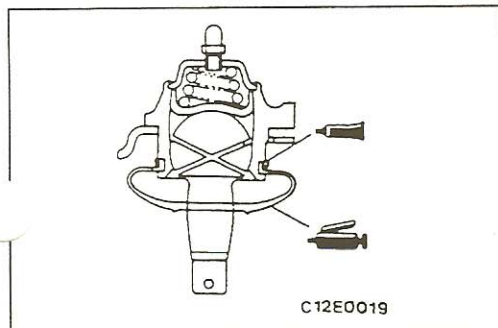
Cracks or damage of the dust cover may cause damage of the ball joint. When it is damaged during service work, replace the dust cover.

UPPER ARM BALL JOINT DUST COVER REPLACEMENT

33200800016

Only when dust cover is damaged accidentally during service work, replace the dust cover as follows:

1. Apply multipurpose grease to the interior of dust cover and the upper arm ball joint.
2. Secure the dust cover to the upper arm ball joint with ring.
3. Press the dust cover with a finger to check whether the dust cover is cracked or damaged.

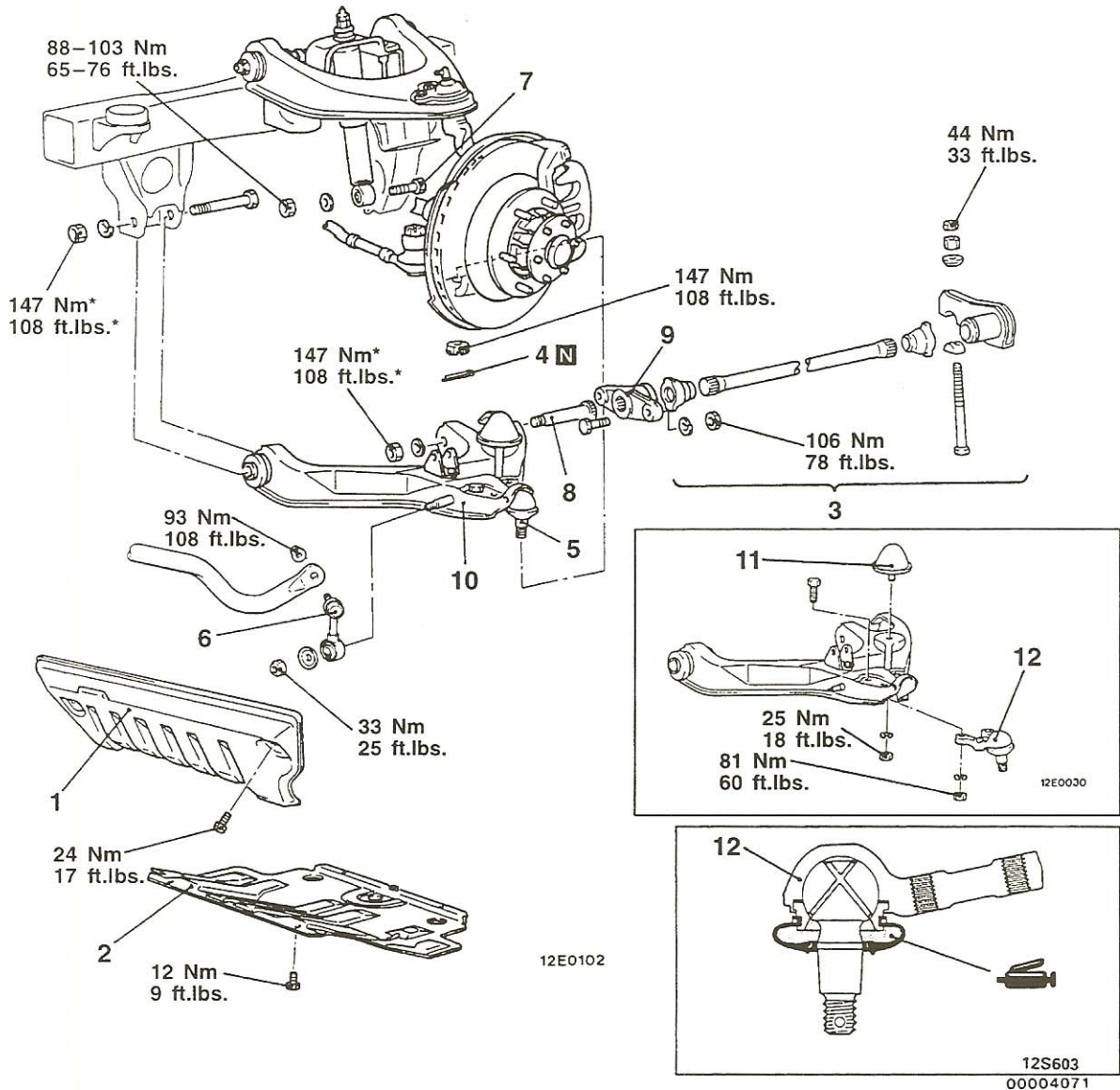


LOWER ARM

REMOVAL AND INSTALLATION

Post-installation Operation

- Press the dust cover with a finger to check whether the dust cover is cracked or damaged.
- Wheel Alignment Inspection and Adjustment (Refer to P.33A-9.)



Removal steps

1. Under skid plate
2. Under cover
 - Bump stopper and bump stopper bracket clearance adjustment (Refer to P.33A-18.)
3. Torsion bar (Refer to P.33A-17.)
4. Split pin
5. Lower ball joint and knuckle connection
6. Stabilizer link assembly (Refer to P.33A-19.)

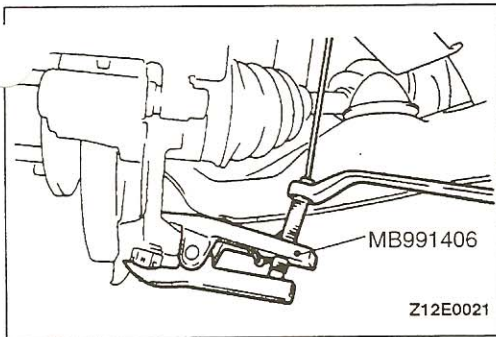
7. Shock absorber mounting bolts
8. Lower arm shaft
9. Anchor arm B
10. Lower arm
11. Bump stopper
12. Lower ball joint

NOTE

- *: Indicates part which should be temporarily tightened, and then fully tightened with the vehicle in an unladen condition.



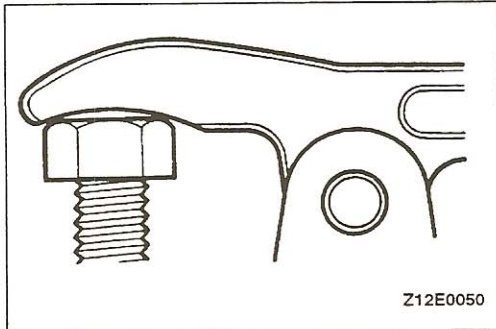
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**REMOVAL SERVICE POINT****◀A▶ LOWER BALL JOINT AND KNUCKLE DISCONNECTION**

Use the special tool to disconnect the lower arm ball joint from the knuckle.

Caution

1. Be sure to tie the cord of the special tool to the nearby part.
2. The nut should only be loosened, not removed.
3. Insert the special tool securely.

**INSPECTION**

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LOWER ARM BALL JOINT END PLAY

Check the lower ball joint end play by the following procedure.

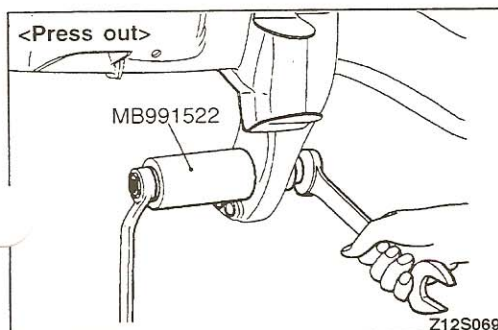
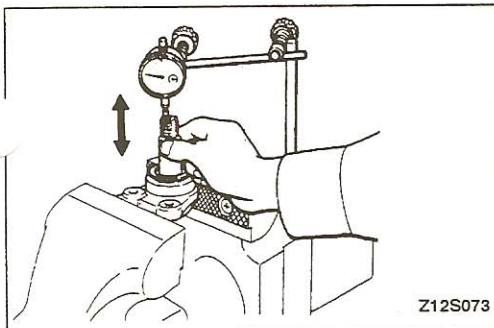
1. Use a dial indicator to measure the lower ball joint end play.
 - Limit: 0.3 mm (.012 in.)**
2. If the lower ball joint end play exceeds the limit, replace the lower ball joint.

LOWER ARM 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 lower arm. (Refer to P.33A-14.)

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.

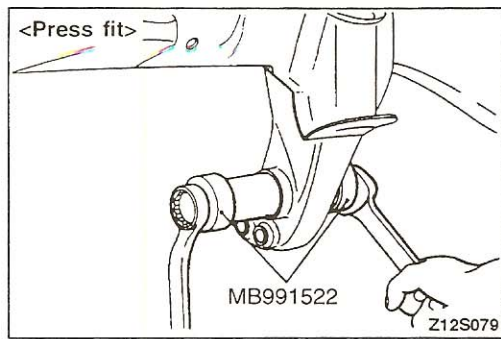
**REAR LOWER ARM BUSHING REPLACEMENT**

33200810019

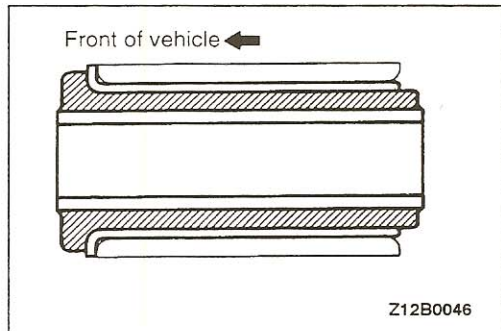
1. Using the special tool, remove the rear lower arm bushing from the bracket.

NOTE

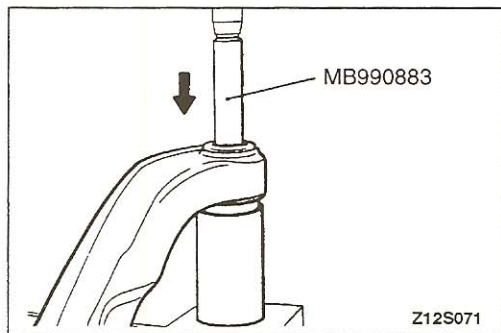
When removing the left hand rear lower arm bushing detach the differential carrier.



- Using the special tool, press-fit the rear lower arm bushing into the bracket.

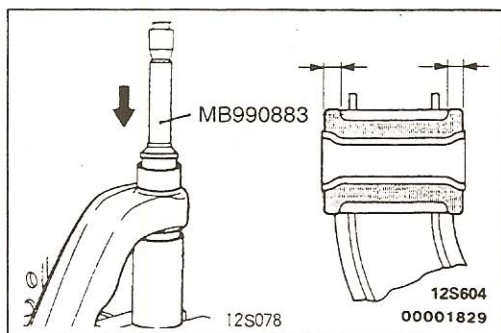
**NOTE**

Rear lower arm bushing should be installed so that it faces as shown in the illustration.

**FRONT LOWER ARM BUSHING REPLACEMENT**

33200810026

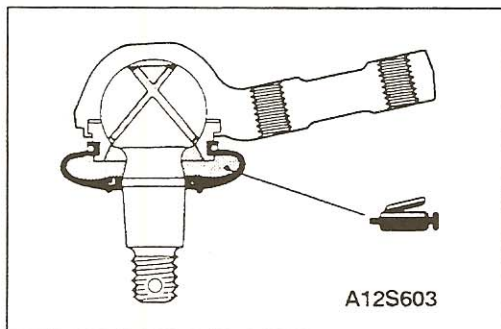
- Use the special tools to remove the front lower arm bushing from the lower arm.



- Coat the front lower arm bushing and the lower arm with soap solution, and then use the special tool to press-fit the front lower arm bushing into the lower arm, taking care not to twist or tilt front lower arm bushing.

NOTE

Press-fit the front lower arm bushing again from the opposite side to equalize bushing projections at both ends.

**LOWER ARM BALL JOINT DUST COVER REPLACEMENT**

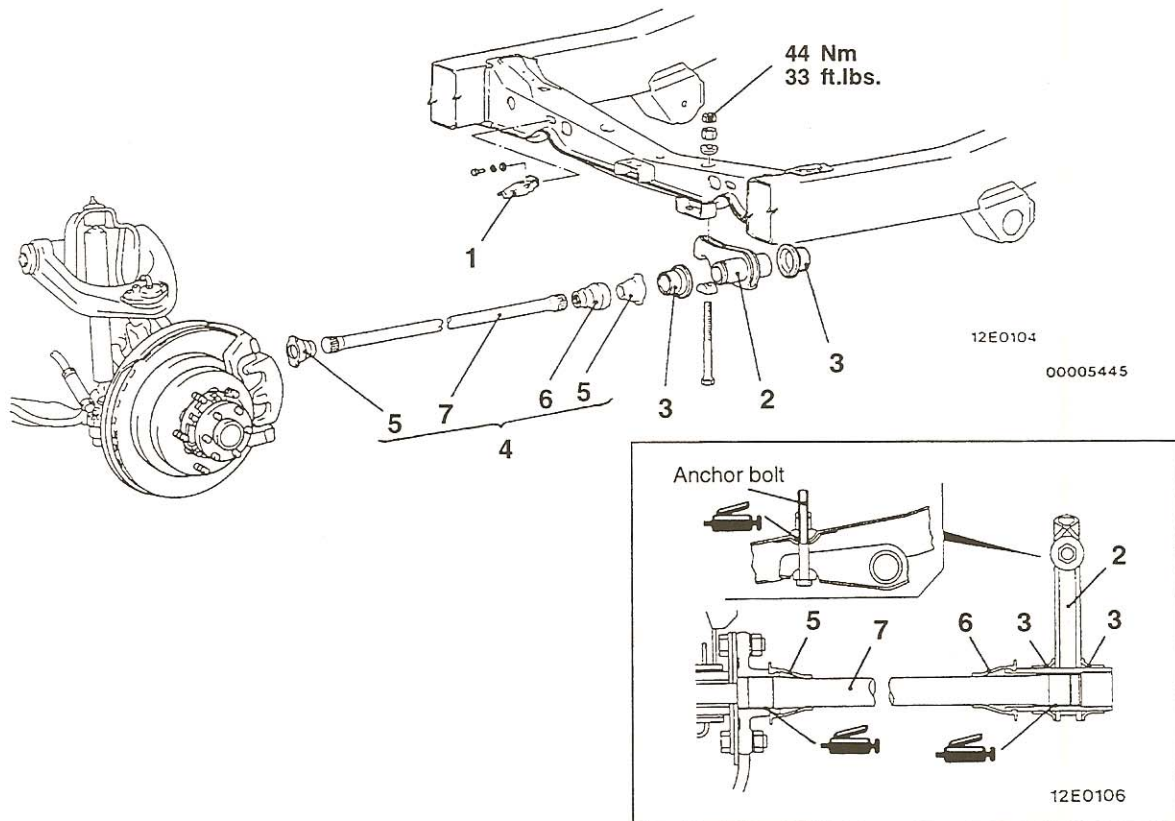
33200820012

Only when dust cover is damaged accidentally during service work, replace the dust cover as follows:

- Apply multipurpose grease to the interior of dust cover and the lower arm ball joint.
- Secure the dust cover to the lower arm ball joint ring.
- Press the dust cover with a finger to check whether the dust cover is cracked or damaged.

TORSION BAR

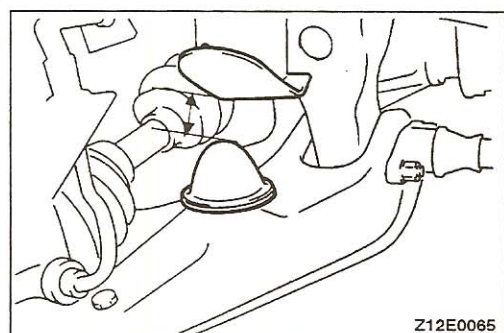
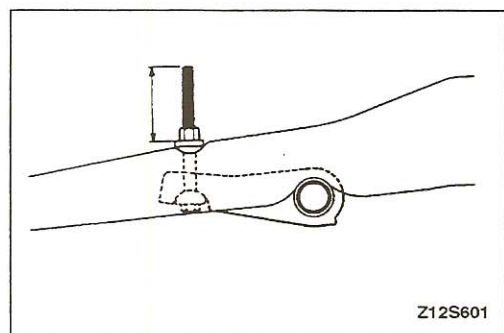
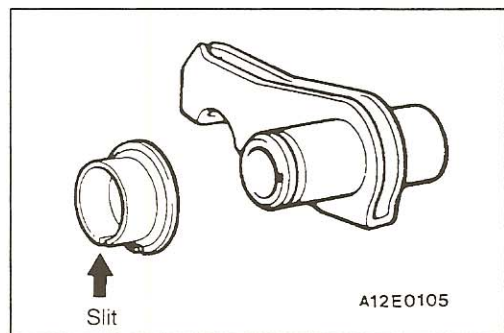
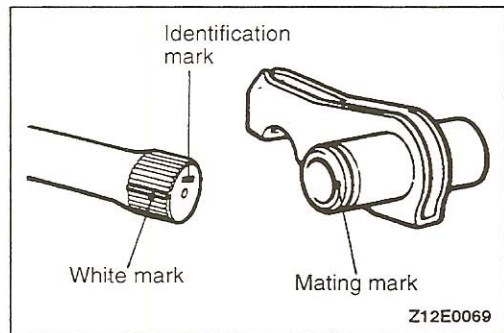
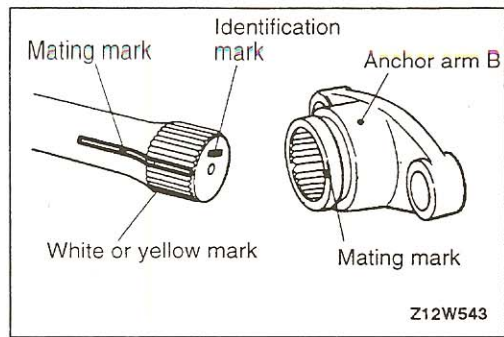
REMOVAL AND INSTALLATION



Removal steps

- ▶C◀ 1. Heat protector (right side only)
 - Bump stopper and bump stopper bracket clearance adjustment
- ▶B◀ 2. Anchor arm assembly
- ▶B◀ 3. Anchor collar

- ▶A◀ 4. Torsion bar assembly
- 5. Dust covers
- 6. Heat cover (right side only)
- 7. Torsion bar



INSTALLATION SERVICE POINTS

▶A◀ TORSION BAR ASSEMBLY INSTALLATION

- (1) Check the identification marks at the end of the left and right shock absorbers.
R → for right side
L → for left side
- (2) When installing the torsion bar, align the white mark on the serrated section of the torsion bar with the mating mark on the anchor arm.

▶B◀ ANCHOR COLLAR INSTALLATION

- (1) Install the anchor collar with the slit downward.

▶C◀ BUMP STOPPER AND BUMP STOPPER BRACKET CLEARANCE ADJUSTMENT

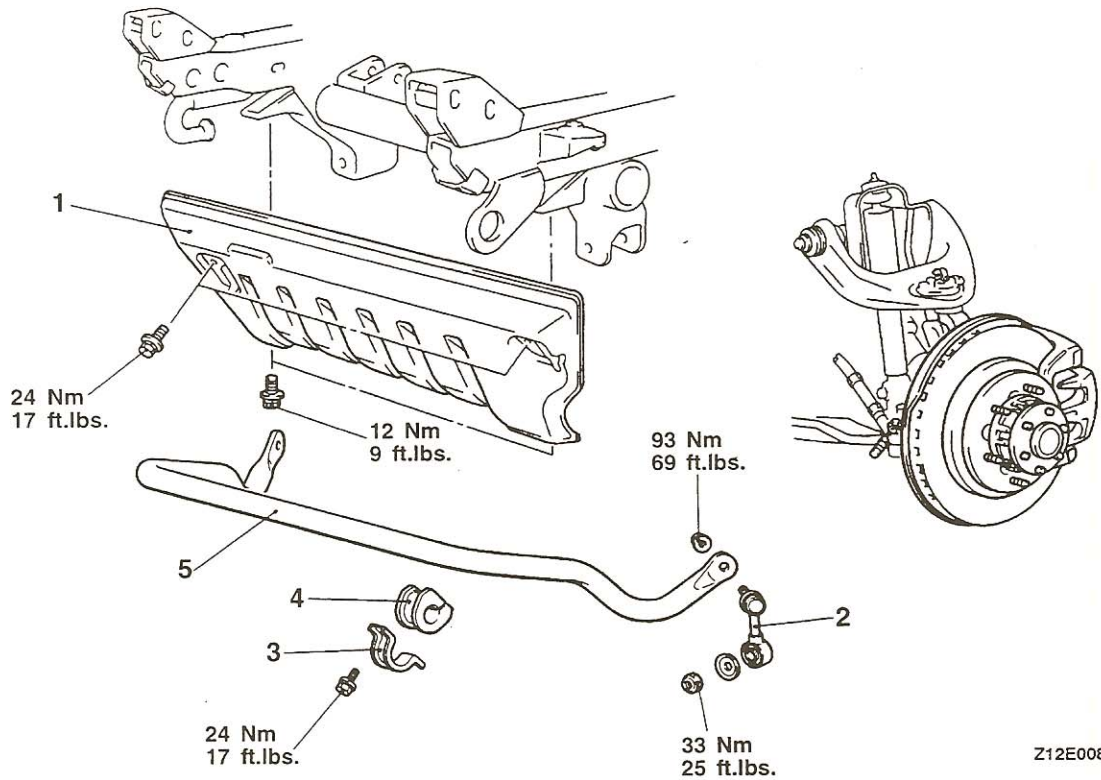
- (1) Tighten the adjusting nut until the protruding length of the anchor bolt is 80 mm (3.15 in.) or less.
- (2) With the vehicle in an unladen condition, measure the distance from the bump stopper to the bump stopper bracket to check if it is at the standard value.
Standard value: 21–23 mm (.83–.91 in.)
- (3) If outside the standard value, adjust the anchor bolt with the adjusting nut.

STABILIZER BAR

REMOVAL AND INSTALLATION

Post-installation Operation

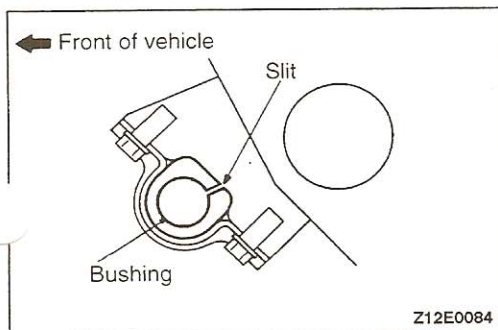
- Press the dust cover with a finger to check whether the dust cover is cracked or damaged.



Z12E0087

Removal steps

- | | |
|--|--|
| <p>►B◄</p> <ol style="list-style-type: none"> 1. Under skid plate 2. Stabilizer link assembly 3. Stabilizer bar bracket | <p>►A◄</p> <ol style="list-style-type: none"> 4. Bushing 5. Stabilizer bar |
|--|--|

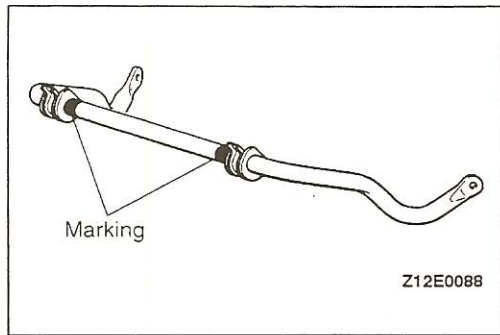


Z12E0084

INSTALLATION SERVICE POINTS

►A◄ BUSHING INSTALLATION

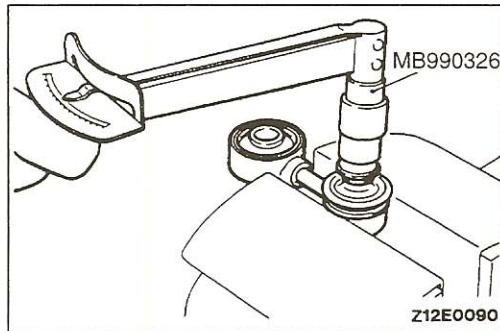
Install the bushing so that the slit is in the position shown in the illustration.



►B◄ STABILIZER BAR BRACKET INSTALLATION

Position the stabilizer bar so that the marking on the stabilizer bar and the edge of the bracket becomes the reference value, and then tighten the stabilizer bar bracket mounting bolt.

Reference value: Approx. 10 mm (.39 in.)



INSPECTION

33200410028

STABILIZER LINK BALL JOINT FOR BREAKAWAY 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 breakaway torque of the ball joint.

Standard value: 1.7–3.1 Nm (15–27 in.lbs.)

2. When the measured value exceeds the standard value, replace the ball joint.
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.

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 assembly. (Refer to P.33A-19.)

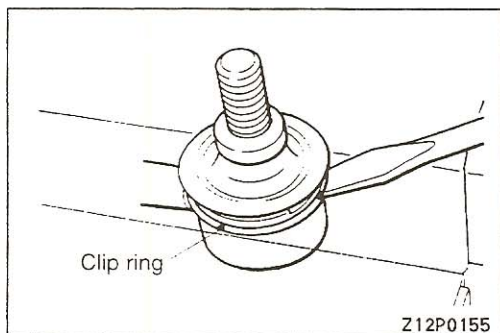
NOTE

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.

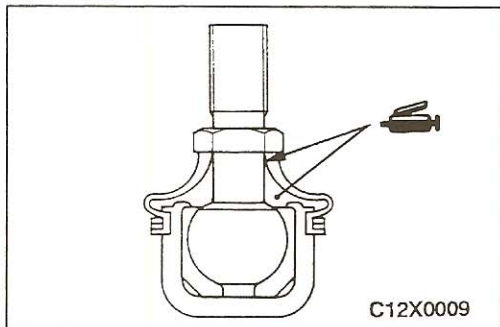
STABILIZER LINK BALL JOINT DUST COVER REPLACEMENT

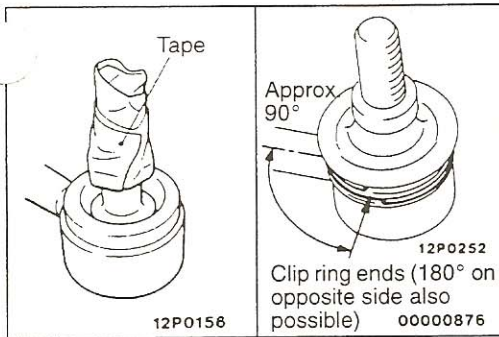
33200830015

- (1) Remove the clip ring and the dust cover.



- (2) Apply multi-purpose grease to the lip and inside of the dust cover.



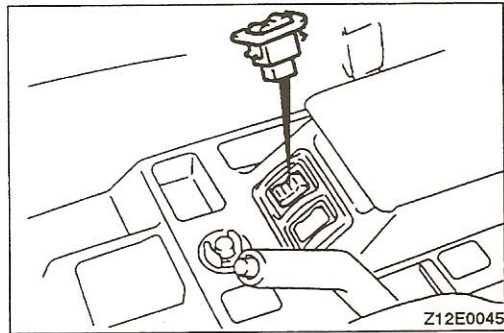


- (3) Use vinyl tape to tape the stabilizer link where shown in the illustration, and then install the dust cover to the stabilizer link.
- (4) Secure the dust cover with the clip ring.

NOTE

When installing the clip ring, align it so that its ends are located at a 90° angle from the axis of the stabilizer link.

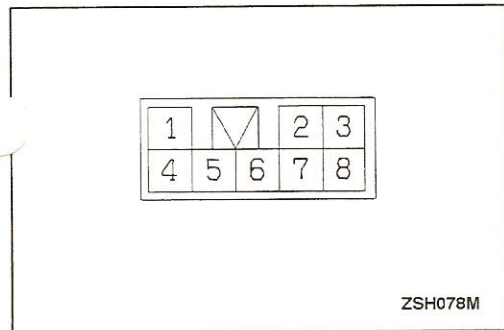
- (5) Press the dust cover with a finger to check whether the dust cover is cracked or damaged.



CONTROL SWITCH

33200720015

REMOVAL AND INSTALLATION



INSPECTION

33200730018

Operate the switch and check the continuity between the terminals.

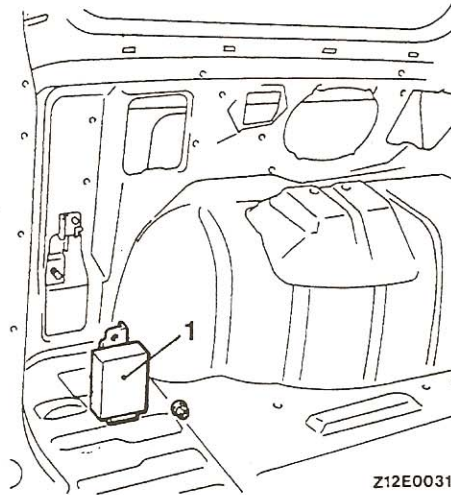
Switch position	Terminal					
	4	5	6	2	7	1
H (Hard)			○—○			
M (Medium)		○—○		○—○		
S (Soft)	○—○			○—○		
						ILL

CONTROL UNIT

33200750021

REMOVAL AND INSTALLATION**Pre-removal and Post-installation Operation**

- Quarter Trim Lower Removal and Installation
(Refer to GROUP 52A – Trims.)



1. Control unit

INSPECTION

Refer to TROUBLESHOOTING.

33200760000

REAR SUSPENSION

CONTENTS

3410900053

COIL SPRING AND AXLE BUMPER	8	SERVICE SPECIFICATIONS	2
GENERAL SPECIFICATIONS	2	SHOCK ABSORBER AND LATERAL ROD ...	6
LOWER ARM	4	Lateral Rod Bushing Replacement	7
Lower Arm Rear Bushing Replacement	5	SPECIAL TOOLS	3
ON-VEHICLE SERVICE	3	STABILIZER BAR	9
Rear Wheel Alignment	3	TROUBLESHOOTING	3

34-2 REAR SUSPENSION – General Specifications/Service Specifications

GENERAL SPECIFICATIONS

34100020096

SUSPENSION TYPE

Items	Specifications
Suspension system	Coil spring type 3-link rigid axle suspension

COIL SPRING <Normal type>

Items	Specifications
Wire dia.×O.D.×free length mm (in.)	14.2 to 15.8×160.2 to 161.8×404.5 (.56 to .62×6.31 to 6.37×15.93)
Coil spring identification color	Green×1
Spring constant N/mm (lbs./in.)	27 to 39 (151 to 218)

COIL SPRING <Sport type>

Items	Specifications
Wire dia.×O.D.×free length mm (in.)	11.8 to 16.0×157.8 to 162.0×396.5 (.47 to .63×6.21 to 6.38×15.61)
Coil spring identification color	Light blue×1
Spring constant N/mm (lbs./in.)	27 to 44 (151 to 252)

SHOCK ABSORBER

Items		Vehicles without remote-controlled variable shock absorbers	Vehicles with remote-controlled variable shock absorbers
		Max. length mm (in.)	457 (18.0)
Min. length mm (in.)		297 (11.7)	297 (11.7)
Stroke mm (in.)		160 (6.3)	160 (6.3)
Damping force [at 0.3 m/sec. (0.9 ft./sec.)] N (lbs.)	Expansion	2,059 (463)	Hard: 3,560 (800) Medium: 2,285 (514) Soft: 1,608 (362)
	Contraction	1,196 (269)	Hard: 1,667 (375) Medium: 1,226 (276) Soft: 814 (183)

SERVICE SPECIFICATIONS


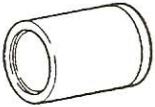

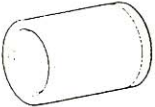
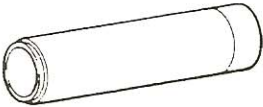

34100030068

Items	Standard value
Toe-in mm (in.)	0 (Non-adjustable)
Camber	0° (Non-adjustable)
Protruding length of stabilizer bar mounting bolt mm (in.)	15–17 (.59–.67)
Protruding length of shock absorber mounting bolt mm (in.)	1–2 (.04–.08)
Distance between actuator mounting surface and shock absorber stud end mm (in.)	1.5–2.5 (.06–.10)

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SPECIAL TOOLS

34100060050

Tool	Tool number and name	Supersession	Application
	MB991293 Rear suspension bushing arbor	–	Removal and installation of lower arm rear bushing
	MB990891 Bushing remover installer base	–	
	MB991318 Lower arm bushing arbor	–	
	MB990971 Bushing remover installer base	–	
	MB991411 Rear wheel bearing and hub installer joint	–	
	MB990650 Lower arm bushing arbor	–	

TROUBLESHOOTING

34100070039

Refer to GROUP 33A–Troubleshooting.

ON-VEHICLE SERVICE

33100100052

REAR WHEEL ALIGNMENT

The rear suspension assembly must be free of worn, loose or damaged parts prior to measurement of rear wheel alignment.

Standard value:

Toe-in 0 mm (0 in.)

Camber 0°

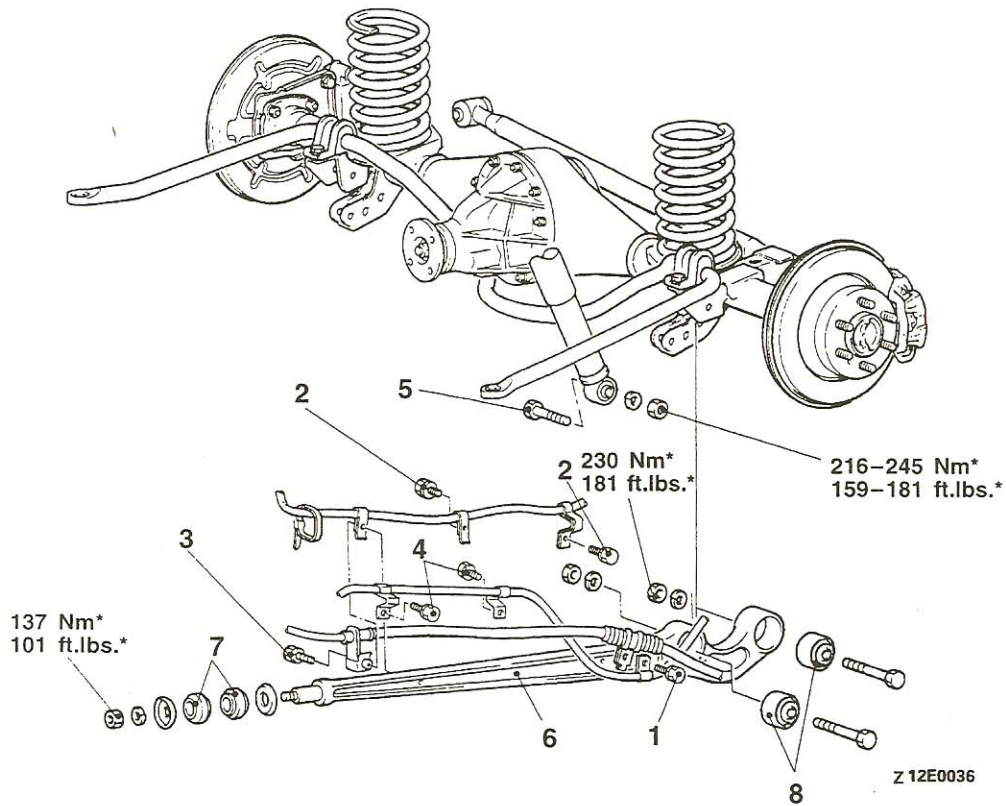
NOTE

Toe-in and camber are set at the factory and cannot be adjusted.

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LOWER ARM

REMOVAL AND INSTALLATION



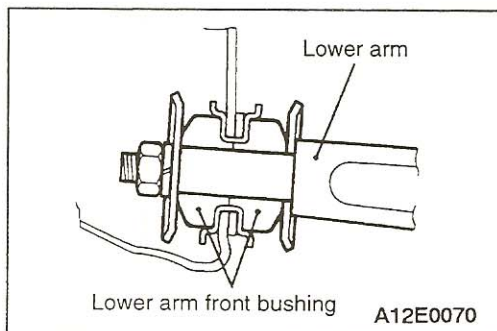
Removal steps

1. Parking brake cable attaching bolt
2. Rear differential lock position harness attaching bolt
3. Parking brake cable attaching bolt
4. Rear sensor attaching bolt (Vehicles with ABS)
5. Shock absorber mounting bolts (lower side)

- ▶A◀
6. Lower arm
 7. Lower arm front bushing
 8. Lower arm rear bushing

NOTE

*: Indicates part which should be temporarily tightened, and then fully tightened with the vehicle in the unladen condition.



INSTALLATION SERVICE POINT

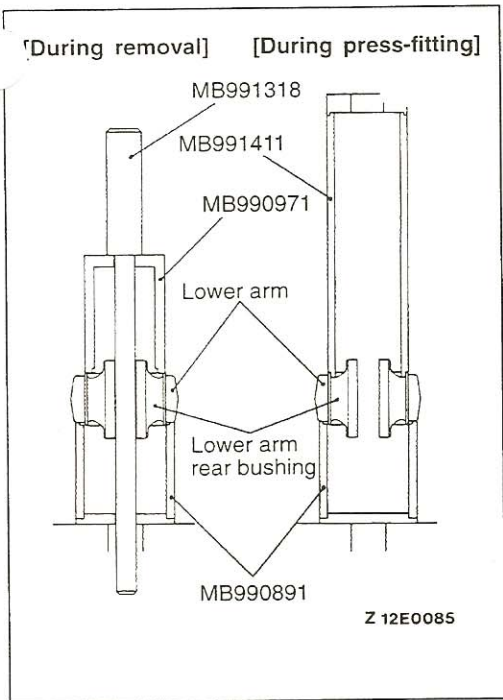
▶A◀ LOWER ARM FRONT BUSHING INSTALLATION

Install the lower arm front bushing so that its direction will be as shown in the illustration.

LOWER ARM REAR BUSHING REPLACEMENT

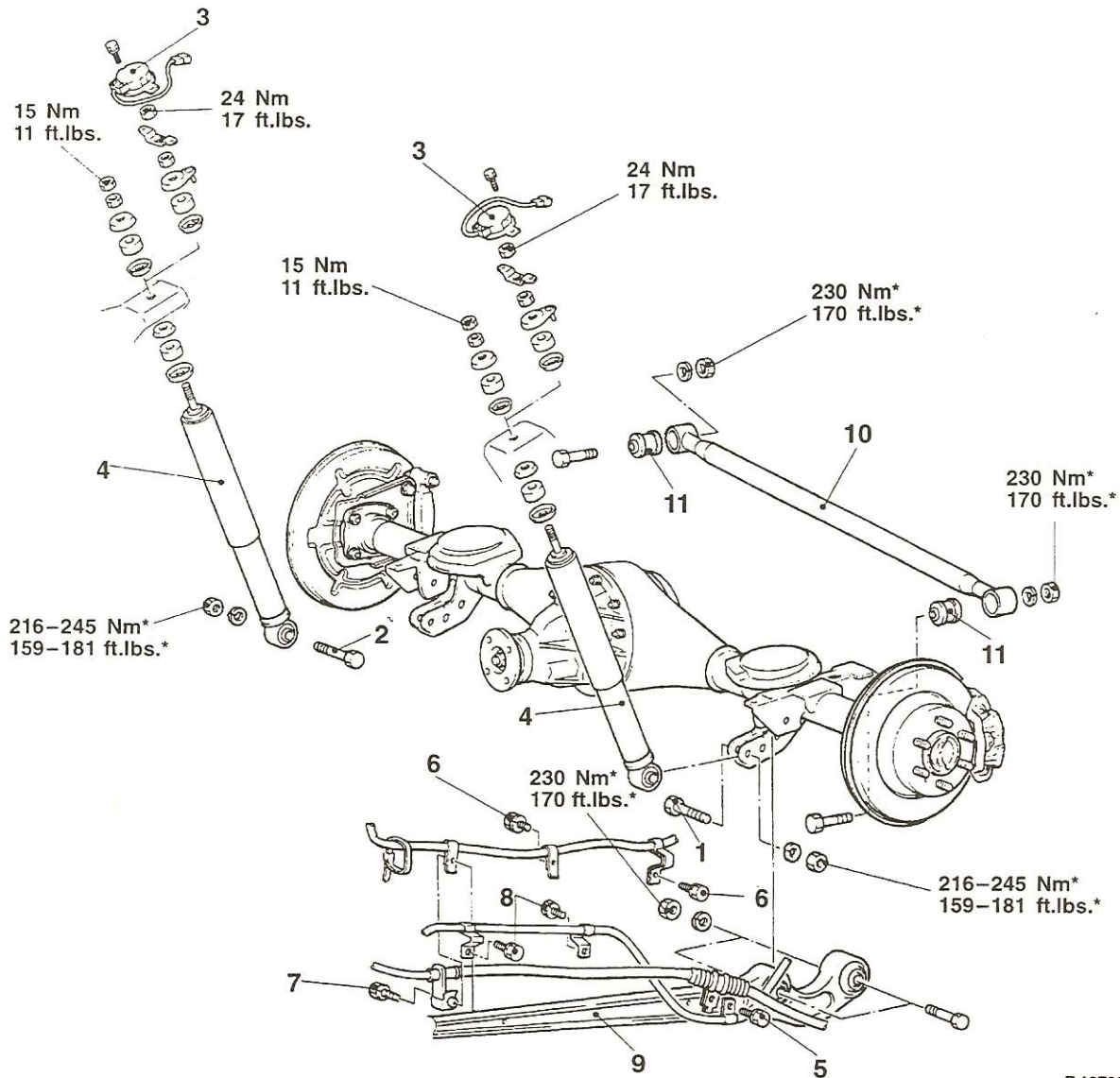
34101110013

Use the special tool to replace the lower arm rear bushing.



SHOCK ABSORBER AND LATERAL ROD

REMOVAL AND INSTALLATION



Z 12E0038

Shock absorber removal steps

1. Shock absorber mounting bolt (lower left side)
2. Shock absorber mounting bolt (lower right side)
- ▶▲ 3. Actuator (Vehicles with remote-controlled variable shock absorbers)
- ▶▲ 4. Shock absorber

Lateral rod removal steps

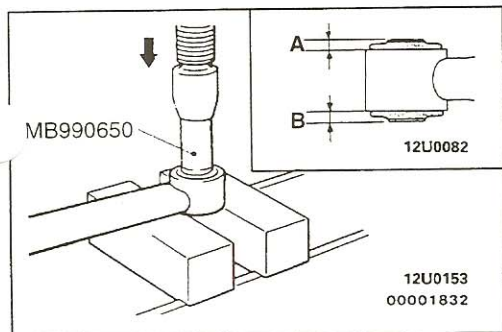
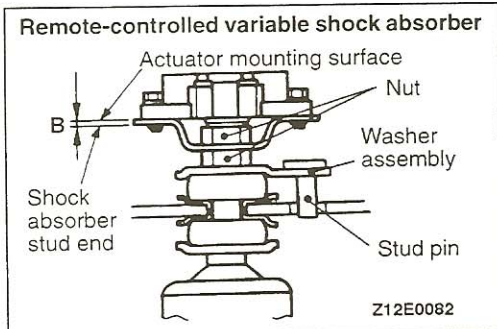
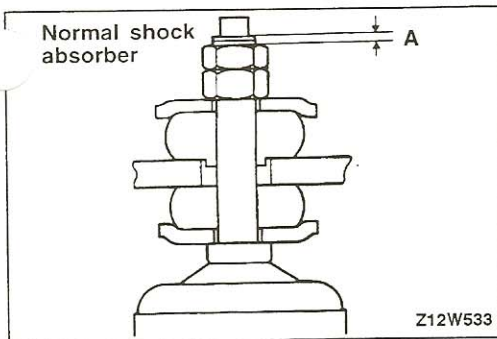
1. Shock absorber mounting bolt (lower left side)
5. Parking brake cable attaching bolt (LH side)

6. Rear differential lock position harness attaching bolt
7. Parking brake cable attaching bolt (LH side)
8. Rear sensor attaching bolt (Vehicles with ABS)
9. Lower arm
10. Lateral rod
11. Lateral rod bushing

NOTE

*: Indicates part which should be temporarily tightened, and then fully tightened with the vehicle in the unl: condition.

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INSTALLATION SERVICE POINT

▶A◀ SHOCK ABSORBER/ACTUATOR (VEHICLES WITH REMOTE CONTROLLED VARIABLE SHOCK ABSORBERS) INSTALLATION

Tighten the nut so that the values shown in the figure (A and B) are at the standard values.

Standard value

(A): 1–2 mm (.04–.08 in.)

(B): 1.5–2.5 mm (.06–.10 in.)

Caution

When tightening the nut, be careful not to bend the stud pin of the washer assembly.

LATERAL ROD BUSHING REPLACEMENT

34101120016

- (1) Use the special tool to drive out and press in the lateral rod bushing.
- (2) Be careful that the difference (A – B) in bushing projection distances does not exceed the following value.

$$A - B = 0 \pm 1.0 \text{ mm } (0 \pm .04 \text{ in.})$$

Caution

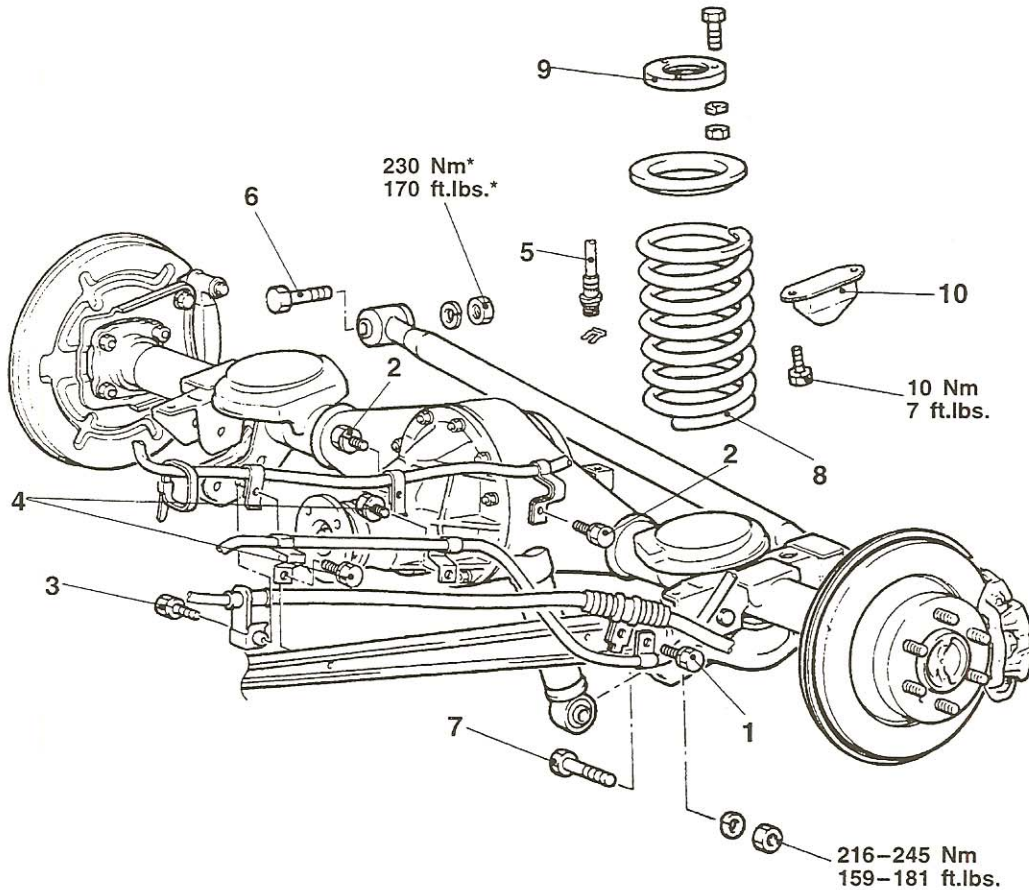
When pressing in the bushing, apply a sufficient amount of liquid soap to the inside of the lateral rod eyes and the rubber area of the bushing.

COIL SPRING AND AXLE BUMPER

REMOVAL AND INSTALLATION

Post-installation Operation

- Brake Fluid Filling and Air Bleeding
(Vehicles without ABS: Refer to GROUP 35A – On-vehicle Service.)
(Vehicles with ABS: Refer to GROUP 35C – On-vehicle Service.)



Z 12E0037

Removal steps

- | | | |
|---|------------|--|
| <ol style="list-style-type: none"> 1. Parking brake cable attaching bolt 2. Rear differential lock position harness attaching bolt 3. Parking brake cable attaching bolt 4. Rear sensor attaching bolt (Vehicles with ABS) 5. Brake hose connection 6. Lateral rod mounting bolt (body side only) | <p>◀A▶</p> | <ol style="list-style-type: none"> 7. Shock absorber mounting bolt (lower side only) 8. Coil spring 9. Rear spring pad 10. Helper rubber |
|---|------------|--|

NOTE

*: Indicates part which should be temporarily tightened, and then fully tightened with the vehicle in the unladen condition.

REMOVAL SERVICE POINT

◀A▶ COIL SPRING REMOVAL

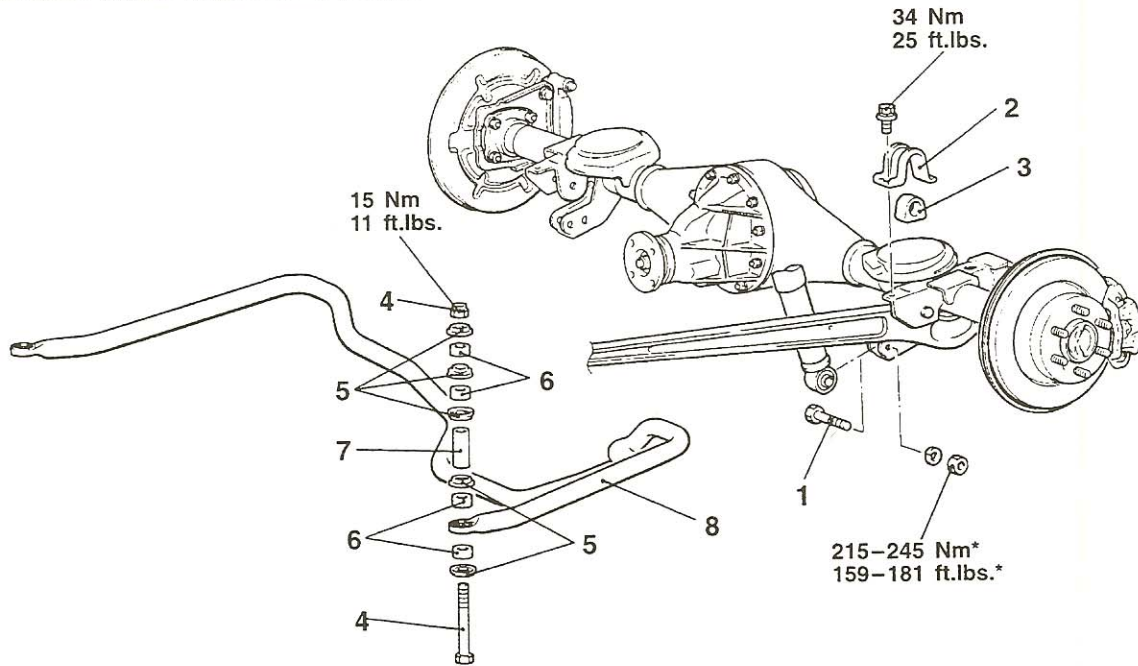
Slowly lower the jack supporting the axle housing, and remove the coil spring and rear spring pad.

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34100970018

STABILIZER BAR

REMOVAL AND INSTALLATION



Z 12E0089

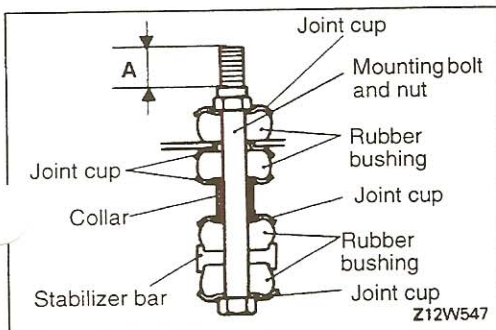
Removal steps

1. Shock absorber mounting bolts (lower side)
2. Bracket C
3. Bushing B
- ▶A◀ 4. Stabilizer bar mounting bolt and nut

5. Joint cup
6. Rubber bushing
7. Collar
8. Stabilizer bar

NOTE

*: Indicates part which should be temporarily tightened, and then fully tightened with the vehicle in the unladen condition.



INSTALLATION SERVICE POINT

▶A◀ STABILIZER BAR MOUNTING BOLT AND NUT INSTALLATION

- (1) To install the stabilizer bar, assemble the joint cups and rubber bushings by the order and the certain direction as shown in the figure.
- (2) Install the nut on the stabilizer bar mounting bolt to the specified dimensions.

Standard value (A): 15–17 mm (.59–.67 in.)

NOTES

SERVICE BRAKES

CONTENTS

3510900098

BASIC BRAKE SYSTEM	35A
ANTI-LOCK BRAKING SYSTEM (ABS) <2WD>	35B
ANTI-LOCK BRAKING SYSTEM (ABS) <AWD>	35C
REAR ANTI-LOCK BRAKING SYSTEM (REAR ABS)	35D

NOTE

The tinted sections are not included in this manual.

NOTES

BASIC BRAKE SYSTEM

CONTENTS

35109000104

BRAKE LINE	25	Front Brake Disc Runout Check and Correction	12
BRAKE PEDAL	18	Front Brake Disc Thickness Check	13
FRONT DISC BRAKE	26	Front Disc Brake Pad Check and Replacement	10
GENERAL SPECIFICATIONS	2	Front Disc Brake Rotor Check	12
LUBRICANTS	3	Load Sensing Proportioning Valve Function Test	8
MASTER CYLINDER AND BRAKE BOOSTER	20	Load Sensing Spring Length Check and Adjustment	8
Master Cylinder	23	Rear Brake Disc Runout Check and Correction	15
ON-VEHICLE SERVICE	6	Rear Brake Disc Thickness Check	15
Bleeding	9	Rear Disc Brake Pad Check and Replacement	14
Brake Booster Operating Test	6	REAR DISC BRAKE	32
Brake Drum Inside Diameter Check	17	SEALANTS	3
Brake Fluid Level Sensor Check	7	SERVICE SPECIFICATIONS	2
Brake Lining and Brake Drum Contact Check	17	SPECIAL TOOLS	3
Brake Lining Thickness Check	16	TROUBLESHOOTING	4
Brake Pedal Check and Adjustment	6		
Check Valve Operation Check	7		

GENERAL SPECIFICATIONS

35100020931

Items		Specifications
Master cylinder	Type	Tandem Type (with level sensor)
	I.D. mm (in.)	23.8 (15/16)
Brake booster	Type	Vacuum Type, tandem
	Effective dia. of power cylinder mm (in.)	205+230 (8+9)
	Boosting ratio	6.0
Proportioning valve type		Load sending proportioning type
Front brakes	Type	Floating caliper, dual pistons, ventilated disc (M-R57W)
	Disc effective dia.×thickness mm (in.)	228×27 (8.98×1.06)
	Wheel cylinder I.D. mm (in.)	42.8 (1 11/16)×2
	Lining thickness mm (in.)	10 (.39)
	Clearance adjustment	Automatic
Rear brakes	Type	Floating caliper, single piston, solid disc (M-R59S)
	Disc effective dia.×thickness mm (in.)	272×18 (10.71×.71)
	Wheel cylinder I.D. mm (in.)	42.8 (1 11/16)
	Lining thickness mm (in.)	9 (.354)
	Clearance adjustment	Automatic

SERVICE SPECIFICATIONS

35100030157

Items		Standard value	Limit	
Brake pedal height mm (in.)		186 – 191 (7.3 – 7.5)	–	
Brake pedal to firewall clearance mm (in.)		100 (3.94) or more	–	
Brake pedal free play mm (in.)		3 – 8 (.12 – .32)	–	
Load sensing spring length mm (in.)		224 – 228 (8.8 – 9.0)	–	
Load sensing proportioning valve output pressure MPa (psi)	When load sensing spring length is 226.7mm (8.9 in.)	Input pressure at 10 (1,422)	6.14 – 7.04 (873.3 – 1,001.3)	–
		Input pressure at 18 (2,560)	7.94 – 9.24 (1,129.3 – 1,314.2)	–
	When load sensing spring length is 257.7mm (10.1 in.)	Input pressure at 18 (2,560)	13.1 – 15.1 (1,863.3 – 2,147.7)	–

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Items		Standard value	Limit
Brake dragging force N (lbs.) [Brake dragging torque] Nm (ft.lbs.)		57 (13) or less [4 (3)] or less	–
Pad thickness mm (in.)	Front	10.0 (.39)	2.0 (.079)
	Rear	9.0 (.35)	–
Disc thickness mm (in.)	Front	27 (1.06)	25.4 (1.0)
	Rear	18 (.71)	16.4 (.646)
Brake disc runout mm (in.)	Front	–	0.06 (.0024)
	Rear	–	0.08 (.0031)
Hub end play mm (in.)		–	0.25 (.0098)
Lining thickness mm (in.)		6.5 (.256)	4.5 (.177)
Brake drum inside diameter mm (in.)		197 (7.756)	198 (7.795)

LUBRICANTS

35100040051

Items	Specified lubricants
Brake fluid	DOT 3 or DOT 4
Brake piston boot inner surfaces	Repair kit grease
Lock pin boot inner surfaces	
Guide pin boot inner surfaces	

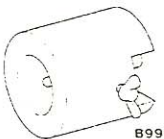
SEALANTS

35100050054

Items	Specified sealants
Thread part of fitting	3M ATD Part No. 8663 or equivalent

SPECIAL TOOLS

35100060156

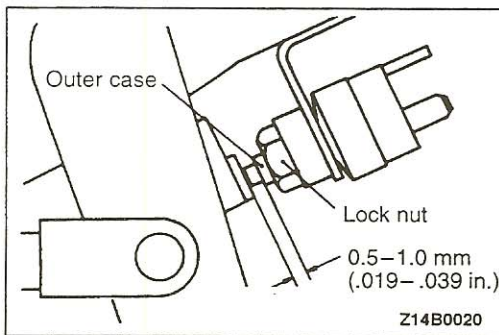
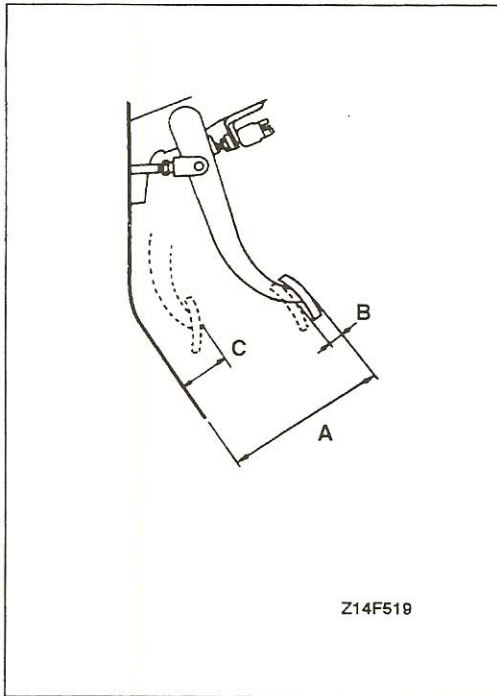
Tool	Tool number and name	Supersession	Application
 <small>B991714</small>	MB991714 Push rod adjusting gauge		Adjusting clearance between brake booster push rod and primary piston

TROUBLESHOOTING

35100070043

Trouble Symptom	Probable Cause	Remedy
Vehicle pulls to one side when brakes are applied	Grease or oil on pad	Replace
	Poor pad contact	Correct
Insufficient braking power	Low or deteriorated brake fluid	Refill or change
	Air in brake system	Bleed the air.
	Vapor lock caused by dragging of the pad	Correct
	Grease or oil on pad	Replace
	Poor pad contact	Correct
	Malfunction of brake booster	Correct
	Clogged brake line	Correct
	Malfunction of proportioning valve	Replace
Increased pedal stroke (Reduced pedal to floorboard clearance)	Air in brake system	Bleed the air.
	Worn pad	Replace
	Excessive push rod to master cylinder clearance	Adjust
	Malfunction of master cylinder	Replace
Brake drag	Incomplete release of parking brake	Correct
	Incorrect parking brake adjustment	Adjust
	Worn brake pedal return spring	Replace
	Lack of lubrication in sliding parts	Lubricate
	Improper push rod to master cylinder clearance	Adjust
	Malfunction of master cylinder piston return spring	Replace
	Clogged master cylinder return port	Correct
Scraping or grinding noise when brakes are applied	Worn brake pad	Replace
	Caliper to wheel interference	Correct or replace
	Interference between dust cover and disc	Correct or replace
	Bent brake backing plate	Correct or replace
	Cracked brake disc	Correct or replace

Trouble Symptom	Probable Cause	Remedy
Squealing, groaning or chattering noise when brakes are applied	Missing or damaged brake pad anti-squeak shim	Replace
	Worn or scored brake discs and pads	Correct or replace
	Burred or rusted calipers	Clean or deburr
	Incorrect brake pedal or booster push rod	Adjust
Squealing noise when brakes are not applied	Bent or loose backing plate	Replace
	Dust cover or brake disc contact	Correct
	Rusted, stuck	Lubricate or replace
	Worn, damaged or insufficiently lubricated wheel bearings	Lubricate or replace
	Improper positioning of pads in caliper	Correct
	Improper installation of support mounting to caliper body	Correct
Groaning, clicking or rattling noise when brakes are not applied	Poor return of brake booster or master cylinder or wheel cylinder	Replace
	Stones or foreign material trapped inside wheel covers	Remove stones, etc.
	Loose wheel nuts	Re-tighten
	Failure of pad shim	Replace
	Worn, damaged or insufficiently lubricated wheel bearings	Lubricate or replace



ON-VEHICLE SERVICE

3510009003

BRAKE PEDAL CHECK AND ADJUSTMENT

1. Turn up the carpet, etc. under the brake pedal.
2. Measure the brake pedal height (A) as shown in the illustration.

Standard value (A): 186 – 191 mm (7.3 – 7.5 in.)

3. Start the engine, depress the brake pedal with approximately 500 N (110 lbs.) of force, and measure the clearance between the brake pedal and the firewall.

Standard value (C): 100 mm (3.94 in.) or more

4. Turn back the carpet, etc.
5. While the engine is stopped, depress the brake pedal two or three times. After thus eliminating the negative pressure in the brake booster, press the pedal down by hand, and confirm that the free play (B) is within the standard value range.

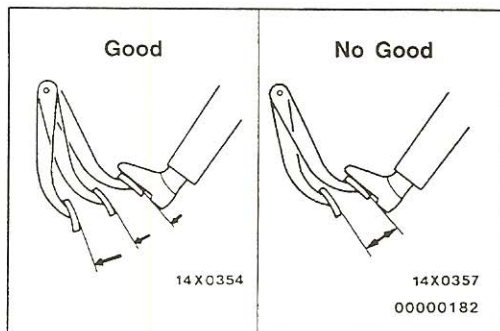
Standard value (B): 3 – 8 mm (.12 – .31 in.)

6. Adjust the brake pedal height.
 - (1) Loosen the lock nut to sufficiently loosen the stop light switch.
 - (2) Adjust the brake pedal height by turning the operation rod with pliers (with lock nut loosened).
 - (3) After turning the stop light switch until it contacts the pedal stop (until immediately before the brake pedal begins to move), turn the stop light switch back 1/2 to 1 revolution and secure with a lock nut.

Caution

Check that the stop light is not illuminated when the brake pedal is not depressed.

7. Check the shift-lock mechanism. (Refer to GROUP 23A – On-vehicle Service.)

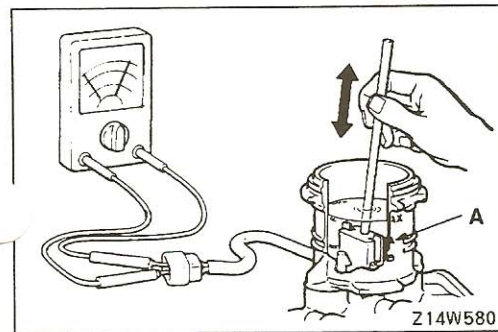
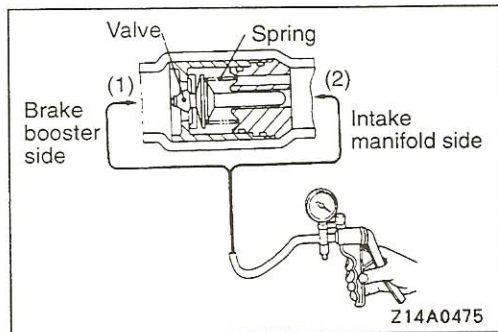
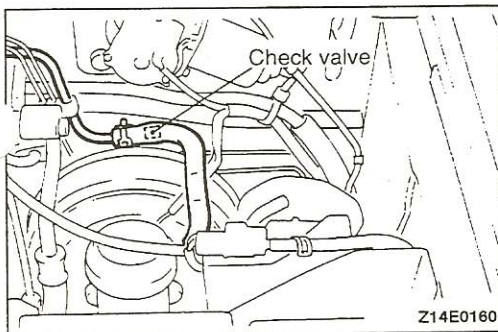
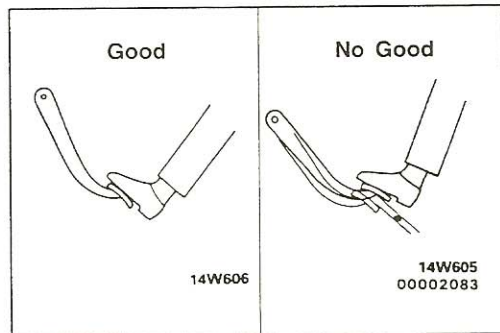
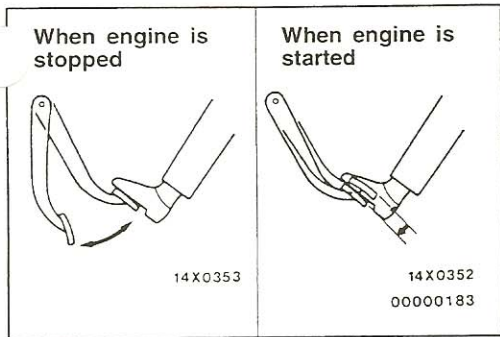


BRAKE BOOSTER OPERATING TEST

35100100056

For simple checking of the brake booster operation, carry out the following tests:

1. Run the engine for one or two minutes, and then stop it. If the pedal depresses fully the first time but gradually becomes higher when depressed succeeding times, the booster is operating properly. If the pedal height remains unchanged, then there is a malfunction of the booster.



2. While the engine is stopped, depress the brake pedal several times.
Then depress the brake pedal and start the engine.
If the pedal moves downward slightly, the booster is in good condition. If there is no change, there is a malfunction of the booster.

3. While the engine is running, depress the brake pedal and then stop the engine.
Keep the pedal depressed for 30 seconds. If the pedal height does not change, the booster is in good condition.
If the pedal rises, there is a malfunction of the booster.
If the above three tests are okay, the booster performance can be judged to be okay.
If any above three test is not okay, there is a malfunction of the check valve, vacuum hose or booster.

CHECK VALVE OPERATION CHECK

35100900069

When checking the check valve, keep the check valve inserted into the vacuum hose.

1. Disconnect the vacuum hose.

NOTE

The check valve is press-fitted inside the vacuum hose.

2. Use a vacuum pump to check the operation of the check valve.

Vacuum pump connection	Accept/reject criteria
Connection at the brake booster side (1)	Negative pressure is created and maintained.
Connection at the engine side (2)	Negative pressure is not created.

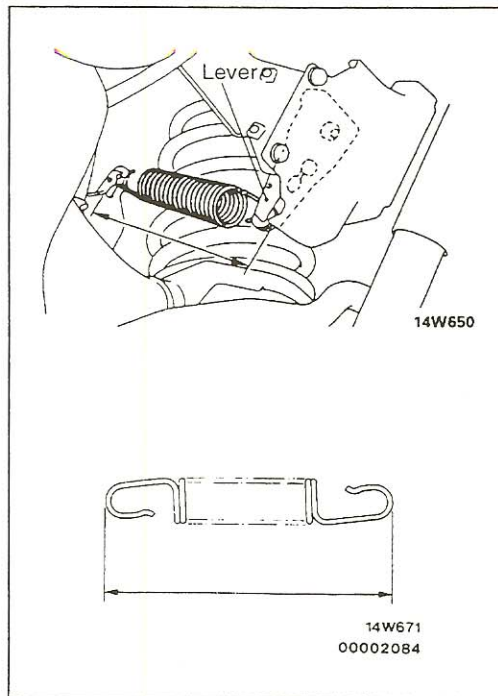
Caution

If there is a malfunction of the check valve, replace it together with the vacuum hose as an assembly.

BRAKE FLUID LEVEL SENSOR CHECK

35100910055

The brake fluid sensor is in good condition if there is no continuity when the float surface is above A and if there is continuity when the float surface is below A.



LOAD SENSING SPRING LENGTH CHECK AND ADJUSTMENT

35100

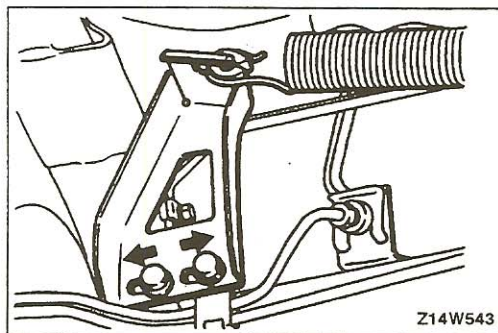
1. Park the vehicle on a level ground. The vehicle should be unloaded and supported only by wheels.

Caution

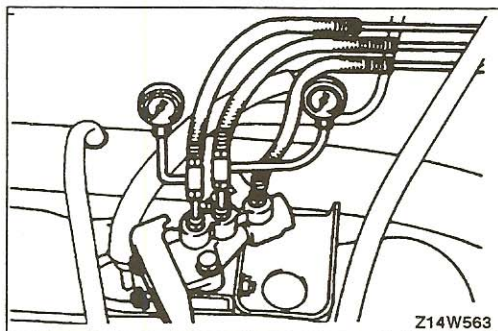
Never support the vehicle with jacks or other similar means.

2. With the lever pressed all the way to the load-sensing proportioning valve side, check whether the length of the spring (the length between its ends) shown in the illustration is at the standard value.

Standard value: 224–228 mm (8.8–9.0 in.)



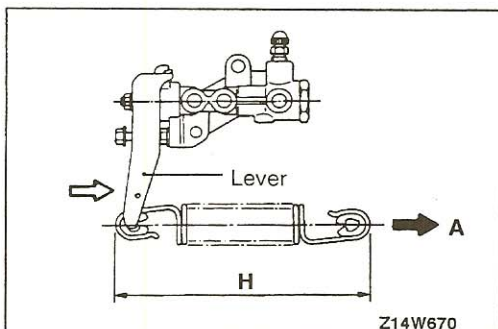
3. If the spring length is not within the standard value, loosen the bolt attaching the support and adjust the distance by moving the support.



LOAD SENSING PROPORTIONING VALVE FUNCTION TEST

35100130017

1. Connect pressure gages to the input and output ports of the load sensing proportioning valve. Bleed the system.



2. Disconnect the spring at the support side.
3. Place the spring so that it is in parallel with the load-sensing proportioning valve, and then pull in the direction indicated by arrow A so that its length H shown in the illustration (the length between its ends) is as noted below.

NOTE

At this time the lever is pressed all the way to load-sensing proportioning valve side. Check that the output fluid pressure is within the standard value at this time.

Standard value:

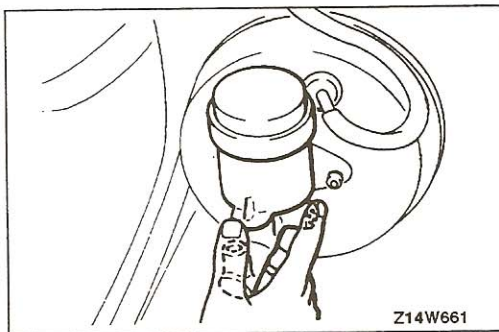
Items	Spring length H mm (in.)	Input fluid pressure MPa (psi)	Output fluid pressure MPa (psi)
Specifications	226.7 (8.9)	10 (1,422)	6.14 – 7.04 (873.3 – 1,001.3)
		18 (2,560)	7.94 – 9.24 (1,129.3 – 1,314.2)

- In the same manner as in step 3., check that the output fluid pressure is within the standard valve when the spring length H is the dimension noted below relative to the load-sensing proportioning valve input fluid pressure.

Standard value:

Items	Spring length H mm (in.)	Input fluid pressure MPa (psi)	Output fluid pressure MPa (psi)
Specifications	257.7 (10.1)	18 (2,560)	13.1 – 15.1 (1,863.3 – 2,147.7)

- After making the check, install the spring. Disconnect the pressure gages from the load-sensing proportioning valve and bleed the air.



BLEEDING

35100140058

Caution

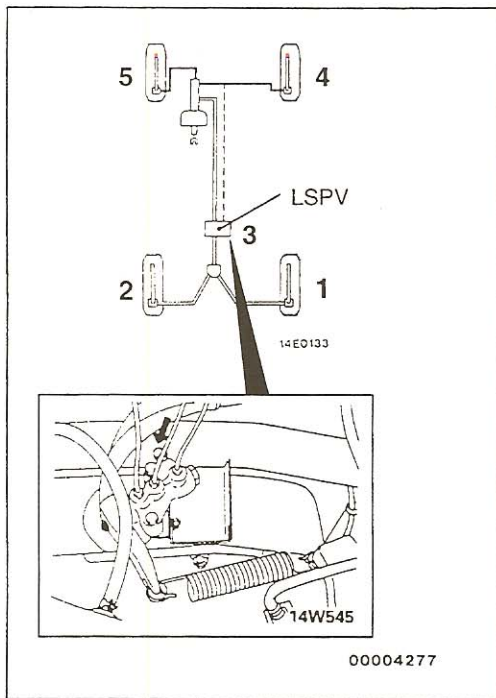
Use only the specified brake fluid. Never mix the specified brake fluid with other fluid as it will influence the braking performance significantly.

Specified brake fluid: DOT 3 or DOT 4

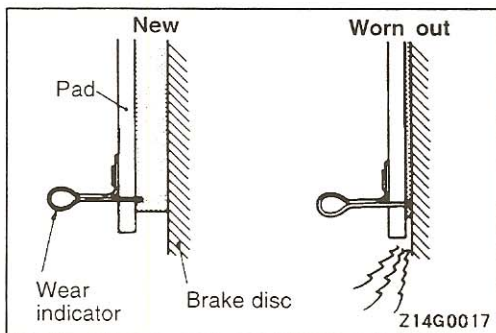
MASTER CYLINDER AIR BLEEDING

If there is no brake fluid in the master cylinder, bleed air from the master cylinder by the following procedure.

- Supply brake fluid to the reservoir tank.
- Depress and hold the brake pedal.
- another person should then plug the outlet of the master cylinder with a finger.
- In the condition in step (3), release the brake pedal.
- Repeat steps (2) to (4) three or four times so as to supply brake fluid inside the master cylinder.

**BRAKE PIPE LINE AIR BLEEDING**

Bleed the brake system in the sequence shown in illustration.

**FRONT DISC BRAKE PAD CHECK AND REPLACEMENT**

35100150051

NOTE

The brake pads have wear indicators that contact the brake disc when the brake pad thickness becomes 2 mm (.08 in.). The wear indicators emit a squealing sound to warn the driver to have the pads replaced and to have the brake system checked.

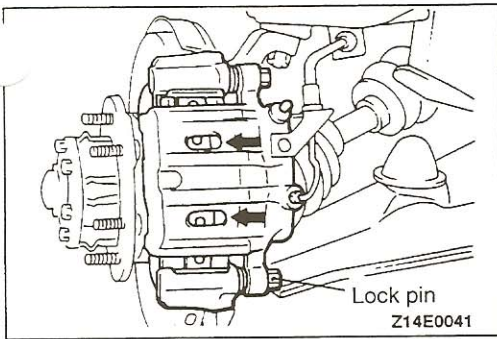
1. Check brake pad thickness through caliper body check port.

Standard value: 10.0 mm (.39 in.)

Limit: 2.0 mm (.08 in.)

Caution

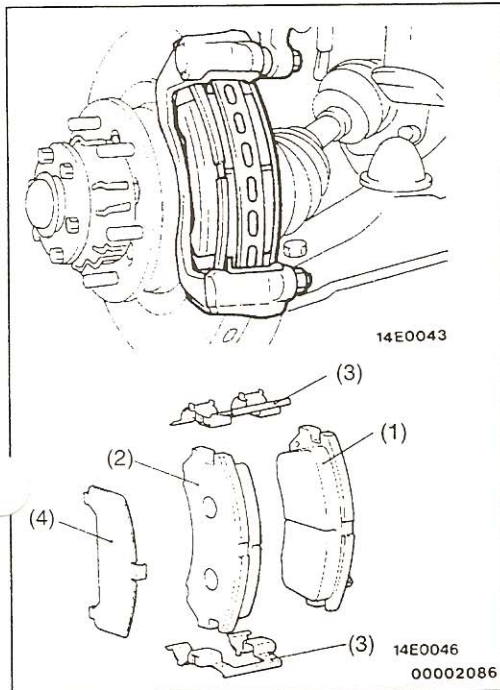
1. When the limit is exceeded, the brake pads on both the left and right wheels must be replaced as a set.
2. If there is a significant difference in the thicknesses of the pads on the left and right sides, check the sliding condition of the piston, lock pin and guide pin.



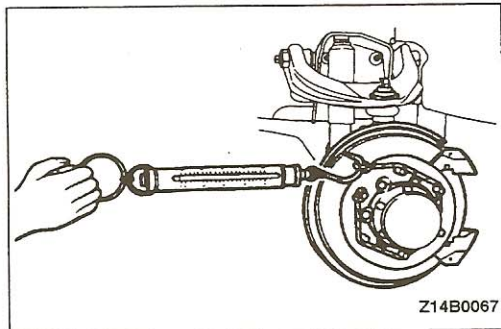
2. Remove the lock pin, and then lift up the caliper assembly and secure it with wire.

Caution

Do not wipe off the special grease that is on the lock pin or allow it to contaminate the lock pin.



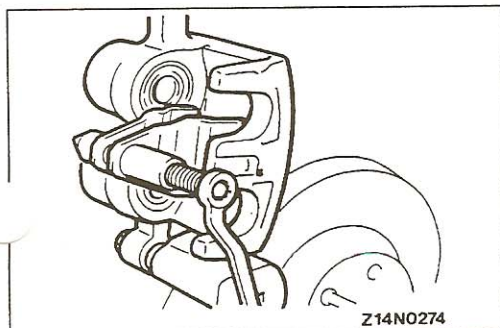
3. Remove the following parts from the caliper support.
 - (1) Pad and wear indicator assembly
 - (2) Pad assembly
 - (3) Clip
 - (4) Outer shim



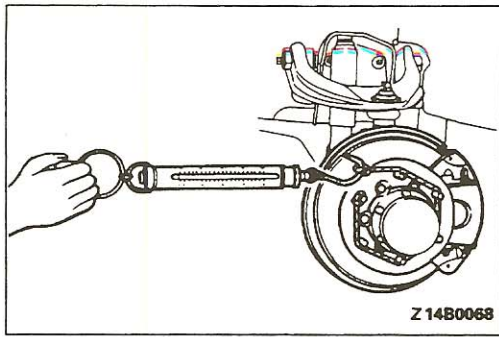
4. In order to measure the dragging force of the disc brakes after installation of the brake pads, use a spring balance to measure the rotational sliding resistance of the hub in the forward direction with the pads removed.
5. Securely attach the pad clip to the caliper support.

Caution

Do not deposit grease or other dirt on pad or brake disc friction surfaces.



6. Clean the piston and press the piston into the cylinder. Be careful that the piston boot does not become caught when lowering the caliper assembly and installing the lock pin.
7. Start the engine and, after strongly depressing the brake pedal 2-3 times, stop the engine.
8. Turn the brake disc forward 10 times.



9. Use a spring balance to measure the rotational sliding resistance of the hub in the forward direction.
10. Calculate the dragging force of the disc brakes (difference between the values measured in steps (8) and (3)).

Standard value: 57 N (13 lbs.) or less

11. If the dragging force exceeds the standard value, disassemble and clean the piston. Check for corrosion or a worn piston seal, and check the sliding condition of the lock pin sleeve and guide pin sleeve.

FRONT DISC BRAKE ROTOR CHECK

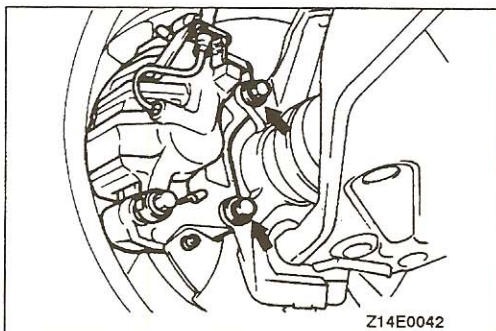
35100270030

Caution

When servicing disc brakes, it is necessary to exercise caution to keep the disc brakes within the allowable service values in order to maintain normal brake operation.

Before re-finishing or re-processing the brake disc surface, the following conditions should be checked.

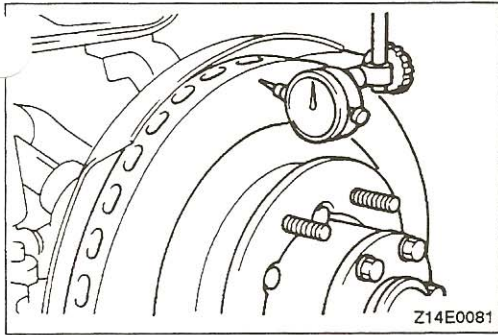
Inspection Items	Remarks
Scratches, rust, saturated lining materials and wear	If the vehicle is not driven for a certain period, the sections of the discs that are not in contact with the lining will become rusty, causing noise and shuddering.
	If grooves resulting from excessive disc wear and scratches are not removed prior to installing a new pad assembly, there will momentarily be inappropriate contact between the disc and the lining (pad).
Runout or drift	Excessive runout or drift of the discs will increase the pedal depression resistance due to piston knock-back.
Change in thickness (parallelism)	If the thickness of the disc changes, this will cause pedal pulsation, shuddering and surging.
Inset or warping (flatness)	Overheating and improper handling while servicing will cause inset or warping.



FRONT BRAKE DISC RUNOUT CHECK AND CORRECTION

35100170149

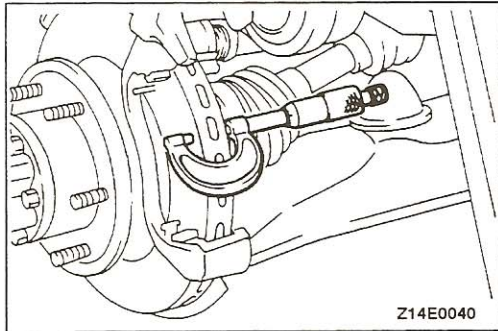
1. Remove the caliper support; then raise the caliper assembly upward and secure by using wire.
2. Inspect the disc surface for grooves, cracks, and rust. Clean the disc thoroughly and remove all rust.



3. Place a dial gage approximately 5 mm (.2 in.) from the outer circumference of the brake disc, and measure the runout of the disc.

Limit: 0.06 mm (.0024 in.)

4. If the runout of the brake disc is equivalent to or exceeds the limit specification, change the phase of the disc and hub, and then measure the runout again.
5. If the runout cannot be corrected by changing the phase of the brake disc, replace the disc or turn rotor with on the car type brake lathe ("Accuturn-8750" or equivalent).



FRONT BRAKE DISC THICKNESS CHECK

35100160139

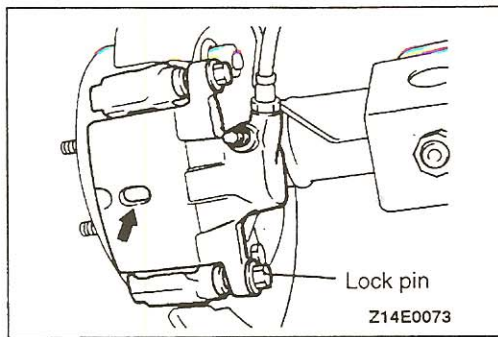
1. Inspect the disc surface for grooves, cracks, and rust. Clean the disc thoroughly and remove all rust.
2. Using a micrometer, measure disc thickness at eight positions, approximately 45° apart and 10 mm (.39 in.) in from the outer edge of the disc.

Standard value: 27 mm (1.06 in.)

Limit: 25.4 mm (1.0 in.)

The difference between any thickness measurements should not be more than 0.015 mm (.0006 in.)

3. Replace the discs and pad assembly for both left and right sides of the vehicle if they are worn beyond the specified limit.
4. If thickness variation exceeds the specification, replace the disc or turn rotor with on the car type brake lathe ("Accuturn-8750" or equivalent).



REAR DISC BRAKE PAD CHECK AND REPLACEMENT

35100

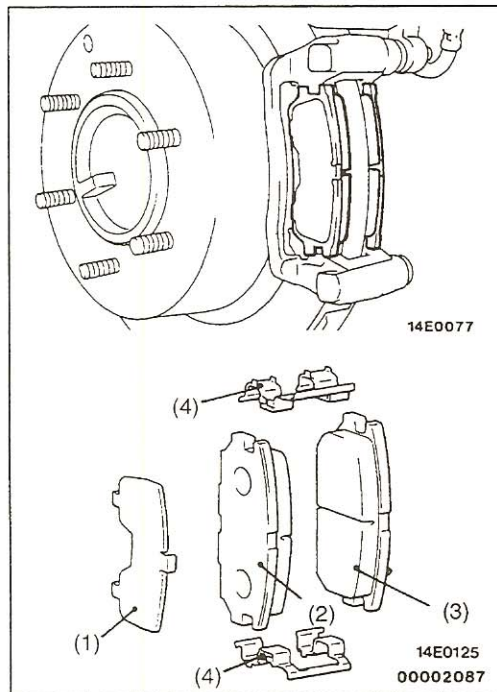
1. Check the brake pad thickness through the caliper bouy check port.

Standard value: 9.0 mm (.35 in.)

Limit: 2.0 mm (.079 in.)

Caution

1. When the limit is exceeded, replace the pads at both sides, and also replace the brake pads for the wheels on the opposite side at the same time.
2. If there is a significant difference in the thicknesses of the both pads, check the sliding condition of the piston, lock pin sleeve and guide pin sleeve.

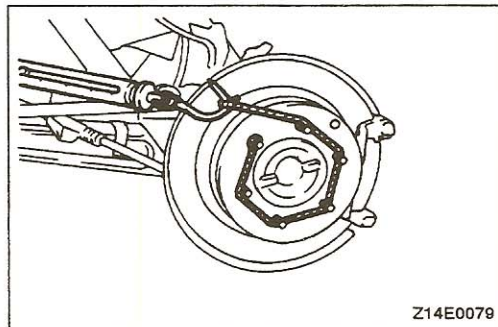


2. Remove lock pin. Lift caliper assembly and retain with wires.

Caution

Do not wipe off the special grease that is on the I pin or allow it to contaminate the lock pin.

3. Remove the following parts from the caliper support.
 - (1) Outer shim
 - (2) Pad assembly
 - (3) Pad and wear indicator assembly
 - (4) Clip



4. In order to measure the dragging force of the disc brakes after installation of the brake pads, use a spring balance to measure the rotational sliding resistance of the hub in the forward direction with the pads removed.

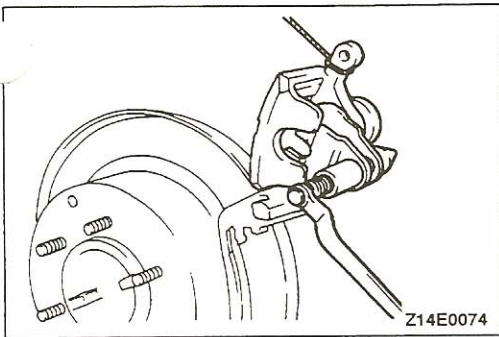
NOTE

To secure the disc to the hub, tighten the nuts.

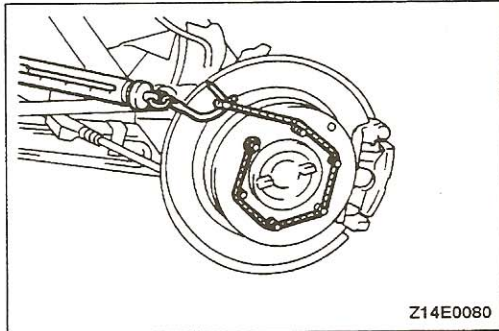
5. Securely attach the pad clip to the caliper support.

Caution

Do not deposit grease or other dirt on pad or brake disc friction surfaces.



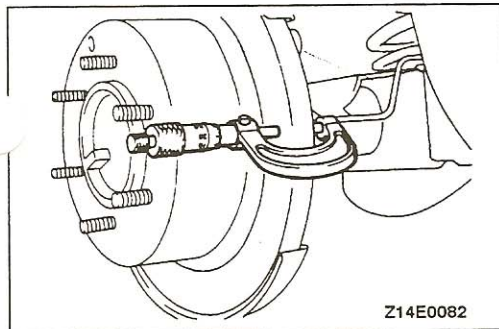
6. Clean the piston and press the piston into the cylinder. Be careful that the piston boot does not become caught when lowering the caliper assembly and installing the lock pin.
7. Start the engine and, after strongly depressing the brake pedal 2-3 times, stop the engine.
8. Turn the brake disc forward 10 times.



9. Use a spring balance to measure the rotational sliding resistance of the hub in the forward direction.
10. Calculate the dragging force of the disc brakes (the difference between the values measured in steps (9) and (4)).

Standard value: 57 N (13 lbs.) or less

11. If the dragging force exceeds the standard value, disassemble piston and clean the piston. Check for corrosion or worn piston seal, and check the sliding condition of the lock pin sleeve and guide pin sleeve.



REAR BRAKE DISC THICKNESS CHECK

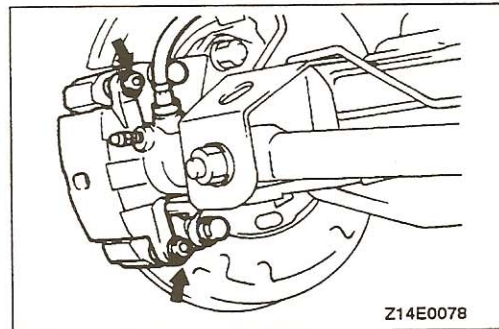
35100200039

1. Remove dirt and rust from the brake disc surface.
2. Measure the disc thickness at 4 locations or more.

Standard value: 18.0 mm (.71 in.)

Limit: 16.4 mm (.646 in.)

Replace the discs and pad assembly for both left and right sides of the vehicle if they are worn beyond the specified limit.



REAR BRAKE DISC RUNOUT CHECK AND CORRECTION

35100210032

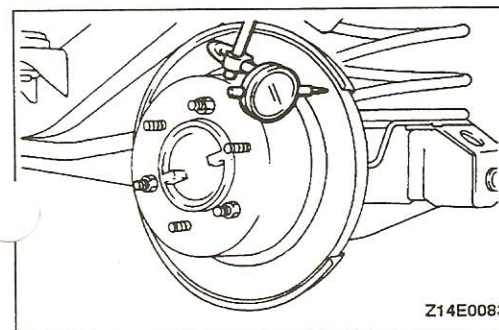
1. Remove the caliper support, raise the caliper assembly, and secure it with a wire, etc.

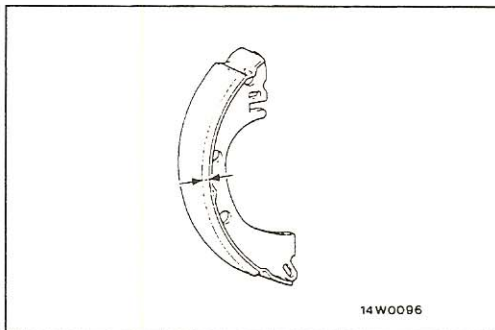
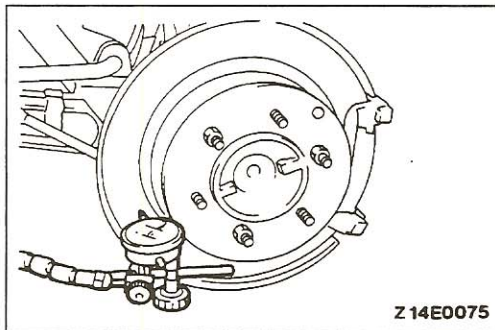
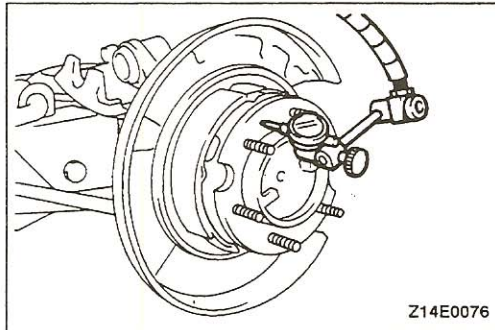
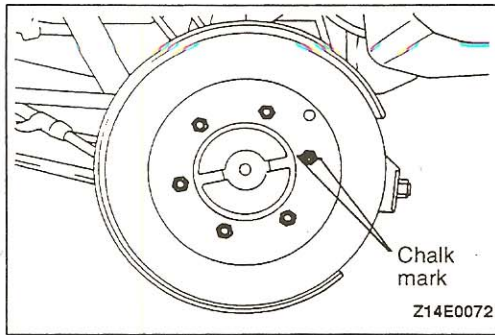
2. Place a dial gage approximately 5 mm (.2 in.) from the outer circumference of the brake disc, and measure the runout of the disc.

Limit: 0.08 mm (.0031 in.)

NOTE

To secure the disc to the hub, tighten the nuts.





3. If the runout of the brake disc is equivalent to or exceeds the limit specification, change the phase of the disc axle shaft and then measure the runout again.

(1) Before removing the brake disc, chalk both sides of the wheel stud on the side at which runout is greatest.

(2) Remove the brake disc, connect a dial gage, and then move the hub in the axial direction and measure the play.

Limit: 0.25 mm (.0098 in.)

(3) If the play does not exceed the limit specification, install the brake disc at a different phase, and then check the runout of the brake disc again.

4. If the runout cannot be corrected by changing the phase of the brake disc, replace the disc.

BRAKE LINING THICKNESS CHECK

35100300067

1. Remove the rear brake assembly and secure it with wire.
2. Remove the brake drum.
3. Measure the wear of the brake lining at the place worn the most.

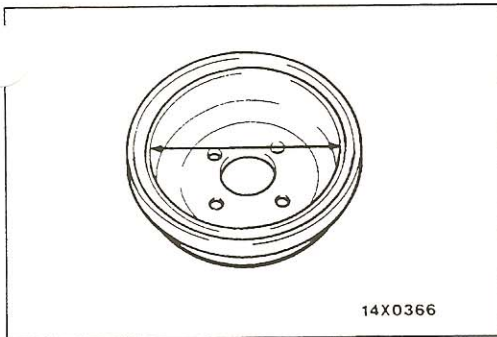
Standard value: 6.5 mm (.256 in.)

Limit: 4.5 mm (.177 in.)

Replace the shoe and lining assembly if brake lining thickness is less than the limit if it is not worn evenly. For information concerning the procedures for installation of the shoe and lining assembly, refer to GROUP 36—Parking Brake Drum.

Caution

1. Whenever the shoe and lining assembly is replaced, replace both R.H. and L.H. assemblies as a set to prevent the vehicle from pulling to one side when braking.
2. If there is a significant difference in thicknesses of the shoe and lining assemblies on the left and right sides, check the sliding condition of the piston.

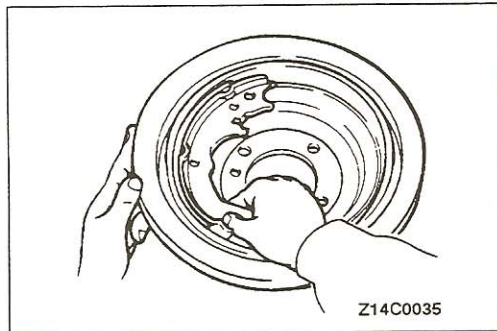
**BRAKE DRUM INSIDE DIAMETER CHECK**

35100320056

1. Remove the rear brake assembly and secure it with wire.
2. Remove the brake drum.
3. Measure the inside diameter of the brake drum at two or more locations.

Standard value: 197 mm (7.756 in.)**Limit: 198 mm (7.795 in.)**

4. Replace brake drums and shoe and lining assembly when wear exceeds the limit value or is badly imbalanced.

**BRAKE LINING AND BRAKE DRUM CONTACT CHECK**

35100310060

1. Remove the rear brake assembly and secure it with wire.
2. Remove the brake drum.
3. Remove the shoe and lining assembly, refer to GROUP 36 – Parking Brake Drum.
4. Chalk the inner surface of the brake drum and rub against the shoe and lining assembly.
5. Replace the shoe and lining assembly or the brake drums if there is a very irregular contact area.
6. For information concerning the procedures for installation of the shoe and lining assembly, refer to GROUP 36 – Parking Brake Drum.

NOTE

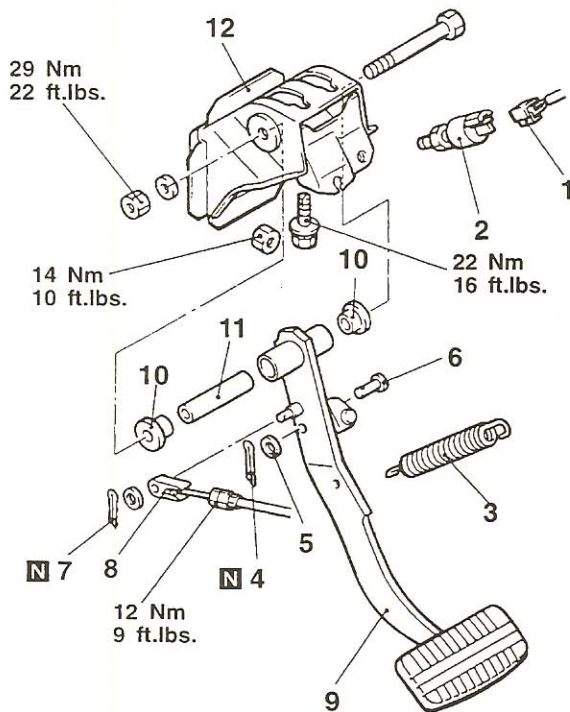
Wipe off chalk after check.

BRAKE PEDAL

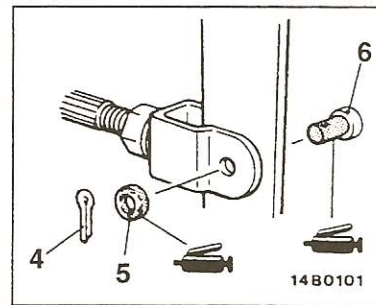
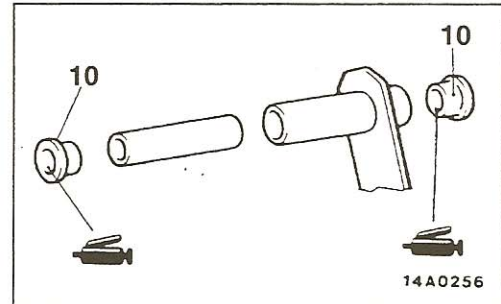
REMOVAL AND INSTALLATION

Post-installation Operation

- Brake Pedal Adjustment (Refer to P.35A-6.)
- Shift Lock Cable Adjustment (Refer to GROUP 23A – Transmission Control)



14E0161
00002088



Stop light switch removal steps

1. Stop light switch connector
2. Stop light switch

Pedal support member removal steps

2. Stop light switch
9. Brake pedal
12. Pedal support member

Brake pedal removal steps

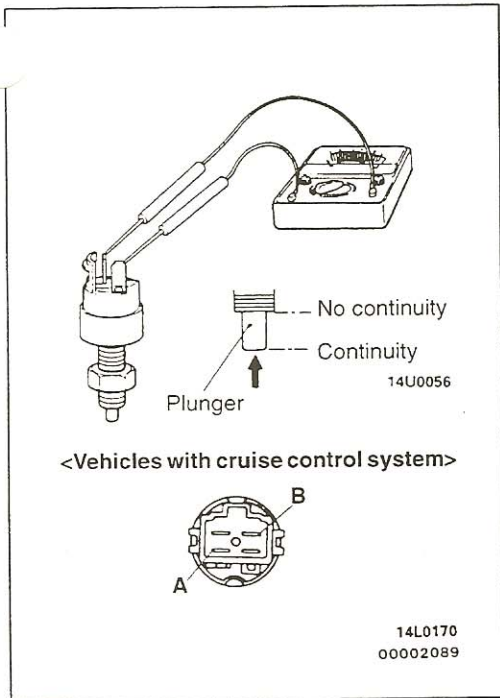
3. Return spring
4. Cotter pin
5. Washer
6. Clevis pin
7. Cotter pin
8. Shift lock cable connection
9. Brake pedal
10. Bushing
11. Spacer
12. Pedal support member

TSB Revision

35100350031

INSPECTION

- Check the bushing for wear.
- Check the brake pedal for bend or twisting.
- Check the brake pedal return spring for damage.



STOP LIGHT SWITCH

35100890052

The stop light switch is in good condition if there is no continuity when the plunger is pressed in, and if there is continuity when the plunger is released outward.

For models equipped with cruise control system, check for continuity at stop light switch connectors A and B.

MASTER CYLINDER AND BRAKE BOOSTER

35100370004

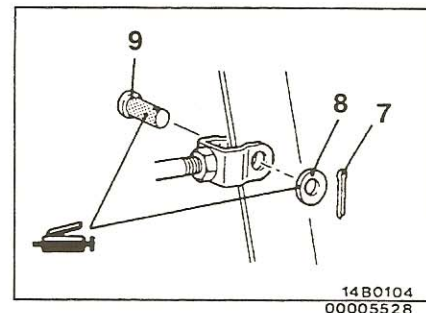
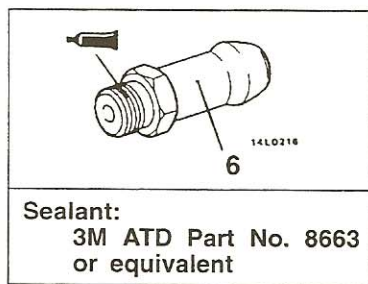
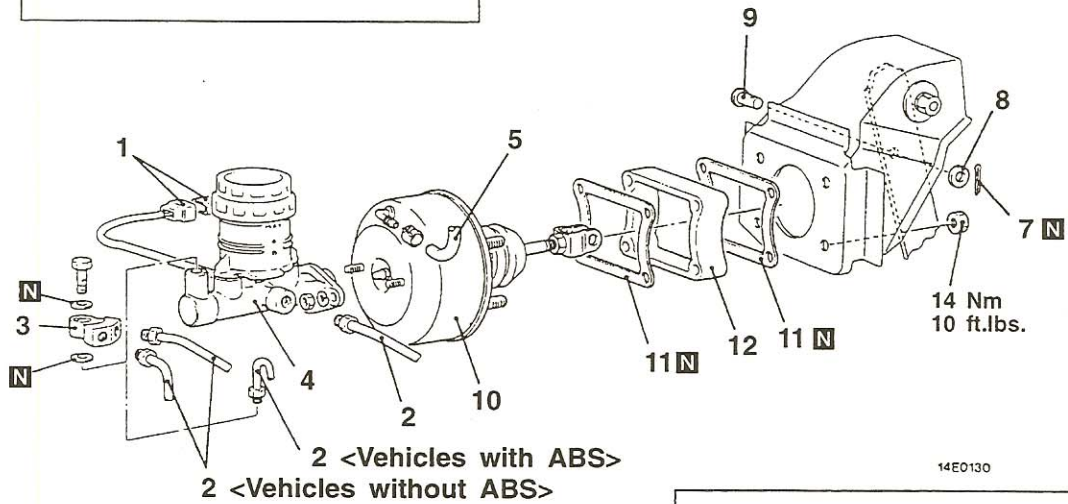
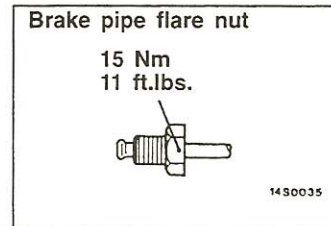
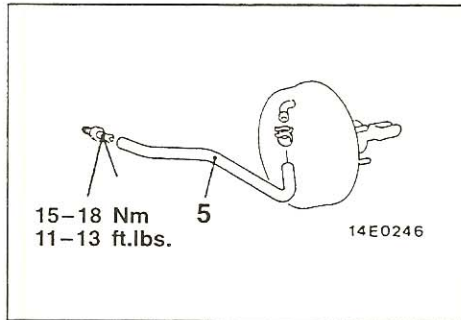
REMOVAL AND INSTALLATION

Pre-removal Operation

- Brake Fluid Draining

Post-installation Operation

- Brake Fluid Supplying
- Bleeding (Vehicles without ABS: Refer to P.35A-9.) (Vehicles with ABS: Refer to GROUP 35C – On-vehicle Service.)
- Brake Pedal Adjustment (Refer to P.35A-6.)



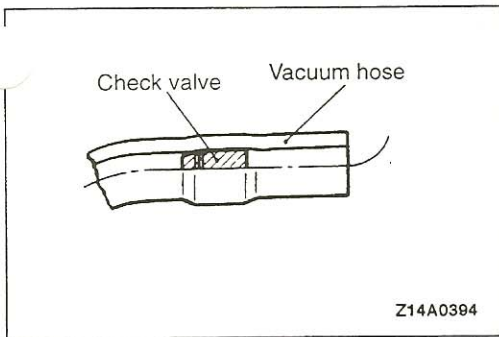
Master cylinder removal steps

1. Brake fluid level sensor connector
 2. Brake pipe
 3. Connector <Vehicles without ABS>
 4. Master cylinder
- B◄ • Clearance check and adjustment between primary piston and push rod

Brake booster removal steps

4. Master cylinder
 5. Vacuum hose (with built-in check valve)
 6. Vacuum pipe
 7. Cotter pin
 8. Washer
 9. Clevis pin
 10. Brake booster
 11. Spacer
 12. Sealant
- ◄A► ►A◄

TSB Revision

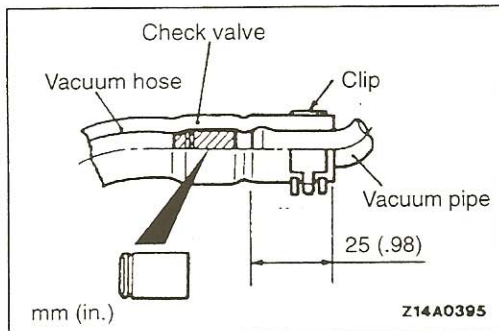


REMOVAL SERVICE POINT

◀A▶ VACUUM HOSES WITH CHECK VALVE REMOVAL

NOTE

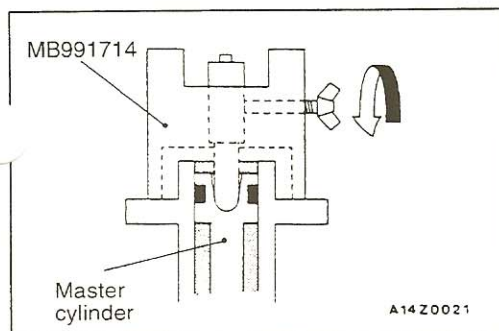
Since the check valve is fitted to the vacuum hose, replace the check valve as an assembly unit together with the vacuum hose if there is a malfunction of the check valve.



INSTALLATION SERVICE POINTS

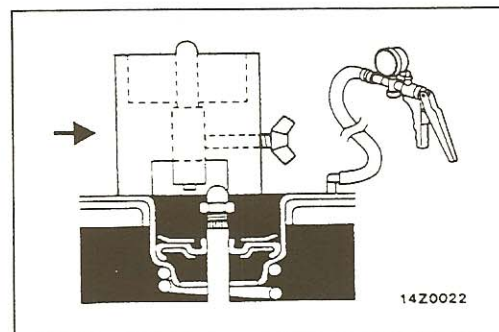
▶A◀ VACUUM PIPE/VACUUM HOSE WITH CHECK VALVE INSTALLATION

- (1) The vacuum hose at the engine should be securely connected until it contacts the hexagonal edge of the fitting, and then should be secured by the hose clip.
- (2) Attach the vacuum hose so that it may be inserted to the dimension shown in the illustration.



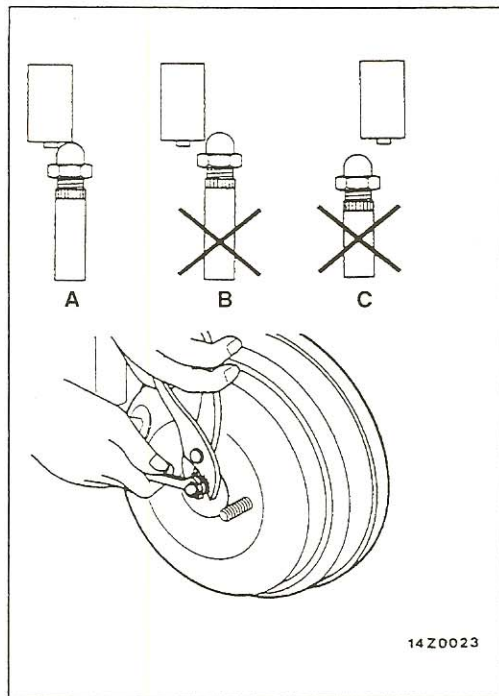
▶B◀ CLEARANCE ADJUSTMENT BETWEEN BRAKE BOOSTER PUSH ROD AND PRIMARY PISTON

- (1) Attach the special tool to the master cylinder.
- (2) Place the shaft of the special tool against the piston of the master cylinder.
- (3) Turn the wing bolt to secure the shaft.



- (4) Use a hand vacuum pump to apply -66.7 kPa (9.7 psi) of negative pressure to the brake booster.
- (5) Turn the special tool upside down and attach it so that it is offset from the center of the brake booster.

35A-22 BASIC BRAKE SYSTEM – Master Cylinder and Brake Booster



- (6) Slide the special tool to the center of the brake booster and check that the shaft projection touches the end of the brake booster push rod as shown at A in the illustration at left.

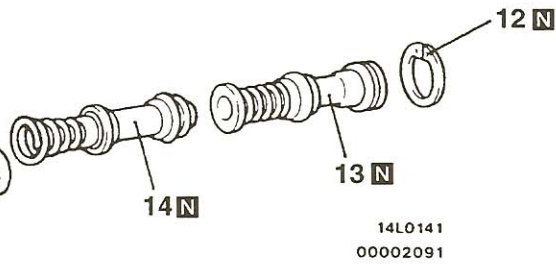
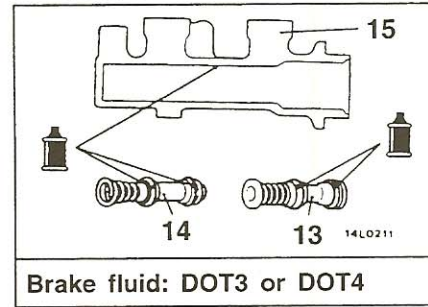
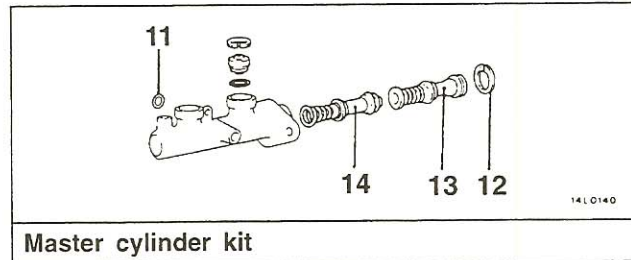
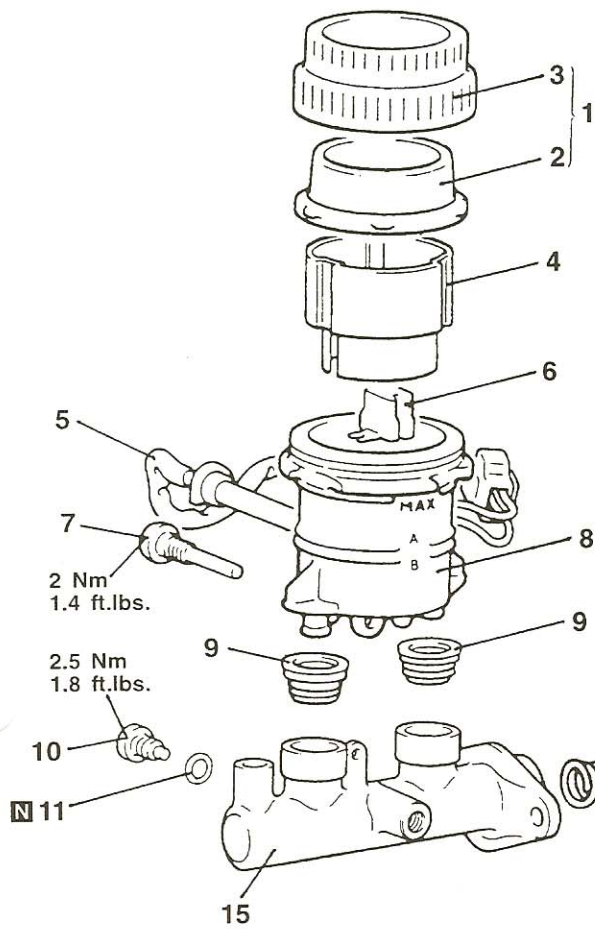
If it is as shown at B or C, adjust the length of the push rod as follows so that it touches as shown at A.

B: If it touches some part other than the shaft projection, shorten the push rod.

C: If it does not touch the shaft at all, lengthen the push rod.

MASTER CYLINDER

DISASSEMBLY AND REASSEMBLY



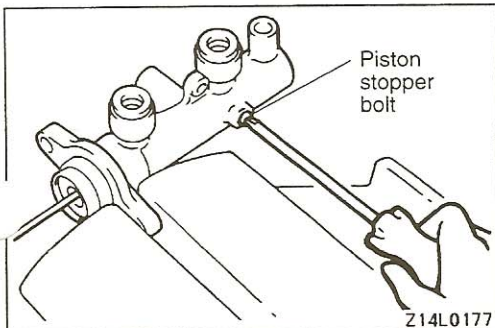
Disassembly steps

1. Reservoir cap assembly
2. Diaphragm
3. Reservoir cap
4. Filter <Vehicles with ABS>
5. Brake fluid level sensor
6. Float
7. Reservoir stopper bolt
8. Reservoir tank
9. Reservoir seal
10. Piston stopper bolt



11. Gasket
12. Stopper ring
13. Primary piston assembly
14. Secondary piston assembly
15. Master cylinder body

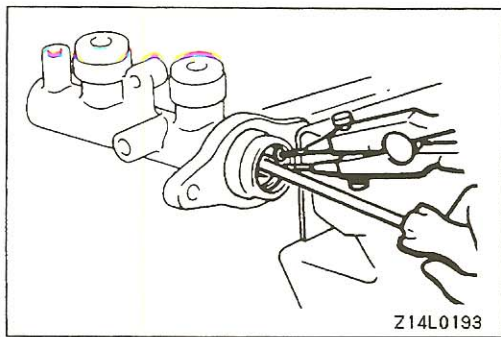
Caution
Do not disassemble the secondary and primary piston assembly.



DISASSEMBLY SERVICE POINTS

◀A▶ PISTON STOPPER BOLT REMOVAL

Remove the piston stopper bolt, while depressing the piston.



◀B▶ STOPPER RING REMOVAL

Remove the piston stopper ring, while depressing the pi:

35100510033

BRAKE LINE

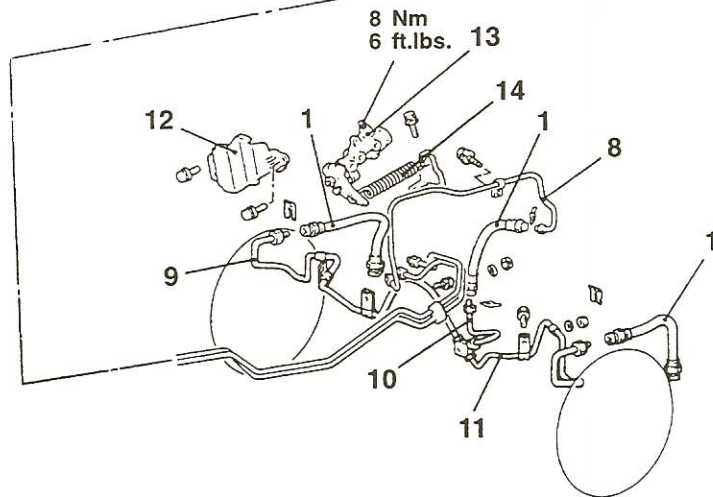
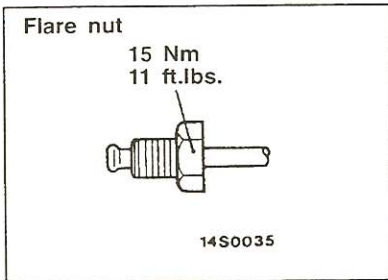
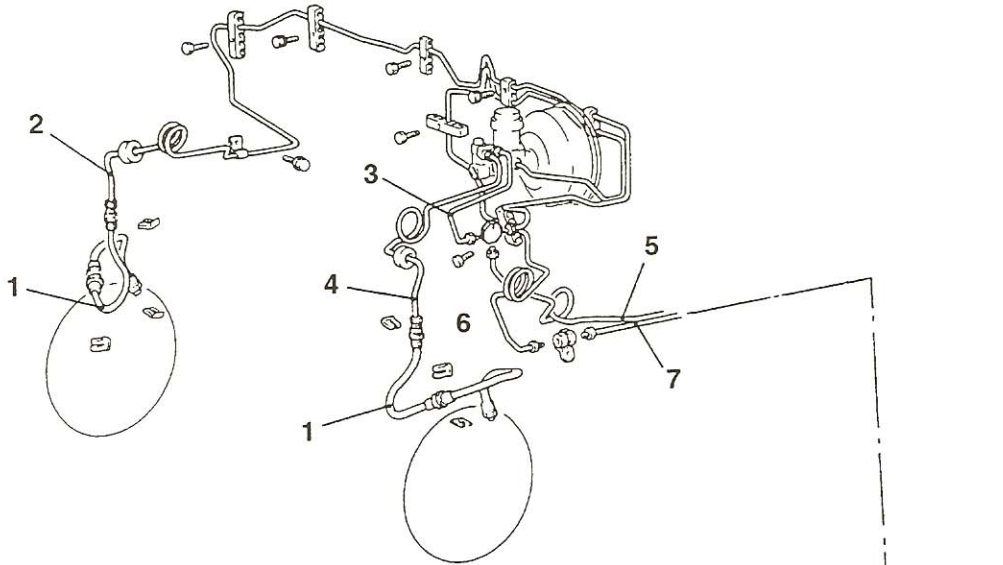
REMOVAL AND INSTALLATION

Pre-removal Operation

- Brake Fluid Draining

Post-installation Operation

- Brake Fluid Supplying
- Bleeding (Refer to P.35A-9.)



14E0247
00005527

1. Brake hose
2. Brake pipe (front, R.H.)
3. Brake pipe (front, R.H. 1)
4. Brake pipe (front, L.H.)
5. Brake pipe (floor)
6. Brake pipe (main 1)
7. Brake pipe (main 2)
8. Brake pipe (main 3)
9. Brake pipe (rear, R.H.)
10. Brake pipe (rear, center)

11. Brake pipe (rear, L.H.)
12. Protector
13. Load sending proportioning valve
14. Load sending spring

Caution
Do not disassemble the load sending proportioning valve because its performance depends on the load of the spring.

TSB Revision

FRONT DISC BRAKE

3510060⁰¹³⁶

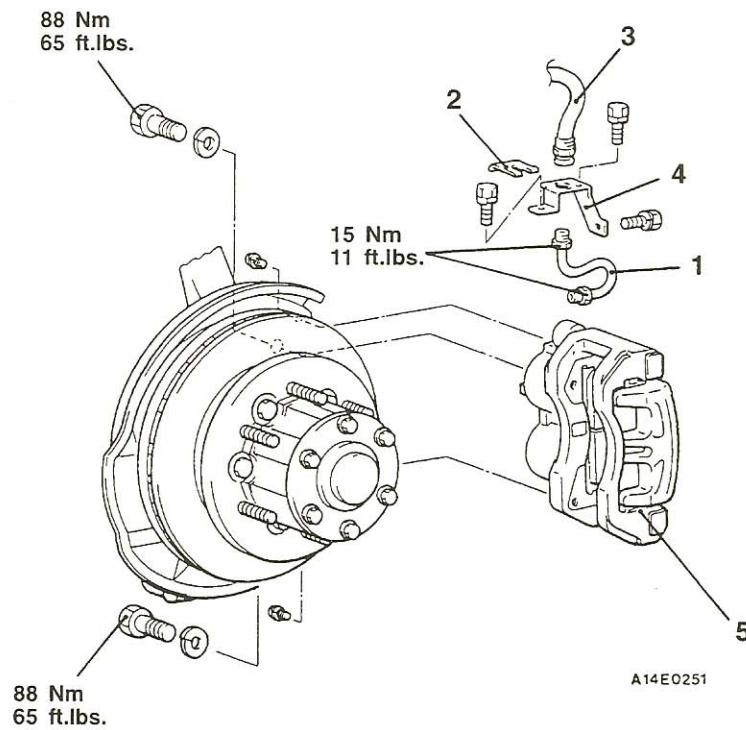
REMOVAL AND INSTALLATION

Pre-Removal Operation

- Brake Fluid Draining

Post-installation Operation

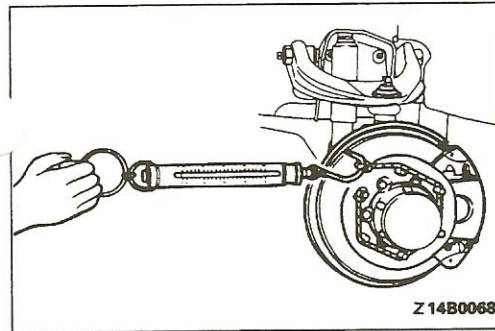
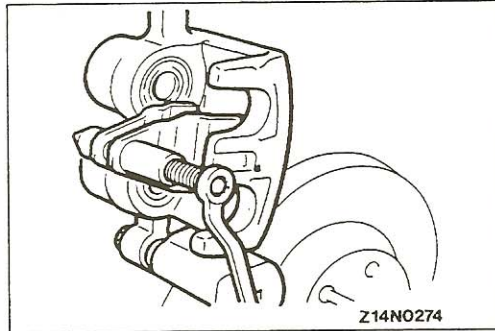
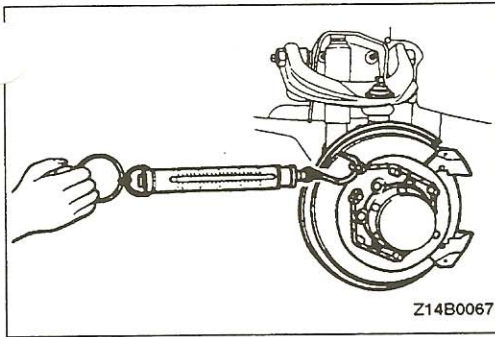
- Brake Fluid Supplying
- Bleeding (Vehicles without ABS: Refer to P.35A-9.)
(Vehicles with ABS: Refer to GROUP 35C – On-vehicle Service.)

**Removal steps**

1. Brake pipe
2. Clip
3. Brake hose
4. Brake hose bracket
5. Front brake assembly



TSB Revision



INSTALLATION SERVICE POINTS

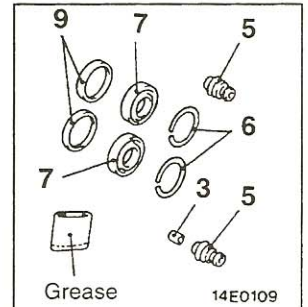
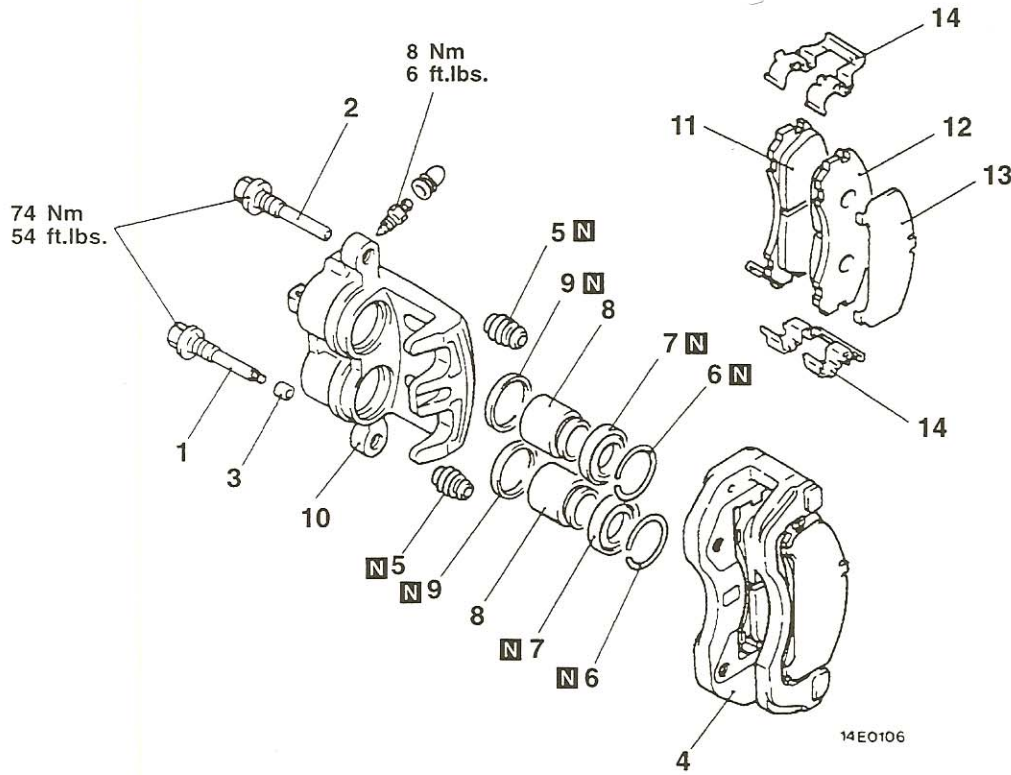
▶A◀ FRONT BRAKE ASSEMBLY INSTALLATION

After installation of the brake assembly, measure the dragging force of the disc brakes by the following procedure.

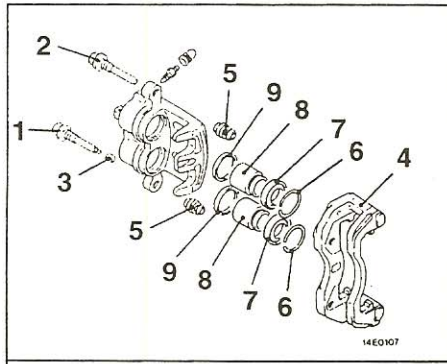
- (1) With the brake assembly removed, use a spring balance to measure the rotational sliding resistance of the hub in the forward direction.
 - (2) After installing the caliper support to the knuckle, use a piston expander to expand the piston, and then install the caliper body.
 - (3) Start the engine and, after strongly depressing the brake pedal 2-3 times, stop the engine.
 - (4) Turn the brake disc forward 10 times.
 - (5) Use a spring balance to measure the rotational sliding resistance of the hub in the forward direction.
 - (6) Calculate the dragging force of the disc brakes [the difference between the values measured in steps (5) and (1)].
- Standard value: 57 N (13 lbs.) or less**
- (7) If the dragging force exceeds the standard value, disassemble piston and clean the piston. Check for corrosion or worn piston seal.

DISASSEMBLY AND REASSEMBLY

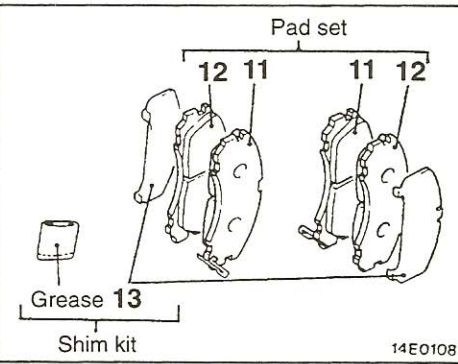
35100620248



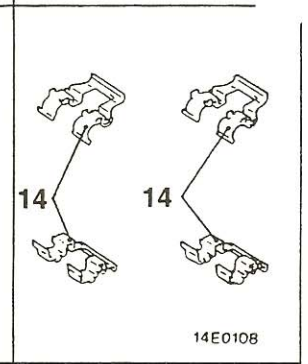
Seal and boot kit



Brake caliper kit



Pad set/Shim kit



Clip kit

00007086

Caliper assembly disassembly steps

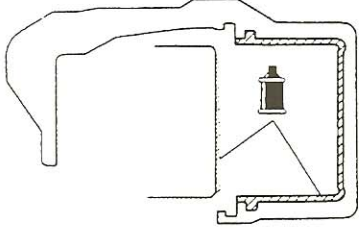
- ▶A◀ 1. Lock pin
- ▶A◀ 2. Guide pin
- ▶A◀ 3. Bushing
- ▶A◀ 4. Caliper support (Pad, clip and shim)
- ▶A◀ 5. Pin boot
- ▶A◀ 6. Boot ring
- ▶A◀ 7. Piston boot
- ▶A◀ 8. Piston
- ▶A◀ 9. Piston seal
- ▶B◀ 10. Caliper body

Pad assembly disassembly steps

- ▶A◀ 1. Lock pin
- ▶A◀ 2. Guide pin
- ▶A◀ 3. Bushing
- ▶A◀ 4. Caliper support (Pad, clip and shim)
- ▶A◀ 11. Pad and wear indicator assembly
- ▶A◀ 12. Pad assembly
- ▶A◀ 13. Outer shim
- ▶A◀ 14. Clip

TSB Revision

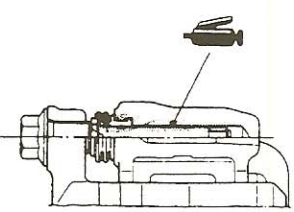
LUBRICATION POINTS



14E0131

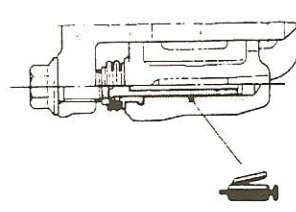
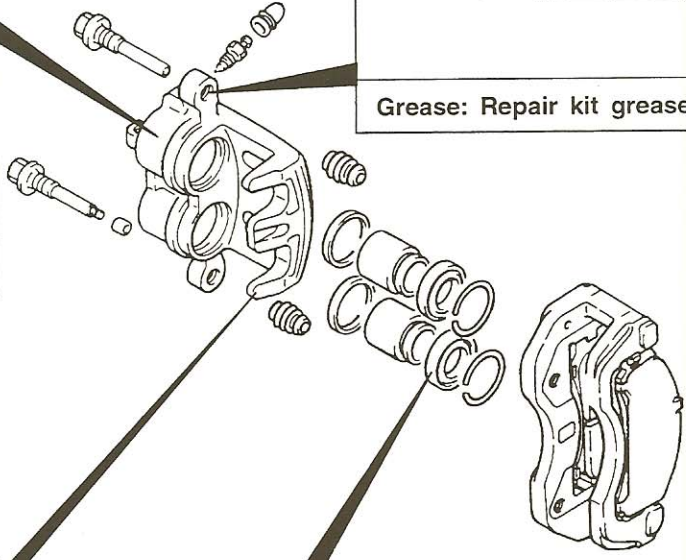
Caution
Special grease has been applied to the inside of the seal and boot kit, so this grease should not be wiped off.

Brake fluid: DOT3 or DOT4



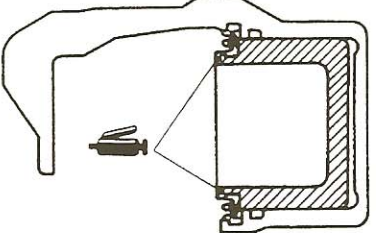
14A0541

Grease: Repair kit grease (orange)



14A0541

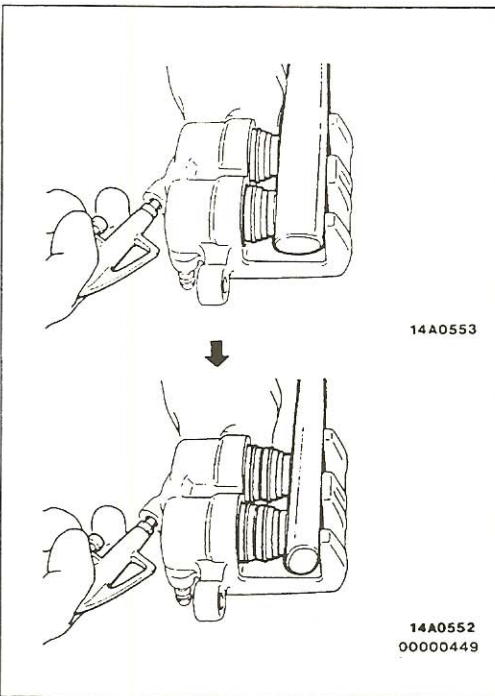
Grease:
Repair kit grease (orange)



14L0128

Grease: repair kit grease (orange)

00002251



DISASSEMBLY SERVICE POINTS

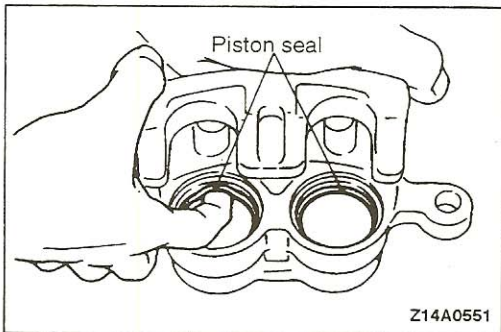
◀A▶ PISTON BOOT/PISTON REMOVAL

Pump in compressed air through the brake hose installation hole and remove the pistons and piston boot.

Caution

When removing the pistons, be sure to use the handle of a plastic hammer and adjust the height of the two pistons while pumping in air slowly in so that the pistons protrude evenly.

Do not remove one piston completely before trying to remove the other piston because it will become impossible to remove the second piston.



◀B▶ PISTON SEAL REMOVAL

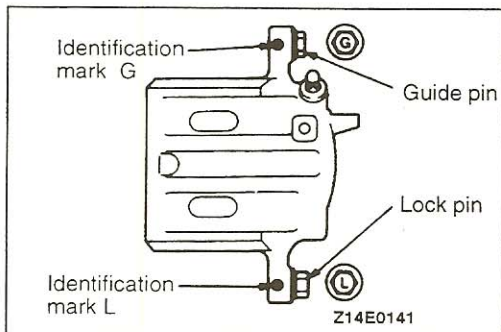
- (1) Remove piston seal with finger tip.

Caution

Do not use a screwdriver or other tools in order to prevent damage to the inner cylinder.

- (2) Clean the piston surface and the inner cylinder with trichloroethylene, alcohol or specified brake fluid.

Specified brake fluid: DOT 3 or DOT 4

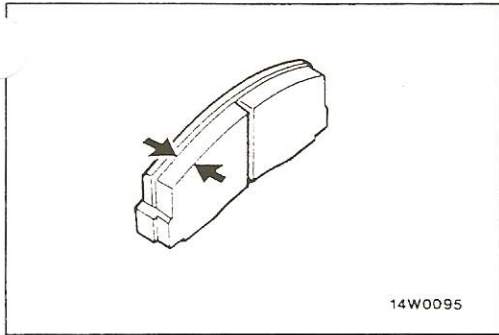


INSTALLATION SERVICE POINT

▶A◀ GUIDE PIN/LOCK PIN INSTALLATION

Install the guide pin and lock pin as shown in the illustration so that each head mark of the guide pin and the lock pin matches the indication mark (G or L) located on the caliper body.

35100630043

**INSPECTION****PAD WEAR**

Measure the thickness at the thinnest and worn area of the pad.

Replace the pad assembly when the pad thickness is less than the limit value.

Standard value: 10.0 mm (.39 in.)

Limit: 2.0 mm (.079 in.)

Caution

1. If the limit is exceeded, replace the pads at both sides, and also replace the brake pads for the wheels on the opposite side at the same time.
2. If there is a significant difference in the thicknesses of the pads on the left and right sides, check the sliding parts.

REAR DISC BRAKE

351007-1

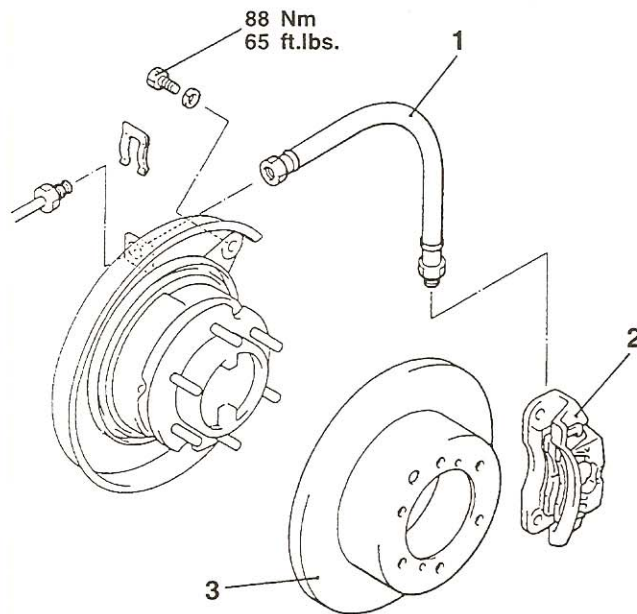
REMOVAL AND INSTALLATION

Pre-removal Operation

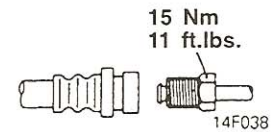
- Brake Fluid Draining

Post-installation Operation

- Brake Fluid Supplying
- Bleeding (Vehicles without ABS: Refer to P.35A-9.)
(Vehicles with ABS: Refer to GROUP 35C – On-vehicles Service.)



Flare nut



14E0116

00002252

Removal steps



1. Brake hose connection
2. Rear brake assembly
3. Brake disc

INSTALLATION SERVICE POINT

▶A◀ REAR BRAKE ASSEMBLY INSTALLATION

Install the rear brake assembly by the same procedure as that for the front brake assembly.
(Refer to P.35A-27.)

INSPECTION

35100710020

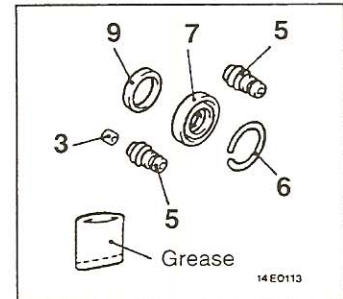
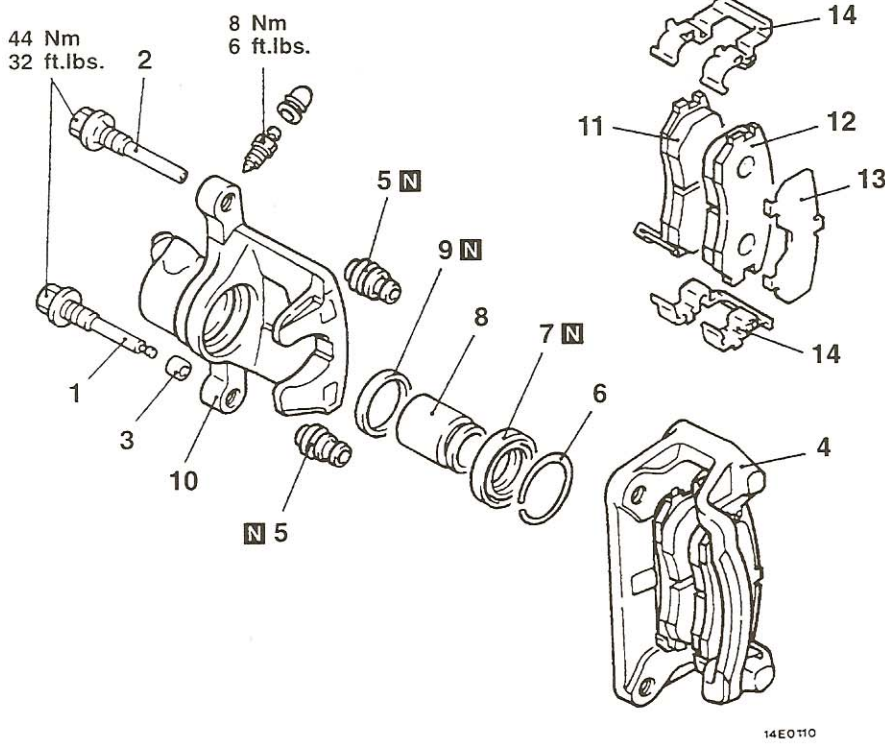
BRAKE DISC

- Check the disc for wear. (Refer to P.35A-15.)
- Check the disc for runout. (Refer to P.35A-15.)
- Check the disc for damage.

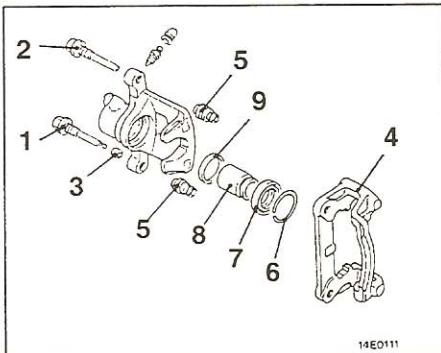
TSB Revision

DISASSEMBLY AND REASSEMBLY

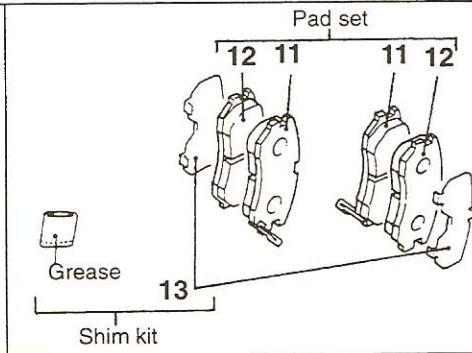
35100720177



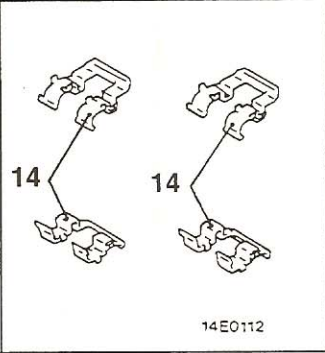
Seal and boot kit



Brake caliper kit



Pad set/Shim kit



Clip kit

00007087

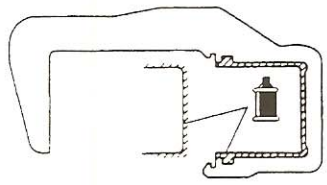
Caliper assembly disassembly steps

- ▶A◀ 1. Lock pin
- ▶A◀ 2. Guide pin
- ▶A◀ 3. Bushing
- ▶A◀ 4. Caliper support (Pad, clip and shim)
- ▶A◀ 5. Pin boot
- ▶A◀ 6. Boot ring
- ▶A◀ 7. Piston boot
- ▶A◀ 8. Piston
- ▶A◀ 9. Piston seal
- ▶A◀ 10. Caliper body

Pad assembly disassembly steps

- ▶A◀ 1. Lock pin
- ▶A◀ 2. Guide pin
- ▶A◀ 3. Bushing
- ▶A◀ 4. Caliper support (Pad, clip and shim)
- ▶A◀ 11. Pad and wear indicator assembly
- ▶A◀ 12. Pad assembly
- ▶A◀ 13. Outer shim
- ▶A◀ 14. Clip

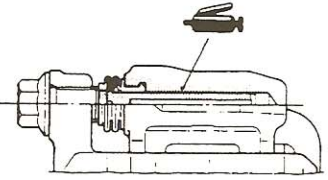
LUBRICATION POINTS



14E0121

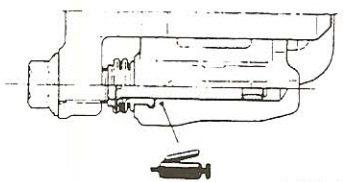
Caution
Special grease has been applied to the inside of the seal and boot kit, so this grease should not be wiped off.

Brake fluid: DOT3 or DOT4



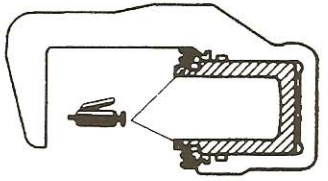
14N0121

Grease:
Repair kit grease (orange)



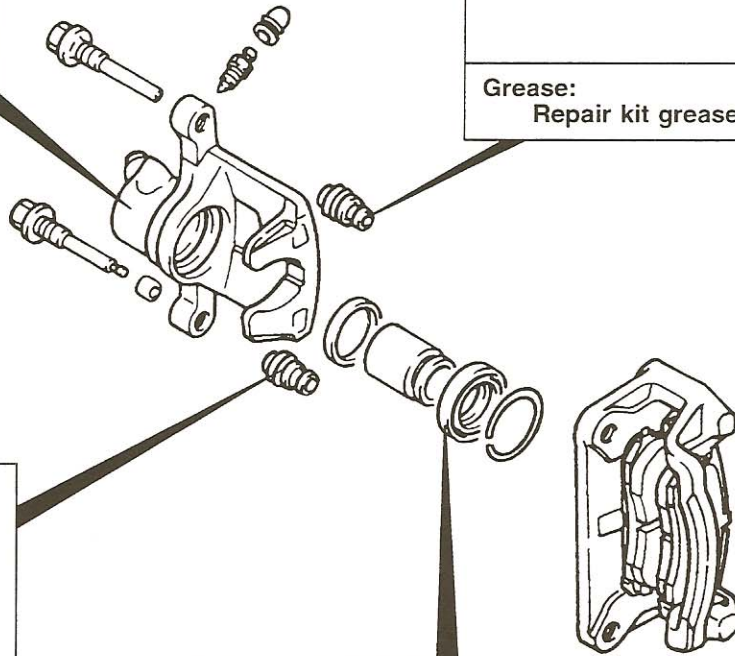
14N0121

Grease:
Repair kit grease (orange)

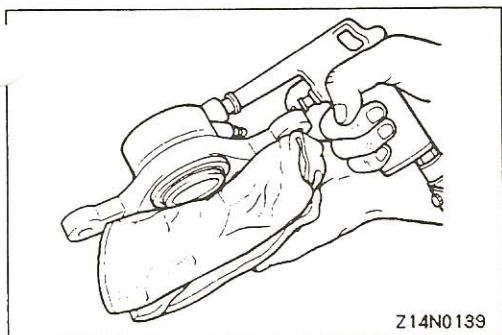


14L0126

Grease:
Repair kit grease (orange)



00002254

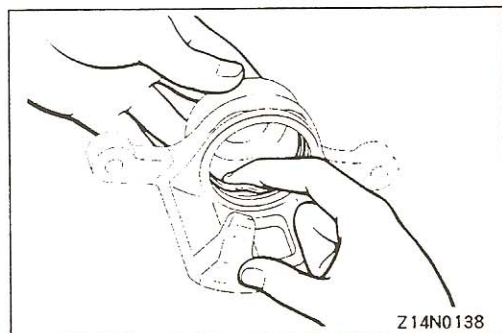


DISASSEMBLY SERVICE POINTS

◀A▶ PISTON BOOT/PISTON REMOVAL

Protect the caliper body with a cloth, and then blow compressed air through the brake hose to remove the piston boot and the piston.

Caution
Blow compressed air gently.



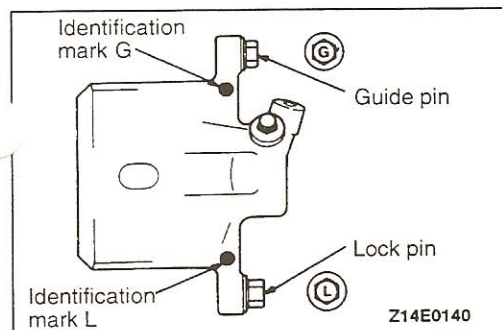
◀B▶ PISTON SEAL REMOVAL

(1) Remove the piston seal with your finger tip.

Caution
Do not use a flat-tipped screwdriver or other tool to prevent damage to inner cylinder.

(2) Clean the piston surface and the inner cylinder with trichloroethylene, alcohol or specified brake fluid.

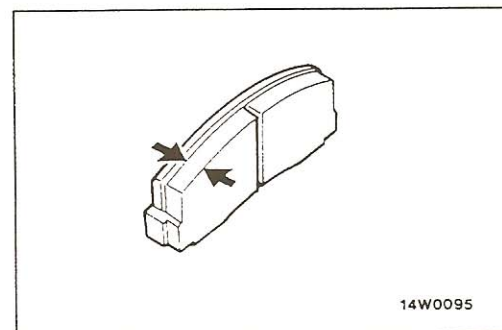
Specified brake fluid: DOT 3 or DOT 4



REASSEMBLY SERVICE POINT

▶A◀ GUIDE PIN/LOCK PIN INSTALLATION

Install the guide pin and lock pin as shown in the illustration so that each head mark of the guide pin and the lock pin matches the indication mark (G or L) located on the caliper body.



INSPECTION

35100730033

PAD WEAR

Measure the thickness at the thinnest and worn area of the pad.

Replace pad assembly when pad thickness is less than the limit value.

Standard value: 9.0 mm (.35 in.)

Limit: 2.0 mm (.079 in.)

Caution

1. If the limit is exceeded, replace the pads at both sides, and also replace the brake pads for the wheels on the opposite side at the same time.
2. If there is a significant difference in the thicknesses of the pads on the left and right sides, check the sliding parts.

NOTES

ANTI-LOCK BRAKING SYSTEM (ABS) <AWD>

CONTENTS

35209000060

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Refer to GROUP 35A for the following items.

BRAKE LINE (BASIC BRAKE SYSTEM)

BRAKE PEDAL

FRONT DISC BRAKE

GENERAL SPECIFICATIONS

LUBRICANTS

MASTER CYLINDER AND BRAKE

BOOSTER

ON-VEHICLE SERVICE

Brake Booster Operating Test
Brake Drum Inside Diameter Check
Brake Fluid Level Sensor Check
Brake Lining and Brake Drum Contact Check
Brake Lining Thickness Check
Brake Pedal Inspection and Adjustment
Check Valve Operation Check
Disc Brake Pad Check

Front Brake Disc Run-out Check and
Correction

Front Brake Disc Thickness Check

Front Disc Brake Pad Replacement

and Brake Drag Check

Front Disc Brake Rotor Inspection

Load Sensing Proportioning Valve Function
Test

Load Sensing Spring Length Check and
Adjustment

Rear Brake Disc Run-out Check and
Correction

Rear Brake Disc Thickness Check

Rear Disc Brake Pad Check and Replacement

REAR DISC BRAKE

SEALANTS

SERVICE SPECIFICATIONS

TROUBLESHOOTING

GENERAL SPECIFICATIONS

3520000000

Items		Specifications
ABS rotor teeth	Front	47
	Rear	47
Speed sensor type		Magnet coil type



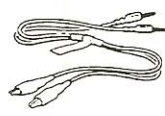
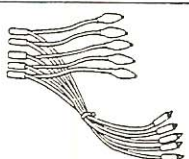
SERVICE SPECIFICATIONS

35200030150

Items		Standard value
Hydraulic unit solenoid valve internal resistance Ω	OUT	4.29 \pm 0.25
	IN	8.54 \pm 0.5
Speed sensor's internal resistance k Ω	Front	1.17 – 1.35
	Rear	1.3 – 1.5
Speed sensor insulation resistance k Ω		100 or more
Clearance between speed sensor pole piece and toothed rotor mm (in.)		0.2 – 1.0 (.008 – .039)
G sensor output voltage V	When G sensor is installed and vehicle is stationary	2.4 \pm 2.6
	When G sensor is held with the arrow facing downwards	3.4 – 3.6

SPECIAL TOOLS

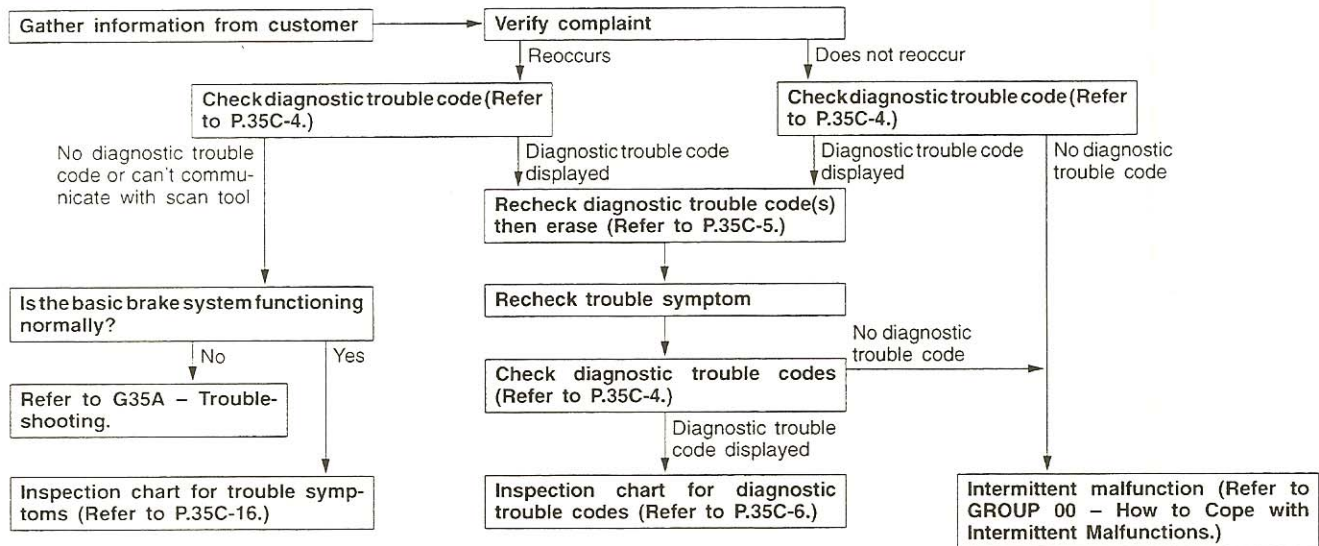
35200060067

Tool	Tool number and name	Supersession	Application
	MB991502 Scan tool (MUT-II)	MB991496-0D	For checking ABS
	ROM pack	–	For checking ABS
	MB991529 Diagnostic trouble code check harness	Tool not necessary if scan tool (MUT-II) is available	For checking ABS when using a warning light
	MB991348 Test harness set	Tool not available	For checking of G-sensor

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TROUBLESHOOTING

DIAGNOSTIC TROUBLESHOOTING FLOW

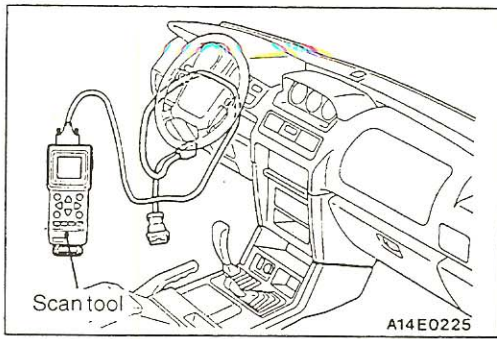


NOTES WITH REGARD TO DIAGNOSIS

The condition listed in the following table are considered normal.

Condition	Explanation of condition
System check sound	When starting the engine, a thudding sound can sometimes be heard coming from inside the engine compartment, but this is because the system operation check is being performed. This is considered normal.
ABS operation sound	<ol style="list-style-type: none"> 1. Sound of the motor inside the ABS hydraulic unit operating (whine) 2. Sound is generated along with vibration of the brake pedal. (scraping) 3. When ABS operates, sound is generated from the vehicle chassis due to repeated brake application and release. (Thump: suspension; squeak: tires)
ABS operation (Long braking distance)	For road surfaces such as snow-covered roads and gravel roads, the braking distance for vehicles with ABS can sometimes be longer than that for other vehicles. Accordingly, advise the customer to drive safely on such roads by lowering the vehicle speed.
System check shock	When depressing the brake pedal slightly during driving at low speed, a shock can sometimes be generated, but this is because the system operation check (starting check that performed at vehicle speed of 8 km [5 mph]) is being performed. This is considered normal.

Diagnosis detection condition depends on a diagnostic trouble code. So, when rechecking a trouble symptom, be sure to satisfy the condition listed in the "Comments" column of the inspection procedure for diagnostic trouble codes.



DIAGNOSTIC FUNCTION

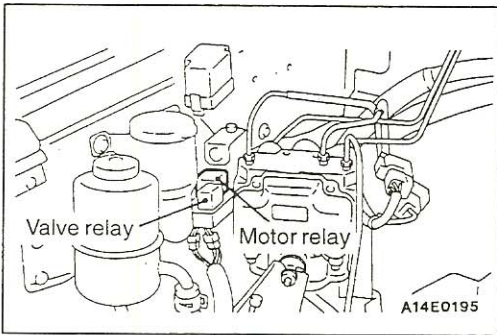
DIAGNOSTIC CODES CHECK

With the Scan Tool (MUT-II)

Connect the scan tool (MUT-II) to the diagnosis connector (16-pin), then check diagnostic codes.

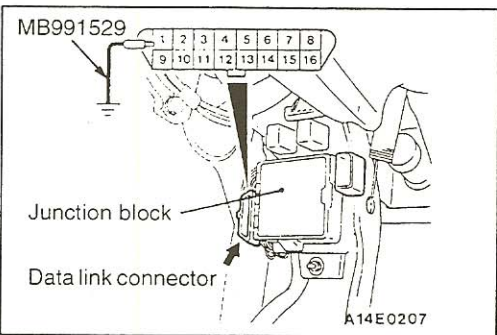
Caution

Turn the ignition switch off before connecting or disconnecting the scan tool.



Without the Scan Tool (MUT-II)

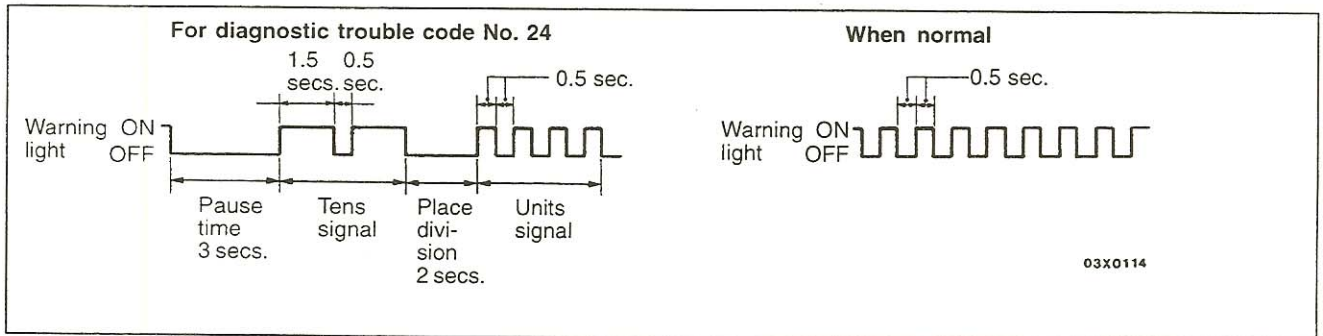
1. Turn the ignition switch off and then remove the valve relay.



2. Use the special tool to ground data link connector terminal (1).
3. Turn the ignition switch to ON and then take a reading of the diagnostic trouble codes from the flashing of ABS warning lamp.

NOTE

The diagnostic trouble code No. 51 (indicating an open or short circuit in the valve relay) will be always output although there is no open or short circuit. That is because the valve relay is removed.



4. After remedying the problems indicated by the diagnostic trouble codes, disconnect the diagnostic trouble code check harness and install the valve relay. Then turn the ignition switch to ON again and check the ABS warning light. (Refer to P.35C-16.) If an abnormality occurs during checking, a problem with the valve relay system may be present. (Refer to P.35C-14.)

ERASING DIAGNOSTIC CODES

With the Scan Tool (MUT-II)

Connect the scan tool to the diagnosis connector (16-pin), then erase the diagnostic codes.

Without the Scan Tool (MUT-II)

Removing the battery cable from the battery (-) terminal for 10 seconds or more, then reconnect the cable.

INSPECTION CHART FOR DIAGNOSTIC TROUBLE CODES

35201130408

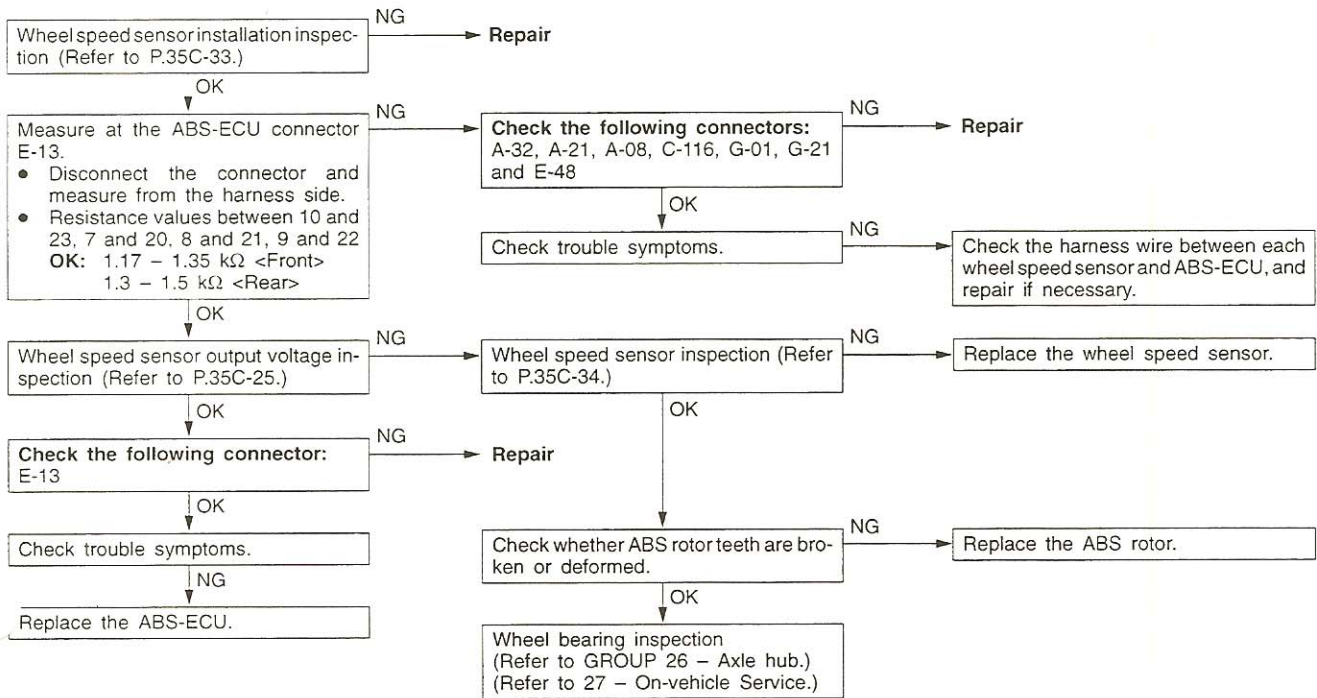
Inspect according to the inspection chart that is appropriate for the malfunction code.

Diagnosis code no.	Inspection item	Diagnosis content	Reference page
11	Front right wheel speed sensor	Open or short circuit	35C-7
12	Front left wheel speed sensor		
13	Rear right wheel speed sensor		
14	Rear left wheel speed sensor		
15	Wheel speed sensor	Abnormal output signal	35C-7
16	Power supply system		35C-8
21	Front right wheel speed sensor	Defective sensor	35C-9
22	Front left wheel speed sensor		
23	Rear right wheel speed sensor		
24	Rear left wheel speed sensor		
25	Free wheel engage switch		35C-9
26	Center differential lock detection switch		35C-10
27	Rear differential lock detection switch <Vehicles with rear differential lock>		35C-11
	Rear differential lock detection switch <Vehicles without rear differential lock>		35C-11
32	G-sensor system		35C-12
33	Stop light switch system		35C-12
41	Front right solenoid valve		35C-13
42	Front left solenoid valve		
43	Rear solenoid valve		
51	Valve relay		35C-14
53	Motor relay, motor		35C-15
63	Replace the ABS-ECU		–
64	Replace the ABS-ECU		–

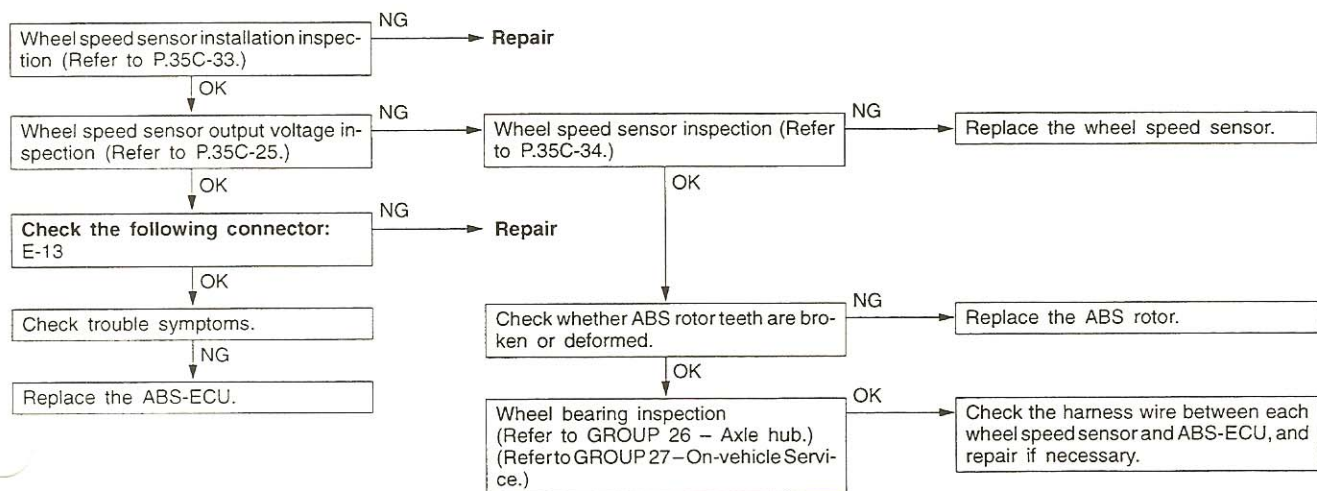
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INSPECTION PROCEDURE FOR DIAGNOSTIC TROUBLE CODES

Code No.11, 12, 13, 14 Wheel speed sensor open or short circuit	Probable cause
[Comment] A sensor is open-circuited or short-circuited circuit in the positive or negative line.	<ul style="list-style-type: none"> • Malfunction of wheel speed sensor • Malfunction of wiring harness or connector • Malfunction of ABS-ECU



Code No.15 Wheel speed sensor (Defective output signal)	Probable cause
[Comment] A malfunction (other than an open or short-circuit) is detected in the output signal from a wheel speed sensor while driving.	<ul style="list-style-type: none"> • Improper installation of wheel speed sensor • Malfunction of wheel speed sensor • Malfunction of ABS rotor • Malfunction of wheel bearing • Malfunction of wiring harness or connector • Malfunction of ABS-ECU



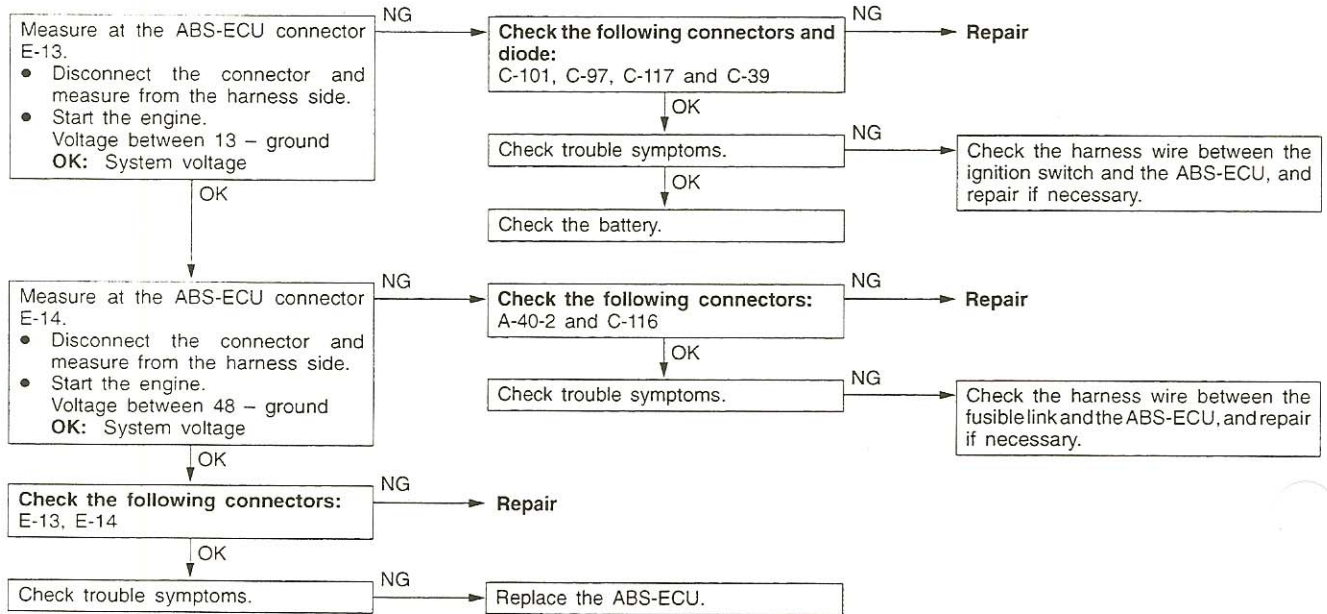
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Code No.16 Power supply system	Probable cause
<p>[Comment] The ABS-ECU power supply voltage or the solenoid valve power supply voltage is less than the specified value. If the voltage returns to the specified value, this code is no longer output.</p>	<ul style="list-style-type: none"> • Malfunction of wiring harness or connector. • Malfunction of ABS-ECU

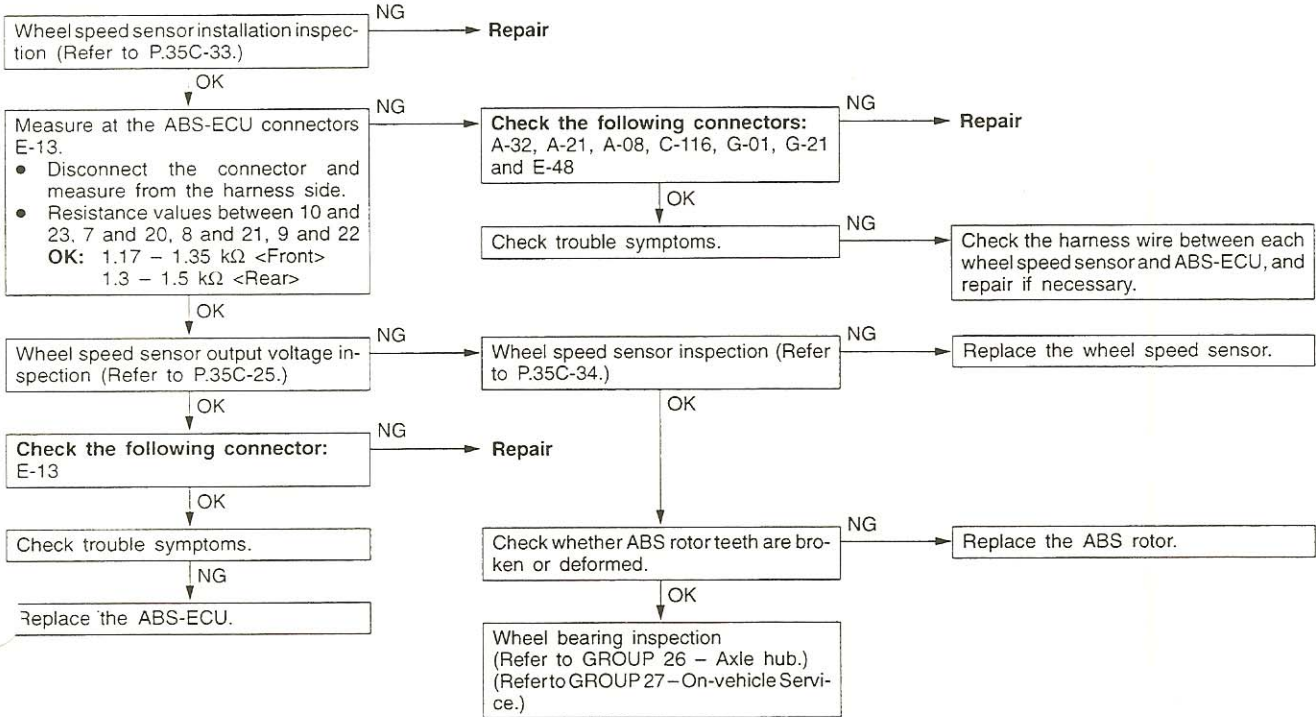
Caution

If the battery voltage drops or rises during inspection, this code will be output as a current problem, and correct diagnosis of the problem cannot be made.

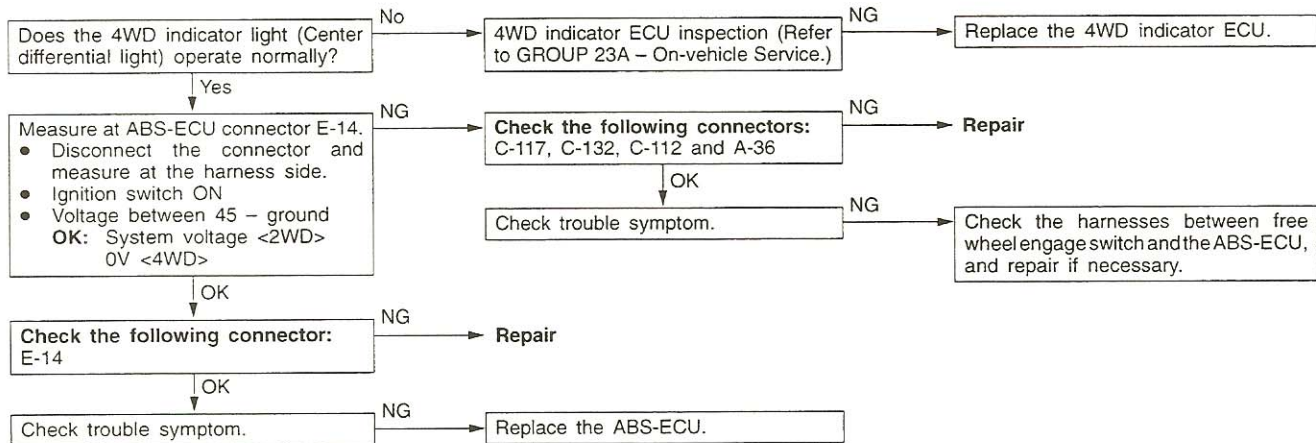
Before carrying out the following inspection, check the battery level, and refill it if necessary.



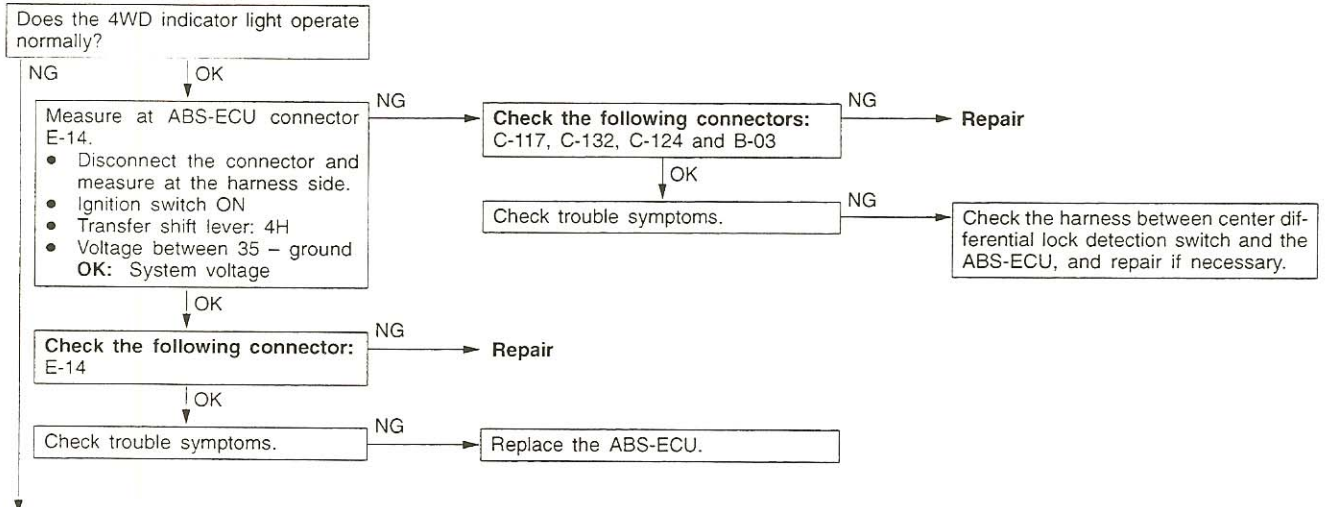
Code No.21, 22, 23, 24 Wheel speed sensor defect	Probable cause
<p>[Comment] The above codes are output in the following cases.</p> <ul style="list-style-type: none"> • An open circuit cannot be found out, but a wheel speed sensor does not output any signal when driving at 8 km/h or higher. • As the sensor output drops due to a malfunctioning sensor or a warped rotor, anti-lock control is continuously carried out. 	<ul style="list-style-type: none"> • Malfunction of wheel speed sensor • Malfunction of ABS rotor • Malfunction of wheel bearing • Malfunction of wiring harness or connector • Malfunction of ABS-ECU



Code No.25 Free wheel engage switch	Probable cause
<p>[Comment] There is an open circuit in the free-wheeling engage switch system.</p>	<ul style="list-style-type: none"> • Malfunction of wiring harness or connector • Malfunction of 4WD indicator ECU • Malfunction of ABS-ECU



Code No.26 Centre differential lock detection switch	Probable cause
<p>[Comment] The above codes are output in the following cases.</p> <ul style="list-style-type: none"> • There is an open circuit in the center differential lock detection switch system. • The free wheel engage switch remains off and the center differential lock detection switch remains on at a vehicle speed of 15 km/h or more for 5 seconds or more. 	<ul style="list-style-type: none"> • Malfunction of wiring harness or connector • Malfunction of free wheel engage switch • Malfunction of 4WD indicator ECU • Malfunction of center differential lock detection switch • Malfunction of ABS-ECU

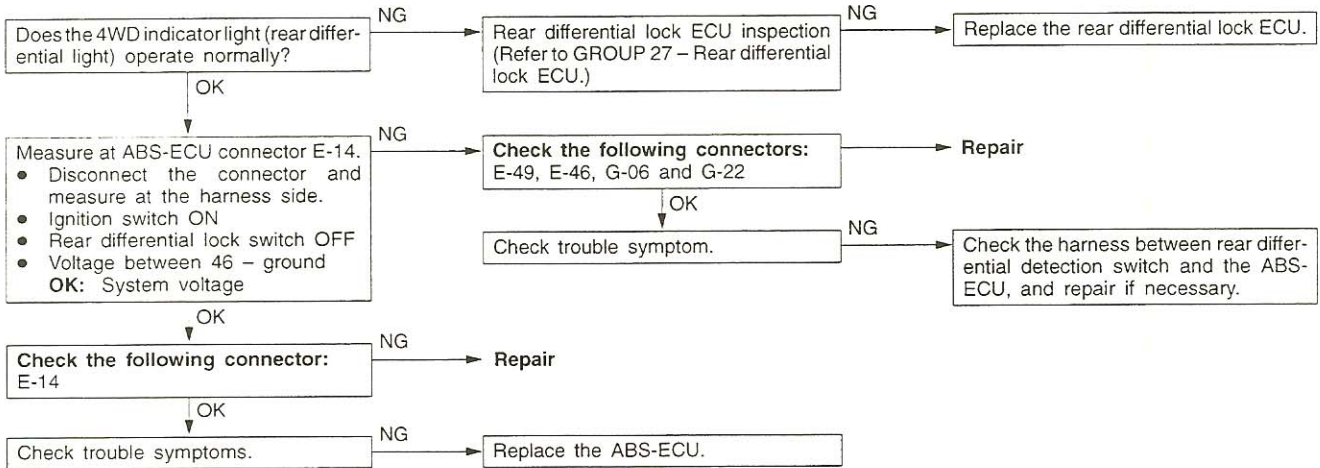


Trouble symptom	Main cause	Remedy
Even when the transfer shift lever is in the "4H" position, the 4WD front wheel indicator light does not illuminate.	Broken harness wire between the 4WD indicator ECU and the free-wheel engage switch, or broken earth wire from the free-wheel engage switch.	Repair the harness.
	Free wheel engage switch is defective.	Replace the switch.
Even when the transfer shift lever is in the "4H" position, the 4WD center differential light does not illuminate.	Broken harness wire between the 4WD indicator ECU and the center differential lock switch	Repair the harness.
	Broken wire in the 4WD indicator ECU circuit	4WD indicator ECU inspection (Refer to GROUP 23A – On-vehicle Service.)
4WD indicator center differential light illuminates regardless of the position of the transfer shift lever.	Short in the harness wire in the center differential lock detection switch circuit	Repair the harness.
	Center differential lock detection switch is defective.	Replace the switch.
	Short inside the ABS-ECU circuit	Replace the ABS-ECU.
	Short inside the the 4WD indicator ECU circuit	4WD indicator ECU inspection (Refer to GROUP 23A – On-vehicle Service.)
No indicator is illuminated.	Power circuit in the 4WD indicator ECU circuit	Repair the harness.
	4WD indicator ECU is defective.	4WD indicator ECU inspection (Refer to GROUP 23A – On-vehicle Service.)

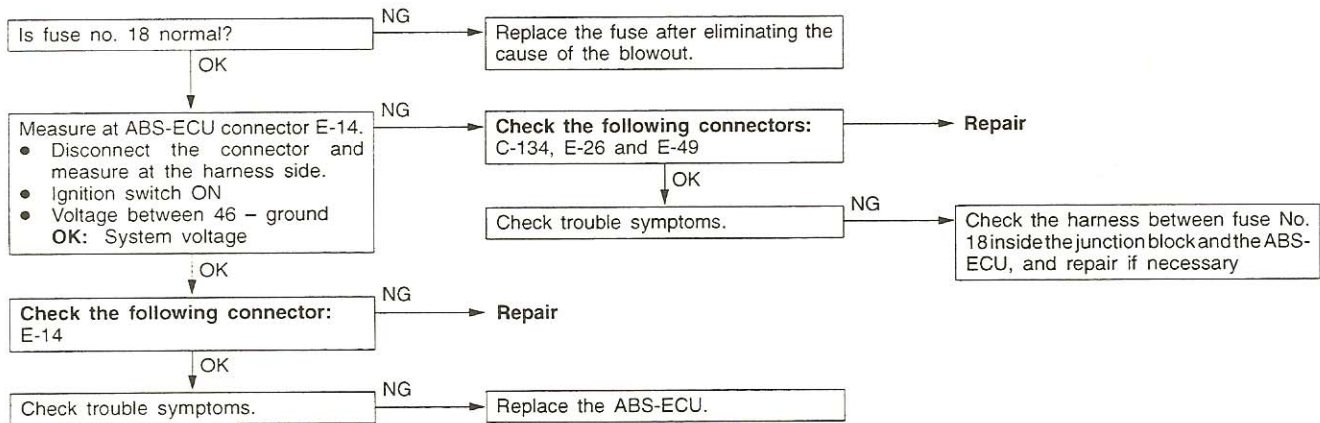
NOTE

When checking a short in the ABS-ECU circuit, remove the ABS-ECU connector and check if the 4WD ind. returns to normal. If it returns to normal, the ABS-ECU is defective. Furthermore, if the ABS-ECU is normal, then the 4WD indicator ECU will be defective.

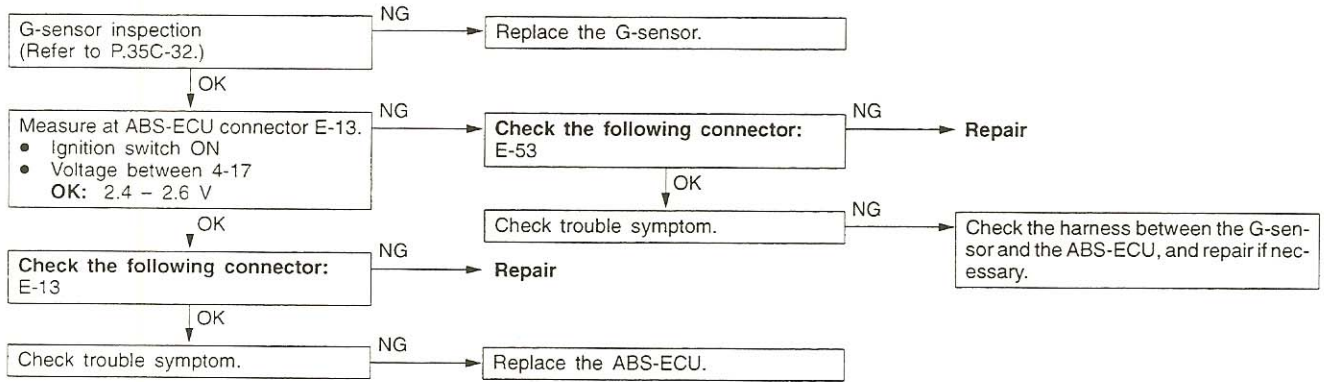
Code No.27 Rear differential lock detection switch <Vehicles with rear differential lock>	Probable cause
[Comment] There is an open circuit in the rear differential lock detection switch system.	<ul style="list-style-type: none"> ● Malfunction of wiring harness or connector ● Malfunction of rear differential lock ECU ● Malfunction of ABS-ECU



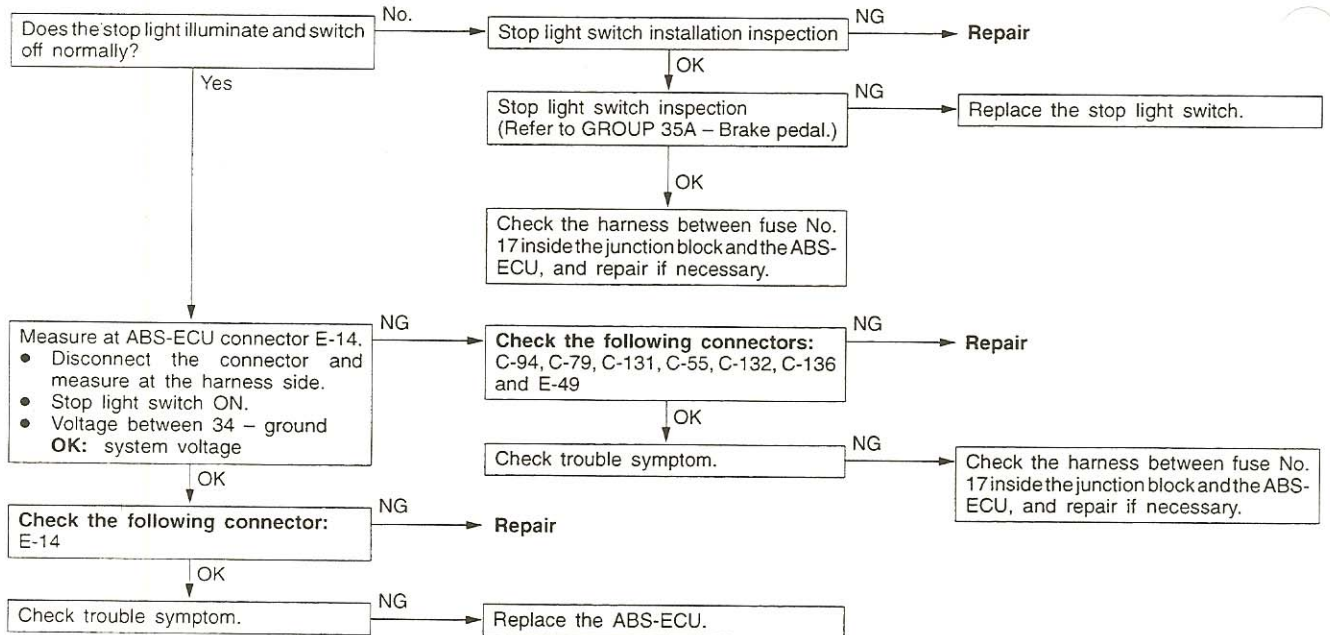
Code No.27 Rear differential lock detection switch <Vehicles without rear differential lock>	Probable cause
[Comment] For vehicles without rear differential lock, battery positive voltage is applied to the ABS-ECU terminal no. 46. This diagnostic trouble code is output when this line is interrupted.	<ul style="list-style-type: none"> ● Malfunction of wiring harness or connector ● Malfunction of ABS-ECU



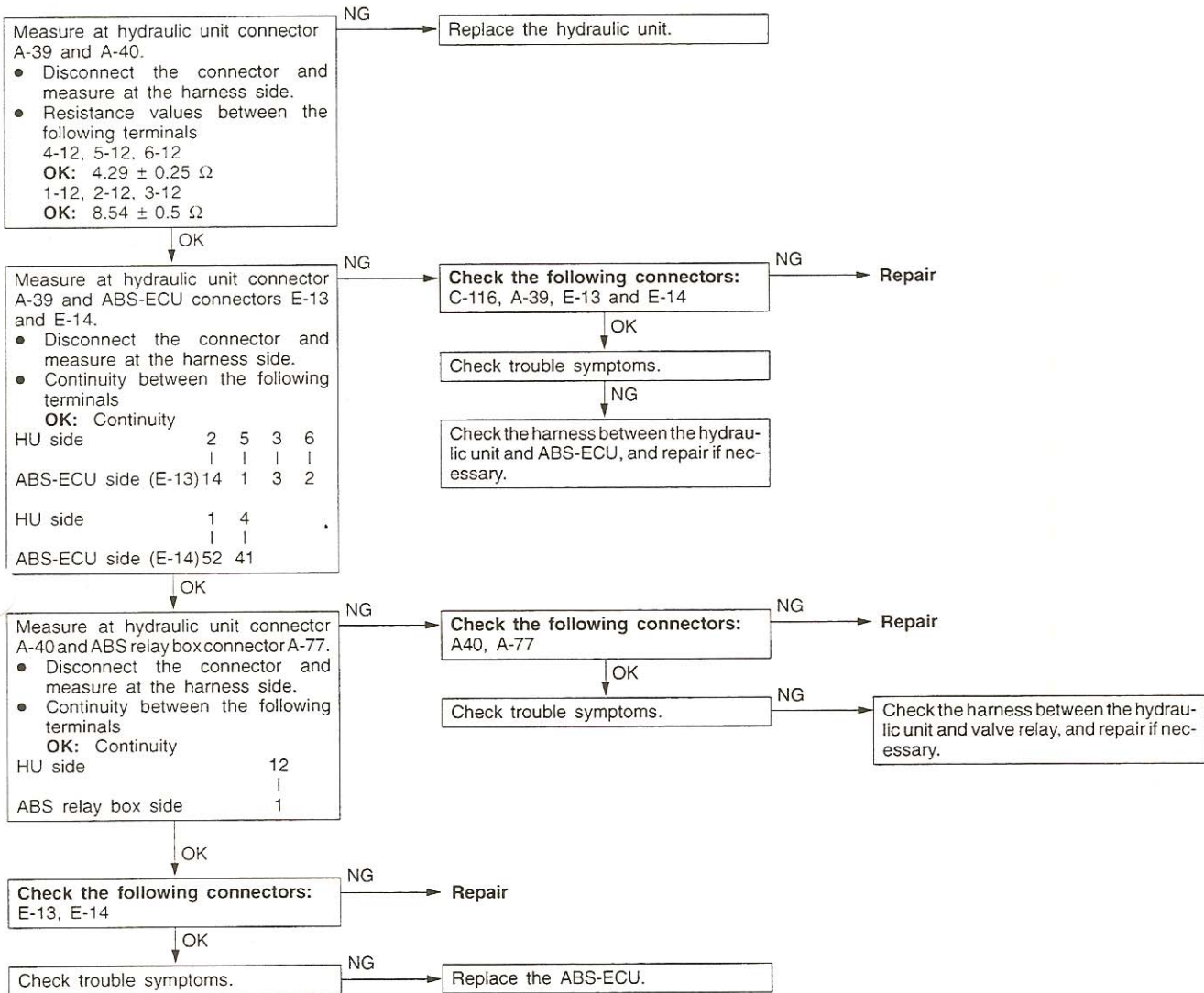
Code No.32 G-sensor system	Probable cause
<p>[Comment] The above codes are output in the following case.</p> <ul style="list-style-type: none"> • The G sensor output is less than 0.5 V or more than 4.5 V. • There is an open or short circuit in the G sensor system. 	<ul style="list-style-type: none"> • Malfunction of G-sensor • Malfunction of wiring harness or connector • Malfunction of ABS-ECU



Code No.33 Stop light switch system	Probable cause
<p>[Comment] The above codes are output in the following cases.</p> <ul style="list-style-type: none"> • The stop light switch can not be turned off. (the stop light switch stays on for 15 minutes or more even though the ABS is not operating) • There is an open circuit in the stop light switch system. 	<ul style="list-style-type: none"> • Malfunction of stop light switch • Malfunction of harness or connector • Malfunction of ABS-ECU



Code No.41, 42, 43 solenoid valve	Probable cause
<p>[Comment] The ABS-ECU always monitors the solenoid drive circuit and judge that there is an open or short circuit in the solenoid coils in the following cases. No current is being supplied to a solenoid even though that solenoid is on. Current continues to be supplied to a solenoid even though that solenoid is off.</p>	<ul style="list-style-type: none"> ● Malfunction of wiring harness ● Malfunction of hydraulic unit ● Malfunction of ABS-ECU

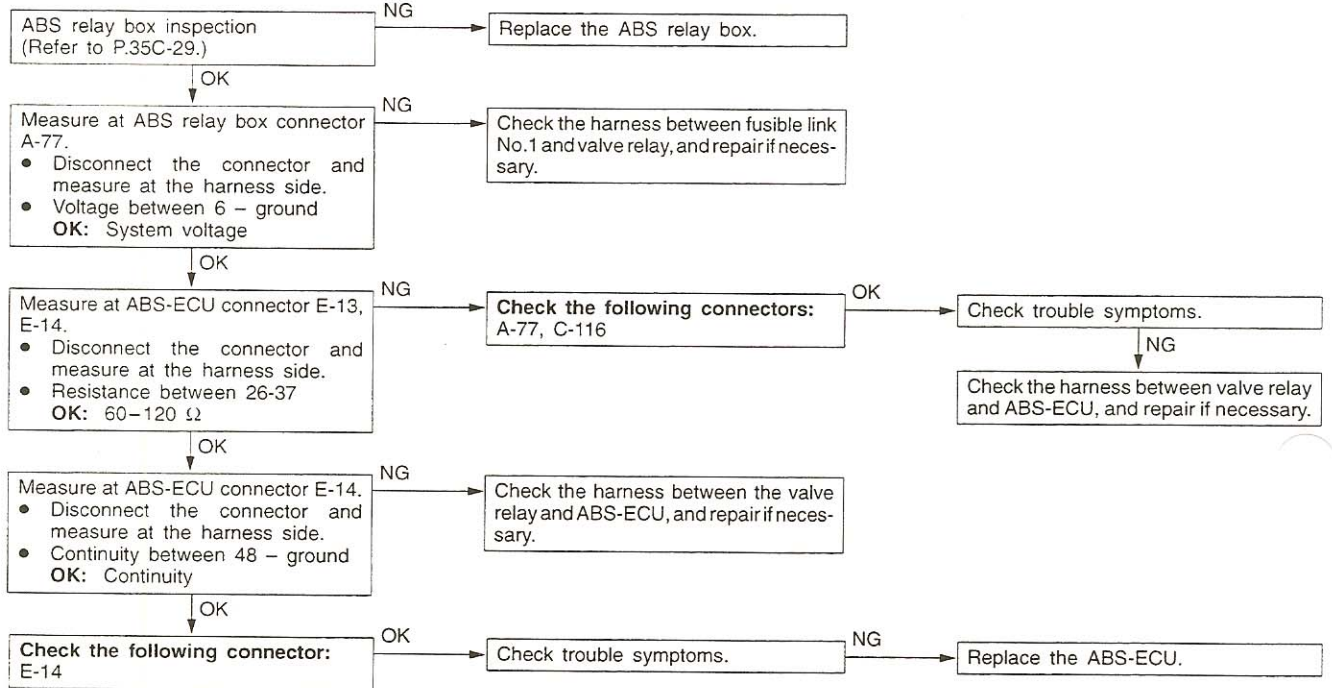


Code No.51 Valve relay	Probable cause
<p>[Comment] When the ignition switch is turned to ON, the ABS-ECU switches the valve relay off and on to check it as the initial check. The valve relay is normally on. So, if power is not being supplied to the relay, the ABS-ECU will judge that the valve relay is defective.</p>	<ul style="list-style-type: none"> ● Malfunction of valve relay ● Malfunction of wiring harness or connector ● Malfunction of ABS-ECU ● Malfunction of hydraulic unit

NOTE

Whenever reading the diagnostic trouble codes using the ABS warning light (P.35C-4), this diagnostic trouble code will be output. That is because the valve relay has been removed.

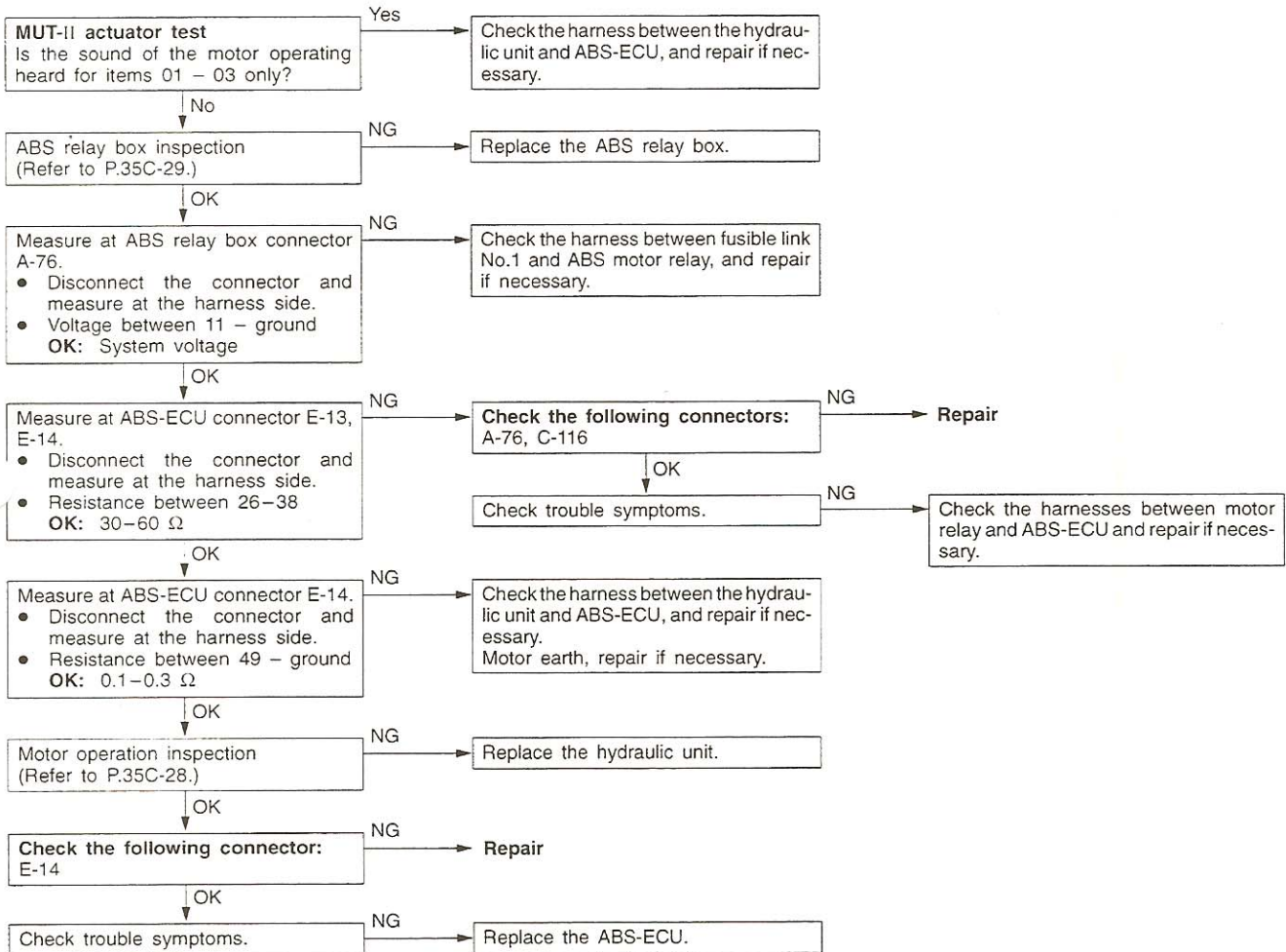
Repair all locations indicated by other diagnostic trouble codes, and then connect the valve relay connector. When the ABS warning light still indicates No.51 even after that, a malfunction in the valve relay system may be present. So, the following checks should then be carried out.

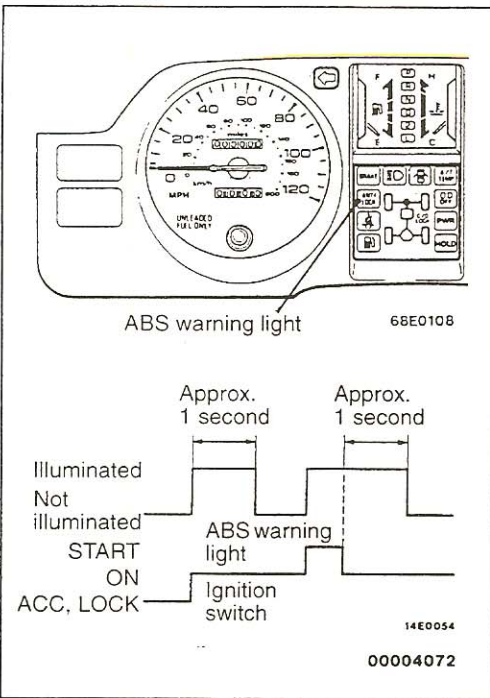


Code No.53 Motor relay, motor	Probable cause
<p>[Comment] The above codes are output in the following cases.</p> <ul style="list-style-type: none"> • When the motor relay is on but no signal is input to the motor monitor line (motor does not run, etc.) • When the motor relay is off and a signal is input to the motor monitor line for 5 seconds or more (motor does not stop, etc.) • When the motor relay does not work 	<ul style="list-style-type: none"> • Malfunction of motor relay • Malfunction of wiring harness or connector • Malfunction of hydraulic unit • Malfunction of ABS-ECU

Caution

The engine should be started and left to run for a while after testing is completed because force-driving of the motor by means of the actuator test will drain the battery,





ABS WARNING LIGHT INSPECTION

35201200017

- Check that the ABS warning light illuminates as follow
1. When the ignition key is turned to ON, the ABS warning light illuminates for approximately 1 second and then switches off.
 2. When the ignition key is turned to START, the ABS warning light remains illuminated.
 3. When the ignition key is released from the “START” position, the ABS warning light illuminates for approximately 1 second and then stays switched off.
 4. If the illumination is other than the above, check the diagnosis codes.

INSPECTION CHART FOR TROUBLE SYMPTOMS

35201140388

Get an understanding of the trouble symptoms and check according to the inspection procedure chart.

Trouble symptom		Inspection procedure No.	Referer page
Communication with MUT-II is not possible.	Communication with all systems is not possible.	1	35C-17
	Communication with ABS only is not possible.	2	35C-17
When the ignition key is turned to “ON” (engine stopped), the ABS warning light does not illuminate.		3	35C-18
After the engine starts, the light remains illuminated.		4	35C-18
When the ignition key is turned to “START”, the ABS warning light does not illuminate.		5	35C-19
After the ignition key is turned to “ON”, the ABS warning light blinks twice, and when turned to “START”, it illuminates. When returned to “ON”, the light flashes once, and then switches off.		6	35C-19
Faulty ABS operation	Unequal braking power on both sides	7	35C-20
	Insufficient braking power	7	35C-20
	ABS operates under normal braking conditions	7	35C-20
	ABS operates before vehicle stops under normal braking conditions	7	35C-20
	Large brake pedal vibration (Caution 2.)	–	–

Caution

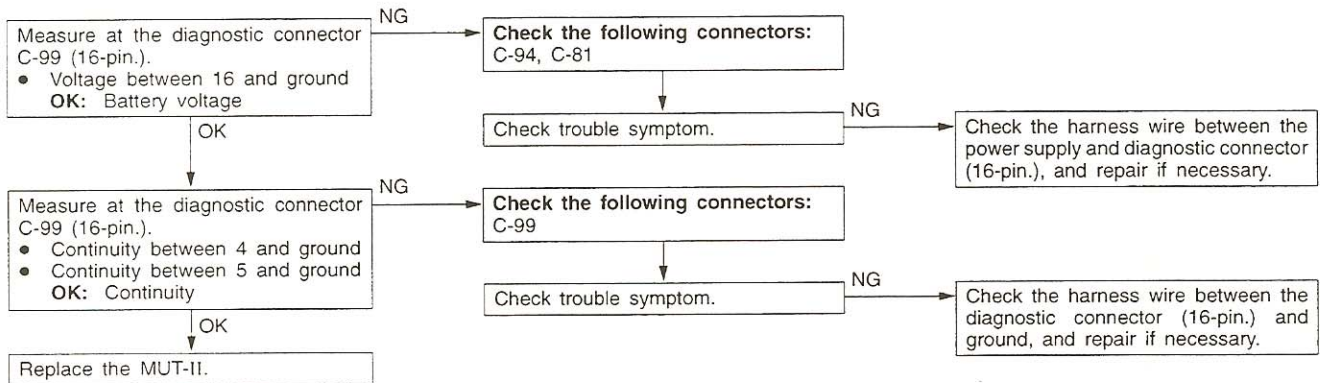
1. If steering movements are made when driving at high speed, or when driving on road surfaces with low frictional resistance, or when passing over bumps, the ABS may operate even though sudden braking is not being applied. Because of this, When getting information from the custo check if the problem occurred while driving under such conditions as these.
2. During ABS operation, changes in the feeling of the brake pedal (vibration may occur or pedal may not be able to be depressed). Such changes are due to intermittent changes in hydraulic pressure inside the brake line to prevent the wheels from locking and is not an abnormality.

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INSPECTION PROCEDURE FOR TROUBLE SYMPTOMS

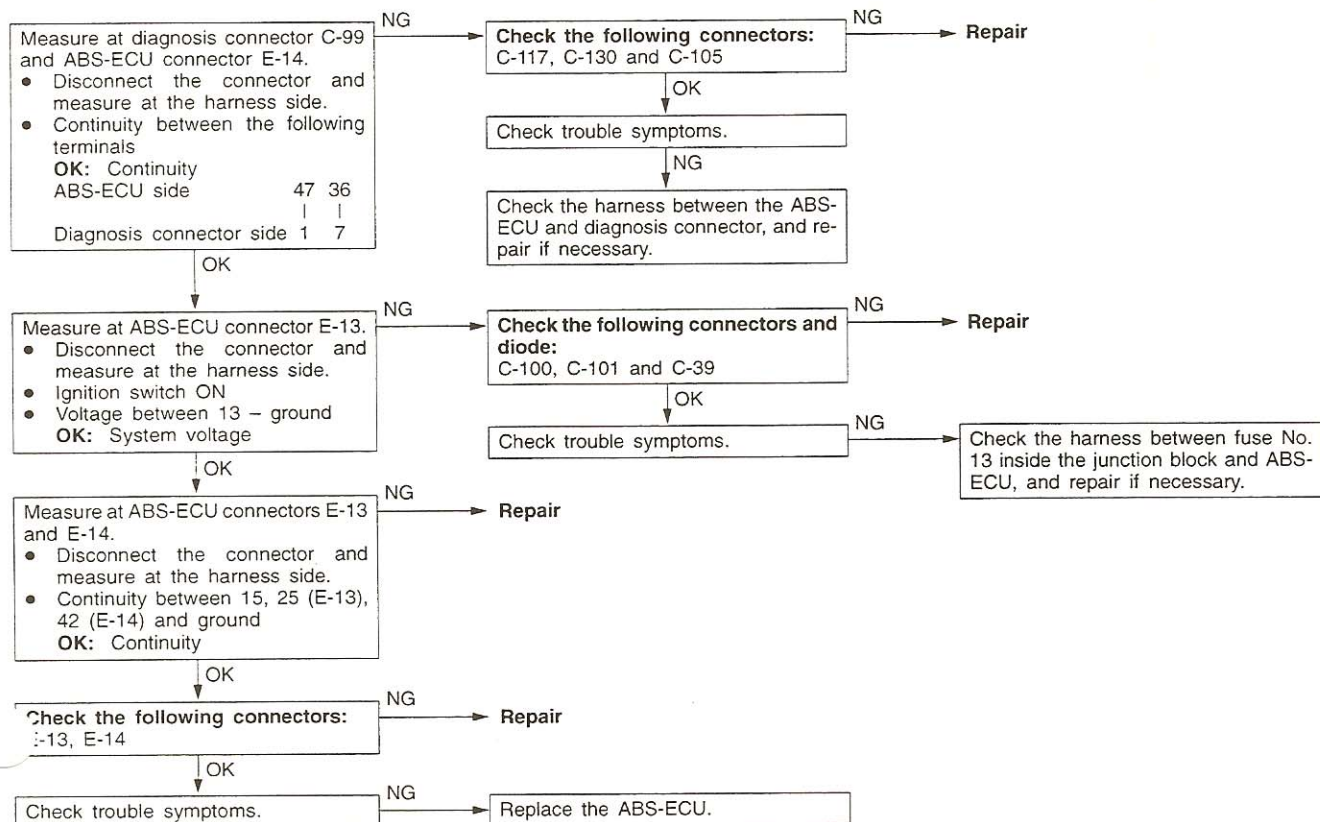
Inspection Procedure 1

Communication with MUT-II is not possible. (Communication with all system is not possible.)	Probable cause
[Comment] The reason is probably a defect in the power supply system (including earth) for the diagnosis line.	<ul style="list-style-type: none"> • Malfunction of connector • Malfunction of harness



Inspection Procedure 2

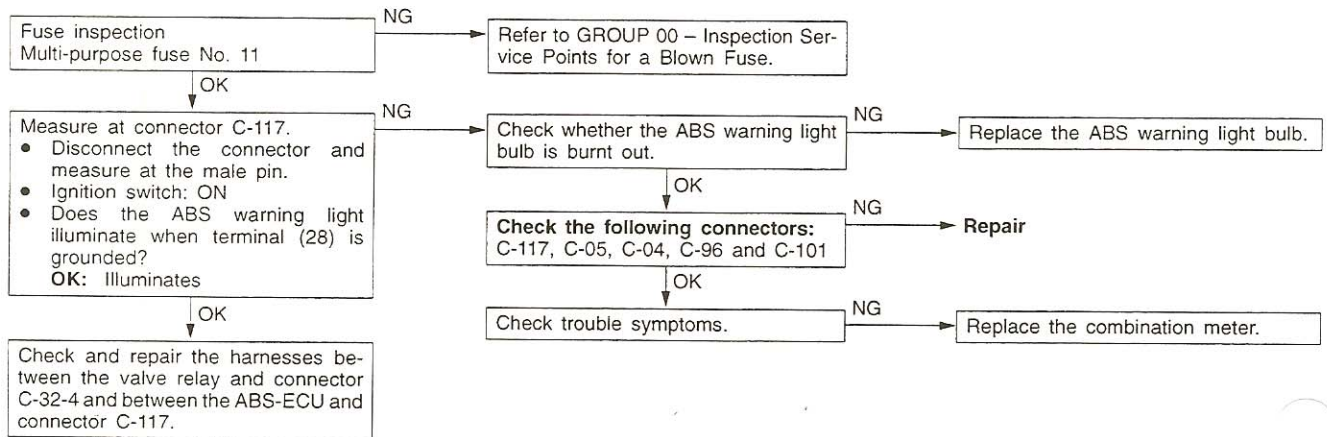
Communication with MUT-II is not possible. (Communication with ABS only is not possible.)	Probable cause
[Comment] When communication with the MUT-II is not possible, the cause is probably an open circuit in the ABS-ECU power circuit or an open circuit in the diagnosis output circuit.	<ul style="list-style-type: none"> • Blown fuse • Malfunction of wiring harness or connector • Malfunction of ABS-ECU



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Inspection Procedure 3

When ignition key is turned to “ON” (engine stopped), ABS warning light does not illuminate	Probable cause
<p>[Comment] When power is supplied to the ABS-ECU, the valve relay turns from off to on, off and back to on again as an initial check. Because of this, the ABS warning light will illuminate twice when the valve relay is off even if there is a problem with the circuit between the ABS warning light and the ABS-ECU. Accordingly, if the light does not illuminate, the cause is probably one of the following items. An open circuit in the light power supply circuit A blown light bulb An open circuit in both the circuit between the ABS warning light and the ABS-ECU and in the circuit between the ABS warning light and the valve relay</p>	<ul style="list-style-type: none"> ● Blown fuse ● Burnt out ABS warning light bulb ● Malfunction of wiring harness or connector

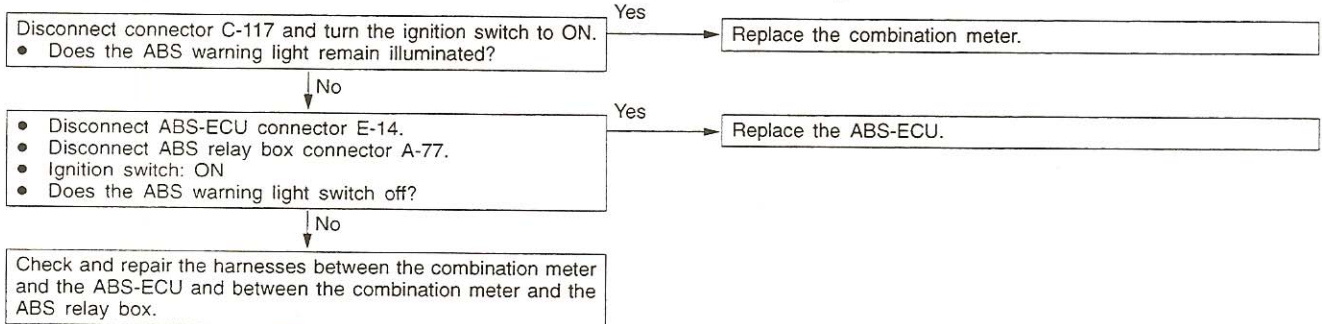


Inspection Procedure 4

Even after the engine is started, the ABS warning light remains illuminated.	Probable cause
<p>[Comment] A short-circuit in the ABS warning light illumination circuit may be present.</p>	<ul style="list-style-type: none"> ● Malfunction of combination meter ● Malfunction of ABS-ECU ● Malfunction of wiring harness

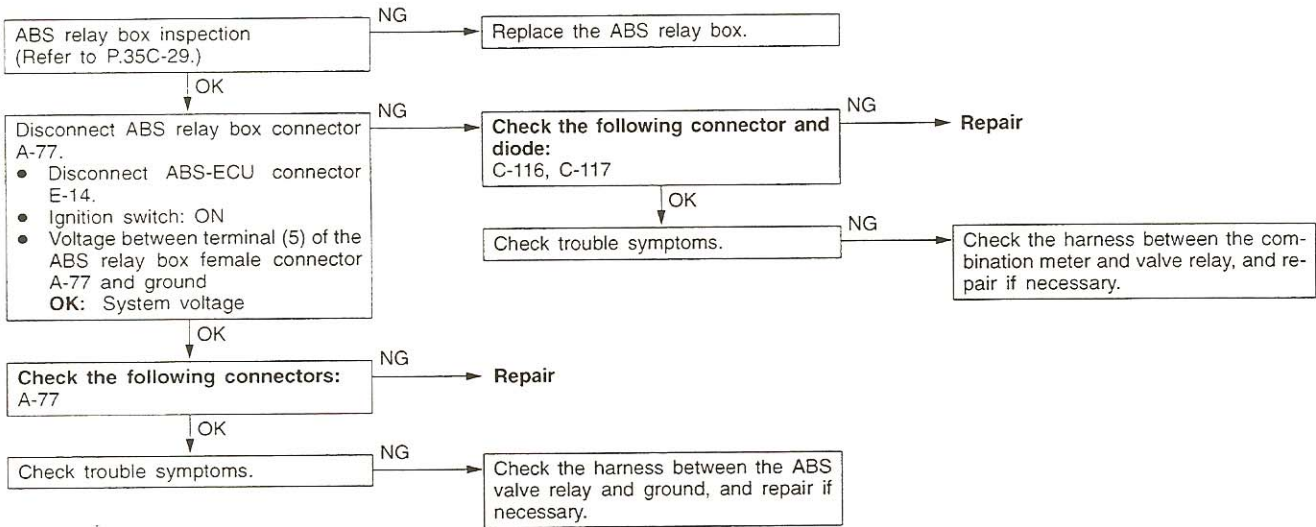
NOTE

This trouble symptom is limited to cases where communication with the MUT-II is possible (ABS-ECU power supply is normal) and the diagnosis code is a normal diagnosis code.



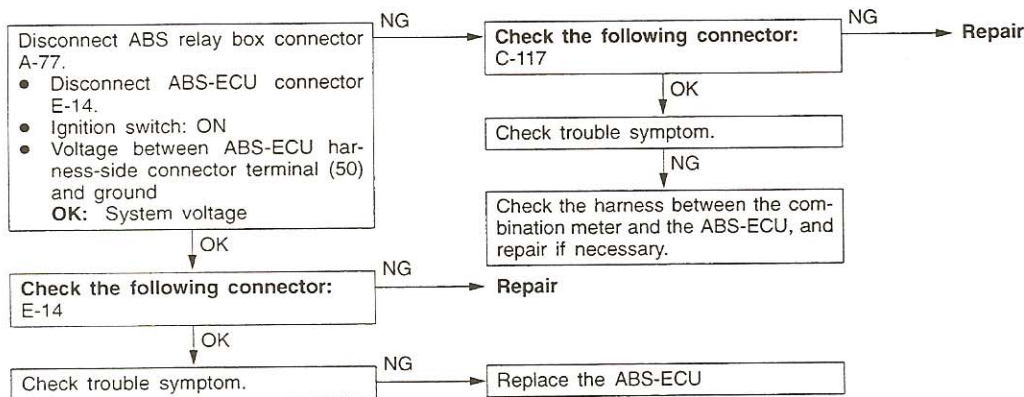
Inspection Procedure 5

<p>When ignition key is turned to “START”, ABS warning light does not illuminate.</p>	<p>Probable cause</p>
<p>[Comment] The ABS-ECU uses the power supply which is turned off when the ignition switch is turned to START. The ABS warning light uses the power supply which is not turned off when the ignition switch is turned to START. Accordingly, when the ignition switch is at START, the power supply to the ABS-ECU is turned off and the valve relay is also turned off. So, when the ABS warning light does not illuminate at this time, the light illumination circuit in the valve relay system is defective.</p>	<ul style="list-style-type: none"> • Malfunction of wiring harness or connector • Malfunction of ABS relay box



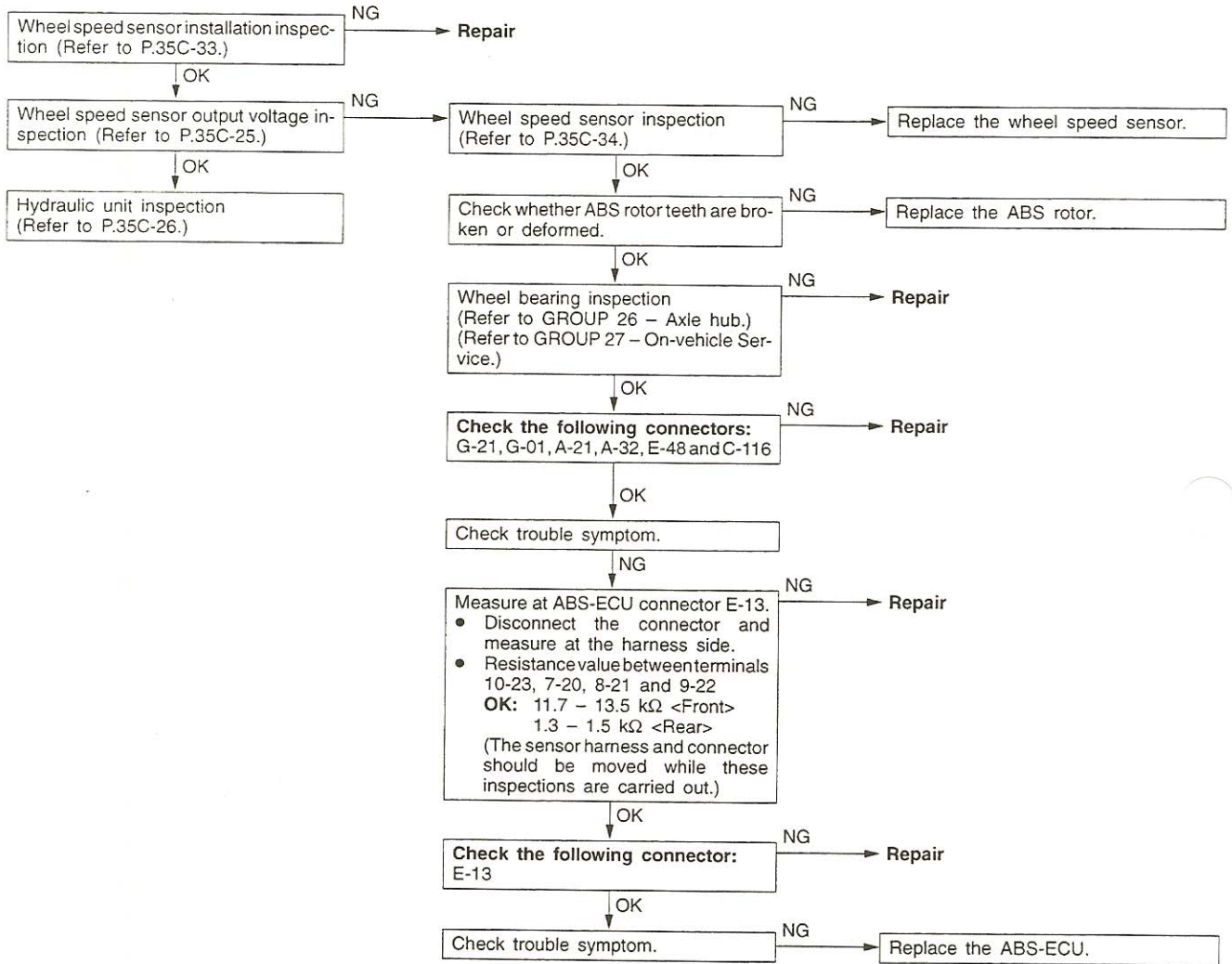
Inspection Procedure 6

<p>The ABS warning light flashes twice after the ignition key is turned to “ON”. The light illuminates when the ignition key is turned to “START”, and when the key is returned to “ON”, it flashes once.</p>	<p>Probable cause</p>
<p>[Comment] The ABS-ECU causes the ABS warning light to illuminate during the initial check (approx. 1 second). During the initial check, the valve relay turns from off to on, off and back to on again, and if there is an open circuit in the harness between the ABS-ECU and the ABS warning light, the light will illuminate only when the valve relay is OFF because of a valve relay test, etc.</p>	<ul style="list-style-type: none"> • Malfunction of wiring harness or connector • Malfunction of ABS-ECU



Inspection Procedure 7

Break operation is abnormal	Probable cause
<p>[Comment] This 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.</p>	<ul style="list-style-type: none"> ● Improper installation of wheel speed sensor ● Incorrect sensor harness contact ● Foreign material adhering to wheel speed sensor ● Malfunction of wheel speed sensor ● Malfunction of ABS rotor ● Malfunction of wheel bearing ● Malfunction of hydraulic unit ● Malfunction of ABS-ECU



SERVICE DATA INSPECTION TABLE

35201150121

The following items can be read by the scan tool from the ABS-ECU input data.

1. When the system is normal

Item No.	Inspection Item	Inspection Conditions	Normal Judgement Value
11	Front-right wheel speed sensor	When vehicle is being driven	Vehicle speeds displayed on the speedometer and scan tool are identical.
12	Front-left wheel speed sensor		
13	Rear-right wheel speed sensor		
14	Rear-left wheel speed sensor		
16	ABS-ECU power supply voltage	IG power supply voltage and valve monitor voltage	9–16 V
25	Free wheel engage switch	During 4WD	ON
		During 2WD	OFF
26	Center differential lock detection switch	When transfer lever is at 4HLC	ON
		When transfer lever is at 4H	OFF
27	Rear differential lock detection switch	When switch is on	ON
		When switch is off	OFF
32	G sensor output voltage	When vehicle is stationary	2.4 – 2.6 V
		When vehicle is being driven	Display value fluctuates with a mean value of 2.5 V.
33	Stop light switch	When brake pedal is depressed	ON
		When brake pedal is released	OFF

2. When system is isolated by the ABS-ECU

When the functioning of the ABS-ECU has been stopped by the on-board diagnostics, the scan tool display data will be different from actual conditions.

ACTUATOR TEST INSPECTION TABLE

35201160018

The following actuators can be force-activated using the scan tool.

NOTE

1. If the functioning of the ABS-ECU has been stopped, actuator testing cannot be carried out.
2. Actuator testing is only possible when the vehicle is stationary. If the vehicle speed during actuator testing exceeds 10 km/h (6 mph), forced actuation will be canceled.

ACTUATOR TEST SPECIFICATIONS

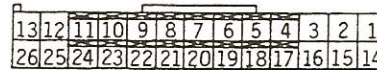
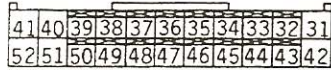
No.	Driving objective	Driving pattern	
01	Solenoid valve and pump motors for each corresponding channel in the hydraulic unit		
02			Solenoid valve for front right wheel
03			Solenoid valve for rear wheels

Z14E0048

TERMINAL VOLTAGE CHART

TERMINAL VOLTAGE CHART

1. Measure the voltages between terminals (12), (25) and (42) (ground terminals) and each respective terminal.
2. The terminal layouts are shown in the illustrations below.



14W0042

Connector Terminal No.	Name of Signal	Inspection Condition		Normal Condition
1	Output from front-left hydraulic unit solenoid (from wheel cylinder)	Ignition switch : ON (When solenoid is off approximately 1 second after engine is started)		System voltage
2	Output from rear hydraulic unit solenoid (from wheel cylinder)			
3	Output from rear hydraulic unit solenoid (to wheel cylinder)			
4	G sensor signal	Ignition switch : ON		2.4 – 2.6 V (Horizontal condition)
13	ABS-ECU power supply	Ignition switch : ON		System voltage
		Ignition switch: START		0 V
14	Output from front-left hydraulic unit solenoid (to wheel cylinder)	Ignition switch : ON (When solenoid is off approximately 1 second after engine is started)		System voltage
17	G sensor ground	At all times		0 V
26	Relay power supply output	Ignition switch : ON		System voltage
32	Memory power supply	At all times		System voltage
34	Stop light switch input	Ignition switch : ON	Stop light switch ON	System voltage
			Stop light switch OFF	1 V or less
35	Center differential lock detection switch input	Ignition switch : ON	Transfer lever: 4H	System voltage
			Transfer lever: 4Lc	1 V or less
36	MUT-II	When scan tool is connected		Serial communication with scan tool
		When scan tool is not connected		1 V or less
37	Vaive relay output	Ignition switch : ON	When relay is on approximately 1 second after engine is started	2 V or less
			When system is normal and relay is off	System voltage
38	Motor relay output	Ignition switch : ON (approximately 1 second after engine is started)	When motor is on	2 V or less
			When motor is off	System voltage

TSB Revision

Connector Terminal No.	Name of Signal	Inspection Condition		Normal Condition
41	Output from front-right hydraulic unit solenoid (from wheel cylinder)	Ignition switch : ON (When solenoid is off approximately 1 second after engine is started)		System voltage
43	ABS operating signal	Ignition switch : ON When motor is on approximately 1 second after engine is started)		System voltage
45	Free wheel engage switch input	Ignition switch : ON	During 4WD	System voltage
			During 2WD	1 V or less
46*1	Ignition switch	Ignition switch : ON		System voltage
		Ignition switch: START		0 V
46*2	Rear differential lock detection switch input	Ignition switch : ON	Rear differential lock switch: ON	0 V
			Rear differential lock switch: OFF	System voltage
47	Diagnostic selection input	When scan tool is connected		0 V
		When scan tool is not connected		Approx. 12 V
48	Valve relay monitor input	Ignition switch : ON		System voltage
49	Motor monitor	Ignition switch : ON (approximately 1 second after engine is started)	When motor is on	System voltage
			When motor is off	0.5 V or less
50	ABS warning light output	Ignition switch : ON	When light is switched off	System voltage
			When light is illuminated	0–2 V
52	Output from front-right hydraulic unit solenoid (to wheel cylinder)	Ignition switch : ON (When solenoid is off approximately 1 second after engine is started)		System voltage

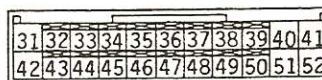
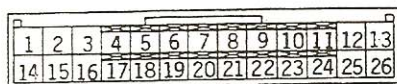
NOTE

(1)*1: Vehicles without rear differential lock.

(2)*2: Vehicles with rear differential lock.

RESISTANCE AND CONTINUITY BETWEEN HARNESS-SIDE CONNECTOR TERMINALS

1. Turn the ignition switch off and disconnect the ABS-ECU connector before measuring resistance and checking continuity.
2. Measure resistance and check continuity between the terminals indicated in the table below.
3. The terminal layouts are shown in the illustrations below.

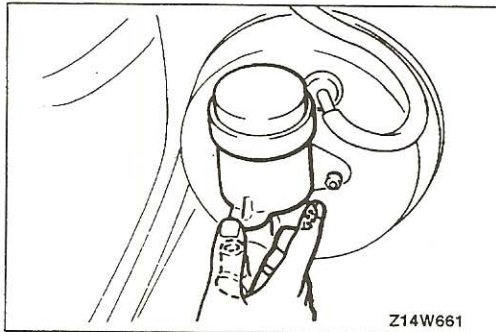


14W0043

Connector Terminal No.	Name of Signal	Normal Condition
1 – Ground	Front-left solenoid (from wheel cylinder)	4.29 ± 0.25 Ω
2 – Ground	Rear solenoid (from wheel cylinder)	4.29± 0.25 Ω
3 – Ground	Rear solenoid (to wheel cylinder)	8.54 ± 0.5 Ω

TSB Revision

Connector Terminal No.	Name of Signal	Normal Condition
7 – 20	Front-left wheel speed sensor (positive wire)	1.17 – 1.35 k Ω
8 – 21	Rear-right wheel speed sensor (positive wire)	1.3 – 1.5 k Ω
9 – 22	Rear-left wheel speed sensor (positive wire)	1.3 – 1.5 k Ω
10 – 23	Front-right wheel speed sensor (positive wire)	1.17 – 1.35 k Ω
14 – Ground	Front-left solenoid (to wheel cylinder)	8.54 \pm 0.5 Ω
15 – Ground	ABS-ECU ground	Continuity
25 – Ground		
41 – Ground	Front-right solenoid (from wheel cylinder)	4.29 \pm 0.25 Ω
42 – Ground	ABS-ECU ground	Continuity
48 – Ground	Valve relay monitor input	Continuity
49 – Ground	Motor monitor	Continuity
52 – Ground	Front-right solenoid (to wheel cylinder)	8.54 \pm 0.5 Ω



ON-VEHICLE SERVICE

35200150054

BLEEDING

Caution

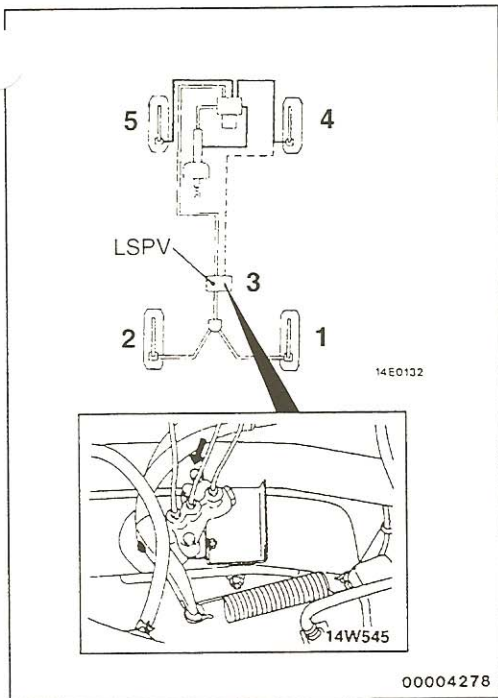
Use the specified brake fluid. Avoid using a mixture of the specified brake fluid and other fluid.

Specified brake fluid: DOT 3 or DOT 4

MASTER CYLINDER AIR BLEEDING

If there is no brake fluid in the master cylinder, bleed air from the master cylinder by the following procedure.

- (1) Supply brake fluid to the reservoir tank.
- (2) Depress and hold the brake pedal.
- (3) Another person should then plug the outlet of the master cylinder with a finger.
- (4) In the condition in step (3), release the brake pedal.
- (5) Repeat steps (2) to (4) three or four times so as to supply brake fluid inside the master cylinder.



BRAKE PIPE LINE AIR BLEEDING

Bleed the brake system in the sequence shown in the illustration.

Furthermore, for vehicles with ABS, start the engine before bleeding the air.

Caution

When supplying brake fluid for vehicles with ABS, the filter should be installed to the master cylinder reserve tank.

WHEEL SPEED SENSOR OUTPUT VOLTAGE MEASUREMENT

35200160286

1. Check that the clearance between the wheel speed sensor and the ABS rotor is within the standard value.
2. Raise up the wheels and release the parking brake.
3. Disconnect the ABS-ECU connector and inspect the connector at the harness side.

Caution

Be sure to remove the connector double lock and insert the probe into the harness side. Inserting it into the terminal side will result in a bad connection.

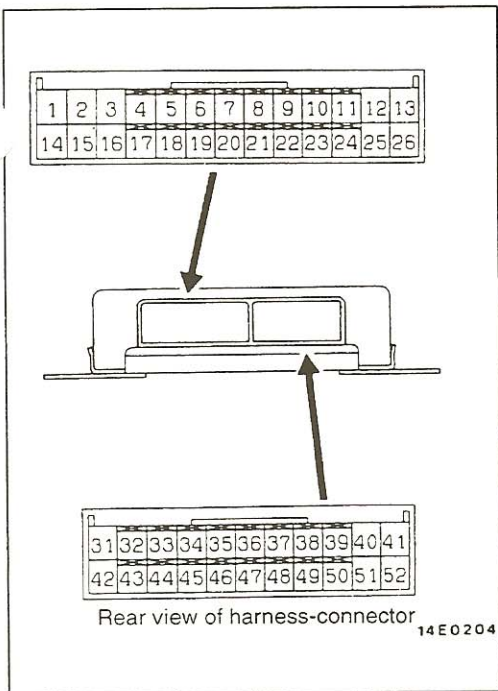
4. Rotate the wheel by hand to be measured at approximately 1/2–1 rotations per second and check the output voltage using a voltmeter (AC mV range) or an oscilloscope.

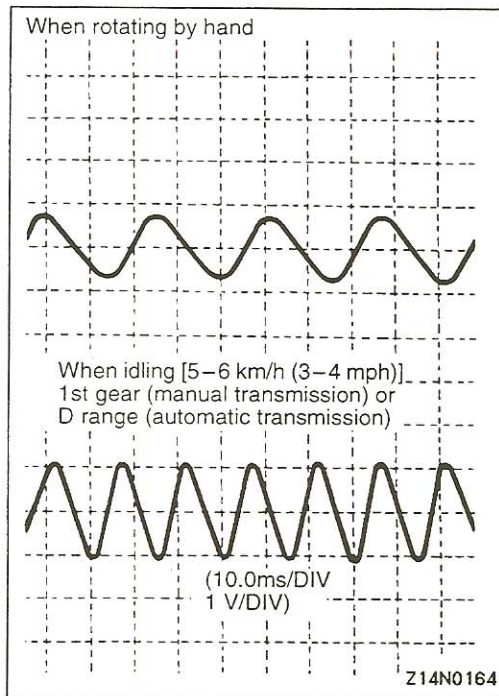
<Terminal No.>

Polarity	Front left	Front right	Rear left	Rear right
+	7	10	9	8
-	20	23	22	21

Output voltage:

When measuring with a voltmeter: 70 mV or more
 When measuring with an oscilloscope: 200 mVp-p or more





5. If the output voltage is lower than the above values, the reason could be as follows:
 - Excessive clearance between the wheel speed sensor pole piece and the ABS rotor
 - Malfunction of wheel speed sensor
 Adjust the wheel speed sensor or replace if necessary.
6. Next, to observe the output of the wheel speed sensors, move the transfer shift lever to the "4H" position, and the transmission control lever to the "D" position, and rotate the wheels.

NOTE

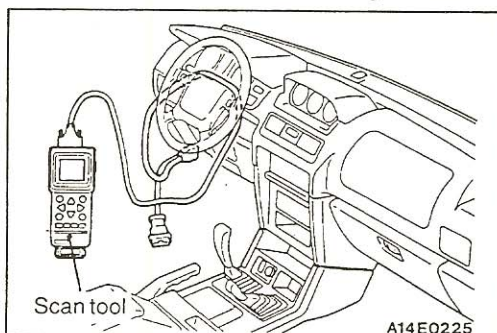
1. Check the connection of the sensor harness and connector before using the oscilloscope.
2. The wave form measurements can also be taken while the vehicle is actually moving.
3. The output voltage will be small when the wheel speed is low. Similarly, it will be large when the wheel speed is high.

WAVE OBSERVATION POINTS

Trouble Symptom	Cause	Suggested remedy
Wave amplitude is too small, or doesn't appear at all	Malfunction of wheel speed sensor	Replace the sensor.
	Wrong clearance between the pole piece and rotor	Adjust the clearance.
Excessive variation in the wave amplitude (However, if the lowest amplitude occurs at 200 mVp-p, there is no problem.)	Excessive runout or eccentricity in the axle hub	Replace the hub.
Noise or interference in the wave pattern	Open circuit in the sensor	Replace the sensor.
	Open circuit in the harness	Repair the harness.
	Incorrect wheel speed sensor installation	Install the sensor correctly.
	Eccentric ABS rotor or broken ABS rotor teeth	Replace the ABS rotor.

NOTE

As the wheel speed sensor harness moves in conjunction with the movement of the front and rear suspension, the wires might break while driving on rough roads, but may have continuity while driving on normal roads. Accordingly, when measuring the wave pattern of the wheel speed sensor output voltage, shake the sensor harness to simulate the special conditions of a rough road.

**HYDRAULIC UNIT CHECK**

35200170098

1. Jack up the vehicle and support it on axle stands.
2. Release the parking brake and feel the drag force (drag torque) on each wheel brake.
3. Connect the scan tool to the data link connector.

Caution

Turn the ignition switch off before connecting or disconnecting the scan tool.

- After checking that the selector lever is in neutral, start the engine.

Caution

At this time, check that the ABS warning light illuminates for a brief period before turning off. If it doesn't turn off, refer to ANTI-LOCK BRAKING SYSTEM TROUBLESHOOTING on P.35C-16.

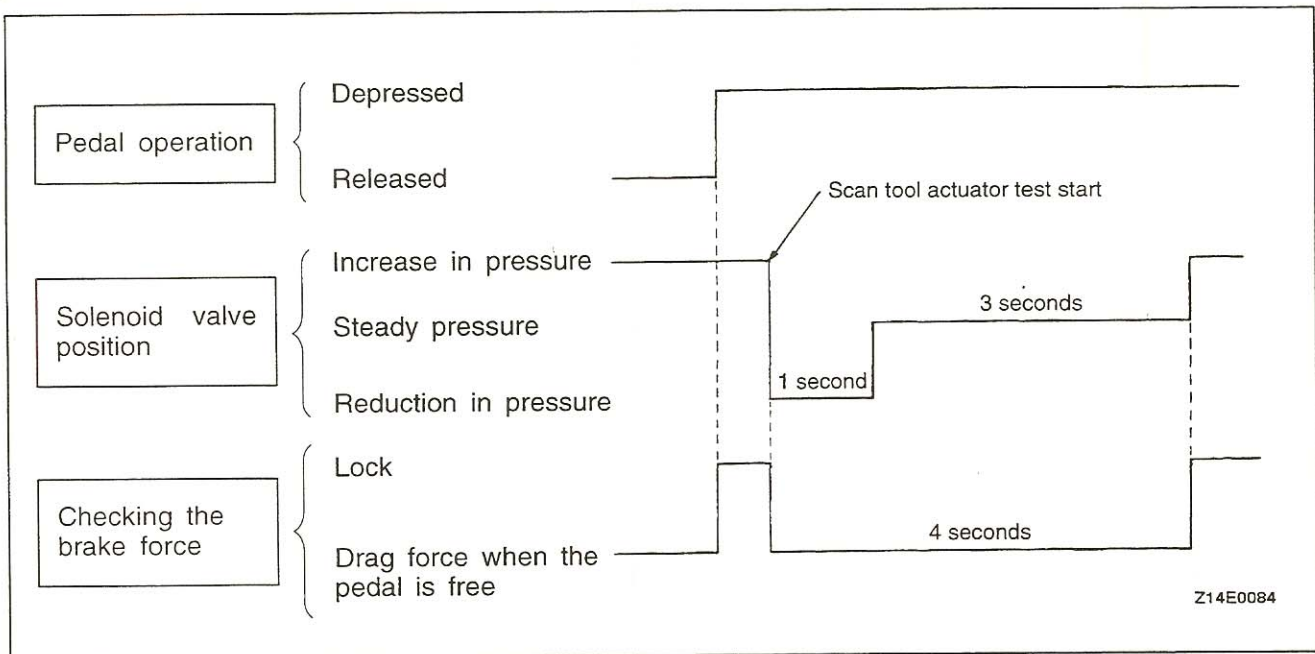
- Depress the brake pedal to lock the wheels.
- Select the item number on the scan tool actuator test for the wheel to be inspected.

Item No.	Drive object	
01	Front left wheel	Solenoid valve and pump monitor in the hydraulic unit corresponding to each wheel at left
02	Front right wheel	
03	Rear wheels	

- Use the scan tool to force-drive the actuator, and turn the wheel by hand to check the change in braking force when the brake pedal is depressed. The result should be as shown in the following illustration.

NOTE

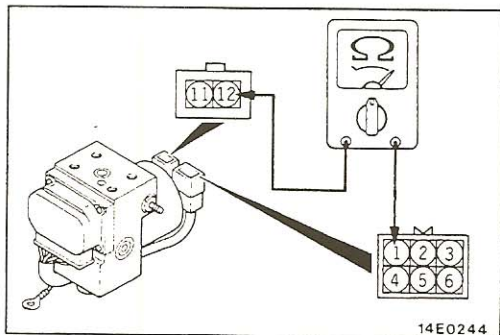
- When the scan tool is used and the ABS system is selected, the ABS system will switch to scan tool mode and the ABS warning light will illuminate.
- When the ABS function has been interrupted by the fail-safe, the scan tool actuator testing cannot be used.



- If a different result is obtained when checking, correct it by following the procedure in the Diagnostic Table for Simple Inspection below.

Diagnostic Table for Simple Inspection

Diagnostic		Cause and remedy	
Normal	Problem	Cause	Suggested remedy
After locking for a 4-second period, the braking force will release.	The wheel will not lock even when the pedal is depressed.	Blockage in the brake line outside the hydraulic unit	Inspect the brake line and clean
		Blockage in the oil pressure circuit in the hydraulic unit	Replace the hydraulic unit.
	Braking force does not release.	Hydraulic unit brake pipes are incorrectly connected	Connect correctly
		Malfunction of hydraulic unit solenoid valve	Replace the hydraulic unit.



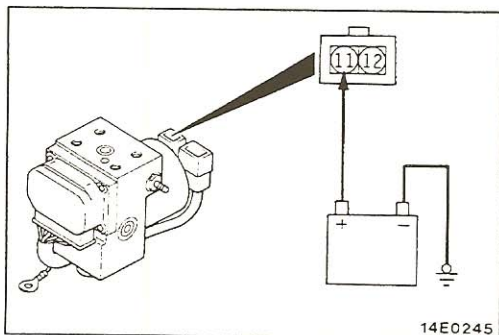
SOLENOID VALVE CHECK

35201070137

Measure the resistance between terminals

Standard value:

Solenoid	Measurement Terminals	Resistance Between Terminals
To front wheel cylinder (right side)	12-4	4.29 ± 0.25 Ω
To front wheel cylinder (left side)	12-5	
To rear wheel cylinder	12-6	
From front wheel cylinder (right side)	12-1	8.54 ± 0.5 Ω
From front wheel cylinder (left side)	12-2	
From rear wheel cylinder	12-3	



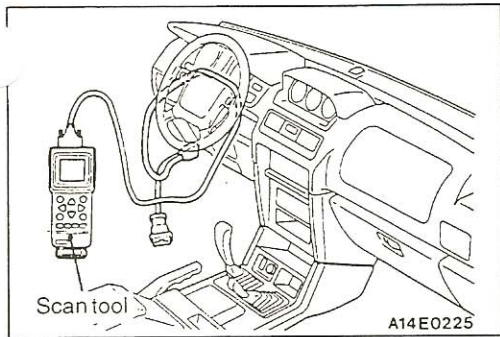
MOTOR OPERATION CHECK

35200180138

Connect the battery and check to be sure that the sound of the hydraulic unit motor operating can be heard.

Caution

The battery power should not be applied for more than 1 second.



G-SENSOR OUTPUT VOLTAGE CHECK 35200190032

1. Unload the vehicle and move it to a horizontal surface.
2. Connect the scan tool to the data link connector.

Caution

Turn the ignition switch off before connecting or disconnecting the scan tool.

3. Start the engine.

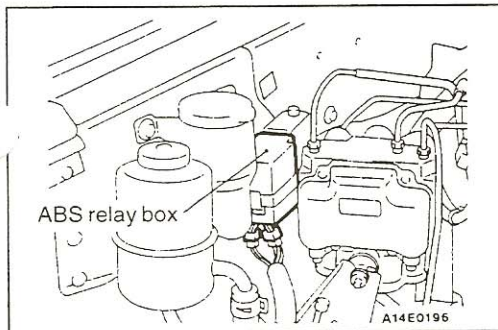
Caution

At this time, check to be sure that the ABS warning light illuminates for a brief period before turning off. If it does not turn off, refer to ANTI-LOCK BRAKING SYSTEM TROUBLESHOOTING on P.35C-16.

4. Check that the G sensor output voltage is within the standard value range.

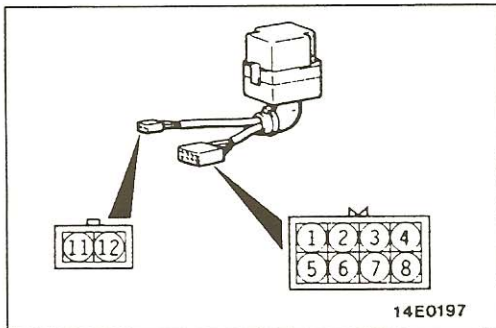
Standard value: 2.5 ± 0.10 V

5. If the G sensor output voltage is not within the standard value range, check the installation condition of the G sensor. If there is a loose bolt, deformation of the G sensor bracket, etc., carry out a repair. If the problem is not repairable, replace the G sensor.



ABS RELAY BOX (WITH BUILT-IN MOTOR RELAY AND VALVE RELAY) CHECK 35201210027

Disconnect the ABS relay box connector and check the continuity between the terminals of the ABS relay box-side connector when current is flowing and when current is not flowing.



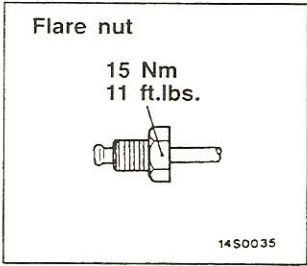
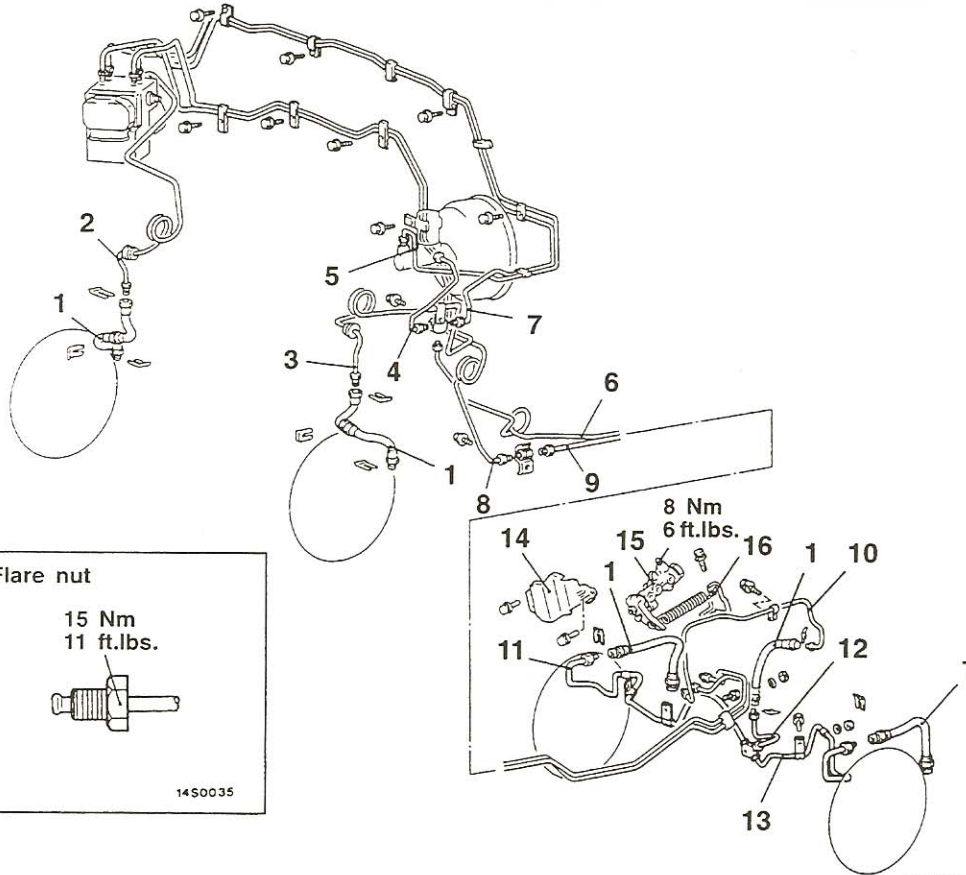
When no current flows	Between terminals (7) – (4)	30–60 Ω
	Between terminals (7) – (8)	60–120 Ω
	Between terminals (11) – (12)	No continuity (Infinite resistance)
	Between terminals (6) – (1)	No continuity (Infinite resistance)
	Between terminals (5) – (2)	Continuity (approx. 0 Ω)
When current flows between terminals (7) – (4)	Between terminals (11) – (12)	Continuity (approx. 0 Ω)
When current flows between terminals (7) – (8)	Between terminals (5) – (2)	No continuity (Infinite resistance)
	Between terminals (6) – (1)	Continuity (approx. 0 Ω)

BRAKE LINE

REMOVAL AND INSTALLATION

Pre-removal Operation
 • Brake Fluid Draining

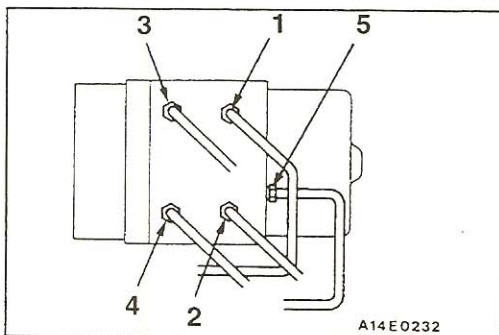
Post-installation Operation
 • Brake Fluid Supplying
 • Bleeding (Refer to P.35C-24.)



- ▶A◀ 1. Brake hose
- ▶A◀ 2. Brake pipe (front, R.H.)
- ▶A◀ 3. Brake pipe (front, L.H.)
- ▶A◀ 4. Brake pipe (A)
- ▶A◀ 5. Brake pipe (B)
- ▶A◀ 6. Brake pipe (floor)
- ▶A◀ 7. Brake pipe (floor 1)
- ▶A◀ 8. Brake pipe (main 1)
- ▶A◀ 9. Brake pipe (main 2)
- ▶A◀ 10. Brake pipe (main 3)
- ▶A◀ 11. Brake pipe (rear, R.H.)

- 12. Brake pipe (rear, center)
- 13. Brake pipe (rear, L.H.)
- 14. Protector
- 15. Load sensing proportioning valve
- 16. Load sensing spring

Caution
 Do not disassemble the load sensing proportioning valve because its performance depends on the set load of the spring.



INSTALLATION SERVICE POINT

▶A◀ BRAKE PIPES TO HYDRAULIC UNIT INSTALLATION

Install the brake pipes as shown in the illustration.

1. From master cylinder to hydraulic unit (to the rear brake)
2. From master cylinder to hydraulic unit (to the front brake)
3. From hydraulic unit to rear brake
4. From hydraulic unit to front brake (LH)
5. From hydraulic unit to front brake (RH)

TSB Revision

HYDRAULIC UNIT

REMOVAL AND INSTALLATION

Pre-removal Operation

- Brake Fluid Draining

Post-installation Operation

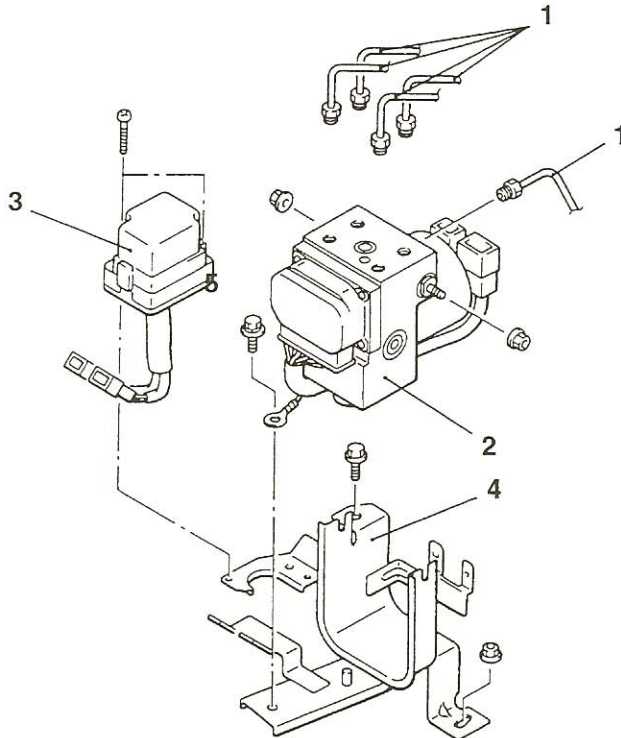
- Brake Fluid Supplying
- Bleeding (Refer to P.35C-24.)
- Checking by Using the Scan Tool (Refer to P.35C-26.)

Flare nut

15 Nm
11 ft.lbs.



1450035



14E0235

00005438

Removal steps

1. Brake tube connection
2. Hydraulic unit

3. ABS relay box
4. Hydraulic unit bracket



REMOVAL SERVICE POINT

◀A▶ HYDRAULIC UNIT REMOVAL

Caution

1. The hydraulic unit is heavy, and so care should be taken when removing it.
2. The hydraulic unit is not to be disassembled; its nuts and bolts should absolutely not be loosened.
3. The hydraulic unit must not be dropped or otherwise subjected to shocks.
4. The hydraulic unit must not be turned upside down or laid on its side.

TSB Revision

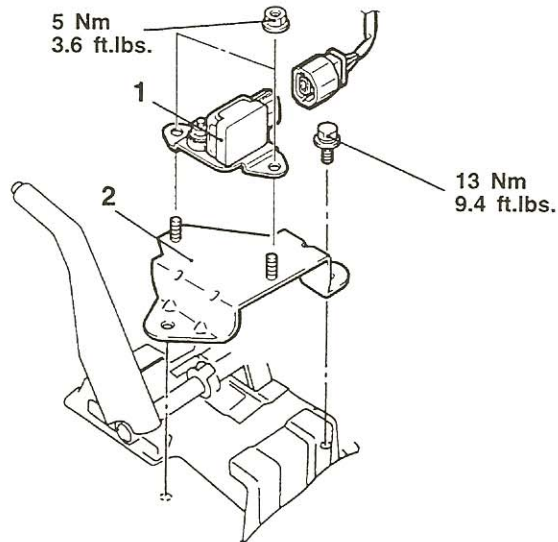
G SENSOR

3520101-3

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation

- Floor Console Removal and Installation
(Refer to GROUP 52A – Floor Console.)



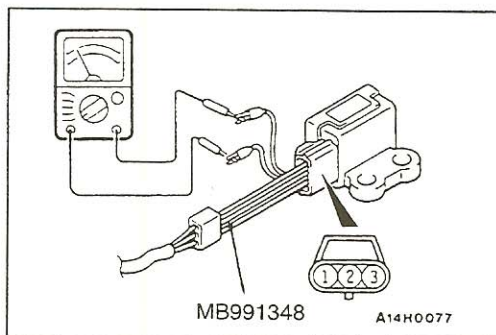
A14E0243

Removal steps

1. G sensor
2. G sensor bracket

Caution

When removing the G sensor, take care not to drop it or subject it to severe impact.



MB991348

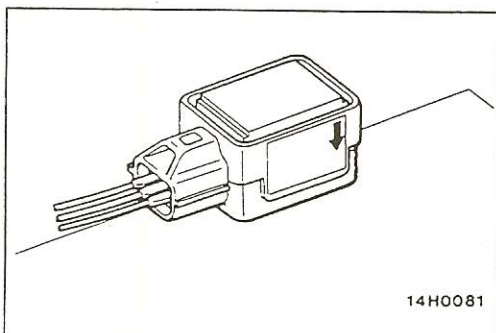
A14H0077

INSPECTION

35201020071

- (1) Disconnect the G-sensor connector and connect the special tool between the terminal of the disconnected connector.
- (2) Turn the ignition switch to ON and take a reading of the following output voltage.
Between terminals (2) and (3)

Standard value: 2.4 – 2.6 V



14H0081

- (3) With the special tool still connected, secure the G-sensor so that the FRONT mark on the sensor mounting surface is facing straight down, and then take a reading of the following output voltage.
Between terminals (2) and (3)

Standard value: 3.4 – 3.6 V

- (4) If the voltage is outside the standard value, after check to be sure that there is no abnormality in the power supply and earth wires, replace the G-sensor.

TSB Revision

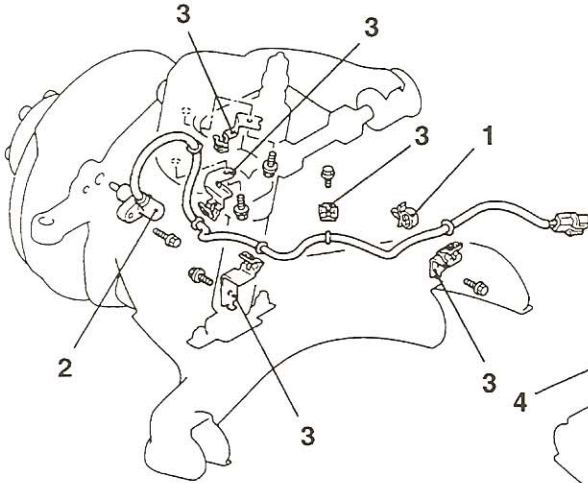
WHEEL SPEED SENSOR

REMOVAL AND INSTALLATION

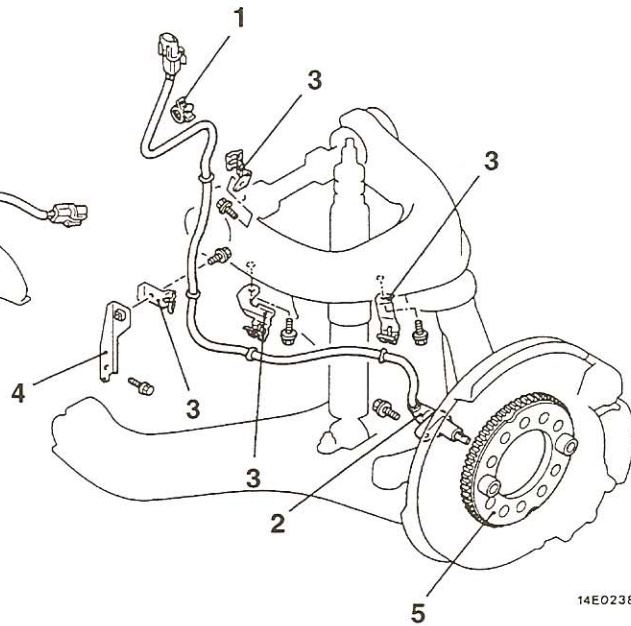
Post-installation Operation

- Anti-Lock Braking System Checking
(Refer to P.35C-25.)

Front-RH

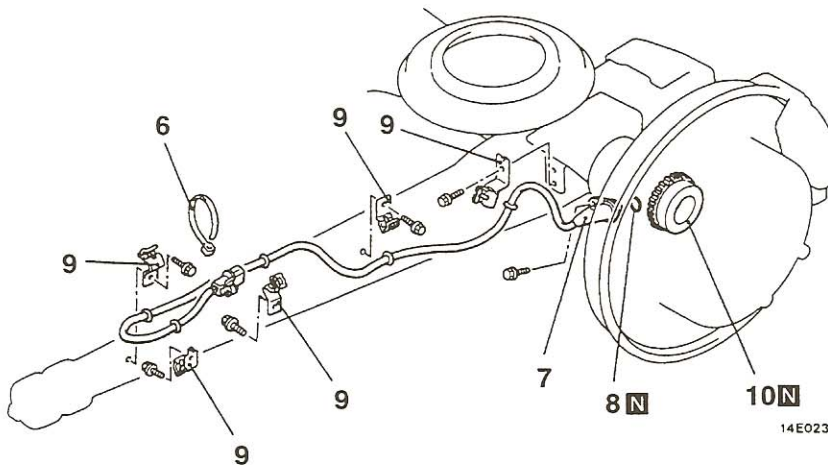


Front-LH



14E0238

Rear



14E0239

00005439

Front speed sensor removal steps



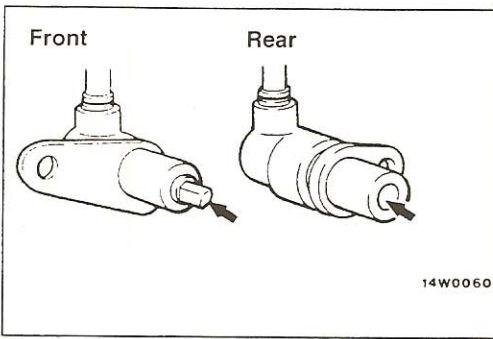
1. Clip
2. Front speed sensor
3. Clip
4. Harness bracket
5. Front ABS rotor
(Refer to GROUP 26 – Axle Hub.)



Rear speed sensor removal steps

6. Band
7. Rear speed sensor
8. O-ring
9. Clip
10. Rear ABS rotor
(Refer to GROUP 27 – Axle shaft.)

TSB Revision

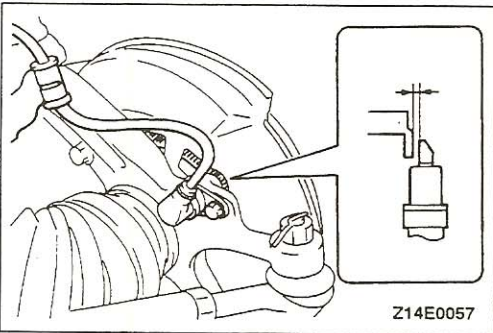


REMOVAL SERVICE POINTS

◀▶ FRONT SPEED SENSOR/REAR SPEED SENSOR REMOVAL

Caution

Be careful when handling the pole piece at the tip of the speed sensor and the toothed edge of the ABS rotor so as not to damage them by contacting other parts.



INSTALLATION SERVICE POINT

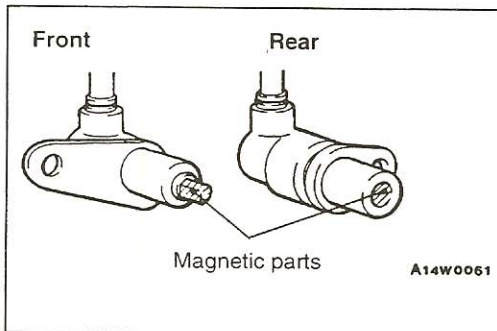
▶◀ FRONT SPEED SENSOR INSTALLATION

Insert a feeler gage into the space between the speed sensor's pole piece and the ABS rotor's toothed surface, and check to be sure that the clearance at all points is at the standard value.

Standard value: 0.2–1.0 mm (.008–.039 in.)

NOTE

If the clearance between the speed sensor's pole piece and the ABS rotor's toothed surface is not within the standard value range, it is probable that the ABS rotor is incorrectly installed, so re-check installation.



INSPECTION

35200840166

SPEED SENSOR

- (1) Check whether any metallic foreign material has adhered to the pole piece at the speed sensor tip. Remove any foreign material.

Also check whether the pole piece is damaged, and, if so, replace it with a new one.

NOTE

The pole piece can become magnetized due to the magnet inside the speed sensor, causing foreign material to easily adhere to it. The pole piece may not be able to correctly sense the wheel rotation speed if foreign matter is on it or if it is damaged.

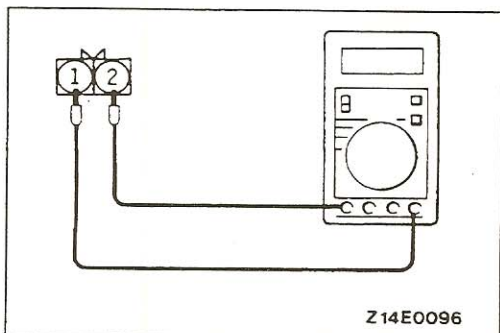
- (2) Measure the resistance between the speed sensor terminals.

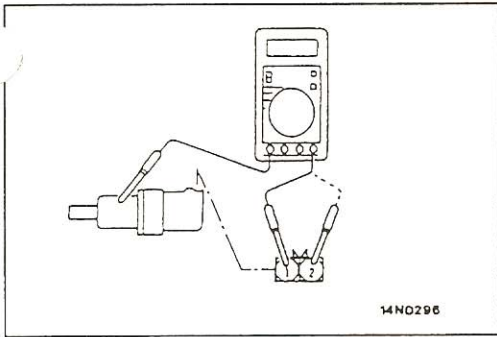
Standard value:

Front: 1.17–1.35 kΩ

Rear: 1.3–1.5 kΩ

If the internal resistance of the speed sensor is not within the standard value, replace it with a new speed sensor.





- (3) Remove all connections from the speed sensor, and then measure the resistance between terminals (1) and (2) and the body of the speed sensor.

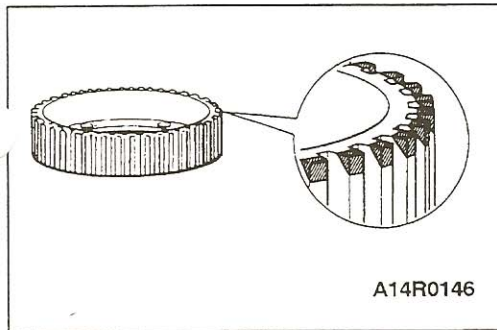
Standard value: 100 kΩ or more

If the speed sensor insulation resistance is outside the standard value range, replace with a new speed sensor.

- (4) Check the speed sensor cable for breakage, damage or disconnection. Replace with a new one if a problem is found.

NOTE

When checking for cable damage, remove the cable clamp part from the body and then gently bend and pull the cable near the clamp.

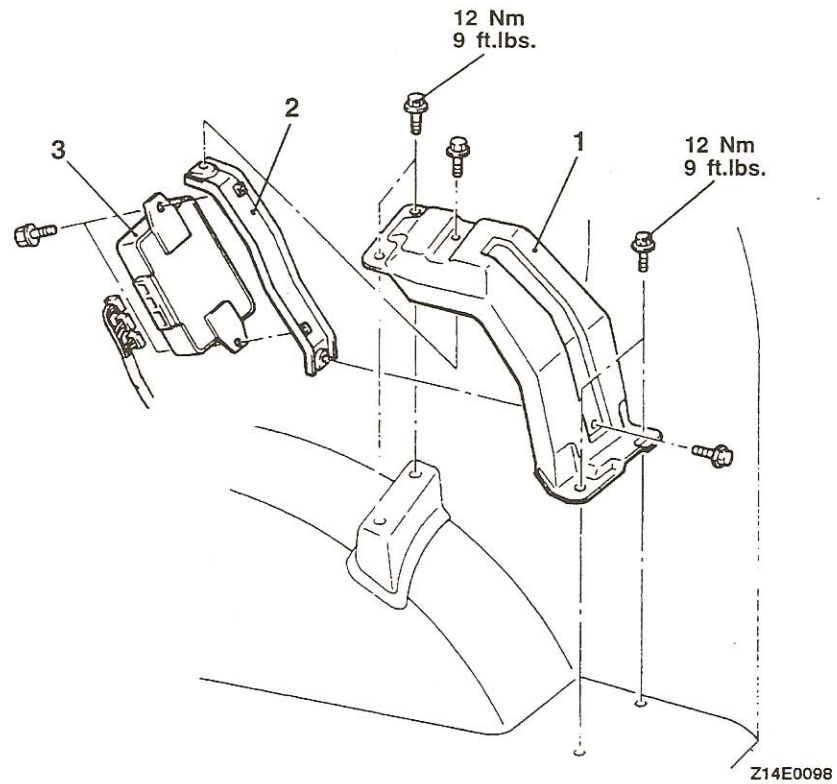


TOOTHED ABS ROTOR

Check whether the ABS rotor teeth are broken or deformed. Replace the ABS rotor if the teeth are damaged or deformed.

ELECTRONIC CONTROL UNIT

35200980033

REMOVAL AND INSTALLATION**Removal steps**

- Third seat
<Vehicles with optional third seat>
(Refer to GROUP 52A – Third seat.)
- Quarter trim, lower
(Refer to GROUP 52A – Trim.)
- 1. Bracket (A)
- 2. Bracket
- 3. Electronic control unit

PARKING BRAKES

CONTENTS

3610900057

LUBRICANTS	2	PARKING BRAKE DRUM	7
ON-VEHICLE SERVICE	2	PARKING BRAKE LEVER	4
Lining Running-in	3	SEALANTS	2
Parking Brake Lever Stroke Check and Adjustment	2	SERVICE SPECIFICATIONS	2
Parking Brake Switch Check	3	TROUBLESHOOTING	2
PARKING BRAKE CABLE	5		

SERVICE SPECIFICATIONS

36100030055

Items	Standard value	Limit
Parking brake lever stroke	4–6 notches	–
Lining thickness mm (in.)	6.5 (.256)	4.5 (.177)
Brake drum inside diameter mm (in.)	197 (7.756)	198 (7.795)

LUBRICANTS

36100040058

Items	Specified lubricant
Backing plate	Brake grease SAE J310, NLGI No. 1
Shoe and lining assembly	
Adjuster	

SEALANTS

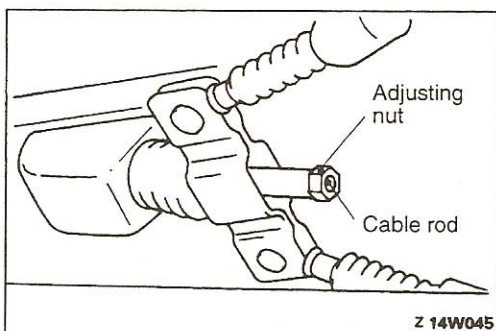
36100050013

Items	Specifications
Both sides of sealer	3M ATD Part No. 8661, 8663 or equivalent
Shoe hold-down pin	3M ATD Part No. 8513 or equivalent
Backing plate	

TROUBLESHOOTING

36100070033

Trouble Symptom	Probable Cause	Remedy
Brake drag	Incomplete release of parking brake	Correct
	Incorrect parking brake adjustment	Adjust
Insufficient parking brake function	Worn brake lining	Replace
	Excessive parking brake lever stroke	Adjust the parking brake lever stroke or check the parking brake cable routing
	Grease or oil on lining surface	Replace
	Parking brake cable sticking	Replace



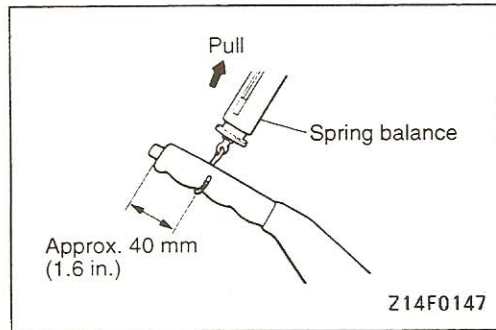
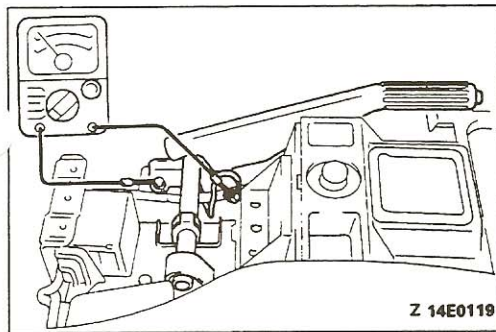
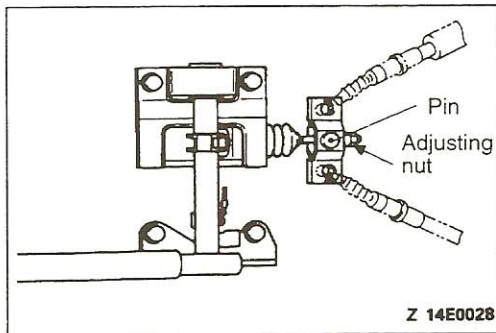
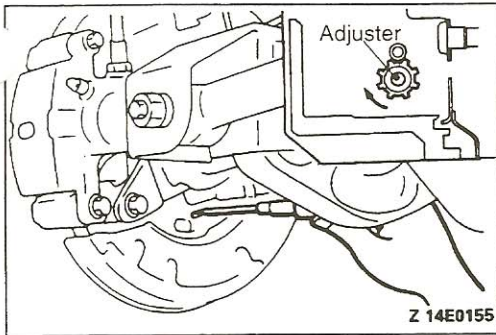
ON-VEHICLE SERVICE

36100090053

PARKING BRAKE LEVER STROKE CHECK AND ADJUSTMENT

Standard value: 4–6 notches

If the parking brake lever stroke is not within the standard value range, make adjustment by the following procedure:
 (1) Loosen the adjuster to slacken the parking brake 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) so that the disc will not rotate.
- (3) Return the adjuster 3–4 notches in the direction opposite to the direction of the arrow.
- (4) Turn the adjusting nut to adjust the parking brake lever stroke to within the standard value range.

Caution

If the number of brake lever notches engaged is less than the standard value, the cable has been pulled excessively. Be sure to adjust it to within the standard value.

- (5) After making the adjustment, check that there is no play between the adjusting nut and the pin. Also check that the adjusting nut is securely held at the nut holder.
- (6) After adjusting the lever stroke, jack up the rear of the vehicle.
- (7) With the parking brake lever in the released position, turn the rear wheel to confirm that the rear brakes are not dragging.

PARKING BRAKE SWITCH CHECK

36100330056

- (1) Disconnect the connector of the parking brake switch, and connect an ohmmeter to the parking brake switch and the switch installation bolt.
- (2) The parking brake switch is good if there is continuity when the parking brake lever is pulled and there is no continuity when it is returned.

LINING RUNNING-IN

36100110032

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.

- (1) Adjust the parking brake stroke to the specified value.
- (2) Hook a spring scale onto the center of the parking brake lever grip and pull it with a force of 98–147 N (22–33 lbs.) in a direction perpendicular to the handle.
- (3) Drive the vehicle at a constant speed of 35–50 km/h (22–31 mph) for 100 meters (328 ft).
- (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.

Caution

Carry out running-in in a place with good visibility, and pay careful attention to safety.

PARKING BRAKE LEVER

36100120042

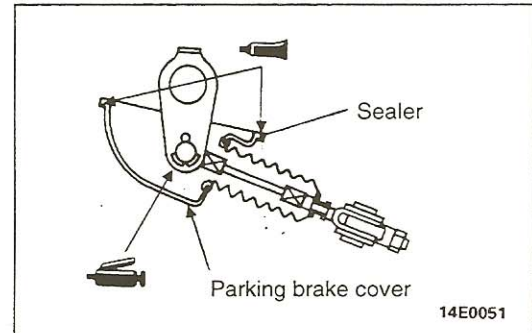
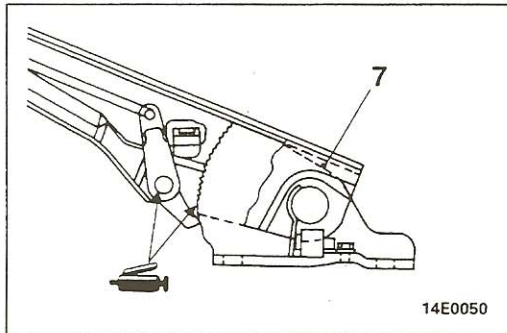
REMOVAL AND INSTALLATION

Pre-removal Operation

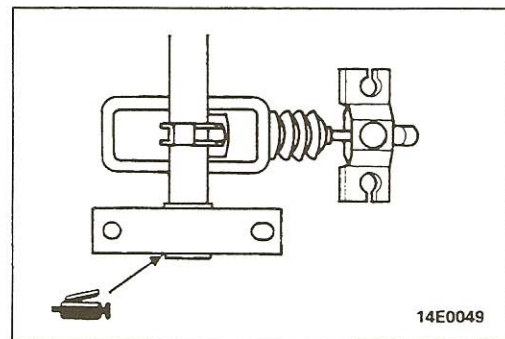
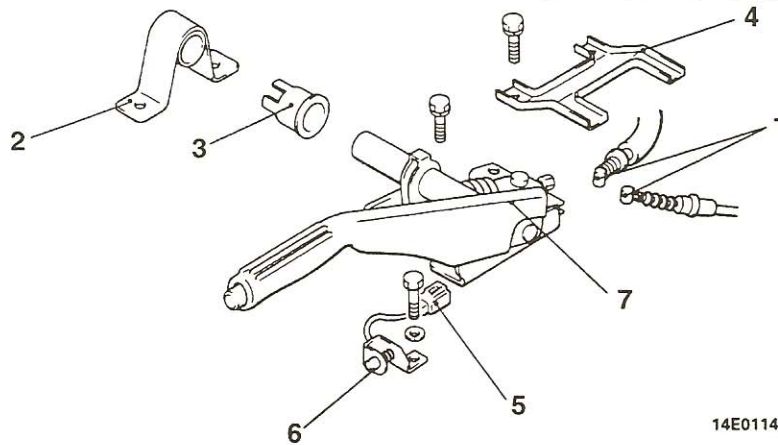
- Floor Console Assembly Removal
(Refer to GROUP 52A – Floor Console.)

Post-installation Operation

- Parking Brake Lever Stroke Adjustment
(Refer to P.36-2.)
- Floor Console Assembly Installation
(Refer to GROUP 52A – Floor Console.)



Sealant:
3M ATD Part No. 8661, 8663 or equivalent

**Removal steps**

1. Parking brake cable connection
2. Parking brake stay
3. Bushing
4. Parking brake shaft cover
5. Parking brake switch connector
6. Parking brake switch
7. Parking brake lever

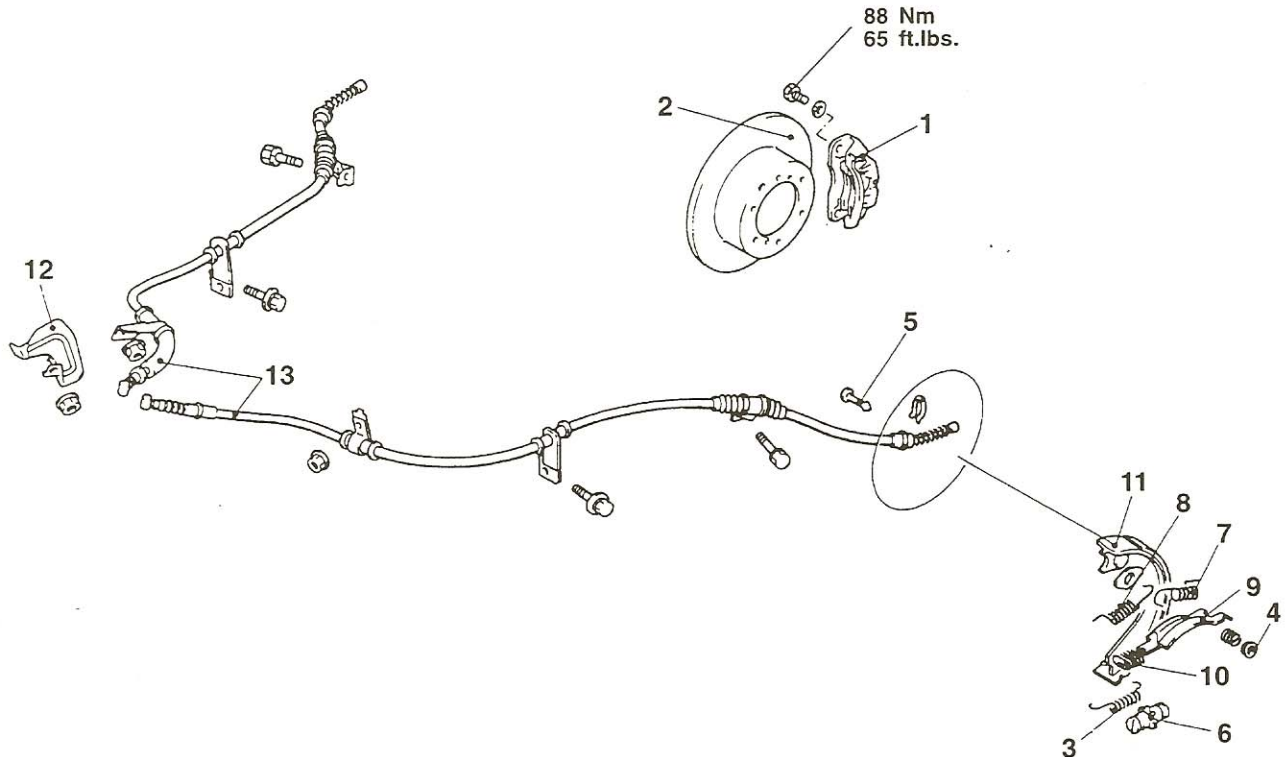
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PARKING BRAKE CABLE

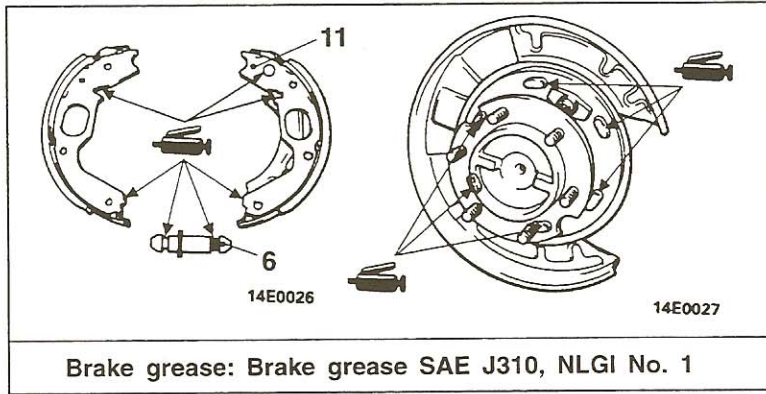
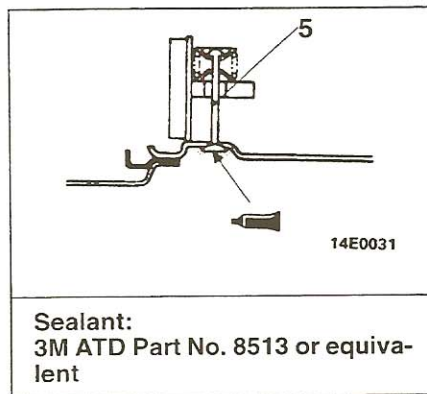
REMOVAL AND INSTALLATION

Post-installation Operation

- Parking Brake Lever Stroke Adjustment (Refer to P.36-2.)



14E0117

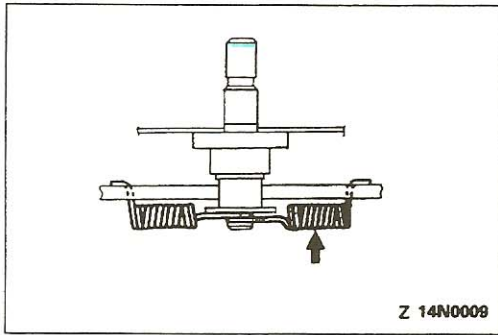


00001862

Removal steps

- | | |
|--|---|
| <ul style="list-style-type: none"> 1. Rear brake assembly 2. Rear brake disc 3. Adjusting wheel spring 4. Shoe hold-down cup 5. Shoe hold-down pin ▶B◀ 6. Adjuster ▶A◀ 7. Anchor to shoe spring | <ul style="list-style-type: none"> ▶A◀ 8. Anchor to shoe spring 9. Strut 10. Strut to shoe spring 11. Shoe and lining assembly 12. Heat protector 13. Parking brake cable |
|--|---|

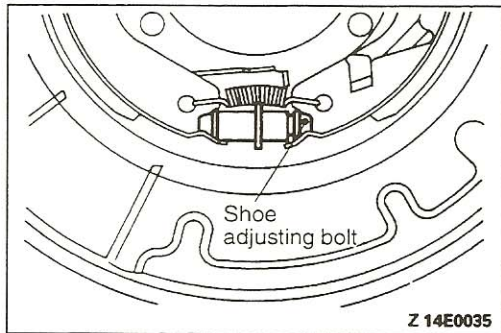
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INSTALLATION SERVICE POINTS

▶A◀ ANCHOR TO SHOE SPRING INSTALLATION

The load on the respective anchor to shoe springs is different, so the spring indicated by the arrow has been painted for identification.



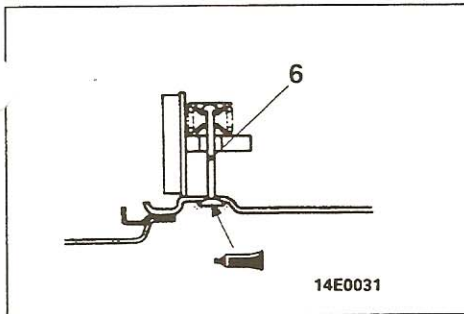
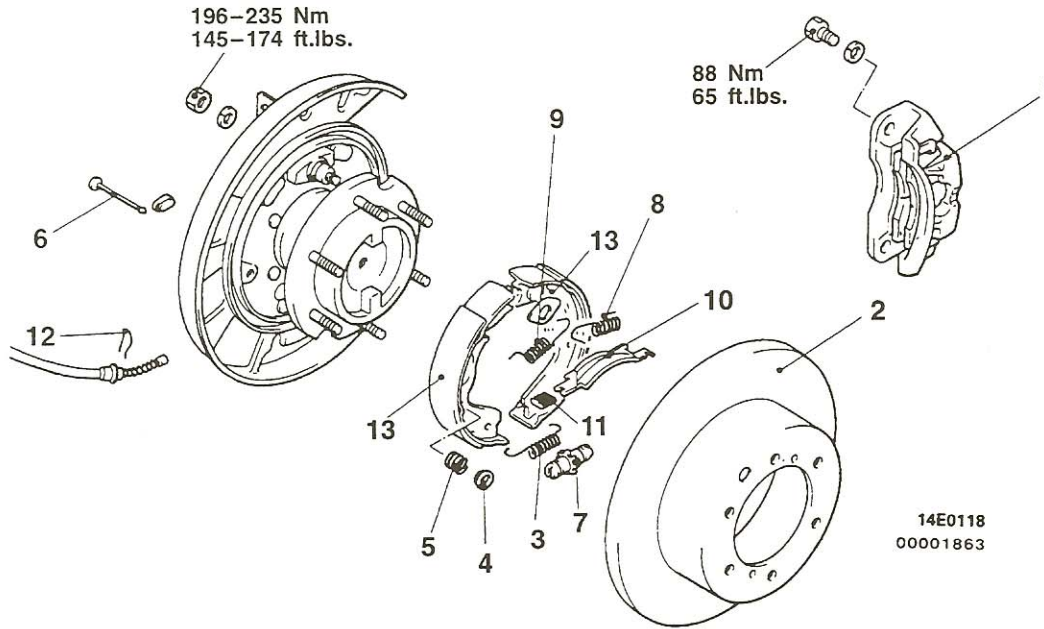
▶B◀ ADJUSTER INSTALLATION

Install the adjuster so that the shoe adjusting bolt for the left-hand wheel is towards the rear of the vehicle, and the shoe adjusting bolt for the right-hand wheel is towards the front of the vehicle.

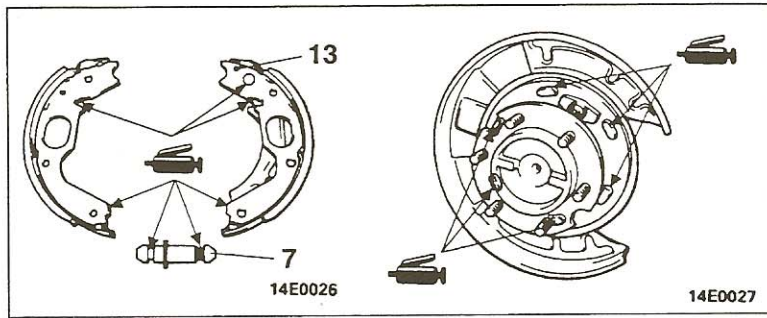
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PARKING BRAKE DRUM

REMOVAL AND INSTALLATION



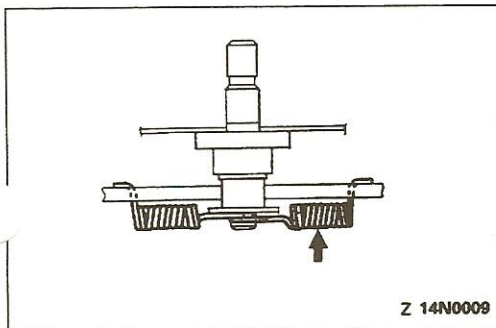
Sealant:
3M ATD Part No. 8513 or equivalent



Brake grease: Brake grease SAE J310, NLGI No. 1

Removal steps

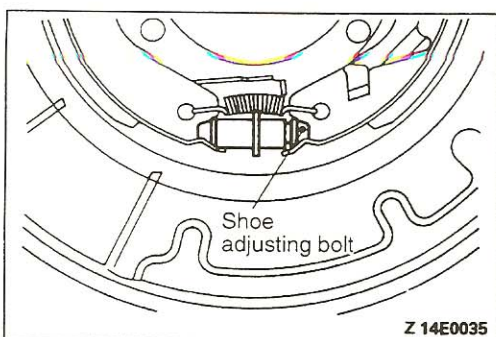
- 1. Rear brake assembly
- 2. Rear brake disc
- 3. Adjusting wheel spring
- 4. Shoe hold-down cup
- 5. Shoe hold-down spring
- 6. Shoe hold-down pin
- 7. Adjuster
- 8. Anchor to shoe spring
- 9. Anchor to shoe spring
- 10. Strut
- 11. Strut to shoe spring
- 12. Clip
- 13. Shoe and lining assembly



INSTALLATION SERVICE POINTS

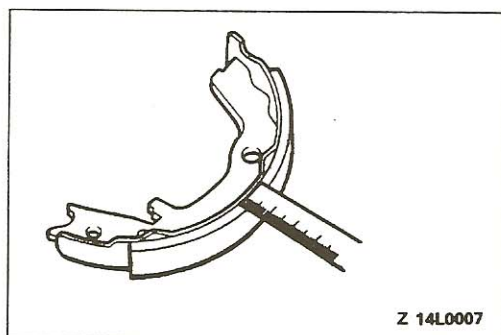
ANCHOR TO SHOE SPRING INSTALLATION

The load on the respective anchor to shoe springs is different, so the spring indicated by the arrow has been painted for identification.



►B◄ ADJUSTER INSTALLATION

Install the adjuster so that the shoe adjusting bolt for left-hand wheel is towards the rear of the vehicle, and the shoe adjusting bolt for the right-hand wheel is towards the front of the vehicle.



INSPECTION

36100260034

UNUSUAL WEAR OF THE BRAKE LINING AND BRAKE DRUM

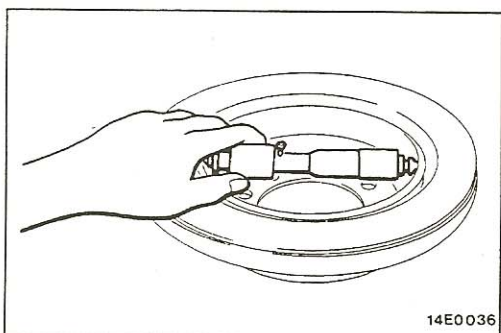
- (1) Measure the thickness of the brake lining at several places.

Standard value: 6.5 mm (.256 in.)

Limit: 4.5 mm (.177 in.)

Caution

Replace the brake shoes if the thickness of the brake lining is the limit value or less.



- (2) Measure the brake disc drum inner diameter at two or more places.

Standard value: 197 mm (7.756 in.)

Limit: 198 mm (7.795 in.)

Caution

Replace if the brake disc drum inner diameter is the limit value or more.

STEERING

CONTENTS

37209000071

STEERING	37A
4-WHEEL STEERING SYSTEM (4WS)	37B
4-WHEEL STEERING SYSTEM (ACTIVE 4WS)	37C

NOTE

The tinted sections are not included in this manual.



STEERING

CONTENTS

37209000187

GENERAL SPECIFICATIONS	2	Steering Wheel Return (to Center) Check	9
LUBRICANTS	3	Tie Rod End Ball Joint Brakeaway Torque Check	8
ON-VEHICLE SERVICE	7	POWER STEERING GEAR BOX*	18
Air Bleeding	11	POWER STEERING OIL PUMP	29
Ball Joint Dust Cover Check	13	SEALANTS AND ADHESIVES	3
Ball Joint End Play Check	8	SERVICE SPECIFICATIONS	2
Drive-Belt Tension Check	10	SPECIAL TOOLS	4
Fluid Level Check	10	STEERING COLUMN AND SHAFT*	14
Fluid Replacement	10	STEERING HOSES	34
Oil Pump Pressure Test	12	STEERING LINKAGE	36
Power Steering Pressure Switch Check	13	TROUBLESHOOTING	5
Stationary Steering Effort Check	9		
Steering Angle Check	8		
Steering Gear Backlash Check	7		
Steering Wheel Free Play Check	7		

WARNINGS REGARDING SERVICING OF SUPPLEMENTAL RESTRAINT SYSTEM (SRS) EQUIPPED VEHICLES

WARNING!

- (1) Improper service or maintenance of any component of the SRS, or any SRS-related component, can lead to personal injury or death to service personnel (from inadvertent firing of the air bag) or to the driver and passenger (from rendering the SRS inoperative).
- (2) Service or maintenance of any SRS component or SRS-related component must be performed only at an authorized MITSUBISHI dealer.
- (3) MITSUBISHI dealer personnel must thoroughly review this manual, and especially its GROUP 52B – Supplemental Restraint System (SRS) and GROUP 00 – Maintenance Service before beginning any service or maintenance of any component of the SRS or any SRS-related component.

NOTE

The SRS includes the following components: impact sensors, SRS diagnosis unit, SRS warning light, 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 (*).

GENERAL SPECIFICATIONS

37200010066

Items		Specifications
Steering wheel diameter mm (in.)		390 (15.35)
Power steering gear box	Steering gear type	Ball and nut, torsion bar type (integral type)
	Steering gear ratio	16.4–18.0
Oil Pump	Oil pump type	Vane type
	Displacement cm ³ /rev. (cu.in./rev.)	9.6 (.59)

SERVICE SPECIFICATIONS

37200030130

Items		Standard value	Limit
Steering wheel free play mm (in.)		26.6 (1.05) or less	50 (1.97)
Steering gear backlash mm (in.)		–	0.5 (.020)
Ball joint end play mm (in.)		–	1.5 (.059)
Steering angle	Inner wheel	29°40' – 32°40'	–
	Outer wheel	29°45'	–
Stationary steering effort N (lbs.)		37 (8.21)	–
Drive belt tension mm (in.)	When checked	13.8–17.8 (.54–.70)	–
	When an old belt is installed	14.8–16.8 (.58–.66)	–
	When a new belt is installed	10.7–13.7 (.42–.54)	–
Oil pump pressure MPa (psi)	Oil pump relief pressure	8.31–9.00 (1,205–1,305)	–
	Pressure under no-load conditions	0.78–0.98 (114–142)	–
	Steering gear retention hydraulic pressure	8.31–9.00 (1,205–1,305)	–
Pressure switch activation oil pressure MPa (psi)	OFF→ON	1.47–1.96 (213–284)	–
	ON→OFF	0.69–1.18 (100–171)	–
Backlash between ball groove of rack piston and balls mm (in.)		–	0.05 (.0020)
Mainshaft end play mm (in.)		0.03 (.0012) or less	–
Cross-shaft end play mm (in.)		0 – 0.05 (0 – .002)	–
Mainshaft total breakaway torque Nm (in.lbs.)		0.45 – 1.25 (4 – 11)	–
Gap between vane and rotor groove mm (in.)		–	0.06 (.0024)
Ball joint starting torque Nm (in.lbs.)	Tie rod end	1 – 3 (9 – 26)	–
	Idler arm	0.5 – 2.0 (4 – 17)	–
	Pitman arm	1 – 3 (9 – 26)	–
Idler arm turning torque N (lbs.)		2.3 – 15.4 (.5 – 33.9)	–

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LUBRICANTS

37200040058

Items		Specified lubricant	Quantity
Power steering fluid		Automatic transmission fluid "DEXRON II"	1.06 dm ³ (1.12 qts.)
Power steering gear box	Bearing, O-ring and oil seal	Automatic transmission fluid "DEXRON II"	As required
Oil pump	Flow control valve and O-ring	Automatic transmission fluid "DEXRON II"	As required
	Friction surface of rotor, vane, cam ring and pump cover		


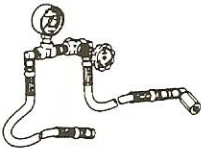
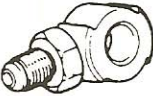
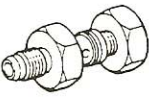

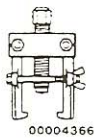



SEALANTS AND ADHESIVES

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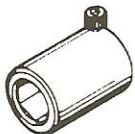
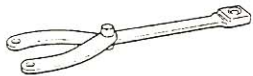
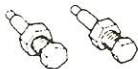

Items	Specifications
Steering column cover assembly installation hole	3M ATD Part No. 8663 or equivalent
Dash panel cover installation surface	
Tie-rod end dust cover installation surface	
Inside of steering column lower pipe bearing	3M Stud Locking Part No. 4170 or equivalent
Connecting the steering column upper and steering column lower (nut side)	
Steering column upper bearing	3M ATD Part No. 8001 or equivalent

SPECIAL TOOLS

37200060061

Tool	Tool number and name	Supersession	Application
	MB991113 or MB990635 Steering linkage puller	MB991113-01	Disconnecting the pitman arm and relay rod Disconnecting the idler arm and relay rod Disconnecting the tie rod and knuckle
	MB990662 Oil pressure gage	MB990662-01	Measuring the oil pump pressure
	MB990993 Oil pressure gage adapter (pump side)	MB990993-01	
	MB990994 Oil pressure gage adapter (hose side)	MB990994-01	
	MB990803 Steering wheel puller	General service tool	Steering wheel removal
 00004366	MB990809 Pitman arm puller	MB990809-01	Removing the pitman arm
 00004350	MB990925 Bearing and oil seal installer set	MB990925-01 or General service tool	Installing the oil seal and ball bearing (Refer to GROUP 26.) MB990928-01, MB990926-01
	MB990938 Handle	MB990938-01	
	MB991203 Oil seal and bearing installer		

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Tool	Tool number and name	Supersession	Application
	MB990228 Preload socket	MB990228-01	Measuring the main shaft total starting torque
	MB991367 Special spanner	MB991367-01	Removing and installing the lock nut
	MB991394 Pin set		
 8990776	MB990776 Front axle base	MB990776-01	Dust cover installation

TROUBLESHOOTING

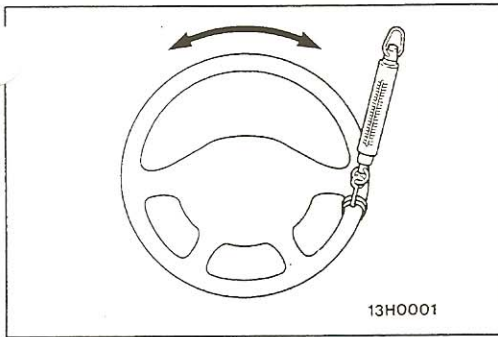
37200070040

Trouble Symptom	Probable Cause	Remedy
Excessive play of steering wheel	Excessive play in steering gear box	Repair
	Loose steering gear mounting bolts	Retighten
	Loose or worn stud of tie rod end	Retighten or replace as necessary.
Difficult steering wheel operation (insufficient power assist)	Loose belt	Adjust the belt tension.
	Damaged belt	Replace the belt.
	Low fluid level	Refill with fluid.
	Air in fluid line	Bleed the system.
	Twisted or damage hoses	Correct the hose routing or replace the hoses.
	Fluid leakage	Check the fluid leakage.
	Malfunction of gear box	Check and replace the gear box if necessary.
Malfunction of oil pump	Check the oil pump pressure and repair the oil pump.	
Rattling noise	Loose installation of oil pump or gear box	Retighten the oil pump or gear box.
	Interference around column or between pressure hose and other parts	Correct or replace the pressure hose and the parts around the column.
	Abnormal noise inside gear box and oil pump	Replace the gear box or oil pump.
Shrill noise	Air sucked into oil pump	Check the oil level and hose clips, bleed the system or replace the oil pump.
	Oil pump seizure	Replace the oil pump.
Squealing noise	Loose belt	Adjust the belt tension.
	Oil pump seizure	Replace the oil pump.

Trouble Symptom	Supersession	Application
Hissing noise	Air sucked into oil pump	Check the oil level and hose clips or bleed the system.
	Damage to the gear box port section	Replace the gear box.
	Malfunction of return hose	Replace the hose.
Whistling noise	Malfunction of gear box port section	Replace the gear box.
Droning noise	Loose mounting bolt on oil pump or oil pump bracket	Retighten the pump bracket or pump mounting bolt.
	Poor condition of oil pump body*	Replace the oil pump.
Squeaking noise	Malfunction of steering stopper contact	Check and adjust the steering stopper.
	Interference of wheel with vehicle body	Adjust the steering angle.
	Malfunction of gear box	Replace the gear box.
Vibration**	Air suction	Bleed the system.
	Malfunction of gear box	Replace the gear box.
Oil leakage from hose connection	Improperly tightened flare nut	Repair or replace
	Incorrectly inserted hose	
	Improperly clamped hose	
Oil leakage from hose assembly	Damaged or clogged hose	Replace
	Malfunction of hose connector	
Oil leakage from oil reservoir	Improperly welded pipe	Weld the pipe or replace.
	Overflow	Bleed the system or adjust the oil level.
Oil leakage from oil pump	Malfunction of oil pump housing	Replace the oil pump.
	Malfunction of O-ring and/or oil seal	Replace the O-ring and oil seal.
Oil leakage from gear box	Malfunction of gear box housing (including leakage from air hole)	Replace the gear box.
	Malfunction of O-ring and/or oil seal	Replace the O-ring and oil seal.

NOTE

- * A slight "beat noise" is produced by the oil pump; this is not a malfunction. (This noise occurs particularly when a stationary steering effort is made.)
- ** A slight vibration may be felt when the stationary steering effort is made due to the condition of the road surface. To check whether the vibration actually exists or not, test-drive the vehicle on a dry concrete or asphalt surface. Moreover, a very slight amount of vibration is not a malfunction.



ON-VEHICLE SERVICE

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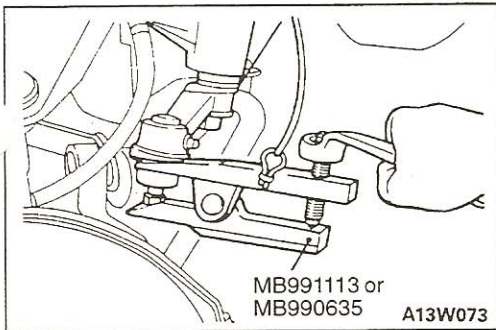
STEERING WHEEL FREE PLAY CHECK

1. When the engine is stopped and the steering wheel is in the straight-ahead position, apply a force of 5N (1.1 lbs.) to the steering wheel in the peripheral direction. Measure the play on the circumference of the steering wheel.

Standard value: 26.6 mm (1.05 in.) or less

Limit: 50 mm (1.97 in.)

2. If the measured value exceeds the repair limit, check the steering gear backlash and linkage ball joint end play.



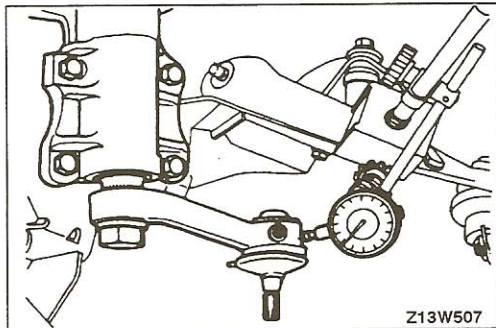
STEERING GEAR BACKLASH CHECK

37200130014

1. Jack up the vehicle front and hold the steering wheel in the straight-ahead position.
2. Use the special tool to disconnect the pitman arm from the relay rod.

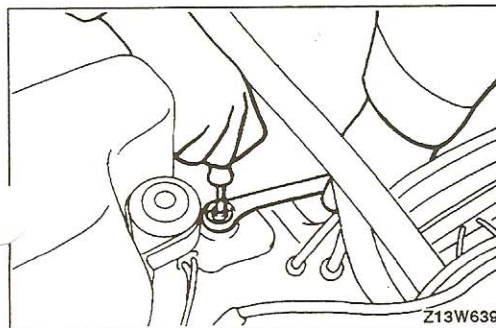
Caution

1. Use cord to bind the special tool closely so it won't become separated.
2. The nut should only be loosened, not removed.



3. Use a dial indicator to measure the steering gear backlash at the pitman arm top end.

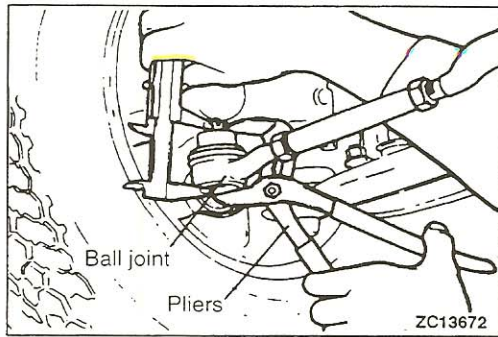
Limit: 0.5 mm (.020 in.)



4. If the measured value exceeds the limit, screw in the steering gear box adjusting bolt until the steering wheel play is within the standard value range.

Caution

1. Be sure to make the adjustment with the steering wheel in the straight-ahead position.
2. If the adjusting bolt is overtightened, more steering effort will be required, and return of the wheel will be adversely affected.

**BALL JOINT END PLAY CHECK**

37200140017

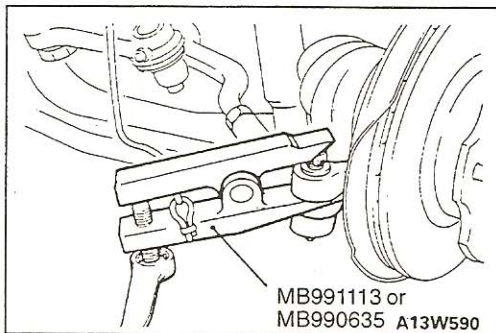
1. Hold the ball joint with pliers.
2. Set a caliper gage as shown in the illustration at left and measure the displacement with the ball stud compressed.

Limit: 1.5 mm (.059 in.)

3. If the measured displacement is over the limit, replace the ball joint.

NOTE

Even if the measured displacement is within the limit, check the ball joint starting torque.

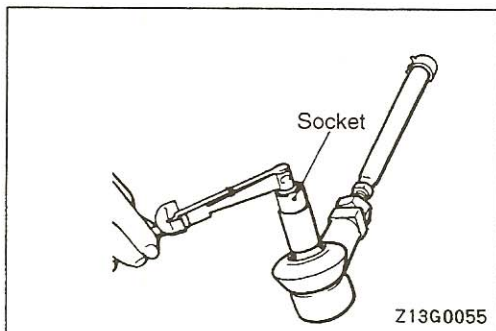
**TIE ROD END BALL JOINT BRAKEAWAY TORQUE CHECK**

37200150065

1. Use the special tool to disconnect the tie rod from the knuckle.

Caution

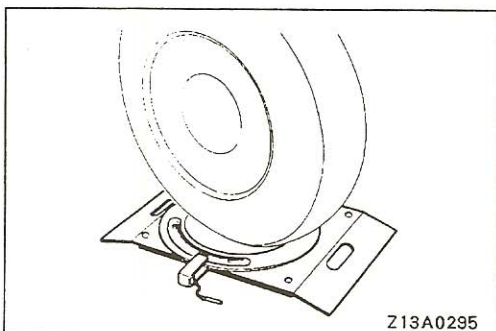
1. Use cord to bind the special tool closely so it won't become separated.
2. The nut should only be loosened, not removed.



2. Move the ball joint stud several times and install the nut to the stud.
Measure the ball joint brakeaway torque.

Standard value: 1 – 3 Nm (9 – 26 in.lbs.)

3. When the measured value exceeds the standard value, replace the tie rod end.
4. 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.

**STEERING ANGLE CHECK**

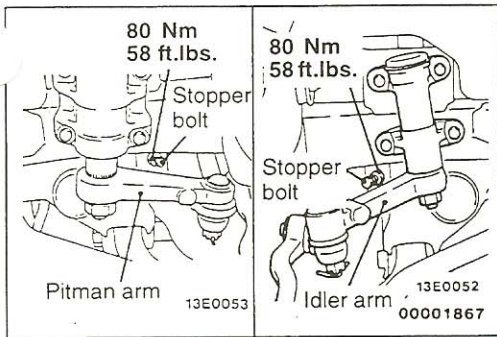
37200110063

1. Place the front wheel on a turning radius gage and measure the steering angle.

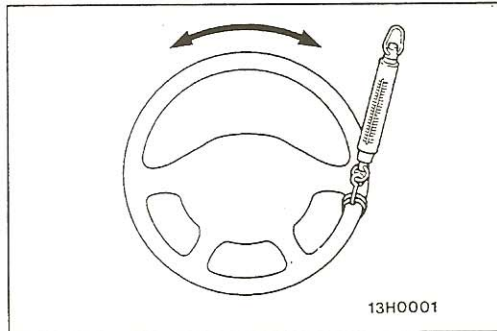
Standard value:

Inner wheel 29°40' – 32°40'

Outer wheel 29°45'



2. If the steering angle is outside the standard value, check the toe-in (refer to GROUP 33A – On-vehicle Service.), and then adjust the steering angle with the stopper bolt.



STATIONARY STEERING EFFORT CHECK

37200170061

1. Place the vehicle on a level surface and set the steering wheel to the straight-ahead position.
2. Set the engine speed to 1,000 r/min.

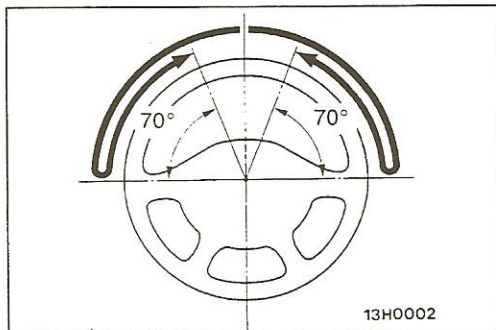
Caution

After checking the engine r/min, there must be a return to the standard idling r/min.

3. Measure the tangential force with a spring balance by turning the steering wheel clockwise and counter clockwise one and a half turns.

Standard value: 37 N (8.21 lbs.) or less

4. If the stationary steering effort exceeds the standard value, check for belt slackness, damage, insufficient oil, air mixed into oil, collapsed or twisted hoses, etc., and repair if found.



STEERING WHEEL RETURN (TO CENTER) CHECK

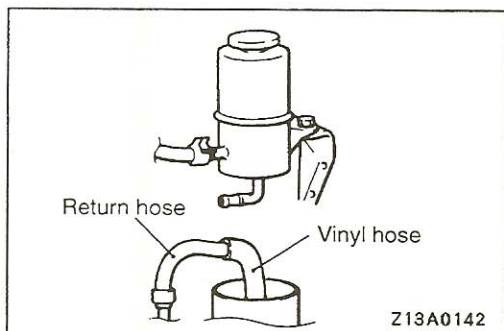
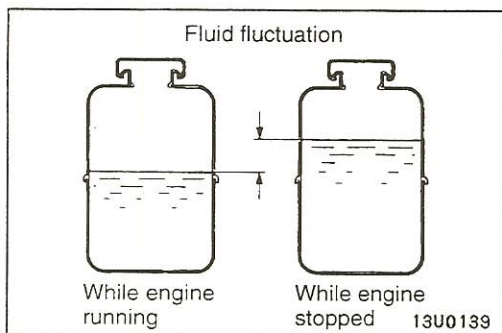
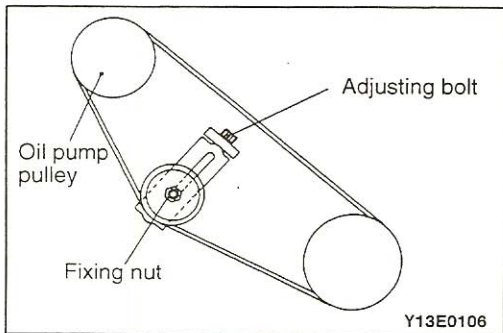
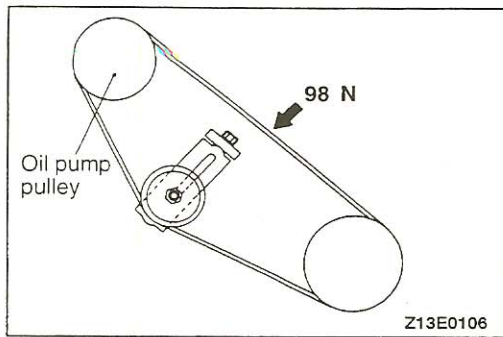
37200180064

To check the return of the steering wheel to the center, carry out a road test and check the following points.

1. Make gentle and sharp turns and check that there is no appreciable difference in steering effort and return to center between right and left turns.
2. Drive at a speed of about 35 km/h (22 mph), turn the steering wheel 90° clockwise or counterclockwise, and release the wheel a second or two later. If the wheel returns more than 70°, the return may be considered good.

NOTE

When the steering wheel is turned abruptly, momentary hard steering might result, but this does not mean a problem. It is caused by low oil pump delivery during idling.



DRIVE-BELT TENSION CHECK

37200190098

1. Measure the flexion of the V belt when it is subjected to a force of 98 N (22 lbs.) in the place shown.

Standard value:

When checked mm (in.)	13.8 – 17.8 (.54 – .70)
When an old belt is installed mm (in.)	14.8 – 16.8 (.58 – .66)
When a new belt is installed mm (in.)	10.7 – 13.7 (.42 – .54)

2. If the flexion value is outside the standard value, adjust by the following procedure.
 - (1) Loosen tension pulley fixing nut.
 - (2) Tighten the fixing nut to the following torque.

Tightening torque: 9.8 – 19.6 Nm (7 – 14 ft.lbs.)
 - (3) Adjusting belt tension with adjusting bolt.
 - (4) Tighten the fixing bolt.

FLUID LEVEL CHECK

37200200050

1. Park the vehicle on a flat, level surface, start the engine, and then turn the steering wheel several times to raise the temperature of the fluid to approximately 50–60°C (122–140°F).
2. With the engine running, turn the wheel all the way to the left and right several times.
3. Check the fluid in the oil reservoir for foaming or milkiness.
4. Check the difference of the fluid level when the engine is stopped and while it is running. If the fluid level changes considerably, air bleeding should be carried out.

FLUID REPLACEMENT

37200210053

Check for contamination in the fluid reservoir. Foamy or cloudy fluid should be replaced.

1. Remove the reservoir cap.
2. Disconnect the return hose from the reservoir tank and remove the fluid.
3. Disconnect the high tension cable.
4. Run the engine intermittently several times with the starting motor to remove the fluid from the gear box.
5. Attach the return hose and fill with the specified automatic transmission fluid.

Specified fluid:

Automatic transmission fluid “DEXRON II”

6. Bleed the system and check the fluid pressure.

AIR BLEEDING

37200220124

Check the stationary steering effort. If it is different from the standard value, there is probably air in the system, so bleed the system.

NOTE

After removing and installing the oil pump, loosen the drive belt and turn the pump pulley by hand several times to supply steering fluid to the pump.

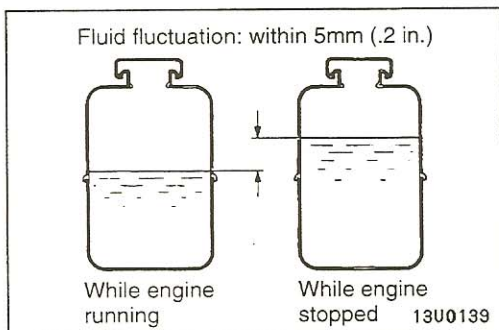
1. Disconnect the ignition power transistor connector (6 pin).
2. Jack up the front wheels and support them by using a rigid rack.
3. Turn the steering wheel all the way to the left and to the right five or six times.
4. While operating the starting motor intermittently, turn the steering wheel all the way to the left and right five or six times (for 15 to 20 seconds).

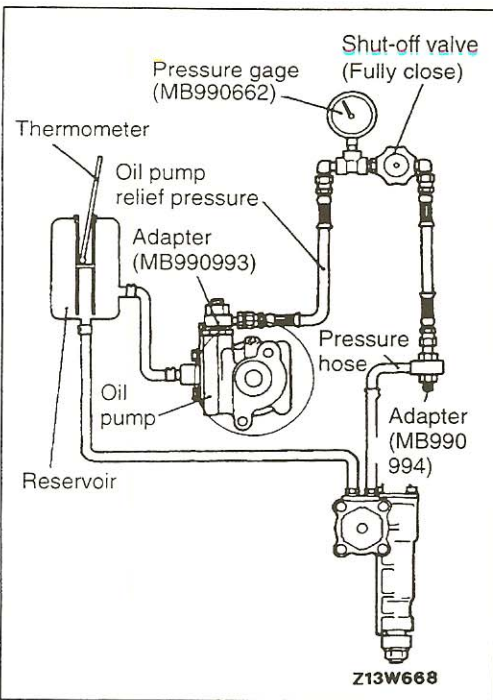
Caution

1. **During air bleeding, refill the steering fluid supply so that the level never falls below the lower position of the filter.**
2. **If air bleeding is done while engine running, the air will be broken up and absorbed into the fluid; be sure to do the bleeding only while cranking.**
5. Confirm that the steering fluid level is between the high and low marks on the dipstick.
6. Reconnect the ignition power transistor connector
7. Start the engine and allow it to run at idle.
8. Turn the steering wheel to the left and right. Repeat until there are no air bubbles in the oil reservoir fluid.
9. Confirm that the fluid is not milky, and that the level is up to the specified position on the dipstick.
10. Confirm that there is very little change in the fluid level when the steering wheel is turned to the left and right.
11. Confirm whether or not the change in the fluid level is within 5 mm (.20 in.) when the engine is stopped and when it is running.
12. If necessary, repeat the bleeding procedure until the fluid is not milky (no bubbles) and the power steering pump makes no noise while engine is running at idle.

Caution

1. **If the change of the fluid level is 5 mm (.20 in.) or more, the air has not been completely bled from the system, and thus must be bled completely.**
2. **If the fluid level rises suddenly after the engine is stopped, the air has not been completely bled.**
3. **If air bleeding is not complete, there will be abnormal noises from the pump and the flow-control valve, and this condition could cause a lessening of the life of the pump, etc.**



**OIL PUMP PRESSURE TEST**

37200230141

OIL PUMP RELIEF PRESSURE CHECK

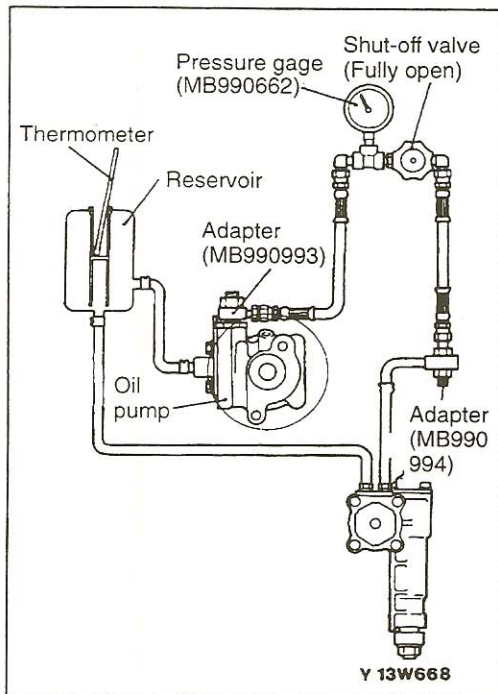
1. Disconnect the pressure hose from the oil pump, and then connect the special tools.
2. Bleed the air, and then turn the steering wheel several times while the vehicle is not moving so that the temperature of the fluid rises to approximately 50–60 °C (122–140 °F).
3. Start the engine and idle it at 1,000±100 r/min.
4. Fully close the shut-off valve of the pressure gage and measure the oil pump relief pressure to confirm that it is within the standard value range.

Standard value: 8.31–9.00 MPa (1,205–1,305 psi.)

Caution

Pressure gage shut off valve must not remain closed for more than 10 seconds.

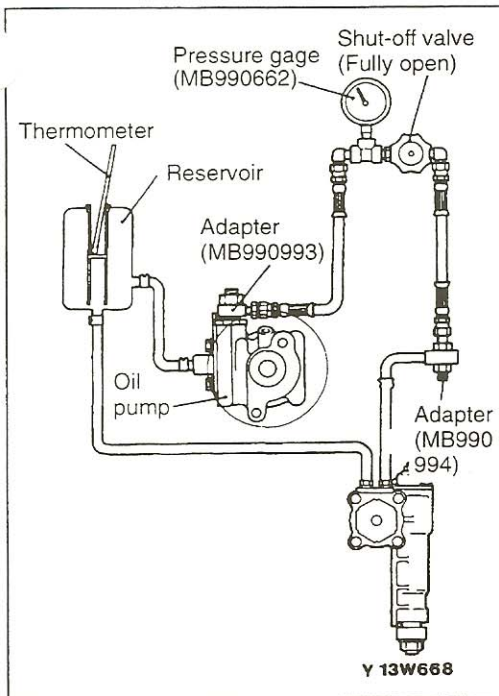
5. If it is not within the standard value, overhaul the oil pump.
6. Remove the special tools, and then tighten the pressure hose to the specified torque.
7. Bleed the system.

**PRESSURE CHECK UNDER NO-LOAD CONDITIONS**

1. Disconnect the pressure hose from the oil pump, and then connect the special tools.
2. Bleed the air, and then turn the steering wheel several times while the vehicle is not moving so that temperature of the fluid raises to approximately 50–60 °C (122–140 °F).
3. Start the engine and idle it at 1,000±100 r/min.
4. Check that the hydraulic pressure is at the standard value when no-load conditions are created by fully opening the shut-off valve of the pressure gage.

Standard value: 0.78–0.98 MPa (114–142 psi.)

5. If it is not within the standard value, the probable cause is a malfunction of the oil line or steering gear box, so check these parts and repair as necessary.
6. Remove the special tools, and then tighten the pressure hose to the specified torque.
7. Bleed the system.

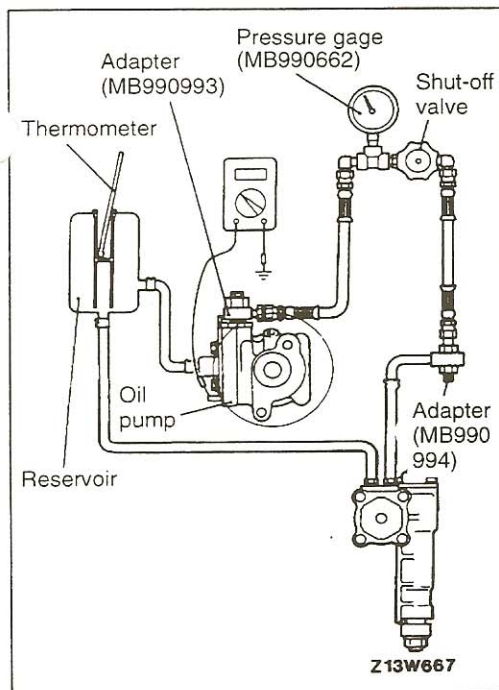


STEERING GEAR RETENTION HYDRAULIC PRESSURE CHECK

1. Disconnect the pressure hose from the oil pump, and then connect the special tools.
2. Bleed the air, and then turn the steering wheel several times while the vehicle is not moving so that the temperature of the fluid rises to approximately 50–60 °C (122–140 °F).
3. Start the engine and idle it at 1,000±100 r/min.
4. Fully open the shut-off valve of the pressure gage.
5. Turn the steering wheel all the way to the left or right, and then check that the retention hydraulic pressure is at the standard value.

Standard value: 8.31–9.00 MPa (1,205–1,305 psi.)

6. If the pressure is not within the standard value, overhaul the steering gear box, and then re-measure the fluid pressure.
7. Remove the special tools, and then tighten the pressure hose to the specified torque.
8. Bleed the system.



POWER STEERING PRESSURE SWITCH CHECK

37200720044

1. Disconnect the pressure hose from the oil pump, and then connect the special tools.
2. Bleed the air, and then turn the steering wheel several times while the vehicle is not moving so that the temperature of the fluid rises to approximately 50–60 °C (122–140 °F).
3. The engine should be idling.
4. Disconnect the connector for the oil-pressure switch, and connect an ohmmeter.
5. Gradually close the shut-off valve of the pressure gage and increase the hydraulic pressure, and then check that the hydraulic pressure that activates the switch is at the standard value.

Standard value: 1.47–1.96 MPa (213–284 psi.)

6. Gradually open the shut-off valve and reduce the hydraulic pressure, and then check that the hydraulic pressure that deactivates the switch is at the standard value.

Standard value: 0.69–1.18 MPa (100–171 psi.)

7. Remove the special tools, and then tighten the pressure hose to the specified torque.
8. Bleed the system.

BALL JOINT DUST COVER CHECK

37200860067

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 pitman arm, tie rod end, or idler arm.

NOTE

Cracks or damage of the dust cover may cause damage of the ball joint.

STEERING COLUMN AND SHAFT

372002

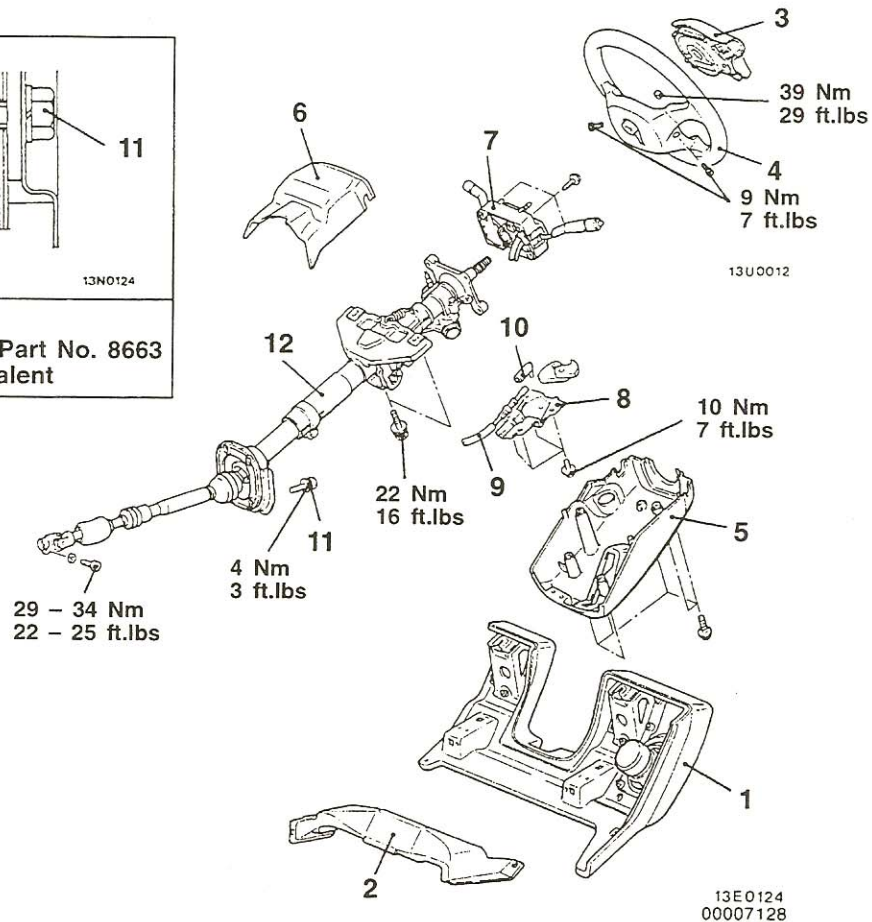
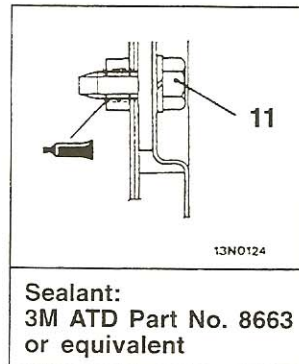
REMOVAL AND INSTALLATION

CAUTION: SRS

Before removal of air bag module, refer to GROUP 52B – SRS Service Precautions and Air Bag Module and Clock spring.

Post-installation Operation

- Steering Wheel Position with Wheels Straight Ahead Checking

**Removal steps**

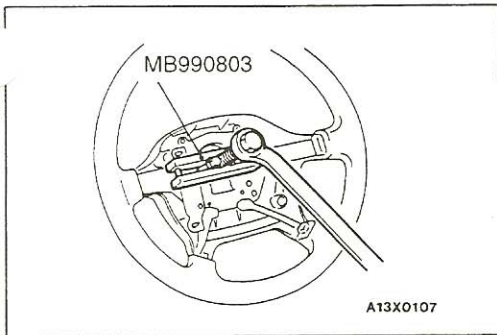
- Knee protector (Refer to GROUP 52A – Instrument Panel.)
- Foot shower duct (Refer to GROUP 55 – Ventilators.)
- Air bag module (Refer to GROUP 52B – Air Bag Module and Clock Spring.)
- Steering wheel
- Lower column cover
- Upper column cover
- Column switch
- Cover (Refer to GROUP 23A – Transmission Control.)
- Key interlock cable (Refer to GROUP 23A – Transmission Control.)
- Slide lever (Refer to GROUP 23A – Transmission Control.)
- Cover attaching bolt
- Steering column and shaft assembly

◀A▶

▶B▶

▶A▶

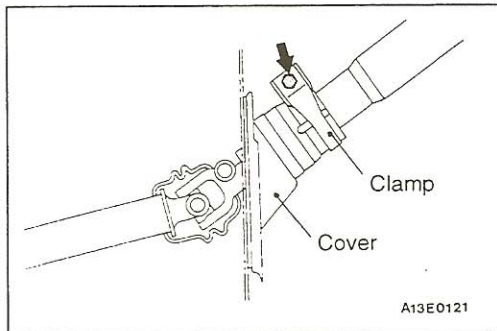
TSB Revision

**REMOVAL SERVICE POINT****◀A▶ STEERING WHEEL REMOVAL**

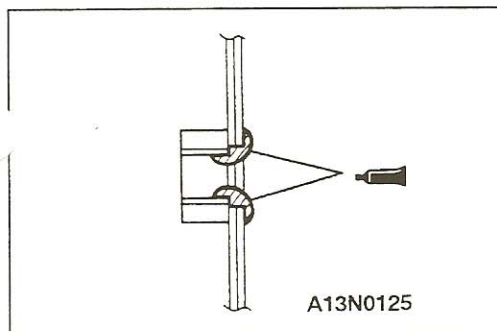
Use a steering wheel puller to remove the steering wheel.

Caution

Do not hammer on the steering wheel to remove it; doing so may damage the collapsible mechanism.

**INSTALLATION SERVICE POINTS****▶A◀ STEERING COLUMN AND SHAFT ASSEMBLY INSTALLATION**

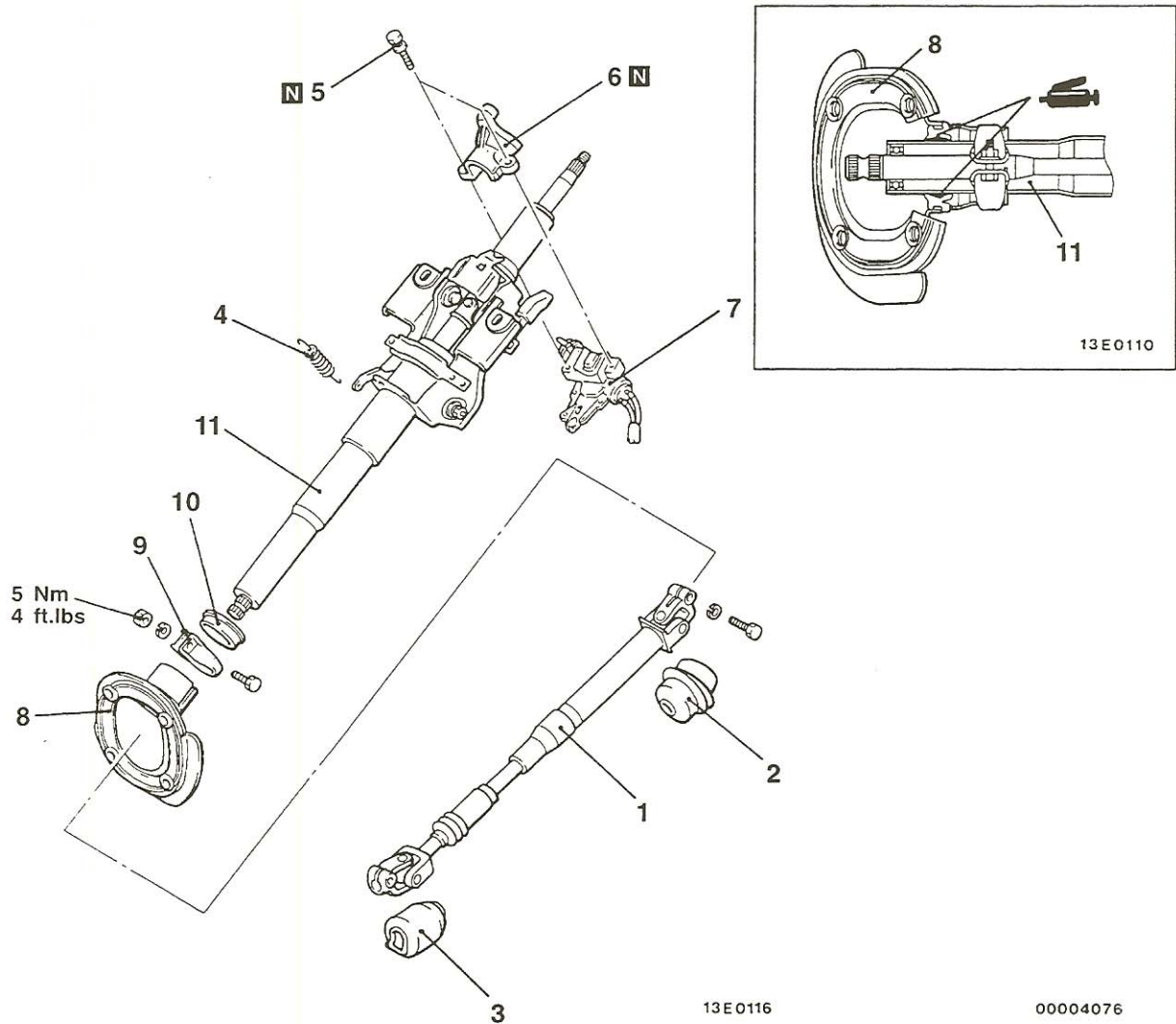
When installing the steering column and shaft assembly to the vehicle body, the bolt indicated by the arrow should never be loosened.

**▶B◀ COVER ATTACHING BOLT INSTALLATION**

Before installing the bolt, apply specified sealant to the toeboard mounting hole.

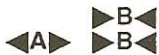
DISASSEMBLY AND REASSEMBLY

37200280061

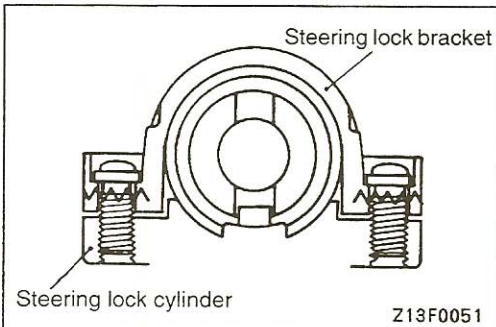


Disassembly steps

1. Joint assembly
2. Upper boot
3. Lower boot
4. Return spring
5. Special bolt
6. Steering lock bracket



7. Steering lock cylinder
8. Cover assembly
9. Clamp
10. Bush
11. Steering column assembly

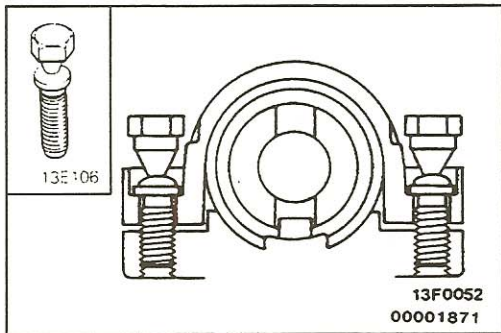
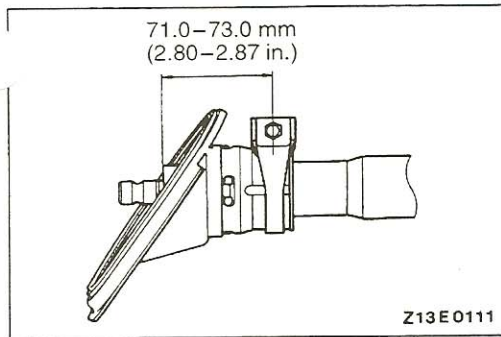


DISASSEMBLY SERVICE POINT

◀A▶ STEERING LOCK BRACKET/STEERING LOCK CYLINDER REMOVAL

If it is necessary to remove the steering lock cylinder, use a hacksaw to cut the special bolts at the steering lock bracket side.

TSB Revision

**REASSEMBLY SERVICE POINTS****▶A◀ CLAMP/COVER ASSEMBLY INSTALLATION**

Install the clamp to the steering column assembly as shown in the illustration.

▶B◀ STEERING LOCK CYLINDER/STEERING LOCK BRACKET/SPECIAL BOLT INSTALLATION

- (1) When installing the steering lock and steering lock bracket to the column tube, temporarily install the steering lock so that it is aligned with the column boss.
- (2) After checking that the lock works properly, tighten the special bolts until the heads twist off.

Caution

The steering lock bracket and bolts must be replaced with new ones when the steering lock is installed.

INSPECTION

37200290033

- Check the steering shaft for play and round movement.
- Check the joints for play, damage, or rough movement.
- Check the boots and cover assembly for damage.

POWER STEERING GEAR BOX

REMOVAL AND INSTALLATION

CAUTION: SRS

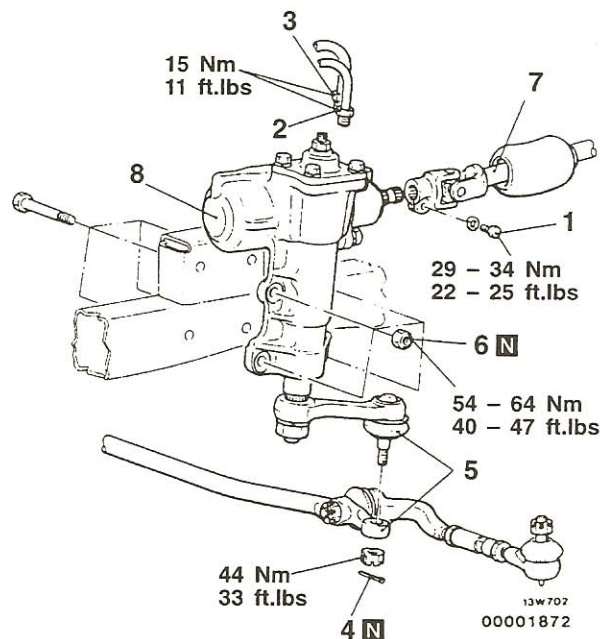
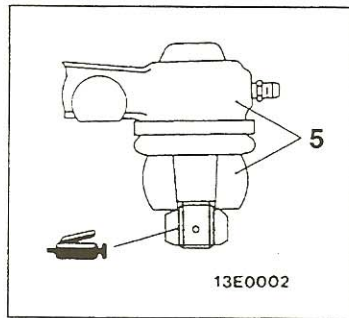
For vehicles with SRS, before removal of steering gear box, refer to GROUP 52B – Service Precautions, center front wheels and remove ignition key. Failure to do so may damage SRS clock spring and render SRS system inoperative, risking serious driver injury.

Pre-removal Operation

- Power Steering Fluid Draining (Refer to P.37A-10.)

Post-installation Operation

- Press the dust cover with a finger to check whether the dust cover is cracked or damaged.
- Power Steering Fluid Supplying (Refer to P.37A-10.)
- Power Steering Fluid Line Bleeding (Refer to P.37A-11.)



Removal steps

1. Bolt
2. Pressure hose connection
3. Return hose connection
4. Split pin



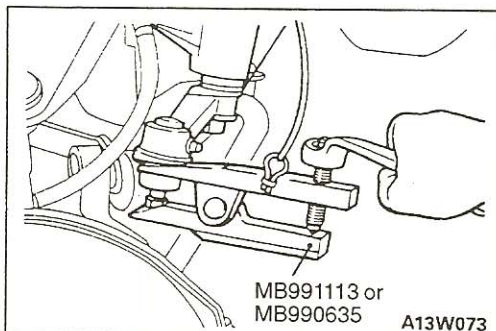
5. Relay rod and pitman arm connection

6. Self-locking nuts

7. Joint assembly connection



8. Power steering gear box



REMOVAL SERVICE POINT

◀A▶ RELAY ROD AND PITMAN ARM DISCONNECTION

Use the special tool to disconnect the pitman arm from the relay rod.

Caution

1. Use cord to bind the special tool closely so it will not become separated.
2. The nut should only be loosened, not removed.

INSTALLATION SERVICE POINT**▶A◀ POWER STEERING GEAR BOX INSTALLATION**

- (1) Install the power steering gear box to the frame after inserting the power steering gear box mainshaft into the joint assembly.
- (2) Before connecting fluid lines, fill the steering gear box with the power steering fluid.

INSPECTION

37200860074

PITMAN ARM 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 pitman arm. (Refer to P.37A-20.)

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.

PITMAN ARM BALL JOINT DUST COVER REPLACEMENT

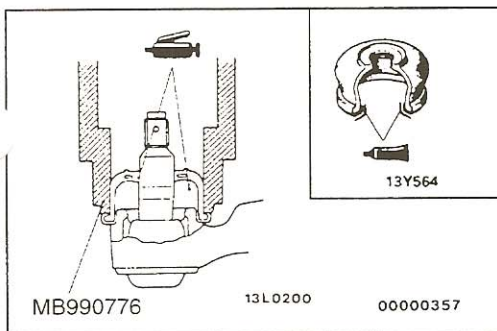
37200820058

Observe the following procedure only when the dust cover is damaged during service work.

- (1) Remove the dust cover.
- (2) Pack dust cover interior with multipurpose grease.
- (3) Apply specified sealant to dust cover lip.

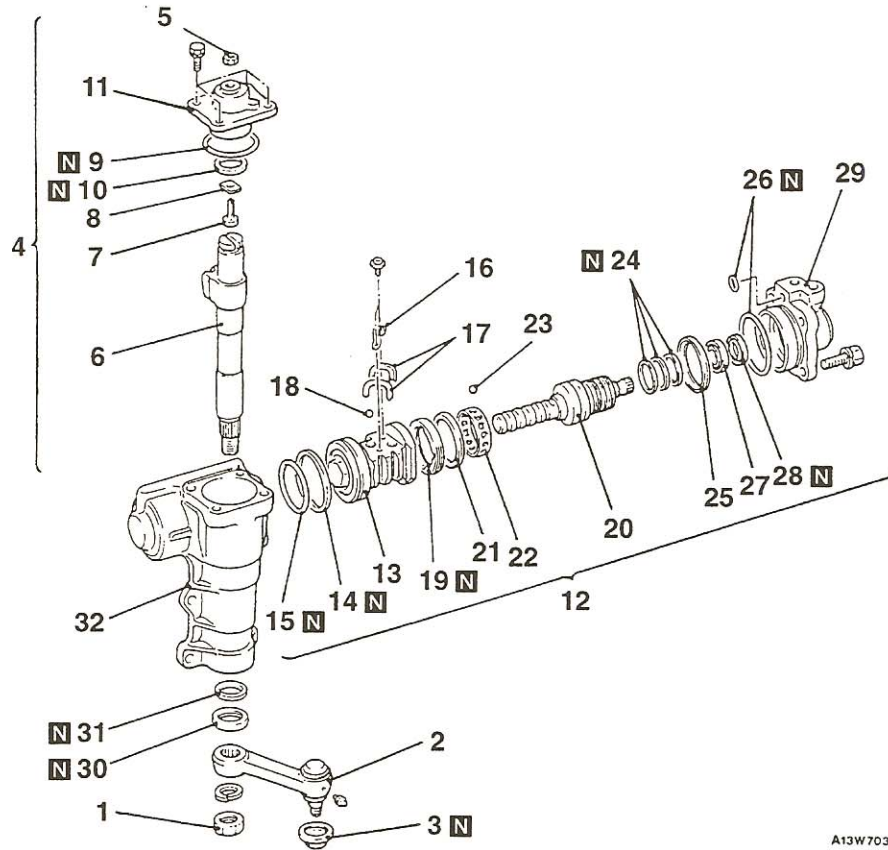
Specified sealant: 3M ATD Part No. 8663 or equivalent

- (4) Using the special tool, install the dust cover to the pitman arm ball joint.
- (5) Check the dust cover for cracks or damage by pushing it with finger.



DISASSEMBLY

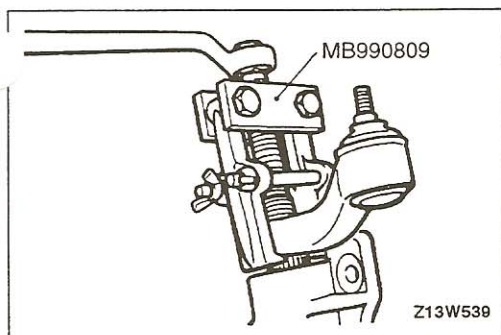
37200420012



A13W703

Disassembly steps

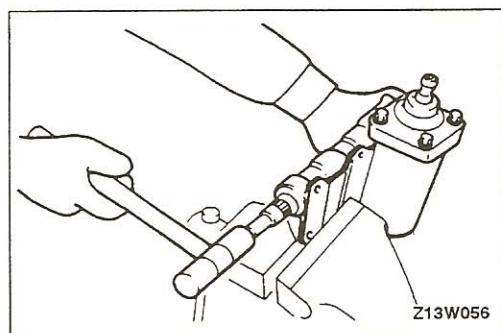
- | | | | |
|--|--|--|---|
| <p>◀A▶</p> <p>◀B▶</p>
<p>◀C▶</p> <p>◀D▶</p> | <p>1. Jam nut</p> <p>2. Pitman arm</p> <p>3. Dust cover</p> <p>4. Side cover and cross-shaft assembly</p> <p>5. Adjusting bolt lock nut</p> <p>6. Cross-shaft</p> <p>7. Adjusting bolt</p> <p>8. Adjusting plate</p> <p>9. O-ring</p> <p>10. Y-packing</p> <p>11. Side cover</p> <p>12. Main shaft and valve assembly</p> <p>13. Rack piston</p> <p>14. Seal ring</p> <p>15. O-ring</p> <p>16. Circulator holder</p> | <p>◀E▶</p> <p>◀F▶</p> <p>◀F▶</p> <p>◀F▶</p>
<p>◀G▶</p> <p>◀G▶</p> | <p>17. Circulator</p> <p>18. Ball</p> <p>19. Lock nut</p> <p>20. Main shaft</p> <p>21. Bearing race</p> <p>22. Cage</p> <p>23. Ball</p> <p>24. Seal ring</p> <p>25. Bearing race</p> <p>26. O-ring</p> <p>27. Bearing</p> <p>28. Oil seal</p> <p>29. Valve housing</p> <p>30. Oil seal</p> <p>31. Y-packing</p> <p>32. Gear box housing</p> |
|--|--|--|---|



DISASSEMBLY SERVICE POINTS

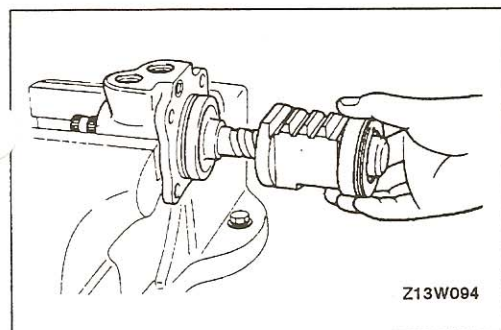
◀A▶ PITMAN ARM REMOVAL

Use the special tool to remove the pitman arm from the gear box assembly.



◀B▶ SIDE COVER AND CROSS-SHAFT ASSEMBLY REMOVAL

With the mainshaft and cross-shaft placed in the straight-ahead position, tap the bottom of the cross-shaft with a plastic hammer to take out the cross-shaft together with the side cover.



◀C▶ Y-PACKING REMOVAL

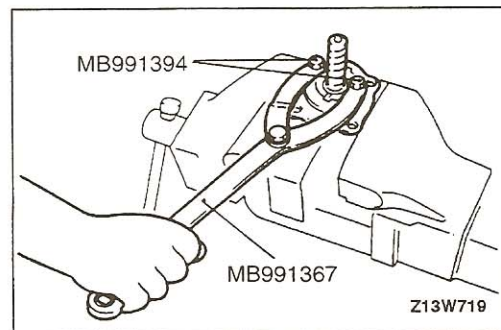
Do not remove the Y-packing at the rear of the needle bearing unless there is fluid leakage from the threads of the adjusting bolt. If there is leakage, replace the Y-packing with a new one.

◀D▶ RACK PISTON REMOVAL

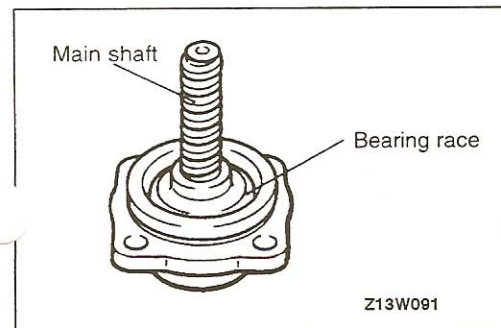
Remove the rack piston from the mainshaft by turning it counterclockwise.

Caution

Be careful not to lose the 26 balls inside the rack piston.

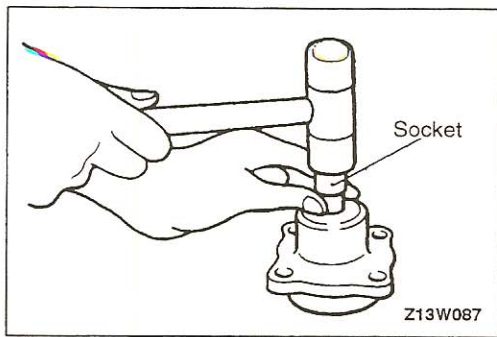


◀E▶ LOCK NUT REMOVAL



◀F▶ MAIN SHAFT/BEARING RACE/CAGE/BALL REMOVAL

When removing the main shaft, remove it while pressing the bearing race so that the balls do not come out.



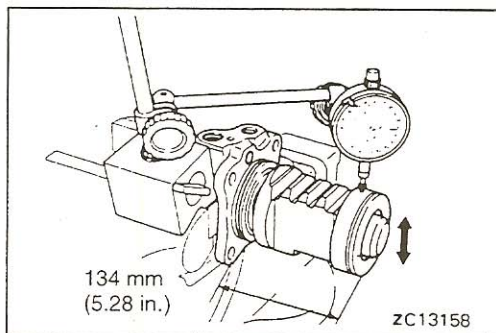
◀G▶ BEARING/OIL SEAL REMOVAL

Use a socket, simultaneously remove the oil seal and bearing from the valve housing.

INSPECTION

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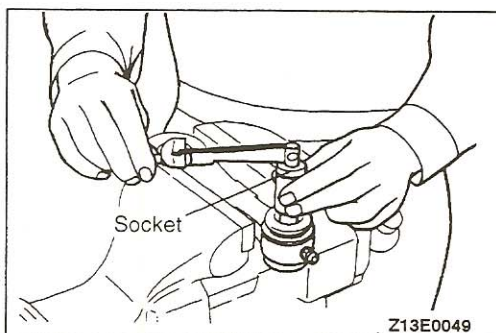
- Check the mainshaft for wear and damage.
- Check the tooth surfaces of the cross shaft and the rack piston for wear and damage.
- Check the contact part of adjusting bolt for uneven wear.
- Check the dust cover and the oil seal for wear and damage.
- Check the O-rings for damage.



1. BACKLASH BETWEEN BALL GROOVE OF RACK PISTON AND BALLS

Set the rack piston to the position shown in the illustration, and then use a dial gage to measure the backlash

Limit: 0.05 mm (.0020 in.)



2. PITMAN ARM BALL JOINT BREAKAWAY TORQUE

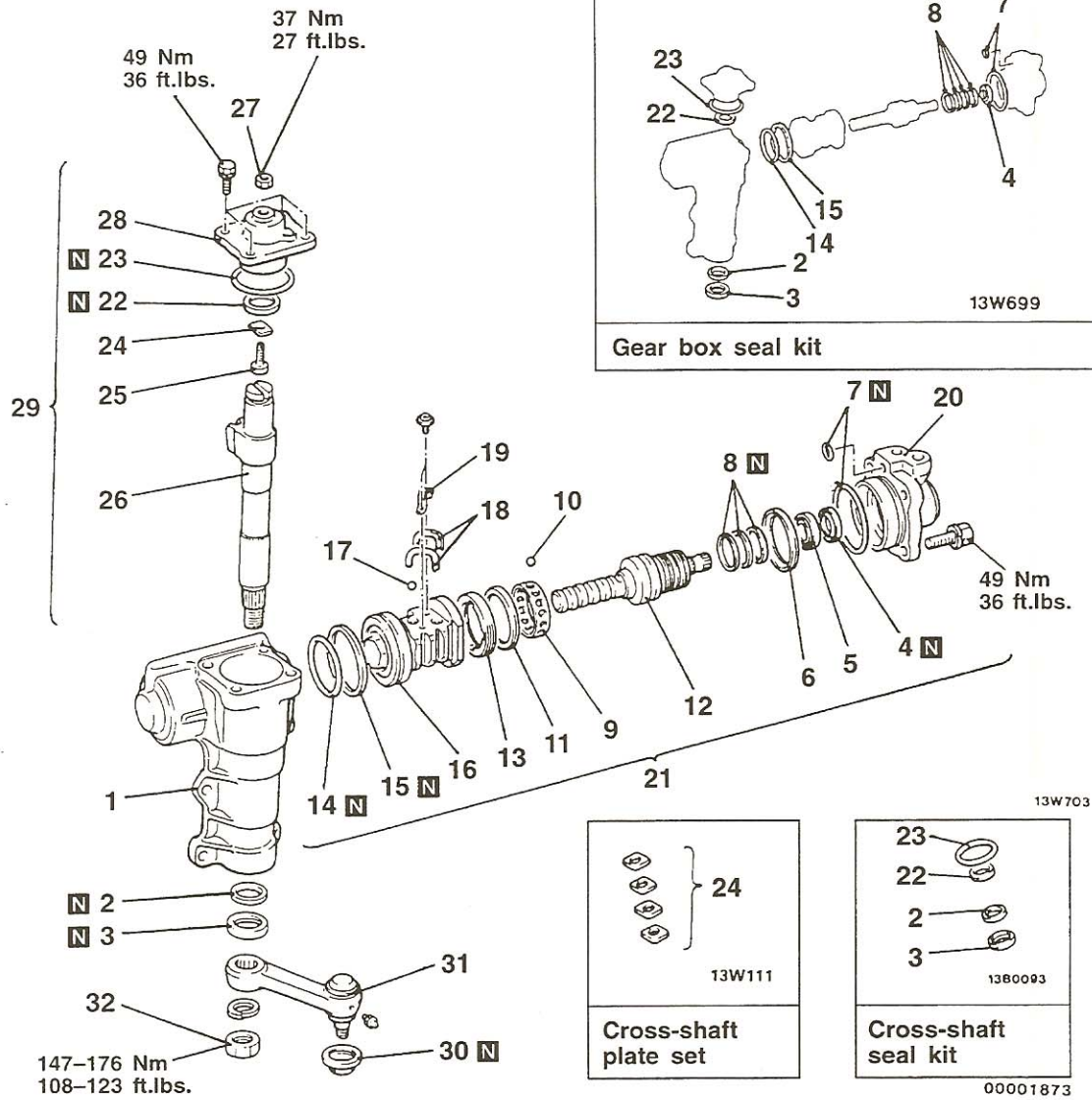
1. Move ball joint stud several times and install nut on stud. Measure ball joint breakaway torque with special tools.

Standard value: 1–3 Nm (9–26 in.lbs.)

2. When the measured value exceeds standard value, replace the tie rod end.
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.

REASSEMBLY

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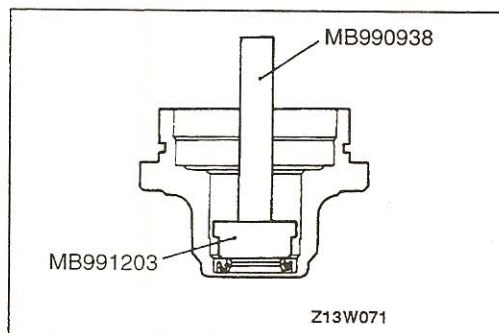
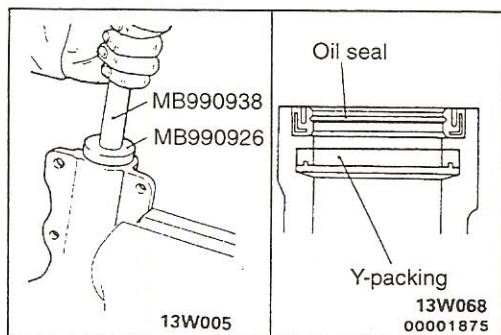
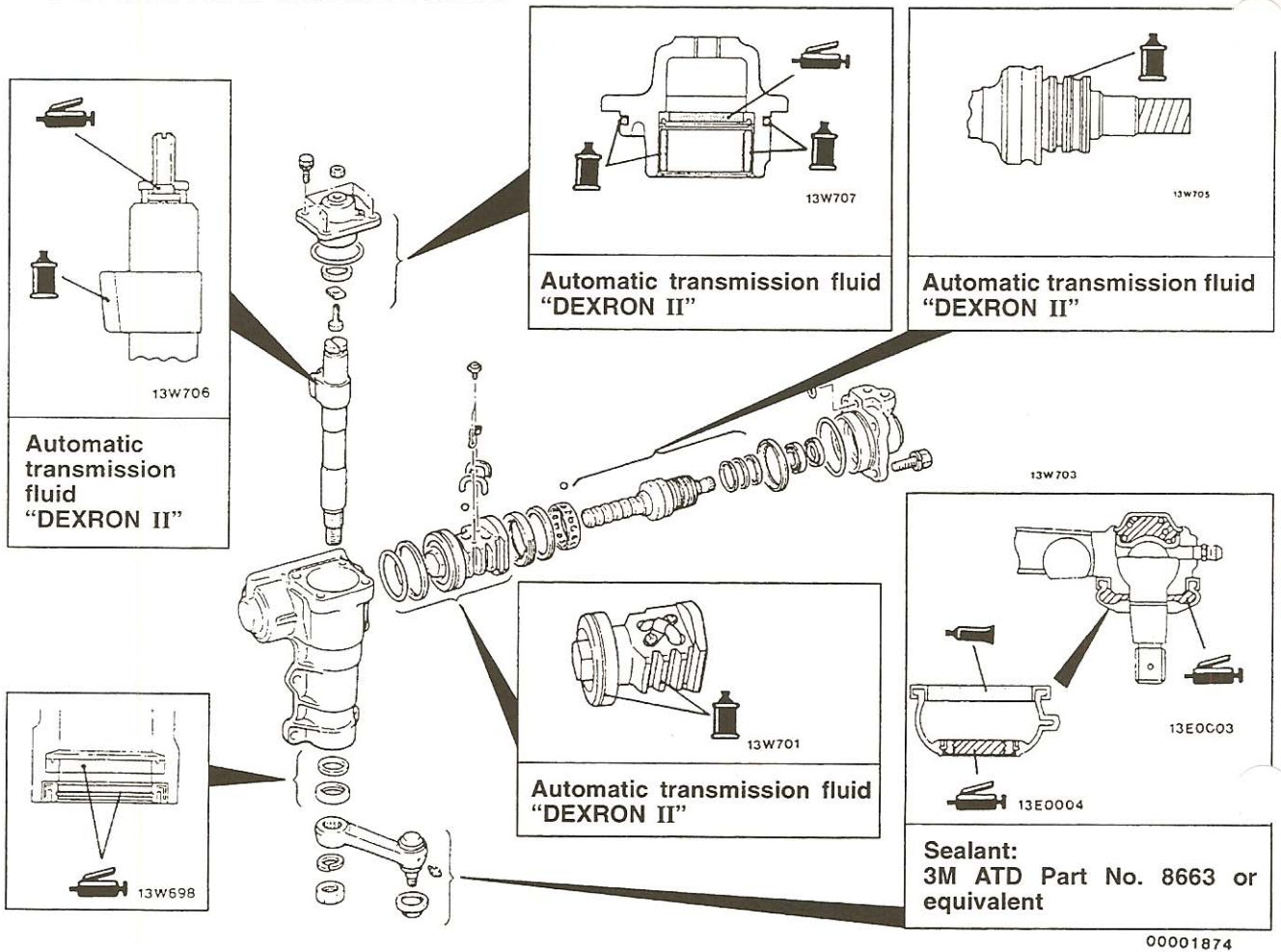


Reassembly steps

- | | | | |
|-----|----------------------------------|-----------------------|---|
| ▶A◀ | 1. Gear box housing | 18. Circulator | |
| ▶A◀ | 2. Y-packing | 19. Circulator holder | |
| ▶B◀ | 3. Oil seal | ▶I◀ | 20. Valve housing |
| ▶B◀ | 4. Oil seal | ▶I◀ | 21. Main shaft and valve assembly |
| ▶C◀ | 5. Bearing | ▶I◀ | 22. Y-packing |
| | 6. Bearing race | ▶I◀ | 23. O-ring |
| | 7. O-ring | ▶J◀ | 24. Adjusting plate |
| ▶D◀ | 8. Seal ring | ▶J◀ | 25. Adjusting bolt |
| ▶E◀ | 9. Cage | ▶K◀ | 26. Cross-shaft |
| ▶E◀ | 10. Ball | ▶K◀ | 27. Adjusting bolt lock nut |
| ▶E◀ | 11. Bearing race | ▶L◀ | 28. Side cover |
| ▶E◀ | 12. Main shaft | ▶L◀ | 29. Side cover and cross-shaft assembly |
| ▶F◀ | 13. Lock nut | ▶M◀ | • Main shaft total starting torque adjustment |
| ▶G◀ | • Main shaft end play adjustment | ▶N◀ | 30. Dust cover |
| ▶H◀ | 14. O-ring | | 31. Pitman arm |
| | 15. Seal ring | | 32. Jam nut |
| | 16. Rack piston | | |
| | 17. Ball | | |

TSB Revision

LUBRICATION AND SEALING POINTS



REASSEMBLY SERVICE POINTS

▶A◀ Y-PACKING/OIL SEAL INSTALLATION

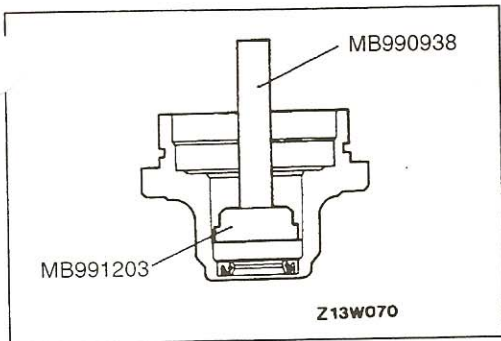
- (1) Install the Y-packing facing the direction shown in the illustration.
- (2) Use the special tool to press-fit the oil seal to the gearbox housing so that it faces in the direction shown in the illustration.

▶B◀ OIL SEAL INSTALLATION

Apply specified automatic transmission fluid to the outside of the oil seal, and then use the special tools to press the oil seal into the valve housing.

Specified fluid:

Automatic transmission fluid "DEXRON II"

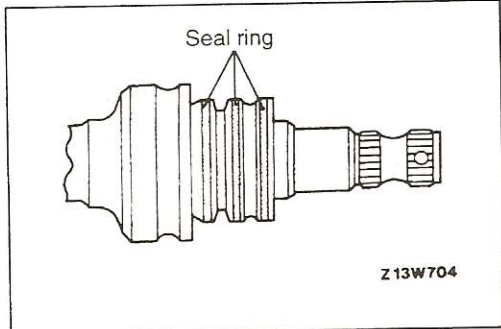


►C◄ BEARING INSTALLATION

Apply specified automatic transmission fluid to the outside of the bearing, and then use the special tools to press the bearing into the valve housing.

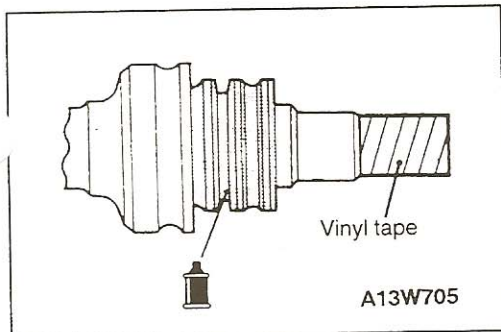
Specified fluid:

Automatic transmission fluid “DEXRON II”



►D◄ SEAL RING INSTALLATION

When installing the seal ring, press it firmly into the valve groove.



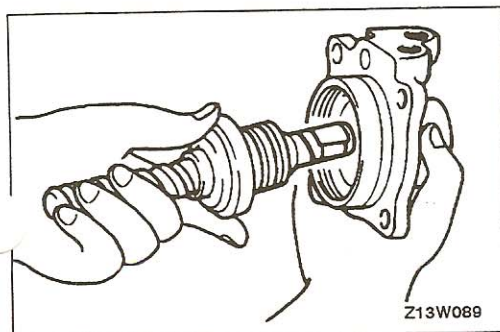
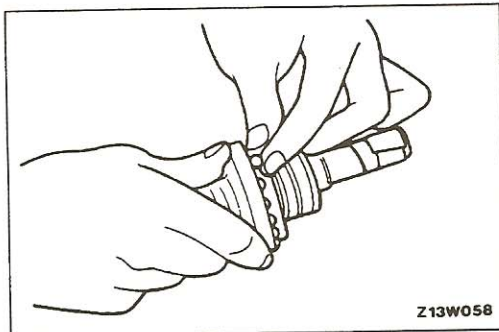
►E◄ CAGE/BALL/BEARING RACE/MAIN SHAFT INSTALLATION

- (1) Apply specified automatic transmission fluid to the valve body.

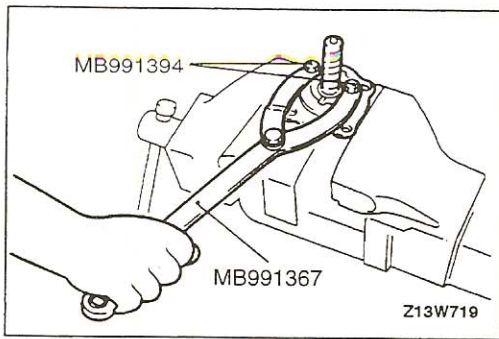
Specified fluid:

Automatic transmission fluid “DEXRON II”

- (2) Wrap vinyl tape around the serrated part so that the oil seal won't be damaged when the valve body is installed to the valve housing.
- (3) Install the valve body to the valve housing.
- (4) Align the cage's hole and the channel in the main shaft, and insert two or three balls.
- (5) Insert the remainder of the balls into the cage's hole while pressing the ball with the bearing race.

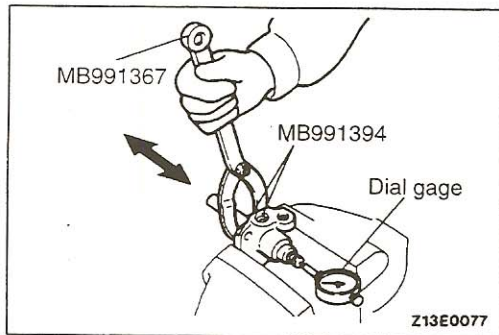


- (6) When installing the main shaft, connect it to the valve housing while pressing the bearing race so that the balls do not come out.



►F◄ LOCK NUT INSTALLATION

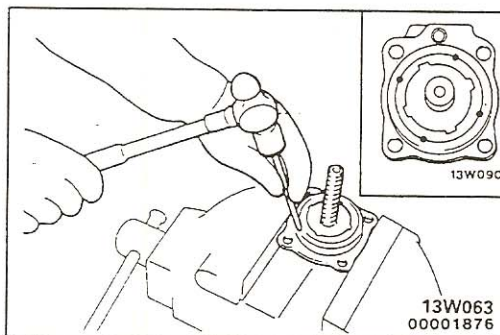
Use the special tool to tighten carefully until the lock contacts the bearing race.



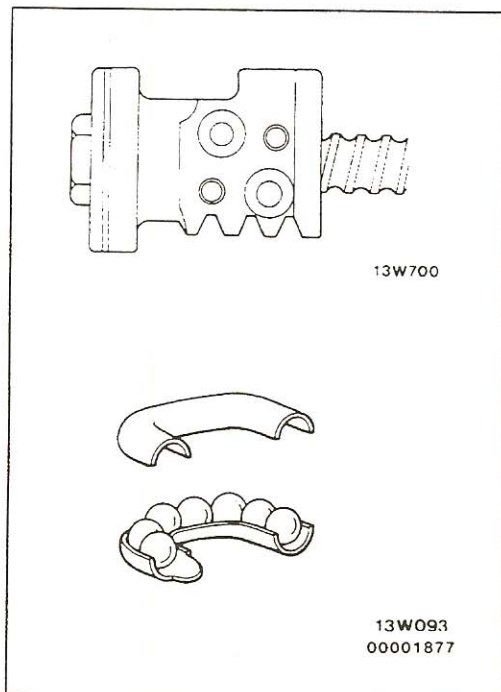
►G◄ MAIN SHAFT END PLAY ADJUSTMENT

- (1) Adjust the play by tightening the lock nut gradually so that the mainshaft end play will meet the range of standard value.

Standard value: 0.03 mm (.0012 in.) or less



- (2) Use a punch to crimp the circumference of the lock nut in order to secure the lock nut.
- (3) Check that the mainshaft rotates smoothly.



►H◄ RACK PISTON INSTALLATION

- (1) Install the rack piston until it comes in contact with the edge of the main shaft.
- (2) Rotate the main shaft to align the ball raceway with the 19-ball insertion hole.

NOTE

The balls must be inserted so that there is no clearance between them.

- (3) Set the remaining seven balls in the circulator, and install the circulator to the rack piston.

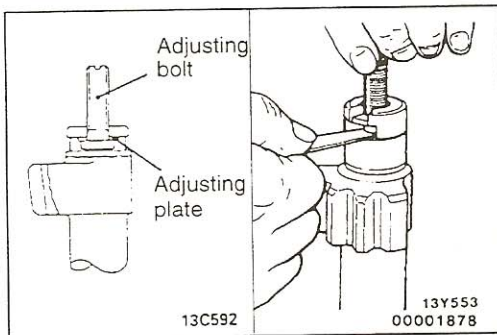
►I◄ VALVE HOUSING INSTALLATION

- (1) Apply specified automatic transmission fluid to the seal ring of the rack piston.

Specified fluid:

Automatic transmission fluid "DEXRON II"

- (2) Insert the valve housing.
- (3) Rotate the main shaft until the rack piston moves to the neutral position (center).



►J◄ ADJUSTING PLATE/ADJUSTING BOLT INSTALLATION

- (1) Install the adjusting plate so that the beveled part is facing downward.
- (2) Use a feeler gage to measure the clearance between the adjusting bolt and the cross-shaft.

Standard value: 0–0.05 mm (0–.002 in.)

- (3) If the clearance exceeds the standard value, replace with a suitable adjusting plate.

►K◄ CROSS-SHAFT/ADJUSTING BOLT LOCK NUT INSTALLATION

Install the cross-shaft to the side cover, and then temporarily tighten the adjusting bolt lock nut.

►L◄ SIDE COVER AND CROSS-SHAFT ASSEMBLY INSTALLATION

Install the side cover assembly (with the cross-shaft) to the gear box.

NOTE

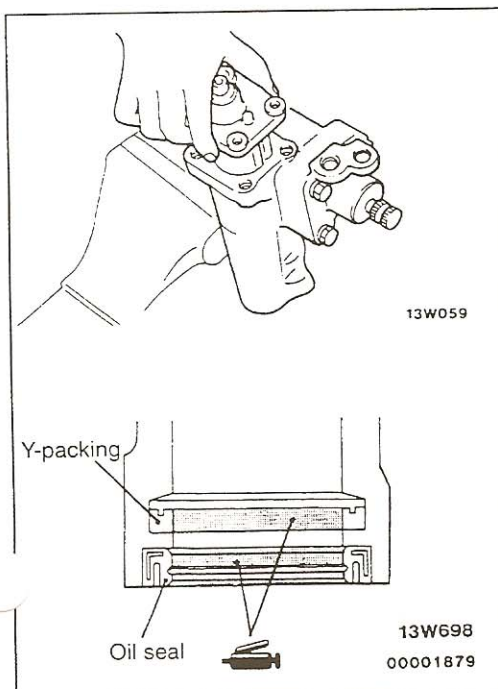
Apply specified automatic transmission fluid to the teeth and shaft areas of the rack piston, and apply multipurpose grease to the oil seal lip.

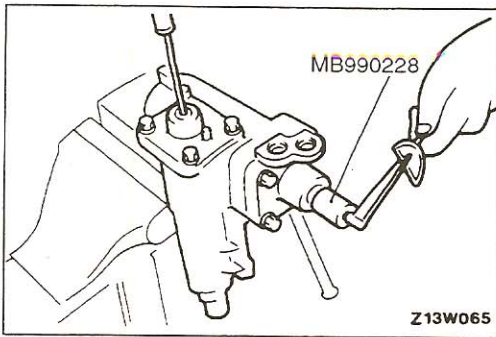
Specified fluid:

Automatic transmission fluid "DEXRON II"

Caution

Do not rotate the side cover during installation. Take care not to damage the cross-shaft oil seal.



**▶M◀MAIN SHAFT TOTAL STARTING TORQUE ADJUSTMENT**

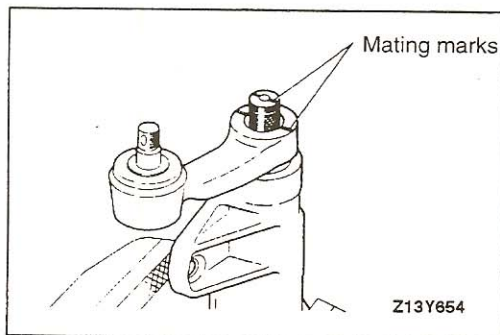
- (1) Use the special tool to measure the main shaft total starting torque while turning the adjusting bolt.

Standard value: 0.45–1.25 Nm (4–11 in.lbs.)

Caution

Adjust by turning the adjusting bolt so that the starting torque at the center position of the rack piston is approximately 0.2 Nm (2 in.lbs.) higher than the values at the both ends of the rack piston.

- (2) Tighten the adjusting bolt lock nut to the specified torque.

**▶N◀PITMAN ARM INSTALLATION**

Install the pitman arm to the gear box so that the mating marks are aligned.

POWER STEERING OIL PUMP

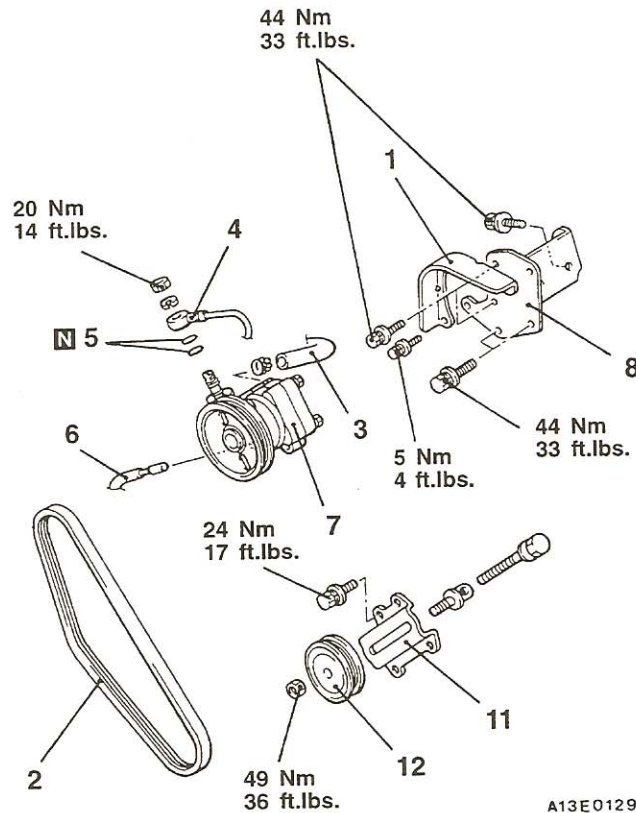
REMOVAL AND INSTALLATION

Pre-removal Operation

- Power Steering Fluid Draining (Refer to P.37A-10.)

Post-installation Operation

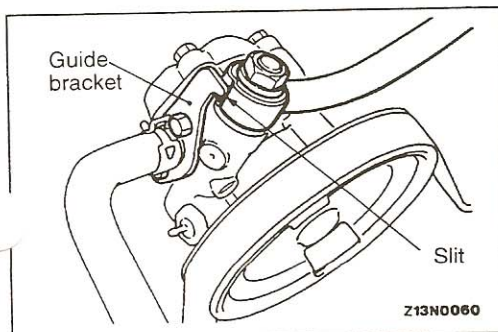
- Power Steering Fluid Supplying (Refer to P.37A-10.)
- V-belt Tension Adjusting (Refer to P.37A-10.)
- Power Steering Fluid Line Bleeding (Refer to P.37A-11.)
- Oil Pump Pressure Check (Refer to P.37A-12.)



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Removal steps

- | | |
|---|--|
| <p>▶◀</p> <ol style="list-style-type: none"> 1. Oil pump pulley cover 2. Belt 3. Suction hose 4. Pressure hose 5. O-ring | <ol style="list-style-type: none"> 6. Pressure switch connector 7. Oil pump 8. Oil pump bracket 9. Oil pump belt tensioner bracket 10. Oil pump belt tension pulley |
|---|--|



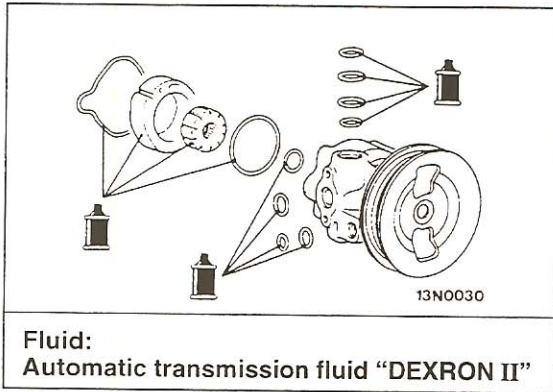
INSTALLATION SERVICE POINT

▶◀ PRESSURE HOSE INSTALLATION

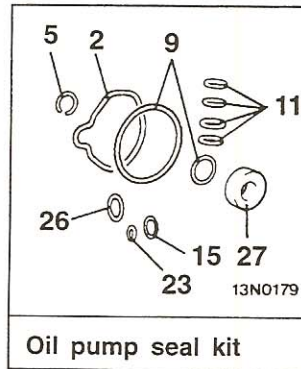
Connect the pressure hose so that its slit part contacts the oil pump's guide bracket.

DISASSEMBLY AND REASSEMBLY

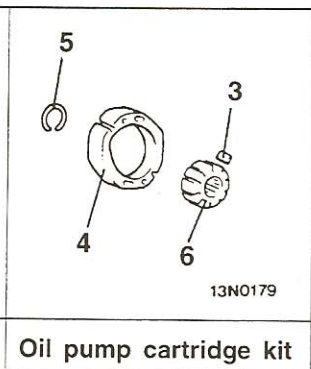
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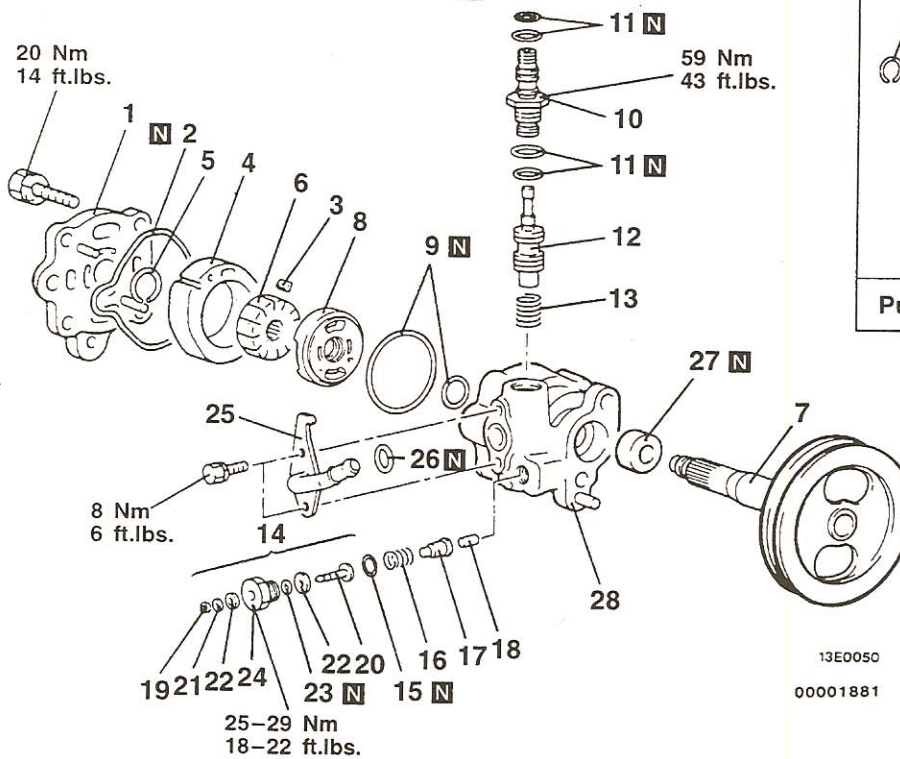
Fluid:
Automatic transmission fluid "DEXRON II"



Oil pump seal kit



Oil pump cartridge kit

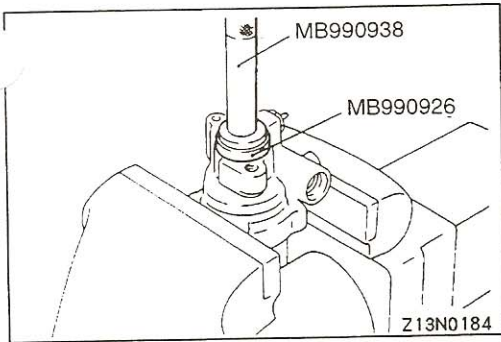


Disassembly steps

- | | | | |
|-----|-------------------------|-----|-----------------------|
| ▶H▶ | 1. Pump cover | ▶B▶ | 15. O-ring |
| ▶G▶ | 2. O-ring | ▶C▶ | 16. Spring |
| ▶F▶ | 3. Vanes | | 17. Plunger |
| ▶E▶ | 4. Cam ring | | 18. Piston rod |
| | 5. Snap ring | | 19. Snap ring |
| | 6. Rotor | | 20. Terminal |
| | 7. Pulley assembly | | 21. Washer |
| ▶D▶ | 8. Side plate | | 22. Insulator |
| ▶B▶ | 9. O-ring | ▶B▶ | 23. O-ring |
| ▶B▶ | 10. Connection | | 24. Plug |
| | 11. O-ring | | 25. Suction connector |
| | 12. Flow control valve | ▶B▶ | 26. O-ring |
| | 13. Flow control spring | ▶A▶ | 27. Oil seal |
| | 14. Terminal assembly | | 28. Oil pump body |

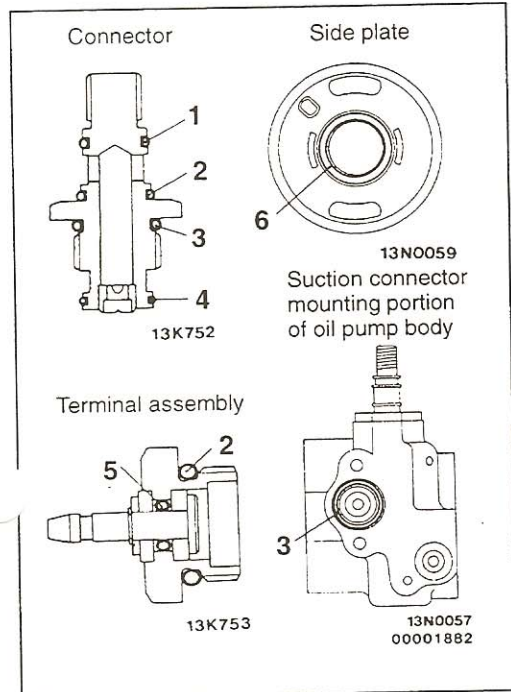
Caution
Do not disassemble the flow control valve.

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REASSEMBLY SERVICE POINTS

▶A◀ OIL SEAL INSTALLATION



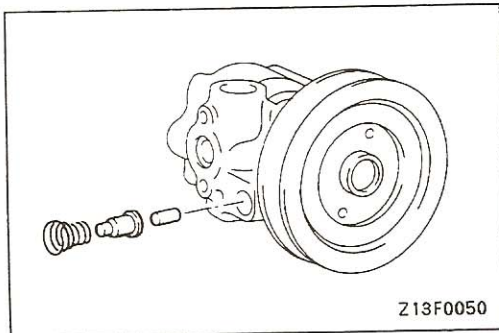
▶B◀ O-RINGS INSTALLATION

Apply specified automatic transmission fluid to the O-rings and install them.

No.	I.D×Width mm (in.)
1	11×1.9 (.433×.075)
2	13×1.9 (.512×.075)
3	17.8×2.4 (.701×.094)
4	13.5×1.5 (.531×.059)
5	3.8×1.9 (.150×.074)
6	16.8×2.4 (.661×.094)

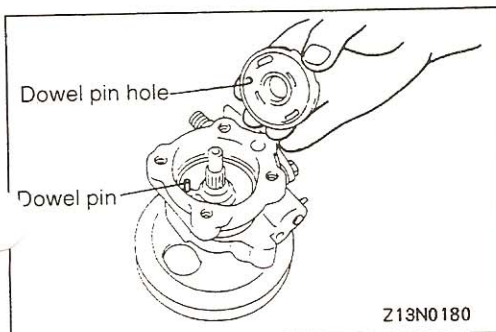
▶C◀ SPRING INSTALLATION

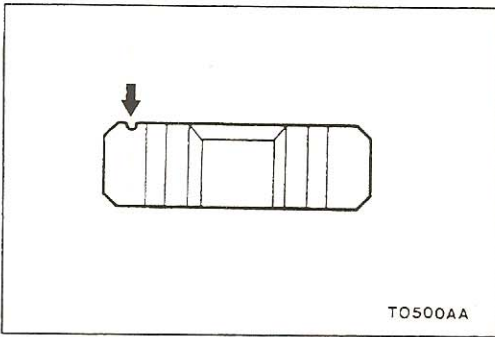
Fit the spring to the oil pump body with the larger-diameter end at the terminal assembly side.



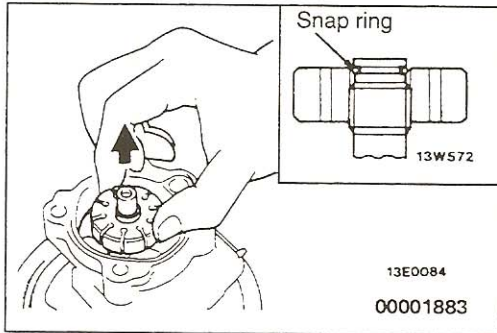
▶D◀ SIDE PLATE INSTALLATION

Line up the dowel pin hole of the side plate with the dowel pin of the pump body when installing the side plate.

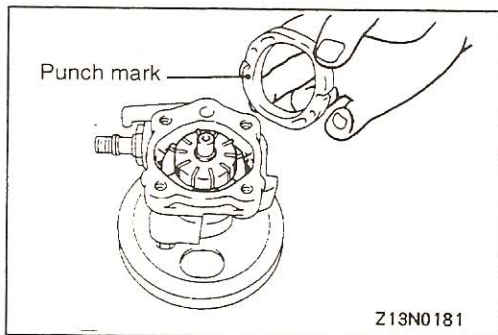


**▶E◀ ROTOR INSTALLATION**

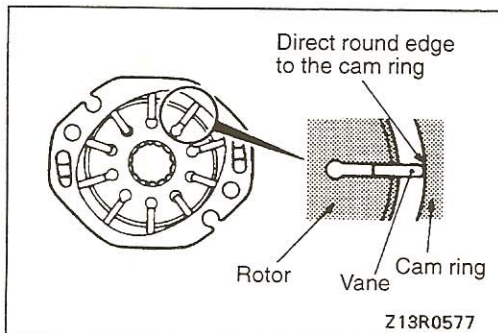
Install the rotor to the pulley assembly so that the ro punch mark is at the pump cover side.

**▶F◀ SNAP RING INSTALLATION**

After installation of the snap ring, lift the rotor and check that the snap ring has entered the countersunk part.

**▶G◀ CAM RING INSTALLATION**

Install the cam ring with the punch mark facing the side plate.

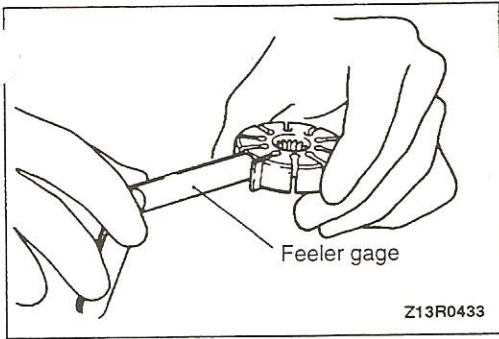
**▶H◀ VANES INSTALLATION**

Install the vanes to the rotor, being careful not to mistake the installation direction.

INSPECTION

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- Check the flow control valve for clogging.
- Check the pulley assembly for wear or damage.
- Check the rotor and vane groove for “stepped” wear.
- Check the contact surface of cam ring and vanes for “stepped” wear.
- Check the vanes for damage.



GAP BETWEEN VANE AND ROTOR GROOVE

Limit: 0.06 mm (.0024 in.)

STEERING HOSES

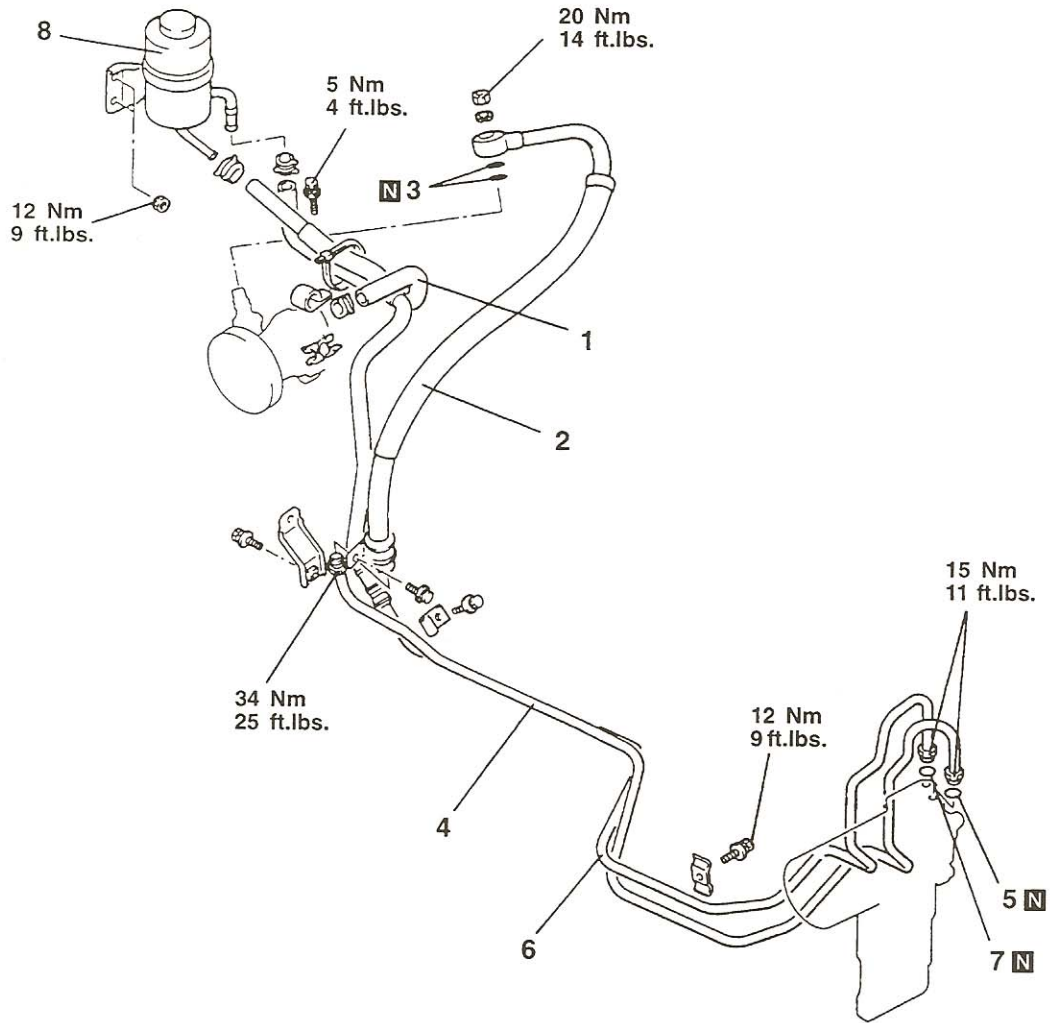
REMOVAL AND INSTALLATION

Pre-removal Operation

- Power Steering Fluid Draining (Refer to P.37A-10.)

Post-installation Operation

- Power Steering Fluid Supplying (Refer to P.37A-10.)
- Power Steering Fluid Line Bleeding (Refer to P.37A-11.)



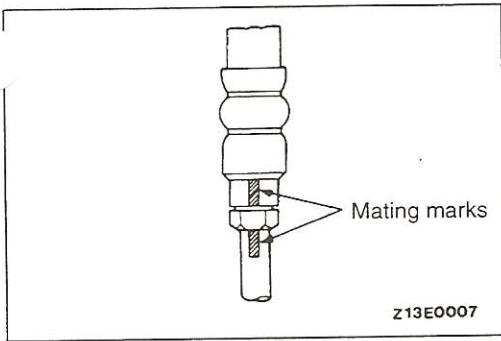
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Removal steps

- ▶◀ 1. Suction hose
- ▶◀ 2. Pressure hose
- ▶◀ 3. O-ring
- ▶◀ 4. Pressure pipe

- 5. O-ring
- 6. Return pipe
- 7. O-ring
- 8. Oil reservoir

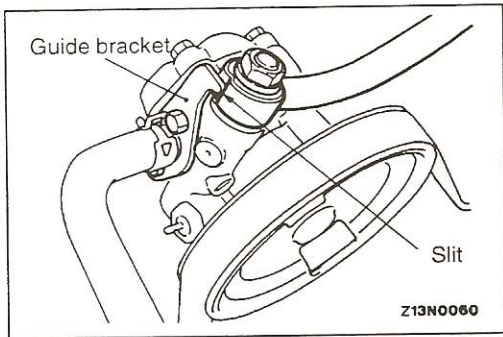
TSB Revision



INSTALLATION SERVICE POINT

▶A◀ PRESSURE PIPE/PRESSURE HOSE INSTALLATION

(1) Install so that the pressure pipe and pressure hose mating marks are aligned.



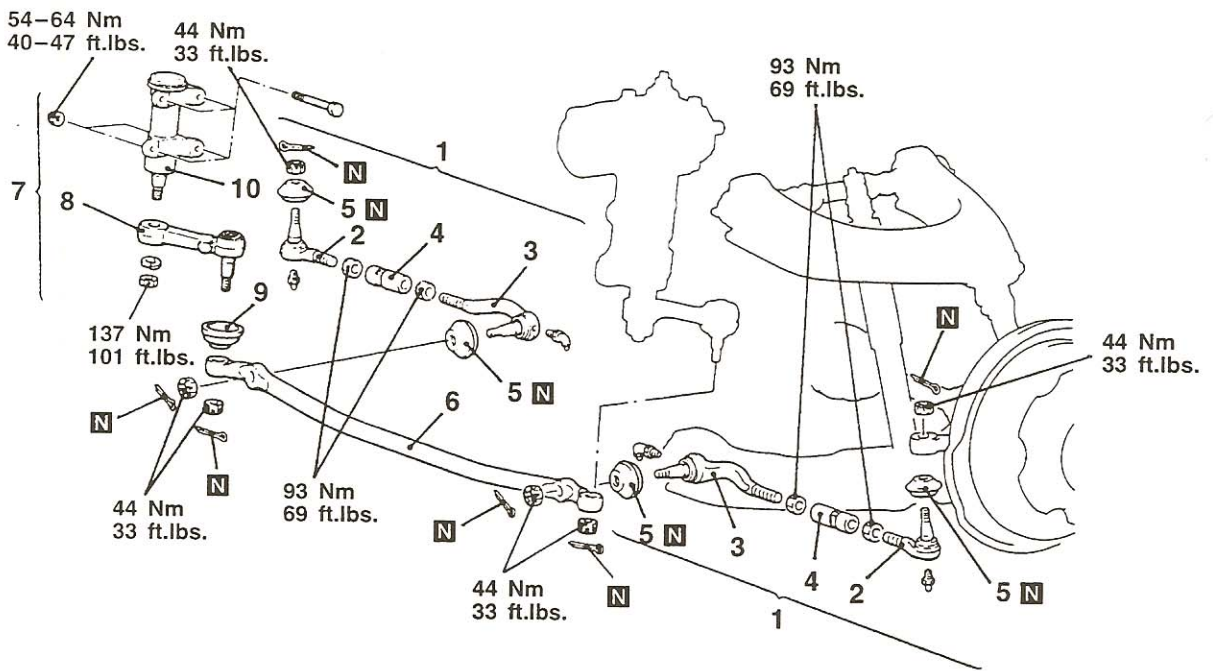
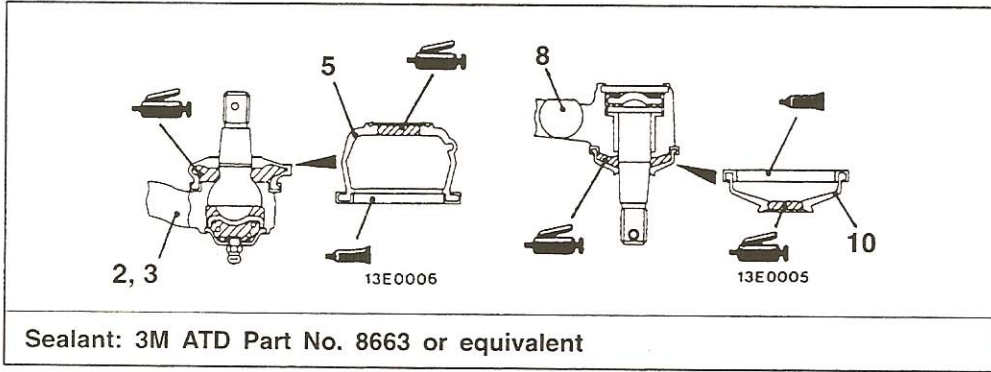
(2) Connect the pressure hose so that its slit part contacts the oil pump guide bracket.

STEERING LINKAGE

REMOVAL AND INSTALLATION

Post-installation Operation

- Press the dust cover with a finger to check whether the dust cover is cracked or damaged.
- Front Wheel Alignment Adjustment (Toe-in)
(Refer to GROUP 33A – On-vehicle Service.)

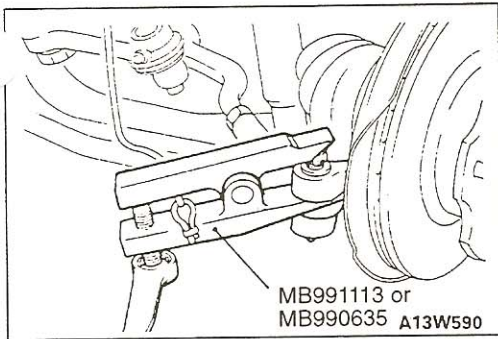


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Removal steps

- | | | | |
|-----|-----------------------|-----|-------------------------|
| ◀A▶ | 1. Tie rod assembly | ◀B▶ | 6. Relay rod |
| ▶A▶ | 2. Tie rod end, outer | | 7. Idler arm (complete) |
| ▶A▶ | 3. Tie rod end, inner | ◀C▶ | 8. Idler arm |
| ▶A▶ | 4. Pipe | | 9. Dust cover |
| | 5. Dust cover | | 10. Idler arm support |

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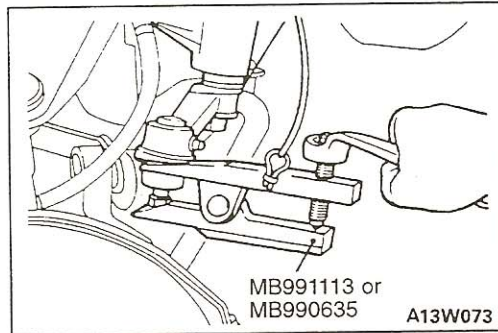
REMOVAL SERVICE POINTS

◀A▶ TIE ROD ASSEMBLY DISCONNECTION

Use the special tool to disconnect the tie rod ends, and then remove the tie rod assembly.

Caution

1. Use cord to bind the special tool closely so it won't become separated.
2. The nut should only be loosened, not removed.

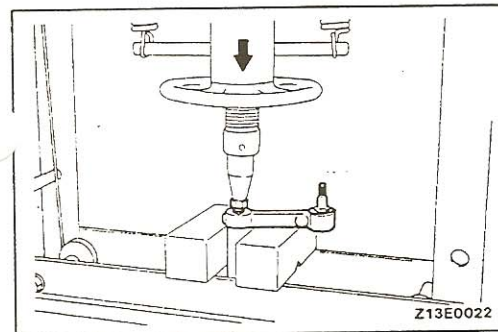


◀B▶ RELAY ROD DISCONNECTION

Use the special tool to disconnect the connecting portions of the idler arm and the steering gear box, and then remove the relay rod.

Caution

1. Use cord to bind the special tool closely so it won't become separated.
2. The nut should only be loosened, not removed.

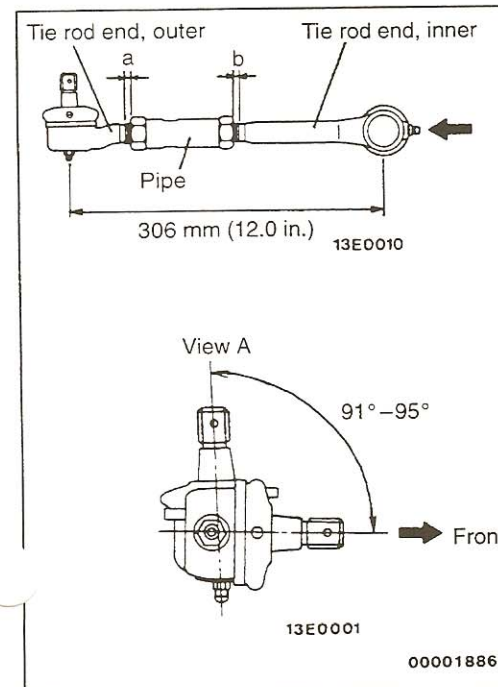


◀C▶ IDLER ARM REMOVAL

Use a bench press to remove the idler arm.

Caution

The nut should only be loosened, not removed.



INSTALLATION SERVICE POINTS

▶A◀ PIPE/TIE ROD END, INNER/TIE ROD END, OUTER INSTALLATION

- (1) Install the tie rod assembly so that the dimension is as shown in the illustration.

NOTE

The illustration at left shows the left-side tie rod assembly. The right-side tie rod assembly is symmetrical to the left-side assembly.

- (2) Adjust the pipe so that the difference between dimensions (a) and (b) is 1.5 mm (.059 in.) or less, and then temporarily tighten the lock nut.

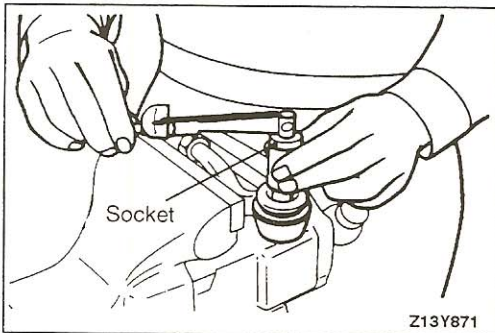
NOTE

Fully tighten the lock nut after the tie rod assembly is installed to the body and the toe-in has been adjusted.

INSPECTION

37200610013

- Check the idler arm support for damage and deformation. ...
- Check the idler arm for damage and deformation.
- Check the dust covers for damage and cracks.
- Check the tie rods for damage and deformation.
- Check the relay rod for bends and damage.
- Check the grease nipples for clogging and looseness.



BALL JOINT STARTING TORQUE CHECK

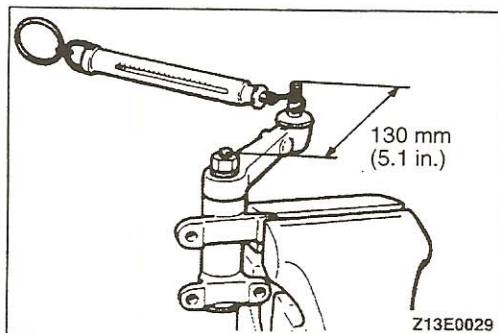
1. After shaking the ball joint stud several times, install the nut to the stud and use the special tool to measure the breakaway torque of the ball joint.

Standard value:

Tie rod end 1–3 Nm (9–26 in.lbs.)

Idler arm 0.5–2.0 Nm (4–17 in.lbs.)

2. When the measured value exceeds the standard value, replace the tie rod assembly.
3. When the measured value is lower than the standard value, check that the ball joint swings smoothly without excessive play. If so, it is possible to use that ball joint.



IDLER ARM STARTING TORQUE CHECK

1. Give 10 hard swing to the idler arm.
2. Measure the idler arm swing resistance with a spring scale.

Standard value:

0.3–2.0 Nm (3–17 in.lbs.)

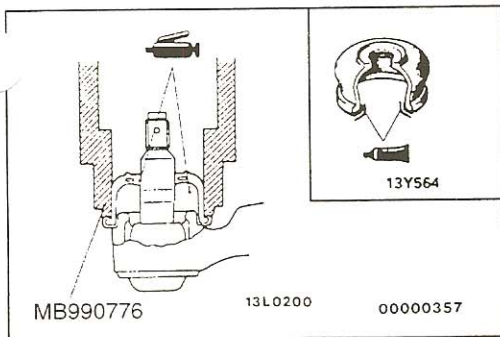
[2.3–15.4 N (.5–33.9 lbs.)]

TIE ROD END/IDLER ARM 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 tie rod end or the idler arm. (Refer to P.37A-36.)

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.



TIE ROD END/IDLER ARM BALL JOINT DUST COVER REPLACEMENT

37200820065

Observe the following procedure only when the dust cover is damaged during service work.

- (1) Remove the dust cover.
- (2) Pack dust cover interior with multipurpose grease.
- (3) Apply specified sealant to dust cover lip.

Specified sealant: 3M ATD Part No. 8663 or equivalent

- (4) Using the special tool, install the dust cover to the tie rod end/idler arm ball joint.
- (5) Check the dust cover for cracks or damage by pushing it with finger.

NOTES

BODY

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42109000157

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GENERAL INFORMATION

OPERATION

<Power window>

- If a power-window (main or sub) switch is pressed (UP side or DOWN side) when the ignition switch is at ON, current flows through fusible link No. 10 to the power-window motor, thus causing the door window glass to close or open.
- When the power-window main switch at the driver's side is pressed all the way to the DOWN side, the switch is locked at the pressed-in position, and the power-window motor operates until the door glass is fully opened.
- When the power-window lock switch is set to the LOCK (ON) position, the power-window motor will not operate if any switch (main or sub) other than at the driver's side is operated.
- A circuit breaker is provided in the power-window motor in order to prevent damage to the motor because of excessive current.

For reference: circuit breaker characteristics
Motor operation is restricted at high temperature [20–25°C (68–77°F)].

Current flow is cut by an initial current flow time of four to 40 seconds; reset occurs within 60 seconds if then left as is.

<Central door locking system>

Vehicles without keyless entry system

- When the door lock switch is set to the LOCK side (or UNLOCK side), the LOCK side (or UNLOCK side) of the door lock relay is turned ON and the door actuators of all doors operate.

NOTE

The door lock actuator contains a PTC thermistor to prevent damage caused by overheating of the motor. If the central door lock is frequently used, the actuator may temporarily fail to operate. If it returns to normal in a few minutes, it is normal.

Vehicles with keyless entry system

- When the lock switch of the transmitter is pushed with all the doors and backdoor in unlocked condition, the door lock signal will be output (0V) from the keyless entry control unit terminal No. 12 to turn on (lock side) the door lock relay to lock all the doors and backdoor.
- When the transmitter unlock switch is pushed once with all the doors and backdoor in locked condition, the door unlock signal will be output (0V) from the keyless entry control unit terminal No. 14 to turn on (unlock side) the door lock relay to unlock the door of the driver's side.

- When the transmitter unlock switch is pushed once again with the same condition as above, the door unlock signal will be output (0V) from the keyless entry control unit terminal No. 13 to turn on (unlock side) the door lock control unit to unlock all the doors and backdoor.
- When the keyless entry system is operated to lock the door of the driver's side, the dome light flickering signal will be output (system voltage) twice from the keyless entry control unit terminal No. 11. And when the door of the driver's side is unlocked, the dome light illuminating signal will be output (0V) for three seconds from the keyless entry control unit terminal No. 11.

NOTE

Following are the functions that the keyless entry control system has in addition to the above.

- Unless any of the door is opened or closed within 30 seconds after the door has been unlocked by the keyless entry system, all the doors and backdoor will be automatically locked. Further, when a code which is different from the code that receiver memorizes is received 30 times consecutively in a minute, the system will not operate for 10 minutes.
- The system will not operate with the ignition switch inserted and any of the doors and backdoor open.

<Sunroof>

- If the ignition switch is in the "ACC" or "ON" position and the sunroof switch is pressed to the "OPEN" side, current flows to the dedicated fuse, sunroof switch, sunroof motor, control unit, sunroof switch and earth, and the sunroof opens.
- When the sunroof switch is pressed to the "CLOSE" side, current flows to the dedicated fuse, sunroof switch, control unit, sunroof motor, sunroof switch and ground, and the sunroof closes.
- The limit switch inside the sunroof motor causes the sunroof to temporarily stop approximately 135 mm (5.3 in.) before the fully open position when opening and approximately 200 mm (7.9 in.) before the fully closed position when closing.

GENERAL SPECIFICATIONS

42100020015

Items		Specifications	
Hood	Type	Rear hinged, front opening type	
Front door	Construction	Front hinged, sash construction	
	Regulator system	Wire type	
	Locking system	Pin-fork type	
Rear door	Construction	Front hinged, sash construction	
	Regulator system	Wire type	
	Locking system	Pin-fork type	
Back door	Construction	Right hinged, sash construction	
	Locking system	Pin-fork type	
Glass	Installation method	Windshield glass	Adhesive type
		Back door window glass	Adhesive type
	Thickness mm (in.)	Windshield glass	5.3 (.21)
		Quarter window glass	4.0 (.16)
		Front door glass	3.5 (.14)
		Rear door glass	3.5 (.14)
		Back door window glass	3.5 (.14)
		Sunroof glass	5.0 (.20)
Frame type		Ladder type	
Power window motor	Type	Permanent magnet type (built-in circuit breaker)	
	Revolutions under no load r/min	75 or more	
	Revolutions under load [At 1 Nm (.72 ft.lbs.)] r/min	65–95	
	Revolutions under load [At 2 Nm (1.45 ft.lbs.)] r/min	50–80	
	Bound current A	34 or less	
	Direction of rotation	Clockwise and anti-clockwise	
Sunroof motor	Type	DC ferrite (with built-in circuit breaker)	
	Speed at no load r/min	155–195	
	Speed at load [At 2 Nm (1.45 ft.lbs.)] r/min	110–150	
	Bound current A	35 or less	
	Turning direction	Both clockwise and anti-clockwise	

Items		Specifications
Power window main switch	Type	Automatic reset type
	Rated load current (Lock switch) A	25
	Rated load current (Power window switch) A	10
Power window sub switch	Type	Automatic reset type
	Rate load current A	10
Power window relay	Maximum contact current A	20
	Rated coil current A	0.2 or less
	Voltage drop between terminals (At 12 V and the rated load current) V	0.3 or less
Door lock control unit	Effective voltage V	10–16
	Current consumption (when not in operation) mA	3 or less
Door Lock power relay	Range of voltage used V	10–16
	Rated load current (at 13.5 V) A	10
	Rated coil current A	0.2 or less
	Voltage drop between terminals V	0.2 or less
Front door lock actuator	Bound current (at 12 V) A	2.5–4.5
	Operator voltage range V	9–15
	*Tripping time (at 12 V) Second	5–30
Rear door lock actuator	Bound current (at 12 V) A	2.5–4.5
	Operator voltage range V	9–15
	*Tripping time (at 12 V) Second	5–30

NOTE

* Tripping time is the time consumed until current reaches 0.5 A after power connection.

SERVICE SPECIFICATIONS

42100030018

Items		Standard value
Door inside handle play mm (in.)		4–10 (.16–.39)
Door outside handle play mm (in.)	Front and rear door	3–12 (.12–.47)
	Back door	2–8 (.08–.31)
Slipping force of motor clutch N (lbs.)		39–49 (9–11)
Sunroof sliding resistance N (lbs.)		196 (44)

TSB Revision




SEALANTS AND ADHESIVES

42100050052

Items	Specified sealants and adhesives
Screen drip Sunroof glass weatherstrip	3M ATD Part No. 8001, 3M ATD Part No. 8011 or equivalent
Fender panel Splash shield Waterproof film	3M ATD Part No. 8625 or equivalent
Windshield glass Rear window glass	3M Super Fast Urethan Auto Glass Sealant Part No. 8609 or equivalent
	3M Super Fast Urethan Primer Part No. 8608 or equivalent
Sunroof glass weatherstrip	3M ATD Part No. 8513 or equivalent
	3M ATD Part No. 8509 or equivalent
Rail end cover	3M ATD Part No. 8531, 8646 or equivalent

SPECIAL TOOLS

42100060048

Tool	Tool number and name	Supersession	Application
	MB990449 Window moulding remover	–	Removal of window moulding
	MB990900-01 Door adjusting wrench	–	Adjustment of door fit
	MB991502 Scan Tool (MUT-II)	MB991496-0D	Cryptographic code registering
	ROM Pack	–	

TROUBLESHOOTING

42100070041

HOOD, GLASS, DOORS AND SUNROOF**Hood**

Trouble Symptom	Probable Cause	Remedy
Incorrect closure	Striker and latch not properly aligned	Adjust the alignment.
Difficult locking and unlocking	Striker and latch not properly aligned	Adjust the alignment.
Uneven body clearance	Incorrectly installed hood or trunk lid	Adjust the installation of the hood or the trunk lid.
Uneven height	Incorrect hood bumper height	Adjust the hood bumper height.

Window glass

Trouble Symptom	Probable Cause	Remedy
Water leak through windshield	Malfunction of seal	Apply sealant.
	Incorrect body flange	Correct
Water leak through door window glass	Incorrect window glass installation	Adjust the position.
	Gap at upper window glass	Adjust the position.
Water leak through quarter window	Malfunction of seal	Apply sealant.
	Incorrect body flange	Correct
Water leak through rear window	Malfunction of seal	Apply sealant.
	Incorrect body flange	Correct

Front/rear/back doors

Trouble Symptom	Probable Cause	Remedy
Malfunction of door window	Incorrect window glass installation	Adjust the position.
	Damaged or defective regulator	Correct or replace
Water leak through door edge	Cracked or defective weatherstrip	Replace
Water leak from door center	Clogged drain hole	Remove the foreign material.
	Damaged waterproof film or poor film contact	Correct or replace
Door is hard to open	Incorrect latch or striker adjustment	Adjust
Door does not open or close completely	Incorrect door installation	Adjust the position.
	Malfunction of door check strap	Correct or replace
	Door check strap and hinge requires grease	Apply grease
Uneven body clearance	Incorrect door installation	Adjust the position.
Wind noise around door	Weatherstrip not holding firmly	Adjust the fit of the door.
	Incorrectly installed weatherstrip	Repair or replace
	Incorrectly closed door	Adjust
	Incorrect door fit adjustment	Adjust
	Incorrect clearance between door glass and door weatherstrip holder	Adjust
Deformed door	Repair or replace	

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Sunroof

Trouble Symptom	Probable Cause	Remedy
Water leaks	Dust accumulated in drainage of housing assembly	Keep dust out of the inside of the drain hose
	Clogged drain hose	Blow air into the drain hose to remove the dust.
	Broken or dislocated drain hose, or failed or cracked clip	Check the hose installation and the flange contact.
	Worn roof lid weatherstrip	Replace
	Excessive roof lid-to-body clearance or incorrectly fitted weatherstrip	Adjust
Wind noise	Loose or deformed deflector	Re-tighten or replace
Roof lid makes noise when moved	Foreign material lodged in guide rail	Check the drive cable and guide rails for foreign material.
	Loose guide rails and lid	Re-tighten
Motor runs but lid does not move or moves only halfway	Foreign material lodged in guide rail	Check the drive cable and guide rails for foreign material.
	Incorrect engagement of motor pinion with drive cable	Check for loose motor installation or a damaged pinion.
	Decrease in clutch slipping force of motor	Adjust or replace
	Increased lid sliding resistance or interference of lid with drive cables, weatherstrip, etc. due to incorrect adjustment of lid	Adjust or replace
Noise in motor (clutch slipping noise made in motor when lid is fully opened or closed is not unusual noise.)	Incorrect engagement of motor pinion with drive cable	Check the pinion installation and re-tighten the motor.
	Worn or damaged motor pinion bearing	Replace the motor assembly.
	Worn or deformed drive cable	Replace

TROUBLESHOOTING HINTS**<Power window>**

1. All door windows cannot be opened or closed.
 - Check fusible link No. 10.
 - Check the power-window relay.
2. One of the door windows cannot be opened or closed.
 - (1) Neither of the power-window switches (main or sub) operates.
 - Check the power-window main switch.
 - Check the power-window motor for the power window that does not operate.
 - (2) Either the power-window main switch or sub-switch does not operate.
 - Check the power-window main switch for the power window that does not operate.
3. The one-touch switch function only does not operate.
 - Replace the power-window main switch.

<Central door locking system>**Vehicles without keyless entry system**

1. Every door lock actuator does not operate.
 - Check fusible link No. 4.
 - Check multi-purpose fuses No. 19 and No. 6.
 - Check the door lock switch.
 - Check the door lock relay.
2. One of the door lock actuators fails to operate.
 - Check the actuator which fails to operate.

Vehicles with keyless entry system

1. The indicator will not light when the transmitter switch of the transmitter is pushed.

- Check or replace the battery.
 - Replace the transmitter.
2. Though the transmitter is transmitting waves (the indicator is lit) the system does not operate.
 - Check the way the code is registered.*
 - Check the keyless entry control unit terminal for voltage.
 - Check to see if the coaxial and ground cables of the antenna are connected.
 3. Only either of the door or the backdoor can lock or unlock.
 - Check the door lock relay.
 - Check the door lock control unit.
 - Check the voltage of the keyless entry control unit terminal.
 4. All the doors and the backdoor can be locked or unlocked by the transmitter, but the dome light does not flicker nor light. (The interlocking lighting of the dome light according to opening and closing of the doors, however, is normal.)
 - Check the voltage of the keyless entry control unit terminal.
 - Check the harness.

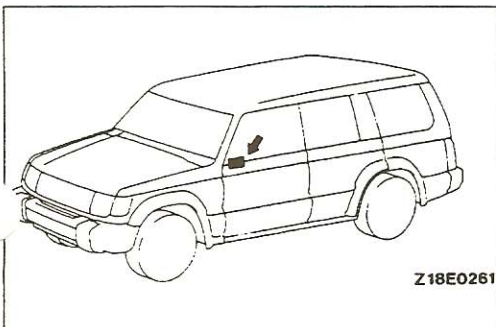
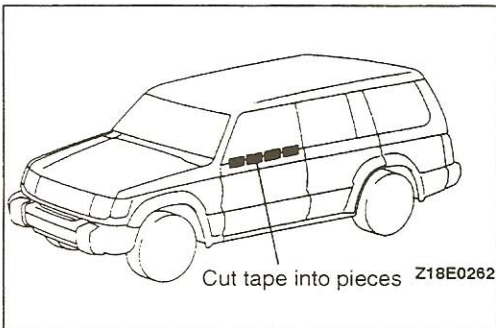
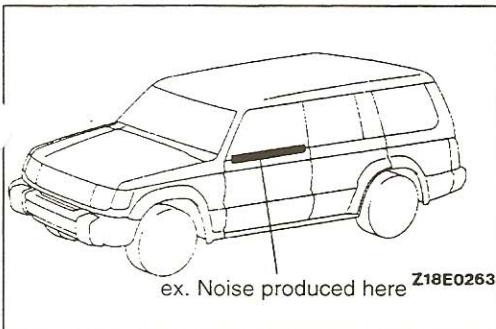
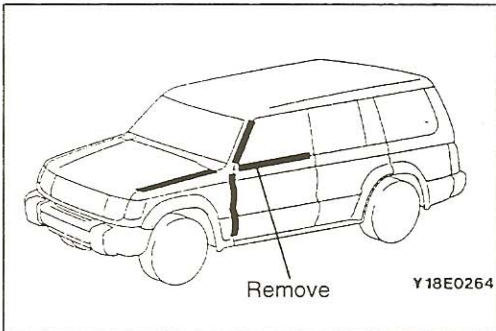
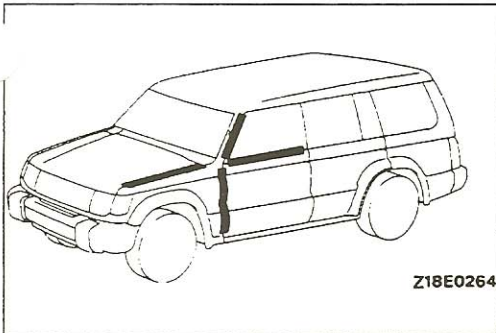
NOTE

*: Carry it out when the transmitter or the keyless entry control unit has been replaced, or a defect in memory of code has occurred.

<Sunroof>

Sunroof does not operate.

- Check dedicated fuse No. 9
- Check sunroof switch
- Check sunroof motor
- Check control unit



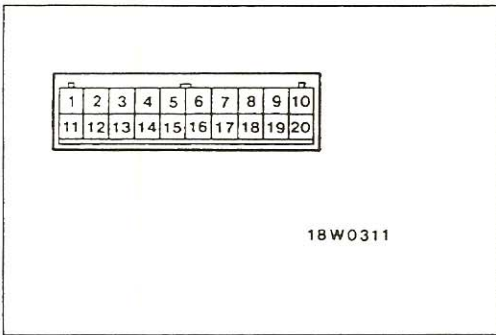
HOW TO LOCATE WIND NOISE

42100420013

- (1) Attach cloth tape to a place which might conceivably be the source of wind noise, such as panel seams, projections, moulding seams, glass and body seams, etc.
- (2) Then carry out a road test in order to determine that the places not covered by tape are not sources of wind noise.
- (3) Remove the strips of tape one by one, carrying out a road test after each is removed, until the wind noise source is found.
- (4) If such a place is found, cover it again and continue with the procedure to determine if there are any other noise sources.
- (5) If no others are found, the last remaining tape is the only source.
- (6) Cut the remaining piece of tape into smaller pieces, attach it again as it was before, and then remove the pieces one by one in the same way so as to narrow down the source.
- (7) Check that wind noise occurs when the last remaining tape is removed, and that noise does not occur when it is re-attached.
- (8) When the source(s) of the wind noise is finally located, attach butyl tape, body sealer or similar material to obstruct this source as much as possible.

KEYLESS ENTRY CONTROL UNIT INSPECTION

42100

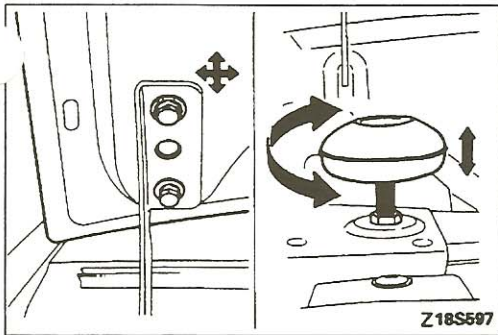


- (1) Remove the combination meter.
(Refer to GROUP 54 – Combination Meter.)
- (2) Disconnect the amplifier and inspect the connector on the wire harness side as shown in the chart below.

Terminal No.	Signal	Conditions		Terminal voltage
2	Door switch	Dome light switch: Door	Door open (Door switch: ON)	0V
			Door shut (Door switch: OFF)	12V
6	Door-lock actuator (Driver side)	LOCK		5V (Pulse output*)
		UNLOCK		0V
8	Key reminder switch	ON (Key removed)		0V
		OFF (Key installed)		5V (Pulse output*)
9	Keyless entry control unit power source	Ignition switch (ACC)		Battery positiv. voltage
10	Keyless entry control unit power source	Always		Battery positive voltage
11	Dome light	All doors closed (Door switch: OFF)	Dome light switch: OFF or ON	0V
			Dome light switch: Door	Battery positive voltage
12	Door lock control unit and door lock relay	LOCK		0V
		UNLOCK		Battery positive voltage
13	Door lock control unit	LOCK		Battery positive voltage
		UNLOCK		0V
14	Door lock relay	LOCK		Battery positive voltage
		UNLOCK		0V
20	Ground	-		0V

NOTE

*: Use an oscilloscope. When using the tester, 0–0.03V is indicated repeatedly.

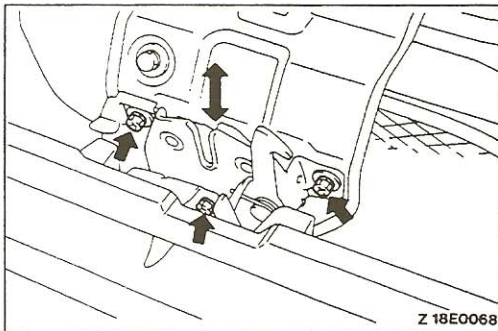


ON-VEHICLE SERVICE

42100090016

HOOD ADJUSTMENT

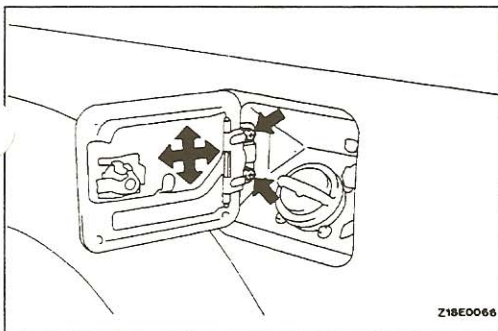
1. Loosen the hood mounting bolts, and then adjust the hood by moving it so that the clearance is equal on all sides.
2. Turn the hood bumpers and adjust the height of the hood.
3. Loosen the hood latch mounting bolts, and move the hood latch to adjust the attachment between the hood latch and hood striker.



FUEL FILLER DOOR ADJUSTMENT

42100110019

Loosen the fuel filler door mounting screw and adjust the fuel filler door so that the clearance around the fuel filler door is even without any height differences.



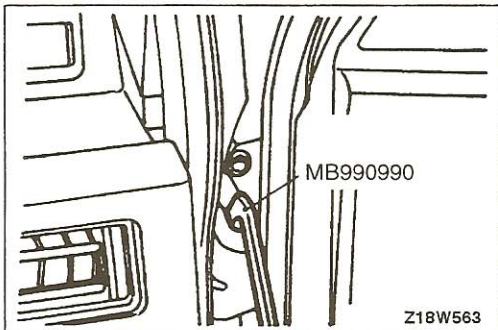
FRONT AND REAR DOOR ADJUSTMENT

42300110015

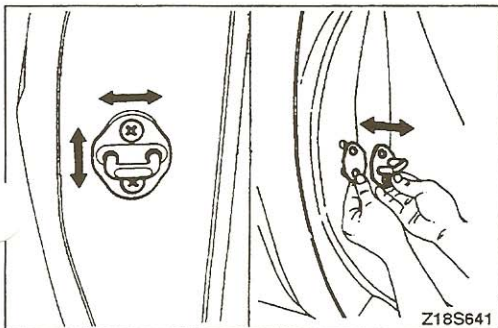
1. Use the special tool to loosen the hinge mounting bolts on the body side, and then adjust the clearance around the door so that it is uniform on all sides.

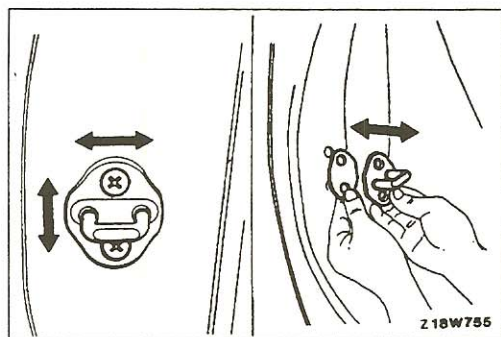
Caution

Attach protection tape to the fender edges where the hinge is installed.



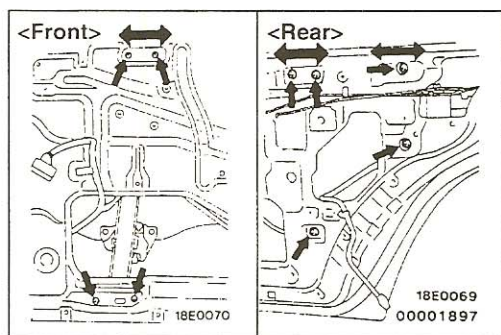
2. When replacing the door, loosen the hinge mounting bolts on the door side and adjust the alignment of the fender panel with the front door panel.
3. Loosen the door striker mounting screws to adjust the alignment of the door panel.
4. Increase or decrease the number of shims and move the striker to adjust the engagement of the striker with the door latch.



**BACK DOOR ADJUSTMENT**

42300170013

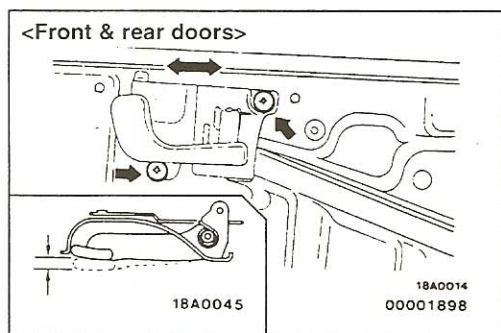
1. Adjust the fit of the door panel to the body by loose the striker mounting screws and moving the striker.
2. Adjust the linking of the striker and the door latch by increasing or decreasing the thickness of the striker shim.

**DOOR WINDOW GLASS ADJUSTMENT**

42300100258

Check that the door window glass runs smoothly in the door glass channel when the glass is fully raised and lowered. If it does not, adjust by the following procedure.

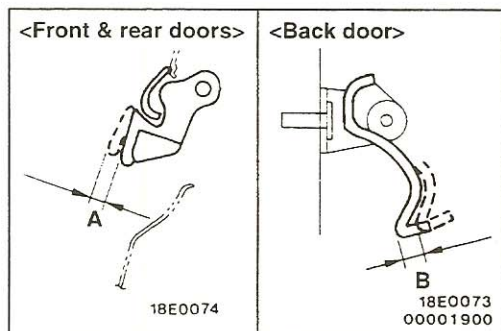
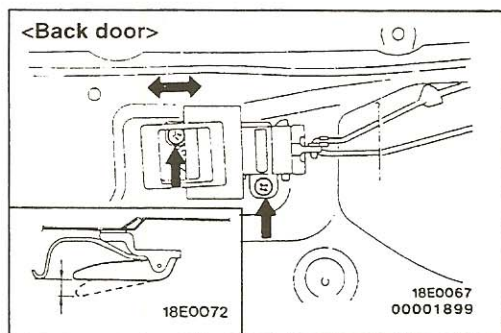
1. Remove the door trim and waterproof film. (Refer to P.42-30, 31.)
2. Loosen the window regulator assembly mounting bolts and move the upper attachment back and forward to adjust the tilt of the glass.
3. Loosen the rear door center sash mounting bolt, and adjust the front-to-back position of the glass.

**DOOR INSIDE HANDLE PLAY ADJUSTMENT**

42300150239

1. Remove the door trim and waterproof film. (Refer to P.42-30, 31.)
2. Move the door inside handle installation position back and forth to adjust so that the inside handle play allowance is at the standard value.

Standard value: 4–10 mm (.16–.39 in.)

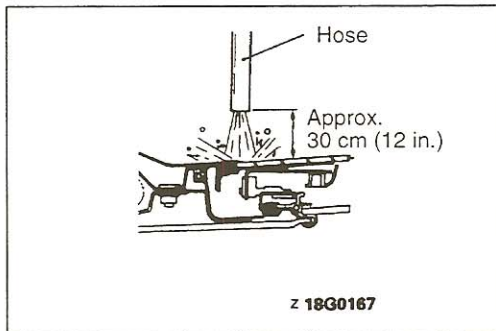
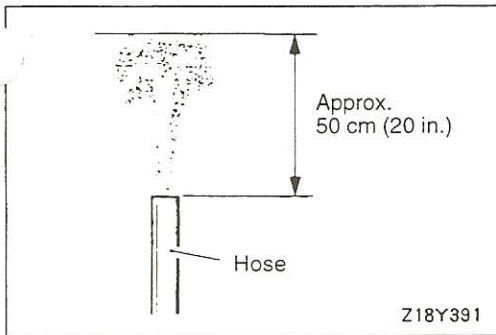
**DOOR OUTSIDE HANDLE PLAY CHECK**

42300160041

If the door outside handle play is not at the standard value, check the door outside handle or door latch assembly, and replace if necessary.

Standard value

- (A): 3–12 mm (.12–.47 in.)
 (B): 2–8 mm (.08–.31 in.)

**WATER TEST**

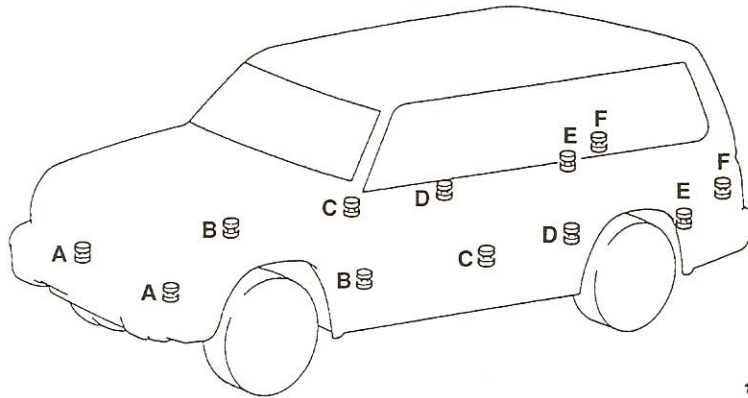
42600090042

1. Fully close the sunroof.
2. Hold the hose upward and adjust the fountain of water to approximately 50 cm (20 in.) high.
3. Pour water over the roof from approximately 30 cm (12 in.) above the roof for more than 5 minutes.
4. While pouring water, check for leaks around the sunroof.
5. In the event of leakage, check the drain hose, weatherstrip contact, etc.

BODY MOUNTING

42100370011

REMOVAL AND INSTALLATION



18E0077
00004077

A	B, C	D, E	F
<p>24 Nm 47 Nm 17 ft.lbs. 35 ft.lbs.</p>	<p>47 Nm 35 ft.lbs.</p>	<p>47 Nm 35 ft.lbs.</p>	<p>18E0259</p> <p>47 Nm 35 ft.lbs. 18E0258</p>

- 1. Special bolt
- 2. Mounting bolt
- 3. Plain washer
- 4. Body mounting rubber
- 5. Body mounting rubber A
- 6. Spacer

- 7. Body mounting rubber B
- 8. Plate
- 9. Washer
- 10. Body mount stopper
- 11. Self locking nut

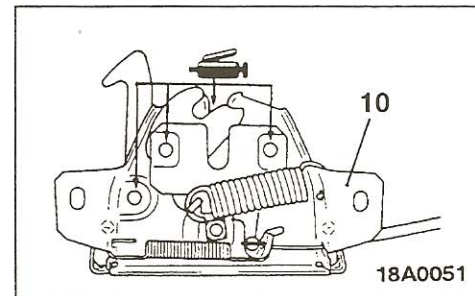
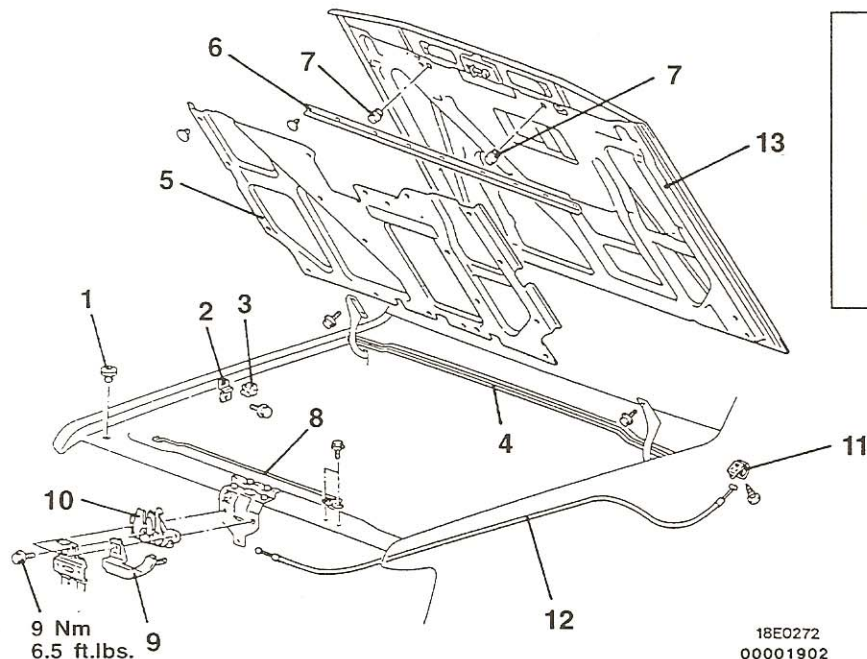
TSB Revision

HOOD

REMOVAL AND INSTALLATION

Hood Post-installation Operation

- Hood Adjustment (Refer to P.42-11.)



18E0272
00001902

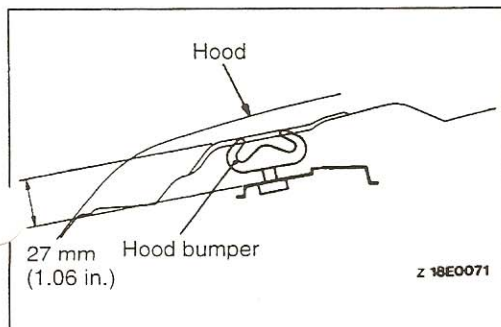
- ▶A◀
1. Hood bumper
 2. Hood bumper bracket
 3. Damper
 4. Hood rear weatherstrip
 5. Hood heat protector
 6. Hood front weatherstrip
 7. Bumper
 8. Hood support rod

Hood latch and hood lock release cable removal steps

- Radiator grille
- 9. Hood cable protector
- 10. Hood latch
- 11. Hood lock release handle
- 12. Hood lock release cable

Hood removal steps

- Washer tube (Refer to GROUP 51 – Windshield Wiper and Washer.)
- 13. Hood



INSTALLATION SERVICE POINT

▶A◀ **HOOD BUMPER INSTALLATION**

Install the hood bumper as shown in the illustration.

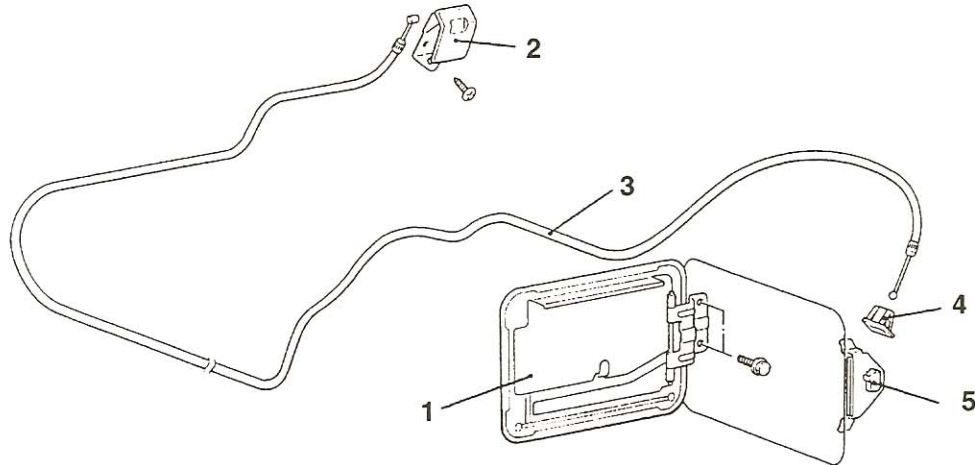
FUEL FILLER DOOR

42100250002

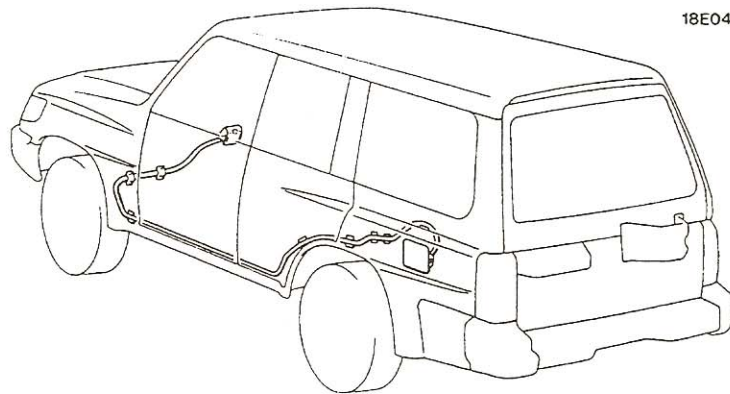
REMOVAL AND INSTALLATION

Fuel Filler Door Post-installation Operation

- Fuel Filler Door Adjustment (Refer to P.42-11.)



18E0486

18E0482
00007118

1. Fuel filler door

Fuel filler door lock release cable removal steps

- Center pillar trim (LH)
(Refer to GROUP 52A – Trims.)
 - Front scuff plate (LH)
(Refer to GROUP 52A – Trims.)
 - Rear scuff plate (LH)
(Refer to GROUP 52A – Trims.)
 - Quarter trim (LH)
(Refer to GROUP 52A – Trims.)
2. Fuel filler door lock release handle
 3. Fuel filler door lock release cable
 4. Cable holder

Fuel filler door hook removal steps

3. Fuel filler door lock release cable connection
5. Fuel filler door hook

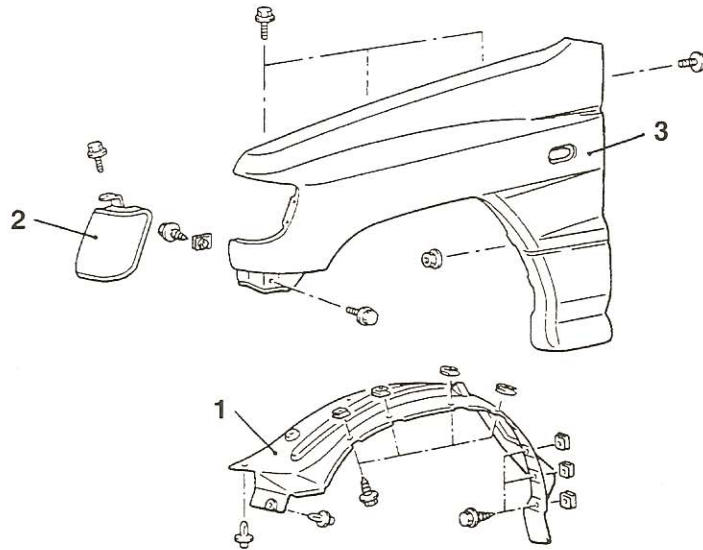
TSB Revision

FENDER

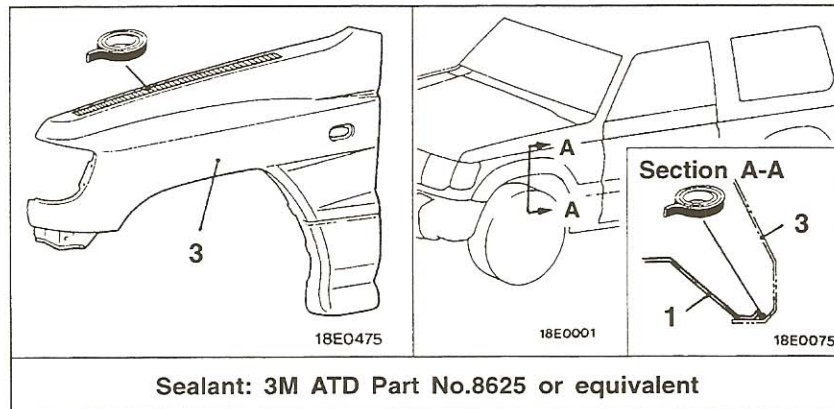
REMOVAL AND INSTALLATION

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

- Front Mud Guard (Refer to GROUP 51 – Side Step.)



18E0474



Sealant: 3M ATD Part No.8625 or equivalent

00007119

Removal steps

1. Splash shield
2. Front turn signal light
 - Front bumper
(Refer to GROUP 51 – Front Bumper.)
3. Front fender panel

TSB Revision

WINDOW GLASS

42200010046

GENERAL

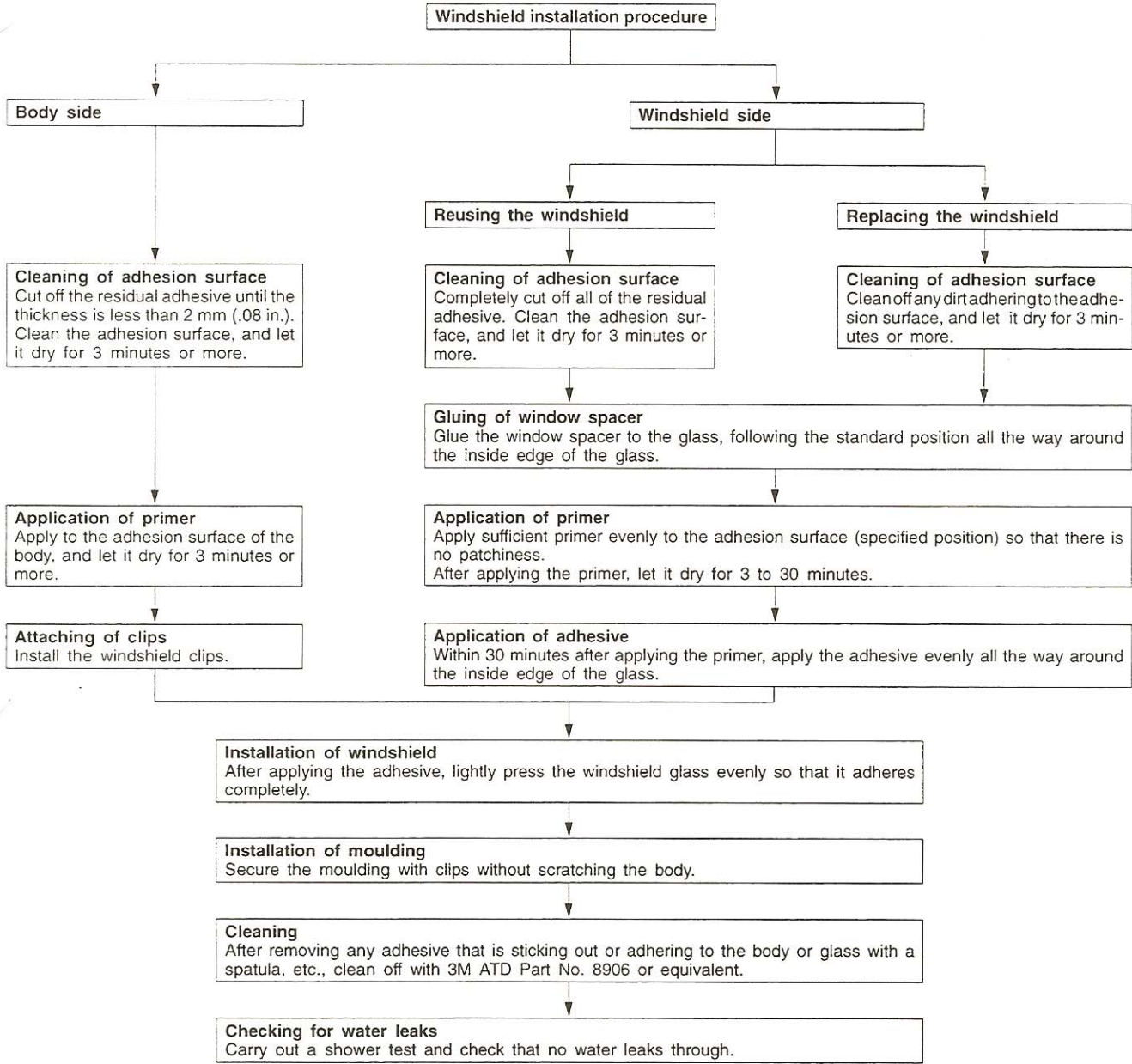
For bonding of the windshield and rear window glass, a single-liquid urethane adhesive is used.

ADHESIVE AND RESERVE ITEMS

Adhesive and Reserve Items		Applications	Quantity
Adhesive	3M SUPER FAST URETHAN 8609	–	One cartridge
	3M SUPER FAST URETHAN PRIMER 8608	–	As required
Reserve Items	Wire (dia.×length)	for cutting adhesive	Five pieces of wire 0.6 mm×1 m (.02 in.×3.3 ft.)
	Adhesive gun	for adhesive application	One
	3M ATD Part No. 8906	for cleaning jointing surfaces	As required
	Wiping rags	–	As required
	Sealer	for prevention of water leaks and gathering after adhesive application	As required
	Glass holder	–	Two
	Windshield moulding (Service Part)	–	One
	Window dam (Service Part)	–	As required

WORKING PROCESS

42200540026



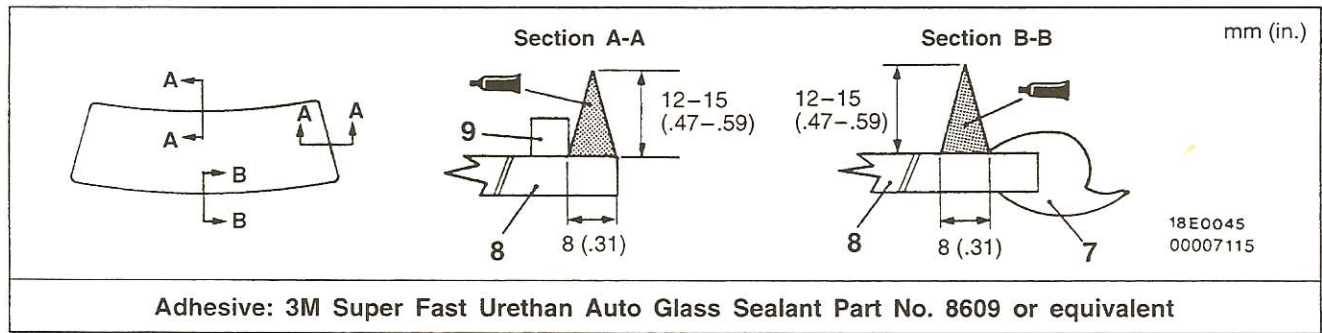
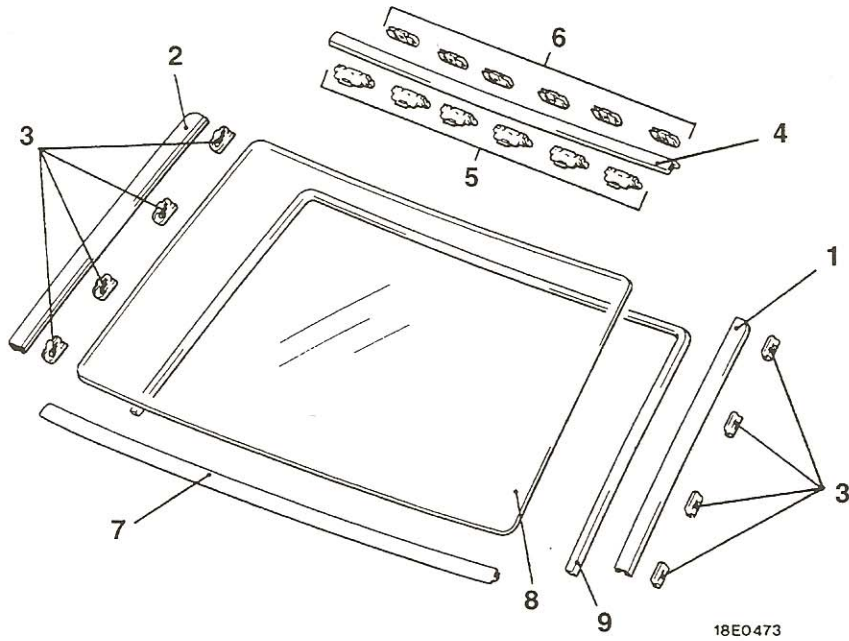
WINDSHIELD

42200100079

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation
Removal and Installation

- Instrument Panel (Refer to GROUP 52A – Instrument Panel.)
- Front Deck Garnish (Refer to GROUP 51 – Garnish and Moulding.)
- Front Pillar Trim (Refer to GROUP 52A – Trims.)



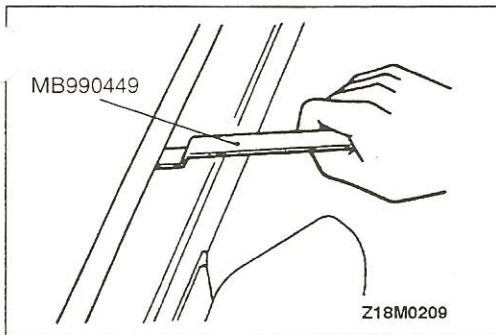
Removal steps



1. Windshield side moulding (LH)
2. Windshield side moulding (RH)
3. Windshield clip
4. Windshield upper moulding



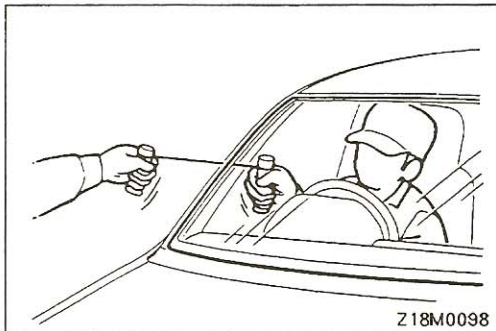
5. Windshield clip (moulding side)
6. Windshield clip (body side)
7. Windshield lower moulding
8. Windshield glass
9. Window spacer

**REMOVAL SERVICE POINTS****◀A▶ WINDSHIELD SIDE MOULDING (L.H.)/WINDSHIELD SIDE MOULDING (R.H.)/WINDSHIELD UPPER MOULDING REMOVAL**

Use the special tool to lever out each moulding.

Caution

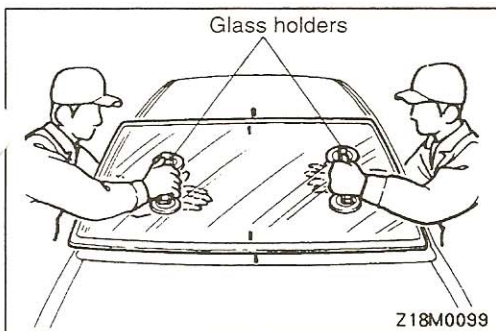
Mouldings that become warped should not be re-used.

**◀B▶ WINDSHIELD GLASS REMOVAL**

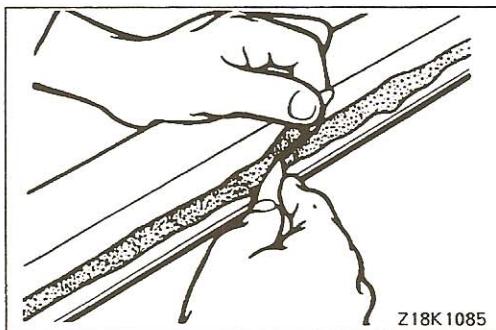
- (1) To protect the body (paint surface), apply cloth tape to all body areas around the installed windshield glass.
- (2) Use a sharp-pointed drill to make a hole in the windshield glass adhesive.
- (3) Pass wire from the inside of the vehicle through the hole.
- (4) Pull the wire alternately from the inside and outside along the windshield glass to cut the adhesive.

Caution

Do not let the wire touch the edge of the windshield glass.



- (5) Make mating marks on the windshield glass and body.
- (6) Use the glass holders to remove the windshield glass.



- (7) Use a knife to cut away the remaining adhesive so that the thickness is within 2 mm (.08 in.) around the entire circumference of the body flange.
- (8) Finish the flange surfaces so that they are smooth.

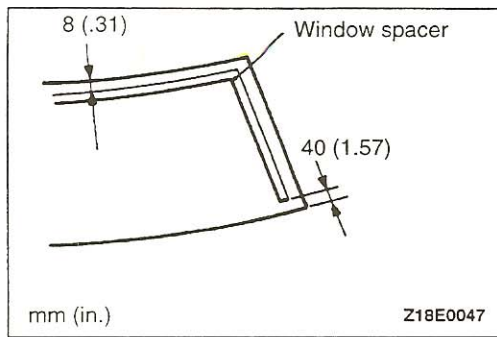
Caution

1. **Be careful not to remove more adhesive than is necessary.**
2. **Be careful also not to damage the paintwork on the body surface with the knife. If the paintwork is damaged, repair the damaged area with repair paint or anti-rust agent.**

- (9) When reusing the glass, remove the adhesive and window spacer chips still adhering to the window glass, and clean with 3M ATD Part No. 8906 or equivalent.
- (10) Clean the body side in the same way.

Caution

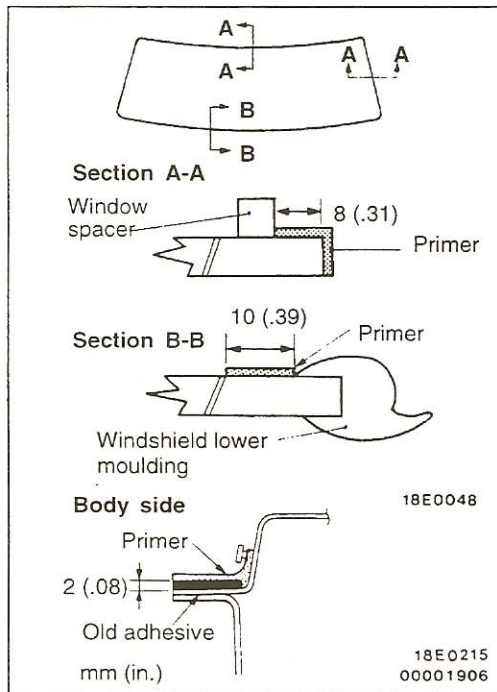
Let the cleaned places stand for 3 minutes or more, and carry out the next procedures after they have dried. Also, do not touch any surface that has been cleaned.



INSTALLATION SERVICE POINTS

►A◄ WINDOW SPACER INSTALLATION

After cleaning the window spacer adhesion surface of the windshield glass with 3M ATD Part No. 8906 or equivalent to remove all grease, etc., attach the window spacer as shown in the illustration.



►B◄ WINDSHIELD GLASS/WINDSHIELD LOWER MOULDING INSTALLATION

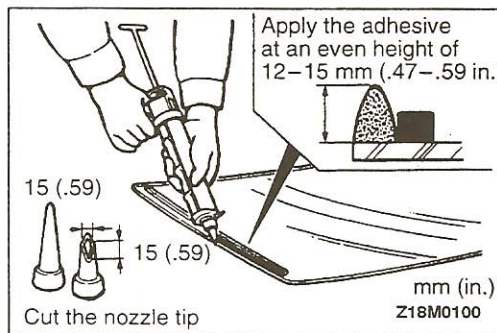
- (1) When replacing the glass, provisionally set the glass against the body, and put mating marks on the glass and body where they match.
- (2) Install the windshield lower moulding onto the windshield glass.
- (3) Soak a sponge in the primer, and apply evenly to the glass and the body in the places shown in the illustration.

Specified primer:

3M Super Fast Urethan Primer Part No. 8608 or equivalent

Caution

1. The primer strengthens the adhesive strength, so be sure to apply it evenly around the entire circumference. Also, a too thick application cause lowering of the adhesive strength.
 2. Do not touch the coated surface.
- (4) After applying the primer, let it dry for 3 to 30 minutes.



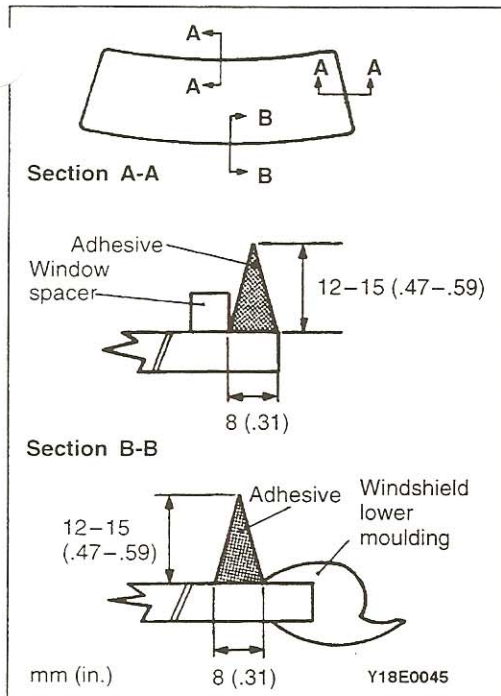
- (5) Within 30 minutes after applying the primer, fill the sealant gun with adhesive and apply the adhesive evenly around the entire circumference of the windshield.

Specified adhesive:

3M Super Fast Urethan Auto Glass Sealant Part No. 8609 or equivalent

NOTE

Cut the nozzle tip of the sealant gun into a V shape to facilitate adhesive application.



- (6) Match up the mating marks on the glass and the body, and lightly press the windshield glass evenly so that it adheres completely.
- (7) After removing any adhesive that is sticking out or adhering to the body or glass with a spatula, etc., clean off with 3M ATD Part No. 8906 or equivalent. After completion of this operation (after installing the glass), place it somewhere where it will not be disturbed, until the adhesive sets.

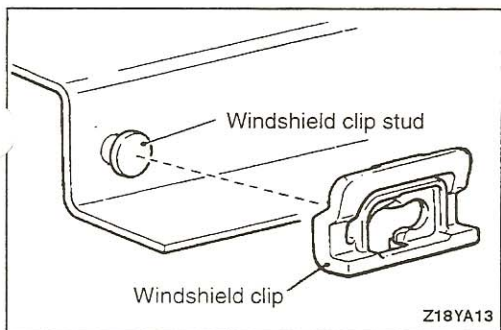
Caution

If heat is applied with an infra-red lamp to shorten the setting time, keep the surface temperature of the adhesive below 100° C.

- (8) After attaching the windshield glass to the body, let it stand for 30 minutes or more, and then test for water leakage.

Caution

1. If moving the vehicle, it should be done gently.
2. When testing for water leakage, do not pinch the end of the hose to spray the water.



WINDSHIELD CLIP STUD REPAIR

42100140018

If the T-studs are broken, use a drill to make holes 3 mm (.12 in.) in diameter in the T-studs, fill the holes with adhesive, and then use screws to mount the window moulding clips.

Caution

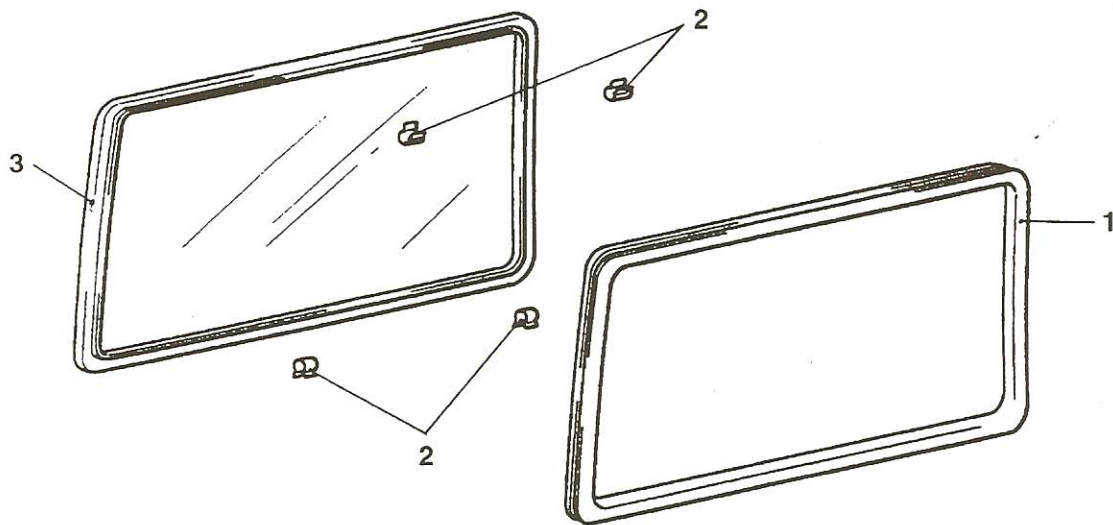
After installing the clips, apply anti-rust solvent to the screw heads to protect them from rust.

QUARTER WINDOW GLASS

42200250141

REMOVAL AND INSTALLATION

<Fixed Type>

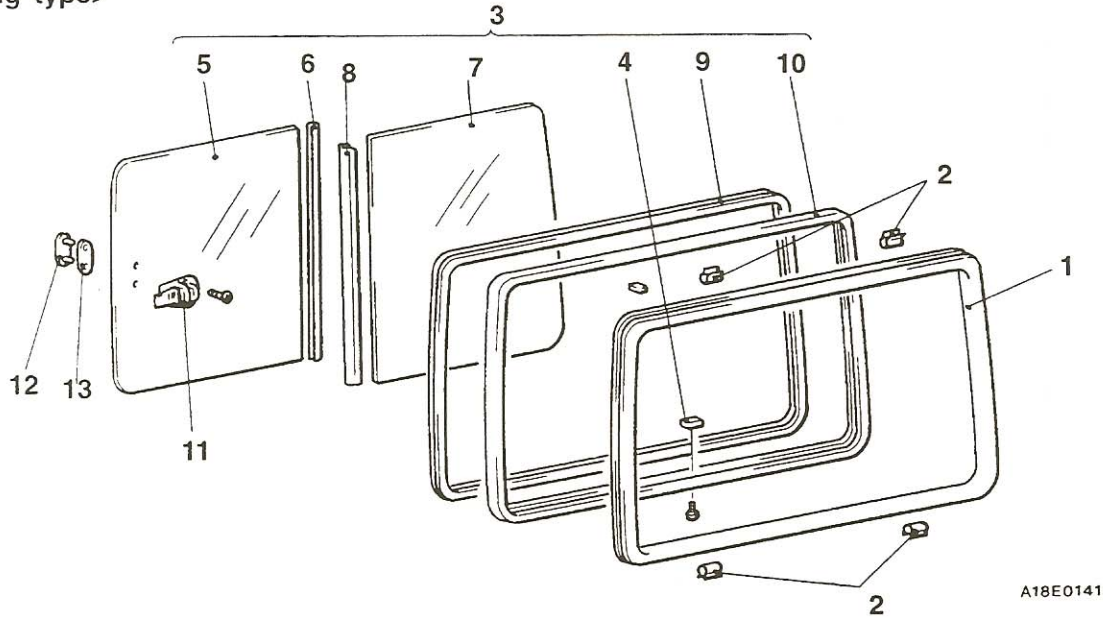


Z18E0140

Quarter window glass removal steps

- Quarter upper trim
(Refer to GROUP 52A – Trims.)
 1. Opening trim
 2. Clip
 3. Quarter window glass assembly

<Sliding type>



Quarter window glass removal steps

- Quarter upper trim
(Refer to GROUP 52A – Trims.)
- 1. Opening trim
- 2. Clip
- 3. Quarter window glass and frame assembly
- 4. Glass stopper
- 5. Quarter window glass (A)
- 6. Edge trim

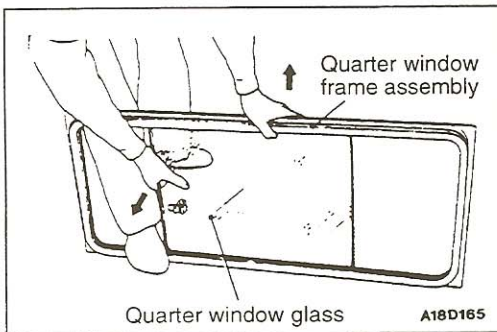
◀A▶

◀A▶

- 7. Quarter window glass (B)
- 8. Seal rubber
- 9. Runchannel
- 10. Quarter window frame assembly

Slide glass lock removal steps

- 11. Slide glass lock
- 12. Connector
- 13. Packing



REMOVAL SERVICE POINT

◀A▶ **QUARTER WINDOW GLASS (A)/QUARTER WINDOW GLASS (B) REMOVAL**

Remove the glass by moving the glass to the center and widening the middle section of the quarter window frame assembly.

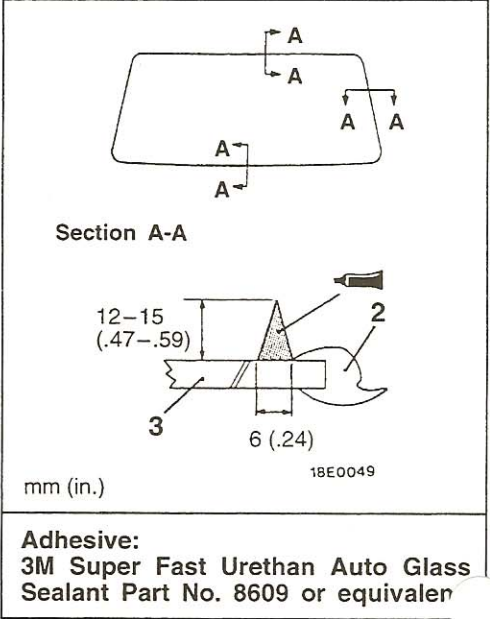
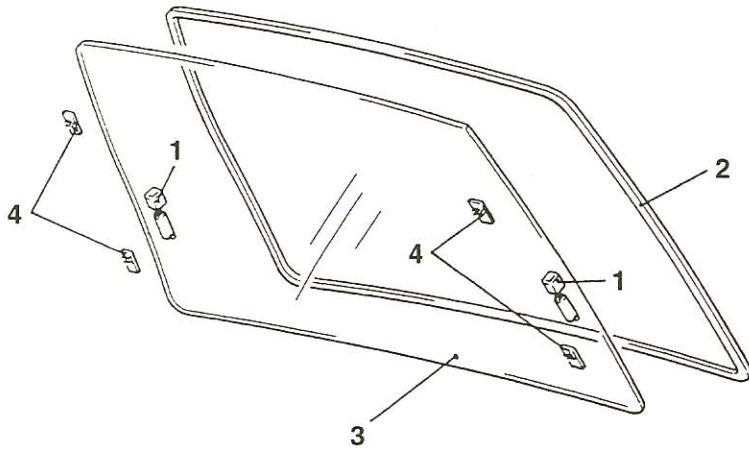
BACK DOOR WINDOW GLASS

42200190047

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation

- Back Door Upper Trim Removal and Installation (Refer to P.42-47.)



00001907

Removal steps

- ▶B◀ 1. Defogger terminal
- ▶B◀ 2. Back door window glass moulding

- ◀A▶ ▶B◀ 3. Back door window glass
- ▶A◀ ▶A◀ 4. Dual lock fastener

REMOVAL SERVICE POINT

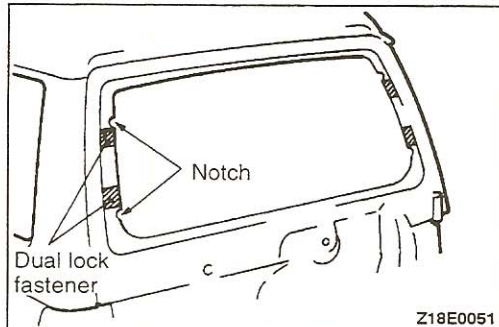
◀A▶ **BACK DOOR WINDOW GLASS REMOVAL**

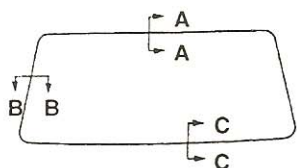
Remove in the same way as for the windshield glass. (Refer to P.42-22.)

INSTALLATION SERVICE POINTS

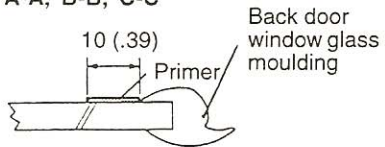
▶A◀ **DUAL LOCK FASTENER INSTALLATION**

Attach the dual lock fasteners so that the fastener ends are aligned with the notches on the body.



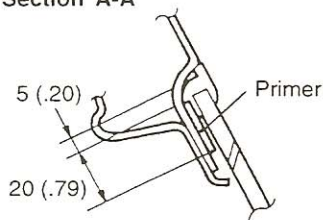


<Application of primer>
Section A-A, B-B, C-C



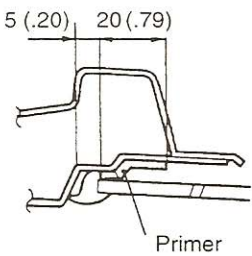
Body side
Section A-A

18E0044



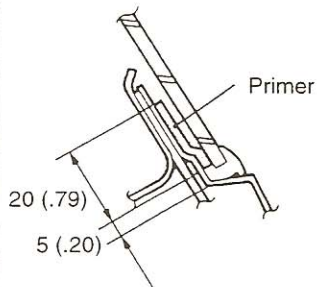
18E0295

Section B-B (Also paint the right side)



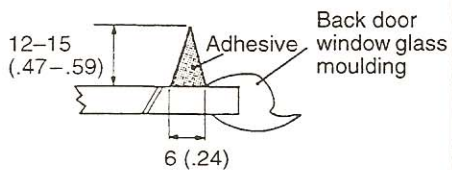
18E0296

Section C-C



18E0294

<Application of adhesive>
Section A-A, B-B, C-C



18E0049

00001908

▶B◀ BACK DOOR WINDOW GLASS/BACK DOOR WINDOW GLASS MOULDING INSTALLATION

Install in the same way as for the windshield glass. (Refer to P.42-23.)

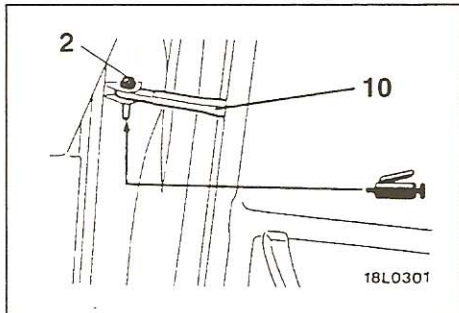
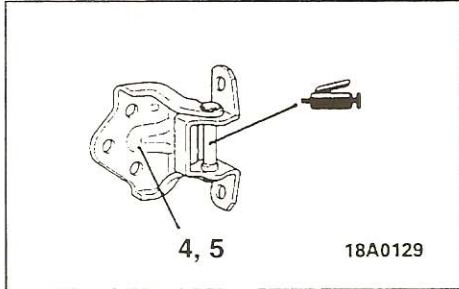
DOOR ASSEMBLY

42300220068

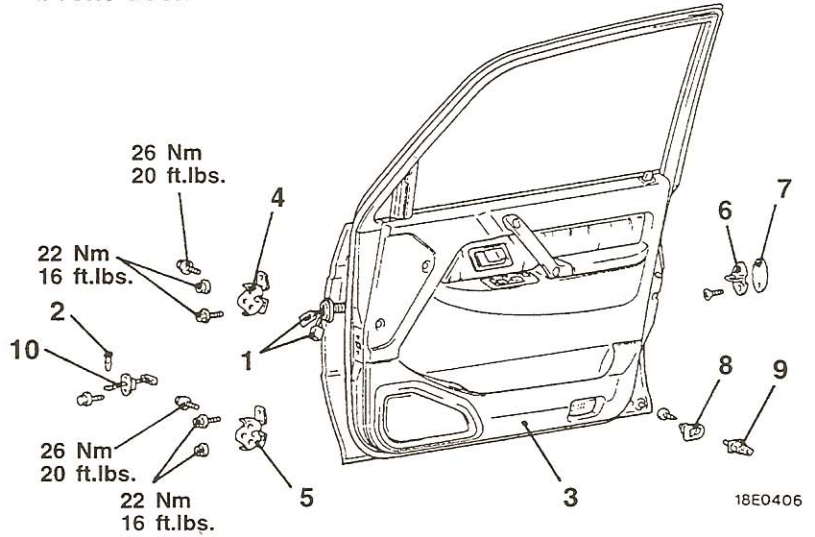
REMOVAL AND INSTALLATION

Door Post-installation Operation

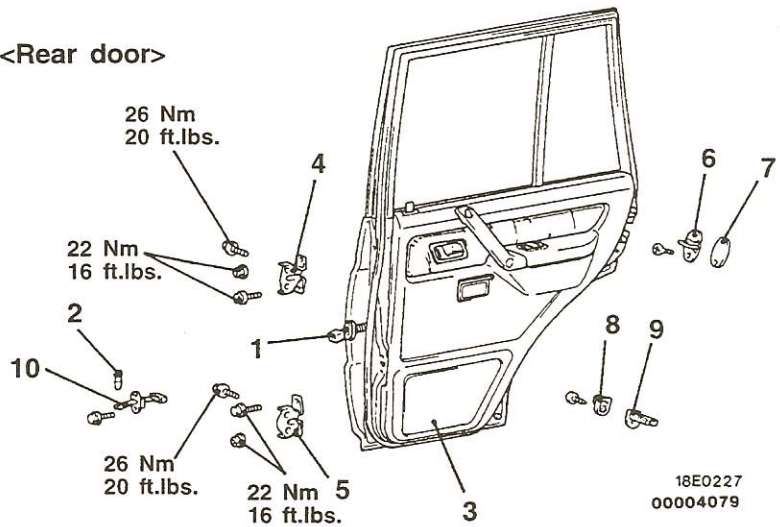
- Door Adjustment (Refer to P.42-11.)



<Front door>



<Rear door>



Door removal steps

1. Door harness connector
2. Spring pin
3. Door assembly
4. Door upper hinge
5. Door lower hinge



Striker removal steps

6. Striker
7. Striker shim

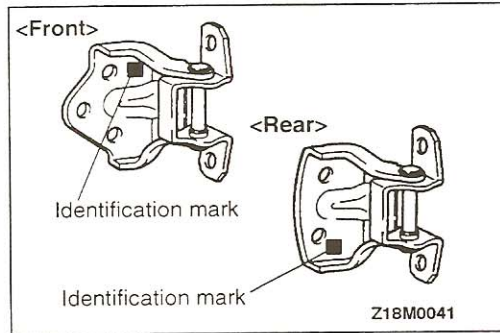
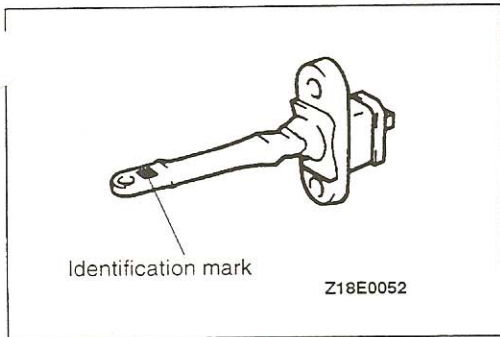
Door switch removal steps

8. Door switch cap
9. Door switch

Door check strap removal steps

- Door trim and waterproof film (Refer to P.42-30, 31.)
- 2. Spring pin
- 10. Door check strap





INSTALLATION SERVICE POINTS

►A◄ DOOR CHECK STRAP INSTALLATION

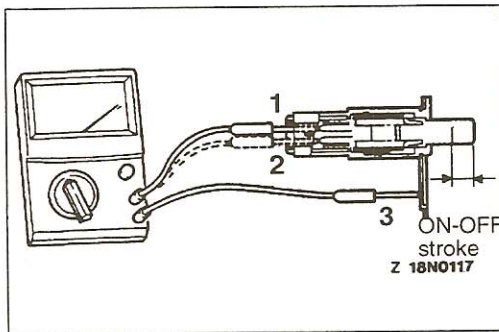
Install the door check so that the identification marks shown below are facing upwards.

Place of application		Identification mark
R.H.	Front door	PR
	Rear door	OR
L.H.	Front door	PL
	Rear door	QL

►B◄ DOOR LOWER HINGE/DOOR UPPER HINGE INSTALLATION

The door hinges depend on their locations, so check the identification marks before installation.

Place of application		Identification mark	
Front door	Upper hinge	F	
	Lower hinge	E	
Rear door	R.H.	Upper hinge	X
		Lower hinge	Z
	L.H.	Upper hinge	W
		Lower hinge	Y



INSPECTION

42300600048

DOOR SWITCH

Operate the switch and check the continuity between the terminals.

<Type 1>

Switch position	Terminal		
	1	2	3
Open (ON)	○	○	○
Depressed (OFF)			

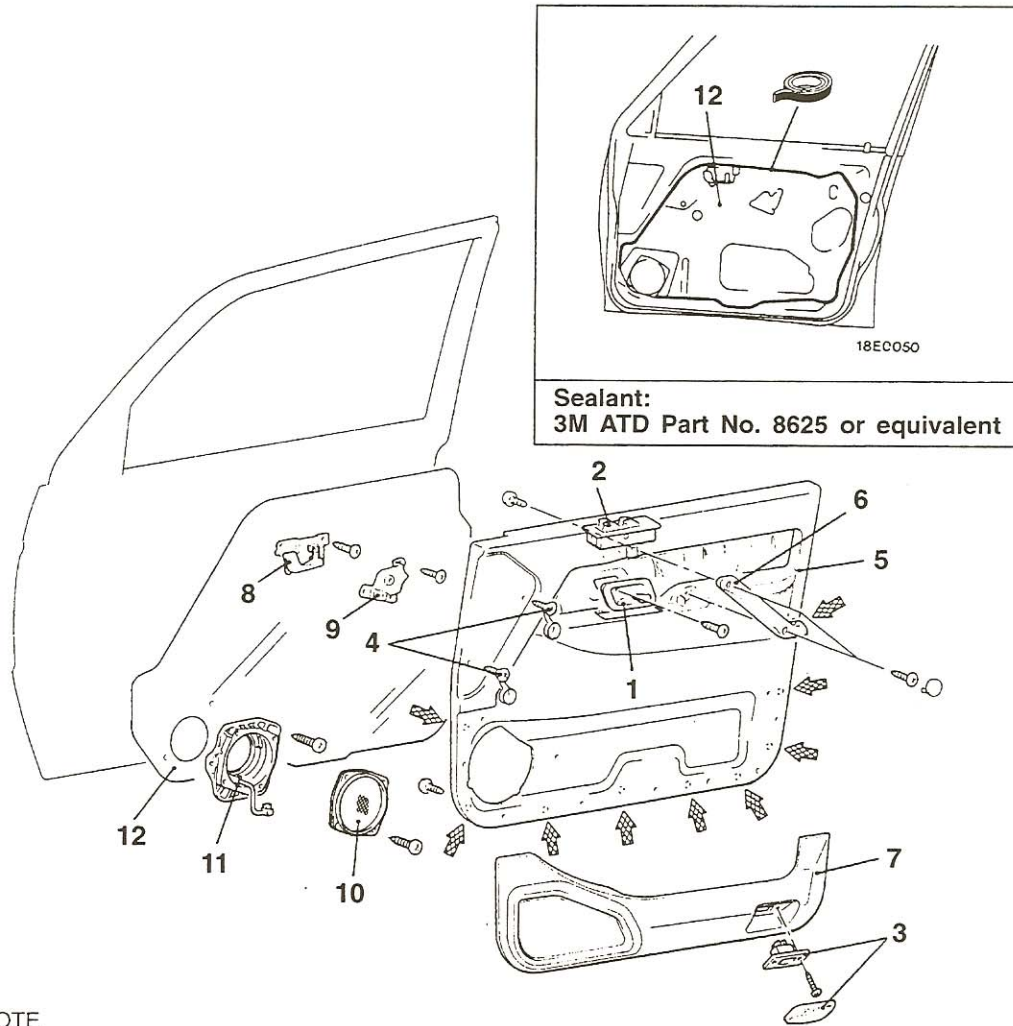
<Type 2>

Switch position	Terminal	
	2	3
Open (ON)	○	○
Depressed (OFF)		

DOOR TRIM AND WATERPROOF FILM

REMOVAL AND INSTALLATION

<Front door>



NOTE

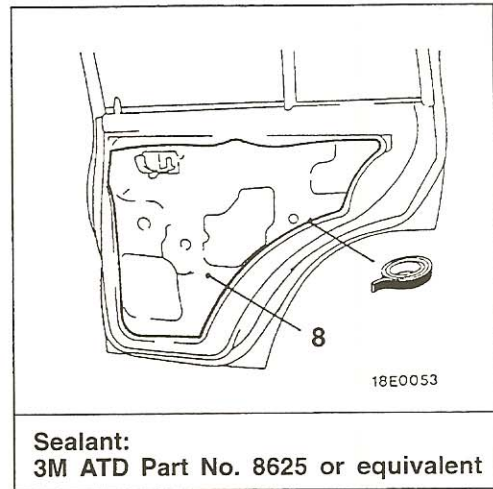
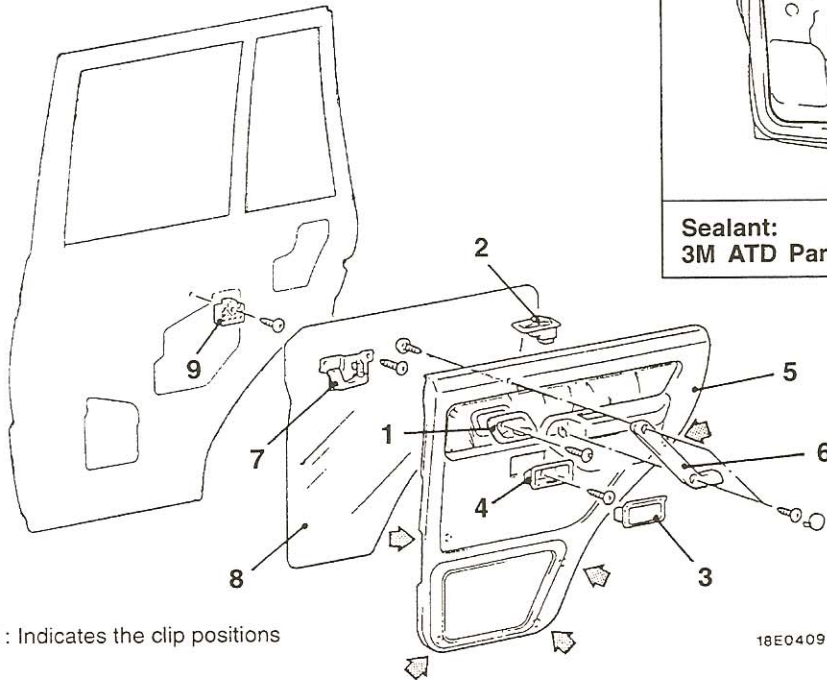
: Indicates the clip positions

18E0481
00007120

Removal steps

- | | | |
|----|---|---|
| ▶◀ | <ol style="list-style-type: none"> 1. Inside handle cover 2. Power window switch 3. Door lamp assembly 4. Screw or clip 5. Door trim 6. Door grip | <ol style="list-style-type: none"> 7. Door pocket 8. Inside handle 9. Armrest bracket 10. Speaker 11. Speaker cover 12. Waterproof film |
|----|---|---|

<Rear door>



Removal steps

- 1. Inside handle cover
- 2. Power window switch
- 3. Ashtray
- 4. Ashtray bracket
- 5. Door trim

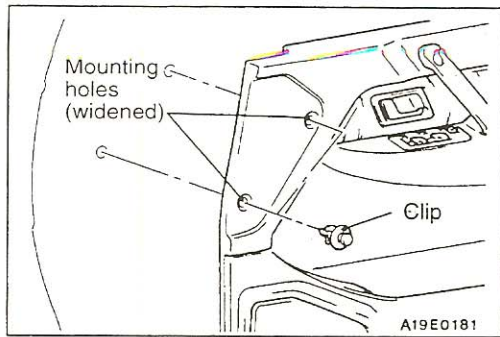
- 6. Door grip
- 7. Inside handle
- 8. Waterproof film
- 9. Screw grommet

INSTALLATION SERVICE POINT

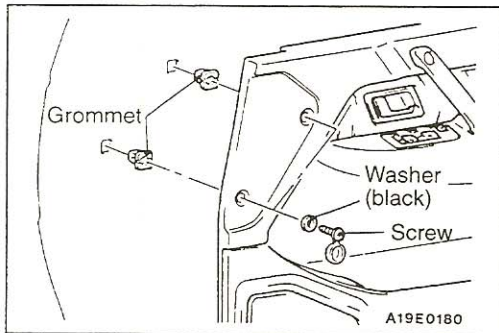
►A◄ SCREW OR CLIP INSTALLATION

Two types of door panel and door trim are available. Identify the type from the table below, and install by the following procedure.

Item	Door panel and door trim type	
	Type A	Type B
Door panel	Round hole 8 mm (.31 in.)	Square hole 10×12 mm (.39×.47 in.)
Door trim	Round hole 11 mm (.43 in.)	Round hole 6 mm (.24 in.)
Securing method	Clip	Cap assembled screw



- When installing the type B door trim to the type A door panel
 - 1) Use a drill or similar tool to widen the mounting hole [6 mm (.24 in.) dia.] in the door trim to 11 mm (.43 in.) in diameter.
 - 2) Secure using clips.



- When installing the type A door trim to the type B door panel
 - 1) Insert grommet into the square mounting holes in the door panel.
 - 2) Tighten using black washers and screws, and then cover the screws with the caps.

DOOR GLASS AND REGULATOR

REMOVAL AND INSTALLATION

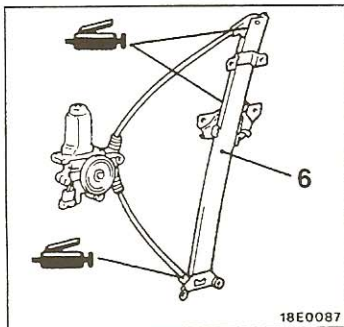
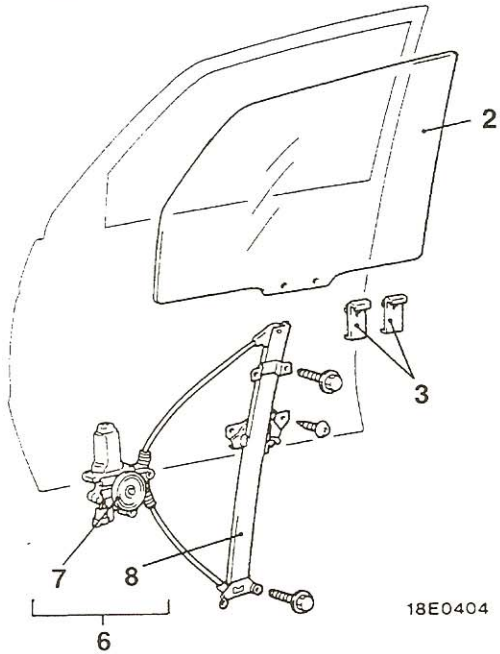
Pre-removal Operation

- Door Trim and Water proof Film Removal (Refer to P.42-30, 31.)

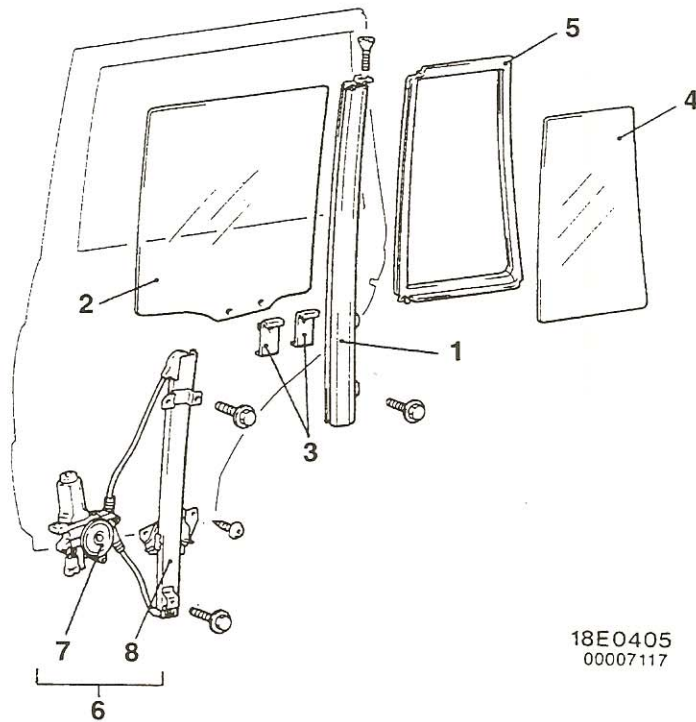
Post-installation Operation

- Door Window Glass Adjustment (Refer to P.42-12.)
- Door Trim and Water proof Film Installation (Refer to P.42-30, 31.)

<Front door>



<Rear door>

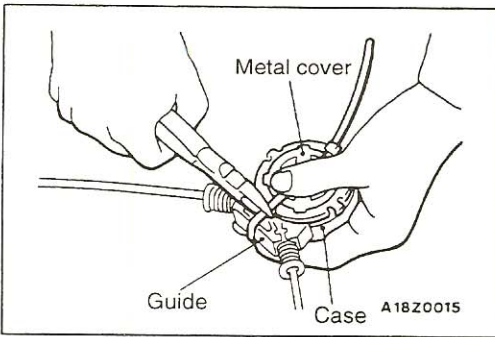


Removal steps

- Rear door belt line moulding (Refer to P.42-45.)
- 1. Rear door center sash
- 2. Door window glass

- 3. Door glass holder
- 4. Stationary window glass
- 5. Stationary window weatherstrip
- 6. Window regulator assembly
- 7. Power window motor
- 8. Window regulator





INSTALLATION SERVICE POINTS

▶A◀ POWER WINDOW MOTOR ASSEMBLY/WINDO REGULATOR ASSEMBLY

POWER WINDOW MOTOR ASSEMBLY AND WINDOW REGULATOR ASSEMBLY INSTALLATION PROCEDURE

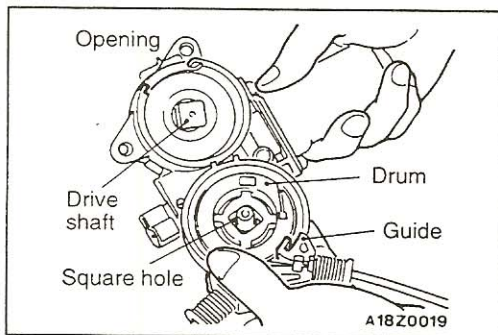
Caution

Be careful when handling the assembly, as the force of the spring may cause the wires to pull out of the drum.

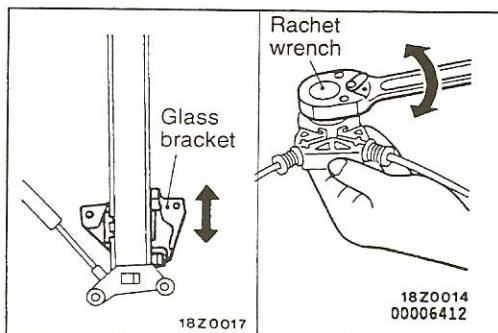
- (1) While pushing the case and the metal cover with your hand, cut the tie-wrap with cutting pliers.
- (2) Remove the metal cover.

NOTE

If the wires pull out of the drum, re-insert them by following the drum and regulator wire installation service points.

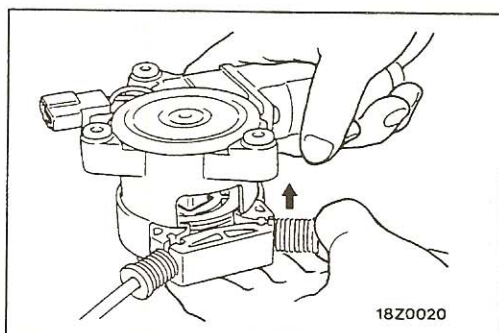


- (3) Align the phases of the power window motor drive shaft and the square hole in the drum while using the guide and the openings in the motor housing as a reference for the installation position.

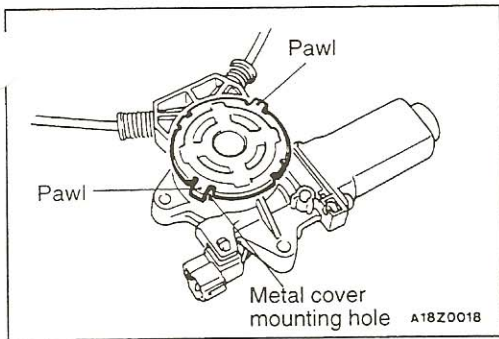


NOTE

- Align the phases by sliding the glass bracket (glass mounting section) or by turning the drum using the handle of a ratchet wrench (with a socket diameter of 12.7 mm [.5 in.]).
- Support the drum and the guide with your hand while turning the drum, otherwise the wires may pull of the drum.



- (4) Align the guide and the opening of the motor housing, and then support the guide and the drum as you slide them into the motor housing.



- (5) After aligning the pawl of the metal cover with the metal cover mounting hole, bend the pawl to attach it securely to the housing.

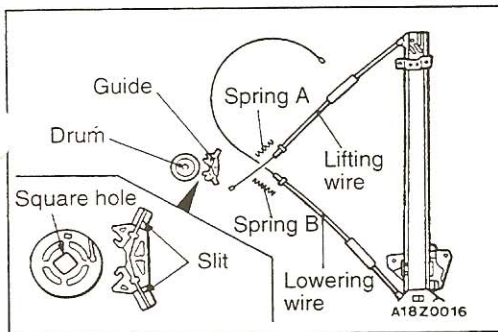
Caution

In order to eliminate any runout in the drum, bend the pawl securely so that there is no play at all in the metal cover. If there is runout in the drum, the glass may not slide up and down smoothly (for example, it may stick while moving down).

NOTE

In the case of the regulator assembly (accessory part), use the new metal cover which is provided as part of the kit. However, if only replacing the motor, re-use the metal cover which was removed.

- (6) Apply system voltage to the power window motor and check that the glass bracket moves smoothly.

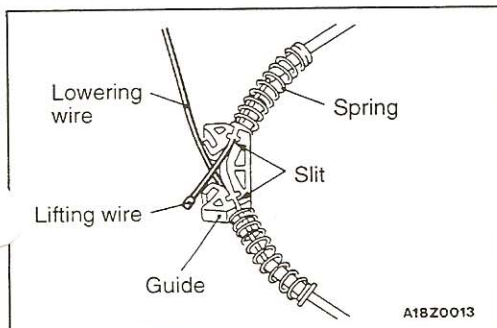


DRUM AND REGULATOR WIRE INSTALLATION PROCEDURE

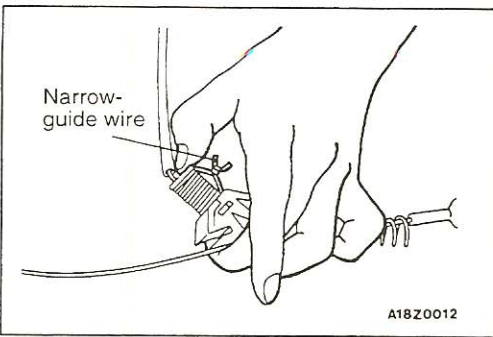
- (1) Place the drum, guide and regulator on a work bench as shown in the illustration.
1. Place the drum so that the square hole is facing upward.
 2. Place the guide so that the slits are facing upward.
 3. Lower the glass bracket of the regulator so that it is in the fully-open position.

NOTE

Some models of vehicle may only have one location where a spring (A or B) is used.



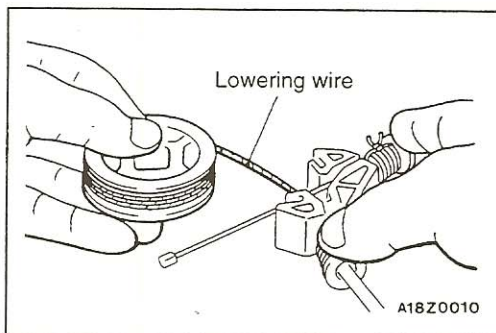
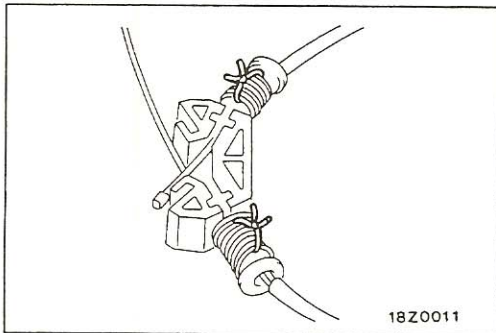
- (2) Pass the springs over the wires, and then install the lowering wire to the guide first, followed by the lifting wire. (The lifting wire should be on top of the lowering wire.)



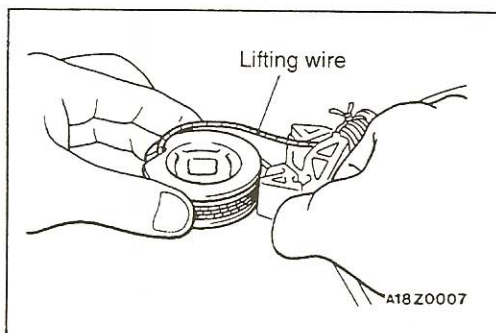
- (3) Use some narrow-gauge wire (approx. 0.5 mm diameter) to compress the springs.

NOTE

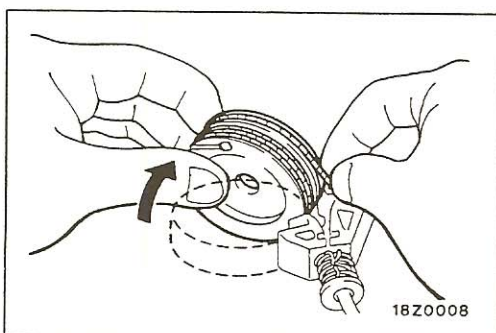
Tie the narrow-gauge wires to the slits in the guide.



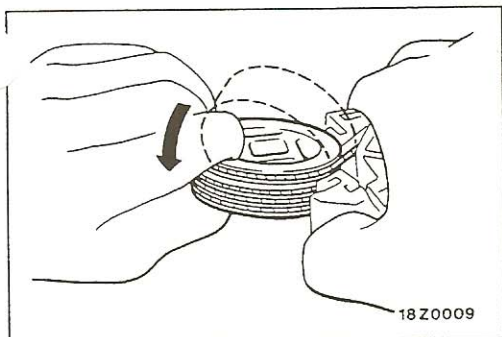
- (4) Insert the end of the lowering wire into the wire hole at the bottom of the drum, and then wrap the wire securely around the groove of the drum from the bottom so that there is no slackness in the wire.



- (5) Wind the lifting wire around the drum.
1. Insert the end of the lifting wire into the wire hole at the top of the drum.



2. Lower the front of the drum until the drum is vertical, and then wrap the lifting wire around the groove of the drum.



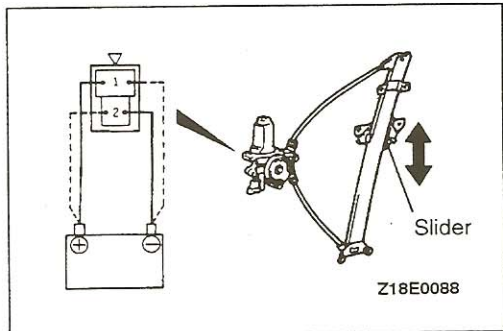
18Z0009

- Return the drum to its original position while holding the wires to make sure that they do not pull out.

NOTE

Install the power window motor to the regulator according to the power window motor and regulator assembly installation procedure below.

- Cut the wire which is compressing the spring in order to release the spring.



Z18E0088

INSPECTION

42900150039

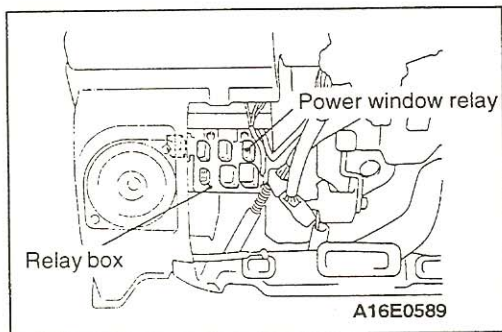
POWER WINDOW MOTOR

- Check that the slider moves smoothly when the battery is directly connected to the motor terminals.
- Check that the slider moves in the opposite direction when the battery is connected with the polarities reversed.

CIRCUIT BREAKER (INCORPORATED IN THE POWER WINDOW MOTOR)

42900170011

- Press the UP switch to fully close the window glass, and continue to press the switch for 10 seconds.
- At the moment that the UP switch is released, press the DOWN switch. The circuit breaker can be considered good if at this time the door window glass begins to open within 60 seconds.

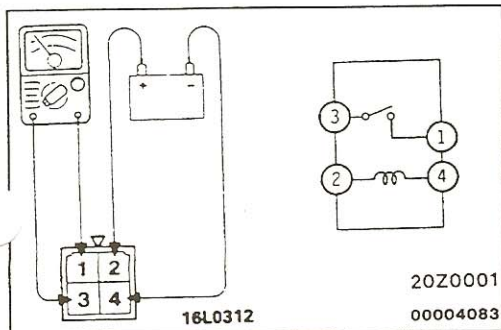


A16E0589

POWER WINDOW RELAY

42900180014

- Remove the power window relay from the relay box.

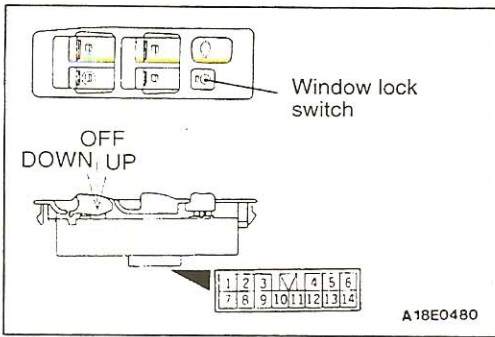


16L0312

20Z0001
00004083

- Check for continuity between the terminals.

When there is no current	Between terminals (2)–(4)	Continuity
	Between terminals (1)–(3)	No continuity
When there is current (between terminals (2)–(4))	Between terminals (1)–(3)	Continuity



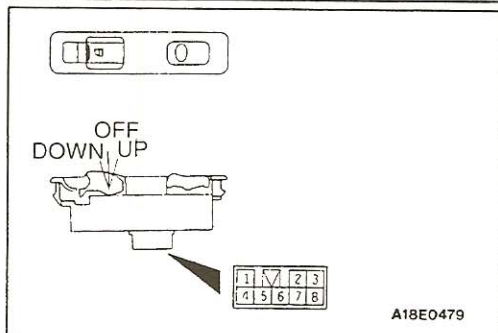
POWER WINDOW SWITCH

42900160100

Operate the switch and check the continuity between terminals.

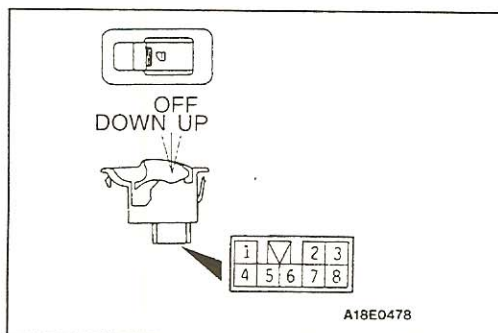
Main Switch

Terminal		Power window switch (normal)			Power window switch (lock)		
		UP	OFF	DOWN	UP	OFF	DOWN
Front (Driver's side)	13	○		○	○		○
	8	○	○	○	○	○	○
	9	○	○	○	○	○	○
	12	○	○	○	○	○	○
Front (Passenger's side)	13	○		○	○		○
	3	○	○	○	○	○	○
	11	○	○	○	○	○	○
	12	○	○	○			
Rear (R.H.)	13	○		○	○		○
	14	○	○	○	○	○	○
	6	○	○	○		○	○
	12	○	○	○			
Rear (L.H.)	13	○		○	○		○
	1	○	○	○	○	○	○
	2	○	○	○		○	○
	12	○	○	○			



Sub-switch <Type 1>

Terminal		Sub-switch		
		UP	OFF	DOWN
Sub-switch	4		○	○
	5	○	○	○
	6	○	○	○
	7	○	○	○
	8	○	○	



Sub-switch <Type 2>

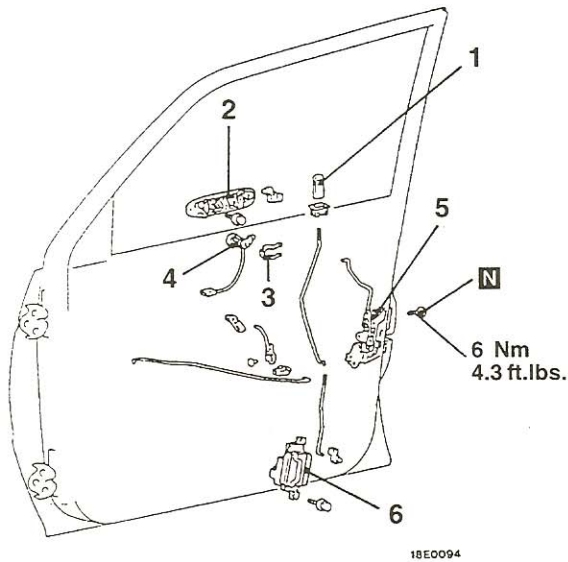
Terminal		Sub-switch		
		UP	OFF	DOWN
Sub-switch	4		○	○
	5	○	○	○
	6	○	○	○
	7	○	○	○
	8	○	○	

42300460264

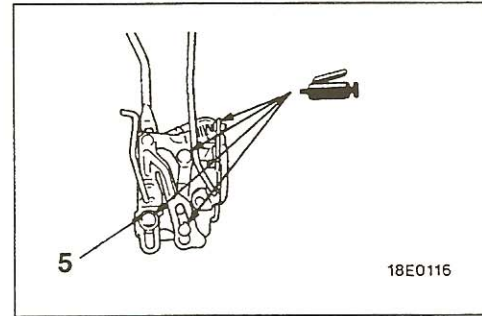
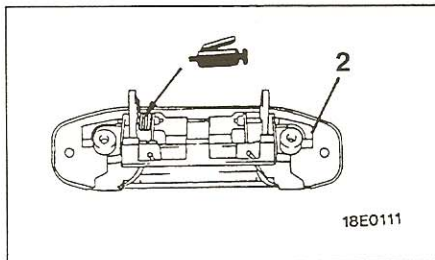
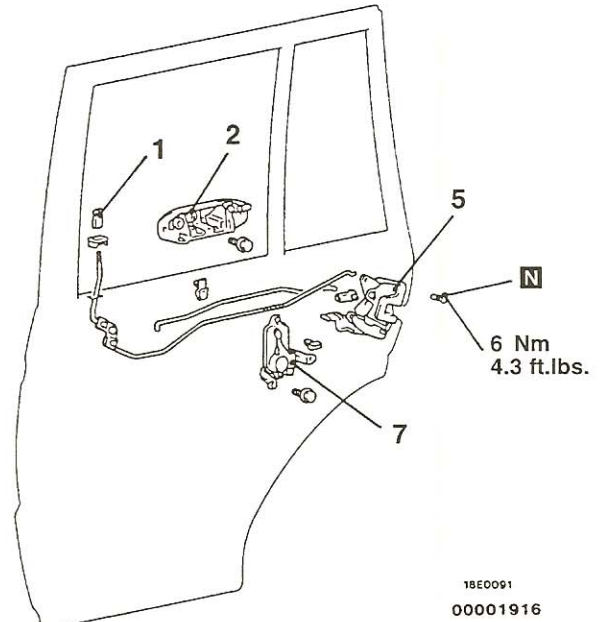
DOOR HANDLE AND LATCH

REMOVAL AND INSTALLATION

<Front door>



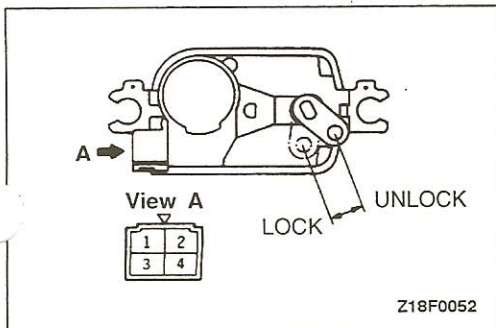
<Rear door>



Removal steps

- Door trim and waterproof film (Refer to P.42-30, 31.)
- Door outside handle play check (Refer to P.42-12.)
- 1. Inside lock knob
- 2. Door outside handle

- 3. Retainer
- 4. Door lock key cylinder
- 5. Door latch assembly
- 6. Front door lock actuator
- 7. Rear door lock actuator



INSPECTION

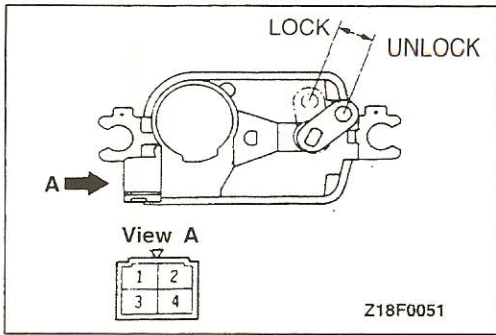
42300610041

FRONT DOOR LOCK ACTUATOR

<L.H.>

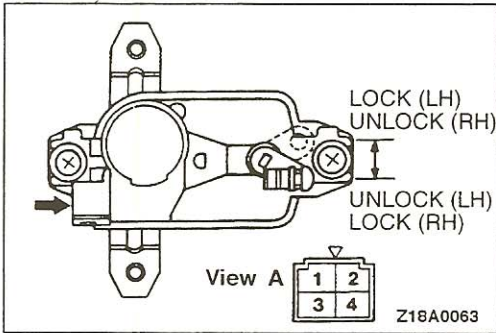
- (1) After setting the rod to the LOCK position and applying battery positive voltage to terminal (1), check if the rod moves to the UNLOCK position when terminal (3) is grounded.
- (2) After setting the rod to the UNLOCK position and applying battery positive voltage to terminal (3), check if the rod moves to the LOCK position when terminal (1) is grounded.

TSB Revision



<R.H.>

- (1) After setting the rod to the LOCK position and applying battery positive voltage to terminal (3), check if the rod moves to the UNLOCK position when terminal (1) is grounded.
- (2) After setting the rod to the UNLOCK position and applying battery positive voltage to terminal (1), check if the rod moves to the LOCK position when terminal (3) is grounded.



REAR DOOR LOCK ACTUATOR

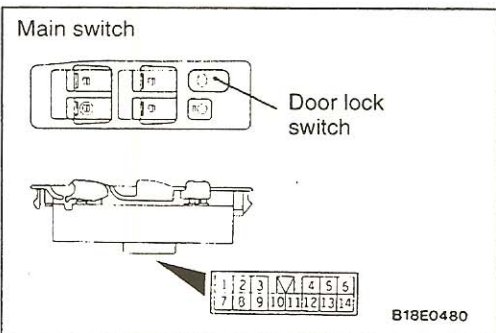
42300620037

<L.H.>

- (1) After setting the rod to the LOCK position and applying battery positive voltage to terminal (3), check if the rod moves to the UNLOCK position when terminal (1) is grounded.
- (2) After setting the rod to the UNLOCK position and applying battery positive voltage to terminal (1), check if the rod moves to the LOCK position when terminal (3) is grounded.

<R.H.>

- (1) After setting the rod to the LOCK position and applying battery positive voltage to terminal (1), check if the rod moves to the UNLOCK position when terminal (3) is grounded.
- (2) After setting the rod to the UNLOCK position and applying battery positive voltage to terminal (3), check if the rod moves to the LOCK position when terminal (1) is grounded.



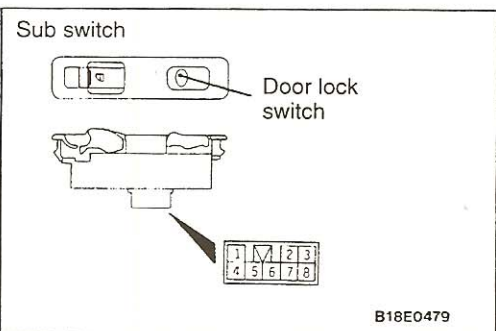
DOOR LOCK SWITCH

42700120096

- (1) Remove the power window switch from the front door.
- (2) Operate the switch and check the continuity between the terminals.

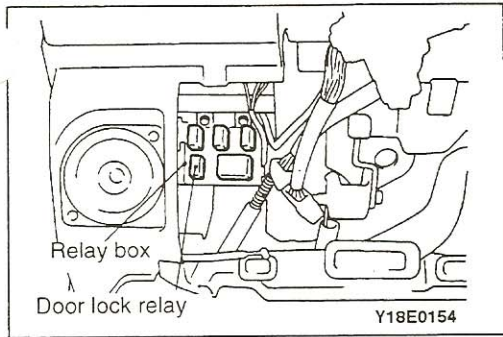
Main switch

Terminal	Switch position		
	LOCK	OFF	UNLOCK
5	○		
10	○		○
12	○		○



Sub-switch

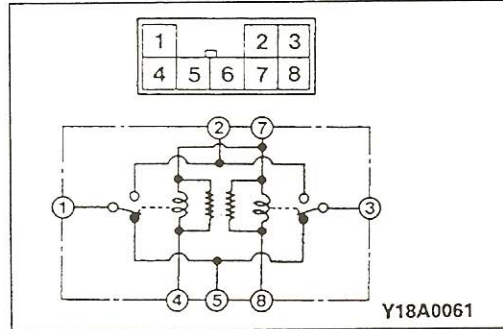
Terminal	Switch position		
	LOCK	OFF	UNLOCK
1	○		
2	○		○
3			○



DOOR LOCK RELAY

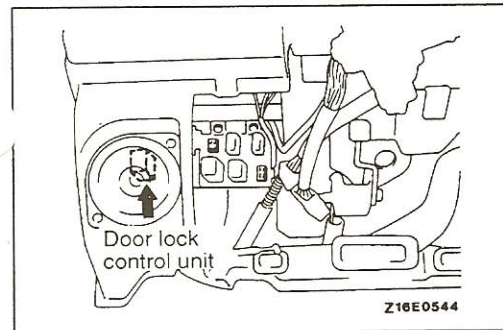
42700130013

- (1) Remove the door lock relay from the relay box.



- (2) Check for continuity between the terminals under the conditions described below.

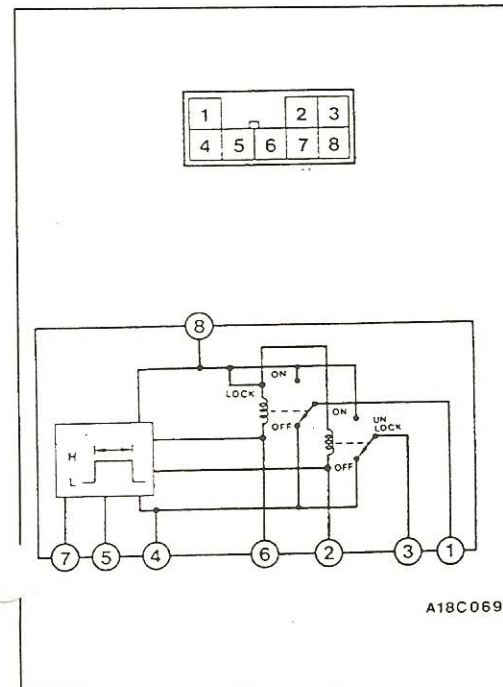
Battery positive voltage	Terminal						
	1	2	3	4	5	7	8
Continuity with no voltage	○	—	○	—	○	—	○
Continuity with voltage	○	○	—	—	—	+	+



DOOR LOCK CONTROL UNIT

42300650067

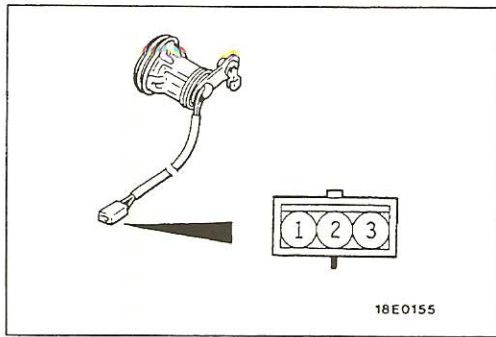
- (1) Remove the knee protector. (Refer to GROUP 52A – Instrument Panel.)
- (2) Remove the door lock control unit from the relay box.



- (3) Apply battery voltage to terminals (8).
- (4) Perform the following check.
 - 1) With terminals (4), (5) and (7) grounded, Connect a needle-type circuit tester between terminal (3) and the ground, and after switching it to the DCV range, and check if the needle moves at the instant when the connection at terminal (5) or (7) is removed.
 - 2) With terminals (4) and (5) grounded, Connect a needle-type circuit tester between terminal (3) and the ground, and after switching it to the DCV range, and check if the needle moves at the instant when the connection at terminal (7) is grounded.
 - 3) With terminal (4) grounded, Connect a needle-type circuit tester between terminal (3) and the ground, and after switching it to the DCV range, and check if the needle doesn't move when terminal (7) is grounded.
- (5) Also, check if there is a voltage of 12V between terminal (6) and the ground, and between terminal (2) and the ground.

NOTE

The reason why the needle of the circuit tester moves in (4) above is because battery voltage appears between terminals (1) and (3) and the ground for approximately 0.5 seconds.



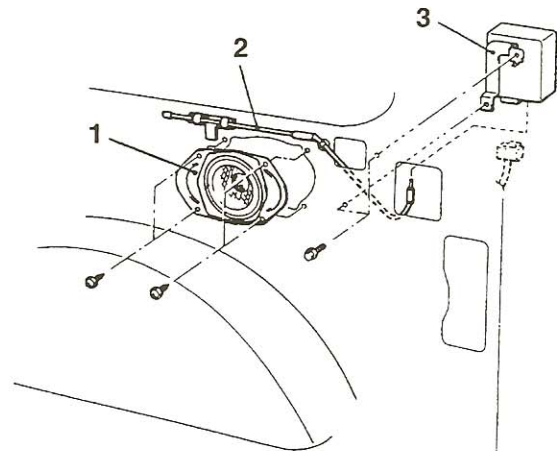
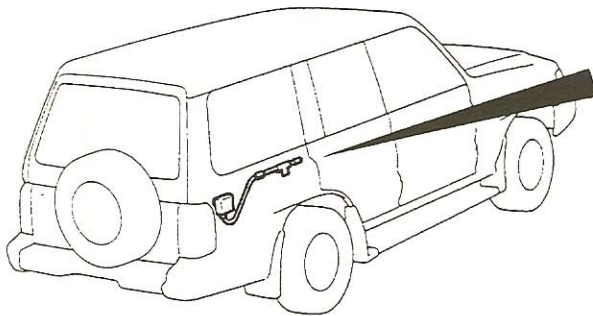
DOOR LOCK KEY CYLINDER SWITCH

42300630146

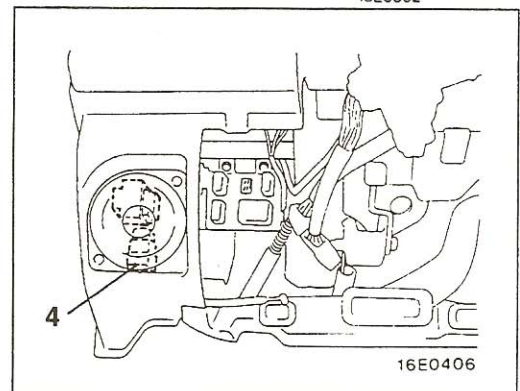
Switch position	Terminal		
	1	2	3
LOCK	○	○	
OFF			
UNLOCK		○	○

KEYLESS ENTRY SYSTEM REMOVAL AND INSTALLATION

42800130184



18E0362

18E0471
00007121

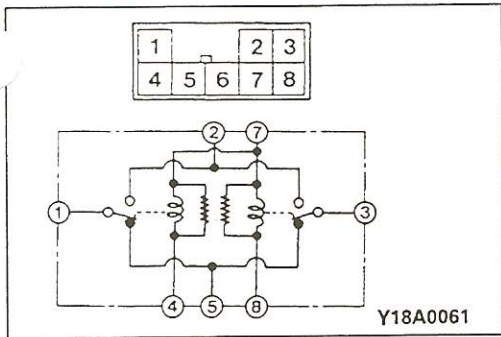
16E0406

Keyless entry control unit removal steps

- Quarter trim lower (Refer to GROUP 52A – Trims.)
- Third seat belt retractor <Vehicles with third seat> (Refer to GROUP 52A – Third Seat belt.)
- 1. Rear speaker
- 2. Antenna
- 3. Keyless entry control unit

Door lock relay removal steps

- Knee protector (Refer to GROUP 52A – Instrumental Panel.)
- 4. Door lock relay

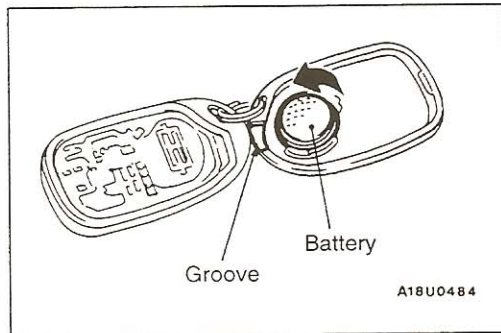


INSPECTION

42800140026

DOOR LOCK RELAY

Battery voltage	Terminal							
	1	2	3	4	5	6	7	8
Continuity with no voltage	○	—	○	—	○		—	○
Continuity with voltage	○	○		⊖	—		⊕	⊖



HOW TO REPLACE A BATTERY OF THE TRANSMITTER

42800090109

1. Insert a flat-tipped screwdriver or similar tool into the groove as shown in the illustration to open the cover, and then remove the battery from the transmitter.
2. Install a battery with its (+) side face-down.

Battery required for replacement: Coin type battery CR2032

3. Securely close the cover.

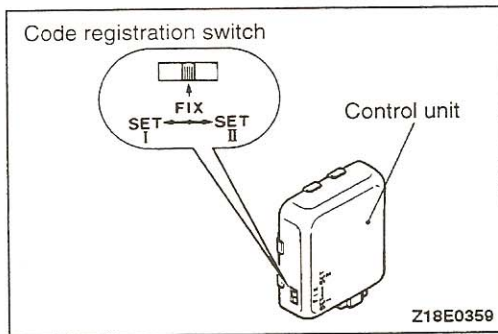
NOTE

- (1) Do not let water or dust stick to the inside of the transmitter when its open. Also, do not touch the precision electronic device.
- (2) If the O-ring is displaced during the assembly of the transmitter, water or dust penetrates in it, causing trouble.

METHOD OF REGISTERING A CRYPTOGRAPHIC CODE

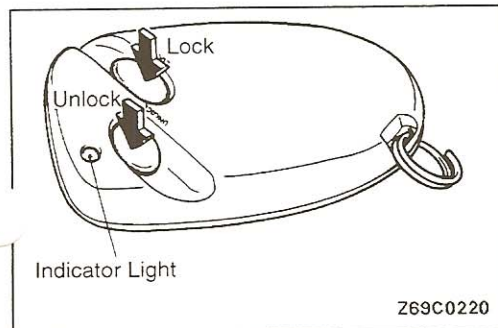
42800100031

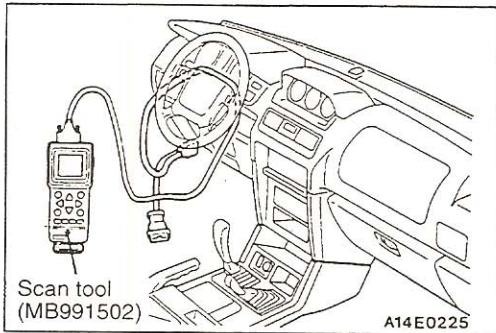
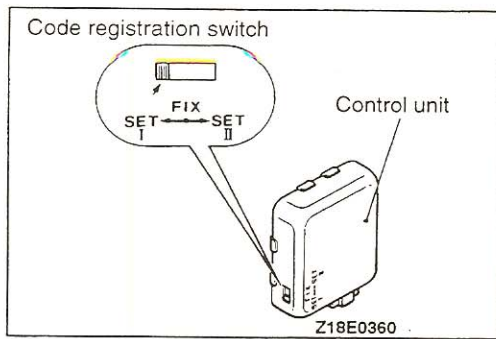
Since the transmitter is memorized by each individual code, it is necessary to register a code on EEPROM in the control unit if the transmitter or control unit is replaced, or cause of the trouble is presumed to be due to faulty registration of the code. Since two different codes at the most can be memorized in the memory space of EEPROM, the old code will become unable to be used if the following registration operation is repeated twice. Meanwhile, register a code after confirming that an ordinary door lock function can be worked through key operation.



WHEN NOT USING THE SCAN TOOL

- (1) Set the code registration switch of the control unit to SET I (registration mode side).
- (2) Push the LOCK or UNLOCK switch of transmitter.





- (3) Set the code registration switch of the control unit to FIX (operation mode) side.
- (4) Confirm that the keyless entry system operates normally. The registration is completed, if it operates normally. If not, repeat (1) – (3).

NOTE

- 1 Confirm that after a code has been registered the registration switch is surely set to FIX.
- 2 In case there are two transmitters, register a code on SET II side in the same manner as SET I.

WHEN USING THE SCAN TOOL

- (1) Connect the scan tool to the data link connector.

NOTE

At this moment, No. 1 terminal of the data link connector becomes grounded and a code is ready to be registered.

Caution

Turn off the ignition switch before connecting or disconnecting the scan tool.

- (2) Close all doors.
- (3) Set the ignition switch to ACC and return it to OFF.

NOTE

At this moment, the door operates, lock and unlock, once, then it becomes registration mode.

- (4) After pressing any switch on the transmitter once, press it two more times within 10 seconds to register the same code for SET I and SET II.
- (5) After registration is completed, the door lock operates, lock and unlock, once.

NOTE

If there are two transmitters, carry out the registration within 10 seconds in the same manner as the first registration. In addition, the second registration shall be done within a minute.

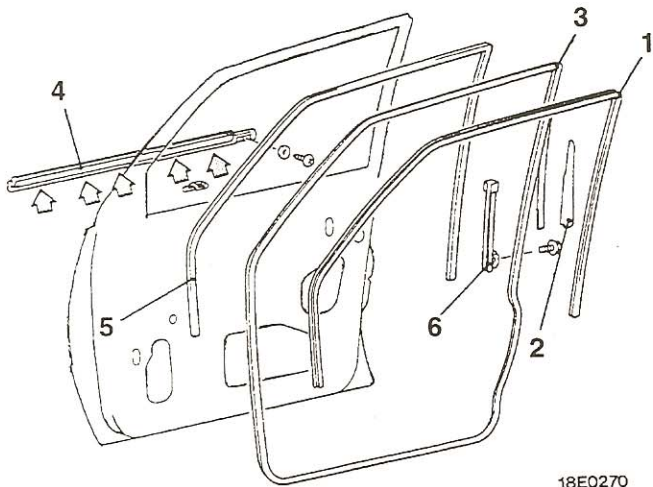
- (6) After the second registration is completed, the door lock operates, lock and unlock, once.
- (7) Registration mode finishes under the following conditions.
 - Registration of two transmitter codes are completed.
 - One minute has passed since the registration mode setting.
 - Scan tool connection is disconnected. (ground mode is released.)
 - Ignition switch is turned ON.
 - Any of the doors are opened.

WINDOW GLASS RUNCHANNEL AND DOOR OPENING WEATHERSTRIP

42300310217

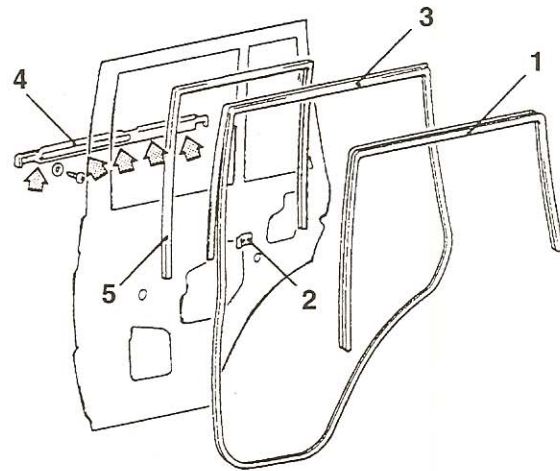
REMOVAL AND INSTALLATION

<Front door>



18E0270

<Rear door>



18E0269

NOTE

◁▷: Indicates the clip positions

00001918

1. Door inner opening weatherstrip

Door outer opening weatherstrip removal steps

2. Weatherstrip protector
3. Door outer opening weatherstrip

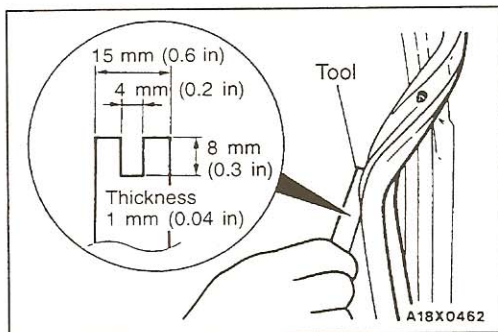


Belt line moulding removal steps

- Door mirror (Refer to GROUP 51 – Door Mirror.)
- 4. Belt line moulding

Window glass runchannel removal steps

- Door window glass (Refer to P.42-33.)
- 5. Window glass runchannel
- 6. Lower rear sash



REMOVAL SERVICE POINT

◁▷ DOOR OUTER OPENING WEATHERSTRIP REMOVAL

Make a tool as shown in the illustration to remove the door opening weatherstrip.

INSTALLATION SERVICE POINT

▷◁ DOOR OUTER OPENING WEATHERSTRIP INSTALLATION

The clip color identifies the left and right weatherstrips, so be sure to use the colors so as to install correctly.

Identification color	Applicable side
White	Left door
Brown	Right door

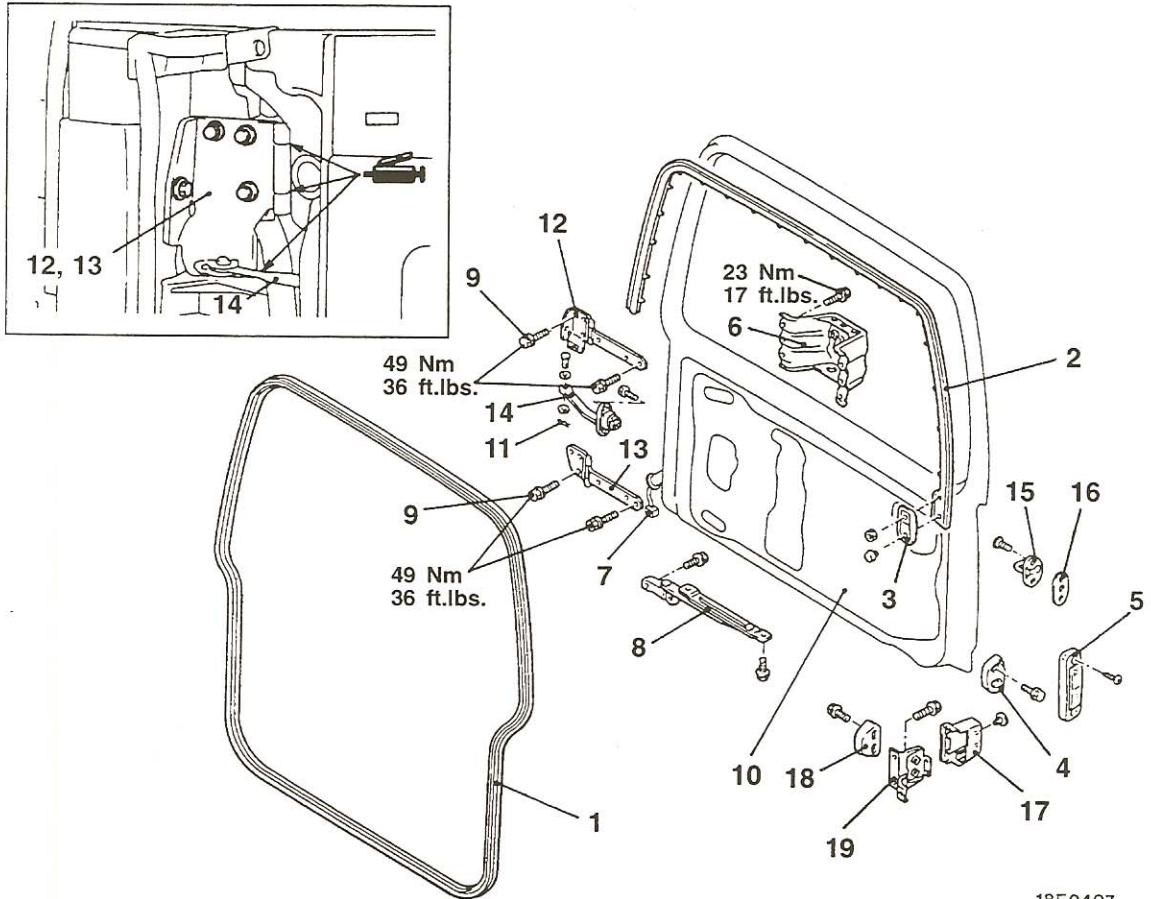
BACK DOOR ASSEMBLY

42300520017

REMOVAL AND INSTALLATION

Back Door Post-installation Operation

- Back Door Adjustment (Refer to P.42-12.)

18E0407
00004084

1. Inner opening weatherstrip
2. Outer opening weatherstrip
3. Weatherstrip plate
4. Bumper rubber
5. Reflex reflector
6. Spare tyre carrier

Back door removal steps

7. Harness connector
8. Back door stopper
9. Hinge attaching bolt
10. Back door

Hinge removal steps

- Back door trim and waterproof film (Refer to P.42-47.)
10. Back door
 11. Split pin
 12. Upper hinge
 13. Lower hinge

Door check strap removal steps

- Back door trim and waterproof film (Refer to P.42-47.)
11. Split pin
 14. Door check strap

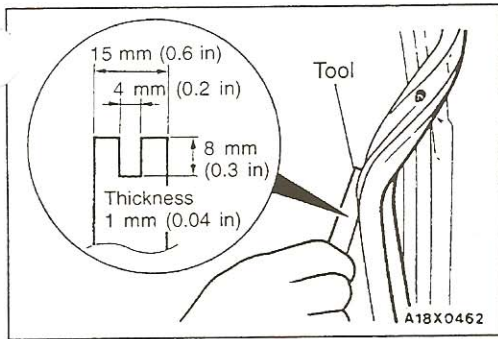
Striker removal steps

15. Striker
16. Shim

Back door bumper bracket removal steps

17. Back door bumper cover
18. Back door bumper female
- Rear combination light (Refer to GROUP 54 – Rear combination light)
19. Back door bumper bracket

TSB Revision



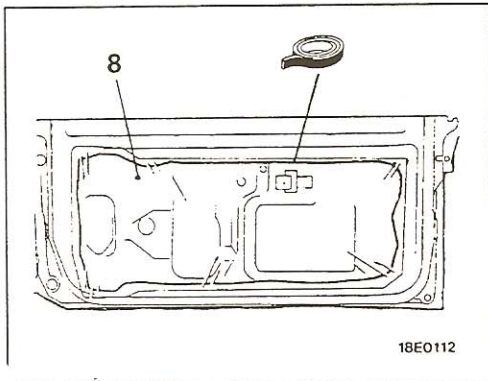
REMOVAL SERVICE POINT

◀A▶ OUTER OPENING WEATHERSTRIP REMOVAL

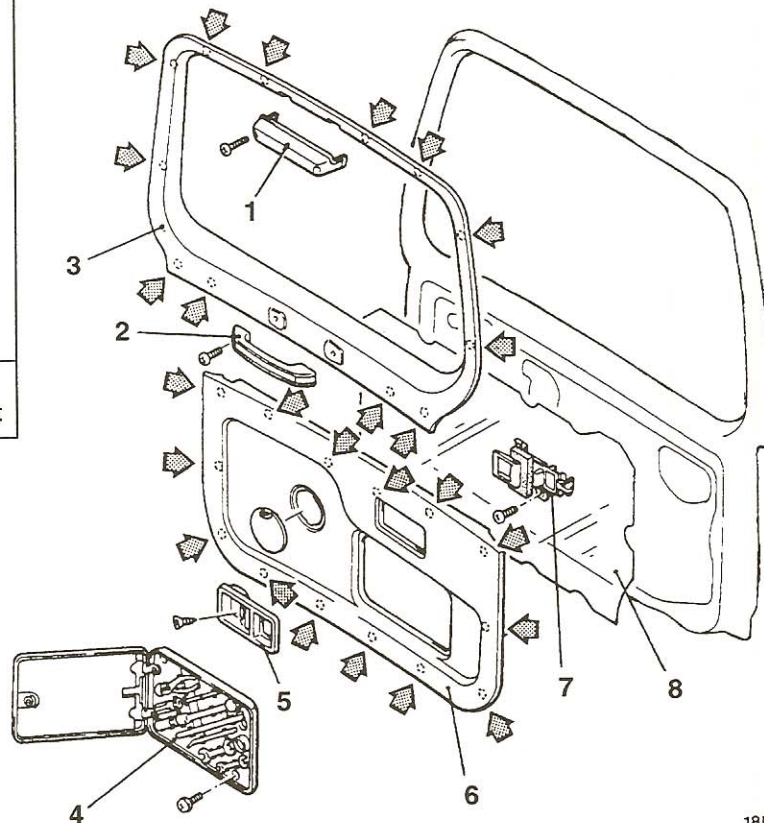
Make a tool as shown in the illustration to remove the outer opening weatherstrip.

42300550015

**BACK DOOR TRIM AND WATERPROOF FILM
REMOVAL AND INSTALLATION**



Sealant:
3M ATD Part No. 8625 or equivalent



NOTE

◀▶ : Indicates the clip positions

18E0101
00001920

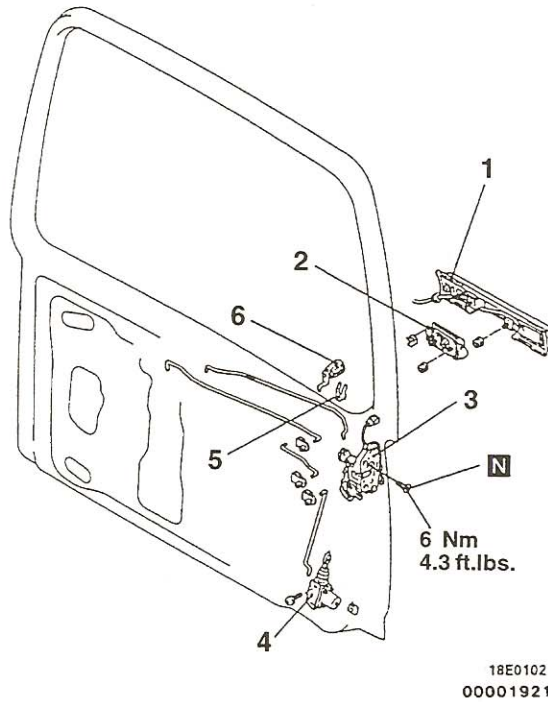
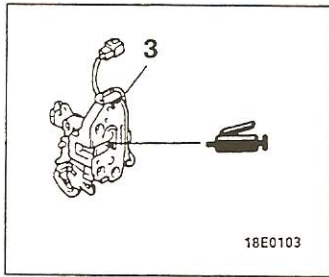
Removal steps

1. Cover
2. Door pull handle
3. Back door upper trim
4. Tool box lid assembly
5. Inside handle cover
6. Back door trim
7. Inside handle
8. Waterproof film

BACK DOOR HANDLE AND LATCH

42300580028

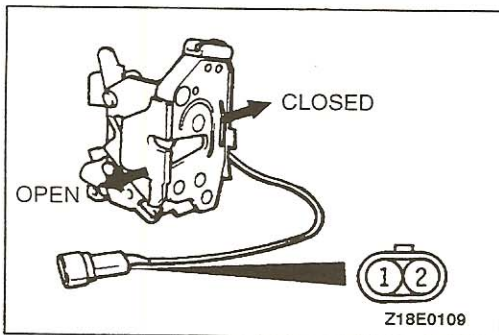
REMOVAL AND INSTALLATION



Removal steps

- Back door trim and waterproof film (Refer to P.42-47.)
- Door outside handle play check (Refer to P.42-12.)
- 1. License plate light garnish

- 2. Door outside handle
- 3. Back door latch assembly
- 4. Back door lock actuator
- 5. Retainer
- 6. Back door key cylinder



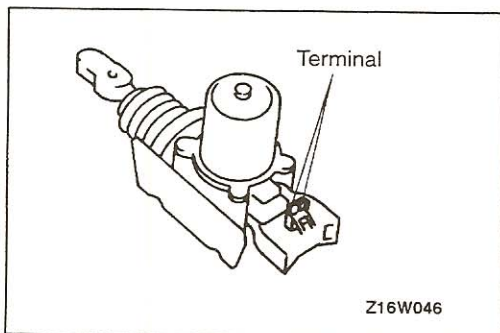
INSPECTION

42300590017

LATCH SWITCH

Check the continuity between the terminals when the latch is moved.

Latch position	Terminal	
	1	2
OPEN	○	○
CLOSED		



BACK DOOR LOCK ACTUATOR

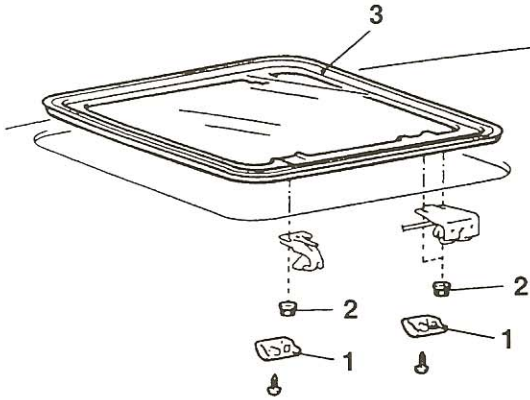
Connect the battery to the actuator terminal, and check that the shaft operates. If the shaft moves in the opposite direction when the connection polarity is changed, the actuator can be considered normal.

SUNROOF

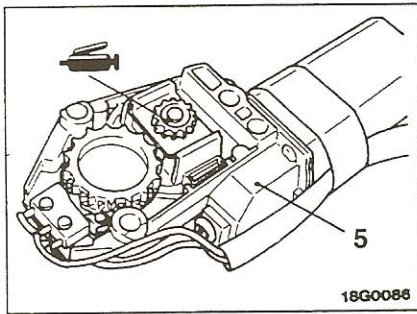
REMOVAL AND INSTALLATION

Post-installation Operation

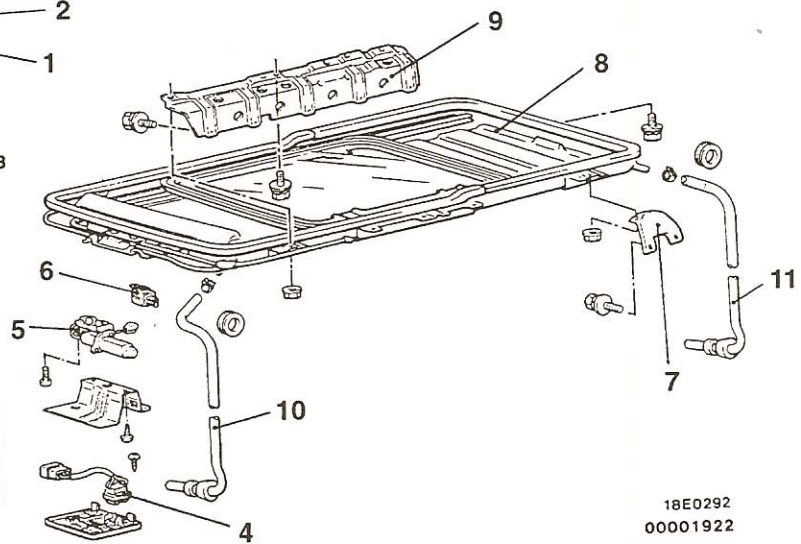
- Water Test (Refer to P.42-13.)



18W148



18G0086



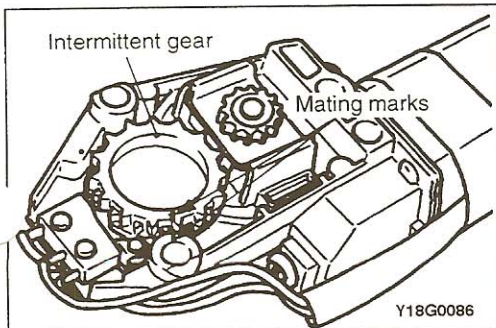
18E0292
00001922

Sunroof glass removal steps

1. Decoration cover
2. Nuts
3. Sunroof glass assembly

Sunroof assembly removal steps

4. Sunroof switch
 - Headlining (Refer to GROUP 52A – Headlining.)
- ◀A▶ ▶B▶ 5. Motor assembly
6. Control unit
7. Rear set bracket
8. Sunroof assembly
9. Front set bracket
- ◀B▶ ▶A▶ 10. Front drain hose
- ◀B▶ ▶A▶ 11. Rear drain hose



Y18G0086

REMOVAL SERVICE POINTS

◀A▶ MOTOR ASSEMBLY REMOVAL

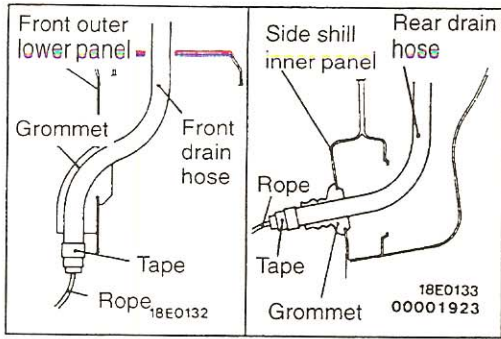
- (1) Close the sunroof fully and remove the motor.

NOTE

If the sunroof does not move, make mating marks on the roof lid and the guide rail.

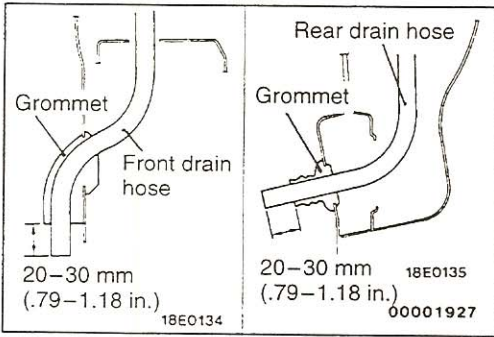
- (2) Make mating marks on the motor intermittent gear and bracket.

TSB Revision



◀B▶ FRONT DRAIN HOSE/REAR DRAIN HOSE REMOVAL

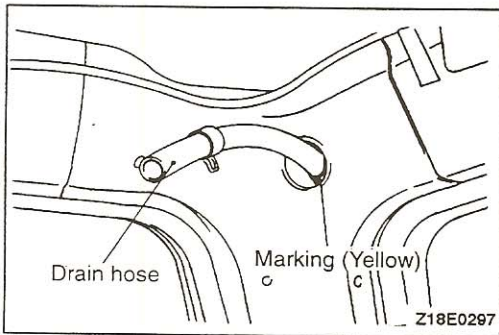
Tie a rope to the end of the drain hose, wind a tape around it so that there is no unevenness, and pull the drain hose into the inside of the passenger compartment.



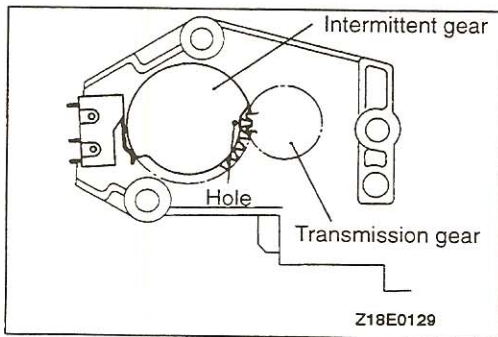
INSTALLATION SERVICE POINTS

▶A◀ REAR DRAIN HOSE/FRONT DRAIN HOSE INSTALLATION

- (1) Tie the rope that was used during removal to the end of the drain hose, and wind tape around it so that there is no unevenness.
- (2) Pull the rope to pull the drain hose through.
- (3) Pull the drain hose until the protruding length from the grommet is as shown in the illustration.

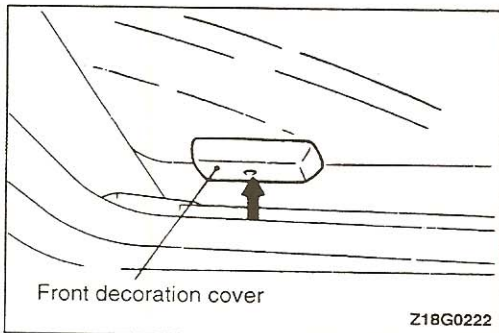


- (4) Align the rear drain hose (R.H.) with the body hole so that the hose marking is at the bottom.



▶B◀ MOTOR ASSEMBLY INSTALLATION

When replacing the motor assembly, open the sunroof glass approximately 200 mm (7.9 in.), set the hole of the intermittent gear so that it is aligned between the teeth of the motor assembly transmission gear, and then install the motor assembly.

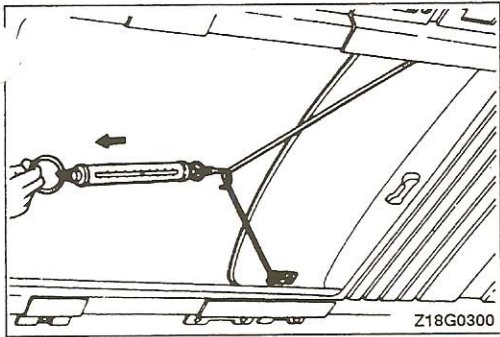


INSPECTION

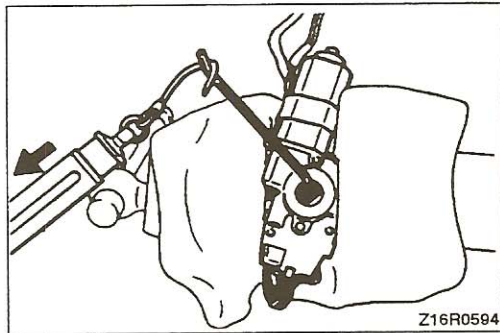
42600130034

SUNROOF SLIDING RESISTANCE

- (1) Remove the front decoration covers.
- (2) Remove the front guide front nut.
- (3) Remove the motor assembly.
- (4) Fasten the string.



- (5) Measure the sunroof drive resistance with a spring scale.
Standard value: 196 N (44 lbs.) or less
- (6) If the resistance exceeds the standard value, check the following.
 - 1) Guide rail installation
 - 2) Defective or worn guide bracket
 - 3) Seized drive cable
 - 4) Malfunction of drive tube



CLUTCH SLIP FORCE

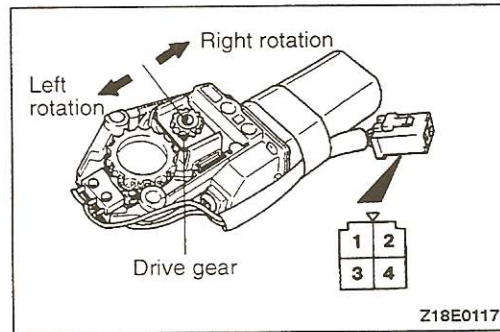
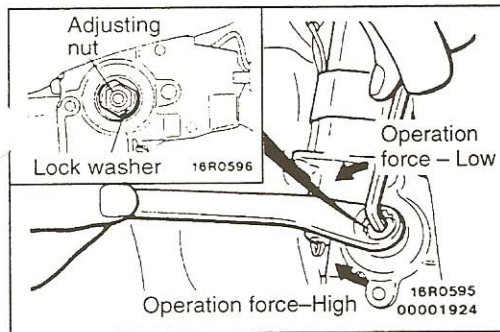
Check the sliding force of the clutch by the following procedure.

- (1) Place the hexagonal wrench from the special tools into hexagonal socket of the motor drive shaft, and use a spring balance to measure the force when the motor clutch starts to slip.

Standard value: 39–49 N (9–11 lbs.)

Caution

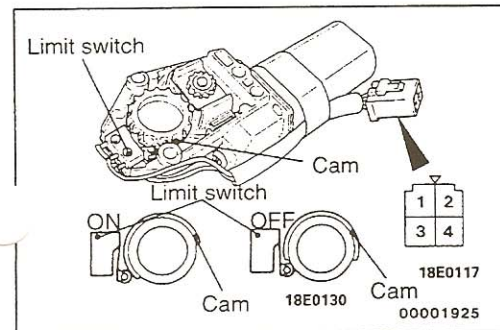
1. Keep the spring balance to the wrench at a right angle.
2. Always use the wrench in the special tools, or the value for the clutch sliding force will be different.
- (2) If the clutch sliding force is not within the standard value, turn the motor adjusting nut to the left or right to adjust.
- (3) After adjusting, tighten the adjusting nut securely with the lock washer.



MOTOR

Check the direction of rotation of the drive gear when the connector is connected to the battery.

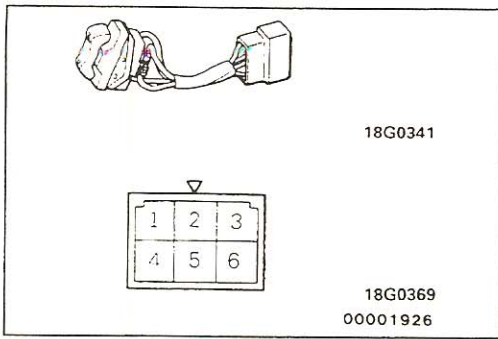
Terminal (1)	Terminal (3)	Drive gear rotation direction
+	-	Right
-	+	Left



LIMIT SWITCH

Turn over the motor and check the continuity at each of the limit switch terminals.

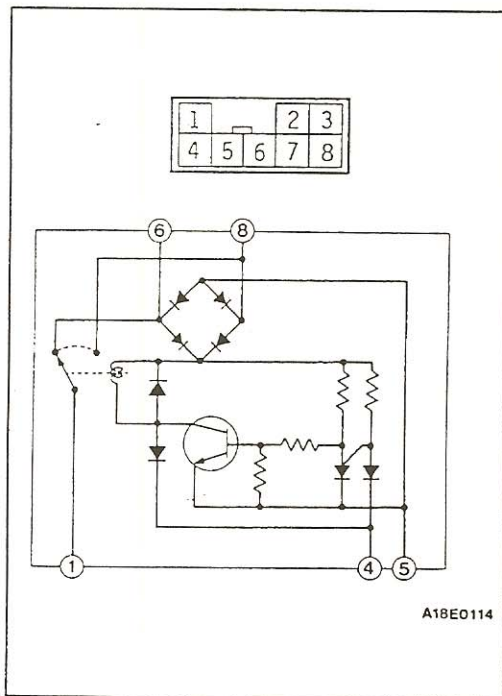
Switch	Terminal	
	2	4
ON		
OFF	○ ————— ○	



SUNROOF SWITCH

Operate the sunroof switch and check the continuity betw the terminals.

Switch	Terminal				
	1	2	3	5	6
OPEN	○	○	○	○	○
OFF		○	○	○	○
CLOSED	○	○	○	○	



CONTROL UNIT

Check for continuity between the terminals under the conditions described below.

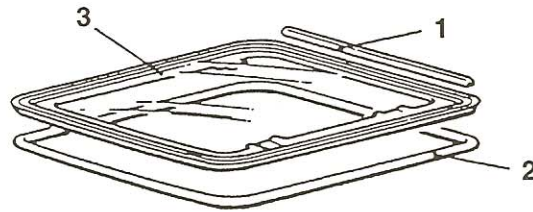
Battery positive voltage	Terminal				
	1	8	6	5	4
Battery positive voltage					
When there is no current	○	○	○	○	○
	⊕	⊕	⊕	⊖	⊕
	⊖	⊖	⊖		
When there is current	○	○	○		
		⊕	⊖		
		⊖	⊕		

NOTE

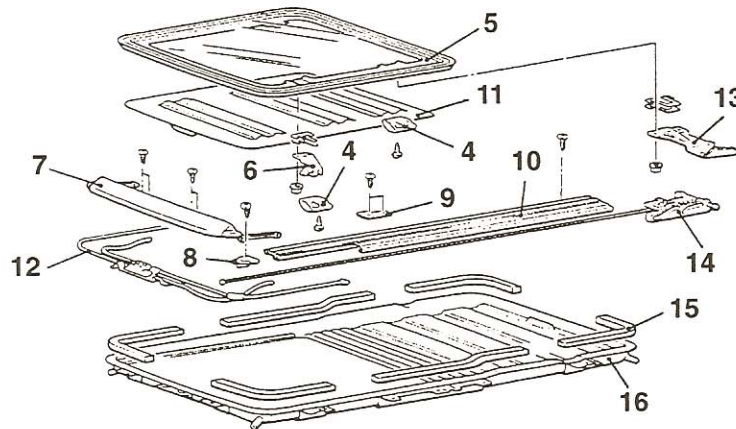
⊕ — ⊖ indicate that there is continuity when the positive battery terminal is connected to the tester plus terminal, and the negative battery terminal is connected to the tester minus terminal.

DISASSEMBLY AND REASSEMBLY

42600140143



18W937



18E0476
00007122

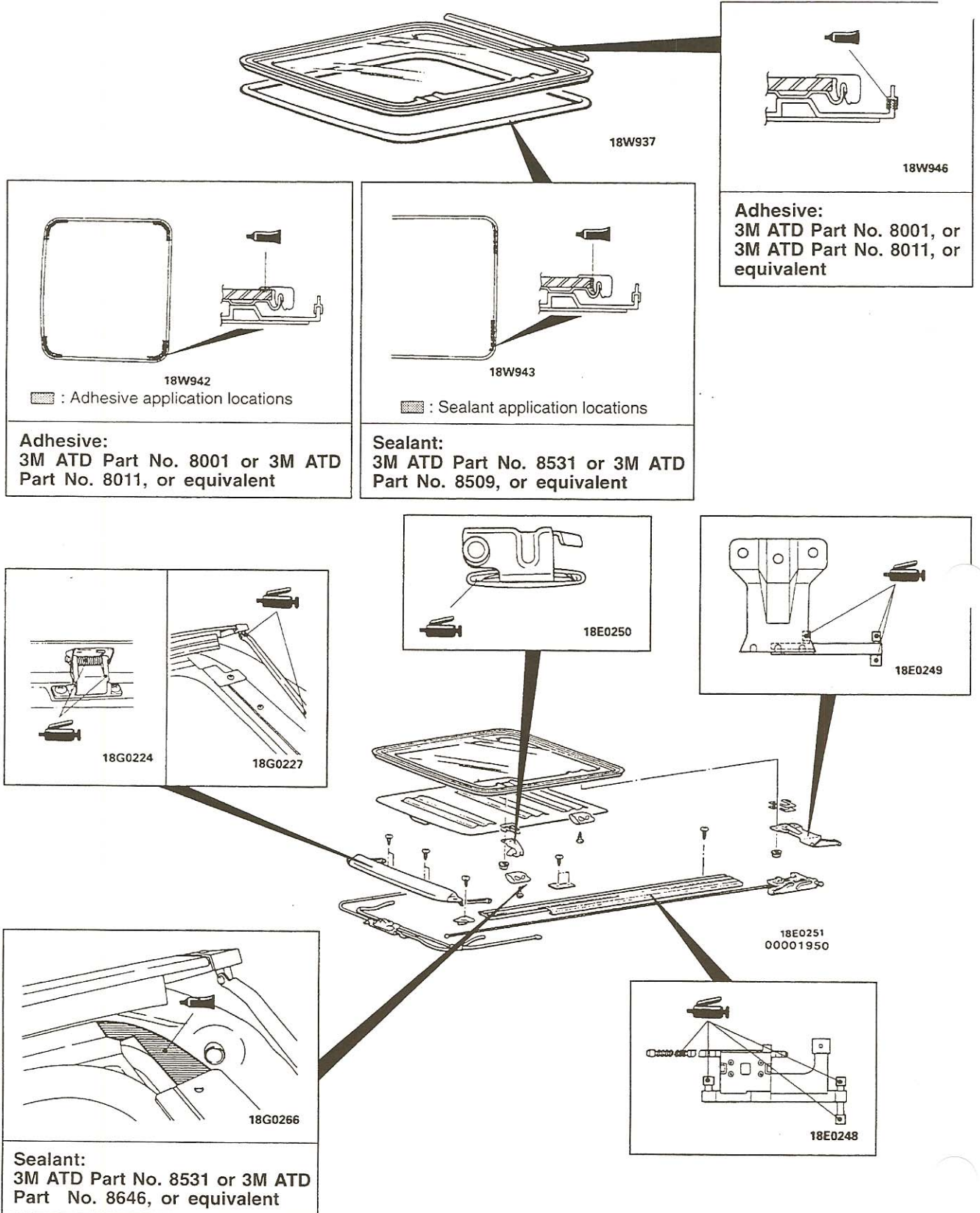
Sunroof glass disassembly steps

1. Screen drip
2. Weatherstrip
3. Sunroof glass

Sunroof assembly disassembly steps

4. Decoration cover
5. Sunroof glass assembly
6. Front guide bracket
7. Deflector assembly
8. Rail end cover
9. Set plate
10. Guide rail assembly
11. Sun shade
12. Drive tube
13. Lifter assembly
14. Slider assembly
15. Sealing tape
16. Housing assembly

LUBRICATION AND SEALING POINTS



EXTERIOR

CONTENTS

51109000258

DOOR MIRROR	23	REAR WIPER AND WASHER	15
FRONT BUMPER	7	SEALANTS AND ADHESIVES	4
GARNISHES AND MOULDINGS	9	SERVICE SPECIFICATIONS	4
GENERAL INFORMATION	2	SIDE STEP	11
GENERAL SPECIFICATIONS	3	SPECIAL TOOLS	5
HEADLIGHT WASHER	18	TROUBLESHOOTING	6
MARK AND STRIPES	20	WINDSHIELD WIPER AND WASHER	12
REAR BUMPER	8		

GENERAL INFORMATION

OPERATION

<Windshield wiper and washer>

Low-speed (and high-speed) wiper operation

- When the wiper switch is turned to LO while the ignition switch is at ACC or ON, the wipers operate continuously at low speed.
- Turning the wiper switch to HI causes the wipers to operate at high speed.

Auto wiper stop operation

- When the wiper switch is at OFF, the cam contacts of the wiper motor cause current to flow through the auto wiper stop circuit, allowing the wiper blades to cycle before they reach the stop positions.

Intermittent wiper operation

- When the wiper switch is at INT while the ignition switch is at ACC or ON, the intermittent wiper relay is energized, causing the intermittent wiper relay contacts to close and open repeatedly.
- When the contacts are closed, the wiper motor is energized.
- When the wiper motor is energized, the relay contacts open; however, the cam contacts keep the wiper motor energized until the wiper blades return to the stop positions.

Washer-wiper operation

- When the washer switch is turned ON, the intermittent wiper relay contacts close causing wipers to cycle two to three times.

<Rear wiper and washer>

Low-speed wiper operation

- When the wiper switch is at ON while the ignition switch at ACC or ON, the wipers operate continuously at low speed.

Auto wiper stop operation

- When the wiper switch is at OFF, the cam contacts of the wiper motor cause current to flow through the auto wiper stop circuit, allowing the wiper blades to cycle before they reach the stop positions.

Intermittent wiper operation

- When the wiper switch is at INT while the ignition switch is at ACC or ON, the intermittent wiper relay is energized, causing the intermittent wiper relay contacts to close and open repeatedly.
- When the contacts are closed, the wiper motor is energized.
- When the wiper motor is energized, the relay contacts open; however, the cam contacts keep the wiper motor energized until the wiper blades return to the stop positions.

Washer-wiper operation

- When the washer switch is turned ON, the intermittent wiper relay contacts close causing wipers to cycle two to three times.

<Headlight washer>

- When the headlight washer switch is turned to ON while the ignition switch is at ON and the lighting switch is at TAIL or HEAD, the headlight washer relay is energized, causing the headlight washer motor to start.

<Remote controlled mirror>

- When the remote controlled mirror switch is operated while the ignition key is at ACC or ON, current flows through fuse No. 5, remote controlled mirror switch, remote controlled mirror, remote controlled mirror switch and ground, causing the mirror to move.

GENERAL SPECIFICATIONS

Windshield wiper motor

Items	Specifications	
Revolution speed at load of 1 Nm (0.72 ft.lbs.) rpm	Low speed	48±4
	High speed	70±7
Nominal torque Nm (ft.lbs.)	21 (15)	
No-load current A	3.7 or less	

Windshield wiper blade

Items	Specifications	
Wiping angle	Driver's side	85°
	Passenger's side	109°
Wiper blade length mm (in.)	Driver's side	475 (18.7)
	Passenger's side	475 (18.7)

Windshield washer motor and pump

Items	Specifications	
Motor type	Direct current ferrite magnet type	
Pump type	Centrifugal type	
Power consumption A	4 or less	
Time of continuous use sec.	With washer fluid	Max. 60
	Empty operation	Max. 20
Nozzle jet pressure kPa (psi)	110 (15.6) or more	
Tank capacity dm ³ (qts.)	3.0 (3.1) or more	

Rear wiper motor

Items	Specifications	
Revolution speed at load of 0.6 Nm (0.43 ft.lbs.) r/min	38±5	
Nominal torque Nm (ft.lbs.)	10 (7)	

Rear wiper blade

Items	Specifications	
Wiping angle	102°	
Wiper blade length mm (in.)	375 (14.8)	

Rear window washer motor and pump

Items	Specifications	
Motor type	Direct current ferrite magnet type	
Pump type	Centrifugal type	
Power consumption A	3.8 or less	
Time of continuous use sec.	With washer fluid	Max. 60
	Empty operation	Max. 20
Nozzle jet pressure kPa (psi)	120 (17) or more	
Tank capacity dm ³ (qts.)	1.4 (1.5) or more	

51-4 EXTERIOR – General Specifications/Service Specifications/Sealants and Adhesives

Intermittent wiper relay

Items	Specifications
Intermittent interval sec.	8 ± 2

Headlight washer motor and pump

Items	Specifications
Motor type	Direct current ferrite magnet type
Pump type	Centrifugal type
Rated current A	21 or less
Nozzle injection pressure kPa (psi)	180 (25.6) or more
Tank capacity dm ³ (qts.)	3.7 (3.9) or more

Check valve

Items	Specifications
Valve opening and closing pressure kPa (psi)	50–110 (7.1–15.6)

Headlight washer relay

Items	Specifications
Timer operation time sec.	0.33

SERVICE SPECIFICATIONS

51100030058

Items		Standard value
Windshield wiper blade installation position mm (in.)	Driver's side	25 – 35 (.98 – 1.38)
	Passenger's side	35 – 45 (1.38 – 1.77)
Rear wiper blade installation position mm (in.)		65 – 75 (2.56 – 2.95)

SEALANTS AND ADHESIVES

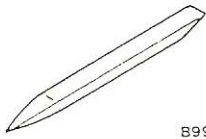
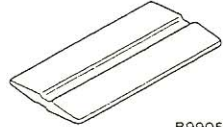
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Items	Specifications
Back door lower garnish	3M ATD Part No. 6382 or equivalent
Back door corner garnish	
License plate garnish	
Front mud guard, Rear step cover	

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SPECIAL TOOLS

51100060187

Tool	Tool number and name	Supersession	Application
 <p style="text-align: right;">B990784</p>	<p>MB990784</p> <p>Ornament remover</p>	<p>General service tool</p>	<p>Removal of mark</p>
 <p style="text-align: right;">B990528</p>	<p>MB990528</p> <p>Stripe tape spatula</p>		<p>Bonding of the stripe tape</p>

TSB Revision

TROUBLESHOOTING

51100070067

TROUBLESHOOTING HINTS

<Windshield wiper and washer>

1. Wipers do not operate. Washer does not operate either.
 - Check multi-purpose fuse No. 9.
 - Check the ground.
2. Low-speed (or high-speed) wiper only does not operate.
 - Check the wiper switch.
3. Wipers do not stop.
 - Check the wiper motor.
 - Check the intermittent wiper relay.
 - Check the wiper switch.
4. Intermittent wiper does not operate.
 - Check the terminal voltage of the steering-column switch (with built-in intermittent wiper relay) while the intermittent wiper relay is energized.

Terminal to be checked: 8

 - When the voltage is 0 V, check intermittent wiper relay or wiper switch.
 - When the voltage is battery voltage, check intermittent wiper relay.
 - When 0 V and battery voltage alternate, intermittent wiper relay and wiper switch are normal.
5. The length of pause for intermittent operation cannot be varied.
 - Check the variable intermittent wiper control switch.
 - Check the intermittent wiper relay.
6. Washer does not operate.
 - (1) Wiper operates during washer-wiper operation.
 - Check the washer motor.
 - (2) Washer-wiper does not operate also.
 - Check the washer switch.
7. Washer-wiper does not operate.
 - Check the intermittent wiper relay.

<Rear wiper and washer>

1. Wipers do not operate.
 - Washer does not operate either.
 - Check multi-purpose fuse No. 9.
 - Check the ground.
 - Check the wiper switch.
2. Wipers do not stop.
 - Check the wiper motor.
 - Check the intermittent wiper relay.
 - Check the wiper switch.
3. Intermittent wiper does not operate.
 - Check the terminal voltage while the intermittent wiper relay is energized.

Terminal to be checked: 2

 - When the voltage is 0 V, check intermittent wiper relay or wiper switch.
 - When the voltage is battery voltage, check intermittent wiper relay.
 - When 0 V and battery voltage alternate, intermittent wiper relay and wiper switch are normal.
4. Washer does not operate.
 - Check the washer motor.
 - Check the washer switch.

<Headlight washer>

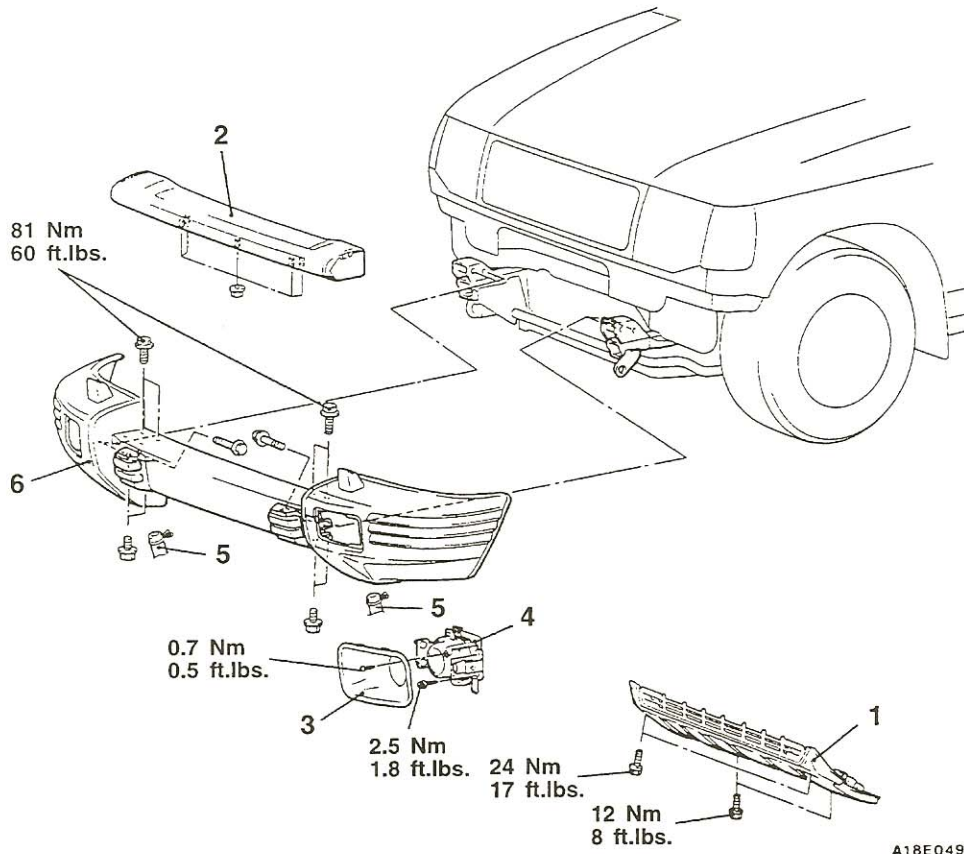
1. Headlight washer motor does not start.
 - (1) Washer motor does not start either.
 - Check multi-purpose fuse No. 3.
 - (2) Washer motor does not start.
 - Check the headlight washer motor.
 - Check the headlight washer relay.
 - Check the headlight washer switch.

<Remote controlled mirror>

- Neither right nor left mirror operates.
- (1) Cigarette lighter also does not operate.
 - Check multi-purpose fuse No. 5.
 - (2) Cigarette lighter operates.
 - Check the remote controlled mirror switch.

FRONT BUMPER

REMOVAL AND INSTALLATION



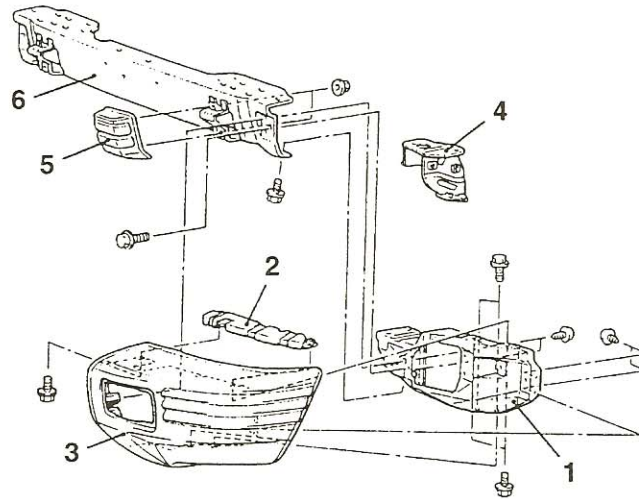
A18E0491

Removal steps

1. Skid plate
2. Bumper garnish
3. Fog lamp bezel
4. Front fog lamp assembly
5. Nozzle assembly and hose connection
- Outside temperature sensor
(Refer to GROUP 54.)
6. Bumper assembly

DISASSEMBLY AND REASSEMBLY

51100160252



A18E0490

Disassembly steps

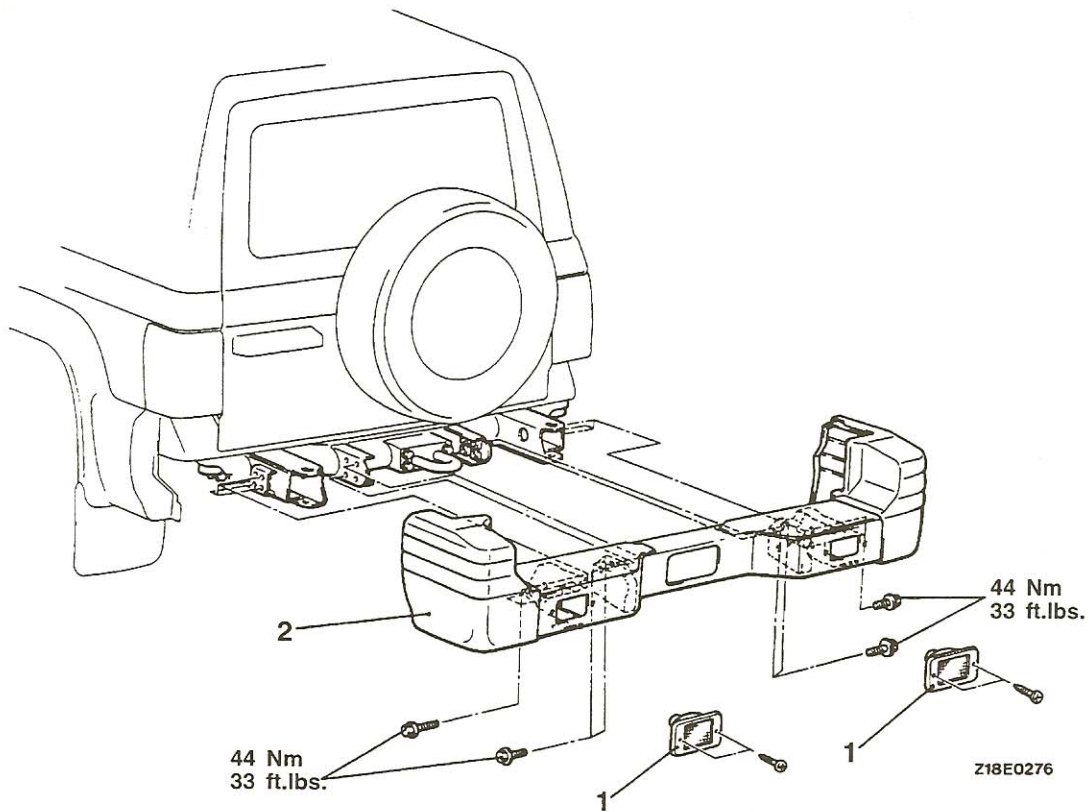
1. Bumper side stay
2. Bumper side upper reinforcement
3. Bumper side face

4. Bumper mount bracket
5. Bumper guard
6. Bumper center face

REAR BUMPER

51100190060

REMOVAL AND INSTALLATION



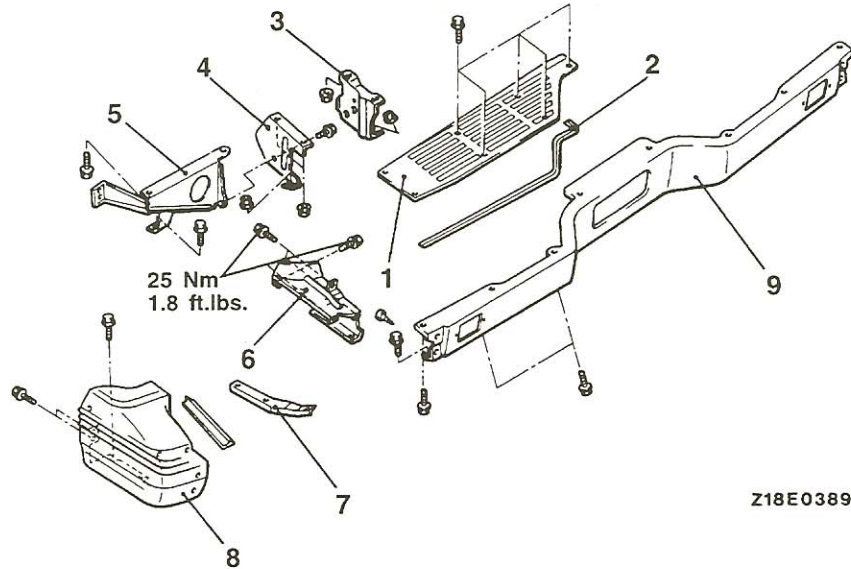
Removal steps

1. Back-up lights
2. Bumper assembly

TSB Revision

DISASSEMBLY AND REASSEMBLY

51100210063



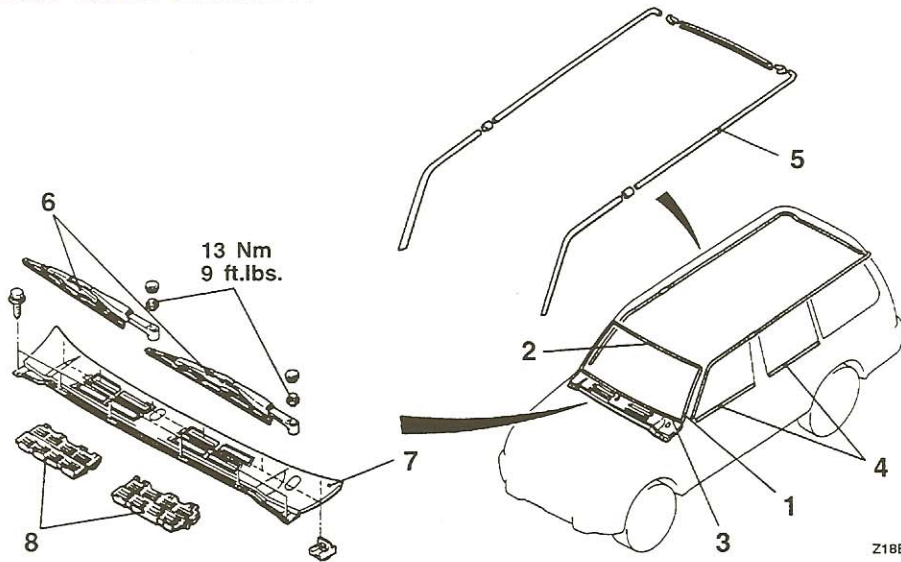
Removal steps

- | | |
|-------------------------|------------------------------------|
| 1. Bumper step plate | 6. Bumper side upper reinforcement |
| 2. Weatherstrip | 7. Bumper side lower reinforcement |
| 3. Bumper stay A | 8. Bumper side face |
| 4. Bumper stay B | 9. Bumper center face |
| 5. Bumper reinforcement | |

GARNISHES AND MOULDINGS

51100440066

REMOVAL AND INSTALLATION

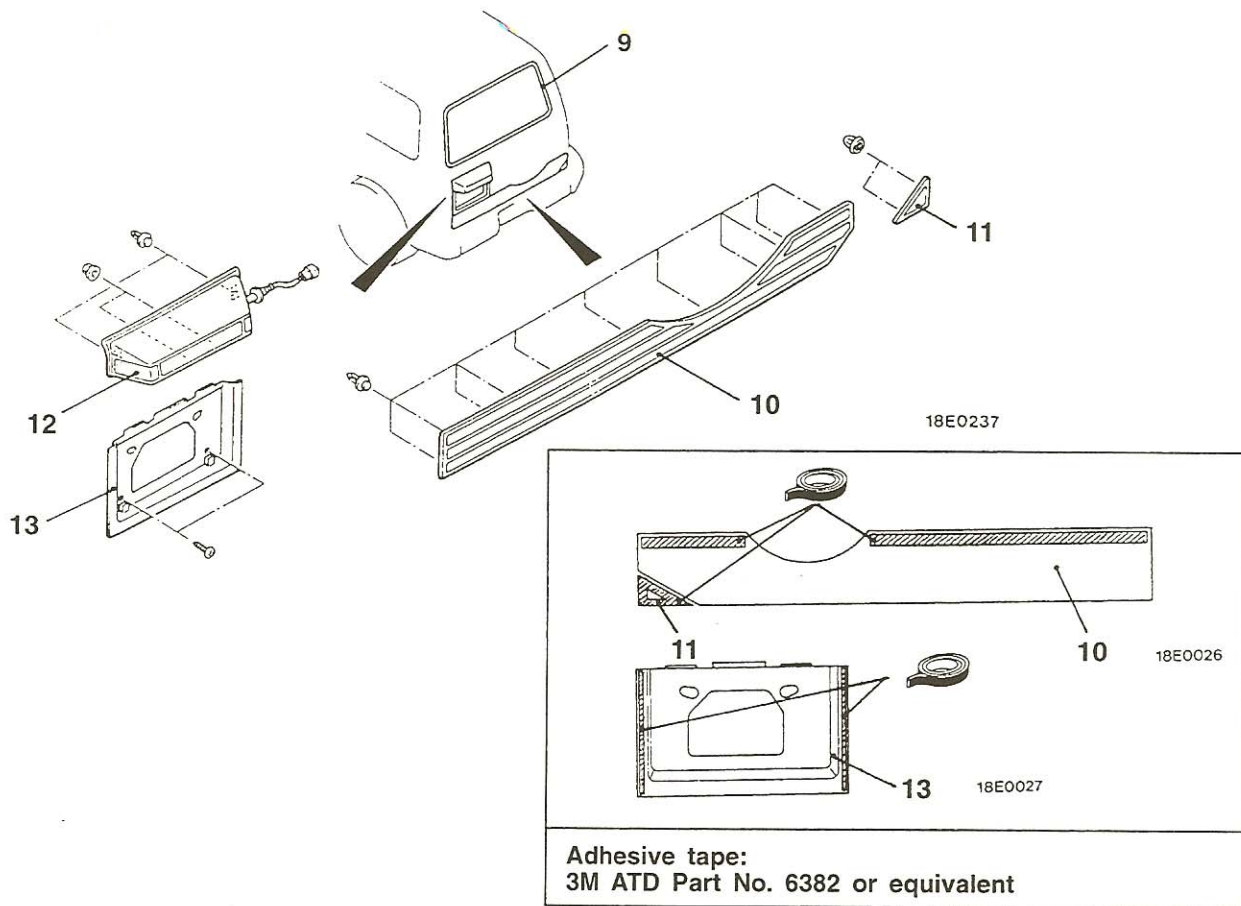


1. Windshield side moulding [Refer to GROUP 42 – Windshield.]
2. Windshield upper moulding [Refer to GROUP 42 – Windshield.]
3. Windshield lower moulding [Refer to GROUP 42 – Windshield.]
4. Belt line moulding [Refer to GROUP 42 – Window Glass Run-channel and Door Opening Weatherstrip.]
5. Drip moulding

Removal steps of front deck garnish

- Hood [Refer to GROUP 42 – Hood.]
- 6. Wiper arm assembly
- 7. Front deck garnish
- 8. Air intake garnish

TSB Revision



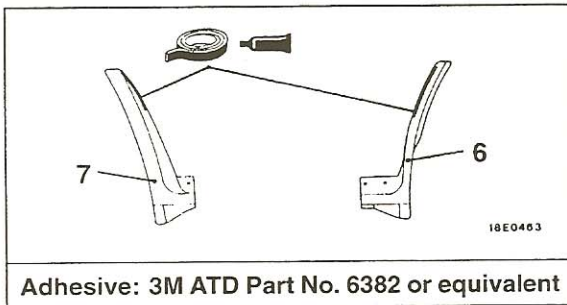
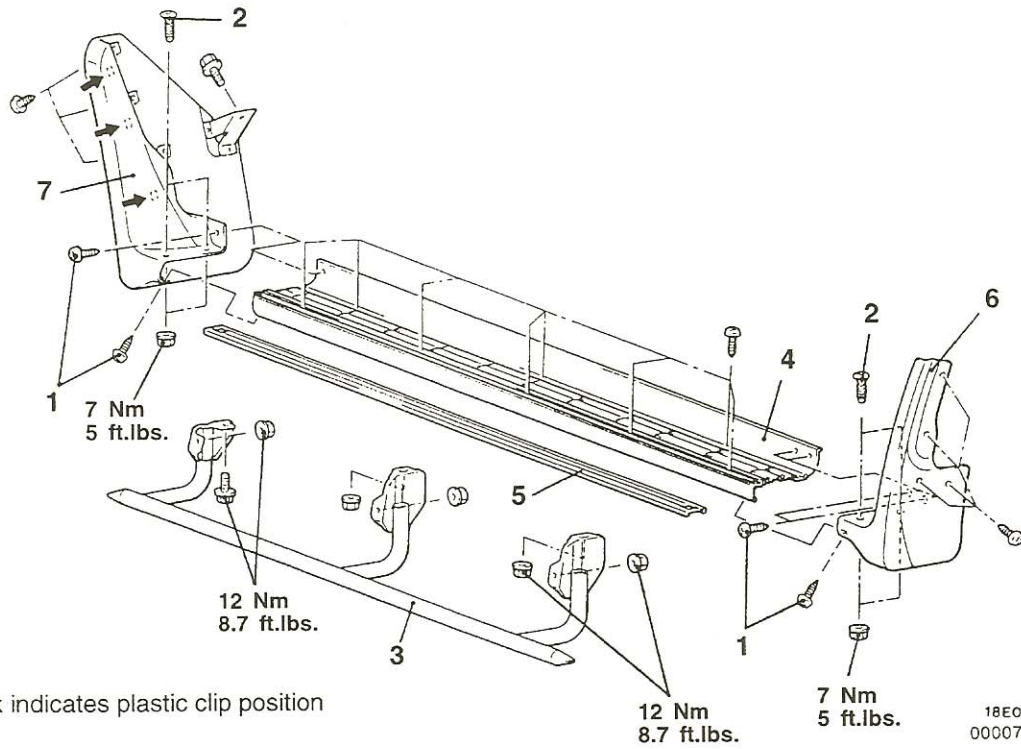
00001952

- 9. Back door window glass moulding
[Refer to GROUP 42 – Back Door Window Glass.]
- 10. Back door lower garnish
- 11. Back door corner garnish

- License light garnish removal steps**
- Back door trim
[Refer to GROUP 42 – Back Door Trim and Waterproof Film.]
 - 12. License light garnish
 - 13. License plate garnish

SIDE STEP

REMOVAL AND INSTALLATION



Removal steps

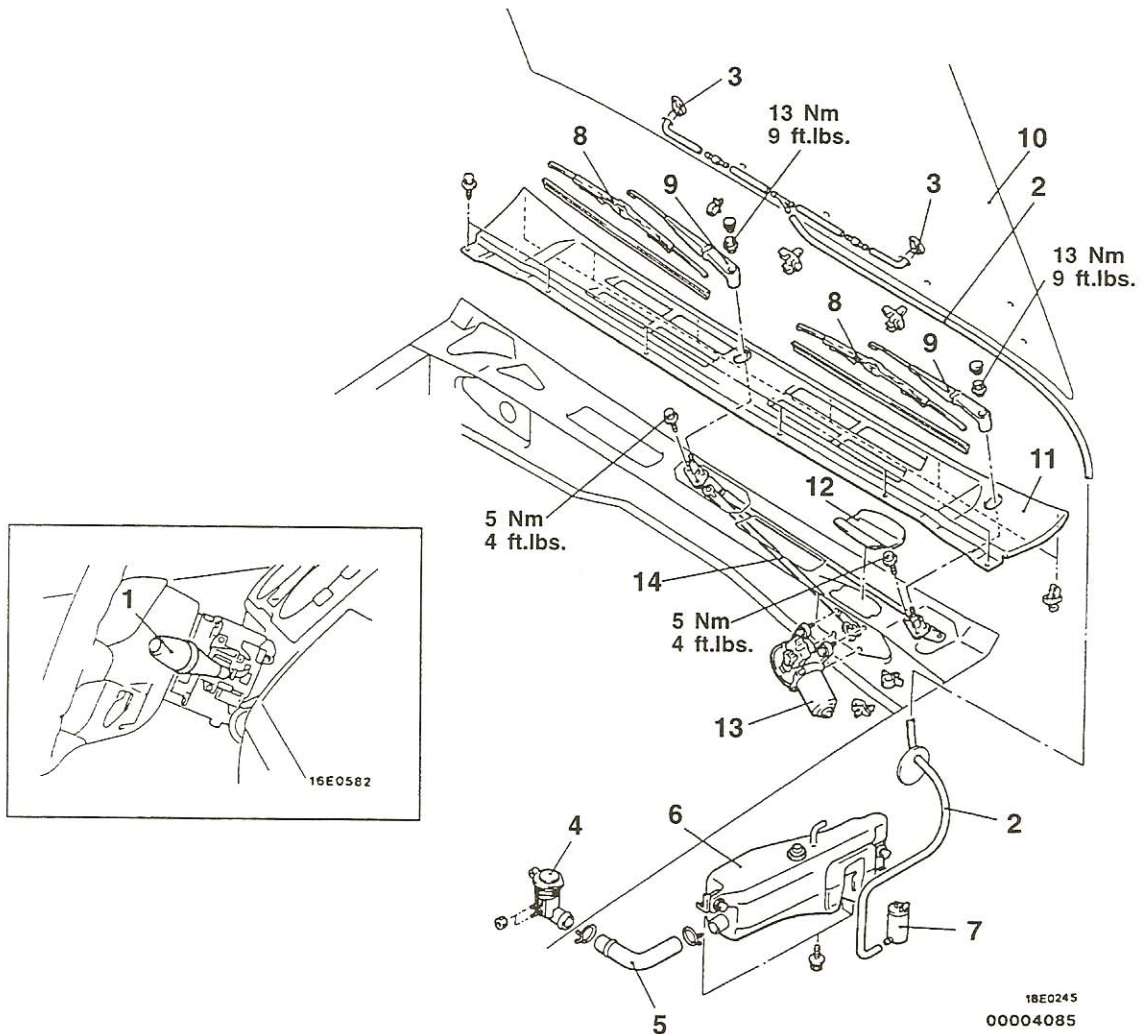
1. Screw
2. Bolt
3. Side step pipe assembly
4. Step plate

5. Non slip cover
6. Rear step cover
7. Front mud guard

WINDSHIELD WIPER AND WASHER

51100760015

REMOVAL AND INSTALLATION



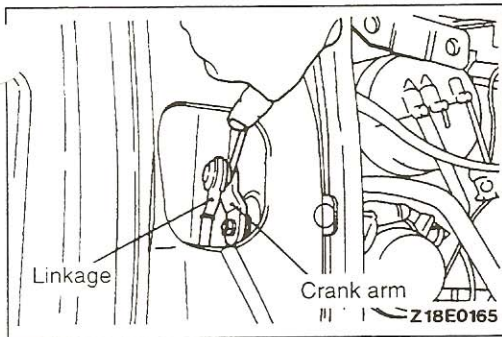
- ◀A▶ 1. Wiper and washer switch (Refer to P.51-14.)
- ▶A▶ 2. Washer tube
- ▶A▶ 3. Washer nozzle
- ▶A▶ 8. Wiper blade
- ▶A▶ 9. Wiper arm
- ▶A▶ 13. Wiper motor

Washer tank removal steps

- Splash shield (Refer to GROUP 42 – Fender.)
- Washer fluid draining
- 2. Washer tube
- 4. Cap
- 5. Hose
- 6. Washer tank assembly
- 7. Washer motor

- Linkage removal steps**
- ▶A▶ 9. Wiper arm
 - ▶A▶ 10. Hood
 - ▶A▶ 11. Front deck garnish
 - ▶A▶ 12. Hole cover
 - ▶A▶ 13. Wiper motor
 - ▶A▶ 14. Linkage

TSB Revision



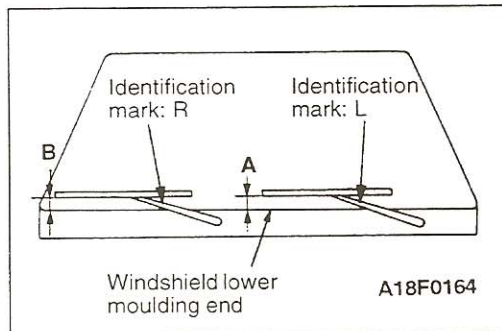
REMOVAL SERVICE POINT

◀A▶ WIPER MOTOR REMOVAL

Loosen the wiper motor assembly mounting bolts, and then remove the wiper motor assembly. Disconnect the linkage and the motor assembly, and then remove the linkage.

Caution

Because the installation angle of the crank arm and the motor has been set, do not remove them unless it is necessary to do so. If they must be removed, remove them only after marking their mounting positions.



INSTALLATION SERVICE POINT

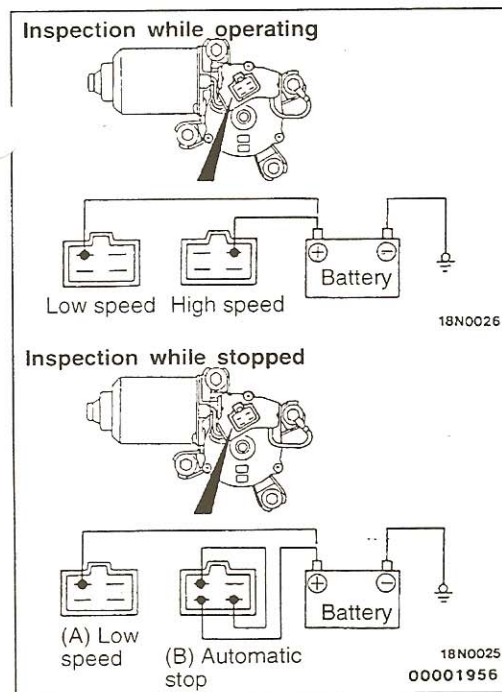
▶A◀ WIPER ARM/WIPER BLADE INSTALLATION

- (1) The movements of the left and right wiper arms are different, so check the identification marks.
- (2) Install the wiper blade in the specified position (standard value) as shown the illustration.

Standard value

(A): 25–35 mm (.98–1.38 in.)

(B): 35–45 mm (1.38–1.77 in.)



INSPECTION

51100770042

WIPER MOTOR

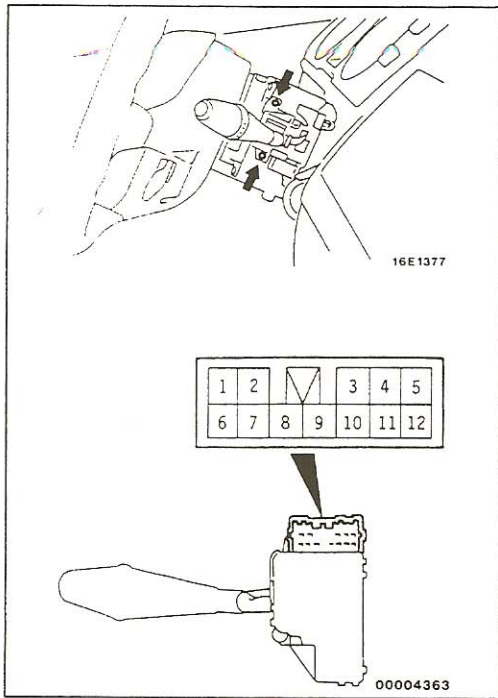
Check the wiper motor the wiring harness connector disconnected and with the wiper motor remaining installed to the body.

Wiper Motor at low speed and at high Speed Operation

Connect a battery to the wiper motor as shown in the illustration and inspect the motor operation at low speed and at high speed.

Wiper Motor at Stop Position Operation

- (1) Run the wiper motor at low speed, disconnect the battery, and stop the motor.
- (2) Reconnect the battery as shown in the illustration, and confirm that after the motor starts operating at low speed, it stops at the automatic stop position.



COLUMN SWITCH

Wiper and Washer Switch

- (1) Remove the column cover lower.
- (2) Remove the column cover upper.
- (3) Loosen the screw indicated by the arrow in the illustration, and then remove the wiper and washer switch.
- (4) Operate the switch and check the continuity between the terminals.

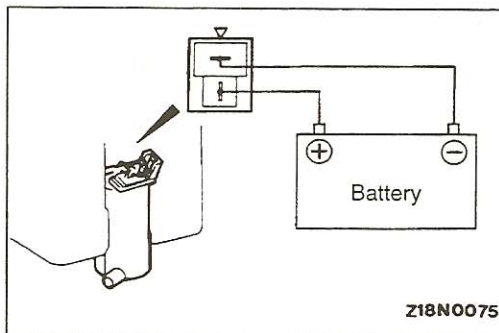
Switch position		Terminal				
		6	7	8	9	10
Wiper switch	OFF		○	○		
	1 (LO)			○		○
	2 (HI)				○	○
Washer switch	ON	○				○

Intermittent Wiper Relay (Intermittent Operation Inspection)

- (1) Connect the column switch connector.
- (2) Turn the ignition switch to ACC.
- (3) Inspect the intermittent operation time when the wiper switch is turned to INT.

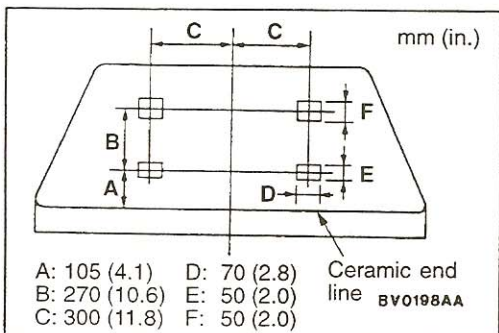
Vehicles without variable intermittent control approx. 3–6 seconds

Vehicles with variable intermittent control
FAST Approx. 3 seconds
SLOW Approx. 12 seconds



WASHER MOTOR

- (1) With the washer motor installed to the washer tank, fill the washer tank with water.
- (2) When the battery is connected as shown in the illustration, check that the water squirts out strongly.

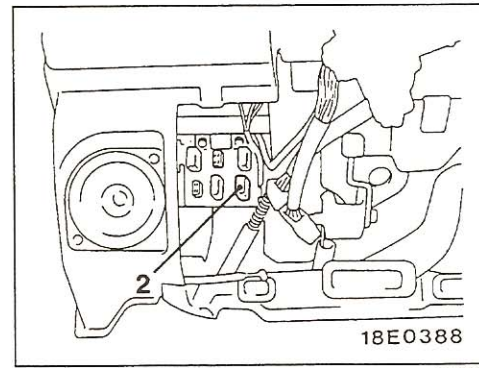
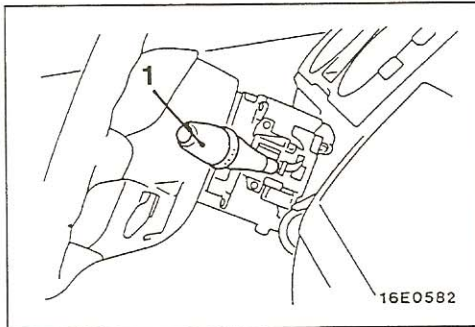
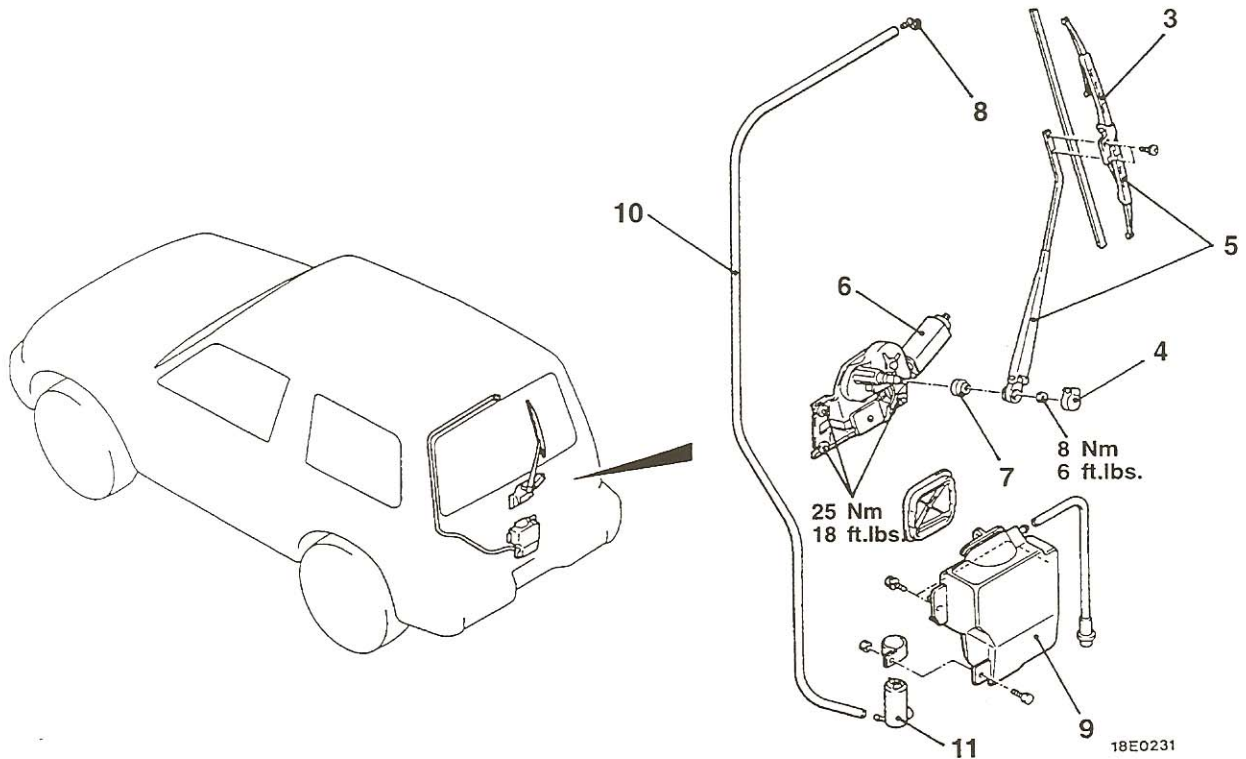


WASHER FLUID EJECTION POINTS CHECK

Adjust the ejection angle by moving the ball inside the nozzle.

REAR WIPER AND WASHER

REMOVAL AND INSTALLATION



- 1. Rear wiper and washer switch (Refer to P.51-16.)
- 3. Wiper blade
- 8. Washer nozzle

Rear intermittent wiper relay removal steps

- Instrument under cover (Refer to GROUP 52A – Instrument Panel.)
- 2. Rear intermittent wiper relay

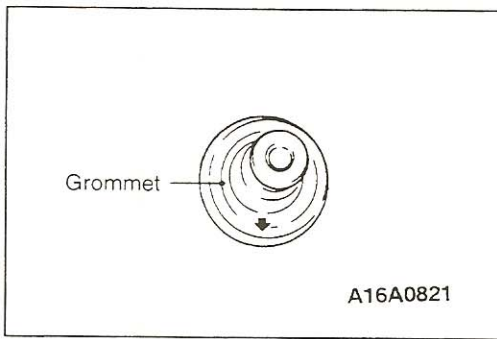
Wiper motor removal steps

- ▶B◀ 4. Cover
- 5. Wiper arm and blade assembly

- Back door trim (Refer to GROUP 42 – Back Door Trim and Waterproof Film.)
- ▶A◀ 6. Wiper motor and bracket assembly
- 7. Grommet

Washer tank and motor removal steps

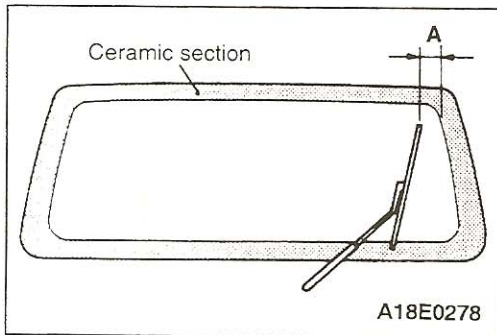
- Back door trim (Refer to GROUP 42 – Back Door Trim and Waterproof Film.)
- 9. Washer tank assembly
- Washer fluid draining
- 10. Washer tube
- 11. Washer motor



INSTALLATION SERVICE POINTS

▶A◀ GROMMET INSTALLATION

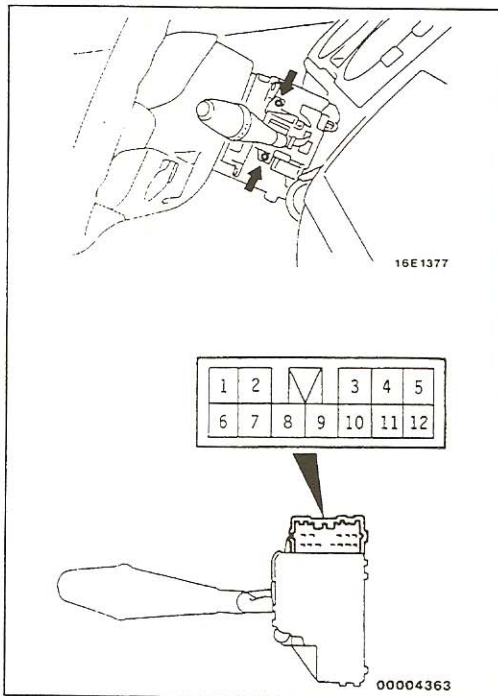
Install the grommet so that the arrow points downwards.



▶B◀ WIPER ARM AND BLADE ASSEMBLY INSTALLATION

Install the wiper blade so that the tip stops at the standard position (standard value).

Standard value (A): 65–75 mm (2.56–2.95 in.)



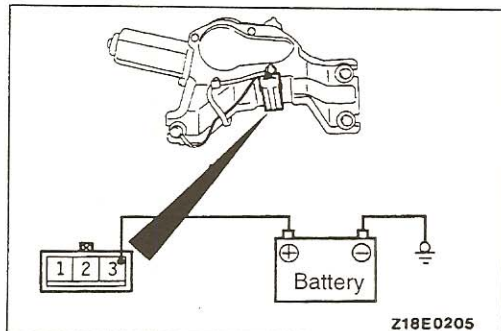
INSPECTION

51100860022

REAR WIPER AND WASHER SWITCH

- (1) Remove the column cover lower.
- (2) Remove the column cover upper.
- (3) Loosen the screw indicated by the arrow in the illustration, and then remove the rear wiper and washer switch.
- (4) Operate the switch and check the continuity between the terminals.

Switch position		Terminal			
		2	3	4	10
Wiper switch	OFF				
	INT		○		○
	ON			○	○
Washer switch	ON	○			○

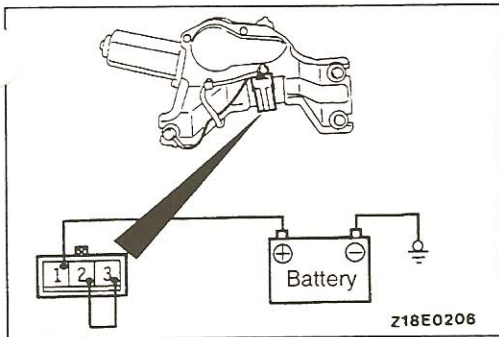


WIPER MOTOR

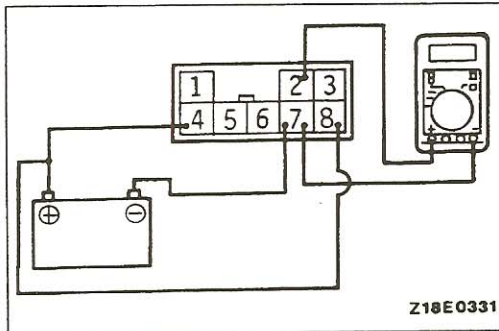
Disconnect the wiring harness connector, and then check the wiper motor with it installed to the body.

Wiper Motor Operation

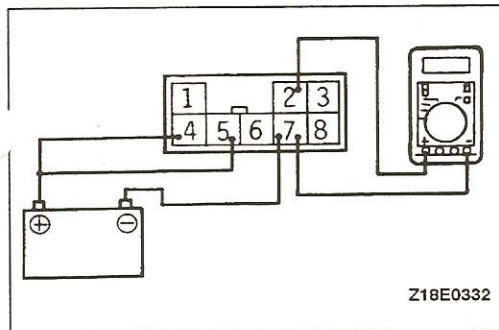
Connect a battery to the wiper motor as shown in the illustration and inspect the motor operation.

**Wiper Motor at Stop Position Operation**

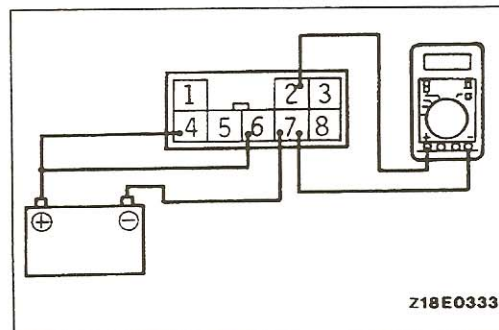
- (1) Run the wiper motor, disconnect the battery, and stop the motor.
- (2) Reconnect the battery as shown in the illustration, and confirm that after the motor starts operating, it stops at the automatic stop position.

**REAR INTERMITTENT WIPER RELAY****1. REAR WIPER AND WASHER FUNCTION CHECK**

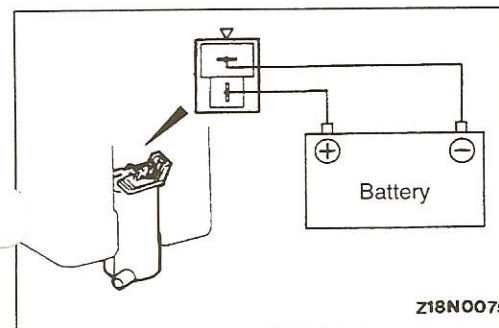
- (1) Connect the (+) terminal of the voltmeter to terminal (2) and the (-) terminal to terminal (7).
- (2) Check that battery voltage shows when the battery (+) terminal is connected to terminal (4), (8) and the battery (-) terminal is connected to terminal (7).

**2. REAR INTERMITTENT WIPER FUNCTION CHECK**

- (1) Connect the (+) terminal of the voltmeter to terminal (2) and the (-) terminal to terminal (7).
- (2) Check that battery voltage shows at approximately 8-second intervals when the positive battery terminal is connected to terminals (4) and (5) and the negative battery terminal is connected to terminal (7).

**3. REAR WIPER ON-FUNCTION CHECK**

- (1) Connect the (+) terminal of the voltmeter to terminal (2) and the (-) terminal to terminal (7).
- (2) Check the battery voltage shows when the battery (+) terminal is connected to terminal (4), (6) and the battery (-) terminal is connected to terminal (7).

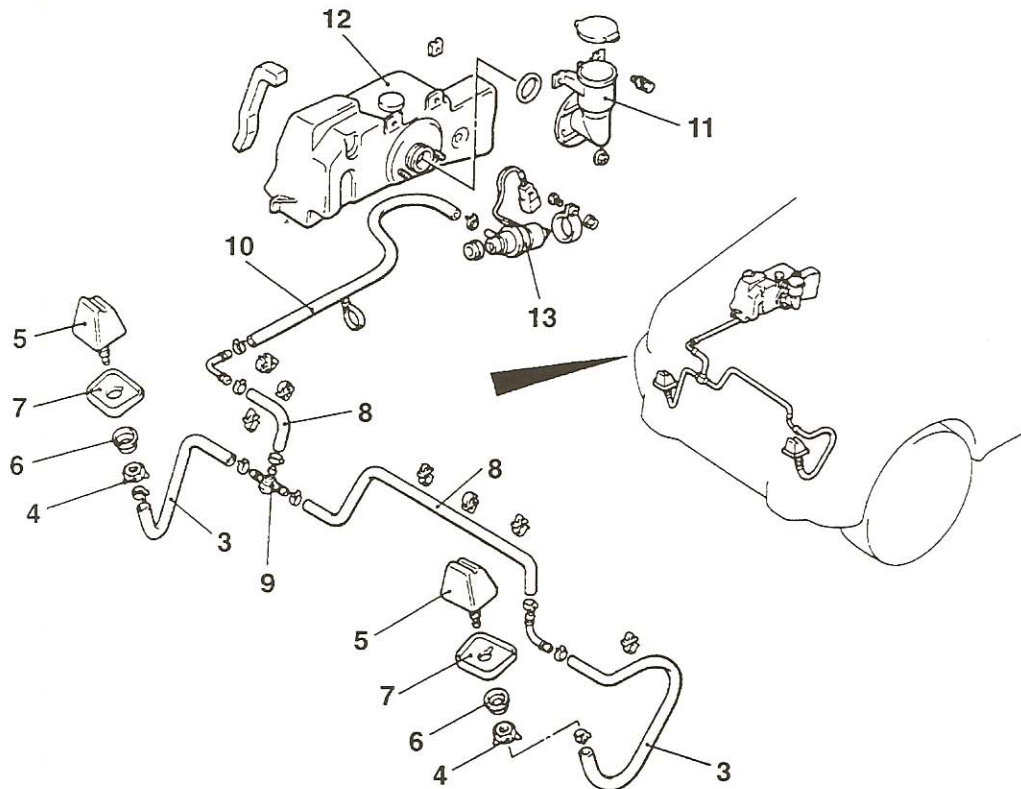
**WASHER MOTOR**

- (1) With the washer motor installed to the washer tank, fill the washer tank with water.
- (2) When the battery is connected as shown in the illustration, check that the water squirts out strongly.

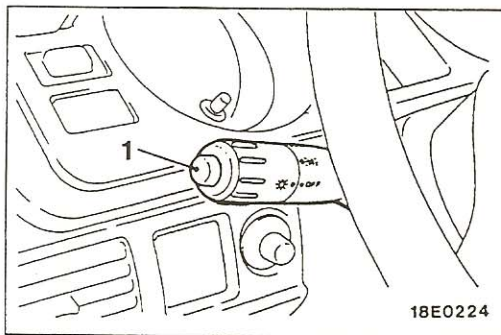
HEADLIGHT WASHER

5110097014

REMOVAL AND INSTALLATION



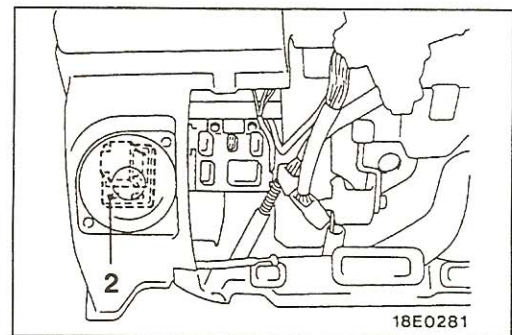
18E0279

**Headlight washer switch removal**

1. Headlight washer switch
(Refer to P.51-19.)

Nozzle and check valve removal steps

- Front bumper (Refer to P.51-7.)
- Washer fluid draining
- 3. Washer hose
- 4. Nut
- 5. Nozzle
- 6. Collar
- 7. Nozzle base
- 8. Washer hose
- 9. Check valve



00001961

Headlight washer relay removal steps

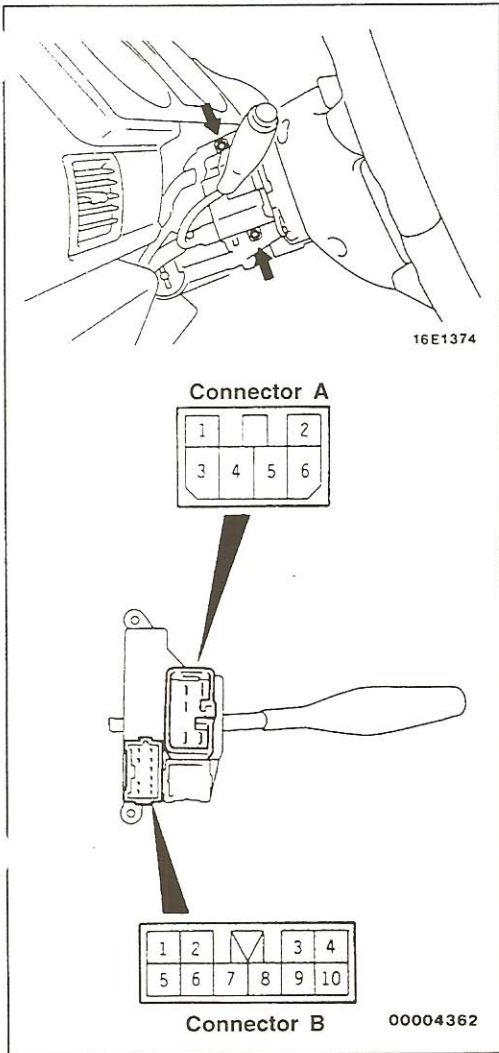
- Instrument under cover (Refer to GROUP 52A – Instrument Panel.)
2. Headlight washer relay

Washer tank removal steps

- Splash shield [RH]
(Refer to GROUP 42 – Fender.)
- Front combination light (Refer to GROUP 54 – Lighting System.)
- Washer fluid draining
- 10. Washer hose
- 11. Cap
- 12. Washer tank assembly
- 13. Washer motor

TSB Revision

51100980032



INSPECTION

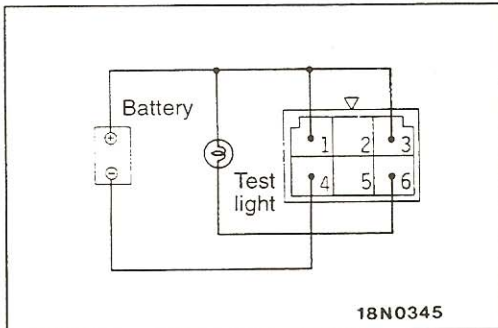
HEADLIGHT WASHER SWITCH

- (1) Remove the column cover lower.
- (2) Remove the column cover upper.
- (3) Loosen the screw indicated by the arrow in the illustration, and then remove the headlight washer switch.
- (4) Disconnect the column switch connector and check the continuity between the terminals for each switch.

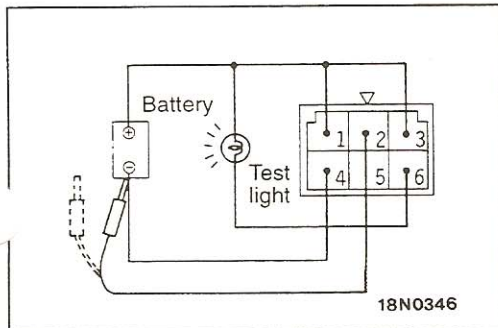
Switch position	Connector A terminal	Connector B terminal
	1	2
OFF		
ON	○ ————— ○	

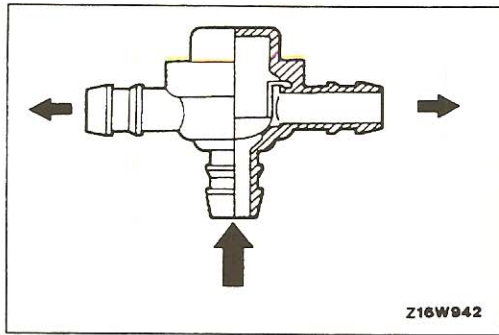
HEADLIGHT WASHER RELAY

- (1) Connect the battery and test light to the relay as shown in the illustration.



- (2) The relay is normal if the light illuminates for approximately 0.3 second upon connection of terminal (2) to the negative battery terminal.

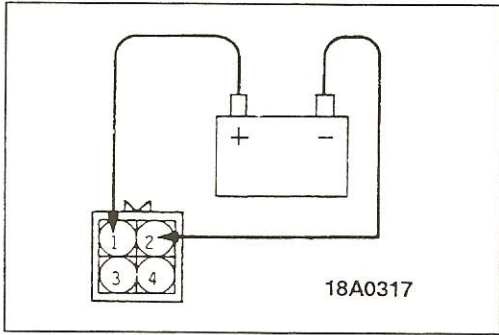




CHECK VALVE

Apply pressure to the inlet of the check valve to check opening pressure.

Opening pressure: 50–110 kPa (7.1–15.6 psi)

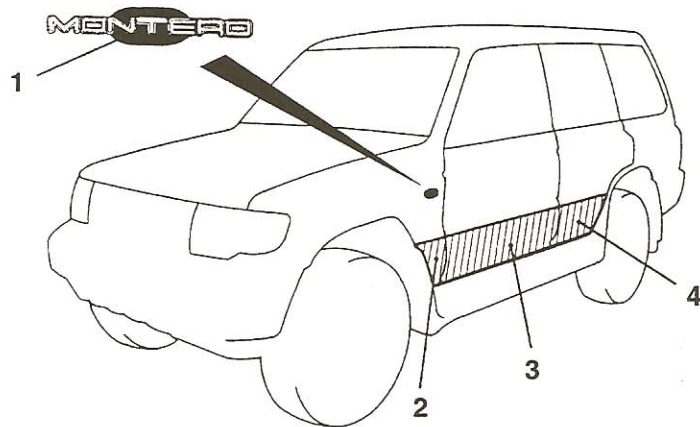


HEADLIGHT WASHER MOTOR

- (1) With the washer motor installed to the washer tank, fill the washer tank with water.
- (2) Connect the positive battery cable to terminal (2) and the negative battery cable to terminal (1), and then check that the washer motor runs and water is injected.

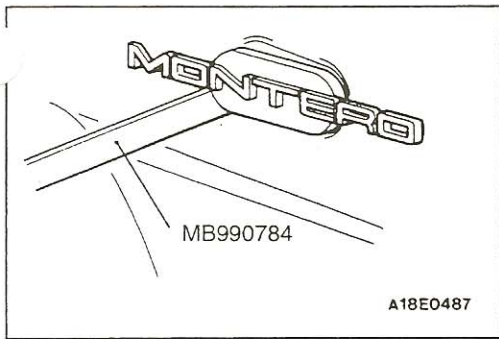
**MARK AND STRIPES
REMOVAL AND INSTALLATION**

5110110141



- ◀A▶ ▶B▶ 1. MONTERO mark
- ▶A▶ 2. Fender stripe
- ▶A▶ 3. Front door stripe
- ▶A▶ 4. Rear door stripe

TSB Revision



REMOVAL SERVICE POINT

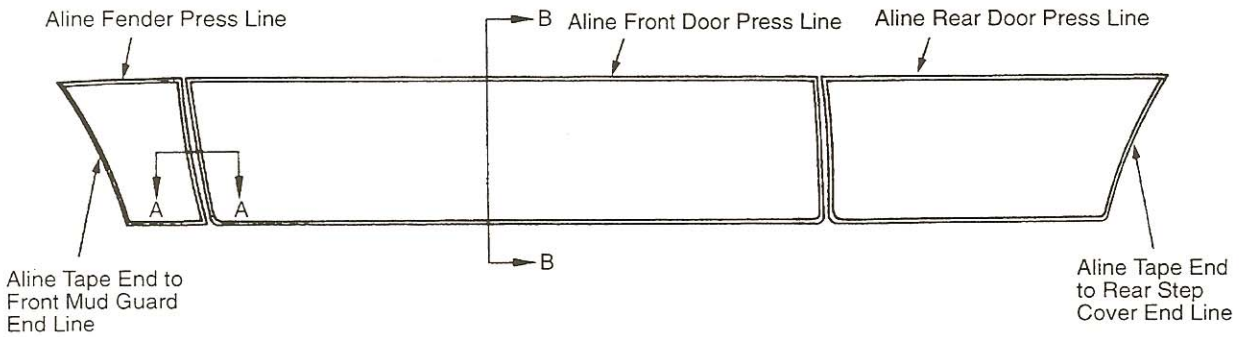
◀A▶ MONTERO MARK REMOVAL

INSTALLATION SERVICE POINT

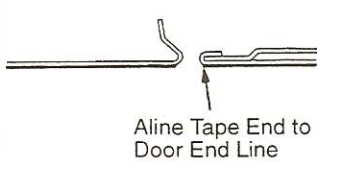
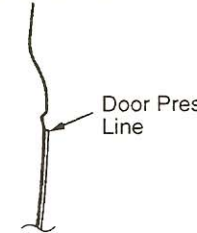
▶A◀ STRIPES INSTALLATION

1. Installation position
Attach to the position shown in the illustration.

STRIPE TAPE



18E0483

SECTION A – A	SECTION B – B
 <p>Aline Tape End to Door End Line</p> <p>18E0477</p>	 <p>Door Press Line</p> <p>18E0485</p>

00007124

2. Install the tape by the following procedure.

- (1) Use unleaded gasoline to wipe off oil from stripe :
adhesion area.
- (2) Remove protective paper from back of stripe tape and adhere entirely to indicated area.

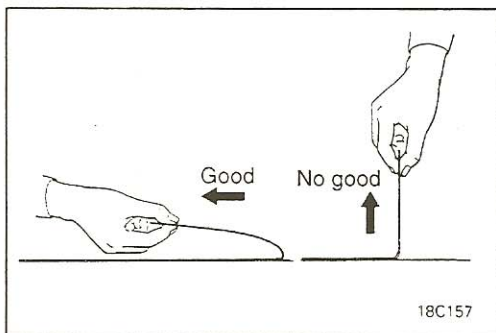
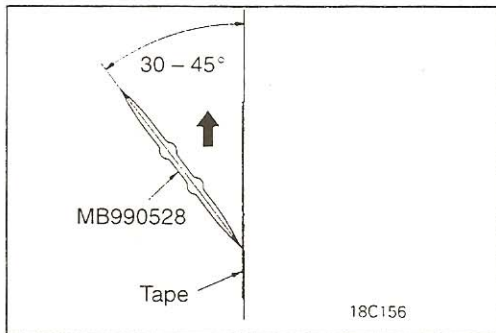
Caution

- Work in a dust-free workplace with temperature at 20 – 38°C (68 – 100°F).
- If workplace temperature is under 20°C (68°F), warm tape and vehicle body (adhesion area) to 20 – 38°C (68 – 100°F).

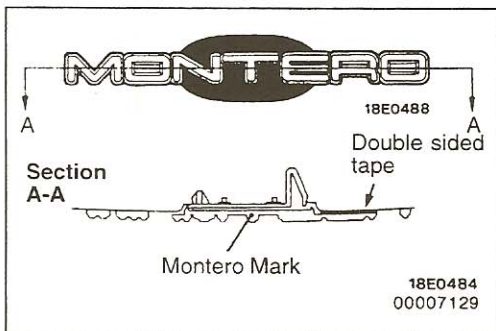
- (3) Use special tool and smooth out tape evenly starting from center of tape and up and then down to press out bubbles.

Caution

- Smoothing out horizontally will cause wrinkles and may displace the tape.
- Adhere tape securely to prevent tape from peeling off.



- (4) Hold one end of top protective paper and slowly peel off horizontally.
- (5) If bubbles are left under the tape, pierce slightly with needle and press out air with a spatula.

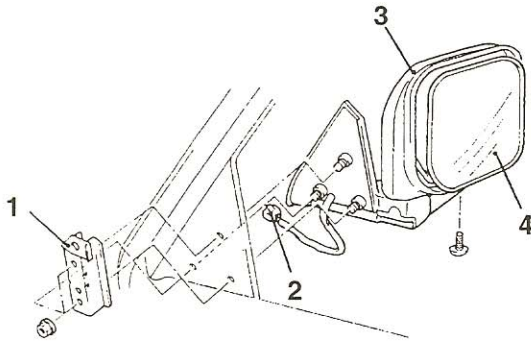


►B◄ MONTERO MARK INSTALLATION

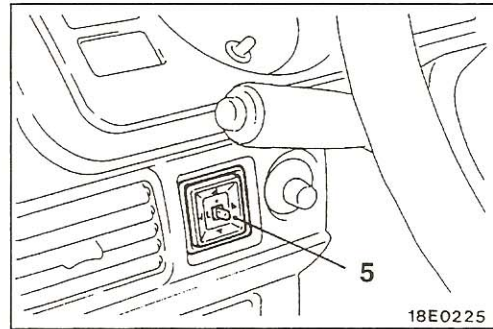
Attach double-sided tape to the mark in the place shown in the illustration so that the mark will not lift up.

DOOR MIRROR

REMOVAL AND INSTALLATION



18E0171



18E0225

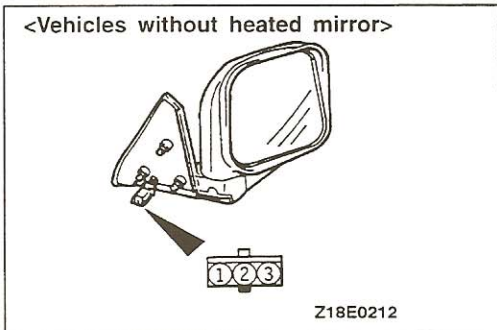
00007125

Door mirror removal steps

- Door speaker (Refer to GROUP 54 – Speaker.)
- 1. Inner cover bracket
- 2. Harness connector
- 3. Door mirror
- 4. Mirror

Remote controlled mirror switch removal

- 5. Remote controlled mirror switch

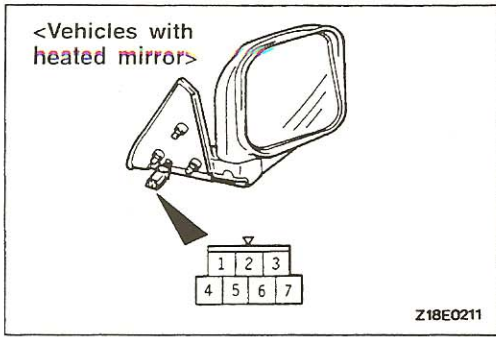


INSPECTION

REMOTE CONTROLLED MIRROR ASSEMBLY
 <Vehicles without heated mirror>

Check that the mirror moves as described in the table when each terminal is connected to the battery.

Battery connection terminals			Mirror operation
1	2	3	
⊖	-----	----- ⊕	Up
⊕	-----	----- ⊖	Down
⊕	----- ⊖		Left
⊖	----- ⊕		Right

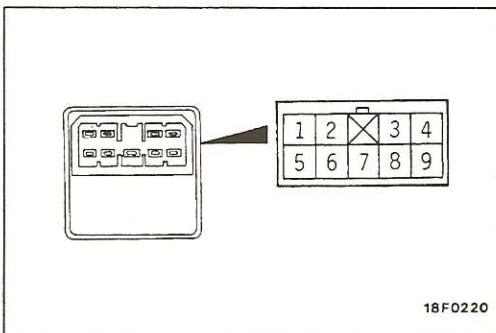


<Vehicles with heated mirror>

1. Check to be sure that the mirror moves as described in the table when each terminal is connected to the battery.

Battery connection terminals			Mirror operation
5	6	7	
⊖	-----	----- ⊕	Up
⊕	-----	----- ⊖	Down
⊕	----- ⊖		Left
⊖	----- ⊕		Right

2. Check if there is continuity between terminals (1) and (4).



REMOTE CONTROLLED MIRROR SWITCH

51100710013

Operate the switch and check the continuity between the terminals.

Direction	Left side					Right side				
	Terminal									
	3	4	6	7	8	2	4	6	7	9
UP		○	○	○	○	○	○	○	○	
DOWN		○	○	○	○	○	○	○	○	
LEFT	○	○	○	○			○	○	○	○
RIGHT	○	○	○	○			○	○	○	○

INTERIOR AND SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

CONTENTS

52109000101

INTERIOR	52A
SUPPLEMENTAL RESTRAINT SYSTEM (SRS)	52B



NOTES

INTERIOR

CONTENTS

52109000439

FLOOR CONSOLE*	5	SECOND SEAT	15
FRONT SEAT	10	SECOND SEAT BELT	21
FRONT SEAT BELT	19	THIRD SEAT	17
HEADLINING	9	THIRD SEAT BELT	22
INSTRUMENT PANEL*	2	TRIMS	7

WARNINGS REGARDING SERVICING OF SUPPLEMENTAL RESTRAINT SYSTEM (SRS) EQUIPPED VEHICLES

WARNING!

- (1) Improper service or maintenance of any component of the SRS, or any SRS-related component, can lead to personal injury or death to service personnel (from inadvertent firing of the air bag) or to the driver (from rendering the SRS inoperative).
- (2) Service or maintenance of any SRS component or SRS-related component must be performed only at an authorized MITSUBISHI dealer.
- (3) MITSUBISHI dealer personnel must thoroughly review this manual, and especially its GROUP 52B – Supplemental Restraint System (SRS) and GROUP 00 – Maintenance Service before beginning any service or maintenance of any component of the SRS or any SRS-related component.











NOTE

The SRS includes the following components: SRS diagnosis unit, SRS warning light, 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 (*).

INSTRUMENT PANEL

52100170000

The bolts and screws described below are used for installing the instrument panel. They are indicated by symbols in the illustration.

Name	Symbol	Size (D×L) mm (in.)	Color	Shape
Tapping screw	A	5×12 (.20×.47)	–	 19Z0004
	B	5×12 (.20×.47)	Black	
	C	5×16 (.20×.62)	–	
	D	5×16 (.20×.62)	Black	
	E	5×20 (.20×.79)	Black	 19Z0003
	F	5×12 (.20×.47)	–	 19Z0022
	G	5×20 (.20×.79)	–	
Washer assembled screw	H	5×12 (.20×.47)	–	 19Z0006
	I	5×16 (.20×.62)	–	
	J	5×16 (.20×.62)	–	 19Z003C
	K	5×20 (.20×.79)	Black	
Washer assembled bolt	L	6×20 (.24×.79)	–	 19Z0019
	M	6×20 (.24×.79)	–	 19Z0029
	N	8×20 (.31×.79)	–	
Cap installed screw	O	5×16 (.20×.62)	–	 19Z0018
Nut	P	6 (.24)	–	 19Z0021
	Q	6 (.24)	–	 19Z0028

D = Thread diameter

L = Effective thread length

TSB Revision

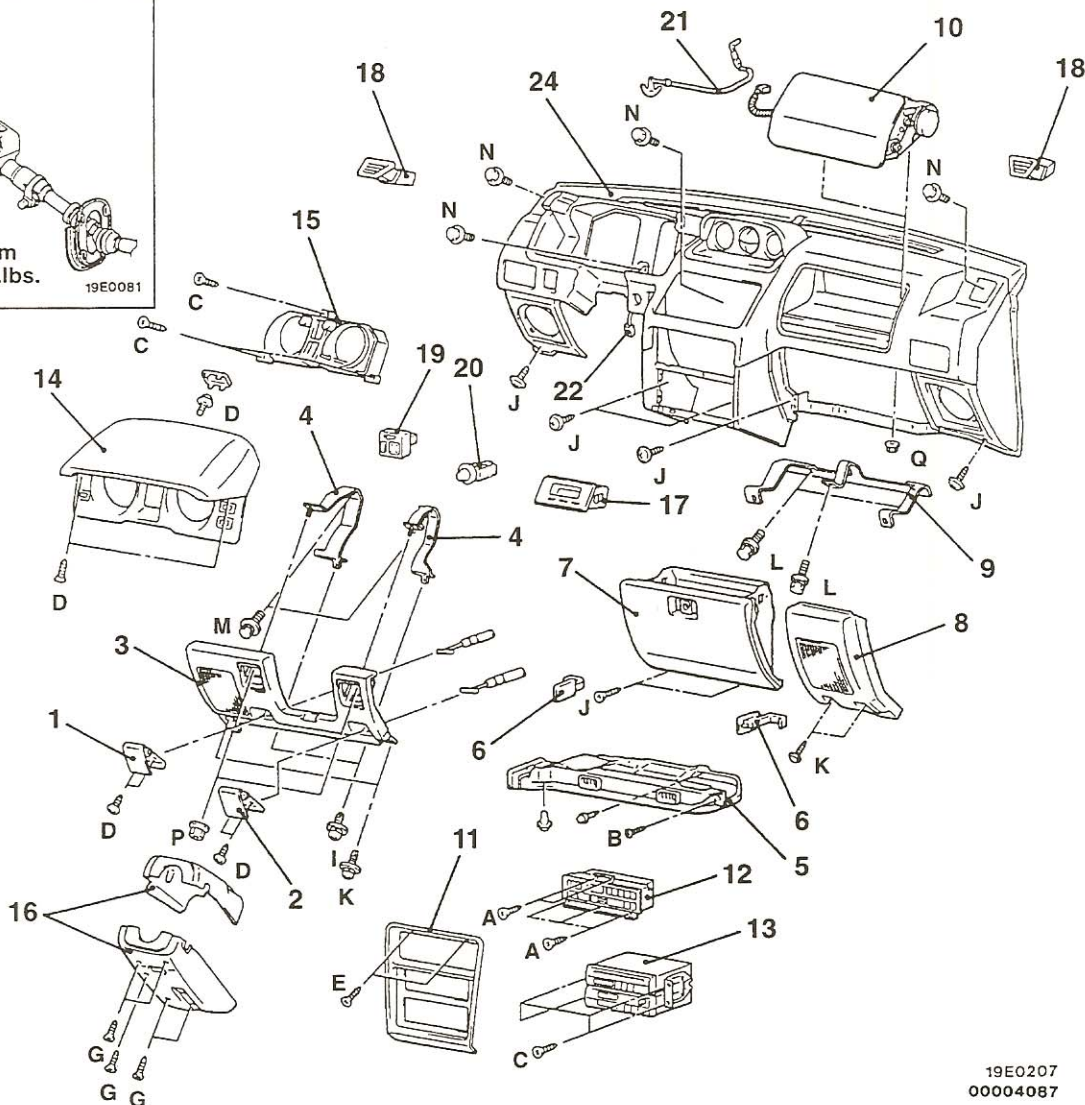
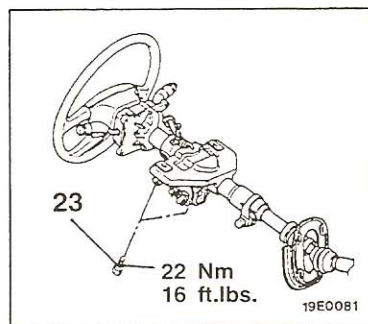
REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation

- Floor Console Assembly Removal and Installation (Refer to P.52A-5.)

CAUTION: SRS

- (1) When removing and installing the floor console (vehicles equipped with SRS), do not let it bump against the SRS diagnostic unit.
- (2) For the passenger side air bag module removal/installation, always observe the service procedures of GROUP 52B – Air Bag Modules and Clock Spring.

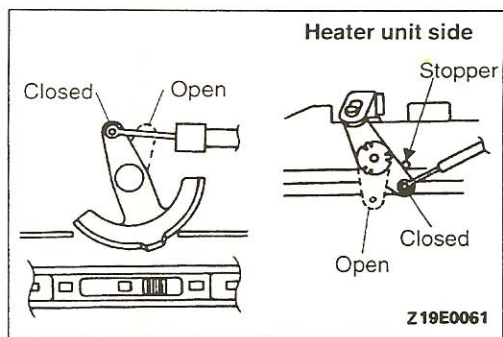


19E0207
00004087

Removal steps

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Hood lock release handle 2. Fuel filler door lock release handle 3. Knee protector 4. Stay 5. Foot shower duct (R.H.) 6. Glove box stopper 7. Glove box assembly 8. Corner cover 9. Stay 10. Passenger-side air bag module assembly 11. Center panel 12. Heater control assembly | <ol style="list-style-type: none"> 13. Radio and tape player 14. Meter bezel assembly 15. Combination meter 16. Column cover 17. Clock 18. Side defroster garnish 19. Door mirror control switch 20. Rheostat ▶A◀ 21. Ventilation control wire 22. Harness connector 23. Steering column installation bolts 24. Instrument panel assembly |
|--|---|

TSB Revision



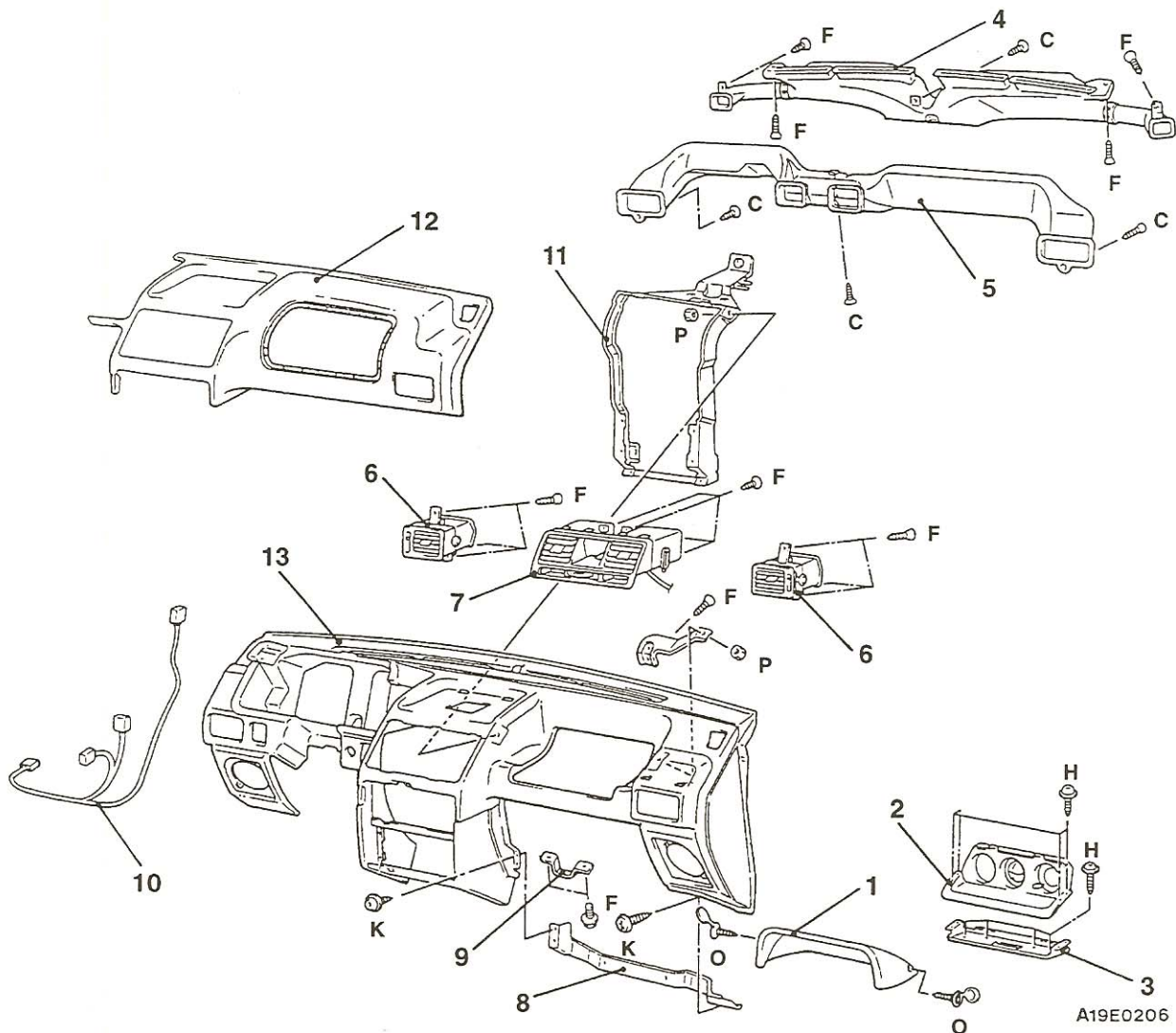
INSTALLATION SERVICE POINT

▶A◀ VENTILATION CONTROL WIRE INSTALLATION

- (1) Set the cool air bypass dial to the closed position.
- (2) Close the cool air bypass lever at the heater unit side (lever is lightly hit against the stopper).
- (3) Install the ventilation control wire and secure it with the clip.

DISASSEMBLY AND REASSEMBLY

52100190074



A19E0206

Disassembly steps

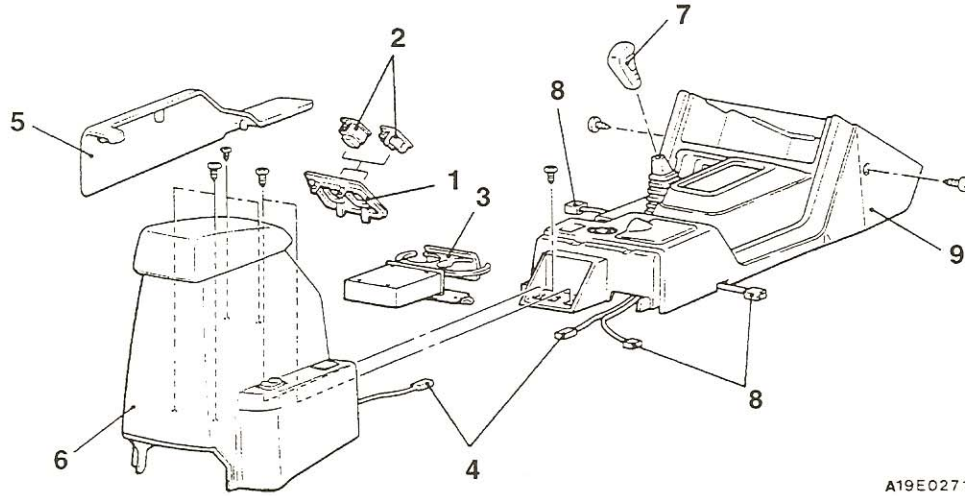
- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Meter hood 2. Multi meter 3. Meter bracket 4. Side defroster duct and defroster nozzle assembly 5. Distribution duct 6. Side air outlet | <ol style="list-style-type: none"> 7. Center air outlet 8. Glove box frame 9. Glove box striker 10. Instrument panel wiring harness 11. Instrument panel reinforcement 12. Instrument panel pad 13. Instrument panel |
|---|---|

TSB Revision

FLOOR CONSOLE

REMOVAL AND INSTALLATION

Caution: SRS
 When removing and installing the floor console assembly, don't allow any impact or shock to the SRS diagnosis unit



A19E0271

Removal steps

1. Switch panel
2. Suspension control switch or hole cover
3. Cup holder assembly
4. Rear console harness connector
5. Side panel A



6. Rear console assembly
7. Transfer shift lever knob
8. Floor console harness connector
9. Front console assembly

REMOVAL SERVICE POINT

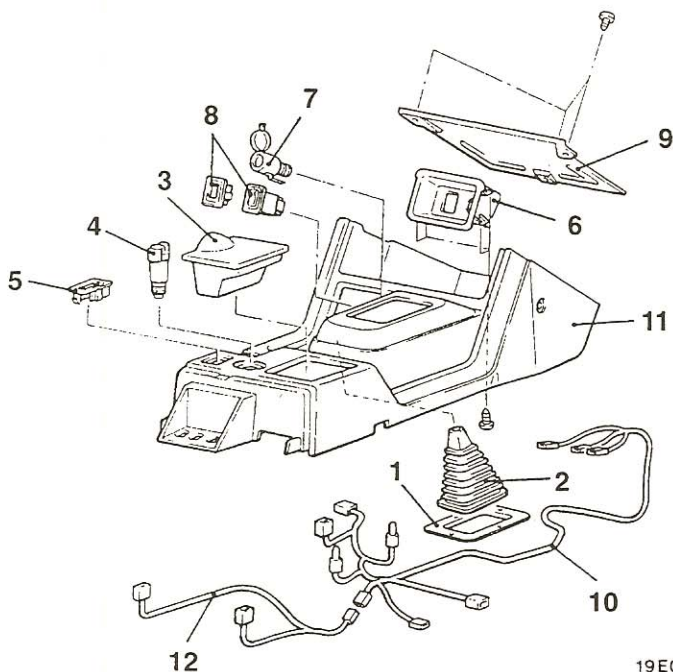
◀A▶ FRONT CONSOLE ASSEMBLY REMOVAL

When removing the A/T front console assembly, set the A/T selector lever to "L".

DISASSEMBLY AND REASSEMBLY

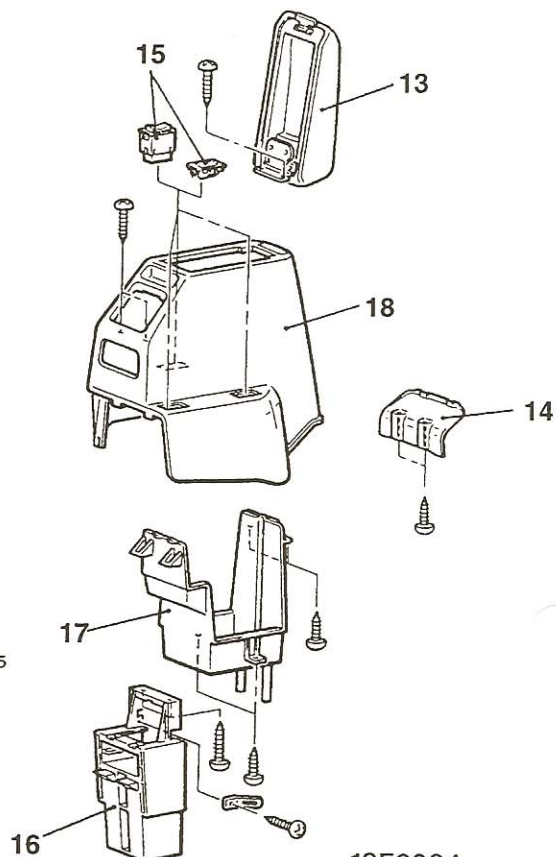
52100240113

<Front console>



19E0085

<Rear console>

19E0264
00007079**Front console assembly
disassembly steps**

1. Boot reinforcement
2. Boot
3. Ashtray
4. Cigarette lighter
5. Hole cover
6. Plate
7. Accessory socket
8. Rear differential lock switch or hole cover
9. Front console cover
10. Floor console wiring harness
11. Front console

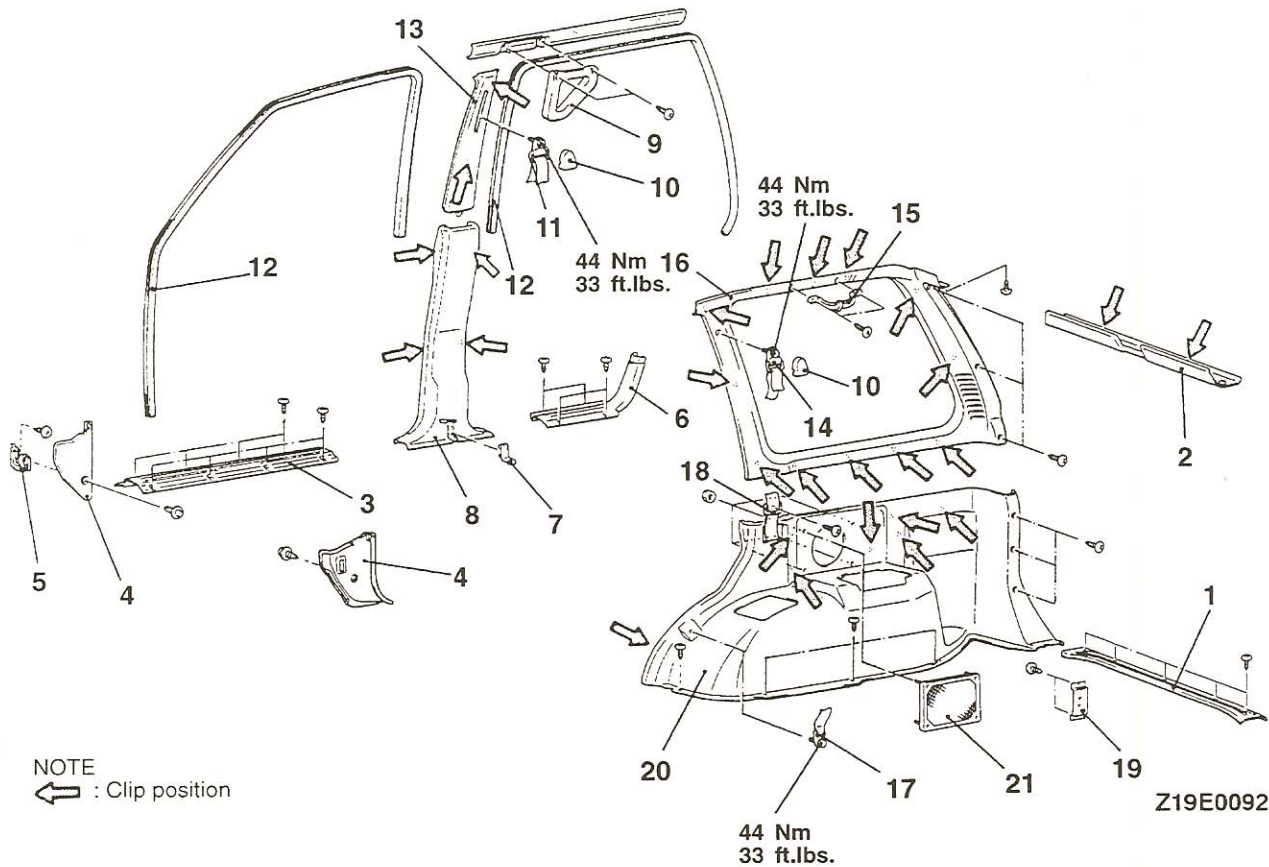
**Rear console assembly
disassembly steps**

12. Rear console wiring harness
13. Lid assembly
14. Rear console cover
15. Switch or hole cover
16. Inner box A
17. Inner box B
18. Rear console

TSB Revision

TRIMS

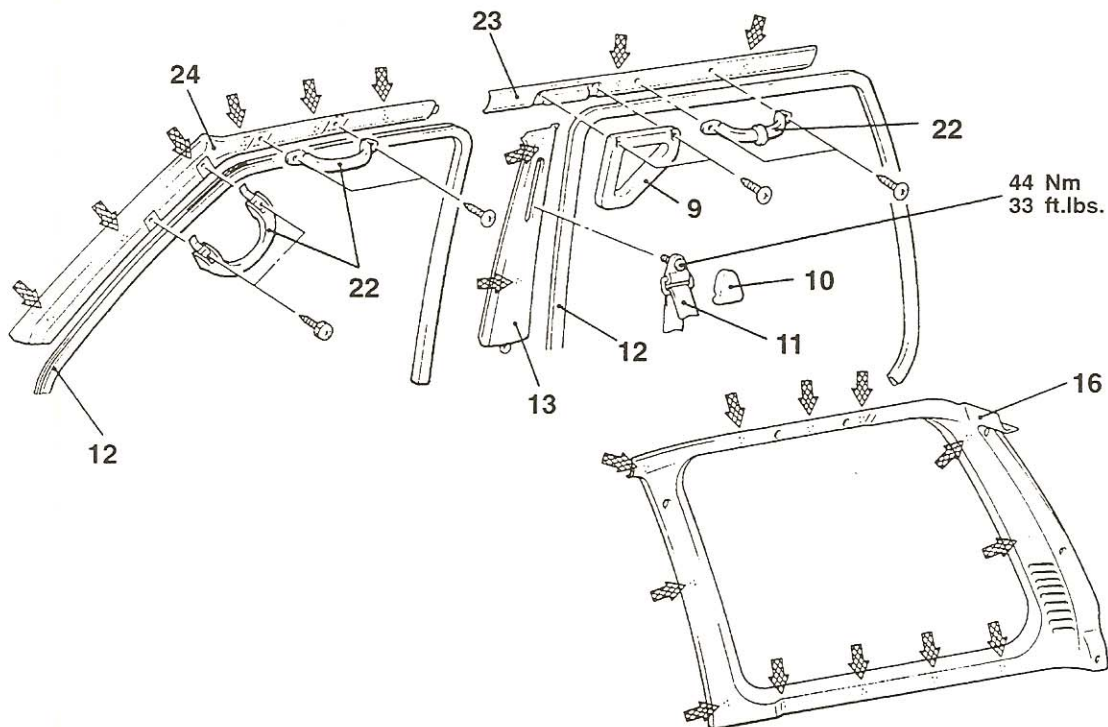
REMOVAL AND INSTALLATION



- 1. Rear trimming plate
 - 2. Rear roof rail trim
- Cowl side trim removal steps**
- 3. Front scuff plate
 - 4. Cowl side trim
 - 5. Cowl side bracket <R.H. side only>

- Center pillar trim removal steps**
- 3. Front scuff plate
 - 6. Rear scuff plate
 - 7. Belt anchor cover
 - 8. Center pillar trim lower
 - 9. Grip
 - 10. Sash guide cover
 - 11. Front seat belt sash guide
 - 12. Door inner opening weatherstrip
 - 13. Center pillar trim upper

- Quarter trim removal steps**
- 2. Rear roof rail trim
 - 10. Sash guide cover
 - 14. Rear seat belt sash guide
 - 15. Assist grip
 - 16. Quarter trim upper
 - 1. Rear trimming plate
 - 17. Rear seat belt anchor plate
 - 18. Rear seat belt garnish
 - 19. Cargo lamp bracket <L.H. side>
 - 20. Quarter trim lower
 - 21. Speaker garnish



NOTE

 : Clip position

A19E0272

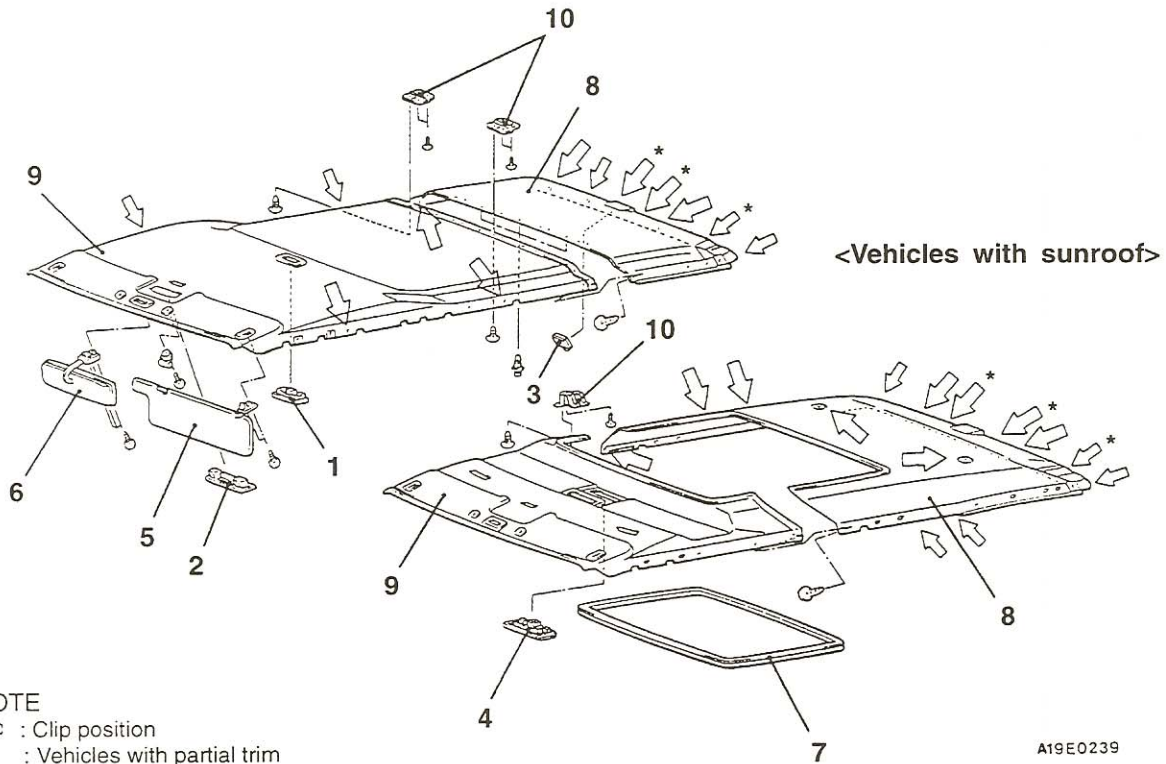
**Front pillar trim, side roof rail trim
removal steps**

9. Grip
10. Sash guide cover
11. Front seat belt sash guide
12. Door inner opening weatherstrip
13. Center pillar trim upper
16. Quarter trim upper
22. Assist grip
23. Side roof rail trim
24. Front pillar trim

HEADLINING

REMOVAL AND INSTALLATION

<Vehicles without sunroof>



NOTE
 ⇄ : Clip position
 * : Vehicles with partial trim

A19E0239

Removal steps <Vehicles without sunroof>

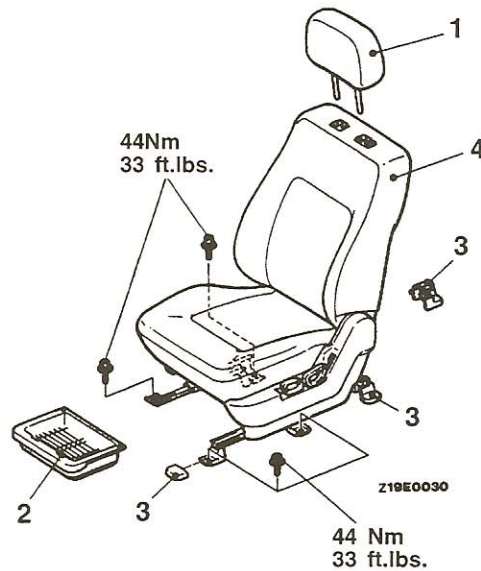
1. Room lamp
2. Map lamp
3. Luggage compartment lamp
5. Sunvisors
6. Inside rear view mirror
- Rear roof rail trim (Refer to P.52A-7.)
- Quarter trim upper (Refer to P.52A-7.)
- Center pillar trim upper (Refer to P.52A-8.)
- Side roof rail trim (Refer to P.52A-8.)
- Front pillar trim (Refer to P.52A-8.)
8. Rear headlining
9. Front headlining
10. Joint bracket

Removal steps <Vehicles with sunroof>

1. Room lamp
2. Map lamp
3. Luggage compartment lamp
4. Sunroof switch
5. Sunvisors
6. Inside rear view mirror
- Rear roof rail trim (Refer to P.52A-7.)
- Quarter trim upper (Refer to P.52A-7.)
- Center pillar trim upper (Refer to P.52A-8.)
- Side roof rail trim (Refer to P.52A-8.)
- Front pillar trim (Refer to P.52A-8.)
7. Headlining trim
8. Rear headlining
9. Front headlining
10. Joint bracket

FRONT SEAT

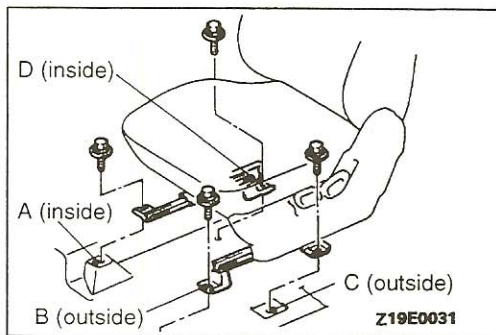
REMOVAL AND INSTALLATION



- 1. Headrest
- 2. Seat under tray <passenger's side only, except Van>

Front seat assembly removal steps

- ▶B◀ 3. Seat anchor covers
- ▶A◀ 4. Front seat assembly



INSTALLATION SERVICE POINTS

▶A◀ FRONT SEAT ASSEMBLY INSTALLATION

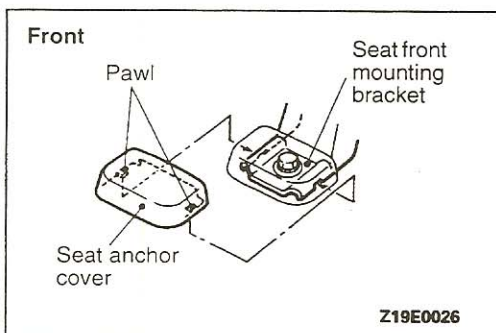
- (1) Install the lower rail so that it matches the left and right front seat mounting hole positions, and lock both sides of the seat adjuster.
- (2) Temporarily tighten the seat mounting bolts in the order A, B, C, and D, and then tighten them to the specified torque.
- (3) After installing the front seat assembly, check that the seat moves backward and forwards smoothly, and that the seat adjuster locks on both sides in all lock positions.

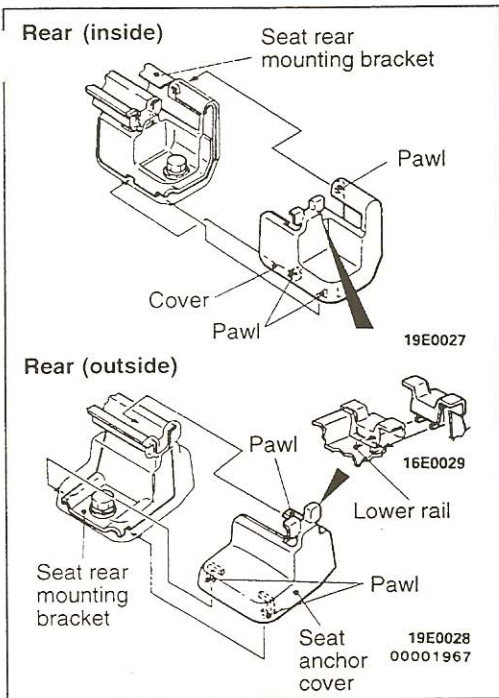
NOTE

The illustration shows the driver's side seat.

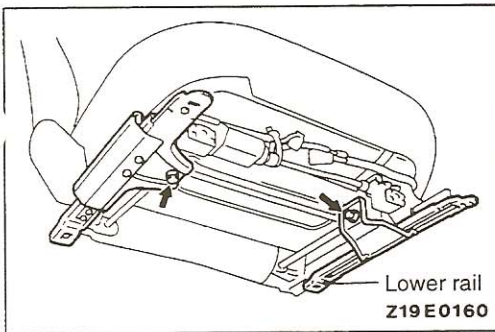
▶B◀ SEAT ANCHOR COVER INSTALLATION

- (1) Press down the front seat anchor cover from the top of the seat front mounting bracket, and hang the anchor cover tab on the bracket.





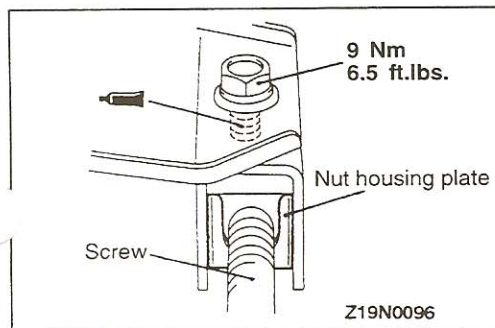
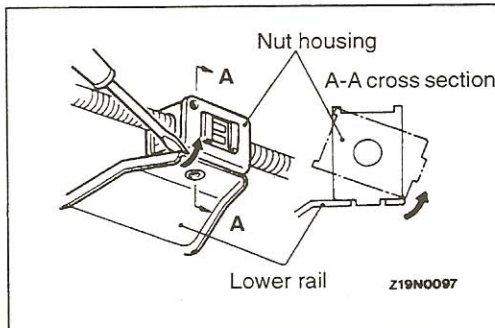
- (2) Insert the rear seat anchor cover from the rear of the seat rear mounting bracket, and hang the anchor cover tab on the bracket while inserting into the lower rail.



FRONT SEAT ASSEMBLY WHEN THERE IS A MALFUNCTION IN THE POWER SEAT SLIDE MECHANISM REMOVAL AND INSTALLATION POINTS 52200480068

If removal of the seat mounting bolt is impossible when there is a malfunction in the slide motor or the side switch and the seat cannot slide, remove and install the front seat assembly by the following procedure.

- (1) Remove the seat cushion assembly. (Refer to P.52-13.)
- (2) Remove the power seat relay box. (Refer to P.52-13.)
- (3) Remove the bolts below the seat cushion as shown in the illustration
- (4) Insert a flat-tipped screwdriver in between the lower rail and the nut housing , and detach the nut housing form the lower rail hole and turn it.
- (5) Slide the seat, and remove the seat mounting bolts.



- (6) When reusing the power height adjuster assembly, apply specified adhesive to the mounting bolt, and tighten to the specified torque.

Specified adhesive:

3M Stud Locking Part No. 4170 of equivalent

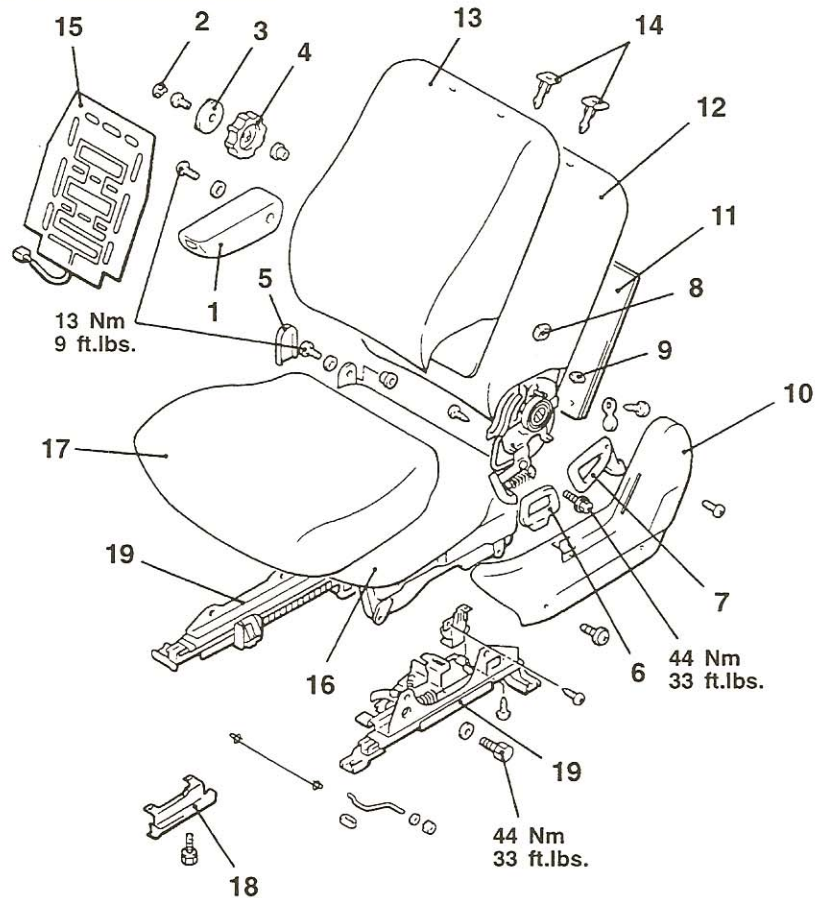
Caution

Match to the left and right nut hosing positions.

DISASSEMBLY AND REASSEMBLY <MANUAL SEAT>

52200150334

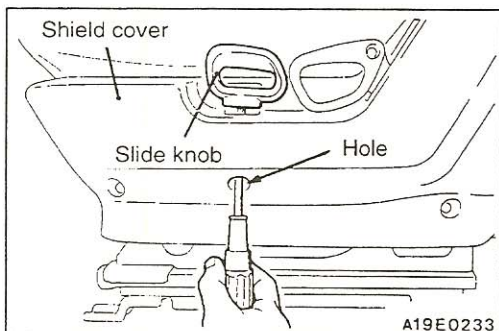
Pre-removal and Post-installation Operation
 • Front Inner Seat Belt Assembly Removal and Installation (Refer to P.52A-19.)



A19E0241

Disassembly steps

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Armrest assembly 2. Side support lever cap 3. Side support lever 4. Lumber support lever 5. Free hinge protector 6. Slide knob 7. Reclining knob 8. Reclining memory knob 9. Walk-in knob 10. Shield cover | <ol style="list-style-type: none"> 11. Back pocket assembly 12. Seatback assembly 13. Seat back cover 14. Headrest guide 15. Seat back heater <Heated seat type> 16. Seat cushion assembly 17. Seat cushion cover 18. Under tray bracket 19. Seat adjuster |
|--|---|



A19E0233

DISASSEMBLY SERVICE POINT

◀A▶ SLIDE KNOB REMOVAL

Pass a screwdriver through the shield cover hole and remove the slide knob mounting screw.

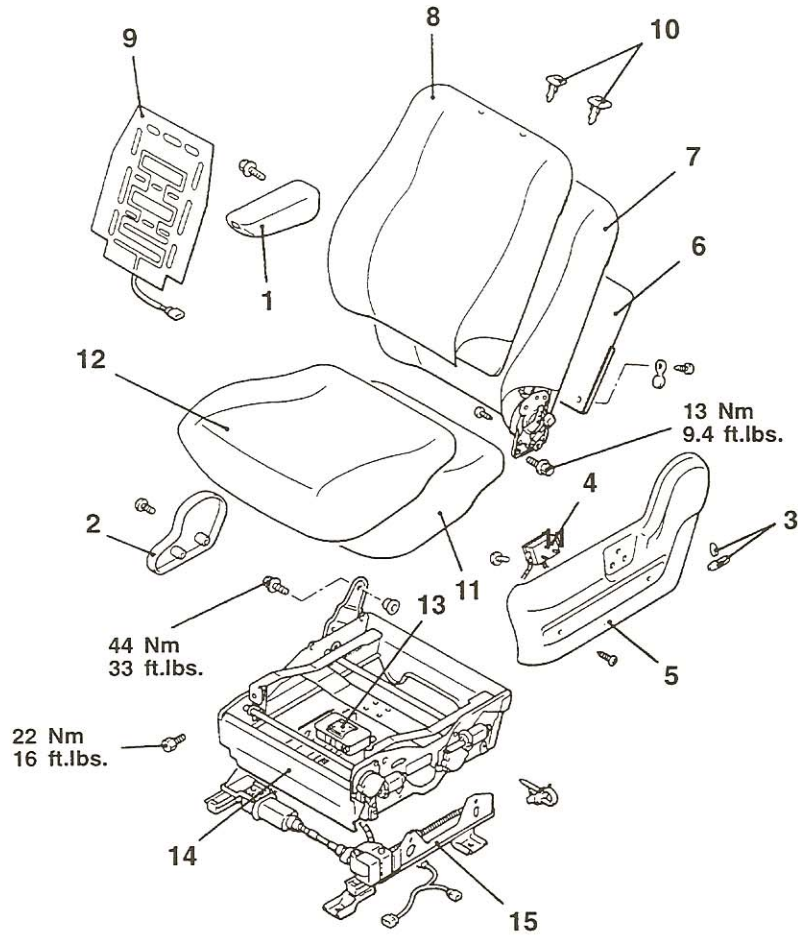
TSB Revision

DISASSEMBLY AND REASSEMBLY <POWER SEAT>

52200150341

Pre-removal and Post-installation Operation

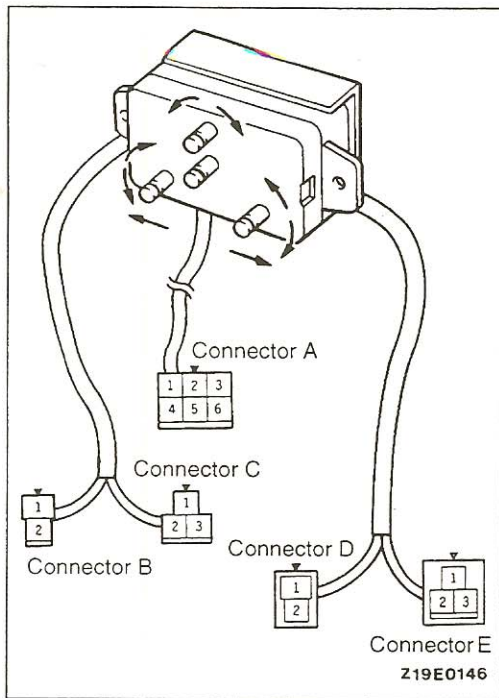
- Front Inner Seat Belt Assembly Removal and Installation (Refer to P.52A-19.)



A19E0242

Disassembly steps

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Armrest assembly 2. Free hinge protector 3. Power seat lever 4. Power seat switch 5. Shield cover 6. Back pocket assembly 7. Seatback assembly 8. Seat back cover | <ol style="list-style-type: none"> 9. Seat back heater
<Heated seat> 10. Headrest guide 11. Seat cushion assembly 12. Seat cushion cover 13. Power seat relay box 14. Leg assembly 15. Power seat adjuster |
|---|---|



INSPECTION

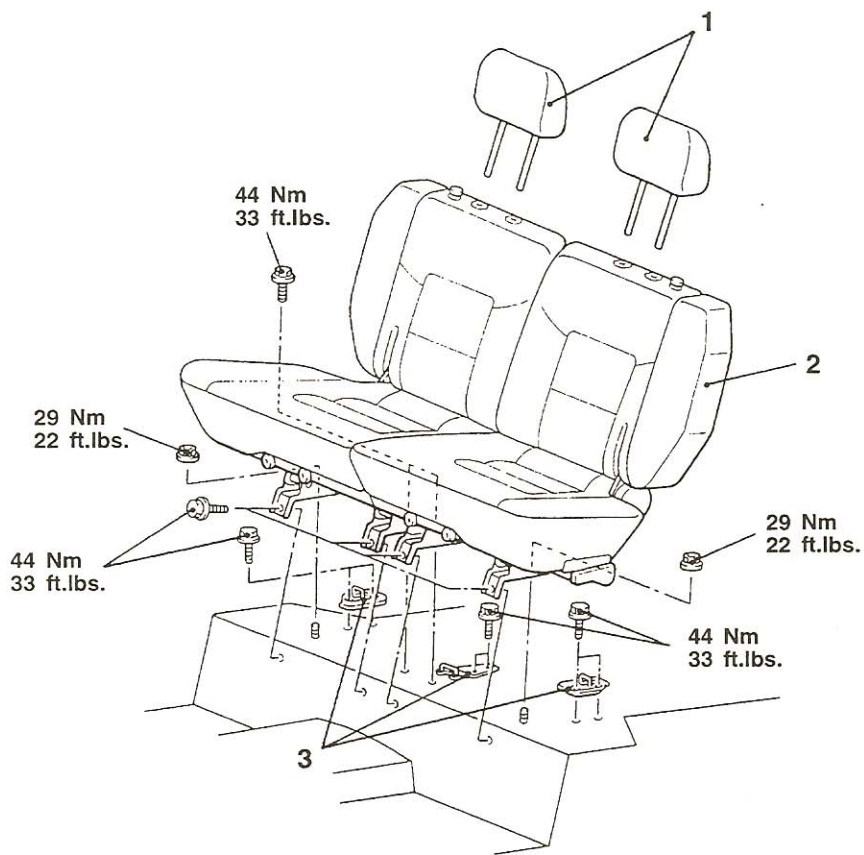
POWER SEAT SWITCH

Operate the power seat switch and check for continuity.

Switch Position		Connector A terminal						Connector B terminal		Connector C terminal			Connector D terminal		Connector E terminal		
		1	2	3	4	5	6	1	2	1	2	3	1	2	1	2	3
Reclining switch	Forward	○	—	○													
	Backward	○	—				○										
Slide switch	Forward	○	○														
	Backward	○	—				○										
Height switch (Front)	Up	○	—					○	—	○							
	Down	○	—					○	—	○							
Height switch (Rear)	Up	○	—									○	—	○			
	Down	○	—										○	—	○	○	○
All switches	OFF		○	○	○	○	○			○	—	○			○		

SECOND SEAT

REMOVAL AND INSTALLATION



A19E0202

Removal steps

1. Headrest

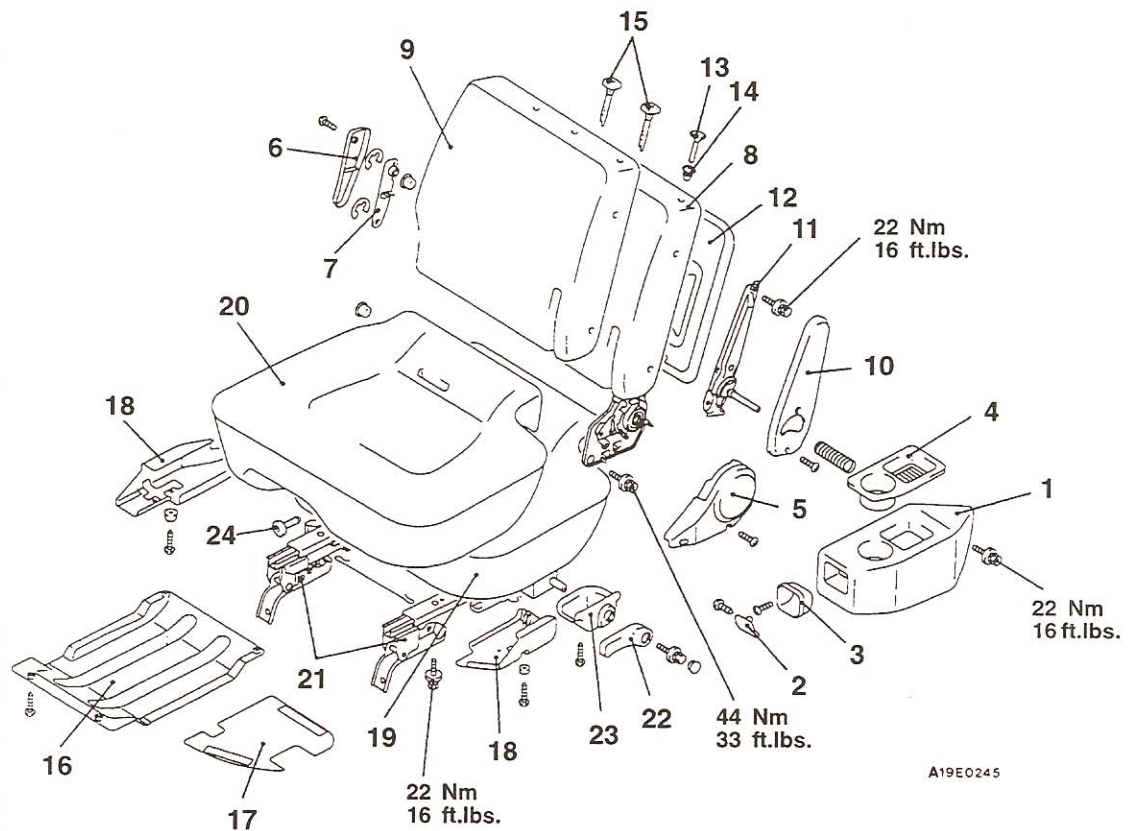
2. Rear seat assembly

3. Striker

TSB Revision

DISASSEMBLY AND REASSEMBLY

52200250041



A19E0245

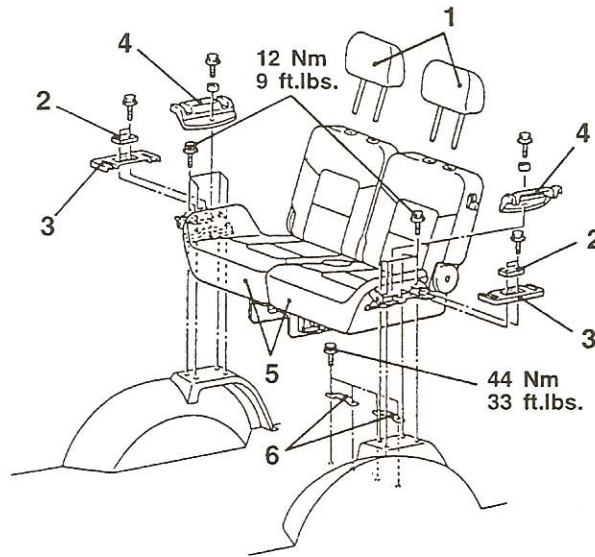
Disassembly steps

- | | |
|-----------------------------|---------------------------|
| 1. Side back assembly | 13. Knob |
| 2. Side back knob | 14. Knob guide |
| 3. Side back garnish | 15. Headrest guide |
| 4. Side back tray | 16. Cushion board |
| 5. Reclining cover | 17. Cushion mat |
| 6. Hinge cover | 18. Seat adjuster cover |
| 7. Hinge plate assembly | 19. Seat cushion assembly |
| 8. Seat back assembly | 20. Seat cushion cover |
| 9. Seat back cover | 21. Seat adjuster |
| 10. Rail cover | 22. Knob |
| 11. Side back hinge bracket | 23. Cover |
| 12. Seat back trim | 24. Headrest guide |

TSB Revision

THIRD SEAT

REMOVAL AND INSTALLATION



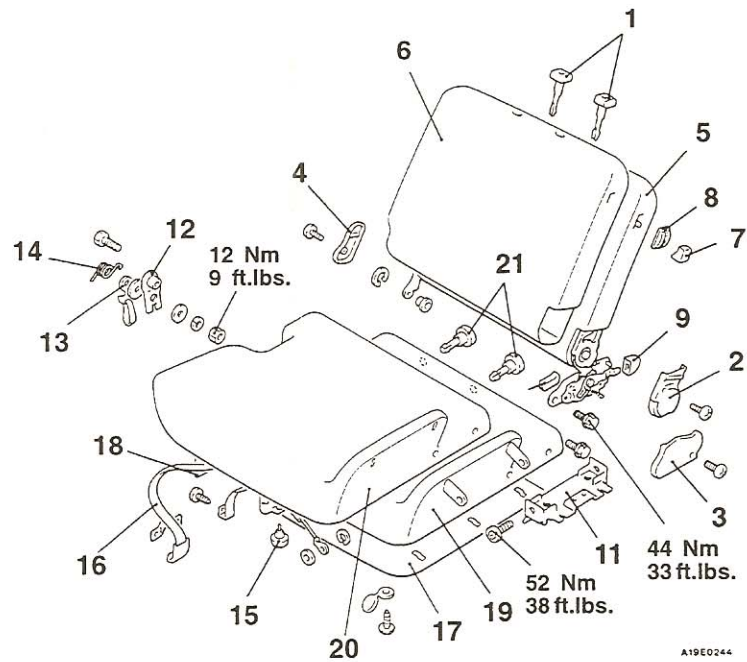
A19E0162

Removal steps

- | | |
|--|--|
| <ul style="list-style-type: none"> 1. Headrest 2. Damper 3. Seat anchor cover (A) | <ul style="list-style-type: none"> 4. Seat anchor cover (B) 5. Third seat assembly 6. Striker |
|--|--|

DISASSEMBLY AND REASSEMBLY

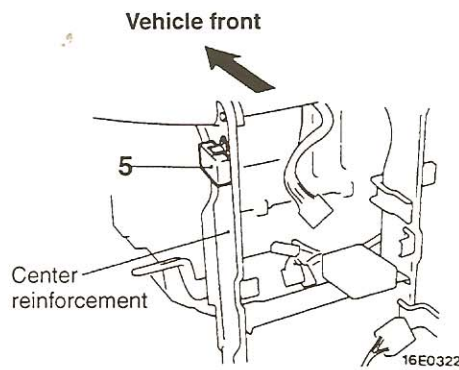
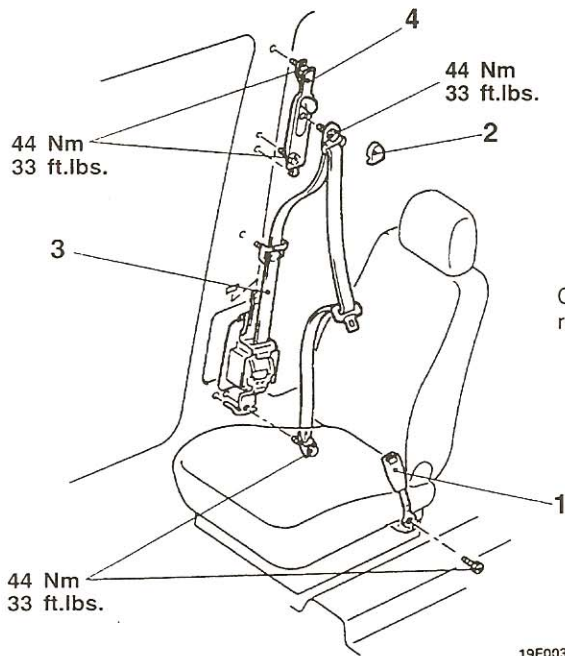
52200300029

**Disassembly steps**

- | | |
|----------------------------|---------------------------|
| 1. Headrest guide | 12. Lock plate |
| 2. Reclining cover | 13. Catch assembly |
| 3. Reclining cushion cover | 14. Torsion spring |
| 4. Free hinge protector | 15. Bumper |
| 5. Seat back assembly | 16. Strap assembly |
| 6. Seat back cover | 17. Back trim |
| 7. Knob | 18. Cushion side trim |
| 8. Garnish | 19. Seat cushion assembly |
| 9. Full flat knob | 20. Seat cushion cover |
| 10. Seat belt protector | 21. Headrest guide |
| 11. Attaching bracket | |

FRONT SEAT BELT

REMOVAL AND INSTALLATION



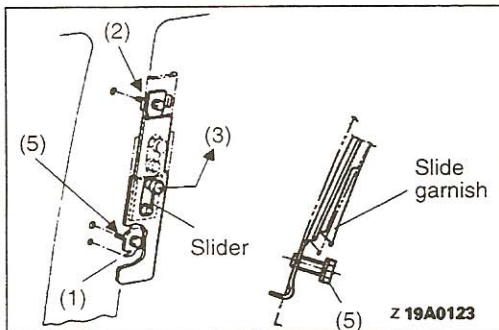
19E0038
00001969

Removal steps

- ▶C◀ 1. Inner seat belt assembly
- 2. Sash guide cover
 - Center pillar trim, lower (Refer to P.52A-7.)
 - Center pillar trim, upper (Refer to P.52A-7.)
- ▶B◀ 3. Outer seat belt assembly
- ▶A◀ 4. Adjustable seat belt anchor

Buzzer assembly removal steps

- Instrument panel assembly (Refer to P.52A-3.)
- 5. Buzzer assembly (built-in seat belt warning timer)



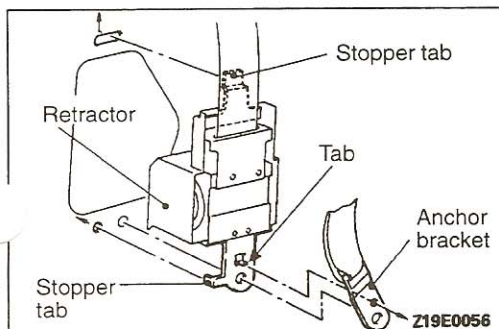
INSTALLATION SERVICE POINT

▶A◀ ADJUSTABLE SEAT BELT ANCHOR INSTALLATION

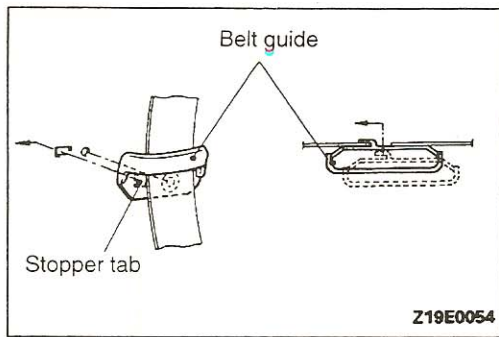
- (1) Securely fit the tab of the adjustable seat belt anchor into the hole in the center pillar.
- (2) Provisionally tighten the installation bolt at the upper side.
- (3) Lock the slider at the uppermost position.
- (4) Raise the slide garnish to the upper side.
- (5) Tighten the lower side mounting bolt to the specified torque.
- (6) Lower the slide garnish and slider, and tighten the upper side mounting bolt to the specified torque.

▶B◀ OUTER SEAT BELT ASSEMBLY INSTALLATION

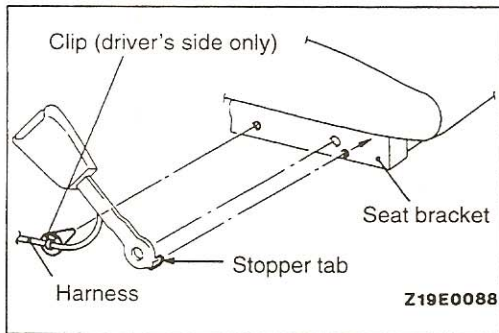
- (1) Securely insert the retractor stopper tab into the body hole.
- (2) Securely insert the retractor bracket tab into the anchor bracket hole.



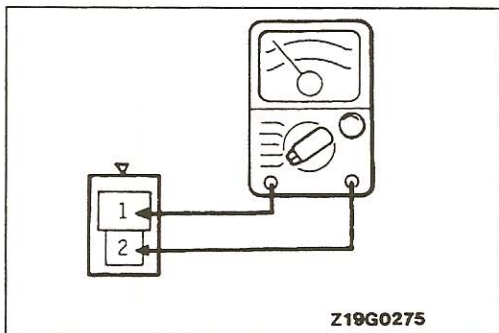
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(3) Securely insert the belt guide tab into the body hole.



►C◄ **INNER SEAT BELT ASSEMBLY INSTALLATION**
Securely insert the stopper tab into the seat bracket hole.



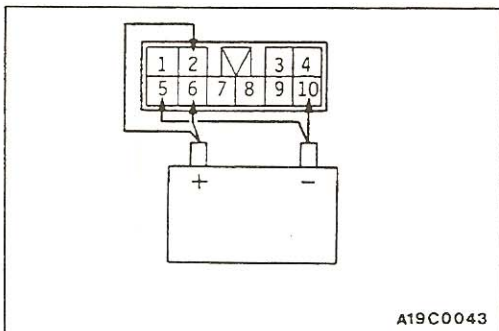
INSPECTION

52300140037

BUCKLE SWITCH

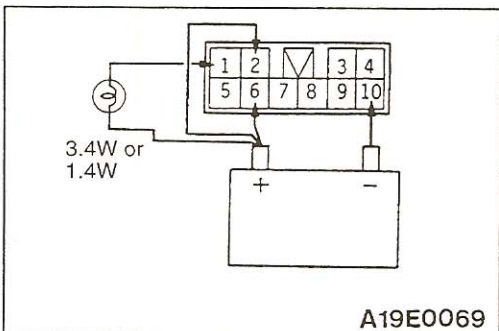
- (1) Disconnect the buckle switch connector.
- (2) Check the continuity between the terminals.

Terminal	1	2
Buckle unlock	○	○
Buckle lock		



BUZZER

- (1) Apply battery positive voltage between terminals (2), (6) and (10).
- (2) Check that the buzzer sounds intermittently when terminal (5) is grounded.

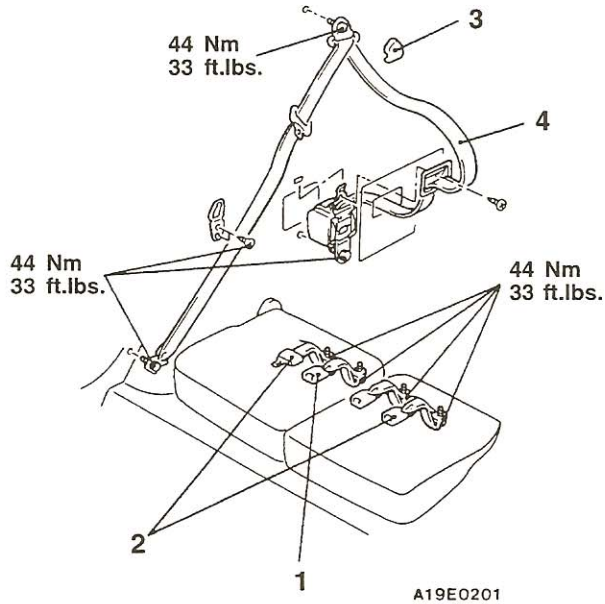


SEAT BELT WARNING TIMER

- (1) Apply battery positive voltage between terminals (2) – (10).
- (2) Connect a bulb between terminal (1) and the positive battery terminal.
- (3) Check that the bulb illuminates for 6 seconds when the terminal (6) is connected to the positive battery terminal.

SECOND SEAT BELT

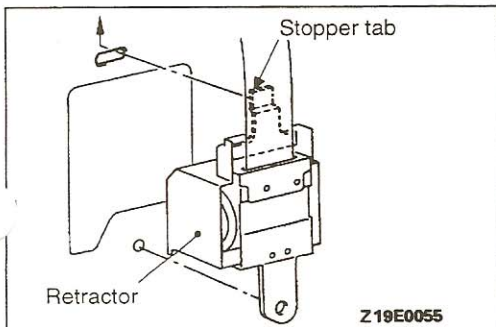
REMOVAL AND INSTALLATION



Removal steps

- Seat cushion board (Refer to P.52A-16.)
- 1. Inner seat belt assembly
- 2. Center seat belt assembly

- 3. Sash guide cover
- Quarter trim lower (Refer to P.52A-7.)
- ▶◀ 4. Outer seat belt assembly



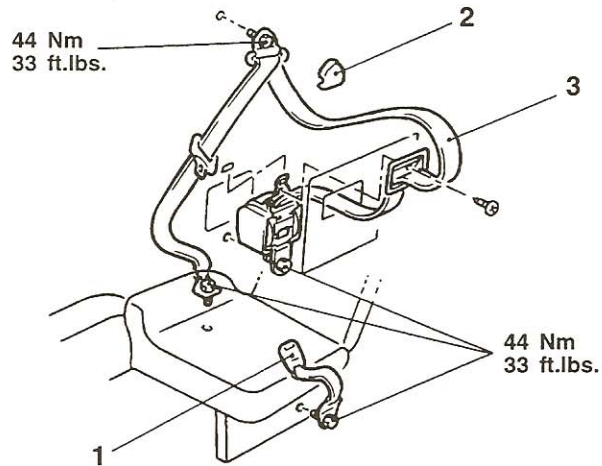
INSTALLATION SERVICE POINT

▶◀ OUTER SEAT BELT ASSEMBLY INSTALLATION

Securely insert the retractor stopper tab into the body hole.

THIRD SEAT BELT

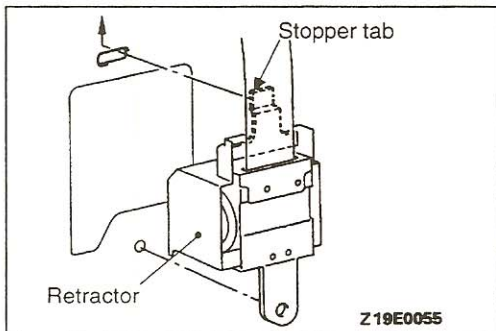
52300220021

REMOVAL AND INSTALLATION

Z19E0040

Removal steps

1. Inner seat belt assembly
2. Sash guide cover
 - Quarter trim, lower (Refer to P.52A-7.)
- ▶A◀ 3. Outer seat belt assembly

**INSTALLATION SERVICE POINT**

- ▶A◀ **OUTER SEAT BELT ASSEMBLY INSTALLATION**
Securely insert the retractor stopper tab into the body hole.

TSB Revision

SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

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52409000155

AIR BAG MODULE DISPOSAL PROCEDURES	41	Warning/Caution Labels	4
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CAUTION

- Carefully read and observe the information in the **SERVICE PRECAUTIONS** (P.52B-7.) Prior to any service.
- For information concerning troubleshooting or maintenance, always observe the procedures in the **Troubleshooting** (P.52B-9.) or the **Maintenance** (P.52B-26.) sections respectively.
- If any SRS components are removed or replaced in connection with any service procedures, be sure to follow the procedures in the **COMPONENT SERVICE** section (P.52B-29.) for the components involved.
- If you have any questions about the SRS, please contact the MMSA Teck Line.

GENERAL INFORMATION

524000*

INTRODUCTION

The Supplemental Restraint System (SRS) is designed to supplement the front seat belts to help reduce the risk or severity of injury to the front seat occupants by activating and deploying two air bags during certain frontal collisions.

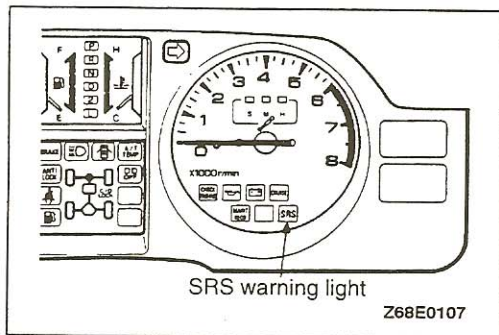
The SRS consists of: left front and right front impact sensors (located on the right and left radiator support panel); air bag modules for the driver (located in the center of the steering wheel) and for the front seat passenger (located above the glove box). Each module contains a folded air bag and an inflator unit. The SRS also contains: an SRS Air Bag Control Unit with safing impact sensor (located in front of the shift lever); and SRS warning light to indicate the operational status of the SRS (located on the instrument panel); clock spring (mounted behind the steering wheel); and wiring.

The SRS is designed so that the air bags will deploy when the safing impact sensor, plus either or both of the left front and right front impact sensors simultaneously activate while the ignition switch is in the ON position. These sensors are designed to be activated in frontal or near-frontal impacts of moderate to severe force.

Only authorized service personnel should work on or around SRS components. Those personnel should read this manual carefully before starting such work.

Caution

Extreme care must be used when servicing the SRS to avoid injury to service personnel (by inadvertent deployment of the air bag) or vehicle occupant (by rendering the SRS inoperative).



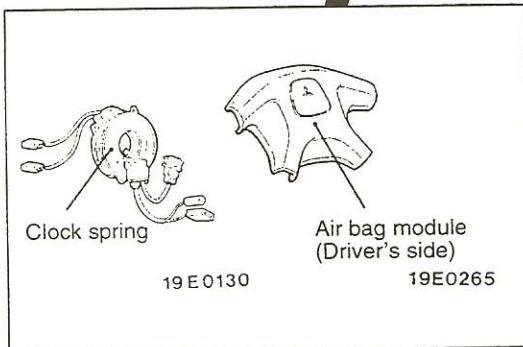
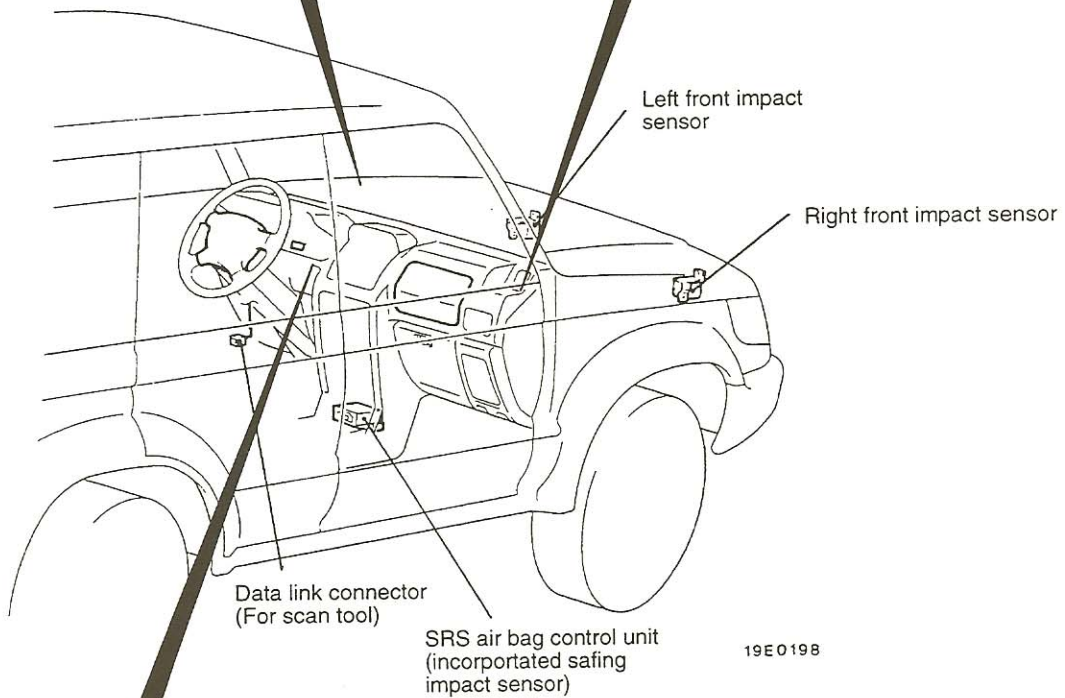
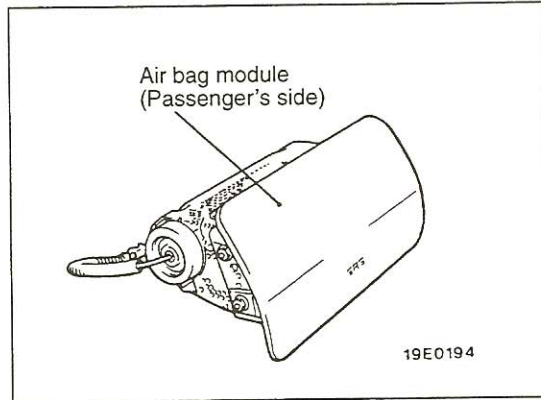
ON-BOARD DIAGNOSTIC/SRS WARNING LIGHT FUNCTION

The diagnosis unit monitors the SRS system and stores data concerning any detected faults in the system. When the ignition key is in "ON" or "START" position, the SRS warning light should illuminate for about 7 seconds and then turn off. That indicates that the SRS system is in operational order. If the SRS warning light does any of the following, immediate inspection by an authorized dealer is needed.

- (1) The SRS warning light does not illuminate as described above.
- (2) The SRS warning light stays on for more than 7 seconds.
- (3) The SRS warning light illuminates while driving.

If a vehicle's SRS warning light is in any of these three conditions when brought in for inspection, the SRS system must be inspected, diagnosed and serviced in accordance with this manual.

CONSTRUCTION DIAGRAM

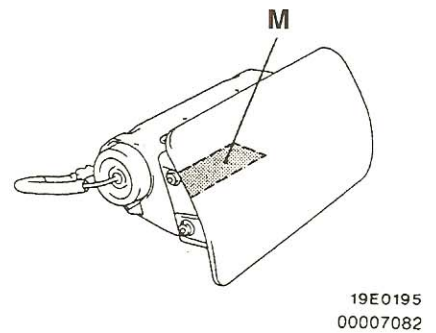
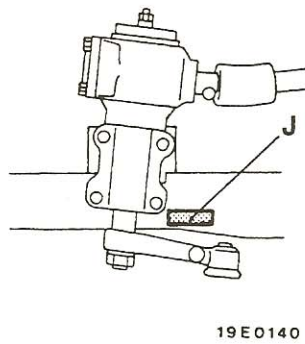
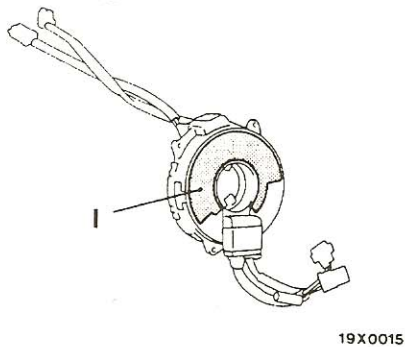
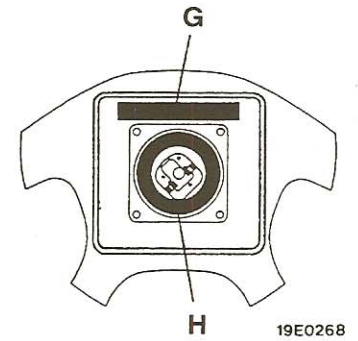
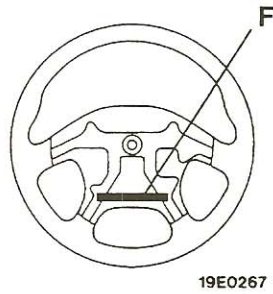
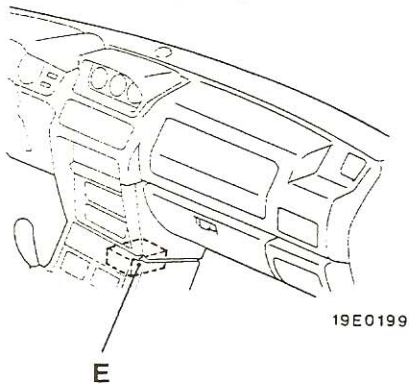
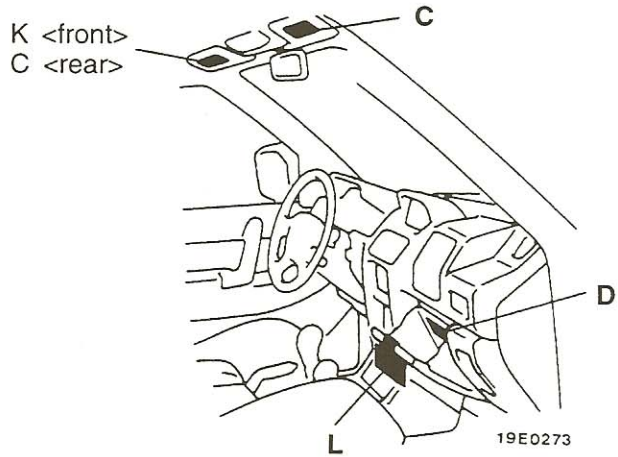
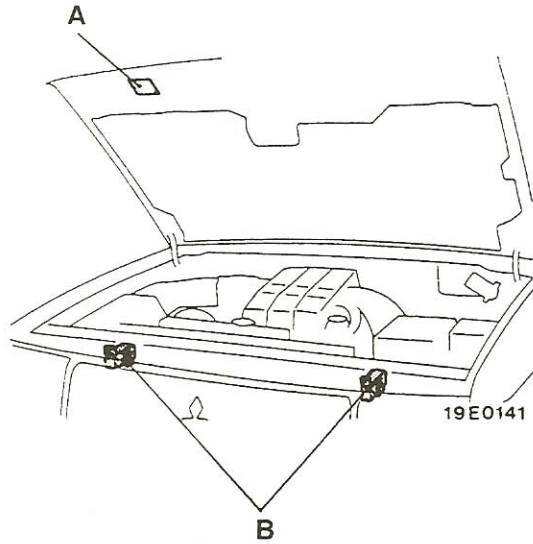




00007081

WARNING/CAUTION LABELS

A number of caution labels relating to the SRS are found in the vehicle, as shown in the following illustration. Follow label instructions when servicing SRS. Label L is not to be removed except by

the vehicle owner. Other labels can be replaced with new ones if they become dirty or damaged.

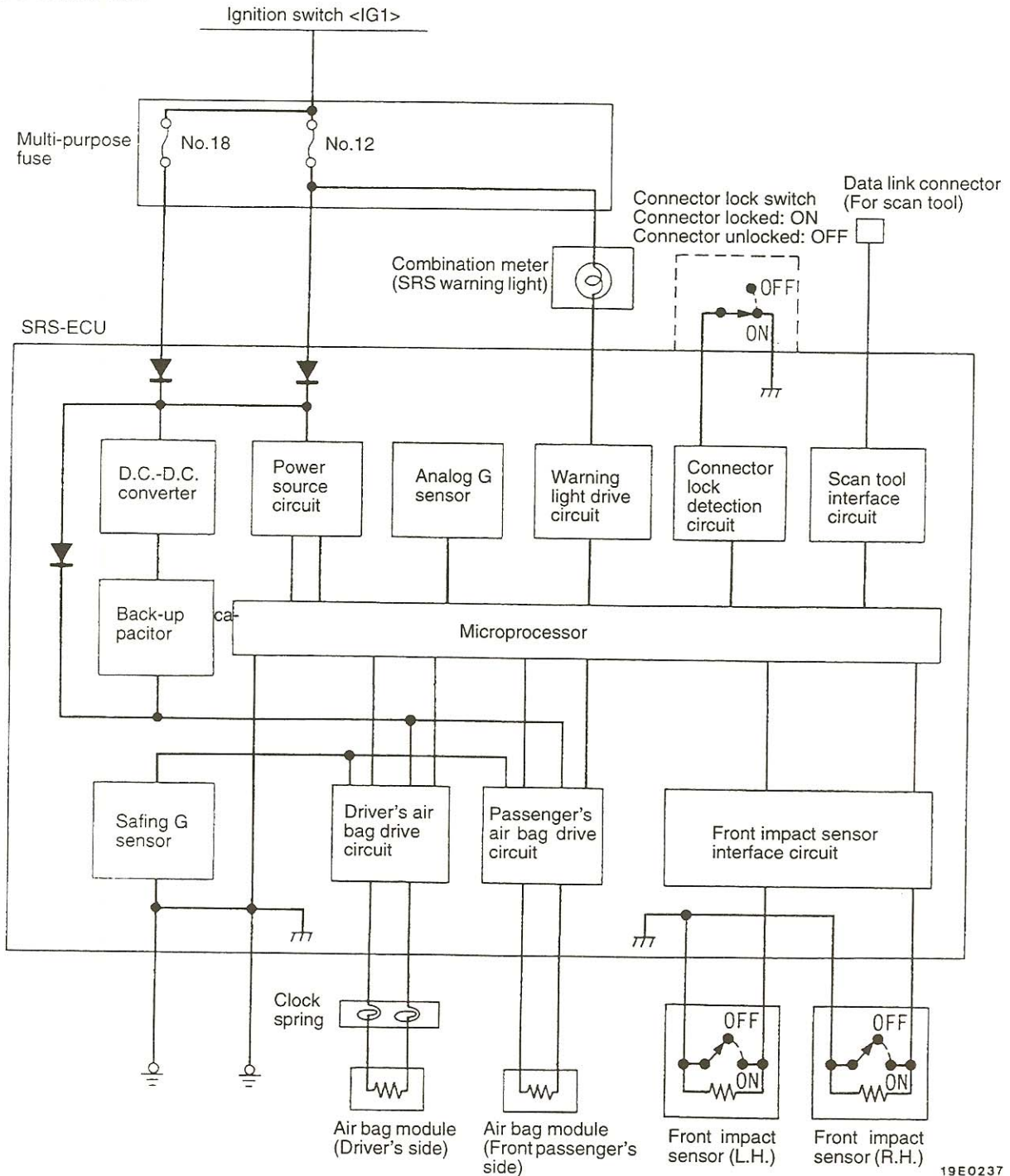


Label contents		Label contents	
A	<p>WARNING This vehicle has an air bag system. Refer to service manual before servicing or disassembling underhood components. Read the "SRS" section of manual for important instructions. Improper service procedures can result in the air bag firing or becoming inoperative, possibly leading to injury.</p>	F	<p>CAUTION: SRS Before replacing steering wheel, read service manual, center front wheels and align SRS clock spring neutral marks. Failure to do so may render SRS system inoperative, risking serious driver injury.</p>
A	<p>WARNING This vehicle has an air bag system. Refer to service manual before servicing or disassembling underhood components. Read the "SRS" section of manual for important instructions. Improper service procedures can result in the air bag firing or becoming inoperative, possibly leading to injury.</p>	G	<p>WARNING: SRS This air bag module cannot be repaired. Do not disassemble or tamper. Do not perform diagnosis. Do not touch with electrical test equipment or probes. Refer to service manual for further instructions, and for special handling, storage and disposal procedures. Tampering or mishandling can result in injury.</p>
B	<p>CAUTION: SRS Read service manual. Do not drop. Do not tamper or disassemble.</p>	H	<p>DANGER POISONOUS FLAMMABLE MATERIAL To prevent personal injury, Do not dismantle, incinerate, or bring into contact with electricity. Store below 200°F (93°C).</p>
C	 <p>WARNING DEATH or SERIOUS INJURY can occur</p> <ul style="list-style-type: none"> • Children 12 and under can be killed by the air bag • The BACK SEAT is the SAFEST place for children • NEVER put a rear-facing child seat in the front • Sit as far back as possible from the air bag • ALWAYS use SEAT BELTS and CHILD RESTRAINTS <p>VO037AA</p>	I	<p>CAUTION: SRS clock spring This is not a repairable part. If defective, replace entire unit per service manual instructions. To recenter rotate clockwise until tight. Then rotate in opposite direction approximately 3 1/3 turns and align ◀▶.</p>
		J	<p>CAUTION: SRS Before removal of steering gearbox, read service manual, center front wheels and remove ignition key. Failure to do so may damage SRS clock spring and render SRS system inoperative, risking serious driver injury.</p>
D	<p>AIR BAG SYSTEM INFORMATION This vehicle has an air bag system which will supplement the seatbelt in certain frontal collisions. The air bag is not a substitute for the seatbelt in any type of collision. The driver and all other occupants should wear seatbelts at all times. WARNING! If the "SRS" warning light does not illuminate for several seconds when the ignition key is turned to "ON" or the engine is started, or if the warning light stays on while driving, take the vehicle to your nearest authorized dealer immediately. Also, if the vehicle's front end is damaged or if the air bag has deployed, take the vehicle for service immediately. The air bag system must be inspected by an authorized dealer ten years after the vehicle manufacture date shown on the certification label located on the left front door latch post or door frame. Read the "SRS" section of your owner's manual before driving for important information about operation and service of the air bag system. When you are going to discard your gas generator or vehicle, please see your dealer.</p>	K	 <p>AIR BAG WARNING FLIP VISOR OVER</p> <p>VO037AA</p>
		L	<p>WARNING Children Can Be KILLED or INJURED by Passenger Air Bag The back seat is the safest place for children 12 and under. Make sure all children use seat belts or child seats. Not to be removed except by owner.</p>
E	<p>CAUTION: Do not disassemble or drop. If defect refer to service manual.</p>		

Label contents

- M WARNING FLAMMABLE/EXPLOSIVE
 SRS AIR BAG MODULE
 TO AVOID SERIOUS INJURY:
- Do not repair, disassemble or tamper.
 - Avoid contact with flame or electricity.
 - Do no diagnosis/use no test equipment or probes.
 - Store below 200°F (93°C).
 - Before doing any work involving module, read service manual for important further data.

SCHEMATIC



19E0237

TSB Revision

SERVICE PRECAUTIONS

1. In order to avoid injury to yourself or others from accidental deployment of the air bag during servicing, read and carefully follow all the precautions and procedures described in this manual.
2. Do not use any electrical test equipment on or near SRS components, except those specified on P.52B-9.
Never use an analog ohmmeter.
3. **Never Attempt to Repair the Following Components:**
 - Front Impact Sensors
 - SRS Air Bag Control Unit (SRS-ECU)
 - Clock Spring
 - Air Bag Module

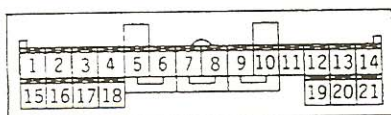
If any of these components are diagnosed as faulty, they should only be replaced, in accordance with the COMPONENT SERVICE procedures in this manual.
4. Do not attempt to repair the wiring harness connectors of the SRS. If any of the connectors are diagnosed as faulty, replace the wiring harness. If the wires are diagnosed as faulty, replace or repair the wiring harness according to the following table.

SRS-ECU terminal No.	Harness Connector (No. of terminals, Color)	Destination of Harness	Corrective Action
1 to 4	21 pins, yellow	–	–
5	21 pins, yellow	Dash wiring harness → Clock spring → Air bag module (Driver's side)	Correct or replace dash wiring harness. Replace clock spring.
6	21 pins, yellow		
7	21 pins, yellow	Dash wiring harness → Air bag module (Front passenger's side)	Correct or replace dash wiring harness.
8	21 pins, yellow		
9,10	21 pins, yellow	–	–
11	21 pins, yellow	Dash wiring harness → Data link connector	Correct or replace dash wiring harness.
12,18	21 pins, yellow	Dash wiring harness → Front wiring harness → Front impact sensor (L.H.)	Correct or replace sensor cable.*
13	21 pins, yellow	Dash wiring harness → Junction block (fuse No.18)	Correct or replace dash wiring harness.
14	21 pins, yellow	Dash wiring harness → Junction block (fuse No.12)	
15	21 pins, yellow	Dash wiring harness → Instrument panel wiring harness → SRS warning light	
16	21 pins, yellow	–	–
17,19	21 pins, yellow	Dash wiring harness → Front wiring harness → Front impact sensor (R.H.)	Correct or replace sensor cable.*
20	21 pins, yellow	Dash wiring harness → Ground	Correct or replace dash wiring harness.
21	21 pins, yellow		

NOTE

- (1) The sensor cable marked with* is available as service part.
- (2) The sensor cable used as a replacement part is routed along the dash wiring harness and front wiring harness.

SRS-ECU Connector



19X0739

TSB Revision

5. After disconnecting the battery cable, wait 60 seconds or more before proceeding with the following work. The SRS system is designed to retain enough voltage to deploy the air for a short time even after the battery has been disconnected, so serious injury may result from unintended air bag deployment if work is done on the SRS system immediately after the battery cables are disconnected.
6. SRS components should not be subjected to heat over 93°C (200°F), so remove the front impact sensors, SRS diagnosis unit, air bag module and clock spring before drying or baking the vehicle after painting.
7. Whenever you finish servicing the SRS, check the SRS warning light operation to make sure that the system functions properly. (Refer to P.52B-2.)
8. Make certain that the ignition switch is OFF when the scan tool is connected or disconnected.
9. If you have any questions about the SRS, please contact the MMSA Teck Line.

NOTE

SERIOUS INJURY CAN RESULT FROM UNINTENDED AIR BAG DEPLOYMENT, SO USE ONLY THE PROCEDURES AND EQUIPMENT SPECIFIED IN THIS MANUAL.



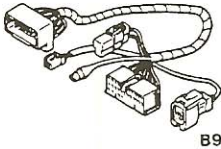
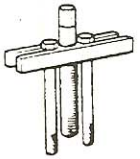
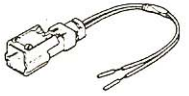
SERVICE SPECIFICATIONS

52400040095

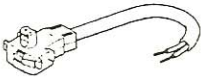
Items	Standard value
Front impact sensor resistance Ω	2,000 \pm 100

SPECIAL TOOLS

52400070162


Tool	Tool number and name	Supersession	Application
	MB991502 Scan tool (MUT-II)	MB991496-0D	<ul style="list-style-type: none"> • Reading diagnostic trouble codes • Erasing diagnostic trouble codes • Reading vehicle data for a specific period • Reading erase times [Refer to MUT-II OPERATING INSTRUCTIONS]
	ROM pack	–	
 B991613	MB991613 SRS Check Harness	–	<ul style="list-style-type: none"> • Checking the SRS electrical circuitry with a digital multi-meter NOTE SRS check harness is used on various Diagnostic Tests.
	MB990803 Steering wheel puller	General service tool	Removal of steering wheel
 13R0732	MB686560 SRS AIR BAG ADAPTER HARNESS A	General service tool	Deployment of air bag module inside the vehicle

TSB Revision

Tool	Tool number and name	Supersession	Application
 13R0751	MR203491 or MB628919 SRS AIR BAG ADAPTER HARNESS B	General service tool	Deployment of air bag module outside the vehicle

TEST EQUIPMENT

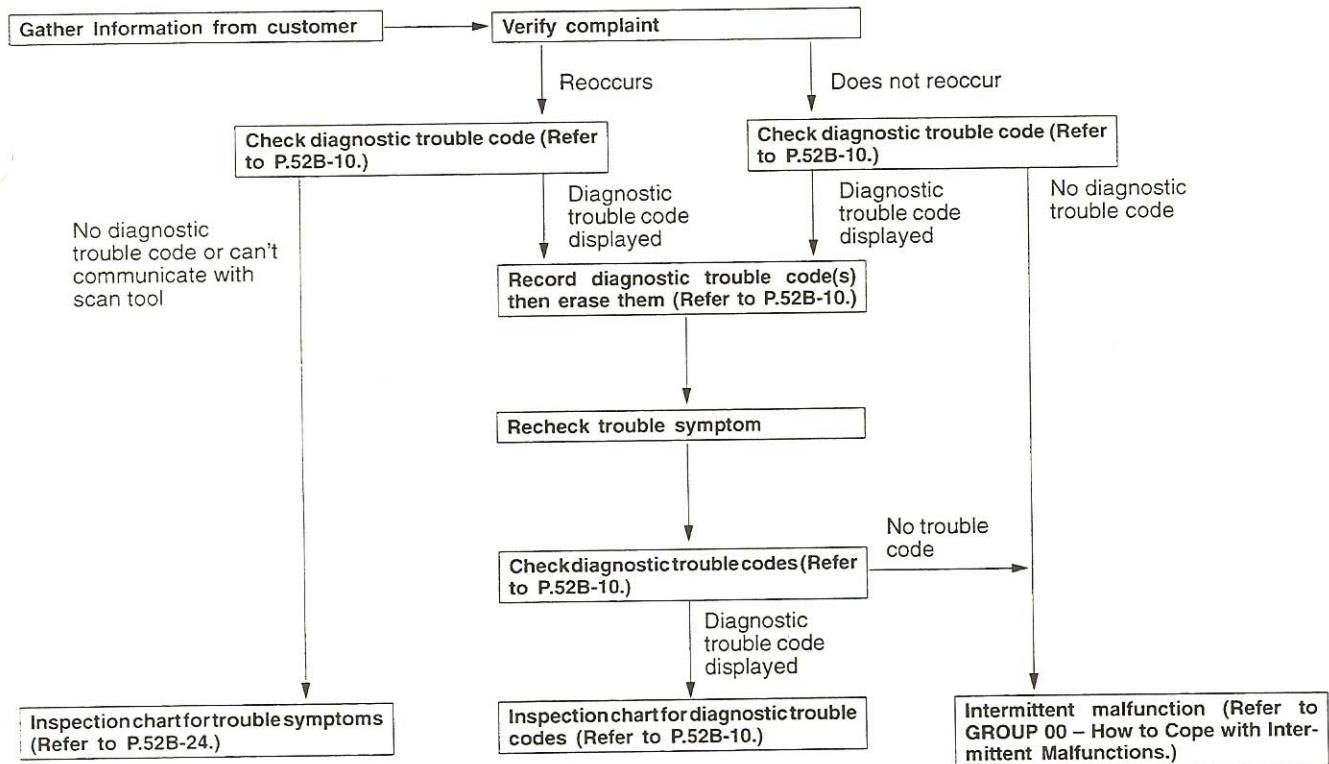
52400080042

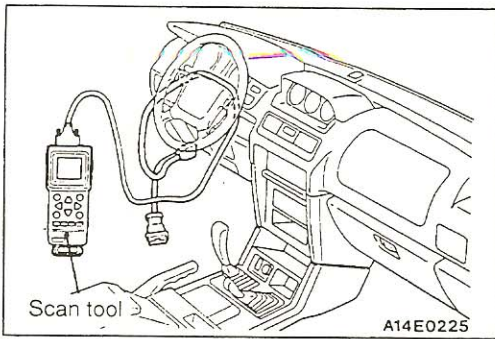
Tool	Name	Use
 Z13R0746	Digital multi-meter Use a multi-meter for which the maximum test current is 2 mA or less at the minimum range of resistance measurement	Checking the SRS electrical circuitry with SRS Check Harness

TROUBLESHOOTING

52400310196

DIAGNOSTIC TROUBLESHOOTING FLOW



**DIAGNOSTIC FUNCTION**

52400320045

DIAGNOSTIC TROUBLE CODES CHECK

Connect the scan tool to the data link connector then check diagnostic trouble codes.

Caution

Turn the ignition switch off before connecting or disconnecting the scan tool.

ERASING DIAGNOSTIC TROUBLE CODES

Connect the scan tool to the data link connector then erase the diagnostic trouble codes.

INSPECTION CHART FOR DIAGNOSTIC TROUBLE CODES

52400330260

Inspect according to the inspection chart that is appropriate for the malfunction code.

Code No.	Diagnostic item	Reference page	
11, 12, 13	Front impact sensor system	52B-11	
14	Analog G sensor system	52B-12	
15, 16	Safing G sensor system	52B-12	
21, 22, 61	Driver's air bag module (squib) system	52B-13	
24, 25, 64	Front passenger's air bag module (squib) system	52B-15	
31, 32	SRS-ECU capacitor system	52B-16	
34*1	Connector lock system	52B-16	
35	SRS-ECU (after deployment of the air bag) system	52B-17	
41*1,*2	IG ₁ (A) power circuit system	52B-18	
42*1,*2	IG ₁ (B) power circuit system	52B-19	
43	SRS warning light circuit system	Light does not illuminate *1	52B-20
		Light does not switch off	52B-21
44	SRS warning light drive circuit system	52B-21	
45	SRS-ECU non-volatile memory (EEPROM) and A/D converter system	52B-22	
51, 52	Driver's air bag module (squib ignition drive circuit) system	52B-22	
54, 55	Front passenger's air bag module (squib ignition drive circuit) system	52B-23	

NOTE

*1: For diagnostic trouble codes marked with *1, if the vehicle condition returns to normal, the diagnostic trouble code will be automatically erased, and the SRS warning light will return to normal.

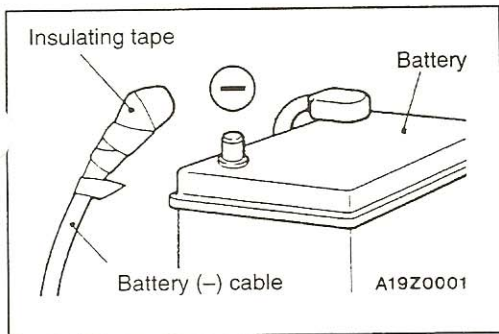
*2: If the vehicle has a discharged battery it will store the diagnostic trouble codes 41 or 42. When these diagnostic trouble codes are displayed, check the battery.

INSPECTION PROCEDURE CLASSIFIED BY DIAGNOSTIC TROUBLE

Code No.11, 12 or 13 Front impact sensor system	Probable cause
<p>[Comment] These diagnostic trouble codes are output if there is abnormal resistance between the input terminals of the SRS-ECU front impact sensor. Refer to table 1 for the conditions for output of each diagnostic trouble code.</p>	<ul style="list-style-type: none"> • Malfunction of front impact sensor • Malfunction of harnesses or connectors • Malfunction of SRS-ECU

TABLE 1: CONDITIONS FOR OUTPUT OF EACH DIAGNOSTIC TROUBLE CODE

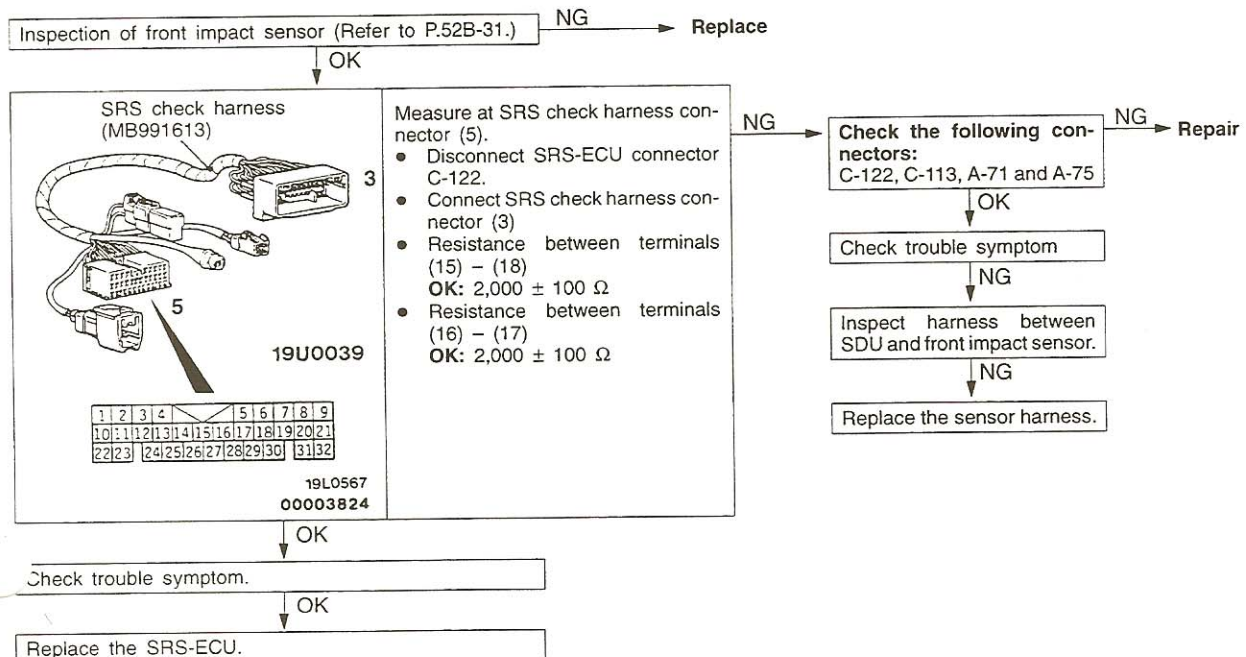
Code No.	Trouble Symptom
11	<ul style="list-style-type: none"> • Short in front impact sensor or harness short • Short in front impact sensor or air bag module (squib) harnesses leading to the vehicle body ground • Short in front impact sensor or air bag module (squib) harnesses leading to the power supply
12	<ul style="list-style-type: none"> • Open circuit in either left or right front impact sensor or open harness • Short in front impact sensor or air bag module (squib) harnesses leading to the power supply
13	<ul style="list-style-type: none"> • Open circuit in both left and light front impact sensors or open harness • Short in front impact sensor or air bag module (squib) harnesses leading to the power supply



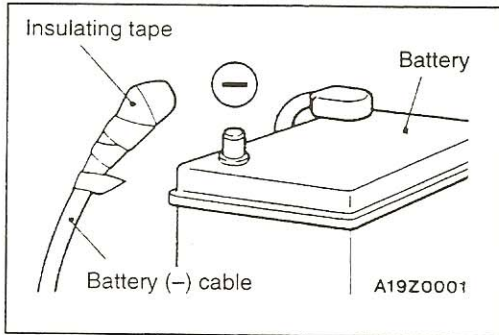
1. Turn the ignition key to the "LOCK" position, disconnect the negative battery cable and tape the terminal.

Caution

Wait at least 60 seconds after disconnecting the battery cable before doing any further work. (Refer to P.52B-8.)



<p>Code No. 14 Analog G sensor system</p>	<p>Probable cause</p>
<p>[Comment] The SRS-ECU monitors the analog G sensor output and outputs this code when it detects a sensor failure, abnormal sensor characteristics or abnormal sensor output.</p>	<ul style="list-style-type: none"> • Malfunction of SRS-ECU



Caution

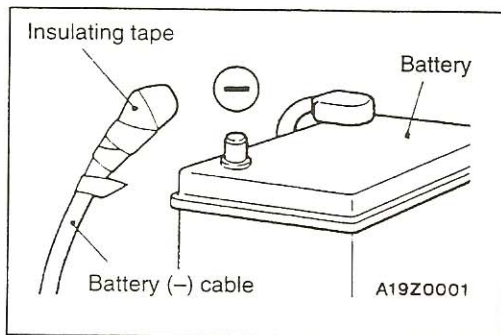
Turn the ignition key to the “LOCK” position, disconnect the negative battery cable and tape the terminal. Wait at least 60 seconds after disconnecting the battery cable before doing any further work. (Refer to P.52B-8.)

Replace the SRS-ECU.

<p>Code No. 15 or 16 Safing G sensor system</p>	<p>Probable cause</p>
<p>[Comment] These codes are output when the resistance value inside the SRS-ECU between the safing G sensor terminals is out of the normal range. Refer to the following table 1 for the trouble causes of each code No.</p>	<ul style="list-style-type: none"> • Malfunction of SRS-ECU

Table 1

Code No.	Trouble Symptom
15	Safing G sensor short-circuited
16	Safing G sensor open-circuited



Caution

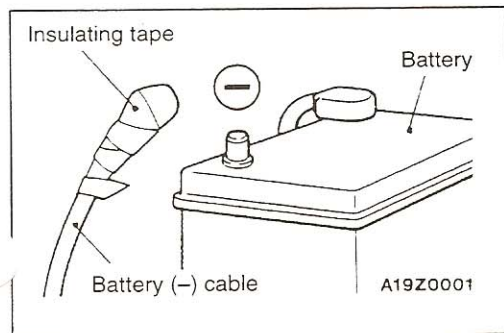
Turn the ignition key to the “LOCK” position, disconnect the negative battery cable and tape the terminal. Wait at least 60 seconds after disconnecting the battery cable before doing any further work. (Refer to P.52B-8.)

Replace the SRS-ECU.

Code No. 21, 22 or 61 Driver's air bag module (squib) system	Probable cause
<p>[Comment] These diagnostic trouble codes are output if there is abnormal resistance between the input terminals of the driver's air bag module (squib). Refer to the following table 1 for the trouble causes of each code No.</p>	<ul style="list-style-type: none"> ● Malfunction of clock spring ● Semi-open circuit due to incorrect clock spring neutral position ● Malfunction of harnesses or connectors ● Malfunction of driver's air bag module (squib) ● Malfunction of SRS-ECU

Table 1

Code No.	Trouble Symptom
21	<ul style="list-style-type: none"> ● Short in driver's air bag module (squib) or harness short ● Short in clock spring
22	<ul style="list-style-type: none"> ● Open circuit in driver's air bag module (squib) or open harness ● Open circuit in clock spring ● Disconnected driver's side air bag module (squib) connector ● Semi-open circuit due to incorrect clock spring neutral position. ● Malfunction of connector contact
61	The harness wire of the driver's air bag module (squib) is grounded to the power supply.

**Caution**

Turn the ignition key to the "LOCK" position, disconnect the negative battery cable and tape the terminal. Wait at least 60 seconds after disconnecting the battery cable before doing any further work. (Refer to P.52B-8.)

Clock spring check (Refer to P.52B-39.) NG → Repair

OK

SRS check harness (MB991613)

1

19U0039

Body wiring harness

Clock spring

19X0604
00003823

SCAN TOOL DIAGNOSTIC TROUBLE CODE

- Disconnect clock spring connector C-129.
- Connect SRS check harness connector (1).
- Connect negative battery cable.
- Erase diagnostic trouble code memory.

Are code Nos. 21, 22 or 61 output?

Yes

Check the following connectors: C-129 ,1 (Air Bag Module connector) NG → Repair

OK

Check trouble symptom.

NG

Replace the driver's air bag module.

Yes

Check the following connectors: C-129 and C-122 NG → Repair

OK

Check trouble symptom.

NG

SRS check harness (MB991613)

3

1

5

19U0039

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	

19L0567
00003824

Check the harness between the SRS-ECU and clock spring.

- Disconnect clock spring connector C-129.
- Connect SRS check harness connector (1).
- Disconnect SRS-ECU connector C-122.
- Connect SRS check harness connector (3).
- Resistance between terminals (5) – (6).

OK: approx. 3 Ω

NG

Repair

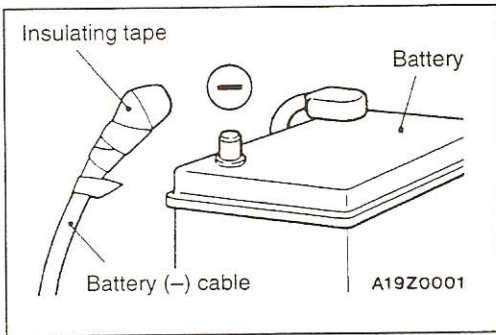
OK

Replace the SRS-ECU.

Code No. 24, 25 or 64 Front passenger's air bag module (squib) system	Probable cause
<p>[Comment] These diagnostic trouble codes are output if there is abnormal resistance between the input terminals of the front passenger's air bag module (squib). Refer to the following table 1 for the trouble causes of each code No.</p>	<ul style="list-style-type: none"> • Malfunction of harnesses or connectors • Malfunction of front passenger's air bag module (squib) • Malfunction of SRS-ECU

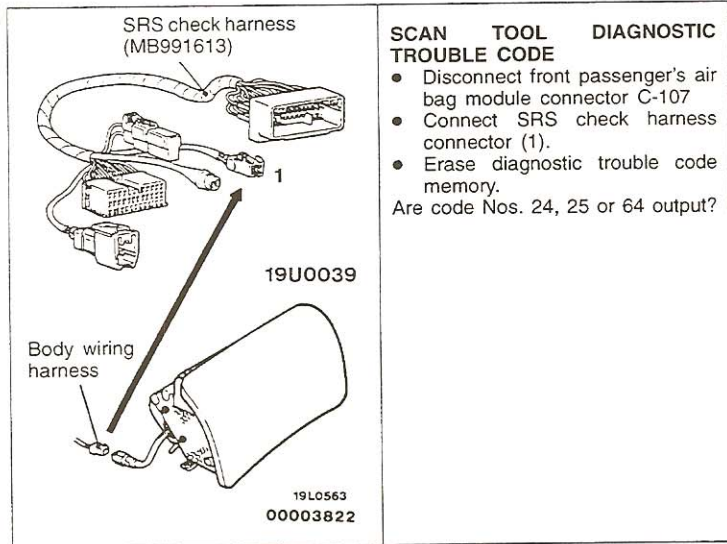
Table 1

Code No.	Trouble Symptom
24	Short in front passenger's air bag module (squib) or harness short
25	<ul style="list-style-type: none"> • Open circuit in front passenger's air bag module (squib) or open harness • Malfunction of connector contact
64	The harness wire of the front passenger's air bag module (squib) is grounded to the power supply.



Caution

Turn the ignition key to the "LOCK" position, disconnect the negative battery cable and tape the terminal. Wait at least 60 seconds after disconnecting the battery cable before doing any further work. (Refer to P.52B-8.)



SCAN TOOL DIAGNOSTIC TROUBLE CODE

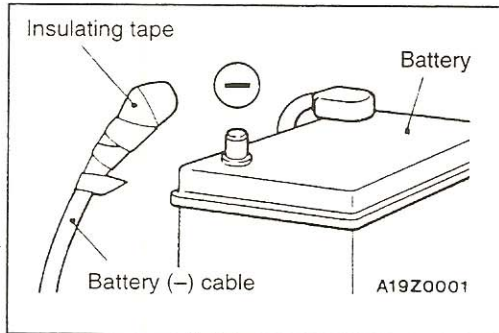
- Disconnect front passenger's air bag module connector C-107
 - Connect SRS check harness connector (1).
 - Erase diagnostic trouble code memory.
- Are code Nos. 24, 25 or 64 output?

```

    graph TD
        Start[Are code Nos. 24, 25 or 64 output?] -- Yes --> CheckConnectors[Check the following connectors:  
C-107 and C-122]
        CheckConnectors -- NG --> Repair1[Repair]
        CheckConnectors -- OK --> CheckSymptom[Check trouble symptom.]
        CheckSymptom -- NG --> CheckHarness[Check the harness between the front passenger's air bag module (squib) and SRS-ECU.]
        CheckHarness -- NG --> Repair2[Repair]
        CheckHarness -- OK --> ReplaceECU[Replace the SRS-ECU.]
    
```

No
 Replace the front passenger's air bag module.

Code No. 31 or 32 SRS-ECU capacitor system	Probable cause
<p>[Comment] These diagnostic trouble codes are output if the voltage at the SRS-ECU capacitor terminals is higher (No. 31) or lower (No. 32) than the specified value for 5 seconds or more.</p>	<ul style="list-style-type: none"> • Malfunction of SRS-ECU

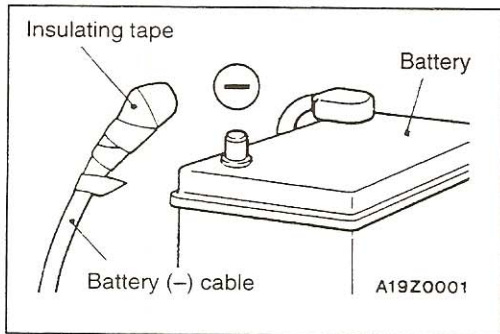


Caution

Turn the ignition key to the “LOCK” position, disconnect the negative battery cable and tape the terminal. Wait at least 60 seconds after disconnecting the battery cable before doing any further work. (Refer to P.52B-8.)

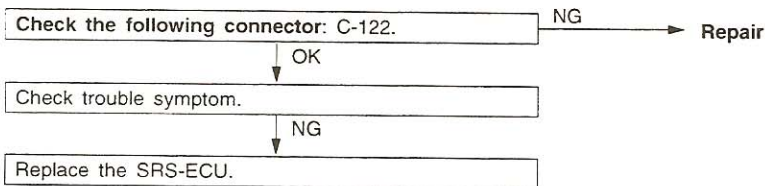
Replace the SRS-ECU.

Code No. 34 Connector lock system	Probable cause
<p>[Comment] This diagnostic trouble code is output when the SRS-ECU connector is connected improperly. However, if the vehicle condition returns to normal, diagnostic trouble code No. 34 will be automatically erased, and the SRS warning light will switch off.</p>	<ul style="list-style-type: none"> • Malfunction of connectors • Malfunction of SRS-ECU

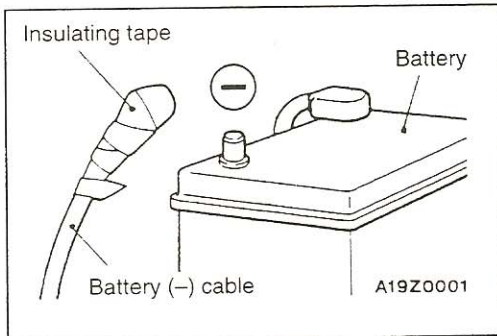


Caution

Turn the ignition key to the “LOCK” position, disconnect the negative battery cable and tape the terminal. Wait at least 60 seconds after disconnecting the battery cable before doing any further work. (Refer to P.52B-8.)



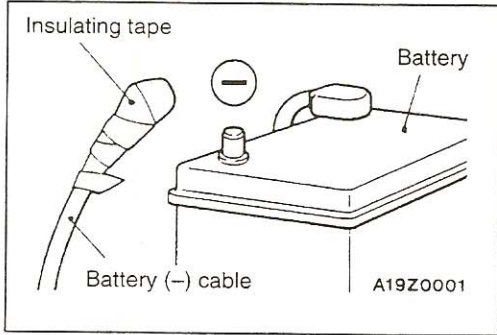
Code No. 35 SRS-ECU (after deployment of the air bag) system	Probable cause
[Comment] After deployment of the air bag, this code is output. If this code is output before deployment of the air bag, a trouble in the SRS-ECU is suspected.	• Malfunction of SRS-ECU

**Caution**

Turn the ignition key to the “LOCK” position, disconnect the negative battery cable and tape the terminal. Wait at least 60 seconds after disconnecting the battery cable before doing any further work. (Refer to P.52B-8.)

Replace the SRS-ECU.

Code No. 41 IG ₁ (A) power circuit system	Probable cause
<p>[Comment] This diagnostic trouble code is output if the voltage between the IG₁ (A) terminal and the ground is lower than the specified value for a continuous period of 5 seconds or more. However, if the vehicle condition returns to normal, diagnostic trouble code No. 41 will be automatically erased, and the SRS warning light will switch off.</p>	<ul style="list-style-type: none"> • Malfunction of harnesses or connectors • Malfunction of SRS-ECU



Caution

Turn the ignition key to the “LOCK” position, disconnect the negative battery cable and tape the terminal. Wait at least 60 seconds after disconnecting the battery cable before doing any further work. (Refer to P.52B-8.)

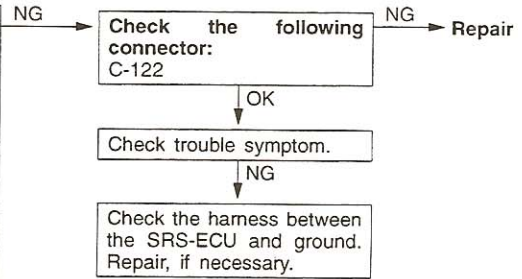
19U0039

19L0567
00003824

Measure at SRS check harness connector (5).

- Disconnect SRS-ECU connector C-122.
- Connect SRS check harness connector (3).
- Continuity between terminals (20) – (21)

OK: Continuity

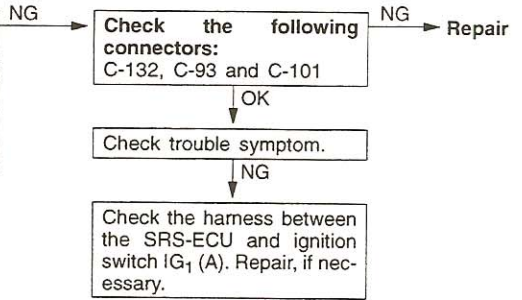


Measure at SRS check harness connector (5).

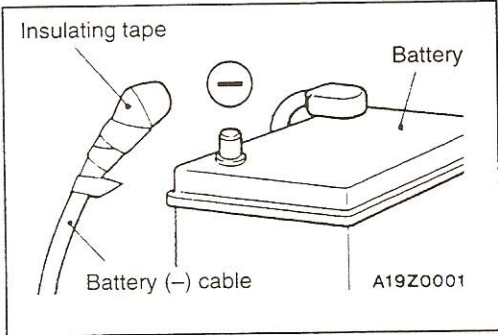
- Disconnect SRS-ECU connector C-122.
- Connect SRS check harness connector (3)
- Connect negative battery cable
- Ignition switch: ON
- Voltage between terminal (14) and ground

OK: 9 V or more

Replace the SRS-ECU.

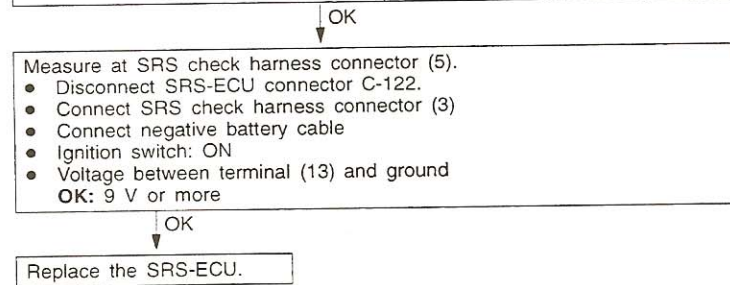
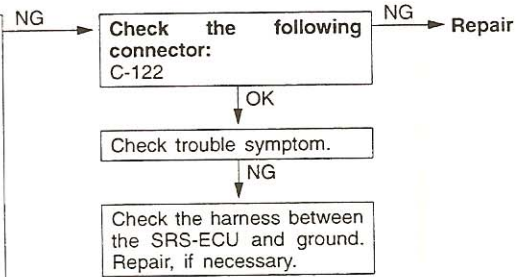
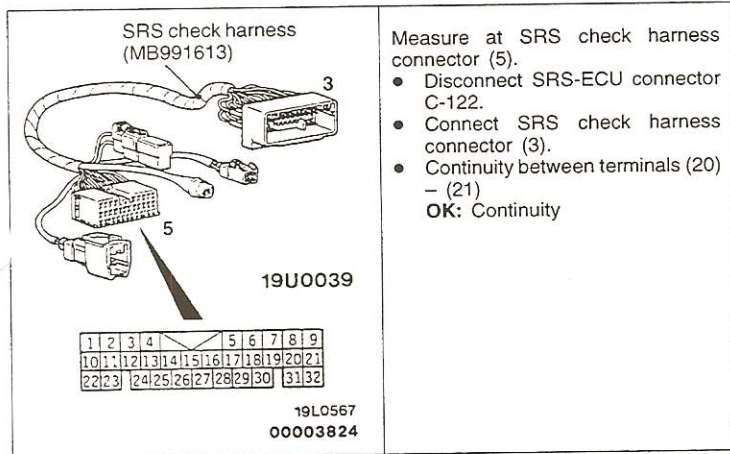


Code No. 42 IG ₁ (B) power circuit system	Probable cause
<p>[Comment] This diagnostic trouble code is output if the voltage between the IG₁ (B) terminal and the ground is lower than the specified value for a continuous period of 5 seconds or more. However, if the vehicle condition returns to normal, diagnostic trouble code No. 42 will be automatically erased, and the SRS warning light will switch off.</p>	<ul style="list-style-type: none"> Malfunction of harnesses or connectors

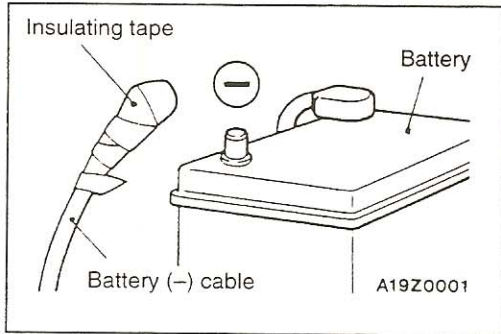


Caution

Turn the ignition key to the “LOCK” position, disconnect the negative battery cable and tape the terminal. Wait at least 60 seconds after disconnecting the battery cable before doing any further work. (Refer to P.52B-8.)

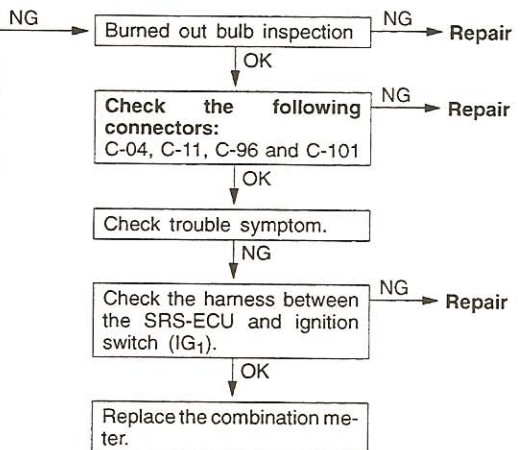
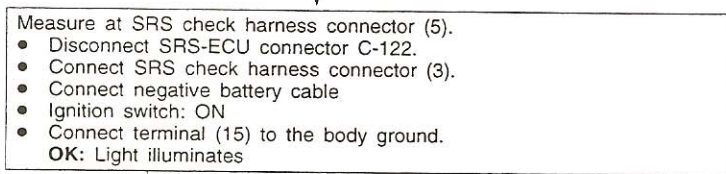
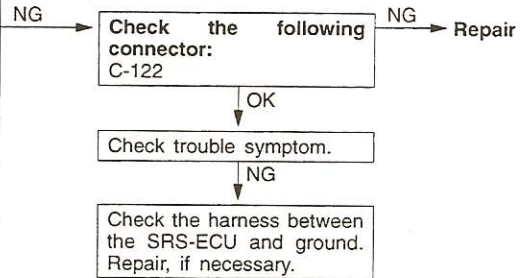
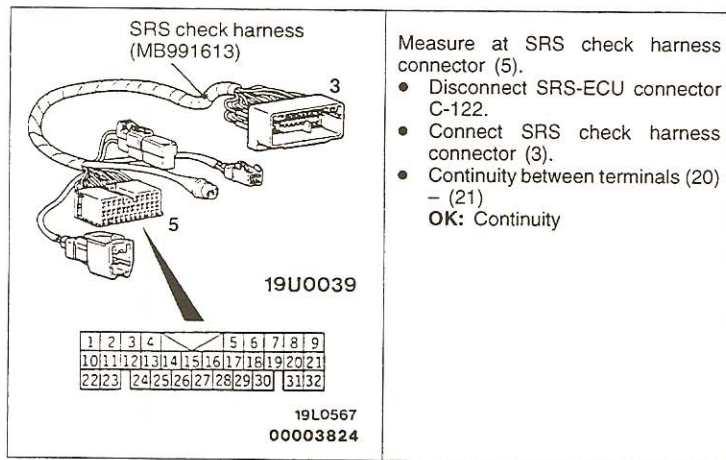


Code No. 43 SRS warning light drive circuit system (Light does not illuminate.)	Probable cause
<p>[Comment] This diagnostic trouble code is output when an open circuit occurs for a continuous period of 5 seconds while the SRS-ECU is monitoring the SRS warning light and the light is OFF (transistor OFF). However, if this code is output due to an open circuit, if the vehicle condition returns to normal, this diagnostic trouble code will be automatically erased, and the SRS warning light will switch off.</p>	<ul style="list-style-type: none"> • Malfunction of harnesses or connectors • Burned out bulb • Malfunction of SRS-ECU • Malfunction of combination meter



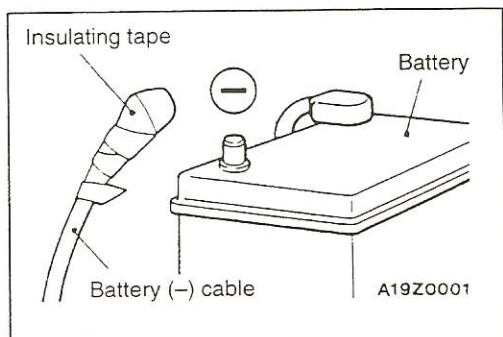
Caution

Turn the ignition key to the “LOCK” position, disconnect the negative battery cable and tape the terminal. Wait at least 60 seconds after disconnecting the battery cable before doing any further work. (Refer to P.52B-8.)



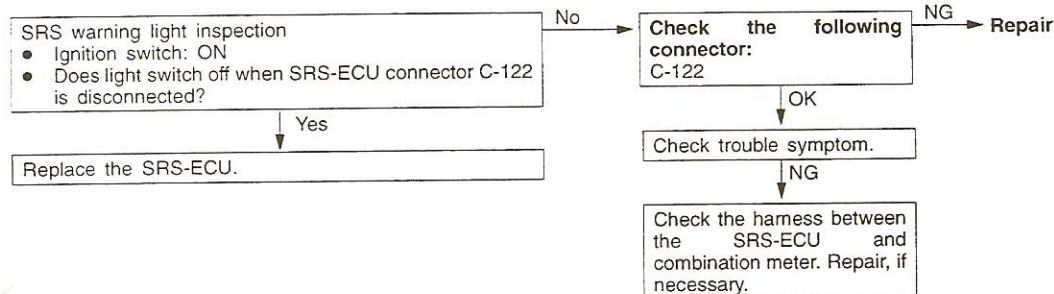
OK
Replace the SRS-ECU.

Code No. 43 SRS warning light drive circuit system (Light does not switch off.)	Probable cause
<p>[Comment] This diagnostic trouble code is output when a short to ground occurs in the harness between the light and the SRS-ECU while the SRS-ECU is monitoring the SRS warning light and the light is ON.</p>	<ul style="list-style-type: none"> • Malfunction of harnesses or connectors • Malfunction of SRS-ECU

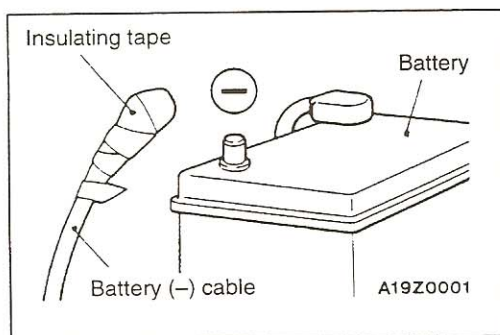


Caution

Turn the ignition key to the “LOCK” position, disconnect the negative battery cable and tape the terminal. Wait at least 60 seconds after disconnecting the battery cable before doing any further work. (Refer to P.52B-8.)



Code No. 44 SRS warning light drive circuit system	Probable cause
<p>[Comment] This diagnostic trouble code is output when a short occurs in the light drive circuit or a malfunction of the output transistor inside the SRS-ECU is detected while the SRS-ECU is monitoring the SRS warning light drive circuit.</p>	<ul style="list-style-type: none"> • Malfunction of SRS-ECU

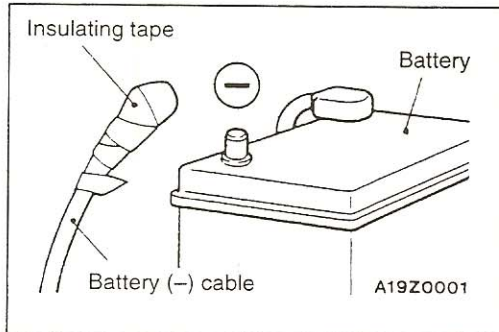


Caution

Turn the ignition key to the “LOCK” position, disconnect the negative battery cable and tape the terminal. Wait at least 60 seconds after disconnecting the battery cable before doing any further work. (Refer to P.52B-8.)

Replace the SRS-ECU.

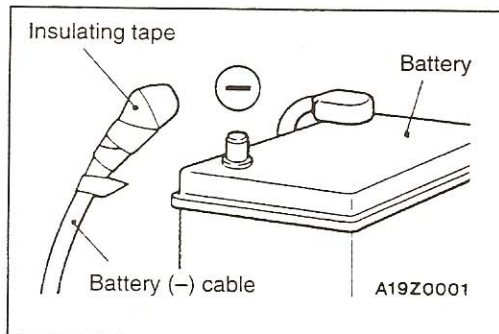
Code No. 45 SRS-ECU non-volatile memory (EEPROM) and A/D converter system	Probable cause
[Comment] This diagnostic trouble code is output if there is a malfunction in the SRS-ECU non-volatile memory (EEPROM) or A/D converter.	<ul style="list-style-type: none"> • Malfunction of SRS-ECU

**Caution**

Turn the ignition key to the “LOCK” position, disconnect the negative battery cable and tape the terminal. Wait at least 60 seconds after disconnecting the battery cable before doing any further work. (Refer to P.52B-8.)

Replace the SRS-ECU.

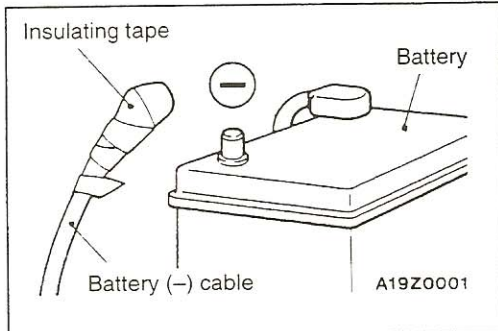
Code No.51 or 52 Drivers’s air bag module (Squib ignition drive circuit) system	Probable cause
[Comment] These diagnostic trouble codes are output when a short-circuit (No.51) or open circuit (No.52) occurs in the squib ignition drive circuit inside the SRS-ECU.	<ul style="list-style-type: none"> • Malfunction of SRS-ECU

**Caution**

Turn the ignition key to the “LOCK” position, disconnect the negative battery cable and tape the terminal. Wait at least 60 seconds after disconnecting the battery cable before doing any further work. (Refer to P.52B-8.)

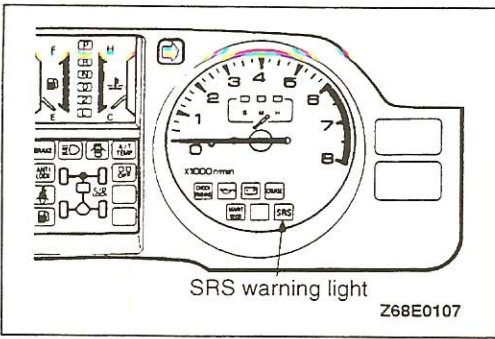
Replace the SRS-ECU.

Code No.54 or 55 Front passenger's air bag module (Squib ignition drive circuit) system	Probable cause
[Comment] These diagnostic trouble codes are output when a short-circuit (No.54) or open circuit (No.55) occurs in the squib ignition drive circuit inside the SRS-ECU.	• Malfunction of SRS-ECU

**Caution**

Turn the ignition key to the “LOCK” position, disconnect the negative battery cable and tape the terminal. Wait at least 60 seconds after disconnecting the battery cable before doing any further work. (Refer to P.52B-8.)

Replace the SRS-ECU.



SRS WARNING LIGHT INSPECTION

52400430014

1. Check to be sure that the SRS warning light illuminates when the ignition switch is in the ON position.
2. Check to be sure that it illuminates for approximately 7 seconds and then switches off.
3. If the above is not the case, inspect diagnostic trouble codes.

INSPECTION CHART FOR TROUBLE SYMPTOMS

52400340249

Get an understanding of the trouble symptoms and check according to the inspection procedure chart.

Trouble symptom		Inspection Procedure No.	Reference page
Communication with scan tool is not possible.	Communication with all systems is not possible.	1	52B-25
	Communication is not possible with SRS only	2	52B-25
When the ignition key is turned to "ON" (engine stopped), the SRS warning light does not illuminate.		Refer to diagnostic trouble code No. 43.	52B-21
After the ignition switch is turned to ON, the SRS warning light is still on after approximately 7 seconds have passed.		Refer to diagnostic trouble code No. 43.	52B-22

INSPECTION PROCEDURE FOR TROUBLE SYMPTOMS

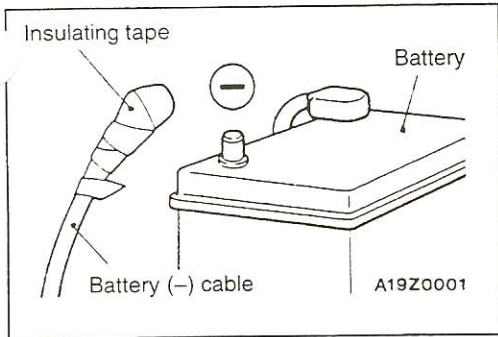
INSPECTION PROCEDURE 1

Communication with scan tool is not possible. (Communication with all systems is not possible)	Probable cause
[Comment] The cause is probably in the power supply system (including ground circuit) of the diagnostic line.	<ul style="list-style-type: none"> • Malfunction of connectors • Malfunction of harness

Refer to GROUP 35C – Troubleshooting.

INSPECTION PROCEDURE 2

Communication with scan tool is not possible. (Communication is not possible with SRS only)	Probable cause
[Comment] If communication is not possible with the SRS only, the cause is probably an open circuit in the on-board diagnostic output circuit of the SRS or in the power circuit (including ground circuit).	<ul style="list-style-type: none"> • Malfunction of harnesses or connectors • Malfunction of SRS-ECU



Caution

Turn the ignition key to the “LOCK” position, disconnect the negative battery cable and tape the terminal. Wait at least 60 seconds after disconnecting the battery cable before doing any further work. (Refer to P.52B-8.)

19U0039

1	2	3	4	5	6	7	8	9
10	11	21	31	41	51	61	71	81
22	23	24	25	26	27	28	29	30
31	32							

19L0567
00003824

Measure at SRS check harness connector (5).

- Disconnect SRS-ECU connector C-122.
- Connect SRS check harness connector (3)
- Continuity between terminals (20) – (21)

OK: Continuity

NG → **Check the following connector: C-122** → NG → Repair

OK ↓

Check trouble symptom

NG ↓

Check the harness between the SRS-ECU and ground, and repair if necessary.

19U0039

1	2	3	4	5	6	7	8	9
10	11	21	31	41	51	61	71	81
22	23	24	25	26	27	28	29	30
31	32							

19L0567
00003824

Measure at SRS check harness connector (5).

- Disconnect SRS-ECU connector C-122
- Connect SRS check harness connector (3)
- Connect negative battery cable
- Voltage between the terminal (13) and ground.
- Voltage between the terminal (14) and ground

OK: 9 V or more

NG → **Check the following connectors: C-80, C-93, C-101 and C-132** → NG → Repair

OK ↓

Check trouble symptom

NG ↓

Check the harness between the SRS-ECU and ignition switch IG₁ (A) or ignition switch IG₁ (B), and repair if necessary.

OK ↓

Inspect the harness between the SRS-ECU and data link connector. → NG → Repair

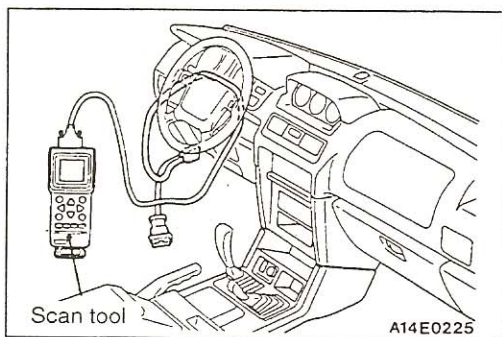
OK ↓

Replace the SRS-ECU

MAINTENANCE

5240039000

The SRS must be inspected by an authorized dealer up to 10 years after the car manufacture date. (Refer to GROUP 00 – Maintenance Service.)



POST-COLLISION DIAGNOSIS

52400110291

To inspect and service the SRS after a collision (whether or not the air bags has deployed), perform the following steps.

SRS AIR BAG CONTROL UNIT MEMORY CHECK

1. Connect the scan tool to the data link connector then check diagnosis codes.

Caution

Turn the ignition switch off before connecting or disconnecting the scan tool.

2. Read (and write down) all displayed diagnostic trouble codes. (Refer to P.52B-10.)

NOTE

If the battery power supply has been disconnected or disrupted by the collision, the scan tool cannot communicate with the SRS diagnosis unit. Inspect and, if necessary, repair the body wiring harness before proceeding.

3. Read the service data (fault duration and how many times the memory was erased) using the scan tool.

NOTE

- Maximum stored period: 9999 minutes (approximately 7 days)
- Maximum number of times to be stored: 250

4. Erase the diagnostic trouble codes then wait 45 seconds or more, read and write down all displayed diagnostic trouble codes. (Refer to P.52B-10.)

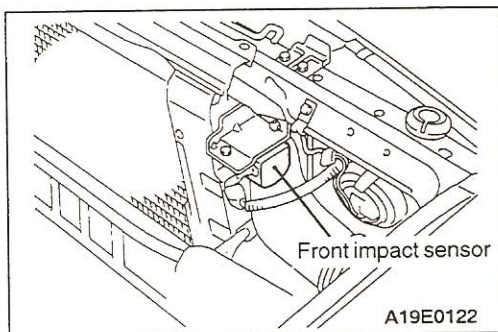
REPAIR PROCEDURE**WHEN AIR BAG DEPLOYS IN A COLLISION.**

1. Replace the following parts with new ones.
 - Front impact sensors (Refer to P.52B-30.)
 - SRS air bag control unit (SRS-ECU) (Refer to P.52B-33.)
 - Air bag modules (Refer to P.52B-35, 36.)
2. Check the following parts and replace if there are any malfunctions.
 - Clock spring (Refer to P.52B-39.)
 - Steering wheel, steering column and intermediate joint.
 - (1) Check wiring harness (built into steering wheel) and connectors for damage, and terminals for deformation.
 - (2) Install air bag module to check fit or alignment with steering wheel.
 - (3) Check steering wheel for noise, binds or difficult operation and excessive free play.
3. Check harnesses for binding, connectors for damage, poor connections, and terminals for deformities. (Refer to P.52B-7.)

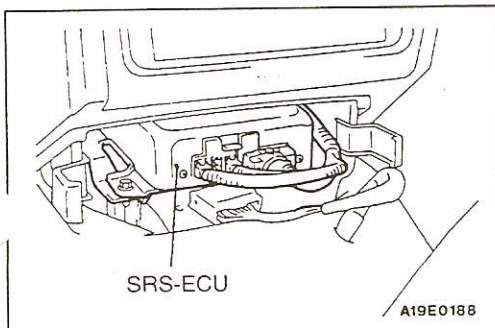
WHEN AIR BAG DOES NOT DEPLOY IN LOW-SPEED COLLISION.

Check the SRS components.

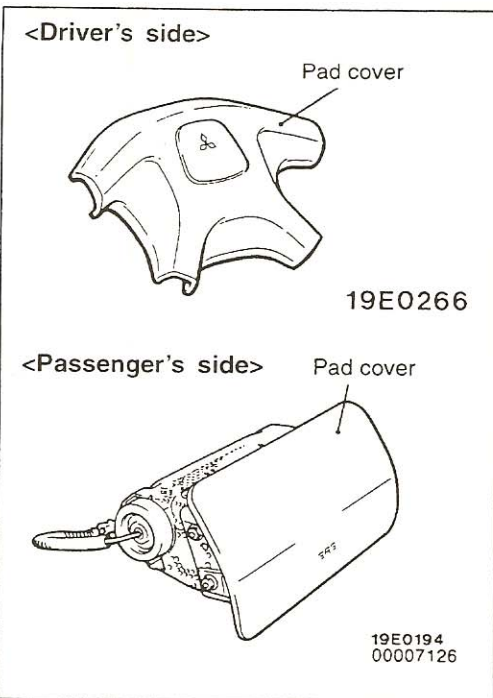
If the SRS components are showing any visible damage such as dents, cracks, or deformation, replace them with new ones. Concerning parts removed for inspection, replacement with new parts and cautionary points for working, refer to appropriate COMPONENT SERVICE, P.52B-29.

**Front impact sensors**

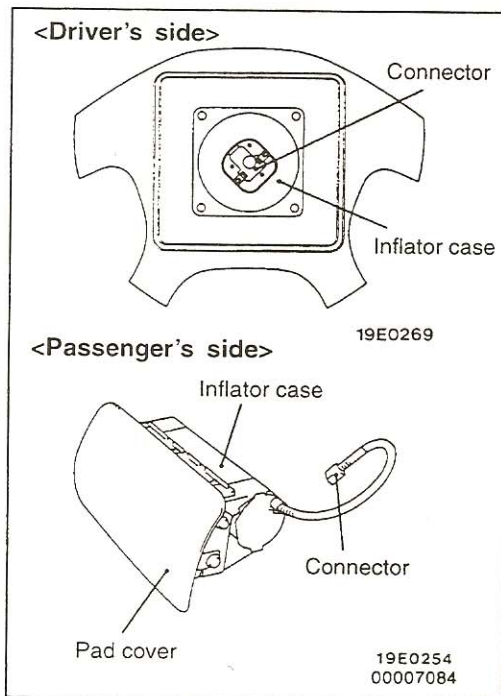
1. Check radiator support panel for deformities or rust.
2. Check front impact sensor for dents, cracks deformities or rust.
3. Check sensor harnesses for binding, connectors for damage, and terminals for deformities.

**SRS air bag control unit (SRS-ECU)**

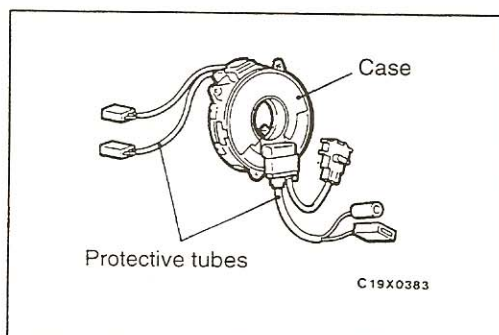
1. Check SRS-ECU case and brackets for dents, cracks or deformities.
2. Check connector for damage, and terminals for deformities.

**Air bag module**

1. Check pad cover for dents, cracks or deformities.



2. Check for connector damage, deformed terminal, and binding harness.
3. Check air bag inflator case for dents, cracks or deformities.
4. Install air bag module to steering wheel to check fit alignment with the steering wheel.

**Clock spring**

1. Check clock spring connectors and protective tubes for damage, and terminals for deformities.
2. Visually check the case for damage.

Steering wheel, steering column and intermediate joint

1. Check wiring harness (built into steering wheel) and connectors for damage, and terminals for deformities.
2. Install air bag module to check fit or alignment with steering wheel.
3. Check steering wheel for noise, binding, difficult operation, or excessive free play.

Harness connector (body and front wiring harness)

Check for binding harness, connector damage, poor connections, and deformed terminals. (Refer to P.52B-7.)

COMPONENT SERVICE

52400290292

If the SRS components are to be removed or replaced as a result of maintenance, troubleshooting, etc., follow the appropriate procedure in this section.

Caution

1. SRS components should not be subjected to heat over 93°C (200°F), so remove the front impact sensors, SRS diagnosis unit, air bag modules and clock spring before drying or baking the vehicle after painting. Recheck SRS system operability after reinstalling them. (Refer to GROUP 00 – Maintenance Service.)
2. If the SRS components are removed for the purpose of inspection, sheet metal repair, painting, etc., they should be stored in a clean, dry place until they are reinstalled.

FRONT IMPACT SENSORS

Caution

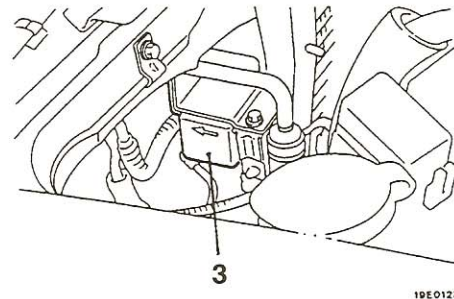
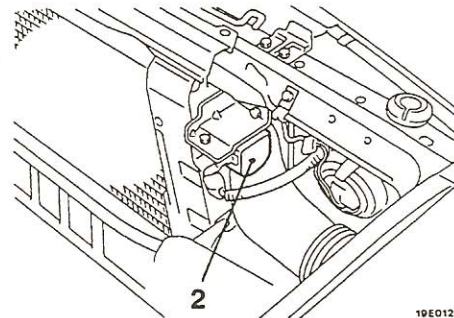
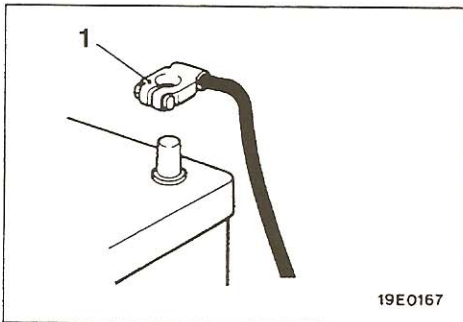
1. Never repair or disassemble a front impact sensor. If faulty, replace it.
2. Handle the front impact sensors very carefully, taking care not to drop them or otherwise subject them to impact. If a sensor

- is dented, cracked, deformed or rusted, replace it with a new one
3. Replace sensors with new ones after the air bags have deployed.

REMOVAL AND INSTALLATION

Pre-removal Operation

- Turn the ignition key to the "LOCK" position.

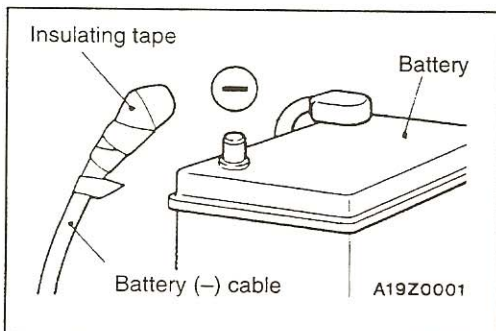


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Removal steps

- ▶C◀ • Post-installation inspection
- ◀A▶ ▶B▶ 1. Negative (-) battery cable connection
- ◀B▶ ▶B▶ 2. Front impact sensor (R.H.)

- ◀B▶ ▶B▶ • Reserve tank
- ▶A▶ ▶B▶ 3. Front impact sensor (L.H.)
- ▶A▶ • Pre-installation inspection



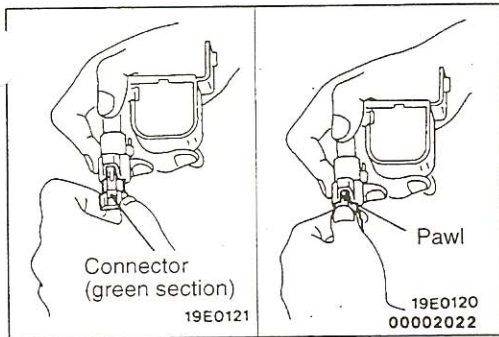
REMOVAL SERVICE POINTS

◀A▶ NEGATIVE (-) BATTERY CABLE DISCONNECTION

Disconnect the negative battery cable from the battery and tape the terminal to prevent accidental connection and air bags deployment.

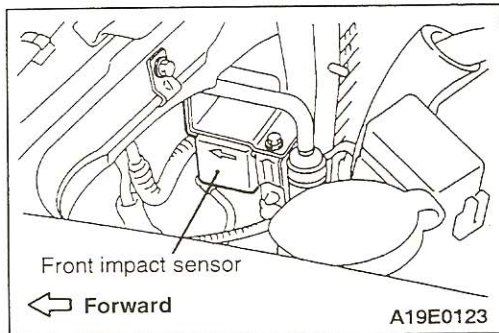
Caution

Wait at least 60 seconds after disconnecting the battery cable before doing any further work. (Refer to P.52B-8.)



◀B▶ FRONT IMPACT SENSOR (R.H.)/FRONT IMPACT SENSOR (L.H.) REMOVAL

- (1) Slide the connector (green section) to release the lock.
- (2) Push down the pawl, and then disconnect the connector.



INSTALLATION SERVICE POINTS

▶A◀ PRE-INSTALLATION INSPECTION

To mount the new front impact sensor, visually check it and measure the resistance between the terminals. (Refer to the previous item "INSPECTION".)

▶B◀ FRONT IMPACT SENSOR (L.H.)/FRONT IMPACT SENSOR (R.H.) INSTALLATION

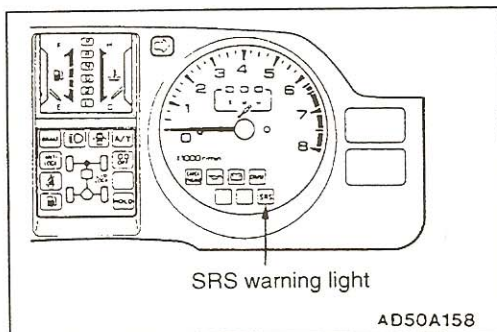
- (1) Securely connect the connector.
- (2) Position the front impact sensor facing toward the front of the vehicle as shown by the arrow in the illustration, and install it securely.

Caution

The SRS may not activate properly if a front impact sensor is not installed properly, which could result in the SRS system not operating properly during a collision.

▶C◀ POST-INSTALLATION INSPECTION

Reconnect the negative battery terminal. Turn the ignition key to the "ON" position. Does the "SRS" warning light illuminate for about 7 seconds, turn off and then remain off for at least 45 seconds? If yes, SRS system is functioning properly. If no, refer to page 52B-10.



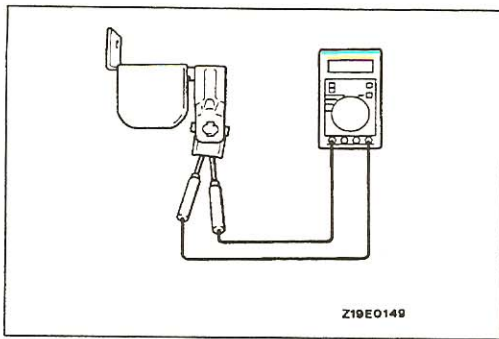
INSPECTION

52400160081

- (1) Check upper frame and sensor brackets for deformities or rust.
- (2) Check sensor harness for binds, connectors for damage, and terminals for deformities.
- (3) Check for dents, cracks, deformation or rust of the front impact sensor.

Caution

If a dent, crack, deformation or rust is detected, replace with a new sensor.

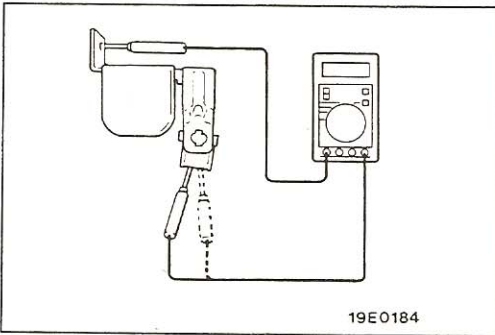


- (4) Measure the resistance between terminals and check whether it is within the standard value.

Standard value: $2,000 \pm 100 \Omega$

Caution

Always replace the sensor with a new one if the resistance is not within the standard value.



- (5) Check for continuity between the terminals and the brackets.

If there is continuity, the sensor insulation is defective, and so the sensor should be replaced with a new one.

SRS AIR BAG CONTROL UNIT (SRS-ECU)

52400210199

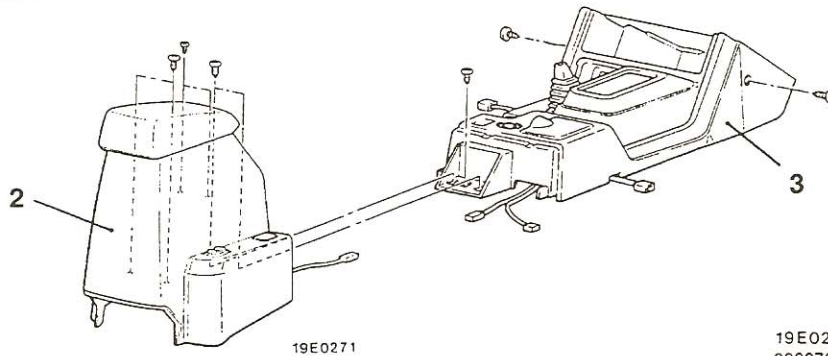
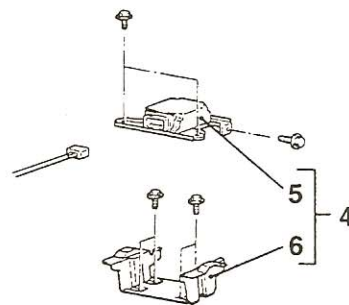
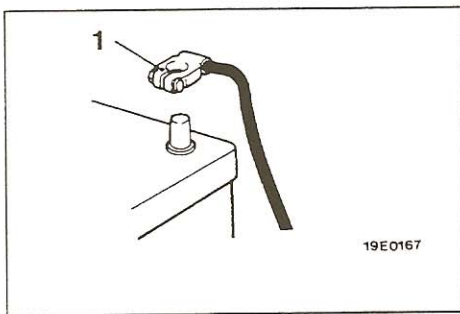
Caution

1. Never attempt to disassemble or repair the SRS-ECU. If faulty, replace it.
2. Do not drop or subject the SRS-ECU to impact or vibration. If dents, cracking, deformation, or rust are discovered on the SRS-ECU, replace it with a new SRS-ECU. Discard the old one.
3. After deployment of the air bags, replace the SRS-ECU with a new one.
4. Never use an ohmmeter on or near the SRS-ECU, and use only the special test equipment described on P.52B-9.

REMOVAL AND INSTALLATION

Pre-removal Operation

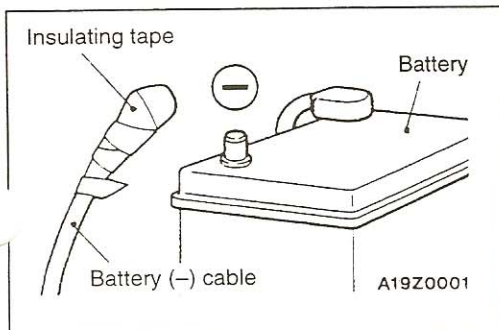
Turn the ignition key to the "LOCK" position.



Removal steps

- ◀A▶ ▶B▶
- Post-installation inspection
 - 1. Negative (-) battery cable connection
 - 2. Rear console assembly
 - 3. Front console assembly

- ▶A▶
- 4. SRS air bag control unit assembly
 - 5. SRS air bag control unit (SRS-ECU)
 - 6. Bracket



SERVICE POINTS OF REMOVAL

◀A▶ NEGATIVE (-) BATTERY CABLE DISCONNECTION

Disconnect the negative battery cable from the battery and tape the terminal to prevent accidental connection and air bags deployment.

Caution

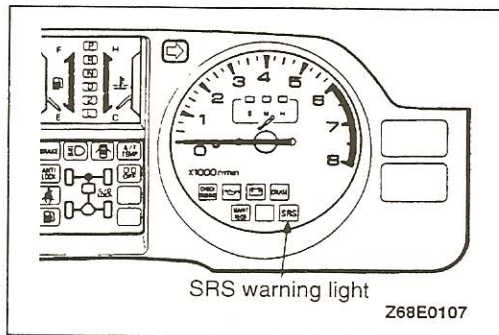
Wait at least 60 seconds after disconnecting the battery cable before doing any further work. (Refer to P.52B-8.)

INSTALLATION SERVICE POINTS

▶A◀ SRS AIR BAG CONTROL UNIT (SRS-ECU) INSTALLATION

Caution

The SRS may not activate if SRS-ECU is not installed properly, which could result in the SRS system not operating properly in a collision.



▶B◀ POST INSTALLATION INSPECTION

Reconnect the negative battery terminal. Turn the ignition key to the "ON" position. Does the "SRS" warning light illuminated for about 7 seconds, turn off and then remain off for at least 45 seconds? If yes, SRS system is functioning properly. If no, refer to page 52B-10.

INSPECTION

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- Check the SRS-ECU case and brackets for dents, cracks or deformities.
- Check the SRS-ECU connectors and lock lever for damage, and terminals for deformities.

Caution

If a dent, cracks, deformation or rust is discovered, replace the SRS-ECU with a new one.

NOTE

Refer to P.52B-10 for inspection of SRS-ECU for other than physical damage.

AIR BAG MODULE AND CLOCK SPRING

Caution

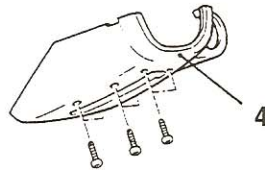
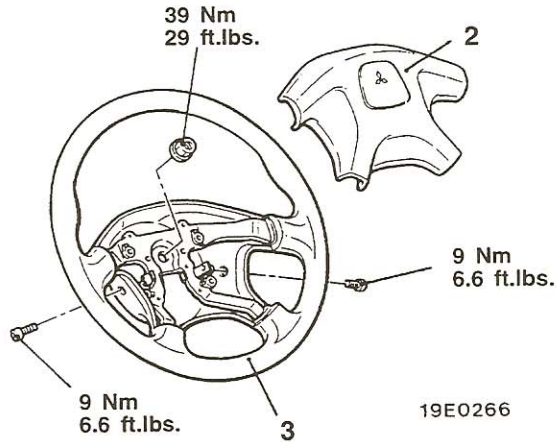
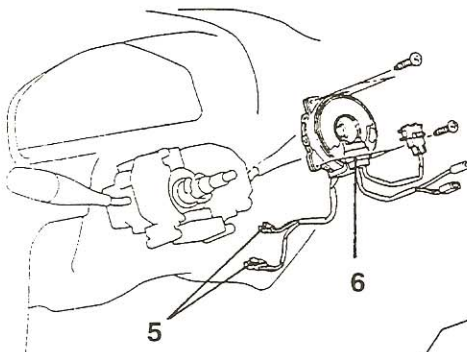
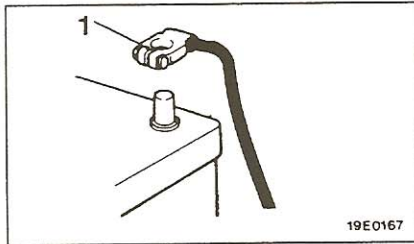
1. Never attempt to disassemble or repair the air bag module or clock spring. If faulty, replace it.
Do not drop the air bag module or clock spring or allow contact with water, grease or oil. Replace it if a dent, crack, deformation or rust are detected.
2. Store the air bag module on a flat surface with the pad cover facing up.
Do not place anything on top of the air bag modules.

4. Do not expose the air bag module to temperature over 93°C (200°F).
5. After deployment of an air bag, replace the air bag module. Check the clock spring and replace it with a new one if any problem is found.
6. Wear gloves and safety glasses when handling an air bag that has deployed.
7. An undeployed air bag module should only be disposed of in accordance with the procedures P.52B-41.

REMOVAL AND INSTALLATION

Pre-removal Operation

- After setting the steering wheel and the front wheels, to the straight ahead position, remove the ignition key.



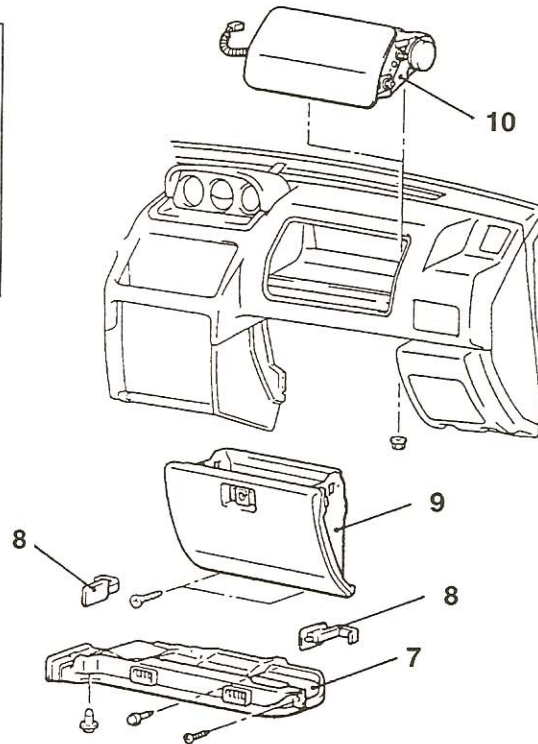
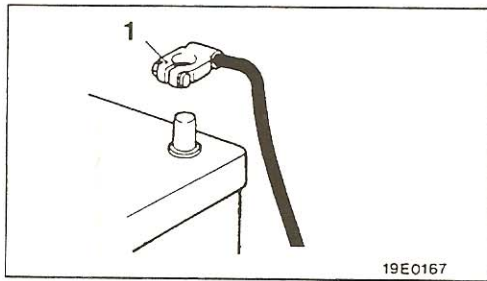
Clock spring removal steps

- ▶D◀ • Post-installation inspection
- ▶A▶▶B▶▶C▶ 1. Negative (-) battery cable connection
- ▶A▶▶B▶▶C▶ 2. Air bag module (Driver's side)
- ▶A▶▶B▶▶C▶ 3. Steering wheel
- ▶A▶▶B▶▶C▶ 4. Column cover lower
- ▶A▶▶B▶▶C▶ 5. Clock spring and body wiring harness connection
- ▶B▶▶A▶▶ 6. Clock spring
- ▶A▶▶ 6. Clock spring
- ▶A▶▶ • Pre-installation inspection

Air bag module removal steps (Driver's side)

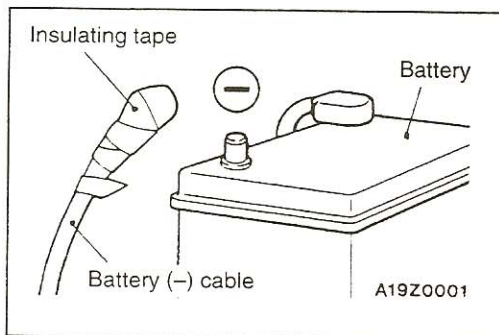
- ▶D◀ • Post-installation inspection
- ▶A▶▶B▶▶ 1. Negative (-) battery cable connection
- ▶A▶▶B▶▶ 2. Air bag module (Driver's side)
- ▶A▶▶ • Pre-installation inspection

<Air bag module (Passenger's side)>

**Air bag module removal steps
(Passenger's side)**

- ◀A▶ ▶D▶
- Post-installation inspection
 - 1. Negative (-) battery cable connection
 - 7. Foot shower duct (R.H.)

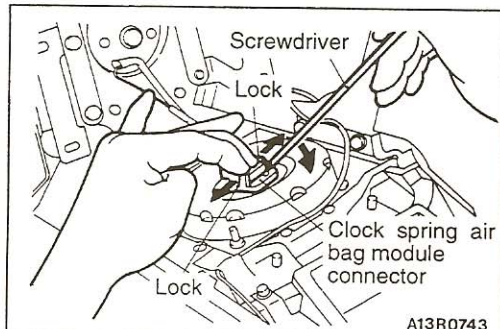
8. Stopper
9. Glove box
10. Air bag module (Passenger's side)
- ▶A▶
- Pre-installation inspection

**REMOVAL SERVICE POINTS****◀A▶ NEGATIVE (-) BATTERY CABLE DISCONNECTION**

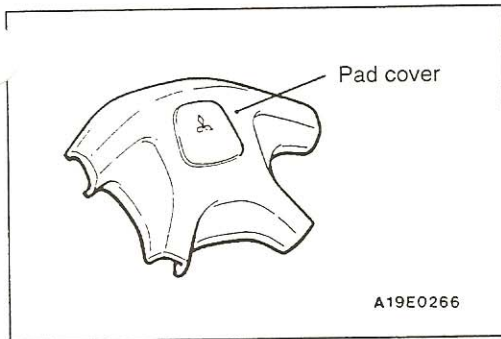
Disconnect the negative battery cable from the battery and tape the terminal to prevent accidental connection and air bags deployment.

Caution

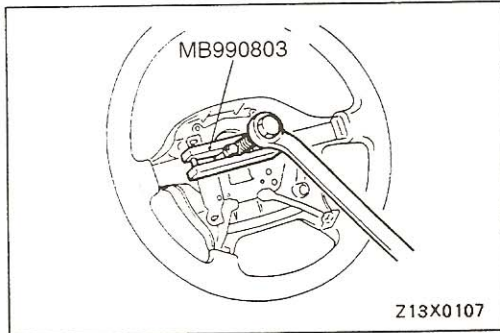
Wait at least 60 seconds after disconnecting the battery cable before doing any further work. (Refer to P.52B-8.)

**◀B▶ AIR BAG MODULE REMOVAL**

- (1) Remove the air bag module mounting nut using a socket wrench from the back side.
- (2) When disconnecting the connector of the clock spring from the air bag module, press the air bag's lock toward the outer side to spread it open. Use a screwdriver to pry gently as shown in the figure at the left, to remove the connector.

**Caution**

1. When disconnecting the air bag module-clock spring connector, take not to apply excessive force to it.
2. The removed air bag module should be stored in a clean, dry place with the pad cover facing up.

**◀C▶ STEERING WHEEL REMOVAL****Caution**

Do not hammer on the steering wheel. Doing so may damage the collapsible column mechanism.

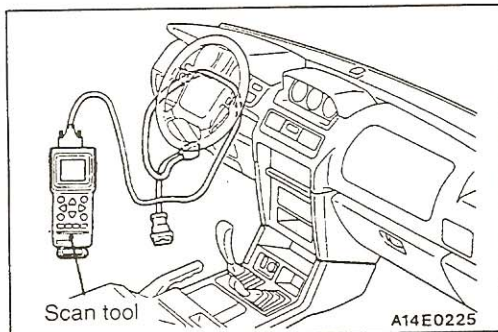
INSTALLATION SERVICE POINTS**▶A◀ PRE-INSTALLATION INSPECTION**

- (1) When installing the new air bag module and clock spring, refer to "INSPECTION".

Caution

Dispose of an air bag module only according to the specified procedure. (Refer to P.52B-41.)

- (2) Connect the battery (-) terminal.

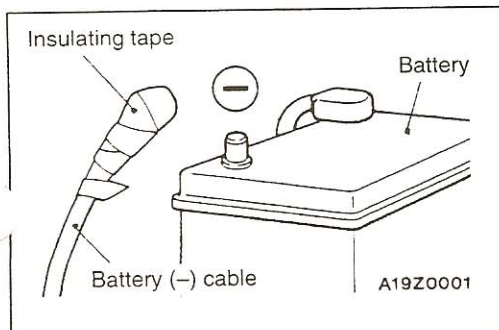


- (3) Connect the scan tool to the data link connector then check diagnostic codes.

Caution

Turn the ignition switch off before connecting or disconnecting the scan tool.

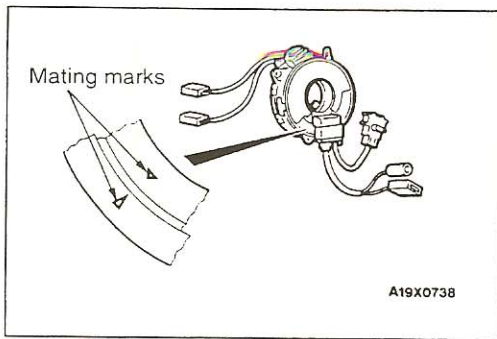
- (4) Turn the ignition key to the "ON" position.
- (5) Conduct diagnostic test using the scan tool to ensure entire SRS operates properly.



- (6) Turn the ignition key to the "LOCK" position. Disconnect the negative battery cable and tape the terminal to prevent accidental connection and air bags deployment.

Caution

Wait at least 60 seconds after disconnecting the battery cable before doing any further work. (Refer to P.52B-8.)



►B◄ CLOCK SPRING INSTALLATION

Align the mating marks of the clock spring. Turn the front wheels to the straight-ahead position. Then install the clock spring to the column switch.

Mating Mark Alignment

Turn the clock spring clockwise fully. Then turn it back approx. 3 and 1/3 turns counterclockwise to align the mating marks.

Caution

Ensure that the clock spring's mating marks are properly aligned. If not, the steering wheel may not rotate completely during a turn, or the flat cable in the clock spring could be damaged. This would prevent normal SRS operation and possibly cause serious injury to the driver.

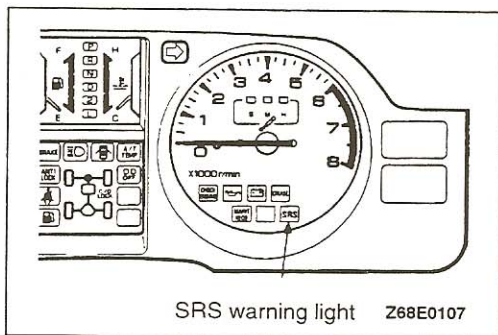
►C◄ STEERING WHEEL INSTALLATION

- (1) Before installing the steering wheel, turn the vehicle's front wheels to the straight-ahead position.

Caution

When installing the steering wheel, ensure that the harness of the clock spring does not become caught or tangled.

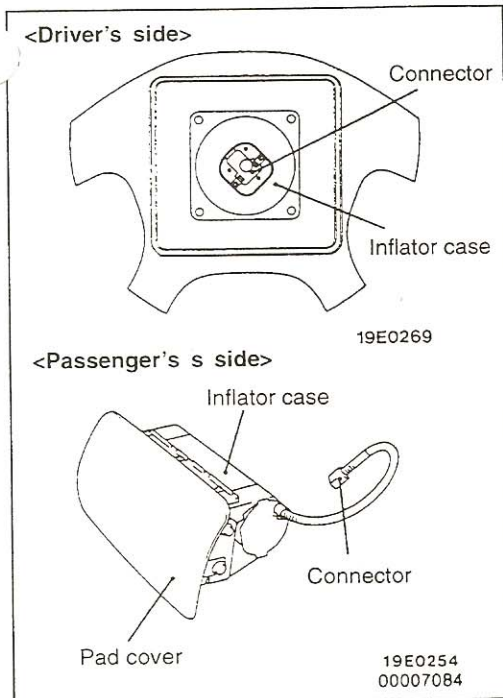
- (2) After securing the steering wheel, turn the steering wheel all the way in both directions to confirm that steering wheel rotation is normal.



►D◄ POST-INSTALLATION INSPECTION

- (1) After installing the clock spring, the steering wheel, the column covers and the air bag module, check steering wheel for noise, binds or difficult operation.
- (2) Reconnect the negative battery terminal. Turn the ignition key to the "ON" position. Does the "SRS" warning light illuminate for about 7 seconds, turn off and then remain off for at least 45 seconds? If yes, SRS system is functioning properly. If no, refer to page 52B-10.)

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INSPECTION

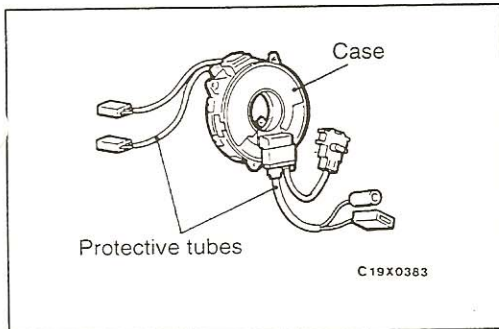
AIR BAG MODULE

If any component damage is found during the following inspection, replace the air bag module with a new one. Dispose of the old one according to the specified procedure. (Refer to P.52B-41.)

Caution

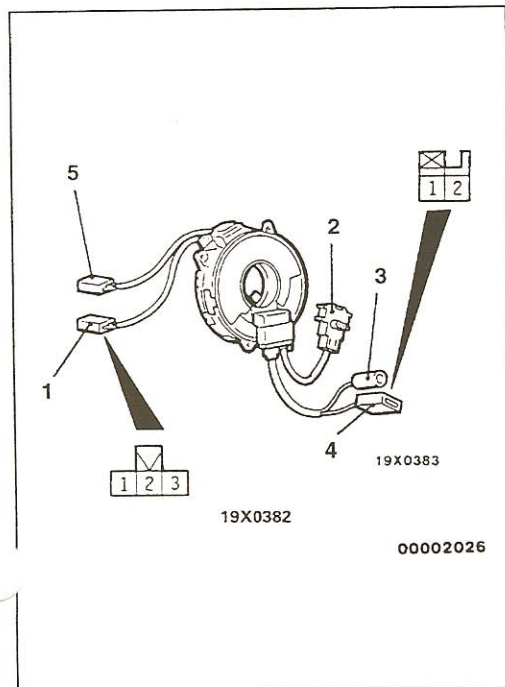
Never attempt to measure the circuit resistance of the air bag module (squib) even if you are using the specified tester. If the circuit resistance is measured with a tester, accidental air bag deployment will result in serious personal injury.

- (1) Check pad cover for dents, cracks or deformities.
- (2) Check the air bag module for dents, cracking or deformation.
- (3) Check hooks and connectors for damage, terminals for deformities, and harness for binds.
- (4) Check air bag inflator case for dents, cracks or deformities.
- (5) Install the air bag module on the steering wheel or dash and check alignment.



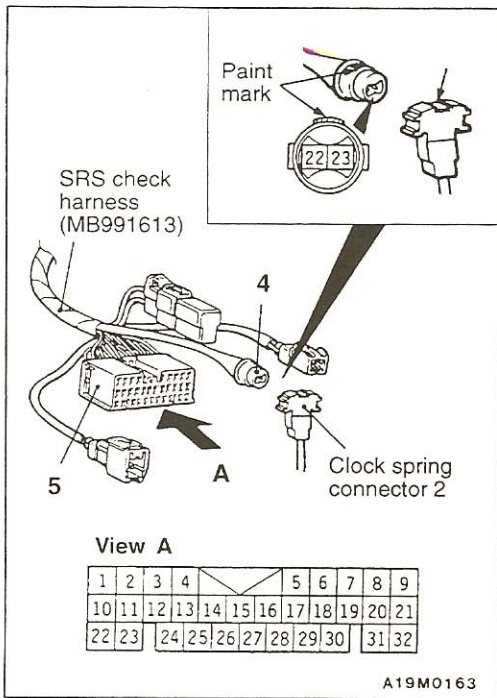
CLOCK SPRING

- (1) Check connectors and protective tube for damage, and terminals for deformities.
- (2) Visually check the case for damage. If, even one abnormality is discovered, replace the clock spring with a new one.



- (3) Check for continuity between the No.1 connector of the clock spring and connectors No. 3 and 4

No.1 connector			No.3 connector	No.4 connector	
Terminal 1	Terminal 2	Terminal 3		Terminal 1	Terminal 2
○				○	
	○		○	○	
		○	○		
To auto-cruise control unit	To ACC power	To horn relay	To horn switch	To auto-cruise control switch	



- (4) Align the paint mark of the SRS check harness connector No.4 with the notch in clock spring connector No.2 (as shown in the illustration) to connect the connectors Nos.2 and 4.
- (5) Check continuity between the terminals 22 and 23 of the SRS check harness connectors No.5.

AIR BAG MODULE DISPOSAL PROCEDURES

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Before either disposing of a vehicle equipped with an air bag, or prior to disposing of the air bag mod-

ule, be sure to first follow the procedures described below to deploy the air bag(s).

UNDEPLOYED AIR BAG MODULE DISPOSAL**Caution**

1. If the vehicle is to be scrapped, or otherwise disposed of, deploy the air bag inside the vehicle. If the vehicle will continue to be operated and only the air bag module is to be disposed of, deploy the air bag outside the vehicle.
2. Since a large amount of smoke is produced when the air bag is deployed, select a well-ventilated site. Moreover, never attempt the test near a smoke sensor.
3. Since there is a loud noise when the air bag is deployed, avoid residential areas whenever possible. If anyone is nearby, give warning of the impending noise.
4. Suitable ear protection should be worn by personnel performing these procedures or by people in the immediate area.

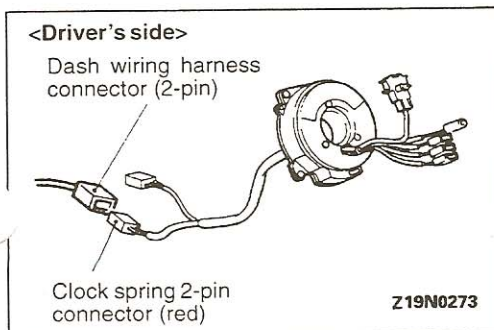
DEPLOYMENT INSIDE THE VEHICLE

(when disposing of a vehicle)

- (1) Move the vehicle to an isolated spot.
- (2) Disconnect the negative (–) and positive (+) battery cables from the battery terminals, and then remove the battery from the vehicle.

Caution

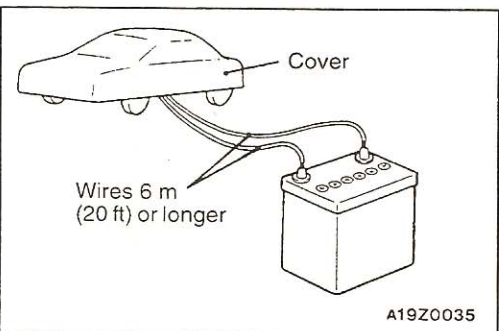
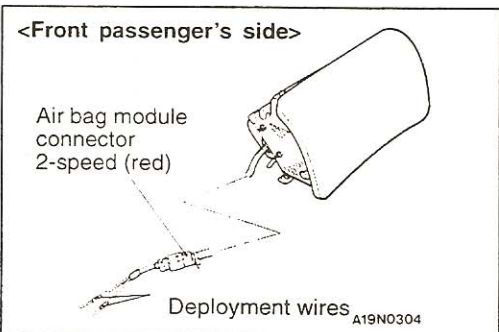
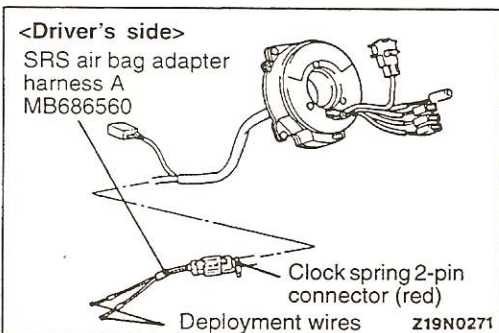
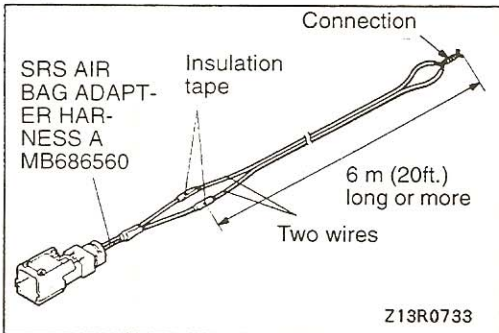
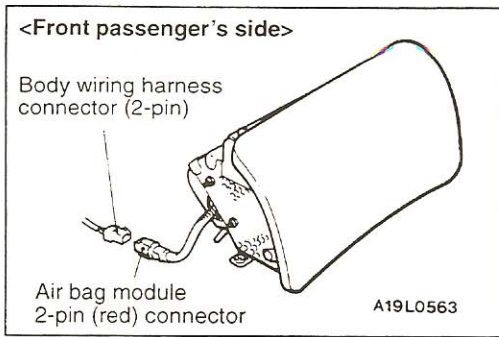
Wait at least 60 seconds after disconnecting the battery cables before doing any further work. (Refer to P.52B-8.)



- (3) Remove the steering column cover lower.
- (4) Remove the connection between the clock spring 2-pin connector (red) and the dash wiring harness connector.

NOTE

If the clock spring connector is disconnected from the dash wiring harness, both electrodes of the clock spring connector will be automatically shorted to prevent unintended deployment of the air bag due to static electricity, etc.



- (5) Open the glove compartment.
- (6) Disconnect the 2-pin (red) connector of the air bag module (front passenger's side) from the body wiring harness connector.

NOTE

If the air bag module (front passenger's side) connector is disconnected from the body wiring harness, both electrodes of the air bag module (front passenger's side) connector will be automatically shorted to prevent unintended deployment of the air bag due to static electricity, etc.

- (7) Connect two wires, each six meters (20 feet) long or more, to the two leads of SRS AIR BAG ADAPTER HARNESS A and cover the connections with insulation tape. The other ends of the two wires should be connected to each other (short-circuited), to prevent sudden unexpected deployment of the air bag.

- (8) Connect the clock spring 2-pin connector (red) to SRS air bag adapter harness A and move the deployment wires out of the vehicle.

- (9) Connect the SRS air bag adapter harness A to the 2-pin connector (red) of the air bag module (front passenger's side) and pass the deployment wire out of the vehicle.

- (10) To suppress the operation sound as much as possible, completely close all door windows, close the door and put the cover on the vehicle.

Caution

If the glass is scratched, air bag deployment could cause it to crack and fly out of the vehicle, so always put a cover over the vehicle.

- (11) At a location as far away from the vehicle as possible, disconnect the two connected wires from each other, and connect them to the two terminals of the battery (removed from the vehicle) to deploy the air bag.

Caution

1. Before deploying the air bag in this manner, first check to be sure that there is no one in or near the vehicle. Wear safety glasses, suitable ear protection.
2. The inflator will be quite hot immediately following the deployment, so wait at least 30 minutes to allow it to cool before attempting to handle it. Although not poisonous, do not inhale gas from air bag deployment. See Deployed Air Bag Module Disposal Procedures (P.52B-46.) for post-deployment handling instructions.
3. If the air bag module fails to deploy, do not go near the module. Contact the MMSA Teck Line.

(12) Dispose of the air bag module after deployment according to the Deployed Air Bag Module Disposal Procedures. (Refer to P.52B-46.)

DEPLOYMENT OUTSIDE THE VEHICLE**Caution**

1. Deploy the air bag in a wide, flat area at least 6 m (20 feet) away from obstacles and other people.
2. Do not perform deployment outside if a strong wind is blowing. If there is a slight breeze, place the air bag module downwind from the battery.

- (1) Disconnect the negative (–) and positive (+) battery cables from the battery terminals, and then remove the battery from the vehicle

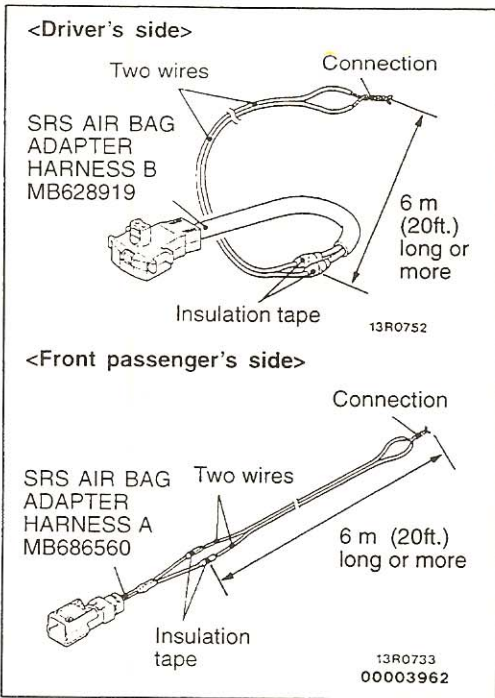
Caution

Wait at least 60 seconds after disconnecting the battery cables before doing any further work. (Refer to P.52B-8.)

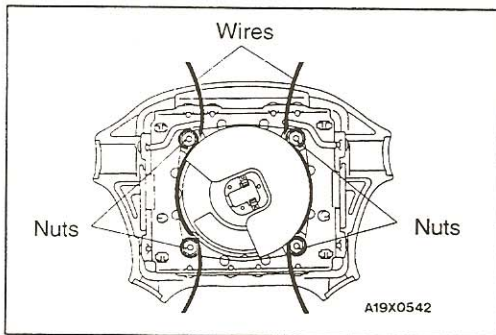
- (2) Remove the air bag modules from the vehicle. (Refer to P.52B-35, 36.)

Caution

Store the air bag module on a flat surface with the pad cover facing up. Do not place anything on top of it.

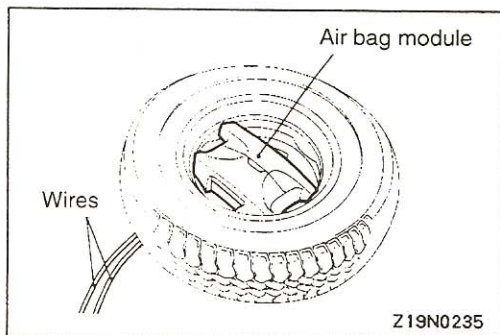


(3) Connect two wires, each six meters (20 feet) long or more, to the two leads of SRS AIR BAG ADAPTER HARNESS B <driver's side> or SRS AIR BAG ADAPTER HARNESS A <front passenger's side>, and cover the connections with insulation tape. The other ends of the two wires should be connected to each other (short-circuited), to prevent sudden unexpected deployment of the air bag.



<Driver's side>

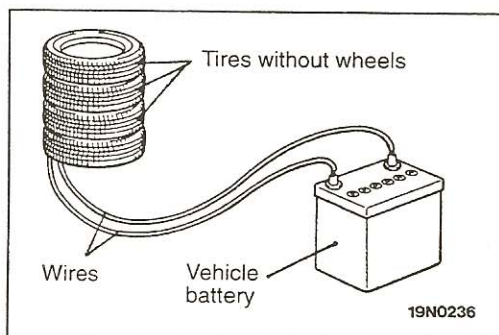
1. Install nuts that are no longer needed to the four bolts on the rear side of the air bag module, and tie on some thick wire to secure to the wheel.
2. Take the SRS air bag adaptor harness B that is connected to the wires, pass it beneath the old tire wheel assembly, and connect it to the air bag module.



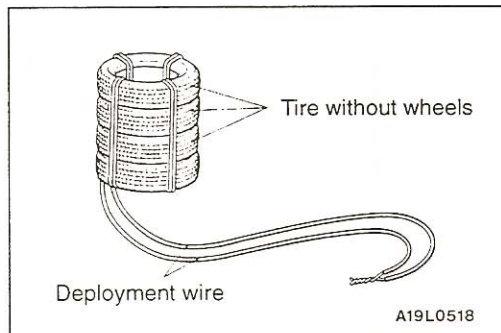
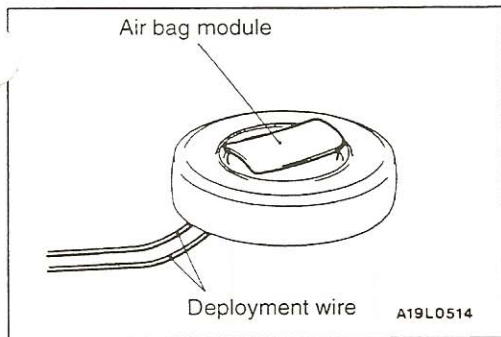
3. Insert the air bag module into the wheel, and secure it with wires that are tied to the bolt holes, the air bag should face upward.

Caution

Leave some space below the wheel for the adaptor harness. If there is no space, the reaction when the air bag deploys could damage the adaptor harness.



4. Place three old tires, without wheels, on top of the tire secured to the air bag module.



<Front passenger's side>

1. Connect the deployment wires to the SRS air bag adapter harness A, pass it beneath the tire, and wheel assembly, and connect it to the air bag module.
2. Pass the thick wires into the hole of the air bag module bracket, and secure it to the wheel of the old tire with wheel (4 locations), with the air bag facing upwards.

Caution

1. Leave some space below the wheel for the deployment wires.
If there is no space, the reaction of the air bag deployment could result in damage of the adaptor harness.
2. While deployment takes place, do not have the connector of the SRS air bag adaptor harness A inserted between the tires.
3. Place three old tires, without wheels, on top of the tire secured to the air bag module, and secure all tires together with ropes (4 locations).

4. At a location as far away from the air bag module as possible, and from a shielded position, if possible, disconnect the two connected wires from each other and connect them to the two terminals of the battery (removed from the vehicle) to deploy the air bag.

Caution

1. Before deployment, check carefully to be sure that no one is nearby.
2. The inflator will be quite hot immediately following deployment, so wait at least 30 minutes to allow it to cool before attempting to handle it.
Although not poisonous, do not inhale gas from air bag deployment. See Deployed Air Bag Module Disposal Procedures (as shown below) for post-deployment handling instructions.
3. If the air bag module fails to deploy when the procedures above are followed, do not go near the module. Contact the MMSA Teck Line.
5. Dispose of the air bag module after deployment according to the Deployed Air Bag Module Disposal Procedures on the next page.

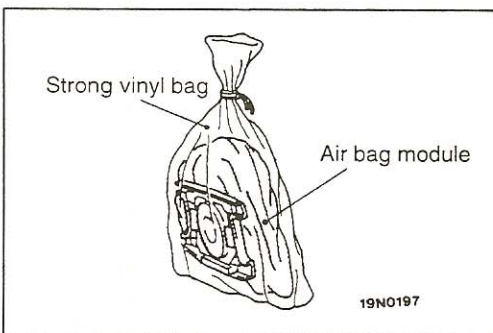
DEPLOYED AIR BAG MODULE DISPOSAL

After deployment, the air bag module should be disposed of in the same manner as any other scrap parts, observe the following precautions during air bag disposal:

- (1) The inflator will be quite hot immediately following deployment, so wait at least 30 minutes to allow it to cool before attempting to handle it.
- (2) Do not put water or oil on the air bag after deployment.
- (3) There may be material on the deployed air bag module, material that could irritate the eyes and/or skin. Wear gloves and safety glasses when handling a deployed air bag module.

Caution

If despite these precautions, the material does, get into the eyes or on the skin, immediately rinse the affected area with a large amount of clean water. If any irritation develops, seek medical attention.



- (4) Tightly seal the air bag module in a strong vinyl bag for disposal.
- (5) Be sure to always wash your hands after completing this operation.

CHASSIS ELECTRICAL

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BATTERY

54100020018

GENERAL SPECIFICATIONS

Items	Specifications
Type	75D26R-MF
Ampere hours (5HR) Ah	52
Cranking rating [at -18°C (0°F)] A	490
Reserve capacity min	123

NOTE

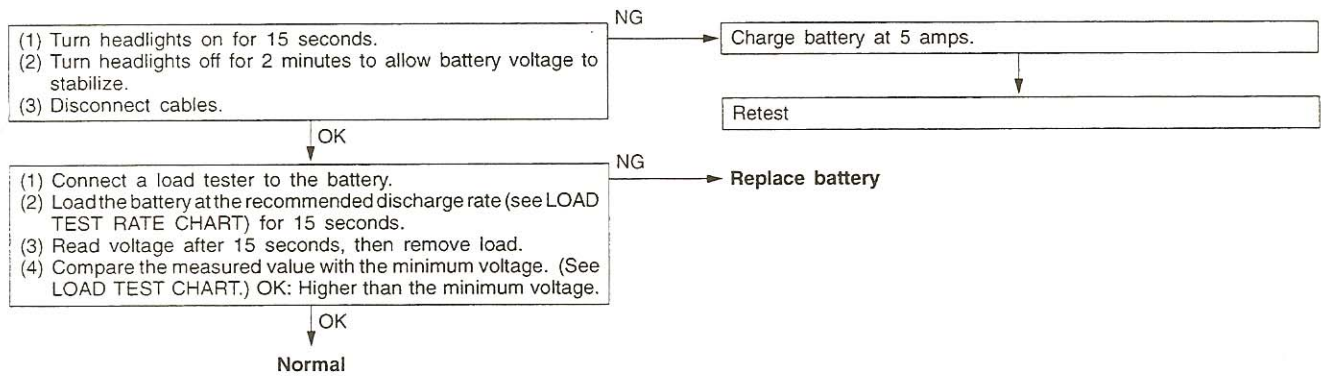
1. CRANKING RATING is the current a battery can deliver for 30 seconds and maintain a terminal voltage of 7.2 V or greater at a specified temperature.
2. RESERVE CAPACITY RATING is the amount of time a battery can deliver 25 A and maintain a minimum terminal voltage of 10.5 V at 27°C (80°F).

TROUBLESHOOTING

54100070013

BATTERY TESTING PROCEDURE

TEST STEP



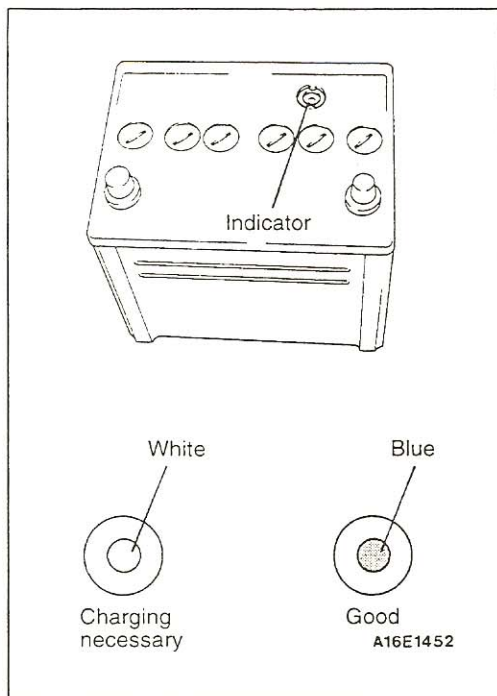
LOAD TEST CHART

Temperature °C (°F)	21 (70) and above	16 (60)	10 (50)	4 (40)	-1 (30)	-7 (20)	-12 (10)	-18 (0)
Minimum voltage	9.6	9.5	9.4	9.3	9.1	8.9	8.7	8.5

LOAD TEST RATE CHART

Load test (AMPS)	240 amps
Cranking rating (0°F)	490 amps
Reserve capacity	123 minutes
Application	75D26R-MF

TSB Revision



ON-VEHICLE SERVICE

5410010003

BATTERY INSPECTION

BATTERY VISUAL INSPECTION (1)

The battery contains a visual test indicator which gives a blue signal when an adequate charge level exists, and a white signal when charging is required.

BATTERY VISUAL INSPECTION (2)

Check that the ignition switch is in the OFF position and all battery fed accessories are off.

1. Disconnect the (-) ground cable from the battery before disconnecting the positive battery cable.
2. Remove the battery from the vehicle.

Caution

If the battery case is cracked or leaking, care should be taken to protect hands from the electrolyte. A suitable pair of rubber gloves (not the household type) should be worn when removing the battery by hand.

3. Inspect the battery carrier for damage caused by loss of acid from the battery. If acid damage is present, it is necessary to clean the area with a solution of clean warm water and baking soda. Scrub the area with a stiff brush. Wipe clean with a cloth moistened with ammonia or baking soda in water.
4. Clean the battery, especially the top with same solution as in step (3).
5. Check the battery case and cover for cracks. If cracks are present, replace the battery.
6. Clean the battery post with a suitable battery post cleaning tool.
7. Clean the inside surfaces of the terminal clamps with a suitable battery terminal cleaning tool. Replace damaged or frayed cables and broken terminal clamps.
8. Install the battery to the vehicle.
9. Connect positive battery cable first, then negative battery cable to the battery in that order.
10. Tighten the hold down nut securely.

BATTERY CHARGING

54100110043

Caution

When batteries are being charged, an explosive gas forms beneath the cover of each cell. Do not smoke near batteries on charge or which have recently been charged. Do not break live circuits at the terminals of the batteries on charge. A spark will occur where the live circuit is broken.

Keep all open flames away from the battery.

Battery electrolyte temperature may temporarily be allowed to rise to 55°C (131°F). An increase in the electrolyte temperature to above 55°C (131°F) is harmful to the battery and may cause deformation of the battery cell, a decrease in the life of the battery, etc.

If the test indicator is white, the battery should be charged as outlined below.

When the dot appears or when the maximum charge shown below is reached, charging should be stopped.

CHARGE RATE

If the test indicator is white, the battery should be charged as outlined below.

When the dot appears or when the maximum charge shown below is reached, charging should be stopped.

NOTE

When the charging is performed at 5 amps, charging is virtually 100% three hours after the indicator's indication changes from white to green.

Use fast charging only in an emergency.

If the indicator does not turn to green even after the battery is charged, the battery should be replaced; do not overcharge.

Charge Rate Chart

Battery	Slow Charging		Fast Charging	
	5 amps	10 amps	20 amps	30 amps
75D26R-MF (490 amps)	15 hrs.	7.5 hrs.	3.75 hrs.	2.5 hrs.

IGNITION SWITCH

54300*

GENERAL INFORMATION

OPERATION

- When the driver's side door is opened, the door switch turns on and the ignition key hole illumination light illuminates.
- When the driver's side door is closed, the door switch turns off and the ignition key hole

illumination light continues to illuminate for approximately 10 seconds due to the electrical discharge from the condenser inside the ignition key hole illumination light timer, and then the light switches off.

TROUBLESHOOTING

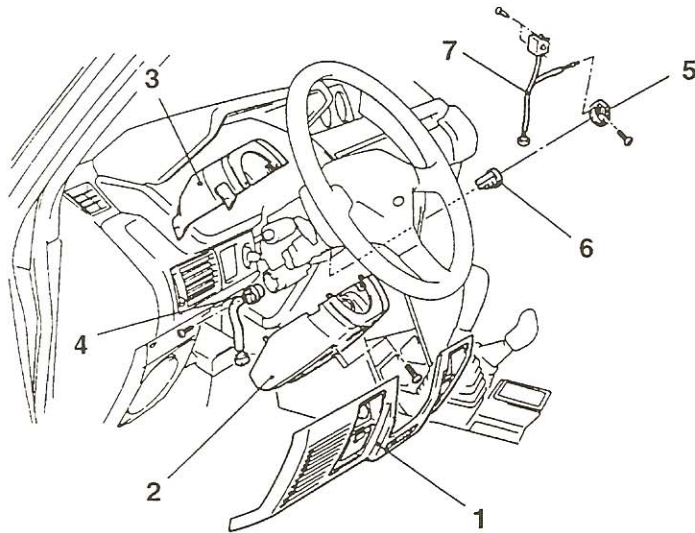
54300070125

TROUBLESHOOTING HINTS

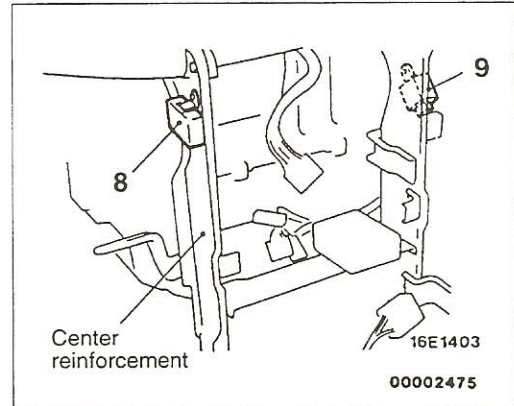
1. Ignition key hole illumination light does not illuminate.
 - (1) Dome light also does not illuminate.
 - Check multi-purpose fuse No. 19.
 - (2) Key reminder buzzer does not sound.
 - Check the door switch (front: L.H.). (Refer to GROUP 42 – Door Assembly.)
2. When the driver's side door is closed, the ignition key hole illumination light switches off immediately.
 - Check the ignition key hole illumination light timer. (Refer to P.54-9.)

IGNITION SWITCH

REMOVAL AND INSTALLATION



16E0583



Key reminder switch removal steps

1. Knee protector
(Refer to GROUP 52A – Instrument Panel.)
2. Column cover lower
7. Key reminder switch segment

Buzzer assembly removal steps

- Instrument Panel
(Refer to GROUP 52A – Instrument Panel.)
- 8. Buzzer assembly (for key reminder, lighting monitor and seat belt)

Ignition key hole illumination ring removal steps

- Knee protector
(Refer to GROUP 52A – Instrument Panel.)
- 2. Column cover lower
- 5. Ignition key hole illumination ring



Ignition switch removal steps

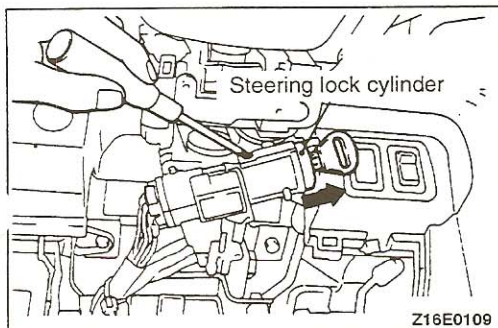
1. Knee protector
(Refer to GROUP 52A – Instrument Panel.)
2. Column cover lower
3. Column cover upper
4. Ignition switch segment

Steering lock cylinder removal steps

1. Knee protector
(Refer to GROUP 52A – Instrument Panel.)
2. Column cover lower
5. Ignition key hole illumination ring
6. Steering lock cylinder

Key hole illumination light timer removal steps

- Instrument Panel
(Refer to GROUP 52A – Instrument Panel.)
- 9. Key hole illumination light timer

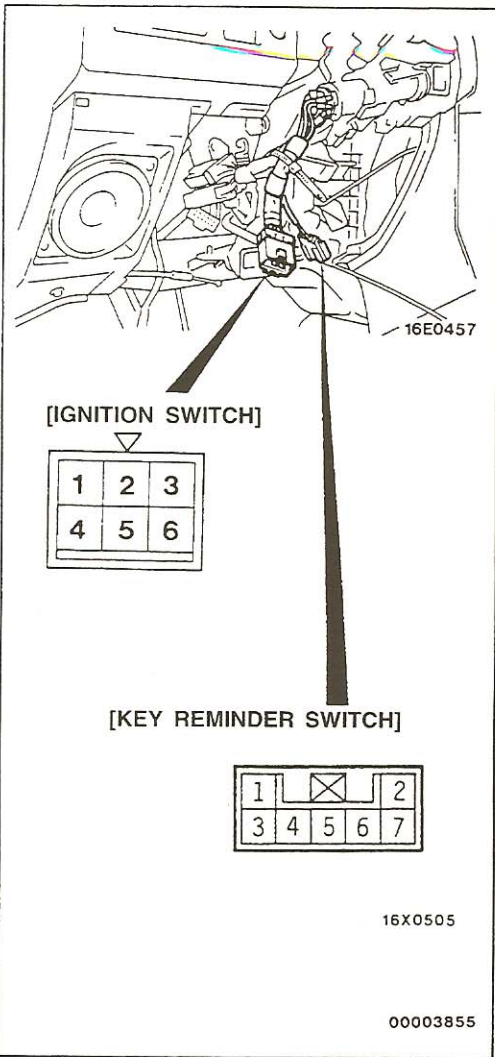


Z16E0109

REMOVAL SERVICE POINT

◀A▶ STEERING LOCK CYLINDER REMOVAL

- (1) Insert the ignition key into the steering lock cylinder and place the key in the ACC position.
- (2) Press the lock pin down with a small Phillips screwdriver to remove the steering lock cylinder.



INSPECTION

54300220230

IGNITION SWITCH CHECK

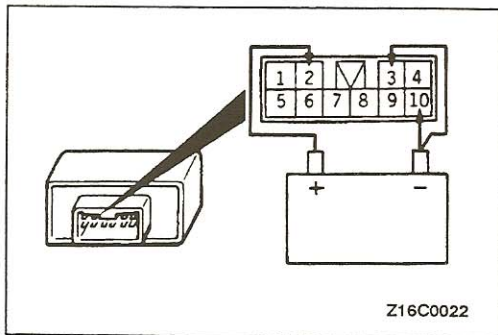
- (1) Remove the knee protector. (Refer to GROUP 52A – Instrument Panel.)
- (2) Remove the column cover lower.
- (3) Disconnect the wiring connector from the ignition switch, and connect an ohmmeter to the switch side connector.
- (4) Operate the switch and check for continuity between the terminals.

Ignition switch

Position	Terminal					
	1	2	3	4	5	6
LOCK						
ACC	○	—				○
ON	○	○	—	○	—	○
START	○	○	○	—	○	

Key reminder switch

Key	Key reminder switch terminal		Key hole illumination light terminal	
	4	6	1	2
Removed	○	○	○ — ○	
Inserted			○ — (V) — ○	

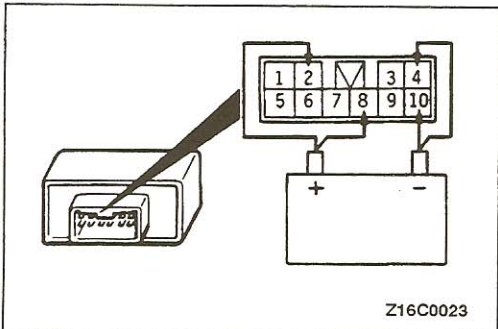


BUZZER ASSEMBLY CHECK

54300540015

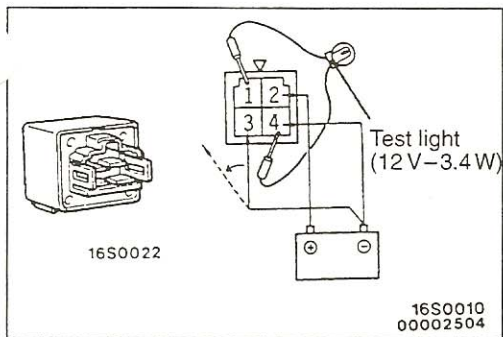
Key Reminder Buzzer Check

- (1) Apply battery positive voltage between terminal 2 and terminal 10.
- (2) Check that the buzzer sounds intermittently when terminal 3 is grounded.



Lighting Monitor Buzzer Check

- (1) Apply battery positive voltage between terminals 2, 8 and 10.
- (2) Check that the buzzer sounds intermittently when terminal 4 is grounded.

**KEY HOLE ILLUMINATION LIGHT TIMER CHECK**

54300830082

- (1) Apply battery positive voltage between terminal 2 and terminal 4.
- (2) Connect a test light between terminal 1 and terminal 4.
- (3) Check that the test light illuminates for 8–16 seconds when terminal 3 is grounded for 3 seconds or more and then disconnected from the ground.

METERS AND GAGES

543000

GENERAL INFORMATION

OPERATION

<Fuel gage>

- When the ignition switch is turned to the “ON” position, the fuel gage is activated.
- When there is much fuel, the unit’s resistance is small and the current flowing in the circuit is great, so the gage’s indicator indicates in the F area.
- When there is little fuel, the unit’s resistance is high and the current flowing in the circuit is small, so the gage’s indicator indicates in the E area.

<Engine coolant temperature gage>

- When the ignition switch is turned to the “ON” position, the engine coolant temperature gage is activated.
- When the engine coolant temperature is high, the unit’s resistance is low and there is a great flow of current in the “H” area.
- When the engine coolant temperature is low, the unit’s resistance is high and there is a small flow of current in the circuit, so the gage’s indicator indicates in the “C” area.

<Reed switch>

- Pulses are produced in accordance with the vehicle speed, and vehicle-speed signals are input to systems (the MFI system, etc.) that regulate according to the vehicle speed.

<Illumination light>

- When the lighting switch is set to the “TAIL” or “HEAD” position, the tail light relay contact closes to turn the tail light relay on and the illumination light illuminates via the rheostat.
- When the rheostat is operated, the voltage applied to the transistor varies, and the illumination light becomes brighter or darker.

<Oil pressure gage>

- When the ignition key is turned to the “ON” position, the oil pressure gage is activated.
- When oil pressure is high, the internal contacts of the gage unit are kept closed for a longer period of time. This causes more current to flow in the circuit, and the gage pointer swings to the high pressure side.
- When oil pressure is low, the internal contacts of the gate unit open in a shorter period of time. Therefore, there is less current flowing in the circuit, and the gage pointer swings to the low pressure side.

<Voltage meter>

- When the ignition key is turned to the “ON” position, the voltage meter operates and indicates a battery positive voltage of approximately 12 V.
- When the engine is started, the voltage meter indicates a battery positive voltage of 12 to 16 V, indicating that the battery is on charge.

<Electronic compass>

- When the ignition switch is turned to the “ON” position, the DC signal output from the Geomagnetic sensor (on-going vehicle direction output, lateral vehicle direction output) is converted from an analog signal to a digital signal by the A/D conversion circuit inside the multi-meter.
- This digital signal is evaluated by the calculating circuit in the CPU and the resulting value is displayed on the digital display.

<Inside and outside temperature sensors>

- When the ignition switch is turned to the “C” position, the DC signal output from the inside temperature sensor and outside temperature sensor is converted from an analog signal to a digital signal by the A/D conversion circuit inside multi-meter.
- This digital signal is evaluated by the calculating circuit in the CPU and the resulting value is displayed on the digital display.

<Automatic transmission position indicator>

- When the ignition key is turned to the “ON” position, the indicator illuminates to indicate the position at which the selector lever is set.

<Oil pressure warning light>

- This warning light illuminates when the ignition switch is at the ON position, and switches off after the engine has started. This indicator illuminates when the oil fails or a problem occurs in the oil circulating system while driving.

<Fuel warning light>

- This warning light illuminates when the fuel in the fuel tank falls less than approx. 11 dm³ (2.9 gals.)

<Brake warning light>

- This warning light illuminates when the ignition switch is at the ON position, and switches off after the engine has started. This warning light illuminates when the parking brake is applied or when the brake fluid level falls to less than the specified level.

<Seat belt warning light>

- This indicator illuminates for four to eight seconds when the ignition switch is at the ON position, even if the driver has fastened his seat belt.

GENERAL SPECIFICATIONS

54300020151

METERS AND GAGES

Items		Specifications
Speedometer	Type	Electrical type
Tachometer	Type	Cross coil type
Fuel gage	Type	Cross coil type
Fuel gage unit	Type	Variable resistance type
Engine coolant temperature gage	Type	Cross coil type
Engine coolant temperature gage unit	Type	Thermistor type
Oil pressure gage	Type	Bimetal type
Oil pressure gage unit	Type	Bimetal type
Inclinometer	Type	Gravity type
	Damping system	Oil-filled system
Voltage meter	Type	Aneroid type
Thermometer	Type	Temperature detection type
Electronic compass	Type	Geo-magnet detection type

INDICATORS AND WARNING LIGHTS

Items		Specifications
Indication lights W	Turn signal indication light	3.4 (158)
	Upper beam indication light	1.4
	Automatic transmission indication light	1.4
	Variable shock absorber indication light	Light emitting diode (LED)
	Overdrive off indication light	1.4
	4WD indication light	1.4
	Cruise control indication light	1.4
	Hold mode indication light	1.4
Warning lights W	Door-ajar warning light	1.4
	Oil pressure warning light	1.4
	Charge warning light	1.4
	Automatic transmission oil temperature warning light	1.4
	Low fuel warning light	3.4 (158)
	Seat belt warning light	1.4
	Brake warning light	1.4
	Check engine/malfunction indicator lamp	1.4
	Anti-lock braking system warning light	1.4
	Supplemental restraint system warning light	1.4

NOTE

The values in parentheses denote SAE trade numbers.

SERVICE SPECIFICATIONS

54300030253

Items		Standard value
Speedometer indication error mph	20	19–22
	40	38–44
	60	57–66
	80	76–88
	100	94–110
Tachometer indication error r/min	700	± 100
	3,000	±150
	5,000	±250
	6,000	±300

TSB Revision

Items		Standard value
Fuel gage unit resistance Ω	Float point "F"	3 \pm 2
	Float point "E"	110 \pm 7
Fuel gage unit float height mm (in.)	A (Float point "F")	119.3 (4.69)
	B (Float point "E")	255.0 (10.03)
Fuel gage resistance Ω	Power supply and ground	115 \pm 11.5
	Power supply and fuel gage	79 \pm 7.9
	Fuel gage and ground	80 \pm 8.0
Engine coolant temperature gage resistance Ω	Power supply and engine coolant temperature gage	145 \pm 14.5
	Power supply and ground	115 \pm 11.5
	Engine coolant temperature gage and ground	246 \pm 24.6
Oil pressure gage resistance Ω		Approx. 50
Voltage meter resistance Ω		380–460
Outside temperature sensor resistance Ω	20°C (68°F)	Approx. 1,200
	40°C (104°F)	Approx. 500

TROUBLESHOOTING

54300070545

TROUBLESHOOTING HINTS**<Meter and gage>**

1. Speedometer does not operate or its operation is incorrect.
 - Check the speedometer cable.
 - Check the speedometer. (Refer to P.54-18.)
2. Tachometer does not operate or its operation is incorrect.
 - Check the tachometer. (Refer to P.54-18.)
3. Fuel gage does not operate or its operation is incorrect.
 - Check the fuel gage. (Refer to P.54-19.)
 - Check the fuel gage unit. (Refer to P.54-19.)
4. The low fuel warning light does not illuminate even if fuel in the fuel tank is less than 11 dm³ (2.9 gals).
 - Check the warning light bulb.
 - Check the fuel level sensor. (Refer to P.54-20.)
5. The engine coolant temperature gage does not operate or its operation is incorrect.
 - Check the engine coolant temperature gage. (Refer to P.54-20.)
 - Check the engine coolant temperature gage unit. (Refer to GROUP 14 – Engine Coolant Temperature Gage Unit.)
6. The illumination light does not illuminate or does not dim.
 - (1) The tail lights illuminate.
 - Check the rheostat. (Refer to P.54-42.)
 - (2) The tail lights do not illuminate.
 - Check dedicated fuse No. 5.
 - Check the tail light relay. (Refer to P.54-40.)
 - Check the lighting switch. (Refer to P.54-43.)

<Multi-meter>

1. The oil pressure gage does not operate or its operation is incorrect.
 - Check the oil pressure gage. (Refer to P.54-21 and refer to P.54-25.)
 - Check the oil pressure gage unit.
2. The voltmeter does not operate or its operation is incorrect.
 - Check the voltage meter. (Refer to P.54-21 and refer to P.54-25.)
3. The on-going direction display deviates.
 - Refer to Troubleshooting on P.54-15.
4. Vehicle magnetic compensation cannot be made.
 - Refer to Troubleshooting on P.54-15.
5. Display is hard to see or no display appears.
 - Refer to Troubleshooting on P.54-15.
6. There is a discrepancy between the outside temperatures and the display temperatures.
 - Check the outside temperature sensor. (Refer to P.54-27.)
 - Refer to Troubleshooting on P.54-15.

ELECTRONIC COMPASS

INSPECTION CHART FOR TROUBLE SYMPTOMS

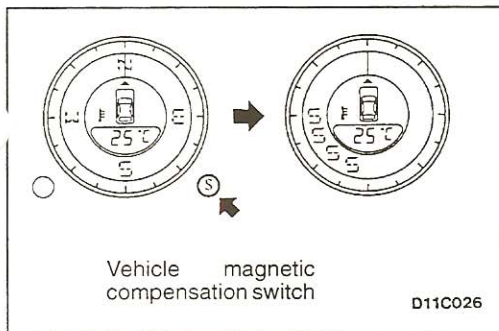
Get an understanding of the trouble symptoms and check according to the inspection procedure chart.

Trouble symptom	Inspection Procedure No.	Reference page
Bearing indicator is off when moving forward	1	54-15
Vehicle magnetic compensation cannot be made	2	54-16
Discrepancy between the outside temperature and the display temperature	3	54-16
Display is hard to see or no display appears	4	54-17

INSPECTION PROCEDURE FOR TROUBLE SYMPTOMS

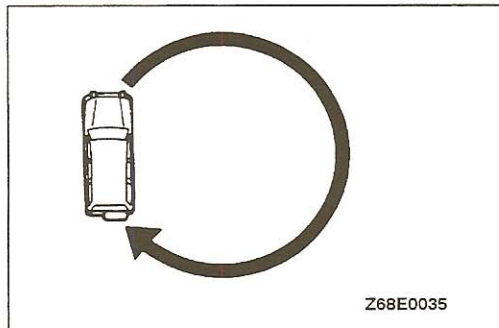
INSPECTION PROCEDURE 1

Bearing indicator is off when moving forward	Probable cause
[Comment] The vehicle magnetism tends to be disturbed particularly at such places as tunnel, railway crossing, area along railway, elevated road, urban area crowded with high-storied buildings, area above subway, etc. If disturbed, the driving direction marker will fluctuate.	<ul style="list-style-type: none"> Vehicle magnetic compensation failed



Vehicle magnetic compensation

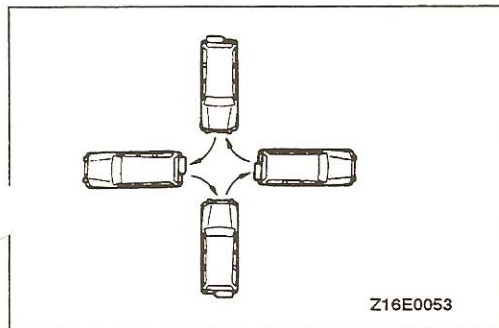
(1) If the vehicle magnetic compensation (azimuth adjustment) switch is pressed, the letter “S” are displayed around the scale. Then when the switch is pressed 0.5 seconds or more further, the letters “S” will move clockwise and anticlockwise. This turns on the magnetic compensation mode.



(2) If the vehicle is driven slowly in a 360° circle, compensation is automatically completed.

NOTE

Compensation is possible if the turn is made to either the left or right.

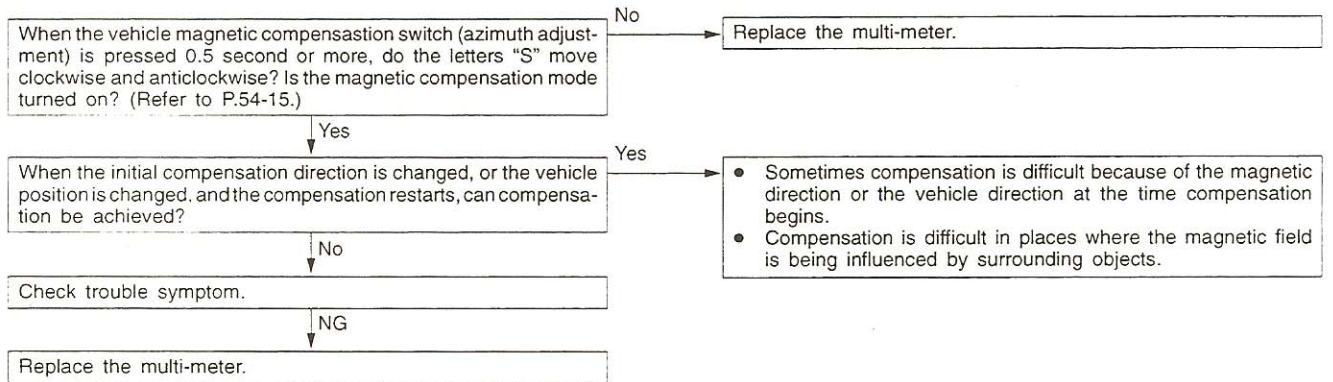


(3) If there is no place to turn the vehicle in a circle, turn the vehicle around by moving it backwards and forwards.

(4) After compensation is completed, a dot showing the current direction of movement will be illuminated.

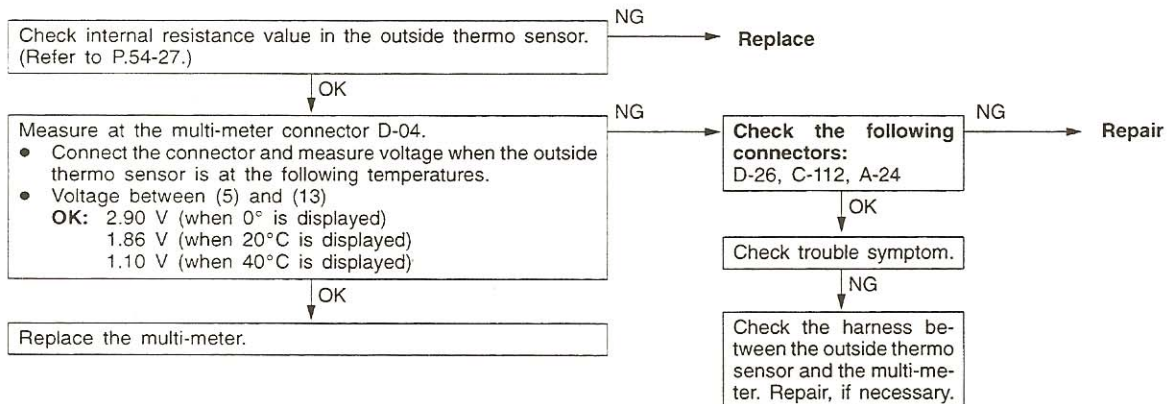
INSPECTION PROCEDURE 2

Vehicle magnetic compensation cannot be made.	Probable cause
[Comment] The multi-meter may be defective.	<ul style="list-style-type: none"> Defective multi-meter



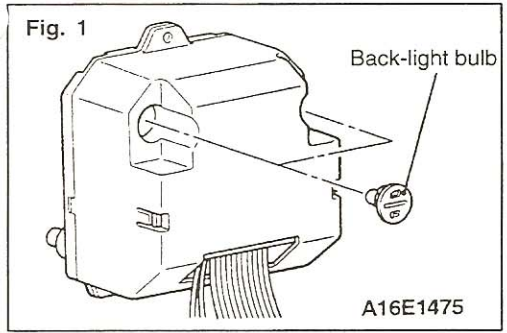
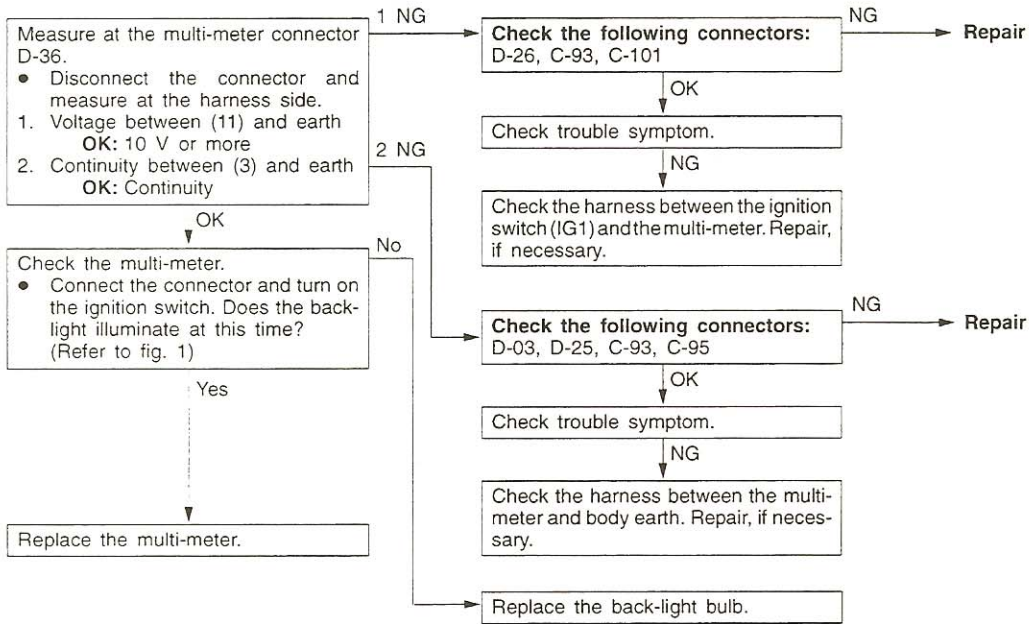
INSPECTION PROCEDURE 3

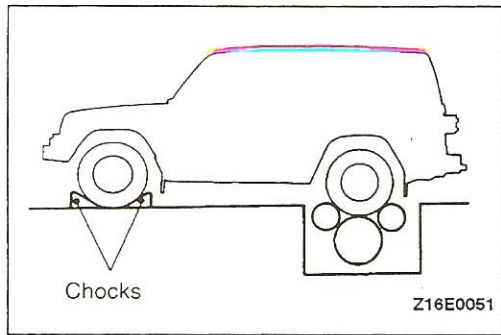
Discrepancy between the outside temperature and the display temperature	Probable cause
[Comment] The outside thermo sensor, multi-meter, harness, or connector may be defective.	<ul style="list-style-type: none"> Defective outside thermo sensor Defective multi-meter Defective harness or connector



INSPECTION PROCEDURE 4

Display is hard to see or no display appears.	Probable cause
[Comment] The multi-meter, harness, or connector may be defective.	<ul style="list-style-type: none"> ● Defective multi-meter ● Defective harness or connector





ON-VEHICLE SERVICE

543000901

SPEEDOMETER CHECK

- (1) Adjust tire pressure to the specified level. (Refer to GROUP 31 – General Specifications.)
- (2) Place the vehicle on a speedometer tester and chock the front wheels.

Caution

Always inspect with the transfer lever in the 2H position.

- (3) Check that the speedometer indication range is within the standard values.

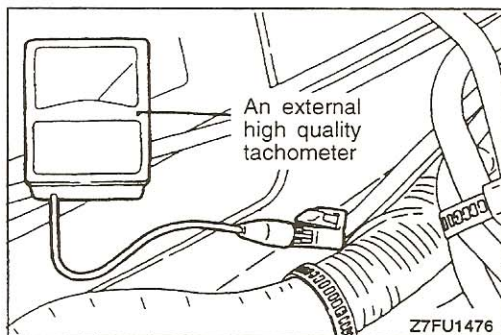
Caution

Do not operate the clutch suddenly or decrease speed rapidly while testing.

Standard value:

Standard indication mph	Allowable range mph
20	19–22
40	38–44
60	57–66
80	76–88
100	94–110

- (4) If not to the standard value, inspect for proper tire size. If not correct, replace tires with original size tires and retest. If correct, replace the speedometer. If still not to standard value, replace vehicle speed sensor.



TACHOMETER CHECK

54300100206

- (1) Insert a paper clip in the connector from the harness side, and attach an external high quality tachometer.

NOTE

For tachometer inspection, use an external high quality indicative tachometer.

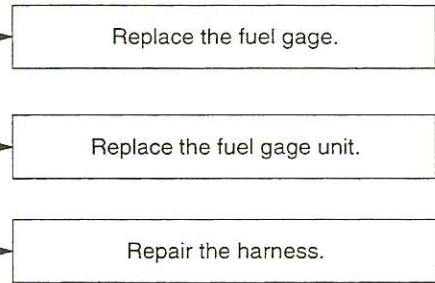
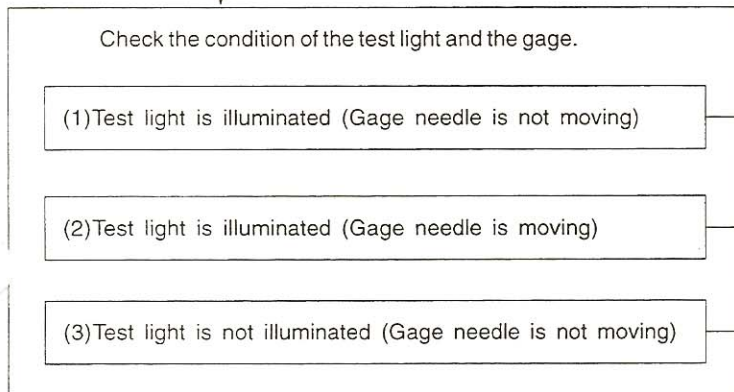
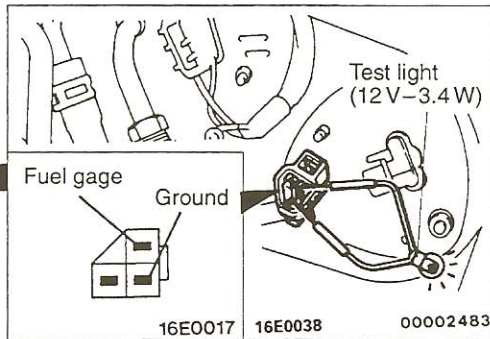
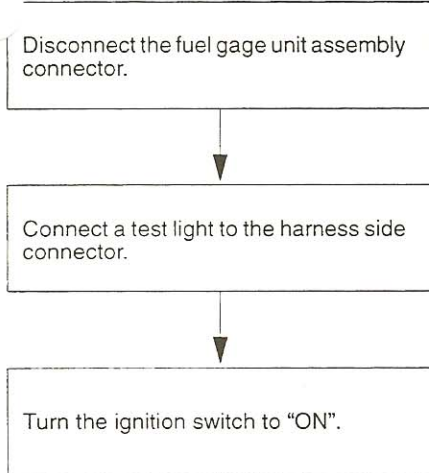
- (2) Compare the readings of the vehicle tachometer and the external tachometer at every engine speed, and check that the variations are within the standard values.

Standard value:

Engine speed r/min	Indicated variation r/min
700	±100
3,000	±150
5,000	±250
6,000	±300

FUEL GAGE SIMPLE INSPECTION

54300110056



FUEL GAGE UNIT CHECK

54300120301

To check, remove the fuel gage unit from the fuel tank. (Refer to GROUP 13F – Fuel Tank.)

Fuel Gage Unit Resistance

- (1) Check that the resistance value between the fuel gage terminal and ground terminal is at the standard value when the fuel gage unit float is at point F (highest) and point E (lowest).

Standard value:

- Point F: $3 \pm 2 \Omega$
- Point E: $110 \pm 7 \Omega$

- (2) Check that the resistance value changes smoothly when the float moves slowly between point F (highest) and point E (lowest).

- (3) If all checks are correct, proceed to fuel gauge unit float height check. If any check is not correct, replace the fuel gauge unit.

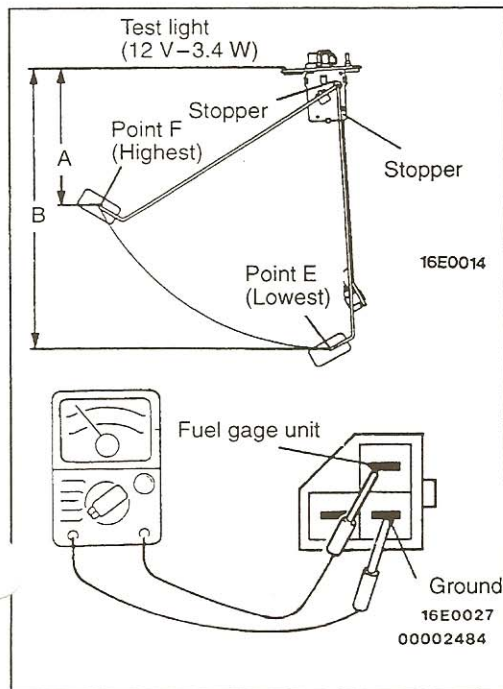
Fuel Gage Unit Float Height

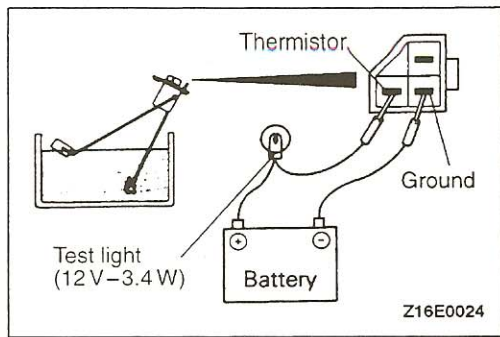
- (1) Move float and measure the height A at point F (highest) and B at point E (lowest) with float arm touching stopper.

Standard value:

- A: 119 mm (4.69 in.)
- B: 255 mm (10.03 in.)

- (2) Adjust the float arm to the standard value, then proceed to the thermistor check.





FUEL LEVEL SENSOR CHECK

54300130014

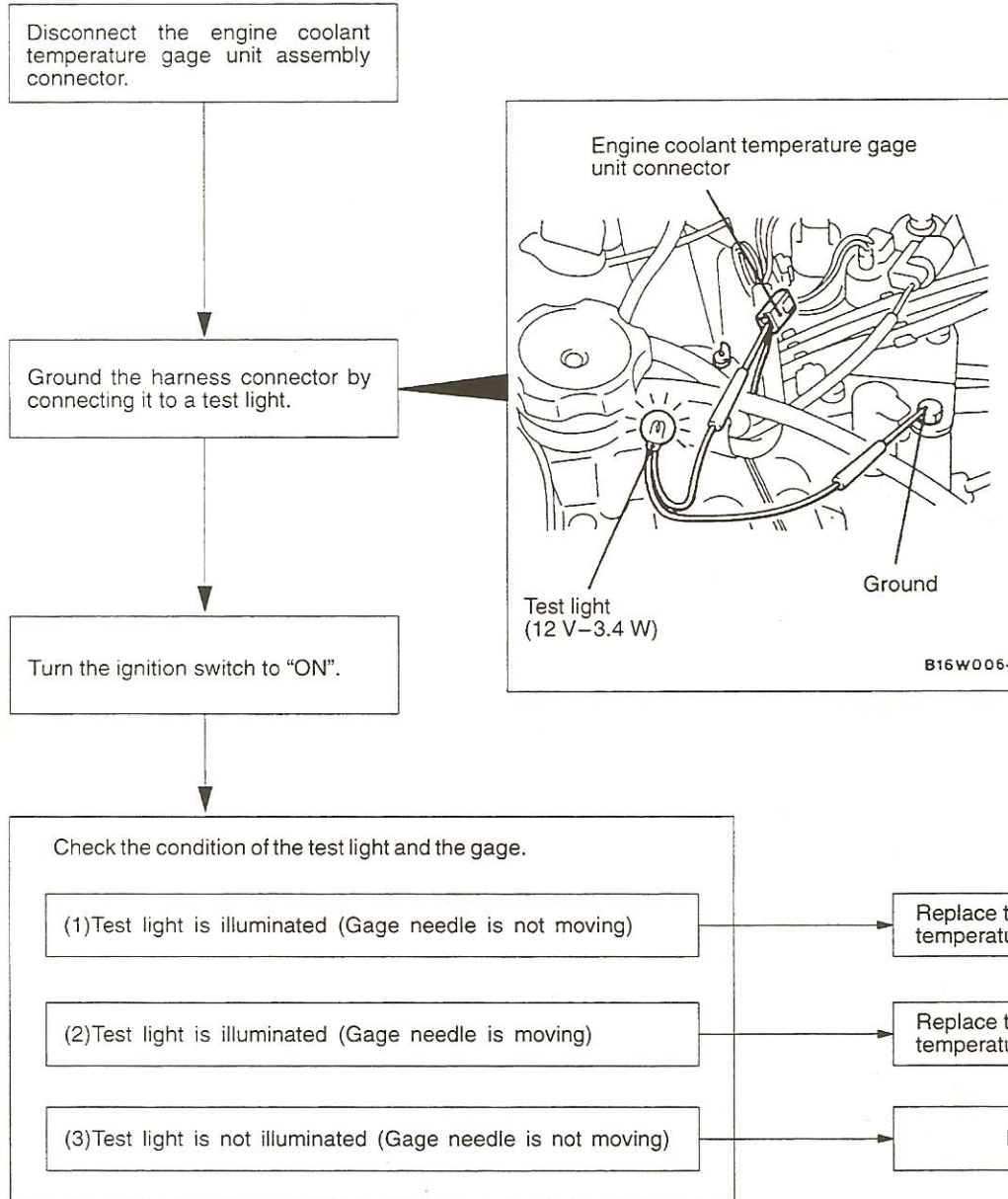
- (1) Connect the fuel gage unit to the battery via a test (12 V-3.4 W), and then immerse the fuel gage unit in water.
- (2) The condition is good if the test light switches off when the fuel gage unit thermistor is in water and illuminates when the thermistor is removed from the water.
- (3) If all checks are correct, the fuel gauge unit is OK. If any check is not correct, replace the fuel gauge unit.

Caution

After completing this test, wipe the unit dry and install it to the fuel tank.

ENGINE COOLANT TEMPERATURE GAGE SIMPLE CHECK

54300140154



ENGINE COOLANT TEMPERATURE GAGE UNIT CHECK

54300150171

Refer to GROUP 14 – Engine Coolant Temperature Gage Unit.

TSB Revision

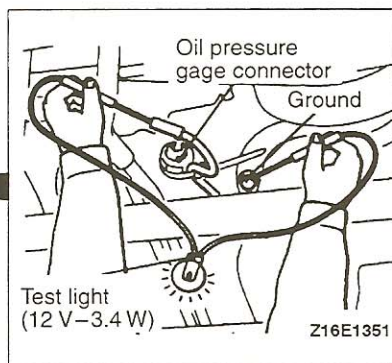
OIL PRESSURE GAGE SIMPLE CHECK

54300160013

Disconnect the oil pressure gage unit coupling connector.

Connect the harness connector via a test light to the ground.

Turn the ignition switch to "ON".



Check the condition of the test light and the gage.

- Test light is illuminated (Gage needle is not moving)
- Test light is illuminated (Gage needle is moving)
- Test light is not illuminated (Gage needle is not moving)

Replace the oil pressure gage.

Replace the oil pressure gage unit.

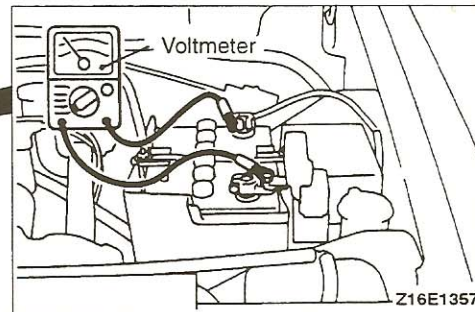
Repair the harness.

VOLTAGE METER SIMPLE CHECK

54300170016

Start the engine and run it at idle.

Connect a voltmeter to the battery.



Check the condition of the voltage meter.

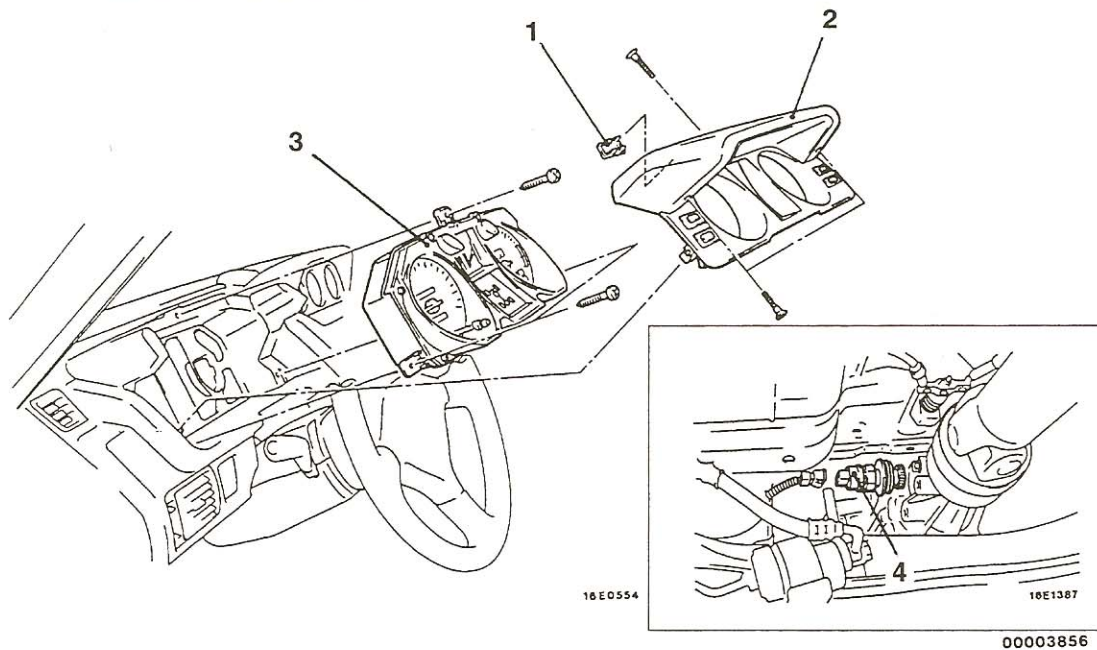
- 1 Voltage indicated by voltmeter differs from voltage indicated by voltage meter (position indicated by pointer).
- 2 Oil pressure gage does not operate.

Replace the oil pressure gage.

Repair the harness or replace the oil pressure gage.

**COMBINATION METER
REMOVAL AND INSTALLATION**

5430029000

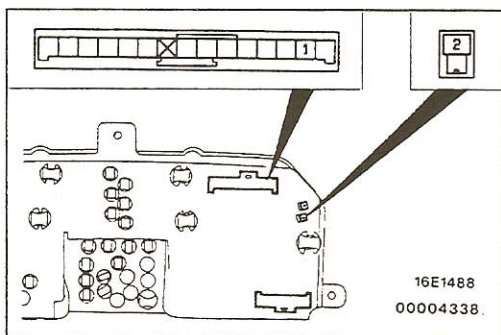


Combination meter removal steps

1. Meter hood plug
2. Meter bezel
3. Combination meter

Removal of vehicle speed sensor

4. Vehicle speed sensor

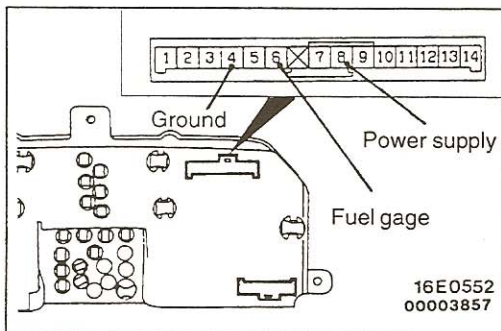


INSPECTION

54300300057

REED SWITCH CHECK

- (1) Check that the speedometer operates correctly.
- (2) Start the engine. Do not disconnect the connectors. Check the continuity between terminals (1) and (2) while moving slowly the vehicle forward. The continuity and discontinuity should alternate.



FUEL GAGE RESISTANCE CHECK

54300120080

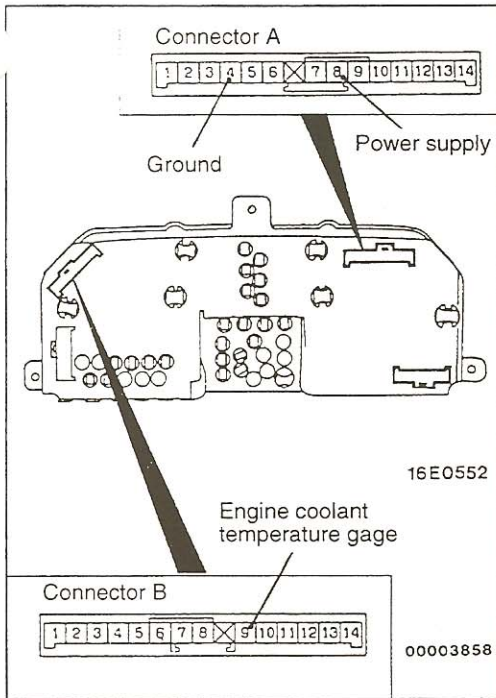
- (1) Use an ohmmeter to measure the resistance between the terminals.

Standard value:

Items	Resistance
Power supply and ground	115±11.5 Ω
Power supply and fuel gage	79±7.9 Ω
Fuel gage and ground	147±14.7 Ω

- (2) If within the standard value, the fuel gauge is OK. If not within the standard value, replace the fuel gauge.

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ENGINE COOLANT TEMPERATURE GAGE RESISTANCE CHECK

54300150065

- (1) Use an ohmmeter to measure the resistance between the terminals.

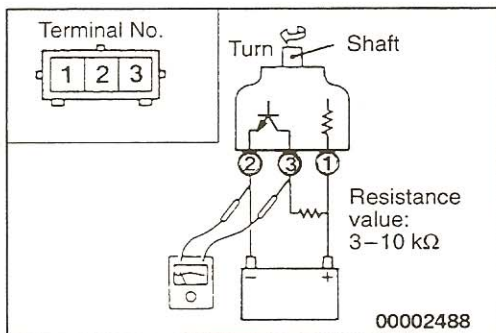
Caution

For inspection, use an ohmmeter which uses a measurement current of 4 mA or less.

Standard value:

Power supply and engine coolant temperature gage	145±14.5 Ω
Power supply and ground	115±11.5 Ω
Engine coolant temperature gage and ground	246±24.6 Ω

- (2) If within the standard value, the engine coolant temperature gage is OK.
If not within the standard value, replace the engine coolant temperature gauge.



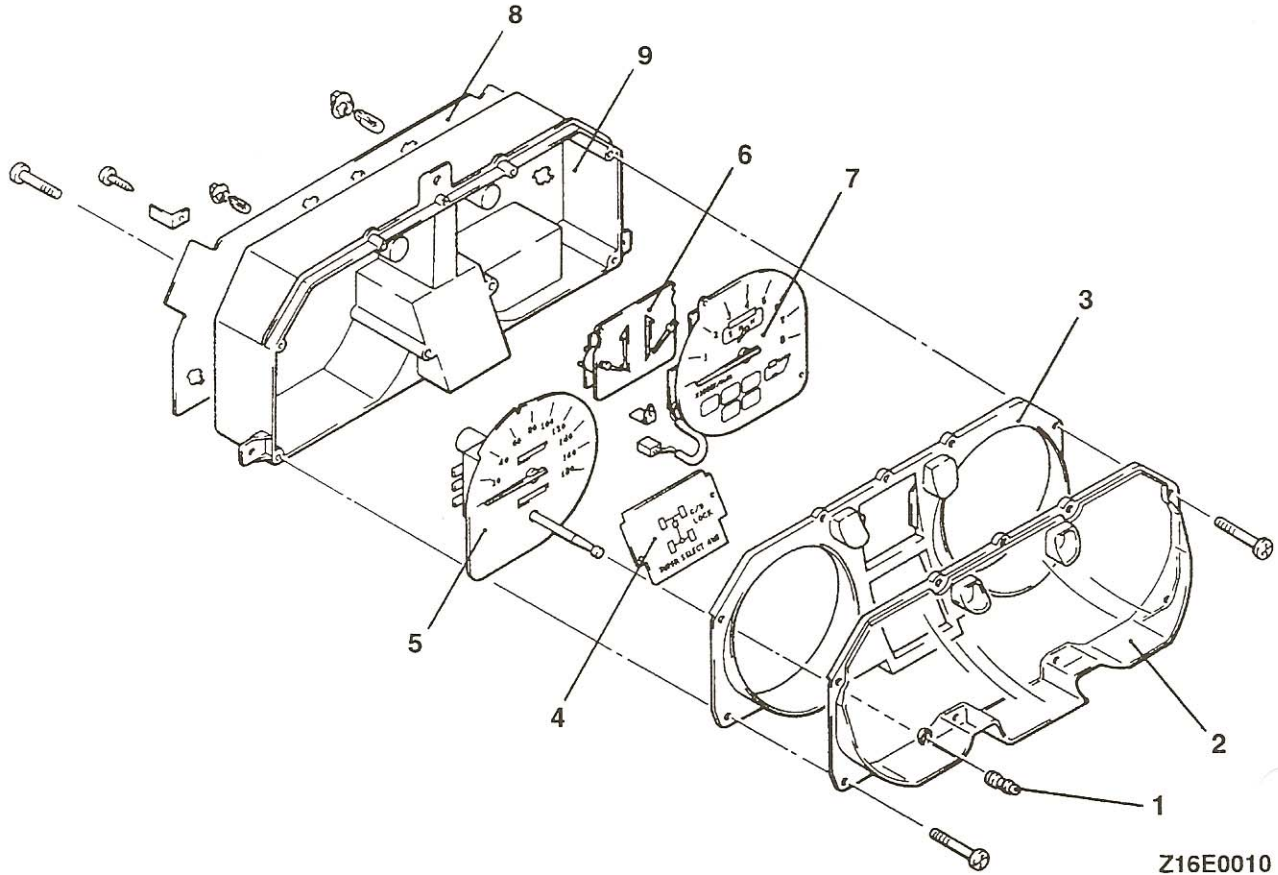
VEHICLE SPEED SENSOR CHECK

54300640029

- (1) Remove the vehicle speed sensor and connect a 3–10 kΩ resistance as shown in the illustration at left.
- (2) Turn the shaft of the vehicle speed sensor and check that there is voltage between terminal (2) and terminal (3). (1 turn = 4 pulses)
- (3) If within the standard value, the vehicle speed sensor is OK.
If not within the standard value, replace the vehicle speed sensor.

DISASSEMBLY AND REASSEMBLY

54300310036



Z16E0010

Disassembly steps

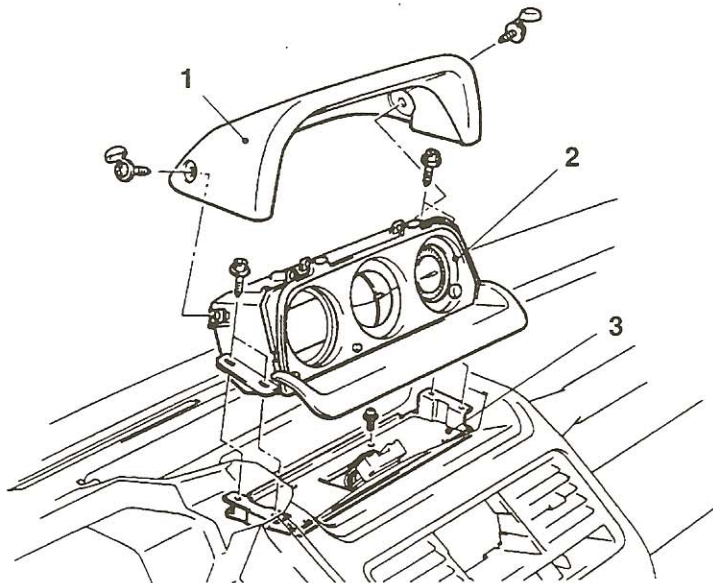
1. Boot
2. Meter glass
3. Window plate
4. Prism indicator lens
5. Speedometer
6. Fuel gage and engine coolant temperature gage
7. Tachometer
8. Printed circuit board
9. Meter case

TSB Revision

MULTI-METER

54300390016

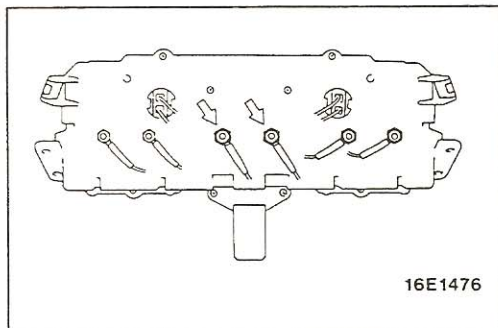
REMOVAL AND INSTALLATION



Z16E0126

Removal steps

1. Meter hood
2. Multi-meter assembly
3. Meter mounting bracket



16E1476

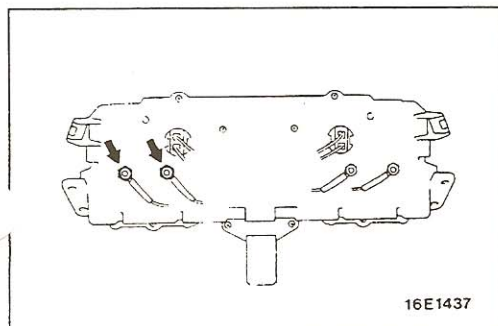
INSPECTION

54300400016

OIL PRESSURE GAGE CHECK

Use an ohmmeter to measure the resistance between the terminals.

Standard value: Approx. 50 Ω



16E1437

VOLTAGE METER CHECK

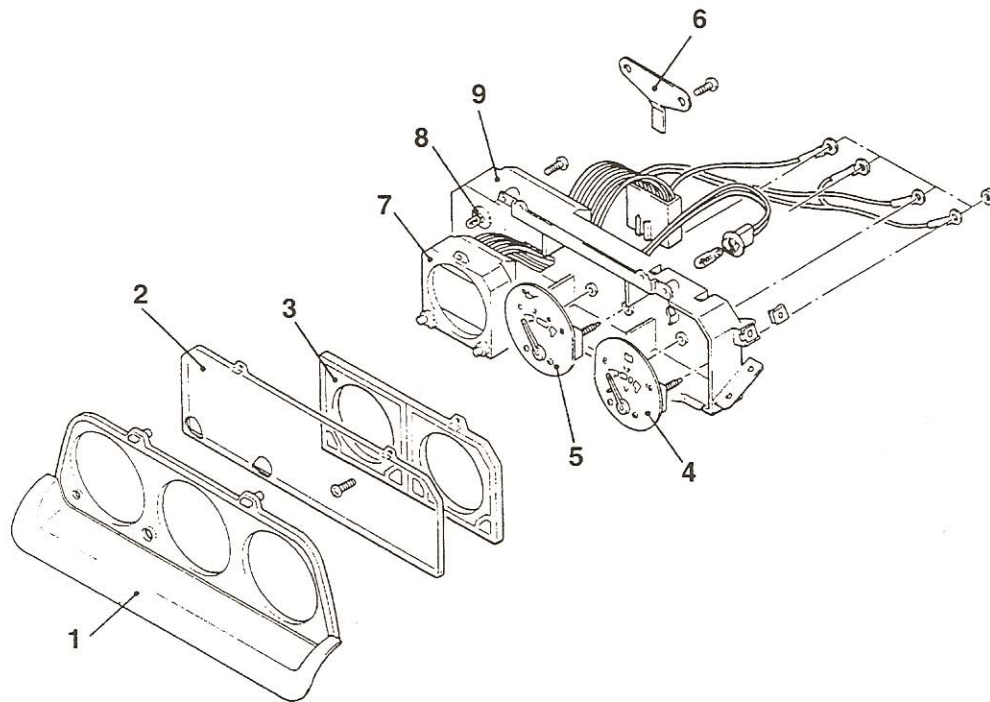
Use an ohmmeter to measure the resistance between the terminals.

Standard value: 380–460 Ω

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DISASSEMBLY AND REASSEMBLY

54300410057



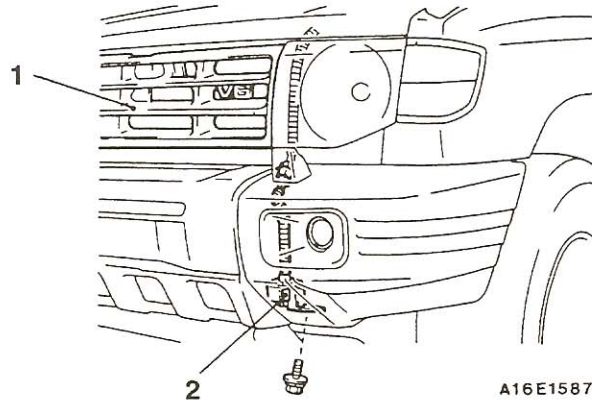
B16E1438

Disassembly step

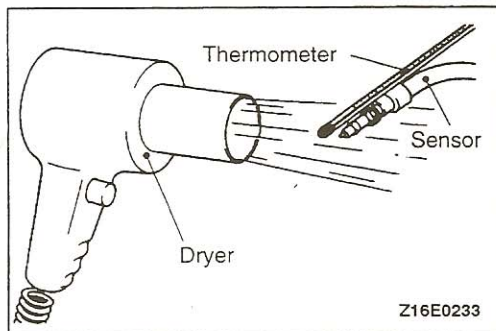
1. Meter garnish
2. Meter glass
3. Window plate
4. Voltage meter
5. Oil pressure gage
6. Connector bracket
7. Electronic compass
8. Back-light bulb
9. Meter case

OUTSIDE TEMPERATURE SENSOR

54300470048

REMOVAL AND INSTALLATION**Removal steps**

1. Radiator grille
2. Outside temperature sensor

**INSPECTION**

54300480010

OUTSIDE TEMPERATURE SENSOR CHECK

Check that the internal resistance values of the outside temperature sensor are at the standard values when each sensor shows temperatures of 20°C (68°F) and 40°C (104°F).

Standard value:

- 20°C (68°F): Approx. 1,200 Ω
- 40°C (104°F): Approx. 500 Ω

LIGHTING SYSTEM

GENERAL INFORMATION

OPERATION

<Low beam and high beam>

- When the ignition switch is at the ACC or ON position and the lighting switch is set to the HEAD position, the headlight relay contact closes to turn the headlight relay on.
- When the dimmer switch is set to the LO position, the low beams illuminate, and when it is set to the HI position, the high beams illuminate.

<Passing>

- If the passing switch is set to the ON position when the ignition switch is at the ACC or ON position and the lighting switch is at the OFF or TAIL position, the low beams and high beams will illuminate simultaneously when the dimmer switch is at the LO position, and the high beams will illuminate when the dimmer switch is at the HI position.

<High beam indicator light>

- When the high beams are illuminated or while passing is operating, the indicator light will illuminate to inform the driver that the high beams are illuminated.

<Fog light>

- When the fog light switch is placed in the ON position, current flows through the dedicated fuse No. 10 to the fog light switch, the fog lights and ground, causing the fog lights to come on.

<Tail light, parking light, side marker light, licence plate light>

- When the lighting switch is set to the TAIL or HEAD position, the tail light relay contact closes to turn the tail light relay on.
- Current flows via dedicated fuse No. 5 and the tail lights, parking lights, side marker lights and license plate light illuminate.

<Turn-signal light>

1. In normal operating condition

- When the ignition switch is turned to the ON position, battery positive voltage is applied through the hazard light switch to the turn-signal and hazard flasher unit.
- When the turn-signal light switch is placed in the L.H. (or R.H.) position, Tr1 in the flasher unit turns on, causing the relay contacts in the flasher unit to close. This causes the L.H. (or R.H.) turn-signal light and turn-signal indicator light to illuminate.
- At the same time, the capacitor is charged through R2 up to the lower limit as set by COM3.

- As soon as the capacitor is fully charged, the output from COM3 is inverted, turning off Tr1. This opens the relay contacts and, as a result, the L.H. (or R.H.) turn-signal light and turn-signal indicator light switch off.
- At the same time as Tr1 turns off, the capacitor starts discharging. As soon as the capacitor completes discharging, the COM3 output is inverted again, causing Tr1 to turn on. This causes the L.H. (or R.H.) turn-signal light and turn-signal indicator light to illuminate.
- This sequences of operations occurs repeatedly, causing the L.H. (or R.H.) turn-signal light and turn-signal indicator light to flash on and off.

2. When one bulb is burnt

- When either one of the turn-signal light bulbs switches off, it causes the resistance of the entire light circuit to increase, resulting in a smaller voltage drop at R1 in the flasher unit.
- This smaller voltage drop is sensed and the lower voltage limit set by COM3 raised, thus shortening the time required by the capacitor before it is fully charged.
- As a result, the on-off cycle of Tr1 becomes shorter with the result that the light flashes on and off more quickly.

<Hazard light>

- When the hazard light switch is placed in the ON position, the flasher unit relay contacts repeatedly close and open, which causes the R.H. and L.H. turn-signal lights, turn-signal indicator lights and hazard warning indicator lights to flash on and off at the same time.

Remark

- The number of times the hazard lights flash on and off does not change even when one bulb is blown.

<Back-up light>

- When the ignition switch is turned to the ON position and the selector lever is moved to the R position (or the park/neutral position switch is switched to the R position), the back-up lights illuminate.

<Stop light>

- Battery positive voltage is constantly applied to the stop light switch through multi-purpose fuse No. 17.
- When the brake pedal is depressed, the stop light switch turns on and the stop lights illuminate.

<Dome light and cargo space light>

- Battery positive voltage is constantly applied to the dome light and cargo space light.
- When the dome light switch or the cargo space light switch is set to the ON position, the dome light or cargo space light always illuminates. When the switch is set to the DOOR position, the dome light or cargo room light illuminates when any door is opened.

<Reading light>

- Battery positive voltage is constantly applied to the reading light.

- When the reading light switch is set to the ON or OFF position, the reading light illuminates or switches off.

<Door-ajar warning light>

- This warning light comes on when the door is either open or not completely closed.

<Vanity mirror light>

- When the lid of the vanity mirror is opened, the vanity mirror light switch is set to the ON position, the vanity mirror light illuminates.

GENERAL SPECIFICATIONS

54200020066

Exterior lights

Items	Specifications
Headlight W	65/45
Fog light W	55
Front combination light W	Front turn-signal/Parking and front side marker light
	27/8 (1157)
Rear combination light cp	Turn-signal light
	32 (1156)
	Stop/tail light
	32/2 (2057)
	Rear side marker light
	3 (168)
Back-up light cp	32 (1156)
License plate light W	10
High-mounted stop light CP	21 (921)

Interior light

Items	Specifications
Dome light W	8
Reading light W	8
Door light W	5
Cargo space light W	10
Vanity mirror light W	1.5
Cigarette light Illumination light W	1.4 (74)
Ashtray illumination light W	1.4 (74)

NOTE

The values in parentheses denote SAE grade numbers.

SERVICE SPECIFICATIONS

54200030250

Items	Standard value	Limit
Headlight intensity cd	–	20,000 or more
Fog light aiming	Vertical direction	100 mm (4 in.) below horizontal (H)
	Horizontal direction	Parallel to direction of vehicles travel

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TROUBLESHOOTING

54200070004

TROUBLESHOOTING HINTS**<Head light>**

1. The headlights do not illuminate at any positions.
 - (1) The tail lights illuminate.
 - Check the headlight relay. (Refer to P.54-40.)
 - Check the lighting switch. (Refer to P.54-43.)
 - (2) Tail lights also do not illuminate or the charging warning light does not turn off.
 - Check fusible link No. 13.
2. Both low beams do not illuminate.
 - Check the dimmer switch. (Refer to P.54-44.)
3. Both high beams do not illuminate but illuminate when the passing switch is turned to the ON position.
 - Check the dimmer switch. (Refer to P.54-44.)
4. The high beam indicator light does not illuminate but illuminates when the dimmer switch is at the HI position or when the passing switch is at the ON position.
 - Check dedicated fuse No. 7.
 - Check the indicator light bulb.
5. The headlights do not illuminate even if passing but illuminate when the dimmer switch is at the LO or HI position and the lighting switch is at the HEAD position.
 - Check the passing switch. (Refer to P.54-44.)

<Fog light>

1. The right or left fog lights only go on.
 - Check the bulb.
2. Fog lights do not go on when the fog light switch is set at ON.
 - Check the dedicated fuse No. 10.
 - Check the fog light switch. (Refer to P.54-41.)

<Tail light, parking light, side marker light, licence plate light>

1. All lights do not illuminate.
 - (1) Headlights illuminate.

- Check dedicated fuse No. 5.
- Check the tail light relay. (Refer to P.54-40.)
- Check the lighting switch. (Refer to P.54-43.)

- (2) The headlights also do not illuminate or the charging warning light does not turn off.
 - Check fusible link No. 13.

2. Either light does not illuminate.

- Check the bulb.
- Check the ground circuit.

<Turn-signal light and hazardlight>

1. Neither the turn-signal lights nor hazard lights operate.
 - Check the hazard light switch. (Refer to P.54-41.)
 - Check the flasher unit.
2. All L.H. or R.H. turn-signal lights do not illuminate.
 - (1) Hazard light is fully operational.
 - Check the turn-signal light switch. (Refer to P.54-43.)
 - Check the hazard light switch. (Refer to P.54-41.)
3. Flashing cycle of turn-signal lights is short.
 - Check the light bulb.
4. Hazard light does not operate.
 - (1) Turn-signal lights are operational.
 - Check the hazard light switch. (Refer to P.54-41.)

<Back-up light>

The back-up lights do not illuminate.

- Check the park/neutral position switch.
- Check the ground circuit.
- Check the back-up light bulb.

<Stop light>

1. The stop lights do not illuminate.
 - Check the stop light switch. (Refer to GROUP 35A – Brake Pedal.)
 - Check multi-purpose fuse No. 17.
2. Either stop light does not illuminate.
 - Check the ground circuit.
3. The stop lights do not illuminate.
 - Check the stop light switch. (Refer to GROUP 35A – Brake Pedal.)

<Dome light and cargo space light>

- When the doors are opened, the dome light or cargo space light does not illuminate for certain doors.
- Check the front or rear door switch. (Refer to GROUP 42 – Door Assembly.)
 - Check the back door switch.
2. When the dome light switch or cargo space light switch is set to the DOOR position and any of the doors are opened, the dome light or cargo space light does not illuminate.
- (1) Illuminates when the switch is at the ON position.
- Check the dome light switch or cargo space light switch.

- (2) It does not illuminate even if the switch is at the ON position.
- Check the light bulb.
 - Check the dome light switch or cargo space light switch.

<Vanity mirror light>

The vanity mirror does not illuminate.

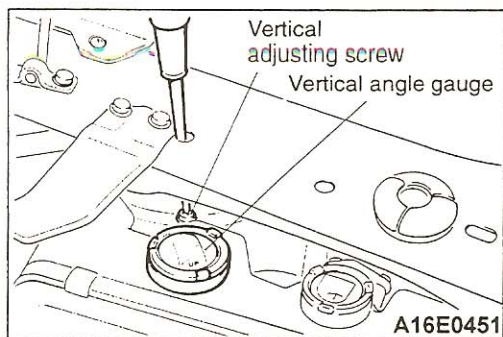
- Check the vanity mirror switch.
- Check the vanity mirror light bulb.

ON-VEHICLE SERVICE

54200090043

HEADLIGHT AIMING**PRE-AIMING INSTRUCTIONS**

1. Check for a badly rusted or malfunctioning headlight assembly.
These conditions must be corrected before a satisfactory adjustment can be made.
2. Place the vehicle on a level floor.
3. Bounce the front suspension through three (3) oscillations by applying body weight to the hood or bumper.
4. Check the tire inflation.
5. Rock the vehicle sideways to allow the vehicle to assume its normal position.
6. If the fuel tank is not full, place a weight in the trunk of the vehicle to simulate the weight of a full tank [3 kg (6.5 lbs.) per gallon].
7. There should be no other load in the vehicle other than the driver or a substituted weight of approximately 70 kg (150 lbs.) placed in the driver's position.
8. Thoroughly clean the headlight lenses.



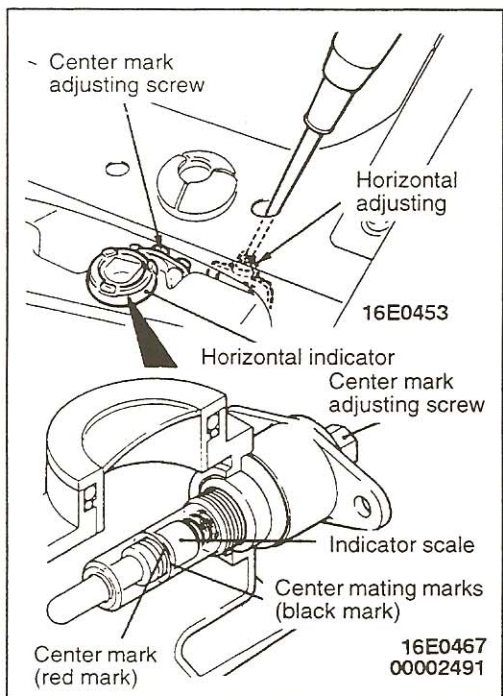
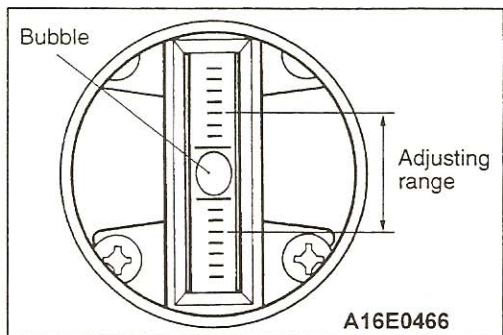
ON-BOARD AIMING ADJUSTMENT

Vertical Adjusting

Adjust the vertical angle by rotating the vertical adjusting screw so that the bubble in the vertical angle gage is inside the adjusting range.

NOTE

The beam angle will change by about 0°12' per graduation.

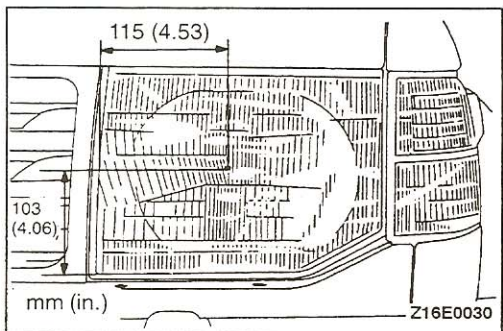


Horizontal Adjusting

Adjust the horizontal angle by turning the horizontal adjusting screw until the center mark (red mark) and the center mating mark (black mark) of the horizontal indicator are aligned.

NOTE

The beam angle will change by about 0°23' per graduation.



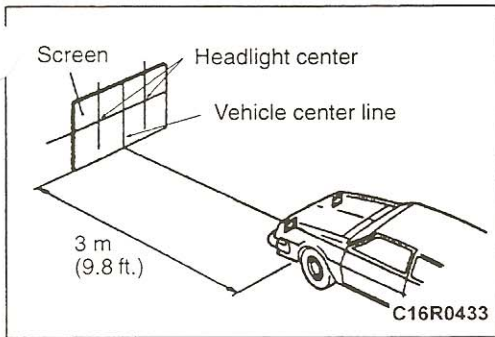
AIMING WITH SCREEN

NOTE

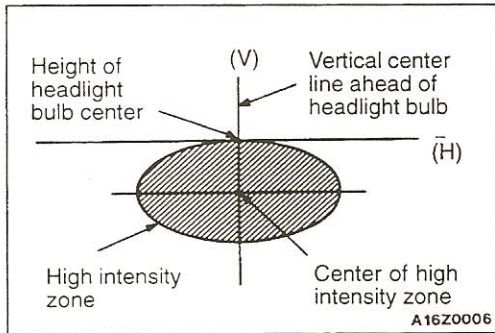
If on-vehicle aiming adjustment cannot be carried out because repairs are being made to the body as a result of an accident, follow the aiming procedure using the screen which is given in the next topic to carry out adjustment.

Headlight Aim Preparation

1. Measure the center of the headlight bulb as shown in the illustration.



2. Place the vehicle on a known level floor 3 m (9.8 feet) from an aiming screen or brightly-colored wall. Four lines of adhesive tape or similar are needed on the screen or wall.
 - (1) Position a vertical tape so that it is aligned with the vehicle center line.
 - (2) Position a horizontal tape with reference to center line of headlight bulb dimension A.
 - (3) Position a vertical tape on the screen with reference to the center line of each headlight bulb dimension B.



Visual Headlight Adjustment

1. A properly aimed lower beam will appear on the aiming screen 3 m (9.8 feet) in front of the vehicle. The shaded area as shown in the illustration indicates high intensity zone.

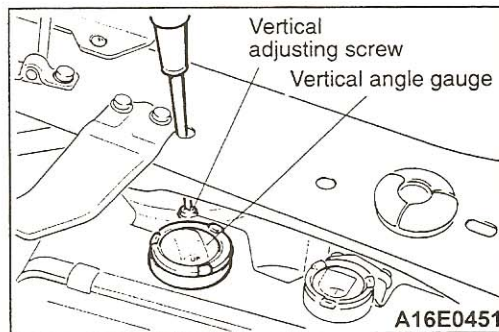
NOTE

3 m (9.8 feet) in front of the vehicle must be the distance measured from the headlight center mark.

2. Adjust the low beam of the headlights to match the low beam pattern of the right and left headlights.

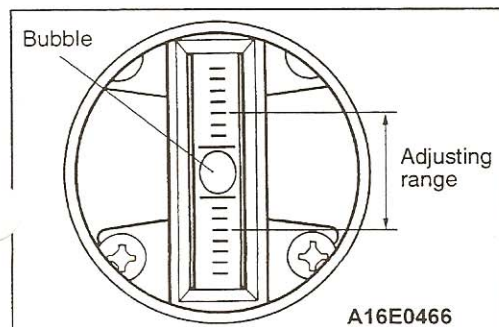
NOTE

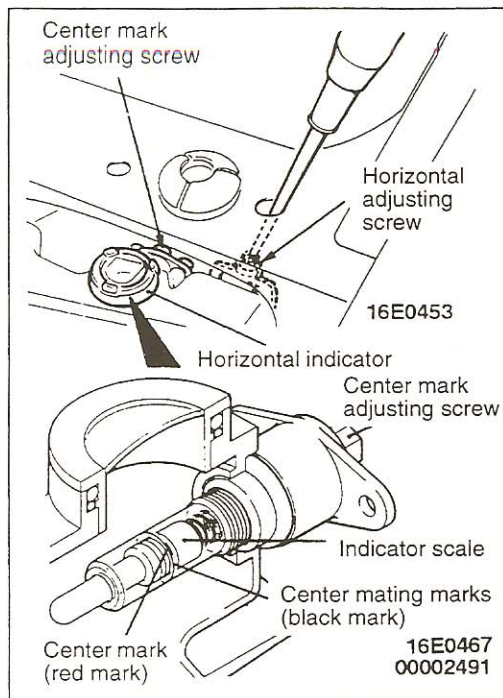
If the visual low beam headlight adjustment is made, high beam adjustment is not necessary.



Vertical Adjusting

1. Adjust the vertical angle by rotating the vertical adjusting screw so that the bubble in the vertical angle gage locates inside the adjusting range.
2. Check that the beam which strikes the screen matches the specified beam pattern. If the pattern does not match, adjust the vertical angle with the vertical adjusting screw until it does match.





Horizontal Adjusting

1. Adjust the horizontal angle by turning the horizontal adjusting screw until the center mark (red mark) and the center mating mark (black mark) of the horizontal indicator are aligned.
2. Check that the beam which strikes the screen matches the specified beam pattern.
If the pattern does not match, adjust by the following procedure.
 - (1) Adjust the horizontal angle by turning the horizontal adjusting screw so that the beam pattern matches the specified pattern.
 - (2) Turn the center mark adjusting screw to align the center mark (red mark) and the center mating mark (black mark) of the horizontal indicator.

LUMINOUS INTENSITY MEASUREMENT

Measure the luminous intensity of the headlights with a photometer in accordance with the instruction manual prepared by the manufacturer of the photometer and make sure that the luminous intensity is within the following limit.

Limit: 20,000 cd or more

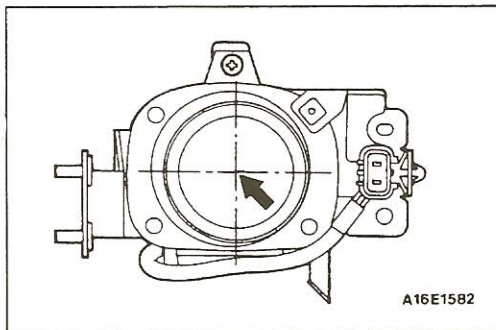
NOTE

- (1) When measuring the luminous intensity of the headlights, keep the engine at 2,000 r/min and have the battery charged.
- (2) If there are specific regulations for luminous intensity of headlights in the region where the vehicle is operated, make sure that the intensity conforms to the requirements of such regulations.

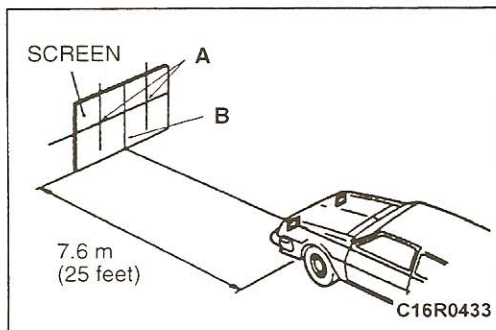
FOG LIGHT AIMING

54200110152

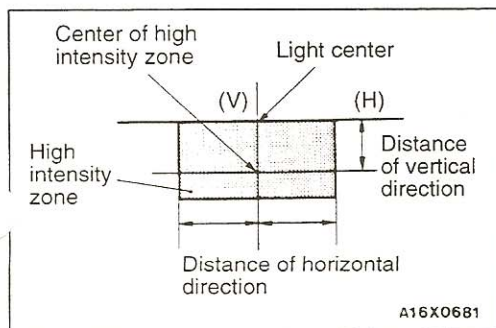
1. Inspect for badly rusted or faulty fog light.
2. These conditions must be corrected before a satisfactory adjustment can be made.
3. Place vehicle on a level floor.
4. Bounce front suspension through three (3) oscillations by applying body weight to hood or bumper.
5. Inspect tire inflation.
6. Rock vehicle sideways to allow vehicle to assume its normal position.
7. If fuel tank is not full, place a weight in trunk of vehicle to simulate weight of a full tank [3 kg (6.5 lbs.) per gallon].
8. There should be no other load in the vehicle other than driver or substituted weight of approximately 70 kg (150 lbs.) placed in driver's position.
Thoroughly clean fog light lenses.



9. Measure the center of the fog lights as shown in the illustration.

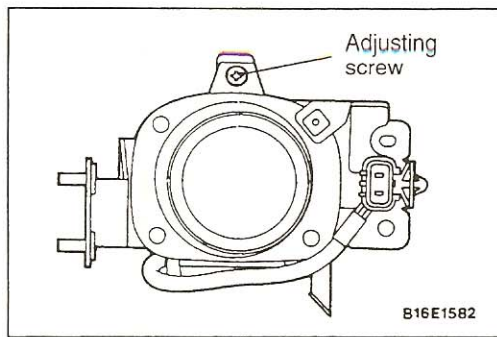


10. Place the vehicle on a known level floor 7.6 m (25 feet) from an aiming screen or brightly-colored wall. Four lines of adhesive tape or similar are needed on the screen or wall.
 - (1) Position a vertical tape so that it is aligned with the vehicle center line.
 - (2) Position a horizontal tape with reference to center line of fog light bulb dimension A.
 - (3) Position a vertical tape on the screen with reference to the center line of each fog light bulb dimension B.

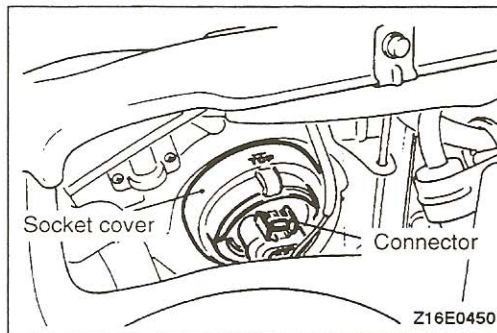


11. Check if the beam shining onto the screen is at the standard value.

Standard value:**(Vertical direction)****100 mm (4 in.) below horizontal (H)****(Horizontal direction)****Parallel to direction of vehicle travel**

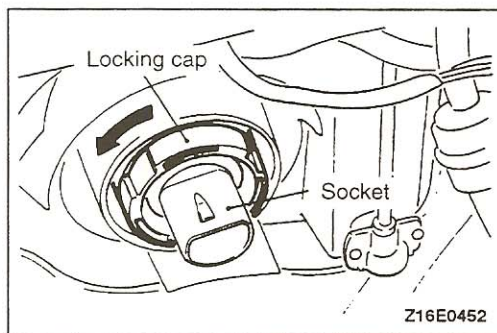
**NOTE**

The horizontal direction is non-adjustable. If the deviation of the light beam axis exceeds the standard value, check that the mounting location or some other point is not defective.

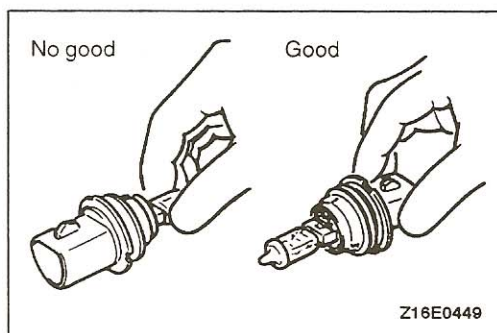
**REPLACEABLE HEADLIGHT BULB REPLACEMENT**

54200130226

- (1) Remove the engine coolant reserve tank (left side only).
- (2) Disconnect the harness connector, and then pull out the socket cover.



- (3) Remove the locking cap by rotating it counter-clockwise, and then draw the socket together with bulb.

**Caution**

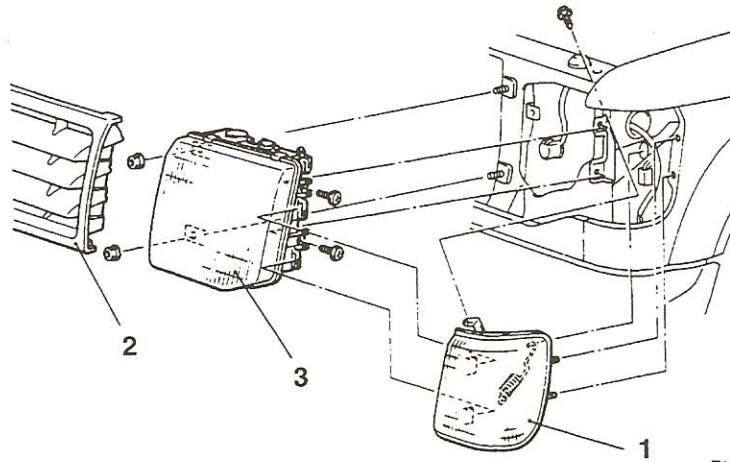
Never hold the halogen light bulb with a bare hand, dirty glove as the bulb may pop after a short time. If the glass surface is dirty, be sure to clean it with alcohol, paint thinner, etc., and install it after drying it thoroughly.

- (4) If the socket cover is not securely installed, the lens will be out of focus, or water will get inside the light unit, so the cover should be securely installed.

HEADLIGHT AND FRONT COMBINATION LIGHT

54200270010

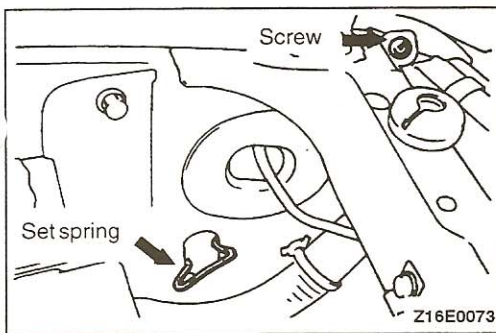
REMOVAL AND INSTALLATION



Z16E0459

Removal steps

- ◀A▶ ▶B▶ 1. Front combination light
- ▶A▶ 2. Radiator grille
- ▶A▶ 3. Headlight



Z16E0073

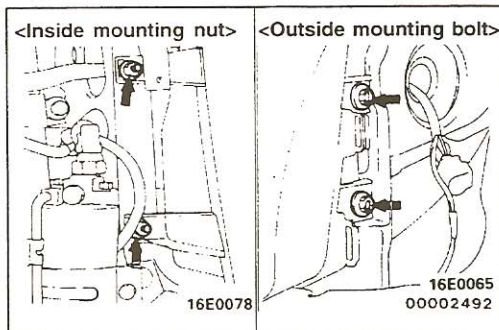
REMOVAL SERVICE POINT

◀A▶ FRONT COMBINATION LIGHT REMOVAL

Remove the front combination light mounting screws and set spring, and then remove the front combination light by pulling it towards the front of the vehicle.

NOTE

For the left side, before removing the front combination light, remove the engine coolant reserve tank in advance.



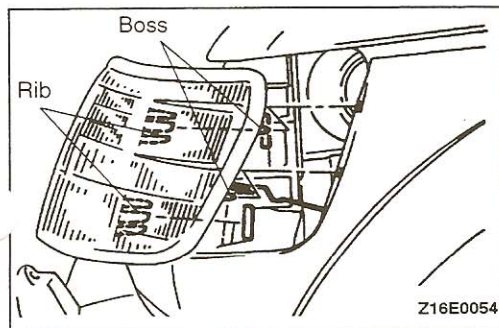
16E0078

16E0065
00002492

INSTALLATION SERVICE POINTS

▶A▶ HEADLIGHT INSTALLATION

After tightening the outside mounting bolt, tighten the inside mounting nut.



Z16E0054

▶B▶ FRONT COMBINATION LIGHT INSTALLATION

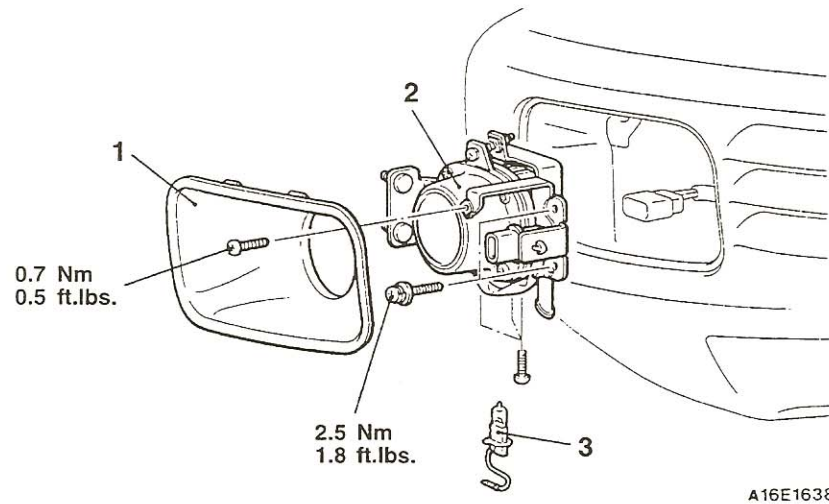
- (1) Align the front combination light positioning bosses with the insertion holes in the fender, and align the ribs with the headlight insertion holes.
- (2) While pushing the front combination light in towards the rear of the vehicle, pull the set spring into the engine compartment to tighten it to the vehicle body, and then tighten with the screw.

TSB Revision

FOG LIGHT

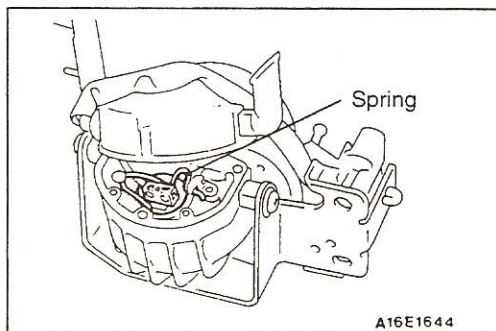
54200150008

REMOVAL AND INSTALLATION



Removal steps

1. Fog light bezel
2. Fog light
3. Bulb



REMOVAL SERVICE POINT

◀A▶ BULB REMOVAL

Remove the bulb attaching spring and pull out the bulb.

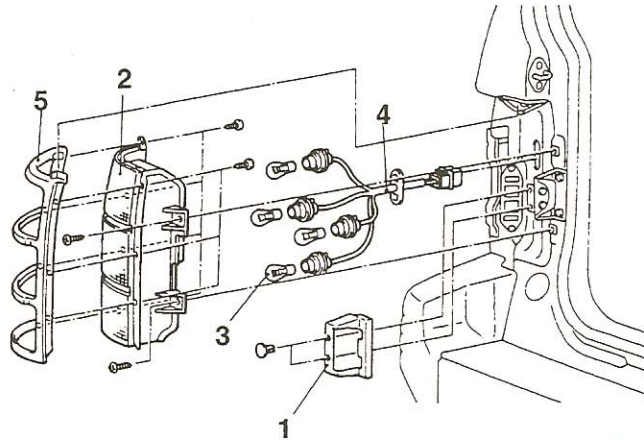
Caution

Do not touch the surface of the bulb glass with hands or dirty gloves. If the surface does become dirty, clean it with alcohol or thinner, and let it dry thoroughly before installing.

REAR COMBINATION LIGHT

54200390136

REMOVAL AND INSTALLATION



Z16E0103

Removal steps

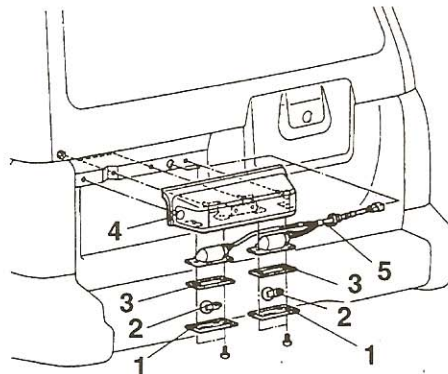
1. Back door bumper cover
2. Rear combination light unit
3. Bulb

- Quarter trim (Refer to GROUP 52A – Trim.)
- 4. Socket assembly
- 5. Rear combination light bezel

LICENSE PLATE LIGHT

54200420033

REMOVAL AND INSTALLATION

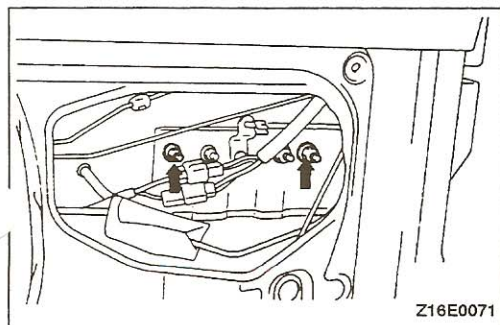


Z16E0101

Removal steps

1. Lens
2. Bulb
3. Lens gasket

- Back door trim (Refer to GROUP 42 – Door Trim and Waterproof Film.)
- 4. License plate light garnish
- 5. Socket assembly



Z16E0071

REMOVAL SERVICE POINT

◀A▶ LICENSE PLATE LIGHT GARNISH REMOVAL

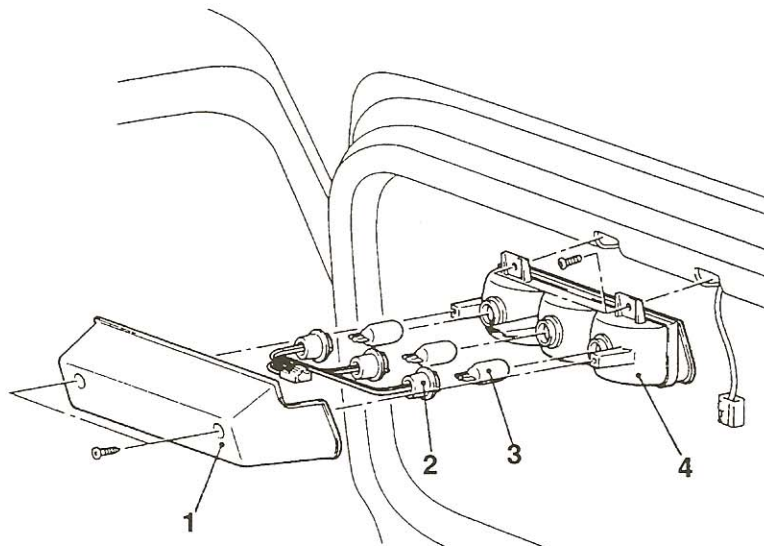
- (1) Take off the waterproof film and remove the license plate light garnish mounting nuts.
- (2) Remove the clips with a flat-tip (-) screwdriver, and then remove the license plate light garnish together with the socket assembly.

TSB Revision

HIGH MOUNTED STOP LIGHT

54200510005

REMOVAL AND INSTALLATION

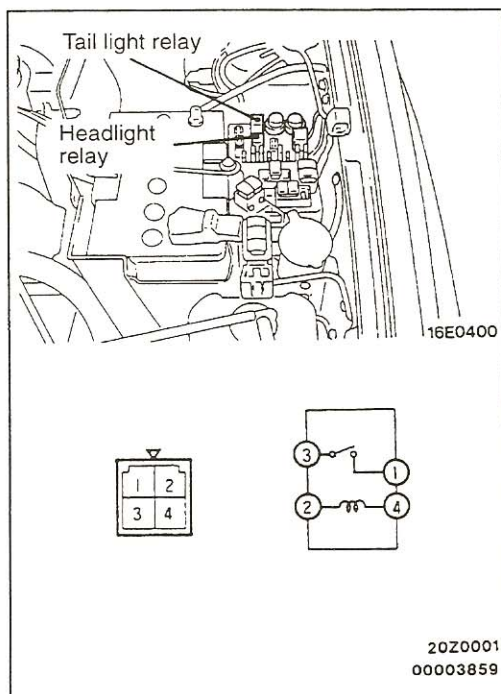


A14E0250

Removal steps

1. Cover
2. Socket assembly

3. Bulb
4. High mounted stop light unit



RELAY

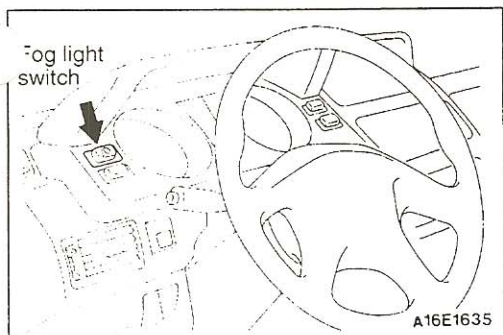
54200880015

INSPECTION

Headlight Relay and Tail Light Relay Check

- (1) Remove the headlight relay or tail light relay from the relay box in the engine compartment.
- (2) Apply battery positive voltage to terminal (2), and check for continuity between the terminals when terminal (4) is grounded.

When power is supplied	Between terminals (1)–(3)	Continuity
When power is not supplied	Between terminals (1)–(3)	No continuity
	Between terminals (2)–(4)	Continuity

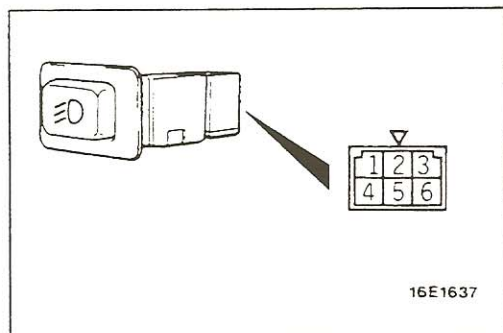


FOG LIGHT SWITCH

54200740085

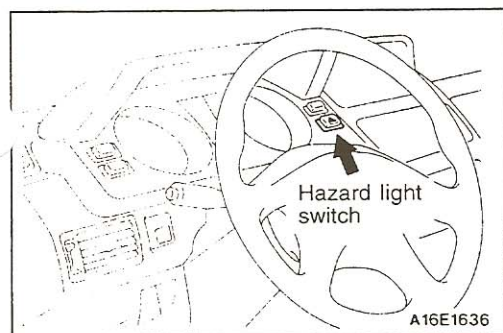
INSPECTION

(1) Remove the fog light switch from the meter bezel.



(2) Operate the switch and check for continuity between the terminals.

Switch position	Terminal						
	1	4	3	6	2	ILL	5
OFF							
ON	○	○	○	○	○	ILL	○

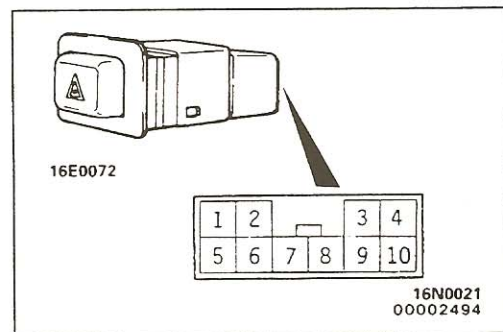


HAZARD LIGHT SWITCH

54200670179

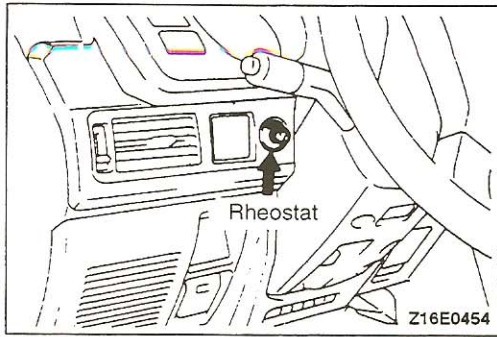
INSPECTION

(1) Remove the hazard light switch from the meter bezel.



(2) Operate the switch and check for continuity between the terminals.

Switch position	Terminal										
	1	2	3	4	5	6	7	8	9	ILL	10
OFF					○	○	○	○	○	ILL	
ON	○	○	○	○	○	○				ILL	○

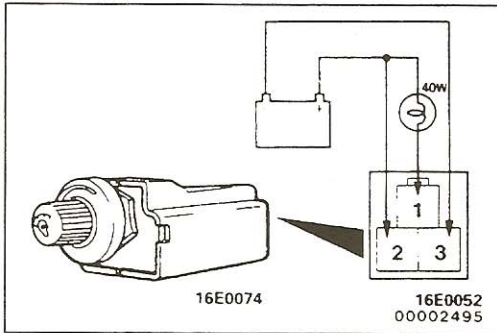


RHEOSTAT

54200610071

INSPECTION

- (1) Remove the knee protector. (Refer to GROUP 52A – Instrument Panel.)
- (2) Remove the rheostat from the instrument panel.



- (3) Connect the battery and the test light (40 W) as shown in the illustration.
- (4) Operate the rheostat, and if the brightness changes smoothly without switching off, then the rheostat function is normal.

COLUMN SWITCH

54300020021

GENERAL SPECIFICATIONS

Items		Specifications
Lighting switch	Rated load A	0.22±0.05
	Voltage drop V	0.2 or less
Turn-signal switch	Rated load A	6.6±0.5
	Voltage drop V	0.2 or less
Dimmer/passing switch	Rated load A	High beam: 12
		Low beam: 10.8
		Passing: 22.8±1.5
	Voltage drop V	0.2 or less

NOTE

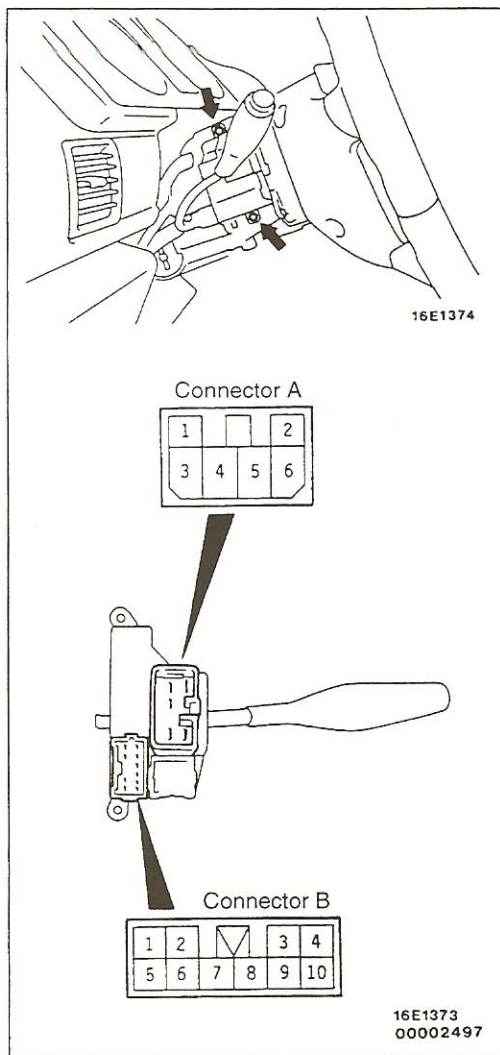
For the windshield wiper and washer switch, refer to GROUP 51 – Windshield Wiper and Washer.
 For the headlight washer switch, refer to GROUP 51 – Headlight Washer.

COLUMN SWITCH

54300870015

INSPECTION**Turn-signal Light and Lighting Switch Check**

- (1) Remove the column cover lower.
- (2) Remove the column cover upper.
- (3) Turn the screws indicated by arrows in the illustration, and then remove the switch.
- (4) Operate the switch and check for continuity between the terminals.



<Lighting switch>

Switch position	Connector A terminal	Connector B terminal		
	1	5	6	7
OFF				
TAIL		○	—	○
HEAD	○	○	—	○

<Dimmer switch>

Switch position	Connector A terminal		
	3	4	6
LOW BEAM	○	—	○
HIGH BEAM		○	—

<Passing switch>

Switch position	Connector A terminal				
	1	2	3	4	6
P1	○	○	○	—	○
P2	○	○		○	—

<Turn-signal light switch>

Switch position	Connector B terminal					
	1	3	4	8	9	10
R.H.				○	—	○
OFF						
L.H.		○	—	○		

NOTE

P1 represents the passing operation when the dimmer switch is in the LOW BEAM position, and P2 represents the operation when it is in the HIGH BEAM position.

Windshield Wiper and Washer Switch Check

Refer to GROUP 51 – Windshield Wiper and Washer.

Headlight Washer Switch Check

Refer to GROUP 51 – Headlight Washer.

HORN

54300010233

GENERAL INFORMATION

OPERATION

- Battery positive voltage is constantly applied to the horn relay through multi-purpose fuse No. 10.
- When the horn switch is turned on, the contact point of the horn relay closes and the horn relay turns on. While the horn switch is on, the horn sounds.

GENERAL SPECIFICATIONS

54300020038

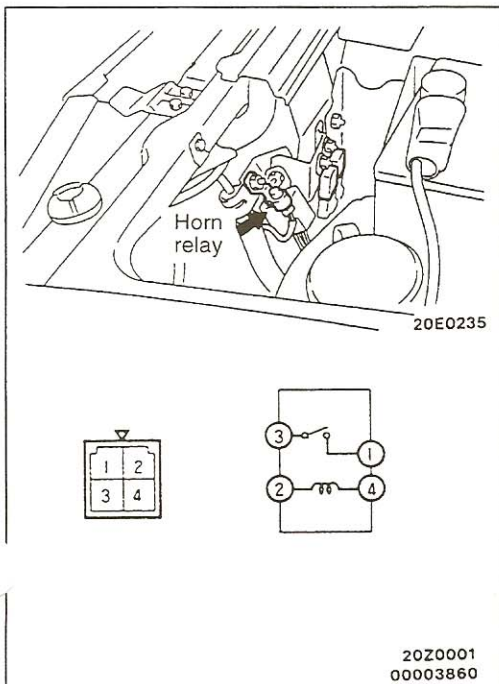
Items		Specifications
Type		Flat type
Effective sounding voltage V		11.5–15
Power consumption A		3.0
Sound level dB		100–112
Fundamental frequency Hz	“Low” sound	350–390
	“High” sound	359–435

TROUBLESHOOTING

54300070255

TROUBLESHOOTING HINTS

- Horn does not sound.
 - Check multi-purpose fuse No. 10.
 - Check the horn relay.
 - Check the horn switch.
- Only one horn sounds.
 - Check the horn.
 - Check the ground circuit.



HORN RELAY

54300650046

INSPECTION

- Remove the horn relay from the engine compartment.
- Apply battery positive voltage to terminal (2), and check for continuity between the terminals when terminal (4) is grounded.

When power is supplied	Between terminals (1)–(3)	Continuity
When power is not supplied	Between terminals (1)–(3)	No continuity
	Between terminals (2)–(4)	Continuity

CIGARETTE LIGHTER

543000*

GENERAL INFORMATION

OPERATION

- When the plug is inserted into the socket, the cigarette lighter turns on.
- Within 18 seconds after the plug element has started heating, the plug will automatically return and the cigarette lighter will switch off.
- When the lighting switch is set to the TAIL or HEAD position, the tail light relay contact closes to turn the tail light relay on.
- Current flows via dedicated fuse No. 5, and the cigarette lighter illumination light and ashtray illumination light illuminate.

GENERAL SPECIFICATIONS

54300020045

Items	Specifications
Max. input W	120
Reset time second	Within 18
Thermal fuse fusion temperature °C (°F)	180–250 (356–482)

TROUBLESHOOTING

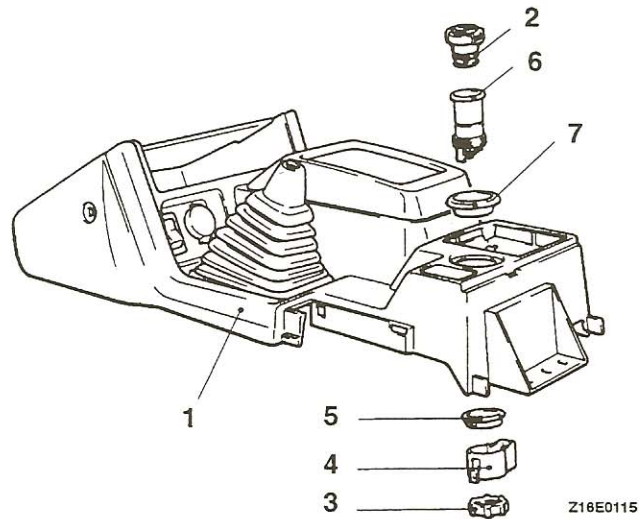
54300070552

TROUBLESHOOTING HINTS

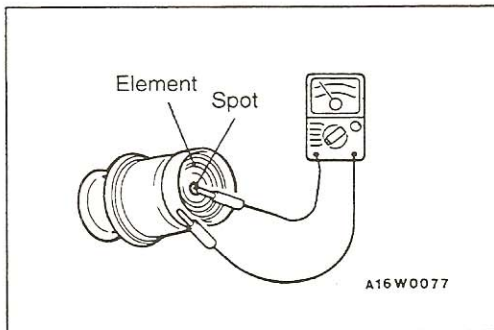
1. The cigarette lighter illumination light does not illuminate.
 - Check the cigarette lighter (see below).
 2. The cigarette lighter illumination light does not illuminate or does not dim.
 - (1) The tail lights illuminate.
 - Check the bulb.
 - Check the rheostat. (Refer to P.54-42.)
 - (2) The tail lights also do not illuminate.
 - Check dedicated fuse No. 5.
 3. The ashtray illumination light does not illuminate.
 - (1) The tail lights illuminate.
 - Check the bulb.
 - (2) The tail lights also do not illuminate.
 - Refer to item 2, step (2).
- Check the tail light relay. (Refer to P.54-40.)
 - Check the column switch. (Refer to P.54-43.)

CIGARETTE LIGHTER

54300560158

REMOVAL AND INSTALLATION**Removal steps**

1. Front console box
(Refer to GROUP 52A – Console Box.)
2. Plug
3. Nut
4. Outer case
5. Washer
6. Socket
7. Protector

**INSPECTION**

54300570052

- Take out the plug, and check for a worn edge on the element spot connection, and for shreds of tobacco or other material on the element.
- Use an ohmmeter to check for continuity in the element.
- Using a ohmmeter, check that the resistance of the element is approximately 1.7 Ω .

ACCESSORY SOCKET

543000

GENERAL INFORMATION

OPERATION

- When the ignition switch is turned to the ACC or ON position, current flows to the coil side of the accessory socket relay.
- The accessory socket relay contact closes to turn the accessory socket relay on.

- When an inspection light or plug-in type accessories are plugged into the accessory socket, the inspection light or accessories can be used.

TROUBLESHOOTING

54300070354

TROUBLESHOOTING HINTS

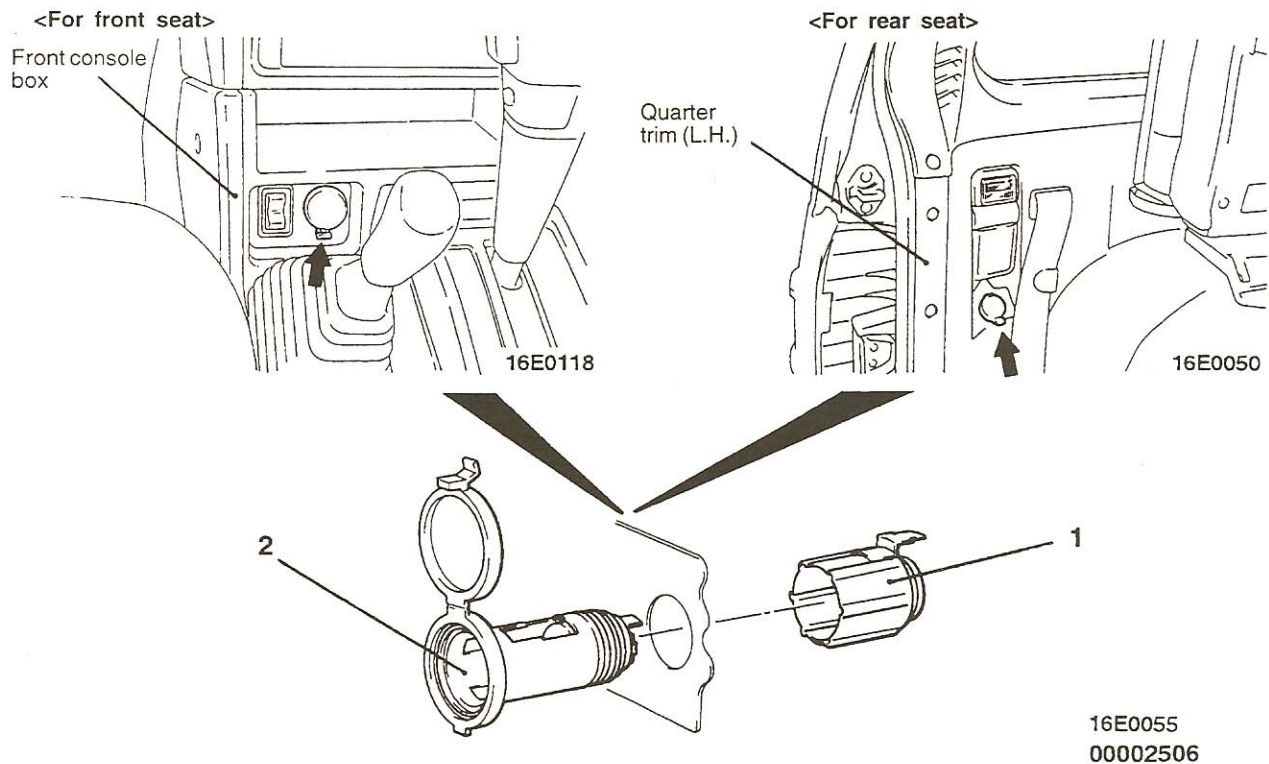
1. The inspection light or accessories cannot be used.

- Check the accessory socket relay. (Refer to P.54-49.)
- Check multi-purpose fuse No. 14.

ACCESSORY SOCKET

54300890042

REMOVAL AND INSTALLATION

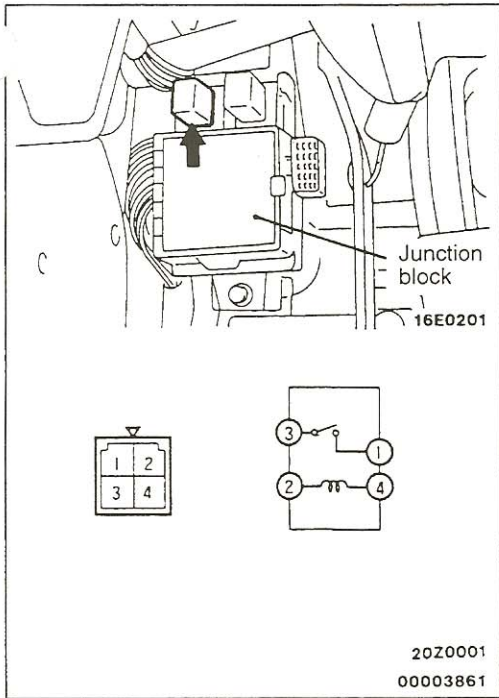


Removal steps

- Front console box (Refer to GROUP 52A – Console Box.)
 - Quarter trim (L.H.) (Refer to GROUP 52A – Trim.)
1. Socket
 2. Outer case

TSB Revision

54300900011



INSPECTION

Accessory Socket Relay Check

- (1) Remove the accessory socket relay from the junction block.
- (2) Apply battery positive voltage to terminal (2), and check for continuity between the terminals when terminal (4) is grounded.

When power is supplied	Between terminals (1)–(3)	Continuity
When power is not supplied	Between terminals (1)–(3)	No continuity
	Between terminals (2)–(4)	Continuity

CLOCK

543000

GENERAL SPECIFICATIONS

Item	Specifications
Type	Crystal oscillator
Display method	Fluorescent digital display
Standard error (seconds/day)	± 2

RADIO AND TAPE PLAYER

54400070173

TROUBLESHOOTING

TROUBLESHOOTING CHART

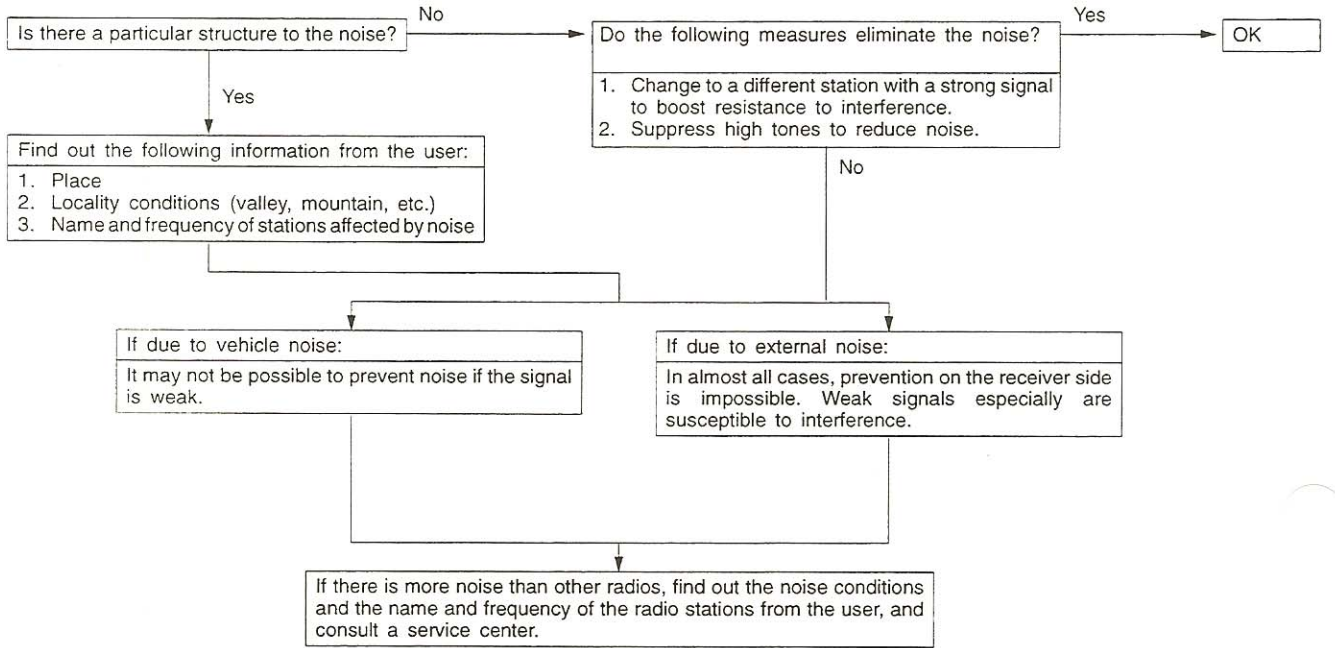
Item	Problem symptom	Relevant chart
Noise	Noise appears at certain places when traveling (AM).	A-1
	Noise appears at certain places when traveling (FM).	A-2
	Mixed with noise, only at night (AM).	A-3
	Broadcasts can be heard but both AM and FM have a lot of noise.	A-4
	There is much noise either on AM or on FM.	A-5
	There is noise when starting the engine.	A-6
	Some noise appears when there is vibration or shocks during traveling.	A-7
	Noise sometimes appears on FM during traveling.	A-8
	Ever-present noise.	A-9
Radio	No power is supplied when the switch is turned on.	B-1
	No sound from one speaker.	B-2
	There is noise but no reception for both AM and FM or no sound from AM, or no sound from FM.	B-3
	Insufficient sensitivity.	B-4
	Distortion on AM or on both AM and FM.	B-5
	Distortion on FM only.	B-6
	Too few automatic select stations.	B-7
	Insufficient memory (preset stations are erased).	B-8
Tape player	Cassette tape is not accepted.	C-1
	No sound.	C-2
	No sound from one speaker.	C-3
	Sound quality is poor, or sound is weak.	C-4
	Cassette tape will not eject.	C-5
	Uneven revolution. Tape speed is fast or slow.	C-6
	Automatic search does not work.	C-7
	Malfunction of auto reverse	C-8
	Tape gets caught in mechanism.	C-9
CD player	CD is not accepted.	D-1
	No sound.	D-2
	CD sound skips.	D-3
	Sound quality is poor.	D-4
	CD cannot be ejected.	D-5
	No sound from one speaker.	D-6

Item	Problem symptom	Relevant chart
Motor antenna	Motor antenna won't extend or retract.	E-1
	Motor antenna extends and retracts but does not receive.	E-2

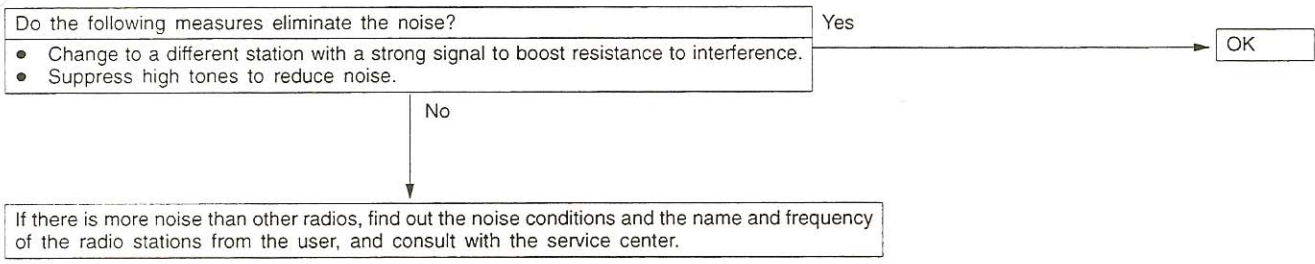
CHART

A. NOISE

A-1 Noise appears at certain places when traveling (AM).



A-2 Noise appears at certain places when traveling (FM).



NOTE

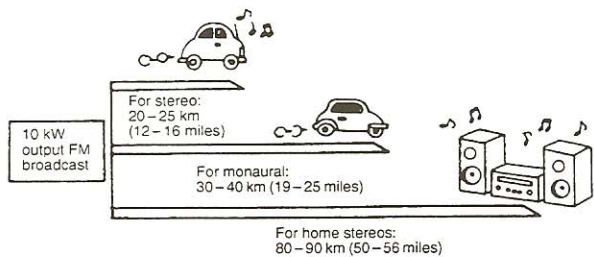
FM waves:

FM waves have the same properties as light, and can be deflected and blocked. Wave reception is not possible in the shadow of obstructions such as buildings or mountains.

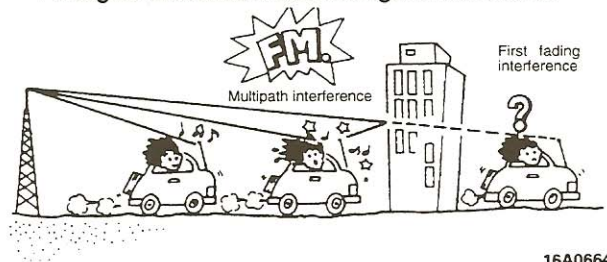
1. The signal becomes weak as the distance from the station's transmission antenna increases. Although this may vary according to the signal strength of the transmitting station and intervening geographical formations or buildings, the area of good reception is approx. 20–25 km (12–16 miles) for stereo reception, and 30–40 km (19–25 miles) for monaural reception.
2. The signal becomes weak when an area of shadow from the transmitting antenna (places where there are obstructions such as mountains or buildings between the antenna and the car), and noise will appear. <This is called first fading, and gives a steady buzzing noise>

3. If a direct signal hits the antenna at the same time as a signal reflected by obstructions such as mountains or buildings, interference of the two signals will generate noise. During traveling, noise will appear each time the vehicle's antenna passes through this kind of obstructed area. The strength and interval of the noise varies according to the signal strength and the conditions of deflection. <This is called multipath noise, and is a repetitious buzzing.>
4. Since FM stereo transmission and reception has a weaker field than monaural, it is often accompanied by a hissing noise.
5. Furthermore, the amount of interference will be comparatively less for vehicles equipped with a diversity antenna system. If there is an equivalent amount of distortion in vehicles or radios of the same type, then differences will be because of differences in antenna systems, and this should be explained to the user. Diversity antenna system: A system where two types of antenna (glass antenna and whip antenna or motor antenna) are equipped and the antenna that provides the best reception can be selected.

FM Broadcast Good Reception Areas



FM Signal Characteristics and Signal Interference



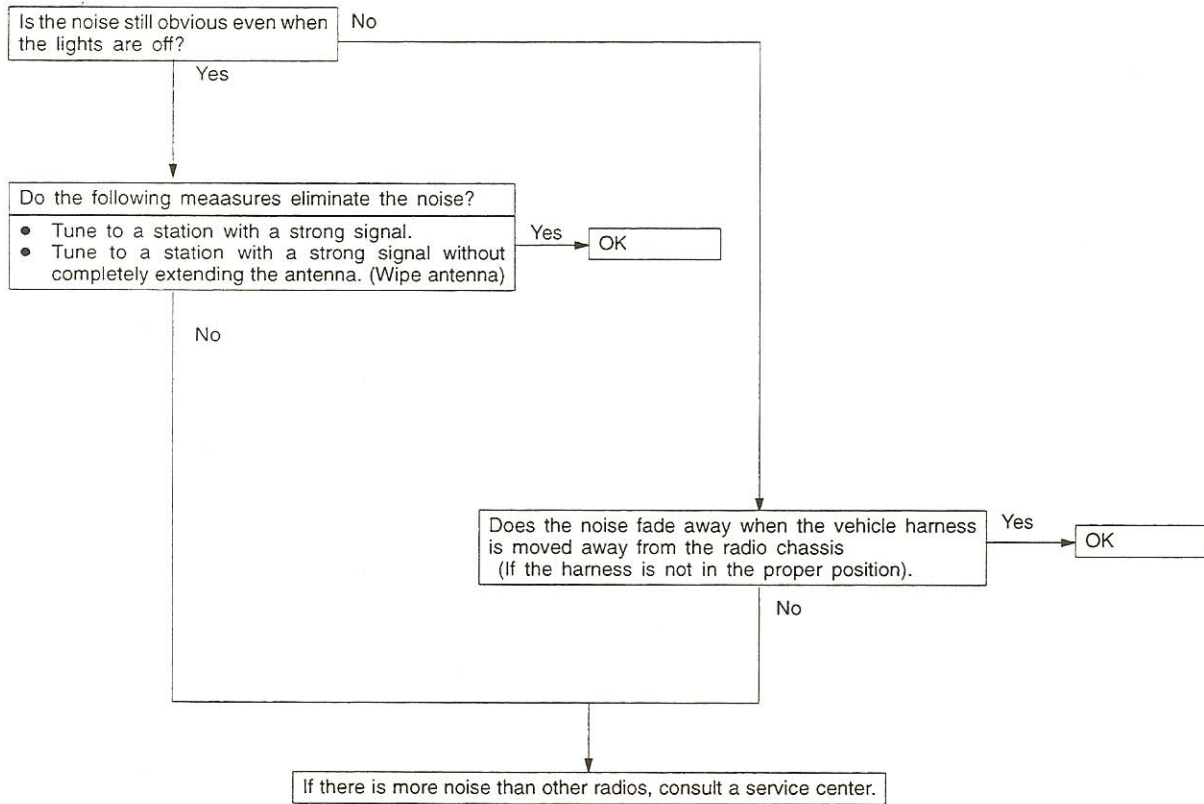
A-3 Mixed with noise, only at night (AM).

The following factors can be considered as possible causes of noise appearing at night.

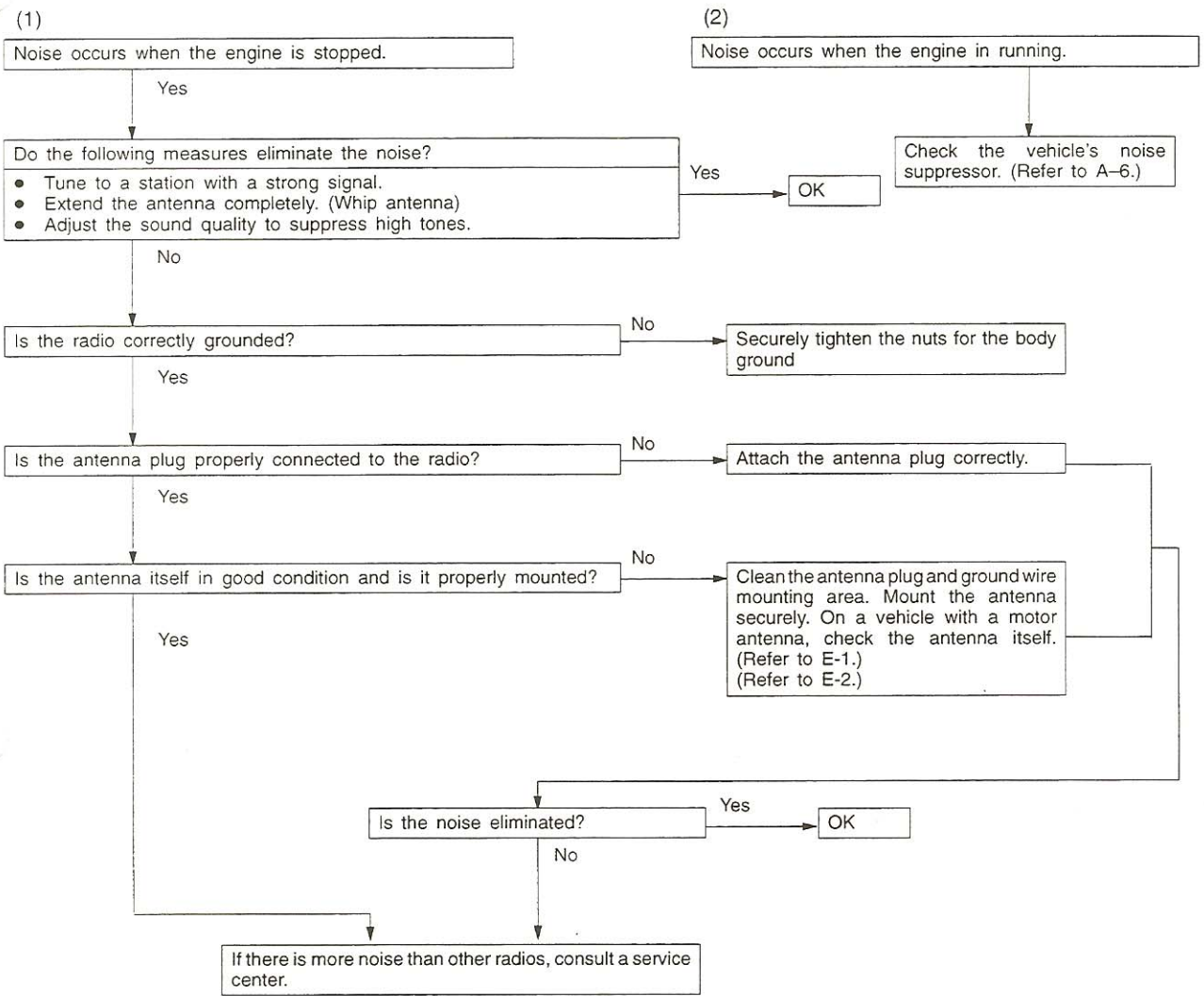
1. Factors due to signal conditions: Due to the fact that long-distance signals are more easily received at night, even stations that are received without problem during the day may experience interference in a general worsening of reception conditions. The weaker a station is the more susceptible it is to interference,

and a change to a different station or the appearance of a beating sound* may occur. Beat sound*: Two signals close in frequency interfere with each other, creating a repetitious high-pitched sound. This sound is generated not only by sound signals but by electrical waves as well.

2. Factors due to vehicle noise: Generator noise may be a cause.



A-4 Broadcasts can be heard but both AM and FM have a lot of noise.



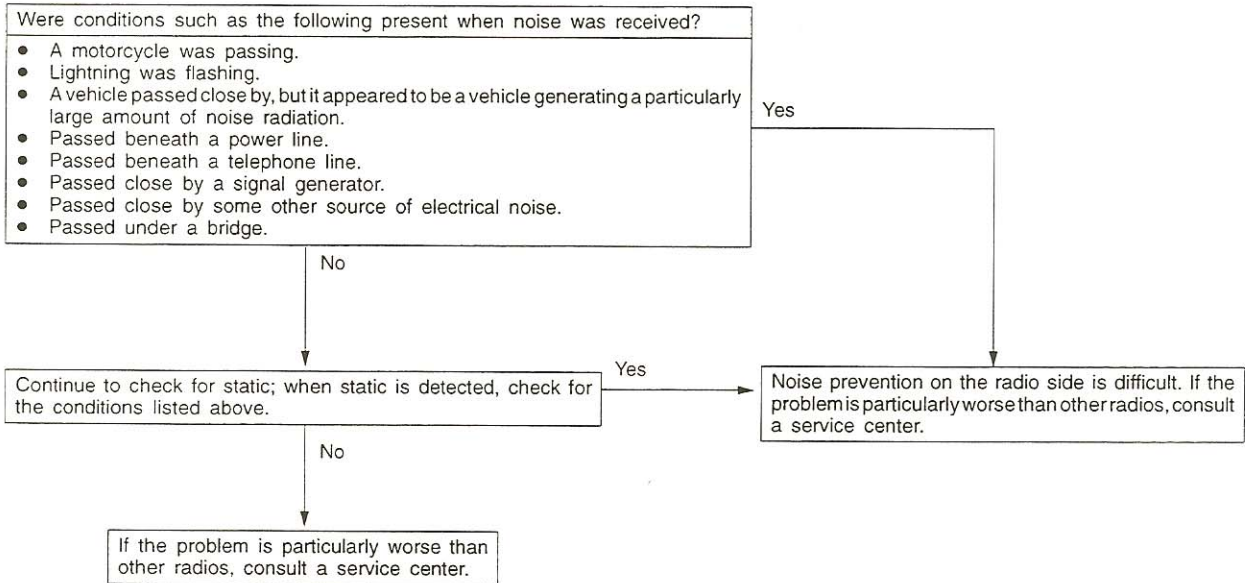
NOTE

- Noise encountered during FM reception only
Due to differences in FM and AM system, FM is not as susceptible as AM to interference from engines, power lines, lightning, etc. On the other hand, due to the characteristics of FM waves, there are sometimes cases of noise or distortion which are generated by typical noise interference (first fading and multipath). (Refer to A-2.)
<Noise (hissing) occurs in weak signal areas such as mountainous regions, but this is not due to a problem with the radio.>

- Furthermore, the amount of interference will be comparatively less for vehicles equipped with a diversity antenna system. If there is an equivalent amount of distortion in vehicles or radios of the same type, then differences will be because of differences in antenna systems, and this should be explained to the user.
Diversity antenna system:
A system where two types of antenna (glass antenna and whip antenna or motor antenna) are equipped and the antenna that provides the best reception can be selected.

A-5 There is more noise either on AM or on FM.

1. There is much noise only on AM.
Due to differences in AM and FM systems,
AM is more susceptible to noise interference.



2. There is much noise only on FM.
- Noise encountered during FM reception only
Due to differences in FM and AM system, FM is not as susceptible as AM to interference from engines, power lines, lightning, etc. On the other hand, due to the characteristics of FM waves, there are sometimes cases of noise or distortion which are generated by typical noise interference (first fading and multipath). (Refer to A-2.)
<Noise (hissing) occurs in weak signal areas such as mountainous regions, but this is not due to a problem with the radio.>

- Furthermore, the amount of interference will be comparatively less for vehicle equipped with a diversity antenna system... If there is an equivalent amount of distortion in vehicles or radios of the same type, then differences will be because of differences in antenna systems, and this should be explained to the user.
Diversity antenna system:
A system where two types of antenna (glass antenna and whip antenna or motor antenna) are equipped and the antenna that provides the best reception can be selected.

A-6 There is noise when starting the engine.

Noise-type sounds are in parentheses ().	Conditions	Cause	Inspection part or remedy	Mounting location
AM, FM: Ignition noise (Popping, Snapping, Cracking, Buzzing)	<ul style="list-style-type: none"> Increasing the engine speed causes the popping sound to speed up and the volume to decrease Disappears when the ignition switch is turned to ACC. 	<ul style="list-style-type: none"> Mainly due to the spark plug circuit. Due to engine noise. 	Ground cable	2, 3, 4
			Noise capacitor	1
			<ul style="list-style-type: none"> Use engine analyzer to diagnose ignition system 	
AM and FM Defogger noise (Popping) A	<ul style="list-style-type: none"> Occurs when the defogger switch is turned on or off. 	<ul style="list-style-type: none"> Glass antenna catches sparks which are produced when the defogger switch is turned on or off. 	-	-
AM and FM Defogger noise B	<ul style="list-style-type: none"> Occurs when the defogger switch is turned on. 	<ul style="list-style-type: none"> Glass antenna catches noise which is produced by electrical parts in the vehicle. 	-	-
AM and FM Defogger noise (Cracking and buzzing) C	<ul style="list-style-type: none"> Occurs due to wire breakage of the print heater when defogger switch is turned on. 	<ul style="list-style-type: none"> Glass antenna catches noise which is produced by sparks in the broken-wire area of the print heater. 	Repair the print heater.	-
Other electrical components	-	Noise may appear as the electrical components become older.	Repair or replace the electrical components.	
Static electricity (Cracking, Crinkling)	<ul style="list-style-type: none"> Disappears when the vehicle is completely stopped. Severe when transmission is engaged and vehicle is moving. 	Occurs when parts or wiring move for some reason and contact metal parts of the body.	Return parts or wiring to their proper position.	
	<ul style="list-style-type: none"> Various noises are produced depending on the body part of the vehicle. 	Due to removal of the front hood, bumpers, exhaust pipe and muffler, suspension, etc.	Ground parts by bonding. Cases where the problem is not eliminated by a single response to one area are common, due to several body parts being imperfectly grounded.	

Caution

1. **Connecting a high tension cable to the noise filter may destroy the noise filter and should never be done.**
2. **Check that there is no external noise. Since failure to do this may result in an incorrect diagnosis due to the inability to identify the noise source, this operation must be performed.**
3. **Noise prevention should be performed by suppressing strong sources of noise step by step.**

NOTE

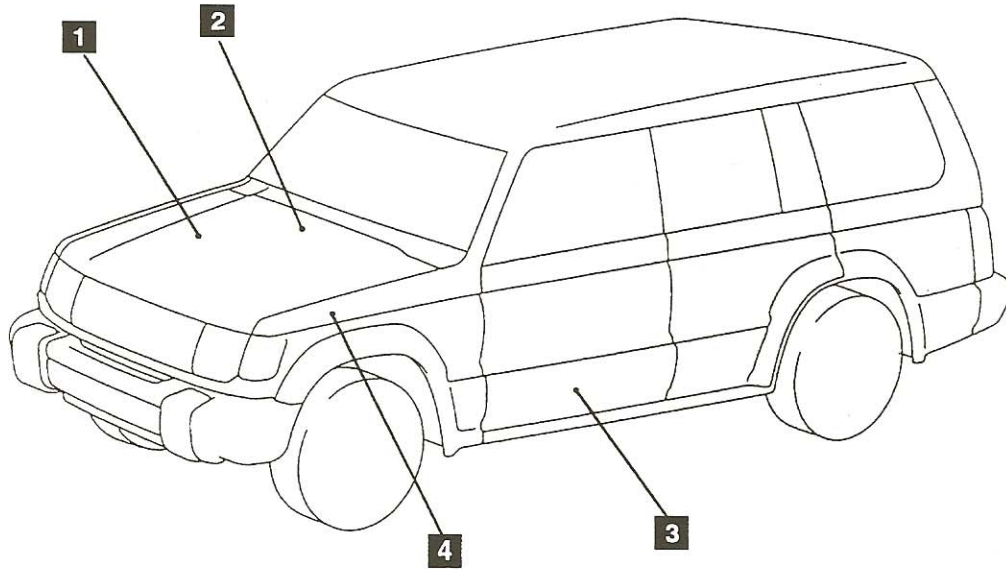
1. Capacitor
The capacitor does not pass DC current, but as the number of waves increases when it

passes AC current, impedance (resistance against AC) decreases, and current flow is facilitated. A noise suppressing capacitor which takes advantage of this property is inserted between the power line for the noise source and the ground. This suppresses noise by grounding the noise component (AC or pulse signal) to the body of the vehicle.

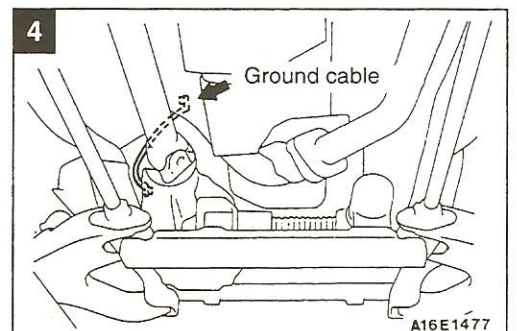
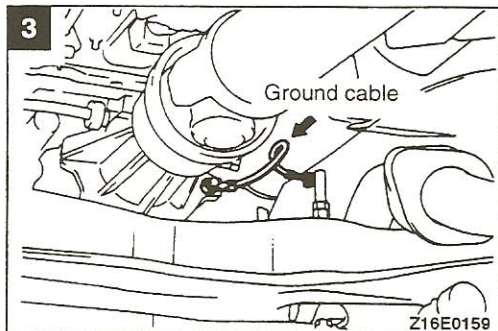
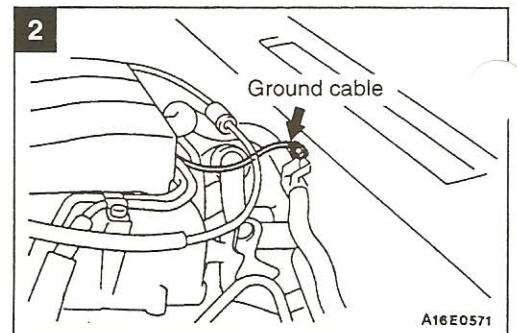
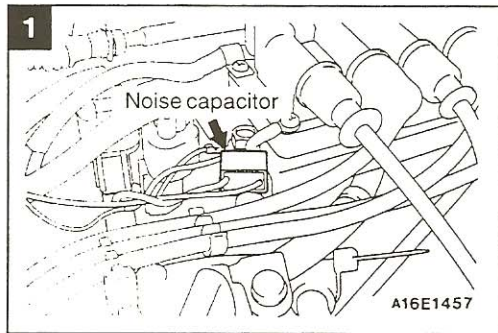
2. Coil

The coil passes DC current, but impedance rises as the number of waves increases relative to the AC current. A noise suppressing coil which takes advantage of this property is inserted into the power line for the noise source, and works by preventing the noise component from flowing or radiating out of the line.

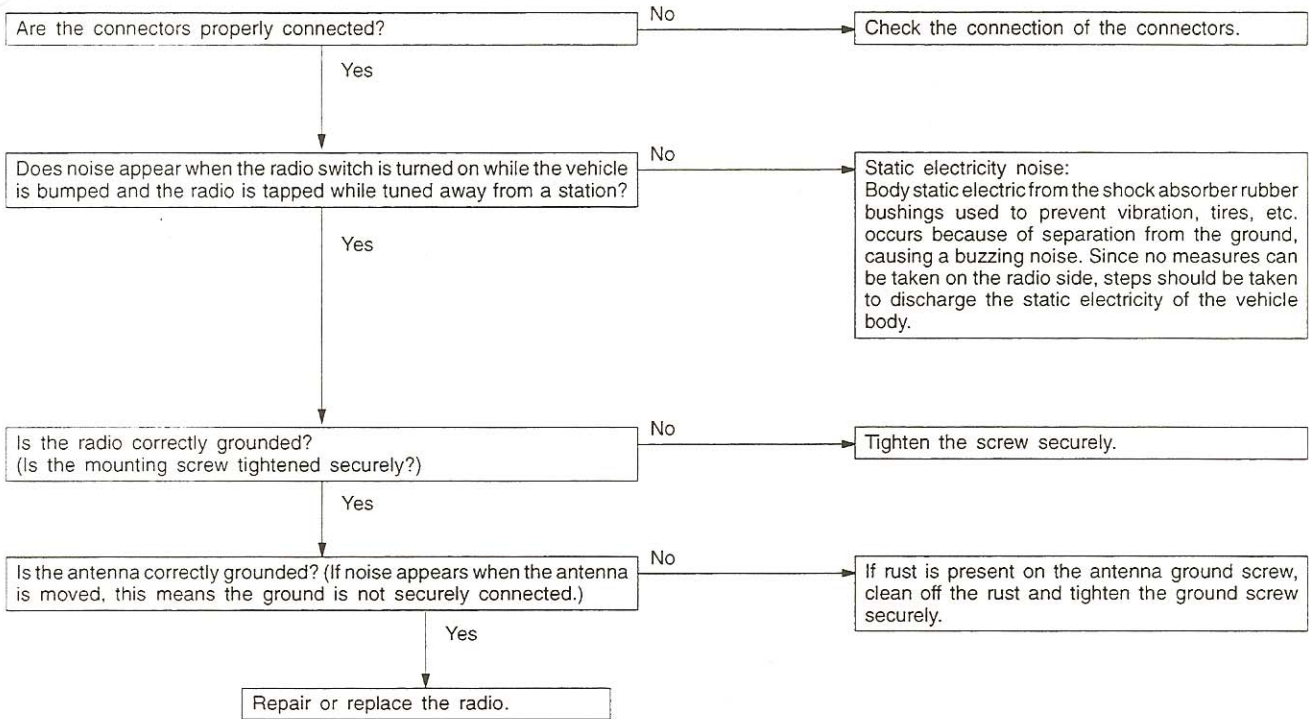
NOISE SUPPRESSOR MOUNTING LOCATION

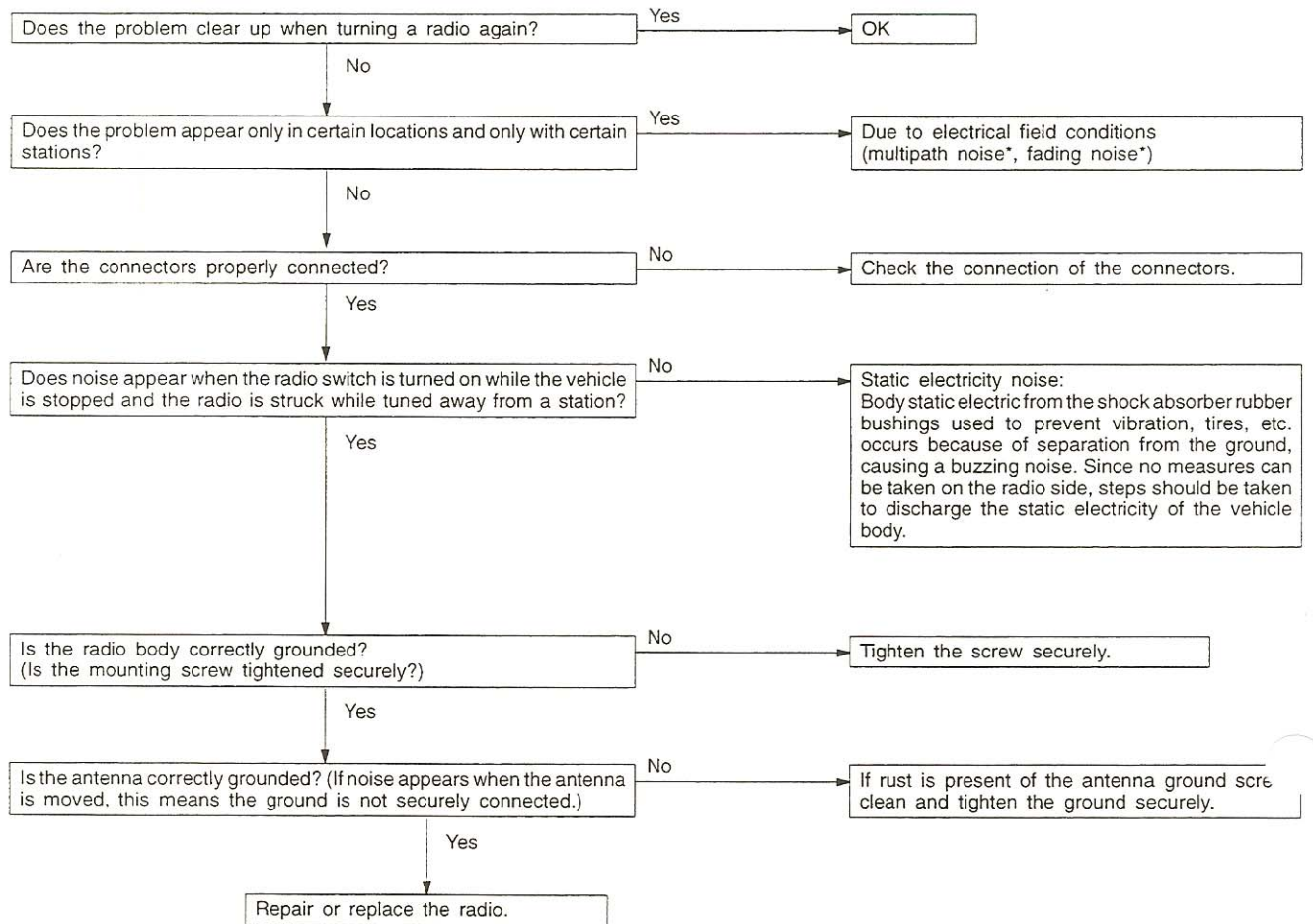


Y18E0003



A-7 Some noise appears when there is vibration or shocks during traveling.



A-8 Noise sometimes appears on FM during traveling.

- * Multipath noise and fading noise:
Because the frequency of FM waves is extremely high, it is highly susceptible to effects from geological formations and buildings. These effects disrupt the broadcast signal and obstruct reception in several ways.
- Multipath noise
This describes the echo that occurs when the broadcast signal is reflected by a large

obstruction and enters the receiver with a slight time delay relative to the direct signal (repetitious buzzing).

- Fading noise
This is a buzzing noise that occurs when the broadcast beam is disrupted by obstructing objects and the signal strength fluctuates closely within a narrow range.

A-9 Ever-present noise.

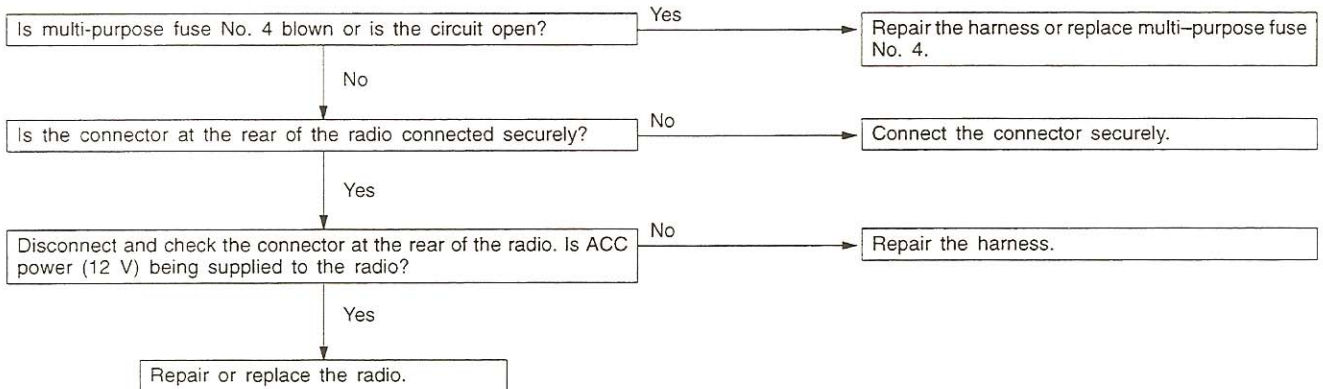
Noise is often created by the following factors, and often the radio is OK when it is checked individually.

- Traveling conditions of the vehicle
- Terrain of area traveled through
- Surrounding buildings
- Signal conditions
- Time period

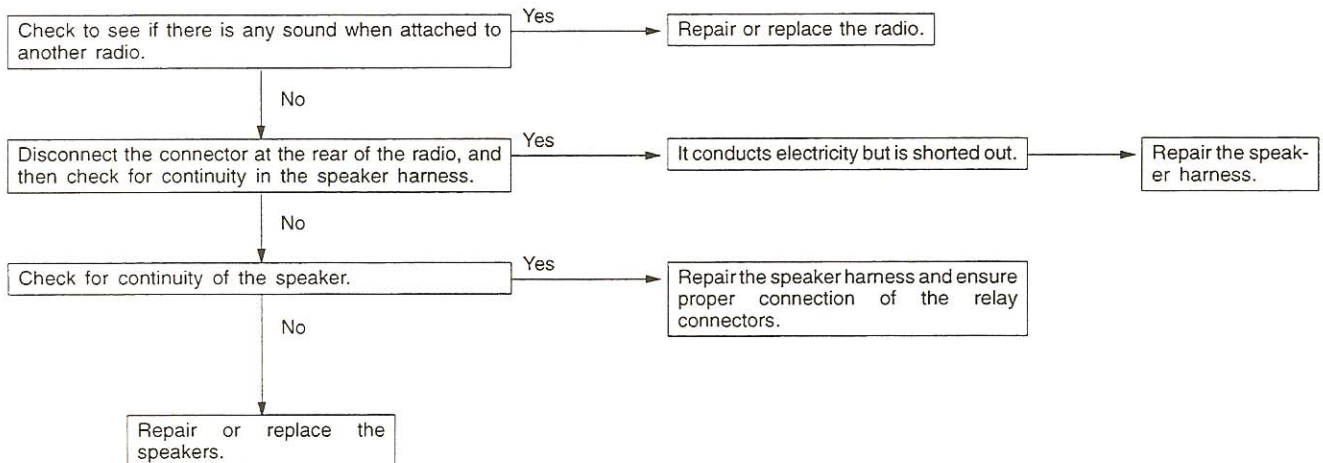
For this reason, if there are still problems with noise even after the measures described in steps A-1 to A-8 have been taken, get information on the factors listed above as well as determining whether the problem occurs with AM or FM, the station names, frequencies, etc., and contact a service center.

B. RADIO

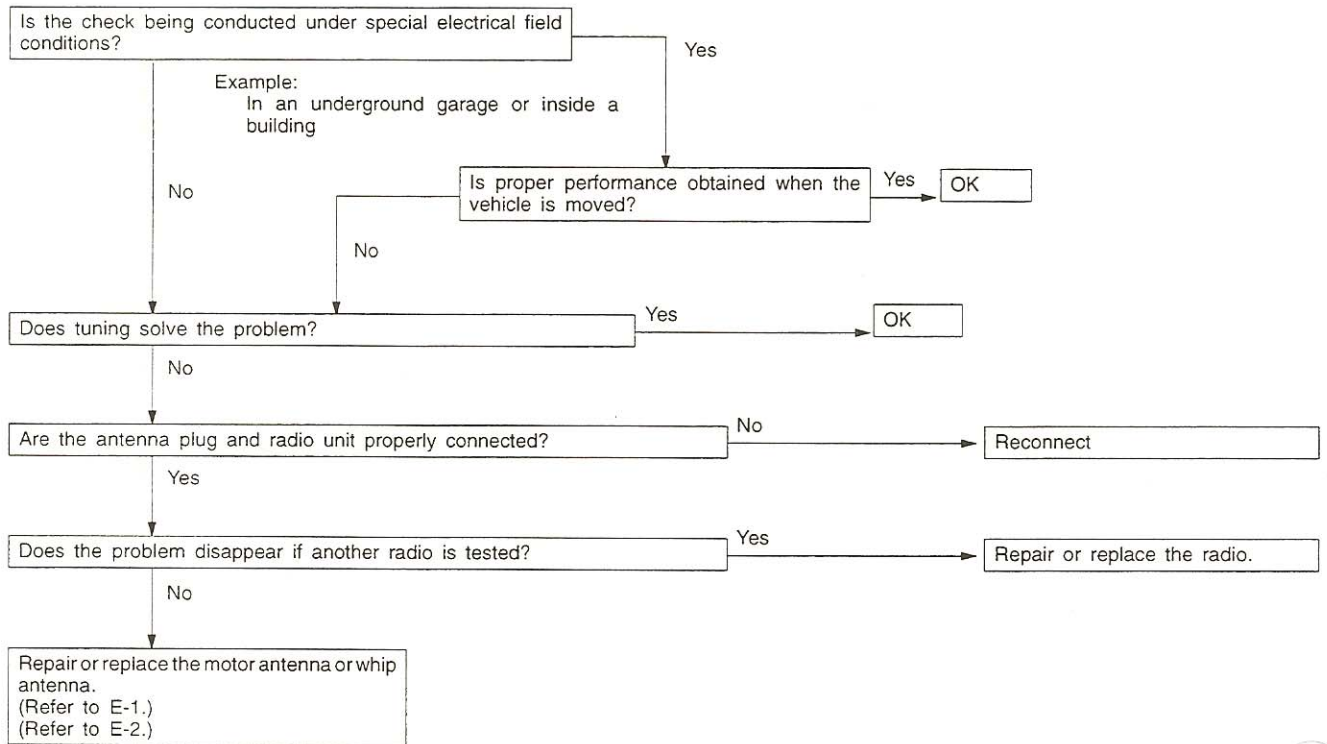
B-1 No power is supplied when the switch is turned on.



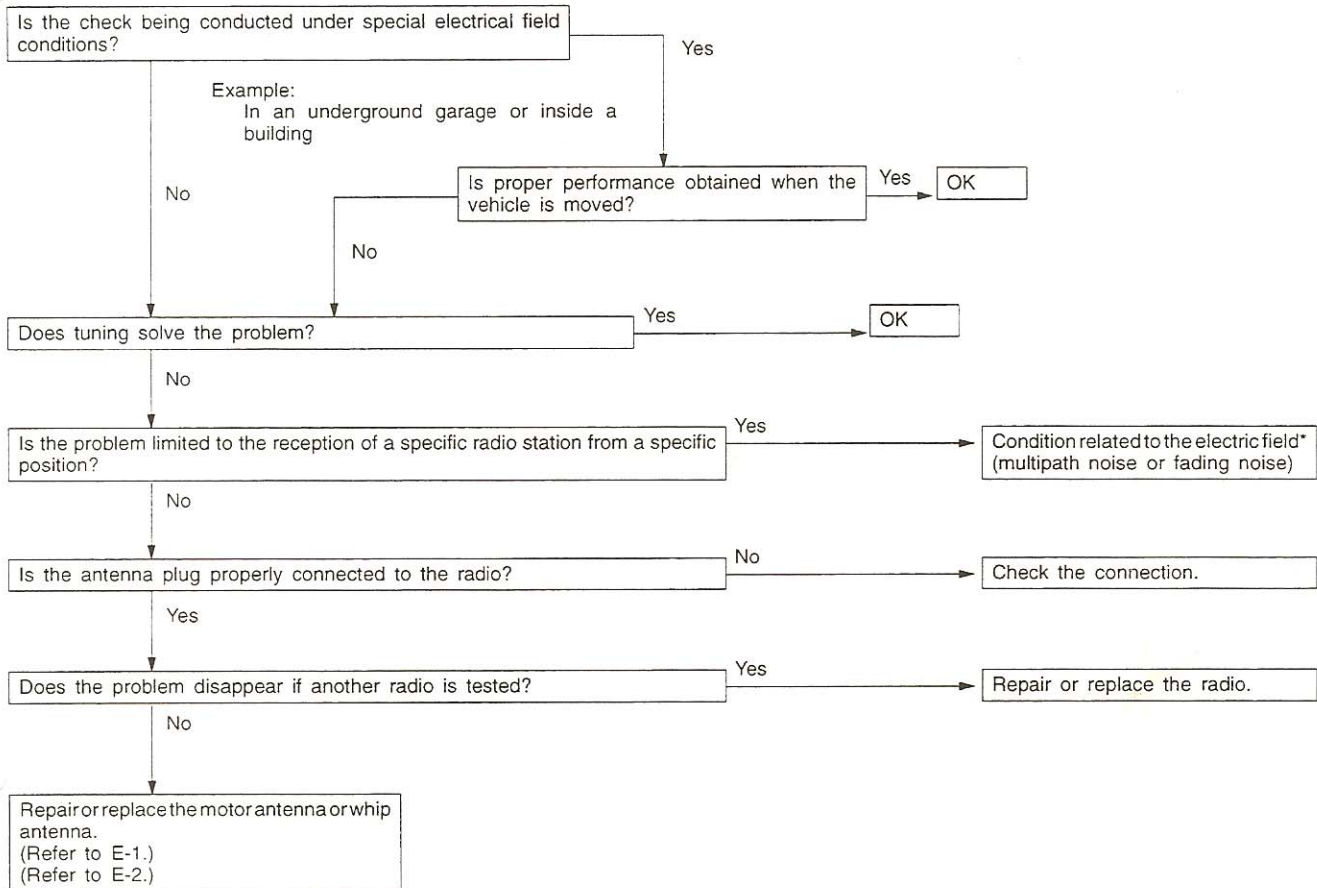
B-2 No sound from one speaker.



B-3 There is noise but no reception for both AM and FM or no sound from AM, or no sound from FM.



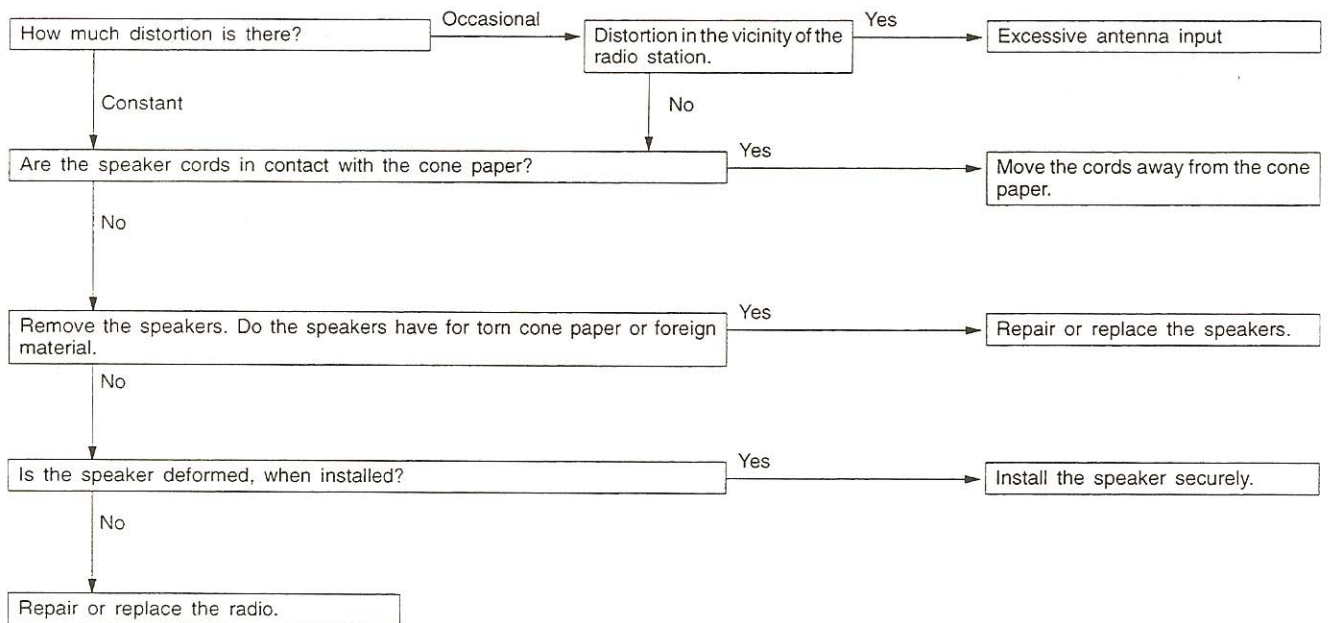
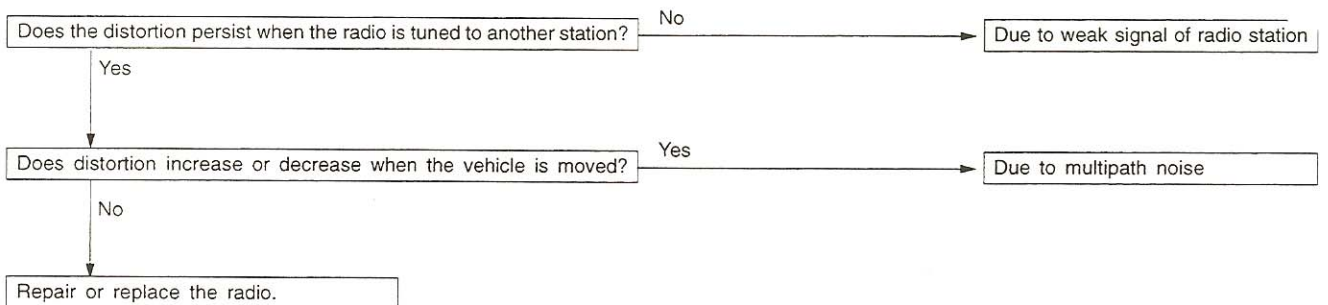
B-4 Insufficient sensitivity.



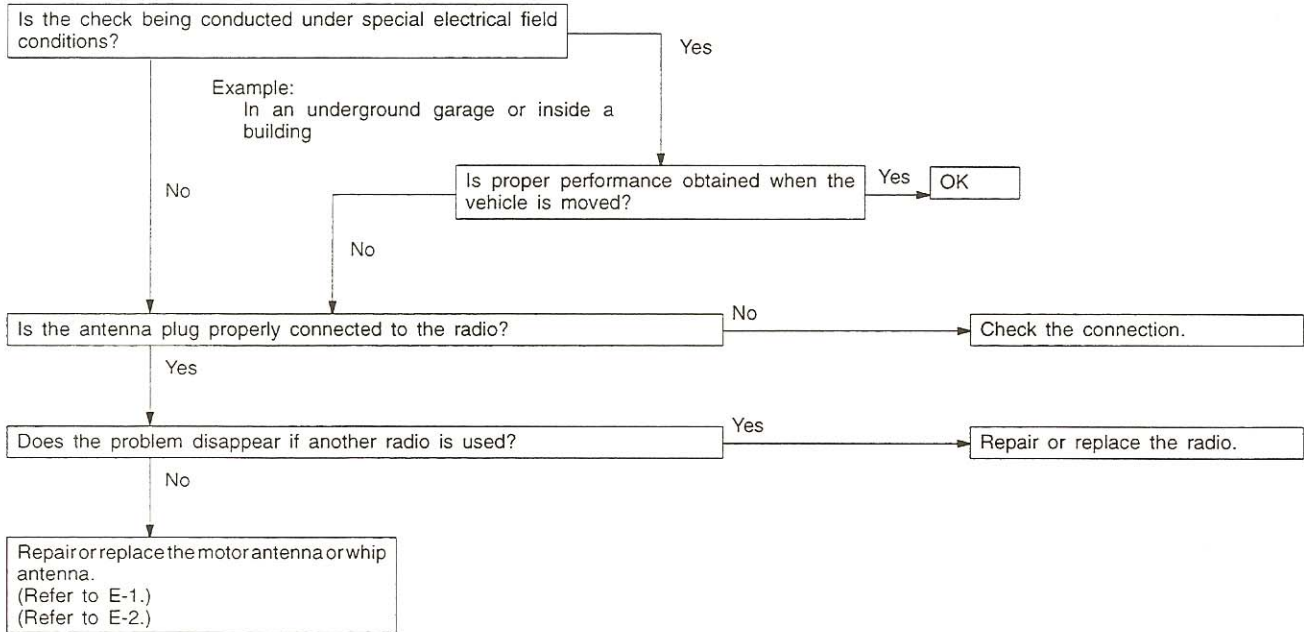
- * Multipath noise and fading noise:
Because the frequency of FM waves is extremely high, it is highly susceptible to effects from geological formations and buildings. These effects disrupt the broadcast signal and obstruct reception in several ways.
- Multipath noise
This describes the echo that occurs when the broadcast signal is reflected by a large

obstruction and enters the receiver with a slight time delay relative to the direct signal (repetitious buzzing).

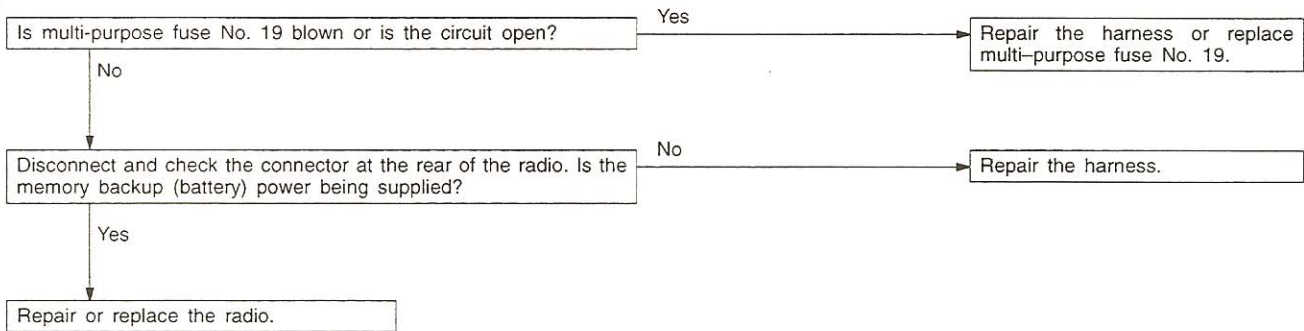
- Fading noise
This is a buzzing noise that occurs when the broadcast beam is disrupted by obstructing objects and the signal strength fluctuates intricately within a narrow range.

B-5 Distortion on AM or on both AM and FM.**B-6 Distortion on FM only.**

B-7 Too few automatic select stations.

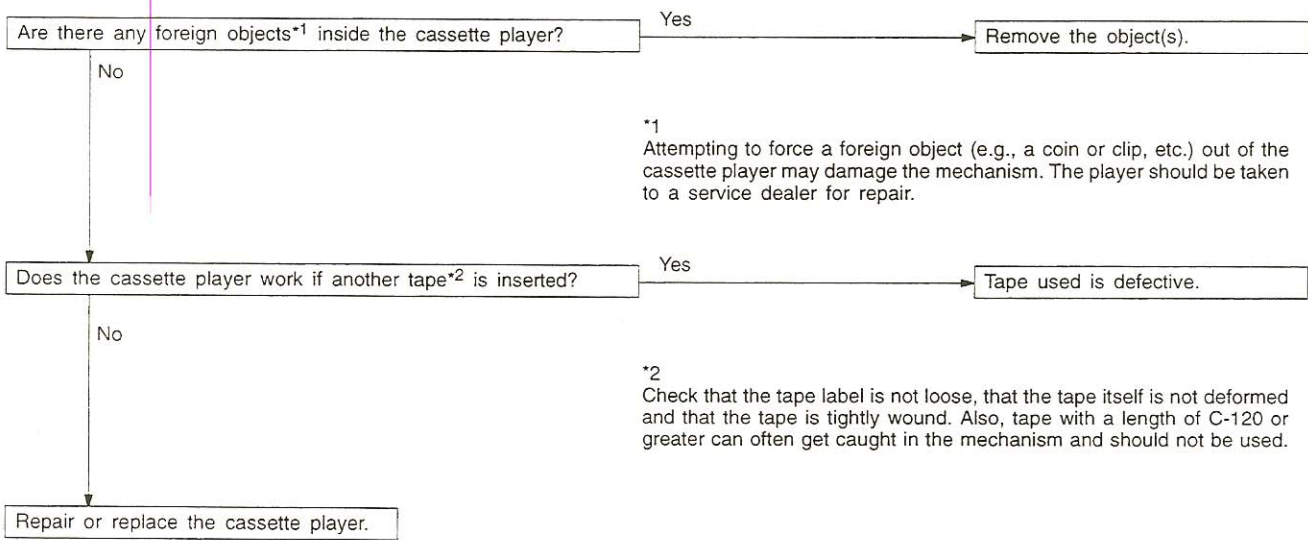


B-8 Insufficient memory (preset stations are erased).

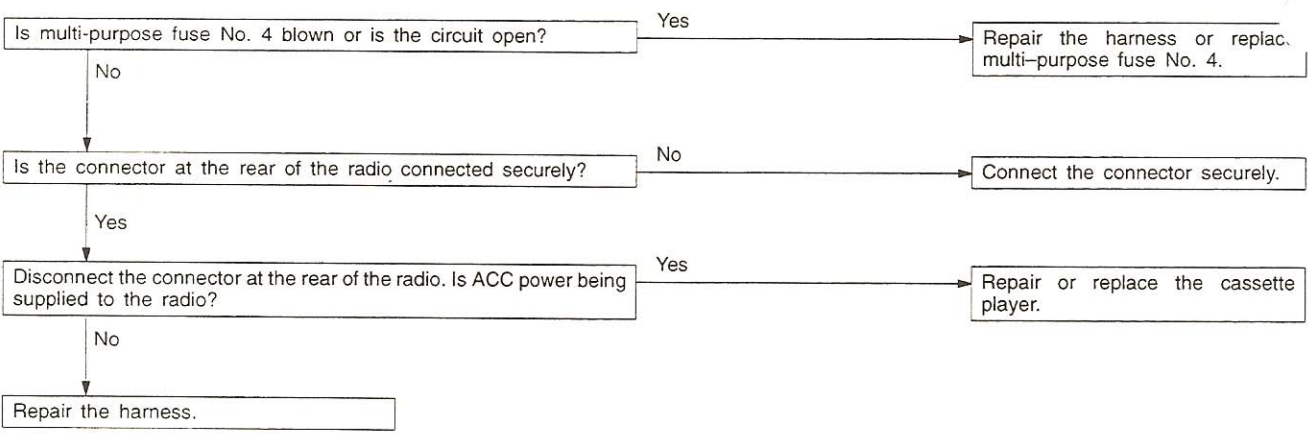


C. CASSETTE PLAYER

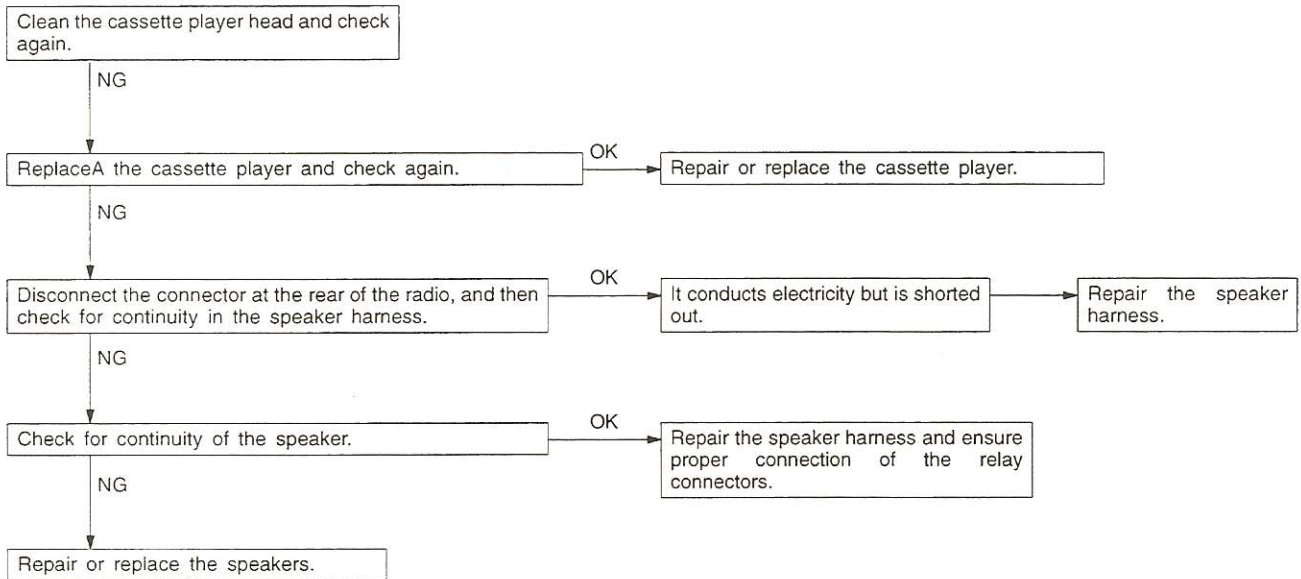
C-1 Cassette tape is not accepted.



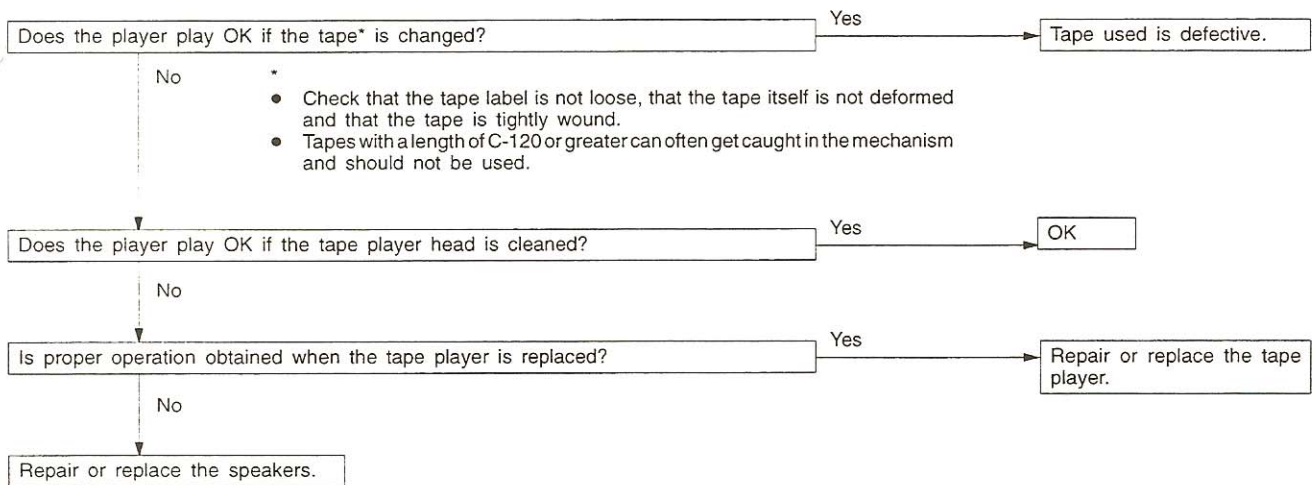
C-2 No sound (even after a tape has been inserted).



C-3 No sound from one speaker.



C-4 Sound quality is poor, or sound is weak.

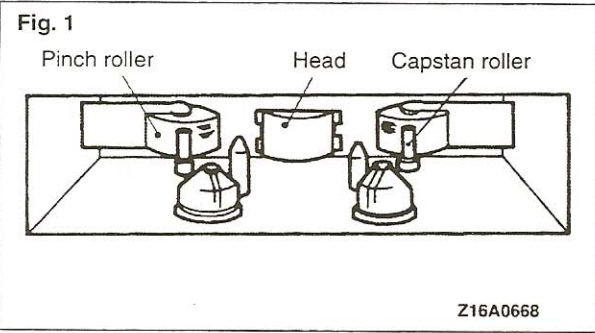
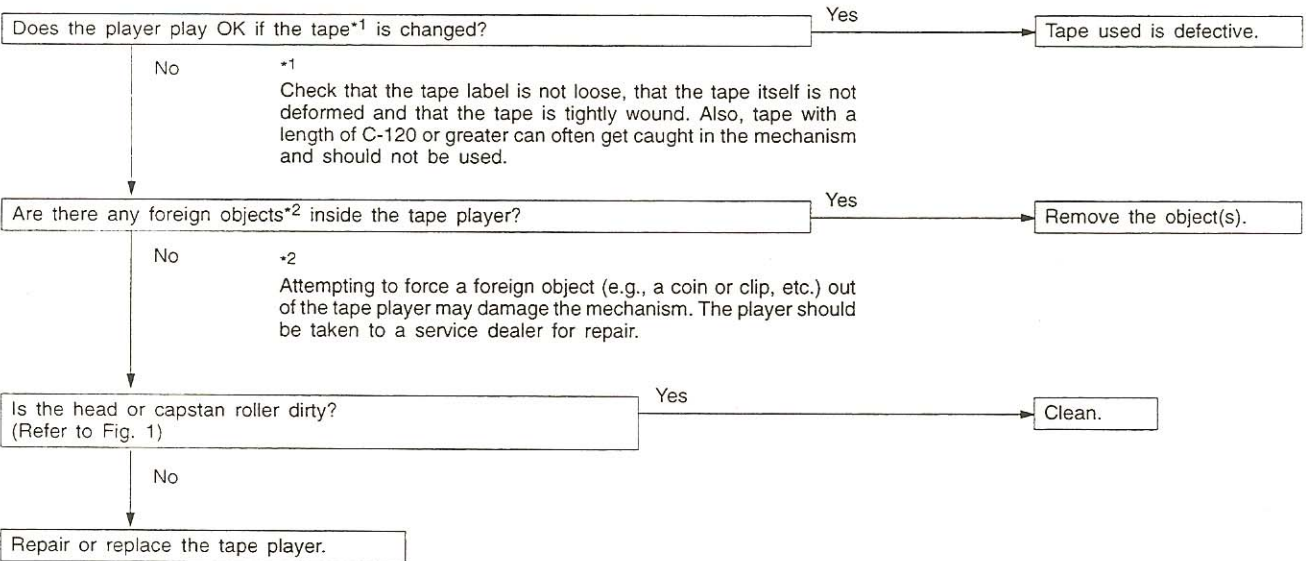


C-5 Cassette tape will not eject.

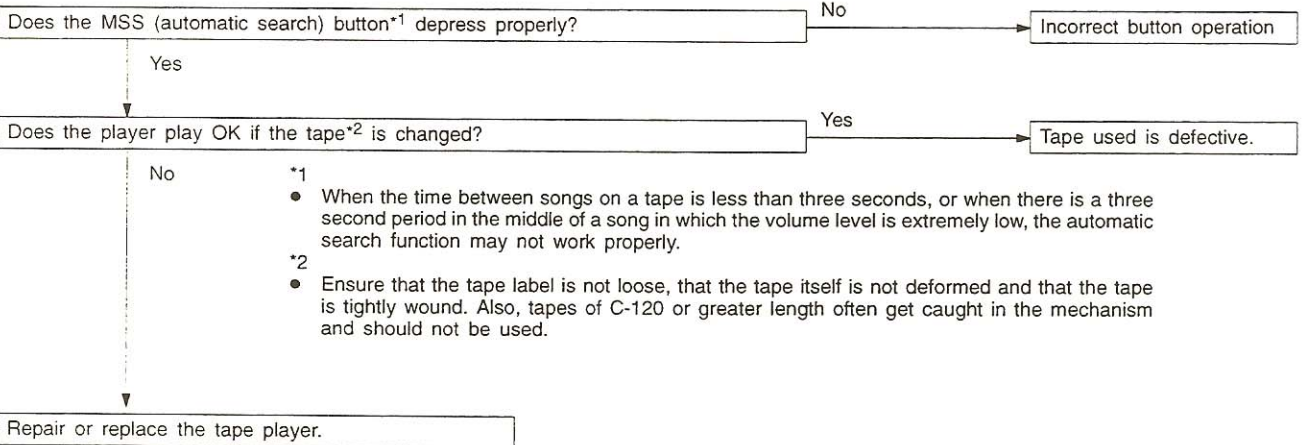
The problems covered here are all the result of the use of a bad tape (deformed or not properly tightened) or of a malfunction of the cassette player itself. Malfunctions involving the tape becoming caught in the mechanism and ruining the case are

also possible, and attempting to force the tape out of the player can cause damage to the mechanism. The player should be taken to a service dealer for repair.

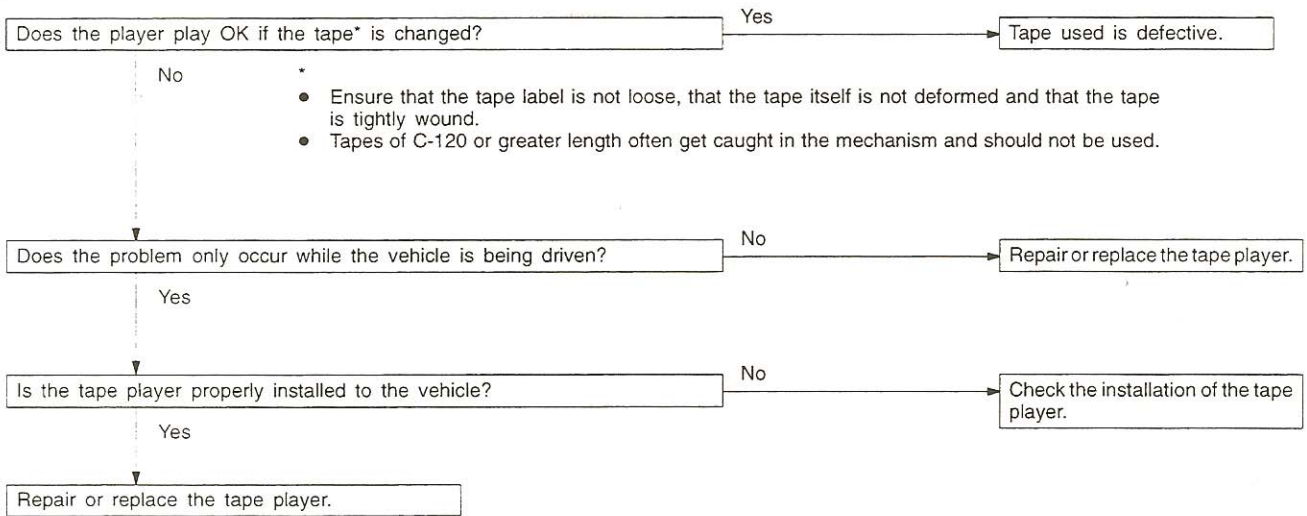
C-6 Uneven revolution. Tape speed is fast or slow.



C-7 Automatic search does not work.

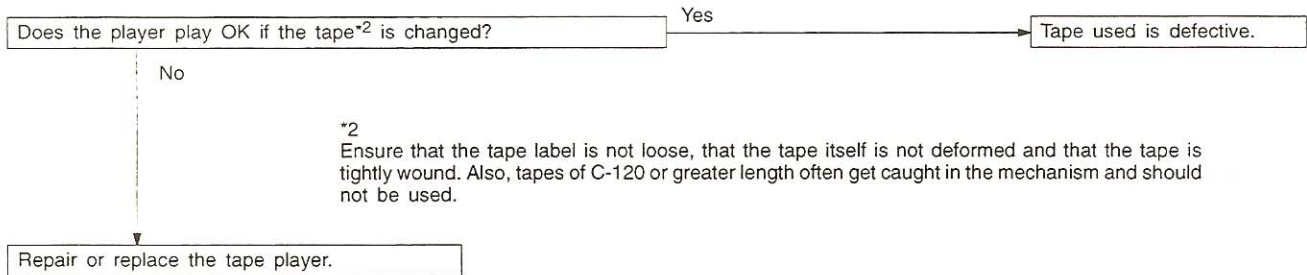


C-8 Malfunction of auto reverse

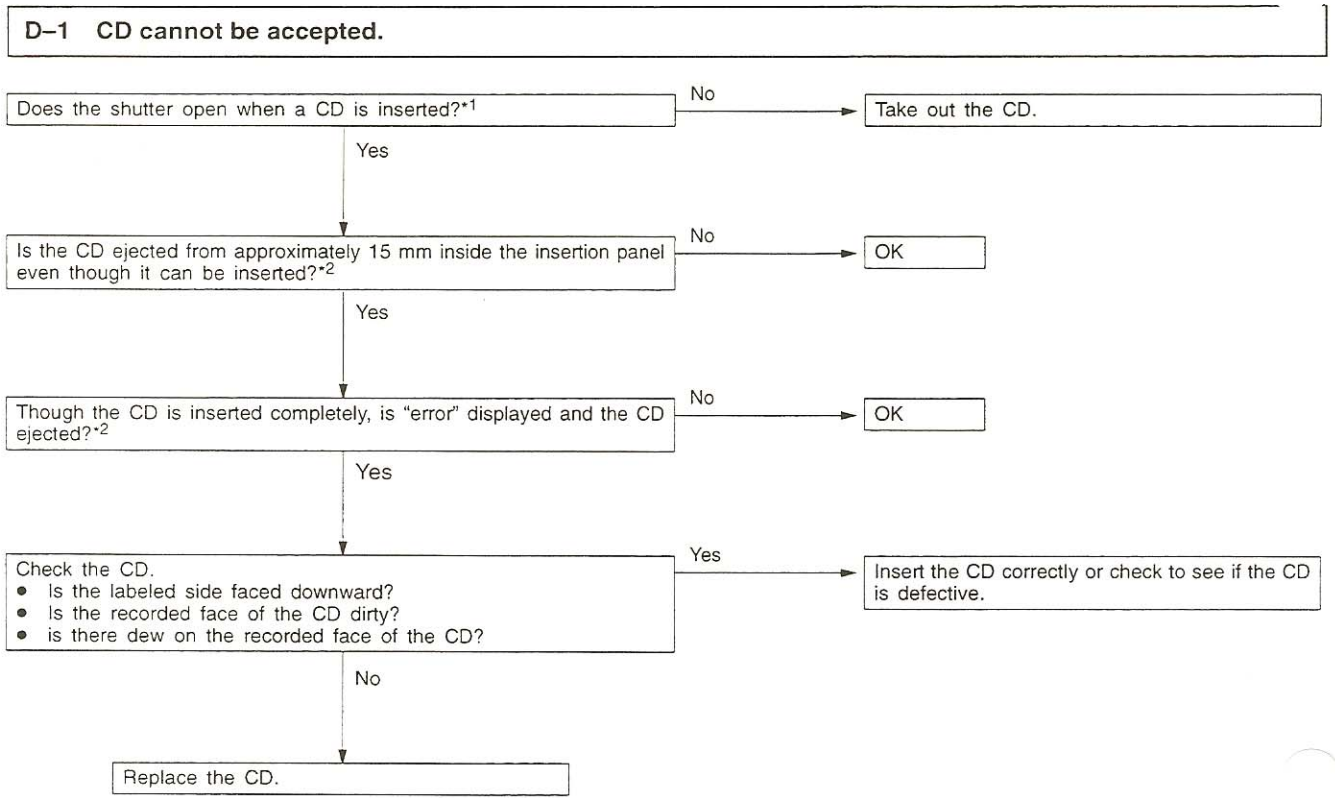


C-9 Tape gets caught in mechanism*1

*1
When the tape is caught in the mechanism, the case may not eject. When this occurs, do not try to force the tape out as this may damage the tape player mechanism. Take the cassette to a service dealer for repair.



D. CD PLAYER

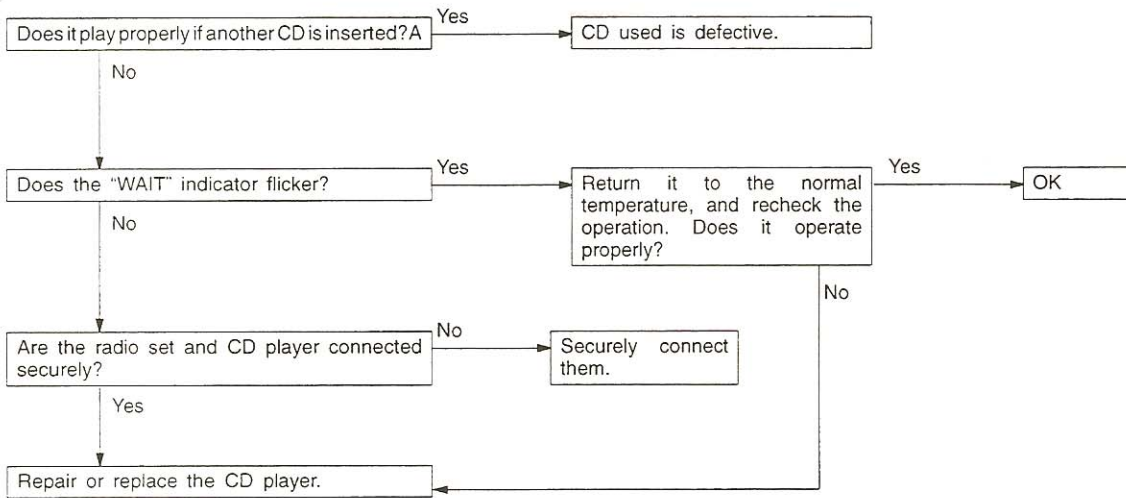


*1 If a CD is already loaded, does the shutter not open to allow insertion when another CD is inserted?

*2 If the key switch is not at ACC or ON, the CD stops at depth of 15 mm below the panel surface even when it is inserted, and it will be rejected when pushed farther?

*3 Even though the CD is loaded, E (error) is sometimes displayed with the CD rejected because of vibration/shock or dew on the CD face or optical lens.

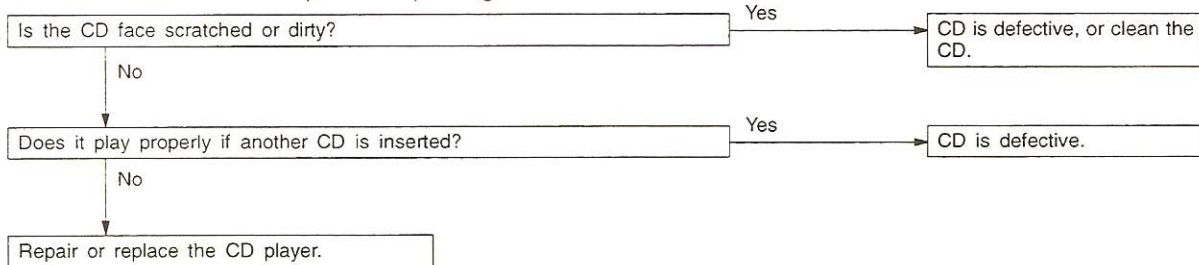
D-2 No sound.



(The combined radio cassette must operate properly.)

D-3 CD sound skips.

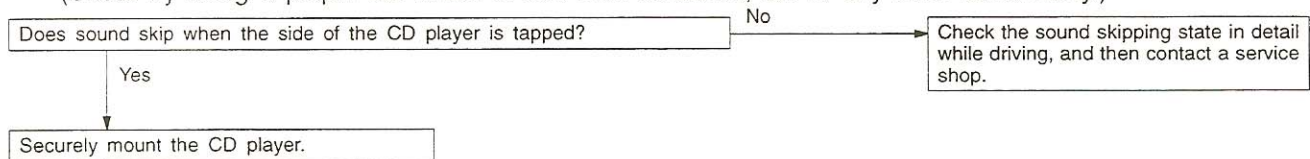
1. Sound sometimes skips while parking.

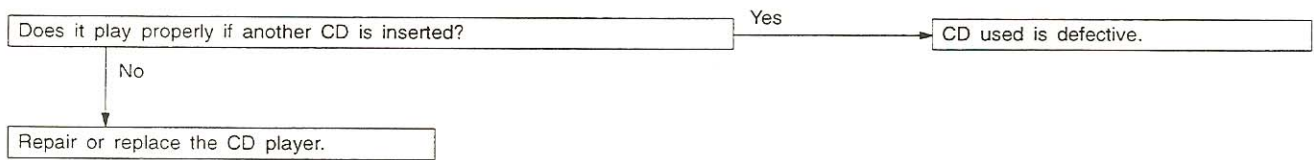
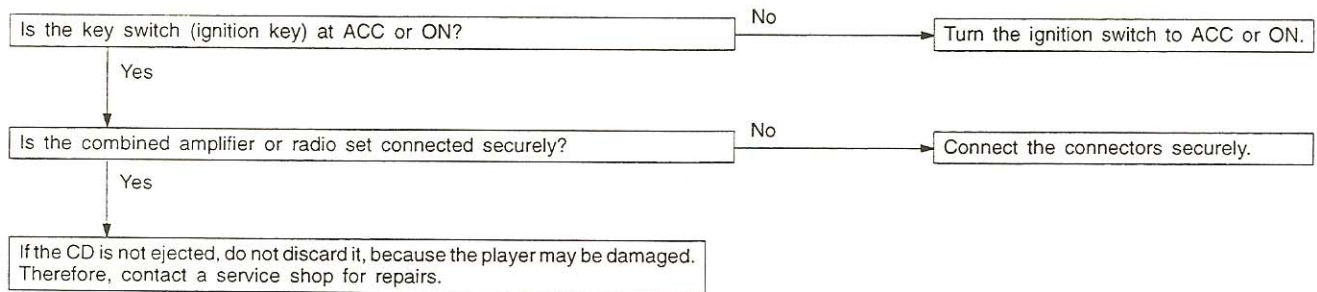
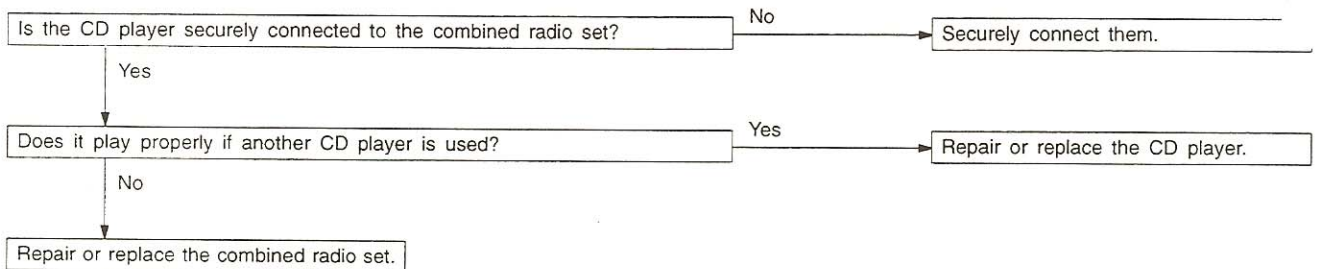


2. Sound sometimes skips while driving.

(Stop vehicle, and check it.)

(Check by using a proper CD which is free from scratches, dirt or any other abnormality.)

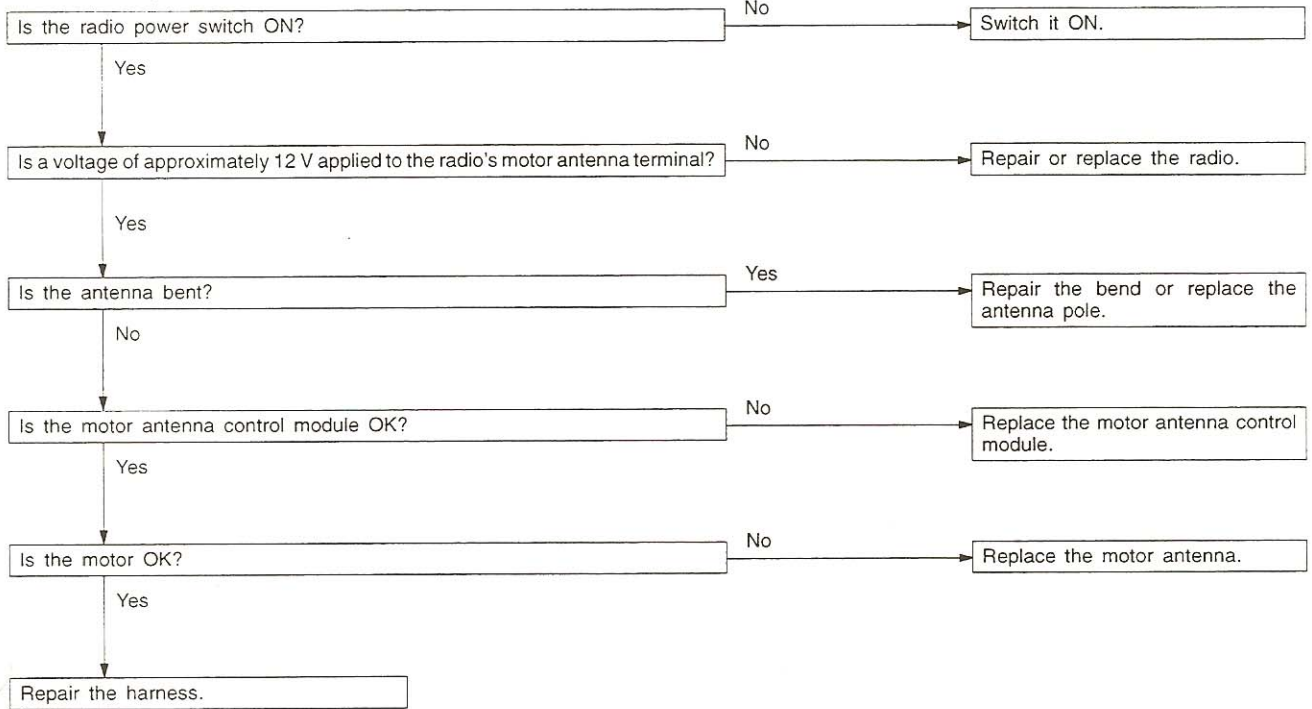


D-4 Sound quality is poor.**D-5 CD cannot be ejected.****D-6 No sound from one speaker.**

E. MOTOR ANTENNA

E-1 Motor antenna won't extend or retract.

Clean and polish the surface of the antenna pole.



E-2 Motor antenna extends and retracts but does not receive.

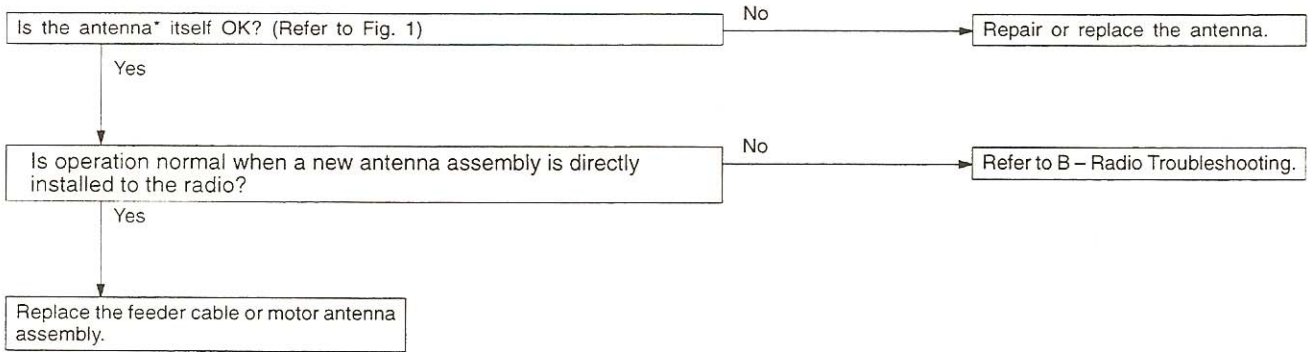
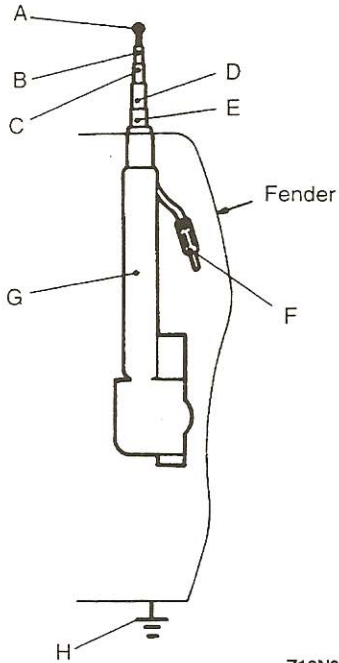


Fig.1



Z16N0087

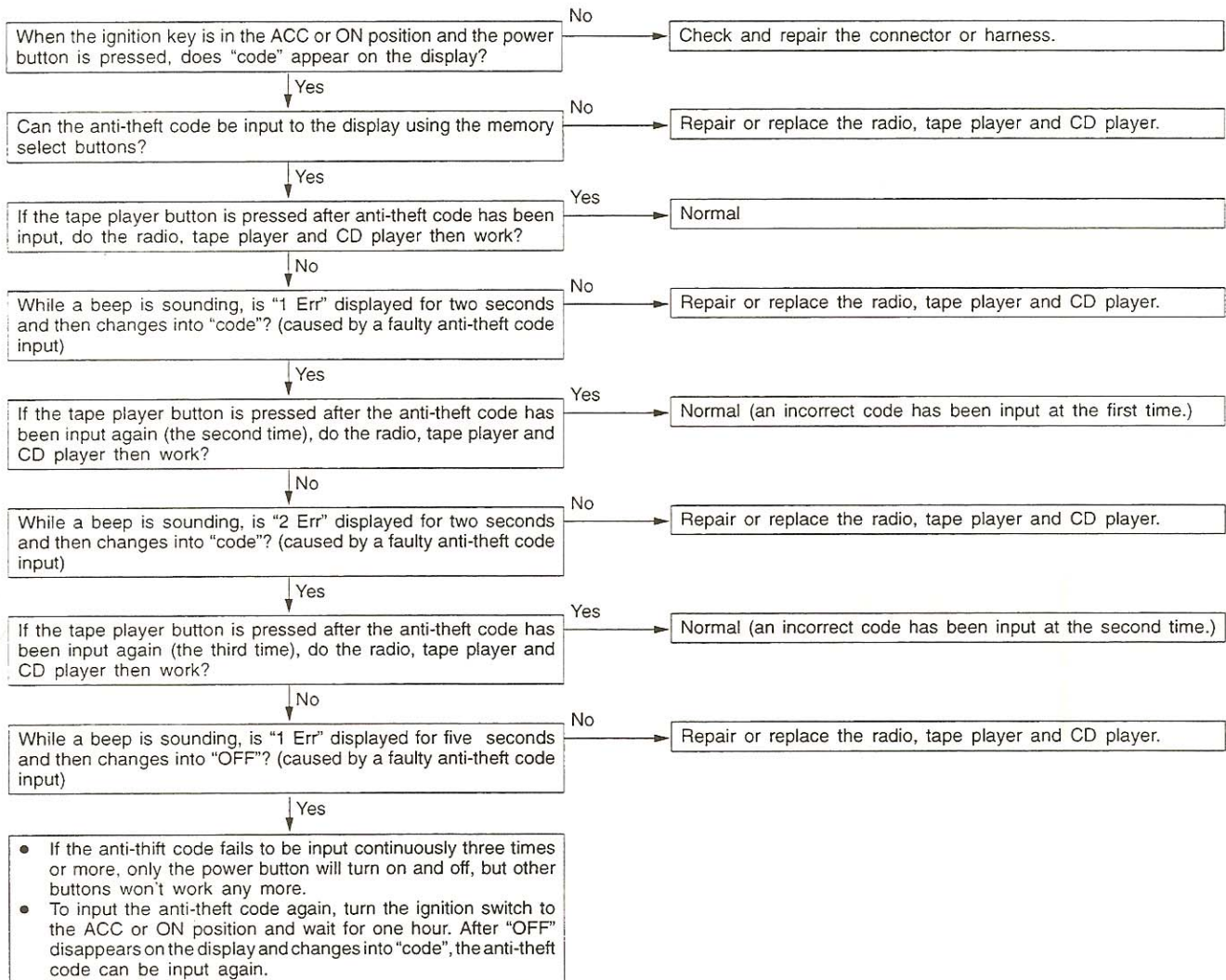
Checking the antenna*

Ohmmeter measurement locations	Result
Circuits from F to A, B, C, D and E	Continuity
Circuit between G and H	Continuity
Circuits from H to A, B, C, D and E	No continuity

ANTI-THEFT SYSTEM

After the power supply to the radio and tape player has been interrupted for one hour or more, the anti-theft system will prevent the radio, tape player

and CD player from working, even if the power supply is restored. Problems with the anti-theft system can be found using the flow chart below.



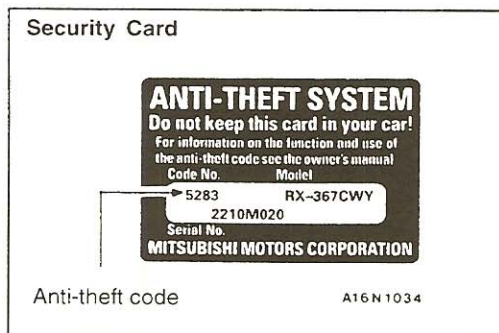
PROCEDURE FOR INPUT OF ANTI-THEFT CODE FOR ANTI-THEFT SYSTEM

54400

The radio, tape player and CD player do not work under the following conditions.

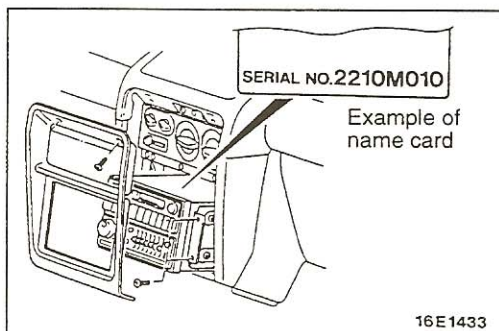
- (1) Power supply to the radio, tape player and CD player has been suspended for more than one hour continuously by removing the cable from the battery terminal or disconnecting the harness connectors.
- (2) The power supply to the radio, tape player and CD player has been suspended for more than one hour owing to blown fuse or discharged battery.
- (3) The radio, tape player and CD player has been replaced.

If the radio, tape player and CD player do not work for these conditions, enter the anti-theft code as follows.



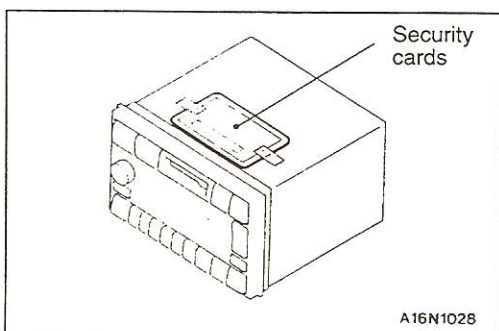
1. Confirm the anti-theft code, using any of the following methods.

- (1) Use the anti-theft code indicated on the cards retained by the user.



- (2) If the anti-theft code is unknown owing to the user's loss of the cards.

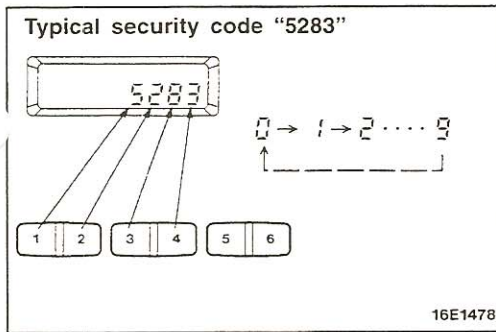
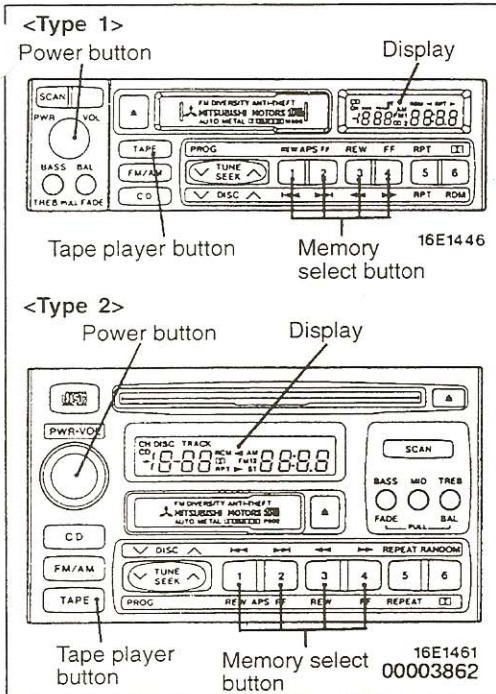
- 1) Remove the radio, tape player and CD player (Refer to P.54-78.)
- 2) Read the serial No. shown on the name card of the radio and tape player.
- 3) Look up the anti-theft code corresponding to the serial number in the serial number–anti-theft code table.



- (3) When the radio, tape player and CD player is replaced: Use the anti-theft code on the cards attached to the upper anti-theft of the replacement radio, tape player and CD player.

NOTE

Deliver the cards (two) to the user.



2. Connect the radio, tape player and CD player to the vehicle harness.
3. Turn the ignition key to the "ACC" position.
4. Press the Power button, and "code" will be displayed on the display.

5. Press No. 1 through No. 4 memory select buttons and set the 4-digit anti-theft code indicated on the card.

NOTE

Pressing the memory select button increases the number displayed.

6. Press the tape player button, and a beep will be heard. If entered correctly, the radio, tape player and CD player will work.
7. If the input anti-theft code does not agree with that in memory, a beep sounds for two seconds. "1 Err" is displayed at that time and changes into "code". Then repeat steps 5 and 6.

NOTE

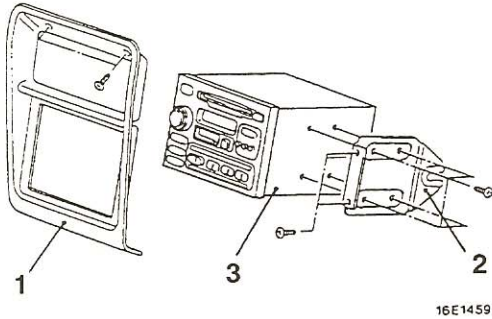
- (1) The anti-theft code can be set three times at the most.
- (2) The second error is displayed as "2 Err". If the third trial fails, a beep sounds for five seconds. "3 Err" is displayed at that time and changes into "OFF".
- (3) When setting is attempted three or more times, keeping the ignition key in the "ACC" or "ON" position for about one hour will automatically erase the "OFF" display. After the erasing, therefore, repeat step 3 and up.

RADIO WITH TAPE PLAYER AND CD PLAYER

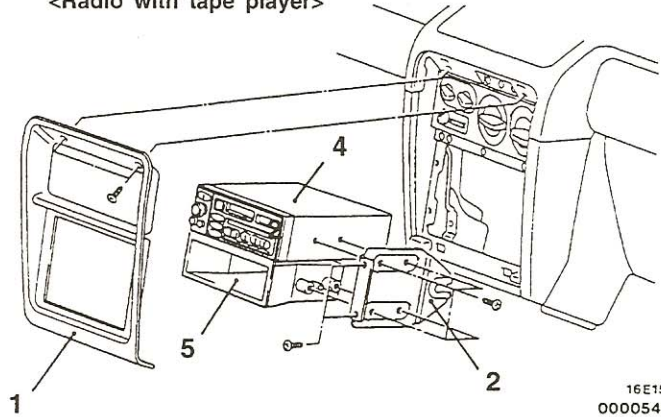
5440011

REMOVAL AND INSTALLATION

<Radio with tape player and CD player>



<Radio with tape player>



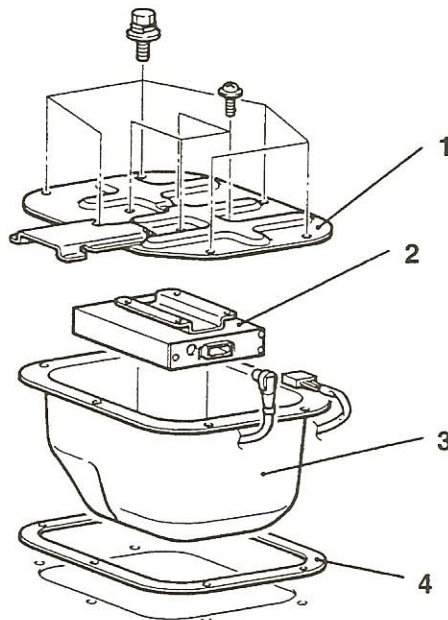
Removal steps

1. Audio panel
2. Bracket
3. Radio with tape player and CD player
4. Radio with tape player
5. Box

AMPLIFIRE

5440041

REMOVAL AND INSTALLATION



Removal steps

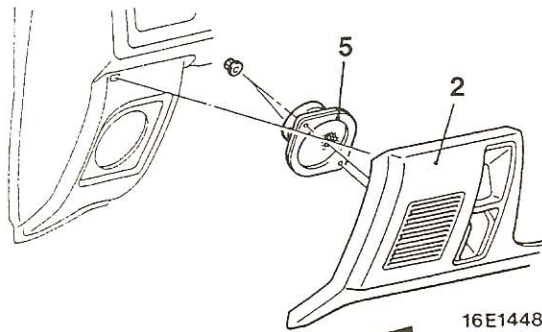
- | | |
|----------------------|----------|
| 1. Amplifier bracket | 3. Cover |
| 2. Amplifire | 4. Seal |

TSB Revision

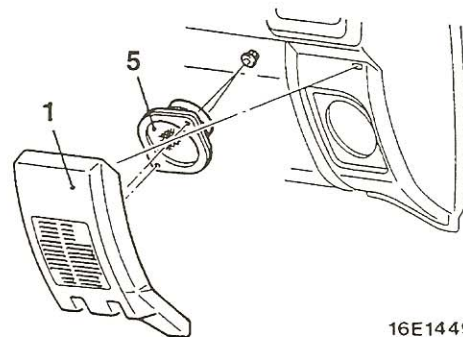
SPEAKER

REMOVAL AND INSTALLATION

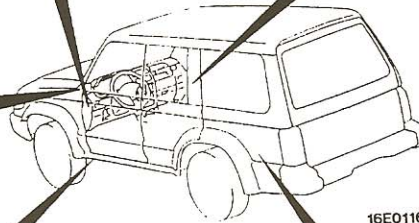
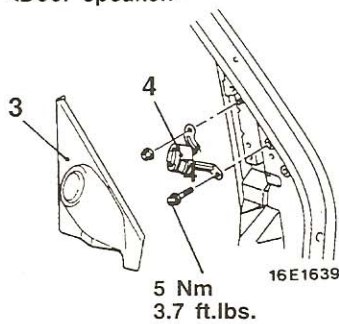
<Front speaker (LH)>



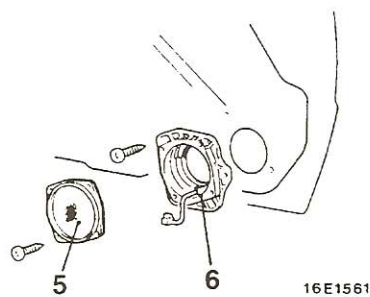
<Front speaker (RH)>



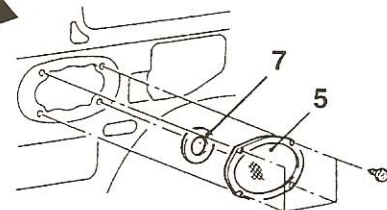
<Door speaker*>



16E0116



<Rear Speaker*>



16E1447
00007078

Front speaker removal steps

1. Instrument corner cover
<RH speaker>
2. Knee protector <LH speaker> (Refer to GROUP 52A – Instrument Panel.)
5. Speaker

Door speaker removal steps

3. Delta cover inner
4. Speaker (tweeter)
- Door trim (Refer to GROUP 42 – Door Trim and Waterproof Film.)
5. Speaker
6. Speaker cover

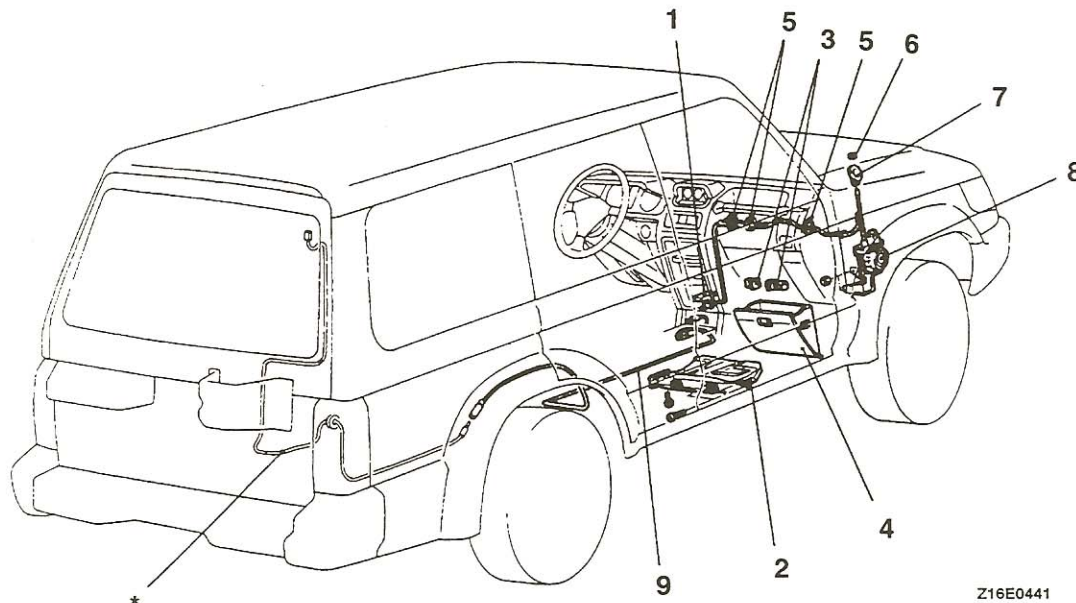
Rear speaker removal steps

- Quarter trim
(Refer to GROUP 52A – Trim.)
- 5. Speaker
- 7. Cushion

NOTE * indicates that the speakers are installed on the right side also.

ANTENNA AND ANTENNA FEEDER CABLE

544003F

**MOTOR ANTENNA AND ANTENNA FEEDER CABLE
REMOVAL AND INSTALLATION****Motor antenna and antenna feeder
cable removal steps**

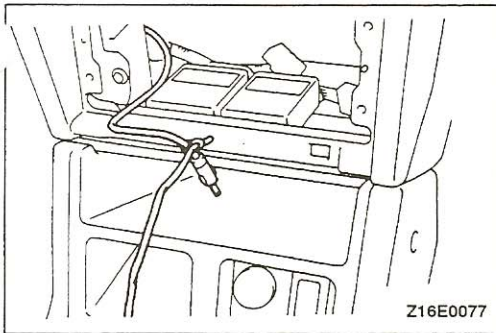
- Radio with tape player and CD player (Refer to P.54-78.)
- 2. Foot shower duct
- 3. Glove box stopper
- 4. Glove box assembly
- 5. Cable band or tape
- 6. Ring nut
- 7. Base
- 8. Motor antenna and antenna feeder cable

**Antenna feeder cable removal
steps**

- Radio with tape player and CD player. (Refer to P.54-78.)
- Front console assembly (Refer to GROUP 52A – Floor console.)
- Rear console assembly (Refer to GROUP 52A – Floor console.)
- Front seat <Passenger's side> (Refer to GROUP 52A – Front seat.)
- Rear seat (Refer to GROUP 52A – Rear seat.)
- Cowl side trim <R.H.> (Refer to GROUP 52A – Trim.)
- Center pillar trim <R.H.> (Refer to GROUP 52A – Trim.)
- Quarter trim lower <R.H.> (Refer to GROUP 52A – Trim.)
- 9. Antenna feeder cable

**Motor antenna control unit removal
steps**

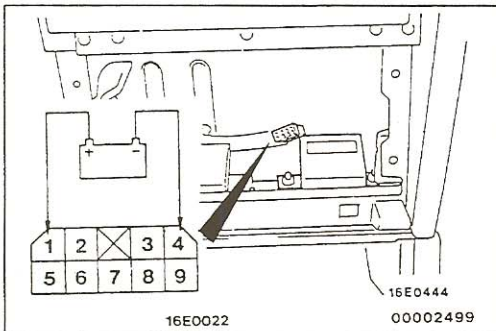
- Radio with tape player and CD player (Refer to P.54-78.)
- 1. Motor antenna control unit



REMOVAL SERVICE POINT

◀▶ MOTOR ANTENNA AND ANTENNA FEEDER CABLE REMOVAL

For ease of installation, tie a cord which is approximately 3 m (9.84 ft.) in length to the feeder cable. Pull out the feeder cable together with the motor antenna.

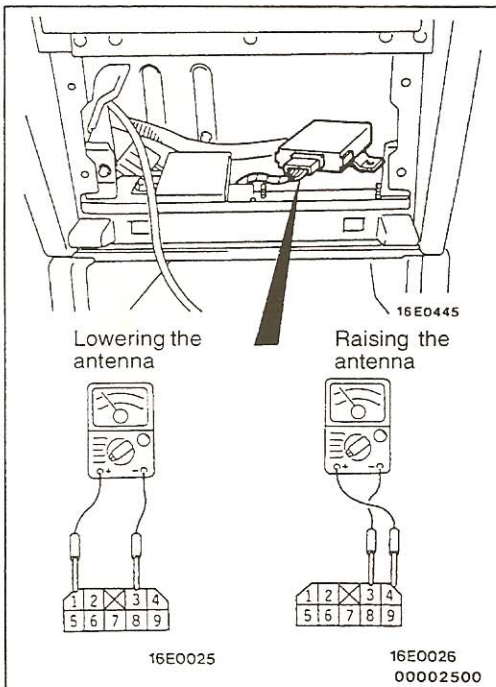


INSPECTION

54400360058

MOTOR ANTENNA CHECK

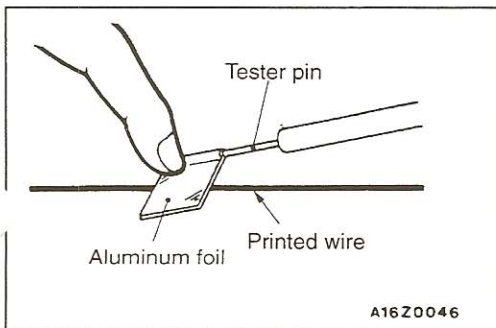
- (1) Remove the radio with tape player. (Refer to P.54-74.)
- (2) Disconnect the motor antenna control module connector and check that the antenna goes up when the positive battery terminal is connected to terminal (1) and the negative battery terminal is connected to terminal (4), and check that it goes down when the connections are reversed.



MOTOR ANTENNA CONTROL UNIT CHECK

- (1) Remove the radio with tape player. (Refer to P.54-78.)
- (2) Remove the motor antenna control unit mounting bolt.
- (3) With the ignition switch turned to ACC or ON, operate the radio switch and check the voltage between the terminals while the antenna is being raised and lowered.

Antenna operation direction	Measurement terminals	Voltage (V)
Lowering	1-3	10-13
Raising	4-3	10-13

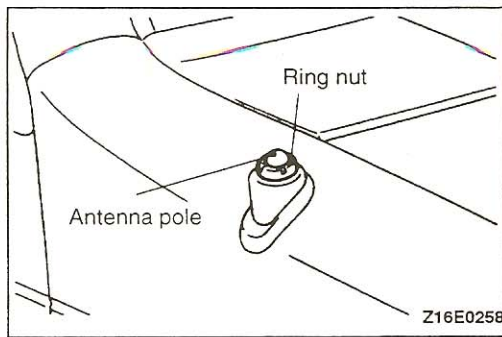


GLASS ANTENNA CONTINUITY CHECK

- (1) Wrap the end of the tester pin with aluminum foil as shown in the illustration.
- (2) While pressing the aluminum foil with your finger, run it along the printed wire and check the continuity.

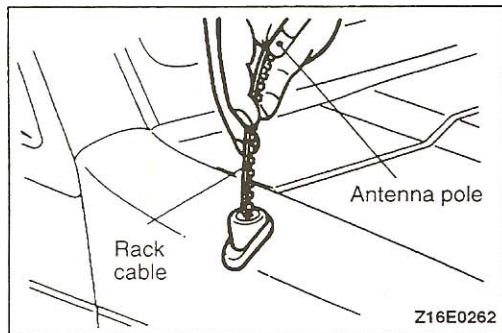
Caution

Be careful not to damage the printed wire of the antenna.

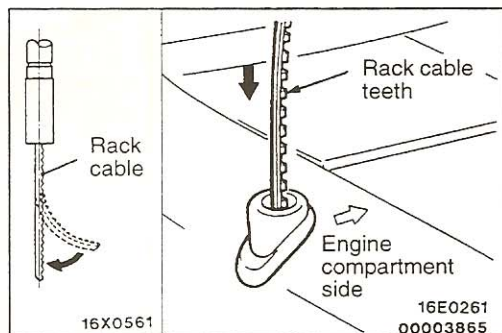
**ANTENNA POLE REPLACEMENT**

54400090049

- (1) Remove the ring nut.



- (2) After turning the ignition switch to ACC or ON, turn the radio switch on to raise the antenna pole, and then remove the antenna pole together with the rack cable.

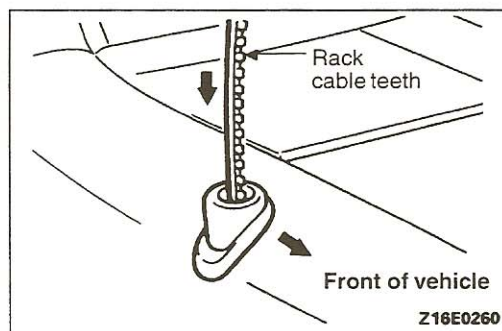


- (3) Draw out the antenna pole to the maximum extension.

NOTE

If there is a bend in the motor end of the rack cable, remove the bend.

- (4) Insert the rack cable into the motor assembly with the rack cable teeth facing the engine compartment side.

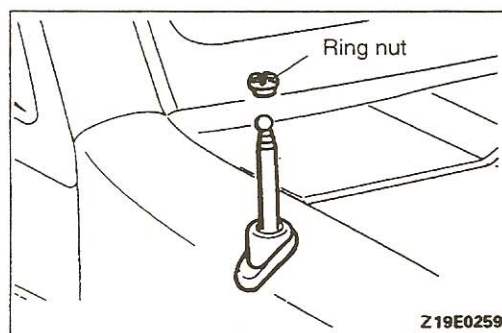


- (5) Turn the rack cable teeth towards the front of the vehicle (90° to right) so that the rack cable meshes with the motor gear.

- (6) If the rack cable pulls out with no resistance when it is lightly pulled, then the cable is not meshed with the motor gear, so check that there are no bends in the end of the rack cable, and then repeat steps (3) and (4) above.

- (7) Set the antenna pole vertically and turn off the radio switch to wind up the rack cable. Insert the antenna into the motor antenna side to align it with the wound-up rack cable.

- (8) After tightening the ring nut, check the movement of the antenna by turning the radio switch on and off.



BACK DOOR WINDOW DEFOGGER

54300010066

GENERAL INFORMATION

OPERATION

- When the ignition switch is at the ON position and the defogger switch is set to the ON (automatic return switch) position, current flows from the defogger timer to the coil side of the defogger relay for a period of 9 to 11 minutes.
- When the defogger relay contact closes to turn the defogger relay on and the defogger has operated for 9 to 11 seconds, the indicator light of the defogger switch illuminates at the same time to inform the driver that the defogger is operating.

NOTE

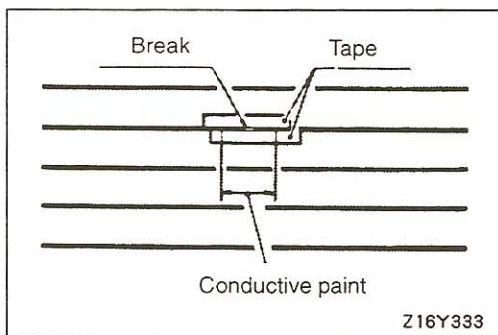
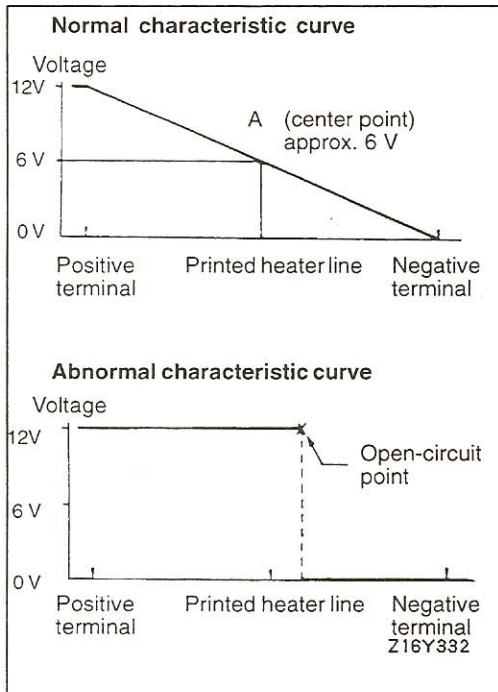
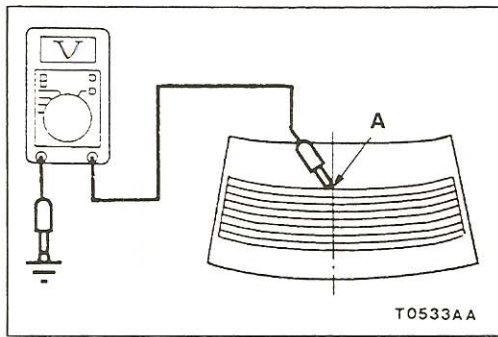
- After the defogger has operated for 9 to 11 minutes, it will automatically stop. Also, if the defogger switch is pressed again while the defogger is operating or if there is no generator current (terminal "L" drops to 3.5 V or below), the defogger will stop operating.
- When the lighting switch is set to the TAIL or HEAD position, the tail light relay contact closes to turn the tail light relay on, and the defogger switch illumination light will illuminate.

TROUBLESHOOTING

54300070569

TROUBLESHOOTING HINTS

1. The defogger does not operate.
 - (1) The indicator light illuminates.
 - Check the ground circuit.
 - (2) The indicator light also does not illuminate.
 - Check fusible link No. 9.
 - Check the defogger relay.
(Refer to P.54-85.)
 - Check the defogger switch.
(Refer to P.54-85.)
 - Check the defogger timer.
(Refer to P.54-86.)
2. The defogger switch illumination light does not illuminate or does not dim.
 - (1) The tail lights illuminate.
 - Check the defogger switch.
(Refer to P.54-85.)
 - Check the rheostat.
(Refer to P.54-42.)
 - (2) The tail lights also do not illuminate.
 - Check dedicated fuse No. 5.
 - Check the defogger relay.
(Refer to P.54-85.)
 - Check the lighting switch.
(Refer to P.54-43.)



ON-VEHICLE SERVICE

54300180000

PRINTED-HEATER LINE CHECK

- (1) Run engine at 2000 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 center A. Condition is good if it indicates approximately 6V.
- (3) If 12 V is indicated at A, there is a break to the negative terminal side. Move test bar slowly to negative terminal to detect where voltage suddenly changes to 0 V.
- (4) If 0 V is indicated at A, there is a break to the positive terminal side. Detect where the voltage changes suddenly (12 V) in the same method described above.

PRINTED-HEATER LINE REPAIR

54300190029

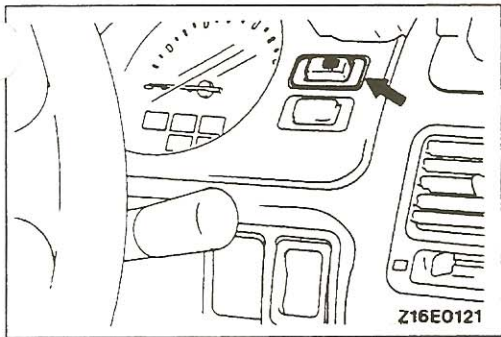
REQUIRED MATERIALS

- Thinner
- Lead-free gasoline
- Tape
- Fine brush
- Conductive paint

- (1) Clean the disconnected area with lead-free gasoline. Apply tape along both sides of the heater element.
- (2) Mix conductive paint thoroughly. Thin the required amount of paint in a separate container with a small amount of thinner and paint over the break three times at 15-minute intervals.
- (3) Remove the tape and leave it for a while before use (circuit complete).
- (4) When completely dry (after 24 hours), finish the exterior with a knife.

Caution

Clean the glass along the defogger heater element with a soft cloth (dry or damp).

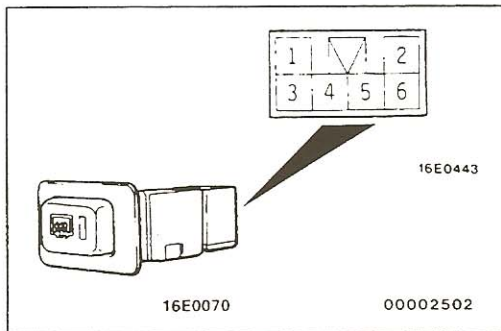


DEFOGGER SWITCH

54300670035

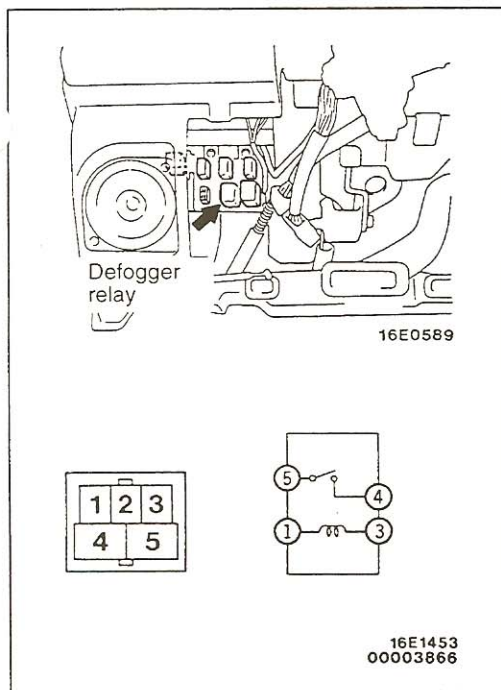
INSPECTION

- (1) Remove the rear window defogger switch from the meter bezel.



- (2) Operate the switch and check for continuity between the terminals.

Switch position	Terminal					
	1	3	4	5	2	6
OFF	ILL 		IND 			
ON						



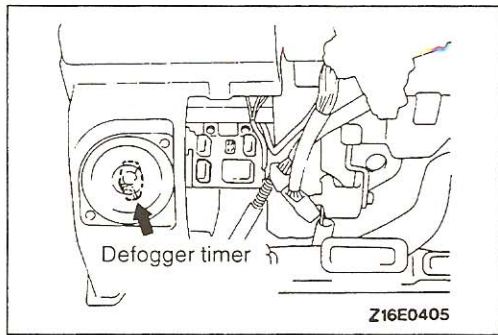
DEFOGGER RELAY

54300680182

INSPECTION

- (1) Remove the instrument under cover. (Refer to GROUP 52A – Instrument Panel.)
- (2) Remove the defogger relay from the relay bracket.
- (3) Apply battery positive voltage to terminal (1), and check for continuity between the terminals when terminal (3) is grounded.

Power is supplied	terminals (4)–(5)	Continuity
Power is not supplied	Terminals (4)–(5)	No continuity
	Terminals (1)–(3)	Continuity

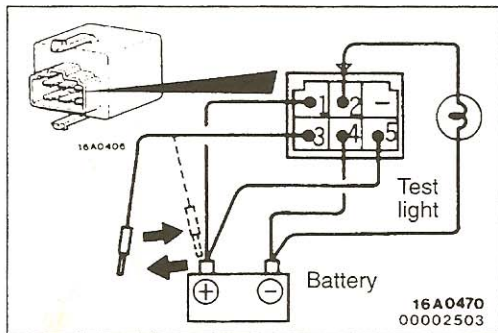


DEFOGGER TIMER

5430085

INSPECTION

- (1) Remove the instrument under cover. (Refer to GROUP 52A – Instrument Panel.)
- (2) Remove the defogger timer from the relay bracket.



- (3) Connect the battery and the test light to the timer as shown in the illustration.
- (4) Check that the test light illuminates for approximately eleven seconds when battery positive voltage is applied to terminal (3) for a few seconds.
- (5) Check that the test light switches off when battery positive voltage is again applied to terminal (3) during the test described above.

HEATER, AIR CONDITIONING AND VENTILATION

CONTENTS

5510900041

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

WARNING

- (1) Improper service or maintenance of any component of the SRS, or any SRS-related component, can lead to personal injury or death to service personnel (from inadvertent firing of the air bag) or to the driver (from rendering the SRS inoperative.)
- (2) Service or maintenance of any SRS component or SRS-related component must be performed only by an authorized MITSUBISHI dealer.
- (3) MITSUBISHI dealer personnel must thoroughly review this manual, and especially its GROUP 52B – Supplemental Restraint System (SRS) and GROUP 00 – Maintenance Service before beginning any service or maintenance of any component of the SRS or any SRS-related component.

NOTE

The SRS includes the following components: impact sensors, SRS diagnosis unit, SRS warning light, air bag module, clock spring and interconnecting wiring. Other SRS-related components that may have to be removed or installed in connection with SRS service or maintenance are indicated in the table of contents by an asterisk (*).

HEATER

5510002

GENERAL SPECIFICATIONS

Items	Specifications
Type	Three-way-flow full-air-mix system
Performance kJ/h (kcal/h,B.T.U./h)	16,744 (4,000, 15,873)

SERVICE SPECIFICATIONS

55100030018

Items	Standard value	
Resistance value of resistor (for blower motor assembly) Ω	Between terminals 2 – 4	1.96 ± 7%
	Between terminals 1 – 2	0.95 ± 7%
	Between terminals 2 – 3	0.33 ± 7%

TROUBLESHOOTING

55100070010

Symptom	Probable cause	Remedy
Improper heat	Obstructed floor outlets	Correct
	Changeover dampers improperly adjusted or binding	Correct
	Obstructed heater hoses	Replace
	Improperly adjusted control cables	Adjust
	Partially plugged heater core	Clean or replace
No ventilation even when mode selection lever is operated	Incorrect adjustment of changeover dampers	Adjust
	Incorrect installation mode selection control wire	Adjust
	Ducts are incorrectly incompletely connected, crushed, bent or clogged.	Repair or replace

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ON-VEHICLE SERVICE

55200880067

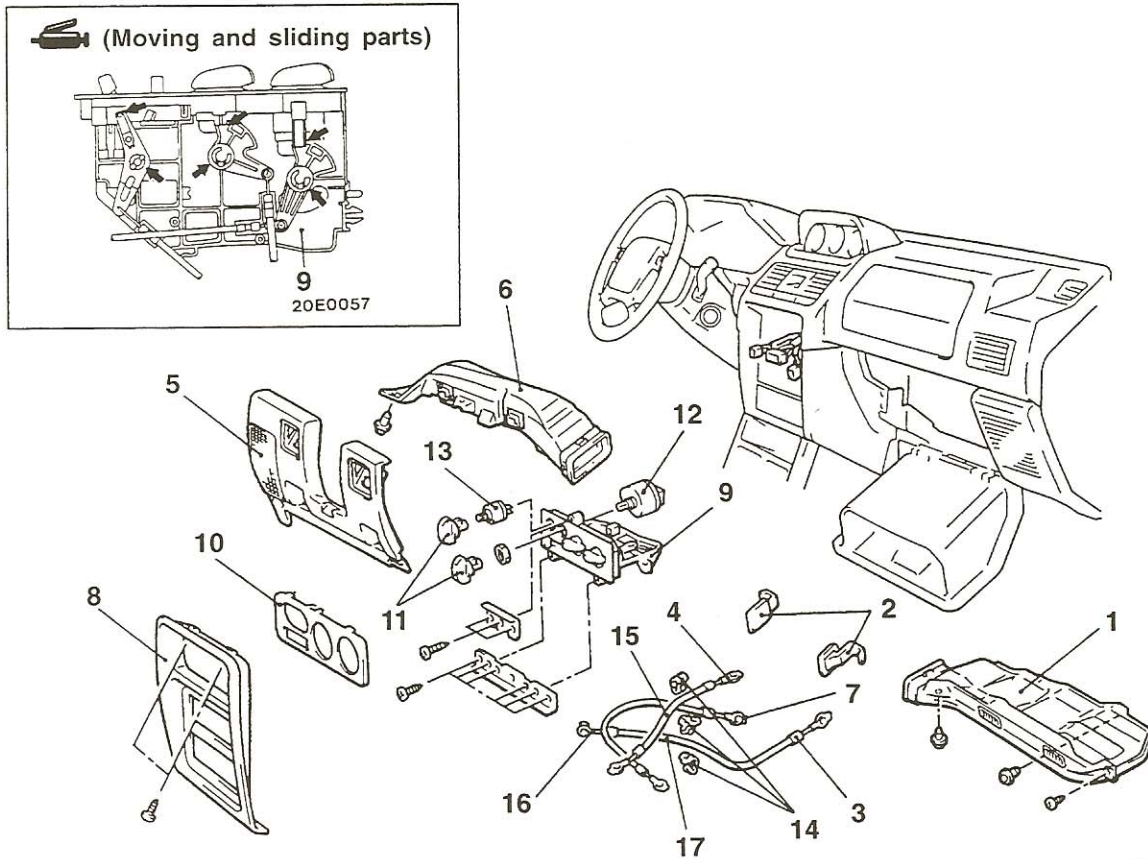
POWER RELAY CHECK

- (1) Remove the heater relay from the junction box.
- (2) Use an ohmmeter to check for continuity between the terminals.

HEATER CONTROL ASSEMBLY

55100110132

REMOVAL AND INSTALLATION



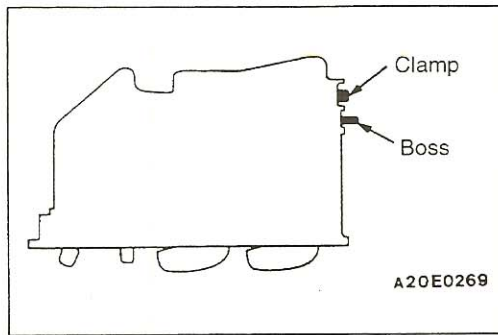
20E0264

00004102

Removal steps

- | | | | |
|-----|--|---------|---|
| | 1. Foot shower duct (RH) | | 8. Center panel |
| | 2. Stopper | ◀A▶ ▶A▶ | 9. Heater control assembly |
| ▶D▶ | 3. Air selection control wire connection | | 10. Bezel |
| ▶C▶ | 4. Temperature control wire connection | | 11. Knob |
| | 5. Knee protector (Refer to GROUP 52A – Instrument Panel.) | | 12. Blower switch |
| | 6. Foot shower duct (LH) | | 13. Air conditioning switch
<Vehicles with air conditioning> |
| ▶B▶ | 7. Mode selection control wire connection | ◀B▶ | 14. Wire clip |
| | | | 15. Temperature control wire |
| | | | 16. Mode selection control wire |
| | | | 17. Air selection control wire |

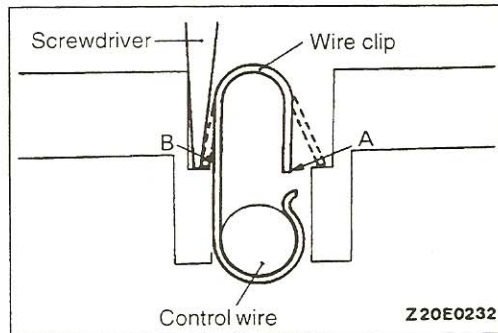
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**REMOVAL SERVICE POINTS****◀A▶ HEATER CONTROL ASSEMBLY REMOVAL**

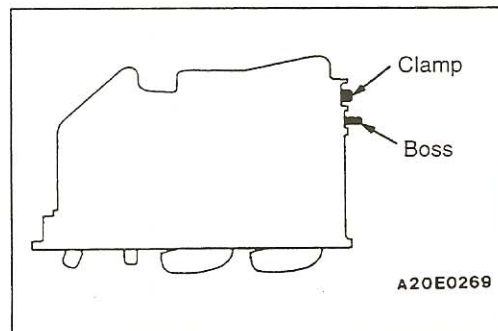
Snap the boss and clamp with knippers or a flat-tipped screwdriver, etc to remove the heater control assembly.

NOTE

The boss and clamp are needed for assembly line at the factory, but not needed for service work.

**◀B▶ WIRE CLIP REMOVAL**

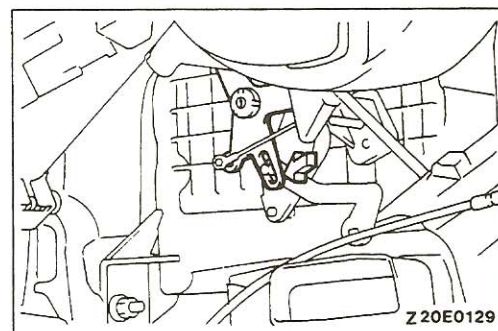
Remove the wire clip by inserting a screwdriver in the position shown in the illustration and pushing the wire clip in directions A and B.

**INSTALLATION SERVICE POINTS****▶A◀ HEATER CONTROL ASSEMBLY INSTALLATION**

Always snap the boss and clamp before installing a new heater control assembly to the instrument panel.

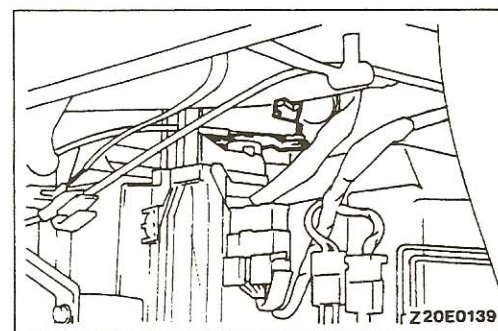
NOTE

The boss and clamp are needed for assembly line at the factory, but not needed for service work.

**▶B◀ MODE SELECTION CONTROL WIRE (HEATER UNIT SIDE) INSTALLATION**

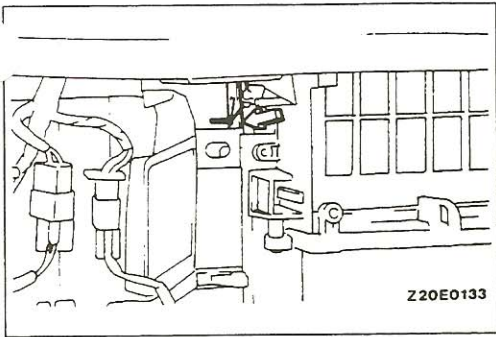
Connect the mode selection control wire to the mode selection damper lever by following the steps below.

- (1) Move the mode selection lever to the defroster position.
- (2) With the air selection damper lever pressed inward in the direction indicated by the arrow, connect the inner cable of the mode selection control wire to the end of the mode selection lever, and then use a clip to secure the outer cable.

**▶C◀ TEMPERATURE CONTROL WIRE (HEATER UNIT SIDE) INSTALLATION**

Connect the temperature control wire to the blend air damper lever by following the steps below.

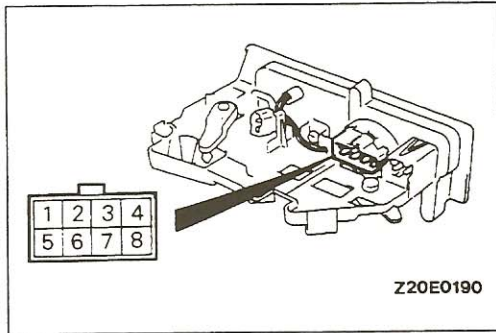
- (1) Move the temperature control lever to the far right position (HOT position).
- (2) With the blend air damper lever pressed completely downward in the direction indicated by the arrow, connect the inner cable of the temperature control wire to the end of the blend air damper lever, and then use a clip to secure the outer cable.



►D◄ AIR SELECTION CONTROL WIRE (BLOWER CASE SIDE) INSTALLATION

Connect the air selection control wire to the air selection damper lever by following the steps below.

- (1) Move the air selection control lever to the recirculation position.
- (2) With the air selection damper lever pressed inward in the direction indicated by the arrow, connect the inner cable of the air selection lever, and then use a clip to secure the outer cable.



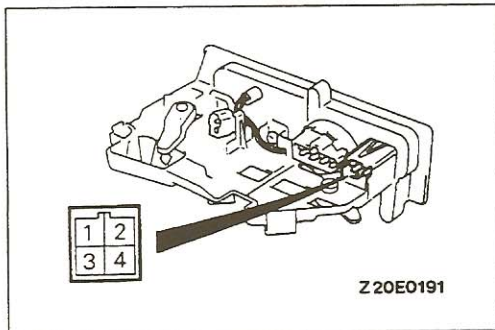
INSPECTION

55100120012

BLOWER SWITCH

Operate the switch and use an ohmmeter to check for continuity between the terminals.

Switch position	Terminal No.							
	5	3	6	2	7	8	1	4
(LO) ●	○—○						○—○	
(ML) ●	○—○		○				○—○	
(MH) ●	○—○			○			○—○	○—○
(HI) ●	○—○				○		○—○	○—○



AIR CONDITIONING SWITCH

<Vehicles with air conditioning>

Operate the switch and use an ohmmeter to check for continuity between the terminals.

Switch position	Terminal No.		
	1	3	4
ECONO	○—○	○—○	
A/C	○—○	○—○	○—○

HEATER UNIT

55100190225

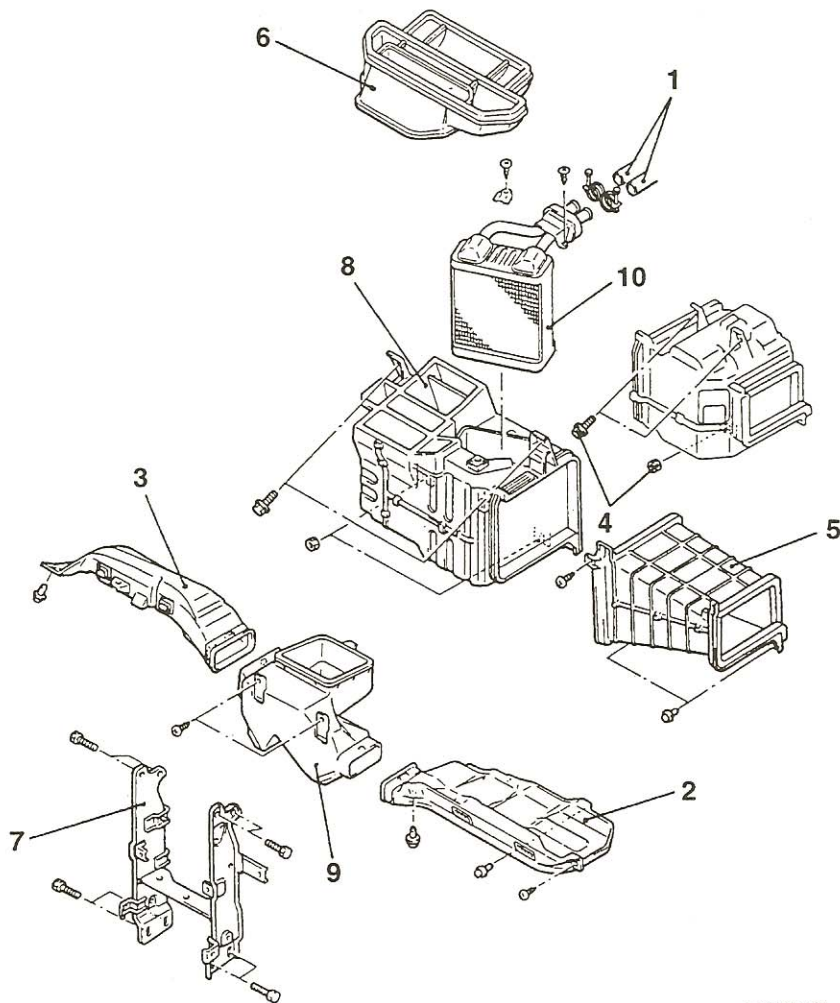
REMOVAL AND INSTALLATION

CAUTION: SRS

When installing or removing the instrument panel, don't allow any impact or shock to the SRS diagnosis unit.

Pre-removal and Post-installation Operation

- Coolant Draining and Supplying
- Instrument Panel Removal and Installation (Refer to GROUP 52A – Instrument Panel.)



A20E0263

Removal steps

1. Water hoses connection
2. Foot shower duct (RH)
3. Foot shower duct (LH)
4. Evaporator mounting bolt and nut
<Vehicles with A/C>
5. Joint duct <Vehicles without A/C>
6. Center duct assembly
7. Center reinforcement
8. Heater unit
9. Foot distribution duct
10. Heater core

INSPECTION

55100200013

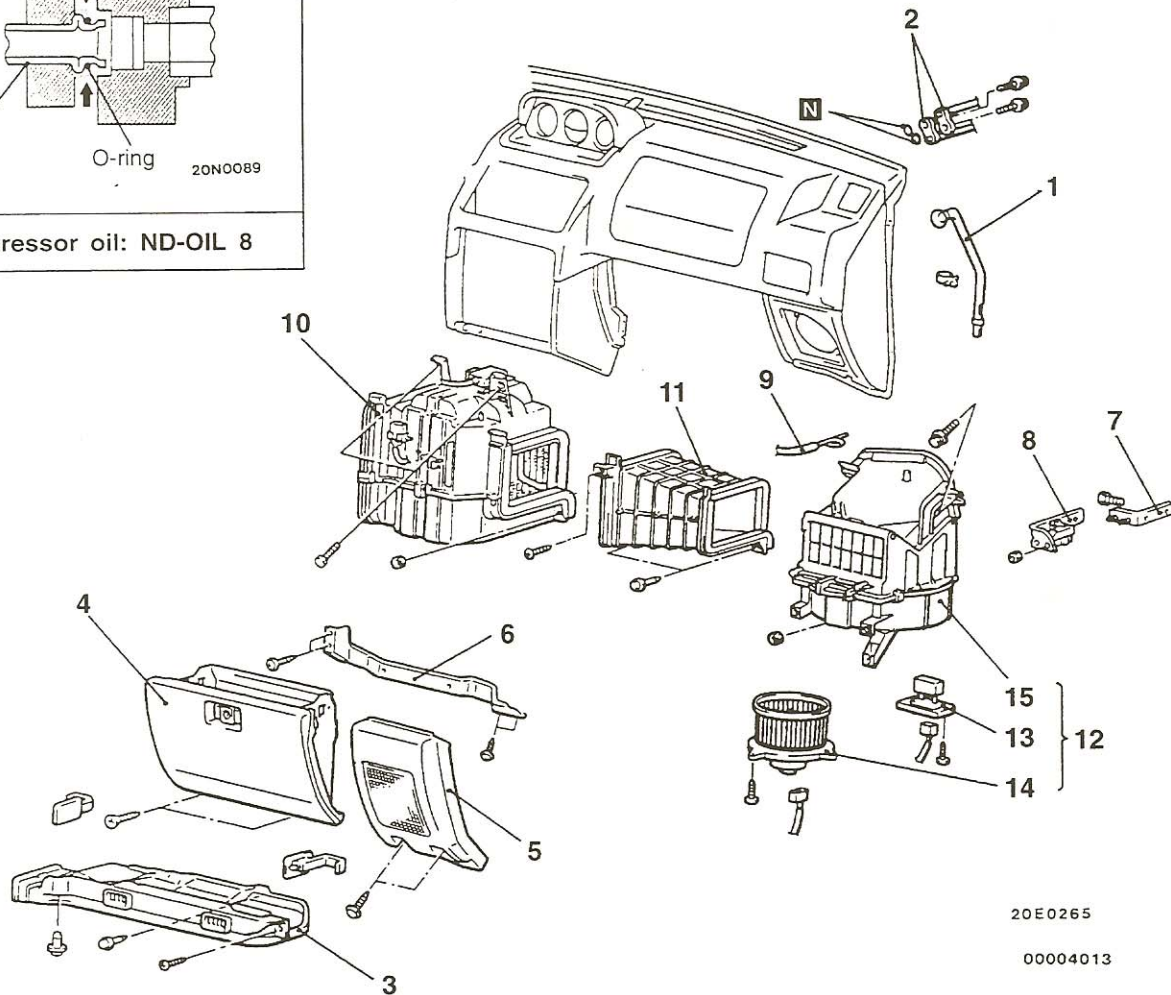
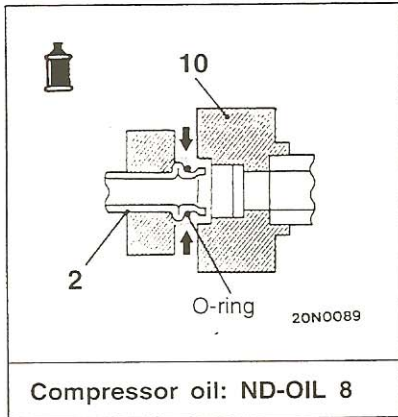
- Check the operation of dampers and link mechanism
- Check the heater core for clogging and water leak

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55100280239

BLOWER ASSEMBLY

REMOVAL AND INSTALLATION



20E0265

00004013

Removal steps

- Refrigerant Discharging and Charging (Refer to P.55-18.)
- 1. Drain hose <Vehicles with air conditioning>
- 2. Liquid pipe and suction hose connection <Vehicles with air conditioning>
- 3. Foot shower duct (R.H.)
- 4. Glove box
- 5. Corner cover
- 6. Lower frame
- 7. Engine control relay assembly
- 8. Bracket
- ▶▲◀ 9. Air selection control wire connection
- 10. Evaporator <Vehicles with air conditioning>

- 11. Duct joint <Vehicles without air conditioning>
- 12. Blower assembly
- 13. Resistor
- 14. Blower motor assembly
- 15. Blower case assembly

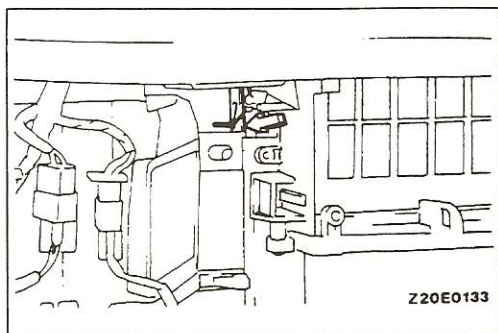
Blower motor assembly removal steps

- 3. Foot shower duct (R.H.)
- 14. Blower motor assembly

Resistor removal steps

- 3. Foot shower duct (R.H.)
- 13. Resistor

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INSTALLATION SERVICE POINT

▶◀ AIR SELECTION CONTROL WIRE INSTALLATION

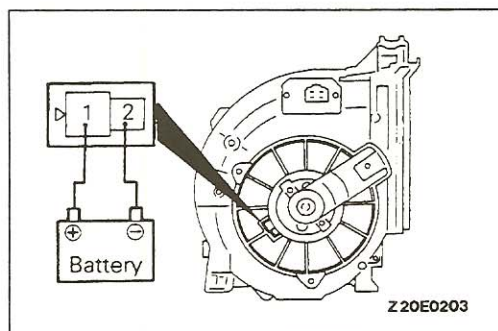
Connect the air selection control wire to the air selection damper lever by following the steps below.

- (1) Move the air selection control lever to the recirculation position.
- (2) With the air selection damper lever pressed inward in the direction indicated by the arrow, connect the inner cable of the air selection control wire to the end of the air selection lever, and then use a clip to secure the outer cable.

INSPECTION

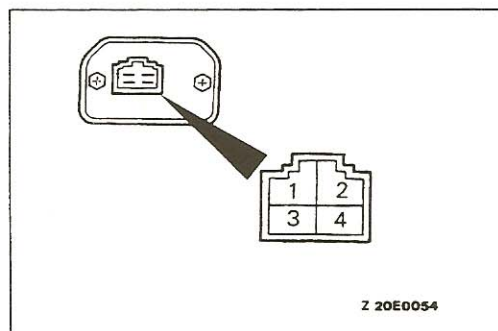
55100290041

- Check for bending or abnormal deflection of the rotating shaft of the blower motor assembly.
- Check for damage to the fan.
- Check for damage to the blower case.
- Check the operation of the inside/outside air selection damper, and check for damage.



BLOWER MOTOR ASSEMBLY

- (1) Connect the blower motor terminals directly to the battery and check that the blower motor operates smoothly.
- (2) Next, reverse the polarity and check that the blower motor operates smoothly in the reverse direction.



RESISTOR

Use an ohmmeter to measure the resistance between the terminals indicated below.

The condition can be considered satisfactory if the value measured at this time is equivalent to the standard value.

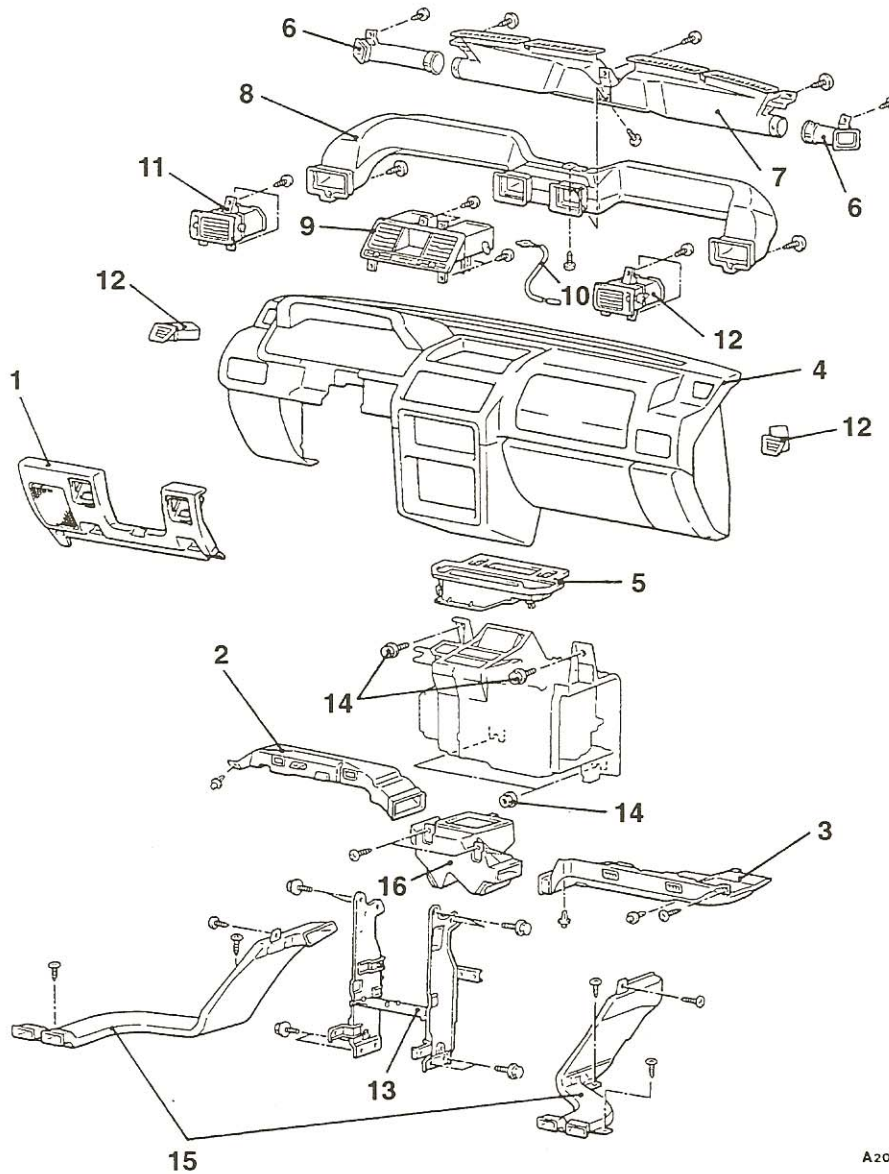
Standard value:

Measurement terminals	Standard value Ω
Between terminals (2)–(4)	Approx. $1.96 \pm 7\%$
Between terminals (1)–(2)	Approx. $0.95 \pm 7\%$
Between terminals (2)–(3)	Approx. $0.33 \pm 7\%$

VENTILATORS (INSTRUMENT PANEL AND FLOOR)

REMOVAL AND INSTALLATION

CAUTION: SRS
When installing or removing the instrument panel, don't allow any impact or shock to the SRS diagnosis unit.



A20E0268

Removal steps

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Knee protector (Refer to GROUP 52A – Instrument Panel.) 2. Foot shower duct (LH) 3. Foot shower duct (RH) 4. Instrument Panel (Refer to GROUP 52A – Instrument Panel.) 5. Center duct assembly 6. Side defroster duct | <ol style="list-style-type: none"> 7. Defroster nozzle 8. Distribution duct 9. Center outlet assembly 10. Ventilation control wire 11. Side outlet assembly 12. Side defroster grille 13. Center reinforcement 14. Heater unit mounting bolts and nuts 15. Rear heater duct 16. Foot distribution duct |
|---|--|



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REMOVAL SERVICE POINT**◀A▶ REAR HEATER DUCT REMOVAL**

Remove the front seat, front scuff plate and cowl side trim, and after taking out the floor carpet, remove the rear heater duct.

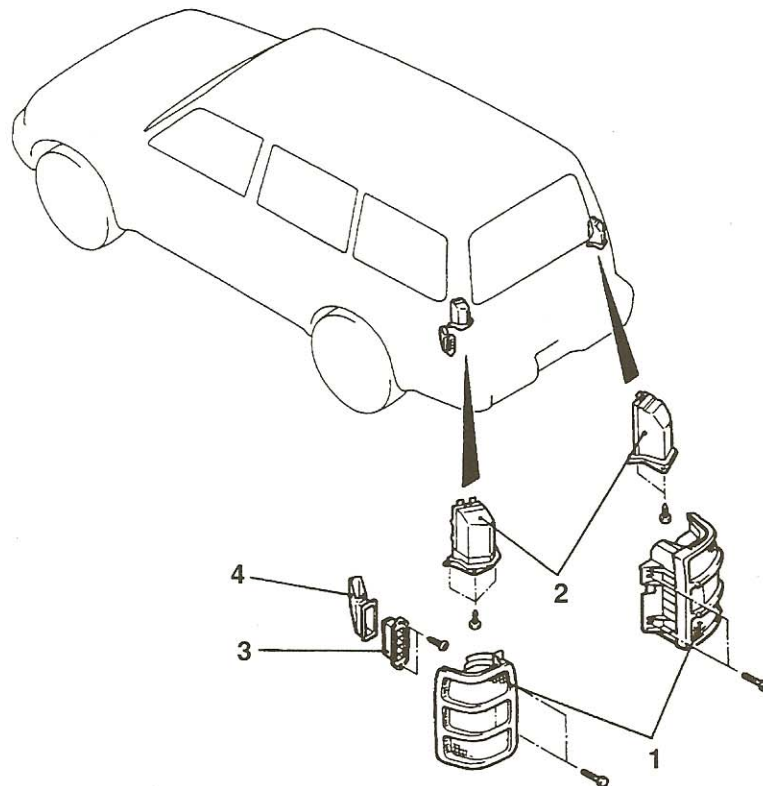
INSTALLATION SERVICE POINT**▶A◀ REAR HEATER DUCT INSTALLATION**

After installing the duct, replace the floor carpet and install the front seat, front scuff plate and cowl side trim.

VENTILATORS (AIR OUTLET)

REMOVAL AND INSTALLATION

55300250052



Z20E0113

Removal steps

1. Rear combination light
(Refer to GROUP 54 – Rear
Combination Light.)
2. Rear ventilator duct assembly
3. Air outlet garnish assembly
4. Air outlet duct

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AIR CONDITIONING

55200020049

GENERAL SPECIFICATIONS

Items		Specifications
Compressor	Model	10PA 15 Inclined-plate type
	No. of cylinders and displacement cm ³	10 cylinders: 155.3
	Compressor oil cm ³ (fl. oz.)	ND 8-OIL: 120 (4.1)
	High pressure relief valve kPa (psi)	Open: 3,432–4,138 (498–600) Close: 2,756 (400)
Protective equipment	Cycling clutch switch °C (°F)	OFF: 1.0 (22)
		ON: 4.5 (39)
Dual pressure switch	Low-pressure side kPa (psi)	OFF: 196±20 (28±3)
		ON: 193 – 240 (28 – 35)
	High-pressure side	OFF: 3,727 ±196 (540 ± 28)
		ON: 3,138±196 (455±28)
Freezer prevention	Air thermo sensor °C (°F)	OFF: 3 (37)
		ON: 4 (39)
	Refrigerant and quantity gr (oz.)	R-134a (HFC-134a): 600 – 650 (21 – 23)

SERVICE SPECIFICATIONS

55200030066

Items	Standard value
Idle speed r/min.	700±100
Idle-up speed r/min.	900±100
Clutch clearance mm (in.)	0.35–0.65 (.0138–.0256)

LUBRICANTS

55200040069

Items	Specified lubricants	Quantity cm ³ (fl. oz.)
Each connection of refrigerant line	ND-OIL 8	As required
Compressor refrigerant unit lubricant	ND-OIL 8	120 (4.1)

SEALANT

55200050017

Items	Specified sealant and adhesive
Air conditioning engine coolant temperature switch thread part	3M Nut Locking Part No. 4171 or equivalent

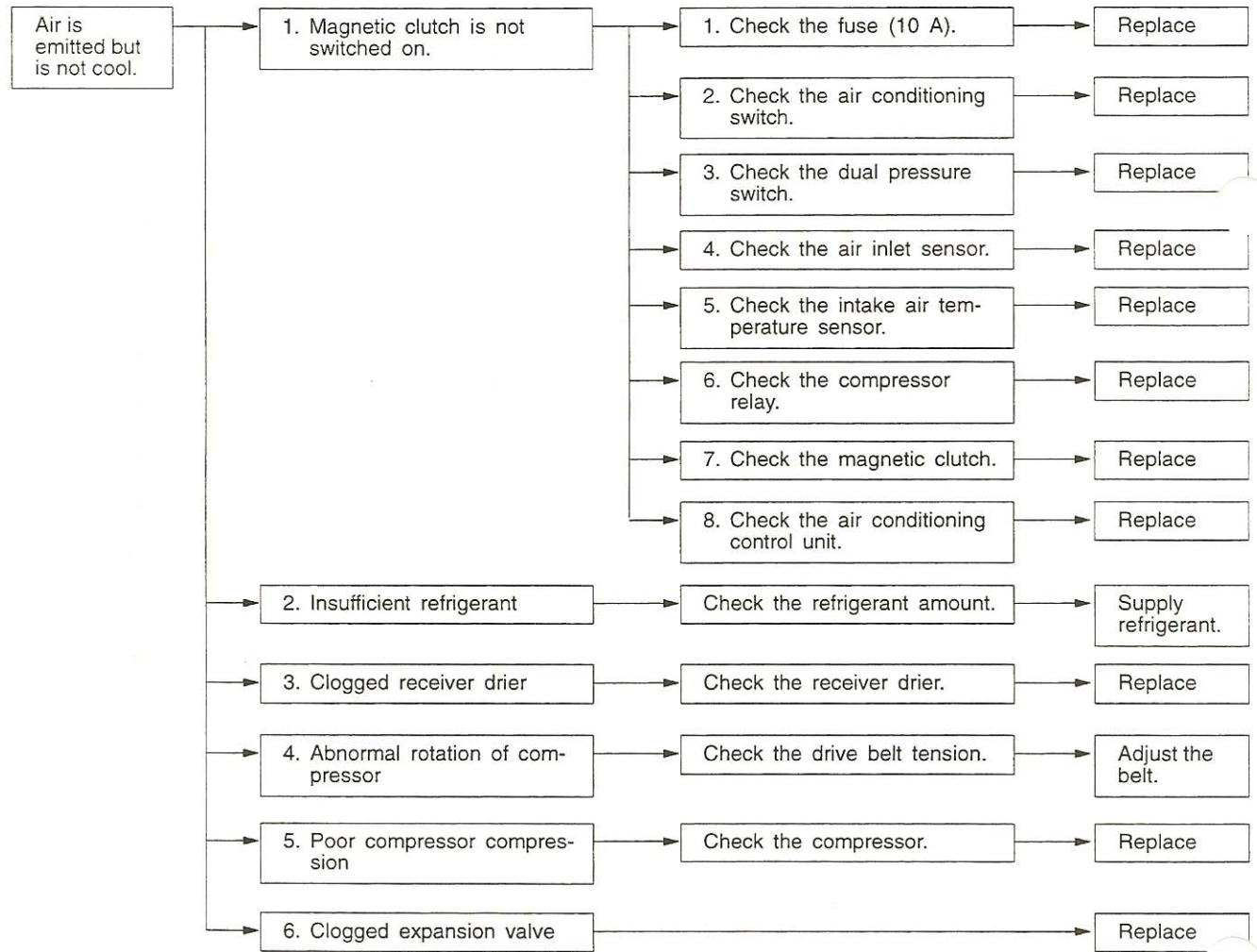
TROUBLESHOOTING

55200070068

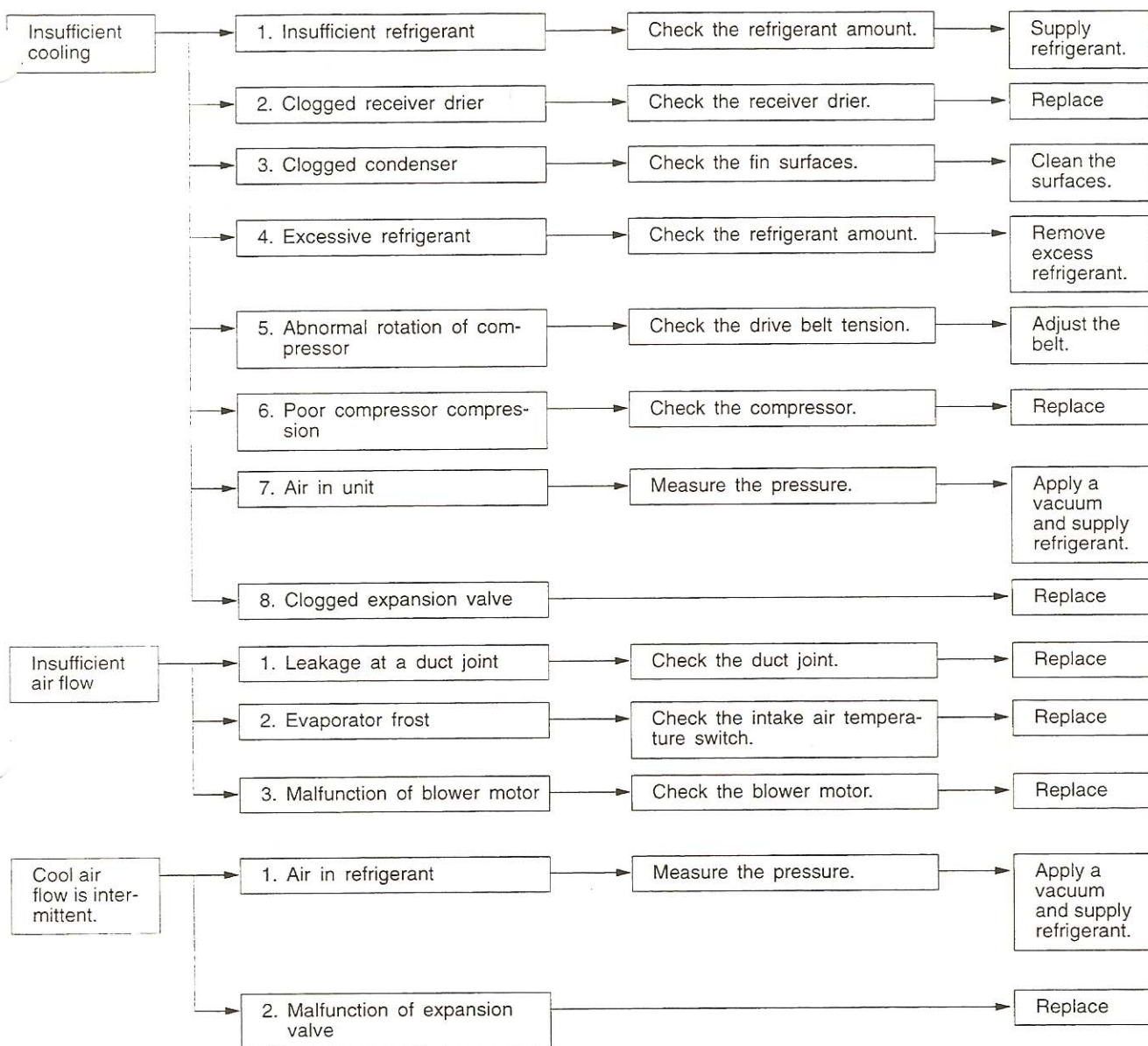
Before replacing or repairing air conditioning components, first determine if the malfunction is due to the refrigerant charge, air flow or compressor. The following diagnostic charts have been developed as a quick reference for determining

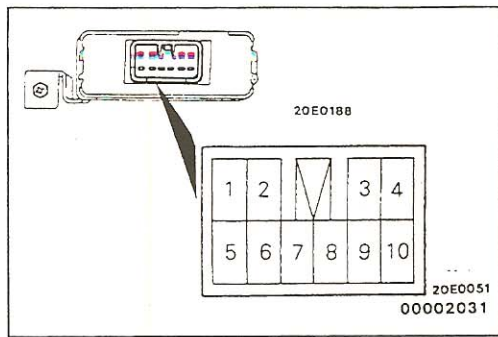
the cause of the malfunction. If these charts do not satisfactorily describe the problem, refer to the appropriate section for a more detailed explanation. After correcting the malfunction, check the complete system to assure that performance is satisfactory.

MALFUNCTION CAUSES AND REMEDIES (Numbers indicate checking/inspection order.)



TSB Revision





TROUBLESHOOTING HINTS

Air Conditioning Control Unit Inspection

Disconnect the amplifier and inspect the connector at the wire harness side as shown in the chart below.

Test Conditions:

- (1) Ignition switch: ON
- (2) Air conditioning switch: ON
- (3) Temperature control lever: MAX. COOL
- (4) Blower switch: HI

Terminal No.	Signal	Conditions	Terminal voltage
1	Air conditioning output	When all conditions for the compressor to turn on are satisfied	Battery positive voltage
3	Air conditioning switch: A/C	Air conditioning switch: A/C	Battery positive voltage
4	Air inlet sensor (+)	Ignition switch, blower switch and air conditioning switch: ON	5.5 V
5	Air conditioning switch: ECONO or A/C	Air conditioning switch: ECONO or A/C	Battery positive voltage
6	Lever position switch	At all times	0 V
7	Air conditioning control unit ground	At all times	0 V
8	Intake air temperature sensor (-)	Terminals (10)-(8) [when the temperature of evaporator outlet portion is 25°C (37°F)]	3.6 V
9	Air inlet sensor (-)	Terminals (4)-(9) [when the temperature of evaporator inlet portion is 25°C (77°F)]	1.5 V
10	Intake air temperature sensor (+)	Ignition switch, blower switch and air conditioning switch: ON	5.5 V

SAFETY PRECAUTIONS

Because R-134a refrigerant is a hydrofluorocarbon (HFC) which contains hydrogen atoms in place of chlorine atoms, it will not cause damage to the ozone layer.

Ozone filters out harmful radiation from the sun. To assist in protecting the ozone layer, Mitsubishi Motors Sales of America recommends an R-134a refrigerant recycling device.

Refrigerant R-134a is transparent and colorless in both the liquid and vapor state. Since it has a boiling point of -29.8°C (-21.7°F), at atmospheric pressure, it will be a vapor at all normal temperatures and pressures. The vapor is heavier than air, nonflammable, and nonexplosive. The following precautions must be observed when handling R-134a.

Caution

Wear safety goggles when servicing the refrigeration system.

R-134a evaporates so rapidly at normal atmospheric pressures and temperatures that it tends to freeze anything it contacts. For this reason, extreme care must be taken to prevent any liquid refrigerant from contacting the skin and especially the eyes. Always wear safety goggles when servicing the refrigeration part of the air conditioning system. Keep a bottle of sterile mineral oil handy when working on the refrigeration system.

1. Should any liquid refrigerant get into the eyes, use a few drops of mineral oil to wash it out. R-134a is rapidly absorbed by the oil.
2. Next splash the eyes with plenty of cold water.
3. Call your doctor immediately even if irritation has ceased after treatment.

Caution

Do not heat R-134a above 40°C (104°F).

In most instances, moderate heat is required to bring the pressure of the refrigerant in its container above the pressure of the system when charging or adding refrigerant.

A bucket or large pan of hot water not over 40°C (104°F) is all the heat required for this purpose. Do not heat the refrigerant container with a blow torch or any other means that could raise the temperature and pressure above this temperature. Do not weld or steam clean on or near the system components or refrigerant lines.

Caution

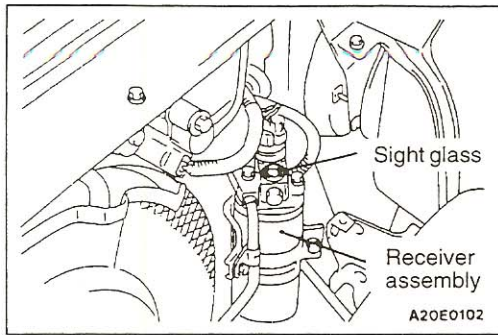
Keep R-134a containers upright when charging the system.

When metering R-134a into the refrigeration system, keep the supply tank or cans in an upright position. If the refrigerant container is on its side or upside down, liquid refrigerant will enter the system and damage the compressor.

Caution

1. **The leak detector for R-134a should be used to check for refrigerant gas leaks.**
2. **Do not allow liquid refrigerant to touch bright metal.**

Refrigerant will tarnish bright metal and chrome surfaces, and in combination with moisture can severely corrode all metal surfaces.



ON-VEHICLE SERVICE

55200090040

TEST PROCEDURES

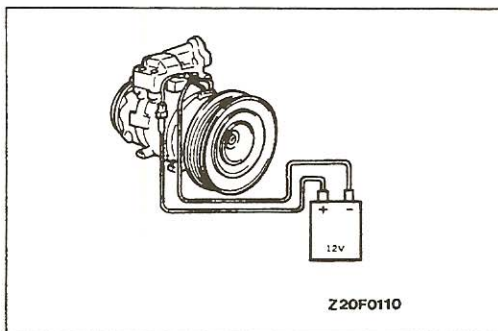
REFRIGERANT LEVEL TEST <Vehicles with sight glass (Up to June 1997)>

The sight glass is a refrigerant level indicator. To check the refrigerant level, clean the sight glass and start the vehicle engine. Push the air conditioning button to operate the compressor, place the blower switch to high and move the temperature control lever to max cool. After operating for a few minutes in this manner, check the sight glass.

- (1) If the sight glass is clear, the magnetic clutch is engaged, the compressor discharge line is warm and the compressor inlet line is cool; the system has a full charge.
- (2) If the sight glass is clear, the magnetic clutch is engaged and there is no significant temperature difference between compressor inlet and discharge lines; the system has lost some refrigerant.
- (3) If the sight glass shows foam or bubbles, the system could be low on charge. The system should be checked to leak evacuated and recharged with some refrigerant.

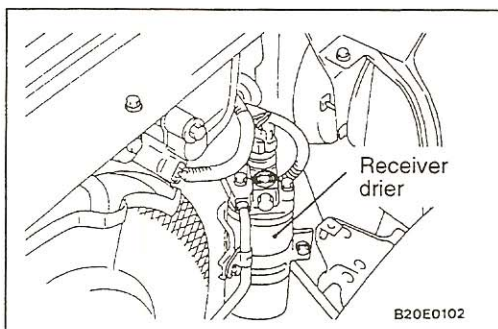
REFRIGERANT LEVEL TEST <Vehicles without sight glass (From July 1997)>

Use the refrigerant recovery station to remove all of the refrigerant, and then calculate the amount of the refrigerant and charge it.



MAGNETIC CLUTCH

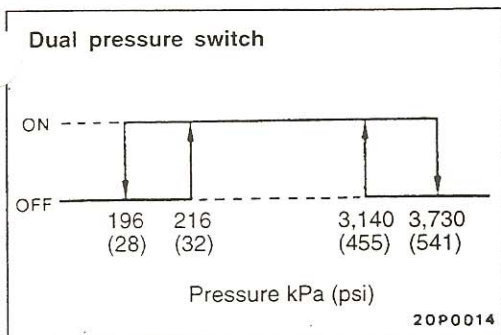
- (1) Disconnect the wiring to the magnetic clutch.
- (2) Connect the positive battery terminal directly to the wiring for the magnetic clutch.
- (3) If the magnetic clutch is normal, there will be a "click." If the pulley and armature do not make contact ("click"), there is a malfunction.



RECEIVER DRIER

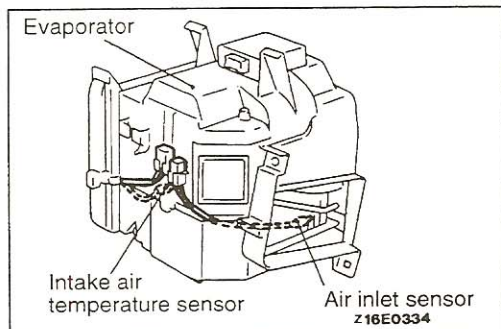
To Test the Receiver Drier

- (1) Operate the unit and check the piping temperature by touching the receiver drier outlet and inlet.
- (2) If there is a difference in the temperatures, the receiver drier is blocked. Replace the receiver drier.



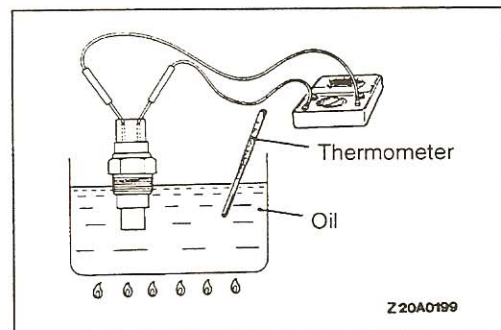
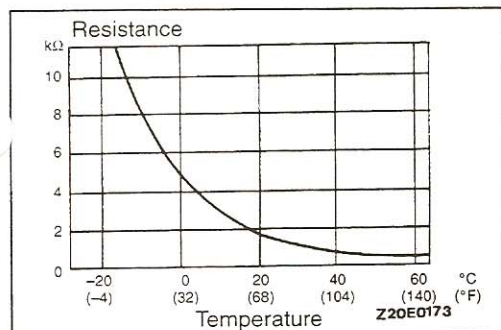
DUAL PRESSURE SWITCH (LOW PRESSURE SWITCH)

- (1) Turn back the adaptor valve handle all the way and install it to the low pressure side service valve.
- (2) With the gage manifold low pressure service valves closed, connect the gage manifold high pressure side charging hose to the adaptor valve.
- (3) Tighten the adaptor valve handle and open the service valve.
- (4) If there is continuity between the dual pressure switch terminals when the low pressure side pressure is at the level shown in the illustration at left when the dual pressure switch is on, the switch is functioning normally. If not, replace the switch.



INTAKE AIR TEMPERATURE SENSOR AND AIR INLET SENSOR

- (1) Disconnect the sensors connector at the evaporator case and then use an ohmmeter to measure the resistance. If the resistance is within 10% of the value on the characteristic curve, the sensor is functioning normally.
- (2) If the sensor is normal, there is a malfunction of the air conditioning control unit, and it should be replaced.



AIR CONDITIONING ENGINE COOLANT TEMPERATURE SWITCH

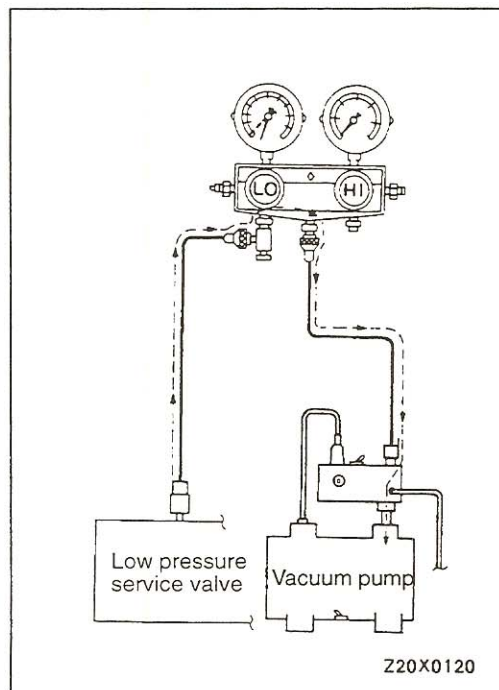
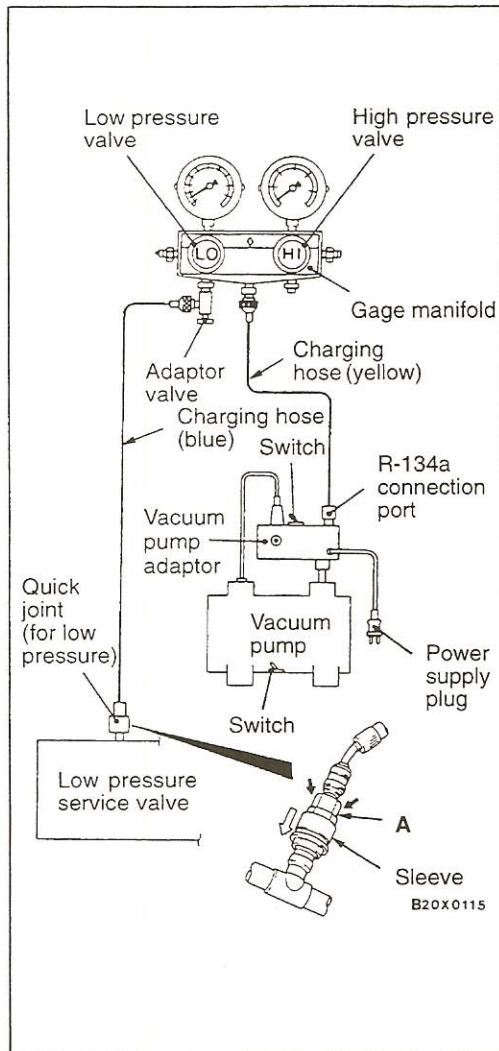
- (1) Dip the air conditioning engine coolant temperature switch in oil and heat the oil with a gas burner or similar item.
- (2) When the oil temperature reaches the standard value, check that there is no continuity between the switch terminals.

Standard value: 112–118°C (234–244°F)

COMPRESSOR DRIVE BELT ADJUSTMENT

55200100149

Refer to GROUP 11A – On-vehicle Service.



CHARGING

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For the vehicles without the sight glass, use the refrige recovery station to charge the refrigerant. <From July 1997/> For the vehicles with the sight glass, charge the refrigerant by the following procedures. <Up to June 1997>

1. With the handles turned in all the way (valves closed), install the adaptor valve to the low-pressure side of the gage manifold.
2. Connect the charging hose (blue) to the adaptor valve.
3. Connect the quick joint (for low pressure) to the charging hose (blue).
4. Connect the quick joint (for low pressure) to the low pressure service valve.

NOTE

The low-pressure service valve should be connected to the compressor.

Caution

1. Use tools that are designed for R-134a.
2. To connect the quick joint, press section A firmly against the service valve until a click is heard. When connecting, run your hand along the hose while pressing to ensure that there are no bends in the hose.

5. Close the high and low pressure valves of the gage manifold.
6. Install the vacuum pump adaptor to the vacuum pump.
7. Connect the vacuum pump plug to the vacuum pu adaptor.
8. Connect the charging hose (yellow) to the R-134a connection port of the vacuum pump adaptor.
9. Tighten the adaptor valve handle (valve open).
10. Open the low pressure valve of the gage manifold.
11. Turn the power switch of the vacuum pump to the ON position.

NOTE

Even if the vacuum pump power switch is turned on, the vacuum pump will not operate because of the power supply connection in step (7).

12. Turn the vacuum pump adaptor switch to the R-134a side to start the vacuum pump.

Caution

Do not operate the air conditioning compressor to carry out evacuation.

13. Evacuate to a vacuum reading of 100 kPa (29.5 in.Hg) or higher (takes approx. 10 minutes).
14. Turn the vacuum pump adaptor switch OFF and allow to stand it for 5 minutes.

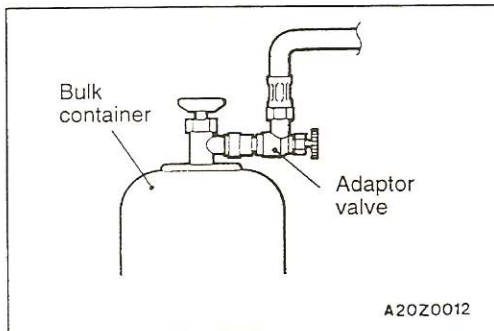
Caution

Do not operate the compressor in the vacuum condition, as damage may occur.

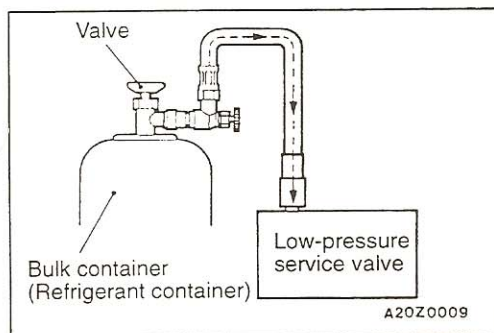
15. Carry out a leak test. (Good if the negative pressure does not drop.)

Caution

If the negative pressure is lost, check for loose connections. Then, repeat the evacuation procedure from step 12. If the negative pressure is still lost, add 1 lb of refrigerant and then use an R-134a compatible leak detector to check the system.



16. Turn the handle of the adaptor valve back all the way (valve closed), remove it from the gage manifold and install the bulk container.



17. Open the valve of the bulk container.
18. Turn the handle of the charge valve back (valve open) and tighten the handle of the adaptor valve (valve open) to charge the system with refrigerant.

Caution

If the bulk container is inverted, liquid refrigerant may be drawn into the compressor, damaging it by hydraulic lock. Keep the bulk container upright to ensure that refrigerant is charged in gas state.

19. If the refrigerant is not drawn in, turn the handle of the adaptor valve back all the way (valve closed).
20. use a leak detector to check for gas leaks. If a gas leak is detected, re-tighten the connections, and then repeat the charging procedure from evacuation in step (12).

Caution

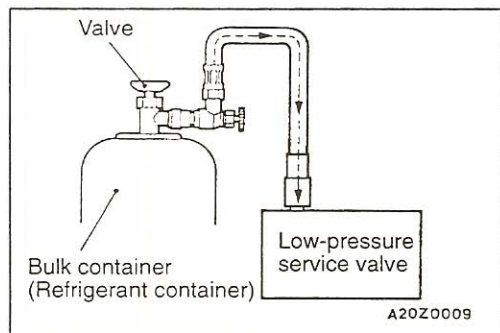
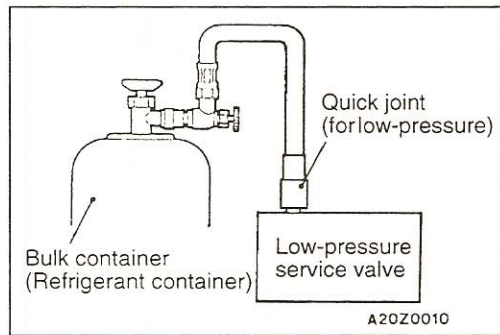
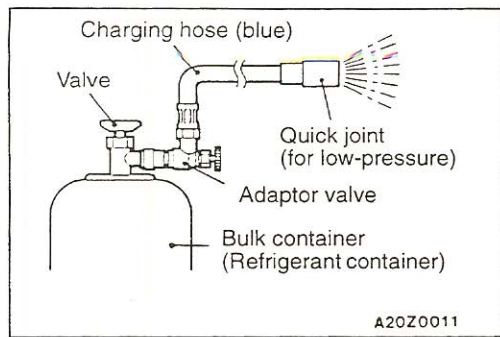
A leak detector designed for R-134a should be used.

21. Start the engine.
22. Operate the air conditioning and set it to the lowest temperature (MAX. COOL).
23. Fix the engine speed at 1,500 r/min.
24. Tighten the handle of the adaptor valve (valve open) to charge the required volume of refrigerant.

Caution

If the bulk container is inverted, liquid refrigerant may be drawn into the compressor, damaging it by hydraulic lock. Keep the bulk container upright to ensure that refrigerant is charged in gas state.

25. After charging with refrigerant, turn the handle of the adaptor valve back all the way (valve closed).
26. Tighten the charge valve handle (valved closed). Disconnect the quick joint (for low pressure) from the low-pressure service valve.



CORRECTING LOW REFRIGERANT LEVEL WHEN THE BULK CONTAINER IS USED

1. Install the adaptor valve with the handle turned all the way in (valve closed) to the charge valve.
2. Connect the charging hose (blue) to the adaptor valve.
3. Connect the charging hose (blue) to the quick joint (for low pressure).
4. Open the valve of the bulk container.
5. Turn the handle of the adaptor valve to bleed the air.
6. Connect the quick joint (for low pressure) to the low pressure service valve.

NOTE

The low-pressure service valve should be connected to the compressor.

7. Start the engine.
8. Operate the air conditioning and set it to the lowest temperature (MAX. COOL).
9. Fix the engine speed at 1,500 r/min.
10. Tighten the handle of the adaptor valve (valve open) and replenish refrigerant while checking the quantity through the sight glass.

Caution

If the bulk container is inverted, liquid refrigerant may be drawn into the compressor, damaging it by hydraulic lock. Keep the bulk container upright to ensure that refrigerant is charged in gas state.

11. After replenishing is completed, turn the handle of the adaptor valve all the way in (valve closed), and disconnect the quick joint.

METHOD USING A REFRIGERANT RECOVERY AND RECYCLING UNIT

Use the refrigerant recovery and recycling unit to refill with refrigerant.

NOTE

Refer to the refrigerant recovery and recycling unit instruction manual for operation of the unit.

DISCHARGING THE SYSTEM

Use the refrigerant recovery unit to discharge refrigerant gas from the system.

NOTE

Refer to the refrigerant recovery and recycling unit instruction manual for operation of the unit.

SUPPLYING OF OIL IN THE AIR CONDITIONING SYSTEM

Too little oil will provide inadequate compressor lubrication and cause a compressor failure. Too much oil will increase discharge air temperature.

When a 10PA15 compressor is installed at the factory, it contains 120 cm³ (4.1 fl.oz.) of refrigerant oil. While the air conditioning system is in operation, the oil is carried through the entire system by the refrigerant.

Some of this oil will be trapped and retained in various parts of the system.

When the following system components are changed, it is necessary to add oil to the system to replace the oil being removed with the component.

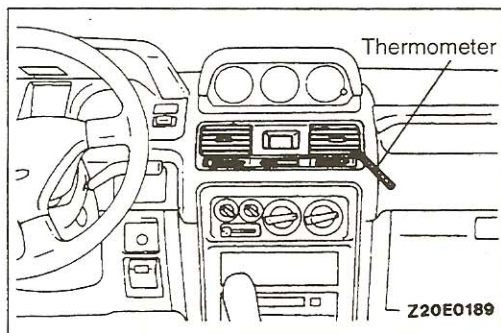
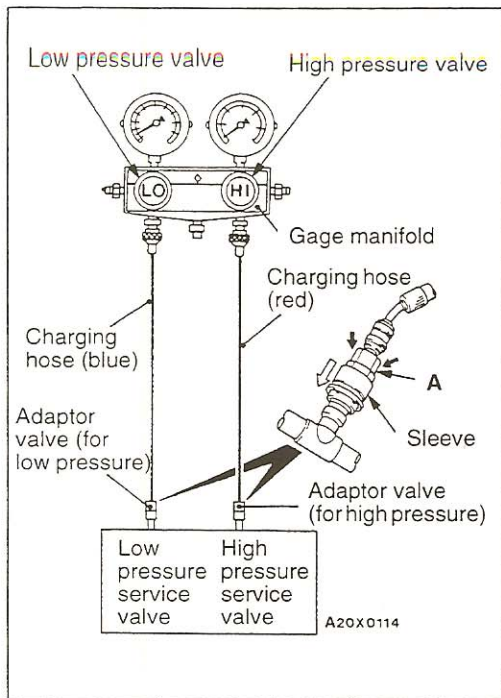
Compressor oil: ND-OIL 8**Quantity:**

Evaporator: 40 cm³ (1.4 fl.oz.)

Condenser: 40 cm³ (1.4 fl.oz.)

Suction hose: 10 cm³ (.3 fl.oz.)

Receiver: 10 cm³ (.3 fl.oz.)



PERFORMANCE TEST

- (1) The vehicles to be tested should be in a place that is not in direct sunlight.
- (2) Close the high and low pressure valves of the gage manifold.
- (3) Connect the charging hose (blue) to the low pressure valve and connect the charging hose (red) to the high pressure valve of the gage manifold.
- (4) Connect the quick joint (for low pressure) to the charging hose (blue), and connect the quick joint (for high pressure) to the charging hose (red).
- (5) Connect the quick joint (for low pressure) to the low-pressure service valve, and connect the quick joint (for high pressure) to the high-pressure service valve.

NOTE

The high-pressure service valve should be connected to the receiver and the low-pressure service valve should be connected to the compressor.

Caution

To connect the quick joint, press section A firmly against the service valve until a click is heard. When connecting, run your hand along the hose while pressing to ensure that there are no bends in the hose.

- (6) Start the engine.
- (7) Set the air conditioning controls as follows:
 Air conditioning switch: A/C – ON position
 Mode selection: Face position
 Temperature control lever: MAX. COOL
 Air selection: Recirculation position
 Blower switch: HI (Fast) position
- (8) Adjust the engine speed to 1,000 r/min with the air conditioning compressor clutch engaged.
- (9) The engine should be warmed up with doors and windows closed.
- (10) Insert a thermometer into the center air conditioning outlet and run the engine for 20 minutes.
- (11) Note the discharge air temperature.

NOTE

If the clutch cycles, take the reading before the clutch disengages.

Performance Temperature Chart

Garage ambient temperature °C (°F)	21 (70)	26.7 (80)	32.2 (90)	37.8 (100)	43.3 (110)
Discharge air temperature °C (°F)	3.0–6.0 (37.4–42.8)	3.0–7.0 (37.4–44.4)	3.5–7.5 (38.3–45.5)	4.0–8.0 (39.2–46.4)	4.5–8.5 (40.1–47.3)
Compressor discharge pressure kPa (psi)	961–1,402 (139–203)	1,029–1,471 (149–213)	1,108–1,549 (161–225)	1,245–1,745 (181–253)	1,304–1,902 (189–276)
Compressor suction pressure kPa (psi)	98–216 (14–31)	98–226 (14–33)	108–235 (16–34)	137–265 (20–38)	157–275 (23–40)

REFRIGERANT LEAK REPAIR PROCEDURE

55200150052

Lost Charge

If the system has lost all charge due to a leak:

- (1) Evacuate the system. (Refer to the evacuation procedure.)
- (2) Charge the system with approximately one pound of refrigerant.
- (3) Check for leaks.
- (4) Discharge the system.
- (5) Repair the leaks.
- (6) Replace the receiver drier.

Caution

Replacement filter-drier units must be sealed while in storage. The drier used in these units will saturate water quickly upon exposure to the atmosphere. When installing a drier, have all tools and supplies ready for quick reassembly to avoid keeping the system open any longer than necessary.

- (7) Evacuate and charge the system.

Low Charge

If the system has not lost all of its refrigerant charge, locate and repair all leaks. If it is necessary to increase the system pressure to find the leak (because of an especially low charge), add refrigerant. If it is possible to repair the leak without discharging the refrigerant system, use the procedure for correcting the low refrigerant level.

HANDLING TUBING AND FITTINGS

Kinks in the refrigerant tubing or sharp bends in the refrigerant hose lines will greatly reduce the capacity of the entire system. High pressures are produced in the system when it is operating. Extreme care must be exercised to make sure that all connections are pressure tight. Dirt and moisture can enter the system when it is opened for repair or replacement of lines or components. The following precautions must be observed. The system must be completely discharged before opening any fitting or connection in the refrigeration system. Open fittings with caution even after the system has been discharged. If any pressure is noticed as a fitting is loosened, allow trapped pressure to bleed off very slowly.

Never attempt to re-bend formed lines to fit. Use the correct line for the installation you are servicing. A good rule for the flexible hose lines is keep the radius of all bends at least 10 times the diameter of the hose. Sharper bends will reduce the flow of refrigerant. The flexible hose lines should be routed so that they are at least 80 mm (3 in.) from the exhaust manifold. It is good practice to inspect all flexible hose lines at least once a year to make sure they are in good condition and properly routed. Use the same type of O-rings in all plumbing connections. These O-rings are not reusable.

COMPRESSOR NOISE

55200870040

When investigating an air conditioning related noise, you first know the conditions when the noise occurs. These conditions are weather, vehicle speed, in gear or in neutral, engine temperature or any other special conditions. Noises that develop during air conditioning operation can often be misleading. For example: what sounds like a failed front bearing or connecting rod may be caused by loose bolts, nuts, mounting brackets or a loose clutch assembly. Check the accessory drive belt tension (power steering, generator or air pump). Improper accessory drive belt tension can cause a misleading noise when the compressor is engaged and little or no noise when the compressor is disengaged. Drive belts are speed sensitive. That is, at different engine speeds and depending upon belt tension, belts can develop unusual noises that are often mistaken for mechanical problems inside the compressor.

Adjustment Procedures

- (1) Select a quiet area for testing. Duplicate conditions as much as possible. Switch the compressor on and off several times to clearly identify the compressor noise.

To duplicate high ambient conditions (high head pressure), restrict air-flow through condenser. Install manifold gage set to make sure discharge pressure does not exceed 2,070 kPa (300 psi).

- (2) Tighten all compressor mounting bolts, clutch mount bolt, and compressor drive belt. Check to assure clutch coil is tight (no rotation or wobble).
- (3) Check the refrigerant hoses for rubbing or interference that could cause abnormal noise.
- (4) Check the refrigerant amount. (Refer to "Charging the System.")
- (5) Recheck the compressor noise by the same procedure as given in step 1.
- (6) If noise still exists, loosen the compressor mounting bolts and re-tighten to the specified torque. Repeat step 1.
- (7) If noise continues, replace the compressor and repeat step 1.

POWER RELAY CHECK

55200880074

- (1) Remove the condenser fan motor relay and compressor relay from the relay box at the left of the engine compartment.
- (2) Use an ohmmeter to check for continuity between the terminals.

IDLE-UP OPERATION CHECK

55200160260

- (1) Before inspection, set the vehicle to the following condition:
 - Engine coolant temperature: 80–90°C (176–194°F)
 - Lights and all accessories: OFF
 - Transmission: N or P
 - Steering wheel: Straight forward position
- (2) Check that the idling speed is at the standard value.

Standard value: 700±100 r/min.**NOTE**

There is no necessity to make an adjustment, because the idling speed is automatically adjusted by the idle air control (IAC) system. If, however, there occurs a deviation from the standard value for some reason, check the Idle Air Control (IAC) system.

- (3) Check that the idling speed becomes the standard value when the air conditioning switch is switched on and the air conditioning is activated.

Standard value: 900±100 r/min.**NOTE**

There is no necessity to make an adjustment, because the idling speed is automatically adjusted by the Idle Air Control (IAC) system. If however, there occurs a deviation from the standard value for some reason, check the Idle Air Control (IAC) system.

AIR CONDITIONING SWITCH

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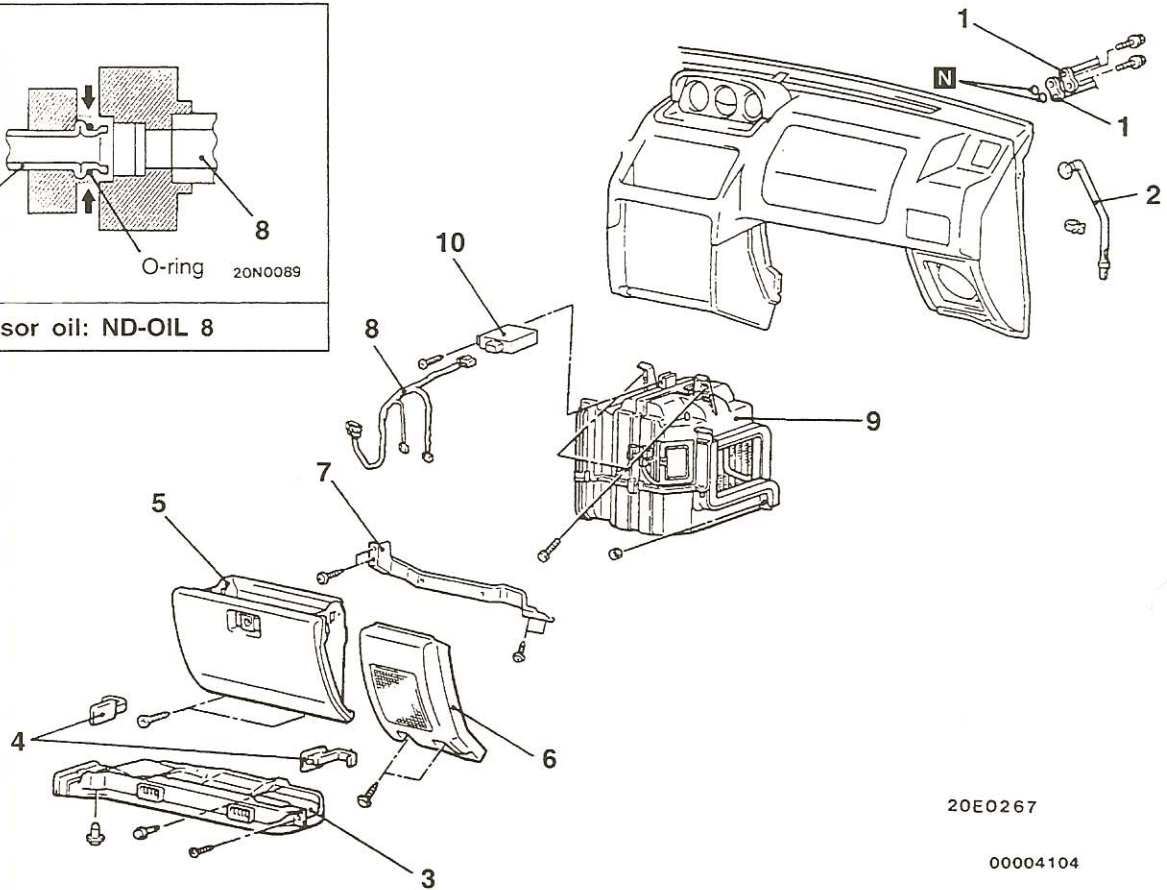
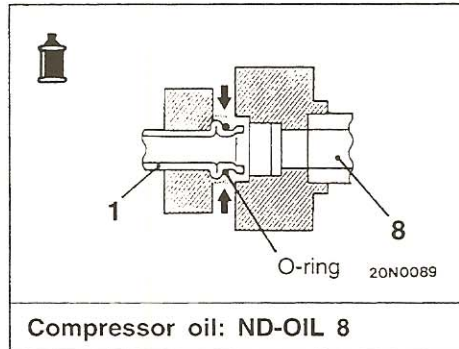
Refer to Heater Control Assembly for the removal, installation and inspection procedures for the air conditioning switch.

EVAPORATOR

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operations

- Refrigerant Discharging and Charging
(Refer to P.55-18.)



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Removal steps

1. High pressure pipe/low pressure hose connection
2. Drain hose
3. Foot shower duct (R.H.)
4. Stopper
5. Glove box

6. Corner cover
7. Lower frame
8. Air conditioning wiring harness
9. Front evaporator
10. Air conditioning control unit



INSTALLATION SERVICE POINT

▶◀ EVAPORATOR INSTALLATION

When replacing the evaporator with new one, refill the evaporator with a specified amount of compressor oil and install it to the vehicle.

Compressor oil: ND-OIL 8

Quantity: 40 cm³ (1.4 fl.oz.)

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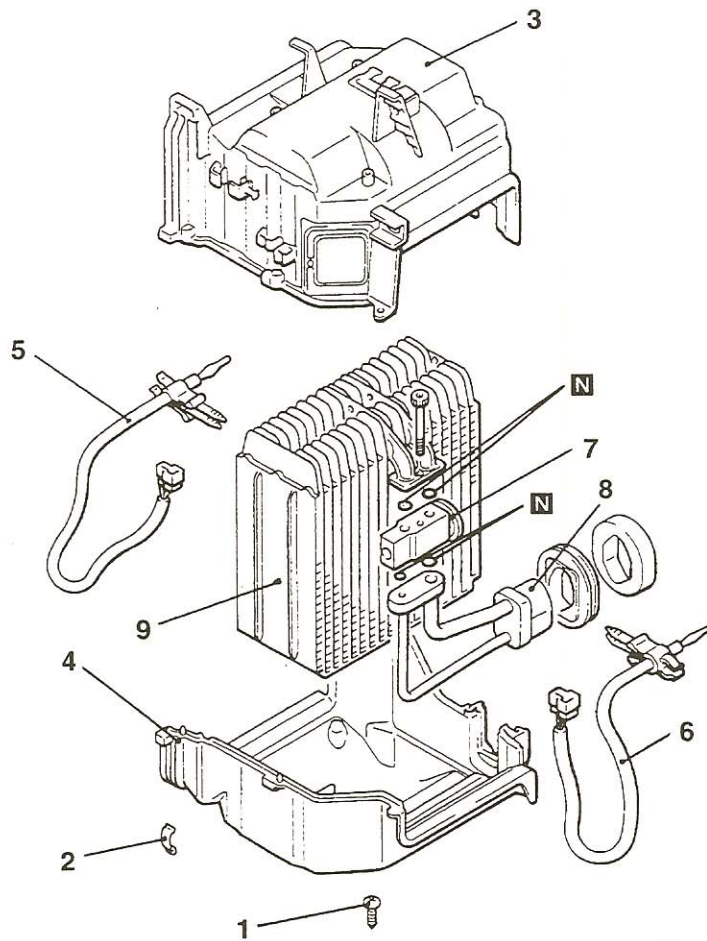
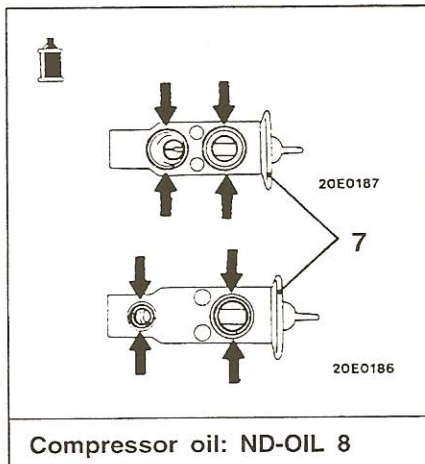
INSPECTION

55200370014

- Check for damage to the evaporator fin part.
- Check for damage or collapse of the drain hose.
- Check for peeling or cracking of the insulator.

DISASSEMBLY AND REASSEMBLY

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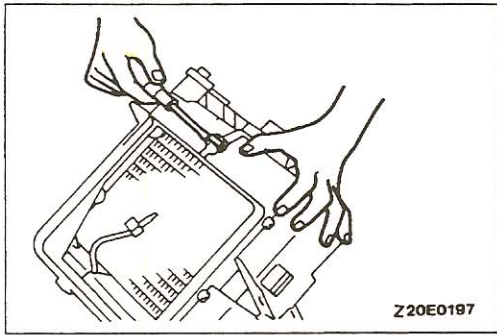
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Disassembly steps

1. Screw
2. Clip
3. Evaporator case (upper)
4. Evaporator case (lower)
5. Air thermo sensor

6. Air inlet sensor
7. Expansion valve
8. Low pressure/high pressure pipe
9. Evaporator



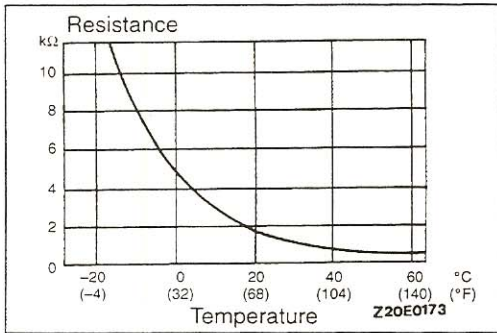


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DISASSEMBLY SERVICE POINT

◀▶ CLIPS REMOVAL

Remove the clips with a flat-tip screwdriver covered with a shop towel to prevent damage to case surfaces.



Z20E0173

INSPECTION

55200390027

INTAKE AIR TEMPERATURE SENSOR AND AIR INLET SENSOR

When the resistance value between the sensor terminals is measured under two or more temperature conditions, the resistance value should be close to the values shown in the graph.

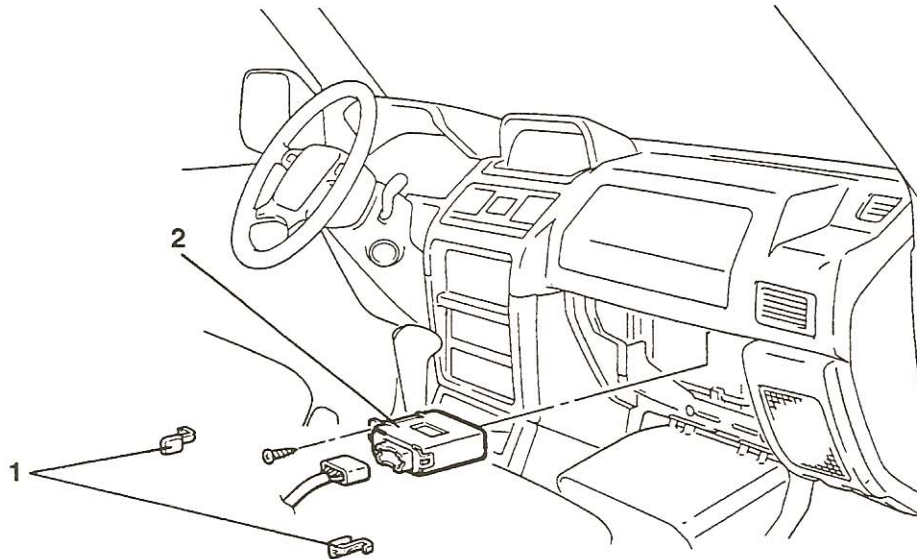
NOTE

The temperature conditions when testing should not exceed the range of the characteristic curve in the graph.

AIR CONDITIONING CONTROL UNIT

55200270017

REMOVAL AND INSTALLATION



A20E0266

Removal steps

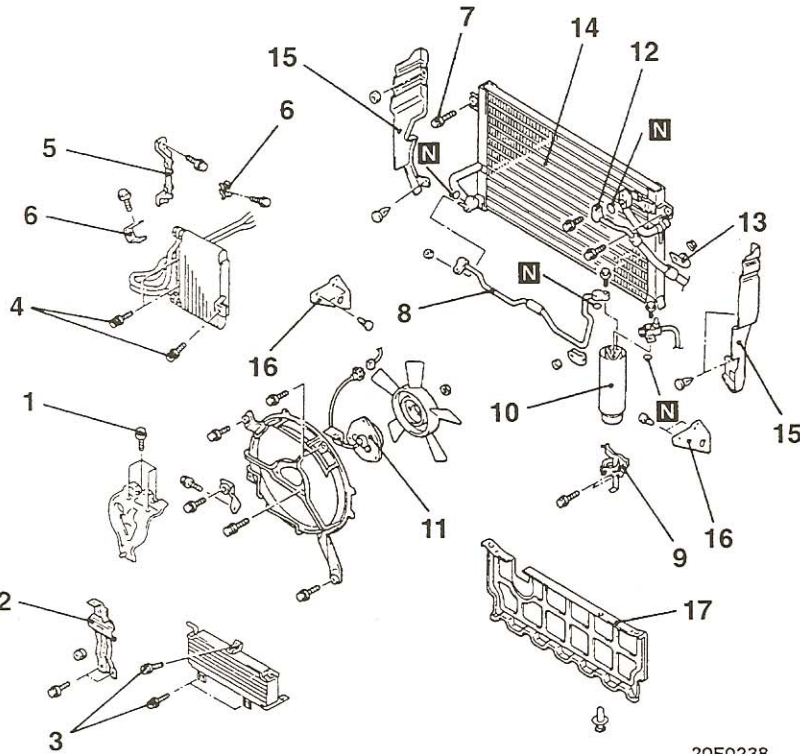
1. Stopper
2. Air conditioning control unit

CONDENSER AND CONDENSER FAN MOTOR

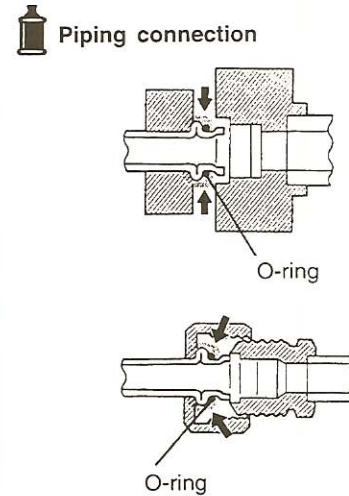
REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation

- Refrigerant Discharging and Charging (Refer to P.55-18.)
- Radiator Grille Removal and Installation



20E0238



20N0089

Compressor oil: ND-OIL 8

00002037

Removal steps

1. Hood latch bracket assembly mounting bolt
2. Hood latch stay
3. Transmission oil cooler mounting bolt
4. Engine oil cooler mounting bolt
5. Engine oil cooler bracket
6. Bracket
7. Condenser mounting bolt
8. High pressure pipe A

9. Receiver bracket
10. Receiver
11. Condenser fan motor
12. High pressure hose connection
13. High pressure hose bracket
- ▶A◀ 14. Condenser
15. Headlight side seal
16. Frame side seal
17. Under seal

INSTALLATION SERVICE POINT

▶A◀ CONDENSER INSTALLATION

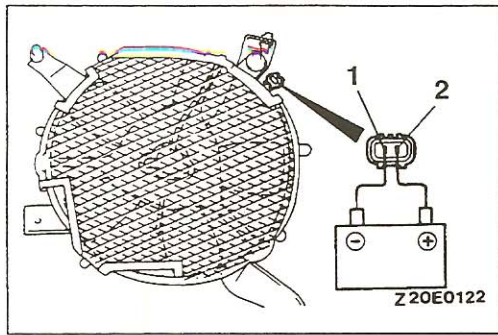
When replacing the condenser with a new one, refill the condenser with a specified amount of compressor oil and install it (to the vehicle).

Compressor oil: ND-OIL 8

Quantity: 40 cm³ (1.4 fl.oz.)

TSB Revision

55-30 AIR CONDITIONING – Condenser and Condenser Fan Motor/Refrigerant Line



INSPECTION

55200680049

- Check the condenser fan for crushing or other damage
- Check the condenser's high-pressure hose and pipe installation parts for damage or deformation.
- Check the condenser fan shroud for damage.

INSPECTION OF CONDENSER FAN MOTOR

When battery voltage is applied to the terminal (2) and terminal (1) is earthed, check that the condenser fan motor turns.

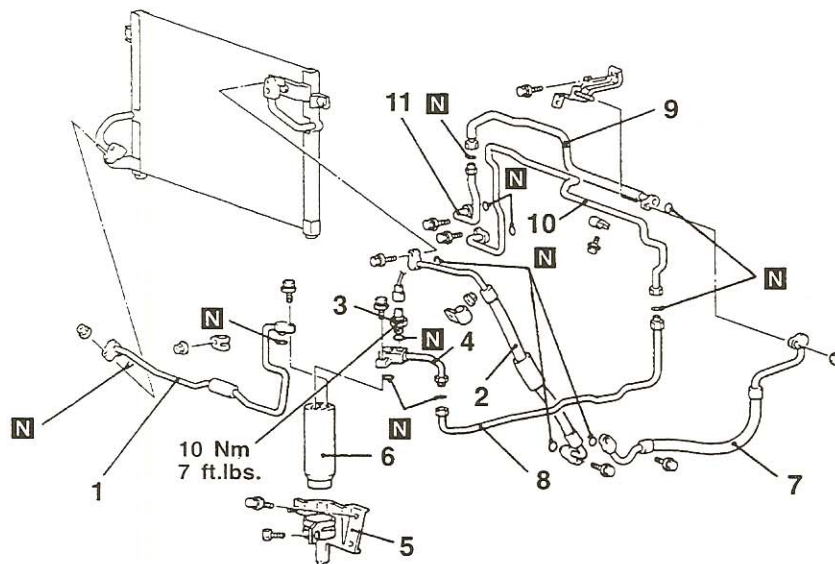
REFRIGERANT LINE

55200640313

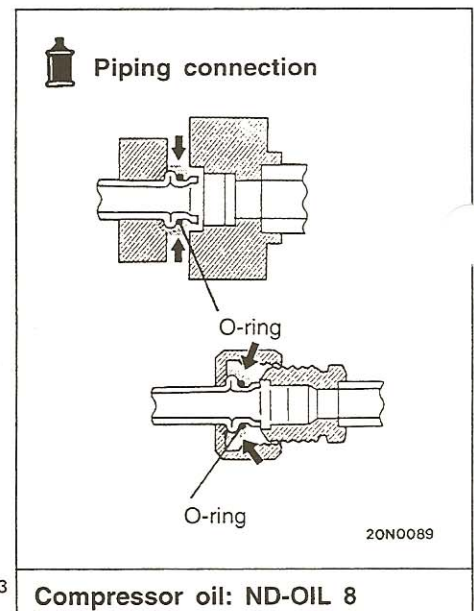
REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation

- Refrigerant Discharging and Charging
(Refer to P.55-18.)



20E0163



Compressor oil: ND-OIL 8

00002038

Removal steps

1. High pressure pipe A
2. High pressure hose
3. Dual pressure switch
4. High pressure pipe B
5. Receiver bracket
6. Receiver
7. Suction hose



8. High pressure pipe C
 - Link bracket (Refer to GROUP 17 – Auto-cruise Control.)
9. Suction pipe A
10. High pressure pipe D
11. Suction pipe B

TSB Revision

INSTALLATION SERVICE POINT

▶A◀ **SUCTION HOSE/RECEIVER INSTALLATION**

When replacing the suction hose or the receiver with new ones, refill them with a specified amount of compressor oil, and then install each of them.

Compressor oil: ND-OIL 8

Quantity:

Suction hose: 10 cm³ (.3 fl.oz.)

Receiver: 10 cm³ (.3 fl.oz.)

INSPECTION

55200650064

DUAL PRESSURE SWITCH (LOW PRESSURE SWITCH)

Refer to P.55-17.

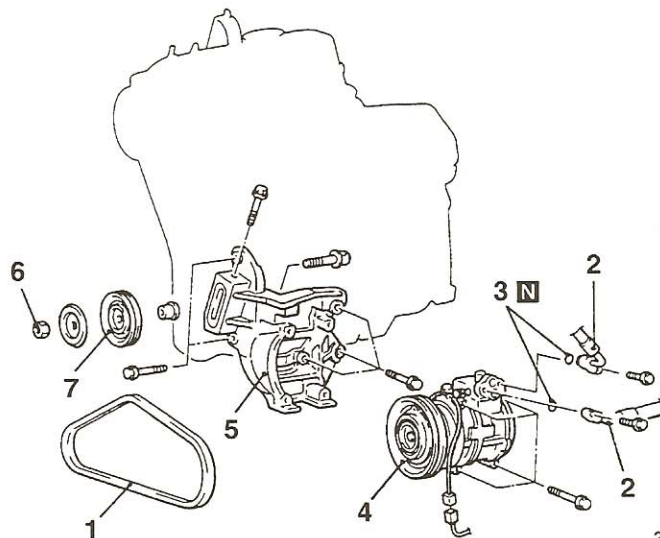
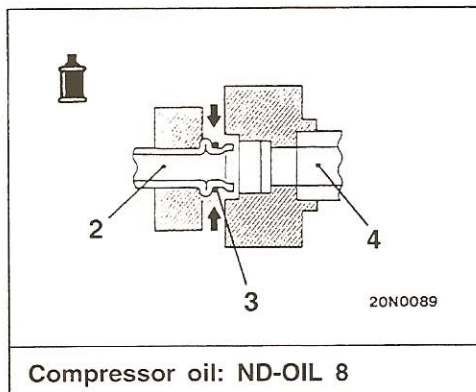
COMPRESSOR AND TENSION PULLEY

55200410334

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation

- Battery and Battery Tray Removal and Installation
- Radiator Shroud Cover Removal and Installation



Compressor removal steps

- Refrigerant Discharging and Charging (Refer to P.55-18.)
 - Compressor Drive Belt Adjustment (Refer to GROUP 11A – On-vehicle Service.)
1. Compressor drive belt
 2. High-pressure hose connection
 3. O-ring
 4. Compressor
 5. Compressor bracket



Tension pulley removal steps

- Compressor Drive Belt Adjustment (Refer to GROUP 11A – On-vehicle Service.)
1. Compressor drive belt
 6. Tension pulley mounting nut
 7. Tension pulley

INSTALLATION SERVICE POINT**▶A◀ COMPRESSOR INSTALLATION**

If a new compressor is installed, first adjust the amount of oil according to the procedures described below, and then install the compressor.

- (1) Measure the amount ($X \text{ cm}^3$) of oil inside the removed compressor.
- (2) Drain the amount of oil calculated according to the following formula from the new compressor, and then install the new compressor.

New compressor oil amount: $120 \text{ cm}^3 - X \text{ cm}^3 = Y \text{ cm}^3$

NOTE

- (1) $Y \text{ cm}^3$ indicates the amount of oil in the refrigerant line, the condenser, the cooling unit, etc.
- (2) When replacing the following parts at the same time as the compressor, subtract the rated oil amount of each part from $Y \text{ cm}^3$ and discharge this amount from the new compressor.

Compressor oil: ND-OIL 8**Quantity:**

Evaporator: 40 cm^3 (1.4 fl.oz.)

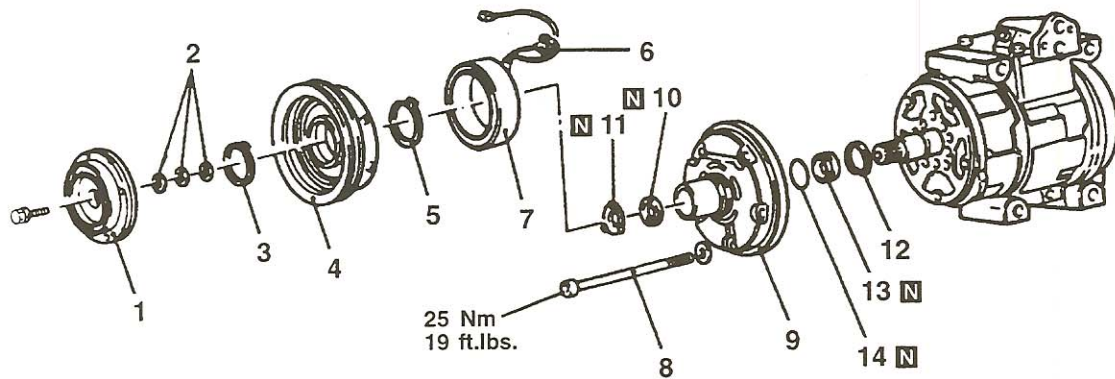
Condenser: 40 cm^3 (1.4 fl.oz.)

Suction hose: 10 cm^3 (.3 fl.oz.)

Receiver: 10 cm^3 (.3 fl.oz.)

DISASSEMBLY AND REASSEMBLY

55200460063



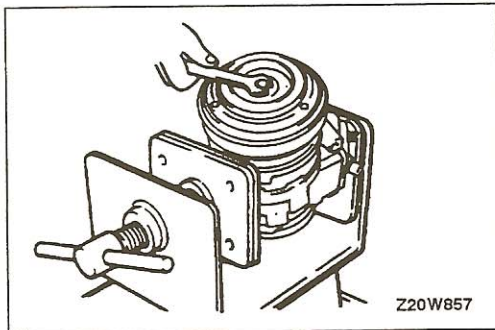
Z20W856

Magnetic clutch disassembly steps

- ◀A▶ ▶D▶ • Clutch clearance adjustment
- 1. Clutch hub
- 2. Shims
- 3. Snap ring
- ◀B▶ 4. Rotor assembly
- 5. Snap ring
- 6. Ground terminal
- ▶C▶ 7. Clutch coil

Compressor front housing and shaft seal disassembly steps

- ◀C▶ ▶B▶ 8. Through bolt
- ◀D▶ 9. Front housing
- 10. Felt
- 11. Felt holder
- ◀E▶ ▶A▶ 12. Snap ring
- 13. Shaft seal
- 14. O-ring



DISASSEMBLY SERVICE POINTS

◀A▶ CLUTCH HUB REMOVAL

- (1) Secure the compressor in a vise.
- (2) If the clutch hub cannot be pulled off by hand, screw in a completely-threaded bolt with a thread length of 8 mm (.315 in.) to raise the clutch hub so it can be removed.

◀B▶ ROTOR ASSEMBLY REMOVAL

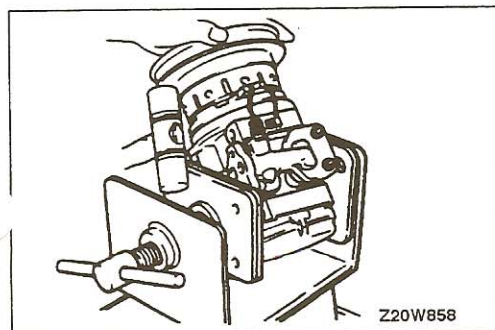
Use a plastic hammer to lightly tap the rotor off the shaft.

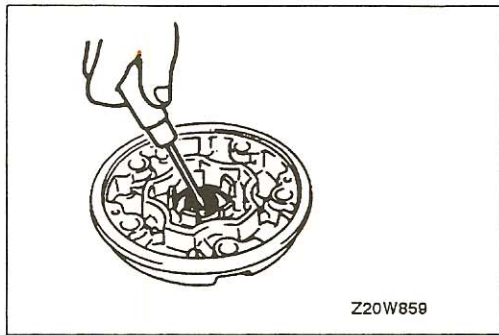
◀C▶ THROUGH BOLT REMOVAL

Remove the through bolt after first securing the rear housing of the compressor by placing it in a vise.

Caution

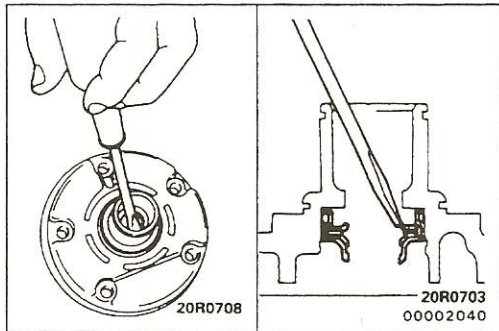
If the through bolt is removed without first doing so, the rear housing will become uncoupled and compressor oil will escape.





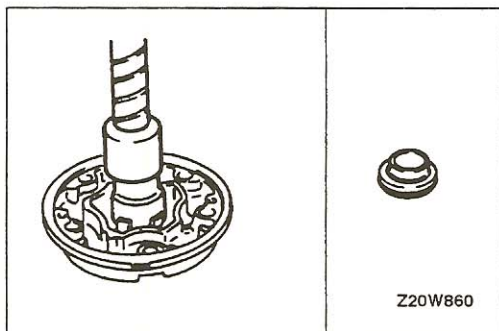
◀D▶ FELT REMOVAL

Use a flat-tip (–) screwdriver to remove the felt from the front housing.



◀E▶ SHAFT SEAL REMOVAL

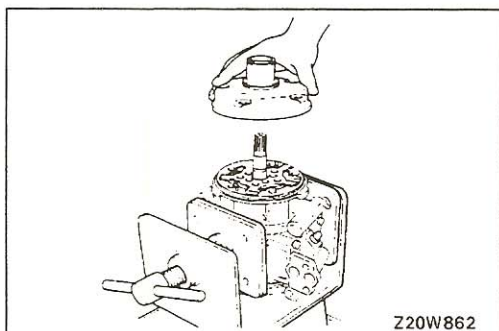
Use a flat-tip (–) screwdriver to remove the shaft seal from the front housing.



REASSEMBLY SERVICE POINTS

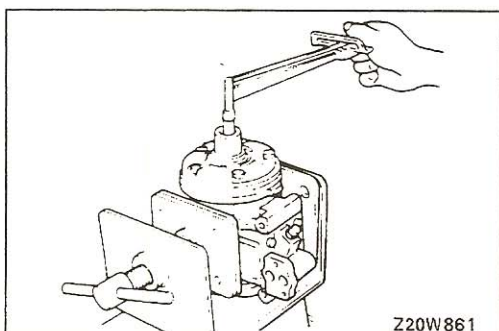
▶A◀ SHAFT SEAL INSTALLATION

- (1) Lubricate the shaft seal with specified compressor oil.
Specified compressor oil: ND-OIL 8
- (2) Set the shaft seal to the front housing so that the projection side of the center ring is at the shaft seal side.
- (3) Use a 21 mm (.83 in.) socket to install the shaft seal.



▶B◀ FRONT HOUSING INSTALLATION

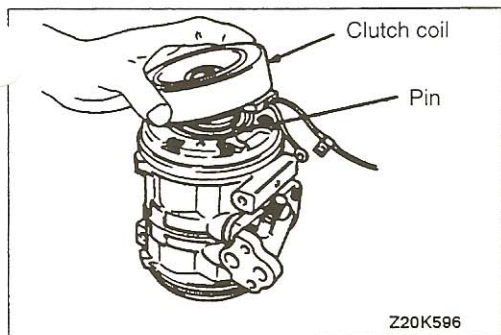
- (1) Apply specified compressor oil to the shaft.
Specified compressor oil: ND-OIL 8
- (2) Install the front housing, taking care not to damage the lip part of the shaft seal.



- (3) Mount the bolt on the shaft, and then measure the shaft starting torque.

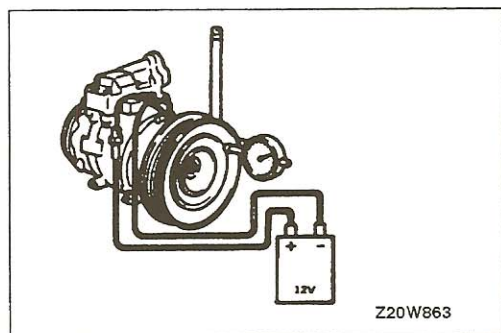
Standard value: 4.9 Nm (43 in.lbs.) or less

- (4) Remove the bolt from the shaft.



►C◄ CLUTCH COIL INSTALLATION

The clutch coil must be aligned with the pin in the compression housing.



►D◄ CLUTCH CLEARANCE ADJUSTMENT

- (1) Connect the magnetic clutch to the battery.
- (2) The clutch hub will be attracted to and fit closely to the rotor.
- (3) Use a shim(s) to adjust so that the amount of movement of the clutch hub is as described below.

Standard value: 0.35–0.65 mm (.0138–.0256 in.)

- (4) Turn the rotor by hand to confirm that it rotates freely.

INSPECTION

55200470042

- Check the surface of the clutch hub for scoring or bluing.
- Check the surface of the rotor for scoring or bluing.
- Check the sealing surfaces for cracks, scratches and deformation.
- Check the front housing for cracks or scoring on the sealing surfaces.
- Check the compressor shaft for scoring.

NOTES

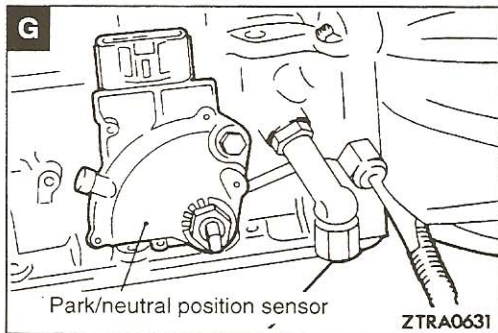
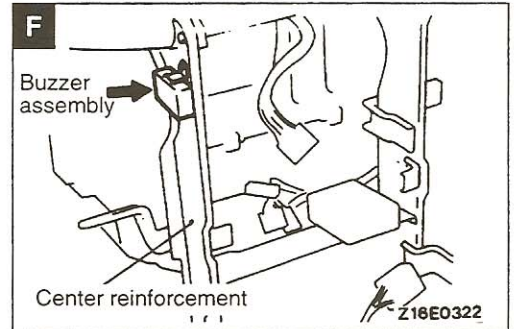
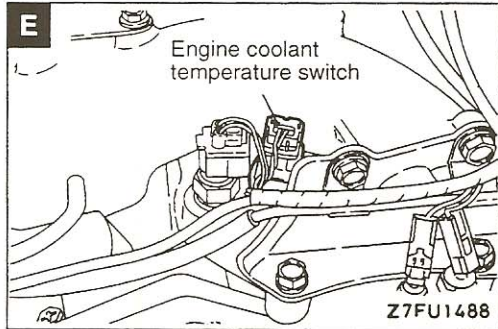
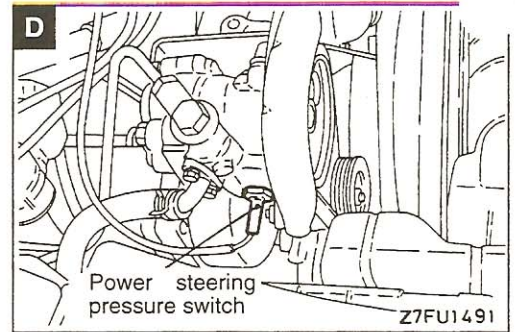
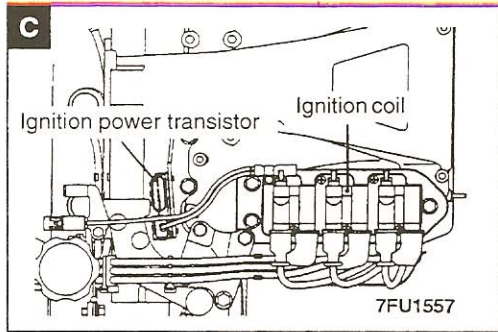
COMPONENT LOCATIONS

CONTENTS

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Control Unit Location	14	Other Devices Location	19
Diode Location	18	Relay Location	7
Fusible Link, Fuse and IOD or Storage Connector Location	2	Sensor Location	10
Grounding Location	4	Solenoid, Solenoid Valve Location	16
Inspection Terminal Location	3		

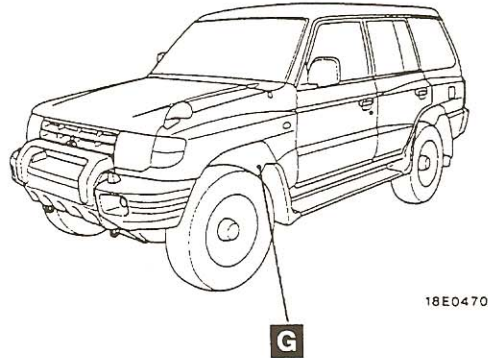
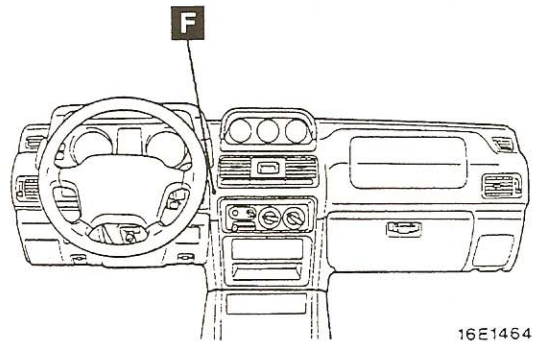
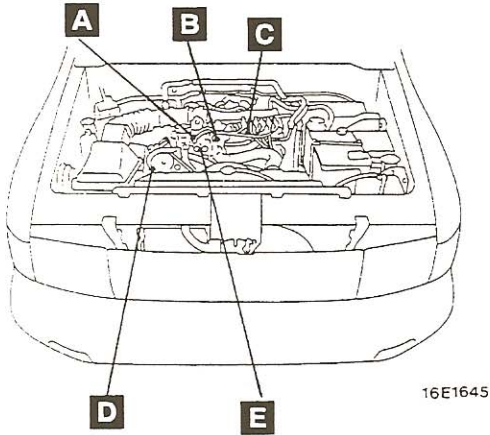




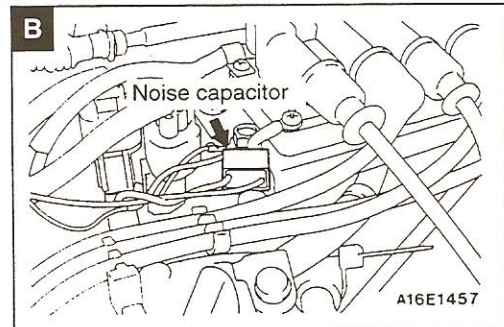
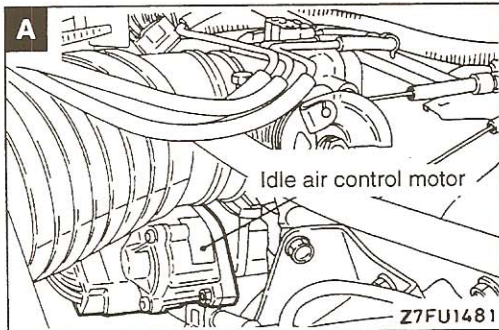
OTHER DEVICES LOCATION

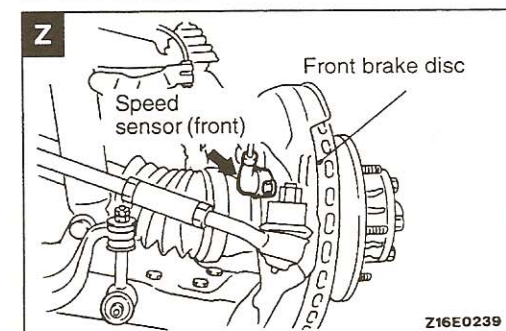
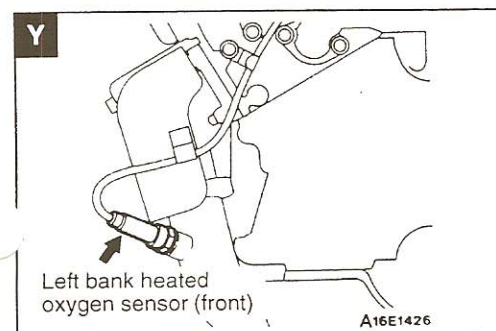
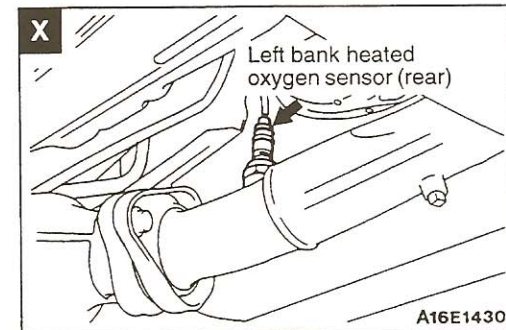
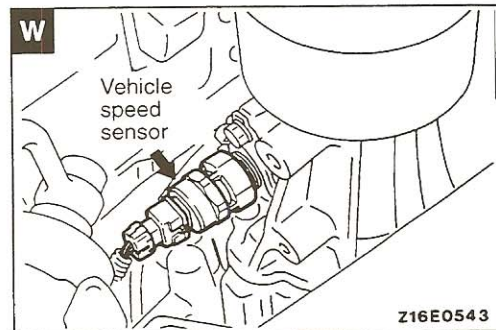
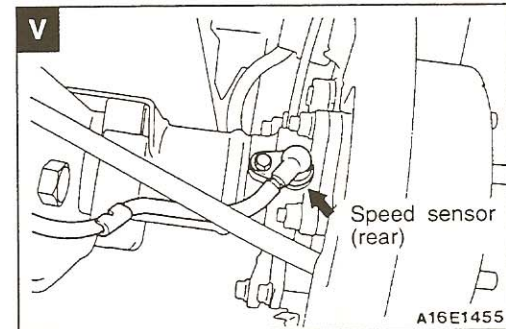
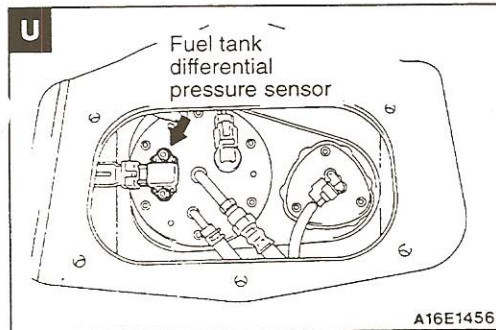
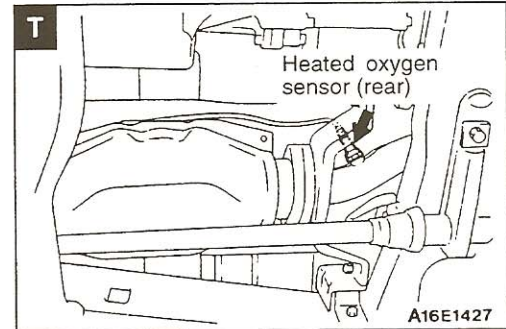
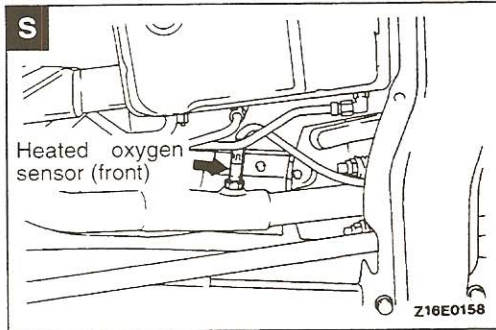
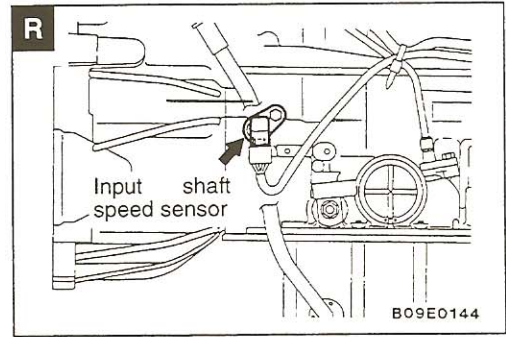
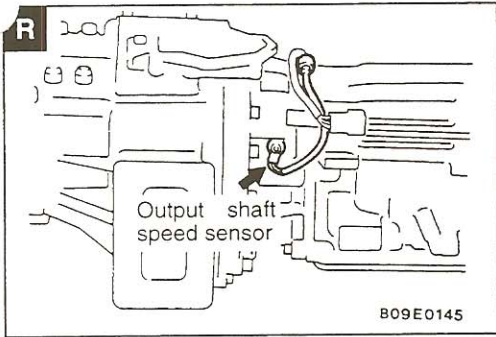
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Name	Symbol	Name	Symbol
Buzzer assembly	F	Ignition power transistor	C
Engine coolant temperature switch	E	Noise capacitor	B
Idle air control motor	A	Park/neutral position sensor	G
Ignition coil	C	Power steering pressure switch	D



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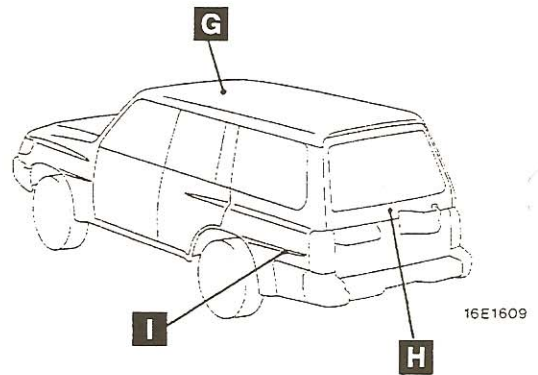
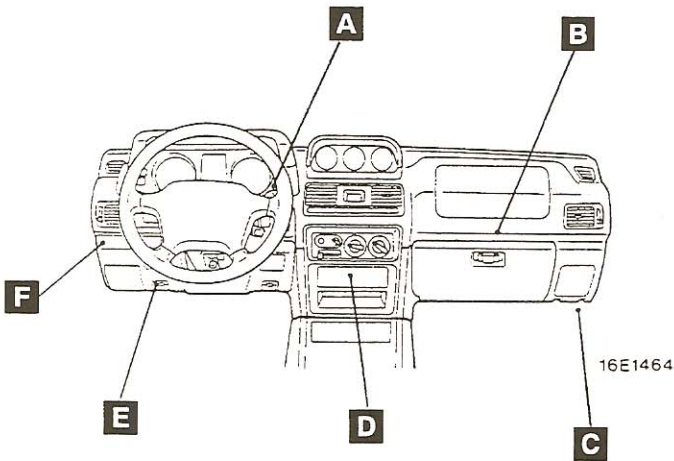


CONTROL UNIT LOCATION

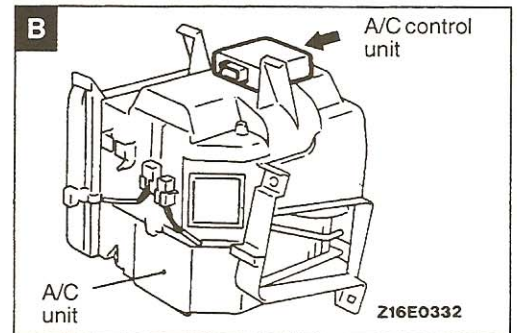
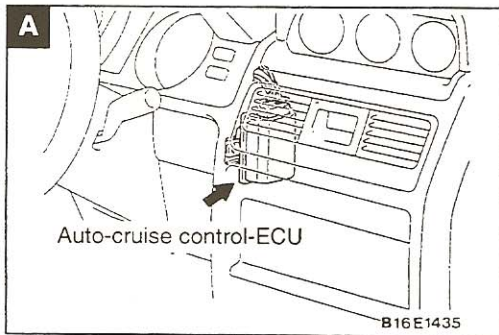
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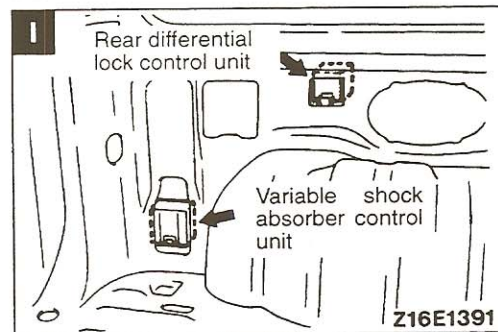
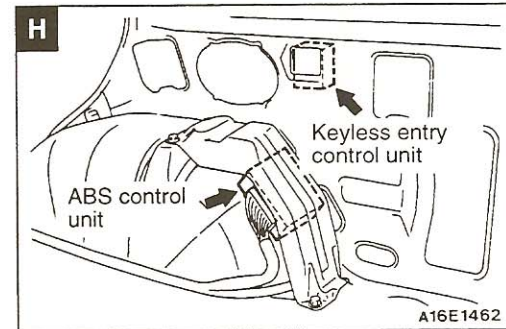
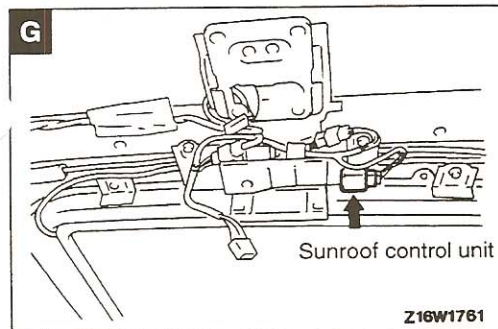
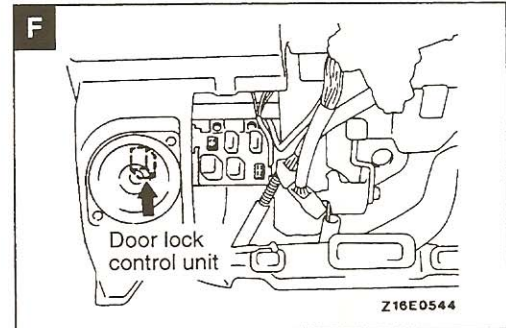
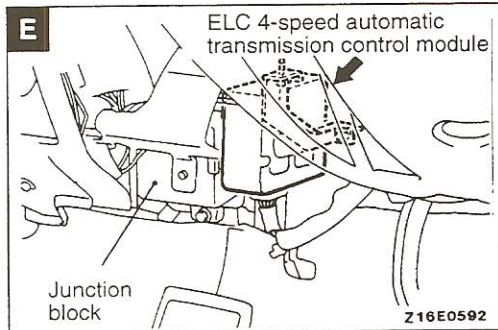
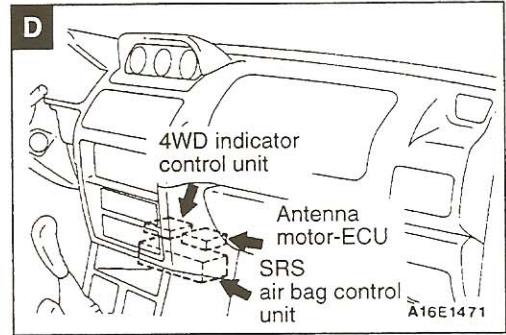
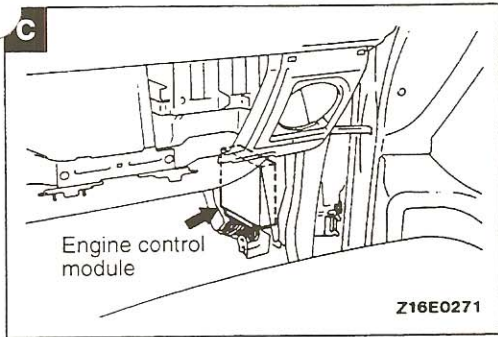
Name	Symbol	Name	Symbol
ABS control unit	H	Engine control module	C
A/C control unit	B	Keyless entry control unit	H
Antenna motor-ECU	D	Rear differential lock control unit	I
Auto-cruise control-ECU	A	SRS air bag control unit	D
Door lock control unit	F	Sunroof control unit	G
		Variable shock absorber control unit	I
ELC 4-speed automatic transmission control module	E	4WD indicator control unit	D

NOTE
The "Name" column is arranged in alphabetical order.



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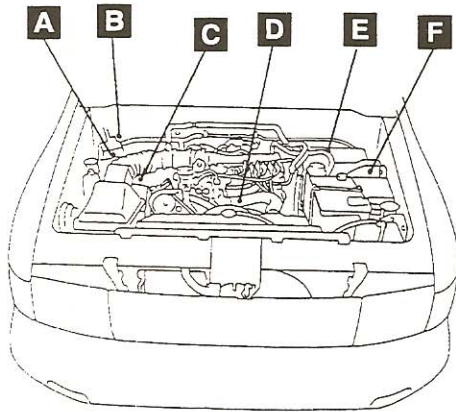


SOLENOID, SOLENOID VALVE LOCATION

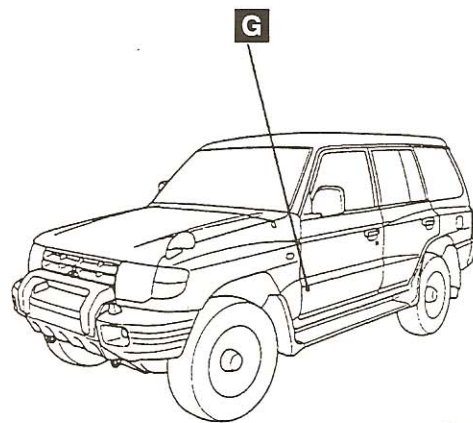
70100080499

Name	Symbol	Name	Symbol
Cruise control actuator (with built-in control valve and release valve) <For California>	B	Evaporative emission purge solenoid	D
Cruise control actuator (with built-in control valve and release valve) <For Federal>	F	Evaporative emission ventilation solenoid	E
EGR solenoid	D	Hydraulic unit (with built-in solenoid valve)	A
ELC 4-speed automatic transmission control solenoid valve	G	Solenoid valve A,B	C

NOTE
The "Name" column is arranged in alphabetical order

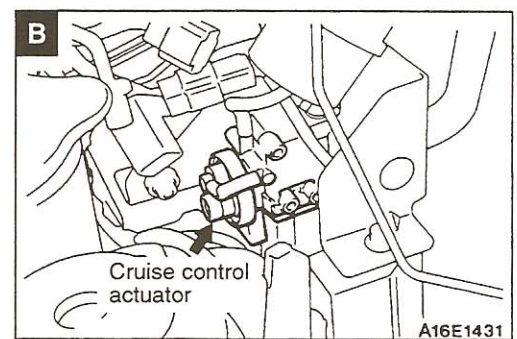
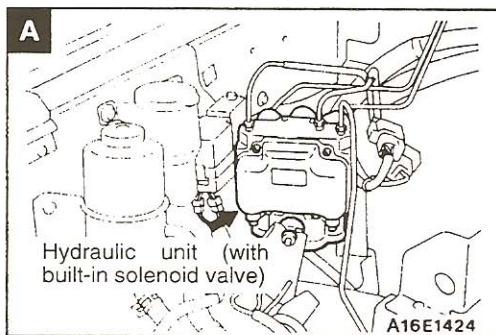


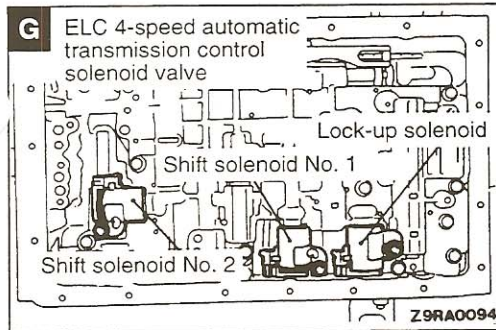
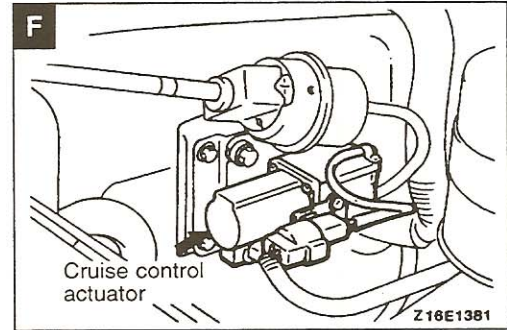
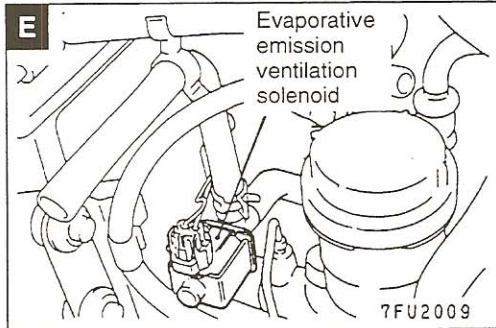
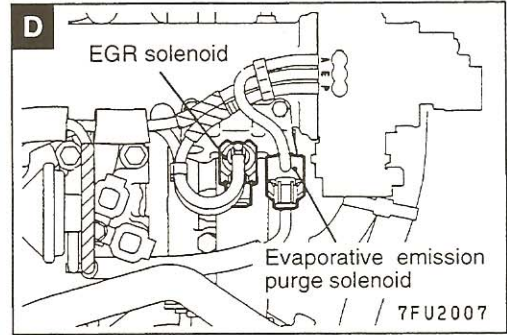
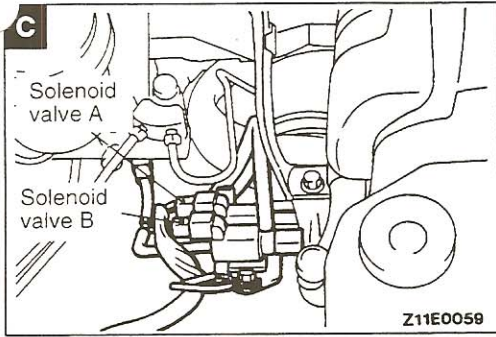
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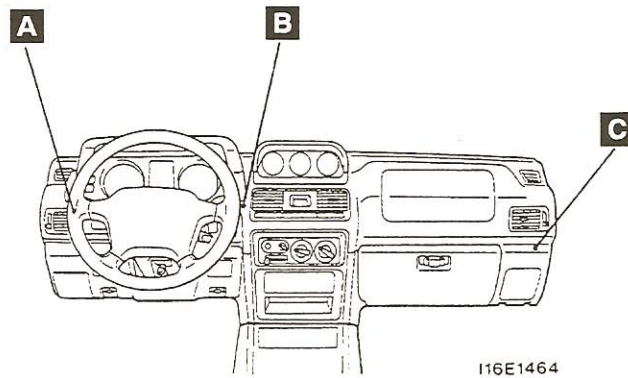


DIODE LOCATION

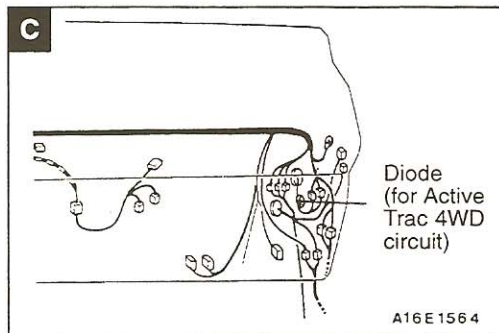
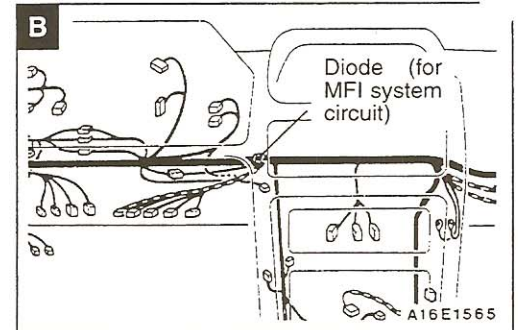
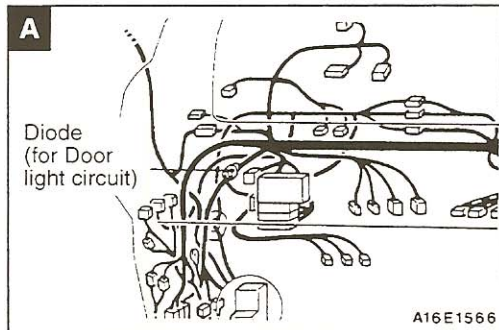
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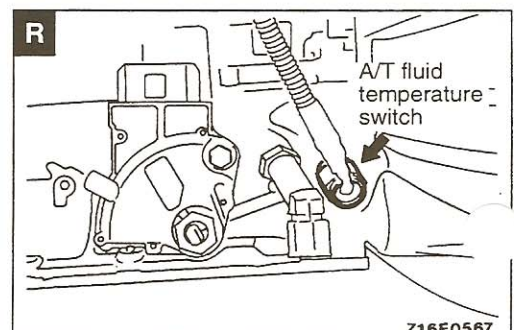
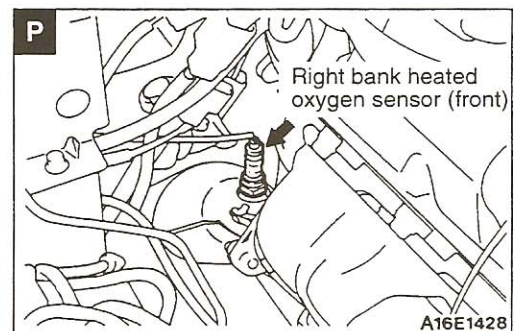
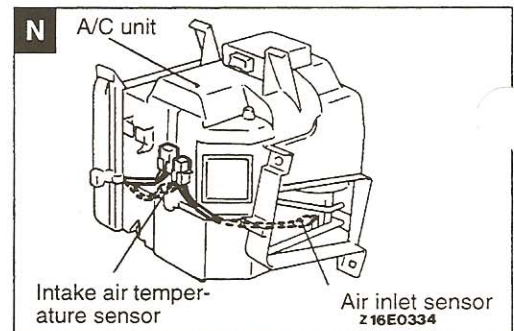
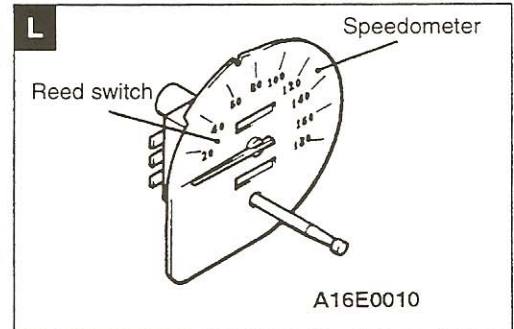
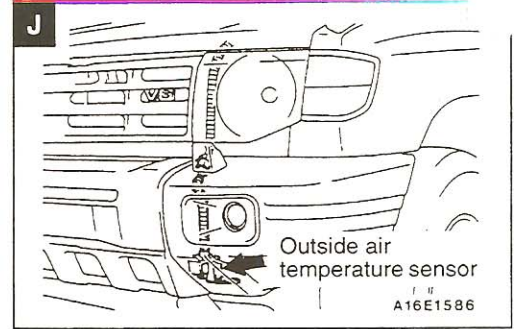
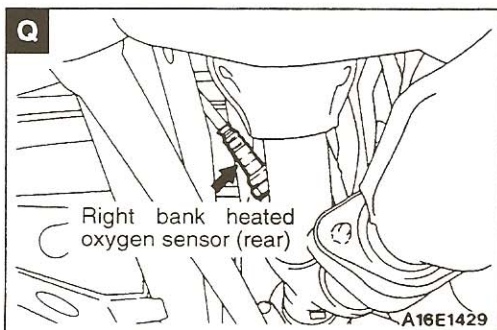
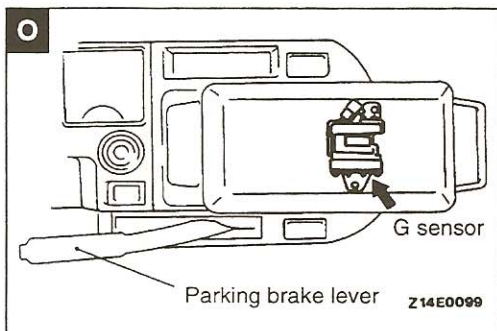
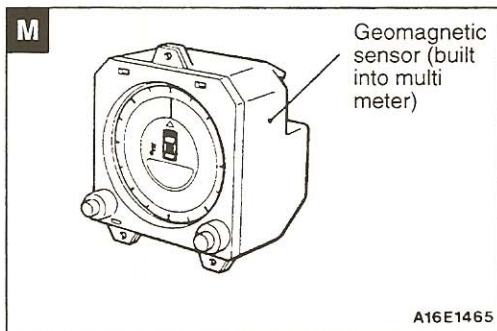
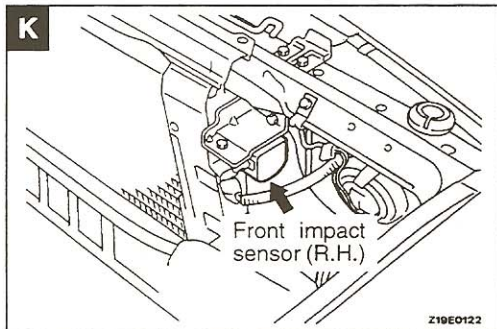
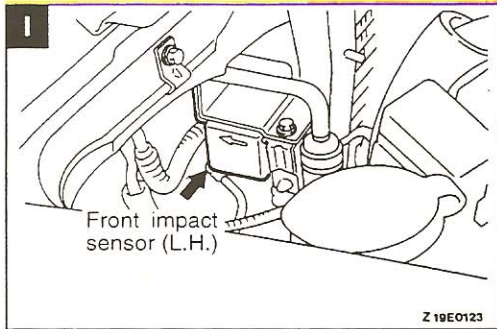
Name	Symbol	Name	Symbol
Diode (for Active Trac 4WD circuit)	C	Diode (for Door light circuit)	A
		Diode (for MFI system circuit)	B

NOTE
The "Name" column is arranged in alphabetical order.

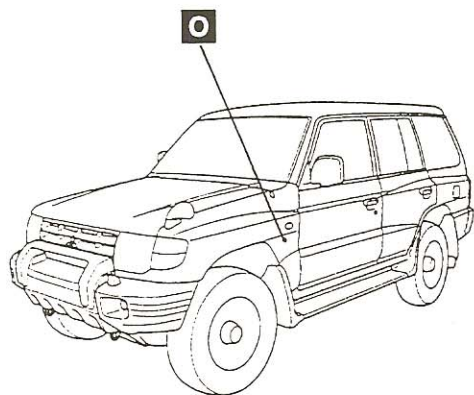


I16E1464



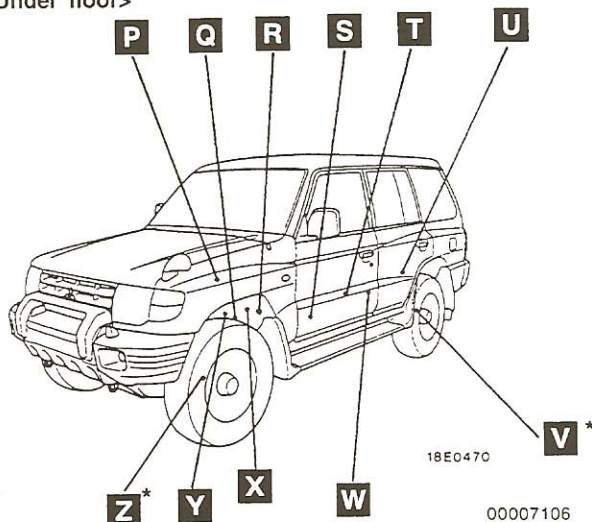


<Floor>



18E0470

<Under floor>

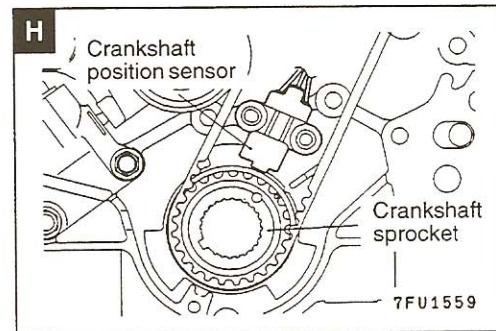
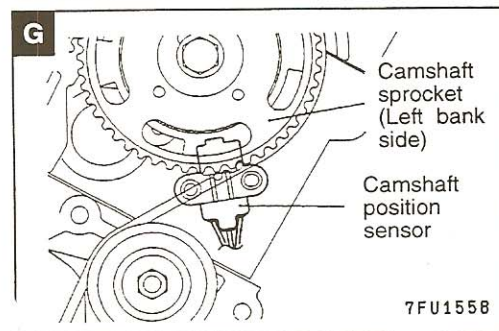
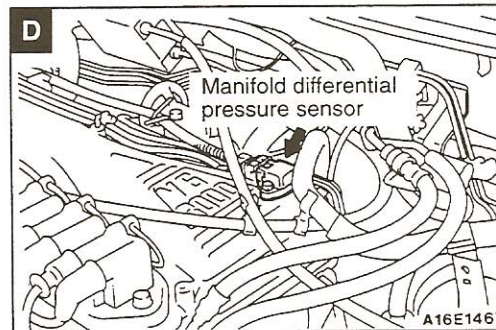
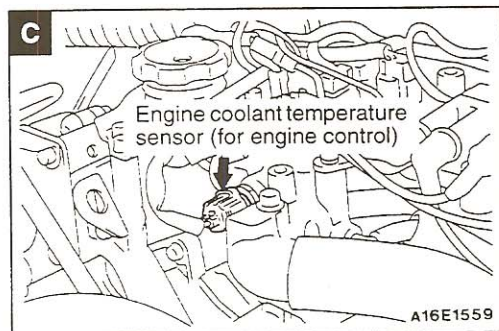
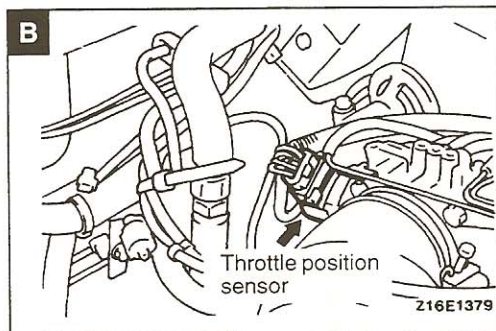
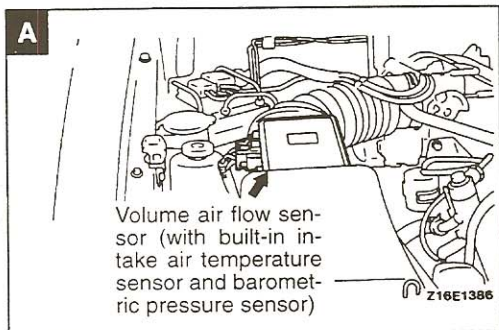


18E0470

00007106

NOTE

* indicates also equipped the right side.

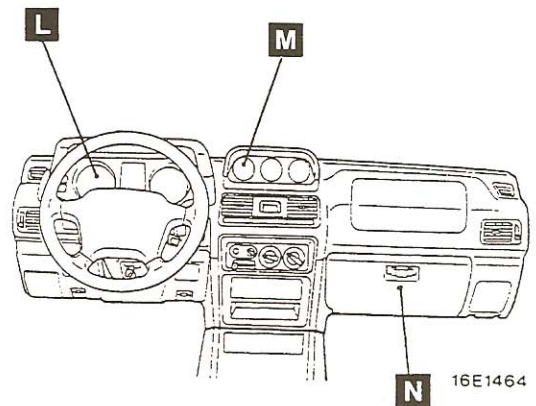
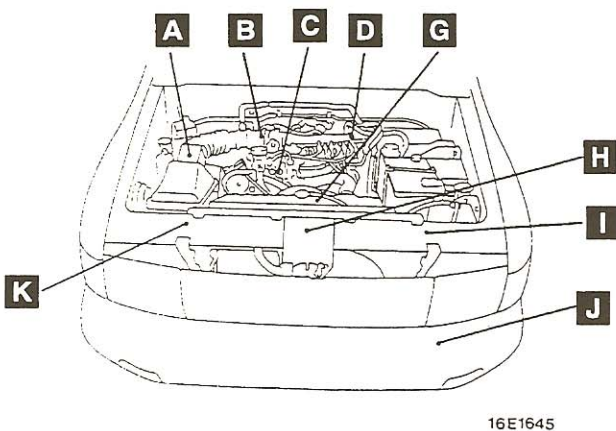


SENSOR LOCATION

70100060A47

Name	Symbol	Name	Symbol
A/T fluid temperature switch	R	Left bank heated oxygen sensor (front) <For California>	Y
Air inlet sensor	N	Left bank heated oxygen sensor (rear) <For California>	X
Camshaft position sensor	G	Manifold differential pressure sensor	D
Crankshaft position sensor	H	Output shaft speed sensor	R
Engine coolant temperature sensor (for engine control)	C	Outside air temperature sensor	J
Front impact sensor (L.H.) <SRS>	I	Reed switch	L
Front impact sensor (R.H.) <SRS>	K	Right bank heated oxygen sensor (front) <For California>	P
Fuel tank differential pressure sensor <For California>	U	Righth bank heated oxygen sensor (rear) <For California>	Q
Geomagnetic sensor (built into multi meter)	M	Speed sensor (front) <ABS>	Z
G sensor <ABS>	O	Speed sensor (rear) <ABS>	V
Heated oxygen sensor (front) <For Federal>	S	Throttle position sensor	B
Heated oxygen sensor (rear) <For Federal>	T	Vehicle speed sensor	W
Input shaft speed sensor	R	Volume air flow sensor (with built-in intake air temperature sensor and barometric pressure sensor)	A
Intake air temperature sensor	N		

NOTE
The "Name" column is arranged in alphabetical order.



00007105

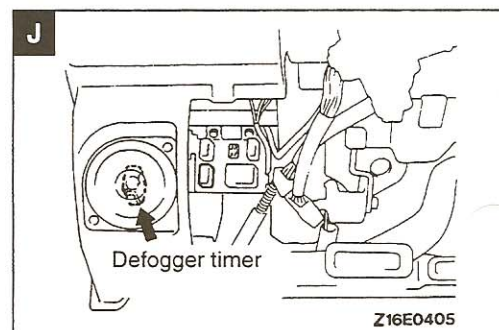
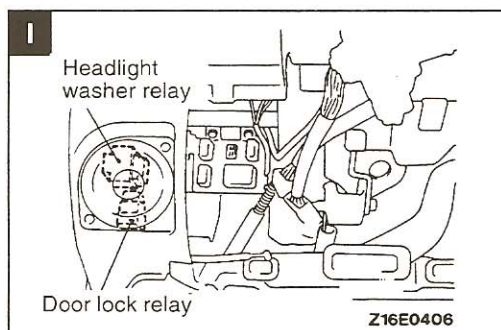
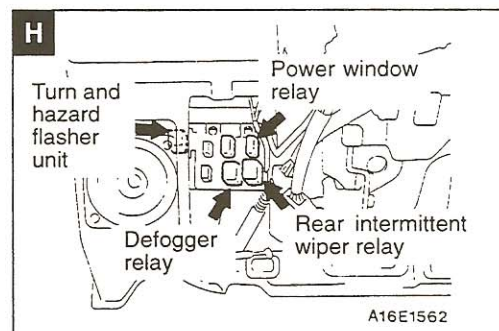
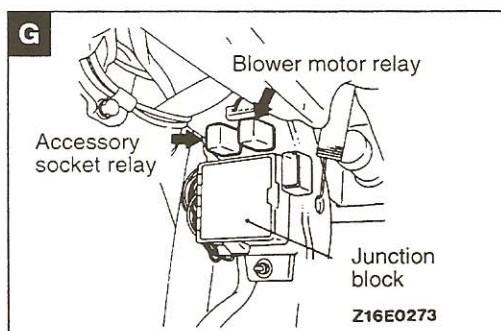
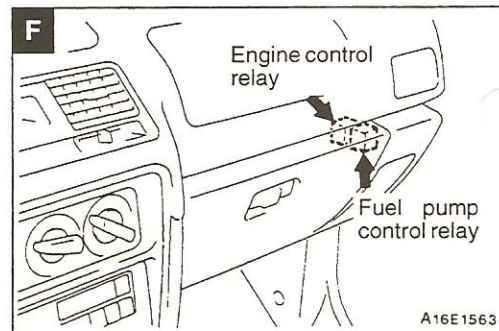
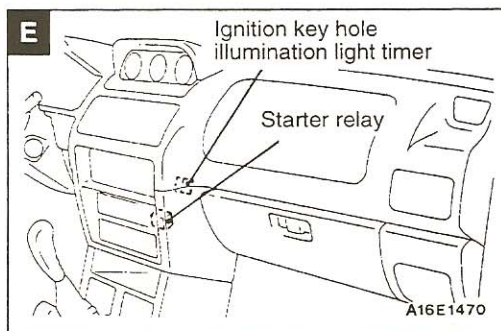
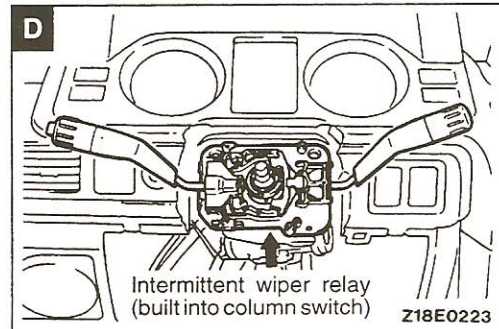
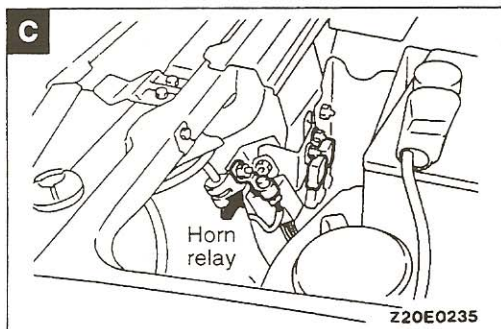
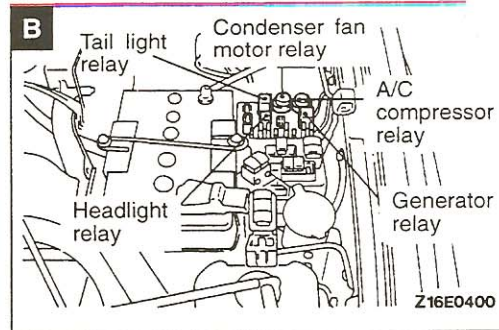
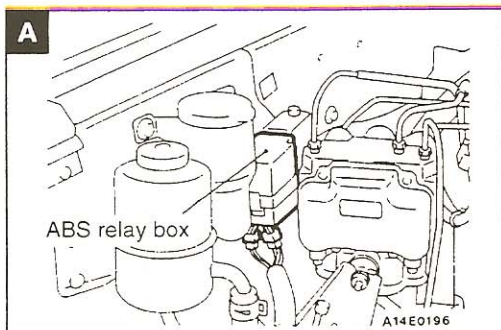
TSB Revision

K

Power seat
relay box



Z19E0133

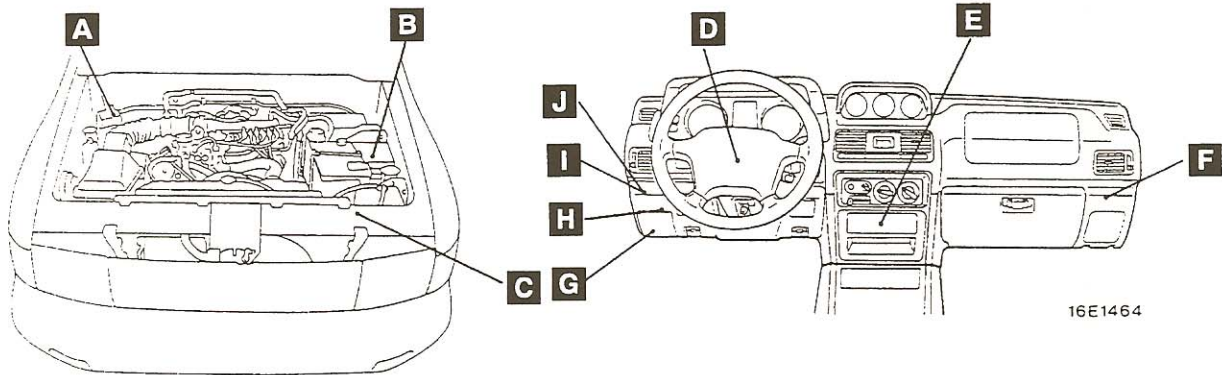


RELAY LOCATION

70100040373

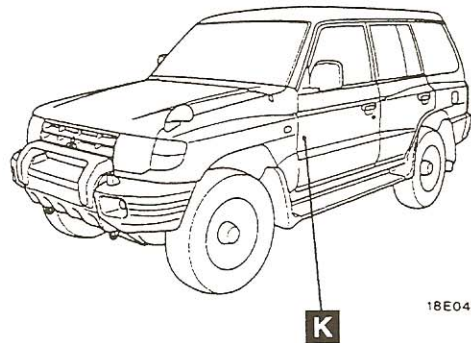
Name	Symbol	Name	Symbol
ABS relay box (with built-in motor relay and valve relay)	A	Headlight relay	B
A/C compressor relay	B	Headlight washer relay	I
Accessory socket relay	G	Horn relay	C
Blower motor relay	G	Ignition key hole illumination light timer	E
Condenser fan motor relay	B	Intermittent wiper relay (rear wiper)	H
Defogger relay	H	Intermittent wiper relay (windshield wiper)	D
Defogger timer	J	Power seat relay box	K
Door lock relay	I	Power window relay	H
Engine control relay	F	Starter relay	E
Fuel pump control relay	F	Tail light relay	B
Generator relay	B	Turn and hazard flasher unit	H

NOTE
The "Name" column is arranged in alphabetical order.



16E1645

16E1464



18E0470

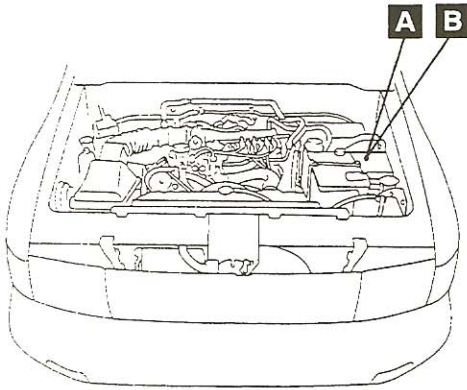
00007104

TSB Revision

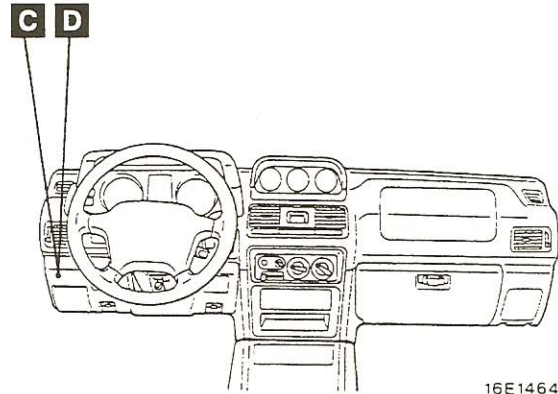
FUSIBLE LINK, FUSE AND IOD OR STORAGE CONNECTOR LOCATION

701000:

Name	Symbol	Name	Symbol
Dedicated fuse No. 2, 3, 5, 7 and 8	B	IOD or storage connector	B
Dedicated fuse No. 9 and 10	D	Multi-purpose fuse	C
Fusible link	A		

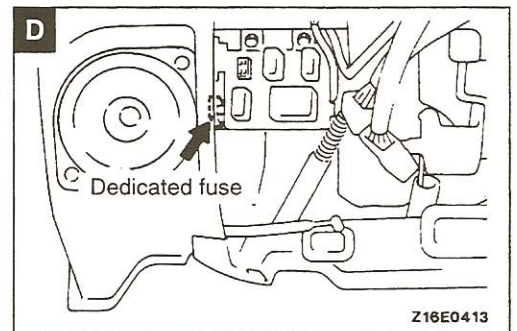
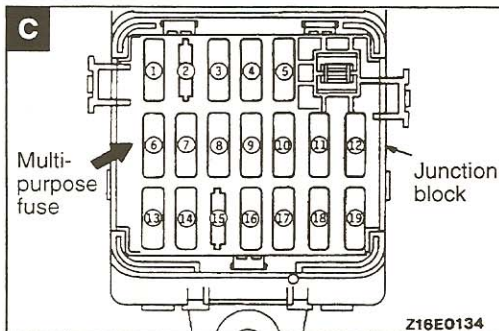
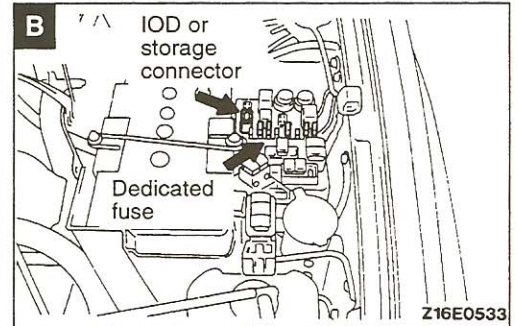
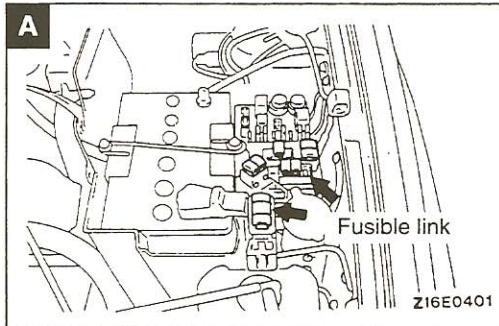


16E1645



16E1464

00007101

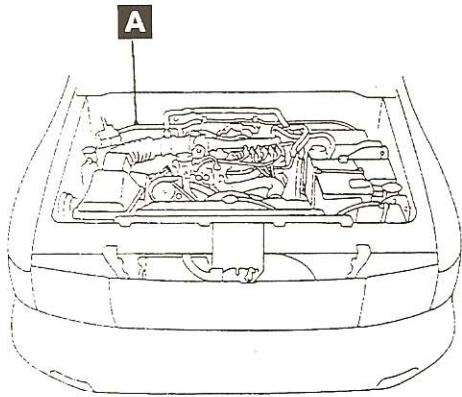


INSPECTION TERMINAL LOCATION

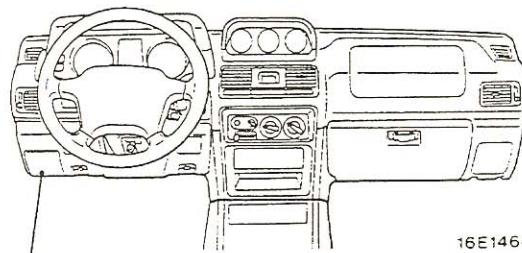
70100020360

Name	Symbol	Name	Symbol
Data link connector	B	Fuel pump check connector	A
Engine speed detection connector	A	Ignition timing adjustment connector	A

NOTE
The "Name" column is arranged in alphabetical order.



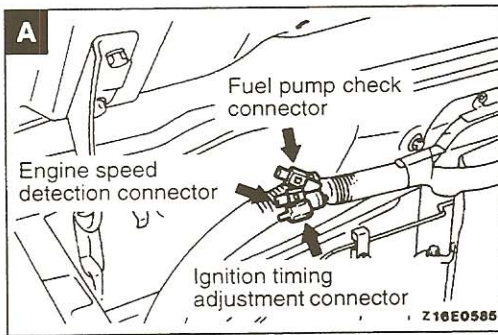
16E1645



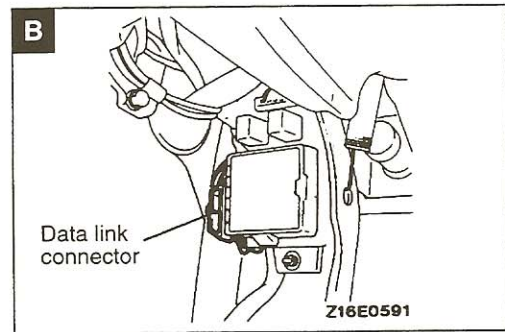
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B

00007102



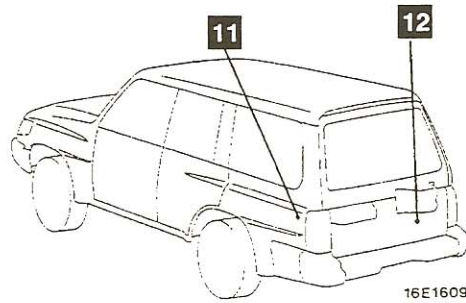
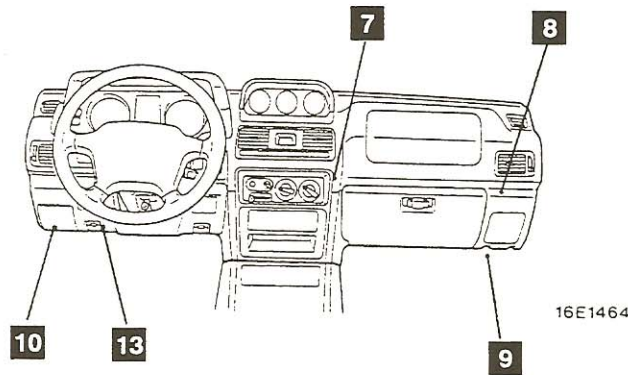
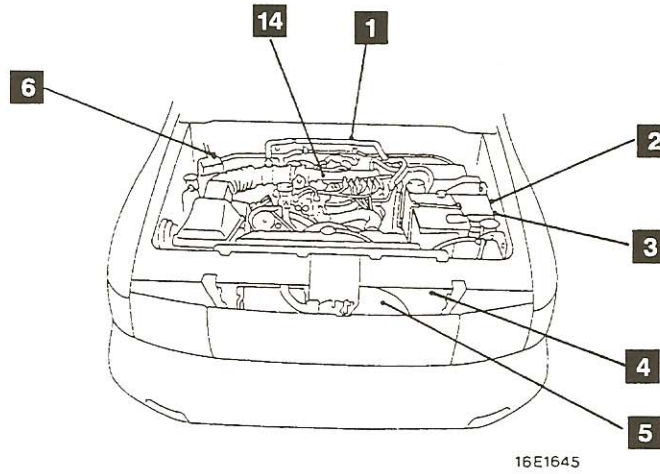
Z16E0586



Z16E0591

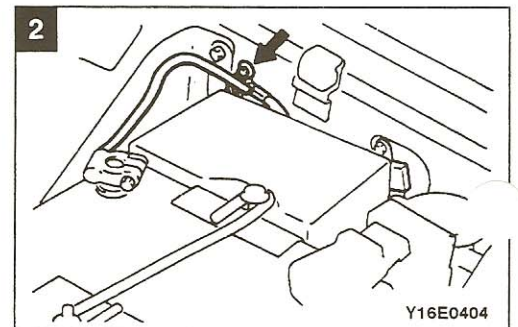
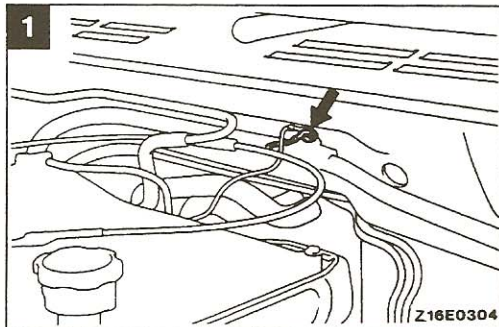
GROUNDING LOCATION

70100030304

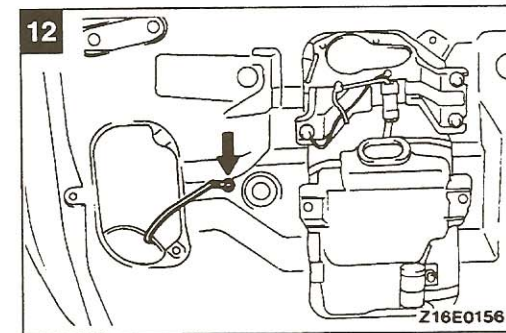
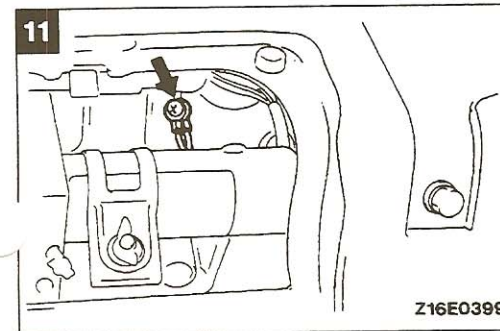
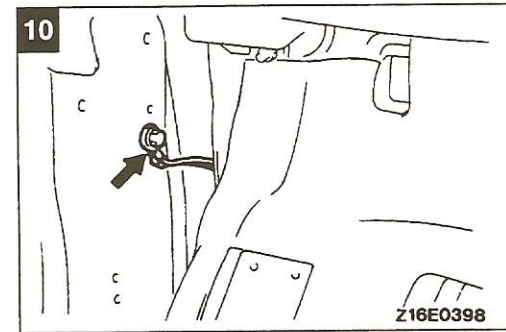
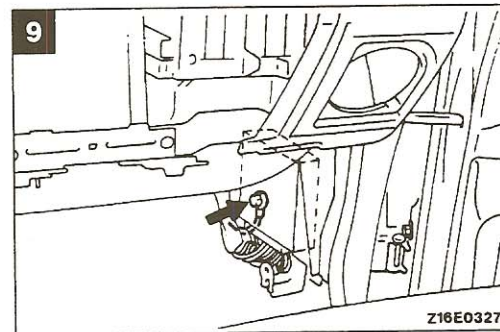
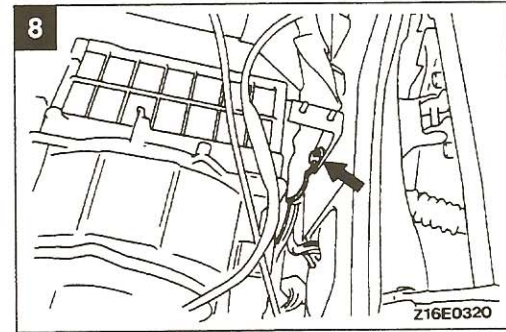
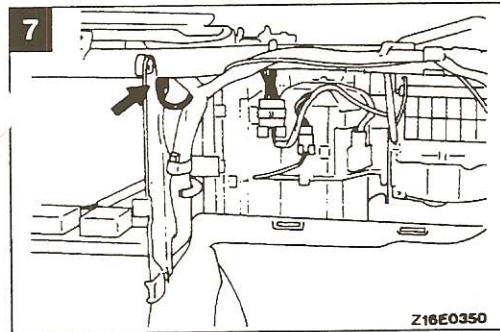
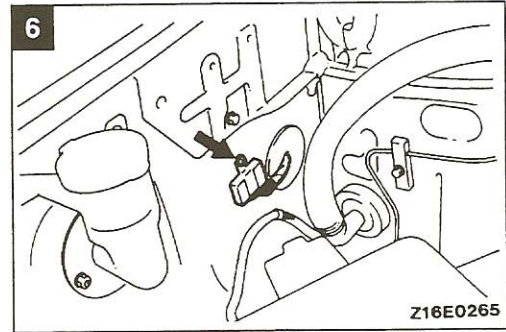
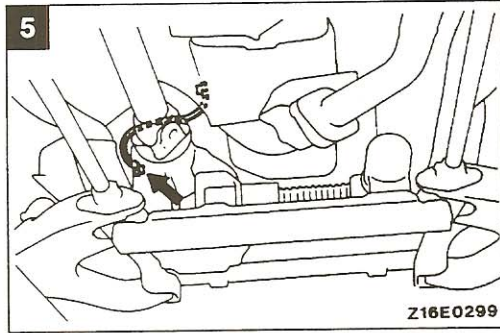
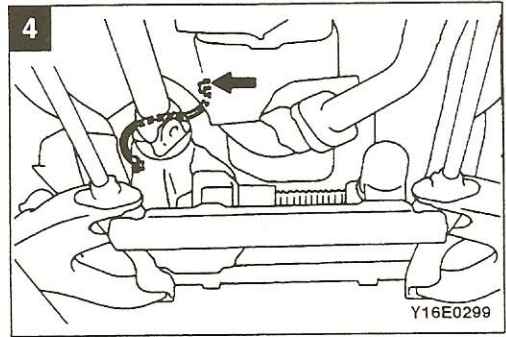
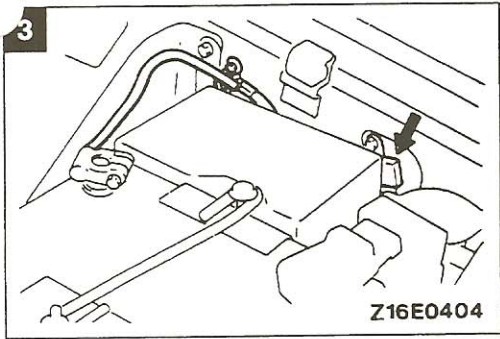


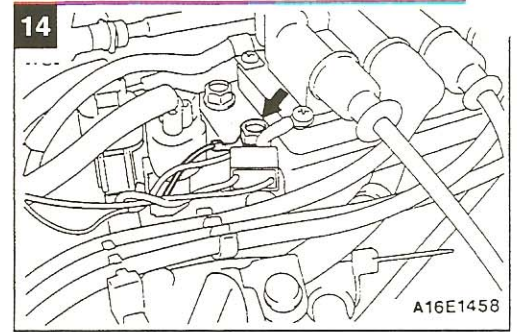
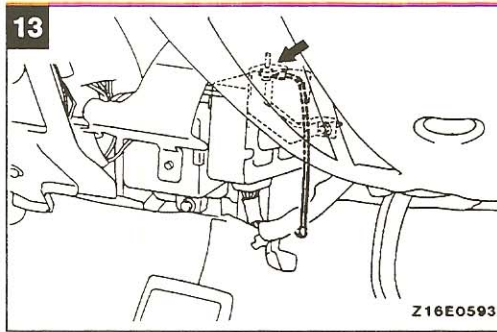
NOTE
Same ground numbers are used in the circuit diagram.

00007103



TSB Revision





CONFIGURATION DIAGRAMS

CONTENTS

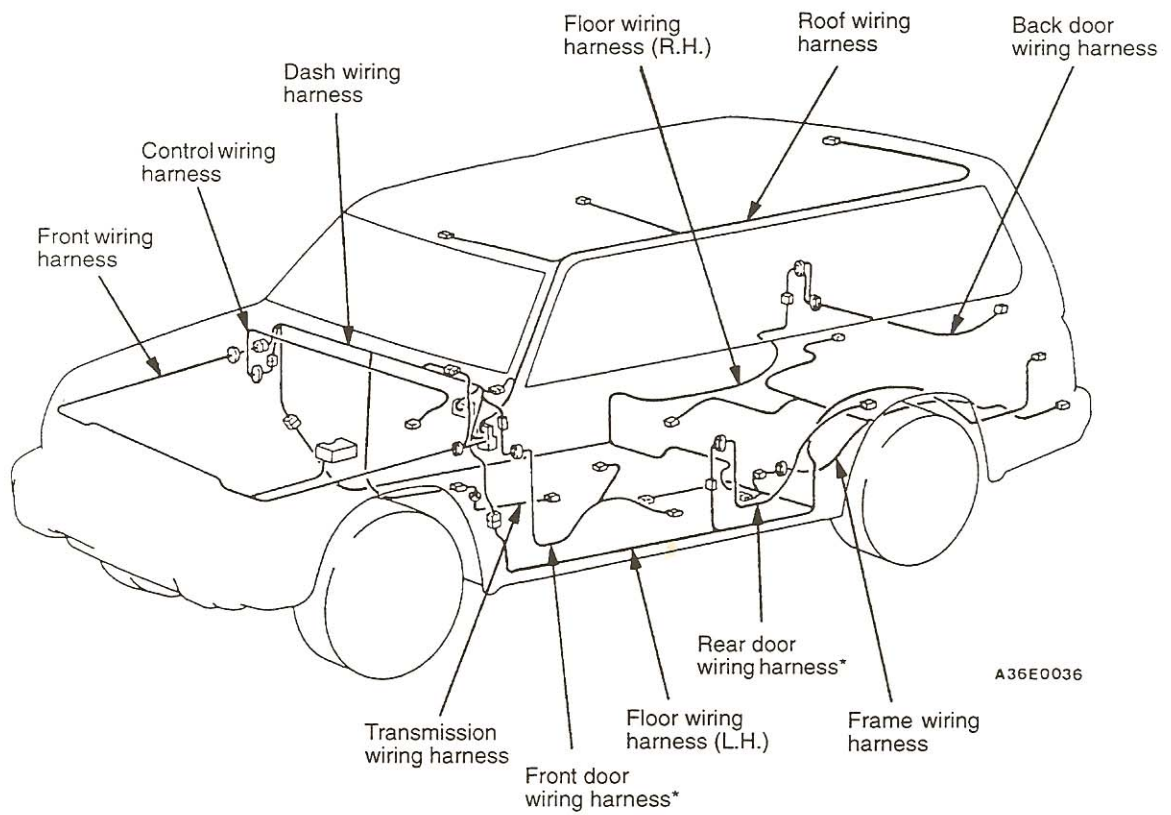
80109000401

Back Door and Rear Under Floor	17	Overall Configuration Diagram	2
Dash Panel	10	Transmission	8
Door	16		
Engine Compartment	4		
Floor and Roof	15		
How to Read Configuration Diagrams	3		
Instrument Panel and Floor Console	14		



OVERALL CONFIGURATION DIAGRAM

80100010000



Remarks

- (1) This diagram shows the main wiring harnesses.
- (2) *: also equipped at the right side.

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HOW TO READ CONFIGURATION DIAGRAMS

The wiring harness diagrams clearly show the connector locations and harness routings at each site on actual vehicles.

Denotes connector No.
 The same connector No. is used throughout the circuit diagrams to facilitate connector location searches.
 The first alphabetical symbol indicates the location site of the connector and a number that follows is the unique number.
 Numbers are assigned to parts in clockwise order on the diagram.

Example: A-12

Number specific to connector (serial number)

Connector location site symbol

- A: Engine compartment
- B: Dash panel
- C: Steering column
- D: Instrument panel

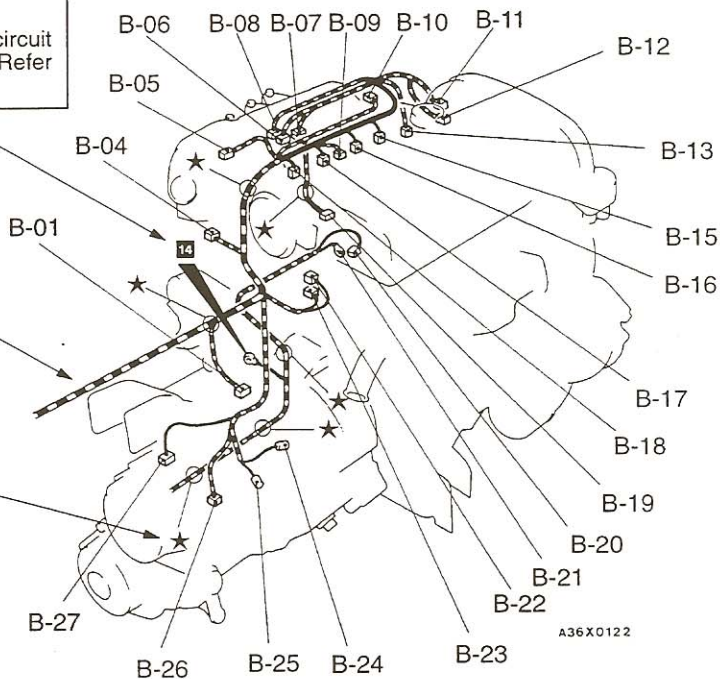
- E: Interior
- F: Luggage compartment
- G: Door

Denotes ground point.
 Same ground number is used throughout circuit diagrams to facilitate search of ground point. Refer to GROUNDING LOCATION.

Denotes a section covered by a corrugated tube.

The mark ★ shows the standard mounting position of wiring harness.

Indicates the device to which the connector is connected.



- | | | | |
|------------|--------------------------|-------------|------------------------------|
| B-01 (3-B) | Vehicle speed sensor | B-16 (2-GR) | Injector No. 2 |
| B-02 (6) | Distributor assembly | B-17 (2-GR) | Injector No. 3 |
| B-03 (2) | Distributor assembly | B-18 (2-GR) | Injector No. 4 |
| B-04 (6-B) | Idle air control motor | B-19 (4) | Heated oxygen sensor (front) |
| B-05 (4-B) | Throttle position sensor | B-20 (1-BR) | Starter motor |

*Denotes connector No. and connector color (except milk white) to facilitate connector identification

Example: (2-B)

Connector color (milk white if no color is indicated)

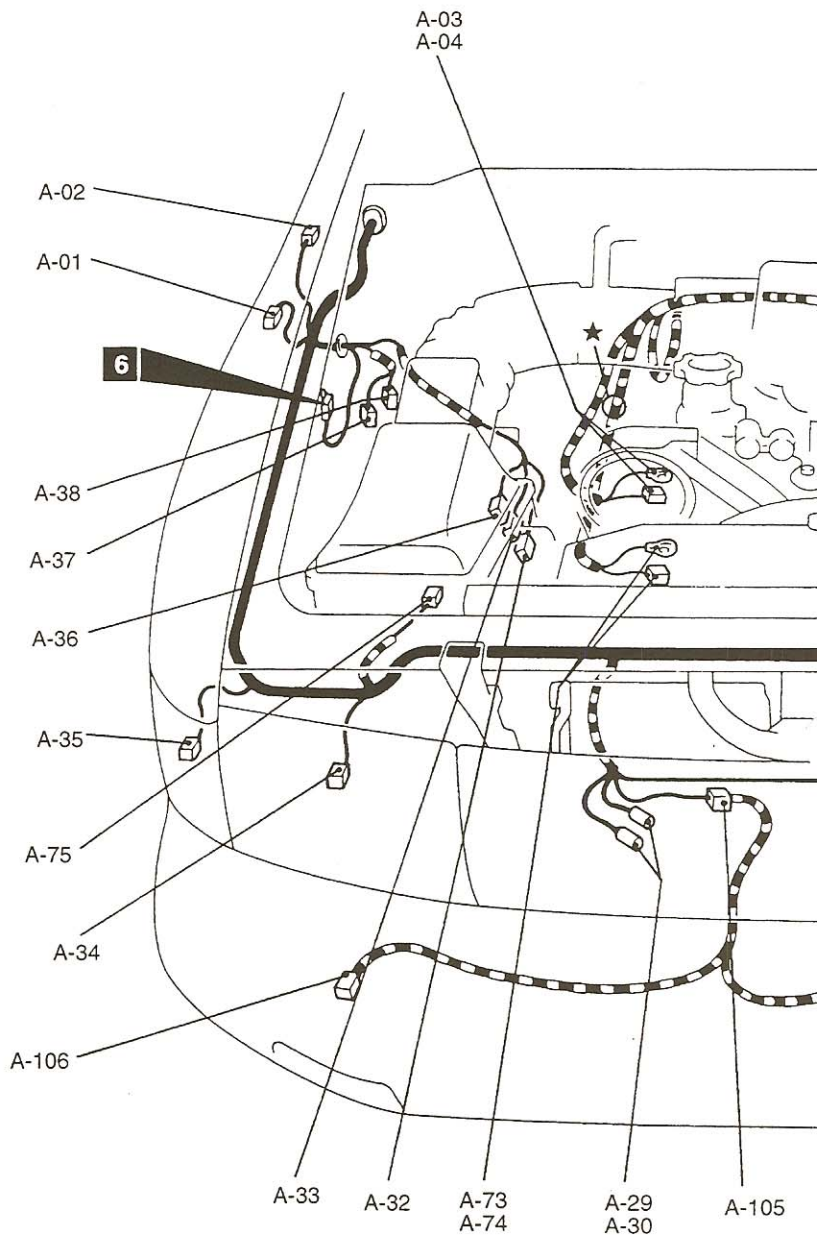
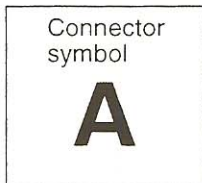
Number of connector pins

*: Typical connector colors

- B : Black
- Y : Yellow
- L : Blue
- G : Green
- R : Red
- BR : Brown
- V : Violet
- O : Orange
- GR : Gray

ENGINE COMPARTMENT

80100031100



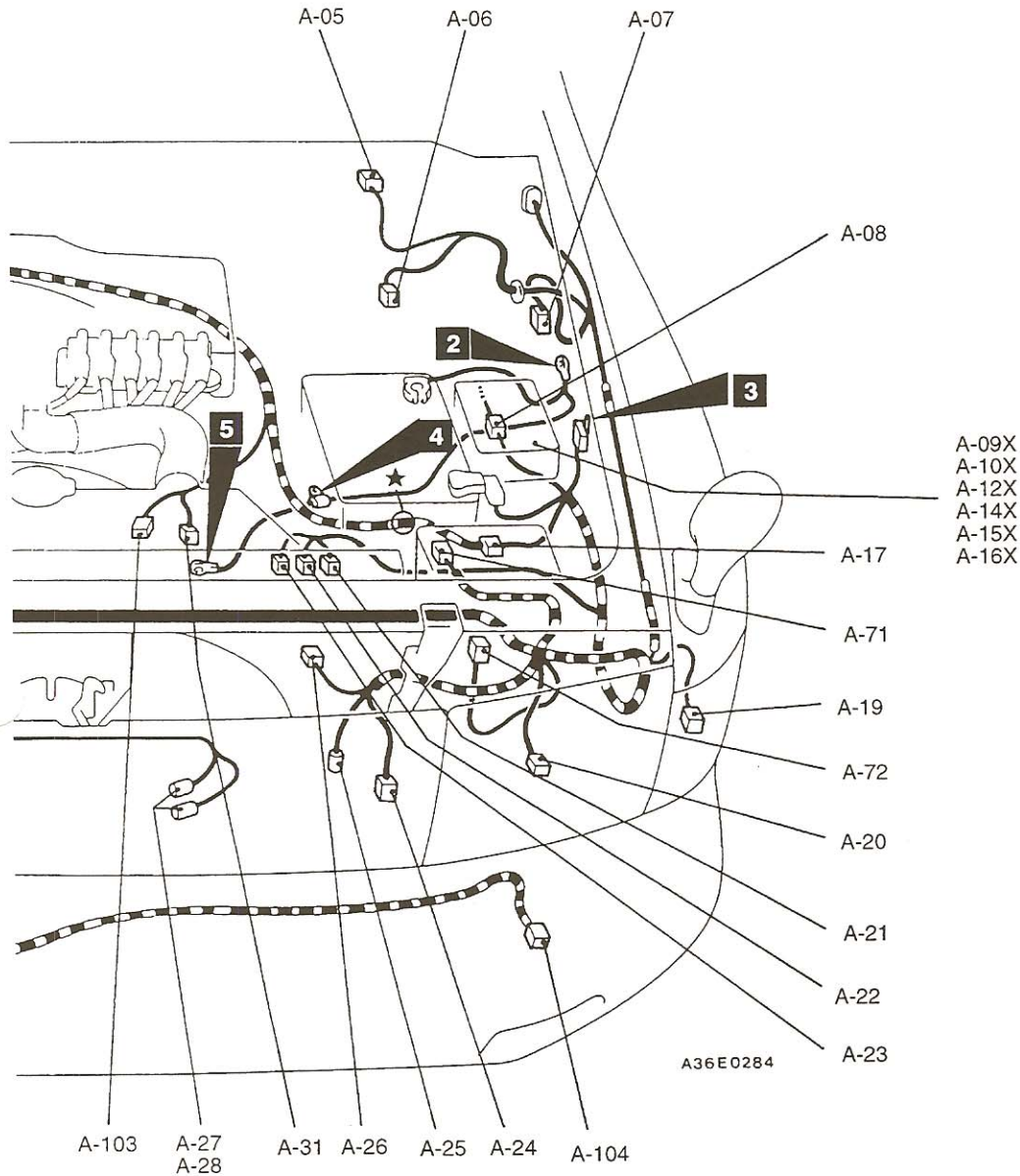
Connector color code

- B : Black
- Y : Yellow
- L : Blue
- G : Green
- R : Red
- BR : Brown
- V : Violet
- O : Orange
- GR : Gray

- A-01 (2-B) Headlight washer motor
- A-02 (2-B) Motor antenna
- A-03 (1) Starter
- A-04 (1-B) Starter
- A-05 (4-B) Windshield wiper motor
- A-06 (2-B) Brake fluid level switch
- A-07 (2-G) Windshield washer motor
- A-08 (12-B) Front wiring harness and control wiring harness combination
- A-09X (4) IOD or storage connector
- A-10X (4) Headlight relay
- A-12X (4) Generator relay
- A-14X (4) Tail light relay

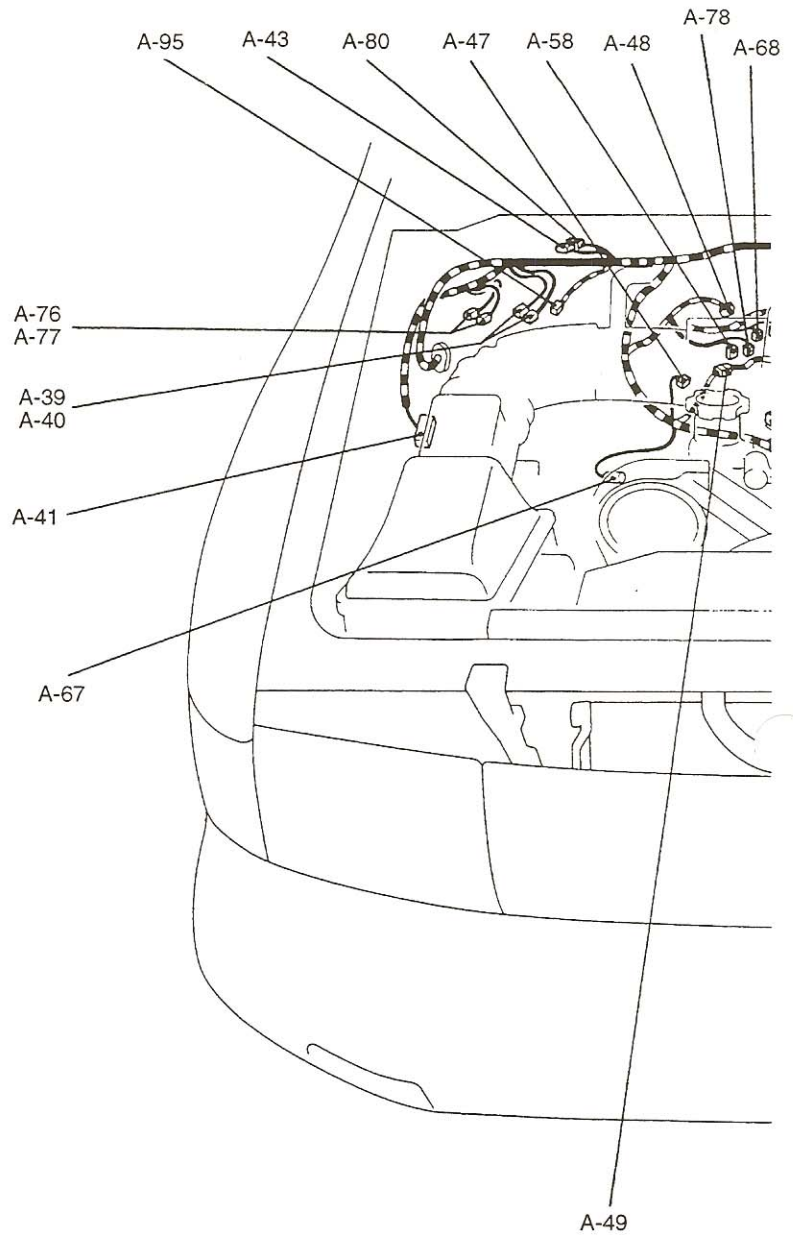
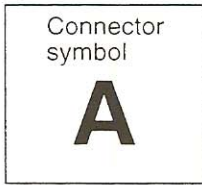
- A-15X (4) Condenser fan motor relay
- A-16X (4) A/C compressor clutch relay
- A-17 (4-B) Positive battery cable and front wiring harness combination
- A-19 (3-B) Front combination light (L.H.)
- A-20 (3-B) Headlight (L.H.)
- A-21 (2-B) Speed sensor (Front: L.H.) <ABS>
- A-22 (4-B) Shock absorber (Front: L.H.) <Remote controlled variable shock absorber>
- A-23 (1-B) Magnetic clutch <A/C>
- A-24 (2-B) Outside temperature sensor <Multi-meter>

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- | | | | |
|-------------|---|-------------|---|
| A-25 (2-BR) | Dual pressure switch <A/C> | A-36 (2-GY) | Free wheel engage switch |
| A-26 (2-B) | Condenser fan motor <A/C> | A-37 (2-B) | Solenoid valve A |
| A-27 (1) | Horn (LO) | A-38 (2-B) | Solenoid valve B |
| A-28 (1) | Horn (LO) | A-71 (2-R) | Front impact sensor (L.H.) |
| A-29 (1) | Horn (HI) | A-72 (4-B) | Horn relay |
| A-30 (1) | Horn (HI) | A-73 (2-B) | Generator |
| A-31 (1-B) | Oil pressure switch | A-74 (1) | Generator |
| A-32 (2-B) | Speed sensor (Front: R.H.) <ABS> | A-75 (2-R) | Front impact sensor (R.H.) |
| A-33 (4-B) | Shock absorber (Front: R.H.)
<Remote controlled variable shock absorber> | A-103 (1-B) | No connection |
| A-34 (3-B) | Headlight (R.H.) | A-104 (2-B) | Fog light (LH) |
| A-35 (3-B) | Front combination light (R.H.) | A-105 (4-B) | Front wiring harness and fog light wiring harness combination |
| | | A-106 (2-B) | Fog light (RH) |

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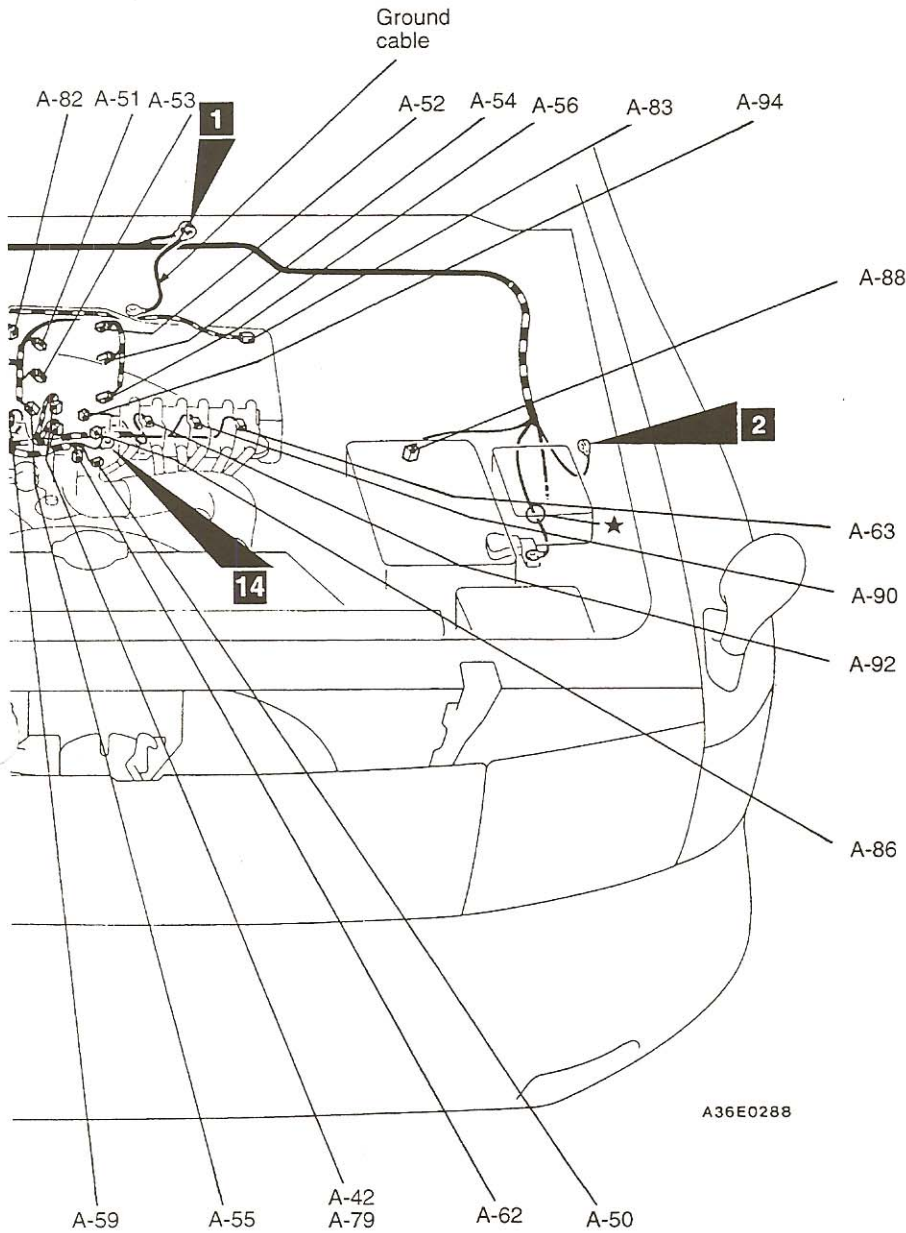
Connector color code

- B : Black
- Y : Yellow
- L : Blue
- G : Green
- R : Red
- BR : Brown
- V : Violet
- O : Orange
- GR : Gray

- A-39 (6-B) Hydraulic unit <ABS>
- A-40 (2-B) Hydraulic unit <ABS>
- A-41 (8-B) Volume air flow sensor (with built-in intake air temperature sensor and barometric pressure sensor)
- A-42 (6-B) Ignition power transistor
- A-43 (1-B) Fuel pump check connector
- A-47 (6-B) Idle air control motor
- A-48 (4-B) Throttle position sensor
- A-49 (8-B) Control wiring harness and injection wiring harness combination
- A-50 (2-B) Capacitor

- A-51 (2-GR) Injector No. 5
- A-52 (2-GR) Injector No. 6
- A-53 (2-GR) Injector No. 3
- A-54 (2-GR) Injector No. 4
- A-55 (2-GR) Injector No. 1
- A-56 (2-GR) Injector No. 2
- A-58 (2-B) Evaporative emission purge solenoid
- A-59 (1-B) Engine coolant temperature gauge unit
- A-62 (2-B) Engine coolant temperature sensor
- A-63 (2-B) Ignition coil

TSB Revision



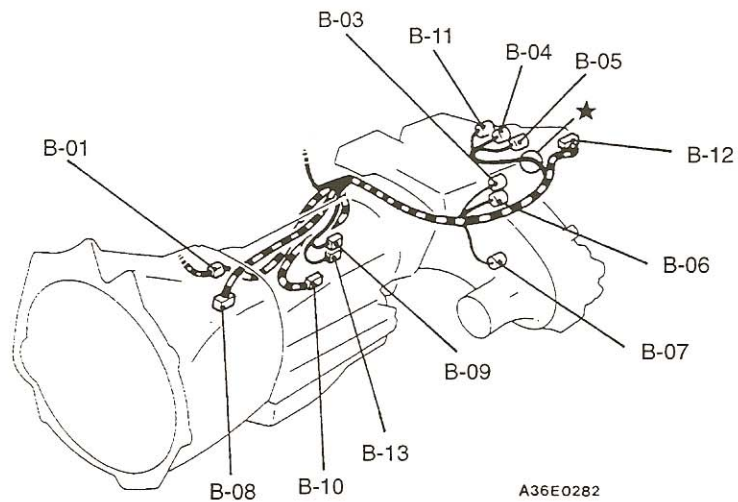
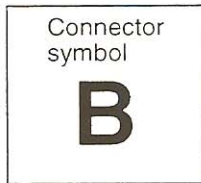
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|-------------|--|-------------|--|
| A-67 (1) | Power steering pressure switch | A-83 (3-B) | Manifold differential pressure sensor
<for Federal> |
| A-68 (4-B) | Right bank heated oxygen sensor
(front)
<for California> | A-86 (3-B) | Crankshaft position sensor |
| A-76 (2-B) | ABS relay box | A-88 (2-B) | Evaporative emission ventilation solenoid |
| A-77 (8-B) | ABS relay box | A-90 (2-B) | Ignition coil |
| A-78 (2-BR) | EGR solenoid | A-92 (2-B) | Ignition coil |
| A-79 (3-B) | Ignition power transistor | A-94 (3-GR) | Camshaft position sensor |
| A-80 (1-L) | Engine speed detection connector | A-95 (4-B) | Cruise control actuator |
| A-82 (4-GR) | Left bank heated oxygen sensor (front)
<for California> | | |

TSB Revision

TRANSMISSION

8010005000



Connector color code

B : Black
 Y : Yellow
 L : Blue
 G : Green
 R : Red
 BR : Brown
 V : Violet
 O : Orange
 GR : Gray

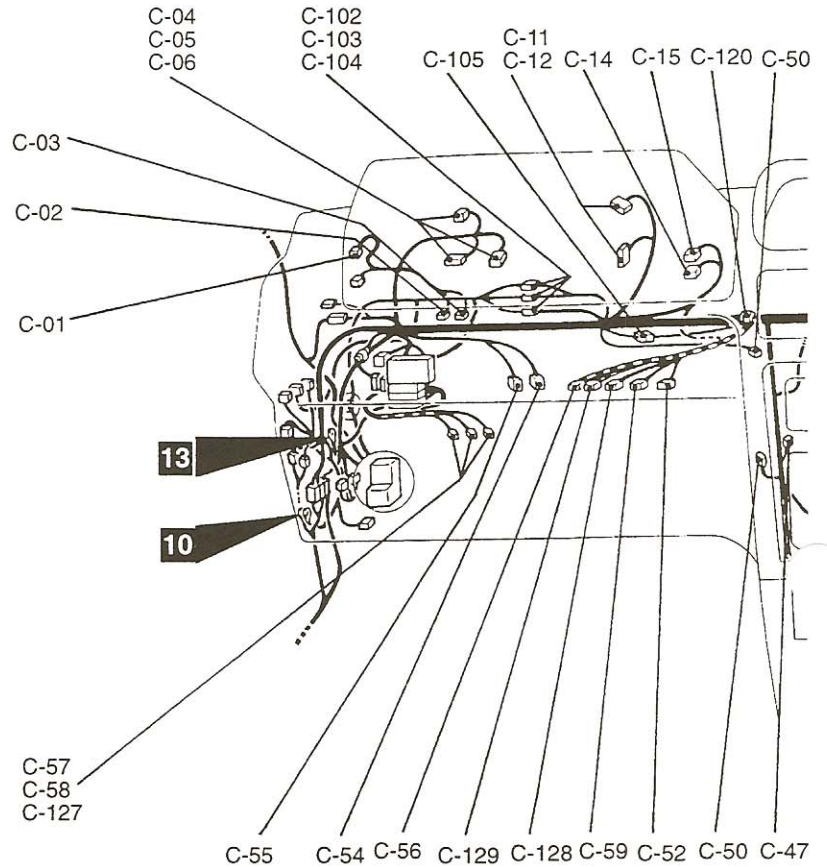
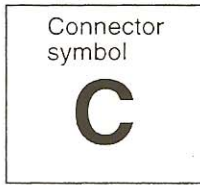
B-01 (1-B)	Battery cable and transmission wiring harness combination	B-09 (4-B)	Left bank heated oxygen sensor (rear) <for California> or heated oxygen sensor (front) <for Federal>
B-03 (1-BR)	Center differential lock detection switch	B-10 (10-B)	ELC 4-speed automatic transmission control solenoid
B-04 (1-BR)	Center differential lock operation detection switch	B-11 (1)	Low range operation detection switch
B-05 (1-B)	4WD operation detection switch	B-12 (3-B)	Vehicle speed sensor
B-06 (1-B)	2WD/4WD detection switch	B-13 (4-GR)	Right bank heated oxygen sensor (rear) <for California> or heated oxygen sensor (rear) <for Federal>
B-07 (1)	High range/low range detection switch		
B-08 (10-B)	Park/neutral position switch		

TSB Revision

NOTES

DASH PANEL

80100060F54

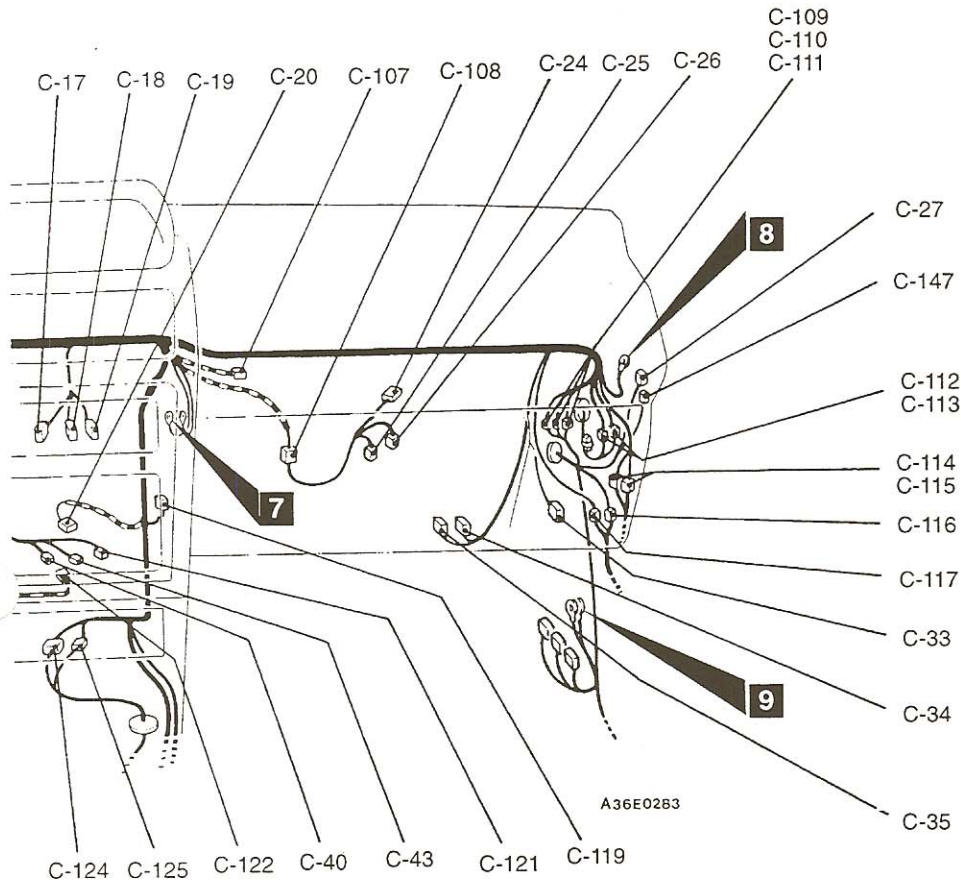


Connector color code

- B : Black
- Y : Yellow
- L : Blue
- G : Green
- R : Red
- BR : Brown
- V : Violet
- O : Orange
- GR : Gray

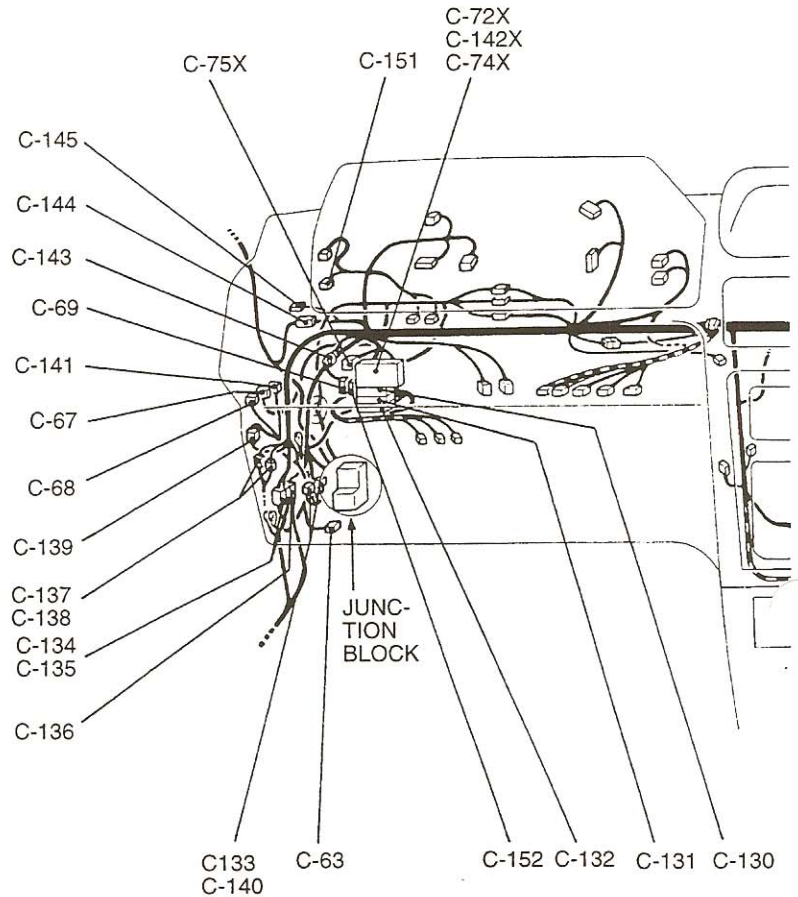
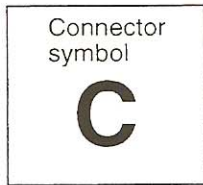
C-01 (8)	Cruise control main switch	C-27 (4)	Engine control relay
C-02 (9)	Remote controlled mirror switch	C-33 (2-B)	Front speaker (R.H.)
C-03 (3)	Rheostat	C-34 (4)	Resistor
C-04 (14)	Combination meter	C-35 (2)	Blower motor
C-05 (12)	Combination meter	C-40 (14)	Antenna motor-ECU
C-06 (2-B)	Combination meter	C-43 (10)	4WD indicator control unit
C-11 (14-B)	Combination meter	C-47 (10-L)	Buzzer assembly
C-12 (12-B)	Combination meter	C-50 (26-Y)	Auto-cruise control unit
C-14 (6-Y)	Defogger switch	C-52 (2)	No connection
C-15 (10-G)	Hazard light switch	C-54 (2)	No connection
C-17 (4)	A/C switch	C-55 (4)	Stop light switch (4-pin)
C-18 (8)	Blower motor switch	C-56 (6-B)	Ignition switch
C-19 (2)	Heater control panel illumination light	C-57 (10)	Column switch
C-20 (14)	Radio	C-58 (6)	Column switch
C-24 (10)	A/C control unit	C-59 (7)	Key reminder switch
C-25 (2)	Intake air temperature sensor	C-102 (2-B)	Front wiring harness and dash wiring harness combination
C-26 (2)	Air inlet sensor	C-103 (8-B)	Front wiring harness and dash wiring harness combination

TSB Revision



C-104 (22-B)	Front wiring harness and dash wiring harness combination	C-114 (14)	Dash wiring harness and front door wiring harness (R.H.) combination
C-105 (1)	Jumper connector <ABS>	C-115 (16)	Dash wiring harness and front door wiring harness (R.H.) combination
C-106 (2)	No connection	C-116 (18-BR)	Control wiring harness and floor wiring harness (R.H.) combination
C-107 (2-R)	Air bag module (passenger's side)	C-117 (32-BR)	Control wiring harness and floor wiring harness (R.H.) combination
C-108 (8-L)	Dash wiring harness and A/C wiring harness combination	C-119 (4-G)	Ignition key hole illumination light timer
C-109 (8-L)	Control wiring harness and dash wiring harness combination	C-120 (4-L)	Diode (Out of use)
C-110 (22-L)	Control wiring harness and dash wiring harness combination	C-121 (1)	No connection
C-111 (8-L)	Control wiring harness and dash wiring harness combination	C-122 (21-Y)	SRS air bag control unit
C-112 (18-B)	Front wiring harness and dash wiring harness combination	C-124 (32)	Dash wiring harness and transmission wiring harness combination
C-113 (4-B)	Front wiring harness and dash wiring harness combination	C-125 (8)	Dash wiring harness and transmission wiring harness combination
		C-127 (12)	Column switch
		C-128 (3)	Clock spring
		C-129 (2-R)	Clock spring
		C-147 (4-B)	Fuel pump control relay

TSB Revision

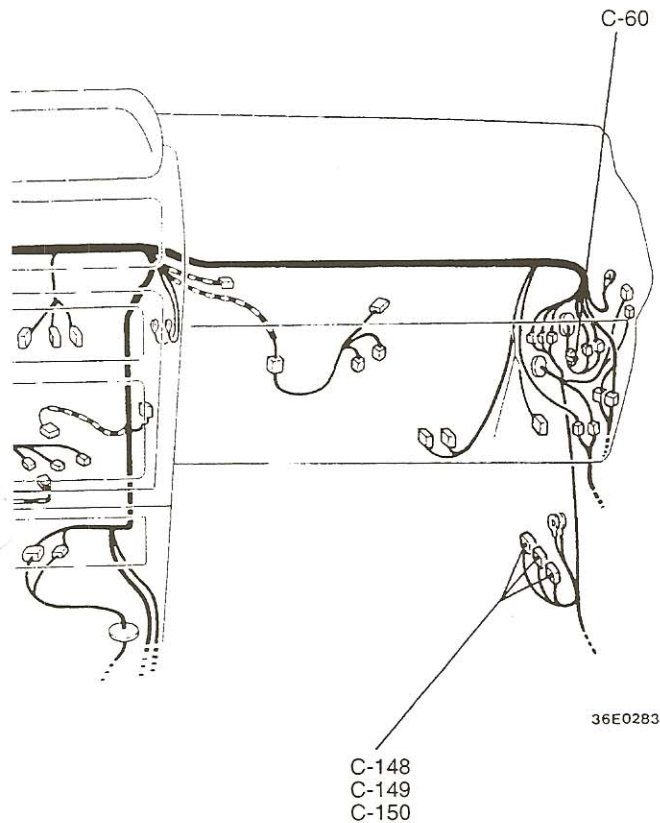


Connector color code

- B : Black
- Y : Yellow
- L : Blue
- G : Green
- R : Red
- BR : Brown
- V : Violet
- O : Orange
- GR : Gray

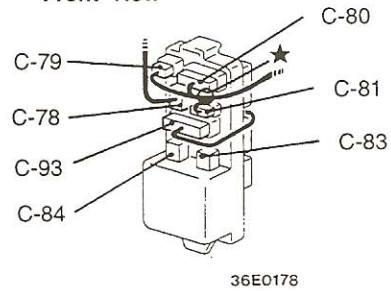
C-60 (2-B)	Diode (for Active Trac 4WD circuit)	C-95 (4)	Dash wiring harness and junction block
C-63 (2-B)	Front speaker (L.H.)	C-96 (16)	Dash wiring harness and junction block
C-67 (6-Y)	Headlight washer relay	C-97 (14)	Dash wiring harness and junction block
C-68 (6)	Defogger timer	C-98 (6)	Dash wiring harness and junction block
C-69 (2-L)	Dedicated fuse No.9 (Sunroof)	C-99 (16)	Data link connector
C-72X (4)	Power window relay	C-100 (10)	Dash wiring harness and junction block
C-74X (8)	Rear intermittent wiper relay	C-101 (8)	Dash wiring harness and junction block
C-75X (3)	Turn and hazard flasher unit	C-130 (33)	J/C (1)
C-78 (4)	Roof wiring harness and junction block	C-131 (33)	J/C (2)
C-79 (1)	Front wiring harness and junction block	C-132 (33)	J/C (3)
C-80 (8)	Front wiring harness and junction block	C-133 (26-Y)	ELC 4-speed automatic transmission control module
C-81 (4)	Front wiring harness and junction block		
C-83 (4)	Blower motor relay		
C-84 (4)	Accessory socket relay		
C-93 (16)	Dash wiring harness and junction block		
C-94 (12)	Dash wiring harness and junction block		

TSB Revision

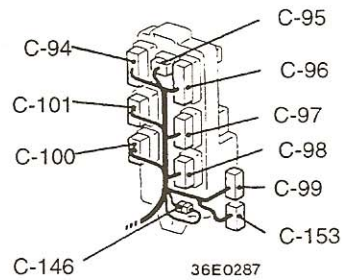


JUNCTION BLOCK

Front View



Rear View



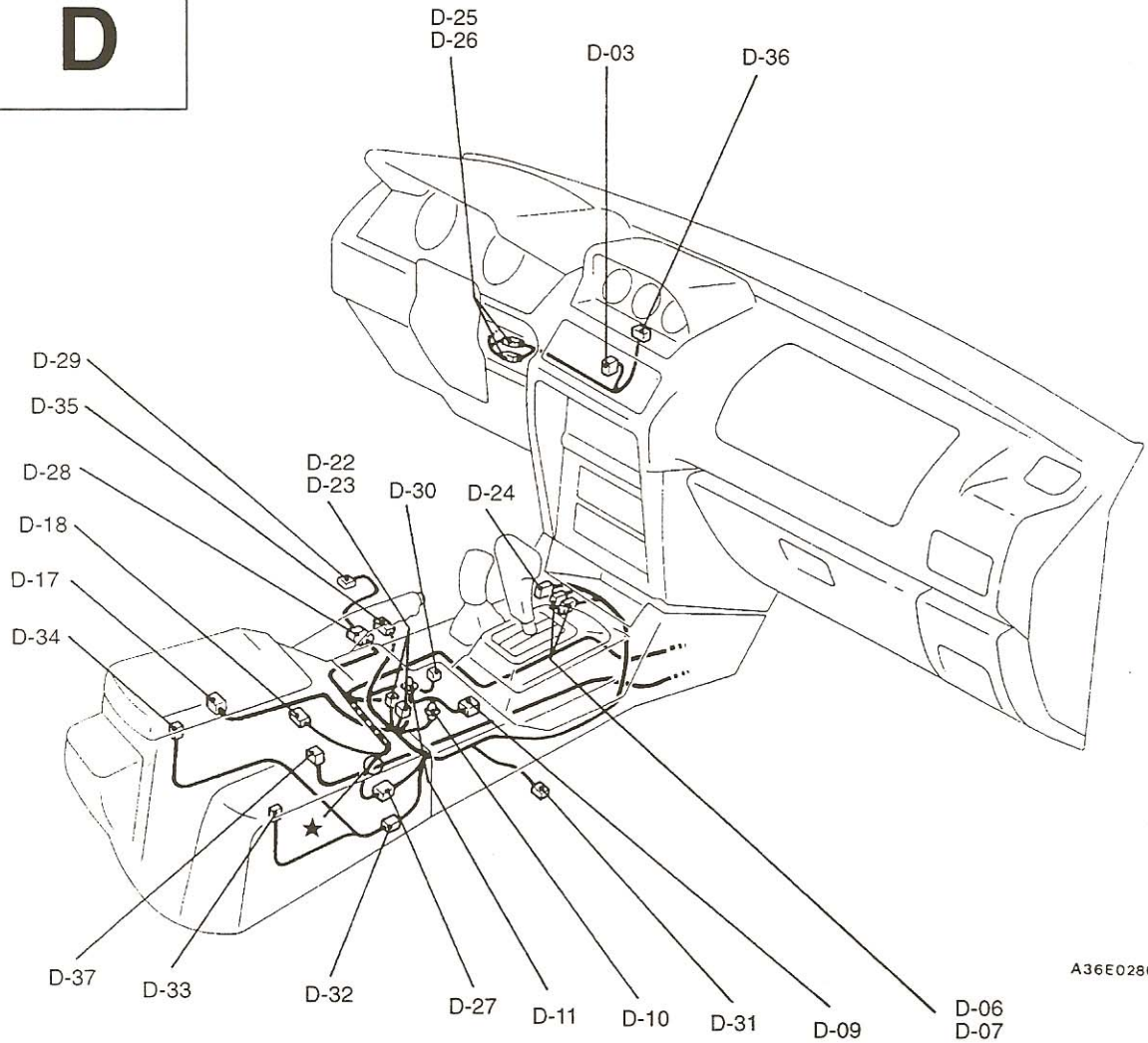
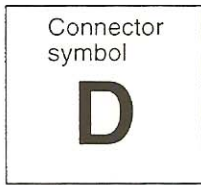
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|--------------|--|---------------|---|
| C-134 (22) | Dash wiring harness and floor wiring harness (L.H.) combination | C-141 (8) | Door lock control unit |
| C-135 (2) | Dash wiring harness and floor wiring harness (L.H.) combination | C-142X (5) | Defogger relay |
| C-136 (32) | Dash wiring harness and floor wiring harness (L.H.) combination | C-143 (2) | Diode (for Door light circuit) |
| C-137 (14-B) | Dash wiring harness and front door wiring harness (L.H.) combination | C-144 (4) | Roof wiring harness and dash wiring harness combination |
| C-138 (16-B) | Dash wiring harness and front door wiring harness (L.H.) combination | C-145 (1) | No connection |
| C-139 (8-L) | Door lock relay jumper connector | C-146 (3) | Jumper connector |
| C-140 (16-Y) | ELC 4-speed automatic transmission control module | C-148 (35-GR) | Engine control module |
| | | C-149 (28-GR) | Engine control module |
| | | C-150 (30-GR) | Engine control module |
| | | C-151 (6) | Fog light switch |
| | | C-152 (2-L) | Dedicated fuse No. 10 (Fog light) |
| | | C-153 (12) | Data link connector |

TSB Revision

INSTRUMENT PANEL AND FLOOR CONSOLE

80100080176

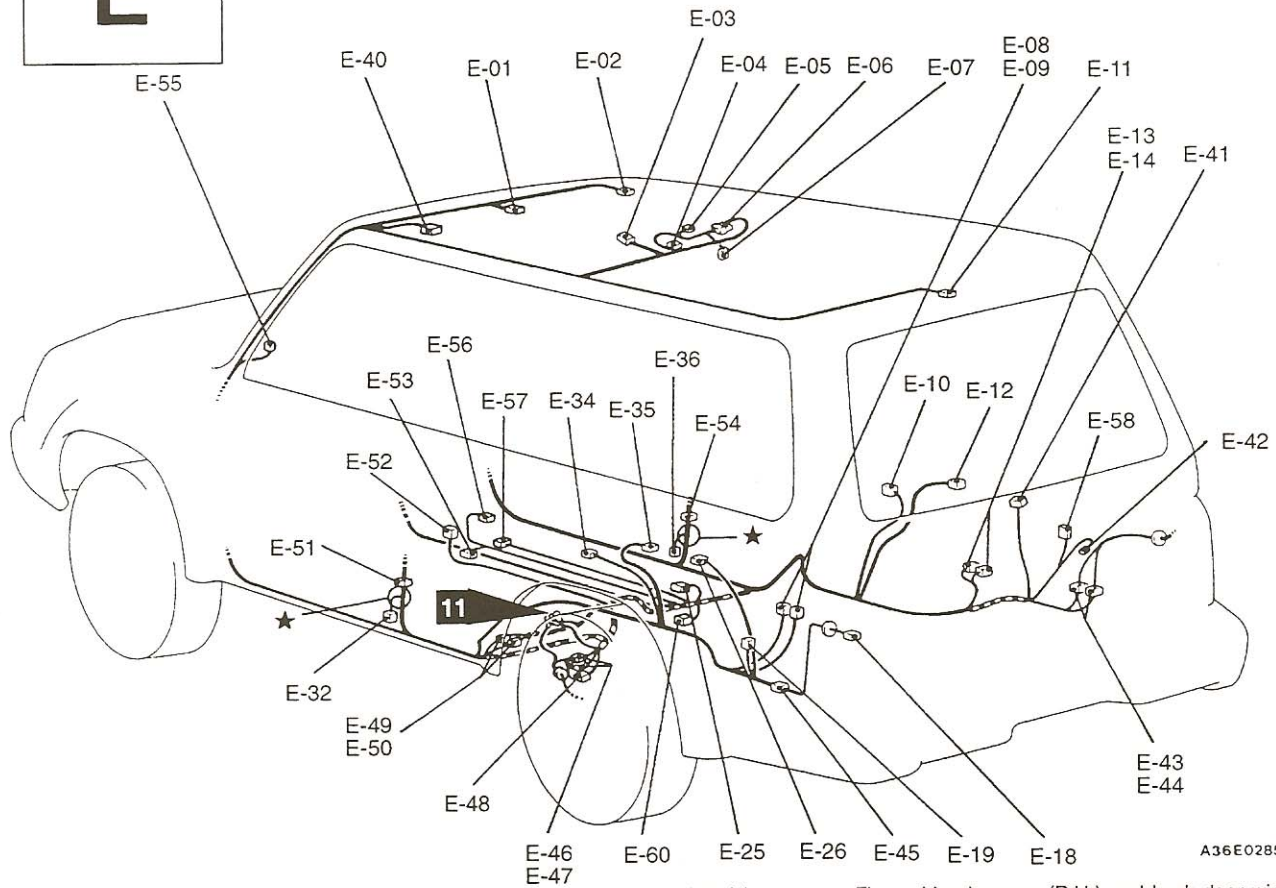
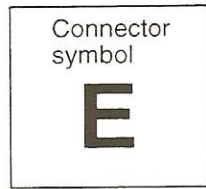


D-03 (4)	Clock	D-28 (2)	Power seat wiring harness and dash wiring harness combination
D-06 (1)	Accessory socket	D-29 (6-B)	Front seat assembly <Power seat>
D-07 (1-B)	Accessory socket	D-30 (8-L)	Pattern select switch <ELC 4-speed automatic transmission>
D-09 (6)	Overdrive switch	D-31 (4-B)	Front seat assembly (passenger's side) <HEATED SEAT>
D-10 (2)	Ashtray illumination light	D-32 (10)	Console wiring harness and rear console wiring harness combination
D-11 (2)	Cigarette lighter illumination light	D-33 (6)	Heated seat switch (passenger's side)
D-17 (2)	Seat belt switch	D-34 (6)	Heated seat switch (driver's side)
D-18 (1)	Parking brake switch	D-35 (4-B)	Front seat assembly (driver's side) <HEATED SEAT>
D-22 (1)	Cigarette lighter	D-36 (14)	Multi-meter <With electronic compass.
D-23 (1-B)	Cigarette lighter	D-37 (6-B)	No connection
D-24 (6)	Rear differential lock switch		
D-25 (6)	Dash wiring harness and instrument panel wiring harness combination		
D-26 (8)	Dash wiring harness and instrument panel wiring harness combination		
D-27 (18)	Dash wiring harness and console wiring harness combination		

TSB Revision

FLOOR AND ROOF

80100090483



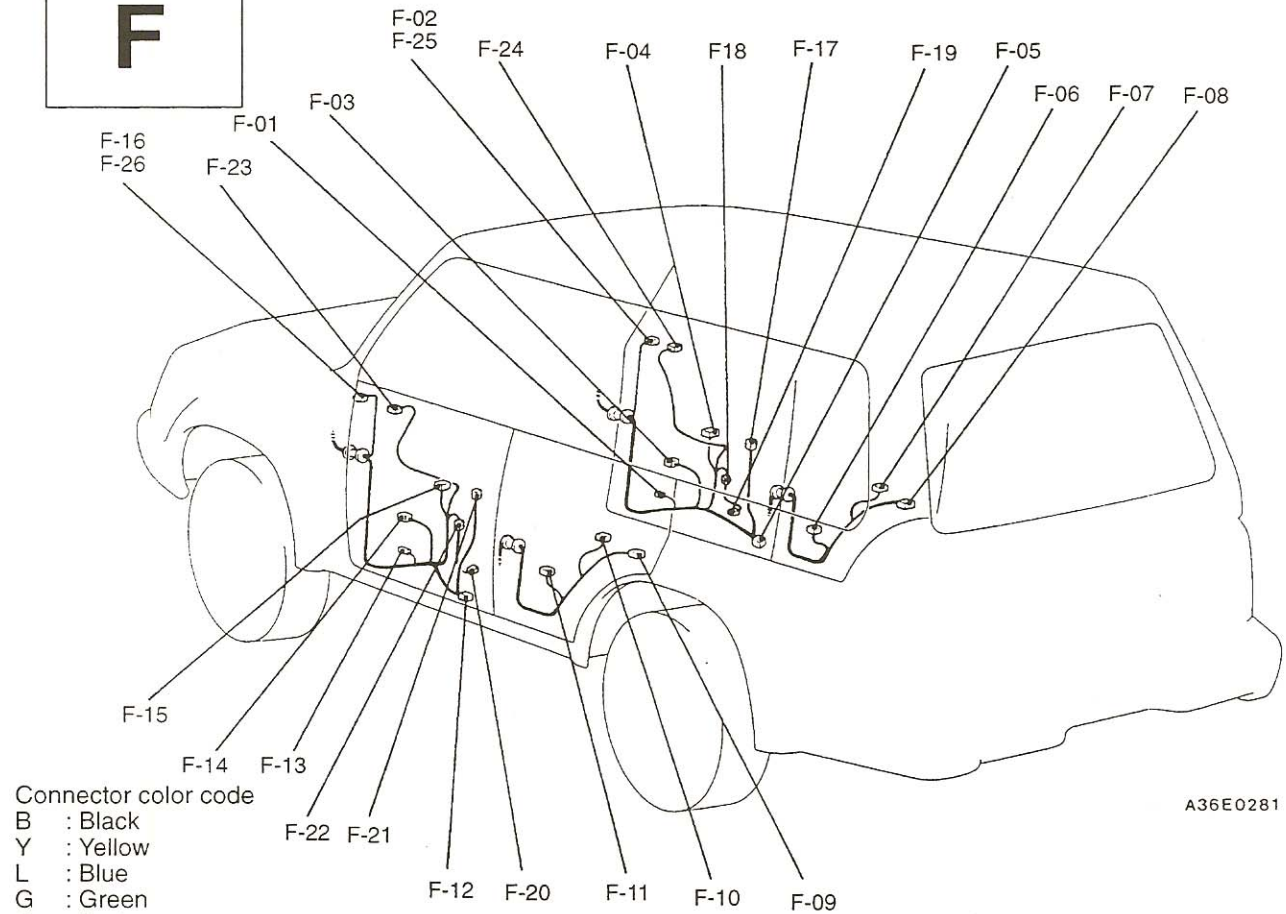
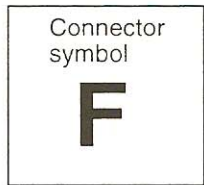
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E-01 (1)	Reading light	E-43 (1)	Floor wiring harness (R.H.) and back door wiring harness combination
E-02 (1)	Vanity mirror light (R.H.)	E-44 (14)	Floor wiring harness (R.H.) and back door wiring harness combination
E-03 (2)	Dome light	E-45 (6)	Floor wiring harness (L.H.) and rear combination light wiring harness combination
E-04 (8)	Sunroof control unit	E-46 (14)	Floor wiring harness (L.H.) and frame wiring harness combination
E-05 (4)	Sunroof motor	E-47 (8)	Floor wiring harness (L.H.) and frame wiring harness combination
E-06 (2-B)	Roof wiring harness and sunroof wiring harness combination	E-48 (4)	Floor wiring harness (R.H.) and frame wiring harness combination
E-07 (6)	Sunroof switch	E-49 (32)	Floor wiring harness (L.H.) and floor wiring harness (R.H.) combination
E-08 (1)	Accessory socket	E-50 (1)	Floor wiring harness (L.H.) and floor wiring harness (R.H.) combination
E-09 (1-B)	Accessory socket	E-51 (6)	Floor wiring harness (L.H.) and rear door wiring harness (L.H.) combination
E-10 (2)	Rear door switch (R.H.)	E-52 (8)	Shock absorber control switch
E-11 (3)	Cargo space light	E-53 (3-B)	G sensor <ABS>
E-12 (2-B)	Rear speaker (R.H.)	E-54 (6)	Floor wiring harness (R.H.) and rear door wiring harness (R.H.) combination
E-13 (26-Y)	ABS control unit	E-55 (1)	No connection
E-14 (22-Y)	ABS control unit	E-56 (20)	No connection <With amplifier>
E-18 (6-B)	Rear combination light (L.H.)	E-57 (18)	Amplifier
E-19 (7)	Variable shock absorber control unit	E-58 (18)	No connection
E-25 (2)	Rear differential lock air pump	E-60 (18)	No connection
E-26 (10)	Rear differential lock control unit		
E-32 (2)	Front door switch (L.H.)		
E-34 (2)	Rear door switch (L.H.)		
E-35 (2-B)	Rear speaker (L.H.)		
E-36 (2)	Front door switch (R.H.)		
E-40 (1)	Vanity mirror light (L.H.)		
E-41 (20)	Keyless entry control unit or short pin		
E-42 (6-B)	Spare connector (for CD auto changer) <Without amplifier>		

TSB Revision

DOOR

80100140



Connector color code

- B : Black
- Y : Yellow
- L : Blue
- G : Green
- R : Red
- BR : Brown
- V : Violet
- O : Orange
- GR : Gray

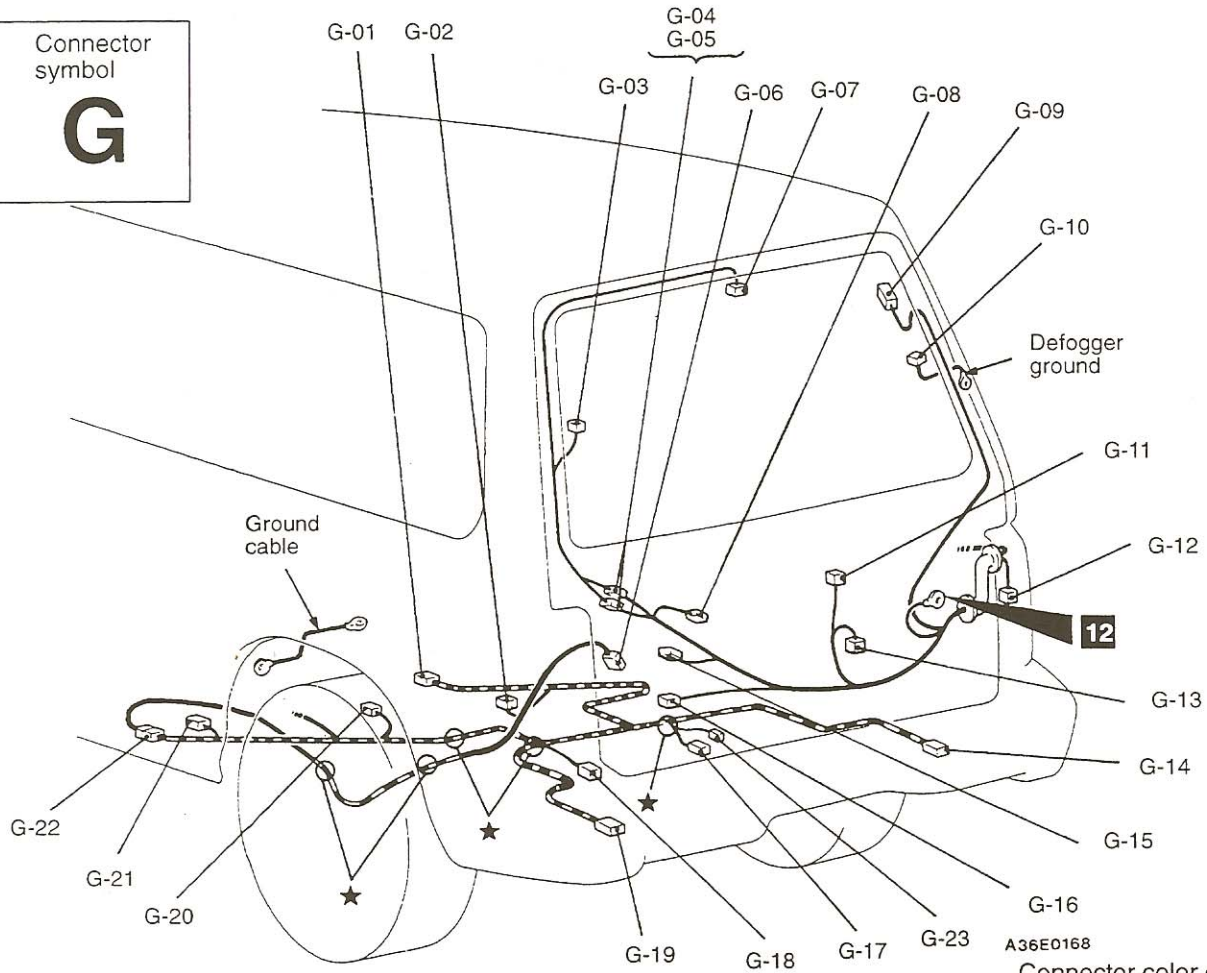
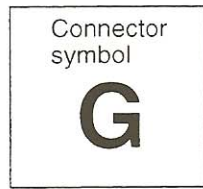
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F-01 (2-B)	Door speaker (R.H.)	F-16 (3)	Remote controlled mirror (L.H.) <Without mirror heater>
F-02 (3)	Remote controlled mirror (R.H.) <Without mirror heater>	F-17 (3)	Key switch (R.H.)
F-03 (2)	Power window motor (Front: R.H.)	F-18 (2)	Front door wiring harness (R.H.) and door light wiring harness combination
F-04 (8)	Power window sub switch and door lock switch (Front: R.H.)	F-19 (2)	Door light (Front: R.H.)
F-05 (4)	Door lock actuator (Front: R.H.)	F-20 (2)	Door light (Front: L.H.)
F-06 (2)	Power window motor (Rear: R.H.)	F-21 (3)	Key switch (L.H.)
F-07 (8)	Power window sub switch (Rear: R.H.)	F-22 (2)	Front door wiring harness (L.H.) and door light wiring harness combination
F-08 (4)	Door lock actuator (Rear: R.H.)	F-23 (2)	Tweeter (L.H.)
F-09 (4)	Door lock actuator (Rear: L.H.)	F-24 (2)	Tweeter (R.H.)
F-10 (8)	Power window sub switch (Rear: L.H.)	F-25 (7)	Remote controlled mirror (R.H.) <With mirror heater>
F-11 (2)	Power window motor (Rear: L.H.)	F-26 (7)	Remote controlled mirror (L.H.) <With mirror heater>
F-12 (4)	Door lock actuator (Front: L.H.)		
F-13 (2-B)	Door speaker (L.H.)		
F-14 (2)	Power window motor (Front: L.H.)		
F-15 (14)	Power window main switch and door lock switch (Front: L.H.)		

TSB Revision

BACK DOOR AND REAR UNDER FLOOR

80100180043



- A36E0168
- Connector color code
- B : Black
 - Y : Yellow
 - L : Blue
 - G : Green
 - R : Red
 - BR : Brown
 - V : Violet
 - O : Orange
 - GR : Gray

- | | | | |
|-------------|--|------------|--|
| G-01 (2-B) | Speed sensor (Rear: R.H.) <ABS> | G-12 (6-B) | Rear combination light (R.H.) |
| G-02 (4-B) | Shock absorber (Rear: R.H.)
<Remote controlled variable shock absorber> | G-13 (2) | Rear washer motor |
| G-03 (1-B) | Defogger (+) | G-14 (2) | Back-up light (R.H.) |
| G-04 (1) | Back door wiring harness and defogger cable combination | G-15 (2) | License plate light |
| G-05 (2) | Back door wiring harness and defogger cable combination | G-16 (2-B) | Door lock actuator (Back door) |
| G-06 (2-GY) | Rear differential lock detection switch | G-17 (2-B) | Fuel pump |
| G-07 (2) | High mounted stop light | G-18 (3) | Fuel gauge unit |
| G-08 (2) | Back door switch | G-19 (2) | Back-up light (L.H.) |
| G-09 (1) | Back door window glass antenna | G-20 (4-B) | Shock absorber (Rear: L.H.)
<Remote controlled variable shock absorber> |
| G-10 (1-B) | Defogger (-) | G-21 (2-B) | Speed sensor (Rear: L.H.) <ABS> |
| G-11 (3) | Rear wiper motor | G-22 (2-B) | Frame wiring harness and position wiring harness combination |
| | | G-23 (3-B) | Fuel tank pressure sensor |

TSB Revision

NOTES

A

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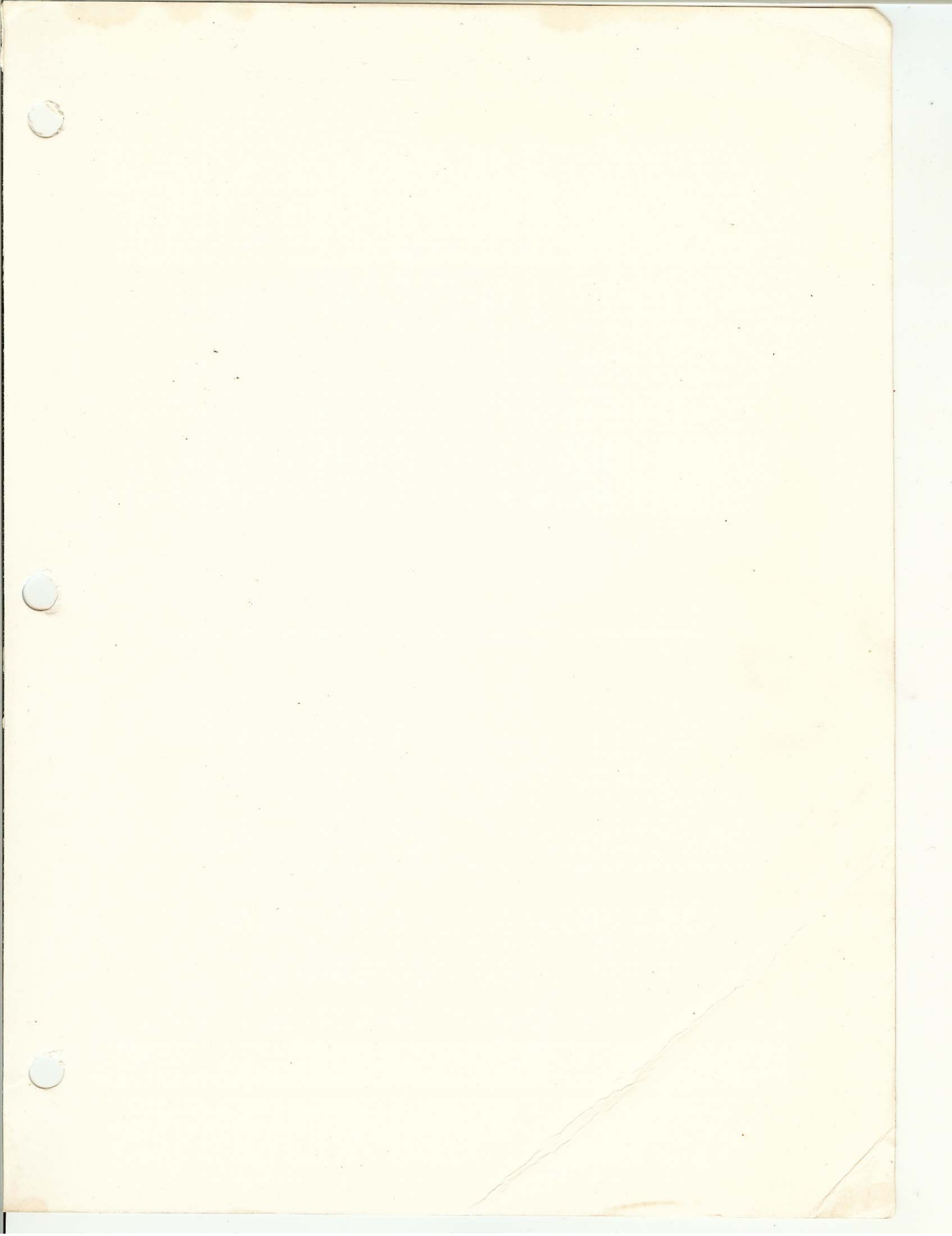
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QUICK REFERENCE CHART

VIN Identification Chart

No.	Item	Contents
1	Country	J: Japan
2	Make	A: Mitsubishi
3	Vehicle Type	4: Multi-Purpose Vehicle (MPV)
4	Other	M: Montero
5	Model Line	R: Montero (All)
6	Series	5: Premium
7	Body Type	1: 5-Door Wagon
8	Engine Type	R: 6G74 3.5L SOHC MFI
9	Check Digit	1 2 3 4 5 6 7 8 9 X
10	Model Year	W: 1998
11	Plant	J: Nagoya-3
12	Serial Number	Digits 12-17 (000001 - 999999)

Fluid Capacities

Description	U.S. Measure	Liter Measure
Engine Oil w/Filter & Cooler	5.5 qts.	4.9 L
Cooling System	10.0 qts.	9.5 L
Manual Transmission	3.3 qts.	3.2 L
Auto Transmission	8.9 qts.	8.5 L
Transfer Case	2.6 qts.	2.5 L
Rear Axle	3.3 qts.	3.2 L
Front Axle	1.22 qts.	1.15 L
Power Steering	1.12 qts.	1.06 L
Fuel Tank	24.3 gallons	92 L

Engine Specifications

Engine Type	6G74 3.5L SOHC MFI
Power	200 hp @ 5000 rpm
Torque	228 lbs-ft @ 3500 rpm
Firing Order	1-2-3-4-5-6
Compression Ratio	9.0:1
Compression Pressure (psi)	171 std./127 min.
Spark Plug Type (NGK)	PFR5J-11
Spark Plug Gap (mm/in)	1.0-1.1 / .039-.043
Basic Ignition Timing	5 deg. BTDC +/- 3 deg.
Curb Idle Speed	700 rpm +/- 100 rpm

Wheel & Tire

Tire Size	265/70HR15
Wheel Size	15 x 7 JJ
Inflation Pressure (psi)	26 Front / 29 Rear#
Wheel Tightening Torque	72-87 ft. lbs.

32 psi rear with excess load or trailer



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